DOT 4794

REPORT NO. CAL-85-N05

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

CHRYSLER CORPORATION
1985 PLYMOUTH RELIANT
4-DOOR SEDAN

NHTSA NO. CF0304
CALSPAN TEST NO. 7333-6

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MARCH 5, 1985

FINAL REPORT

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U.S. DEPARTMENT OF TRANSPORTATION
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OFFICE OF MARKET INCENTIVES
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NHTSA New Car Assessment Program (NCAP) Frontal Barrier Impact Test on 1985 Plymouth Reliant 4-Door Sedan to Indicant Requirements of FMVSS 212, 219 (Partial), and 301-75	March 5, 1985
	6. Performing Organization Code: CAL
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15. Supplementary Notes

16. Abstract

A frontal load cell barrier test of a 1985 Plymouth Reliant 4-door sedan was performed at the Calspan Corporation, Advanced Technology Center crash test facility in Buffalo, New York, on February 5, 1985.

Impact speed was 35.0 mph, and the ambient temperature at the barrier face at the time of impact was 20°F. The maximum post-test vehicle crush was 26.6 inches.

The test vehicle appeared to comply with the indicant requirements of the following Federal Motor Vehicle Safety Standard.

1. FMVSS No. 219 (Partial), "Windshield Zone Intrusion"
2. FMVSS No. 301-75, "Fuel System Integrity"

The test vehicle did not appear to comply with FMVSS 212, "Windshield Mounting" with 49.5 percent retention loss.

Type of Restraint System 3-point continuous webbing, manual system at each front outboard seating position.

17. Key Words	18. Distribution Statement
35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP) FMVSS 212 Indicant Testing FMVSS 219 (Partial) Indicant Testing FMVSS 301-75 Indicant Testing	Copies of this report are available from: Technical Reference Division National Highway Traffic Safety Admin. Nassif Building, Room 5108 400 Seventh St., S.W., Washington, DC 20590

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Unclassified	Unclassified		

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

SECTION 1

PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is part of the Composite FY 85 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-84-D-01149. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 30 mph FMVSS 212/219/301-75 requirements.

The 35 mph frontal barrier impact test was conducted in accordance with the Office of Market Incentives (OMI) Laboratory Indicant Test Procedure. Standards Enforcement Indicant Test Program data for FMVSS No. 212, "Windshield Mounting," FMVSS No. 219 (Partial), "Windshield Zone Intrusion," FMVSS No. 301-75, "Fuel System Integrity," as well as occupant performance data are provided herein.

SECTION 2
SUMMARY OF TEST NUMBER CF0304

A load cell barrier consisting of 36 load cells was impacted by a 1985 Plymouth Reliant 4-door sedan at a velocity of 35.0 mph. The test was performed at the Calspan Corporation Advanced Technology Center on February 5, 1985. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by one real-time camera and 16 high-speed cameras. Camera locations and other pertinent camera information can be found in this report.

Two Part 572, 50th percentile male anthropomorphic test devices (ATDs) were placed in the driver and right-front passenger seating positions, according to dummy placement instructions specified in Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with head and chest triaxial accelerometers and right/left femur load cells. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver ATD (Serial 1021) was certified prior to the test. The right-front passenger ATD (Serial 1020) had been used in a previous test (CF0303) and the Injury Criteria values were not exceeded in that test. Certification details, along with instrumentation calibration data are found in Appendix C.

The 65 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 driver's head struck the steering wheel rim and hub and his HIC was 831. The maximum chest deceleration over 3 milliseconds was 54 g's and femur loads were 925 and 1085 pounds.

The right-front passenger HIC was 843 and maximum chest deceleration over 3 milliseconds was 44 g's. Femur loads were 595 and 840 pounds.

Table 1

GENERAL TEST AND VEHICLE DATA

Vehicle Year/Make/Model/Body Style 1985 Plymouth Reliant 4-door sedan

NHTSA No. CF0304 VIN. 1P3BP26C9FF139258

Body Color Brown Date of Manufacture 10/84

Engine: 4 cylinders; -- C.I.D.; 2.2 Liters; -- CC
X Gas; -- Diesel; -- Turbocharged
-- Longitudinal; X Transverse

Transmission 3 Speed -- Manual X Automatic -- Overdrive
Final Drive; X Front Wheel; -- Rear Wheel; -- Four Wheel

Date Received 11/26/85 Odometer Reading; 20
-- A/C; X P/S; X P/B; -- P/wdo.; -- Tilt Wheel
-- P/seats; -- Cruise Control

Type of Occupant Restraint 3-point Continuous Manual Belt System

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 35 psi, Rear 35 psi

Recommended Tire Size: P175/80R13

Recommended Cold Tire Pressure: Front 35 psi, Rear 35 psi

Tires on Vehicle: P175/80R13; Manufacture: Goodyear

Number of Occupants: 3 Front; 3 Rear; -- 3rd Seat; 6 TOTAL

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

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

Vehicle Capacity Weight (VCW) = 1015 lbs. (A)

No. of Occupants x 150 lbs. = 900 lbs. (B)

Rated Cargo and Luggage
Weight (RCLW) A-B = 115 lbs.

GVWR 3568 lbs. GAWR: Front 1941 lbs. Rear 1677 lbs.

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

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

Right Front = 780 lbs. Right Rear = 450 lbs.

Left Front = 830 lbs. Left Rear = 480 lbs.

TOTAL FRONT WEIGHT = 1610 lbs. (63.4 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 930 lbs. (36.6 % of Total Vehicle Weight)

TOTAL DELIVERY WEIGHT = 2540 lbs.

CALCULATION FOR TARGET TEST WEIGHT

UDW = Unloaded Delivered Weight (2540 lbs.)

VCW = Vehicle Capacity Weight (1015 lbs.)

DSC = Designated Seating Capacity (6)

RCLW = VW - 150 (DSC) = 115 lbs.

Target Test Weight = UDW + RCLW + (2 dummies x 164 lbs./dummy)

Target Test Weight = 2983 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 77 POUNDS CARGO

Right Front = 880 lbs. Right Rear = 640 lbs.

Left Front = 900 lbs. Left Rear = 640 lbs.

TOTAL FRONT WEIGHT = 1780 lbs. (58.2 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 1280 lbs. (41.8 % of Total Vehicle Weight)

TOTAL TEST WEIGHT = 3060 lbs.

Weight of ballast secured in vehicle trunk area = 0 lbs.

VEHICLE ATTITUDE (all dimensions in inches)

Delivered Attitude: RF 26.5 LF 26.9 RR 25.6 LR 26.1

Test Attitude: RF 25.2 LF 25.4 RR 23.8 LR 24.0

Wheel Base: 100.4 in.; C.G. = 42.0 in. rearward of front wheel C/L

Remarks: None

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

POST-IMPACT DATA

Type of Test Frontal Impact Impact Angle 0 °

Date of Test 2/5/85 Time of Test 1250 hrs.

Ambient Temperature 20 °F. at impact area

Temperature in Occupant Compartment 72 °F.

Windshield Molding Temperature 65 °F.

Required Impact Velocity Range: 34.5 to 35.5 mph

Impact Velocity: primary = 35.0 mph, secondary 35.0 mph

Distance From Front Bumper to Barrier Face When Entering Speed Trap 52 inches; Exiting Speed Trap 12 inches

VEHICLE REBOUND AND CRUSH (inches)

Vehicle Length: Pre-test = R 174.5 ℄ 178.6 L 174.6

Post-test = R 152.3 ℄ 152.0 L 151.8

Crush = R 22.2 ℄ 26.6 L 22.8

Distance from front of test vehicle to point of impact:

R 17.4 C/L 17.3 L 17.8

VISIBLE DUMMY CONTACT POINTS

	Driver	Passenger
Head	Steering Wheel Rim and Hub	Dash Panel
Chest	Steering Wheel Rim	None
Abdomen	None	None
Left Knee	Dash Panel	Dash Panel
Right Knee	Dash Panel	Dash Panel

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

	Front		Rear	
	Left	Right	Left	Right
Door Opening	Not Operable	Not Operable	Operable	Not Operable

Seat Movement	Front Left	Front Right
Seat Back Failure	None	None
Seat Shift (in.)	.9" forward	2.5" forward

Glazing Damage

Backlight/Windshield: Windshield shattered

Other notable impact effects: Windshield retention loss across the entire bottom and 18.5 inches on the driver side. Film coverage of the passenger belt spool-out indicates that the right rail of the bench seat moved considerably forward at impact.

SECTION 3

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

- "Windshield Mounting," FMVSS No. 212 Data
- "Windshield Zone Intrusion," FMVSS No. 219 (Partial) Data
- "Fuel System Integrity," FMVSS No. 301-75

Figure 1

FMVSS NO. 212, "WINDSHIELD MOUNTING", DATA SHEET

Details of windshield mounting such as retention method, trim type, etc.:

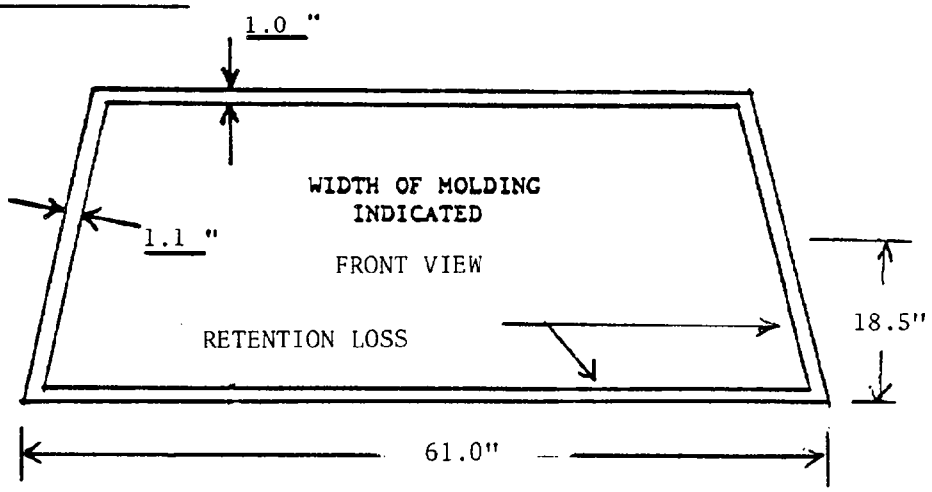
Windshield is bonded in place. There is a 1.0 inch chrome strip along the top and a 1.1 inch chrome strip on each side.

FMVSS 212 REQUIREMENTS: **The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.**

FMVSS 212 TEST DATA:

	WINDSHIELD PERIPHERY		
	PRE-TEST (in.)	POST-TEST (in.)	PERCENT RETENTION
RIGHT SIDE	80.25	49.75	62.0
LEFT SIDE	80.25	31.25	38.9
TOTAL	160.5	81.0	50.45

AREA OF RETENTION FAILURE:



FAILURE DETAILS:

Retention loss occurred along the entire bottom of the windshield and separation from the "A" post on the driver side (Figure A-14).

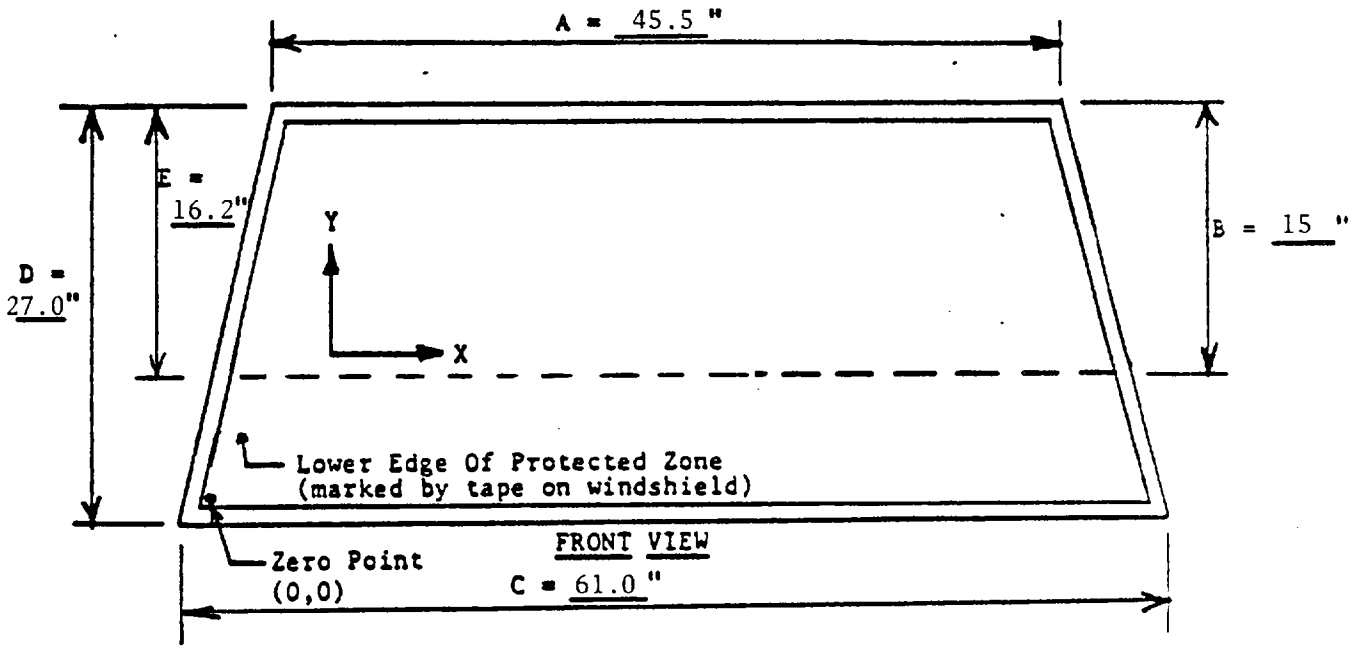
Figure 2

FMVSS NO. 219, (PARTIAL) "WINDSHIELD ZONE INTRUSION", DATA SHEET

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5" dia. rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. Draw the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 1/2" distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection onto the outer surface of the windshield of this line.

FMVSS 219 TEST DATA:



DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 1/4":
(Show location of penetration on above sketch)

None

	COORDINATES	
	X	Y
1.		
2.		
3.		
4.		

Figure 3

FMVSS NO. 301-75, "FUEL SYSTEM INTEGRITY", DATA SHEETS

TEST VEHICLE NHTSA NO.: CF0304 ; TEST DATE: 2/5/85

VEHICLE MAKE/MODEL/BODY STYLE: 1985 Plymouth Reliant 4-door sedan

USABLE CAPACITY OF VEHICLE'S FUEL TANK: 14.0 Gallons (figure furnished by vehicle manufacturer)

TEST REQUIREMENTS:

Test vehicle's engine operated to "run dry" condition, and then a small amount of Stoddard solvent which has been dyed RED shall be added to the vehicle's fuel tank. Operate the fuel pump enough to completely fill the fuel system ahead of the fuel tank, and add 92 to 94% of the stated USABLE CAPACITY to the fuel tank.

AMOUNT OF STODDARD SOLVENT ADDED TO VEHICLE'S FUEL TANK:

13.0 Gallons Which is 93 % of the Stated USABLE CAPACITY.

SOLVENT SPILLAGE MEASUREMENT AFTER 35 MPH FRONTAL BARRIER IMPACT TEST:

	Actual	Maximum Allowable
From impact until vehicle motion ceases - - - -	0	1 oz.
For 5 min. period after vehicle motion ceases -	0	5 oz.
For next 25 minutes at barrier face - - - - - -	0	1 oz./1 minute

SOLVENT SPILLAGE DETAILS:

STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1 to 3 minutes)

Time reqd. for machine to rotate 90° = 2 minutes, 57 seconds

FMVSS 301-75 Position Hold Time = 5 minutes, 0 seconds

TOTAL- - - - - - - - = 7 minutes, 57 seconds

Next Whole Minute Interval - - - - - = 8 minutes

Figure 3

FMVSS NO. 301-75 TEST DATA....Continued:

VEHICLE STATIC ROLLOVER DATA:

	First 5 Minutes FROM ONSET OF ROTATION	6th. Minute	7th. Minute	8th. Minute
Maximum Allowable Solvent Spillage - -	5 oz.	1 oz.	1 oz.	1 oz.
0 to 90° (filler cap down) - - - - - -	0	0	0	0
90 to 180° - - - - - - - - - - - - - -	0	0	0	0
180 to 270°- - - - - - - - - - - - - -	0	0	0	0
270 to 360°- - - - - - - - - - - - - -	0	0	0	0

Solvent Spillage Location(s):

OMI FINAL DATA

SECTION 4

Occupant and Vehicle Information

I. OMI DATA

1. Dummy Injury Criteria Data Summary
2. Dummy Positioning Data
3. Seat Belt Positioning Data
4. Seat Belt Performance Assessment Data
5. Driver Dummy to Steering Column Dimensions
6. Camera Locations
7. Vehicle Target Locations

II. OVR DATA

1. Load Cell Barrier Data
2. Vehicle Accelerometer Data

III. AID DATA

1. Test Vehicle Measurements
2. Accident Investigation Damage Data Summary

Table 2

DUMMY INJURY CRITERIA VALUES

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R *
DUMMY (1)	-127	-26	50	128	-59	46	-14	54
DUMMY (2)	- 80	30	78	114	-38	40	10	44
DUMMY (3)								
DUMMY (4)								

	MAXIMUM FORCE-FEMUR LOAD (LBS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	925	1085
DUMMY (2)	595	840
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)	1215	--	340
DUMMY (2)	2075	780	--
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**			
	HIC	t_1 (SEC)	t_2 (SEC)	AVE. ACC. (g) t_1 TO t_2
DUMMY (1)	831	.06787	.09457	62
DUMMY (2)	843	.08647	.11400	62
DUMMY (3)				
DUMMY (4)				

*DEFINED AS EXCEEDING 0.003 SEC. DURATION

**AS DEFINED IN FMVSS NO. 208

Figure 4

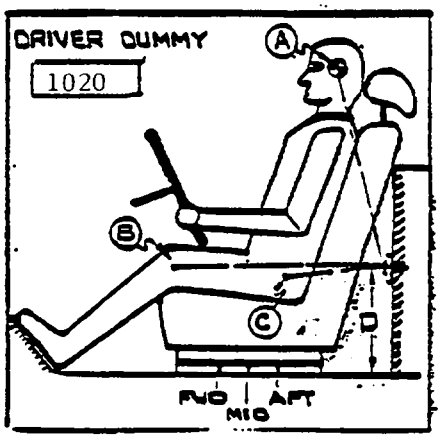
PART 572 DUMMY IN-VEHICLE POSITION

Test No. CF0304 Vehicle 1985 Plymouth Reliant 4-door sedan

SEAT TYPE:
- X Bench
- ___ Bucket
- ___ Split Bench

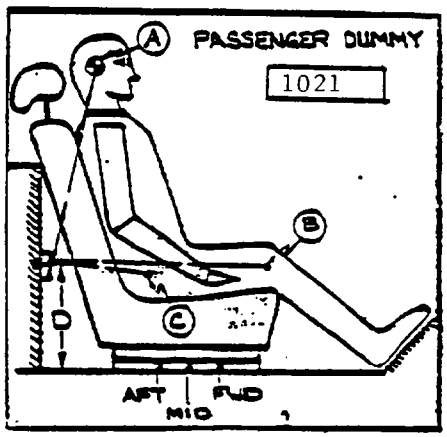
ADJUSTER TYPE:
- X Manual
- ___ Power

BUCKET SEAT BACK TYPE:
- X Fixed
- ___ Adjustable Reclining



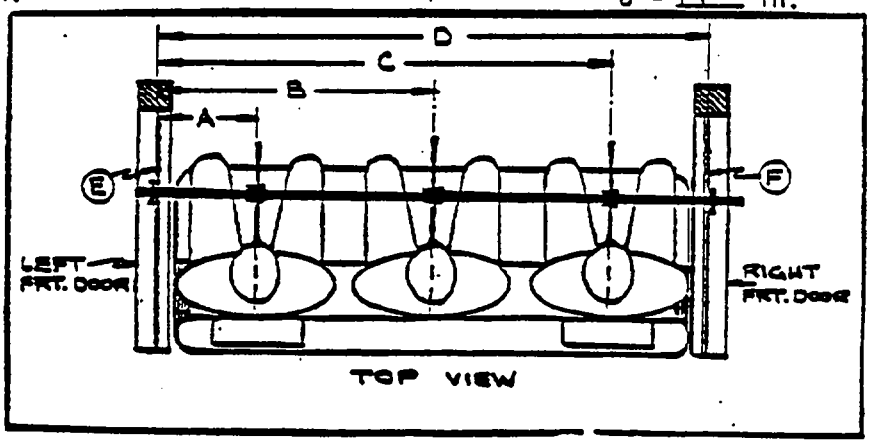
MEASUREMENT LOCATION

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



A =	23.0 in.	7	Degrees
B =	25.1 in.	94	Degrees
C =	9.6 in.	117	Degrees
D =	13 in.		

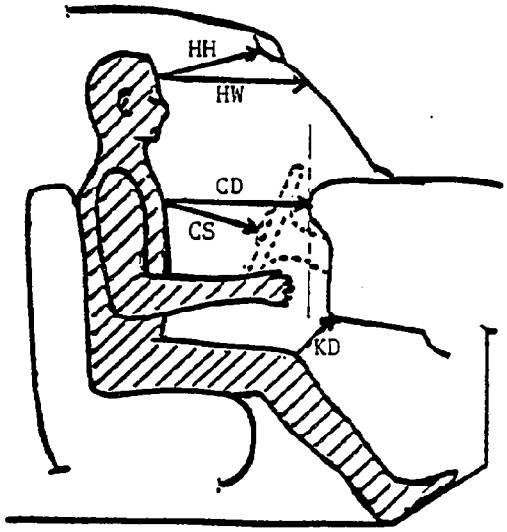
A =	23.2 in.	8	Degrees
B =	25.3 in.	94	Degrees
C =	9.7 in.	116	Degrees
D =	13 in.		



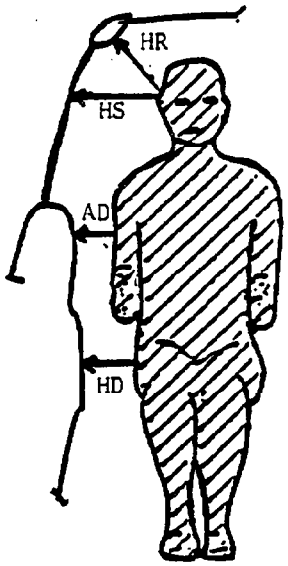
DUMMY ID	1020	1021
A = Left Door to Driver Centerline	12 in.	
B = Left Door to Center Passenger Centerline	-- in.	
C = Left Door to Right Passenger Centerline	38.9 in.	
D = Left Door to Right Door	50.8 in.	
E, F = Window Glass Height (Right and Left Must be Equal)	12 in.	

	DRIVER	PASSENGER
HH	12.2"	12.0"
HW	16.4"	16.2"
CD	20.0"	20.2"
CS	13.5"	--
KDL	5.2"	5.2"
KDR	6.2"	5.2"
SA	Fixed	Fixed
TA	25.0°	24.5°

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



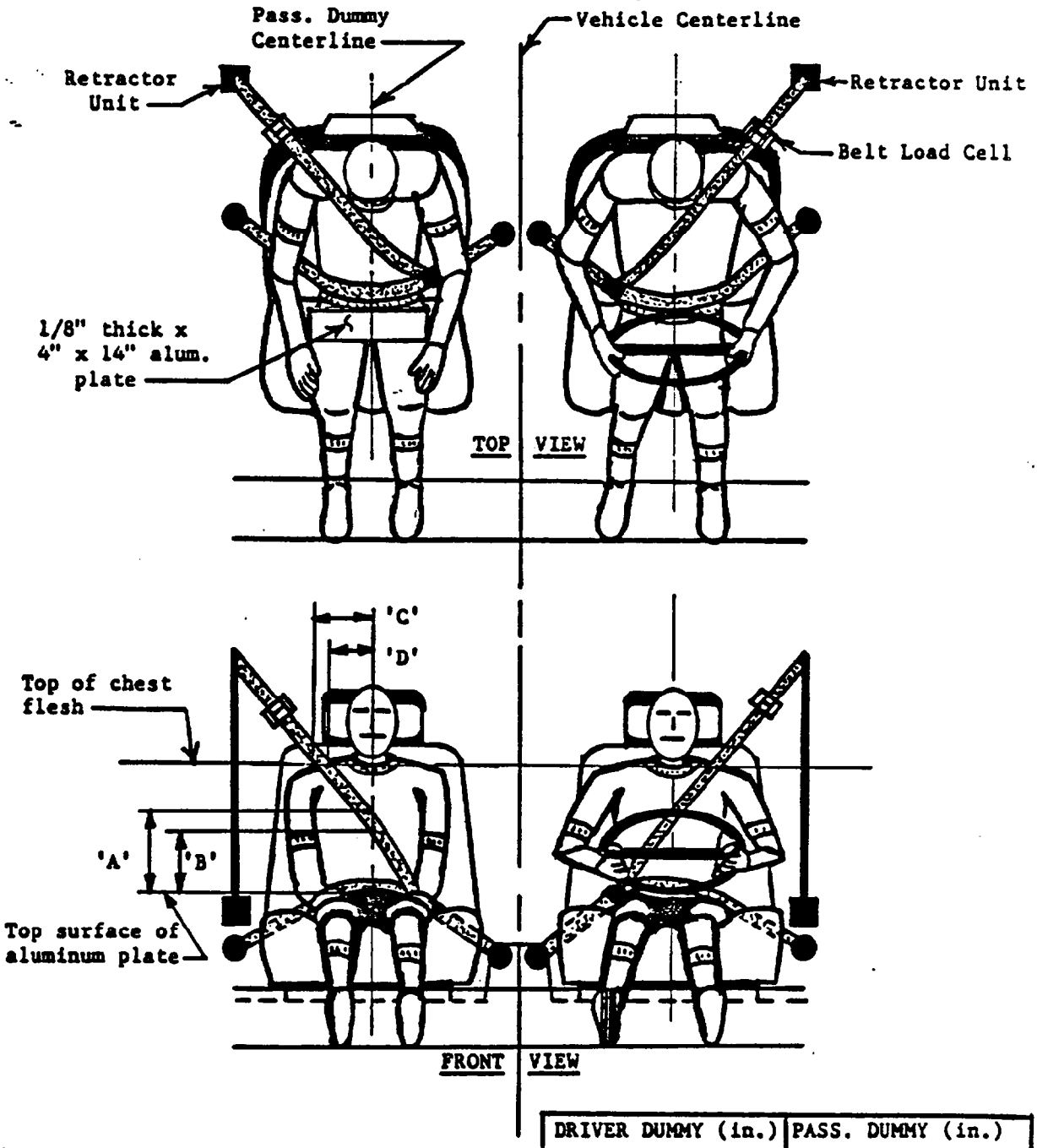
	DRIVER	PASSENGER
HR	5.2"	5.2"
HS	8.6"	8.7"
AD	4.3"	4.4"
HD	7.4"	7.1"

Figure 5

OCCUPANT CLEARANCE DIMENSIONS

Figure 6

SEAT BELT POSITIONING DATA



	DRIVER DUMMY (in.)	PASS. DUMMY (in.)
1. Dimension 'A'--alum. plate to belt upper edge on dummy centerline	14.2"	14.5"
2. Dimension 'B'--alum. plate to belt lower edge on dummy centerline	11.1"	11.2"
3. Dimension 'C'--dummy centerline to outer edge at chest flesh top	6.6"	6.7"
4. Dimension 'D'--dummy centerline to inner edge at chest flesh top	4.0"	4.1"
5. Lap belt tension (lbs.)	NA	NA
6. Shoulder belt tension (lbs.)	3.00 lbs.	3.25 lbs.

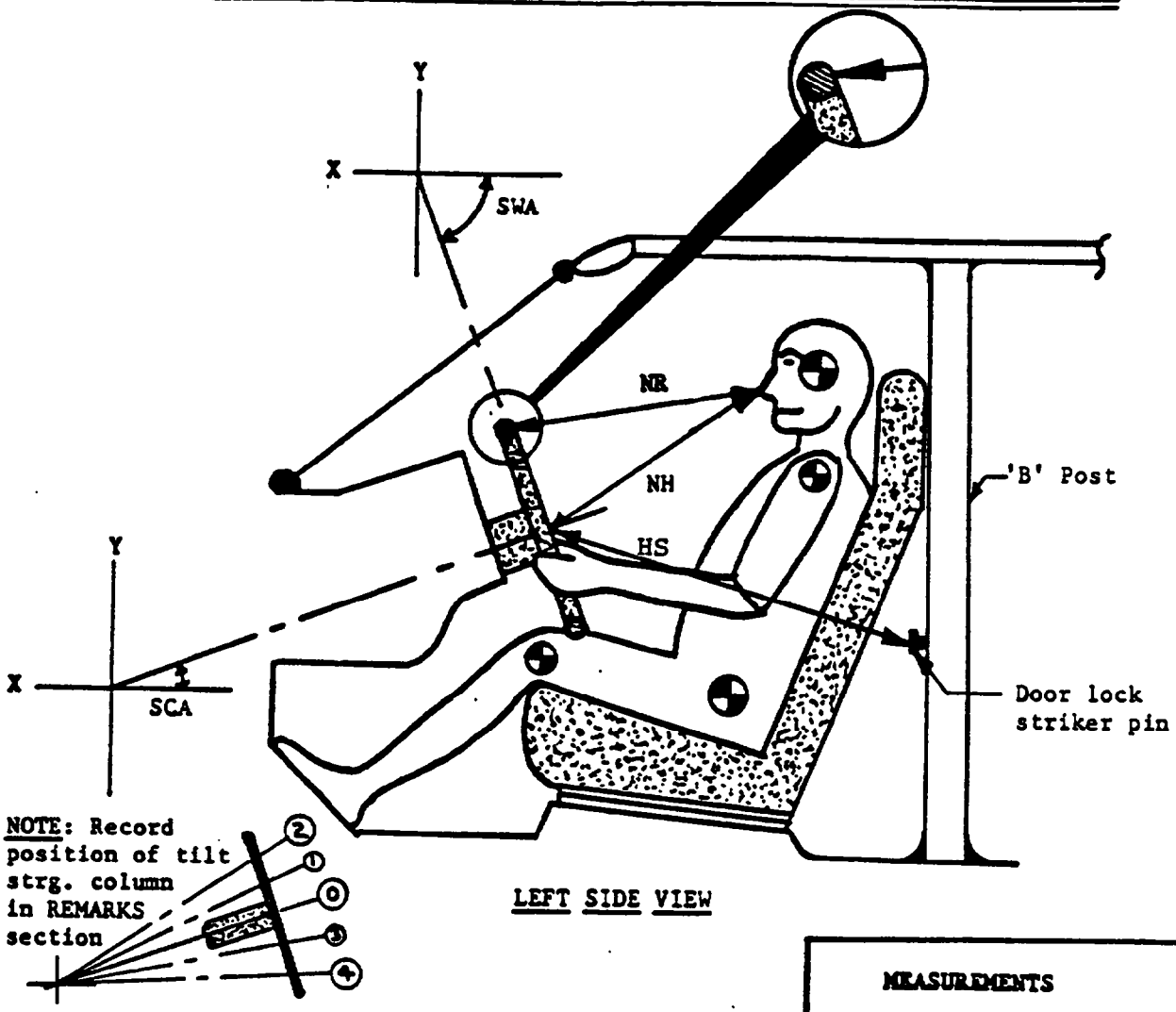
Table 3

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

Belt Length Data:	Driver	Passenger
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	66.3"	65.9"
Shoulder belt length as measured on Part 572 Dummy.	33.3"	33.4"
Lap belt length as measured on Part 572 Dummy.	33.0"	32.5"
Belt Spool-Off Data:		
As determined by film analysis.	3.2"	4.2"
As determined mechanically.	3.1"	4.1"
Belt Stretch Data:		
Measured electronically between shoulder belt load cell and the "D" ring.	.24"/ft.	.92"/ft.

Figure 7

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



LEFT SIDE VIEW

	MEASUREMENTS	
NR--Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	17.1	Inches
NH--Distance from tip of dummy's nose to center of steering column hub	19.1	Inches
HS--Distance from center of steering column hub to the forward surface of the door lock striker pin.	22.5X 16.2Y	Inches
SCA--Angle of steering column relative to the horizontal X axis	26°	Degrees
SWA--Angle of steering wheel relative to the horizontal X axis.	64°	Degrees

● REMARKS CONCERNING ADJUSTABLE OR TILT STEERING COLUMN IF VEHICLE IS SO EQUIPPED:

Not adjustable.

NOTE: Camera Information Shown on Table 4

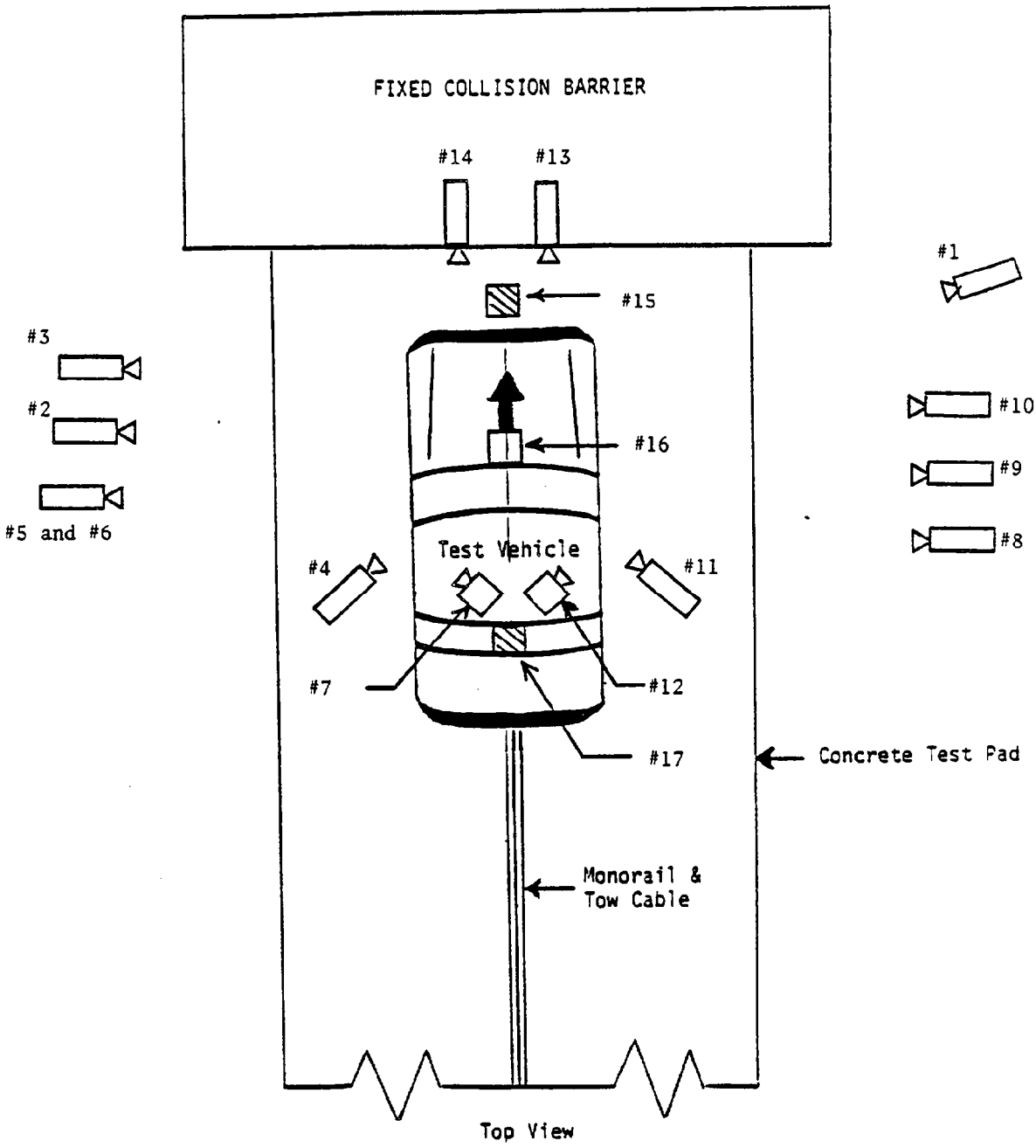


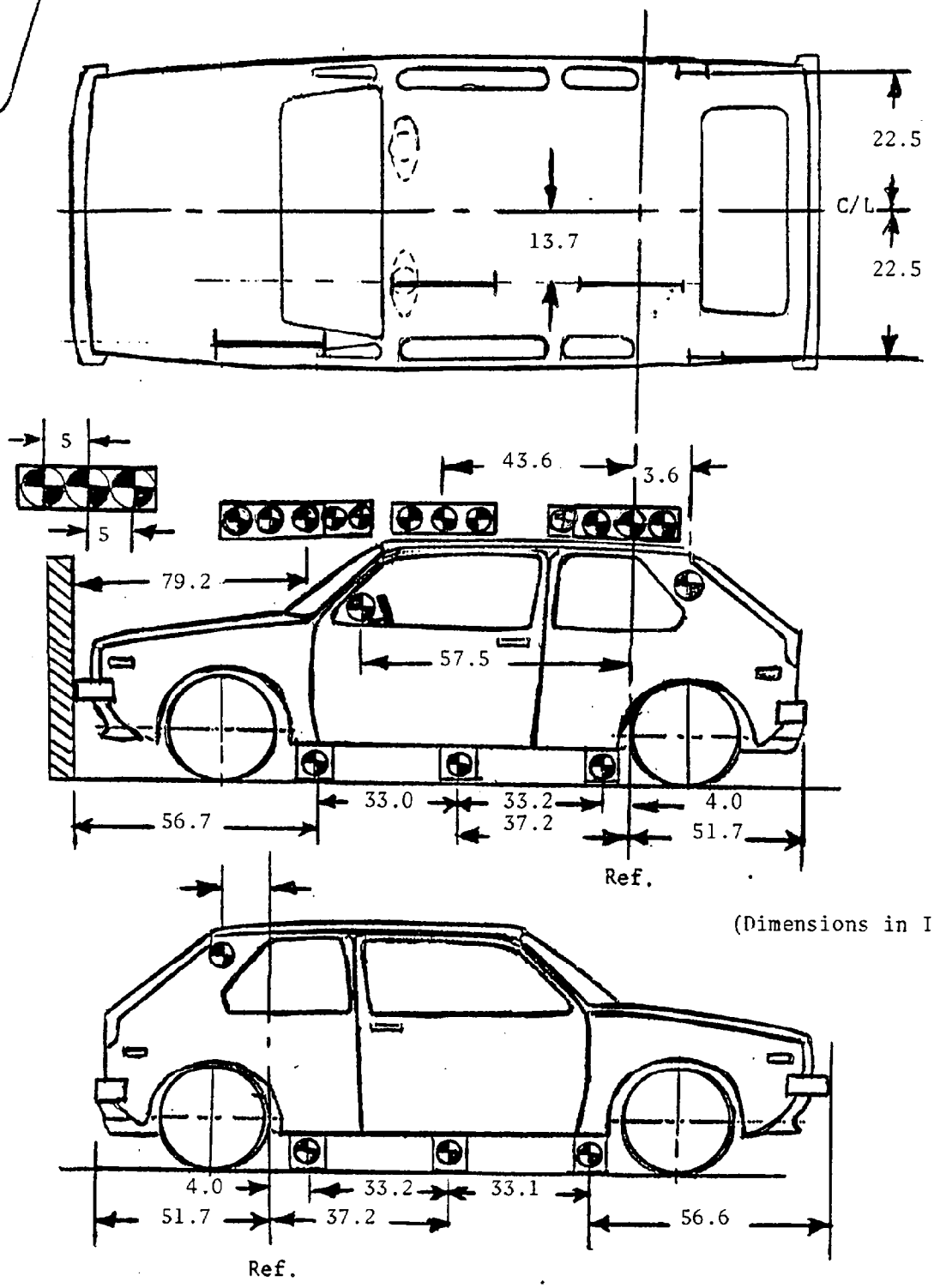
Figure 8 CAMERA POSITION FOR FRONTAL IMPACTS

Table 4
HIGH-SPEED CAMERA LOCATIONS

Test No. CF0304 Vehicle 1985 Plymouth Reliant 4-Door Sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (in)* X	Y	Z	ANGLE ** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
1	Real Time Camera	--	--	--	--	--	--	24
2	Overall Left Side	236	63	50	-5	--	13	530
3	Left Side View	248	40	41	-6	--	25	540
4	Driver and Interior View	96	108	67	-15	80	25	530
5	Steering Column (Bottom)	270	78	46	-4	247	25	540
6	Steering Column (Top)	270	78	60	-11	247	25	540
7	Left Belt	--	--	--	--	--	8	1290
8	Overall Right Side	282	80	46	-4	--	13	800
9	Right Side View	280	69	51	-5	--	25	830
10	Right Passenger View	282	58	58	-3	260	35	760
11	Passenger and Interior View	96	108	63	-16	80	25	590
12	Right Belt	--	--	--	--	--	8	1380
13	Passenger Front View	21	0	72	-33	105	13	540
14	Driver Front View	21	0	72	-33	105	13	610
15	Windshield View	0	0	126	-47	--	13	540
16	Pit View of Engine	0	38	-120	90	--	13	800
17	Pit View of Fuel Tank	0	132	-120	90	--	13	750

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



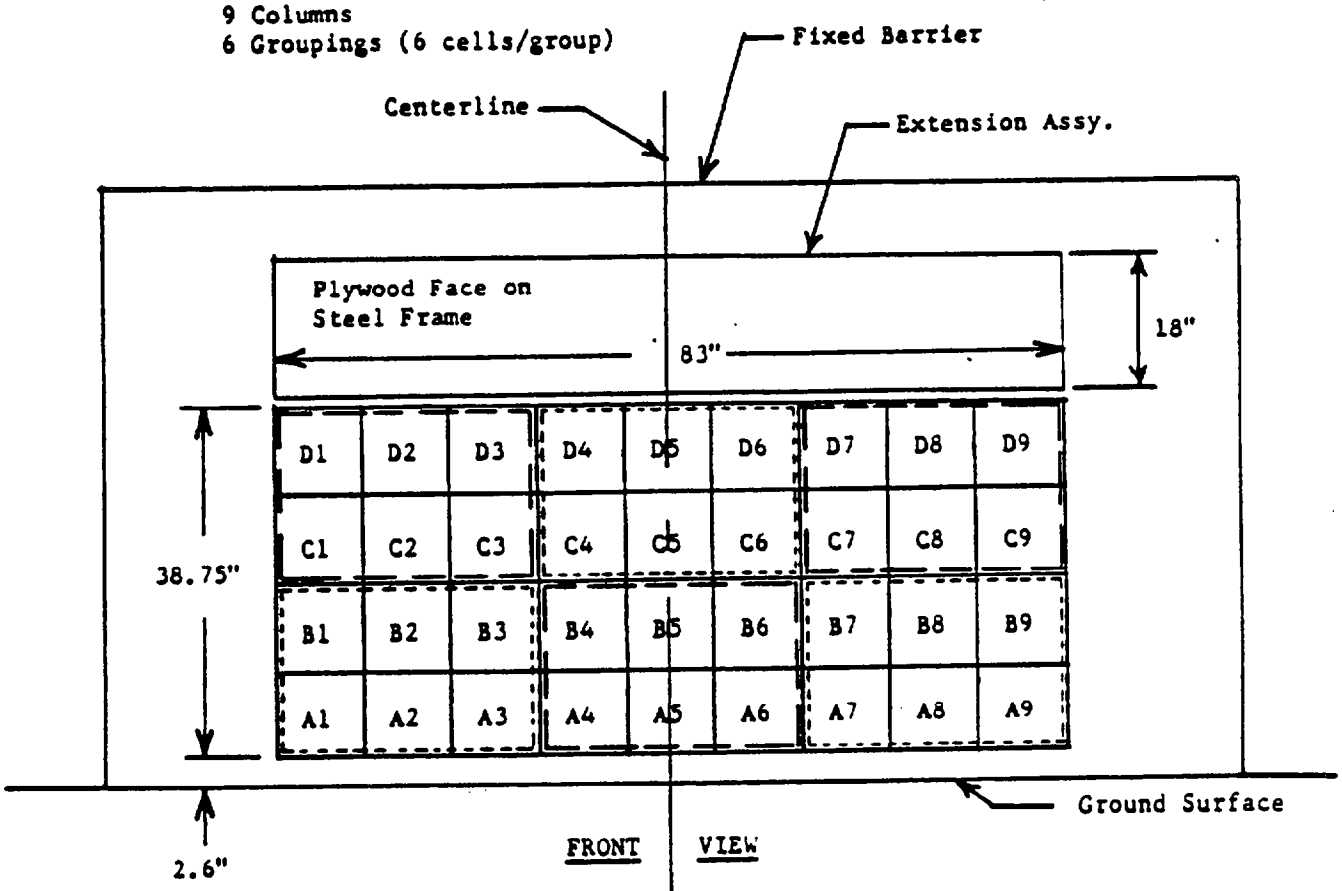
(Dimensions in Inches)

Figure 9 VEHICLE TARGET LOCATIONS

Figure 10

LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells
4 Rows
9 Columns
6 Groupings (6 cells/group)

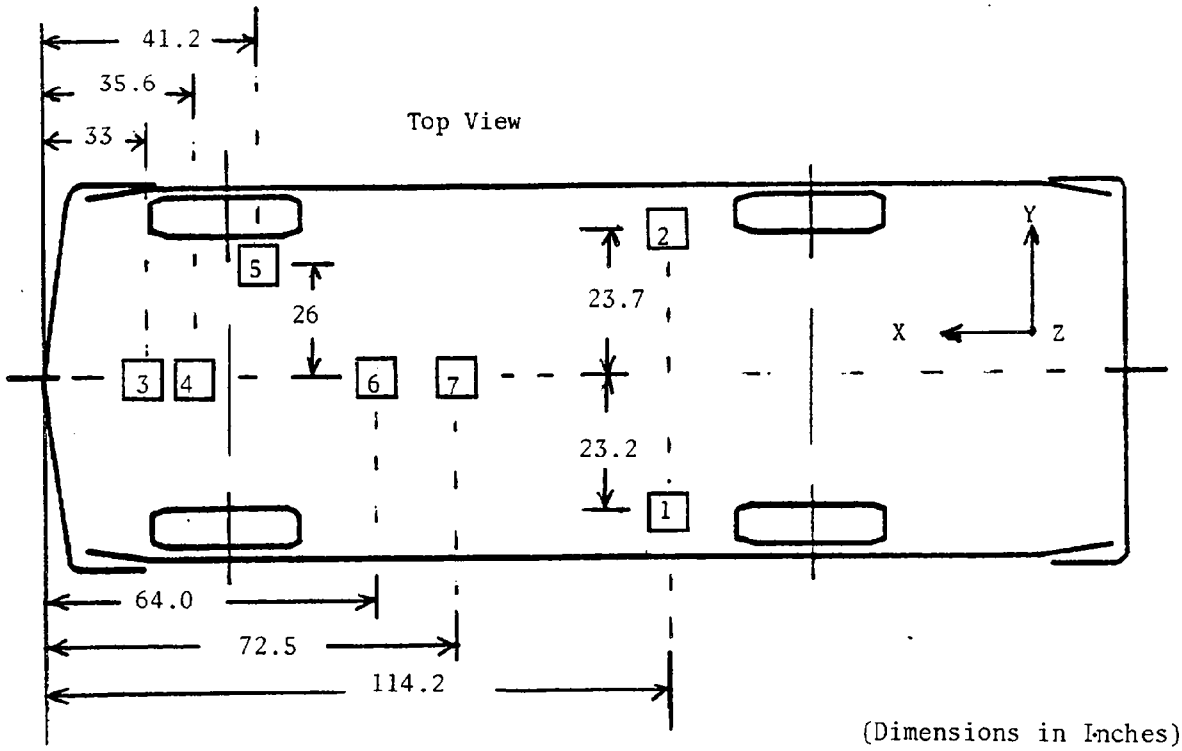


6 GROUPINGS OF 6 LOAD CELLS EACH

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

The following data is presented in Appendix B:

(1) Data from 36 individual load cells
(2) Total or Sum of 36 individual load cells
(3) Data from 6 Groupings shown above (6 cells/group)



(Dimensions in Inches)

ACCELEROMETER NUMBER*	ACCELEROMETER LOCATION	DIRECTION		
		X	Y	Z
1	Left Rear Seat Crossmember	X		
2	Right Rear Seat Crossmember	X		
3	Top of Engine	X		
4	Bottom of Engine	X		
5	Right Disc Brake Caliper	X		
6	Instrument Panel	X		
7	Center of Gravity (C/G)	X		

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

FIGURE 11 VEHICLE ACCELEROMETER LOCATIONS

Figure 12

TEST VEHICLE MEASUREMENTS

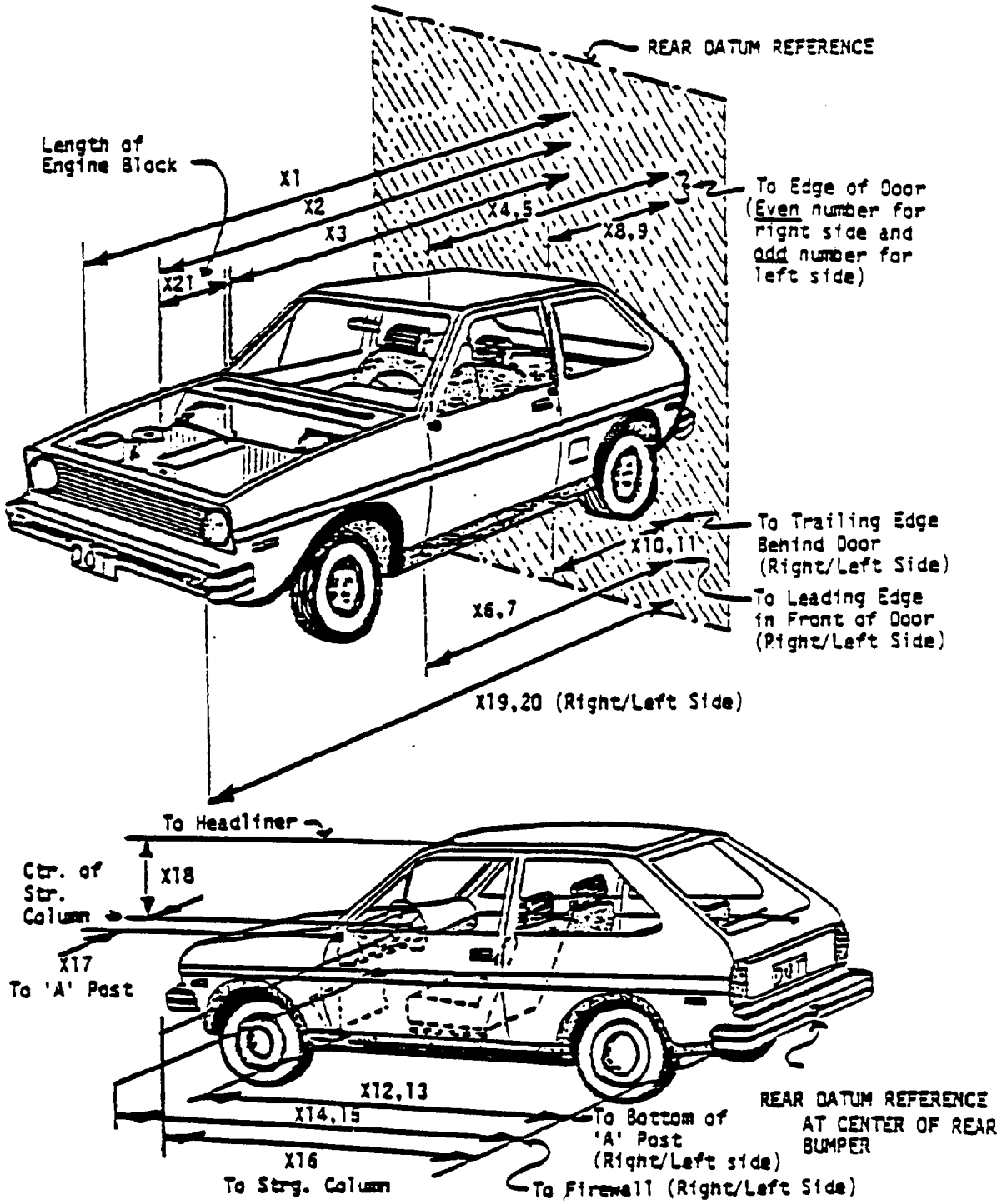


Table 5

VEHICLE MEASUREMENTS

All Dimensions in Inches

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	178.6	152.0	26.6
X2	Rear Surface of Vehicle to Front of Engine	155.7	142.8	12.9
X3	Rear Surface of Vehicle to Firewall	131.2	125.0	6.2
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	117.0	115.3	1.7
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	117.1	116.0	1.1
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	119.6	117.5	2.1
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	119.7	118.4	1.3
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	79.1	78.2	.9
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	79.0	78.5	.5
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	79.1	78.4	.7
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	79.2	78.7	.5
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	116.2	115.9	.3
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	116.1	115.9	.2
X14	Rear Surface of Vehicle to Firewall, Right Side	130.7	123.5	7.2
X15	Rear Surface of Vehicle to Firewall, Left Side	131.2	124.5	6.7
X16	Rear Surface of Vehicle to Steering Column	103.4	99.0	4.4
X17	Center of Steering Column to "A" Post	13.7	12.8	.9
X18	Center of Steering Column to Headliner	17.2	17.8	-.6
X19	Rear Surface of Vehicle to Right Side of Front Bumper	174.5	152.3	22.2
X20	Rear Surface of Vehicle to Left Side of Front Bumper	174.6	151.8	22.8
X21	Length of Engine Block	14.6	14.6	0

Table 6

ACCIDENT INVESTIGATION DIVISION DATA FOR 35 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: 1985 Plymouth Reliant 4-door sedan

VEH. NHTSA NO.: CF0304 ; VIN: 1P3BP26C9FF139258

MODEL YEAR: 1985 ; BUILD DATE: 10-84 ; TEST DATE: 2/5/85

VEH. SIZE CATEGORY: mid-size ; TEST WEIGHT: 3060 pounds

VEH. WHEELBASE: 100.4" ; FRONT OVERHANG: 38.3" ; OVERALL WIDTH: 68.6"

ACCELEROMETER DATA:

LOCATION: 42.0 inches rearward of front wheel C/L

CALIBRATION PROCEDURE: Shaker table/least squares

LINEARITY: ± 0.75% ; INTEGRATION ALGORITHM: Hybrid Simpson-Newton 3/8

VEH. IMPACT SPEED: 35.0 mph ; TIME OF SEPARATION: 153.2 milliseconds

VELOCITY CHANGE: 49.76 mph

COLLISION DEFORMATION CLASSIFICATION (CDC) CODE:
F (Frontal) 12FDEW3

CRUSH DEPTH DIMENSIONS:

C1= 23.1 inches

C2= 25.1 inches

C3= 26.1 inches

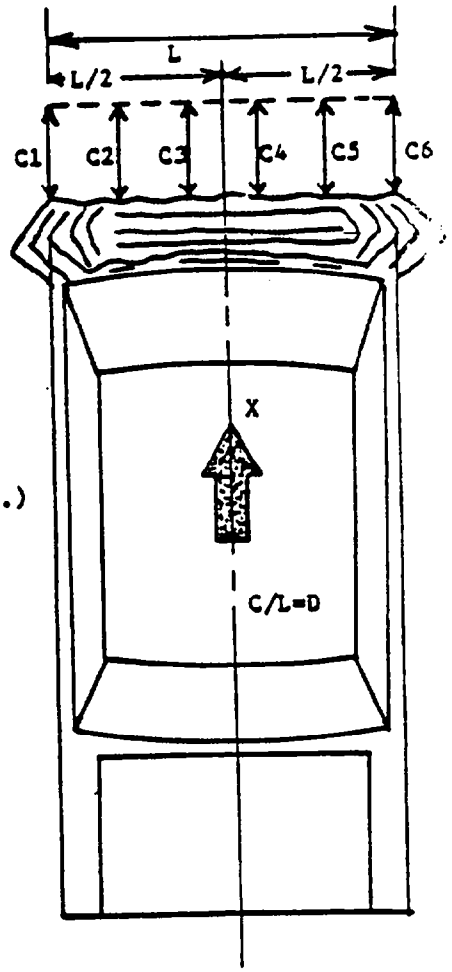
C4= 25.7 inches

C5= 24.9 inches

C6= 24.4 inches

MIDPOINT OF DAMAGE: D = Vehicle Centerline (Longitud.)

LENGTH OF DAMAGED REGION: L = 60.5 inches



National Accident Sampling System — Continuous Sampling Subsystem: Vehicle Data

FIELD MEASUREMENTS

1985 PLYMOUTH RELIANT 'K'

Complete When Applicable	
End Damage	**Side Damage**
Undeformed end width 60.5	Bowing: B1 _____ X1 _____
Corner shift: A1 _____	B2 _____ X2 _____
A2 _____	Bowing constant
End shift at frame (CDC) (check one)	$\frac{X1 + X2}{2}$ = _____
< 4 inches _____	
≥ 4 inches _____	

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

12FDEW3

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
1	Bumper	60.5	26.6	60.5	27	26.5	26.4	26	26.3	28.3	
	Free/space		0		-3.9	-1.4	-.3	.3	-1.4	-3.9	
1	ACTUAL CRUSH		26.6	60.5	23.1	25.1	26.1	25.7	24.9	24.4	

*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.

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

Average Track: N/A
Maximum Width: N/A
TEST Curb Weight:
Overall Length: 178.6
Wheel Base: 100.3
Engine Size: cyl. 4
displ.

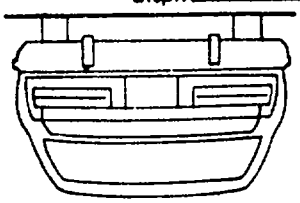
WHEEL STEER ANGLES

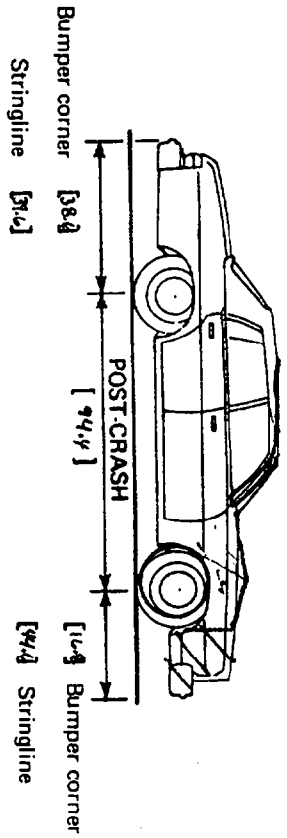
(For locked front wheels or displaced rear axles only)

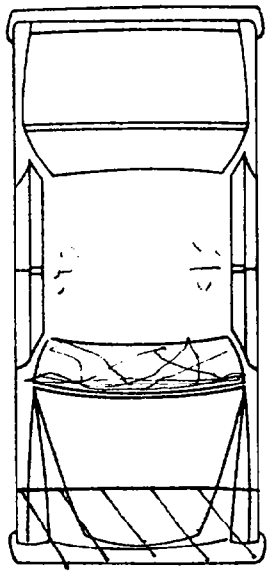
RF ± 0 1 °
LF ± 0 0 °
RR ± N/A °
LR ± N/A °

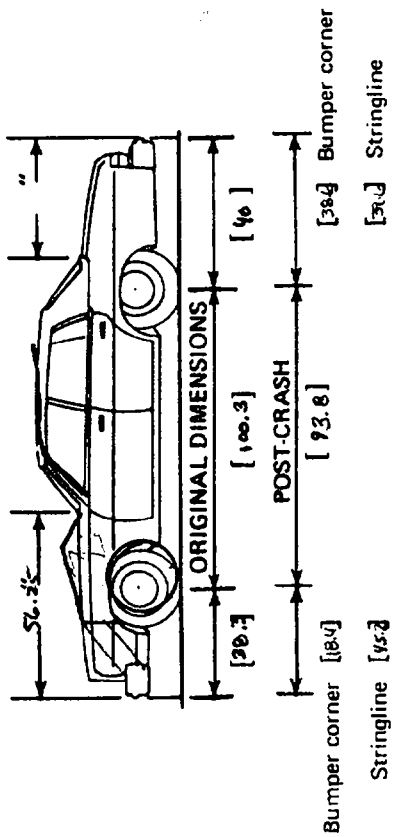
Within ± 5 degrees

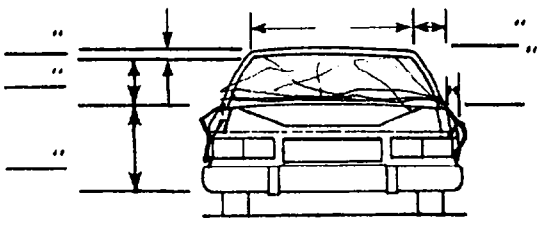
Vehicle No.: 1985 Reliant "K" PLYMOUTH











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 the back of page 3.
Annotate any damage caused by extrication such as component removal by torching, prying or hydraulic shears.
If the vehicle contacted a pedestrian, complete the back of this page.

