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REPORT NO. 6525-V-40

NEW CAR ASSESSMENT AND STANDARDS  
ENFORCEMENT INDICANT TESTING  
FMVSS NOS. 212, 219 AND 301-75

Ford Motor Company  
1981 Ford Escort 2-Door Hatchback  
NHTSA 308-40-503

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FINAL REPORT

Prepared For  
U. S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
Enforcement  
Office of Vehicle Safety Compliance  
Nassif Building - 400 Seventh Street, S. W.  
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FINAL REPORT ACCEPTED BY:

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Contract Technical Manager

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16. Abstract A frontal barrier impact test of a 1981 Ford Escort 2-Door Hatchback was performed at Calspan Advanced Technology Center, Buffalo, New York for the New Car Assessment and Standards Enforcement Indicant Testing of FMVSS 212 - Windshield Mounting; FMVSS 219 - Windshield Zone Intrusion; and FMVSS 301-75 Fuel System Integrity for the Office of Vehicle Safety Compliance, the Office of Automotive Ratings, and for Research and Development.  Impact speed was 35.2 mph. Post-Test Maximum Vehicle Crush was 22.9". Post-Test Maximum Forward Intrusion was 7.7".  The vehicle complied with: FMVSS 212 - Windshield Retention FMVSS 219 - Windshield Intrusion  Results for FMVSS 301-75 - Fuel System Integrity - were not conclusive. FMVSS 208 - Injury Criteria - were exceeded by Right Front Passenger - Head - with a HIC of 1011.					
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TABLE OF CONTENTS

	<u>Page No.</u>
SECTION 1 - PURPOSE AND TEST PROCEDURE	1-1
SECTION 2 - SUMMARY OF TEST NUMBER 40	2-1
SECTION 3 - SUMMARY OF FMVSS NOS. 212, 219 AND 301-75	3-1
SECTION 4 - OCCUPANT AND VEHICLE INFORMATION	4-1
APPENDIX A - STILL PHOTOGRAPHS	A-1
APPENDIX B - VEHICLE AND DUMMY RESPONSE DATA	B-1
APPENDIX C - DUMMY CERTIFICATION TESTS	C-1

## LIST OF FIGURES

<u>Figure No.</u>		<u>Page No.</u>
1	WINDSHIELD ZONE INTRUSION, FMVSS 219 - DATA SHEET	3-3
2	PROTECTED ZONE	3-4
3	SUMMARY OF FMVSS 212 DATA	3-5
4	PRE-TEST AND POST-TEST MEASUREMENT POINTS	4-2
5	VEHICLE ACCELEROMETER LOCATIONS	4-4
6	CAMERA POSITION FOR FRONTAL IMPACTS	4-5
7	PART 572 DUMMY IN-VEHICLE POSITION	4-8
APPENDIX A		
A-1	PRE- AND POST-TEST FRONT AND REAR VIEWS	A-2
A-2	PRE- AND POST-TEST RIGHT AND LEFT SIDE VIEWS	A-3
A-3	PRE- AND POST-TEST RIGHT AND LEFT FRONT THREE-QUARTER VIEWS	A-4
A-4	PRE- AND POST-TEST RIGHT AND LEFT FRONT QUARTER PANEL VIEWS	A-5
A-5	PRE- AND POST-TEST FRONT AND REAR UNDERBODY	A-6
A-6	PRE- AND POST-TEST DRIVER AND PASSENGER VIEWS	A-7
A-7	PRE- AND POST-TEST VIEWS OF VEHICLE INTERIOR	A-8
A-8	POST-TEST VEHICLE DASH PANEL	A-8
A-9	VELOCITY TRAP COUNTER	A-8
A-10	PRE- AND POST-TEST WINDSHIELD VIEWS	A-9
A-11	ENGINE COMPARTMENT ACCELEROMETER	A-9
A-12	FUEL FILLER CAP	A-9
A-13	LOCATION OF STAPLE IN REAR DECK	A-10
A-14	STAPLE IN REAR DECK	A-10
A-15	STAPLE WITH REAR DECK CUT AWAY	A-10
A-16	HOLES ON FUEL TANK WITH STAPLE REMOVED	A-10

LIST OF TABLES

<u>Table No.</u>		<u>Page No.</u>
1	CRASH TEST SUMMARY	2-4
2	VEHICLE TEST WEIGHTS AS TESTED	2-5
3	SUMMARY OF TEST CONDITIONS	2-6
4	POST-IMPACT DATA - STANDARDS 219 AND 301	3-2
5	FUEL SYSTEM INTEGRITY POST-IMPACT TEST DATA FMVSS NO. 301-75	3-7
6	VEHICLE MEASUREMENTS	4-3
7	HIGH SPEED CAMERA LOCATIONS	4-6
8	HIGH SPEED CAMERA INFORMATION	4-7
9	DUMMY INJURY CRITERIA VALUES	4-10

## SECTION 1

### PURPOSE AND TEST PROCEDURE

#### PURPOSE:

The purpose of this test was to determine whether the subject vehicle (a 1981 Ford Escort 2-Door Hatchback) meets the requirements of FMVSS Nos. 212, 219 and 301-75 at a higher test speed and also to obtain structural information and dummy injury criteria values for Research and Development and the Office of Automotive Ratings of the NHTSA. This test is part of the New Car Assessment Program B.O.A., Task 2, sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DOT-HS-8-01938.

#### TEST PROCEDURE:

The Calspan Corporation, Advanced Technology Center, Transportation Research Department Test Procedure for the New Car Assessment Crash Tests submitted to, and approved by, the Contract Technical Manager (CTM) contains the specific procedures used to perform this test.

With the exception of a higher test speed, this procedure is not in conflict with any portion of FMVSS Procedures issued by the Office of Standard Enforcement and the amendments in effect as noted by the applicable contract.

## SECTION 2

### SUMMARY OF TEST NUMBER 40

A frontal barrier crash test was performed October 10, 1980 on a 1981 Ford Escort, 2-door hatchback at an impact velocity of 35.2 mph. Pre- and post-test photographs of the vehicle and occupants can be found in Appendix A. Table 1 presents pertinent crash test information

Two 50th percentile Part 572 anthropomorphic test devices (ATDs) were placed in the front bucket seats and restrained with the production seat belt system.

Both ATDs were fully instrumented with femur load cells and triaxial accelerometers in the head and chest areas. These ATDs had been certified prior to the test and certification details, along with instrumentation calibration data, are found in Appendix C.

Injury criteria values are presented in Table 9. Appendix B contains dummy response data traces along with vehicle acceleration data traces.

## GENERAL COMMENTS

A 1981 Ford Escort 2-door hatchback was tested in a 35.2 mph frontal barrier impact.

### Vehicle

The vehicle sustained 22.9 inches of static crush and approximately 31 inches of dynamic crush. The maximum post-test firewall intrusion was 7.7 inches on the right side, the same side on which the engine auxiliary equipment is mounted. Peak vehicle deceleration was 30 g's at approximately 60 milliseconds and the average deceleration was approximately 14 g's with a total change in velocity of 38 mph.

The floor board/firewall area underwent severe upward deformation and both sills buckled, deforming outward and downward. The steering wheel moved upward and rearward during the impact. Neither driver nor passenger doors were operable after impact.

### Driver

Driver kinematics were quite good with the driver moving straight forward and the belt remaining in place on the shoulder. The occupant's head struck the upper steering wheel rim bending it downward. The chest and abdomen did not appear to strike the lower wheel rim or wheel hub. The belt retractor spool-off for the driver was 2½ inches. The driver complied with all FMVSS 208 Injury Criteria with a HIC number of 618, maximum chest deceleration over 3 milliseconds of 50 g's, and femur loads of 740 and 640 pounds.

### Passenger

The passenger's kinematics also looked quite good as the dummy moved straight forward and the belt remained in position on the shoulder. The

occupant's head struck the dash panel, see Figure A-6, and as the occupant rebounded, the belt slipped off the shoulder and the occupant rotated in an outboard direction. The belt retraction spool-off was 2-3/4 inches, slightly more than the driver's side because none of the passenger's kinematic energy could be absorbed by the steering wheel and column. The occupant failed to comply with the FMVSS 208 Head Injury Criteria with a HIC number of 1011, but did comply with the chest and femur injury criteria with maximum chest deceleration over 3 milliseconds of 40 g's and femur loads of 280 and 408 pounds.

Table 1

CRASH TEST SUMMARY

TEST NO. 308-40-503

PROJECT: NEW CAR ASSESSMENT PROGRAM

DATE: 10-10-80

TIME: 1335

TEMP: 68°F.

VEHICLE 1981 Ford Escort 2-Door Hatchback

TEST WEIGHT (lbs) 2590

IMPACT ANGLE (deg)\* 0

IMPACT VELOCITY (mph)\*\* 35.2

MAX. CRUSH (in) STATIC 22.9

MAX. INTRUSION (in) 7.7

DUMMIES

TYPE Hybrid II Part 572 Hybrid II Part 572

LOCATION LF(1) 110 RF(2) 320

RESTRAINT Production 3-Point  
Belt System Production 3-Point  
Belt System

NUMBER OF DATA CHANNELS 38

NUMBER OF HIGH SPEED CAMERAS 10 + 1 Real Time

\*With respect to tow track Centerline

\*\*Speed trap measurement (+ .05% accuracy)

Table 2

VEHICLE TEST WEIGHTS AS TESTED

Left Front	770	lbs	Left Rear	570	lbs
Right Front	710	lbs	Right Rear	540	lbs
TOTAL FRONT	<u>1480</u>	lbs	TOTAL REAR	<u>1110</u>	lbs

Total Weight =  $\frac{1480 + 1110}{1} = 2590$  lbs

Wheel Base =  $\frac{94.5}{1} = 94.5$  inches

$Cg_{F.W.} = \frac{1110 \text{ lbs} \times 94.5 \text{ inches}}{2590 \text{ lbs}} = 40.5$  inches

CALCULATION FOR TEST WEIGHT

- RCLW = Rated Cargo and Luggage Weight
- UDW = Unloaded Delivered Weight (2100 lbs)
- VCW = Vehicle Capacity Weight (750 lbs)
- DSC = Designated Seating Capacity (4)

RCLW = VCW - 150 (DSC)  
 RCLW =  $\frac{750}{1} - 150 (4) = 150$  lbs

TEST WEIGHT = UDW + RCLW + (No. Dummies x 164 lbs)  
 TEST WEIGHT =  $\frac{2100}{1} \text{ lbs} + \frac{150}{1} \text{ lbs} + 2 (164 \text{ lbs})$   
 TEST WEIGHT =  $\frac{2578}{1} \text{ lbs}$  Calculated

Table 3  
SUMMARY OF TEST CONDITIONS

TEST VEHICLE INFORMATION

Vehicle Manufacturer Ford Motor Company  
 Make/Model Escort Sedan  
 Body Style 2-Door Hatchback Model Year 1981  
 VIN 1FABP0528BT104502 Build Date 9-80  
 NHTSA No. 308-40-503 Color Silver  
 Engine Data: 4 cylinders 1.6 Liters ~~XXXXXX~~ displacement  
 Transmission Data: 4 speed (X) Manual ( ) Automatic  
 Date Vehicle Received by Laboratory \_\_\_\_\_  
 Dealer's Name & Address DeLacy Ford, Inc., Lancaster, New York

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

Vehicle Manufactured by Ford Motor Company  
 Date of Manufacture 9-80 VIN 1FABP0528BT104502  
 GVRW 3038 lbs GAWR: Front 1687 lbs Rear 1361 lbs

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

Vehicle Load (up to capacity) - Front 35 psi  
 Rear 35 psi  
 Recommended Tire Size P155/80R13  
 Vehicle Capacity: Types of Seats    Bench X Bucket    Split Bench  
 Number of Occupants (Designated Seating Capacity): 2 Front  
2 Rear  
4 TOTAL  
 Cargo Load = 150 lbs  
 TOTAL = 750 lbs

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

Right Front = 660 lbs Right Rear = 400 lbs  
 Left Front = 650 lbs Left Rear = 390 lbs  
 TOTAL FRONT WEIGHT = 1310 lbs ( 62.4 % of Total Vehicle Weight)  
 TOTAL REAR WEIGHT = 790 lbs ( 37.6 % of Total Vehicle Weight)  
 TOTAL DELV. WEIGHT = 2100 lbs

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 162 lbs CARGO

Right Front = 710 lbs Right Rear = 540 lbs  
 Left Front = 770 lbs Left Rear = 570 lbs  
 TOTAL FRONT WEIGHT = 1480 lbs ( 57.1 % of Total Vehicle Weight)  
 TOTAL REAR WEIGHT = 1110 lbs ( 42.9 % of Total Vehicle Weight)  
 TOTAL TEST WEIGHT = 2590 lbs  
 weight of ballast secured in vehicle trunk area = 0 lbs

Table 3  
SUMMARY OF TEST CONDITIONS (Cont'd)

TEST CONDITIONS

Date of Test 10-10-80 Time of Test 1335 am/pm  
Ambient Temperature 68 °F at impact area  
Temperature in Occupant Compartment 70 °F  
Windshield Molding Temperature 73 °F

VEHICLE ATTITUDE (all dimensions in inches)

Delivered Attitude:	RF <u>25.5</u>	LF <u>25.5</u>	RR <u>25.5</u>	LR <u>25.5</u>
Test Attitude:	RF <u>24.7</u>	LF <u>24.7</u>	RR <u>24.5</u>	LR <u>24.6</u>

VEHICLE TIRE DATA

Recommended Cold Tire Pressure: Front = 35 psi Rear = 35 psi  
Recommended Tire Size P155/80R13 Load Range \_\_\_\_\_  
Tires on Vehicle Michelin P155/80R13  
Is Spare Tire a "Space Saver" \_\_\_\_\_ yes X no  
Is Spare Tire Standard Equipment X yes \_\_\_\_\_ no

TEST FLUID DATA

Test Fluid Type: Red Stoddard Solvent #2 Spec. Grav.: 0.764  
Kinematic Viscosity 0.96 Centistokes  
EPA Capacity 10 gal (SPV) EPA Capacity  
Test Volume 9.3 gal 93% of EPA Capacity  
Fuel System Capacity (data from Owner's Manual) 10 gal  
Details of fuel system Engine operated fuel pump. Fuel tank is located forward of rear wheels and held in place by two tank straps. The filler tube is on right side of vehicle and sealed by a twist type cap which is concealed by a hinged access door.  
Electric Fuel Pump \_\_\_\_\_ Yes X No Fuel Injection \_\_\_\_\_ Yes X No  
Does electric fuel pump operate with ignition switch "on" and the engine not operating - Yes - No

VEHICLE REBOUND AND CRUSH

Overall Length of Test Vehicle: Pre-Test = R 162.4 /L 162.4 inches  
Post-Test = R 142.2 /L 141.0 inches  
Crush = R 20.2 /L 21.4

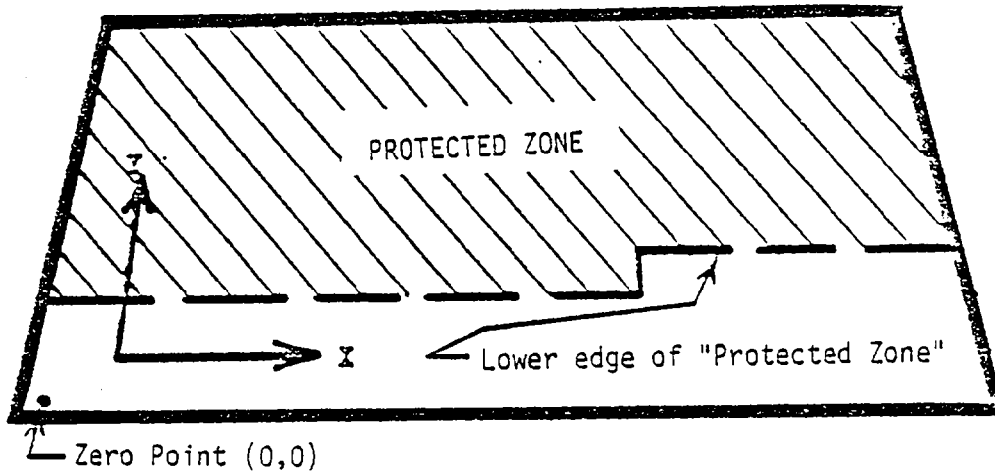
FOR FRONTAL IMPACTS, distance from front of test vehicle to the barrier after impact = 15.75 inches

## SECTION 3

### SUMMARY OF FMVSS NOS. 212, 219 AND 301-75

- Post Impact Data
- Windshield Zone Intrusion FMVSS 219
- Protected Zone
- Summary of FMVSS 212 Data
- Fuel System Integrity FMVSS 301-75





FRONT VIEW

With the zero coordinate for the X-Y grid located at the lower right corner (passenger side) of the windshield, record the following positions:

- (1) The area that the "Protected Zone" template was penetrated more than .25 inches by a vehicle component other than one which is normally in contact with the windshield.

None

Coordinates	
X	Y

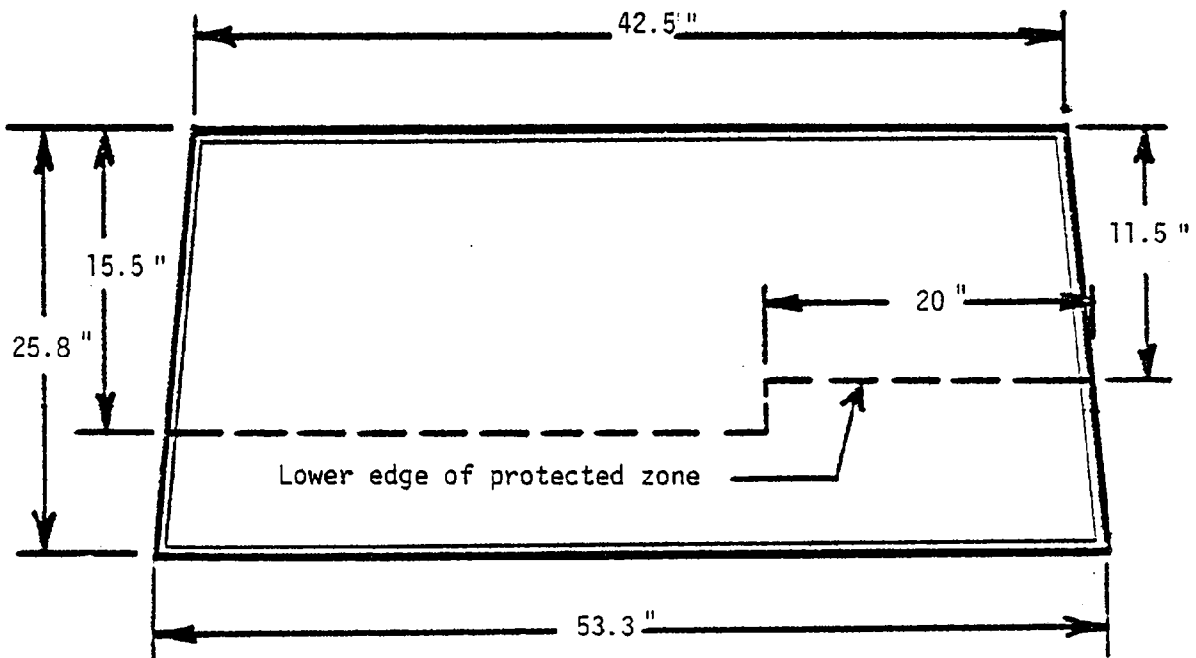
- (2) The area beneath the "Protected Zone" that the inner surface of the windshield was penetrated by a vehicle component.

None

Coordinates	
X	Y

- (3) Record any windshield retention clips or brackets used to insure that the windshield would not disengage from the body.

FIGURE 1 WINDSHIELD ZONE INTRUSION, FMVSS 219 - DATA SHEET



FRONT VIEW OF WINDSHIELD

Provide all dimensions necessary to reproduce the protected zone.

Method of adhering styrofoam to the windshield:

RTV adhesive applied to windshield surface and to back-side of  
styrofoam which was then clamped in place until dry.

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FIGURE 2: PROTECTED ZONE

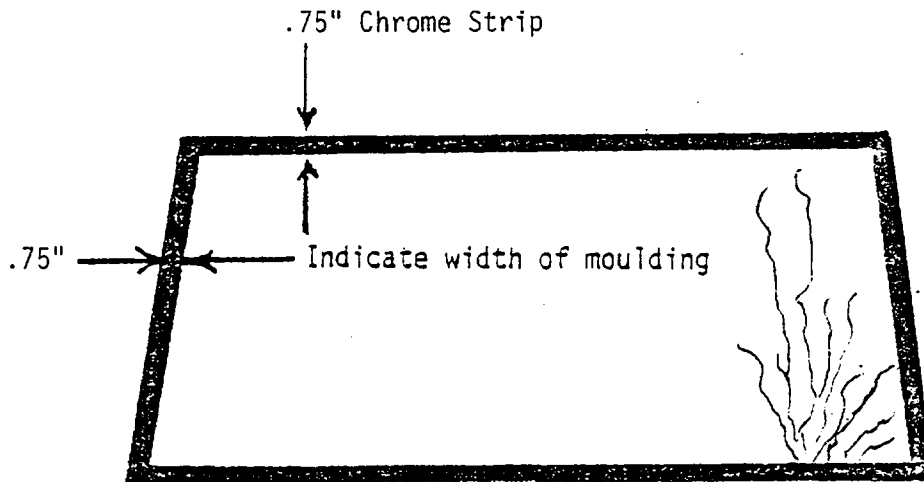
Details of windshield mounting (method of retention, type of trim, etc.):

Windshield is bonded in place and has a three-quarter inch chrome piece  
around the perimeter of the window.

	Windshield Periphery		Retention %
	Pre-Test	Post-Test	
Right Side	73.7	73.7	100
Left Side	73.7	73.7	100
TOTAL	147.4	147.4	100

The standard requires that Post-Test be a minimum of 75 percent of the Pre-Test total periphery measurement for vehicle not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles which are equipped with occupant passive restraints.

AREA OF RETENTION FAILURE



FRONT VIEW

FIGURE 3 SUMMARY OF FMVSS 212 DATA

### DISCUSSION OF FUEL SYSTEM INTEGRITY TEST

The results obtained for compliance test FMVSS 301-75, Fuel System Integrity were inconclusive. Although more fuel leaked from the tank than is allowed by the Standard, two sources of leakage were discovered both of which can be considered abnormal. The test procedure for the crash test called for onboard cameras to view the seat belt retainers and record spool-off. Because of the positions of the retractors the movie camers were mounted on the vehicle floor pan above the fuel tank. The welding of the mounts to the floor pan generated enough heat to melt the seal around the fuel tank rollover valve, allowing fuel to leak when the vehicle was rotated. In addition, staples were used to attach the vehicle interior carpeting to the floor pan and one staple penetrated through the floor pan into the fuel tank (see Figures A-13 through A-16), allowing fuel to leak when the vehicle was rotated.

For these reasons, it was not possible to determine if the 1981 Ford Escort was in compliance with the Standard.

Table 5

"FUEL SYSTEM INTEGRITY" POST-IMPACT TEST DATA

FMVSS No. 301-75

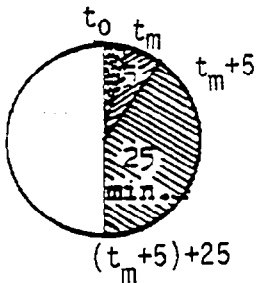
TEST VEHICLE NHTSA NO. 308-40-503 Test Date 10-10-80  
 Vehicle Manufacture/Make/Model 1981 Ford Escort 2-Door Hatchback

Test vehicle fuel tank filled to 90-91% of capacity with Stoddard Solvent and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE

- Frontal (35 mph)
- Oblique (30 mph) with \_\_\_\_\_° barrier face first contacting  
     \_\_\_\_\_ driver \_\_\_\_\_ passenger side
- Rear Moving Barrier (35 mph)
- Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT



	Actual	Max. Allow.
From impact until vehicle motion ceases	0	1 oz
For 5 min. period after vehicle motion ceases	0	5 oz
For next 25 min.	0	1 oz/1 min

TEST VEHICLE STATIC ROLLOVER

Test information will be added to the following static rollover data sheets

- (1) Figure 8A - Rollover data for 0° to 90° test phase
- (2) Figure 8B - Rollover data for 90° to 180° test phase
- (3) Figure 8C - Rollover data for 180° to 270° test phase
- (4) Figure 8D - Rollover data for 270° to 360° test phase

SOLVENT SPILLAGE DETAILS

No fuel leakage was observed for at least 30 minutes after impact.

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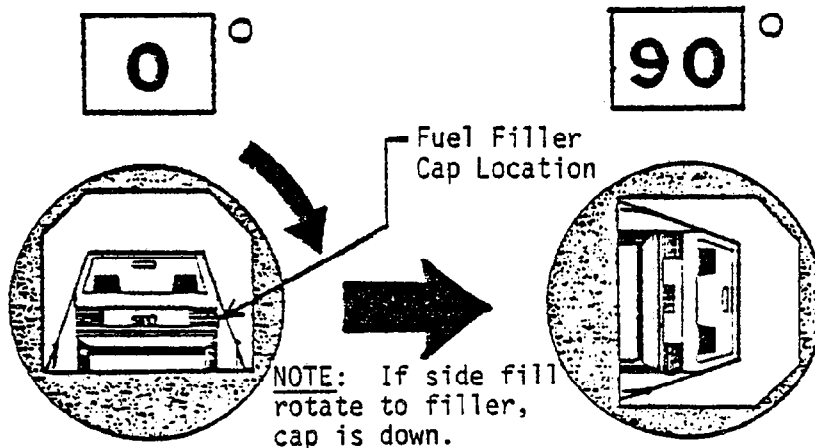
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Table 5A  
FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time = 2 minutes 57 seconds  
 (Spec. Range = 1 to 3 min.)  
 FMVSS 301-75 Position Hold Time = 5 minutes 00 seconds  
 TOTAL = 7 minutes 57 seconds  
 Next Whole Minute Interval = 8 minutes

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. <u>from</u> onset of rotation	6th min.	7th min.	8th min. if reqd.
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Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
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ACTUAL TEST VEHICLE SOLVENT SPILLAGE

10.5	7	7	6
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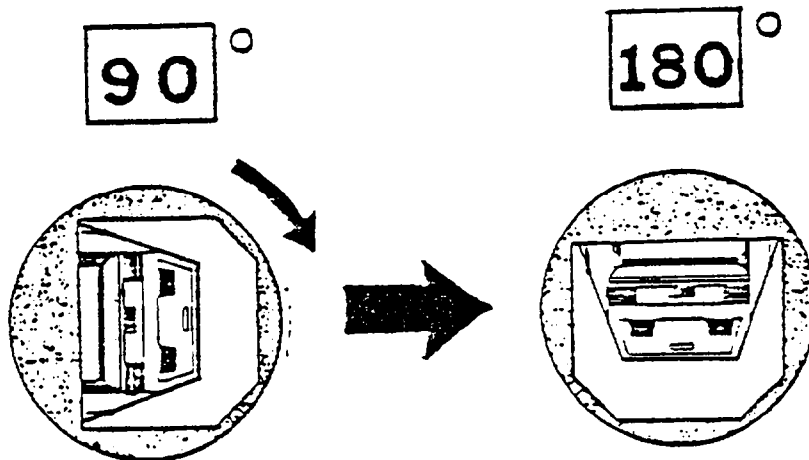
NOTE: Record spillage for whole minute intervals only as determined above.

SOLVENT SPILLAGE LOCATION(S)

Fuel leakage accorded at 30° rotation.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time = \_\_\_\_\_ minutes \_\_\_\_\_ seconds  
 (Spec. Range = 1 to 3 min.)  
 FMVSS 301-75 Position Hold Time = 5 minutes 00 seconds  
 TOTAL = \_\_\_\_\_ minutes \_\_\_\_\_ seconds  
 Next Whole Minute Interval = \_\_\_\_\_ minutes

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. <u>from</u> onset of rotation	6th min.	7th min.	8th min. if reqd.
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Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
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ACTUAL TEST VEHICLE SOLVENT SPILLAGE

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NOTE: Record spillage for whole minute intervals only as determined above.

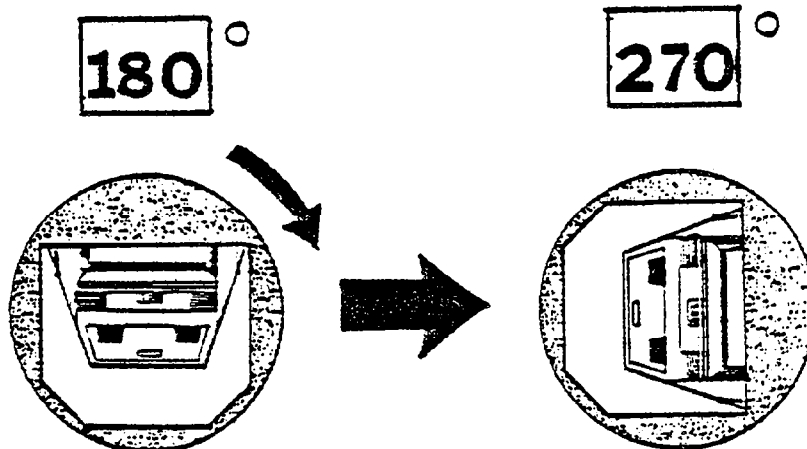
SOLVENT SPILLAGE LOCATION(S)

Not performed.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

VEHICLE NHTSA ID NO. 308-40-503

Table 5C  
FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time = \_\_\_\_\_ minutes \_\_\_\_\_ seconds  
(Spec. Range = 1 to 3 min.)  
FMVSS 301-75 Position Hold Time = 5 minutes 00 seconds  
TOTAL = \_\_\_\_\_ minutes \_\_\_\_\_ seconds  
Next Whole Minute Interval = \_\_\_\_\_ minutes

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. <u>from</u> onset of rotation	6th min.	7th min.	8th min. if reqd.
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Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
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ACTUAL TEST VEHICLE SOLVENT SPILLAGE

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NOTE: Record spillage for whole minute intervals only as determined above.

SOLVENT SPILLAGE LOCATION(S)

Not performed.

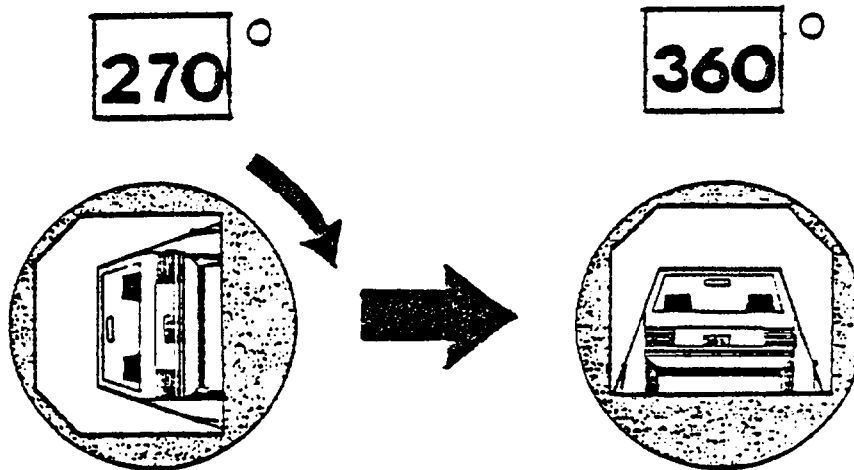
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FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time = \_\_\_\_\_ minutes \_\_\_\_\_ seconds  
 (Spec. Range = 1 to 3 min.)  
 FMVSS 301-75 Position Hold Time = 5 minutes 00 seconds  
 TOTAL = \_\_\_\_\_ minutes \_\_\_\_\_ seconds  
 Next Whole Minute Interval = \_\_\_\_\_ minutes

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. <u>from</u> onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	-------------------

Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

ACTUAL TEST VEHICLE SOLVENT SPILLAGE

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NOTE: Record spillage for whole minute intervals only as determined above.

SOLVENT SPILLAGE LOCATION(S)

Not performed.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



## SECTION 4

### OCCUPANT AND VEHICLE INFORMATION

- Vehicle Measurements
- Vehicle Accelerometer Locations
- Camera Positions and Locations
- Dummy In-Vehicle Position
- Dummy Injury Criteria Values

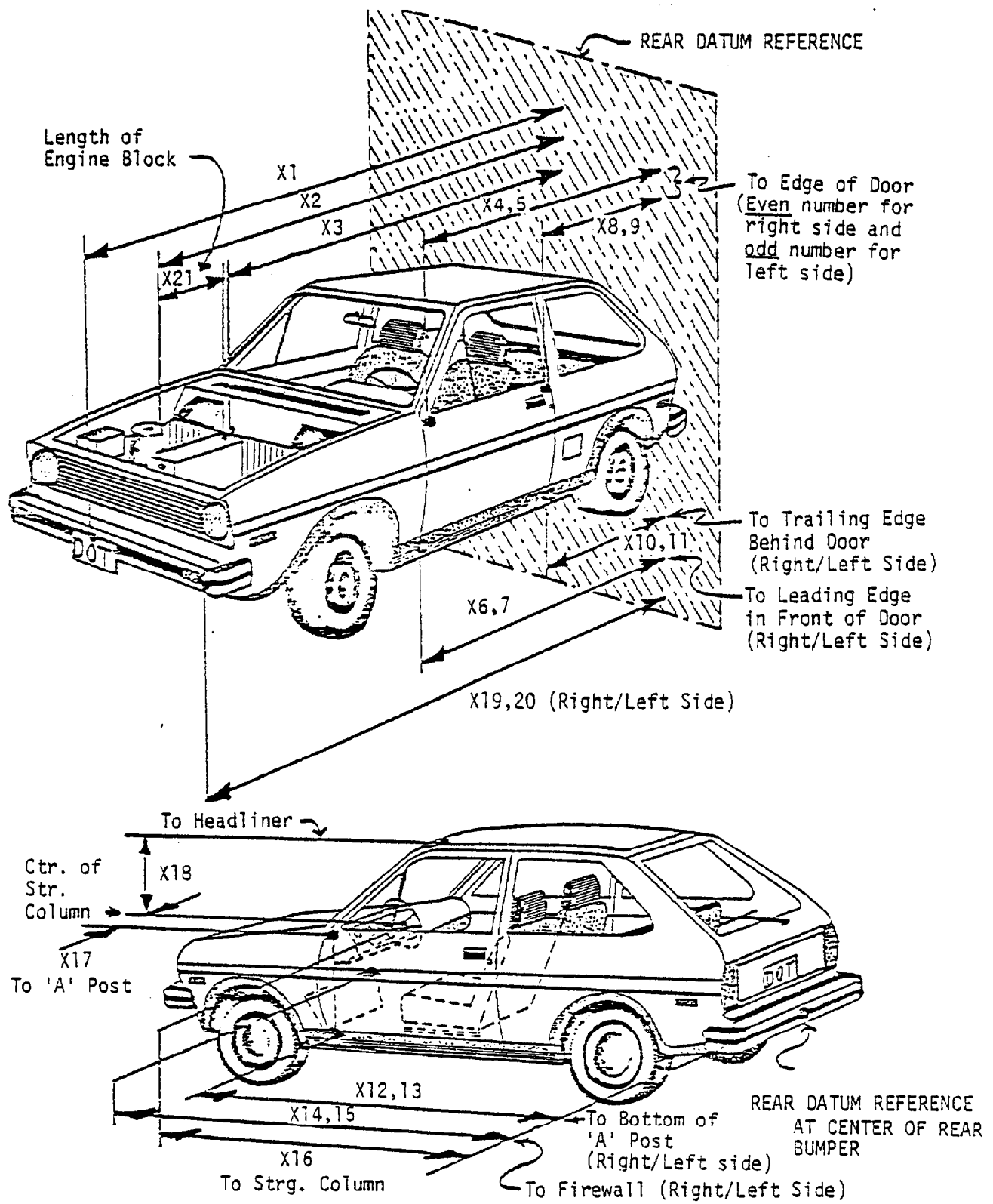


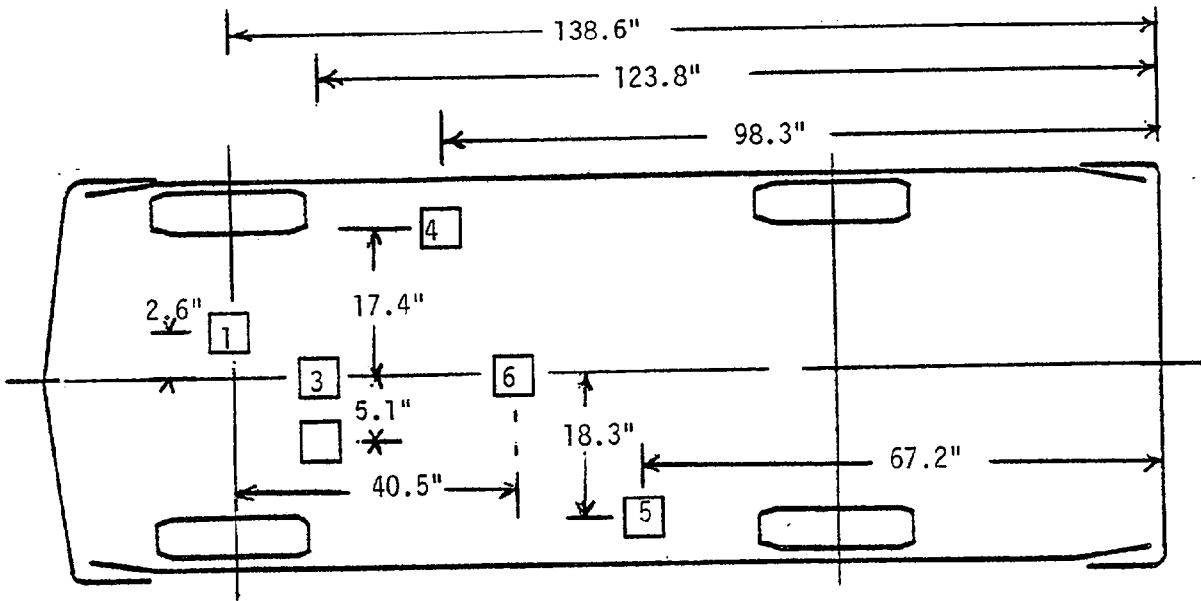
FIGURE 4 PRE-TEST AND POST-TEST MEASUREMENT POINTS

1981 Ford Escort

Table 6

VEHICLE MEASUREMENTS

NO.	TYPE OF MEASUREMENT	ALL DIMENSIONS IN INCHES		Dif
		PRE-TEST	POST TEST	
X1	Total Length of Vehicle at Centerline	165.7	142.8	22
X2	Rear Surface of Vehicle to Front of Engine	143.6	134.7	8
X3	Rear Surface of Vehicle to Firewall	124.9	120.4	4
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	111.	110.3	1
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	111.6	109.1	2
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	110.7	109.4	1
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	110.8	108.5	2
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	64.3	63.1	1
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	64.3	62.8	1
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	64.2	63.1	1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	64.2	62.8	1
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	108.1	106.0	2
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	108.0	104.3	3
X14	Rear Surface of Vehicle to Firewall - Right Side	122.5	114.8	7
X15	Rear Surface of Vehicle to Firewall - Left Side	123.2	116.8	6
X16	Rear Surface of Vehicle to Steering Column	94.8	920	2
X17	Center of Steering Column to "A" Post	14.6	15.1	-
X18	Center of Steering Column to Headliner	17.0	16.6	
X19	Rear Surface of Vehicle to Right Side of Front Bumper	162.4	142.2	20
X20	Rear Surface of Vehicle to Left Side of Front Bumper	162.4	141.0	21
X21	Length of Engine Block	12.3	12.3	
X22	Dash to Rear Deck	90.4	88.6	1



ACCELEROMETER NUMBER *	ACCELEROMETER LOCATION	DIRECTION		
		X	Y	Z
1	Engine	X		X
2	Firewall Above Steering Column	X		X
3	Firewall at Vehicle Centerline	X		X
4	Front Seat Crossmember	X		X
5	Rear Seat Crossmember	X		X
6	Center of Gravity	X	X	X

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

FIGURE 5 VEHICLE ACCELEROMETER LOCATIONS

NOTE: Camera Information Shown on Tables 7 and 8.

