

**NEW CAR ASSESSMENT PROGRAM (NCAP)  
FRONTAL BARRIER IMPACT TEST**

VOLKSWAGEN DO BRASIL S.A.  
1989 VOLKSWAGEN FOX  
2-DOOR SEDAN

NHTSA NO. MK5801  
CALSPAN TEST NO. 7731-13

CALSPAN CORPORATION  
ADVANCED TECHNOLOGY CENTER  
P.O. BOX 400  
BUFFALO, NEW YORK 14225

May 18, 1989



**FINAL REPORT**

Prepared for:  
U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
OFFICE OF MARKET INCENTIVES  
400 SEVENTH STREET, S.W.  
ROOM NO. 5313 (NRM-20)  
WASHINGTON, DC 20590

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                                      |                                                                                                                                                                                                                                |                                                                        |  |
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| 9. Performing Organization Name and Address<br>Calspan Advanced Technology Center<br>P.O. Box 400<br>Buffalo, NY 14225                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                      |                                                                                                                                                                                                                                | 10. Work Unit No.<br>911-13-897                                        |  |
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| <p>16. Abstract</p> <p>A frontal barrier impact test of a 1989 Volkswagen Fox 2-Door Sedan was performed at the Calspan Advanced Technology Center crash test facility in Buffalo, New York on May 18, 1989.</p> <p>The impact speed was 34.8 mph and the ambient temperature was 76°F. The maximum vehicle crush was 19.5 inches. The test vehicle was equipped with a 3-point continuous restraint system.</p> <p>With regard to FMVSS 208 "Occupant Crash Protection," injury criteria, the driver dummy exceeded the maximum chest requirement but appears to comply with the head and femur requirements. The passenger dummy appears to comply with the head, chest and femur requirements as specified by FMVSS 208.</p> |  |                                                      |                                                                                                                                                                                                                                |                                                                        |  |
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Section 1  
PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is part of the Composite FY 89 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-87-D-02012. 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 requirements.

The 35 mph frontal barrier impact test was conducted in accordance with the Office of Market Incentives (OMI) Laboratory Indicant Test Procedure.

Section 2  
SUMMARY OF TEST NUMBER MK5801

A load cell barrier consisting of 36 load cells was impacted by a 1989 Volkswagen Fox 2-Door Sedan at a velocity of 34.8 mph. The test was performed at the Calspan Corporation Advanced Technology Center on May 18, 1989. 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 15 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. These ATDs had been used in previous tests, the driver (Serial No. 1019) in test MK0503 and the right front passenger (Serial No. 1020) in tests MK0503 and MK0500. The Injury Criteria Values were not exceeded in these 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. Accelerometer #3, located on the top of the engine, experienced a cut wire 25 msec. after impact. Accelerometer #6, located on the instrument panel, experienced a cut wire 30 msec. after impact.

The driver's head struck the steering wheel rim and hub; the HIC was 786.9. The maximum chest deceleration over 3 milliseconds was 63.5 g's and femur loads were 139.4 and 738.4 pounds.

The right-front passenger's HIC was 818.1 and maximum chest deceleration over 3 milliseconds was 57.9 g's. Femur loads were 1018.9 and 507.7 pounds.

Table 1

## GENERAL TEST AND VEHICLE DATA

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1989 Volkswagen Fox 2-Door Sedan  
 NHTSA NO.: MK5801 VIN.: 9WBAA0306KP006662  
 BODY COLOR: White DATE OF MANUFACTURE: 10/88  
 Engine: 4 cylinders; 109 C.I.D.; -- Liters; -- CC  
X Gas; -- Diesel; -- Turbocharged  
X Longitudinal; -- Transverse  
 Transmission: 4 Speed X Manual; -- Automatic; -- Overdrive  
 Final Drive: X Front Wheel; -- Rear Wheel; -- Four Wheel  
 Date Received: 2/22/89 Odometer Reading: 13  
-- A/C; -- 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 26 psi, Rear 32 psi  
 Recommended Tire Size: 155SR13/17570SR13  
 Recommended Cold Tire Pressure: Front 26 psi, Rear 32 psi  
 Tires on Vehicle: 155/R13; Manufacturer: Pirelli  
 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. Knob  
 Vehicle Capacity Weight (VCW) = 760 lbs. (A)  
 No. of Occupants x 150 lbs. = 600 lbs. (B)  
 Rated Cargo and Luggage Weight (RCLW) A-B = 160 lbs.  
 GVWR 2886 lbs. GAWR: Front 1520 lbs. Rear 1432 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 = <u>650</u> lbs.                                                | Right Rear = <u>430</u> lbs. |
| Left Front = <u>630</u> lbs.                                                 | Left Rear = <u>440</u> lbs.  |
| TOTAL FRONT WEIGHT = <u>1280</u> lbs. ( <u>59</u> % of Total Vehicle Weight) |                              |
| TOTAL REAR WEIGHT = <u>870</u> lbs. ( <u>41</u> % of Total Vehicle Weight)   |                              |
| TOTAL DELIVERY WEIGHT = <u>2150</u> lbs.                                     |                              |

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight ( 2150 lbs.)  
VCW = Vehicle Capacity Weight ( 760 lbs.)  
DSC = Designated Seating Capacity ( 4 )  
RCLW = VCW - 150 (DSC) = 160 lbs.  
Target Test Weight = UDW + RCLW + (2 dummies x 164 lbs./dummy)  
Target Test Weight = 2638 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 162 POUNDS CARGO:

|                                                                              |                              |
|------------------------------------------------------------------------------|------------------------------|
| Right Front = <u>730</u> lbs.                                                | Right Rear = <u>620</u> lbs. |
| Left Front = <u>720</u> lbs.                                                 | Left Rear = <u>570</u> lbs.  |
| TOTAL FRONT WEIGHT = <u>1450</u> lbs. ( <u>55</u> % of Total Vehicle Weight) |                              |
| TOTAL REAR WEIGHT = <u>1190</u> lbs. ( <u>45</u> % of Total Vehicle Weight)  |                              |
| TOTAL TEST WEIGHT = <u>2640</u> lbs.                                         |                              |
| Weight of ballast secured in vehicle trunk area = <u>0</u> lbs.              |                              |

VEHICLE ATTITUDE (all dimensions in inches):

|                                                                                 |                |                |                |                |
|---------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|
| Delivered Attitude:                                                             | RF <u>25.3</u> | LF <u>25.3</u> | RR <u>25.0</u> | LR <u>25.0</u> |
| Test Attitude:                                                                  | RF <u>24.3</u> | LF <u>24.5</u> | RR <u>23.6</u> | LR <u>23.8</u> |
| Wheel Base: <u>93.2</u> in.; C.G. = <u>42.0</u> 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 Barrier Impact Angle: 0 °  
 Date of Test: 5/18/89 Time of Test: 12:30  
 Ambient Temperature: 76 °F at impact area  
 Temperature in Occupant Compartment: 70 °F.  
 Windshield Molding Temperature: 70 °F.  
 Required Impact Velocity Range: 34.5 to 35.5 mph  
 Impact Velocity: primary = 34.8 mph, secondary = 34.7 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 | <u>160.9</u> | C <sub>L</sub> | <u>163.1</u> | L | <u>160.8</u> |
|                 | Post-test | = R | <u>141.8</u> | C <sub>L</sub> | <u>143.6</u> | L | <u>142.9</u> |
|                 | Crush     | = R | <u>19.1</u>  | C <sub>L</sub> | <u>19.5</u>  | L | <u>17.9</u>  |

Distance from front of test vehicle to point of impact:

R 17.1 C/L 16.7 L 16.7

**VISIBLE DUMMY CONTACT POINTS:**

|            | <u>Driver</u>               | <u>Passenger</u>  |
|------------|-----------------------------|-------------------|
| Head       | <u>Steering rim and hub</u> | <u>Glove box</u>  |
| Chest      | <u>No contact</u>           | <u>No contact</u> |
| Abdomen    | <u>Lower steering rim</u>   | <u>No contact</u> |
| Left Knee  | <u>Dashpanel</u>            | <u>Glove box</u>  |
| Right Knee | <u>Dashpanel</u>            | <u>Glove boc</u>  |

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

|              |                 |                 |
|--------------|-----------------|-----------------|
|              |                 | <u>Front</u>    |
|              | <u>Left</u>     | <u>Right</u>    |
| Door Opening | <u>Operable</u> | <u>Operable</u> |

|                      |             |              |
|----------------------|-------------|--------------|
|                      |             | <u>Front</u> |
|                      | <u>Left</u> | <u>Right</u> |
| <u>Seat Movement</u> | <u>Left</u> | <u>Right</u> |
| Seat Back Failure    | <u>None</u> | <u>None</u>  |
| Seat Shift (in.)     | <u>None</u> | <u>None</u>  |

Glazing Damage

Backlight/Windshield Windshield sustained stress cracks but remained intact.

Section 3  
**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
3. Test Vehicle Measurements

**Table 2**  
**DUMMY INJURY CRITERIA VALUES**

|           | MAXIMUM ACCELERATION ("G") |     |    |       |       |     |    |      |
|-----------|----------------------------|-----|----|-------|-------|-----|----|------|
|           | HEAD                       |     |    |       | CHEST |     |    |      |
|           | X                          | Y   | Z  | R     | X     | Y   | Z  | R*   |
| DUMMY (1) | -120                       | -35 | 50 | 127.3 | -51   | -43 | 27 | 63.5 |
| DUMMY (2) | -60                        | 18  | 69 | 84.1  | -61   | 36  | 22 | 57.9 |
| DUMMY (3) |                            |     |    |       |       |     |    |      |
| DUMMY (4) |                            |     |    |       |       |     |    |      |

|           | MAXIMUM FORCE - FEMUR LOAD (LBS) |             |
|-----------|----------------------------------|-------------|
|           | LEFT FEMUR                       | RIGHT FEMUR |
| DUMMY (1) | 139.4                            | 738.4       |
| DUMMY (2) | 1018.9                           | 507.7       |
| DUMMY (3) |                                  |             |
| DUMMY (4) |                                  |             |

|           | MAXIMUM FORCE - SEAT BELTS LOADS (LBS) |                              |                             |
|-----------|----------------------------------------|------------------------------|-----------------------------|
|           | SHOULDER STRAP<br>UPPER BELT LOAD      | LAP STRAP<br>RIGHT BELT LOAD | LAP STRAP<br>LEFT BELT LOAD |
| DUMMY (1) | 1530.8                                 | --                           | 1972.4                      |
| DUMMY (2) | 1988.7                                 | 1087.5                       | --                          |
| DUMMY (3) |                                        |                              |                             |
| DUMMY (4) |                                        |                              |                             |

|           | HEAD INJURY CRITERIA** |                      |                      |                                                   |
|-----------|------------------------|----------------------|----------------------|---------------------------------------------------|
|           | HIC                    | 36 millisecond max.  |                      | AVE. ACC. (g)<br>t <sub>1</sub> TO t <sub>2</sub> |
|           |                        | t <sub>1</sub> (SEC) | t <sub>2</sub> (SEC) |                                                   |
| DUMMY (1) | 786.9                  | 0.06292              | 0.09435              | 57.5                                              |
| DUMMY (2) | 818.1                  | 0.06450              | 0.09990              | 55.7                                              |
| DUMMY (3) |                        |                      |                      |                                                   |
| DUMMY (4) |                        |                      |                      |                                                   |

\*DEFINED AS EXCEEDING 0.003 SEC. DURATION

\*\*AS DEFINED IN FMVSS NO. 208

Figure 1

**PART 572 DUMMY IN-VEHICLE POSITION**

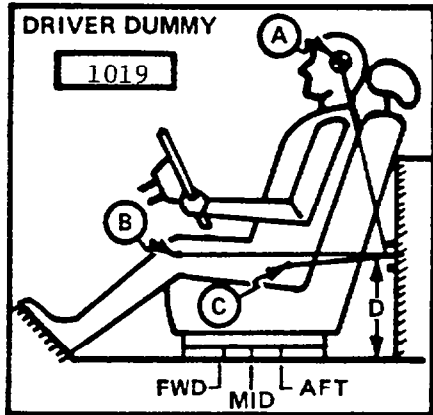
TEST NO.: MK5801

VEHICLE: 1989 Volkswagen Fox

SEAT TYPE:  
       Bench  
  X   Bucket  
       Split Bench

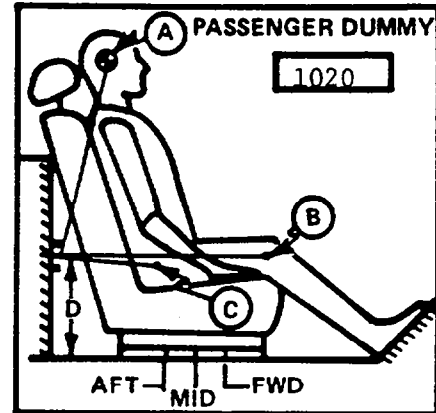
ADJUSTER TYPE:  
  X   Manual  
       Power

BUCKET SEAT BACK TYPE:  
       Fixed  
  X   Adjustable Reclining



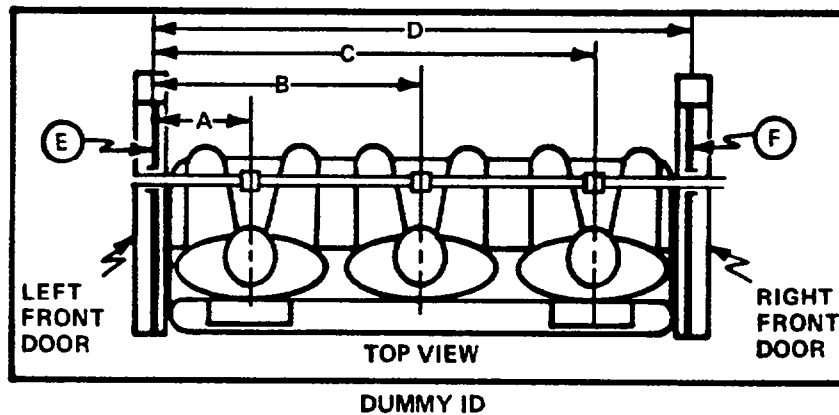
**MEASUREMENT LOCATION**

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



A = 19.9 in. 38 Degrees  
 B = 31.8 in. 103 Degrees  
 C = 19.6 in. 125 Degrees  
 D = 18.6 in.

A = 20.8 in. 38 Degrees  
 B = 33.8 in. 104 Degrees  
 C = 19.7 in. 125 Degrees  
 D = 18.6 in.



1019

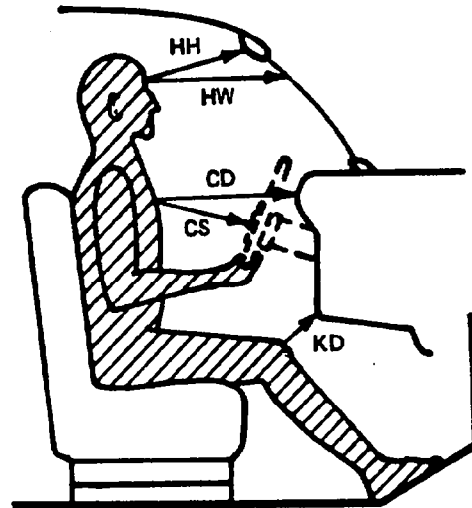
1020

|      |   |                                                    |                 |
|------|---|----------------------------------------------------|-----------------|
| A    | = | Left Door to Driver Centerline                     | <u>11.2</u> in. |
| B    | = | Left Door to Center Passenger Centerline           | <u>—</u> in.    |
| C    | = | Left Door to Right Passenger Centerline            | <u>36.6</u> in. |
| D    | = | Left Door to Right Door                            | <u>47.2</u> in. |
| E, F | = | Window Glass Height (Right and Left Must Be Equal) | <u>11.0</u> in. |

Figure 2

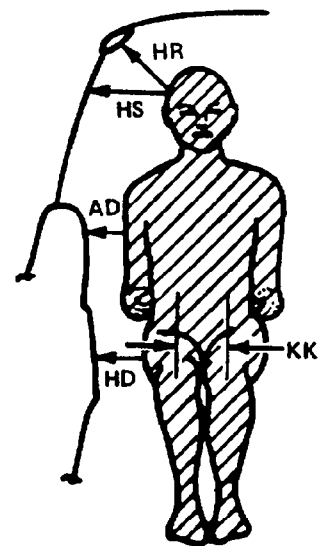
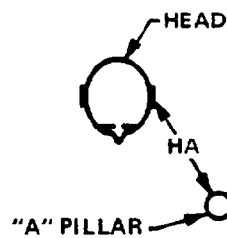
OCCUPANT CLEARANCE DIMENSIONS

|     | DRIVER   | PASSENGER |
|-----|----------|-----------|
| HH  | 11.3     | 11.5      |
| HW  | 15.8     | 15.4      |
| CD  | 18.0     | 19.8      |
| CS  | 12.8     | --        |
| KDL | 4.3      | 5.4       |
| KDR | 4.0      | 5.1       |
| SA  | See note | See note  |
| TA  | 18°      | 18°       |



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

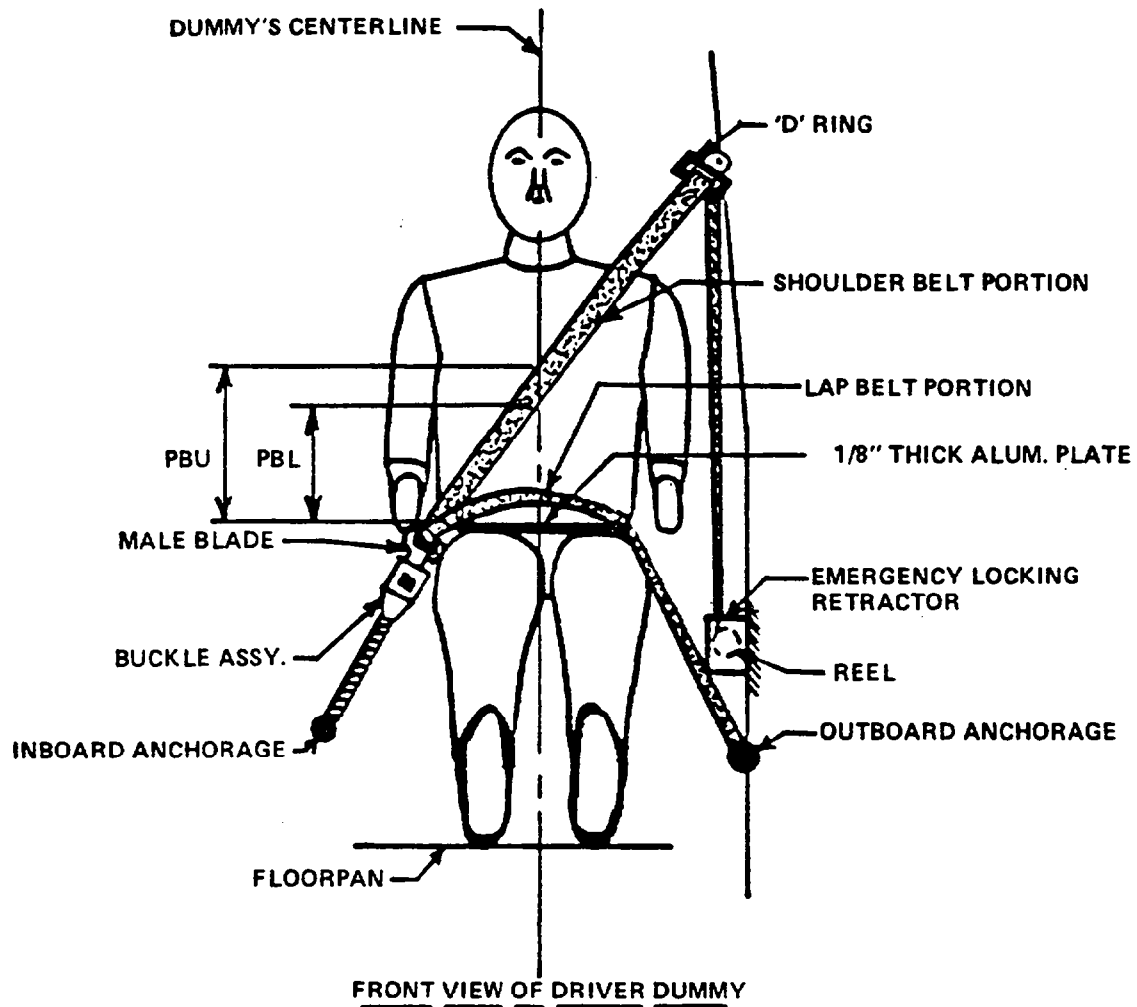
HA = Head Target to "A" Pillar  
 HR = Head to Side Roof  
 HS = Head to Side Window  
 AD = Arm to Door  
 HD = Hip to Door  
 KK = Knee to Knee



|    | DRIVER | PASSENGER |
|----|--------|-----------|
| HR | 5.2    | 4.8       |
| HS | 8.0    | 7.5       |
| AD | 4.4    | 3.6       |
| HD | 7.1    | 6.2       |
| KK | 10.1   | 7.8       |
| HA | 16.9   | 16.4      |

Note: Seat adjustment dial was set at 225° rotation from full upright (5/8 of a turn) as recommended by the manufacturer.

Figure 3  
SEAT BELT POSITIONING DATA



|                                                             | DRIVER DUMMY<br>(inches) | PASSENGER DUMMY<br>(inches) |
|-------------------------------------------------------------|--------------------------|-----------------------------|
| <u>PBU</u> -- Top surface of alum. plate to upper edge      | 14.4                     | 14.3                        |
| <u>PBL</u> -- Top surface of alum. plate to belt lower edge | 11.2                     | 11.1                        |
| <u>LAP BELT TENSION</u>                                     | --                       | --                          |
| <u>SHOULDER BELT TENSION</u>                                | 2 lbs                    | 2 lbs                       |

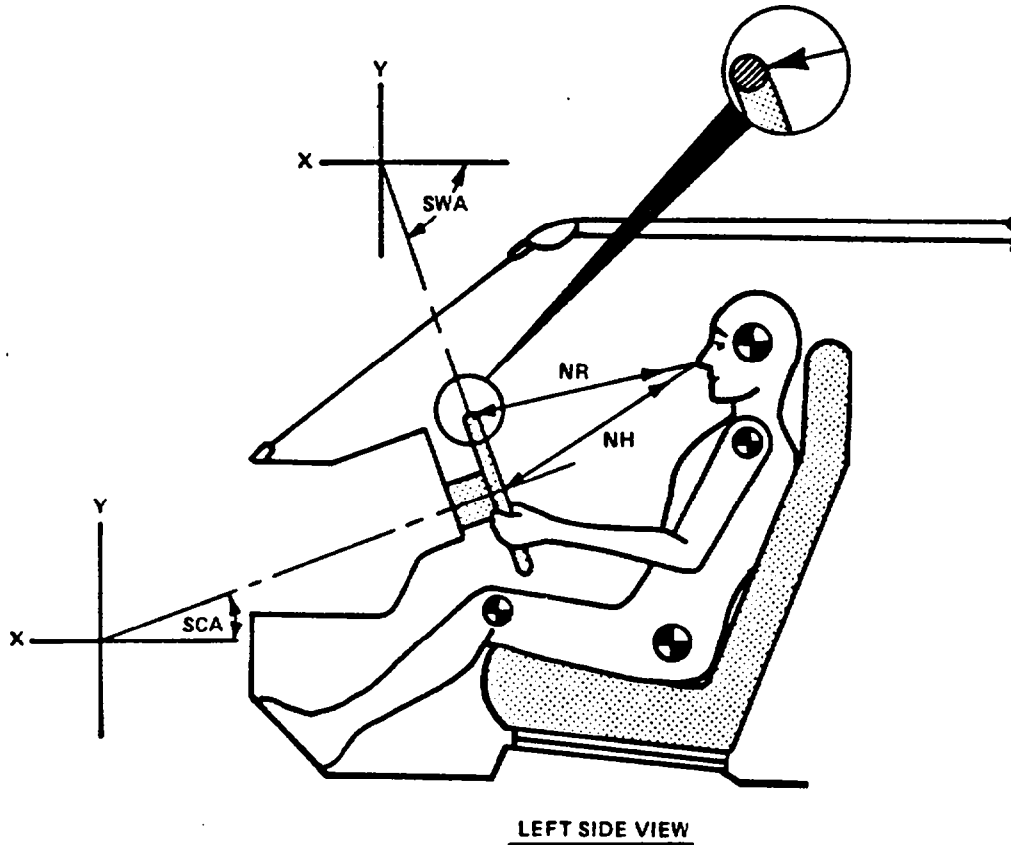
Table 3

**SEAT BELT PERFORMANCE ASSESSMENT TEST DATA**

| <u>BELT LENGTH DATA:</u>                                                                   | <u>Driver</u>    | <u>Passenger</u> |
|--------------------------------------------------------------------------------------------|------------------|------------------|
| Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems. | <u>95.0"</u>     | <u>96.0"</u>     |
| Should belt length as measured on Part 572 Dummy.                                          | <u>41.5"</u>     | <u>41.5"</u>     |
| Lap belt length as measured on Part 572 Dummy.                                             | <u>35.0"</u>     | <u>36.0"</u>     |
| <u>BELT SPOOL-OFF DATA:</u>                                                                |                  |                  |
| As determined by film analysis.                                                            | <u>1.0"</u>      | <u>1.5"</u>      |
| As determined mechanically.                                                                | <u>1.5"</u>      | <u>2.0"</u>      |
| As determined electronically.                                                              | <u>1.5"</u>      | <u>1.9"</u>      |
| <u>BELT STRETCH DATA:</u>                                                                  |                  |                  |
| Measured electronically between shoulder belt load cell and the "D" ring.                  | <u>0.7 in/ft</u> | <u>1.4 in/ft</u> |
| Measured Mechanically                                                                      | <u>0.0 in/ft</u> | <u>0.0 in/ft</u> |

Figure 4

**DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS**



|                                                                                          | MEASUREMENTS |         |
|------------------------------------------------------------------------------------------|--------------|---------|
| <u>NR</u> -- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim | 15.3         | Inches  |
| <u>NH</u> -- Distance from tip of dummy's nose to center of steering column hub          | 16.9         | Inches  |
| <u>SCA</u> -- Angle of steering column relative to the horizontal X axis                 | 22           | Degrees |
| <u>SWA</u> -- Angle of steering wheel relative to the horizontal X axis                  | -68          | Degrees |

