D074281

CALSPAN ADVANCED TECHNOLOGY CENTER

IMPROVED LIGHTWEIGHT SUBCOMPACT
SIDE STRUCTURE CRASH TEST REPORT

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Calspan Report No. 6225-V-22

Prepared For:

THE BUDD COMPANY
TECHNICAL CENTER
FORT WASHINGTON, PA 19034

PURCHASE ORDER NO. TC-19302

TEST: TEST NO. 19
TYPE OF TEST: CAR-TO-CAR FRONT-TO-SIDE OBLIQUE
TEST DATE: 15 JANUARY 1981

A DIVISION OF CALSPAN CORPORATION
AN ARVIN COMPANY P.O. BOX 400 BUFFALO, NEW YORK 14225

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TEST OBJECTIVE

The objective of this 60° oblique side impact was to obtain performance data on the modified side structure of a 1976 Volkswagen Rabbit. The Budd Company designed and fabricated the "optimized" (approximately 25 pounds per side) alteration. This test was a 29.59 MPH, 60° oblique impact by an unmodified 1978 Chevrolet Impala into the left side of the VW Rabbit at the DOR point.

A secondary test objective was the acquisition of side impact data using the newly modified side impact dummy developed by HSRI under contract to the DOT/NHTSA. This dummy was placed in the struck vehicle driver position.

This test program is part of the National Highway Traffic Safety Administration (NHTSA) Contract DOT-HS-7-01588 to improve subcompact side structures.

PRESENTATION OF RESULTS

This test report presents the test results from a car-to-car, front-to-side, 60° oblique impact. Included in this document are still photographs, vehicle and dummy response data in plotted form, vehicle interior and exterior damage sketches, pre- and post-test measurements for side intrusion and door crush. High speed motion pictures and color photographs were obtained and submitted to the sponsor under separate cover.

Table 1

CRASH TEST SUMMARY

TEST NO. 19 PROJECT Improved Lightweight Subcompact Side Structure

DATE 1-15-81 TIME 2:26 TEMP. 28°F.

TEST CONDITION Car-to-Car, 60° Oblique

VEHICLE NO. 1 1978 Chevrolet Impala

VEHICLE NO. 2 1976 VW Rabbit (Modified)

	VEH. NO. 1	VEH. NO. 2
TEST WEIGHT (lbs)	3960	2240
IMPACT ANGLE (deg)*	0°	300°
IMPACT VELOCITY (mph)**	29.59"	0
MAX. CRUSH (in)	7.4"	12.0" at Window Sill Height
MAX. INTRUSION (in)	-	9.1" at Plane 2, Row 3

DUMMIES	VEH. NO. 1	VEH. NO. 2
TYPE	Hybrid II, Part 572	Side Impact Dummy - S/N 873
LOCATION	LF (1)	LF (1)
RESTRAINT	Production 3-Pt. System	

NUMBER OF DATA CHANNELS 65
NUMBER OF HIGH SPEED CAMERAS 10

*WITH RESPECT TO TOW TRACK CENTERLINE
**SPEED TRAP MEASUREMENT (±0.5% ACCURACY)

Table 1 (Continued)

OBSERVATIONS (VEHICLE NO. 1)

GLAZING Undamaged

DOORS Undamaged

SEAT ANCHORAGES Intact

RESTRAINTS Intact

OBSERVATIONS (VEHICLE NO. 2)

GLAZING Windshield is cracked; Driver side front window is broken out; Driver side rear window (plastic) is intact.

DOORS Driver side door is jammed closed; Passenger side door is undamaged.

SEAT ANCHORAGES Intact

RESTRAINTS Not used

GENERAL COMMENTS VW Structure - A-pillar is buckled approximately 9" above the sill and the connection between A-pillar and sill is damaged. The A-pillar window post and the roof line are undamaged. The sill is rolled upward between the A and B-pillars due to the action of the door interlocks. The B-pillar external surface looks quite good with maximum deformation approximately 15" above the sill. Left side damage extends from the A-pillar to the rear wheel well. The left front fender is damaged due to a secondary collision with the Impala. Maximum exterior deformation is approximately 8" rearward of the A-pillar at window sill height. Generally the maximum deformation extends in a vertical line from the sill to the window sill approximately 8" rearward of the A-pillar and in a horizontal line at Impala bumper height.

Table 1 (Continued)

The B-pillar is buckled, on the interior, at the top of the gusset between the floor and the B-pillar. The maximum B-pillar intrusion is also located at that point. The rear floor pan and the seat riser are badly deformed. The steering wheel and column are bent inboard due to intrusion at the window sill level. The roof and roll bar are undamaged.

VW Occupant - The SID driver occupant travelled across the vehicle and came to rest in the passenger seat with its feet in front of the driver's seat. The driver's head broke through the side window and struck the hood of the oncoming Impala as shown by chalk marks. A summary of the response is shown in Table 10.

Data Quality:

Vehicle 2, Position 1:

- Upper spine Y accelerometer was intermittantly open.
- Head Z accelerometer had broken wire.
- Left lower rib Y accelerometer was intermittantly open.

Table 2

VEHICLE TEST WEIGHTS - TEST NO. 19

Bullet Vehicle - 1978 Chevrolet Impala

Left Front	1070	lbs.	Left Rear	900	lbs.
Right Front	1100	lbs.	Right Rear	890	lbs.
Total Front	2170	lbs.	Total Rear	1790	lbs.

Total Weight = 2170 lbs. + 1790 lbs. = 3960 lbs.

Wheel Base = 115 in.

Cg_{FW} = $\frac{1790 \text{ lbs.} \times 115 \text{ in.}}{3960 \text{ lbs.}}$ = 51.98 in.

Target Vehicle - 1976 VW Rabbit (Modified)

Left Front	650	lbs.	Left Rear	470	lbs.
Right Front	670	lbs.	Right Rear	450	lbs.
Total Front	1320	lbs.	Total Rear	920	lbs.

Total Weight = 1320 lbs. + 920 lbs. = 2240 lbs.

Wheel Base = 95 in.

Cg_{FW} = $\frac{920 \text{ lbs.} \times 95 \text{ in.}}{2240 \text{ lbs.}}$ = 39.01 in.

Figure 1 PRE-TEST NO. 19 - IMPACT CONFIGURATION

Note: Due to a loss of still film all pre-test photographs are from Test No. 17.

Figure 2 VEHICLE 1 (1978 CHEVROLET IMPALA) - PRE- AND POST-TEST FRONT THREE-QUARTER VIEW

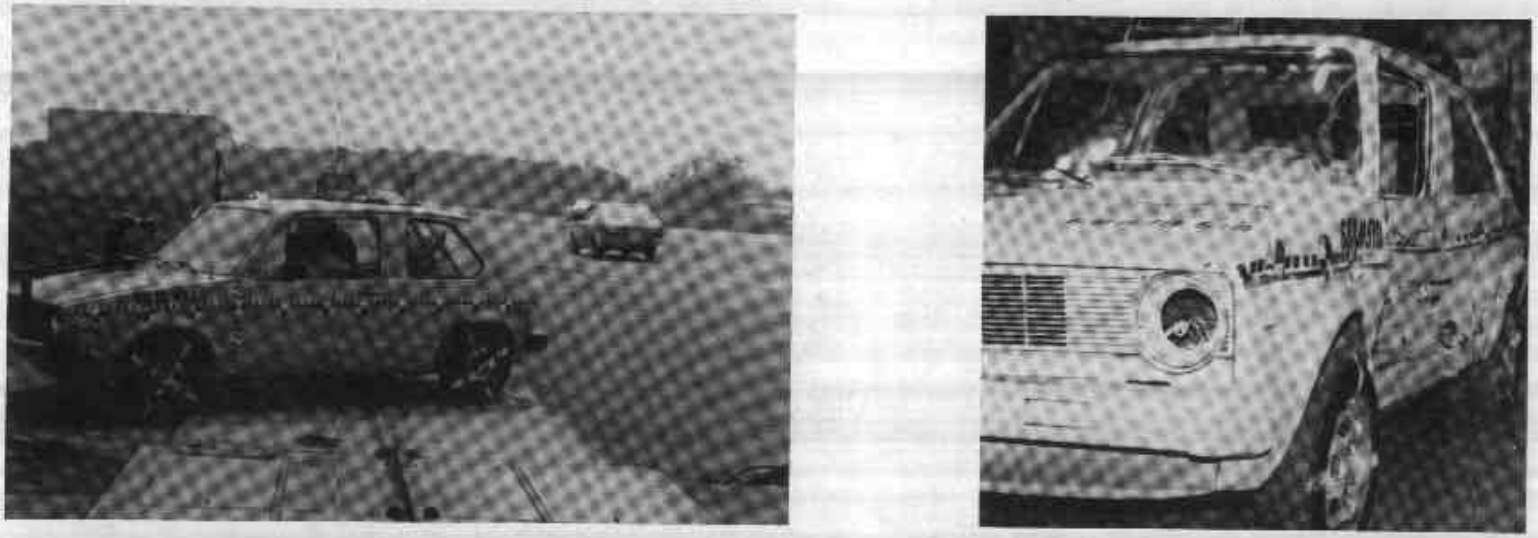


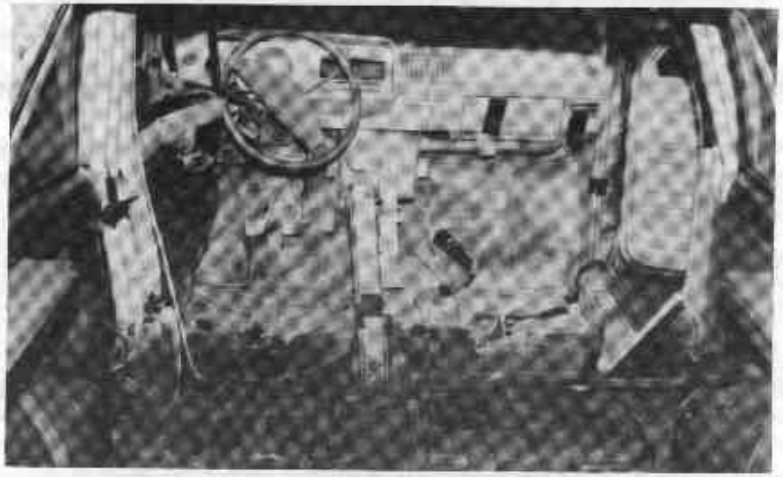
Figure 3 VEHICLE 2 (1975 VW RABBIT) - PRE- AND POST-TEST FRONT THREE-QUARTER VIEW

Note: Due to a loss of still film all pre-test photographs are from Test No. 17.

Figure 4 VEHICLE 2 (1976 VW RABBIT) - PRE- AND POST-TEST SIDE VIEW

Figure 5 VEHICLE 2 (1976 VW Rabbit) - PRE- AND POST-TEST REAR THREE-QUARTER VIEW

Note: Due to a loss of still film all pre-test photographs are from Test No. 17.



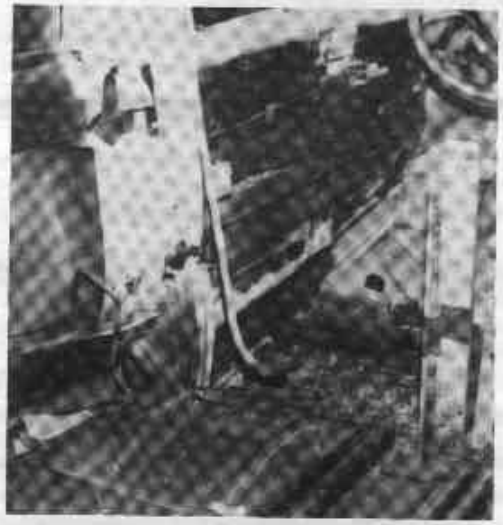


Figure 6 VEHICLE 2 (1976 VW RABBIT) - PRE- AND POST-TEST INTERIOR VIEWS

Note: Due to a loss of still film all pre-test photographs are from Test No. 17.

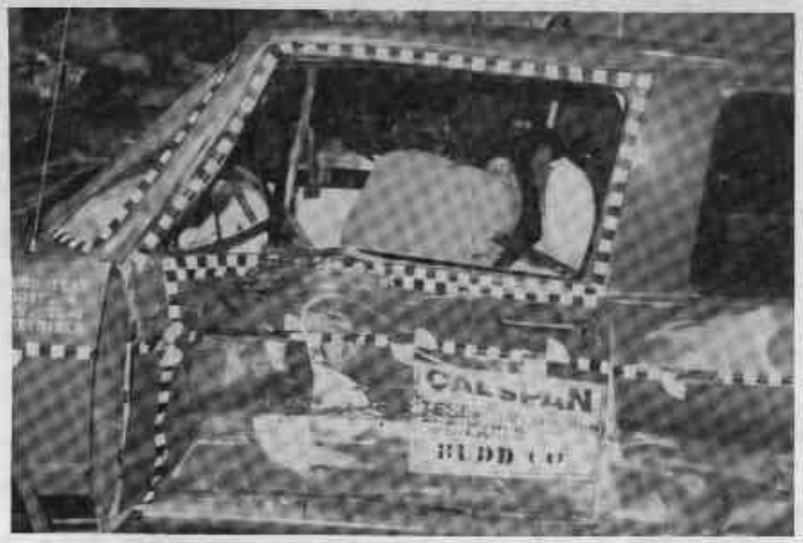


Figure 7 VEHICLE 2 (1976 VW RABBIT) - PRE AND POST-TEST OCCUPANT POSITION

Note: Due to a loss of still film all pre-test photographs are taken from Test No. 17.

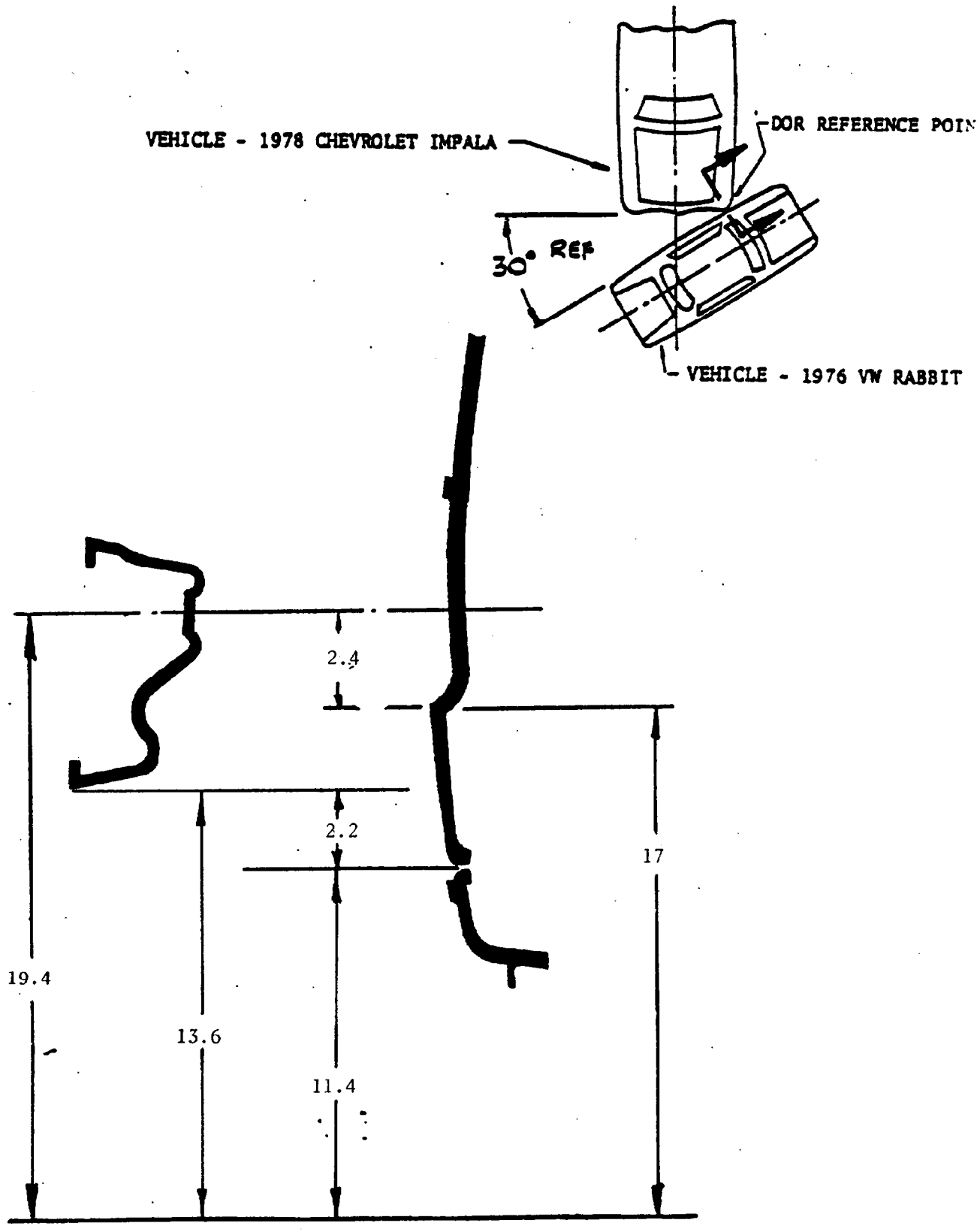
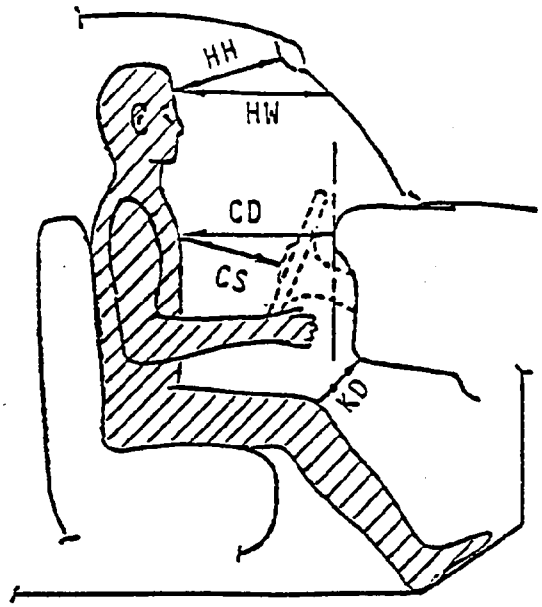


Figure 8 BUDD DYNAMIC TEST NO. 19

	VW DRIVER	IMPALA DRIVER
HH	16-1/2	14
HW	21-1/2	21
CD	21	22-1/2
CS	13-3/4	16-7/8
KDL	5-3/4	8-1/2
KDR	6	8



	VW DRIVER	IMPALA DRIVER
HR	6-1/4	7-3/4
HS	7	9
AD	3.25	5-3/4
HD	5-5/8	6-1/4

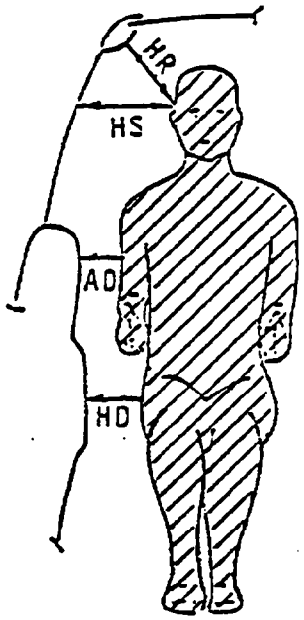


Figure 9 BUDD DYNAMIC TEST NO. 19

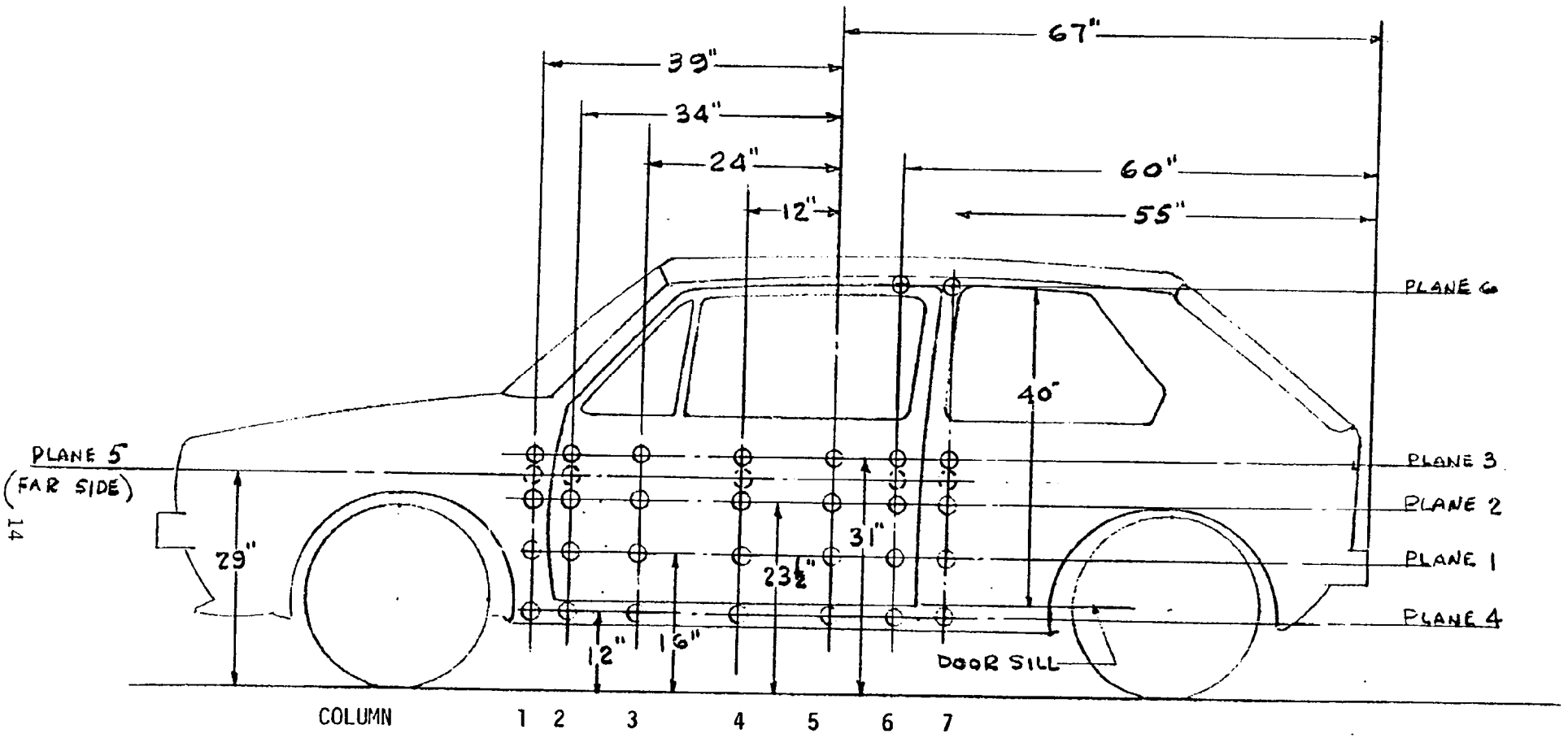


Figure 10 SIDE INTRUSION MEASUREMENT LOCATIONS

Table 3

SIDE INTRUSION MEASUREMENTS

DIMENSIONS LISTED BELOW ARE FROM POINTS SHOWN ON FIG. 10 TO REF. PLANES LOCATED PARALLEL TO AND OUTBOARD FROM ℄ OF VEHICLE (L. SIDE 34" - R. SIDE 34")

		DIMENSIONS (INCHES) ROW						
PLANE NO.		1	2	3	4	5	6	7
1	PRE	4.75	4.8	4.7	4.6	4.6	4.6	4.7
	POST	7.4	11.2	14.2	14.2	12.9	11.8	10.6
	DIFF.	2.65	6.4	9.5	9.6	8.3	7.2	5.9
2	PRE	4.1	4.2	4.0	3.9	3.8	3.8	4.0
	POST	7.5	12.5	15.9	15.4	14.4	13.7	12.3
	DIFF.	3.4	8.3	11.9	11.5	10.6	9.9	8.3
3	PRE	4.5	4.5	4.3	4.3	4.3	4.2	4.2
	POST	7.4	10.3	14.5	13.8	11.8	11.1	10.4
	DIFF.	2.9	5.8	10.2	9.5	7.5	6.9	6.2
4	PRE	5.9	5.8	5.8	5.8	5.8	5.8	5.8
	POST	8.0	10.0	10.5	10.4	10.3	9.9	9.2
	DIFF.	2.1	4/2	4/7	4/6	4/5	4.1	3.4
5	PRE	3.4	3.4	3.3	3.3	3.3	3.3	3.5
	POST	2.5	2.5	2.5	2.5	2.7	2.8	2.9
	DIFF.	-.9	-.9	-.8	-.8	-.6	-.5	-.6
6	PRE						12.2	12.2
	POST						13.1	13.1
	DIFF.						.9	.9
7	PRE							
	POST							
	DIFF.							

1976 VW RABBIT

BUDD DYNAMIC TEST NO.

Table 4

DOOR THICKNESS MEASUREMENTS

DIMENSIONS LISTED BELOW ARE MEASURED WITH A ROD THROUGH A 1/8" HOLE AT EACH LOCATION AS SHOWN IN FIGURE 9

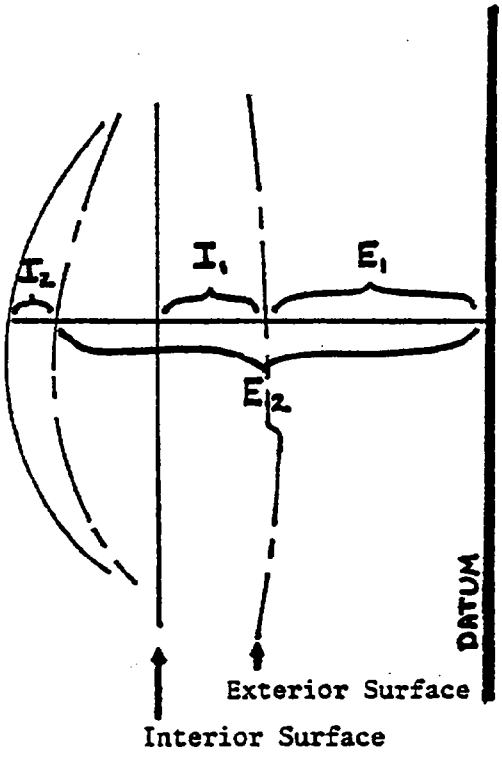
PLANE NO.		THICKNESS (INCHES) ROW 2	3	4	5
1	PRE	3.3	3.3	3.3	2.8
	POST	.3	0.0	.7	.0
	DIFF.	-3.0	-3.3	-2.6	-2.8
2	PRE	.7	4.1	4.1	3.9
	POST	.7	1.3	.3	1.3
	DIFF.	0	-2.8	-3.8	-2.6
3	PRE	.4	3.6	3.1	3.1
	POST	1.2	1.1	2.4	3.0
	DIFF.	+0.8	-2.5	-.7	-.1

1976 VW RABBIT

BUDD DYNAMIC TEST NO. 19

Table 5

INTRUSION DIMENSIONS



NOTE: All dimensions taken positive from datum toward vehicle interior.

Where:
- E_1 = pre-test exterior surface (Table 3)
- E_2 = post-test exterior surface (Table 3)
- I_1 = pre-test door thickness (Table 4)
- I_2 = post-test door thickness (Table 4)

$$\text{Intrusion} = (E_2 + I_2) - (E_1 + I_1)$$

$$\therefore \text{Intrusion} = (E_2 - E_1) + (I_2 - I_1)$$

Dimension listed below are for points shown on Figure 10.

	COLUMN NO.			
PLANE NO.	2	3	4	5
1	3.4	6.2	7.0	5.5
2	8.3	9.1	7.7	8.0
3	6.6	7.7	8.8	7.4

1976 VW RABBIT BUDD DYNAMIC TEST NO. 19

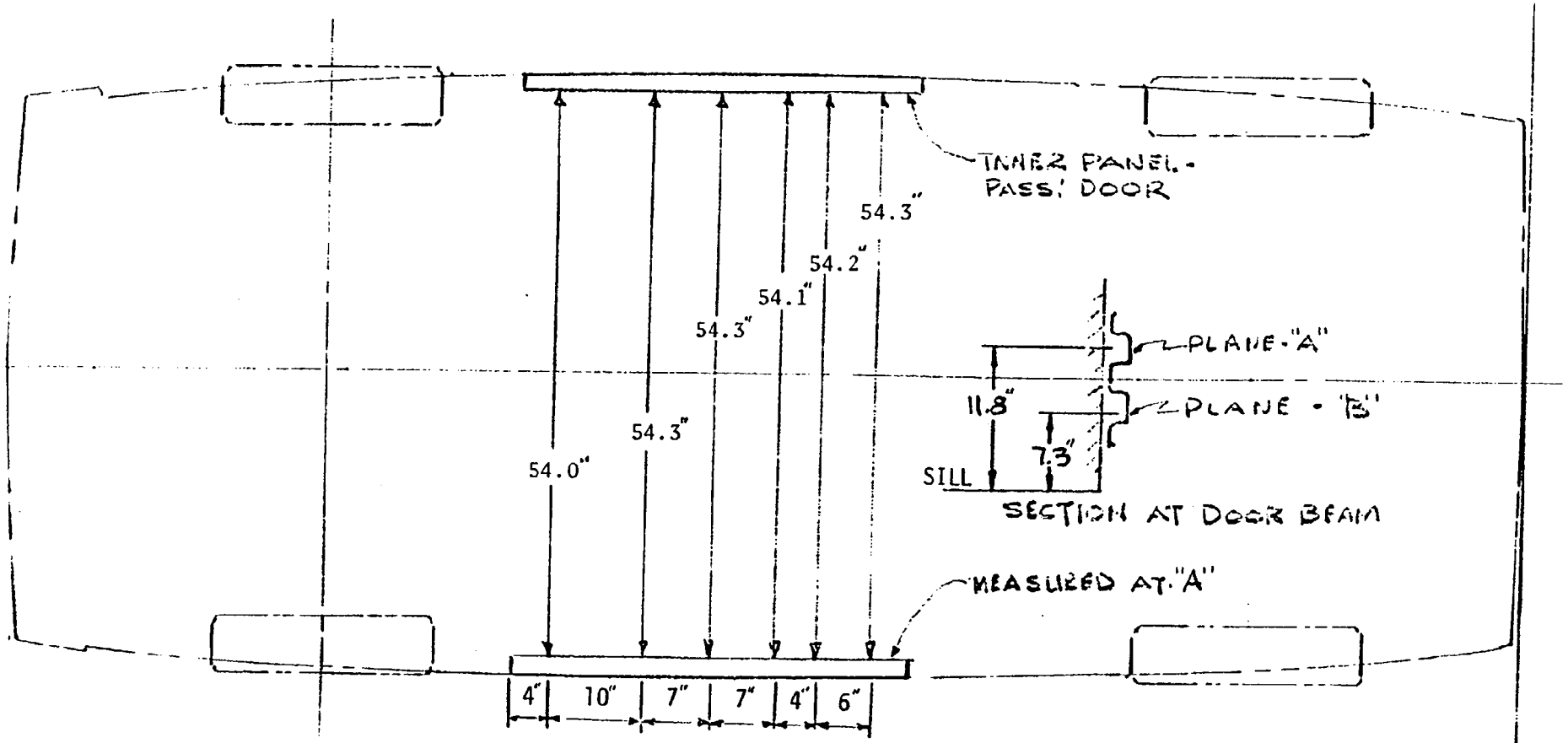


Figure 11 PRE-TEST DOOR BEAM INTRUSION MEASUREMENTS - PLANE "A"

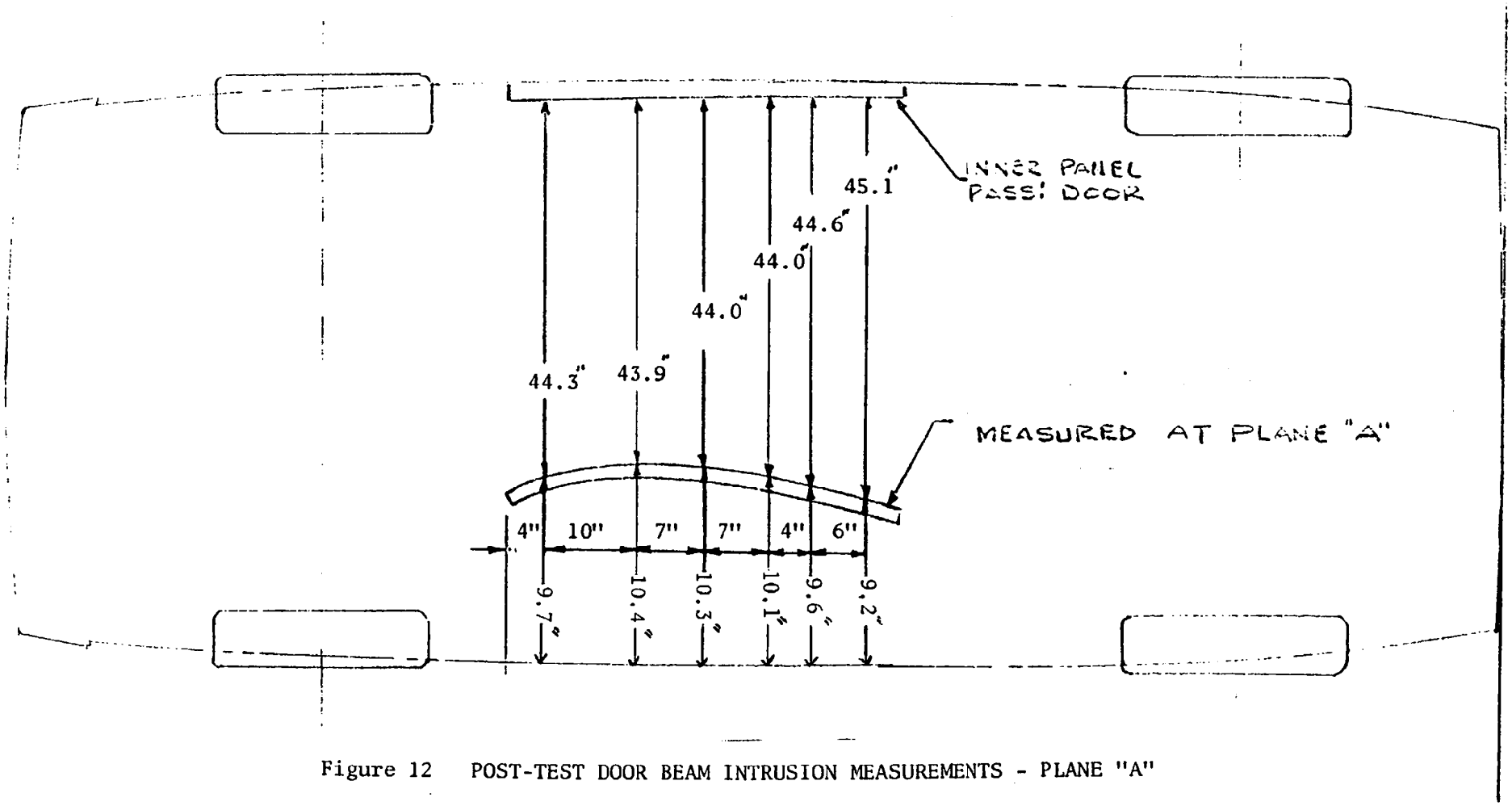


Figure 12 POST-TEST DOOR BEAM INTRUSION MEASUREMENTS - PLANE "A"

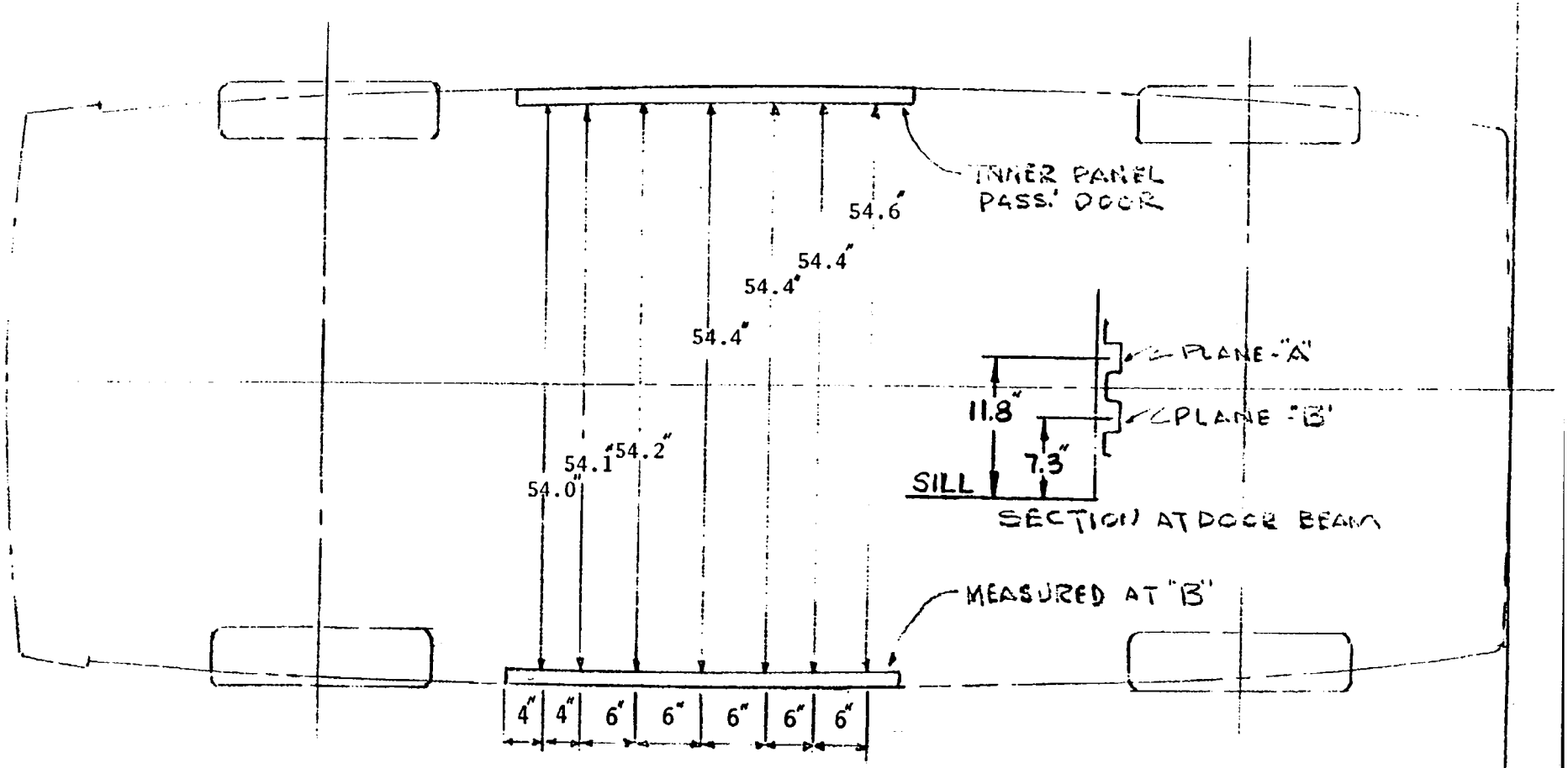


Figure 13 PRE-TEST DOOR BEAM INTRUSION MEASUREMENTS - PLANE "B"

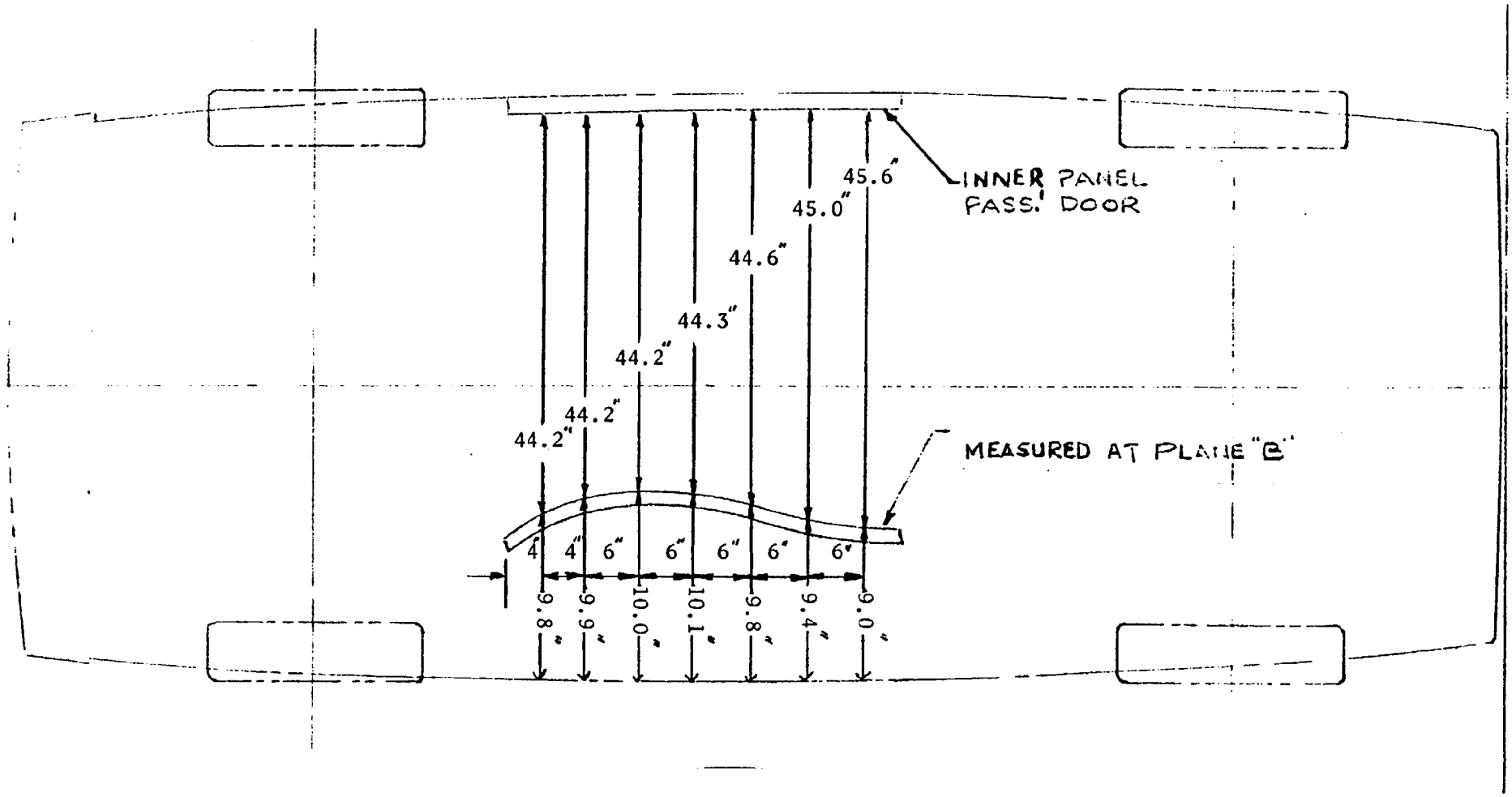


Figure 14 POST-TEST DOOR BEAM INTRUSION MEASUREMENTS - PLANE "B"

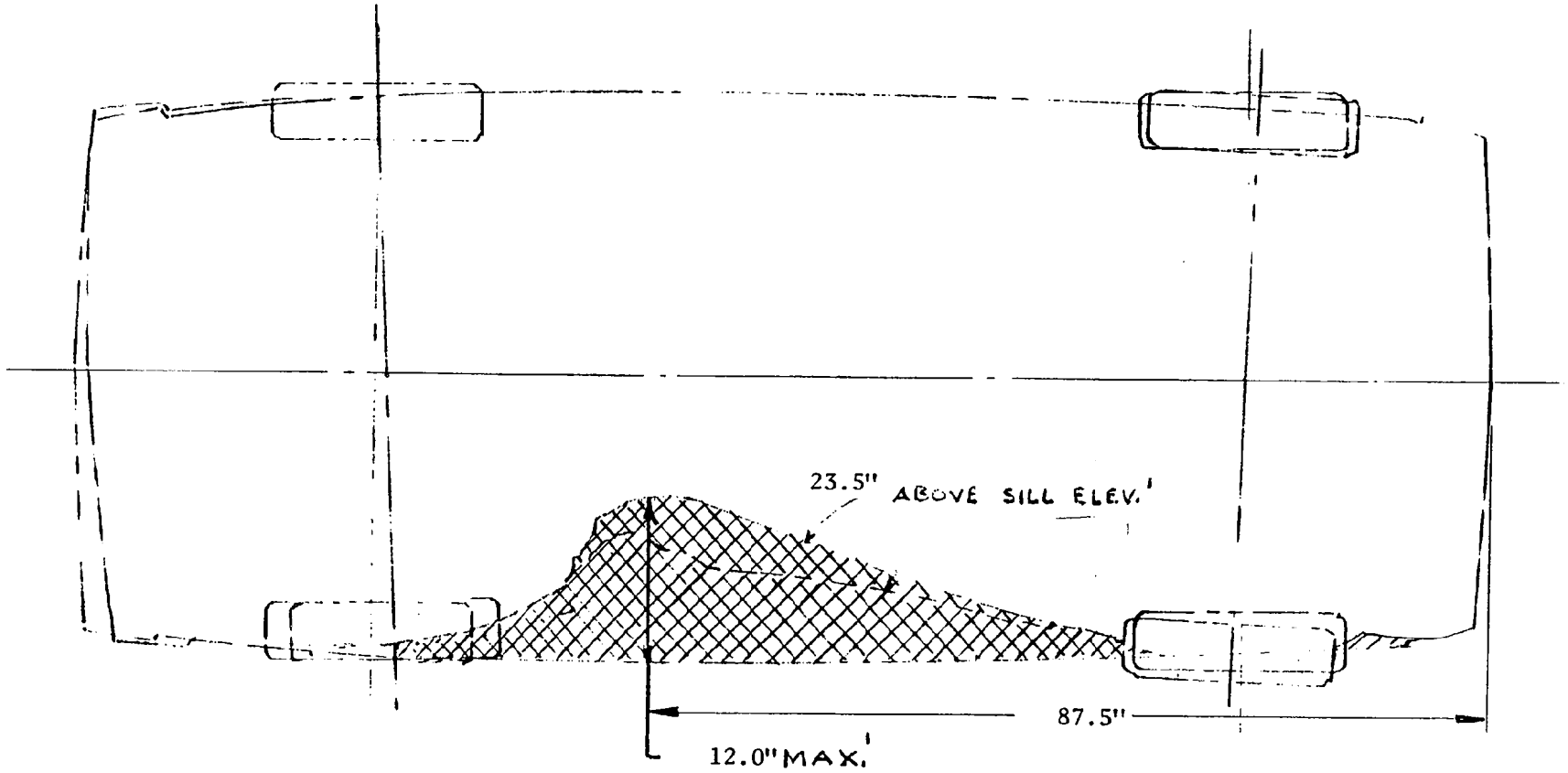


Figure 15 PRE- & POST-TEST MAX. EXTERIOR DEFORMATION

CAR NO. 2 1976 VW RABBIT

BUDD DYNAMIC TEST NO. 19

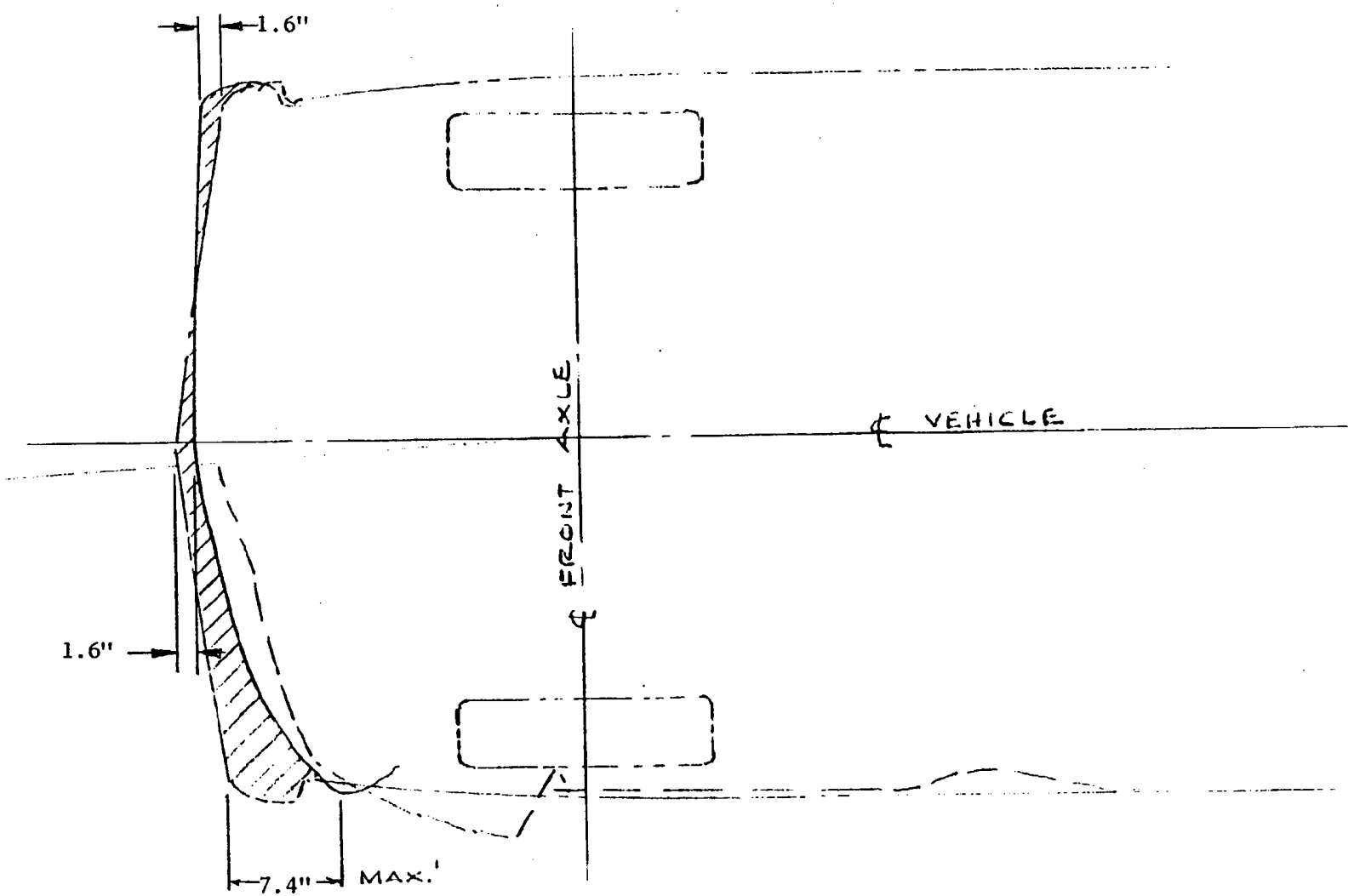


Figure 16 PRE- AND POST-TEST DEFORMATION

CAR NO. 1 1978 CHEVROLET IMPALA

BUDD DYNAMIC TEST NO. 19

Table 6

ELECTRONIC INSTRUMENTATION

CAR 1 - 1978 CHEVROLET IMPALA — BUDD DYNAMIC TEST NO. 19

TRANSDUCER DESCRIPTION OR ACCELEROMETER LOCATION *	DIRECTION OF PARAMETER BEING MEASURED	LOCATION ON VEHICLE	DESCRIPTION LISTED ON DATA PLOTS
VEHICLE ACCELEROMETER			
1	X	Left Sill next to Rear Seat	Veh. #1 Acc. Pack #1
2	X	Right Sill next to Rear Seat	Veh. #1 Acc. Pack #2
3	X, Y, Z	Deck Over Rear Axle	Veh. #1 Acc. Pack #3
4	X, Y, Z	Firewall	Veh. #1 Acc. Pack #4
5	X	Rear Compartment	Veh. #1 Acc. Pack #5
6	X, Y, Z	Top of Engine, Carburetor	Veh. #1 Acc. Pack #6
7	X	Front Crossmember	Veh. #1 Acc. Pack #7
8	X	Bumper (rear face)	Veh. #1 Acc. Pack #8
9	X	Rear Compartment	Veh. #1 Acc. Pack #9
DUMMY			
LF Head (Dummy (1))	X, Y, Z	Left Front Seat	Veh. #1 Pos. #1 Head
LF Chest (Dummy (1))	X, Y, Z	Left Front Seat	Veh. #1 Pos. #1 Chest
LF Femurs (Dummy (1))	R, L**	Left Front Seat	Veh. #1 Pos. #1 Femur
LF Belts (Dummy (1))	U, R, L***	Left Front Seat	Veh. #1 Pos. #1 Belts
MISCELLANEOUS			
10	Yaw Rate	Centerline Behind Front Seats	Veh. #1 Yaw Rate

*See Accelerometer Layout Diagram, Figure 17

**Right and Left Femur Forces

***Upper, Lower Right and Lower Left Belt Forces

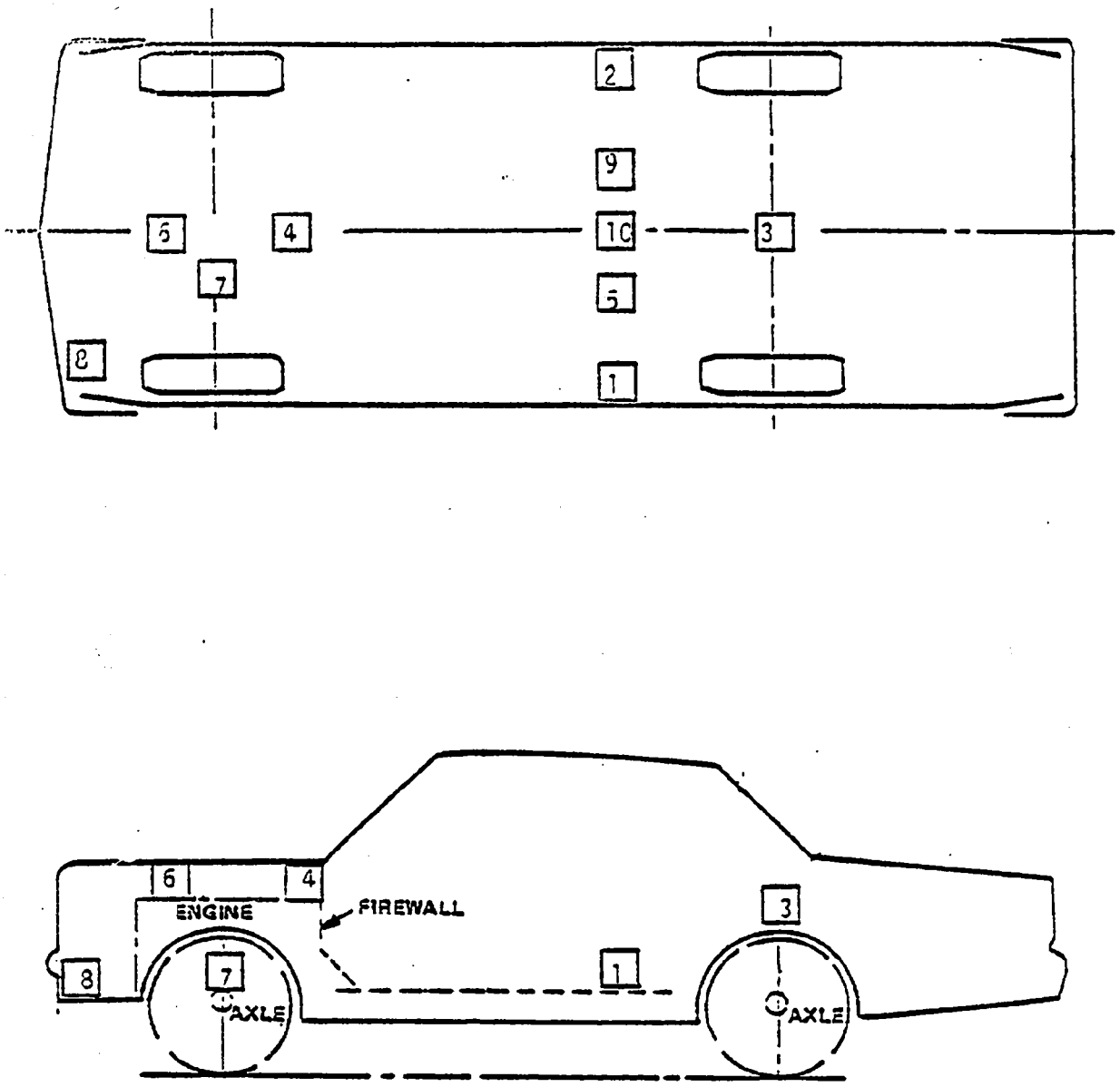


Figure 17 ACCELEROMETER LOCATIONS

VEHICLE NO. 1 1978 CHEVROLET IMPALA BUDD DYNAMIC TEST NO. 19

Table 7
ELECTRONIC INSTRUMENTATION

VEHICLE 2 1976 Volkswagen Rabbit — BUDD DYNAMIC TEST NO. 19

TRANSDUCER DESCRIPTION OR ACCELEROMETER LOCATION *	DIRECTION OF PARAMETER BEING MEASURED	LOCATION ON VEHICLE	DESCRIPTION LISTED ON DATA PLOTS
VEHICLE ACCELEROMETER			
1	X, Y, Z	Right Sill next to Front Seat	Acc. Pack #1
2	X, Y, Z	Right Sill next to Rear Seat	Acc. Pack #2
3	X, Y, Z	Deck over Rear Axle	Acc. Pack #3
4	X	Rear Compartment	Acc. Pack #4
5	X	Rear Compartment	Acc. Pack #5
6	Y	Lower Left Door Centerline	Acc. Pack #6
7	Y	Mid-Rear of Left Door	Acc. Pack #7
8	Y	Upper Left Door Centerline	Acc. Pack #8
9	Y	Mid-Front of Left Door	Acc. Pack #9
DUMMY			
LF Head (Dummy (1))	X, Y, Z	Left Front Seat	Pos. #1 Head
LF Upper Spine (Dummy (1))	X, Y, Z	Left Front Seat	Pos. #1 Upper Spine
LF Lower Spine (Dummy (1))	X, Y, Z	Left Front Seat	Pos. #1 Lower Spine
LF Pelvis (Dummy (1))	X, Y, Z	Left Front Seat	Pos. #1 Pelvic
LF Upper Left Rib(Dummy(1))	Y	Left Front Seat	Pos. #1 Upper L Rib Y
LF Lower Left Rib(Dummy(1))	X	Left Front Seat	Pos. #1 Lower L Rib X
LF Upper Right Rib(Dummy(1))	Y	Left Front Seat	Pos. #1 Upper R Rib Y
LF Upper Sternum(Dummy(1))	X	Left Front Seat	Pos. #1 Upper Front X
LF Lower Sternum(Dummy(1))	X	Left Front Seat	Pos. #1 Lower Front X
LF Lower Right Rib(Dummy(1))	X	Left Front Seat	Pos. #1 Lower R Rib X
MISCELLANEOUS			
10	Yaw Rate	Centerline behind Front Seats	Yaw Rate
11-14	Side Intrusion	Side Intrusion (Driver Side)	Pot. #1, 2, 3, 4

*SEE ACCELEROMETER LAYOUT DIAGRAM FIGURE 18

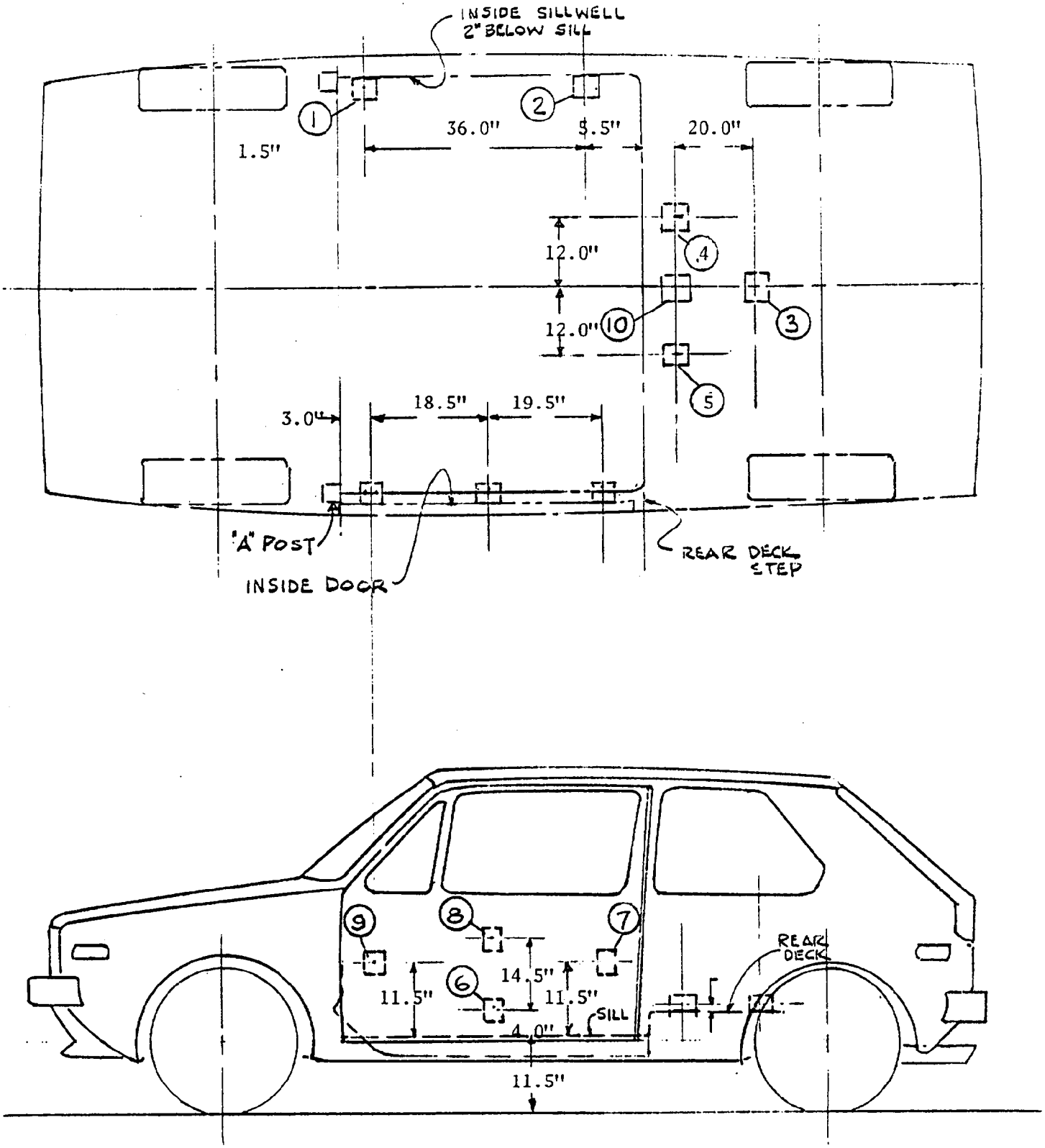


Figure 18 VEHICLE ACCELEROMETER LOCATIONS

CAR NO. 2 TARGET VEHICLE - 1976 VOLKSWAGEN RABBIT BUDD DYNAMIC TEST NO. 19

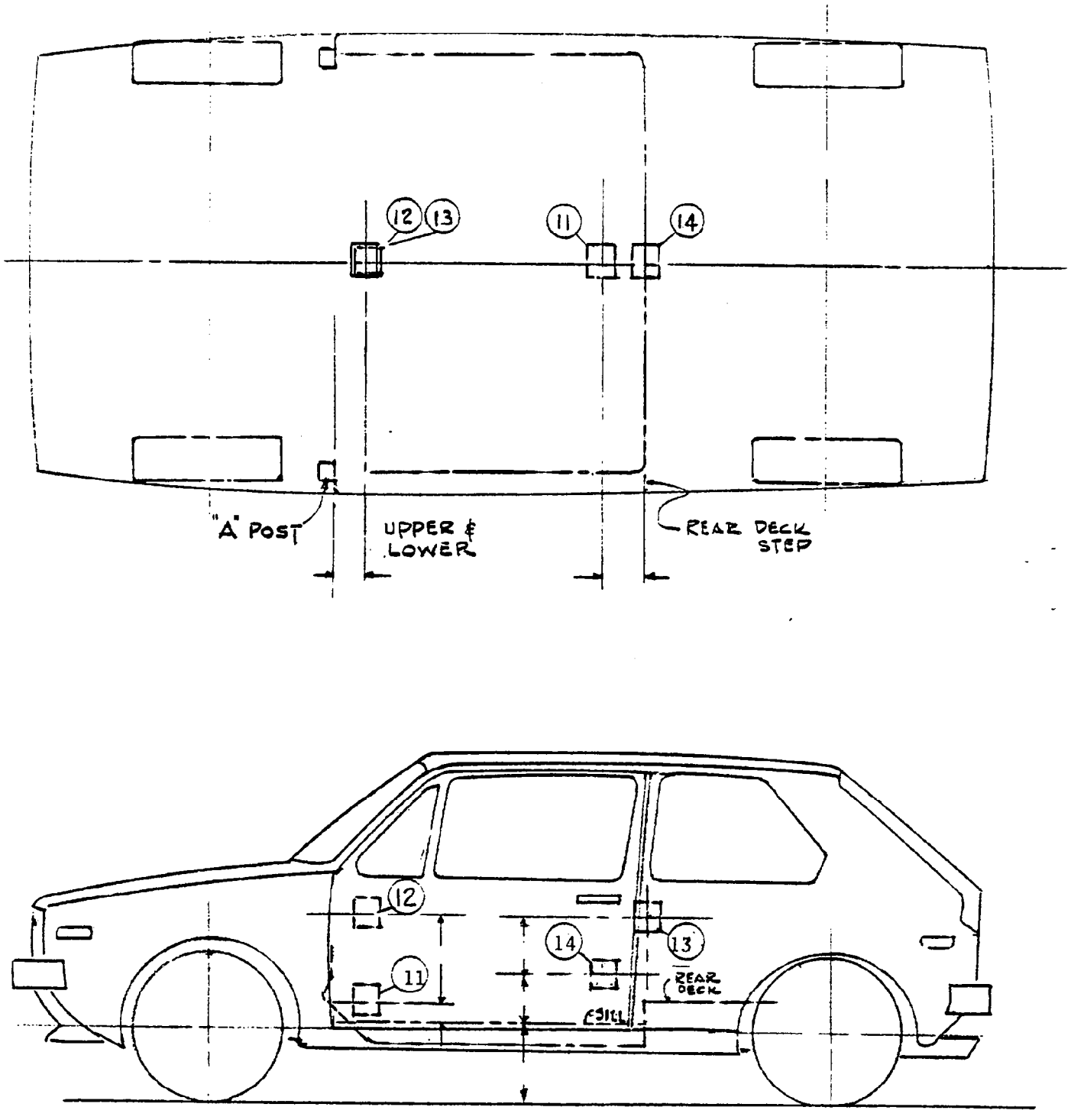


Figure 19 POTENTIOMETER LOCATIONS
CAR NO. 2 TARGET VEHICLE - 1976 VOLKSWAGEN RABBIT BUDD DYNAMIC TEST NO. 19

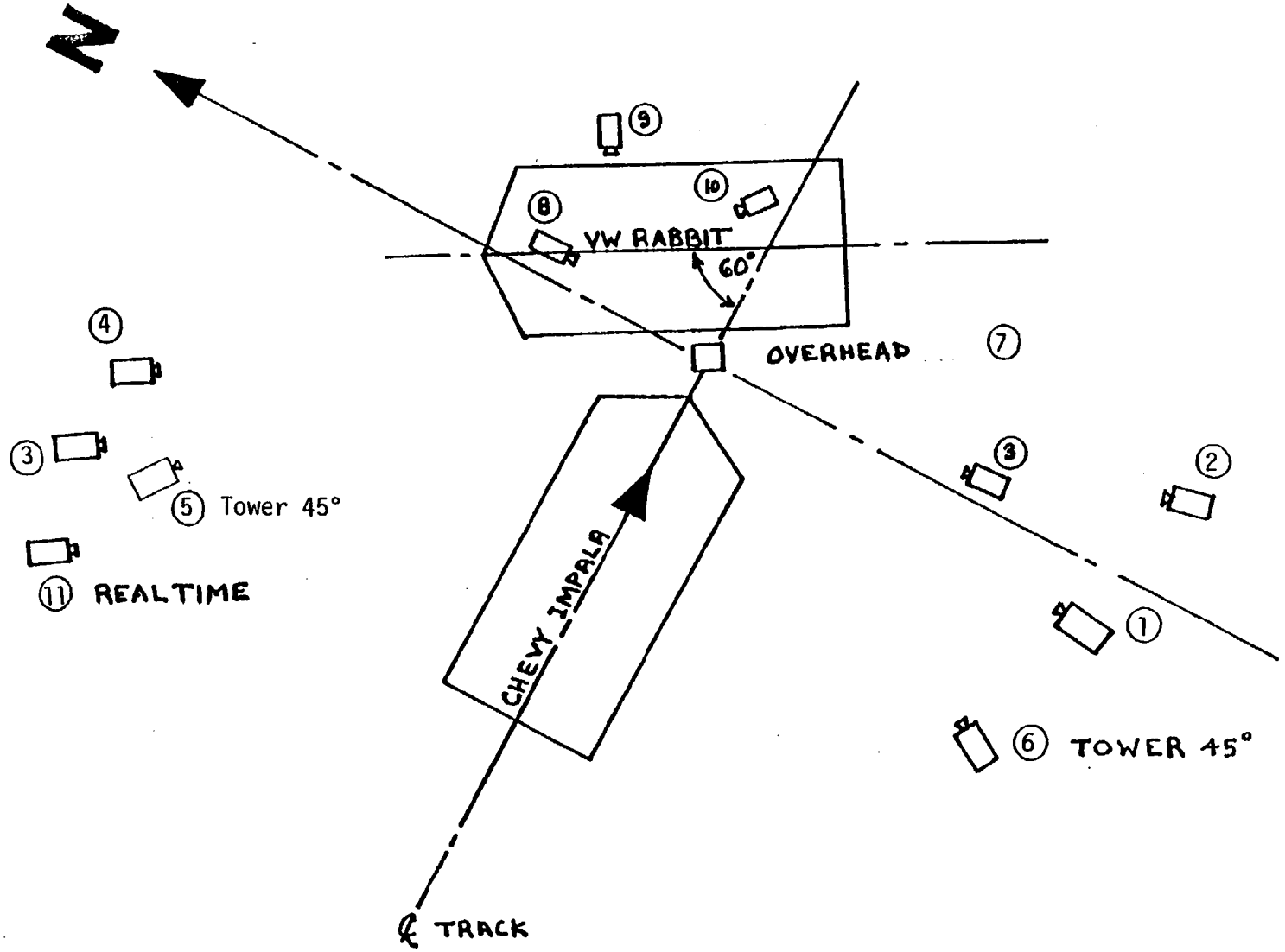


Figure 20 CAMERA POSITIONS

BUDD DYNAMIC TEST NO. 19

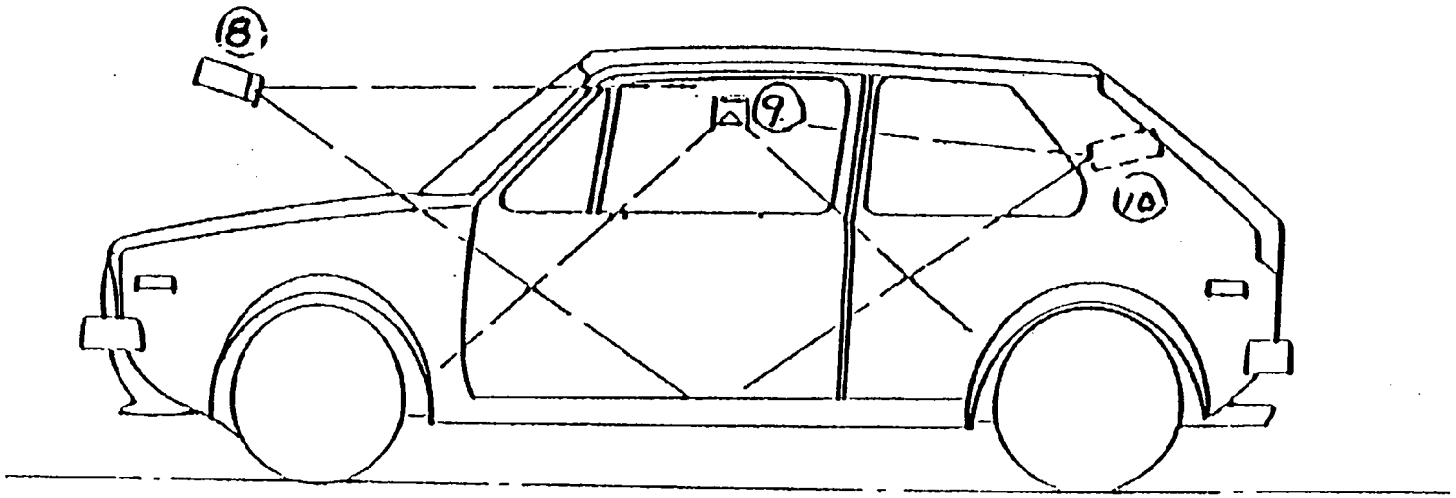


Figure 21 ON-BOARD HIGH SPEED CAMERA LOCATIONS

VEHICLE NO. 2 VW RABBIT BUDD DYNAMIC TEST NO. 19

Table 8

HIGH SPEED CAMERA INFORMATION
BUDD DYNAMIC TEST NO. 19

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)
1	SOUTH WIDE	PHOTOSONIC	13 mm	450
2	SOUTH LOW	PHOTOSONIC	50 mm	450
3	NORTH WIDE	PHOTOSONIC	13 mm	500
4	NORTH CLOSE	PHOTOSONIC	50 mm	450
5	NORTH TOWER	PHOTOSONIC	50 mm	450
6	TOWER 45°	PHOTOSONIC	13 mm	450
7	TOWER	PHOTOSONIC	13 mm	450
8	O.B. HOOD	STALEX	8 mm	1100
9	O.B. DOOR	STALEX	8 mm	1100
10	O.B. REAR	STALEX	8 mm	1400

NOTE: CAMERAS ARE NUMBERED ACCORDING TO SPLICING SEQUENCE OF FILM.