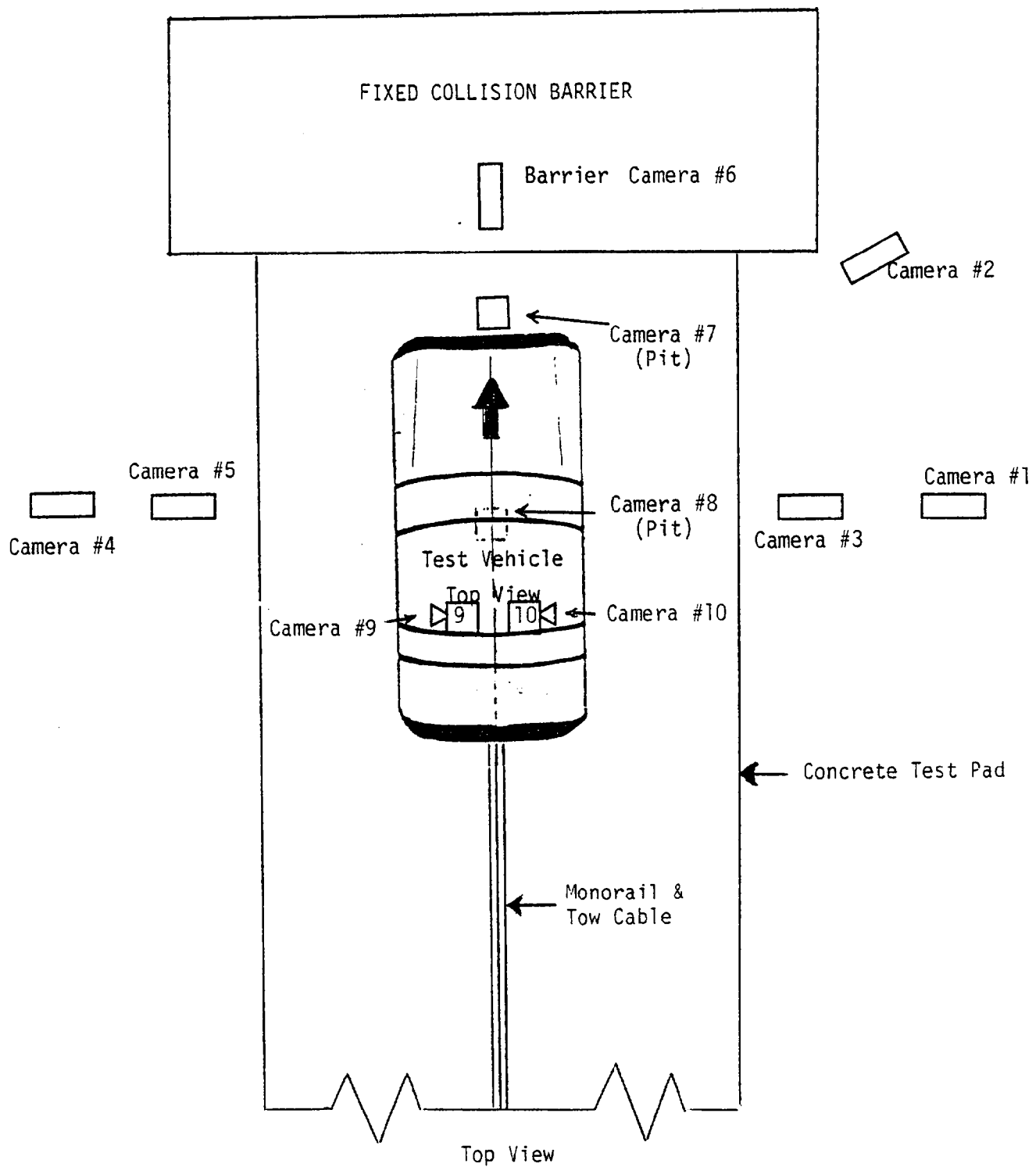


FIGURE 6 CAMERA POSITION FOR FRONTAL IMPACTS

Table 7

HIGH SPEED CAMERA LOCATIONSTest No.: 308-40-503Vehicle No. 1981 Ford Escort

CAMERA NUMBER	VIEW	CAMERA POSITIONS (IN)*			CAMERA ANGLE (DEG)**	FILM PLANE TO HEAD TARGET (IN)
		X	Y	Z		X
1	Impact Event	307	72	59.2	-3.5	288
2	Windshield	116	3.0	47	-7	--
3	Right Front Passenger	281	72	41	-2	262
4	Impact Event	324	72	59.5	-3	305
5	Driver	285	72	41	-3	266
6	Vehicle Front (Barrier)	0	12	58	-23	--
7	Front Underbody (Pit)	0	32	120	+90	--
8	Rear Underbody (Pit)	0	120	120	+90	--
9	Left Belt Retractor	--	--	--	--	--
10	Right Belt Retractor	--	--	--	--	--

\* X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

\*\* Referenced to Horizontal Plane

Table 8

HIGH SPEED CAMERA INFORMATION  
(Test 308-40-503)

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)
1	Impact Event	Photosonic	13 mm	900
2	Windshield	Photosonic	13 mm	900
3	Right Front Passenger	Photosonic	35 mm	900
4	Impact Event	Photosonic	13 mm	900
5	Driver	Photosonic	35 mm	900
6	Vehicle Front Barrier	Photosonic	8 mm	1000
7	Front Underbody (Pit)	Photosonic	13 mm	--
8	Rear Underbody (Pit)	Photosonic	13 mm	--
9	Left Belt Retractor	Stalex	35 mm	950
10	Right Belt Retractor	Stalex	35 mm	1150

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 OF FILM.

**FIGURE 7**  
**PART 572 DUMMY IN-VEHICLE POSITION**

Test No. 40

Vehicle 1981 Ford Escort

**SEAT TYPE:**

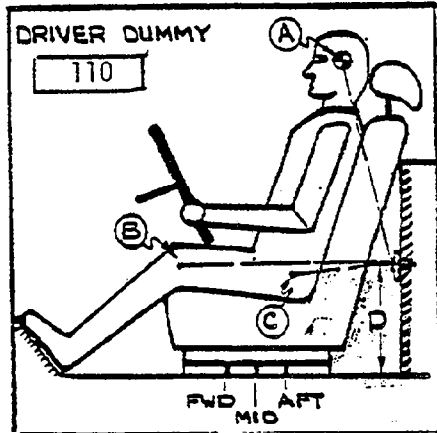
- Bench
- Bucket
- Split Bench

**ADJUSTER TYPE:**

- Manual
- Power

**BUCKET SEAT BACK TYPE:**

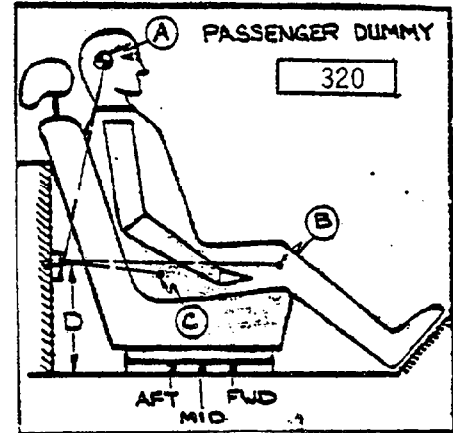
- Fixed
- Adjustable Reclining



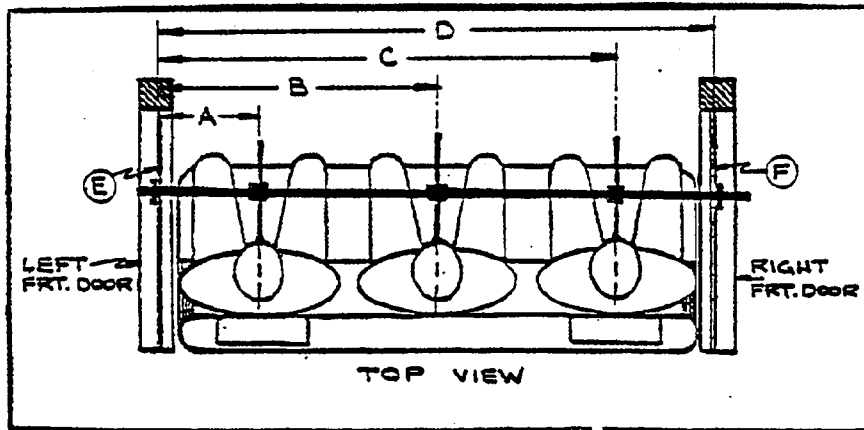
A = 24.5 in. 29 Degrees  
 B = 32.7 in. 91 Degrees  
 C = 19 in. 109 Degrees  
 D = 14.0 in.

**MEASUREMENT LOCATION:**

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



A = 25.0 in. 32 Degrees  
 B = 34 in. 94 Degrees  
 C = 18.2 in. 114 Degrees  
 D = 14.0 in.

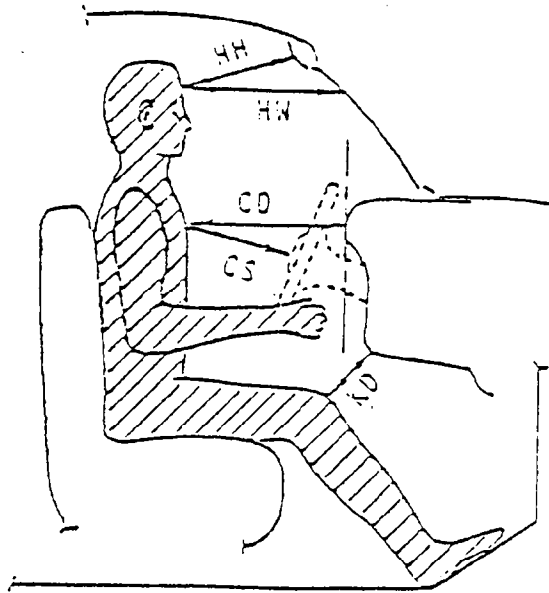


DUMMY ID

110      --      320

A	=	Left Door to Driver Centerline	<u>12.2</u> in.
B	=	Left Door to Center Passenger Centerline	<u>--</u> in.
C	=	Left Door to Right Passenger Centerline	<u>36.5</u> in.
D	=	Left Door to Right Door	<u>48.7</u> in.
E, F	=	Window Glass Height (Right and Left Must be Equal)	<u>9.7</u> in.

	<u>DRIVER</u>	<u>PASS</u>
HH	11.2	11.0
HW	16.2	16.5
CD	20.2	19.6
CS	13.7	
KDL	3.4	4.5
KDR	4.3	4.5



HR	5.5	5.2
HS	6.7	6.7
AD	2.5	3.7
HD	5.5	6.0

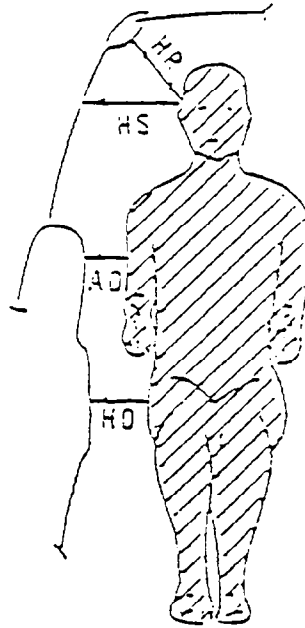


FIGURE 8 OCCUPANT CLEARANCE DIMENSIONS

Table 9  
**DUMMY INJURY CRITERIA VALUES**  
 1981 FORD ESCORT

	MAXIMUM ACCELERATION ("G") *							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R
DUMMY (1)	-90	-15	40	90	-44	-16	-25	50
DUMMY (2)	-84	28	72	109	-35	21	10	40
DUMMY (3)								
DUMMY (4)								

	MAXIMUM FORCE-FEMUR LOAD (LBS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	740	640
DUMMY (2)	280	480
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)	1600	1800	760
DUMMY (2)	1760	880	2000
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**				SEVERITY INDEX
	HIC	t <sub>1</sub> (SEC)	t <sub>2</sub> (SEC)	AVE. ACC. (g) t <sub>1</sub> TO t <sub>2</sub>	HEAD
DUMMY (1)	618	.0663	.0888	59.6	820
DUMMY (2)	1011	.0843	.0966	92.5	1408
DUMMY (3)					
DUMMY (4)					

\* DEFINED AS EXCEEDING 0.003 SEC. DURATION  
 \*\* AS DEFINED IN FMVSS NO. 208

APPENDIX A

STILL PHOTOGRAPHS

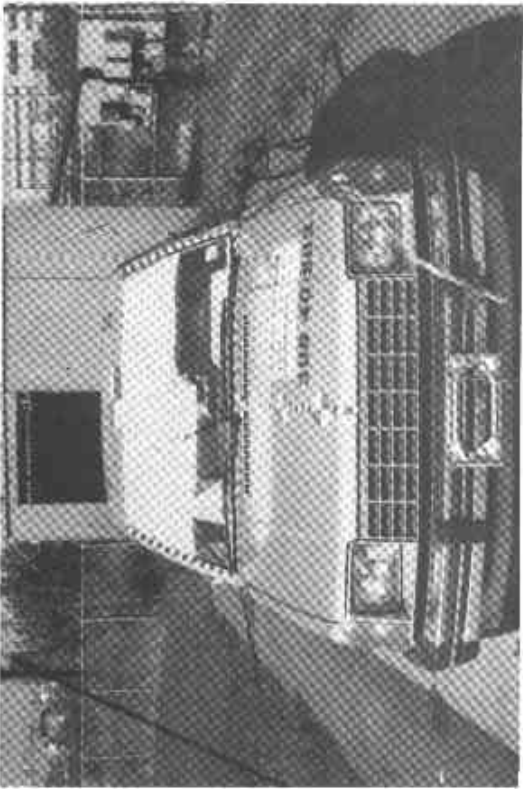
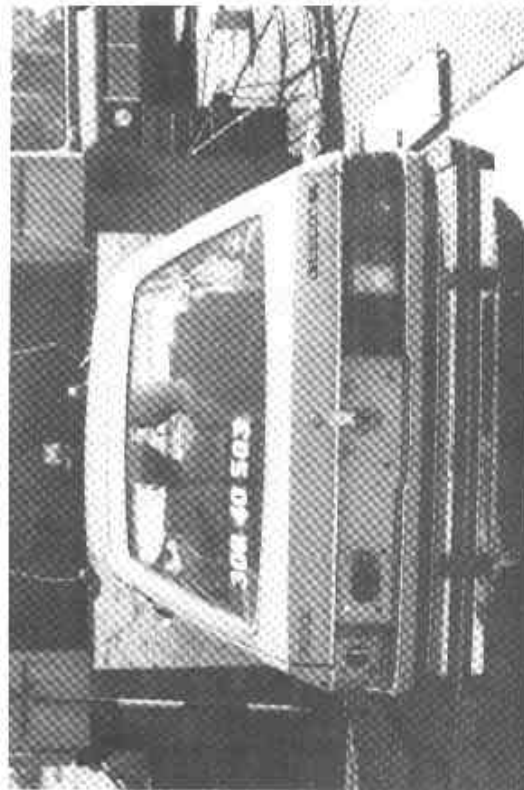


FIGURE A-1 PRE- AND POST-TEST FRONT AND REAR VIEWS

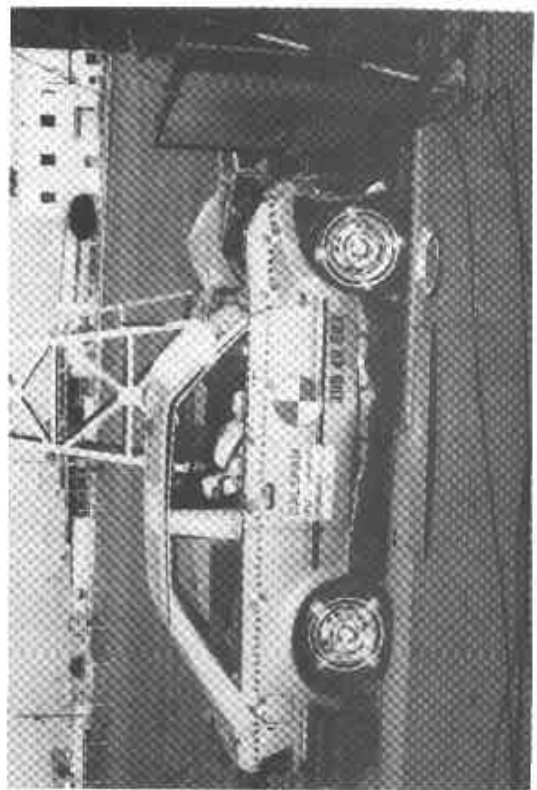
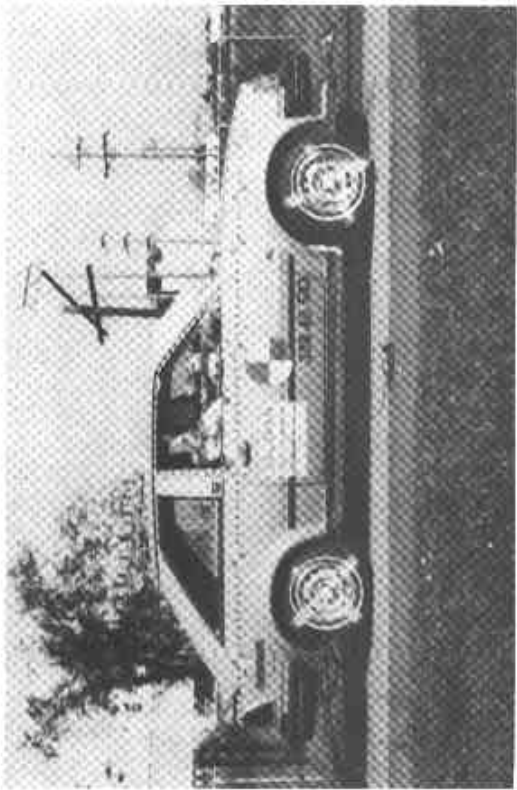
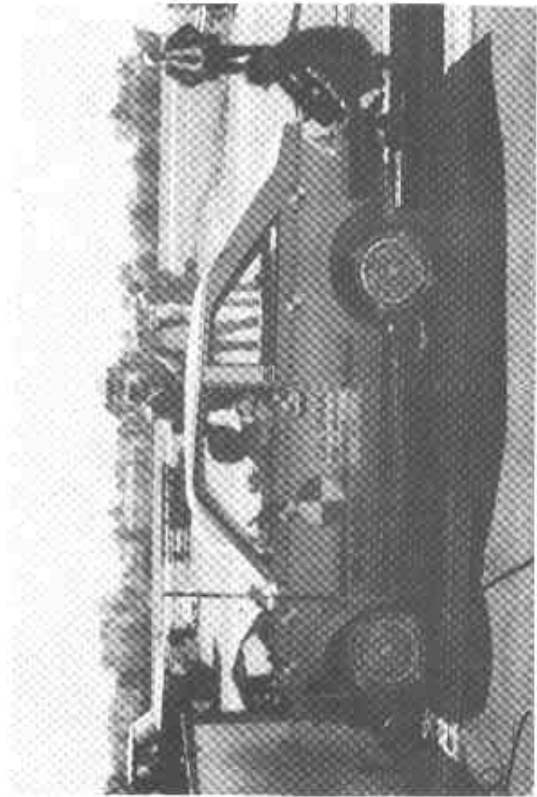
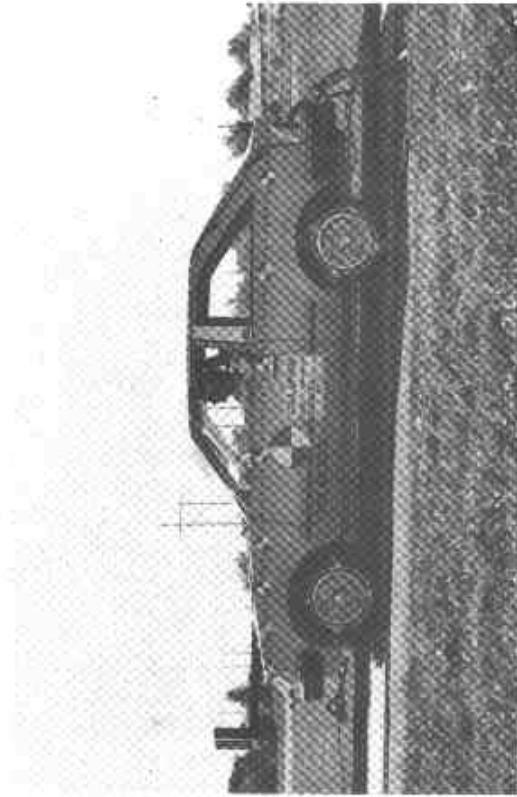


FIGURE A-2 PRE- AND POST-TEST RIGHT AND LEFT SIDE VIEWS

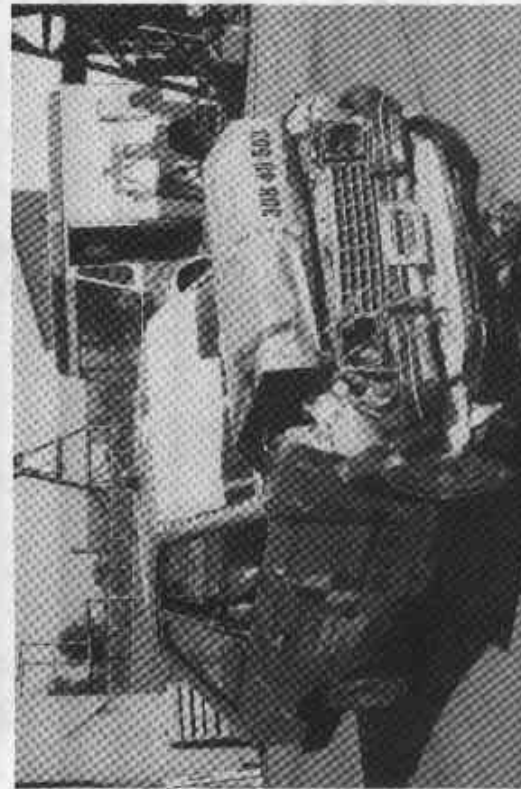
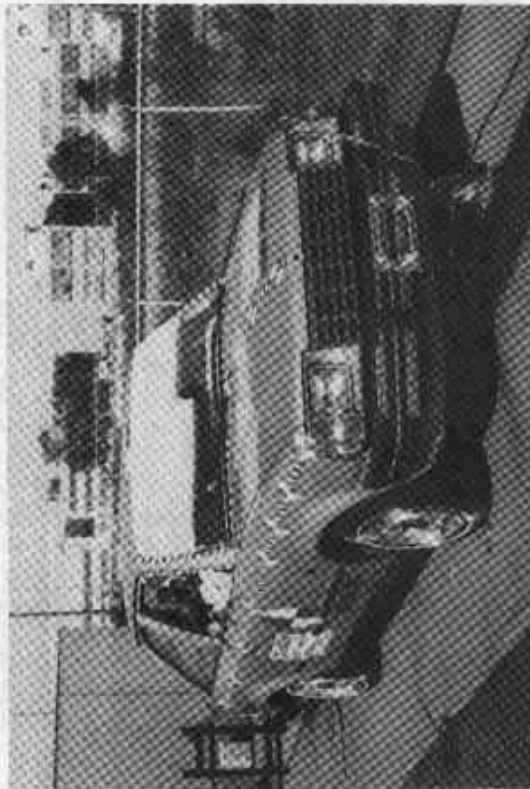
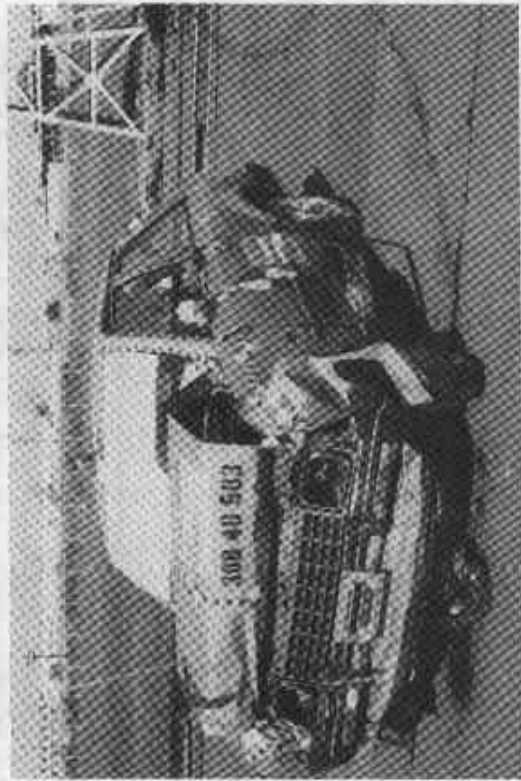
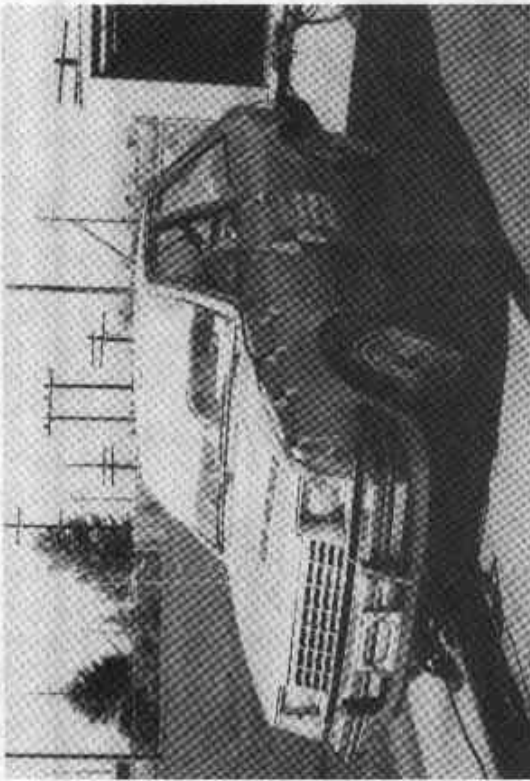


FIGURE A-3 PRE- AND POST-TEST RIGHT AND LEFT FRONT THREE-QUARTERS VIEWS

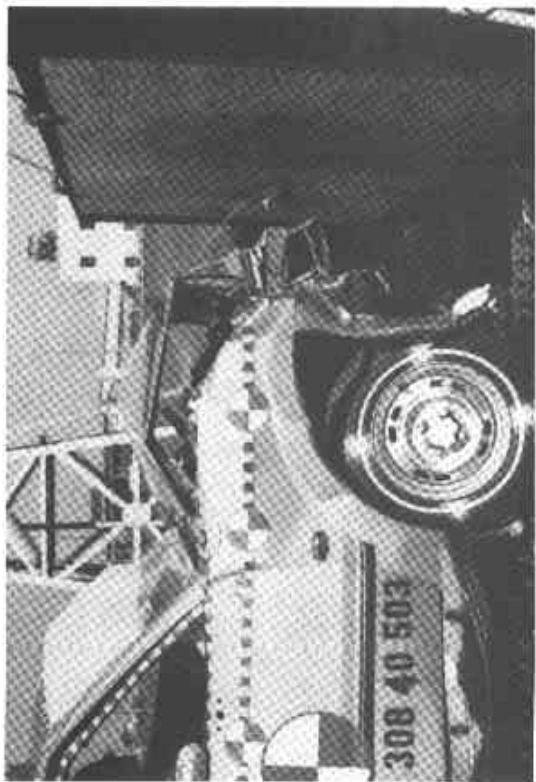
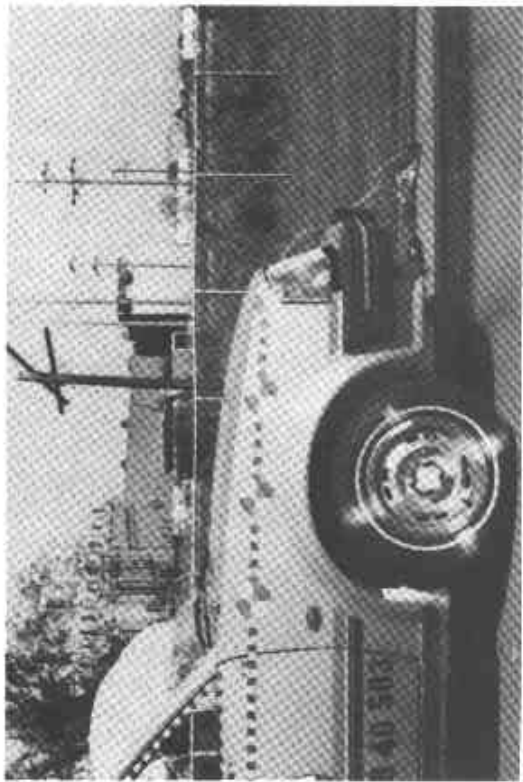
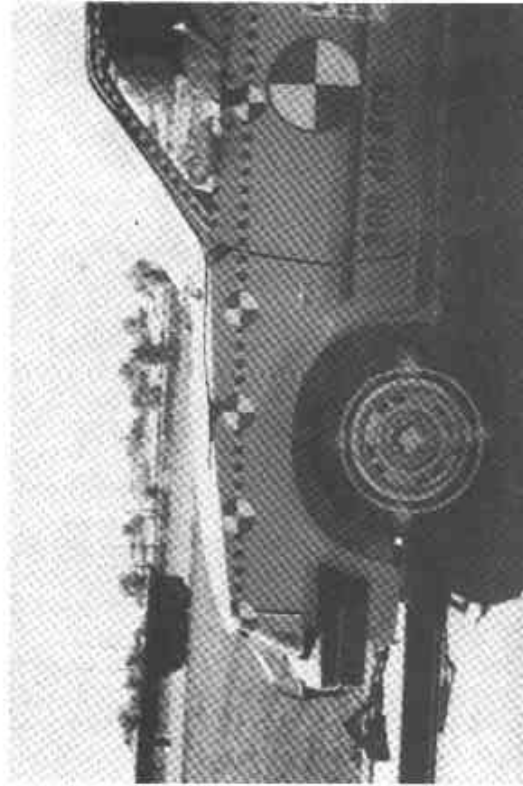


FIGURE A-4 PRE- AND POST-TEST RIGHT AND LEFT FRONT QUARTER PANEL VIEWS

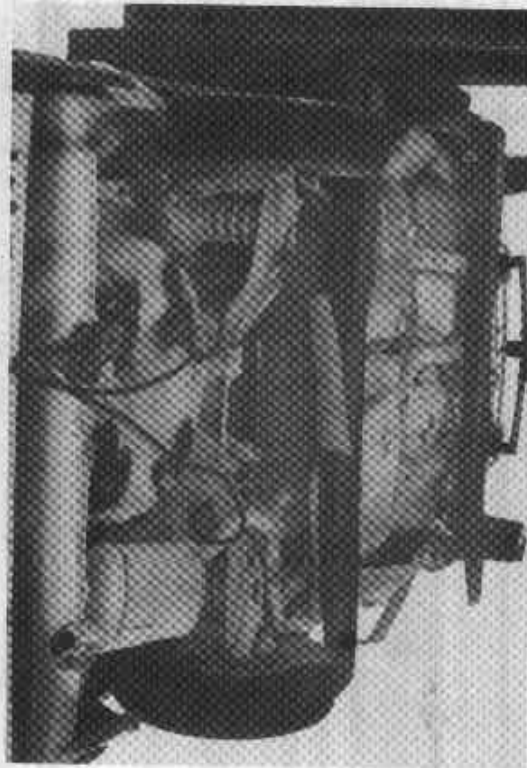
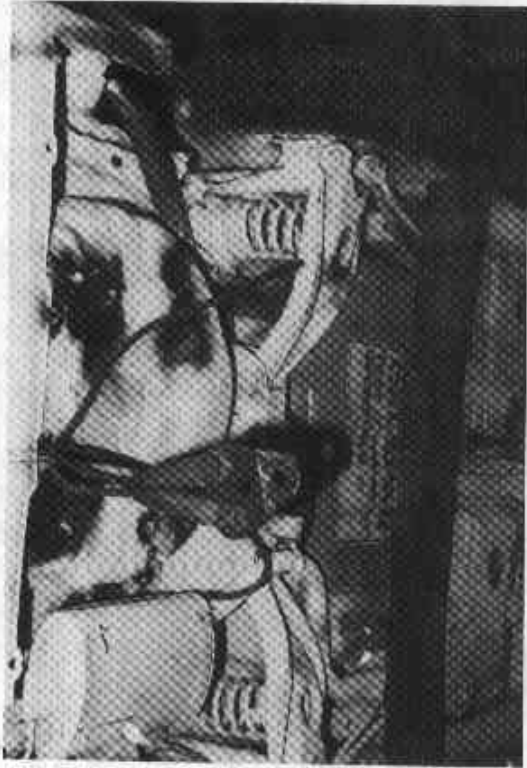


FIGURE A-5 PRE- AND POST-TEST FRONT AND REAR UNDERBODY VIEWS

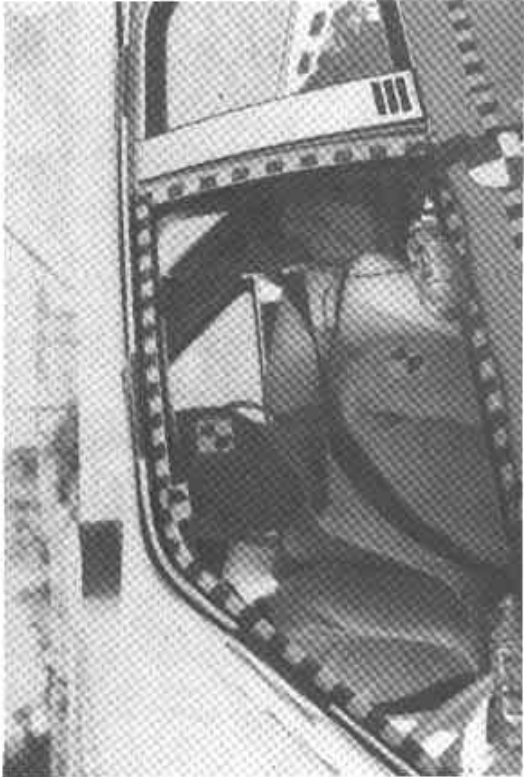


FIGURE A-6 PRE- AND POST-TEST DRIVER AND PASSENGER VIEWS



FIGURE A-7 PRE- AND POST-TEST VIEWS OF VEHICLE INTERIOR



A-8



FIGURE A-8 POST-TEST VEHICLE DASH PANEL

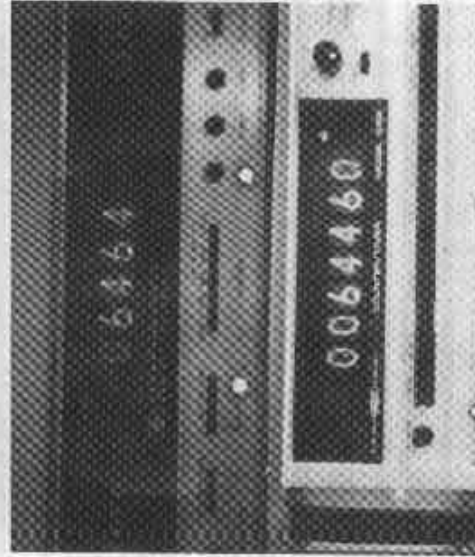


FIGURE A-9 VELOCITY TRAP COUNTER

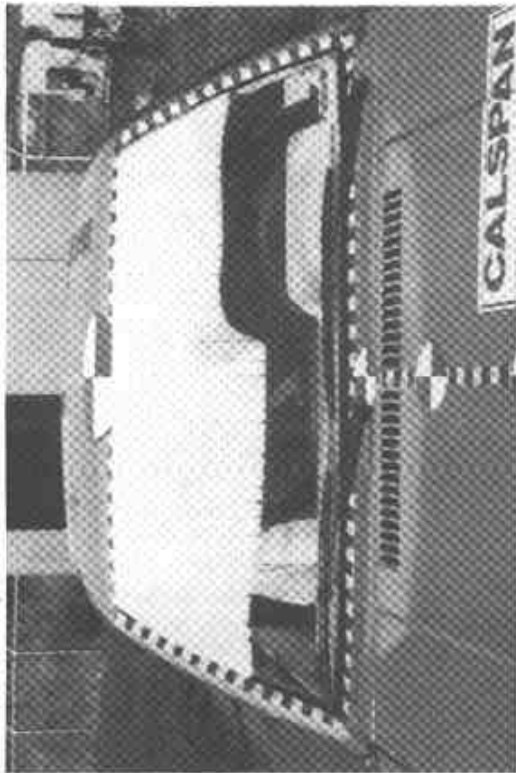
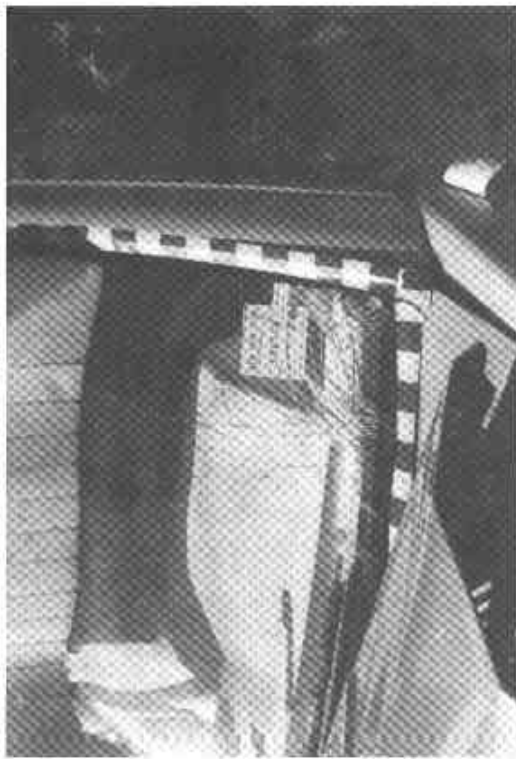


