REPORT NOS. 212-CAL-83-002
212-CAL-83-002
301-CAL-83-002

NHTSA NEW VEHICLE ASSESSMENT AND STANDARDS ENFORCEMENT INDICANT TESTING

FMVSS 212, 219, 301

GENERAL MOTORS

1983 CHEVROLET CAPRICE CLASSIC

4-DOOR SEDAN

NHTSA NO. CD0104

CALSPAN TEST NO. 7103-V-3

CALSPAN CORPORATION

ADVANCED TECHNOLOGY CENTER

P. O. BOX 400

BUFFALO, NEW YORK 14225

FEBRUARY 1983

FINAL REPORT

Prepared for:

U. S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ENFORCEMENT

OFFICE OF VEHICLE SAFETY COMPLIANCE

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WASHINGTON, DC 20590

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16. Abstract

A frontal load cell barrier test of a 1983 Chevrolet Caprice Classic 4-door sedan was performed at Calspan Corporation, Advanced Technology Center, Transportation Research/Physical Sciences Department facility for the New Car Assessment and Standards Enforcement Testing of FMVSS 212 - Windshield Mounting; FMVSS 219 - Windshield Zone Intrusion; 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 35.33 mph. Ambient temperature on the test date was 25°F. The post-test vehicle crush was 28.4 inches and intrusion of the firewall into compartment was 8.0 inches.

The test vehicle appeared to comply with the following vehicle performance standards:

FMVSS 212 - Windshield Retention
FMVSS 219 - Windshield Intrusion
FMVSS 301-75 - Fuel System Integrity

With regard to occupant restraint performance (FMVSS 208 - Injury Criteria) the driver met the criteria but the passenger did not meet the head criterion (HIC 1083.6).

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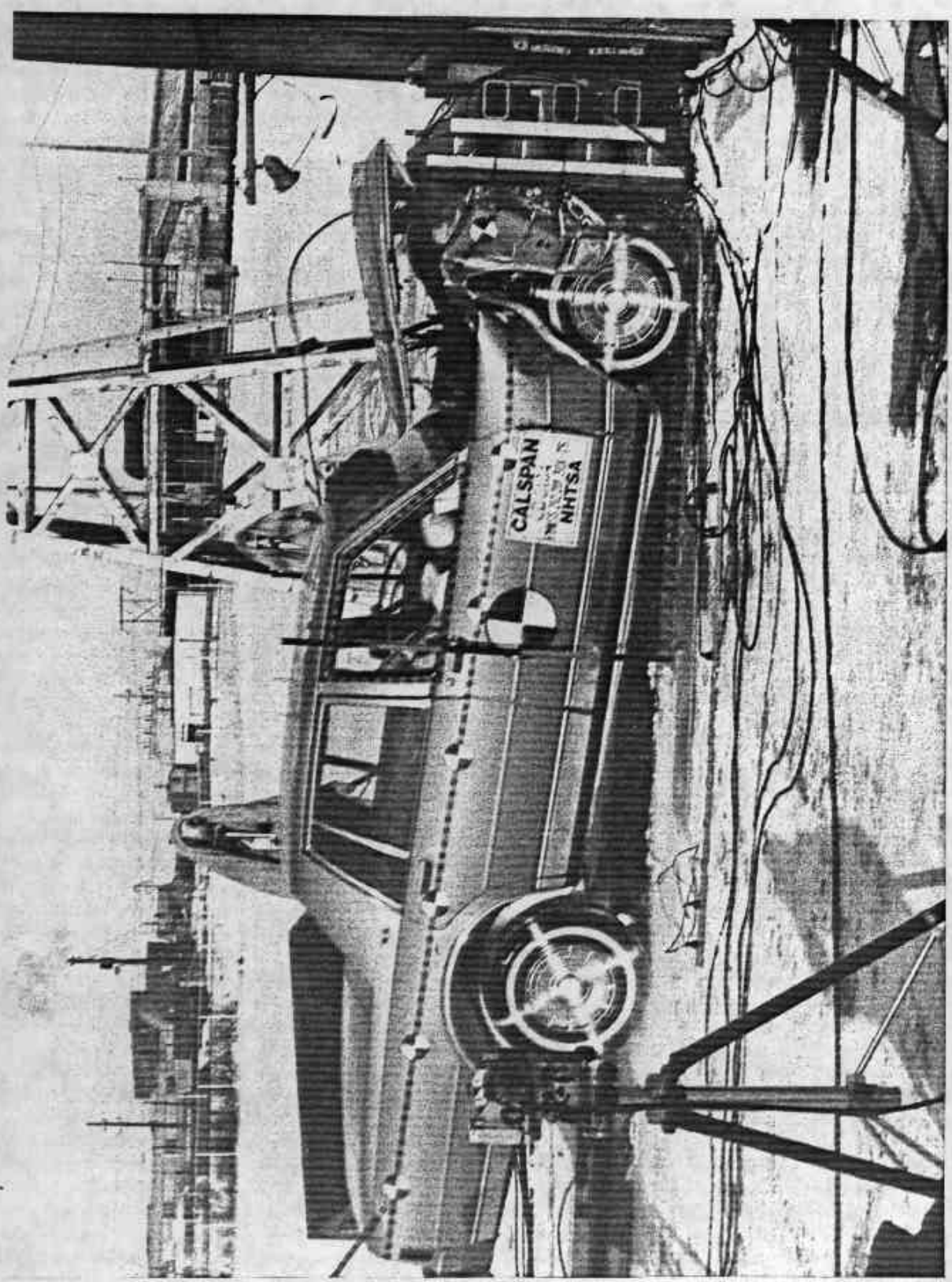
SECTION 1

PURPOSE AND TEST PROCEDURE

This frontal barrier test is part of the Composite FY-83 Vehicle Barrier Impact Testing program, sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract DTNH22-82-C-01140. The purpose of this test was to obtain vehicle crashworthiness, occupant restraint performance, and indicant standards enforcement data for impact speeds in excess of the current FMVSS requirements.

The test was performed in accordance with the Office of Automobile Ratings Laboratory Procedure No. IP-212-02 dated April 4, 1980. Indicant test data for FMVSS 212, "Windsheild Mounting;" FMVSS 219, "Windsheild Zone Intrusion;" and FMVSS 301-75, "Fuel System Integrity," as well as occupant performance data for a nominally 35 mph impact is provided herein.



IMPACT PHOTOGRAPH

SECTION 2

SUMMARY OF TEST NUMBER CD0104

A load cell barrier consisting of 36 load cells (Figure 6) was impacted by a 1983 Chevrolet Caprice Classic at a velocity of 35.33 mph. The test was performed at the Calspan Corporation, Advanced Technology Center on January 20, 1983. Pre- and post-test photographs of the vehicle and occupants can be found in Appendix A. Table 1 presents pertinent crash test information.

Two Part 572, 50th percentile male Anthropomorphic Test Devices (ATDs) were placed in the 1983 Chevrolet Caprice Classic in the driver and right front passenger seating positions, according to dummy placement procedures specified in Laboratory Procedures for Vehicle Assessment IP-212-02.

The occupant dummies were instrumented with head and chest triaxial accelerometers and femur load cells. Load cells were also placed on the lap and shoulder belts to measure dummy torso and lap loading. The driver ATD (Serial No. 1019) had been used in a previous test (CD0301). The FMVSS Injury Criteria Values were not exceeded in that test. The right front passenger ATD (Serial No. 1020) had been certified prior to this test; verification details along with instrumentation calibration data are found in Appendix C of this report.

The crash test was recorded by one real time camera and 12 high-speed cameras. Camera locations and other pertinent camera information are found in Section 4 of this report.

The 69 channels of data were recorded on six 14-channel FM tape recorders. Appendix B contains the vehicle, load cell barrier and dummy response data traces. The Injury Criteria Values are presented in Table 10.

GENERAL COMMENTS

The 1983 Chevrolet Caprice Classic, 4-door sedan was equipped with a 3.8 Liter, V6 engine, three speed automatic transmission, power brakes, power steering and air conditioner. The total test weight with two 50th percentile male dummies, instrumentation and two on-board cameras was 4120 pounds.

The 1983 Chevrolet Caprice Classic which was involved in a frontal load cell barrier crash at a velocity of 35.33 mph appeared to comply with FMVSS Nos. 212 - Windshield Mounting; 219 - Windshield Intrusion; and 301-75 - Fuel System Integrity. There was 100 percent windshield retention, no intrusion into the protected or unprotected zone of the windshield and no fuel leakage after impact or any phase of the rollover test.

The vehicle sustained 28.4 inches of static crush and approximately 32 inches of dynamic crush. Maximum firewall intrusion into the occupant compartment was 8 inches. The maximum load cell barrier force measured by the 36 load cells was 105,000 pounds at 20 milliseconds. A second force peak of 104,000 pounds was recorded at 57.5 milliseconds.

At impact the windshield cracked on the driver's side lower corner. All other glazing remained intact. Both front doors were operable after impact.

The driver's head struck the upper steering wheel and center hub. The femurs contacted the underside of the dash panel. The driver satisfied all FMVSS 208 - Injury Criteria with a HIC of 881.9, maximum chest deceleration over 3 milliseconds of 41.7 g's, and femur loads of 650 and 675 pounds. Belt spoolout as measured by the transducer and film analysis was 2.25 inches and belt stretch was .325 inches per foot as measured between the retractor and and "D" ring.

The right front passenger head struck the dash panel and thus did not meet the FMVSS 208 - Head Injury Criteria (HIC of 1083.6).

The remaining criteria were satisfactory as indicated by a maximum chest deceleration over 3 milliseconds of 47.1 g's, and femur loads of 544 and 600 pounds. Belt spoolout measured by the transducer was 2.5 inches and film analysis indicated 2.3 inches. Belt stretch was .44 inches per foot as measured between the retractor and "D" ring.

Table 1

CRASH TEST SUMMARY

TEST NO. CD0104

PROJECT: FY 83 New Car Assessment Program FMVSS No. 208/212/219/301-75

DATE: 1/20/83

TIME: 1405 TEMP: 25°F

VEHICLE	1983 Chevrolet Caprice Classic
TEST WEIGHT (lbs)	4120
IMPACT ANGLE (deg)*	0
IMPACT VELOCITY (mph)**	35.33
MAX. CRUSH (in) STATIC	28.4
MAX. INTRUSION (in)	8.0

DUMMIES

TYPE	Hybrid II, Part 572	Hybrid II, Part 572
LOCATION	LF (1) - Ser. 1019	RF (2), Ser. 1020
RESTRAINT	Production 3-Point Belt System	Production 3-Point Belt System

NUMBER OF DATA CHANNELS	69
NUMBER OF HIGH SPEED CAMERAS	12 + 1 Real Time Camera

*With respect to tow track Centerline

**Speed trap measurement (± .05% accuracy)

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION

Make/Model Chevrolet Caprice Classic Body Style 4-Door Sedan

Model Year 1983 NHTSA No. CD0104 Color Silver

Engine Data: 6 cylinders, 3.8L cubic inches

Transmission Data: 3 speed, ( ) manual (X) automatic

Date Rec'd 1-10-83 Air Cond. X Pw. Str. X Pw. Brks. X

Dealer's Name & Address Roger Holler Winter Park, Fla.

Odometer Reading 01978

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

Vehicle Manufactured by: General Motors of Canada

Date of Manufacture 9-82 VIN 2G1ANG994D1117500

GVRW 4795 lbs., GAWR: front 2251 lbs., rear 2544 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 P205/75R15 Load Range 1BA B ___ C ___ D

Recommended Cold Tire Pressure: front 35 psi, rear 35 psi

Tires on Vehicle P205/75R15

Is Spare Tire a "Space Saver?" X yes ___ no

Is Spare Tire Standard Equipment? X yes ___ no

Vehicle Capacity: Types of Seats: X bench, ___ bucket, ___ split bench

Number of Occupants (Designated Seating Capacity): 3 front

3 rear

6 TOTAL

Cargo Load: 200 lbs.

TOTAL = 1100 lbs.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

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

Right Front = 1000 lbs. Right Rear = 830 lbs.
Left Front = 950 lbs. Left Rear = 820 lbs.
TOTAL FRONT WEIGHT = 1950 lbs. (54.2 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 1650 lbs. (48.8 % of Total Vehicle Weight)
TOTAL DELIVERY WEIGHT = 3600 lbs.

CALCULATION FOR TARGET TEST WEIGHT

RCLW = Rated Cargo and Luggage Weight
UDW = Unloaded Delivered Weight (3600 lbs.)
VCW = Vehicle Capacity Weight (1100 lbs.)
DSC = Designated Seating Capacity (6)
RCLW = VCW - 150 (DSC) = 200 lbs.
Target Test Weight = UDW + RCLW + (2 dummies X 164 lbs./dummy)
Target Test Weight = 4128 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 192 POUNDS CARGO

Right Front = 1050 lbs. Right Rear = 1010 lbs.
Left Front = 1050 lbs. Left Rear = 1010 lbs.
TOTAL FRONT WEIGHT = 2100 lbs. (51.0 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 2020 lbs. (49.0 % of Total Vehicle Weight)
TOTAL TEST WEIGHT = 4120 lbs.
Weight of ballast secured in vehicle trunk area = 0 lbs.

VEHICLE ATTITUDE (all dimensions in inches)

Delivered Attitude: RF 28.5 LF 29.0 RR 28.7 LR 28.7
Test Attitude: RF 28.0 LF 28.1 RR 27.2 LR 27.2
Remarks: Wheel Base = 115.9
Vehicle c/g tested 56.8 inches rearward of front wheel C/L.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

POST-IMPACT DATA

Type of Test Frontal Barrier Impact Impact Angle 0 °

Date of Test 1/20/83 Time of Test 1405

Ambient Temperature 25 °F at impact area

Temperature in Occupant Compartment 71 °F

Windshield Molding Temperature 33 °F

Required Impact Velocity Range: 34.5 to 35.5 mph

Impact Velocity: primary = 35.33 mph, secondary 35.33 mph

VEHICLE REBOUND AND CRUSH (inches)

Vehicle Length: Pre-test =	R 207.2	℄ 211.6	L 207.2
Post-test =	R 182.2	℄ 183.2	L 183.2
Crush =	R 25.0	℄ 28.4	L 24.0

Distance from front of test vehicle to point of impact:

R 35.2 C/L 35.6 L 36.0

VISIBLE DUMMY CONTACT POINTS

	Driver	Passenger
Head	S/W Rim and Hub	Dash Panel
Chest		
Abdomen		
Left Knee	Dash Panel	Dash Panel
Right Knee	Dash Panel	Dash Panel

	Front		Rear	
	Left	Right	Left	Right
Door Opening	Operable	Operable	Operable	Operable

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

	Front		Rear	
Seat Movement	Left	Right	Left	Right
Seat Back Failure	None	None		
Seat Shift (in.)	5 inch Forward	None		

Glazing Damage

Backlight/Windshield Windshield has stress crack on the driver side.

Other notable impact effects: _____

SECTION 3

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

- Summary of FMVSS 212, 219, and 301 Data
- Post-Impact Data for FMVSS Nos. 212, 219, and 301-75
- Windshield Retention, FMVSS No. 212 Data
- Protected Zone for FMVSS No. 219
- Windshield Zone Intrusion, FMVSS No. 219 Data
- Fuel System Integrity, FMVSS No. 301-75 Data

Table 3

SUMMARY OF FMVSS 212, 219 AND 301 DATA

PRE-IMPACT DATA

Make/Model: 1983 Chevrolet Caprice Classic

Body Style: 4-door Model Year: 1983

NHTSA No.: CD0104 Color: Silver

DATA FROM CERTIFICATION LABEL

Vehicle Manufacturer: General Motors Corporation

Date of Manufacture: 9/82 VIN: 2G1AN6994D1117500

GVWR: 4795 lbs., GAWR: Front 2251 lbs., Rear 2544 lbs.

POST-IMPACT DATA

Type of Test: Frontal Load Cell Barrier Impact

Date of Test: 1/20/83 Time: 1405 Temp.: 25 °F

Required Impact Velocity Range: 34.5 to 35.5 mph

Impact Velocity: Primary = 35.33 mph, Secondary = 35.33 mph

Test Weight 4120 lbs., Static Crush 25.8 AVG in., Rebound 35.6in.

FUEL SYSTEM DATA

Test Fluid Type: Red Stoddard Solvent #2 , Spec. Grav.: 0.764

Kinematic Viscosity 0.96 Centistokes

EPA Capacity* 25 gal.

Test Volume 23.25 gal. (93% of EPA Capacity)

Fuel System Capacity (data from Owner's Manual) 25 gal.

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 X no

Test vehicle fuel tank filled to 93% of "usable" [redacted]' capacity with Stoddard Solvent and with electric fuel pump operating (if it will operate without engine operation) until start of static roll.

*with entire fuel system filled from fuel tank through carburetor bowl.

SUMMARY OF FMVSS 212, 219, AND 301 DATA (cont'd)

Details of fuel system: Engine operated fuel pump. The fuel tank is located aft of the rear axle and held in place by two tank straps. The fuel tube is at the rear center of the vehicle and sealed by a screw-type cap which is concealed by the hinged license plate door.

Table 4

POST-IMPACT DATA - FMVSS NOS. 212, 219, AND 301-75

DATA SHEET

TYPE OF TEST ___X___ Frontal (0°) Impact

_____ Oblique (____°) Impact on _____ Left (Driver's) Side

_____ Right Side

_____ Lateral or Side Impact on _____ Left (Driver's) Side

_____ Right Side

_____ Rear Impact

DATE OF TEST 1/20/83 TIME 1405 TEMP 25 °F

VEHICLE NHTSA NO. CD0104 VIN 2G1AN6994D1117500

REQUIRED VEHICLE VELOCITY RANGE 34.5 to 35.5 mph

IMPACT VELOCITY (traps within 5 feet of impact event) _____

Trap No. 1 = 35.33 mph Trap No. 2 = 35.33 mph

Distance from the vehicle's front bumper to the barrier face entering the vehicle velocity measurement device = 58

exiting the vehicle velocity measurement device = 18

VEHICLE STATIC CRUSH (for frontal and rear impacts only)

Driver's Side = 24.0 in Passenger's Side = 25.0 in

C/L = 28.4 in. Average = 25.8 in.

Crush Details:

VEHICLE STATIC CRUSH (for side impacts only)

Amount of Crush = - inches on - side

Crush Details:

VEHICLE REBOUND (from rigid barrier only)

Driver's Side = 36.0 in Passenger's Side = 35.2 in

C/L = 35.6 in. Average = 35.6 in.

REMARKS

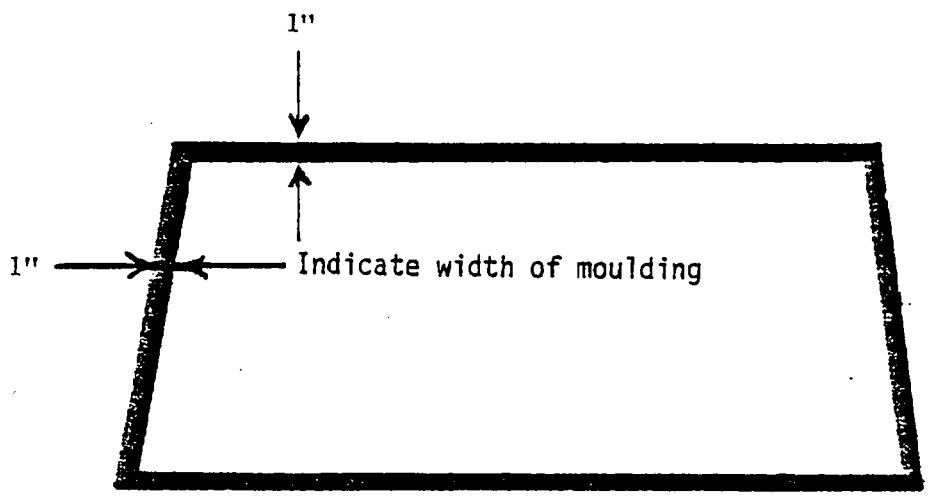
Details of windshield mounting (method of retention, type of trim, etc.):

Windshield is bonded in place and has a one inch chrome strip along the top and sides.

	Windshield Periphery		
	Pre-Test	Post-Test	Retention %
Right Side	86.25	86.25	100%
Left Side	86.25	86.25	100%
TOTAL	172.5	172.5	100%

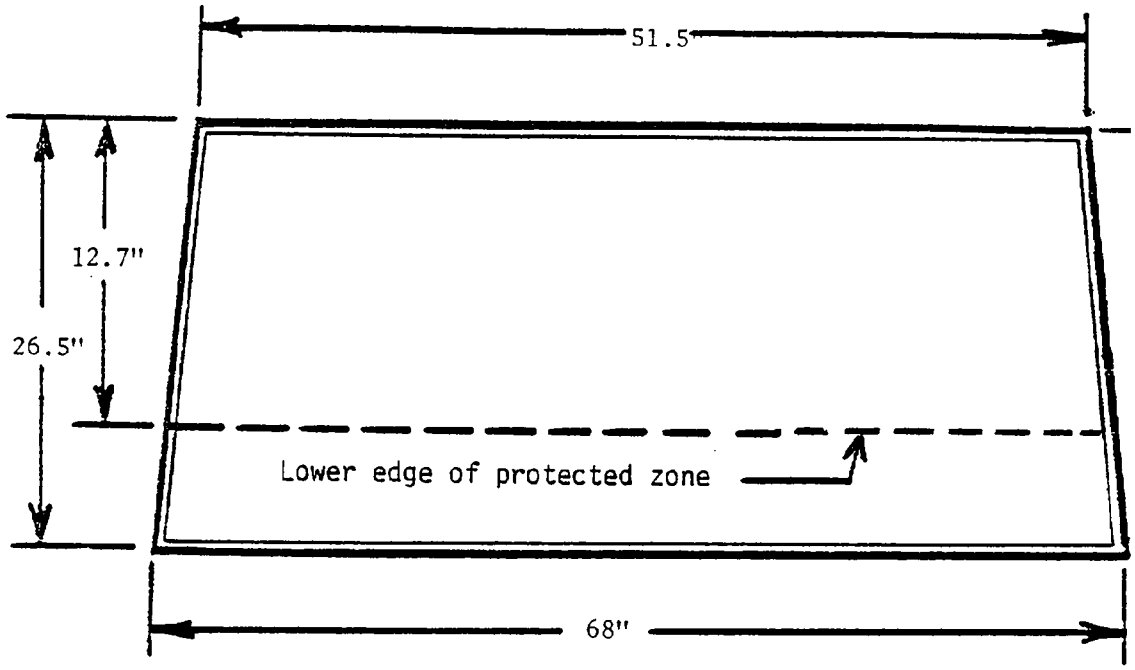
The standard requires that Post-Test be a minimum of 75 percent of the Pre-Test total periphery measurement for vehicle not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles which are equipped with occupant passive restraints.

AREA OF RETENTION FAILURE



FRONT VIEW

Figure 1 WINDSHIELD RETENTION, FMVSS NO. 212 DATA



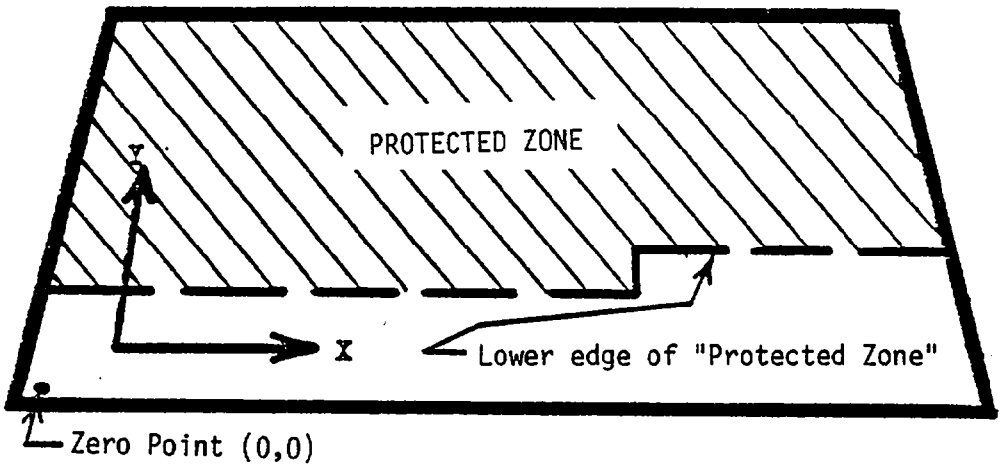
FRONT VIEW OF WINDSHIELD

Provide all dimensions necessary to reproduce the protected zone.

Method of adhering styrofoam to the windshield:

Silicone rubber sealant adhesive was applied to windshield surface and to back side of styrofoam. The stryofoam was then clamped in place until dry.

Figure 2 PROTECTED ZONE



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 3 WINDSHIELD ZONE INTRUSION, FMVSS 219 DATA

Table 5

"FUEL SYSTEM INTEGRITY" POST-IMPACT TEST DATA

FMVSS No. 301-75

TEST VEHICLE NHTSA NO. CD0104 Test Date 1/20/83

Vehicle Manufacture/Make/Model 1983 Chevrolet Caprice Classic

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

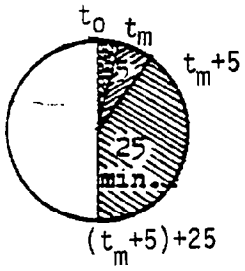
_x_ Frontal (35 mph)

____ 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

SOLVENT SPILLAGE DETAILS

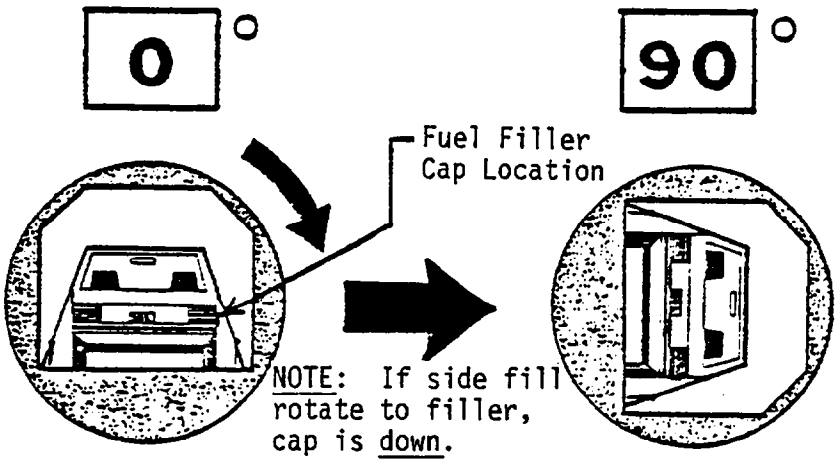
None

VEHICLE NHTSA ID NO. CD0104

Table 6

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 min.)	=	2	minutes	49	seconds
FMVSS 301-75 Position Hold Time	=	5	minutes	00	seconds
TOTAL	=	8	minutes	49	seconds
Next Whole Minute Interval	=	7	minutes		

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. from 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

0	0	0	0

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

SOLVENT SPILLAGE LOCATION(S)

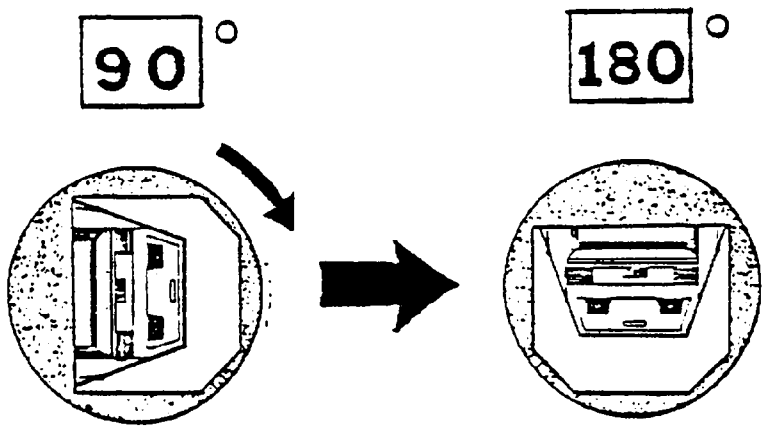
None

VEHICLE NHTSA ID NO. CD0104

Table 6 (cont'd)

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 min.)	=	2	minutes	50	seconds
FMVSS 301-75 Position Hold Time	=	5	minutes	00	seconds
TOTAL	=	7	minutes	50	seconds
Next Whole Minute Interval	=	8	minutes		

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. from 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

0	0	0	0

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

SOLVENT SPILLAGE LOCATION(S)

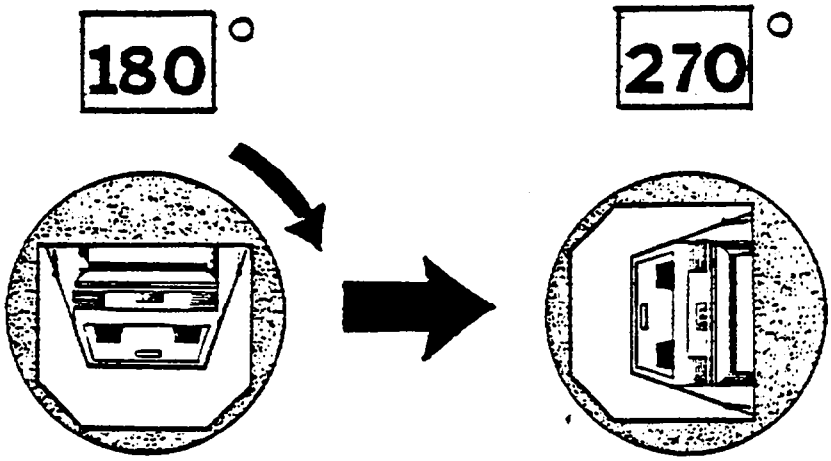
None

VEHICLE NHTSA ID NO. CD0104

Table 6 (cont'd)

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 min.)	=	2	minutes	56	seconds
FMVSS 301-75 Position Hold Time	=	5	minutes	00	seconds
TOTAL	=	7	minutes	56	seconds
Next Whole Minute Interval	=	8	minutes		

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. from 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

0	0	0	0

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

SOLVENT SPILLAGE LOCATION(S)

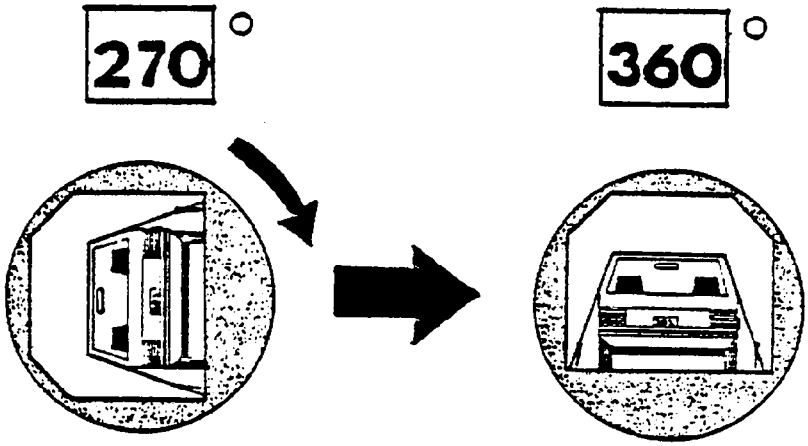
None

VEHICLE NHTSA ID NO. CD0104

Table 6 (cont'd)

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 min.)	=	7	minutes	59	seconds
FMVSS 301-75 Position Hold Time	=	5	minutes	00	seconds
TOTAL	=	7	minutes	59	seconds
Next Whole Minute Interval	=	8	minutes		

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. from 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

0	0	0	0

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

SOLVENT SPILLAGE LOCATION(S)

None

SECTION 4

OCCUPANT AND VEHICLE INFORMATION
(OMI AND AID DATA)

- Vehicle Measurements
- Vehicle Accelerometer Locations
- Load Cell Barrier-Load Cells Locations
- AID Data Summary
- Camera Positions and Locations
- Owner's Manual Seat Belt Instructions
- Dummy In-Vehicle Positioning
- Dummy Injury Criteria Values

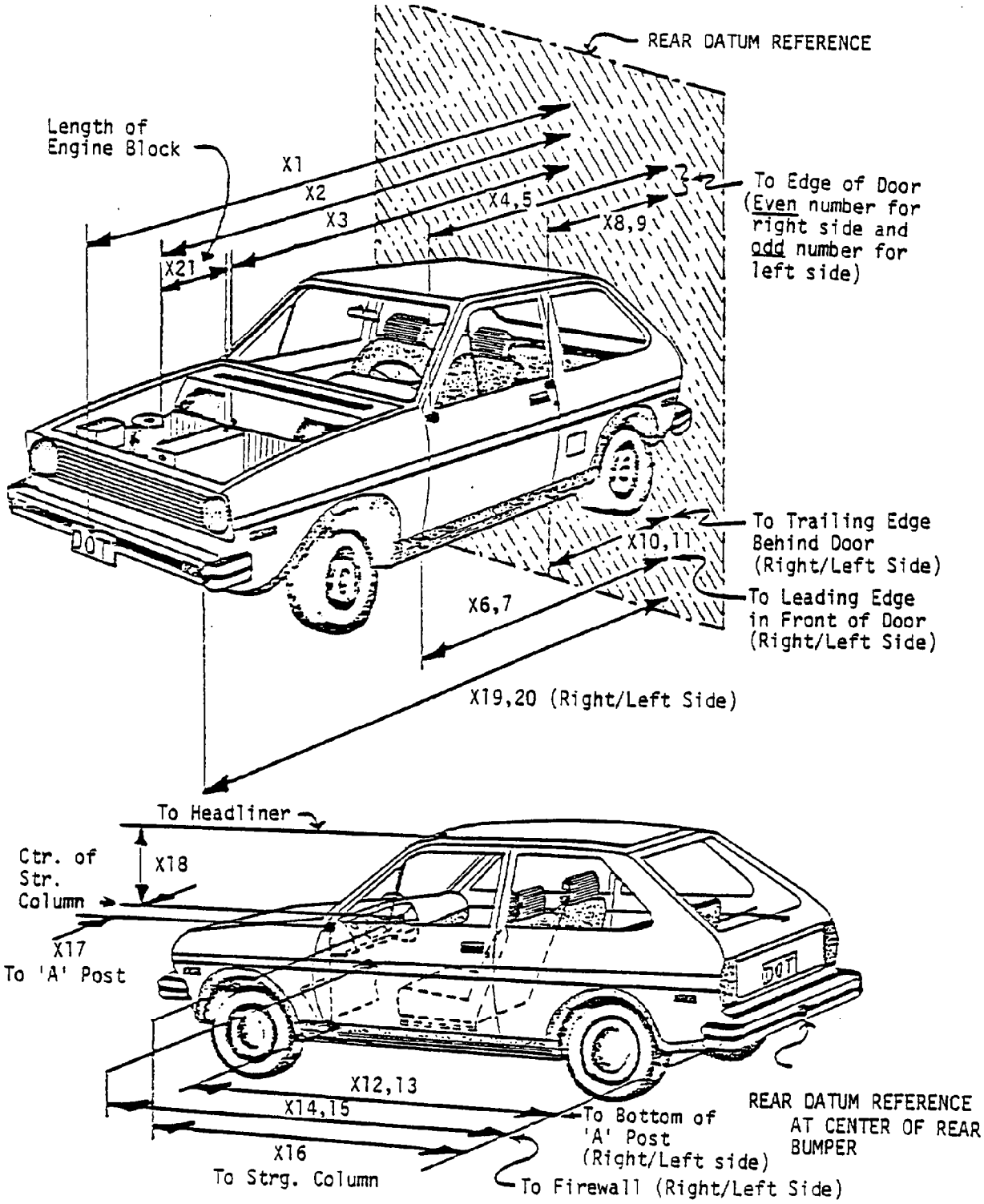


Figure 4 PRE- AND POST-TEST MEASUREMENT POINTS

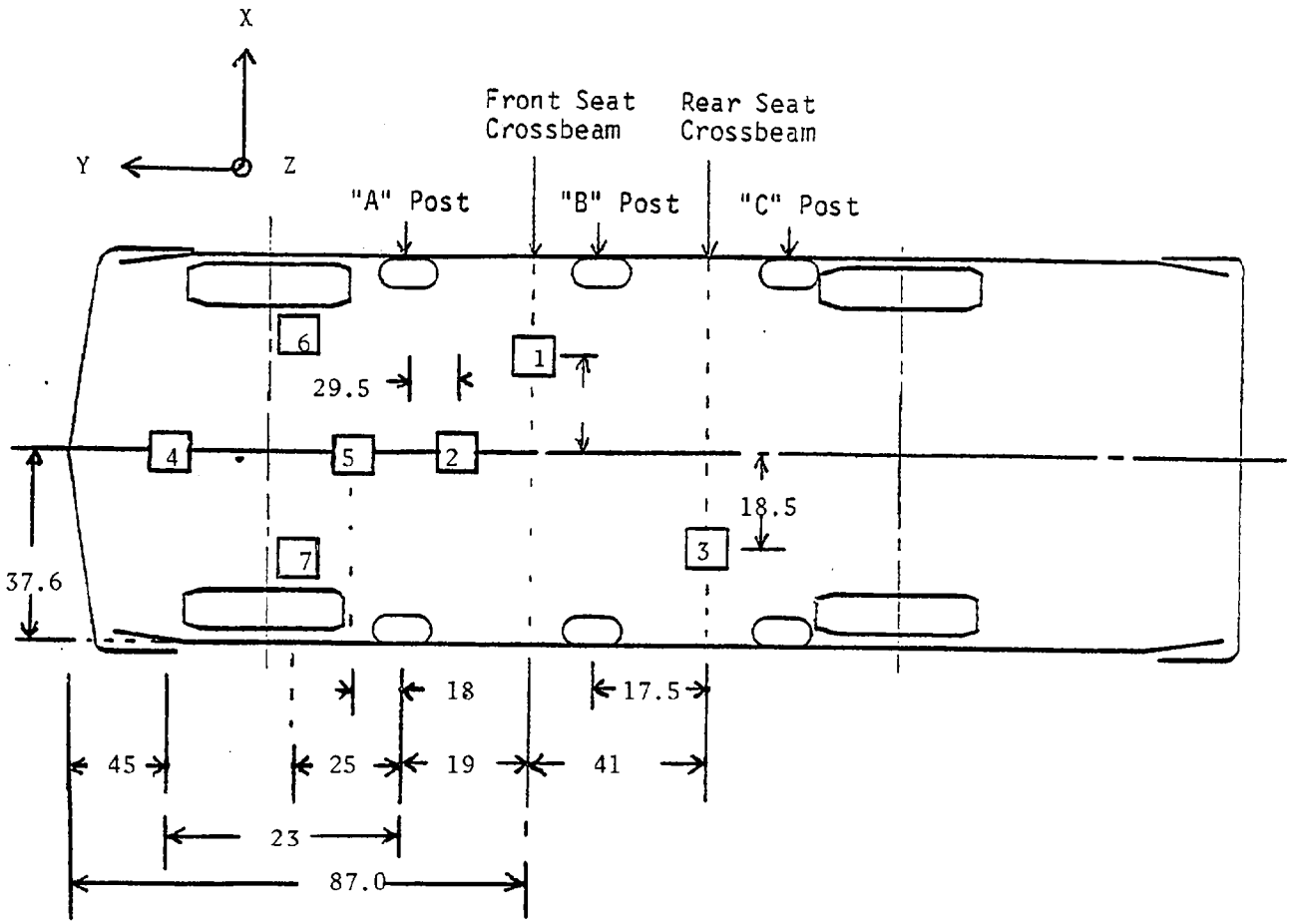
Table 7

VEHICLE MEASUREMENTS

CD0104

All Dimensions in Inches

No.	1983 Chevrolet Caprice Classis	Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	211.6	183.2	28.4
X2	Rear Surface of Vehicle to Front of Engine	175.6	169.5	6.1
X3	Rear Surface of Vehicle to Firewall	152.7	146.5	6.2
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	139.5	139.1	.4
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	139.6	139.3	.3
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	143.7	144.0	-.3
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	143.7	143.2	.5
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	100.2	100.0	.2
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	100.3	100.2	.1
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	101.0	101.3	-.3
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	101.2	101.2	0
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	142.9	142.8	.1
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	142.9	142.4	.5
X14	Rear Surface of Vehicle to Firewall, Right Side	149.5	145.7	3.8
X15	Rear Surface of Vehicle to Firewall, Left Side	151.2	143.2	8.0
X16	Rear Surface of Vehicle to Steering Column	124.8	125.5	-.7
X17	Center of Steering Column to "A" Post	18.1	16.9	1.2
X18	Center of Steering Column to Headliner	17.8	19.7	-1.9
X19	Rear Surface of Vehicle to Right Side of Front Bumper	207.2	182.2	25.0
X20	Rear Surface of Vehicle to Left Side of Front Bumper	207.3	183.3	24.0
X21	Length of Engine Block	18.9	18.9	0



ACCELEROMETER NUMBER *	ACCELEROMETER LOCATION	DIRECTION		
		X	Y	Z
1	Front Seat Crossmember	X		
2	Vehicle C.G.	X		
3	Rear Seat Crossmember	X		
4	Top of Engine	X		
5	Bottom of Engine	X		
6	Right Front Brake Caliper	X		
7	Left Front Brake Caliper	X		

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

Figure 5 VEHICLE ACCELEROMETER LOCATIONS

36 LOAD CELLS
4 ROWS
9 COLUMNS

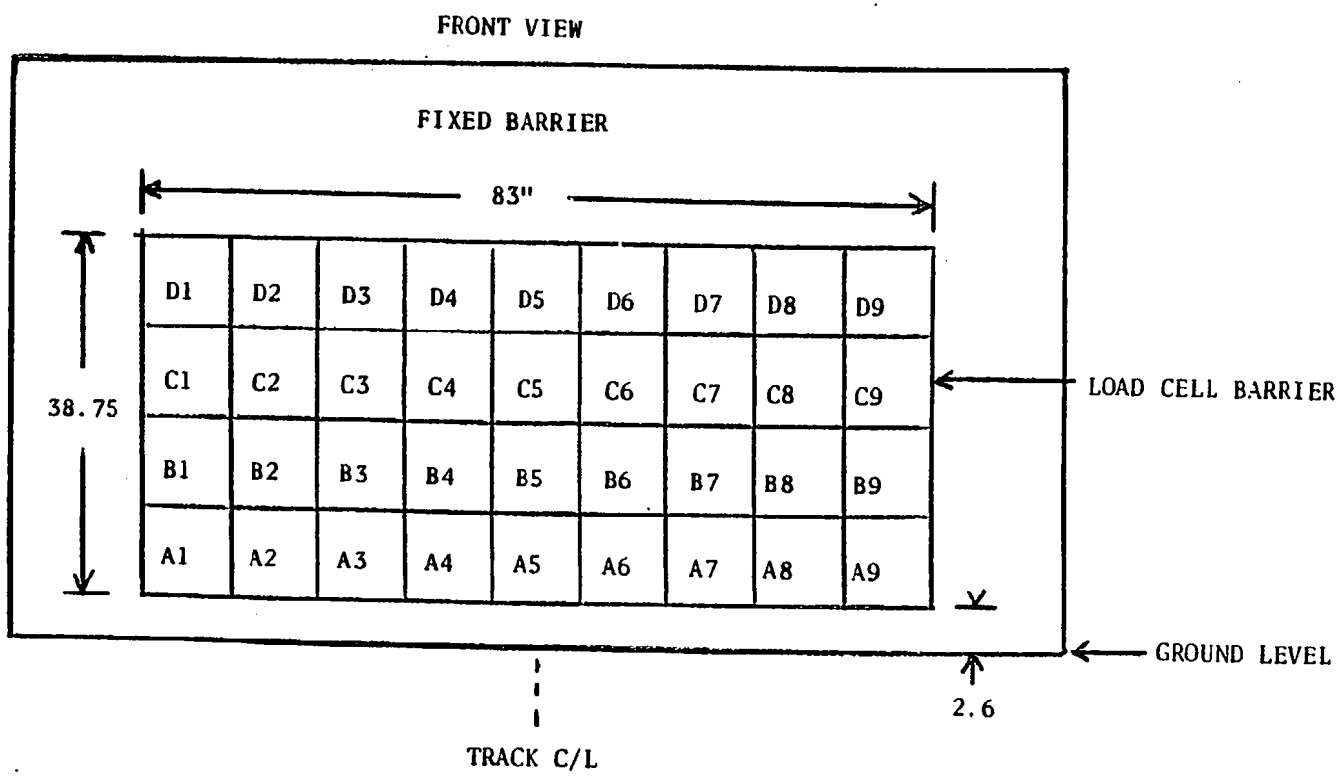


Figure 6 FIXED LOAD CELL BARRIER-LOAD CELL LOCATIONS

Table 8

ACCIDENT INVESTIGATION DIVISION

Data Summary

Test No. CD0104

Date 1/20/82

		Vehicle No. 1
Impact Description		Frontal-Load Cell Barrier
Make		1983 Chevrolet Caprice Classic
Model		4-Door Sedan
Year		1983
Size Category		Full Size
Test Weight		4120
Wheelbase		115.9
Front Overhang		40.5
Overall Width		75.2
Accelerometer Location		56.8 inches rearward of front wheel C/L
Calibration Procedure		Shaker Table least squares
Accelerometer Linearity		± 0.75%
Integration Algorithm		Hybrid Simpson - Newton 3/8
Impact Speed		35.33
Time of Separation		232 ms
Velocity Change		-37.45
CDC		12FDEW3
Damage Length	L:	71"
Crush Dimensions	C1:	23.75
	C2:	25.25
	C3:	27.5
	C4:	27.25
	C5:	26.25
	C6:	24.85
Midpoint of Damage	D:	0

*Rear seat crossmember accelerometer was used instead of the c.g. accelerometer. C.G. data were contaminated. Rear seat crossmember accelerometer was located 128 inches rearward of front bumper.

National Accident Sampling System — Continuous Sampling Subsystem: Vehicle Data

FIELD MEASUREMENTS

DOT TEST FMVSS 212, 219, 301-75S CD 0104 1983 Chev. Caprice Classic

Complete When Applicable

VIN = 2G1AN6994D1117500

End Damage	Side Damage
Undeformed end width 71"	Bowing: B1 _____ X1 _____
Corner shift: A1 –	B2 _____ X2 _____
A2 –	Bowing constant
End shift at frame (CDC) (check one)	$\frac{X1 + X2}{2}$ = _____
< 4 inches – upshift ≥ 4"	
≥ 4 inches –	

Note: Measure C1 to C6 from Driver to Passenger side in Front or Rear impacts—
Rear to Front in Side impacts.

12 + 20 (upshift) = 32 FDEW3

Specific Impact Number	Plane* of C-Measurements	Direct Damage Width** (CDC)	Direct Damage Max*** Crush	Field L**	C_1	C_2	C_3	C_4	C_5	C_6	±D
SAE Barrier	Bumper	71"	28.4"	71"	28.5	27.75	28.25	28.5	28.75	29.6	0
	Free/space				4.75	2.5	.75	.75	2.5	4.75	
	Resultant actual crush			71"	23.75	25.25	27.5	27.75	26.25	24.85	0

*Identify the plane at which the C-measurements are taken (e.g., at bumper, above bumper, at sill, above sill, at beltline, etc.) or label adjustments (e.g., free space).

Free space value is defined as the distance between the baseline and the original body contour taken at the individual C locations. This may include the following: bumper lead, bumper taper, side protrusion, side taper, etc. Record the value for each C-measurement and maximum crush.

**Measure and document on the vehicle diagram the beginning or end of the direct damage width and field L (e.g., side damage with respect to undamaged axle).

***Measure and document on the vehicle diagram the location of the maximum crush.

Note: Use as many lines/columns as necessary to describe each damage profile.

FIGURE 7

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NATIONAL ACCIDENT SAMPLING SYSTEM—CONTINUOUS SAMPLING SUBSYSTEM: VEHICLE 1983 Chev. Caprice

DAMAGE DESCRIPTION

Tire—Wheel Damage

a. Rotation physically restricted

RF 1
LF 1
RR 2
LR 2

b. Tire deflated

RF 2
LF 2
RR 2
LR 2

(1) Yes, (2) No, (8) NA, (9) Unk.

TYPE OF TRANSMISSION

___ Manual ✓ Automatic

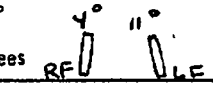
Pre Crash Average Track: 61.3
Maximum Width: 75.3
~~Curb~~ Crash Weight: 4120.
Measured Overall Length: 211.6

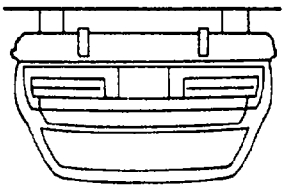
WHEEL STEER ANGLES

(For locked front wheels or displaced rear axles only)

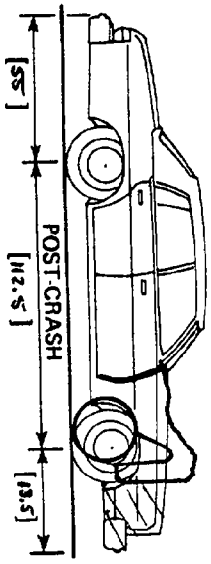
RF ⊕ 0 1 °
LF ⊕ 0 2 °
RR ± — — °
LR ± — — °

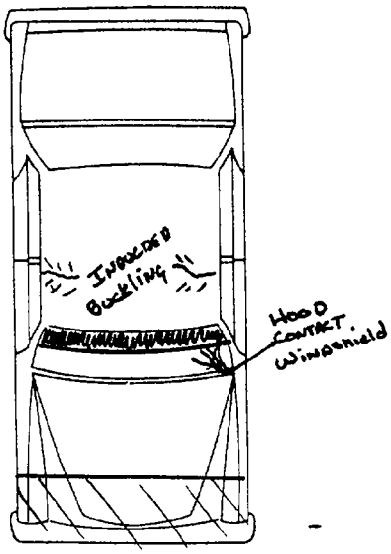
Within ± 5 degrees

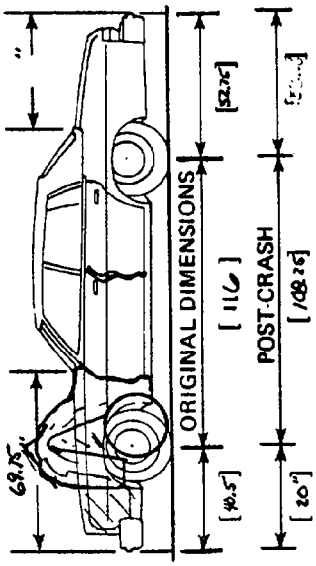


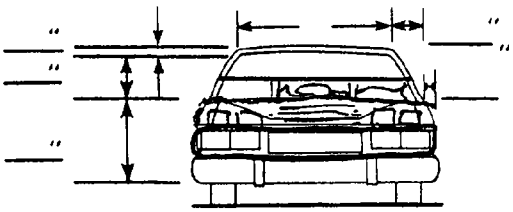


OAL Pretest = 211.6
" Post " = 183.2
MAX. CRUSH = 28.4









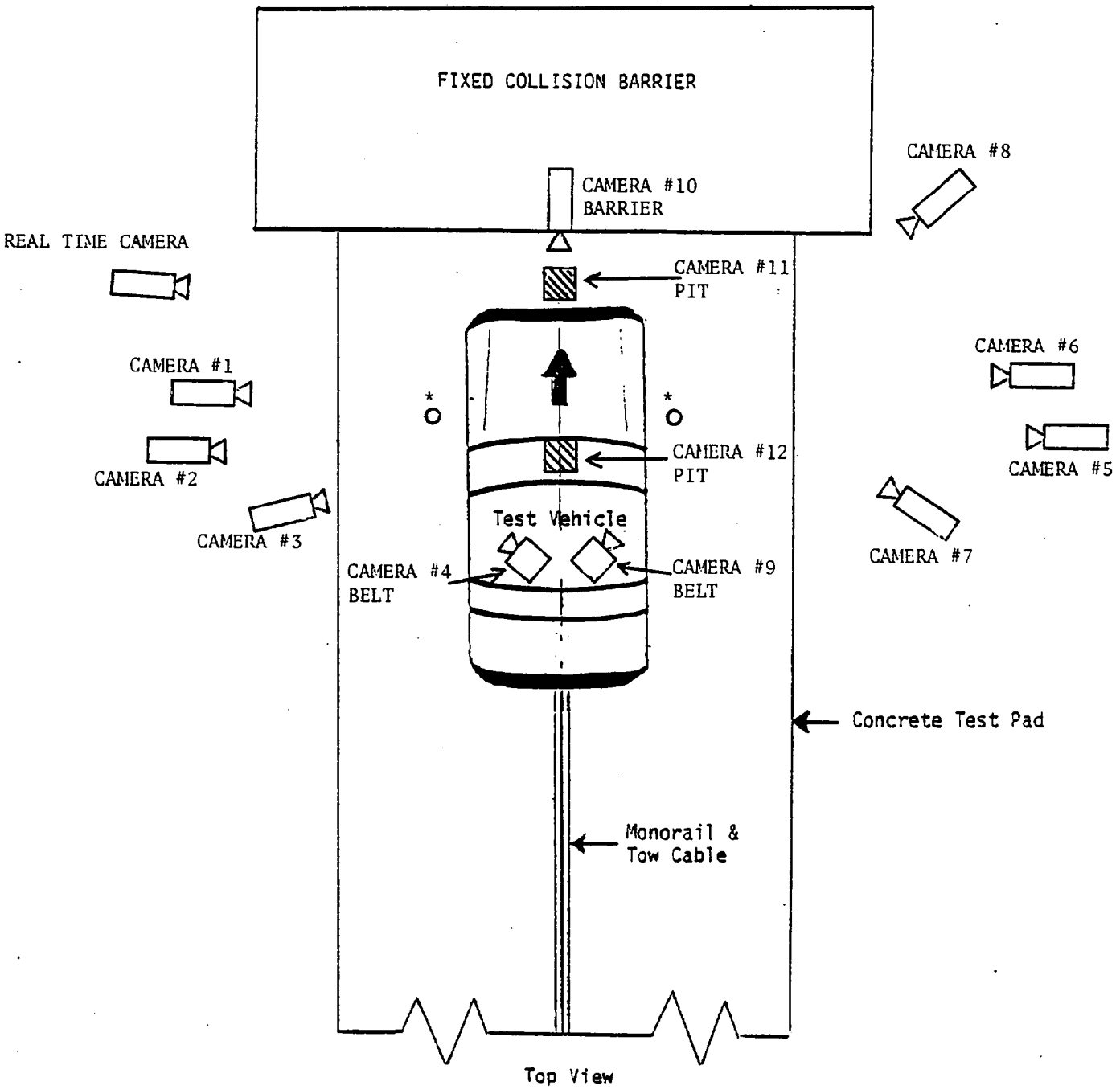
*Note: Hood Removed Prior To inspection

Note: Sketch new perimeter and cross hatch direct damage and single hatch induced damage on all views. Annotate observations which might be useful in reconstructing the accident (e.g., grass in tire bead, direction of striations, scuff on sidewall, etc.)

If pulling trailer sketch type of trailer and damage received on reverse side.

Annotate any damage caused by extrication such as component removal by torching, prying or hydraulic shears.

NOTE: Camera Information Shown on Table 9.



*Stadia Pole 72" from Barrier Face

Figure 8 CAMERA POSITION FOR FRONTAL IMPACTS

Table 9

HIGH-SPEED CAMERA LOCATIONS

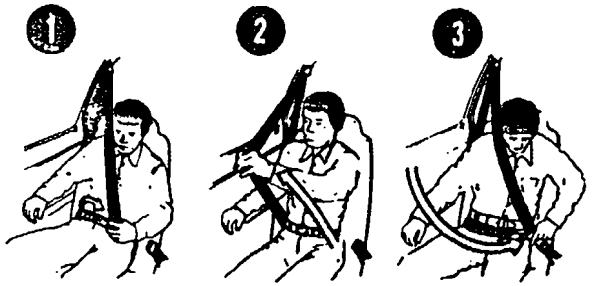
Test No. CD0104 Vehicle 1983 Chrevrolet Caprice Classic

CAMERA NO.	VIEW	CAMERA POSITIONS (in)* X	Y	Z	ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
1	Driver (redundant)	224	70	42	0	-	13	1050
2	Driver (close)	360	96	57	-3.5	335	50	875
3	Right Front Pass. (redundant)	173	132	75	-10.0	148	25	900
4	Right Front Pass (close)	-	-	-	-	-	8	750
5	Vehicle Left Side	212	76	43	-3.0	-	13	-
6	Vehicle Right Side	349	107	59	-3.5	324	50	1000
7	Windshield	163	147	77	-12.0	138	25	-
8	Vehicle Front (Barrier)	174	-12	53	-1.0	-	25	900
9	Pit Front (Engine)	-	-	-	-	-	8	750
10	Pit Rear (Fuel Tank)	0	0	120	-41	-	8	900
11	Right Belt Retractor	0	36	-120	+90	-	25	1000
12	Left Belt Retractor	0	136	-120	+90	-	13	-

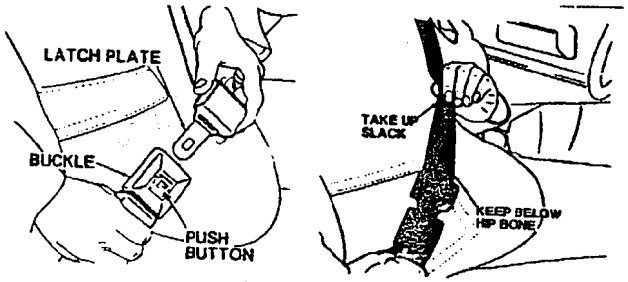
*X = film plane to monorail centerline
Y = film plane to impact location
Z = film plane to ground
** = referenced to horizontal plane

Front Seat Lap-Shoulder Belt

- Close the front door fully. The belt tension reliever will not work when the door is open.
- Adjust the front seat as needed and sit up straight and well back in the seat.
- There are a number of ways the lap-shoulder belt may be put on easily. For example:
  - The lap-shoulder belt may be put on using one hand by: (1) Holding the latch plate and pulling the belt as far as it will reach across your waist (see illustration). (2) Then, hold the latch plate at a right angle to the webbing. At the same time, slide it up the belt by raising it toward the upper outside corner of the windshield. (3) Finally, pull the latch plate down across your body and push it into the buckle until it clicks.

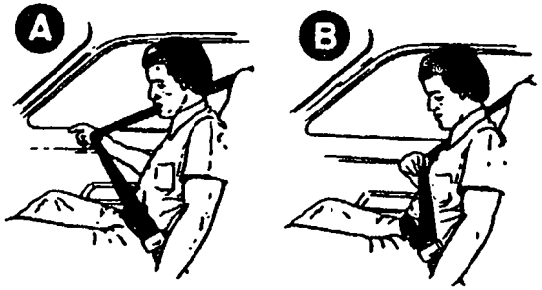


  - One easy two-handed method is to hold the webbing just behind the latch plate using the hand nearest the door. Then, bring it down across your body. While holding the webbing taut with one hand, slide the latch plate up the belt with the other hand. Finally, hold the latch plate and push it into the buckle until it clicks.
  - Position the "lap" portion of the belt across your lap as LOW ON THE HIPS as possible. If the lap portion did not snug itself to your satisfaction, adjust it to a SNUG FIT by pulling the "shoulder" portion of the belt UPWARD through the latch plate, until the lap portion is snug across your lap. This reduces the risk of sliding under the belt during an accident.



CAUTION: A snug fit with the lap belt positioned low on the hips is necessary to help lessen the chance and/or severity of injury in an accident. This spreads the force of the lap belt over the strong hipbone instead of across the soft abdomen. To help lessen the chance and/or severity of injury in an accident: never use the same belt for more than one person at a time; do not put the lap belt over the optional center armrest; do not wear belts twisted; and do not let belts or belt hardware become damaged by pinching them in the seat or door.