(24 fps) REAL TIME MOVIE FILM COVERAGE OF PRE-CRASH, POST-CRASH AND CRASH EVENT SPLICED AT START AND END OF FILM.

Table 9

DUMMY INJURY CRITERIA VALUES

CAR 1 - STRIKING VEHICLE - 1978 CHEVROLET IMPALA BUDD DYNAMIC TEST NO. 19

	MAXIMUM ACCELERATION ("G") *											
	HEAD				CHEST				PELVIS			
	X	Y	Z	R	X	Y	Z	R	X	Y	Z	R
DUMMY (1)	-19	-4	11	**19	-19	3	-5	**18.5				
DUMMY (2)												
DUMMY (3)												
DUMMY (4)												

	MAXIMUM FORCE-FEMUR LOAD (LBS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	-108	230
DUMMY (2)		
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)	775	1000	250
DUMMY (2)			
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**				SEVERITY INDEX	
	HIC	t_1 (SEC)	t_2 (SEC)	AVE. ACC. (g) t_1 TO t_2	HEAD	CHEST
DUMMY (1)	58.5	.0924	.1527	15.7	72.9	
DUMMY (2)						
DUMMY (3)						
DUMMY (4)						

*NOT INCLUDING SECONDARY IMPACTS

**DEFINED AS EXCEEDING 0.003 SEC. DURATION

Table 10

SIDE IMPACT DUMMY INJURY CRITERIA VALUES

MAXIMUM ACCELERATION ("G")*

VEHICLE NO. 2 - VW RABBIT

BUDD DYNAMIC TEST NO. 19

	X	Y	Z	RESULTANT**
HEAD	-38	42	N.G.	47***
UPPER SPINE	-15	71	-54	57
LOWER SPINE	120	80	-94	81
PELVIC	-38	116	-32	108

UPPER LEFT RIB (Y)		53	
LOWER LEFT RIB (X)	N.G.		
UPPER RIGHT RIB (Y)		64	
LOWER RIGHT RIB (X)	28		
UPPER STERNUM (X)	-30		
LOWER STERNUM (X)	-35		
RIB CAGE DEFLECTION (COMP. +)			

HIC	***186.3
T1 (Sec)	.0687
T2 (Sec)	.1065
AVE. ACC. (G)	30.0
HEAD SEVERITY	248.6

*NOT INCLUDING SECONDARY IMPACTS
**DEFINED AS EXCEEDING .003 SEC. DURATION
***CALCULATED FOR X & Y AXIS ONLY

TEST NO. 19

VEHICLE 1 - 1978 CHEVROLET IMPALA

DUMMY DATA

	FILTER CHANNEL
Head Accelerations	1000
Chest	180
Femur	600

HEAD INJURY CRITERION
HEAD SEVERITY INDEX

SIDE IMPACT CAR-TO-CAR BUDD #19

RUN= 510

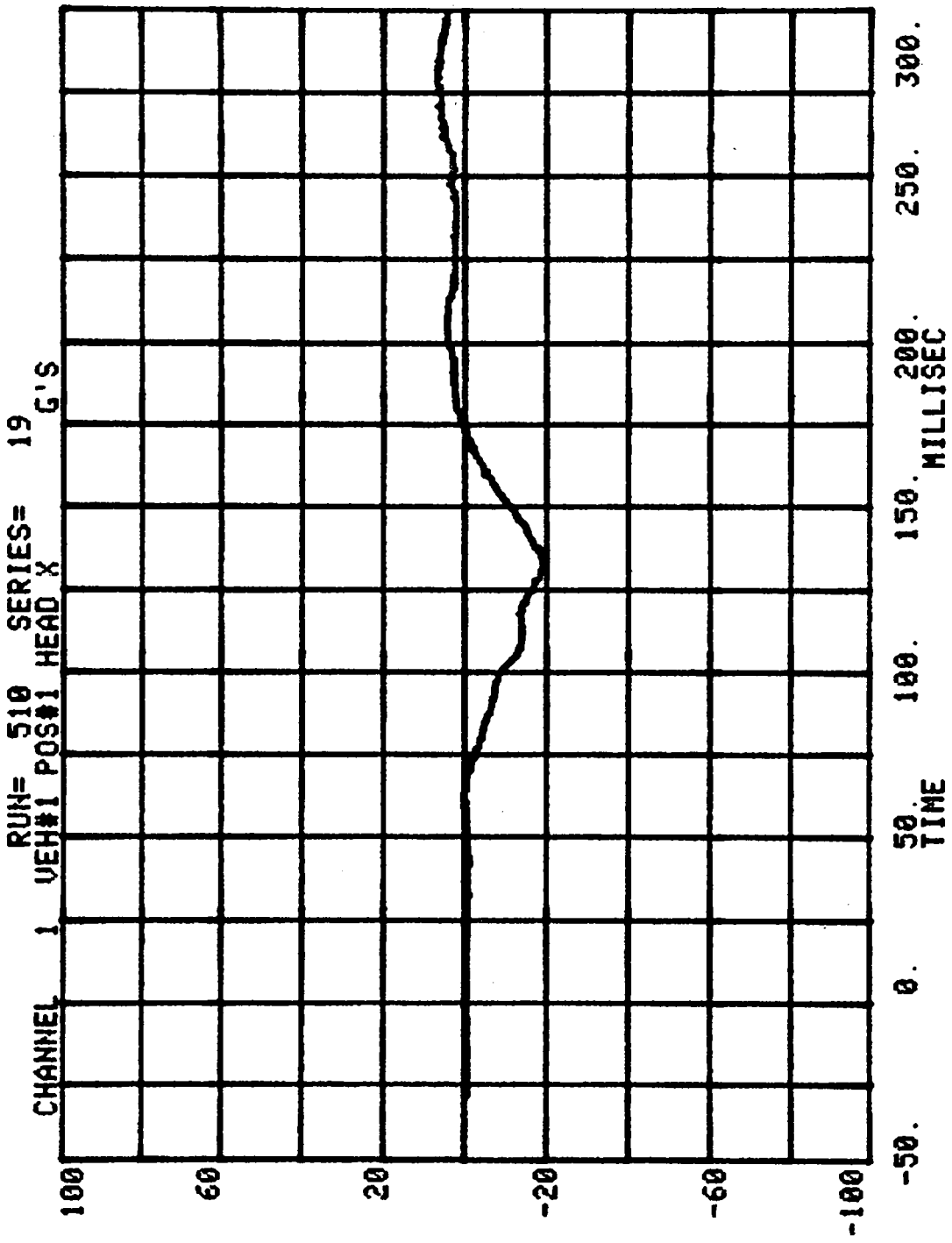
VEH#1 POS#1 HEAD RESULT

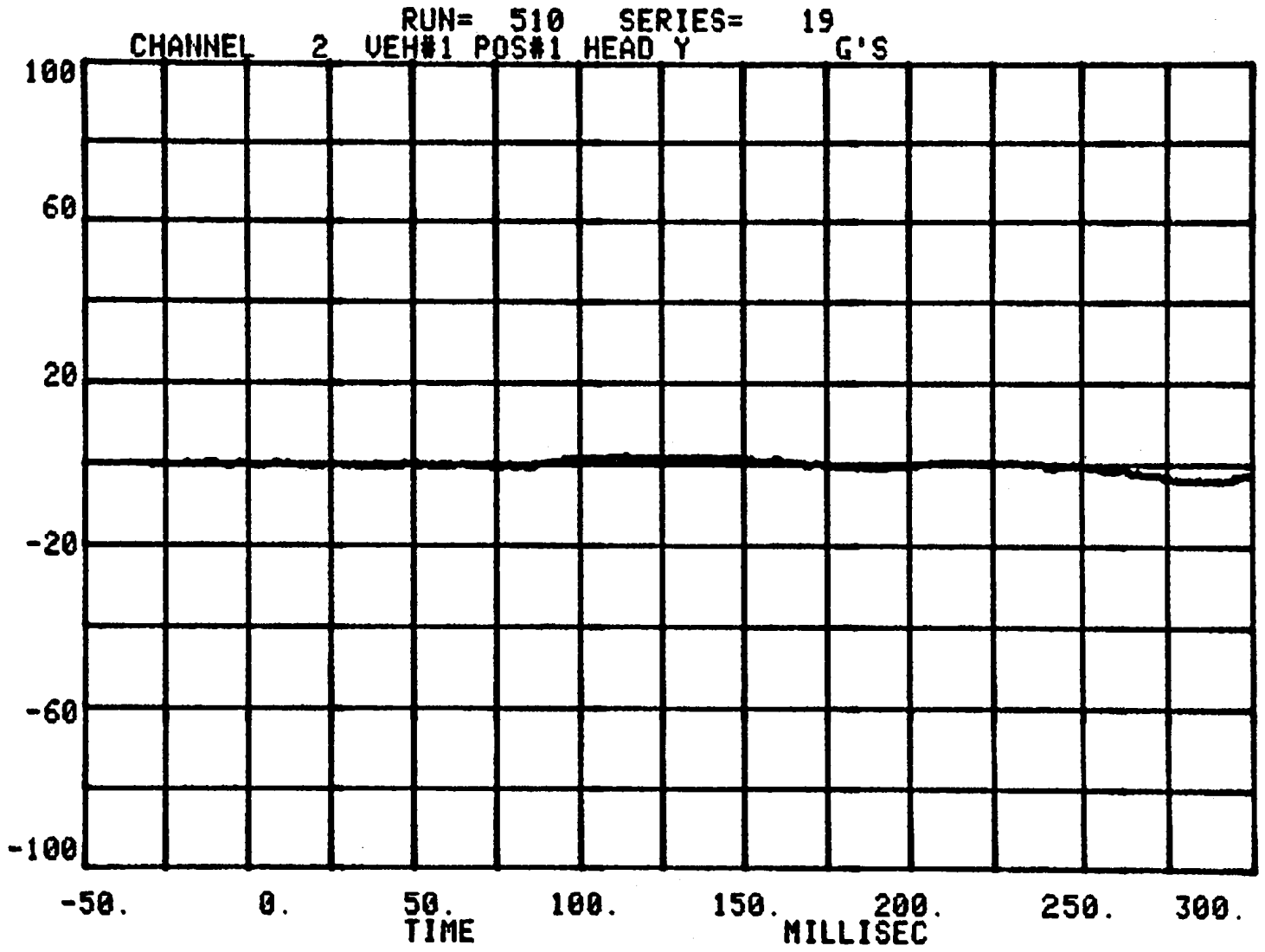
HIC= 58.5 FROM T1= .09240 TO T2= .15270

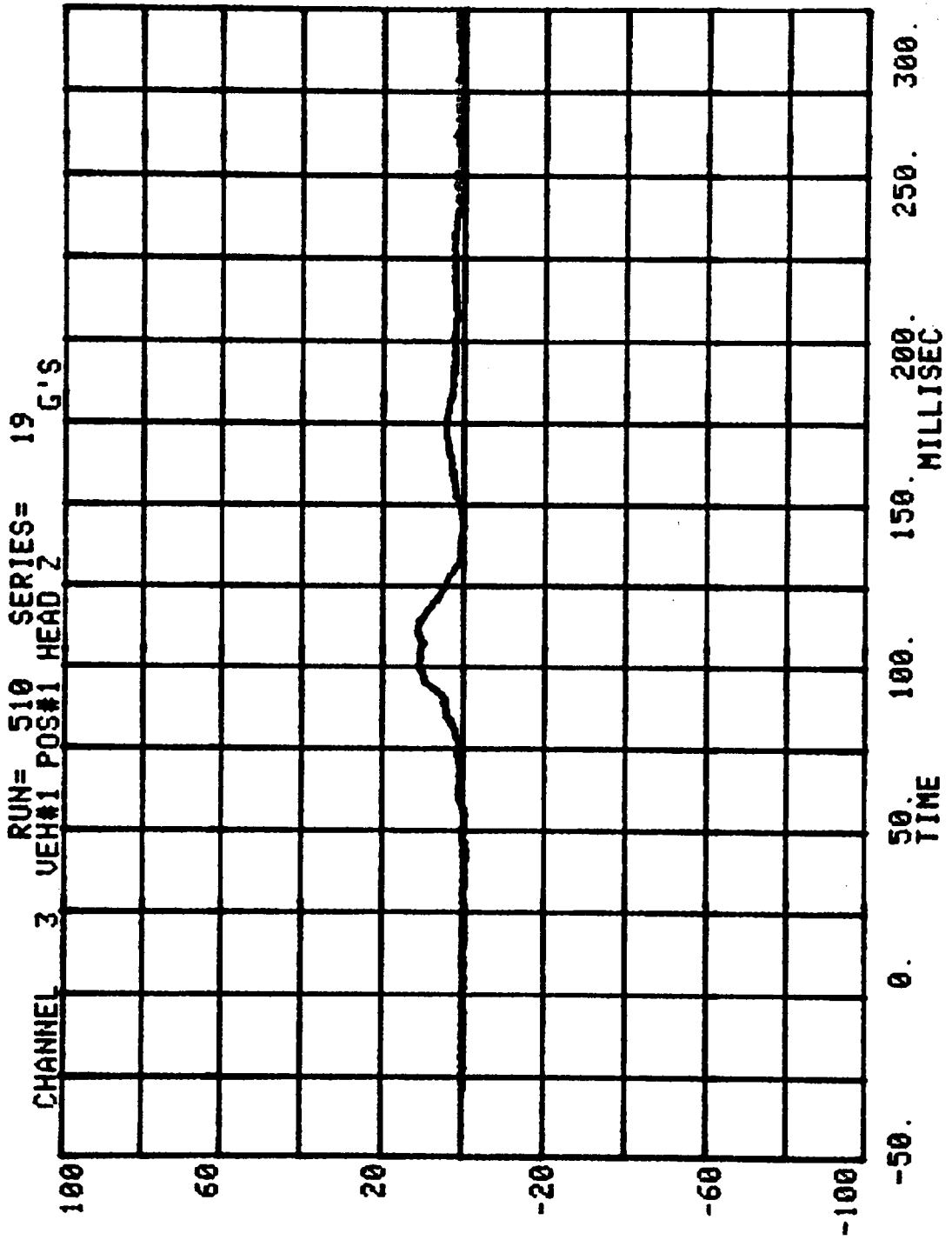
AVERAGE ACCELERATION BETWEEN T1 AND T2= 15.7G'S

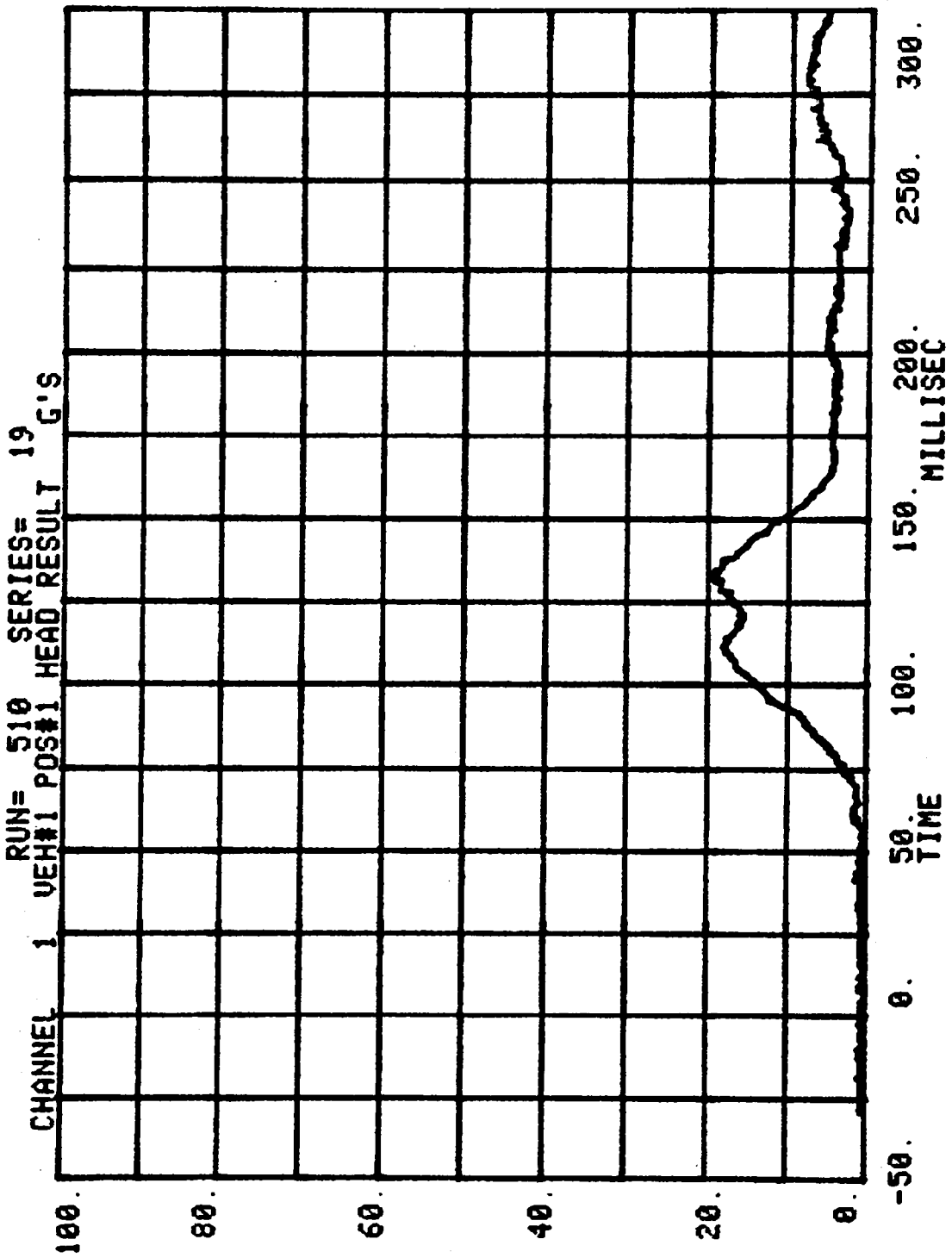
EVENT TIME= 300.0 MSEC

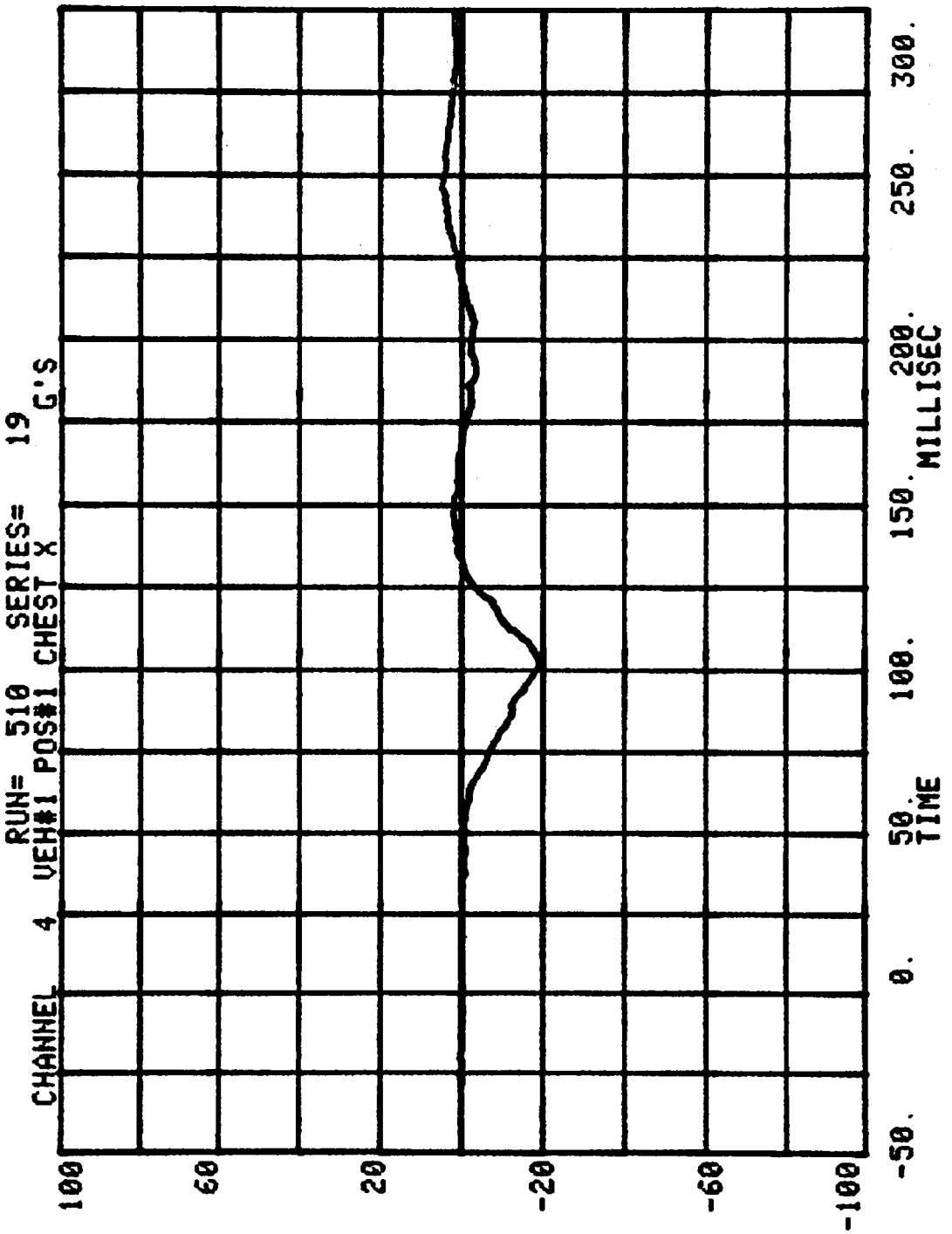
SEVERITY INDEX= 72.9

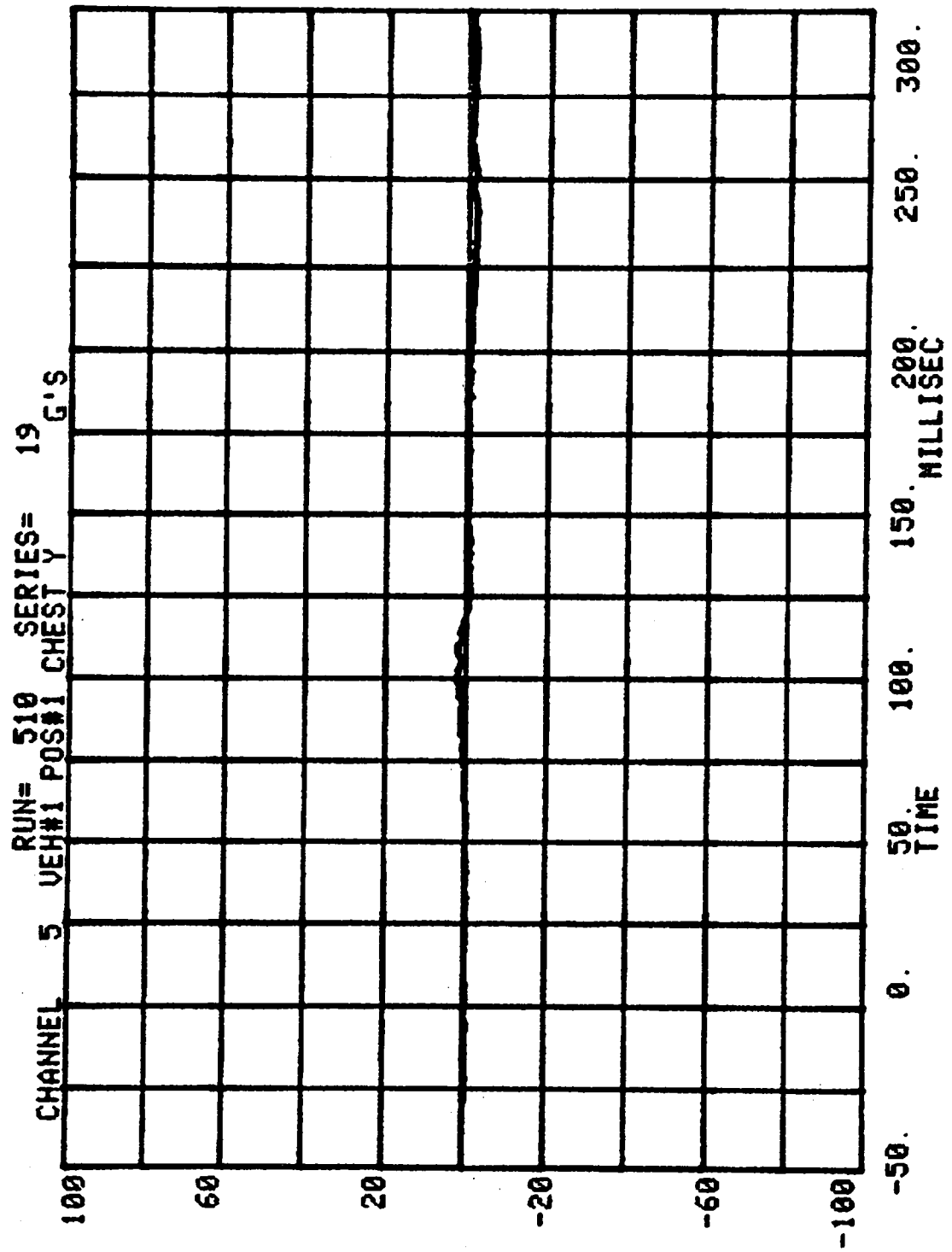

CHANNEL 1 VEH#1 POS#1 HEAD X
RUN= 510 SERIES= 19
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

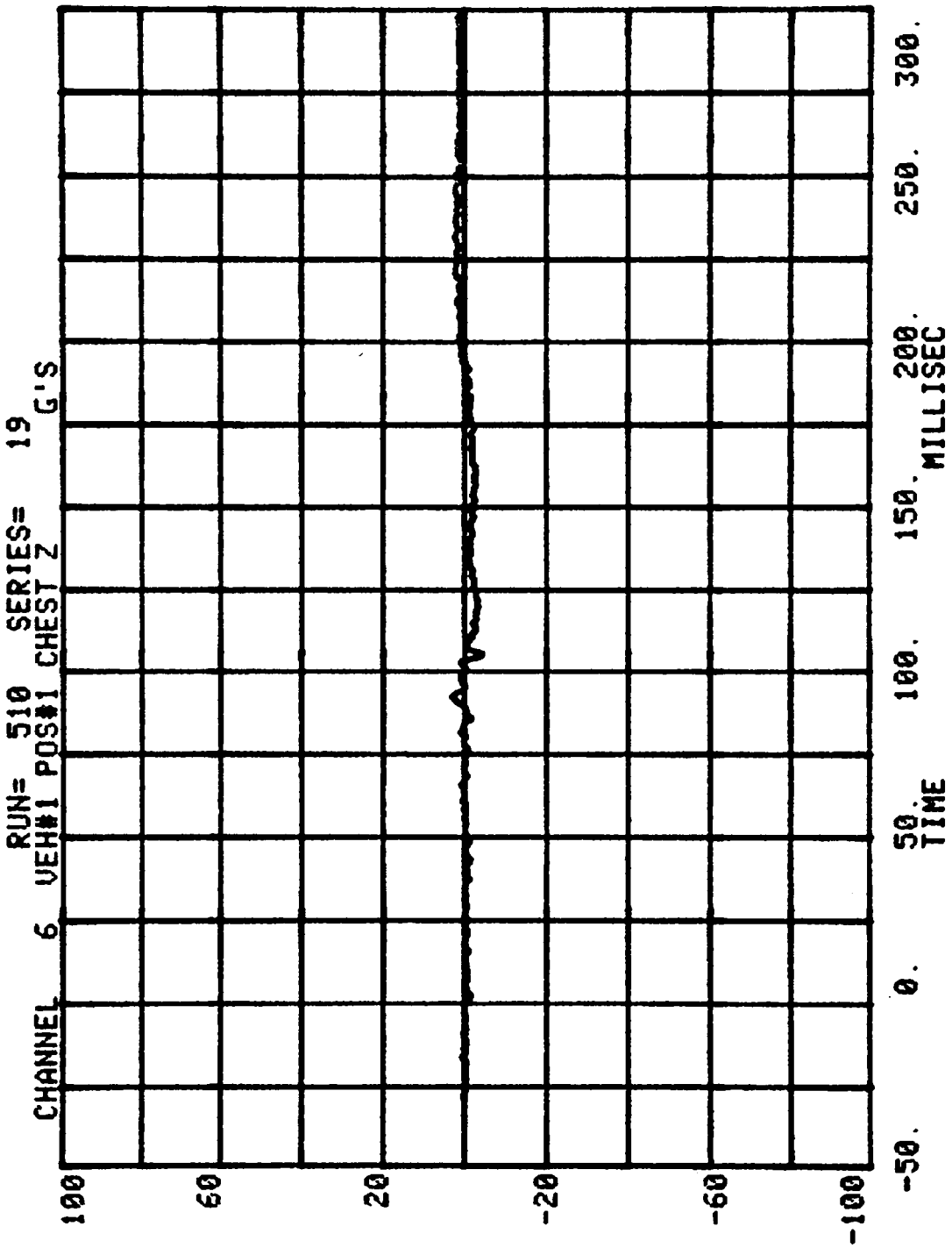

RUN= 510 SERIES= 19
CHANNEL 2 VEH#1 POS#1 HEAD Y G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

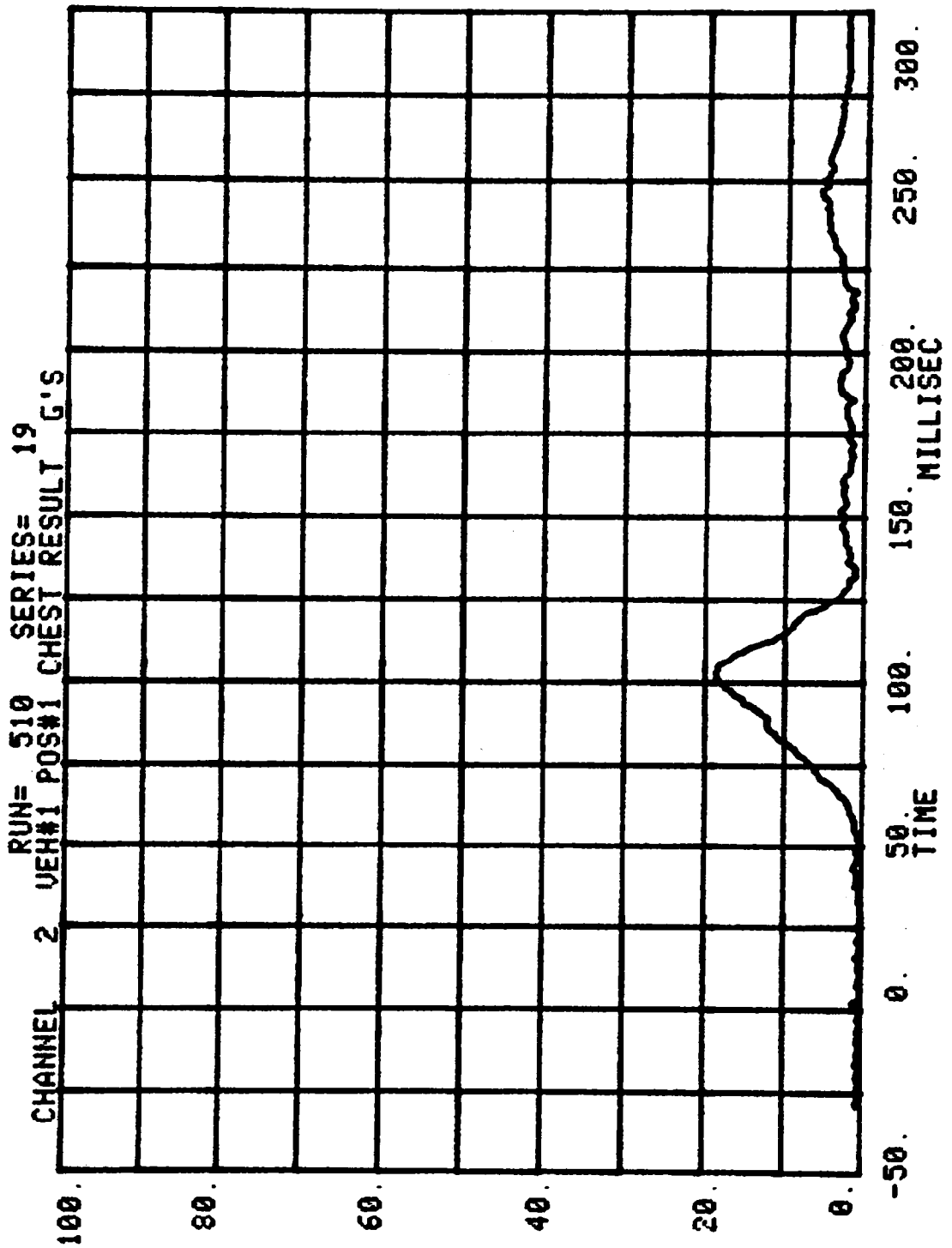

CHANNEL 3 VEH#1 POS#1 HEAD Z
RUN= 510 SERIES= 19
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

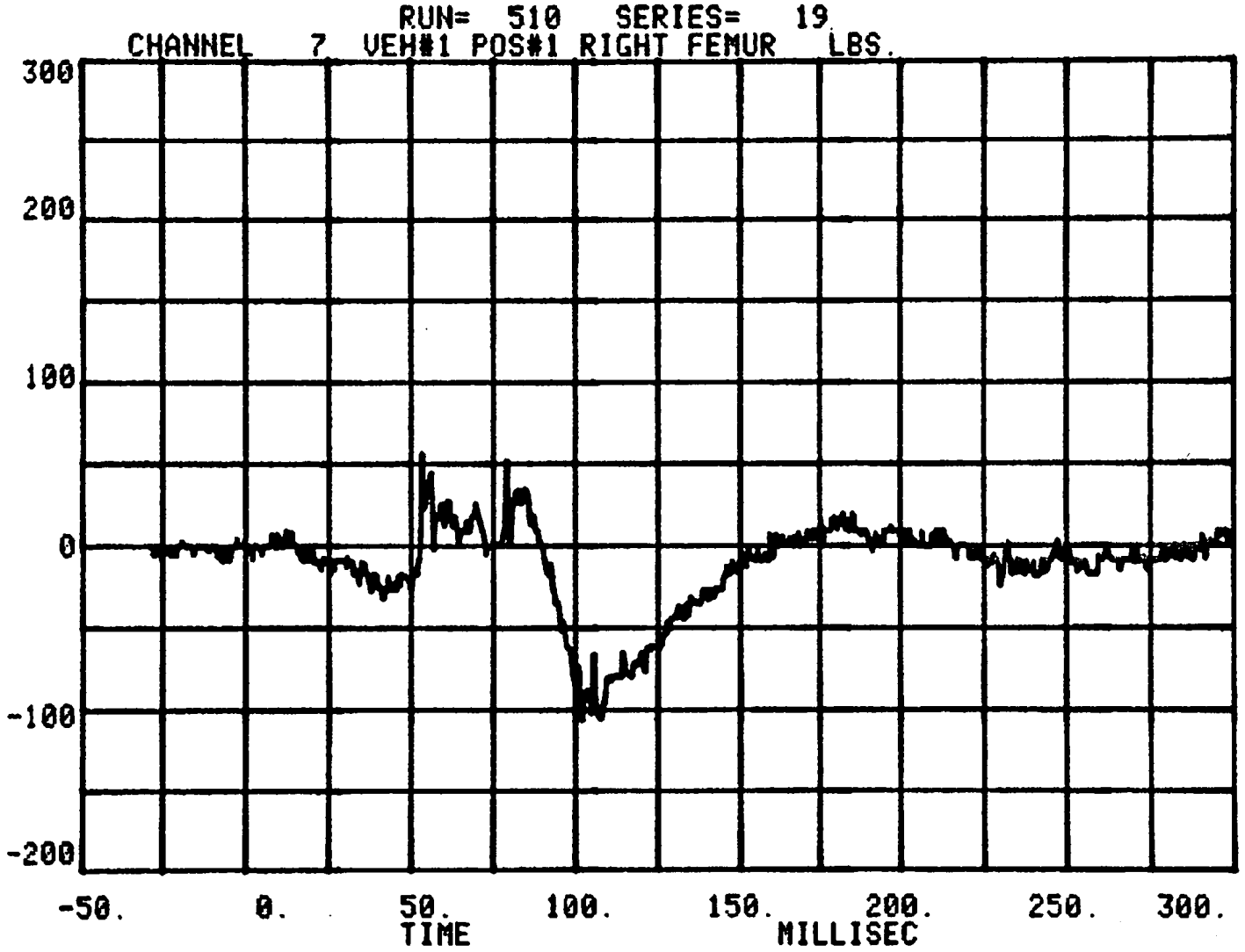

CHANNEL 1
RUN= 510
VEH#1 POS#1
SERIES= 19
HEAD RESULT
G'S
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

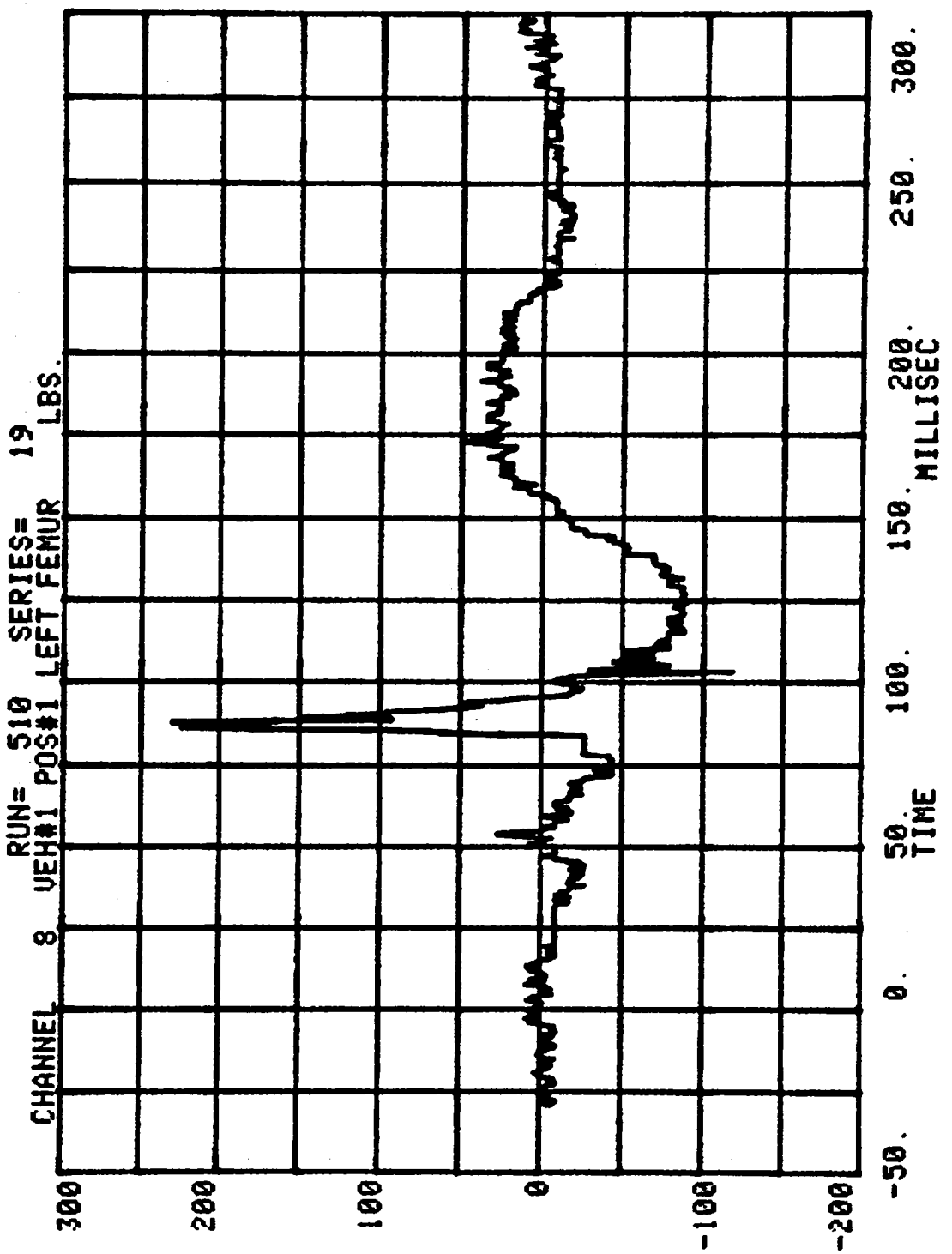

CHANNEL 4 RUN= 510 SERIES= 19
VEH#1 POS#1 CHEST X G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

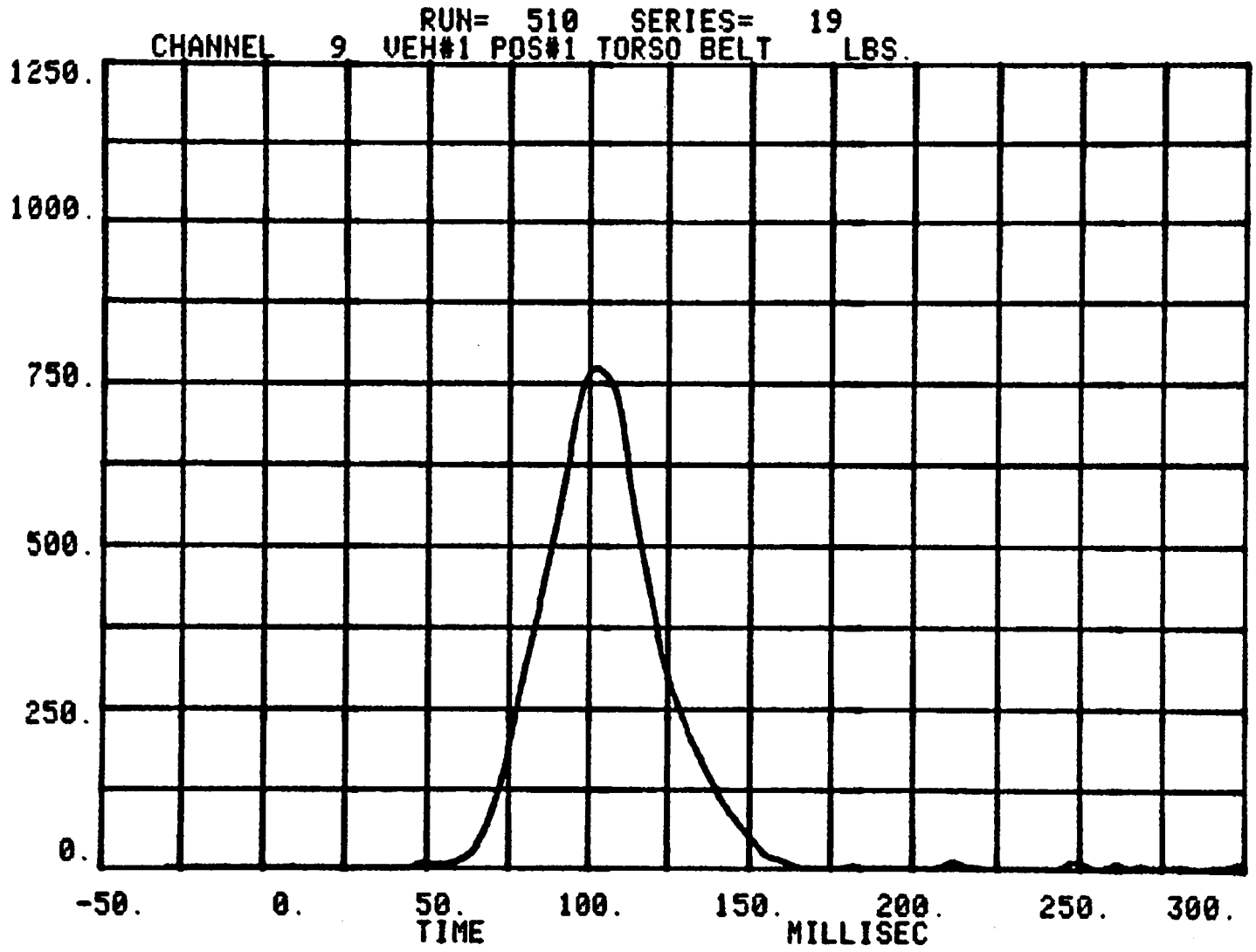

CHANNEL 5 VEH#1 POS#1 CHEST Y
RUN= 510 SERIES= 19
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

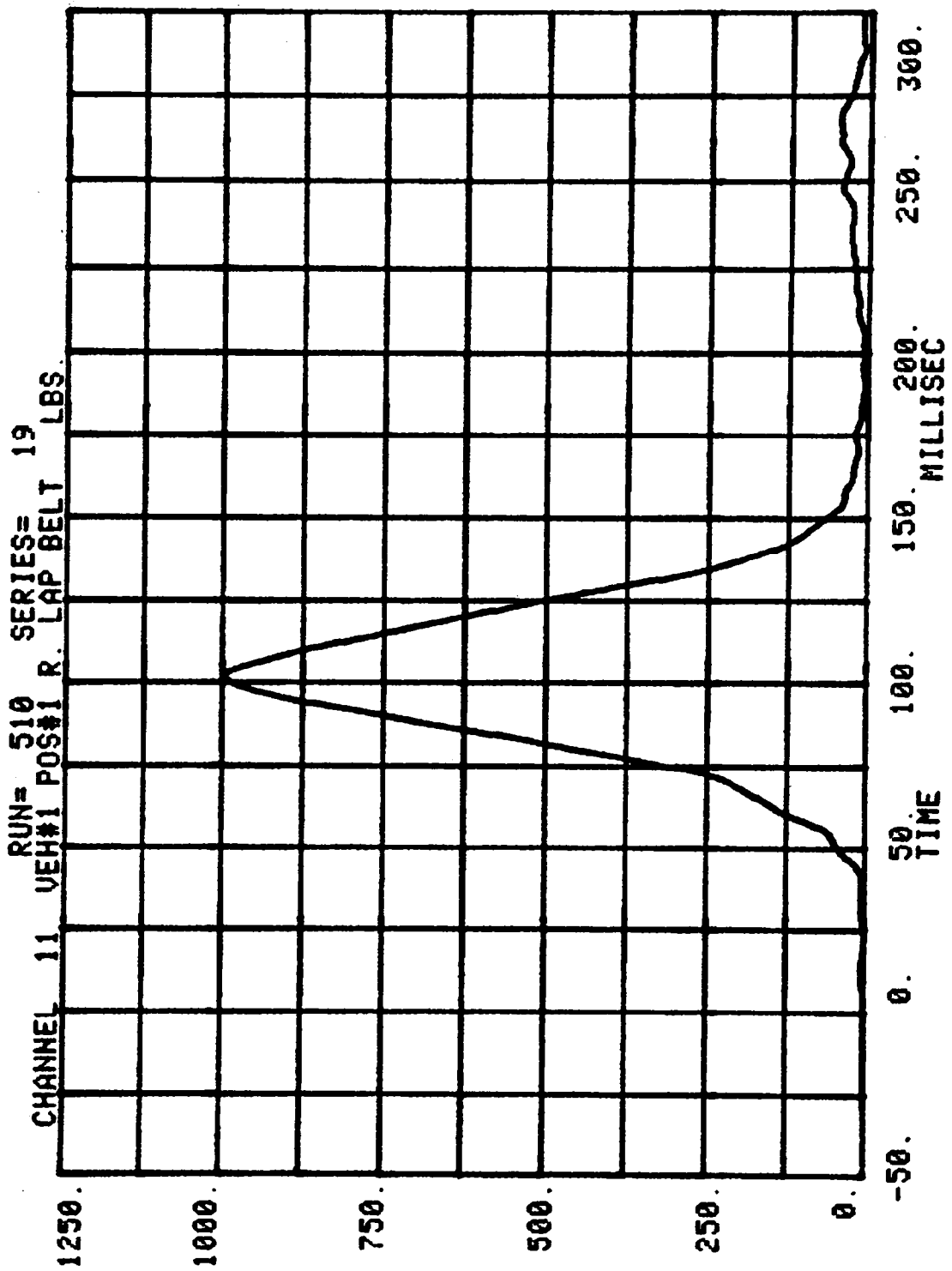

CHANNEL 6 RUN= 510 SERIES= 19
VEH#1 POS#1 CHEST Z
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

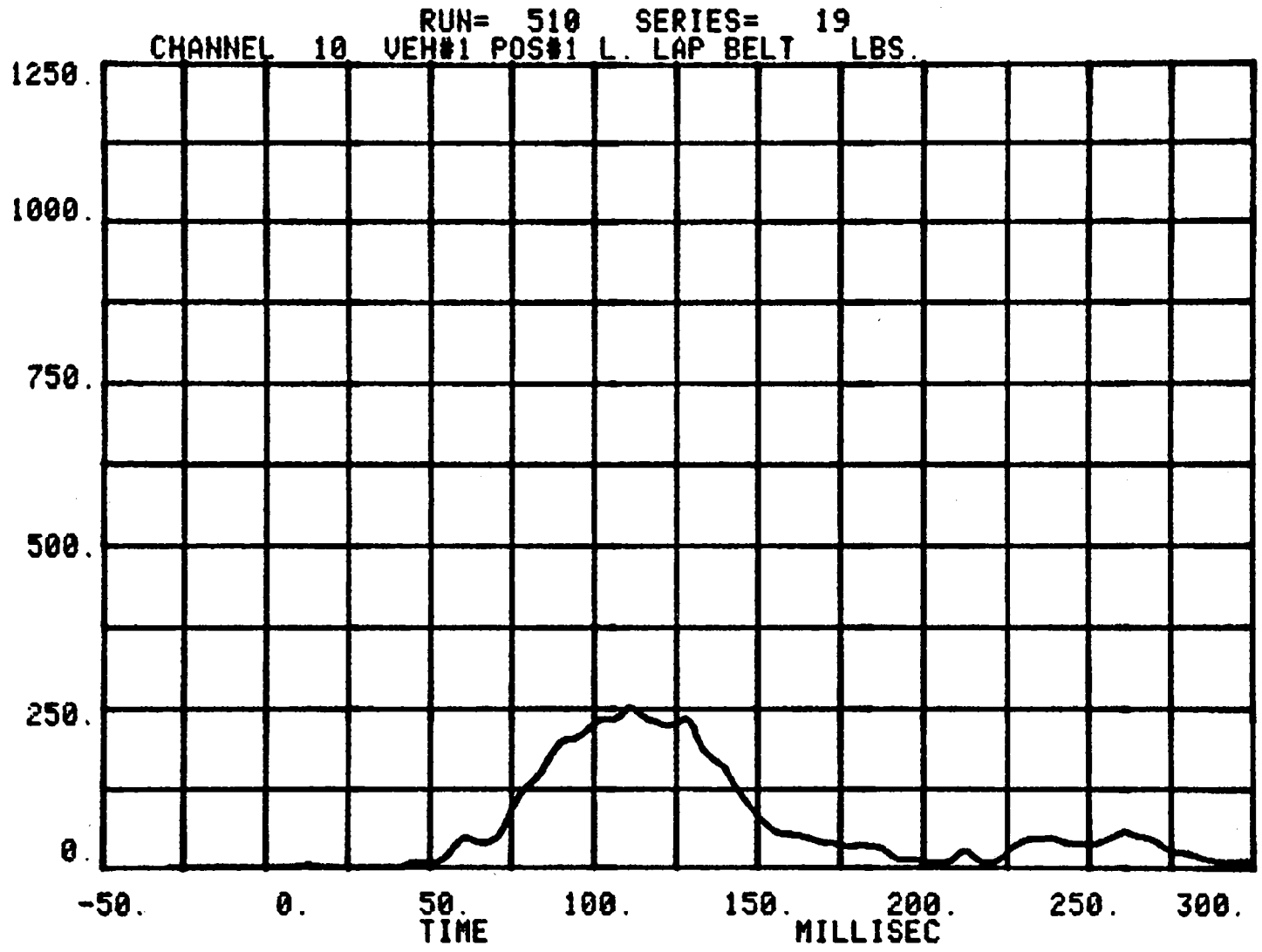

CHANNEL 2 VEH#1 POS#1 CHEST RESULT G'S
RUN= 510 SERIES= 19
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 510 SERIES= 19
CHANNEL 7 VEH#1 POS#1 RIGHT FEMUR LBS.
300
200
100
0
-100
-200
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 8 RUN= 510 SERIES= 19
VEH#1 POS#1 LEFT FEMUR LBS.
300
200
100
0
-100
-200
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 510 SERIES= 19
CHANNEL 9 VEH#1 POS#1 TORSO BELT LBS.
1250.
1000.
750.
500.
250.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 11 VEH#1 POS#1 R. LAP BELT
RUN= 510 SERIES= 19
LBS.
1250.
1000.
750.
500.
250.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

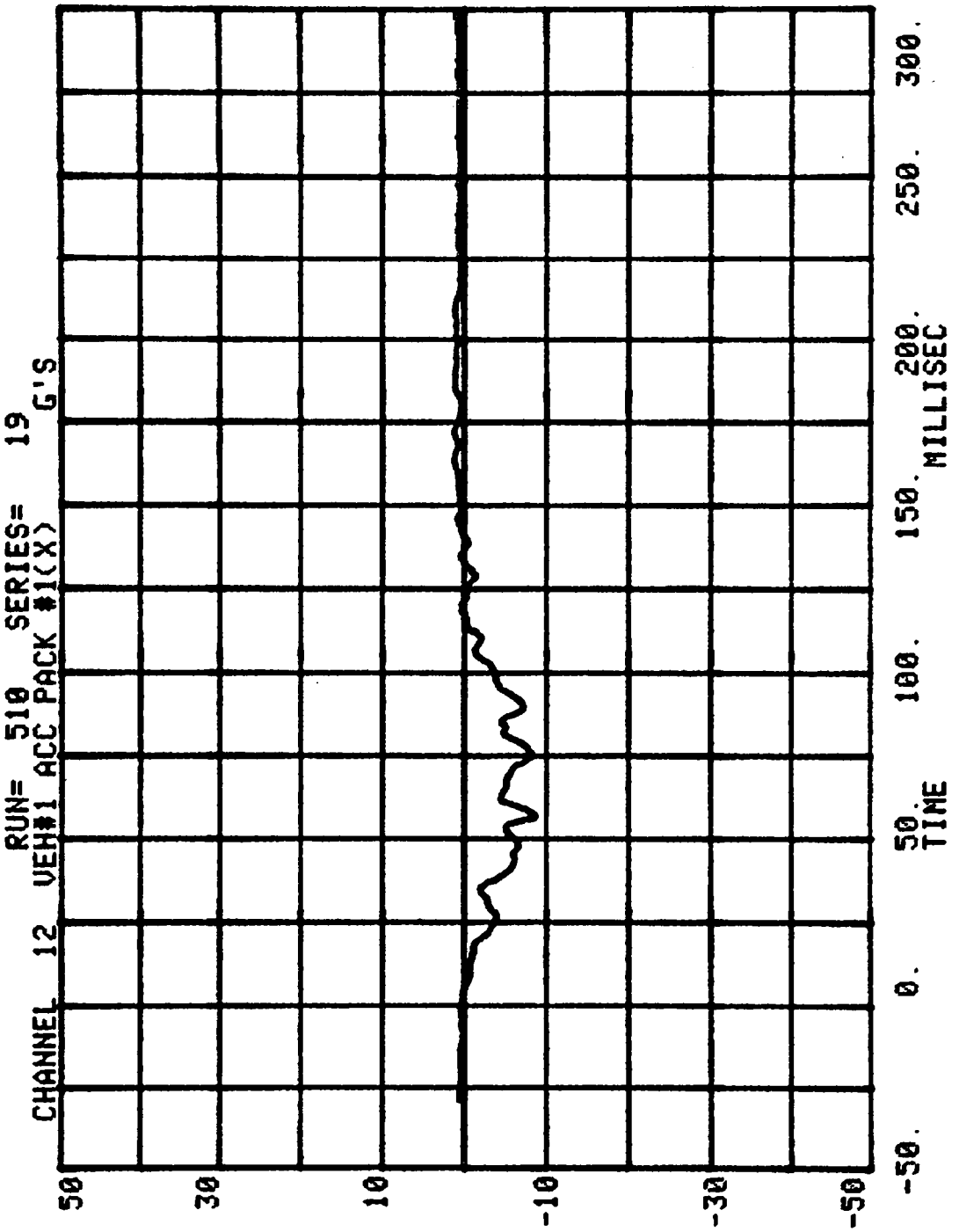

RUN= 510 SERIES= 19
CHANNEL 10 VEH#1 POS#1 L. LAP BELT LBS.
1250.
1000.
750.
500.
250.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

