REPORT NO. CAL-86-N11

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

VOLKSWAGON OF AMERICA

1986 Volkswagon Scirocco

2-Door Hatchback

NHTSA NO. MG5802

CALSPAN TEST NO. 7457-11

CALSPAN CORPORATION

ADVANCED TECHNOLOGY CENTER

P.O. BOX 400

BUFFALO, NEW YORK 14225

MARCH 14, 1986

FINAL REPORT

Prepared for:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF MARKET INCENTIVES

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16. Abstract

A frontal load cell barrier test of a 1986 Volkswagon Scirocco 2-Door Hatchback was performed at the Calspan Corporation, Advanced Technology Center crash test facility in Buffalo, New York, on March 14, 1986.

Impact speed was 35.0 mph, and the ambient temperature at the barrier face at the time of impact was 47°F. The maximum post-test vehicle crush was 23.0 inches.

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

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

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

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Section 1

PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is part of the Composite FY 86 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 MG5802

A load cell barrier consiting of 36 load cells was impacted by a 1986 Volkswagon Scirocco 2-Door Hatchback at a velocity of 35.0 mph. The test was performed at the Calspan Corporation Advanced Technology Center on March 14, 1986. 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 No. 320) and the right front passenger ATD (Serial No. 1020) had been used in 2 previous tests (MG0103, MG0106) and the Injury Criteria Values were not exceeded in both tests. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 67 channels of data were recorded in 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; the HIC was 887. The maximum chest deceleration over 3 milliseconds was 52 g's and femur loads were 481 and 394 pounds.

The right-front passenger HIC was 1070. Femur loads were 449 and 184 pounds.

Data Acquisition Problem: Data was lost after 65 milliseconds for the right front passenger's chest z accelerometer.

Table 1

GENERAL TEST AND VEHICLE DATA

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1986 Volkswagon Scirocco 2-Door Hatchback

NHTSA NO.: MG5802 VIN.: WVWCA0537GK002243

BODY COLOR: Gray DATE OF MANUFACTURE: 9-85

Engine: 4 cylinders; 109 C.I.D.; - Liters; - CC
X Gas; - Diesel; - Turbocharged
- Longitudinal; X Transverse

Transmission: 5 Speed X Manual; - Automatic; - Overdrive
Final Drive: X Front Wheel; - Rear Wheel; - Four Wheel

Date Received: 1-7-86 Odometer Reading: 41
- A/C; X P/S; X P/B; - P/wdo.; - Tilt Wheel
- P/seats; - Cruise Control

Type of Occupant Restraint: 3-Point Continuous Belt System

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 28 psi, Rear 31 psi

Recommended Tire Size: 175-70HR13

Recommended Cold Tire Pressure: Front 27 psi, Rear 27 psi

Tires on Vehicle: 175/70R13; Manufacturer: Continental

Number of Occupants: 2 Front; 2 Rear; - 3rd Seat; 4 TOTAL

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

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

Vehicle Capacity Weight (VCW) = 777 lbs. (A)

No. of Occupants x 150 lbs. = 600 lbs. (B)

Rated Cargo and Luggage Weight (RCLW) A-B = 177 lbs.

GVWR 2998 lbs. GAWR: Front 1720 lbs. Rear 1345 lbs.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

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

Right Front = 700 lbs. Right Rear = 430 lbs.

Left Front = 700 lbs. Left Rear = 390 lbs.

TOTAL FRONT WEIGHT = 1400 lbs. (66 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 720 lbs. (34 % of Total Vehicle Weight)

TOTAL DELIVERY WEIGHT = 2120 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight (2120 lbs.)

VCW = Vehicle Capacity Weight (777 lbs.)

DSC = Designated Seating Capacity (4)

RCLW = VCW - 150 (DSC) = 177 lbs.

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

Target Test Weight = 2625 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND POUNDS CARGO:

Right Front = 720 lbs. Right Rear = 570 lbs.

Left Front = 750 lbs. Left Rear = 540 lbs.

TOTAL FRONT WEIGHT = 1470 lbs. (57 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 1110 lbs. (43 % of Total Vehicle Weight)

TOTAL TEST WEIGHT = 2580 lbs.

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

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 26.7 LF 26.5 RR 25.7 LR 25.6

Test Attitude: RF 25.2 LF 24.8 RR 23.6 LR 23.3

Wheel Base: 94.5 in.; C.G. = 40.6 in. rearward of front wheel C/L

Remarks: _____

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

POST-IMPACT DATA:

Type of Test: Frontal Impact Impact Angle: 0 °

Date of Test: 3-14-86 Time of Test: 12:05

Ambient Temperature: 47 °F at impact area

Temperature in Occupant Compartment: 72 °F.

Windshield Molding Temperature: 72 °F.

Required Impact Velocity Range: 34.5 to 35.5 mph

Impact Velocity: primary = 35.0 mph, secondary = 34.9 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:		R	C_L	L
	Pre-test =	163.9	165.9	163.8
	Post-test =	140.9	142.9	143.4
	Crush =	23.0	23.0	20.4

Distance from front of test vehicle to point of impact:

R 9.6 C/L 9.2 L 10.2

VISIBLE DUMMY CONTACT POINTS:

	Driver	Passenger
Head	Rim & Hub	Contacted Right Knee
Chest	No Contact	No Contact
Abdomen	No Contact	No Contact
Left Knee	Dash	Dash
Right Knee	Dash	Dash

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

	Front	
	Left	Right
Door Opening	Operable	Not operable

	Front	
Seat Movement	Left	Right
Seat Back Failure	None	None
Seat Shift (in.)	None	None

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.:

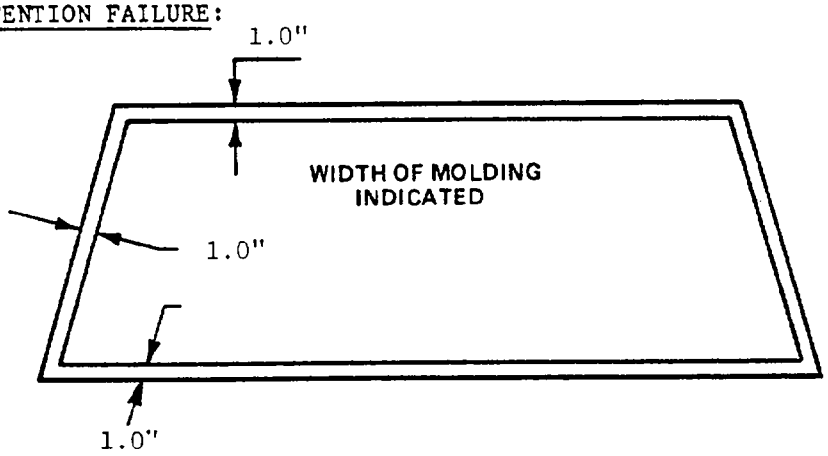
Windshield is held in place with rubber molding.

FMVSS 212 REQUIREMENTS: The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery mesurement 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 PREIPHERY		
	PRE-TEST (in.)	POST-TEST (in.)	PERCENT RETENTION
RIGHT SIDE	75	75	100%
LEFT SIDE	75	75	100%
TOTAL	150	150	100%

AREA OF RETENTION FAILURE:



FRONT VIEW

FAILURE DETAILS:

None

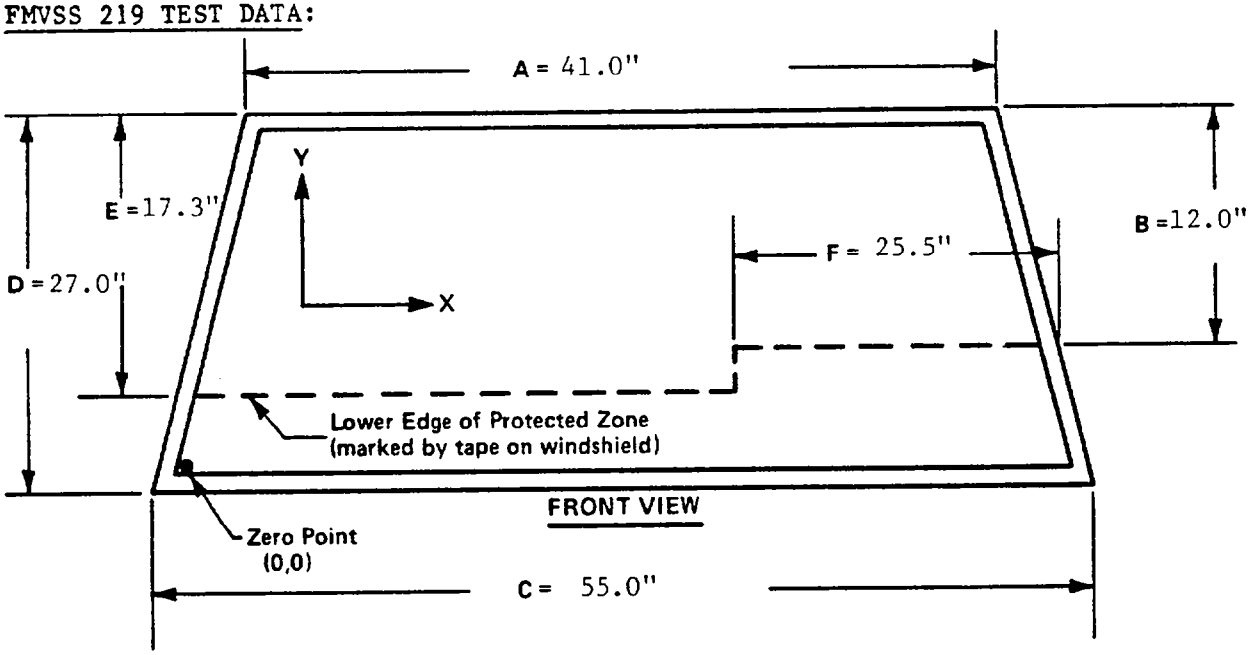
Figure 2

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. The locus of points is drawn on the inner surface of the windshield contacted 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 of this line onto the outer surface of the windshield.

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.		

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Figure 3

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

TEST VEHICLE NHTSA NO.: MG5802 ; TEST DATE: 3-14-86

VEHICLE MAKE/MODEL/BODY STYLE: 1986 Volkswagon Scirocco 2-Door Hatchback

USABLE CAPACITY OF VEHICLE'S FUEL TANK: 13.7 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:

12.74 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,	58	seconds
FMVSS 301-75 Position Hold Time	=	5 minutes,	0	seconds
TOTAL	=	7 minutes,	58	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):

None

Section 4
OMI FINAL DATA

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)	-90	-16	59	94	-50	-28	-17	52
DUMMY (2)	-43	15	58	60	-44	30	N.D.	N.D.
DUMMY (3)								
DUMMY (4)								

	MAXIMUM FORCE - FEMUR LOAD (LBS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	481	394
DUMMY (2)	449	184
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)	1515	-	1609
DUMMY (2)	2058	1725	-
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**			
	HIC	t_1 (SEC)	t_2 (SEC)	AVE. ACC. (g) t_1 TO t_2
DUMMY (1)	887	.05850	.09645	55.9
DUMMY (2)	1070	.05550	.12630	47.0
DUMMY (3)				
DUMMY (4)				

*DEFINED AS EXCEEDING 0.003 SEC. DURATION

**AS DEFINED IN FMVSS NO. 208

N.D. = No Data. See page 2-2 for explanation.

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Figure 4

PART 572 DUMMY IN-VEHICLE POSITION

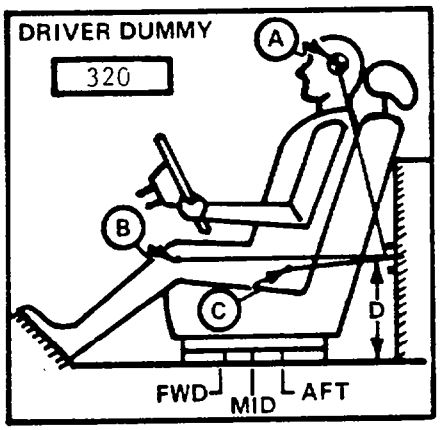
TEST NO.: 716-110-719

VEHICLE: 1986 Volkswagon Scirocco 2-Door Hatchback

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

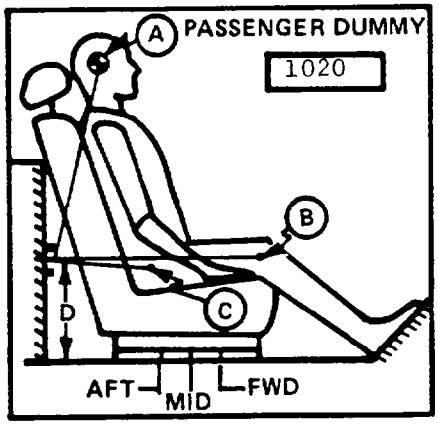
ADJUSTER TYPE:
- X Manual
- \- Power

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



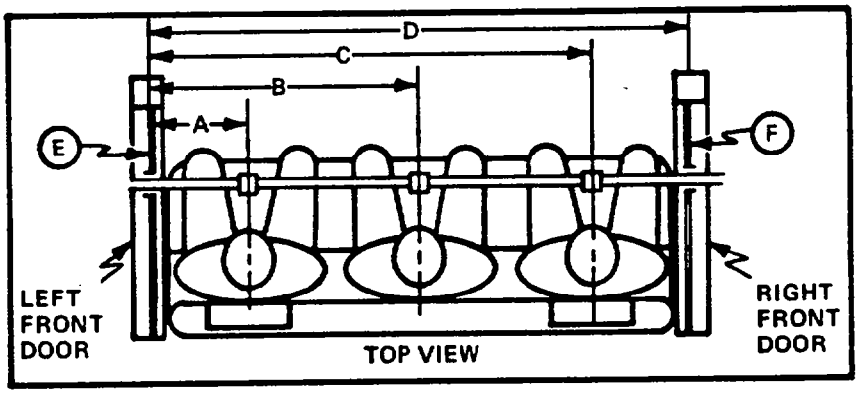
MEASUREMENT LOCATION

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



A =	20.8	in.	43	Degrees
B =	33.7	in.	100	Degrees
C =	20.7	in.	123	Degrees
D =	17	in.		

A =	20.5	in.	43	Degrees
B =	33.8	in.	97	Degrees
C =	21.0	in.	120	Degrees
D =	17	in.		

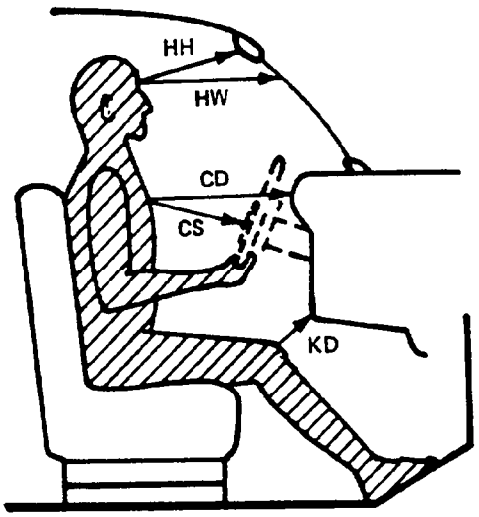


DUMMY ID	320	1020
A = Left Door to Driver Centerline	12.2 in.	
B = Left Door to Center Passenger Centerline	\- in.	
C = Left Door to Right Passenger Centerline	38.5 in.	
D = Left Door to Right Door	49.5 in.	
E, F = Window Glass Height (Right and Left Must Be Equal)	10.0 in.	

Figure 5

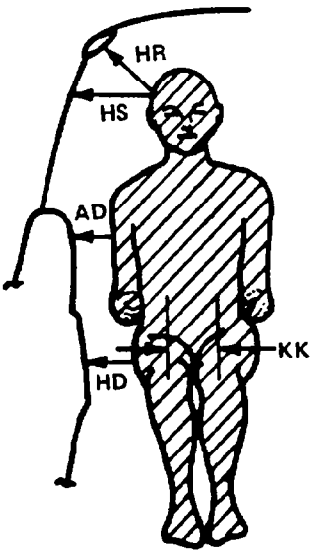
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	11.2	11.25
HW	18.7	18.2
CD	19.8	20.5
CS	12.6	-
KDL	7.0	5.25
KDR	7.7	5.25
SA	25°	25°
TA	21°	21°



HH = Head to Windshield Header
HW = Head to Windshield
CD = Chest to Dash
CS = Chest to Steering Wheel
KD(L/R)= Knee to Dash (Left/Right)
SA = Seat Back Angle
TA = Torso Angle

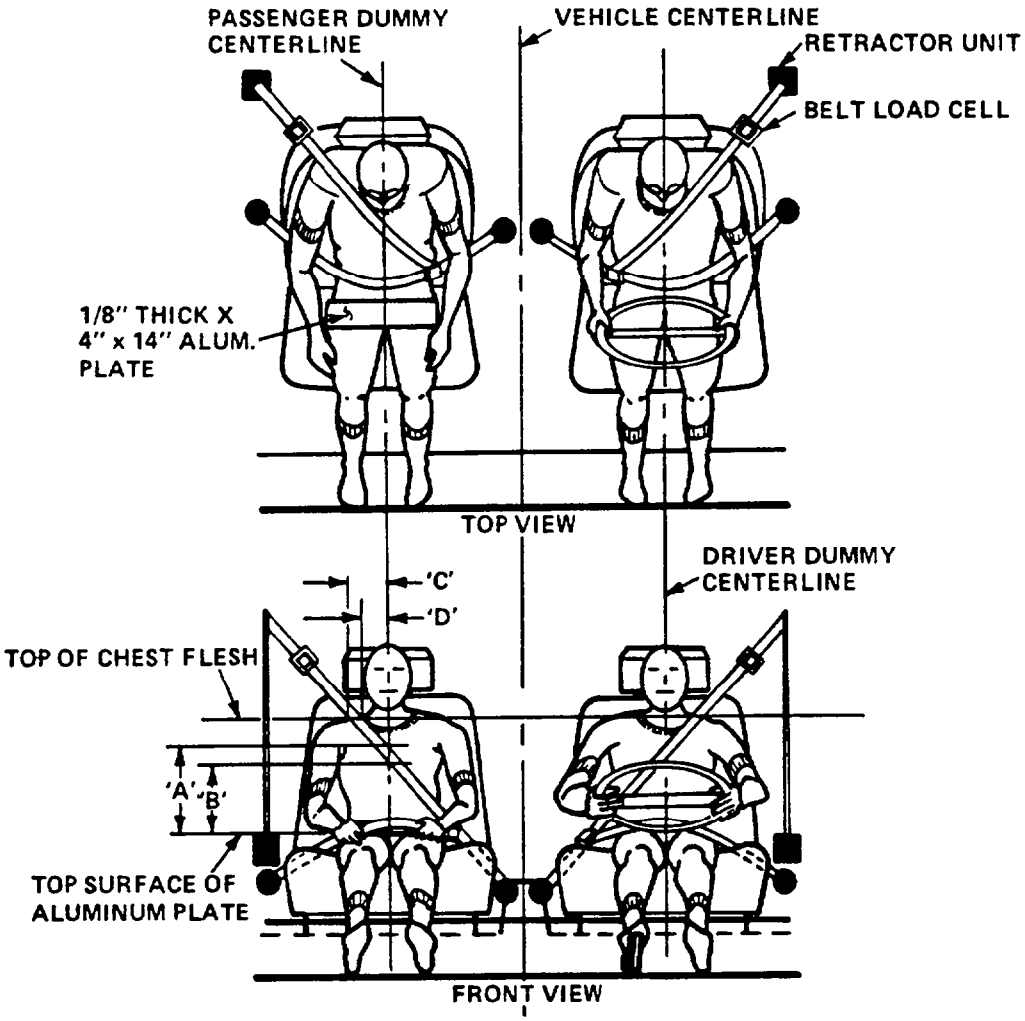
HR = Head to Side Roof
HS = Head to Side Window
AD = Arm to Door
HD = Hip to Door
KK = Knee to Knee



	DRIVER	PASSENGER
HR	5.0	5.0
HS	7.5	7.5
AD	3.5	4.0
HD	5.0	4.5
KK	10.0	10.0

Figure 6

SEAT BELT POSITIONING DATA



		DRIVER DUMMY (in.)	PASS. DUMMY (in.)
1.	Dimension 'A'--alum. plate to belt upper edge on dummy centerline.	12.5	12.5
2.	Dimension 'B'--alum. plate to belt lower edge on dummy centerline.	9.5	9.5
3.	Dimension 'C'--dummy centerline to outer edge at chest flesh top	5.2	5.3
4.	Dimension 'D'--dummy centerline to inner edge at chest flesh top	3.0	3.0
5.	Lap belt tension (lbs.)	-	-
6.	Shoulder belt tension (lbs.)	4.0	3.0

Table 3

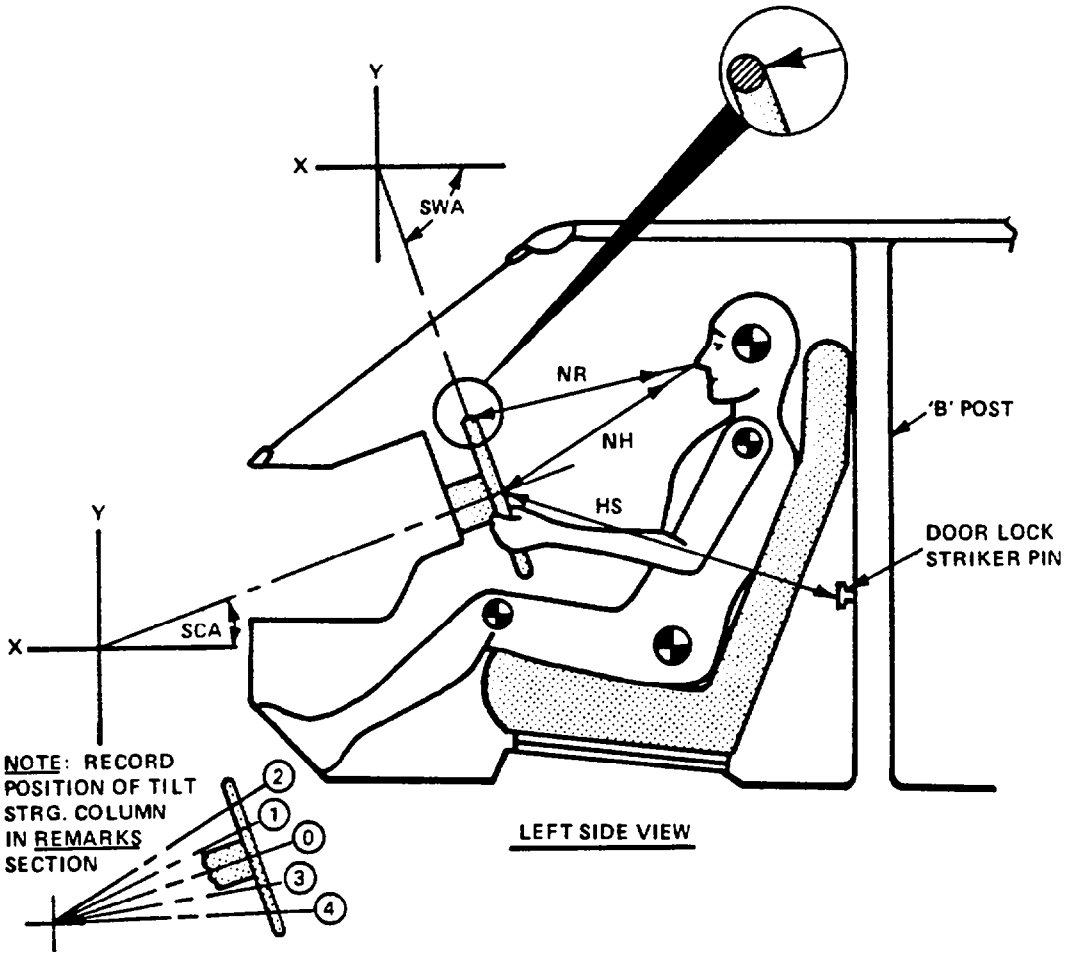
SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:	Driver	Passenger
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	91.5	91.5
Should belt length as measured on Part 572 Dummy.	50.5	50.5
Lap belt length as measured on Part 572 Dummy.	41.0	41.0
BELT SPOOL-OFF DATA:		
As determined by film analysis.	2.5	2.5
As determined mechanically.	3.4	3.0
As determined electronically.	2.7	See Note
BELT STRETCH DATA:		
Measured electronically between shoulder belt load cell and the "D" ring.	.88" per ft	.88" per/ft.
Measured between two inch reference marks on belt.	1.2" per ft.	1.2" per/ft.

Note: Belt spool out data for position #2 was lost.

Figure 7

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



	MEASUREMENTS	
NR--Distance from tip of dummy's nose to top rear surface to steering wheel rim	13.0	Inches
NH--Distance from tip of dummy's nose to center of steering column hub	17.2	Inches
HS--Distance from center of steering column hub to the forward surface of the door lock striker pin	y = 16 x = 31.5	Inches
SCA--Angle of steering column relative to the horizontal X axis	-19.0	Degrees
SWA--Angle of steering wheel relative to the horizontal X axis	71.0	Degrees

REMARKS CONCERNING ADJUSTABLE OR TILT STEERING COLUMN IF VEHICLE IS SO EQUIPPED:
Vehicle does not have an adjustable steering column.

Figure 8

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 4

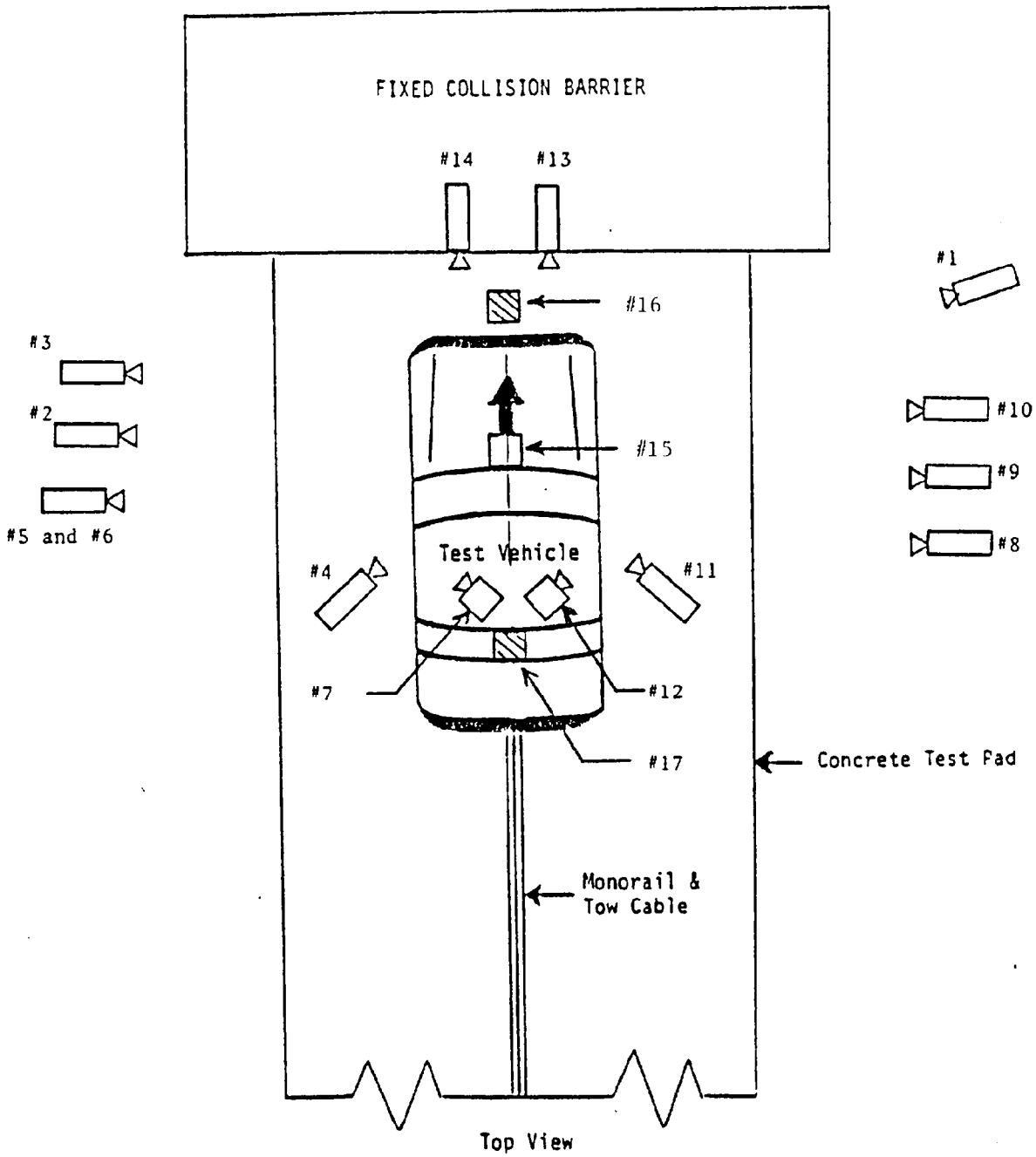


Table
HIGH-SPEED CAMERA LOCATIONS

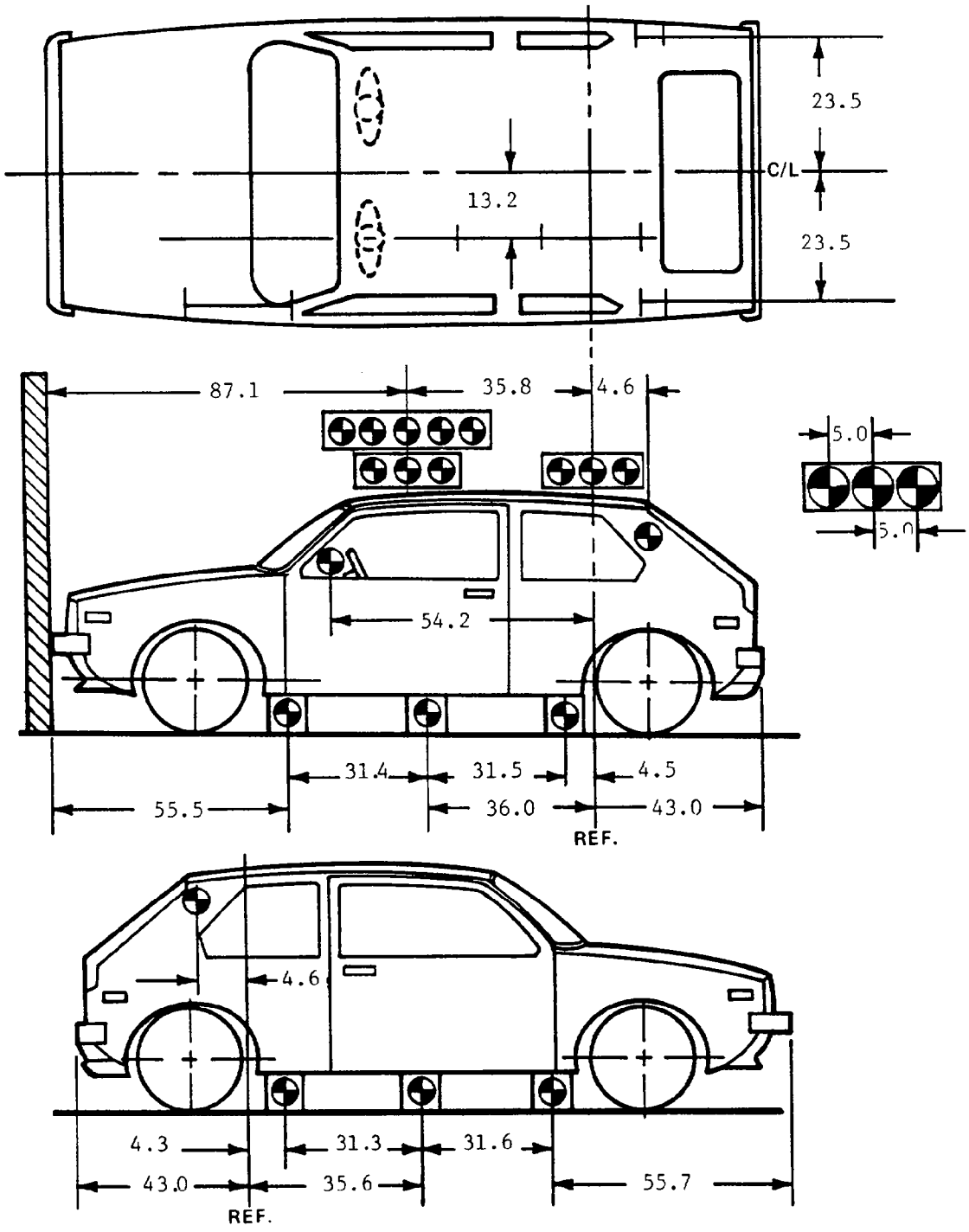
Test No. MG5802 Vehicle 1986 Volkswagon Scirocco 2-Door Hatchback

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	215	57	41	-5	--	13	530
3	Left Side View	205	37	50	-6	--	25	530
4	Driver and Interior View	101	124	70	-15	--	13	680
5	Steering Column (Bottom)	230	80	46	-5	213	25	540
6	Steering Column (Top)	230	80	70	-10	213	25	540
7	Left Belt	--	--	--	--	--	8	860
8	Overall Right Side	280	91	48	-6	--	13	810
9	Right Side View	270	79	47	-5	--	25	820
10	Right Passenger View	282	67	51	-4	265	35	780
11	Passenger and Interior View	101	124	72	-15	--	25	590
12	Right Belt	--	--	--	--	--	8	650
13	Passenger Front View	21	0	72	-38	103	13	500
14	Driver Front View	21	0	72	-38	103	13	580
15	Windshield View	0	0	126	-53	--	13	530
16	Pit View of Engine	0	36	-120	90	--	13	820
17	Pit View of Fuel Tank	0	130	-120	90	--	13	810

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

Figure 9

VEHICLE TARGET LOCATIONS



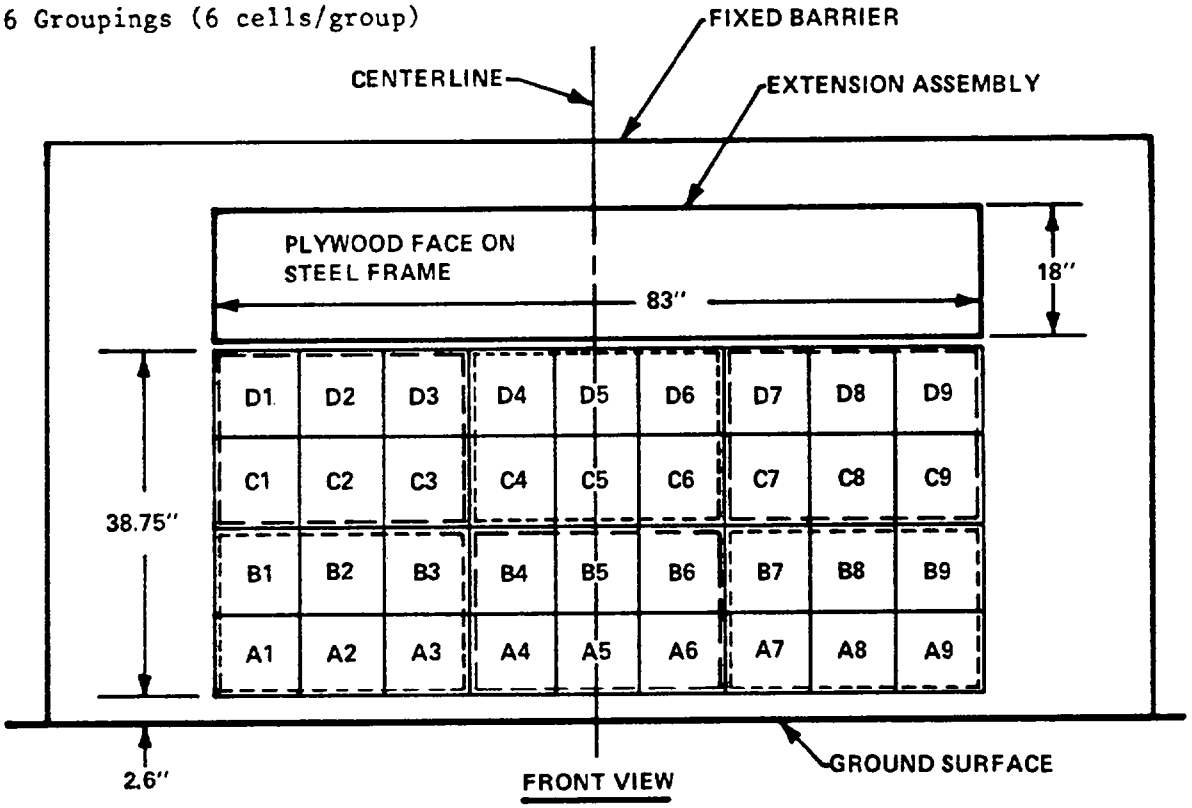
(DIMENSIONS IN INCHES)

7457-11

Figure 10

LOAD CELL LOCATIONS ON FIXED BARRIER

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



6 GROUPS OF 6 LOAD CELLS EACH

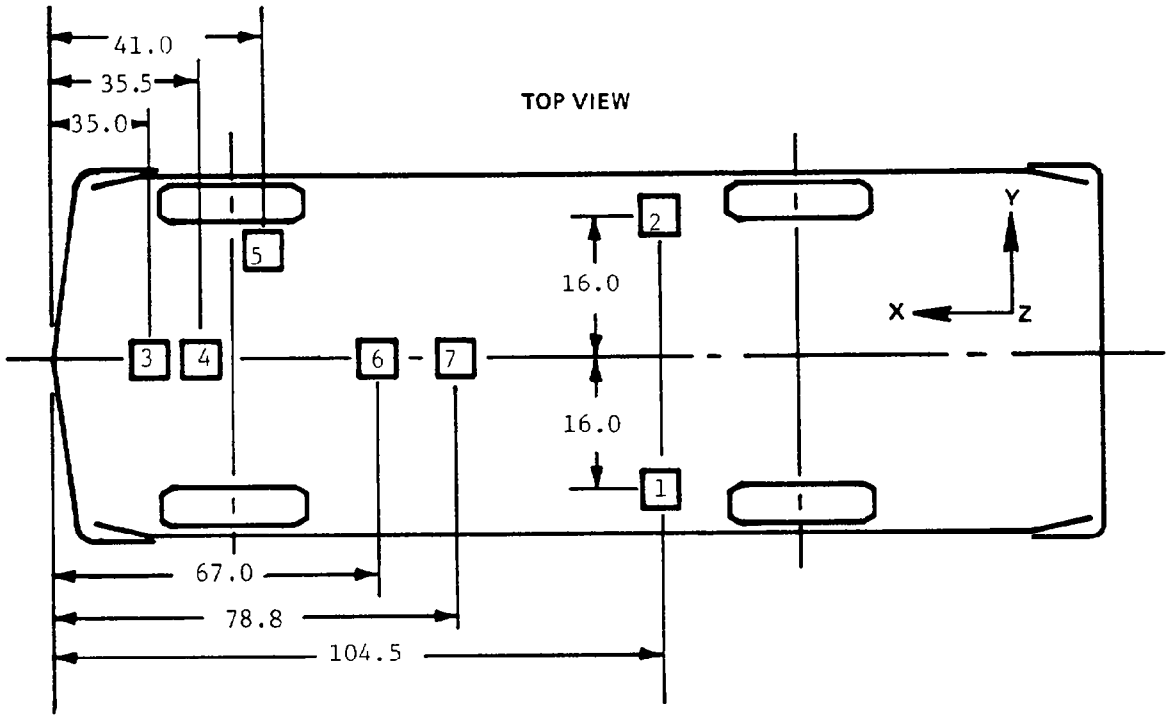
Group 4 C1 thru D3	Group 5 C4 thru D6	Group 6 C7 thru D9
Group 1 A1 thru B3	Group 2 A4 thru B6	Group 3 A7 thru B9

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)

Figure 11

VEHICLE ACCELEROMETER LOCATIONS



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 12

TEST VEHICLE MEASUREMENTS

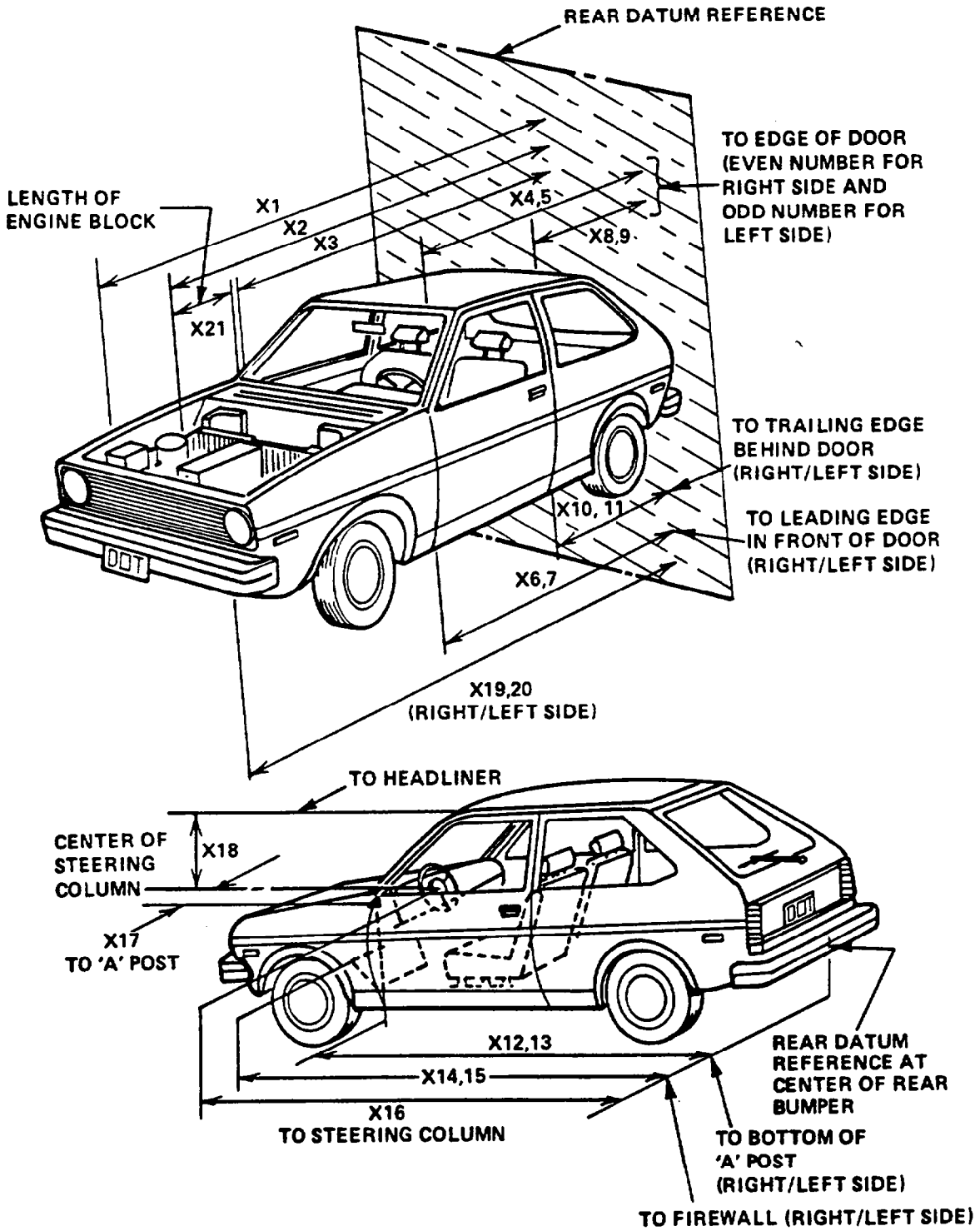


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Table

VEHICLE MEASUREMENTS

All Dimensions in Inches

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	165.9	142.9	23.0
X2	Rear Surface of Vehicle to Front of Engine	135.2	127.4	7.8
X3	Rear Surface of Vehicle to Firewall	121.4	112.5	8.9
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	109.5	108.5	1.0
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	109.5	108.5	1.0
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	109.0	108.0	1.0
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	109.2	107.9	1.3
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	60.5	60.1	.4
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	60.5	59.5	1.0
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	61.3	60.1	1.2
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	61.5	60.0	1.5
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	109.2	108.0	1.2
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	109.5	108.5	1.0
X14	Rear Surface of Vehicle to Firewall, Right Side	117.0	105.0	12.0
X15	Rear Surface of Vehicle to Firewall, Left Side	118.8	110.0	8.8
X16	Rear Surface of Vehicle to Steering Column	92.9	88.9	4.0
X17	Center of Steering Column to "A" Post	16.6	19.6	-3.0
X18	Center of Steering Column to Headliner	16.1	17.0	-.9
X19	Rear Surface of Vehicle to Right Side of Front Bumper	163.9	140.9	23.0
X20	Rear Surface of Vehicle to Left Side of Front Bumper	163.8	143.4	20.4
X21	Length of Engine Block	15.5	15.5	0

Note: Measurements are not done in the same location as Accident Investigation measurements. Therefore, measurements may not be equal.

Table 6

ACCIDENT INVESTIGATION DIVISION DATA
FOR 35 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Volkswagon Scirocco 2-Door Hatchback

VEH. NHTSA NO.: MG5802 ; VIN: WVWCA0537GK002243

MODEL YEAR: 1986 ; BUILD DATE: 9-85 ; TEST DATE: 3-14-86

VEH. SIZE CATEGORY: Compact ; TEST WEIGHT: 2580

VEH. WHEELBASE: 94.5 ; FRONT OVERHANG: 38.2 ; OVERALL WIDTH: 64.0

ACCELEROMETER DATA:

LOCATION: 40.6 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 ; TIME OF SEPARATION: 274.5 msec

VELOCITY CHANGE: 37.4

COLLISION DEFORMATION CLASSIFICATION (CDC) CODE:

F (Frontal) 12 FDEW 3

CRUSH DEPTH DIMENSIONS:

C1 = 20.2 inches

C2 = 21.6 inches

C3 = 22.4 inches

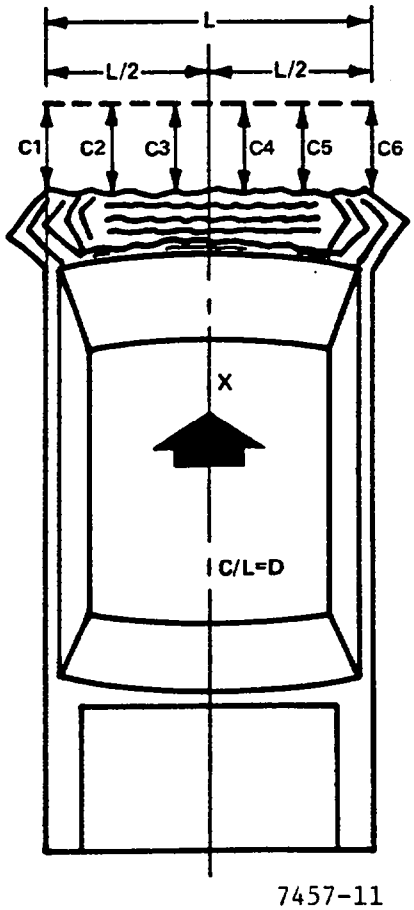
C4 = 22.7 inches

C5 = 23.0 inches

C6 = 23.2 inches

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

LENGTH OF DAMAGED REGION: L = 57.0 inches



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National Accident Sampling System — Continuous Sampling Subsystem: Vehicle Data

FIELD MEASUREMENTS

1986 Volkswagon Scirocco

NCI

Complete When Applicable	
End Damage	**Side Damage**
Undeformed end width 67.0	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.

1ZFDEW3

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	57"	25.7	57"	22.7	22.7	22.9	23.2	24.1	25.7	Ø
	Free Space		2.5		2.5	1.1	.5	.5	1.1	2.5	
1	Actual Crush	57"	23.2	57"	20.2	21.6	22.4	22.7	23.0	23.2	Ø

*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.

NCI

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: —
Maximum Width: —
Curb Weight: 2580
Overall Length: 165.9
Wheel Base: 94.5
Engine Size: cyl. —
displ. —

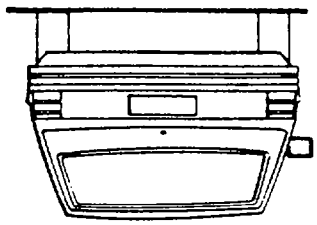
WHEEL STEER ANGLES

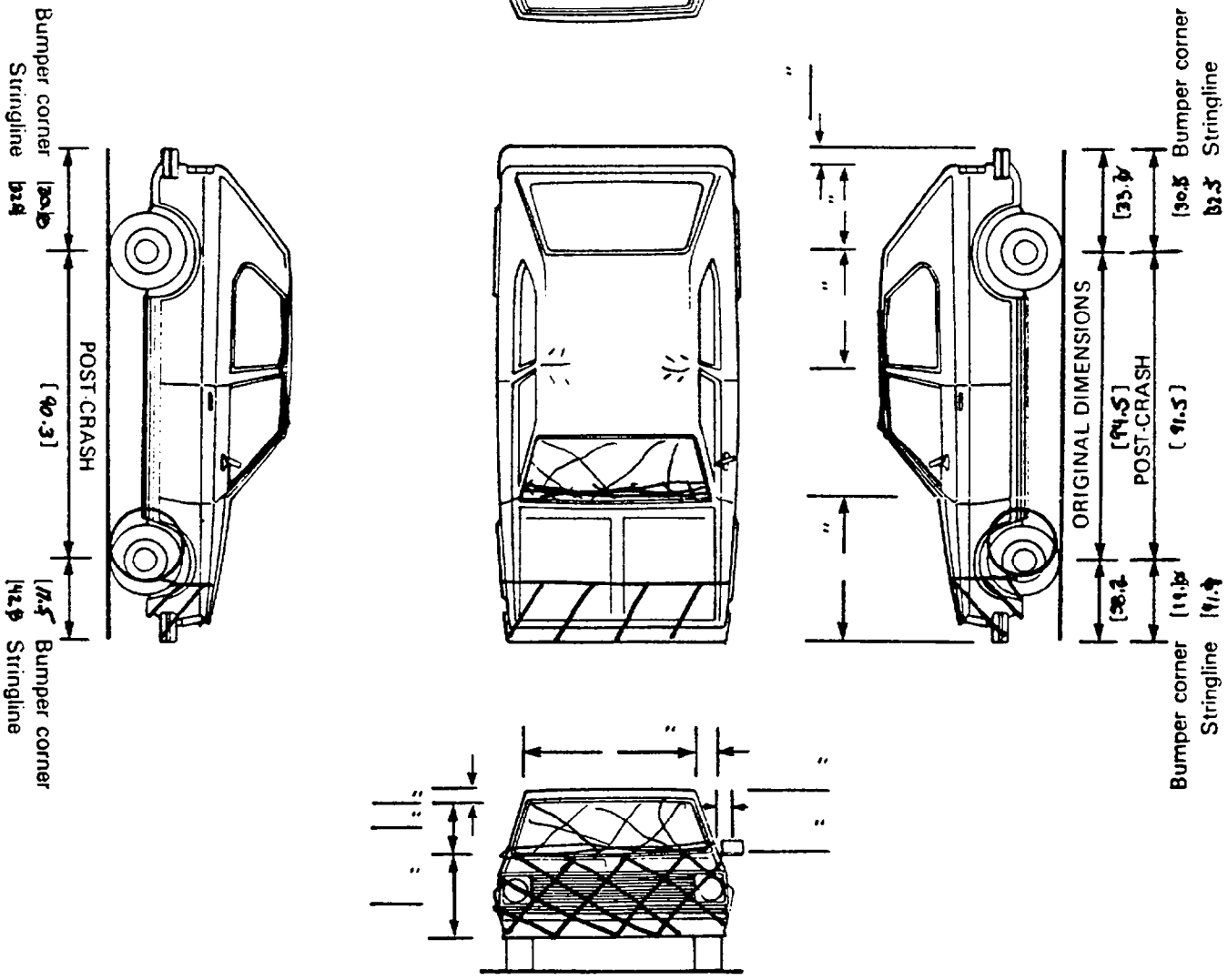
(For locked front wheels or displaced rear axles only)

RF 00 4 °
LF 00 1 °
RR ± N/A °
LR ± N/A °

Within ± 5 degrees

1986 Volkswagon Scirocco





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 this page
Annotate any damage caused by extrication such as component removal by torching, prying or hydraulic shears
If the vehicle contacted a pedestrian, complete page 6R

APPENDIX A

PHOTOGRAPHS

Figure A-1 PRE-TEST FRONT VIEW

7457-11

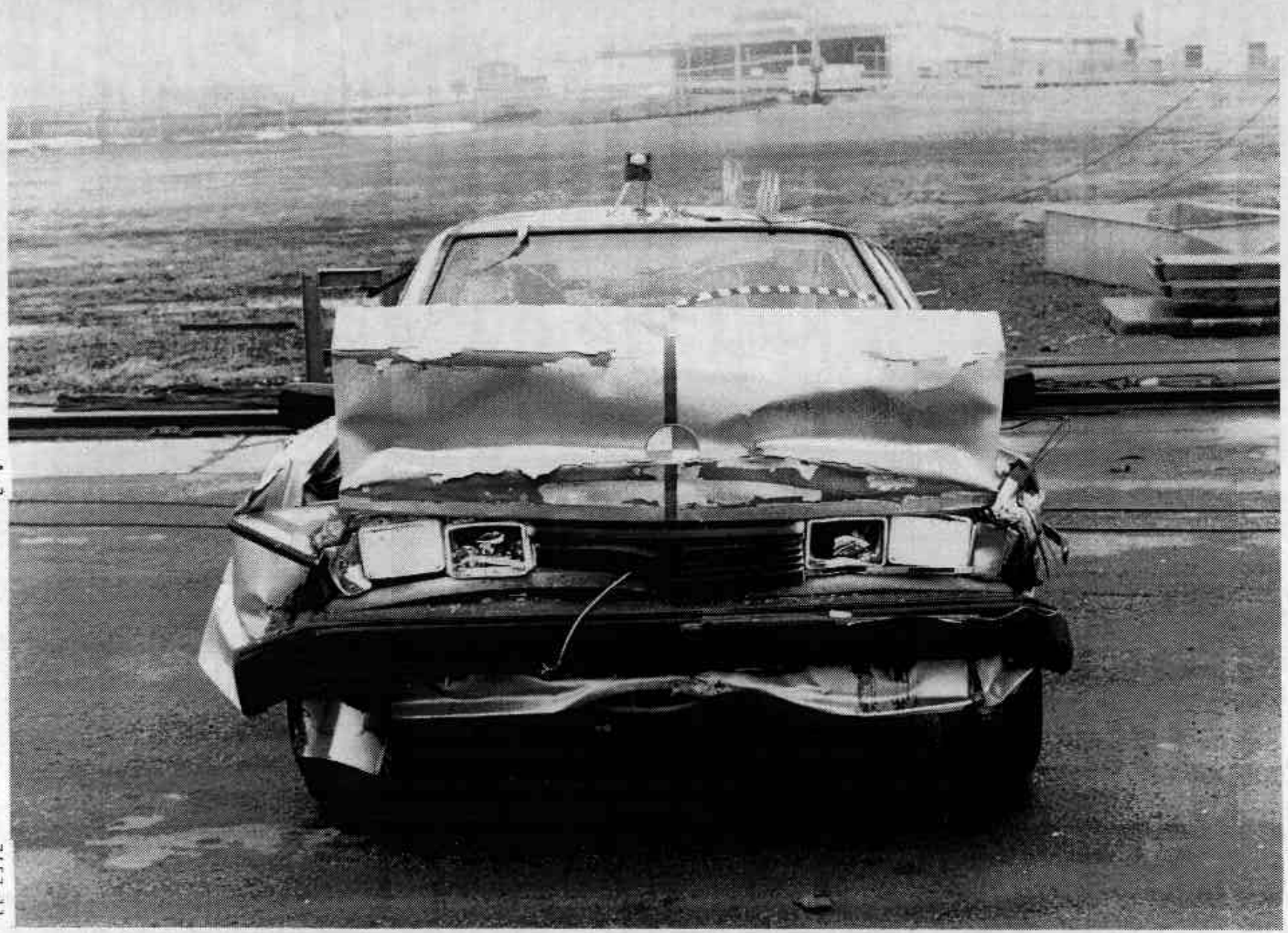


Figure A-2 POST-TEST FRONT VIEW

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

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

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A-9

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

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

7457-11

A-11

7457-11

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

Figure A-11 POST-TEST TOP VIEW

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Figure A-12 PRE-TEST WINDSHIELD VIEW