- The shoulder portion of the front seat belt is designed to lock only during a sudden stop or impact. At other times it is designed to move freely with the person.
- For those who find the shoulder belt too snug, belt pressure against the chest can be reduced by using the tension reliever built into the retractor. To use this feature: (A) Start by pulling the shoulder belt outward far enough so that when you let go, it returns to the chest (Step "A" in the illustration). (B) Then, adjust the belt tension by pulling down slightly on the shoulder portion of the belt and letting go (Step "B" in the illustration). The least amount of belt possible should be pulled from the retractor (about 25 millimeters or one inch) to minimize belt pressure.



- To release the tension reliever and get rid of slack, pull the shoulder belt out and let it retract, or, lean far forward and then back.

CAUTION: If shoulder belt slack is used to minimize belt pressure, the amount of slack should be kept to a minimum. Too much belt slack could reduce the amount of protection because the belt may not be able to restrain you properly in an accident.

Do NOT wear the shoulder portion of the belt under your arm nearest the door or otherwise out of position. Such use could increase the chance and/or the severity of injury in an accident.

- To unfasten the belt, push in the button in the center of the buckle.
- To stow the belt, pull it out about 150 millimeters (six inches) and let go. Hold the latch plate as it retracts to keep it from possibly striking people or things nearby. If you forget, the retractor is designed to rewind the belt when the front door is opened. If needed, slide the latch plate down the webbing to let the belt retract fully. Be sure that the belt is fully retracted and the latch plate is out of the way before closing the vehicle door. This will help prevent damage to interior trim and the seat belt assembly.

Figure 9 OWNER'S MANUAL SEAT BELT INSTRUCTIONS

Figure 10

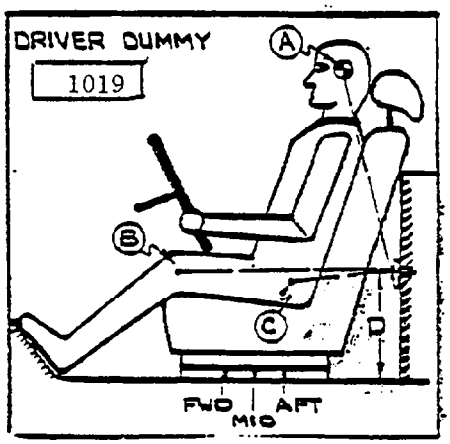
PART 572 DUMMY IN-VEHICLE POSITION

Test No. CD0104 Vehicle 1983 Chevrolet Caprice Classic

SEAT TYPE:
X Bench
___ Bucket
___ Split Bench

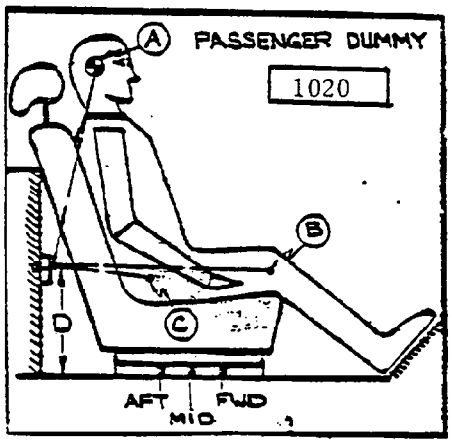
ADJUSTER TYPE:
X Manual
___ Power

BUCKET SEAT BACK TYPE:
X Fixed
___ Adjustable Reclining



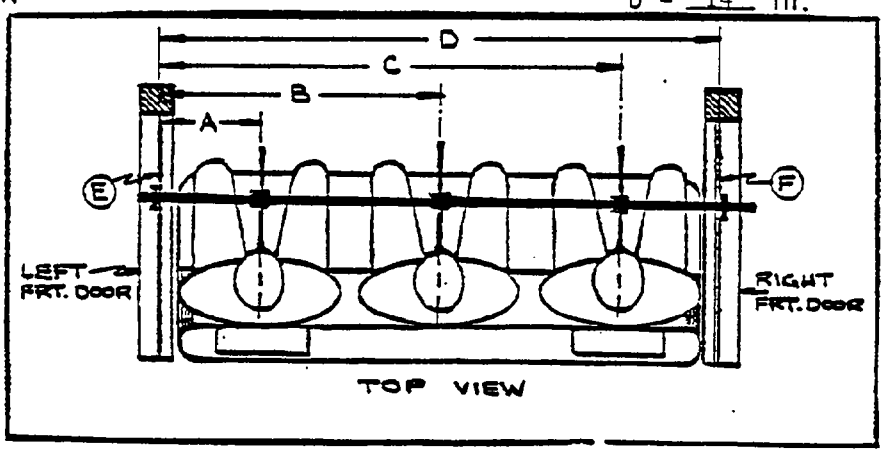
MEASUREMENT LOCATION

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



A = 24.2 in. -3 Degrees
B = 21.5 in. 95 Degrees
C = 7.5 in. 126 Degrees
D = 14 in.

A = 24.6 in. -2 Degrees
B = 22.5 in. 96 Degrees
C = 7.5 in. 127 Degrees
D = 14 in.

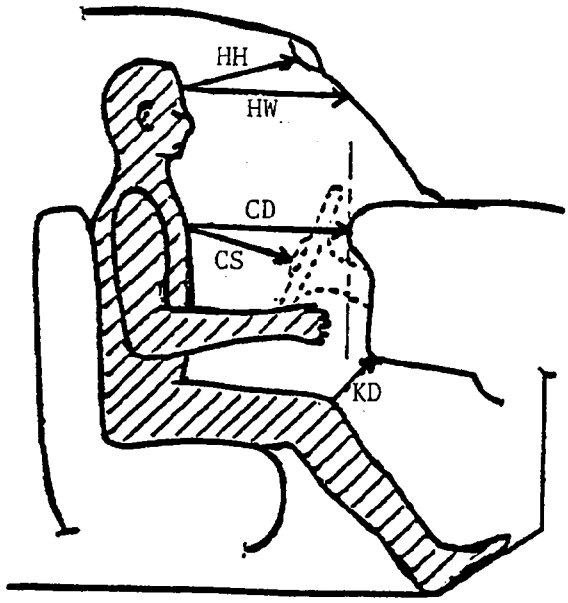


DUMMY ID

1019 - 1020

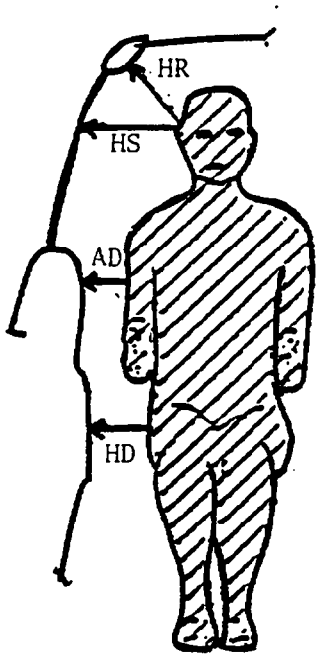
A	=	Left Door to Driver Centerline	44 in.
B	=	Left Door to Center Passenger Centerline	- in.
C	=	Left Door to Right Passenger Centerline	13.9 in.
D	=	Left Door to Right Door	57.7 in.
E, F	=	Window Glass Height (Right and Left Must be Equal)	12.7 in.

	DRIVER	PASSENGER
HH	14.7	15
HW	20.2	19.3
CD	21.0	21.2
CS	15.0	-
KDL	9.0	9
KDR	9.5	9
SA	21.0	22.0
TA	21.0	23.0



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

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



	DRIVER	PASSENGER
HR	6.5	6.3
HS	10.5	10.4
AD	5.5	6.6
HD	6.2	6.5

Figure 11 OCCUPANT CLEARANCE DIMENSIONS

Table 10

DUMMY INJURY CRITERIA VALUES

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R *
DUMMY (1)	-138	-113	76	193	-36	-18	-14	41.7
DUMMY (2)	-59	68	66	111	-25	41	-18	47.1
DUMMY (3)								
DUMMY (4)								

	MAXIMUM FORCE-FEMUR LOAD (LBS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	650	675
DUMMY (2)	544	600
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)	1400	2130	1200
DUMMY (2)	2000	1750	2375
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
DUMMY (1)	881.9	.07155	.12375	49.1	1995.6
DUMMY (2)	1083.6	.08347	.12780	56.9	1574.5
DUMMY (3)					
DUMMY (4)					

*DEFINED AS EXCEEDING 0.003 SEC. DURATION

**AS DEFINED IN FMVSS NO. 208

APPENDIX A

PHOTOGRAPHS

FIGURE A-1 PRE-TEST FRONT VIEW

FIGURE A-2 POST-TEST FRONT VIEW

7103-V-3

FIGURE A-3 PRE-TEST LEFT SIDE VIEW

FIGURE A-4 POST-TEST LEFT SIDE VIEW

FIGURE A-5 PRE-TEST RIGHT SIDE VIEW

FIGURE A-6 POST-TEST RIGHT SIDE VIEW

FIGURE A-7 PRE-TEST FRONT THREE-QUARTERS VIEW

7103-V-3

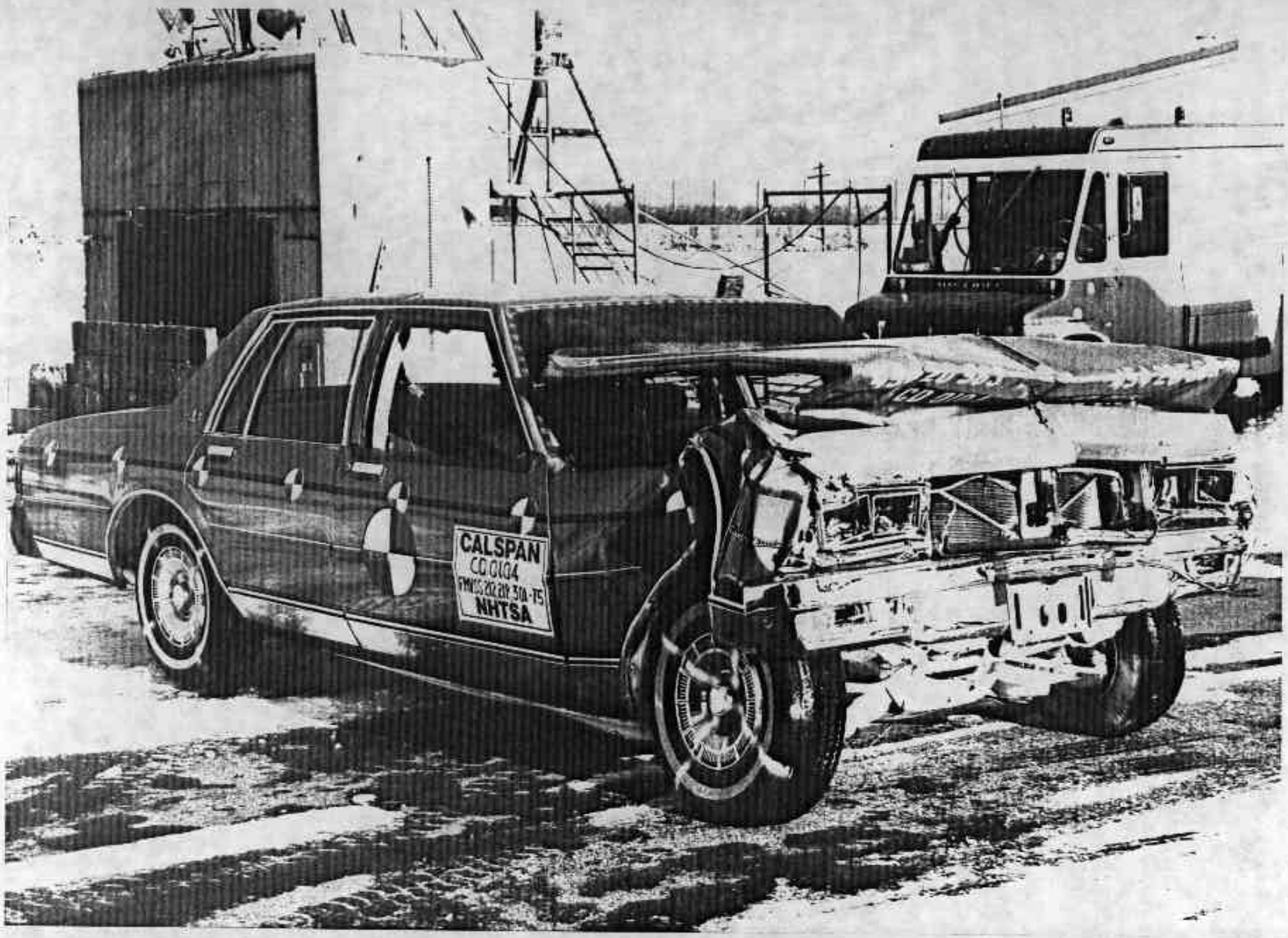


FIGURE A-8 POST-TEST FRONT THREE-QUARTERS VIEW

FIGURE A-9 PRE-TEST REAR THREE-QUARTERS VIEW

FIGURE A-10 POST-TEST REAR THREE-QUARTERS VIEW

FIGURE A-11 POST-TEST TOP VIEW

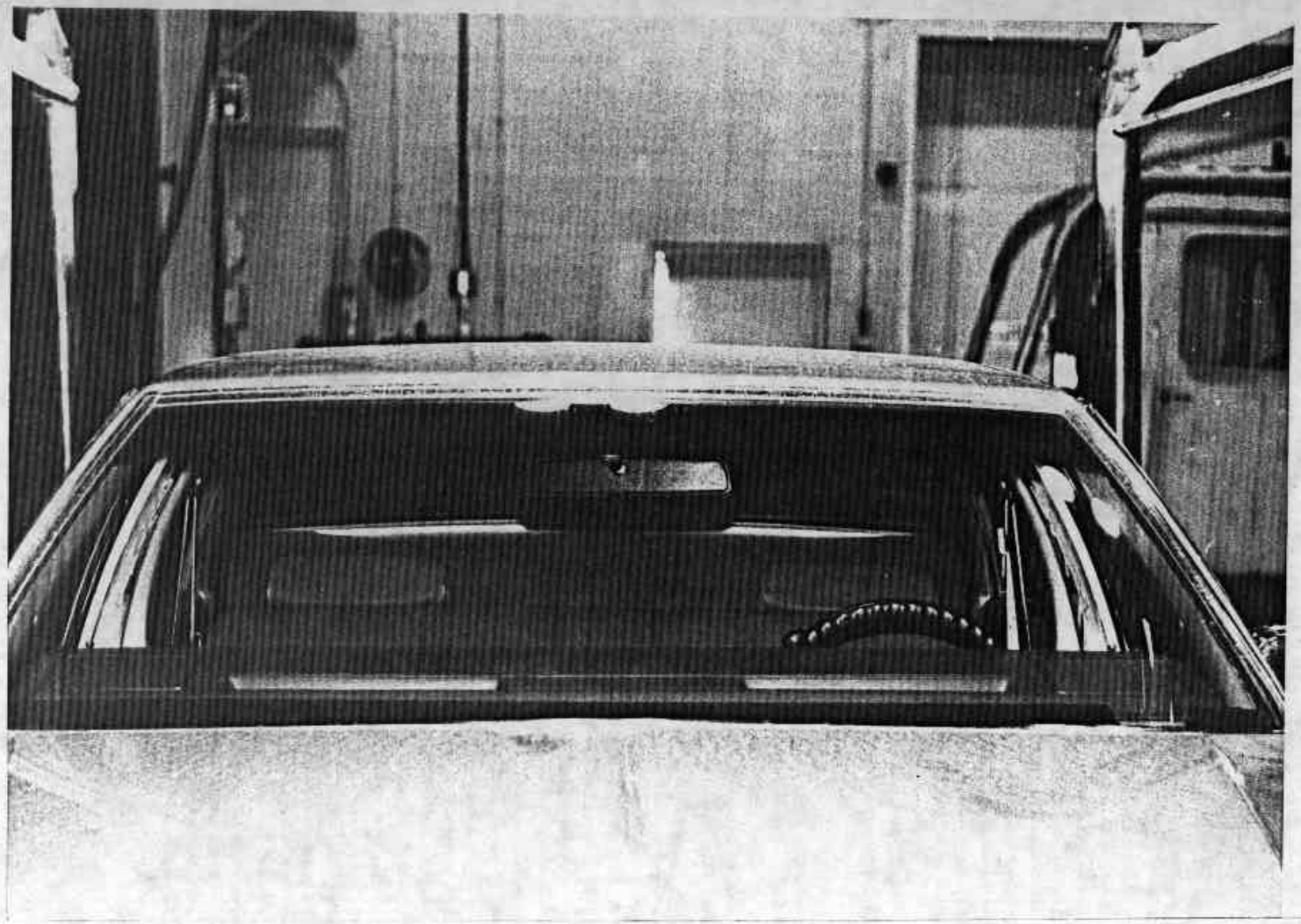


FIGURE A-12 PRE-TEST VIEW OF WINDSHIELD

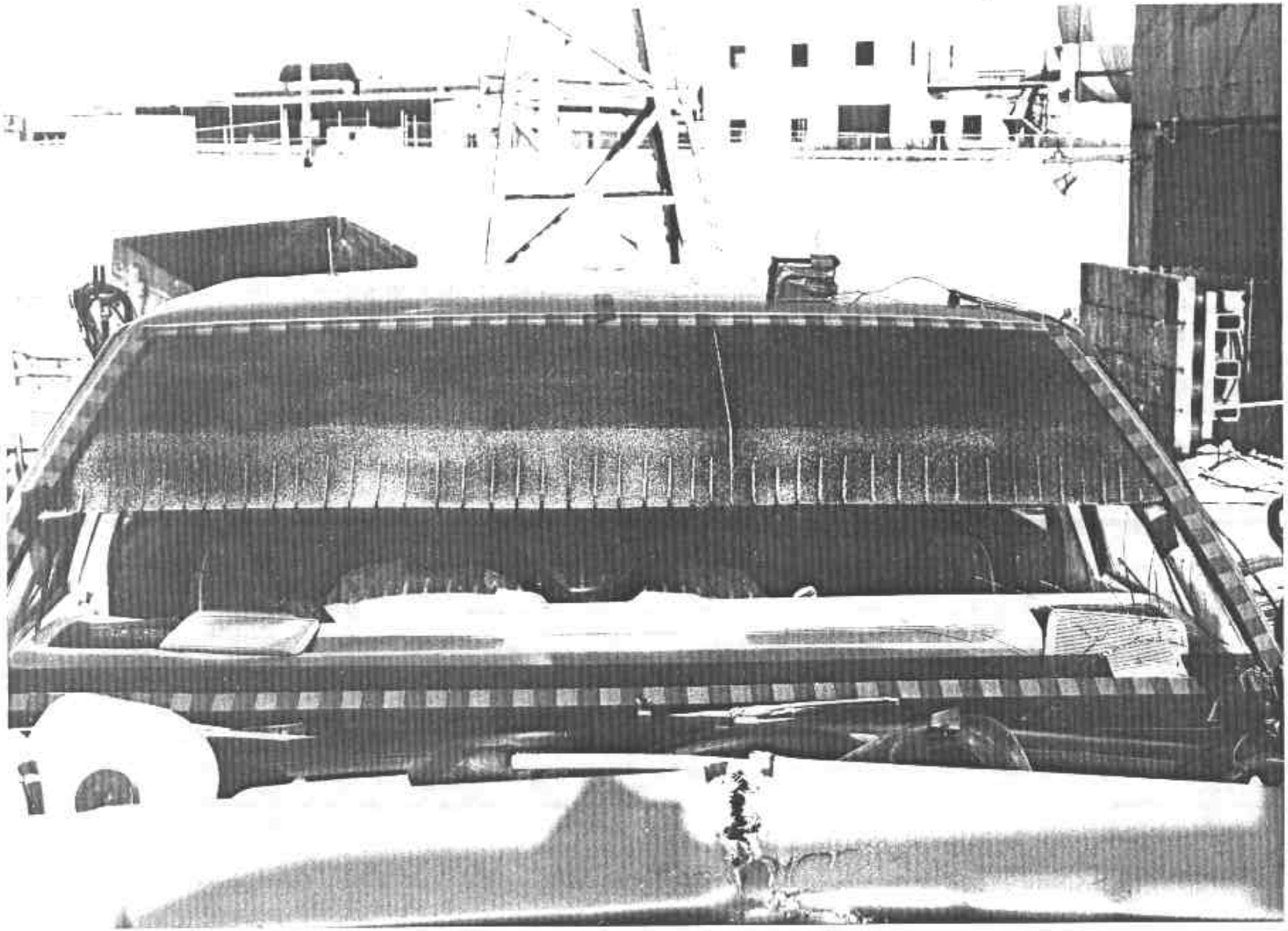


FIGURE A-13 POST-TEST VIEW OF WINDSHIELD AND TEMPLATE

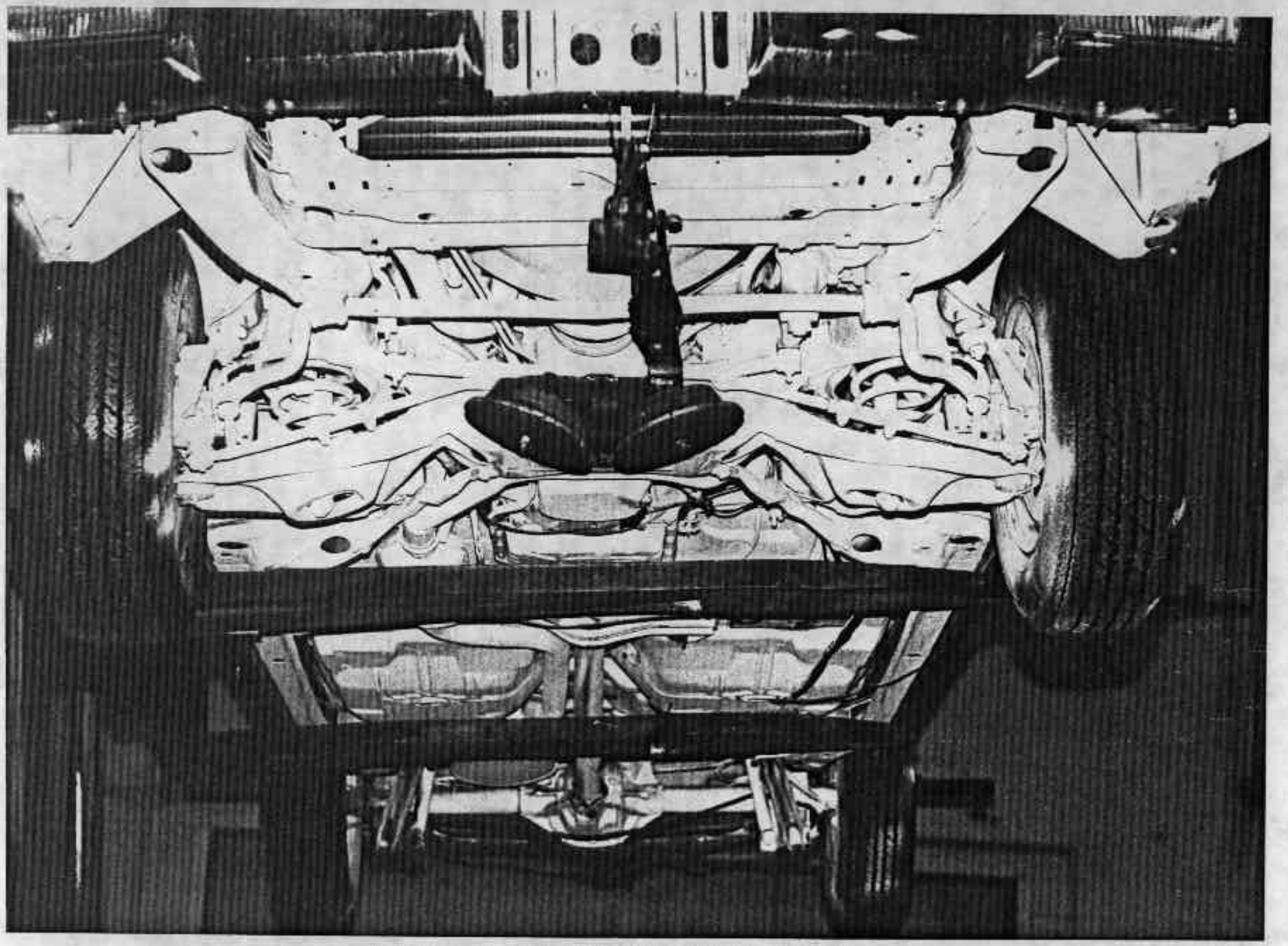


FIGURE A-14 PRE-TEST FRONT UNDERBODY VIEW

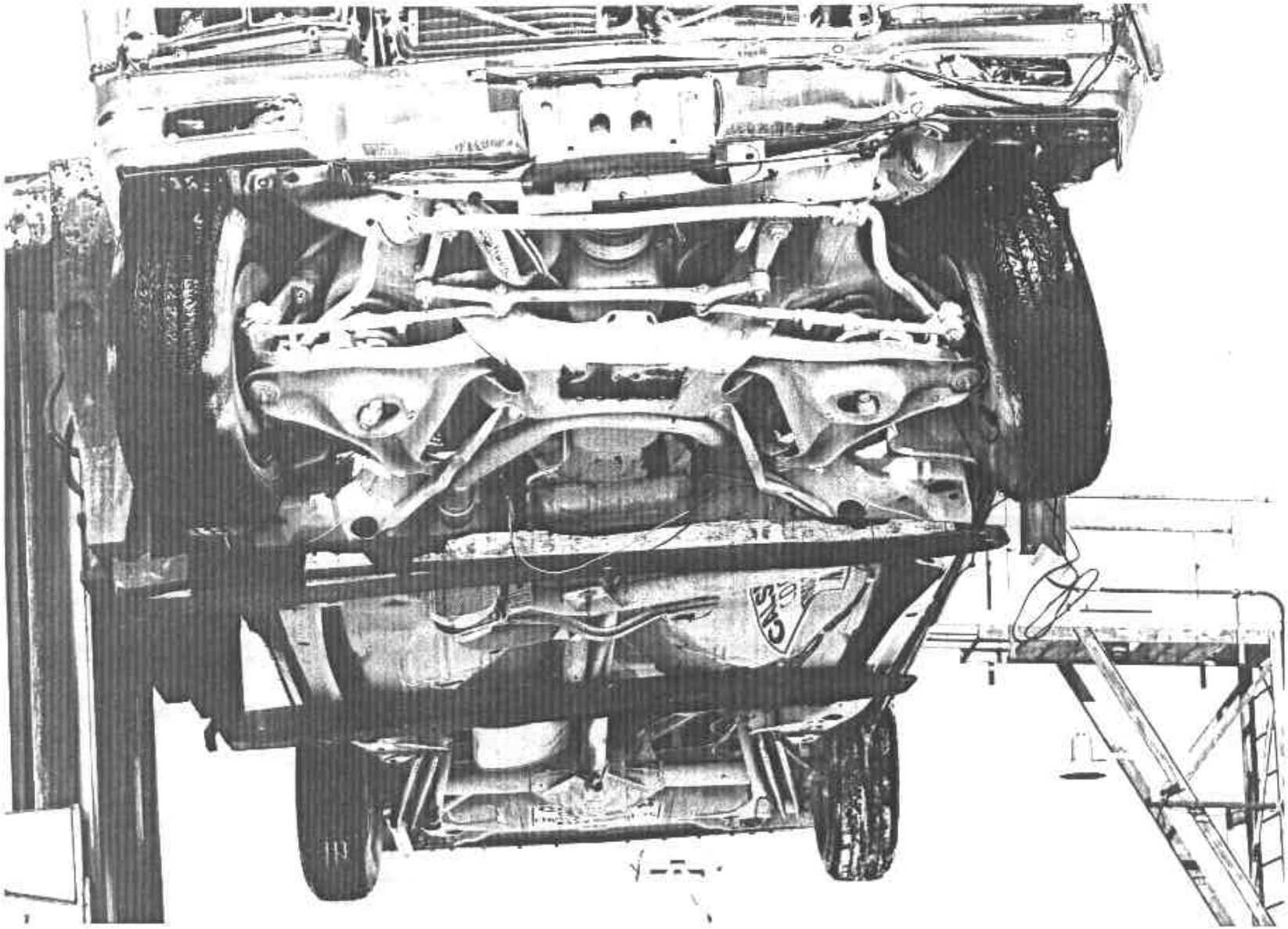


FIGURE A-15 POST-TEST FRONT UNDERBODY VIEW

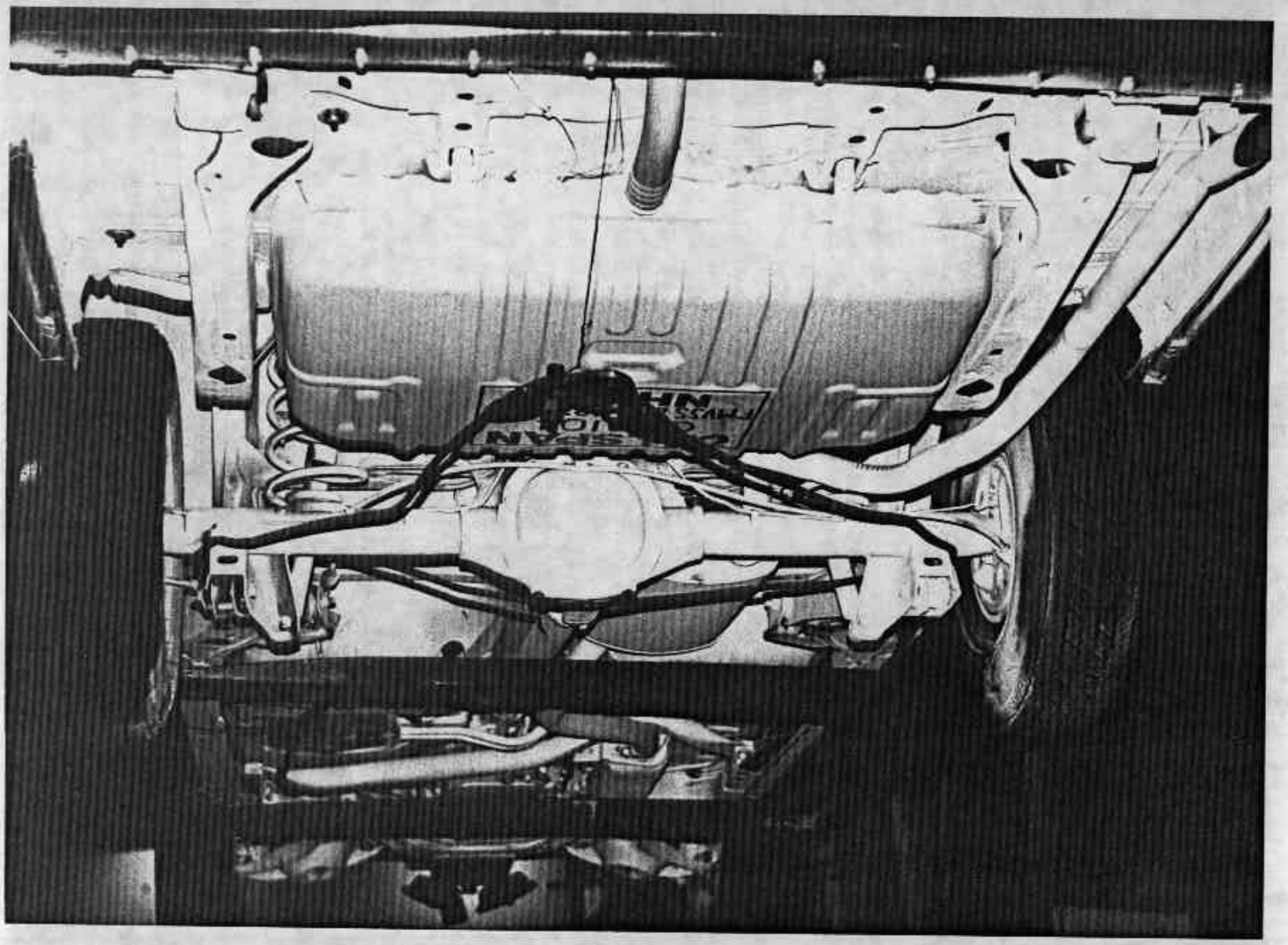


FIGURE A-16 PRE-TEST REAR UNDERBODY VIEW

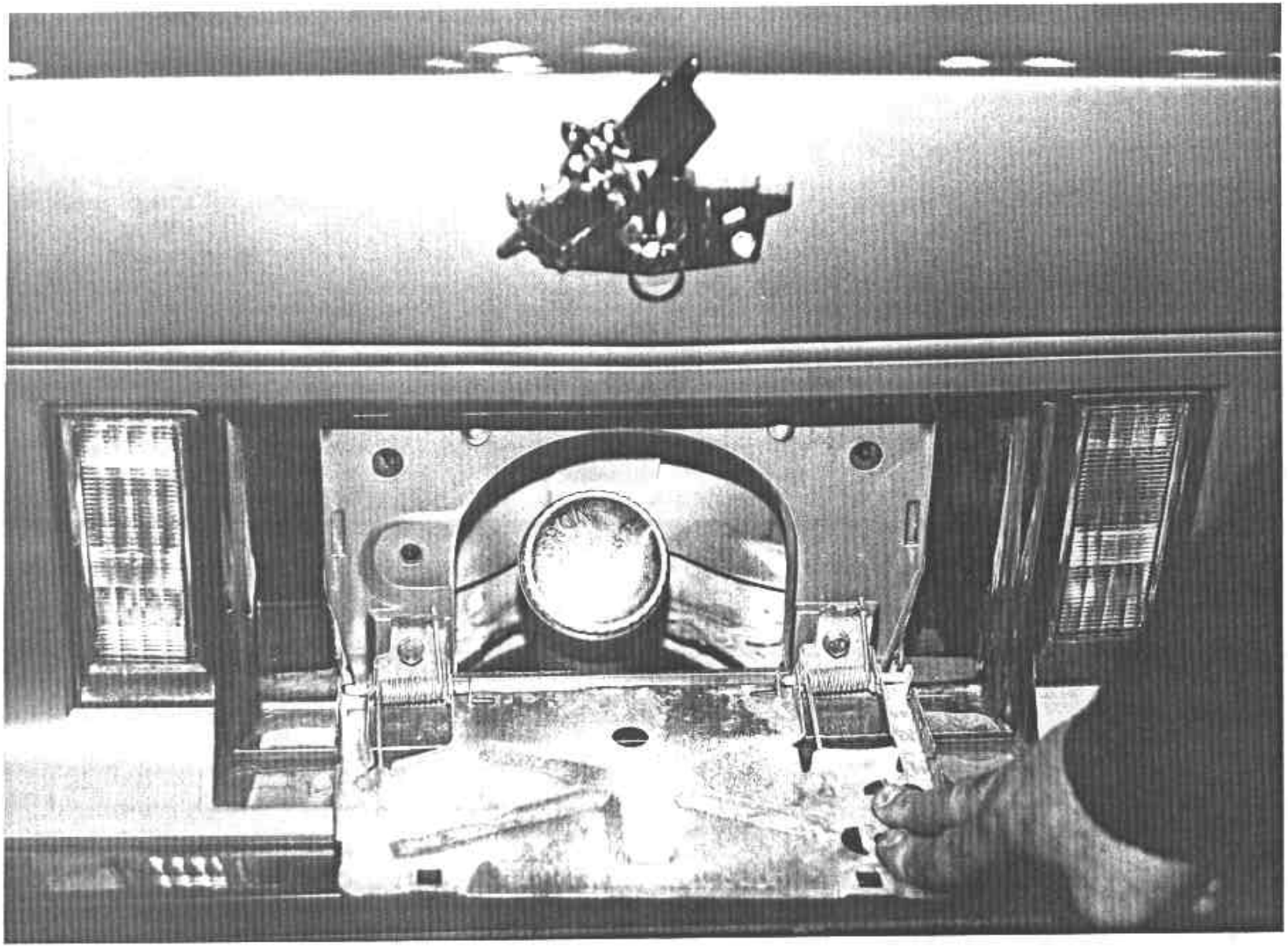


FIGURE A-17 FILLER CAP VIEW

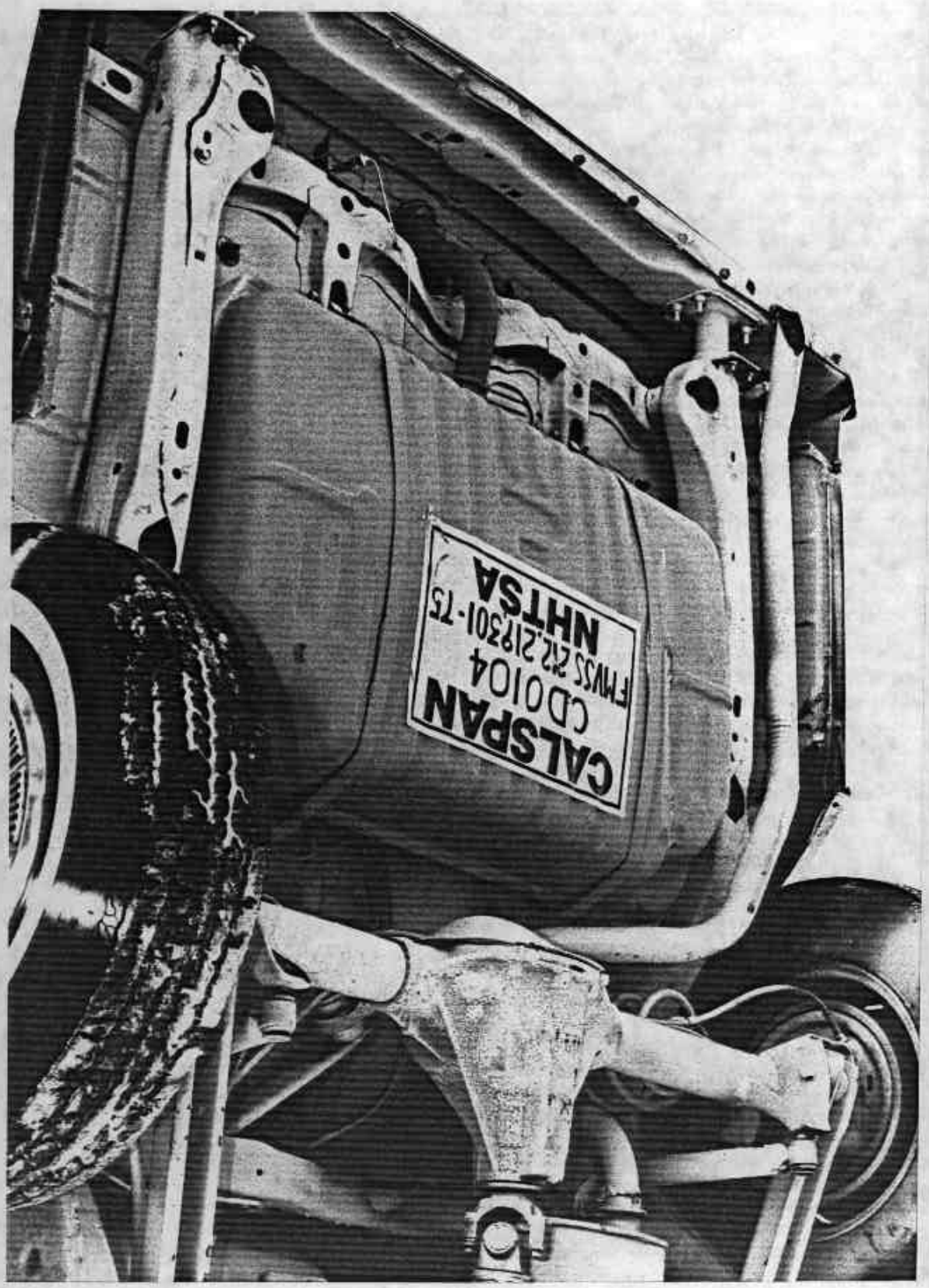


FIGURE A-18 POST-TEST VIEW OF FUEL TANK AND FUEL LINES

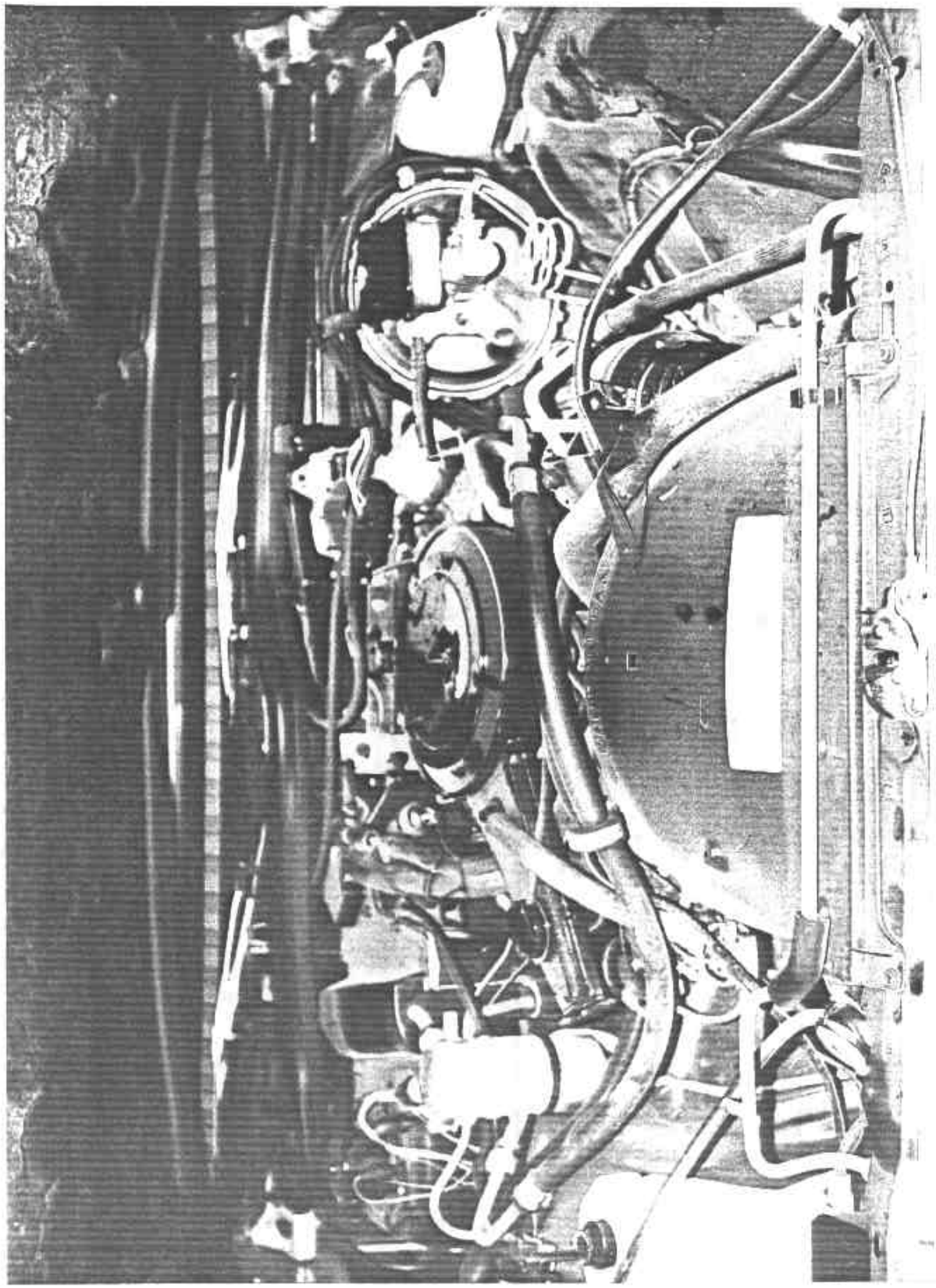


FIGURE A-19 PRE-TEST VIEW OF ENGINE COMPARTMENT

FIGURE A-20 PRE-TEST DRIVER POSITION VIEW

FIGURE A-21 POST-TEST DRIVER POSITION VIEW

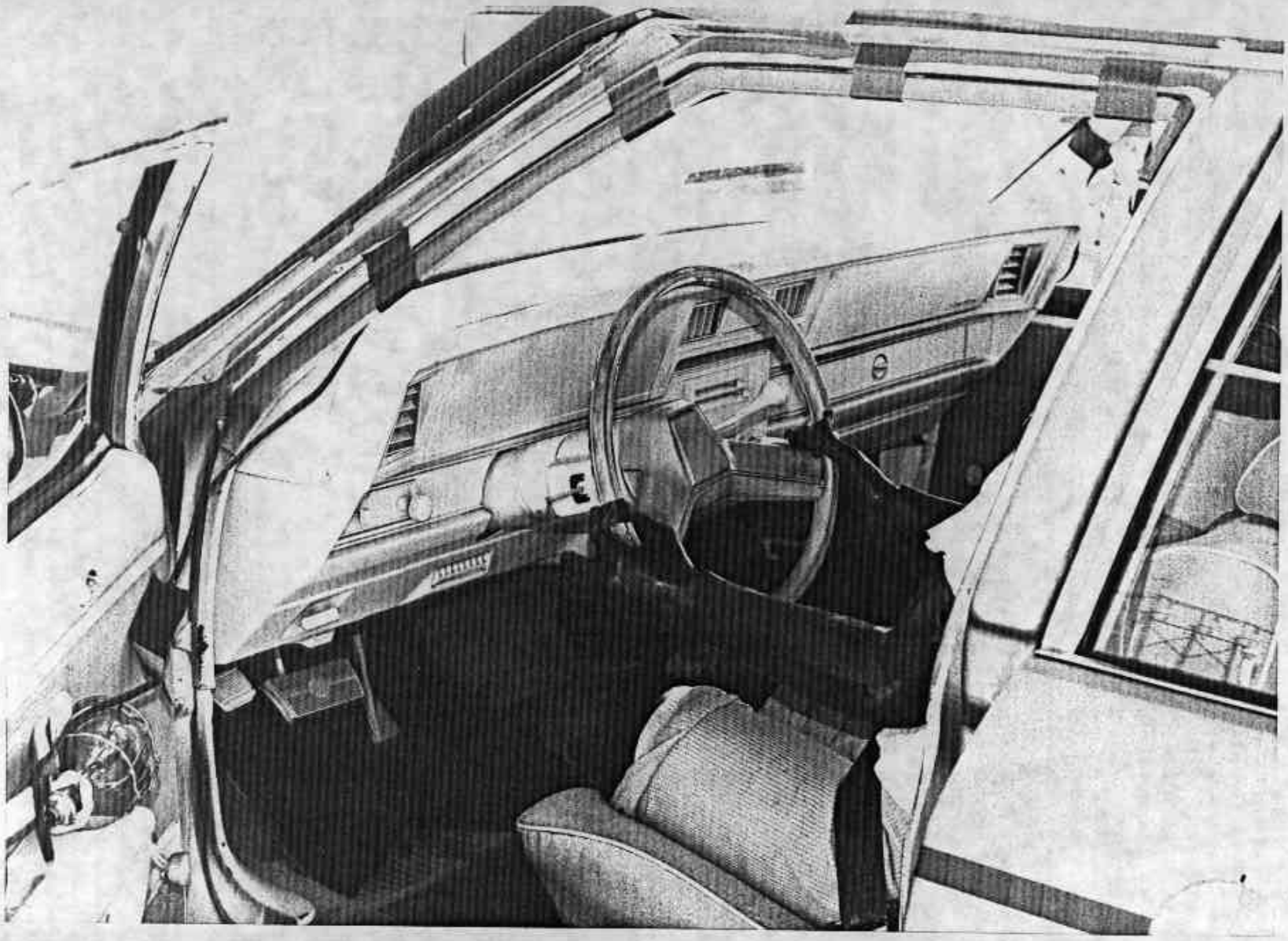


FIGURE A-22 PRE-TEST DRIVE AND INTERIOR VIEW

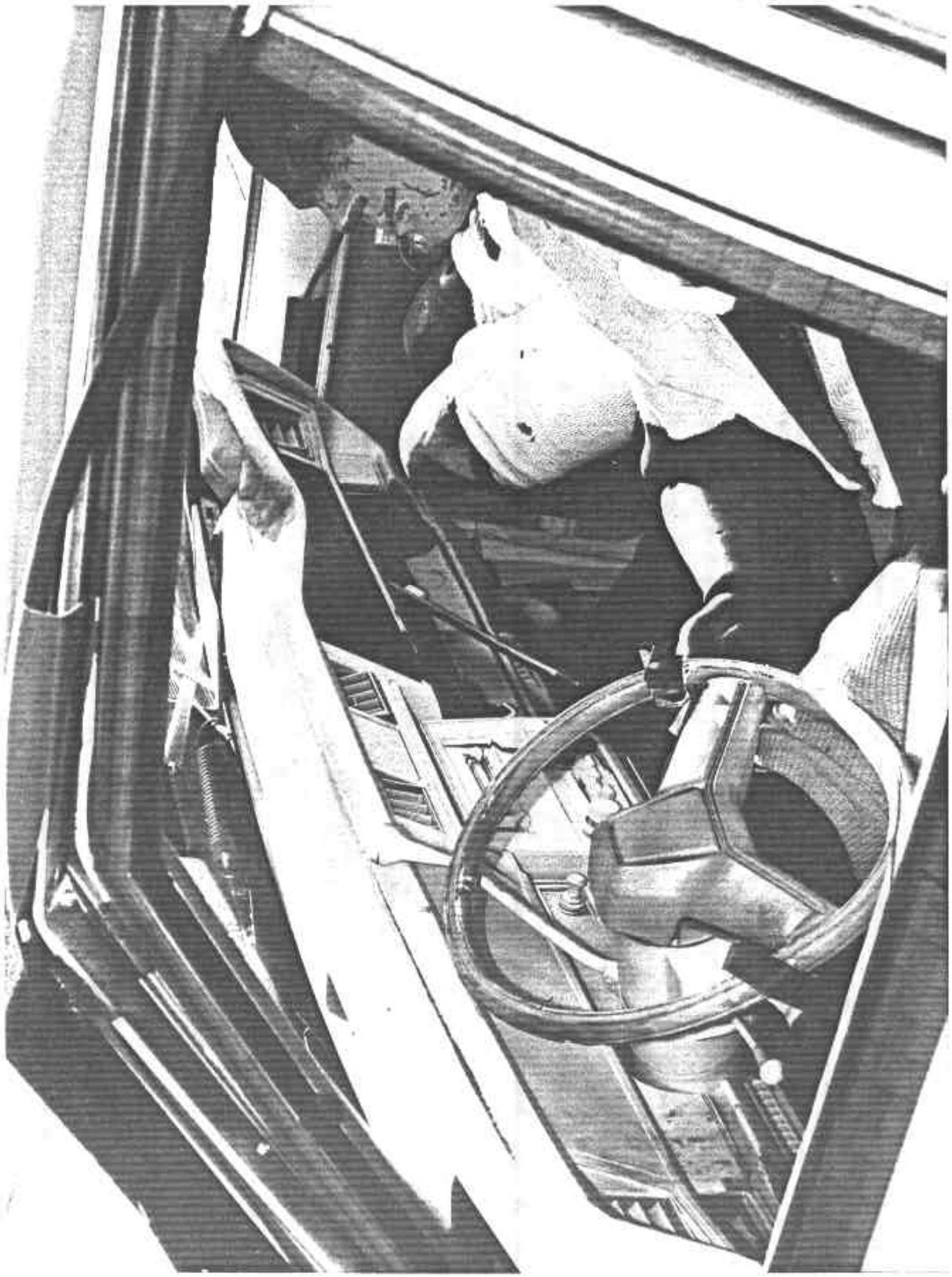


FIGURE A-23 POST-TEST DRIVER AND INTERIOR VIEW

FIGURE A-24 PRE-TEST RIGHT FRONT PASSENGER POSITION

FIGURE A-25 POST-TEST RIGHT FRONT PASSENGER POSITION

FIGURE A-26 PRE-TEST RIGHT FRONT PASSENGER AND INTERIOR VIEW

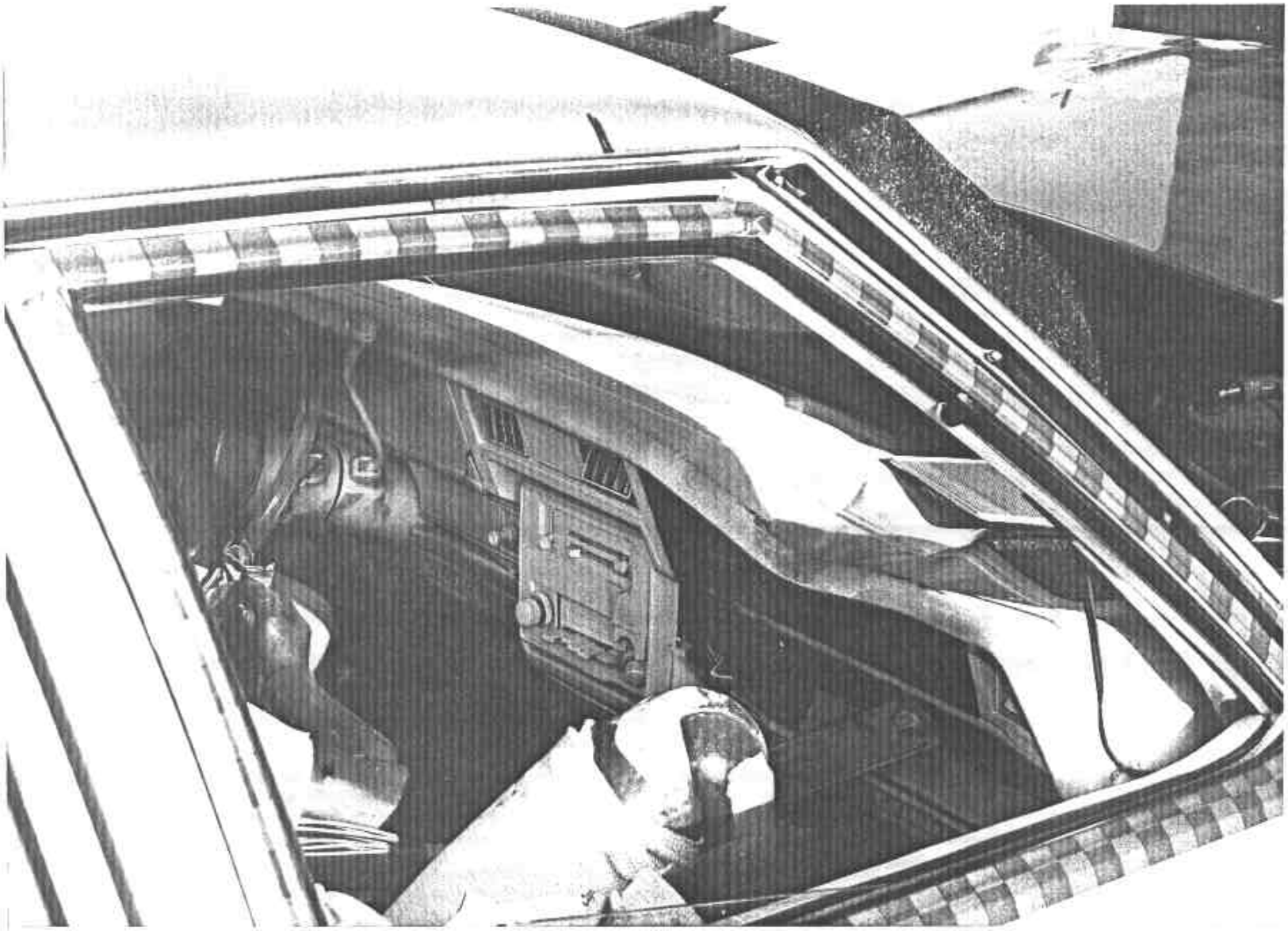


FIGURE A-27 PRE-TEST RIGHT FRONT PASSENGER AND INTERIOR VIEW

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA

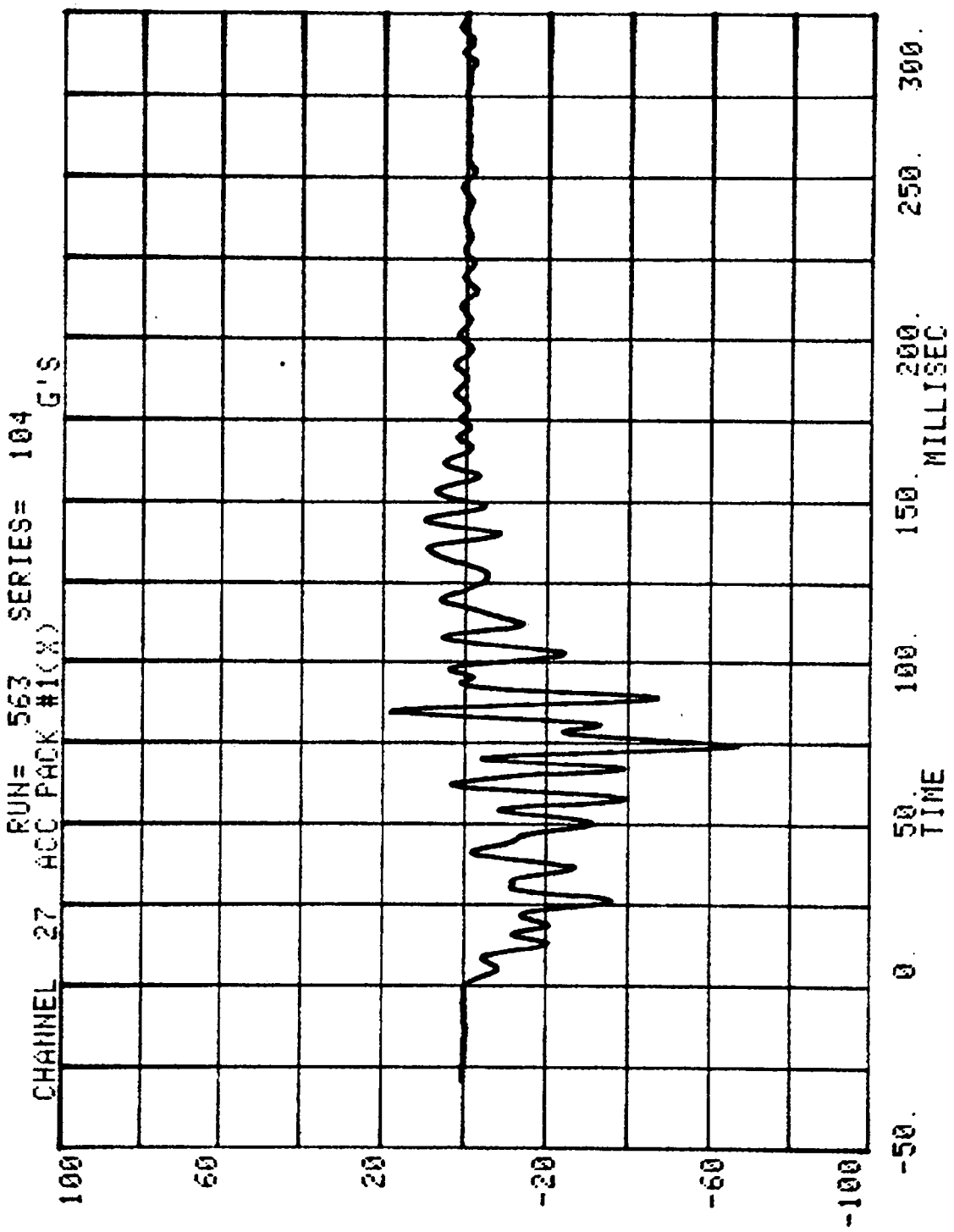
TEST NO. CD0104

1983 CHEVROLET CAPRICE CLASSIC

VEHICLE DATA

FILTER CHANNEL CLASS

60


CHANNEL 27 ACC PACK #1(X)
RUN= 563 SERIES= 104
G'S
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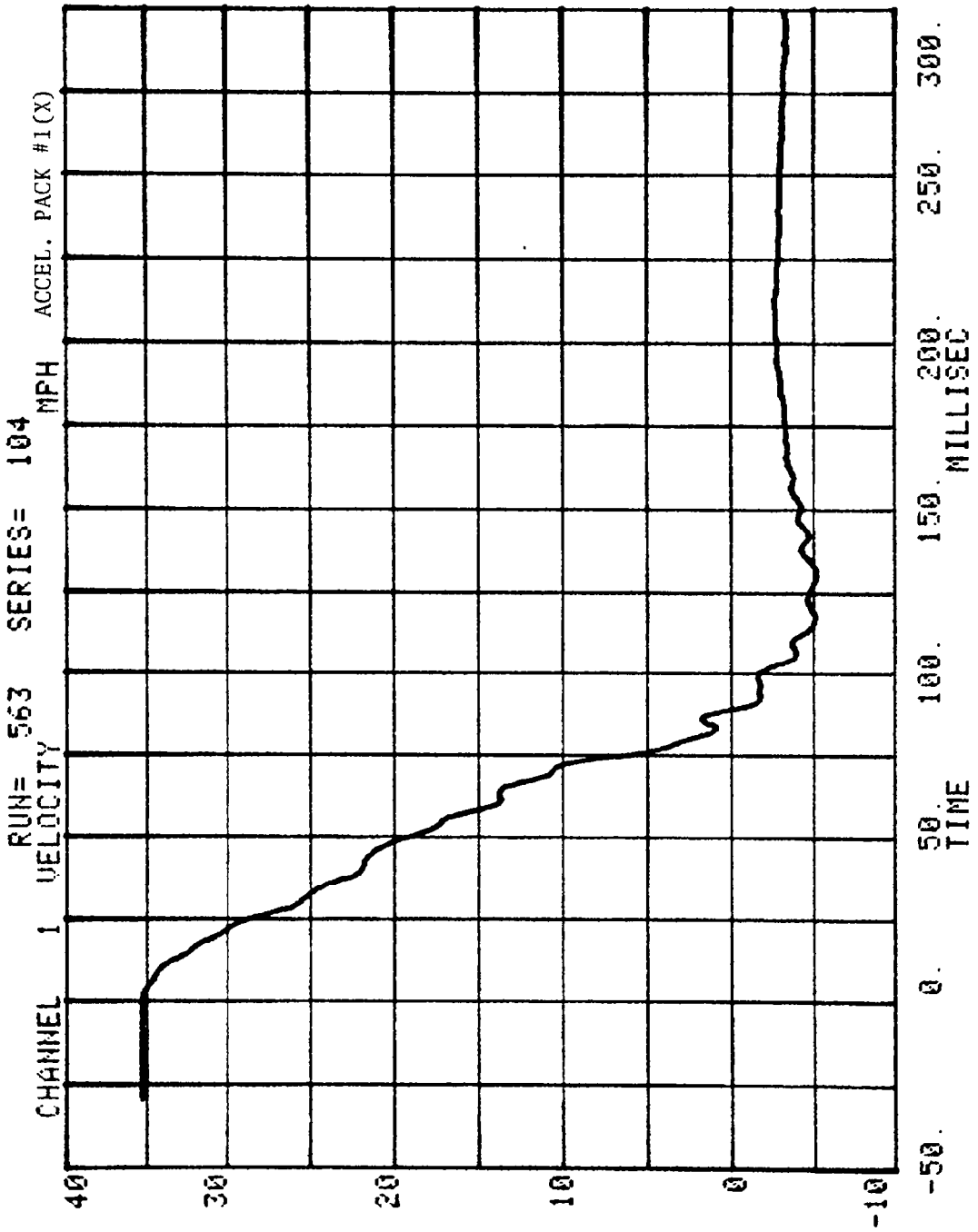
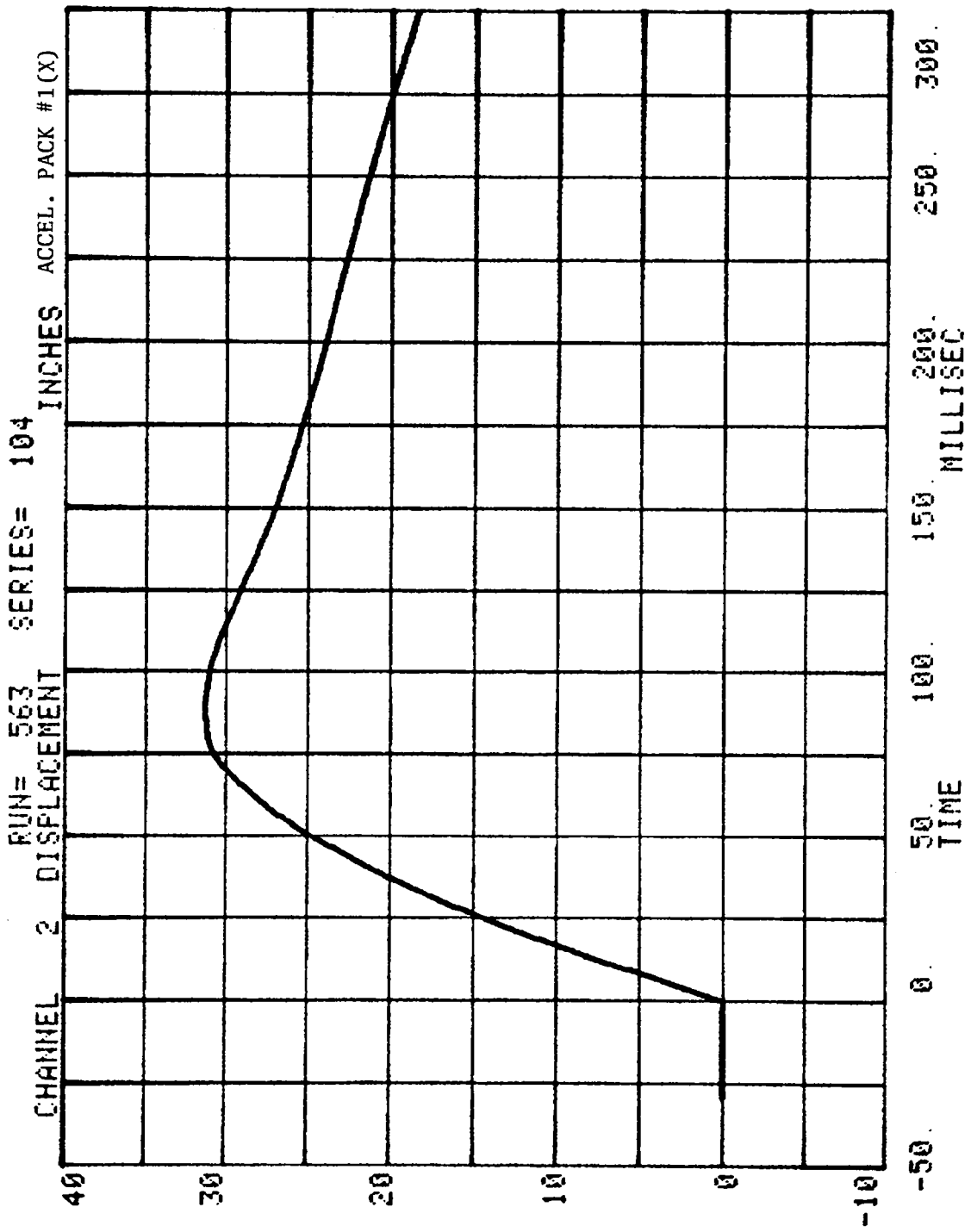
60
20
-20
-60
-100
-50.
0
50.
100
150
200.
250.
300.
TIME
MILLISEC