FIGURE A-10 PRE- AND POST-TEST WINDSHIELD VIEWS

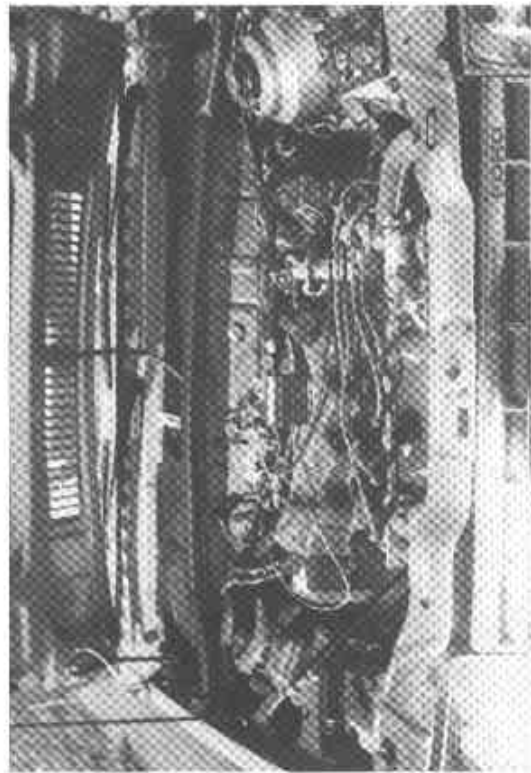
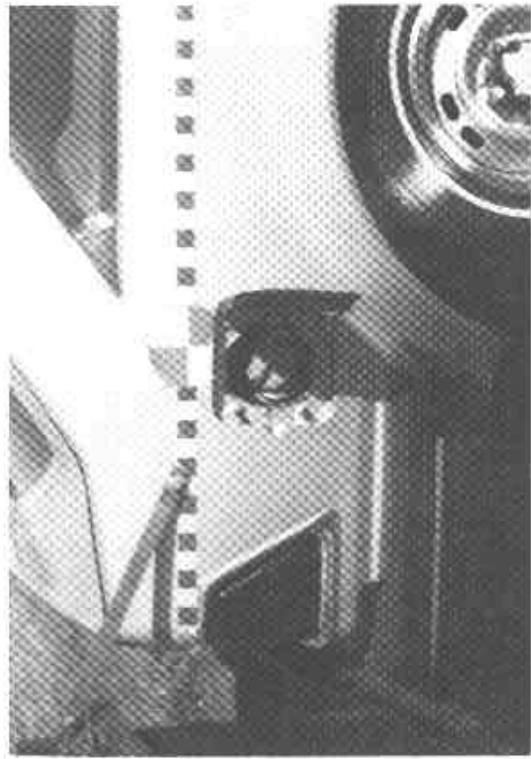


FIGURE A-12 FUEL FILLER CAP

FIGURE A-11 ENGINE COMPARTMENT ACCELEROMETER

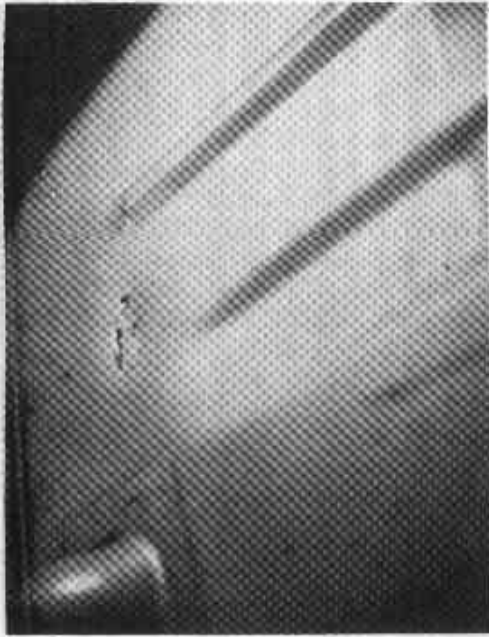


FIGURE A-14 STAPLE IN REAR DECK



FIGURE A-16 HOLES ON FUEL TANK WITH STAPLE REMOVED



FIGURE A-13 LOCATION OF STAPLE IN REAR DECK

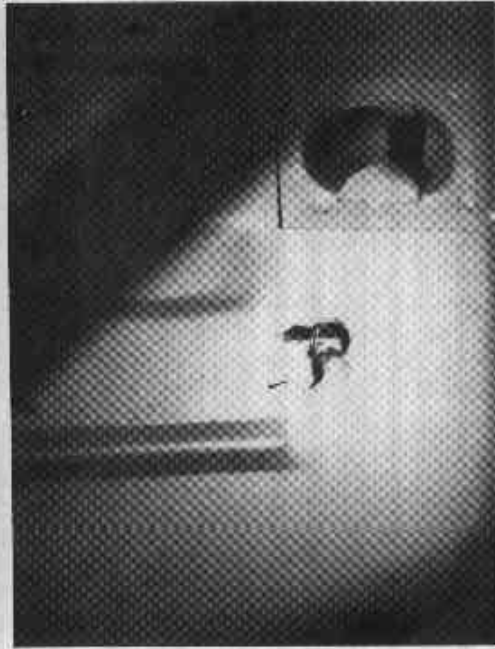


FIGURE A-15 STAPLE WITH REAR DECK CUT AWAY

Test No. 308-40-503

1981 Ford Escort

Vehicle Data

Filter Channel Class

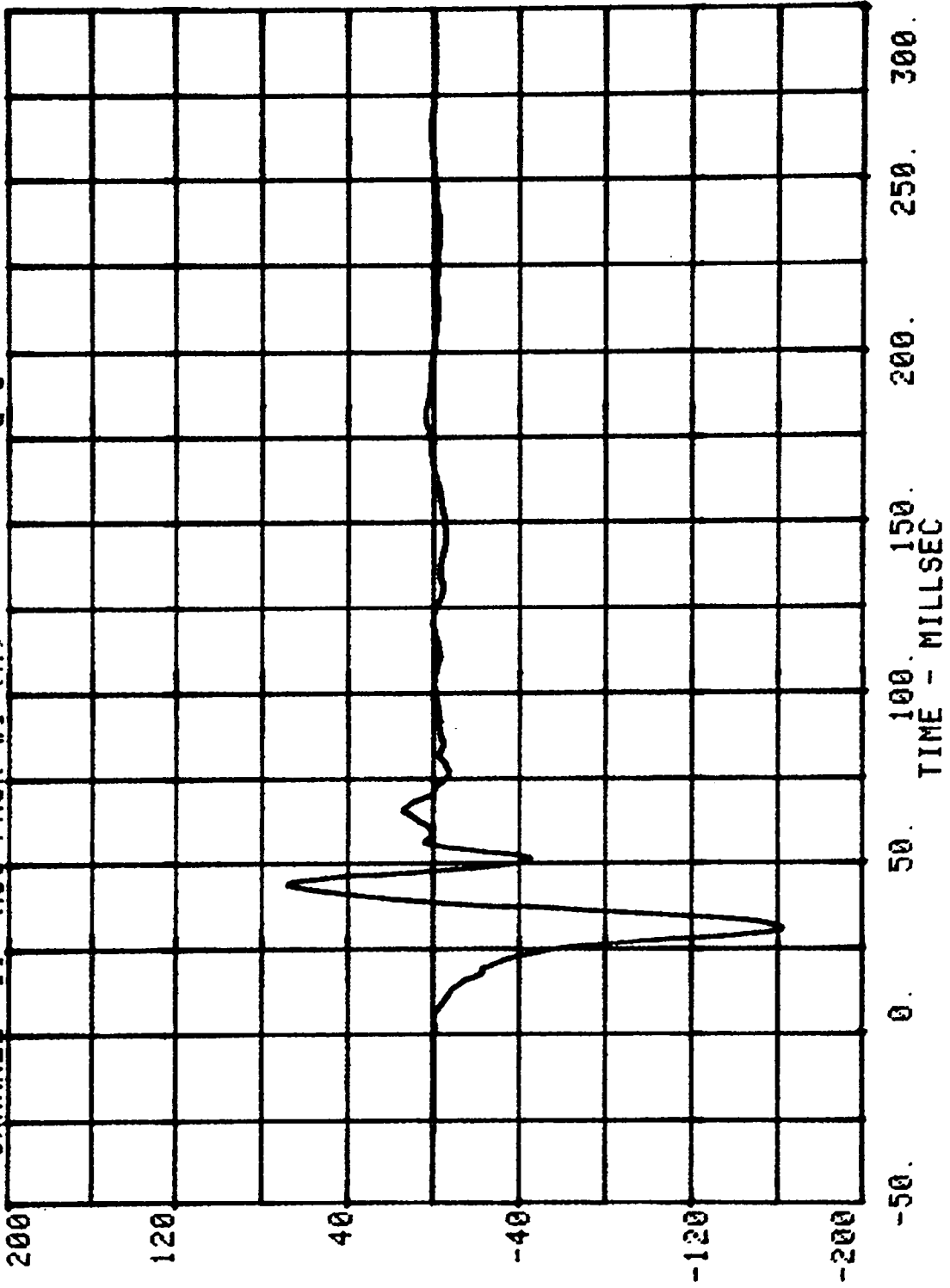
Vehicle Data

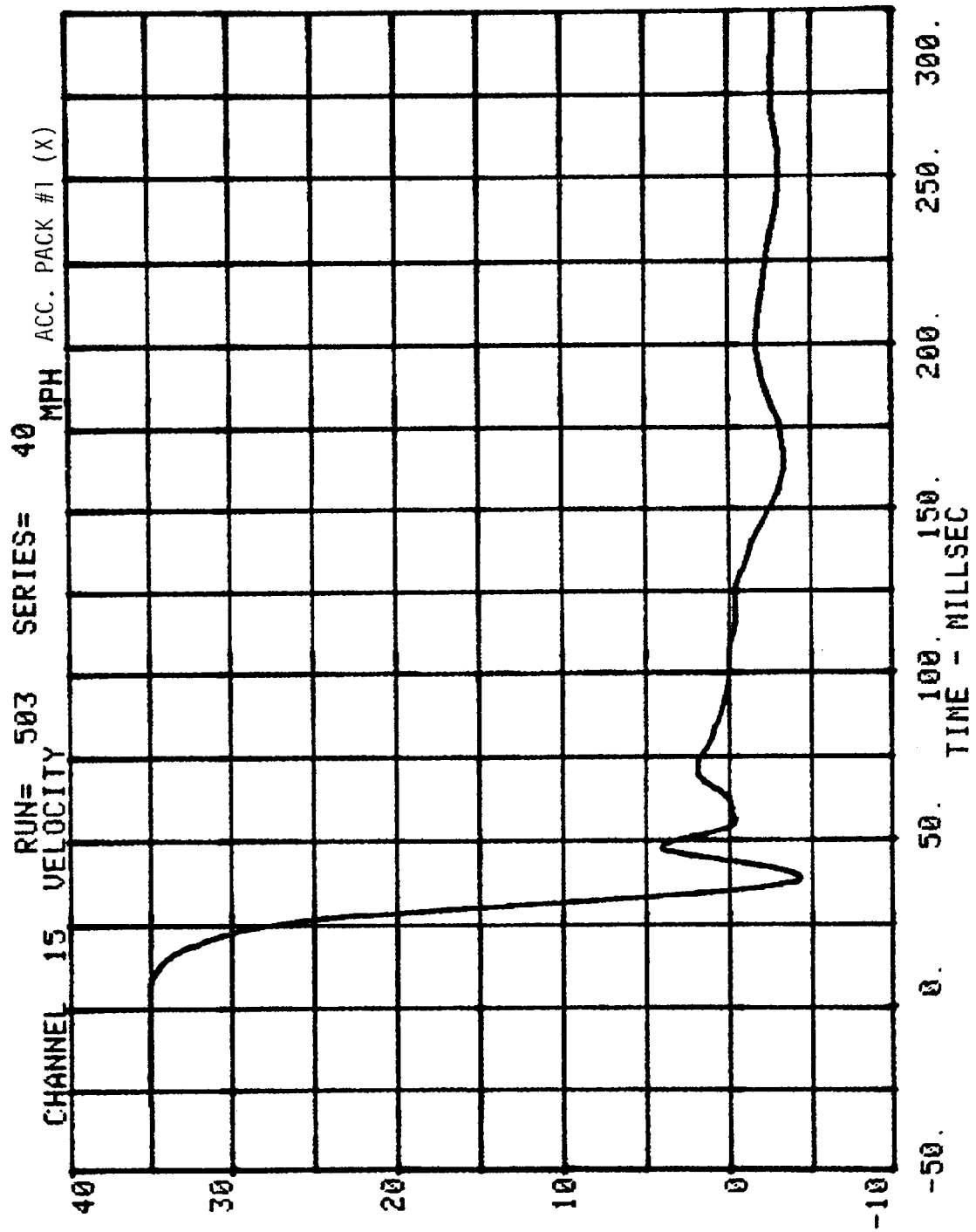
60

B-2

6525-V-40

CHANNEL 11 ACC PACK #1 (X) SERIES= 40 G'S





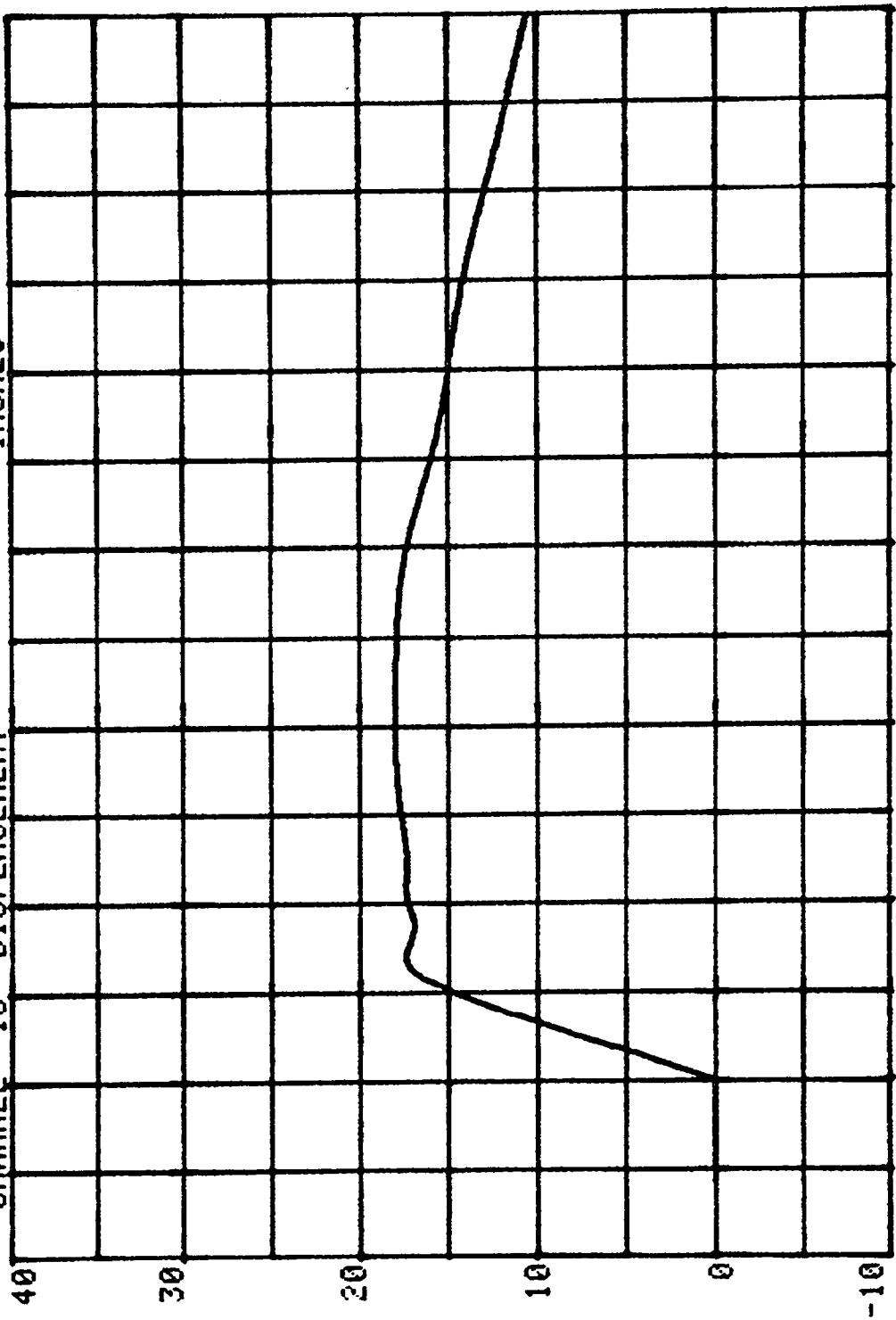
CHANNEL 16 DISPLACEMENT

RUN= 503

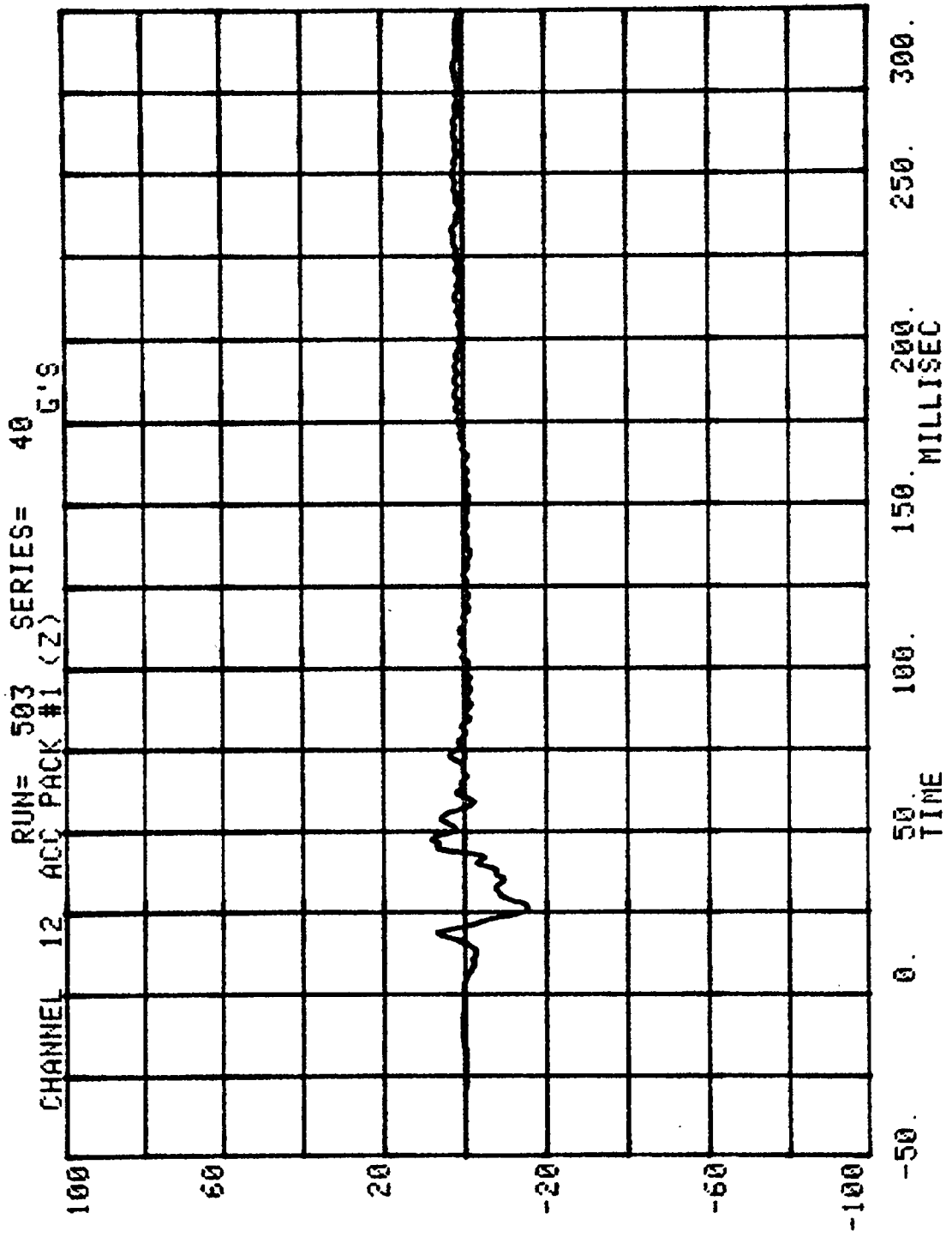
SERIES= 40

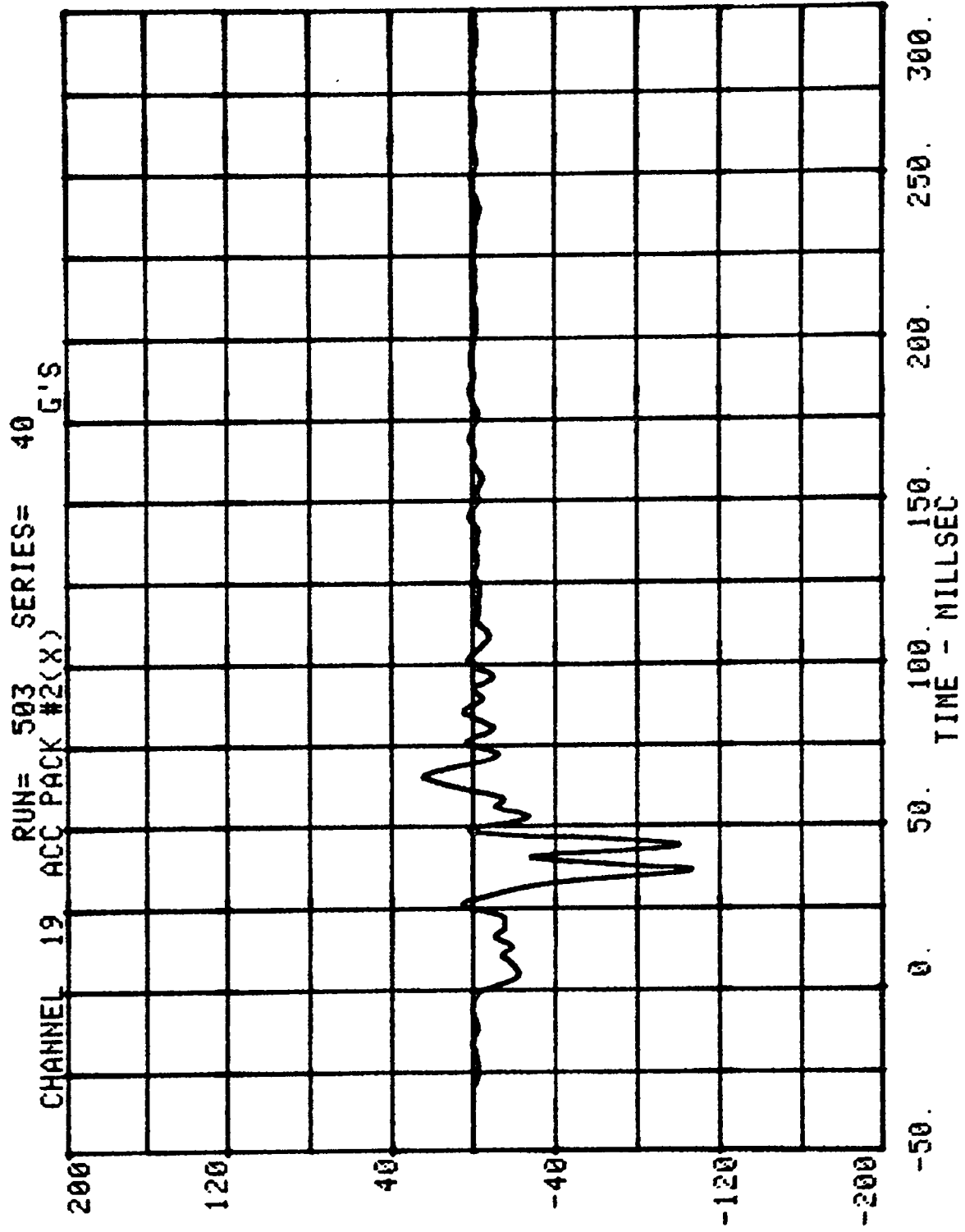
INCHES

ACC. PACK #1 (X)

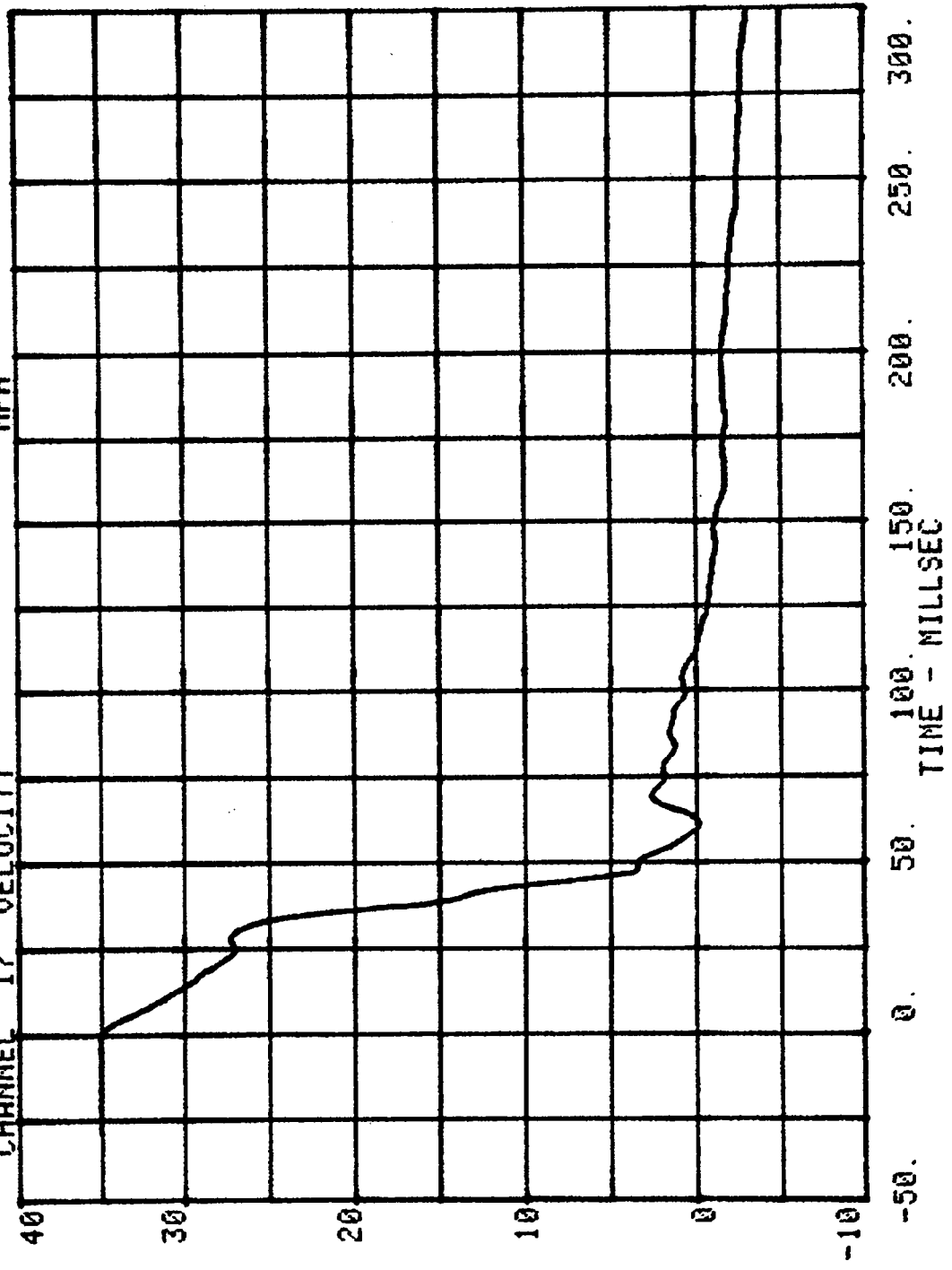


300.  
250.  
200.  
150.  
100.  
50.  
0.  
-50.

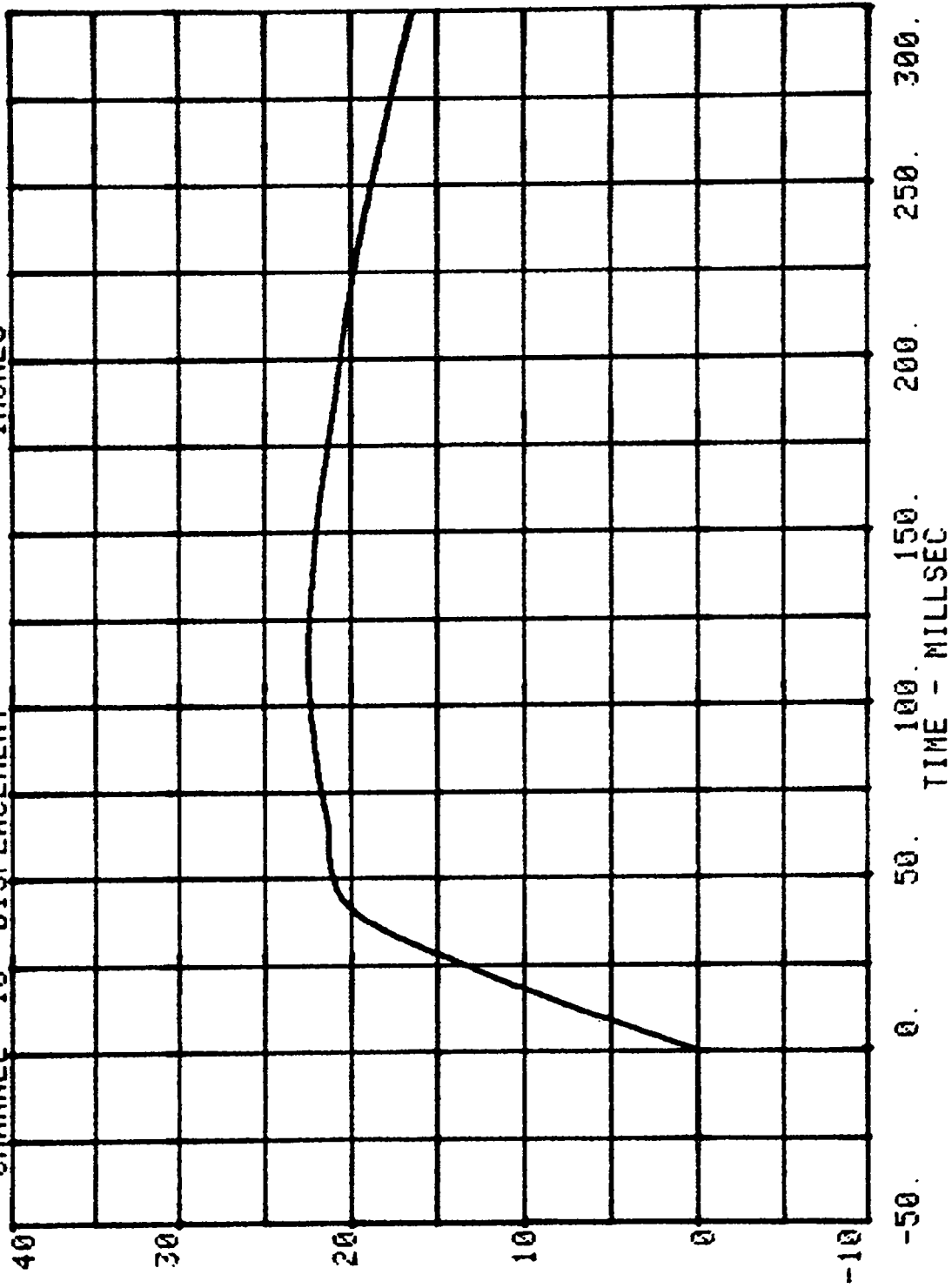


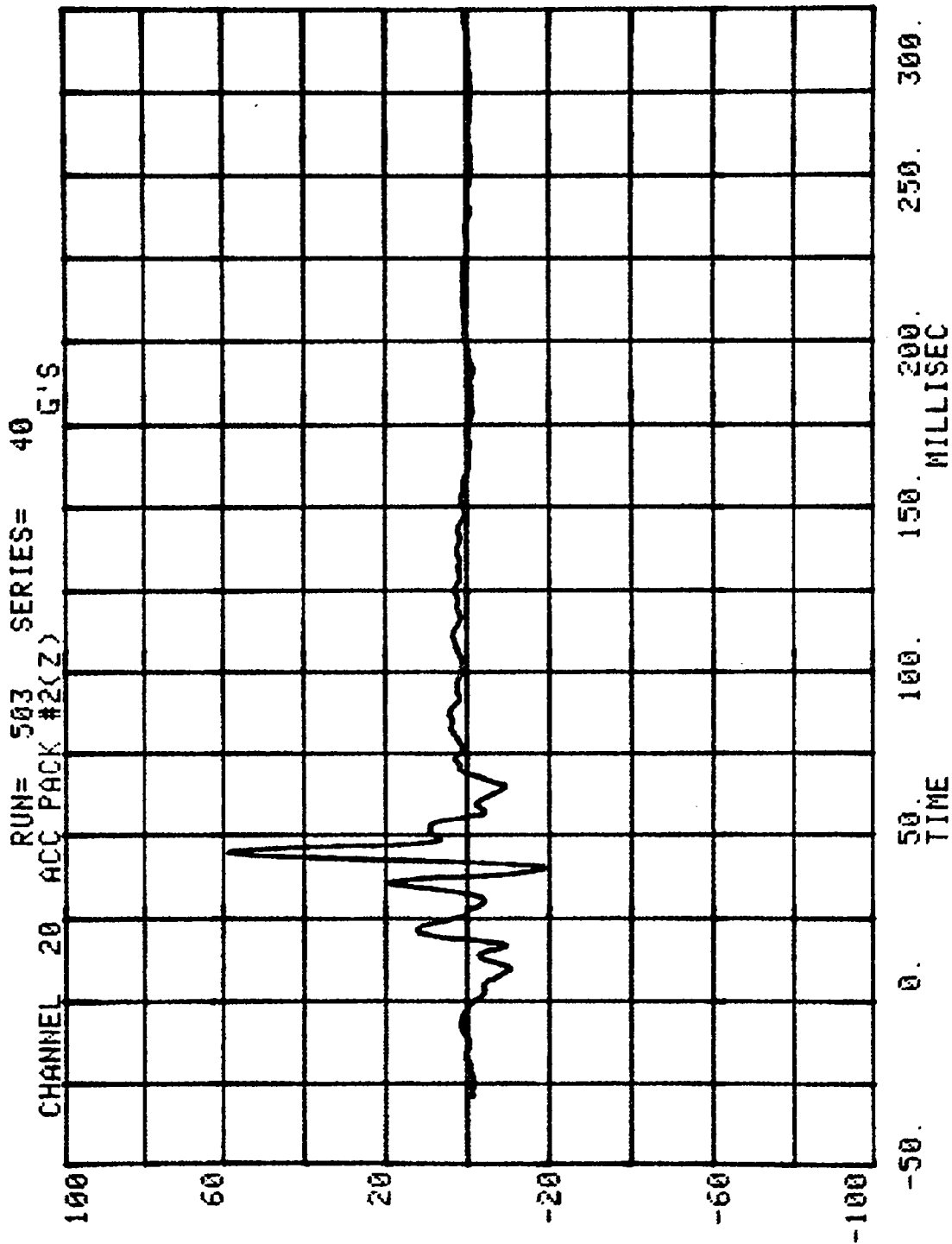


CHANNEL 17 VELOCITY RUN= 503 SERIES= 40 MPH ACC. PACK #2 (X)