Figure 5

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 4

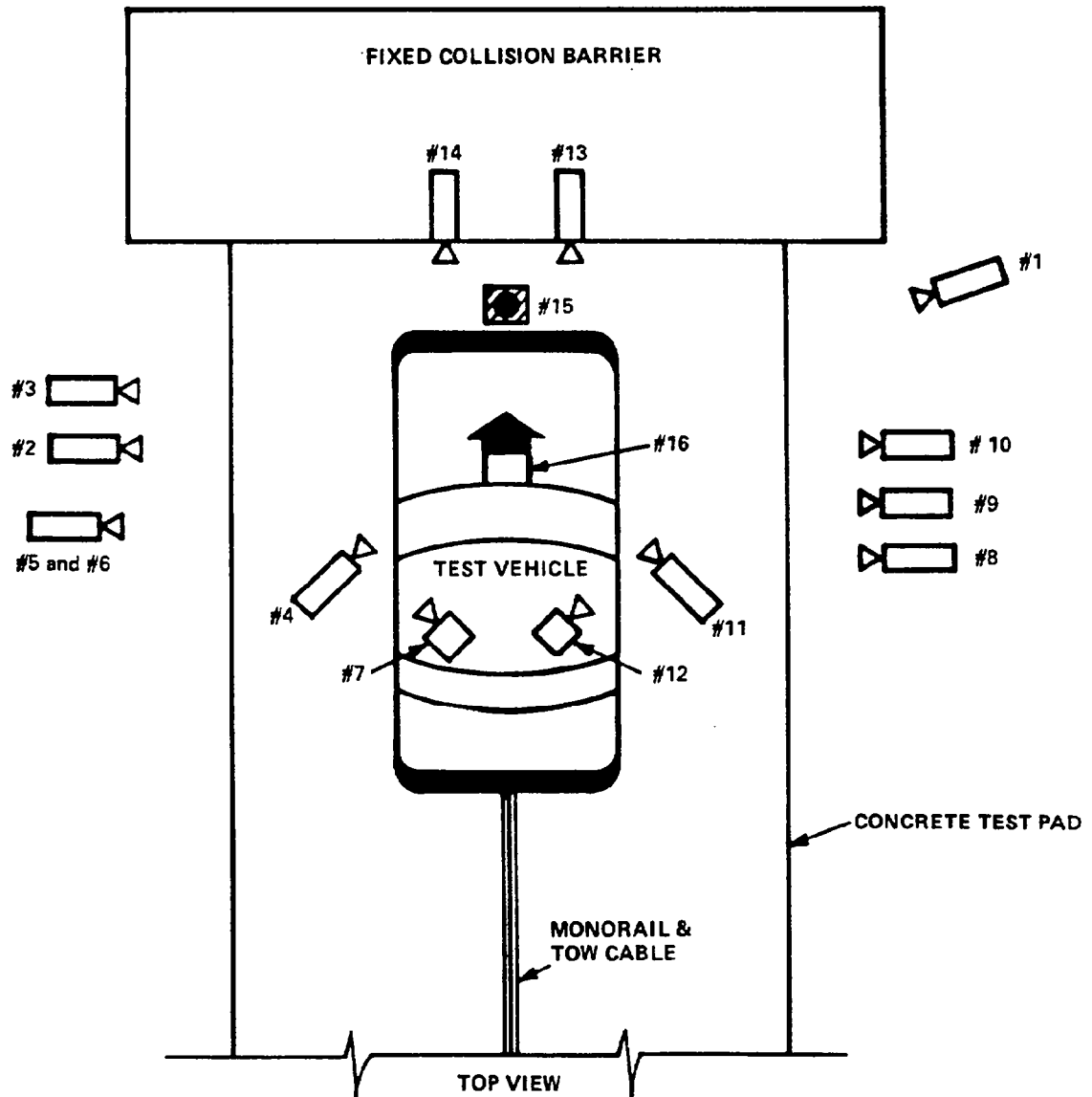


Table 4  
HIGH-SPEED CAMERA LOCATIONS

Test No. MK5801

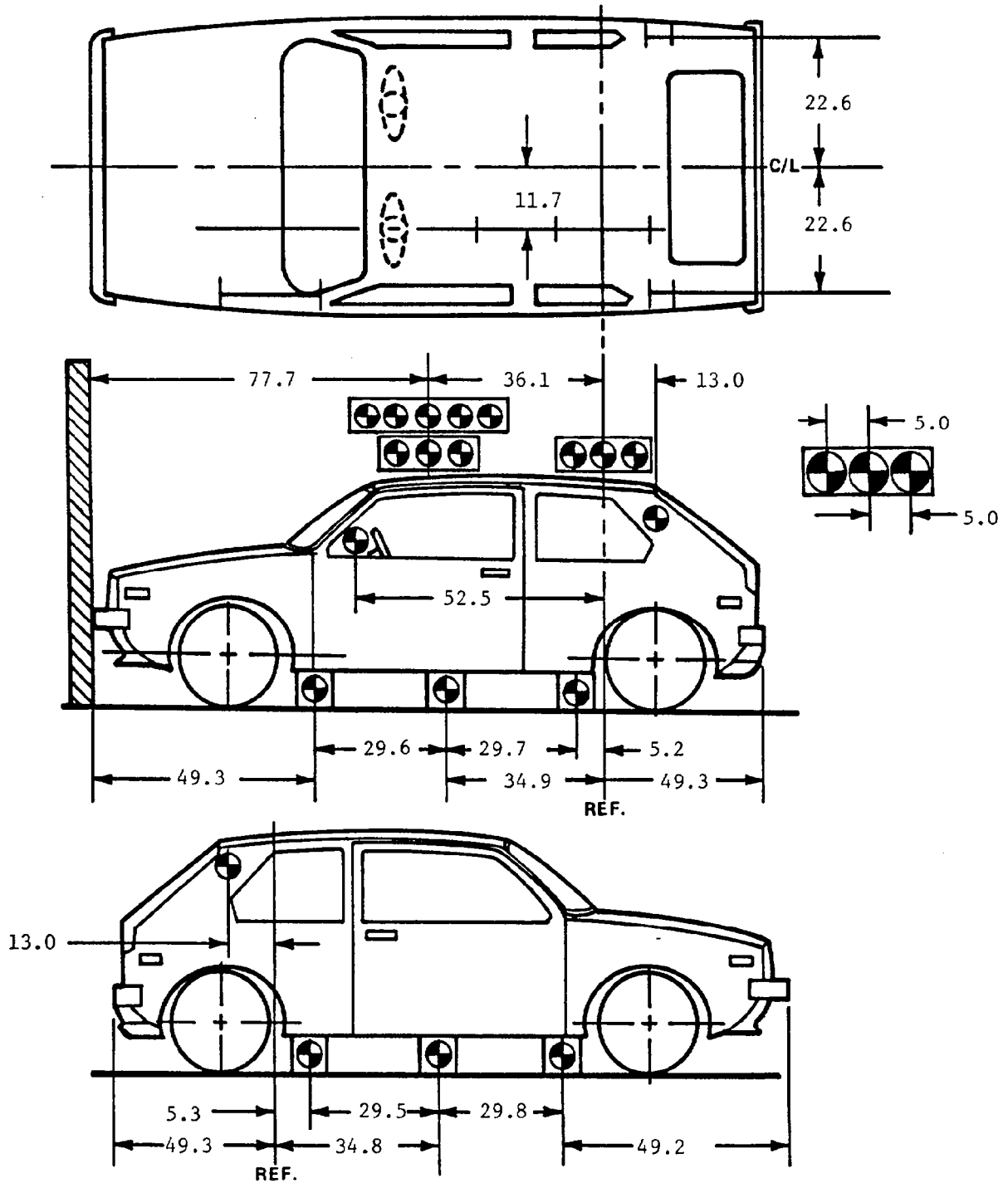
Vehicle 1989 Volkswagen Fox

| CAMERA NO. | VIEW                        | CAMERA POSITIONS (in)* |    |      | ANGLE** (deg) | FILM PLANE TO HEAD TARGET | LENS (mm) | SPEED (fps) |
|------------|-----------------------------|------------------------|----|------|---------------|---------------------------|-----------|-------------|
|            |                             | X                      | Y  | Z    |               |                           |           |             |
| 1          | Real-Time Camera            | --                     | -- | --   | --            | --                        | --        | 24          |
| 2          | Overall Left Side           | 279                    | 57 | 42   | 5             | 263                       | 13        | 530         |
| 3          | Left Side View              | 225                    | 39 | 41   | 5             | 209                       | 25        | 520         |
| 4          | Driver and Interior View    | 80                     | 82 | 71   | 20            | 64                        | 13        | 910         |
| 5          | Steering Column (Bottom)    | 290                    | 82 | 50   | 4             | 274                       | 25        | 540         |
| 6          | Steering Column (Top)       | 290                    | 94 | 74   | 10            | 274                       | 25        | 550         |
| 7          | Left Belt                   | --                     | -- | --   | --            | --                        | 8         | 680         |
| 8          | Overall Right Side          | 232                    | 64 | 43   | 1             | 216                       | 13        | 840         |
| 9          | Right Side View             | 249                    | 41 | 44   | 3             | 233                       | 25        | 800         |
| 10         | Right Passenger View        | 276                    | 64 | 54   | 5             | 260                       | 35        | 740         |
| 11         | Passenger and Interior View | 72                     | 94 | 71   | 20            | 56                        | 25        | 590         |
| 12         | Right Belt                  | --                     | -- | --   | --            | --                        | 8         | no timing   |
| 13         | Passenger Front View        | 24                     | -5 | 73   | 42            | --                        | 13        | 590         |
| 14         | Driver Front View           | 24                     | -5 | 73   | 38            | --                        | 13        | 570         |
| 15         | Windshield View             | 0                      | 0  | 126  | -55           | --                        | 13        | 570         |
| 16         | Pit View of Engine          | 0                      | 32 | -120 | 90            | --                        | 13        | 860         |

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

Figure 6

VEHICLE TARGET LOCATIONS



(DIMENSIONS IN INCHES)

Figure 7

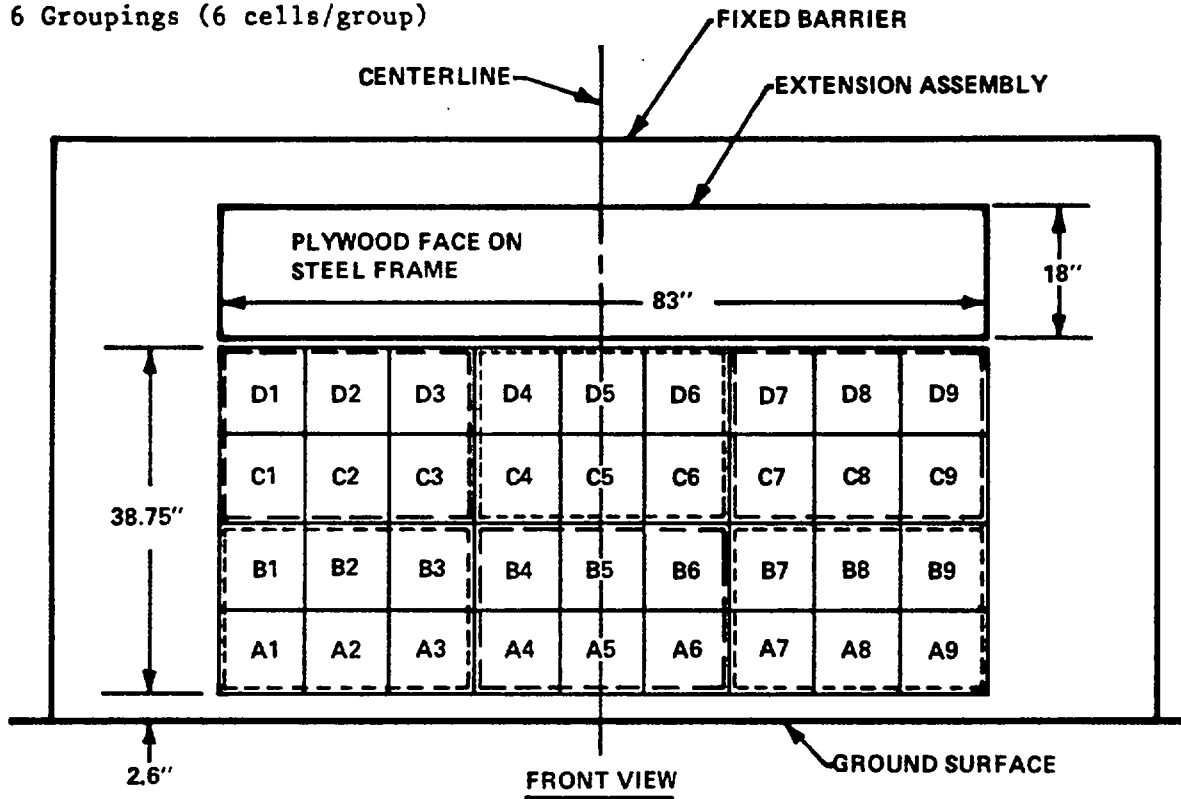
LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells

4 Rows

9 Columns

6 Groupings (6 cells/group)



6 GROUPS OF 6 LOAD CELLS EACH

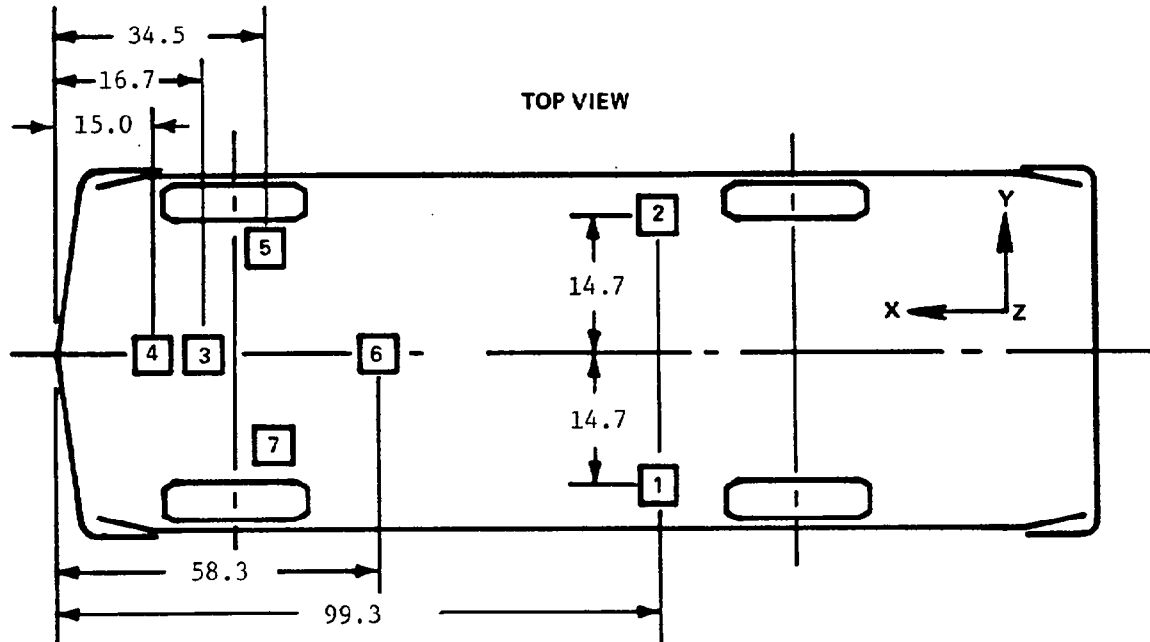
|                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| Group 4<br>C1 thru D3 | Group 5<br>C4 thru D6 | Group 6<br>C7 thru D9 |
| Group 1<br>A1 thru B3 | Group 2<br>A4 thru B6 | Group 3<br>A7 thru B9 |

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 8

VEHICLE ACCELEROMETER LOCATIONS



| ACCELEROMETER<br>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                        | Left Disc Brake Caliper     | X         |   |   |

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

Figure 9

TEST VEHICLE MEASUREMENTS

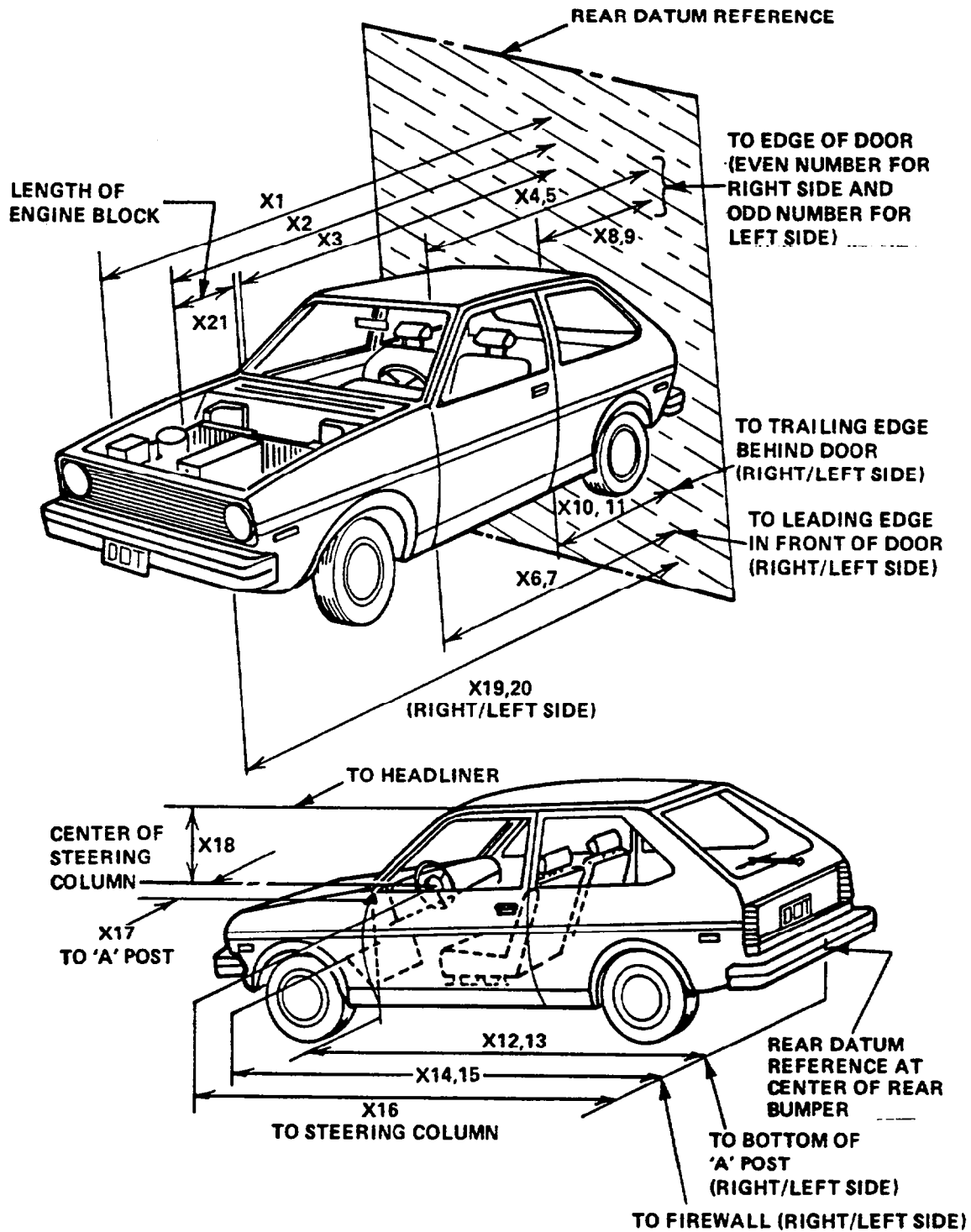


Table 5

## VEHICLE MEASUREMENTS

| No. |                                                              | All Dimensions in Inches |           |             |
|-----|--------------------------------------------------------------|--------------------------|-----------|-------------|
|     |                                                              | Pre-Test                 | Post-Test | Differences |
| X1  | Total Length of Vehicle at Centerline                        | 163.1                    | 143.6     | 19.5        |
| X2  | Rear Surface of Vehicle to Front of Engine                   | 152.1                    | 138.6     | 13.5        |
| X3  | Rear Surface of Vehicle to Firewall                          | 127.2                    | 120.1     | 7.1         |
| X4  | Rear Surface of Vehicle to Upper Leading Edge of Right Door  | 112.5                    | 113.4     | -0.9        |
| X5  | Rear Surface of Vehicle to Upper Leading Edge of Left Door   | 112.5                    | 113.9     | -1.4        |
| X6  | Rear Surface of Vehicle to Lower Leading Edge of Right Door  | 112.0                    | 111.0     | 1.0         |
| X7  | Rear Surface of Vehicle to Lower Leading Edge of Left Door   | 111.5                    | 112.0     | -0.5        |
| X8  | Rear Surface of Vehicle to Upper Trailing Edge of Right Door | 66.5                     | 67.4      | -0.9        |
| X9  | Rear Surface of Vehicle to Upper Trailing Edge of Left Door  | 66.4                     | 67.8      | -1.4        |
| X10 | Rear Surface of Vehicle to Lower Trailing Edge of Right Door | 67.4                     | 66.5      | 0.9         |
| X11 | Rear Surface of Vehicle to Lower Trailing Edge of Left Door  | 66.8                     | 67.2      | -0.4        |
| X12 | Rear Surface of Vehicle to Bottom of "A" Post of Right Side  | 112.3                    | 111.4     | 0.9         |
| X13 | Rear Surface of Vehicle to Bottom of "A" Post of Left Side   | 112.0                    | 112.3     | -0.3        |
| X14 | Rear Surface of Vehicle to Firewall, Right Side              | 127.7                    | 121.3     | 6.4         |
| X15 | Rear Surface of Vehicle to Firewall, Left Side               | 127.2                    | 124.8     | 2.4         |
| X16 | Rear Surface of Vehicle to Steering Column                   | 97.4                     | 96.5      | 0.9         |
| X17 | Center of Steering Column to "A" Post                        | 16.4                     | 15.0      | 1.4         |
| X18 | Center of Steering Column to Headliner                       | 16.2                     | 13.4      | 2.8         |
| X19 | Rear Surface of Vehicle to Right Side of Front Bumper        | 160.9                    | 141.8     | 19.1        |
| X20 | Rear Surface of Vehicle to Left Side of Front Bumper         | 160.8                    | 142.9     | 17.9        |
| X21 | Length of Engine Block                                       | 18.5                     | 18.5      | 0.0         |