Figure 13 TEST VEHICLE DAMAGE DETAILS

APPENDIX A

PHOTOGRAPHS

Figure A-1 PRE-TEST FRONT VIEW

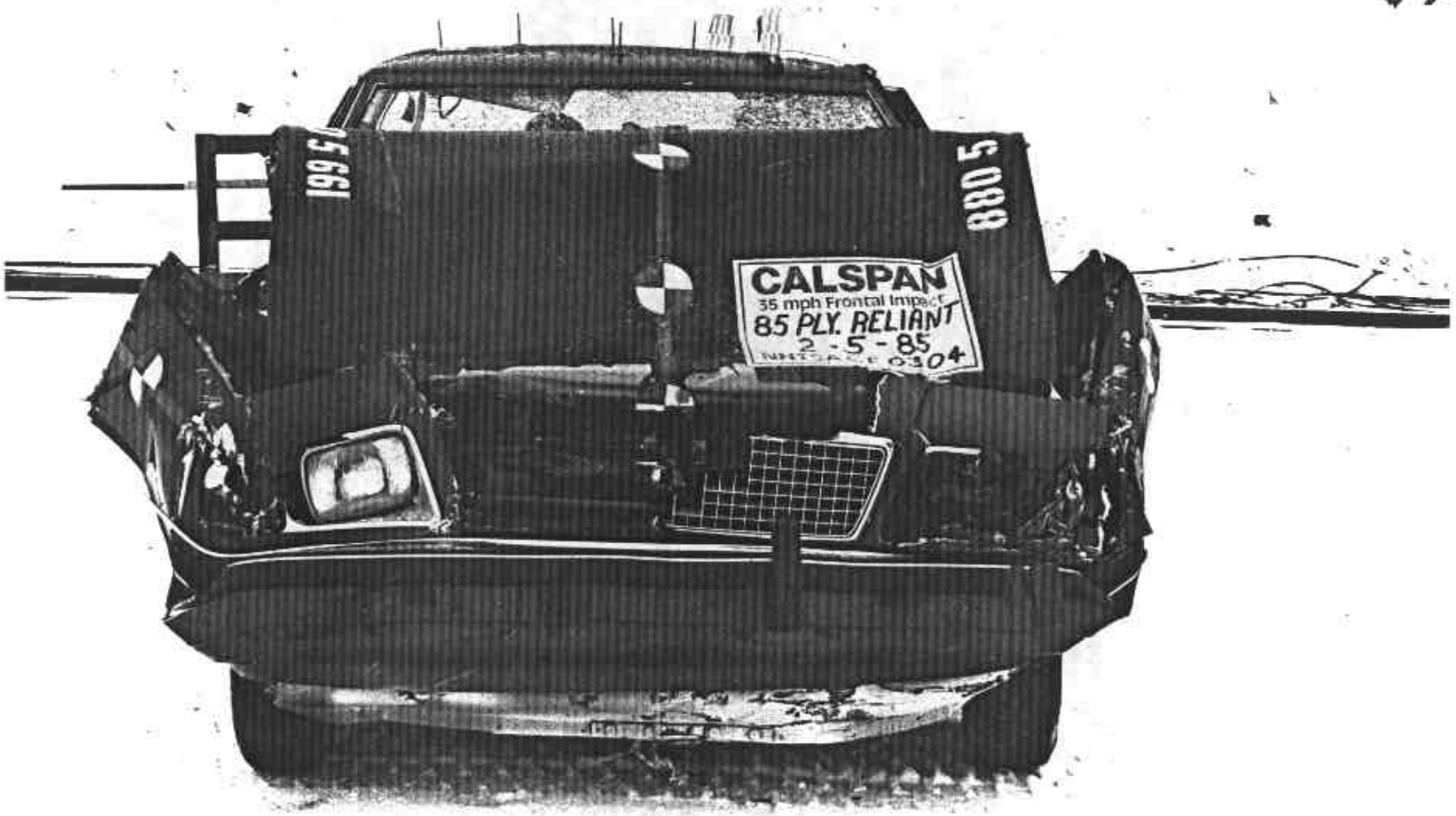


Figure A-2 POST-TEST FRONT VIEW

Figure A-3 PRE-TEST LEFT SIDE VIEW

7333-6

Figure A-4 POST-TEST LEFT SIDE VIEW

A-6

7333-6

Figure A-5 PRE-TEST RIGHT SIDE VIEW

7333-6

Figure A-6 POST-TEST RIGHT SIDE VIEW

Figure A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

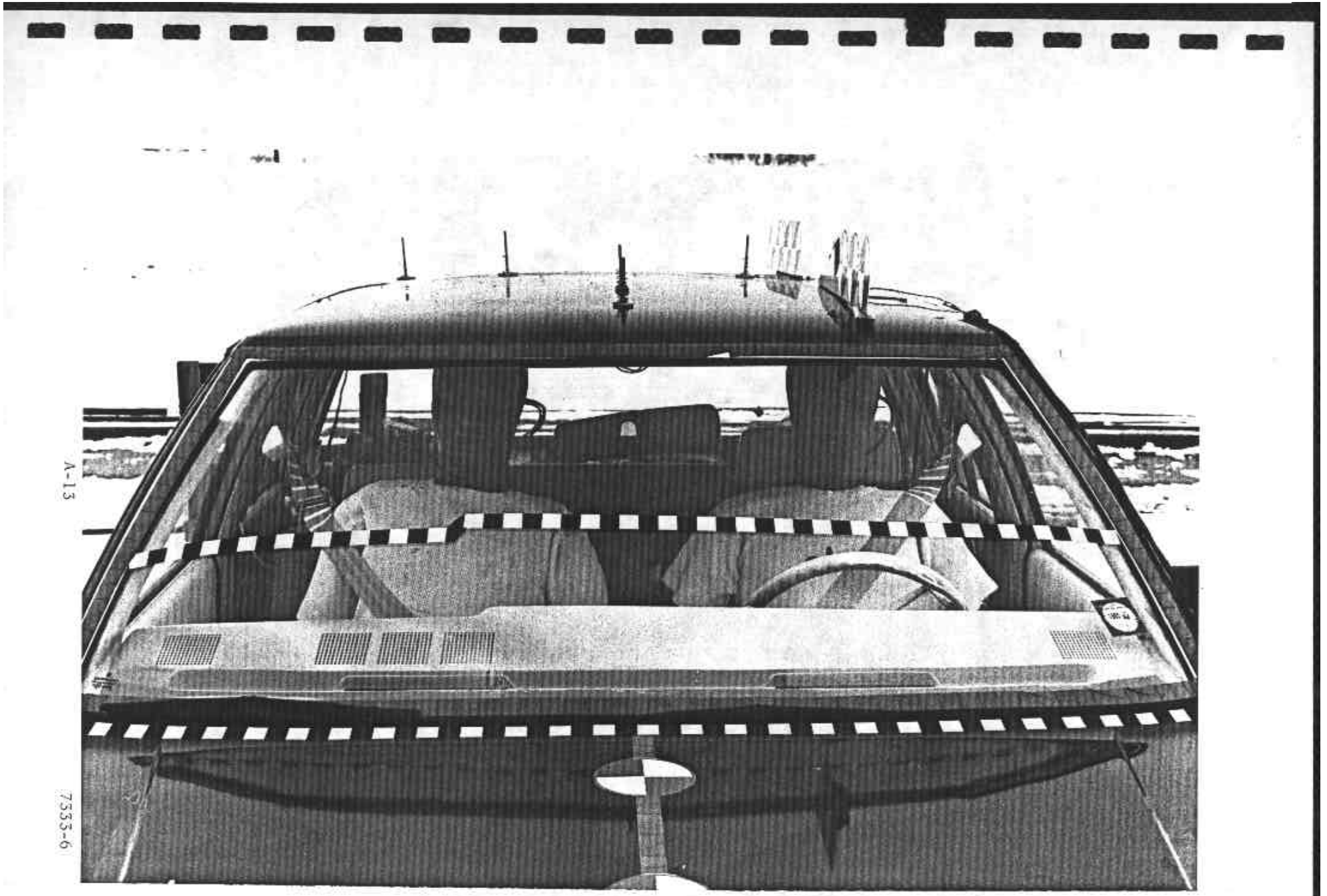
7333-6

Figure A-9 PRE-TEST LEFT REAR THREE-QUARTER VIEW

Figure A-10 POST-TEST LEFT REAR THREE-QUARTER VIEW

Figure A-11 POST-TEST TOP VIEW

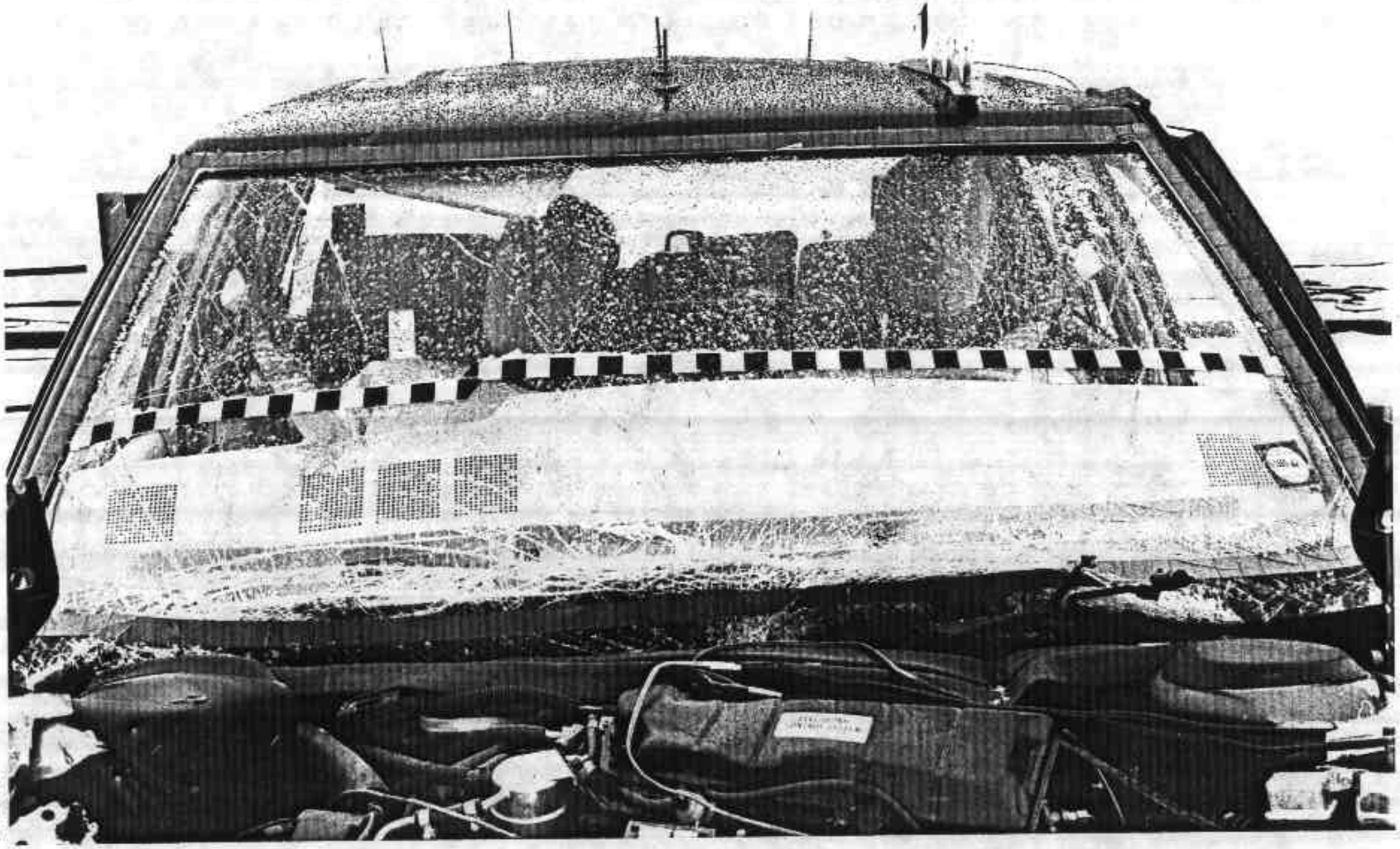
7333-6



A-13

7553-6

Figure A-12 PRE-TEST WINDSHIELD VIEW



7333-6

Figure A-13 POST-TEST WINDSHIELD VIEW

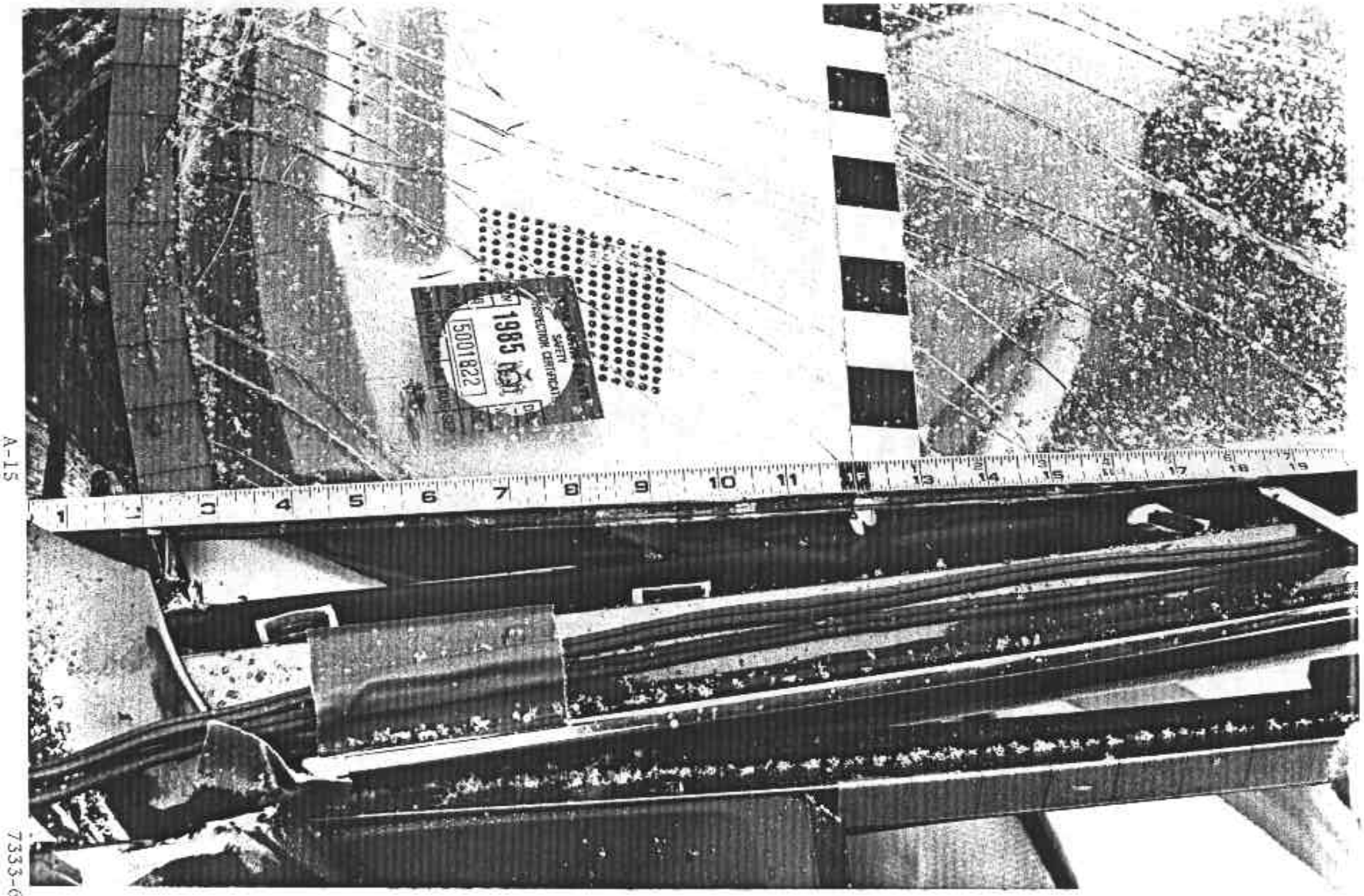


Figure A-14 POST-TEST WINDSHIELD SEPARATION FROM "A" POST VIEW

7333-6

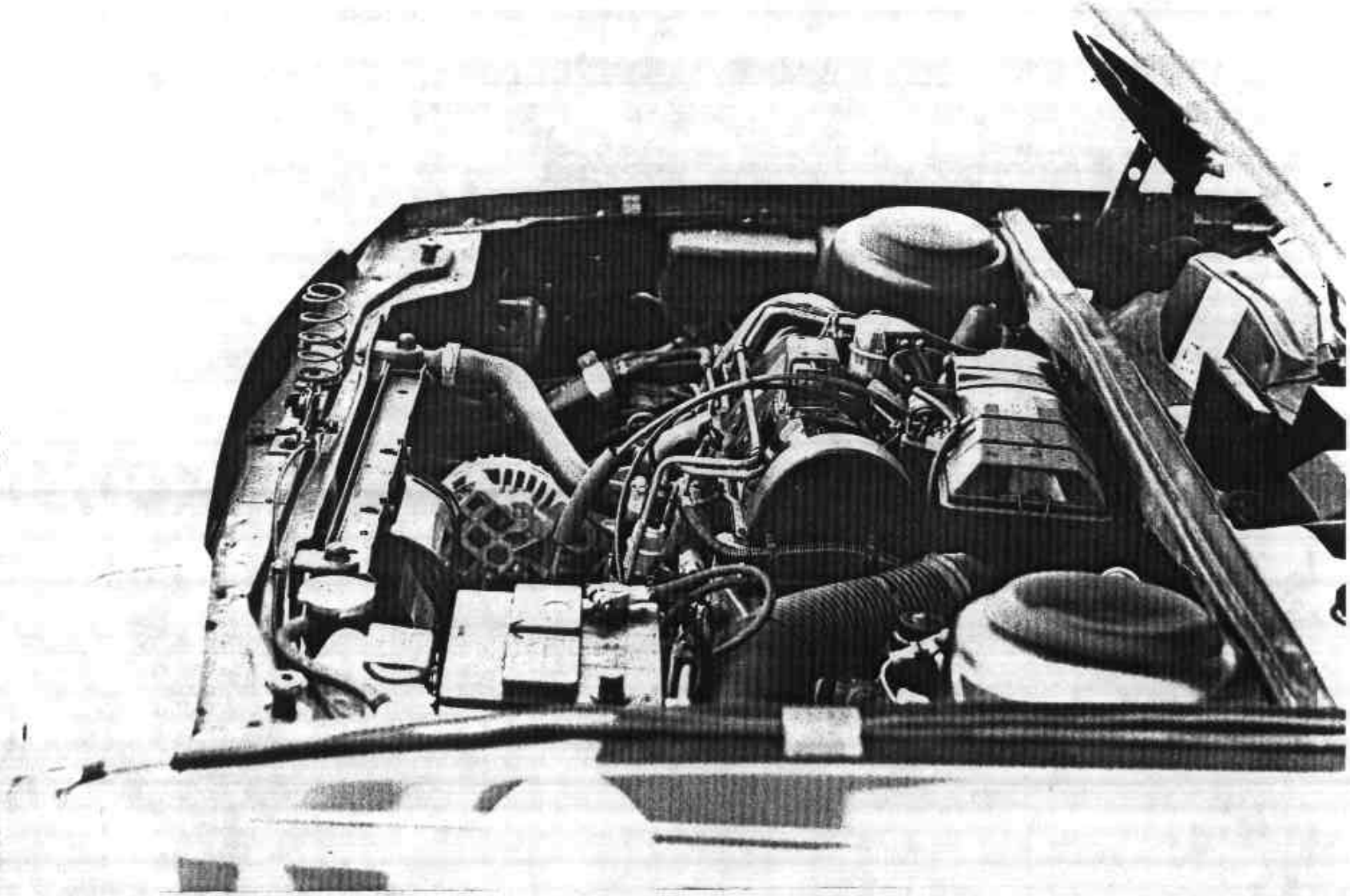
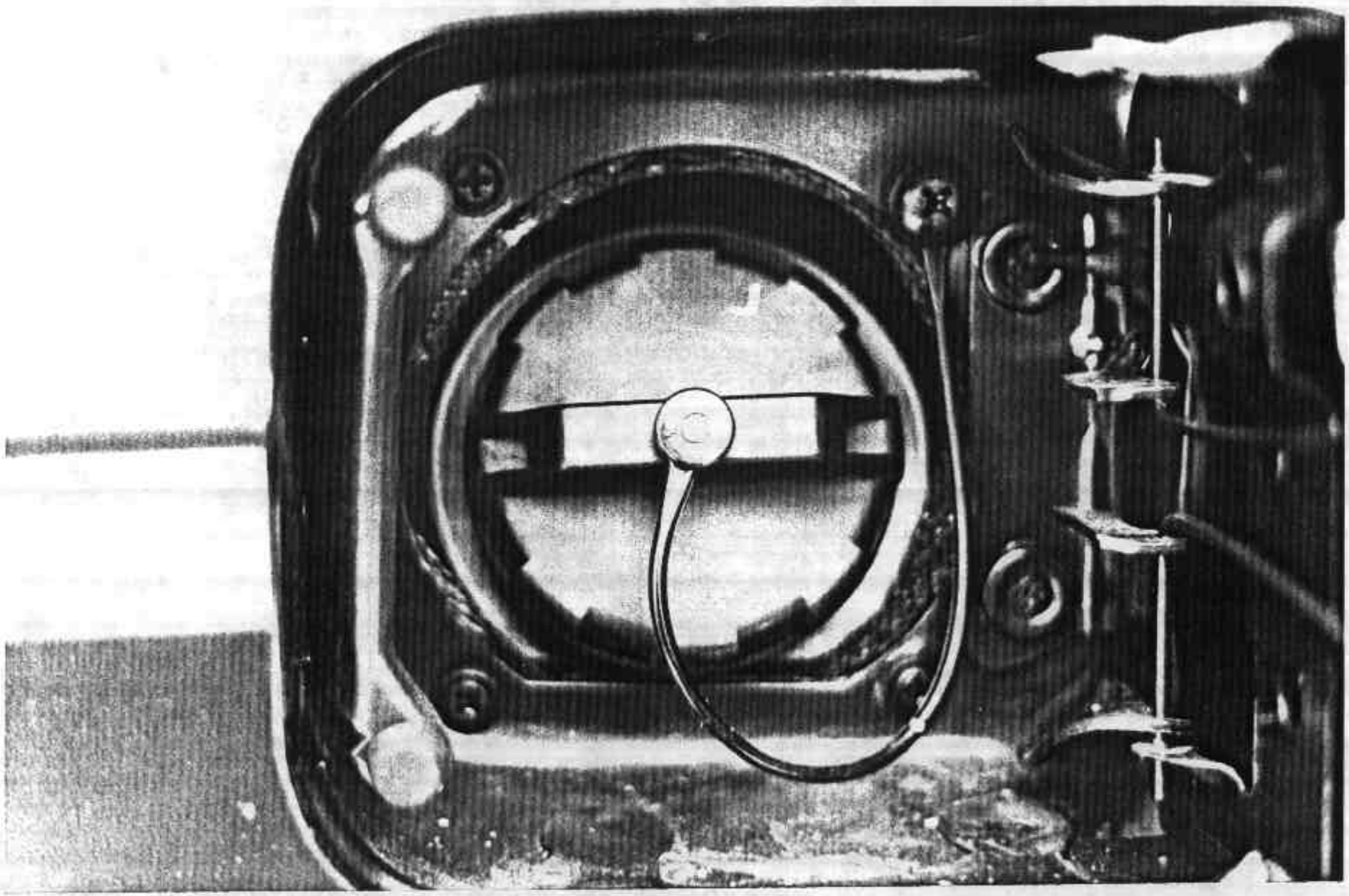


Figure A-15 PRE-TEST ENGINE COMPARTMENT VIEW

Figure A-16 POST-TEST ENGINE COMPARTMENT VIEW



A-18

7333-6

Figure A-17 PRE-TEST FUEL FILLER CAP VIEW

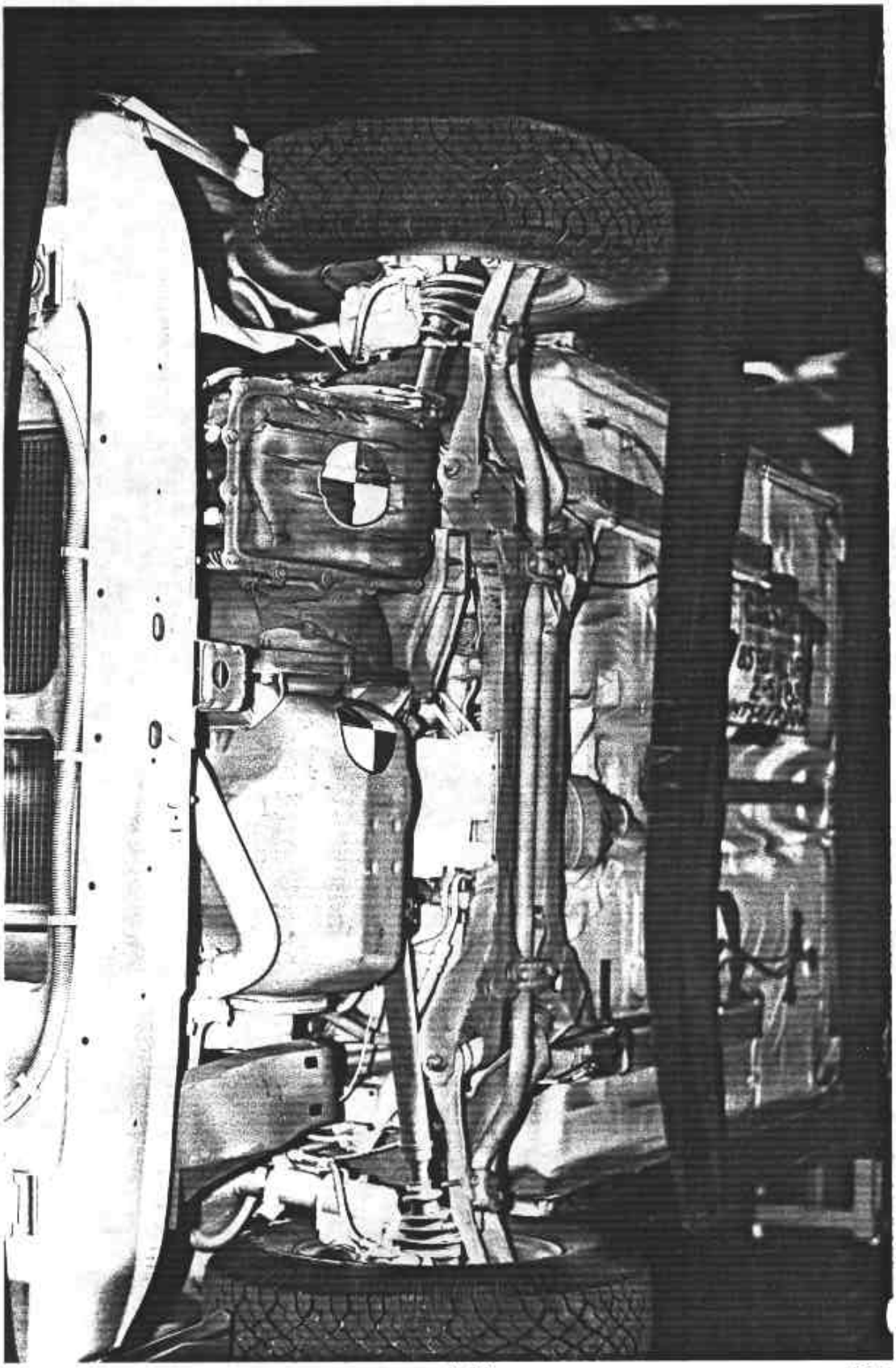


Figure A-18 PRE-TEST FRONT UNDERBODY VIEW

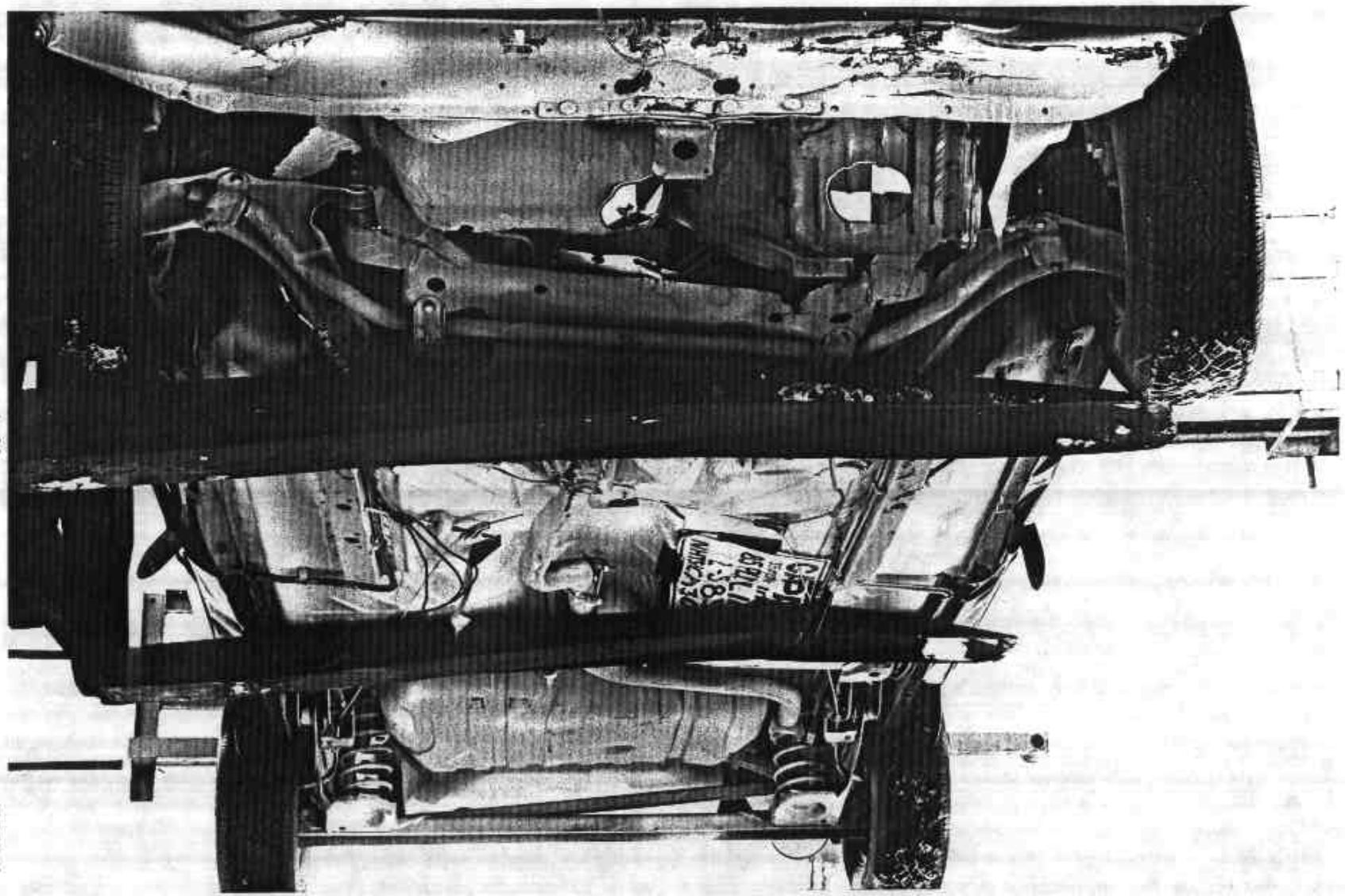


Figure A-19 POST-TEST FRONT UNDERBODY VIEW

7333-6

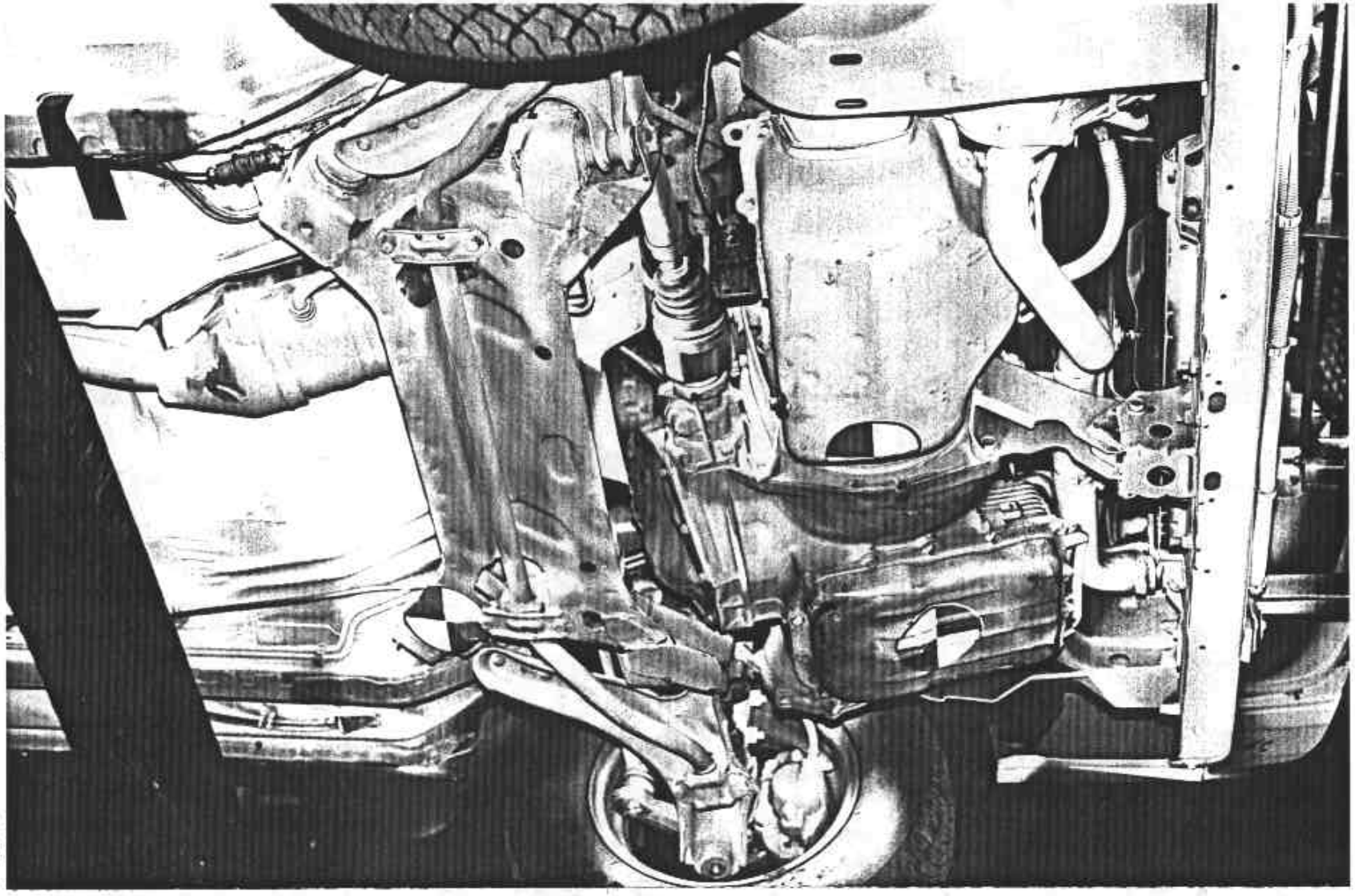


Figure A-20 PRE-TEST FRONT-SIDE UNDERBODY VIEW

7333-6

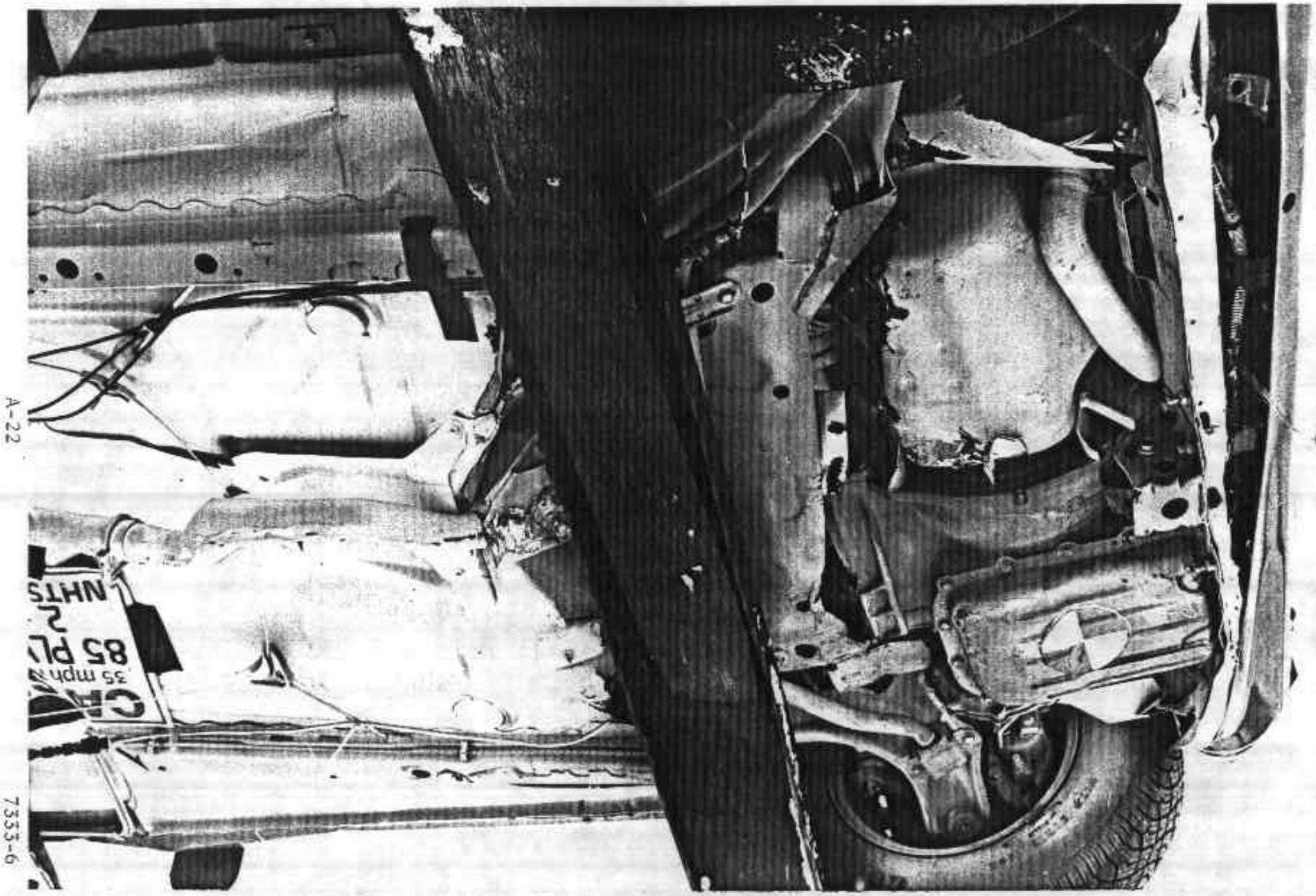


Figure A-21 POST-TEST FRONT-SIDE UNDERBODY VIEW

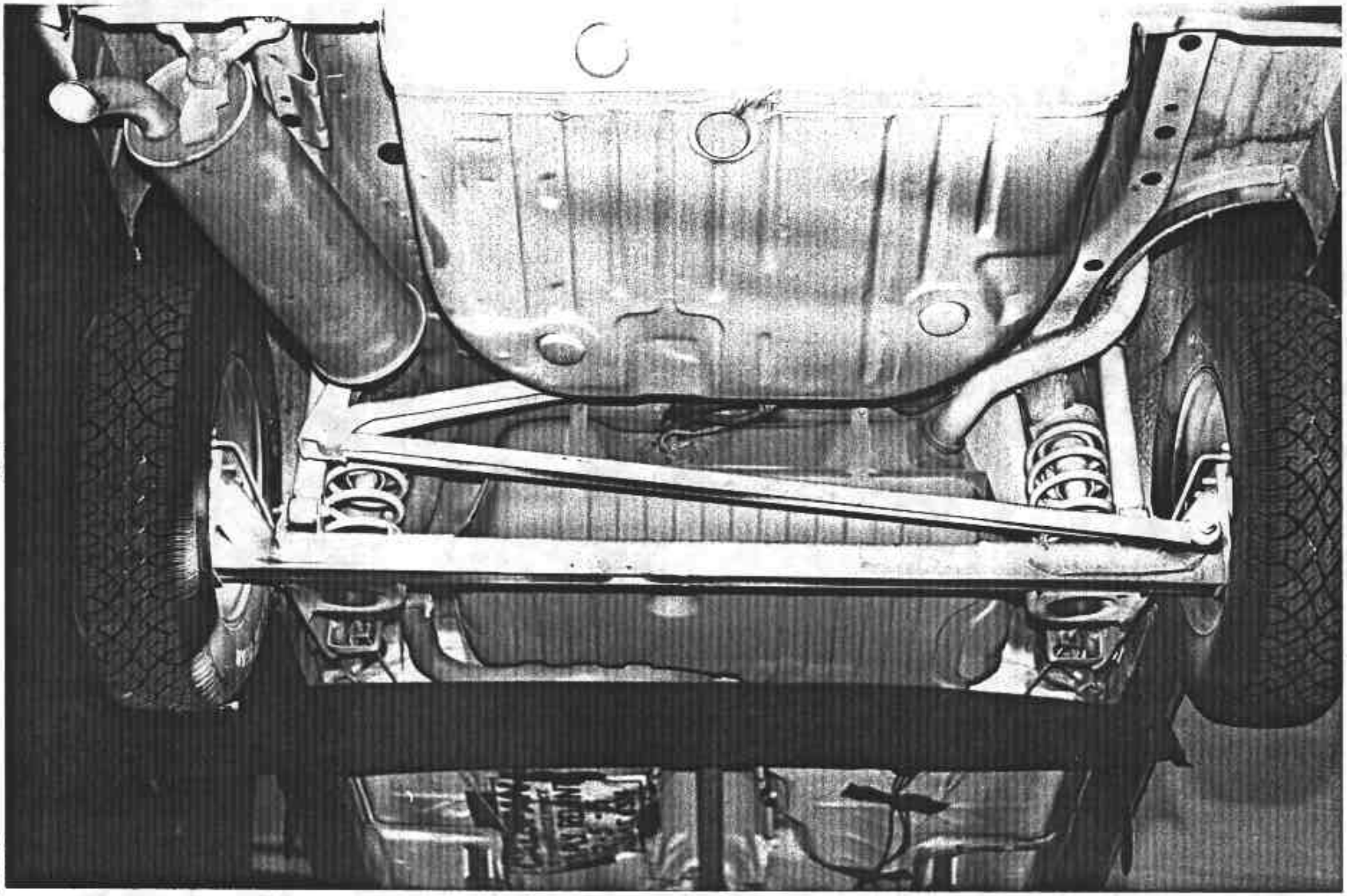


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Figure A-22 PRE-TEST REAR UNDERBODY VIEW

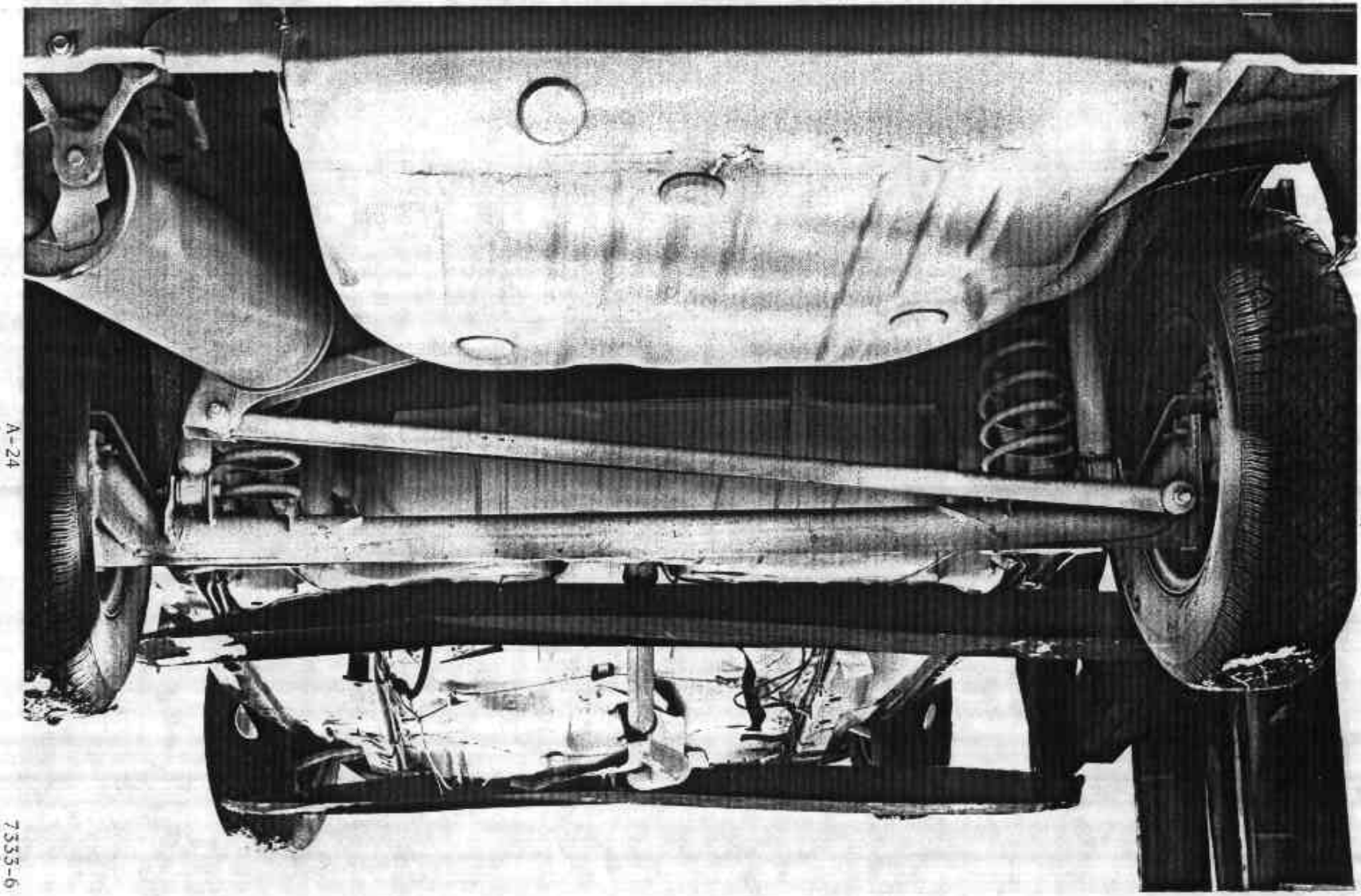

Figure A-23 POST-TEST REAR UNDERBODY VIEW

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7333-6

Figure A-24 PRE-TEST DRIVER POSITION VIEW

7333-6

Figure A-25 POST-TEST DRIVER POSITION VIEW

A-27

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Figure A-26 PRE-TEST PASSENGER POSITION VIEW

A-28

7333-6

Figure A-27 POST-TEST PASSENGER POSITION VIEW

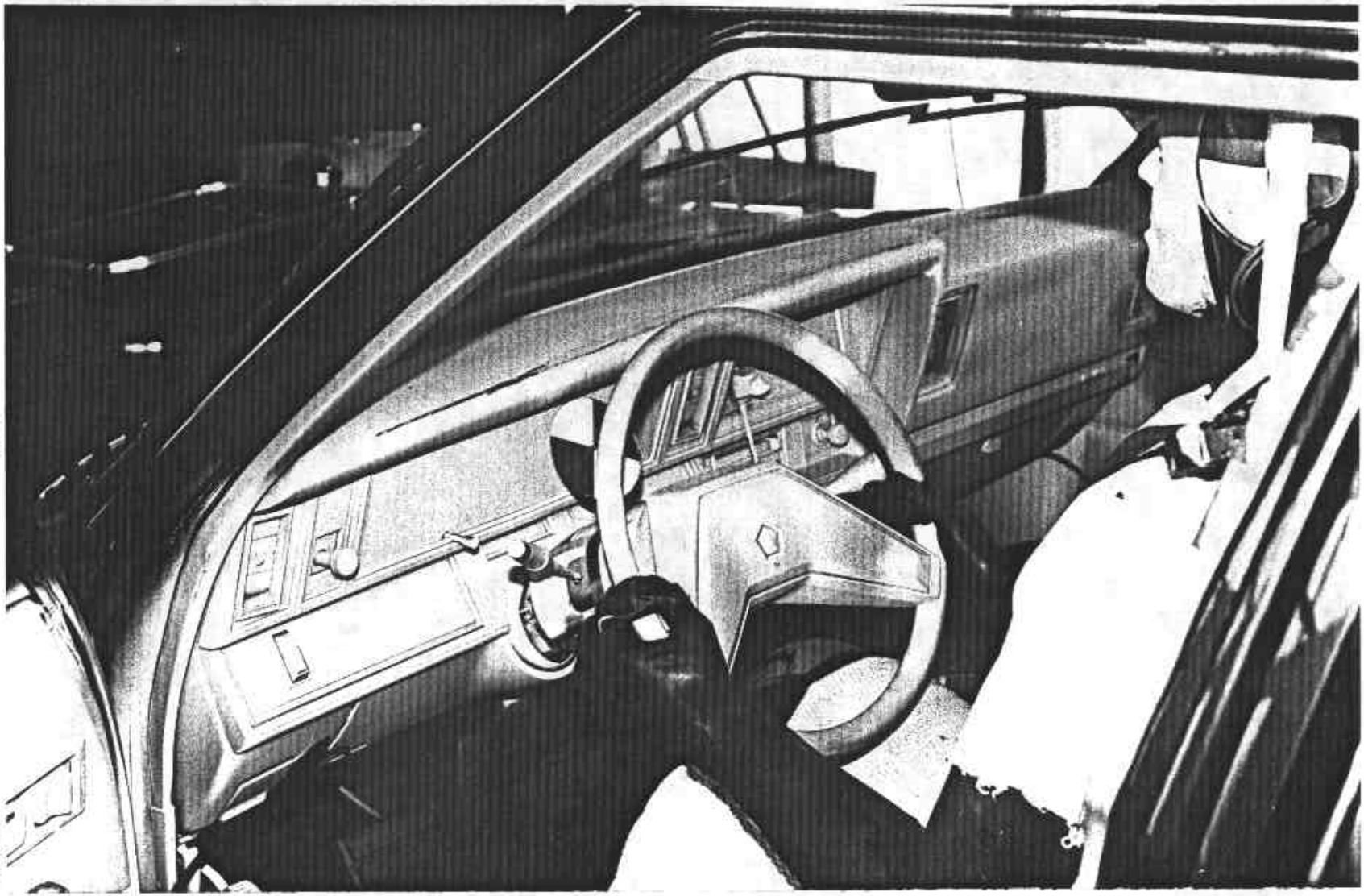

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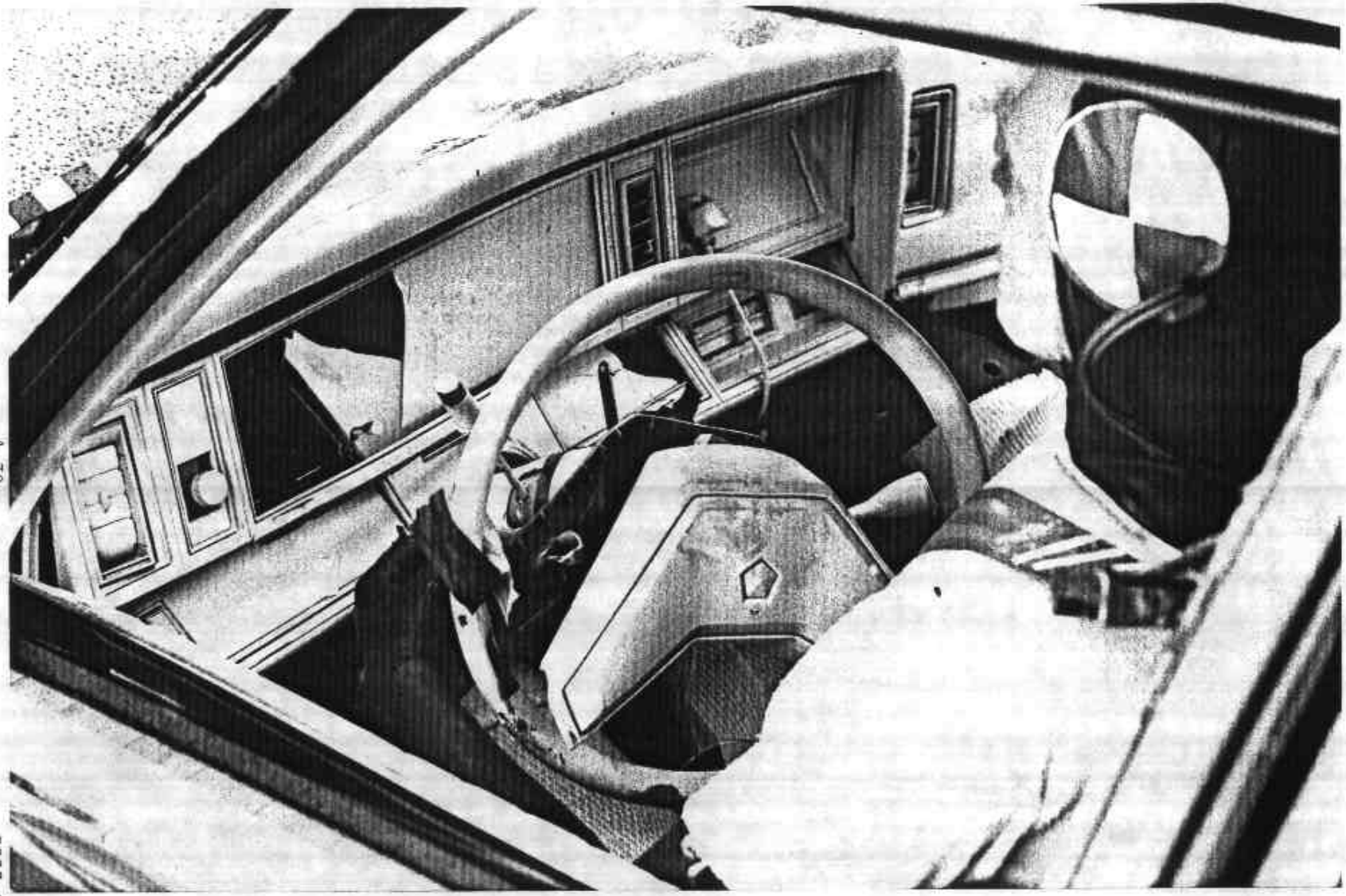
Figure A-28 PRE-TEST DRIVER AND INTERIOR VIEW



A-30

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Figure A-29 POST-TEST DRIVER AND INTERIOR VIEW