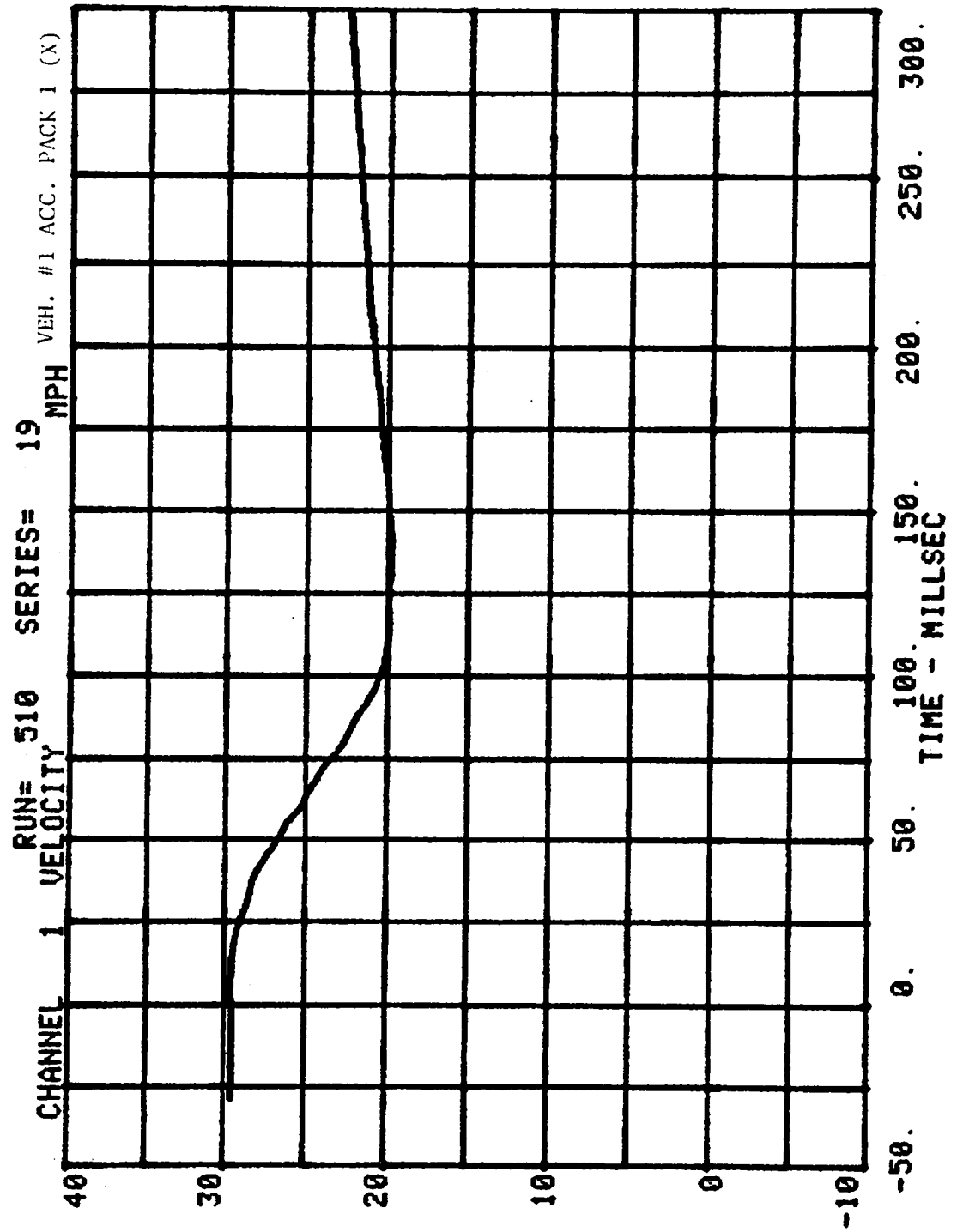
TEST NO. 19

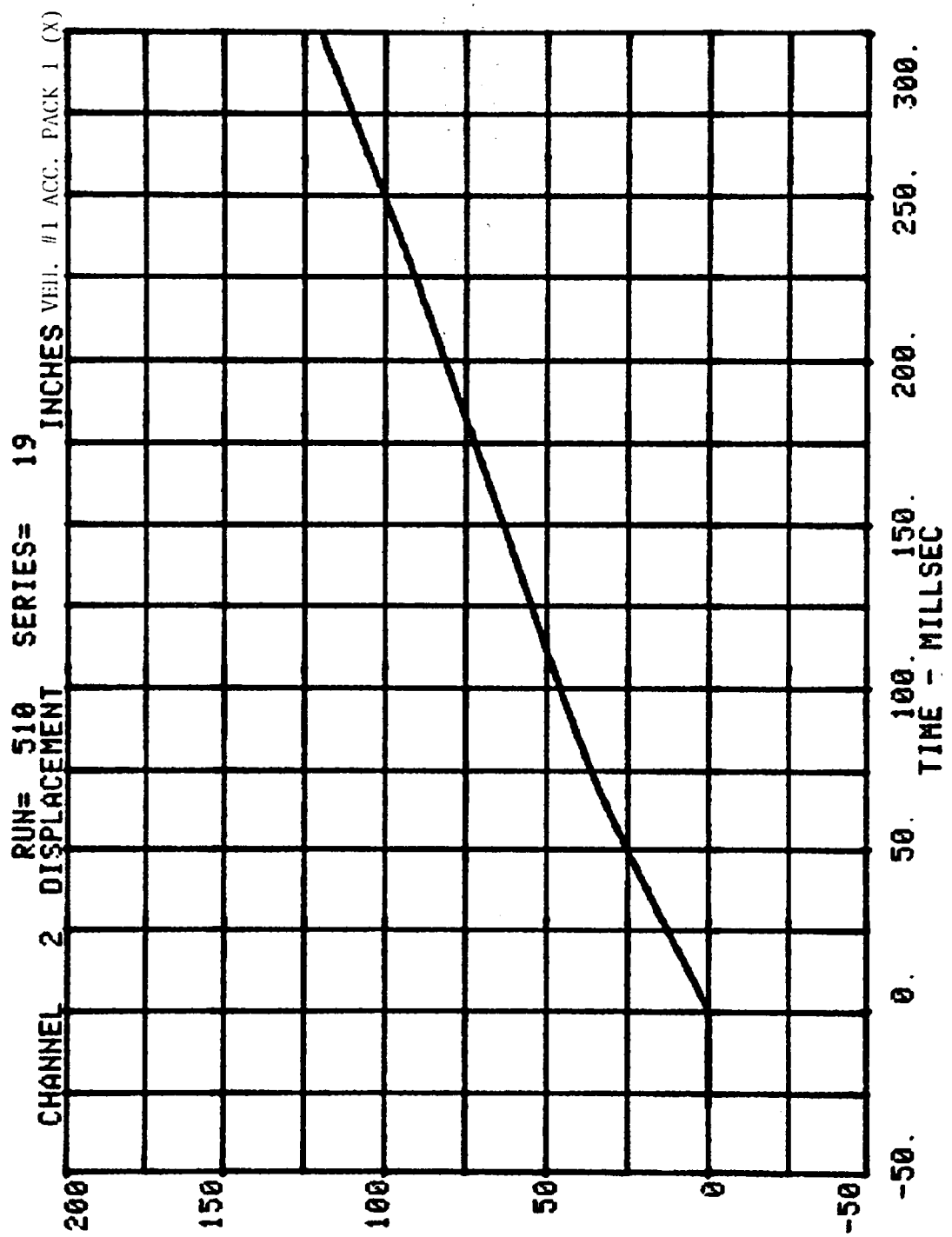
VEHICLE NO. 1 - CHEVROLET IMPALA

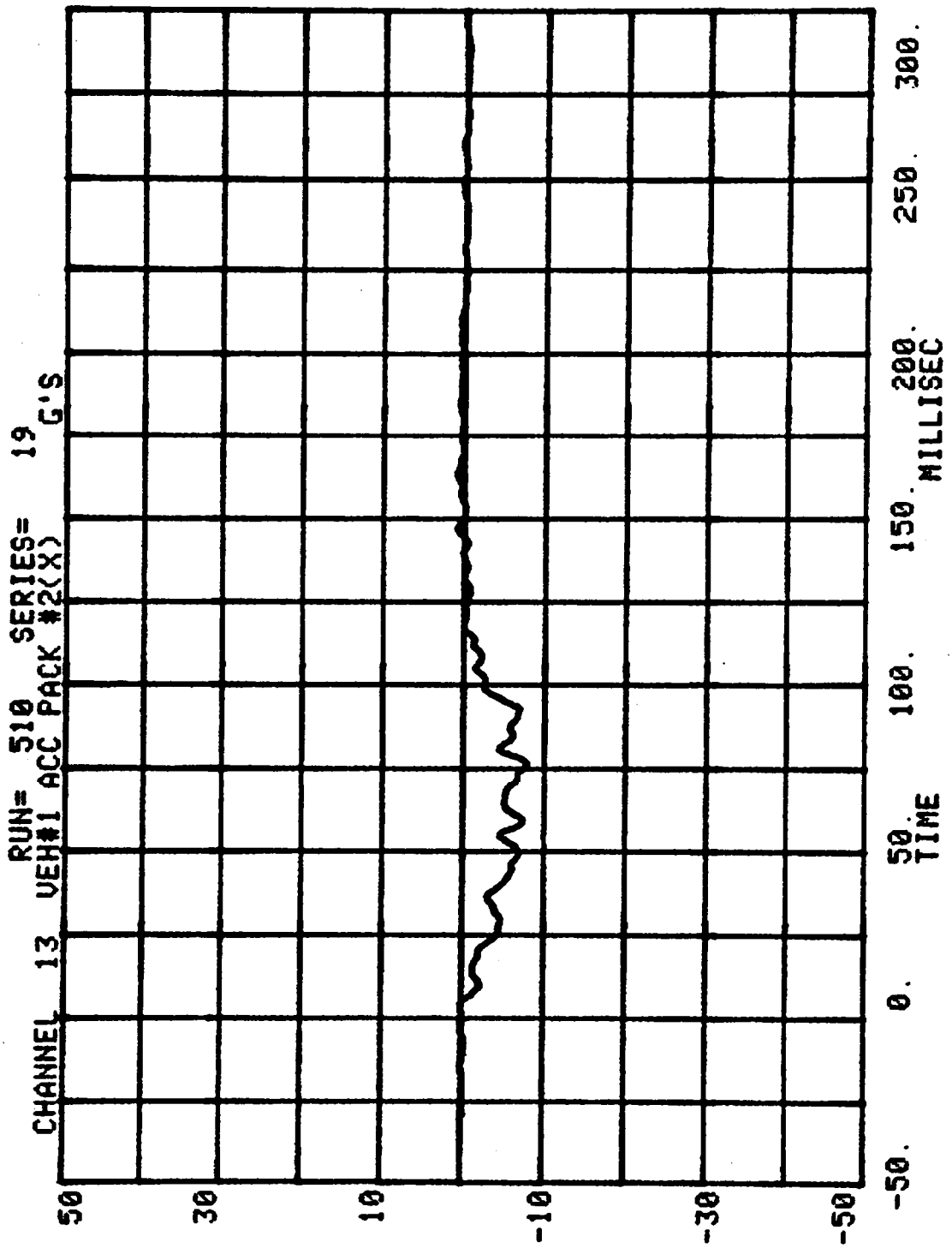
VEHICLE DATA

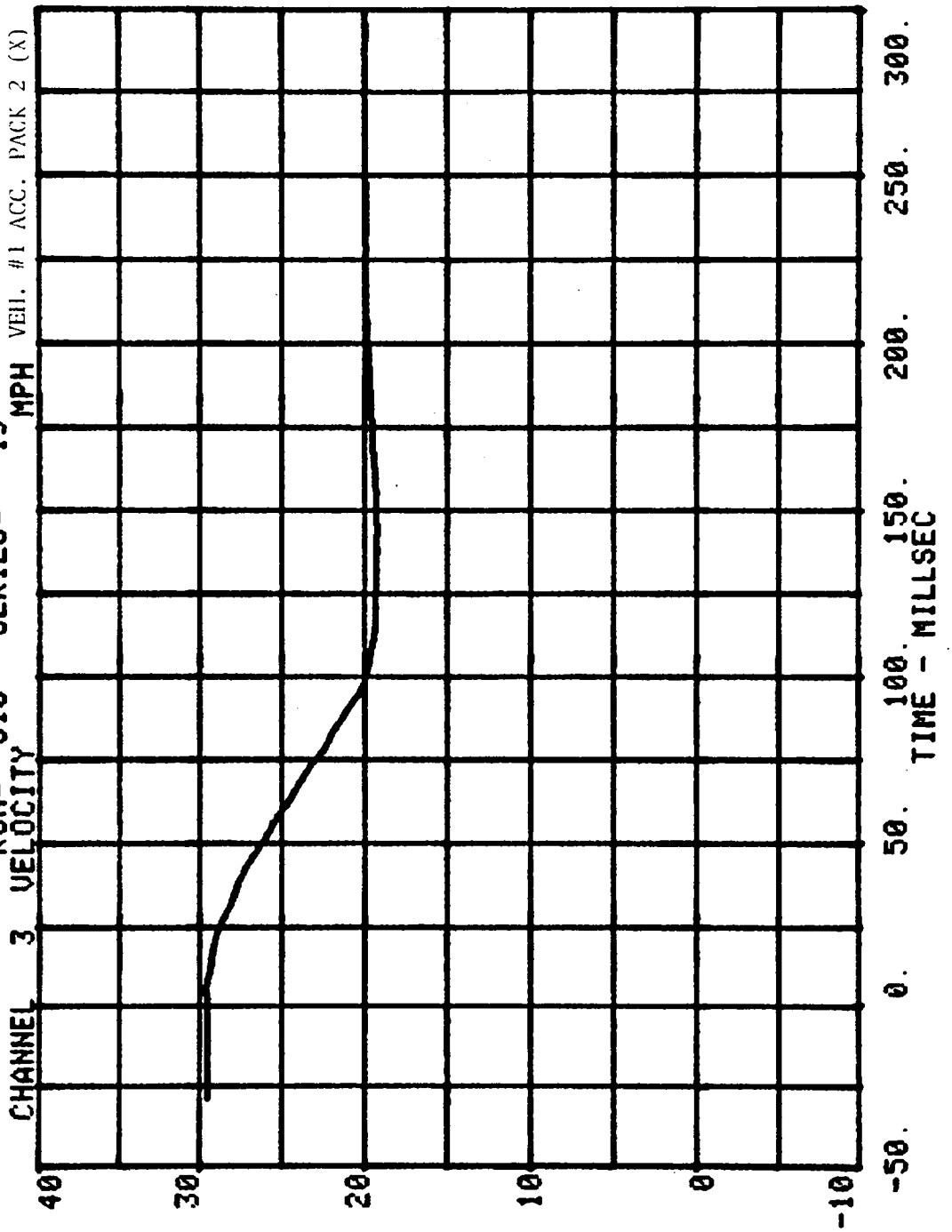
60 H_z Channel Class

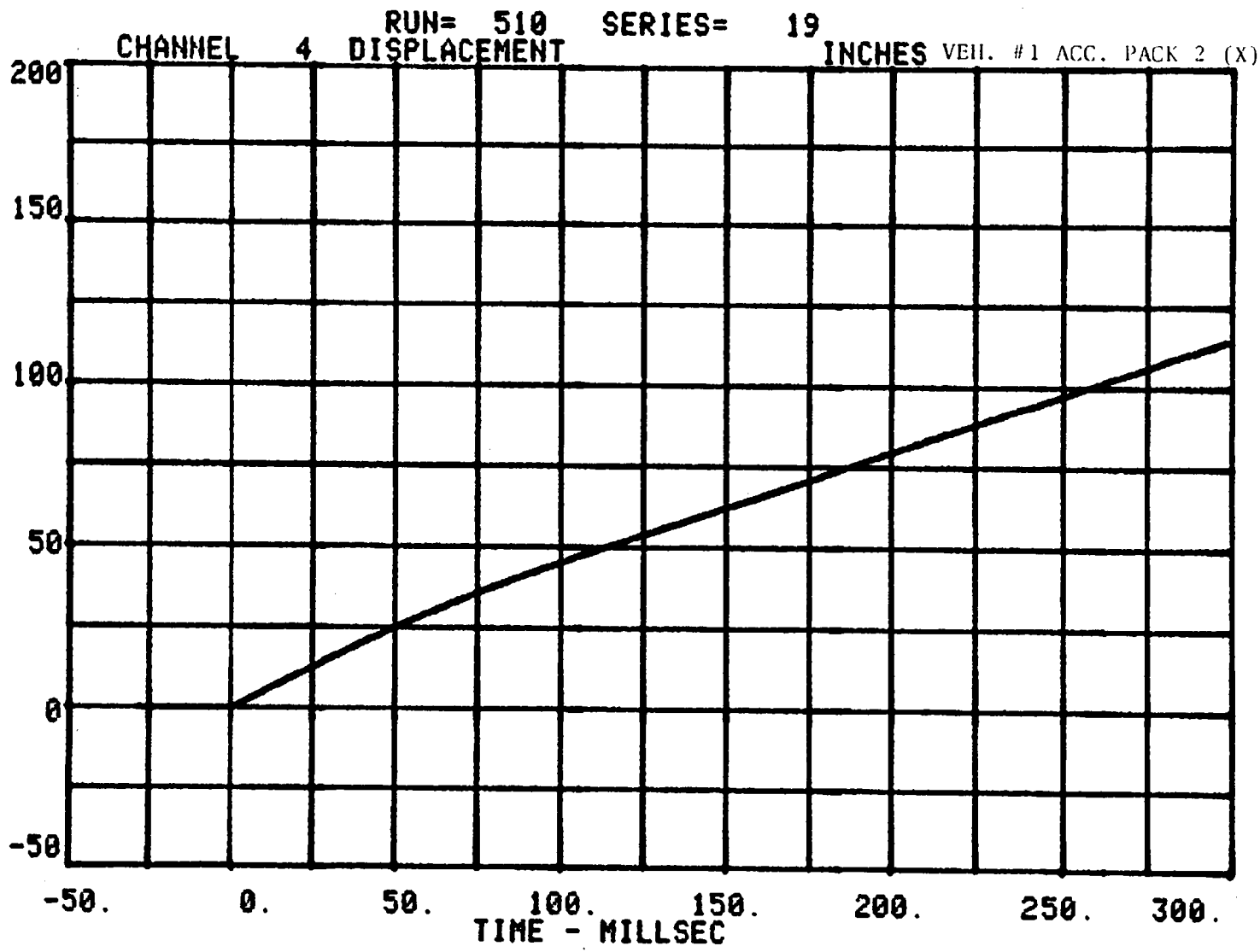

CHANNEL 12 VEH#1 ACC PACK #1(X)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

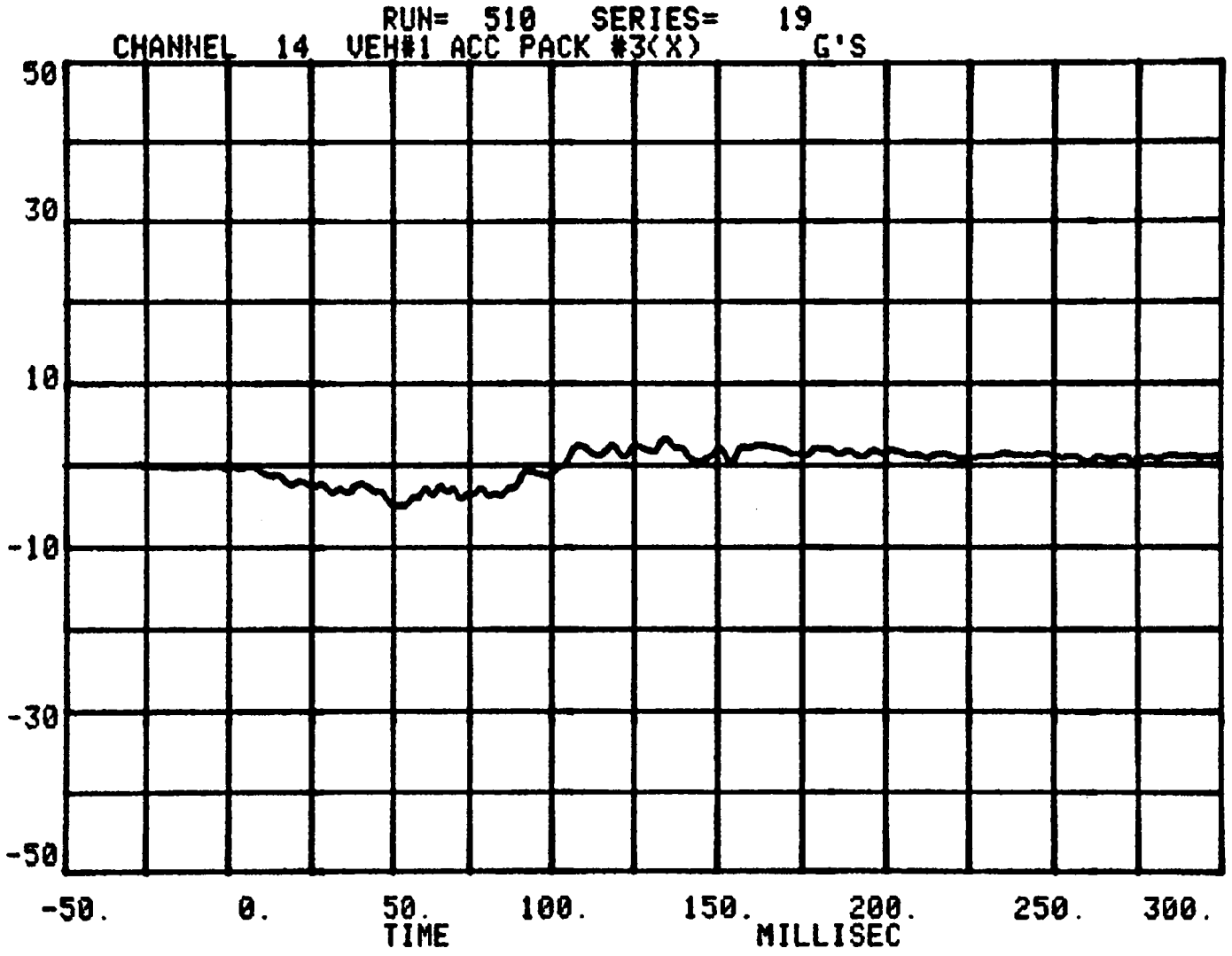

CHANNEL 1 VELOCITY
RUN= 510 SERIES= 19
MPH
VEH. #1 ACC. PACK 1 (X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

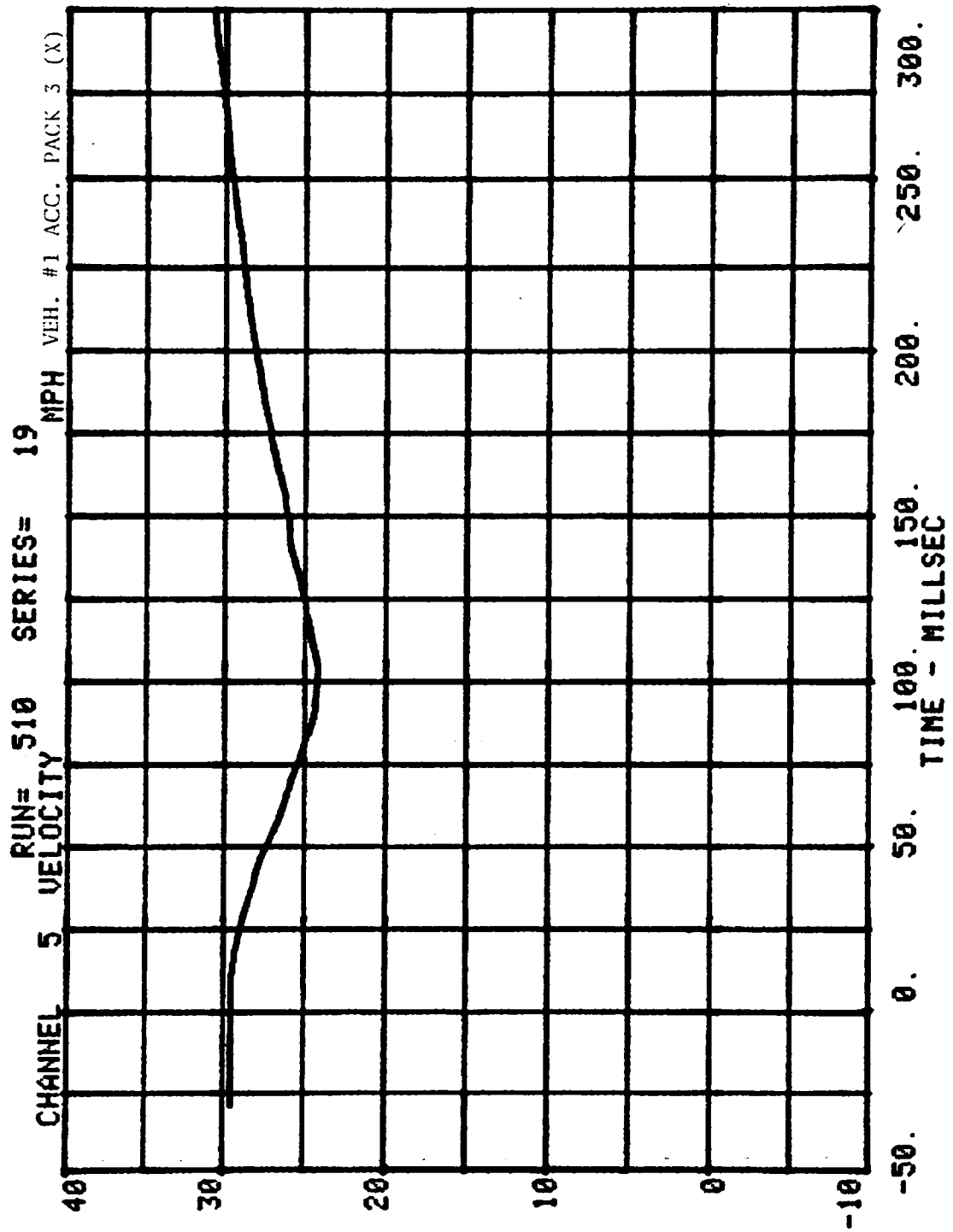

CHANNEL 2 DISPLACEMENT
RUN= 510 SERIES= 19
INCHES VEH. #1 ACC. PACK 1 (X)
200
150
100
50
0
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

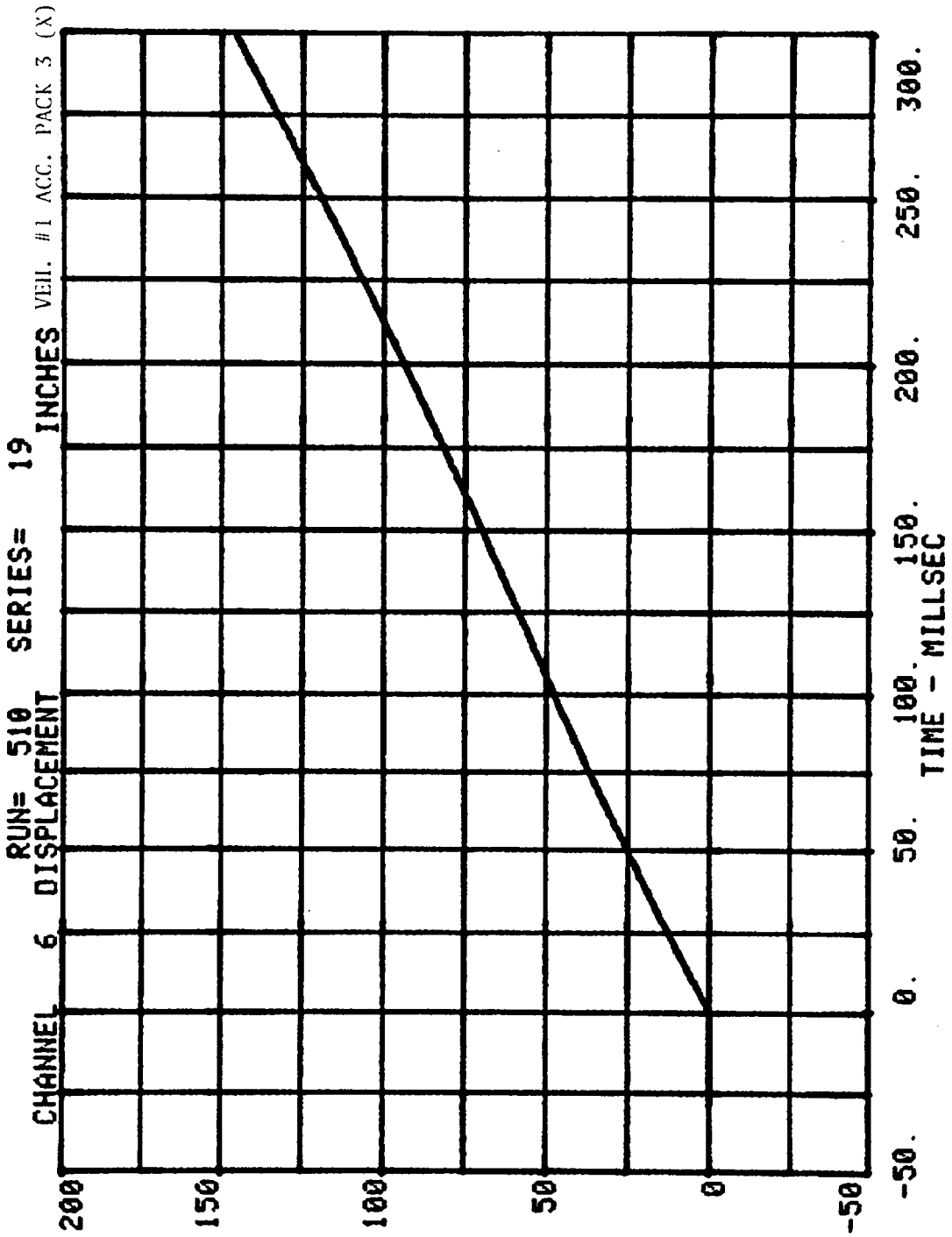

CHANNEL 13 VEH#1 ACC PACK #2(X)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

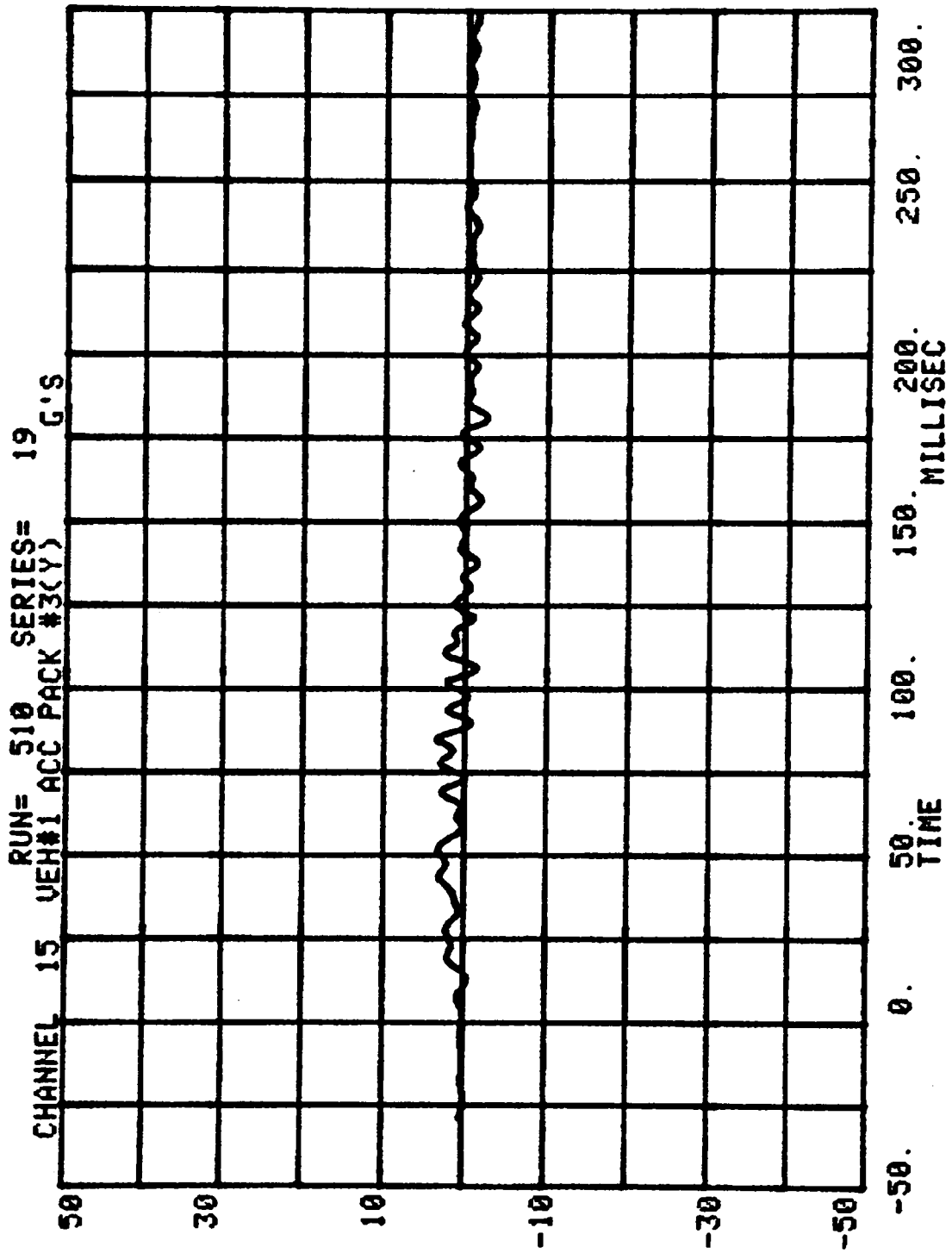

CHANNEL 3 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #1 ACC. PACK 2 (X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

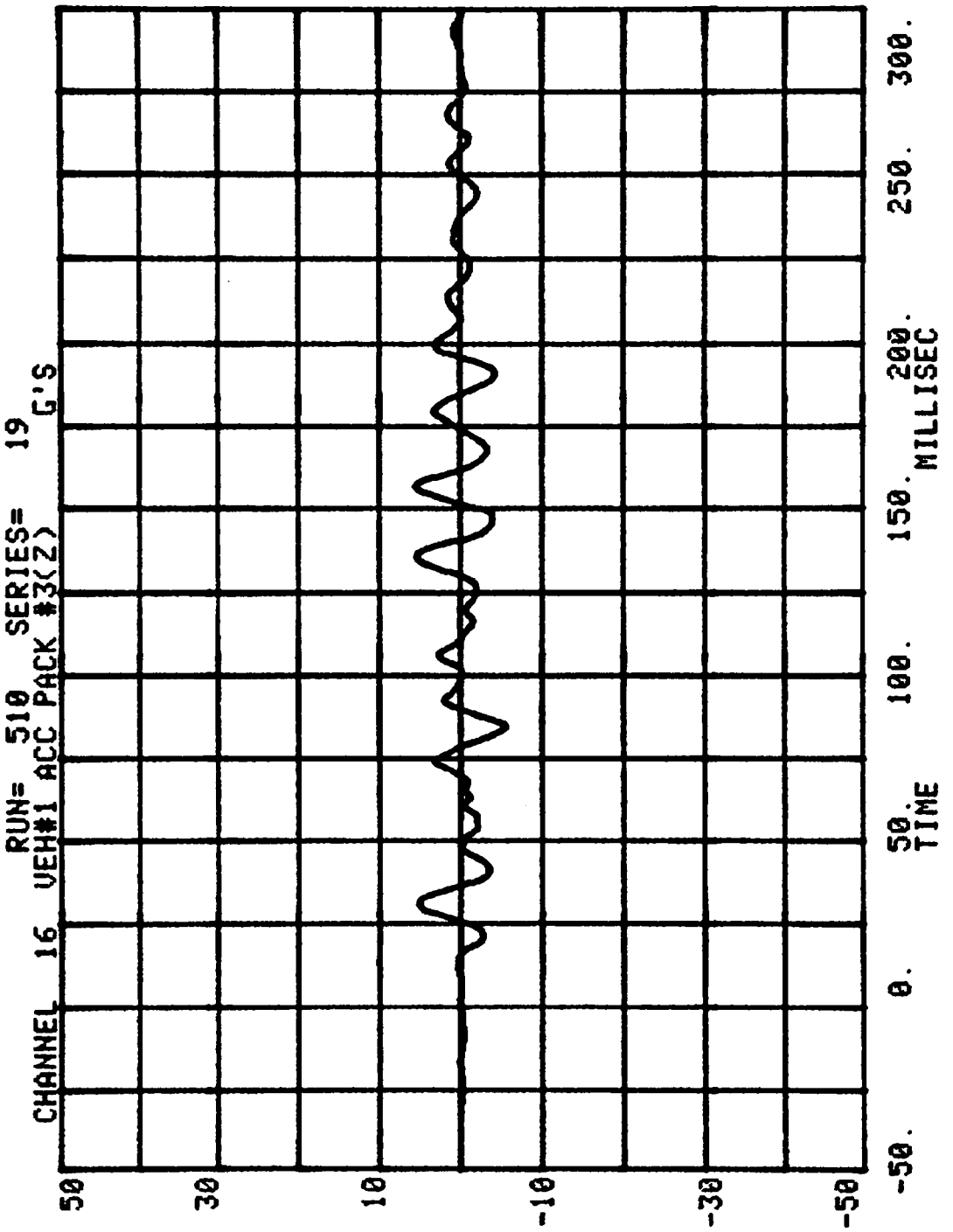

RUN= 510 SERIES= 19
CHANNEL 4 DISPLACEMENT INCHES
VEH. #1 ACC. PACK 2 (X)
200
150
100
50
0
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

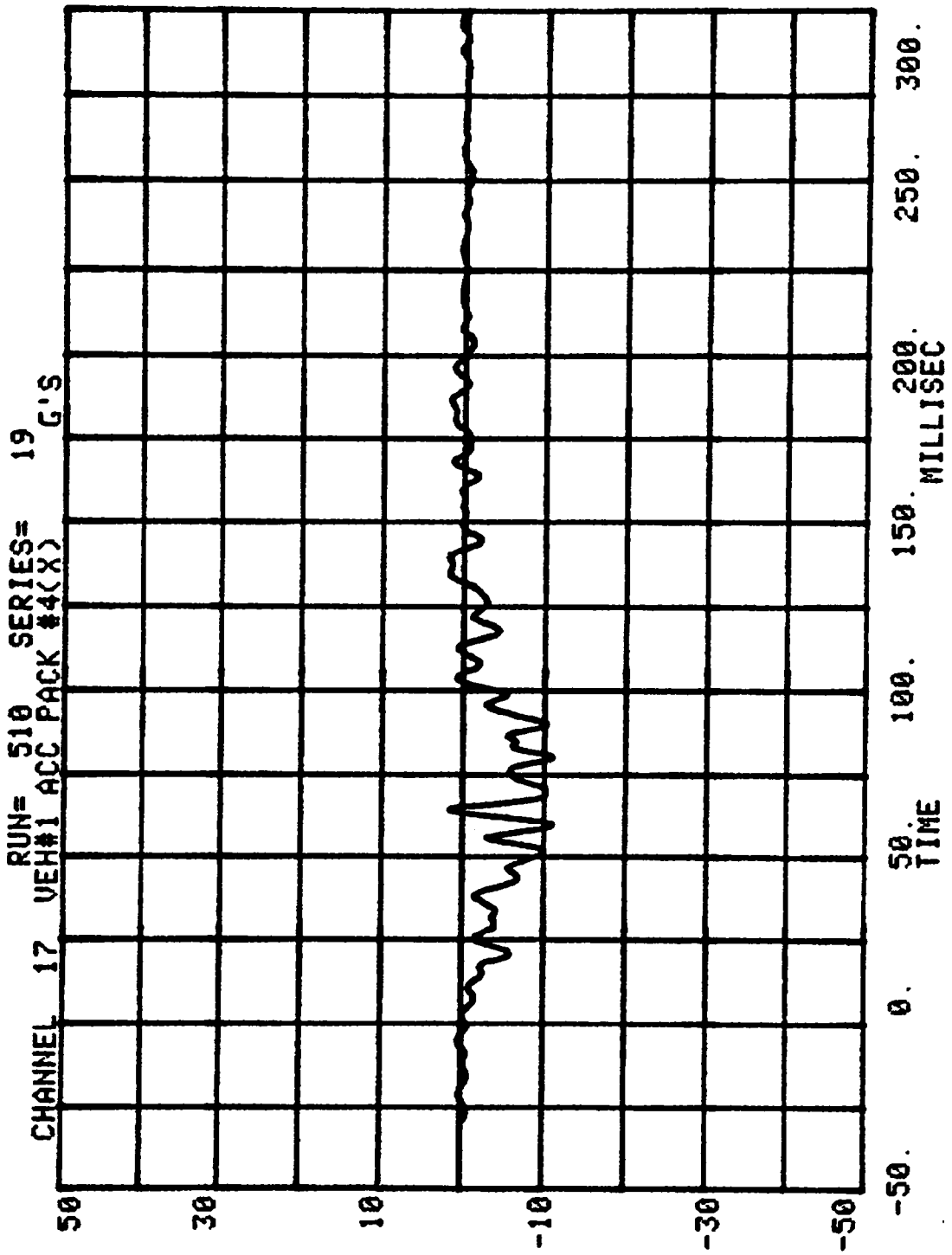

RUN= 510 SERIES= 19
CHANNEL 14 VEH#1 ACC PACK #3(X) G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

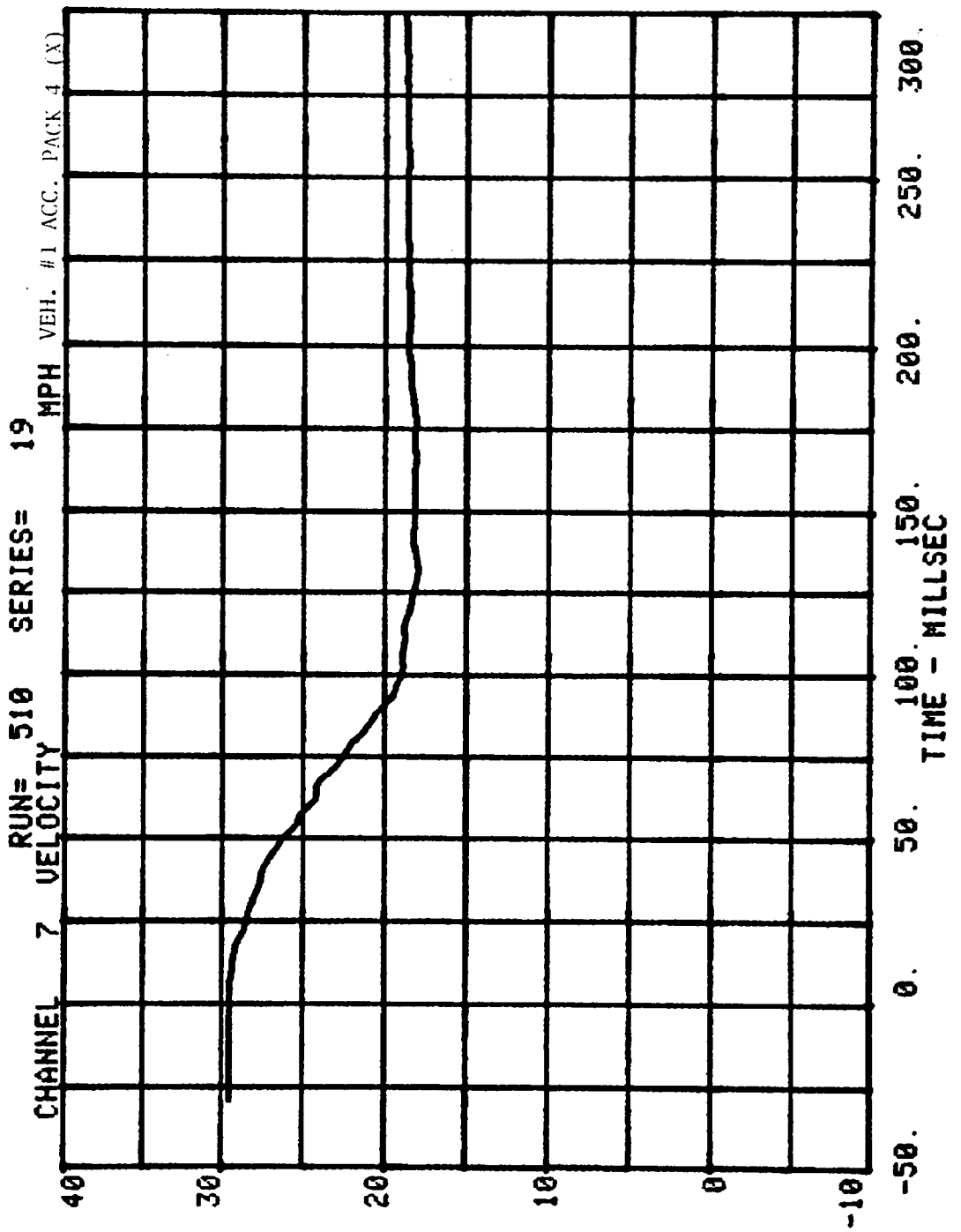

CHANNEL 5 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #1 ACC. PACK 3 (X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

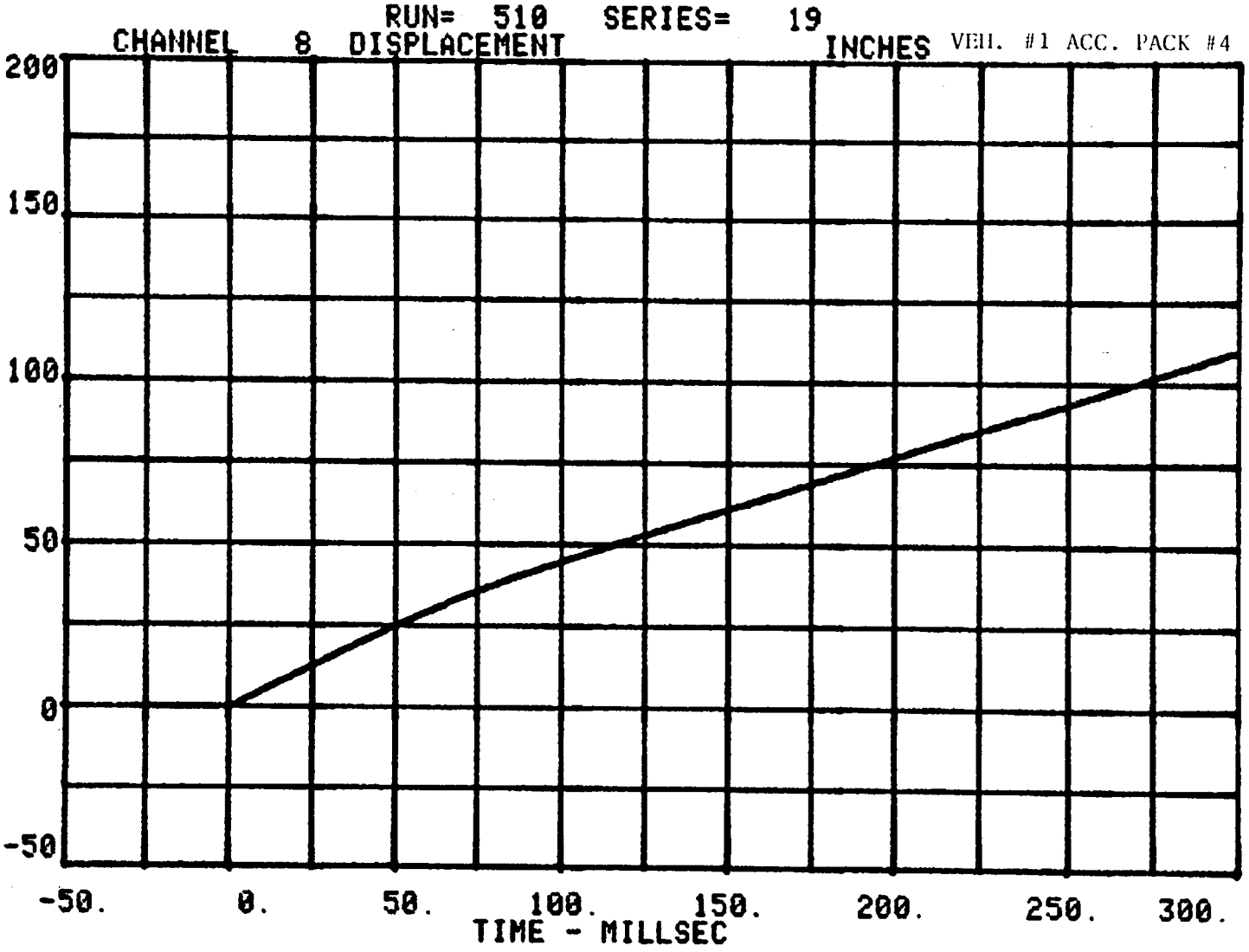

CHANNEL 6 DISPLACEMENT
RUN= 510 SERIES= 19
INCHES VEH. #1 ACC. PACK 3 (X)
200
150
100
50
0
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

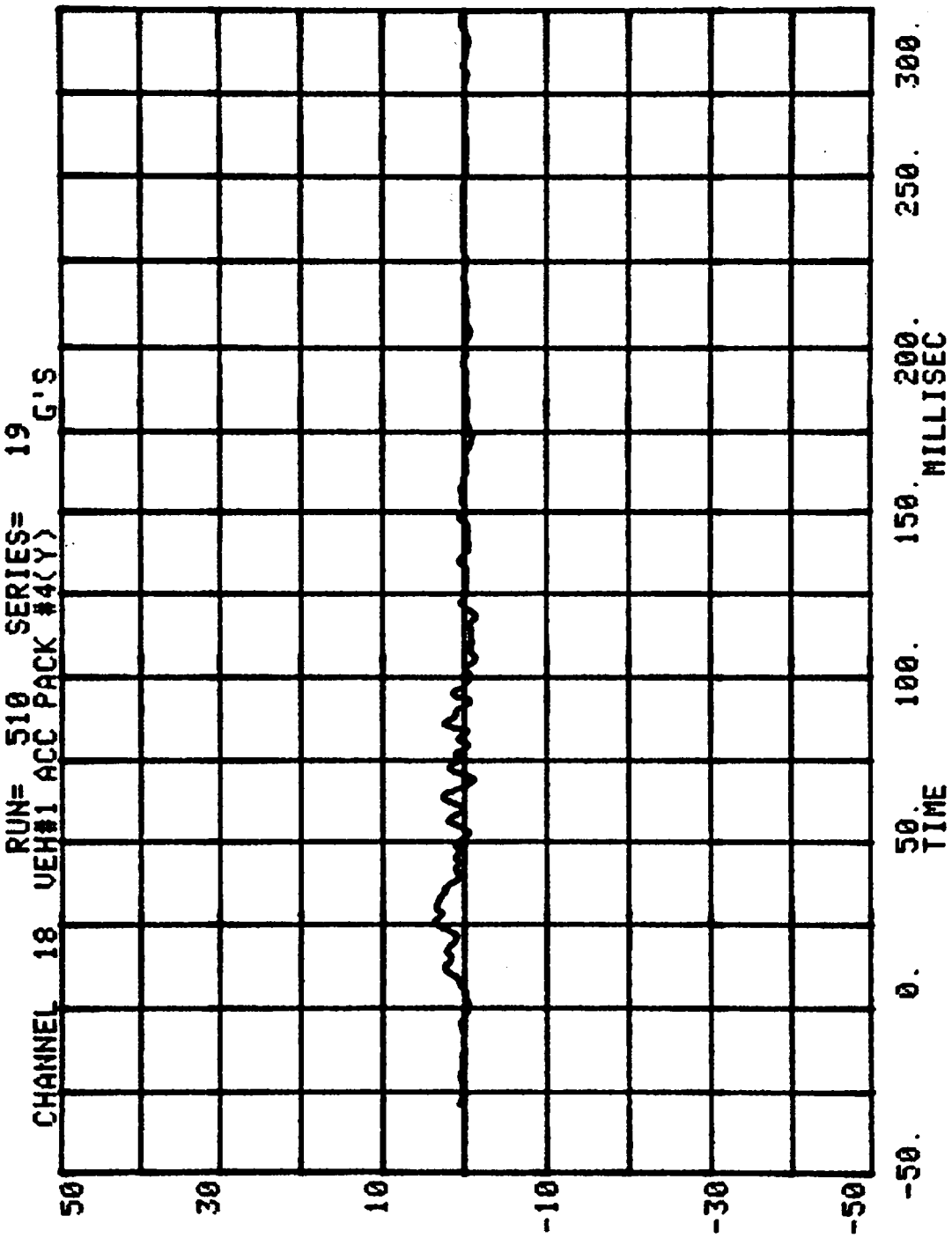

CHANNEL 15 VEH#1 ACC PACK #3(Y)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

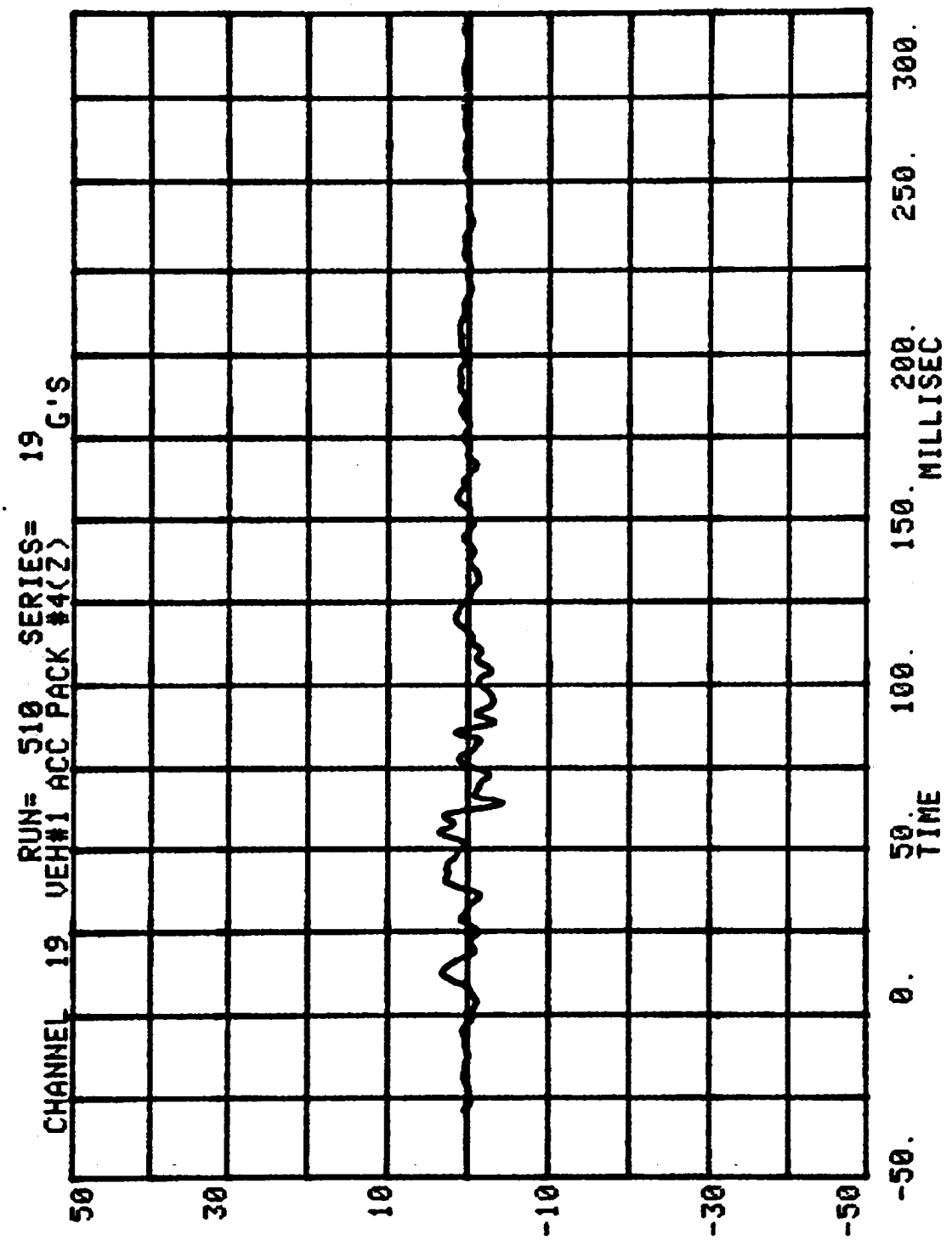

CHANNEL 16 VEH#1 ACC PACK #3(Z)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

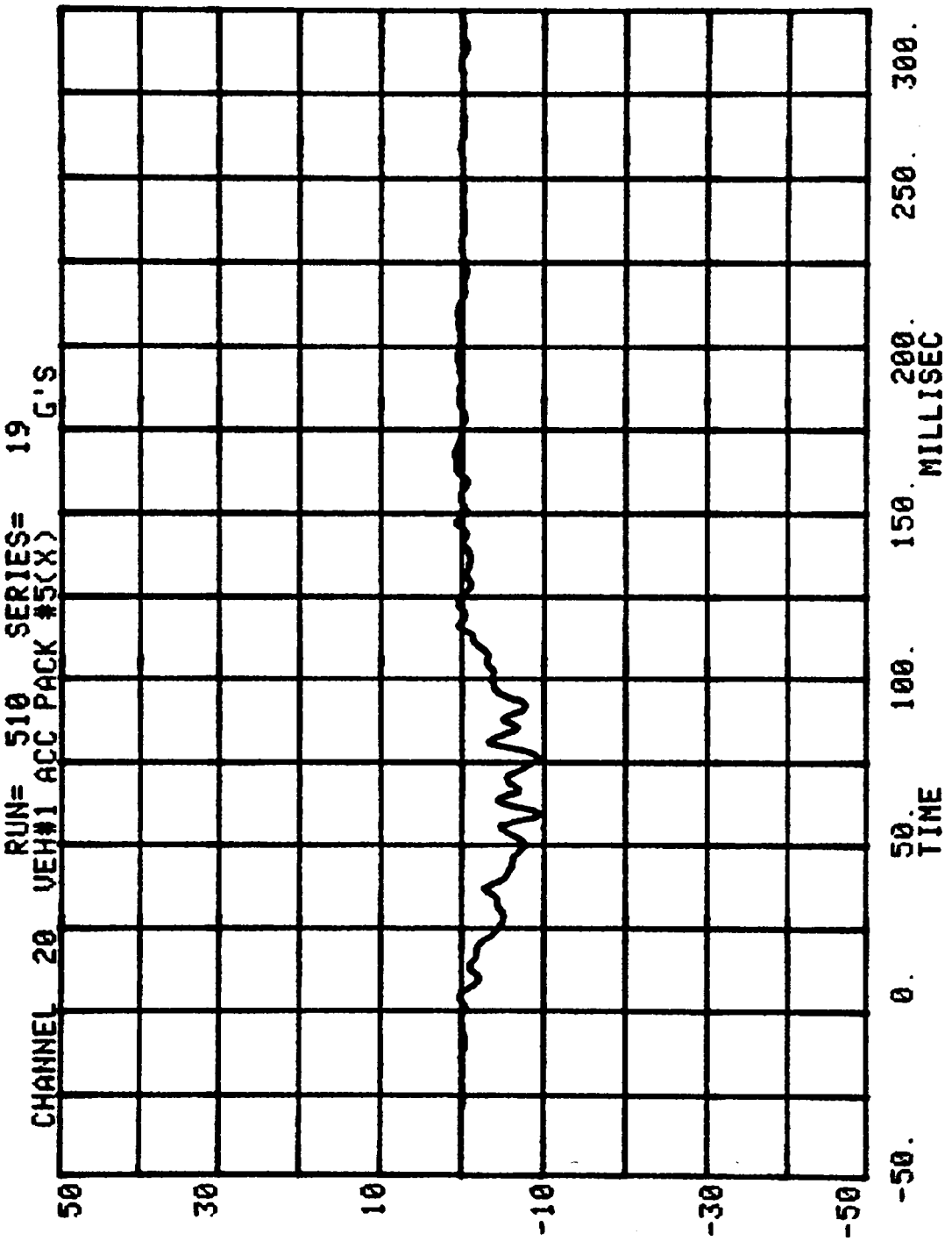

CHANNEL 17 VEH#1 ACC PACK #4(X)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

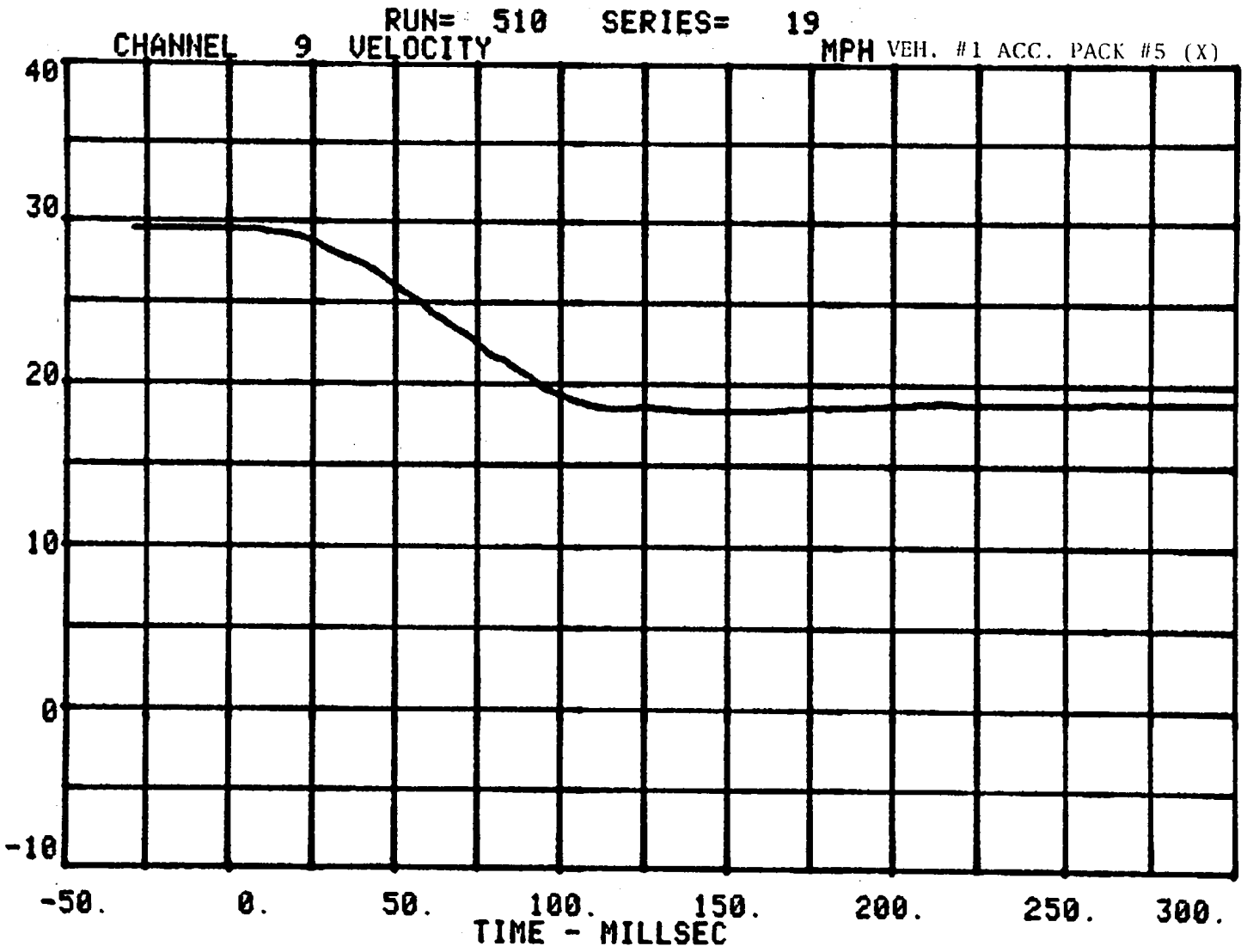

CHANNEL 7 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #1 ACC. PACK 4 (X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

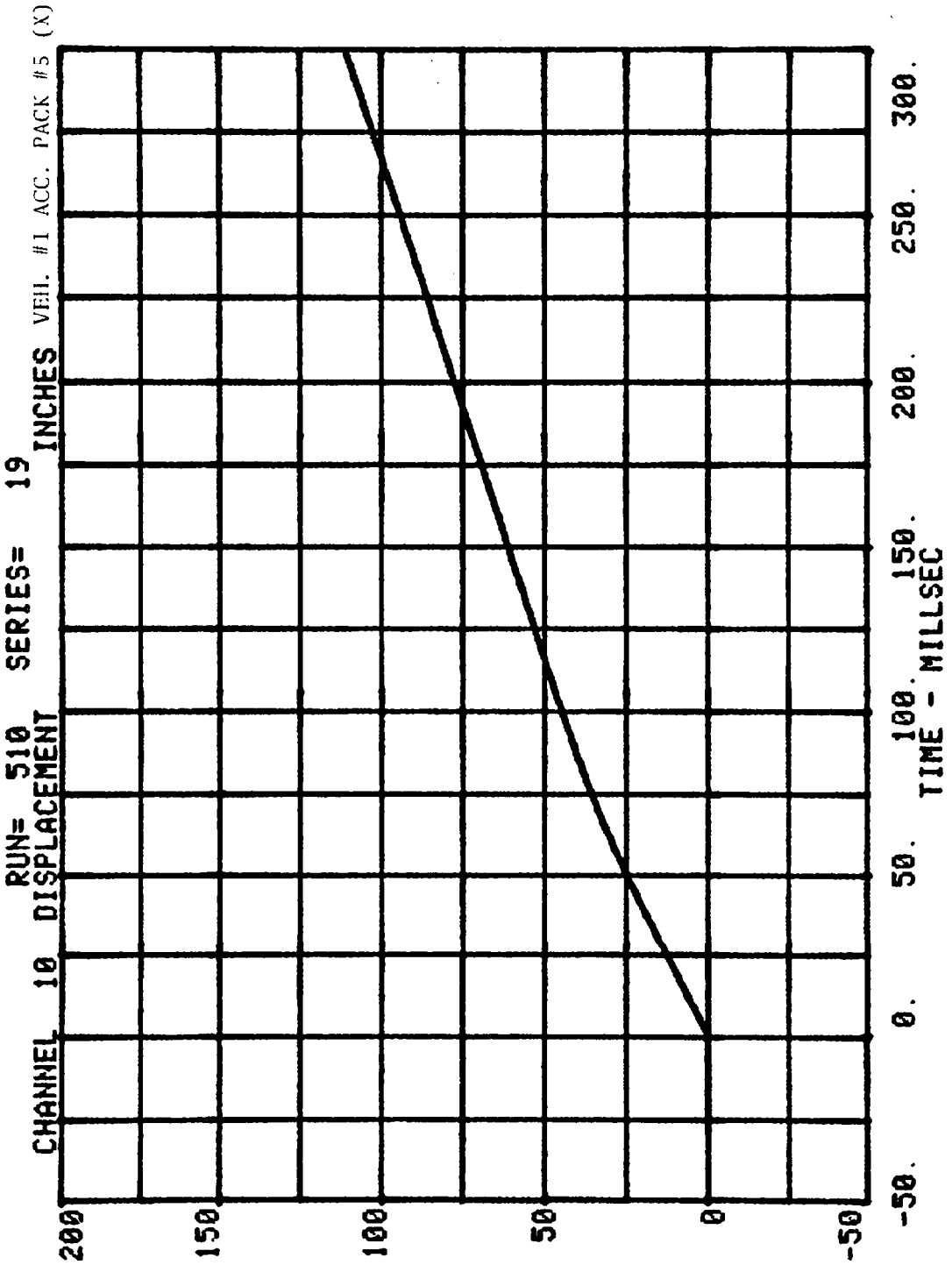

RUN= 510 SERIES= 19
CHANNEL 8 DISPLACEMENT INCHES
VEH. #1 ACC. PACK #4 (X)
200
150
100
50
0
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

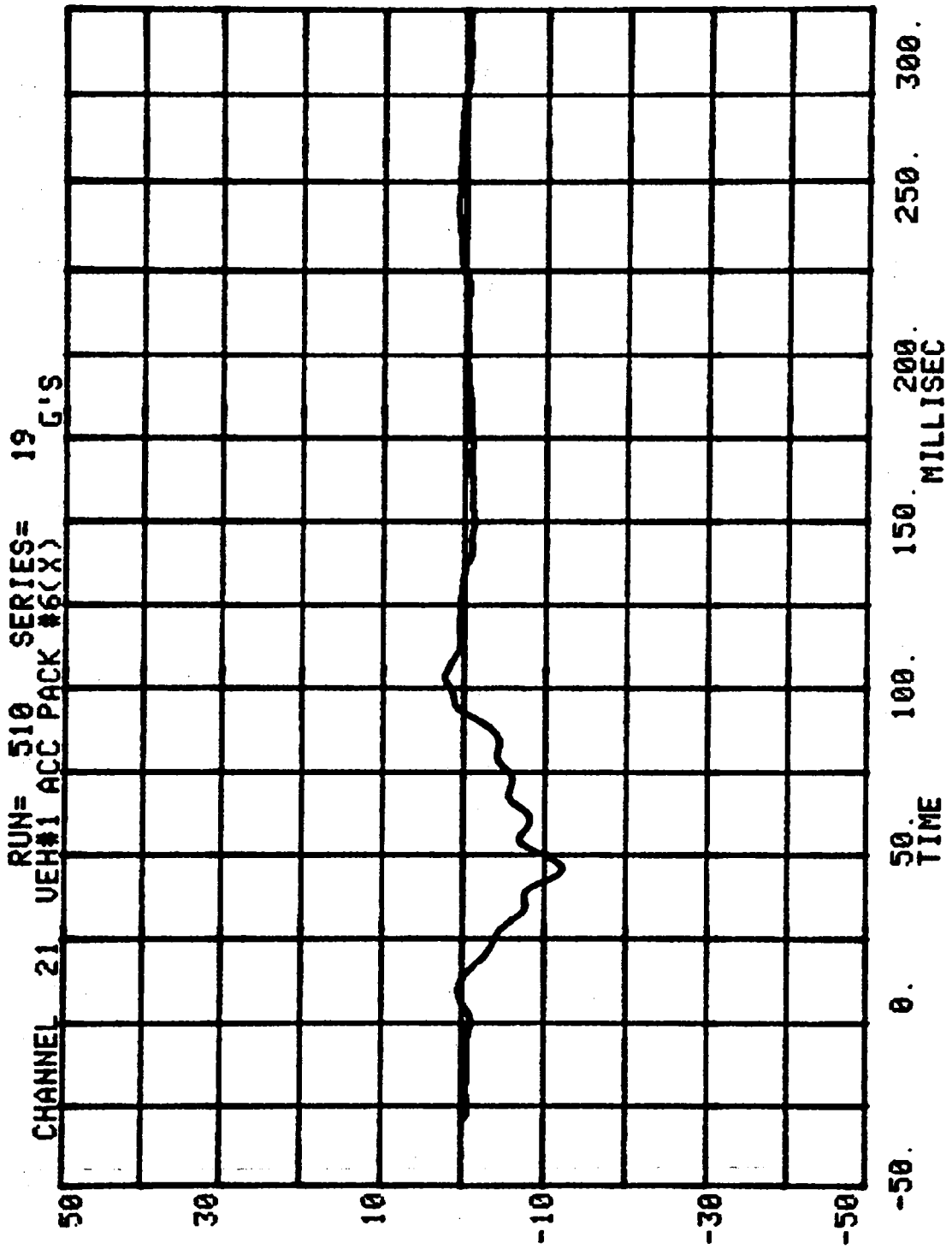

CHANNEL 18 VEH#1 ACC PACK #4(Y)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