**Appendix A**  
**PHOTOGRAPHS**

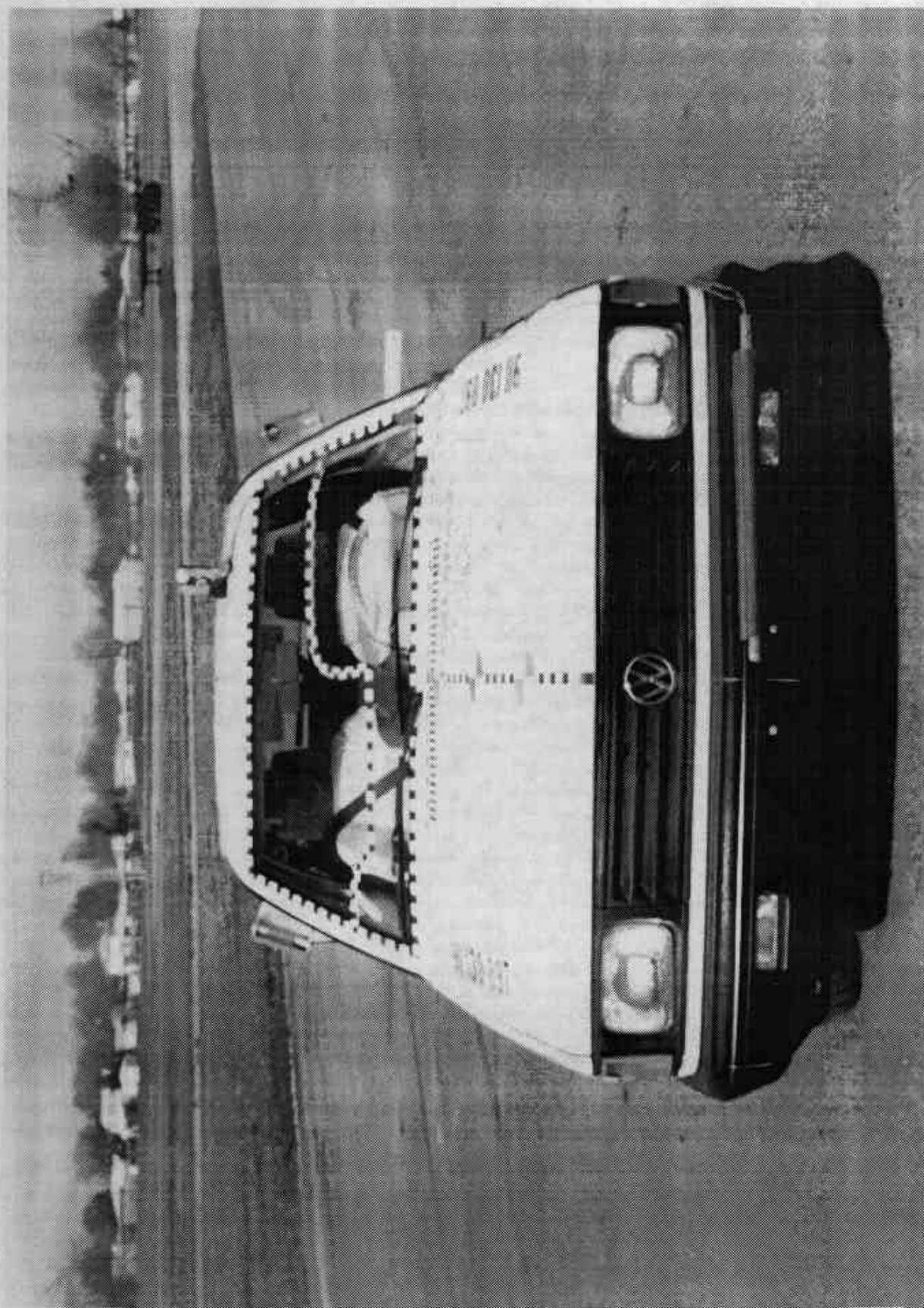


Figure A-1 PRE-TEST FRONT VIEW

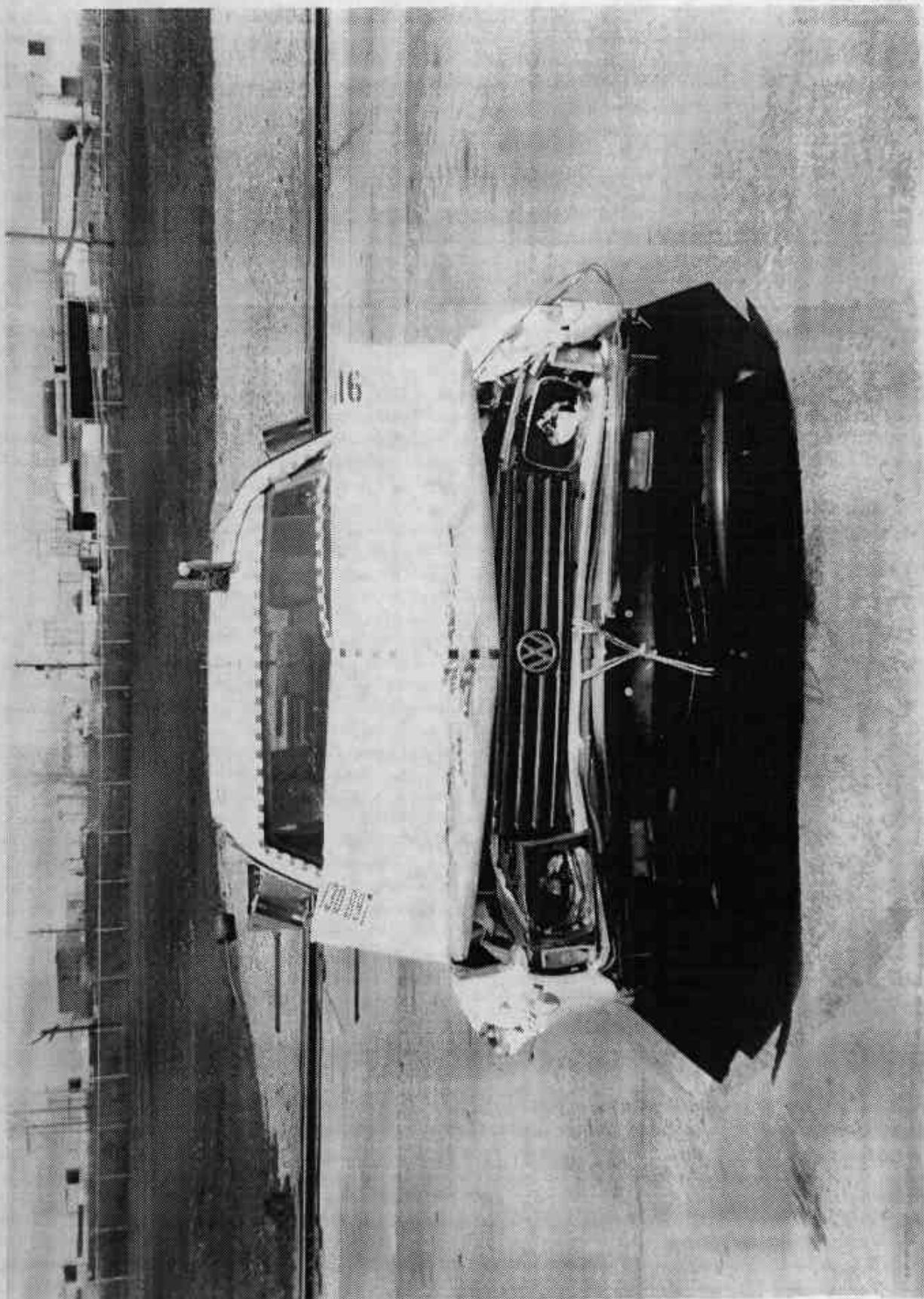


Figure A-2 POST-TEST FRONT VIEW

A-3

7731-13

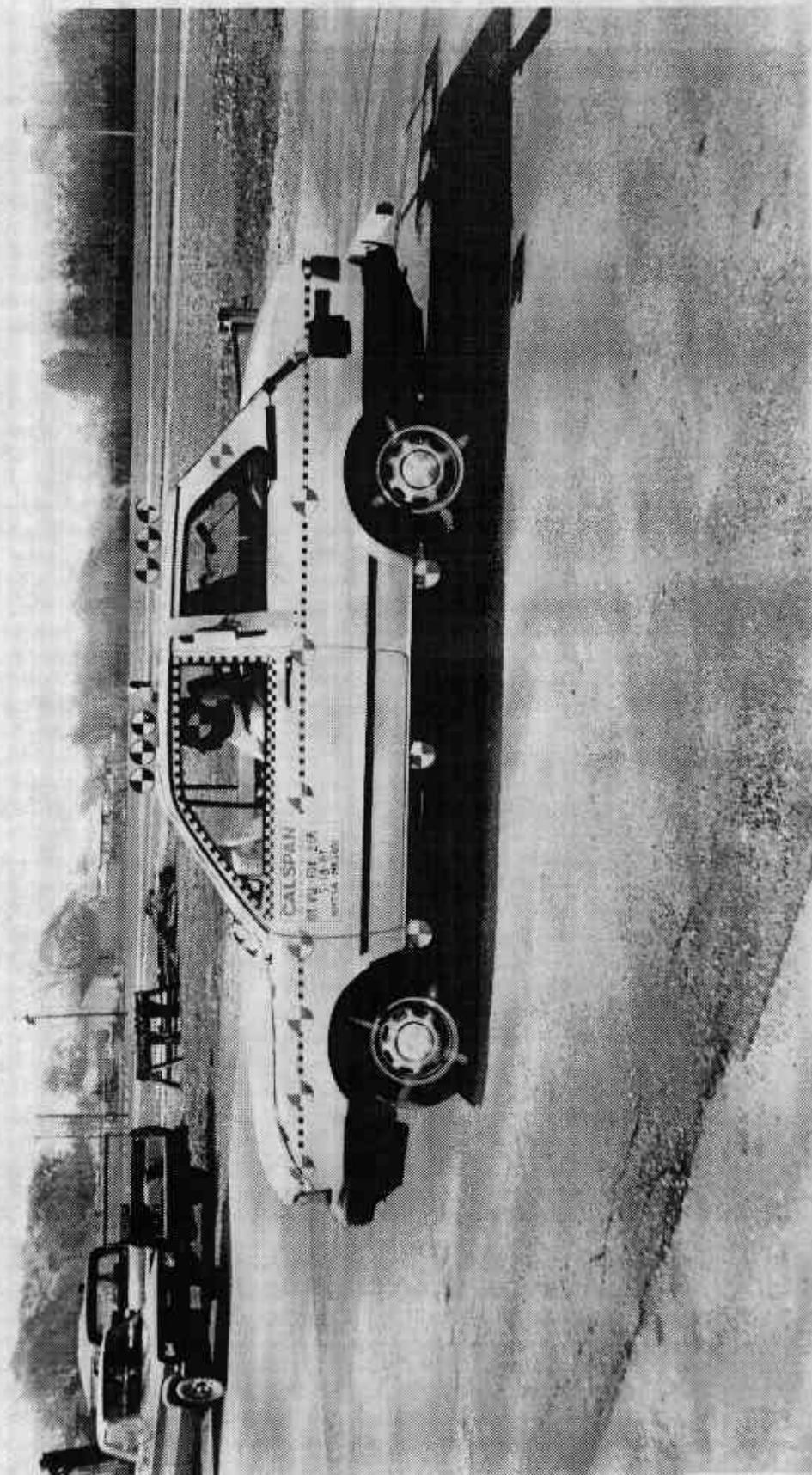


Figure A-3 PRE-TEST LEFT SIDE VIEW

A-4

7731-13

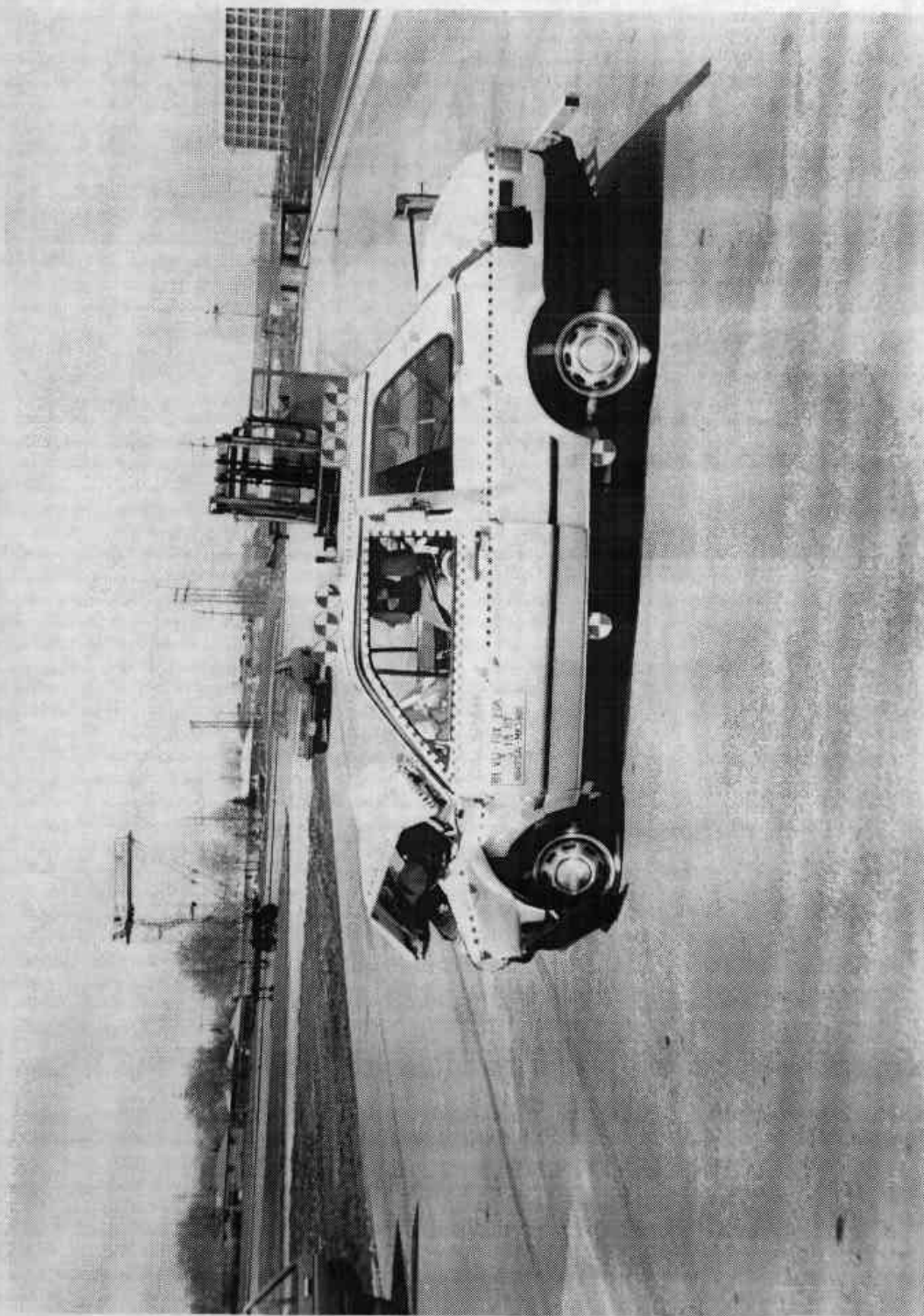


Figure A-4 POST-TEST LEFT SIDE VIEW

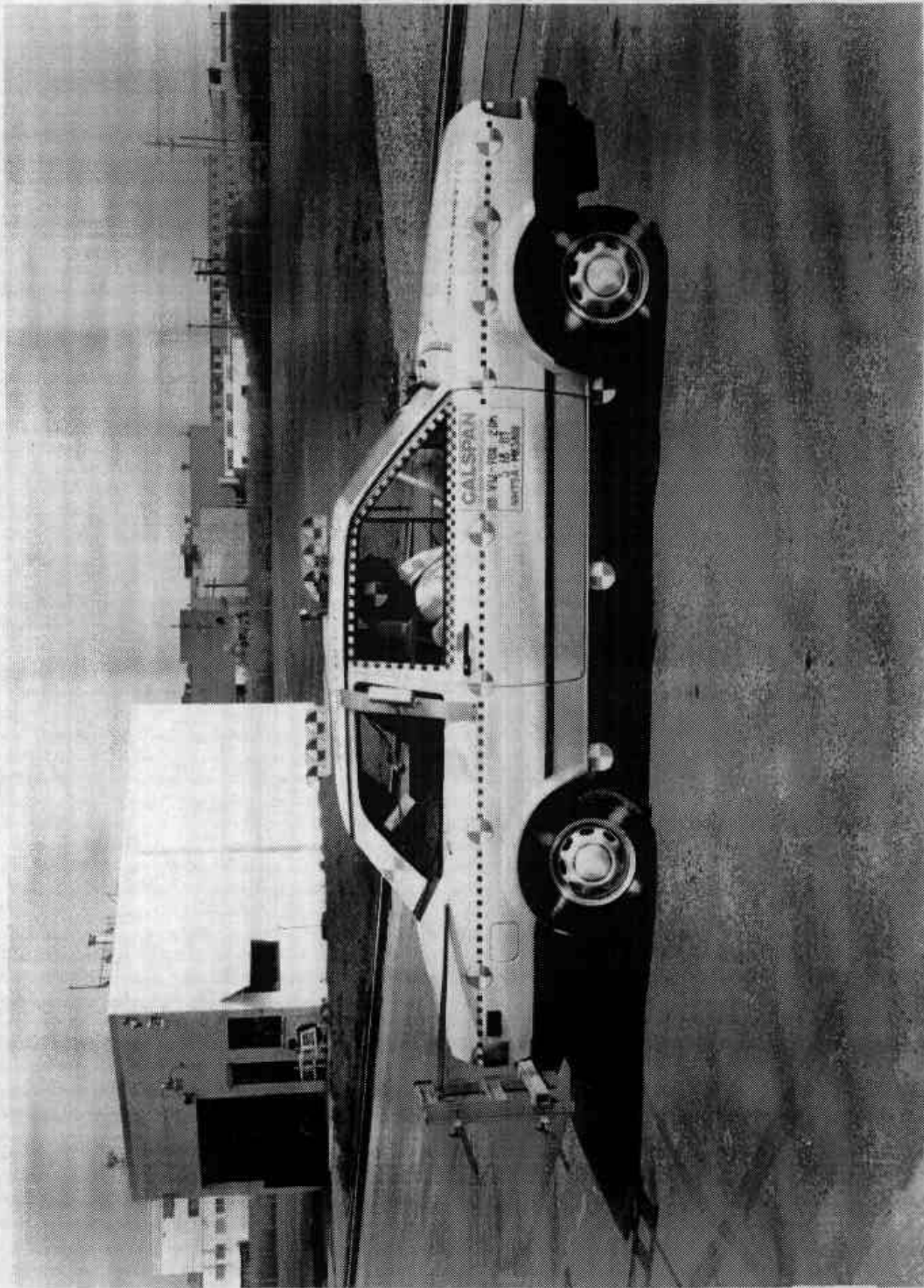


Figure A-5 PRE-TEST RIGHT SIDE VIEW

A-6

7731-13

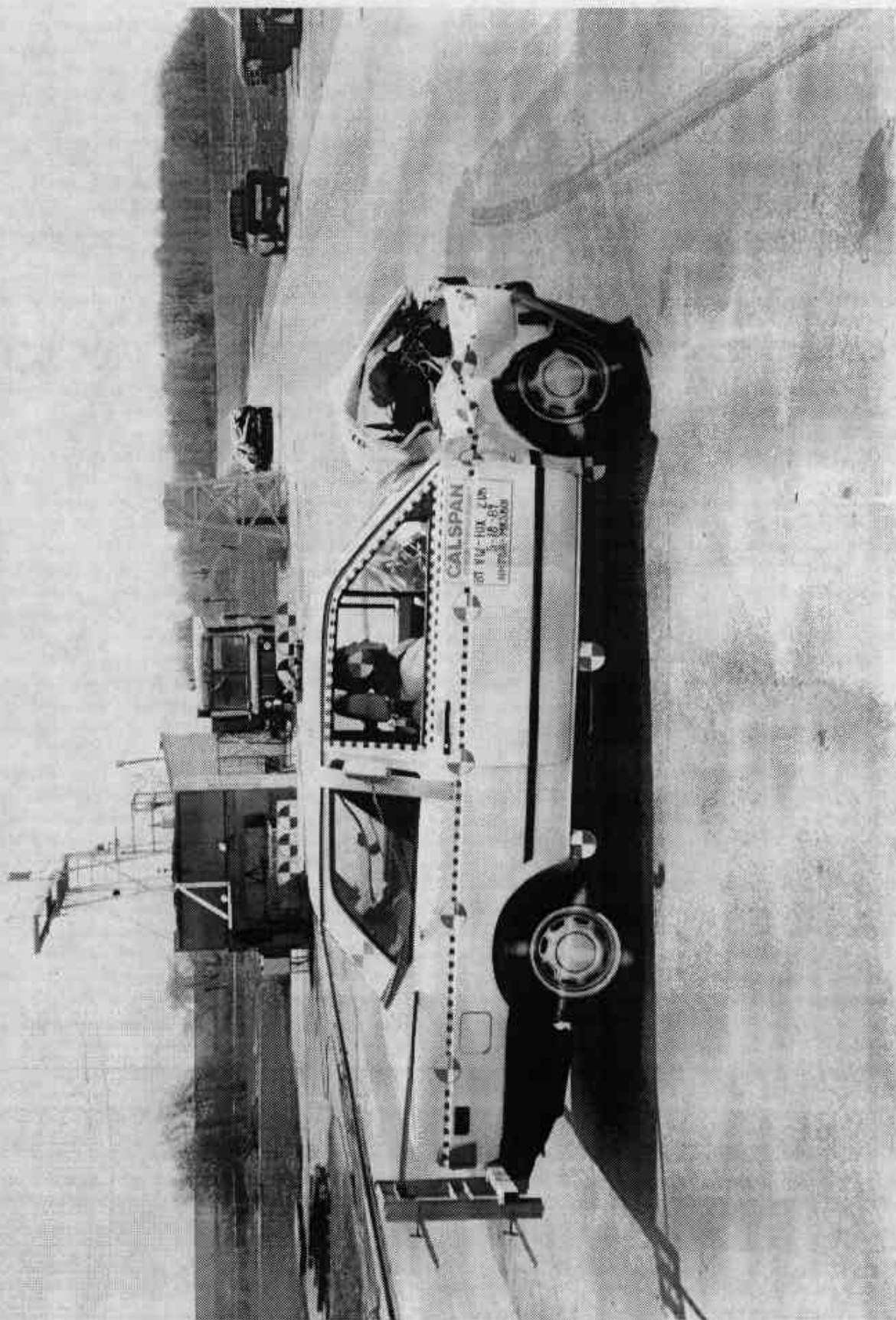


Figure A-6 POST-TEST RIGHT SIDE VIEW

A-7

7731-13



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

A-8

7731-13

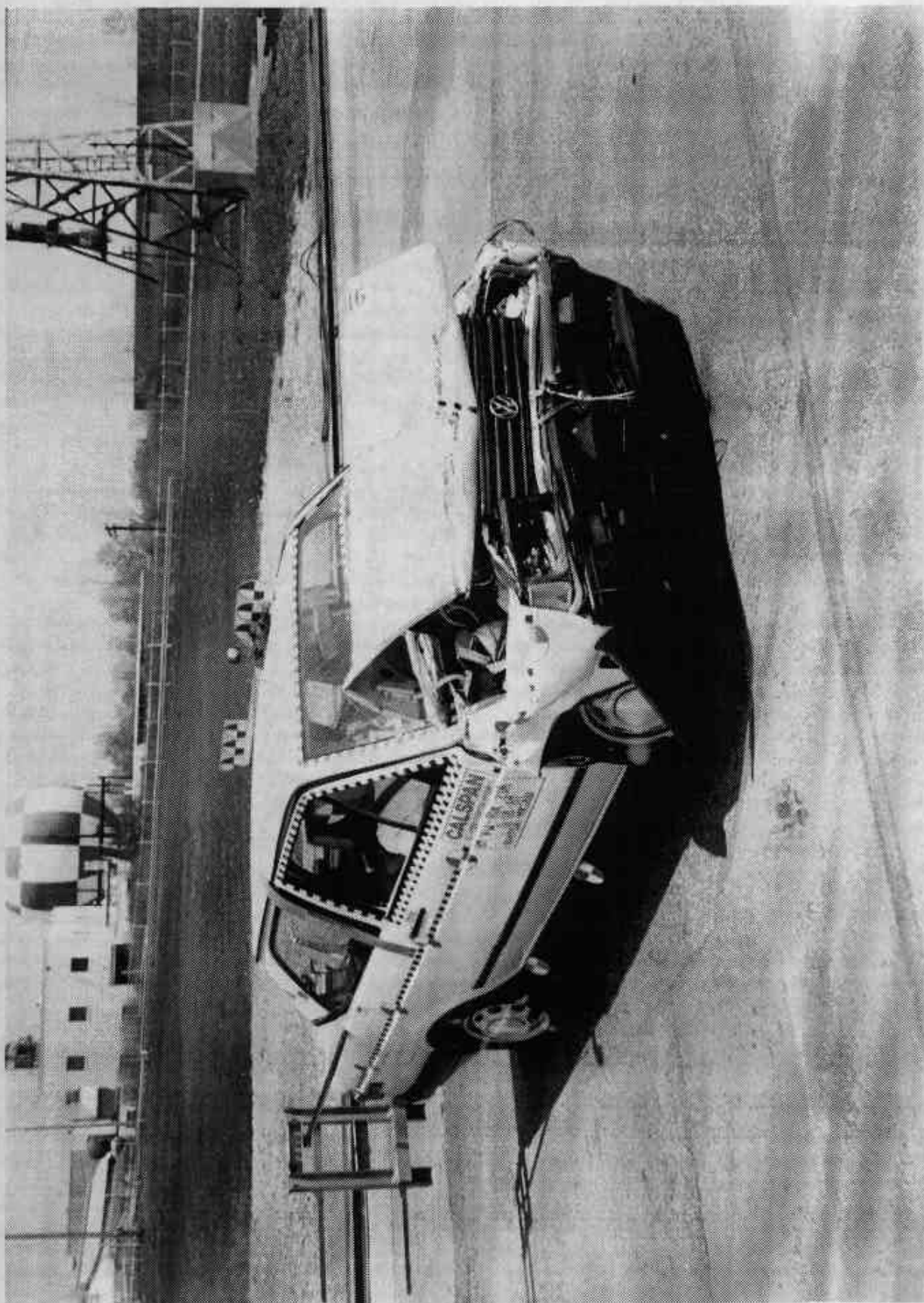


Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-9

7731-13

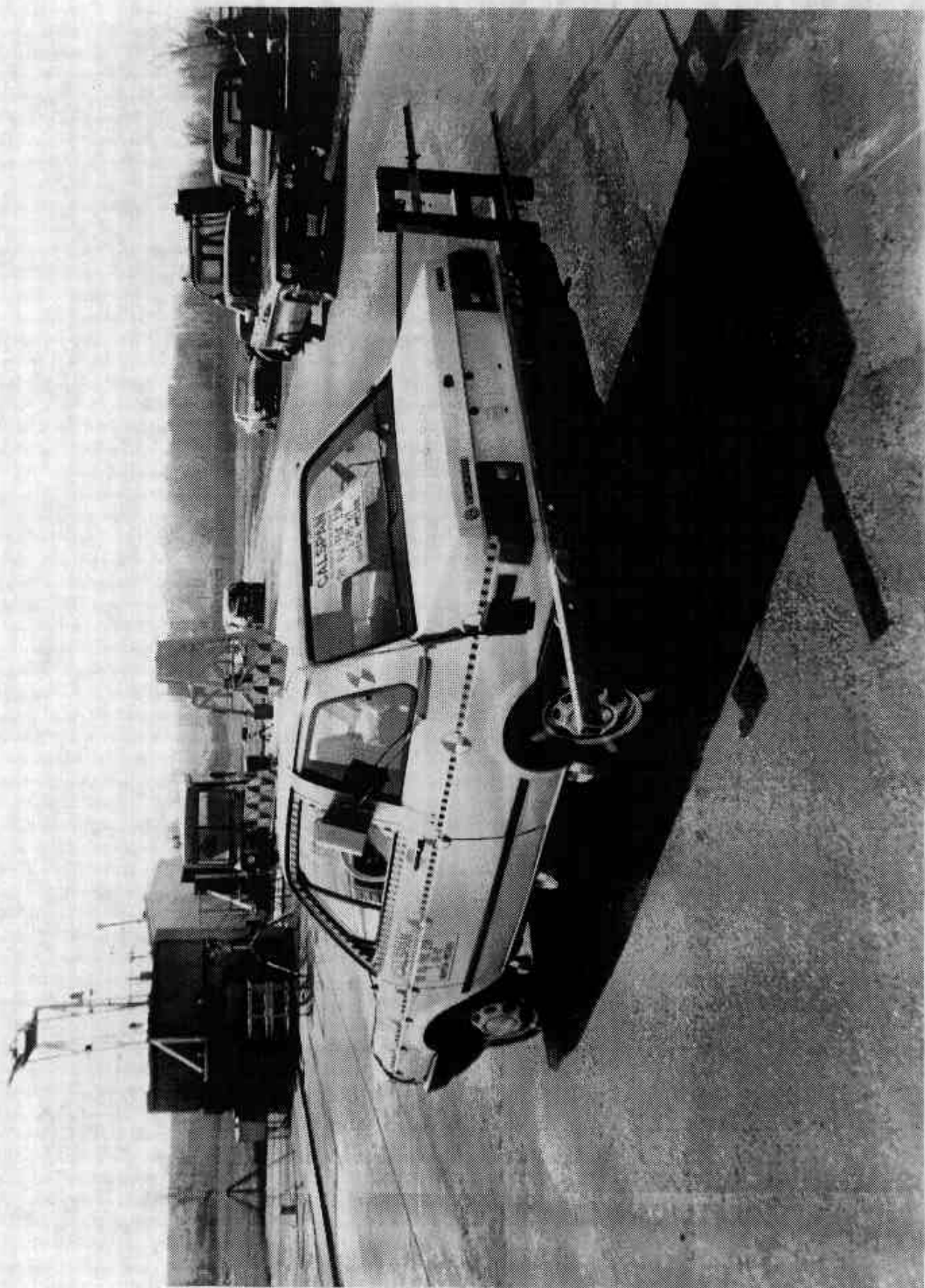


Figure A-9 PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-10

7731-13

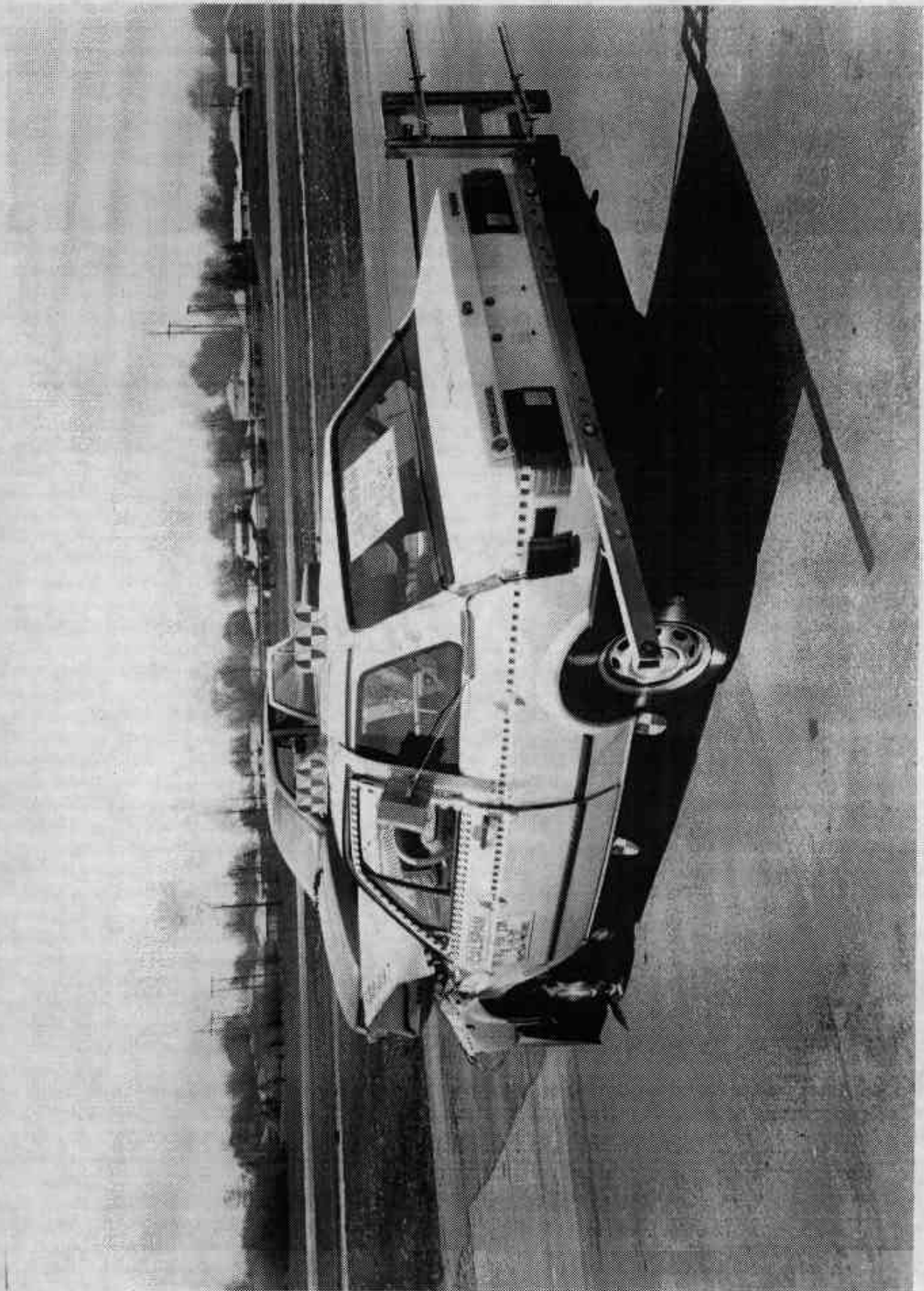


Figure A-10 POST-TEST LEFT REAR THREE-QUARTER VIEW

A-11

7731-13

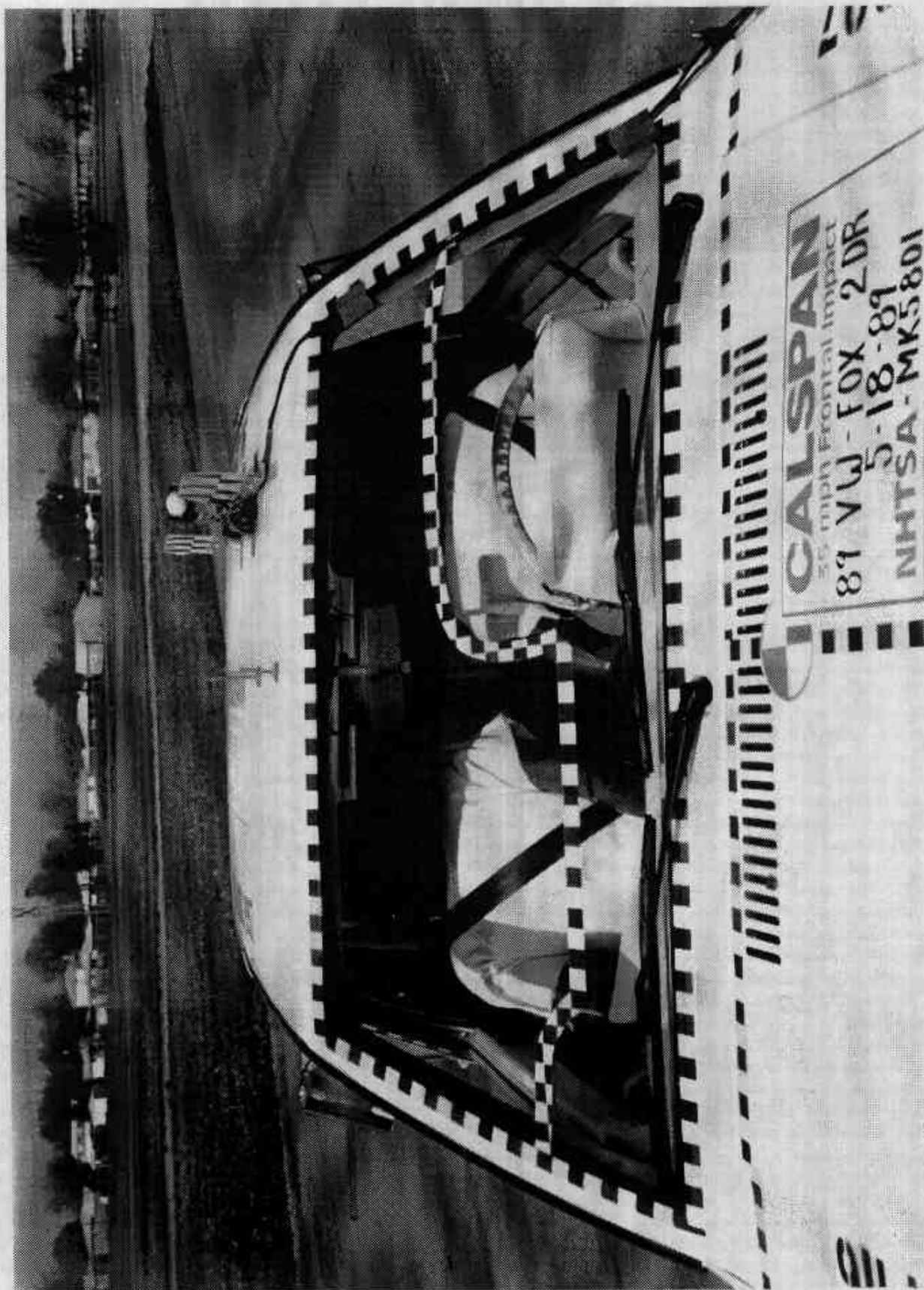


Figure A-11 PRE-TEST WINDSHIELD VIEW

A-12

7731-13

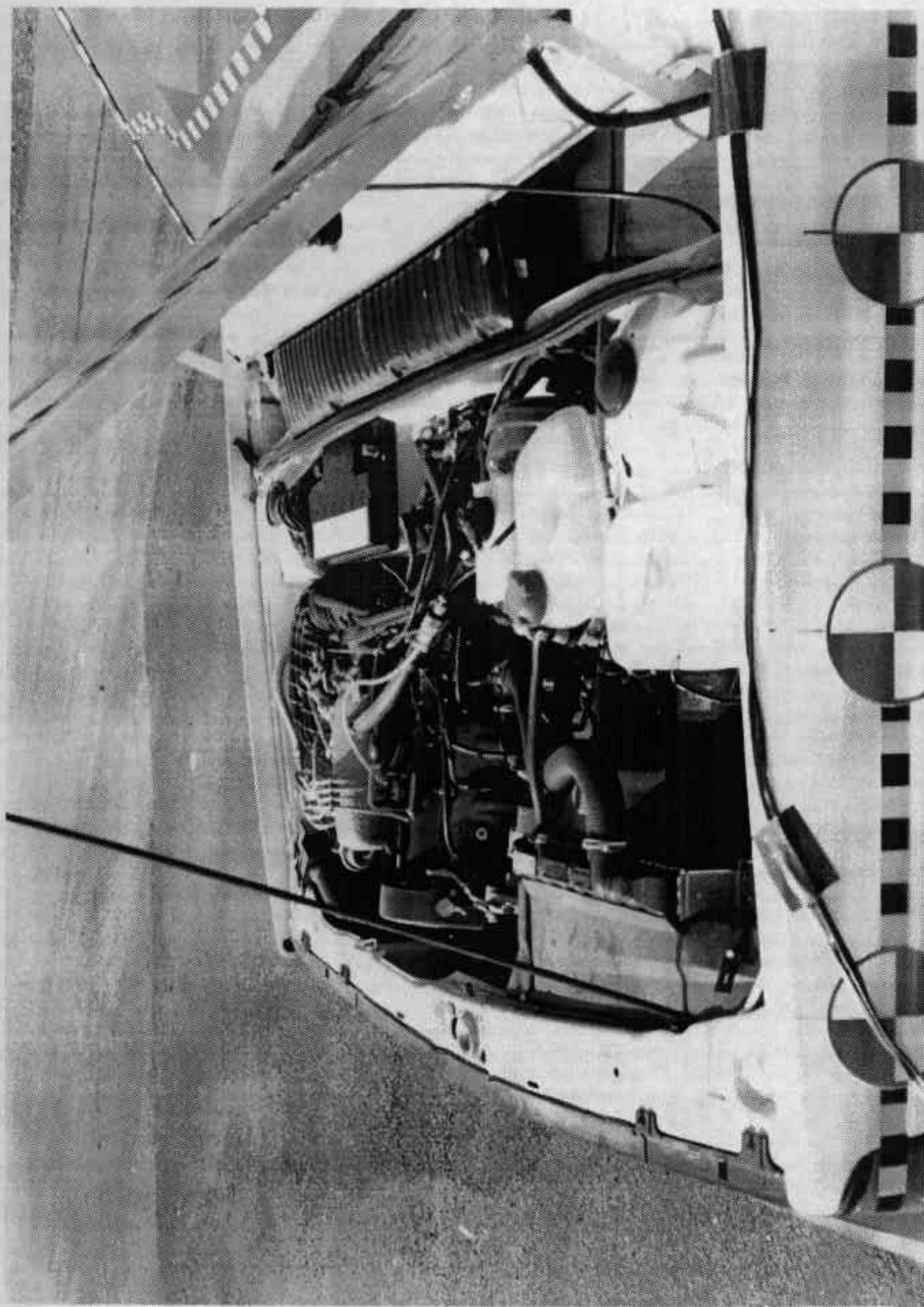


Figure A-12 PRE-TEST ENGINE COMPARTMENT VIEW

A-13

7731-13

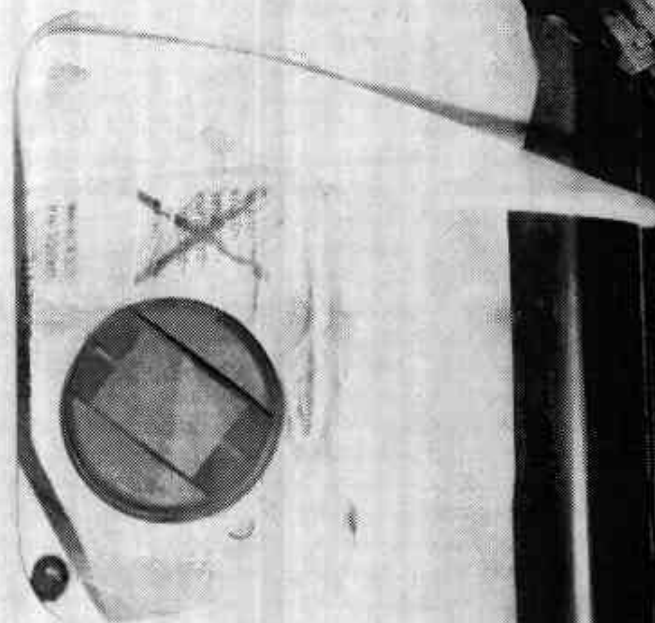
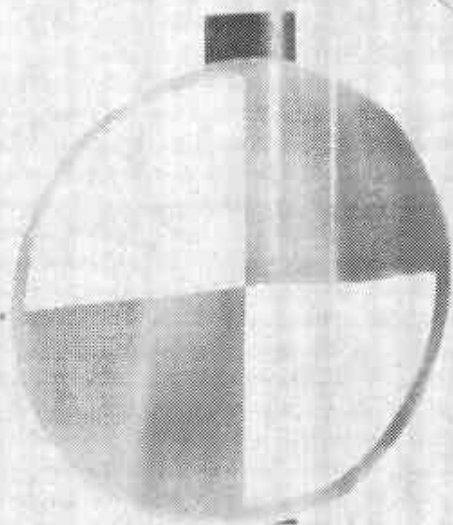