7457-11

Figure A-13 POST-TEST WINDSHIELD VIEW

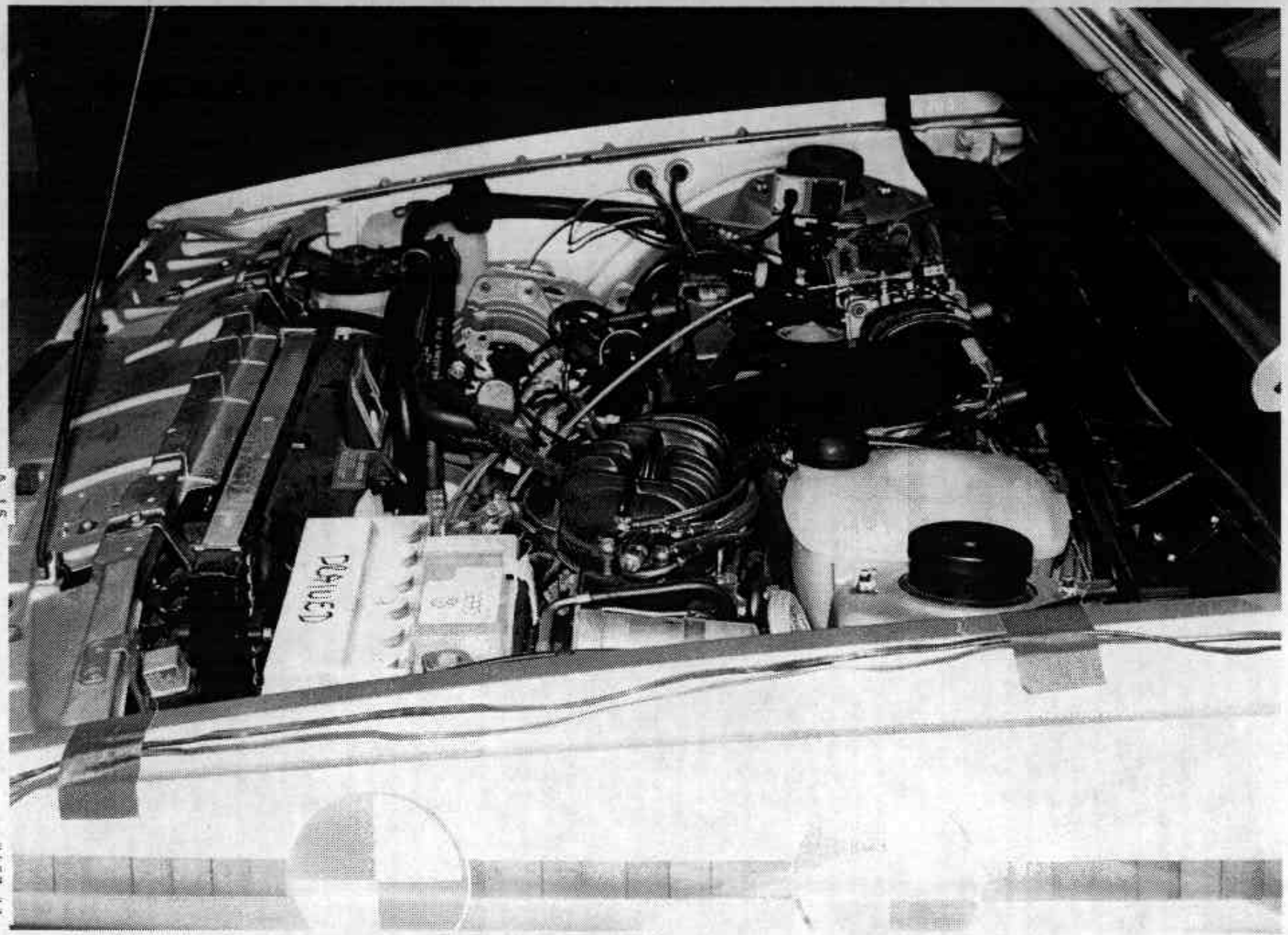


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

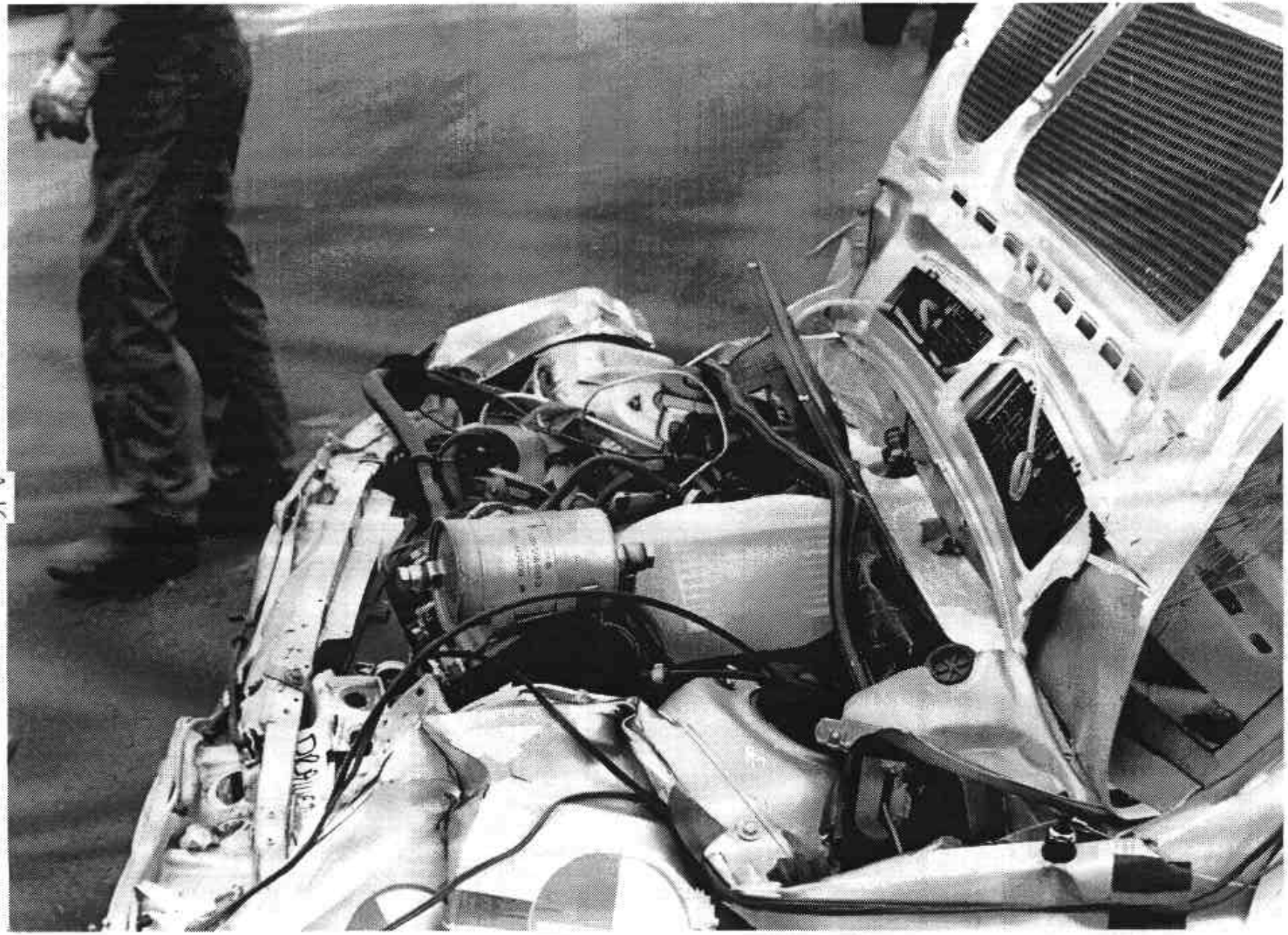
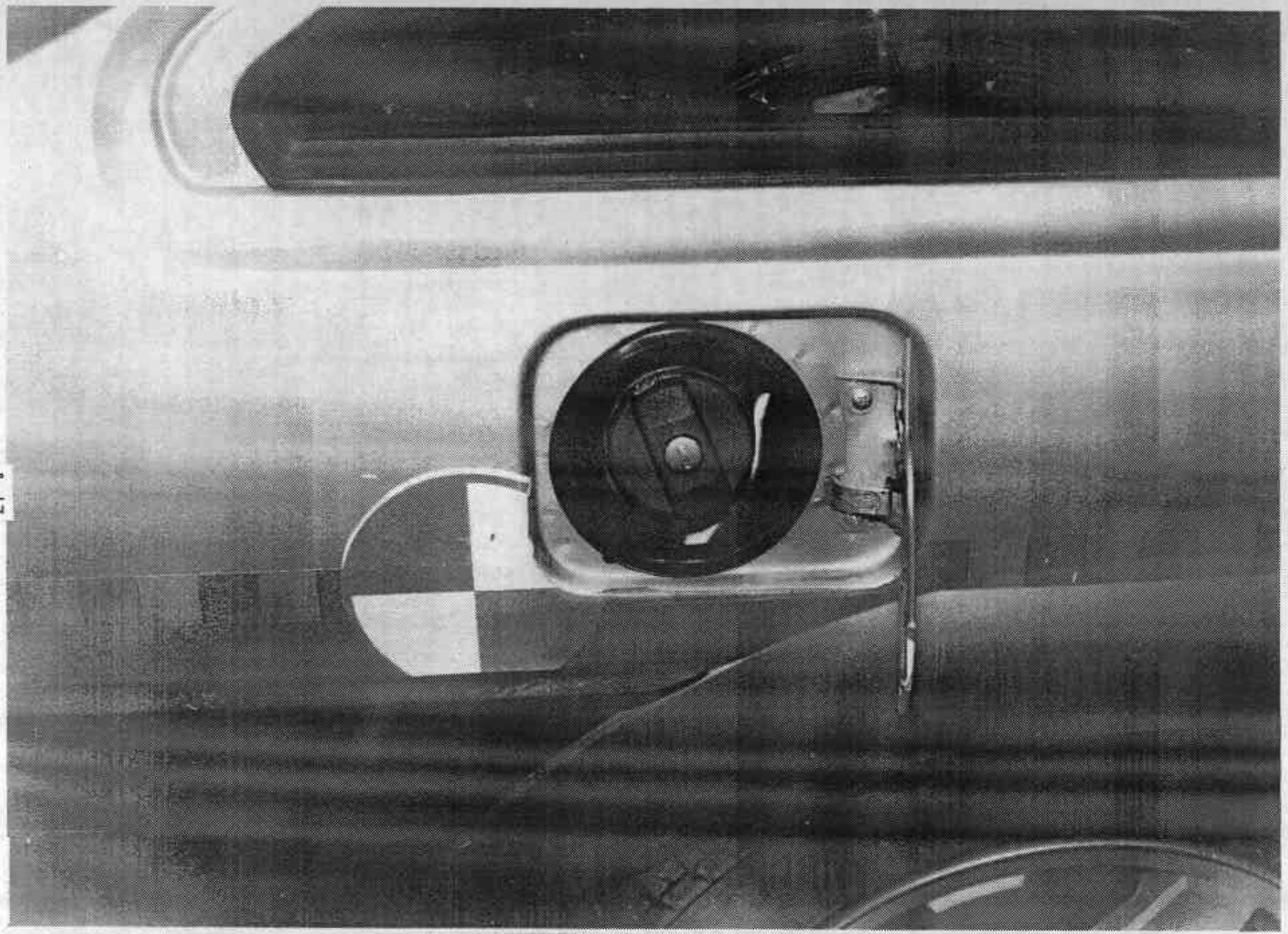


Figure A-15 POST-TEST ENGINE COMPARTMENT VIEW



A-17

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Figure A-16 PRE-TEST FUEL FILTER CAP VIEW

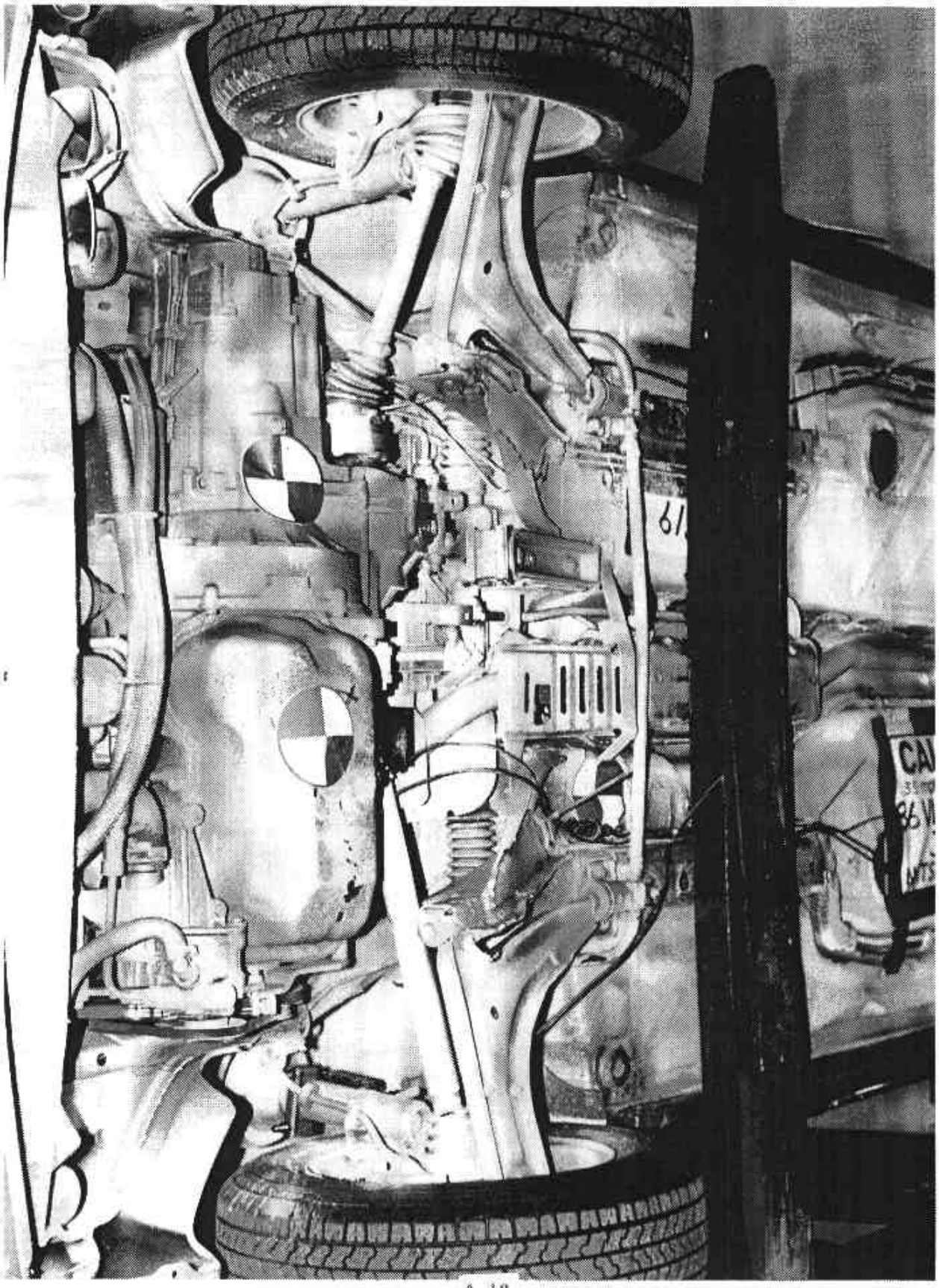
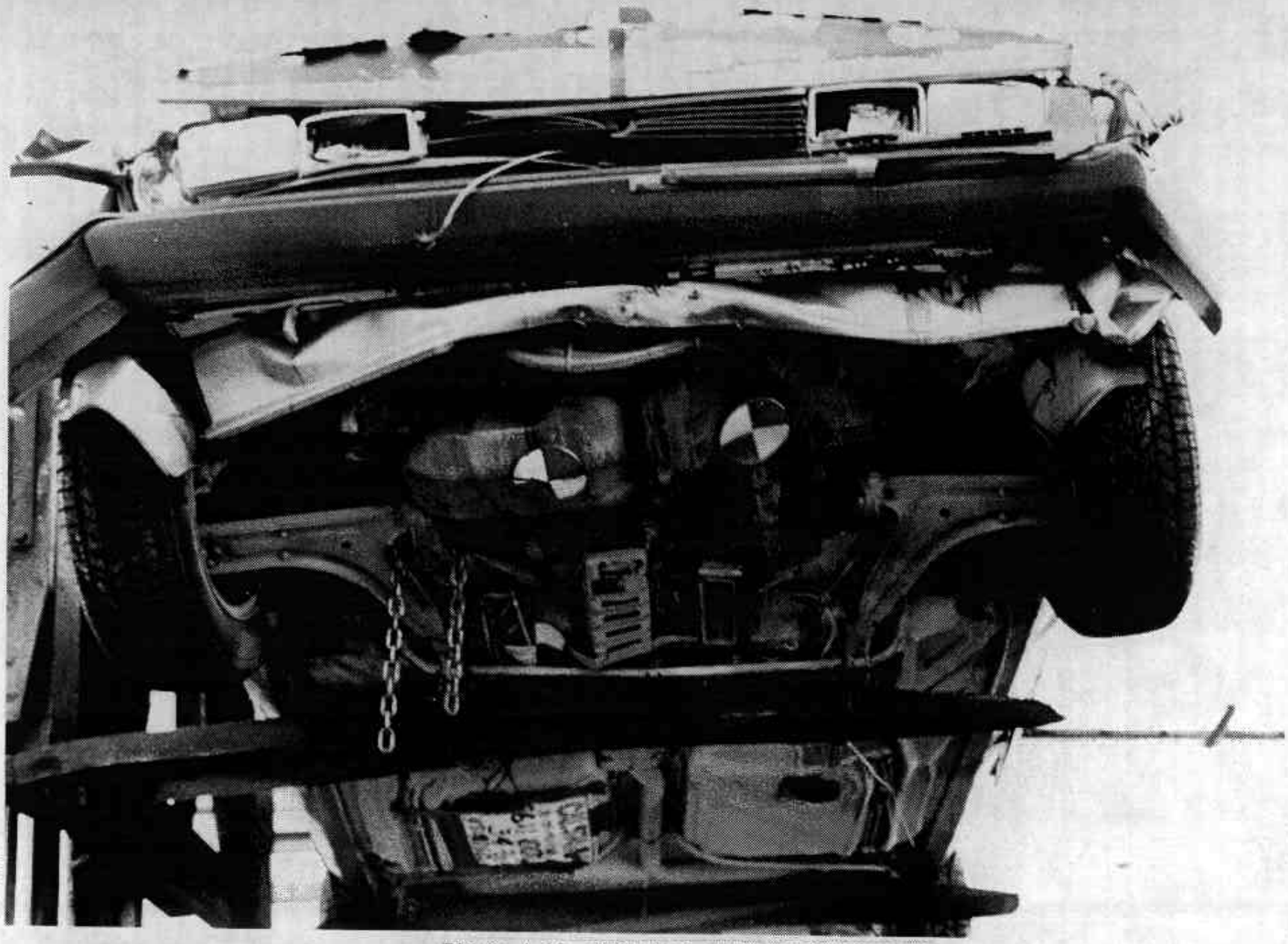


Figure A-17 PRE-TEST FRONT UNDERBODY VIEW



A-19

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Figure A-18 POST-TEST FRONT UNDERBODY VIEW

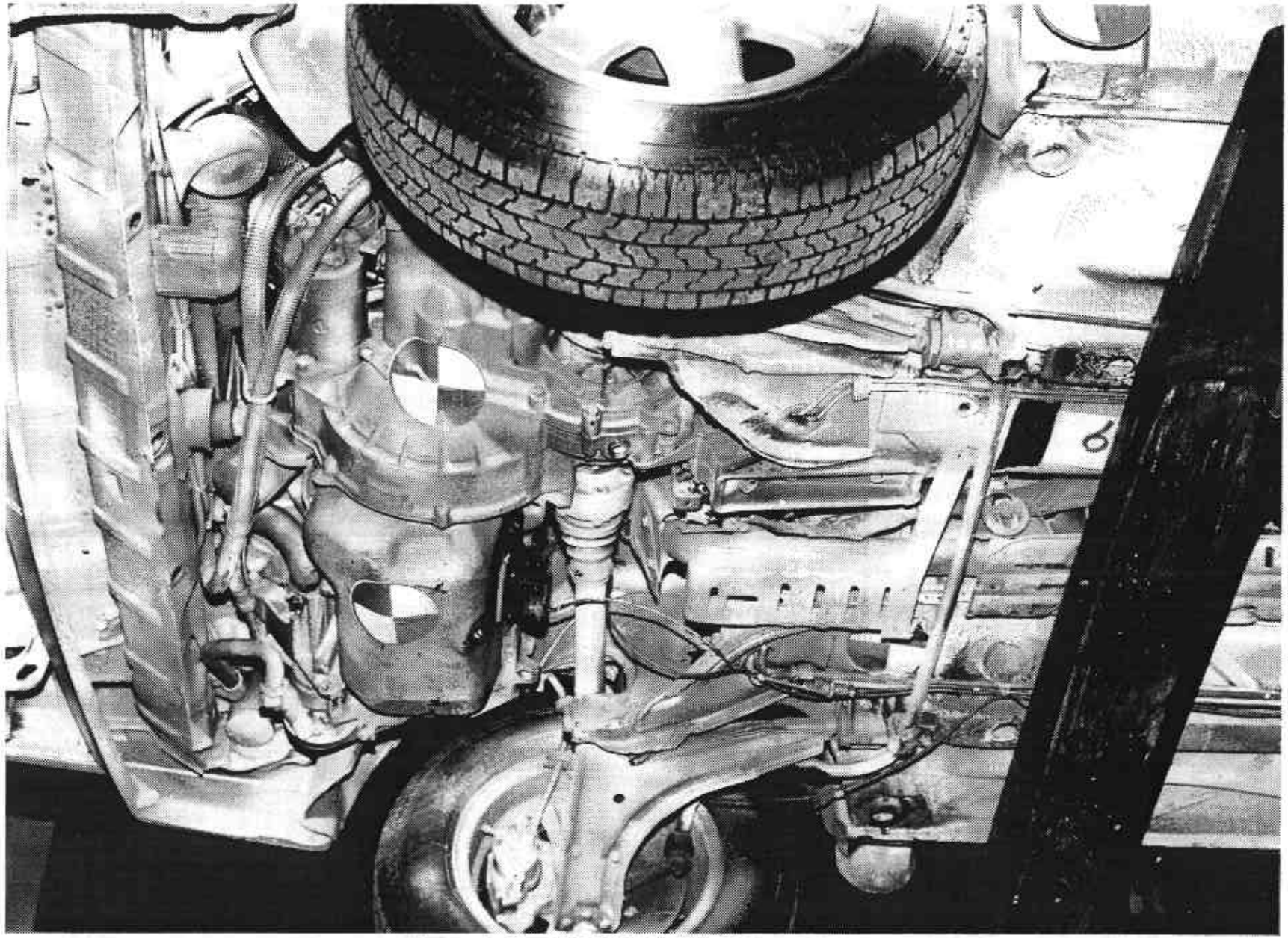


Figure A-19 PRE-TEST FRONT-SIDE UNDERBODY VIEW

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

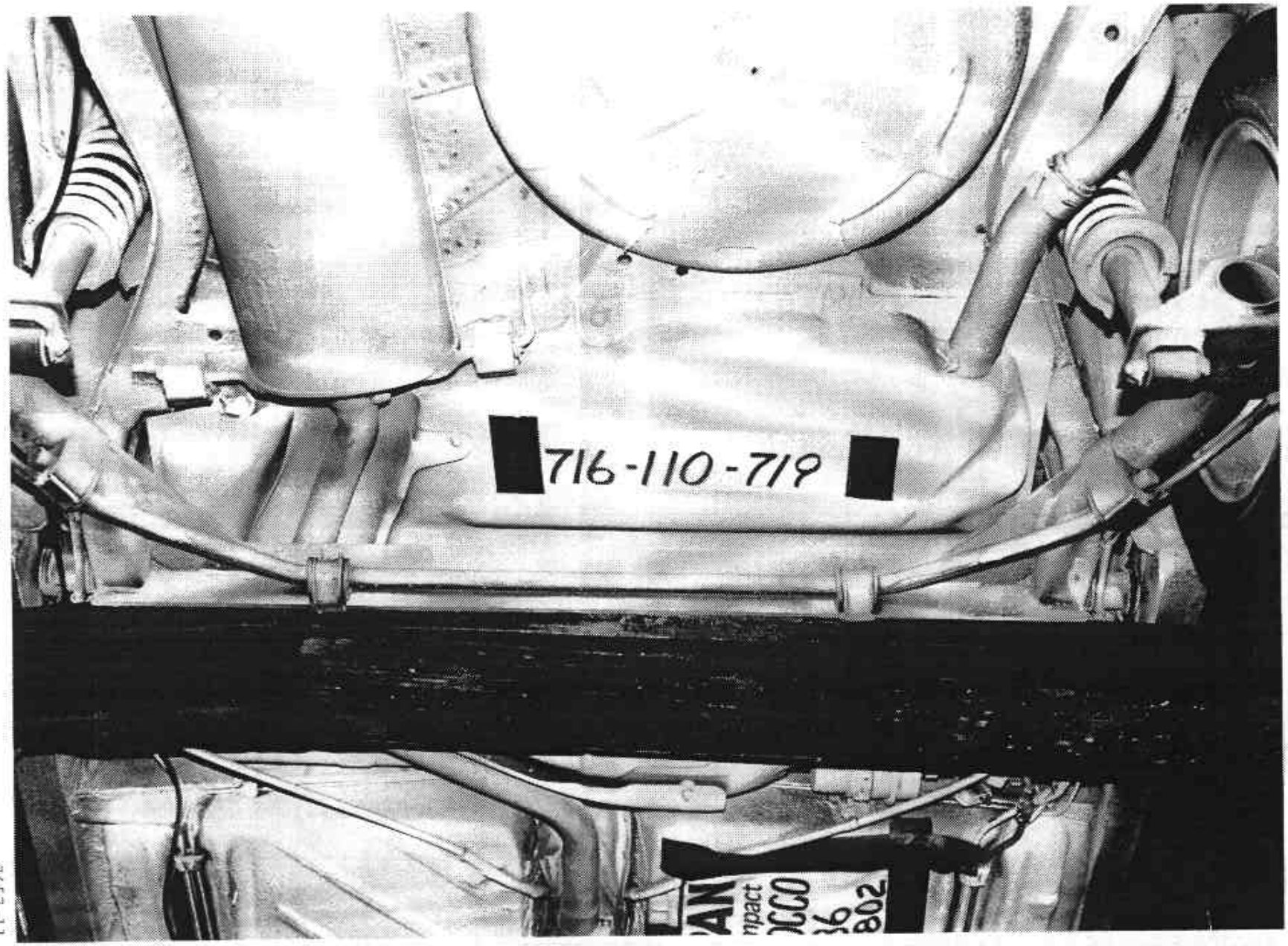


Figure A-21 PRE-TEST REAR UNDERBODY VIEW

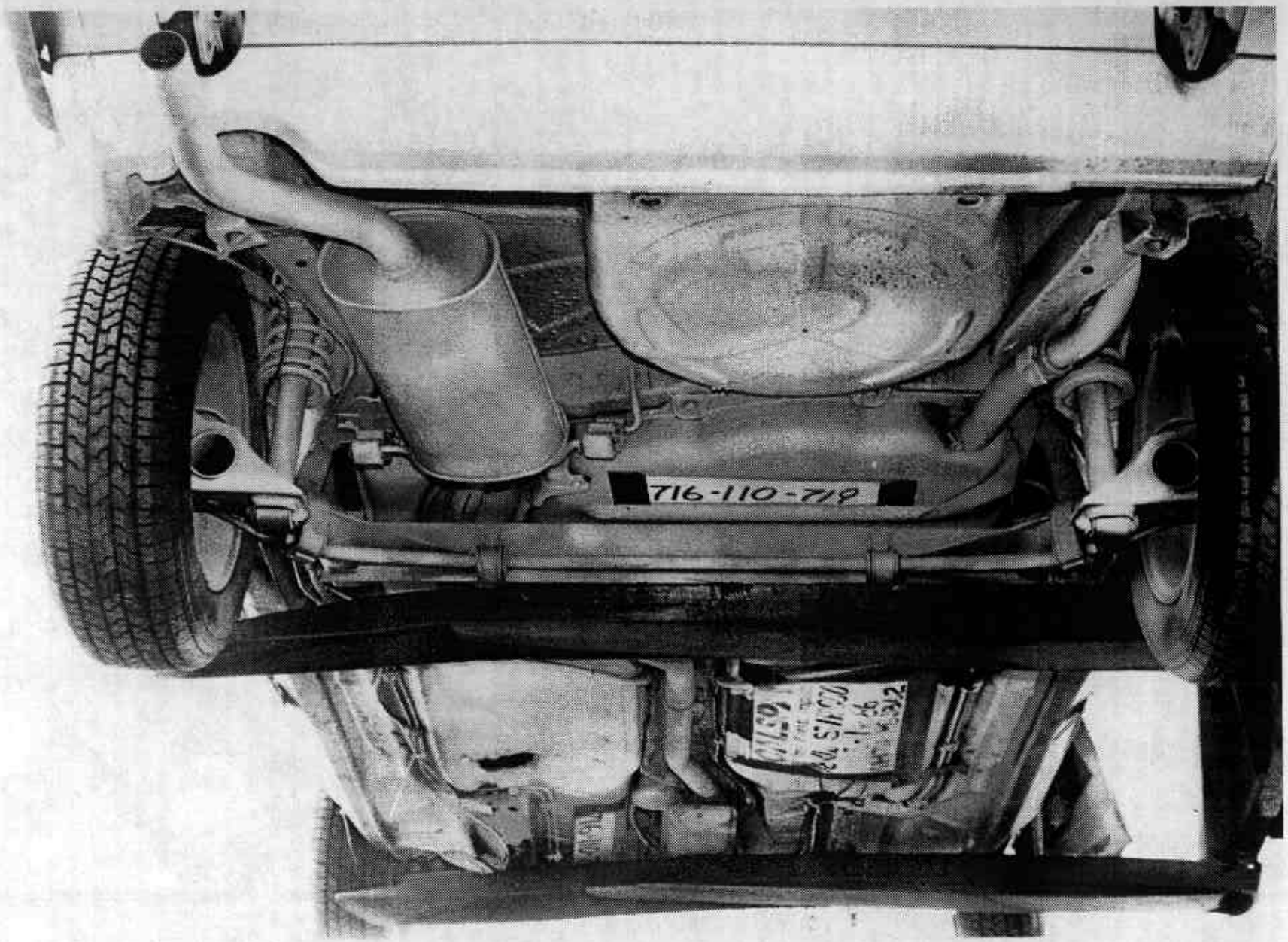
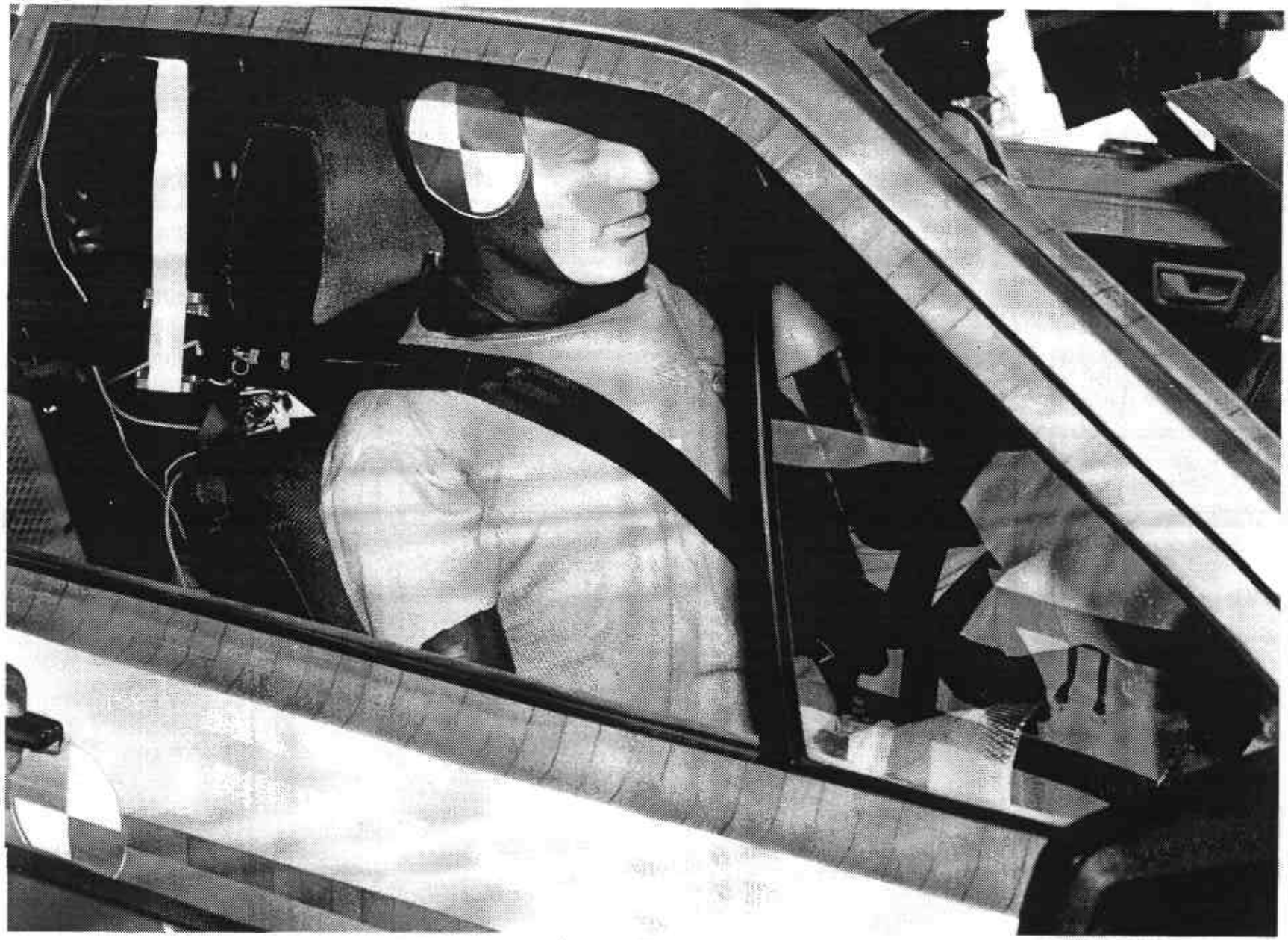


Figure A-22 POST-TEST REAR UNDERBODY VIEW

Figure A-23 PRE-TEST DRIVER POSTION VIEW

Figure A-24 POST-TEST DRIVER POSTION VIEW

7457-11



A-26

747-11

Figure A-25 PRE-TEST PASSENGER POSITION VIEW

Figure A-26 POST-TEST PASSENGER POSITION VIEW

7457-11

Figure A-27 PRE-TEST DRIVER AND INTERIOR VIEW

Figure A-28 POST-TEST DRIVER AND INTERIOR VIEW

Figure A-29 PRE-TEST PASSENGER AND INTERIOR VIEW

Figure A-30 POST-TEST PASSENGER AND INTERIOR VIEW

APPENDIX B

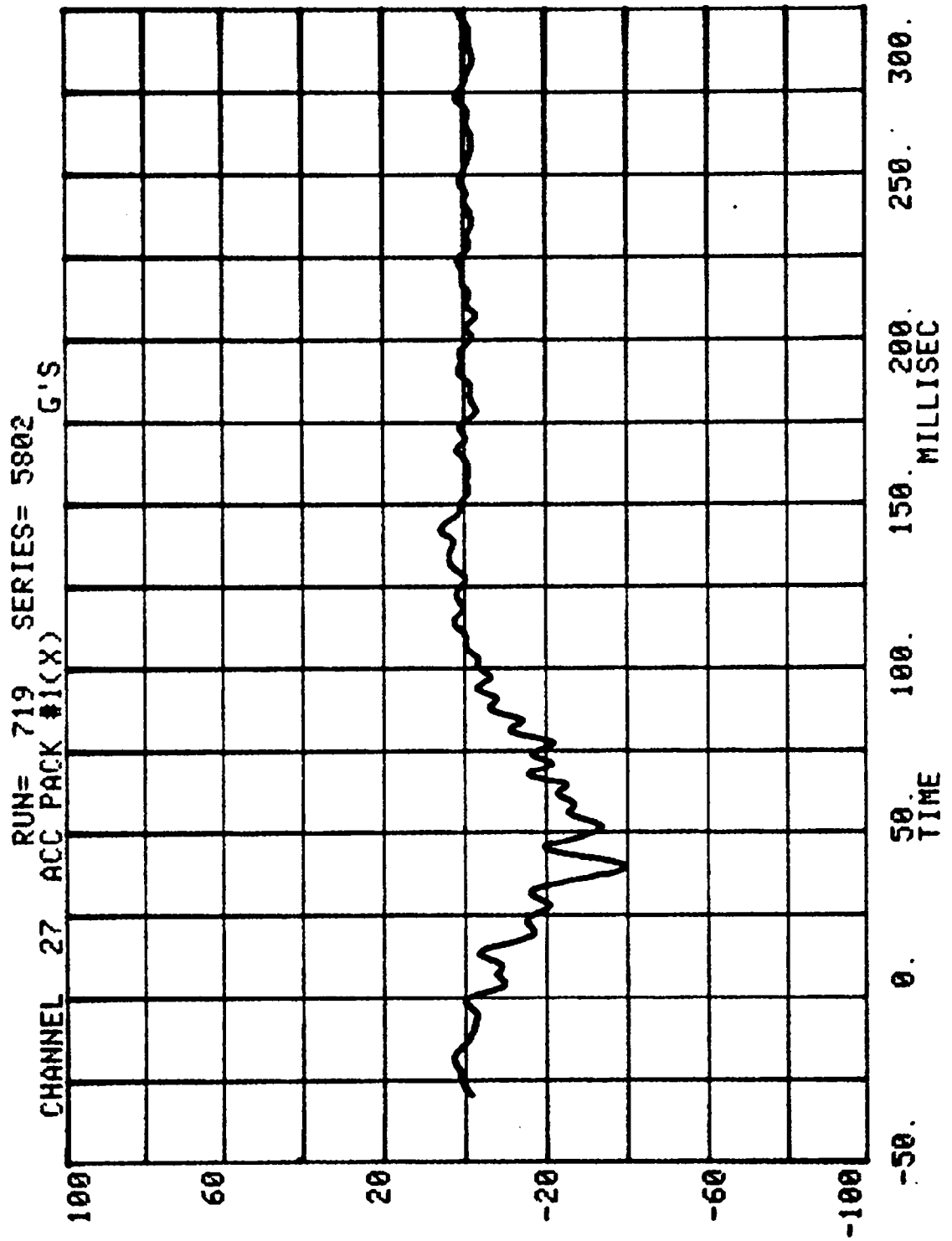
VEHICLE, DUMMY RESPONSE DATA AND LOAD CELL BARRIER DATA

TEST NO. MG5802

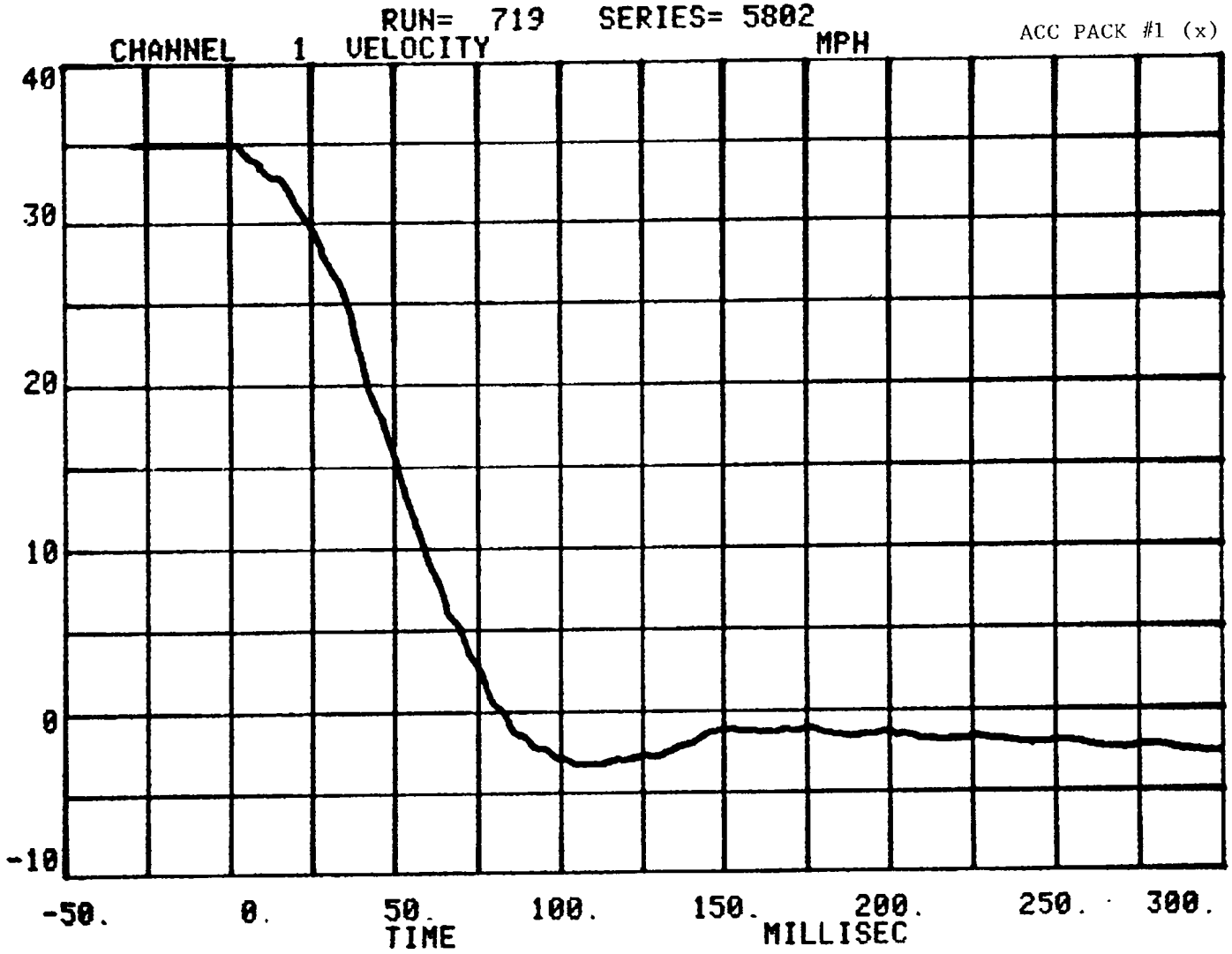
VEHICLE DATA

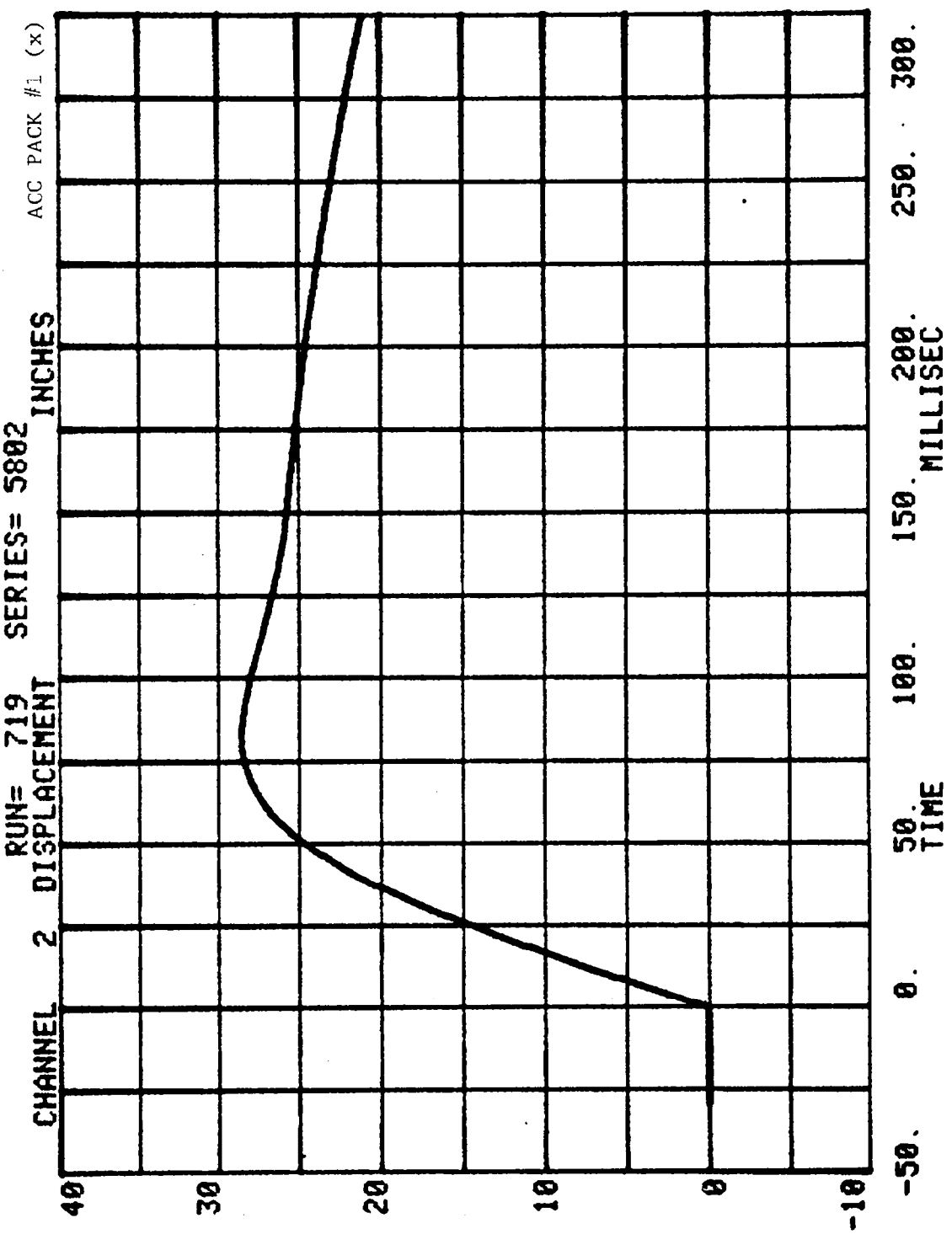
FILTER CHANNEL CLASS

60

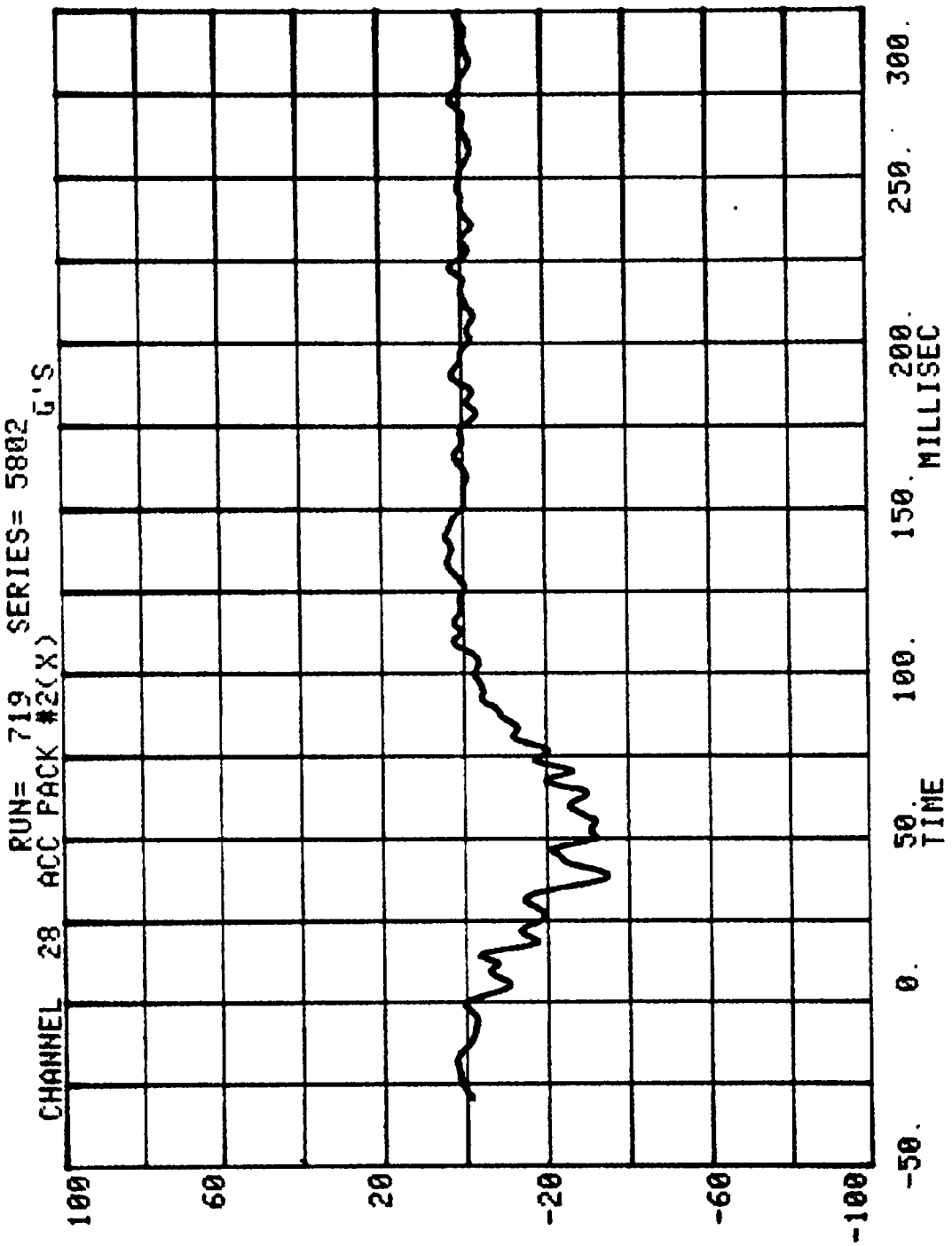

CHANNEL 27 ACC PACK #1(X)
RUN= 719 SERIES= 5802
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

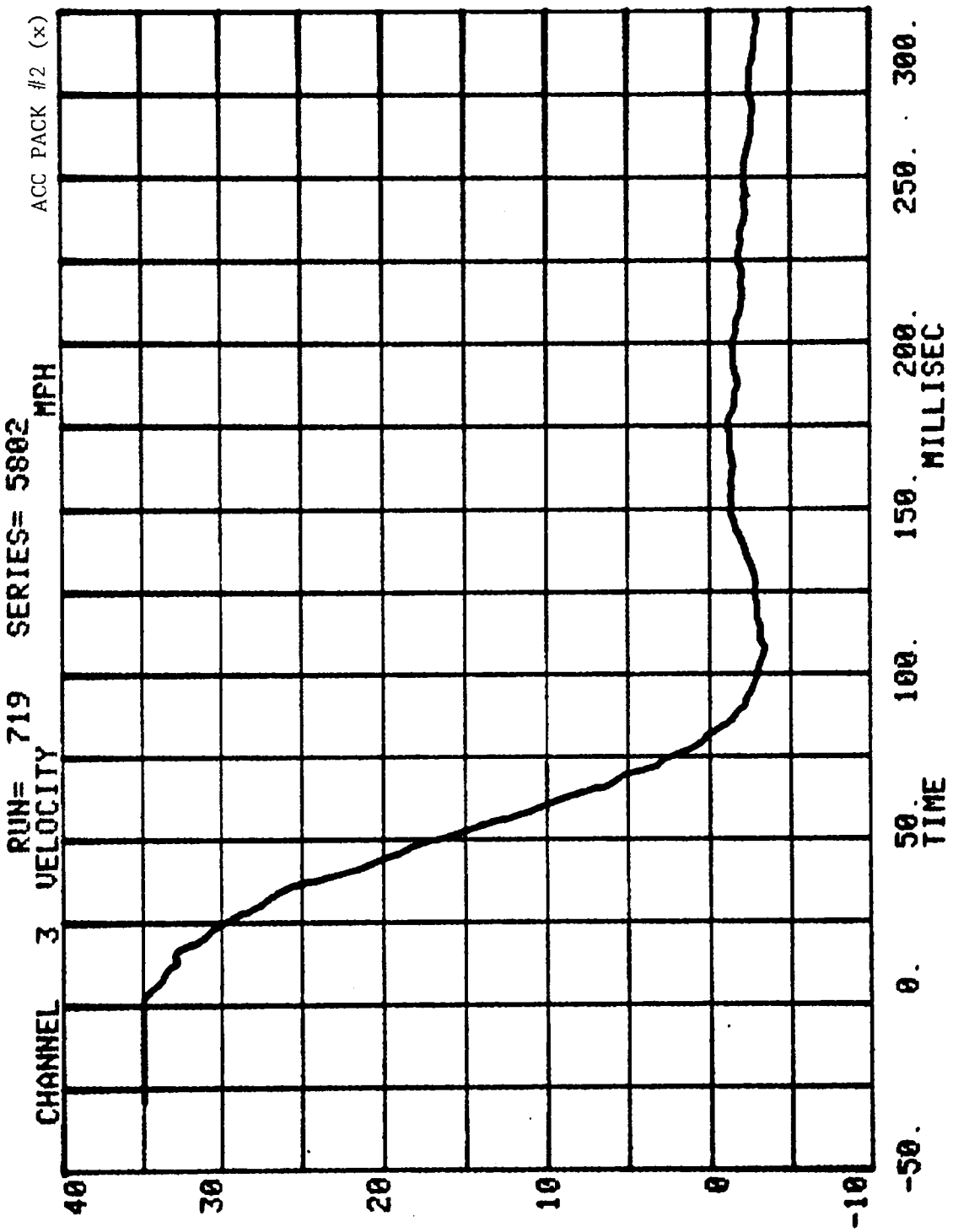

RUN= 719 SERIES= 5802
CHANNEL 1 VELOCITY MPH
ACC PACK #1 (x)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

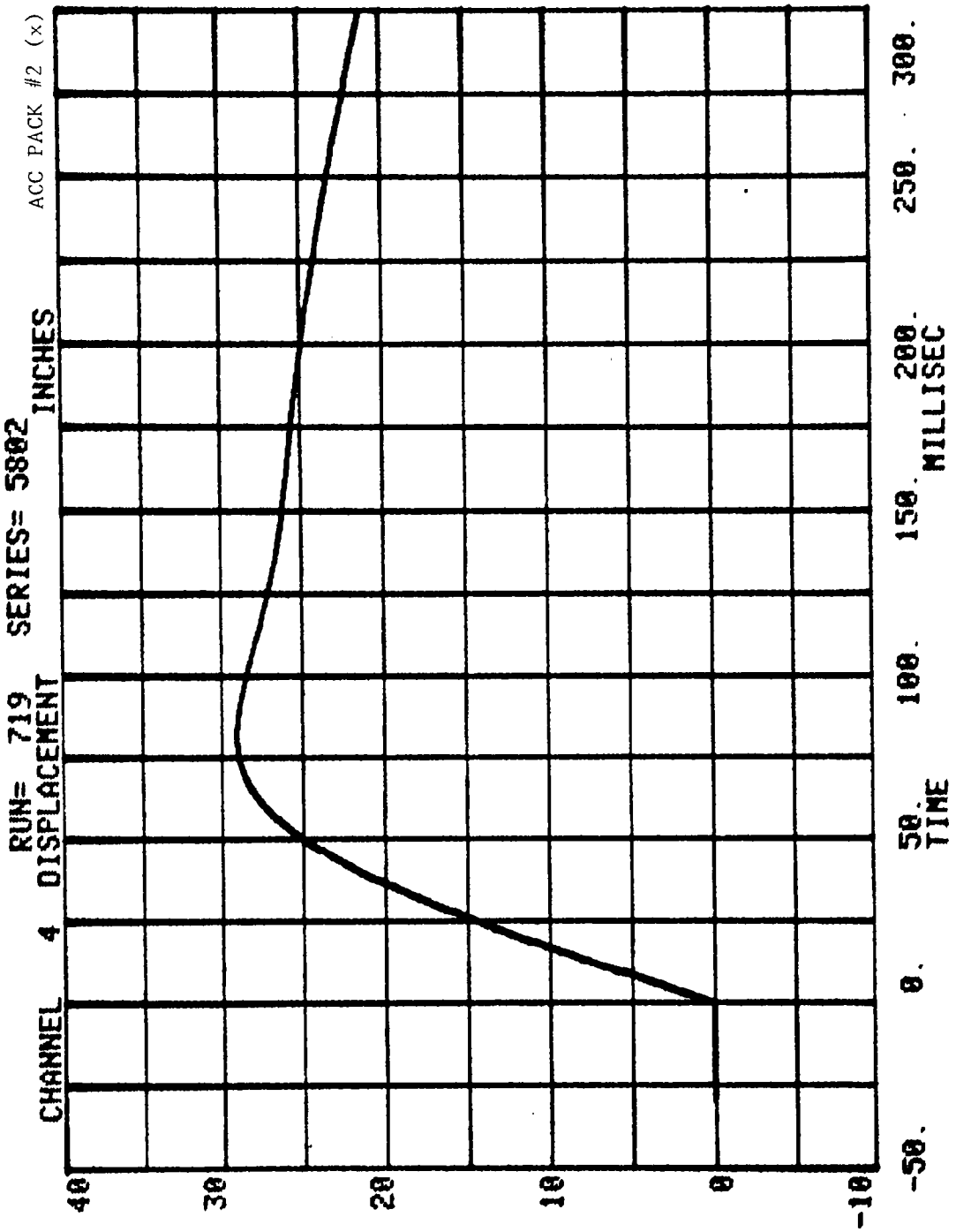

ACC PACK #1 (x)
CHANNEL 2 DISPLACEMENT
RUN= 719 SERIES= 5802
INCHES
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