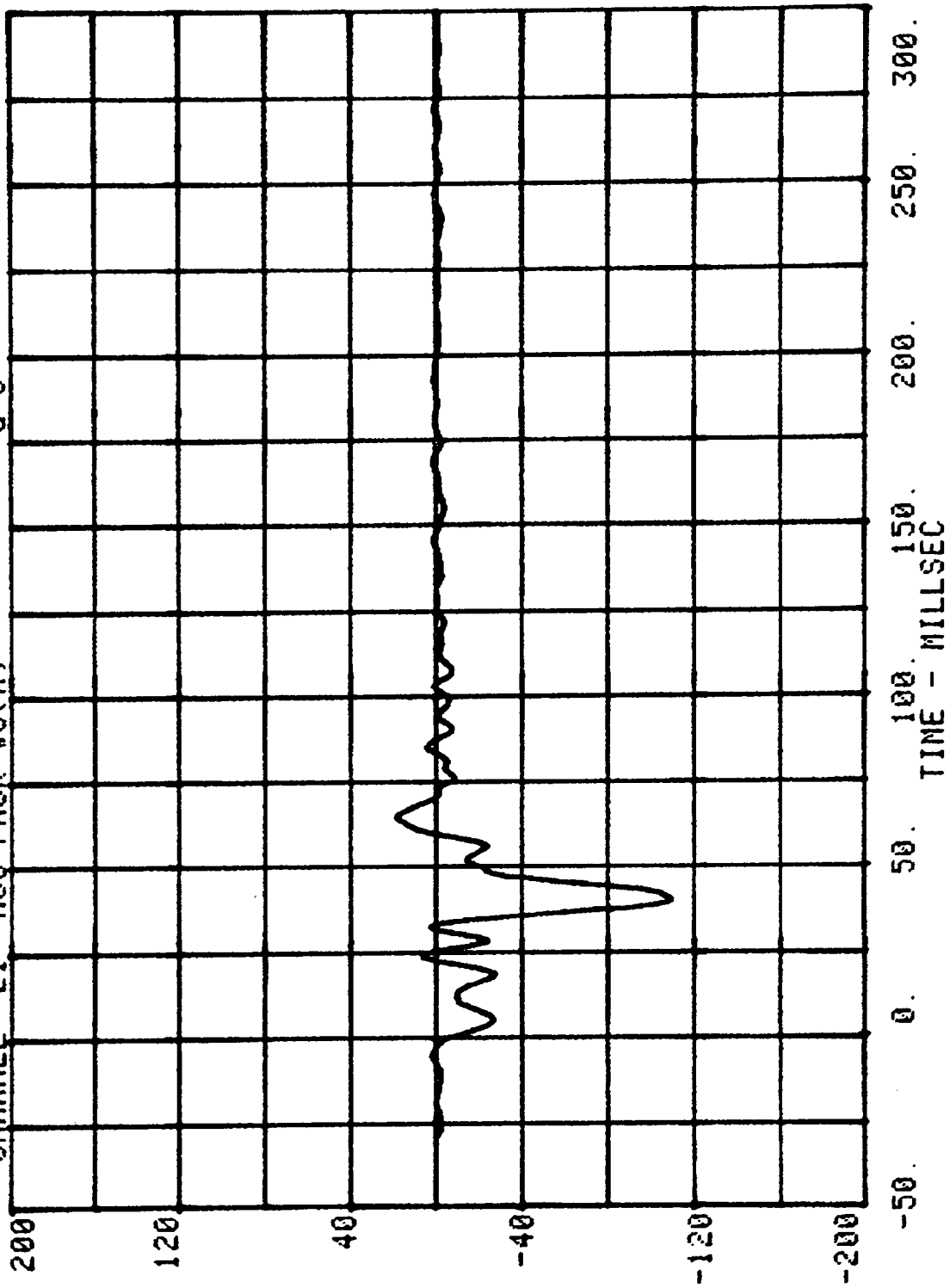


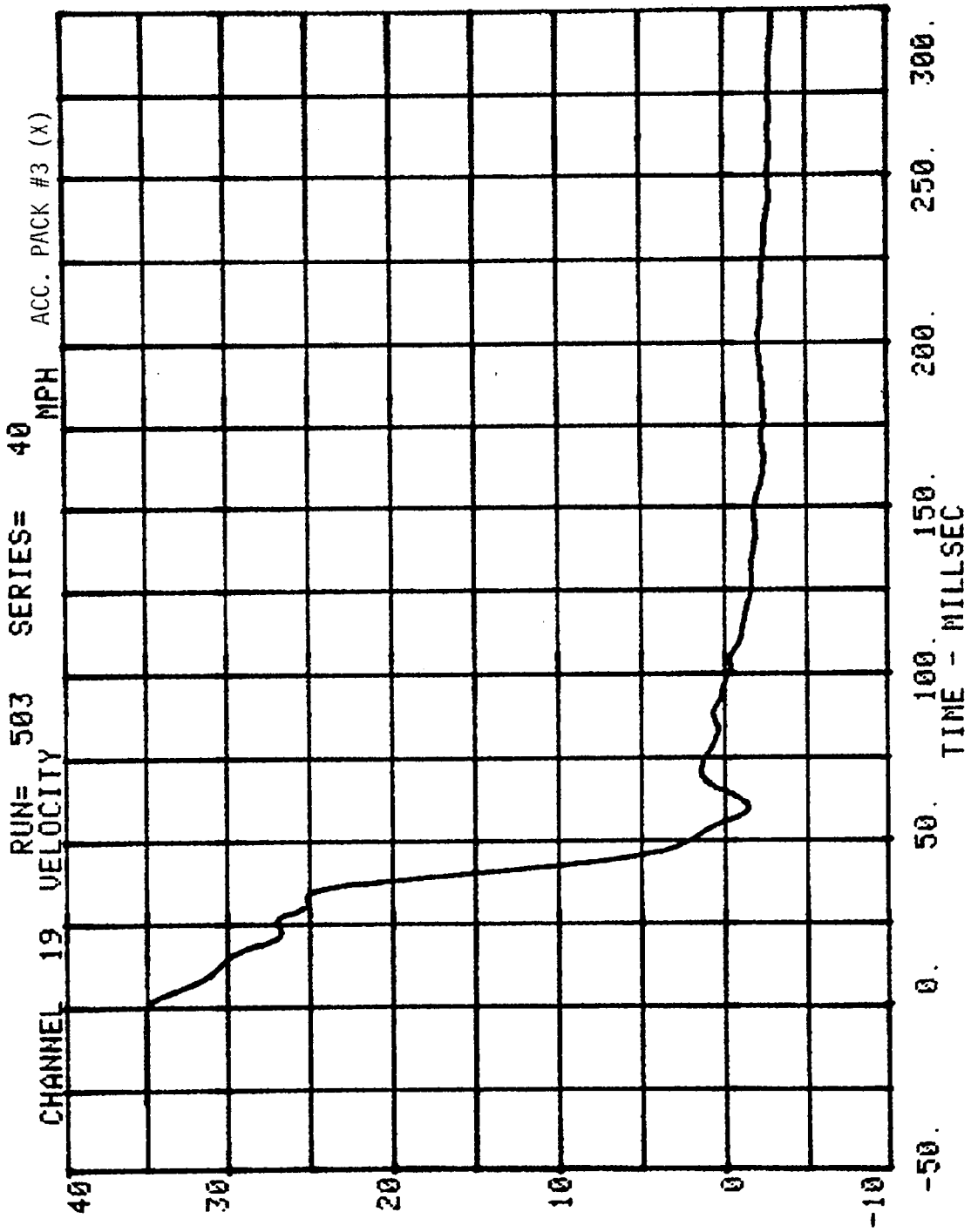
CHANNEL 18 DISPLACEMENT  
RUN= 503  
SERIES= 40  
INCHES  
ACC. PACK #2 (X)

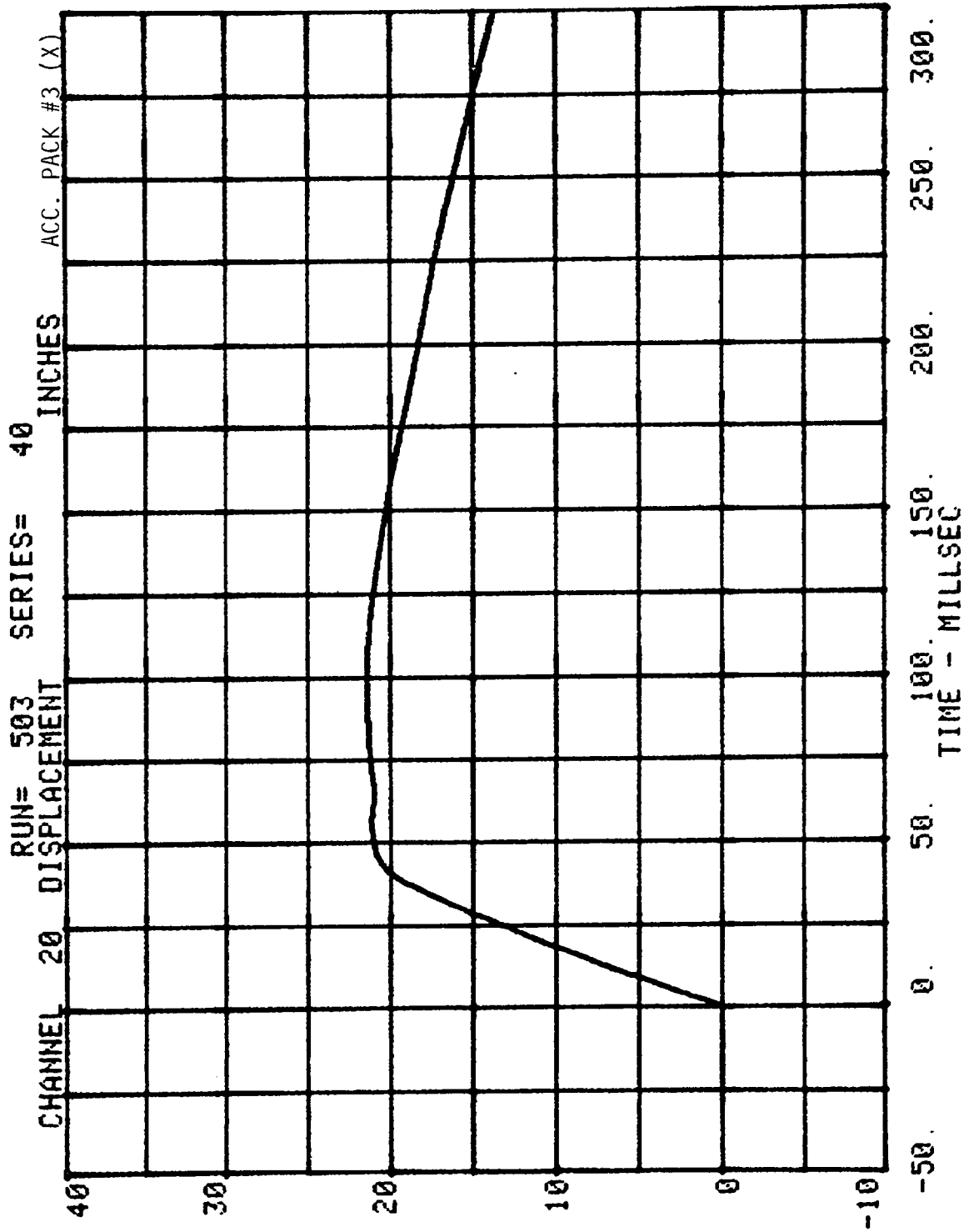


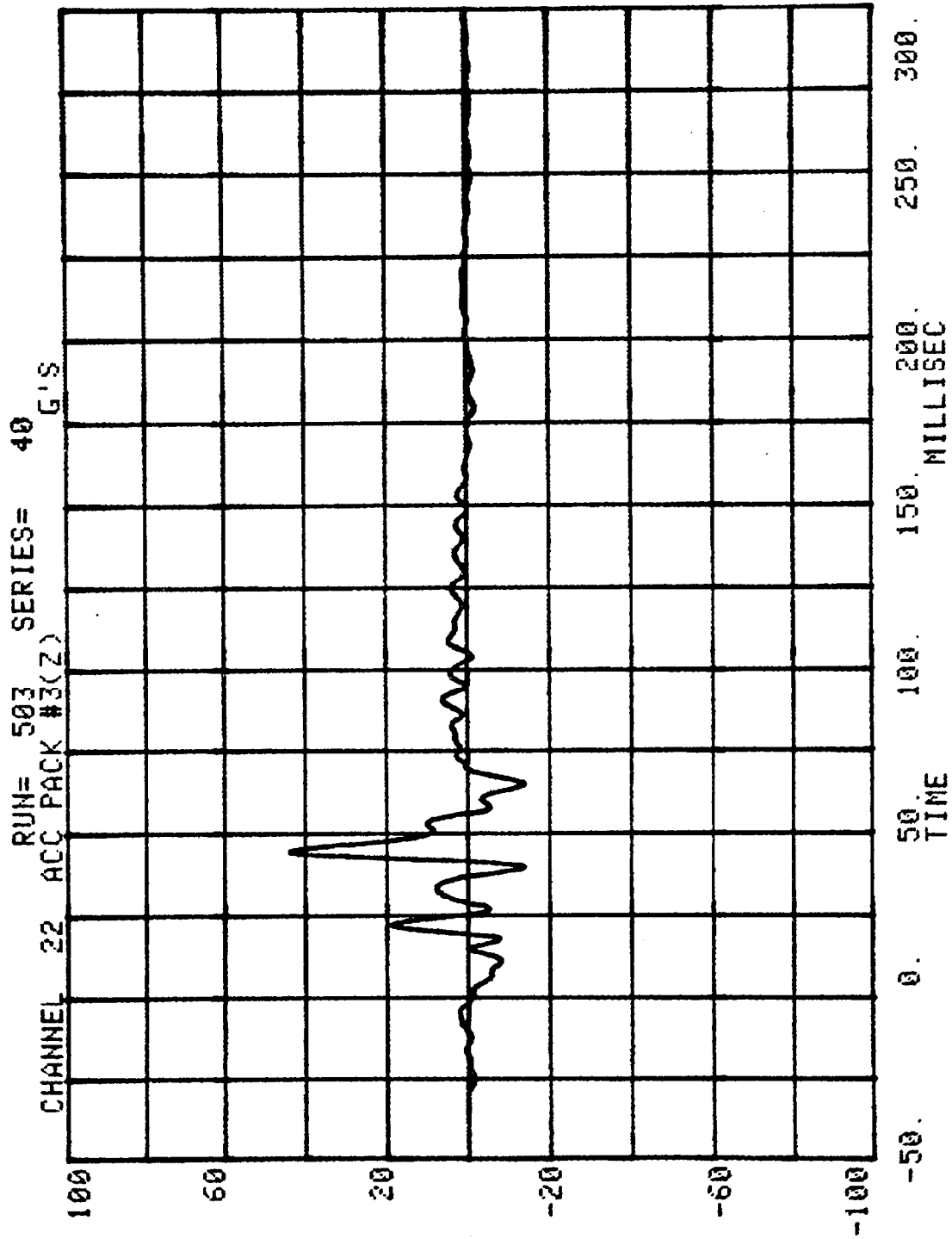


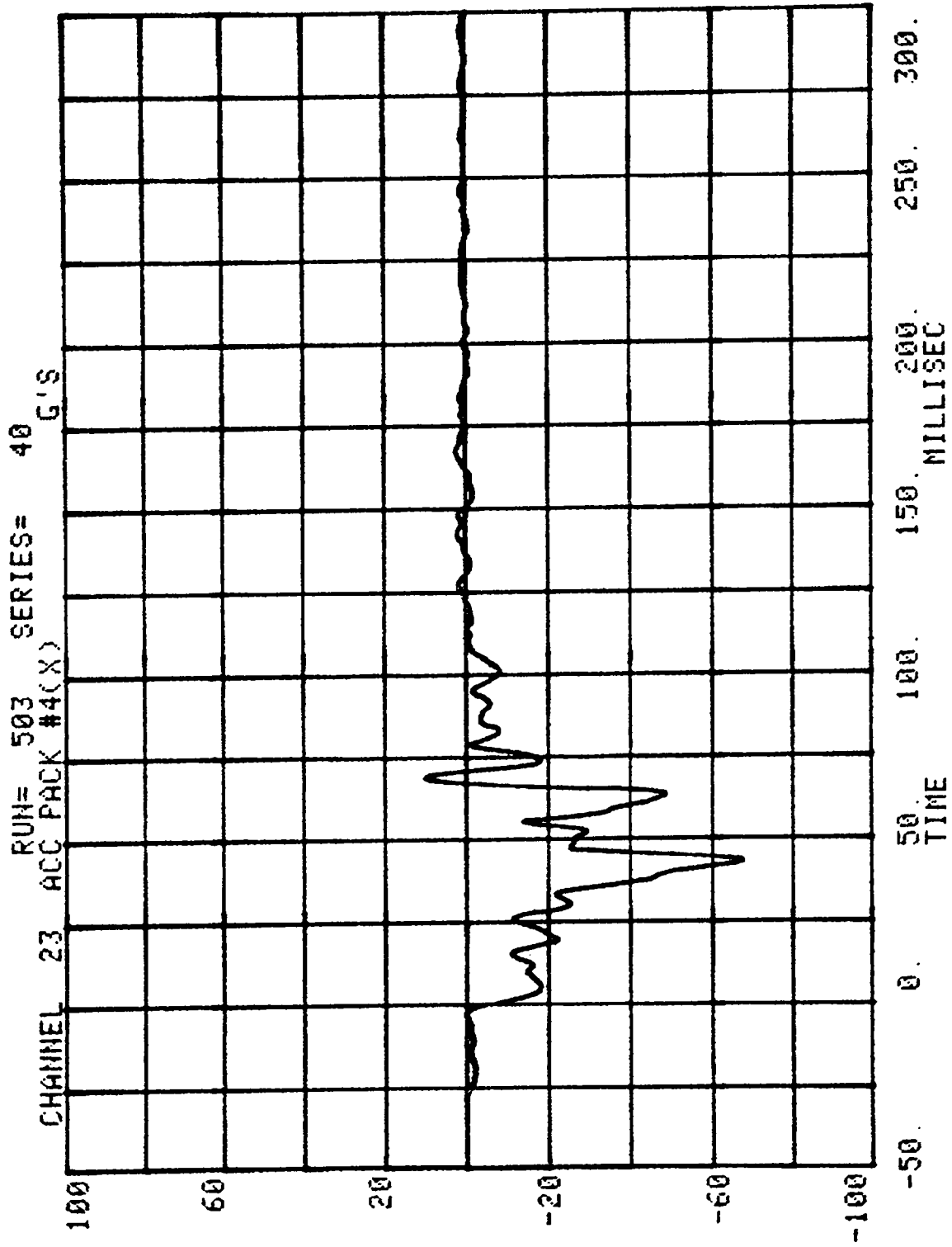
CHANNEL 21 ACC PACK #3(X) RUN= 503 SERIES= 40 G'S

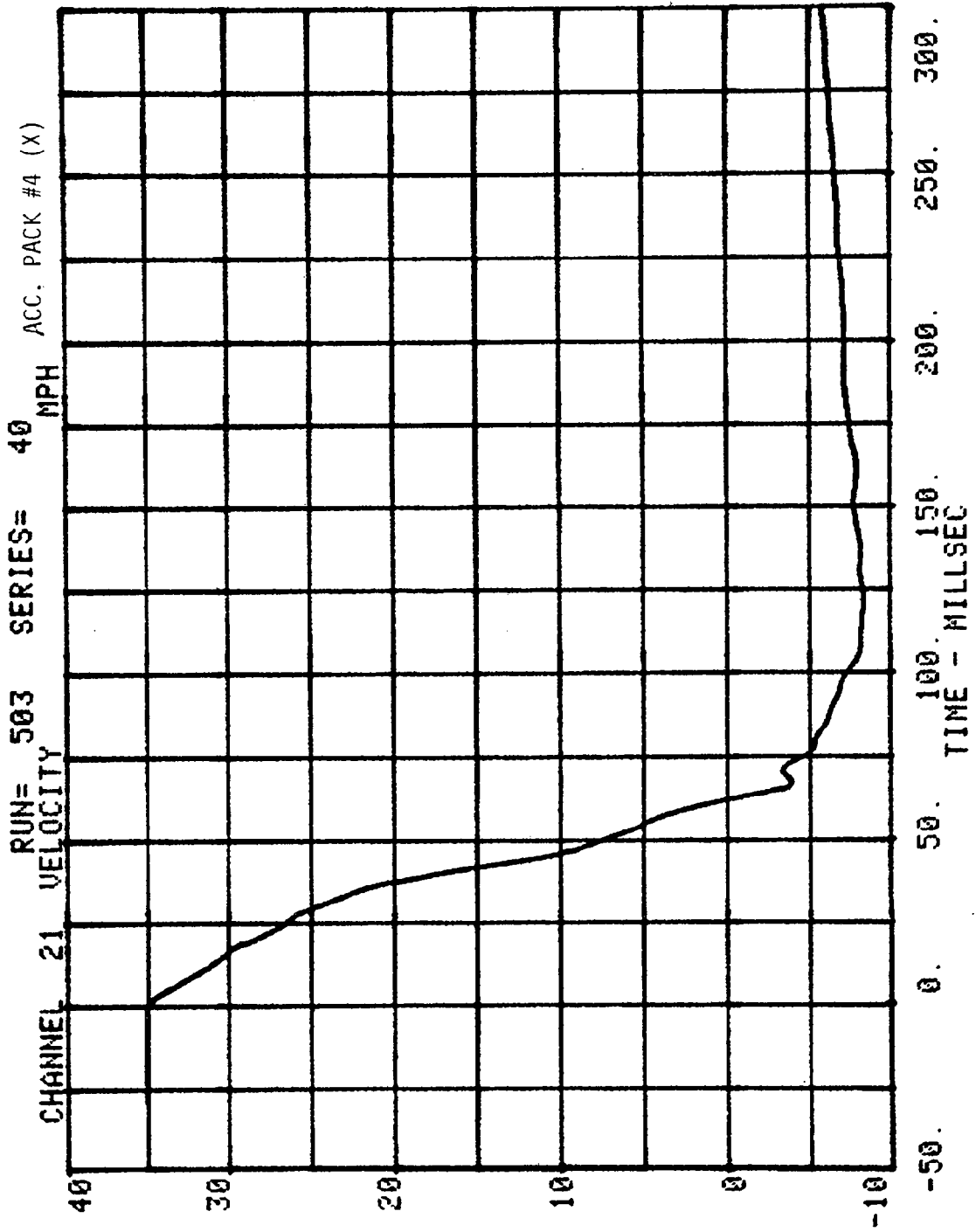




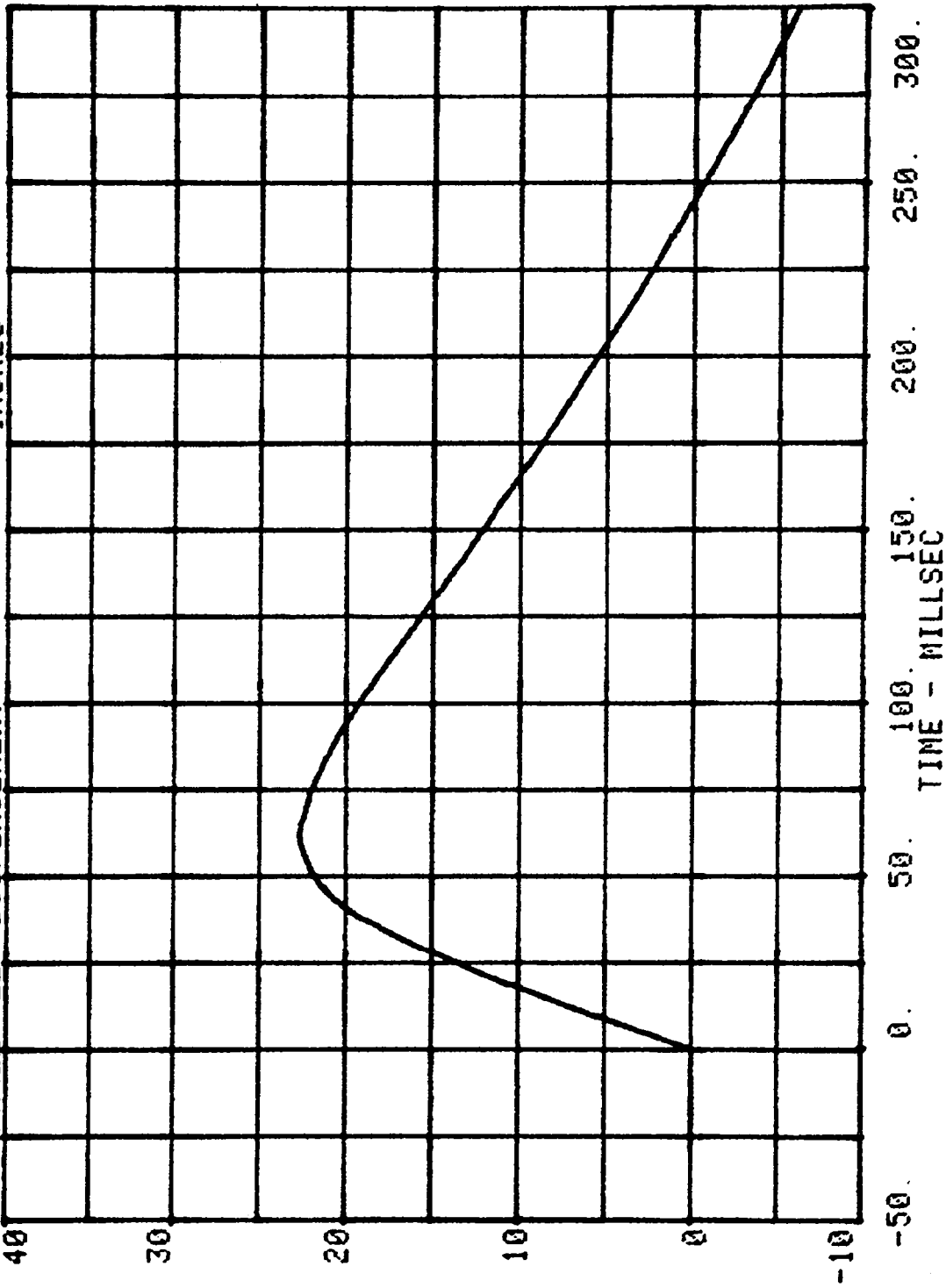


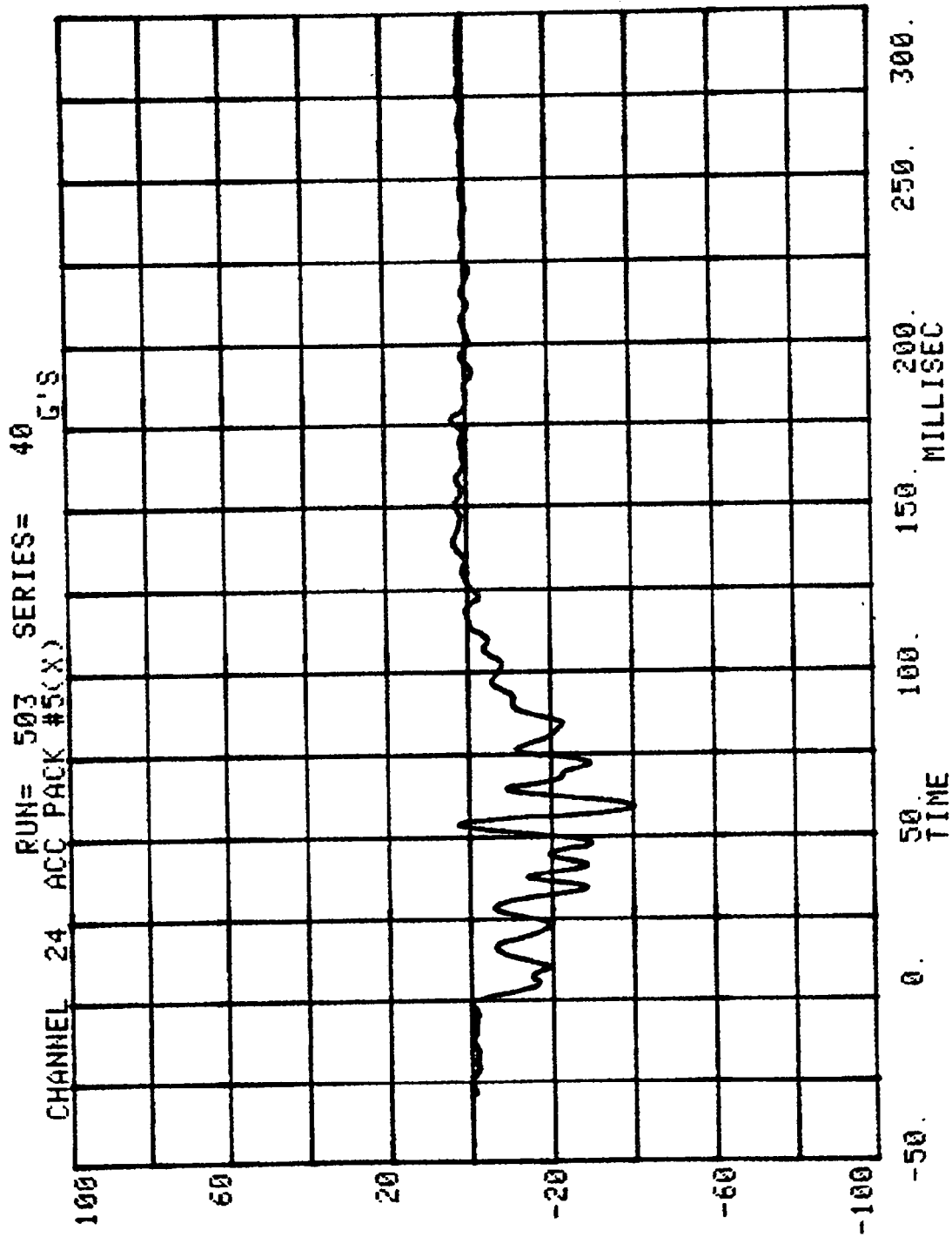






CHANNEL 22 DISPLACEMENT RUN= 503 SERIES= 40 INCHES ACC. PACK #4 (X)



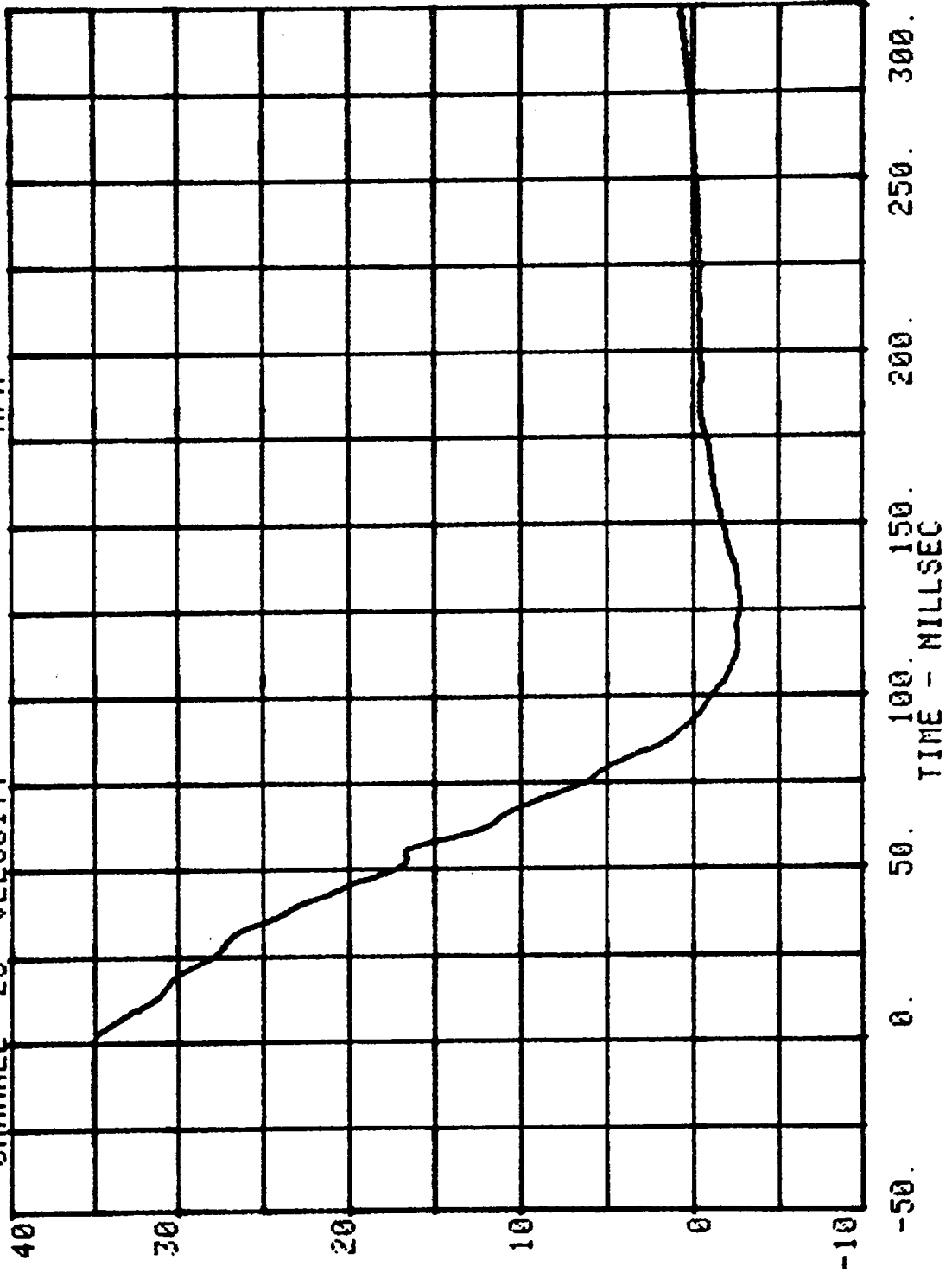


ACC. PACK #5 (X)

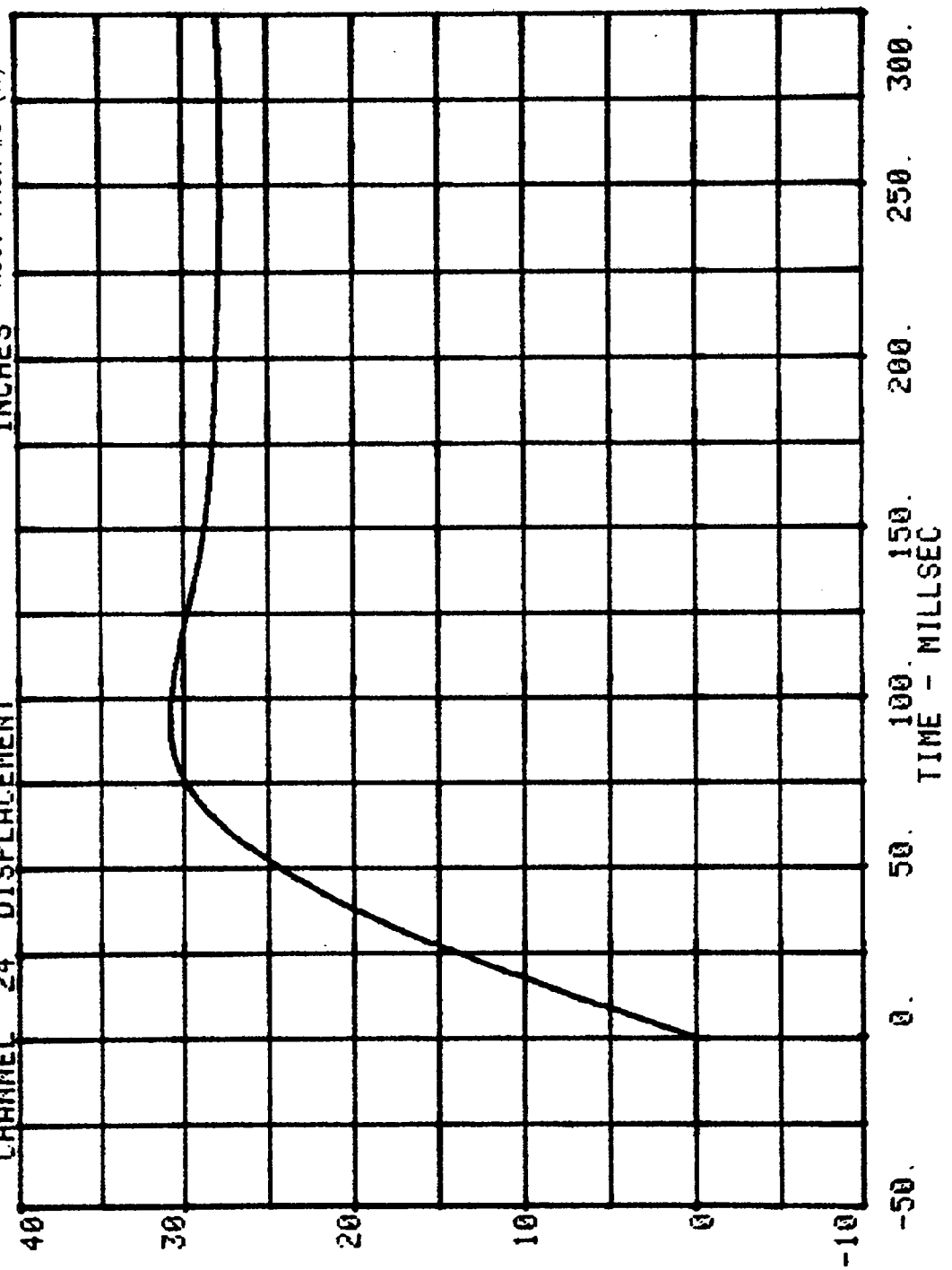
SERIES= 40 MPH

RUN= 503

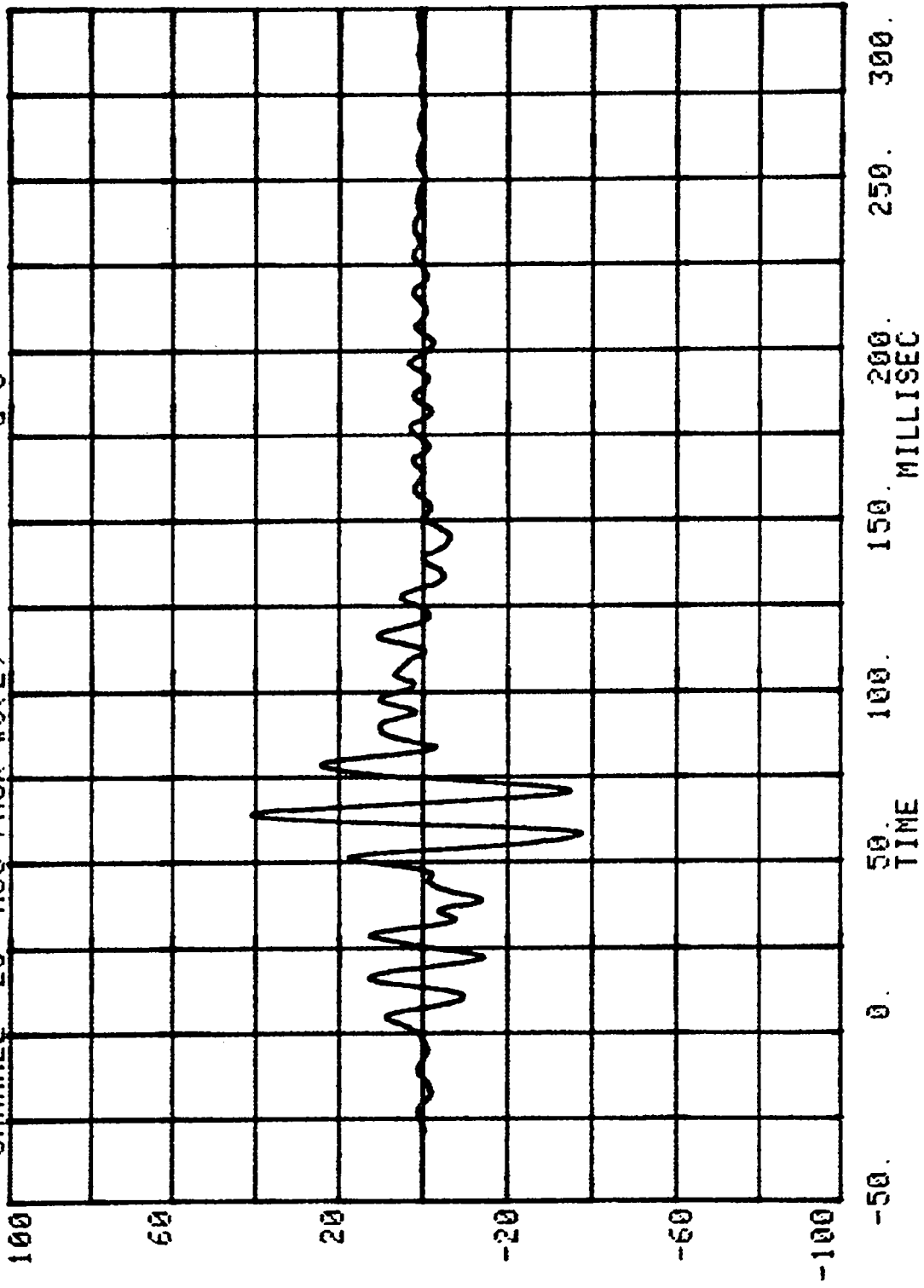
CHANNEL 23 VELOCITY

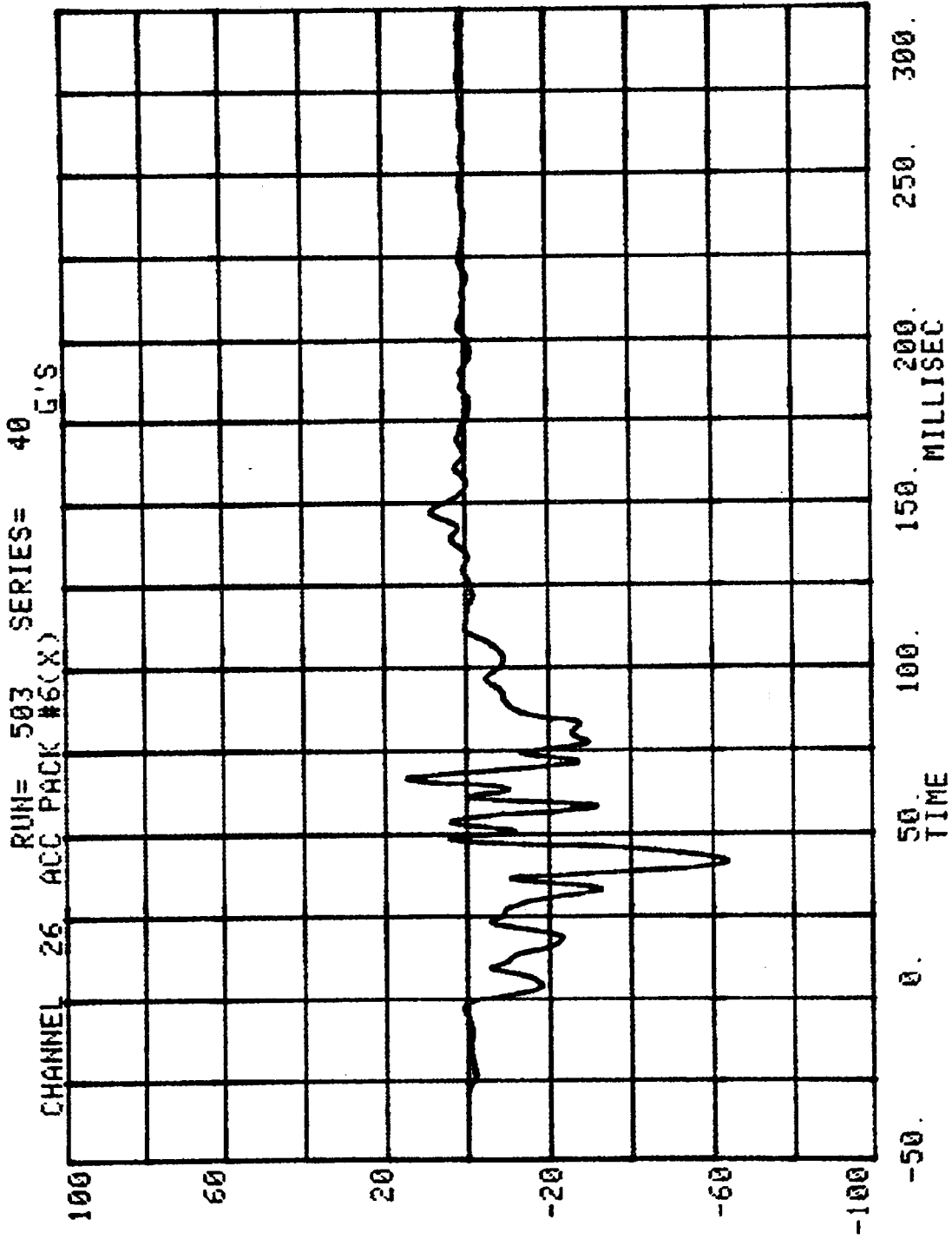


CHANNEL 24 DISPLACEMENT      RUN= 503      SERIES= 40      INCHES      ACC. PACK #5 (X)