Figure A-13 PRE-TEST FUEL CAP VIEW

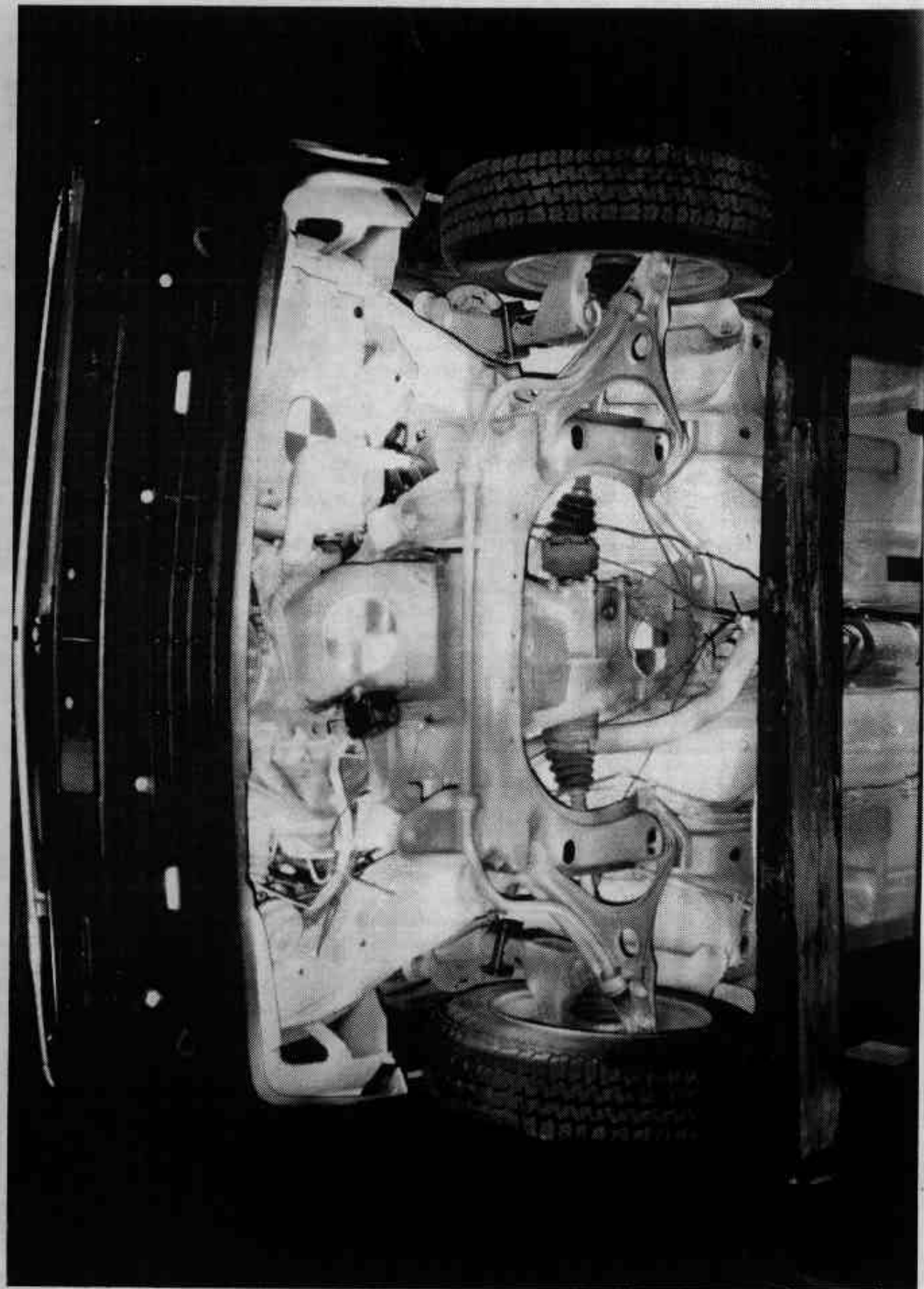


Figure A-14 PRE-TEST FRONT UNDERBODY VIEW

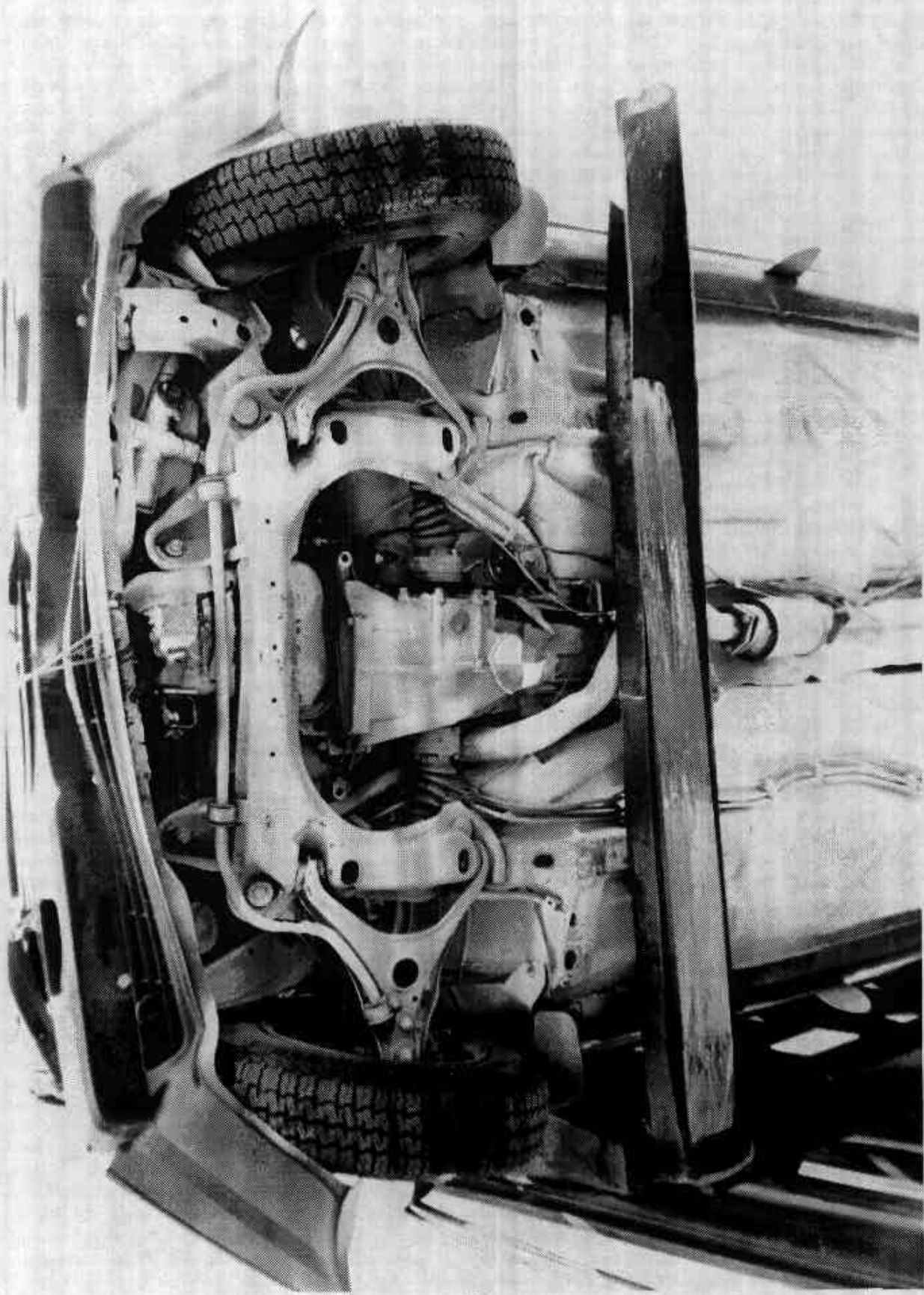


Figure A-15 POST-TEST FRONT UNDERBODY VIEW

A-16

7731-13

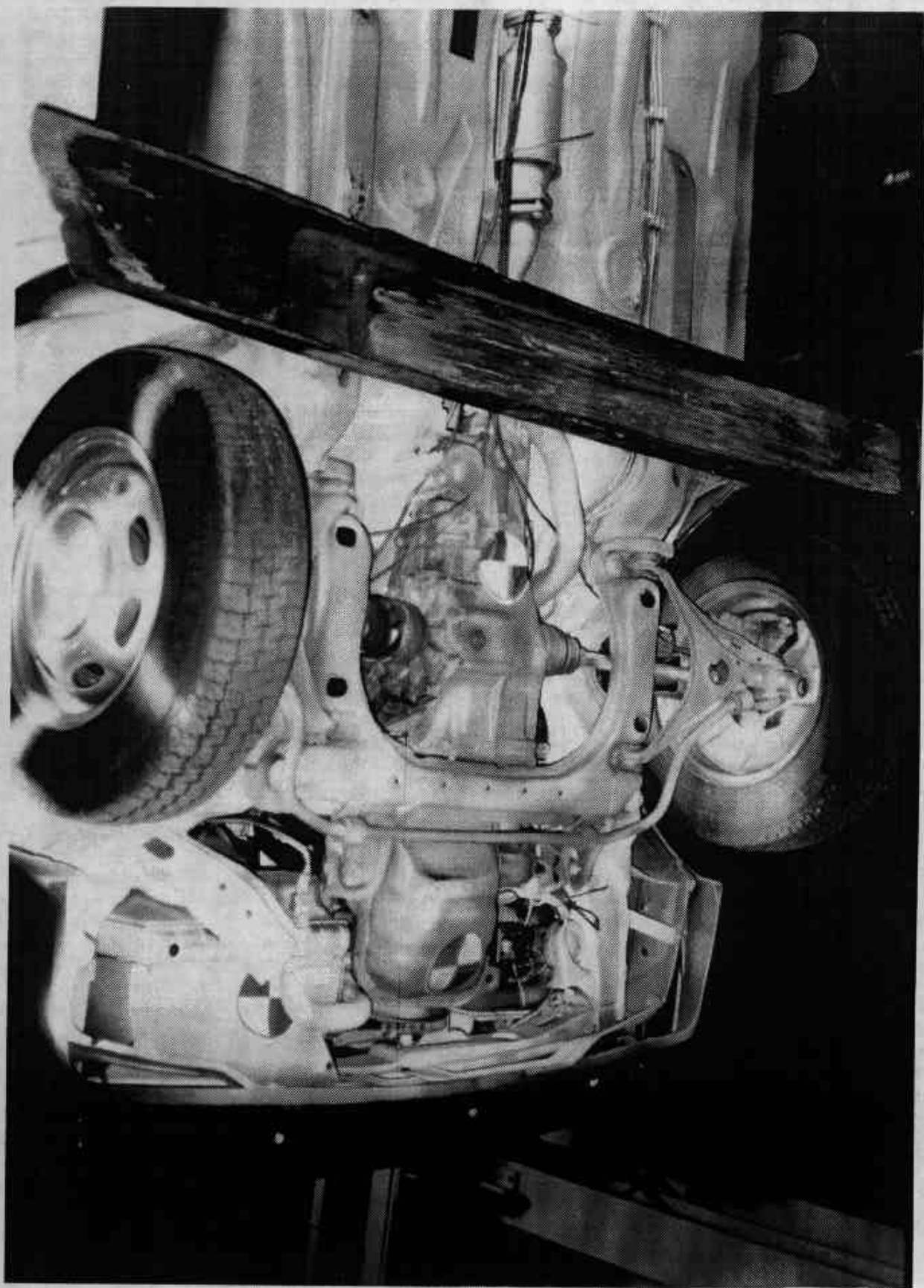


Figure A-16 PRE-TEST FRONT SIDE UNDERBODY VIEW

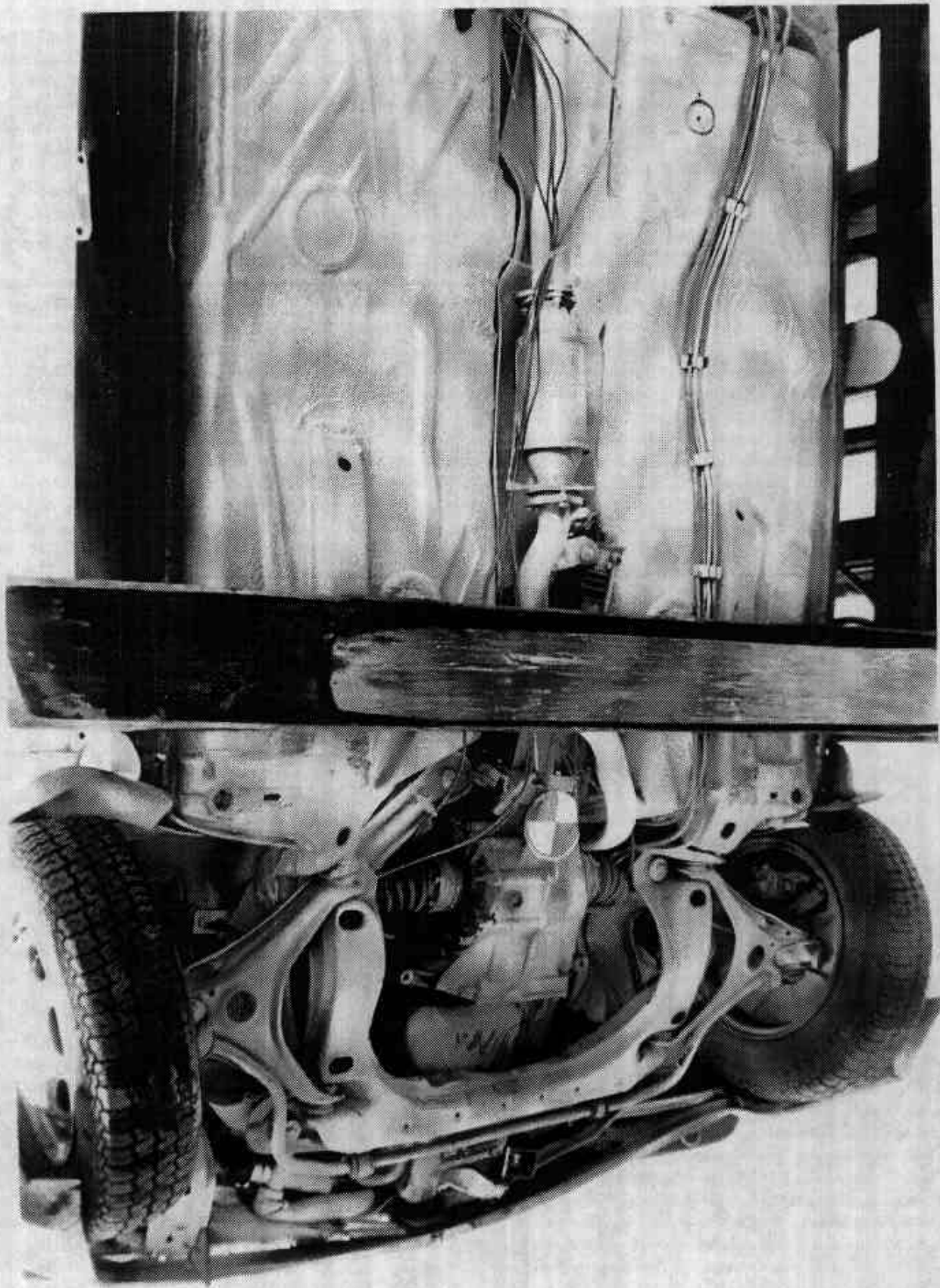


Figure A-17 POST-TEST FRONT SIDE UNDERBODY VIEW

A-18

7731-13

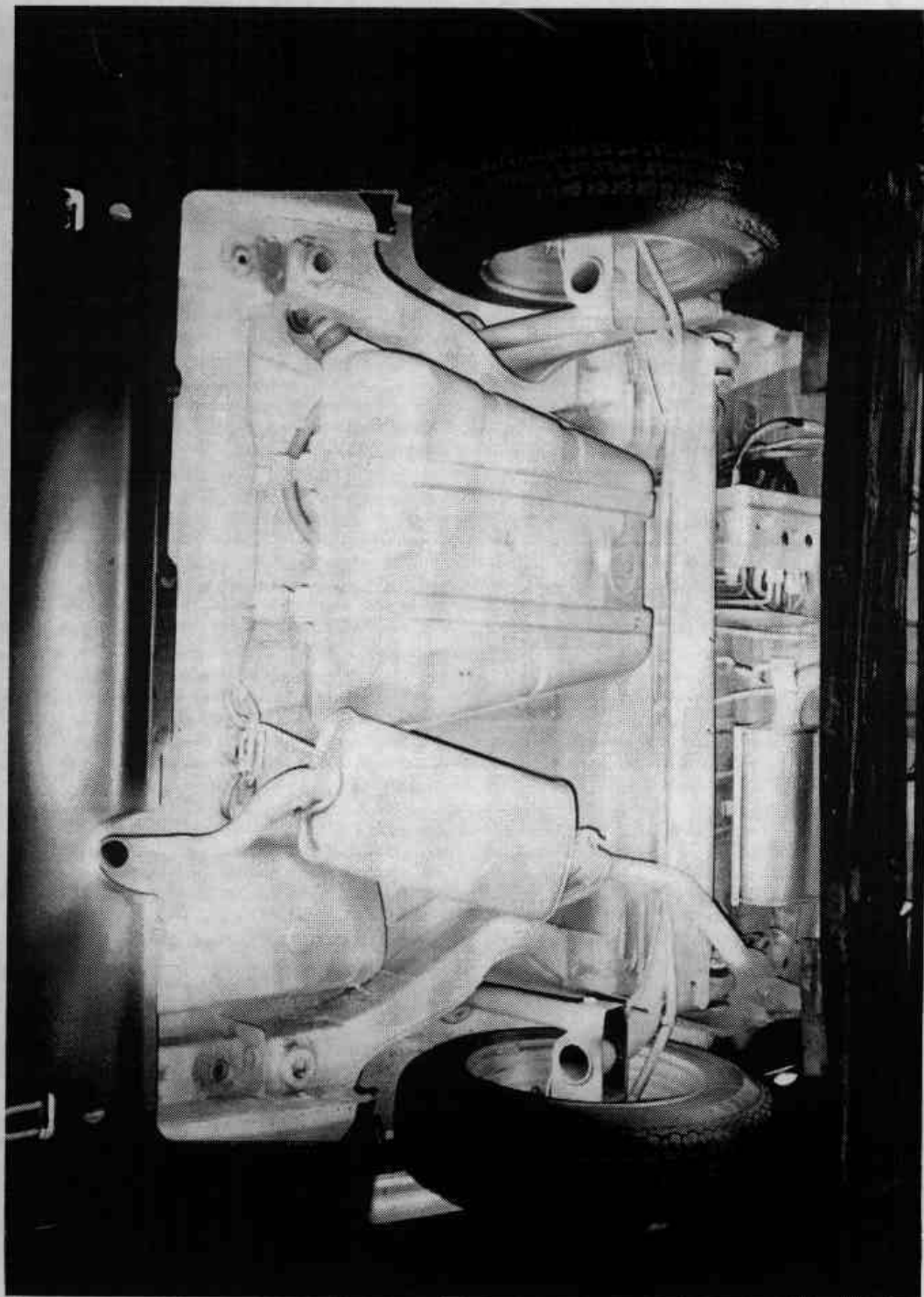


Figure A-18 PRE-TEST REAR UNDERBODY VIEW

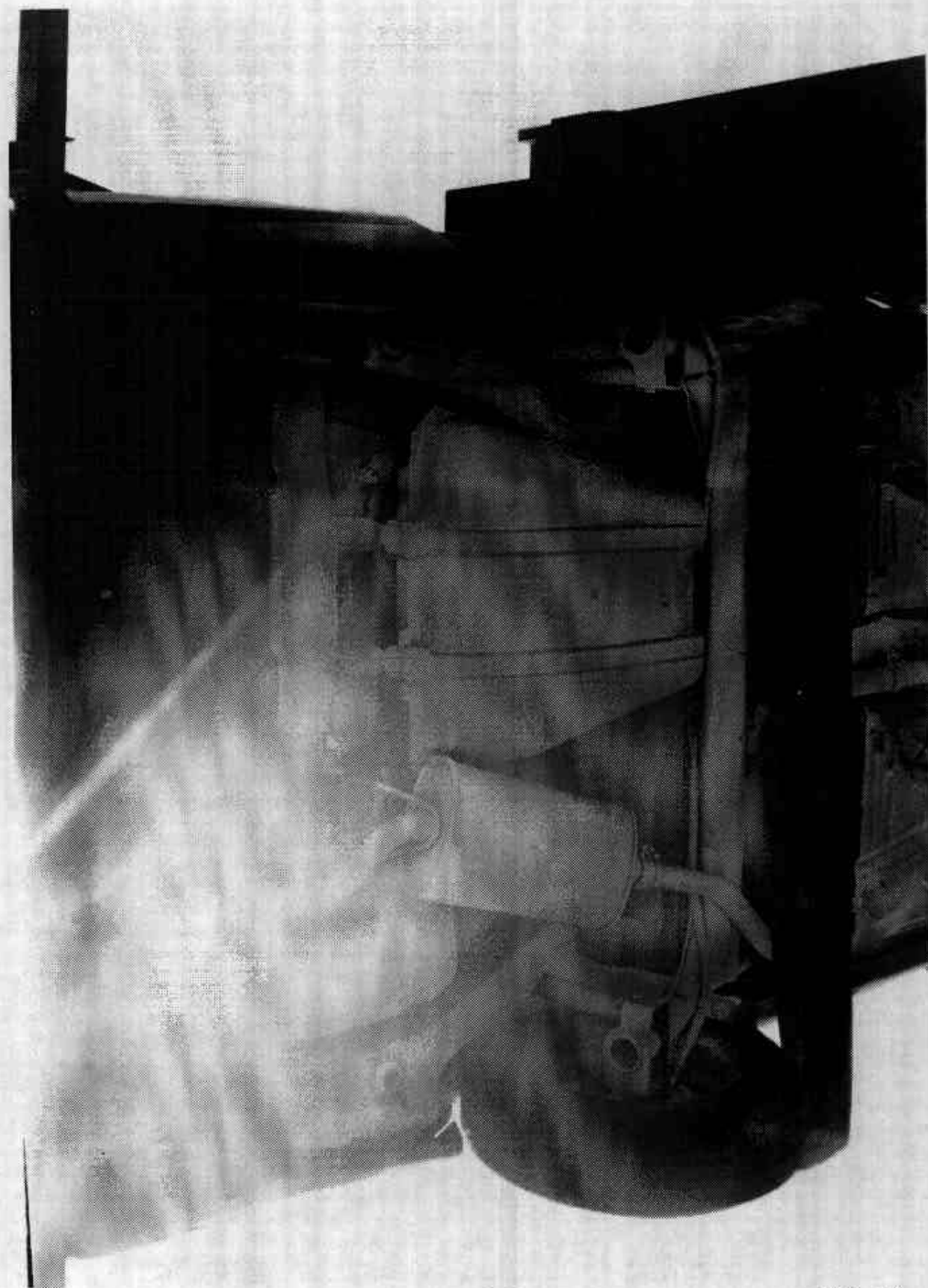


FIGURE A-19 POST-TEST REAR UNDERBODY VIEW

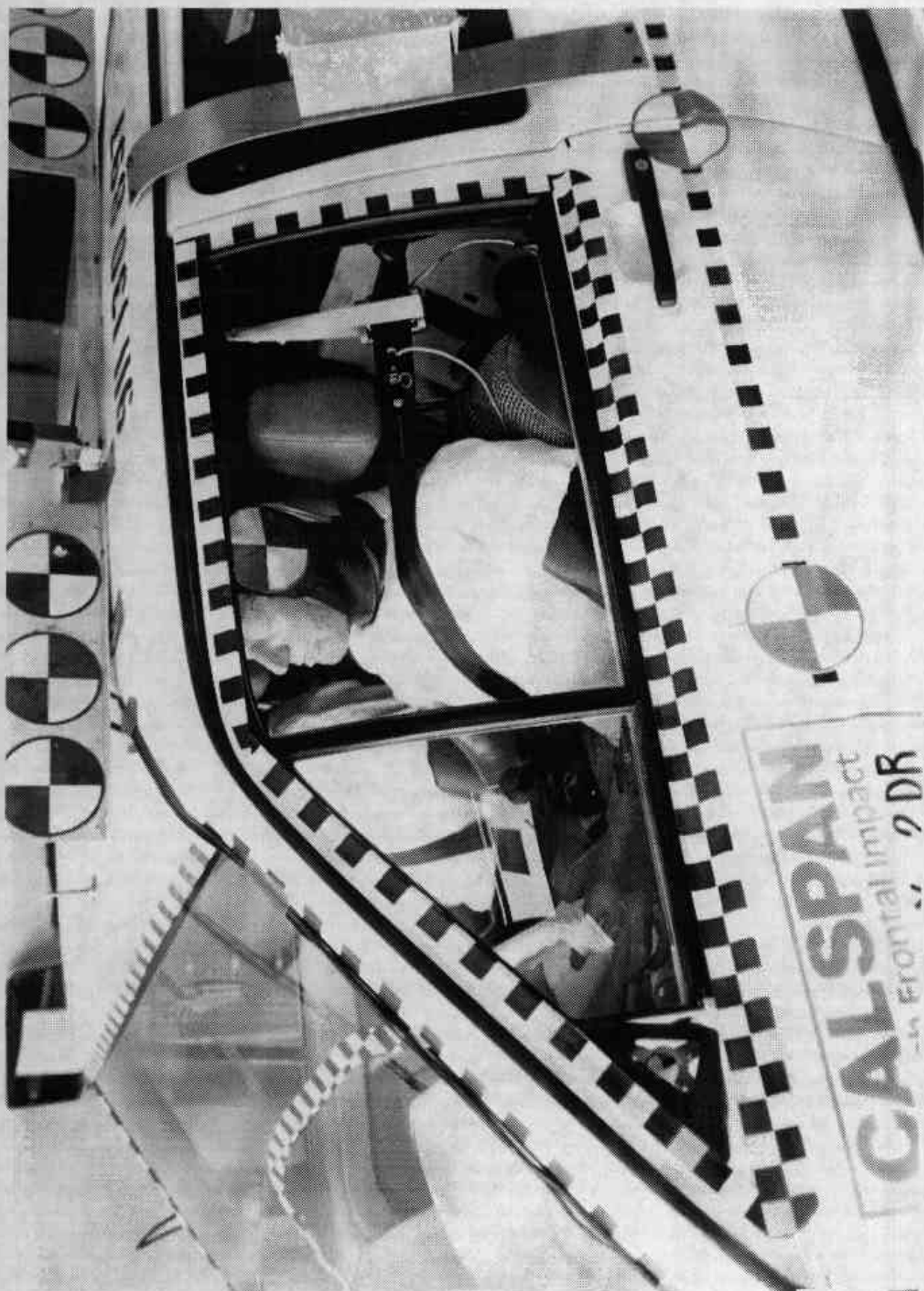


Figure A-20 PRE-TEST DRIVER POSITION VIEW



Figure A-21 POST-TEST DRIVER POSITION VIEW



Figure A-22 PRE-TEST PASSENGER POSITION VIEW

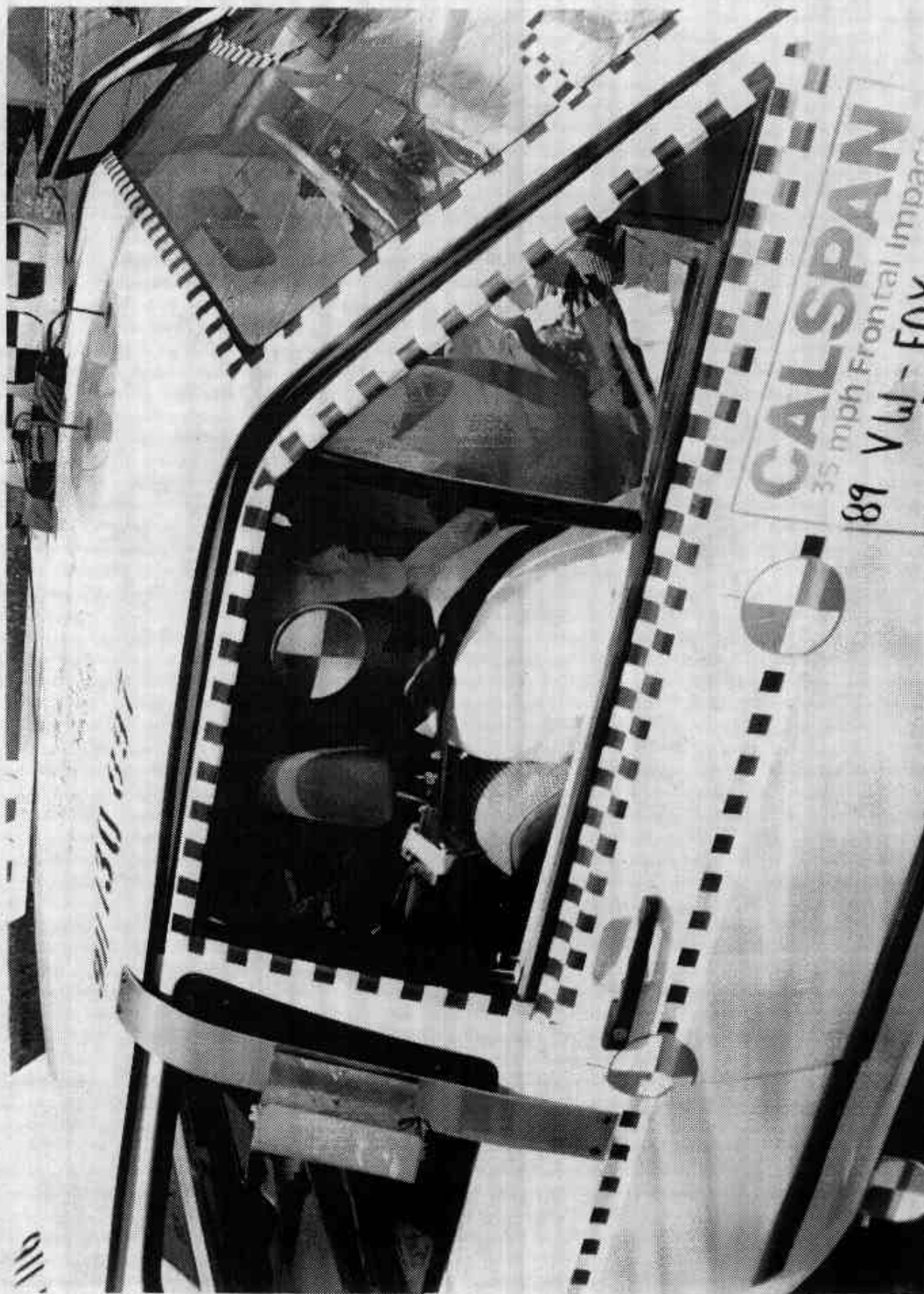


Figure A-23 POST-TEST PASSENGER POSITION VIEW



Figure A-24 PRE-TEST DRIVER AND INTERIOR VIEW

A-25

7731-13

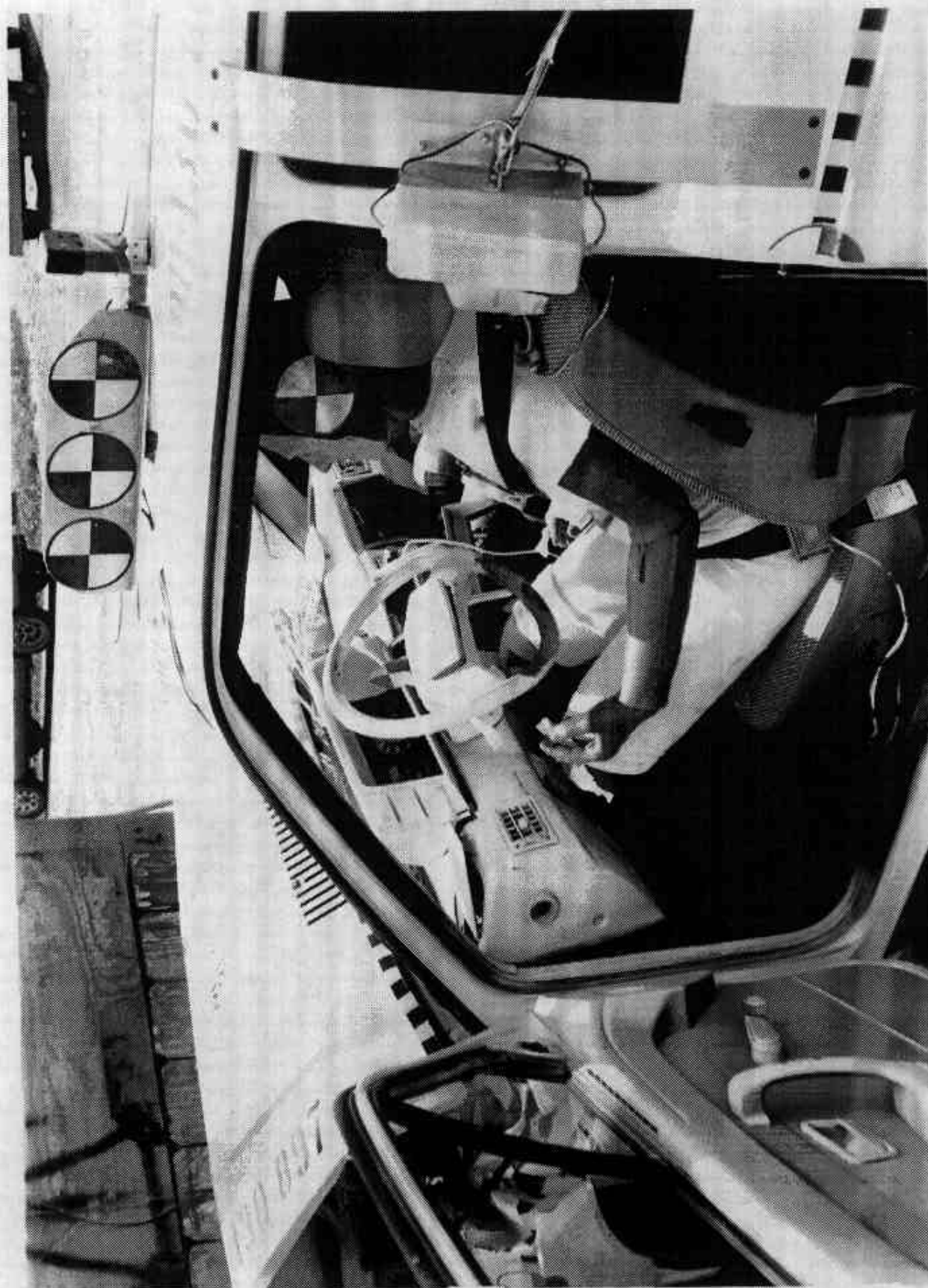