CHANNEL 1 VELOCITY
RUN= 563 SERIES= 104 MPH ACCEL. PACK #1(X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 2 DISPLACEMENT
RUN= 563 SERIES= 104
INCHES ACCEL. PACK #1(X)
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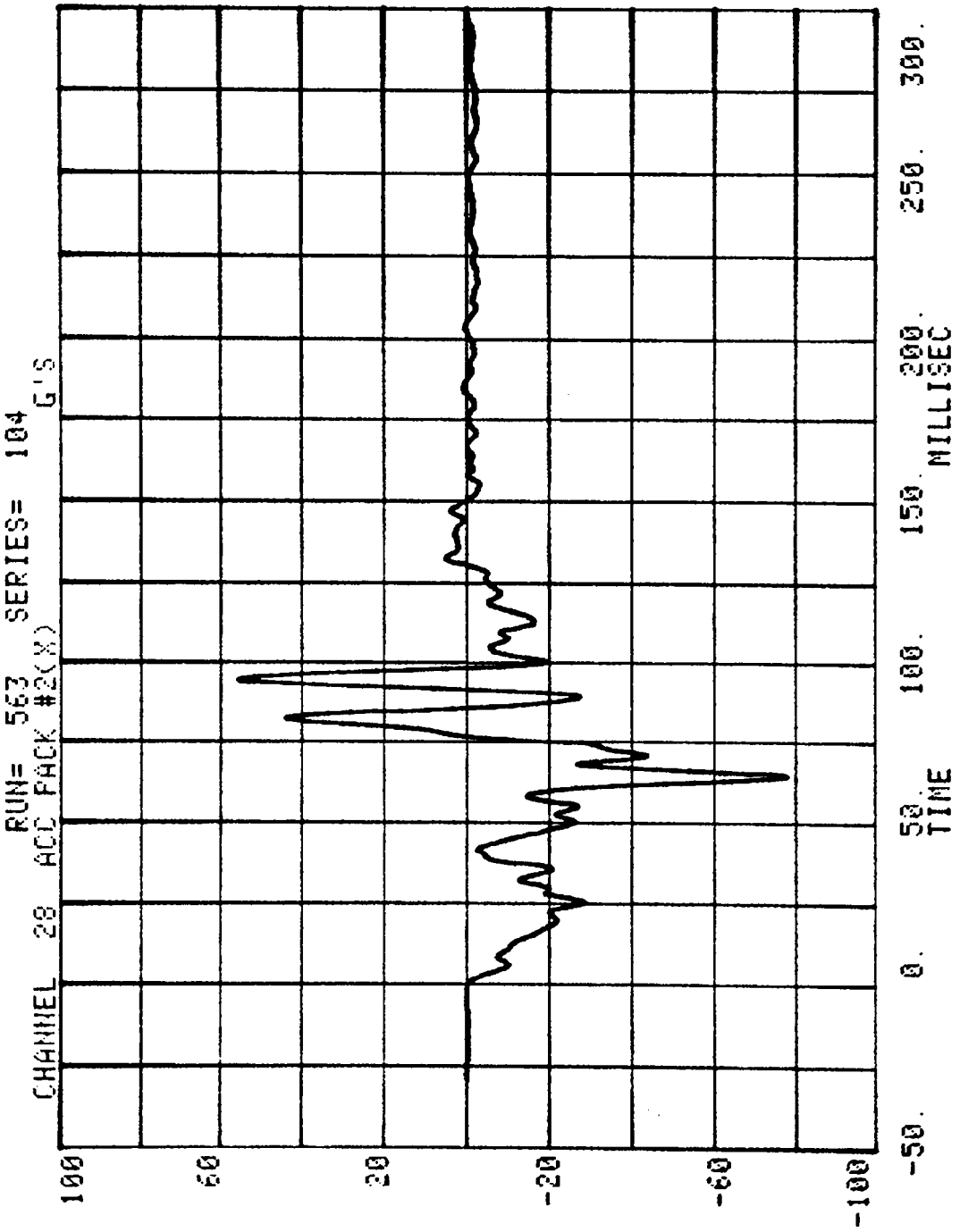
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 28 ACC PACK #2(X)
RUN= 563 SERIES= 104
G'S
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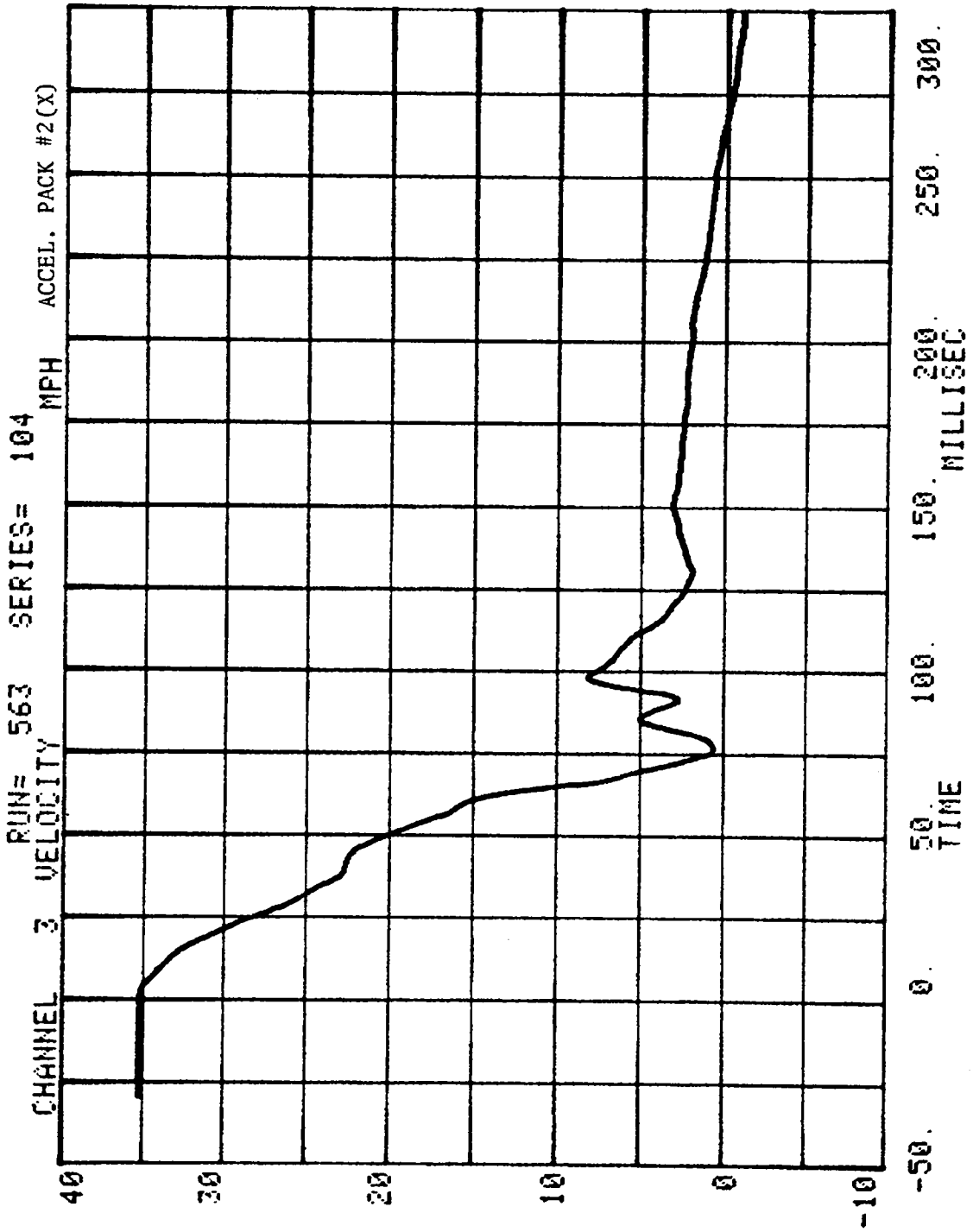
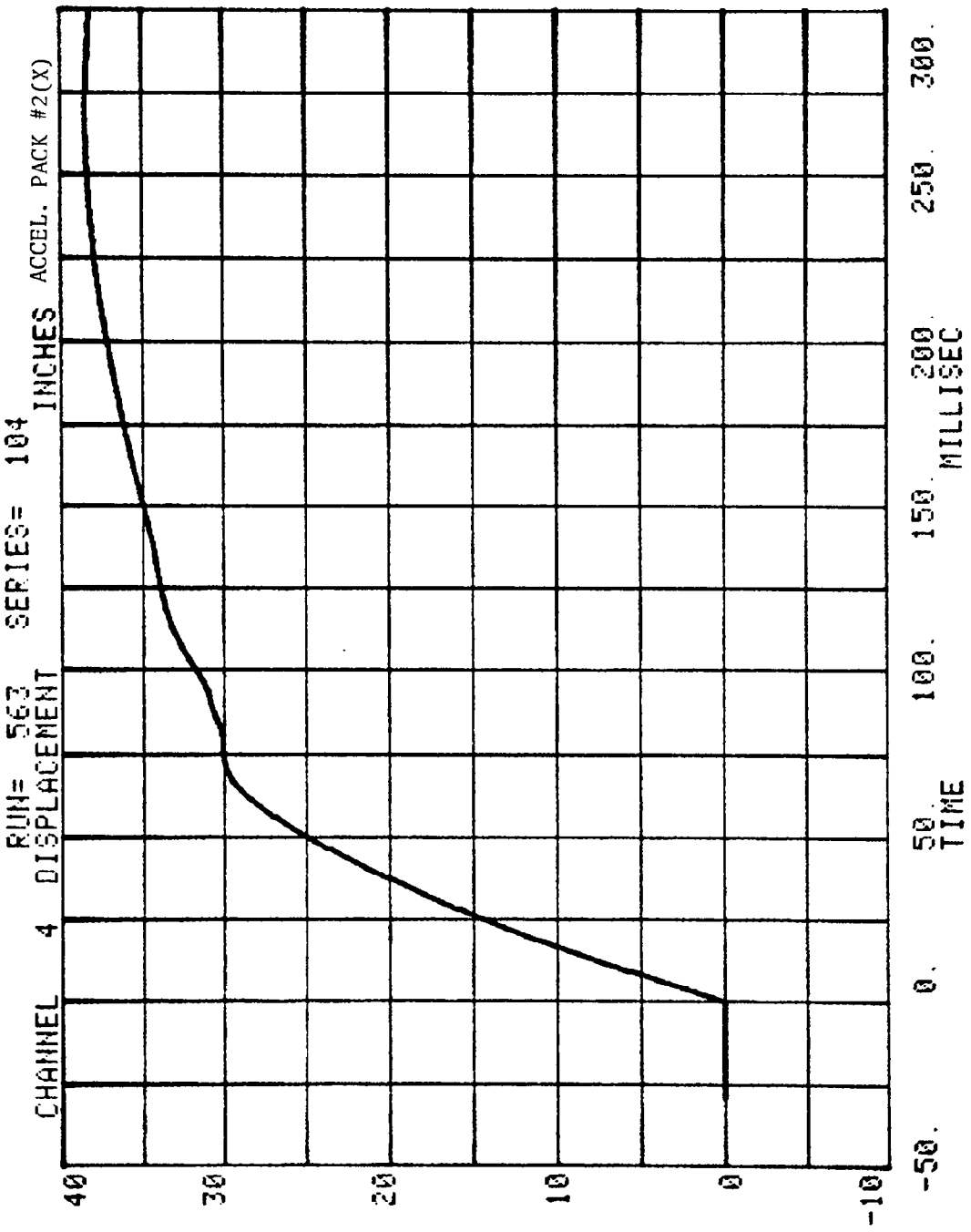
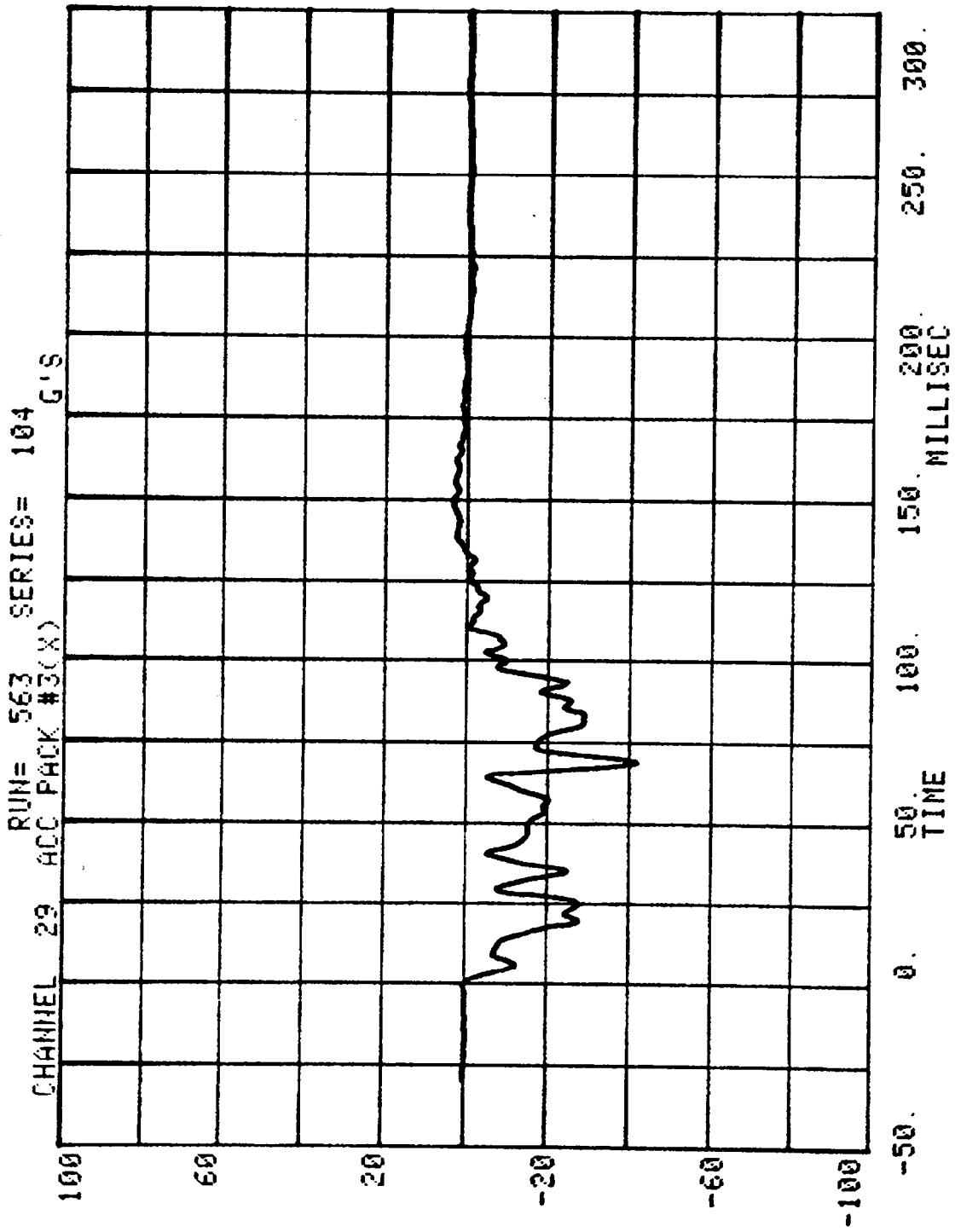
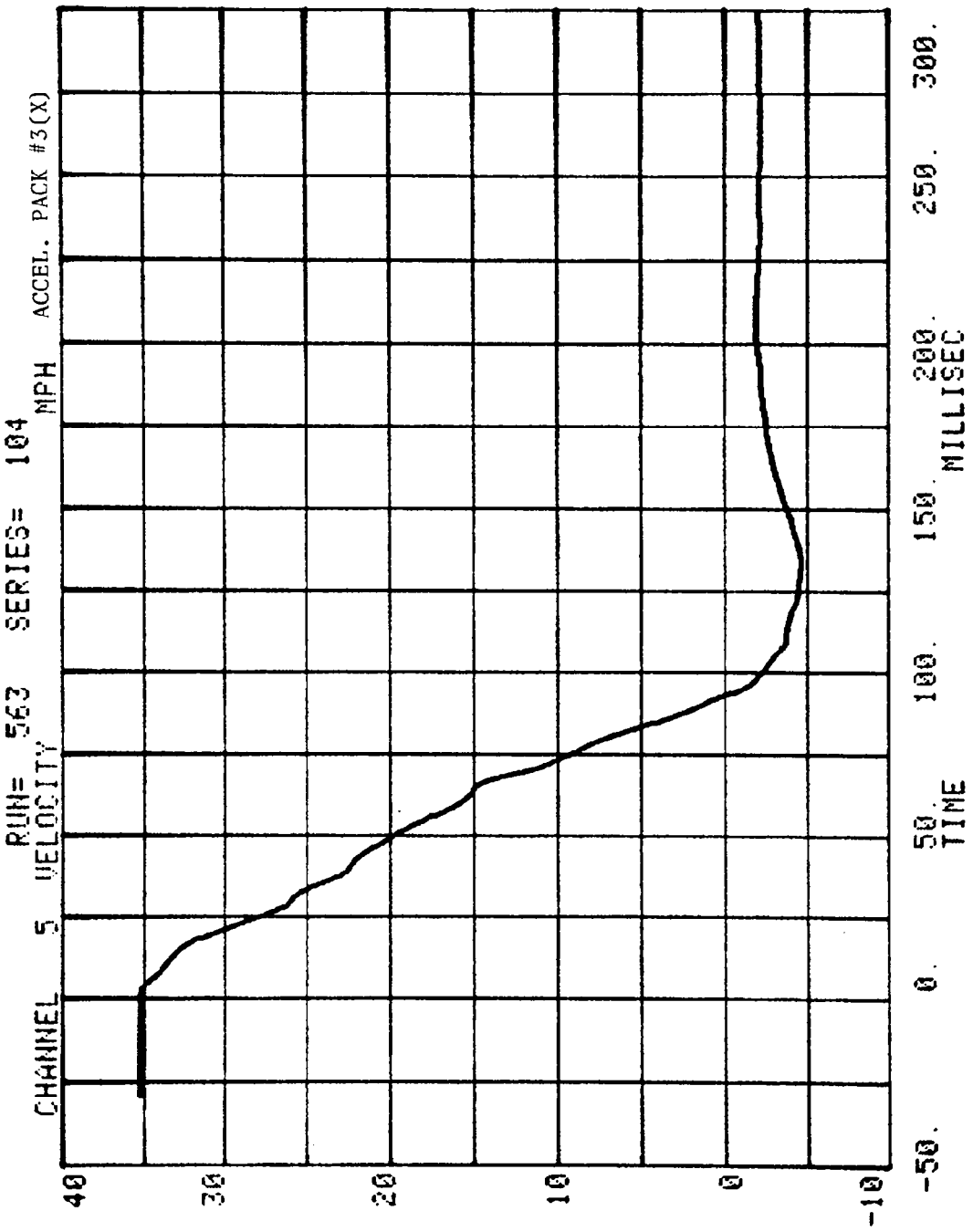
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 3 VELOCITY
RUN= 563 SERIES= 104
MPH
ACCEL. PACK #2(X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 4 RUN= 563 SERIES= 104
DISPLACEMENT INCHES ACCEL. PACK #2(X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME MILLISEC


CHANNEL 29 ACC PACK #3(X)
RUN= 563 SERIES= 104
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 5 VELOCITY
RUN= 563 SERIES= 104 MPH
ACCEL. PACK #3(X)
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30
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10
0
-10
-50.
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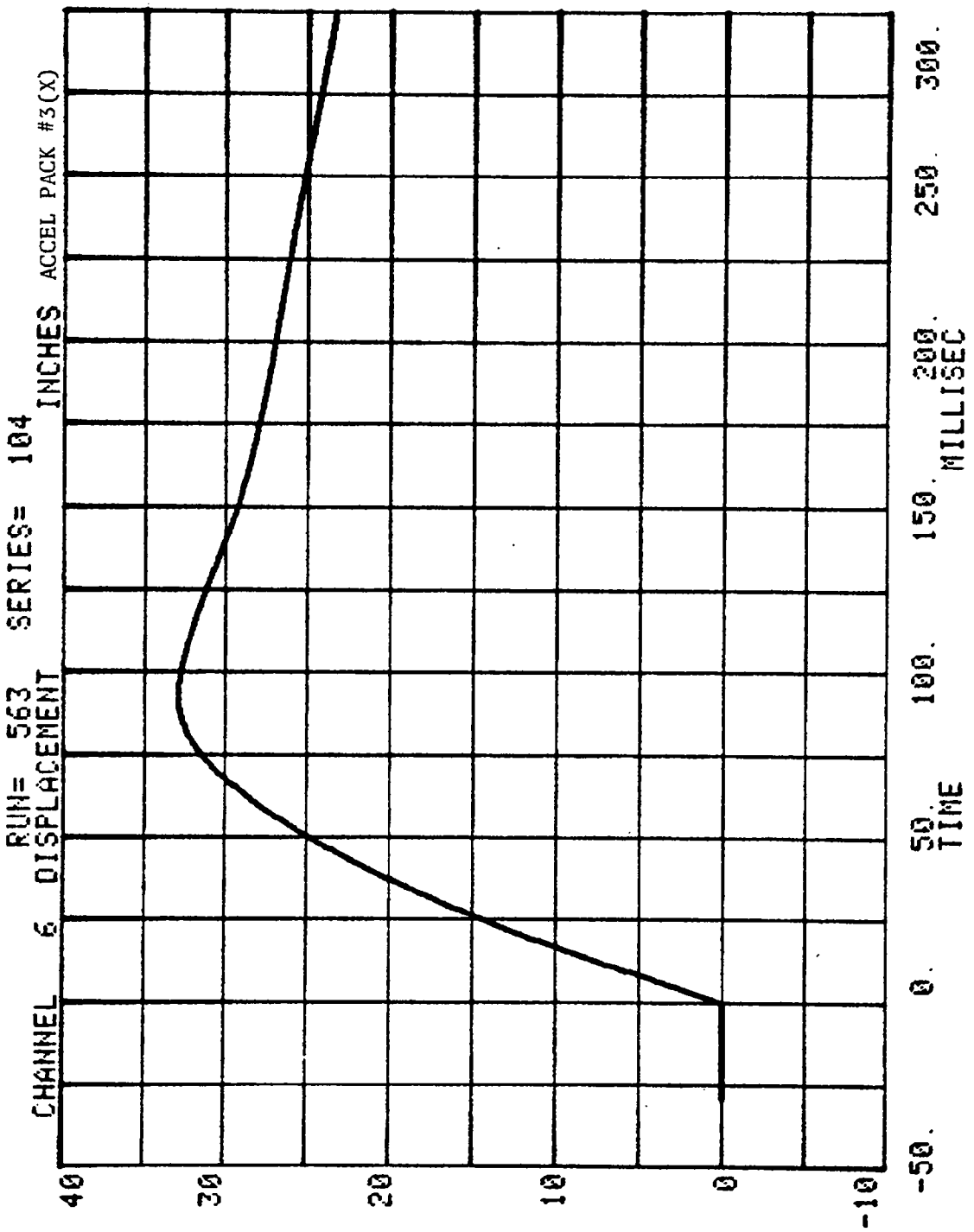
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 6 DISPLACEMENT
RUN= 563 SERIES= 104
INCHES ACCEL PACK #3(X)
40
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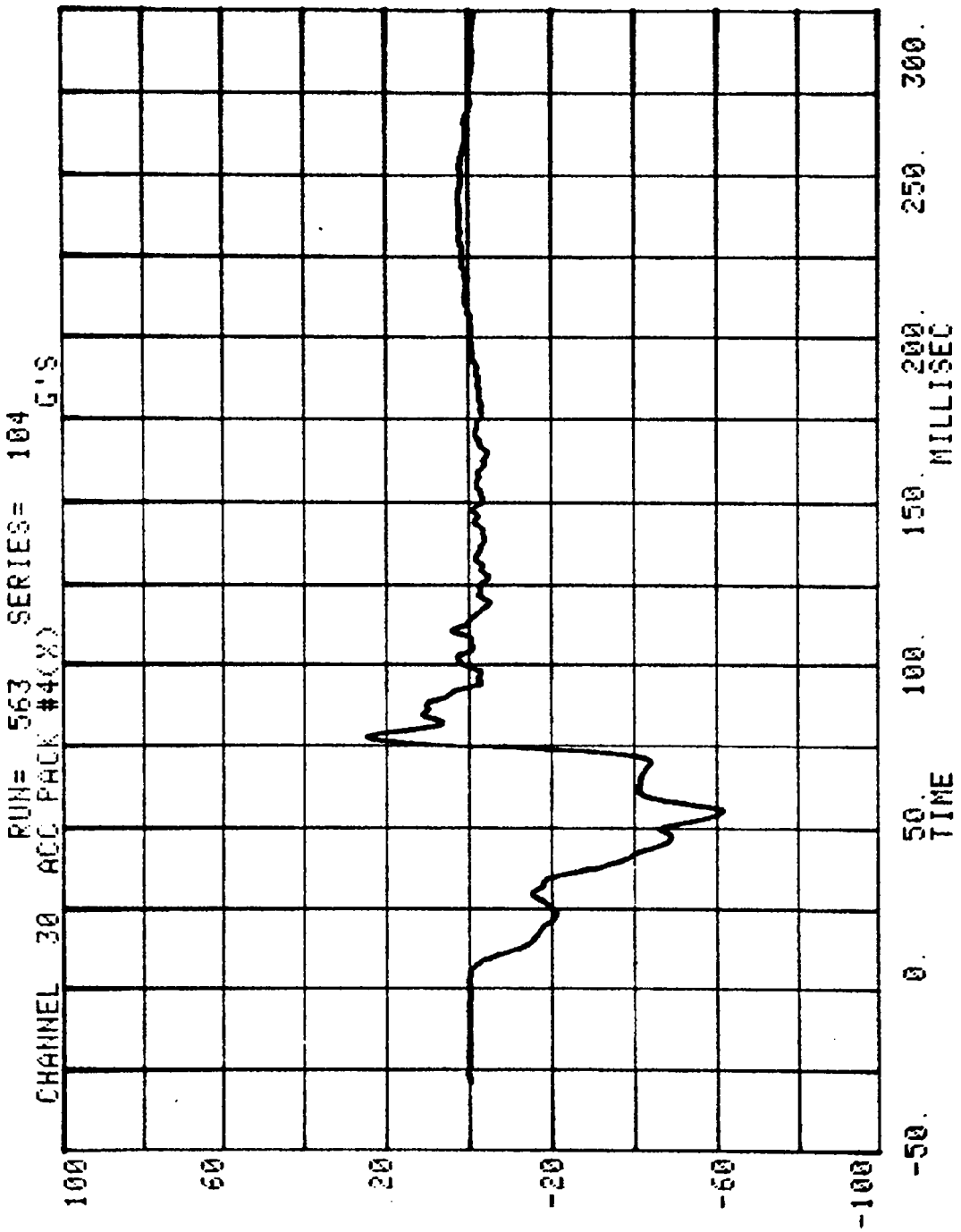
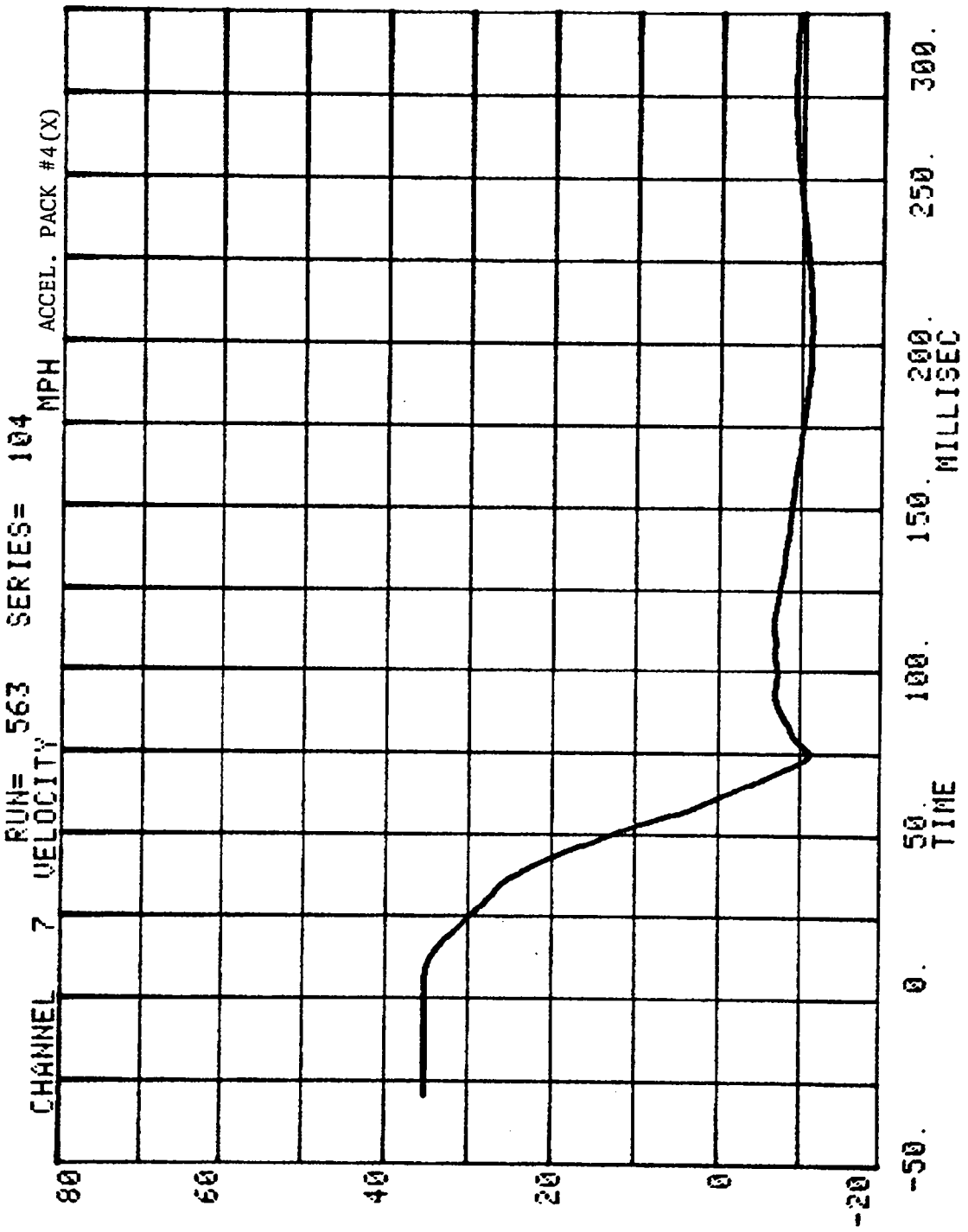
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 563 SERIES= 104
CHANNEL 30 ACC PACK #4(X)
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 7 VELOCITY
RUN= 563 SERIES= 104
MPH ACCEL. PACK #4(X)
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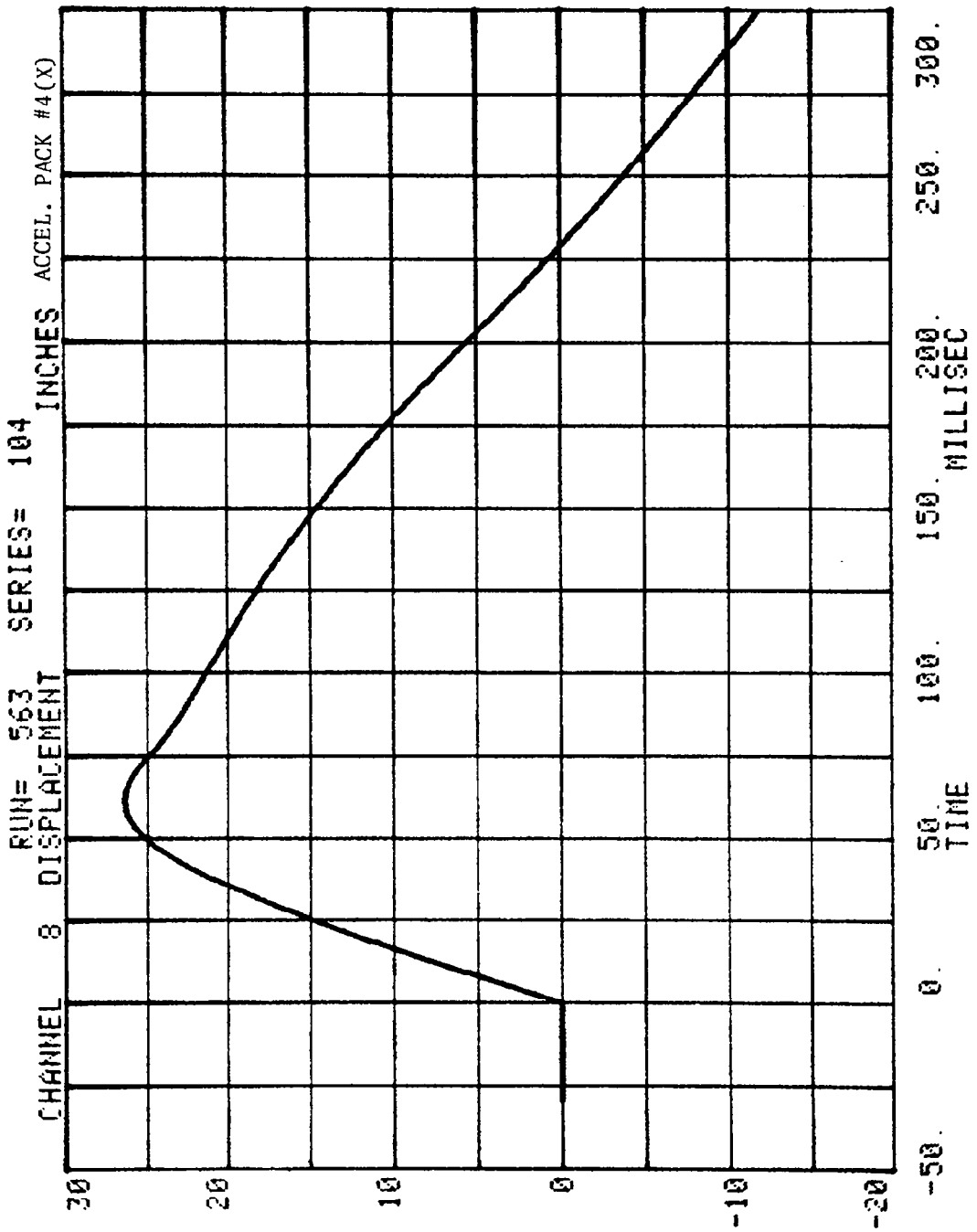
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 8 DISPLACEMENT
RUN= 563 SERIES= 104
INCHES ACCEL. PACK #4(X)
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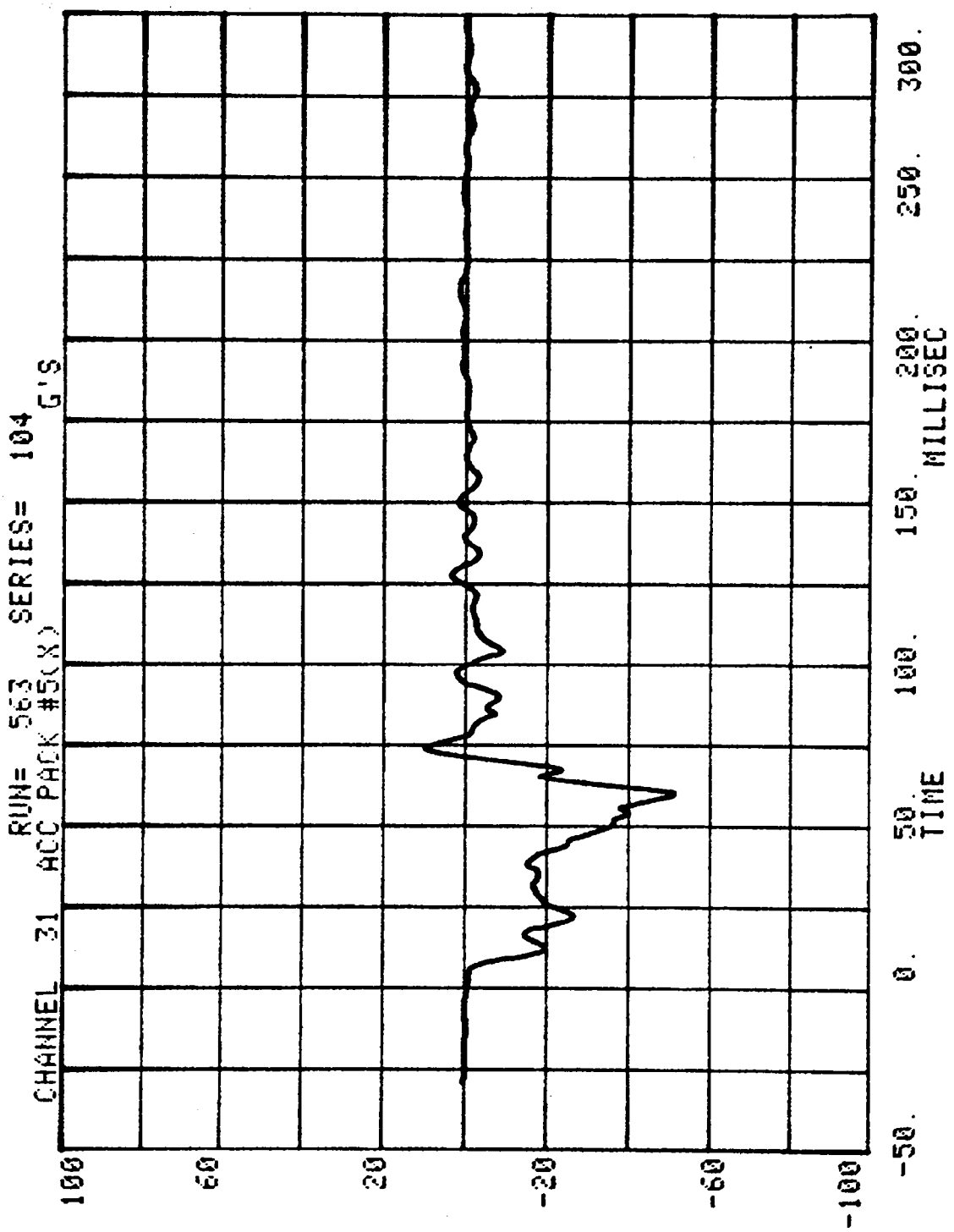
-10
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 31 ACC PACK #5(X)
RUN= 563 SERIES= 104
G'S
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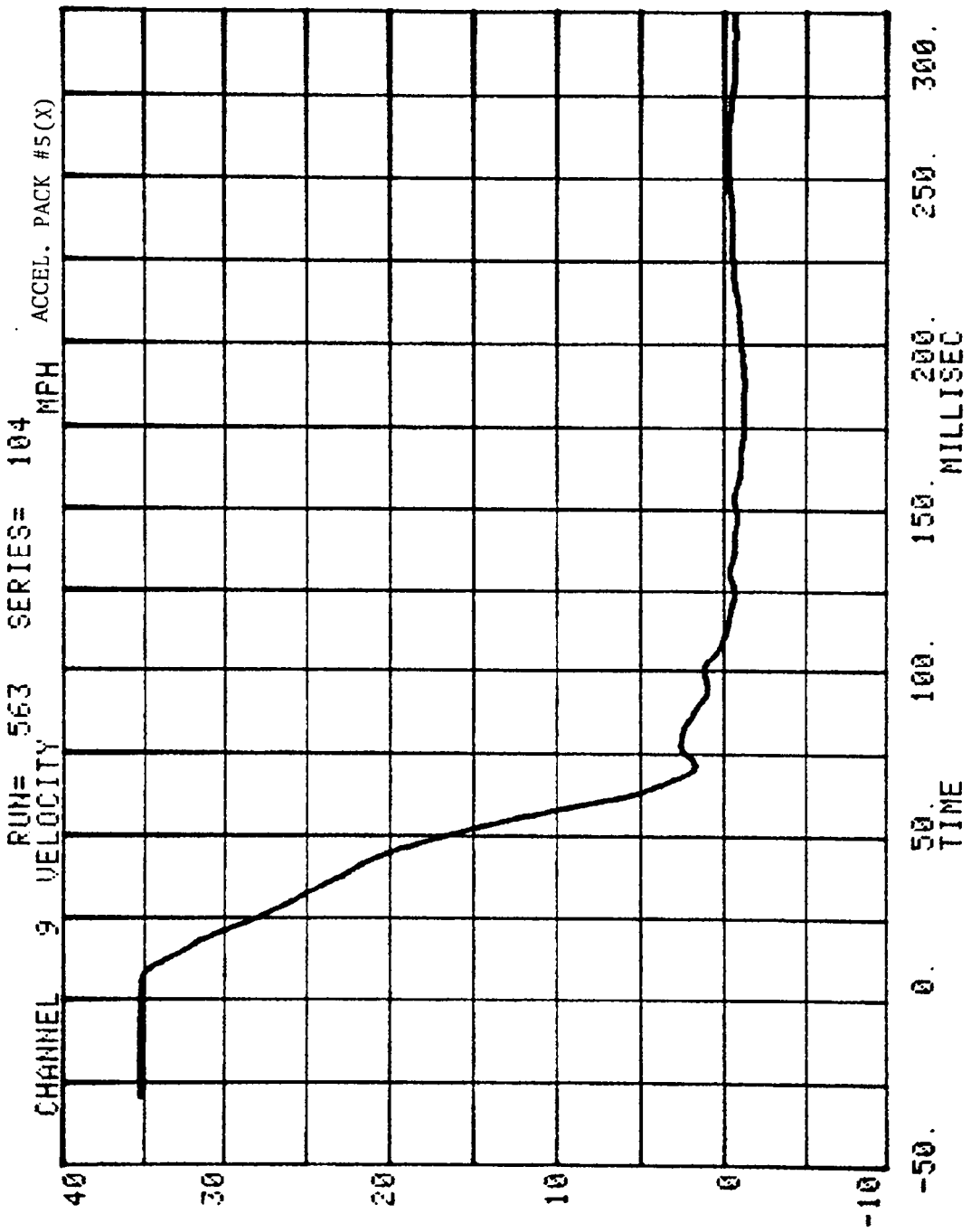
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 9 VELOCITY
RUN= 563 SERIES= 104
MPH
ACCEL. PACK #5(X)
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30
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10
0
-10
-50.
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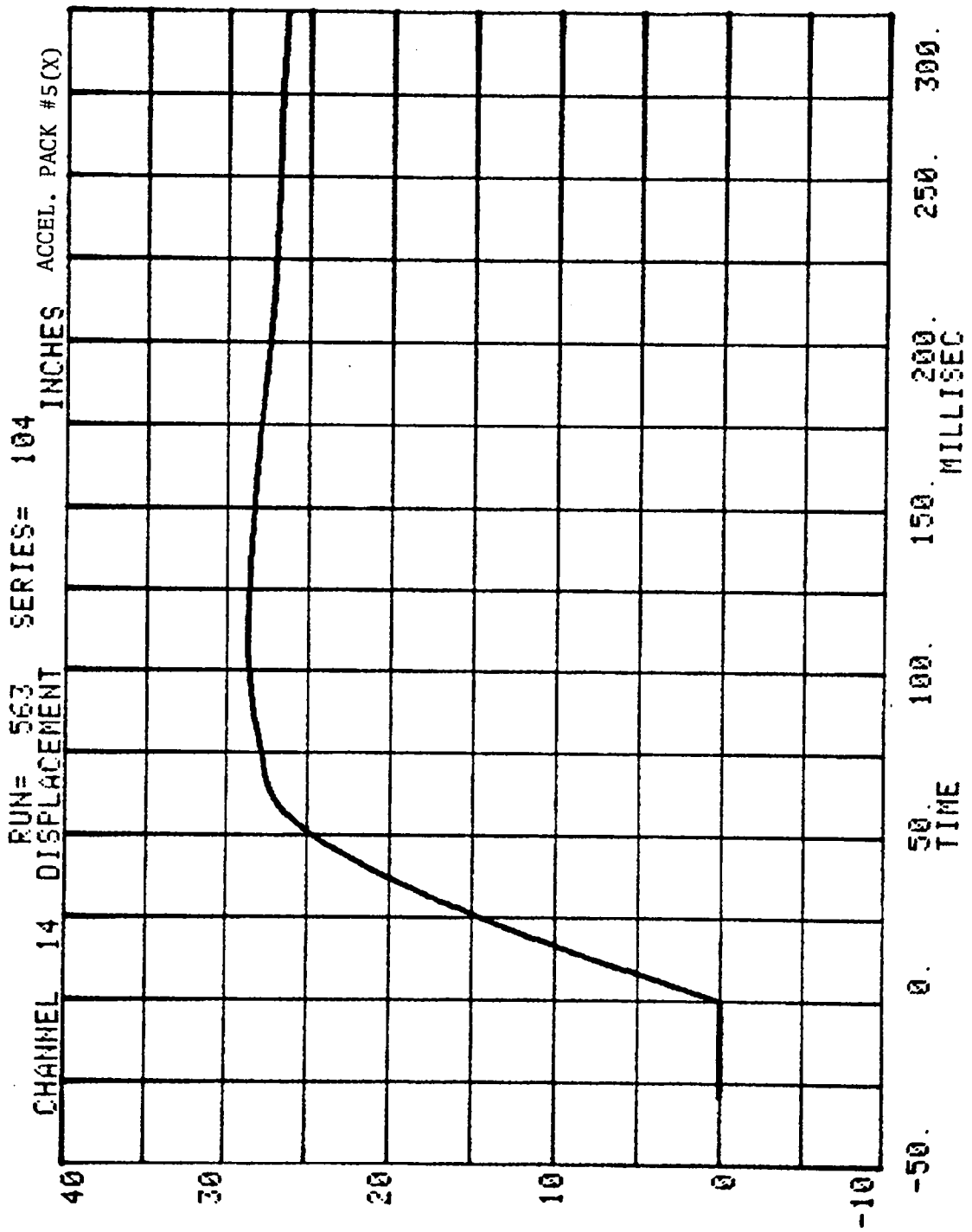
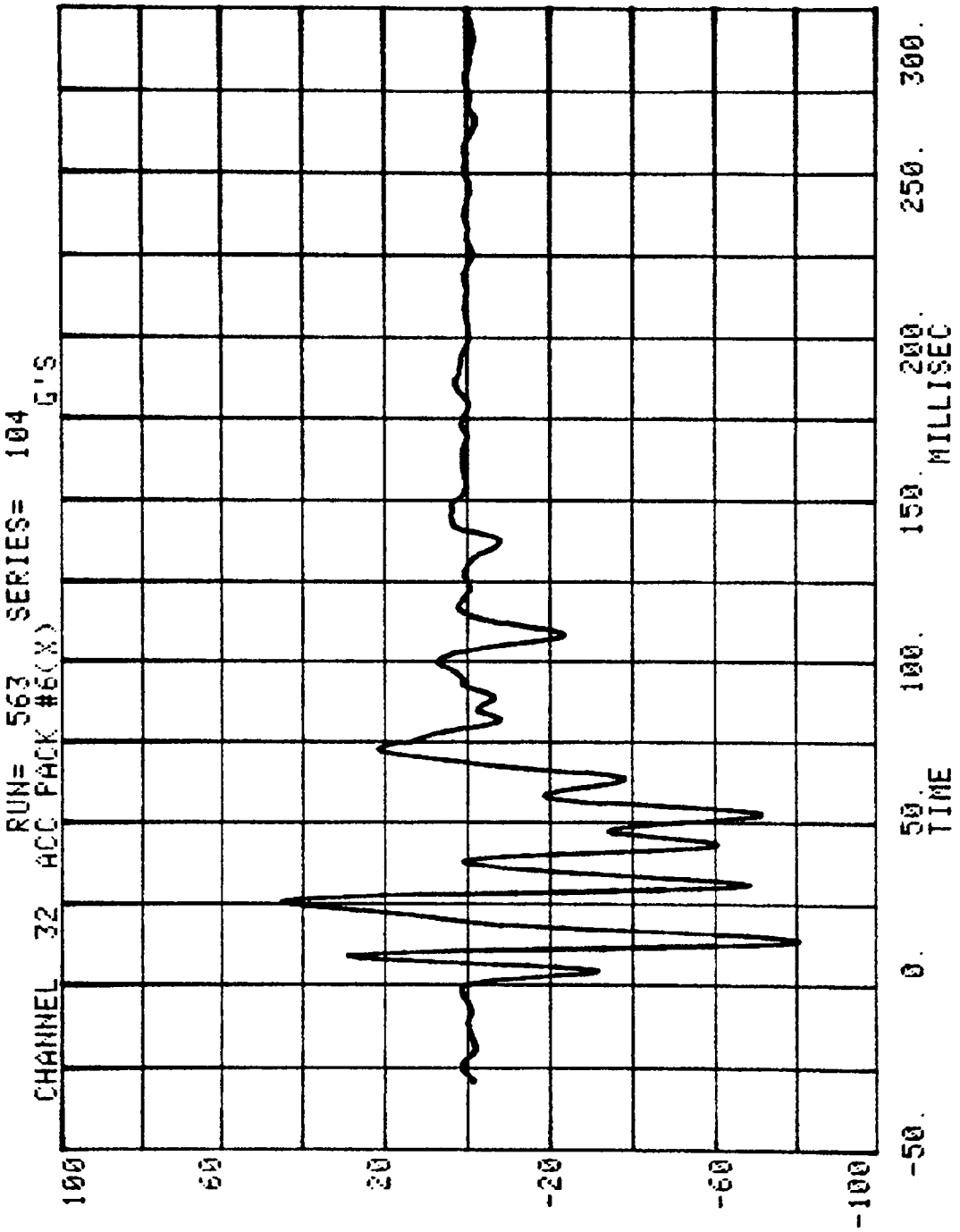
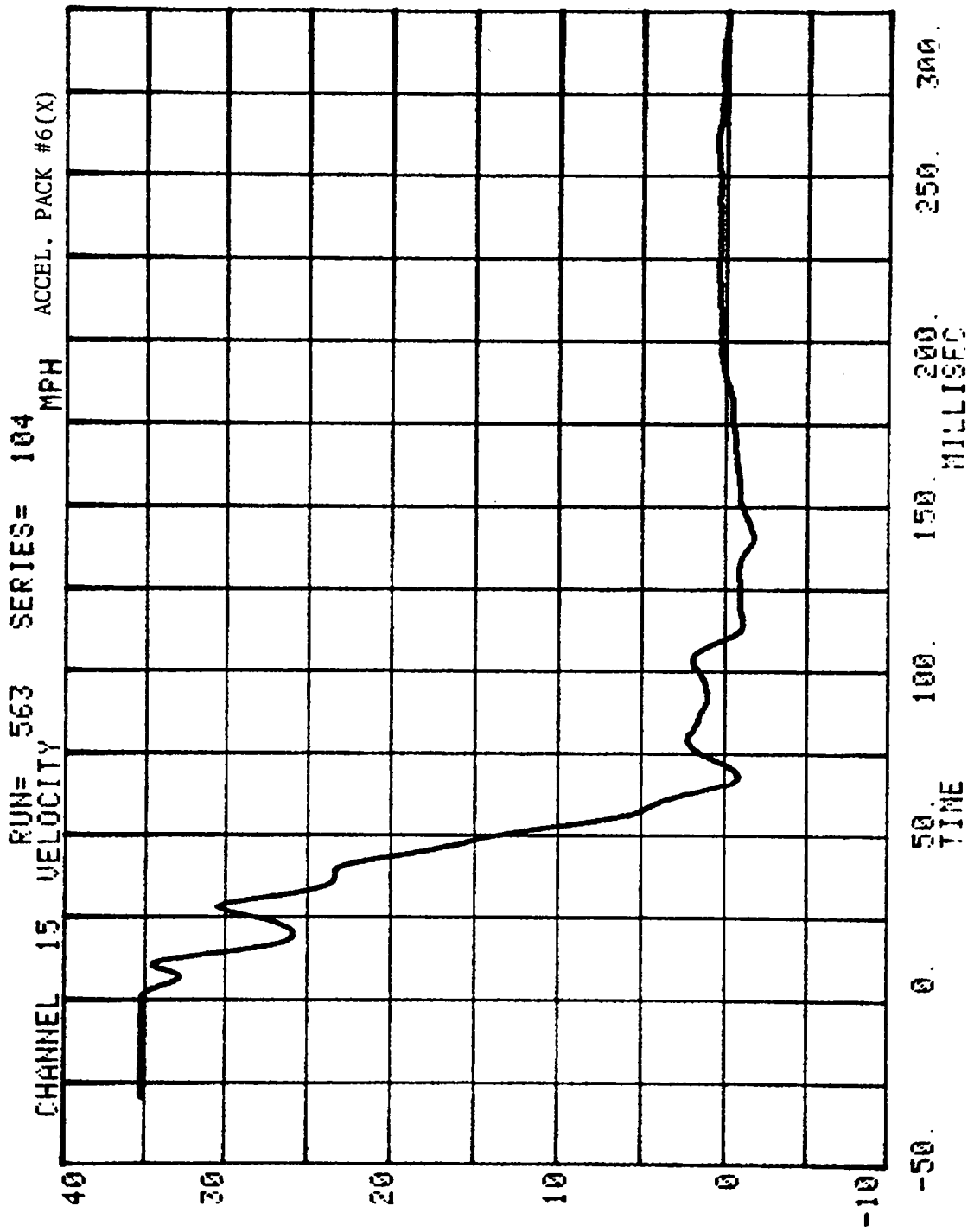
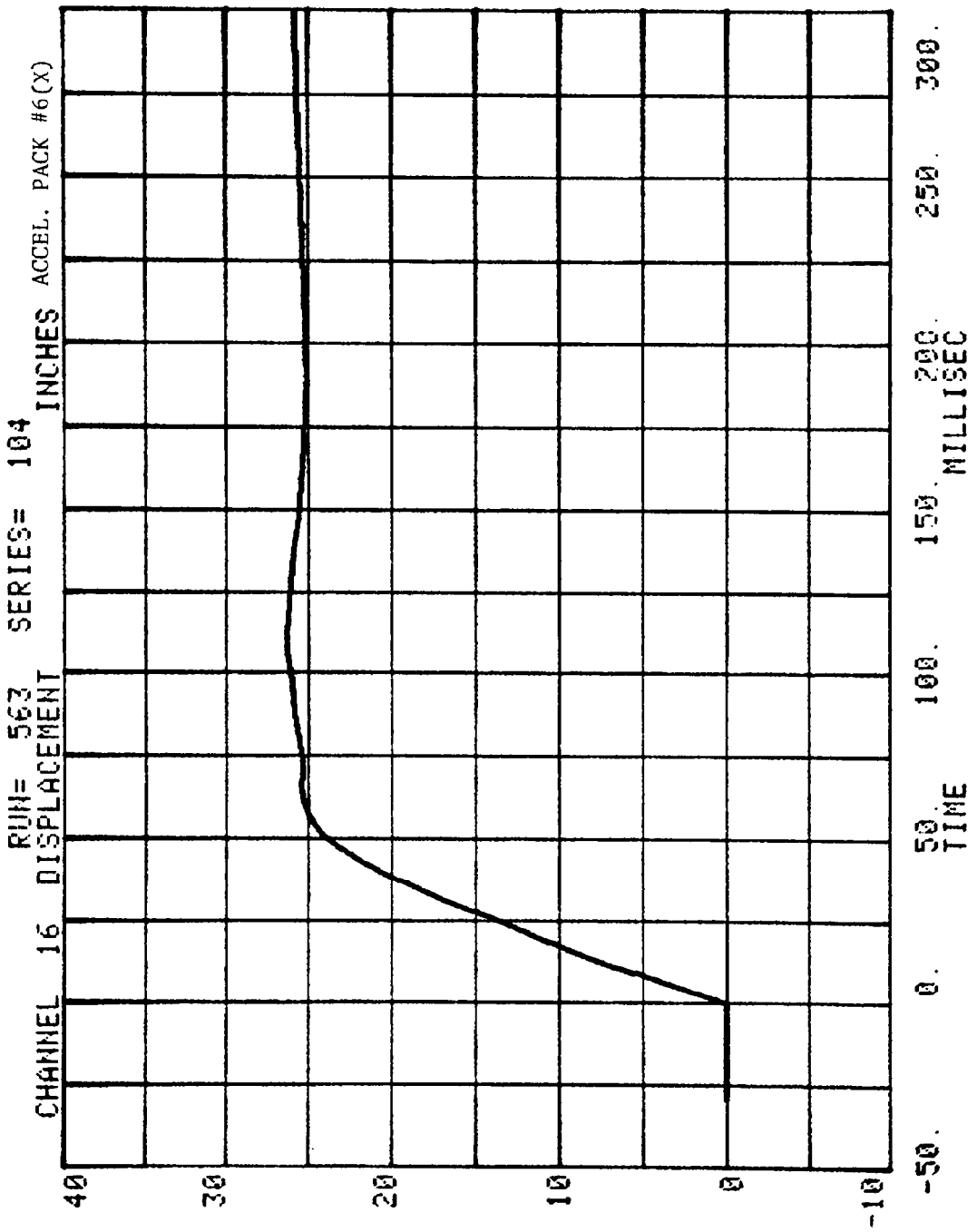
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 14 DISPLACEMENT
RUN= 563 SERIES= 104
INCHES ACCEL. PACK #5(X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 32 RUN= 563 SERIES= 104
ACC PACK #6(X)
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 15 VELOCITY
RUN= 563 SERIES= 104
MPH
ACCEL. PACK #6(X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 16 DISPLACEMENT
RUN= 563 SERIES= 104
INCHES ACCEL. PACK #6(X)
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30
20
10
0
-10
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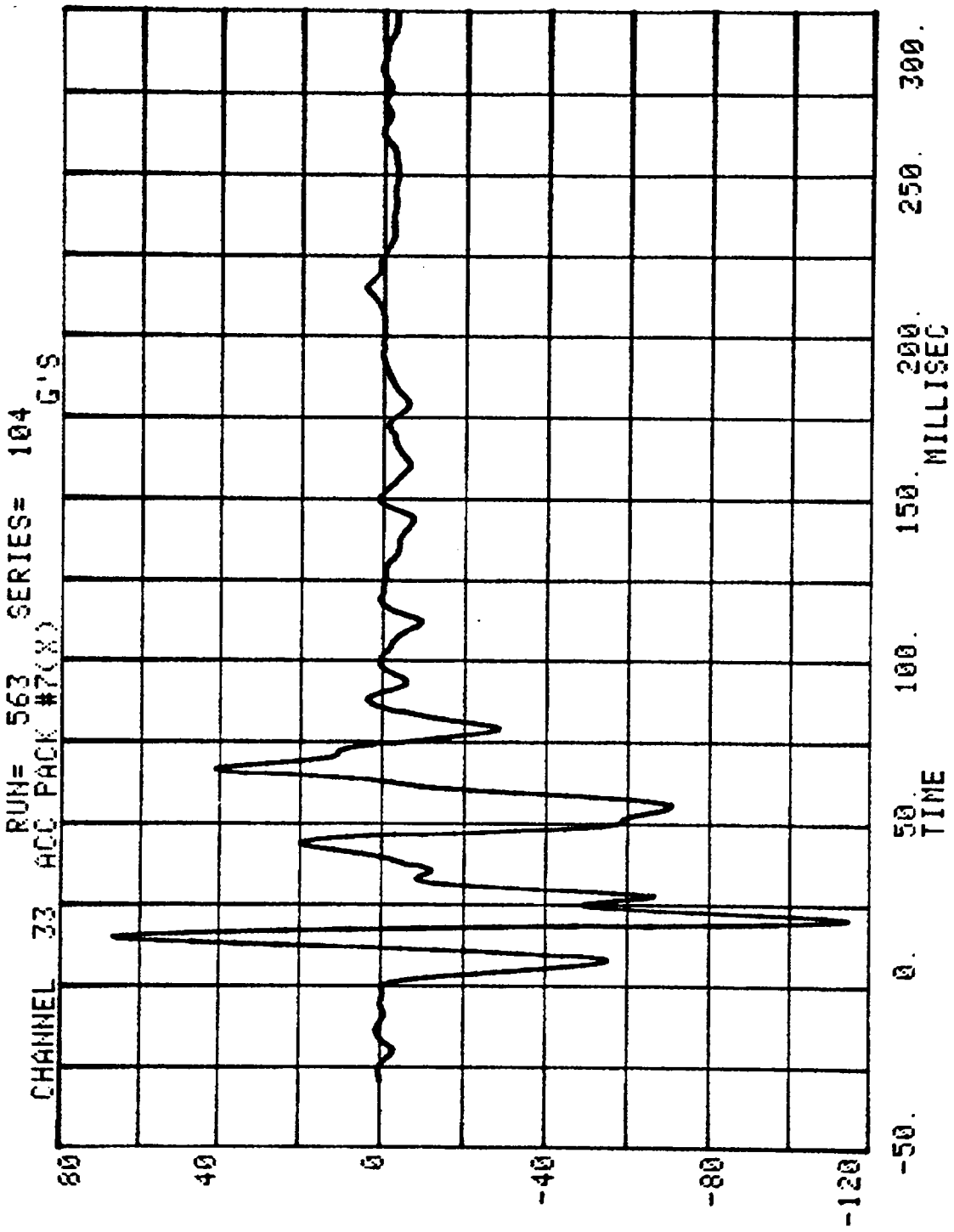
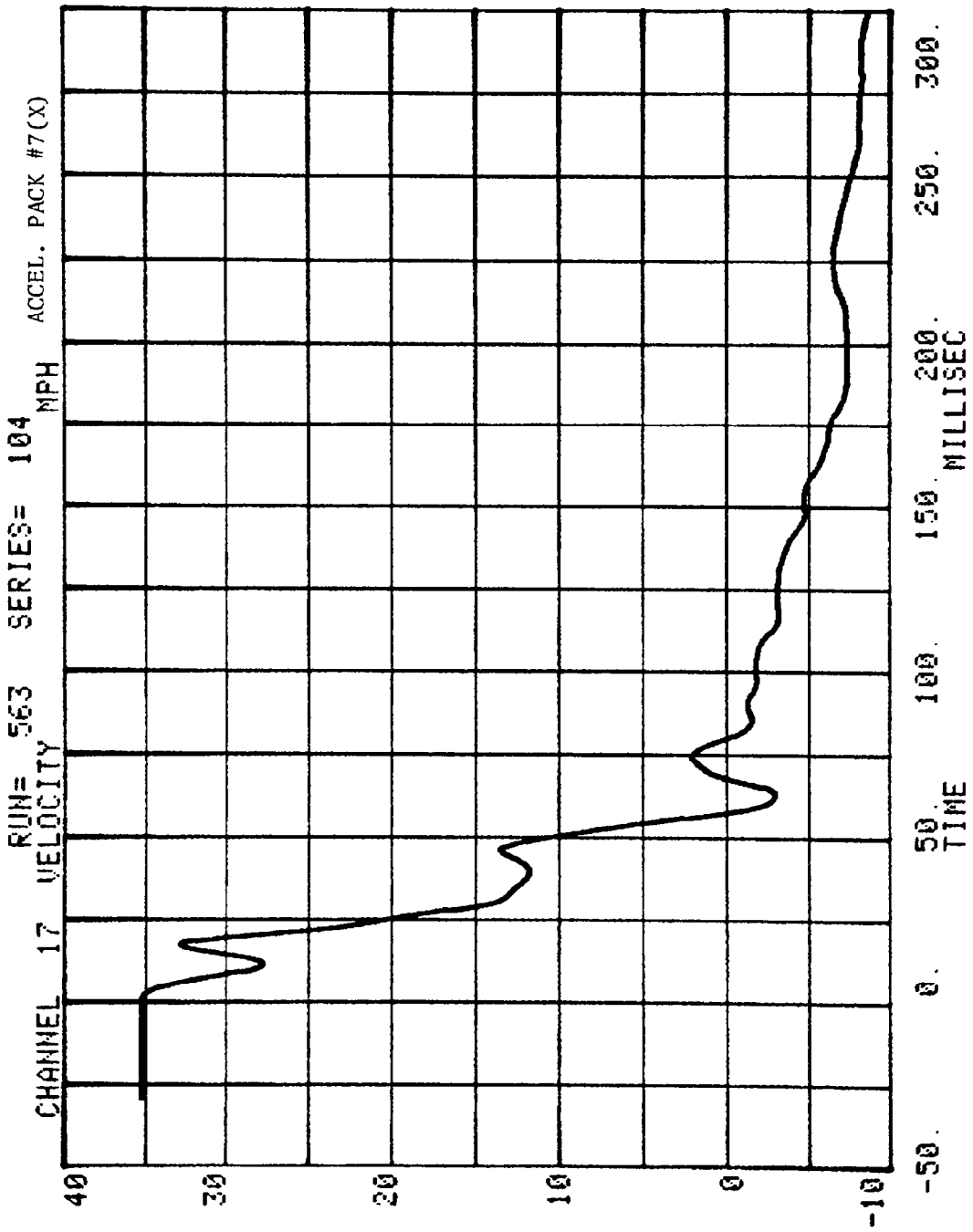
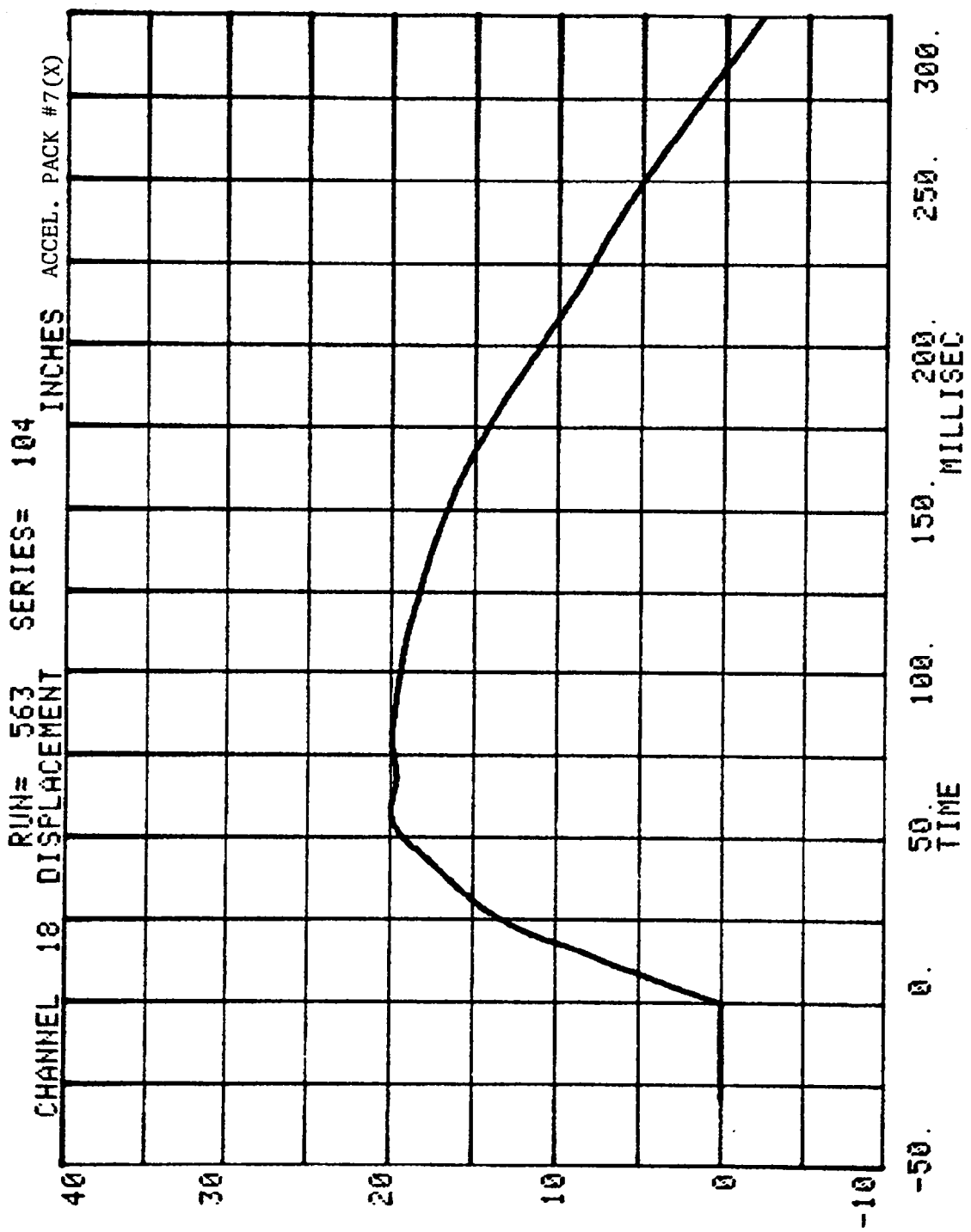
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 33 ACC PACK #7(X)
RUN= 563 SERIES= 104
G'S
80
40
0
-40
-80
-120
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 17 VELOCITY
RUN= 563 SERIES= 104 MPH
ACCEL. PACK #7(X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 18 RUN= 563 SERIES= 104
DISPLACEMENT INCHES ACCEL. PACK #7(X)
40
30
20
10
0
-10
-50.
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50.
100.
150.
200.
250.
300.
TIME MILLISEC