7333-6

Figure A-30 PRE-TEST PASSENGER AND INTERIOR VIEW

A-32

7333-6

Figure A-31 POST-TEST PASSENGER AND INTERIOR VIEW

APPENDIX B

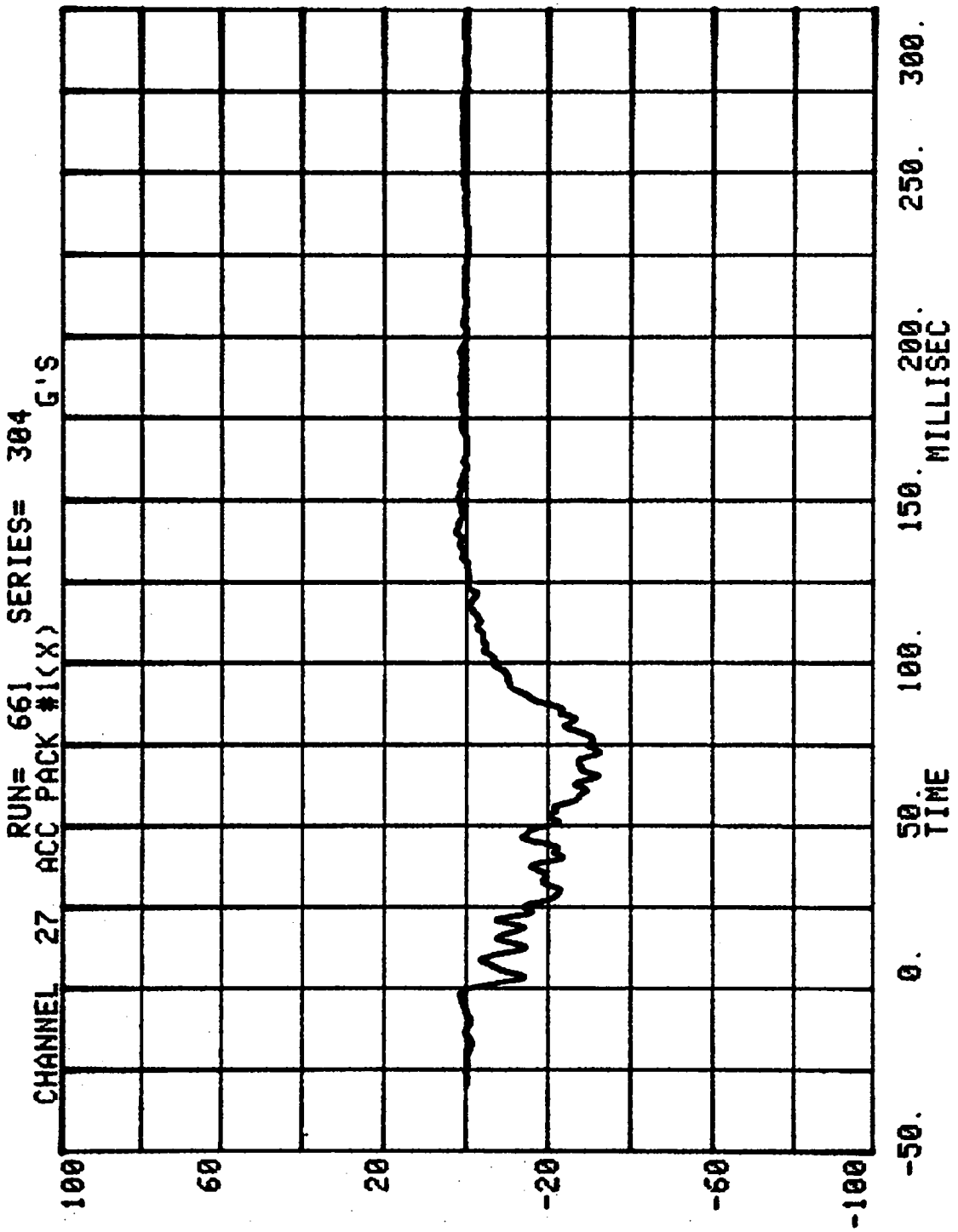
VEHICLE, DUMMY AND LOAD CELL BARRIER DATA

TEST NO. CF0304

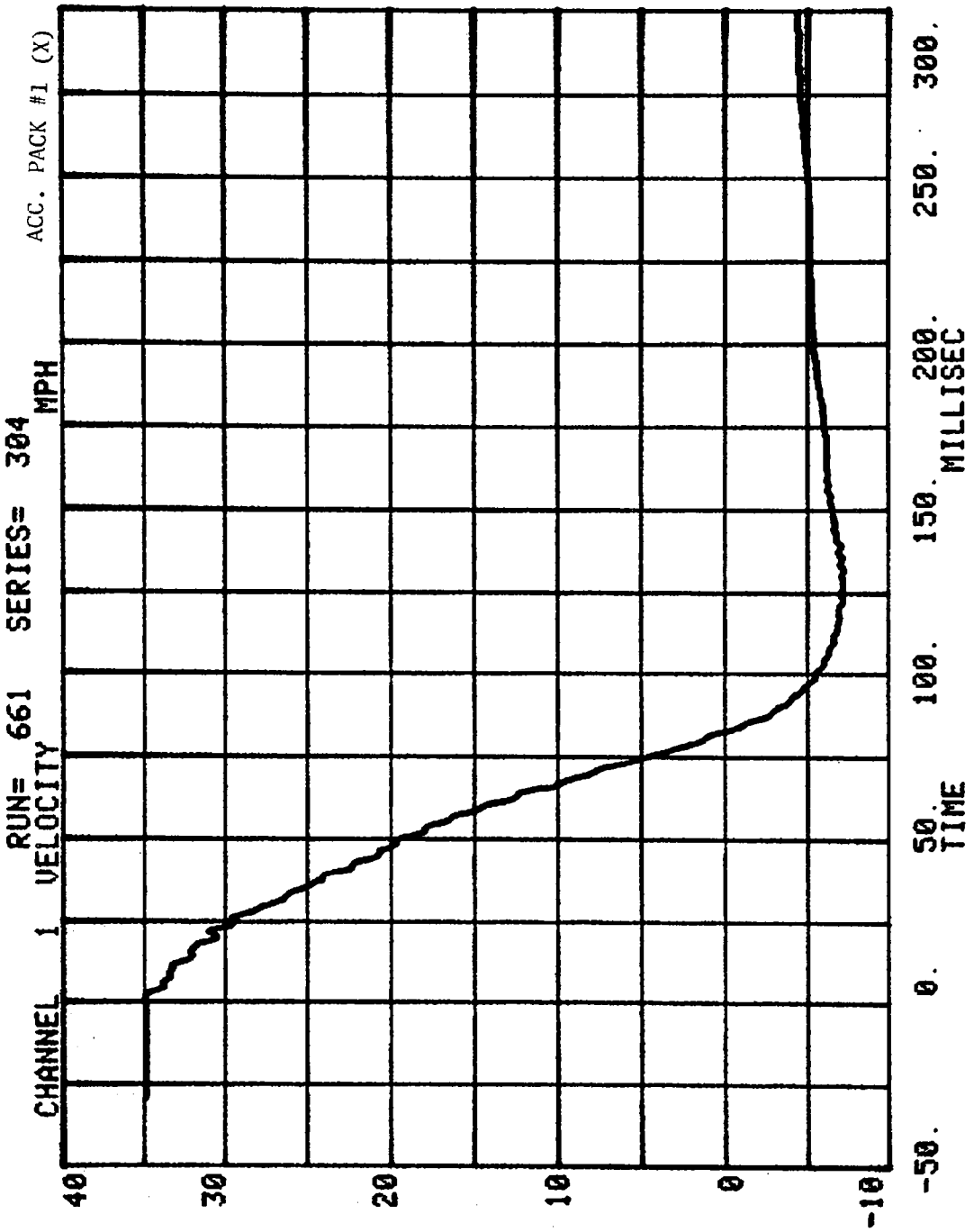
VEHICLE DATA

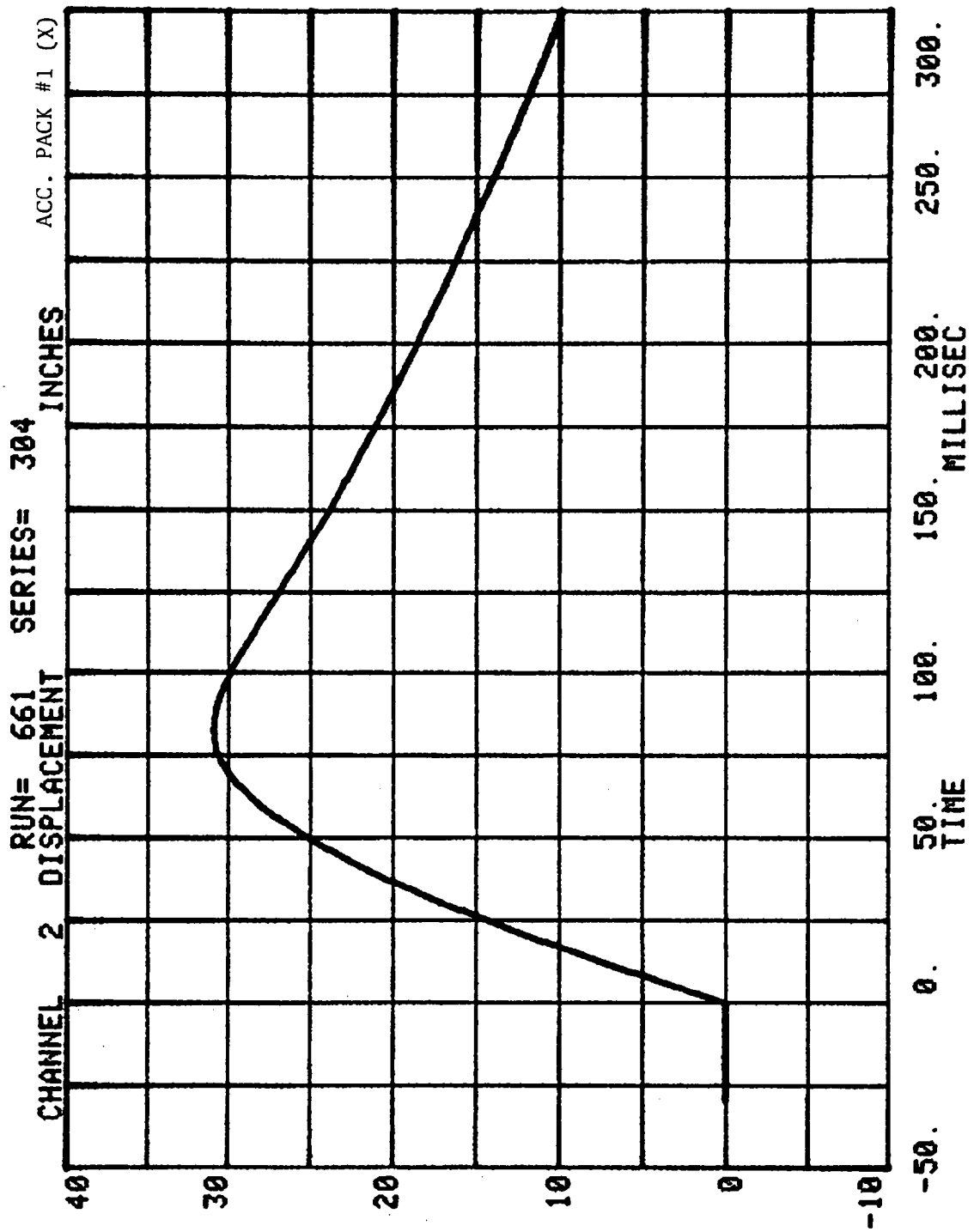
FILTER CHANNEL CLASS

60

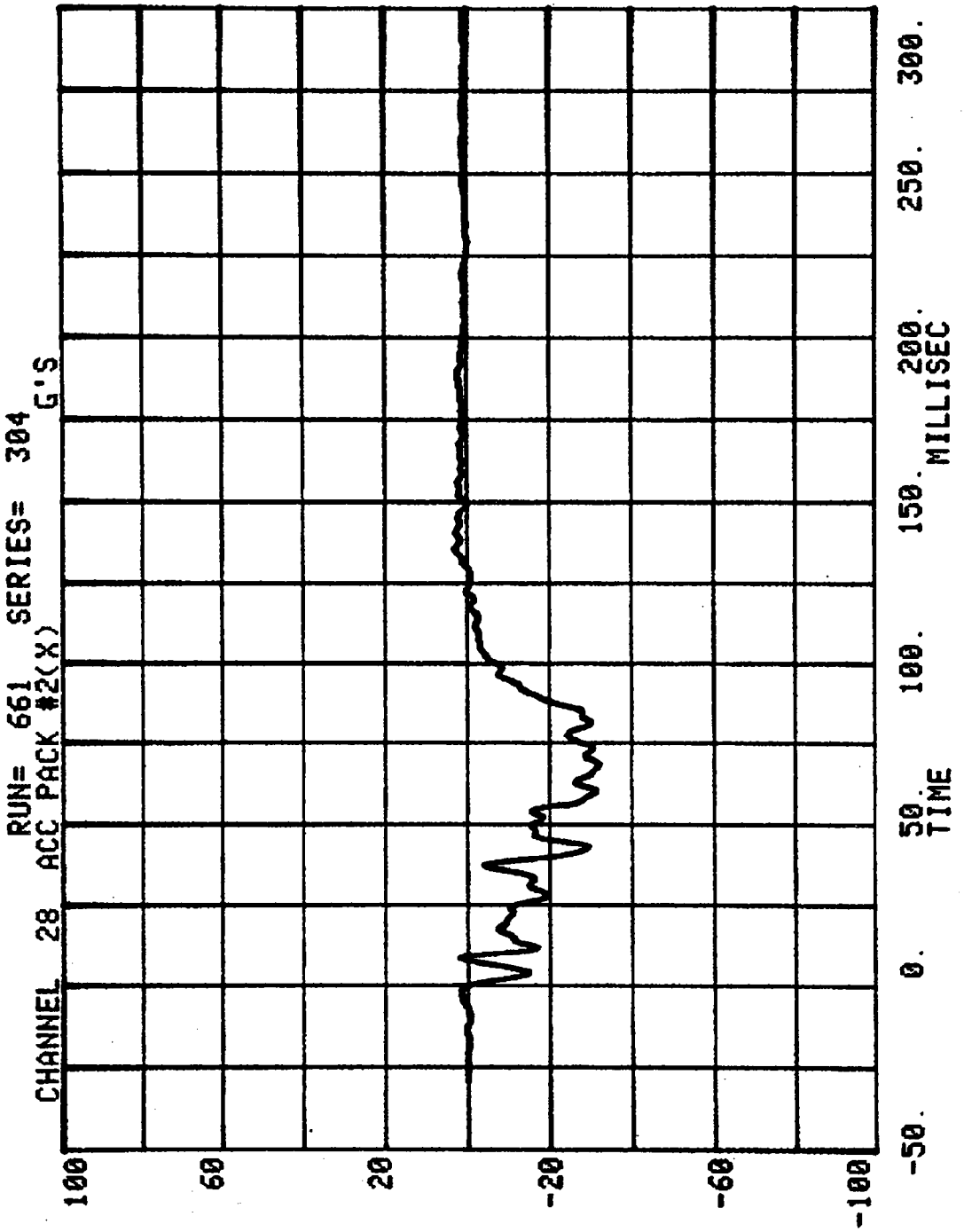

CHANNEL 27 ACC PACK #1(X)
RUN= 661 SERIES= 304
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

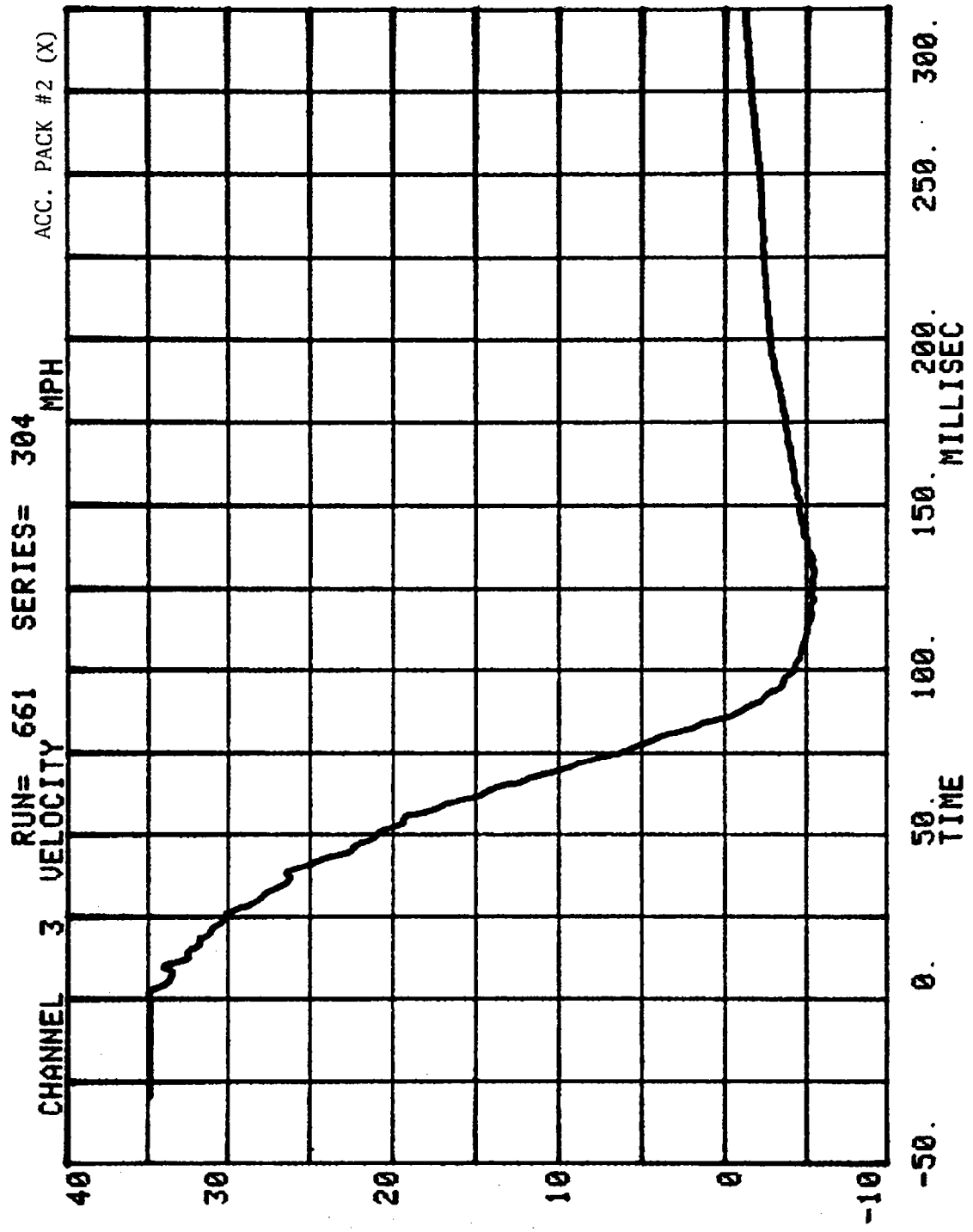
7333-6

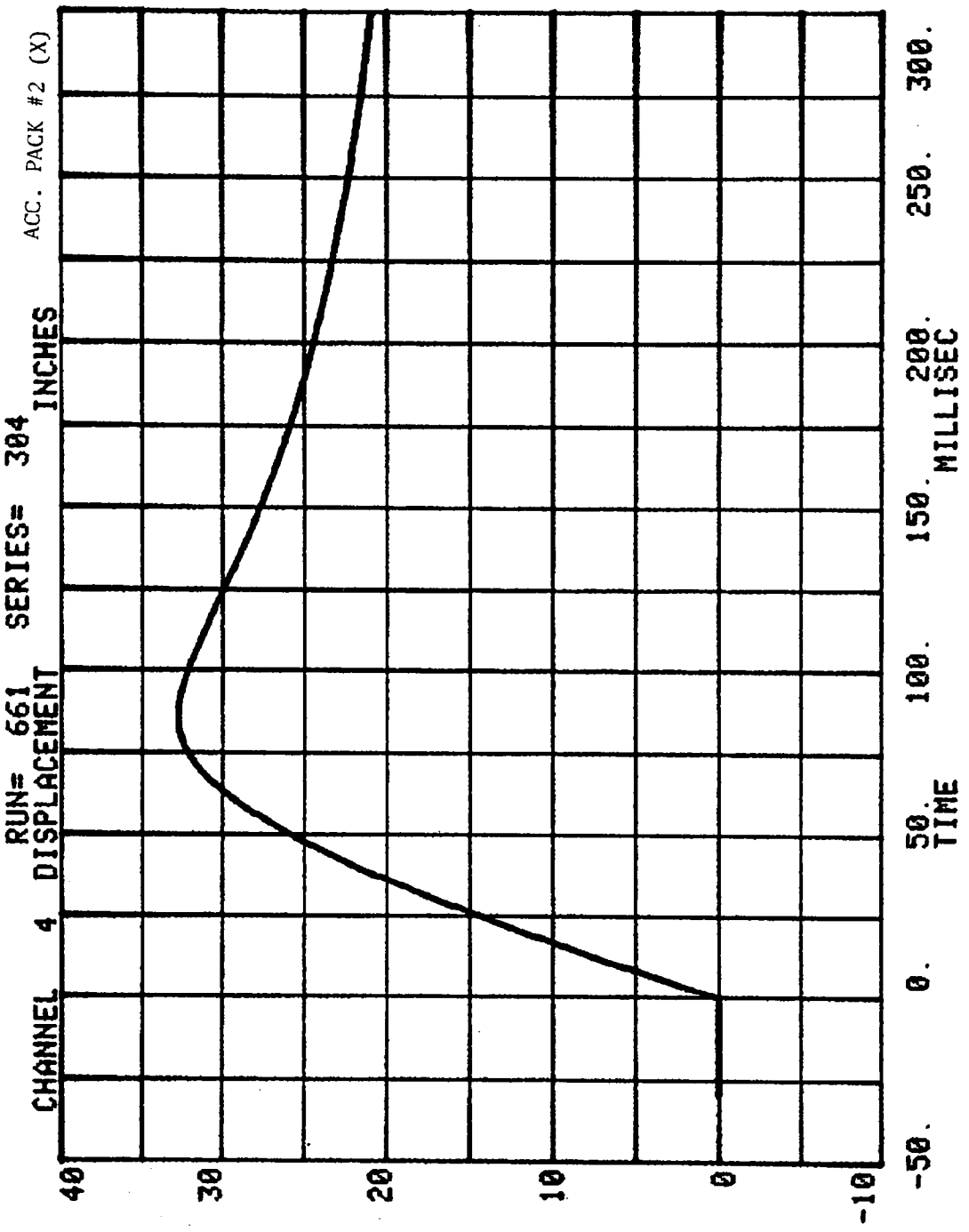

CHANNEL 1 VELOCITY
RUN= 661 SERIES= 304 MPH
ACC. PACK #1 (X)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 2 DISPLACEMENT
RUN= 661 SERIES= 304
ACC. PACK #1 (X)
INCHES
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6


CHANNEL 28 ACC PACK #2(X)
RUN= 661 SERIES= 304
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


ACC. PACK #2 (X)
CHANNEL 3 VELOCITY
RUN= 661 SERIES= 304
MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 4 DISPLACEMENT
RUN= 661 SERIES= 304 INCHES
ACC. PACK #2 (X)
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30
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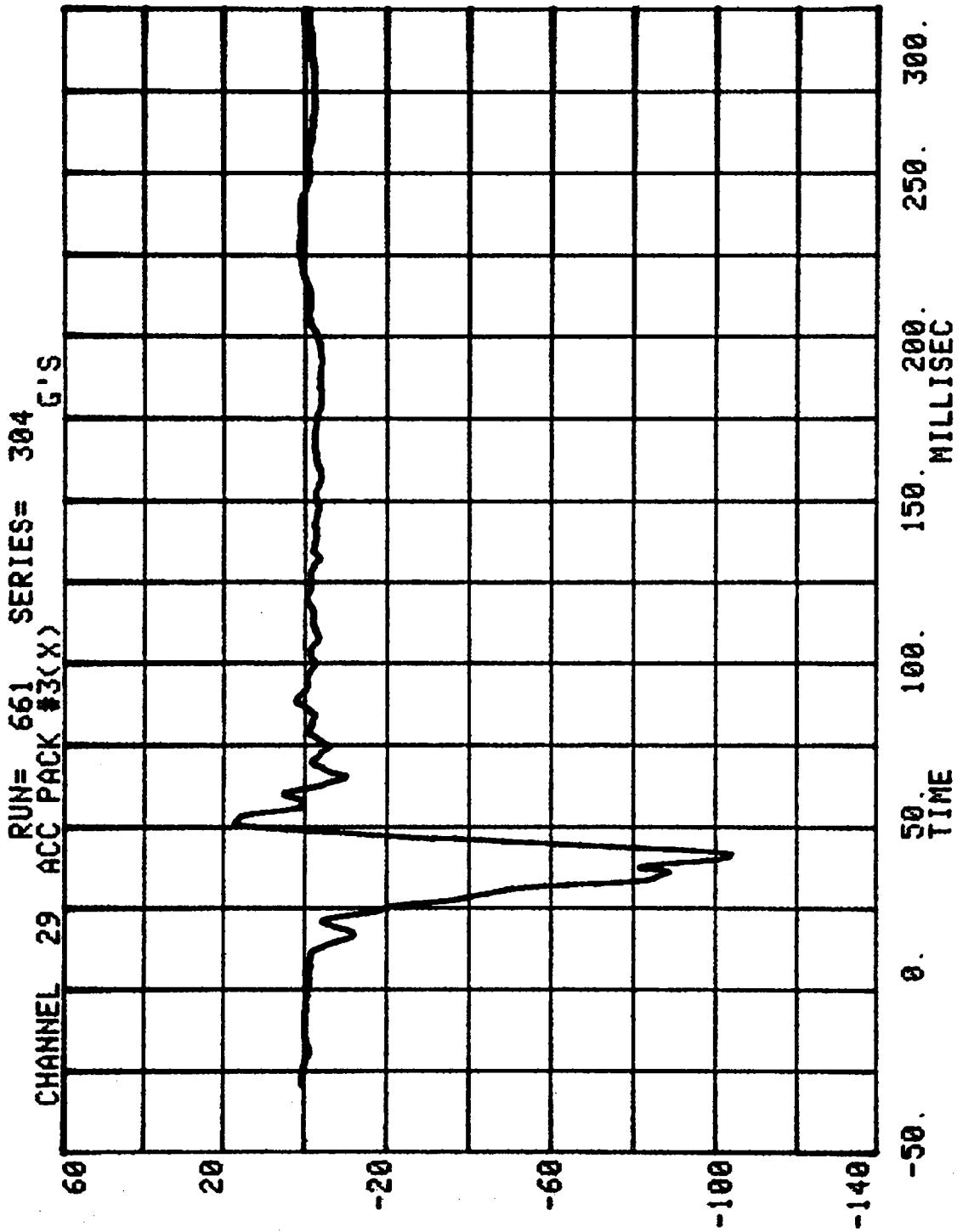
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC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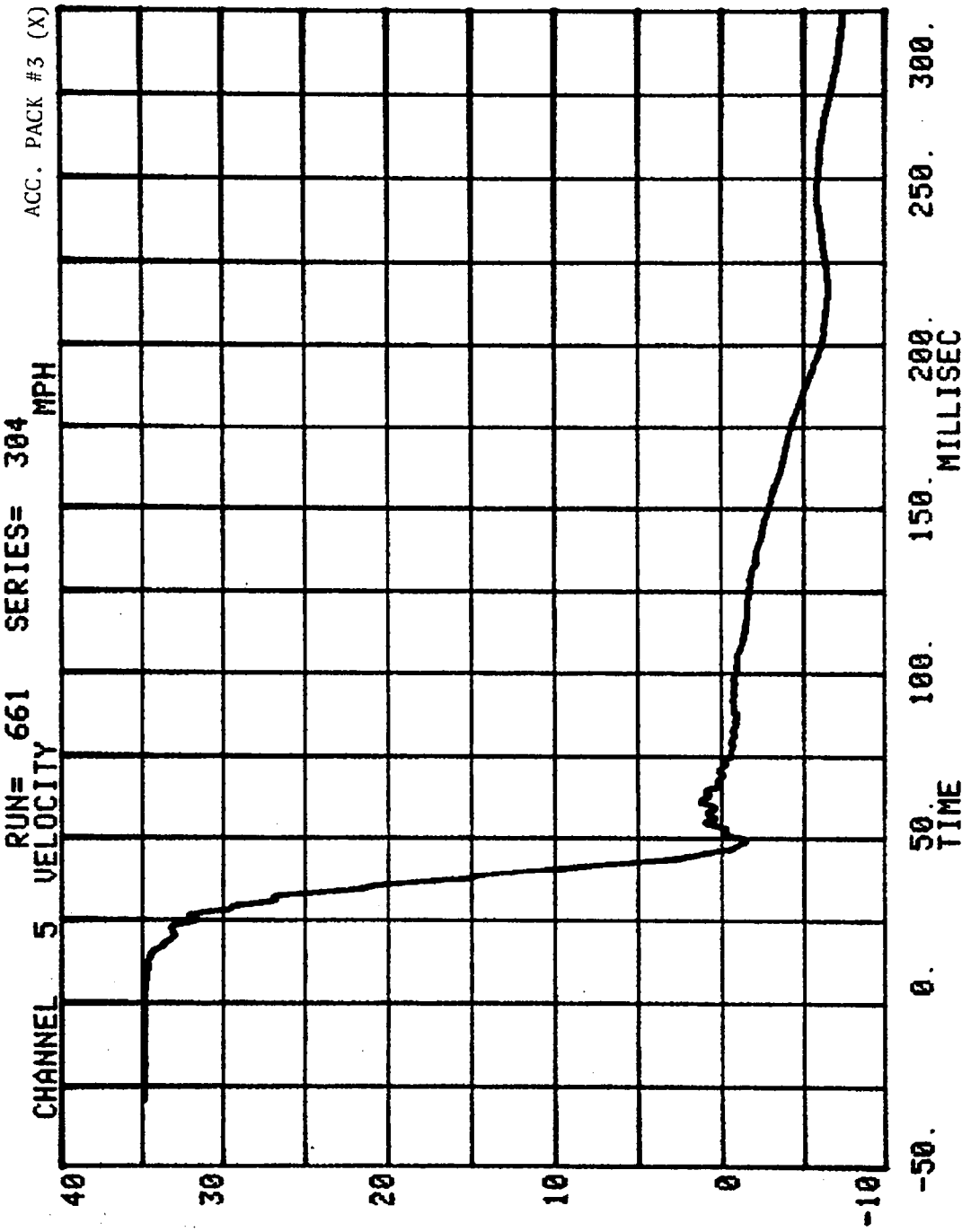
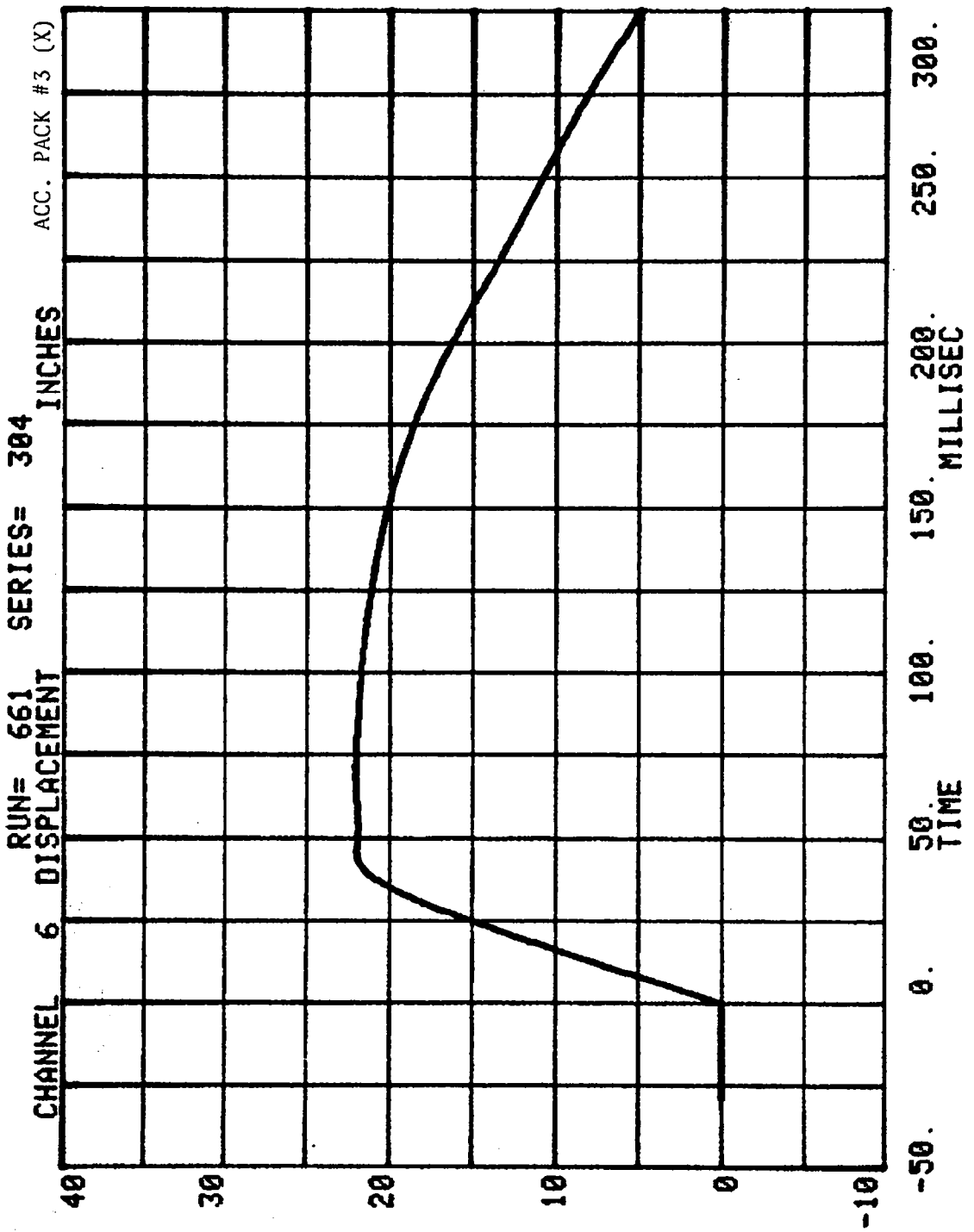
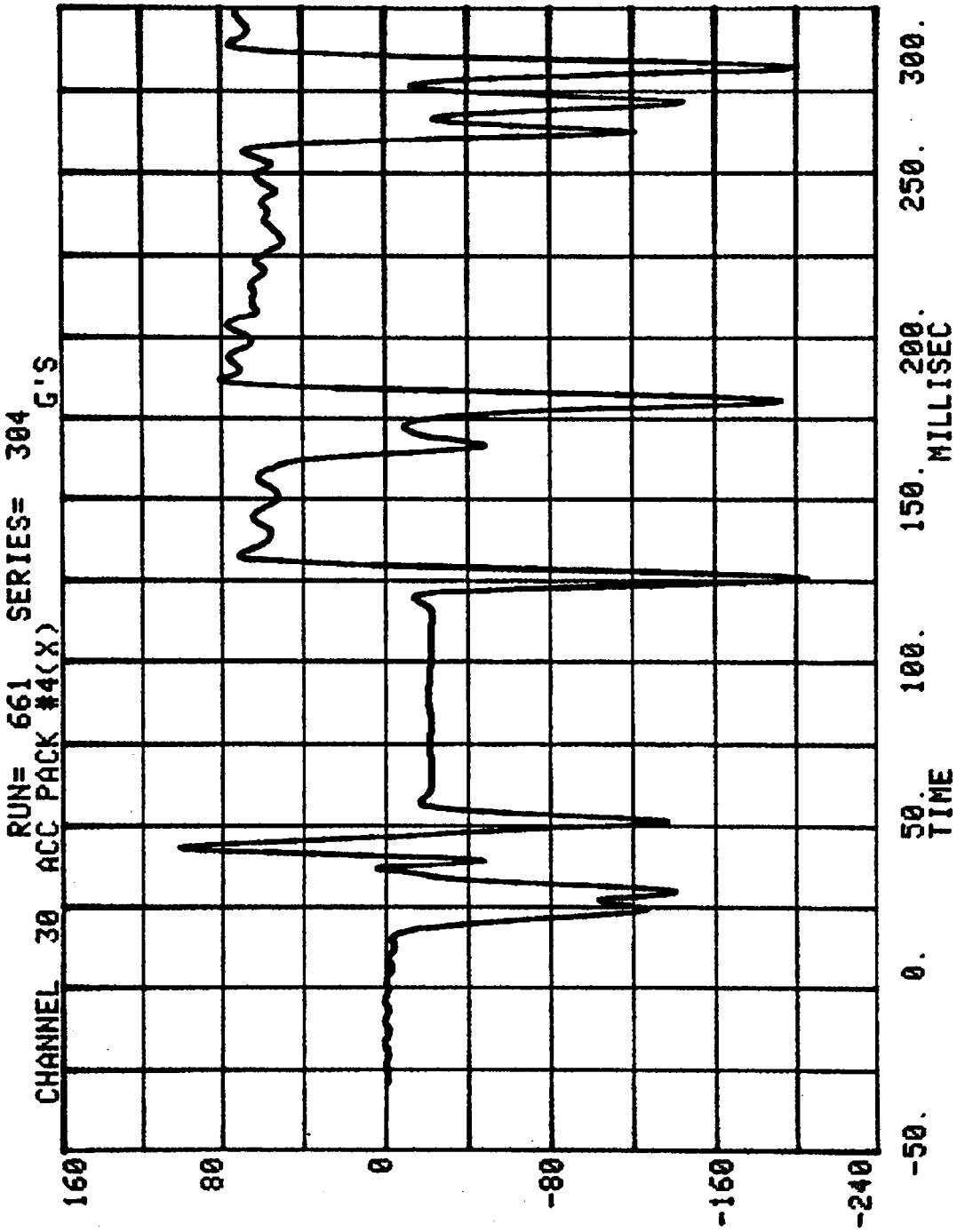
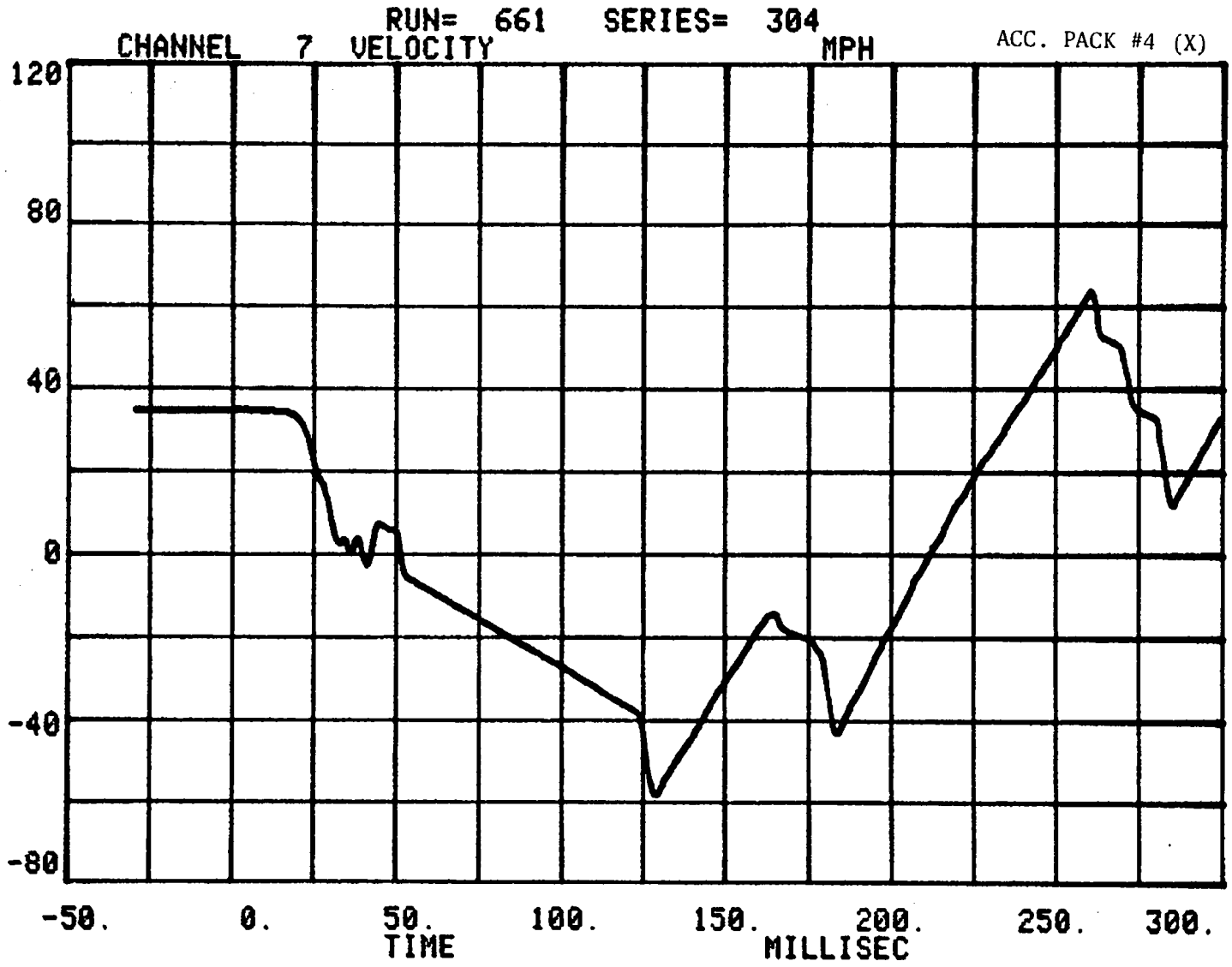
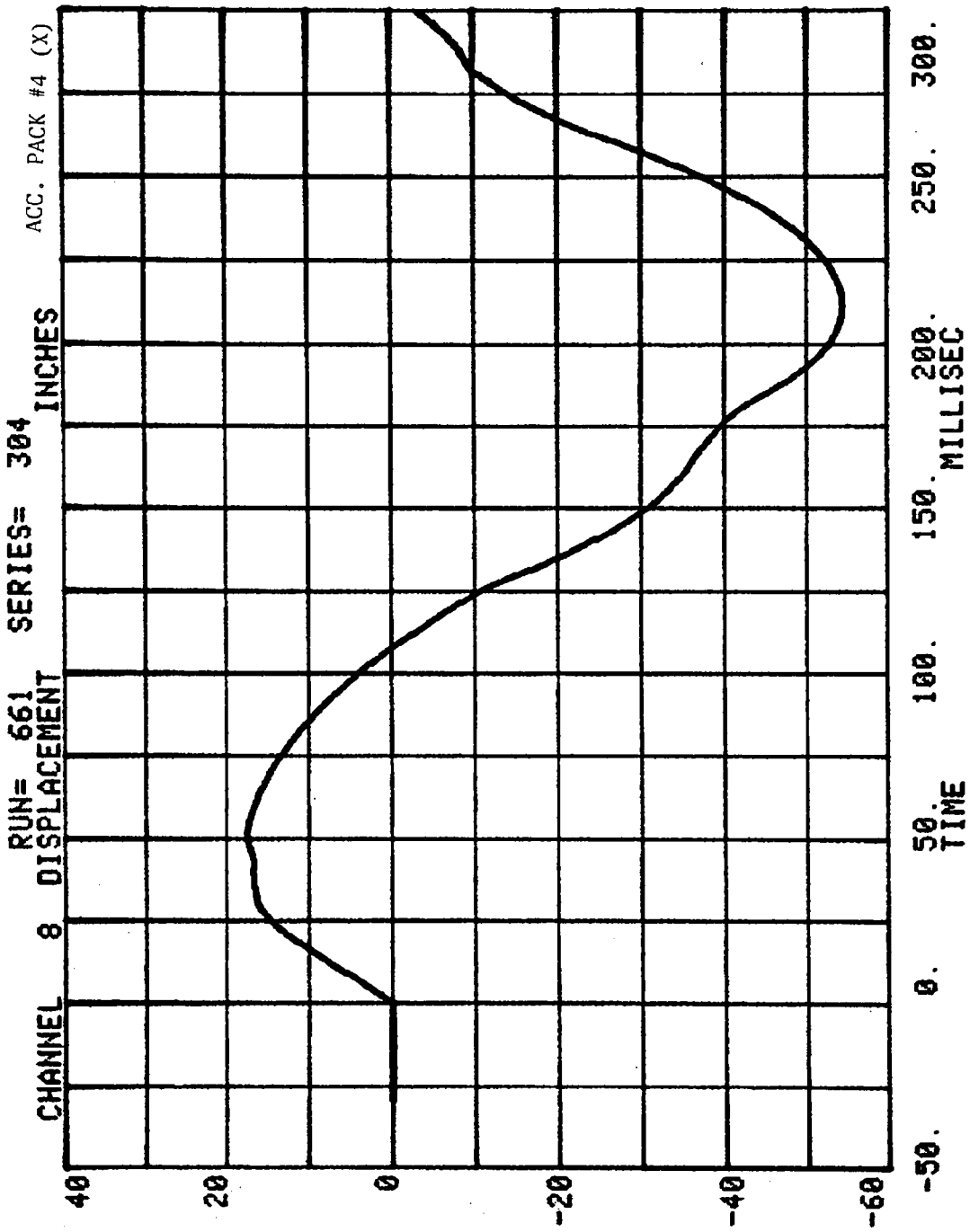
RUN= 661 SERIES= 304
G'S
60
20
-20
-60
-100
-140
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

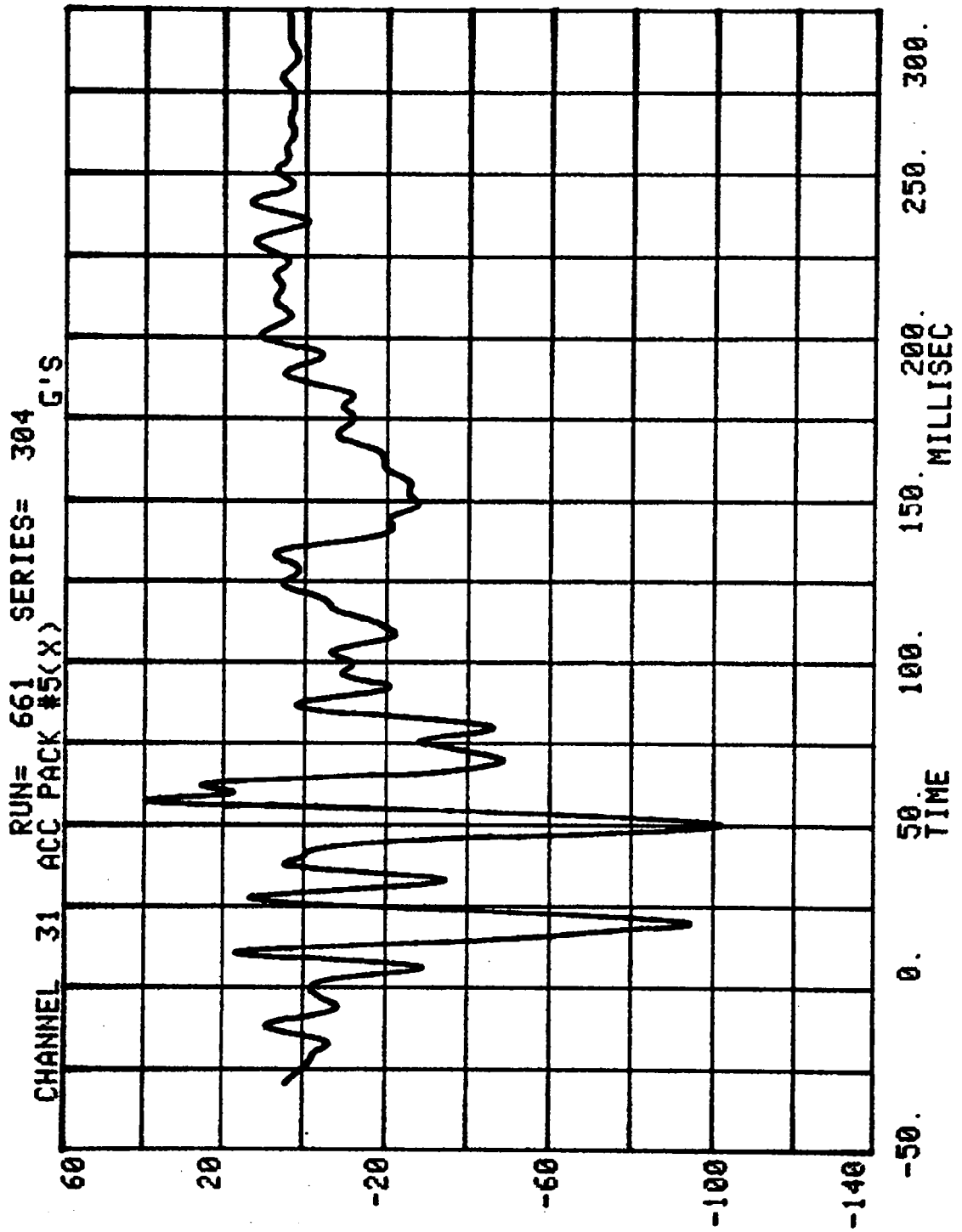

ACC. PACK #3 (X)
CHANNEL 5 VELOCITY
RUN= 661 SERIES= 304 MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


ACC. PACK #3 (X)
CHANNEL 6 DISPLACEMENT
RUN= 661 SERIES= 304
INCHES
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

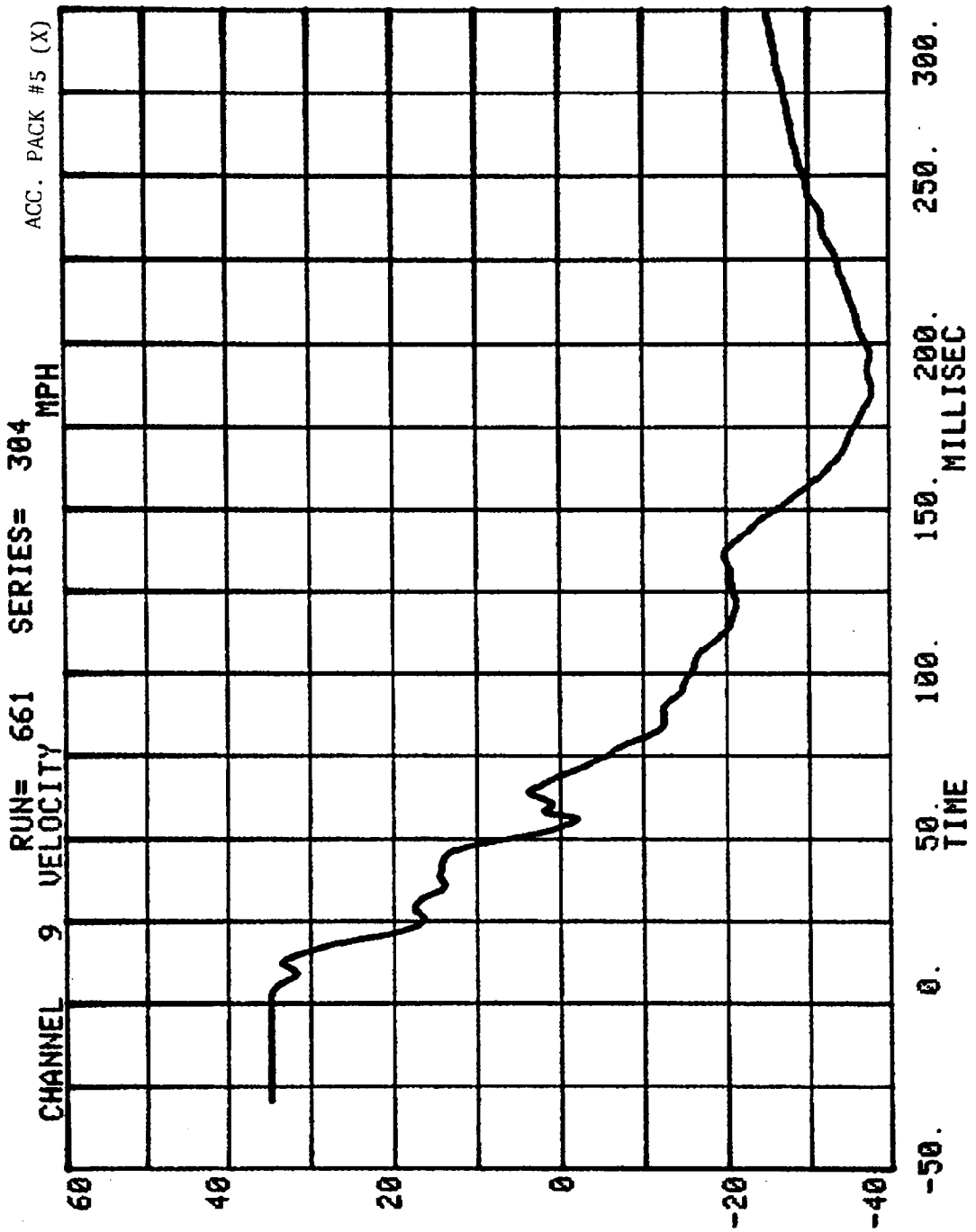

CHANNEL 30 ACC PACK #4(X)
RUN= 661 SERIES= 304
G'S
160
80
0
-80
-160
-240
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 661 SERIES= 304
CHANNEL 7 VELOCITY
MPH
ACC. PACK #4 (X)
120
80
40
0
-40
-80
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

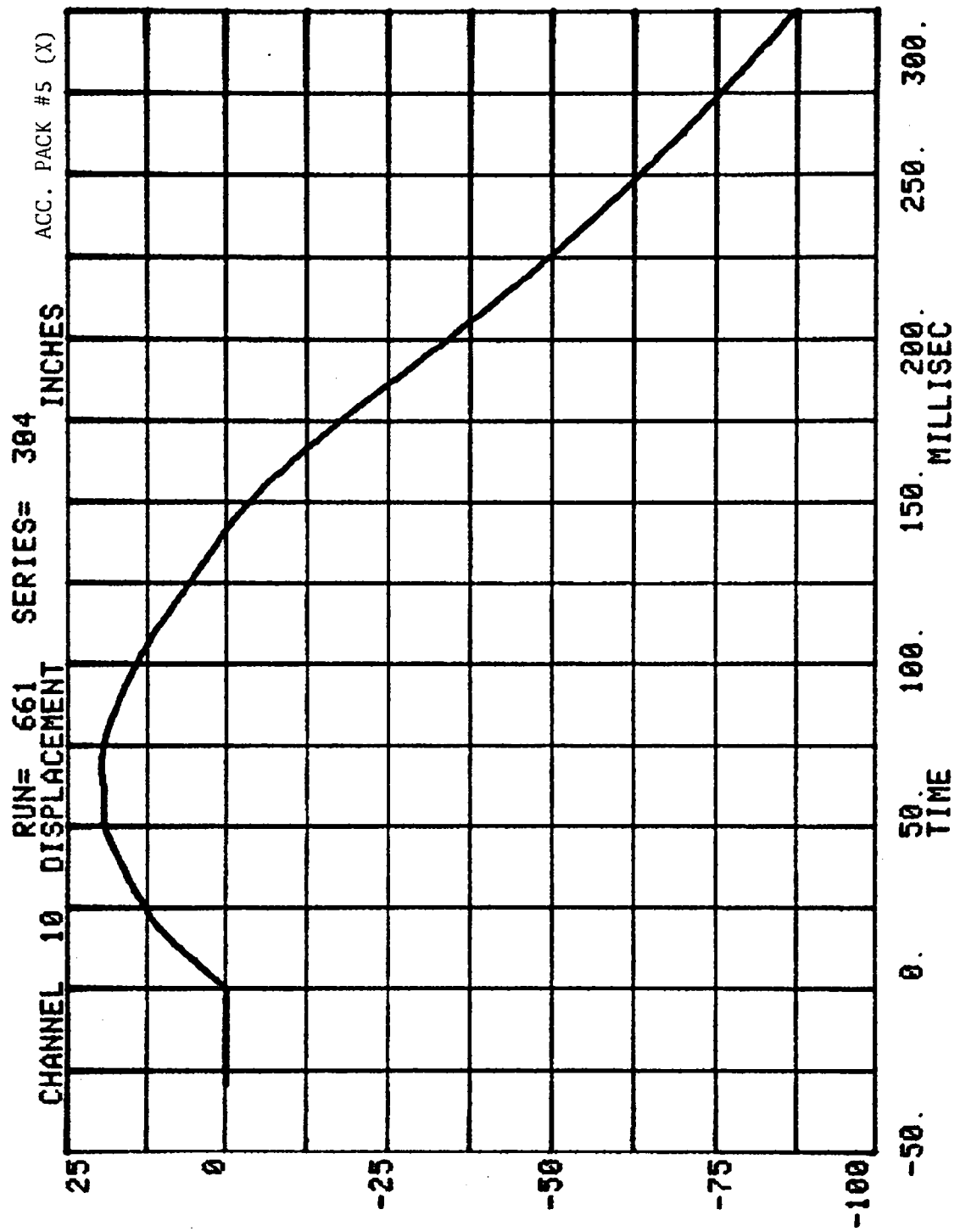

CHANNEL 8 DISPLACEMENT
RUN= 661 SERIES= 304
ACC. PACK #4 (X)
INCHES
40
20
0
-20
-40
-60
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

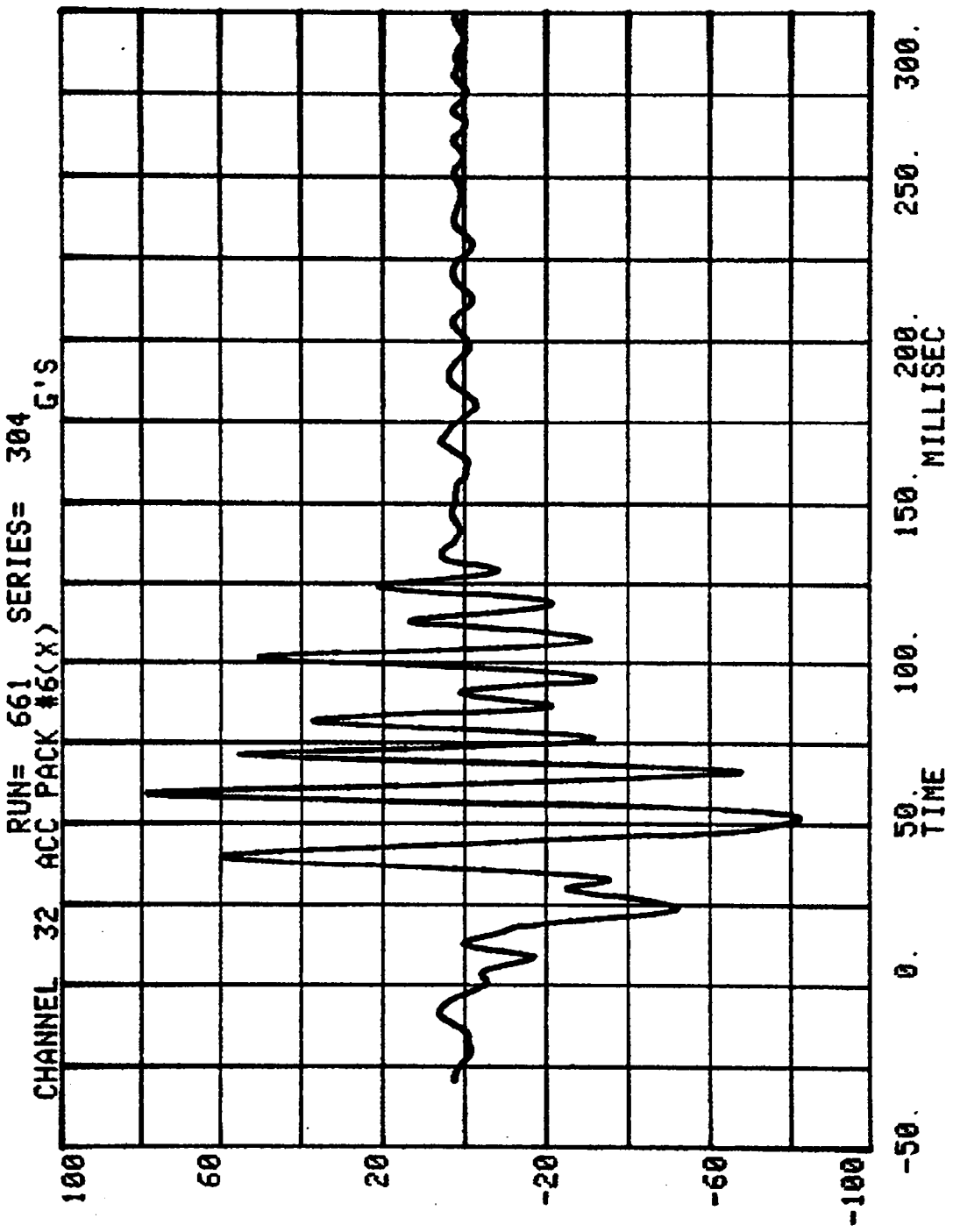

CHANNEL 31 ACC PACK #5(X)
RUN= 661 SERIES= 304
G'S
60
20
-20
-60
-100
-140
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