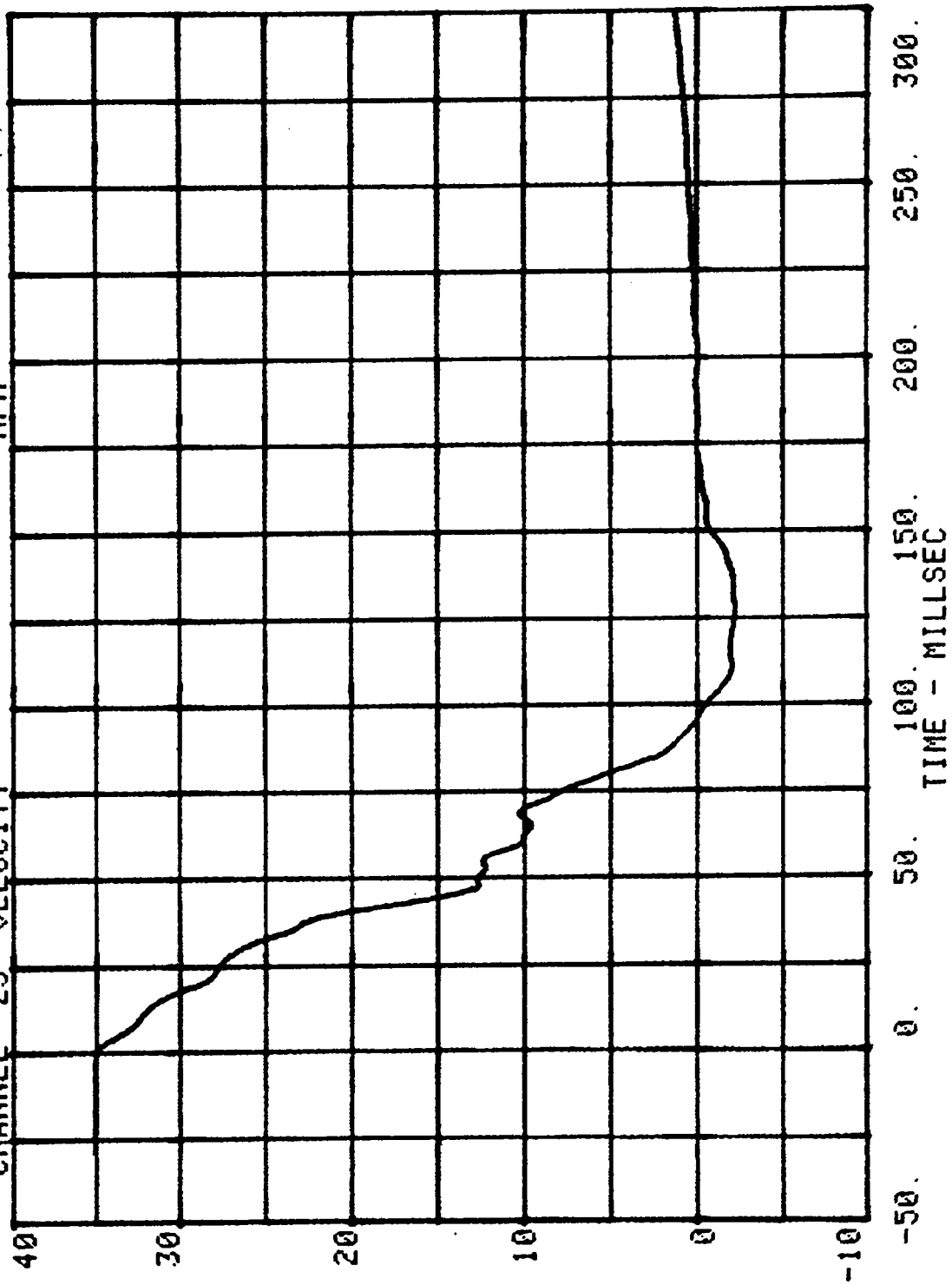


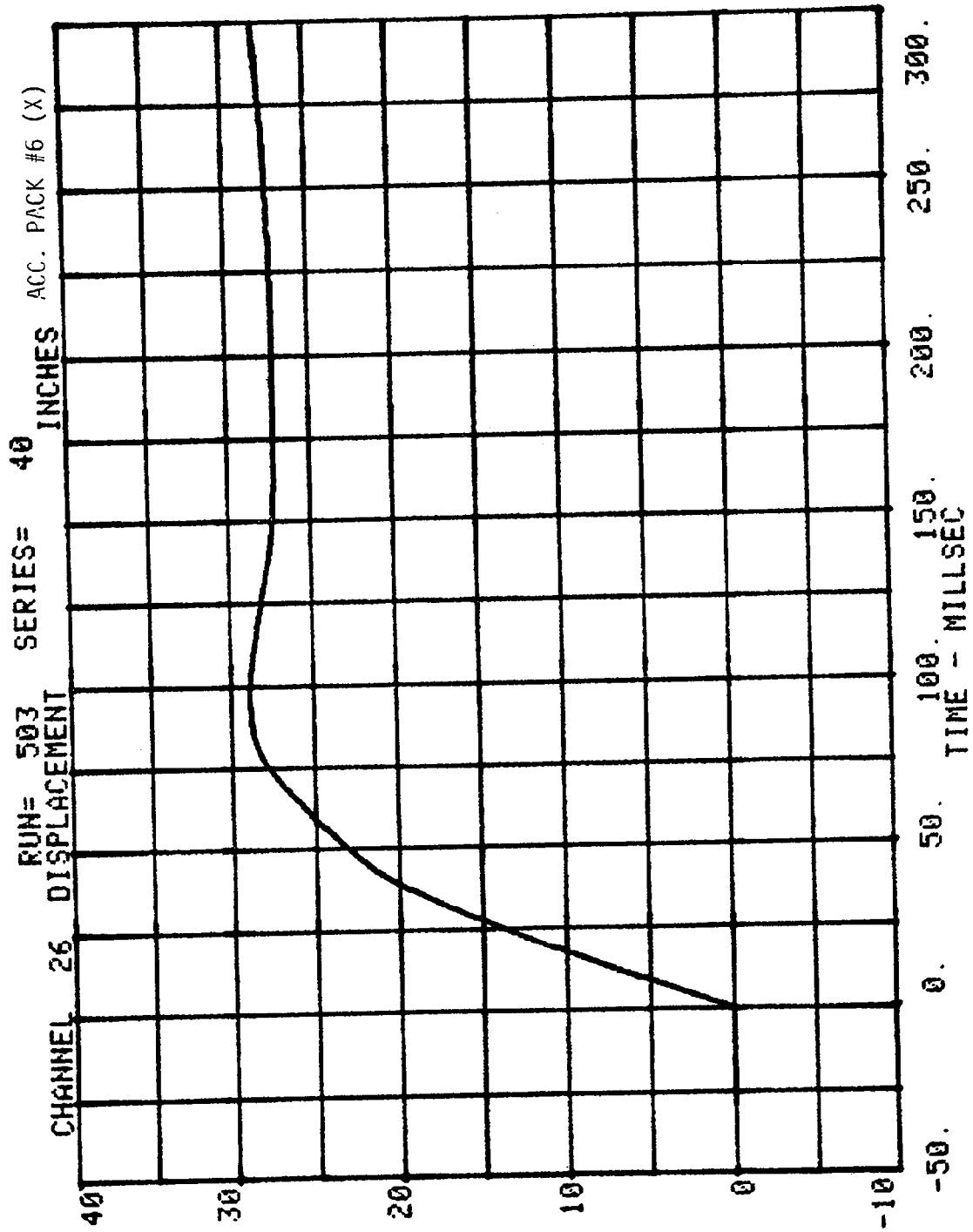
CHANNEL 25 ACC PACK #5(Z) RUN= 503 SERIES= 40 G'S



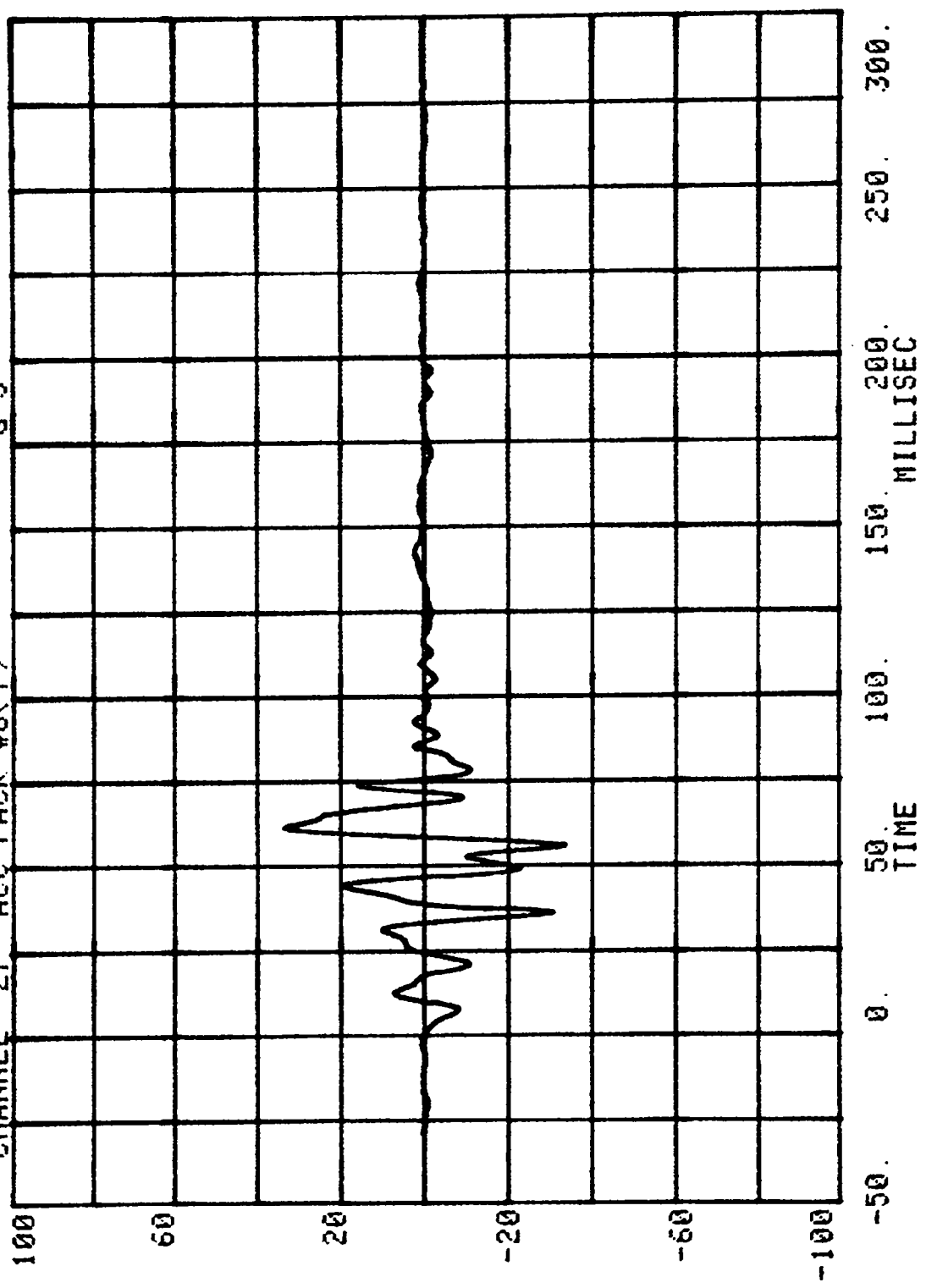


CHANNEL 25 VELOCITY RUN= 503 SERIES= 40 MPH ACC. PACK #6 (X)

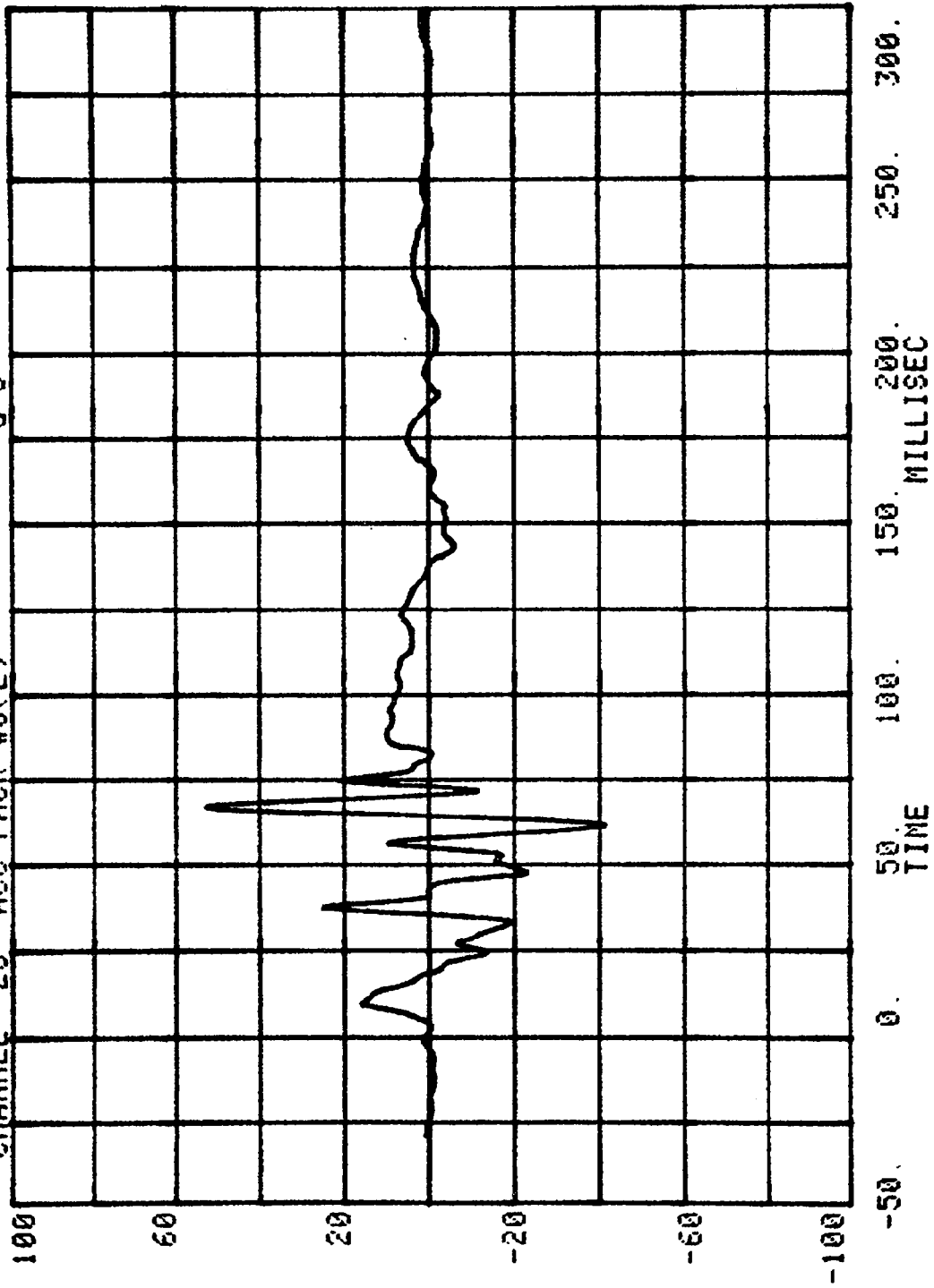


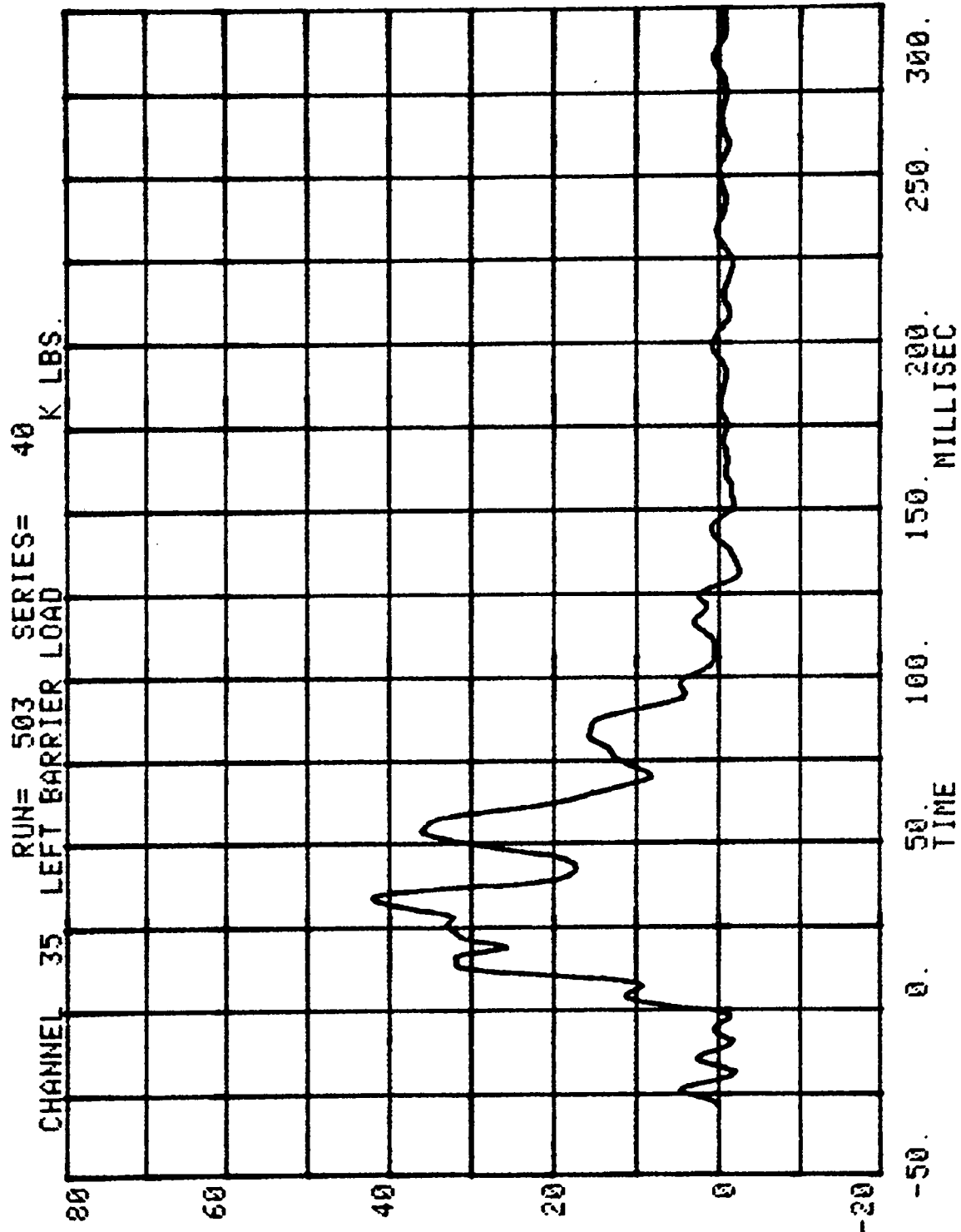


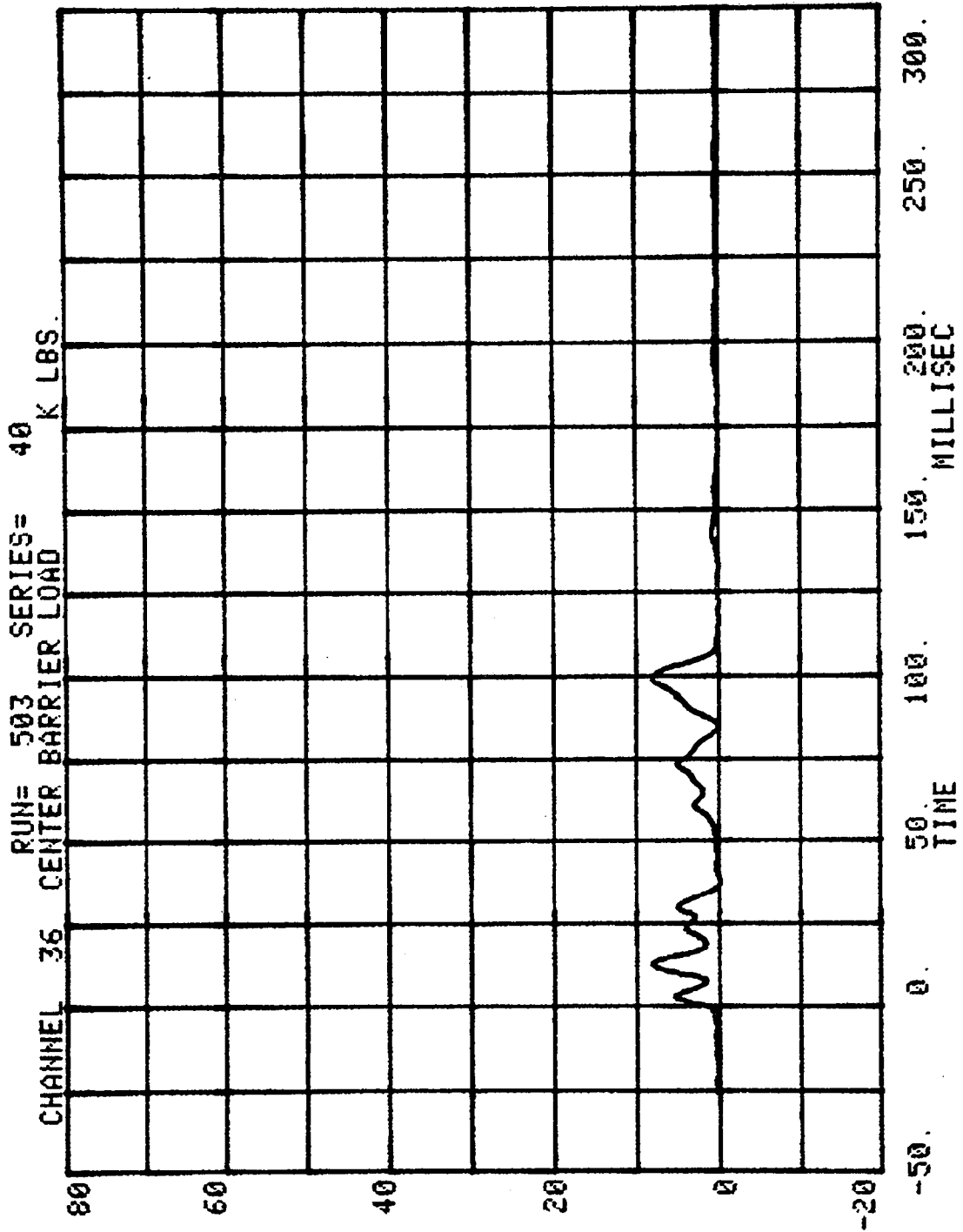
CHANNEL 27 ACC PACK #6(Y) RUN= 503 SERIES= 40 G'S



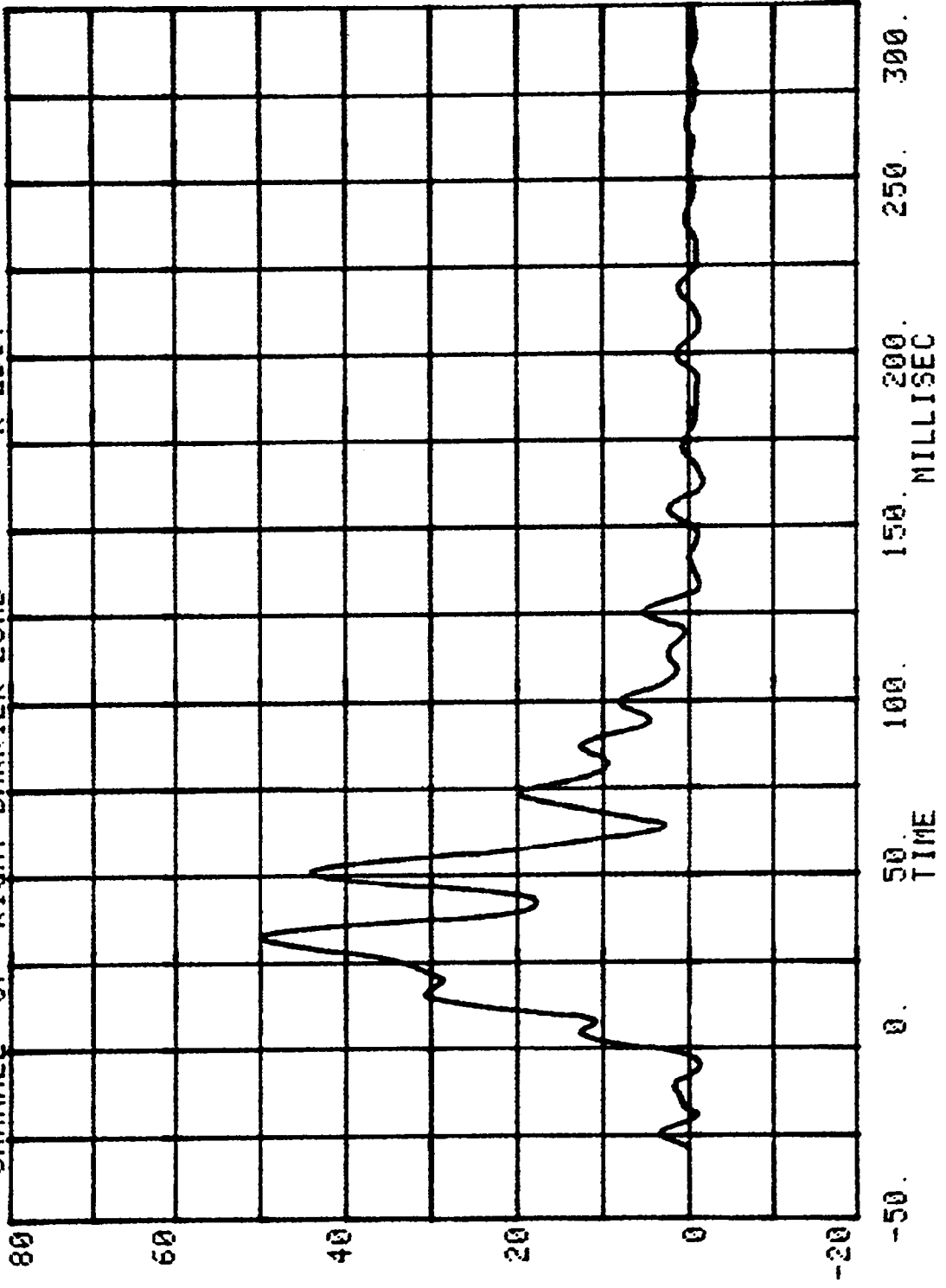
CHANNEL 28 ACC PACK #6(Z) RUN= 503 SERIES= 40 G'S

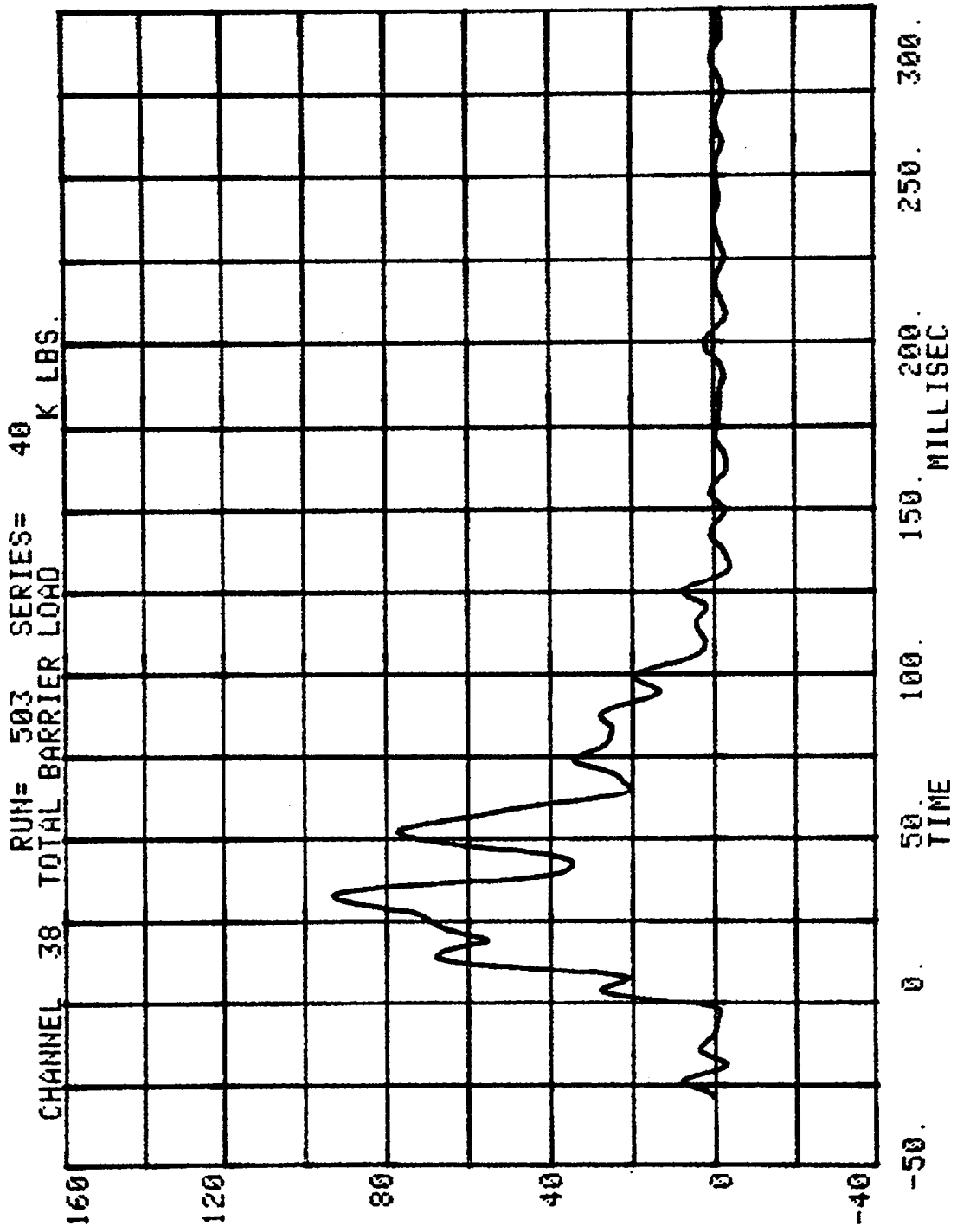






CHANNEL 37 RIGHT BARRIER LOAD 40 K LBS. SERIES= 503 RUN= 503





Test 308-40-503  
1981 Ford Escort  
Dummy Data

	Filter Channel Class
Head Acceleration	1000
Chest Acceleration	180
Femur Forces	600
Belt Loads	60

HEAD INJURY CRITERION  
HEAD SEVERITY INDEX

NCA BARRIER TEST #40

RUN= 503

POS#1 HEAD RESULTANT

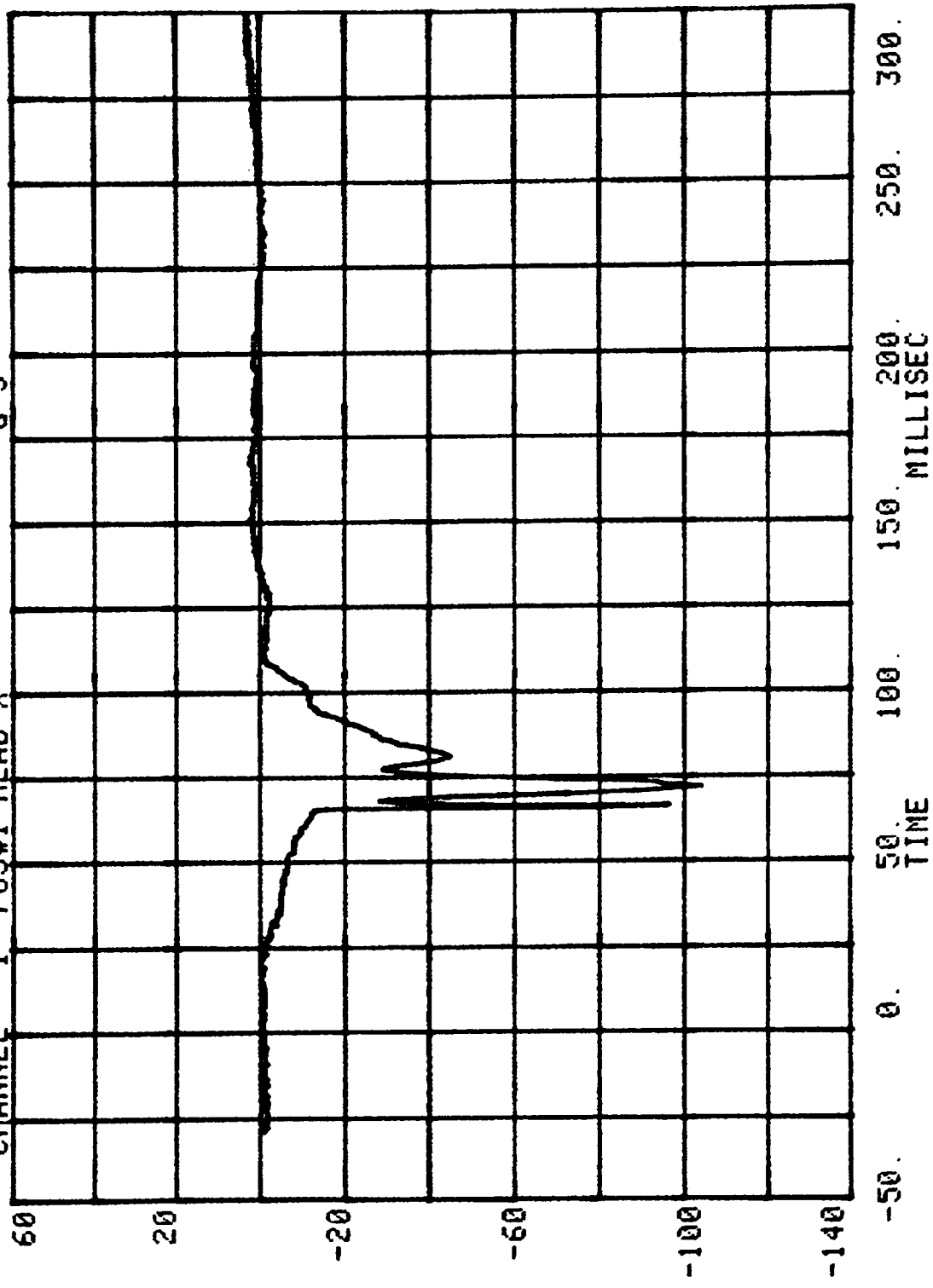
HIC= 618.2 FROM T1= .06630 TO T2= .08880  
AVERAGE ACCELERATION BETWEEN T1 AND T2= 59.6G'S  
EVENT TIME= 300.0 MSEC  
SEVERITY INDEX= 820.6