Figure A-25 POST-TEST DRIVER AND INTERIOR VIEW



Figure A-26 PRE-TEST PASSENGER AND INTERIOR VIEW

A-27

7731-13



Figure A-27 POST-TEST PASSENGER AND INTERIOR VIEW

**Appendix B**

**VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA**

TEST NO. MK5801

VEHICLE DATA

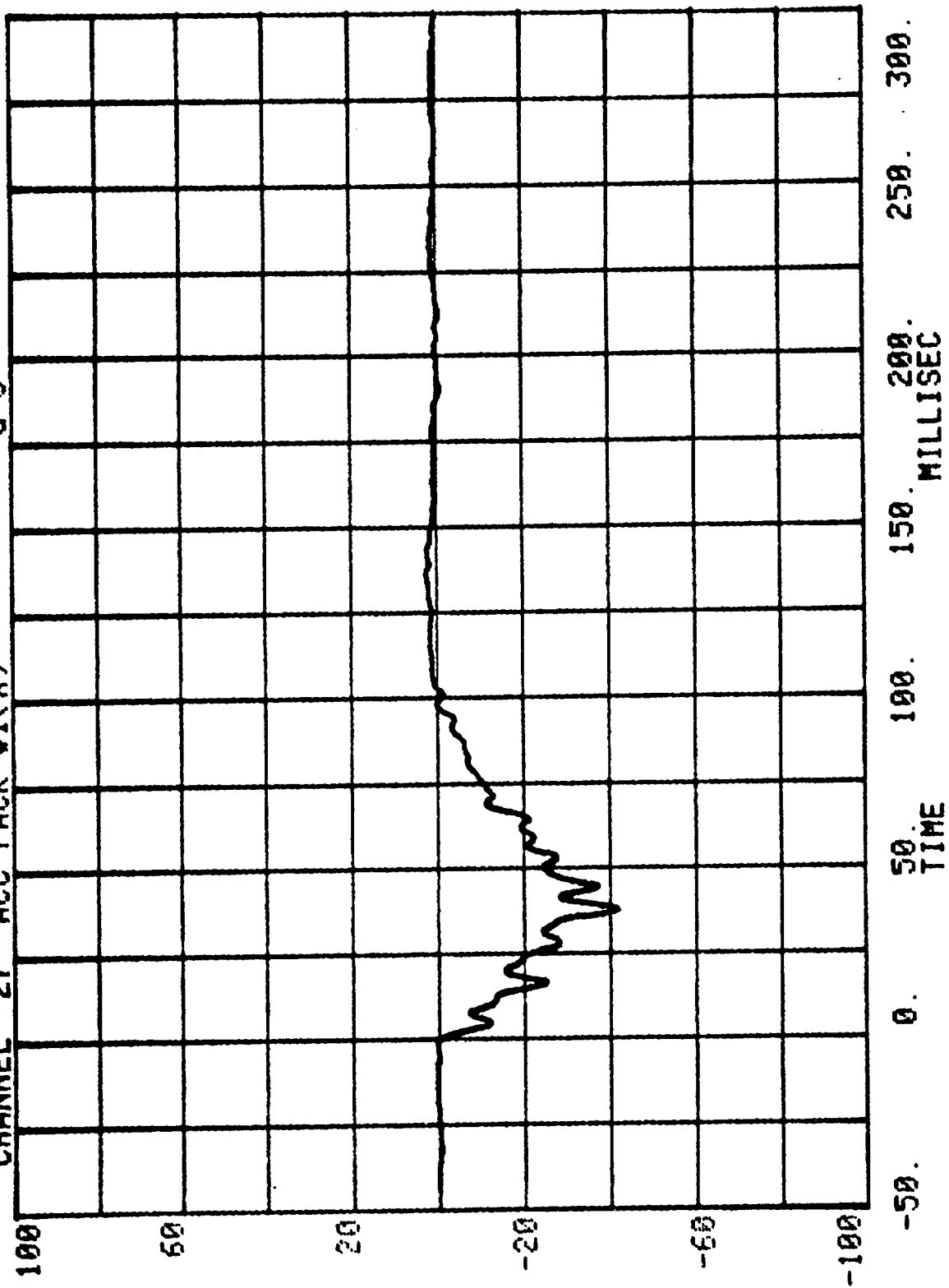
FILTER CHANNEL CLASS

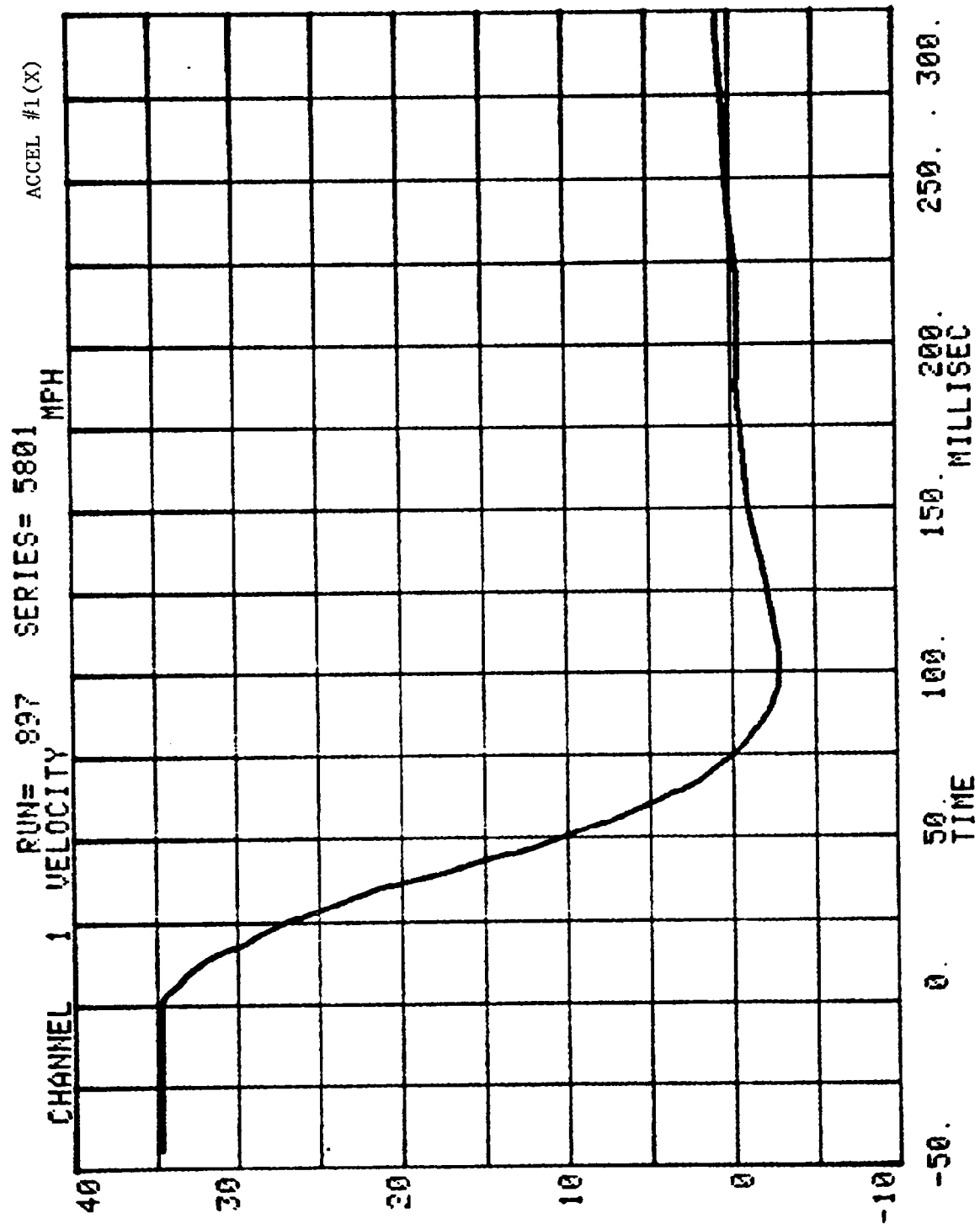
60

B-2

7731-13

RUN= 897 SERIES= 5801 G'S  
CHANNEL 27 ACC PACK #1(X)





ACCEL. #1(X)

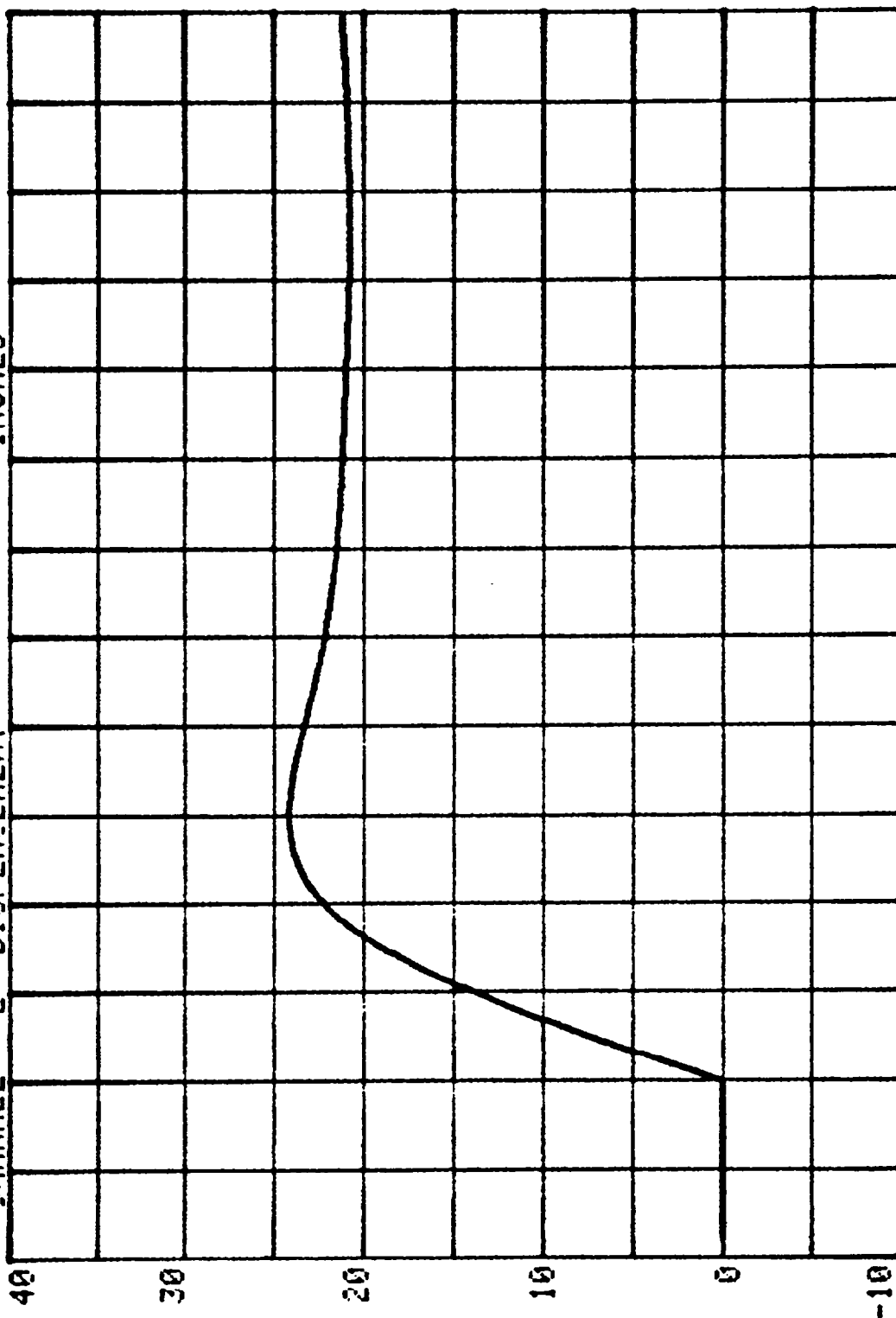
SERIES= 5801

INCHES

RUN= 897

DISPLACEMENT

CHANNEL 2



250. 300.

150. 200. MILLISEC

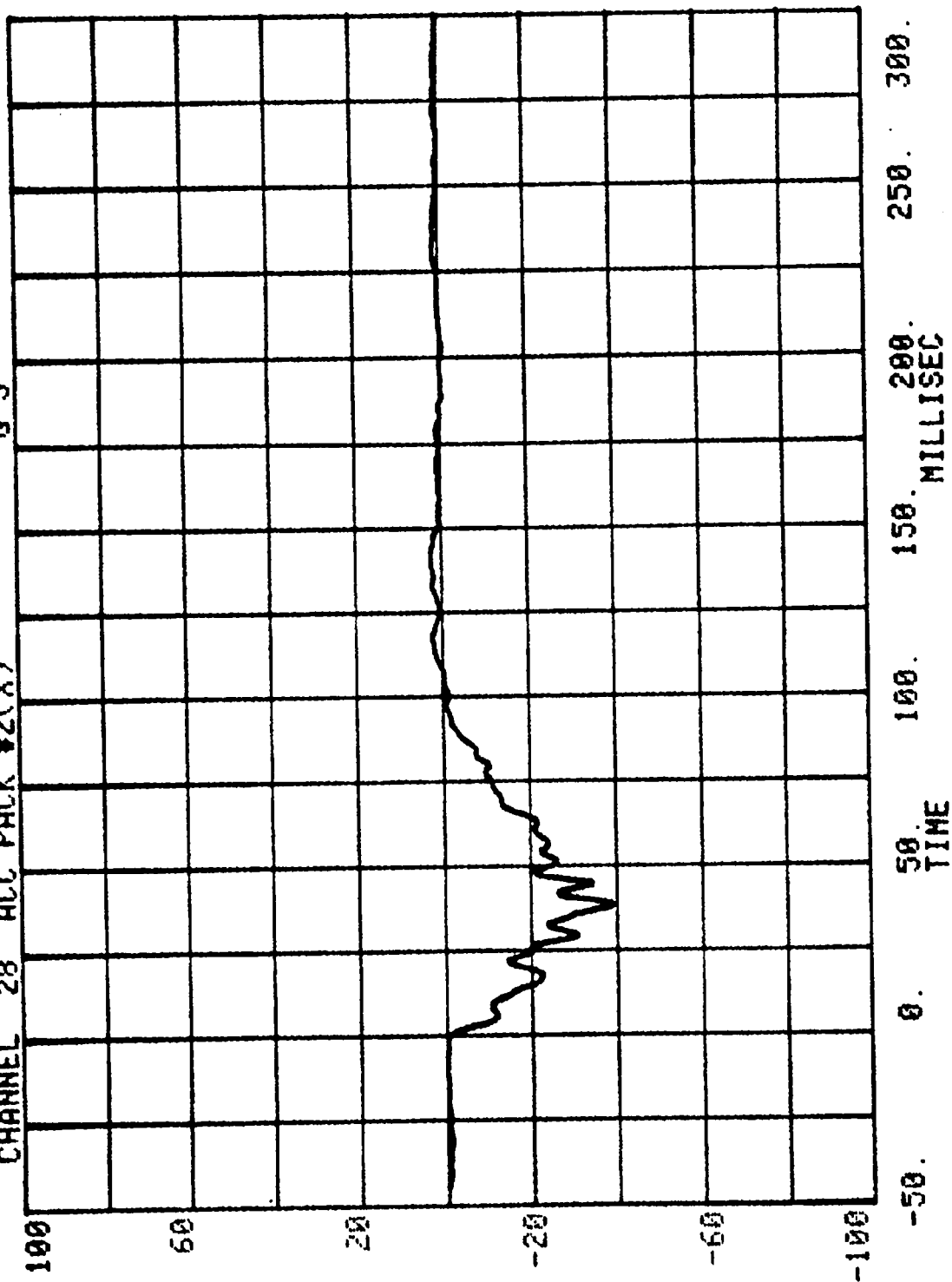
100.

50. TIME

0.

-50.

RUN= 897 SERIES= 5801 G'S  
CHANNEL 28 ACC PACK #2(X)



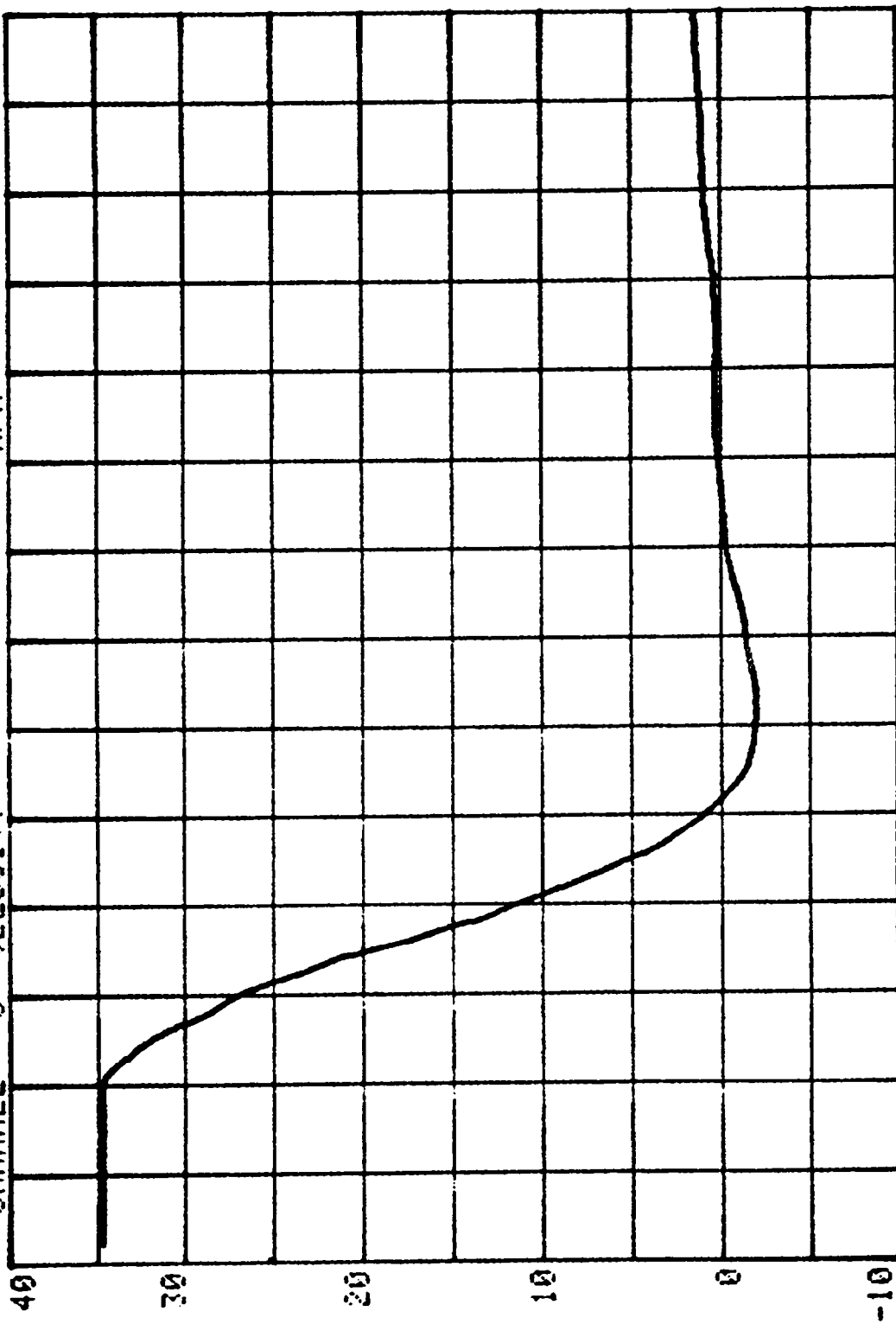
ACCEL #2 (X)

RUN= 897 SERIES= 5801

MPH

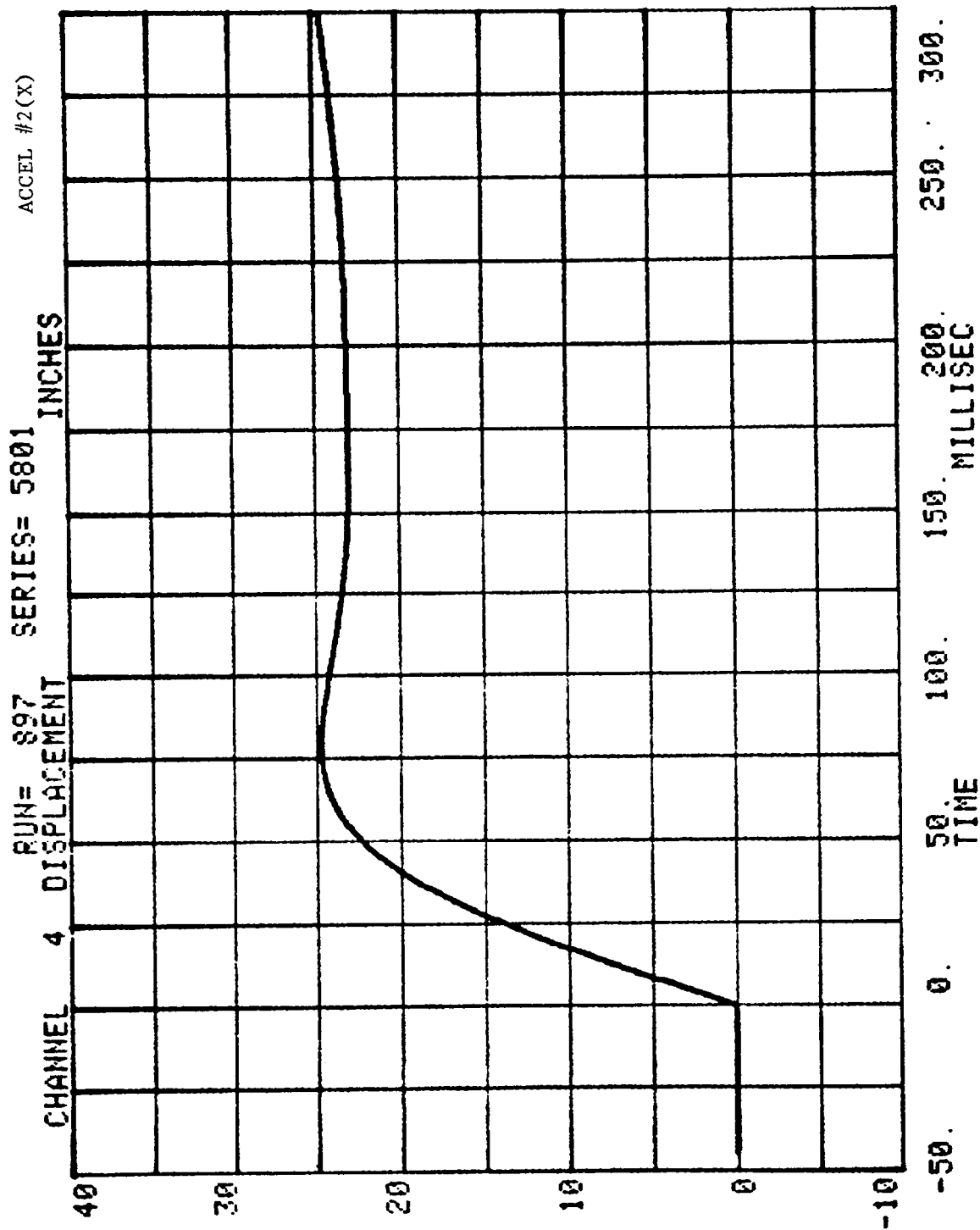
VELOCITY

CHANNEL 3

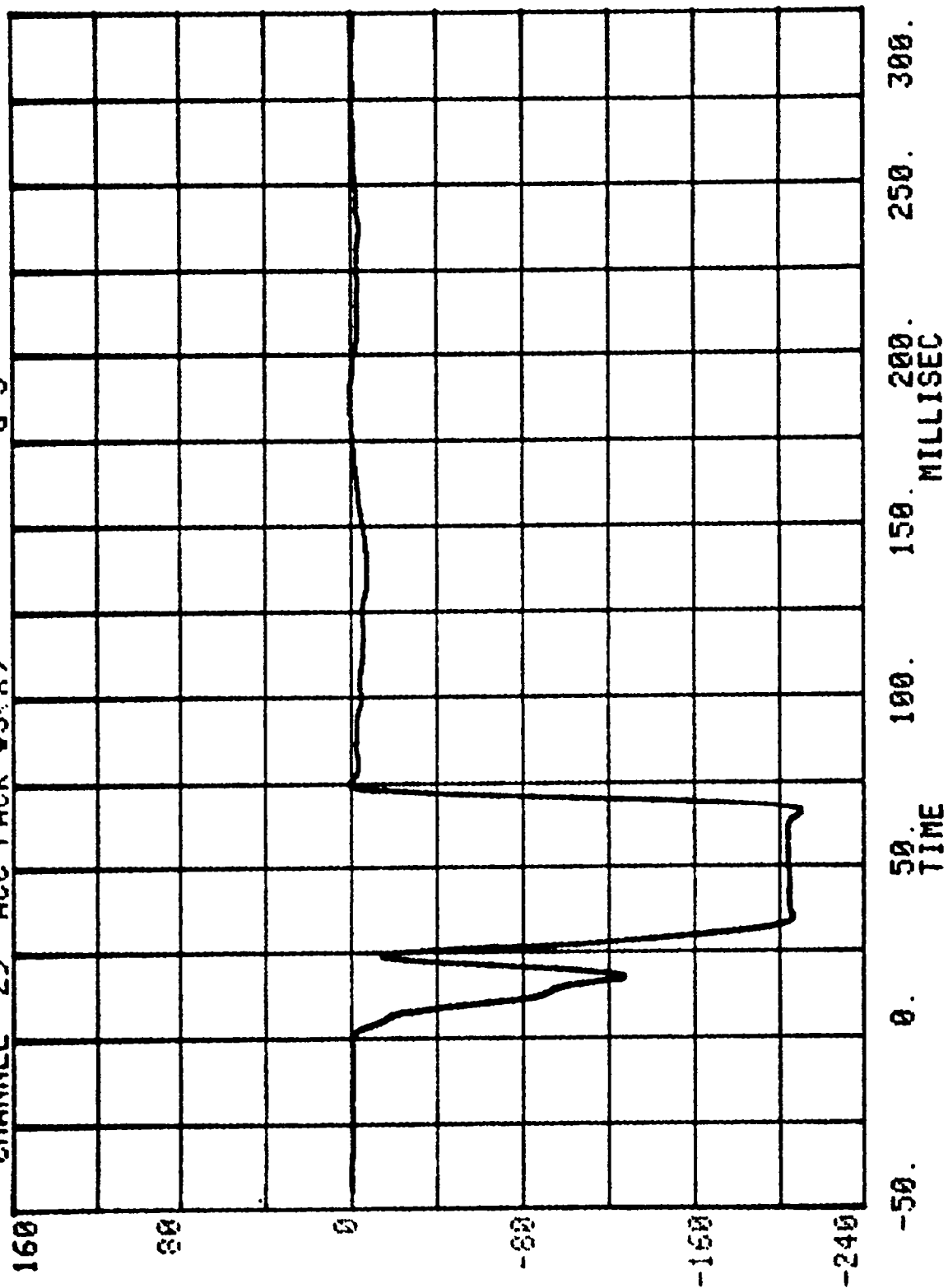


300.  
250.  
200.  
150.  
100.  
50.  
0.  
-50.