TEST NO. CD0104

LOAD CELL BARRIER DATA

FILTER CHANNEL CLASS

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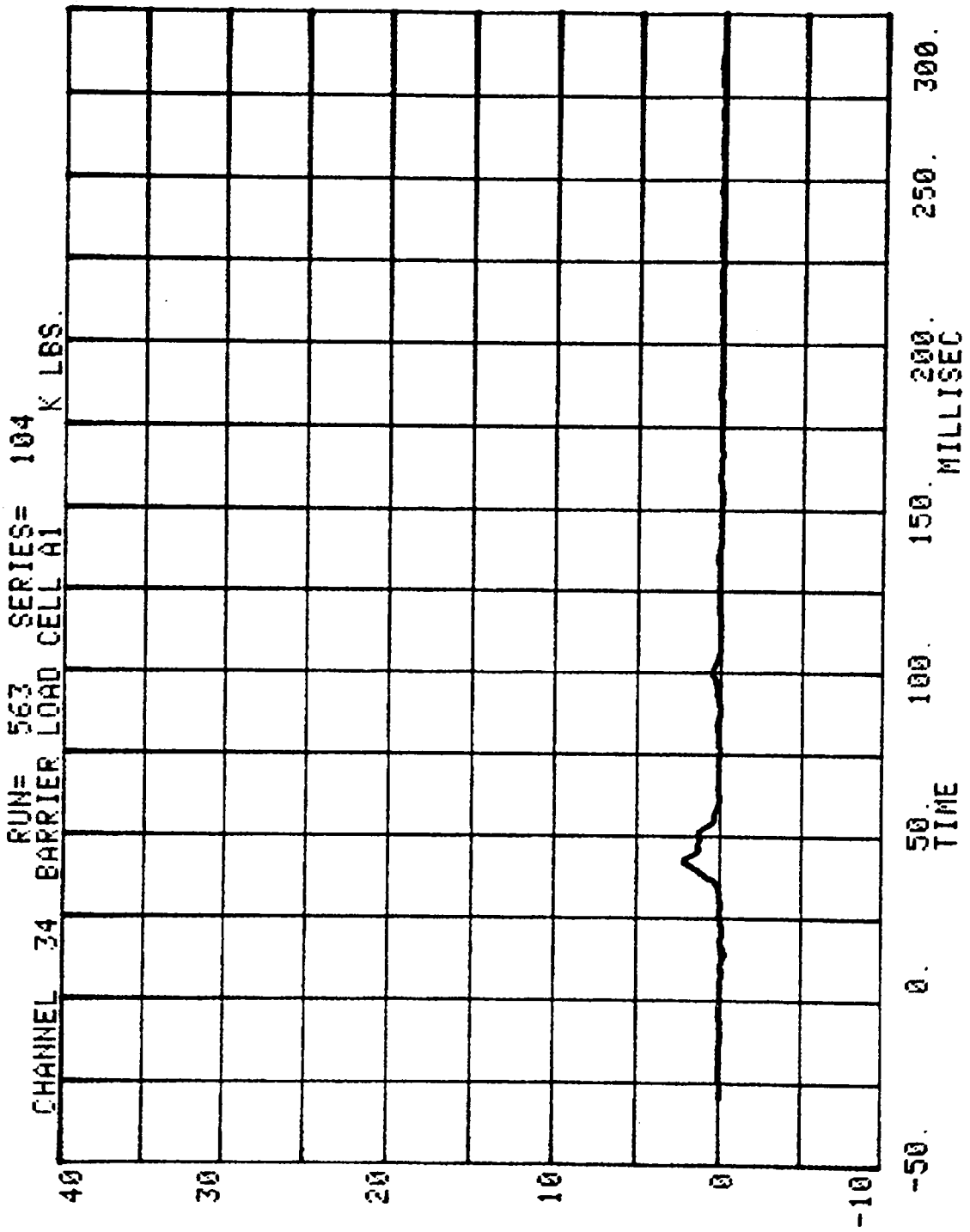
CHANNEL 34 BARRIER LOAD CELL A1
RUN= 563 SERIES= 104
K LBS.
40
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0
-10
-50.
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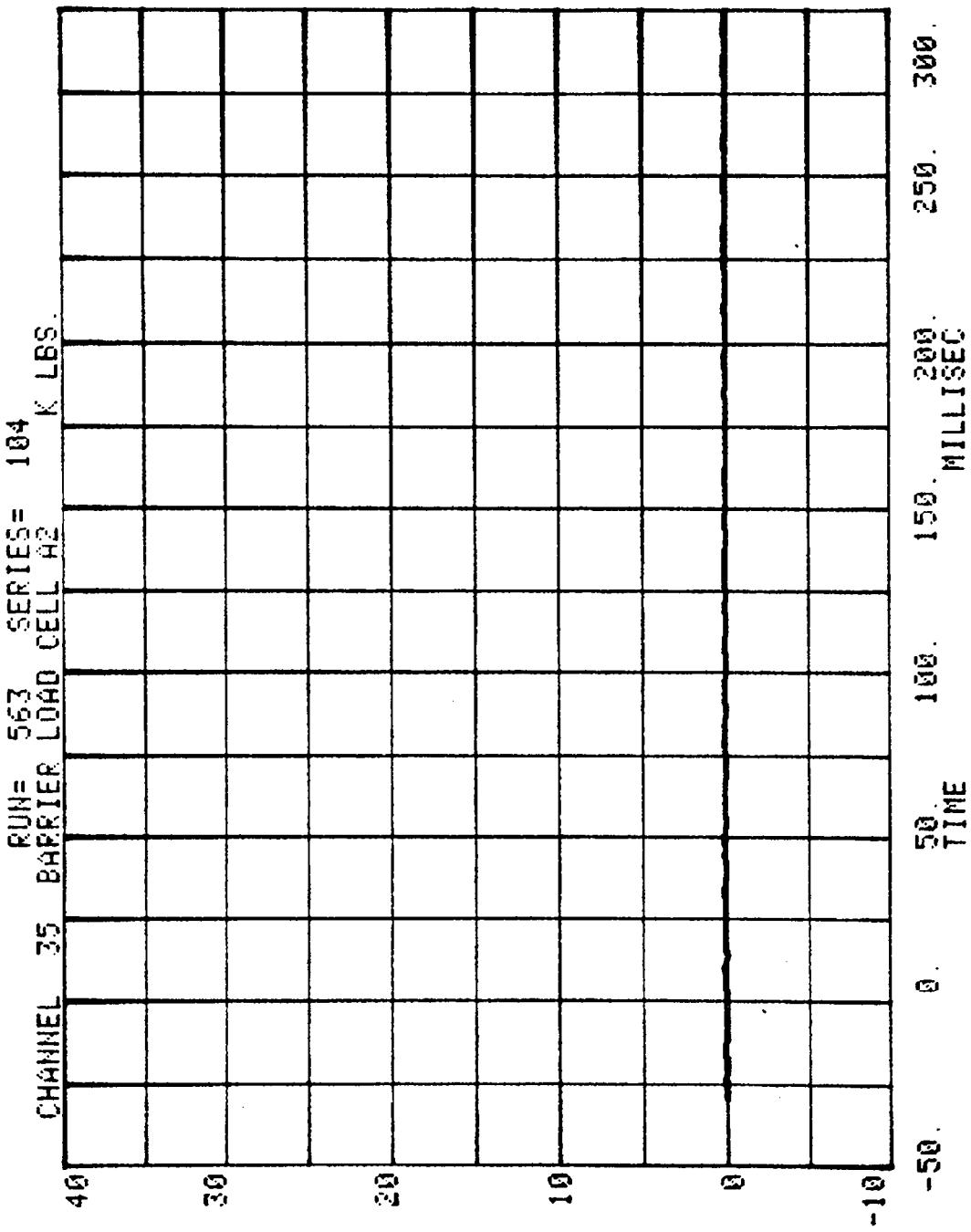
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 35 RUN= 563 SERIES= 104
BARRIER LOAD CELL A2
K LBS.
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-10
-50.
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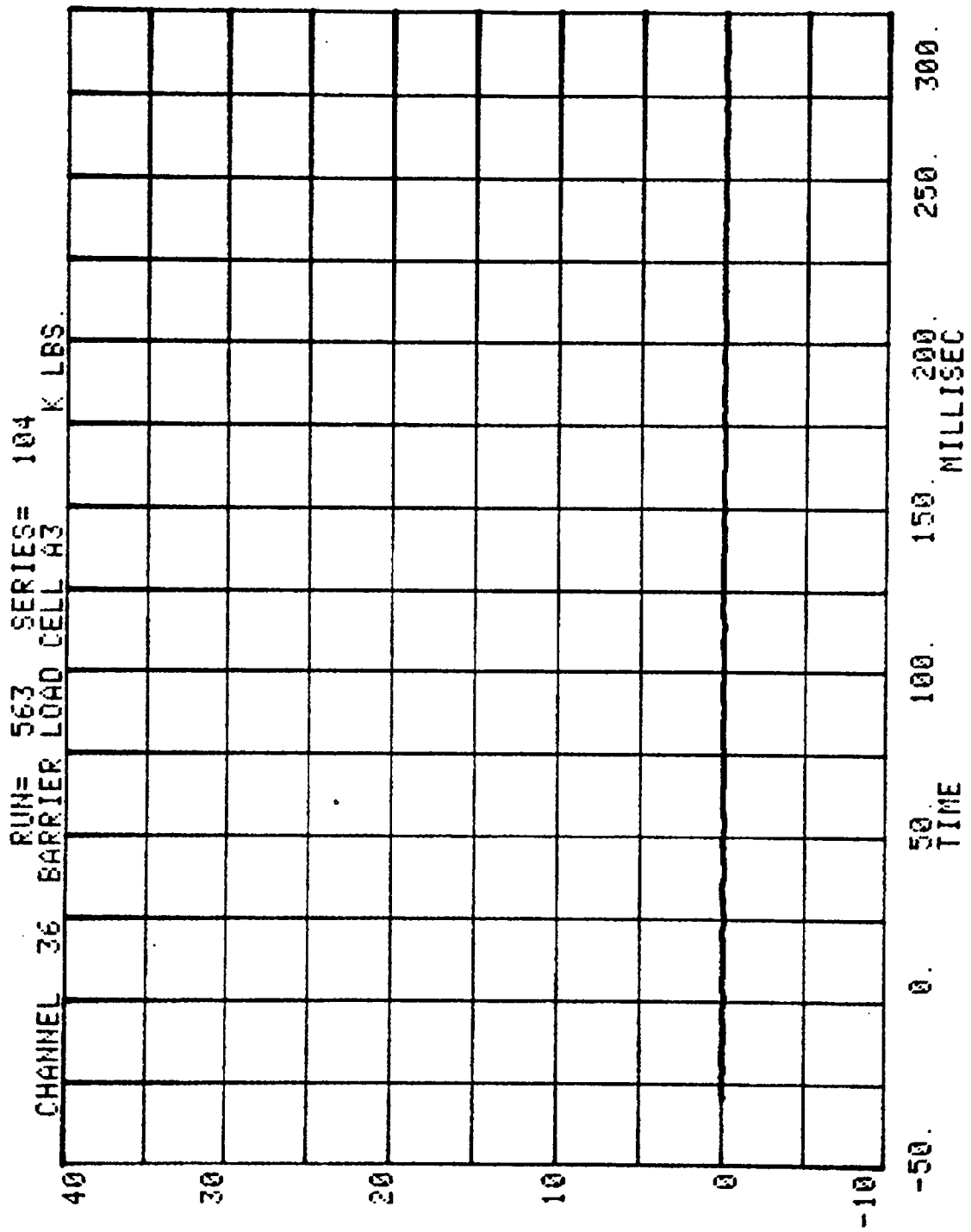
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 36 RUN= 563 SERIES= 104
BARRIER LOAD CELL A3
K LBS.
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-10
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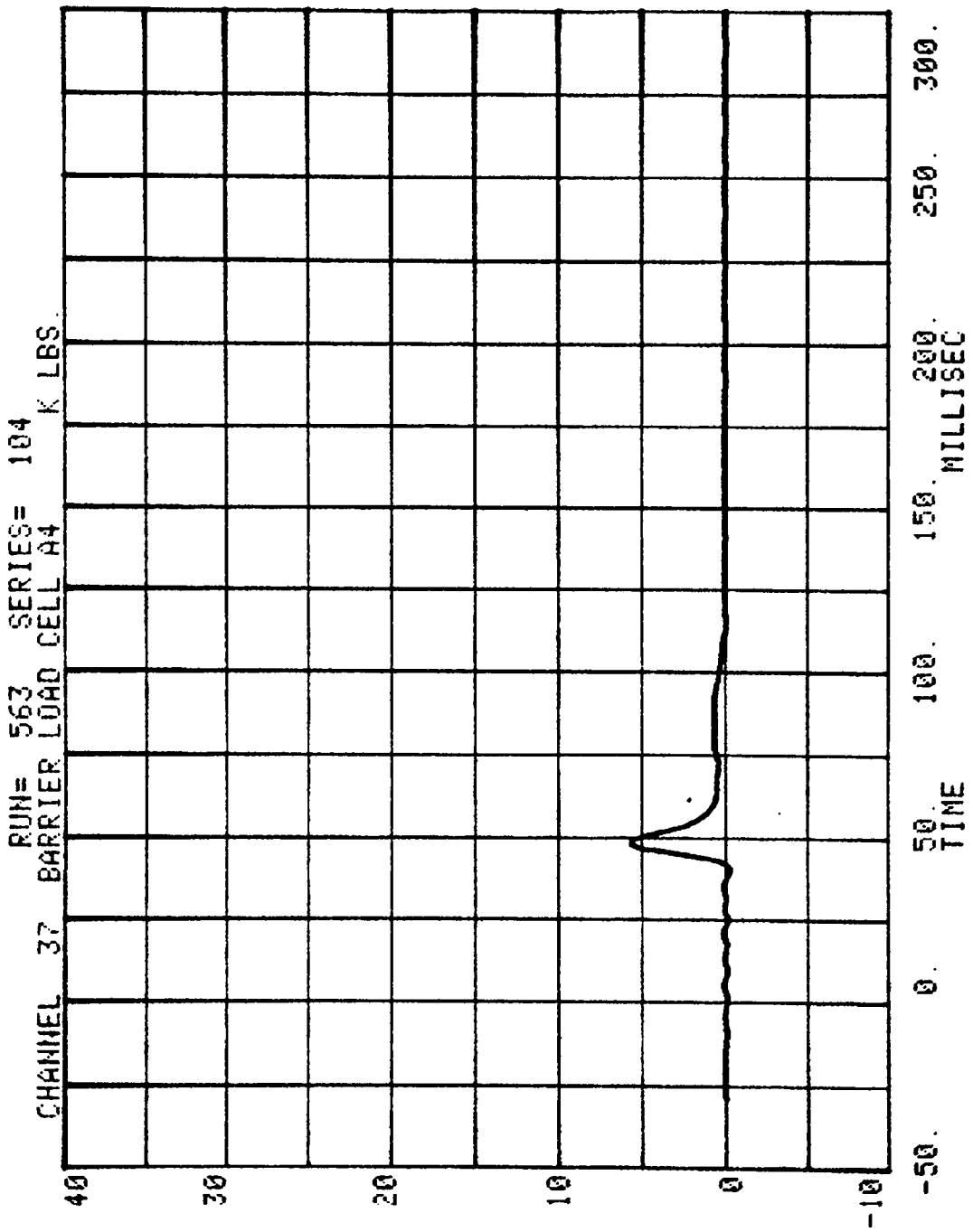
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 37 RUN= 563 SERIES= 104
BARRIER LOAD CELL A4
K LBS.
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-10
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0.
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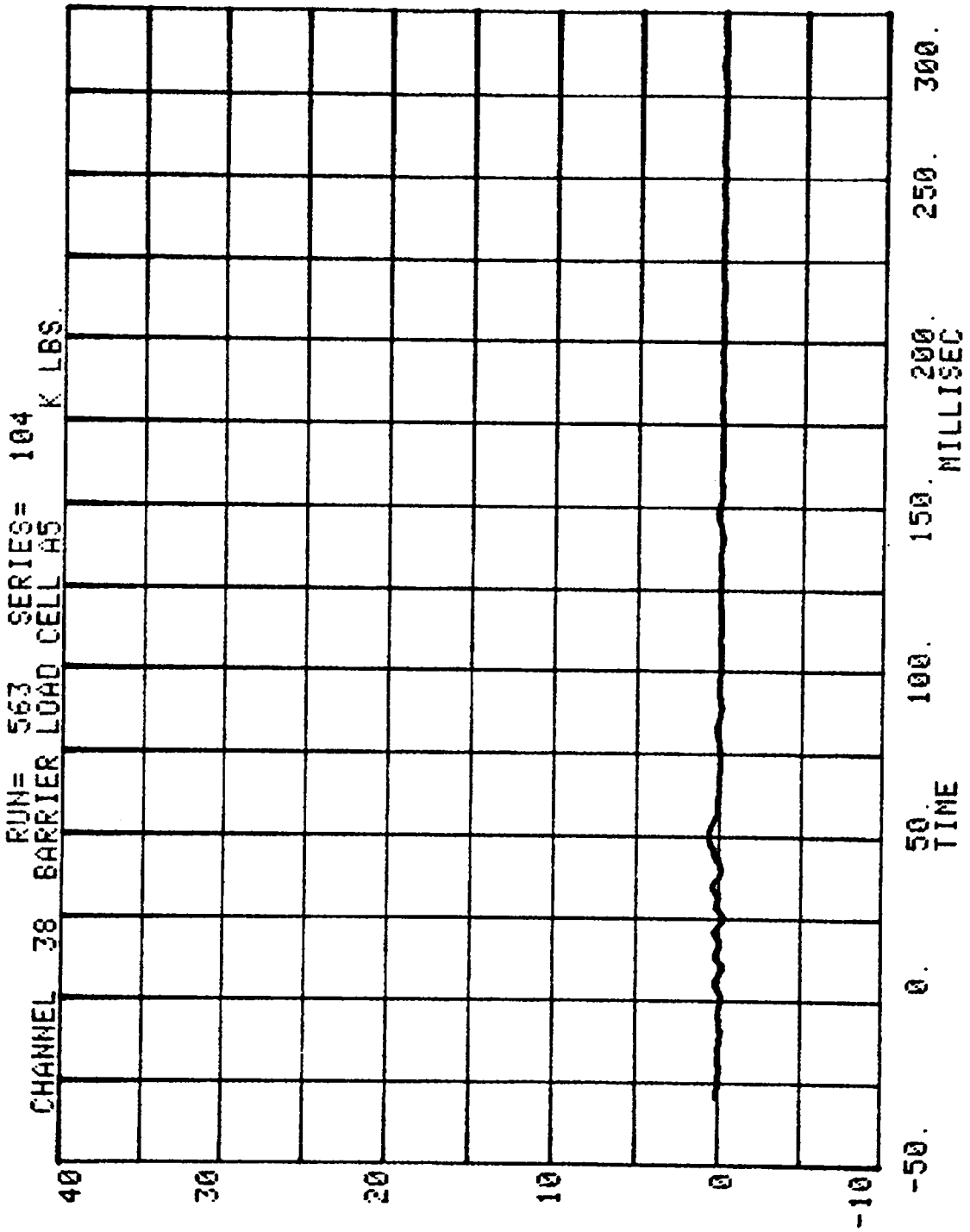
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 38 BARRIER LOAD CELL A5
RUN= 563 SERIES= 104
K LBS.
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-10
-50.
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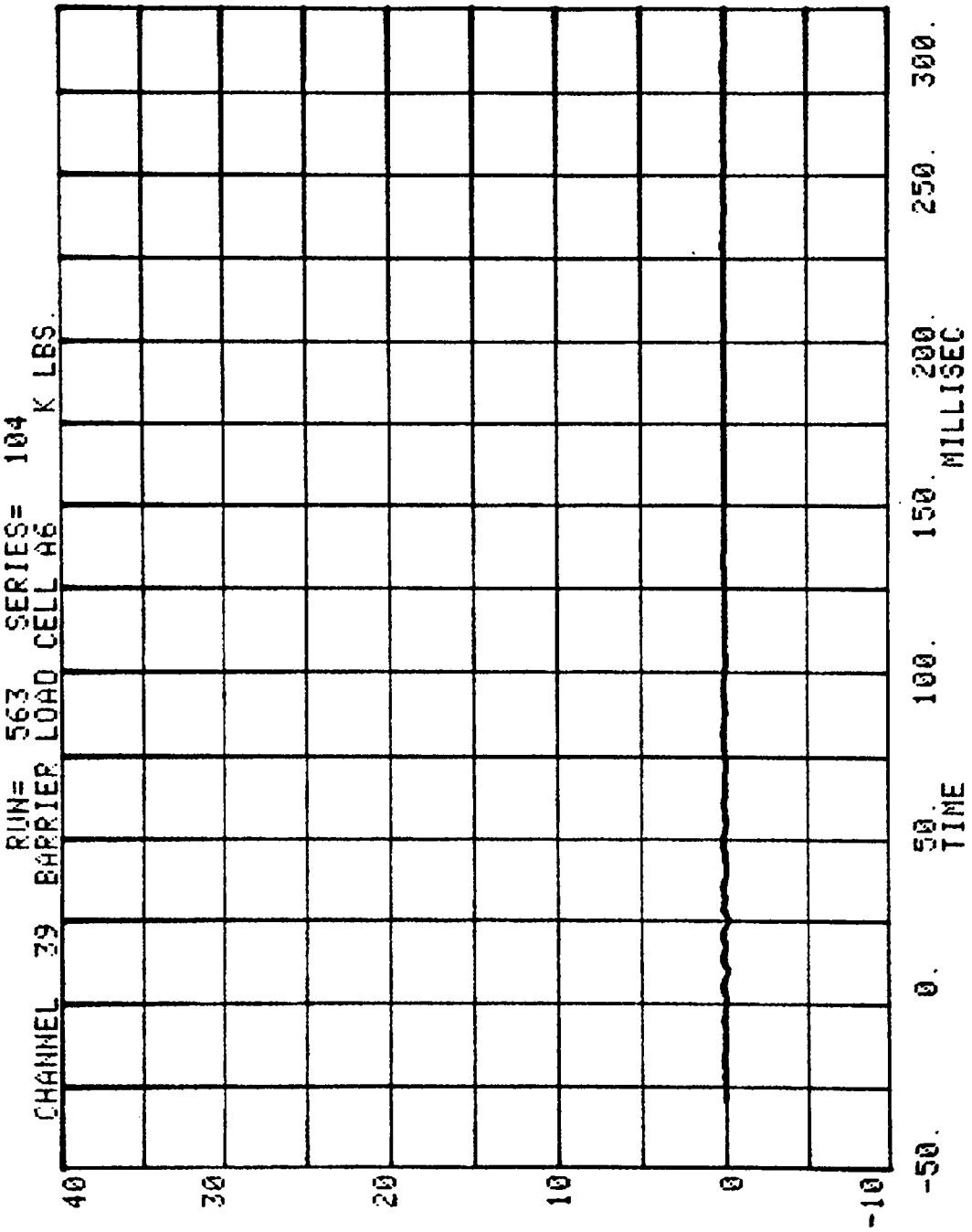
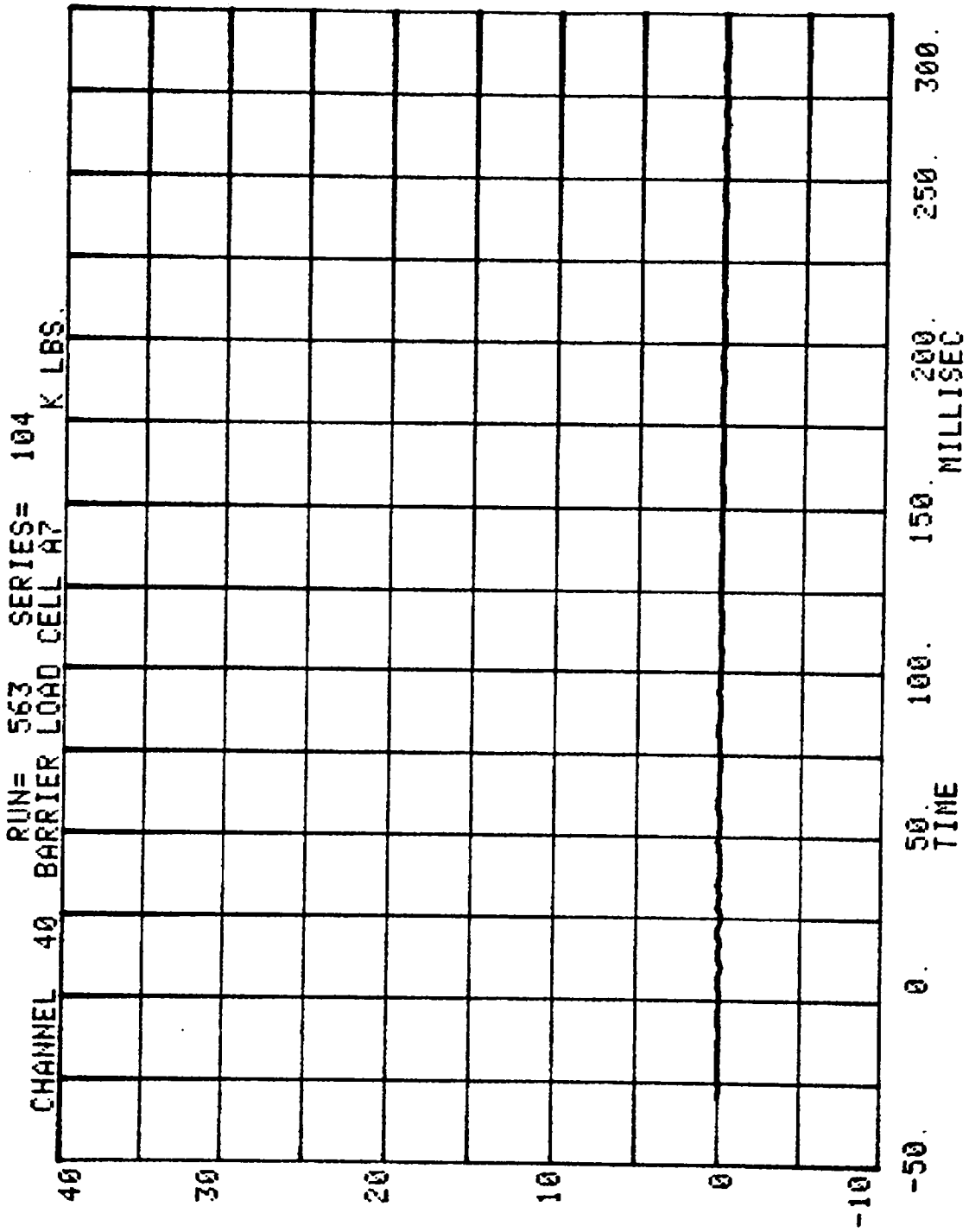
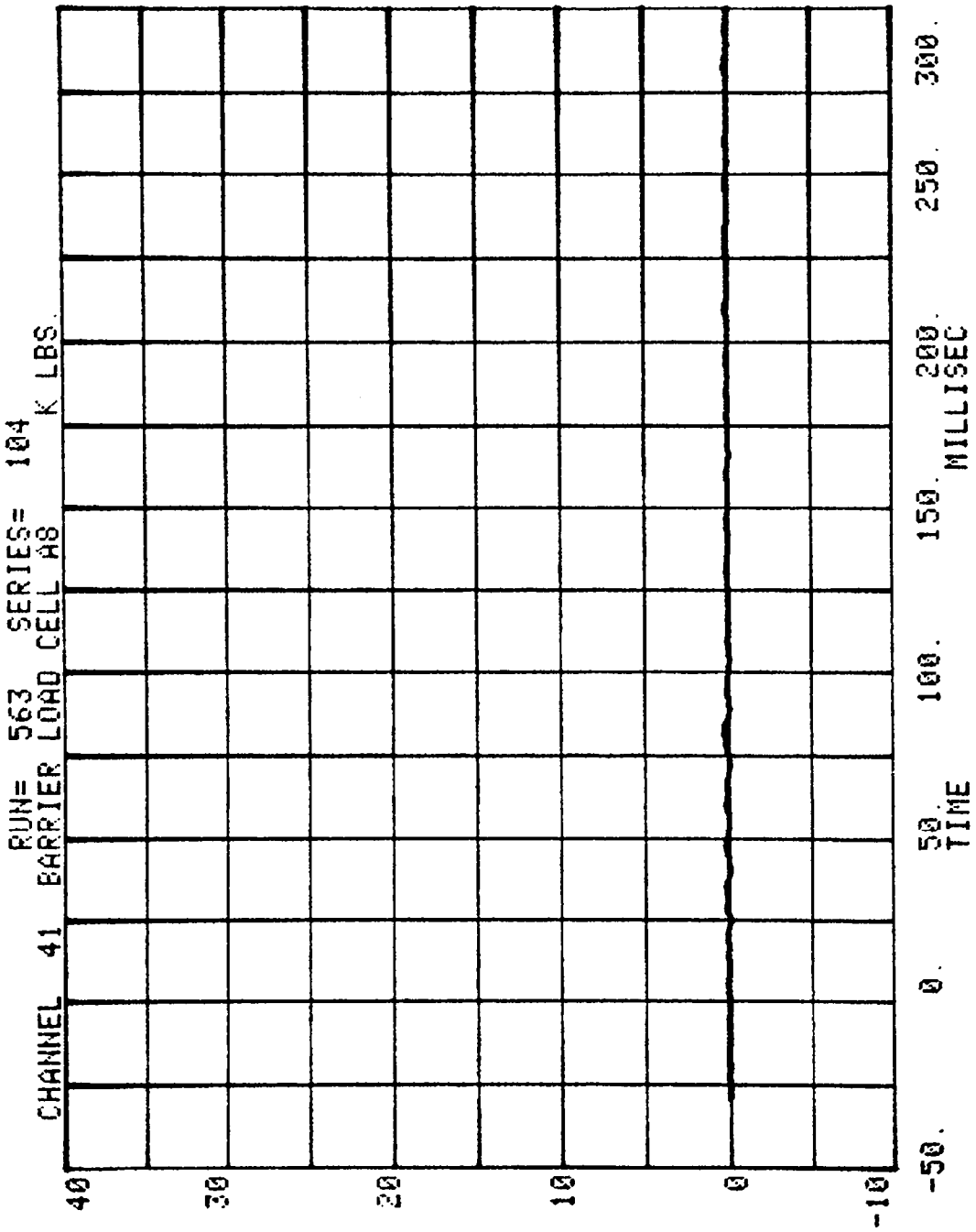
250.
300.
TIME
MILLISEC


CHANNEL 39
RUN= 563
BARRIER LOAD CELL A6
SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 40 BARRIER LOAD CELL A7
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 41 RUN= 563 SERIES= 104
BARRIER LOAD CELL A8
K LBS.
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-10
-50.
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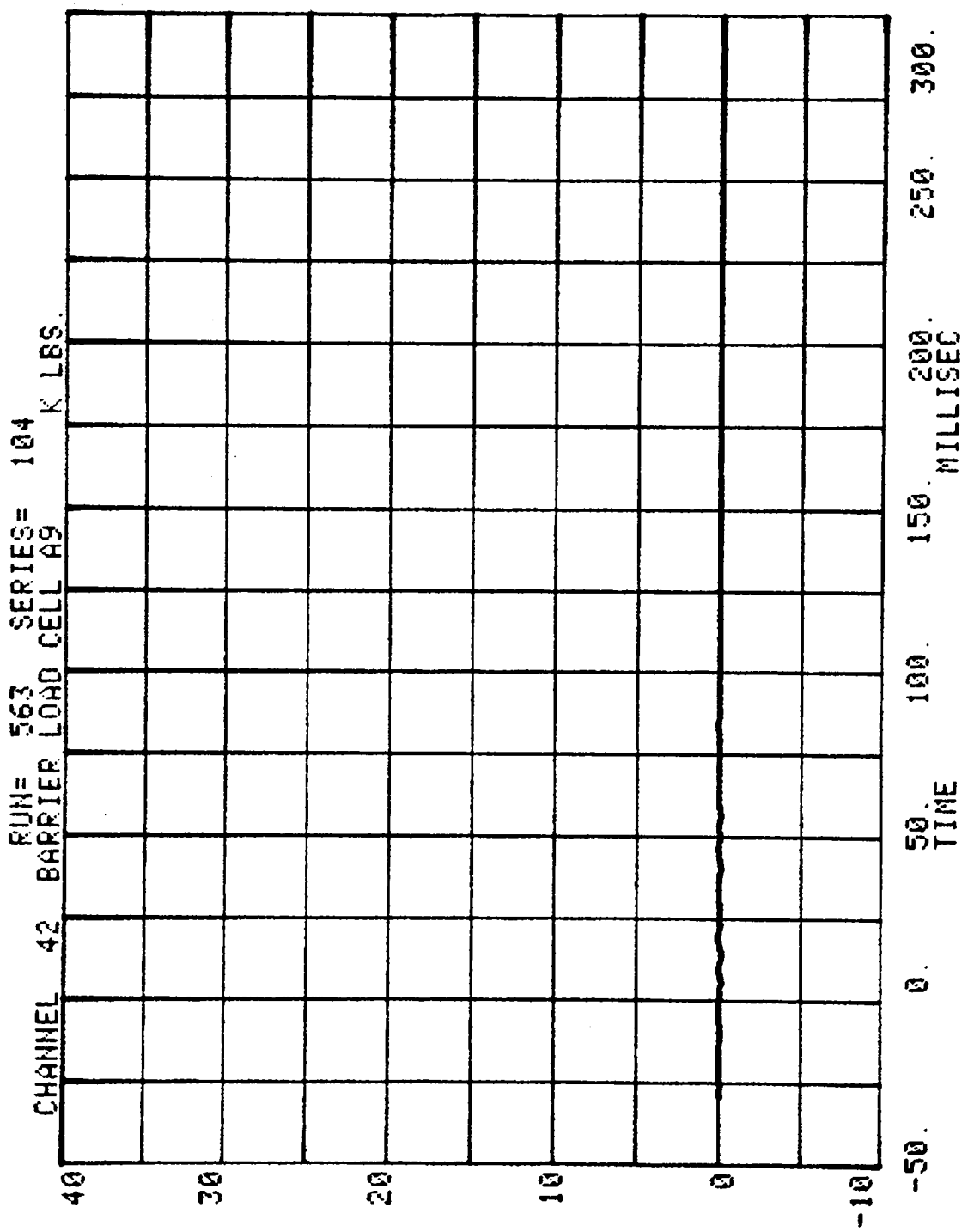
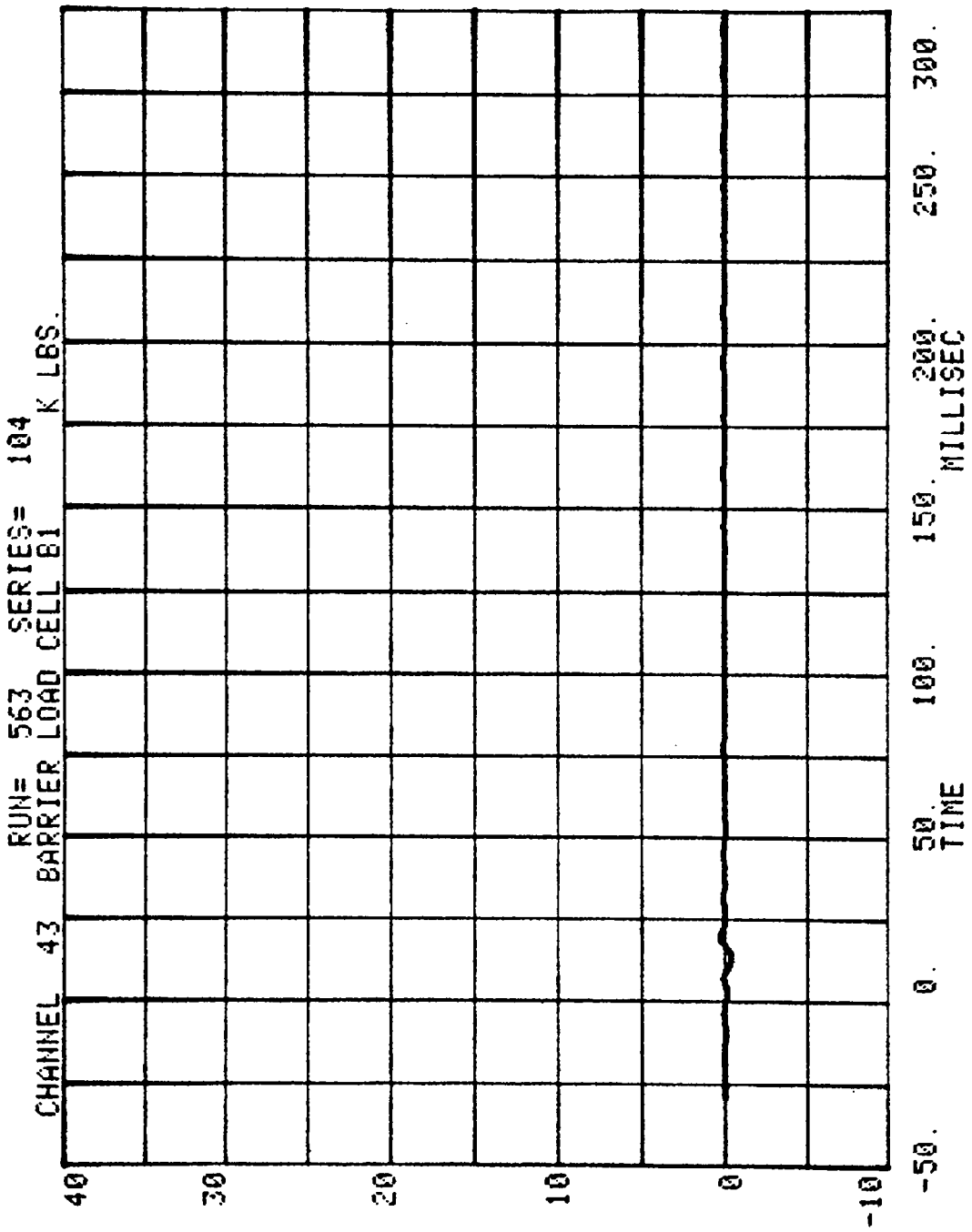
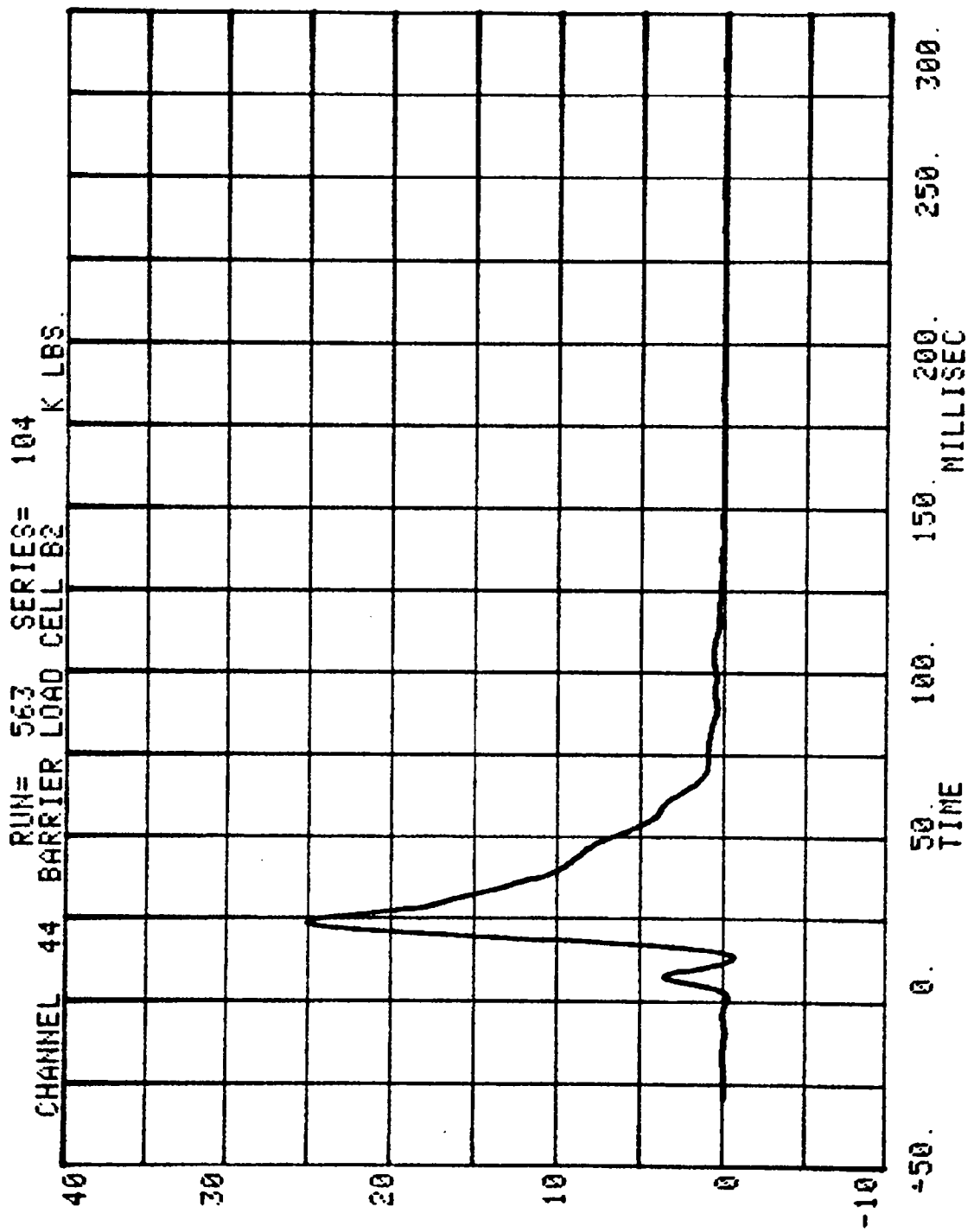
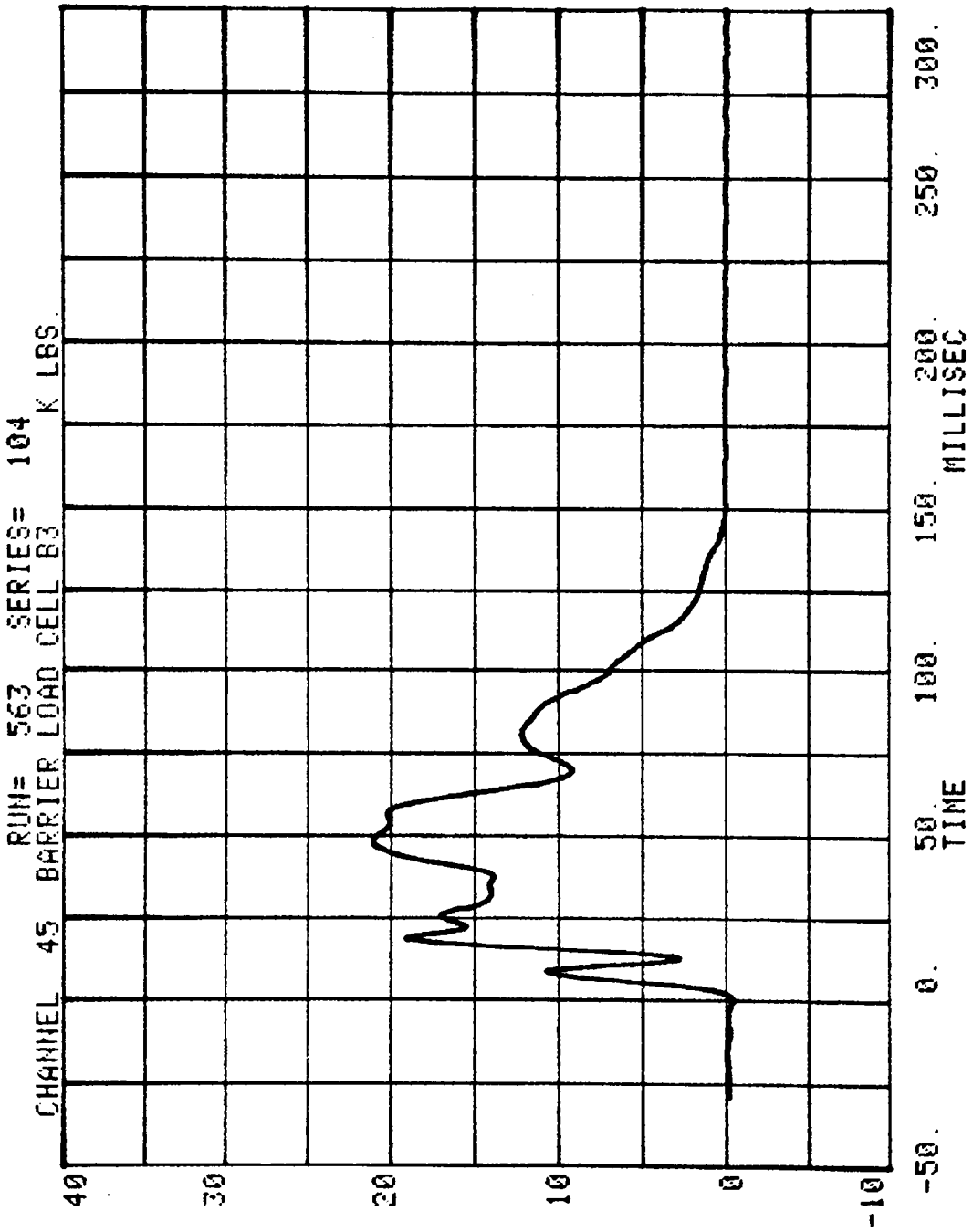
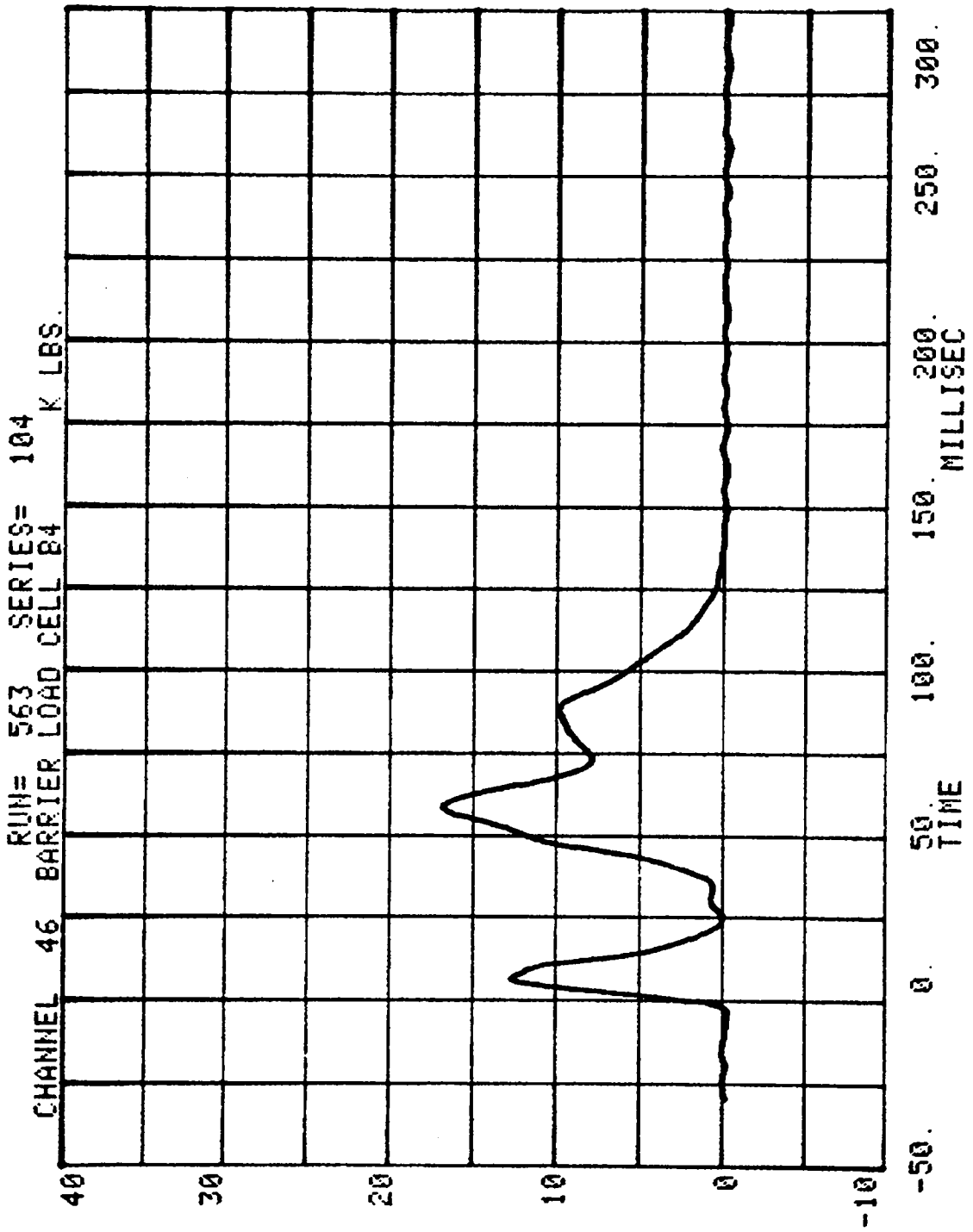
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