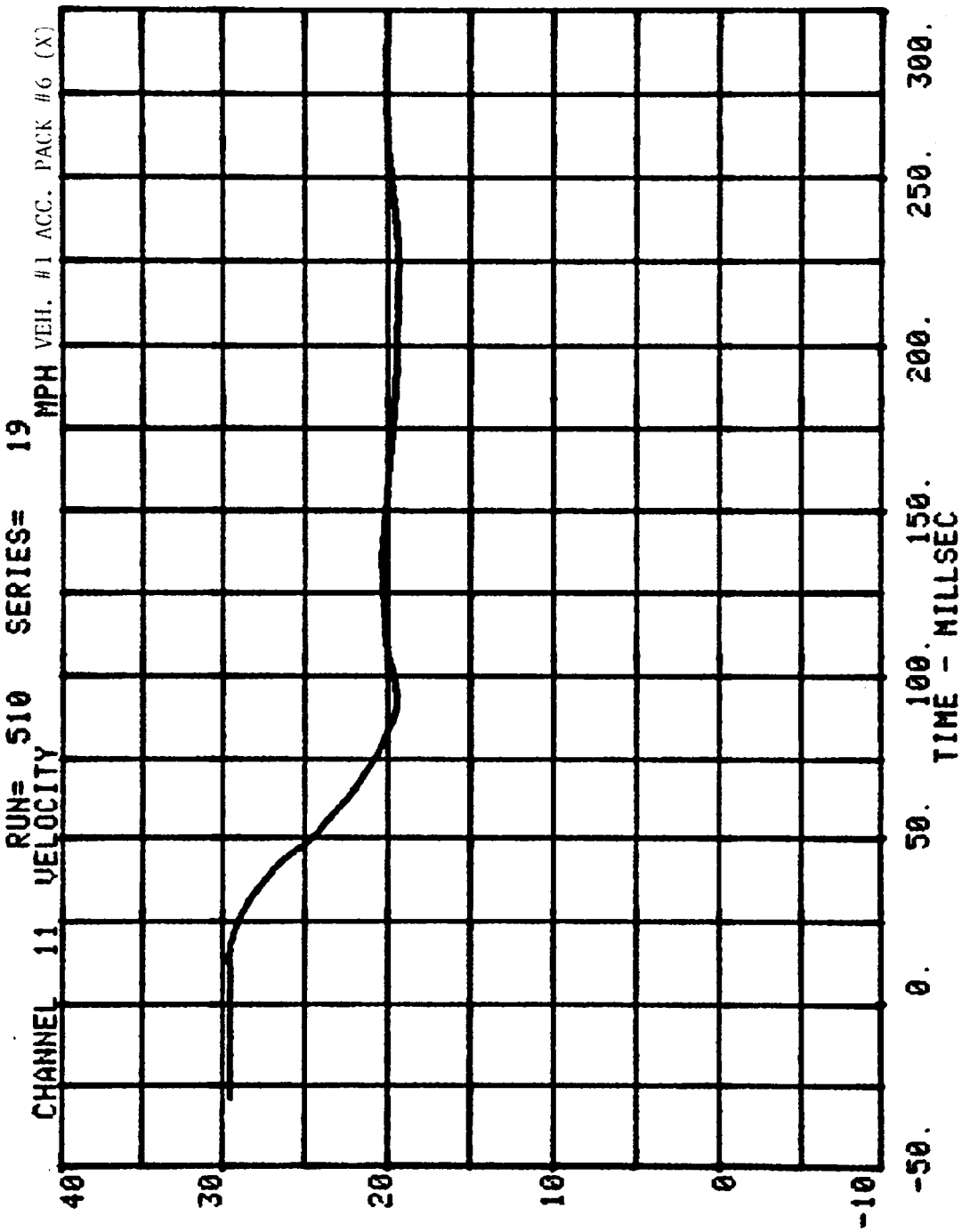

CHANNEL 19
RUN= 510 SERIES= 19
VEH#1 ACC PACK #4(Z)
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

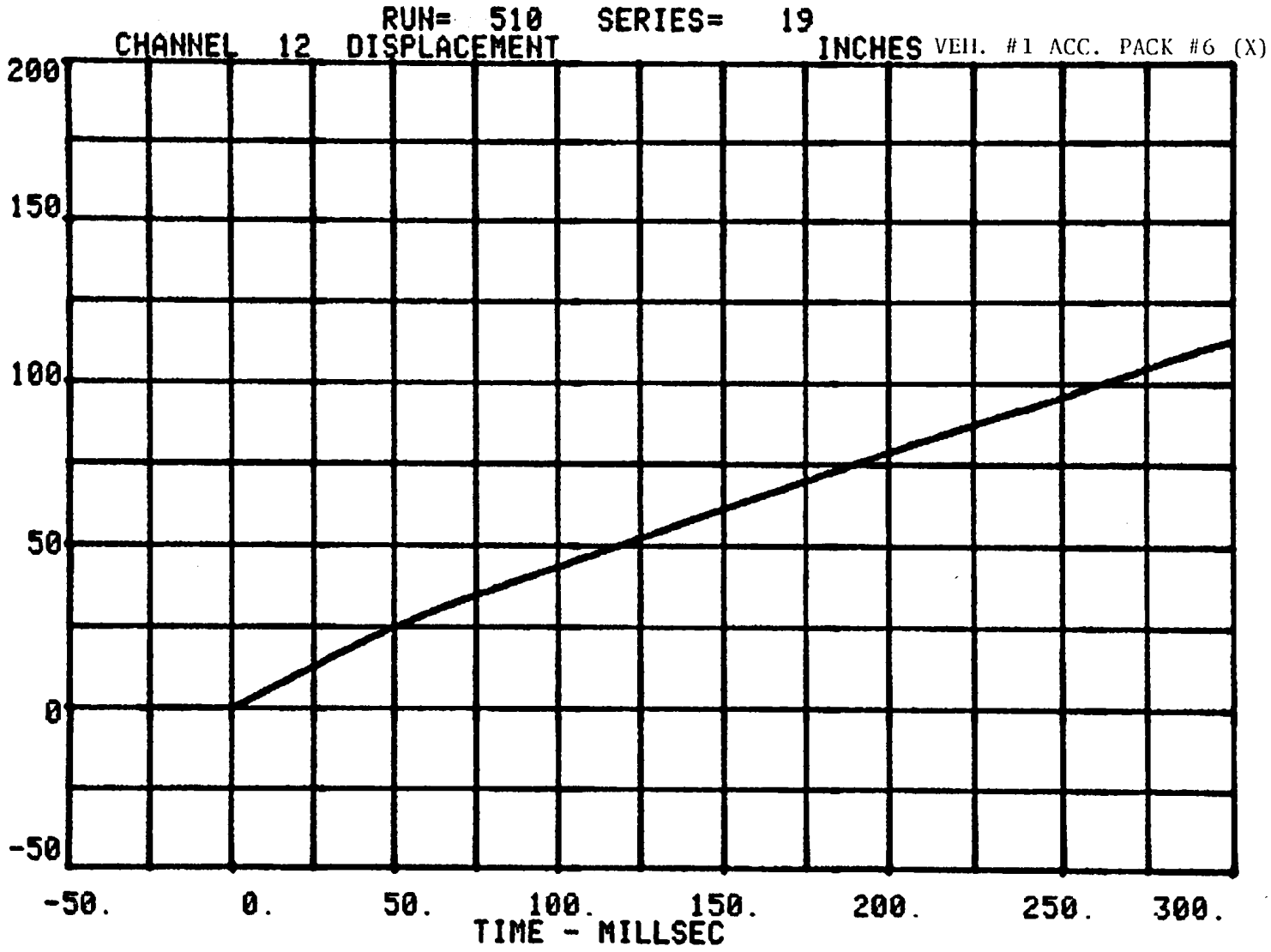

CHANNEL 20 VEH#1 ACC PACK #5(X)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

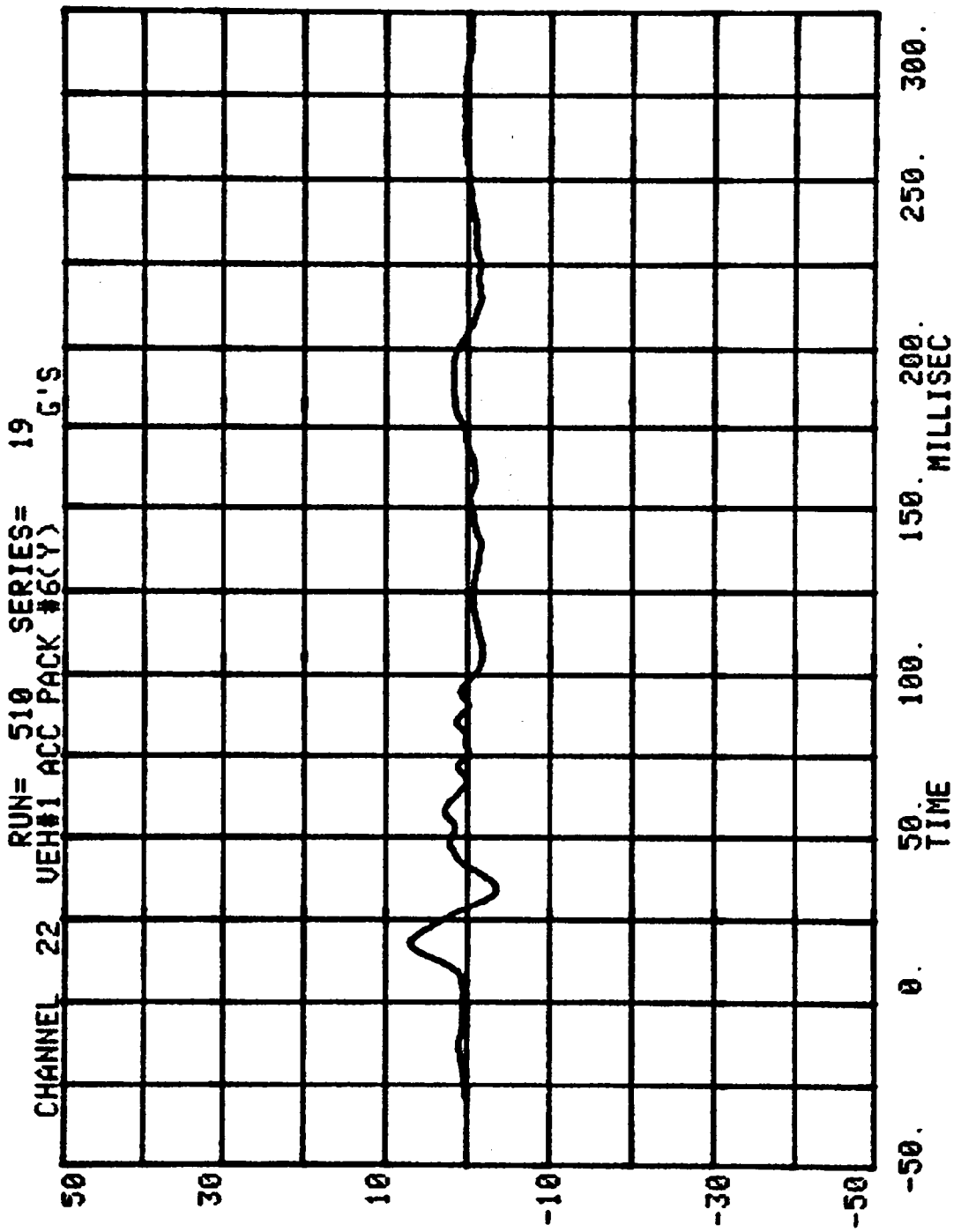

RUN= 510 SERIES= 19
CHANNEL 9 VELOCITY
MPH
VEH. #1 ACC. PACK #5 (X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

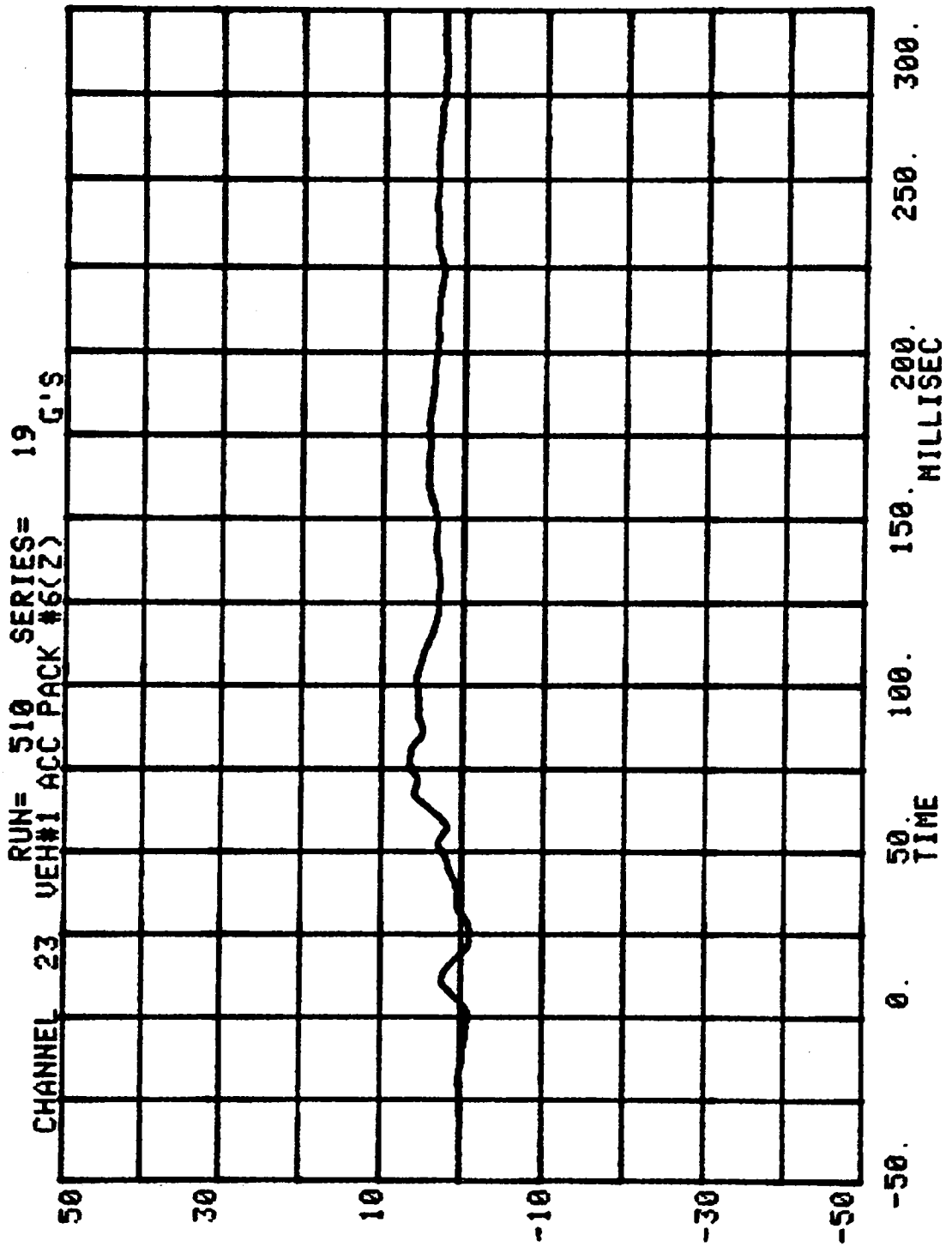

CHANNEL 10 DISPLACEMENT
RUN= 510 SERIES= 19
INCHES VEH. #1 ACC. PACK #5 (X)
200
150
100
50
0
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

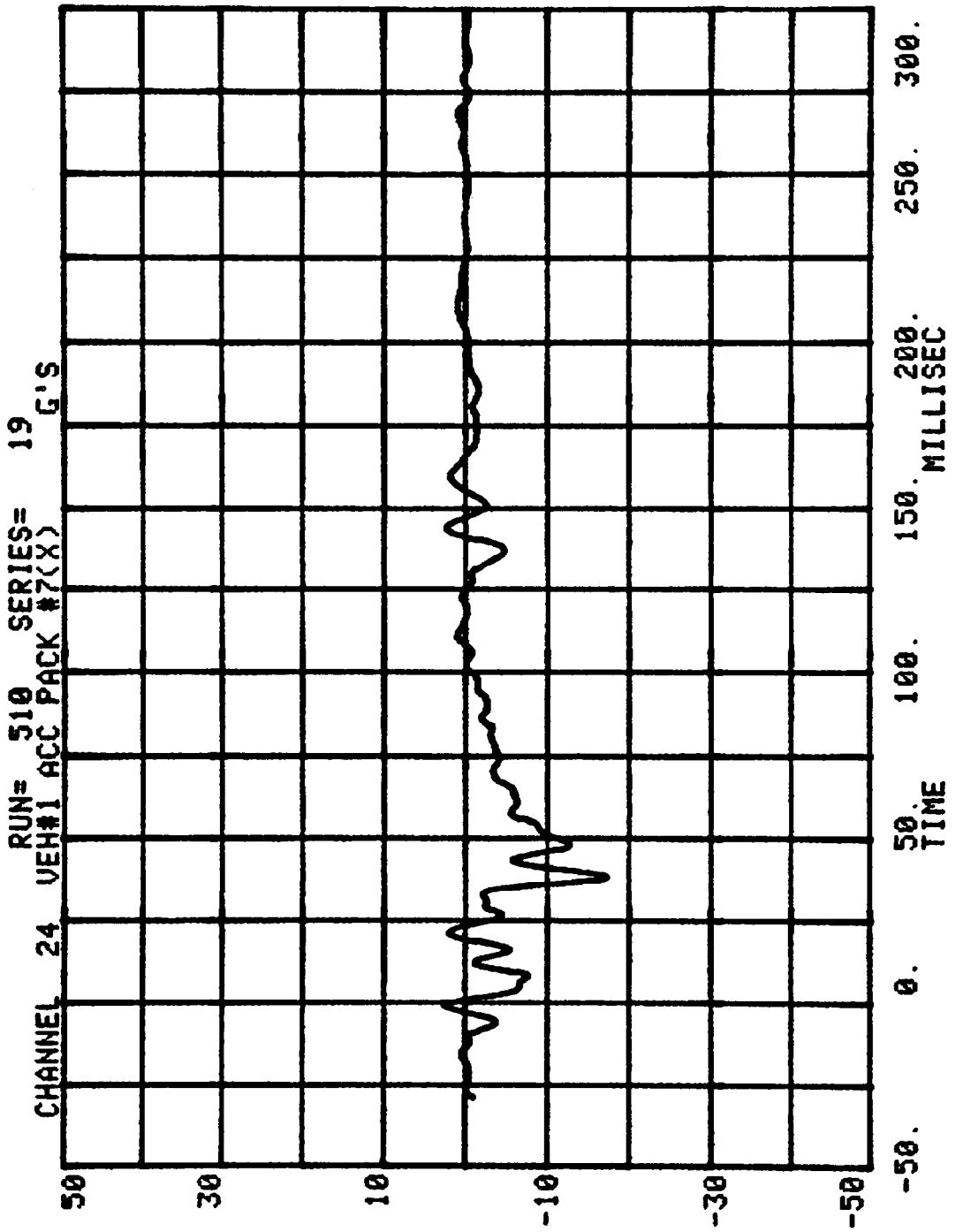

CHANNEL 21 VEH#1 ACC PACK #6(X)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

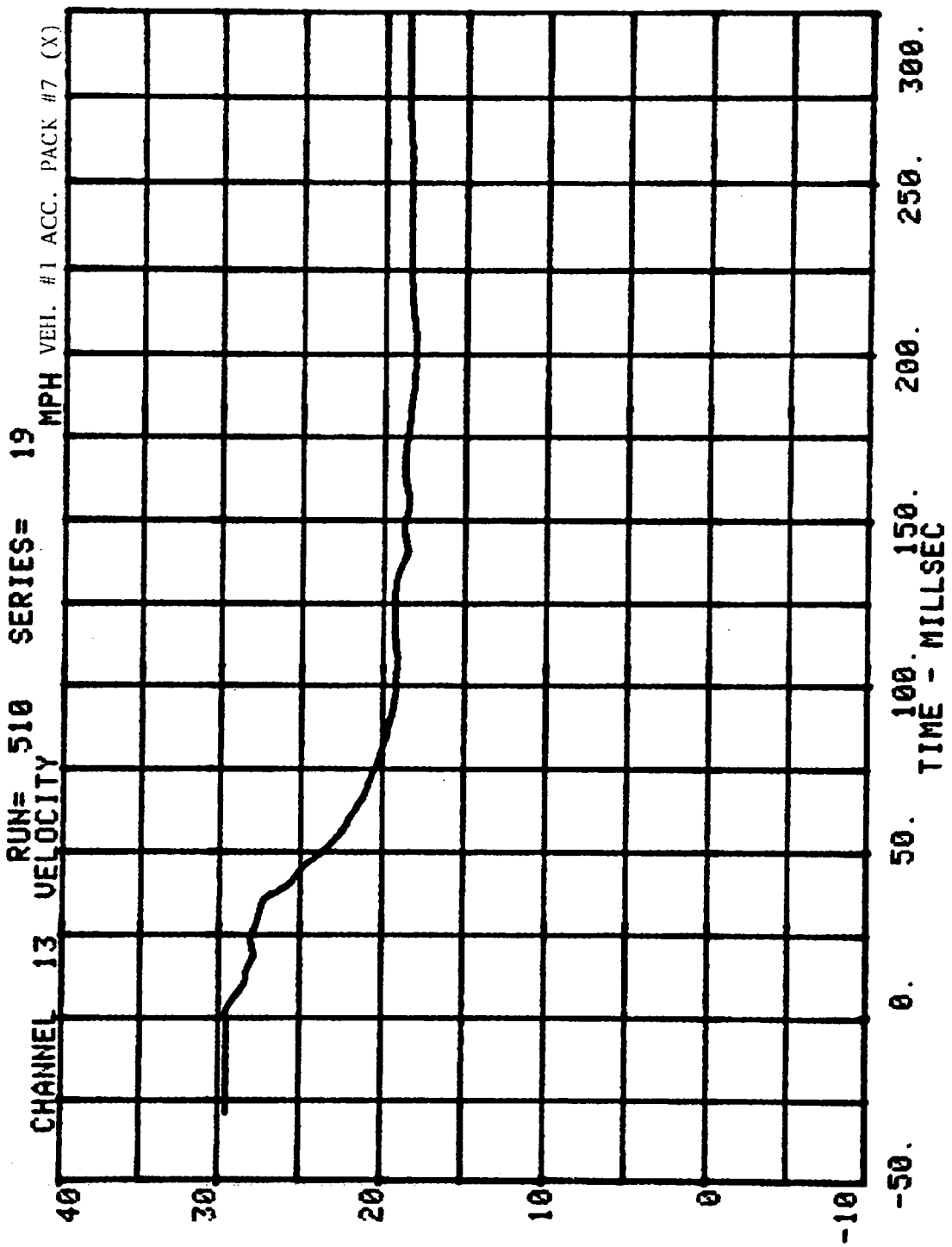

CHANNEL 11 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #1 ACC. PACK #6 (X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

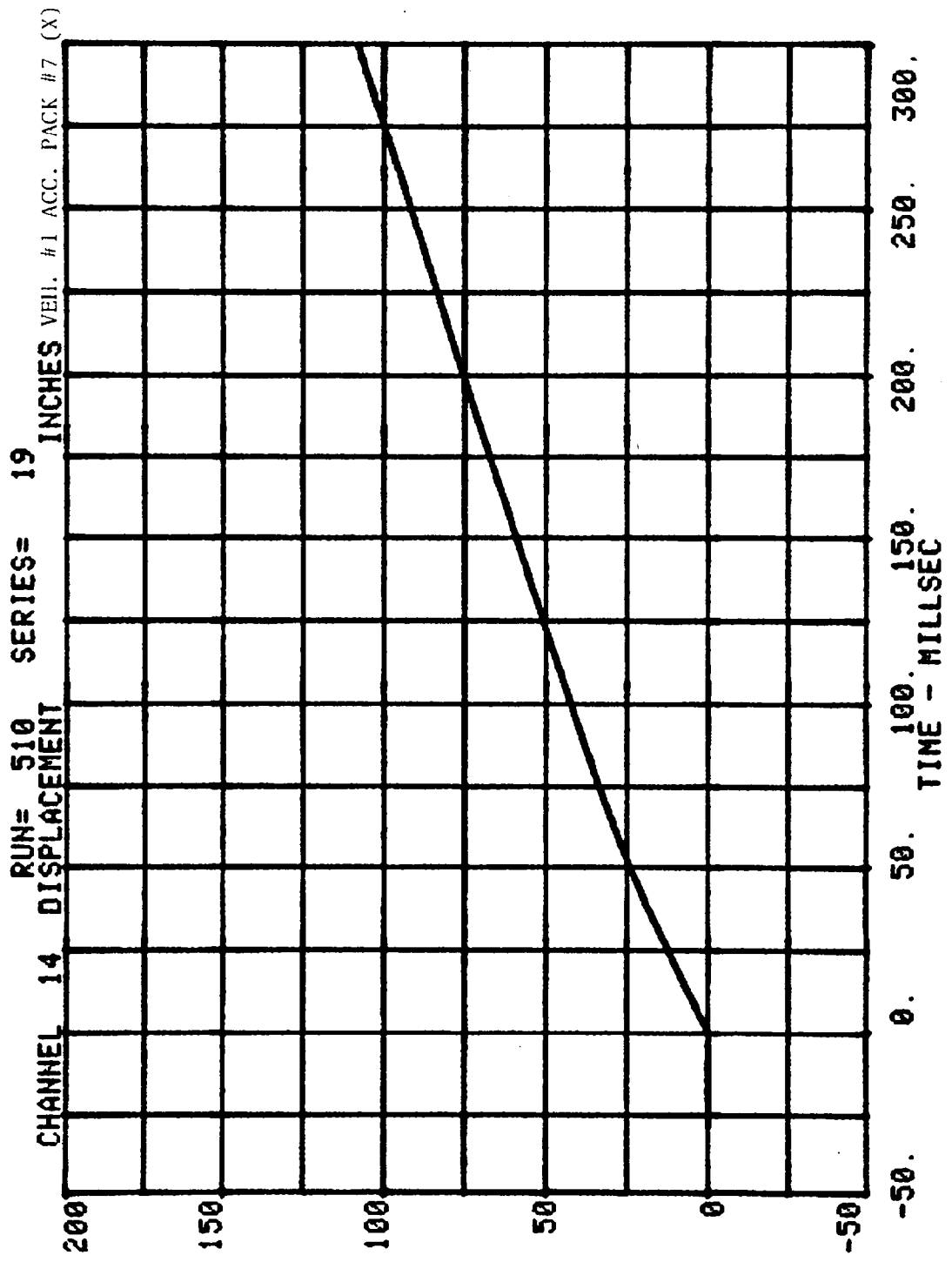

RUN= 510 SERIES= 19
CHANNEL 12 DISPLACEMENT INCHES
VEH. #1 ACC. PACK #6 (X)
200
150
100
50
0
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

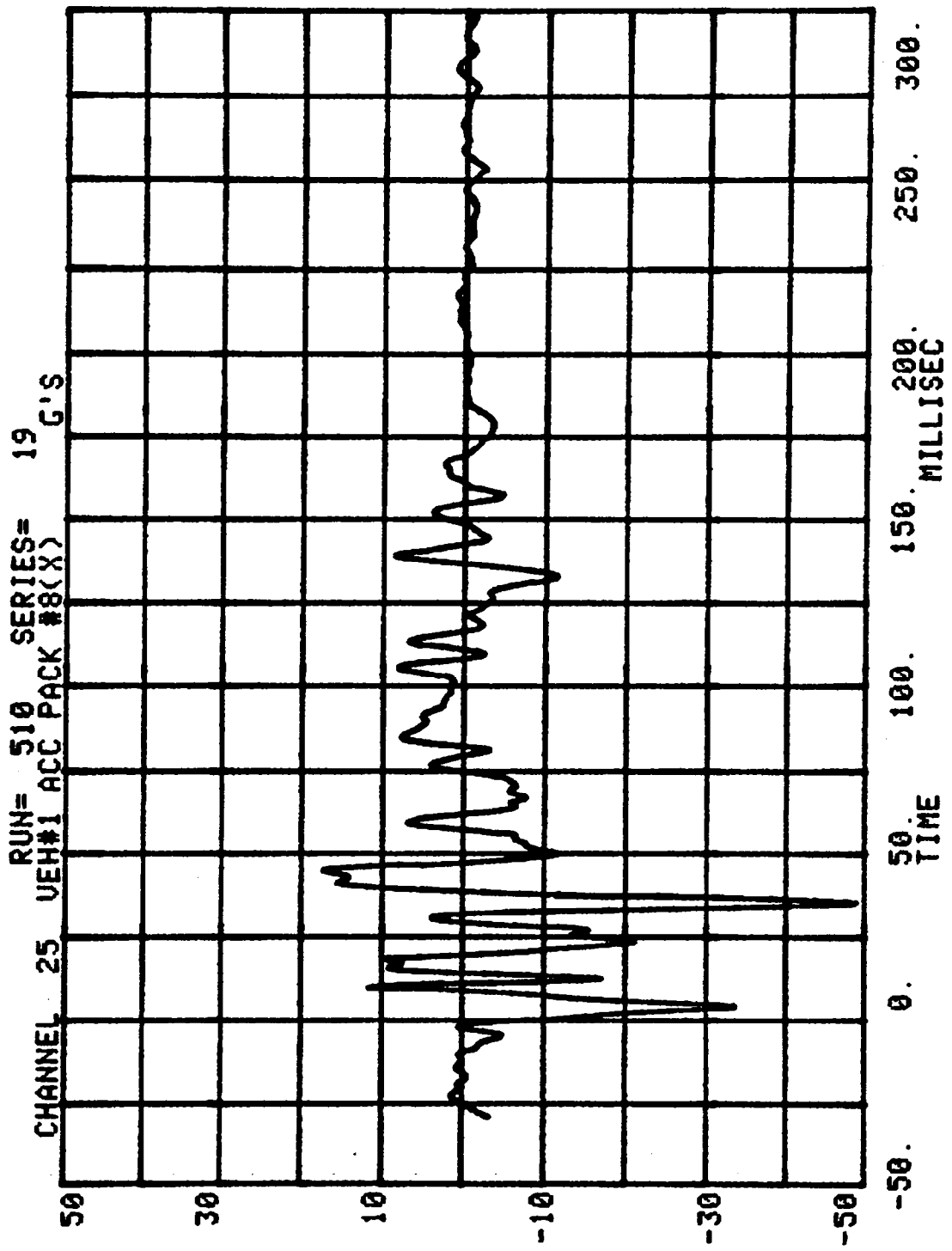

CHANNEL 22
RUN= 510 SERIES= 19
VEH#1 ACC PACK #6(Y)
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

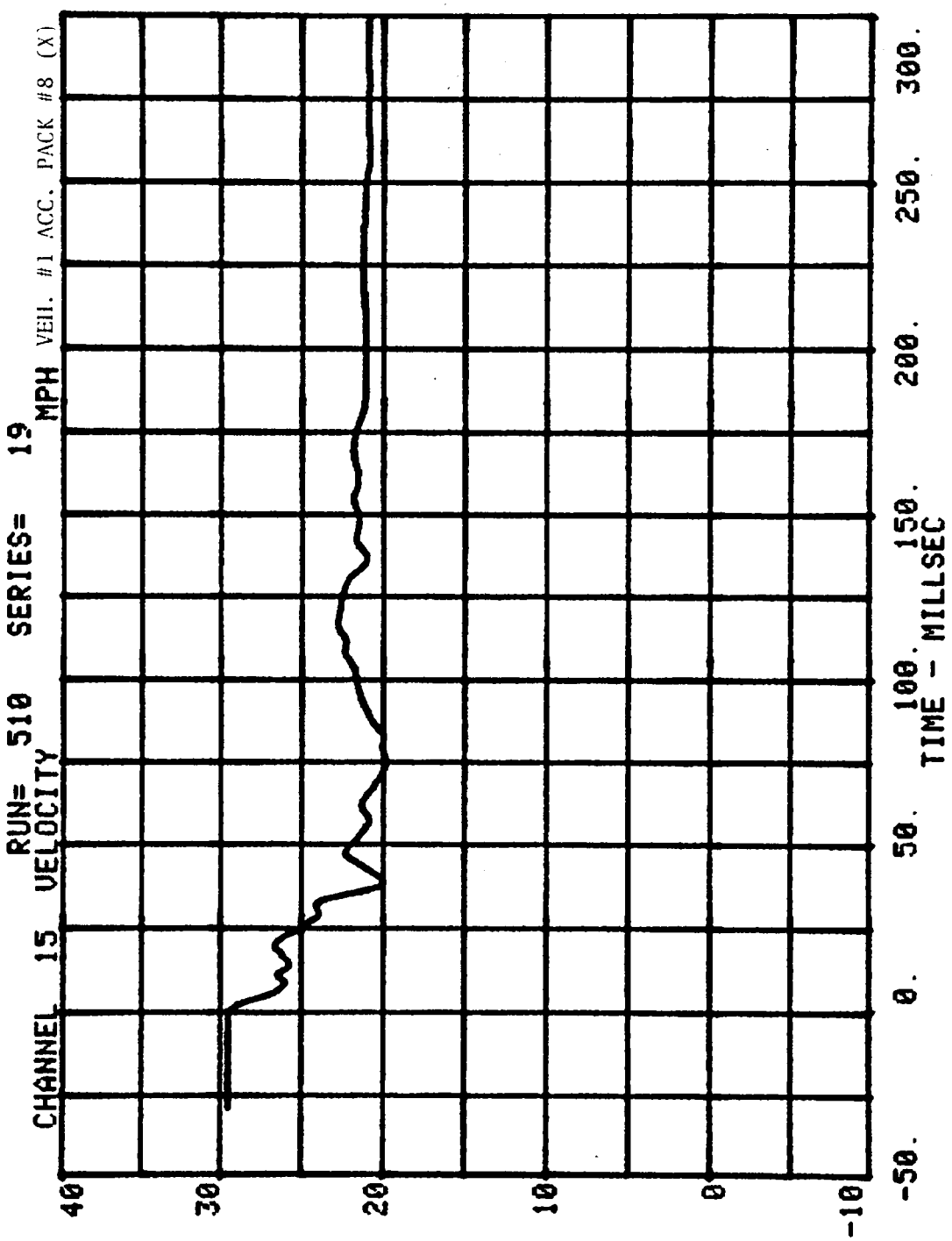

CHANNEL 23 VEH#1 ACC PACK #6(Z)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

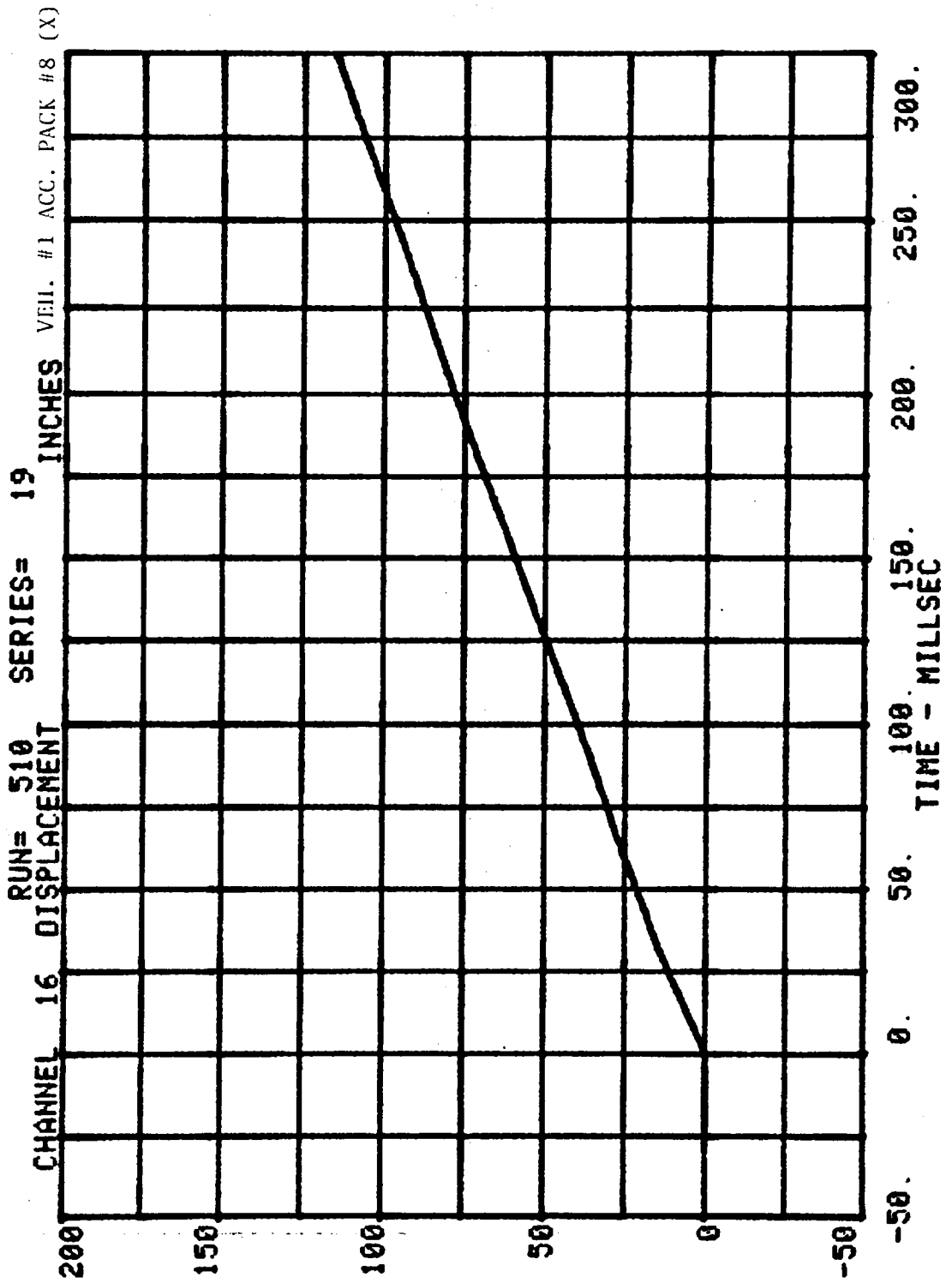

CHANNEL 24 VEH#1 ACC PACK #7(X)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

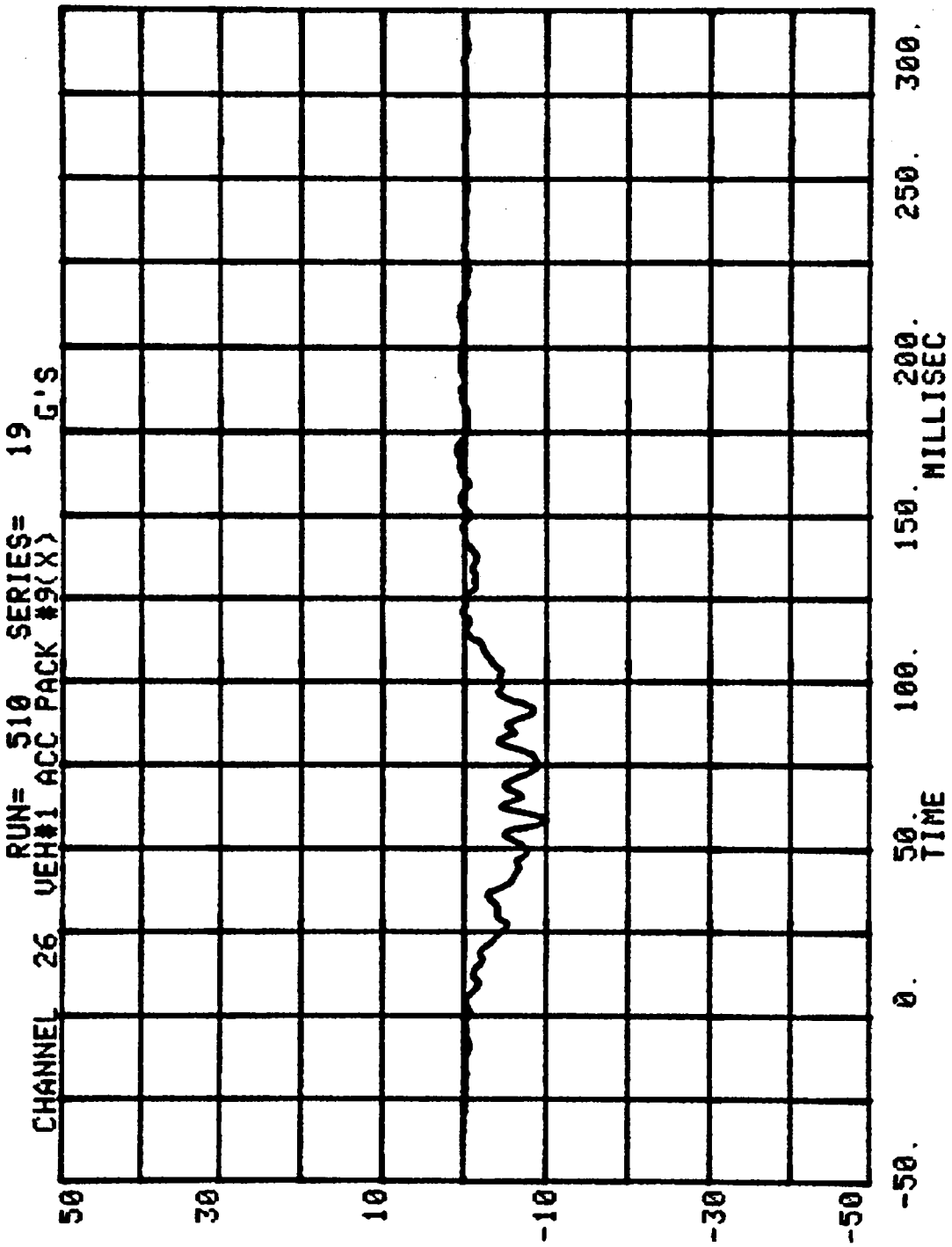

CHANNEL 13 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #1 ACC. PACK #7 (X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

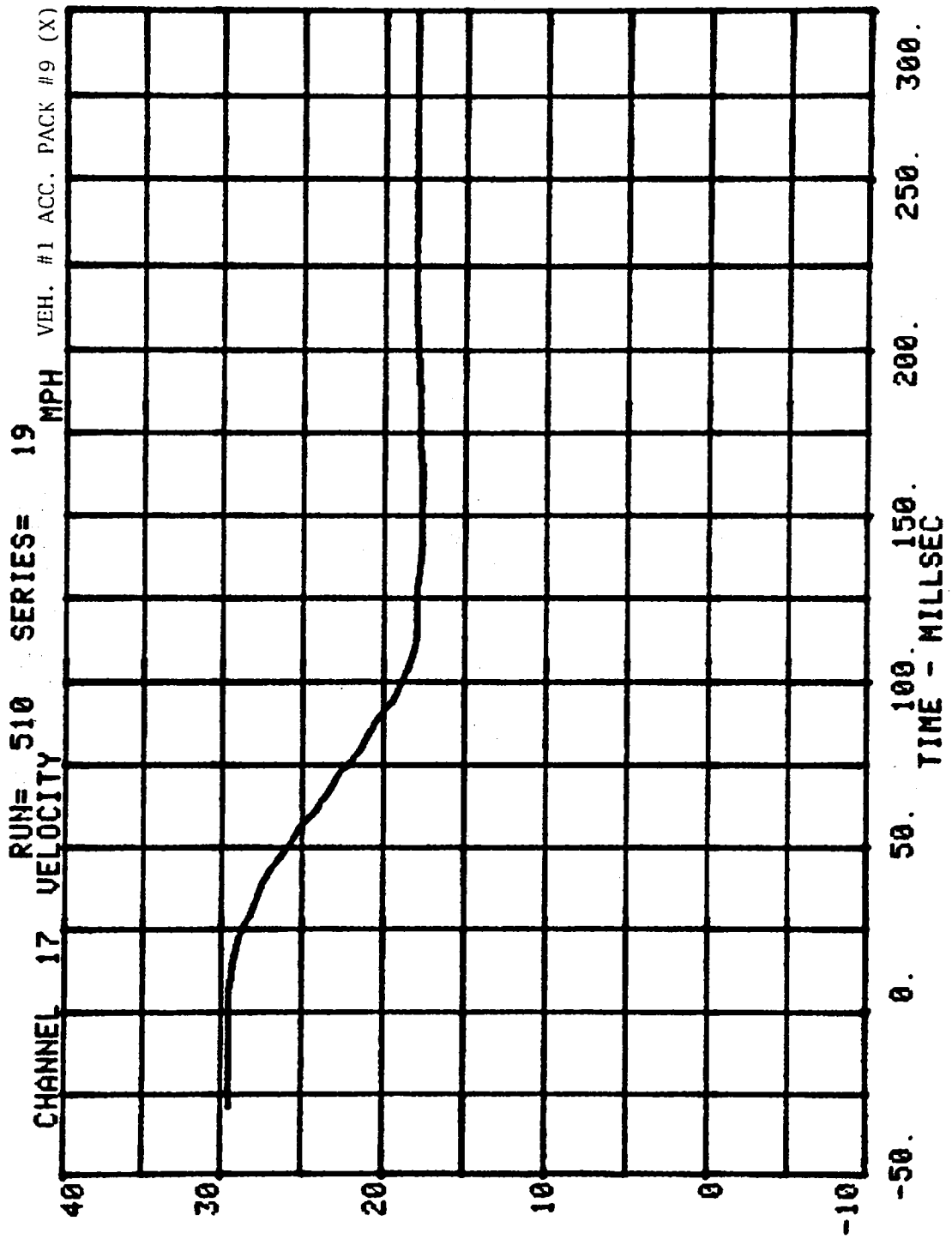

CHANNEL 14 DISPLACEMENT
RUN= 510 SERIES= 19
INCHES VEH. #1 ACC. PACK #7 (X)
200
150
100
50
0
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

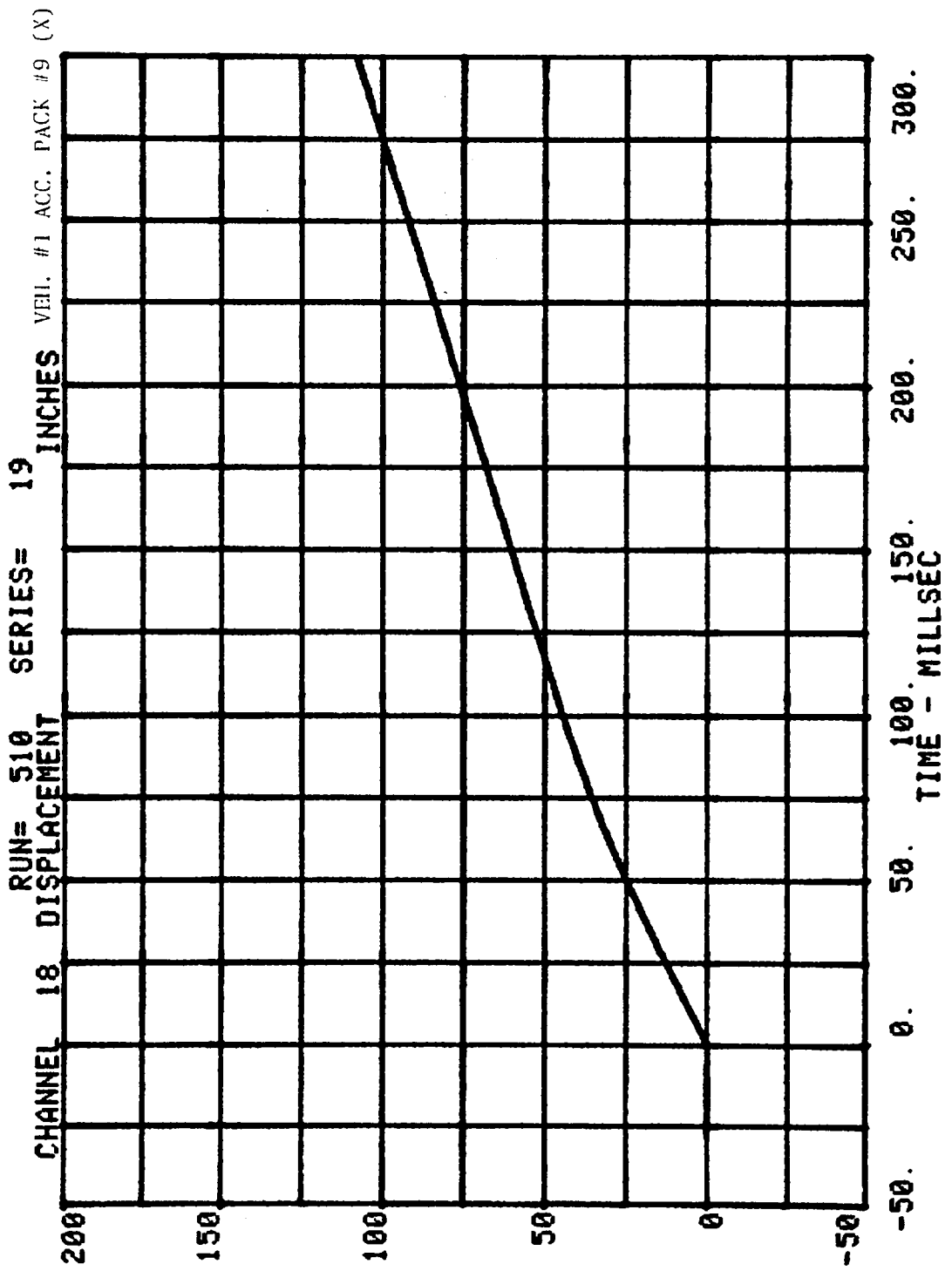

CHANNEL 25 VEH#1 ACC PACK #8(X)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

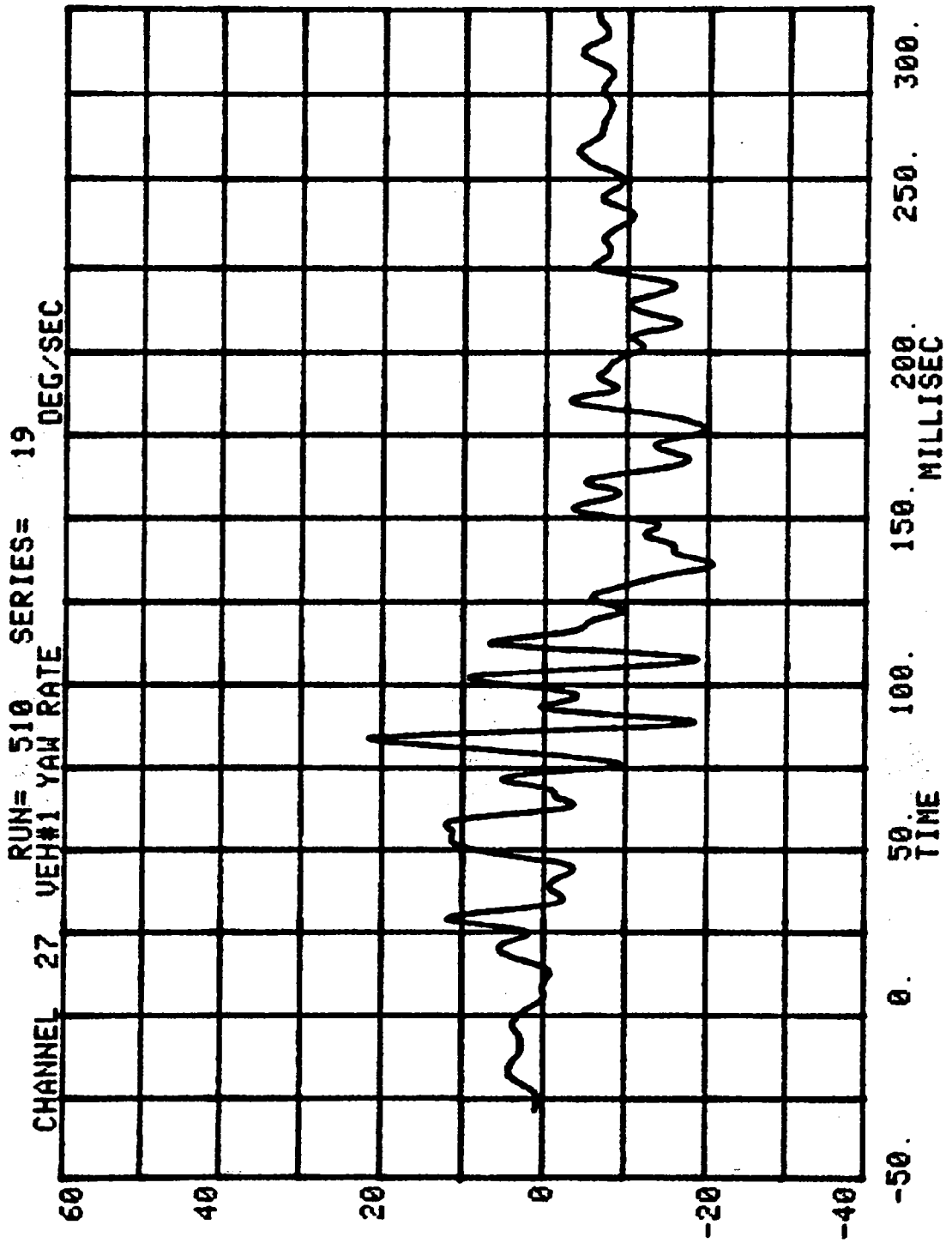

CHANNEL 15 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #1 ACC. PACK #8 (X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

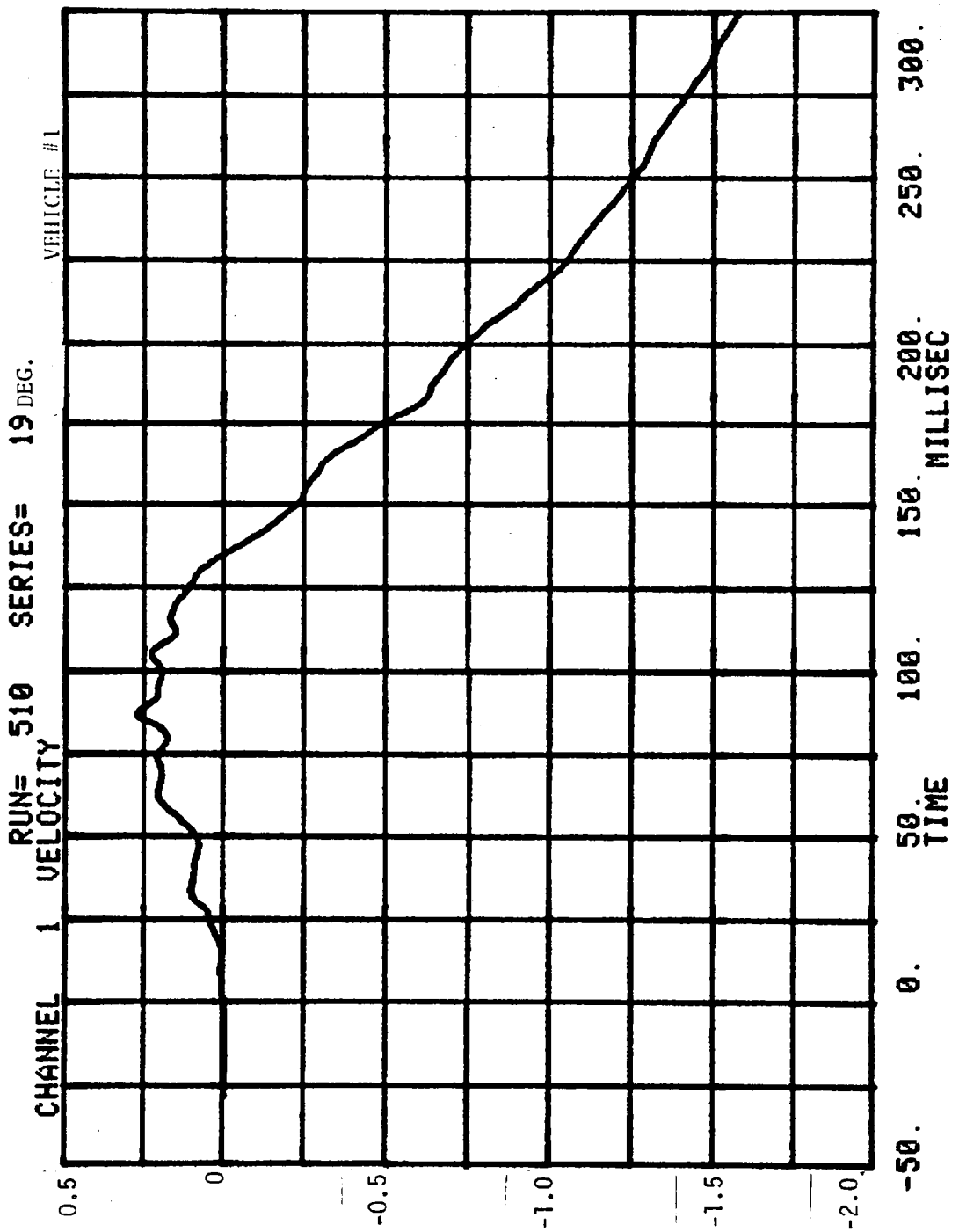

CHANNEL 16 DISPLACEMENT
RUN= 510 SERIES= 19
INCHES
VEIL. #1 ACC. PACK #8 (X)
200
150
100
50
0
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC


CHANNEL 26 VEH#1 ACC PACK #9(X)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 17 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #1 ACC. PACK #9 (X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC


CHANNEL 18 DISPLACEMENT RUN= 510 SERIES= 19 INCHES VEH. #1 ACC. PACK #9 (X)
200
150
100
50
0
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC


CHANNEL 27 VEH#1 YAW RATE
RUN= 510 SERIES= 19
DEG/SEC
60
40
20
0
-20
-40
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

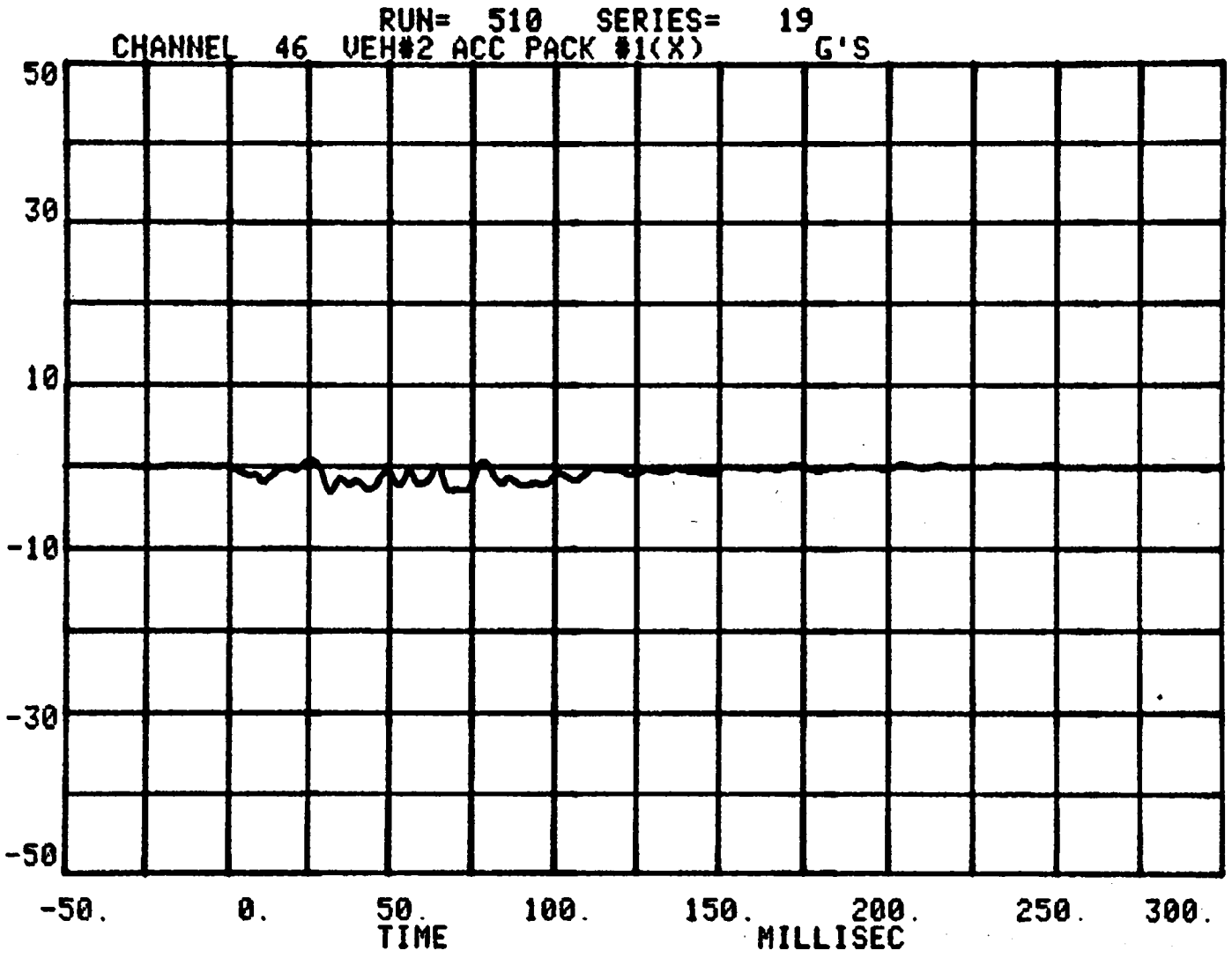

CHANNEL 1 VELOCITY
RUN= 510 SERIES= 19 DEG.
VEHICLE #1
0.5
0
-0.5
-1.0
-1.5
-2.0
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