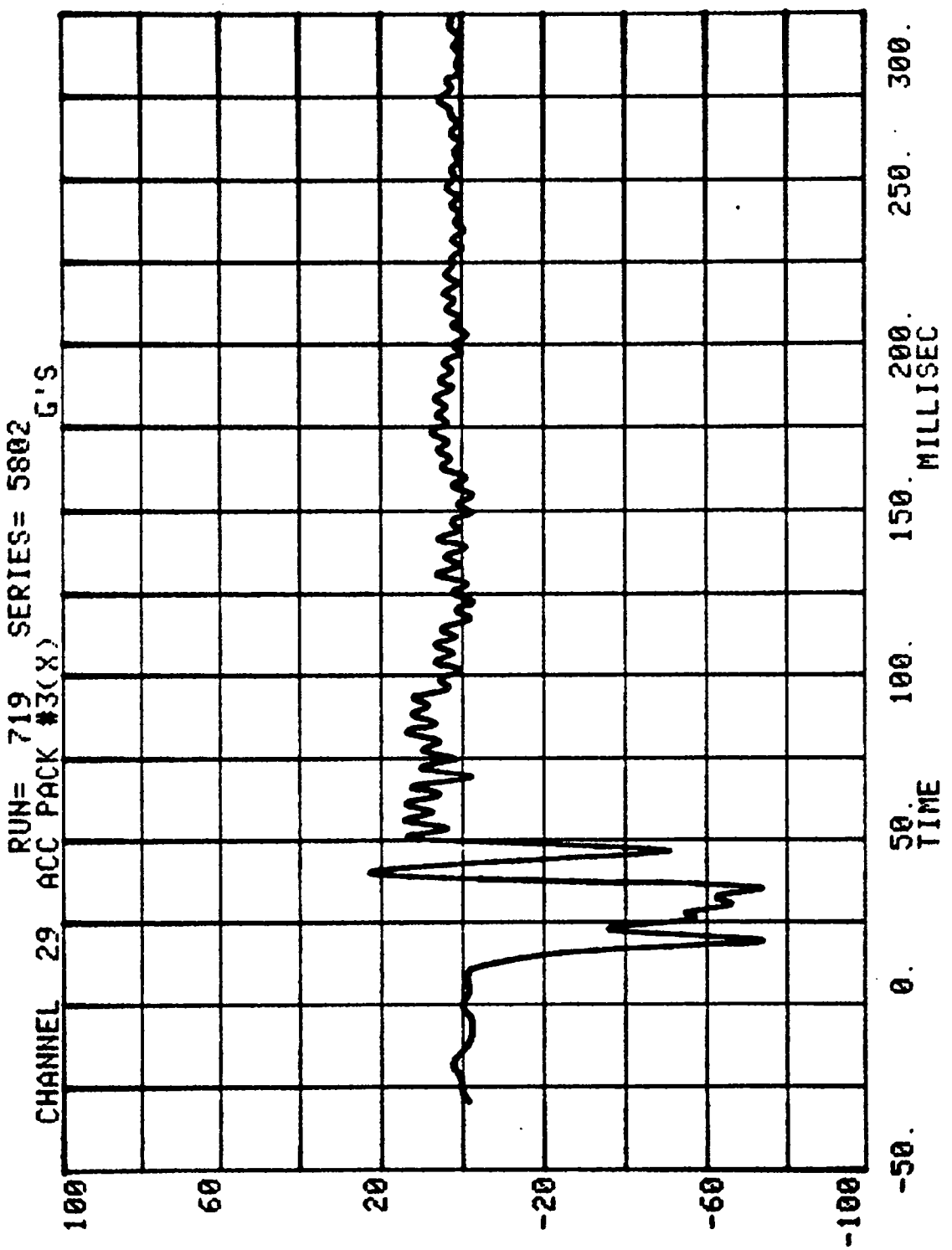

CHANNEL 28
RUN= 719 SERIES= 5802
ACC PACK #2(X)
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

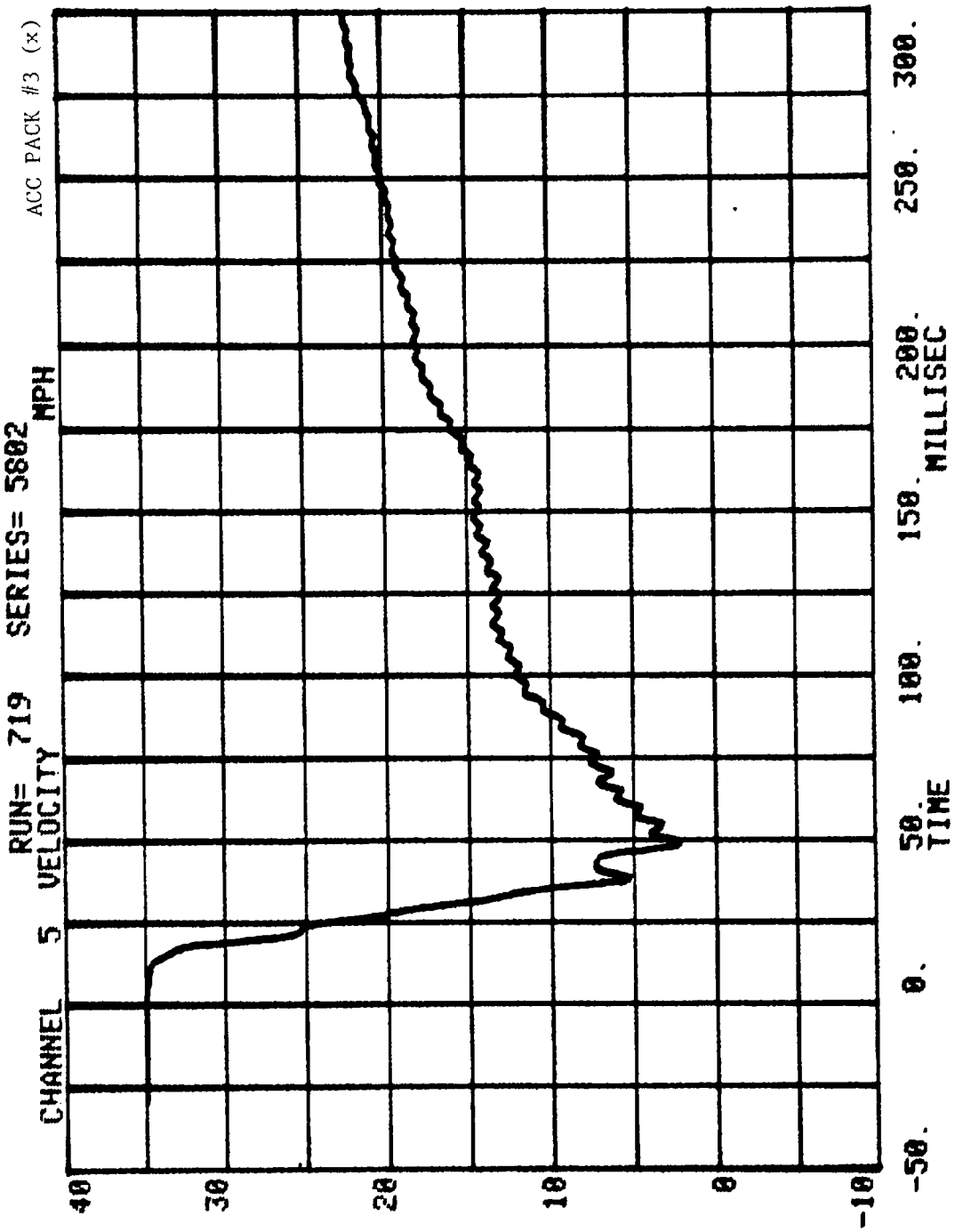

ACC PACK #2 (x)
CHANNEL 3 VELOCITY
RUN= 719 SERIES= 5802
MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


ACC PACK #2 (x)
RUN= 719 SERIES= 5802
CHANNEL 4 DISPLACEMENT INCHES
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME MILLISEC

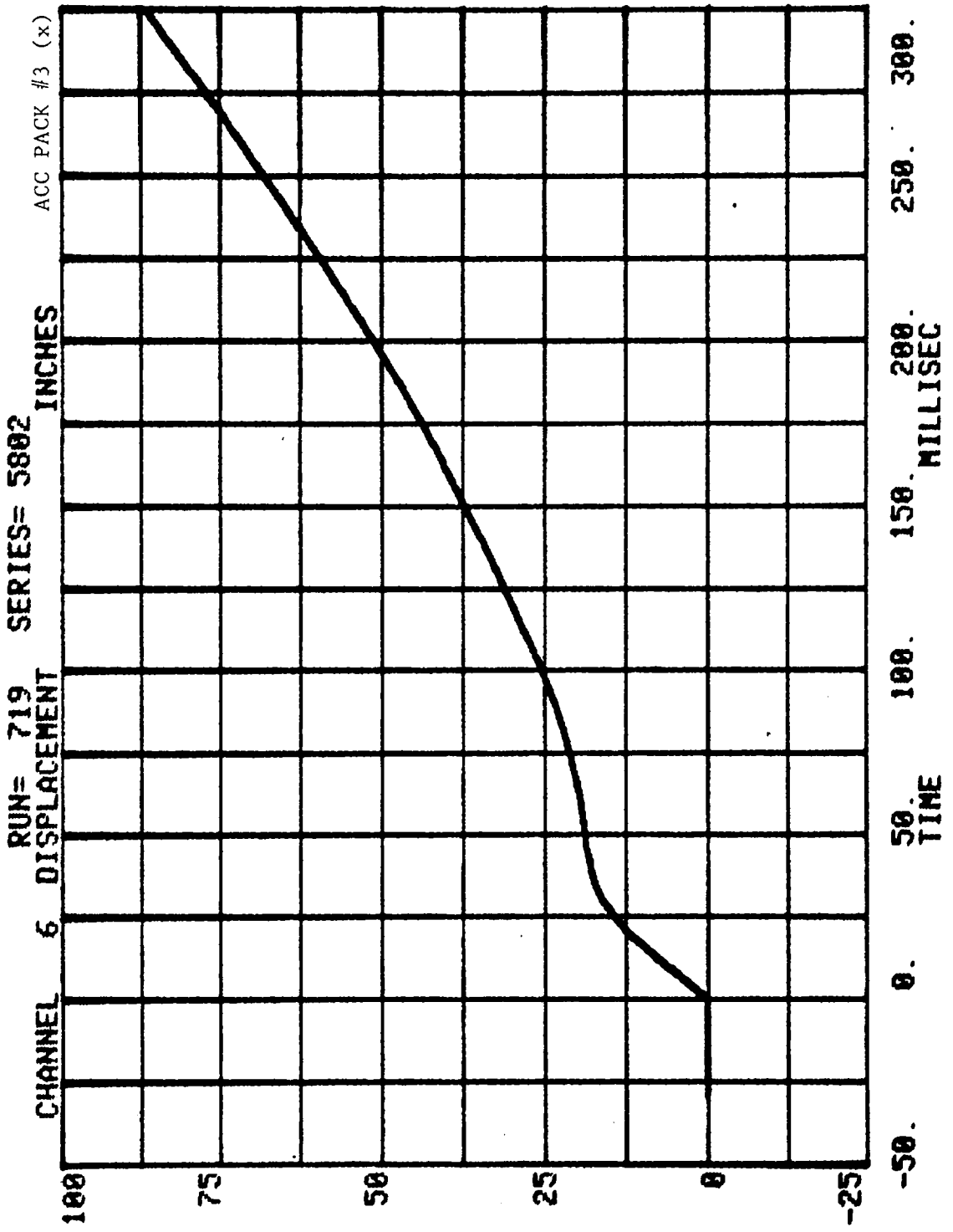
7457-11


RUN= 719 SERIES= 5802
CHANNEL 29 ACC PACK #3(X)
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

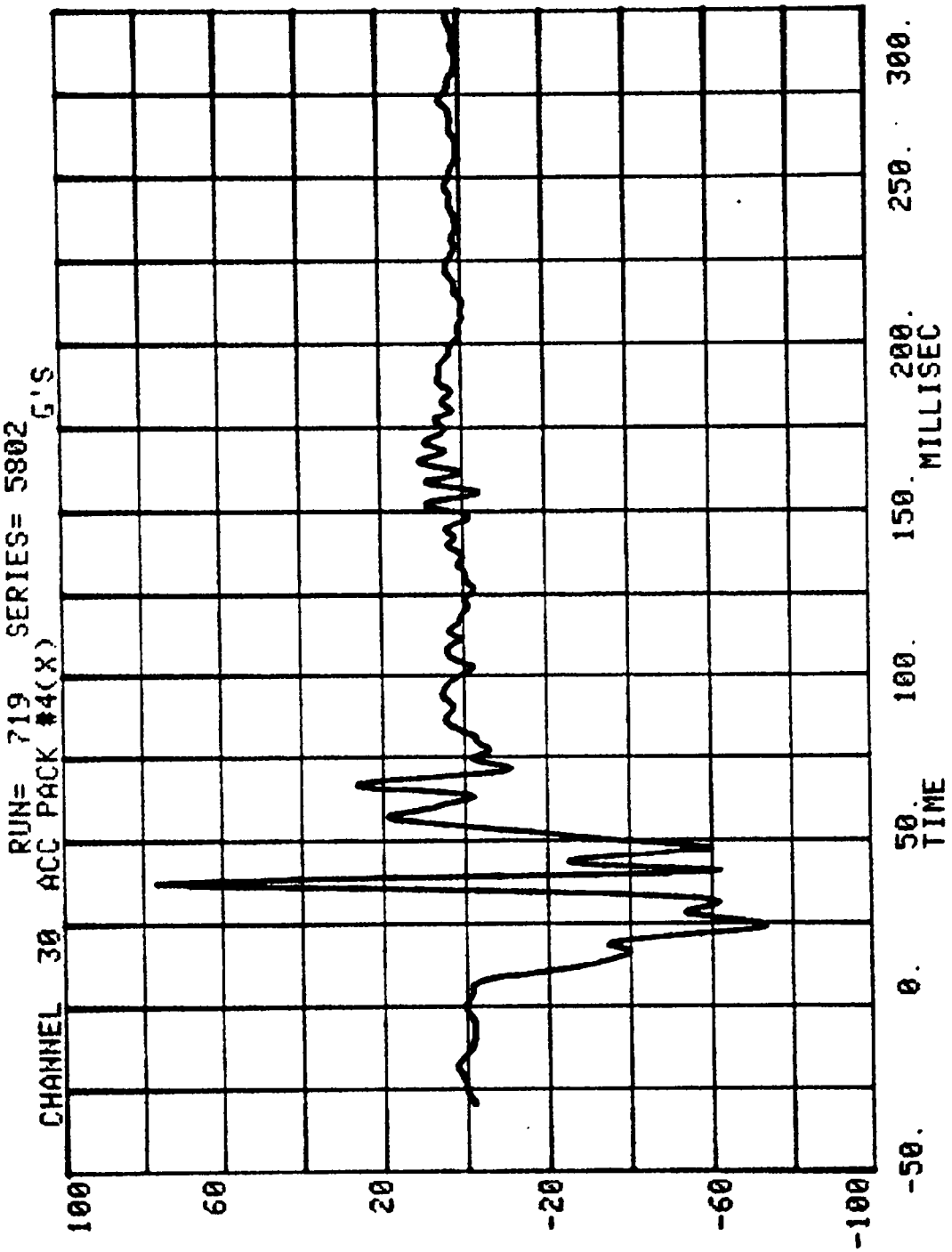
7457-11


ACC PACK #3 (x)
CHANNEL 5 VELOCITY
RUN= 719 SERIES= 5802
MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

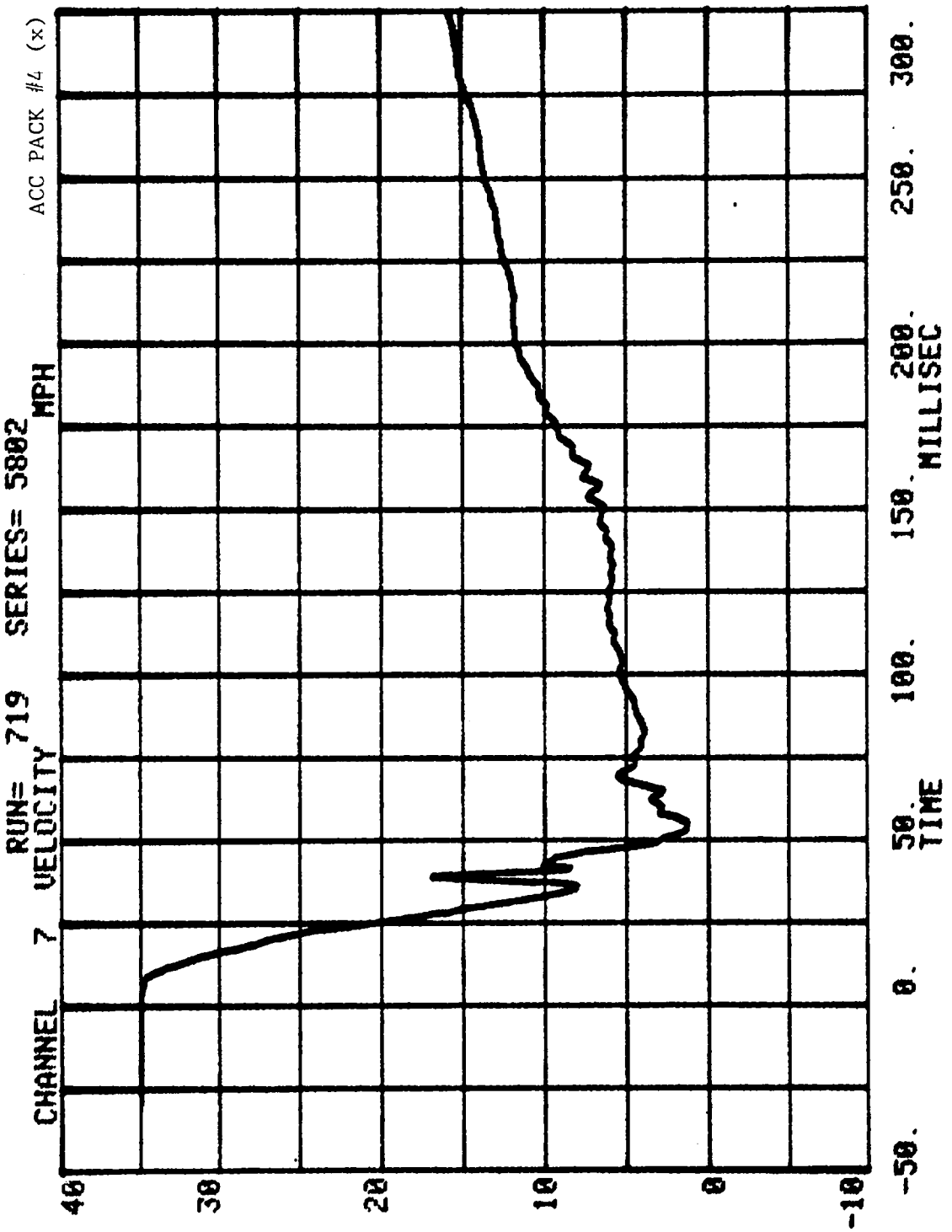
7457-11

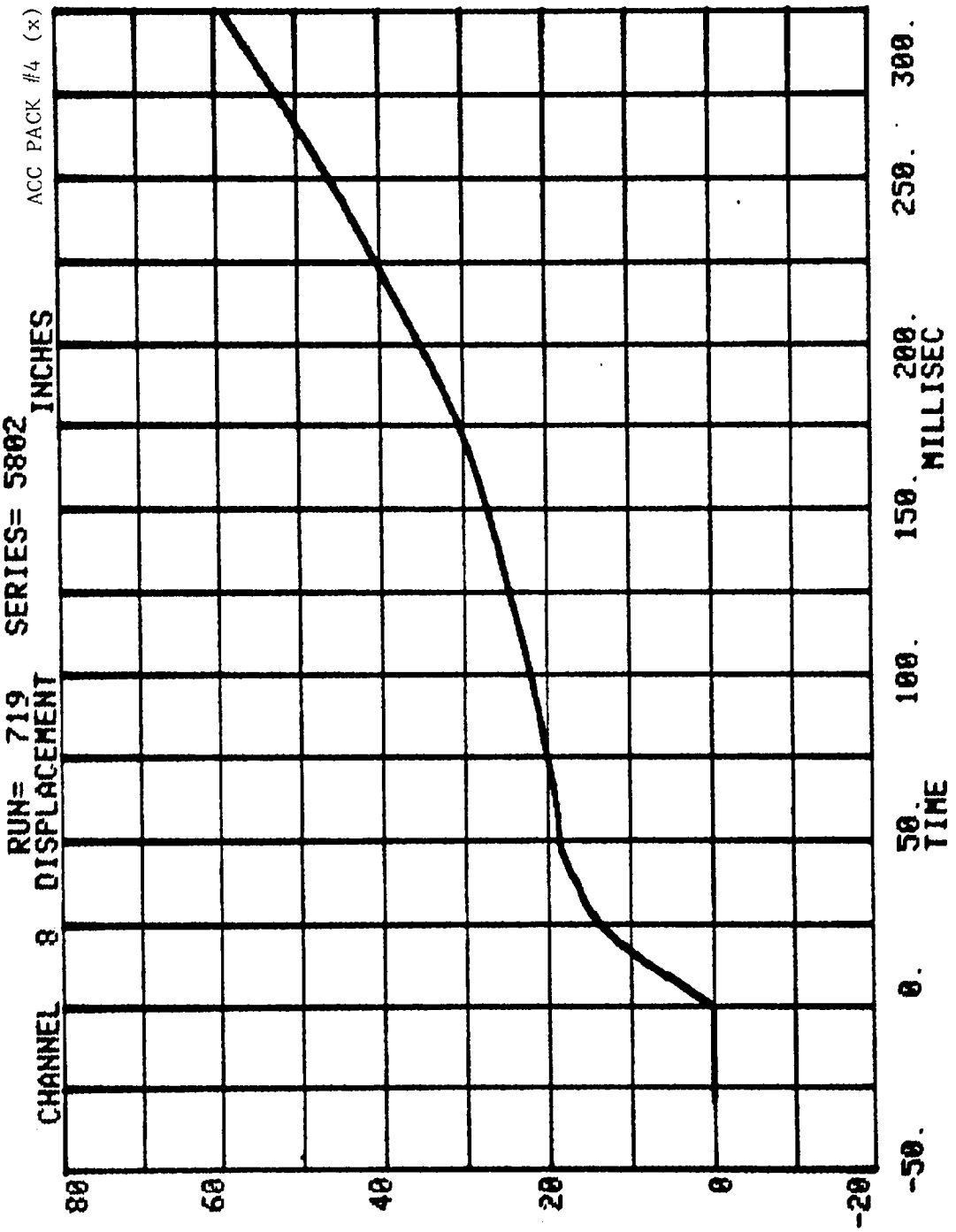

ACC PACK #3 (x)
RUN= 719 SERIES= 5802
CHANNEL 6 DISPLACEMENT INCHES
100
75
50
25
0
-25
-50.
0.
50.
100.
150.
200.
250.
300.
TIME MILLISEC

7457-11

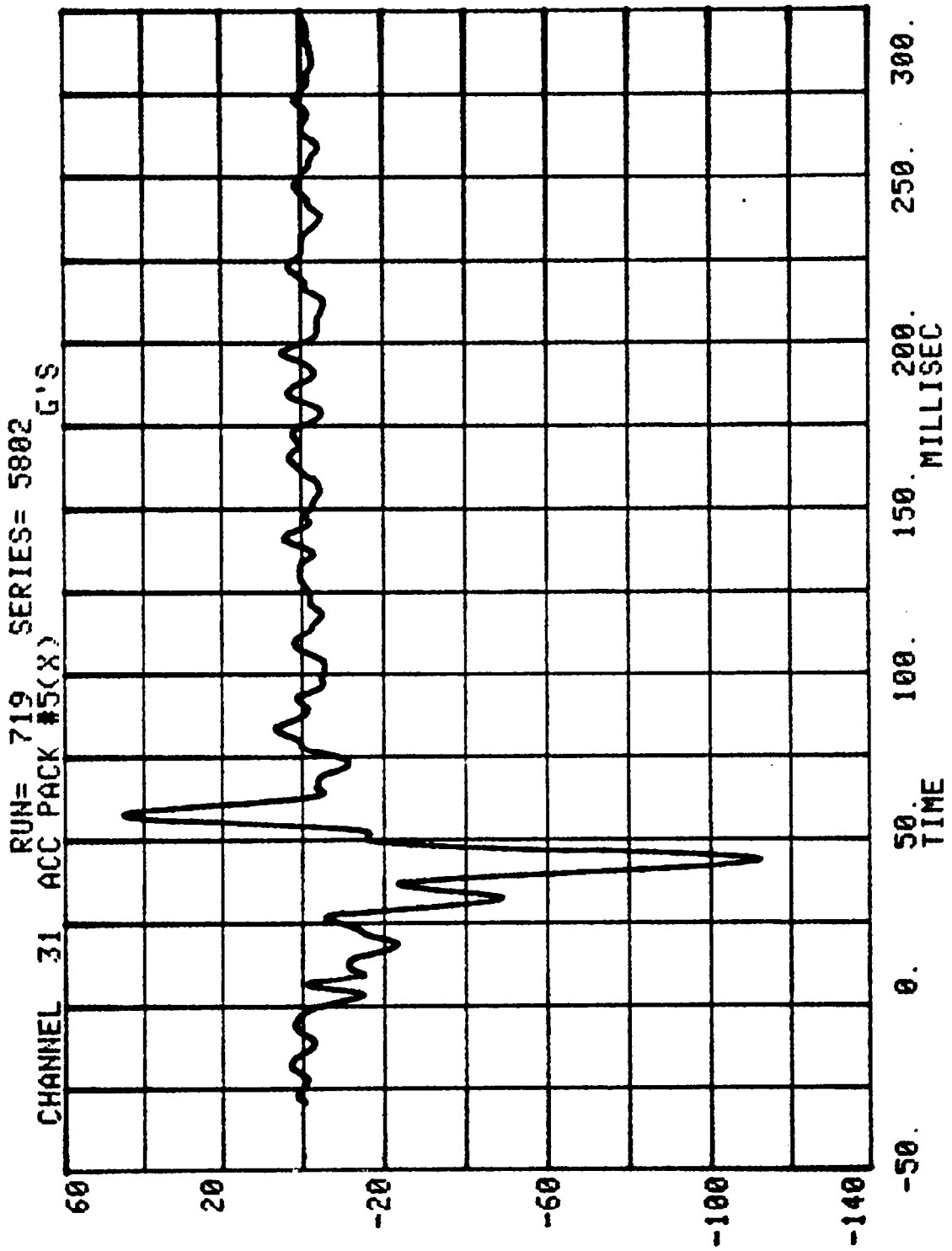

CHANNEL 30 ACC PACK #4(X)
RUN= 719 SERIES= 5802
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

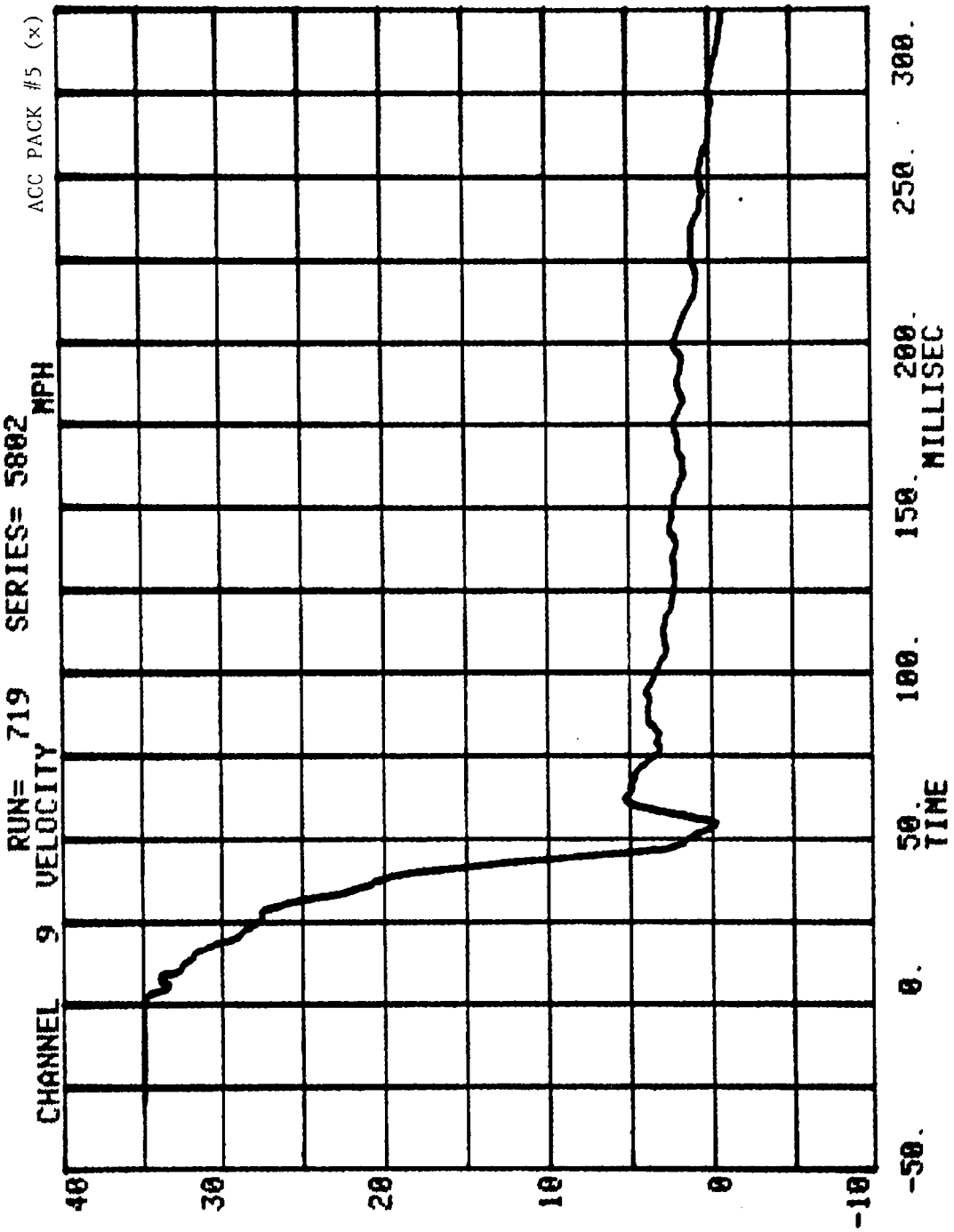

ACC PACK #4 (x)
CHANNEL 7 VELOCITY
RUN= 719 SERIES= 5802
MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


ACC PACK #4 (x)
CHANNEL 8 DISPLACEMENT RUN= 719 SERIES= 5802 INCHES
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME MILLISEC

7457-11


CHANNEL 31 ACC PACK #5(X)
RUN= 719 SERIES= 5802
G'S
60
20
-20
-60
-100
-140
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11


ACC PACK #5 (x)
CHANNEL 9 VELOCITY
RUN= 719 SERIES= 5802
MPH
40
30
20
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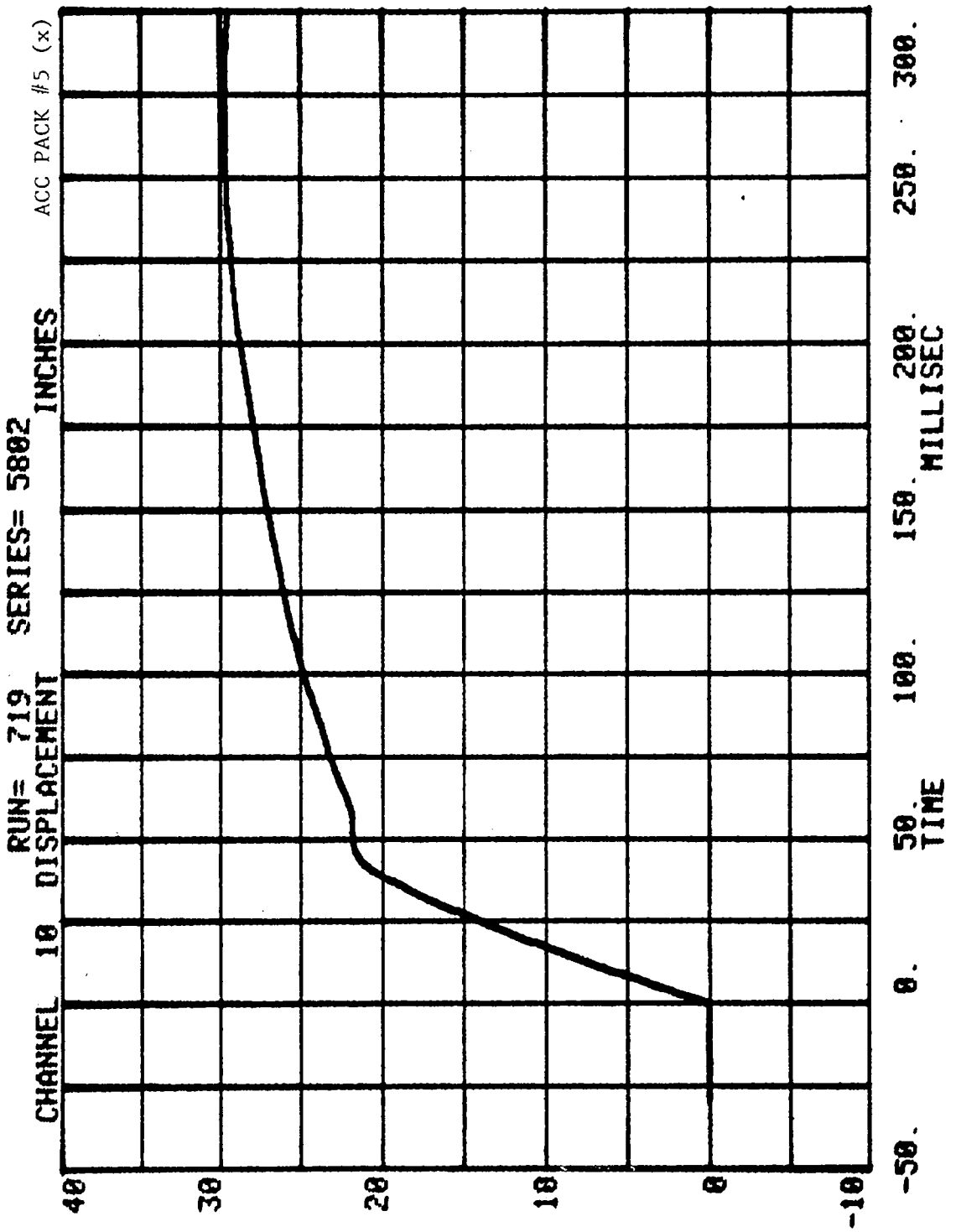
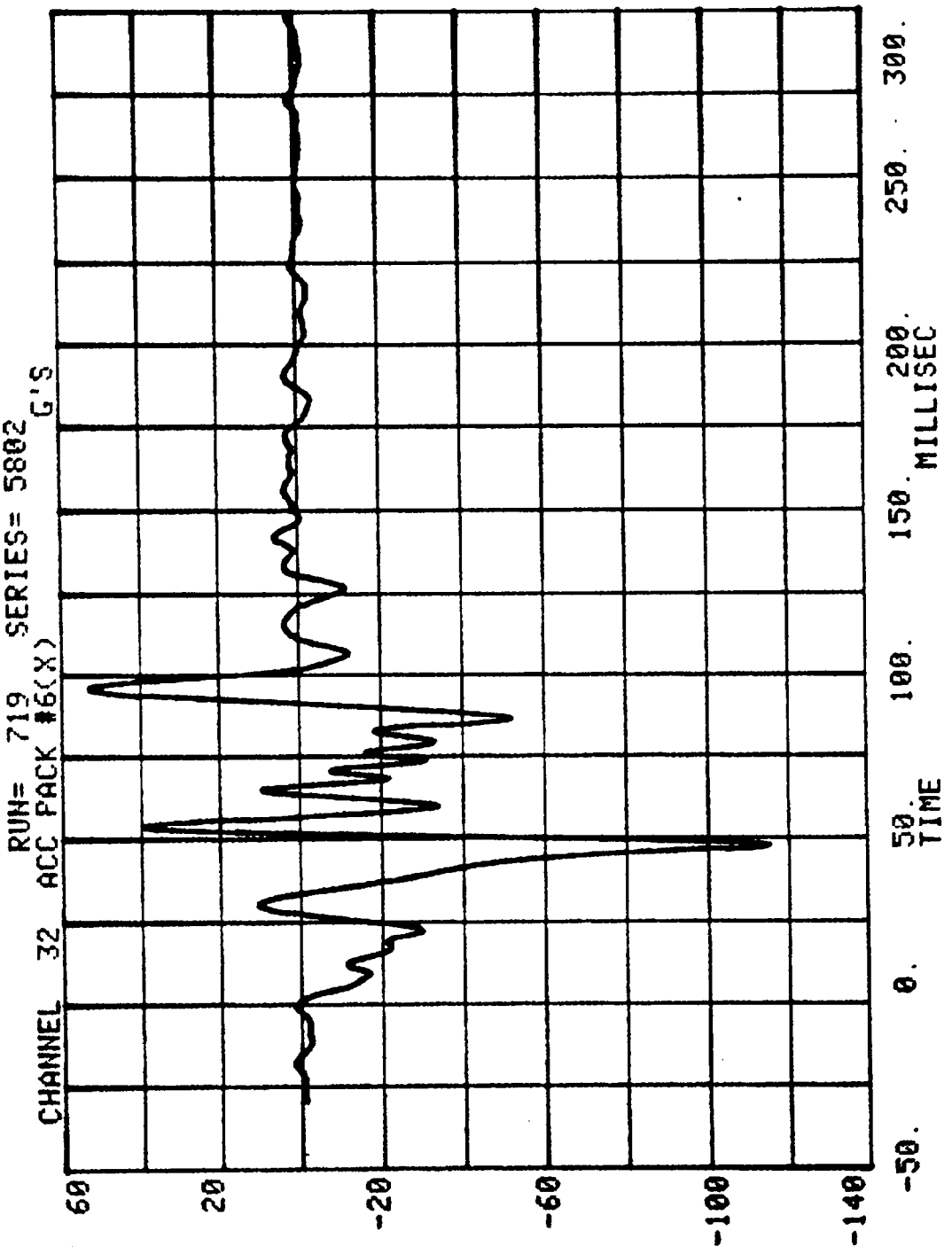
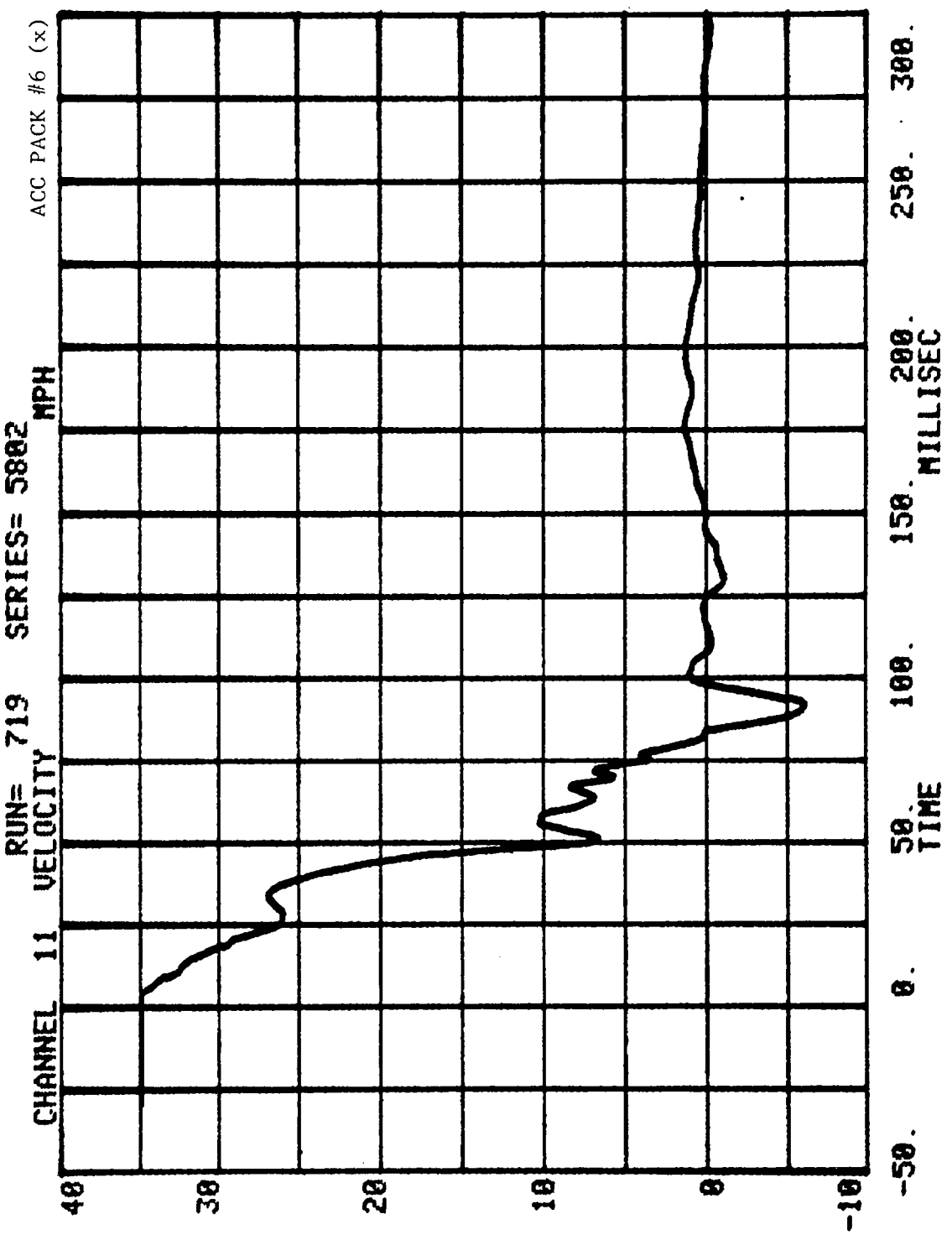
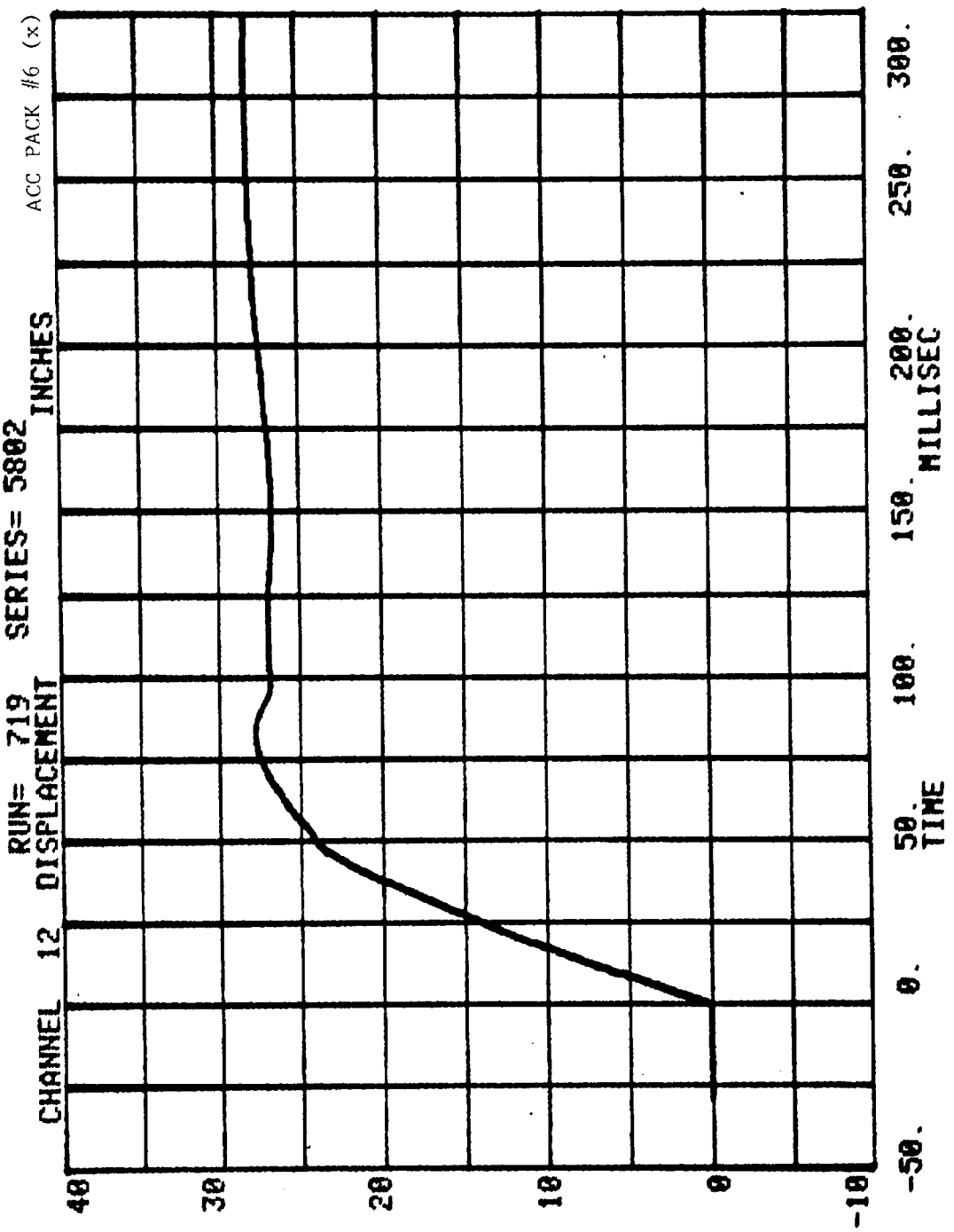
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 10 DISPLACEMENT
RUN= 719 SERIES= 5802 INCHES
ACC PACK #5 (x)
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

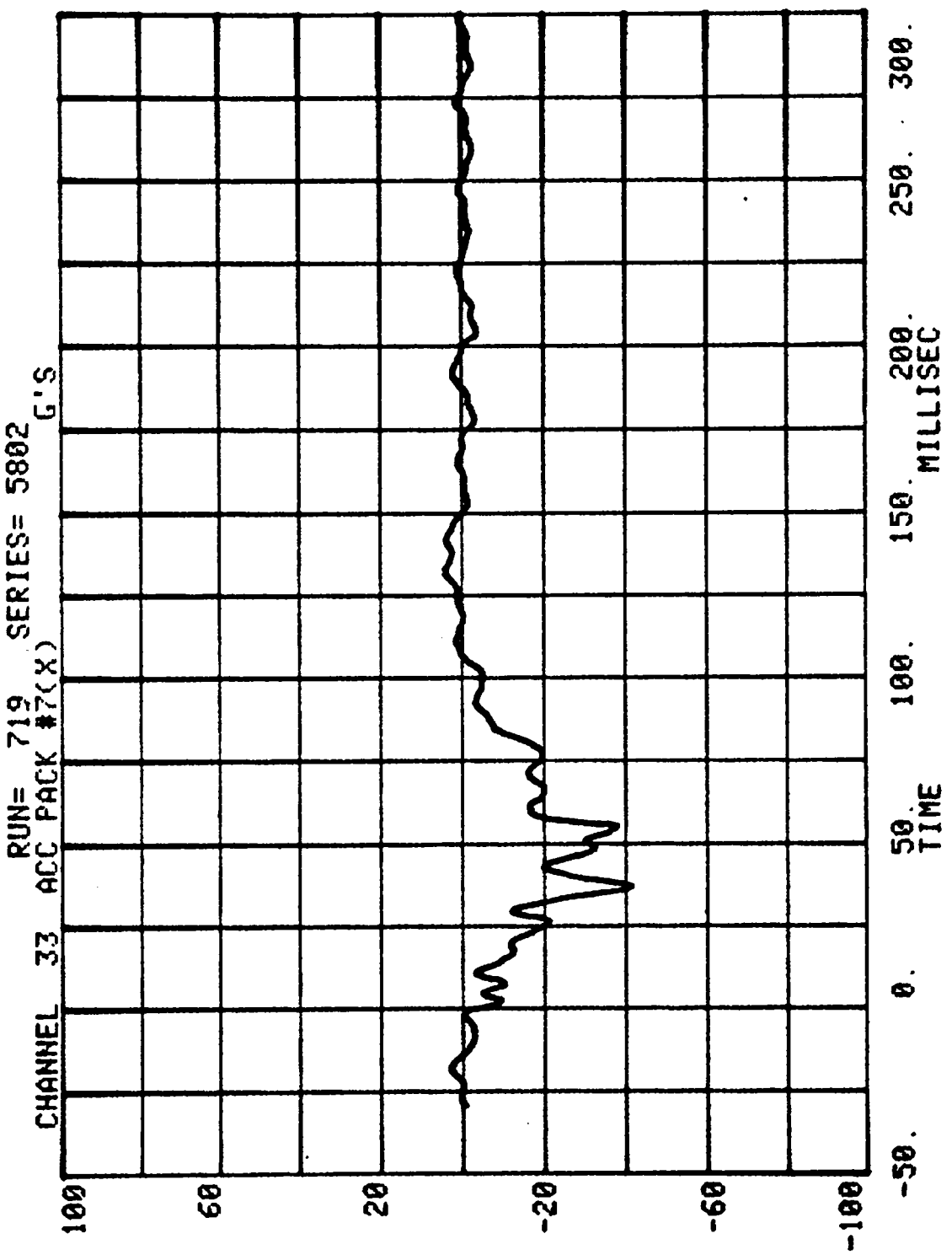

CHANNEL 32 ACC PACK #6(X)
RUN= 719 SERIES= 5802
G'S
60
20
-20
-60
-100
-140
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

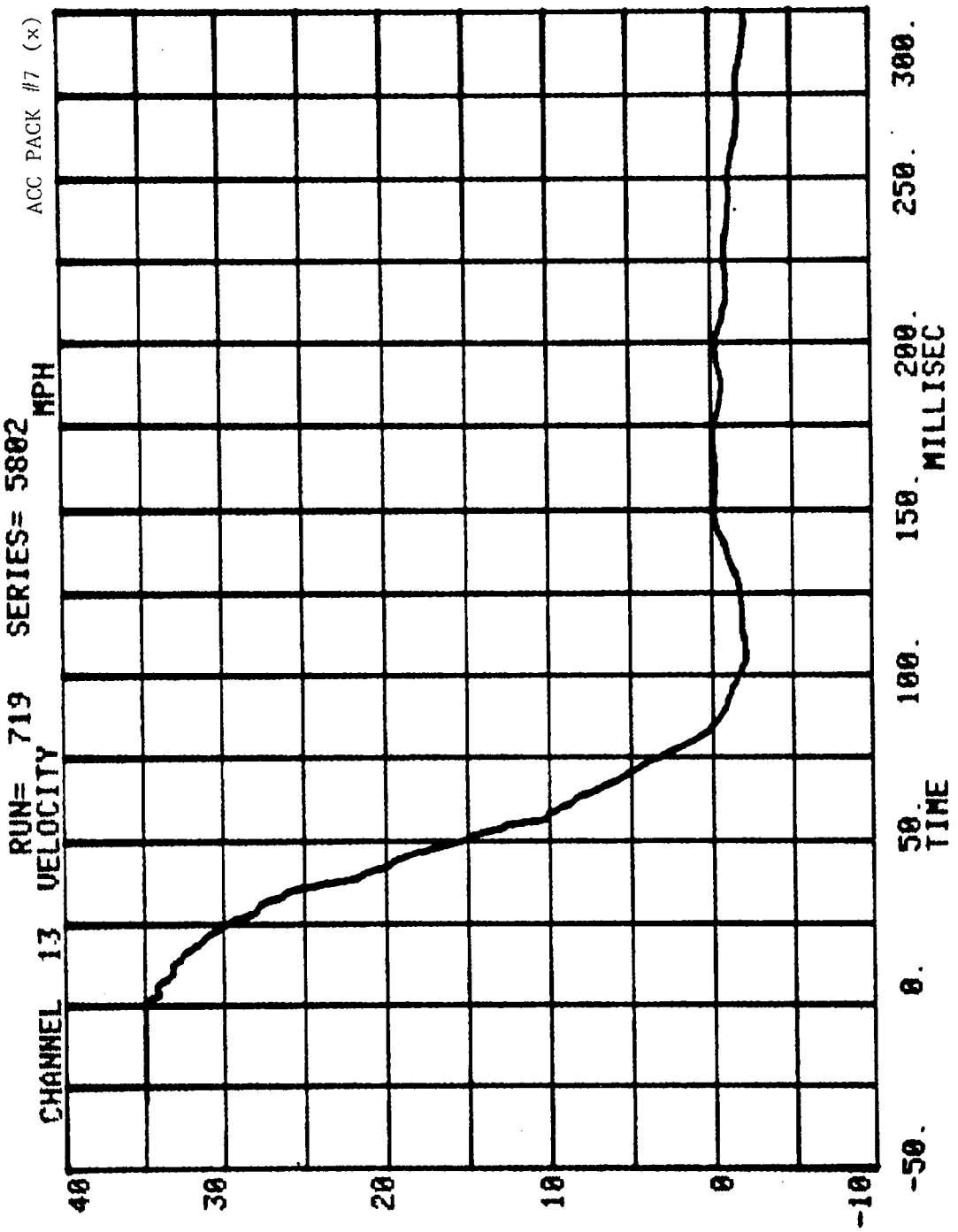

ACC PACK #6 (x)
CHANNEL 11 VELOCITY
RUN= 719 SERIES= 5802
MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

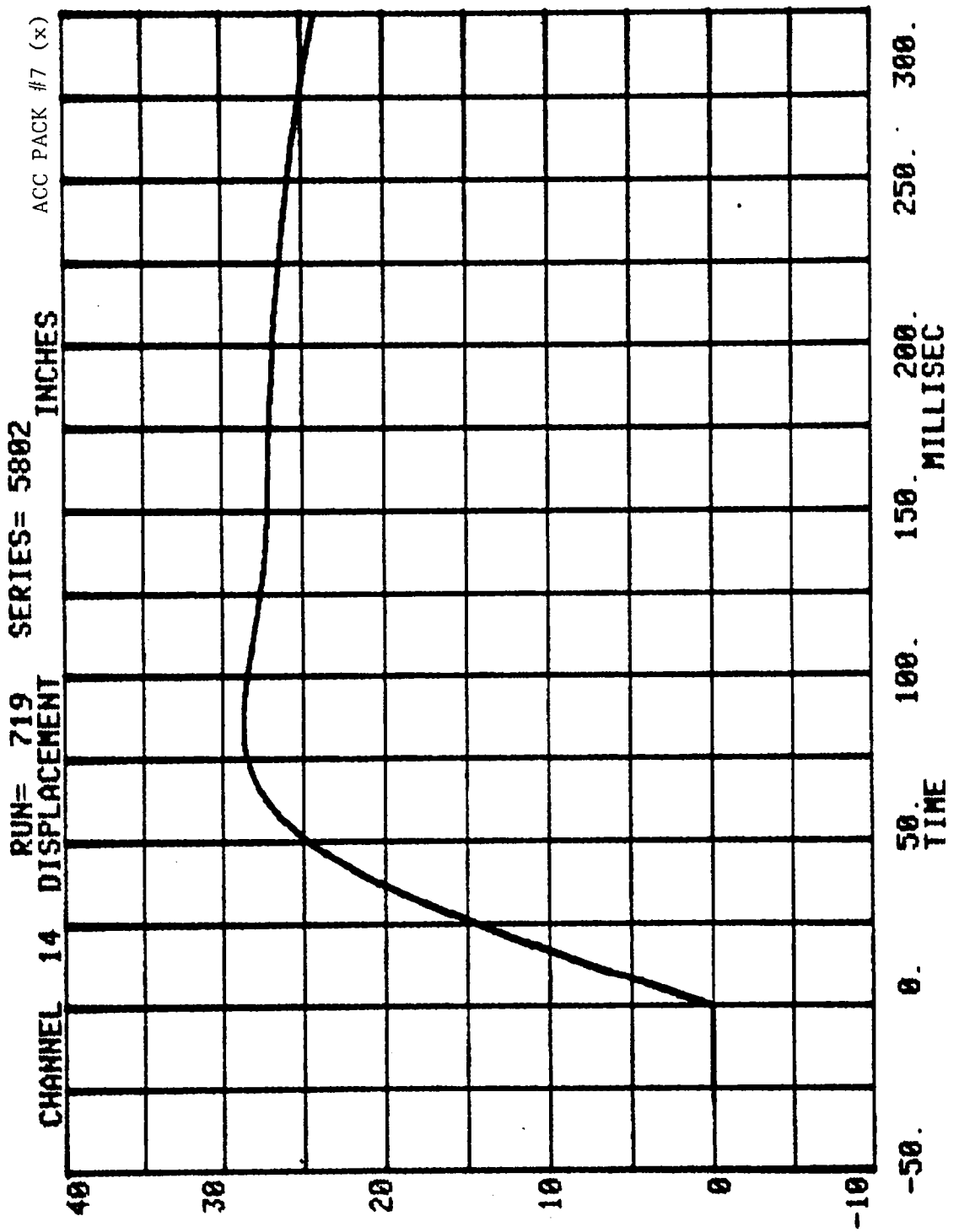

ACC PACK #6 (x)
RUN= 719 SERIES= 5802
CHANNEL 12 DISPLACEMENT INCHES
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME MILLISEC

7457-11


CHANNEL 33 ACC PACK #7(X)
RUN= 719 SERIES= 5802
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11


ACC PACK #7 (x)
CHANNEL 13 VELOCITY
RUN= 719 SERIES= 5802
MPH
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