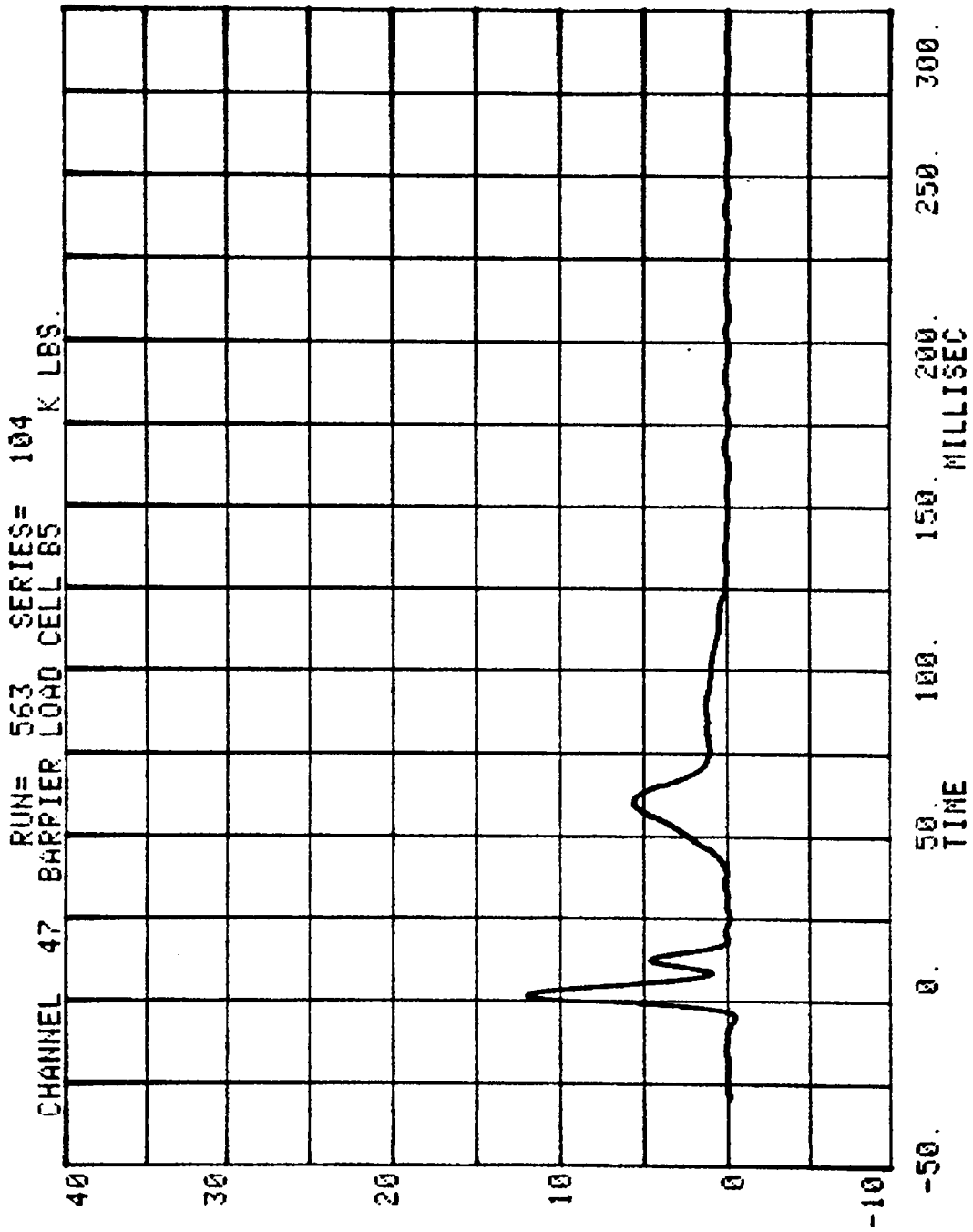

CHANNEL 42 BARRIER LOAD CELL A9
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

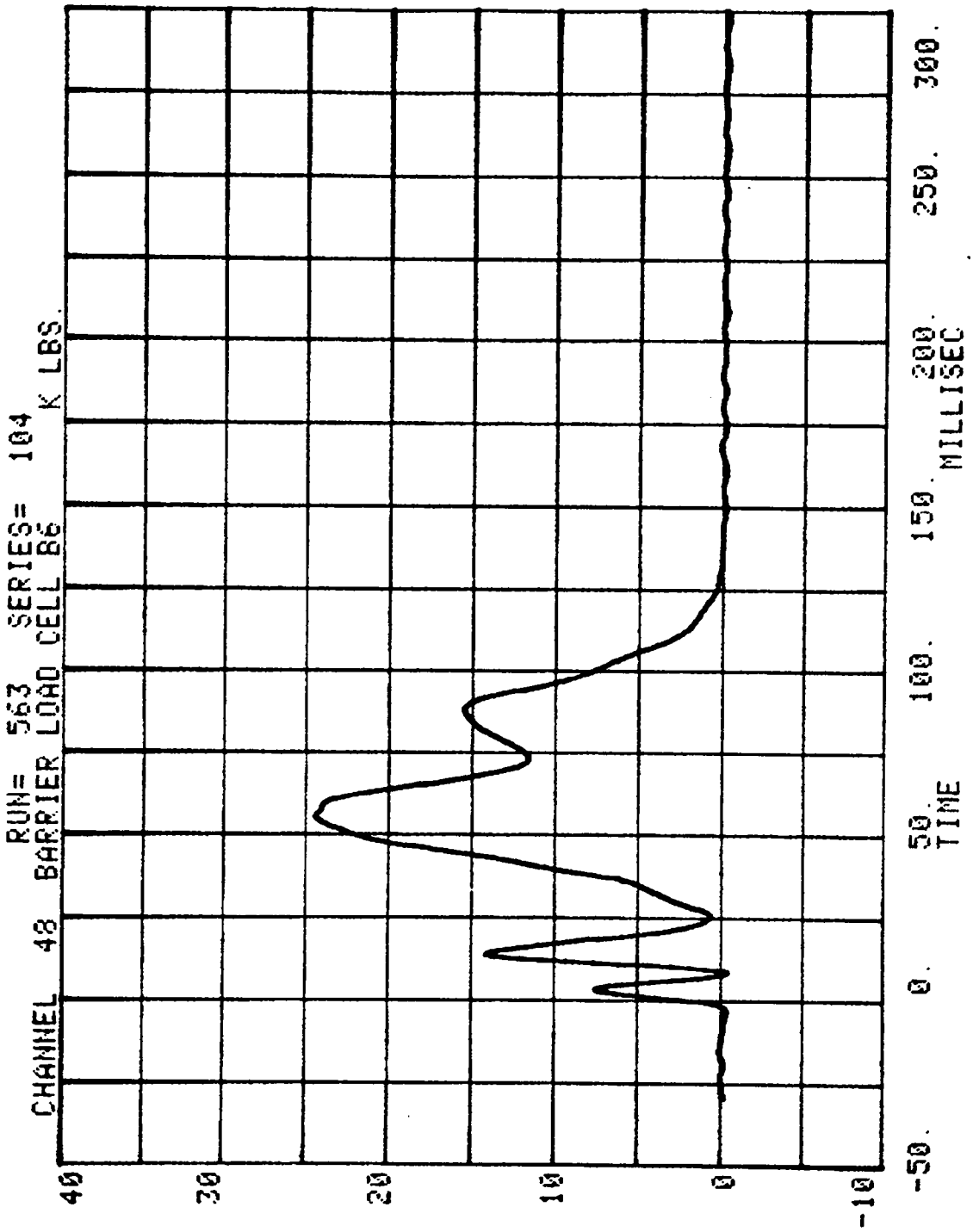

CHANNEL 43 RUN= 563 SERIES= 104
BARRIER LOAD CELL 81
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

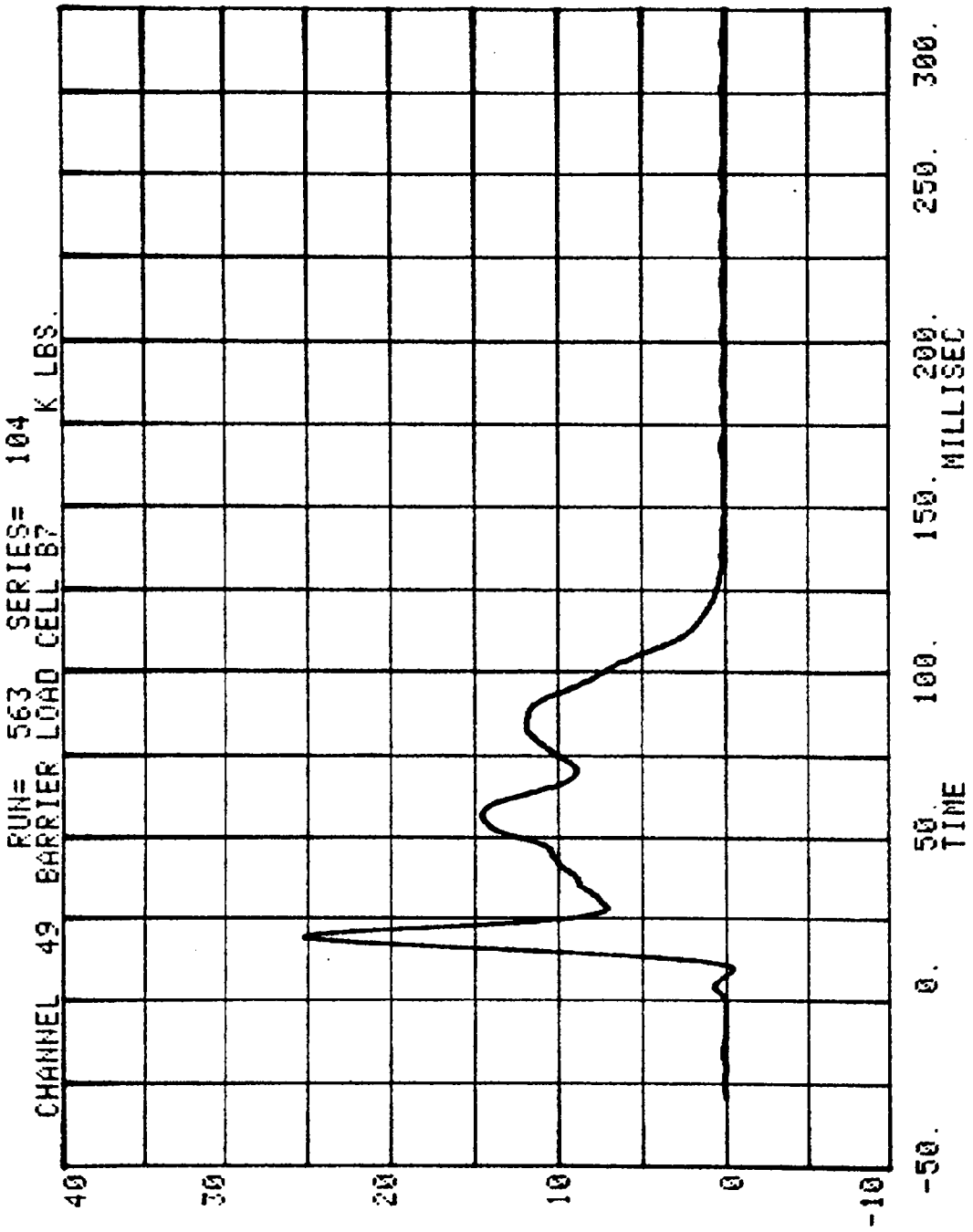

CHANNEL 44 BARRIER LOAD CELL B2
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

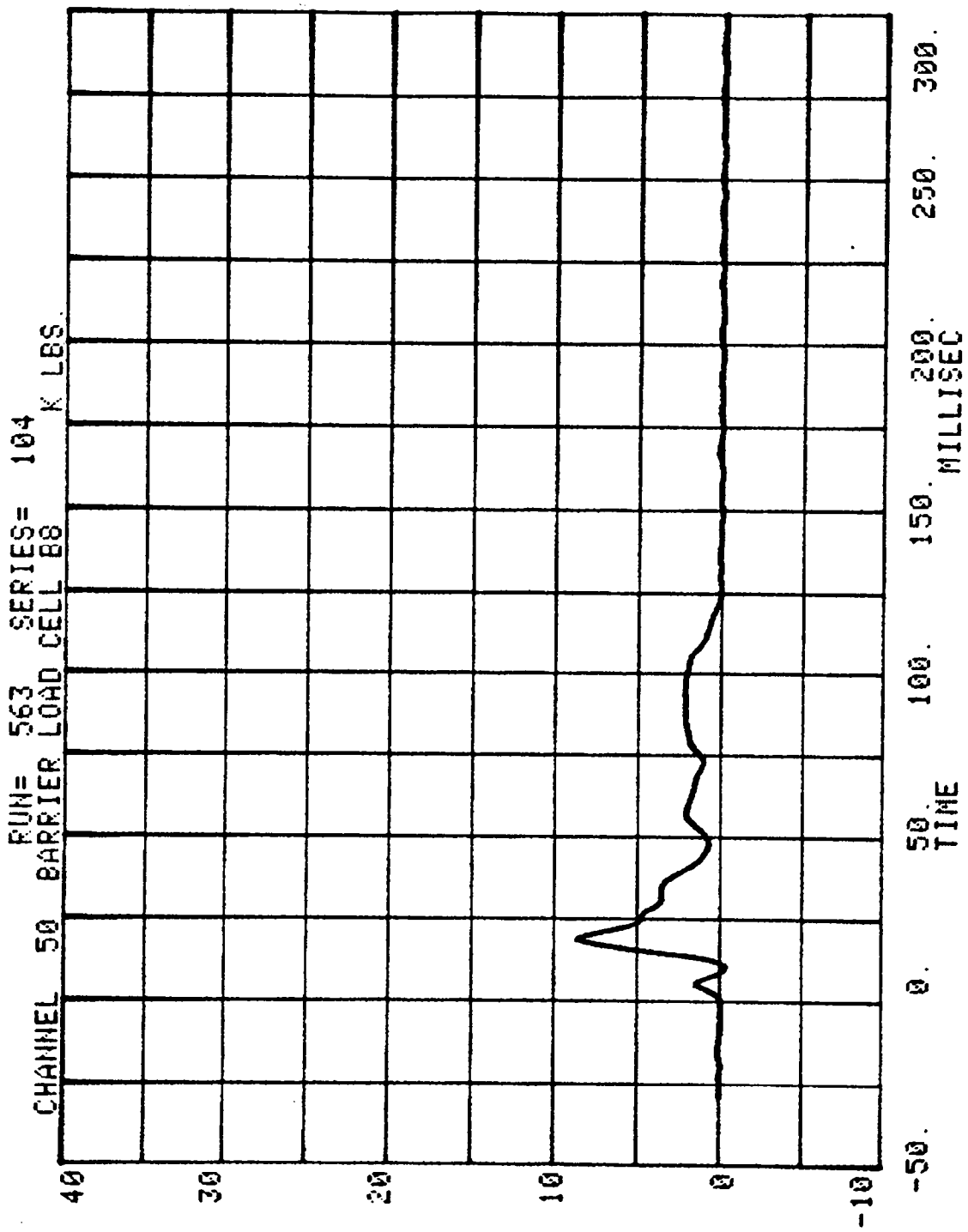

CHANNEL 45 RUN= 563 SERIES= 104
BARRIER LOAD CELL B3
K LBS
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

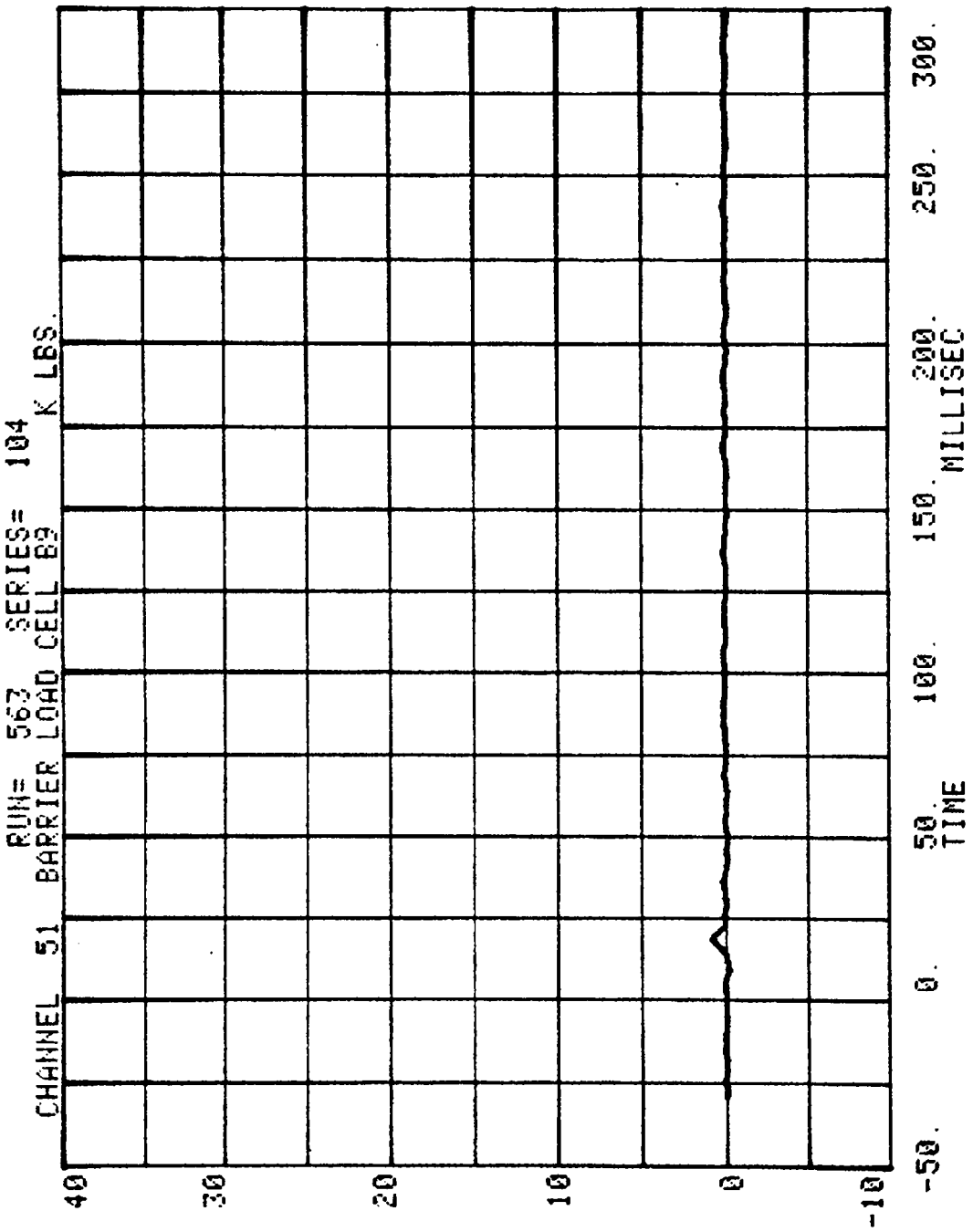

CHANNEL 46 BARRIER LOAD CELL 84
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

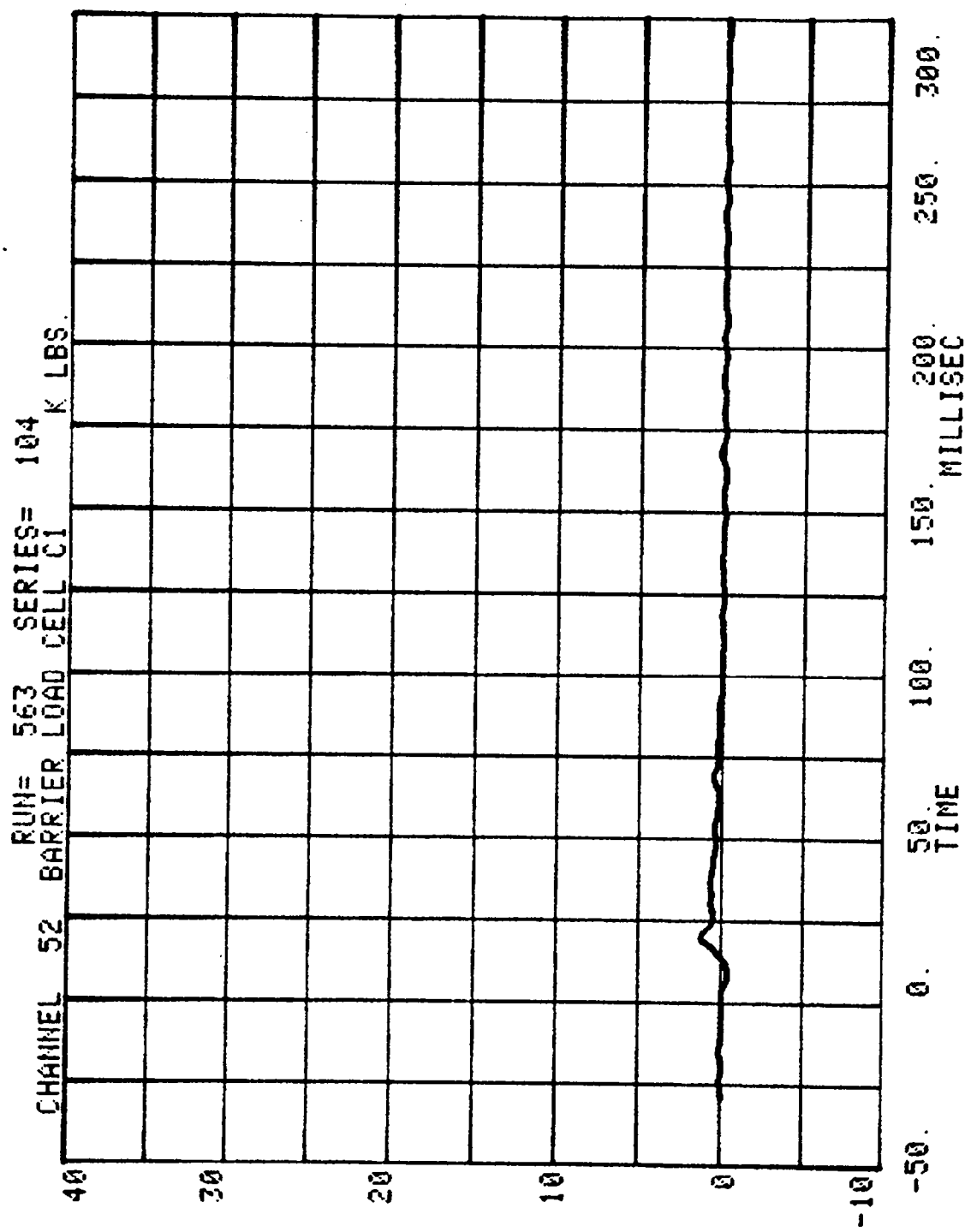

CHANNEL 47
RUN= 563
BARRIER LOAD CELL 85
SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

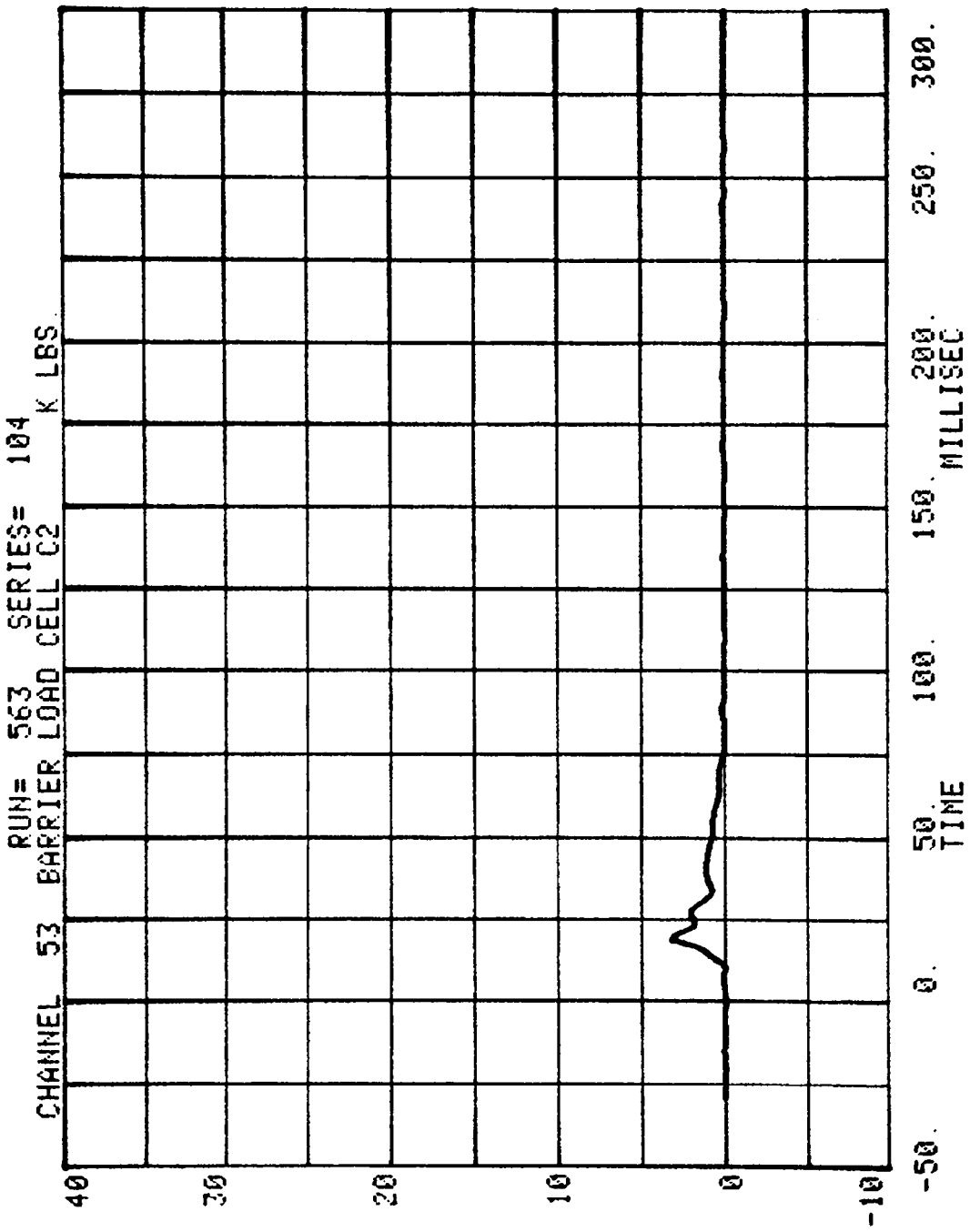

CHANNEL 48 BARRIER LOAD CELL 86
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 49 RUN= 563 SERIES= 104
BARRIER LOAD CELL B7
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

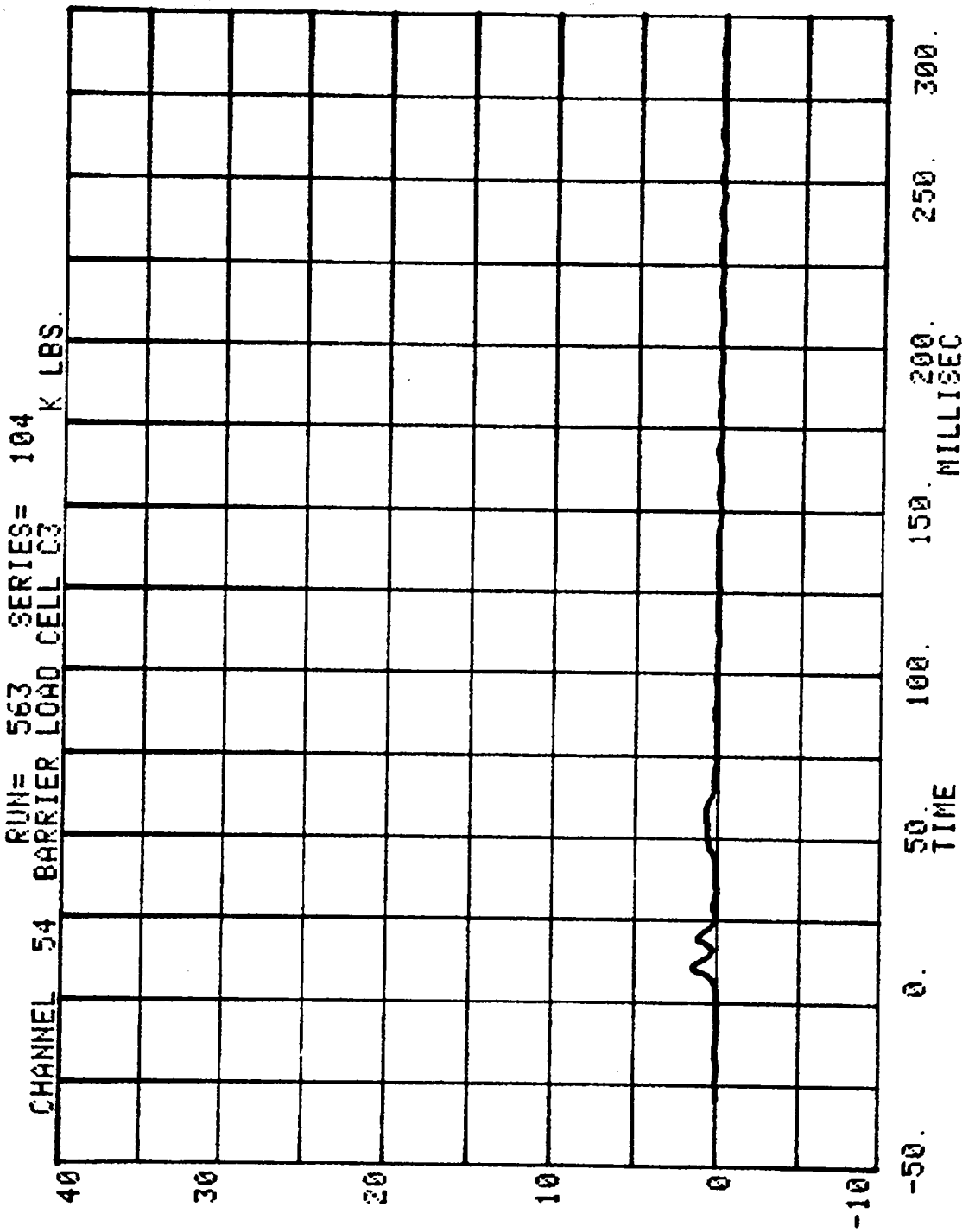

CHANNEL 50 BARRIER LOAD CELL 88
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

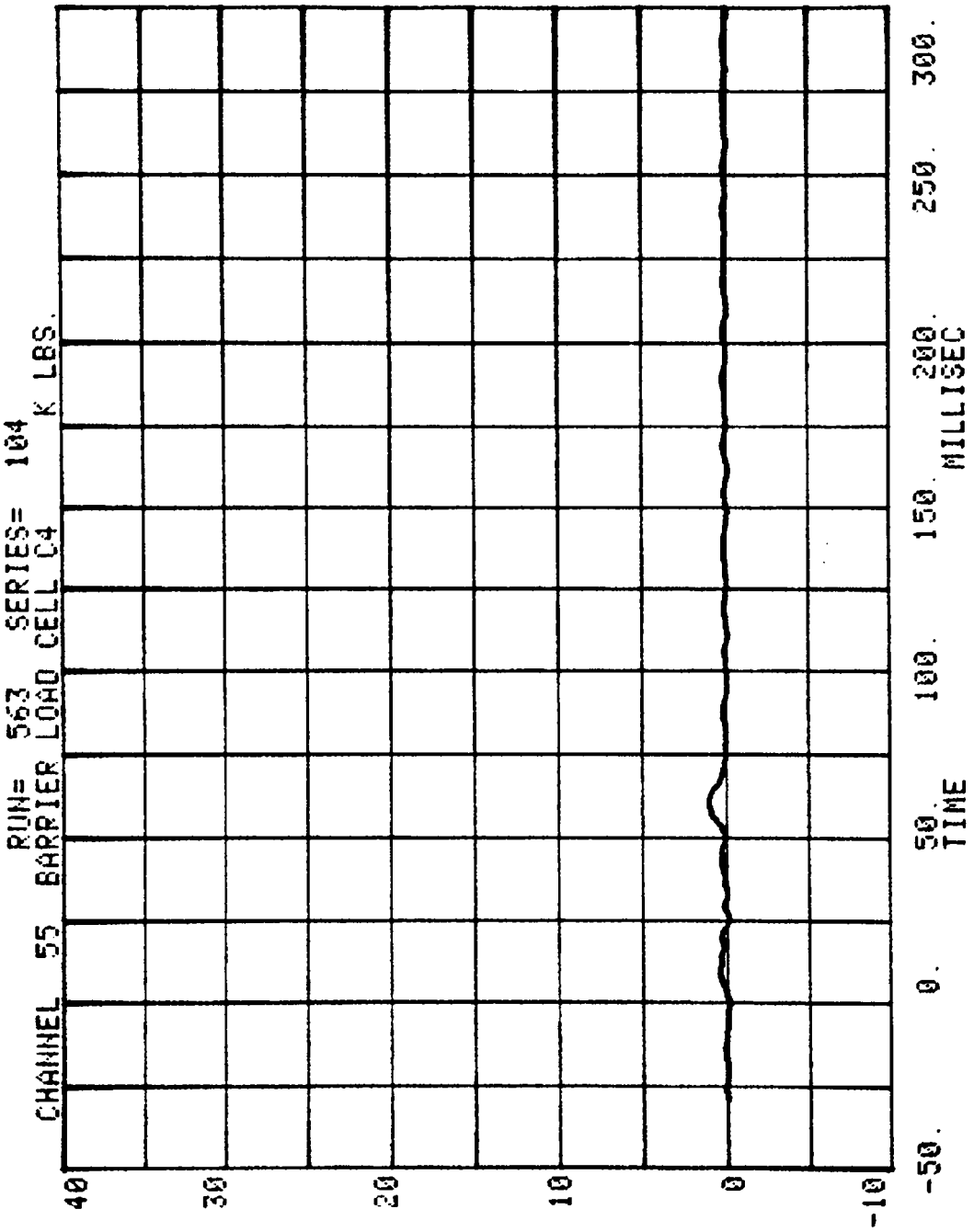

CHANNEL 51 RUN= 563 SERIES= 104
BARRIER LOAD CELL B9
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

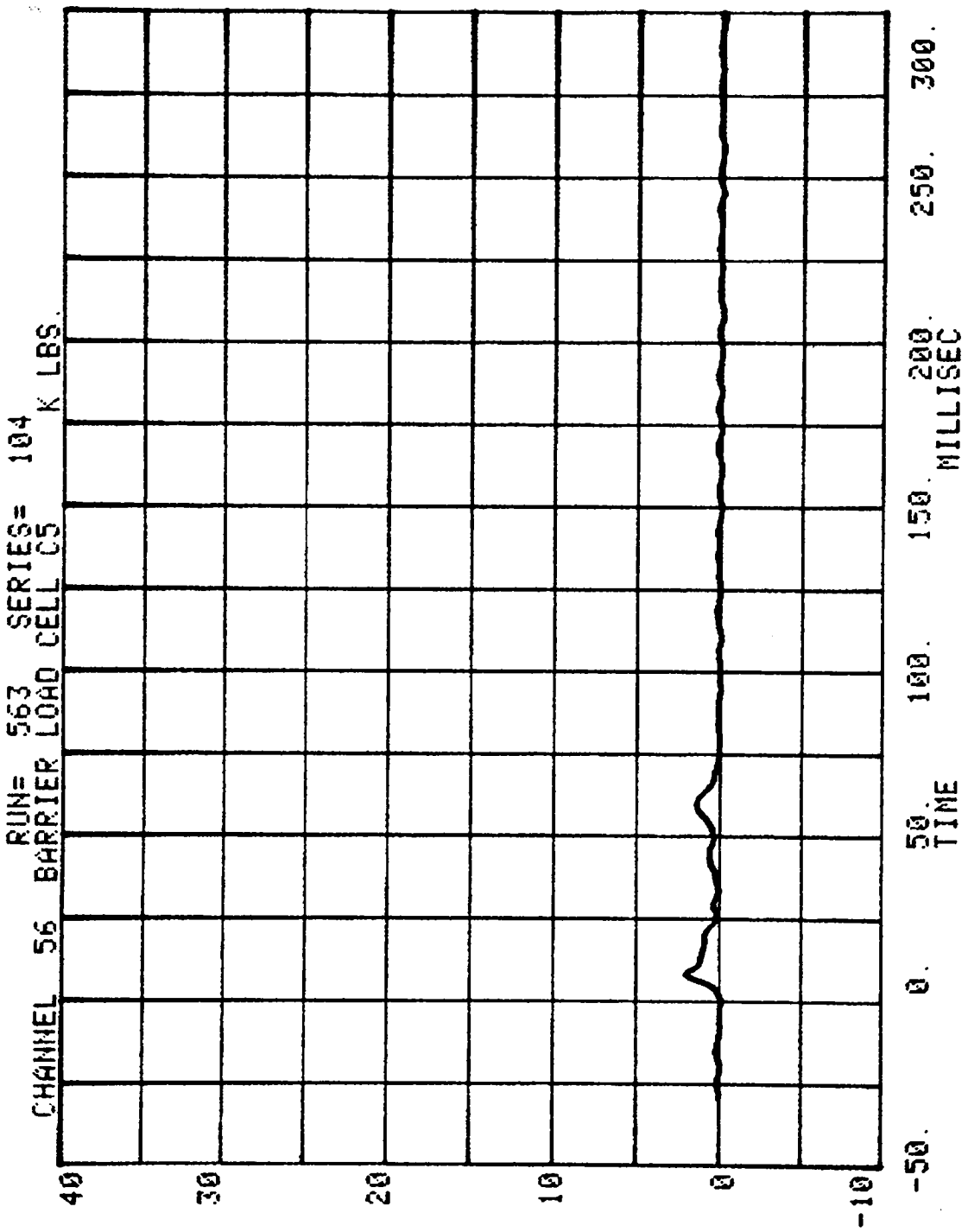

CHANNEL 52 BARRIER LOAD CELL C1
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

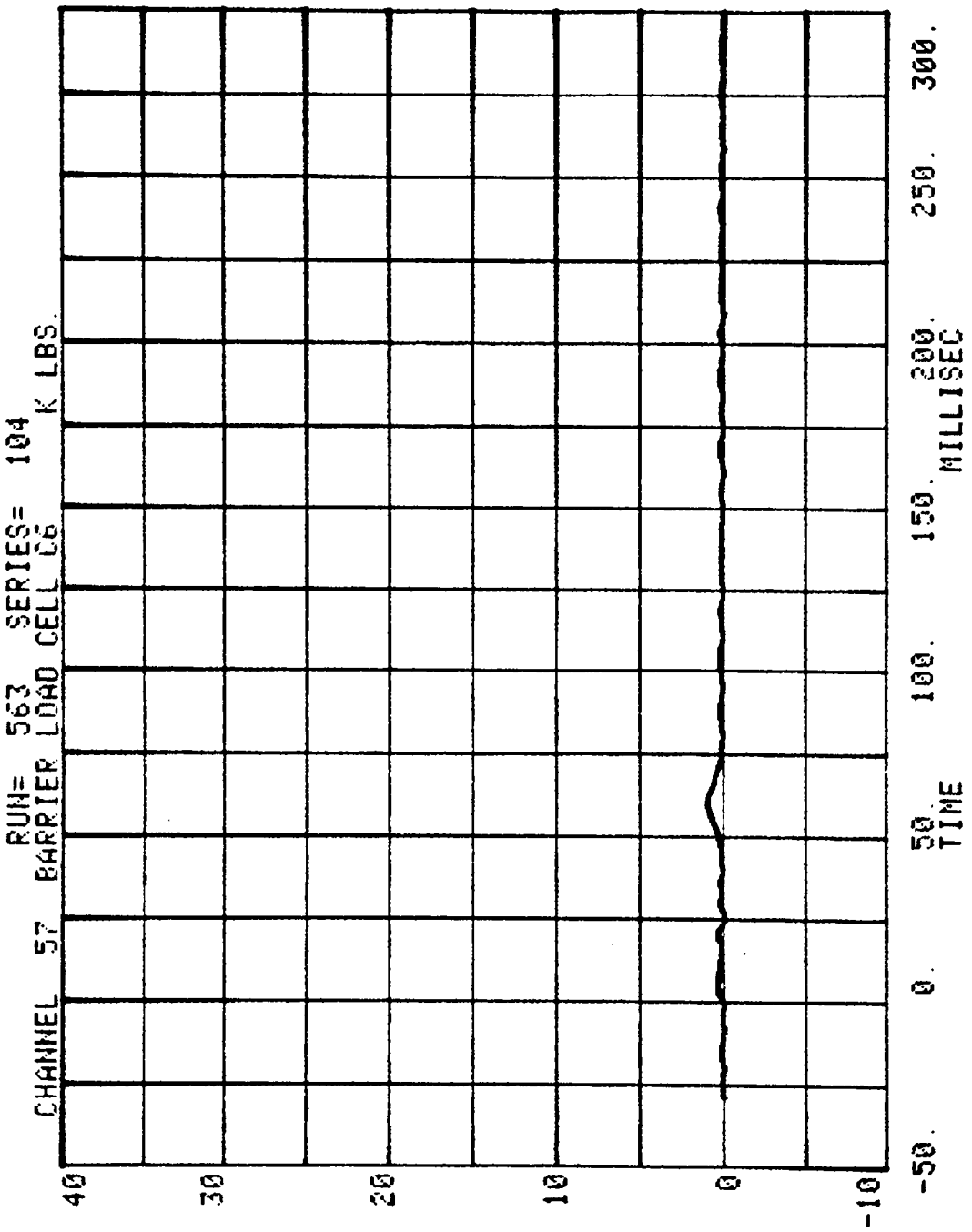

CHANNEL 53 BARRIER LOAD CELL C2
RUN= 563 SERIES= 104
K LBS
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

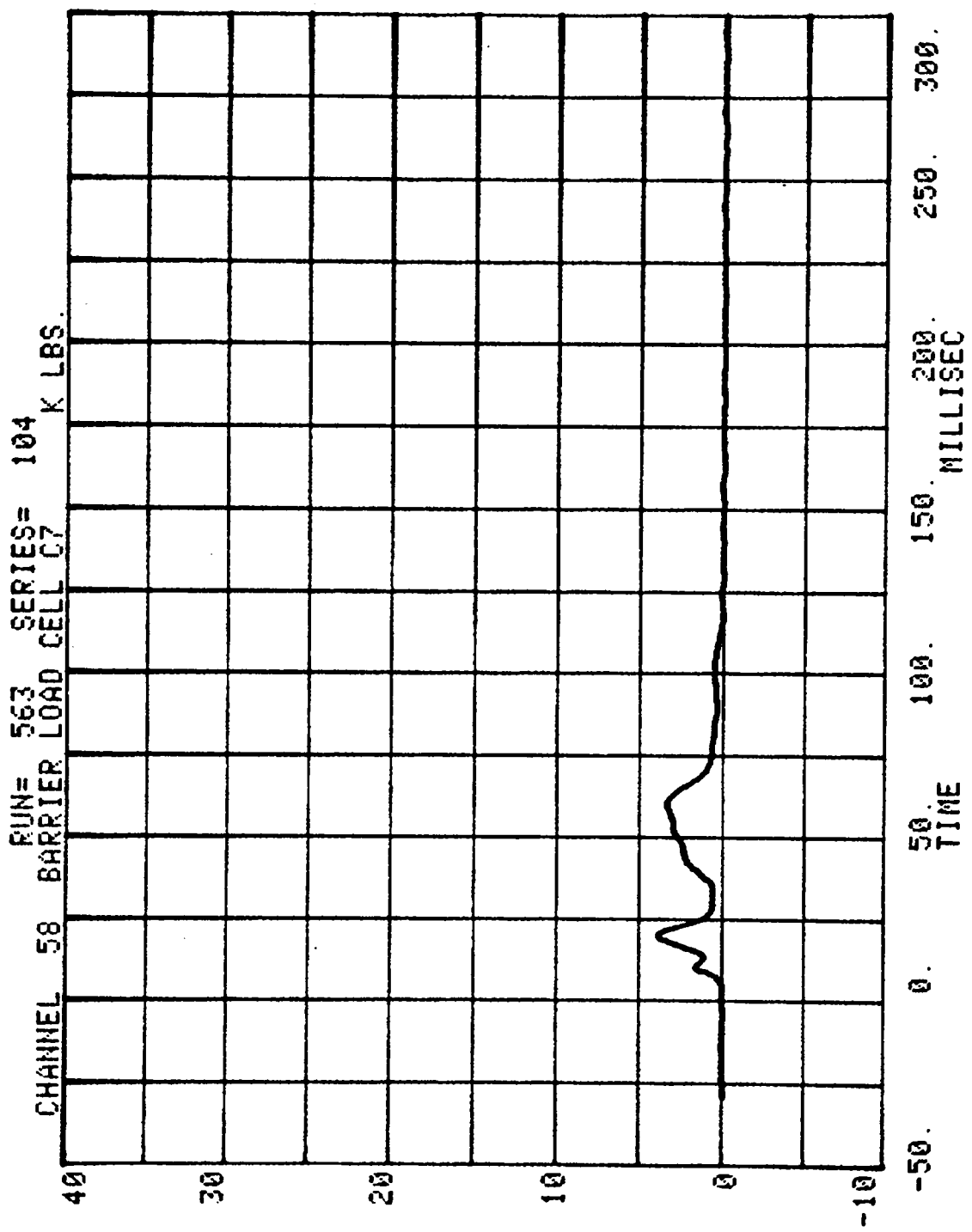
7103-V-3

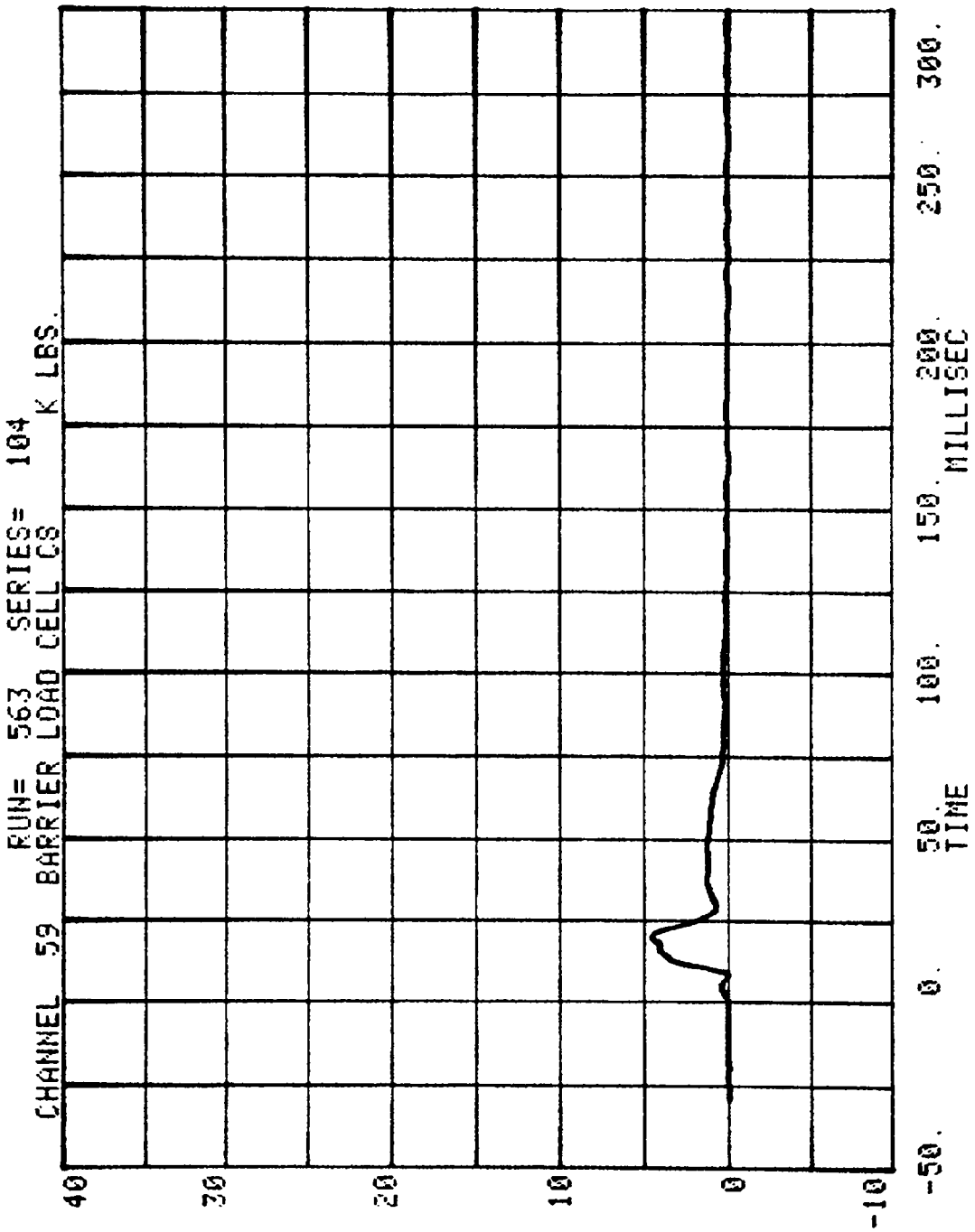

CHANNEL 54 BARRIER LOAD CELL C3
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

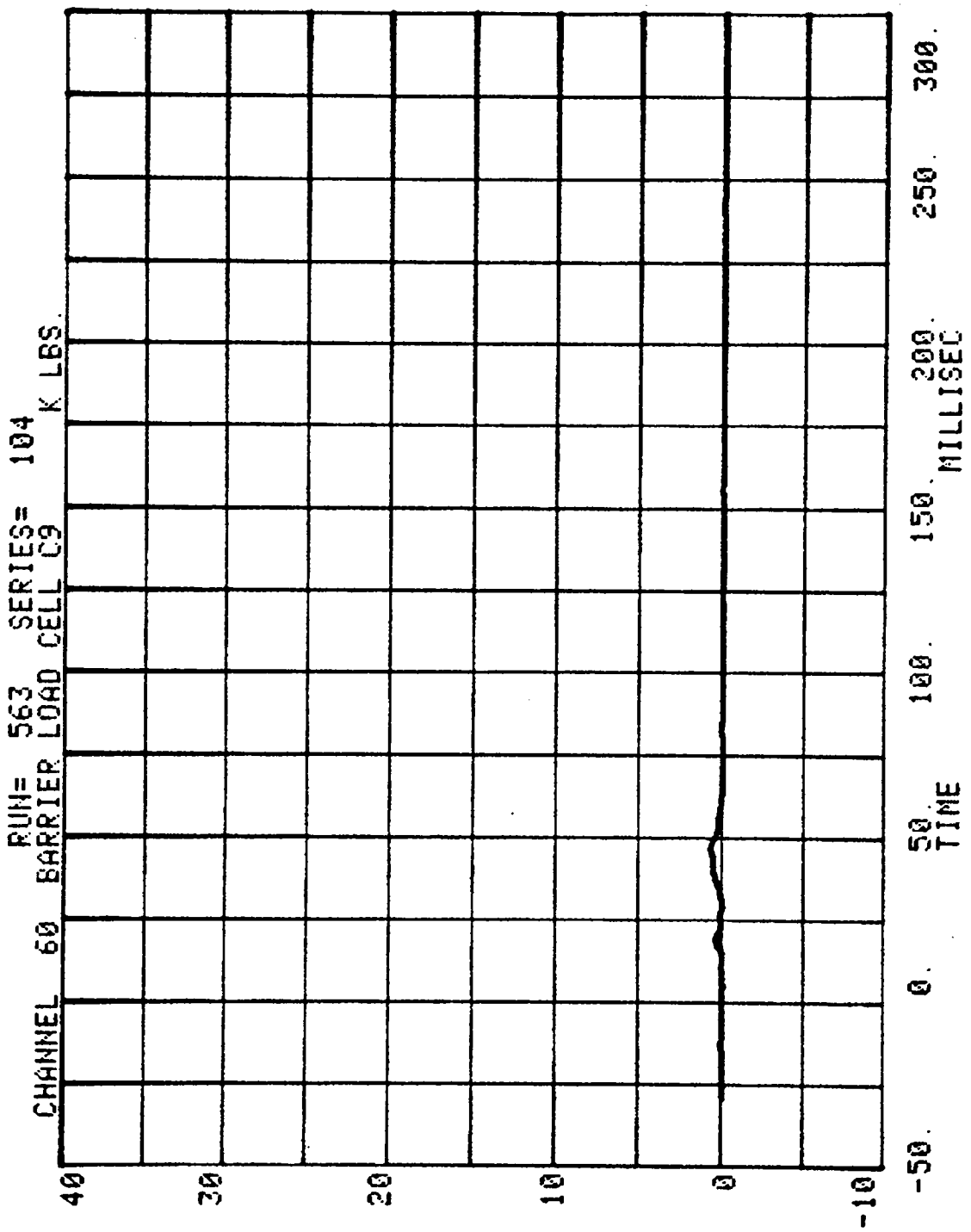

CHANNEL 55 RUN= 563 SERIES= 104
BARRIER LOAD CELL C4
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