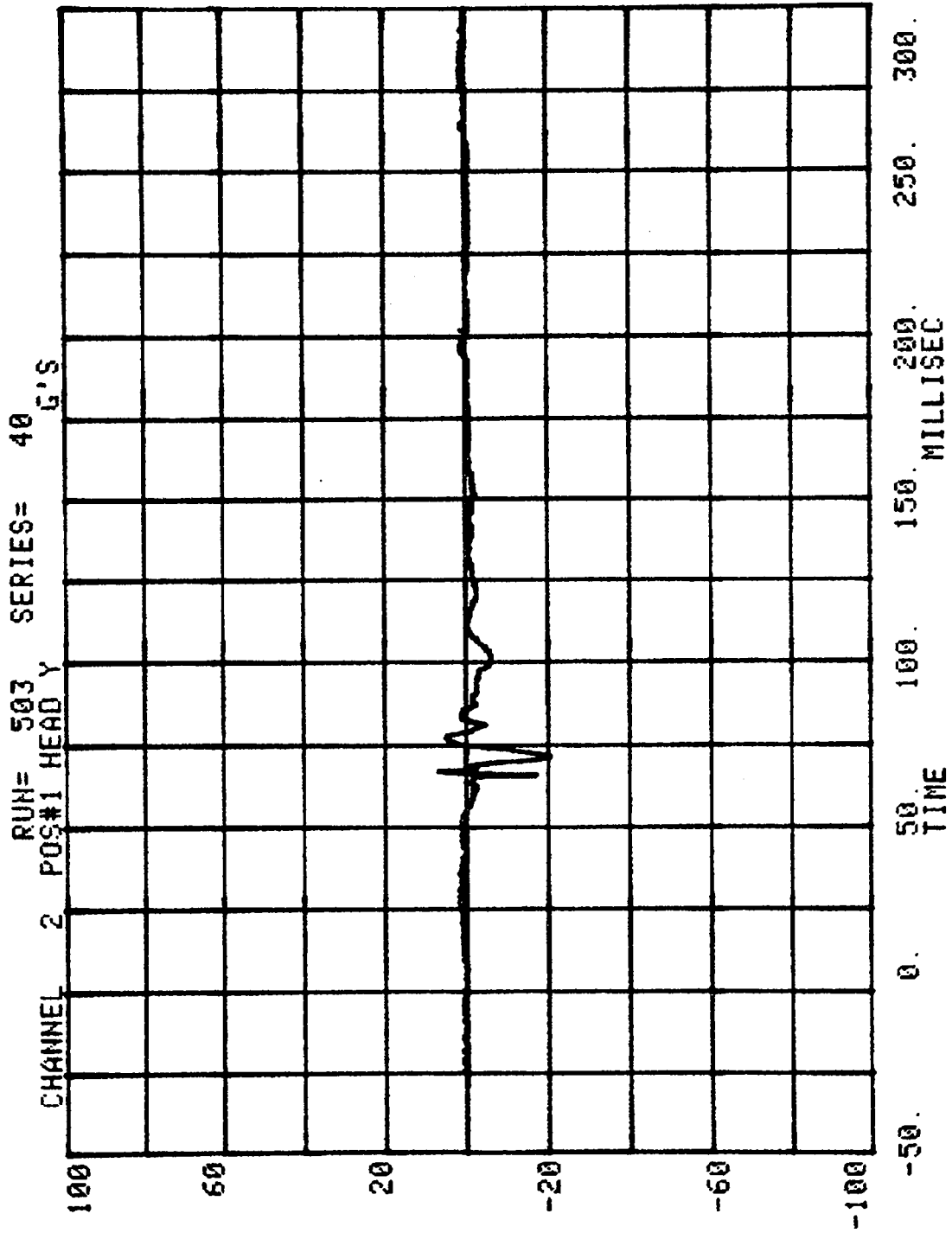
CHANNEL 1 POS#1 HEAD X G'S

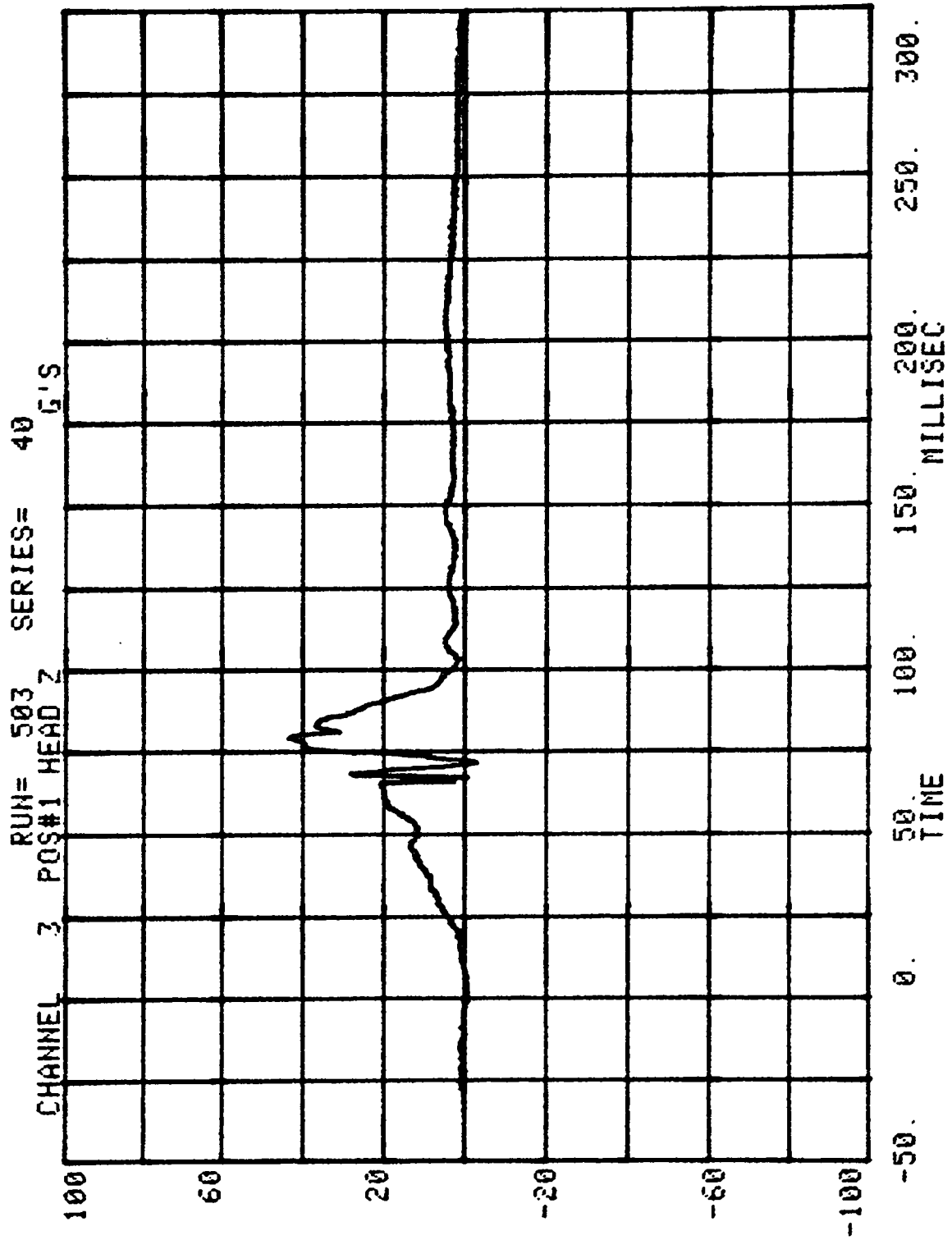
RUN= 503

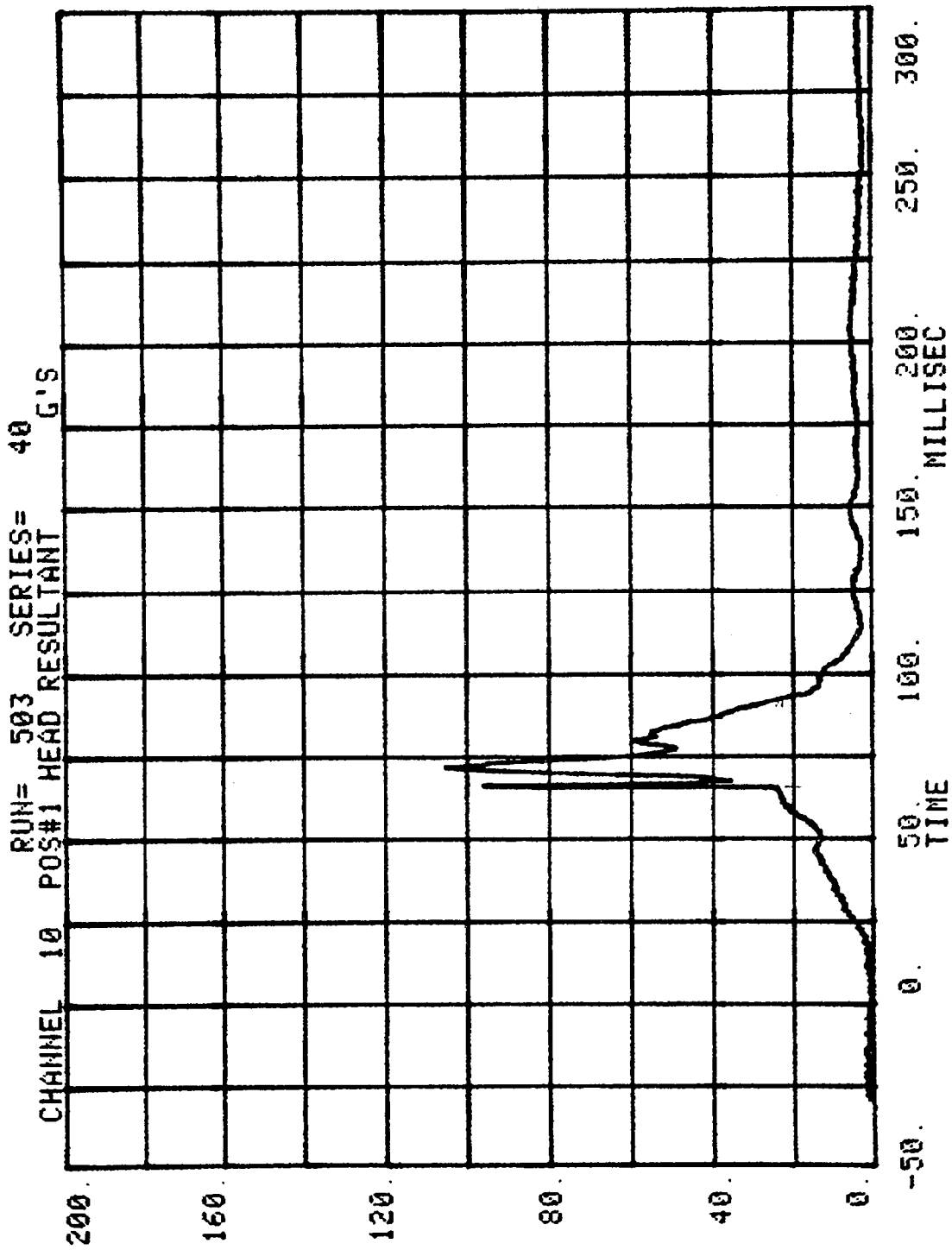
SERIES=

40

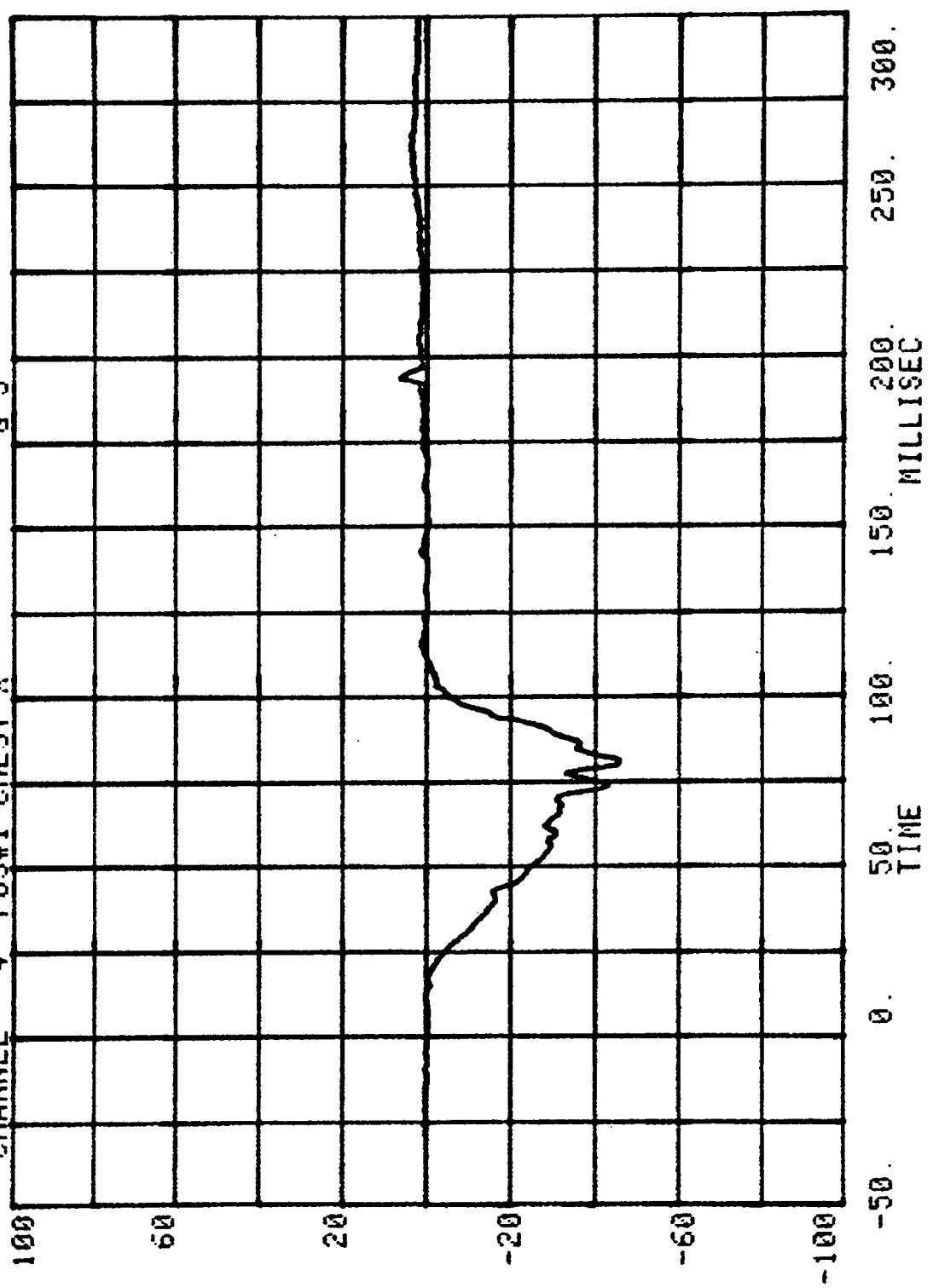


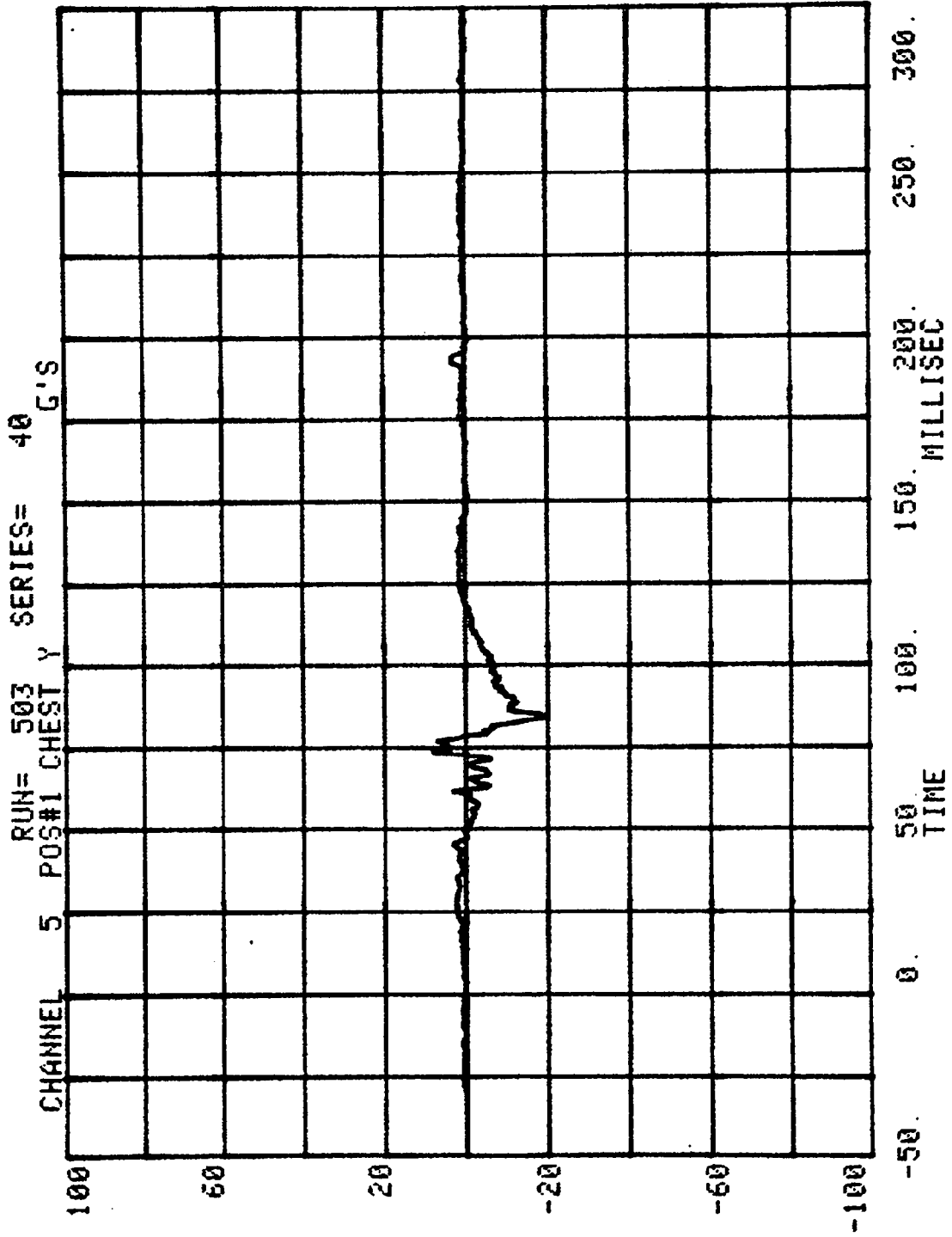


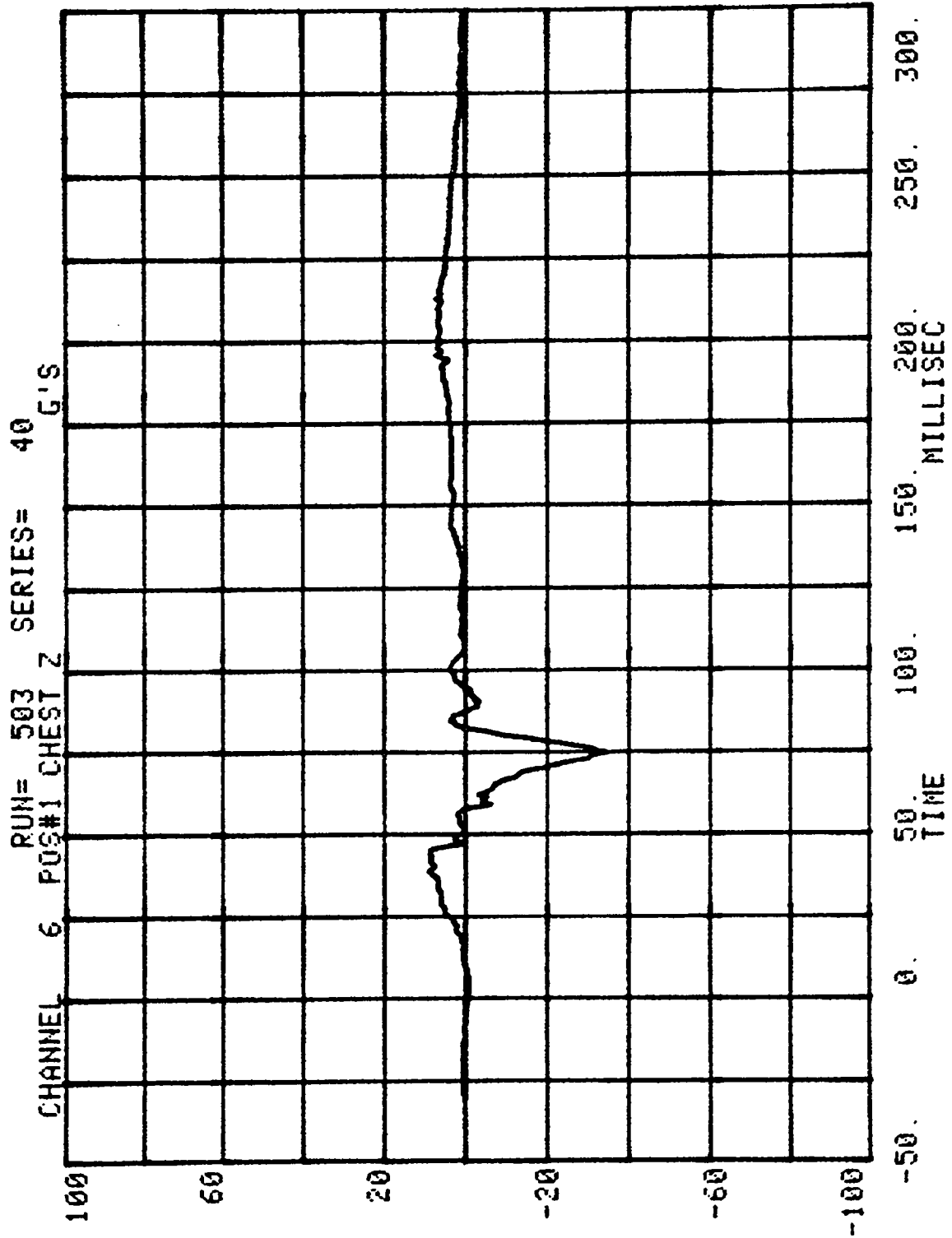


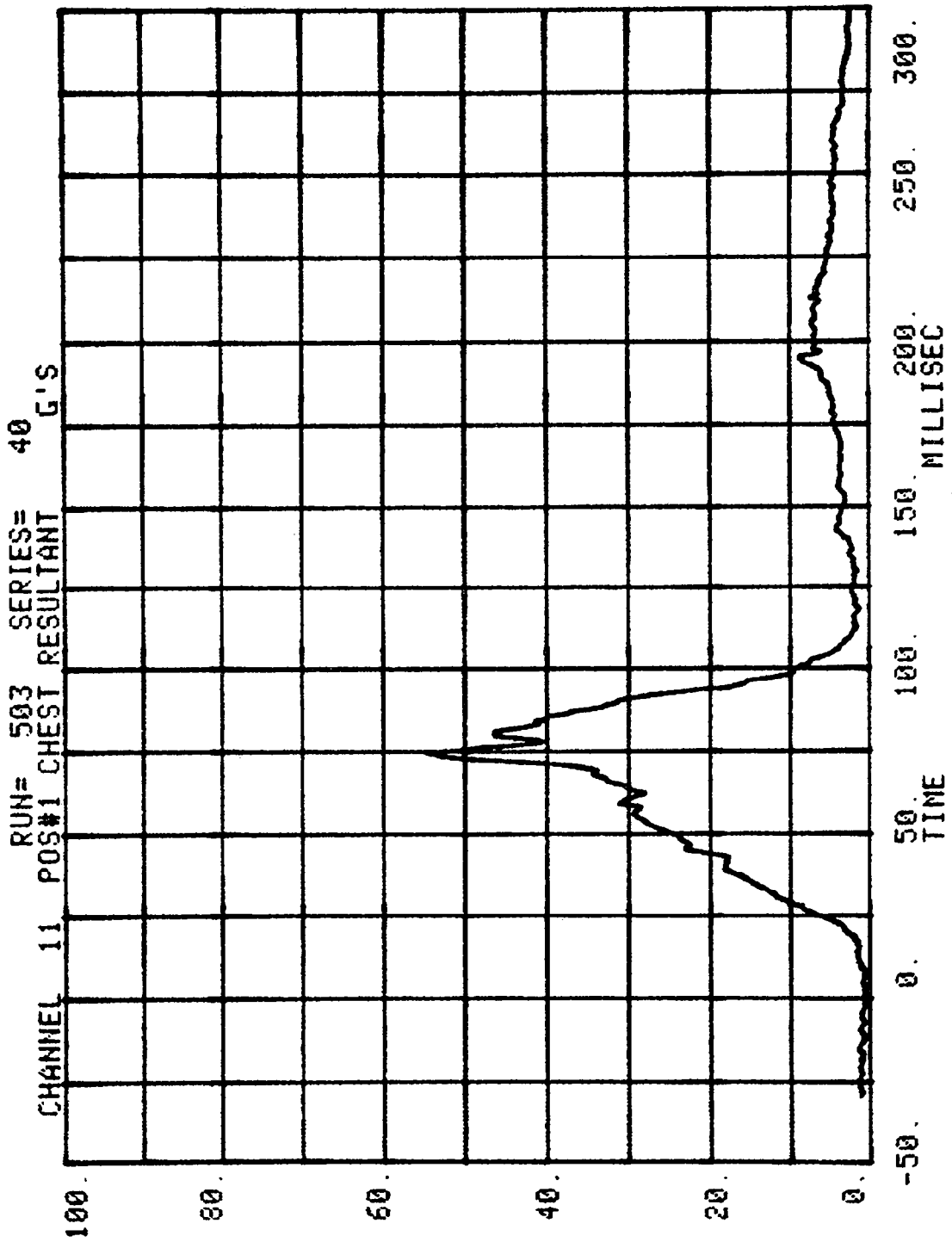


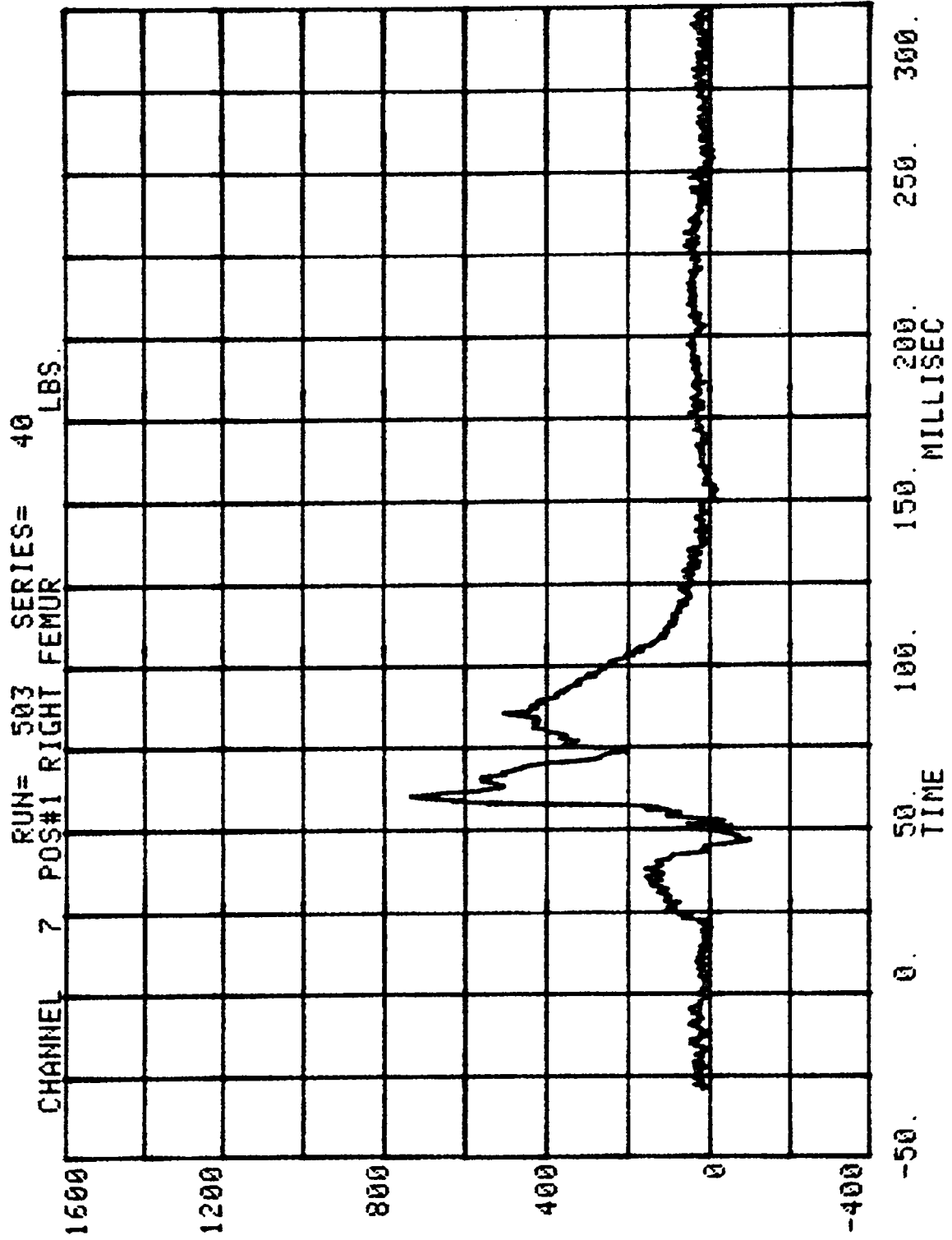
CHANNEL 4 POS#1 CHEST X  
RUN= 503 SERIES= 40 G'S