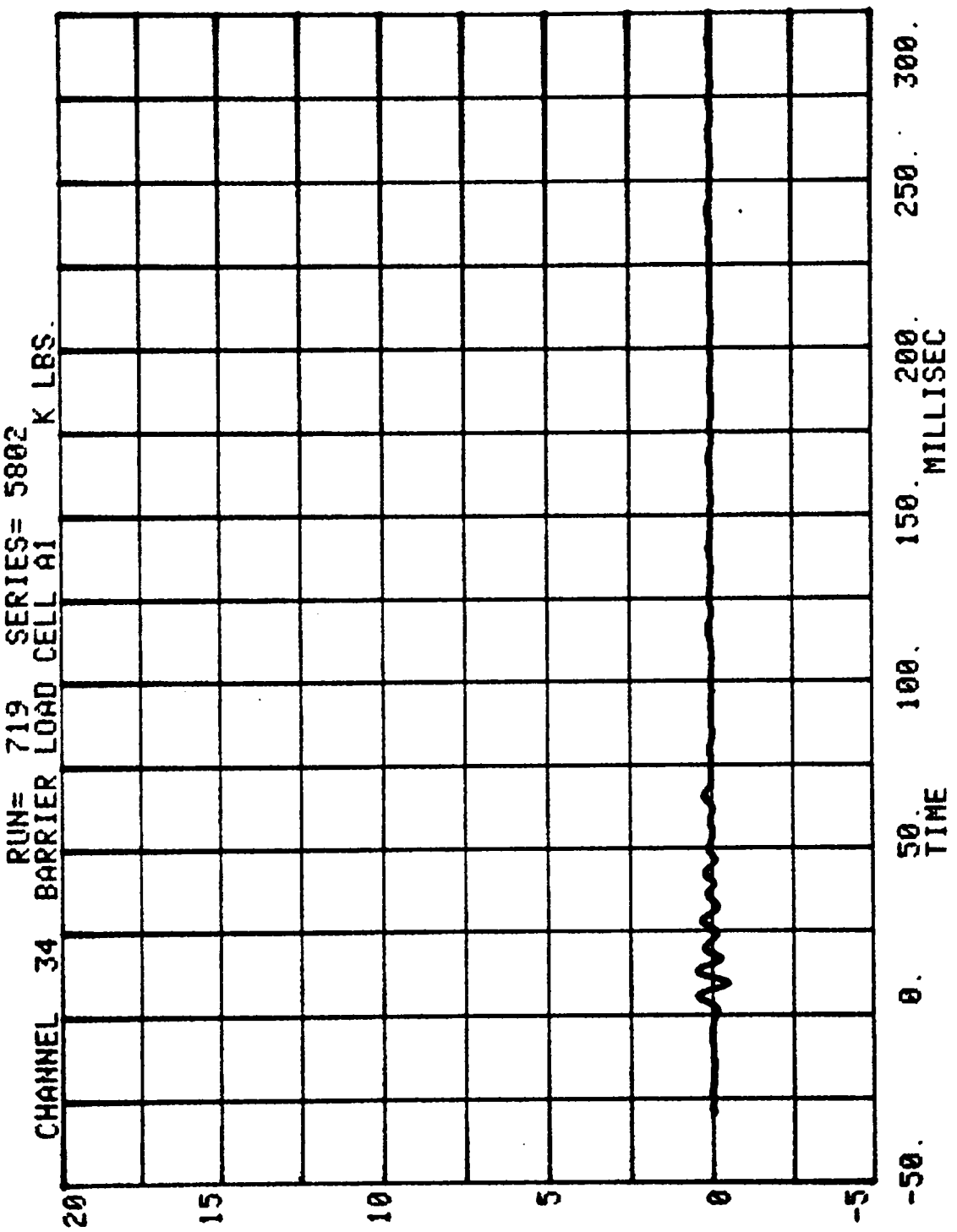

ACC PACK #7 (x)
CHANNEL 14 DISPLACEMENT
RUN= 719 SERIES= 5802
INCHES
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

TEST NO. MG5802

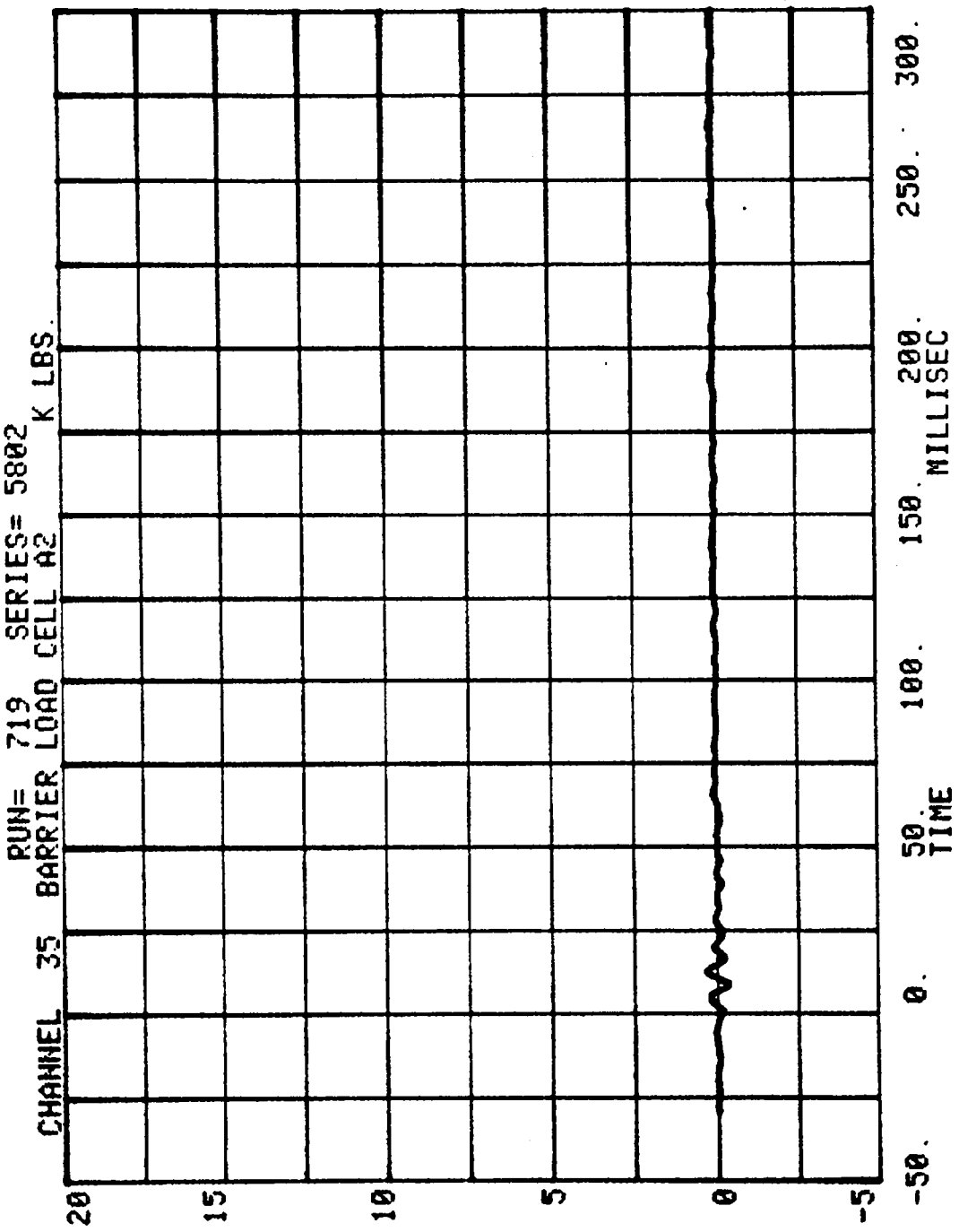
LOAD CELL BARRIER DATA

FILTER CHANNEL CLASS

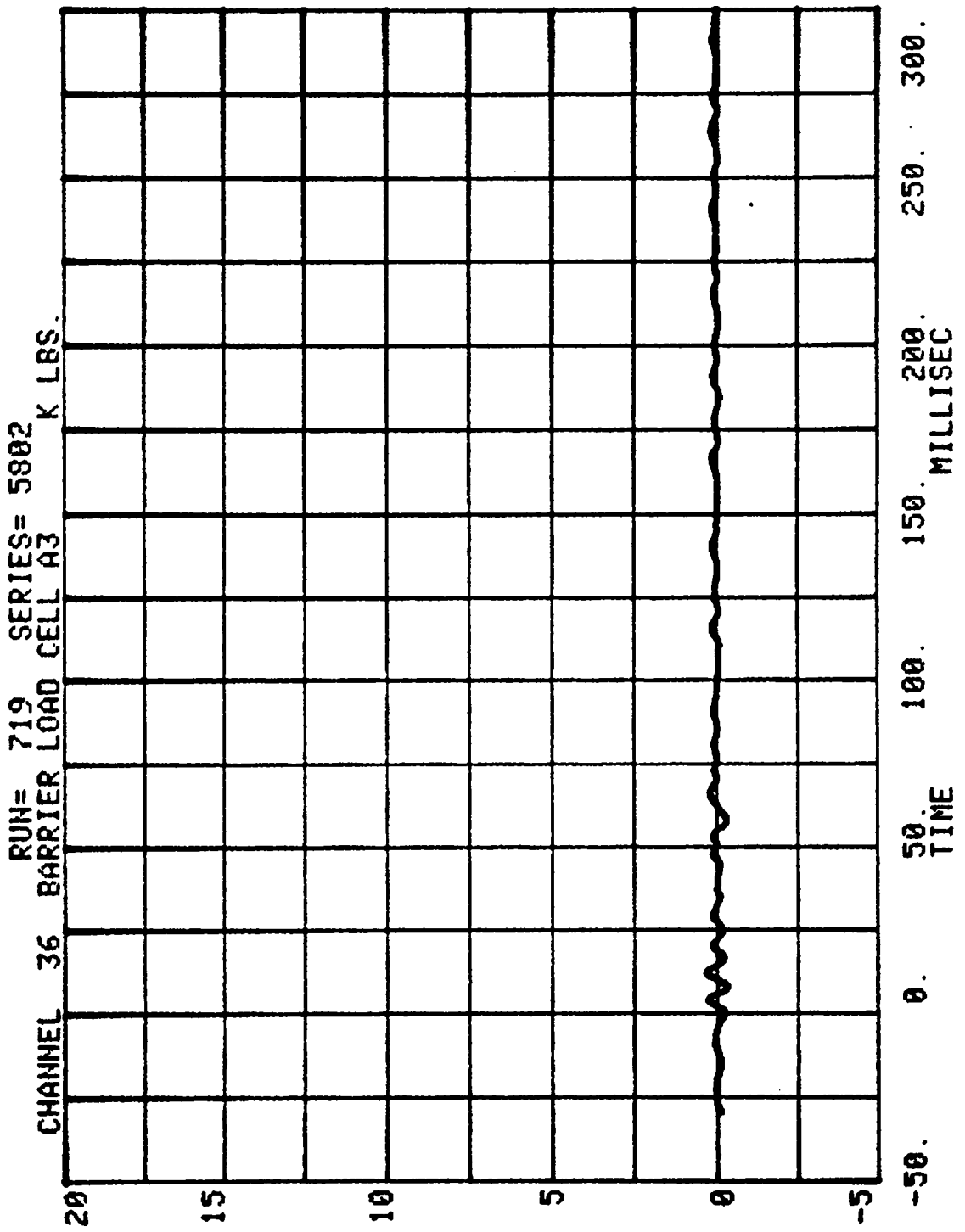
60

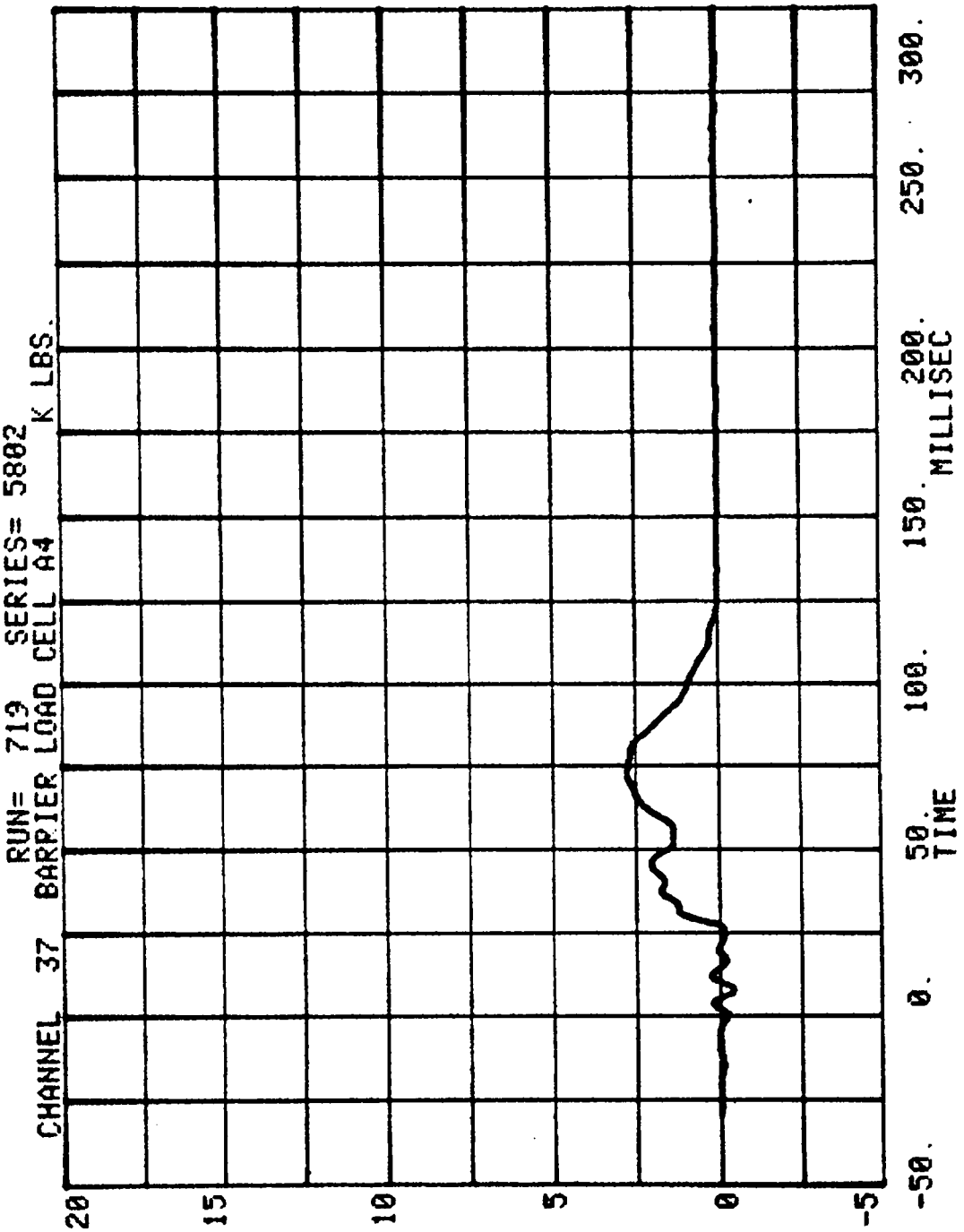

CHANNEL 34 BARRIER LOAD CELL A1
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

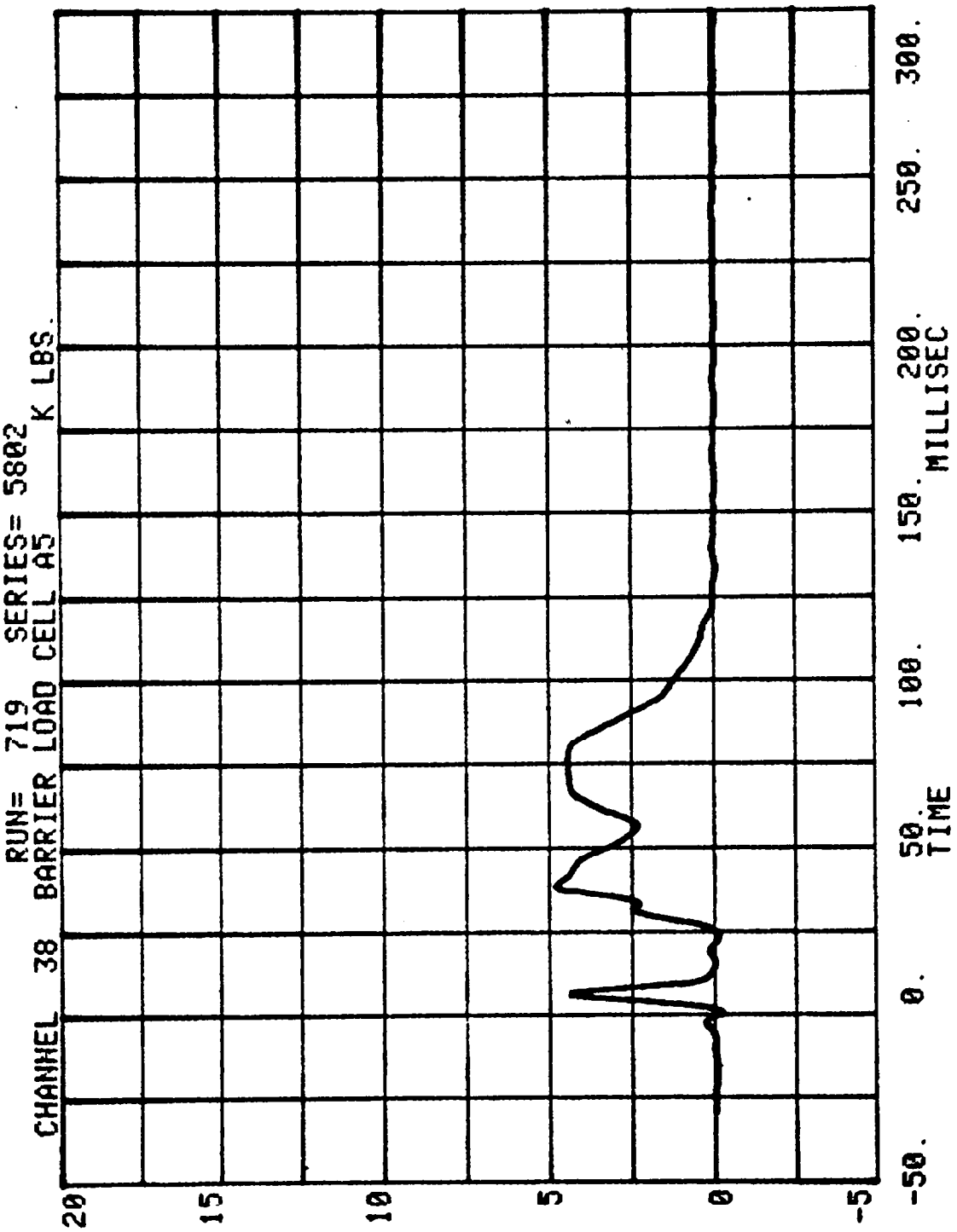

CHANNEL 35 BARRIER LOAD CELL A2
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

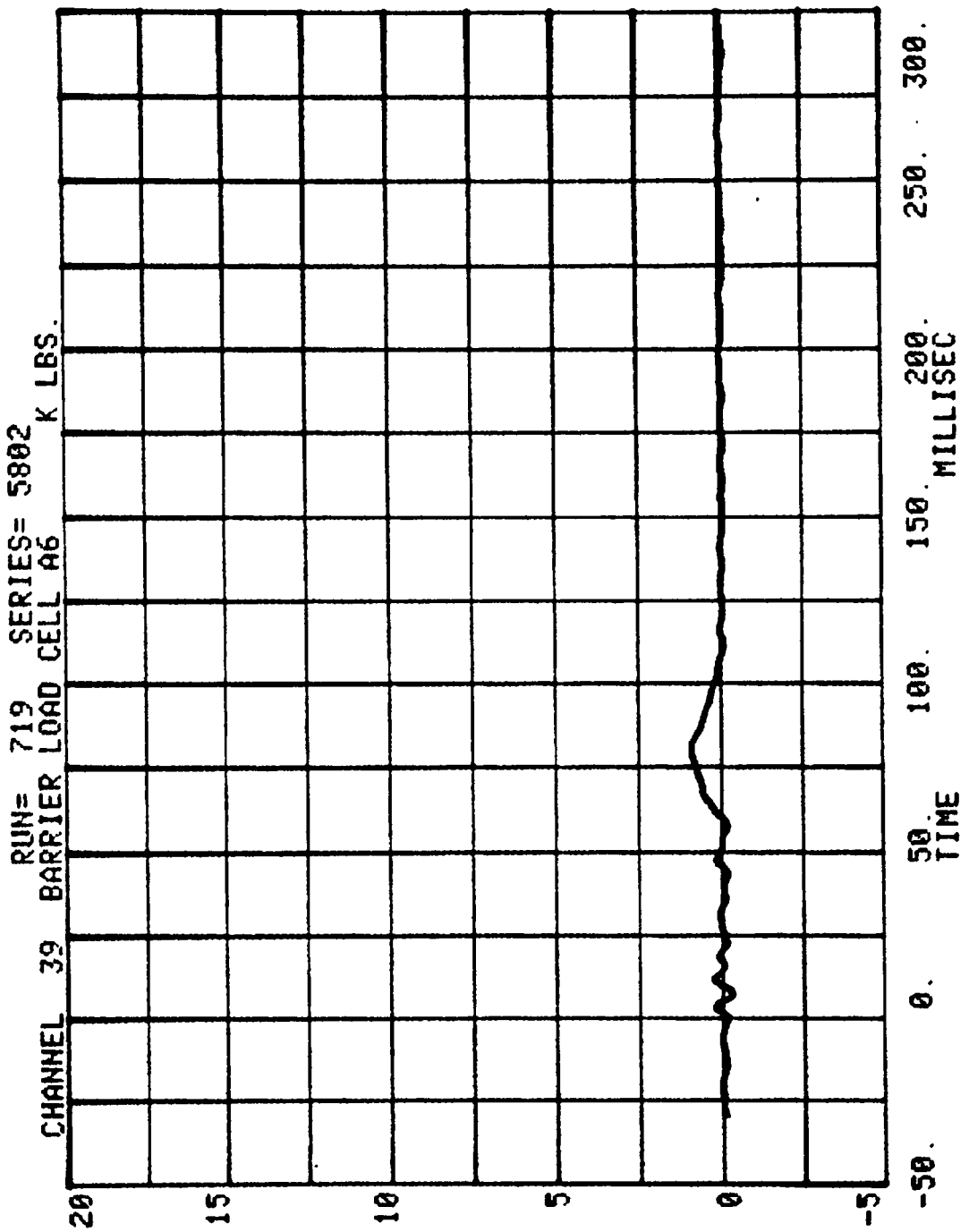
7457-11

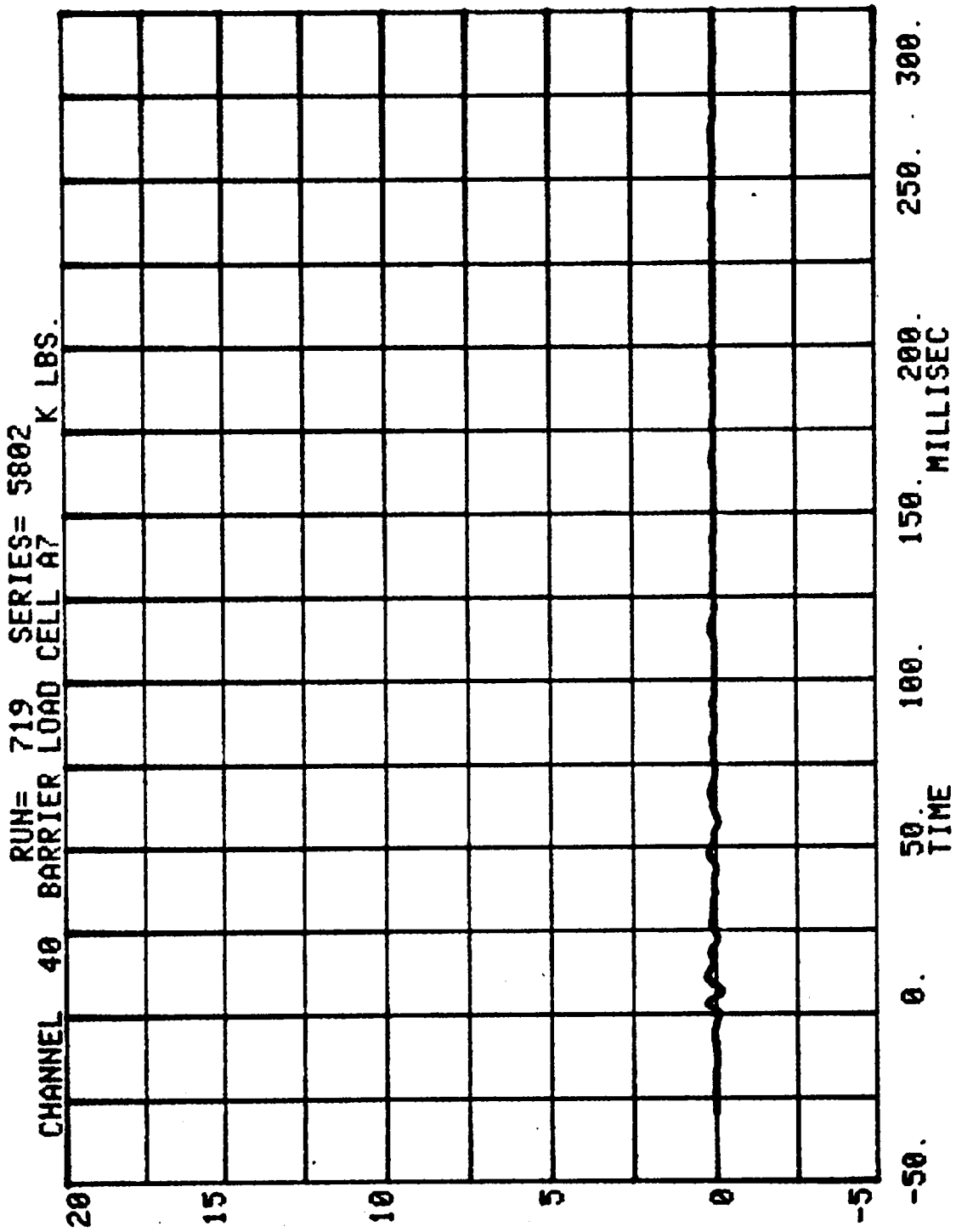

CHANNEL 36 BARRIER LOAD CELL A3
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

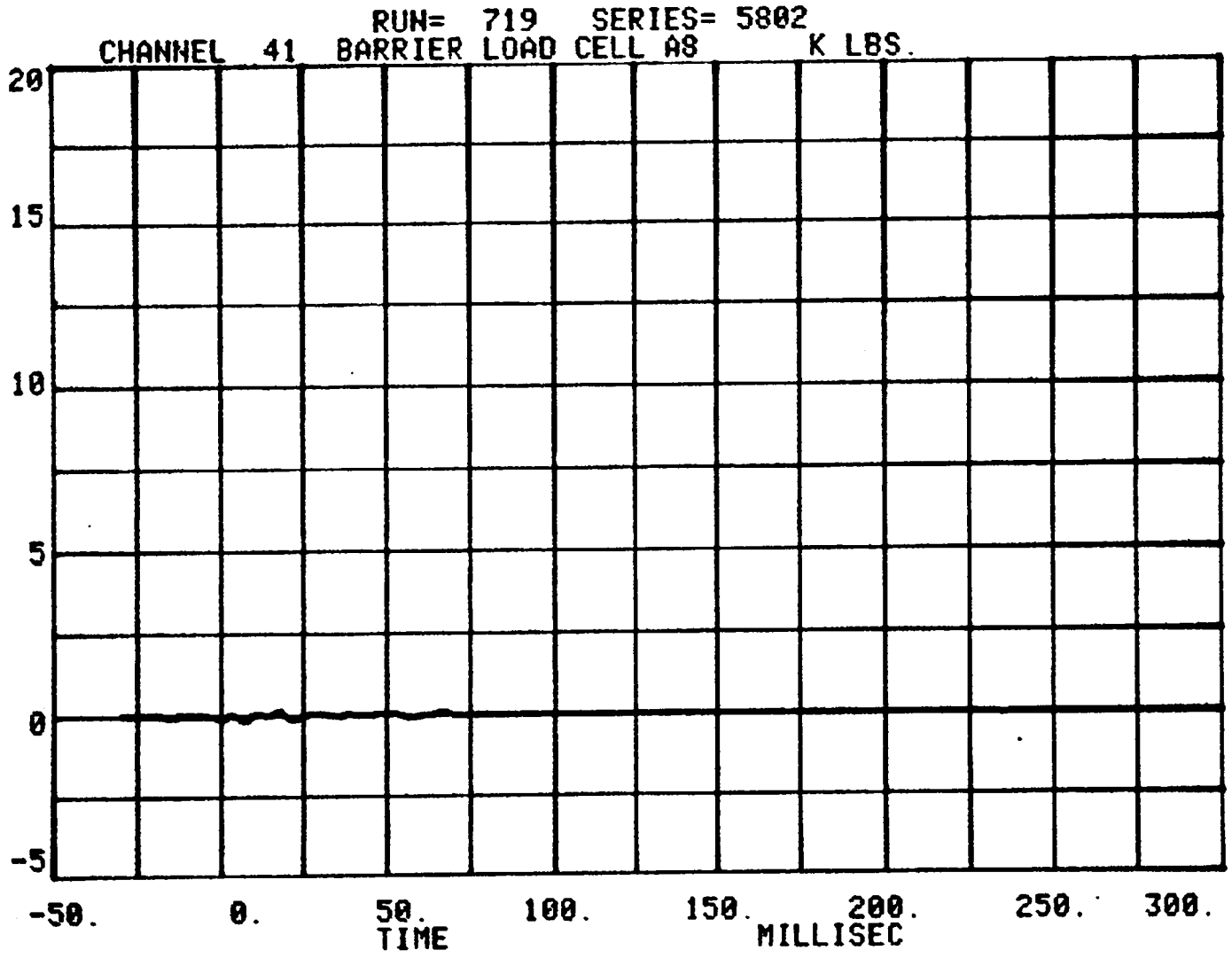

CHANNEL 37
RUN= 719 SERIES= 5802
BARRIER LOAD CELL A4
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

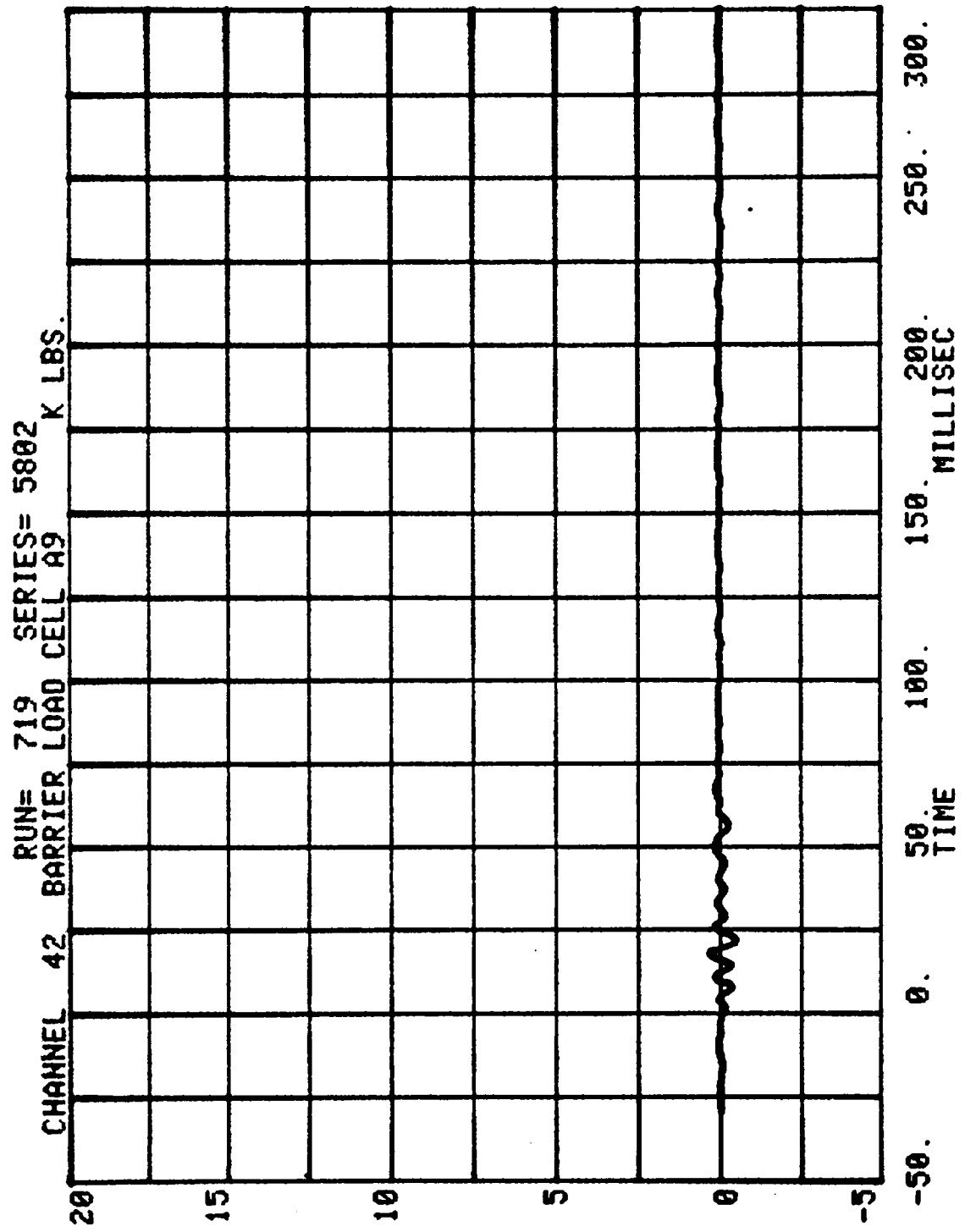
7457-11


RUN= 719 SERIES= 5802
BARRIER LOAD CELL A5
CHANNEL 38
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

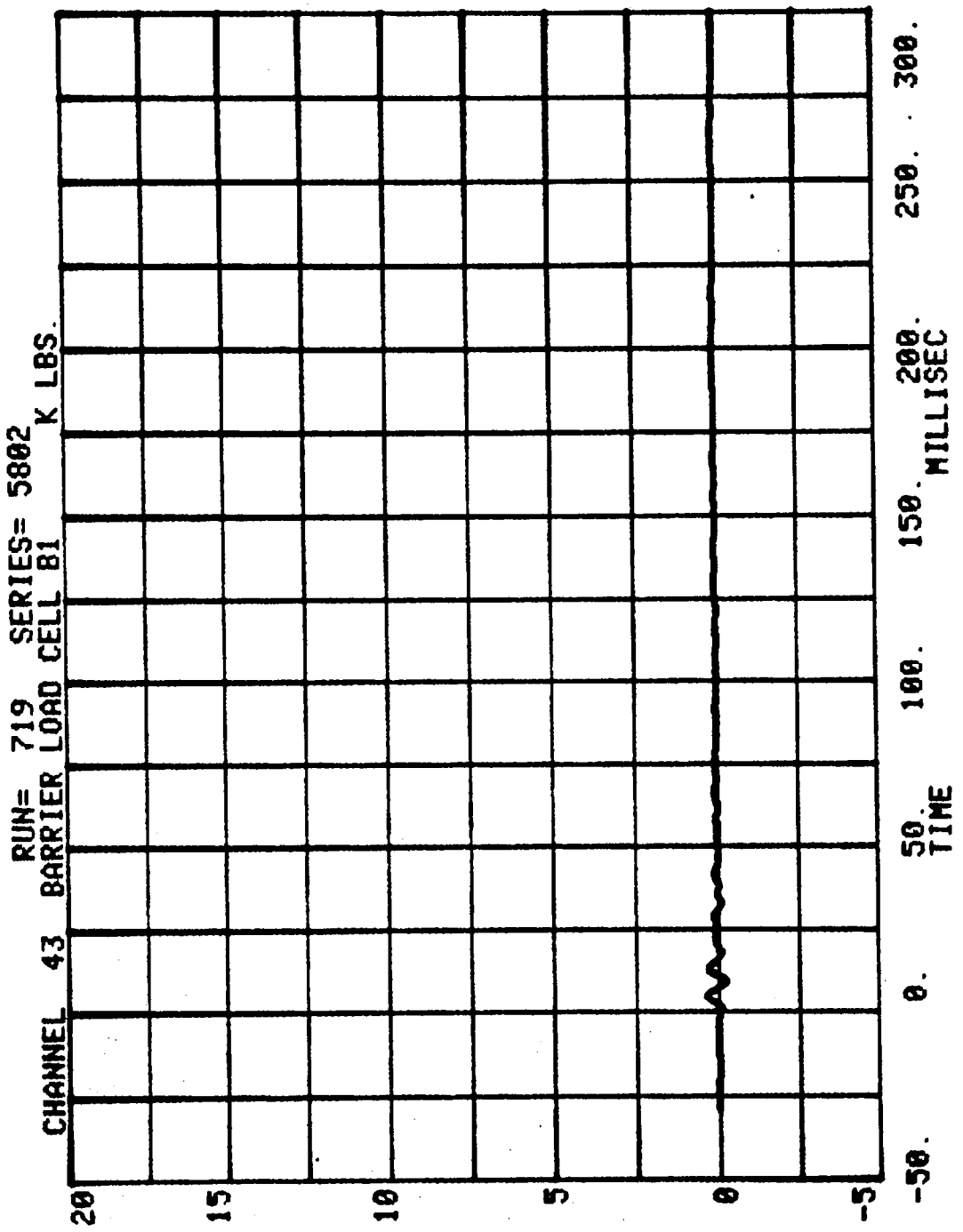

CHANNEL 39 BARRIER LOAD CELL A6
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 40 BARRIER LOAD CELL A7
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

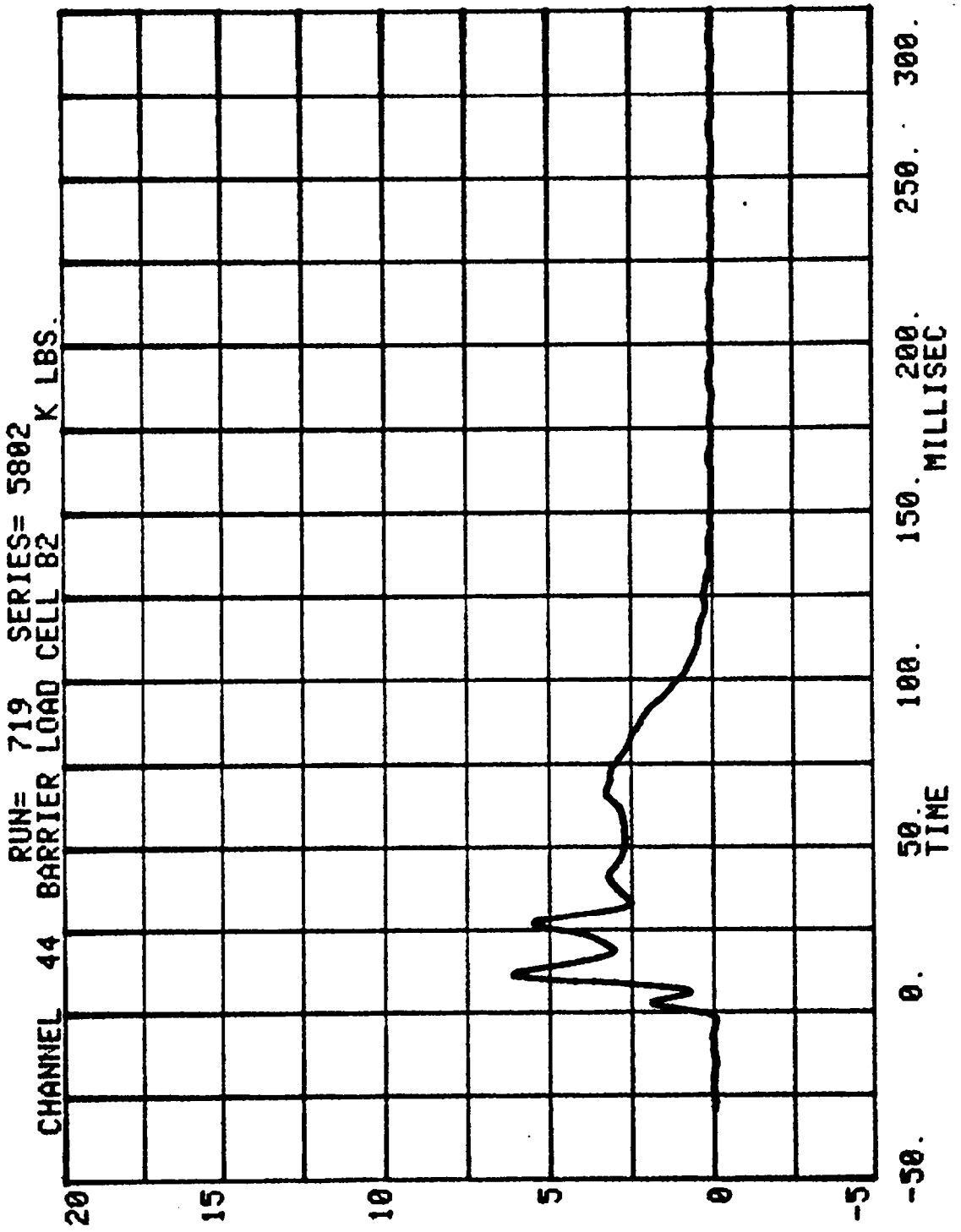

RUN= 719 SERIES= 5802
CHANNEL 41 BARRIER LOAD CELL A8 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

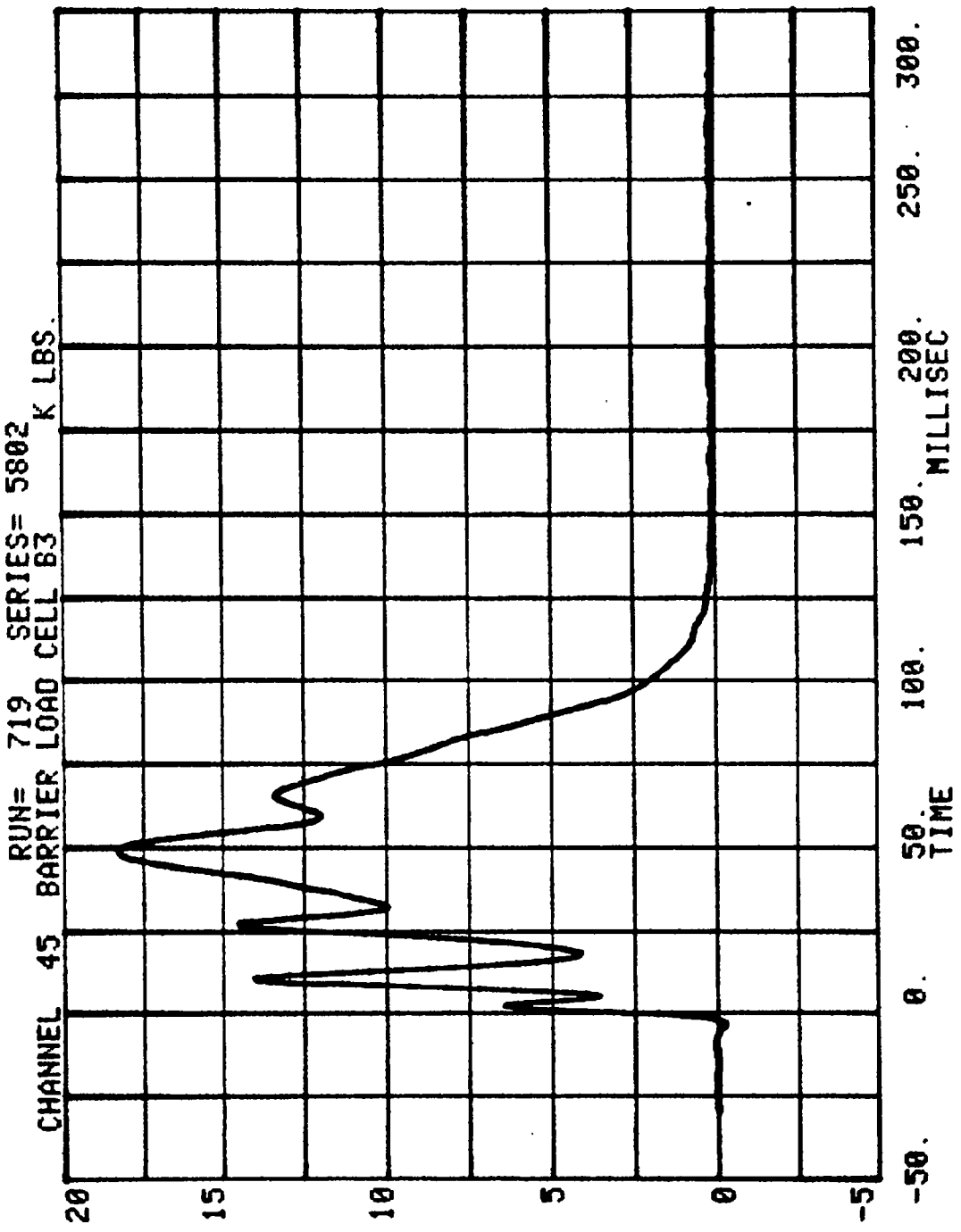

CHANNEL 42 BARRIER LOAD CELL A9
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

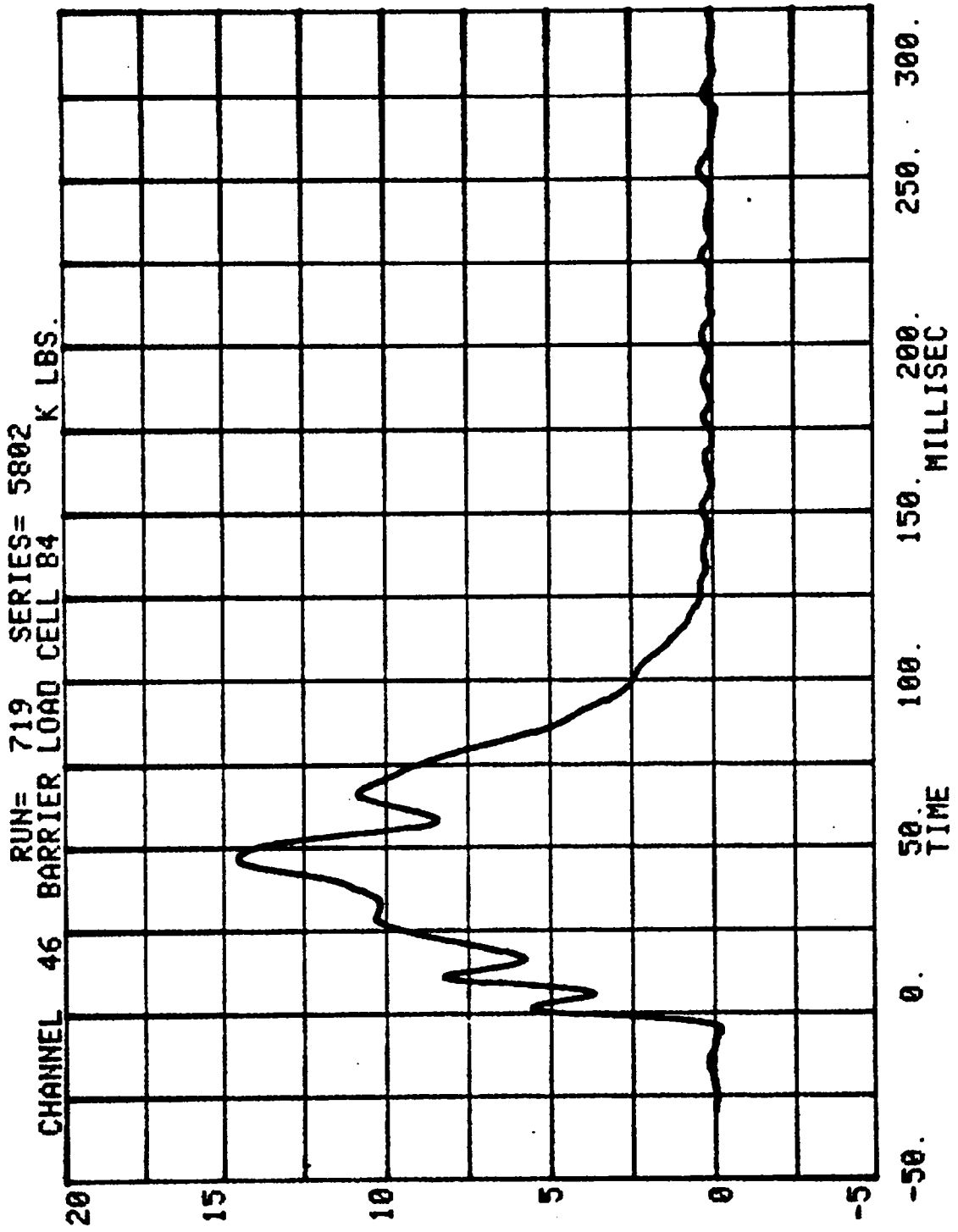

CHANNEL 43 BARRIER LOAD CELL 81
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

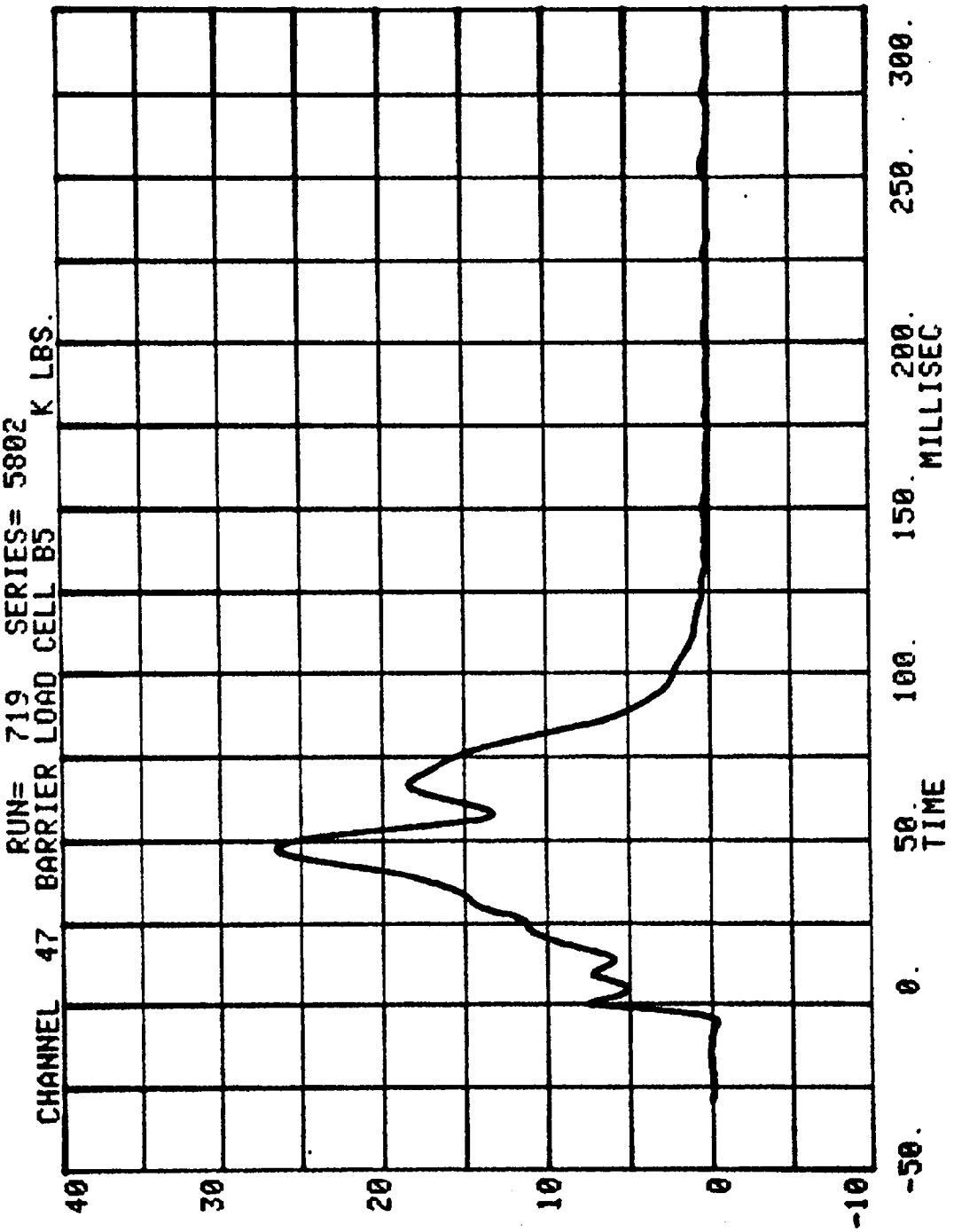
7457-11

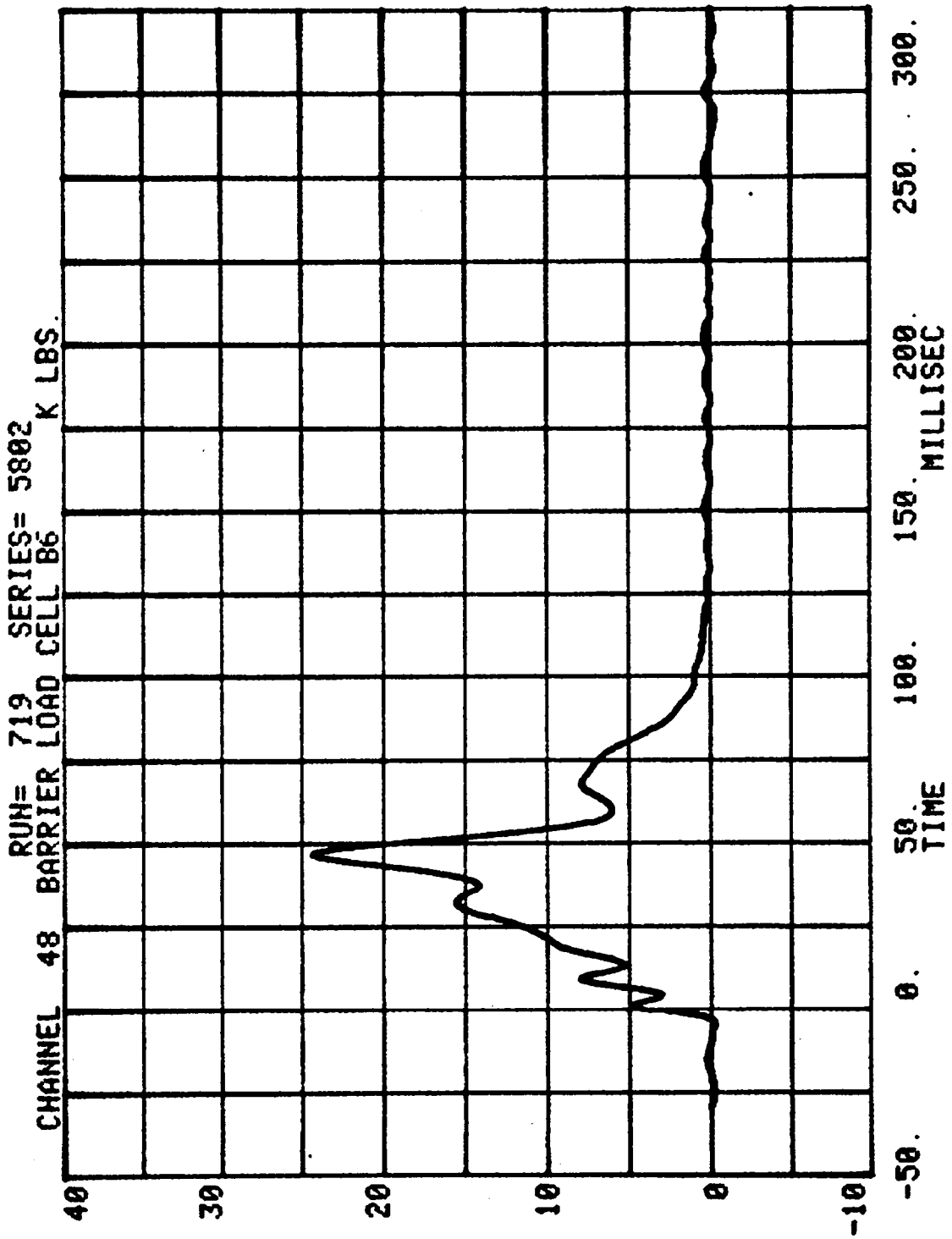

RUN= 719 SERIES= 5802
CHANNEL 44 BARRIER LOAD CELL 82
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 45 BARRIER LOAD CELL B3
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