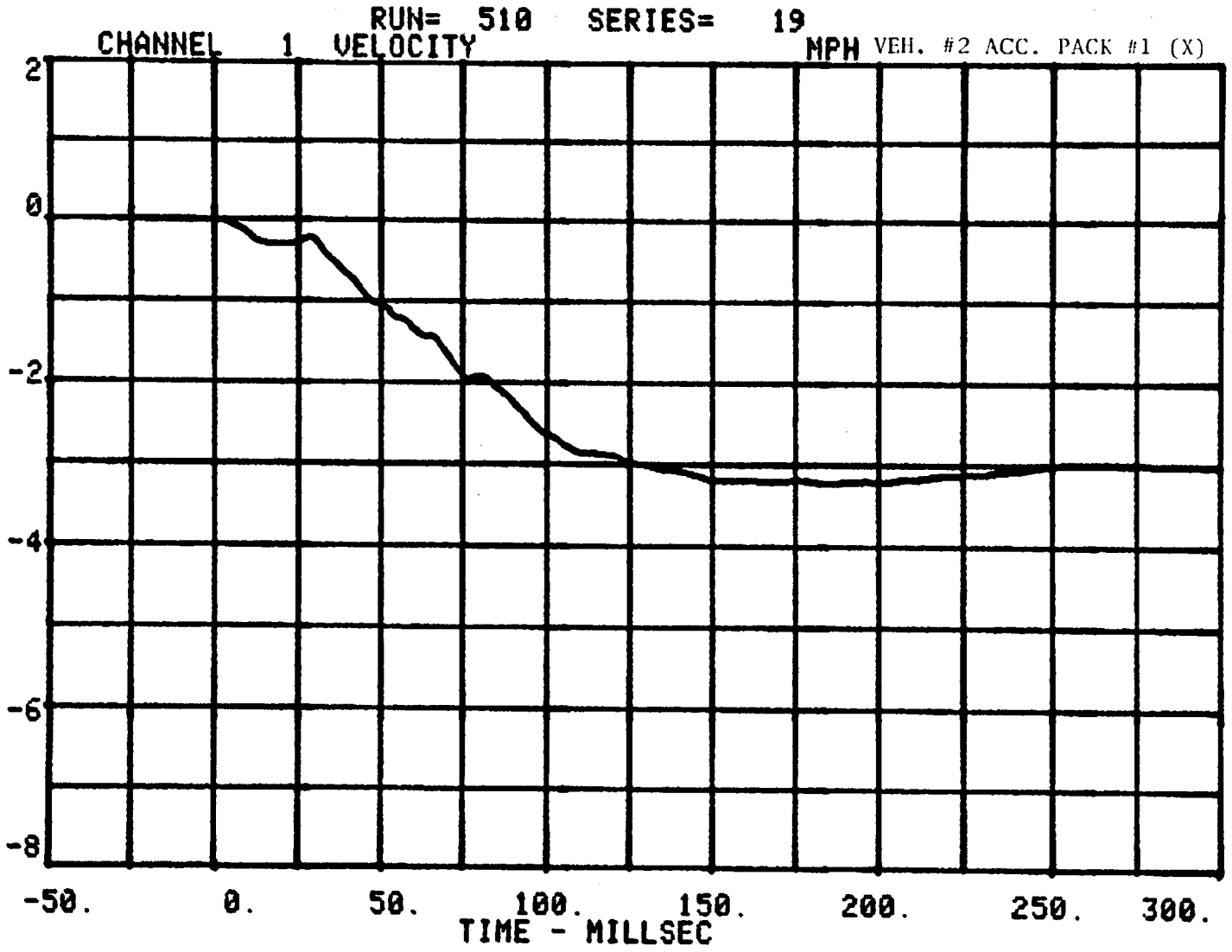
TEST NO. 19

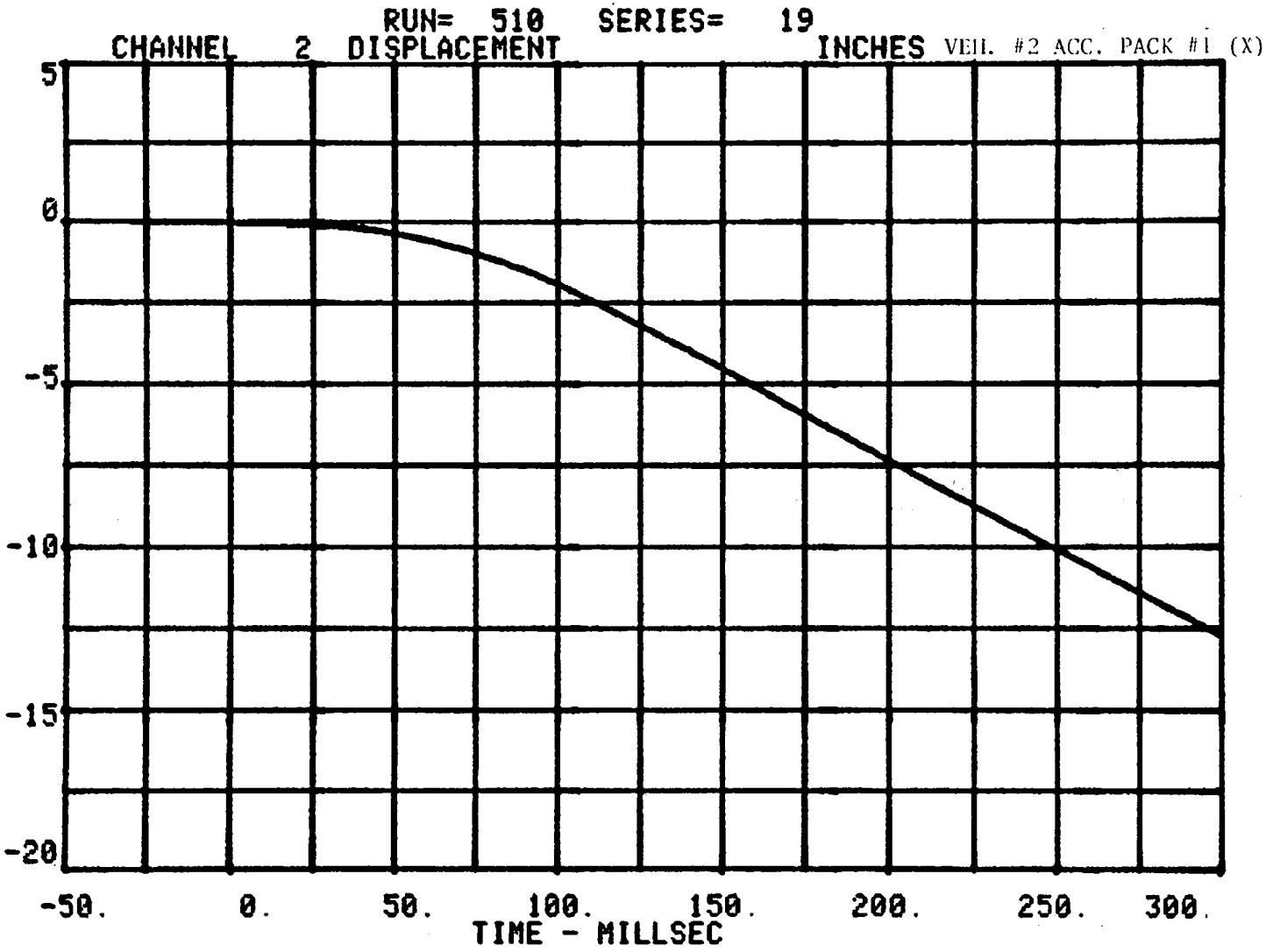
VEHICLE 2 - 1976 VOLKSWAGEN RABBIT

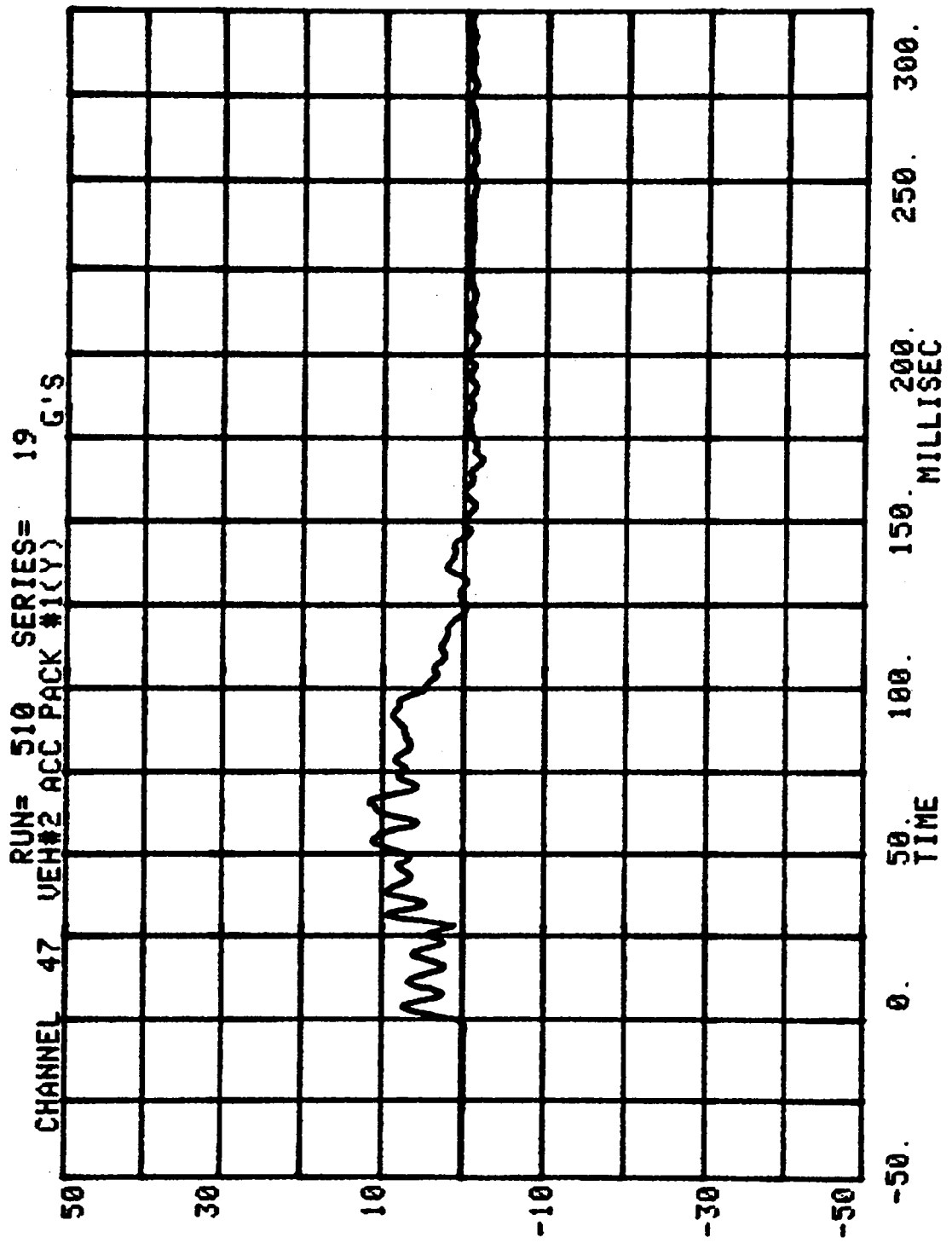
VEHICLE DATA

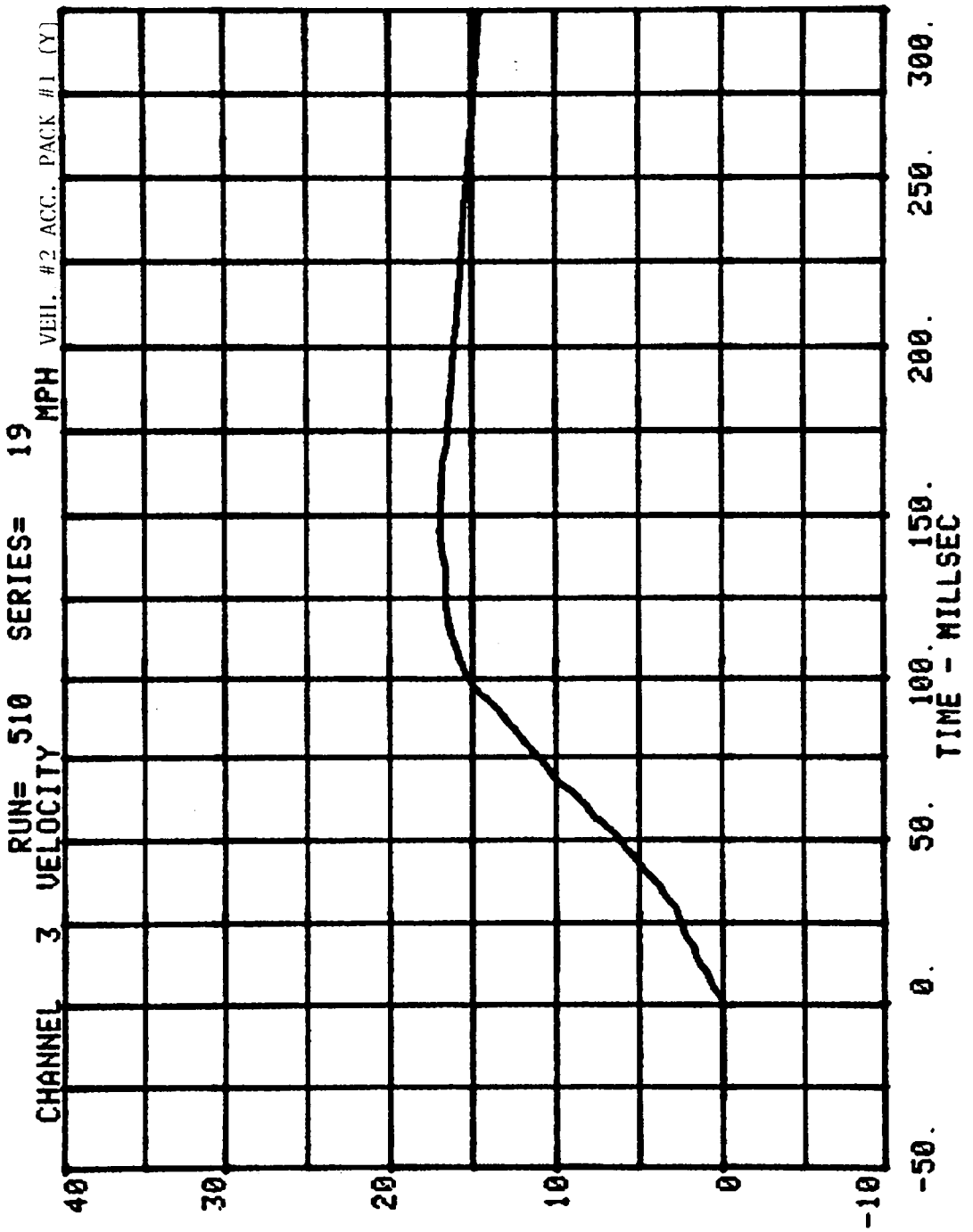
60 H_z Channel Class

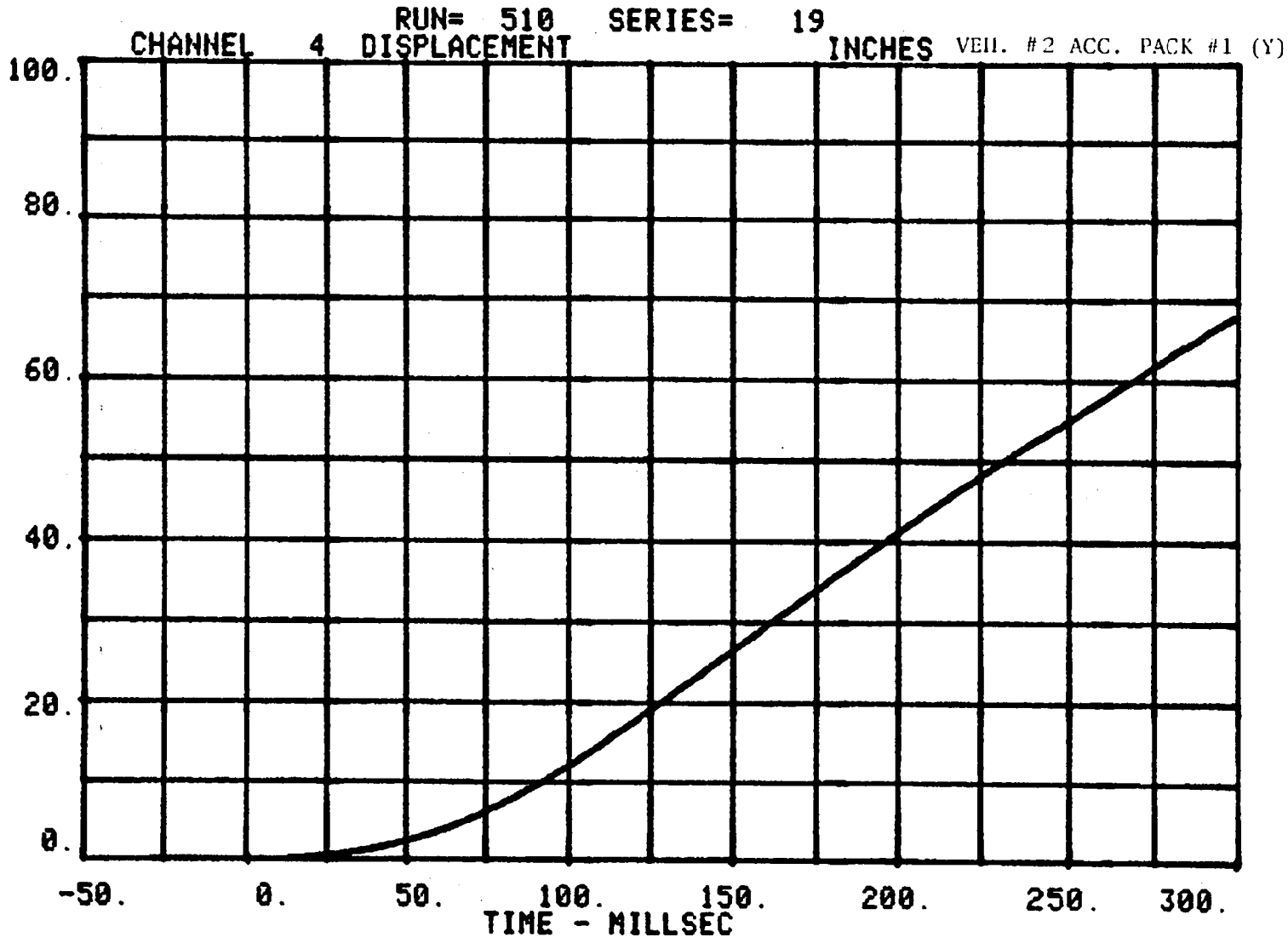

RUN= 510 SERIES= 19
CHANNEL 46 VEH#2 ACC PACK #1(X) G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

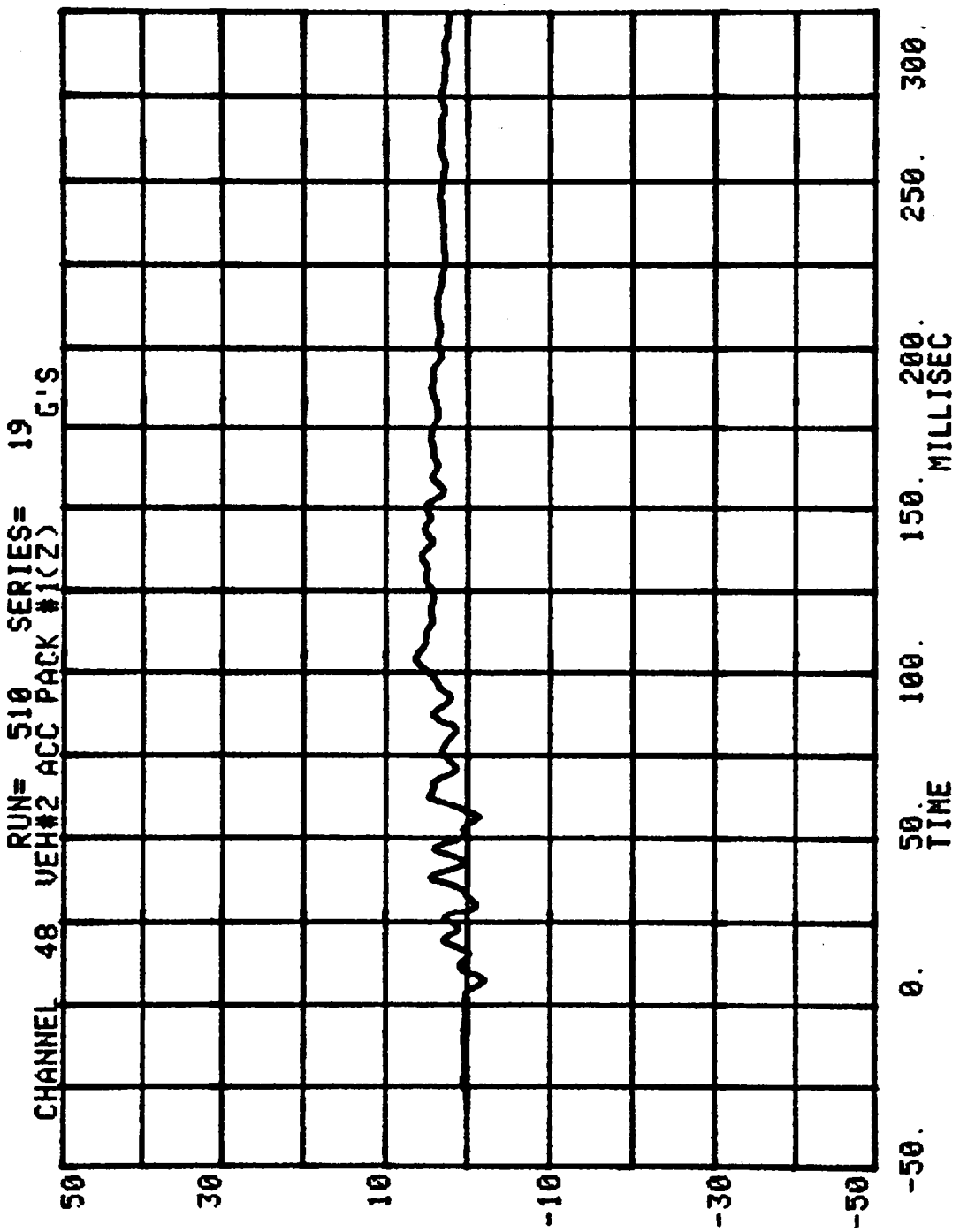

RUN= 510 SERIES= 19
CHANNEL 1 VELOCITY
MPH
VEH. #2 ACC. PACK #1 (X)
2
0
-2
-4
-6
-8
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC


RUN= 510 SERIES= 19
CHANNEL 2 DISPLACEMENT INCHES VEH. #2 ACC. PACK #1 (X)
5
0
-5
-10
-15
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC


CHANNEL 47
RUN= 510 SERIES= 19
VEH#2 ACC PACK #1(Y)
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 3 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #2 ACC. PACK #1 (Y)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC


RUN= 510 SERIES= 19
CHANNEL 4 DISPLACEMENT INCHES
VEH. #2 ACC. PACK #1 (Y)
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC


CHANNEL 48
VEH#2 ACC PACK #1(Z)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

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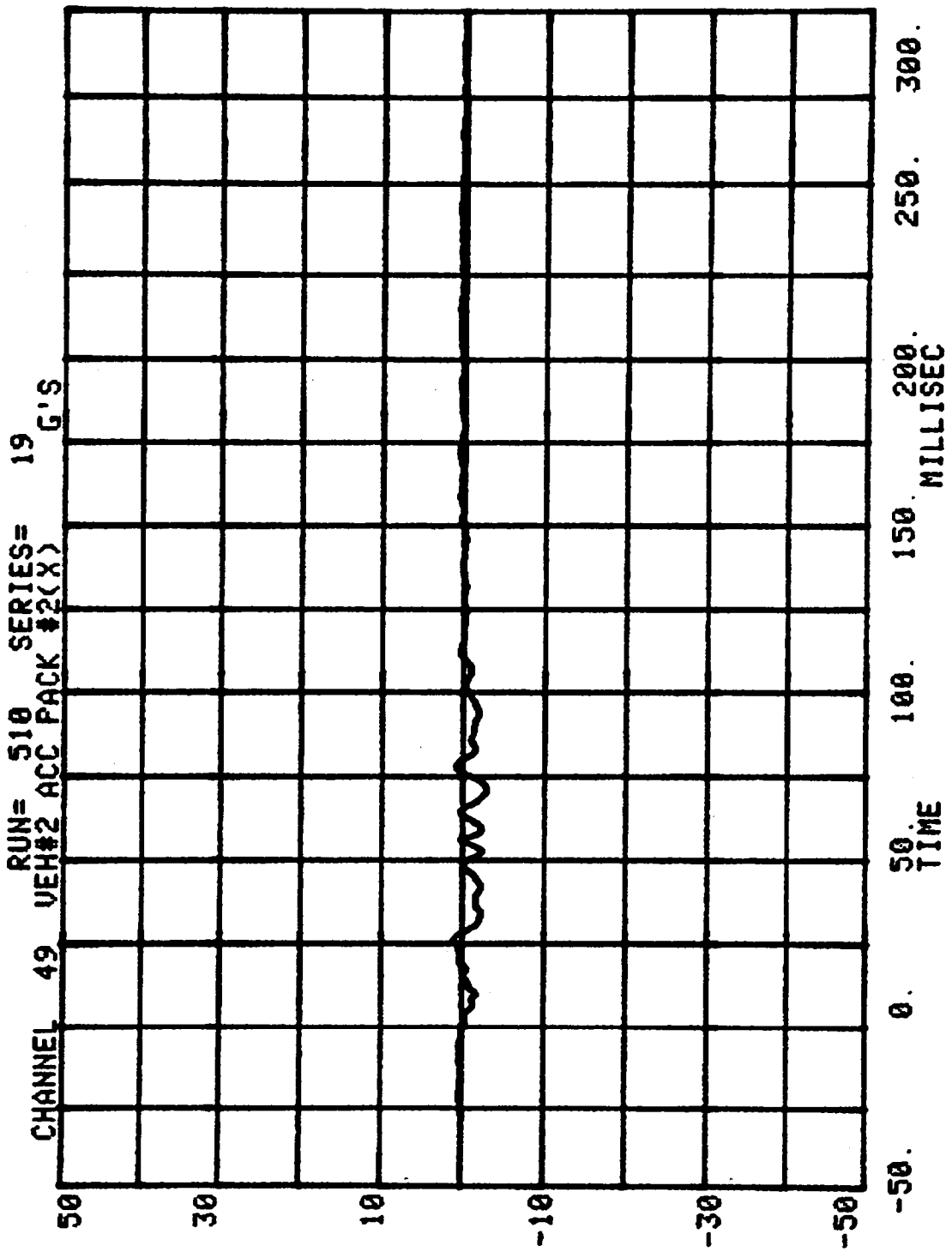
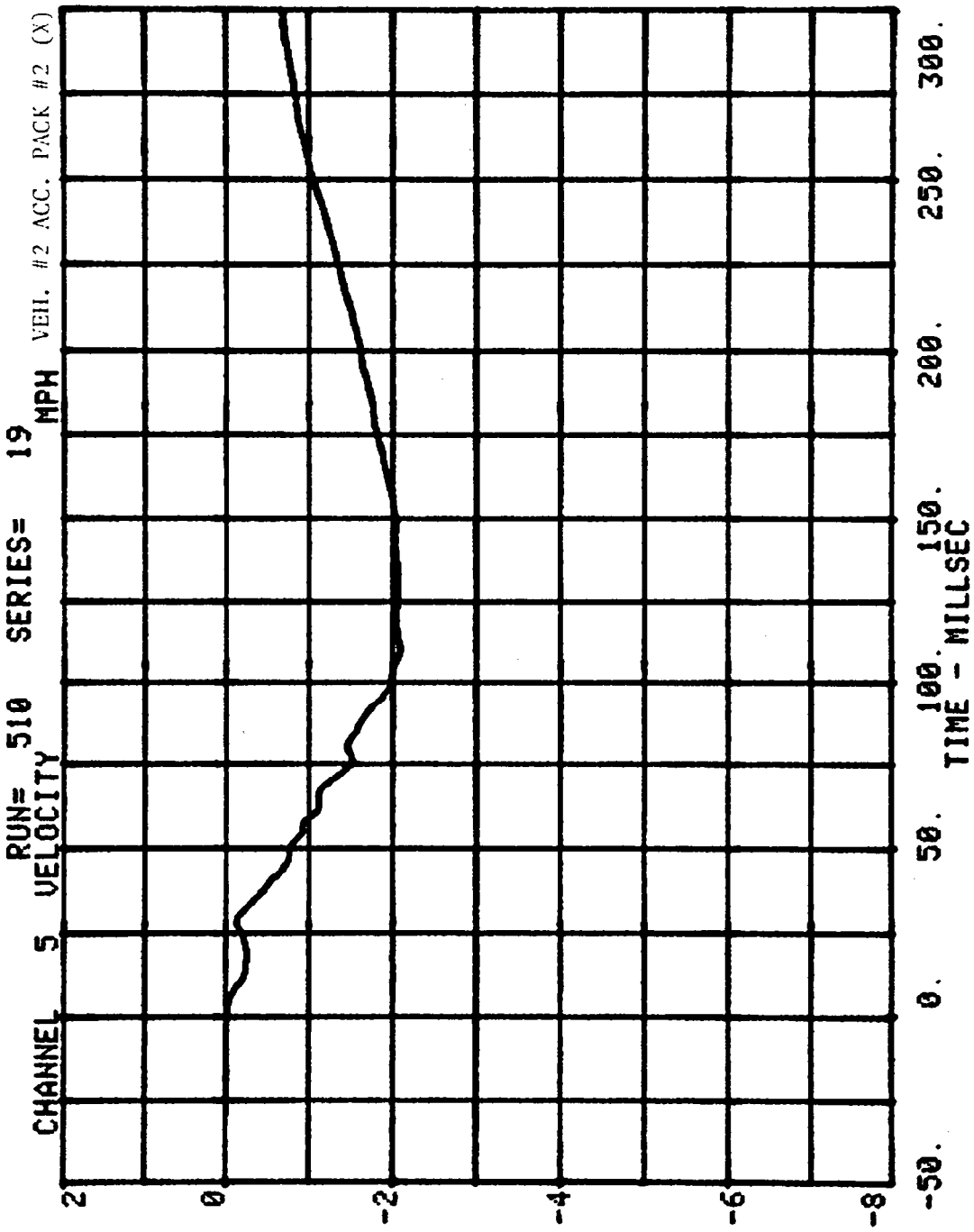
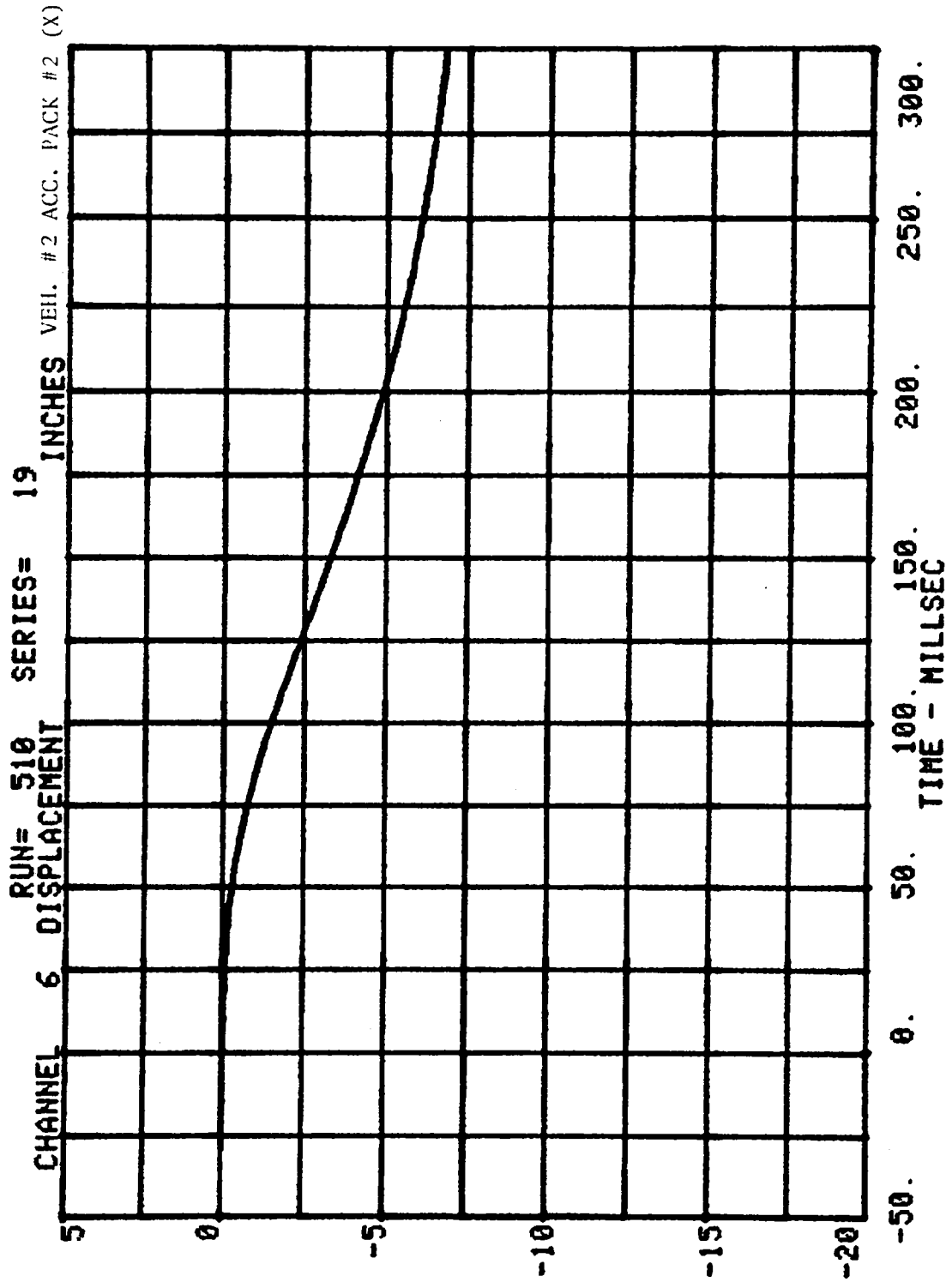
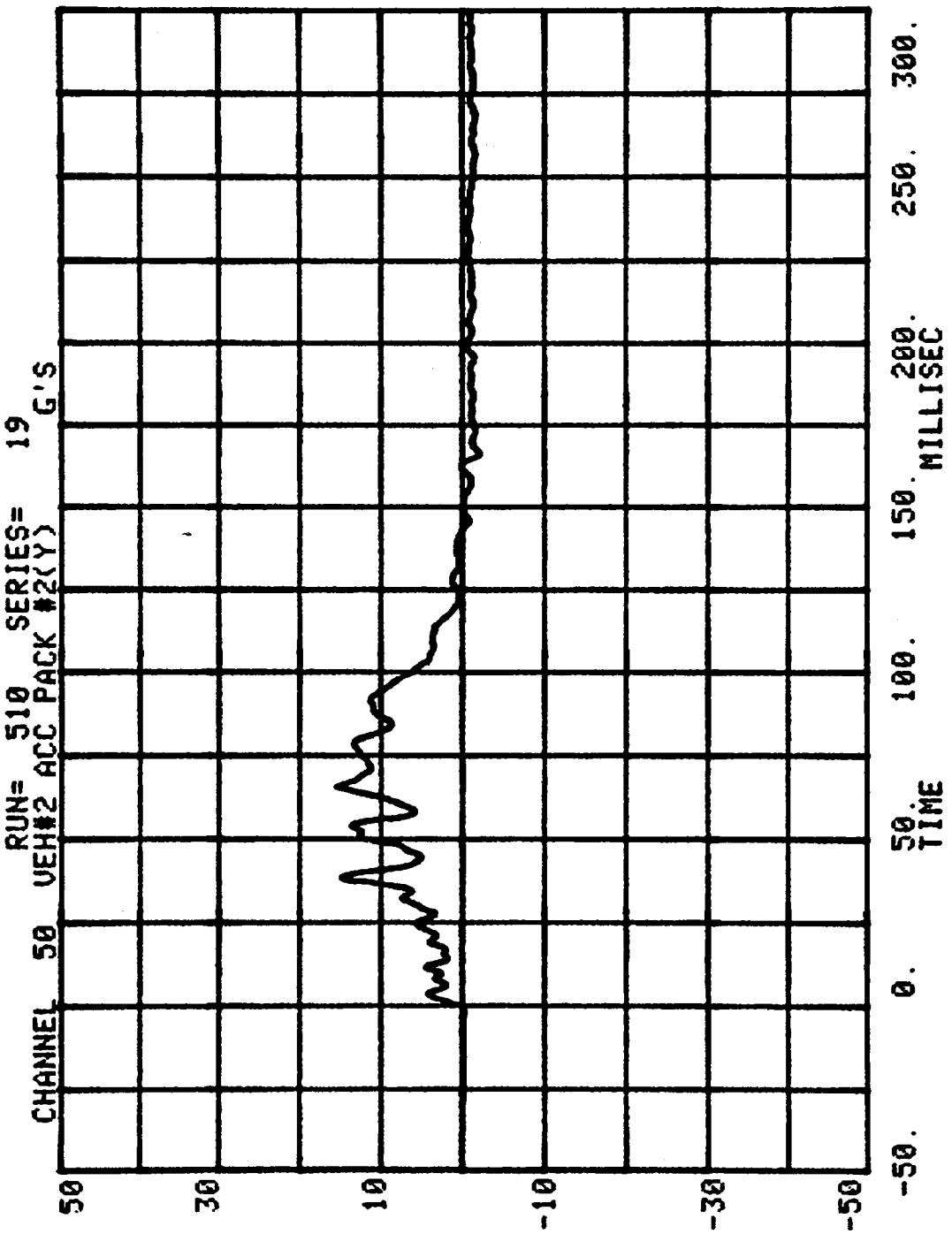
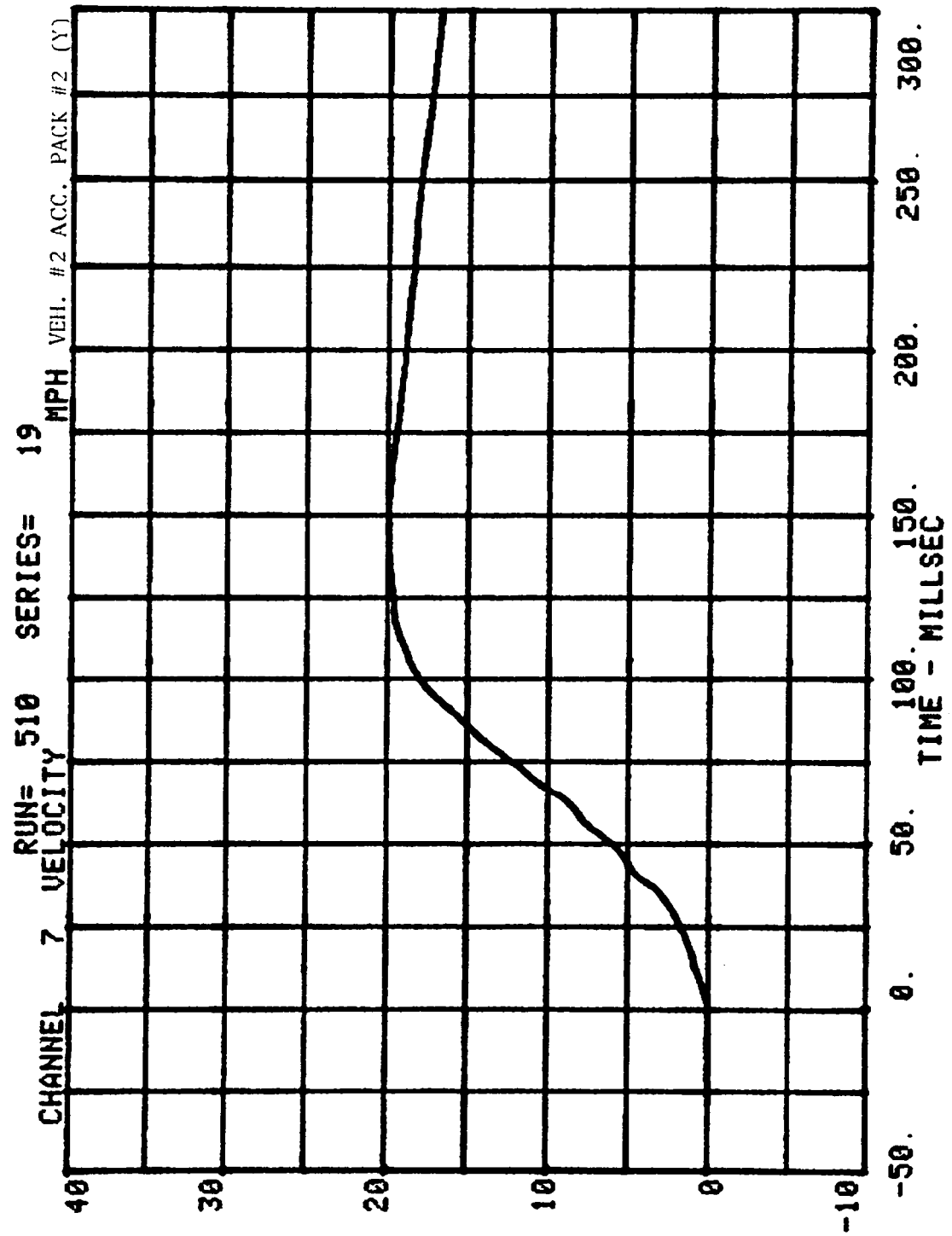
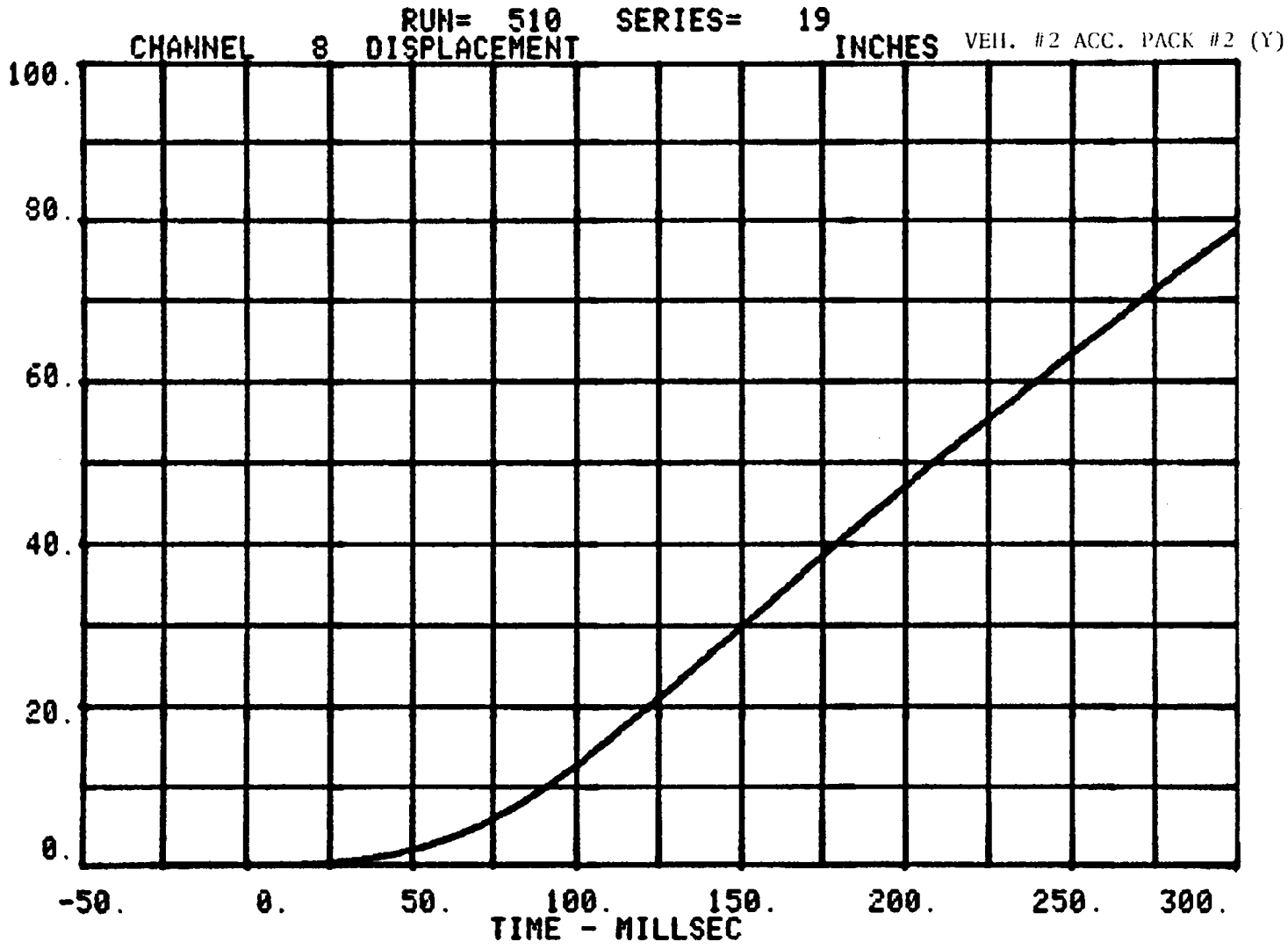

CHANNEL 49
RUN= 510
VEH#2 ACC PACK #2(X)
SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

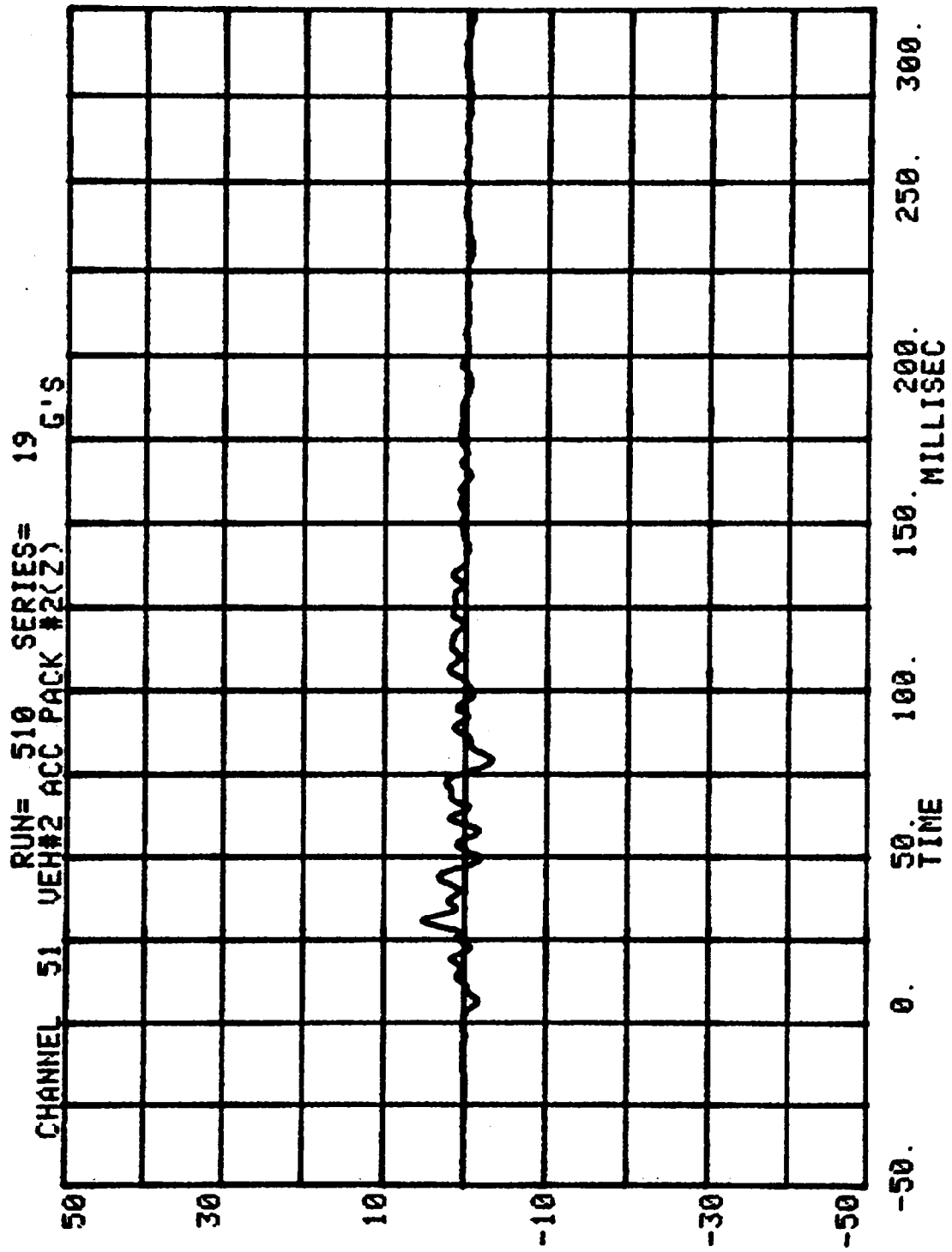

CHANNEL 5 VELOCITY
RUN= 510 SERIES= 19 MPH
VEH. #2 ACC. PACK #2 (X)
2
0
-2
-4
-6
-8
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

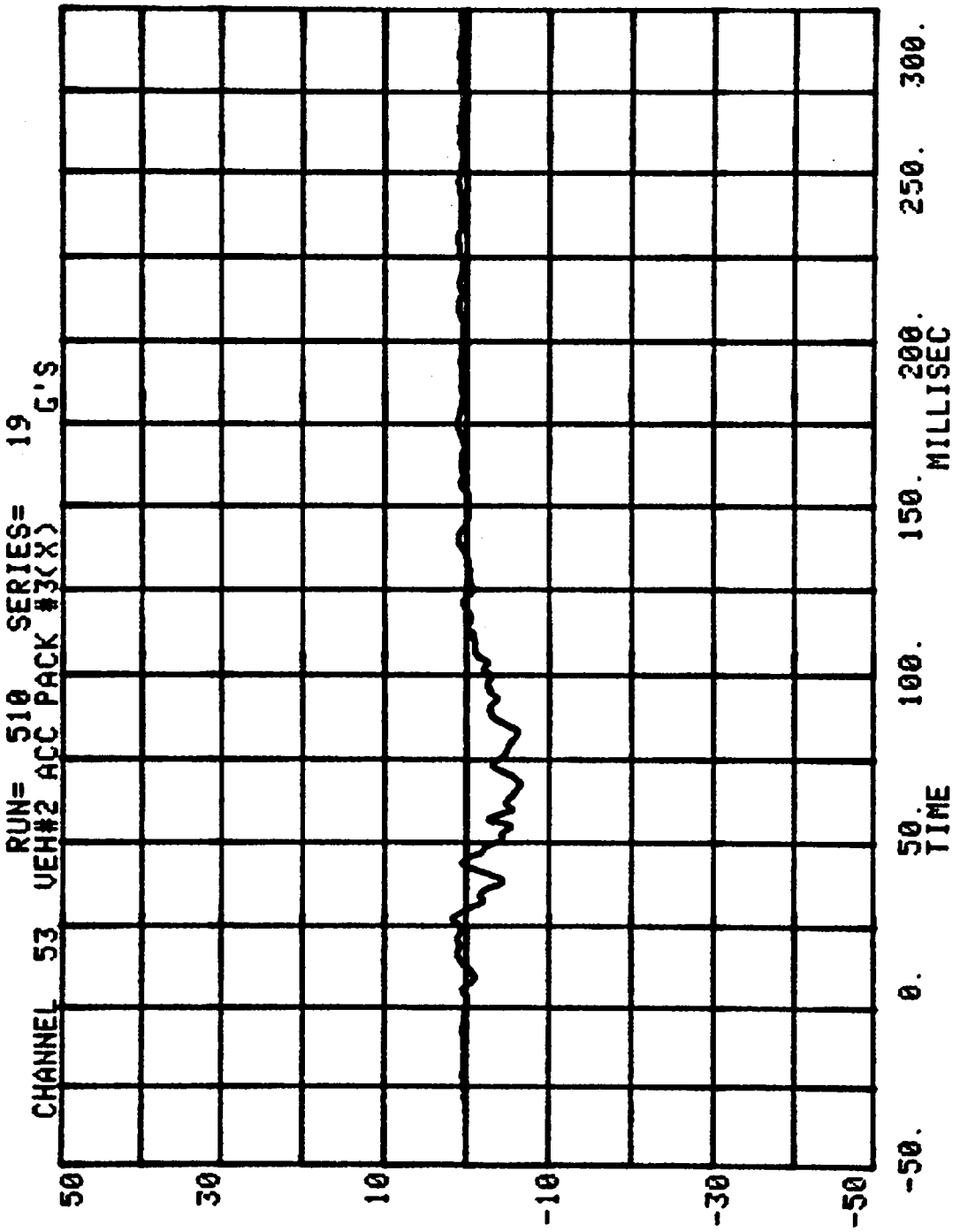

CHANNEL 6 DISPLACEMENT
RUN= 510 SERIES= 19
INCHES VEH. #2 ACC. PACK #2 (X)
5
0
-5
-10
-15
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC


CHANNEL 50 VEH#2 ACC PACK #2(Y)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 7 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #2 ACC. PACK #2 (X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC


RUN= 510 SERIES= 19
CHANNEL 8 DISPLACEMENT INCHES
VEH. #2 ACC. PACK #2 (Y)
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC


CHANNEL 51
RUN= 510 SERIES= 19
VEH#2 ACC PACK #2(Z)
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 53 VEH#2 ACC PACK #3(X)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

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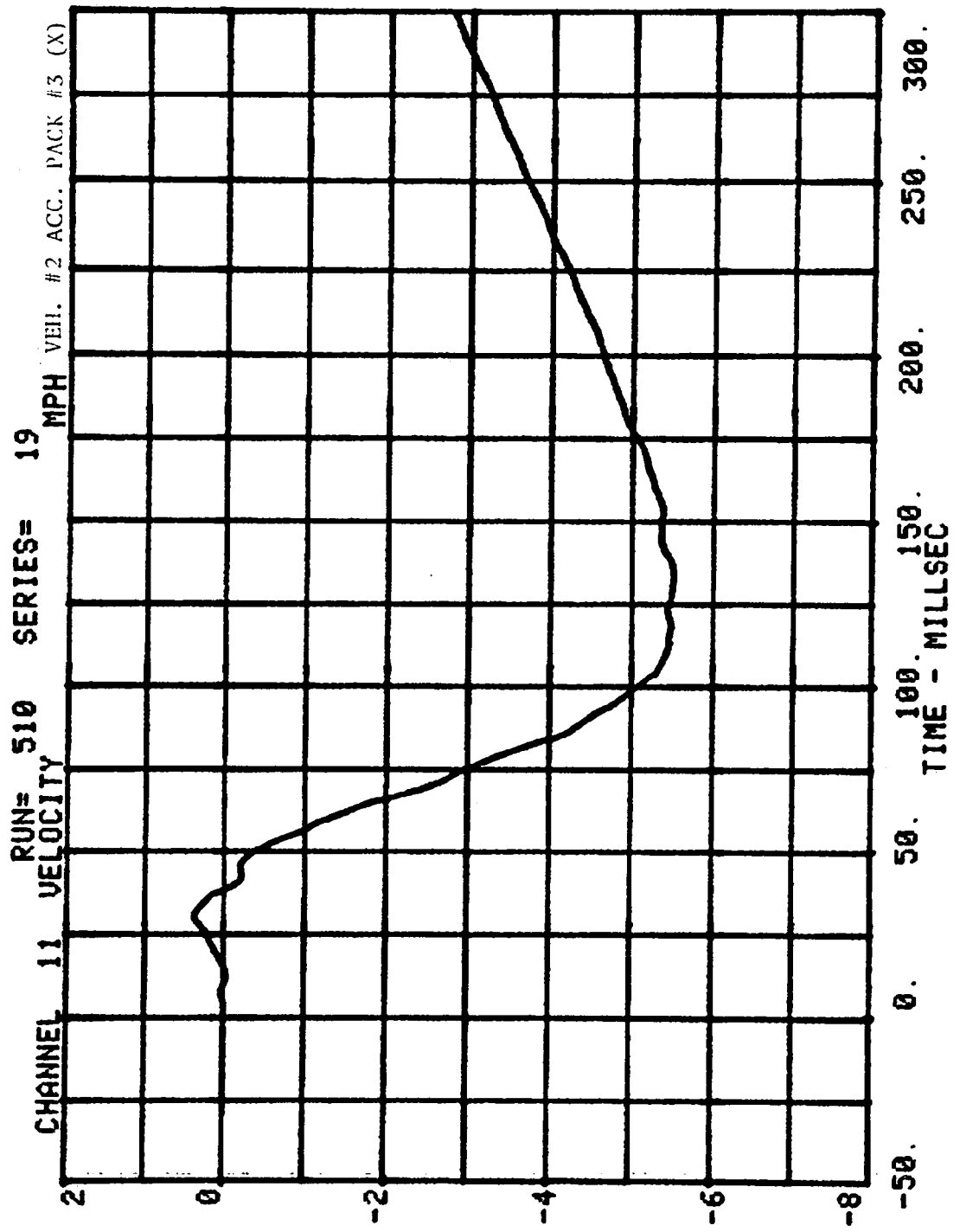
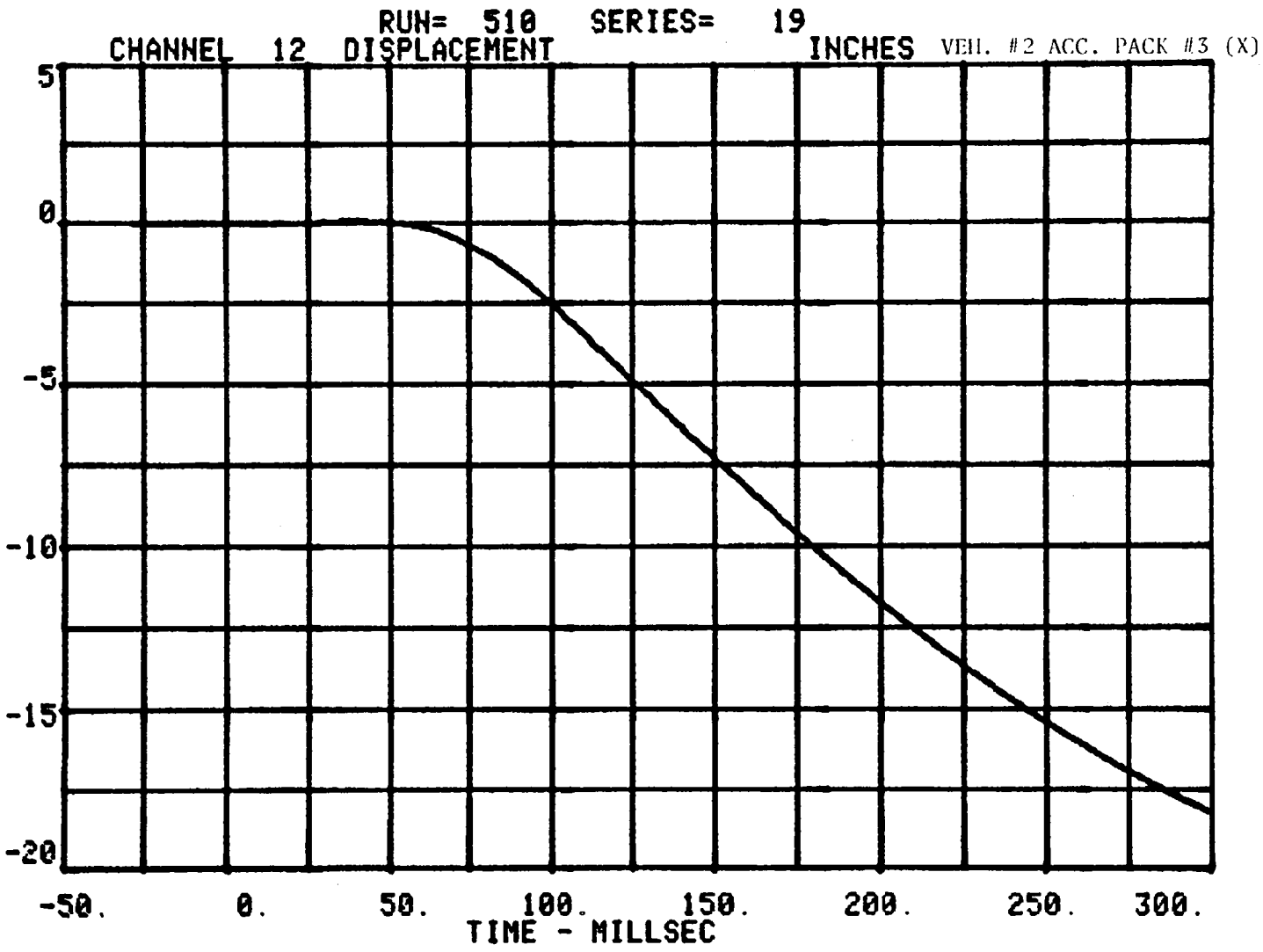
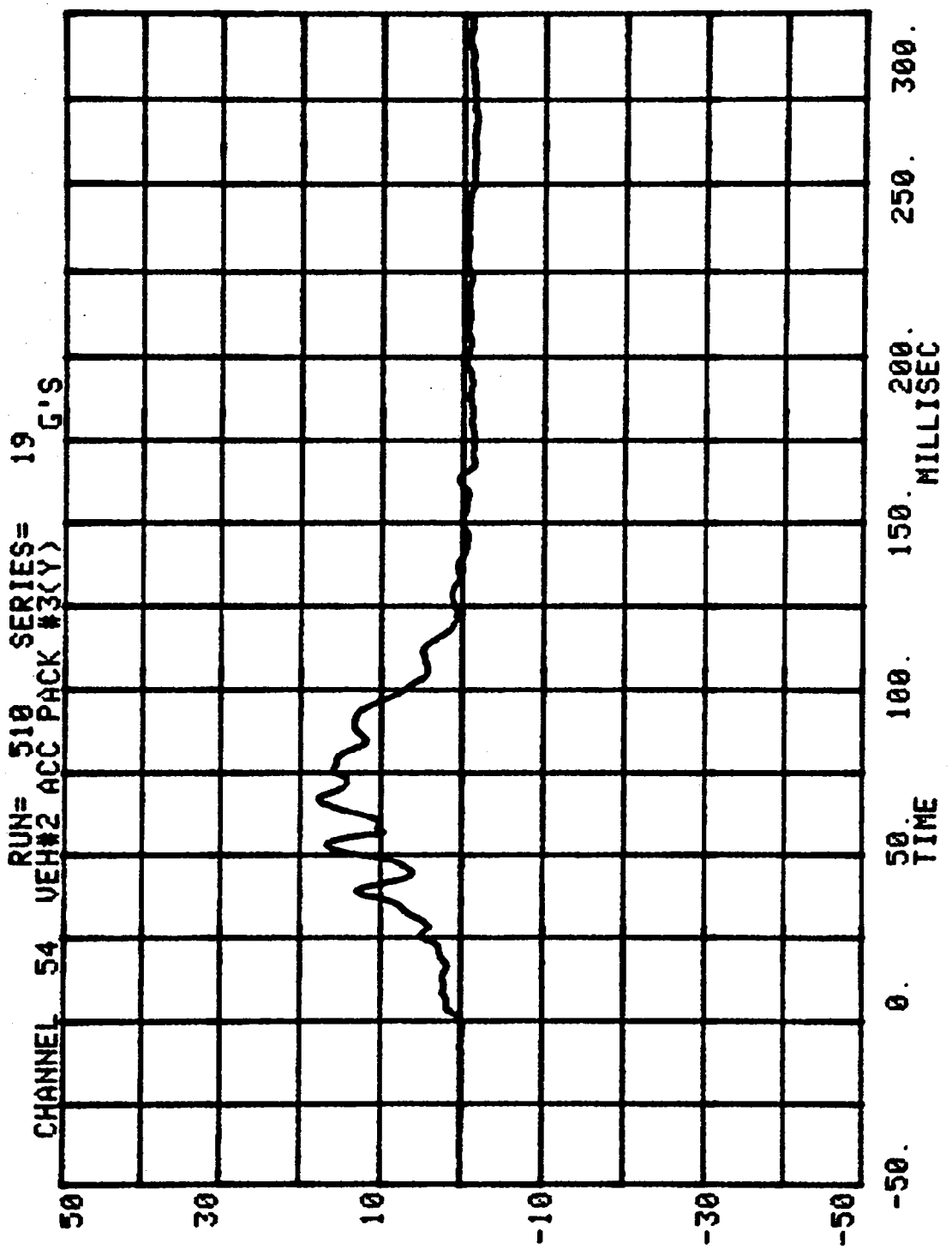
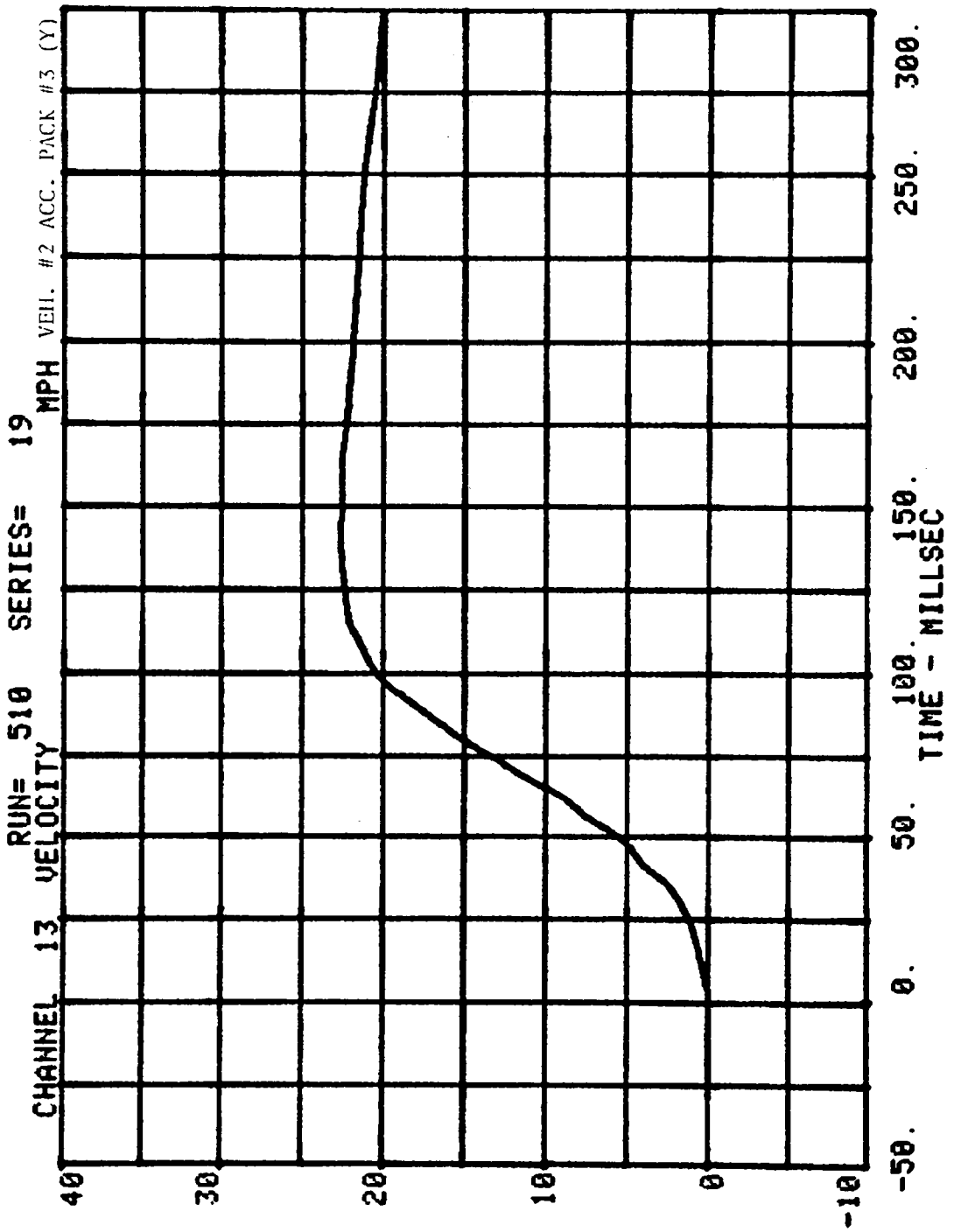
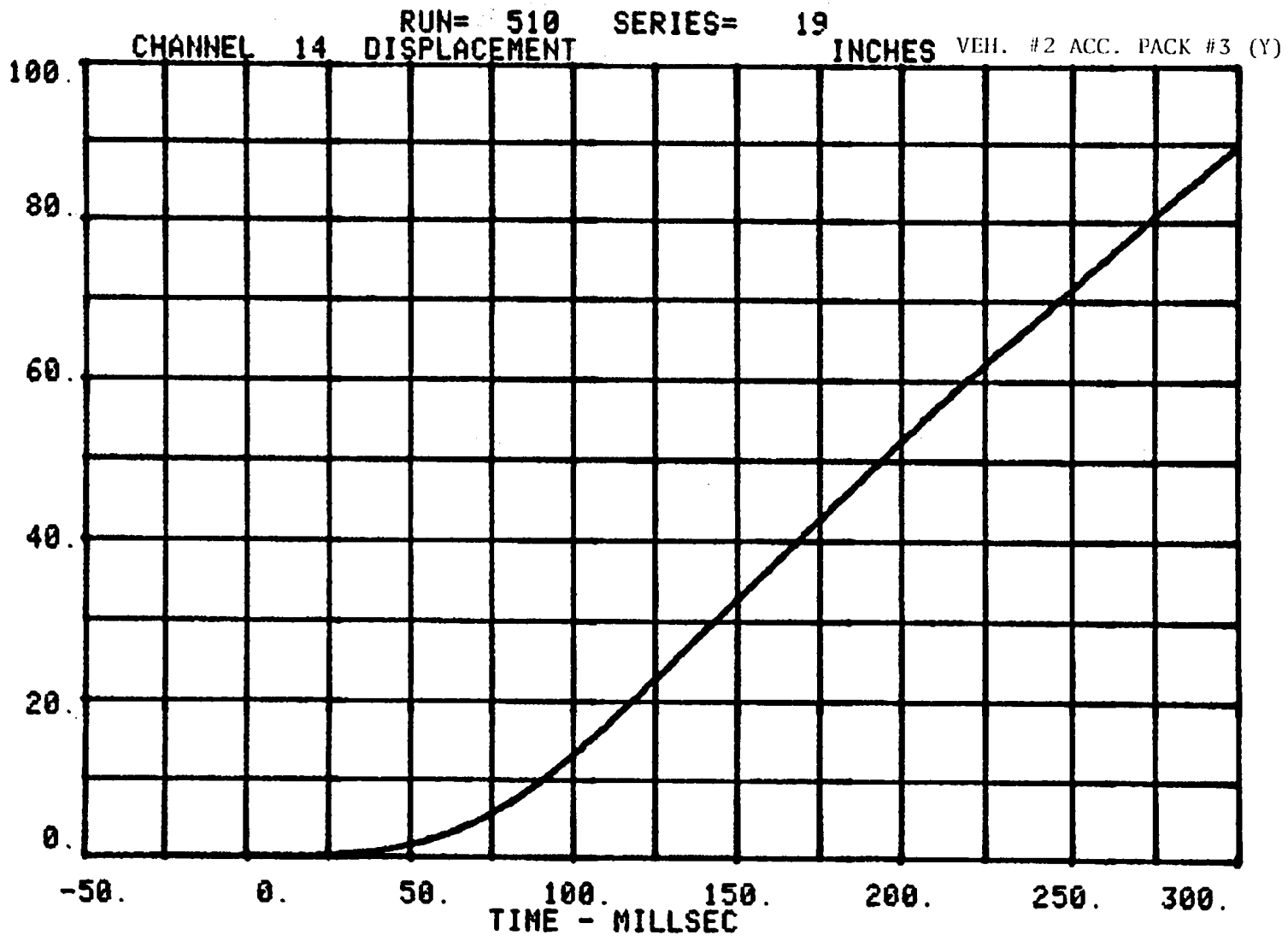
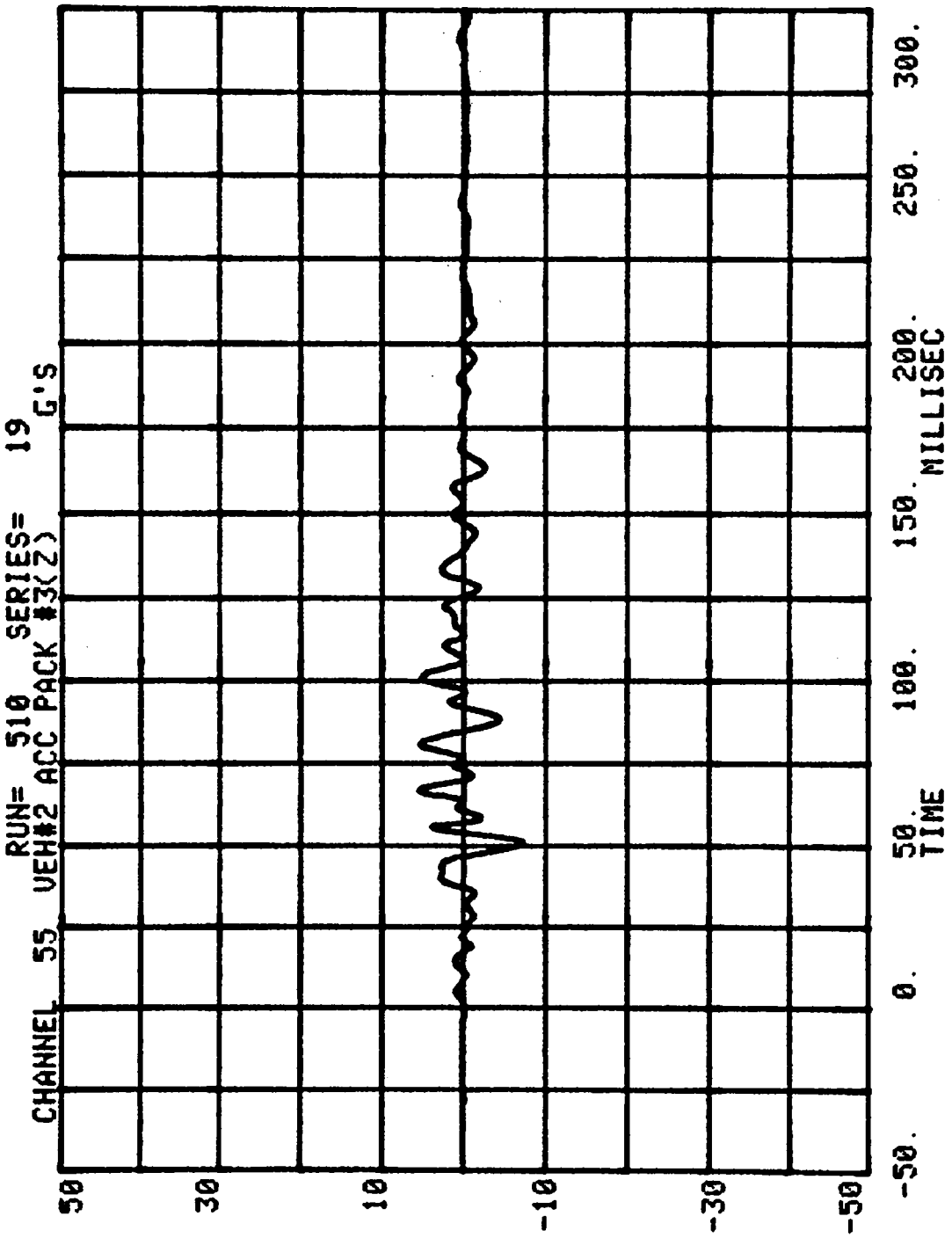