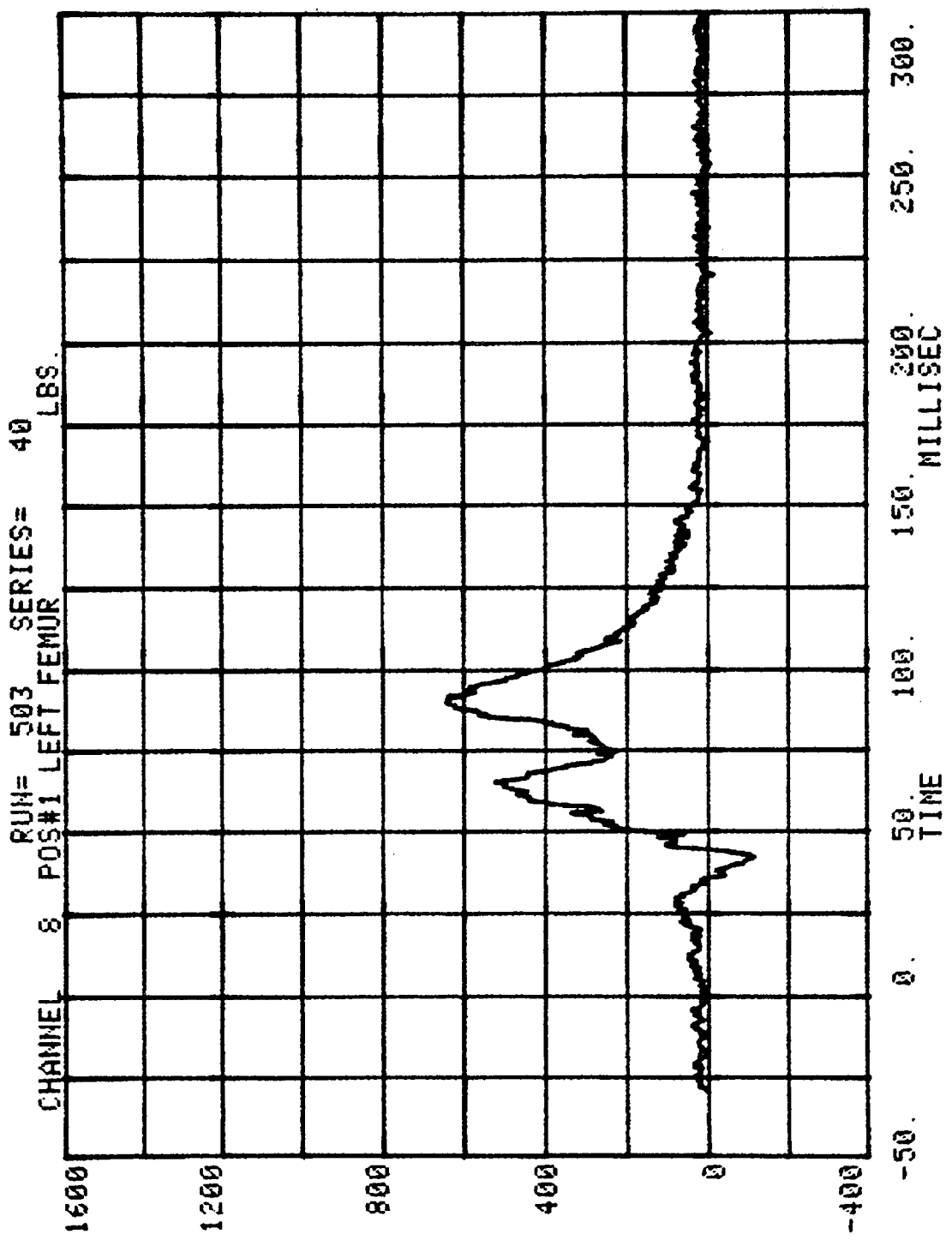


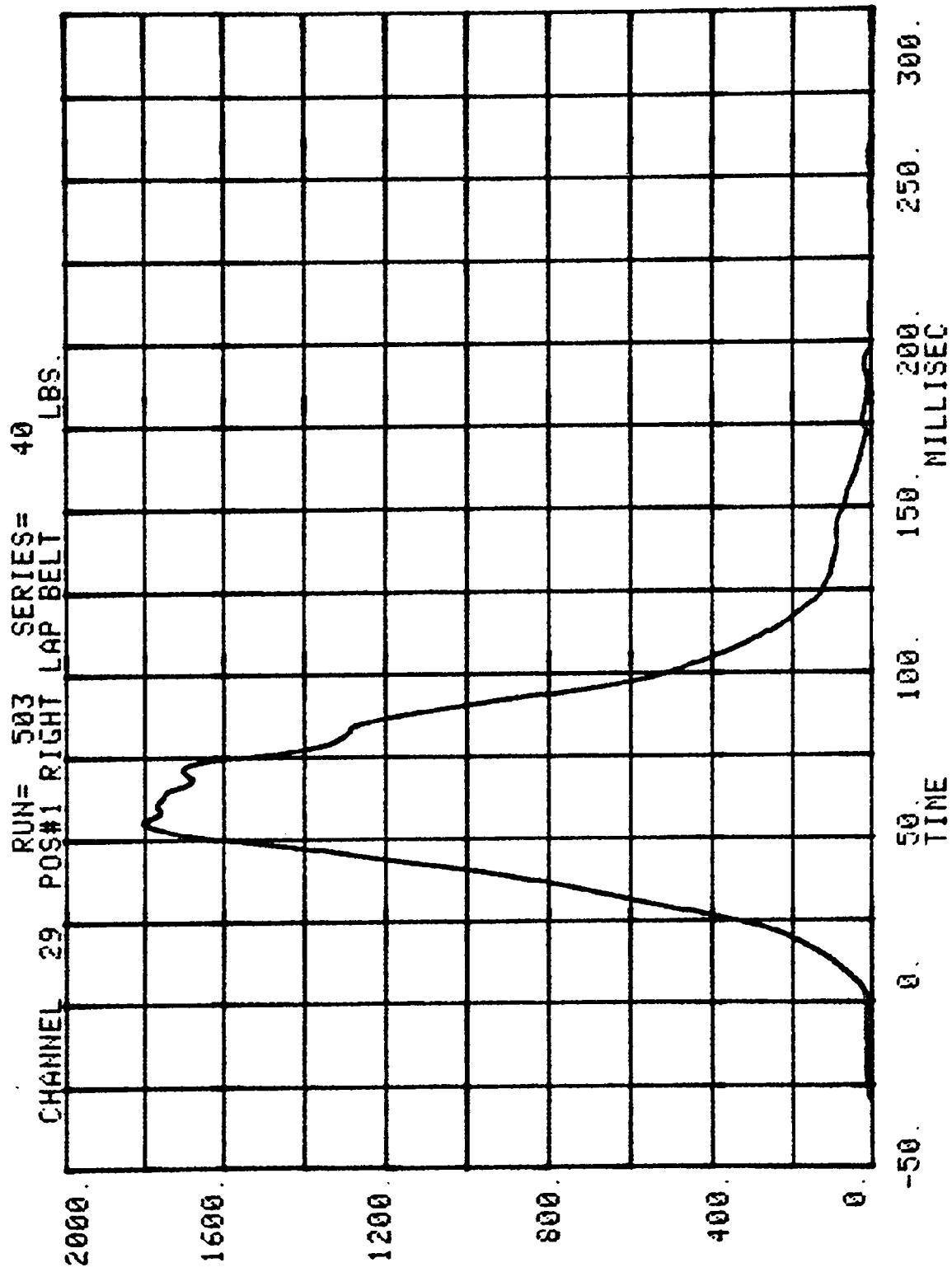


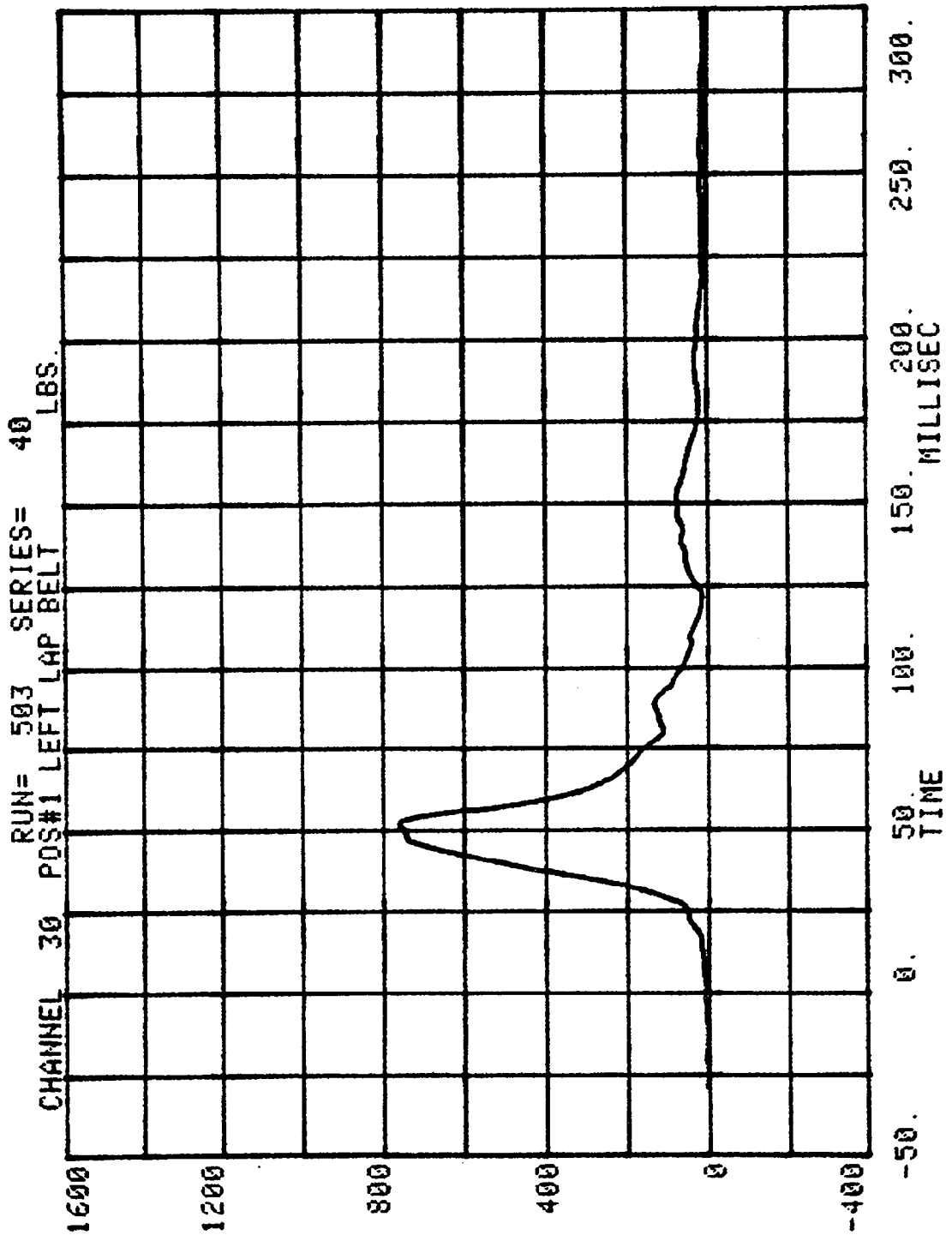




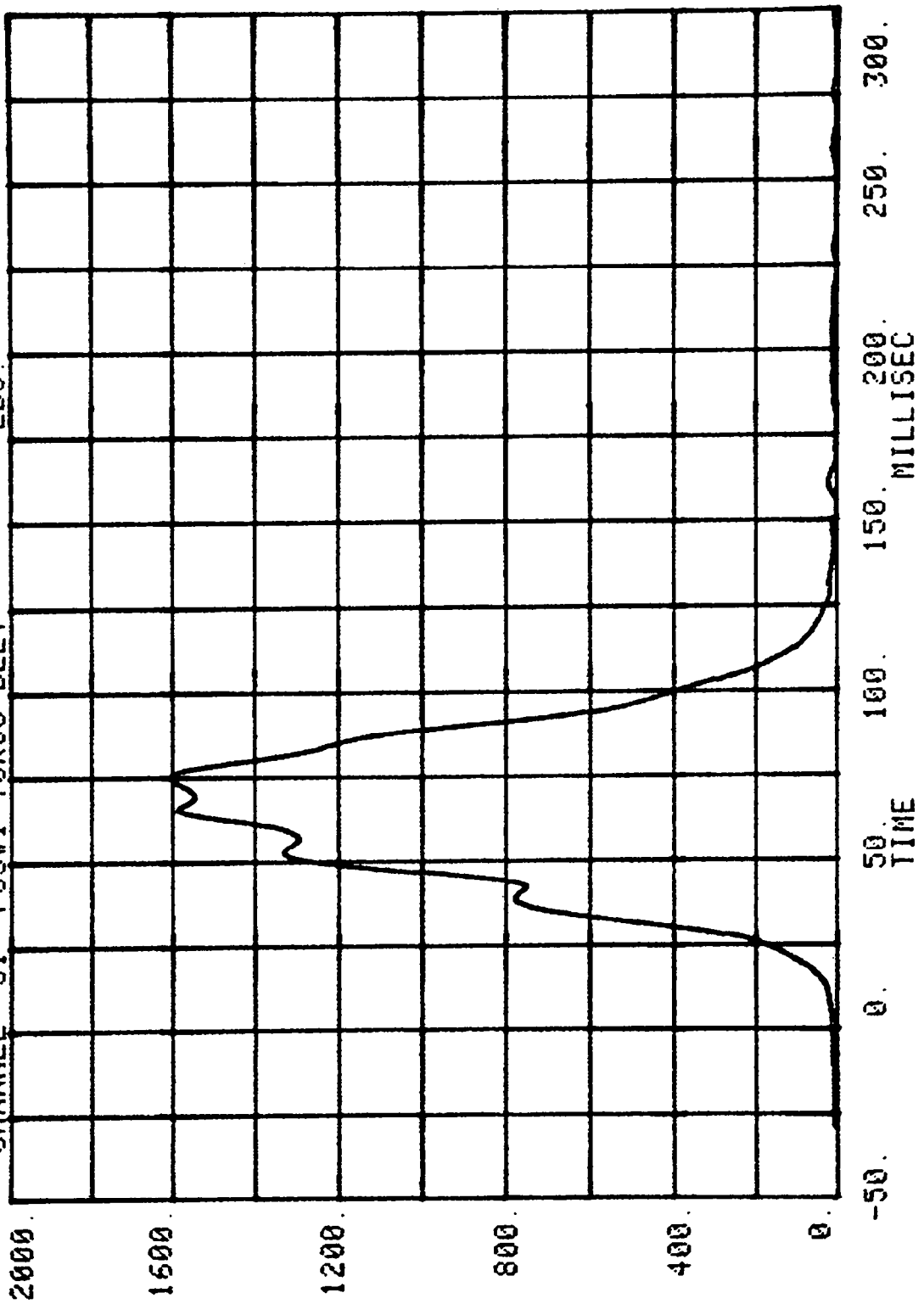








CHANNEL 31 POS#1 TORSO BELT  
RUN= 503 SERIES= 40 LBS.



HEAD INJURY CRITERION  
HEAD SEVERITY INDEX

NCA BARRIER TEST #40

RUN= 503

POS#2 HEAD RESULTANT

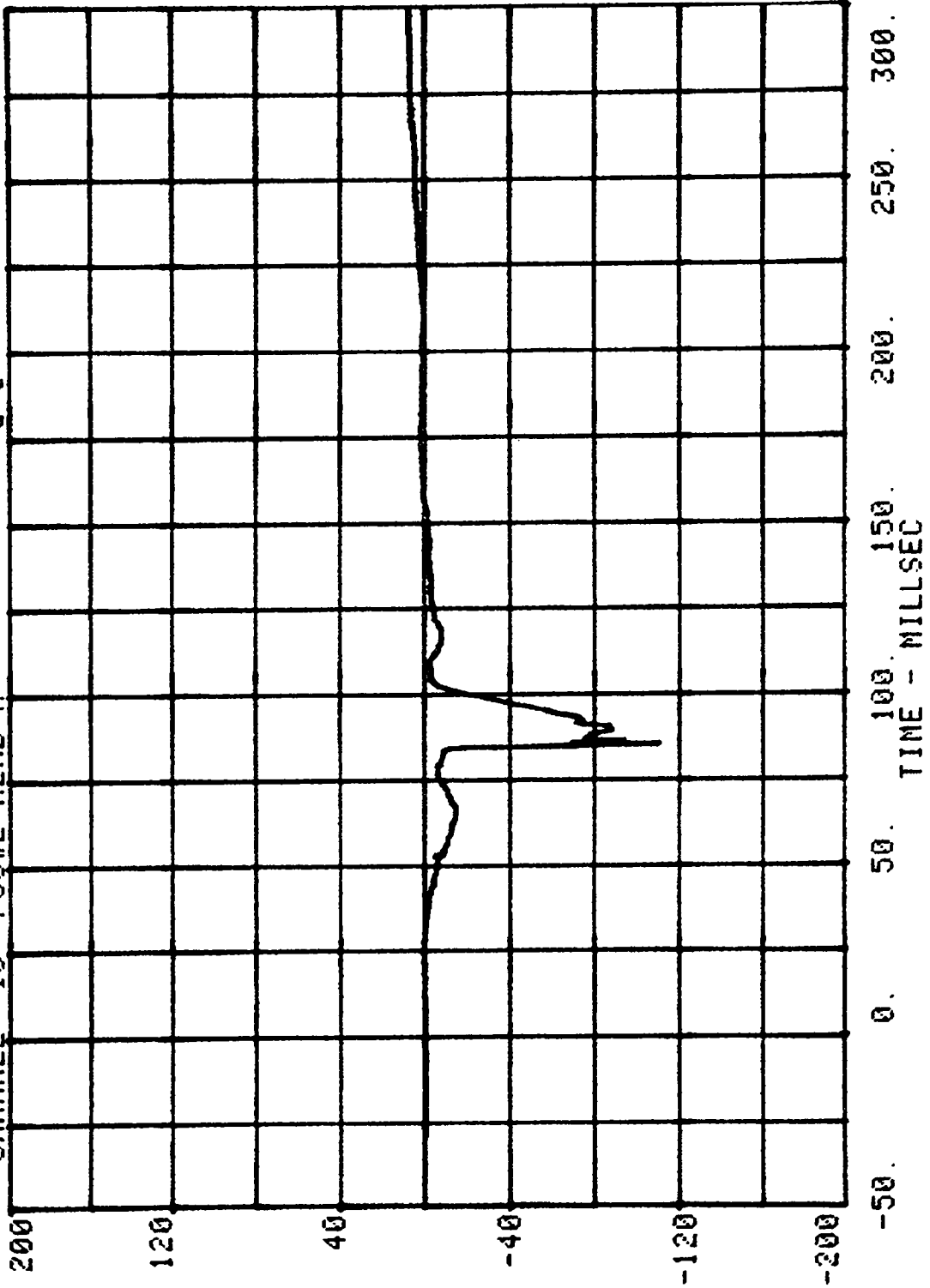
HIC=1011.2 FROM T1= .08430 TO T2= .09660

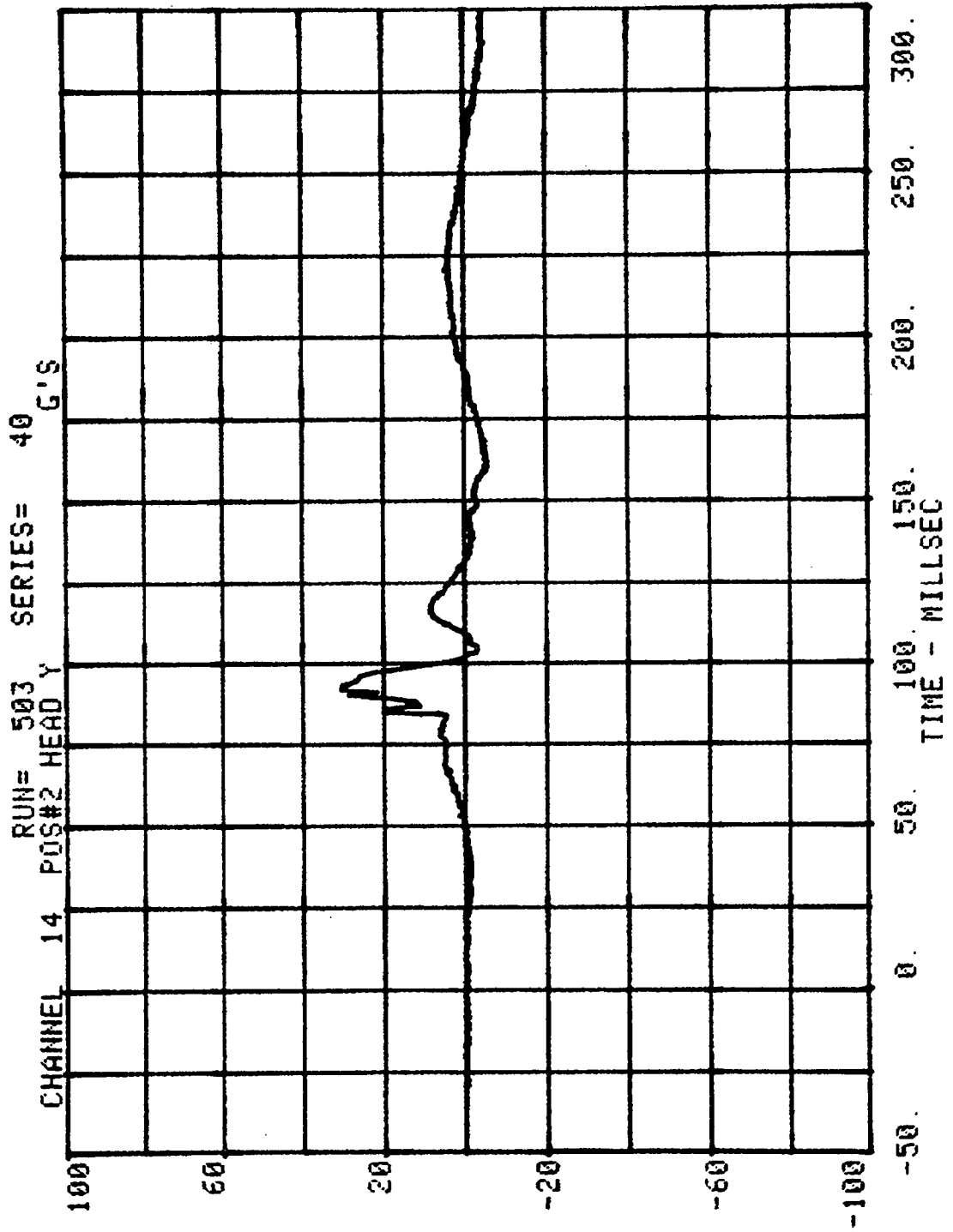
AVERAGE ACCELERATION BETWEEN T1 AND T2= 92.5G'S

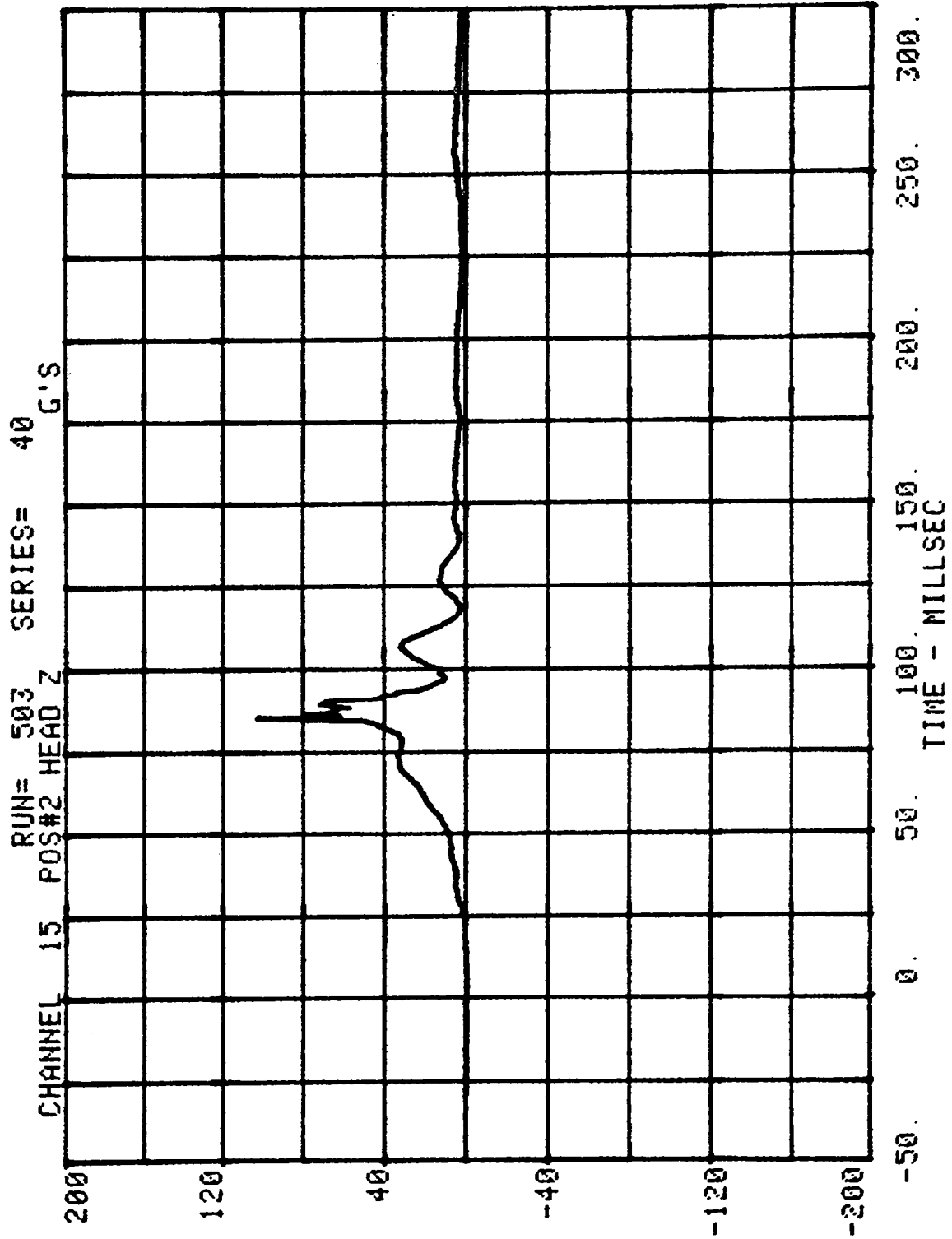
EVENT TIME= 300.0 MSEC

SEVERITY INDEX=1402.4

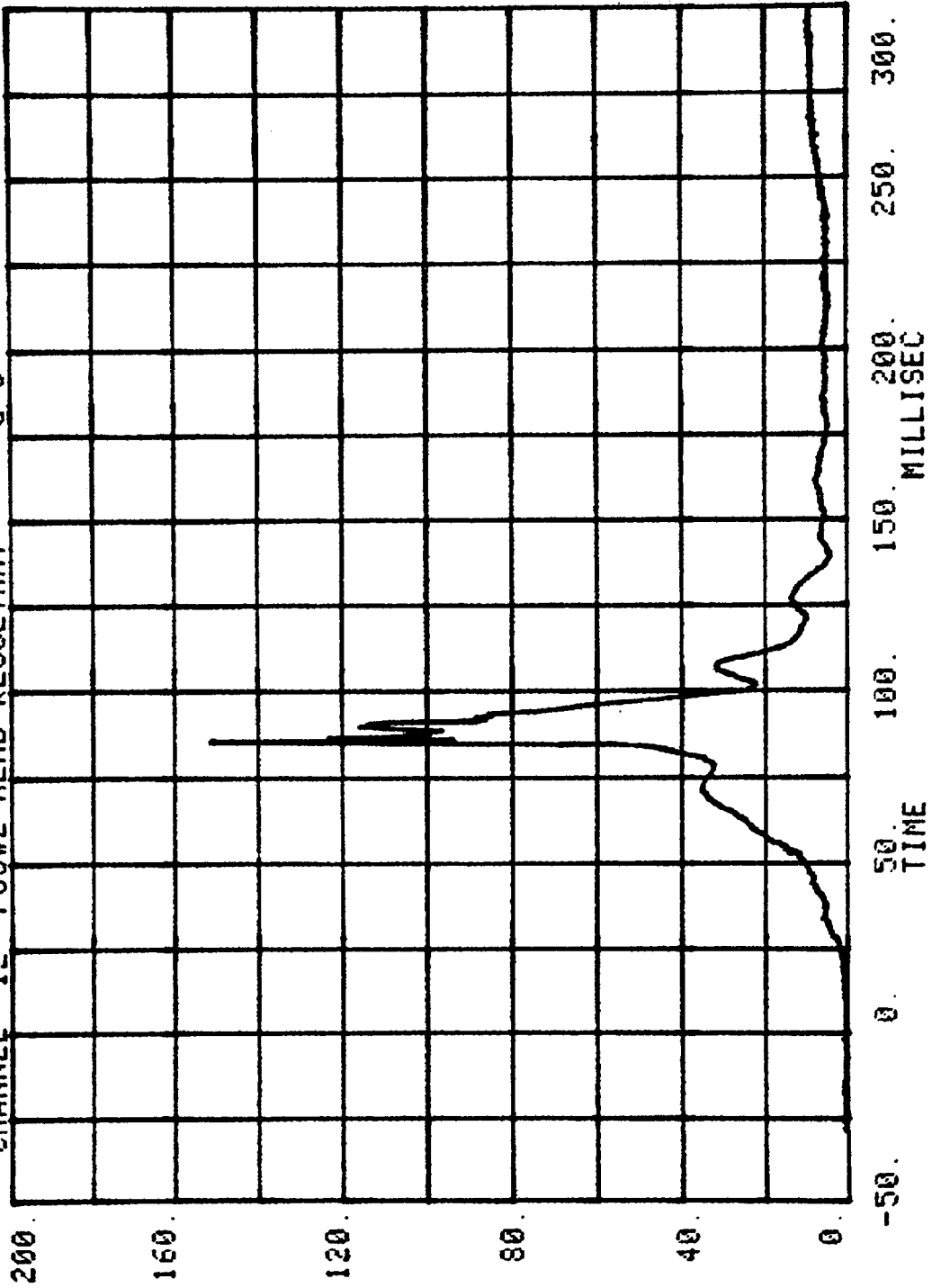
CHANNEL 13 POS#2 HEAD X  
RUN= 503 SERIES= 40 G'S