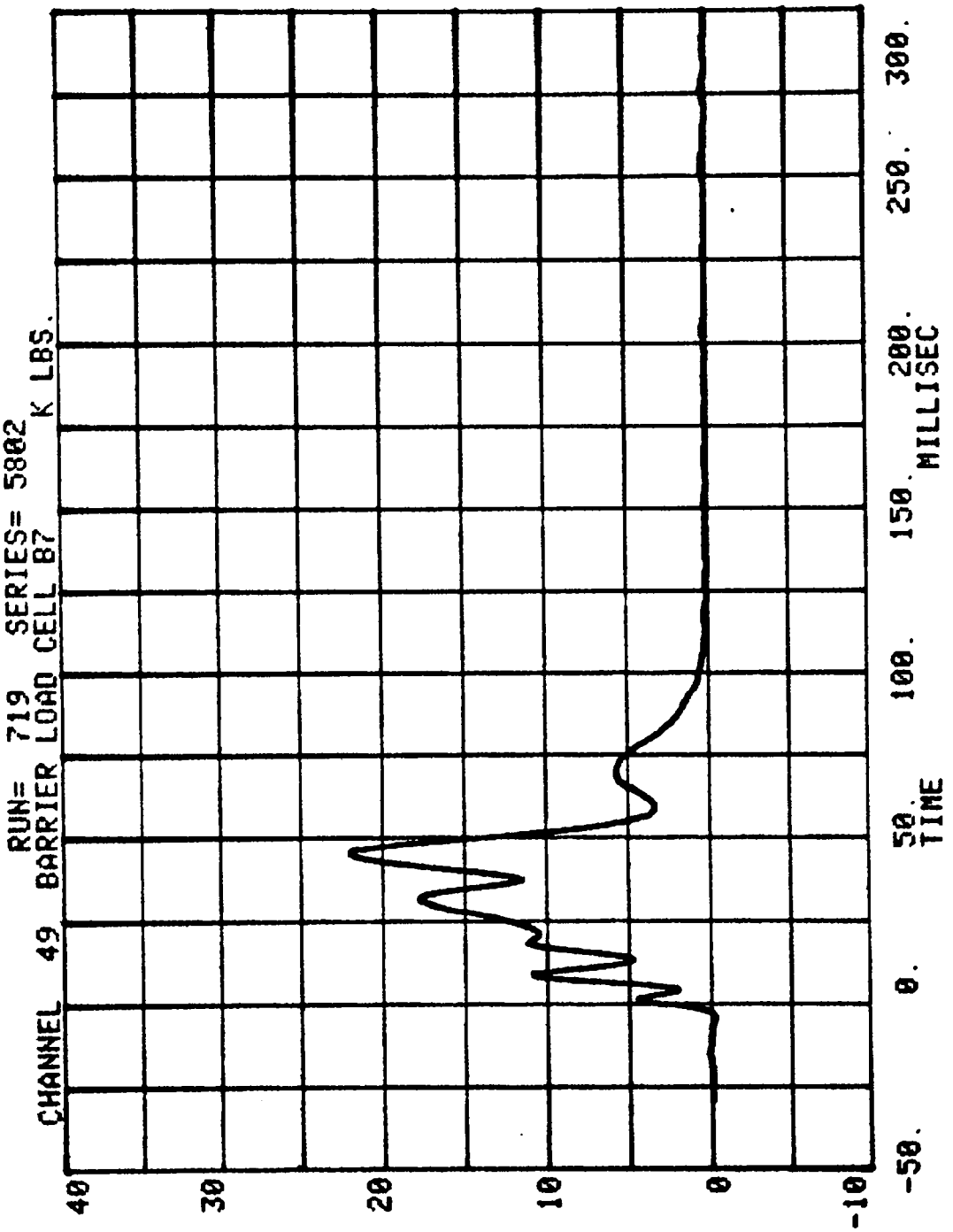
7457-11

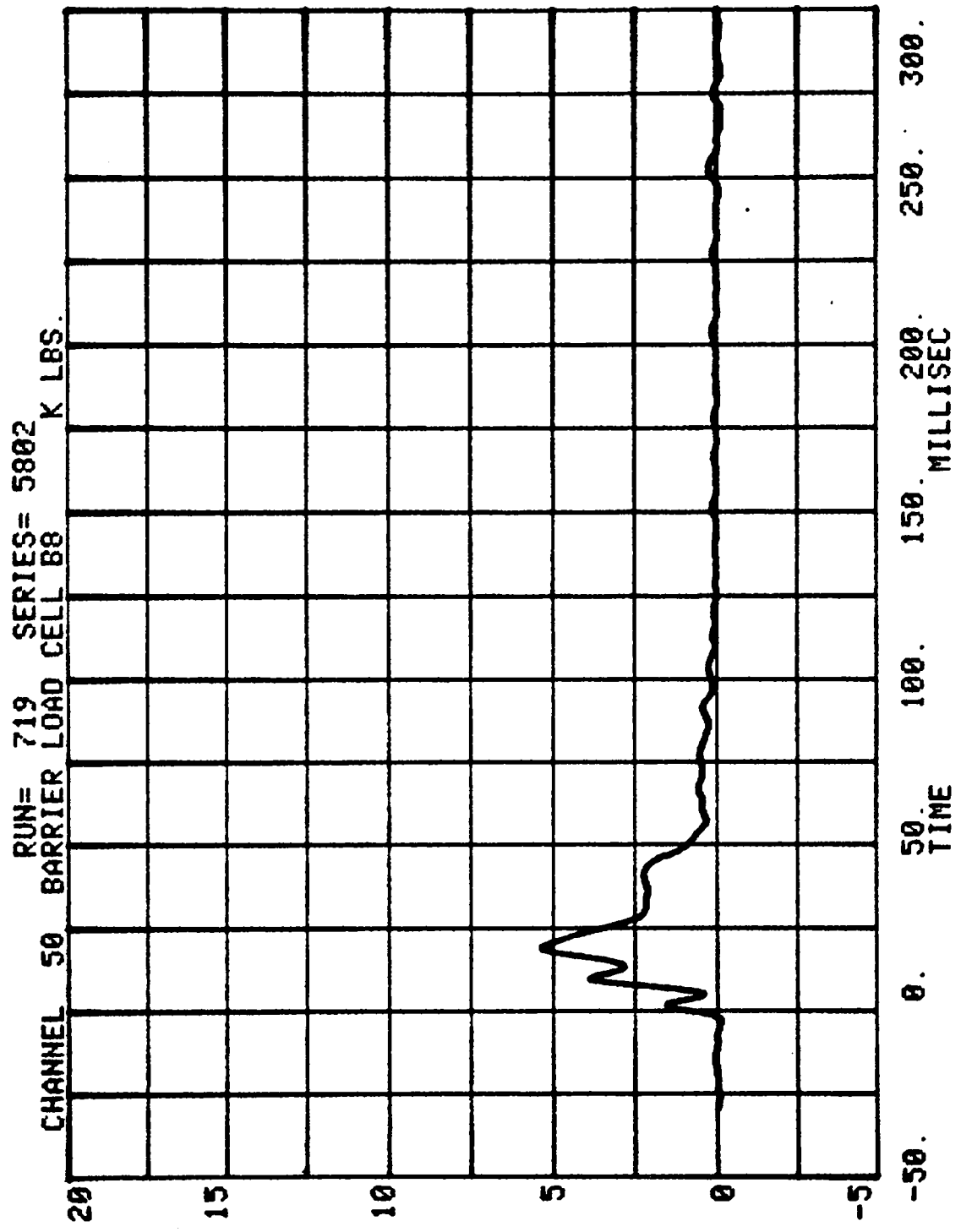

CHANNEL 46 BARRIER LOAD CELL B4
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 47 BARRIER LOAD CELL B5
RUN= 719 SERIES= 5802
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

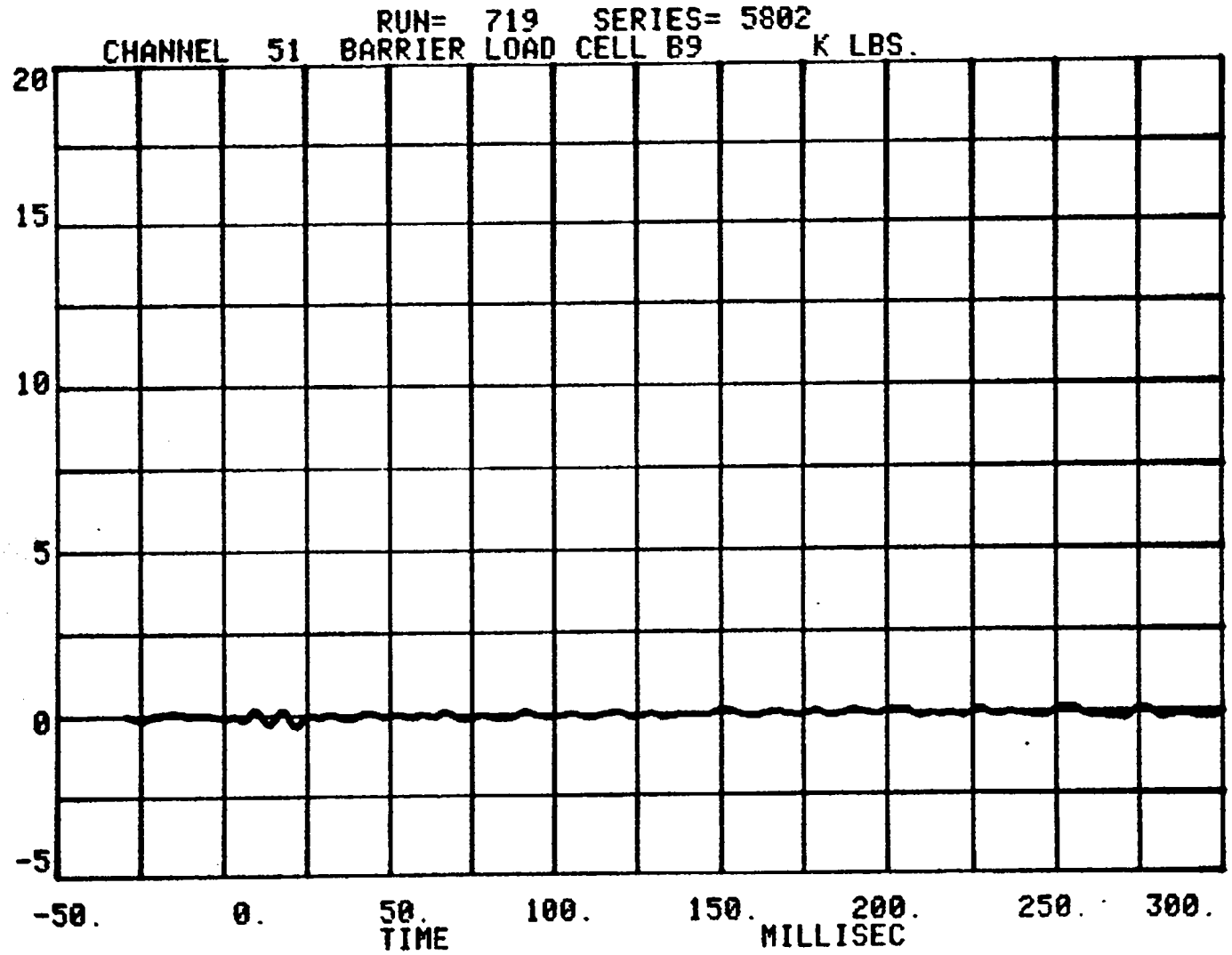

CHANNEL 48 BARRIER LOAD CELL B6
RUN= 719 SERIES= 5802
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

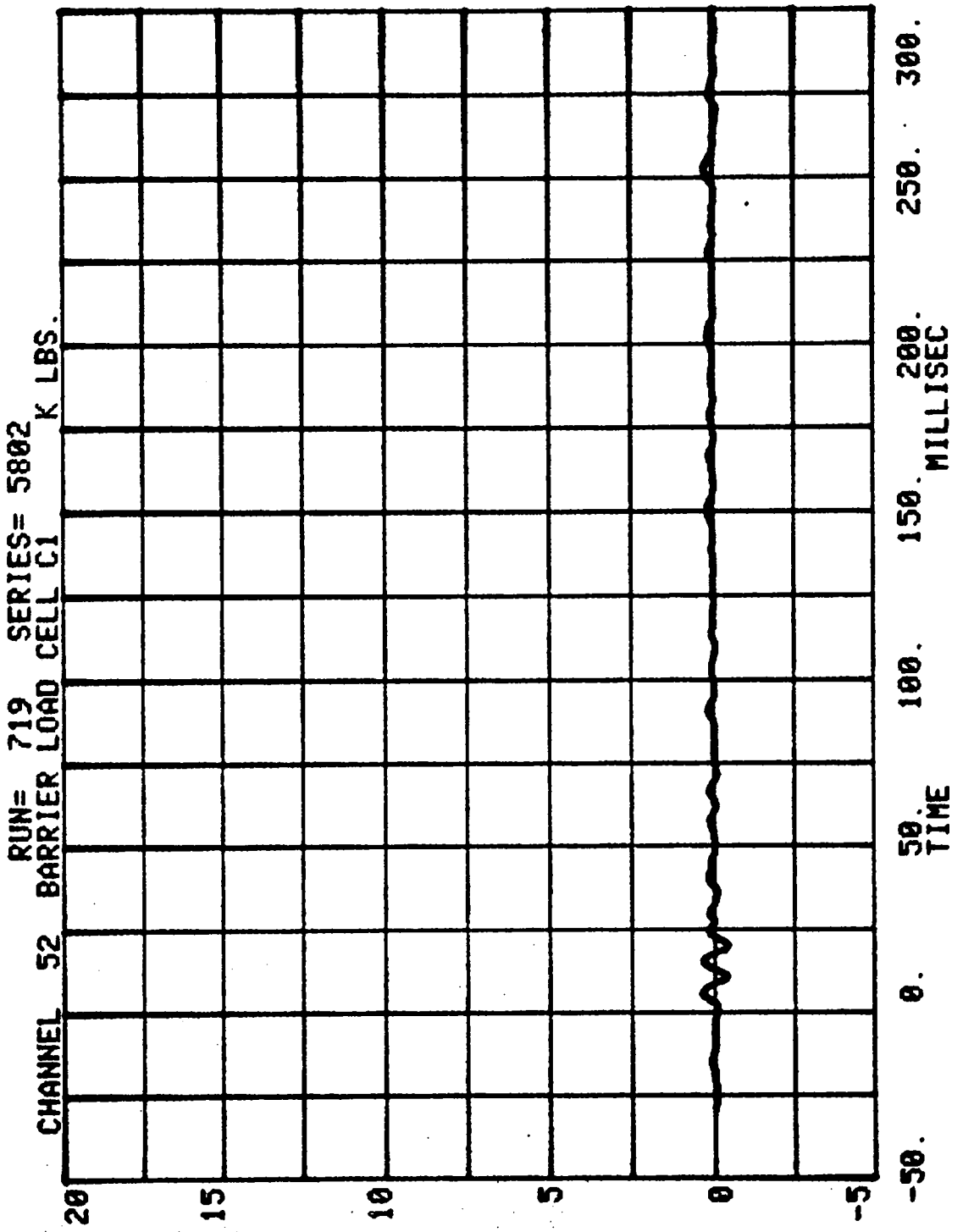
7457-11

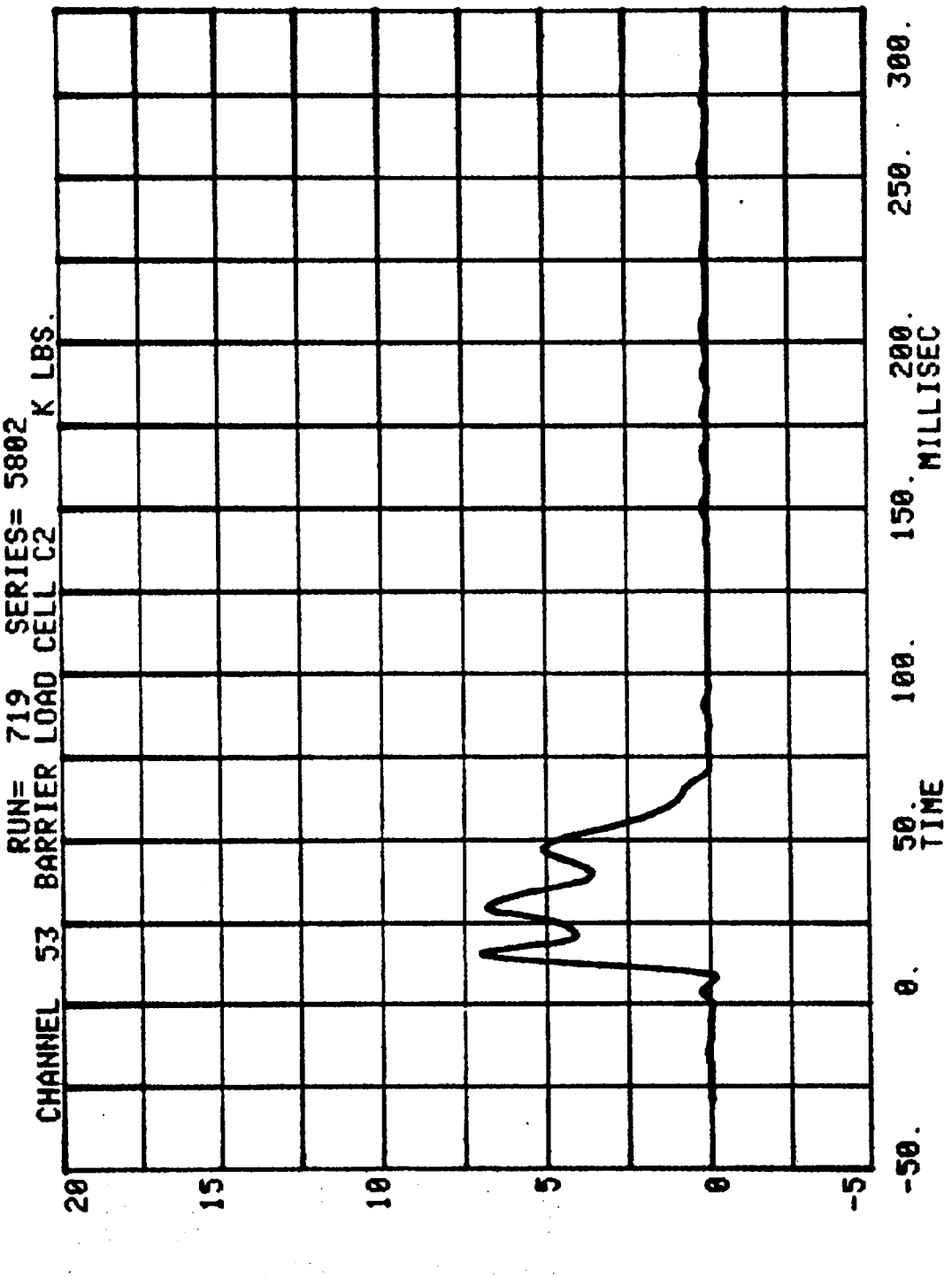

CHANNEL 49
RUN= 719
BARRIER LOAD CELL 87
SERIES= 5802
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 50 BARRIER LOAD CELL B8
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

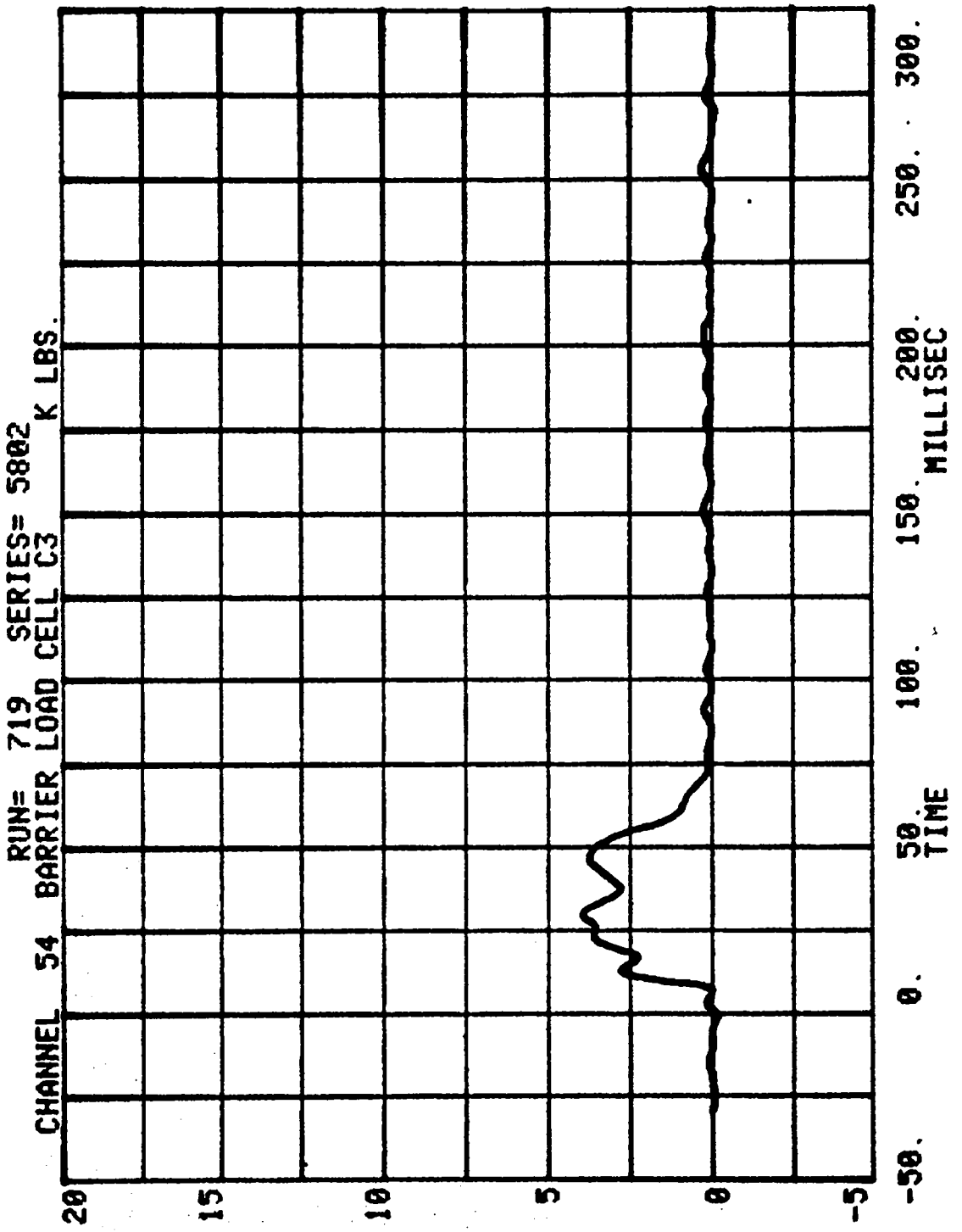
7457-11


RUN= 719 SERIES= 5802
CHANNEL 51 BARRIER LOAD CELL B9 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

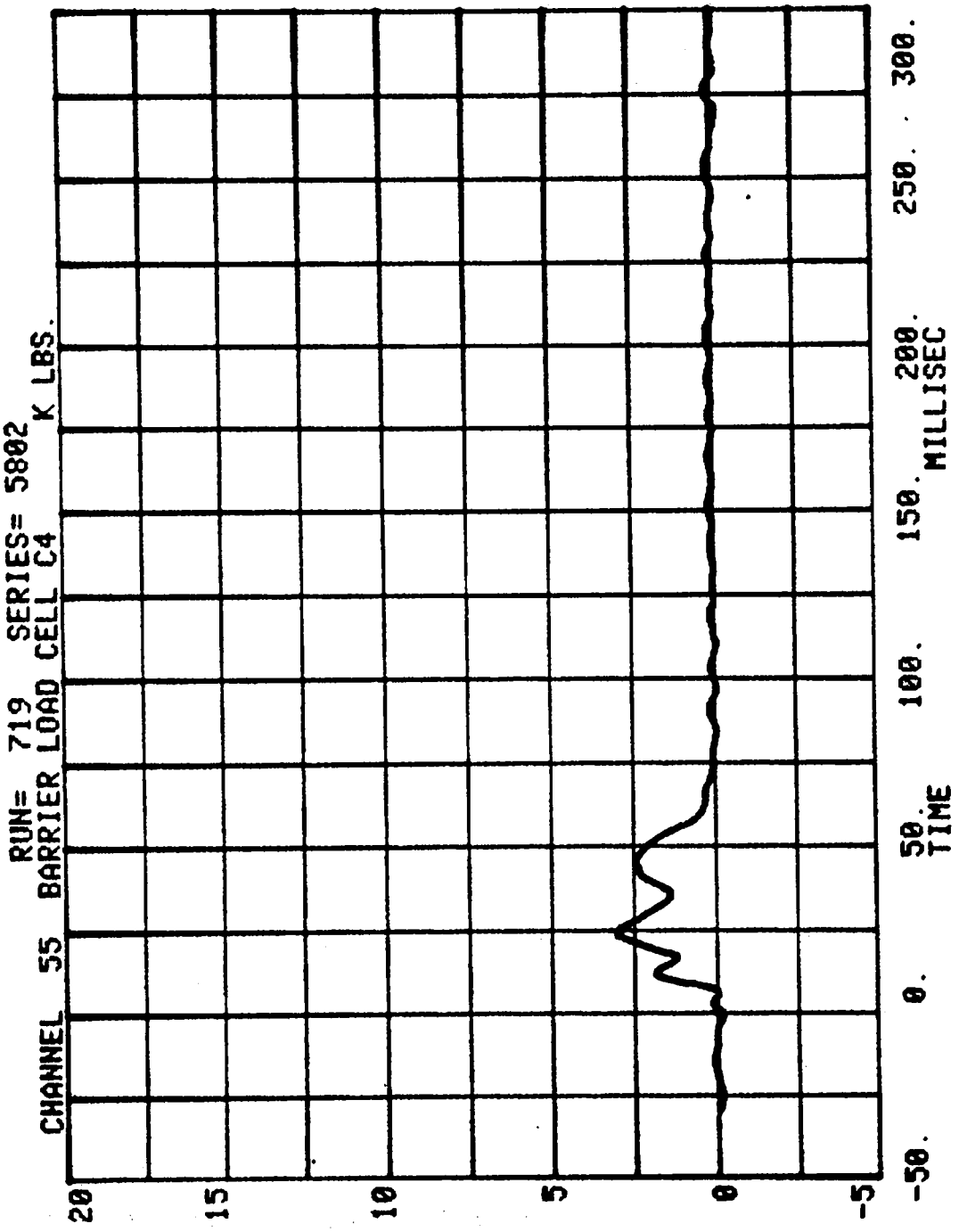

CHANNEL 52 BARRIER LOAD CELL C1
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 53 BARRIER LOAD CELL C2
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

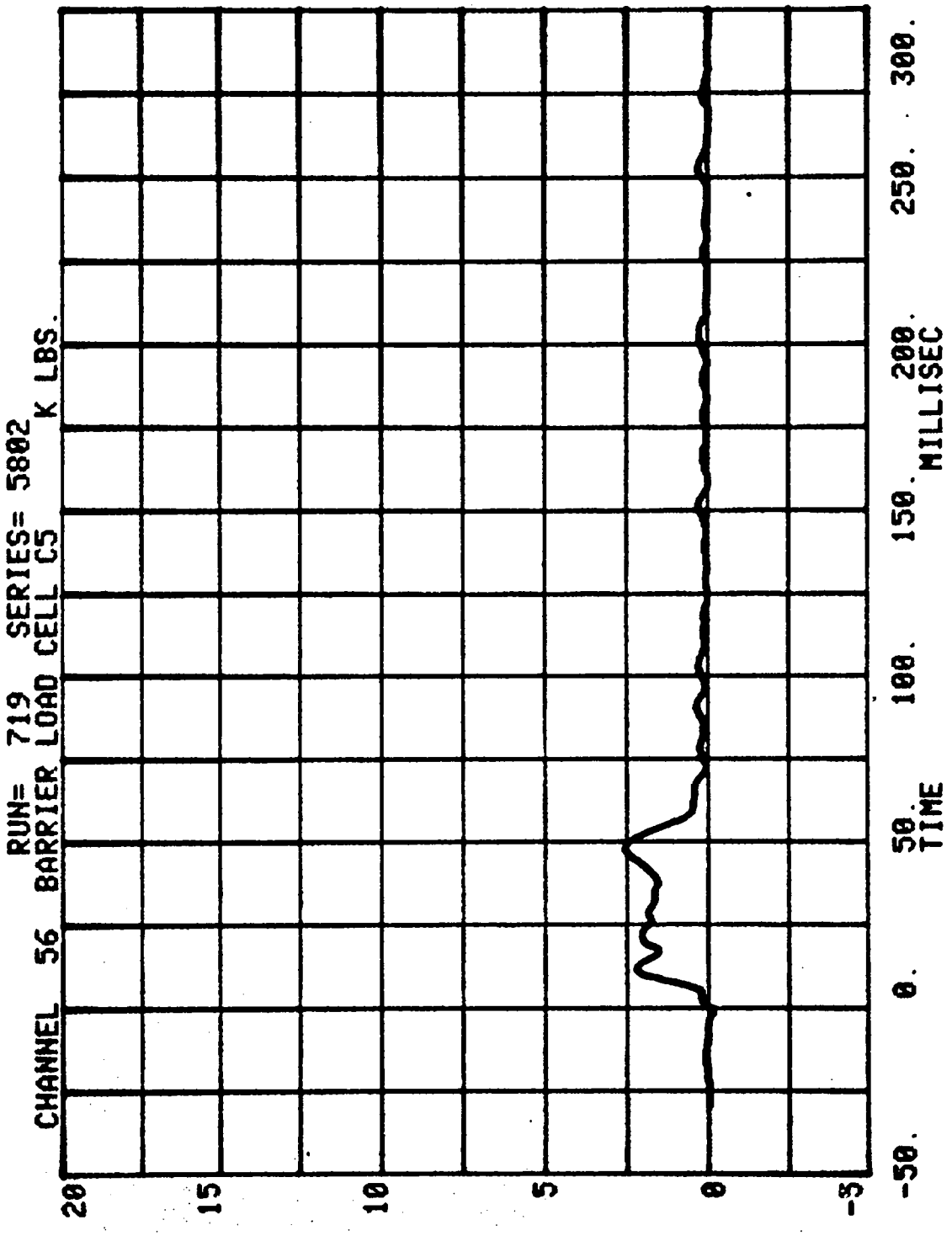
7457-11


CHANNEL 54 RUN= 719 SERIES= 5802
BARRIER LOAD CELL C3
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11


CHANNEL 55 BARRIER LOAD CELL C4
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11


CHANNEL 56 BARRIER LOAD CELL C5
RUN= 719 SERIES= 5802
K LBS.
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150.
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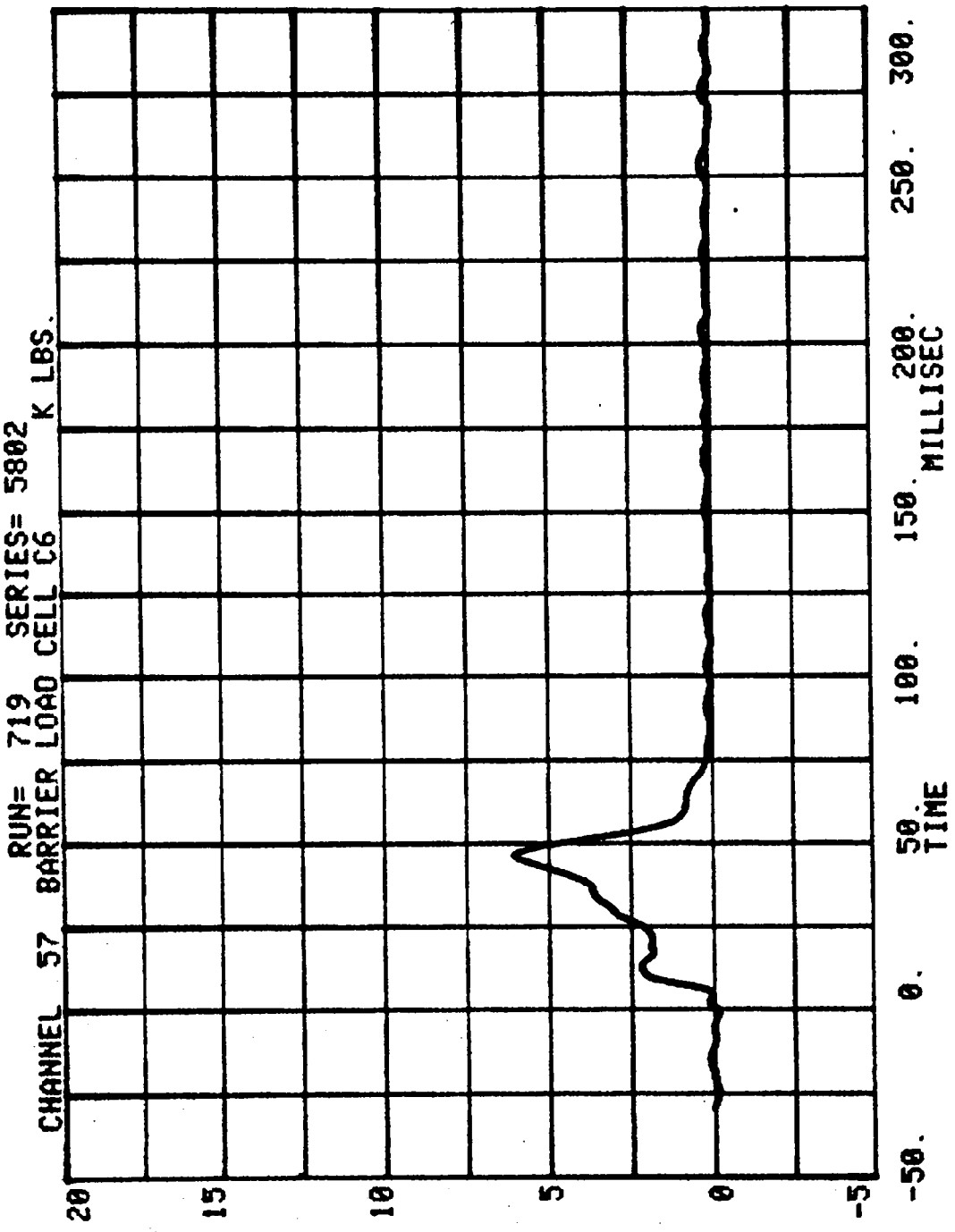
TIME
MILLISEC


CHANNEL 57
RUN= 719 SERIES= 5802
BARRIER LOAD CELL C6
K LBS.
20
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0
-5
-50.
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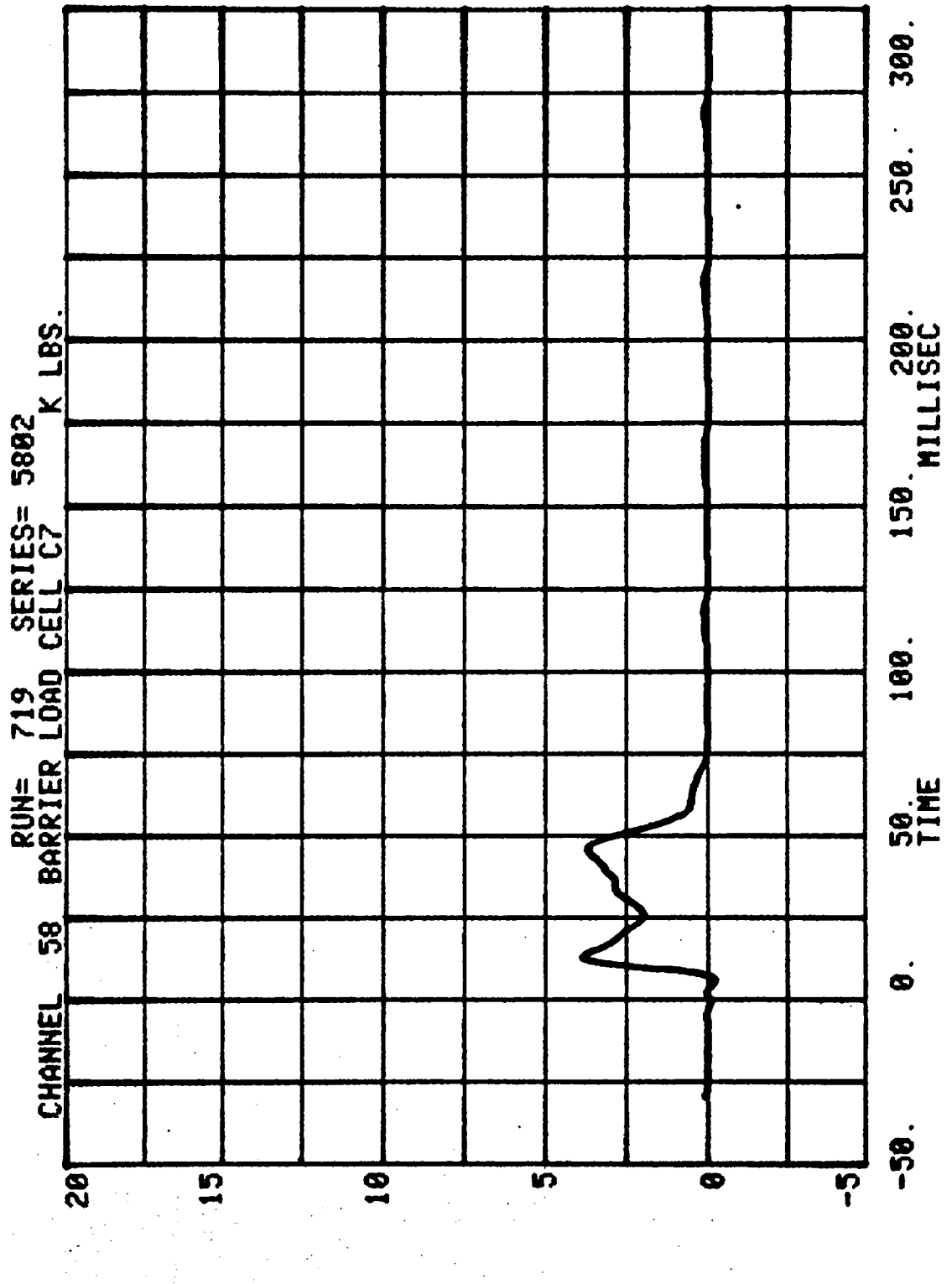
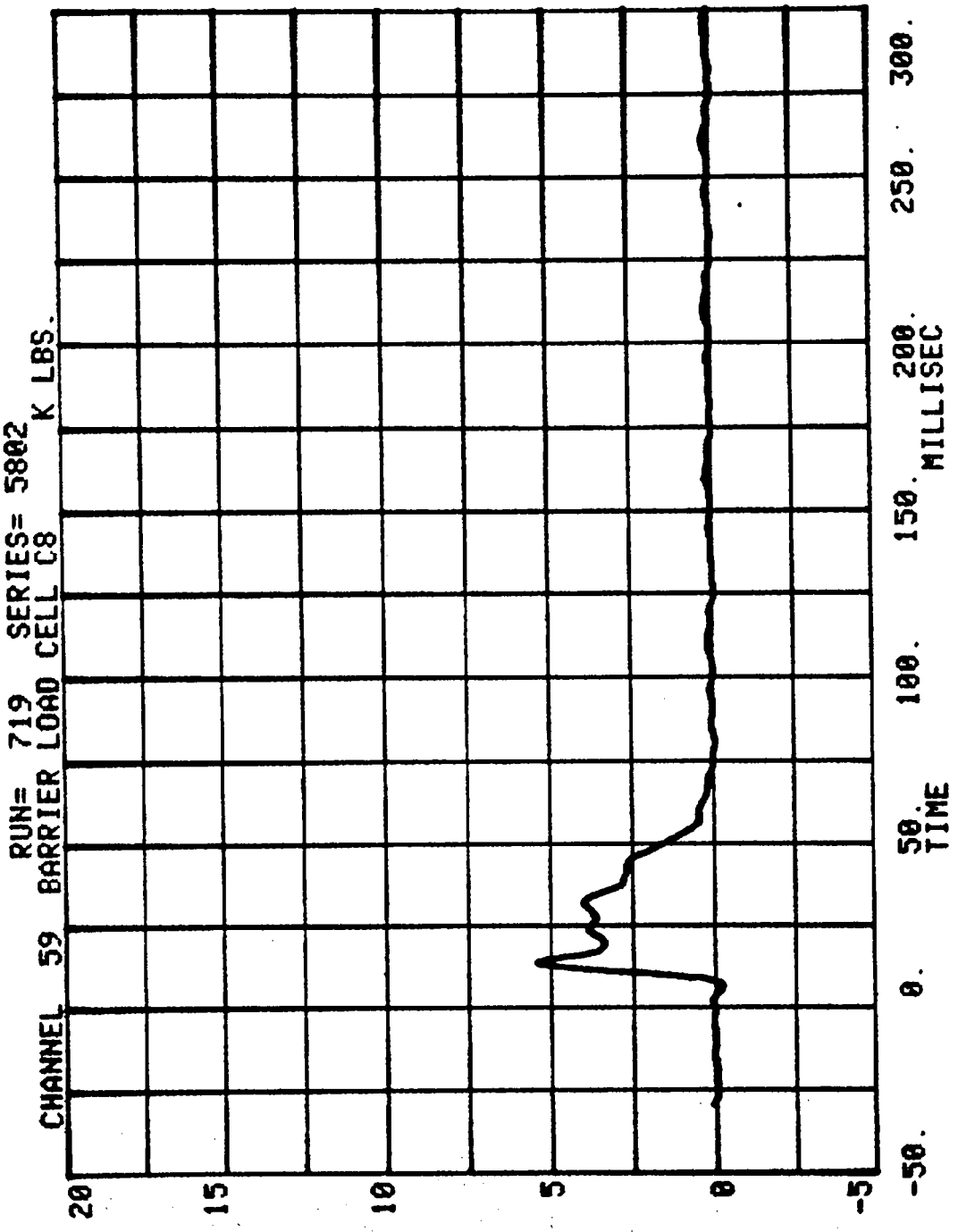
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 58 BARRIER LOAD CELL C7
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 59 BARRIER LOAD CELL C8
RUN= 719 SERIES= 5802 K LBS.
20
15
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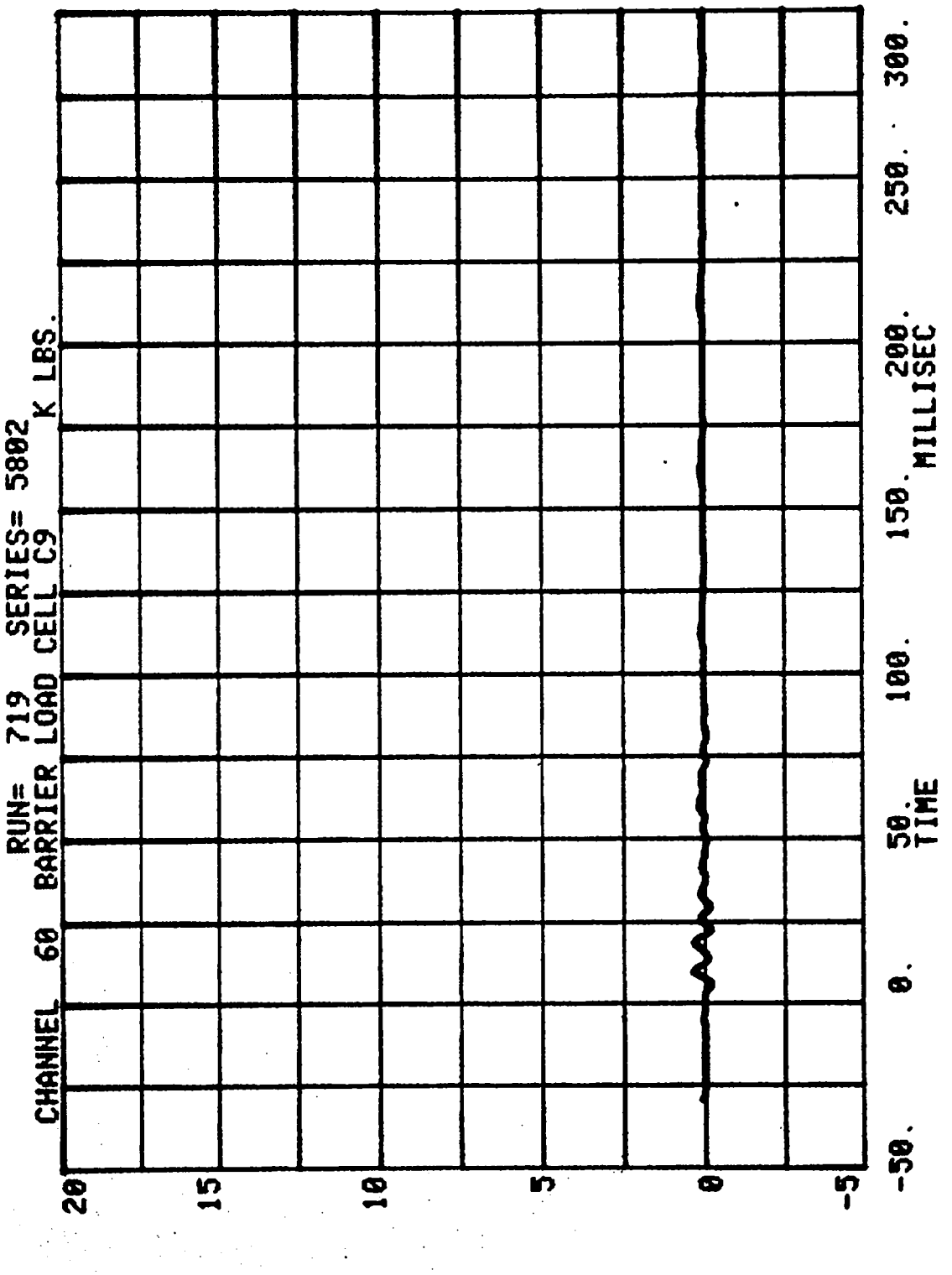
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 60 BARRIER LOAD CELL C9
RUN= 719 SERIES= 5802
K LBS.
20
15
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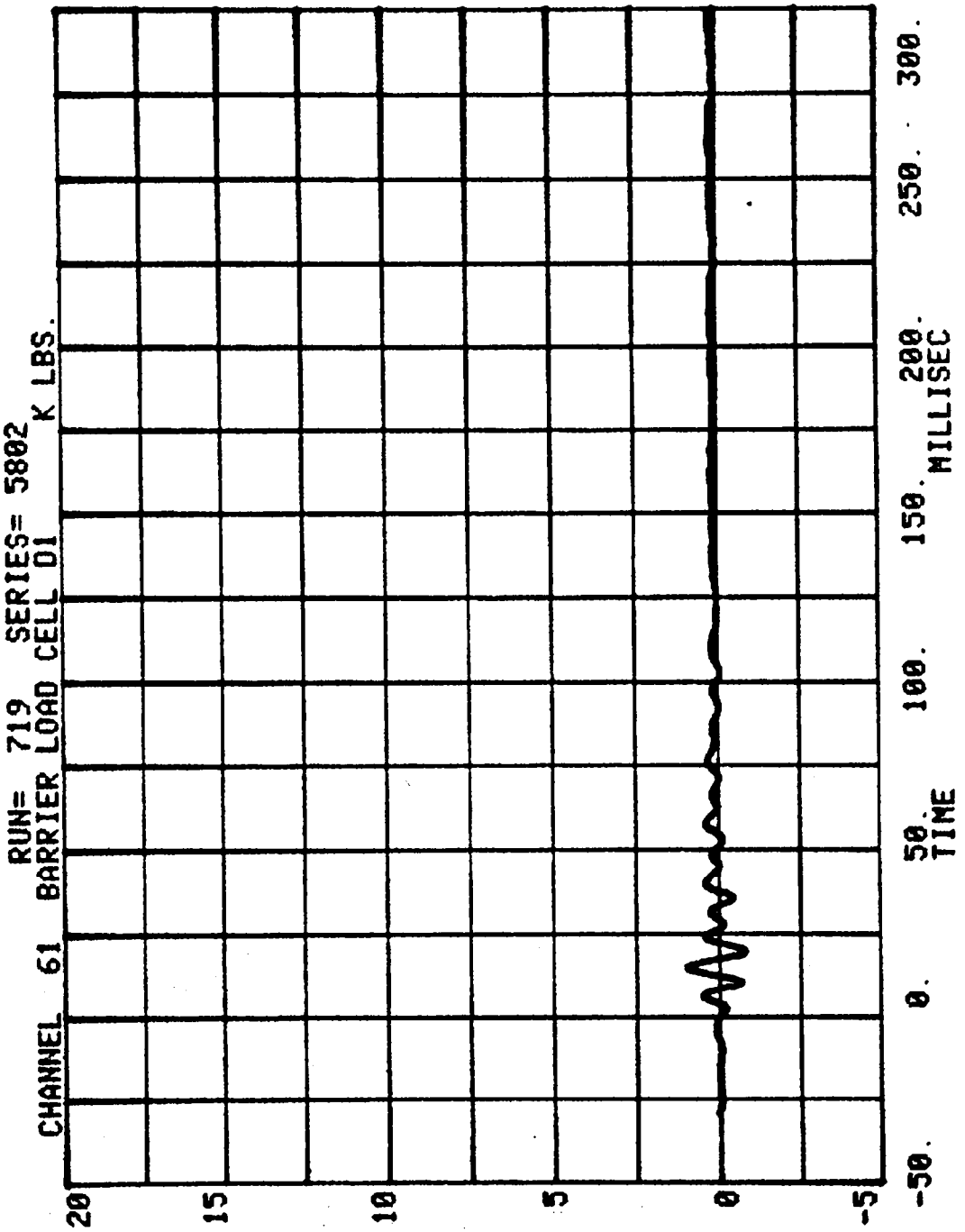
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 61 BARRIER LOAD CELL 01
RUN= 719 SERIES= 5802
K LBS.
20
15
10
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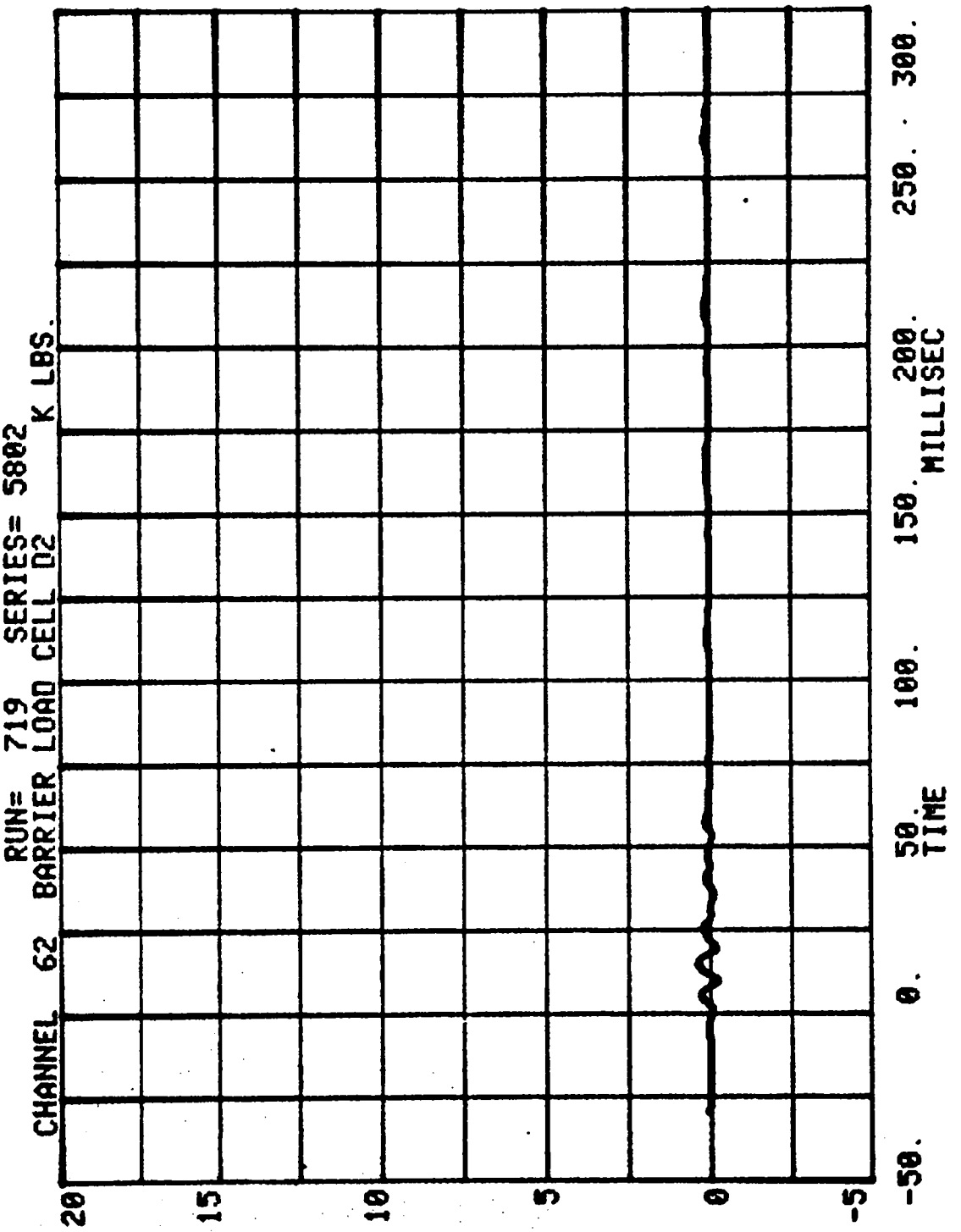
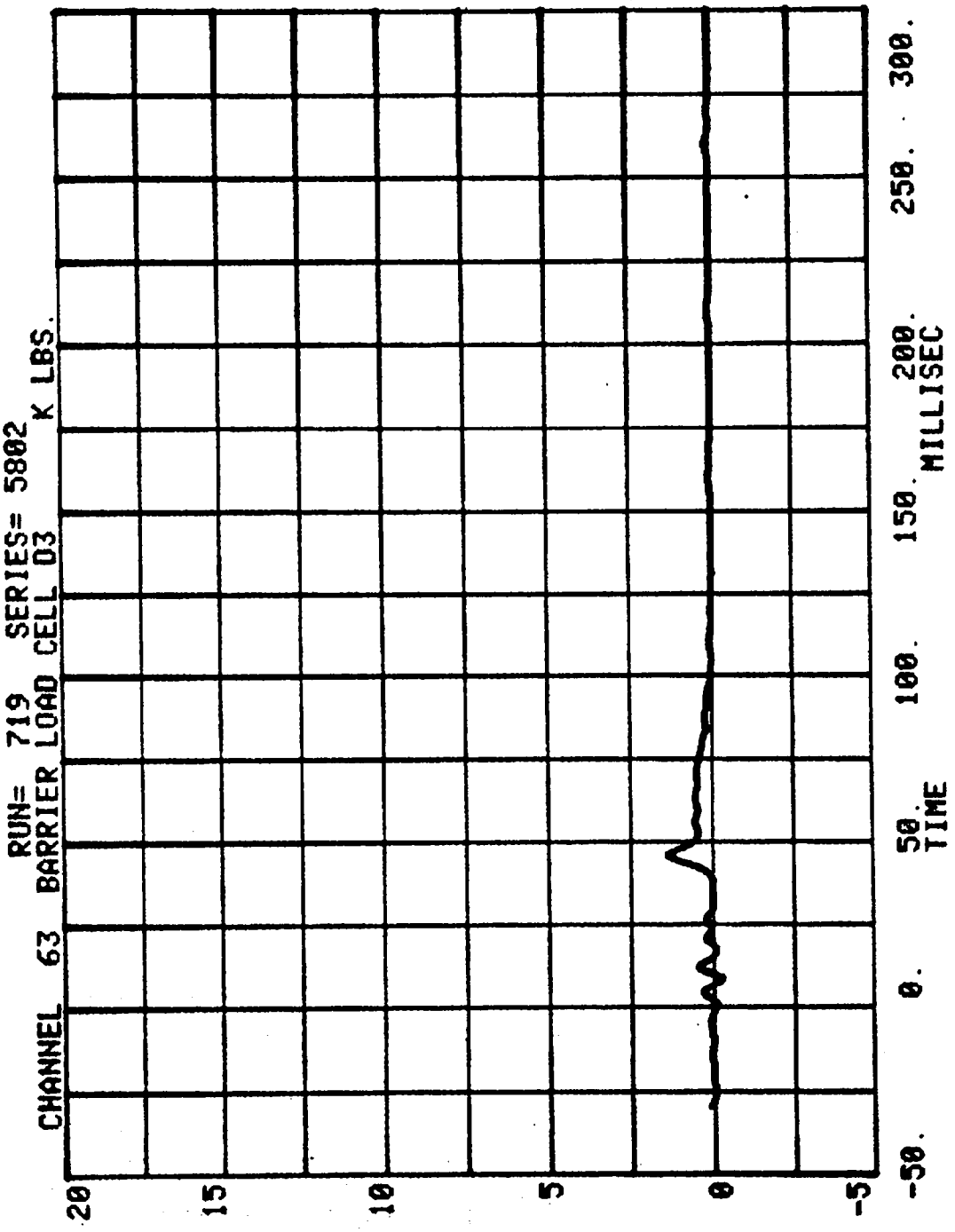
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