CHANNEL 11 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #2 ACC. PACK #3 (X)
2
0
-2
-4
-6
-8
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

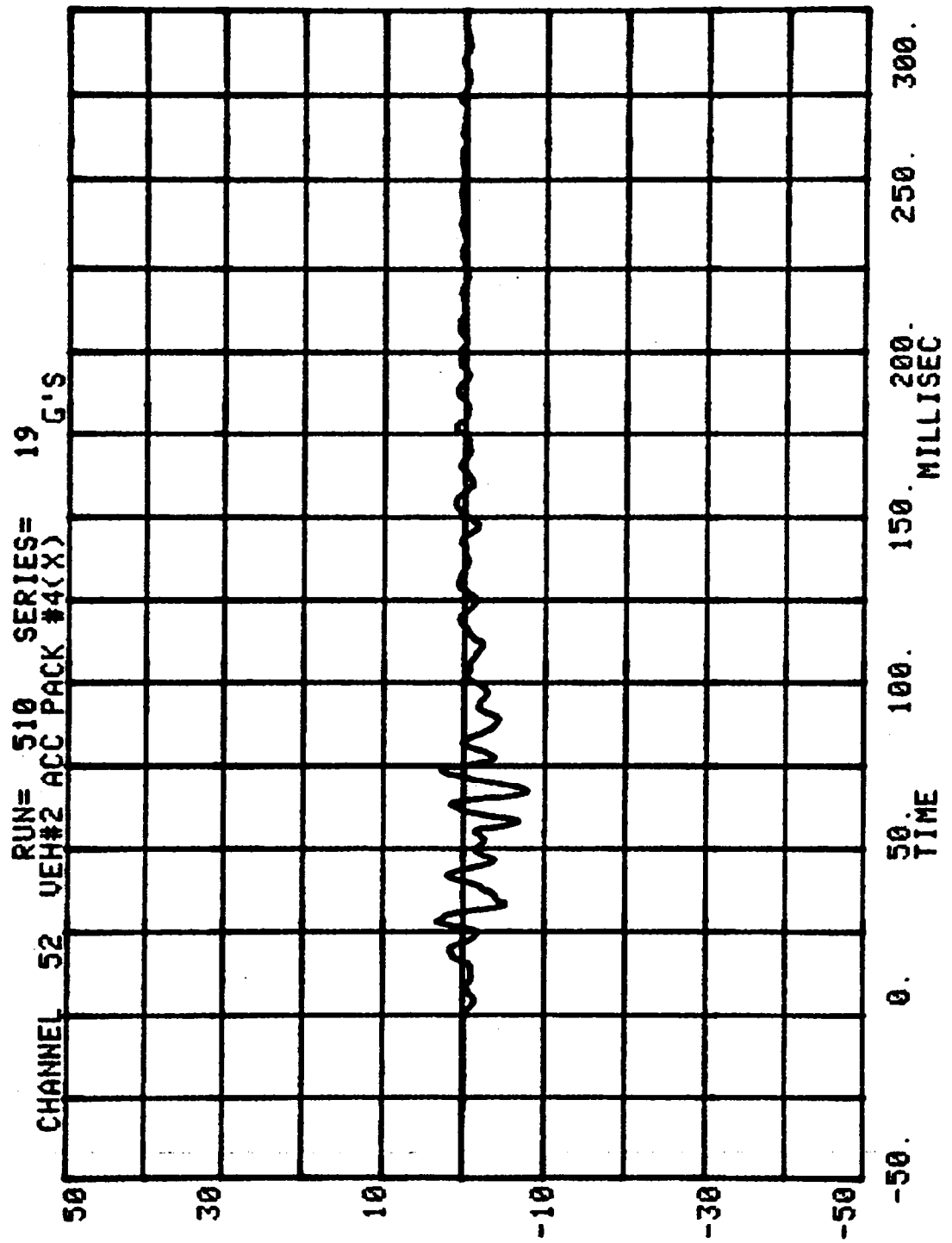

RUN= 510 SERIES= 19
CHANNEL 12 DISPLACEMENT INCHES
VEH. #2 ACC. PACK #3 (X)
5
0
-5
-10
-15
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

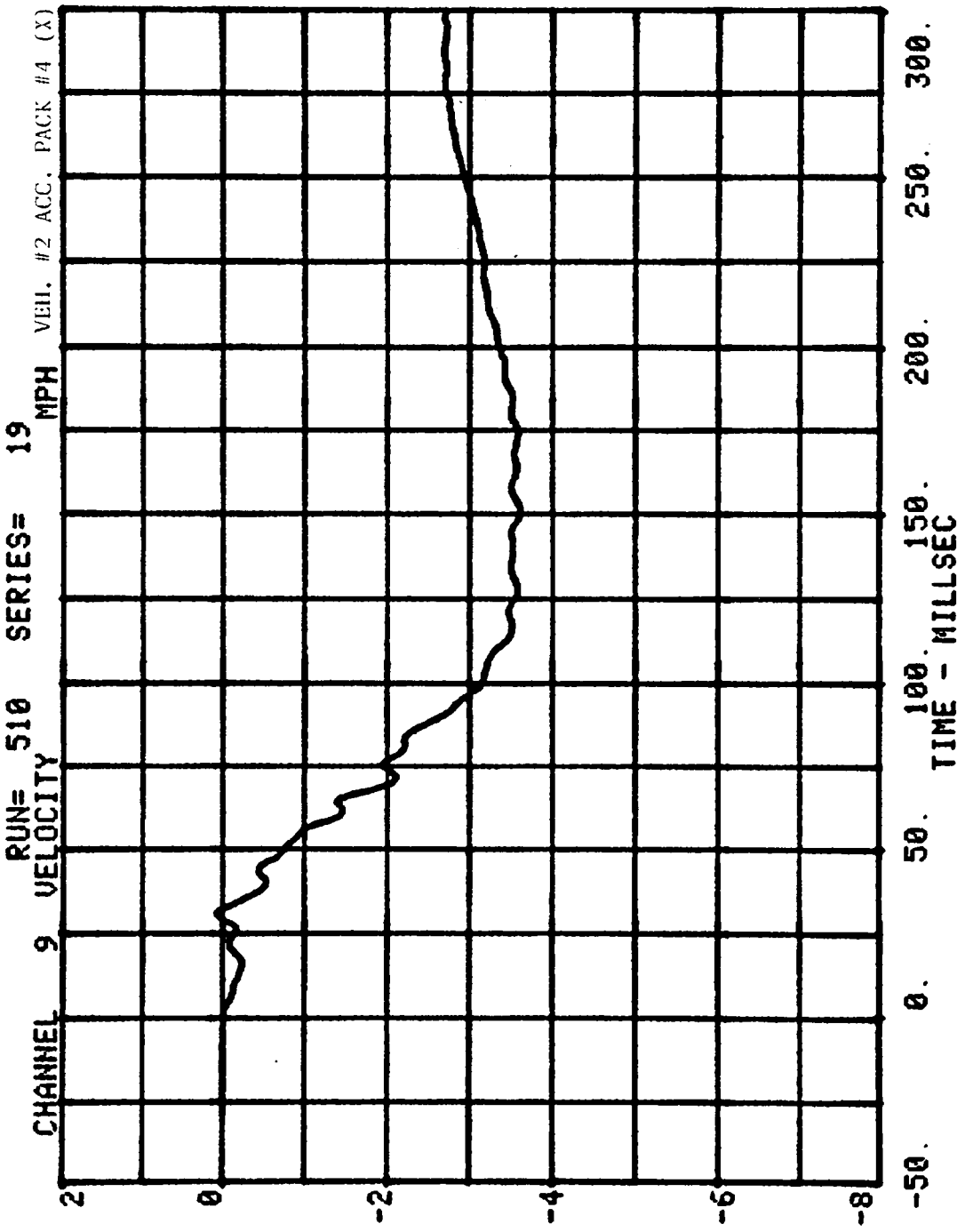

CHANNEL 54 VEH#2 ACC PACK #3(Y)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

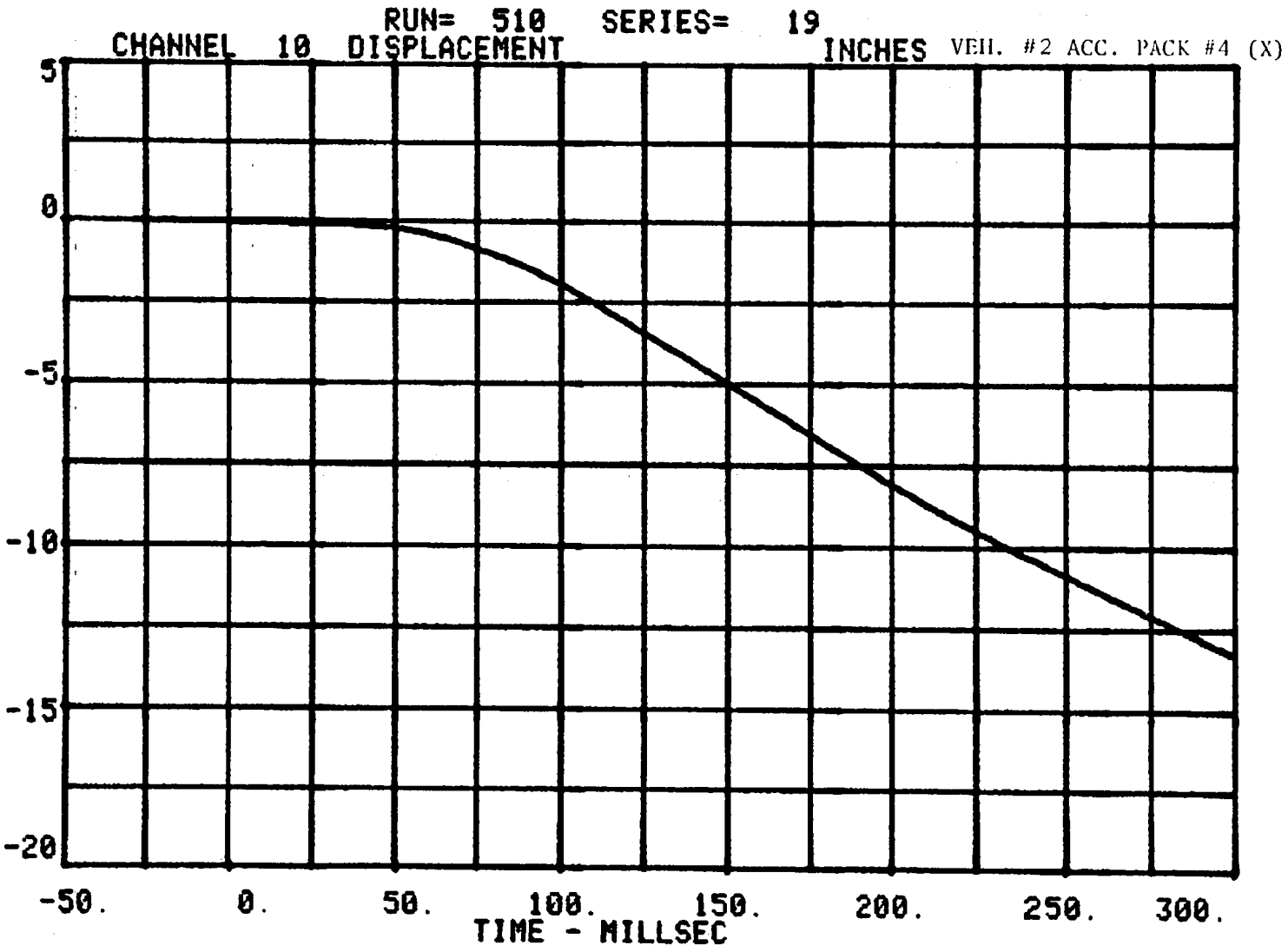

CHANNEL 13 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #2 ACC. PACK #3 (Y)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

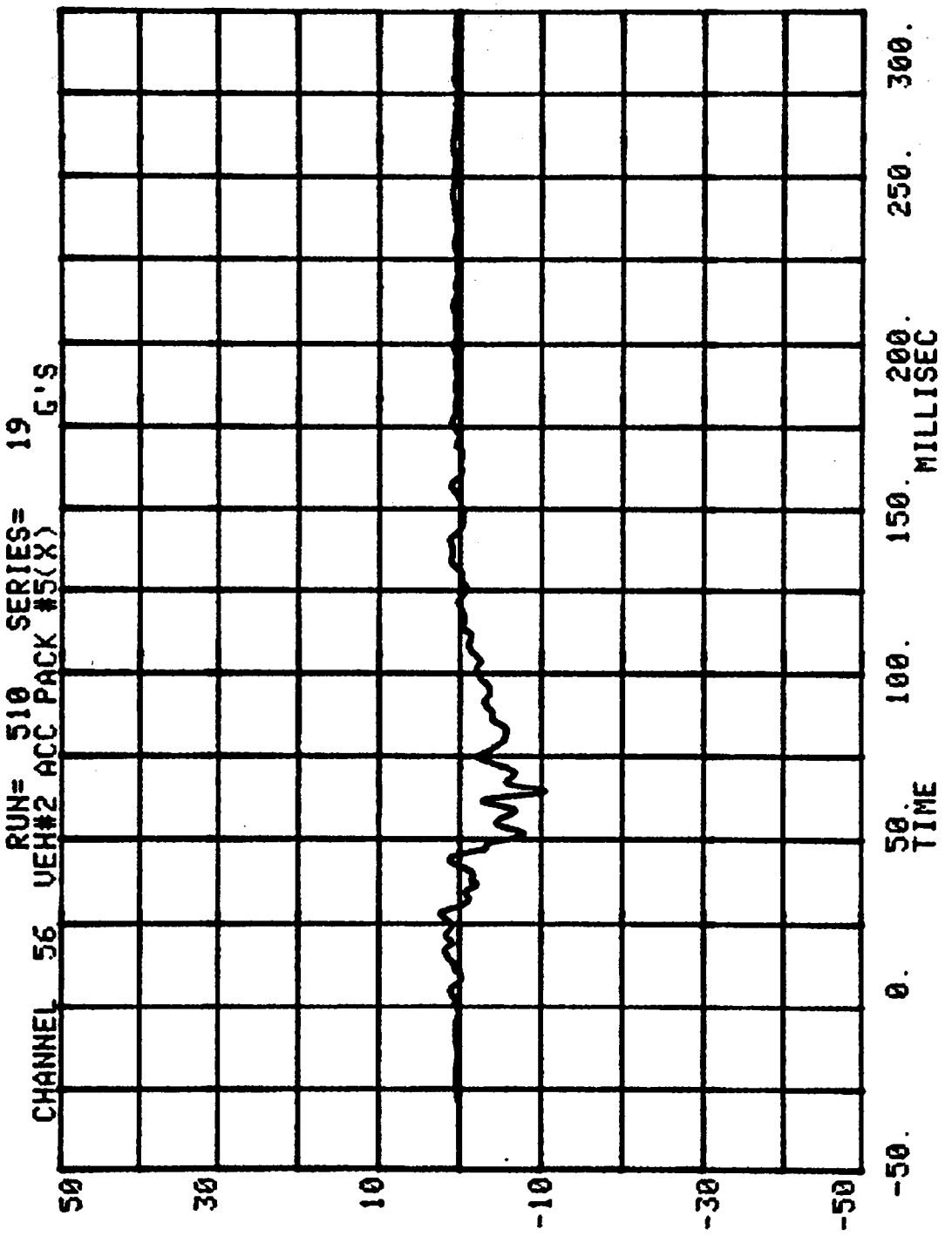

RUN= 510 SERIES= 19
CHANNEL 14 DISPLACEMENT
INCHES
VEH. #2 ACC. PACK #3 (Y)
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

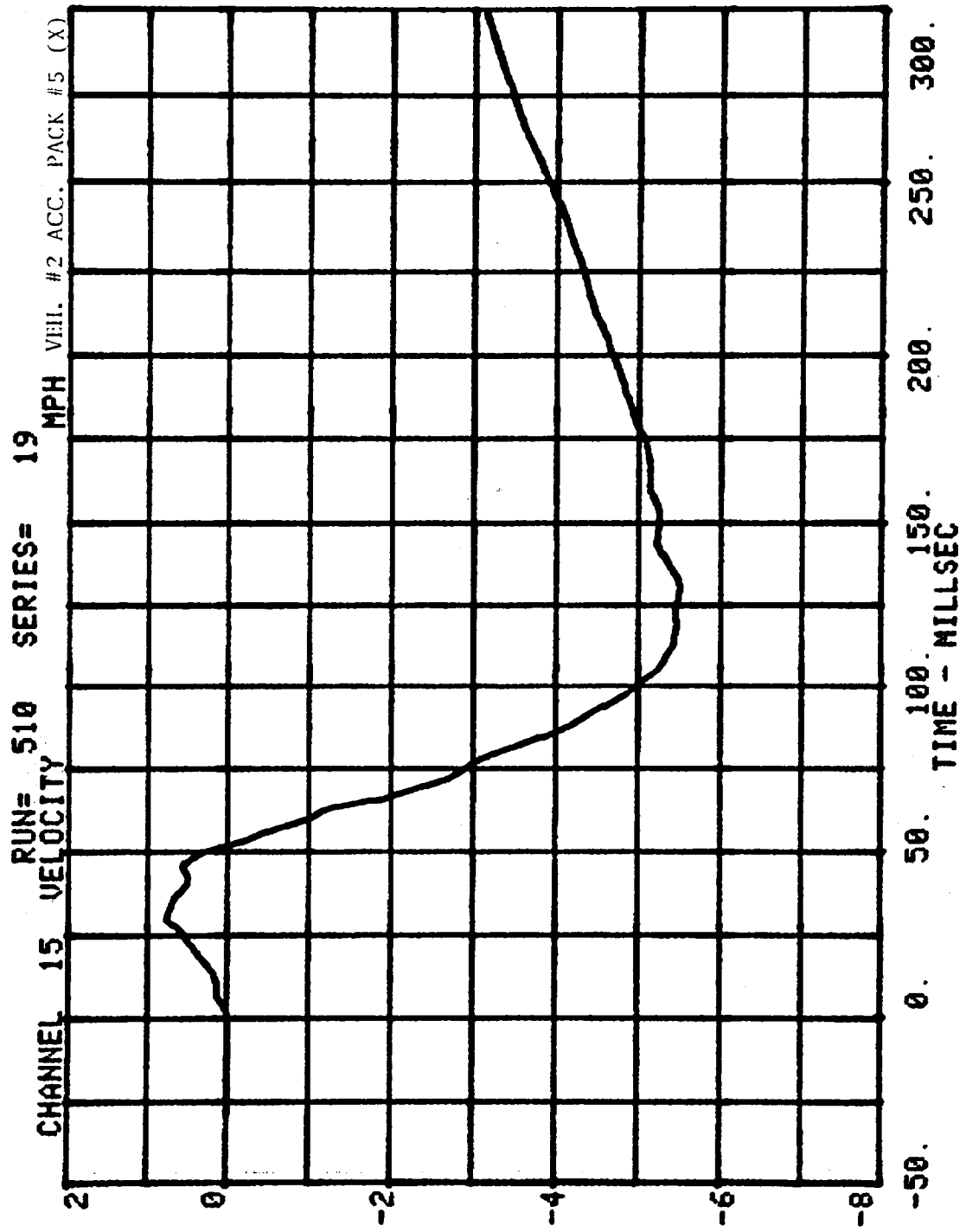

CHANNEL 55 VEH#2 ACC PACK #3(Z)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

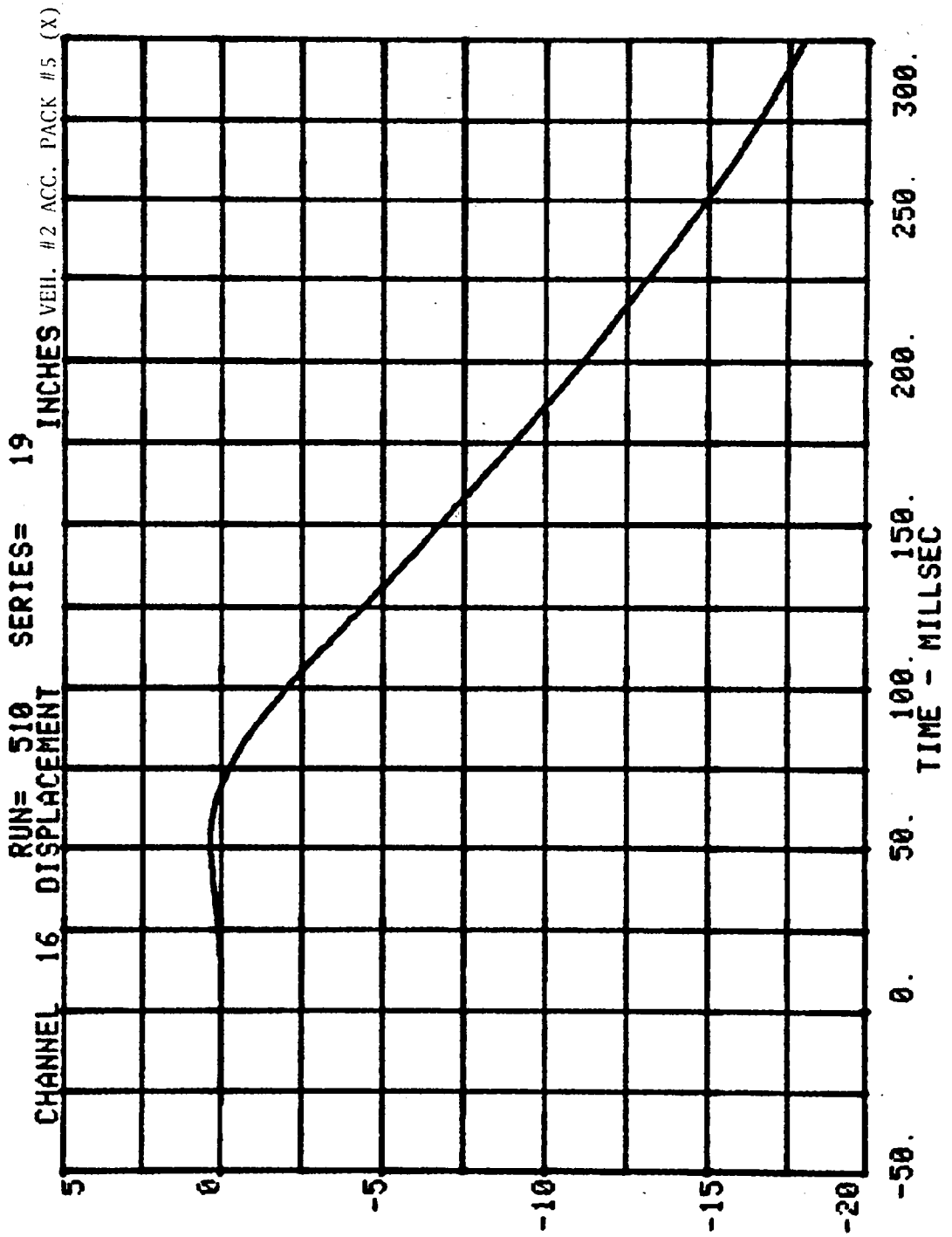

CHANNEL 52 VEH#2 ACC PACK #4(X)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

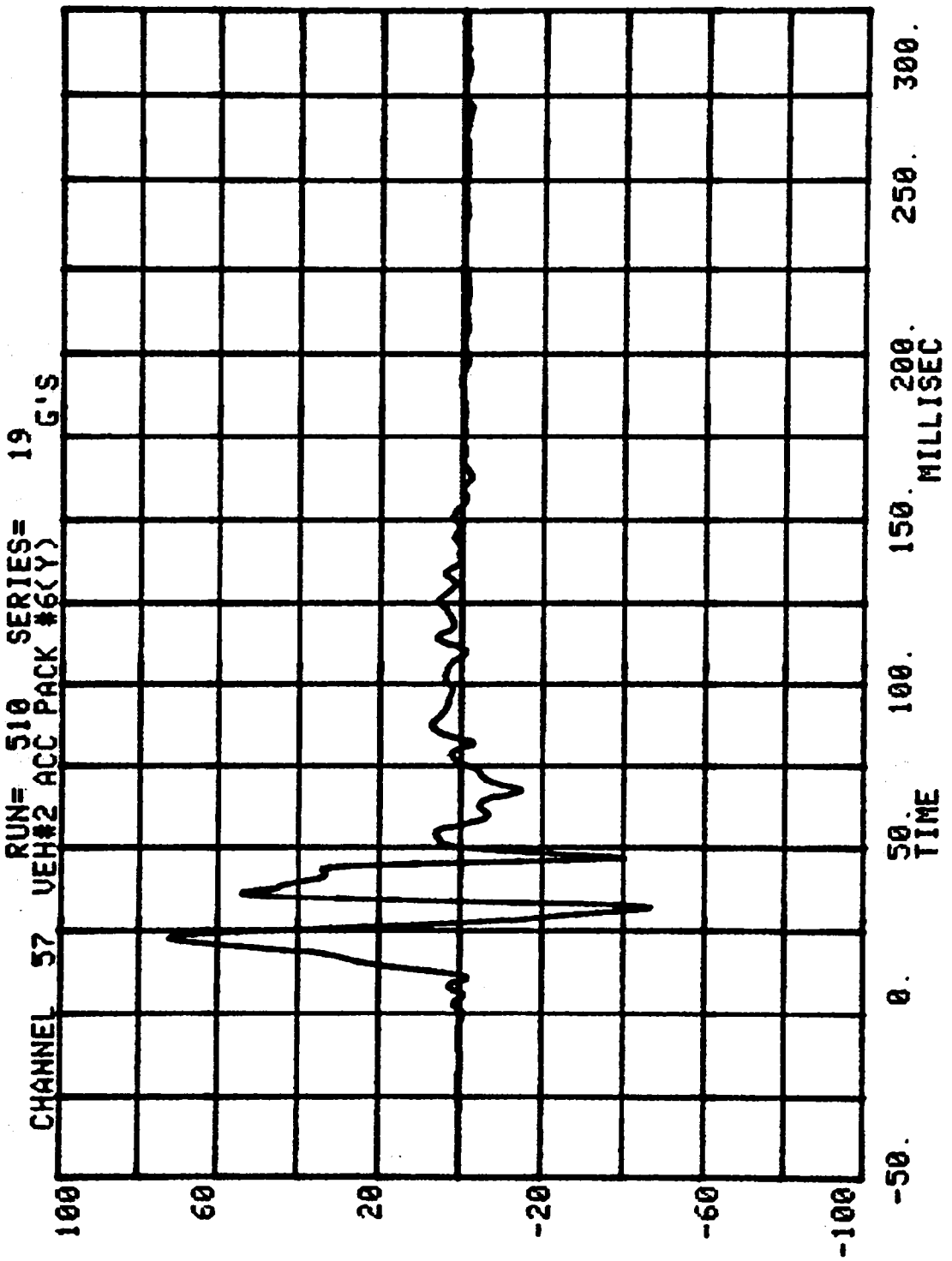

CHANNEL 9 VELOCITY
RUN= 510 SERIES= 19 MPH
VEH. #2 ACC. PACK #4 (X)
2
0
-2
-4
-6
-8
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

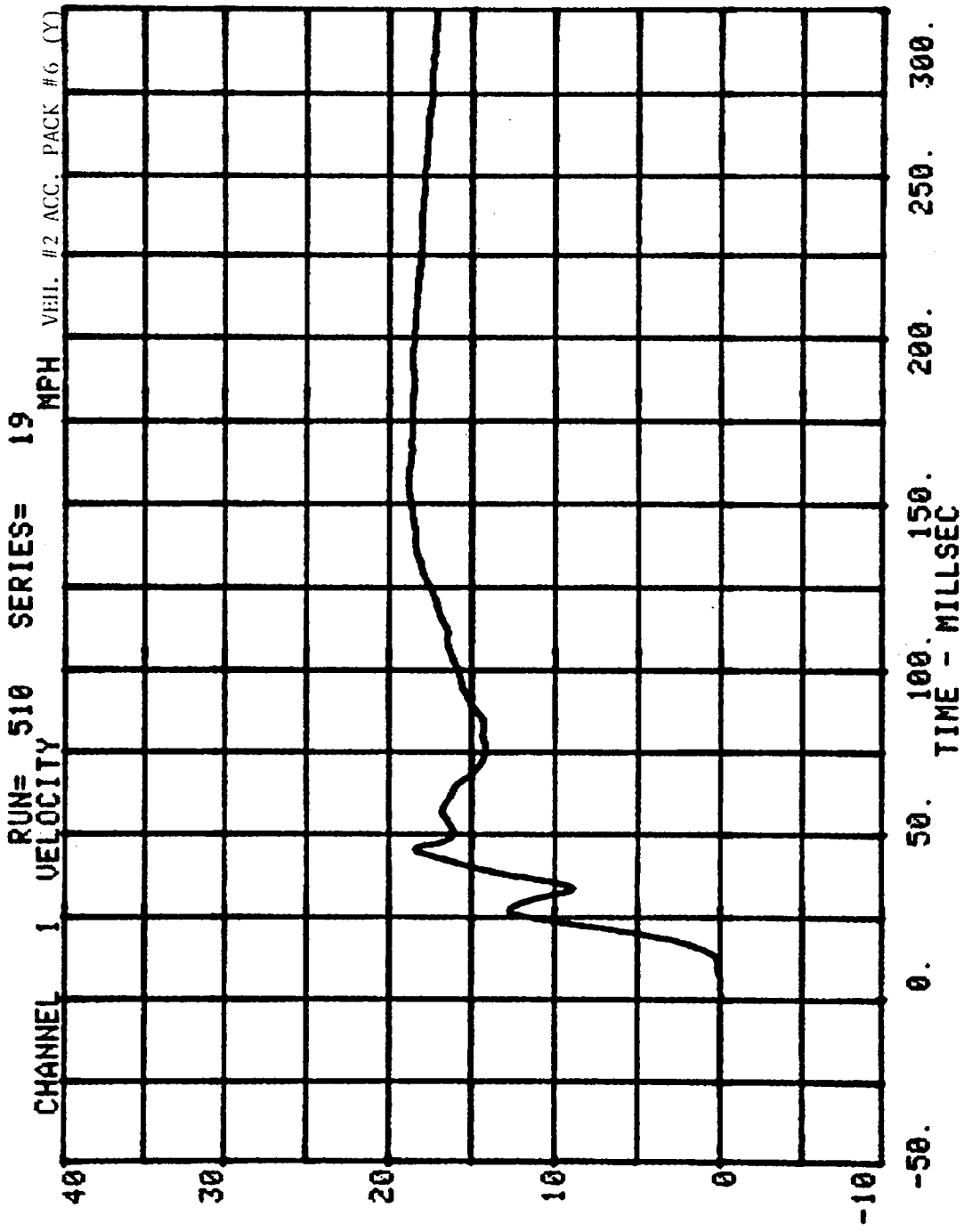

RUN= 510 SERIES= 19
CHANNEL 10 DISPLACEMENT
INCHES
VEH. #2 ACC. PACK #4 (X)
5
0
-5
-10
-15
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

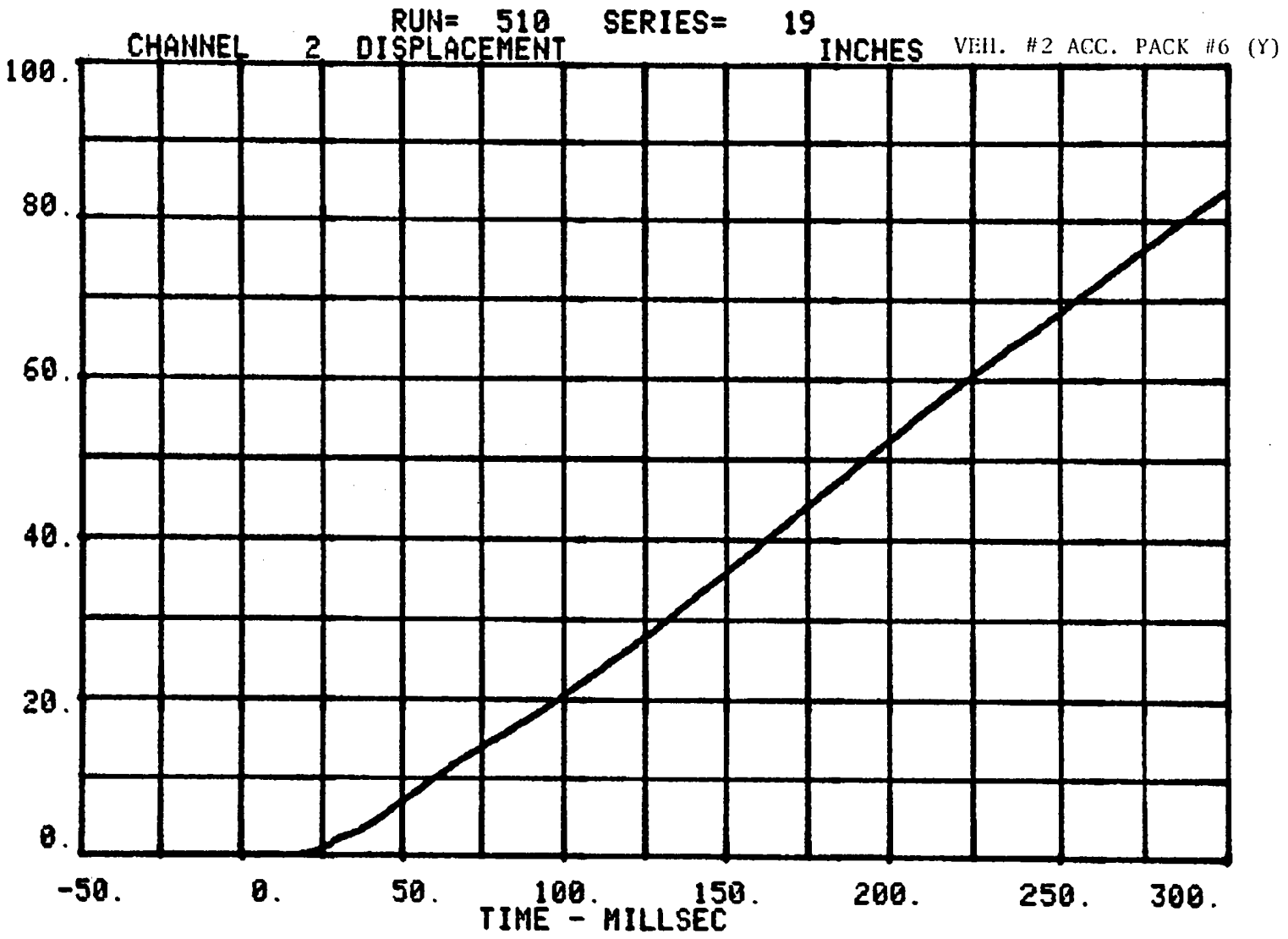

CHANNEL 56 VEH#2 ACC PACK #5(X)
RUN= 510 SERIES= 19
G'S
50
30
10
-10
-30
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

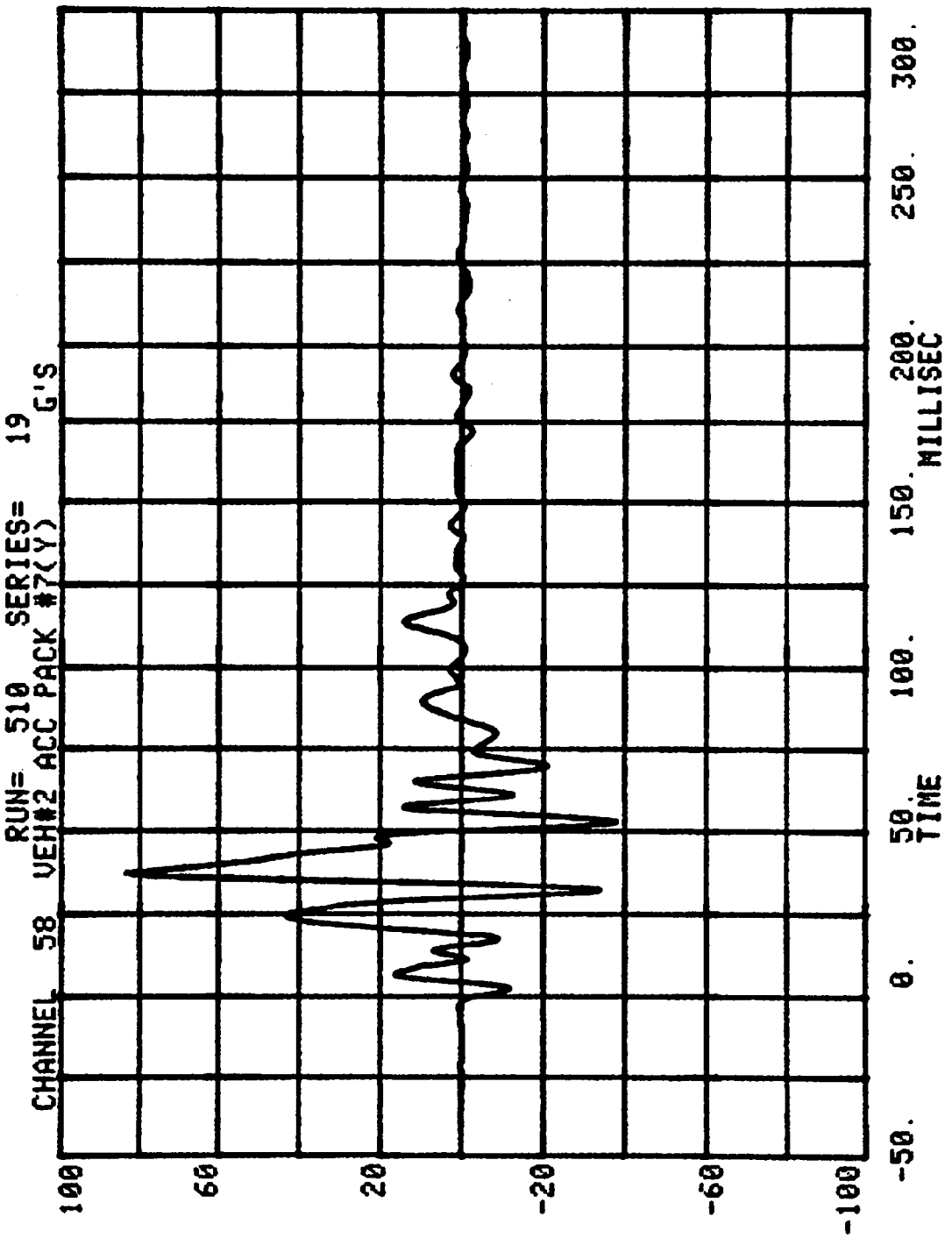

CHANNEL 15 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #2 ACC. PACK #5 (X)
2
0
-2
-4
-6
-8
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

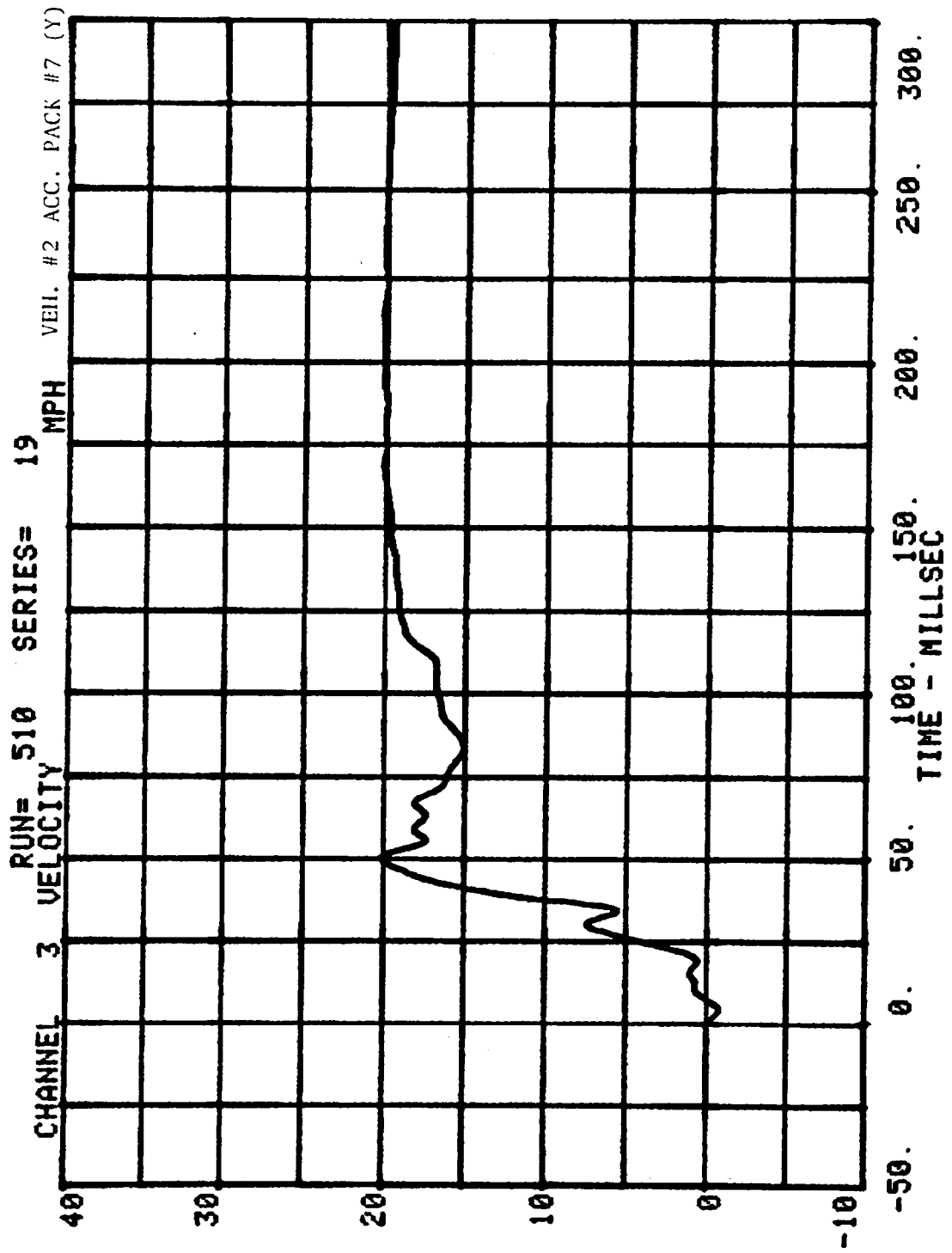

CHANNEL 16 DISPLACEMENT
RUN= 510 SERIES= 19
INCHES VEH. #2 ACC. PACK #5 (X)
5
0
-5
-10
-15
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

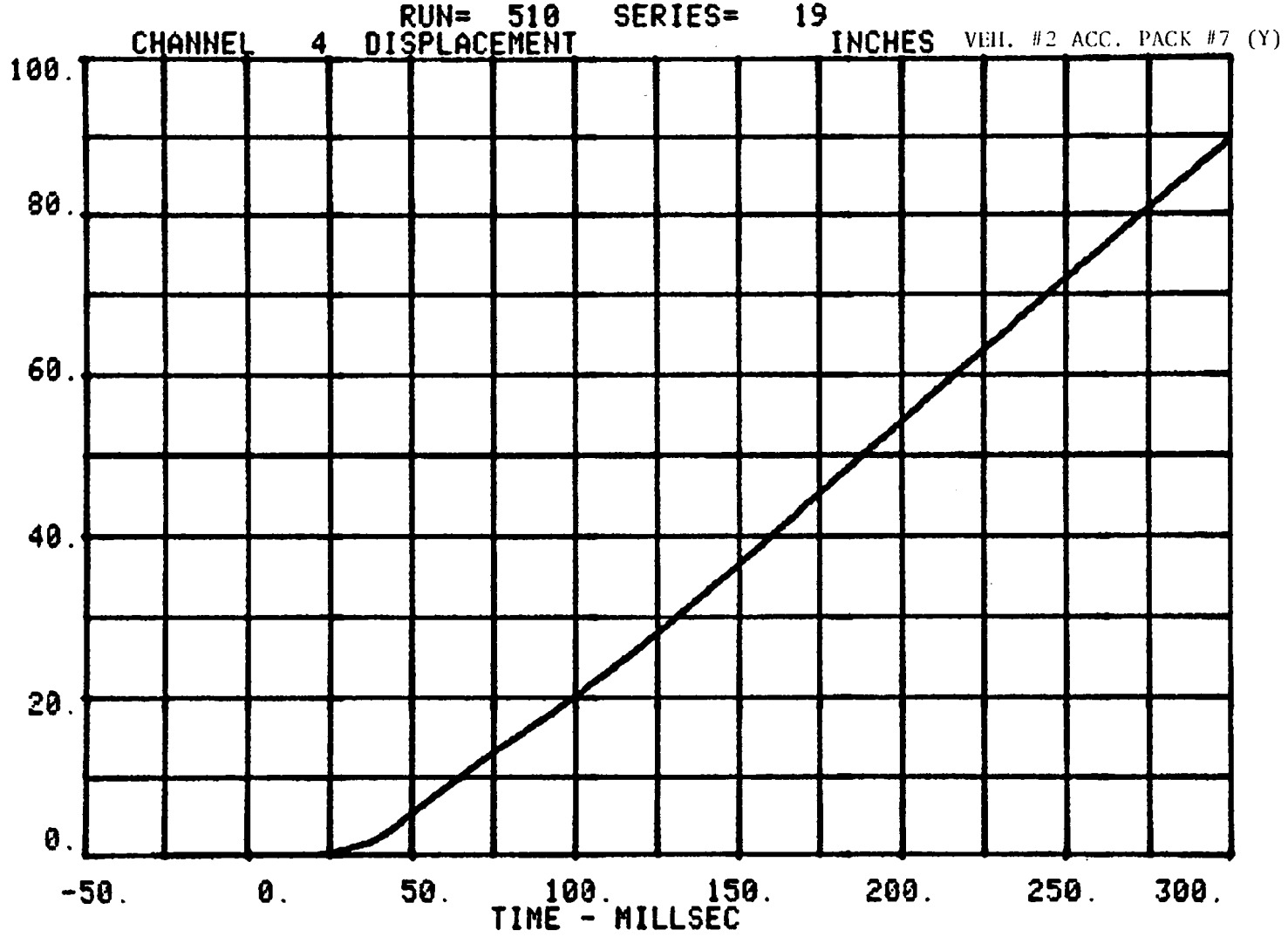

CHANNEL 57 VEH#2 ACC PACK #6(Y)
RUN= 510 SERIES= 19
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

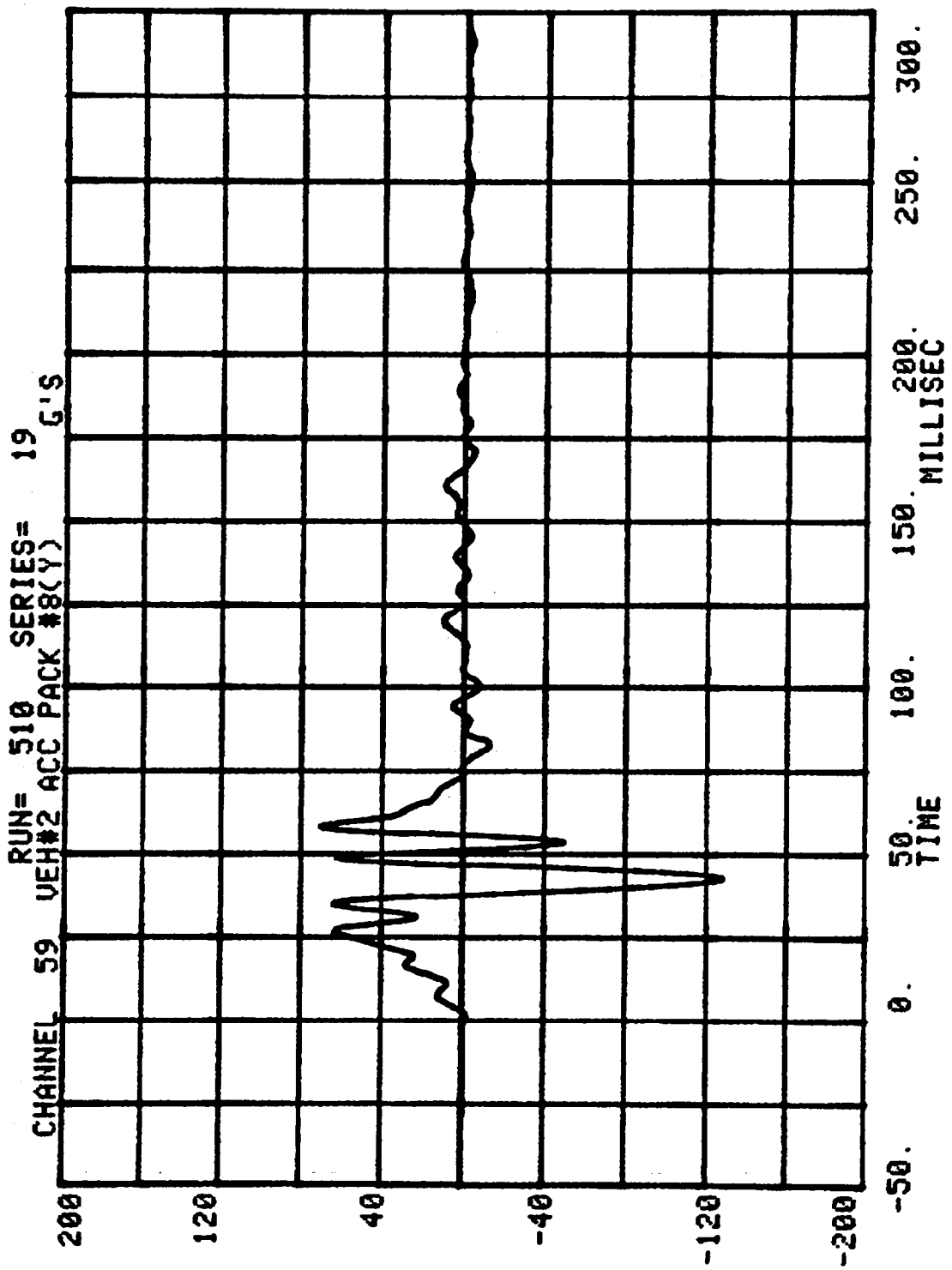

CHANNEL 1 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #2 ACC. PACK #6 (Y)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

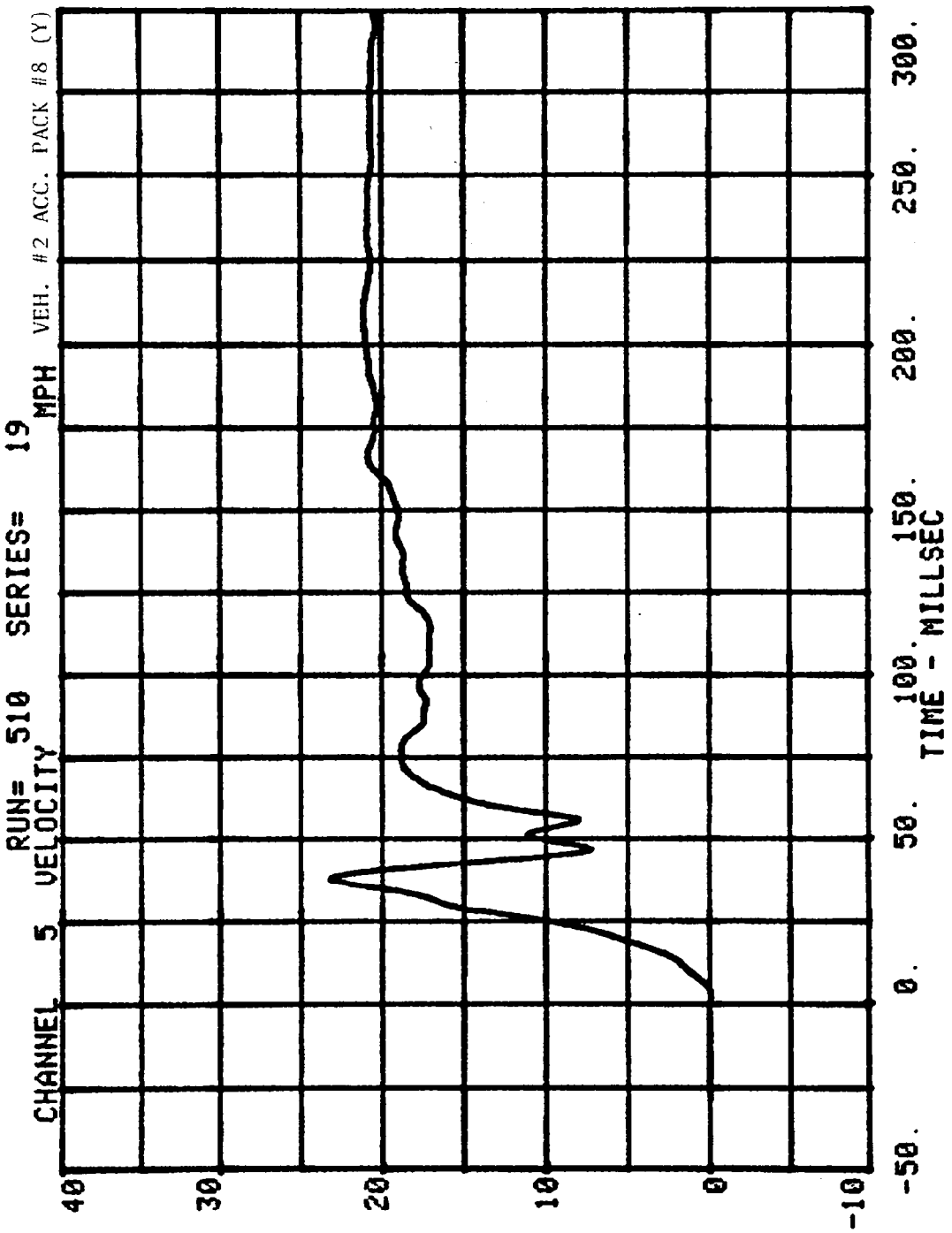

RUN= 510 SERIES= 19
CHANNEL 2 DISPLACEMENT
INCHES
VEH. #2 ACC. PACK #6 (Y)
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

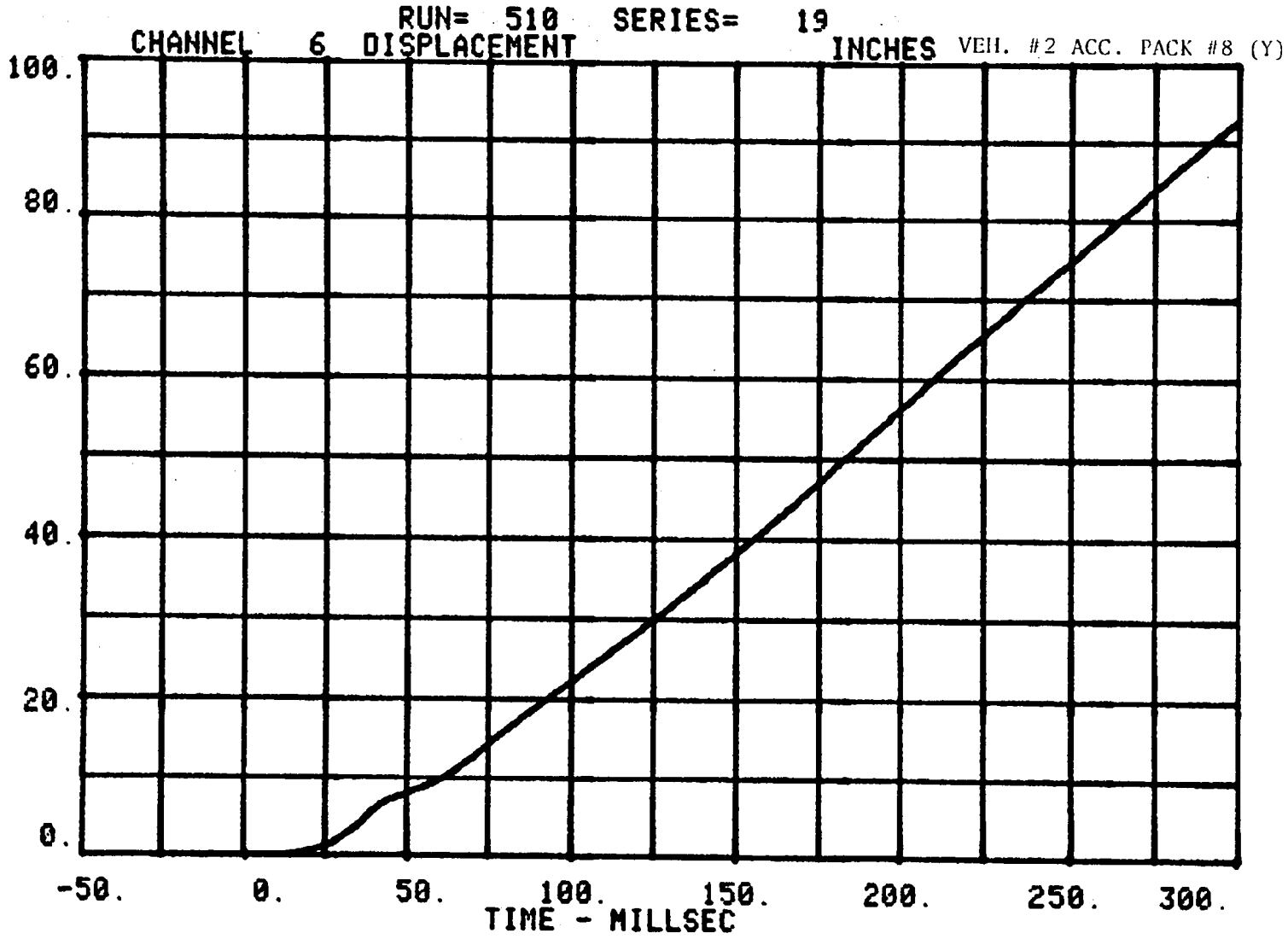

CHANNEL 58
RUN= 510 SERIES= 19
VEH#2 ACC PACK #7(Y)
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

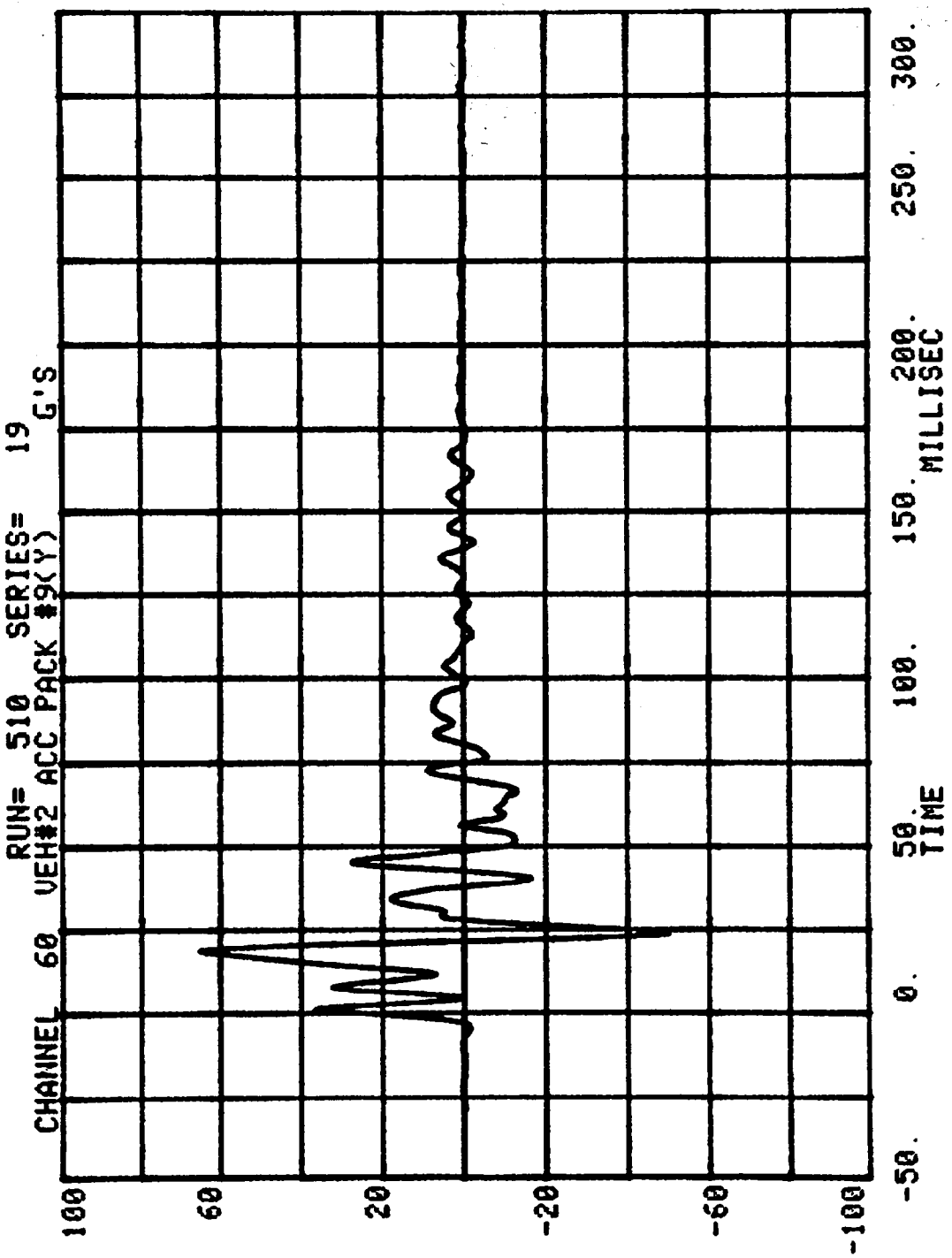

CHANNEL 3 VELOCITY
RUN= 510 SERIES= 19
MPH
VEH. #2 ACC. PACK #7 (Y)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

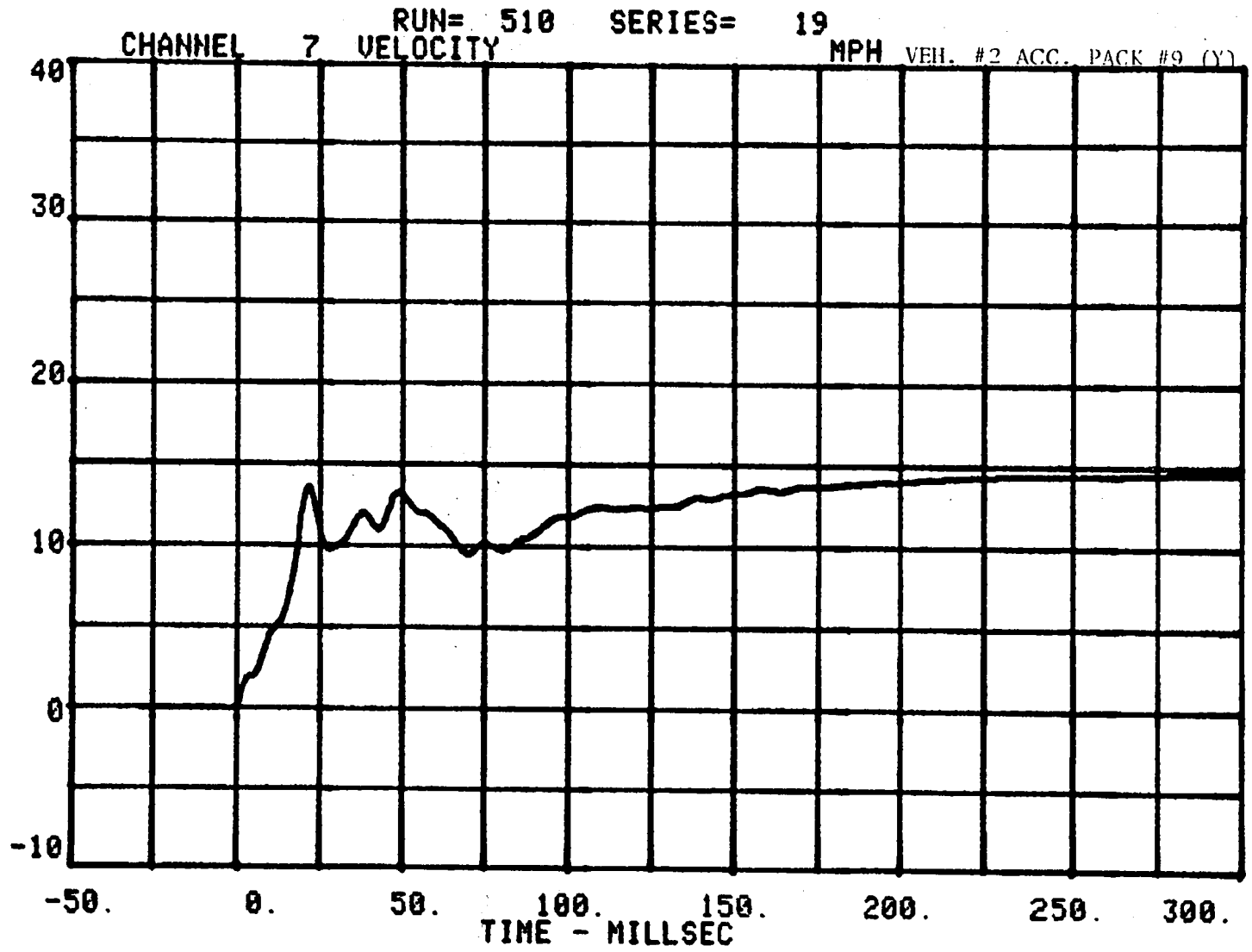

RUN= 510 SERIES= 19
CHANNEL 4 DISPLACEMENT INCHES
VEH. #2 ACC. PACK #7 (Y)
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