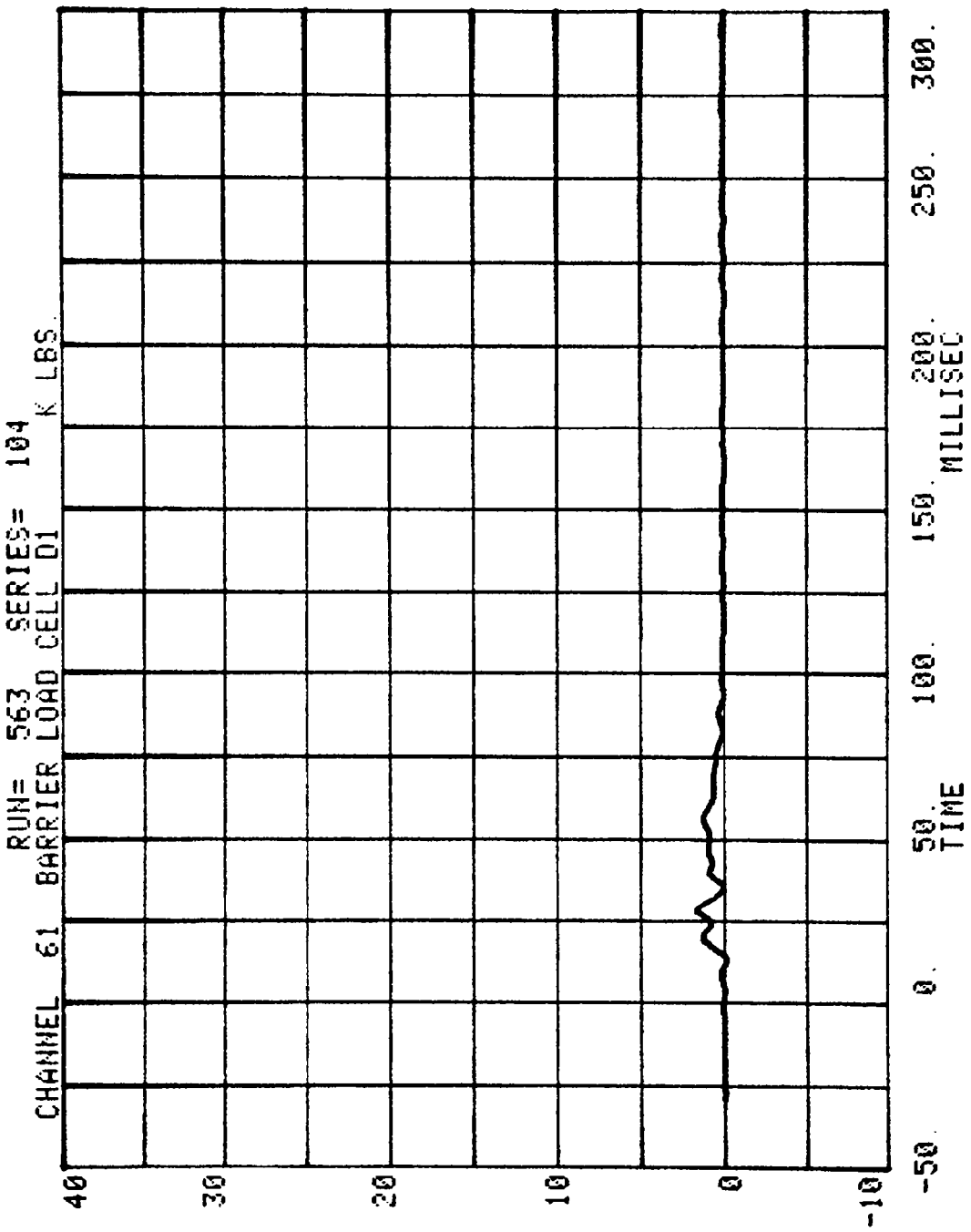

CHANNEL 56 RUN= 563 SERIES= 104
BARRIER LOAD CELL C5
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

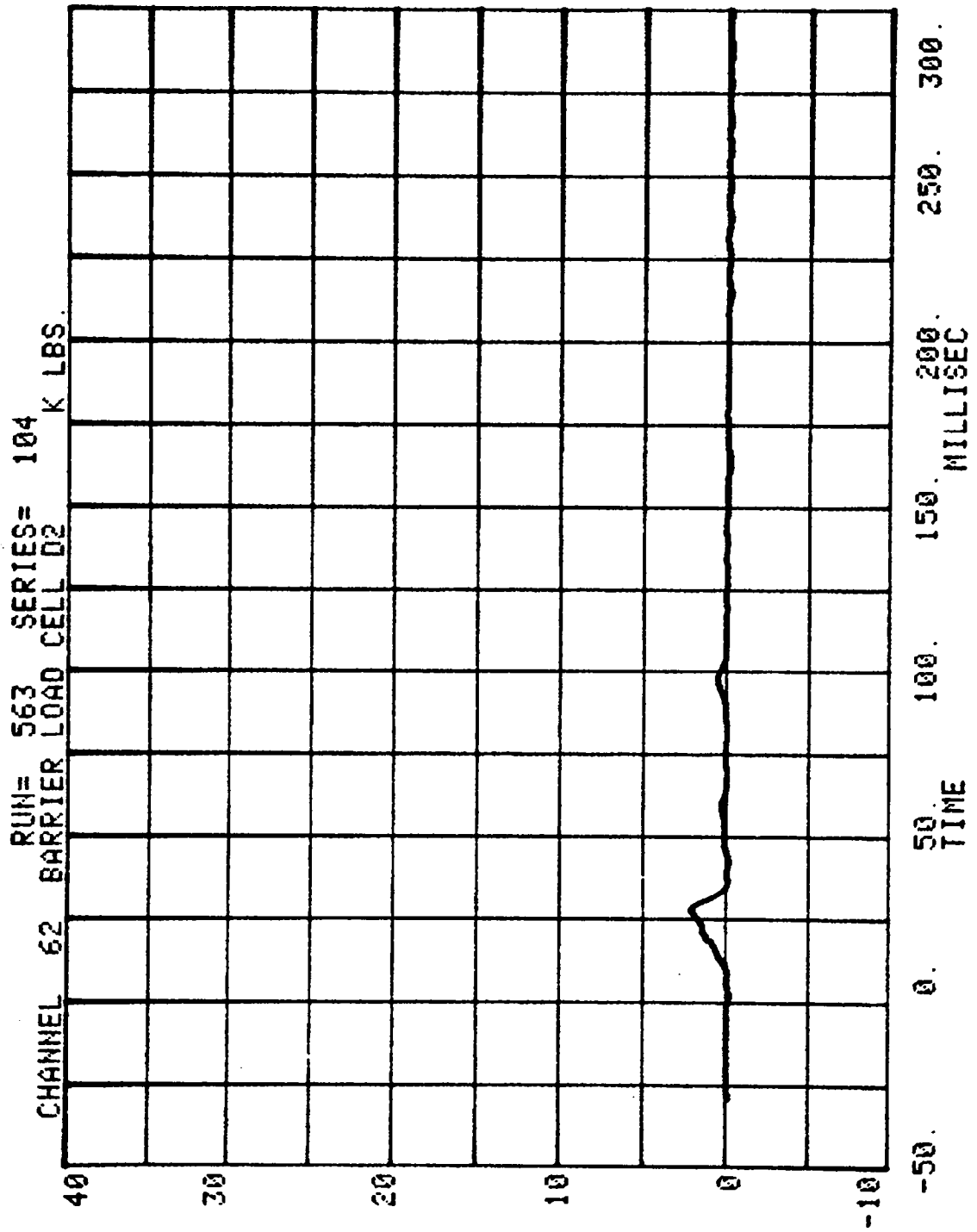

CHANNEL 57 RUN= 563 SERIES= 104
BARRIER LOAD CELL C6 K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

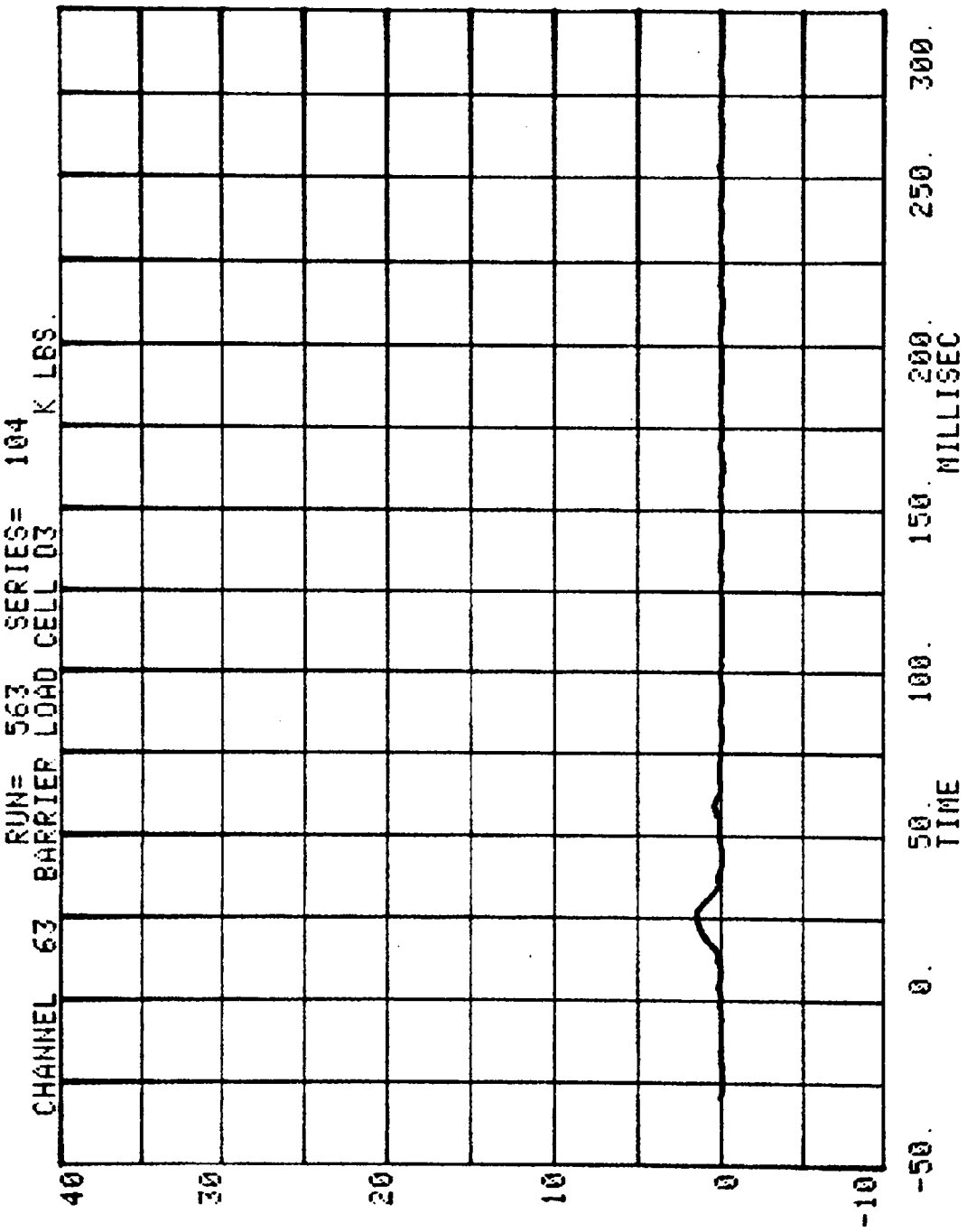

CHANNEL 58 RUN= 563 SERIES= 104
BARRIER LOAD CELL C7
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

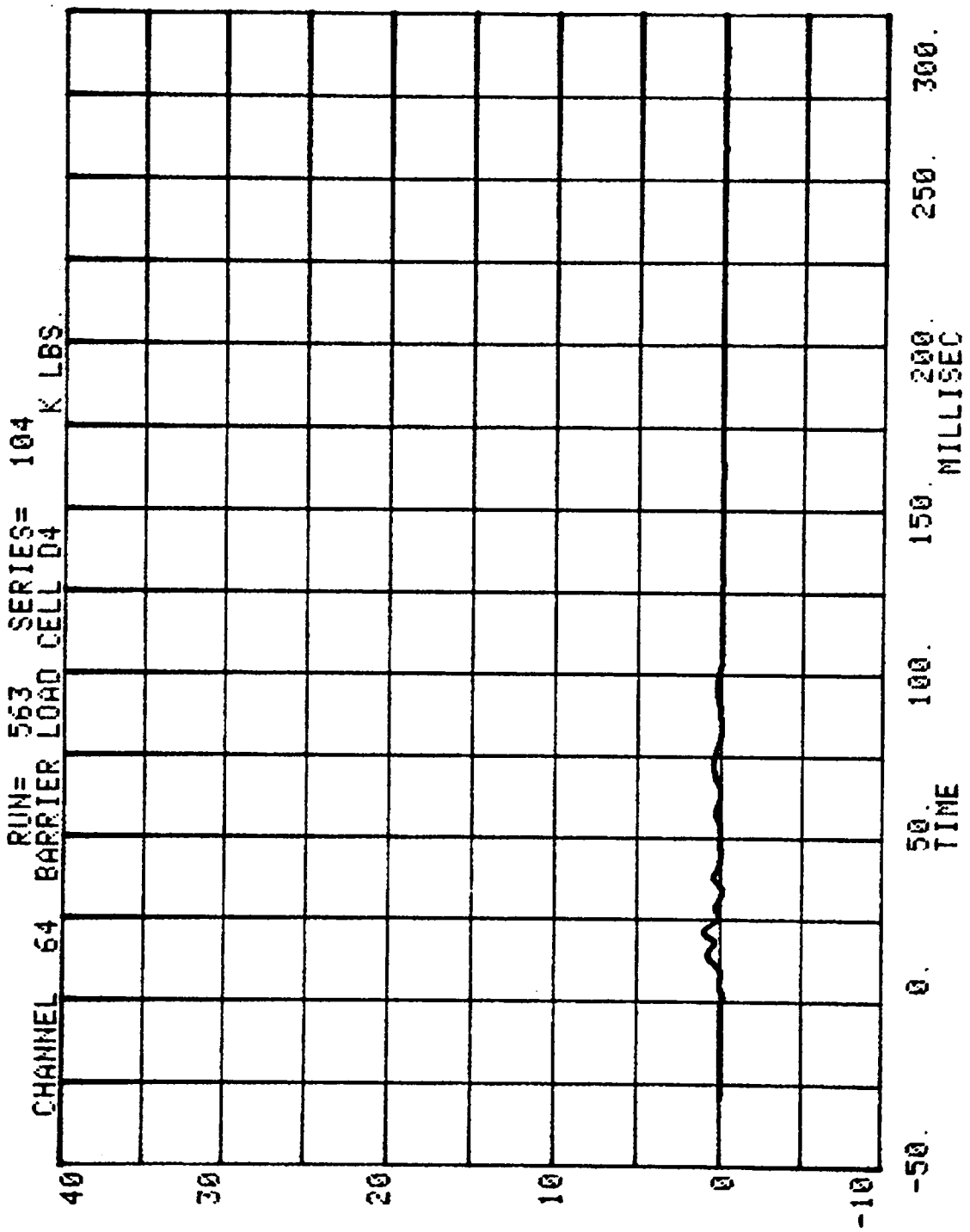

CHANNEL 59 BARRIER LOAD CELL CS
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

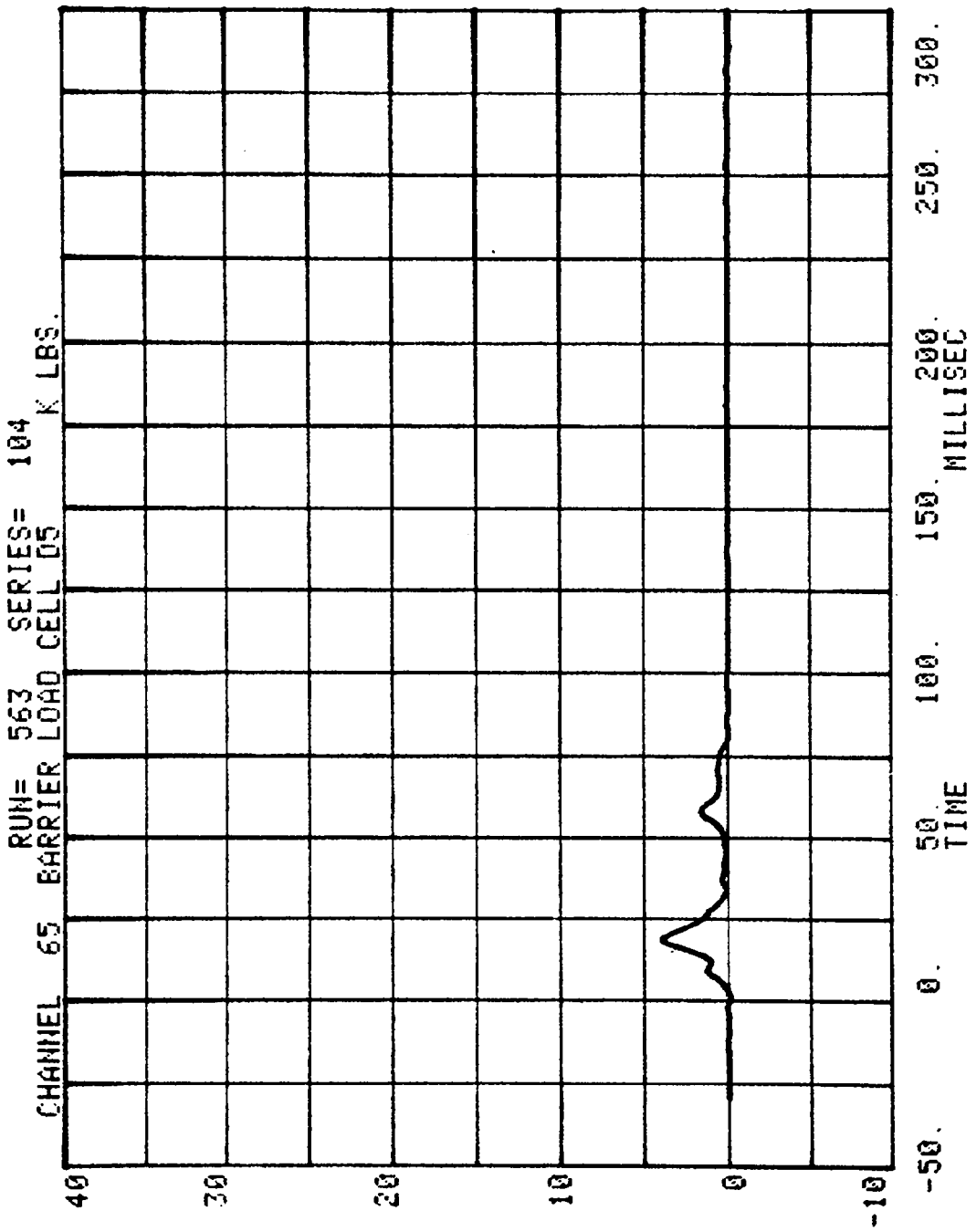

CHANNEL 60 BARRIER LOAD CELL C9
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

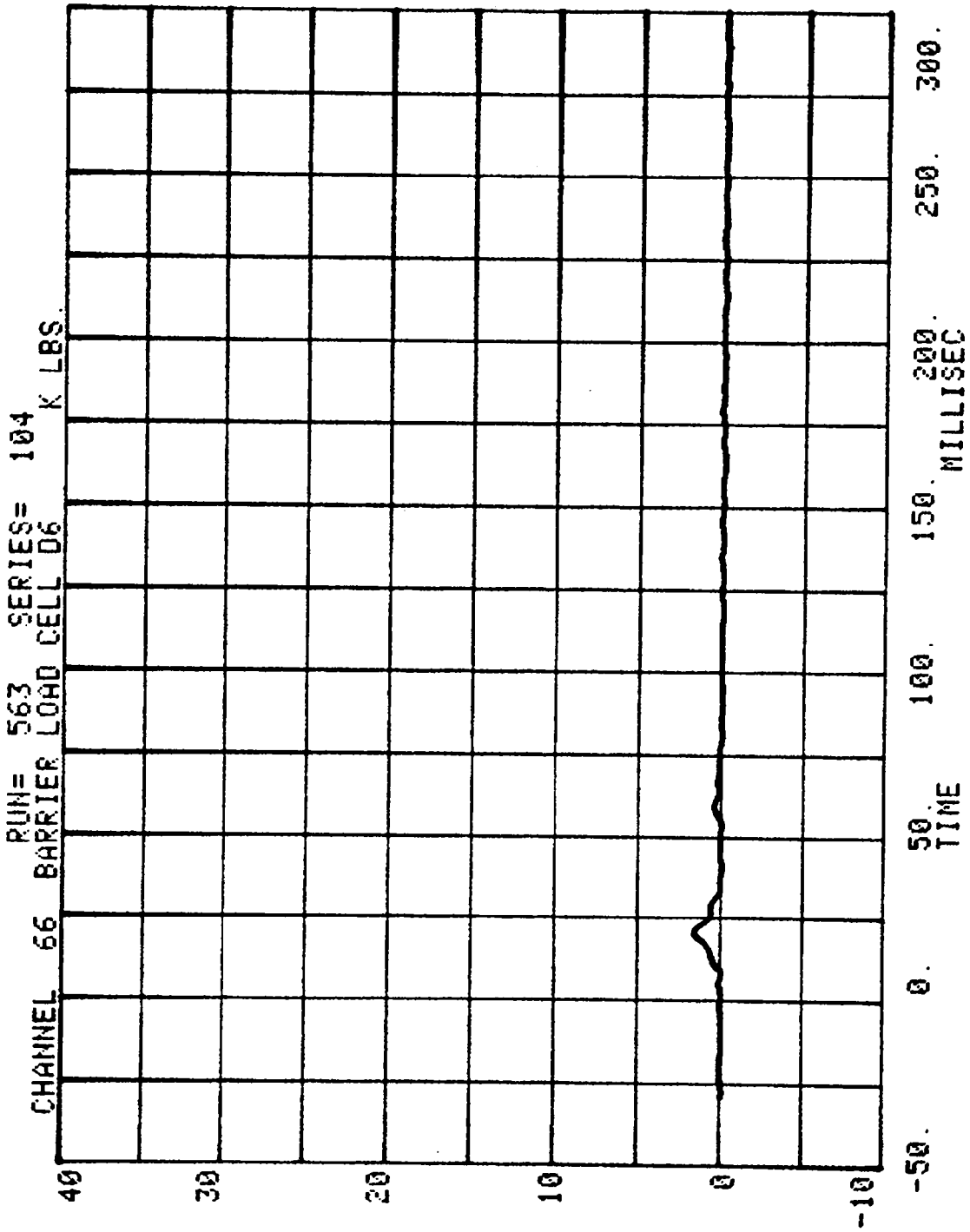

CHANNEL 61
RUN= 563
BARRIER LOAD CELL D1
SERIES= 104
K LBS
40
30
20
10
0
-10
-50
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

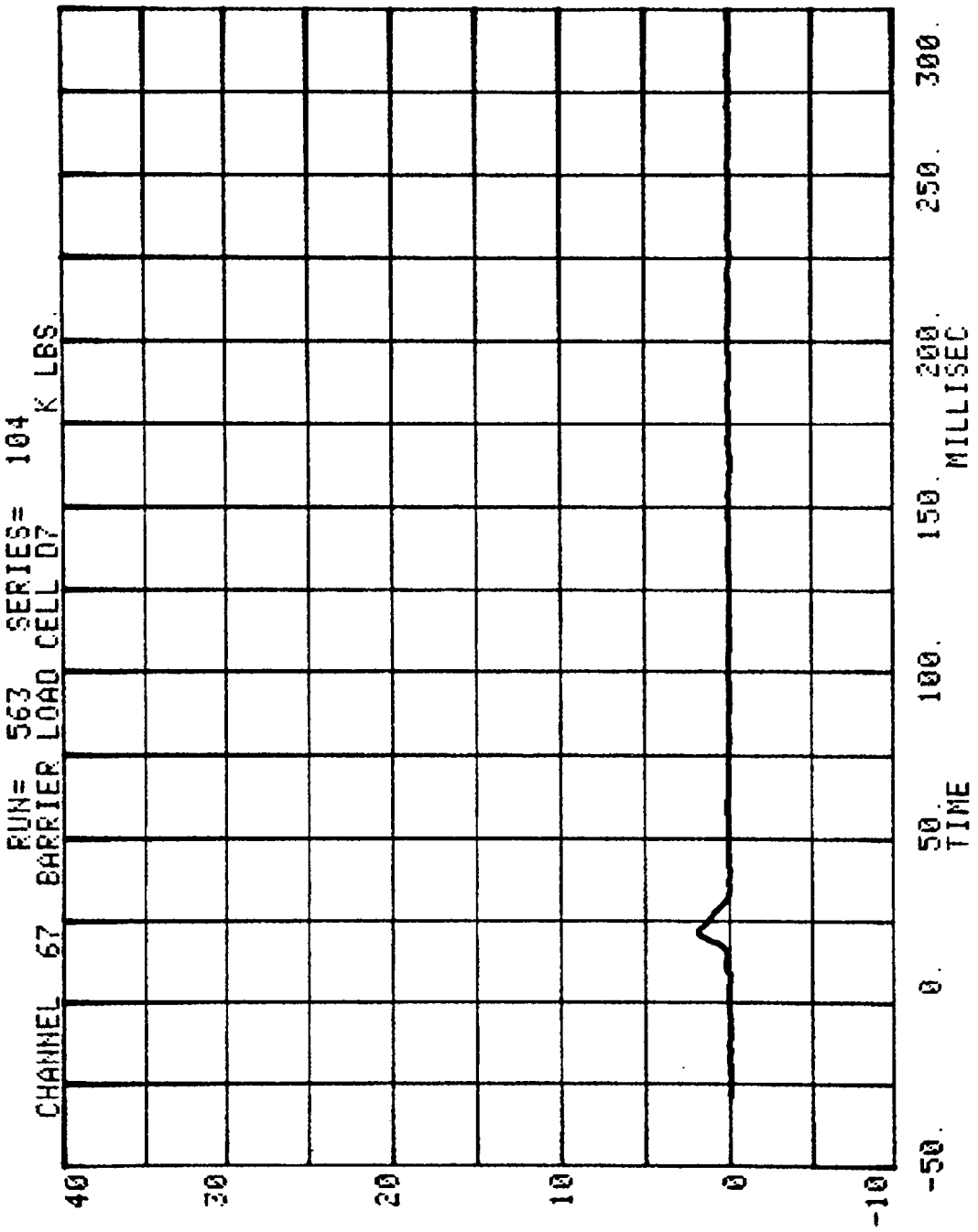

CHANNEL 62 BARRIER LOAD CELL D2
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

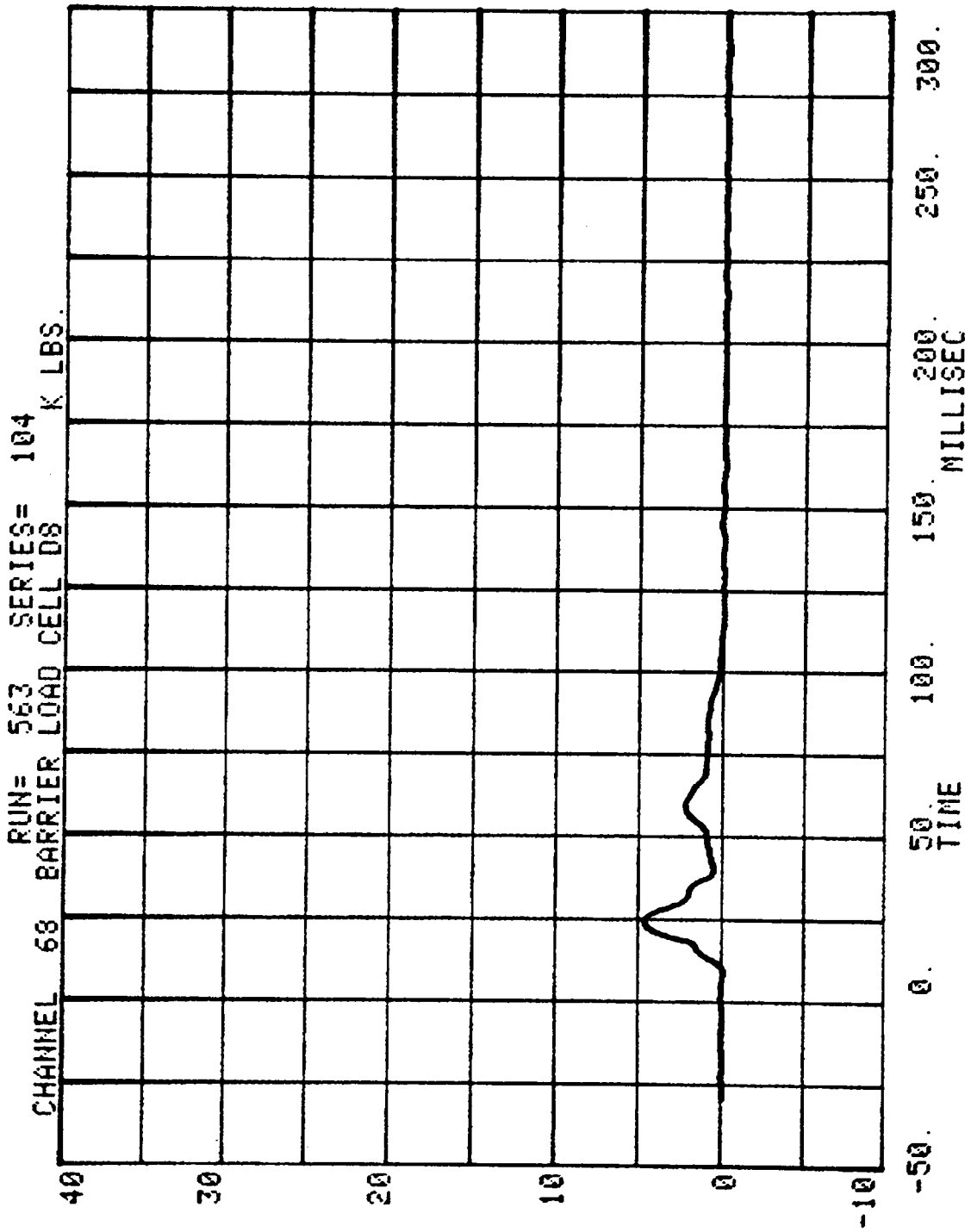

CHANNEL 63 RUN= 563 SERIES= 104
BARRIER LOAD CELL 03
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

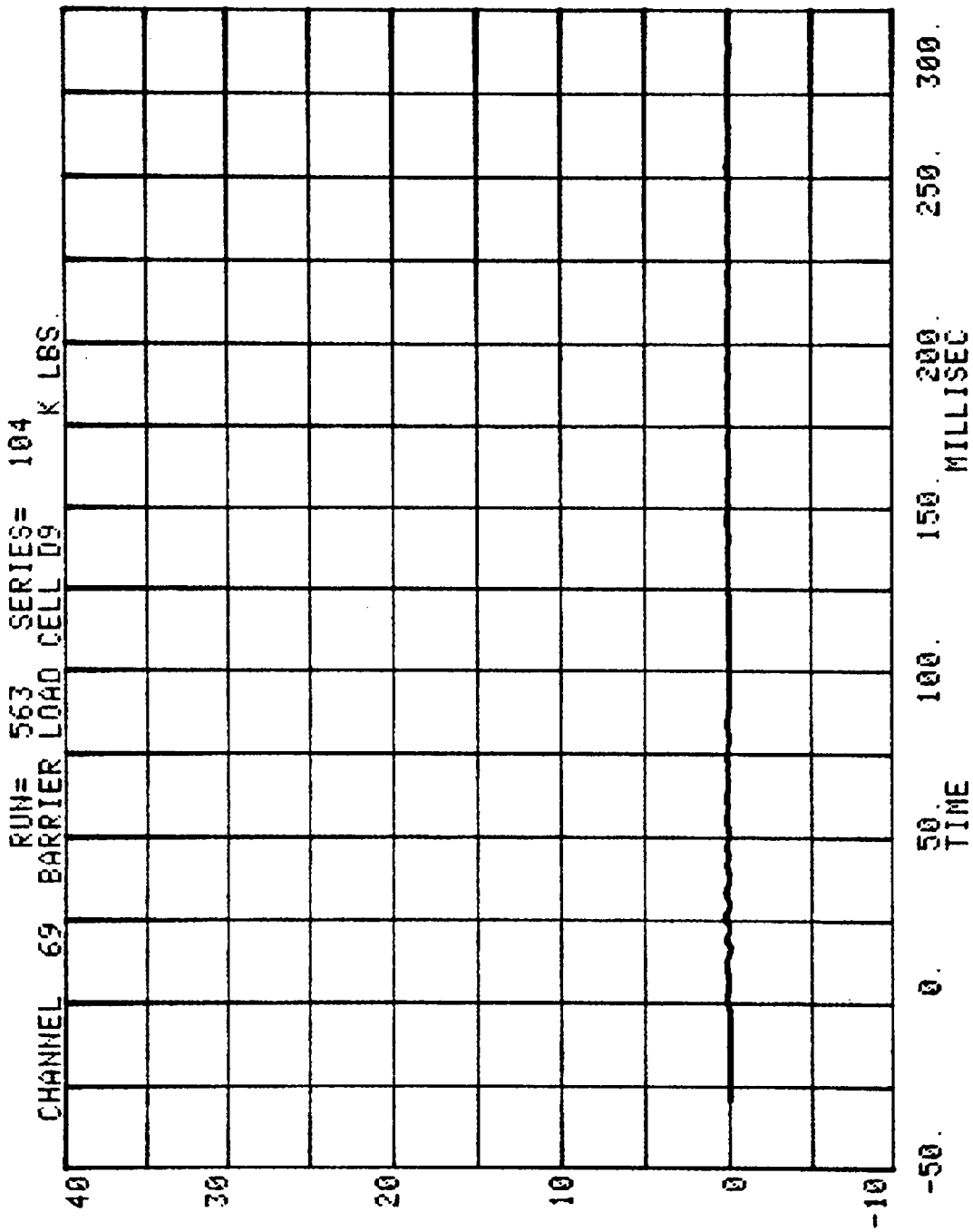

CHANNEL 64
RUN= 563
BARRIER LOAD CELL D4
SERIES= 104
K LBS
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

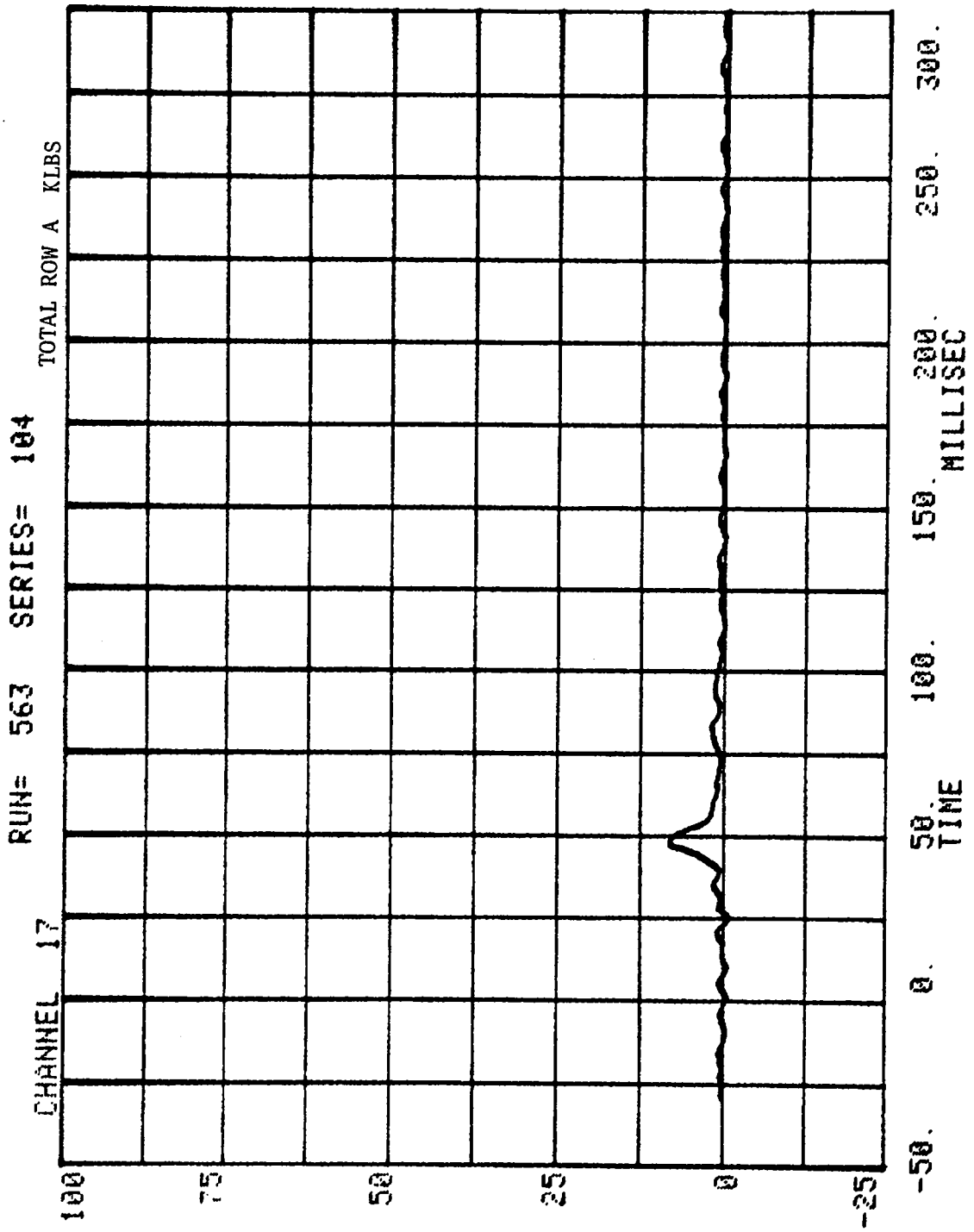

CHANNEL 65 BARRIER LOAD CELL 05
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

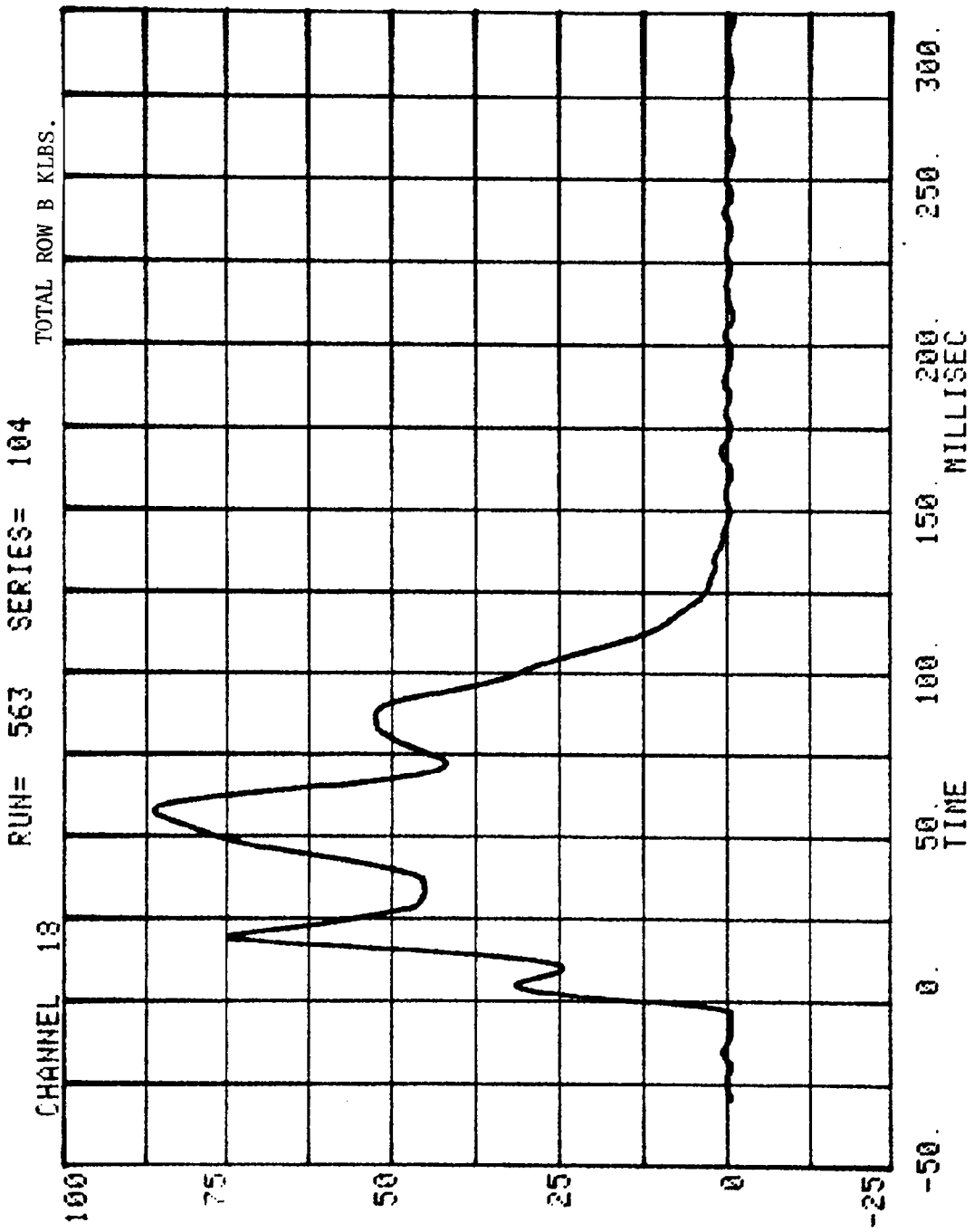

CHANNEL 66 BARRIER LOAD CELL D6
RUN= 563 SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

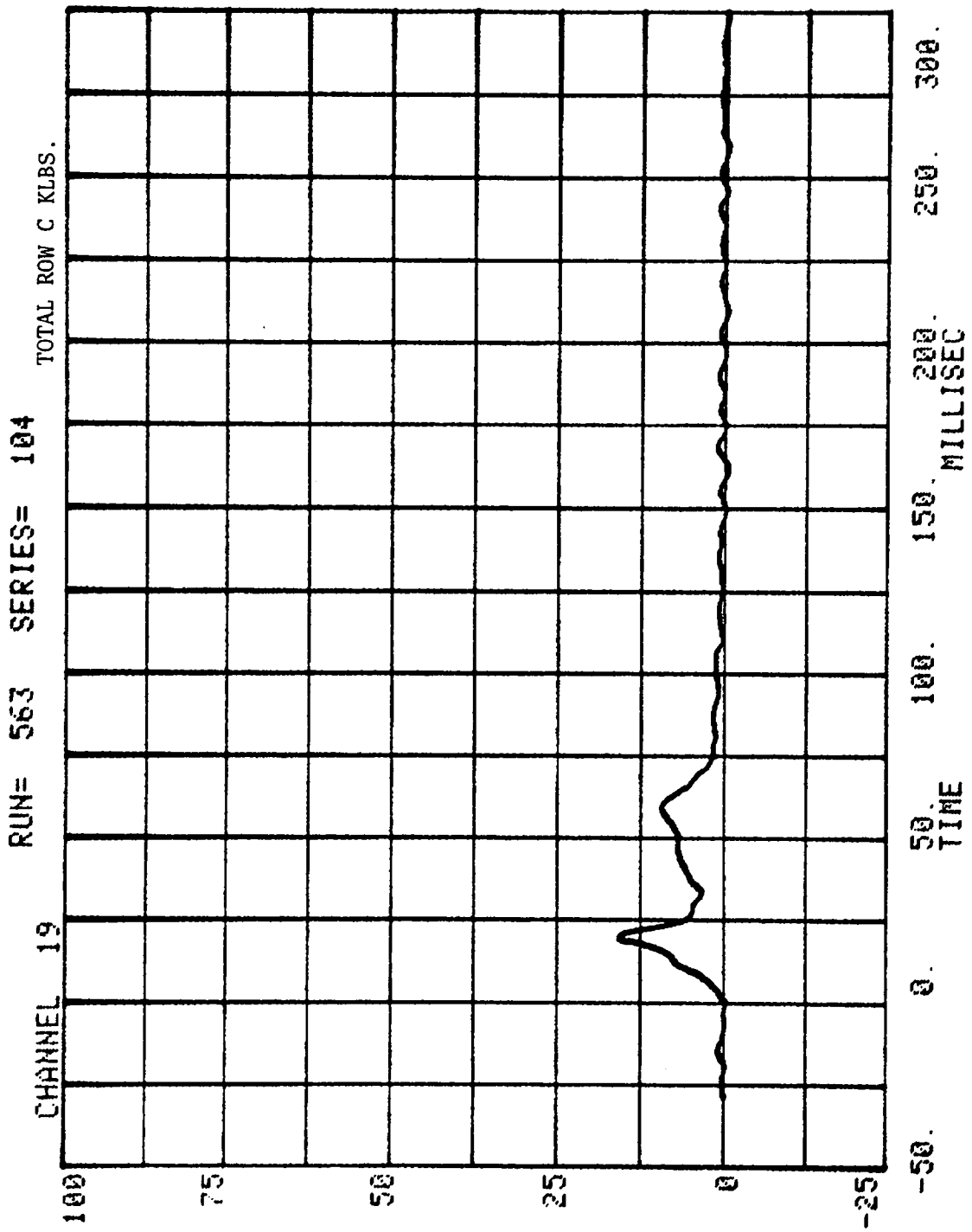

CHANNEL 67
RUN= 563
BARRIER LOAD CELL D7
SERIES= 104
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

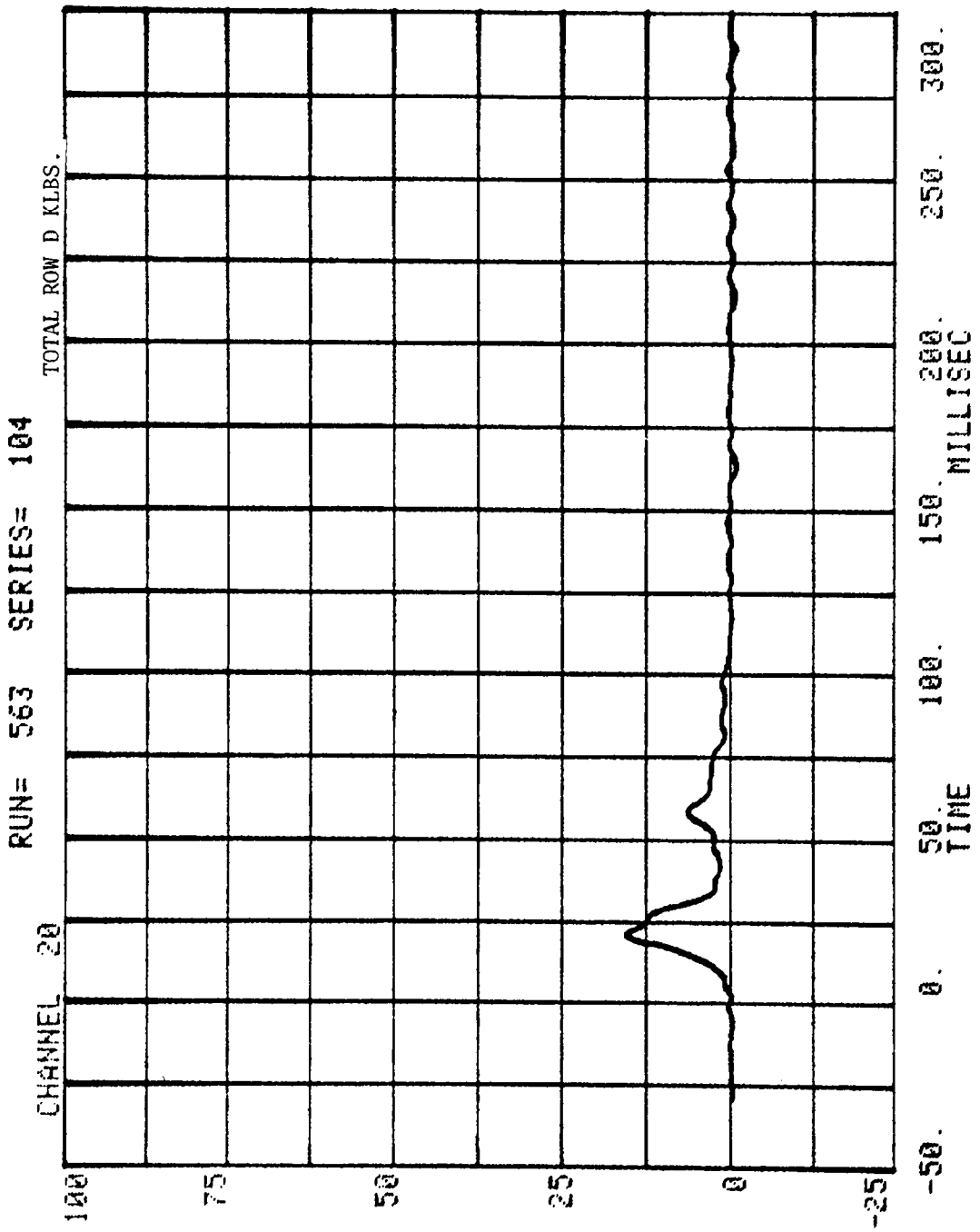

CHANNEL 68 RUN= 563 SERIES= 104
BARRIER LOAD CELL DS
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

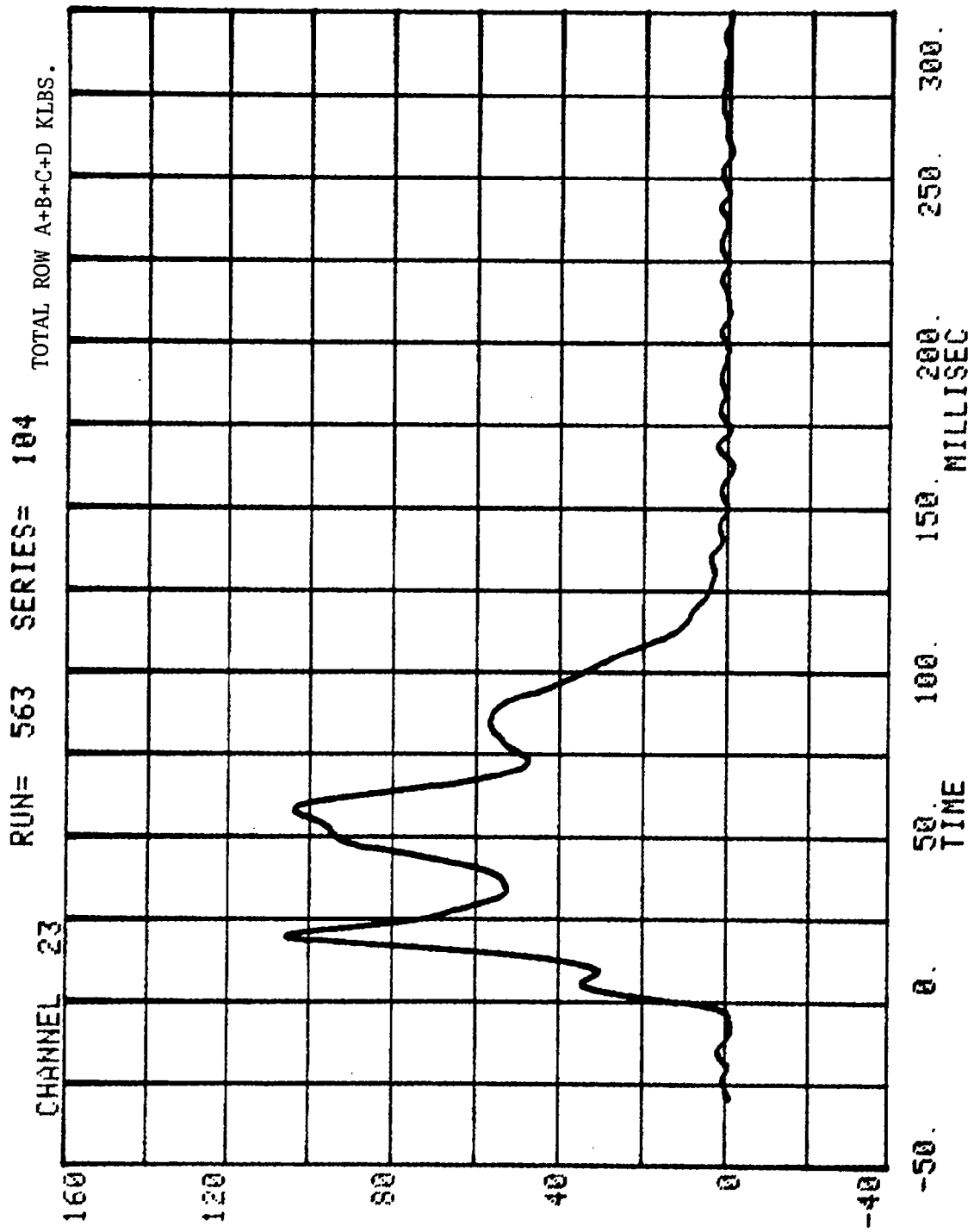

CHANNEL 69 RUN= 563 SERIES= 104
BARRIER LOAD CELL D9 K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 17
RUN= 563 SERIES= 104
TOTAL ROW A KLBS
100
75
50
25
0
-25
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 18
RUN= 563 SERIES= 104
TOTAL ROW B KLBS.
100
75
50
25
0
-25
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 19
RUN= 563 SERIES= 104
TOTAL ROW C KLBS.
100
75
50
25
0
-25
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 563 SERIES= 104
CHANNEL 20
TOTAL ROW D KLBS.
100
75
50
25
0
-25
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 23
RUN= 563 SERIES= 104
TOTAL ROW A+B+C+D KLBS.
160
120
80
40
0
-40
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

TEST NO. CDO104

DUMMY DATA

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

HEAD INJURY CRITERION
HEAD SEVERITY INDEX

CAR TO LOAD CELL BARRIER

RUN= 563

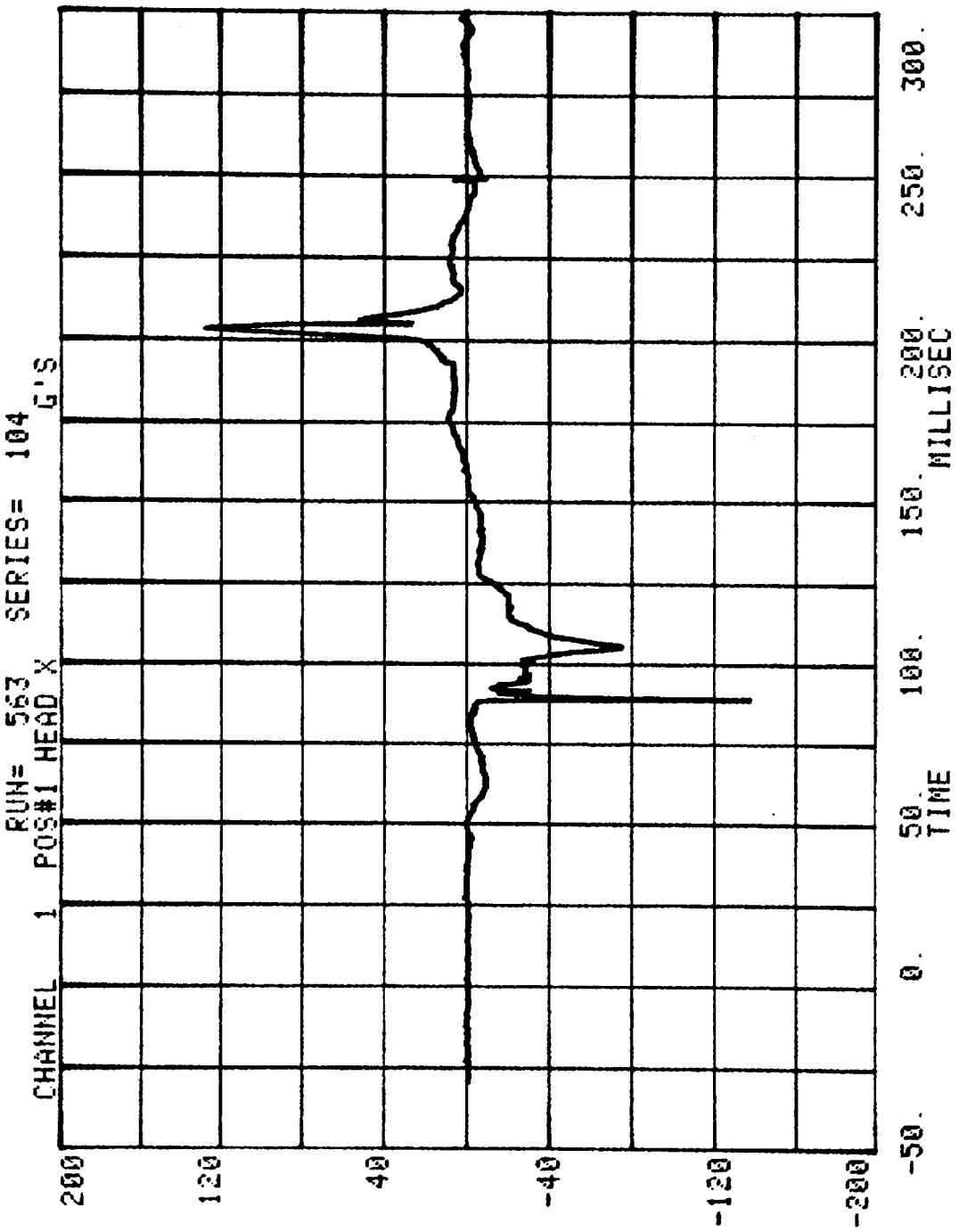
POS#1 HEAD RESULTANT

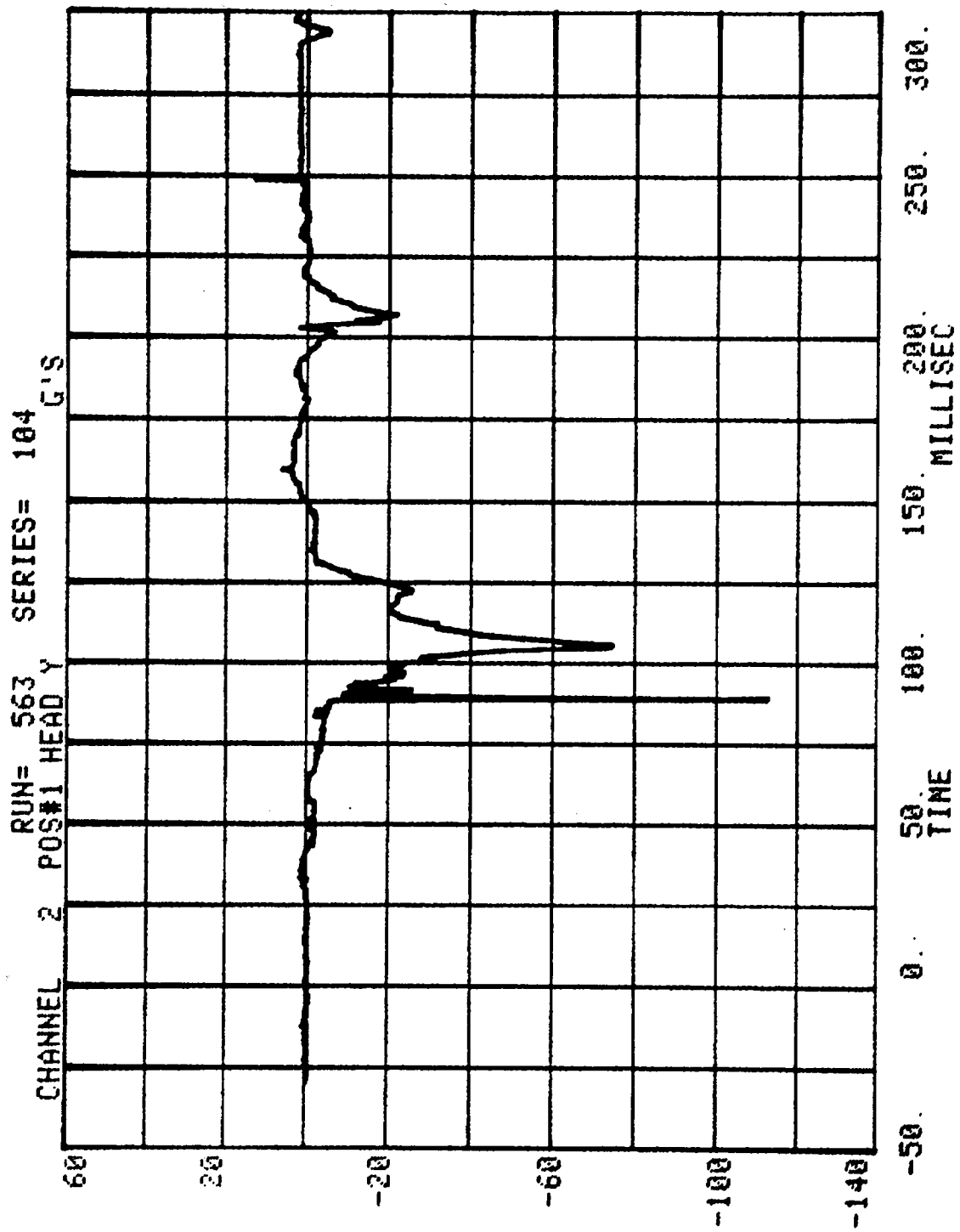
HIC= 881.9 FROM T1= .07155 TO T2= .12375