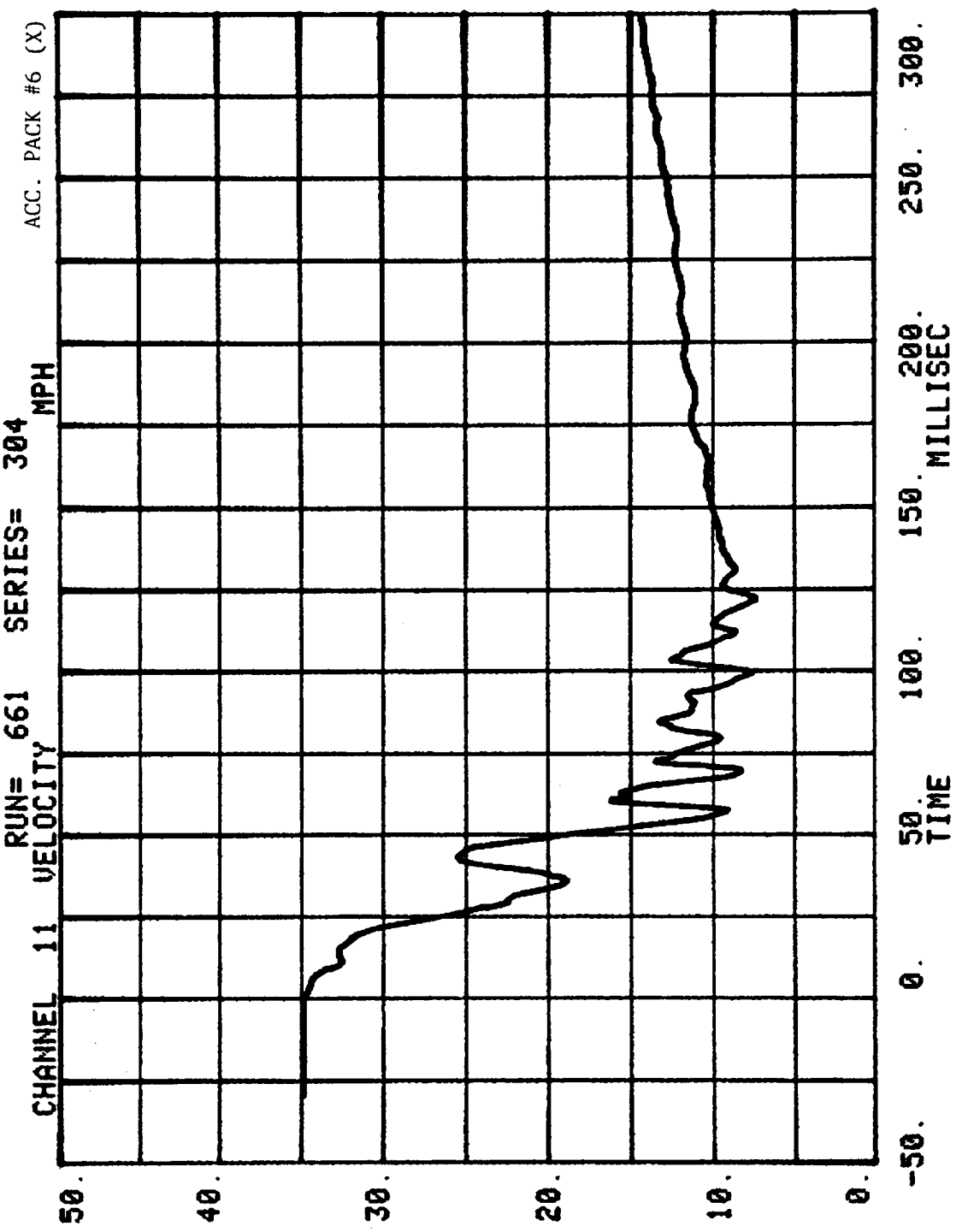
7333-6

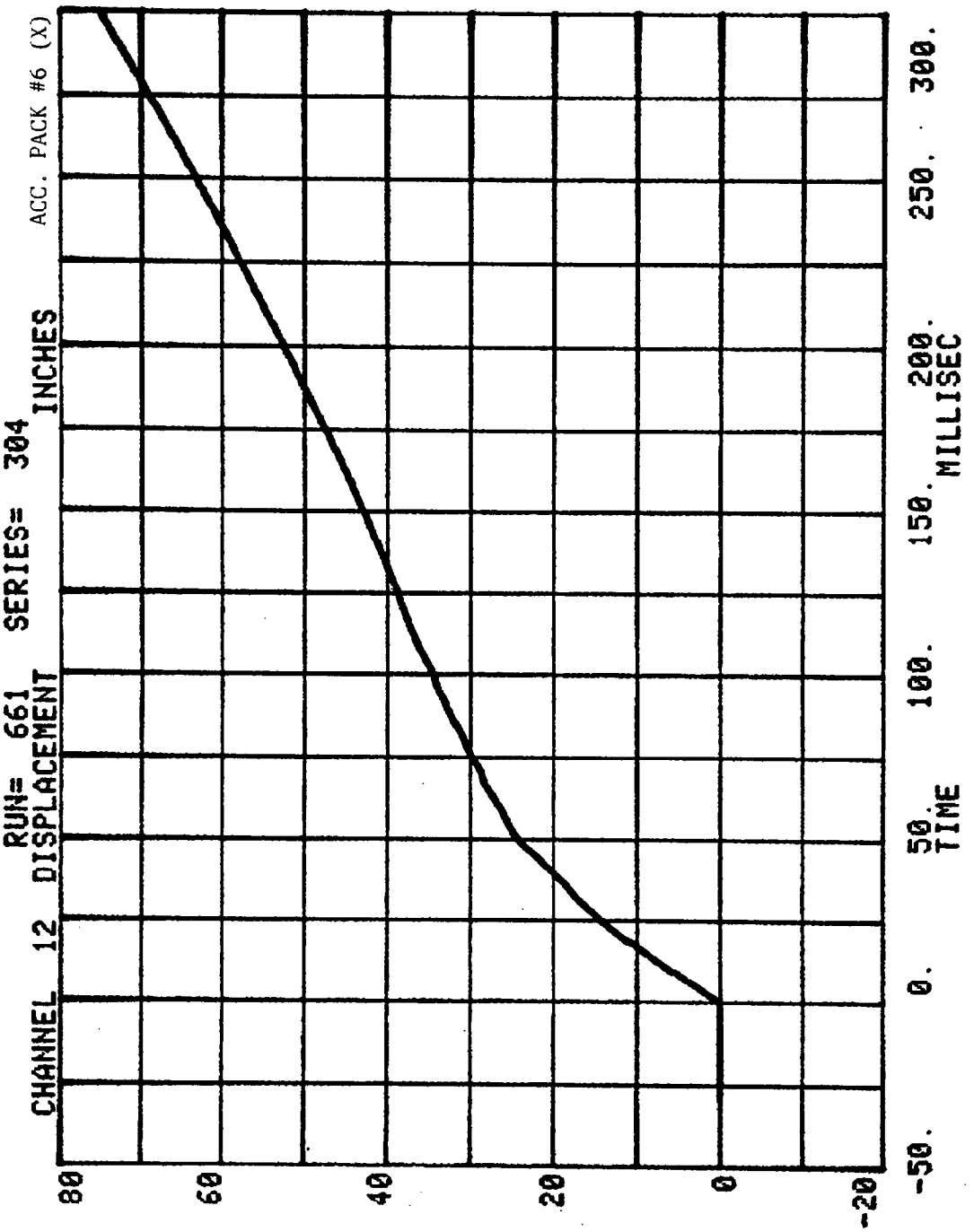

ACC. PACK #5 (X)
CHANNEL 9 VELOCITY
RUN= 661 SERIES= 304 MPH
60
40
20
0
-20
-40
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6

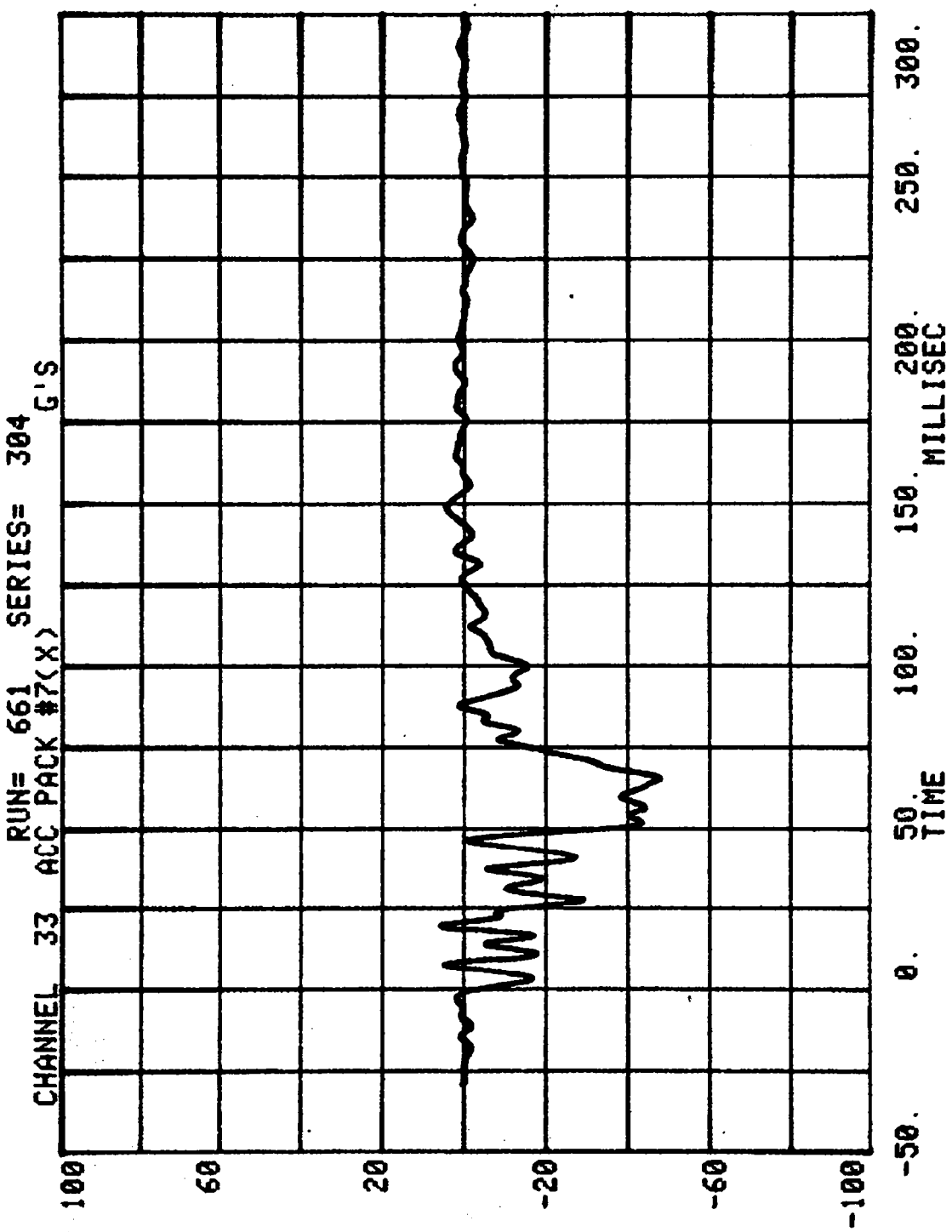

CHANNEL 10 DISPLACEMENT
RUN= 661 SERIES= 304
INCHES
ACC. PACK #5 (X)
25
0
-25
-50
-75
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

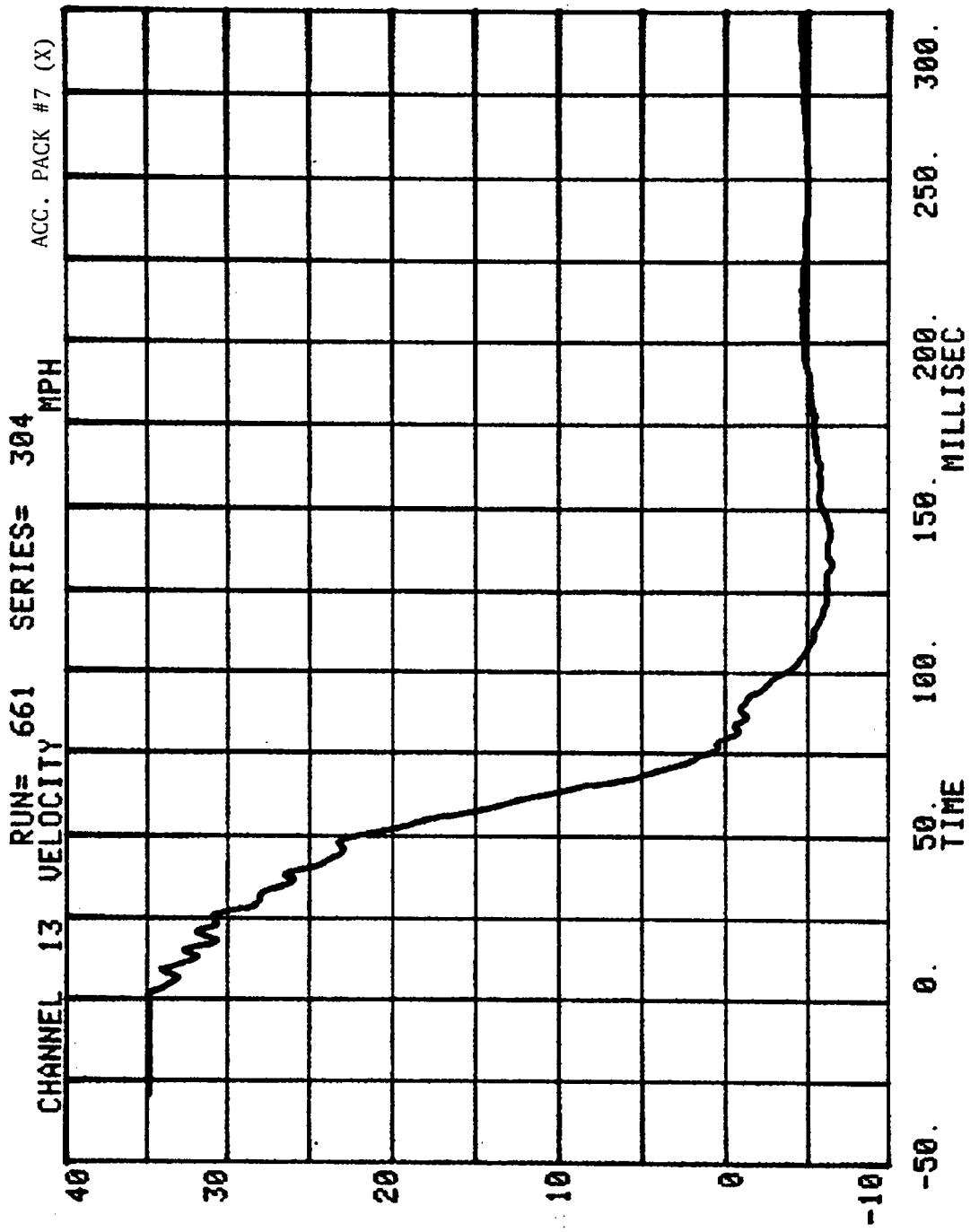

CHANNEL 32 ACC PACK #6(X)
RUN= 661 SERIES= 304
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


ACC. PACK #6 (X)
CHANNEL 11 VELOCITY
RUN= 661 SERIES= 304 MPH
50.
40.
30.
20.
10.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

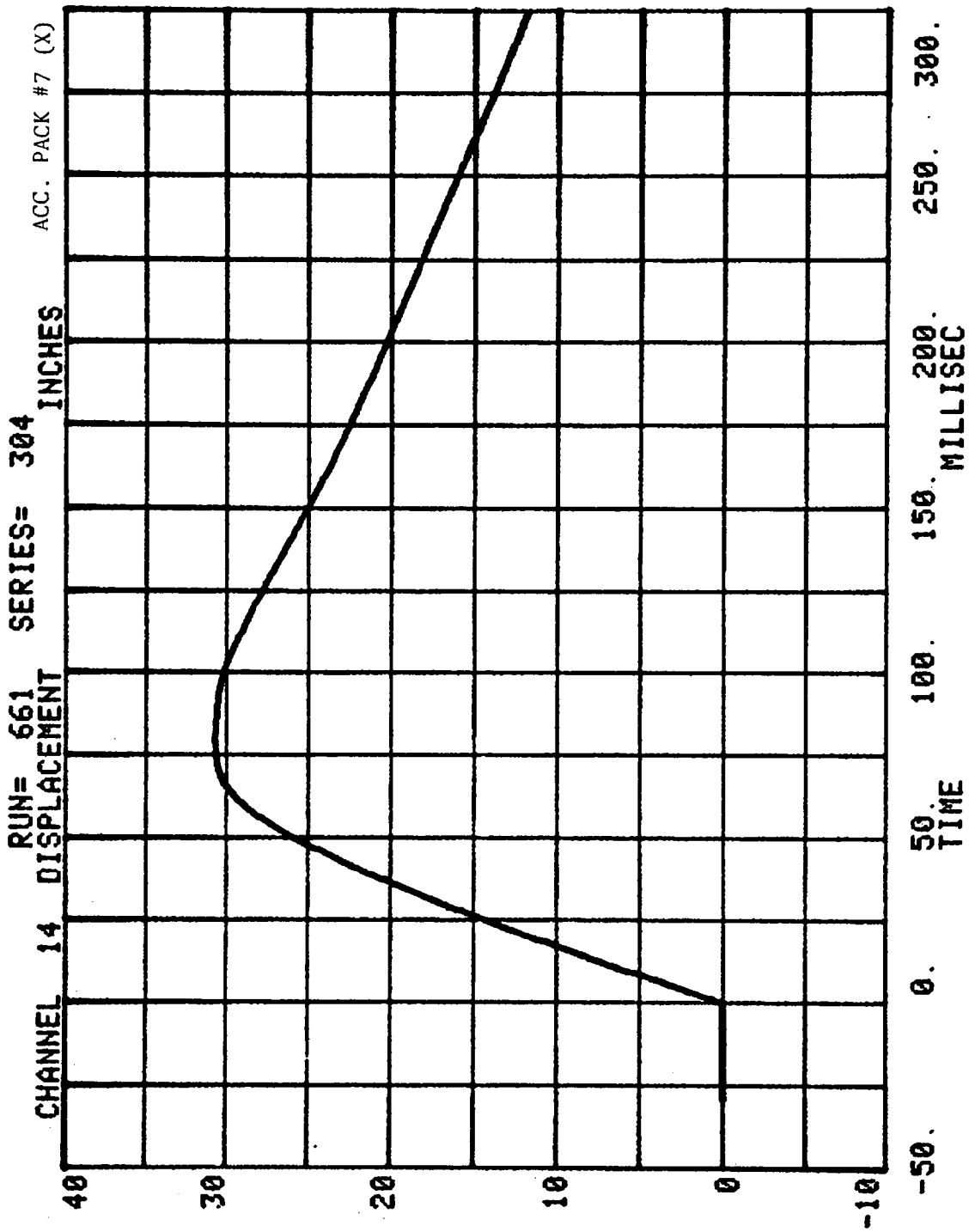

CHANNEL 12 DISPLACEMENT
RUN= 661 SERIES= 304
INCHES
ACC. PACK #6 (X)
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6


CHANNEL 33 ACC PACK #7(X)
RUN= 661 SERIES= 304
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
TIME
100.
150.
200.
MILLISEC
250.
300.


ACC. PACK #7 (X)
CHANNEL 13 VELOCITY
RUN= 661 SERIES= 304 MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

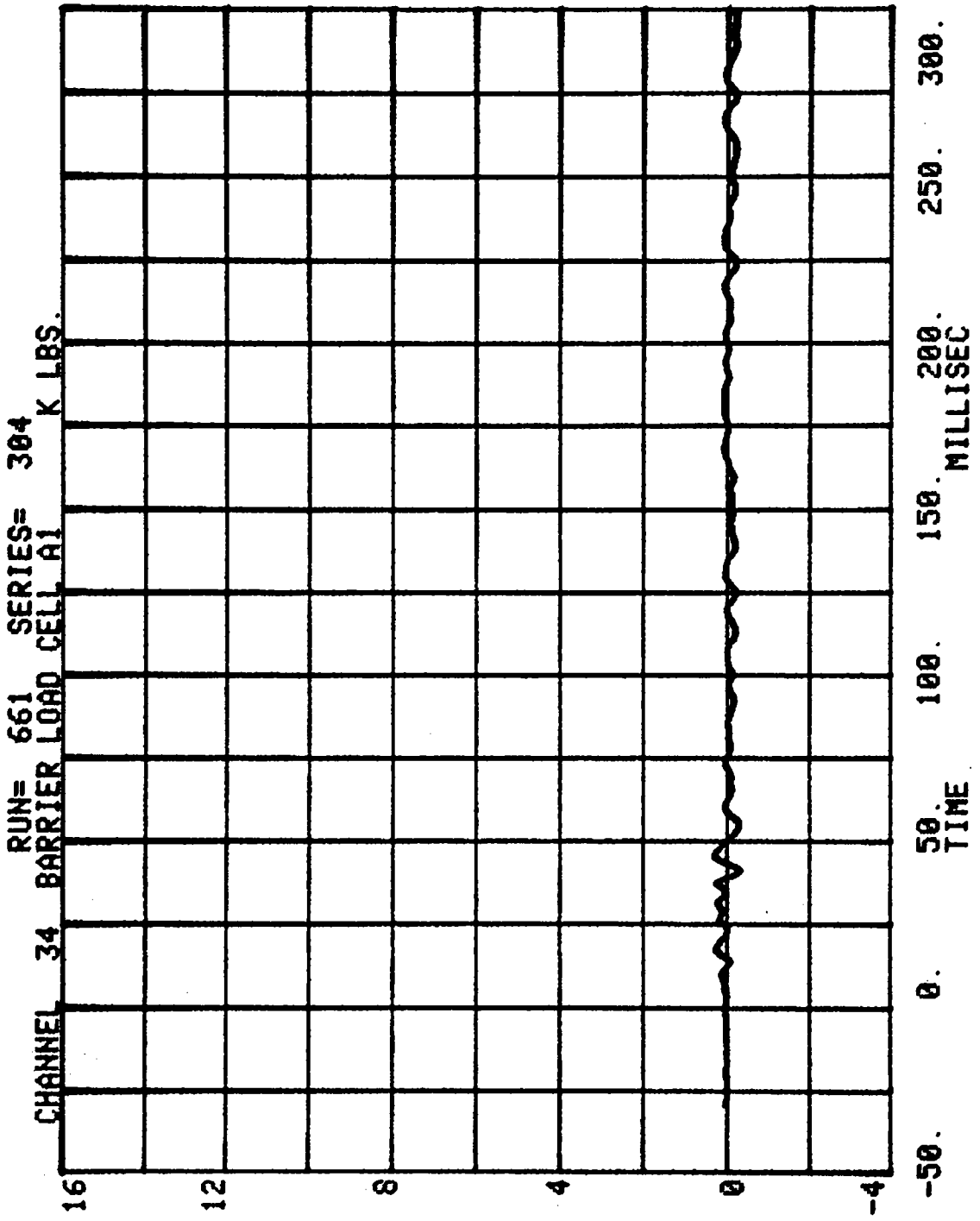
7333-6

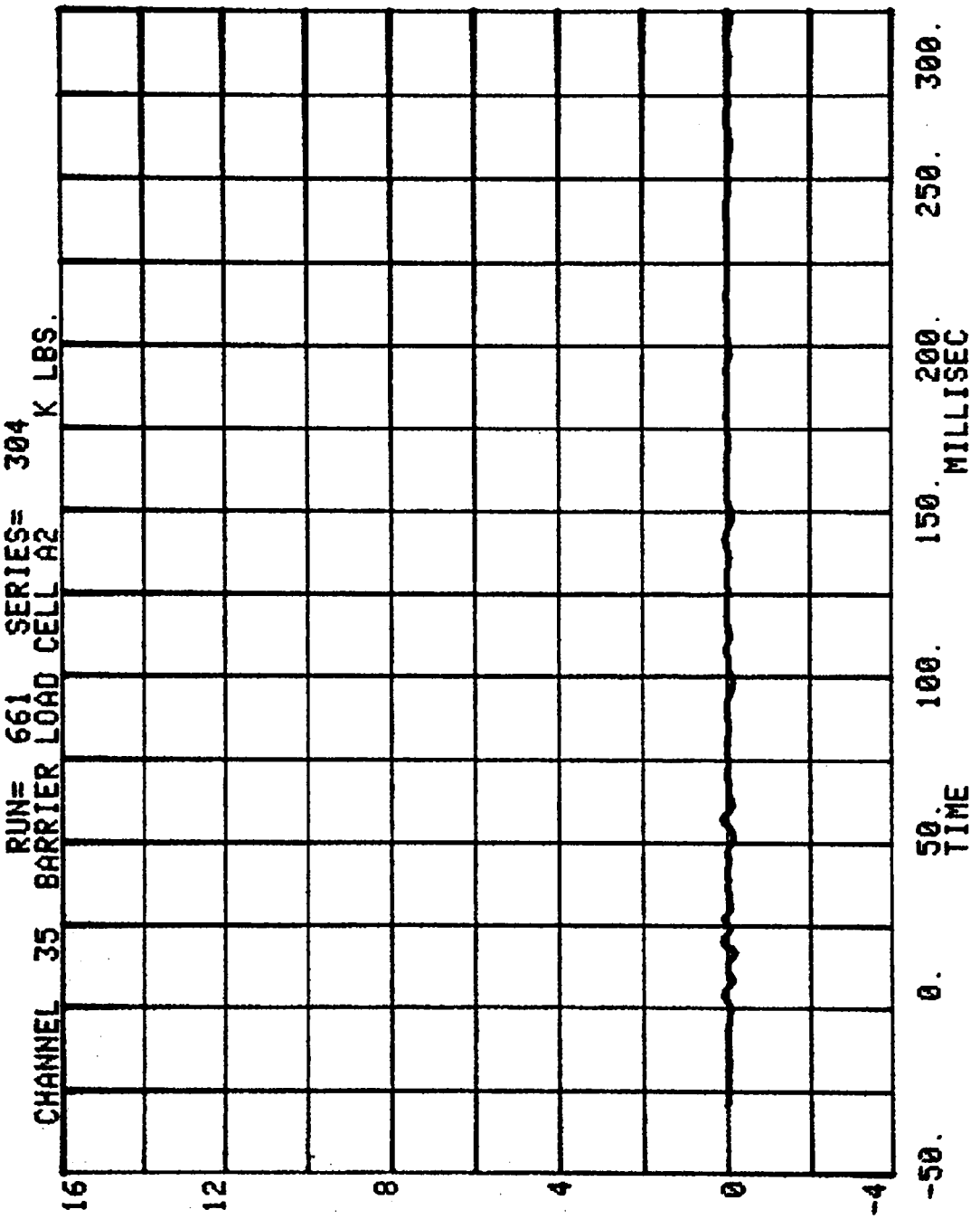

CHANNEL 14 DISPLACEMENT
RUN= 661 SERIES= 304
ACC. PACK #7 (X)
INCHES
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

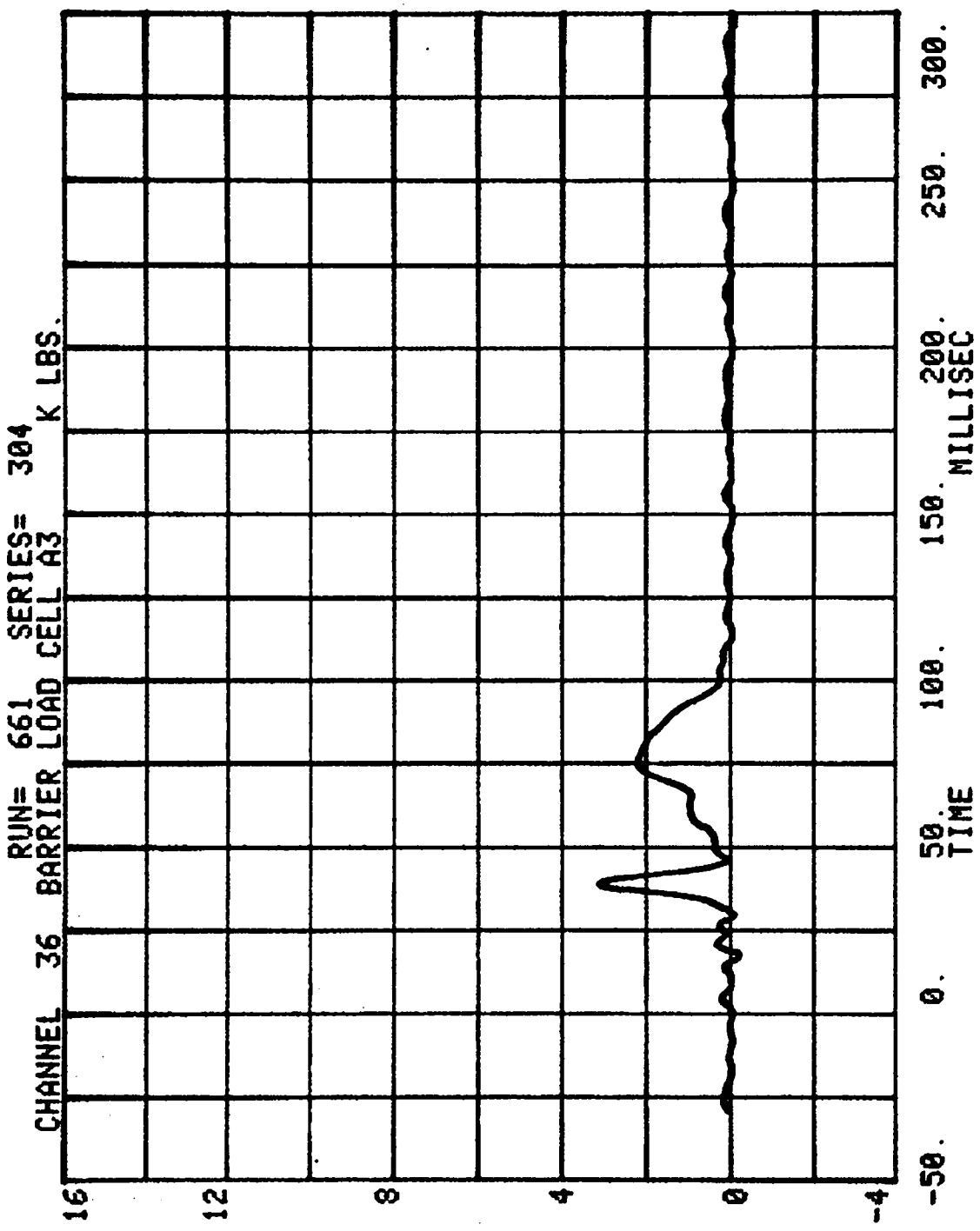
TEST NO. CF0304

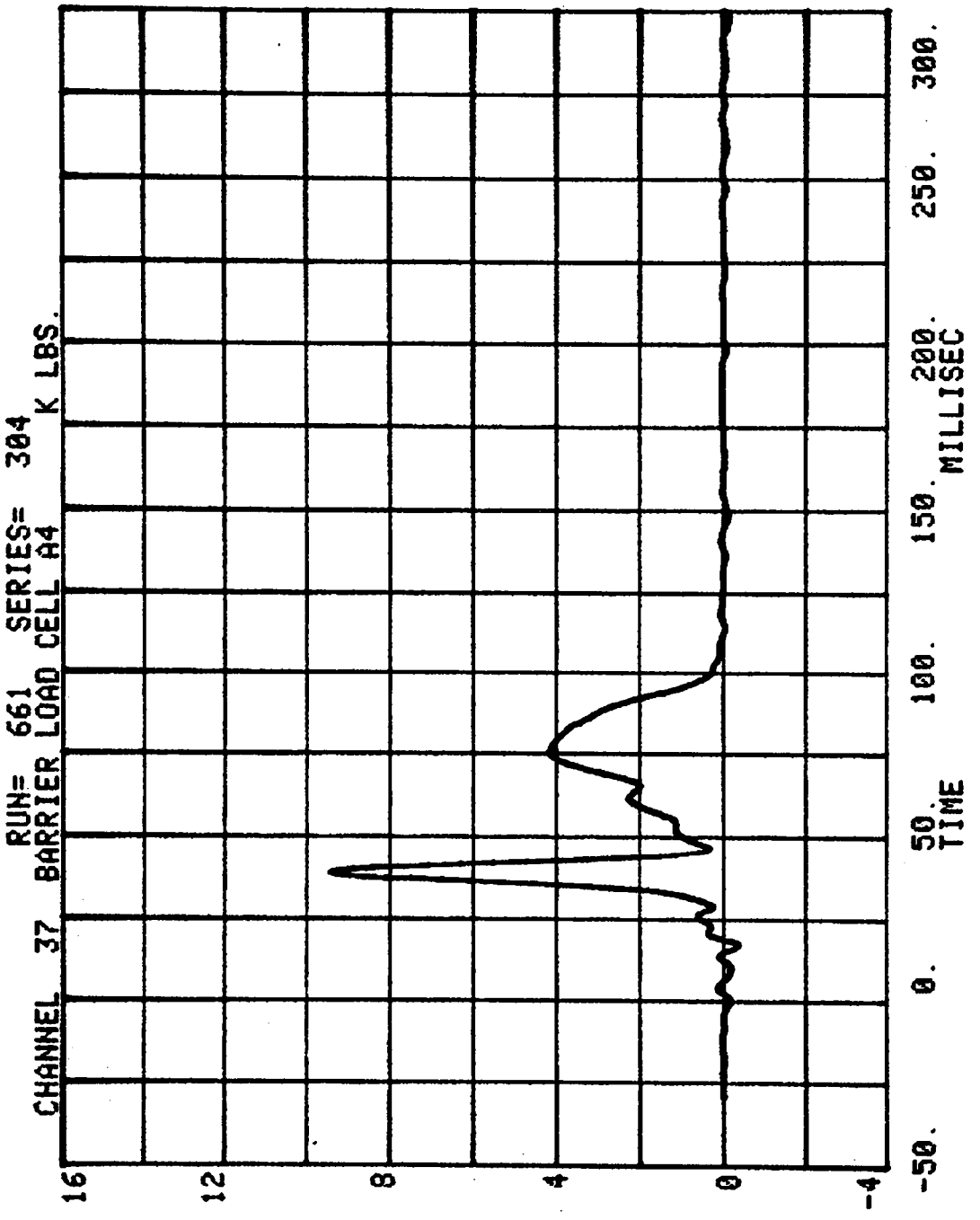
DUMMY DATA

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

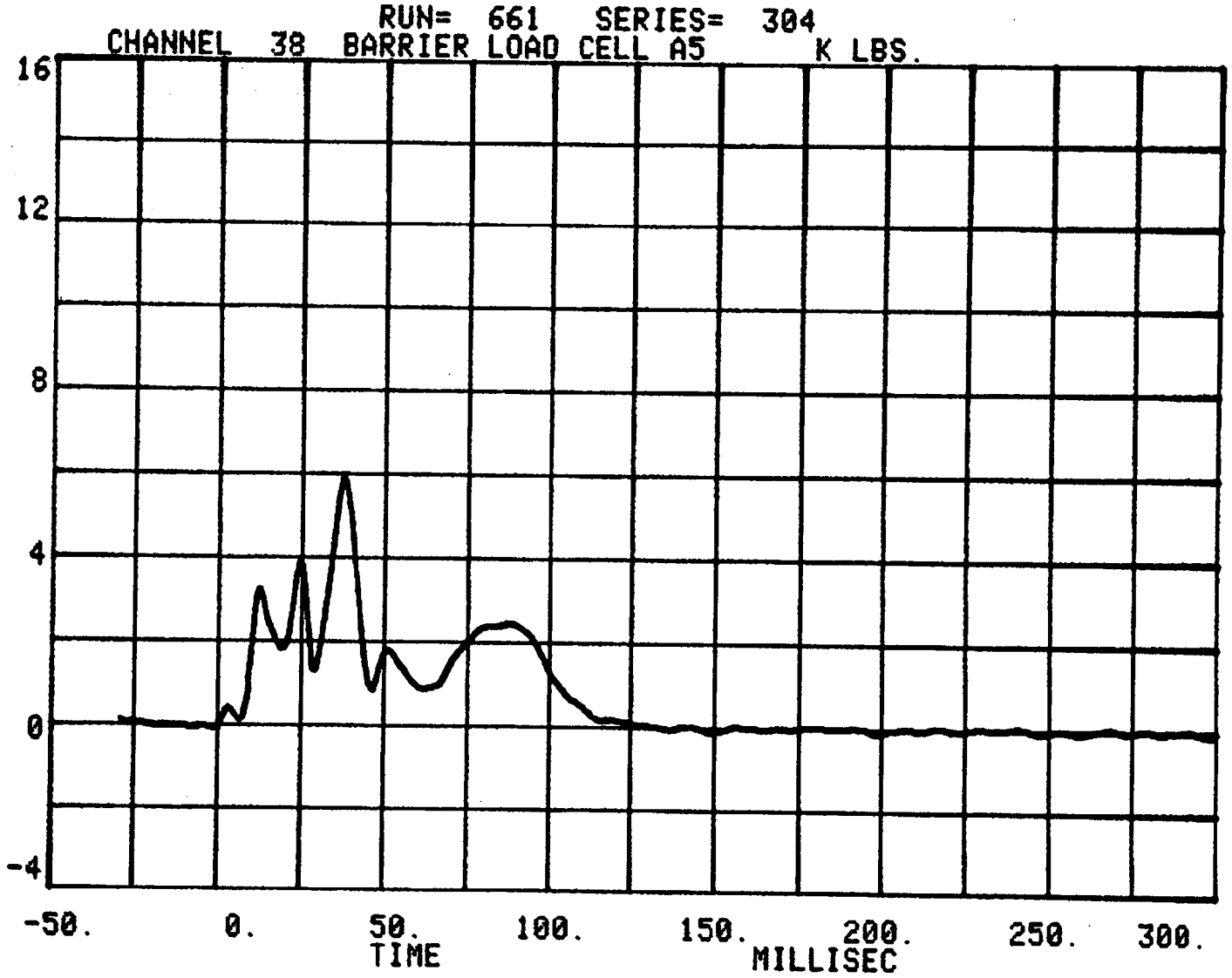

CHANNEL 34 BARRIER LOAD CELL A1
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

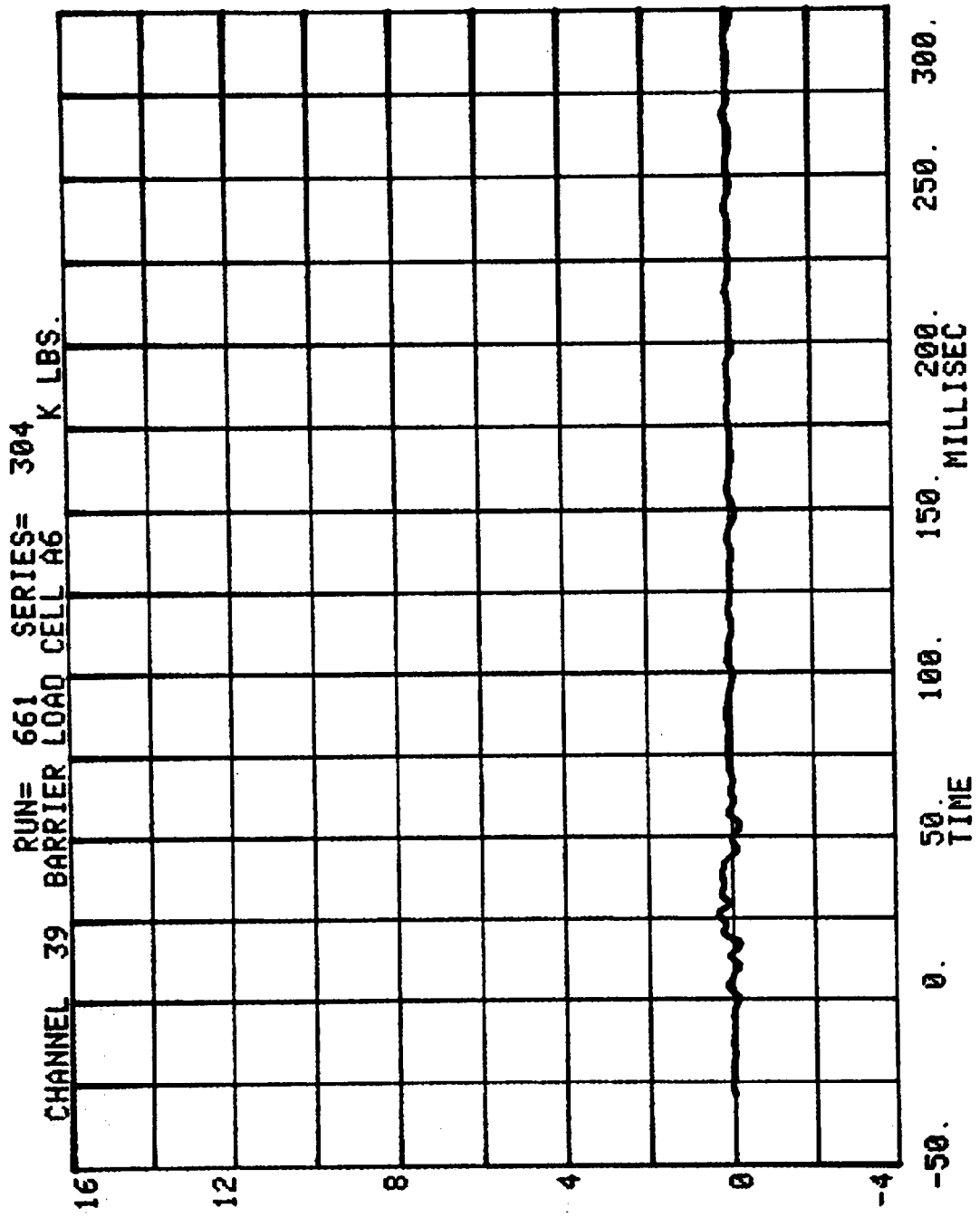

CHANNEL 35 BARRIER LOAD CELL A2
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 36 BARRIER LOAD CELL A3
RUN= 661 SERIES= 304 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

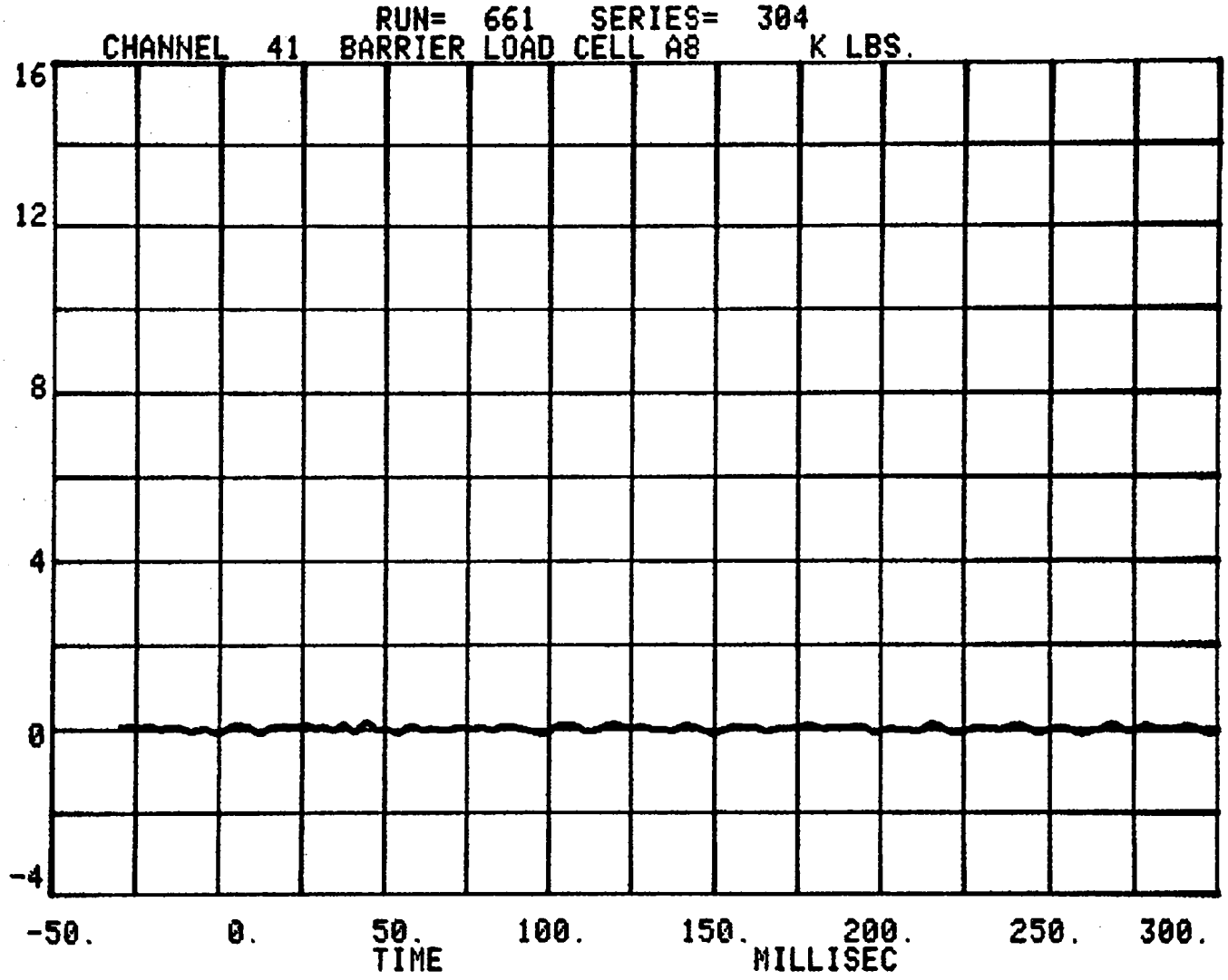

CHANNEL 37 BARRIER LOAD CELL A4
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6

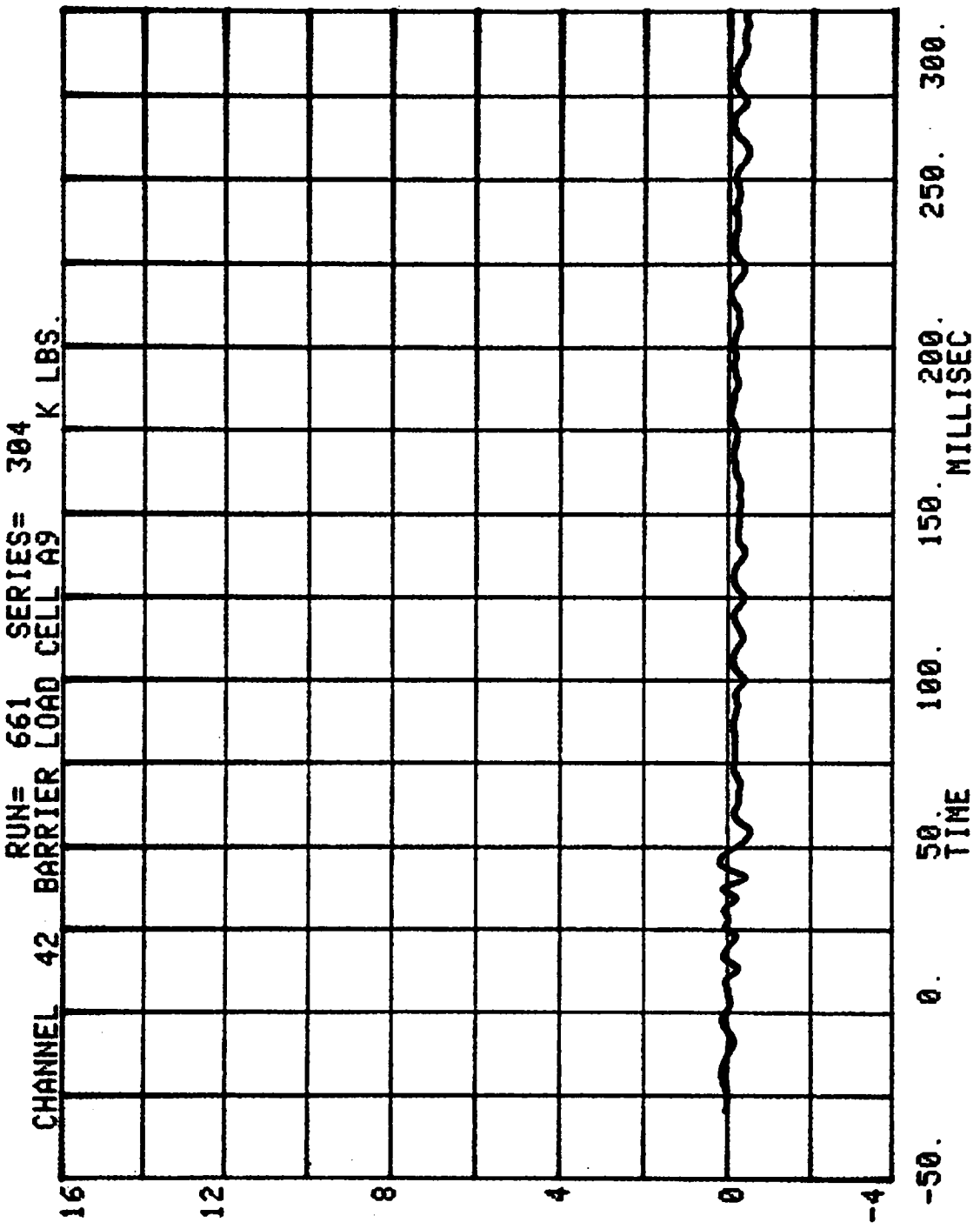

RUN= 661 SERIES= 304
CHANNEL 38 BARRIER LOAD CELL A5
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

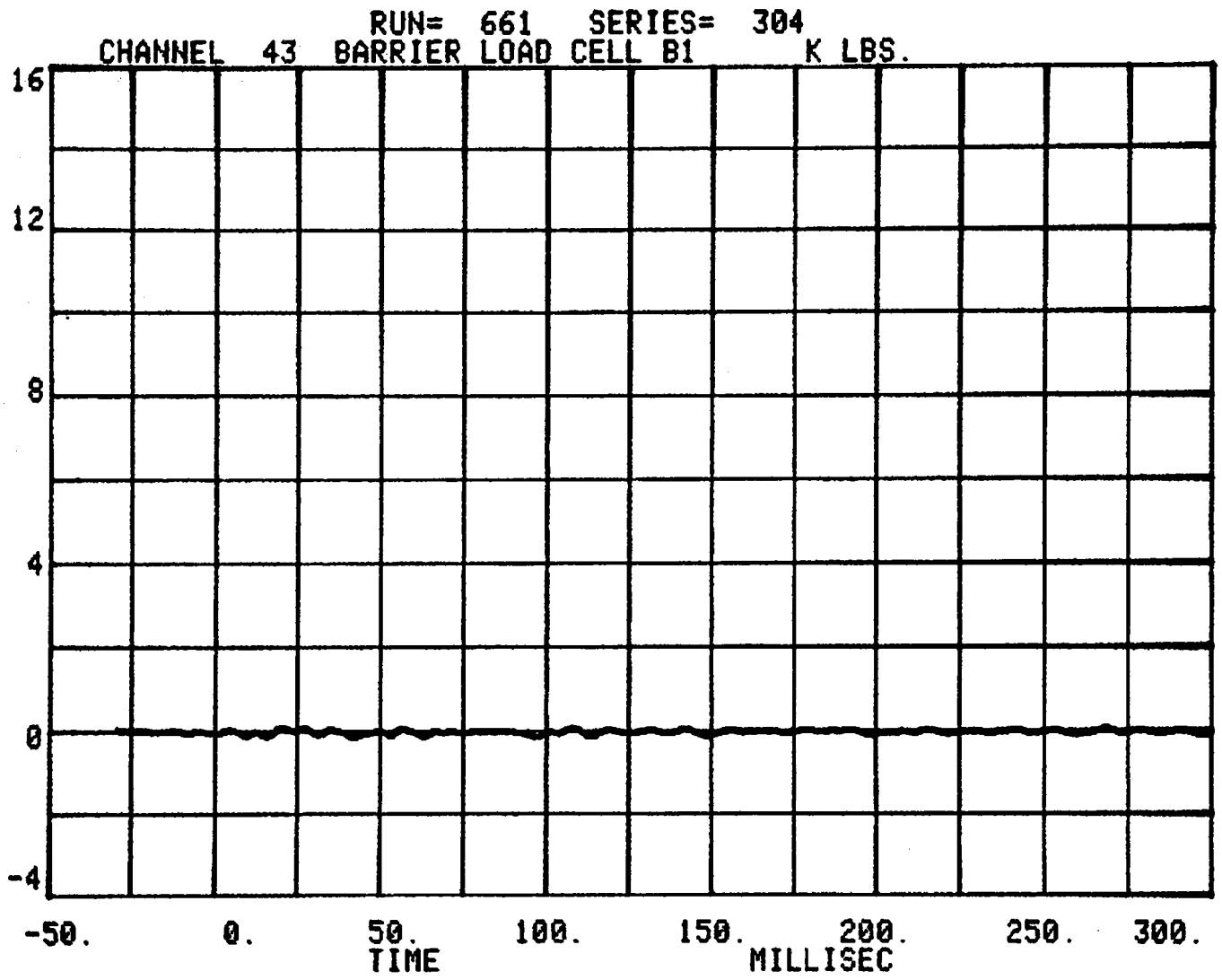

CHANNEL 39 BARRIER LOAD CELL A6
RUN= 661 SERIES= 304 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

CHANNEL 40 BARRIER LOAD CELL A7
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

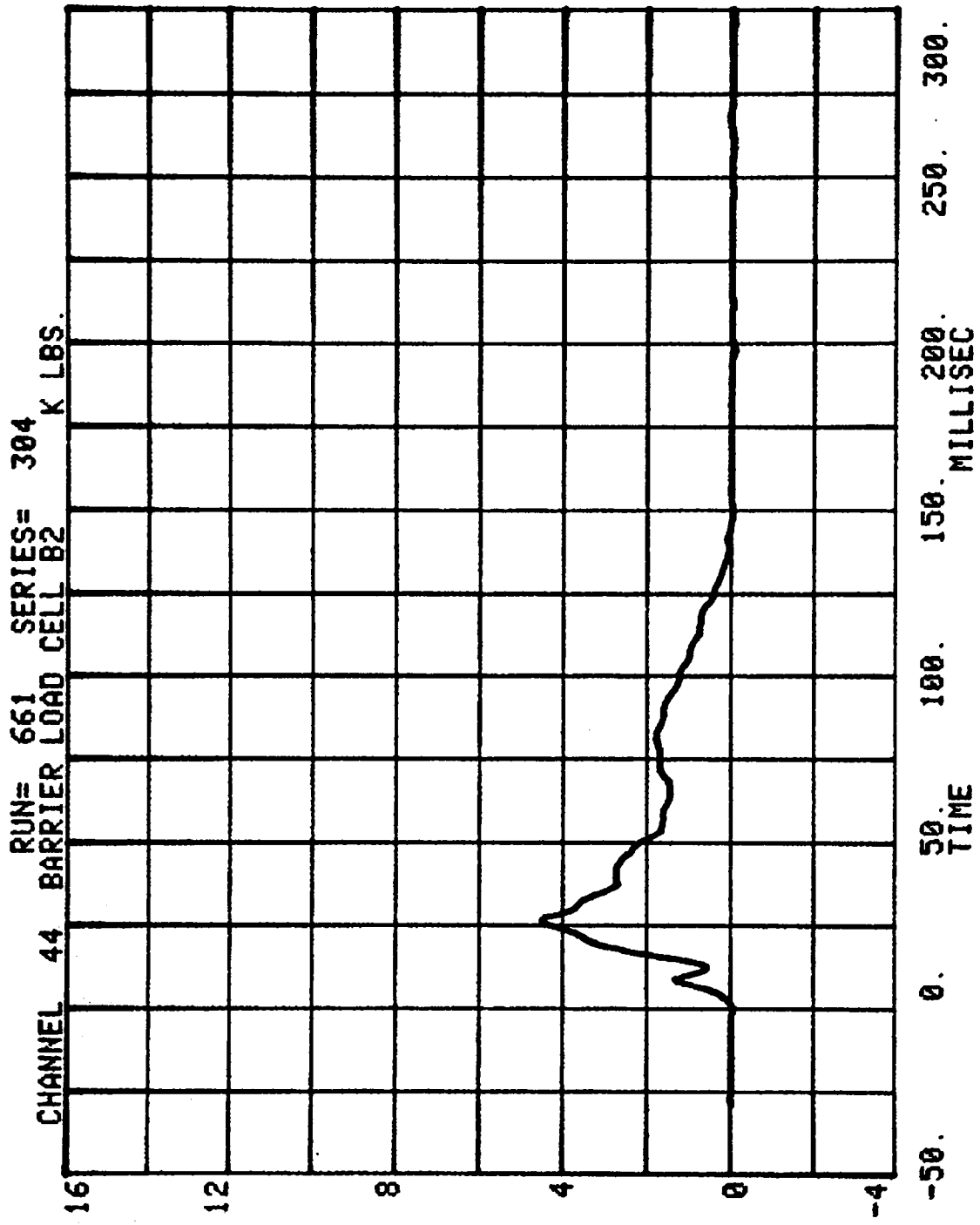

RUN= 661 SERIES= 304
CHANNEL 41 BARRIER LOAD CELL A8 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

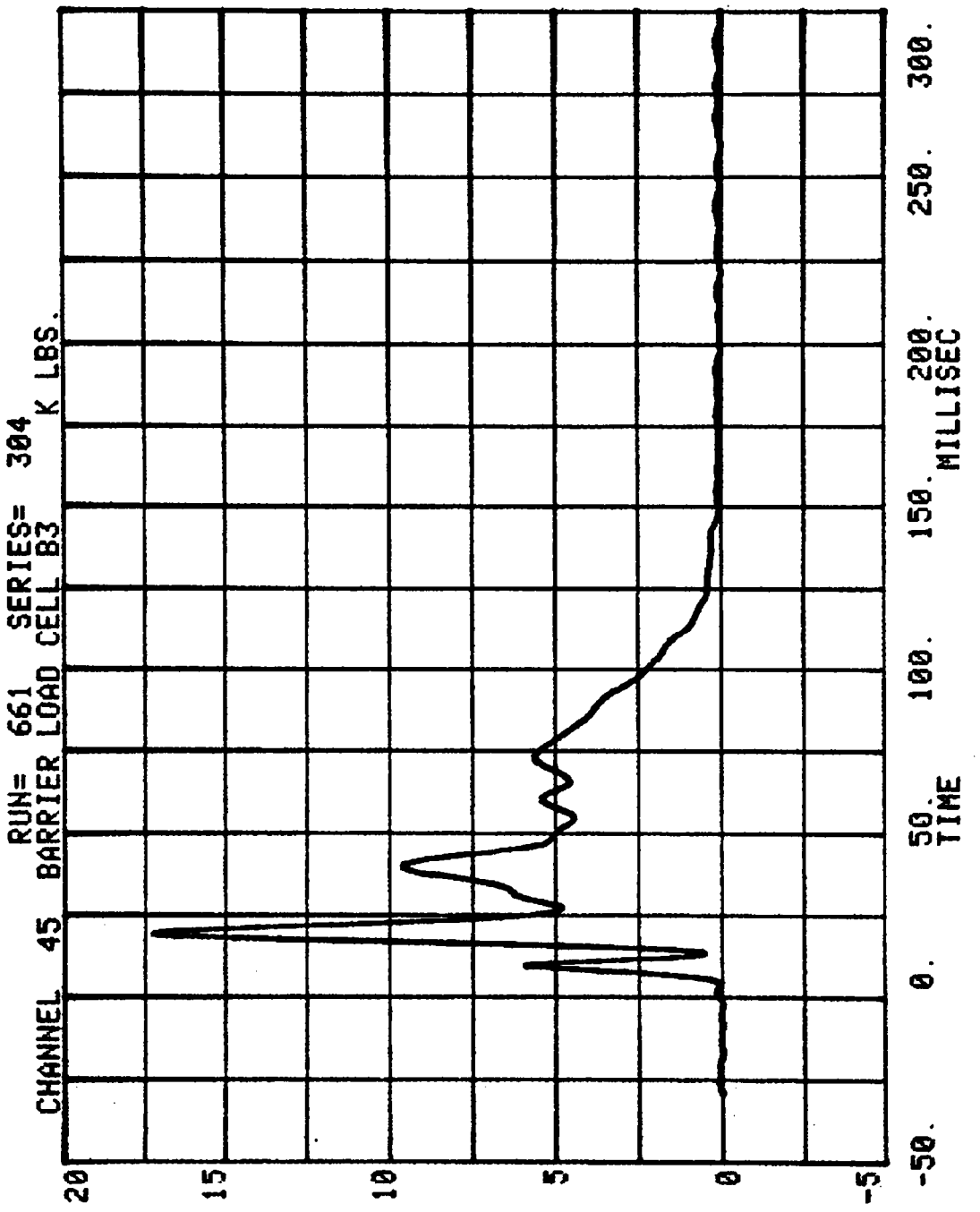
7333-6

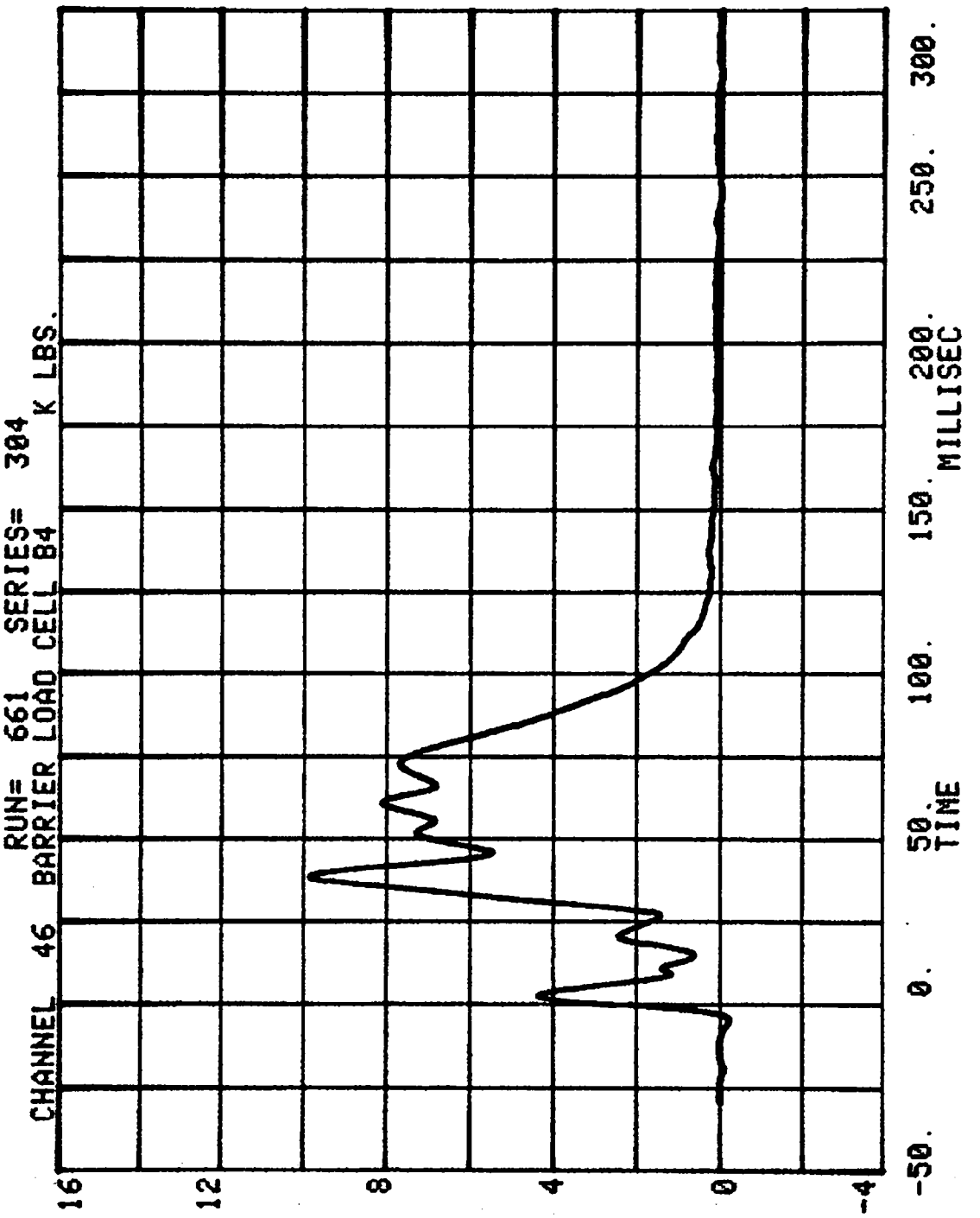

CHANNEL 42 BARRIER LOAD CELL A9
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