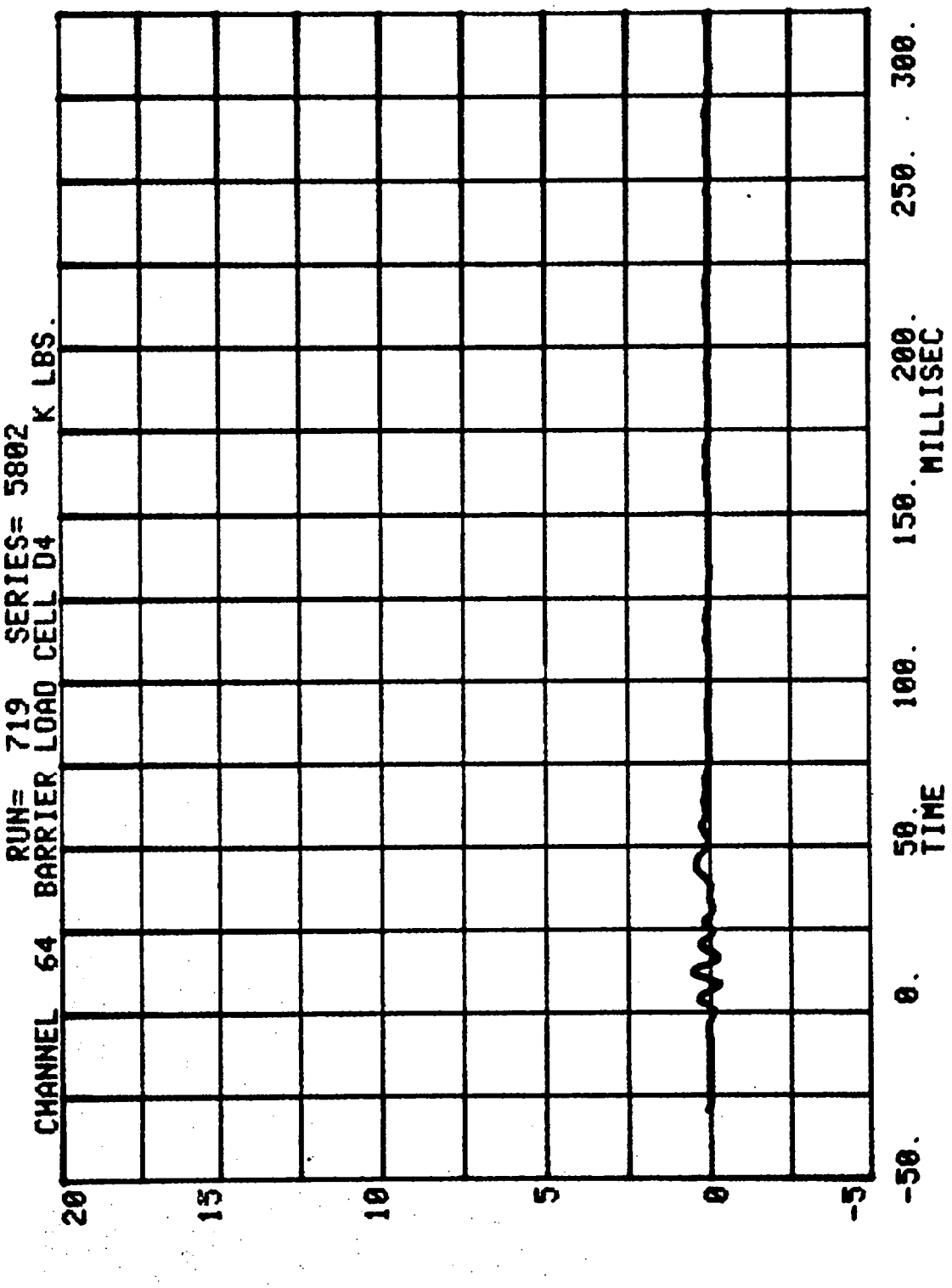
7457-11


CHANNEL 62
RUN= 719 SERIES= 5802
BARRIER LOAD CELL D2
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

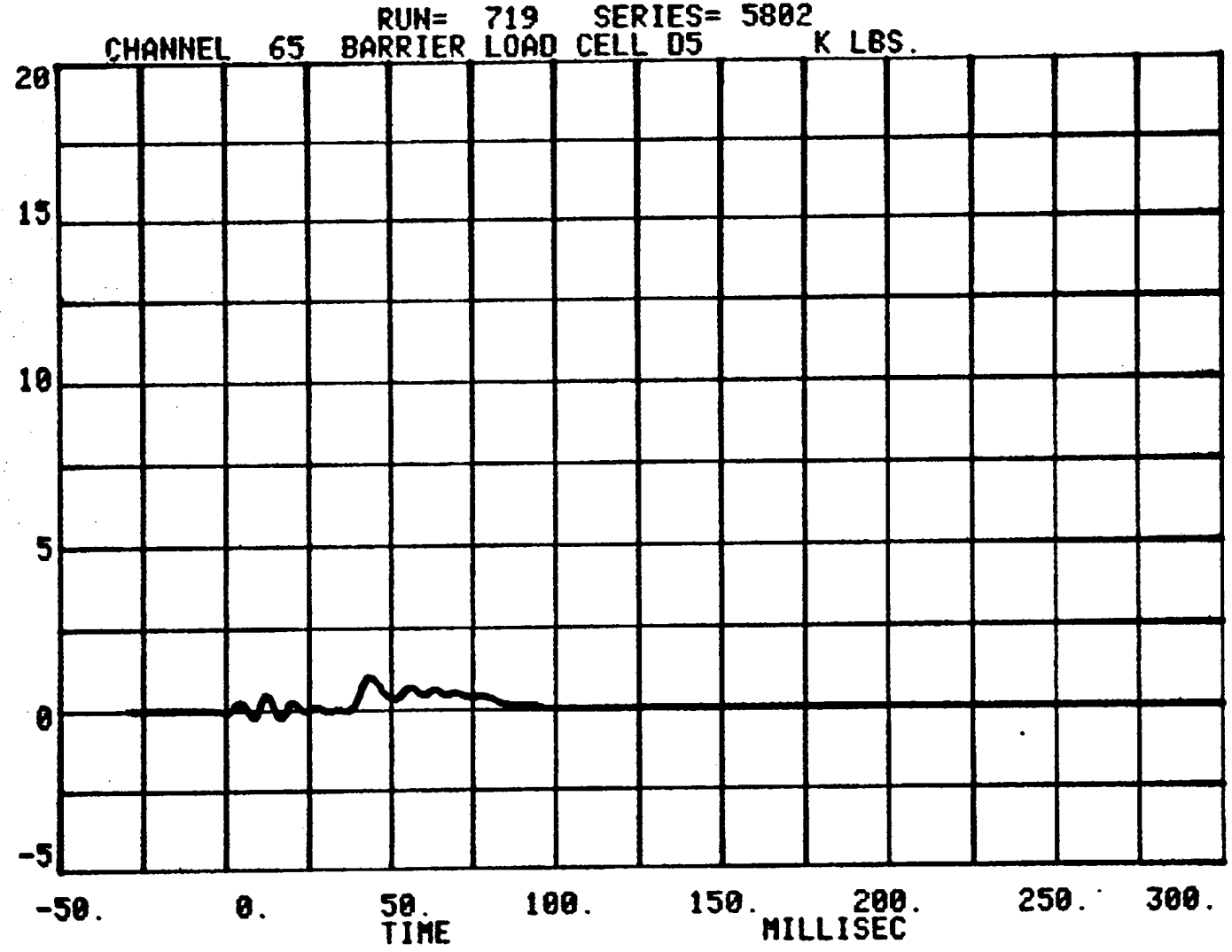
7457-11

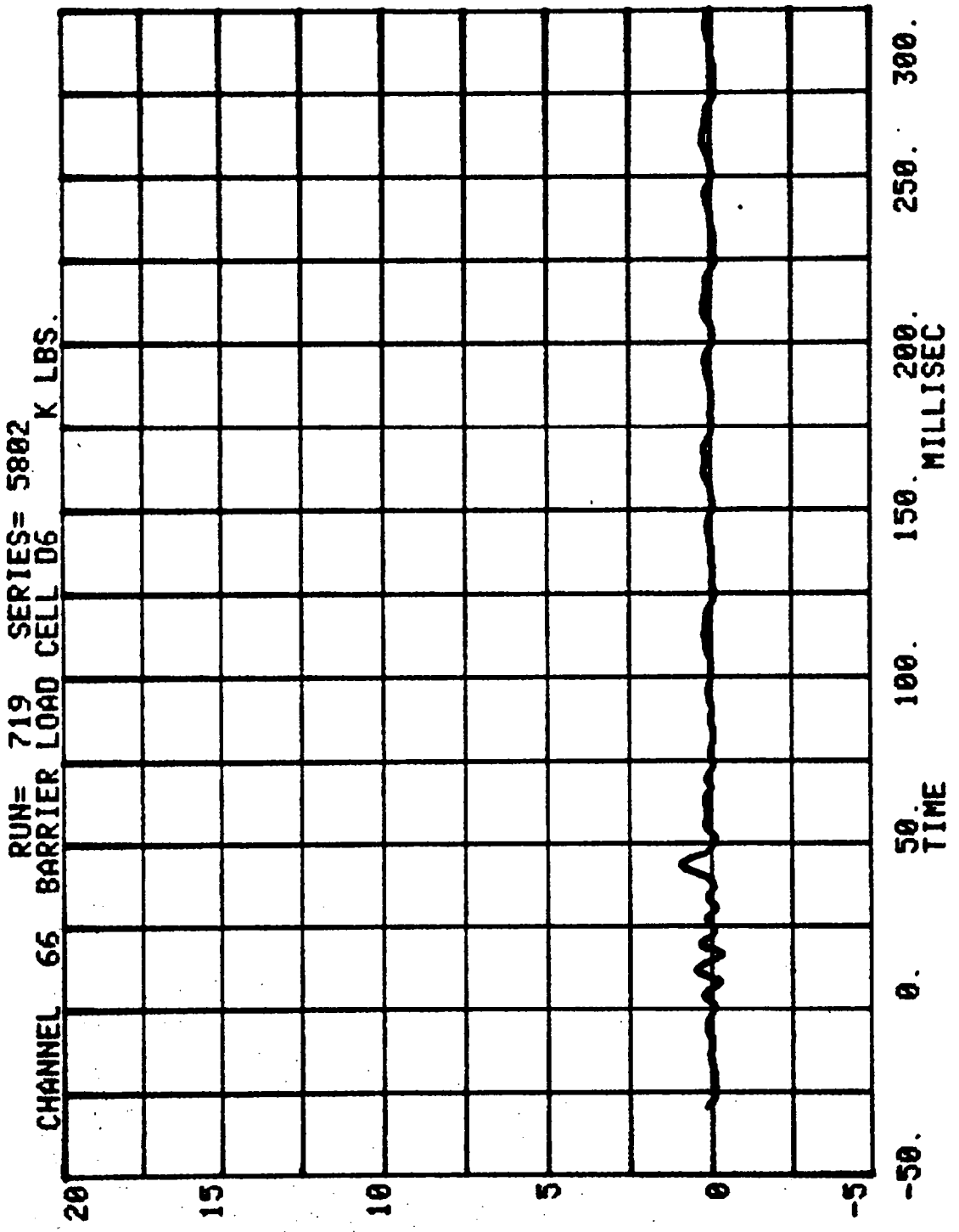

CHANNEL 63 BARRIER LOAD CELL 03
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

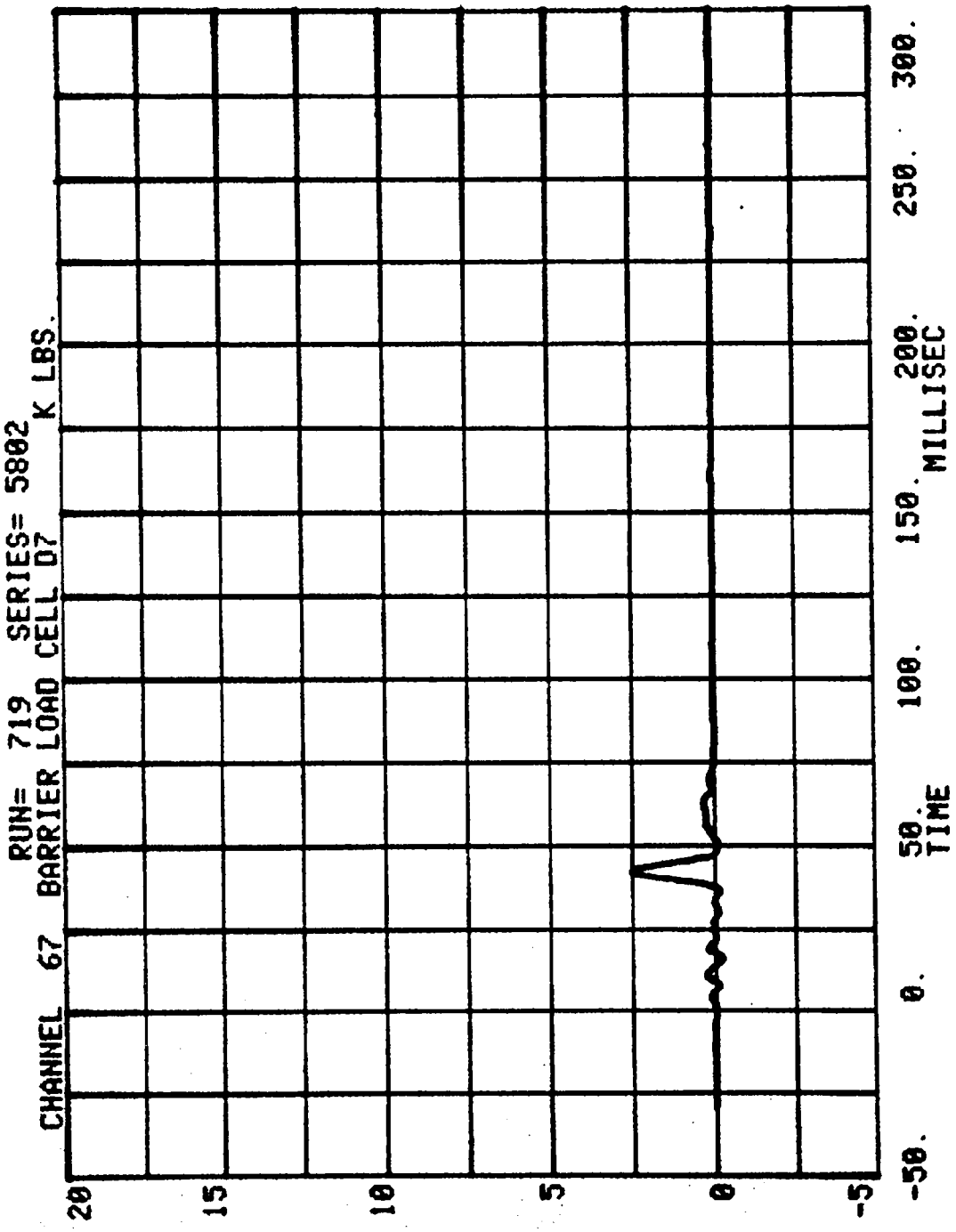
7457-11


CHANNEL 64 BARRIER LOAD CELL D4
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

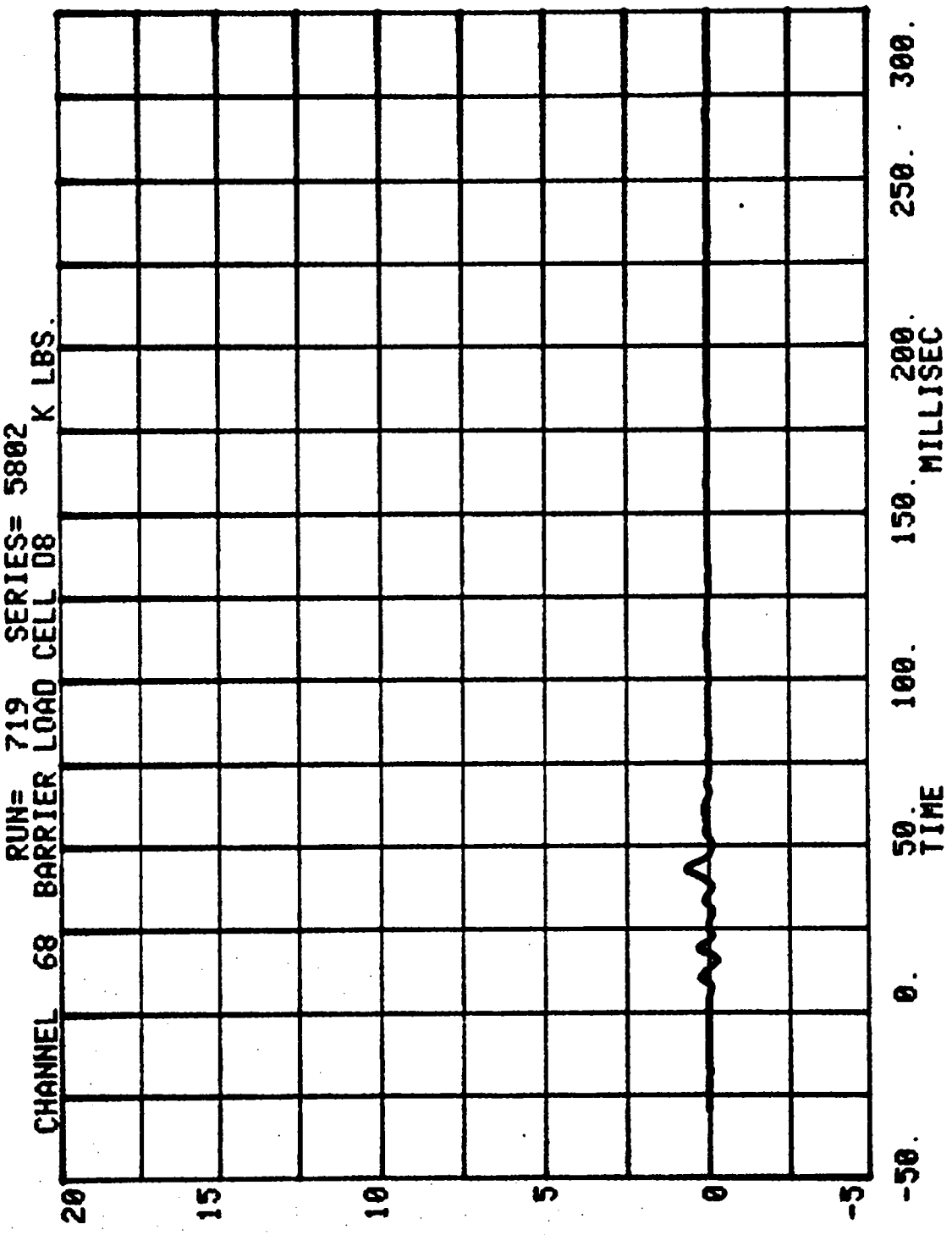
7457-11


RUN= 719 SERIES= 5802
CHANNEL 65 BARRIER LOAD CELL 05 K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

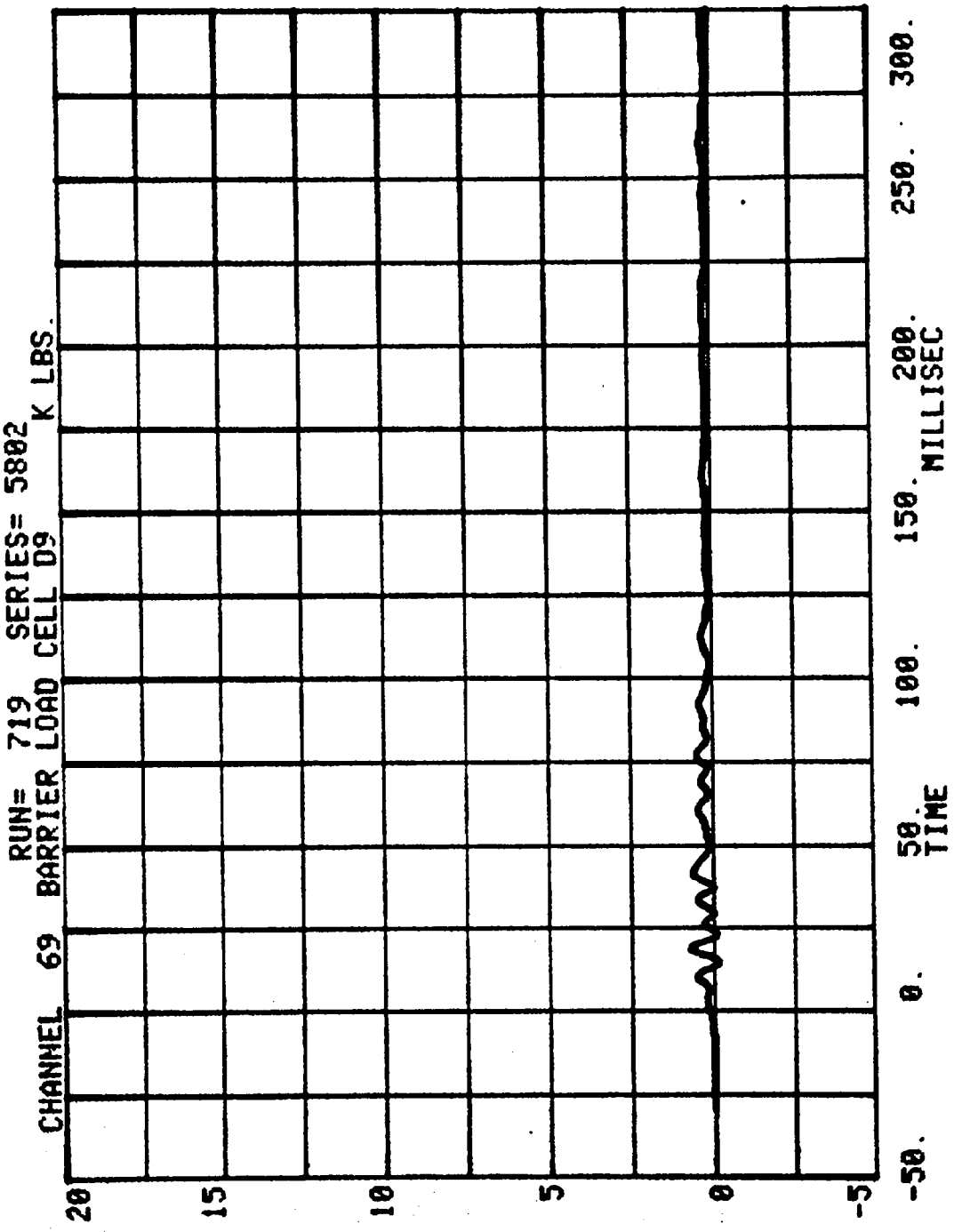

RUN= 719 SERIES= 5802
CHANNEL 66 BARRIER LOAD CELL D6
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


RUN= 719 SERIES= 5802
BARRIER LOAD CELL 07
CHANNEL 67
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11


CHANNEL 68 BARRIER LOAD CELL 08
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

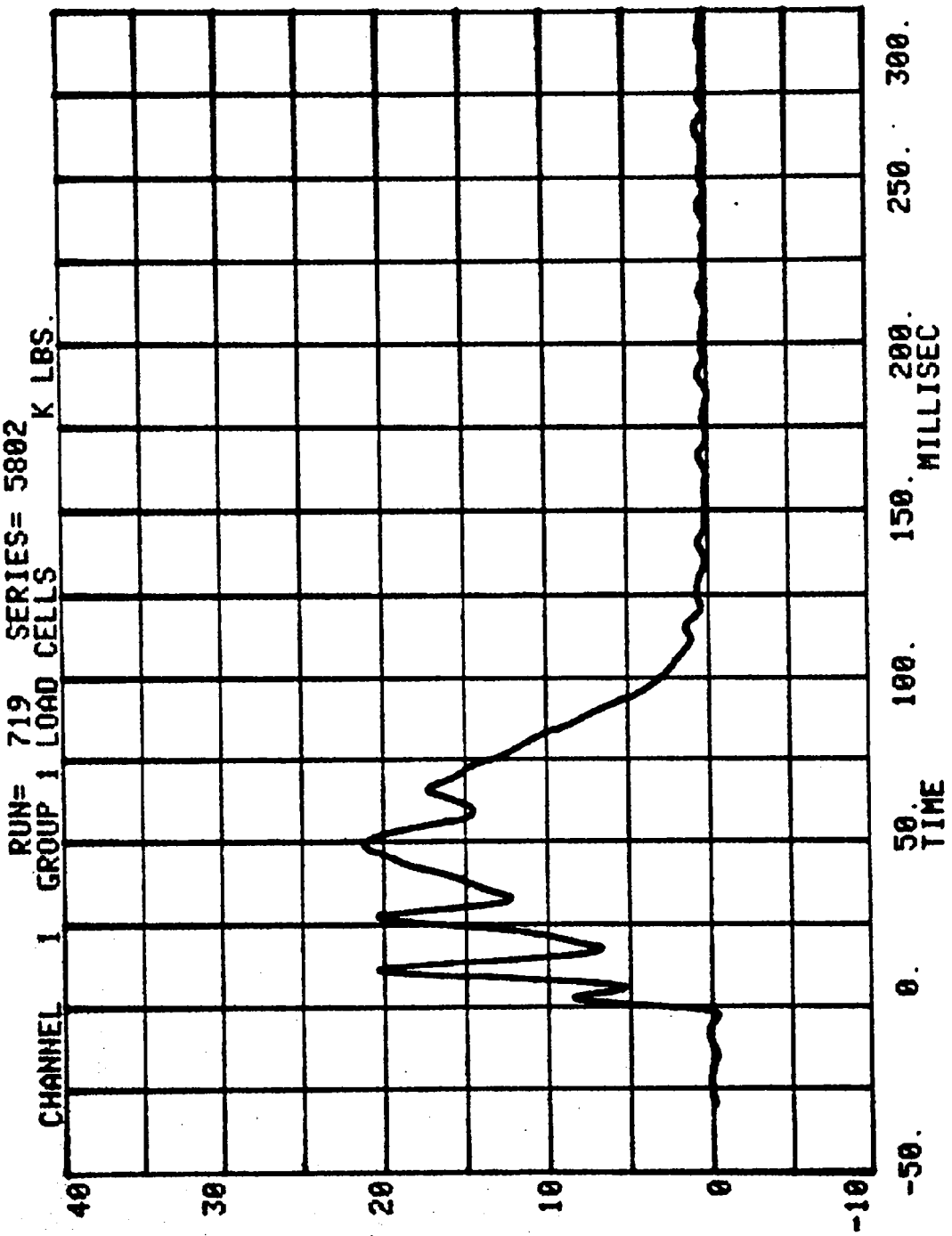

CHANNEL 69 BARRIER LOAD CELL 09
RUN= 719 SERIES= 5802
K LBS.
20
15
10
5
0
-5
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

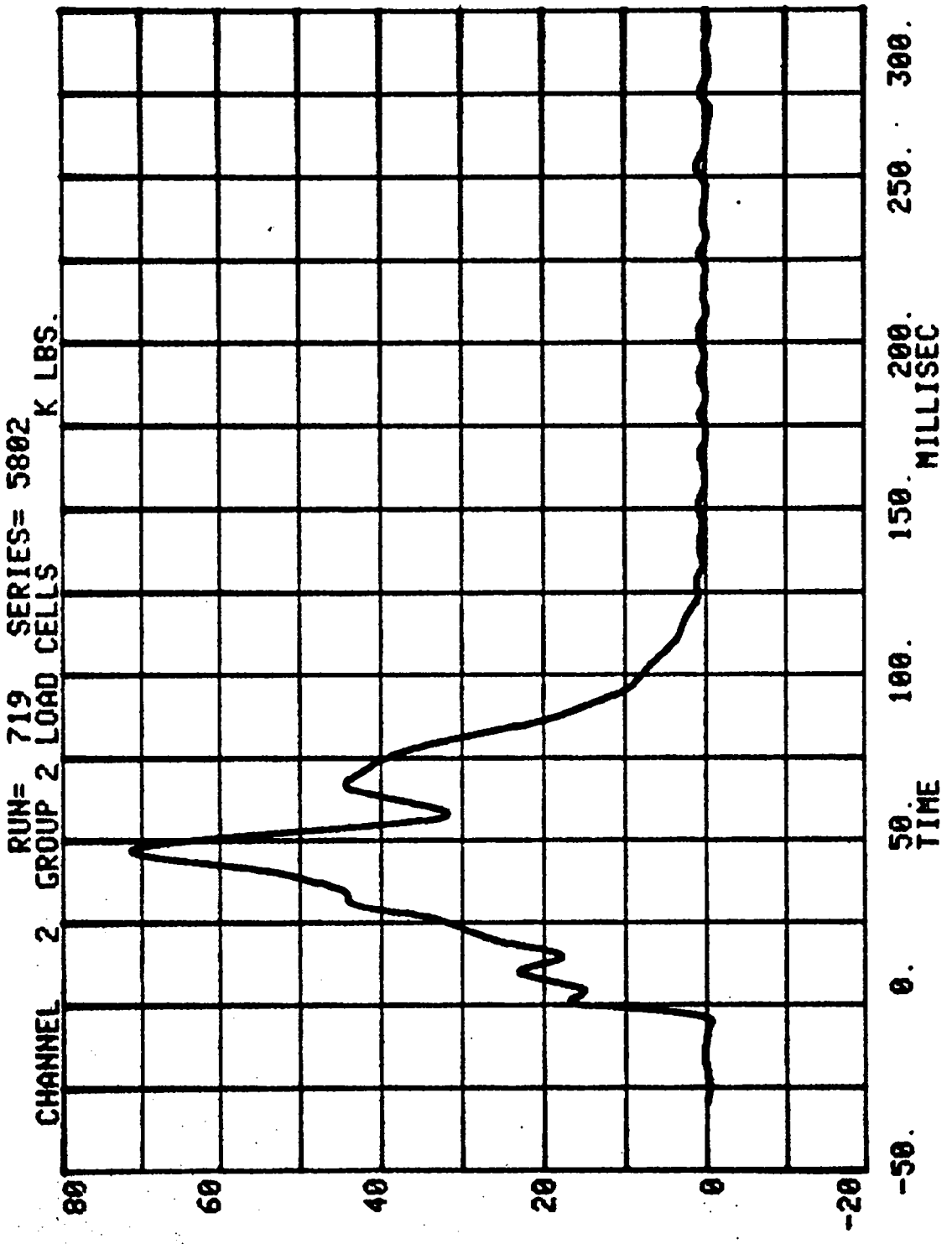
NEW CAR ASSESSMENT BARRIER TESTS - 1986

RUN # 719 SERIES # 5802

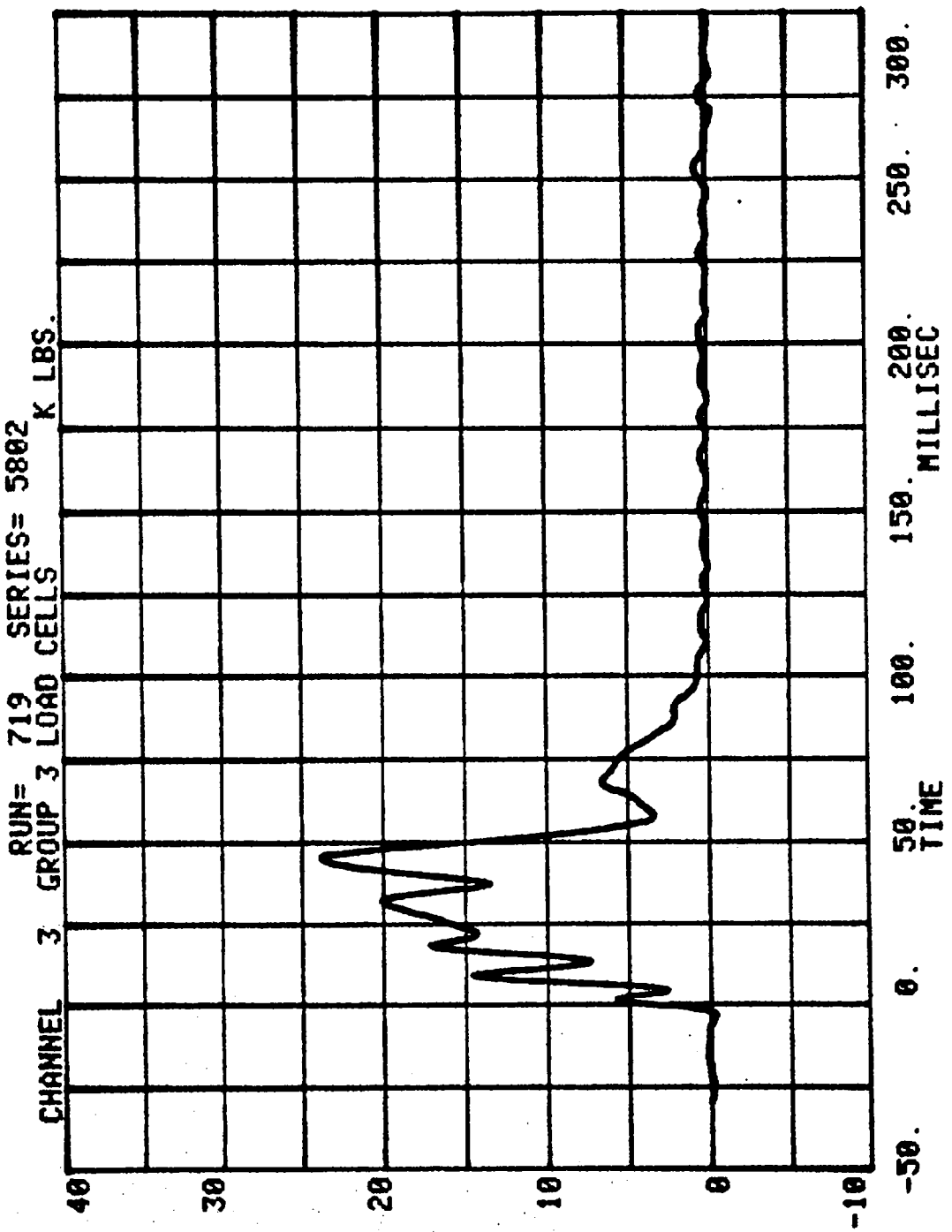
CHAN	TITLE	MINIMUM	MAXIMUM
1	GROUP 1 LOAD CELLS	-.335	21.207 K LBS.
2	GROUP 2 LOAD CELLS	-.601	71.564 K LBS.
3	GROUP 3 LOAD CELLS	-.364	23.861 K LBS.
4	GROUP 4 LOAD CELLS	-.441	11.064 K LBS.
5	GROUP 5 LOAD CELLS	-.623	12.632 K LBS.
6	GROUP 6 LOAD CELLS	-.386	9.947 K LBS.
7	TOTAL LOAD CELL SUM	-.961	144.603 K LBS.


CHANNEL 1 GROUP 1 LOAD CELLS
RUN= 719 SERIES= 5802
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

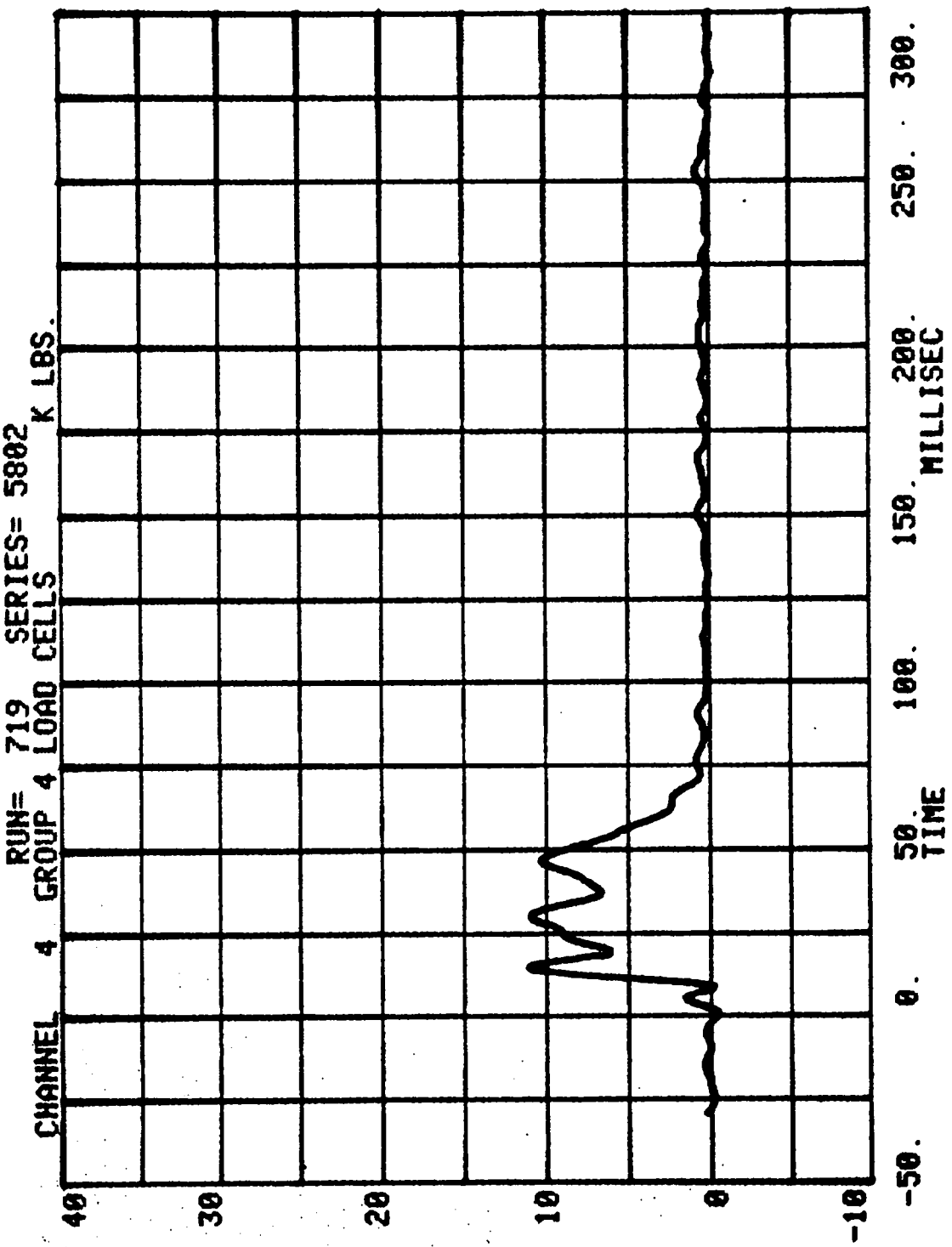
7457-11


CHANNEL 2
RUN= 719 SERIES= 5802
GROUP 2 LOAD CELLS
K LBS.
80
60
40
20
0
-20
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

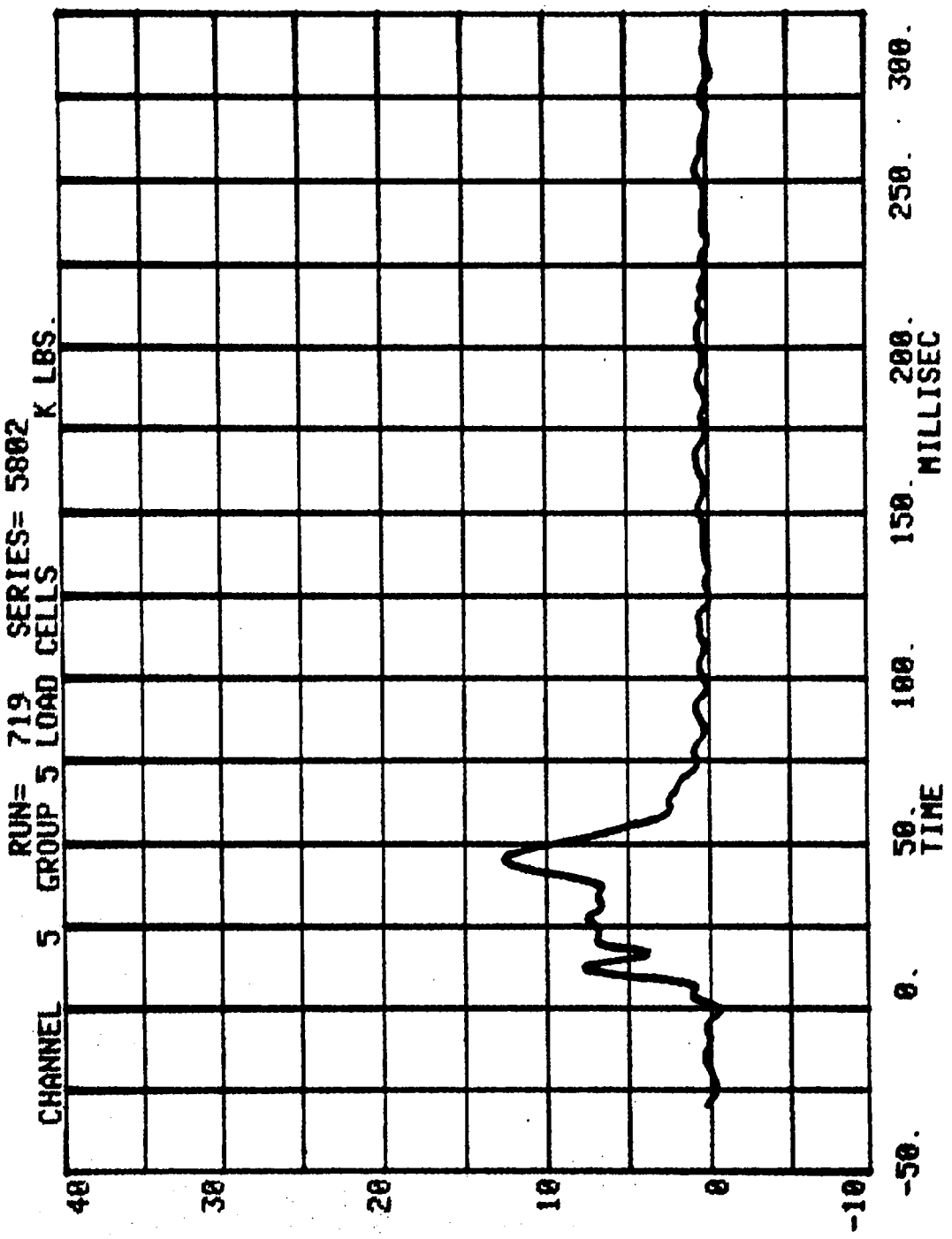
7457-11


CHANNEL 3 GROUP 3 LOAD CELLS
RUN= 719 SERIES= 5802
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

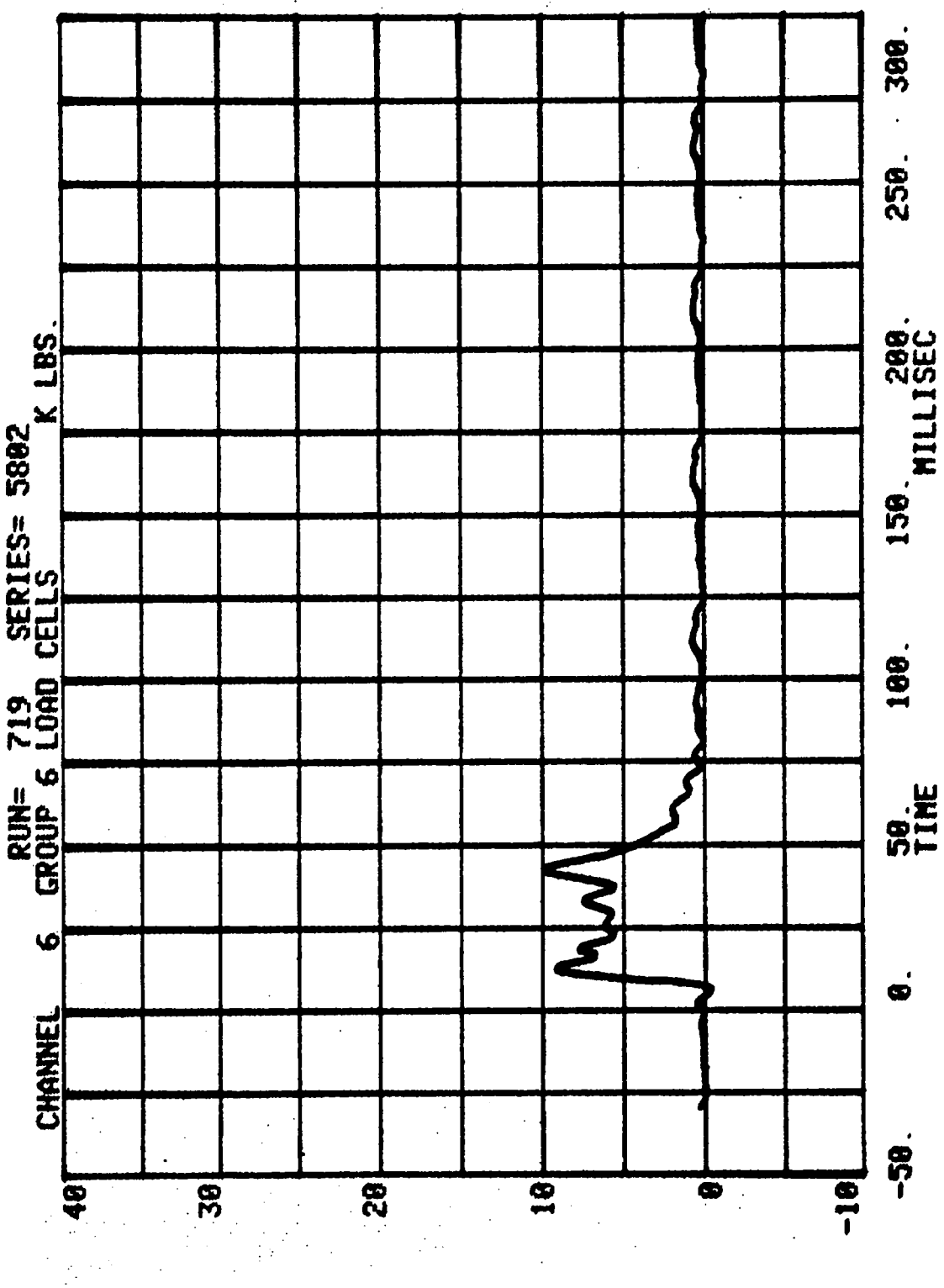
7457-11

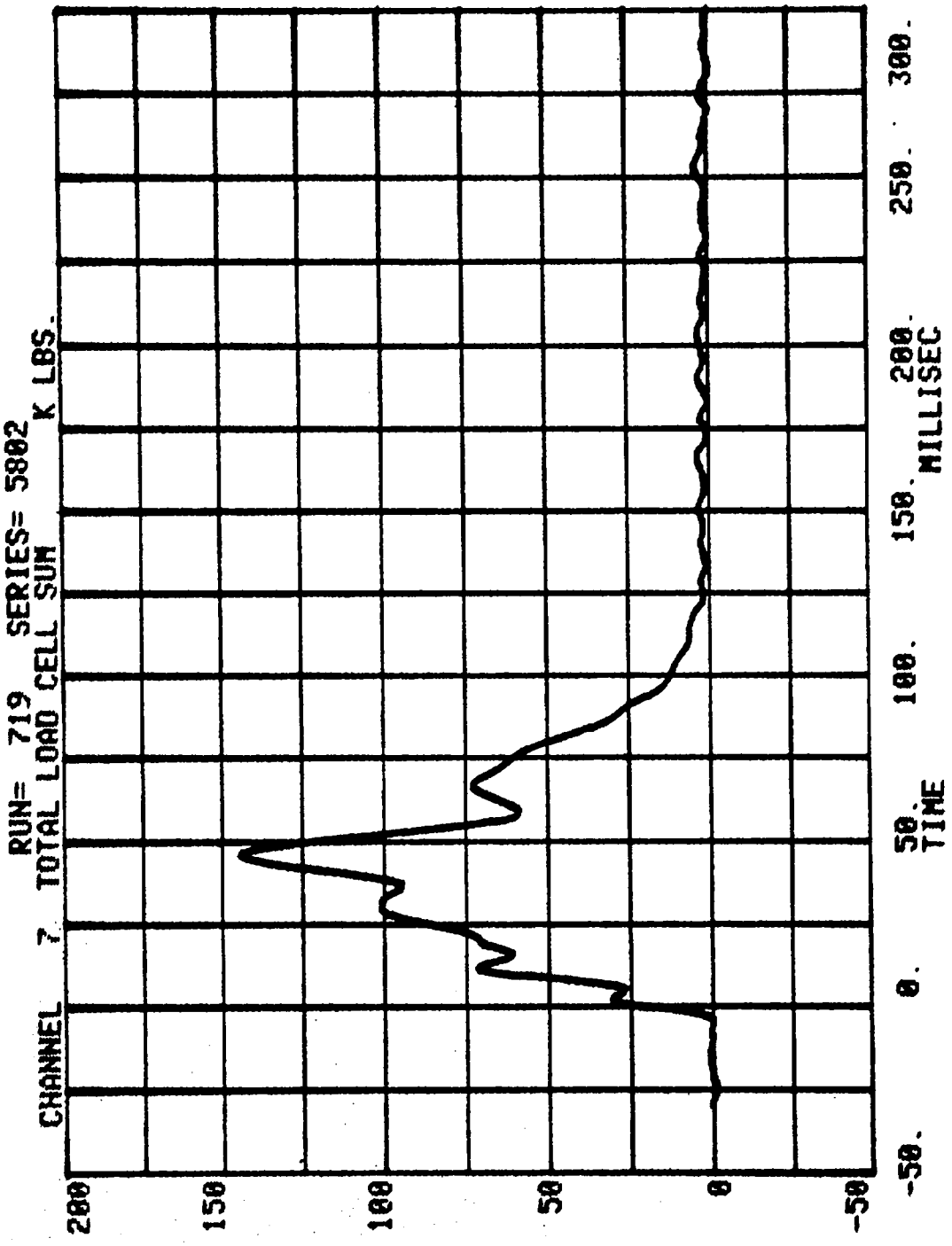

CHANNEL 4 GROUP 4 LOAD CELLS
RUN= 719 SERIES= 5802
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11


CHANNEL 5 GROUP 5 LOAD CELLS
RUN= 719 SERIES= 5802
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11


CHANNEL 6 GROUP 6 LOAD CELLS
RUN= 719 SERIES= 5802
K LBS.
40
30
20
10
0
-10
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 7. TOTAL LOAD CELL SUM
RUN= 719 SERIES= 5802
K LBS.
200
150
100
50
0
-50
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

TEST NO. MG5802

DUMMY DATA

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

HEAD INJURY CRITERION
HEAD SEVERITY INDEX

NEW CAR ASSESSMENT BARRIER TESTS - 1986

RUN= 719

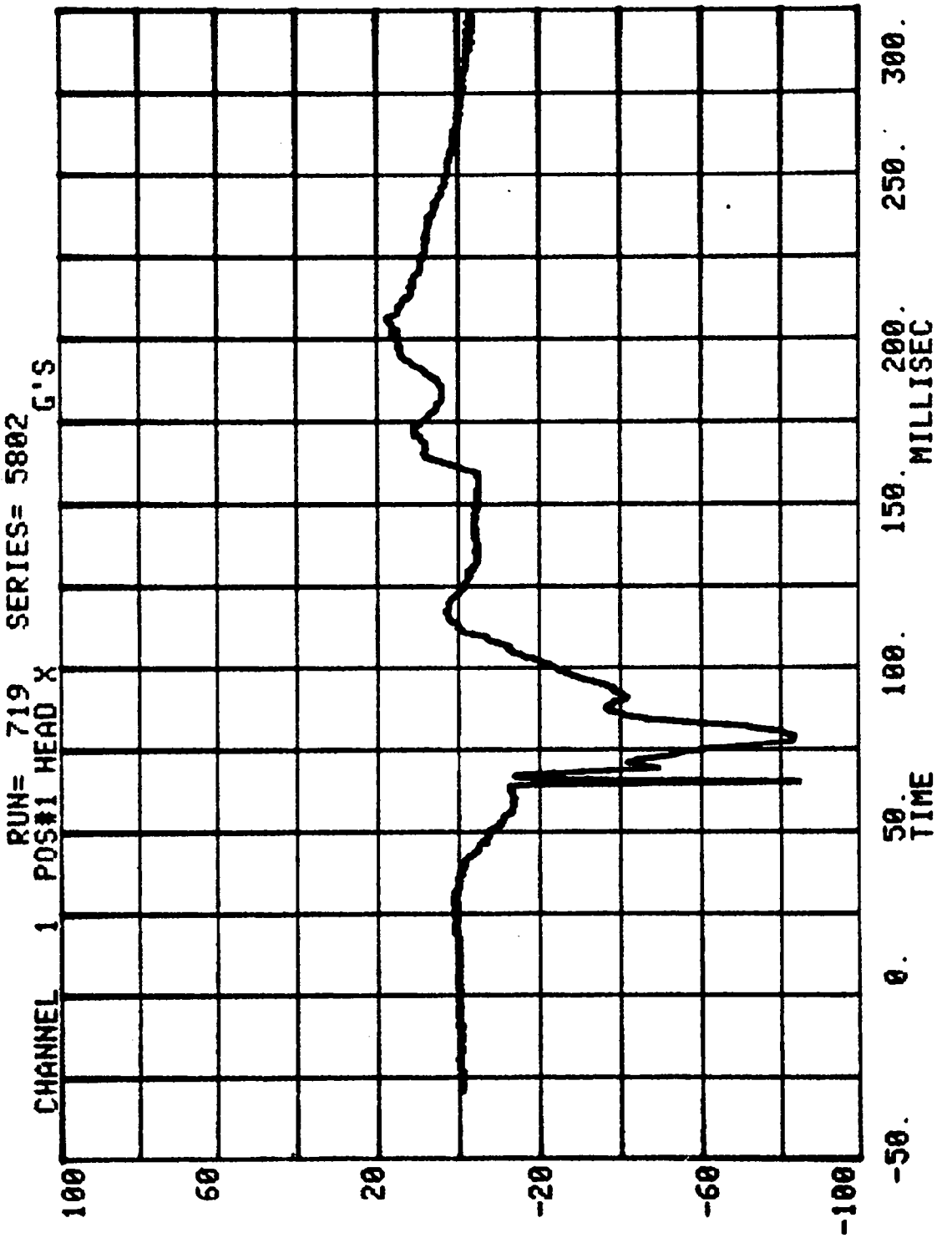
POS#1 HEAD R

HIC= 887.0 FROM T1= .05850 TO T2= .09645

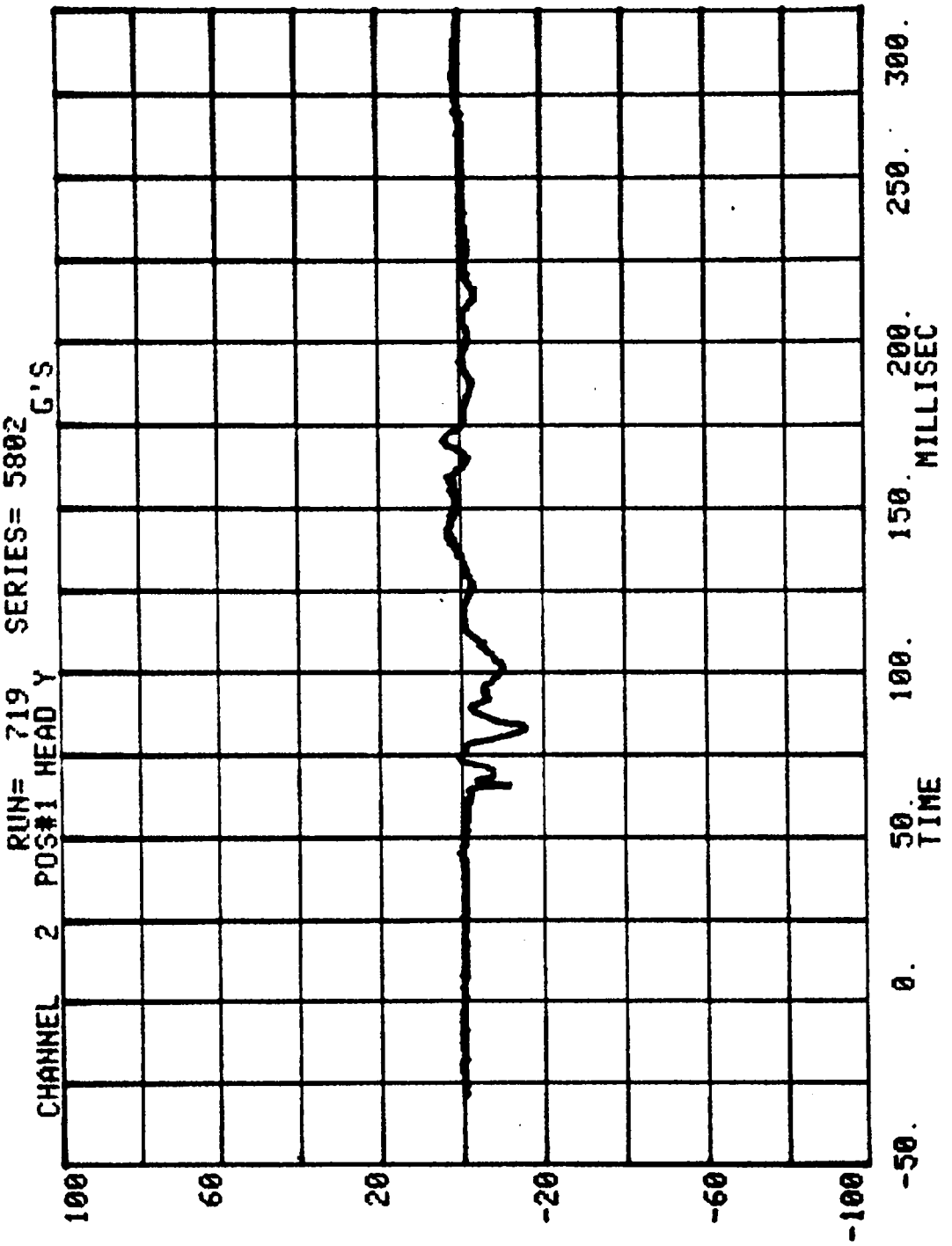
AVERAGE ACCELERATION BETWEEN T1 AND T2= 55.9G'S

EVENT TIME= 300.0 MSEC

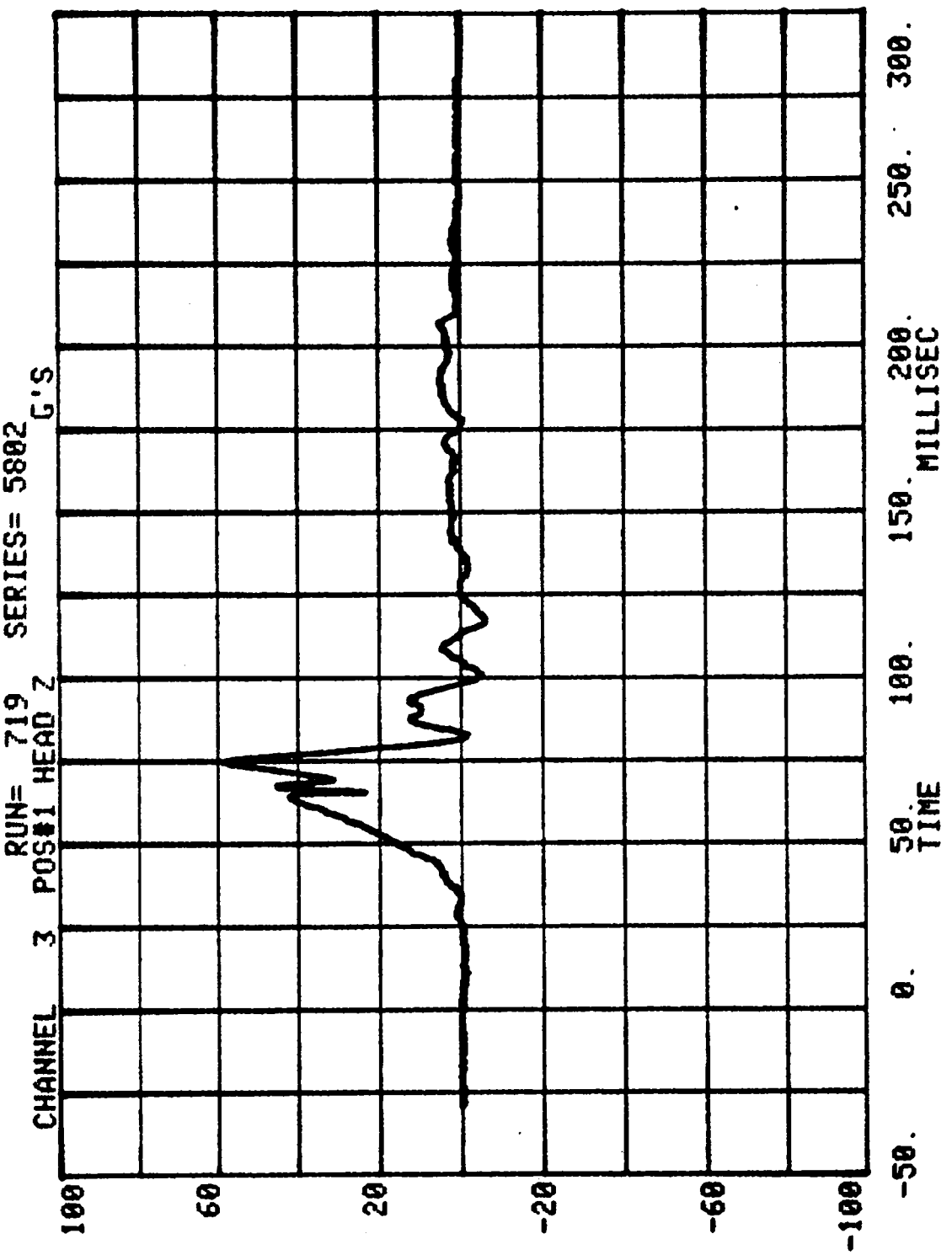
SEVERITY INDEX=1173.6


CHANNEL 1 POS#1 HEAD X
RUN= 719 SERIES= 5802
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