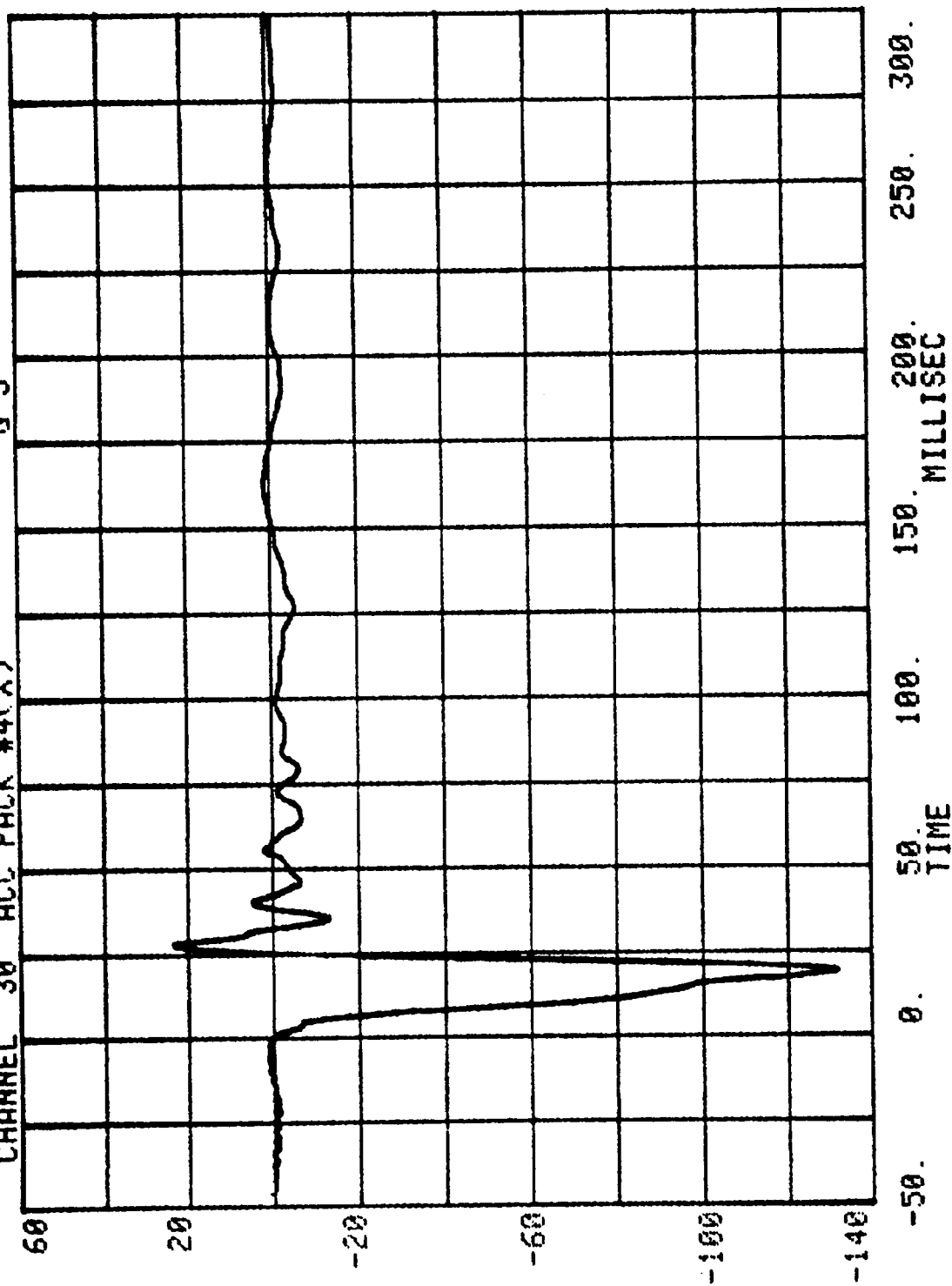
TIME



RUN= 897 SERIES= 5801  
CHANNEL 29 ACC PACK #3(X) G'S

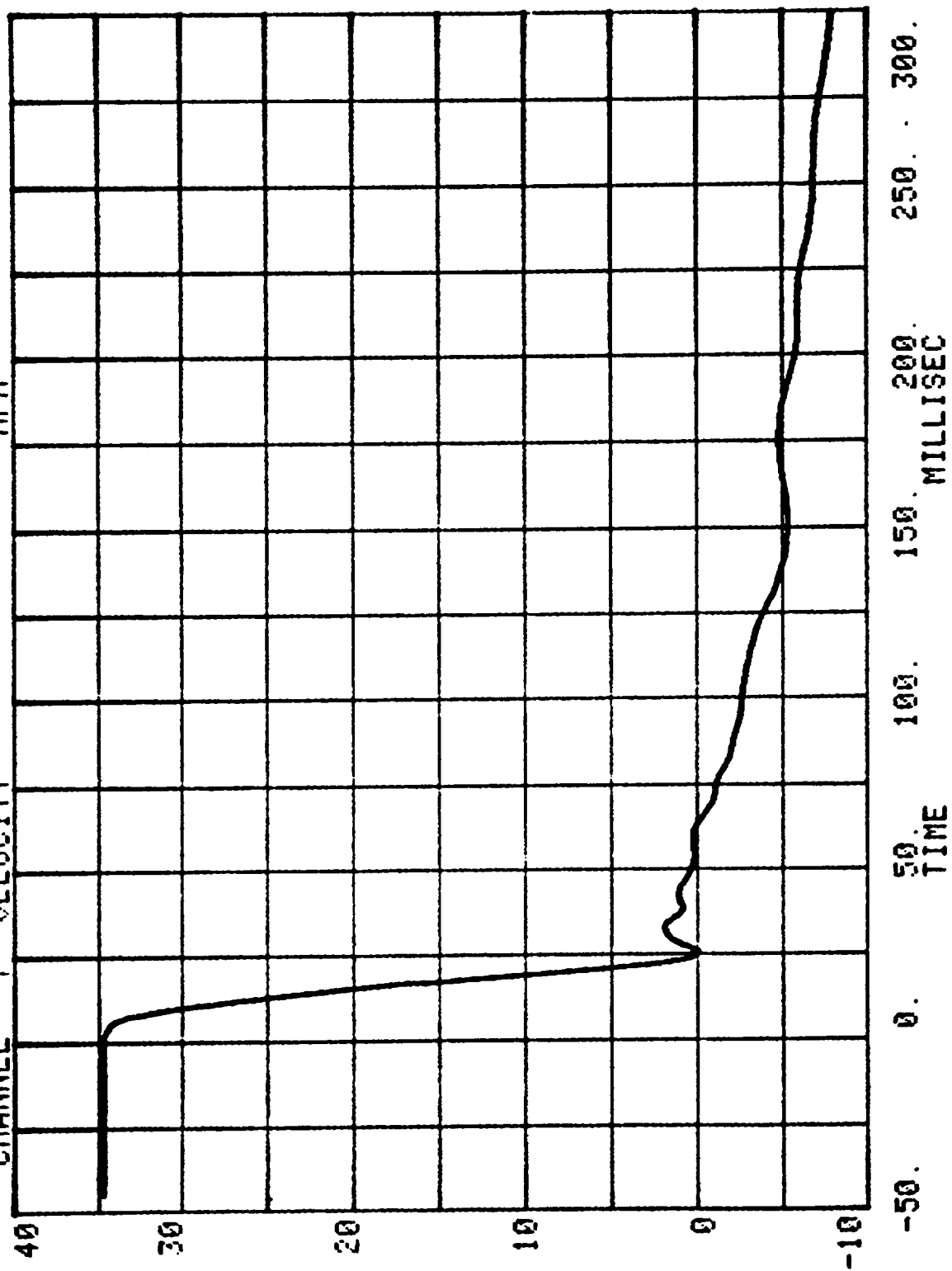


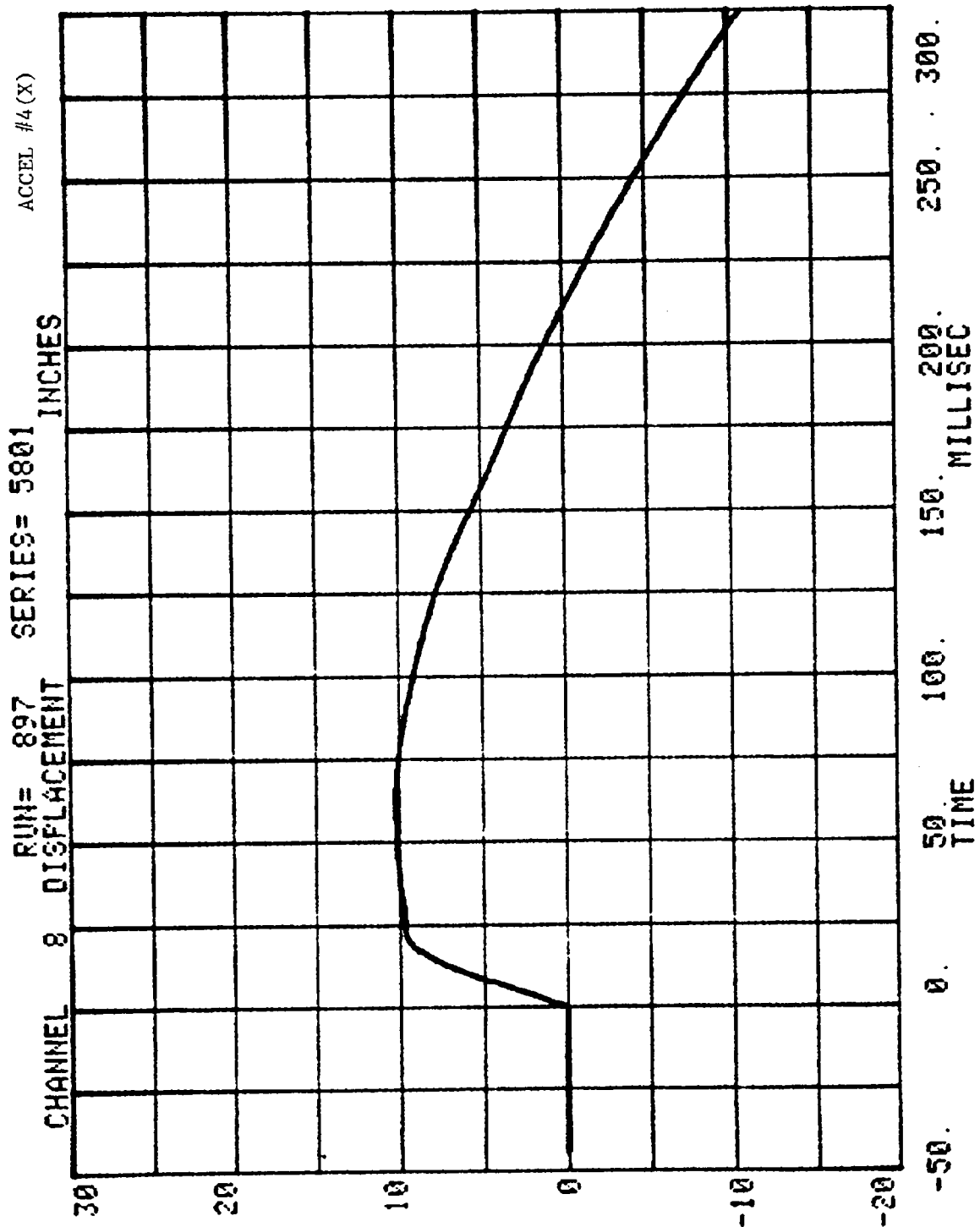
RUN= 897 SERIES= 5801 G'S  
CHANNEL 30 ACC PACK #4(X)



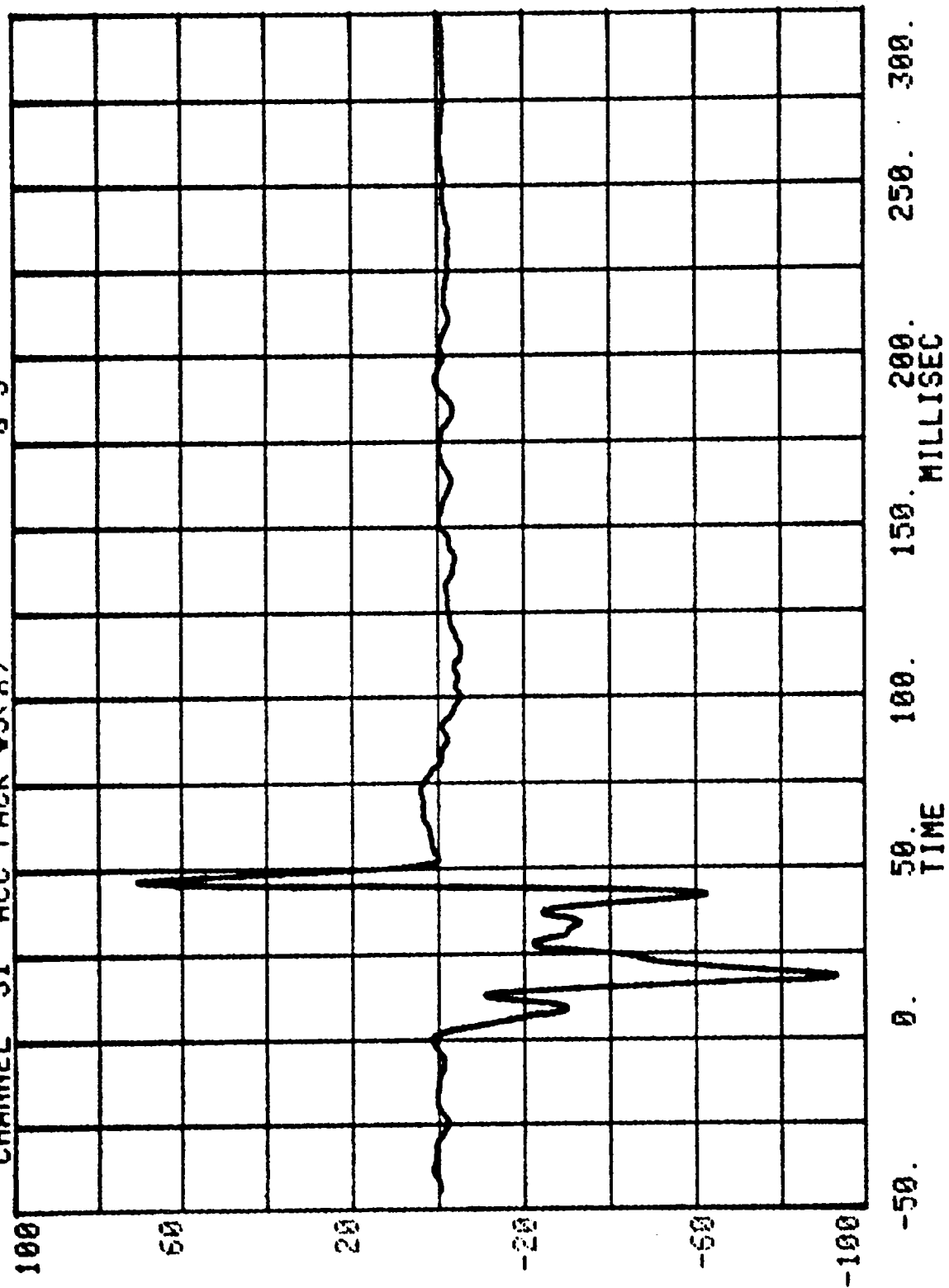
ACCEL #4 (X)

CHANNEL 7 VELOCITY  
RUN= 897 SERIES= 5801 MPH



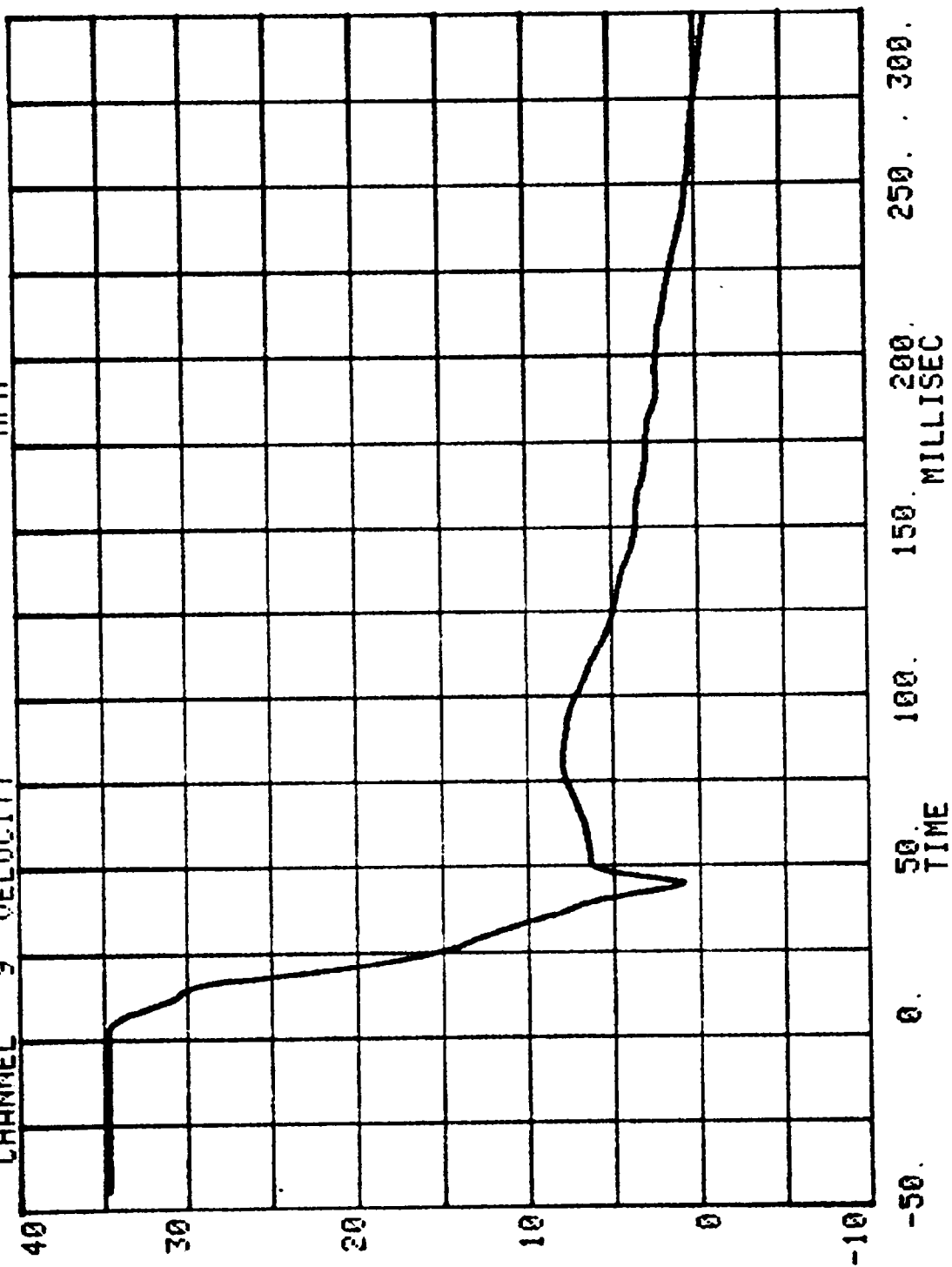


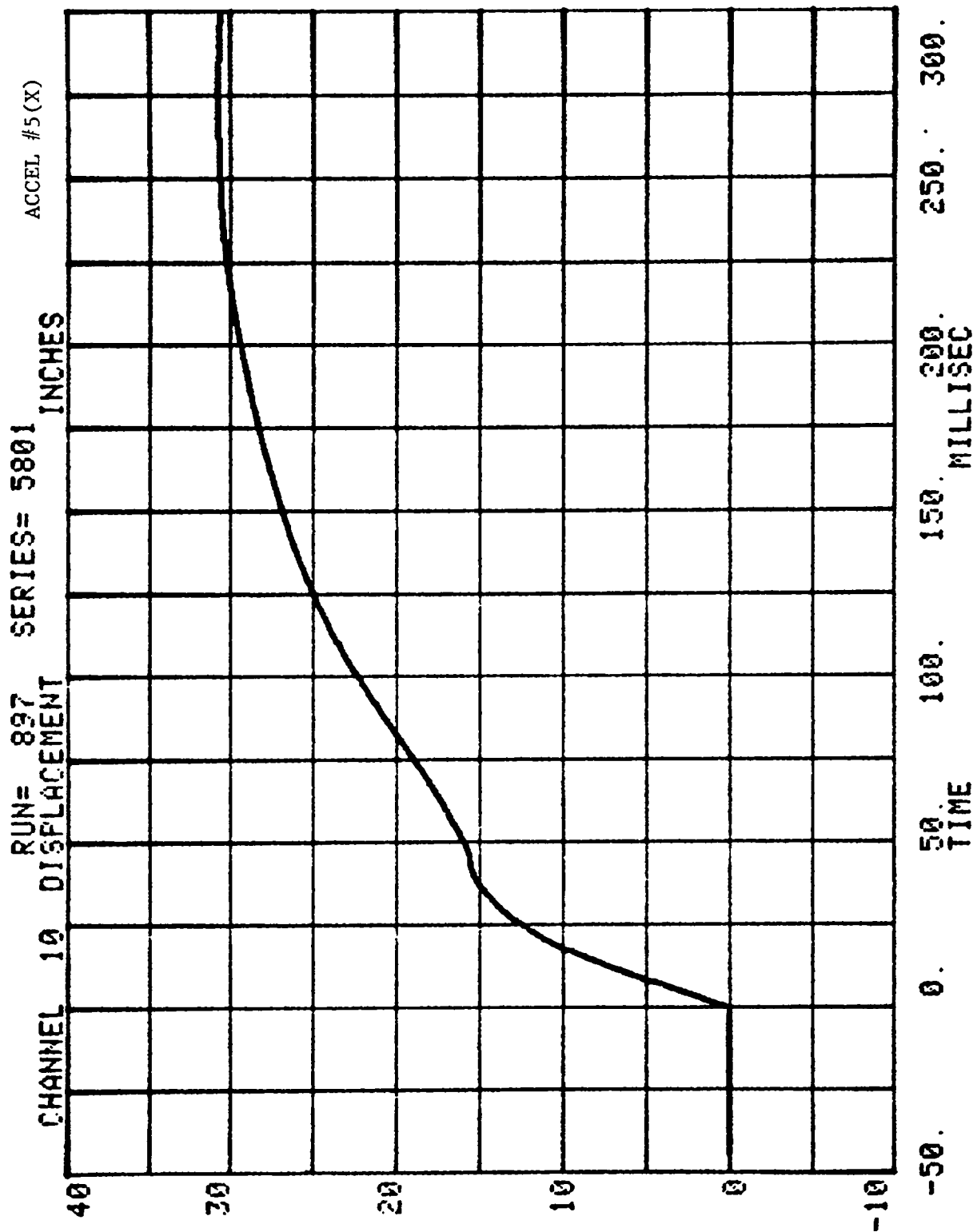
RUN= 897 SERIES= 5801 G'S  
CHANNEL 31 ACC PACK #5(X)



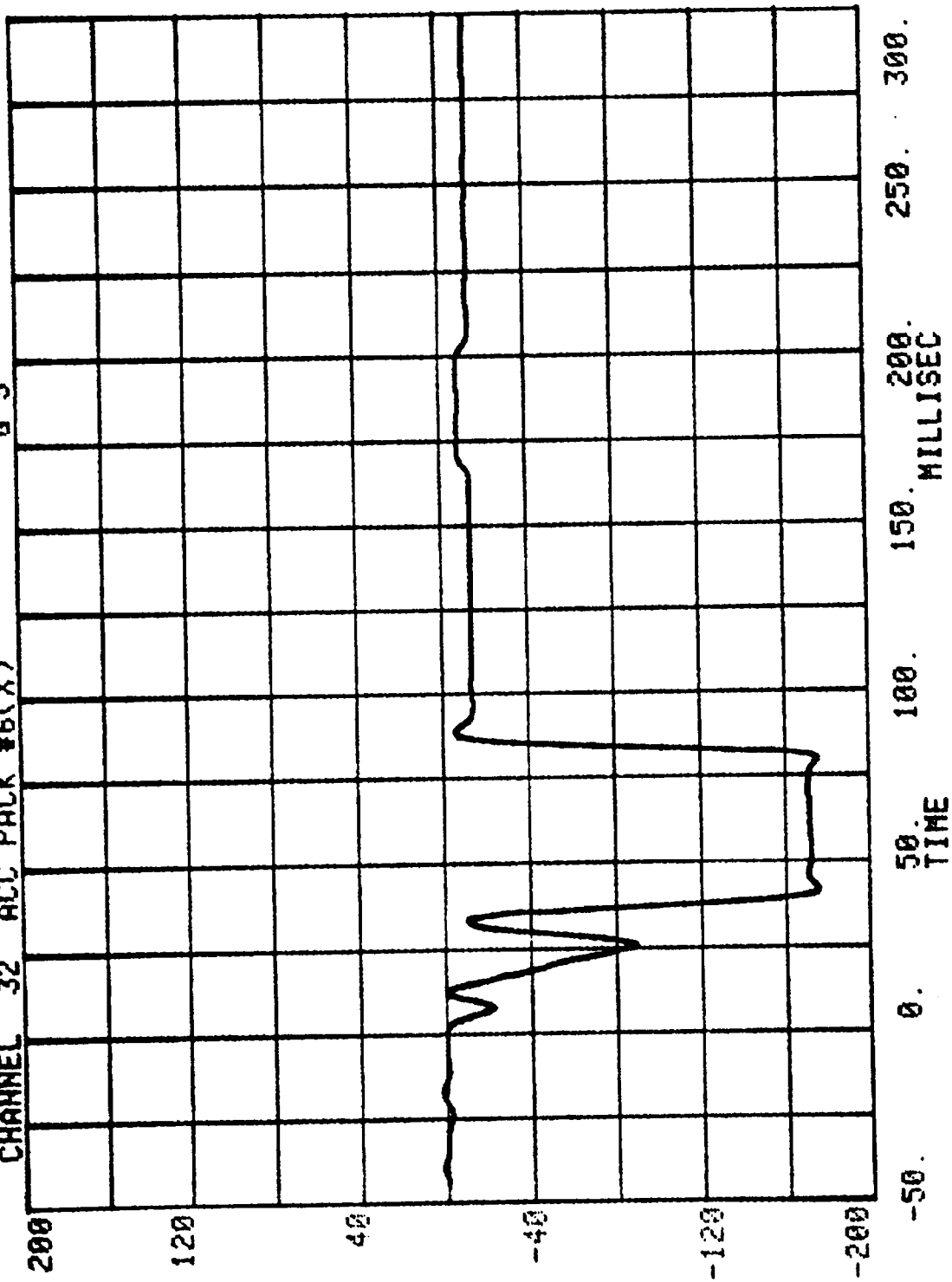
ACCEL #5 (X)