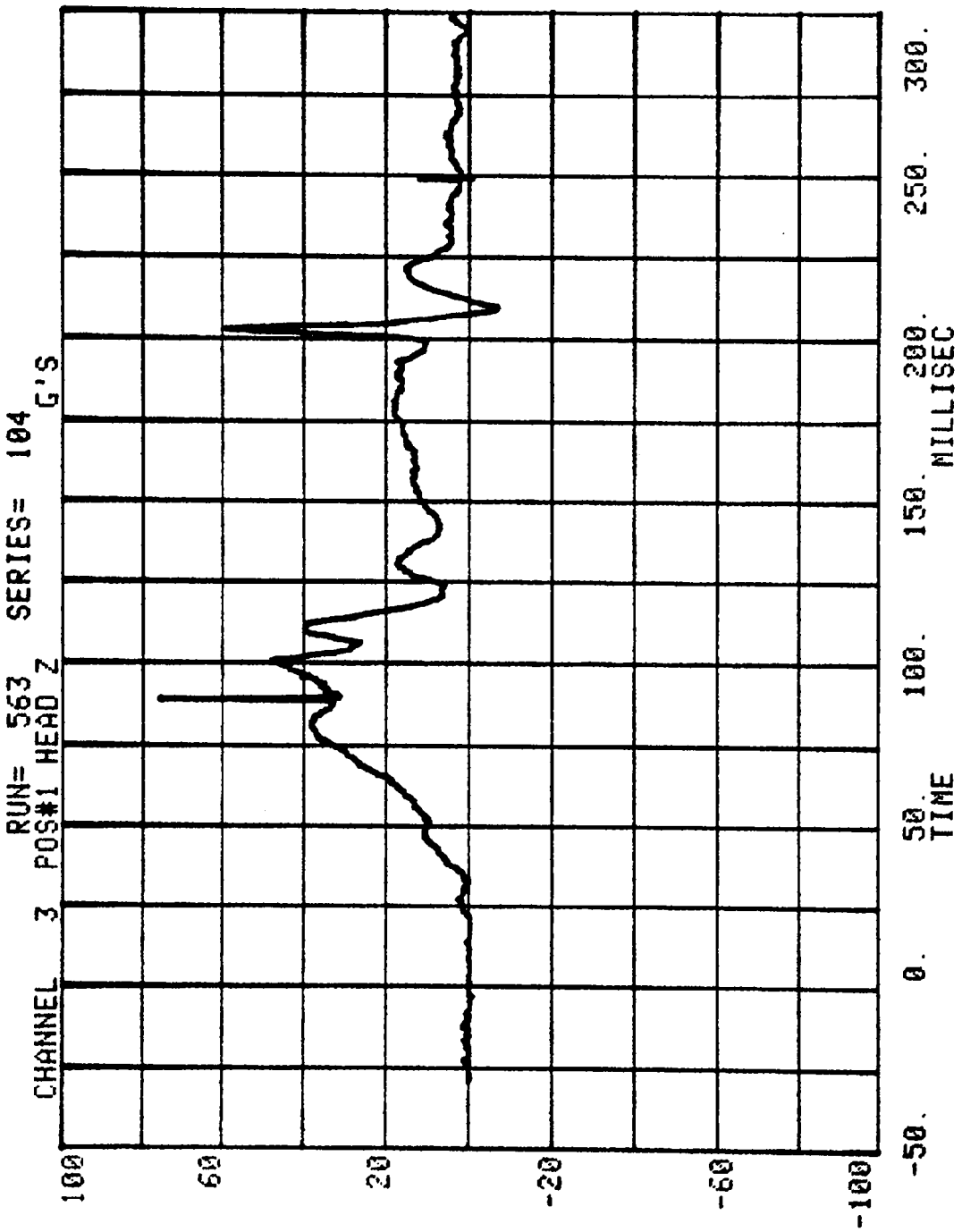
AVERAGE ACCELERATION BETWEEN T1 AND T2= 49.1G'S

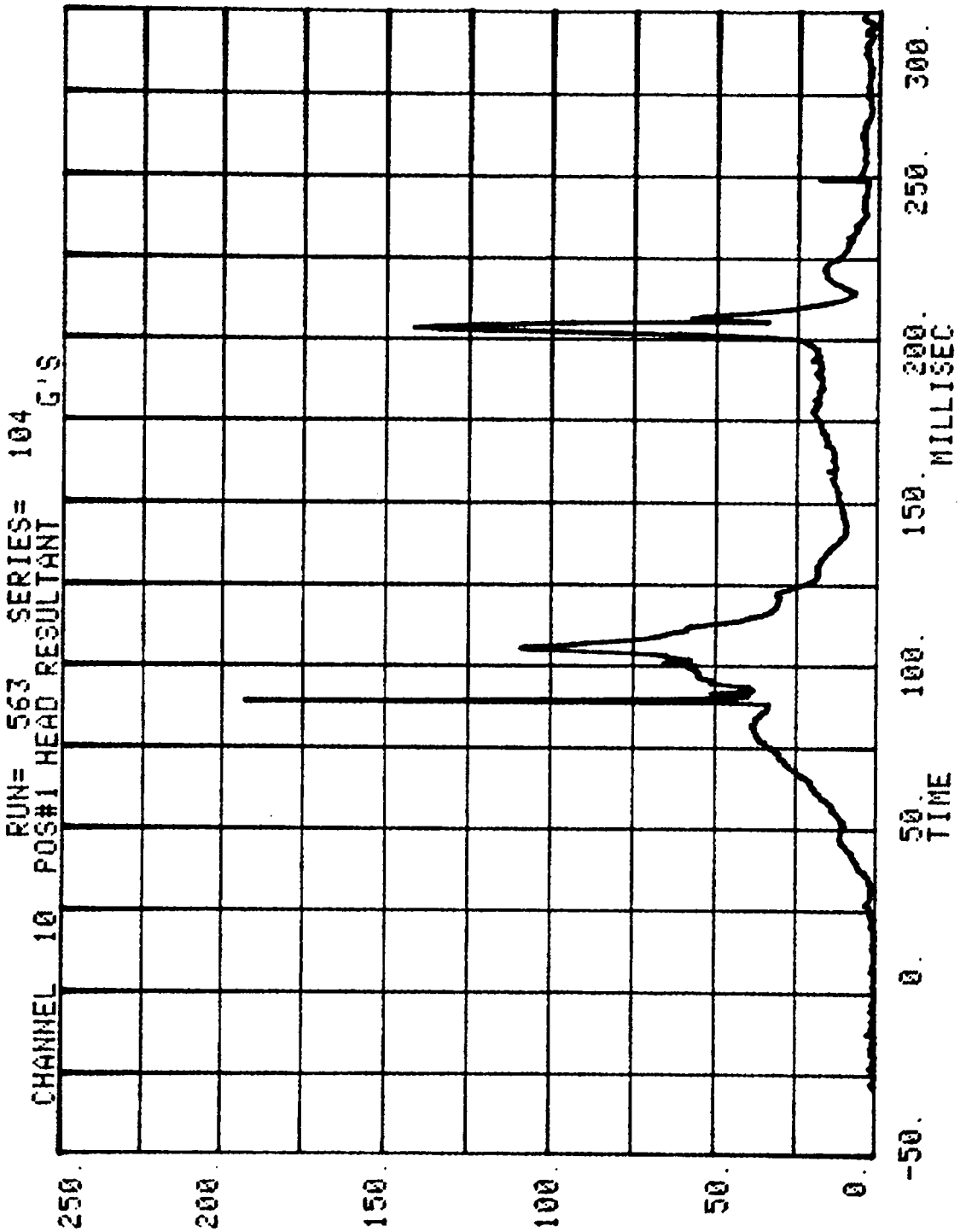
EVENT TIME= 300.0 MSEC

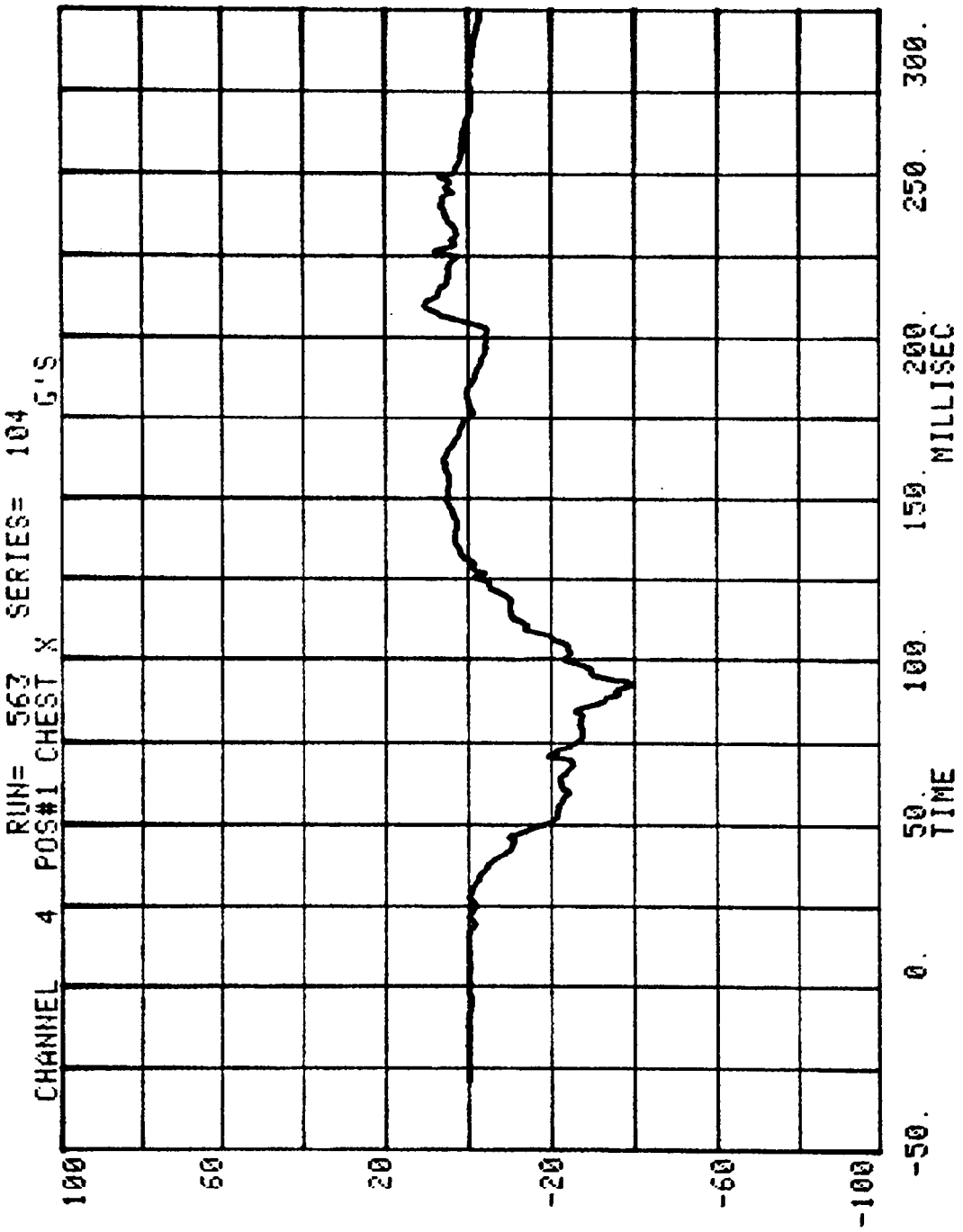
SEVERITY INDEX=1995.6

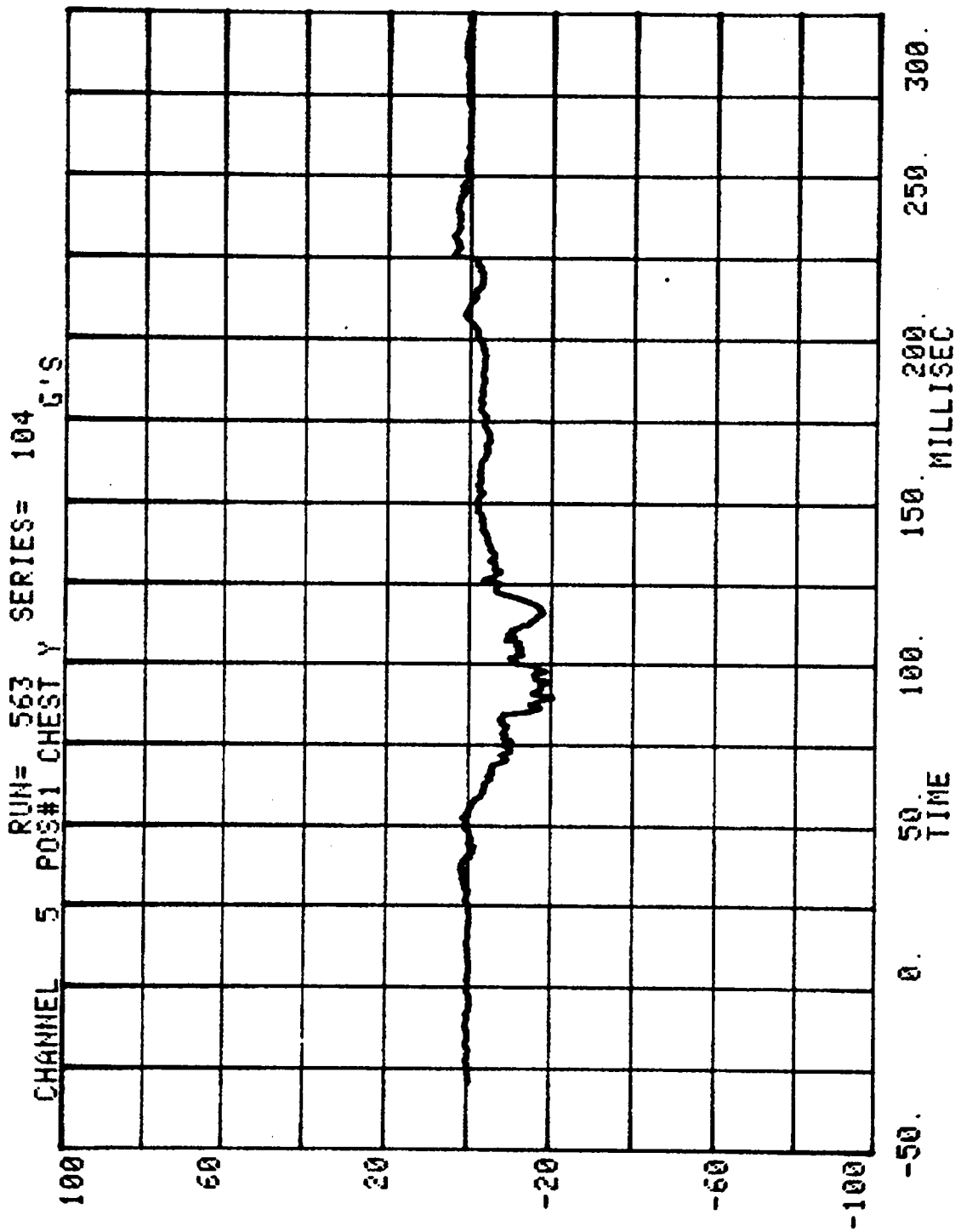

CHANNEL 1 RUN= 563 SERIES= 104
POS#1 HEAD X G'S
200
120
40
-40
-120
-200
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

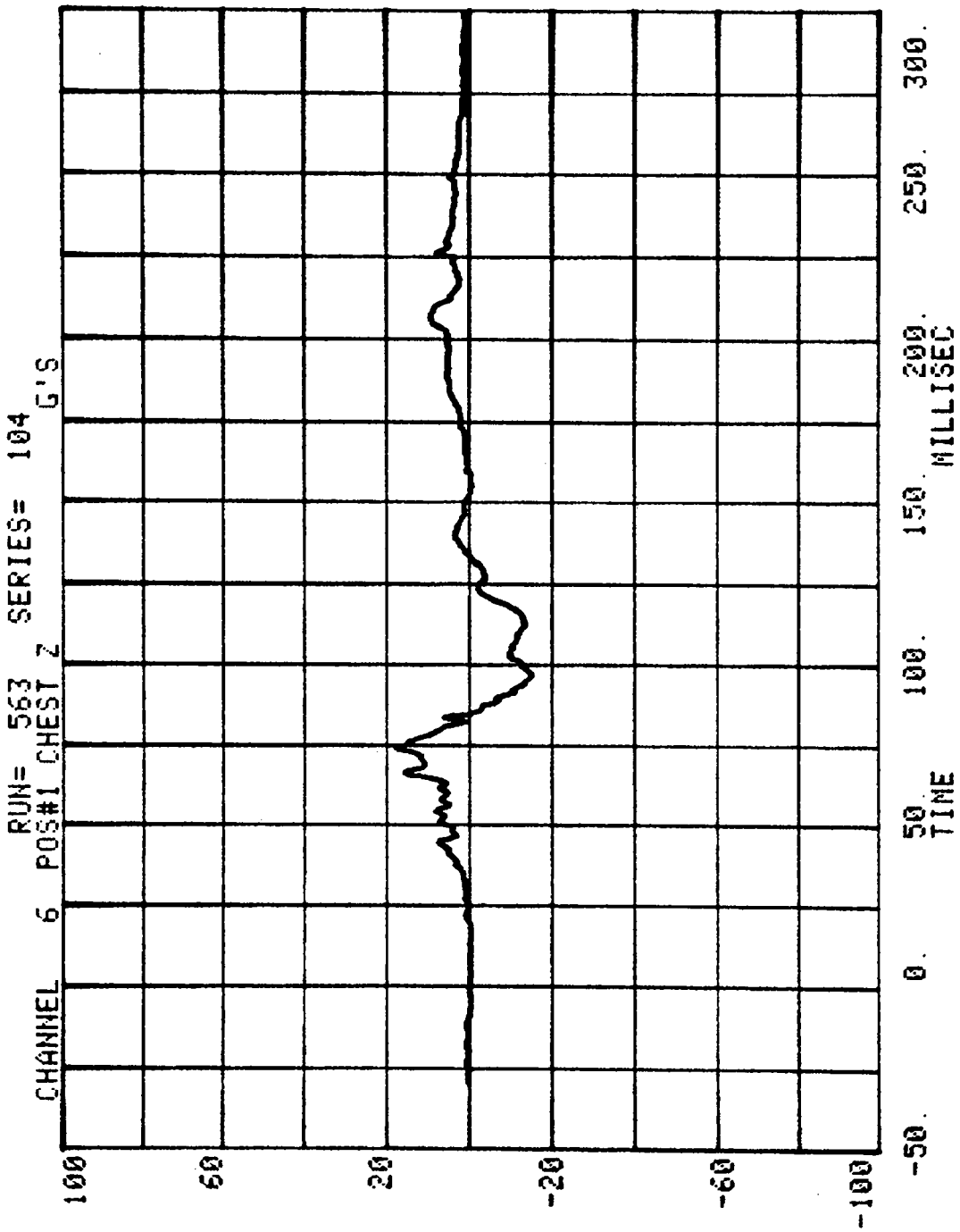

CHANNEL 2 POS#1 HEAD Y
RUN= 563 SERIES= 104
G'S
60
20
-20
-60
-100
-140
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

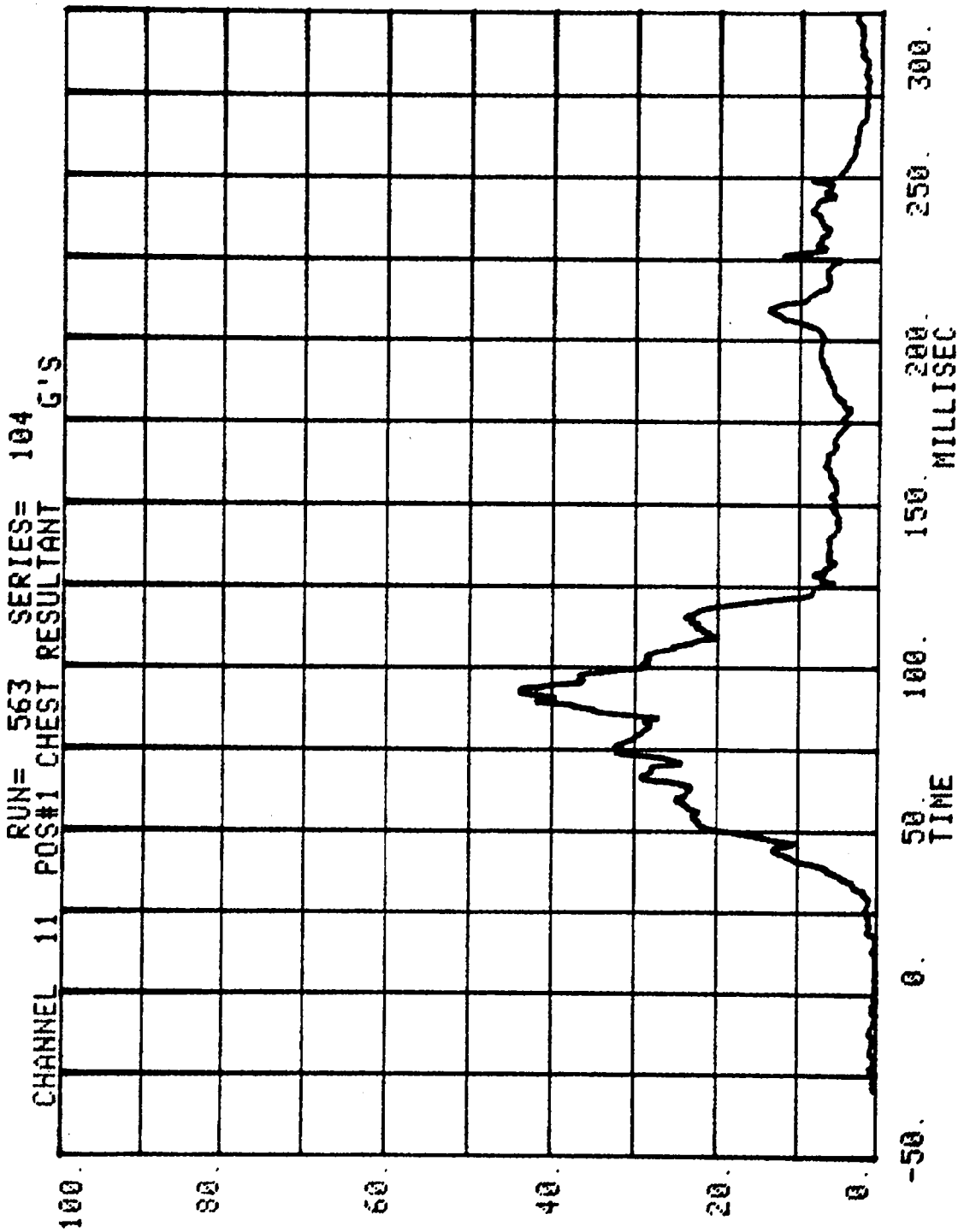

CHANNEL 3 RUN= 563 SERIES= 104
POS#1 HEAD Z G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

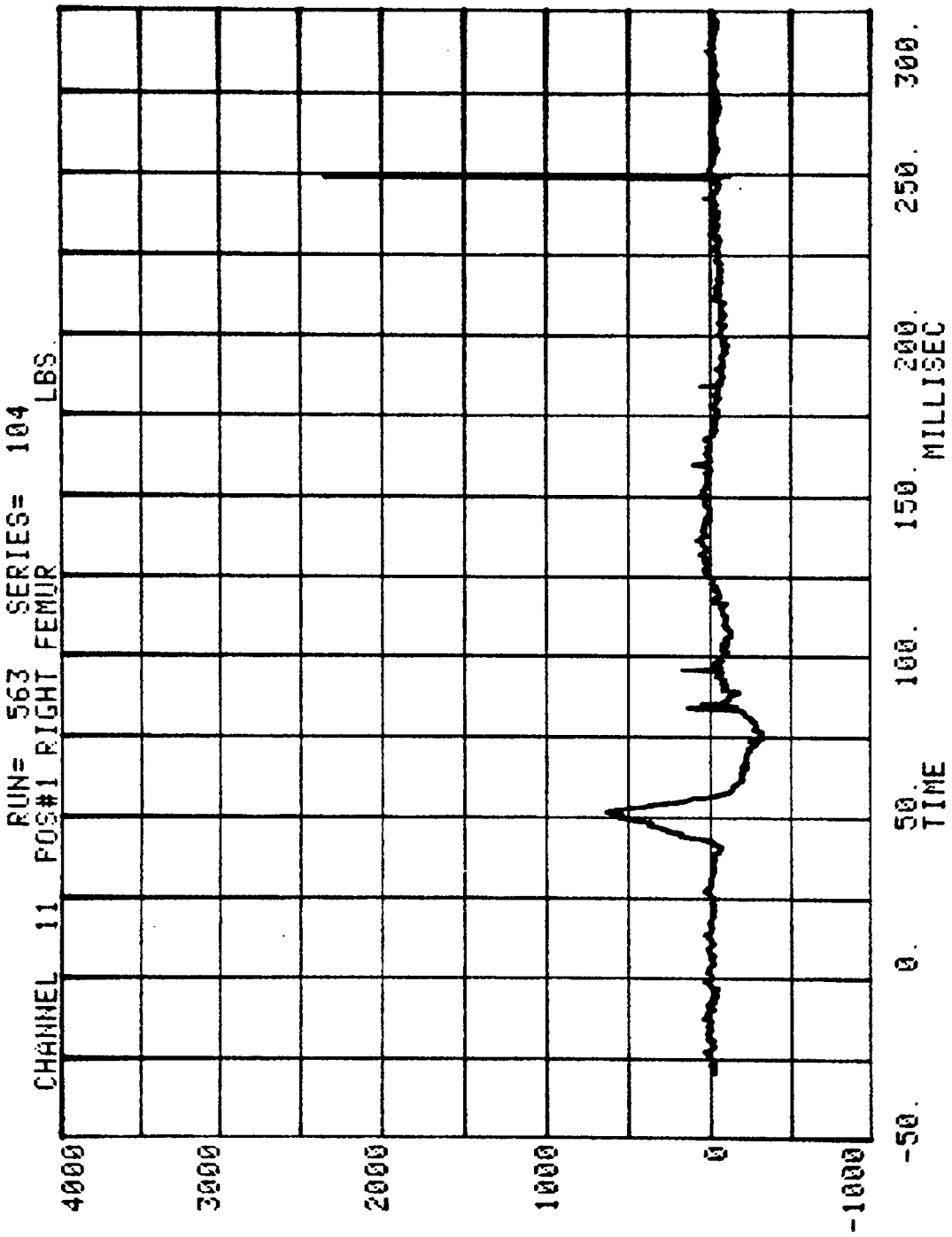

CHANNEL 10 POS#1 HEAD RESULTANT
RUN= 563 SERIES= 104
G'S
250.
200.
150.
100.
50.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

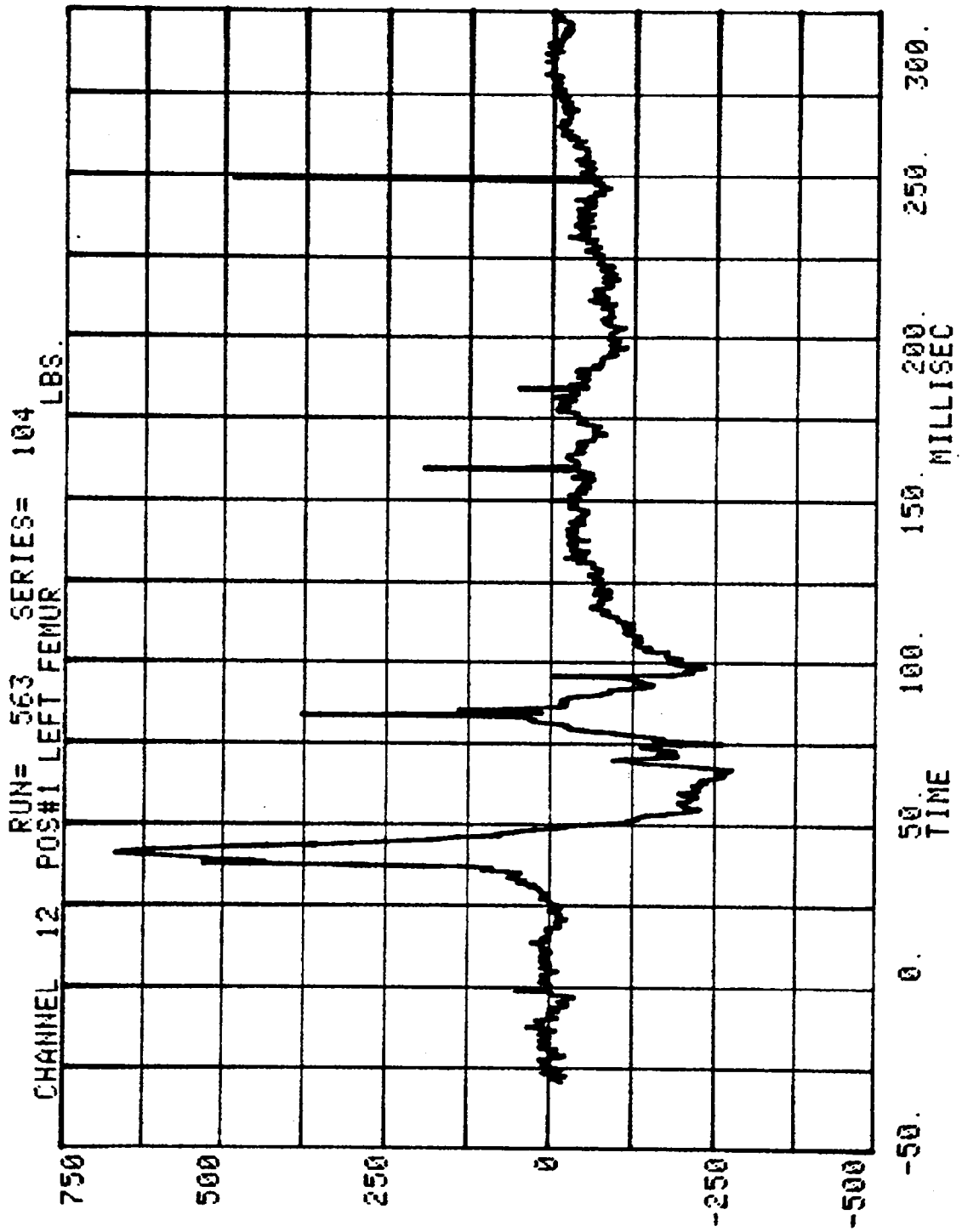

CHANNEL 4 RUN= 563 SERIES= 104
POS#1 CHEST X G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

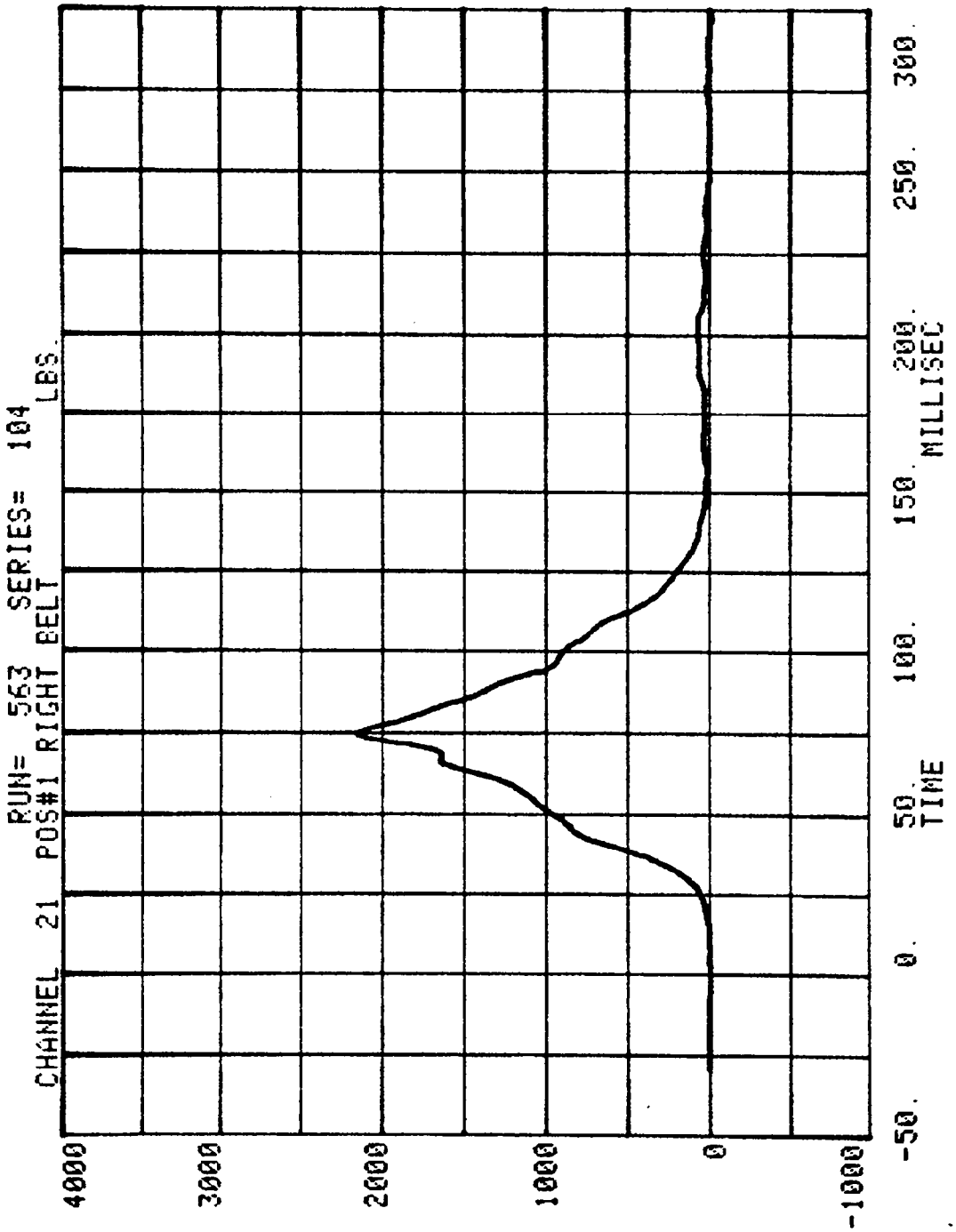

CHANNEL 5 POS#1 CHEST Y
RUN= 563
SERIES= 104
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

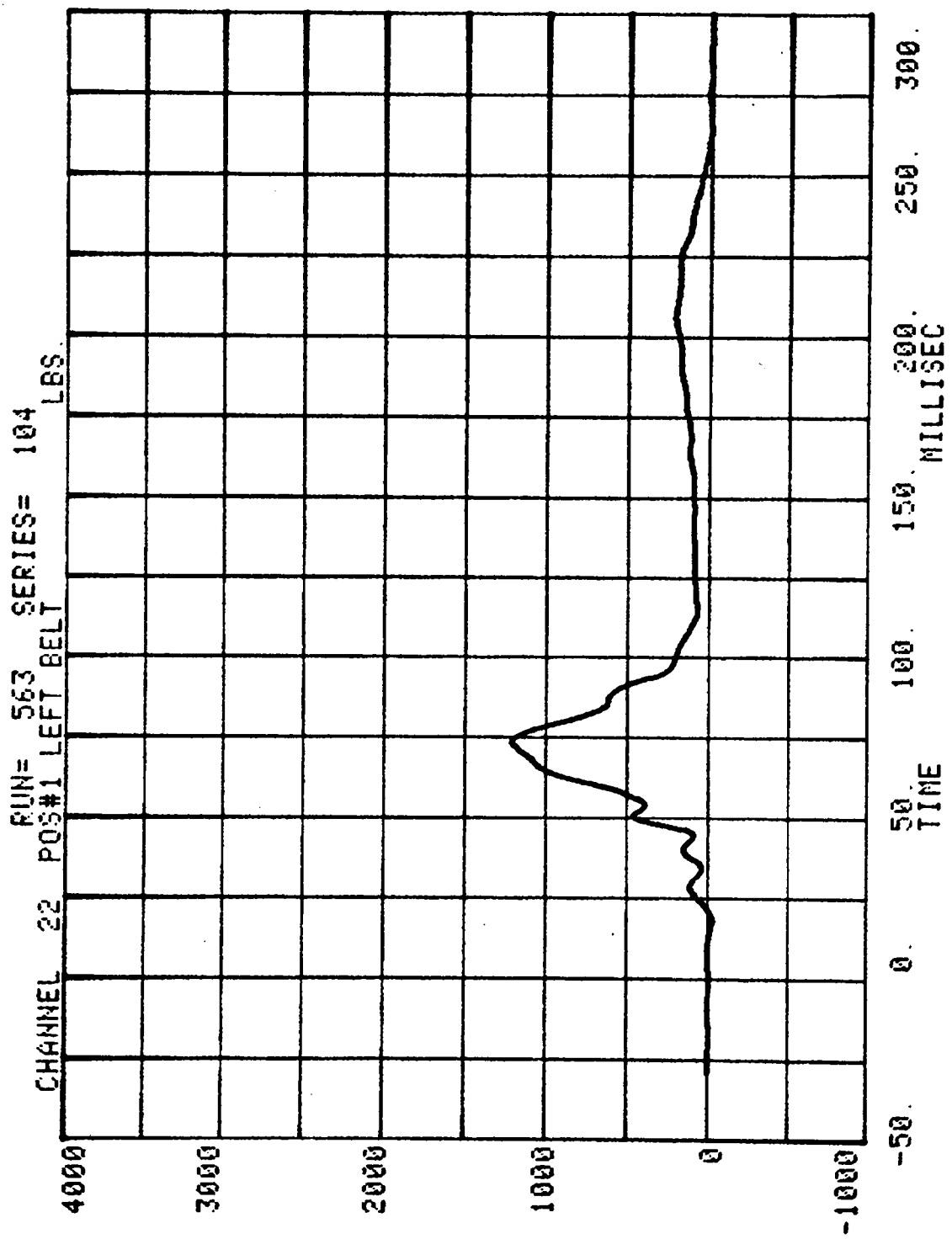

CHANNEL 6 POS#1 CHEST Z
RUN= 563 SERIES= 104
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

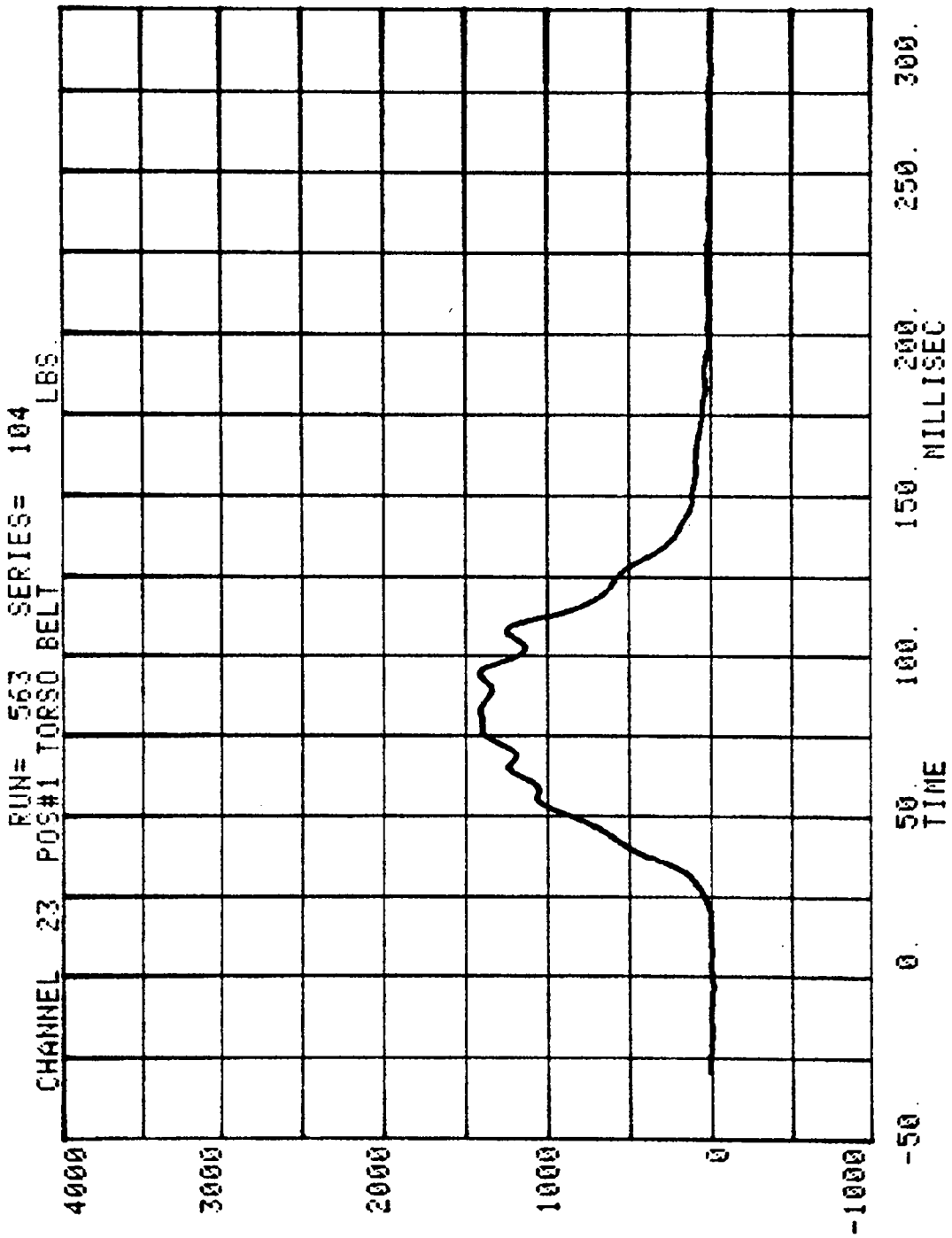

CHANNEL 11 RUN= 563 SERIES= 104
POS#1 CHEST RESULTANT G'S
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

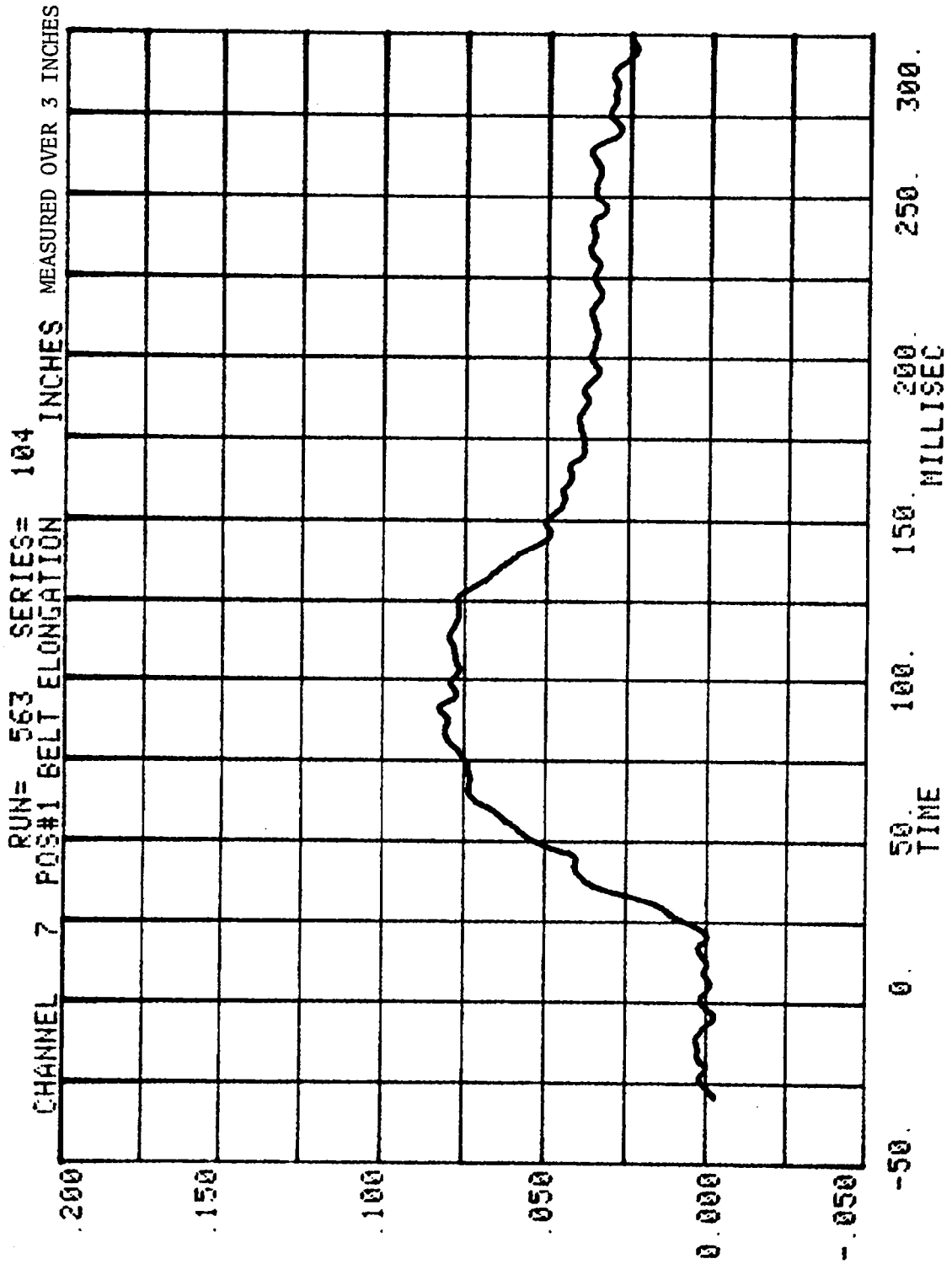

CHANNEL 11 RUN= 563 SERIES= 104
POS#1 RIGHT FEMUR
LBS
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

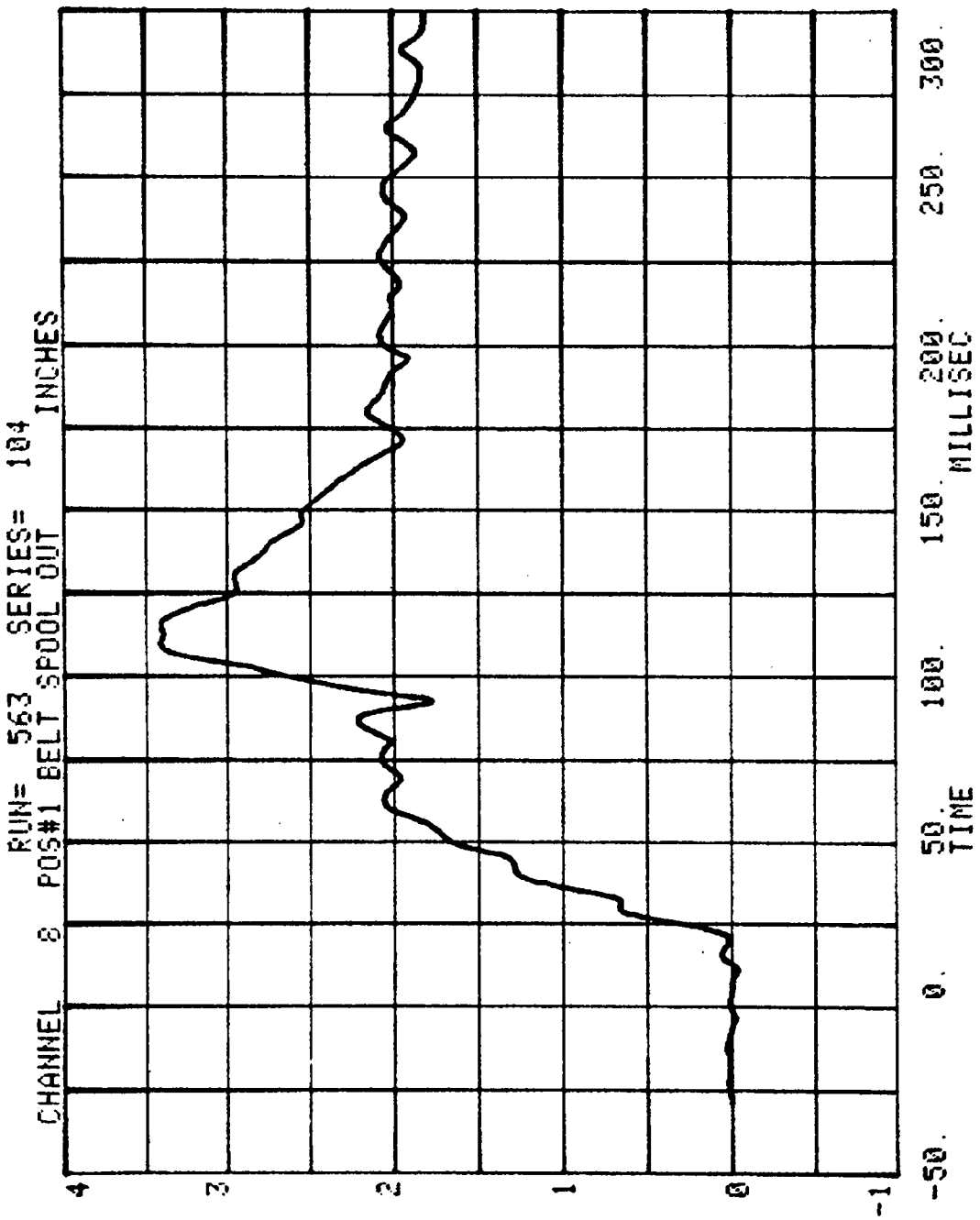

CHANNEL 12 RUN= 563 SERIES= 104
POS#1 LEFT FEMUR
LBS.
750
500
250
0
-250
-500
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 21 RUN= 563 SERIES= 104
POS#1 RIGHT BELT LBS.
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 22 RUN= 563 SERIES= 104
POS#1 LEFT BELT
LBS
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 23 RUN= 563 SERIES= 104
POS#1 TORSO BELT
LBS
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250
300
TIME
MILLISEC


CHANNEL 7 RUN= 563 SERIES= 104
POS#1 BELT ELONGATION
INCHES MEASURED OVER 3 INCHES
.200
.150
.100
.050
0.000
-.050
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 8 RUN= 563 SERIES= 104
POS#1 BELT SPOOL OUT
INCHES
4
3
2
1
0
-1
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

HEAD INJURY CRITERION
HEAD SEVERITY INDEX

CAR TO LOAD CELL BARRIER

RUN= 563

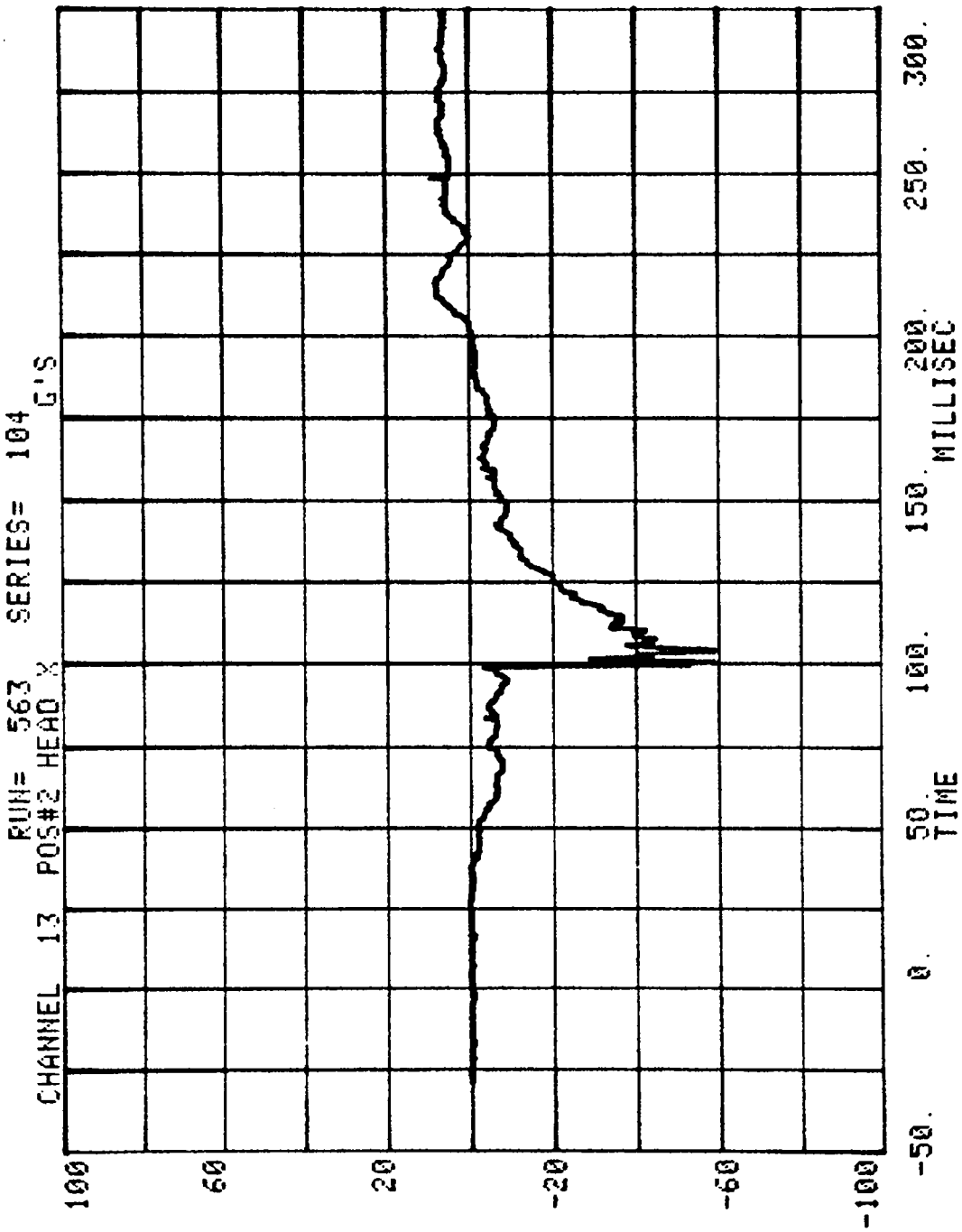
POS#2 HEAD RESULTANT

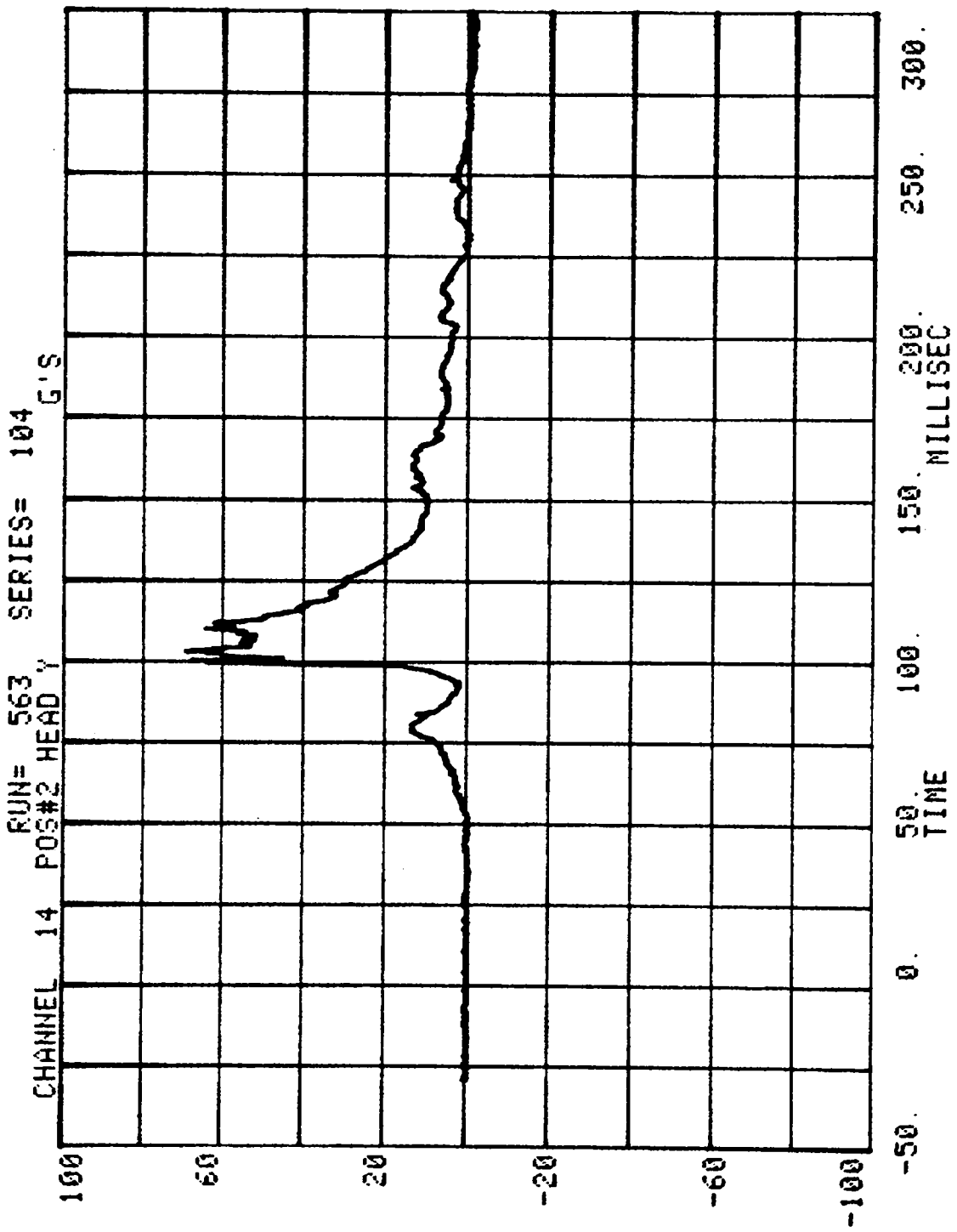
HIC=1083.6 FROM T1= .08347 TO T2= .12780