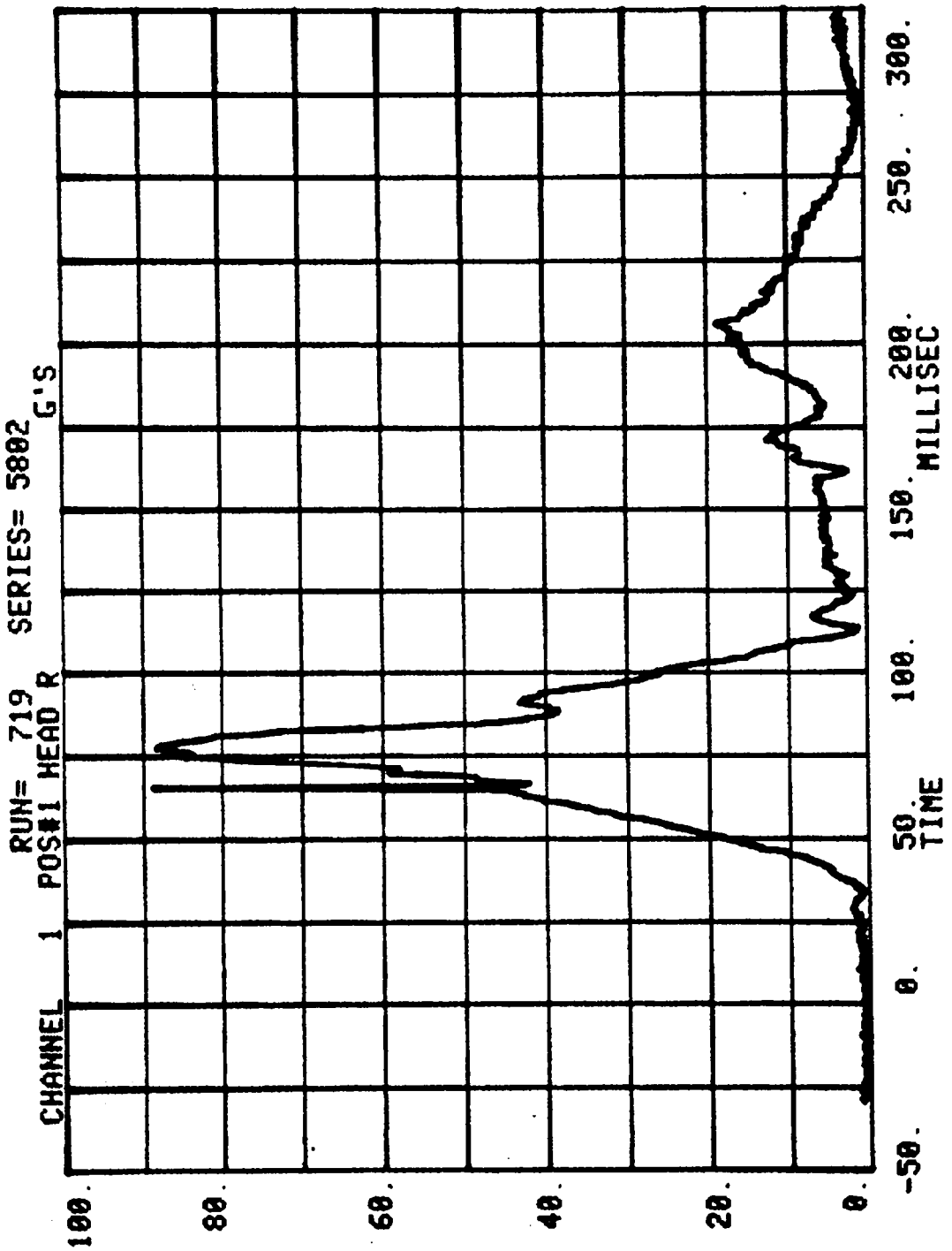
7457-11


CHANNEL 2 POS#1 HEAD Y
RUN= 719 SERIES= 5802
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

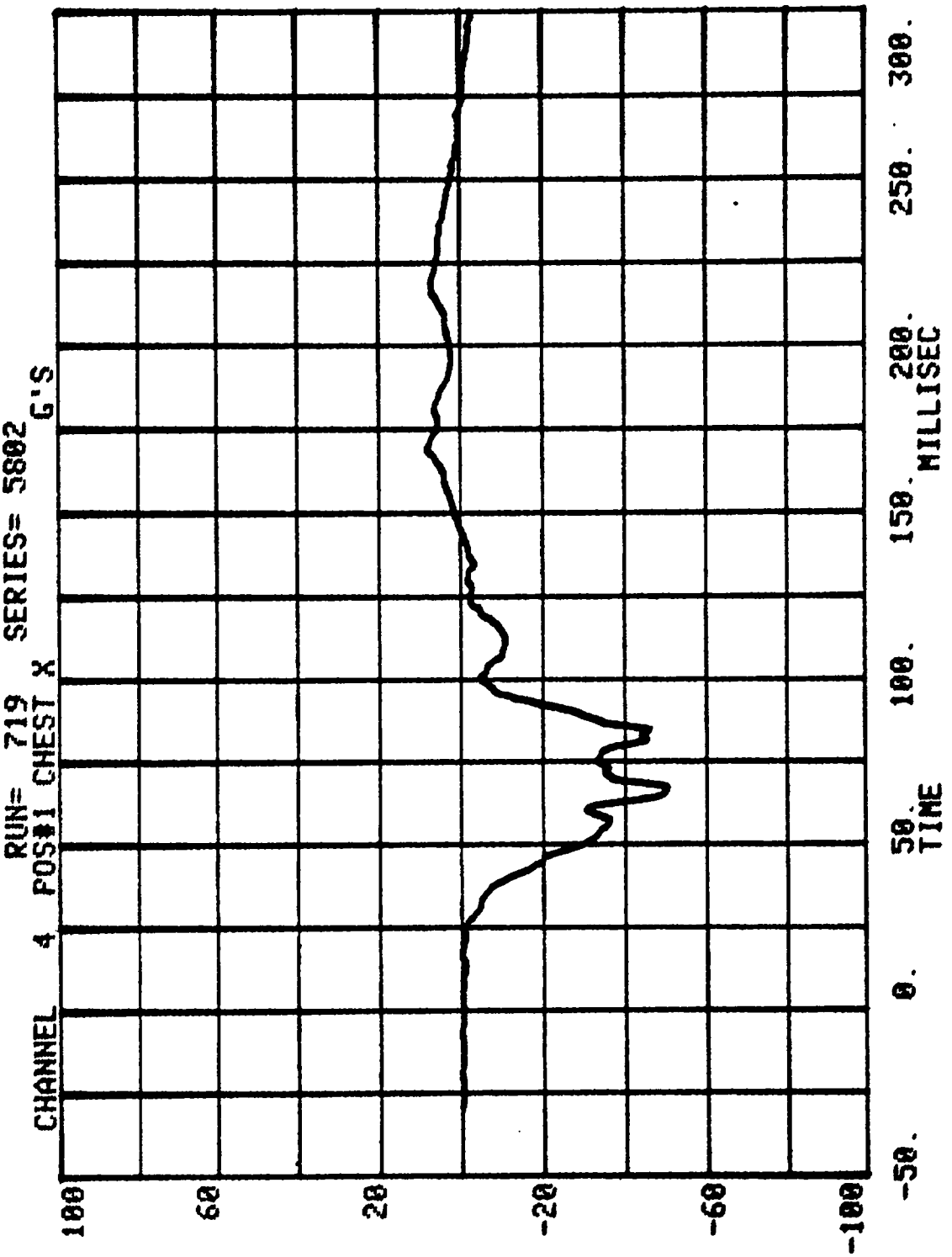
7457-11

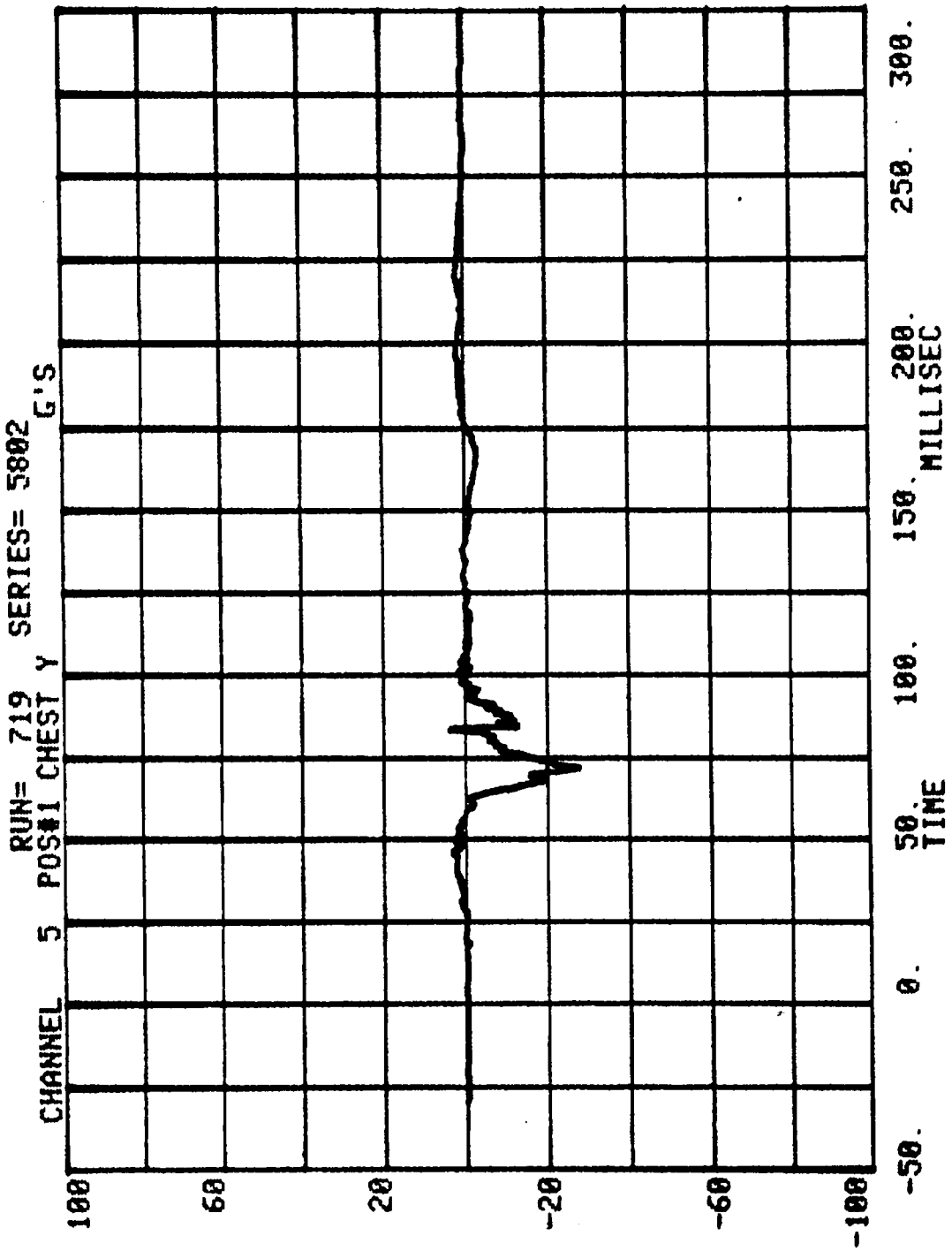

CHANNEL 3 POS#1 HEAD Z
RUN= 719 SERIES= 5802
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

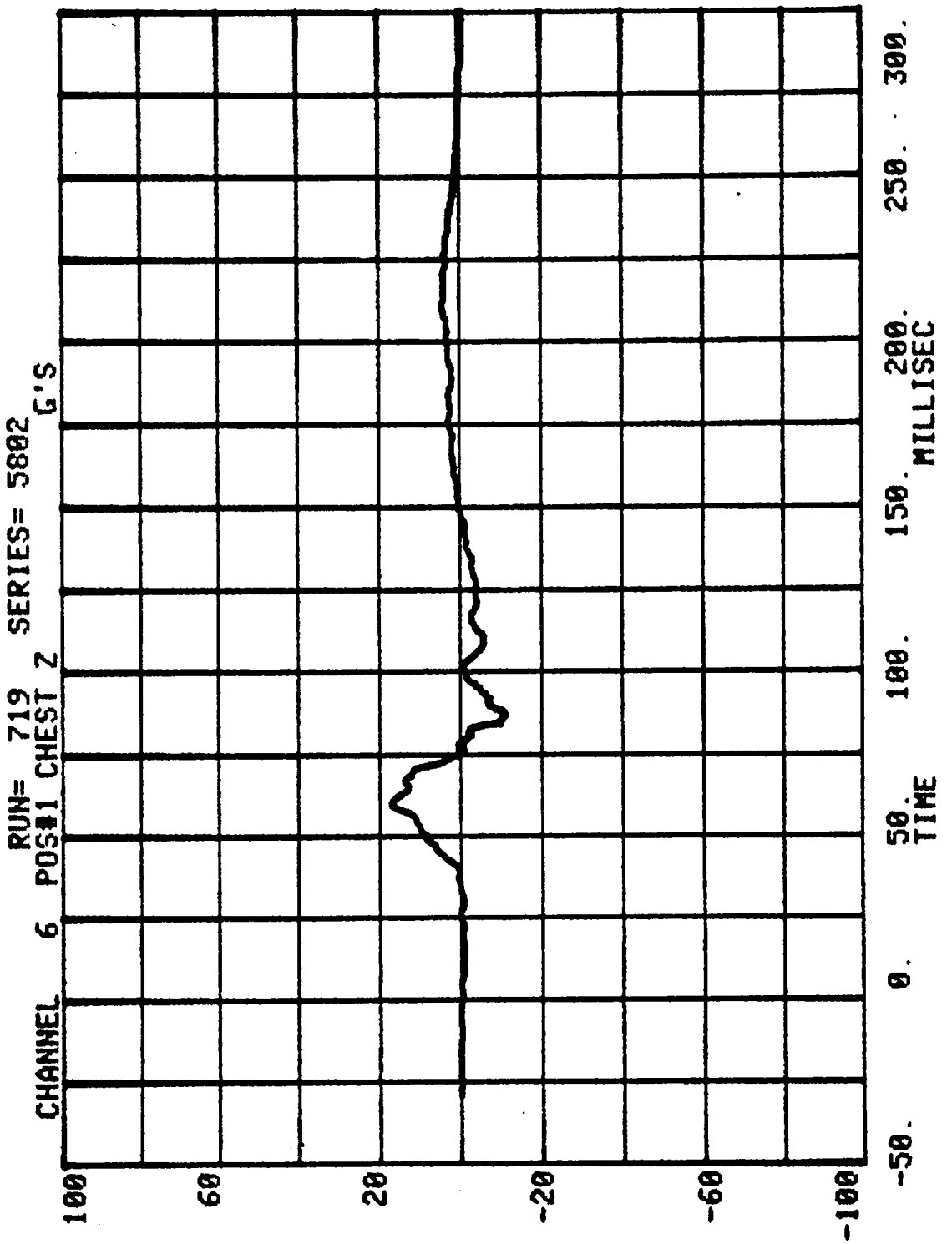

CHANNEL 1 RUN= 719 SERIES= 5802
POS#1 HEAD R
G'S
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

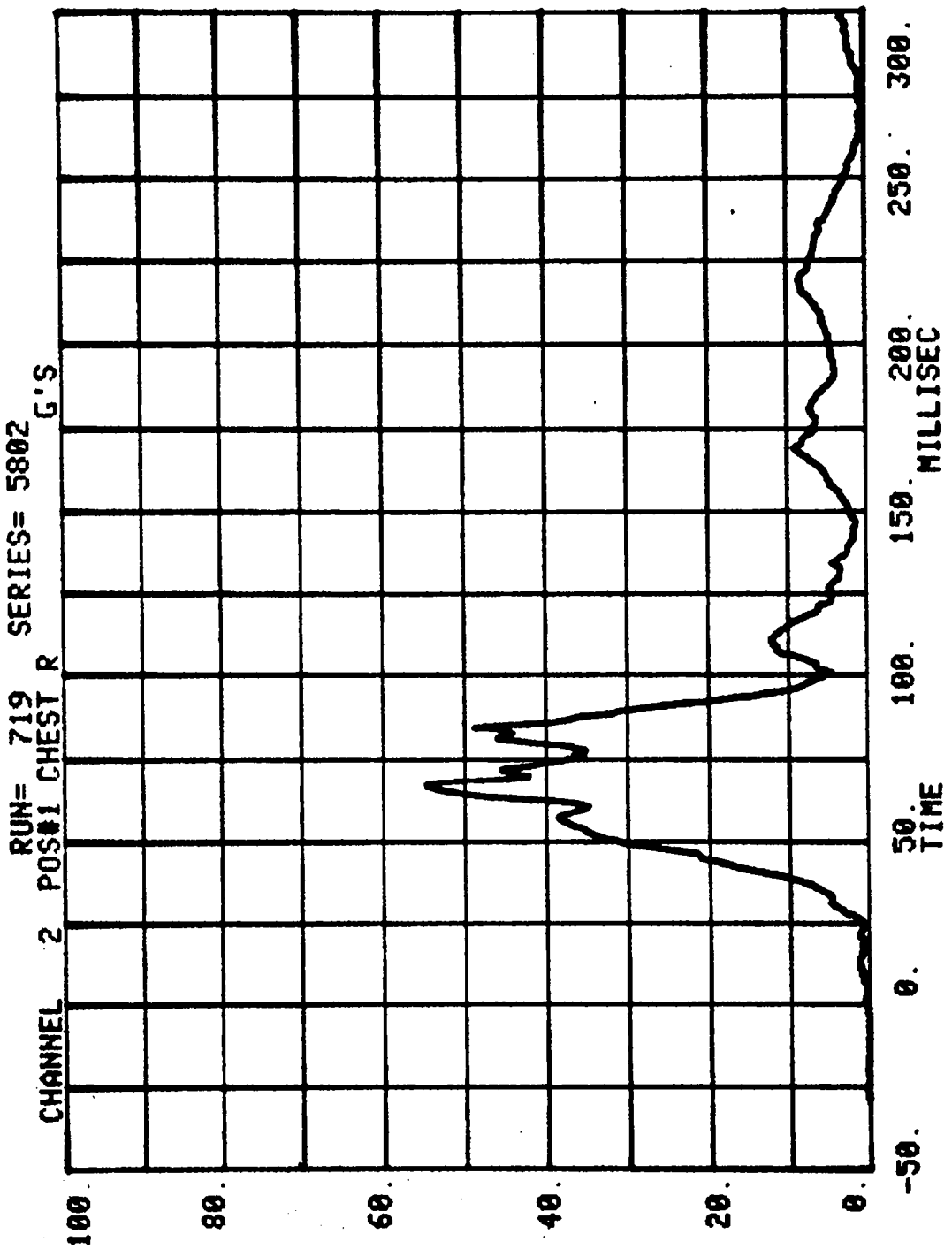

CHANNEL 4 POS#1 CHEST X
RUN= 719 SERIES= 5802
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

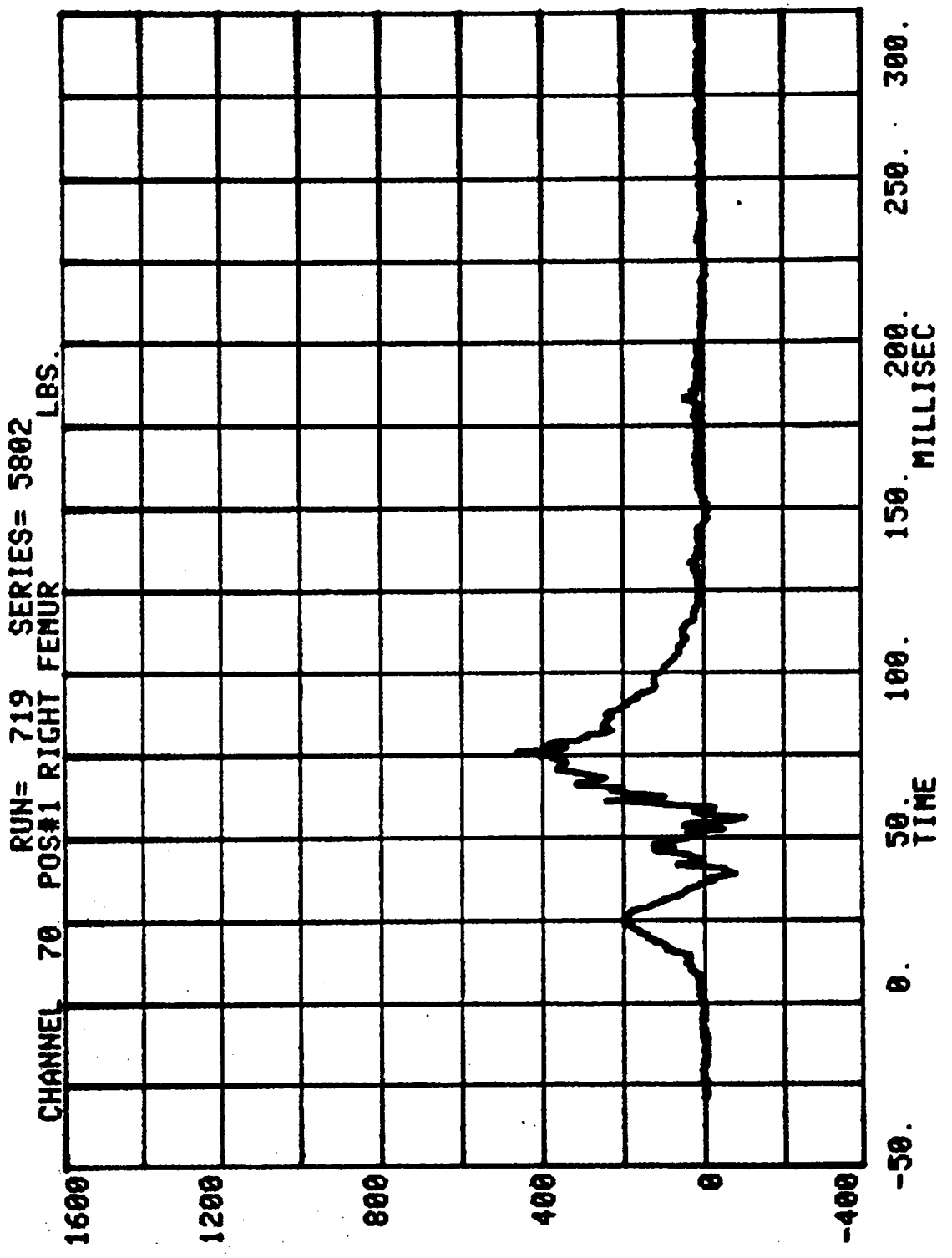

CHANNEL 5 RUN= 719 SERIES= 5802
POS#1 CHEST Y
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

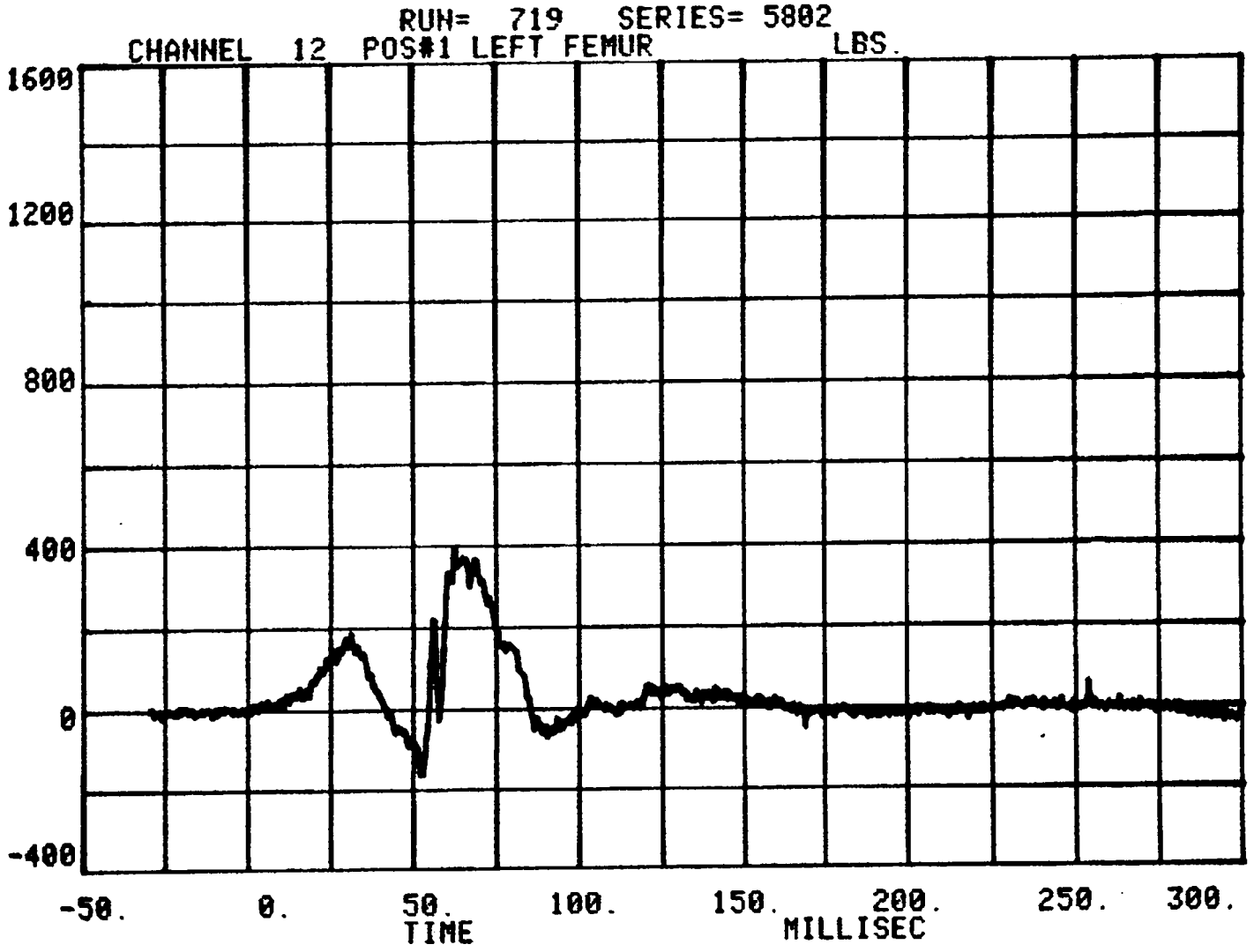

CHANNEL 6 POS#1 CHEST Z
RUN= 719 SERIES= 5802
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

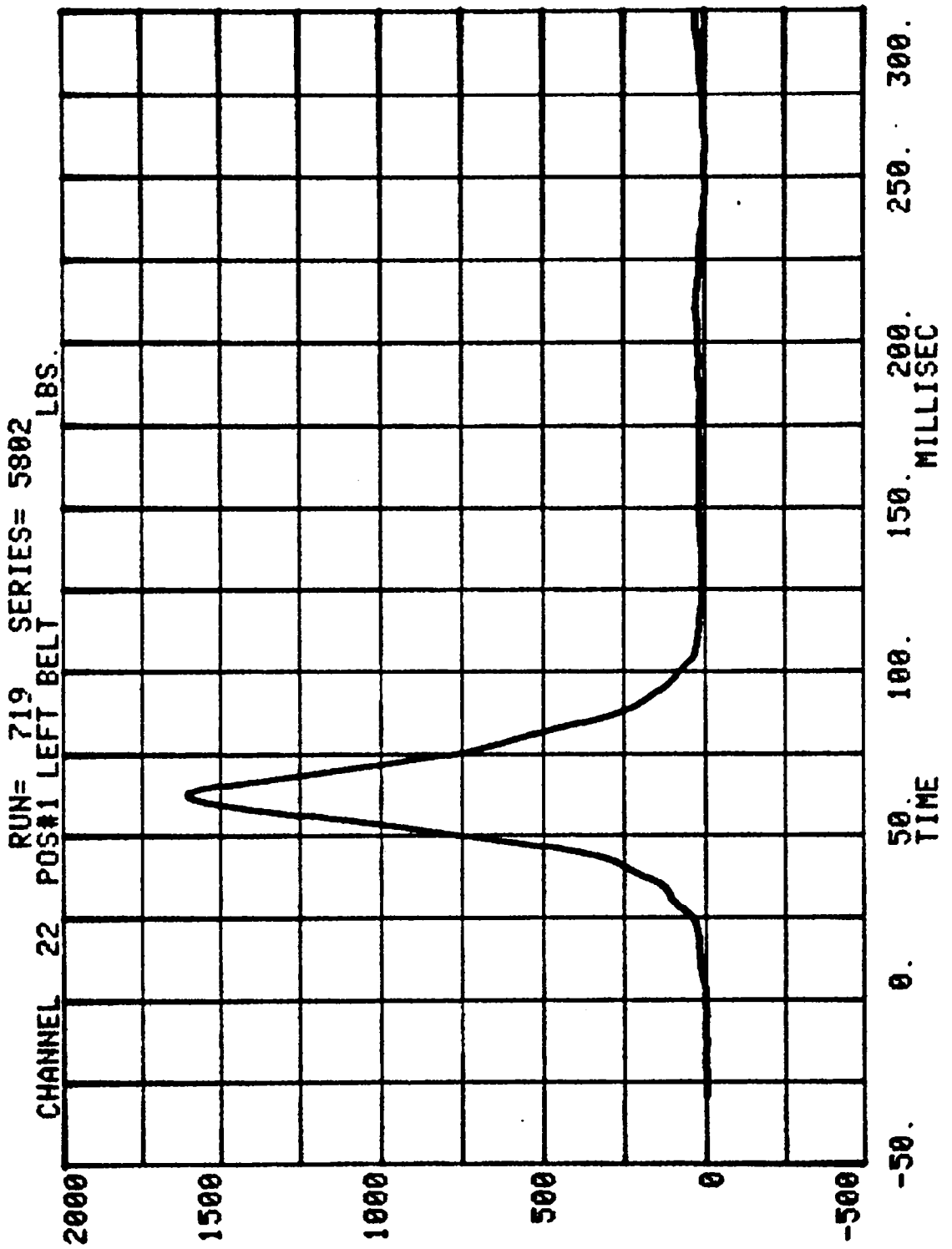
7457-11


CHANNEL 2 POS#1 CHEST R
RUN= 719 SERIES= 5802
G'S
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

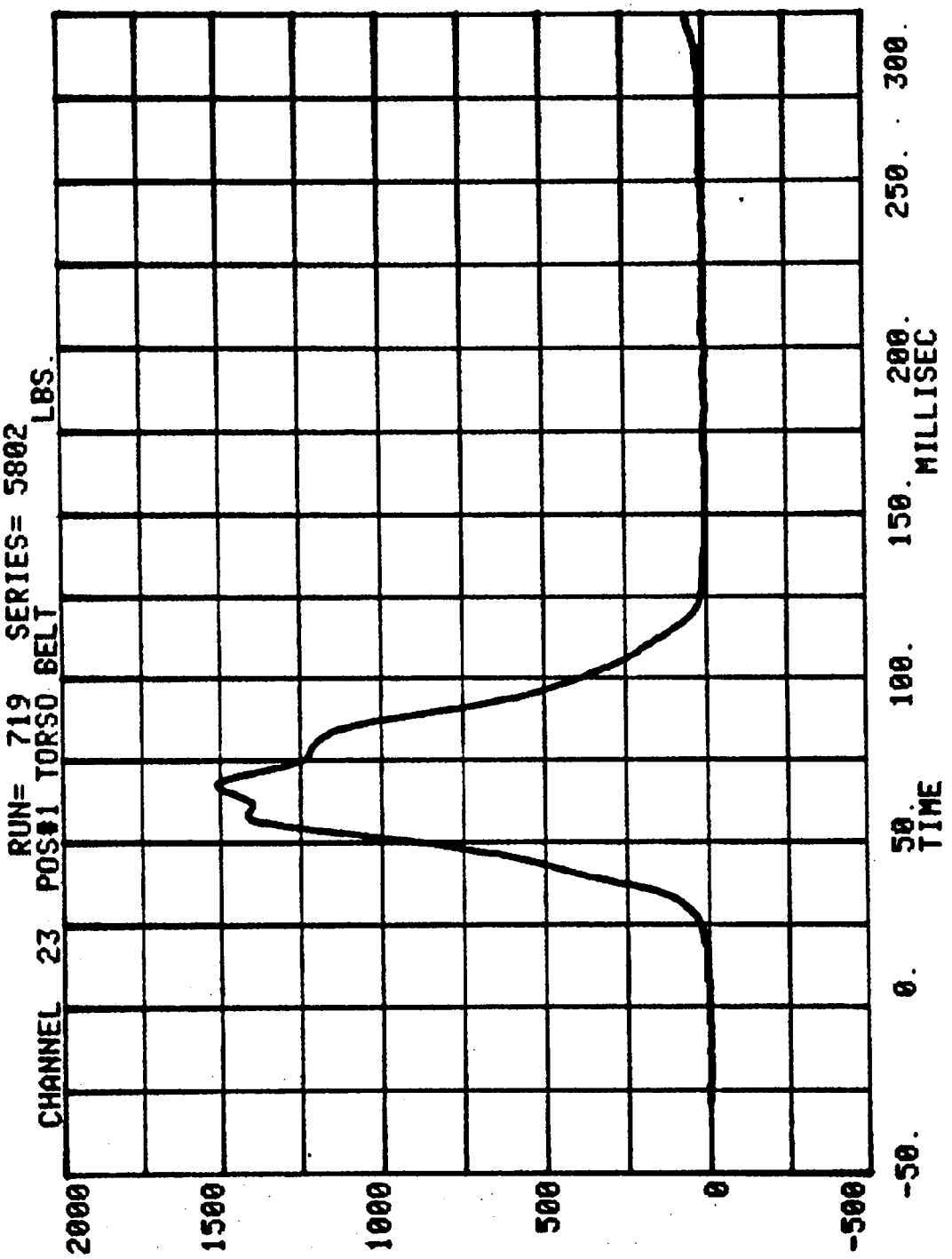

CHANNEL 70 POS#1 RIGHT FEMUR
RUN= 719 SERIES= 5802
LBS.
1600
1200
800
400
0
-400
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

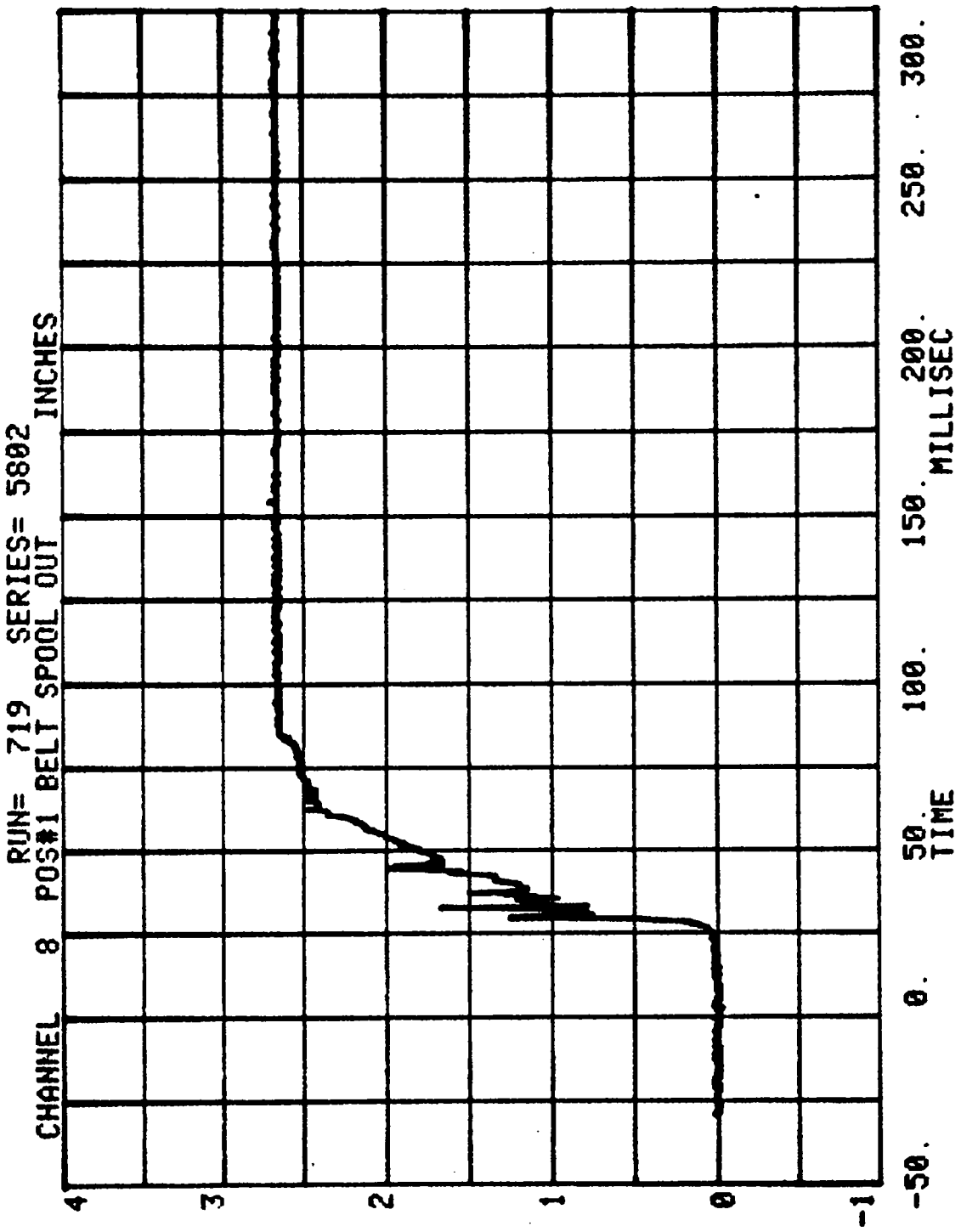

RUN= 719 SERIES= 5802
CHANNEL 12 POS#1 LEFT FEMUR LBS.
1600
1200
800
400
0
-400
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 22 POS#1 LEFT BELT
RUN= 719 SERIES= 5802
LBS.
2000
1500
1000
500
0
-500
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

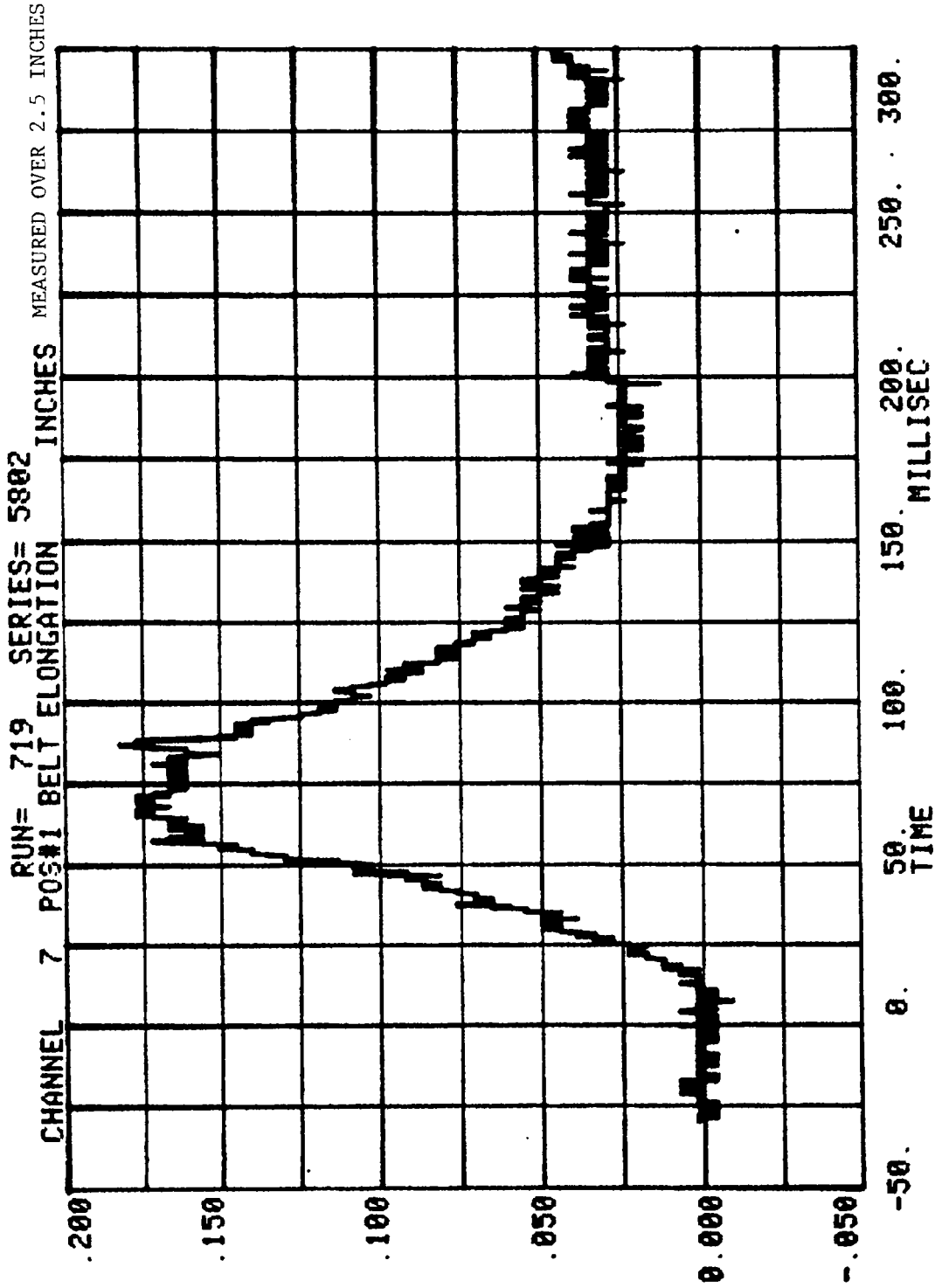
7457-11


CHANNEL 23 POS#1 TORSO BELT
RUN= 719 SERIES= 5802
LBS.
2000
1500
1000
500
0
-500
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11


CHANNEL 8 POS#1 BELT SPOOL OUT
RUN= 719 SERIES= 5802 INCHES
4
3
2
1
0
-1
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11


CHANNEL 7 RUN= 719 SERIES= 5802
POS#1 BELT ELONGATION INCHES MEASURED OVER 2.5 INCHES
.200
.150
.100
.050
0.000
-.050
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

HEAD INJURY CRITERION
HEAD SEVERITY INDEX

NEW CAR ASSESSMENT BARRIER TESTS - 1986

RUN= 719

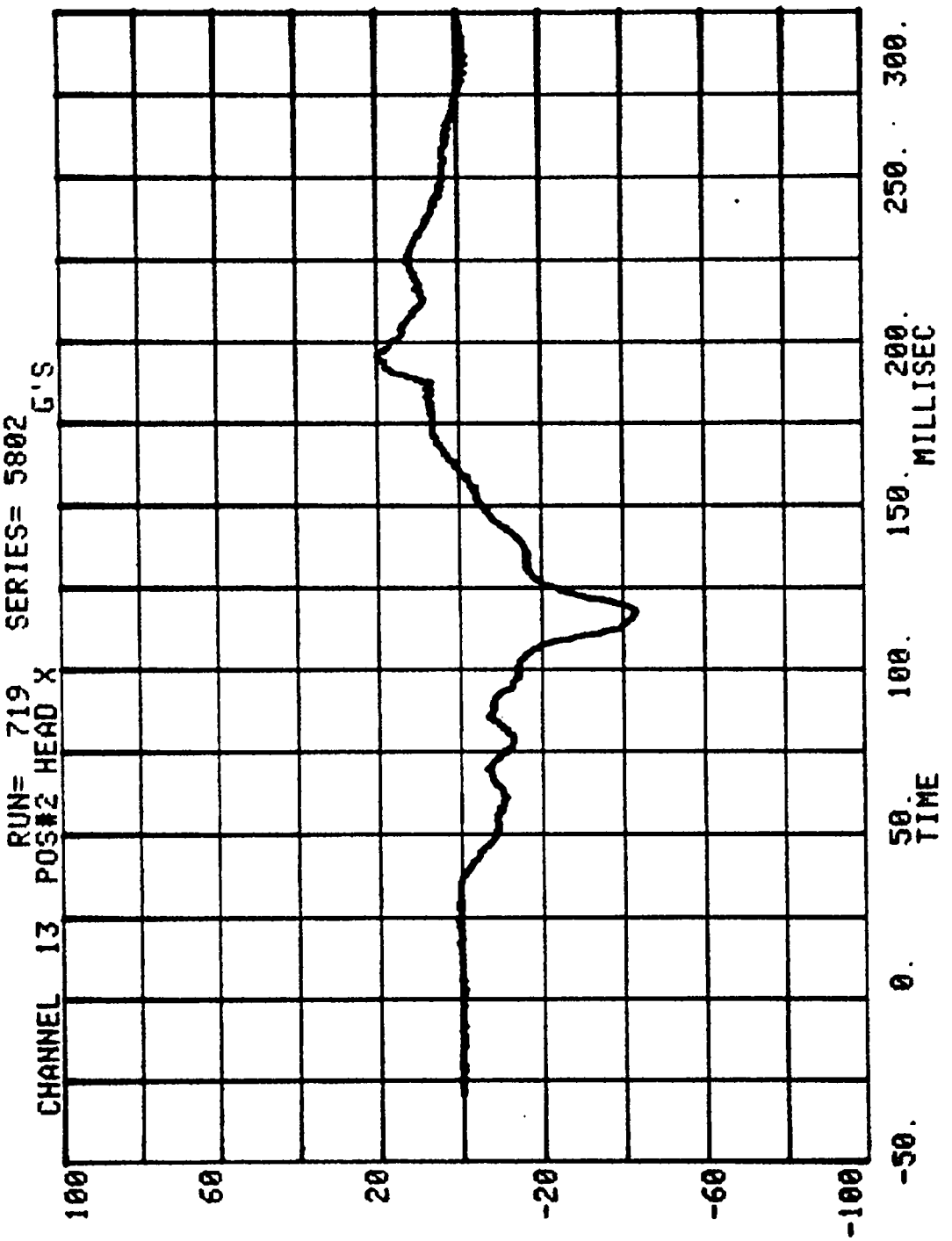
POS#2 HEAD R

HIC=1070.0 FROM T1= .05550 TO T2= .12630

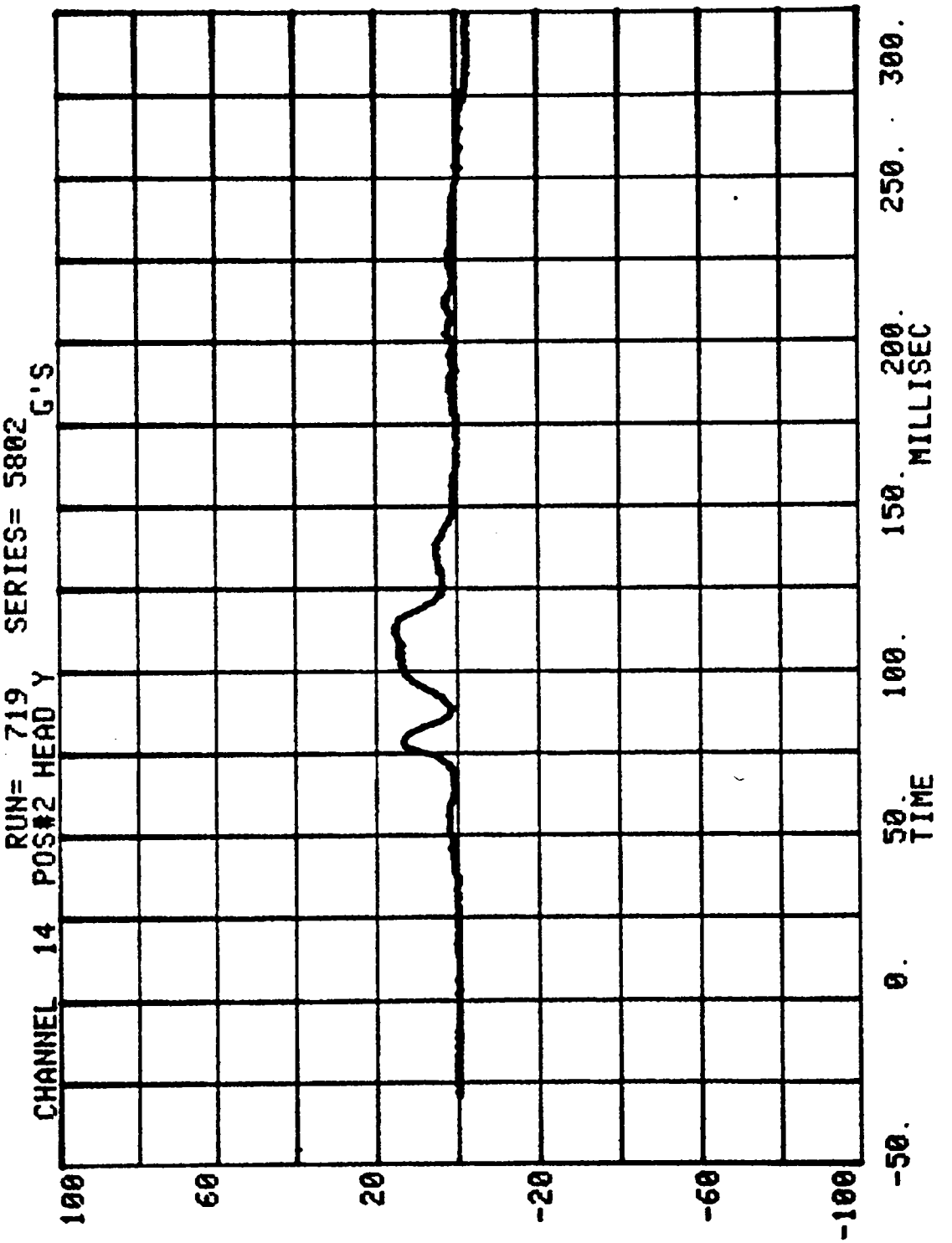
AVERAGE ACCELERATION BETWEEN T1 AND T2= 47.0G'S

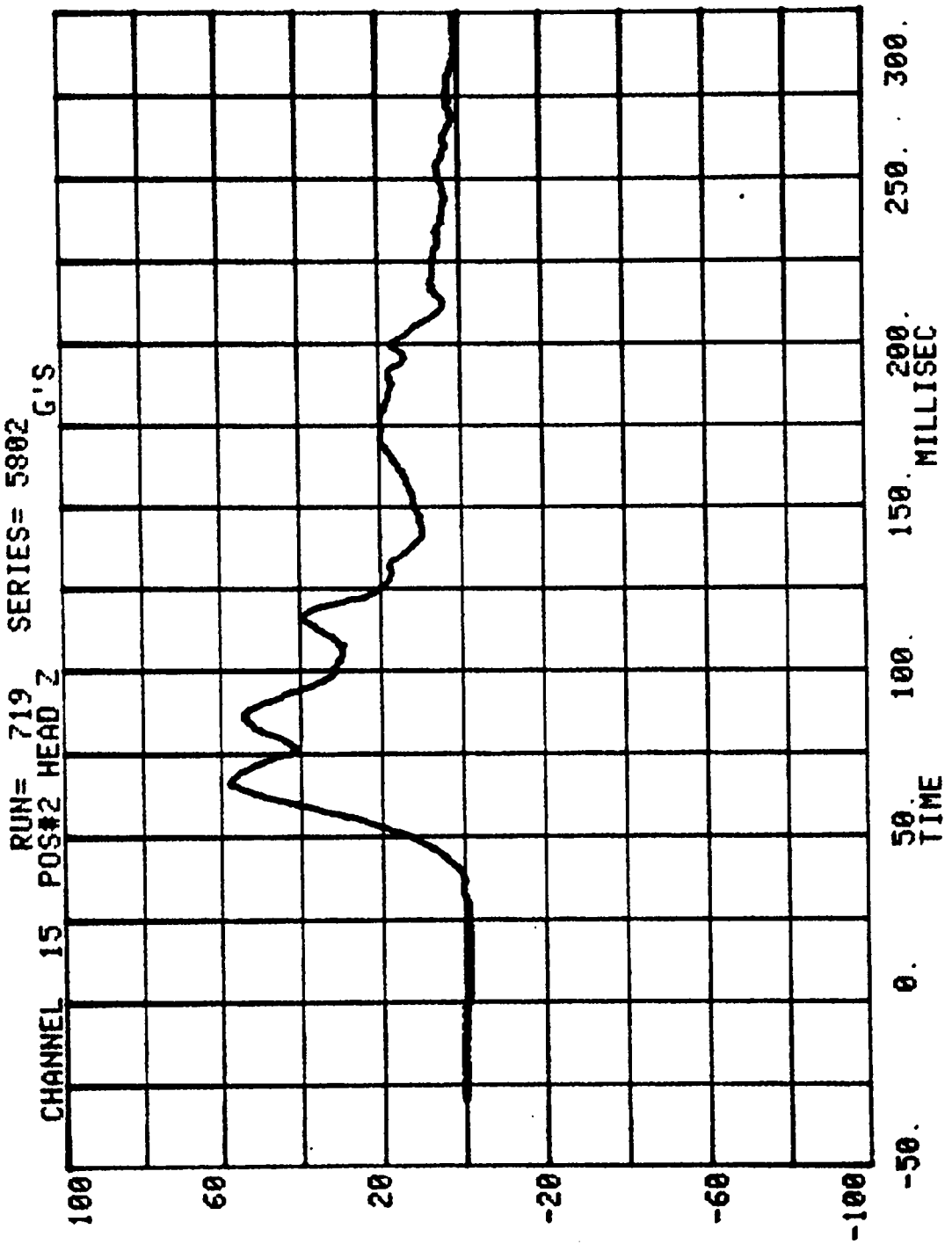
EVENT TIME= 300.0 MSEC

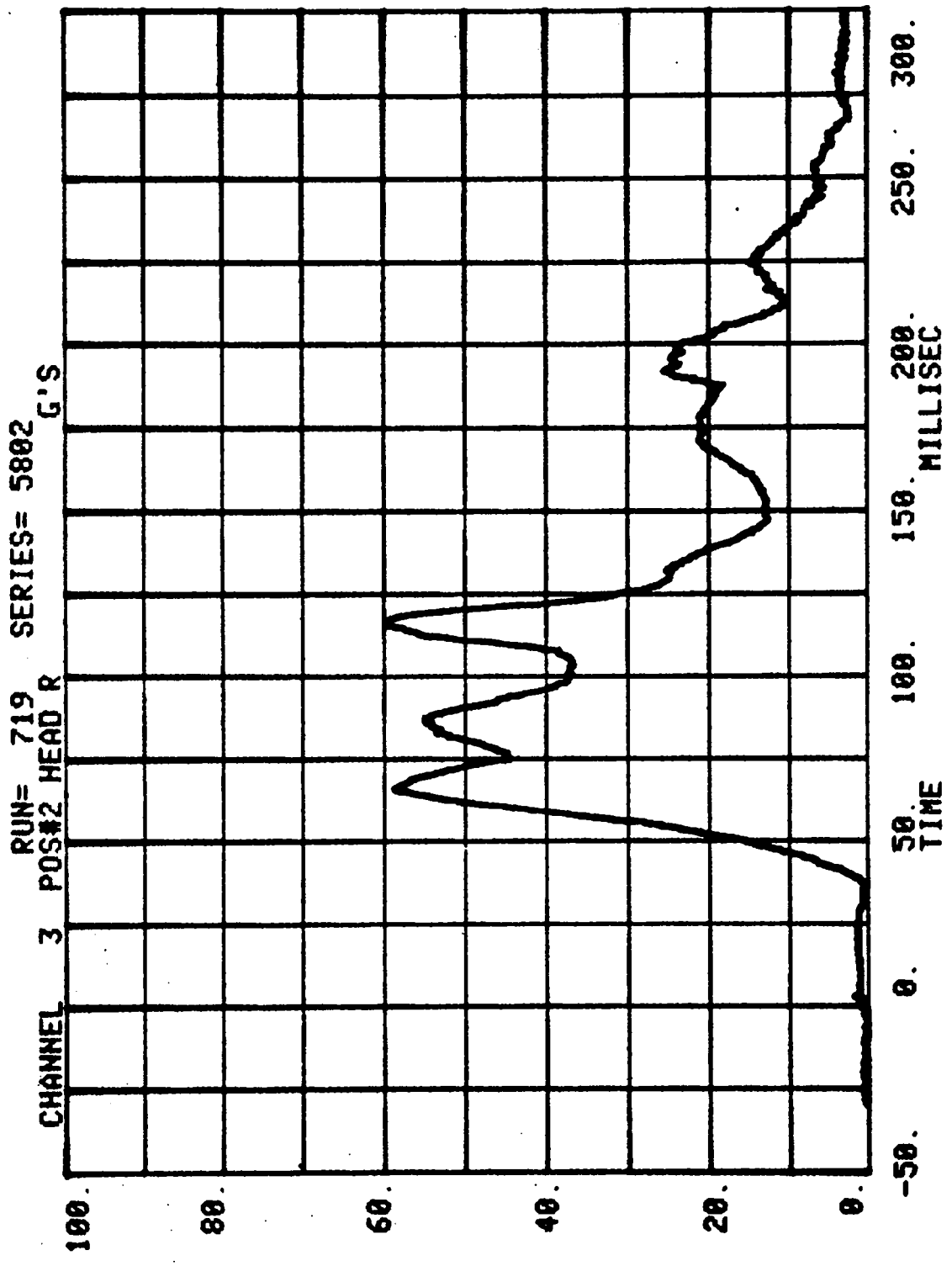
SEVERITY INDEX=1310.5

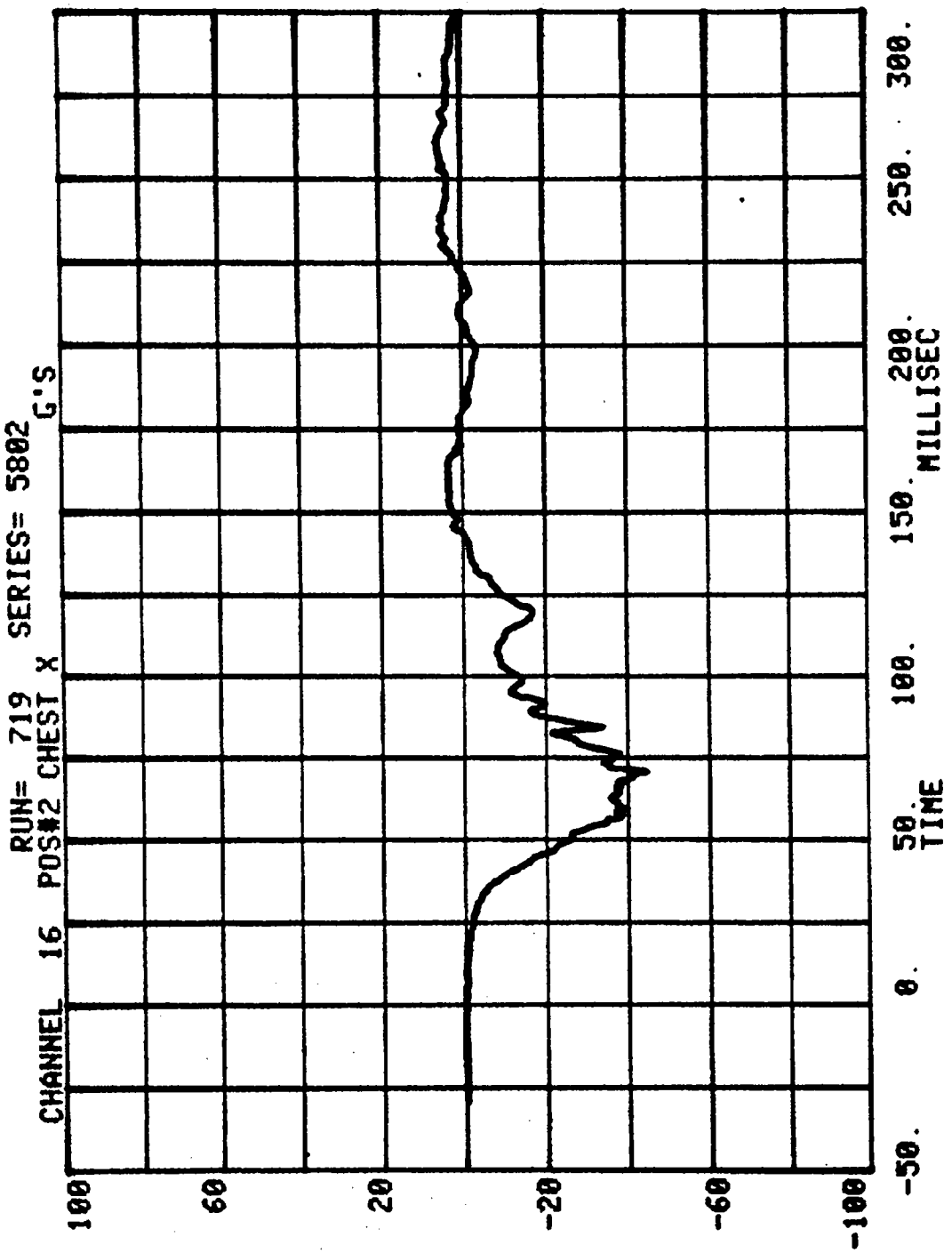

CHANNEL 13 POS#2 HEAD X
RUN= 719 SERIES= 5802
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