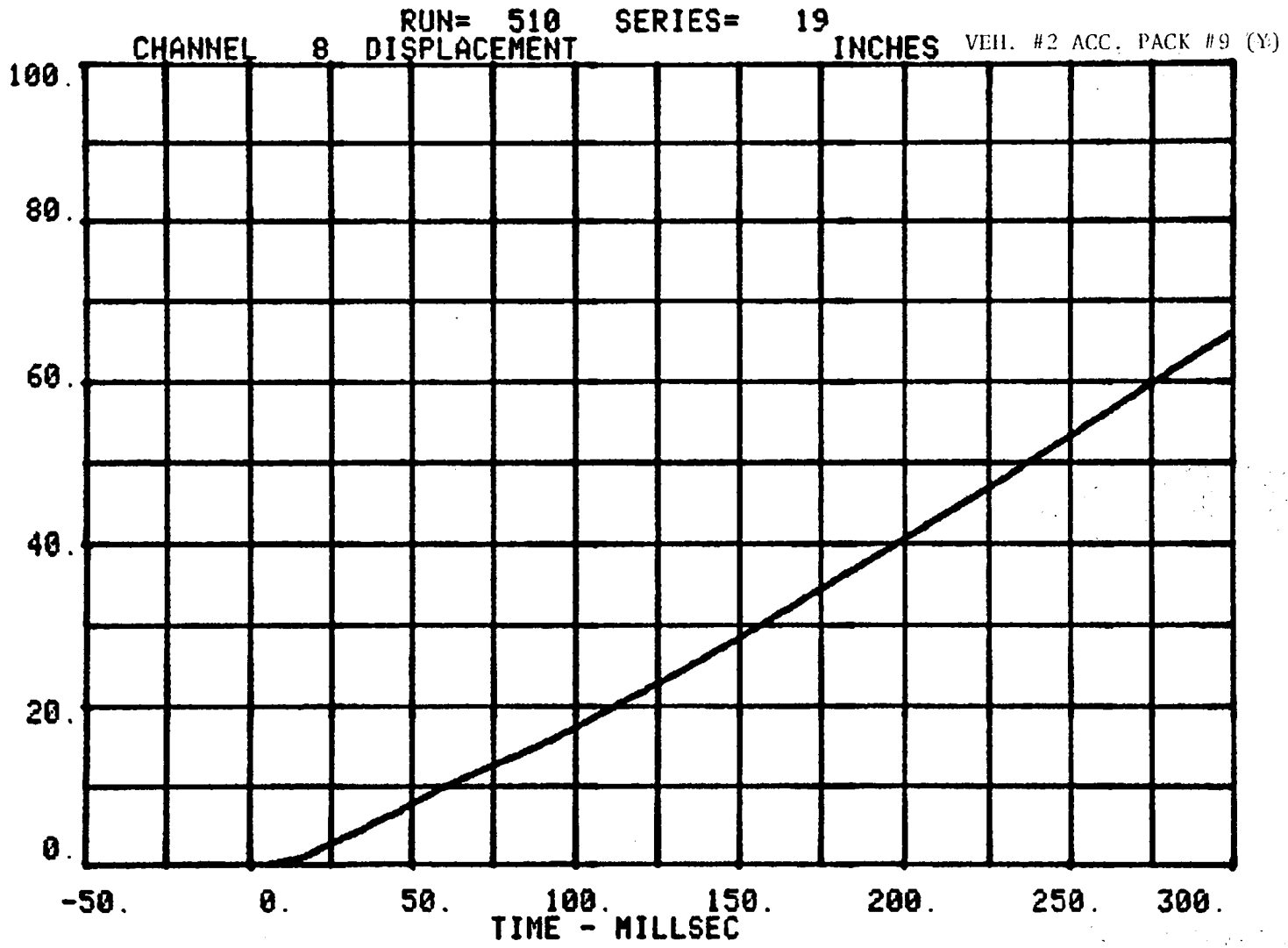

CHANNEL 59 VEH#2 ACC PACK #8(Y)
RUN= 510 SERIES= 19
G'S
200
120
40
-40
-120
-200
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

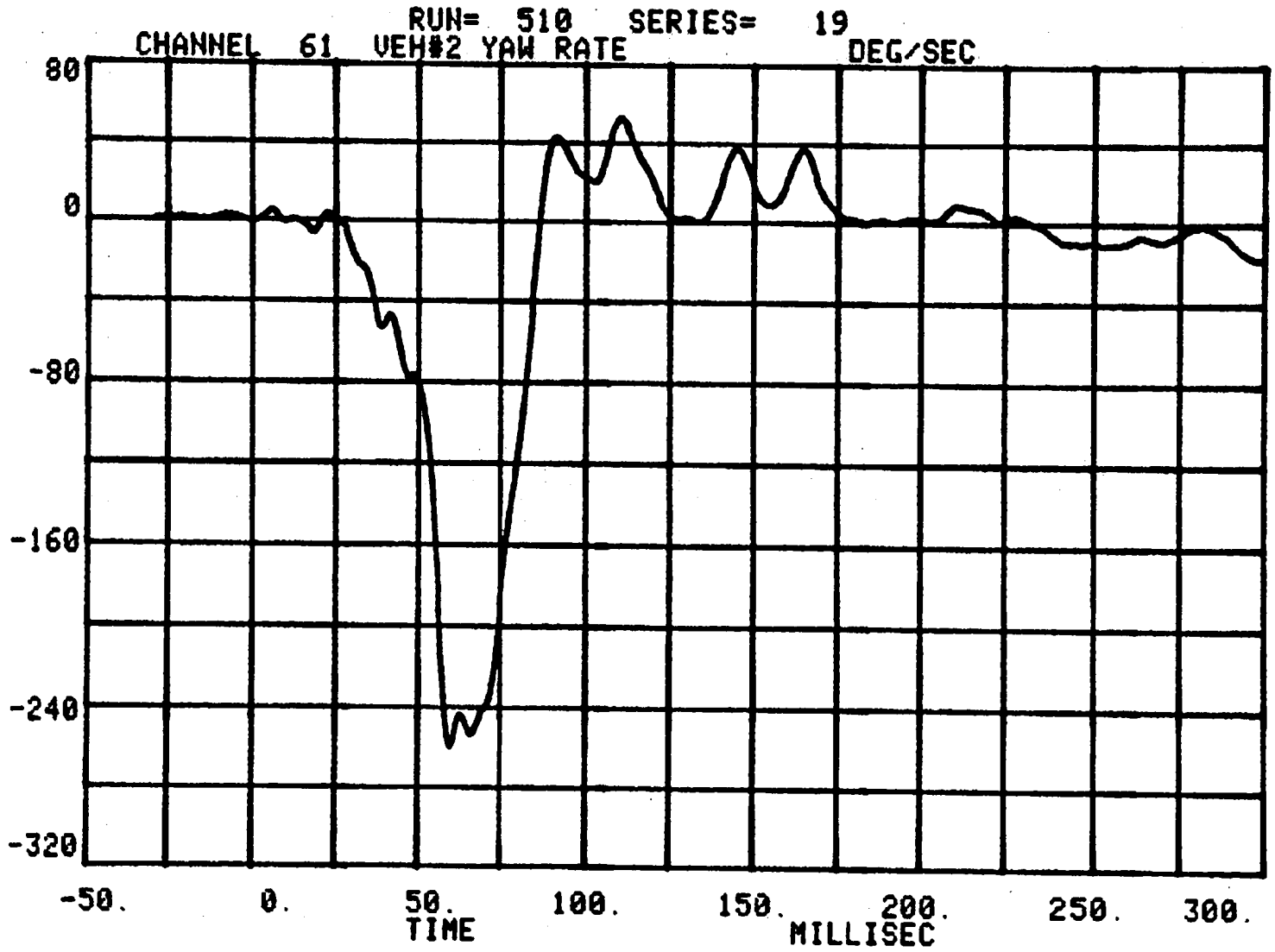

CHANNEL 5 VELOCITY
RUN= 510 SERIES= 19
MPH VEH. #2 ACC. PACK #8 (Y)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

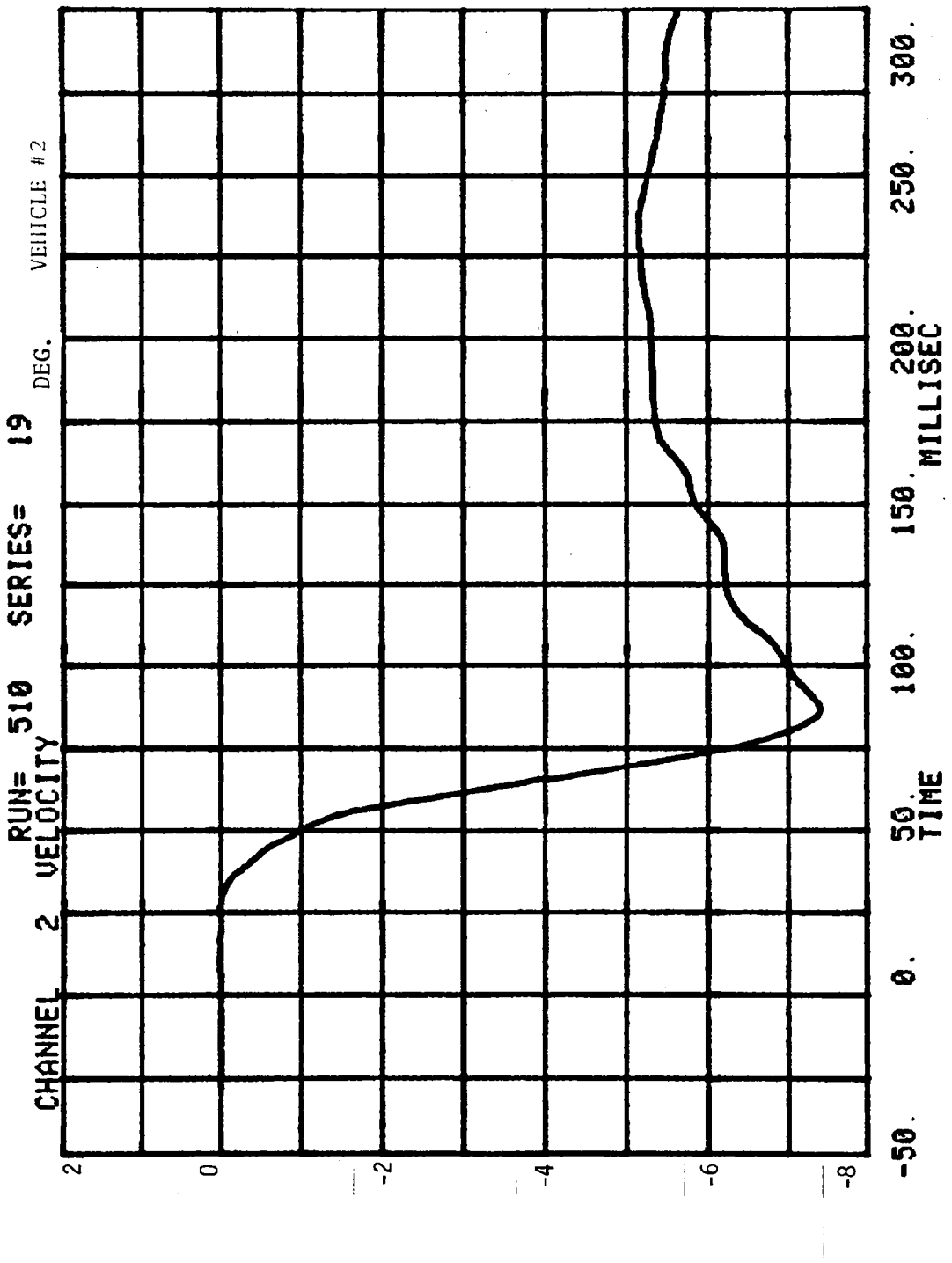

RUN= 510 SERIES= 19
CHANNEL 6 DISPLACEMENT
INCHES
VEH. #2 ACC. PACK #8 (Y)
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

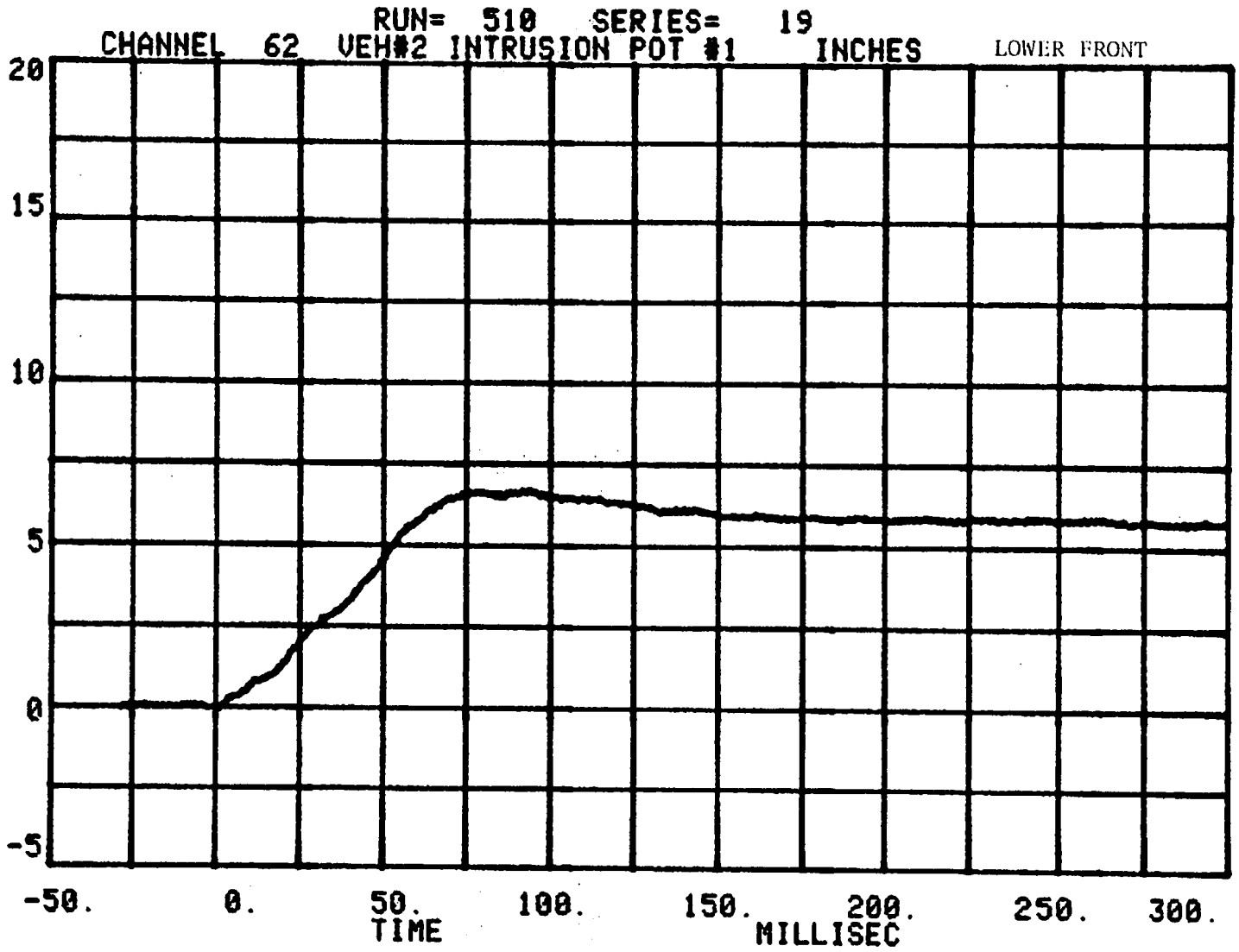

CHANNEL 60 VEH#2 ACC PACK #9(Y)
RUN= 510 SERIES= 19
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

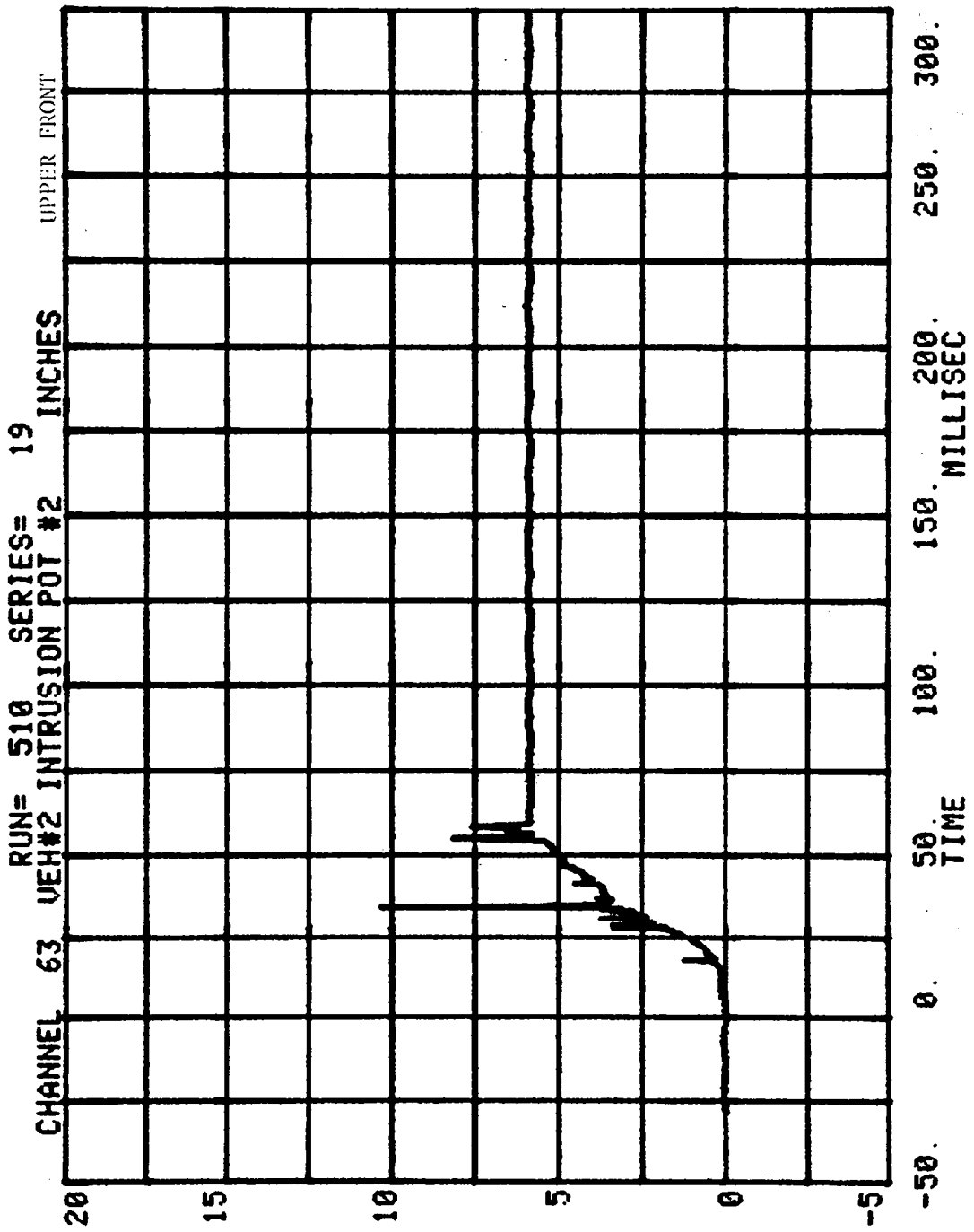

RUN= 510 SERIES= 19
CHANNEL 7 VELOCITY
MPH
VEH. #2 ACC. PACK #9 (Y)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

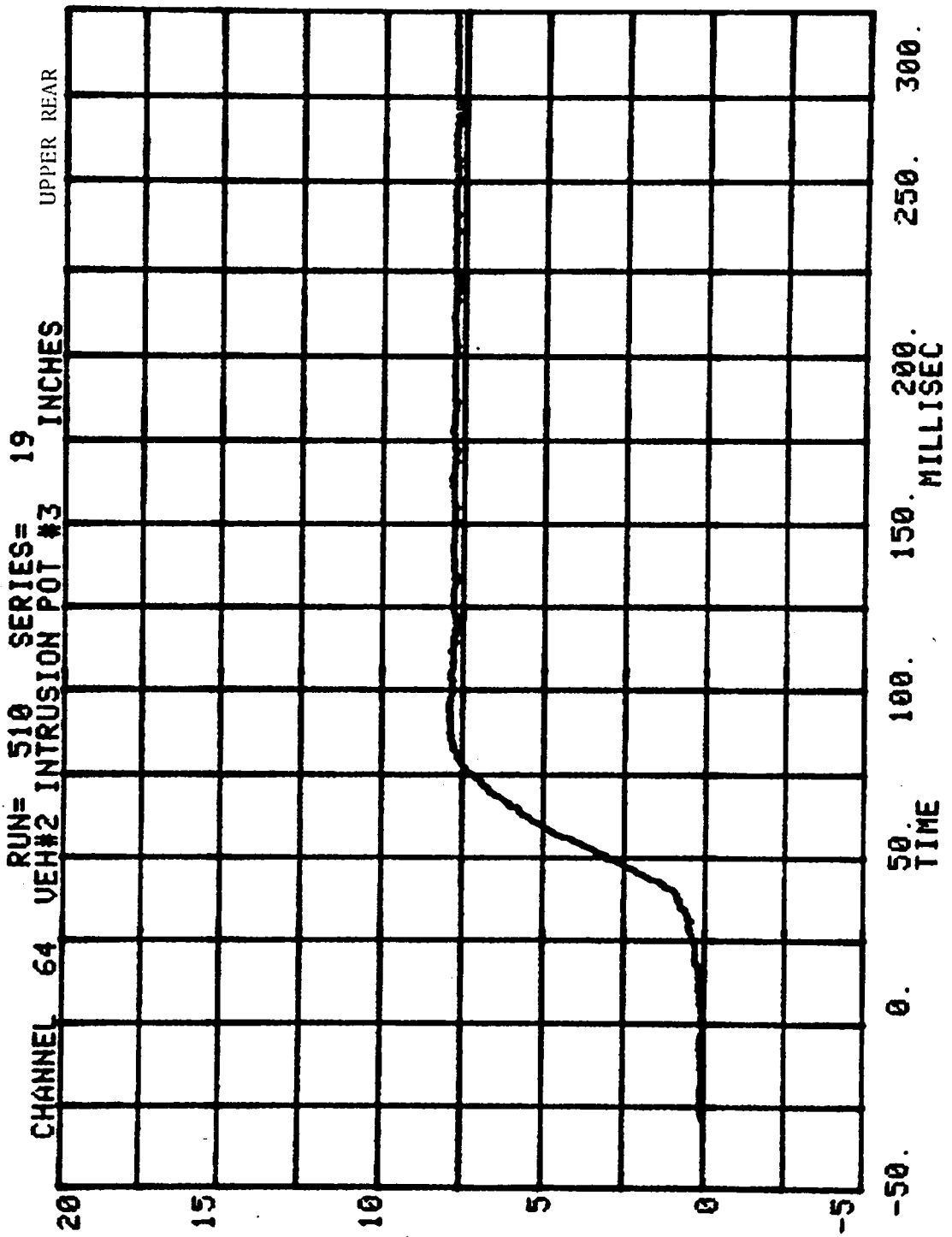

RUN= 510 SERIES= 19
CHANNEL 8 DISPLACEMENT INCHES
VEH. #2 ACC. PACK #9 (Y)
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

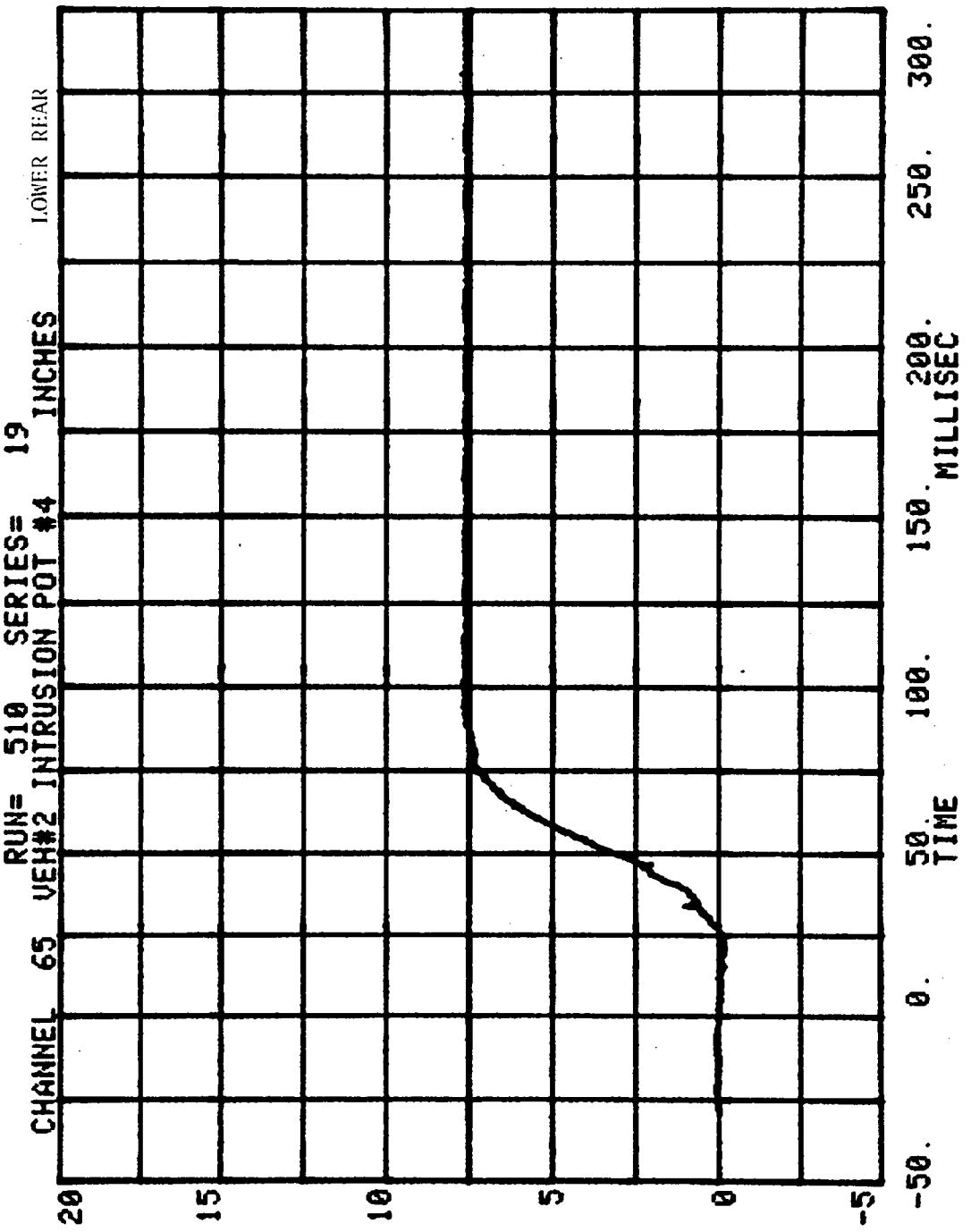

RUN= 510 SERIES= 19
CHANNEL 61 VEH#2 YAW RATE
DEG/SEC
80
0
-80
-160
-240
-320
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 2 VELOCITY
RUN= 510 SERIES= 19
DEG.
VEHICLE #2
2
0
-2
-4
-6
-8
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 510 SERIES= 19
CHANNEL 62 VEH#2 INTRUSION POT #1 INCHES
LOWER FRONT
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 63 VEH#2 INTRUSION POT #2
RUN= 510 SERIES= 19
INCHES
UPPER FRONT
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


UPPER REAR
CHANNEL 64 RUN= 510 SERIES= 19
VEH#2 INTRUSION POT #3 INCHES
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME MILLISEC


CHANNEL 65 VEH#2 INTRUSION POT #4 LOWER REAR
RUN= 510 SERIES= 19
INCHES
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

TEST NO. 19

VEHICLE 2 - 1976 VOLKSWAGEN RABBIT

DUMMY DATA

	FILTER CHANNEL CLASS
Head Accelerations	1000
Chest Accelerations	180
Pelvic Accelerations	180

HEAD INJURY CRITERION
HEAD SEVERITY INDEX
(X AND Y ONLY)

SIDE IMPACT CAR-TO-CAR BUDD #19

RUN= 510

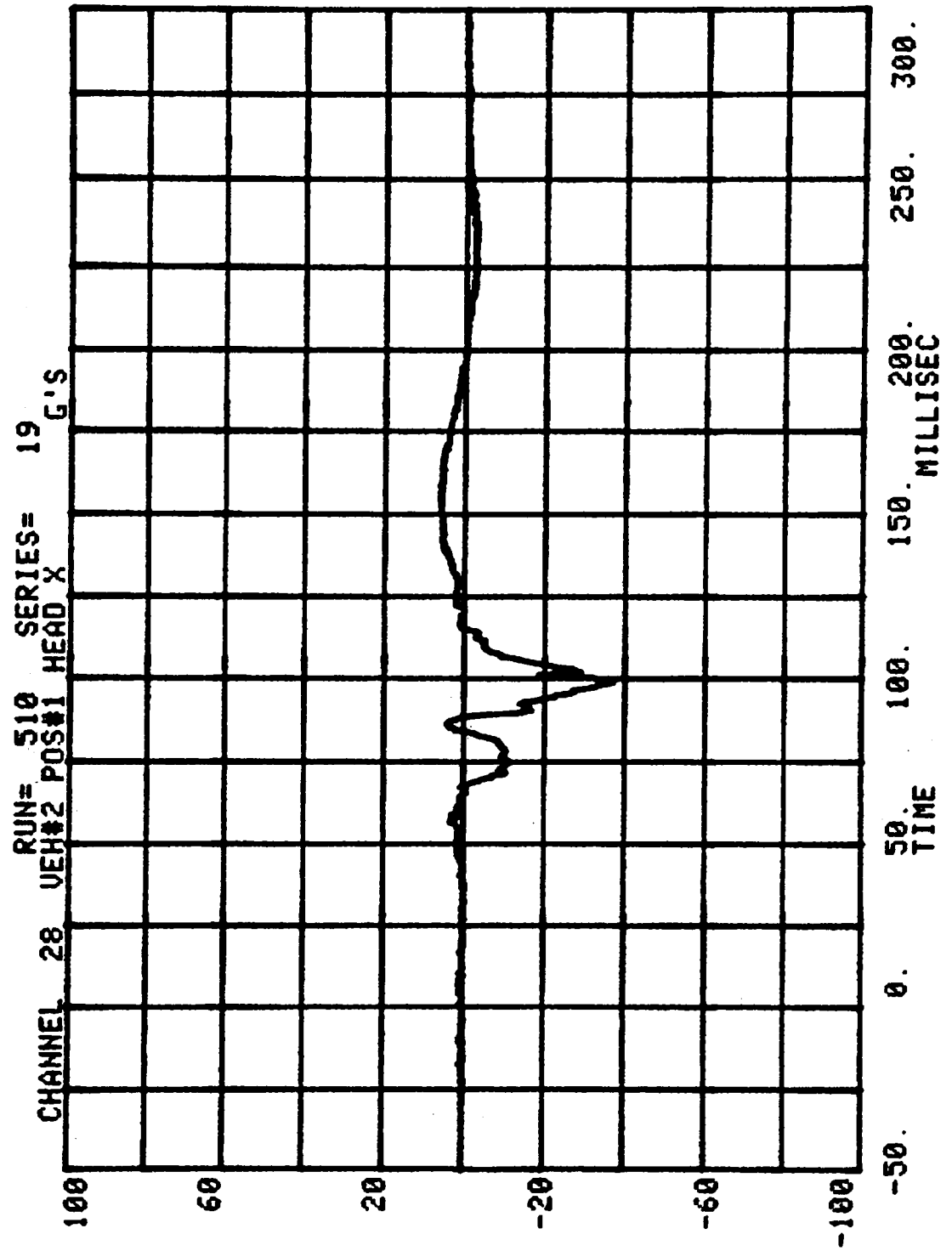
VEH#2 POS#1 HEAD RESULT

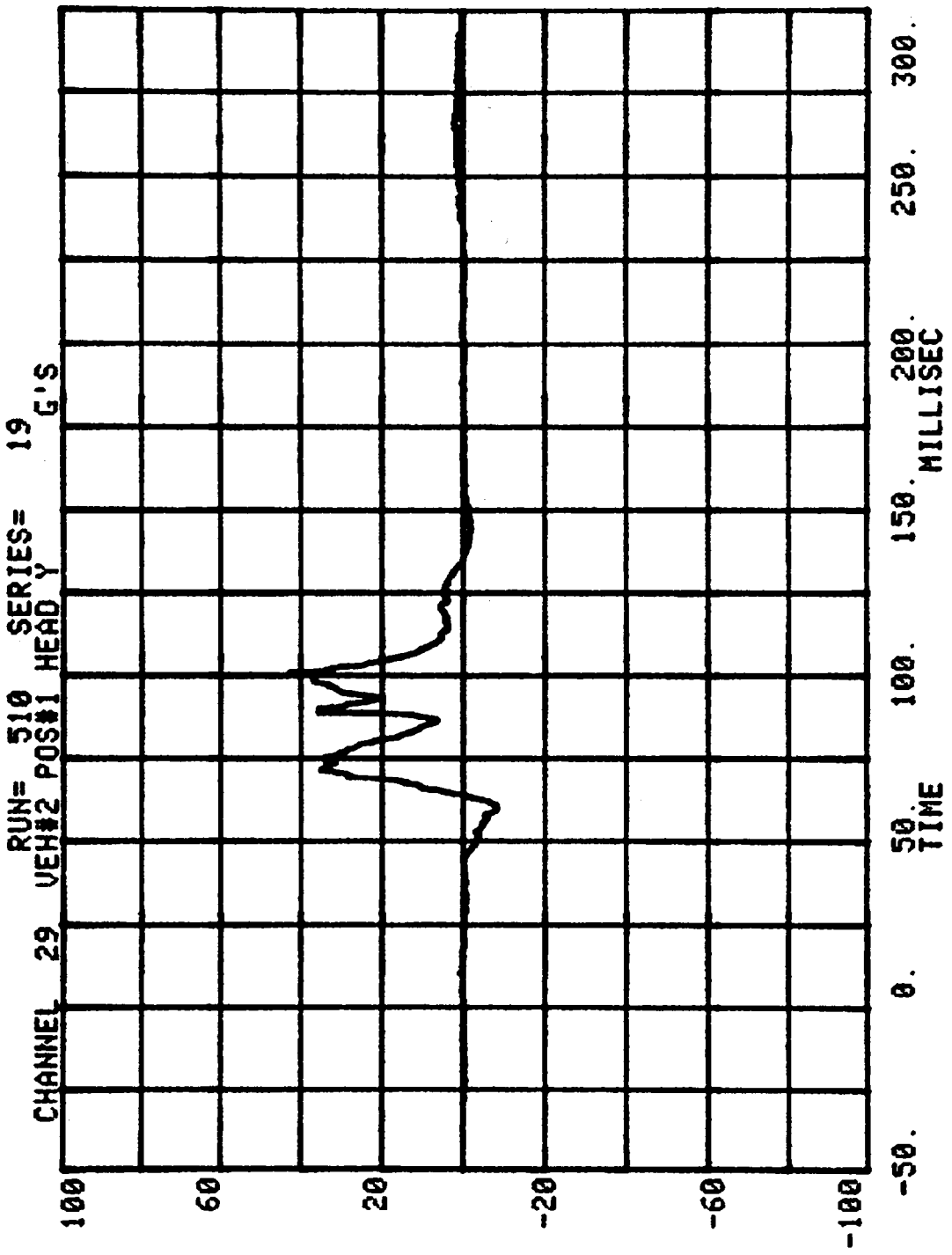
HIC= 186.3 FROM T1= .06870 TO T2= .10650

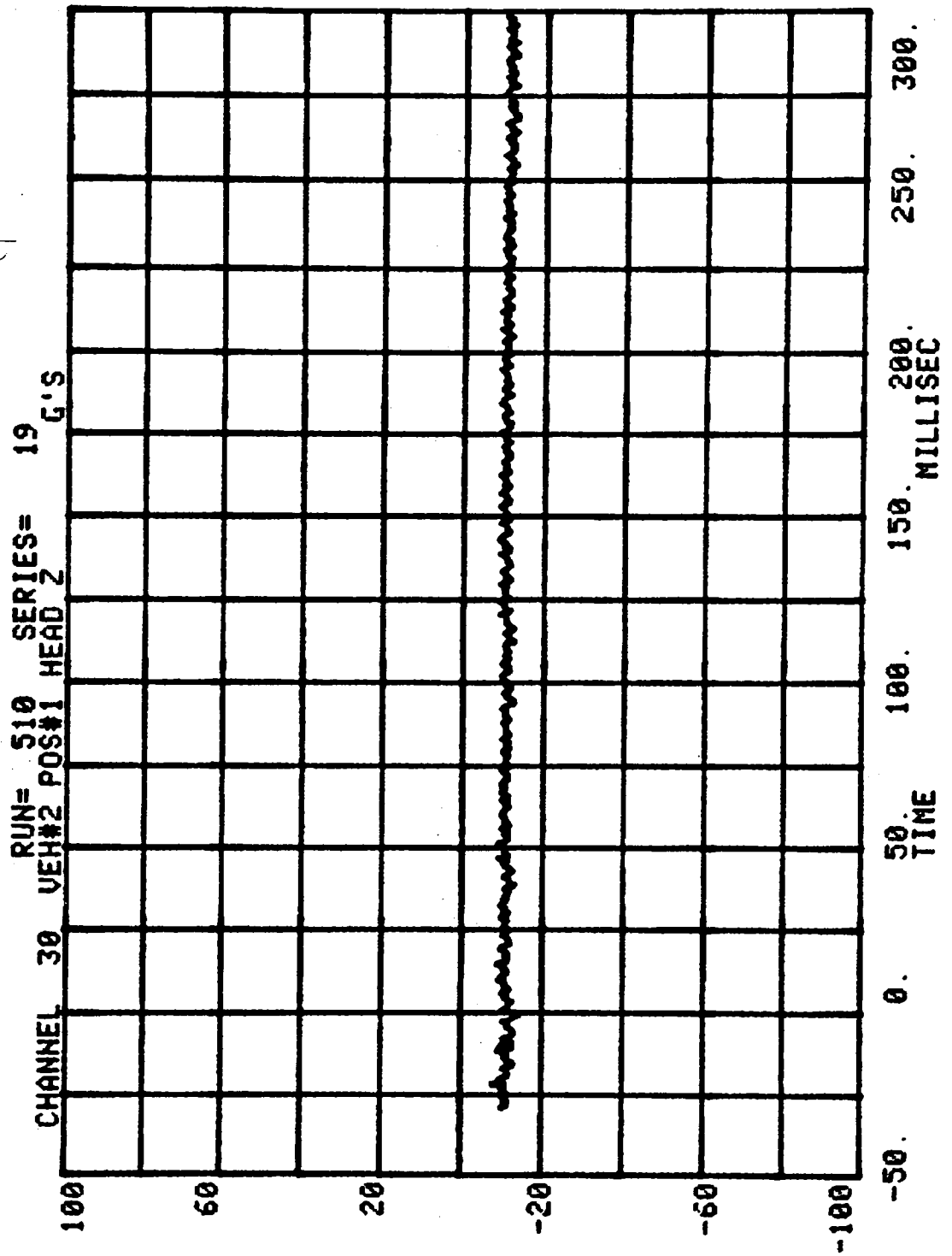
AVERAGE ACCELERATION BETWEEN T1 AND T2= 30.0G'S

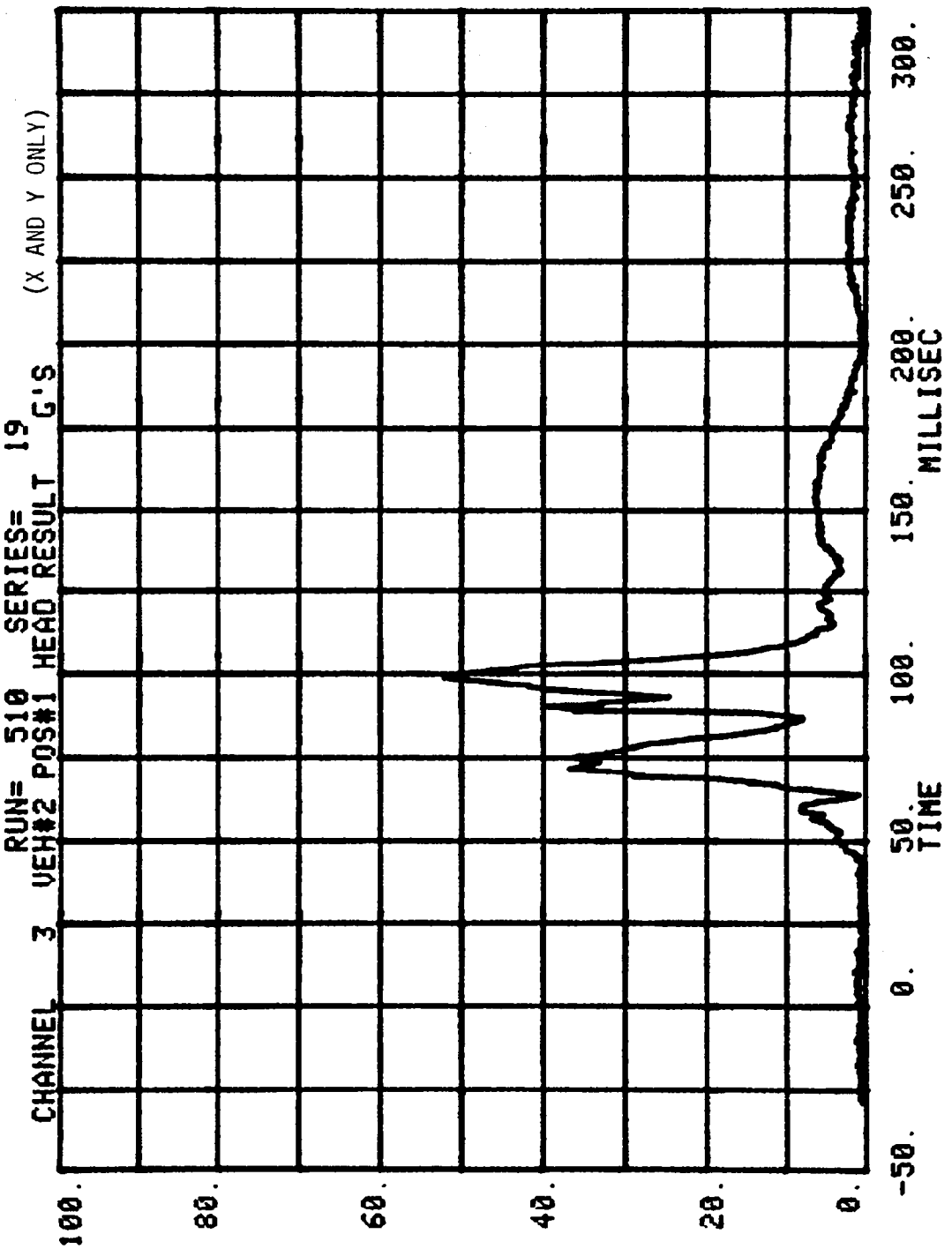
EVENT TIME= 300.0 MSEC

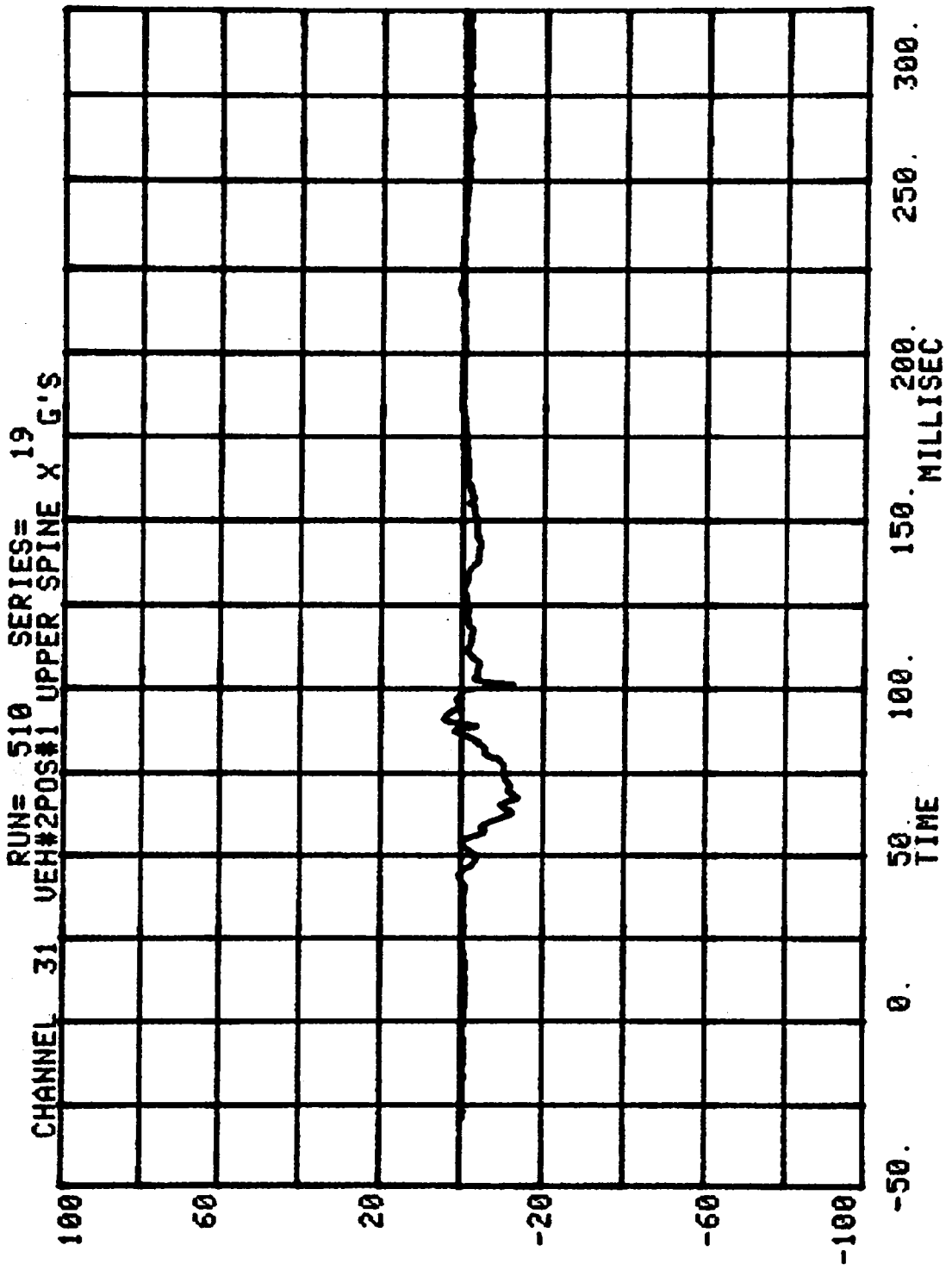
SEVERITY INDEX= 248.6

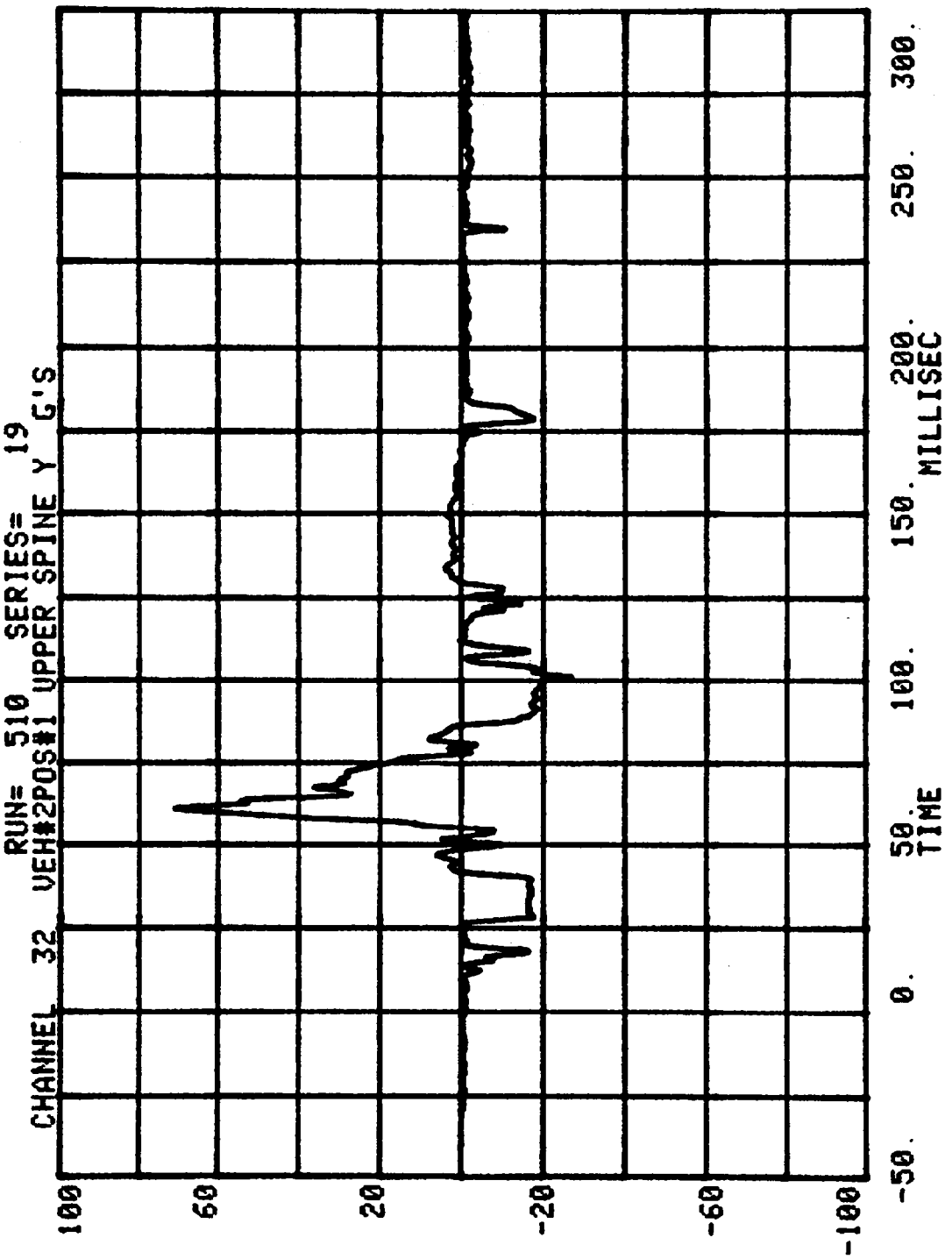

CHANNEL 28 VEH#2 POS#1 HEAD X
RUN= 510 SERIES= 19
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

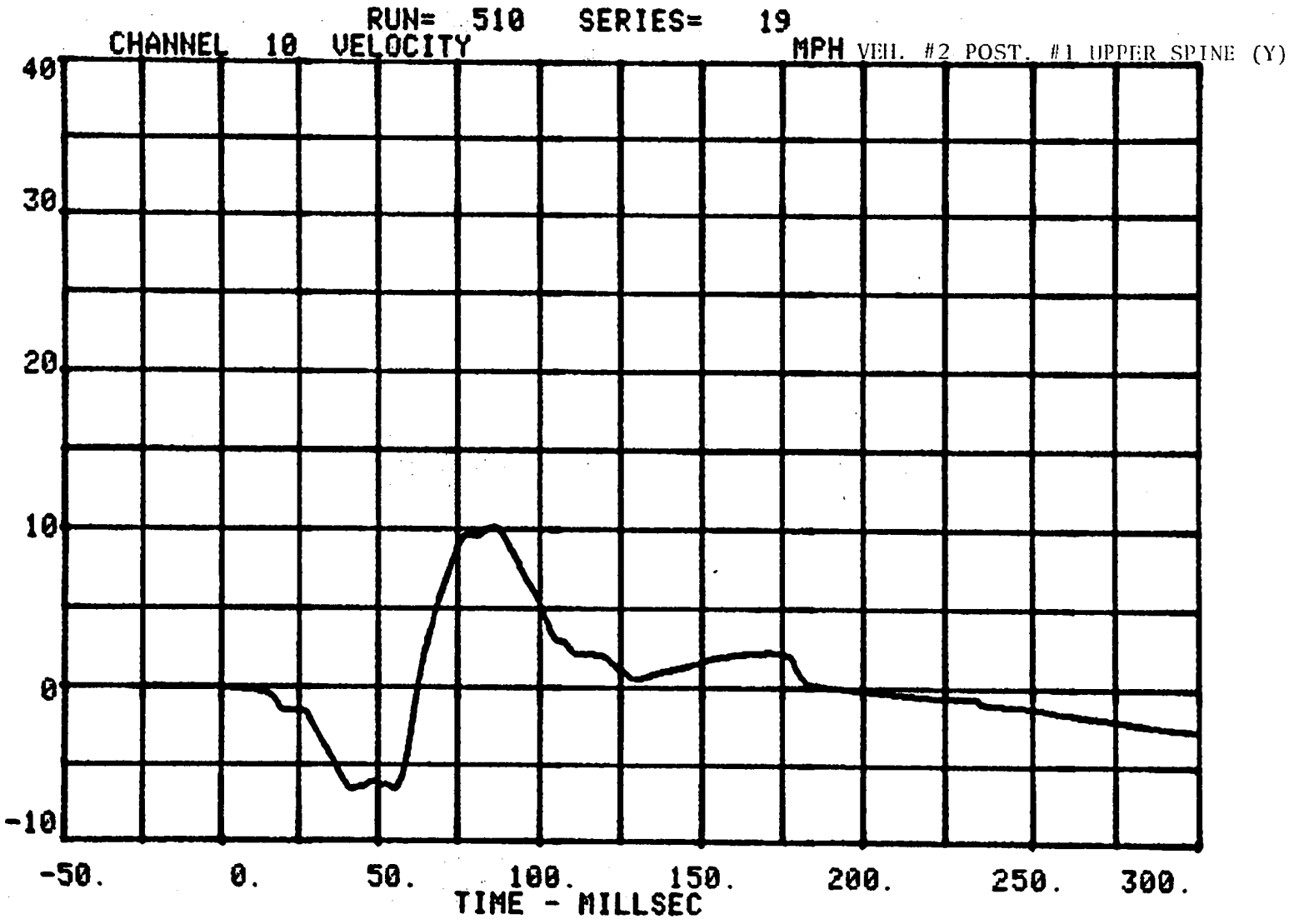

CHANNEL 29 VEH#2 POS#1 HEAD Y
RUN= 510 SERIES= 19
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

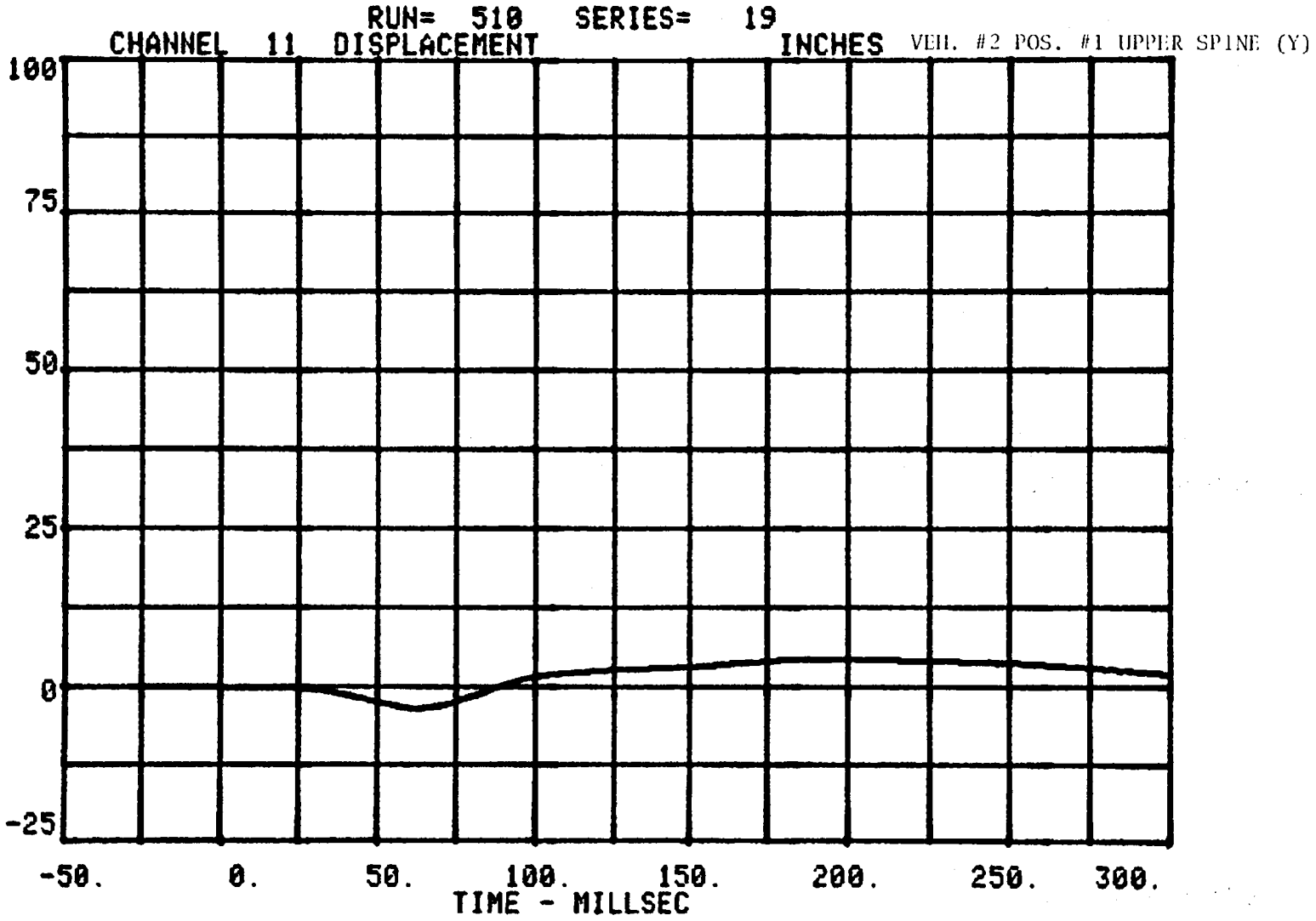

CHANNEL 30 RUN= 510 SERIES= 19
VEH#2 POS#1 HEAD 2
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

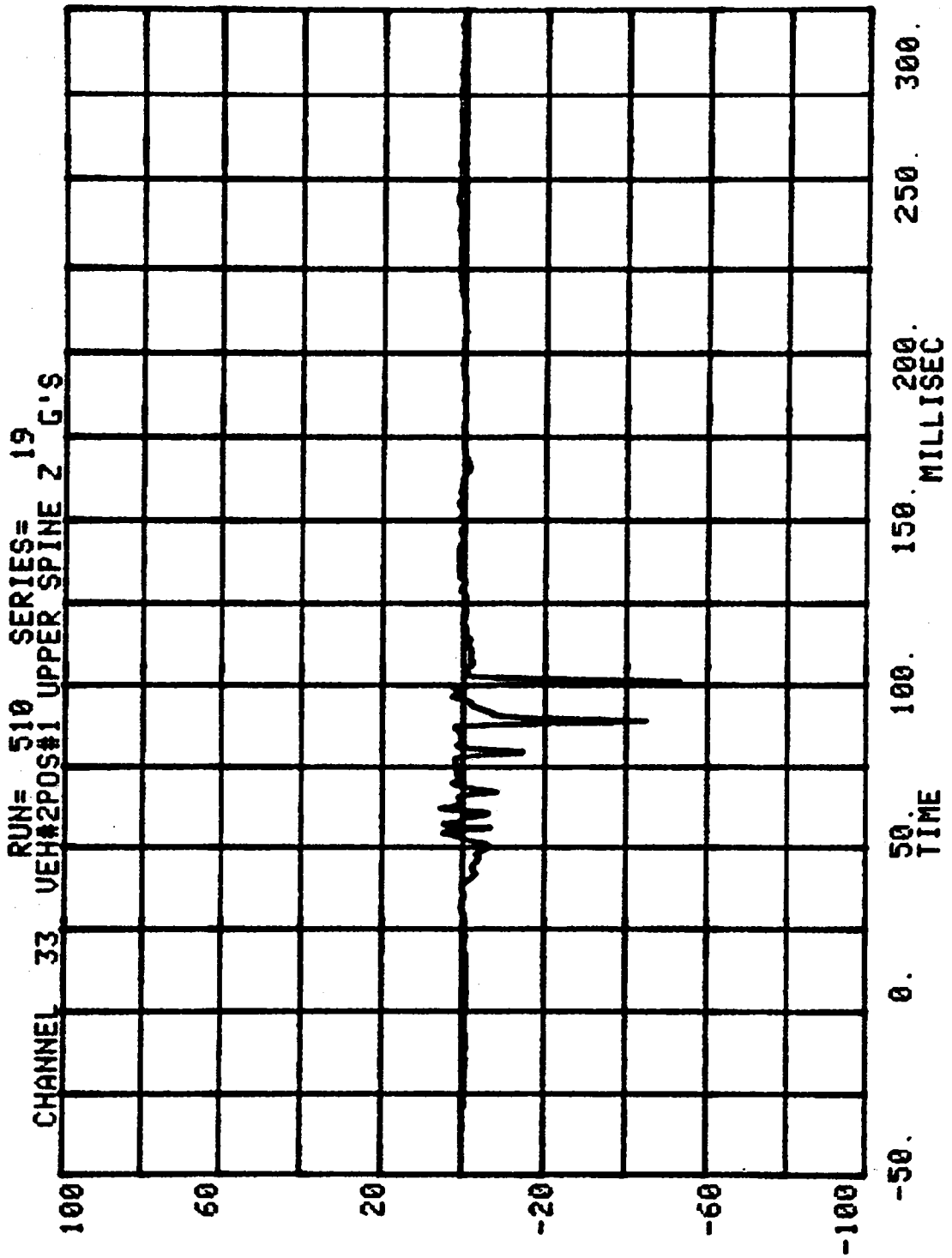

CHANNEL 3 RUN= 510 SERIES= 19
VEH#2 POS#1 HEAD RESULT G'S
(X AND Y ONLY)
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

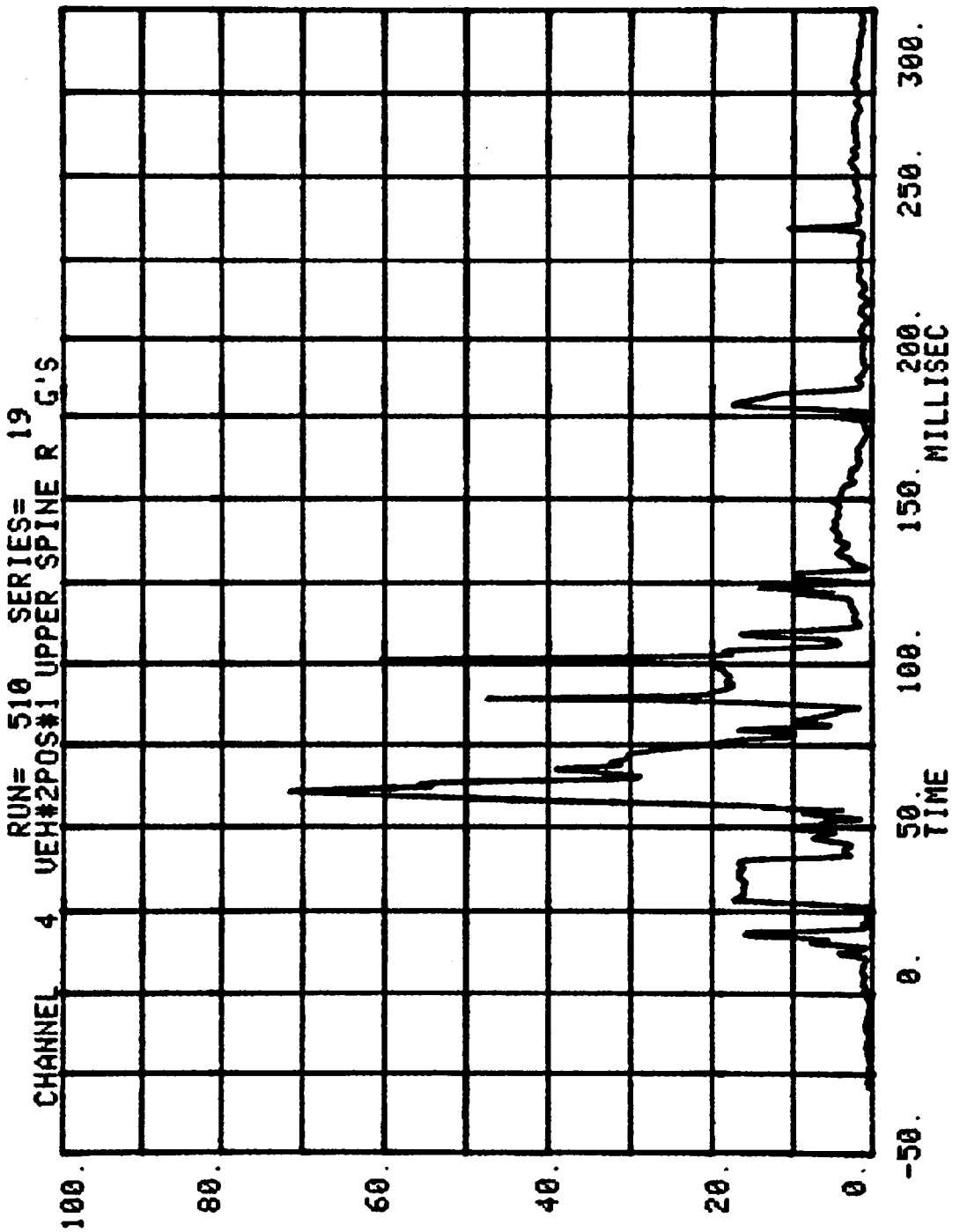

CHANNEL 31 VEH#2POS#1 UPPER SPINE X G'S
RUN= 510 SERIES= 19
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

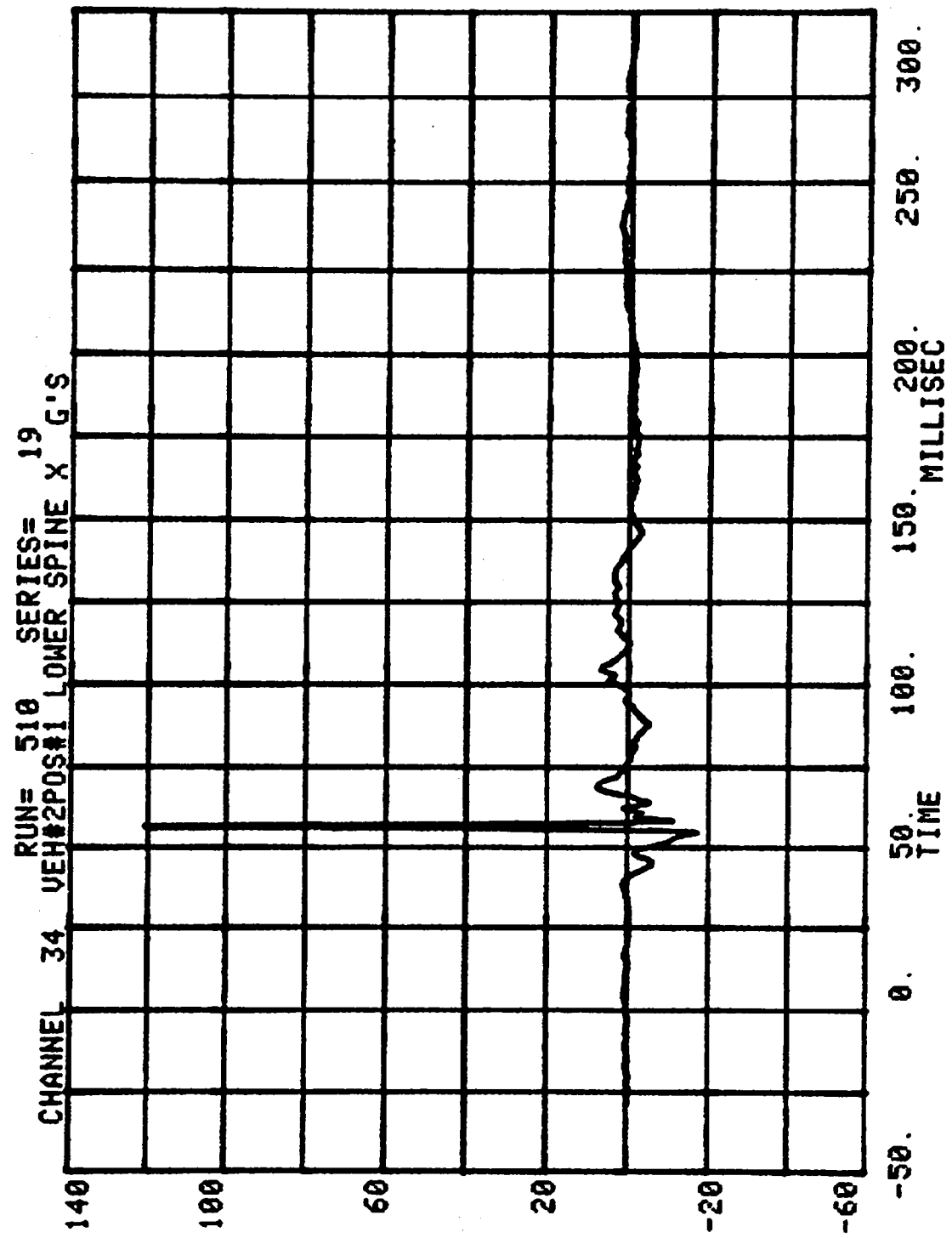

CHANNEL 32 VEH#2POS#1 UPPER SPINE Y G'S
RUN= 510 SERIES= 19
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