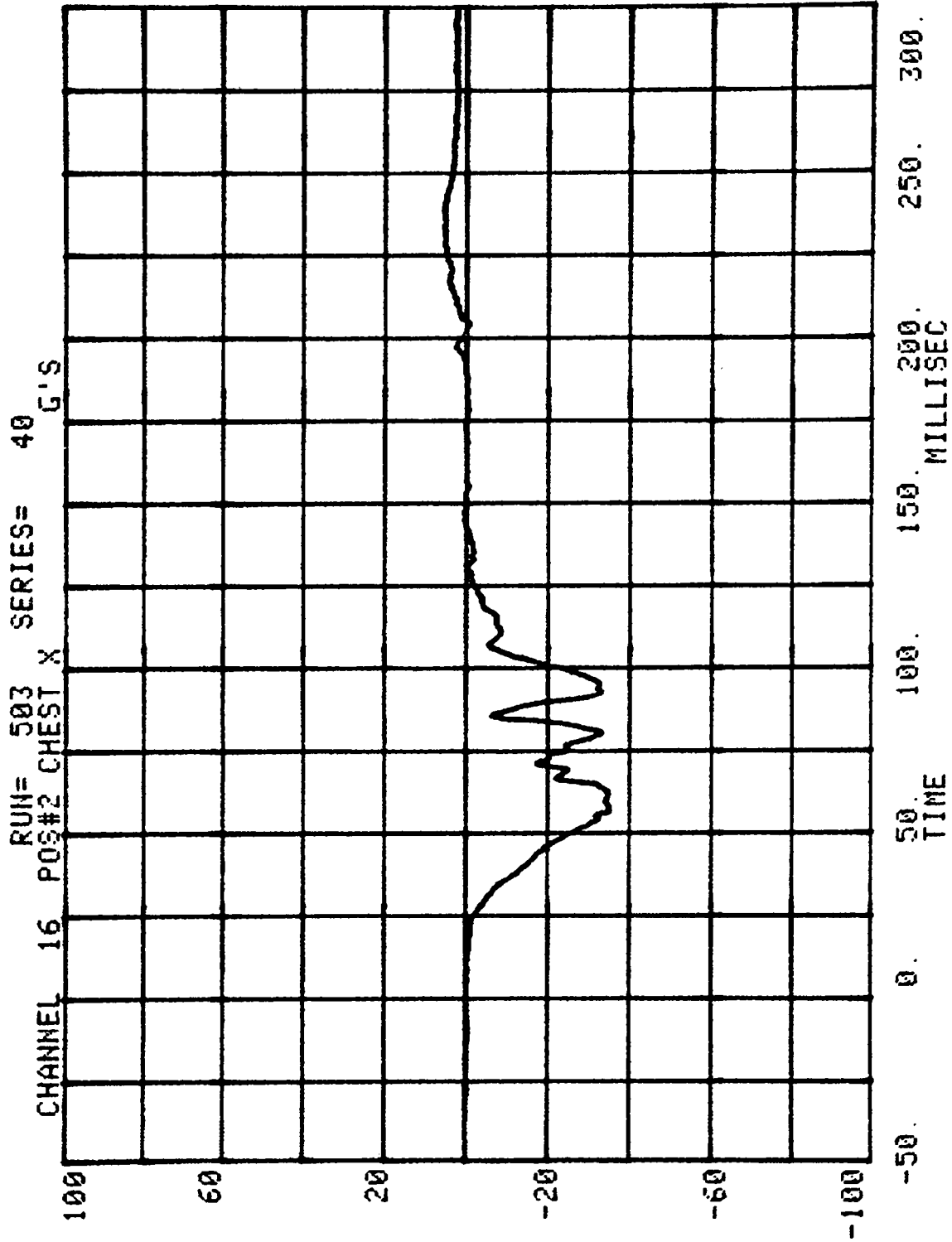


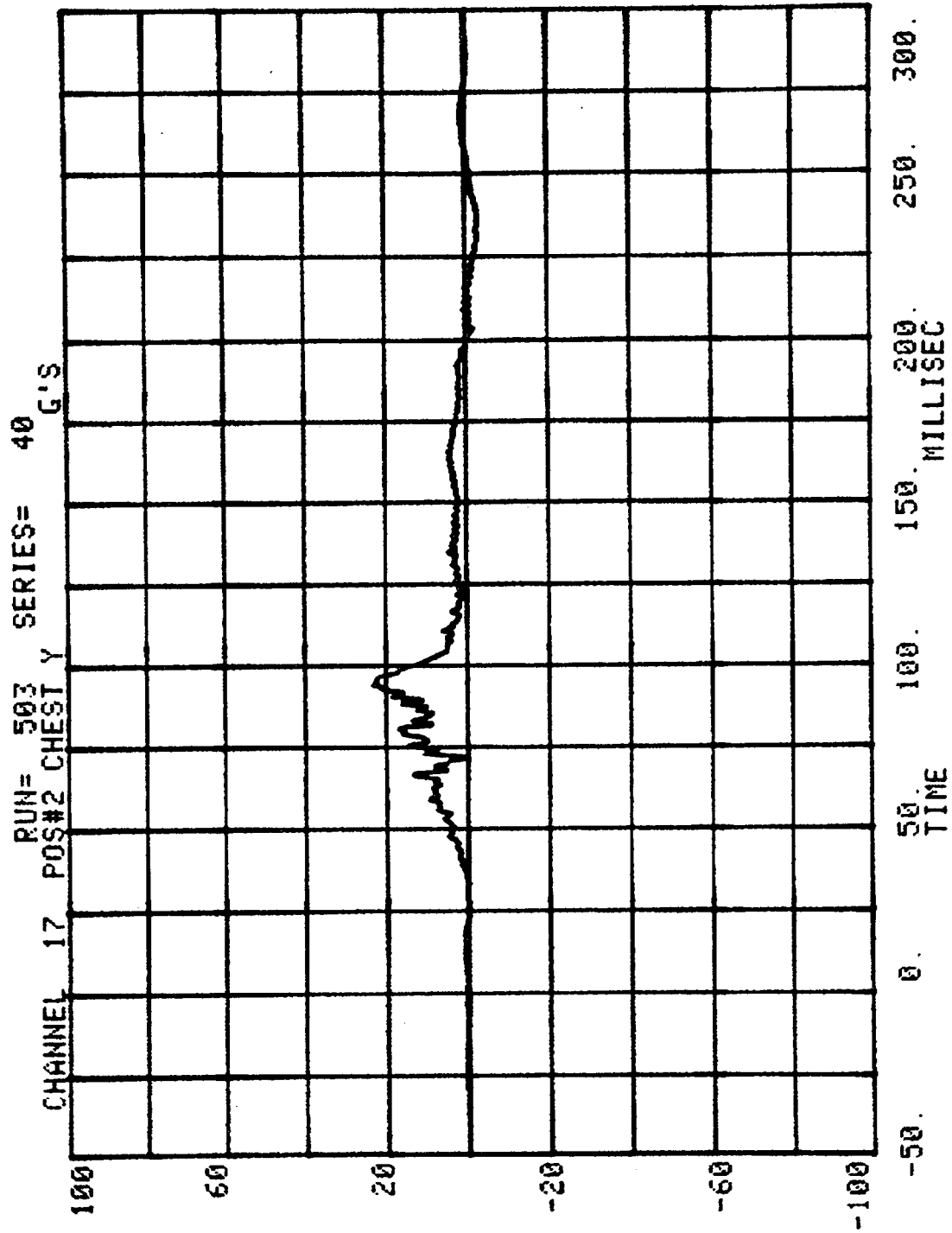




CHANNEL 12 POS#2 HEAD RESULTANT 40 G'S





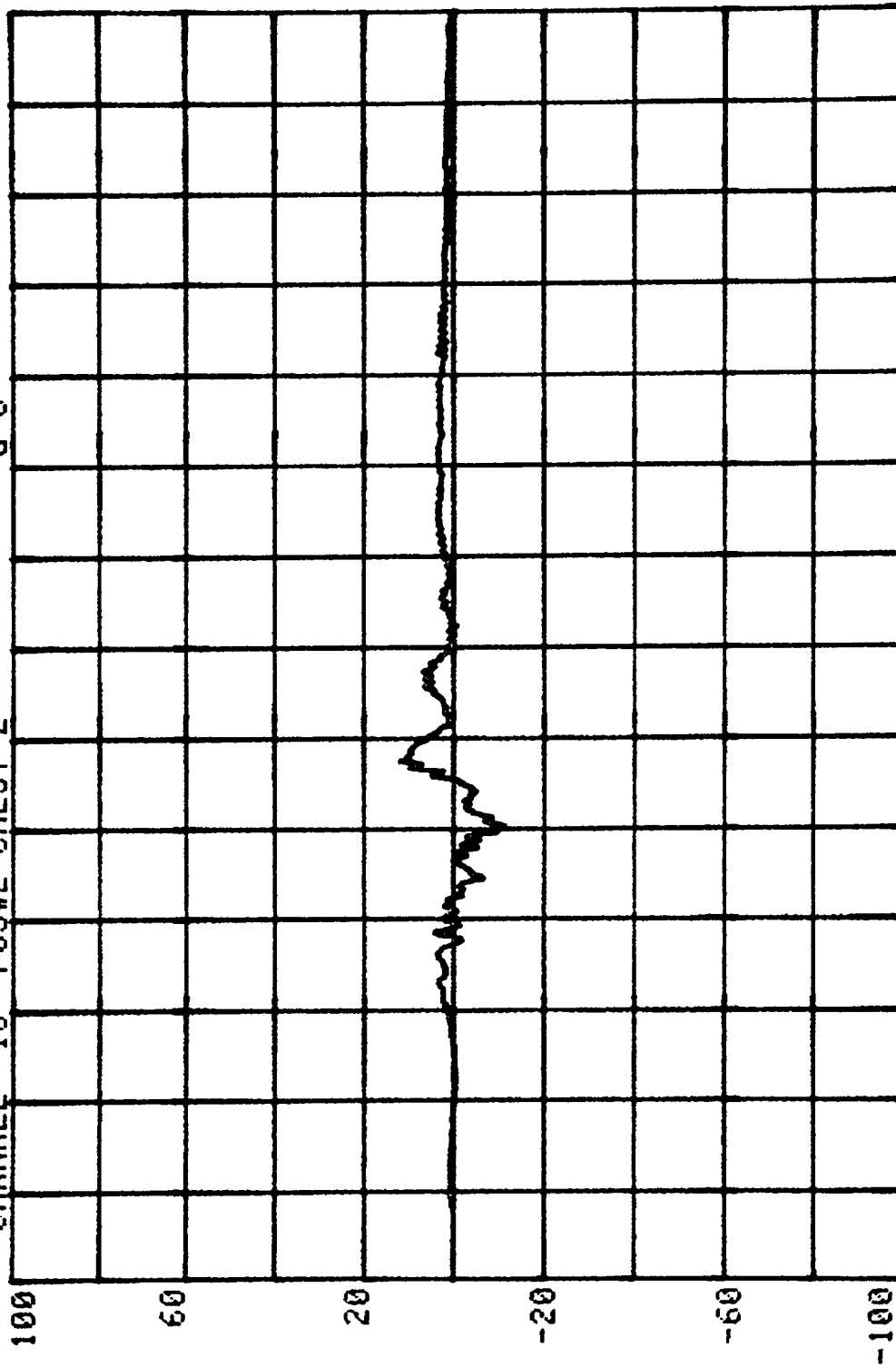


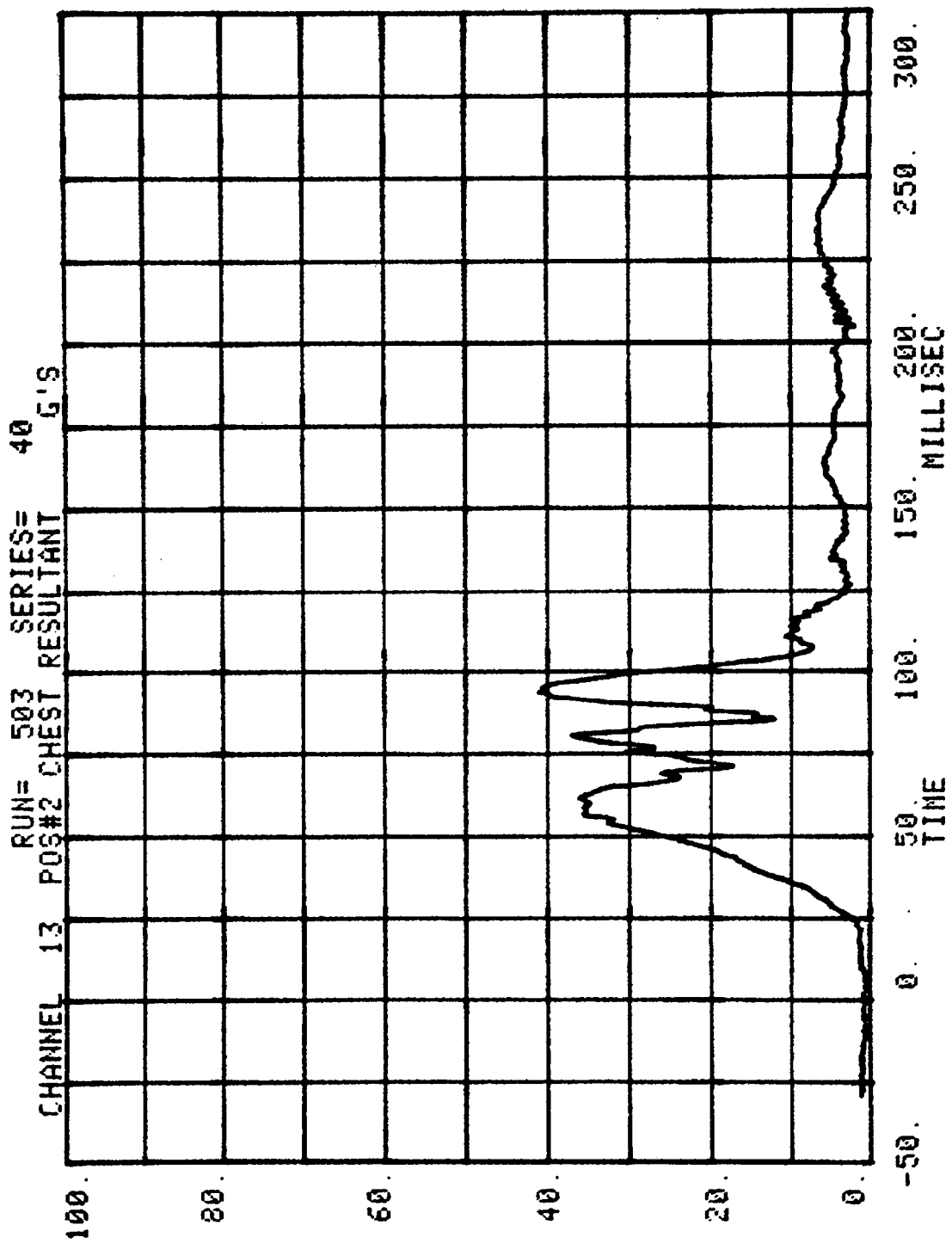
CHANNEL 18 POS#2 CHEST Z

RUN= 503

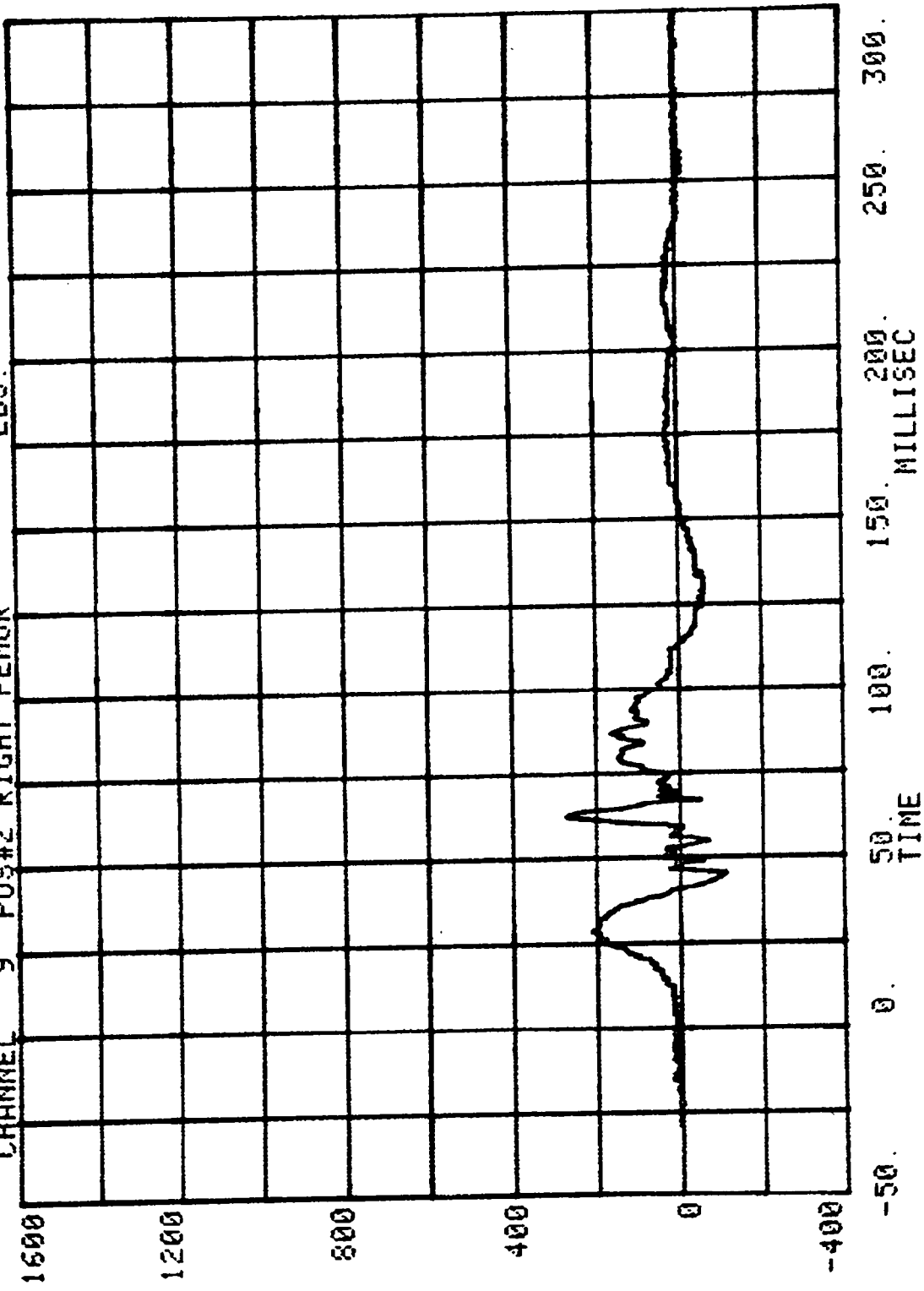
SERIES=

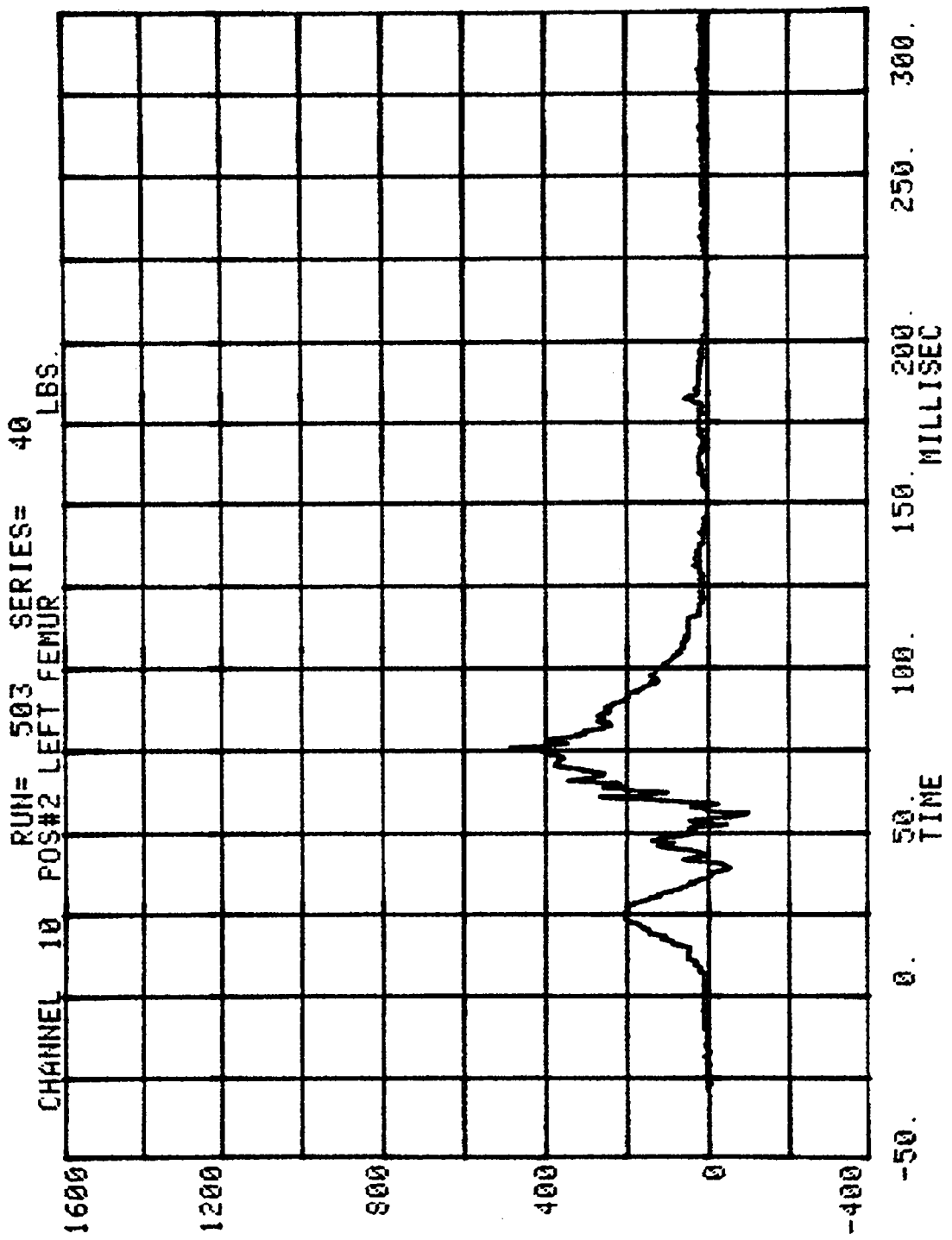
40 G'S

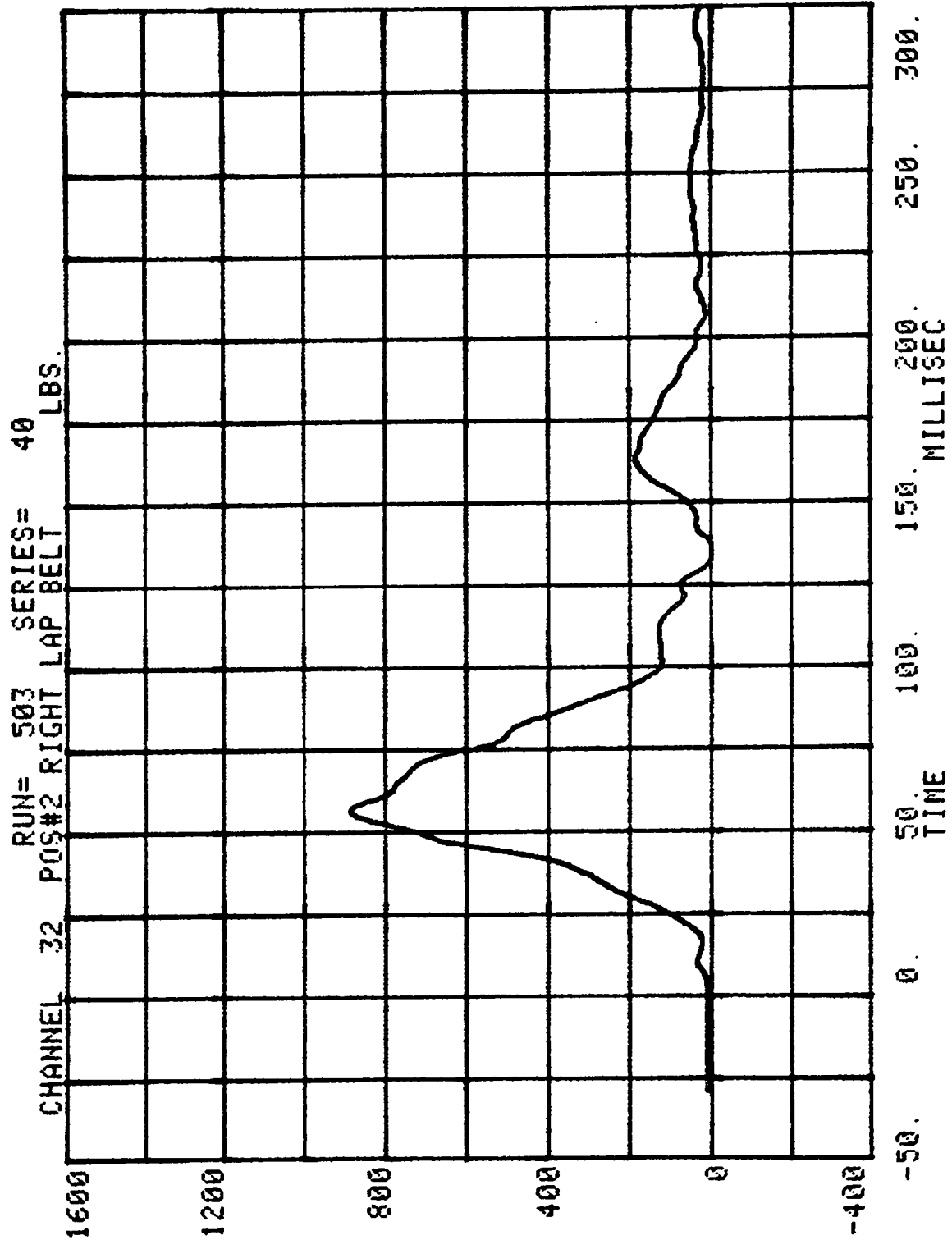


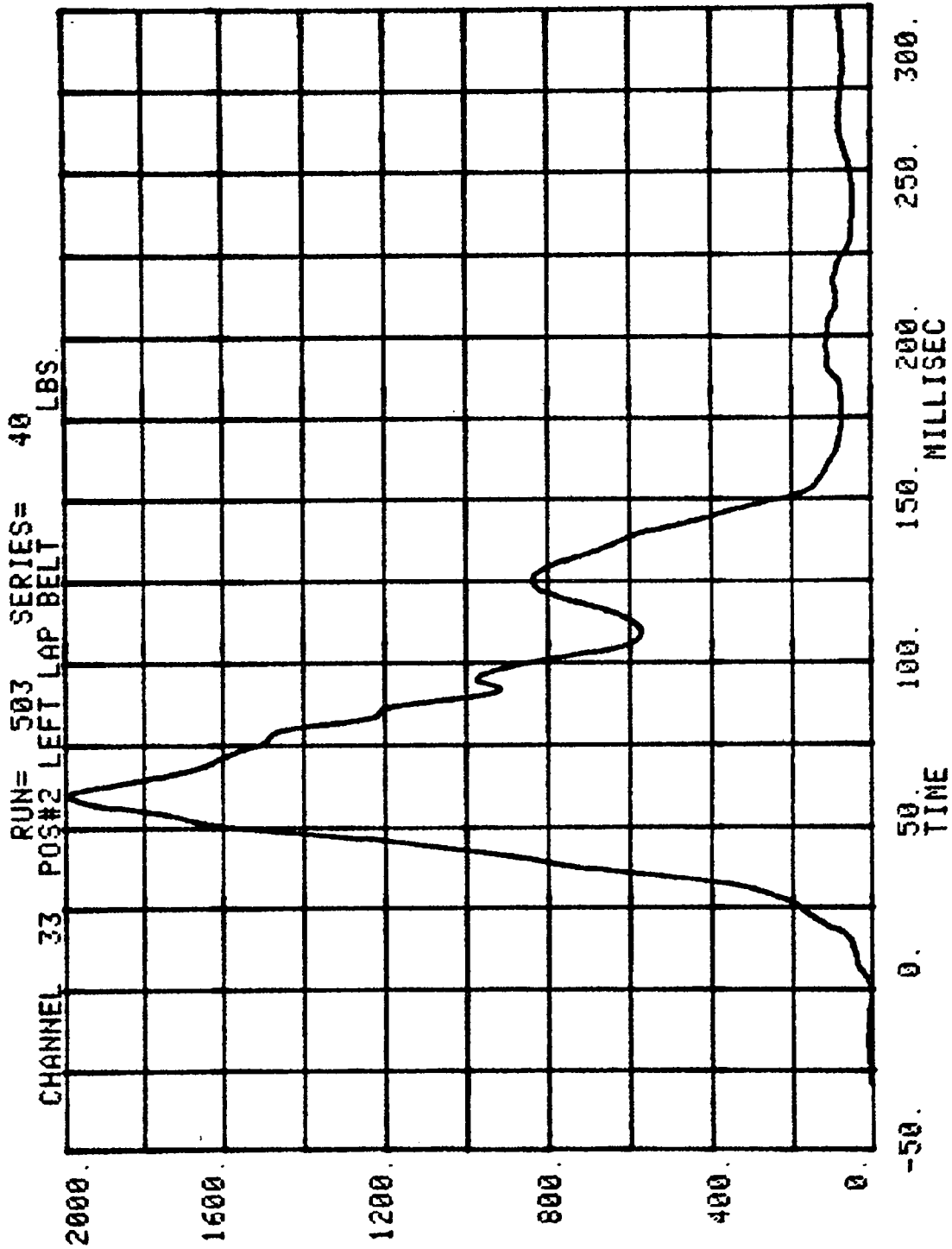


CHANNEL 9 POS#2 RIGHT FEMUR RUN= 503 SERIES= 40 LBS.







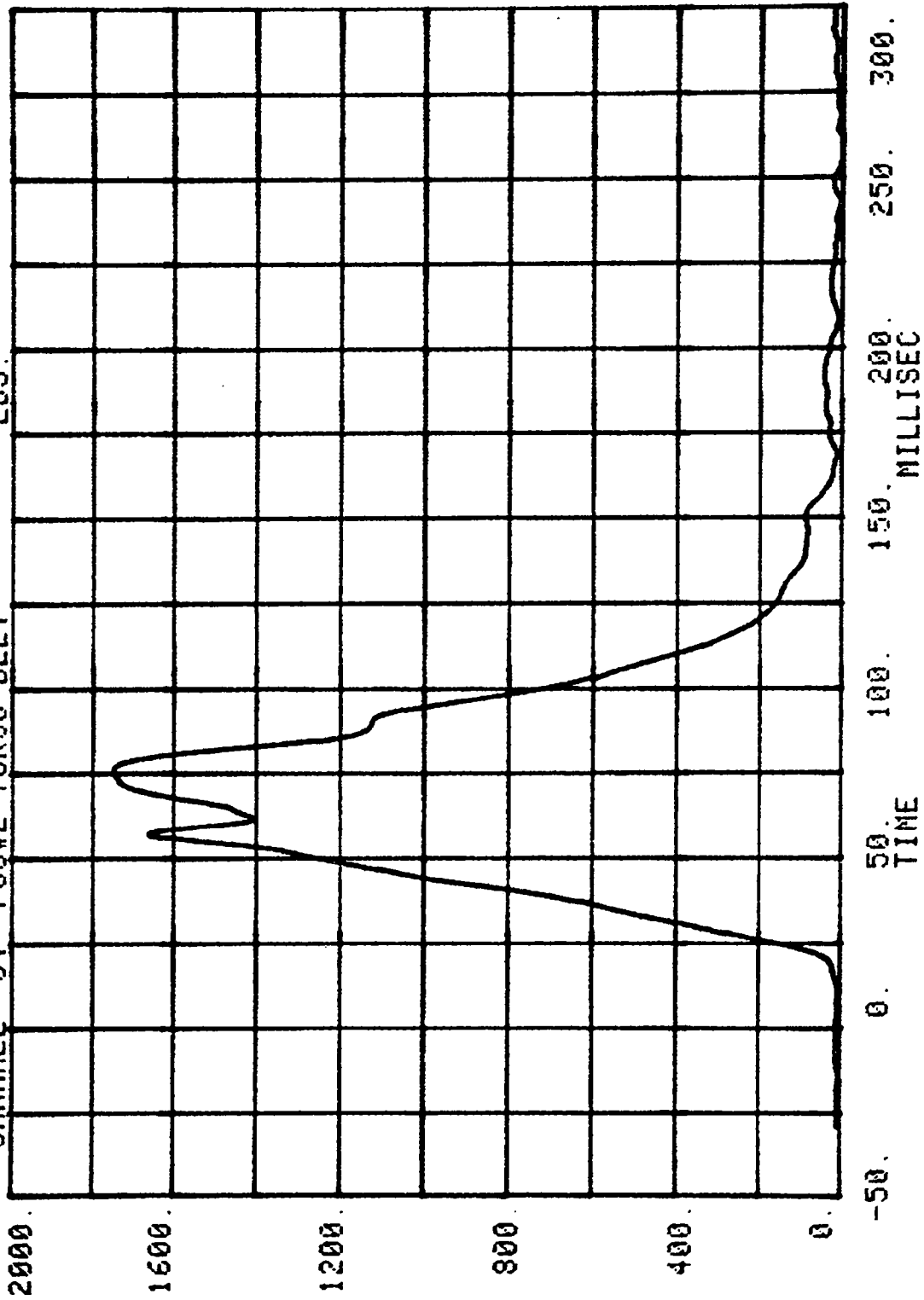


CHANNEL 34 POS#2 TORSO BELT

RUN= 503

SERIES= 40

LBS.



This test report contains results from certification tests performed on an Alderson Research Laboratories Model HYBRID II, 50th percentile anthropomorphic test dummies, Serial Nos. 110 and 320, which were completed on September 24, 1980. The results indicate that the dummies meet all of the performance requirements of the six standard tests as specified in 49 CFR Part 572, Federal Register, Vol. 42, No. 25, dated February 7, 1977.

The tests were conducted at the Dummy Certification Test Facility of Calspan Corporation, Advanced Technology Center. Results of the tests are summarized in Tables 1 and 2, along with the Part 572 requirements.

P.572 DUMMY CALIBRATION TEST DATA

NHTSA DUMMY I.D. NO.:

1	1	0
---	---	---

LABORATORY TECHNICIAN: Gary Gestwick

APPROVED BY: \_\_\_\_\_

	Pre-Test Calibration	Post-Test Calibration
Date of Dummy Calibration - - - - -	9/24/80	
Calibration Sequential Number for Dummy - - - -	10	
Temperature in Lab. (Spec. = 66 to 78°F) - - - -	70° - 74°	
Relative Humidity in Lab. (Spec. = 10 to 70%) -	56% - 68%	

TEST PARAMETER	SPECIFICATION		
<b>1. HEAD DROP TEST:</b>			
a. Peak Resultant Accel. - -	210 to 260G	250 g	
b. Peak Lateral Accel. - -	≤10G	8 g	
c. Time above 100G - - - -	0.9 to 1.5 ms	1.05 ms	
<b>2. NECK BENDING TEST:</b>			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	22.39 fps	
b. Pendulum Avg. Decel. (over t <sub>3</sub> - t <sub>2</sub> ) - - - -	20 to 24G	22.5 g	
c. Peak Resultant Head Acceleration - - - -	26G maximum	26 g	
d. Pendulum Decel. (t <sub>2</sub> -t <sub>1</sub> )	≤3 ms	1 ms	
e. Pendulum Decel. (t <sub>3</sub> -t <sub>2</sub> )	25 to 30 ms	26.5 ms	
f. Pendulum Decel. (t <sub>4</sub> -t <sub>3</sub> )	≤10 ms	2 ms	
g. Pendulum Direction Reversal Time - - - -	≥123 ms	110 ms	
h. Max. Head Rotation - -	63 to 73°	65°	
i. Chordal Displacement:			
Head Rotation Angle - -			
0°	Time	-2 to 2 ms	0 ms
	Displ.	-.5 to .5 in	0.0 in
30°	Time	25.6 to 34.4 ms	29 ms
	Displ.	2.1 to 3.1 in.	2.7 in
60°	Time	40.3 to 51.7 ms	45.5 ms
	Displ.	4.3 to 5.3 in.	4.8 in
Maximum ( °)	Time	53.2 to 66.8 ms	57 ms
	Displ.	5.0 to 6.0 in.	5.3 in

Continued

P. 572 DUMMY CALIBRATION TEST DATA .... Continued:

Dummy I.D. No.:

1	1	0
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TEST PARAMETER	SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
<b>2. NECK BENDING TEST ....</b>			
<u>Continued</u>			
i. Chordal Displacement:			
Head Rotation Angle --			
60°	Time	67.0 to 83.0 ms	67.5 ms
	Displ.	4.3 to 5.3 in.	4.9 in
30°	Time	85.4 to 104.6 ms	90 ms
	Displ.	2.1 to 3.1 in.	2.5 in
0°	Time	101.0 to 123.0 ms	107 ms
	Displ.	-.5 to 0.5 in.	0.1 in
<b>3. ABDOMINAL COMPRESSION TEST:</b>			
(Preload = 10 pounds)			
a. Force @ 1" - - - - -	50 to 63 lbs.	54 lbs	
b. Force @ 1.3" - - - - -	73 to 88 lbs.	76 lbs	
<b>4. LUMBAR FLEXION TEST:</b>			
a. Force @ 20° - - - - -	22 to 34 lbs.	33.5 lbs	
b. Force @ 30° - - - - -	34 to 46 lbs.	46.0 lbs	
c. Force @ 40° - - - - -	46 to 58 lbs.	55.5 lbs	
d. Return Angle - - - - -	12° maximum	8°	
<b>5. CHEST IMPACT TESTS:</b>			
a. High Speed			
(1) Probe Speed - - - - -	21.78-22.22 fps	21.84 fps	
(2) Peak Deflection - - - - -	1.7" maximum	1.6 in	
(3) Peak Resistive Force - - - - -	2250 lbs. maximum	1803 lbs	
(4) Internal Hysteresis - - - - -	50 to 70%	56.2%	
b. Low Speed			
(1) Probe Speed - - - - -	13.86-14.14 fps	14.09 fps	
(2) Peak Deflection - - - - -	1.1" maximum	1.0 in	
(3) Peak Resistive Force - - - - -	1450 lbs. maximum	1143 lbs	
(4) Internal Hysteresis - - - - -	50 to 70%	56.1%	

P.572 DUMMY CALIBRATION TEST DATA .....Continued:

Dummy I.D. No.:

1	1	0
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TEST PARAMETER	SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
<b>6. KNEE IMPACT TESTS:</b>			
a. Right Side --			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.87 fps	
(2) Maximum Force - -	1850 to 2500 lbs	2050 lbs	
(3) Time Above 1000#	1.7 ms minimum	1.85 ms	
b. Left Side --			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.88 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2400 lbs	
(3) Time Above 1000#	1.7 ms minimum	1.9 ms	

INSTRUMENT CALIBRATION INFORMATION

DUMMY I.D. NO.:

1	1	0
---	---	---

CALIB. SEQ. NOS. FOR DUMMY: \_\_\_\_\_ & \_\_\_\_\_

A. DUMMY INSTRUMENTS:

1. Head Accelerometers--

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

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

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

3. Chest Potentiometer - - -

4. Femur Load Cells--

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

B. CALIB. LAB. INSTRUMENTS:

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

MANUFACTURER	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
ENDEVCO	CS75	1/80	1/81
ENDEVCO	CU62	1/80	1/81
ENDEVCO	CU88	1/80	1/81
CEC	A510	1/80	1/81
ENDEVCO	DA87	1/80	1/81
CEC	A122	1/80	1/81
GSE	312	1/80	1/81
GSE	306	1/80	1/81
CEC	A48 22704	7/80	7/81
CEC	A 22960	1/80	1/81
TRANSDUCER INC.	20051	4/80	4/81
BLH	72952	9/80	9/81
CIC	567-11	9/80	9/81

P.572 DUMMY CALIBRATION TEST DATA

NHTSA DUMMY I.D. NO.:

3	2	0
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LABORATORY TECHNICIAN: Gary R. Gestwick

APPROVED BY: \_\_\_\_\_

	Pre-Test Calibration	Post-Test Calibration
Date of Dummy Calibration - - - - -	9/24/80	
Calibration Sequential Number for Dummy - - - -	12	
Temperature in Lab. (Spec. = 66 to 78°F)- - - -	70° - 74°	
Relative Humidity in Lab. (Spec. = 10 to 70%) -	56% - 68%	

TEST PARAMETER	SPECIFICATION		
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<b>1. HEAD DROP TEST:</b>			
a. Peak Resultant Accel. -	210 to 260G	212 g	
b. Peak Lateral Accel. - -	≤10G	10 g	
c. Time above 100G - - - -	0.9 to 1.5 ms	1.1 ms	

<b>2. NECK BENDING TEST:</b>			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	22.08 fps	
b. Pendulum Avg. Decel. (over t <sub>3</sub> - t <sub>2</sub> ) - - - -	20 to 24G	22 g	
c. Peak Resultant Head Acceleration - - - -	26G maximum	22 g	
d. Pendulum Decel. (t <sub>2</sub> -t <sub>1</sub> )	≤3 ms	1 ms	
e. Pendulum Decel. (t <sub>3</sub> -t <sub>2</sub> )	25 to 30 ms	26.5 ms	
f. Pendulum Decel. (t <sub>4</sub> -t <sub>3</sub> )	≤10 ms	4 ms	
g. Pendulum Direction Reversal Time - - - -	≥123 ms	108 ms	
h. Max. Head Rotation - -	63 to 73°	64°	
i. Chordal Displacement:			
Head Rotation Angle - -			

0°	Time	-2 to 2 ms	0 ms
	Displ.	-.5 to .5 in	0.0 in
30°	Time	25.6 to 34.4 ms	30 ms
	Displ.	2.1 to 3.1 in.	2.7 in
60°	Time	40.3 to 51.7 ms	46.5 ms
	Displ.	4.3 to 5.3 in.	4.7 in
Maximum ( °)	Time	53.2 to 66.8 ms	58.5 ms
	Displ.	5.0 to 6.0 in.	5.0 in

P. 572 DUMMY CALIBRATION TEST DATA .... Continued:

Dummy I.D. No.:

3	2	0
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TEST PARAMETER	SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
<b>2. NECK BENDING TEST ....</b>			
<u>Continued</u>			
i. Chordal Displacement:			
Head Rotation Angle --			
60°	Time	67.0 to 83.0 ms	67.5 ms
	Displ.	4.3 to 5.3 in.	4.8 in
30°	Time	85.4 to 104.6 ms	90 ms
	Displ.	2.1 to 3.1 in.	2.4 in
0°	Time	101.0 to 123.0 ms	106 ms
	Displ.	-.5 to 0.5 in.	0.0 in
<b>3. ABDOMINAL COMPRESSION TEST:</b>			
(Preload = 10 pounds)			
a. Force @ 1" - - - - -	50 to 63 lbs.	54 lbs	
b. Force @ 1.3" - - - - -	73 to 88 lbs.	78 lbs	
<b>4. LUMBAR FLEXION TEST:</b>			
a. Force @ 20° - - - - -	22 to 34 lbs.	33.0 lbs	
b. Force @ 30° - - - - -	34 to 46 lbs.	44 lbs	
c. Force @ 40° - - - - -	46 to 58 lbs.	54.0 lbs	
d. Return Angle - - - - -	12° maximum	4°	
<b>5. CHEST IMPACT TESTS:</b>			
a. High Speed			
(1) Probe Speed - - -	21.78-22.22 fps	21.92 fps	
(2) Peak Deflection -	1.7" maximum	1.65 fps	
(3) Peak Resistive Force - - - - -	2250 lbs. maximum	1752 lbs	
(4) Internal Hysteresis - - - - -	50 to 70%	51.1%	
b. Low Speed			
(1) Probe Speed - - -	13.86-14.14 fps	13.97 fps	
(2) Peak Deflection -	1.1" maximum	1.0 in	
(3) Peak Resistive Force - - - - -	1450 lbs. maximum	1143 lbs	
(4) Internal Hysteresis - - - - -	50 to 70%	50.7%	

P.572 DUMMY CALIBRATION TEST DATA .....Continued:

Dummy I.D. No.:

3	2	0
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TEST PARAMETER	SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
<b>6. KNEE IMPACT TESTS:</b>			
a. Right Side --			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.99 fps	
(2) Maximum Force - -	1850 to 2500 lbs	2150 lbs	
(3) Time Above 1000#	1.7 ms minimum	2.0 ms	
b. Left Side --			
(1) Probe Speed - - -	6.76 to 7.04 fps	7.03 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	1950 lbs	
(3) Time Above 1000#	1.7 ms minimum	2.3 ms	

INSTRUMENT CALIBRATION INFORMATION

DUMMY I.D. NO.:

3	2	0
---	---	---

CALIB. SEQ. NOS. FOR DUMMY: \_\_\_\_\_ & \_\_\_\_\_

A. DUMMY INSTRUMENTS:

1. Head Accelerometers--

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

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

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

3. Chest Potentiometer - - -

4. Femur Load Cells--

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

B. CALIB. LAB. INSTRUMENTS:

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

MANUFACTURER	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
ENDEVCO	CS75	1/80	1/81
ENDEVCO	CU62	1/80	1/81
ENDEVCO	CU88	1/80	1/81
CEC	A514	1/80	1/81
ENDEVCO	CK11	1/80	1/81
CEC	A115	1/80	1/81
GSE	77	1/80	1/81
GSE	76	1/80	1/81
CEC	22704	7/80	7/81
CEC	22960	1/80	1/81
TRANSDUCER INC.	20051	4/80	4/81
BLH	72952	9/80	9/81
CIC	567-11	9/80	9/81
	C-10	6525-V-40	

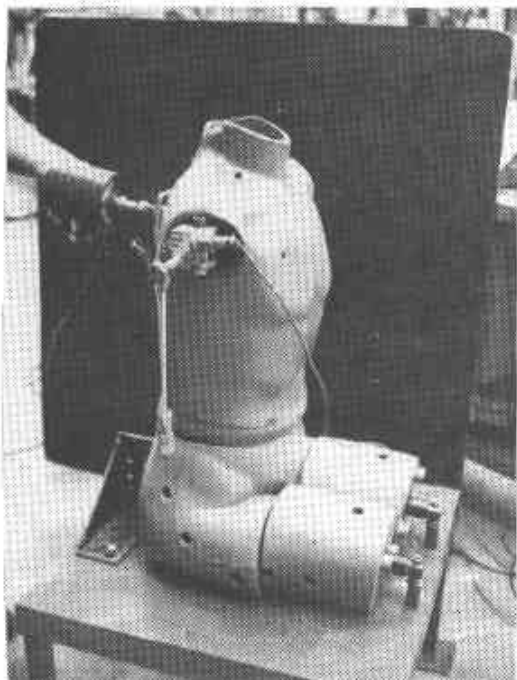


Figure 1

LUMBAR SPINE FLEXION TEST APPARATUS

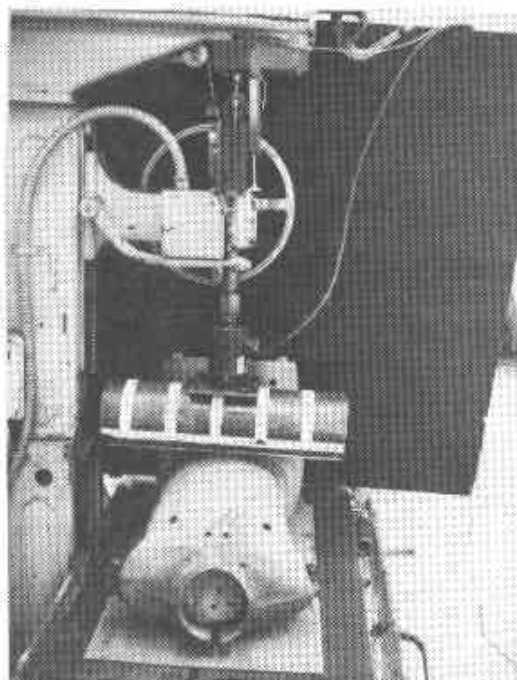


Figure 2

ABDOMEN PRESS TEST APPARATUS

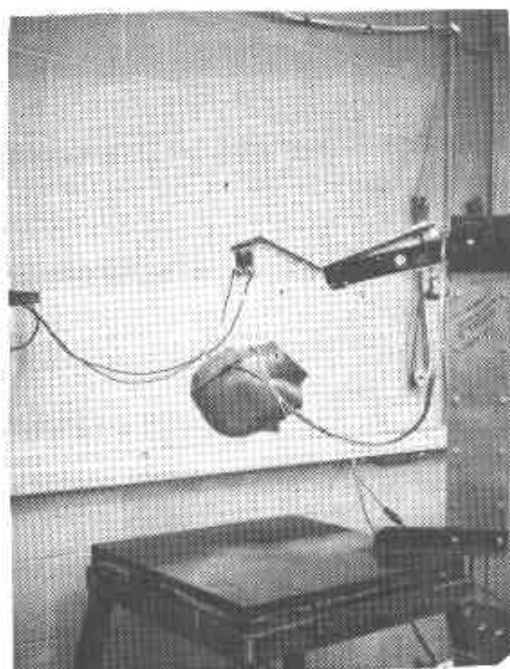


Figure 3

HEAD DROP TEST APPARATUS

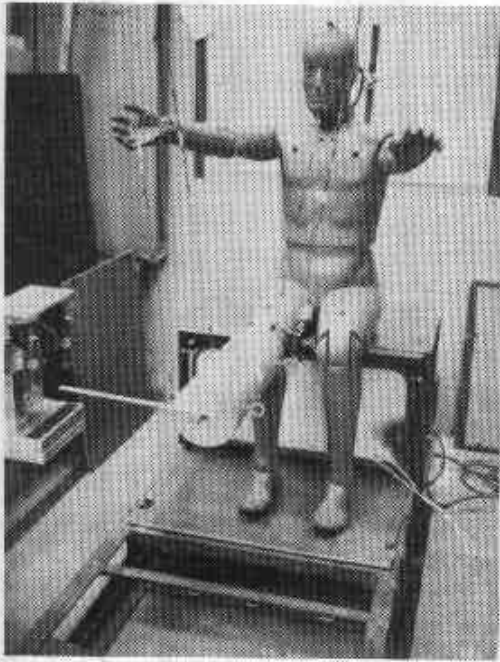


Figure 4  
KNEE IMPACT TEST APPARATUS

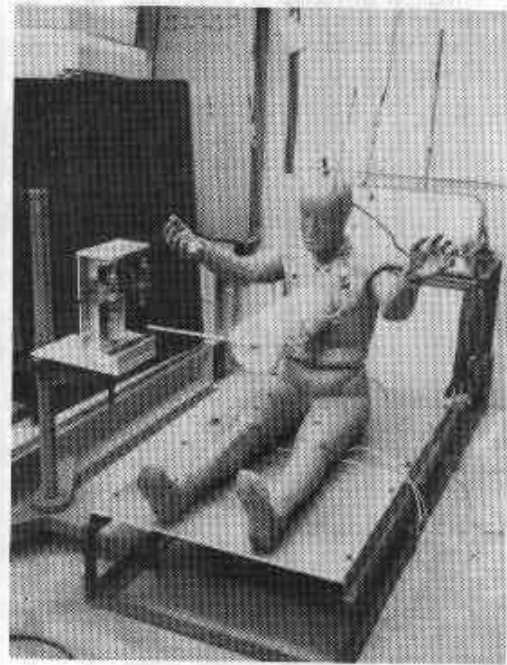


Figure 5  
THORAX IMPACT TEST APPARATUS

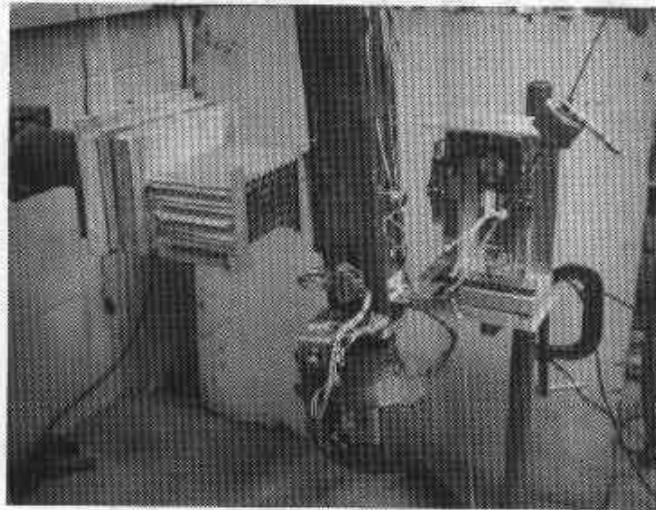


Figure 6  
NECK IMPACT TEST APPARATUS

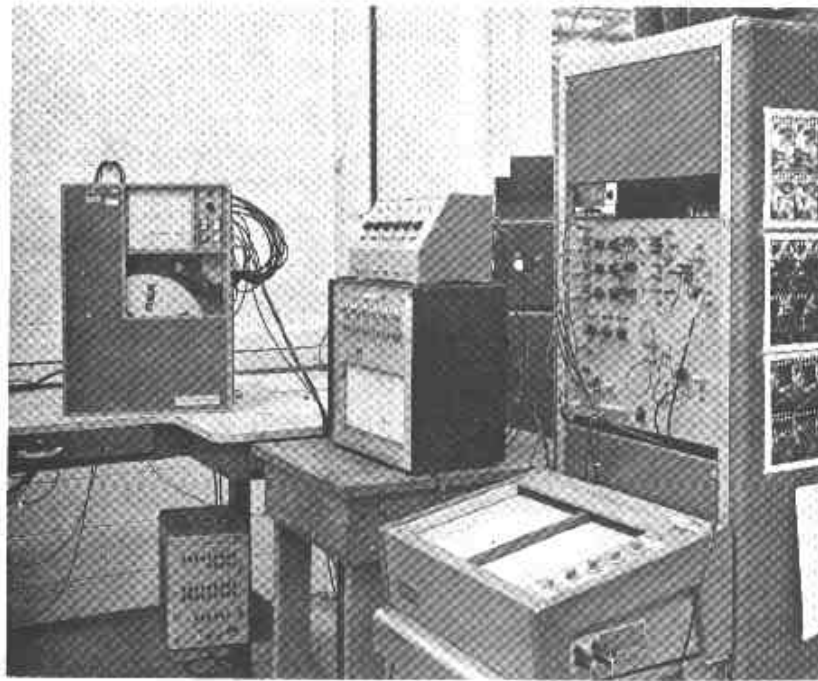


Figure 7 ELECTRONIC TEST EQUIPMENT