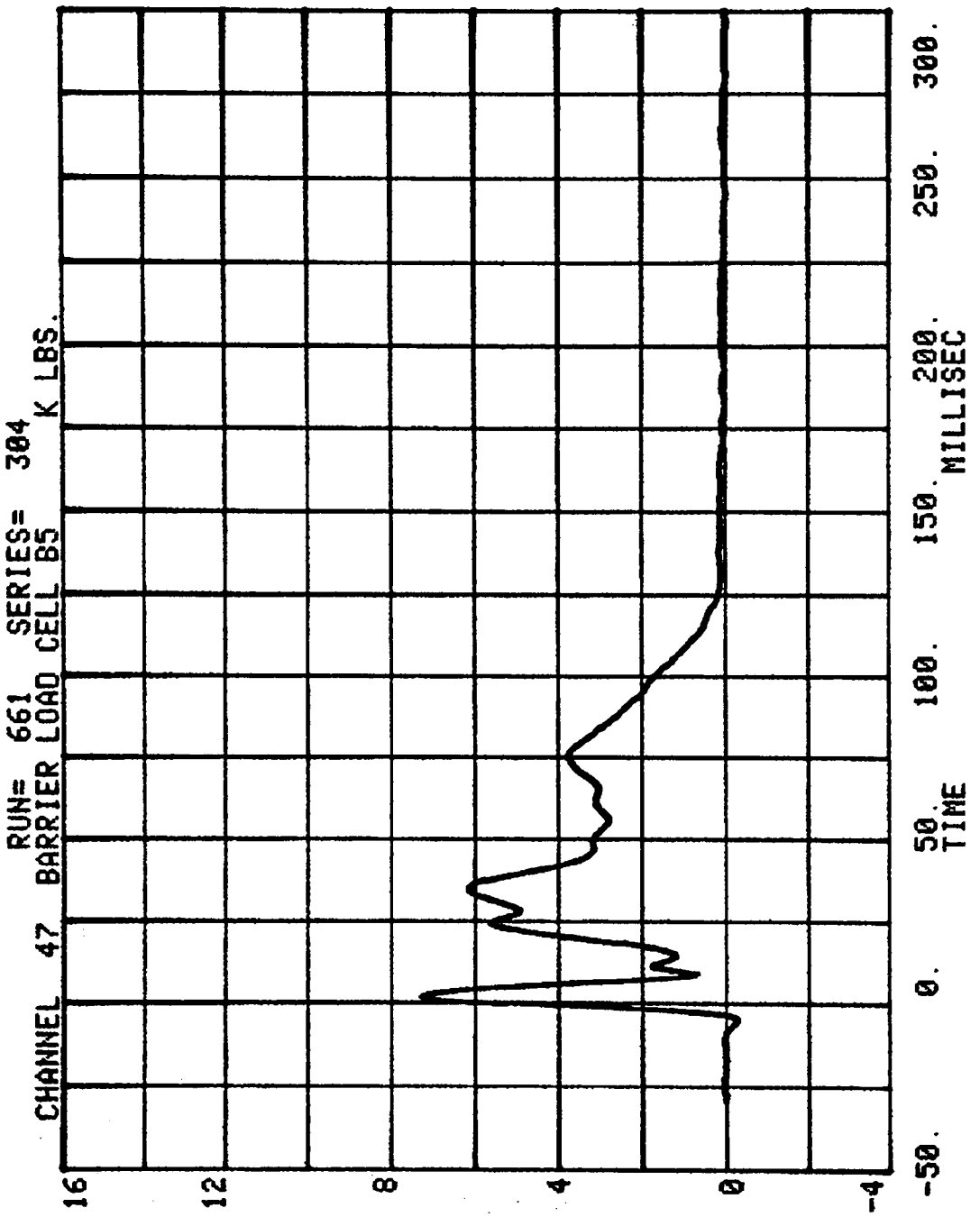

RUN= 661 SERIES= 304
CHANNEL 43 BARRIER LOAD CELL B1 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6

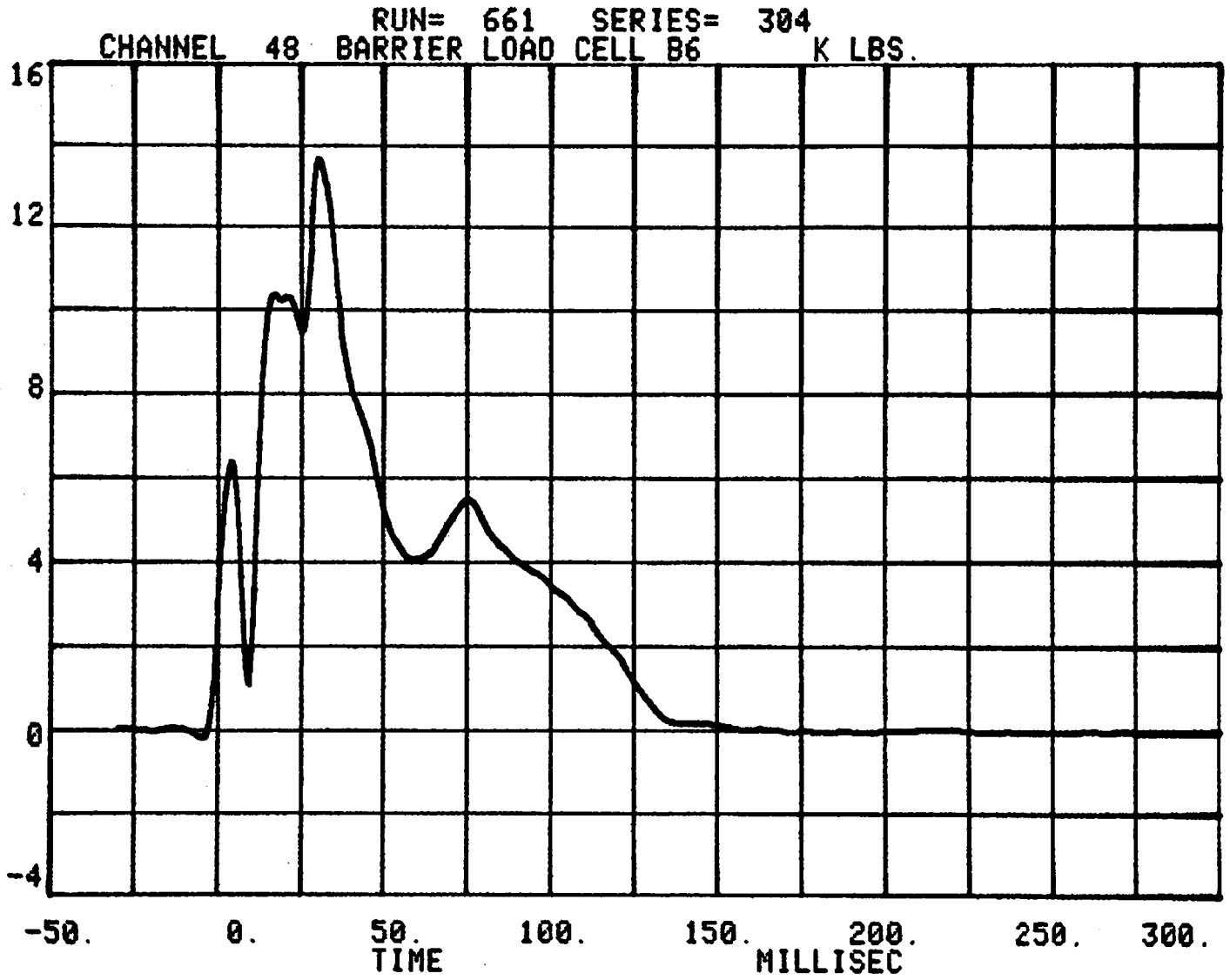

CHANNEL 44 BARRIER LOAD CELL B2
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 45 BARRIER LOAD CELL B3
RUN= 661 SERIES= 304 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

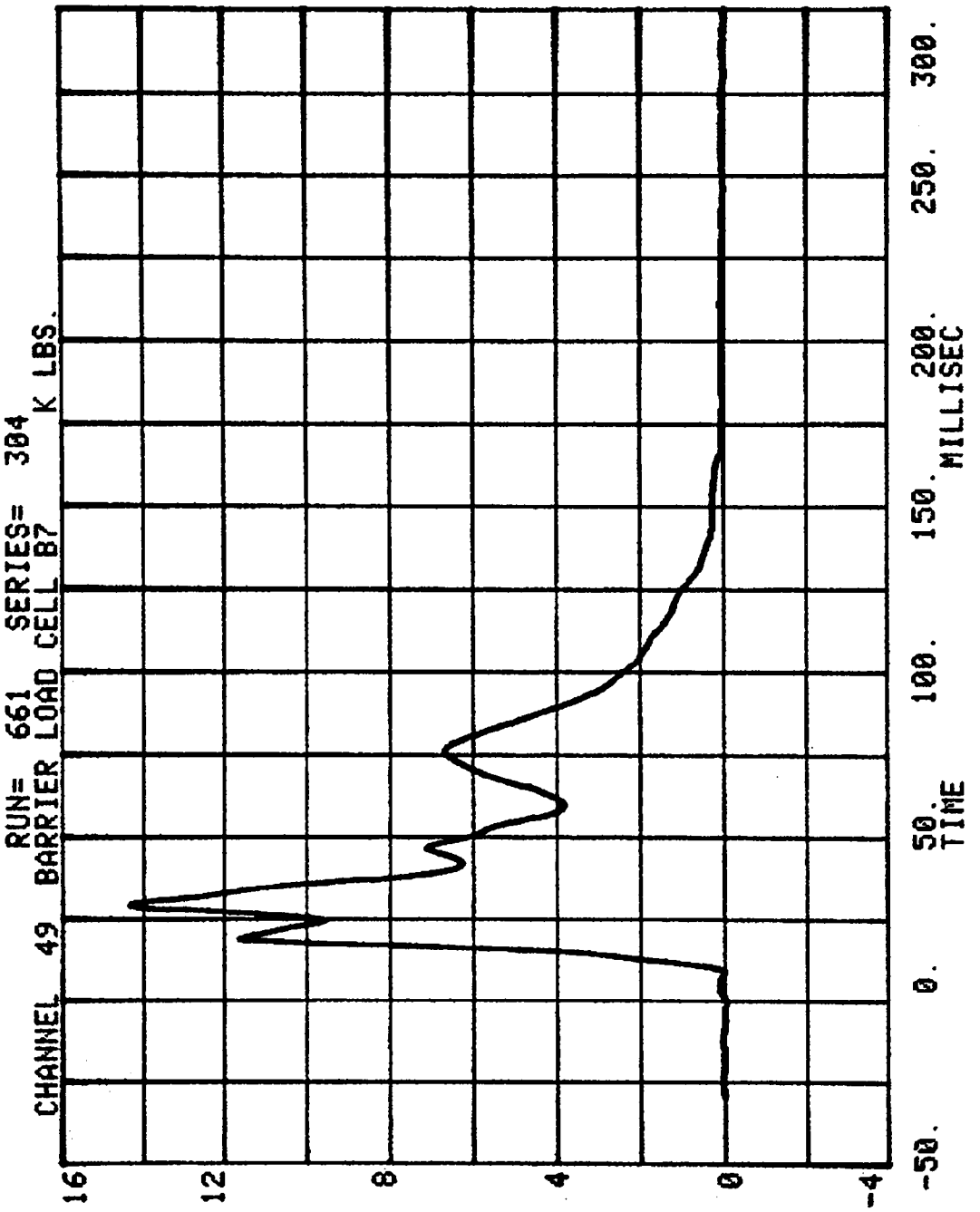

CHANNEL 46 BARRIER LOAD CELL B4
RUN= 661 SERIES= 304 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

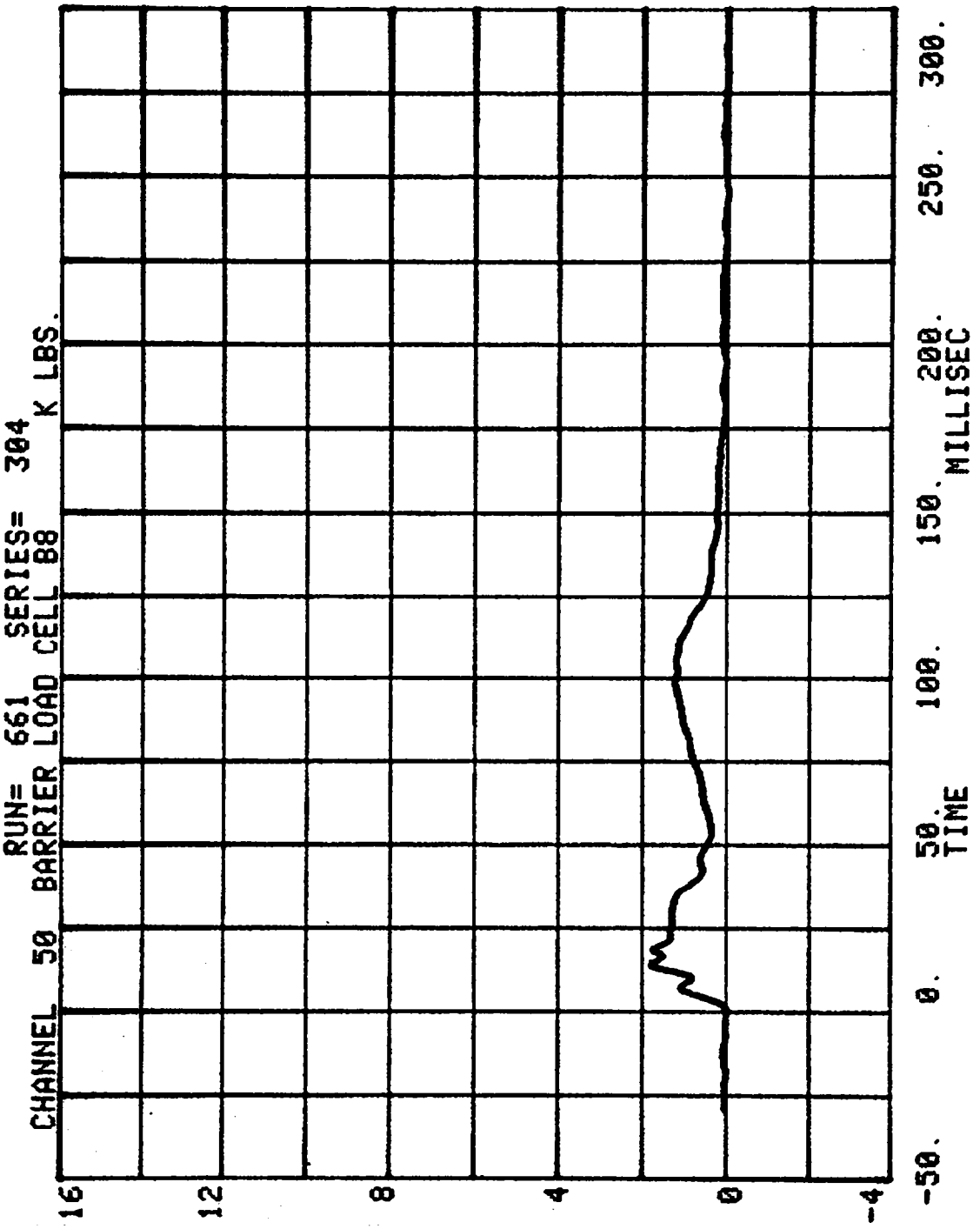

CHANNEL 47 BARRIER LOAD CELL B5
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6

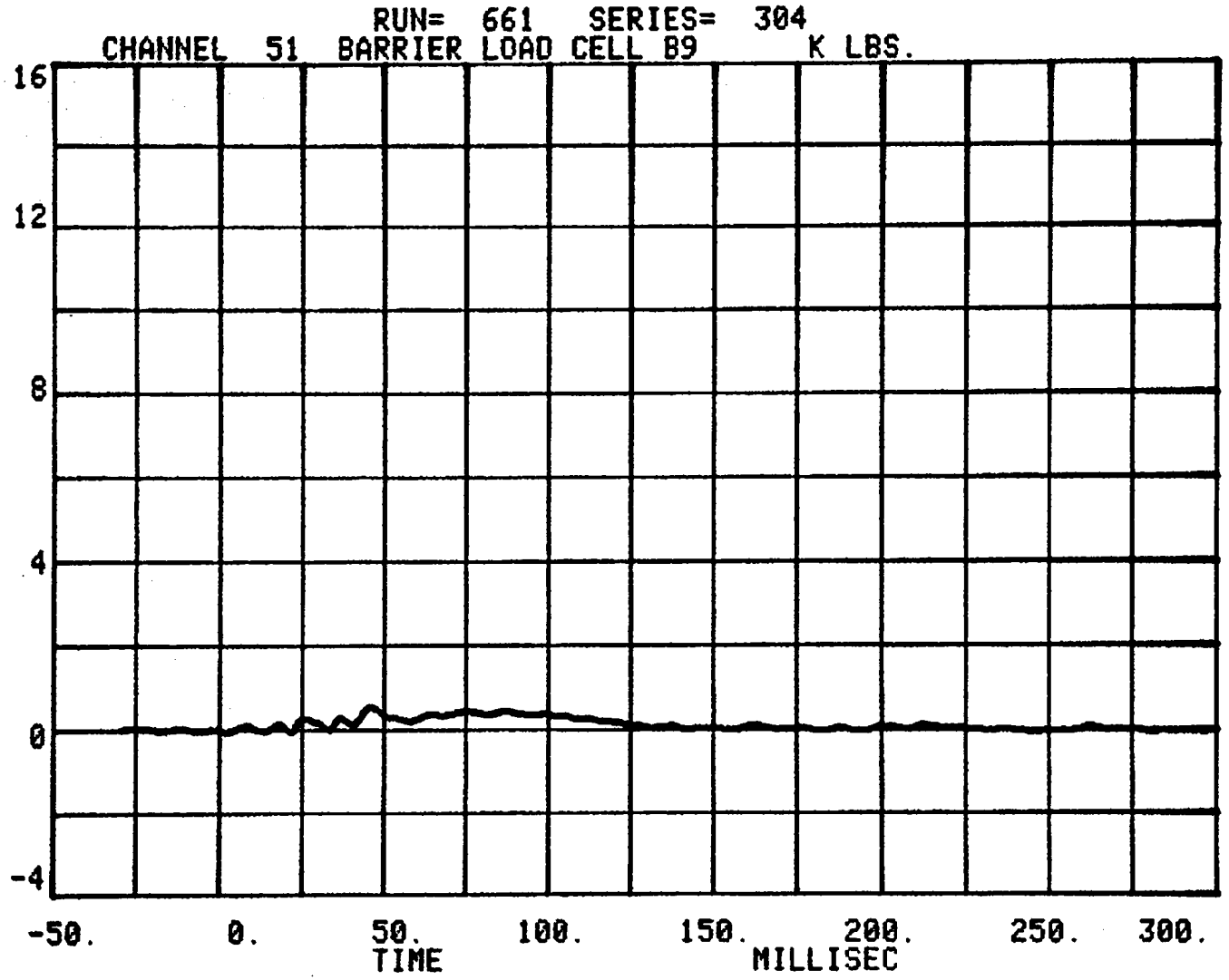

RUN= 661 SERIES= 304
CHANNEL 48 BARRIER LOAD CELL B6 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6

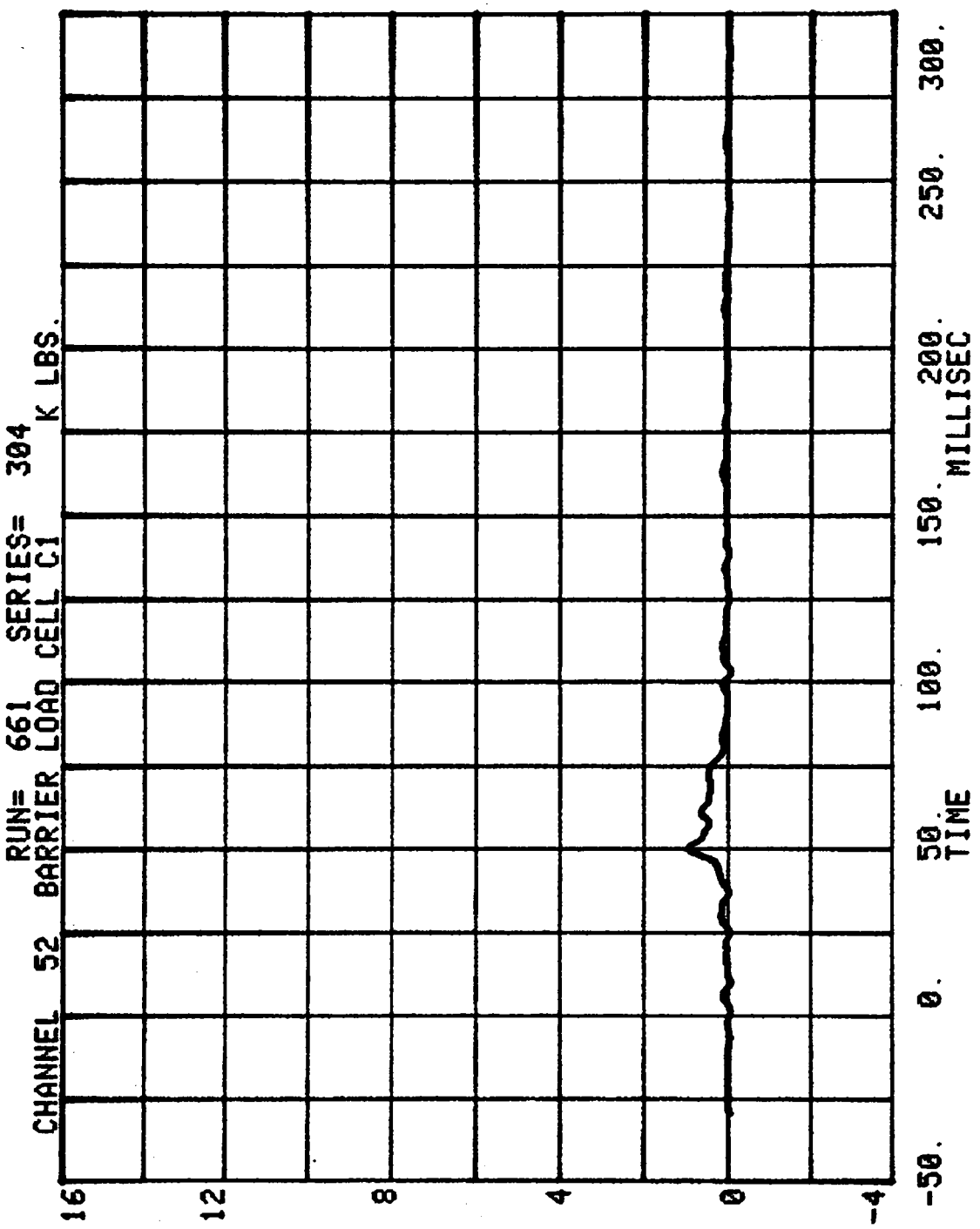

CHANNEL 49 BARRIER LOAD CELL B7
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

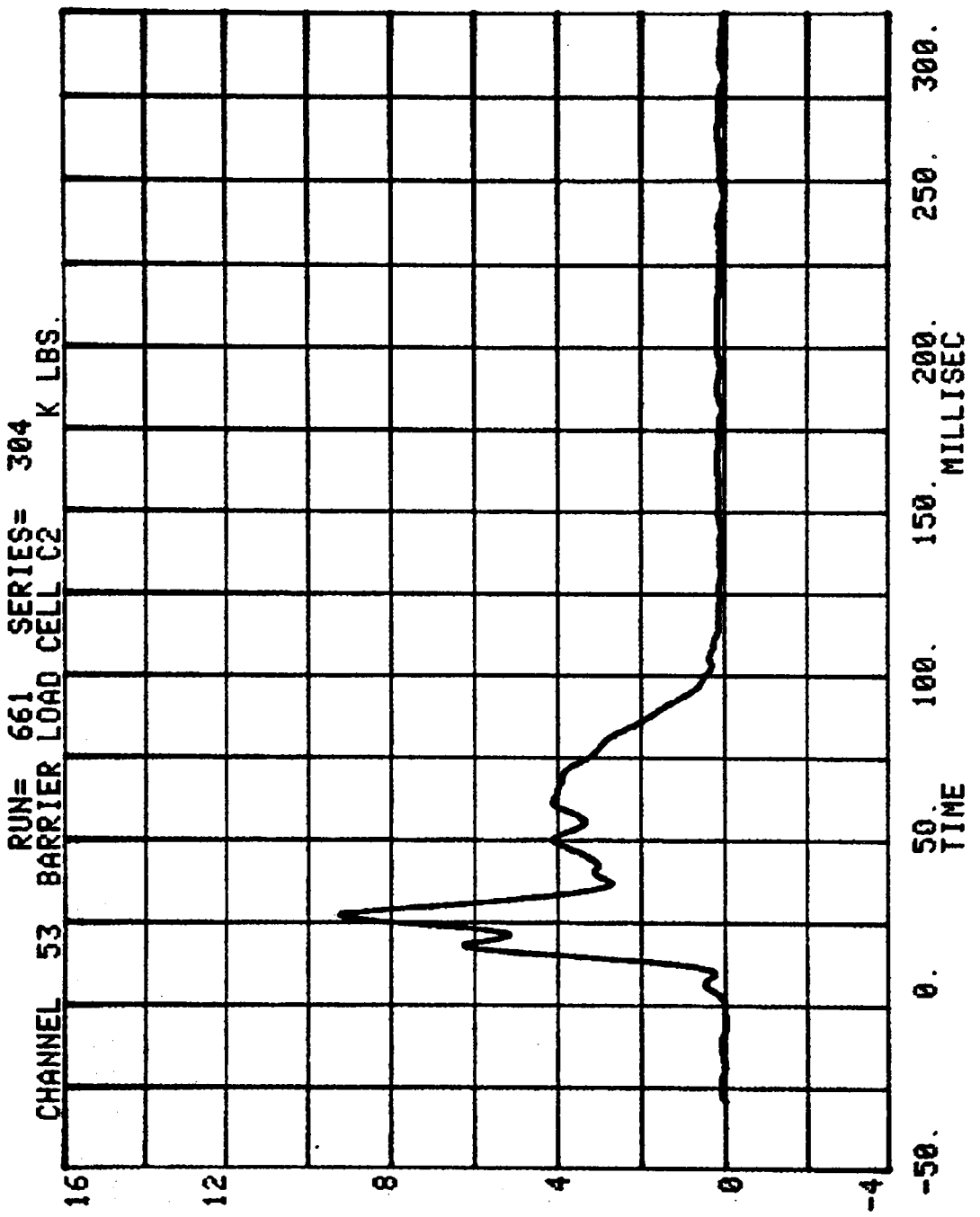

CHANNEL 50 BARRIER LOAD CELL 88
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

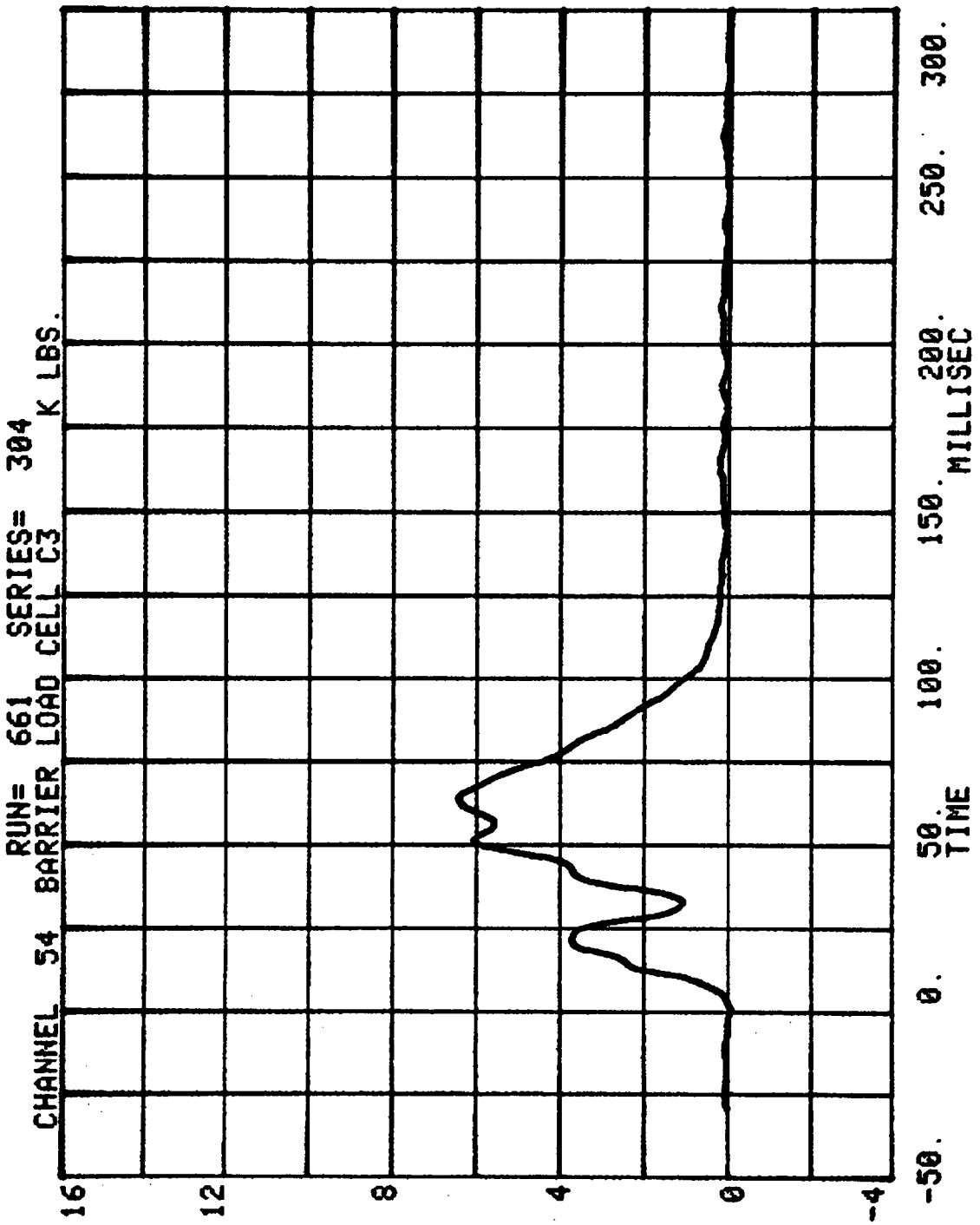
7333-6

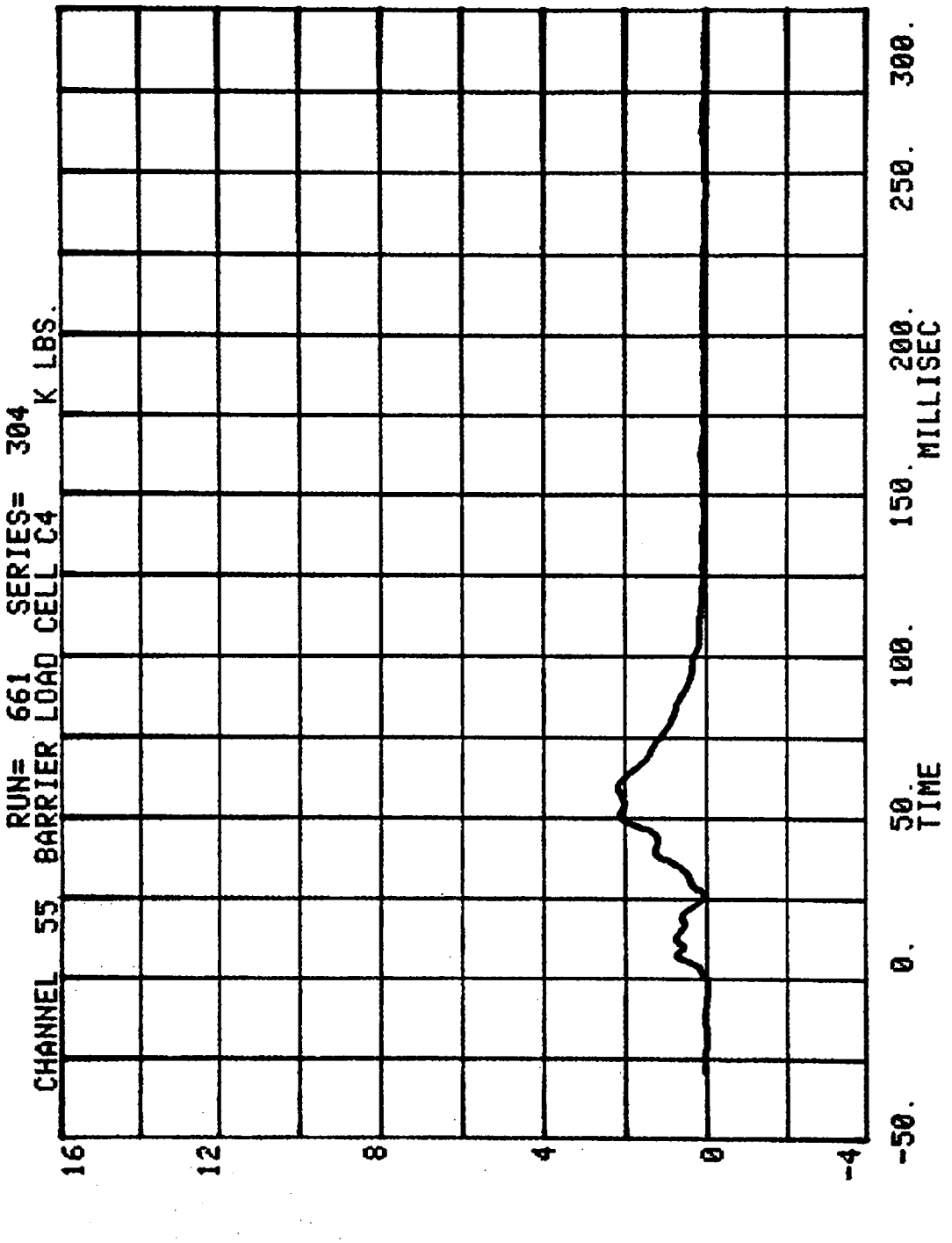

RUN= 661 SERIES= 304
CHANNEL 51 BARRIER LOAD CELL B9 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

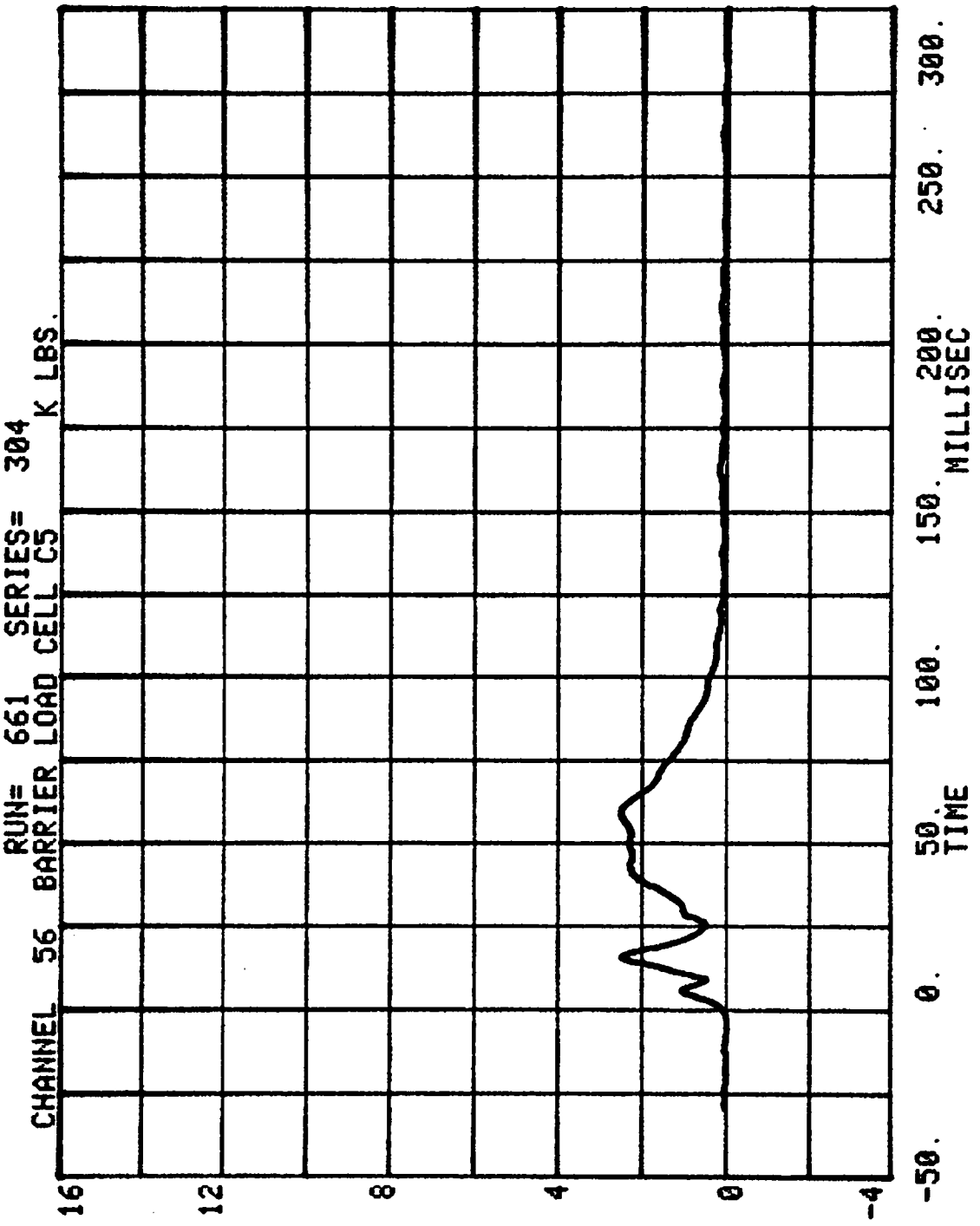
7333-6


CHANNEL 52 BARRIER LOAD CELL C1
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

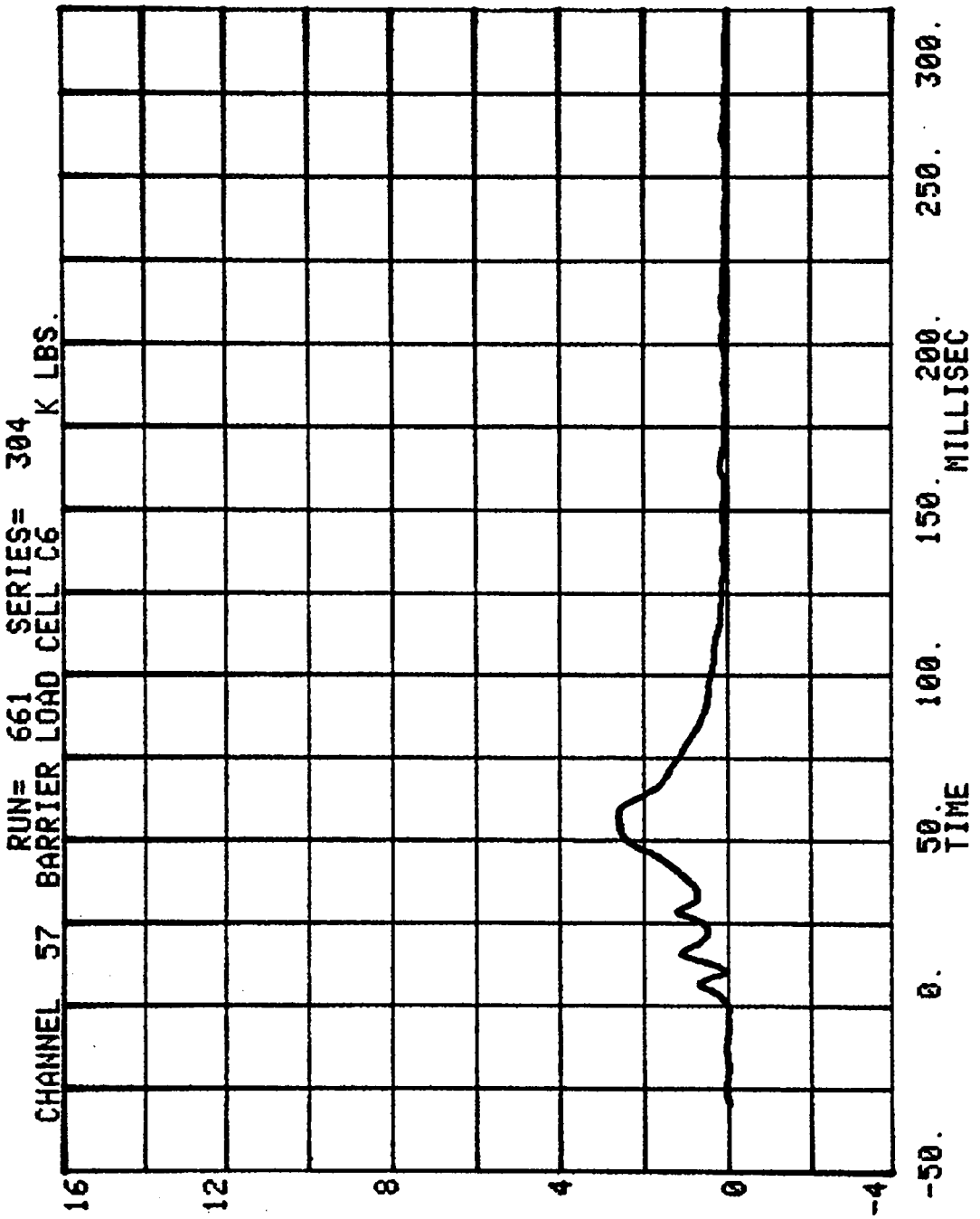

CHANNEL 53 BARRIER LOAD CELL C2
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 54 BARRIER LOAD CELL C3
RUN= 661 SERIES= 304 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

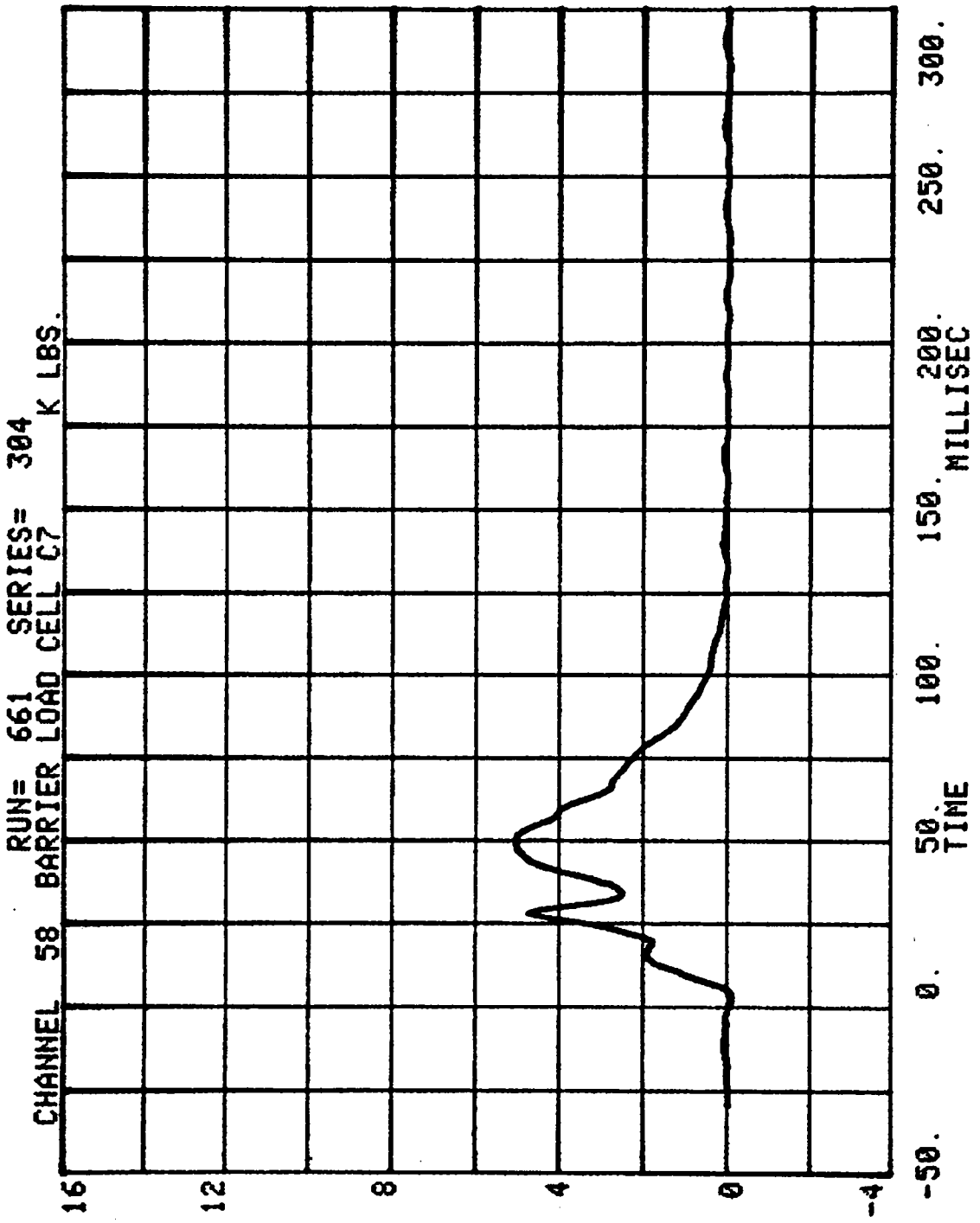

CHANNEL 55 BARRIER LOAD CELL C4
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

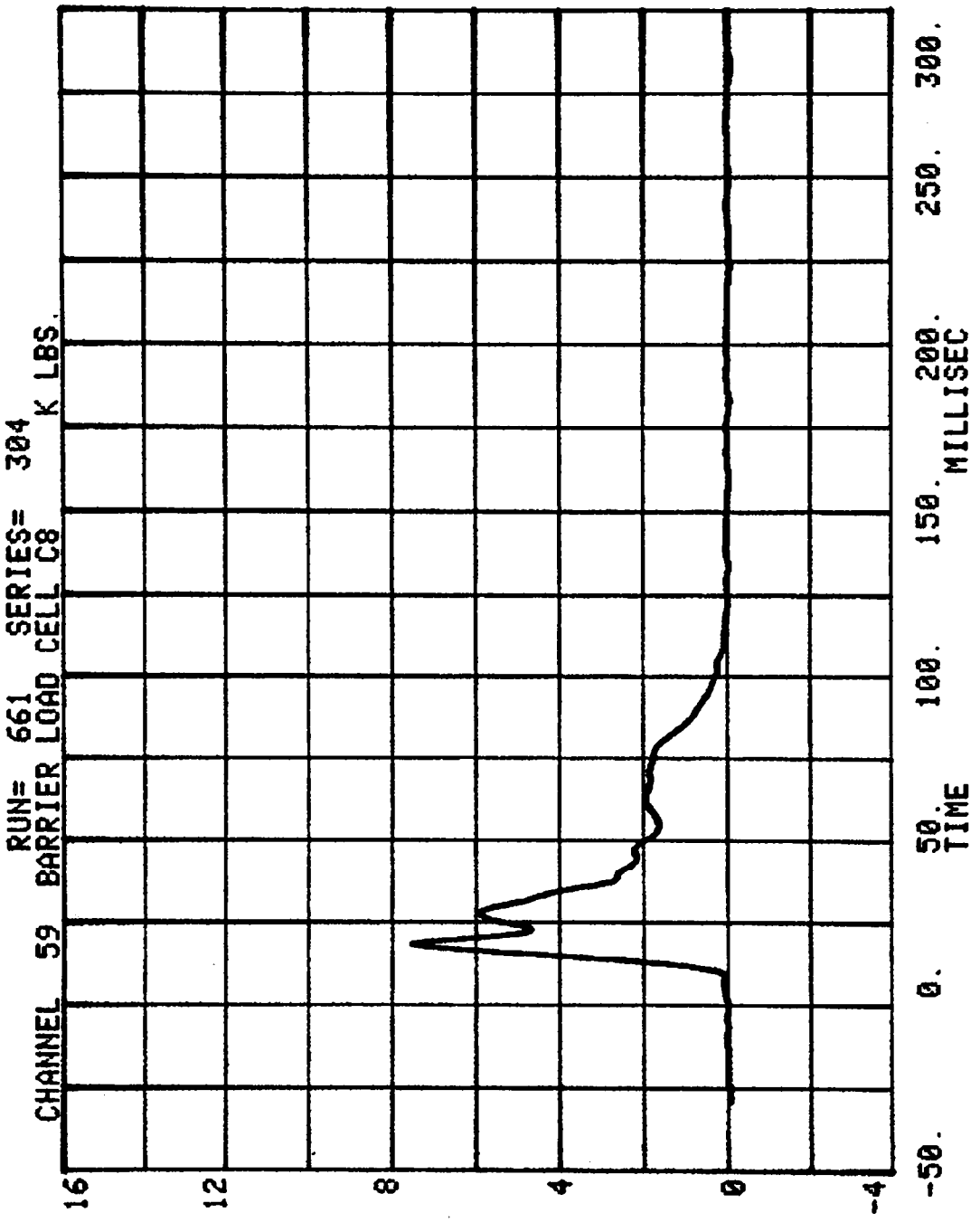

CHANNEL 56 BARRIER LOAD CELL C5
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6

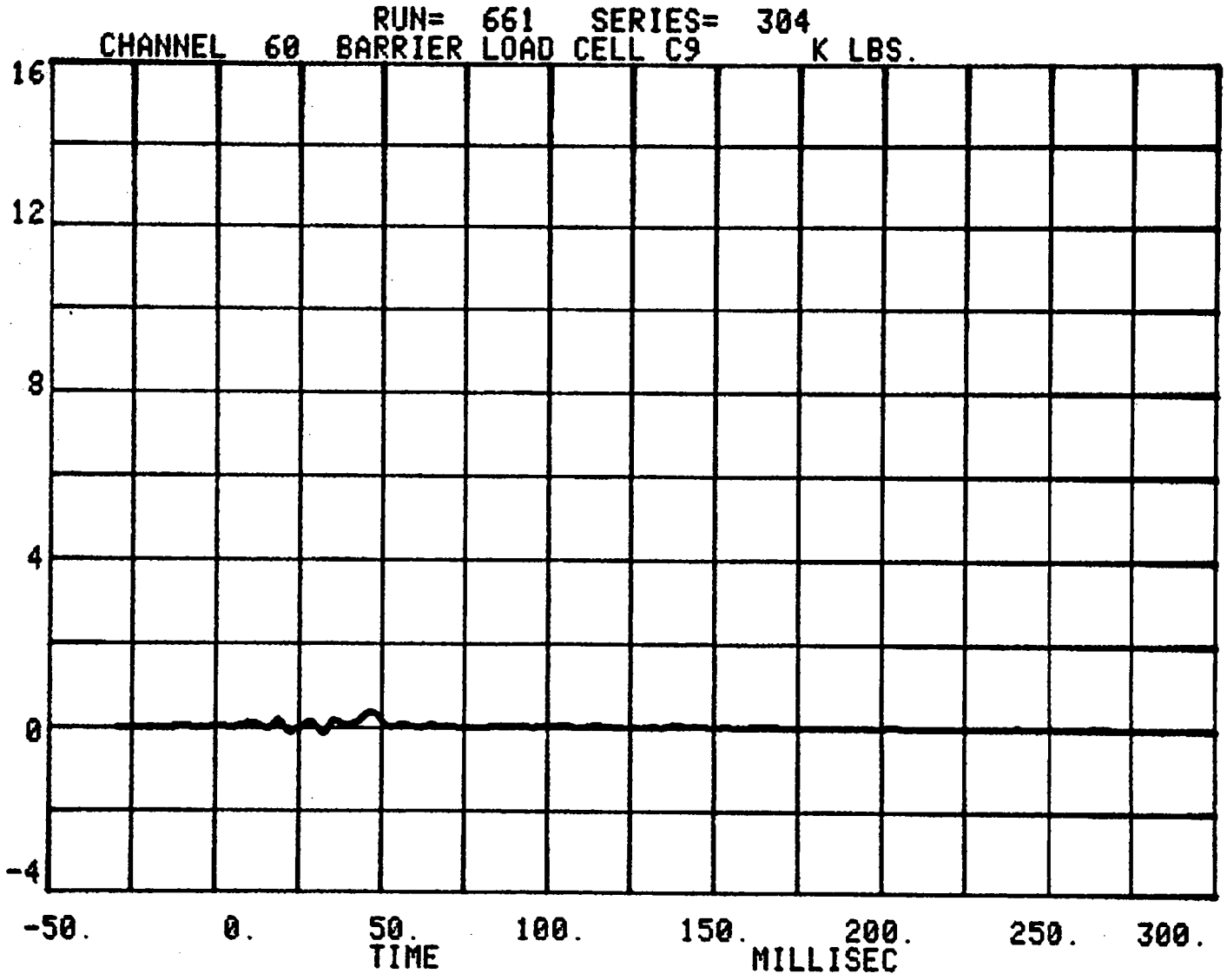

CHANNEL 57 BARRIER LOAD CELL C6
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6

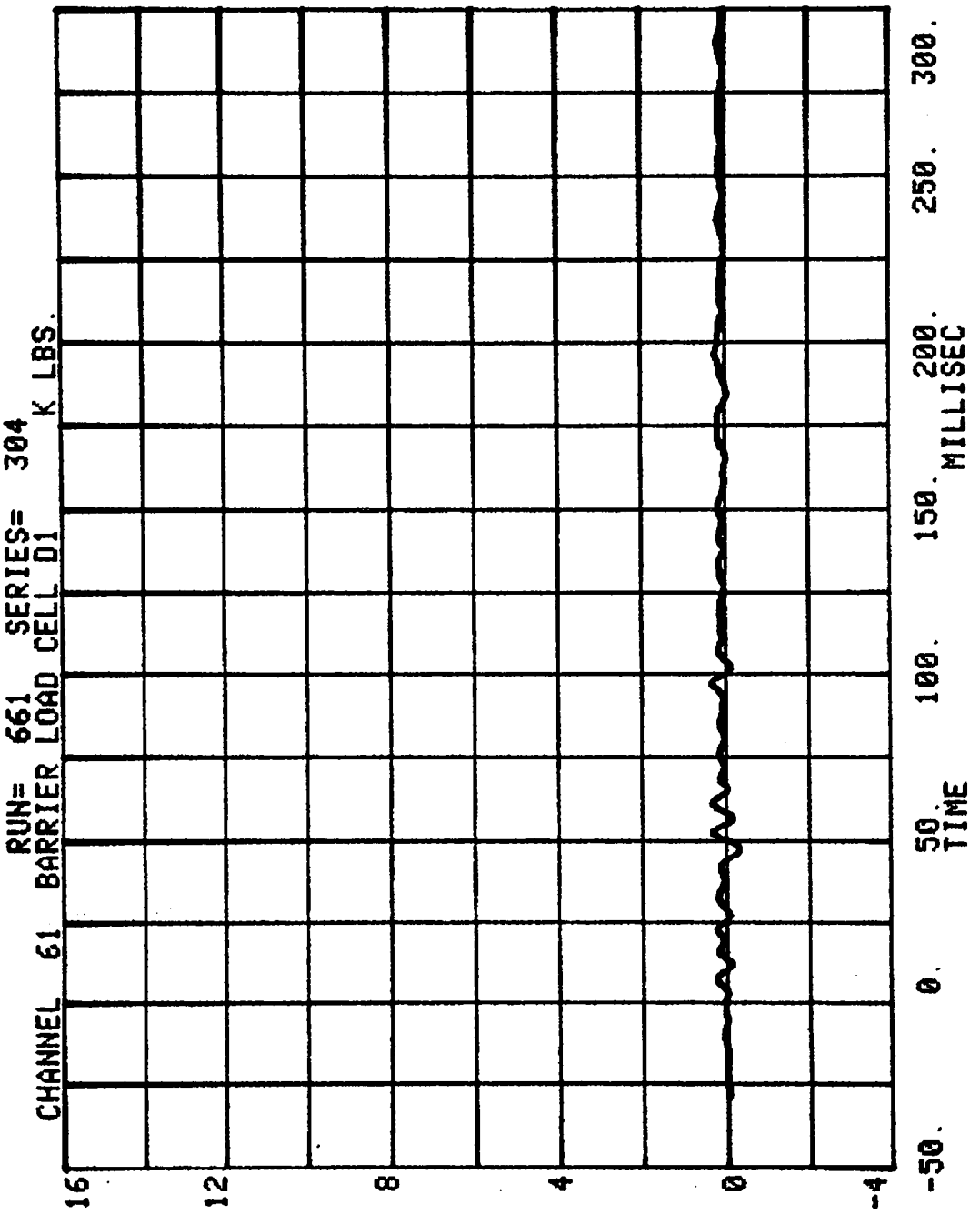

CHANNEL 58 RUN= 661 SERIES= 304
BARRIER LOAD CELL C7 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