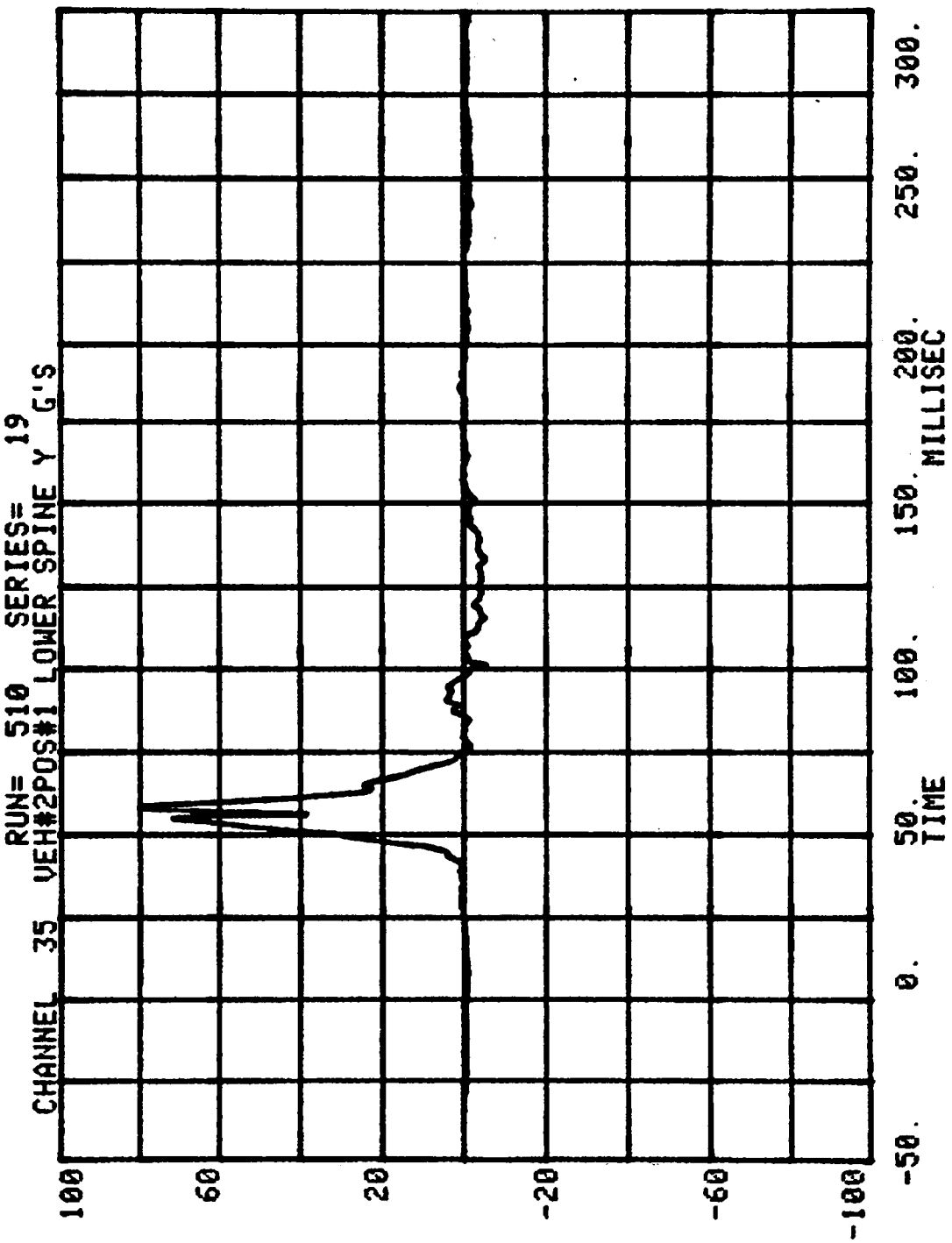

RUN= 510 SERIES= 19
CHANNEL 10 VELOCITY
MPH VEH. #2 POST. #1 UPPER SPINE (Y)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

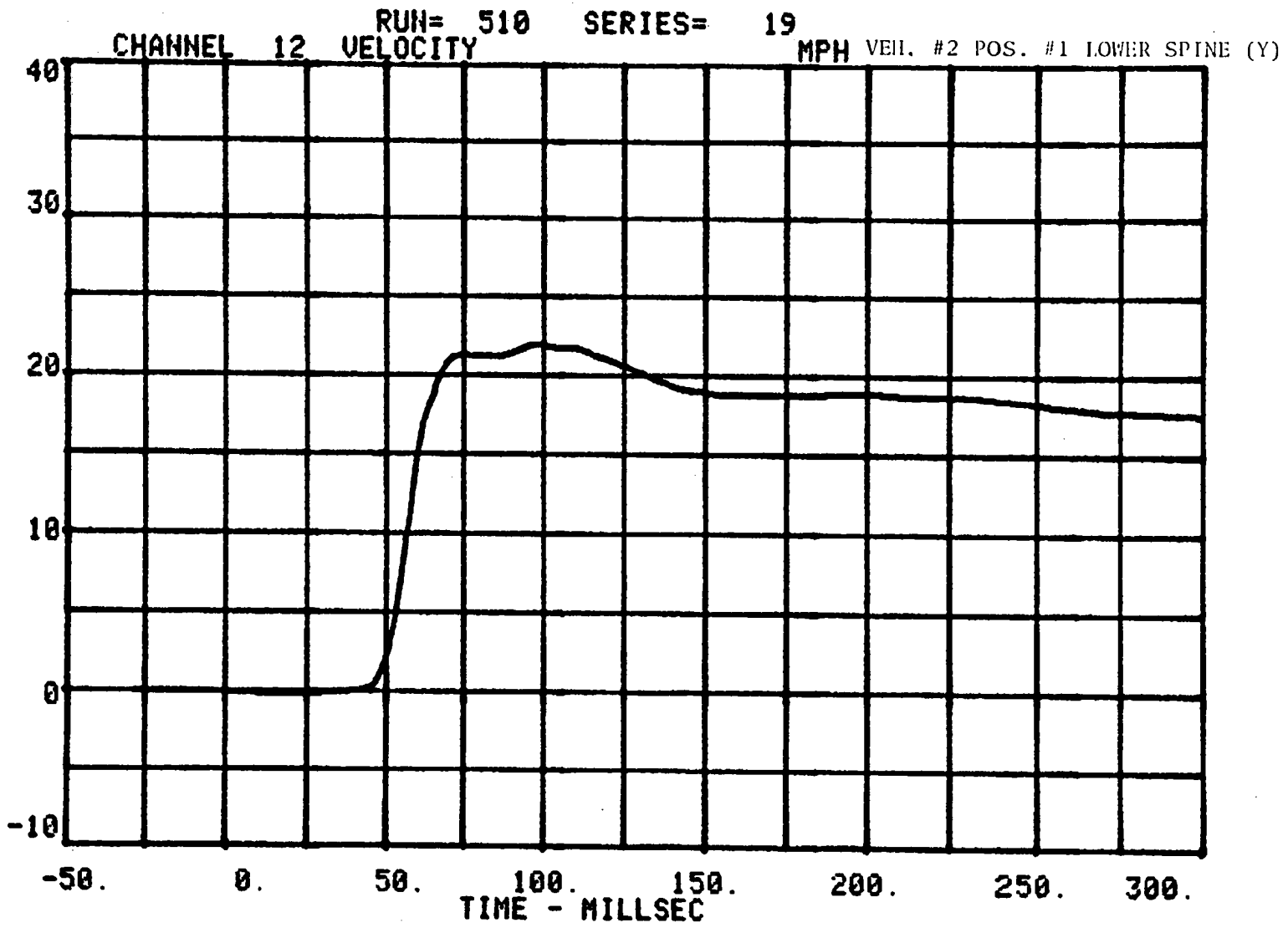

RUN= 510 SERIES= 19
CHANNEL 11 DISPLACEMENT INCHES
VEH. #2 POS. #1 UPPER SPINE (Y)
100
75
50
25
0
-25
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

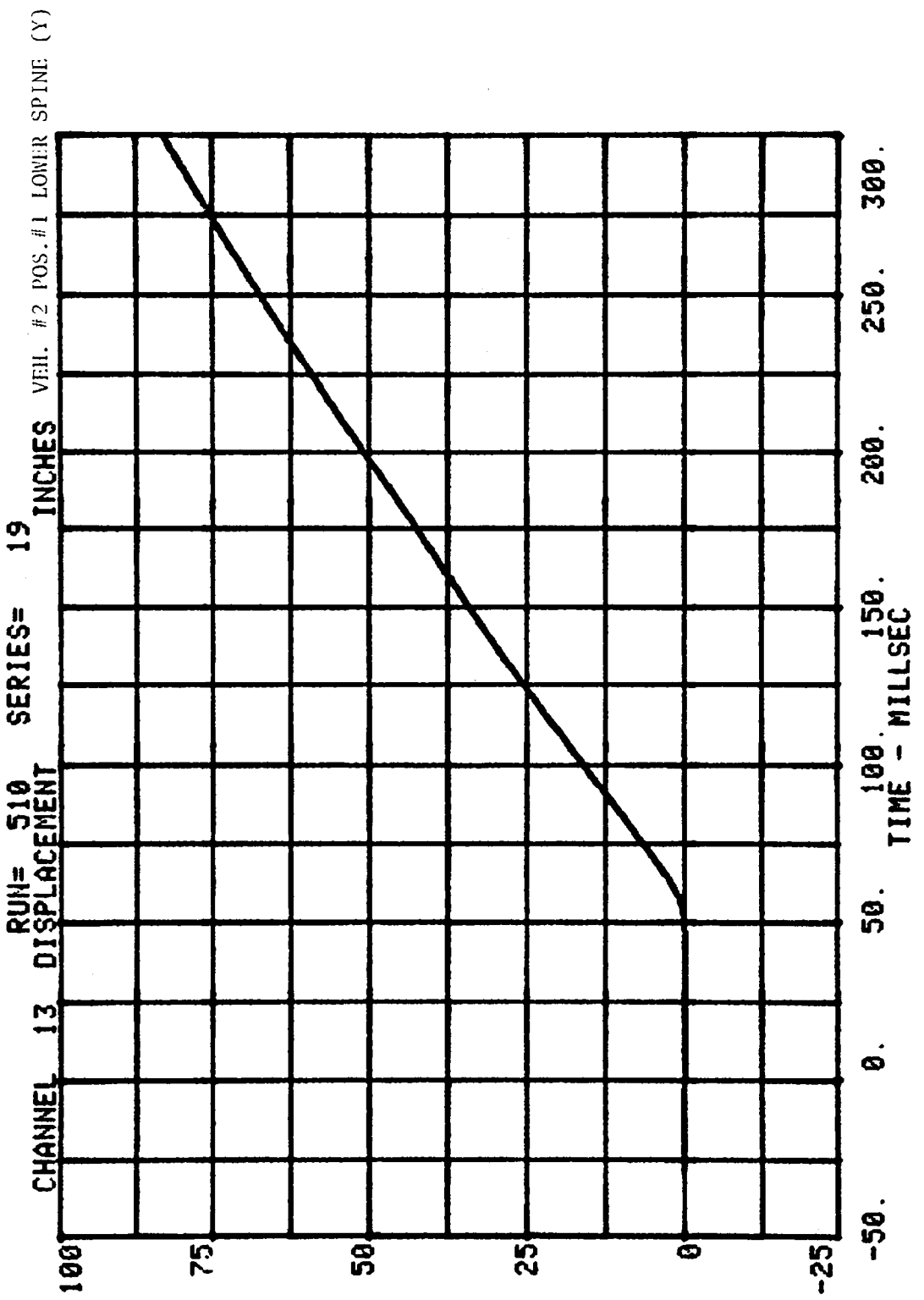

CHANNEL 33 VEH#2POS#1 UPPER SPINE Z
RUN= 510 SERIES= 19
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

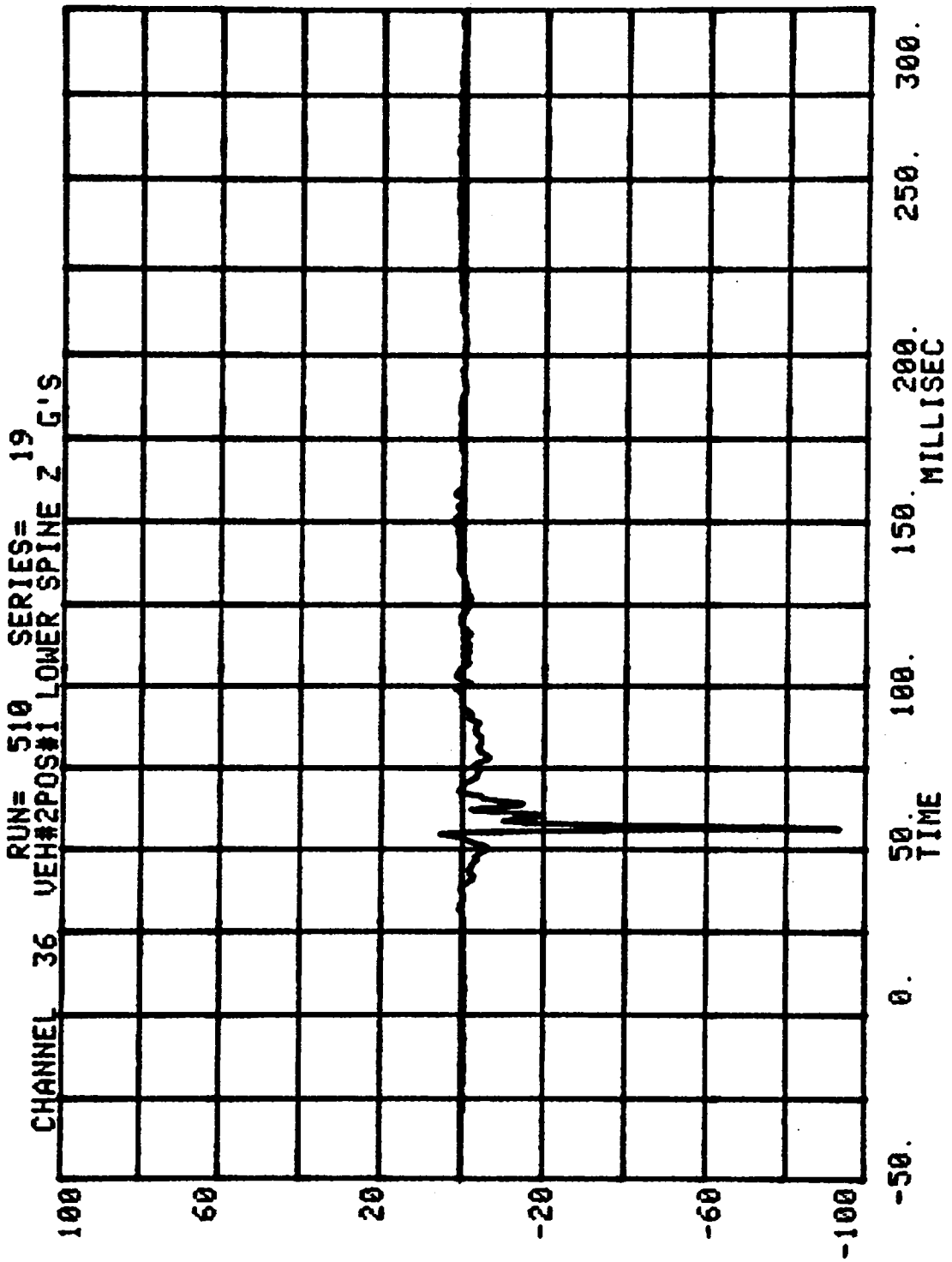

CHANNEL 4 VEH#2POS#1 UPPER SPINE R G'S
RUN= 510 SERIES= 19
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

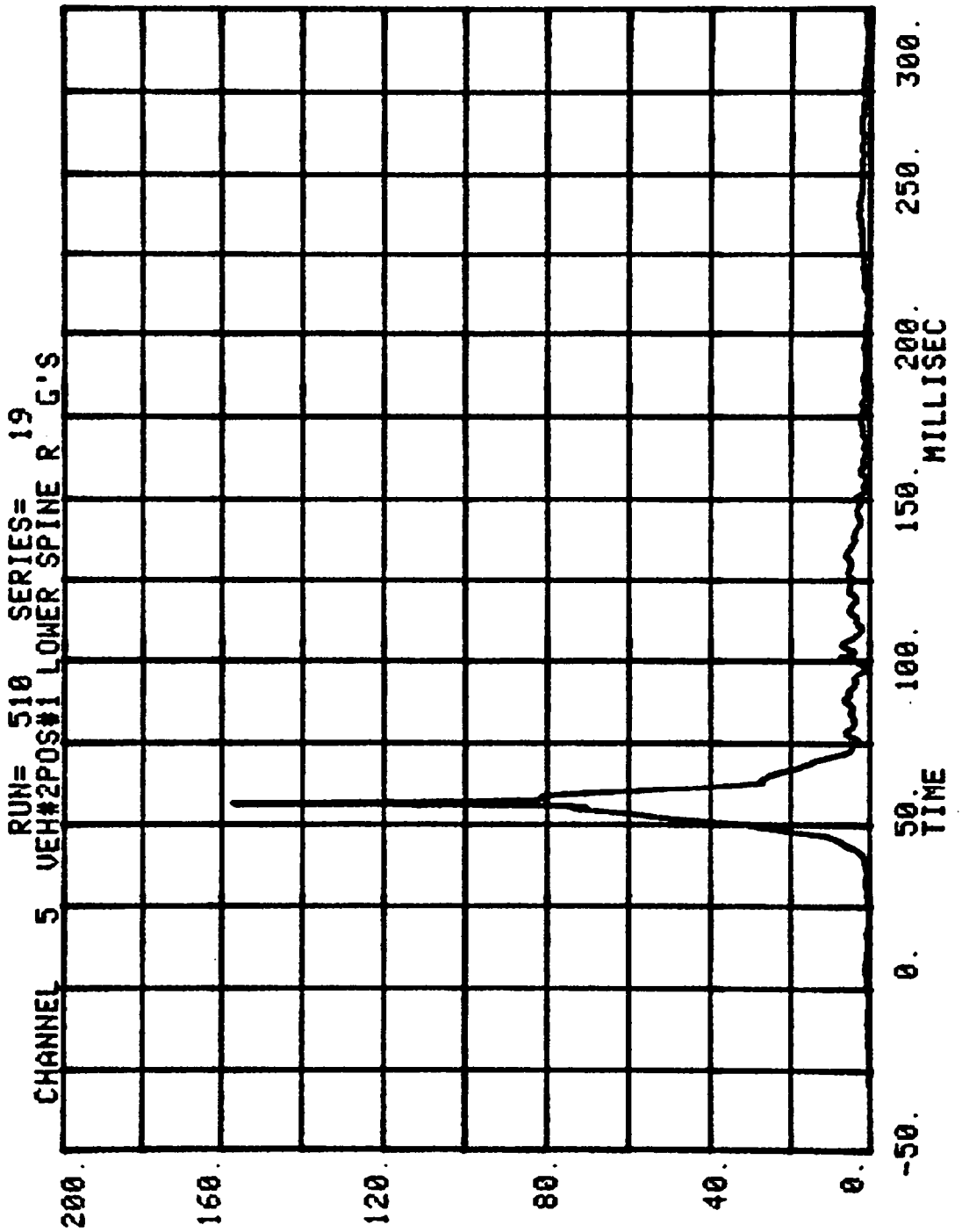

CHANNEL 34 VEH#2POS#1 LOWER SPINE X G'S
RUN= 510 SERIES= 19
140
100
60
20
-20
-60
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

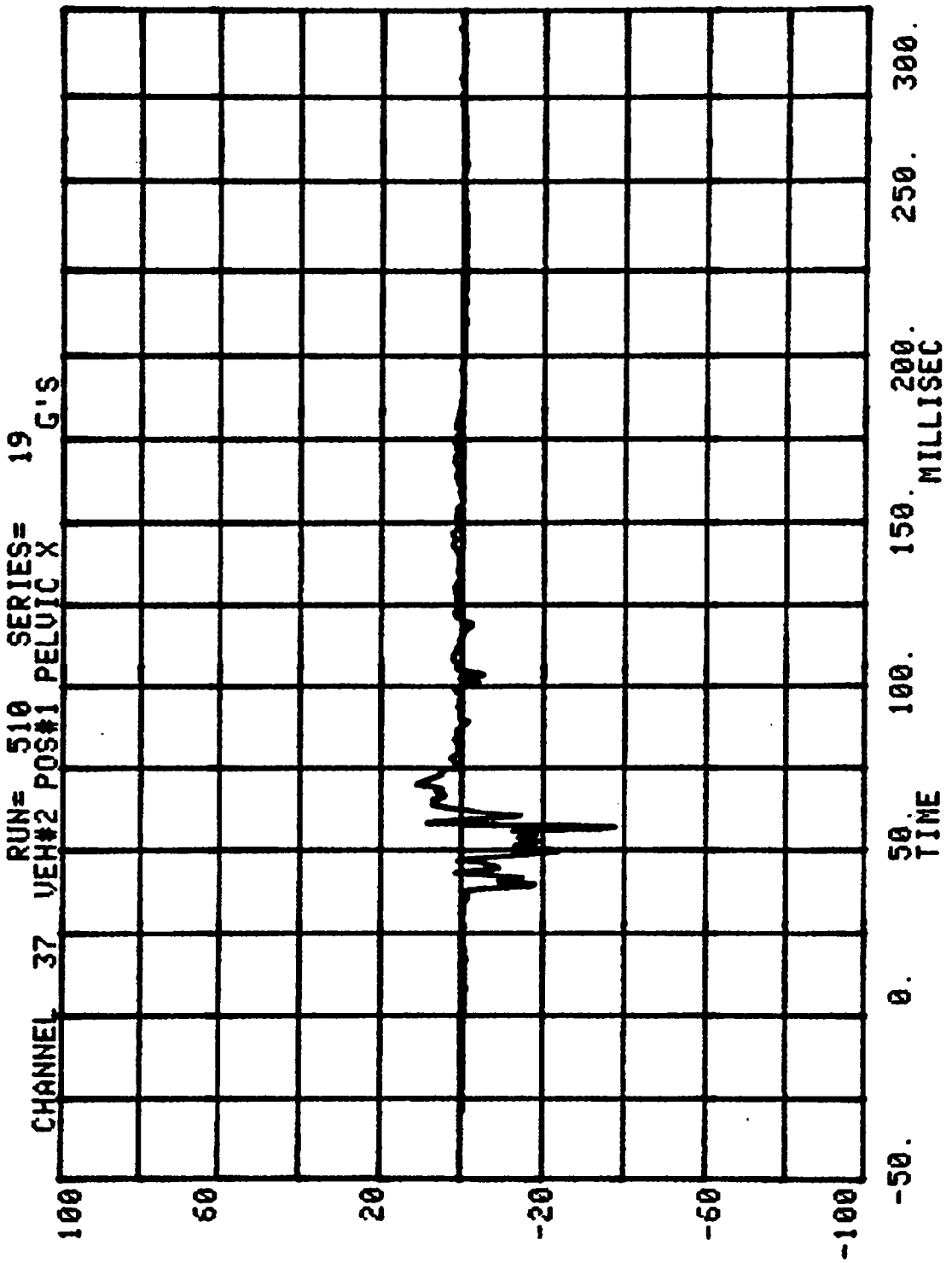

CHANNEL 35 VEH#2POS#1 LOWER SPINE Y G'S
RUN= 510 SERIES= 19
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

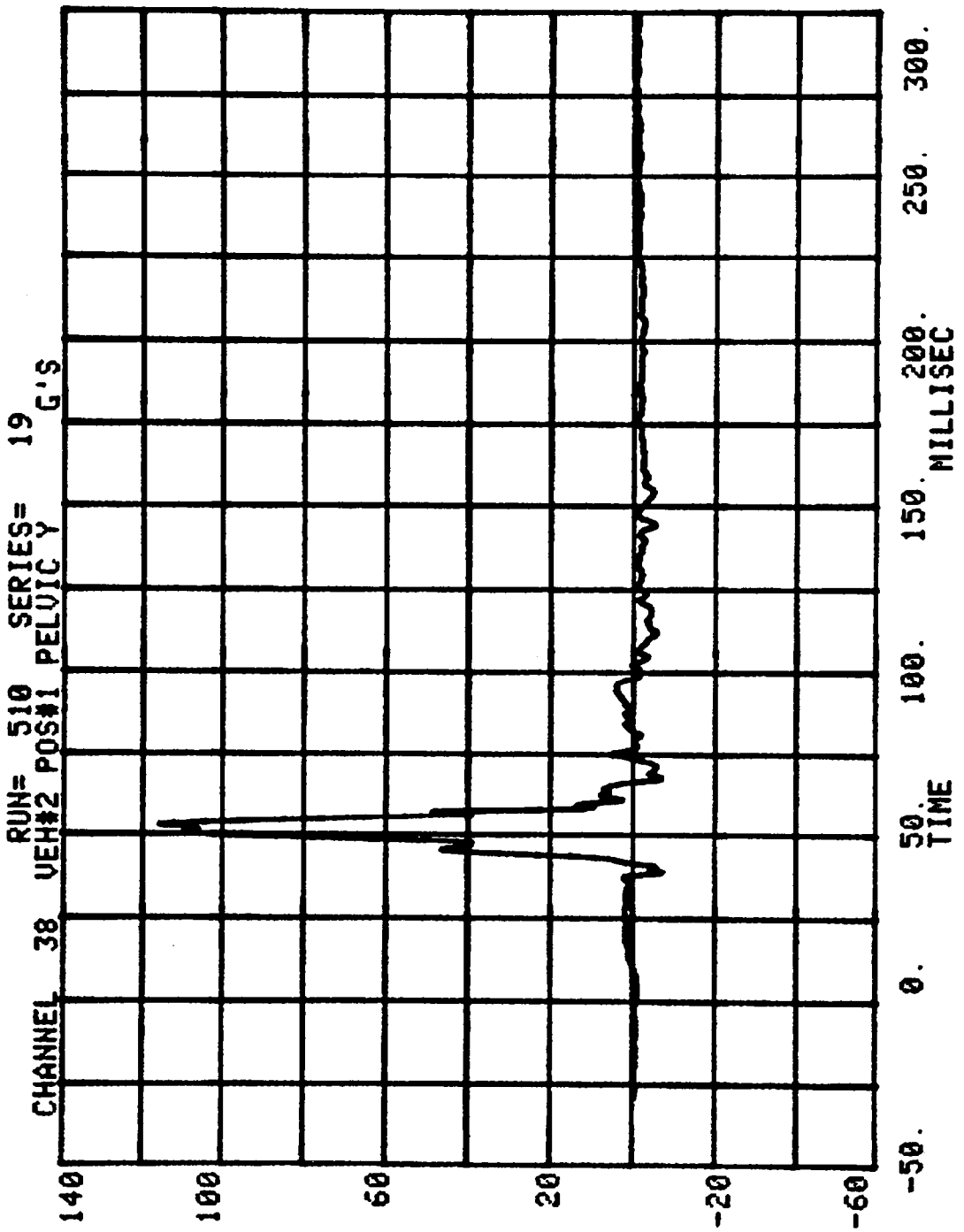

RUN= 510 SERIES= 19
CHANNEL 12 VELOCITY
MPH
VEH. #2 POS. #1 LOWER SPINE (Y)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

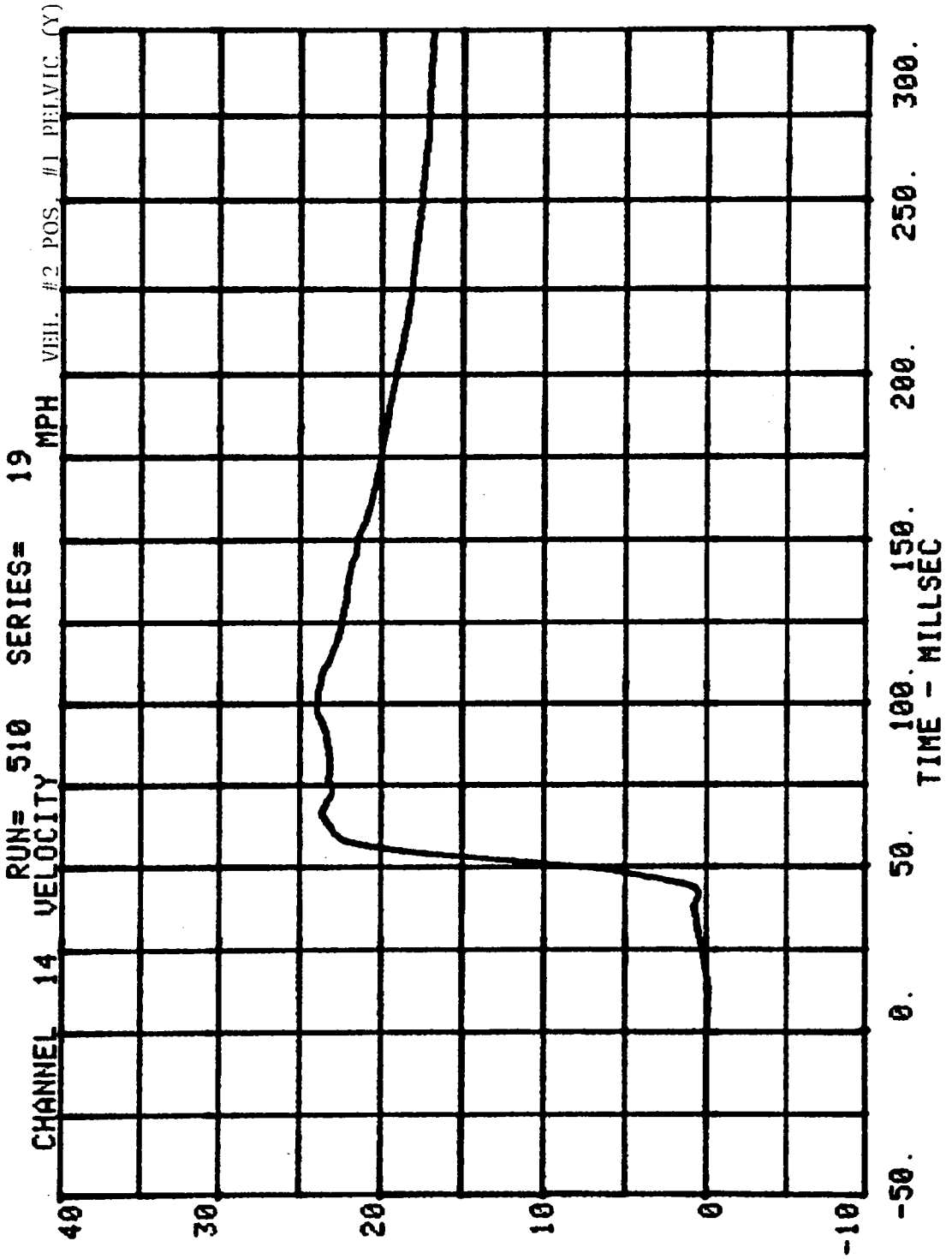

CHANNEL 13 DISPLACEMENT
RUN= 510 SERIES= 19
INCHES
VEH. #2 POS. #1 LOWER SPINE (Y)
100
75
50
25
0
-25
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

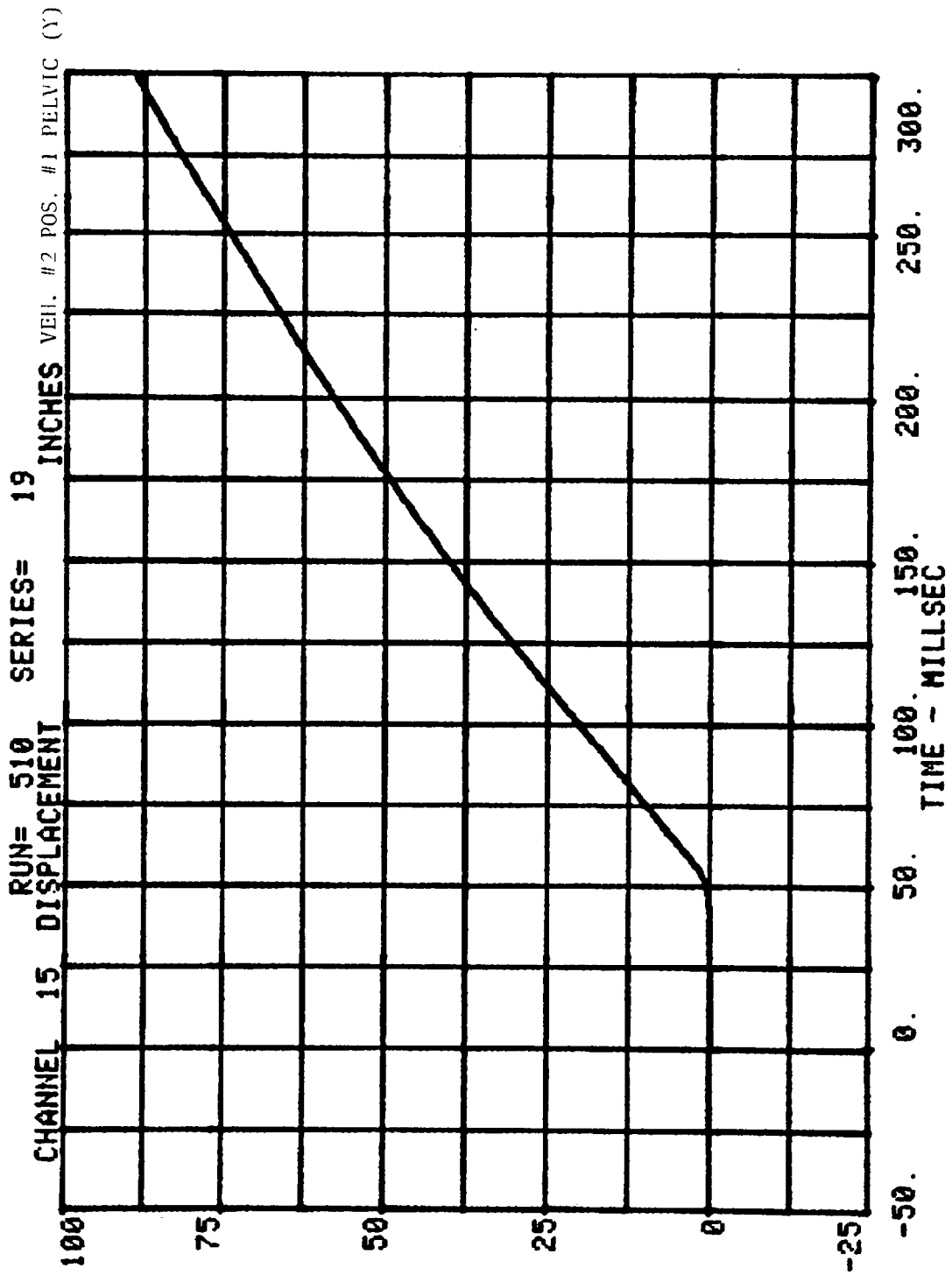

CHANNEL 36 VEH#2POS#1 LOWER SPINE Z
RUN= 510 SERIES= 19
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

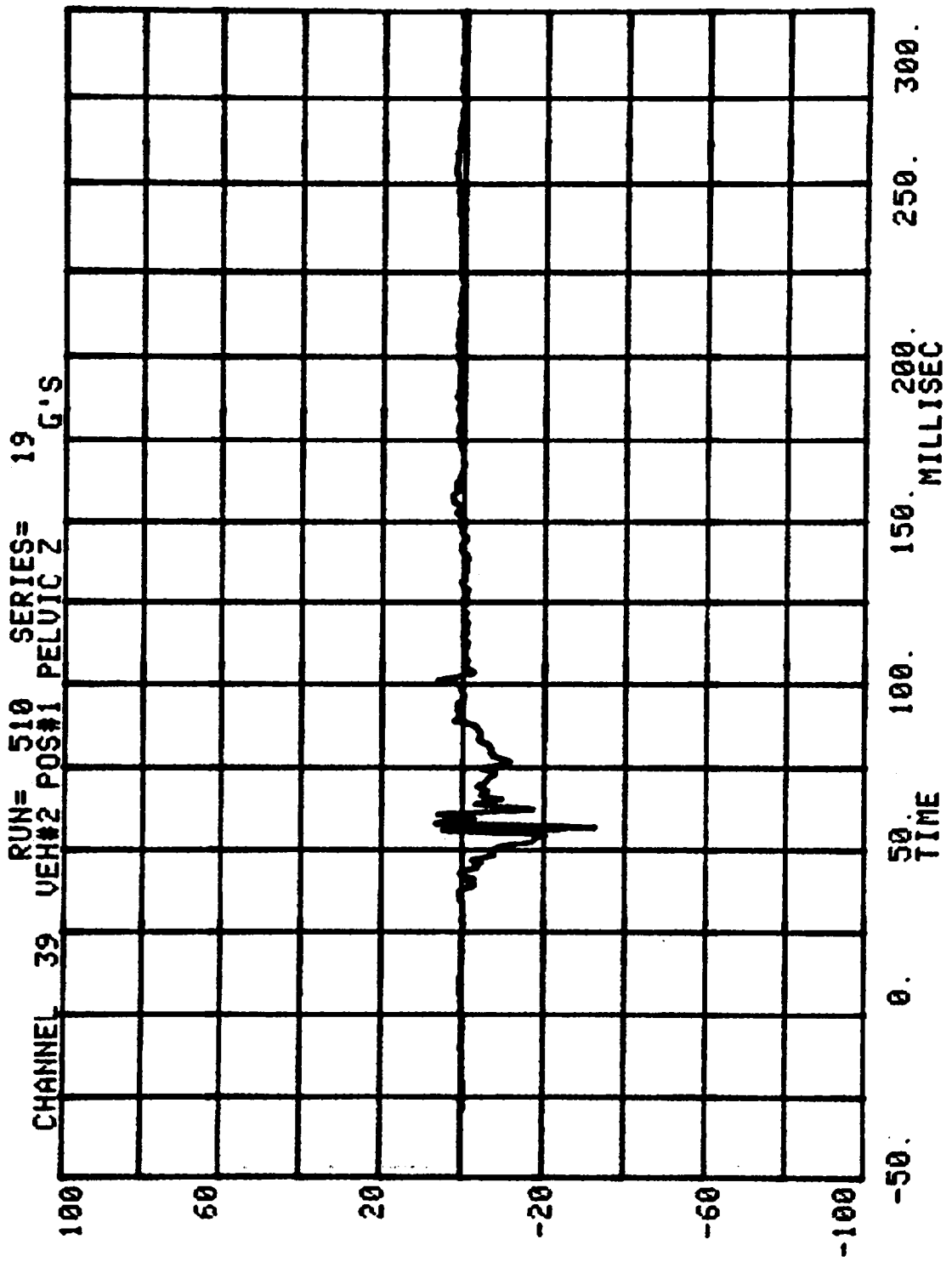

CHANNEL 5 VEH#2POS#1 LOWER SPINE R G'S
RUN= 510 SERIES= 19
200.
160.
120.
80.
40.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

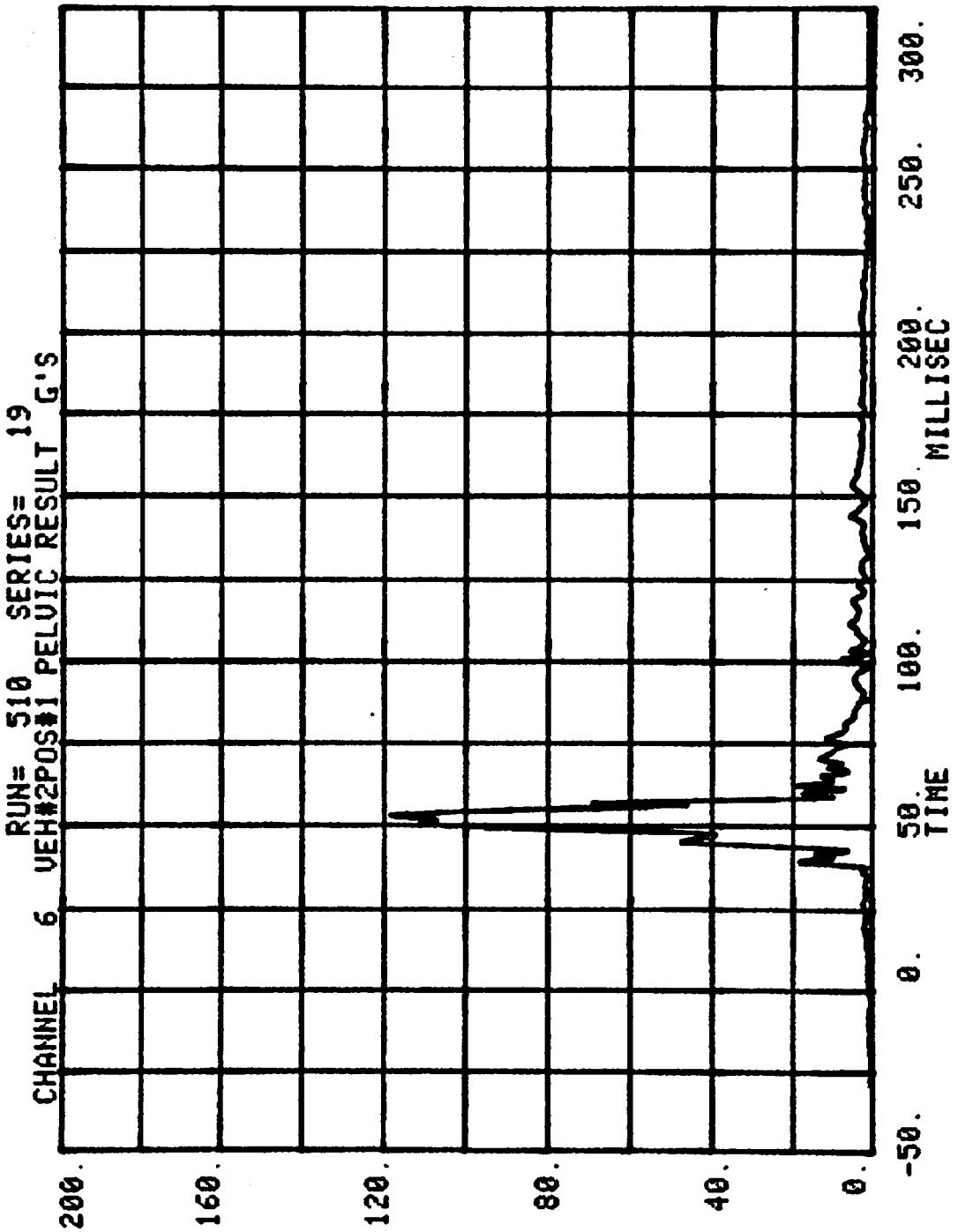

CHANNEL 37 RUN= 510 SERIES= 19
VEH#2 POS#1 PELVIC X G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

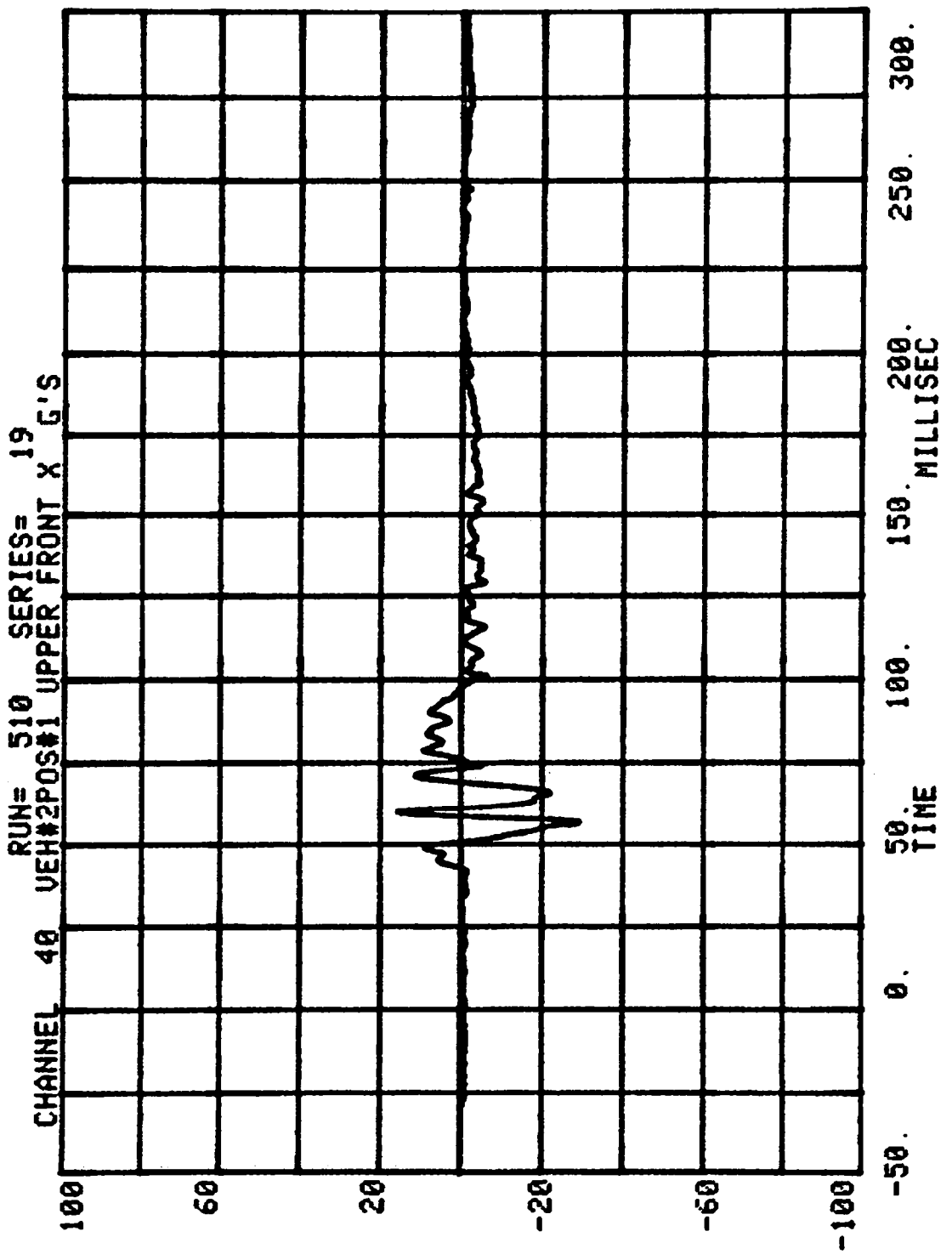

CHANNEL 38 VEH#2 POS#1 PELVIC Y
RUN= 510 SERIES= 19
G'S
140
100
60
20
-20
-60
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

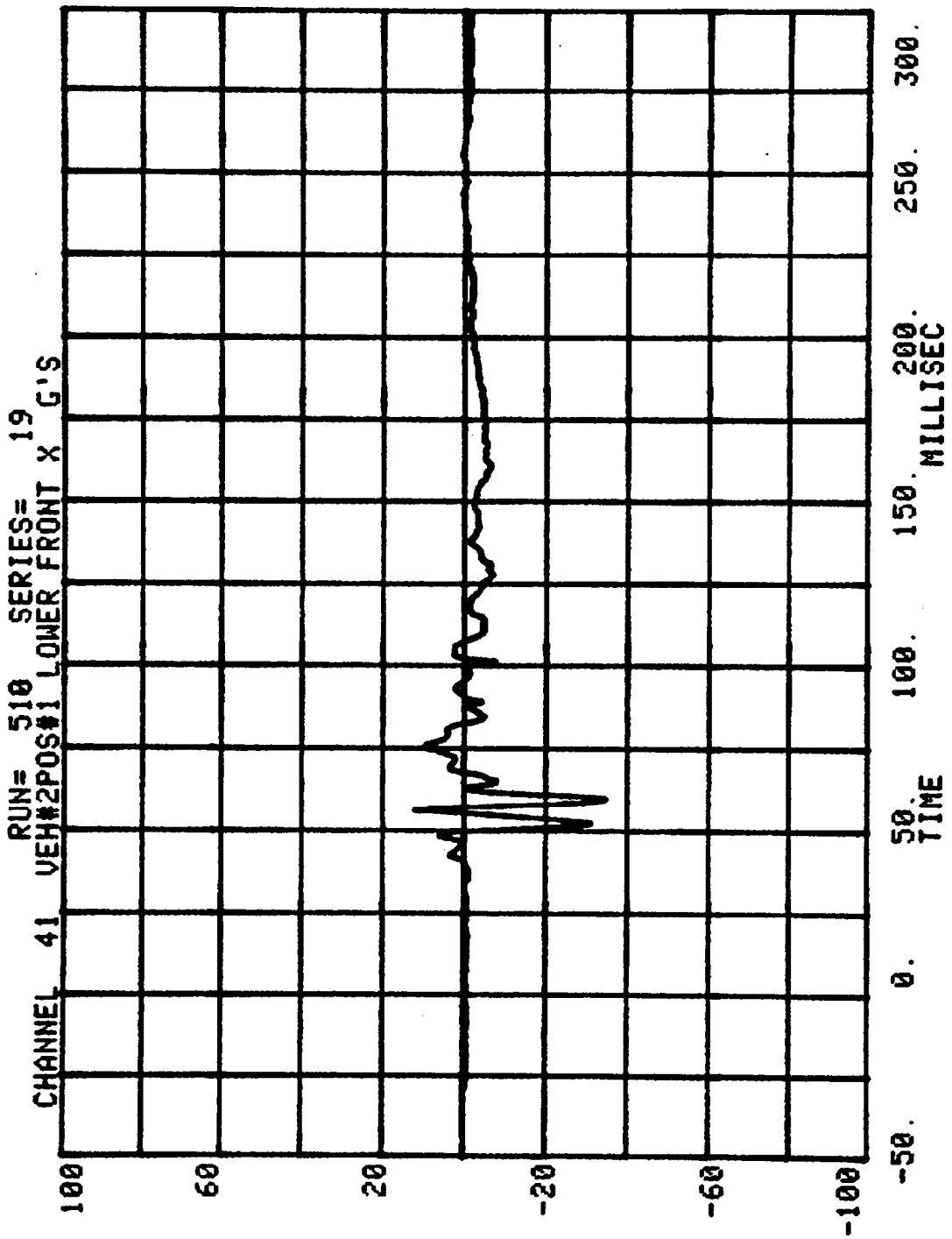

CHANNEL 14 VELOCITY
RUN= 510 SERIES= 19
MPH
VEH. #2 POS. #1 PELVIC (Y)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

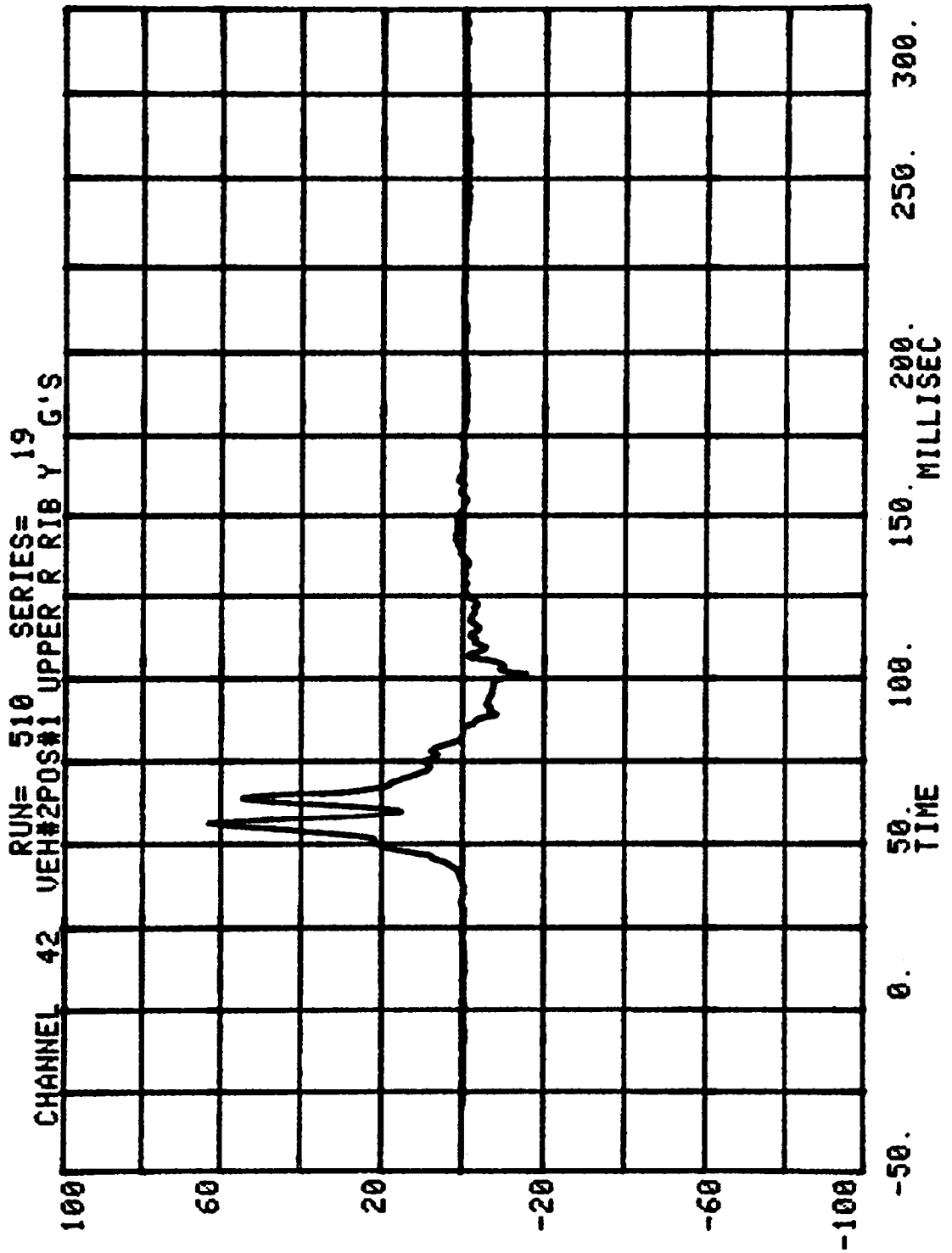

CHANNEL 15 DISPLACEMENT
RUN= 510 SERIES= 19
VEH. #2 POS. #1 PELVIC (Y)
INCHES
100
75
50
25
0
-25
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC

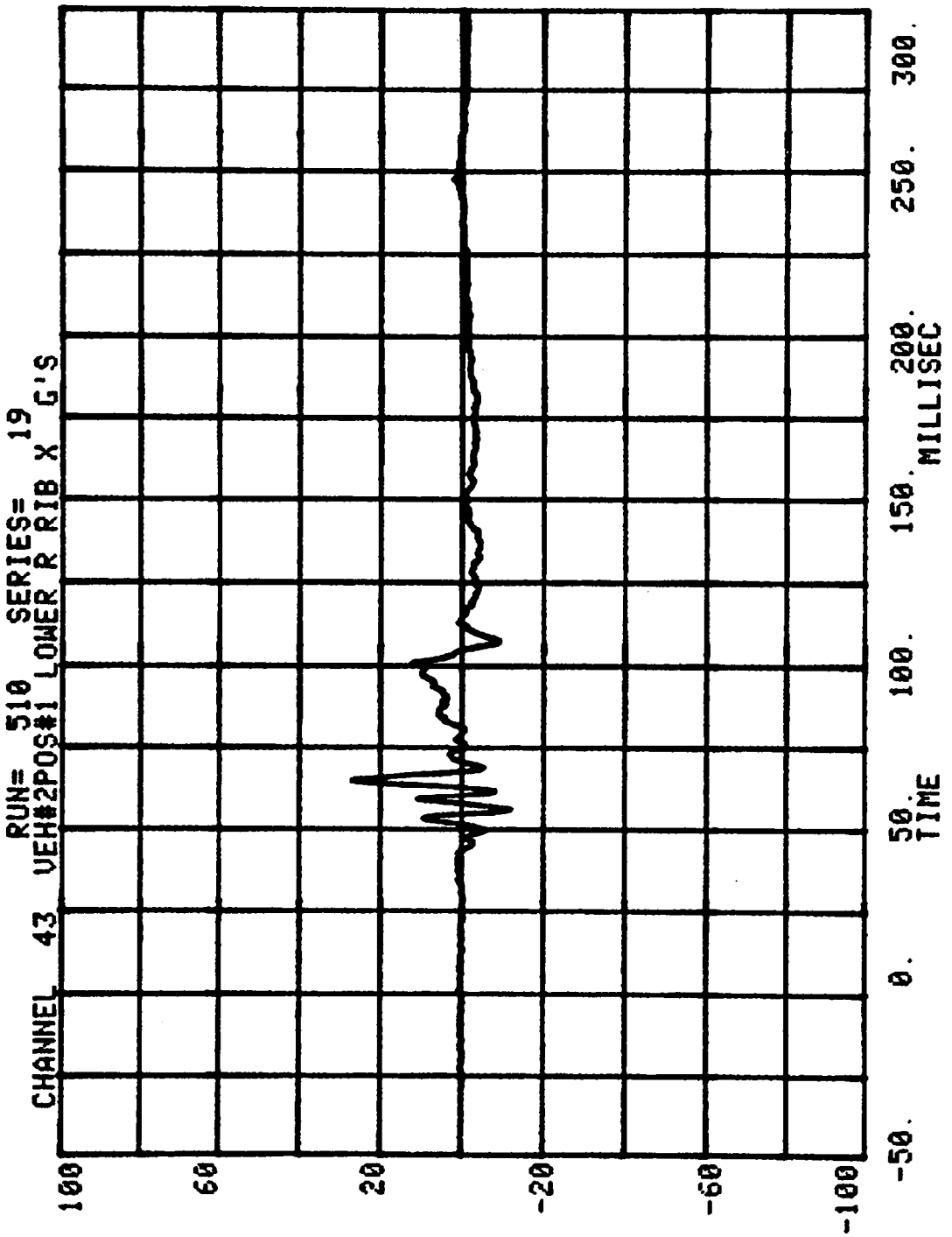

CHANNEL 39
RUN= 510 SERIES= 19
VEH#2 POS#1 PELVIC Z
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

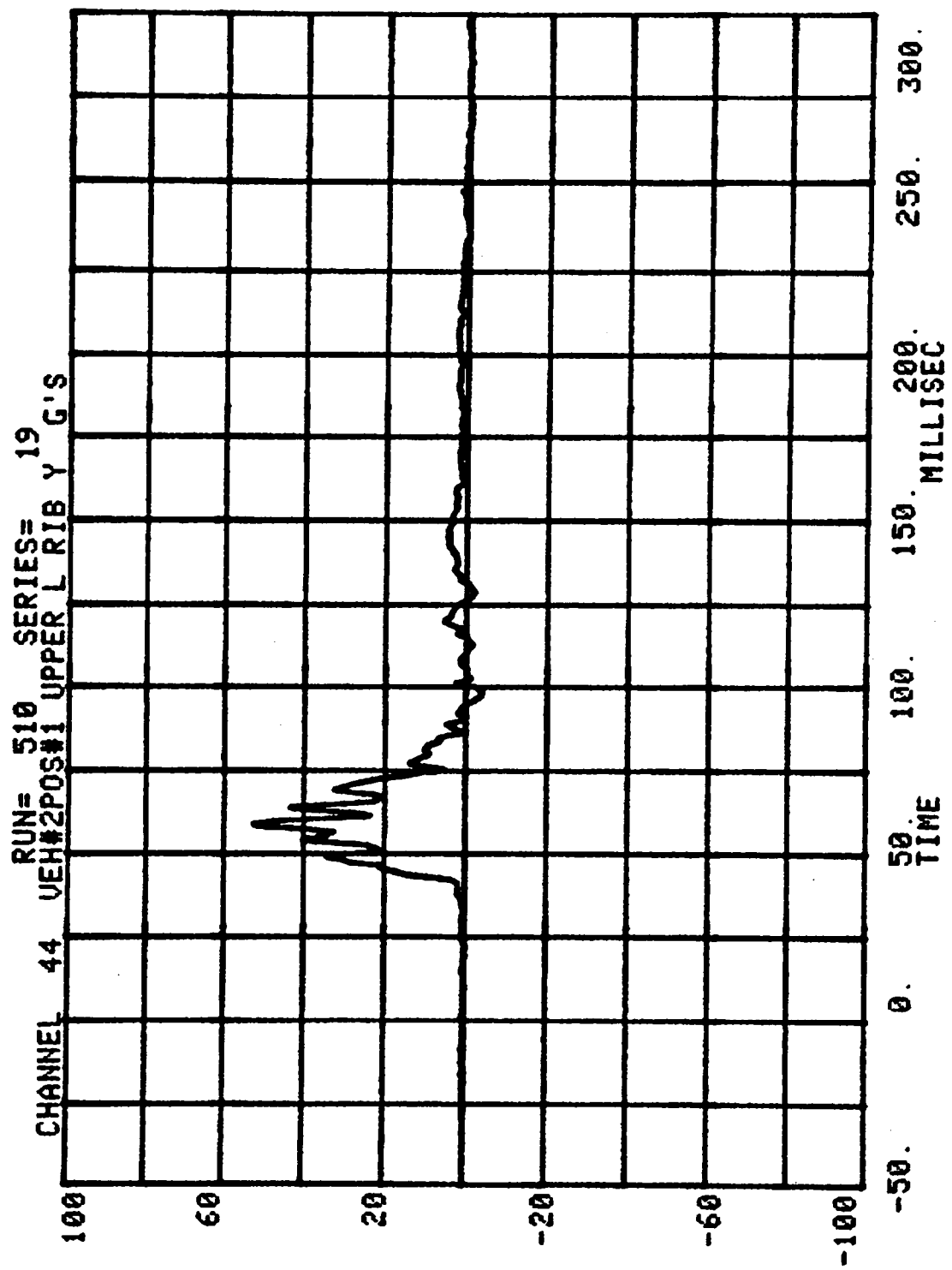

CHANNEL 6 VEH#2POS#1 PELVIC RESULT G'S
RUN= 510 SERIES= 19
200.
160.
120.
80.
40.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

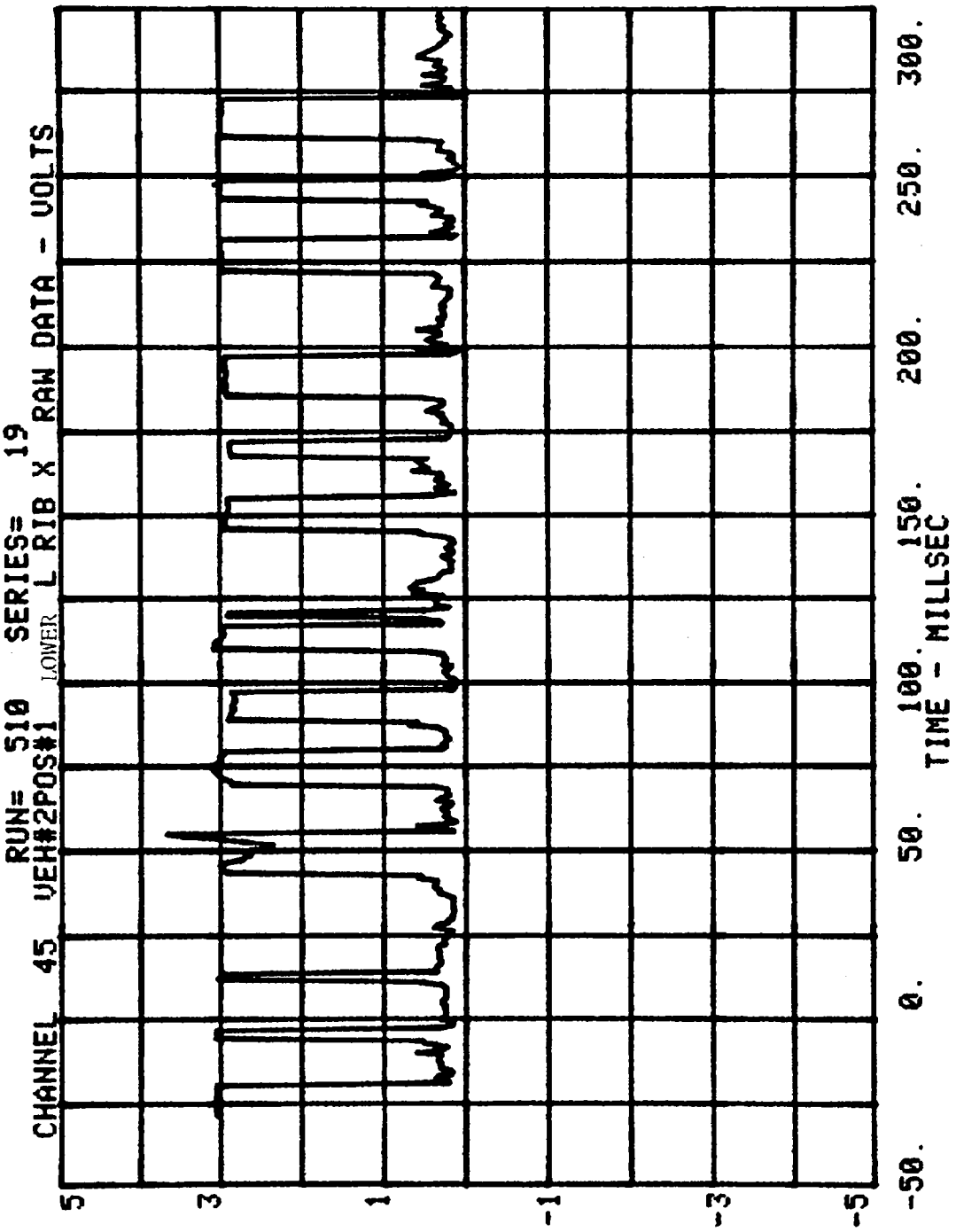

CHANNEL 40 VEH#2POS#1 UPPER FRONT X G'S
RUN= 510 SERIES= 19
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 41 VEH#2POS#1 LOWER FRONT X G'S
RUN= 510 SERIES= 19
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 42 VEH#2POS#1 UPPER R RIB Y G'S
RUN= 510 SERIES= 19
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 43 VEH#2POS#1 LOWER R RIB X G'S
RUN= 510 SERIES= 19
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 44 VEH#2POS#1 UPPER L RIB Y G'S
RUN= 510 SERIES= 19
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 45 VEH#2POS#1 LOWER L RIB X RAW DATA - VOLTS
RUN= 510 SERIES= 19
5
3
1
-1
-3
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME - MILLSEC