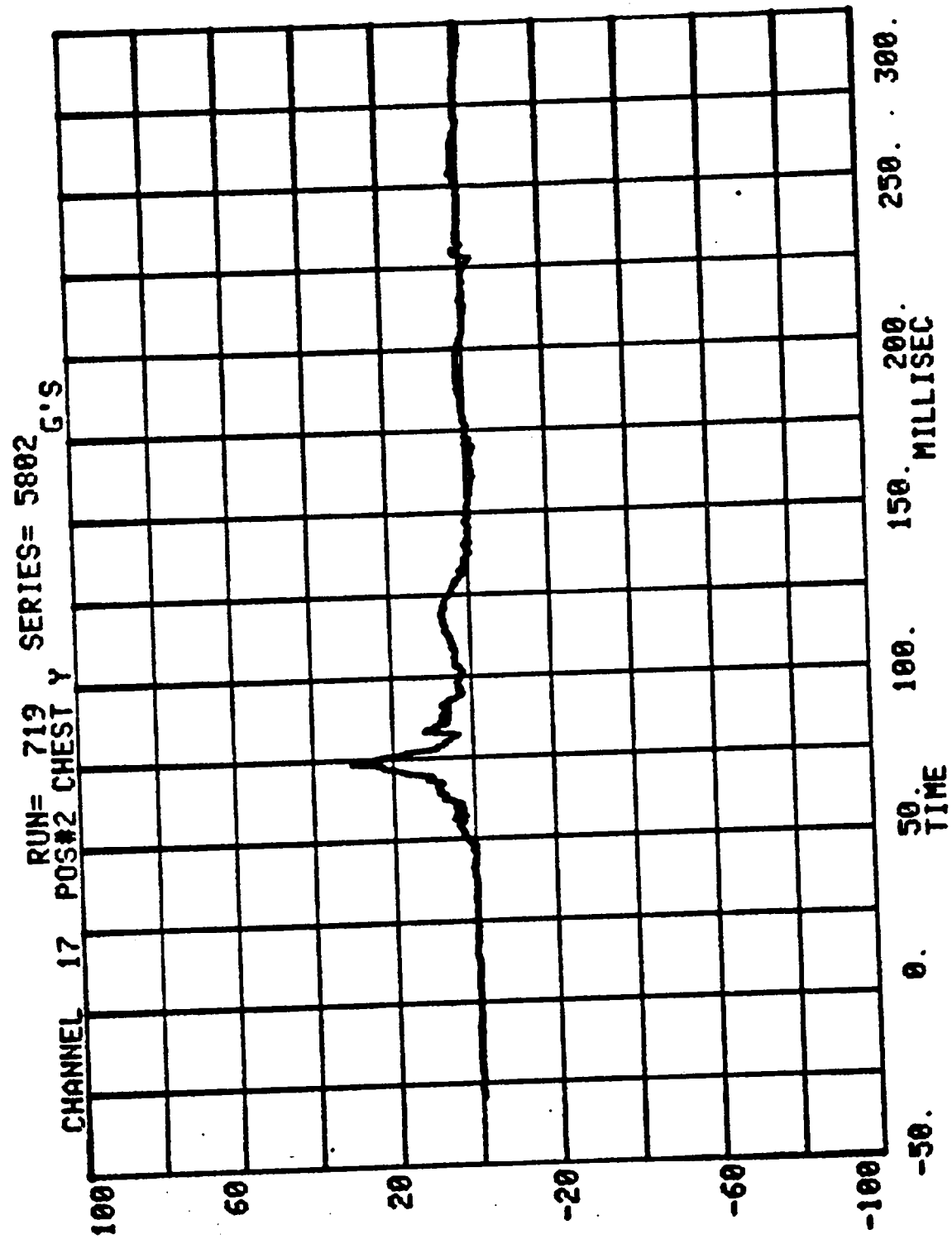

CHANNEL 14 POS#2 HEAD Y
RUN= 719 SERIES= 5802
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

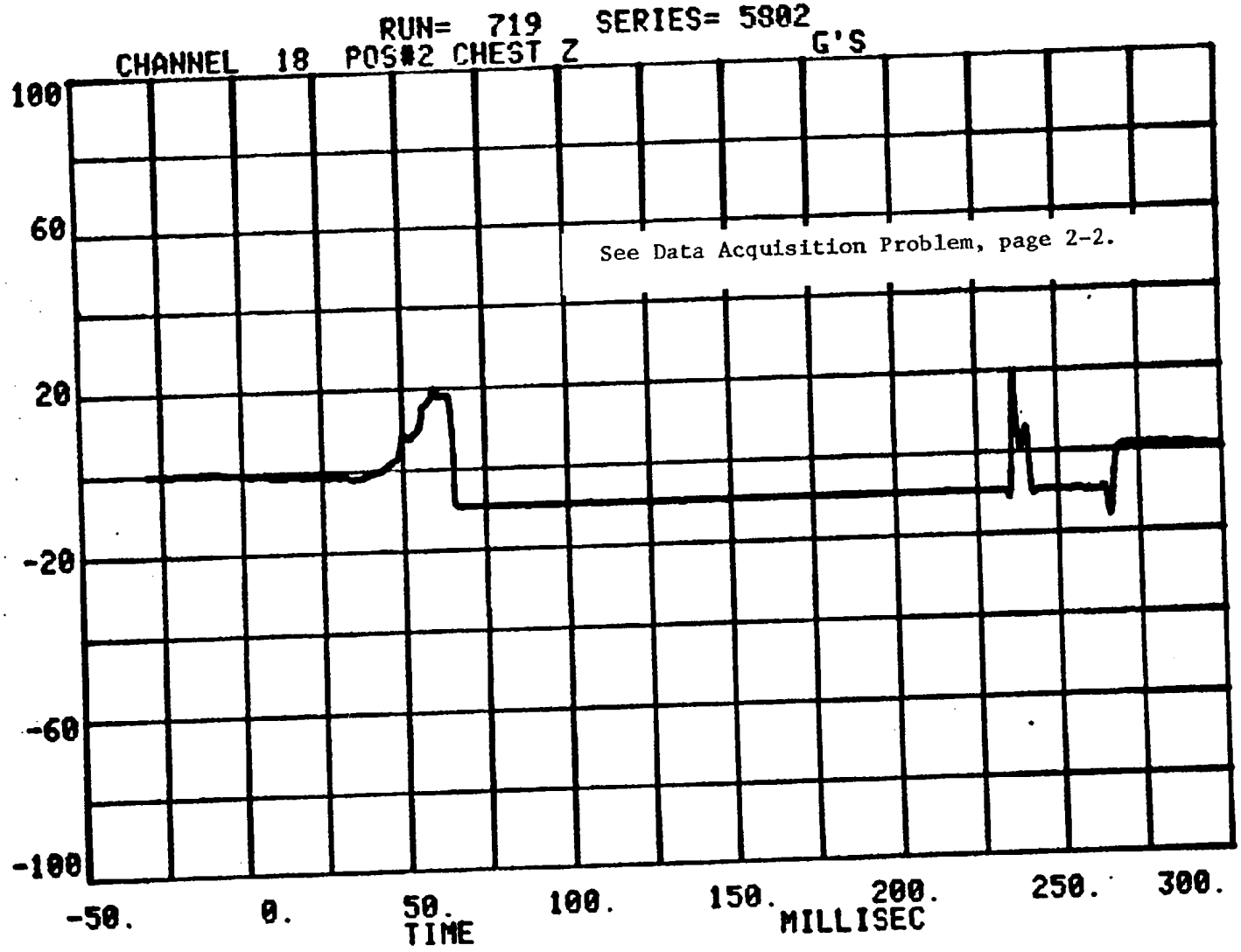

CHANNEL 15 POS#2 HEAD 2
RUN= 719 SERIES= 5802
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 3 RUN= 719 SERIES= 5802
POS#2 HEAD R
G'S
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

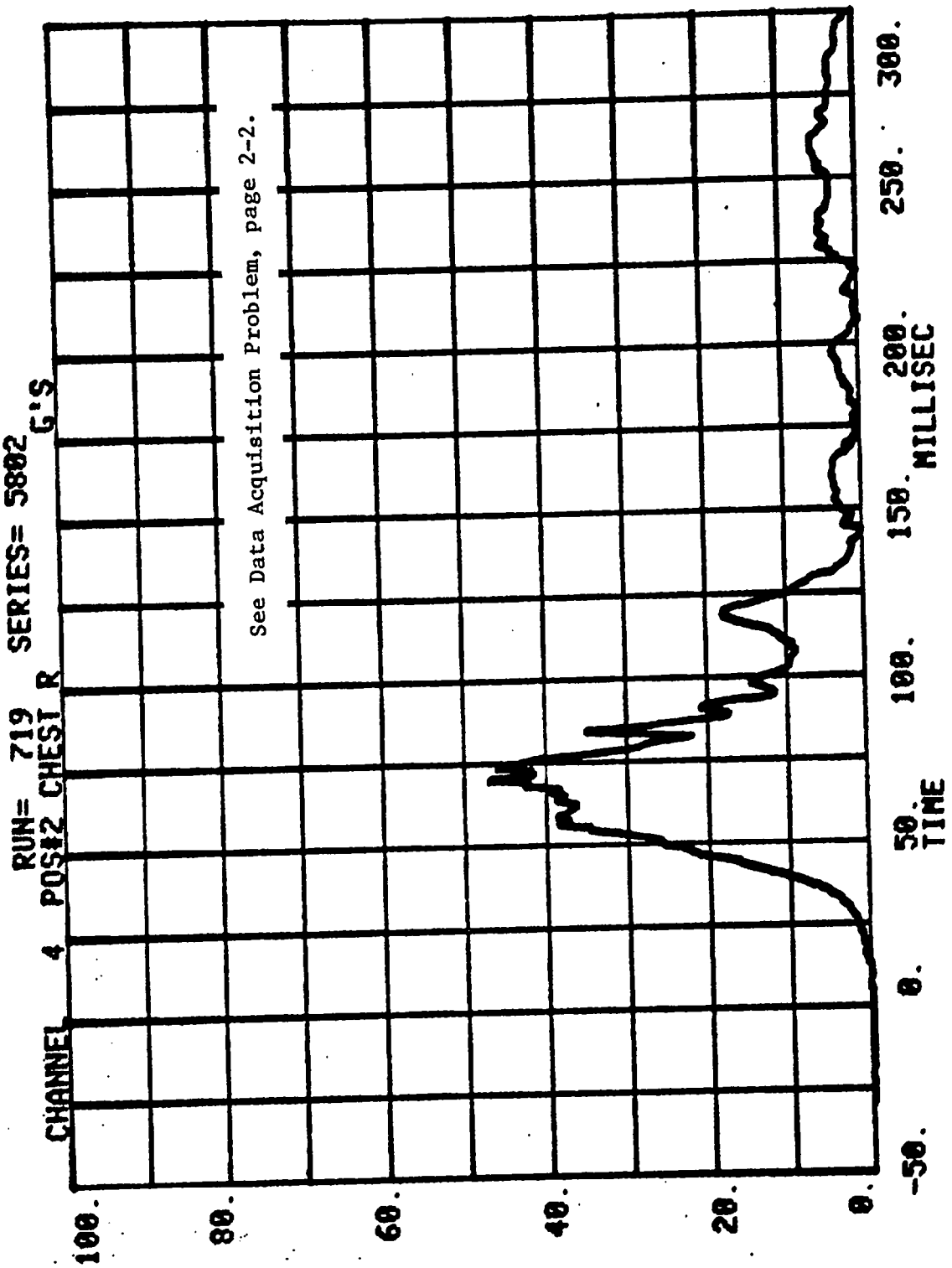

CHANNEL 16 RUN= 719 SERIES= 5802
POS#2 CHEST X
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

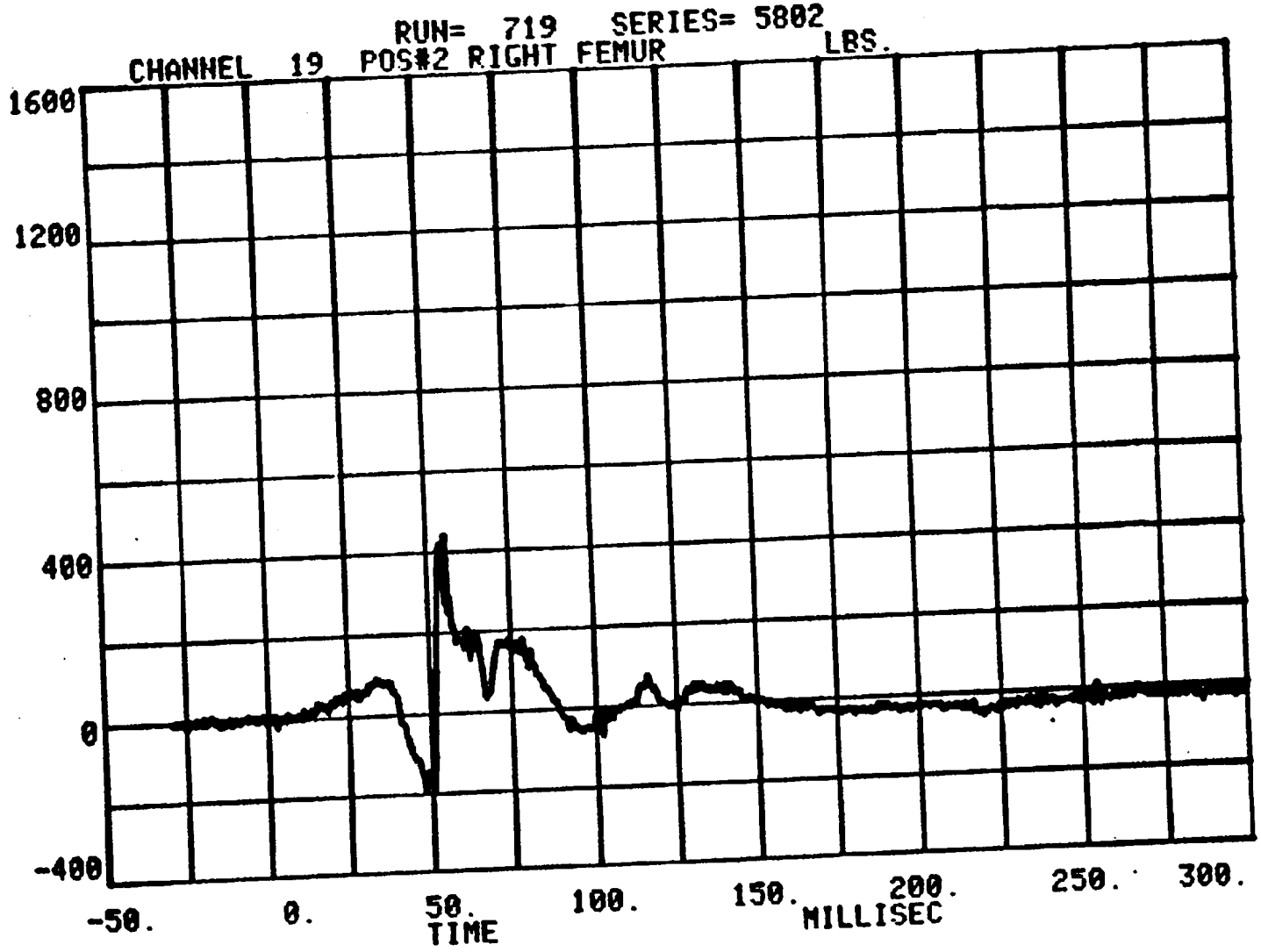

CHANNEL 17 POS#2 CHEST Y
RUN= 719 SERIES= 5802
G'S
100
60
20
-20
-60
-100
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC



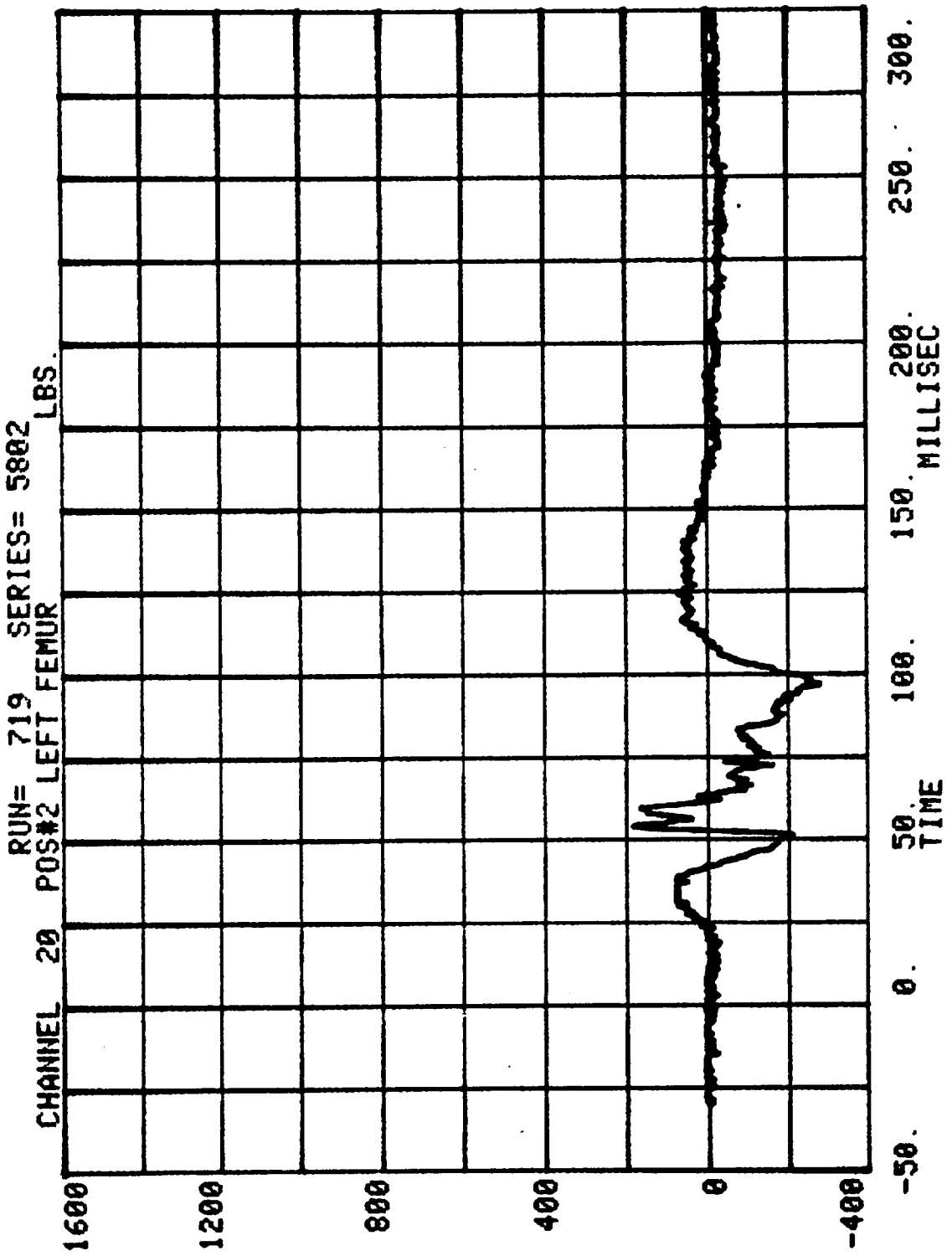
See Data Acquisition Problem, page 2-2.


CHANNEL 4 POS#2 CHEST R
RUN= 719 SERIES= 5802
G'S
See Data Acquisition Problem, page 2-2.
100.
80.
60.
40.
20.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

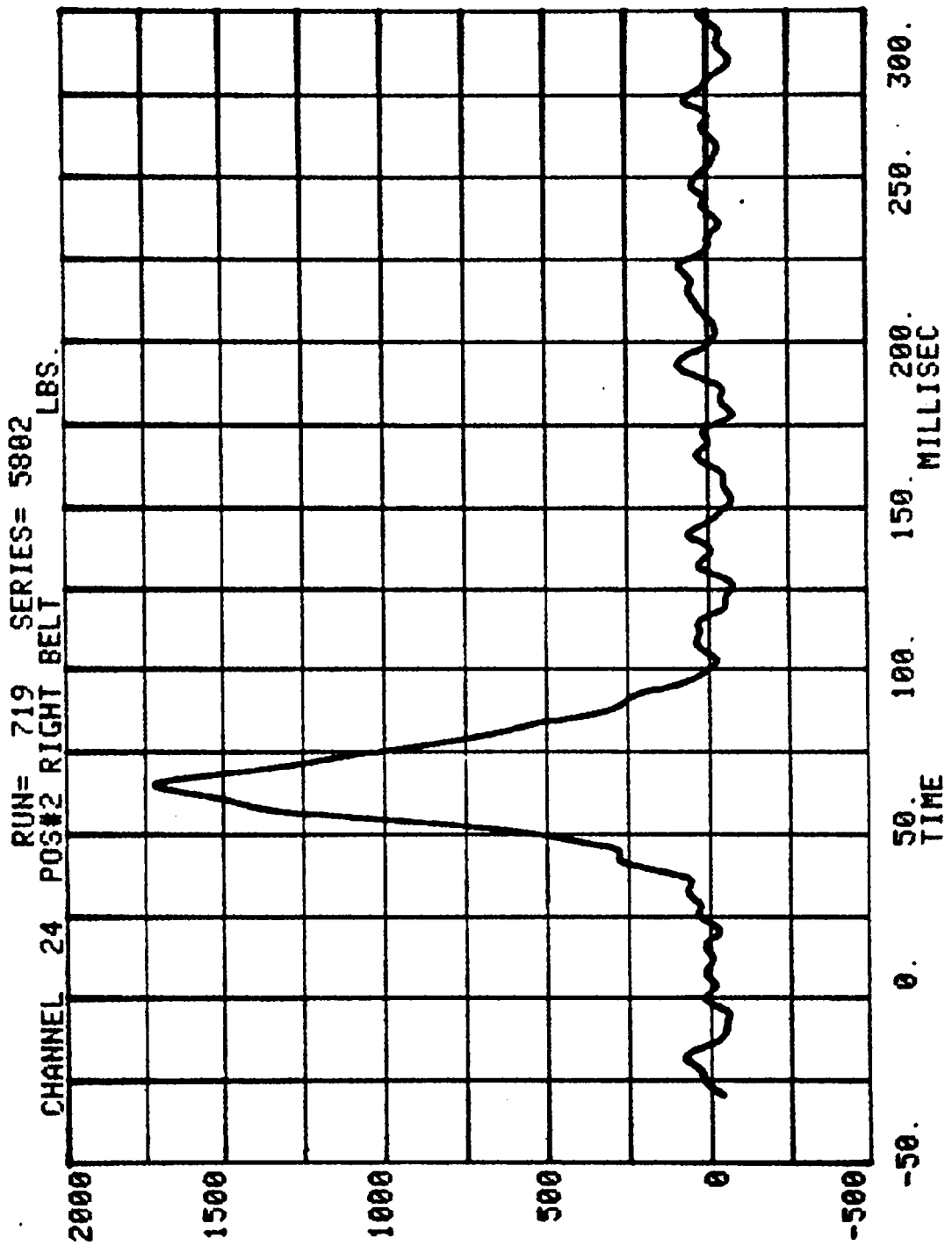
7457-11


RUN= 719 SERIES= 5802
CHANNEL 19 POS#2 RIGHT FEMUR
LBS.
1600
1200
800
400
0
-400
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

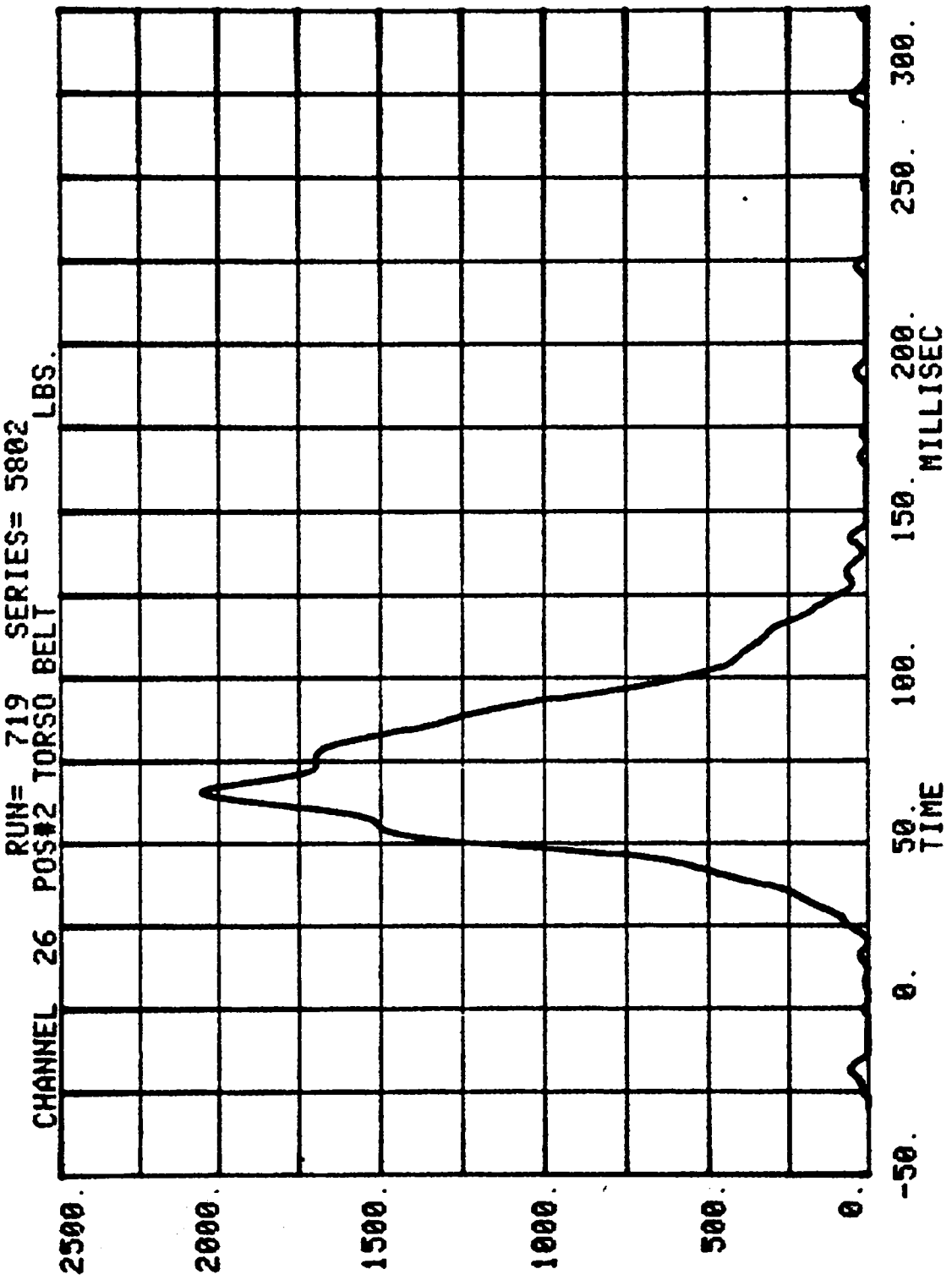
7457-11

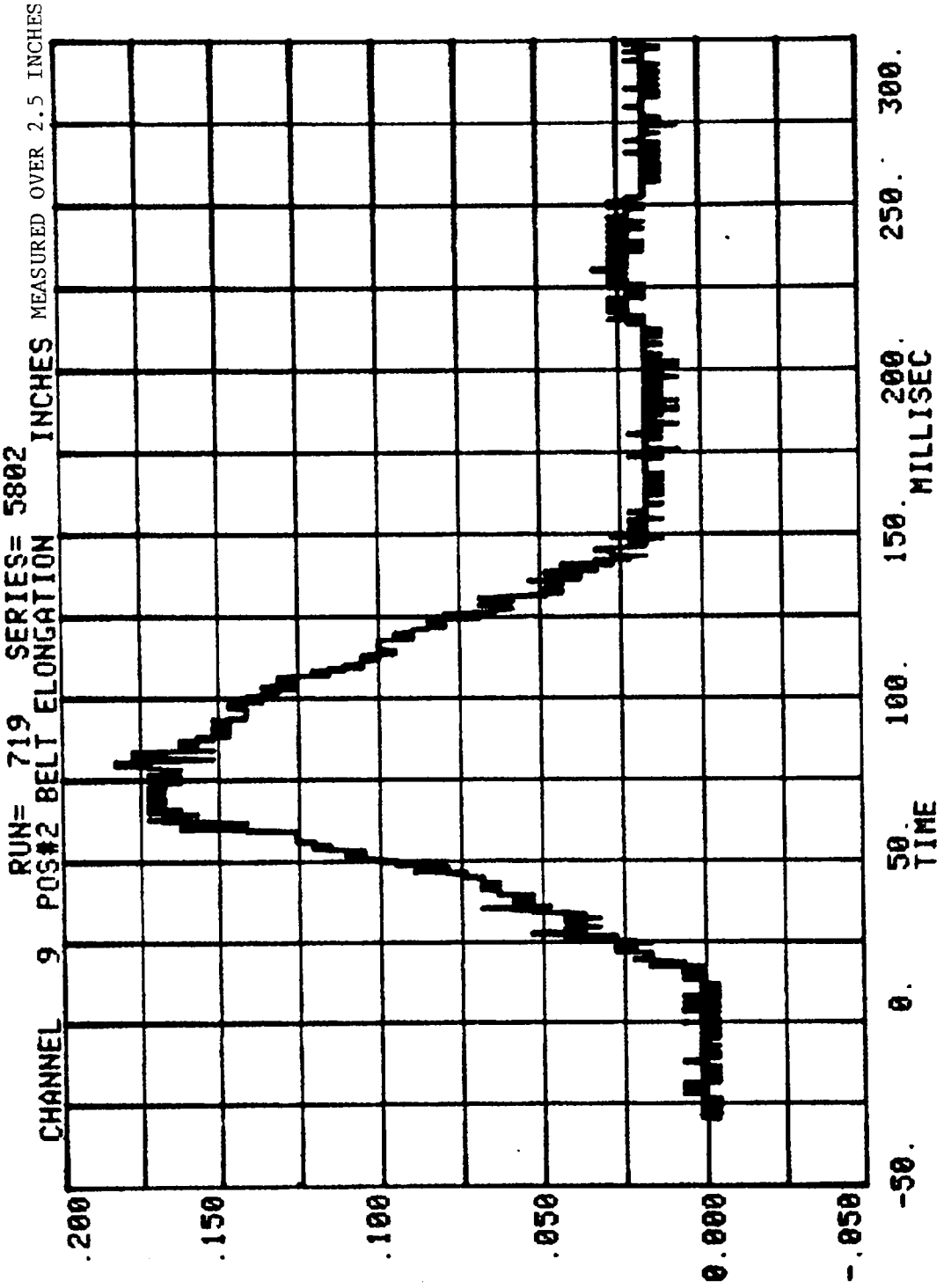

CHANNEL 20 POS#2 LEFT FEMUR
RUN= 719 SERIES= 5802
LBS.
1600
1200
800
400
0
-400
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11


CHANNEL 24 POS#2 RIGHT BELT
RUN= 719 SERIES= 5802 LBS.
2000
1500
1000
500
0
-500
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11


CHANNEL 26 POS#2 TORSO BELT
RUN= 719 SERIES= 5802
LBS.
2500.
2000.
1500.
1000.
500.
0.
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC


CHANNEL 9 RUN= 719 SERIES= 5802
POS#2 BELT ELONGATION INCHES MEASURED OVER 2.5 INCHES
.200
.150
.100
.050
0.000
-.050
-50.
0.
50.
100.
150.
200.
250.
300.
TIME
MILLISEC

7457-11

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
320	2-22-86
1020	2-22-86

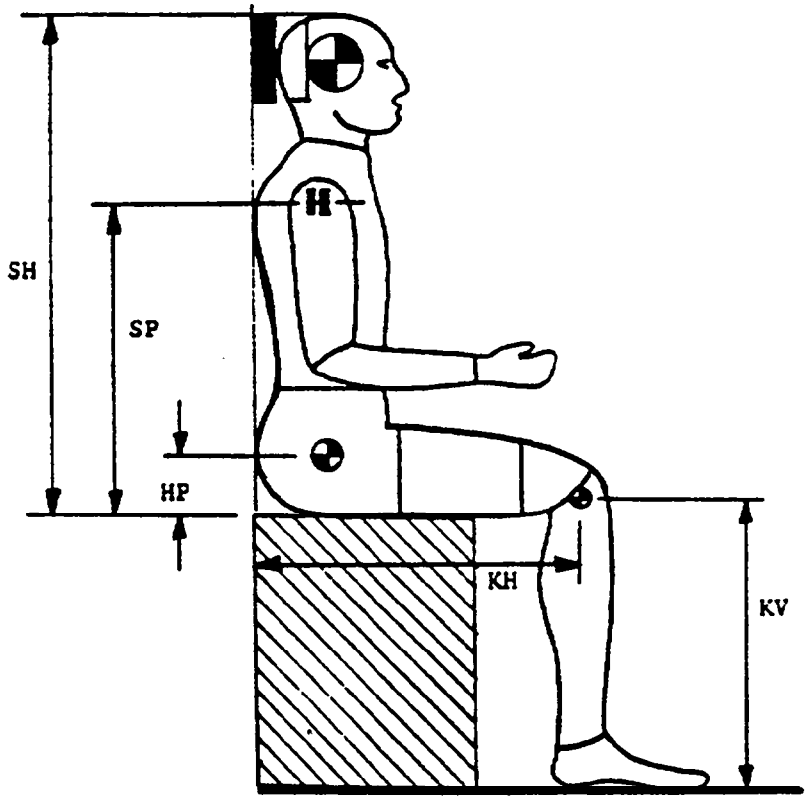
Electronic Test Equipment

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.: 320

I. CONFIGURATION VERIFICATION DATA:



	P.572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		2-22-86	
VERIFICATION NUMBER FOR DUMMY*		2	
SH - Seated Height- - - - - - - -	35.6 to 35.8"	35.7"	
SP - Shoulder Pivot Height- - - -	21.8 to 22.4"	22.1"	
HP - Hip Pivot Height - - - - - -	3.9" ref.	3.9"	
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.5"	
KV - Knee Pivot from floor- - - -	19.3 to 19.9"	19.7"	
SW - Shoulder Width - - - - - - -	17.8 to 18.4"	18.1"	
HW - Hip Width- - - - - - - - - -	14.0 to 15.4"	15.0"	

TECHNICIAN'S NAME: DWH

* 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.: 320

TECHNICIAN'S NAME: DWH

			PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION----------			2-22-86	
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)			20-31 %	%
TEST PARAMETER		SPECIFICATION		
1. HEAD DROP TEST--				
a. Peak Resultant Accel.-		210 to 260G	220g	
b. Peak Lateral Accel.- -		≤ - 10G	2g	
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	22.9 fps	
b. Pend. Avg. Decel. over $t_3 - t_2$		20 to 24G	24g	
c. Peak Resultant Head Acceleration - - - - -		26G max.	25g	
d. Pendulum Decel.(t_2-t_1)		≤ - 3ms	2 ms	
e. Pendulum Decel.(t_3-t_2)		25 to 30 ms	26.4 ms	
f. Pendulum Decel.(t_4-t_3)		≤ - 10ms	3 ms	
g. Max. Head Rotation - -		63 to 73°	65°	
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	29.2 ms	
	Displ.-	2.1 to 3.1"	3.1"	
60°	Time- -	40.3 to 51.7ms	44.5 ms	
	Displ.-	4.3 to 5.3"	5.0"	
Maximum (65 °)	Time- -	53.2 to 66.8ms	57.7 ms	
	Displ.-	5.0 to 6.0"	5.3"	

*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.: 320

TECHNICIAN'S NAME: DWH

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	68.7 ms	
	Displ.	4.3 to 5.3 in.	5.1"	
30°	Time	85.4 to 104.6 ms	89.0 ms	
	Displ.	2.1 to 3.1 in.	2.7"	
0°	Time	101.0 to 123.0 ms	101.8 ms	
	Displ.	-.5 to 0.5 in.	0.0"	
3. ABDOMINAL COMPRESSION TEST:				
(Preload = 10 pounds)				
a. Force @ .5" - - - - -		23 to 36 lbs.	26#	
b. Force @ .75" - - - - -		36 to 50 lbs.	42.1#	
c. Force @ 1.0" - - - - -		50 to 63 lbs.	57.5#	
d. Force @ 1.3" - - - - -		73 to 88 lbs.	82.5#	
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - - -		22 to 34 lbs.	33.0#	
b. Force @ 30° - - - - -		34 to 46 lbs.	42.0#	
c. Force @ 40° - - - - -		46 to 58 lbs.	55.0#	
d. Return Angle - - - - -		12° maximum	5°	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed- - -		21.78-22.22 fps	22.20 fps	
(2) Peak Deflection-		1.7" maximum	1.52"	
(3) Peak Resistive Force- - - - - -		2250 lbs. maximum	2236#	
(4) Internal Hysteresis - - -		50 to 70%	56.1%	
b. Low Speed				
(1) Probe Speed- - -		13.86-14.14 fps	13.95 fps	
(2) Peak Deflection-		1.1" maximum	.92"	
(3) Peak Resistive Force- - - - - -		1450 lbs. maximum	1404#	
(4) Internal Hyster.		50 to 70%	51.2%	

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

II. PERFORMANCE VERIFICATION DATA (Continued) NHTSA DUMMY I.D. NO.: 320

TECHNICIAN'S NAME: DWH

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.	2450 #	
(3) Time Above 1000#-	1.7 ms minimum	4.7 ms	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.87 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2150#	
(3) Time Above 1000#-	1.7 ms minimum	3.7 ms	

REMARKS:

INSTRUMENT CALIBRATION INFORMATION

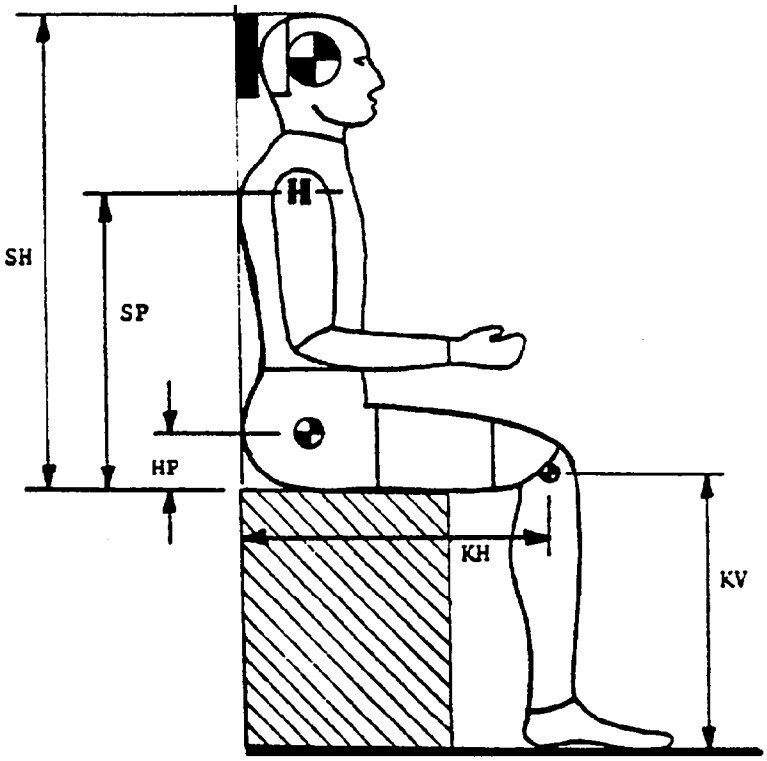
HTSA DUMMY ID NO. 320 CALIB. SEQ. NOS. FOR DUMMY: 2

	MANUFACTURER	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
A. DUMMY INSTRUMENTS:				
1. Head Accelerometers --				
a. Triaxial unit - - - - -	NA	--	--	--
b. Uniaxial units				
(1) Longitudinal (A_x) -	Endevco	CJ22	10-85	4-86
(2) Lateral (A_y) - - -	Endevco	CS41	10-85	4-86
(3) Vertical (A_z) - - -	Endevco	CH21	10-85	4-86
2. Chest Accelerometers -- (Vehicle Crash Test Usage)				
a. Triaxial unit - - - - -	NA	--	--	--
b. Uniaxial units				
(1) Longitudinal (A_x) -	CEC	A73	10-85	4-86
(2) Lateral (A_y) - - -	Endevco	CE06	10-85	4-86
(3) Vertical (A_z) - - -	CEC	A44	10-85	4-86
3. Chest Potentiometer - - -	NA	--	--	--
4. Femur Load Cells --				
a. Right Side - - - - - -	GSE	549	11-85	5-86
b. Left Side - - - - - -	GSE	548	11-85	5-86
B. CALIB. LAB. INSTRUMENTS:				
1. Pendulum Accelerometer - - -	CEC	18259	9-85	3-86
2. Test Probe Accelerometer - - -	CEC	17815	9-85	3-86
3. Lumbar Flexion Test Push Force Gauge - - - - - - - - -	Transducer Inc	20051	11/85	5/86
4. Abdominal Compression Test Force Gauge - - - - - - - - -	BLH	72952	11/85	5/86
5. Abdominal Compression Test Displacement Gauge - - - - -	CIC	567-11	11/85	5/86

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		2-22-86	
VERIFICATION NUMBER FOR DUMMY*		2	
SH - Seated Height- - - - - - - -	35.6 to 35.8"	35.7"	
SP - Shoulder Pivot Height- - - -	21.8 to 22.4"	22.1"	
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"	18.0"	
HW - Hip Width- - - - - - - - - -	14.0 to 15.4"	14.7"	

TECHNICIAN'S NAME: DWH

* 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: DWH

			PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION----------			2-22-86	
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)			20-31 %	%
TEST PARAMETER		SPECIFICATION		
1. HEAD DROP TEST--				
a. Peak Resultant Accel.-		210 to 260G	220g	
b. Peak Lateral Accel.- -		≤ - 10G	3g	
c. Time above 100G- - - -		0.9 to 1.5ms	1.05 ms	
2. NECK BENDING TEST--				
a. Pendulum Speed - - - -		21.5 to 25.5 fps	23.03 fps	
b. Pend. Avg. Decel. over $t_3 - t_2$		20 to 24G	24g	
c. Peak Resultant Head Acceleration - - - - -		26G max.	25.6g	
d. Pendulum Decel.(t_2-t_1)		≤ - 3ms	2 ms	
e. Pendulum Decel.(t_3-t_2)		25 to 30 ms	26.5 ms	
f. Pendulum Decel.(t_4-t_3)		≤ - 10ms	3.2 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	29 ms	
	Displ.-	2.1 to 3.1"	3.1"	
60°	Time- -	40.3 to 51.7ms	44 ms	
	Displ.-	4.3 to 5.3"	5.2"	
Maximum (°)	Time- -	53.2 to 66.8ms	58.6 ms	
	Displ.-	5.0 to 6.0"	5.7"	

*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: DWH

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	69 ms	
	Displ.	4.3 to 5.3 in.	5.1"	
30°	Time	85.4 to 104.6 ms	89.4 ms	
	Displ.	2.1 to 3.1 in.	2.6"	
0°	Time	101.0 to 123.0 ms	105 ms	
	Displ.	-.5 to 0.5 in.	0	
3. ABDOMINAL COMPRESSION TEST: (Preload = 10 pounds)				
a. Force @ .5" - - - - -		23 to 36 lbs.	28.2"	
b. Force @ .75" - - - - -		36 to 50 lbs.	43.7"	
c. Force @ 1.0" - - - - -		50 to 63 lbs.	61.0"	
d. Force @ 1.3" - - - - -		73 to 88 lbs.	84.5"	
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - - -		22 to 34 lbs.	33.5#	
b. Force @ 30° - - - - -		34 to 46 lbs.	45.5#	
c. Force @ 40° - - - - -		46 to 58 lbs.	56.5#	
d. Return Angle - - - - -		12° maximum	8°	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed- - -		21.78-22.22 fps	22.2 fps	
(2) Peak Deflection-		1.7" maximum	1.68"	
(3) Peak Resistive Force- - - - - -		2250 lbs. maximum	2028#	
(4) Internal Hysteresis - - -		50 to 70%	58.7%	
b. Low Speed				
(1) Probe Speed- - -		13.86-14.14 fps	14.1 fps	
(2) Peak Deflection-		1.1" maximum	1.02"	
(3) Peak Resistive Force- - - - - -		1450 lbs. maximum	1394#	
(4) Internal Hyster.		50 to 70%	61.2%	

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

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

TECHNICIAN'S NAME: DWH

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	6.99 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2375#	
(3) Time Above 1000#-	1.7 ms minimum	4.4 ms	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.89 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2000#	
(3) Time Above 1000#-	1.7 ms minimum	3.5 ms	

REMARKS:

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NO. 1020 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	CS70	10-85	4-86
(2) Lateral (A_y) - - -	Endevco	CH35	10-85	4-86
(3) Vertical (A_z) - - -	Endevco	CU88	10-85	4-86
2. Chest Accelerometers -- (Vehicle Crash Test Usage)				
a. Triaxial unit - - - - -	NA	--	--	--
b. Uniaxial units				
(1) Longitudinal (A_x) -	CEC	A84	10-85	4-86
(2) Lateral (A_y) - - -	Endevco	CY71	10-85	4-86
(3) Vertical (A_z) - - -	CEC	A86	10-85	4-86
3. Chest Potentiometer - - -	NA	--	--	--
4. Femur Load Cells --				
a. Right Side - - - - - -	GSE	551	11-85	5-86
b. Left Side - - - - - -	GSE	552	11-85	5-86
B. CALIB. LAB. INSTRUMENTS:				
1. Pendulum Accelerometer - - -	CEC	18259	9/85	3/86
2. Test Probe Accelerometer - - -	CEC	17815	9/85	3/86
3. Lumbar Flexion Test Push Force Gauge - - - - - - - - -	Transducer Inc.	20051	11-85	5-86
4. Abdominal Compression Test Force Gauge - - - - - - - - -	BLH	72952	11-85	5-86
5. Abdominal Compression Test Displacement Gauge - - - - -	CIC	567-11	11-85	5-86

APPENDIX D

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

WARNING

■ For your and your passenger's protection, use safety belts at all times while the vehicle is in motion.

■ Safety belts must be properly positioned on the body. Improperly positioned safety belts can cause serious personal injury in case of an accident. Therefore heed all of the following warnings and instructions.

■ When fastening the lap/shoulder belt, the shoulder belt should be positioned midway over the shoulder – never across the neck. See illustration on next page.

■ The combination lap/shoulder belt on the front seats can be adjusted to fit over the body by using the seat height adjustor* or by having a shoulder belt height adjustor installed in your vehicle. Contact your VW dealer.

■ Children who are less than 12 years old should sit in the rear and should wear, depending on age, either a child restraint system or the existing safety belts:
– Infants or toddlers should be secured with a child restraint system designed for their size which conforms to Federal Regulation FMVSS 213.

*where applicable

When installing and using a child restraint system, always follow the instructions of the manufacturer.

– Children at about six years old and older may wear lap belts.

– If the child is big enough to wear a combination lap/shoulder belt, make sure that the shoulder belt is positioned midway over the shoulder – never across the neck of the child. See illustration on next page.

■ Do not strap in more than one person with each belt.

■ For maximum effectiveness, the lap belt must be worn low and tight across the pelvic crest.

■ Do not wear shoulder part of belt under your arm or otherwise out of position. This would increase the possibility of serious injury in case of an accident.

■ Belts should not be worn twisted.

■ Do not wear belts over rigid or breakable objects in or on your clothing, such as eye glasses, pens, keys, etc. as these may cause injury.

■ Several layers of heavy clothing may interfere with proper positioning of belts.

■ Belts must not rub against sharp objects.

■ Keep belt buckles free of any obstruction that may prevent secure locking.

■ Make sure the belt of the unoccupied passenger seat is fully wound up on its retractor so that the belt tongue is in its stowed position. This reduces the possibility of the tongue becoming a striking object in case of a sudden stop.

■ Belts that have been subjected to excessive stretch forces in an accident must be replaced.

■ If belts show damage to webbing bindings, buckles or retractors, they should be replaced.

■ If belts do not work properly, see your VW dealer.

■ Do not modify or disassemble the safety belts in your vehicle.

■ The belts must be kept clean as otherwise the retractors may not work properly (also see "Vehicle care", page 59.

■ Never bleach or dye safety belts.

■ Do not allow safety belts to retract until they are completely dry.

Combination lap-shoulder belts

Belt warning system

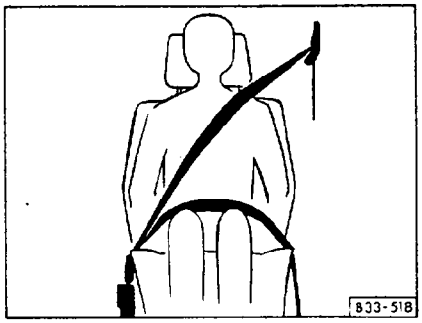
An audio-visual warning system is interconnected with the driver's safety belt.

Every time the ignition is turned on, the "FASTEN BELTS" warning light will come on for about six seconds as a reminder to buckle up. If the driver does not fasten the safety belt, the chime will also come on for six seconds. With the driver's door closed, the chime will go off as soon as the driver has buckled up.

Inertia reel retractor

The combination lap-shoulder belt with inertia reel locking mechanism adjusts automatically to your size and movements as long as the pull on the belt is slow.

Rapid deceleration during hard braking or a collision locks the belt. The belt will also lock when you drive up or down a steep hill or in a sharp curve.



■ To fasten, grasp belt tongue and pull belt in continuous slow motion across your chest and lap.

■ Insert belt tongue into buckle on inboard side of seat. Push down until it is securely locked with an audible click. Pull belt to check.

■ Pull shoulder section to make sure belt fits snugly across the hips.

The shoulder belt must be positioned midway over the shoulder – **never across the neck.** See illustration.

■ Belts should fit snugly across the pelvis and chest. Make sure any slack is wound on the retractor.

■ Do not wear shoulder part of belt under your arm or otherwise out of position. This would increase the possibility of serious injury in case of an accident.

■ To unfasten belt, push in release button on buckle. Belt will spring out of buckle.

■ To release a locked belt, lean back to take the body pressure off the belt.

■ To store lap-shoulder belt, allow belt to wind up on retractor as you guide belt tongue to its stowed position.