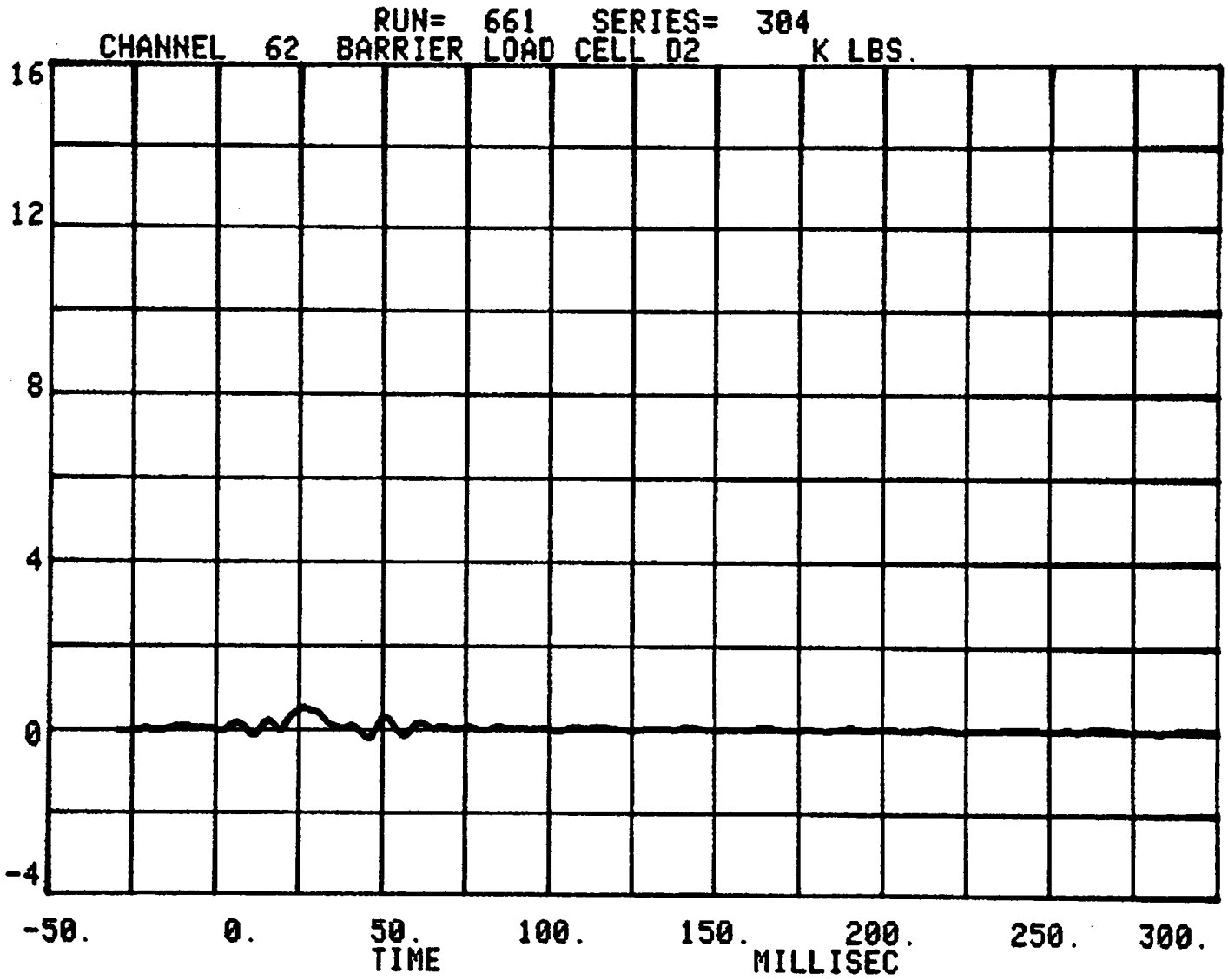

CHANNEL 59 BARRIER LOAD CELL C8
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

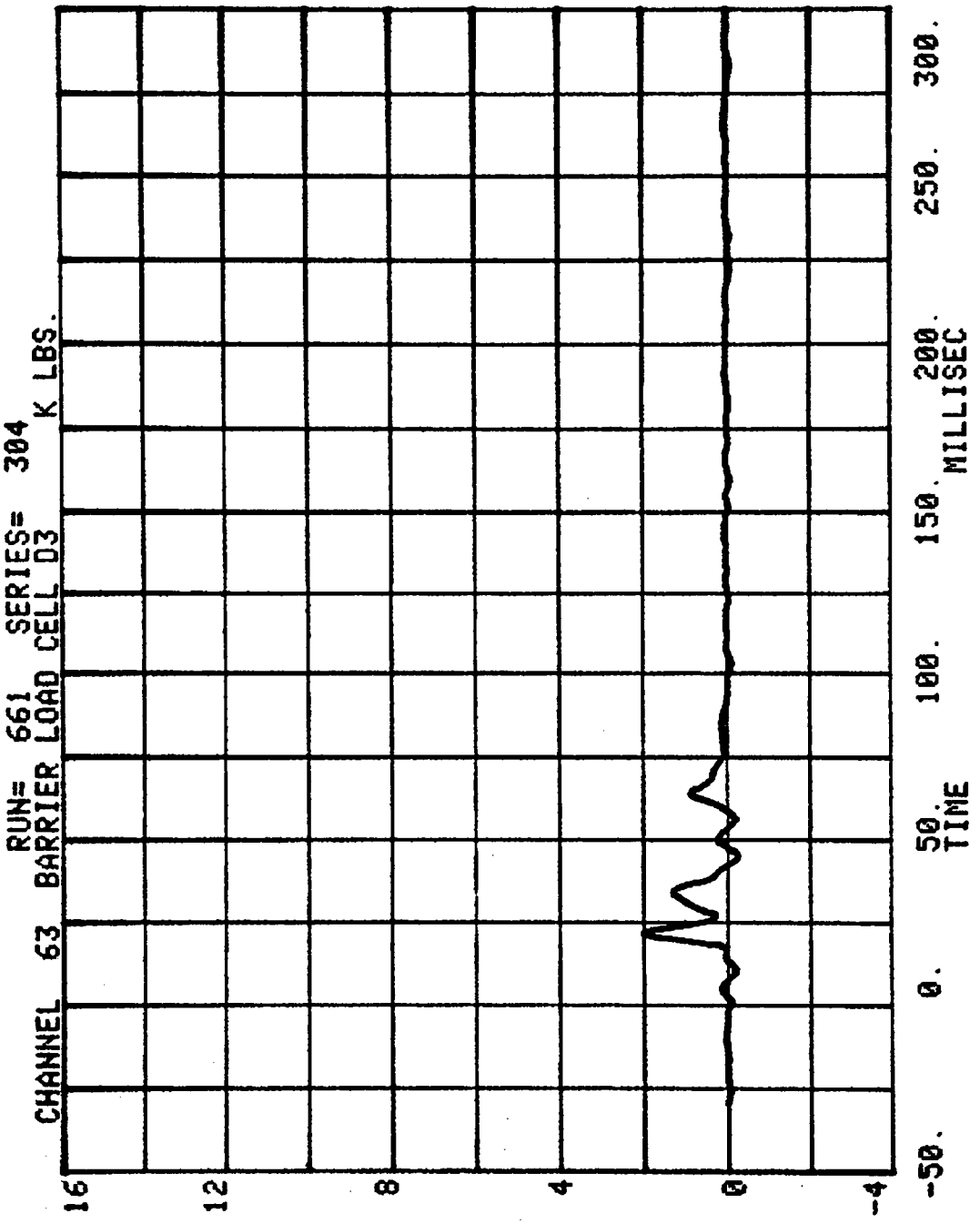
7333-6


RUN= 661 SERIES= 304
CHANNEL 60 BARRIER LOAD CELL C9 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

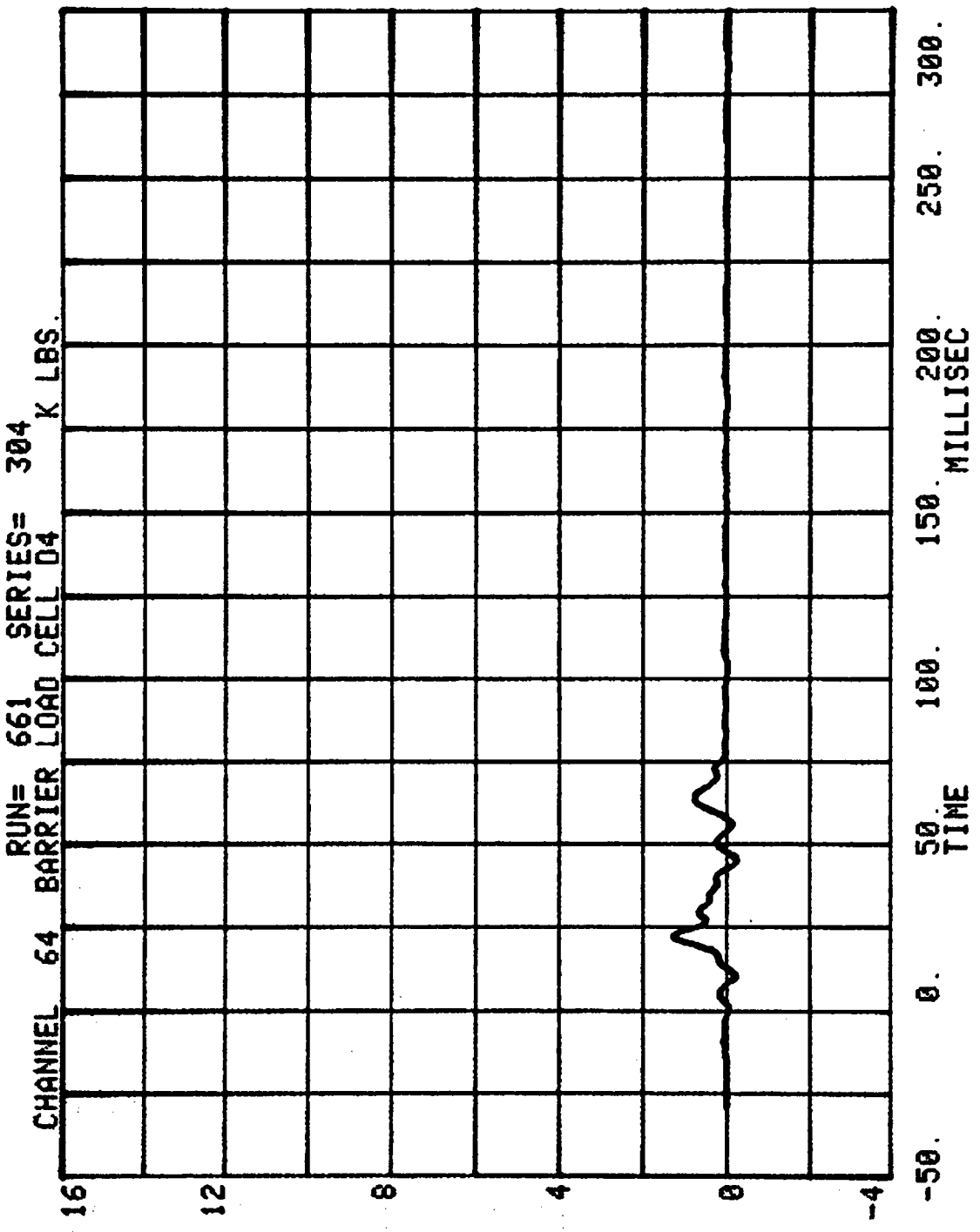
7333-6

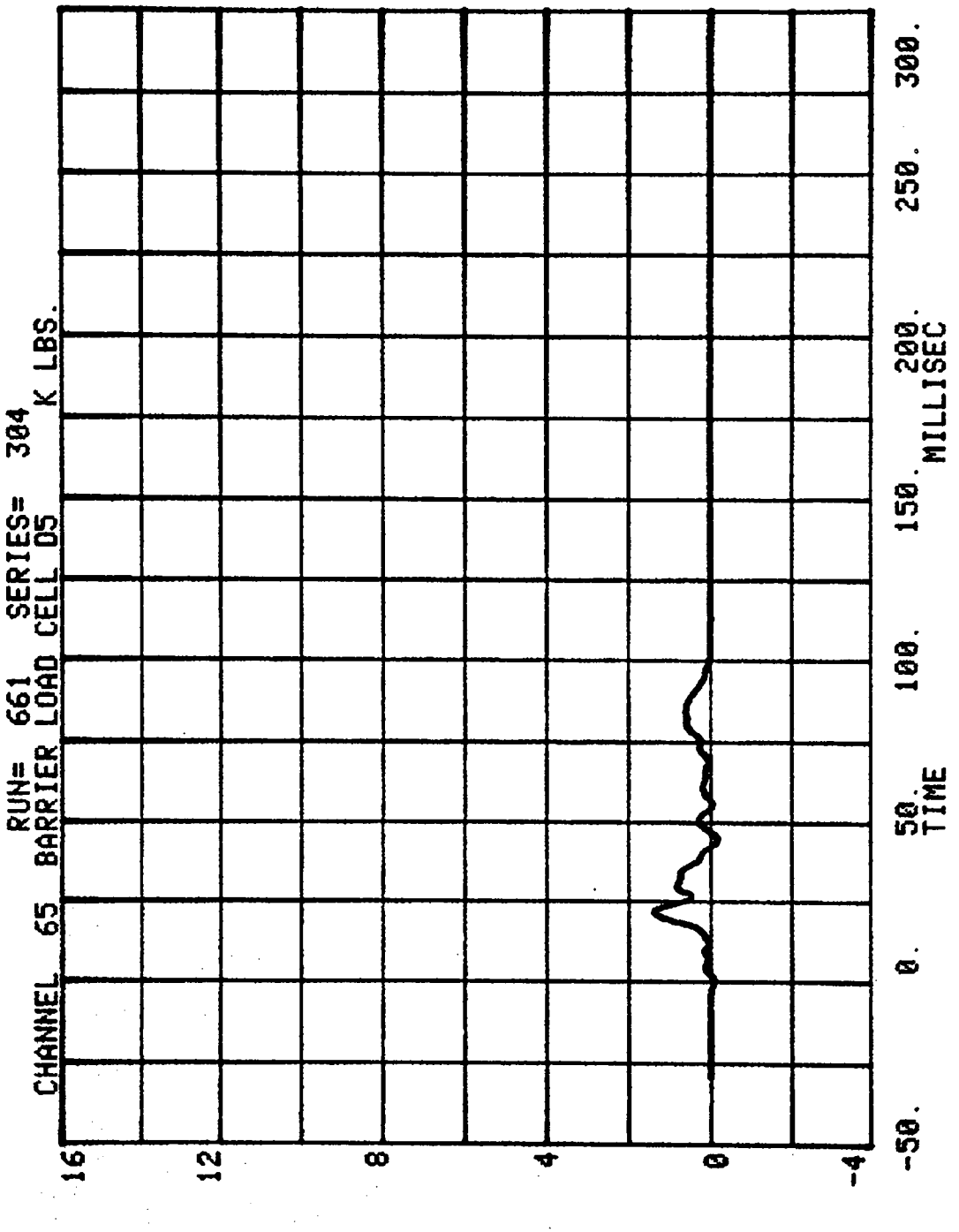

CHANNEL 61 RUN= 661 SERIES= 304
BARRIER LOAD CELL D1 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME MILLISEC

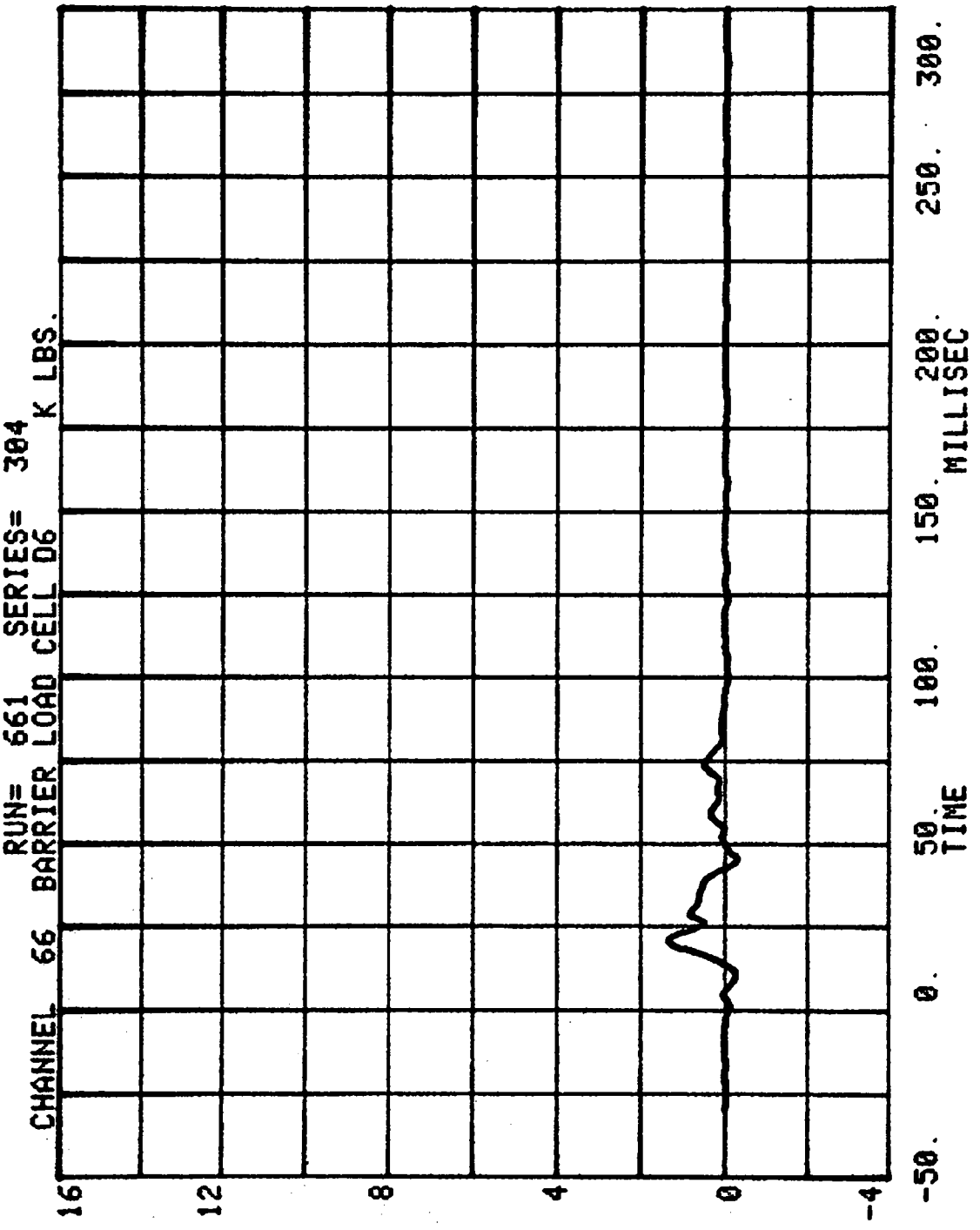

RUN= 661 SERIES= 304
CHANNEL 62 BARRIER LOAD CELL 02
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

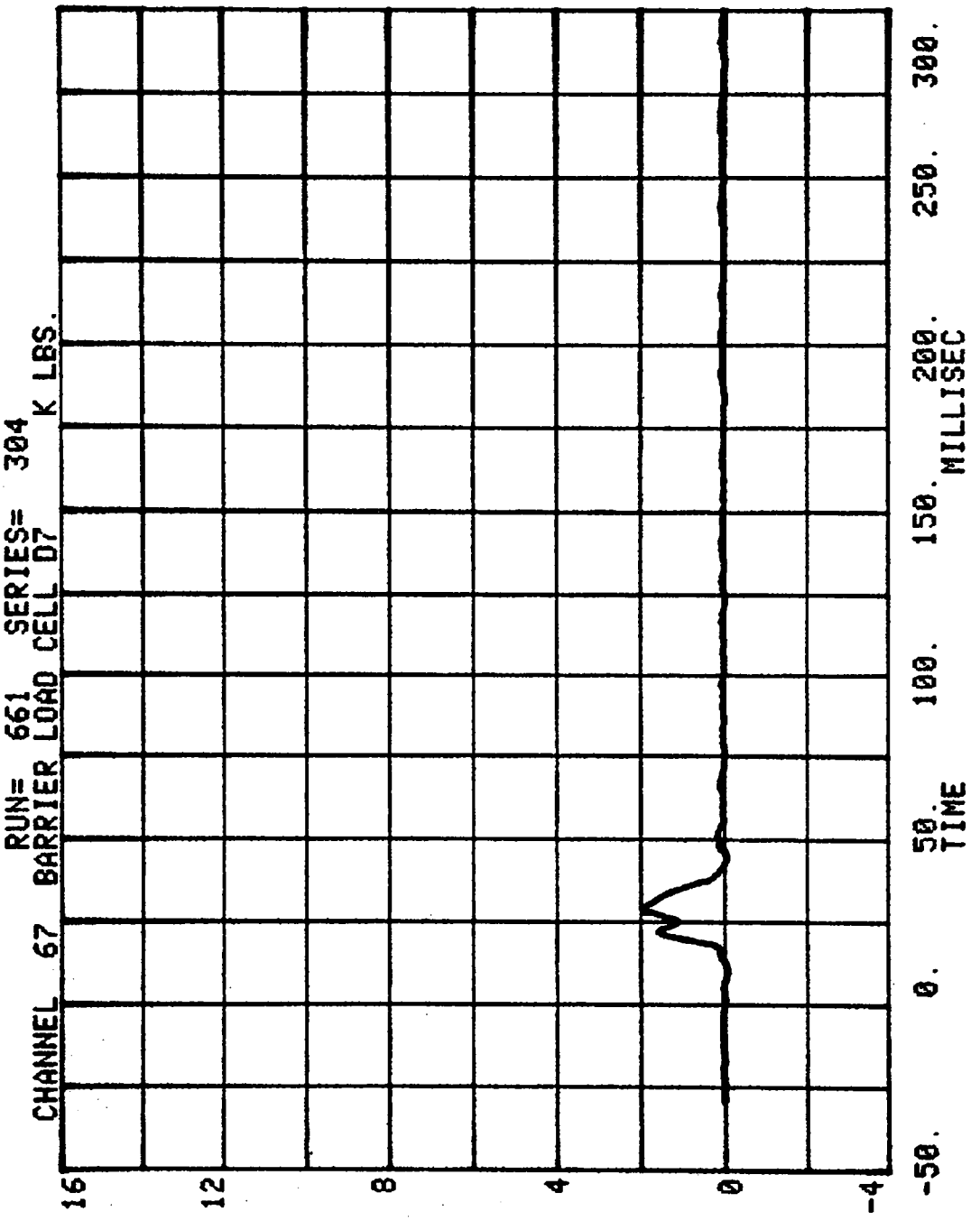

CHANNEL 63 BARRIER LOAD CELL 03
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

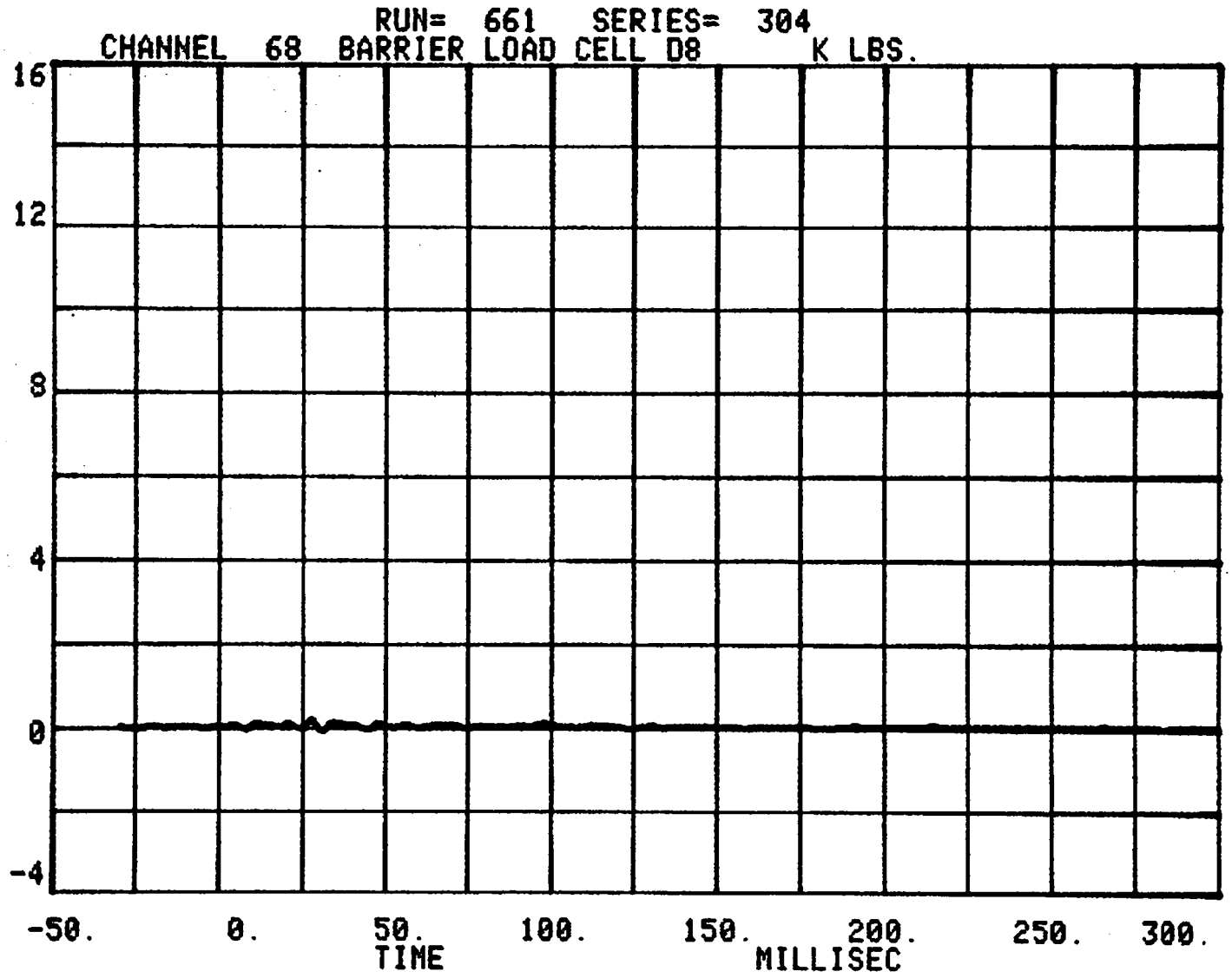
7333-6

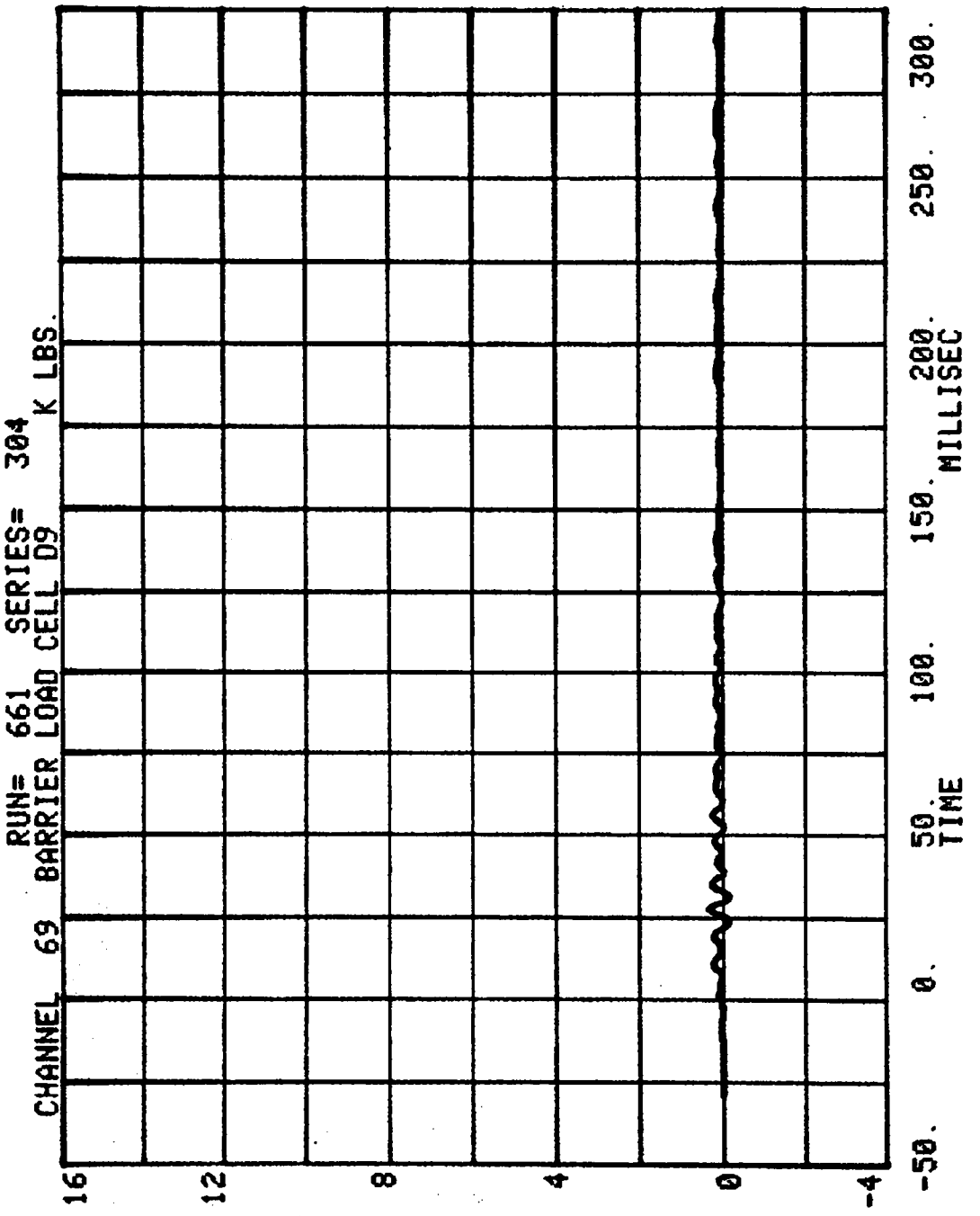

CHANNEL 64 BARRIER LOAD CELL 04
RUN= 661 SERIES= 304 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

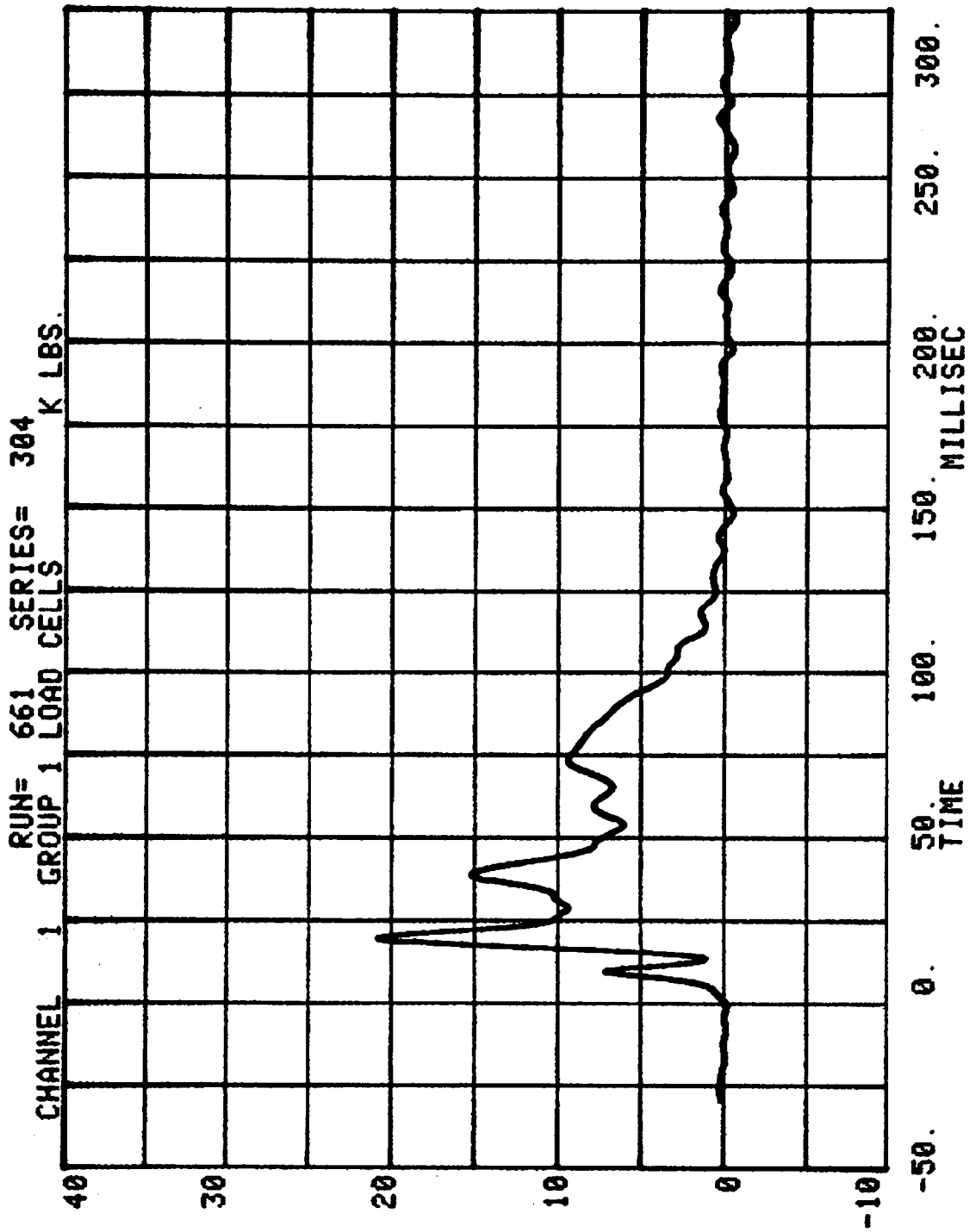

CHANNEL 65 BARRIER LOAD CELL 05
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 66 BARRIER LOAD CELL 06
RUN= 661 SERIES= 304
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

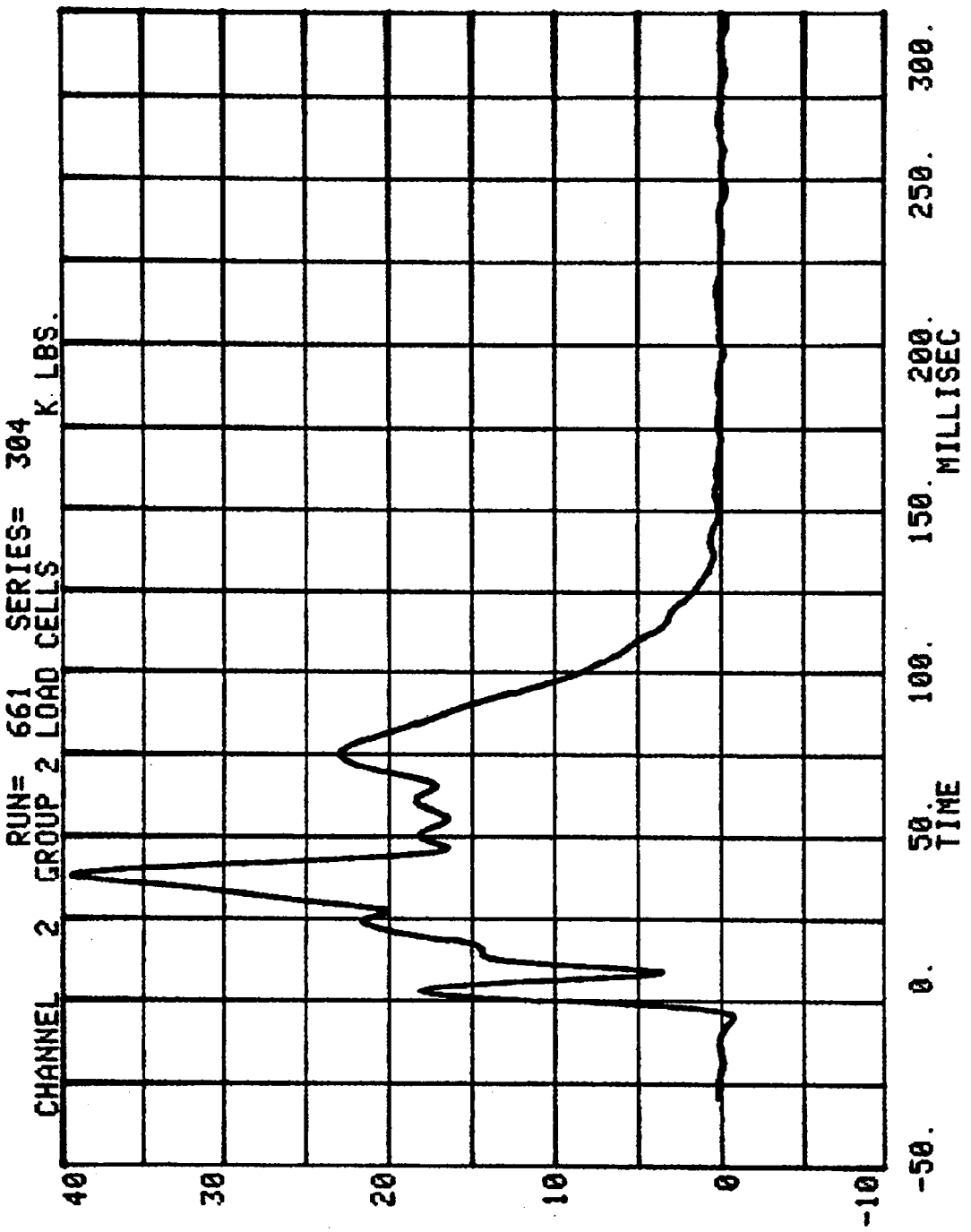

RUN= 661 SERIES= 304
CHANNEL 67 BARRIER LOAD CELL D7
K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 661 SERIES= 304
CHANNEL 68 BARRIER LOAD CELL D8 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

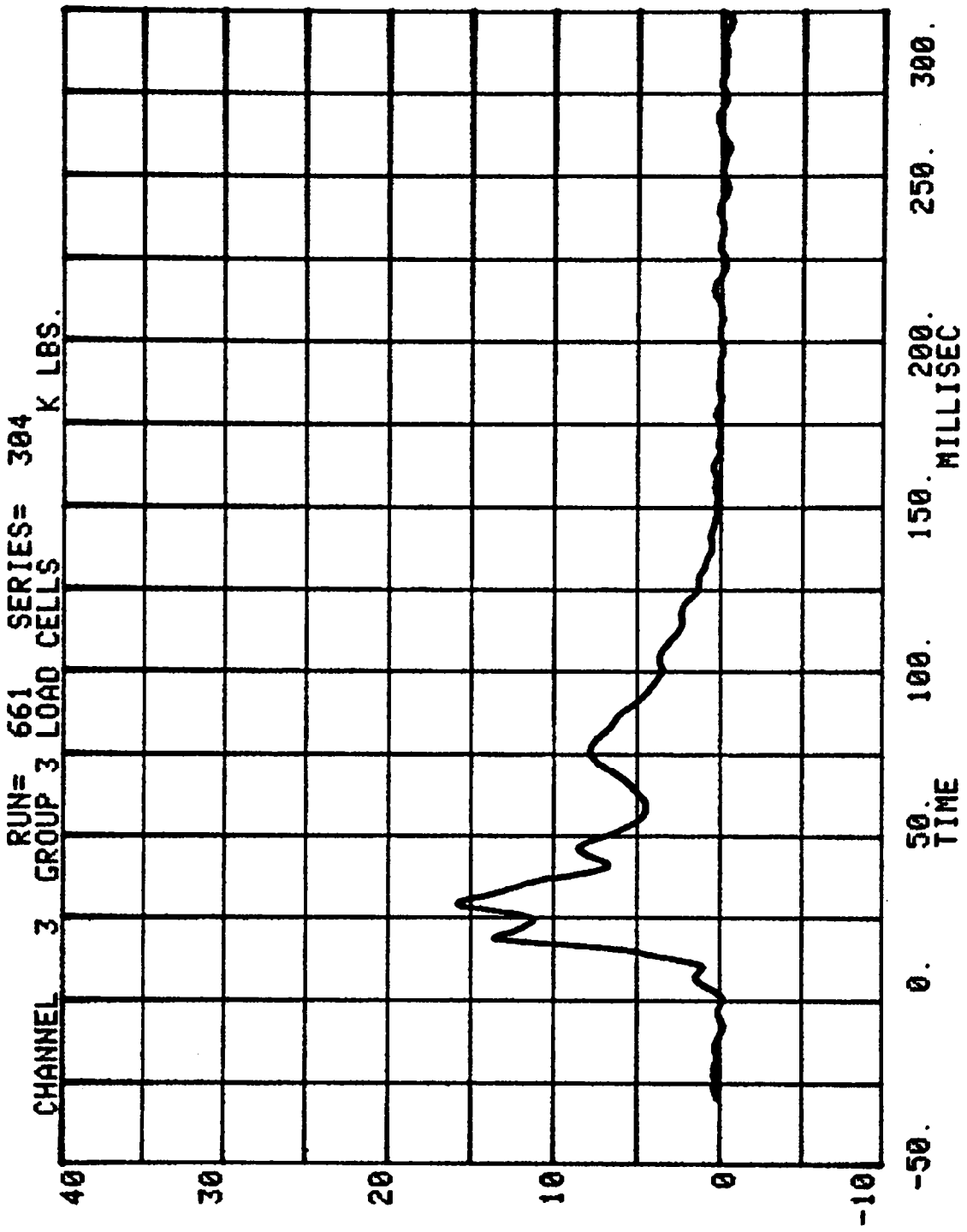

CHANNEL 69 RUN= 661 SERIES= 304
BARRIER LOAD CELL D9 K LBS.
16
12
8
4
0
-4
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

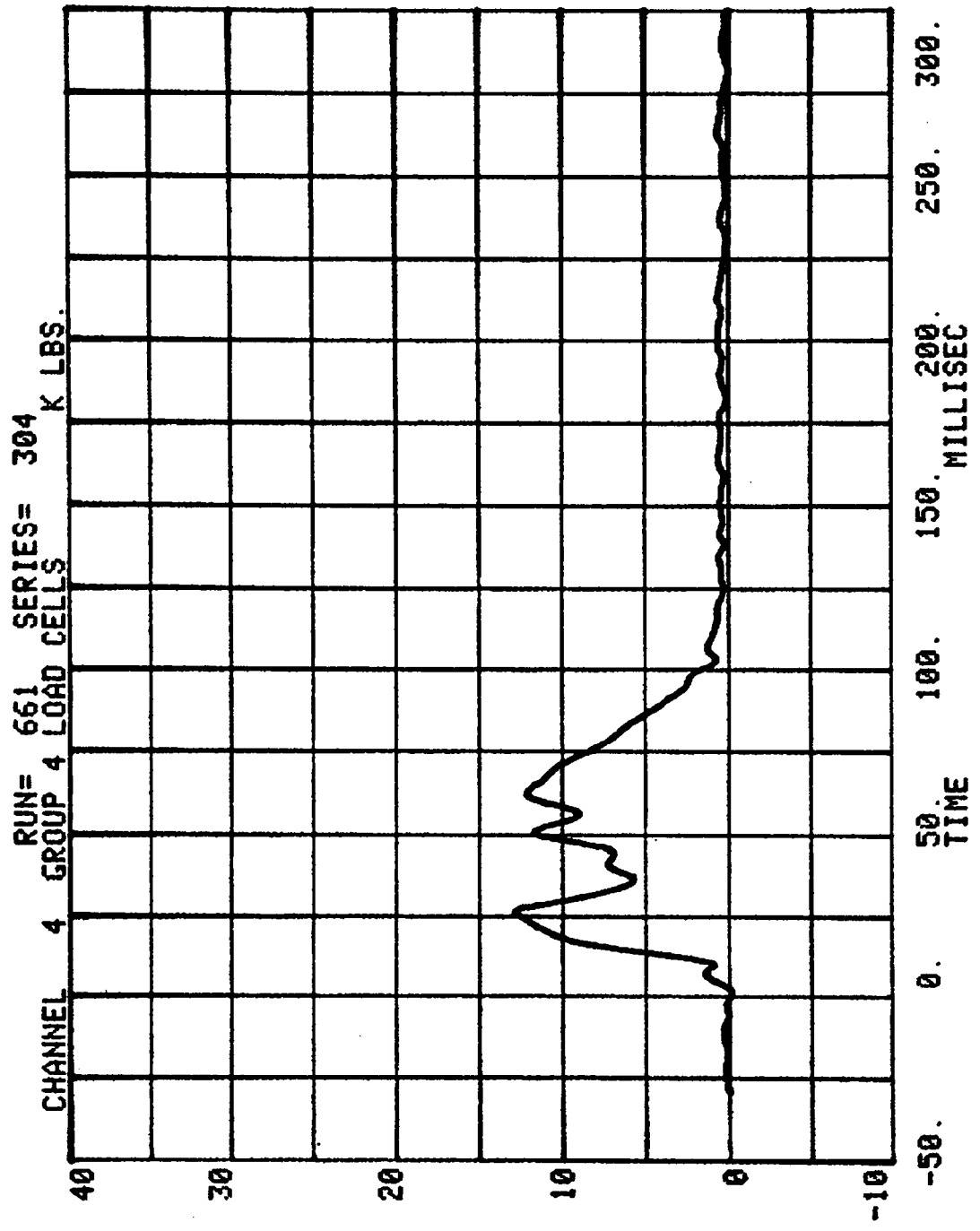

CHANNEL 1 GROUP 1 RUN= 661 SERIES= 304
LOAD CELLS
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

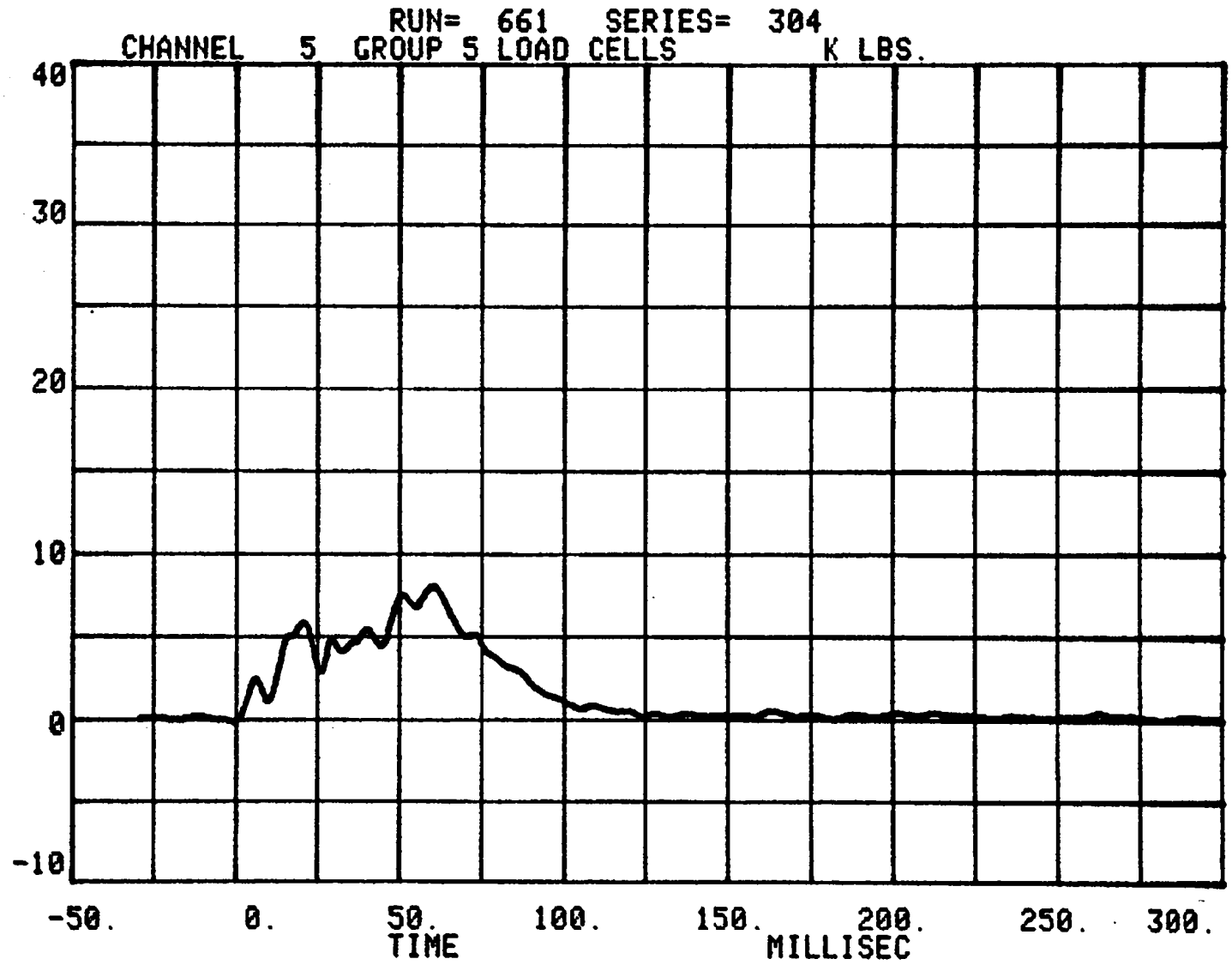
7333-6

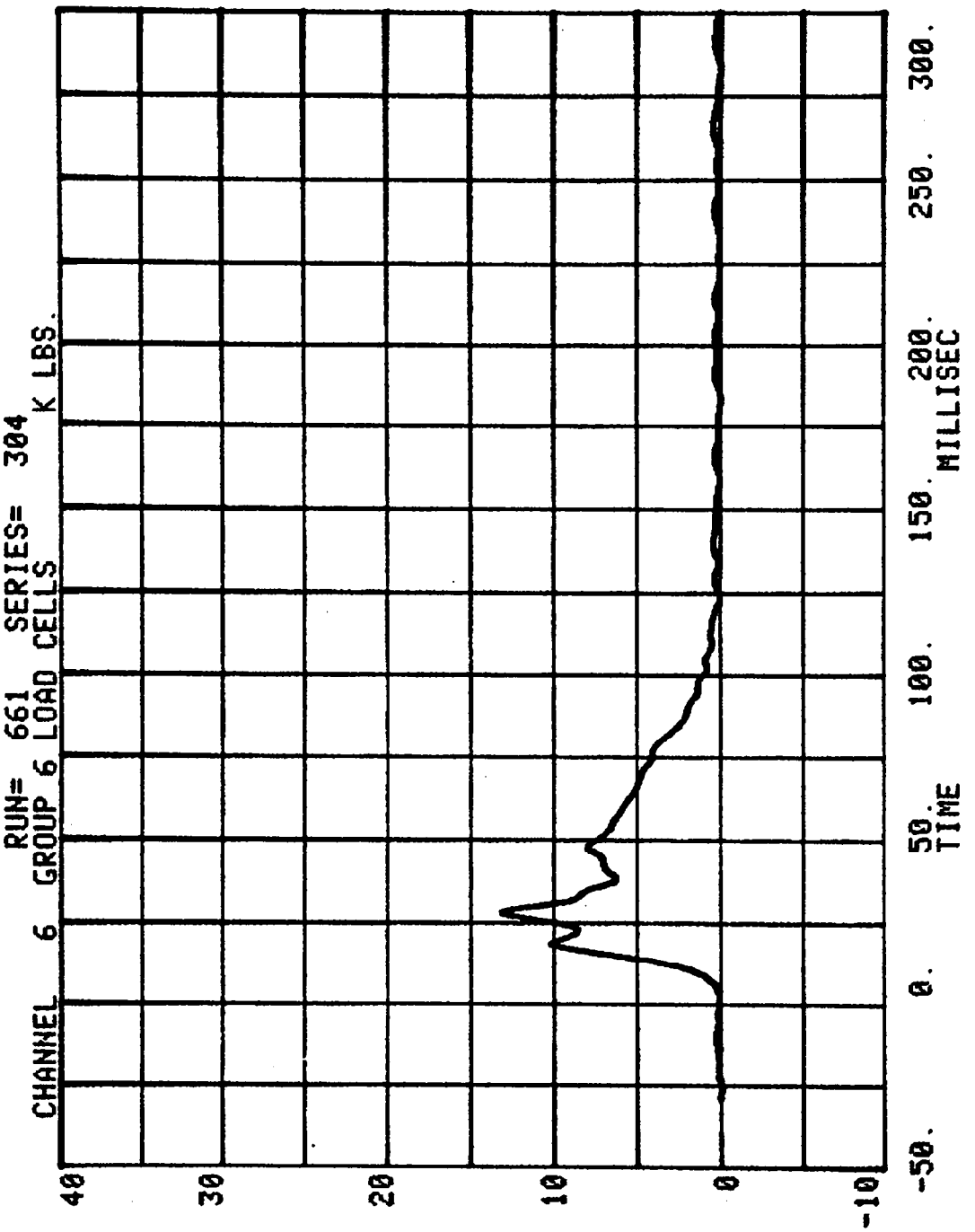

CHANNEL 2
RUN= 661 SERIES= 304
GROUP 2 LOAD CELLS
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

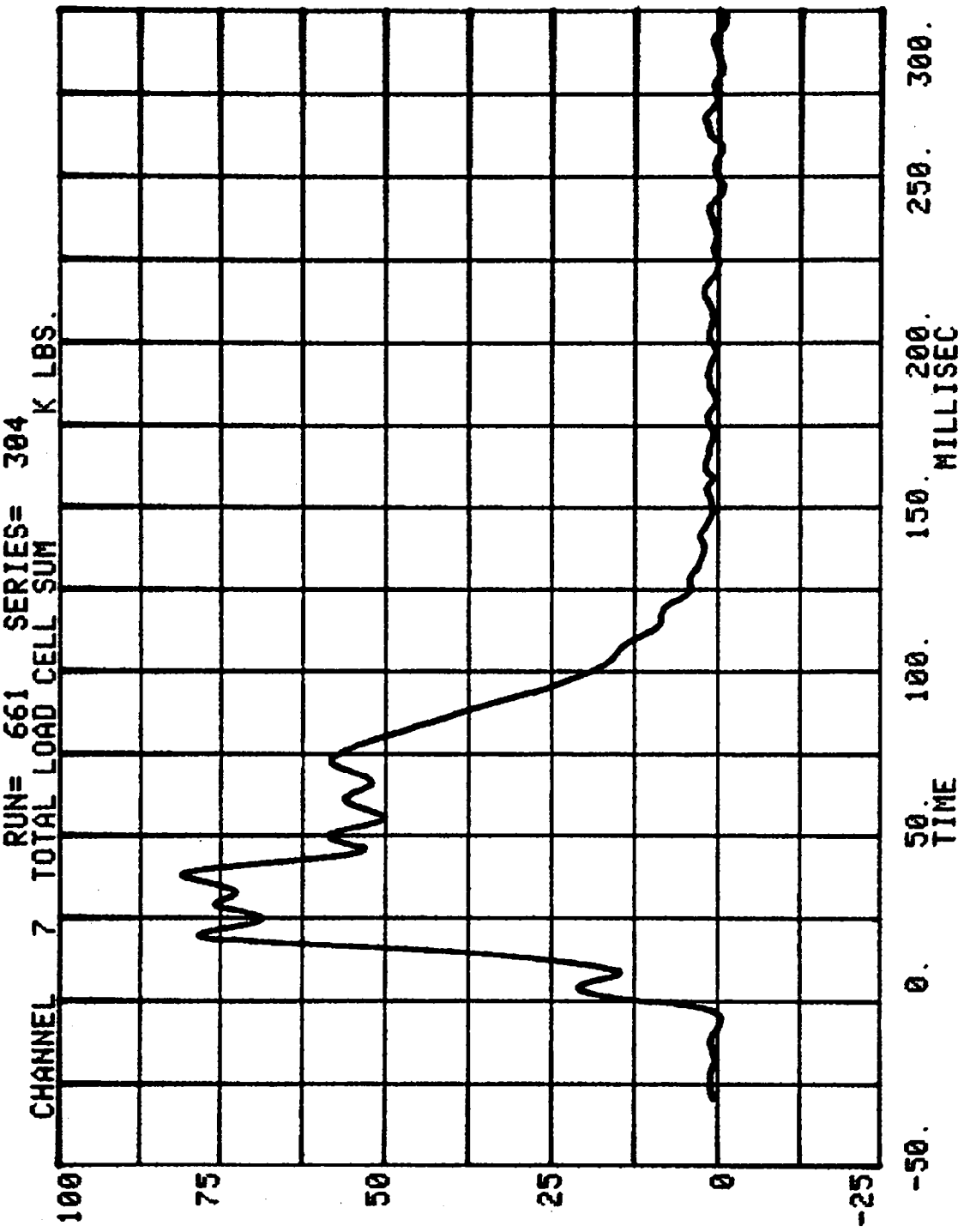
7333-6


CHANNEL 3 GROUP 3 LOAD CELLS
RUN= 661 SERIES= 304
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 4 GROUP 4 LOAD CELLS
RUN= 661 SERIES= 304
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 661 SERIES= 304
CHANNEL 5 GROUP 5 LOAD CELLS K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 6 GROUP 6 LOAD CELLS
RUN= 661 SERIES= 304
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 661 SERIES= 304
CHANNEL 7 TOTAL LOAD CELL SUM
K LBS.
100
75
50
25
0
-25
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