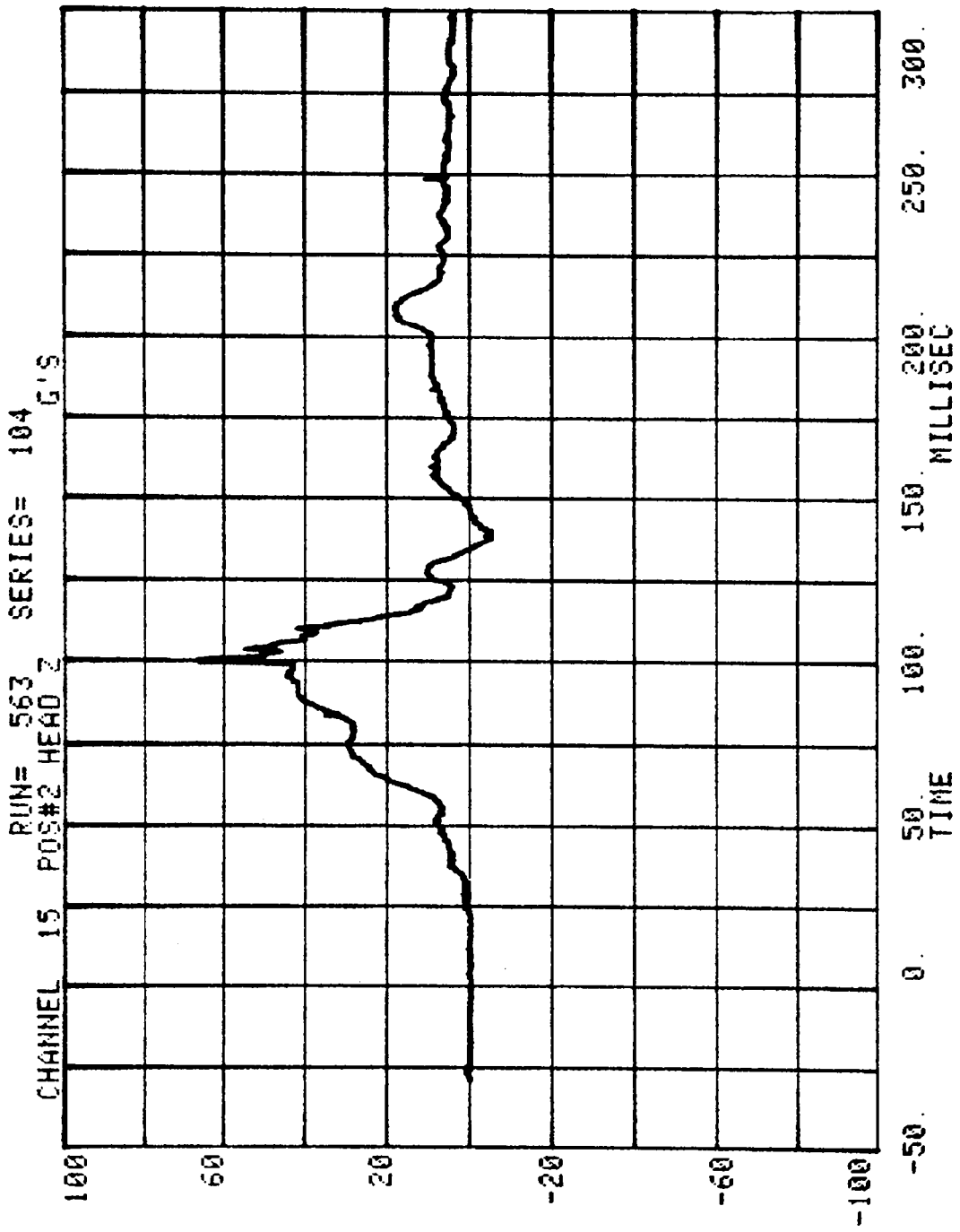
AVERAGE ACCELERATION BETWEEN T1 AND T2= 56.9G'S

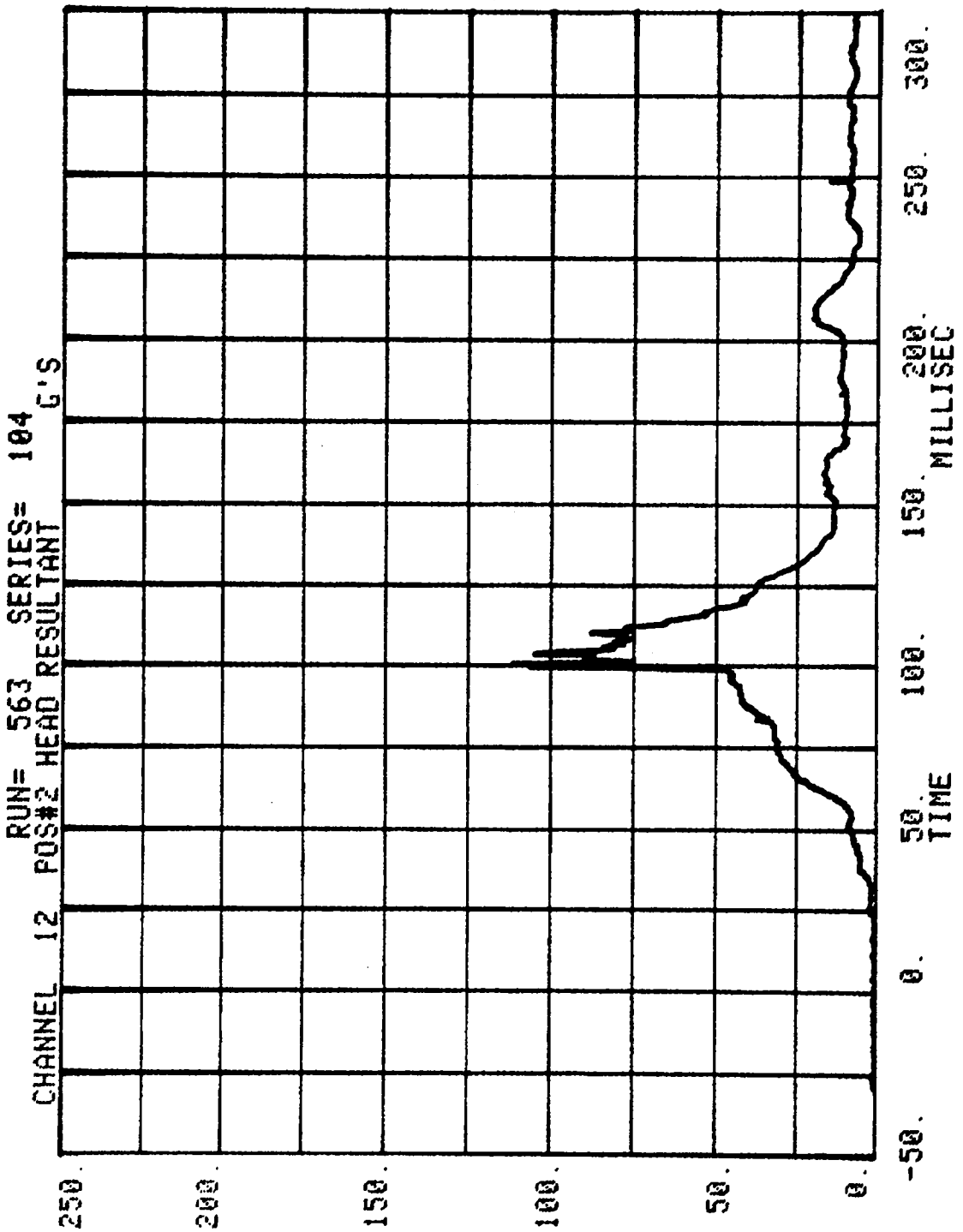
EVENT TIME= 300.0 MSEC

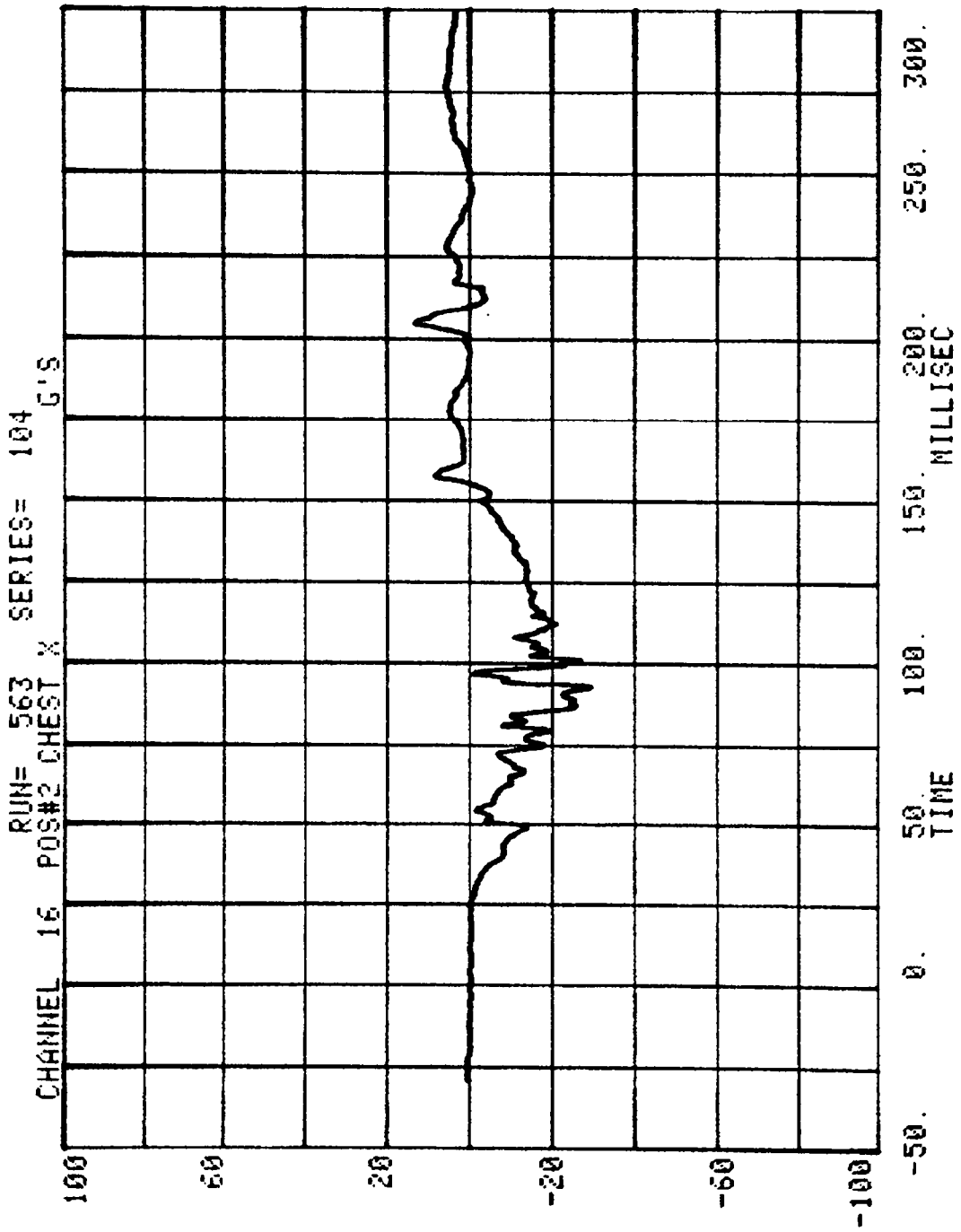
SEVERITY INDEX=1574.5

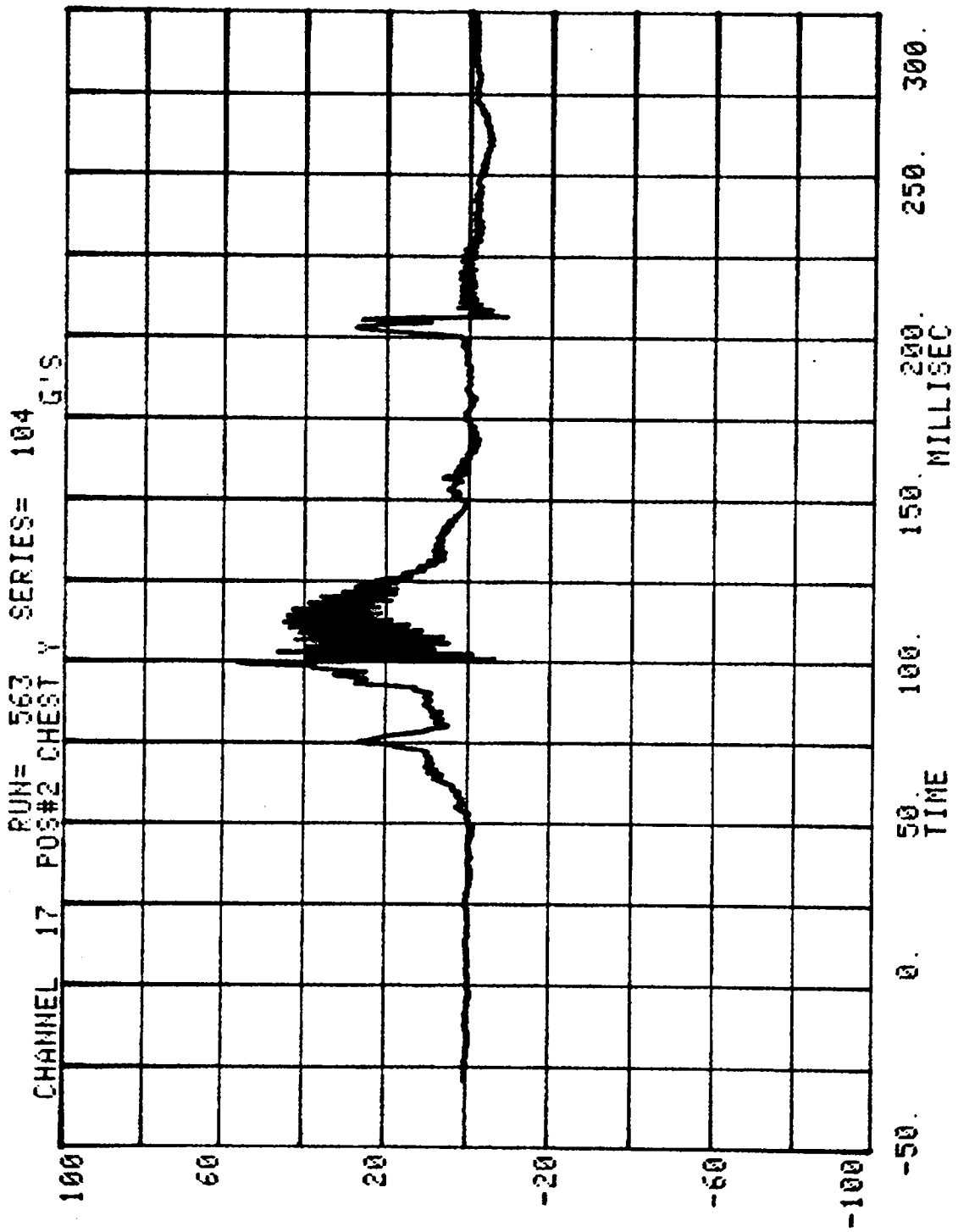

CHANNEL 13 RUN= 563 SERIES= 104
POS#2 HEAD X G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

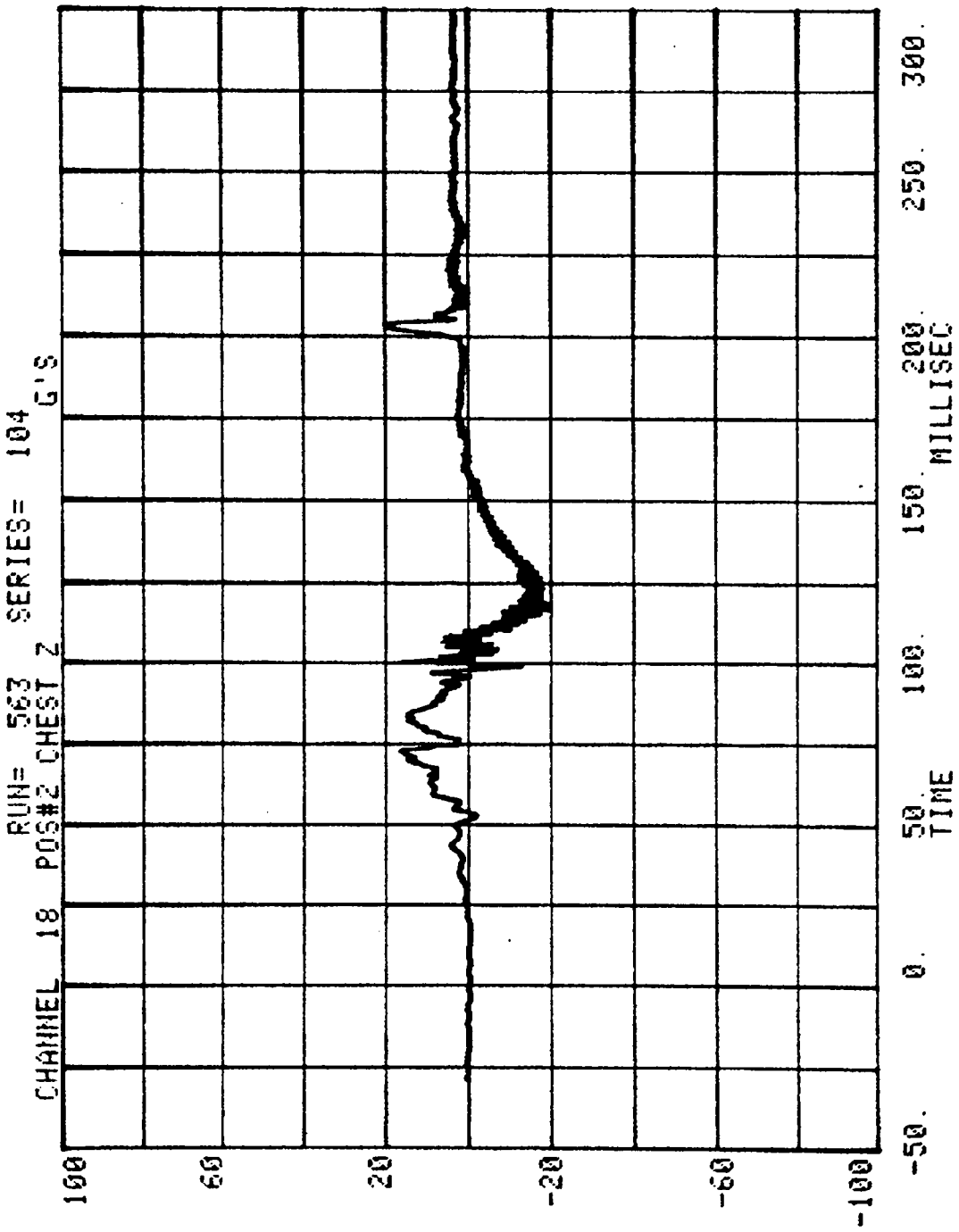

CHANNEL 14 POS#2 HEAD Y
RUN= 563 SERIES= 104
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

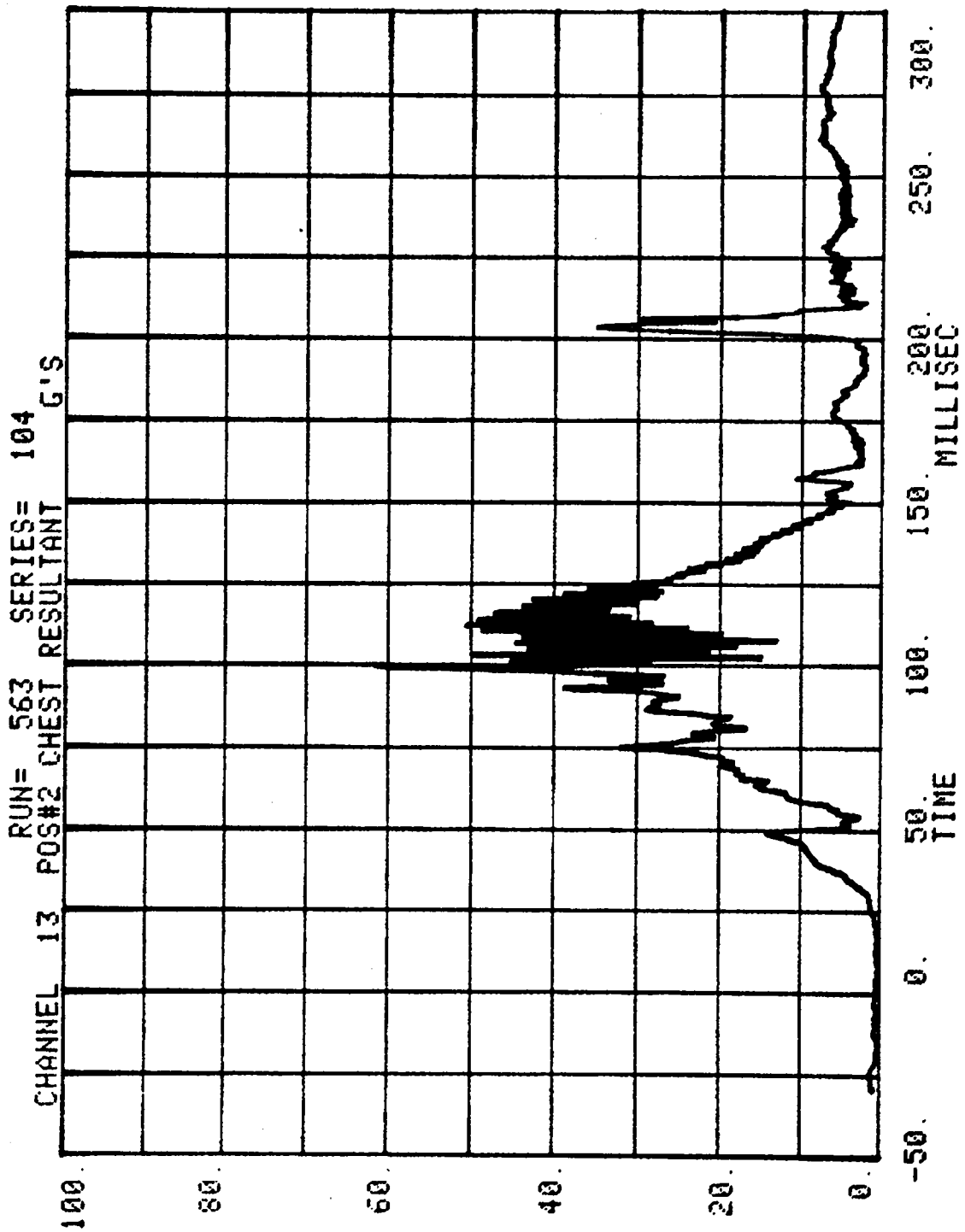

CHANNEL 15 POS#2 HEAD 2
RUN= 563 SERIES= 104
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

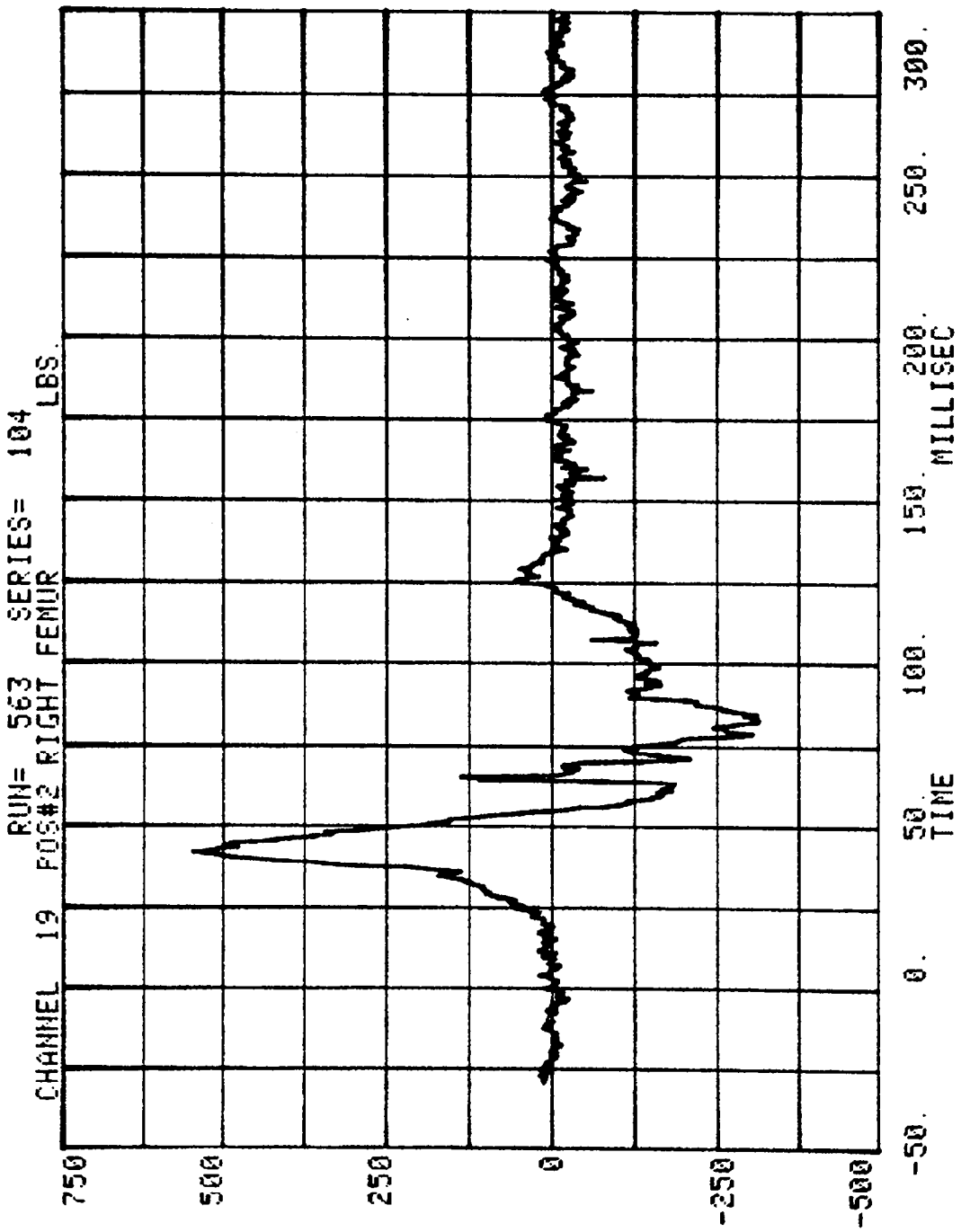

CHANNEL 12 POS#2 HEAD RESULTANT
RUN= 563 SERIES= 104
G'S
250.
200.
150.
100.
50.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

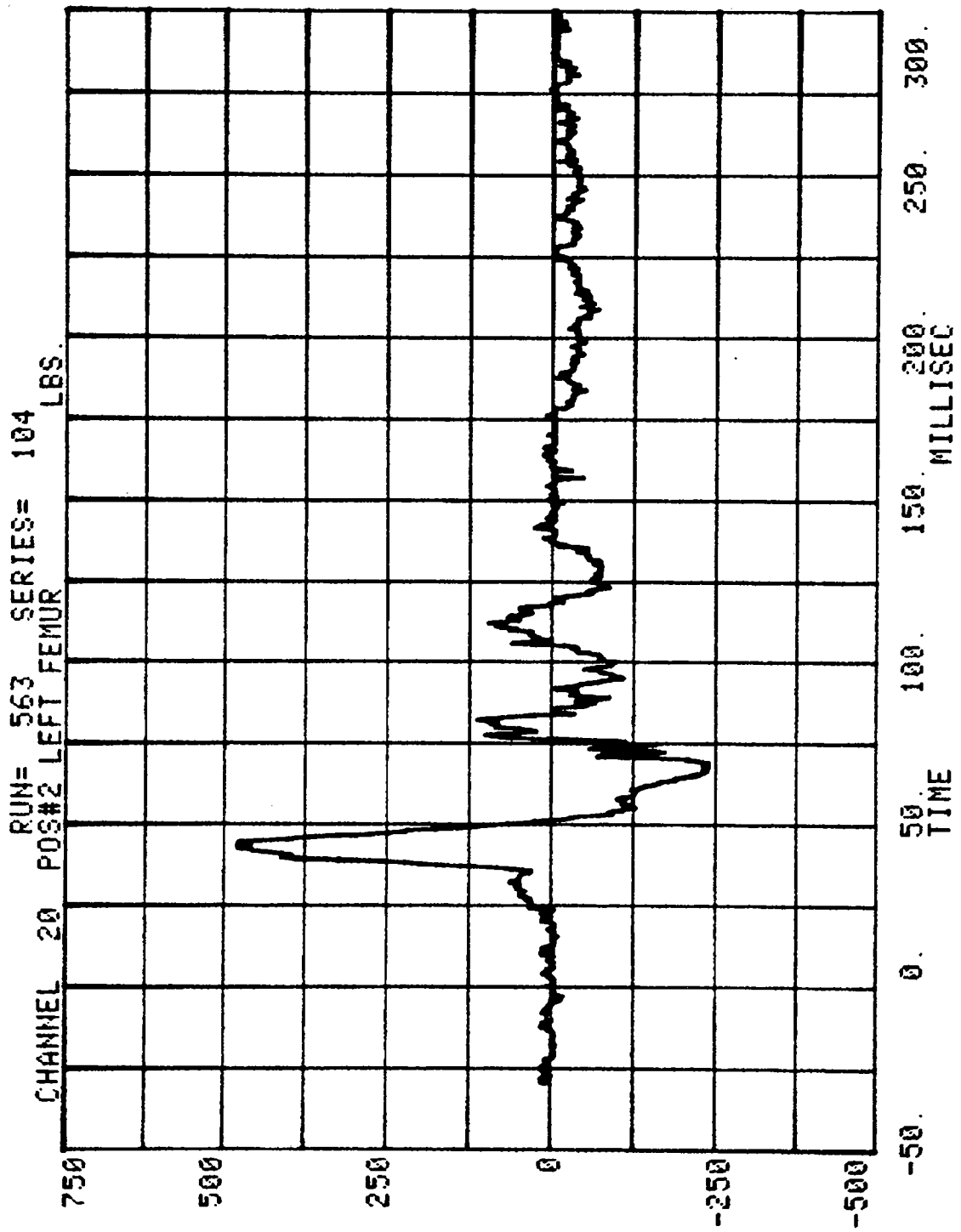

CHANNEL 16 POS#2 CHEST X
RUN= 563 SERIES= 104
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

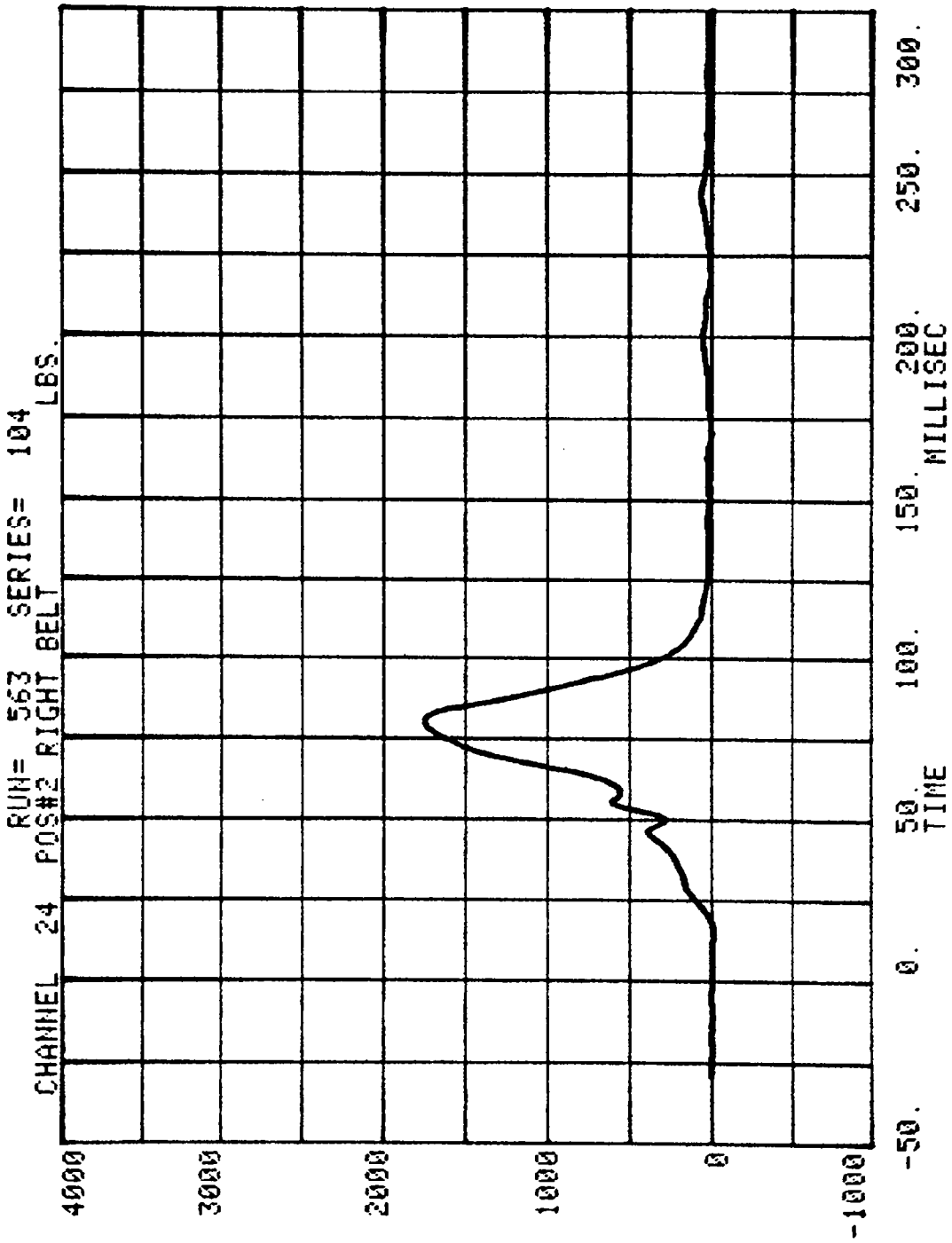

CHANNEL 17 POS#2 CHEST Y
RUN= 563 SERIES= 104
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

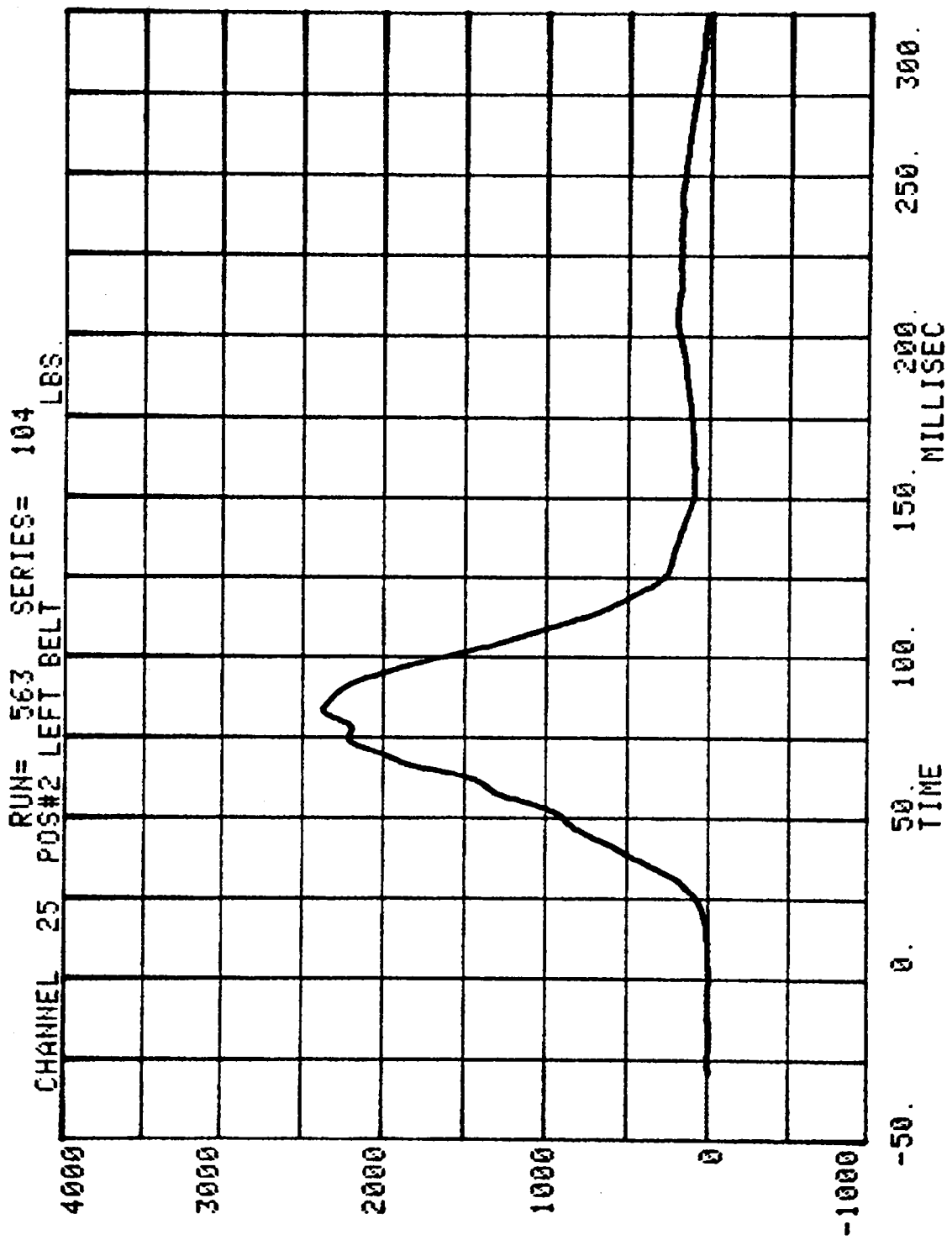

CHANNEL 18 POS#2 CHEST Z
RUN= 563 SERIES= 104
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

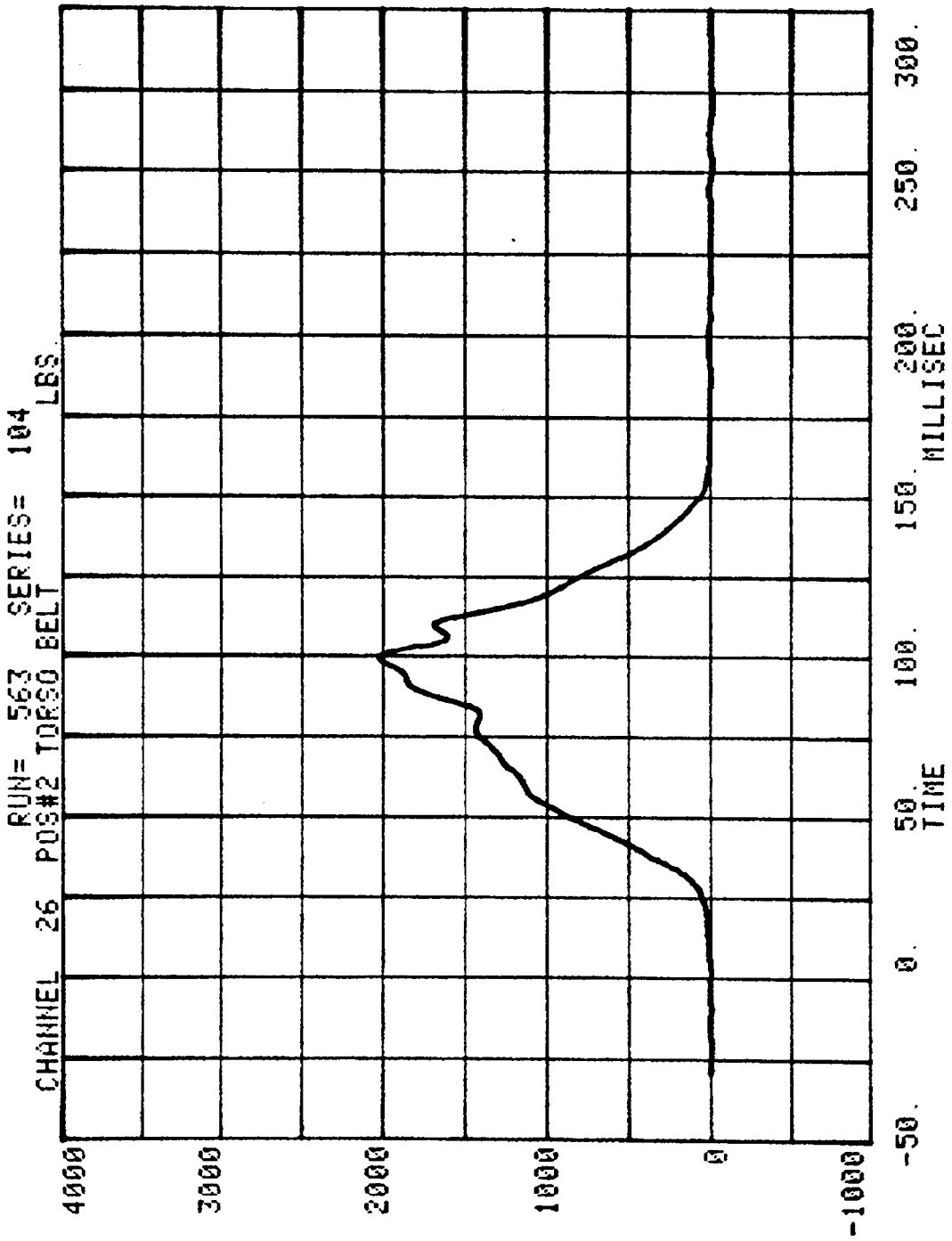

CHANNEL 13 POS#2 CHEST
RUN= 563 SERIES= 104
RESULTANT G'S
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

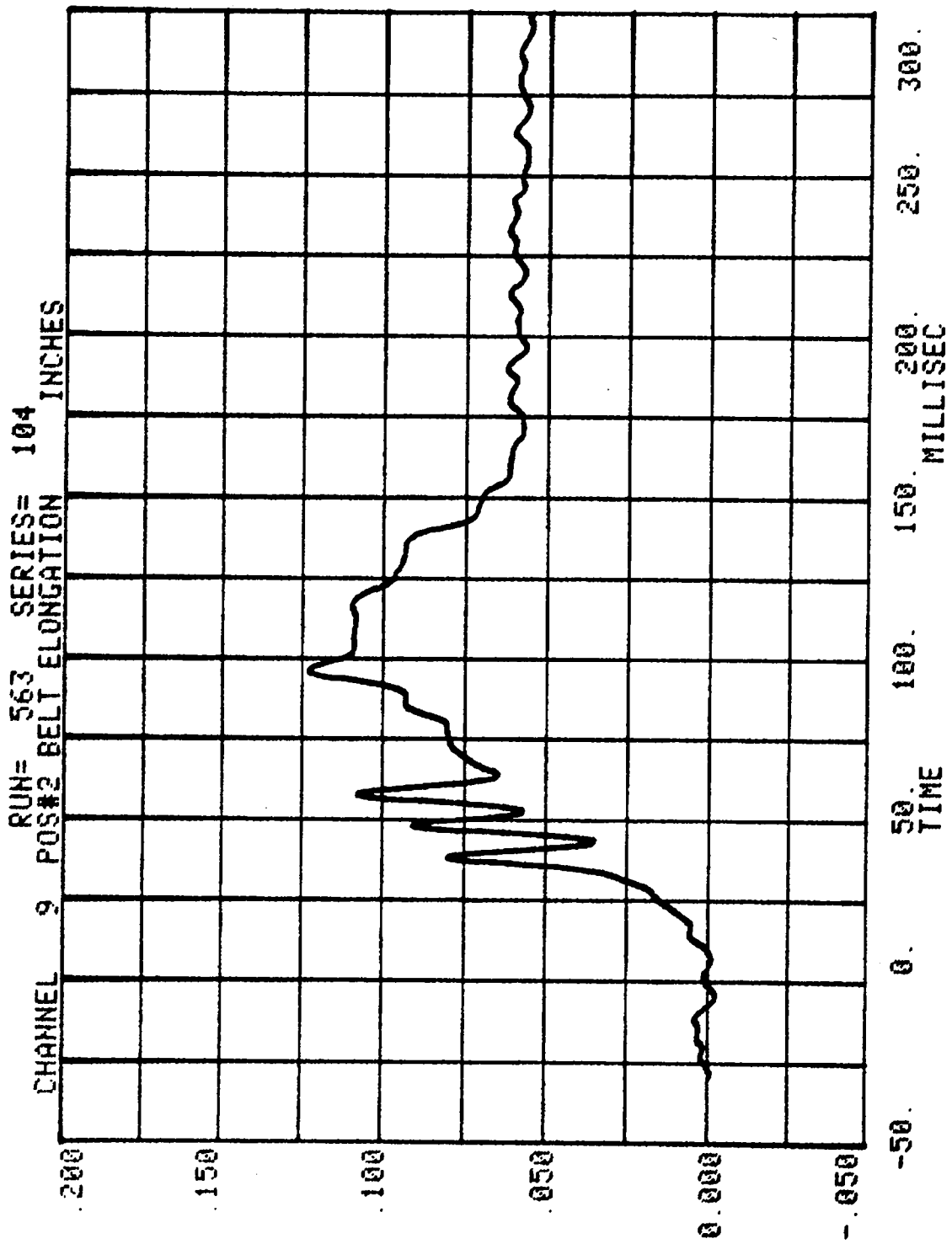

CHANNEL 19 RUN= 563 SERIES= 104
POS#2 RIGHT FEMUR
LBS.
750
500
250
0
-250
-500
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

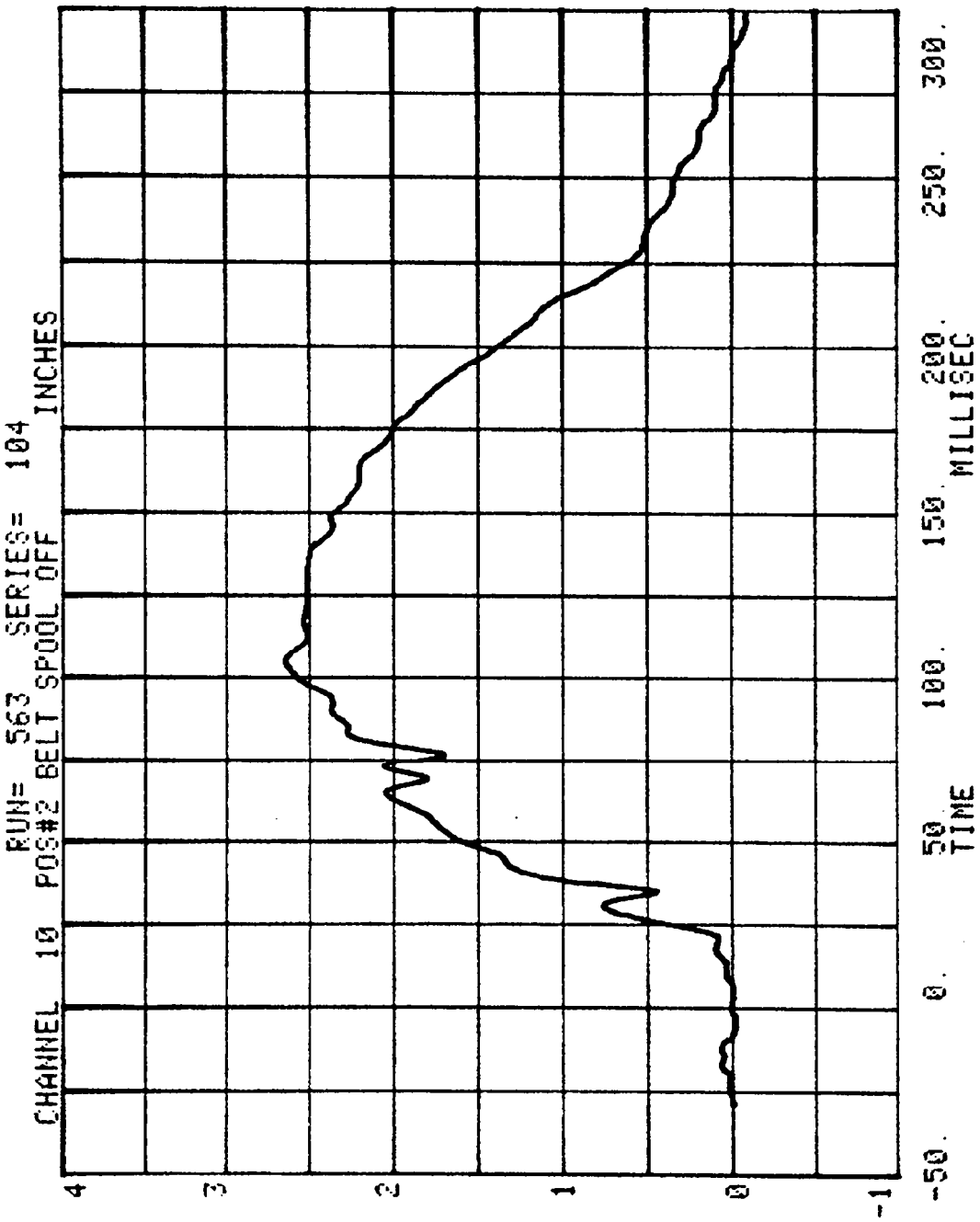

CHANNEL 20 RUN= 563 SERIES= 104
POS#2 LEFT FEMUR
LBS.
750
500
250
0
-250
-500
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 24 RUN= 563 SERIES= 104
POS#2 RIGHT BELT
LBS.
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 25 RUN= 563 SERIES= 104
POS#2 LEFT BELT
LBS.
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 26 POS#2 RUN= 563 SERIES= 104
TORSO BELT
LBS
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 9 POS#2 BELT ELONGATION
RUN= 563 SERIES= 104
INCHES
.200
.150
.100
.050
0.000
-.050
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 10 RUN= 563 SERIES= 104
POS#2 BELT SPOOL OFF
INCHES
4
3
2
1
0
-1
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

APPENDIX C

DUMMY CERTIFICATION TESTS

Appendix C contains the results from certification tests performed on the 50th percentile male anthropometric test devices utilized for this crash test. The results indicate that the dummies meet all of the performance requirements of the six standard tests as specified in 49 CFR Part 572, Federal Register, Volume 42, No. 25, dated February 7, 1977.

The tests were conducted at the Dummy Certification Test Facility of Calspan Corporation, Advanced Technology Center. A summary of the test results, Part 572 specifications and instrument calibration information is included in this Appendix.

Dummy serial numbers and certification dates are:

Serial No.	Completion Date
1019	12/23/82
1020	12/23/82

Electronic Test Equipment

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

P.572 DUMMY CALIBRATION TEST DATA

NHTSA DUMMY ID NO. 1020

LABORATORY TECHNICIAN: Gary Gestwick

APPROVED BY: [illegible]

	Pre-Test Calibration	Post-Test Calibration
Date of Dummy Calibration - - - - - - - - - - - -	12/14/82-12/23/82	
Calibration Sequential Number for Dummy - - - -	1	
Temperature in Lab. (Spec. = 66 to 78°F)- - - -	68° to 70°	
Relative Humidity in Lab. (Spec. = 10 to 70%) -	22% to 32%	

TEST PARAMETER			SPECIFICATION		
1. HEAD DROP TEST:					
a. Peak Resultant Accel. -			210 to 260G	215 g	
b. Peak Lateral Accel. - -			≤10G	4 g	
c. Time above 100G - - - -			0.9 to 1.5 ms	1.1 ms	
2. NECK BENDING TEST:					
a. Pendulum Speed - - - -			21.5 to 25.5 fps	22.7 fps	
b. Pendulum Avg. Decel. (over $t_3 - t_2$) - - - -			20 to 24G	23 g	
c. Peak Resultant Head Acceleration - - - -			26G maximum	24.5 g	
d. Pendulum Decel. (t_2-t_1)			≤3 ms	2.8 ms	
e. Pendulum Decel. (t_3-t_2)			25 to 30 ms	26.5 ms	
f. Pendulum Decel. (t_4-t_3)			≤10 ms	5 ms	
g. Pendulum Direction Reversal Time - - - -				111 ms	
h. Max. Head Rotation - -			63 to 73°	70°	
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.	2.8 in	
	60°	Time	40.3 to 51.7 ms	43.5 ms	
		Displ.	4.3 to 5.3 in.	4.8 in	
	Maximum	Time	53.2 to 66.8 ms	59.5 ms	
	(°)	Displ.	5.0 to 6.0 in.	5.5 in	

Continued

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

NHTSA DUMMY ID NO. 1020

TEST PARAMETER		SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
2. NECK BENDING TEST .... Continued				
i. Chordal Displacement:				
Head Rotation Angle --				
60°	Time	67.0 to 83.0 ms	75.5 ms	
	Displ.	4.3 to 5.3 in.	4.7 in	
30°	Time	85.4 to 104.6 ms	94 ms	
	Displ.	2.1 to 3.1 in.	2.4 in	
0°	Time	101.0 to 123.0 ms	109 ms	
	Displ.	-.5 to 0.5 in.	0.0 in	
3. ABDOMINAL COMPRESSION TEST:				
(Preload = 10 pounds)				
a. Force @ 1" - - - - -		50 to 63 lbs.	57 lbs	
b. Force @ 1.3" - - - -		73 to 88 lbs.	88 lbs	
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - -		22 to 34 lbs.	30.5 lbs	
b. Force @ 30° - - - -		34 to 46 lbs.	42.5 lbs	
c. Force @ 40° - - - -		46 to 58 lbs.	56 lbs	
d. Return Angle - - -		12° maximum	9°	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed - -		21.78-22.22 fps	22.20 fps	
(2) Peak Delfection -		1.7" maximum	1.68 in	
(3) Peak Resistive Force - - - - - -		2250 lbs. maximum	2000 lbs	
(4) Internal - - - - Hysteresis		50 to 70%	61.6%	
b. Low Speed				
(1) Probe Speed - - -		13·86-14.14 fps	14.01 fps	
(2) Peak Deflection -		1.1" maximum	0.9 in	
(3) Peak Resistive Force - - - - - -		1450 lbs. maximum	1300 lbs	
(4) Internal Hysteresis- - - -		50 to 70%	60.6%	

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

NHTSA DUMMY ID NO. 1020

TEST PARAMETER	SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
6. KNEE IMPACT TESTS:			
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	1.77 ms	
b. Left Side --			
(1) Probe Speed - - -	6.76 to 7.04 fps	7.03 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	1900 lbs	
(3) Time Above 1000#	1.7 ms minimum	2.02 ms	

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NO. 1020 CALIB. SEQ. NOS. FOR DUMMY: 1 & _____

	MANUFACTURER	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
A. DUMMY INSTRUMENTS:				
1. Head Accelerometers--				
a. Triaxial unit - - - - -				
b. Uniaxial units				
(1) Longitudinal (A_x) -	ENDEVCO	DB47	6/82	1/83
(2) Lateral (A_y) - - -	ENDEVCO	CX05	6/82	1/83
(3) Vertical (A_z) - - -	ENDEVCO	CJ54	6/82	1/83
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 - - - - - -	GSE	312	6/82	1/83
b. Left Side	GSE	311	6/82	1/83
B. CALIB. LAB. INSTRUMENTS:				
1. Pendulum Accelerometer - -	CEC	22707	6/82	1/83
2. Test Probe Accelerometer -	CEC	22958	6/82	1/83
3. Lumbar Flexion Test Push Force Gauge - - - - - - -	TRANSDUCER INC.	20051	6/82	1/83
4. Abdominal Compression Test Force Gauge - - - - - - -	BLH	72952	6/82	1/83
5. Abdominal Compression Test Displacement Gauge - - - -	CIC	567-11	6/82	1/83
	C-6		7103-V-3	

P.572 DUMMY CALIBRATION TEST DATA

NHTSA DUMMY ID NO. 1019

LABORATORY TECHNICIAN: Gary Gestwick

APPROVED BY: D. Alianello

	Pre-Test Calibration	Post-Test Calibration
Date of Dummy Calibration - - - - - - - - - - - -	12/14/82-12/23/82	
Calibration Sequential Number for Dummy - - - -	1	
Temperature in Lab. (Spec. = 66 to 78°F)- - - -	68° to 70°	
Relative Humidity in Lab. (Spec. = 10 to 70%) -	22% to 32%	

TEST PARAMETER		SPECIFICATION		
1. HEAD DROP TEST:				
a. Peak Resultant Accel. -		210 to 260G	215 g	
b. Peak Lateral Accel. - -		≤10G	4 g	
c. Time above 100G - - - -		0.9 to 1.5 ms	1.2 ms	
2. NECK BENDING TEST:				
a. Pendulum Speed - - - -		21.5 to 25.5 fps	23.2 fps	
b. Pendulum Avg. Decel. (over $t_3 - t_2$) - - - -		20 to 24G	23.5 g	
c. Peak Resultant Head Acceleration - - - -		26G maximum	25.5 g	
d. Pendulum Decel. (t_2-t_1)		≤ 3 ms	2.9 ms	
e. Pendulum Decel. (t_3-t_2)		25 to 30 ms	26.5 ms	
f. Pendulum Decel. (t_4-t_3)		≤10 ms	6.2 ms	
g. Pendulum Direction Reversal Time - - - -			114 ms	
h. Max. Head Rotation - -		63 to 73°	73°	
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	29.5 ms	
	Displ.	2.1 to 3.1 in.	2.9 in	
60°	Time	40.3 to 51.7 ms	44 ms	
	Displ.	4.3 to 5.3 in.	4.9 in	
Maximum (°)	Time	53.2 to 66.8 ms	62 ms	
	Displ.	5.0 to 6.0 in.	5.7 in	

Continued

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

NHTSA DUMMY ID NO. 1019

TEST PARAMETER		SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
2. NECK BENDING TEST .... Continued				
i. Chordal Displacement: Head Rotation Angle --				
60°	Time	67.0 to 83.0 ms	78.5 ms	
	Displ.	4.3 to 5.3 in.	4.8 in	
30°	Time	85.4 to 104.6 ms	96 ms	
	Displ.	2.1 to 3.1 in.	2.4 in	
0°	Time	101.0 to 123.0 ms	110.5 ms	
	Displ.	-.5 to 0.5 in.	0.1 in	
3. ABDOMINAL COMPRESSION TEST: (Preload = 10 pounds)				
a. Force @ 1" - - - - -		50 to 63 lbs.	60 lbs	
b. Force @ 1.3" - - - -		73 to 88 lbs.	81 lbs	
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - -		22 to 34 lbs.	32 lbs	
b. Force @ 30° - - - -		34 to 46 lbs.	39.5 lbs	
c. Force @ 40° - - - -		46 to 58 lbs.	49.5 lbs	
d. Return Angle - - -		12° maximum	6°	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed - -		21.78-22.22 fps	22.11 fps	
(2) Peak Delfection -		1.7" maximum	1.52 in	
(3) Peak Resistive Force - - - - - -		2250 lbs. maximum	1920 lbs	
(4) Internal - - - - Hysteresis		50 to 70%	56.4%	
b. Low Speed				
(1) Probe Speed - - -		13.86-14.14 fps	14.08 fps	
(2) Peak Deflection -		1.1" maximum	0.96 in	
(3) Peak Resistive Force - - - - - -		1450 lbs. maximum	1220 lbs	
(4) Internal Hysteresis- - - -		50 to 70%	62.2%	

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

NHTSA DUMMY ID NO. 1019

TEST PARAMETER	SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
6. KNEE IMPACT TESTS:			
a. Right Side --			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.99 fps	
(2) Maximum Force - -	1850 to 2500 lbs	2050 lbs	
(3) Time Above 1000#	1.7 ms minimum	1.75 ms	
b. Left Side --			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.99 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2025 lbs	
(3) Time Above 1000#	1.7 ms minimum	1.79 ms	

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NO. 1019 CALIB. SEQ. NOS. FOR DUMMY: 1 & _____

	MANUFACTURER	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
A. DUMMY INSTRUMENTS:				
1. Head Accelerometers--				
a. Triaxial unit - - - - -				
b. Uniaxial units				
(1) Longitudinal (A_x) -	ENDEVCO	DB47	6/82	1/83
(2) Lateral (A_y) - - -	ENDEVCO	CX05	6/82	1/83
(3) Vertical (A_z) - - -	ENDEVCO	CJ54	6/82	1/83
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 - - - - - -	GSE	312	6/82	1/83
b. Left Side	GSE	311	6/82	1/83
B. CALIB. LAB. INSTRUMENTS:				
1. Pendulum Accelerometer - -	CEC	22707	6/82	1/83
2. Test Probe Accelerometer -	CEC	22958	6/82	1/83
3. Lumbar Flexion Test Push Force Gauge - - - - - - -	TRANSDUCER INC.	20051	6/82	1/83
4. Abdominal Compression Test Force Gauge - - - - - - -	BLH	72952	6/82	1/83
5. Abdominal Compression Test Displacement Gauge - - - -	CIC	567-11	6/82	1/83
	C-10		7103-V-1	