CHANNEL 9 VELOCITY  
RUN= 897 SERIES= 5801 MPH

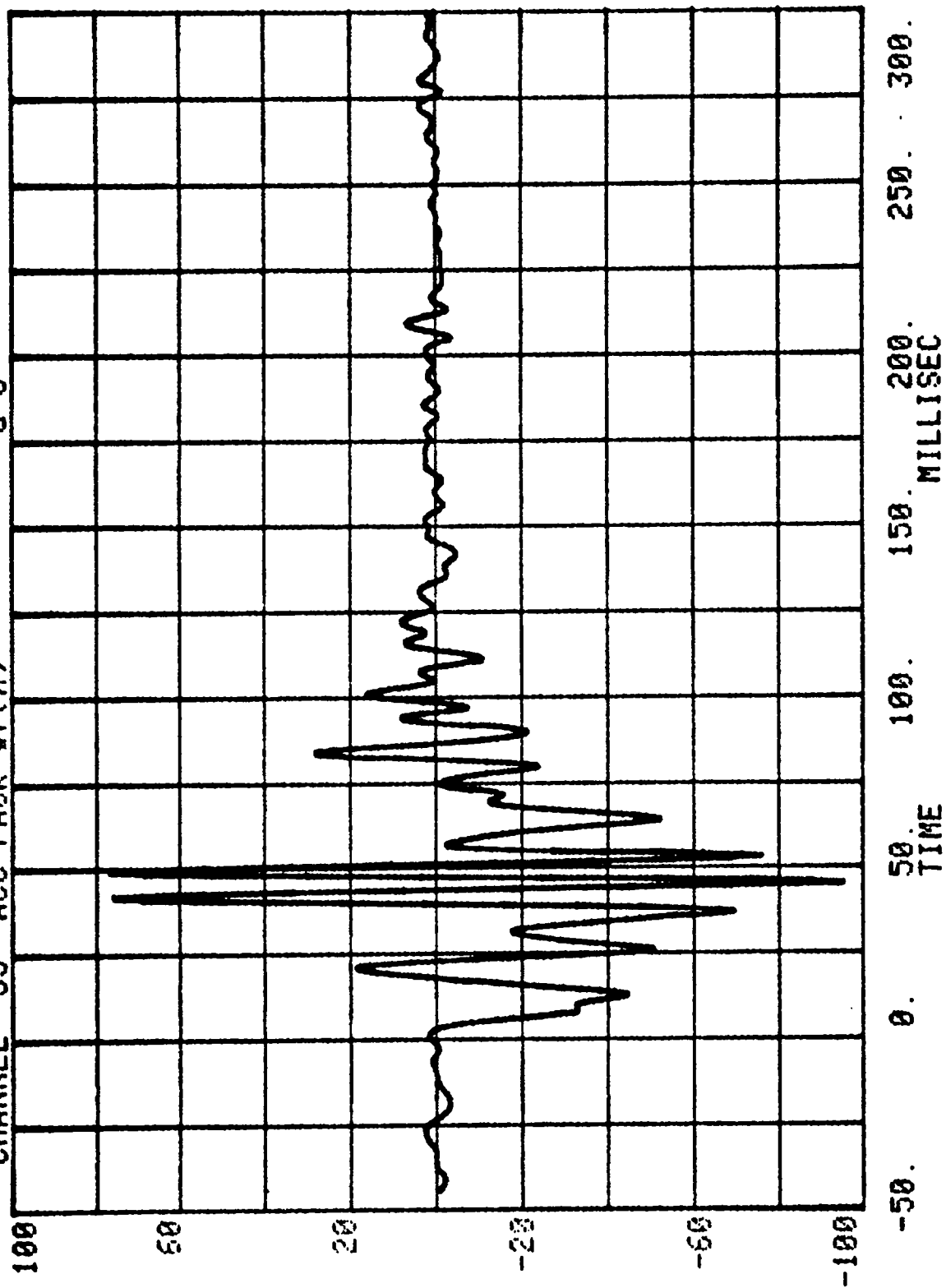




CHANNEL 32 ACC PACK #6(X) RUN= 897 SERIES= 5801 G'S



RUN= 897 SERIES= 5801 G'S  
CHANNEL 33 ACC PACK #7(X)



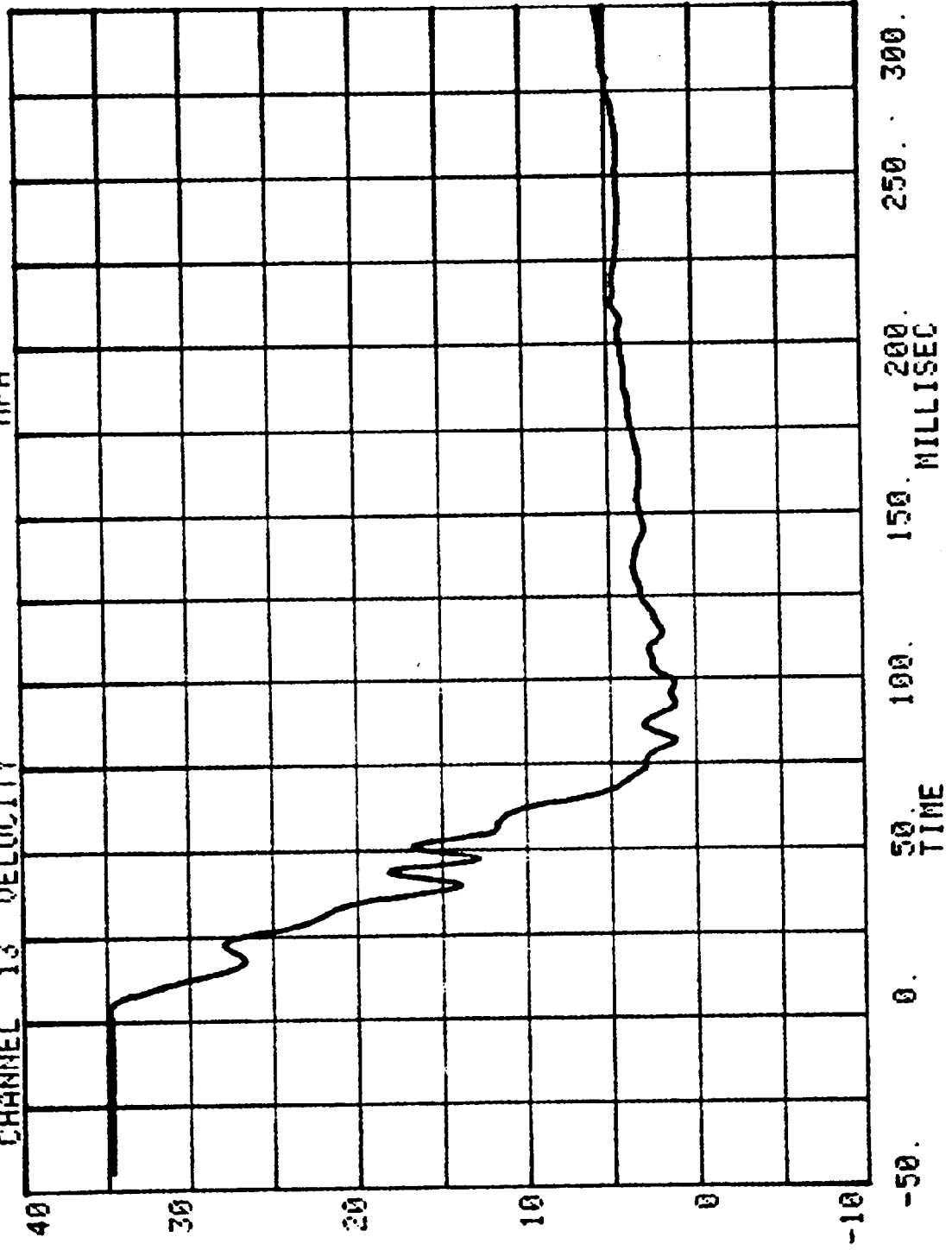
ACCEL #7(X)

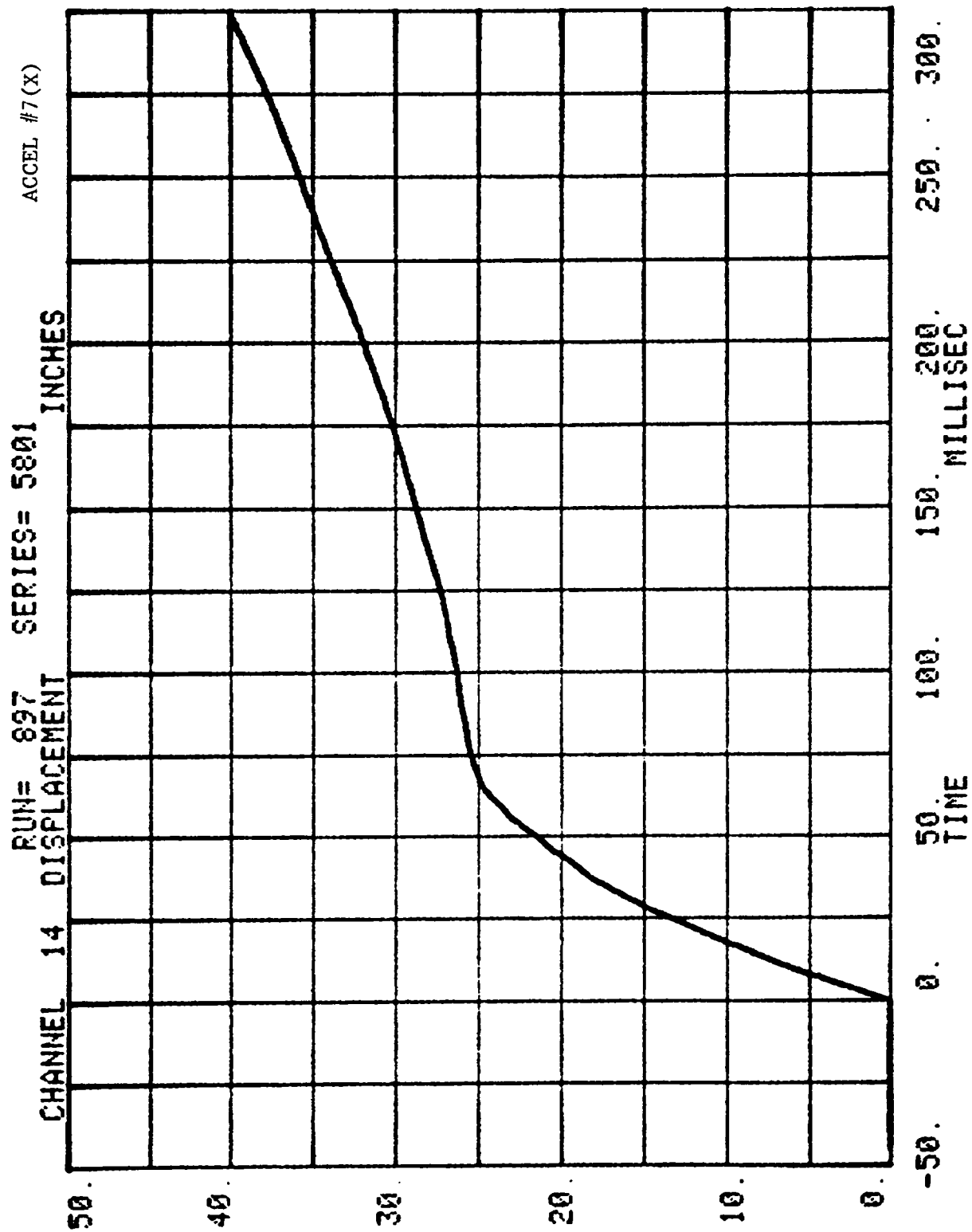
CHANNEL 13 VELOCITY

RUN= 897

SERIES= 5801

MPH





TEST NO. MK5801

LOAD CELL BARRIER DATA

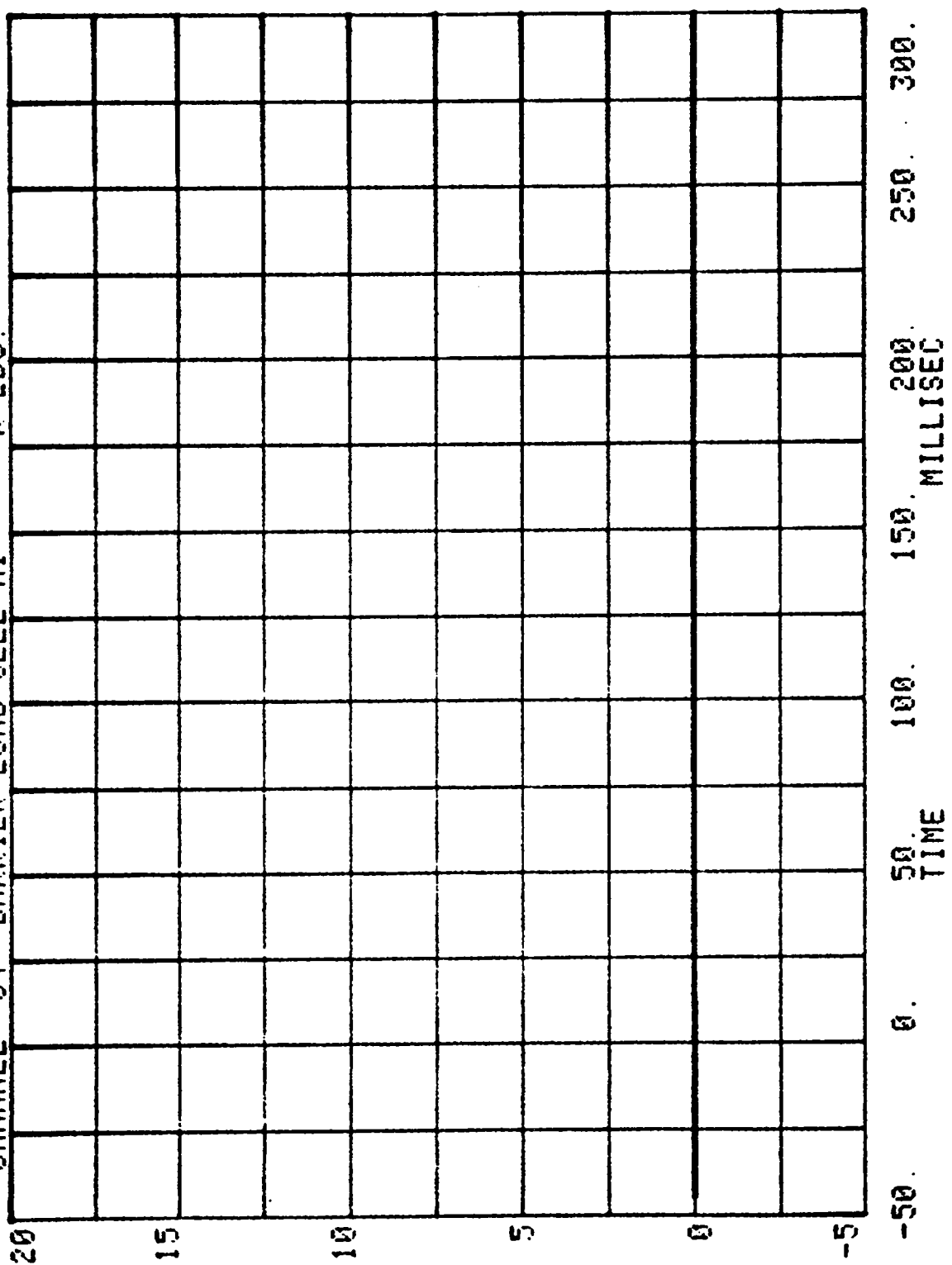
FILTER CHANNEL CLASS

60

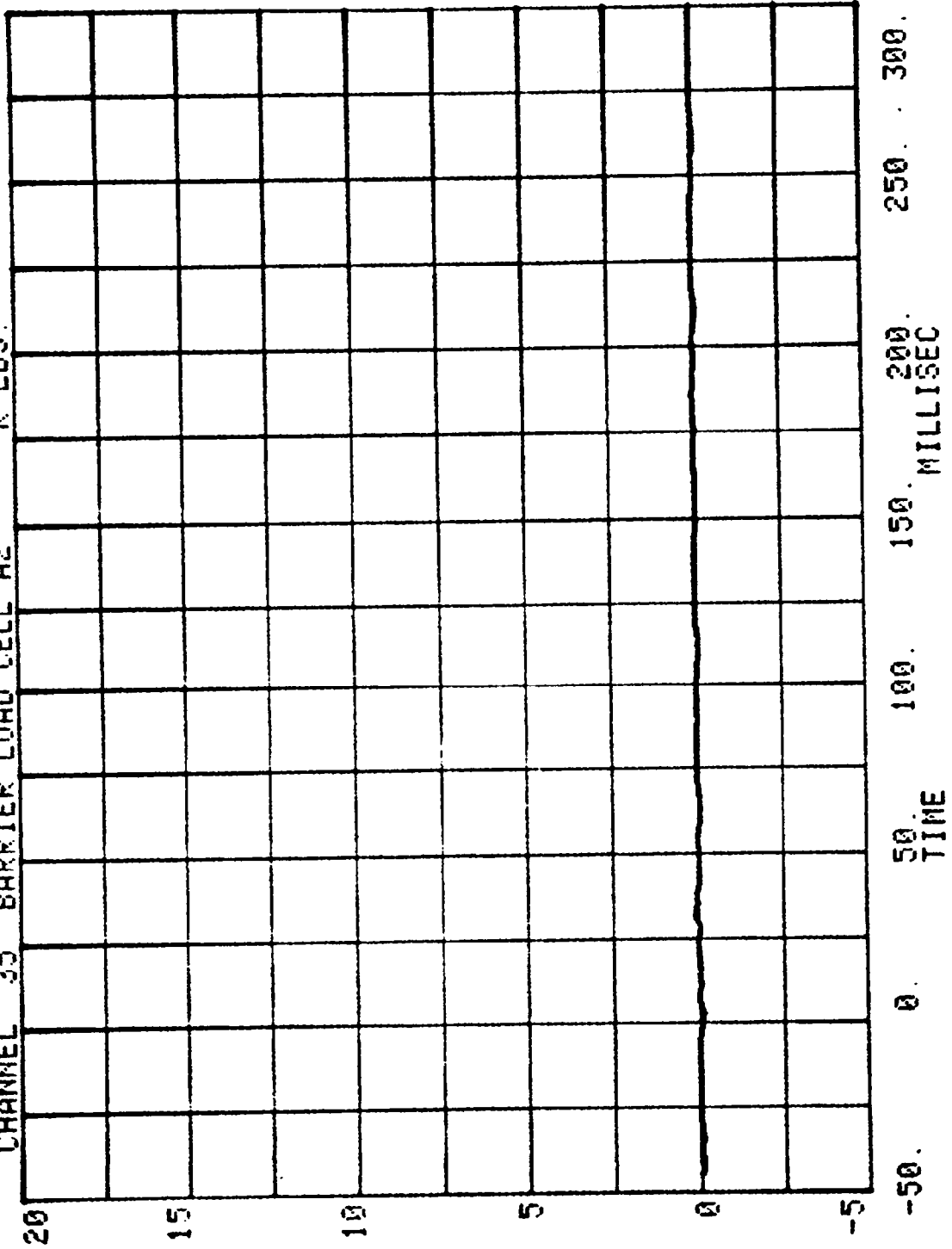
B-20

7731-13

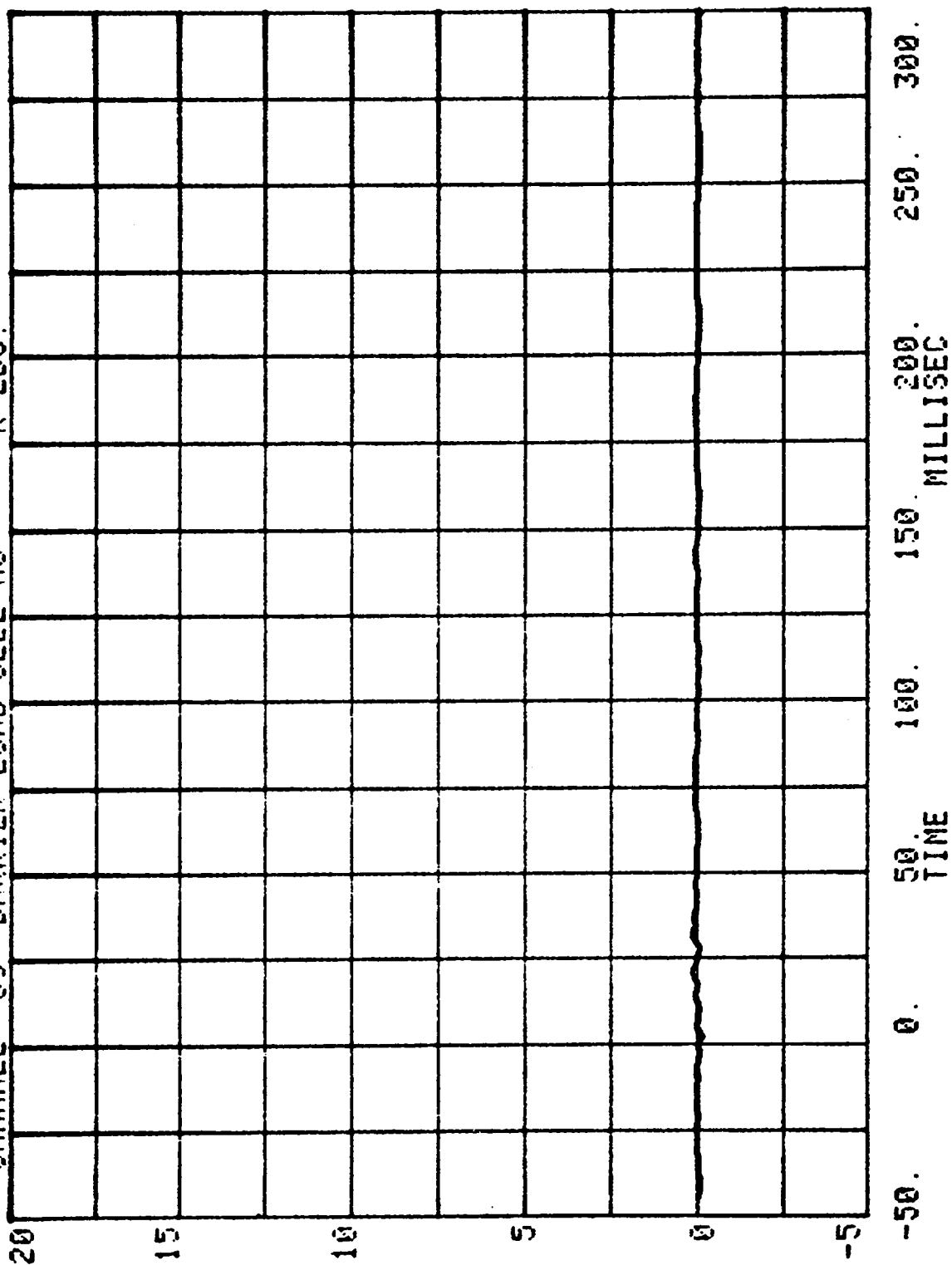
RUN= 897 SERIES= 5801  
CHANNEL 34 BARRIER LOAD CELL A1 K LBS.



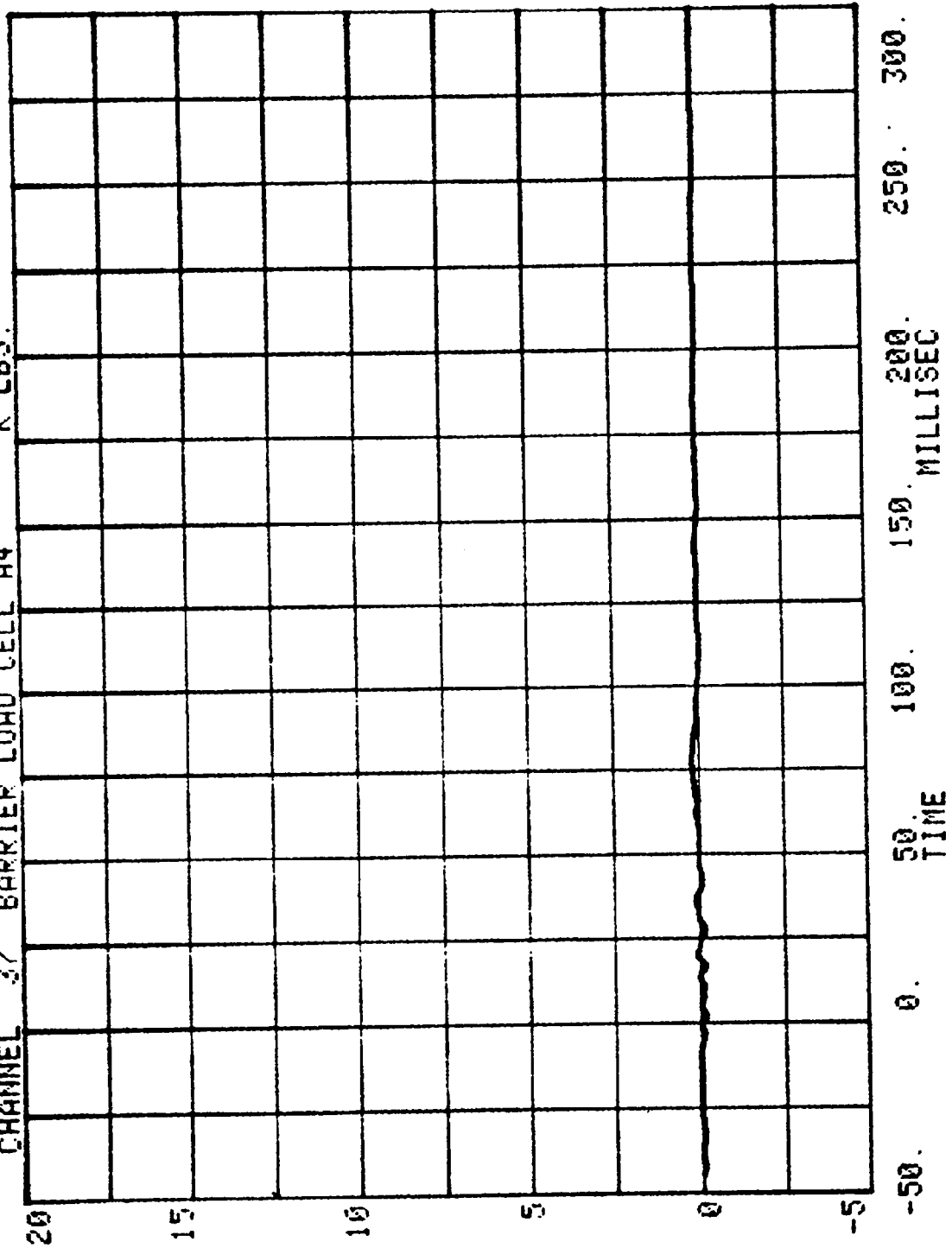
CHANNEL 35 BARRIER LOAD CELL A2 RUN= 897 SERIES= 5801 K LBS.



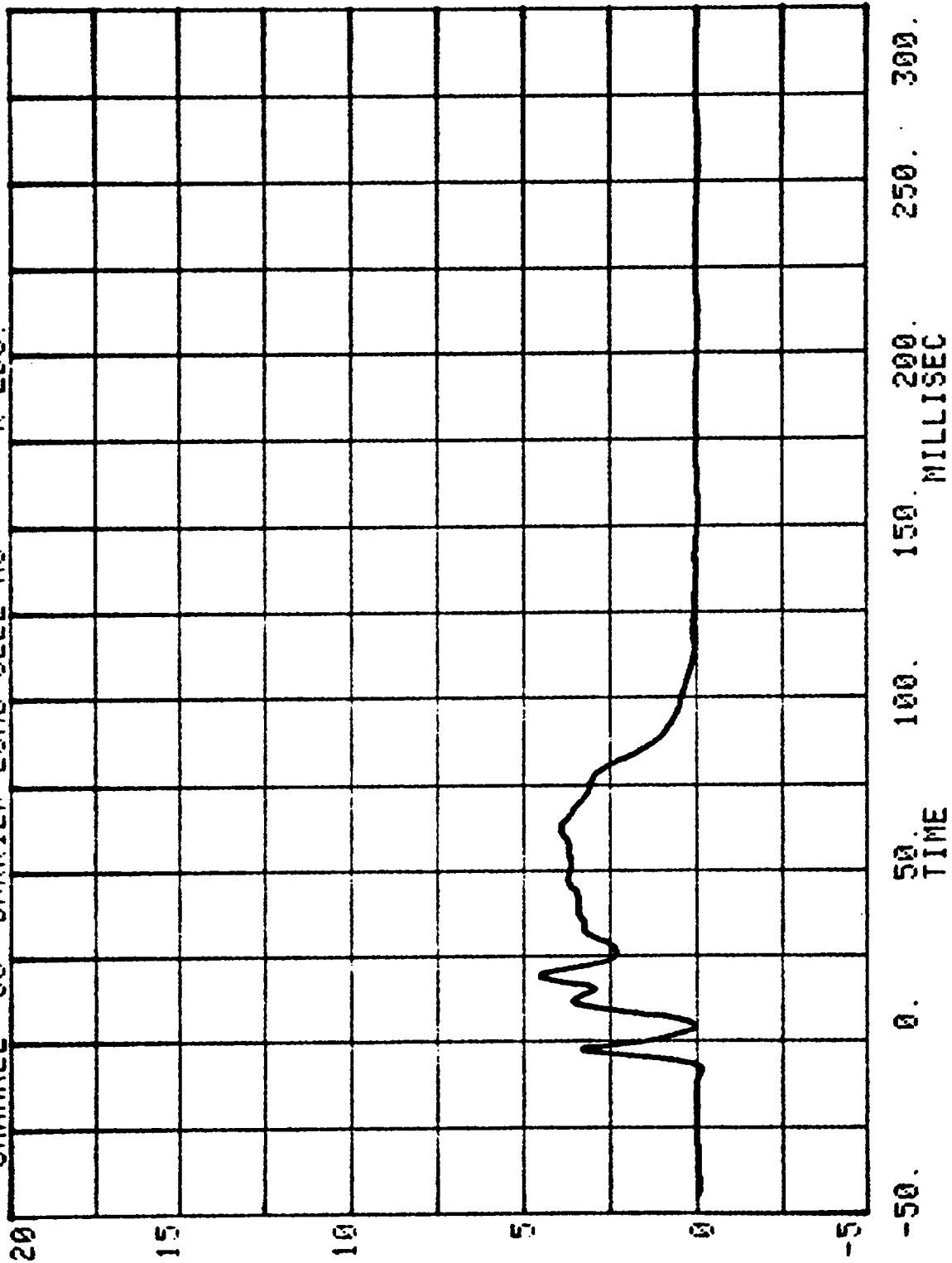
CHANNEL 36 BARRIER LOAD CELL A3 RUN= 897 SERIES= 5801 K LBS.