TEST NO. CF0304

LOAD CELL BARRIER DATA
FILTER CHANNEL CLASS

60

HEAD INJURY CRITERION
HEAD SEVERITY INDEX

CAR TO LOAD CELL BARRIER

RUN= 661

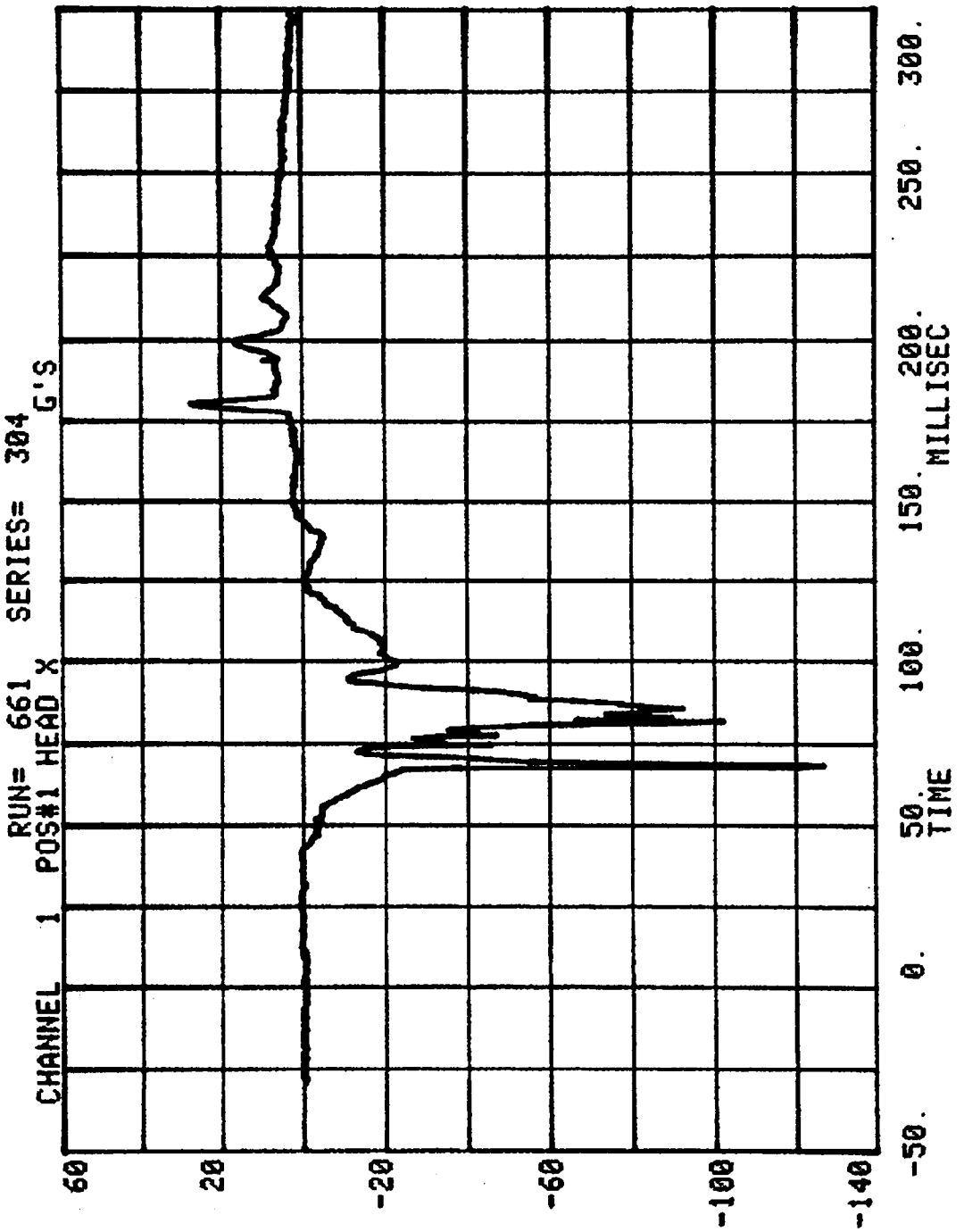
POS#1 HEAD RESULTANT

HIC= 831.5 FROM T1= .06787 TO T2= .09457

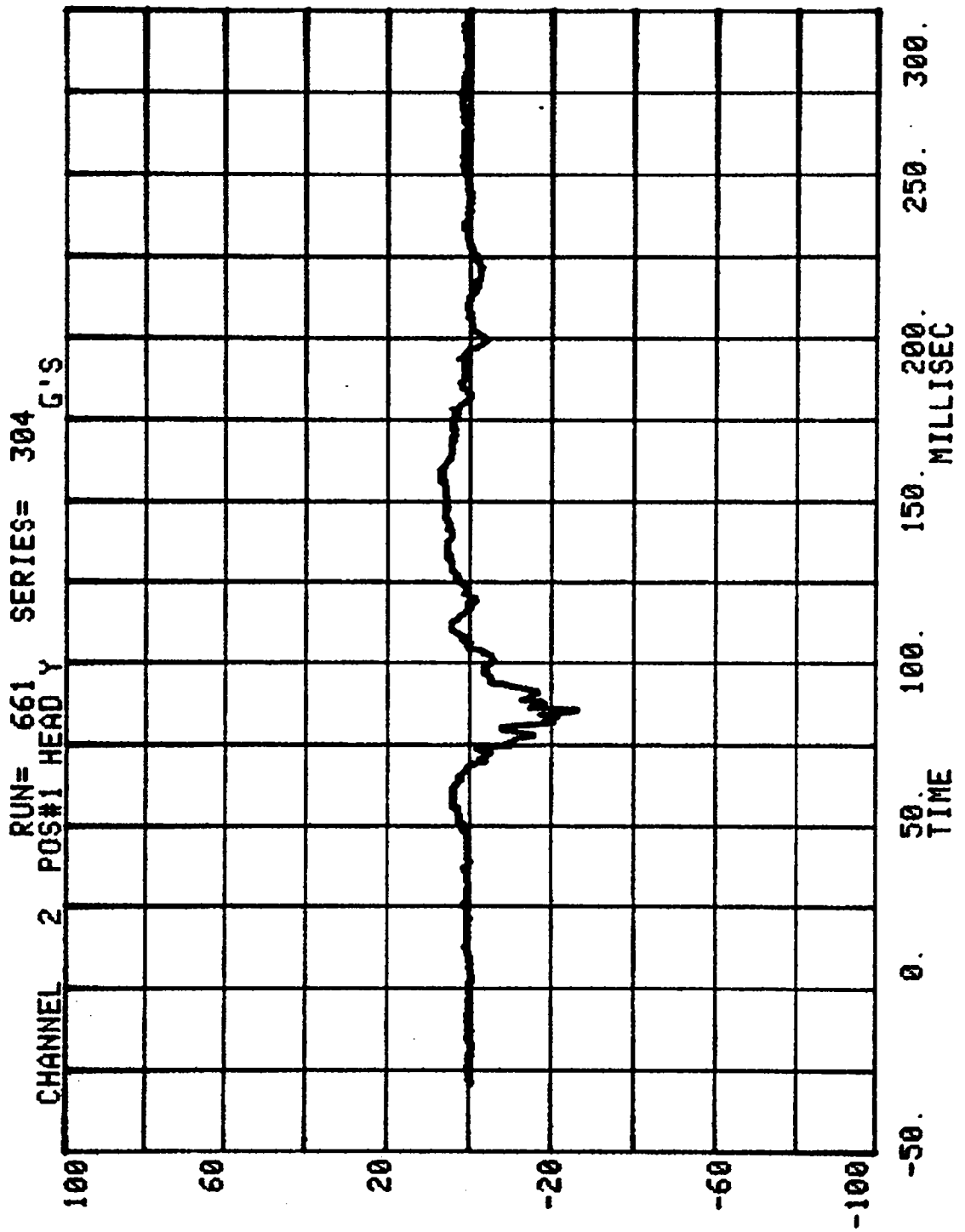
AVERAGE ACCELERATION BETWEEN T1 AND T2= 62.7G'S

EVENT TIME= 300.0 MSEC

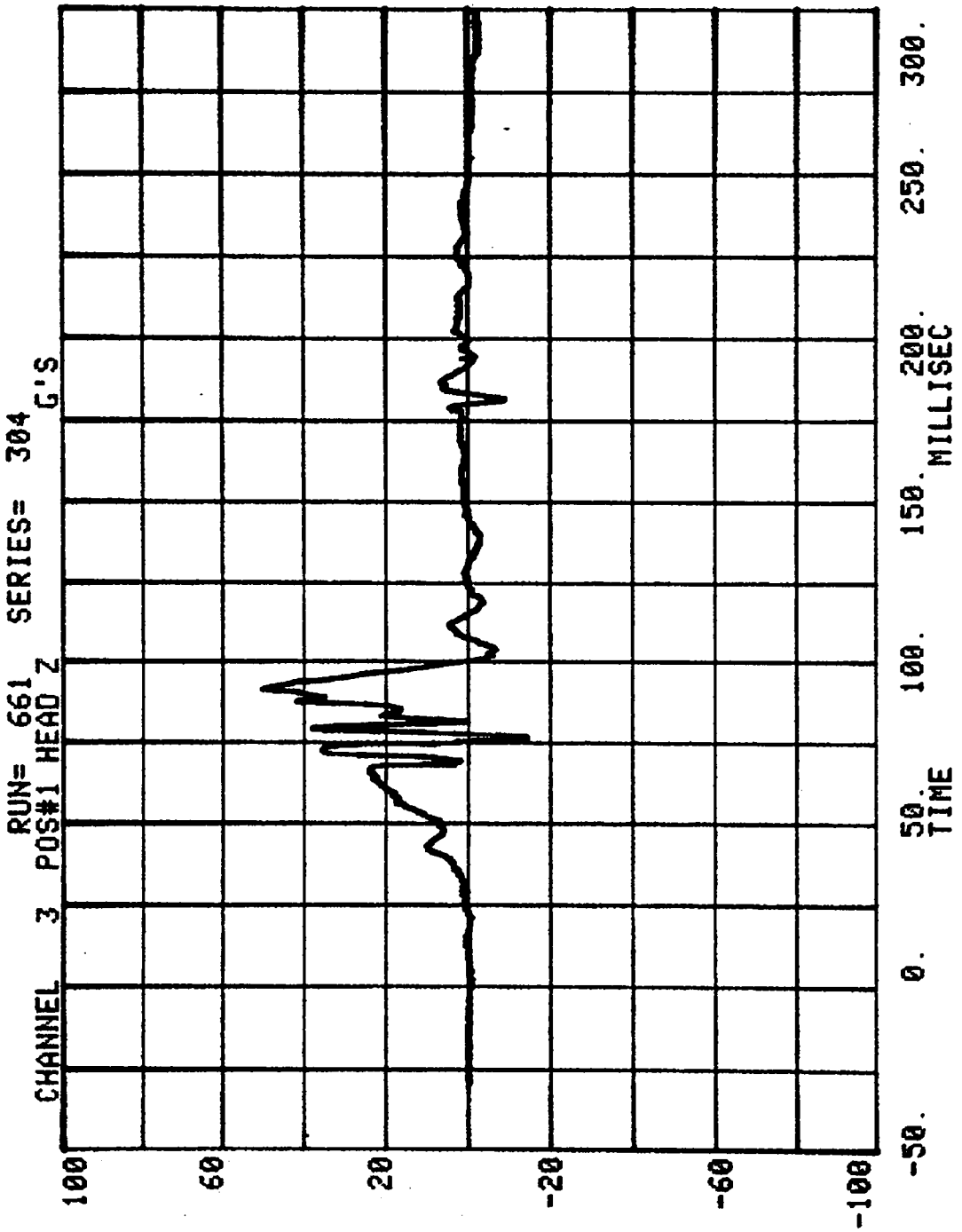
SEVERITY INDEX=1176.5


CHANNEL 1 RUN= 661 SERIES= 304
POS#1 HEAD X
G'S
60
20
-20
-60
-100
-140
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

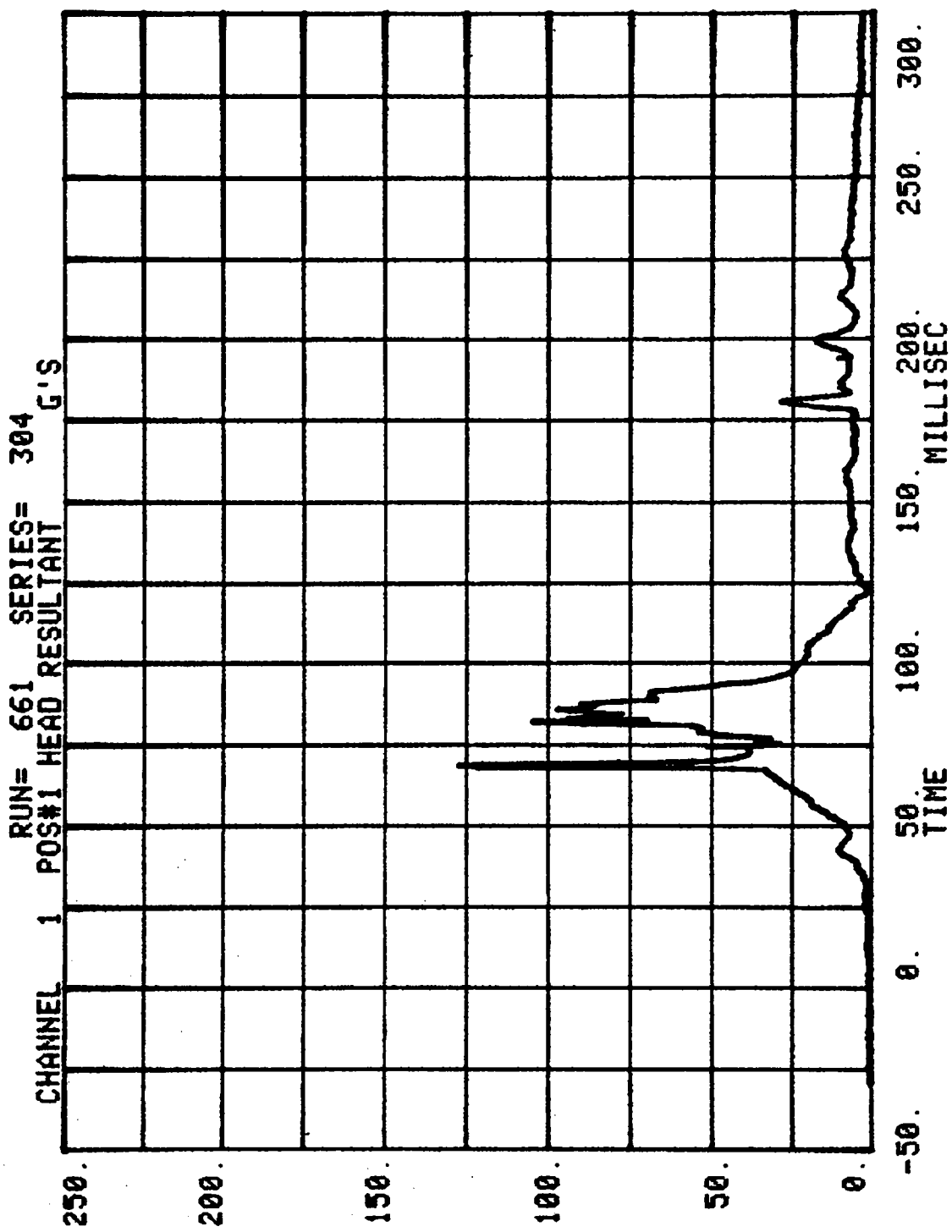
7333-6

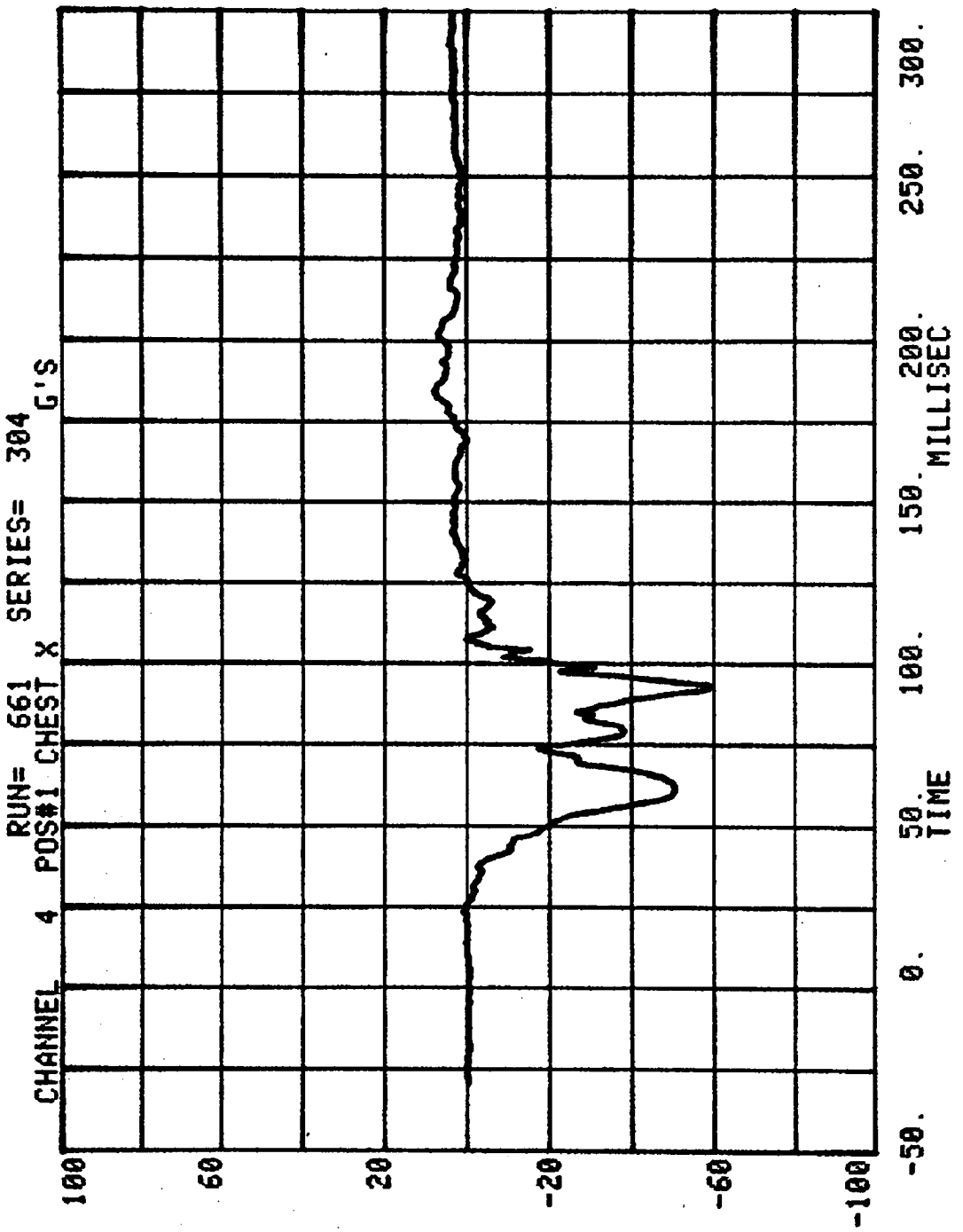

CHANNEL 2 POS#1 HEAD Y
RUN= 661 SERIES= 304 G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6

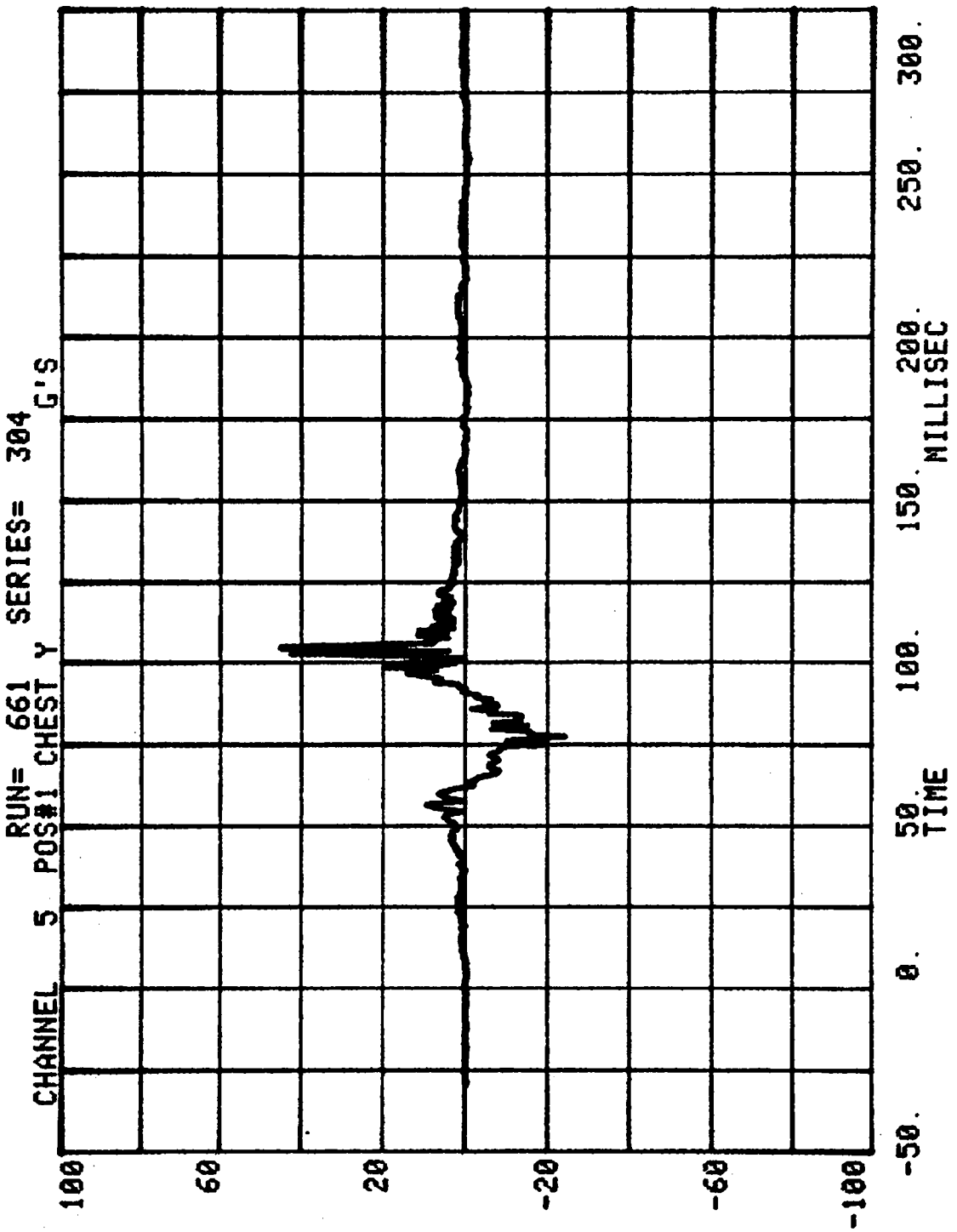

CHANNEL 3 POS#1 HEAD Z
RUN= 661 SERIES= 304
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6

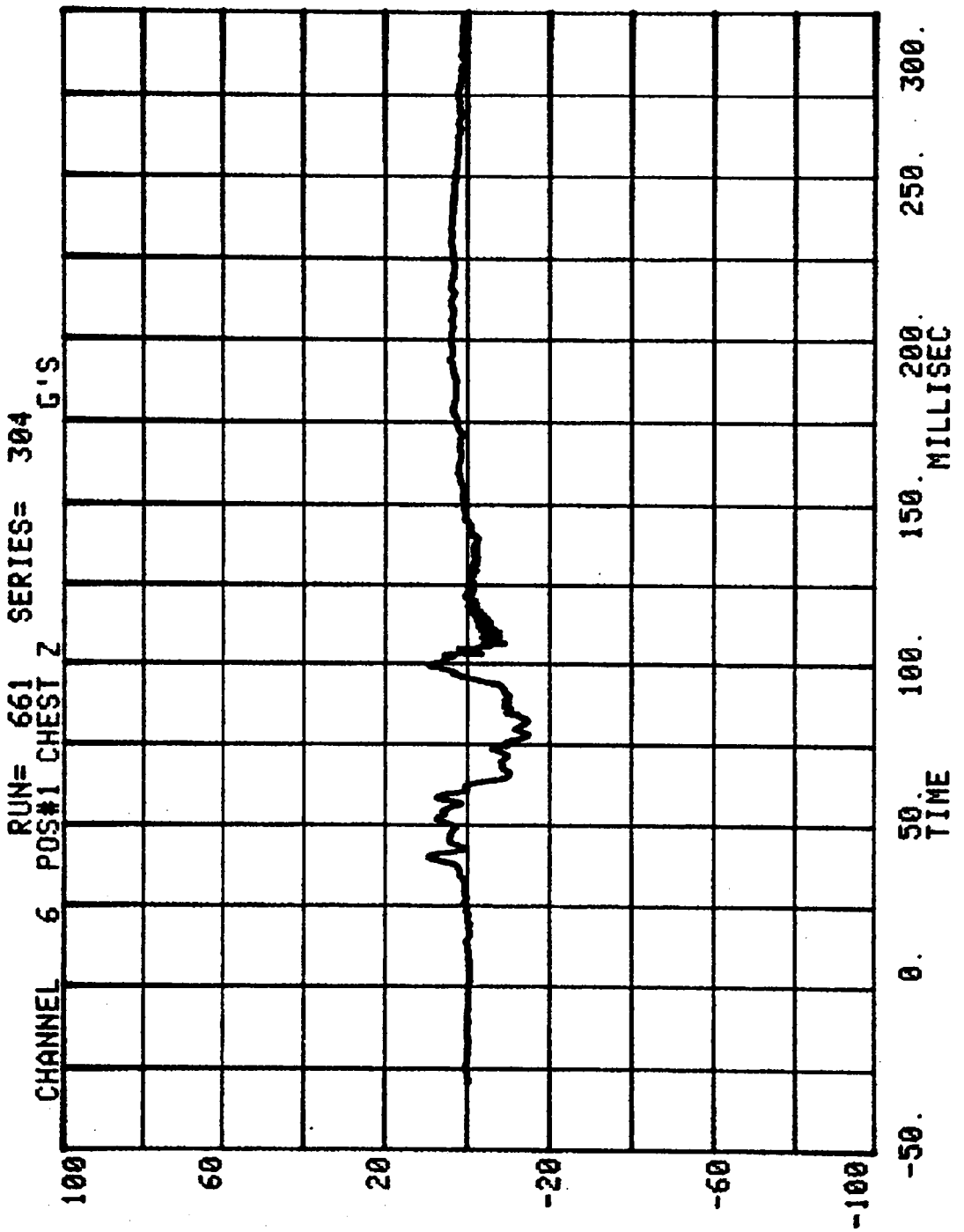

CHANNEL 1 POS#1 HEAD RESULTANT
RUN= 661 SERIES= 304
G'S
250.
200.
150.
100.
50.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

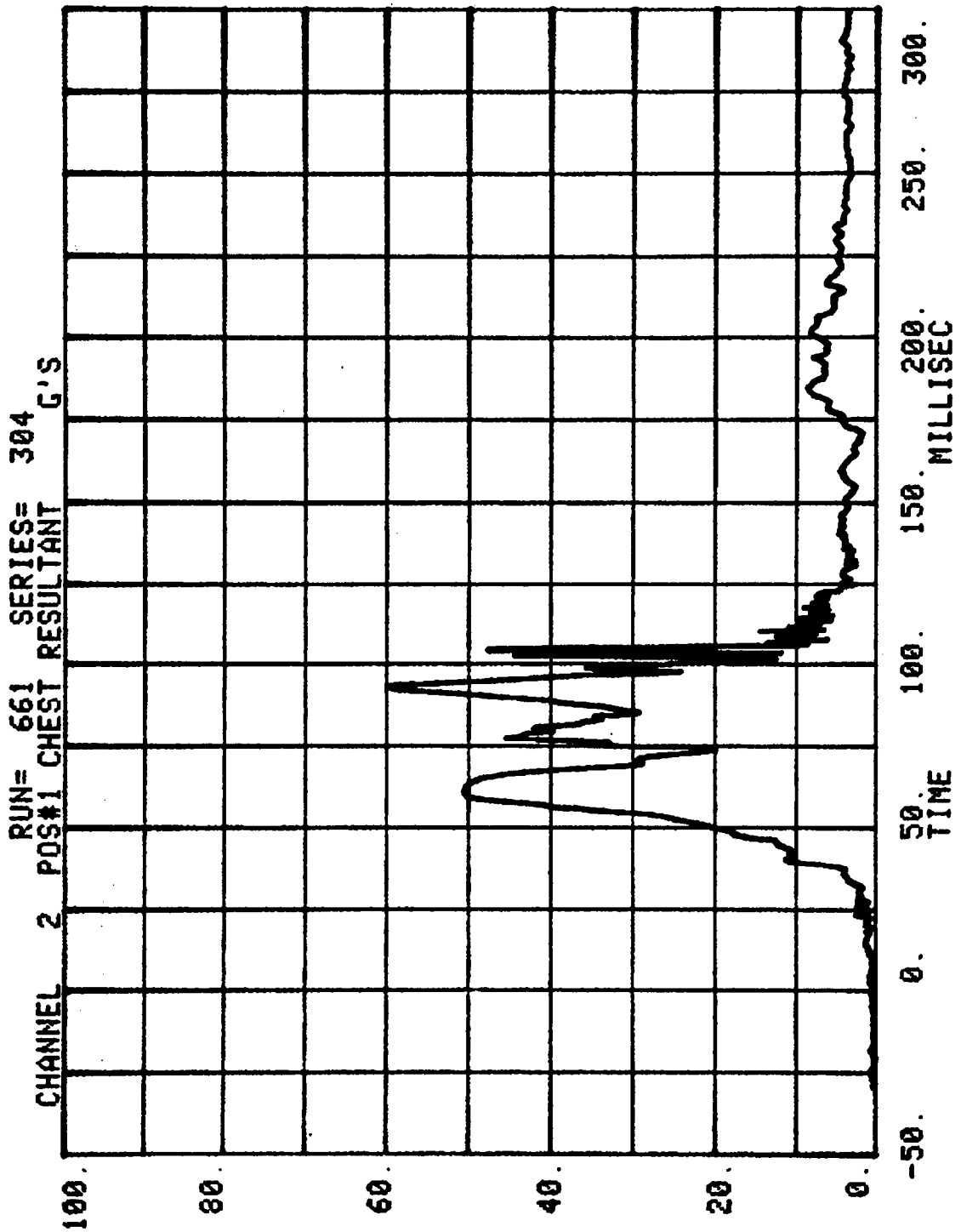

CHANNEL 4 RUN= 661 SERIES= 304
POS#1 CHEST X
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6

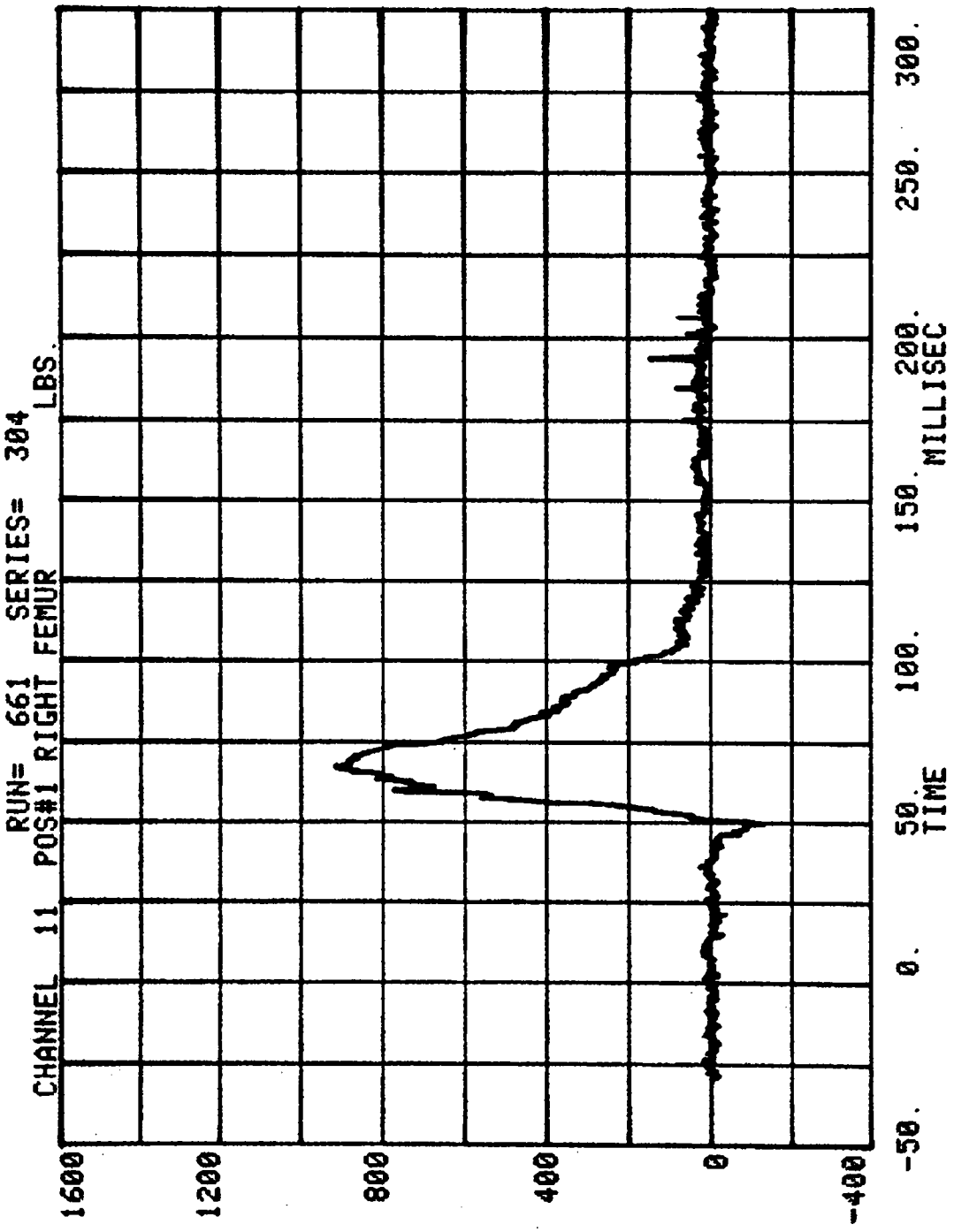

CHANNEL 5 POS#1 CHEST Y
RUN= 661 SERIES= 304
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6

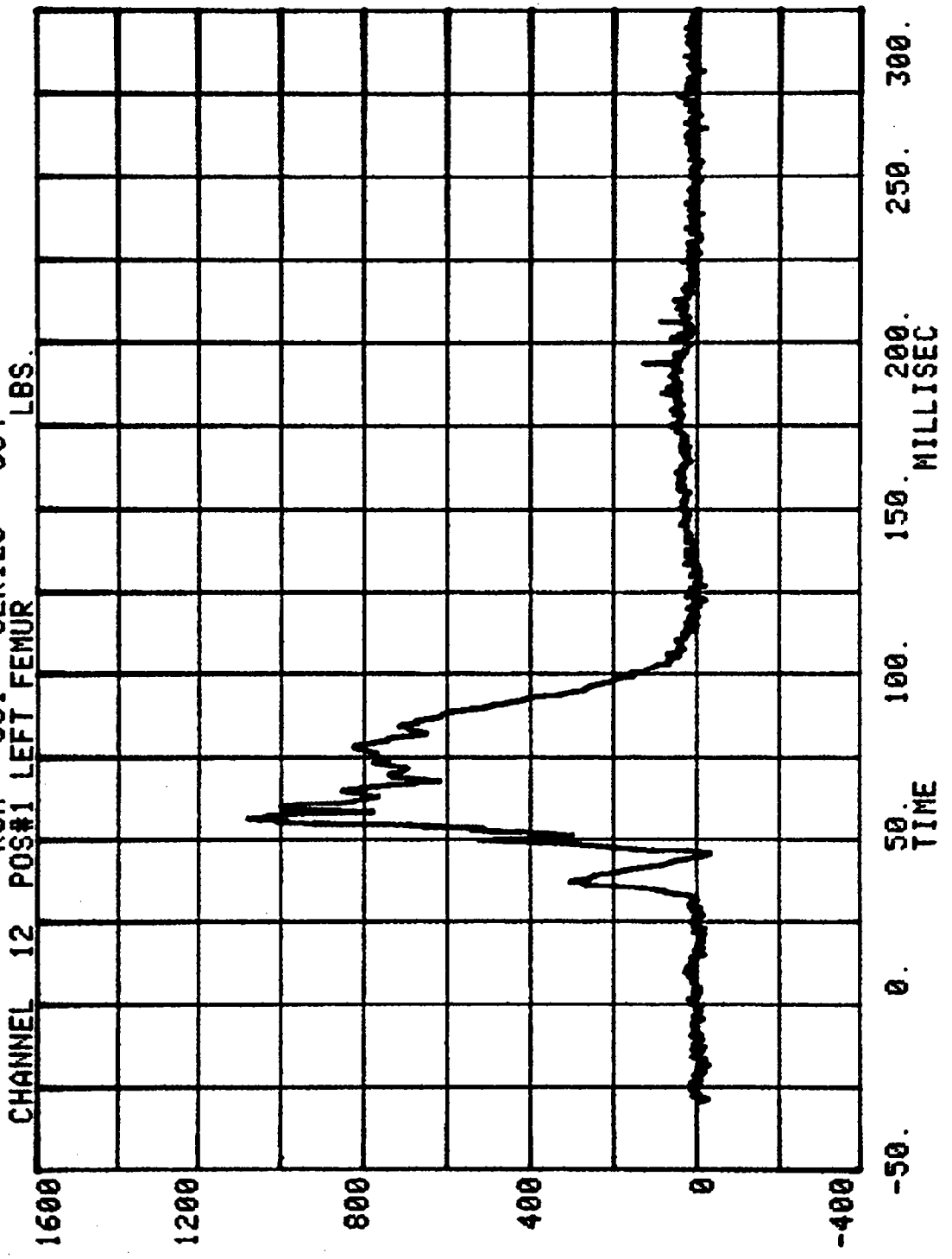

RUN= 661 SERIES= 304
CHANNEL 6 POS#1 CHEST Z
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 2 RUN= 661 SERIES= 304
POS#1 CHEST RESULTANT G'S
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

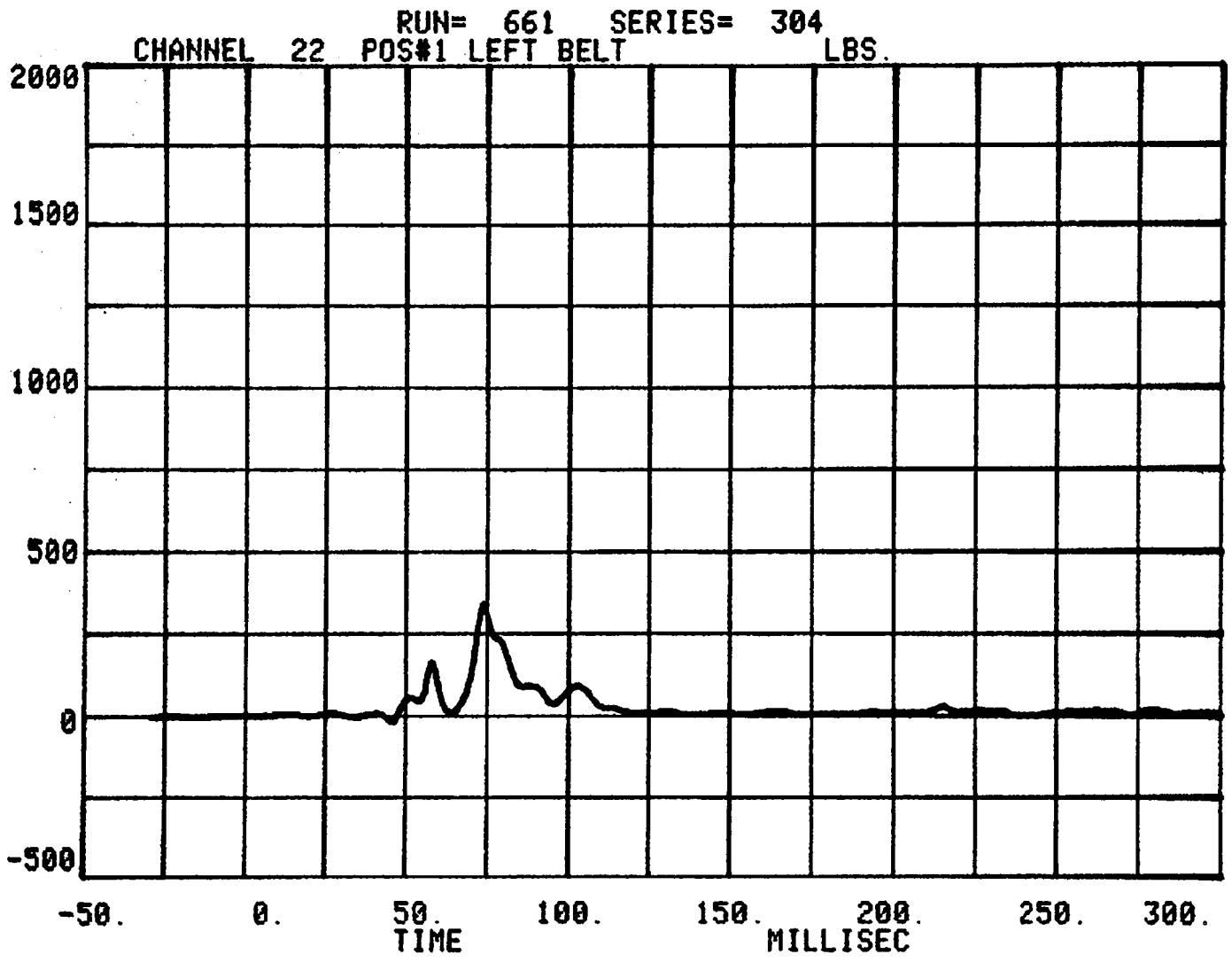
7333-6


CHANNEL 11 RUN= 661 SERIES= 304
POS#1 RIGHT FEMUR LBS.
1600
1200
800
400
0
-400
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

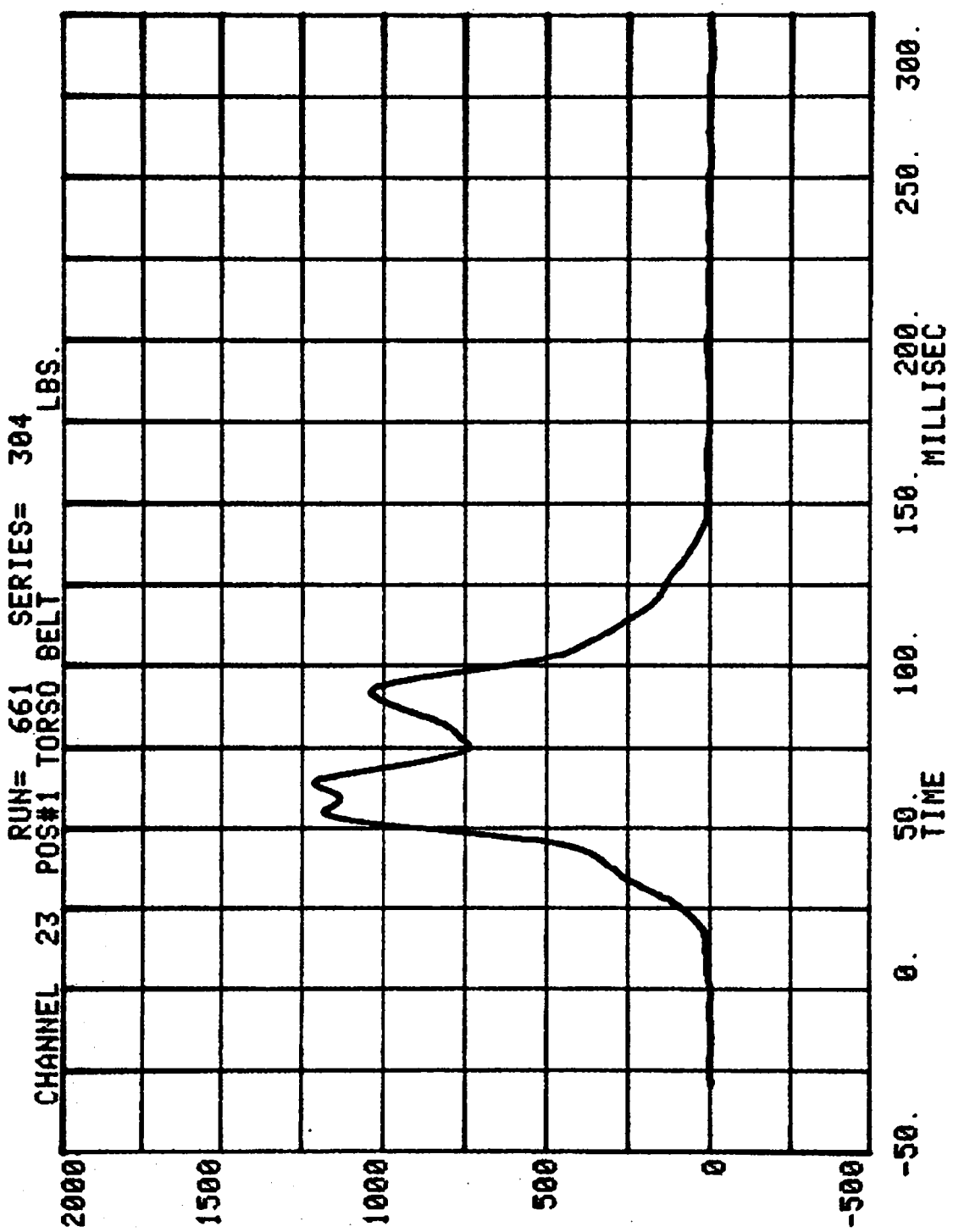
7333-6

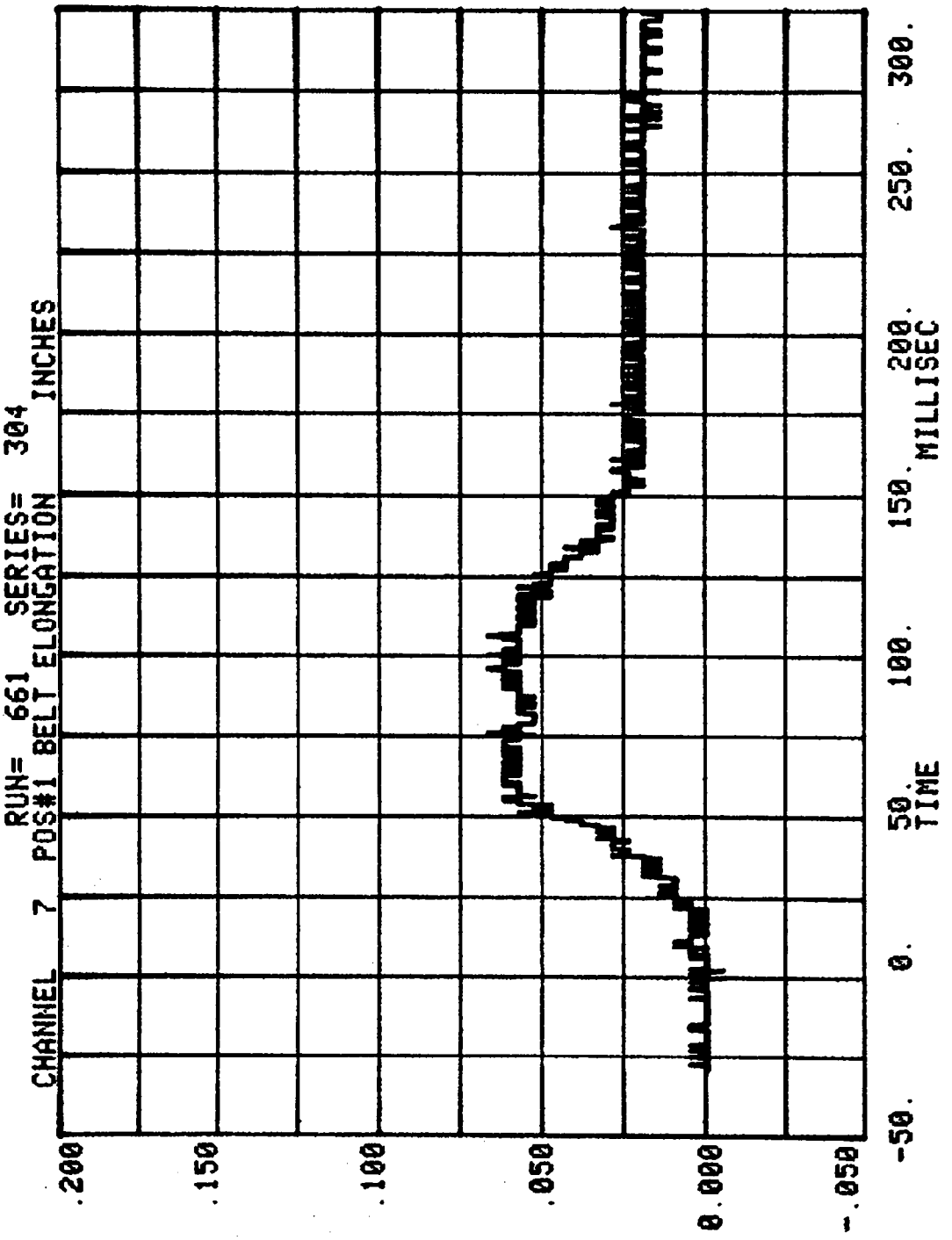

CHANNEL 12 POS#1 LEFT FEMUR
RUN= 661 SERIES= 304
LBS.
1600
1200
800
400
0
-400
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6


RUN= 661 SERIES= 304
CHANNEL 22 POS#1 LEFT BELT LBS.
2000
1500
1000
500
0
-500
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6


CHANNEL 23 RUN= 661 SERIES= 304
POS#1 TORSO BELT
LBS.
2000
1500
1000
500
0
-500
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 7 RUN= 661 SERIES= 304
POS#1 BELT ELONGATION INCHES
.200
.150
.100
.050
0.000
-.050
-50.
0.
50.
100.
150.
200.
250.
300.
TIME MILLISEC

7333-6

HEAD INJURY CRITERION
HEAD SEVERITY INDEX

CAR TO LOAD CELL BARRIER

RUN= 661

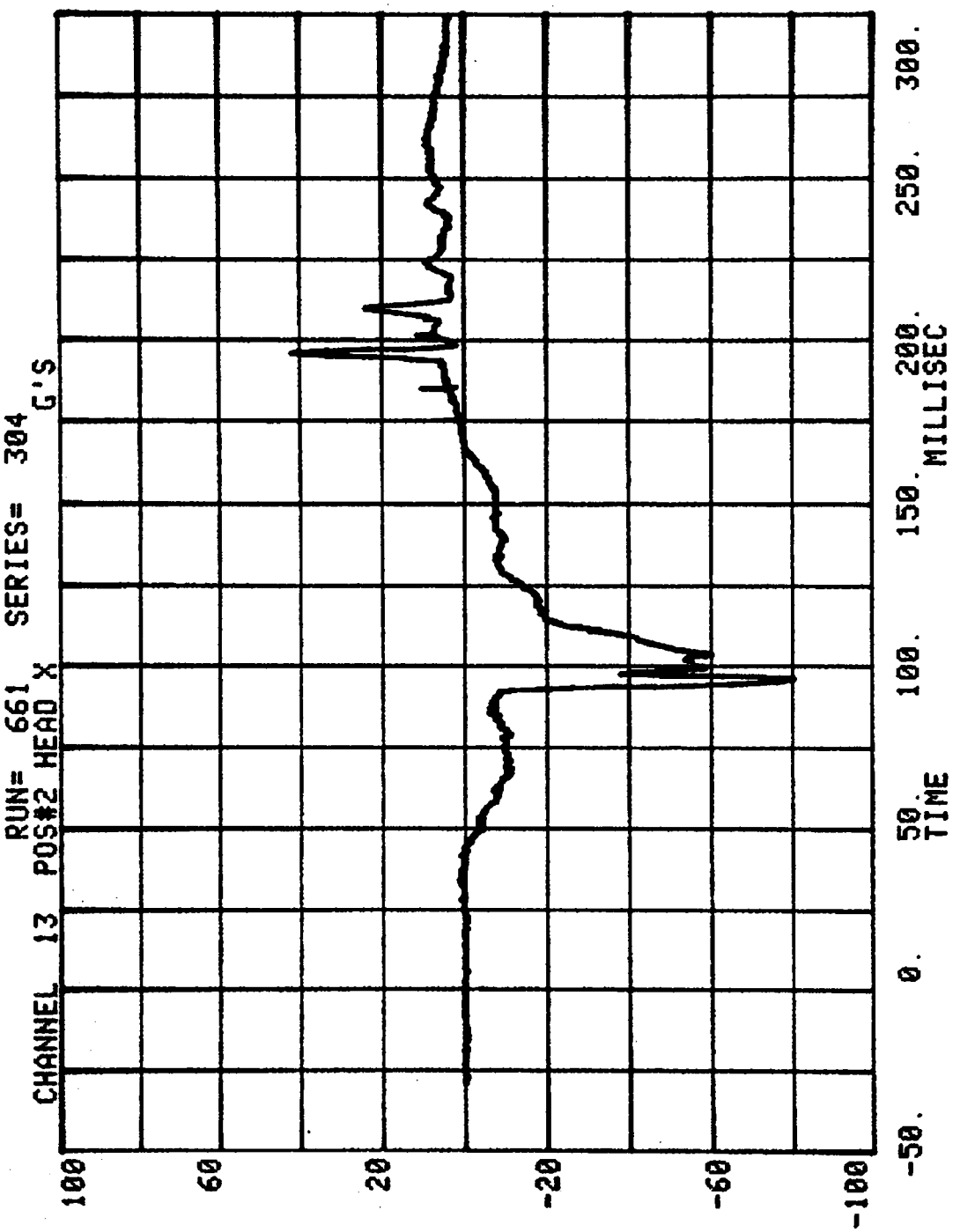
POS#2 HEAD RESULTANT

HIC= 843.1 FROM T1= .08647 TO T2= .11400

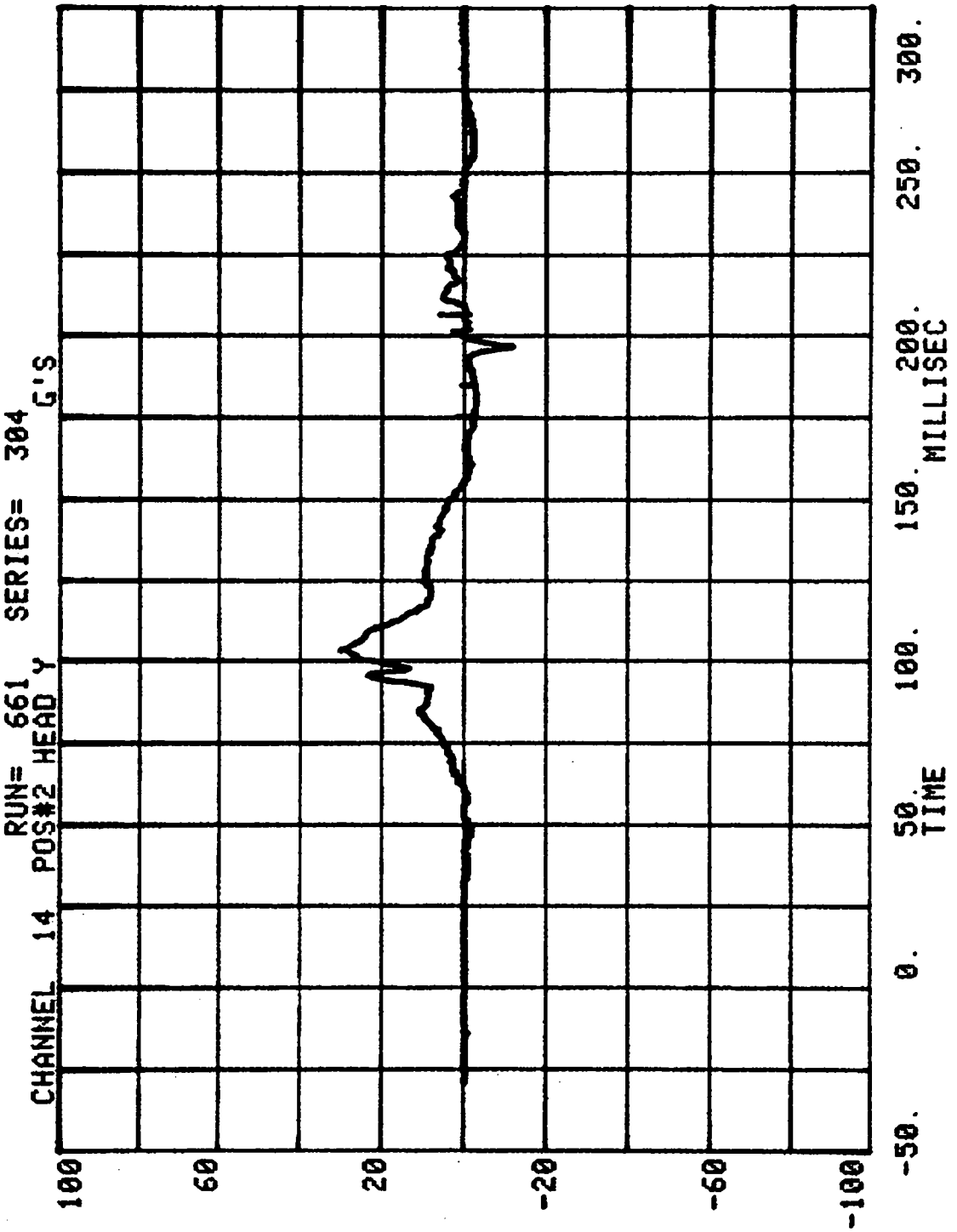
AVERAGE ACCELERATION BETWEEN T1 AND T2= 62.3G'S

EVENT TIME= 300.0 MSEC

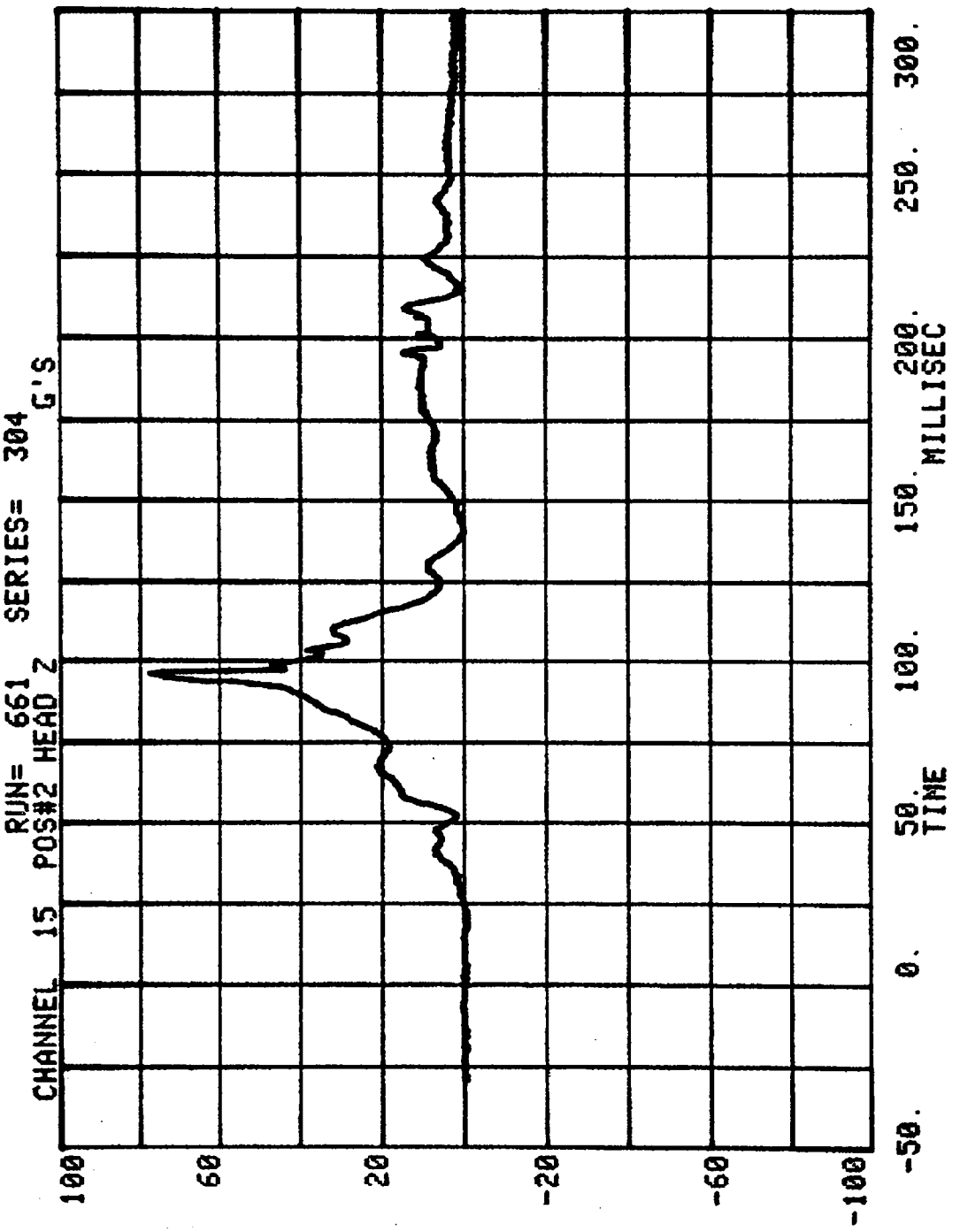
SEVERITY INDEX=1216.4


CHANNEL 13 POS#2 HEAD X
RUN= 661 SERIES= 304 G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

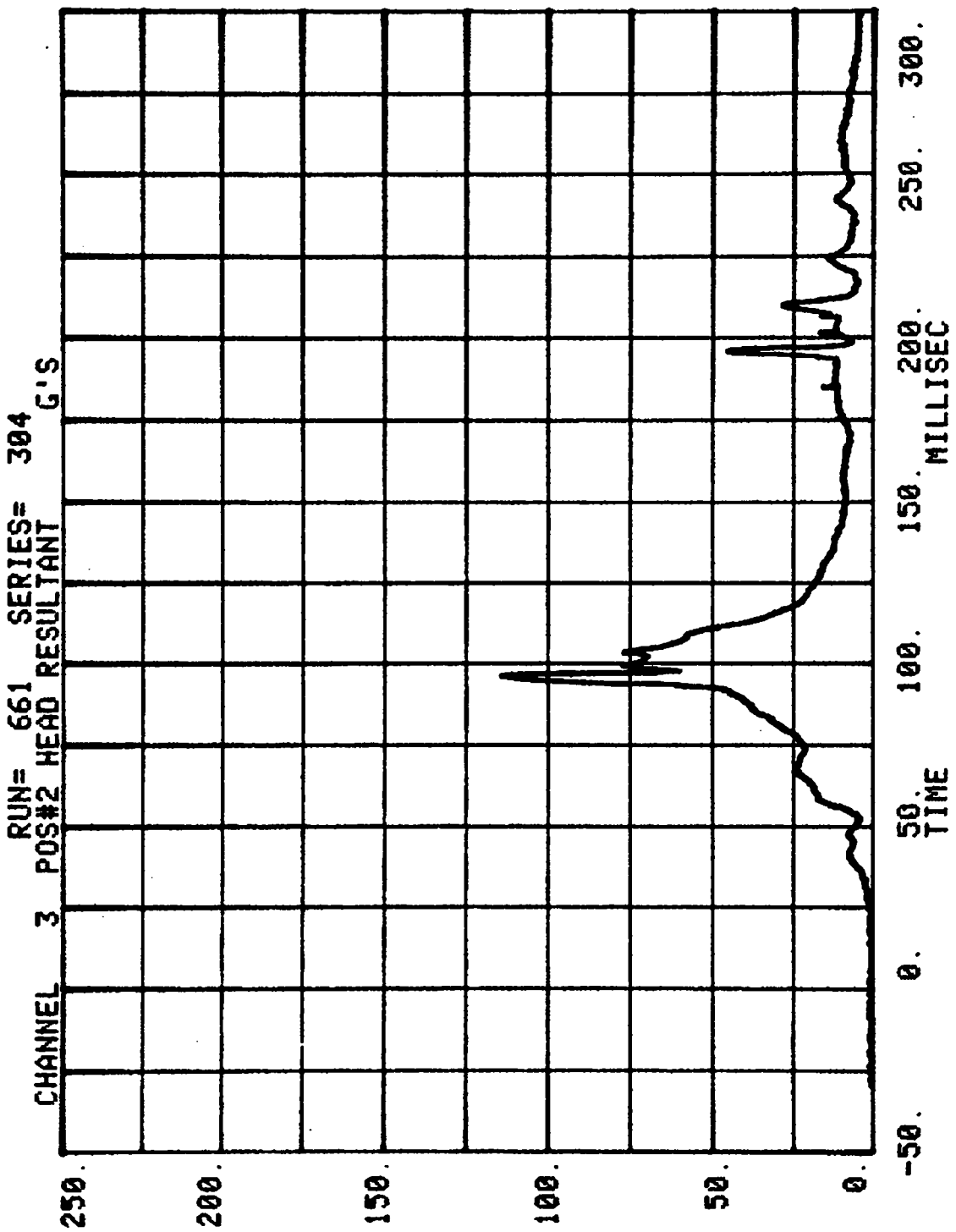
7333-6


CHANNEL 14 POS#2 HEAD Y
RUN= 661 SERIES= 304
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

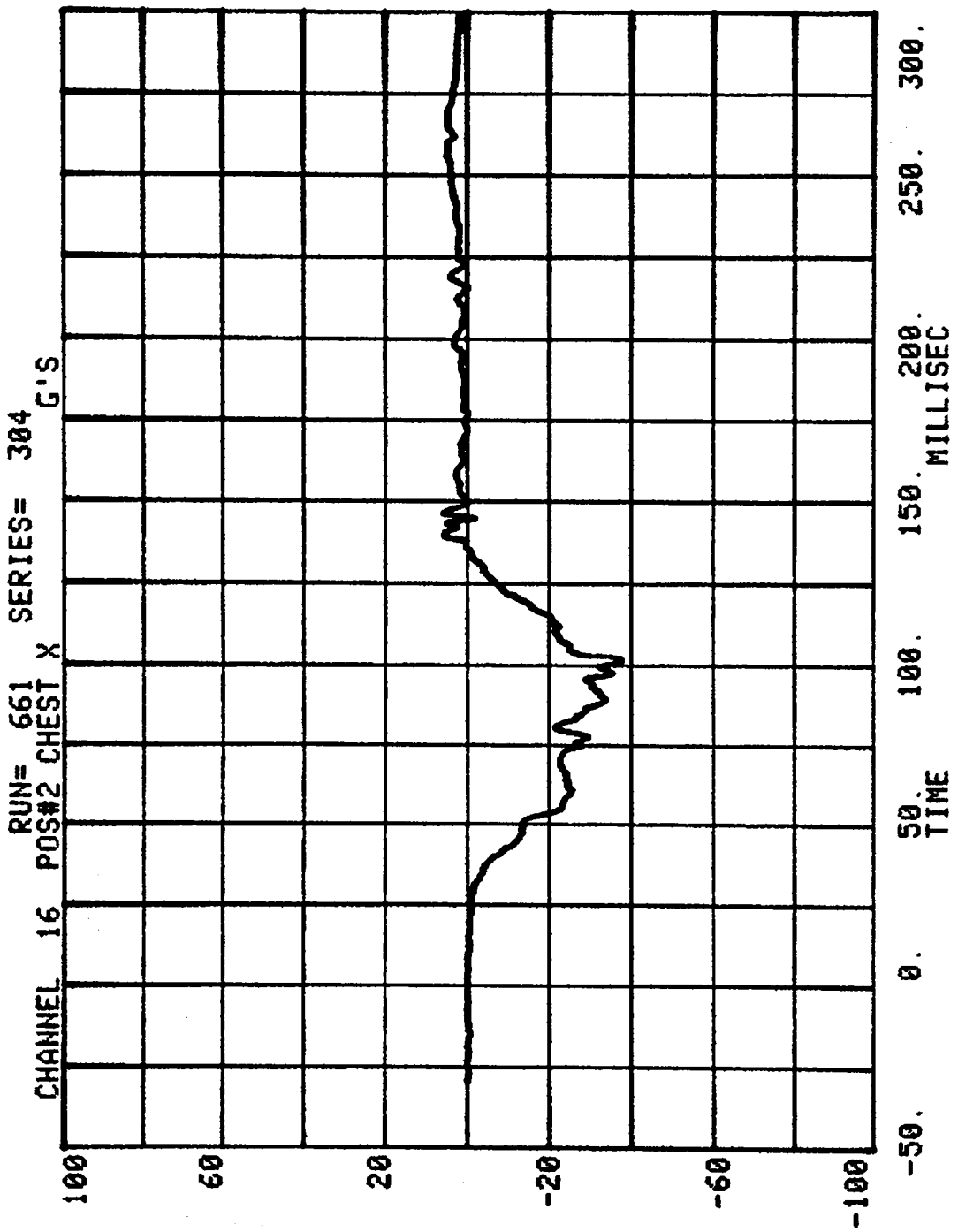
7333-6


CHANNEL 15 POS#2 HEAD 2
RUN= 661 SERIES= 304
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

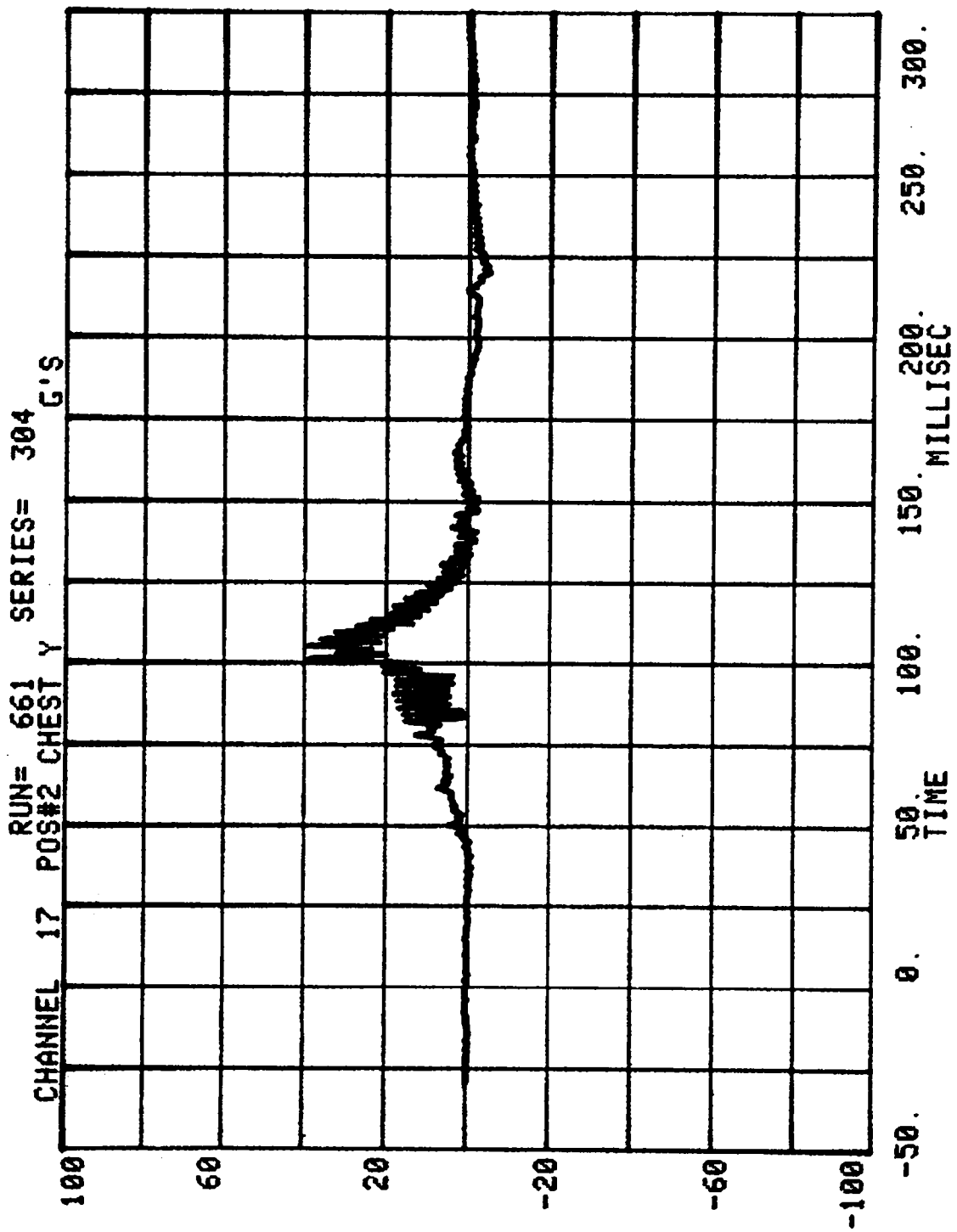
7333-6


CHANNEL 3 RUN= 661 SERIES= 304
POS#2 HEAD RESULTANT G'S
250.
200.
150.
100.
50.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

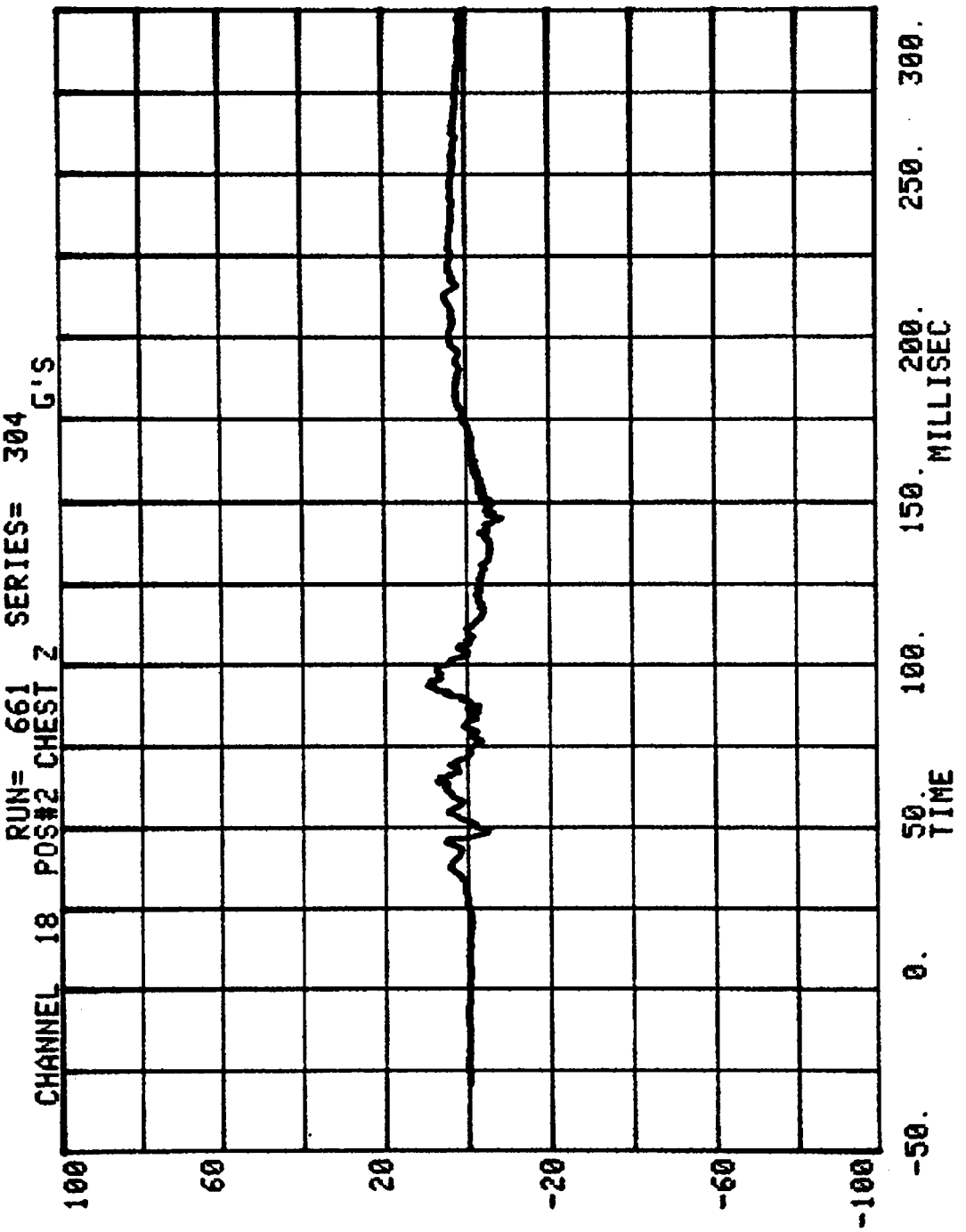
7333-6

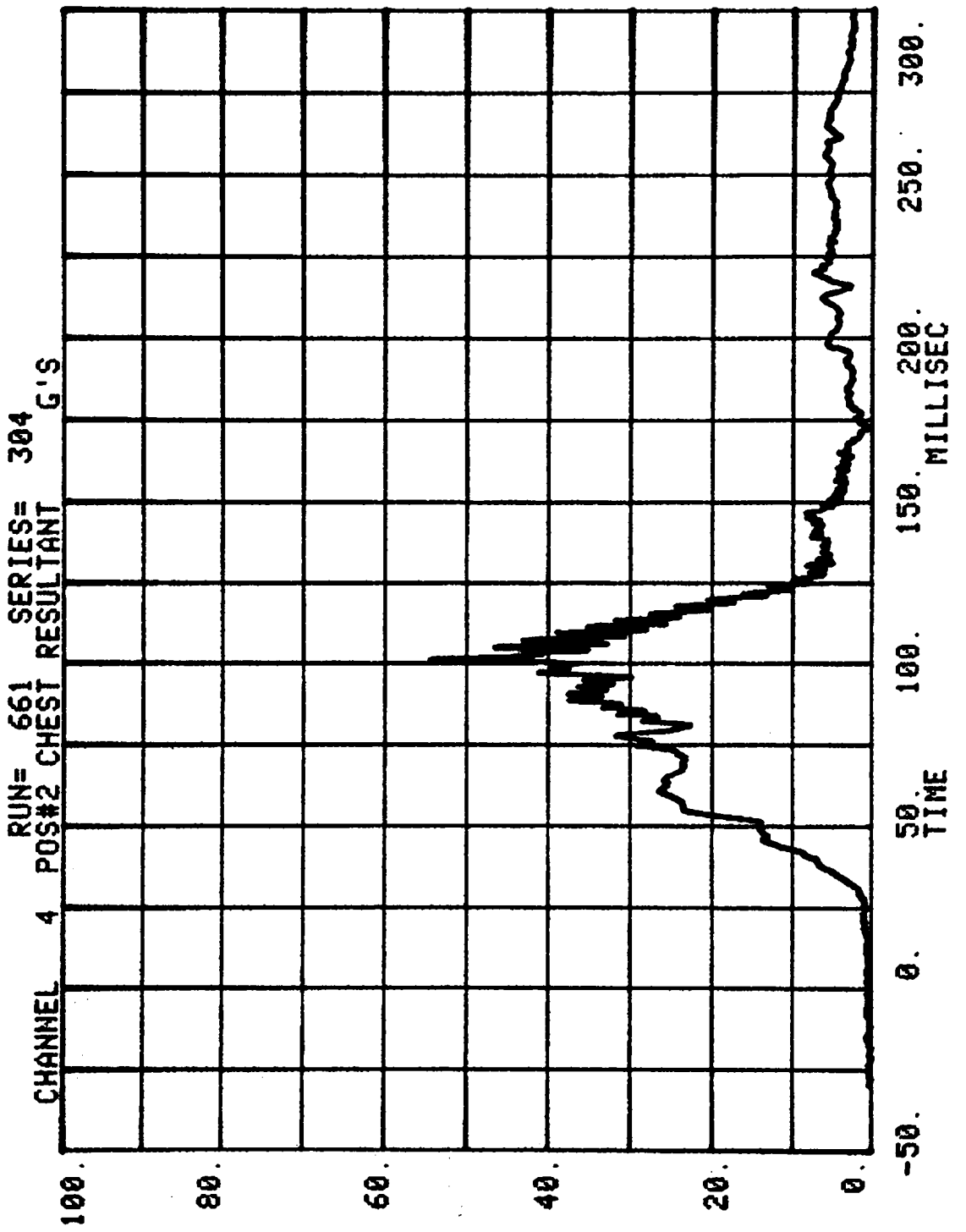

CHANNEL 16 POS#2 CHEST X
RUN= 661 SERIES= 304
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

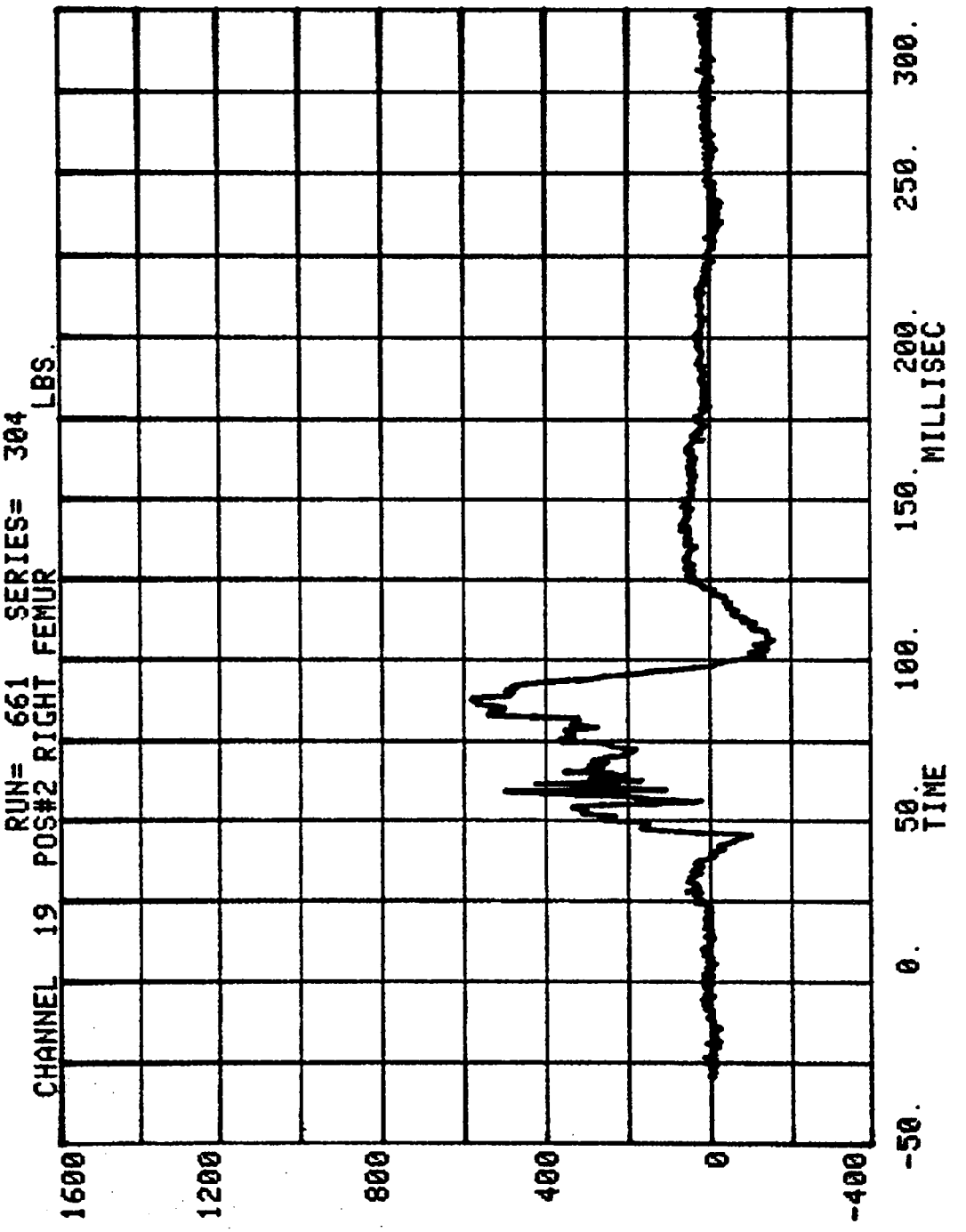
7333-6


CHANNEL 17 POS#2 CHEST Y
RUN= 661 SERIES= 304
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

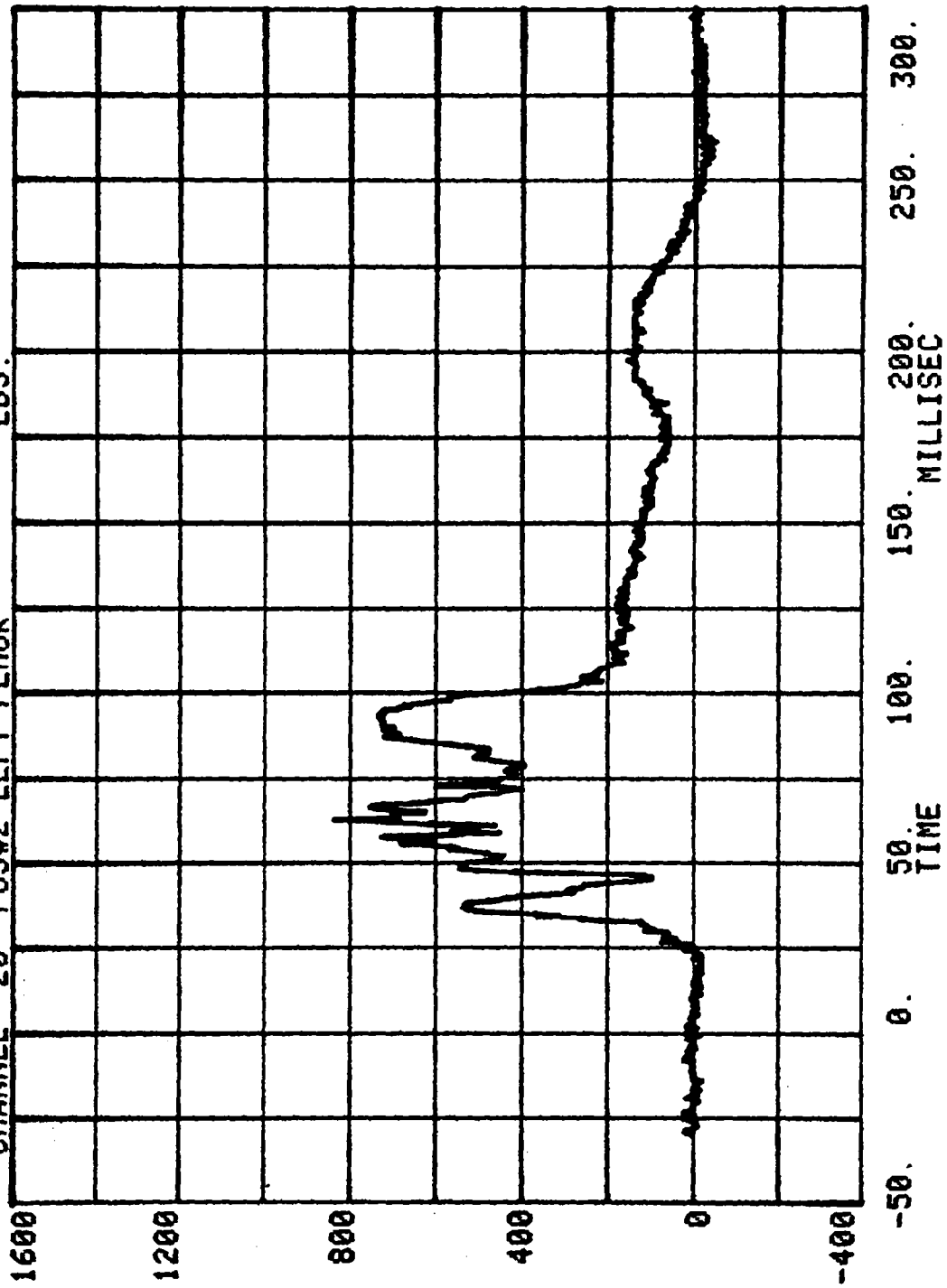
7333-6


CHANNEL 18 POS#2 CHEST 2
RUN= 661 SERIES= 304
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

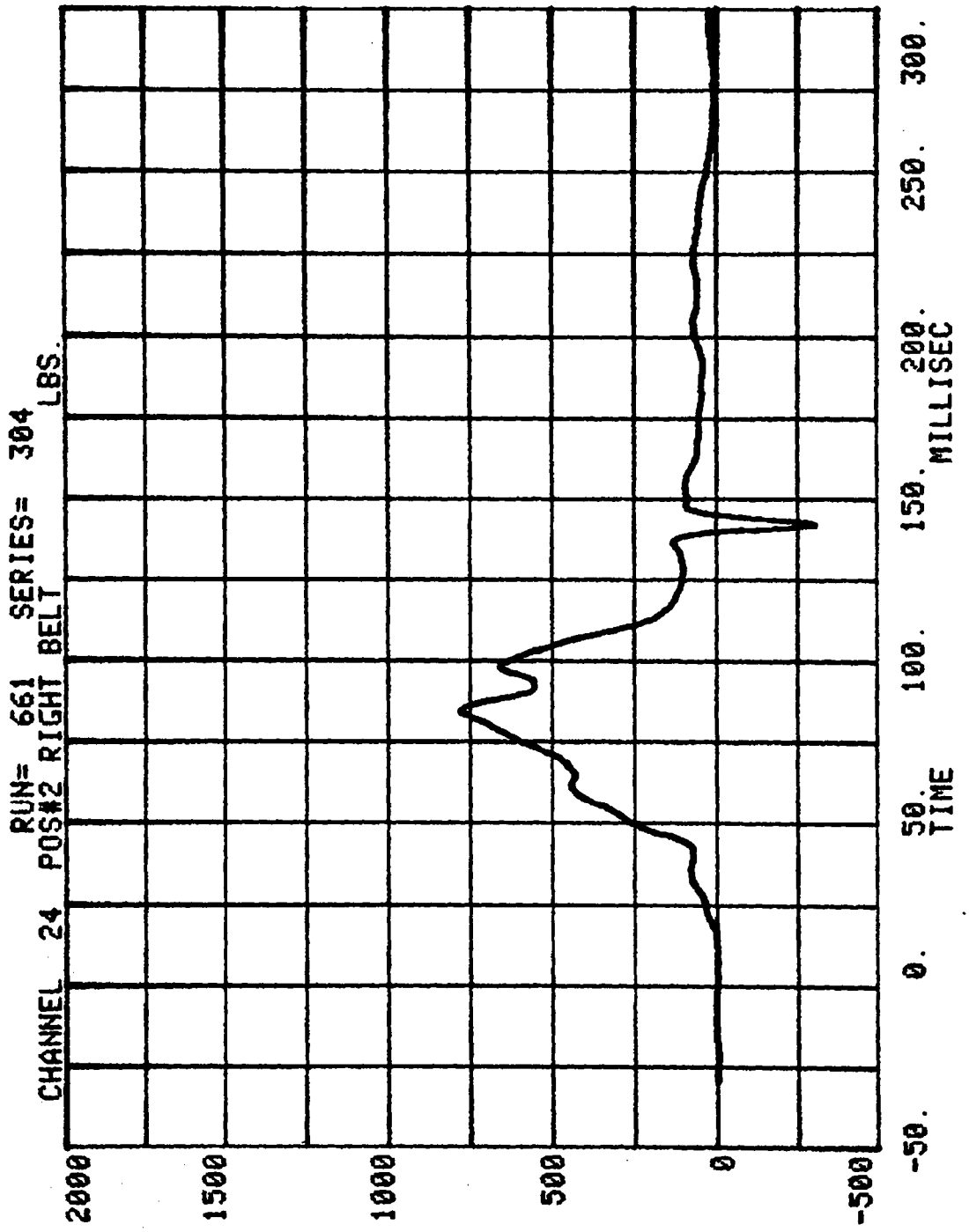

CHANNEL 4 POS#2 CHEST RESULTANT
RUN= 661 SERIES= 304
G'S
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

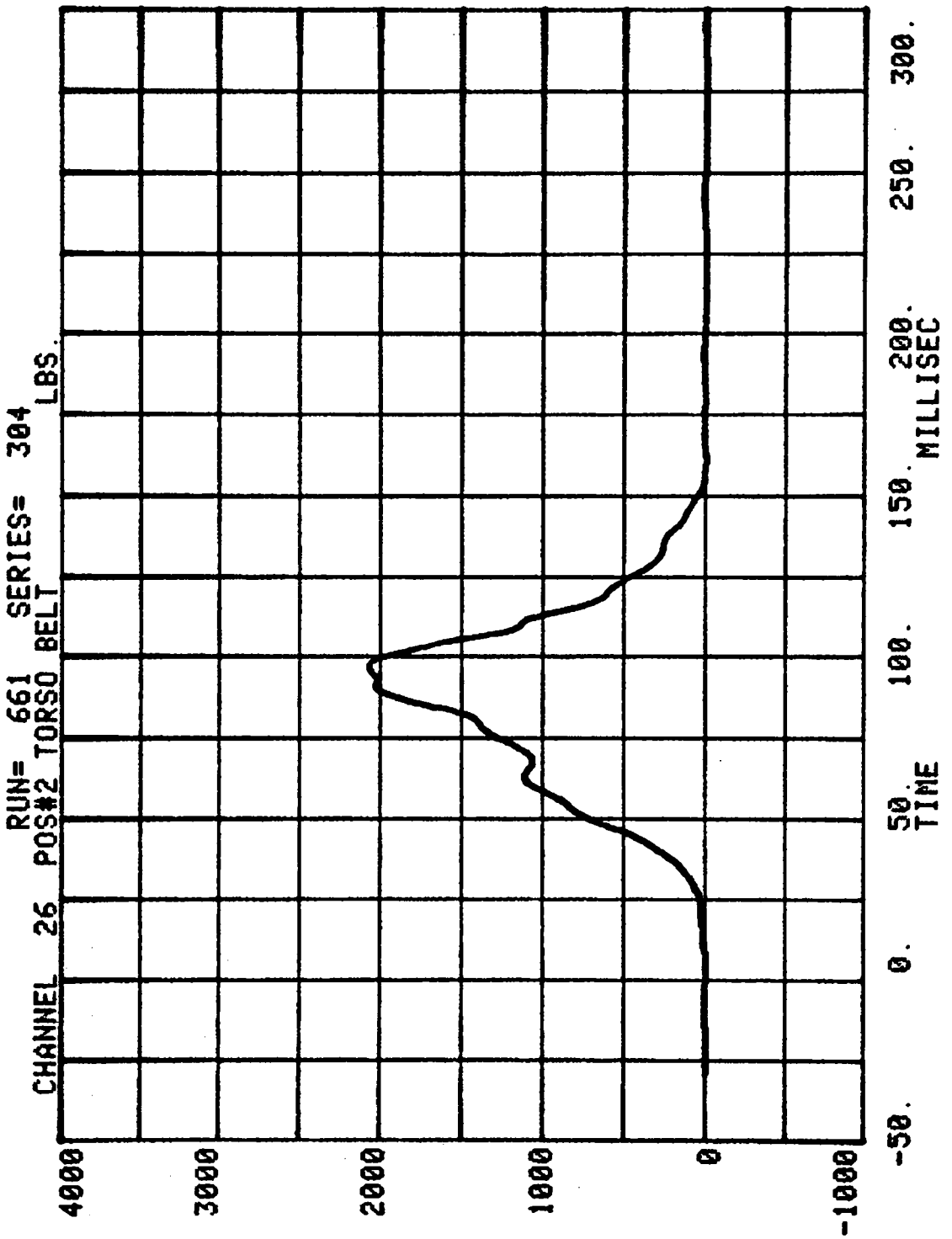

CHANNEL 19 RUN= 661 SERIES= 304
POS#2 RIGHT FEMUR LBS.
1600
1200
800
400
0
-400
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

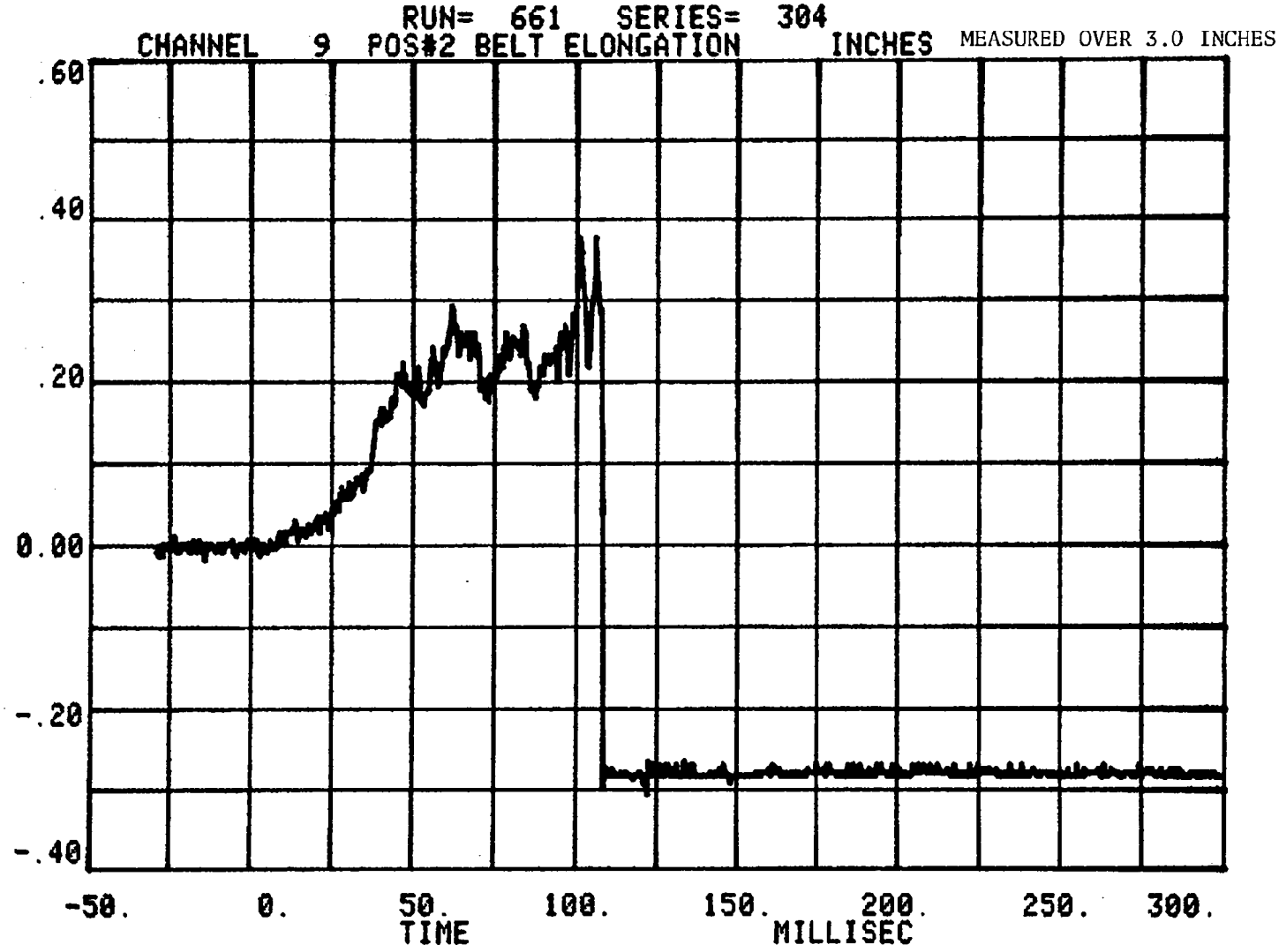
7333-6


CHANNEL 20 POS#2 LEFT FEMUR
RUN= 661 SERIES= 304
LBS.
1600
1200
800
400
0
-400
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7333-6


CHANNEL 24 POS#2 RIGHT BELT
RUN= 661 SERIES= 304
LBS.
2000
1500
1000
500
0
-500
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 26 POS#2 TORSO BELT
RUN= 661 SERIES= 304
LBS.
4000
3000
2000
1000
0
-1000
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 661 SERIES= 304
CHANNEL 9 POS#2 BELT ELONGATION INCHES
MEASURED OVER 3.0 INCHES
.60
.40
.20
0.00
-.20
-.40
-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
1020	1/8/85
1021	1/31/85

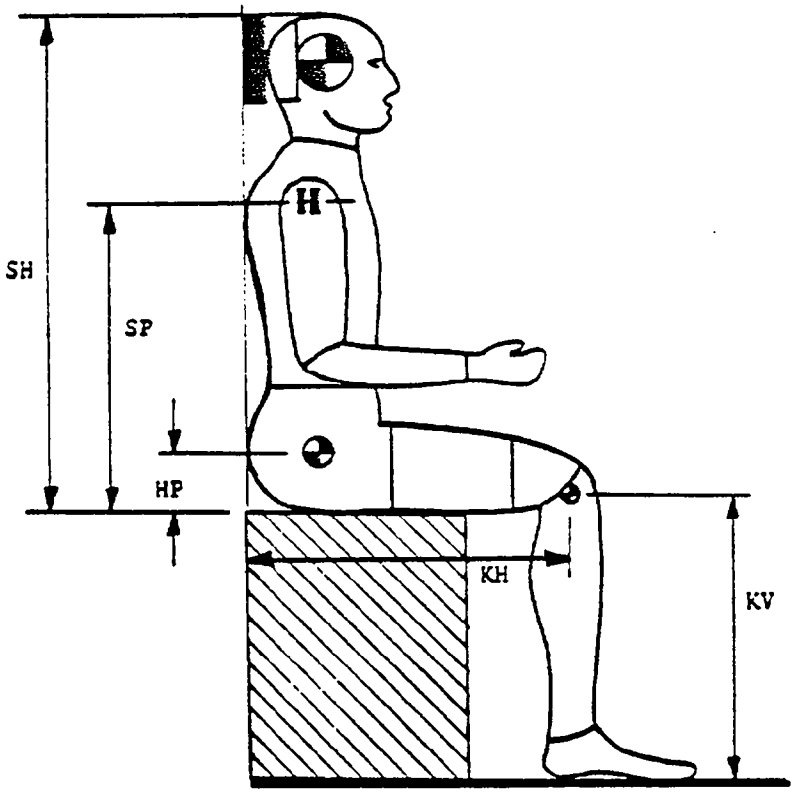
Electronic Test Equipment

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

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.: 1020

I. CONFIGURATION VERIFICATION DATA:



	P.572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		1/3/85	
VERIFICATION NUMBER FOR DUMMY*		1	
SH - Seated Height- - - - - - - -	35.6 to 35.8"	35.6"	
SP - Shoulder Pivot Height- - - -	21.8 to 22.4"	22.0"	
HP - Hip Pivot Height - - - - - -	3.9" ref.	3.9"	
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.6"	
KV - Knee Pivot from floor- - - -	19.3 to 19.9"	19.6"	
SW - Shoulder Width - - - - - - -	17.8 to 18.4"	17.9"	
HW - Hip Width- - - - - - - - - -	14.0 to 15.4"	14.6"	

TECHNICIAN'S NAME: G. Gestwick

* Sequential number beginning with "1" at the start of each fiscal year's crash test program

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA: NHTSA DUMMY I.D. NO.: 1020

TECHNICIAN'S NAME: G. Gestwick

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION----------		1/3/85-1/8/85	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*------		1	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		70 - 74 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		21 - 30 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST--			
a. Peak Resultant Accel.-	210 to 260G	250 g.	
b. Peak Lateral Accel.- -	≤ - 10G	5 g.	
c. Time above 100G- - - -	0.9 to 1.5ms	1.1 ms.	
2. NECK BENDING TEST--			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	23.2 fps	
b. Pend. Avg. Decel. over $t_3 - t_2$	20 to 24G	24 g.	
c. Peak Resultant Head Acceleration - - - - -	26G max.	24.5 g.	
d. Pendulum Decel.(t_2-t_1)	≤ - 3ms	2 ms.	
e. Pendulum Decel.(t_3-t_2)	25 to 30 ms	28 ms.	
f. Pendulum Decel.(t_4-t_3)	≤ - 10ms	4 ms.	
g. Max. Head Rotation - -	63 to 73°	71°	
h. Chordal Displacement-- Head Rotation Angle-			
0° Time- -	-2 to 2 ms	0 ms.	
0° Displ.-	-.5 to .5"	0.0 in.	
30° Time- -	25.6 to 34.4ms	28 ms.	
30° Displ.-	2.1 to 3.1"	2.7 in.	
60° Time- -	40.3 to 51.7ms	43 ms.	
60° Displ.-	4.3 to 5.3"	5.0 in.	
Maximum (71 °) Time- -	53.2 to 66.8ms	59 ms.	
Maximum (71 °) Displ.-	5.0 to 6.0"	5.8 in.	

*beginning with "1" at the start of each fiscal year's crash test program

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA (Continued) NHTSA DUMMY I.D. NO.: 1020

TECHNICIAN'S NAME: G. Gestwick

TEST PARAMETER		SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
2. NECK BENDING TEST.... Continued:				
h. Chordal Displacement:				
Head Rotation Angle--				
60°	Time	67.0 to 83.0 ms	74.5 ms.	
	Displ.	4.3 to 5.3 in.	4.8 in.	
30°	Time	85.4 to 104.6 ms	92 ms.	
	Displ.	2.1 to 3.1 in.	2.4 in.	
0°	Time	101.0 to 123.0 ms	106.5 ms.	
	Displ.	-.5 to 0.5 in.	0.0 in.	
3. ABDOMINAL COMPRESSION TEST:				
(Preload = 10 pounds)				
a. Force @ .5" - - - - -		23 to 36 lbs.	25.0 lbs.	
b. Force @ .75" - - - - -		36 to 50 lbs.	40.0 lbs.	
c. Force @ 1.0" - - - - -		50 to 63 lbs.	59.5 lbs.	
d. Force @ 1.3" - - - - -		73 to 88 lbs.	87.0 lbs.	
4. LUMBAR FLEXION TEST:				
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.	57.0 lbs.	
d. Return Angle - - - - -		12° maximum	8°	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed- - -		21.78-22.22 fps	21.88 fps	
(2) Peak Deflection-		1.7" maximum	1.5 in.	
(3) Peak Resistive Force- - - - -		2250 lbs. maximum	1920 lbs.	
(4) Internal Hysteresis - - -		50 to 70%	51.0%	
b. Low Speed				
(1) Probe Speed- - -		13.86-14.14 fps	13.91 fps	
(2) Peak Deflection-		1.1" maximum	.96 in.	
(3) Peak Resistive Force- - - - -		1450 lbs. maximum	1220 lbs.	
(4) Internal Hyster.		50 to 70%	55.9%	

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA (Continued) NHTSA DUMMY I.D. NO.: 1020

TECHNICIAN'S NAME: G. Gestwick

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
6. KNEE IMPACT TESTS:			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	7.02 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2450 lbs.	
(3) Time Above 1000#	1.7 ms minimum	1.88 ms.	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.78 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	1900 lbs.	
(3) Time Above 1000#	1.7 ms minimum	1.88 ms.	

REMARKS:

INSTRUMENT CALIBRATION INFORMATION

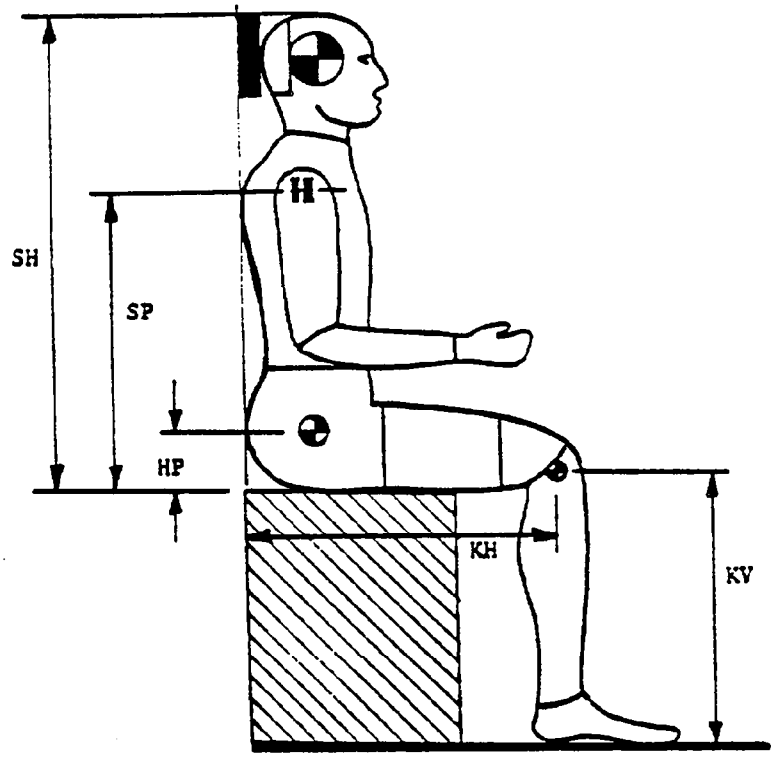
TSA DUMMY ID NO. 1020 CALIB. SEQ. NOS. FOR DUMMY: 1

DUMMY INSTRUMENTS:	MANUFACTURER	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. Head Accelerometers --				
a. Triaxial unit - - - - -				
b. Uniaxial units				
(1) Longitudinal (A_x) -	Endevco	CJ22	10-84	4-85
(2) Lateral (A_y) - - -	Endevco	CS41		
(3) Vertical (A_z) - - -	Endevco	CH21		
2. Chest Accelerometers -- (Vehicle Crash Test Usage)				
a. Triaxial unit - - - - -				
b. Uniaxial units				
(1) Longitudinal (A_x) -	CEC	22960		
(2) Lateral (A_y) - - -	Endevco	CE06		
(3) Vertical (A_z) - - -	CEC	22703		
3. Chest Potentiometer - - -	Ohmite	7915	1-85	7-85
4. Femur Load Cells --				
a. Right Side - - - - - -	GSE	76	10-84	4-85
b. Left Side - - - - - -	GSE	77	10-84	4-85
CALIB. LAB. INSTRUMENTS:				
1. Pendulum Accelerometer - - -	CEC	19965	1-85	7-85
2. Test Probe Accelerometer - - -	CEC	25184		
3. Lumbar Flexion Test Push Force Gauge - - - - - - - - -	Transducer Inc.	20051		
4. Abdominal Compression Test Force Gauge - - - - - - - - -	BLH	72952		
5. Abdominal Compression Test Displacement Gauge - - - - -	CIC	567-11		

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.: 1021

I. CONFIGURATION VERIFICATION DATA:



	P.572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		1/31/85	
VERIFICATION NUMBER FOR DUMMY*		2	
SH - Seated Height- - - - - - - -	35.6 to 35.8"	35.6"	
SP - Shoulder Pivot Height- - - -	21.8 to 22.4"	21.9"	
HP - Hip Pivot Height - - - - - -	3.9" ref.	3.9"	
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.6"	
KV - Knee Pivot from floor- - - -	19.3 to 19.9"	19.6"	
SW - Shoulder Width - - - - - - -	17.8 to 18.4"	17.9"	
HW - Hip Width- - - - - - - - - -	14.0 to 15.4"	14.7"	

TECHNICIAN'S NAME: G. Gestwick

* Sequential number beginning with "1" at the start of each fiscal year's crash test program

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA: NHTSA DUMMY I.D. NO.: 1021

TECHNICIAN'S NAME: G. Gestwick

			PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION----------			1/31/85	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*------			2	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----			68 - 70 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)			22 - 28 %	%
TEST PARAMETER		SPECIFICATION		
1. HEAD DROP TEST--				
a. Peak Resultant Accel.-		210 to 260G	220 g	
b. Peak Lateral Accel.- -		≤ - 10G	2 g	
c. Time above 100G- - - -		0.9 to 1.5ms	1.2 ms	
2. NECK BENDING TEST--				
a. Pendulum Speed - - - -		21.5 to 25.5 fps	23.0 fps	
b. Pend. Avg. Decel. over $t_3 - t_2$		20 to 24G	23 g	
c. Peak Resultant Head Acceleration - - - - -		26G max.	23.5 g	
d. Pendulum Decel.(t_2-t_1)		≤ - 3ms	2.8 ms	
e. Pendulum Decel.(t_3-t_2)		25 to 30 ms	26.9 ms	
f. Pendulum Decel.(t_4-t_3)		≤ - 10ms	7.5 ms	
g. Max. Head Rotation - -		63 to 73°	67°	
h. Chordal Displacement-- Head Rotation Angle-				
0°	Time- -	-2 to 2 ms	0 ms	
	Displ.-	-.5 to .5"	0.0"	
30°	Time- -	25.6 to 34.4ms	30 ms	
	Displ.-	2.1 to 3.1"	3.1"	
60°	Time- -	40.3 to 51.7ms	45 ms	
	Displ.-	4.3 to 5.3"	5.1"	
Maximum (67 °)	Time- -	53.2 to 66.8ms	56 ms	
	Displ.-	5.0 to 6.0"	5.6"	

*beginning with "1" at the start of each fiscal year's crash test program

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA (Continued) NHTSA DUMMY I.D. NO.: 1021

TECHNICIAN'S NAME: G. Gestwick

TEST PARAMETER		SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
2. NECK BENDING TEST.... Continued:				
h. Chordal Displacement:				
Head Rotation Angle--				
60°	Time	67.0 to 83.0 ms	68 ms	
	Displ.	4.3 to 5.3 in.	5.0"	
30°	Time	85.4 to 104.6 ms	87 ms	
	Displ.	2.1 to 3.1 in.	2.6"	
0°	Time	101.0 to 123.0 ms	102 ms	
	Displ.	-.5 to 0.5 in.	0.0"	
3. ABDOMINAL COMPRESSION TEST:				
(Preload = 10 pounds)				
a. Force @ .5" - - - - -		23 to 36 lbs.	23 lbs.	
b. Force @ .75" - - - - -		36 to 50 lbs.	39 lbs.	
c. Force @ 1.0" - - - - -		50 to 63 lbs.	59 lbs.	
d. Force @ 1.3" - - - - -		73 to 88 lbs.	87 lbs.	
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - - -		22 to 34 lbs.	30 lbs.	
b. Force @ 30° - - - - -		34 to 46 lbs.	44 lbs.	
c. Force @ 40° - - - - -		46 to 58 lbs.	55 lbs.	
d. Return Angle - - - - -		12° maximum	2°	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed- - -		21.78-22.22 fps	21.81 fps	
(2) Peak Deflection-		1.7" maximum	1.55"	
(3) Peak Resistive Force- - - - - -		2250 lbs. maximum	2125 lbs.	
(4) Internal Hysteresis - - -		50 to 70%	60.0%	
b. Low Speed				
(1) Probe Speed- - -		13.86-14.14 fps	13.90 fps	
(2) Peak Deflection-		1.1" maximum	.88"	
(3) Peak Resistive Force- - - - - -		1450 lbs. maximum	1295 lbs.	
(4) Internal Hyster.		50 to 70%	62.5%	

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA (Continued) NHTSA DUMMY I.D. NO.: 1021

TECHNICIAN'S NAME: G. Gestwick

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
6. KNEE IMPACT TESTS:			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	7.01 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2400 lbs.	
(3) Time Above 1000#	1.7 ms minimum	2.1 ms	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	7.01 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2125 lbs.	
(3) Time Above 1000#	1.7 ms minimum	2.0 ms	

REMARKS:

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NO. 1021 CALIB. SEQ. NOS. FOR DUMMY: 2

A. DUMMY INSTRUMENTS:	MANUFACTURER	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. Head Accelerometers --				
a. Triaxial unit - - - - -	NA			
b. Uniaxial units				
(1) Longitudinal (A_x) -	Endevco	CL79	10-84	4-85
(2) Lateral (A_y) - - -		CU75	10-84	4-85
(3) Vertical (A_z) - - -		CX42	10-84	4-85
2. Chest Accelerometers -- (Vehicle Crash Test Usage)				
a. Triaxial unit - - - - -	NA			
b. Uniaxial units				
(1) Longitudinal (A_x) -	CEC	22292	10-84	4-85
(2) Lateral (A_y) - - -	Endevco	DA87	10-84	4-85
(3) Vertical (A_z) - - -	CEC	22959	10-84	4-85
3. Chest Potentiometer - - -	Ohmite	7915	1-85	7-85
4. Femur Load Cells --				
a. Right Side - - - - - -	GSE	80	10-84	4-85
b. Left Side - - - - - -	GSE	81	10-84	4-85
B. CALIB. LAB. INSTRUMENTS:				
1. Pendulum Accelerometer - - -	CEC	19965	1-85	7-85
2. Test Probe Accelerometer - - -	CEC	25184	1-85	7-85
3. Lumbar Flexion Test Push Force Gauge - - - - - - - - -	Transducer Inc.	20051	1-85	7-85
4. Abdominal Compression Test Force Gauge - - - - - - - - -	BLH	72952	1-85	7-85
5. Abdominal Compression Test Displacement Gauge - - - - -	CIC	567-11	1-85	7-85

APPENDIX D

VEHICLE' OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

Seats, Safety Belts, Mirrors

Safety Belts

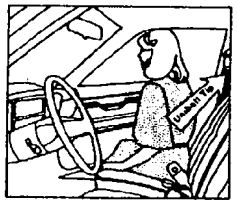
Always use the safety belts. The chance of a serious injury is greatly reduced when the belts are properly used.

Safety belts provide protection against being thrown from the vehicle as well as reducing the risk of an injury caused by striking the interior of the vehicle.

Front Seats

The "UNIBELT" or single continuous-belt restraint system, is installed for the driver and front seat passenger. The unibelt system incorporates an inertia sensitive belt webbing retractor which is designed to lock (i.e., prevent belt travel) *only during very sudden stops or impacts.* This feature allows the shoulder belt to move freely with the wearer under normal conditions. *The retractor will not lock by jerking or pulling the webbing rapidly by hand.*

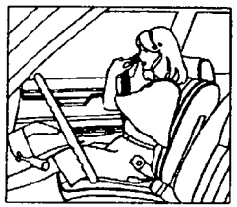
UNIBELT OPERATING INSTRUCTIONS



1

1. Enter the vehicle and close the door. Sit well back and erect and adjust the seat. Note the metal tip of the unibelt in its stowed position.

2. Grasp the metal tip and slide it up the webbing as far as necessary to go around your lap as you pull out the webbing. A couple of tries and this will become an automatic one handed operation.


2

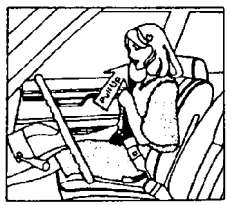
3. As you pull the webbing across your lap and over your shoulder, move the metal tip toward the buckle.

Insert the tip into the buckle until a "click" is heard.

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

3

4. Position the lap belt with the upper edge of the belt drawn across the thighs and snug against the hips. Slack will automatically be removed due to tension created by the retractor. If a snug fit in the lap belt portion is desired, pull up on the shoulder belt as shown. *A snug belt reduces the risk of sliding under the belt in a collision.*



4

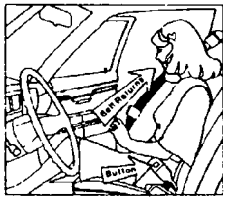
5. If the shoulder belt feels too tight, move your shoulder forward slightly, or withdraw an inch or so of webbing by giving a slight tug on the belt.

The belt will retain the small amount of slack necessary for comfort when you return to your normal seating position. If the belt is still too tight, pull out 6 to 8 inches of webbing, let it return to your chest and repeat the above motion.


5

CAUTION: *The amount of slack in the shoulder belt should be kept to a minimum. Too much slack could reduce the amount of protection because the belt may not be able to properly restrain you in an accident.*

The shoulder belt will allow unrestricted movement of the upper body under normal conditions. Extreme movements will probably require resetting the slack in the shoulder belt. The belt will lock in the event of an accident.



6

6. To release the belt, push the button on the buckle. The belt will automatically retract to its stowed position when the door is opened.

If needed, slide the tip down the webbing to allow the belt to fully retract.