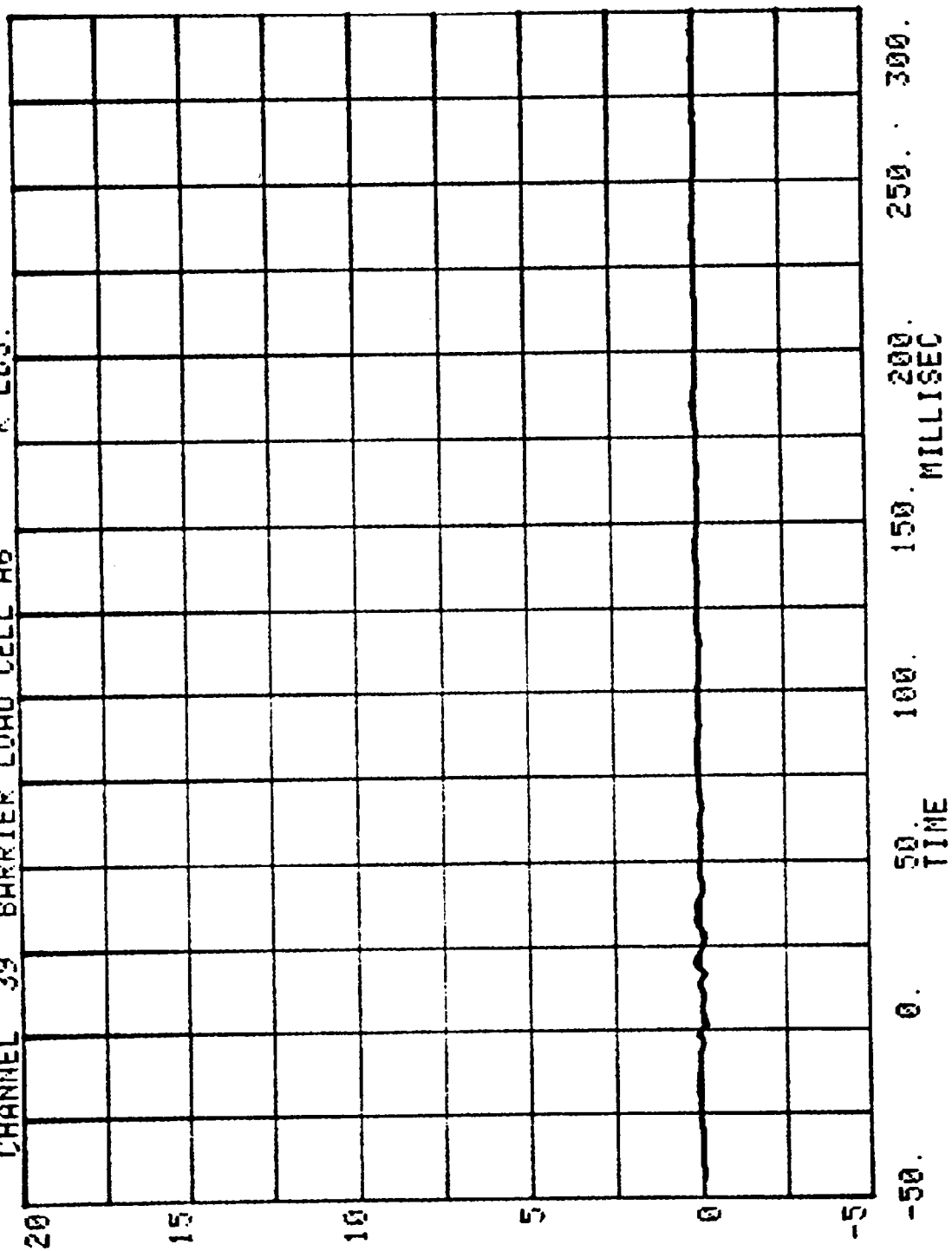
CHANNEL 37 BARRIER LOAD CELL A4 RUN= 897 SERIES= 5801 K LBS.



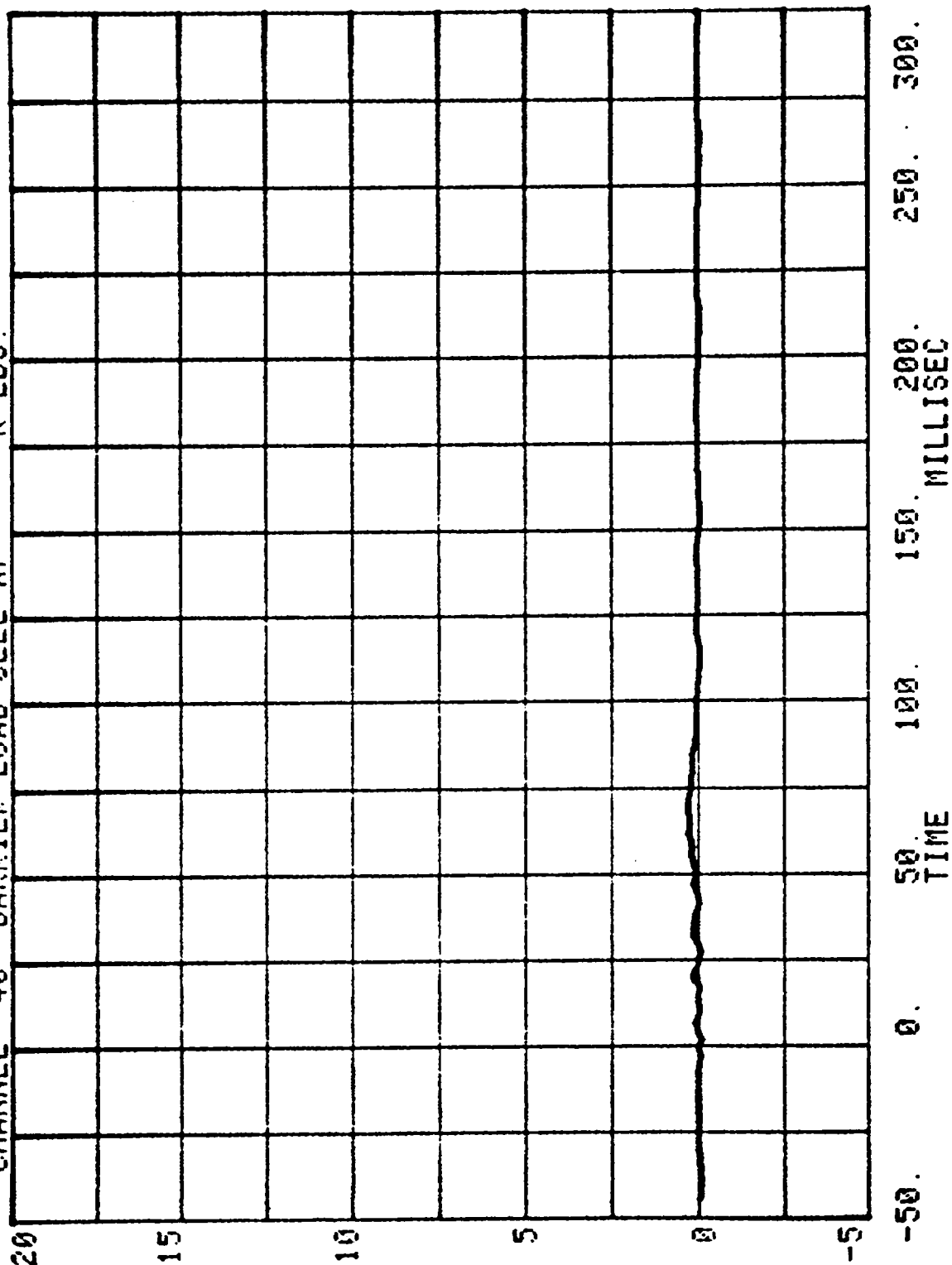
RUN= 897 SERIES= 5801  
CHANNEL 38 BARRIER LOAD CELL A5 K LBS.



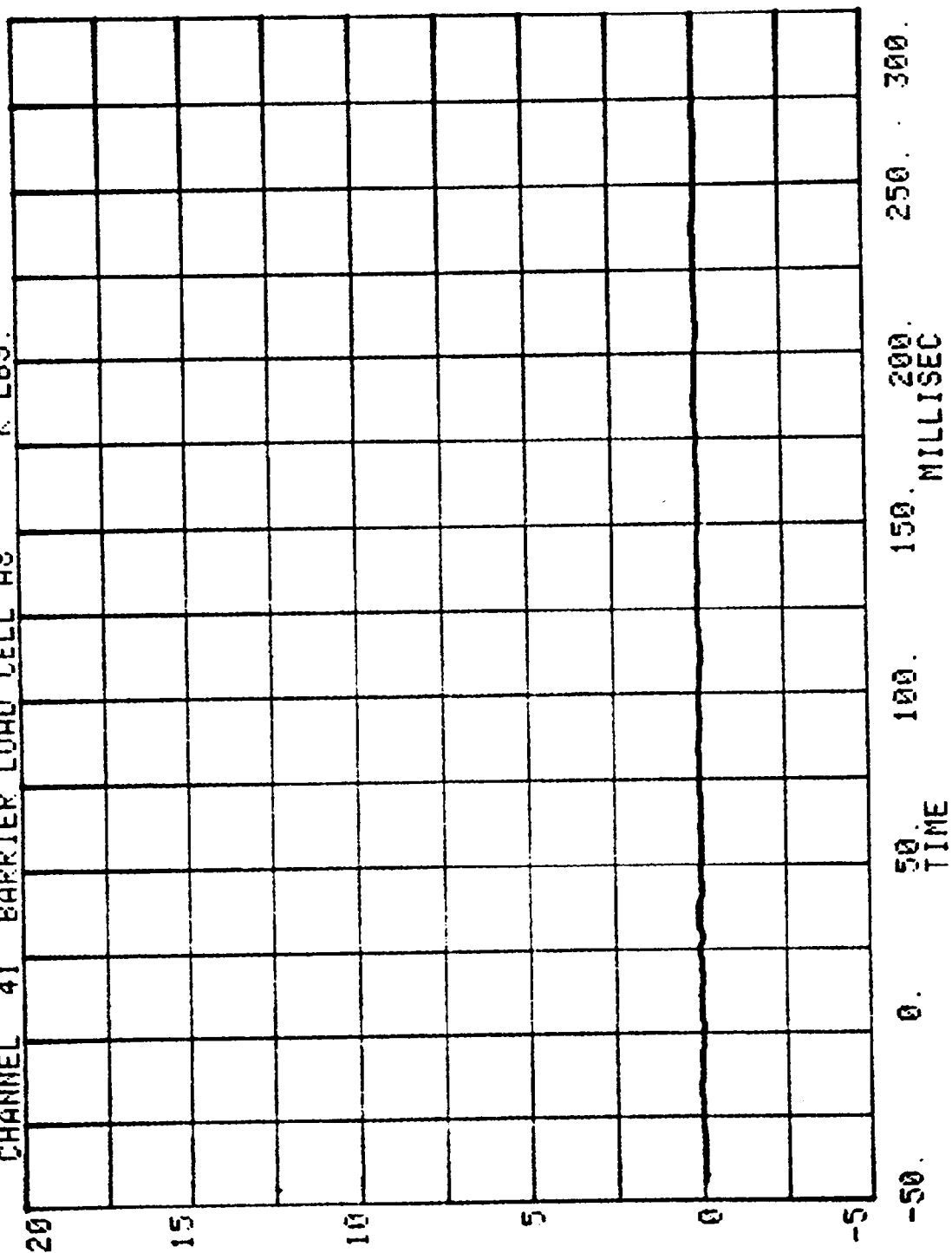
CHANNEL 39 BARRIER LOAD CELL A6 RUN= 897 SERIES= 5801 K LBS.



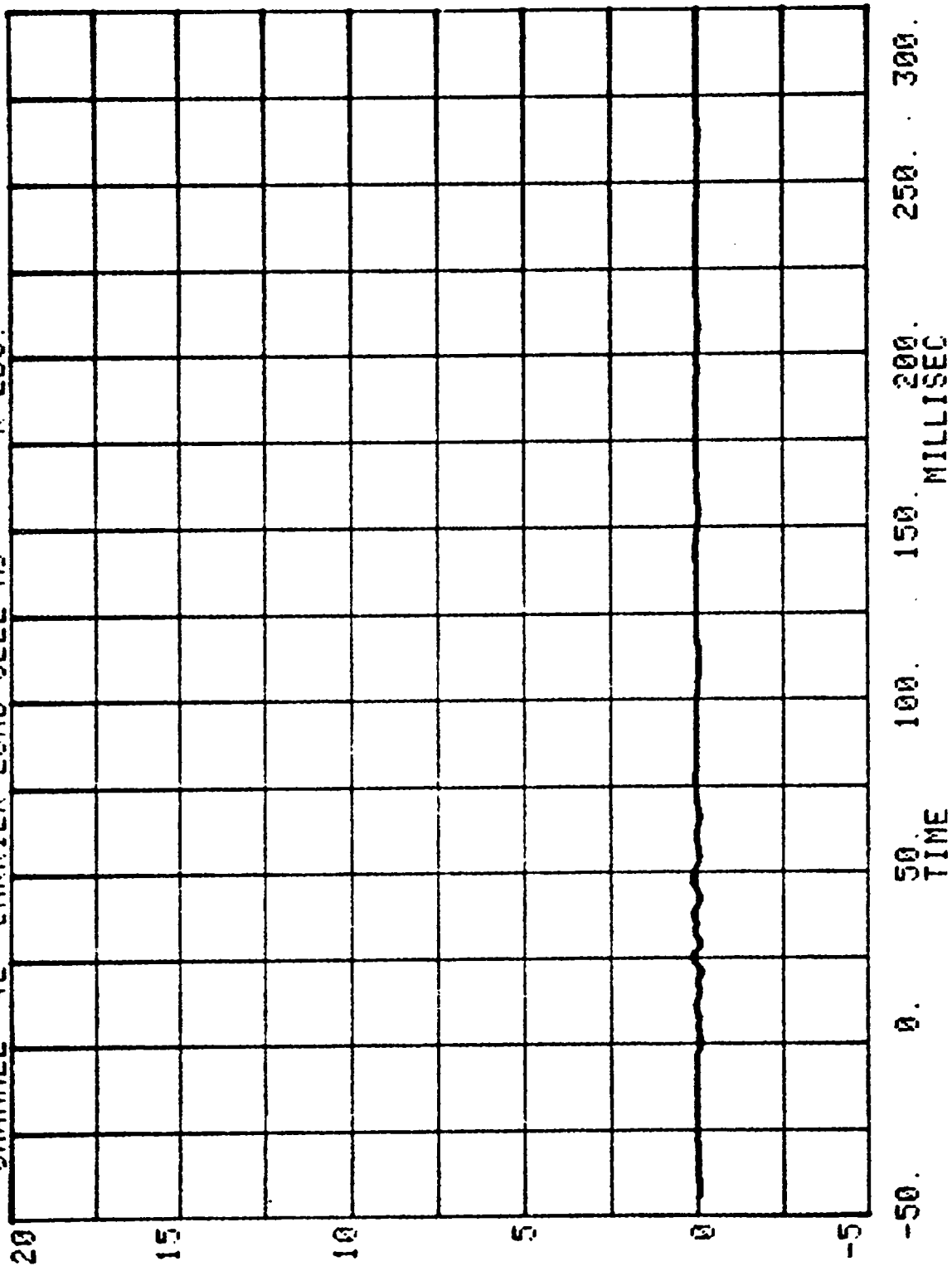
CHANNEL 40 RUN= 897 SERIES= 5801 K LBS.  
BARRIER LOAD CELL A7



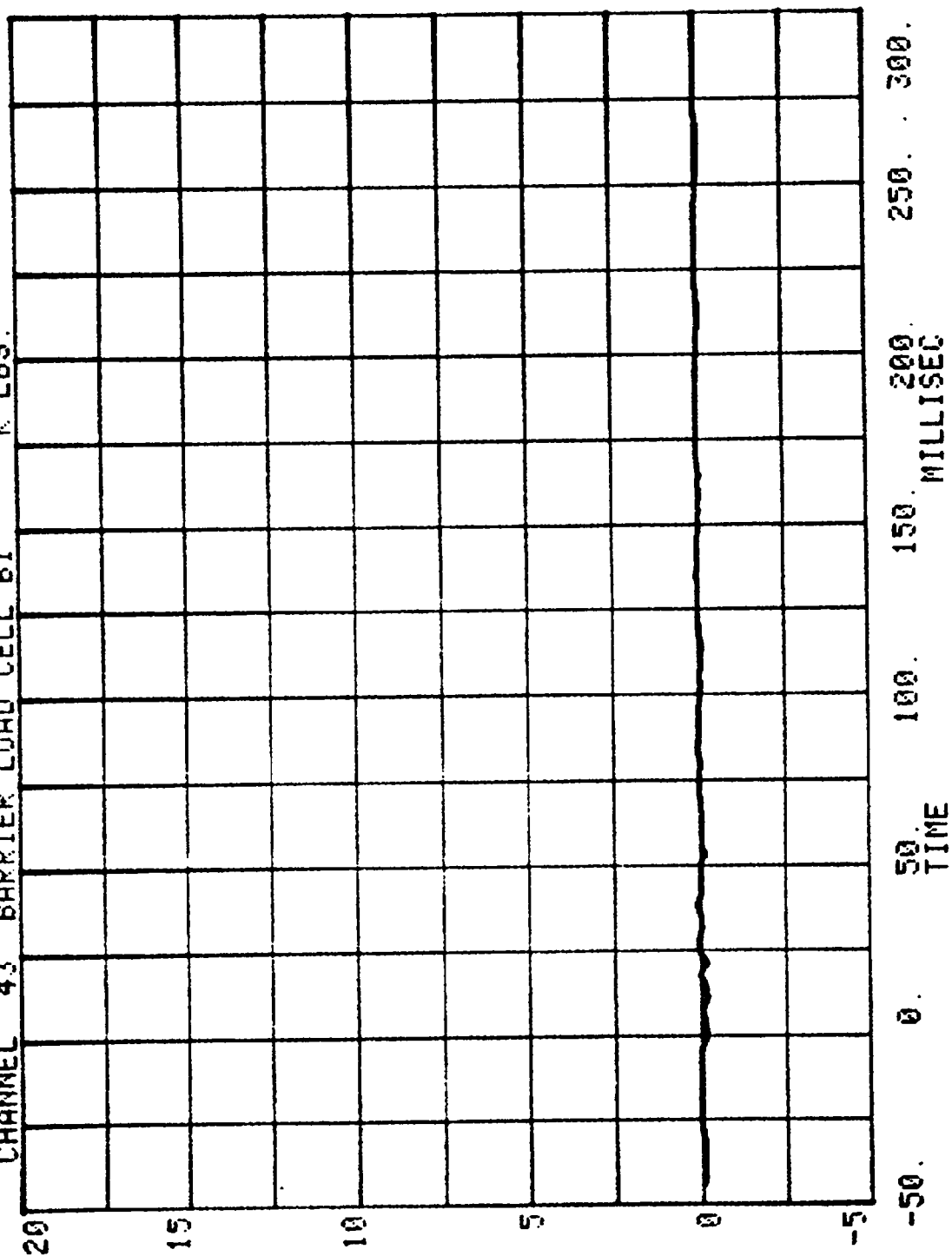
CHANNEL 41 BARRIER LOAD CELL A3 RUN= 897 SERIES= 5801 K LBS.



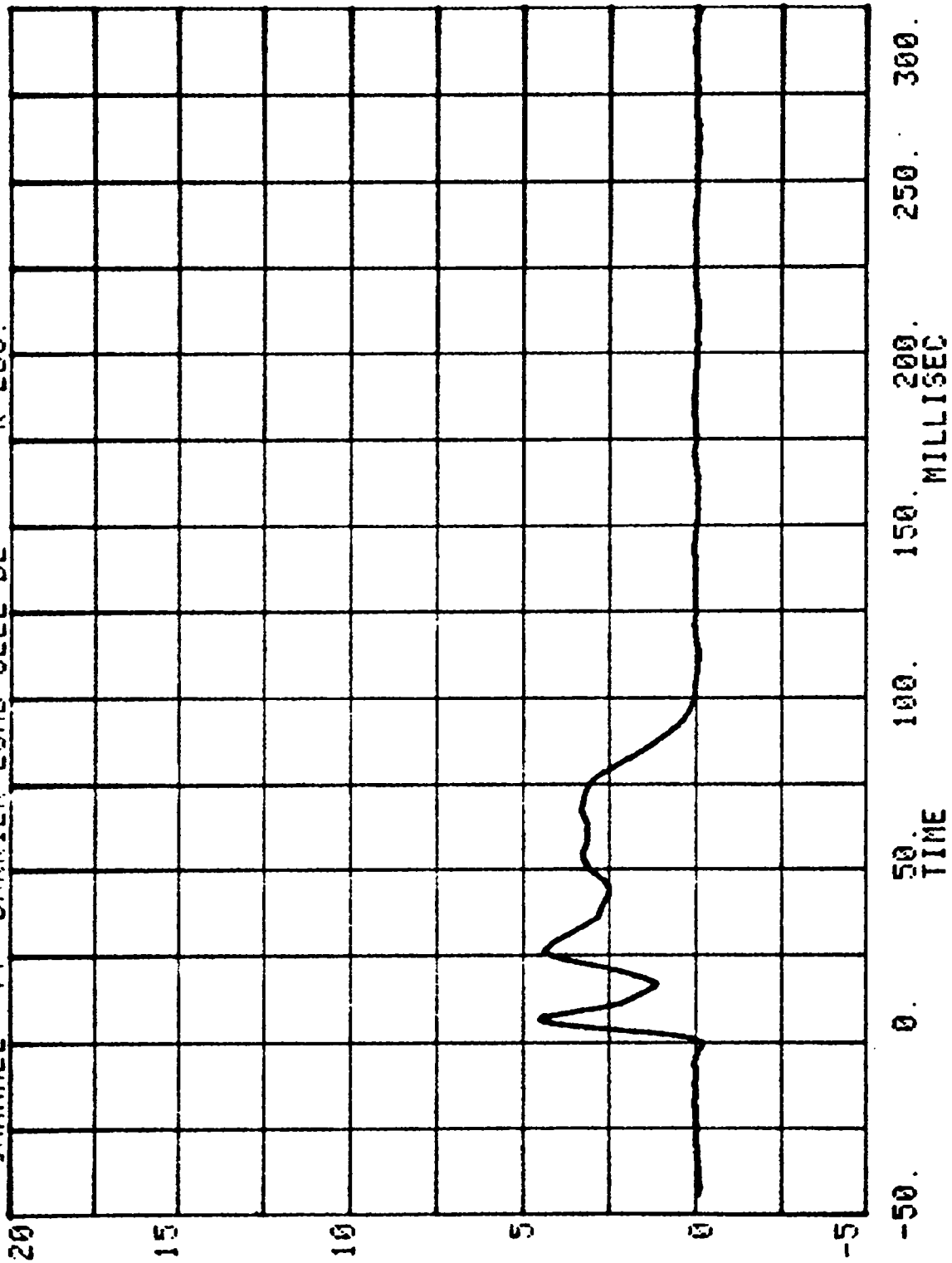
RUN= 897 SERIES= 5801  
CHANNEL 42 BARRIER LOAD CELL A9 K LBS.



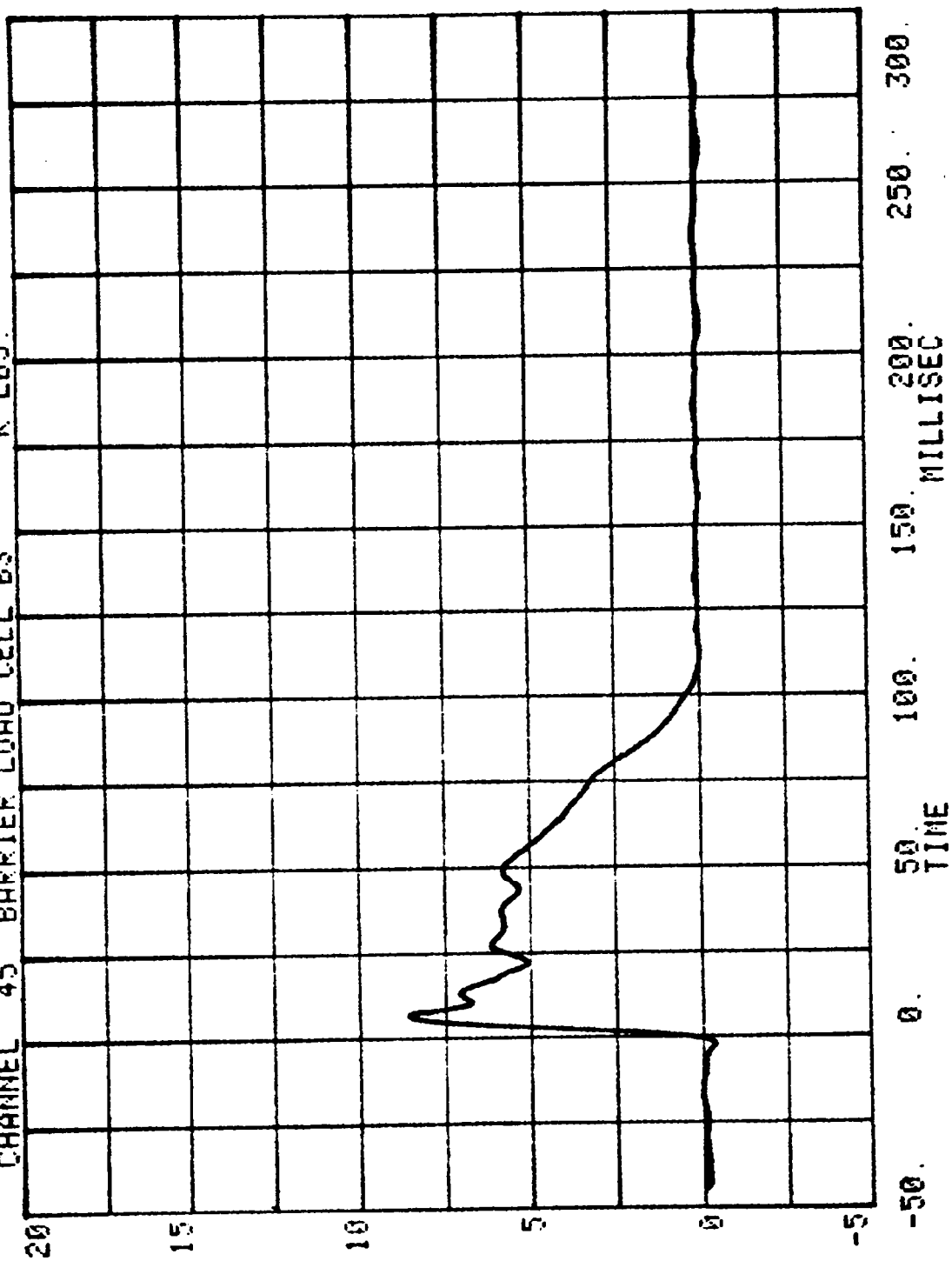
CHANNEL 43 BARRIER LOAD CELL B1 RUN= 897 SERIES= 5801 K LBS.



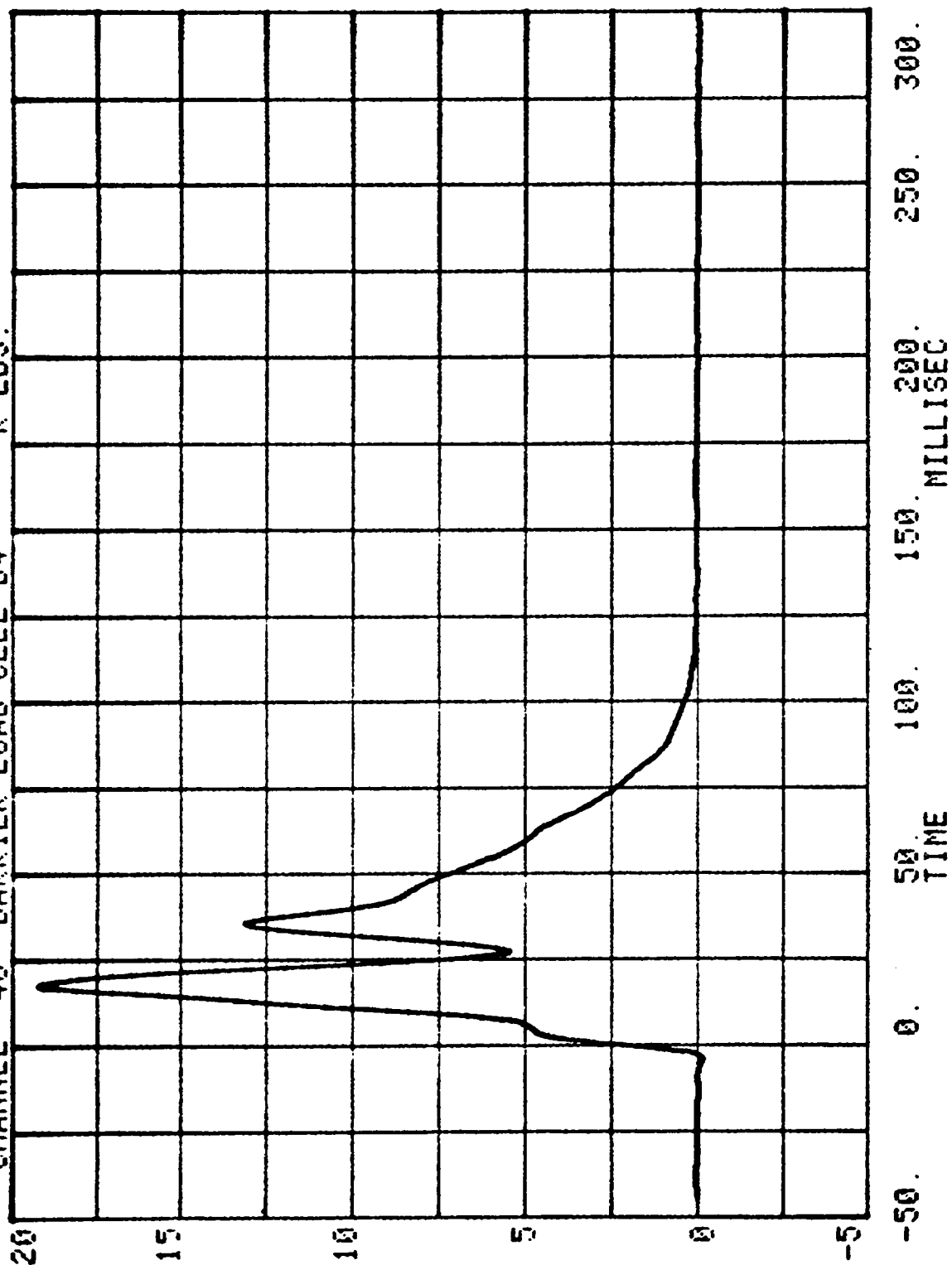
CHANNEL 44 RUN= 897 SERIES= 5801  
BARRIER LOAD CELL B2 K LBS.



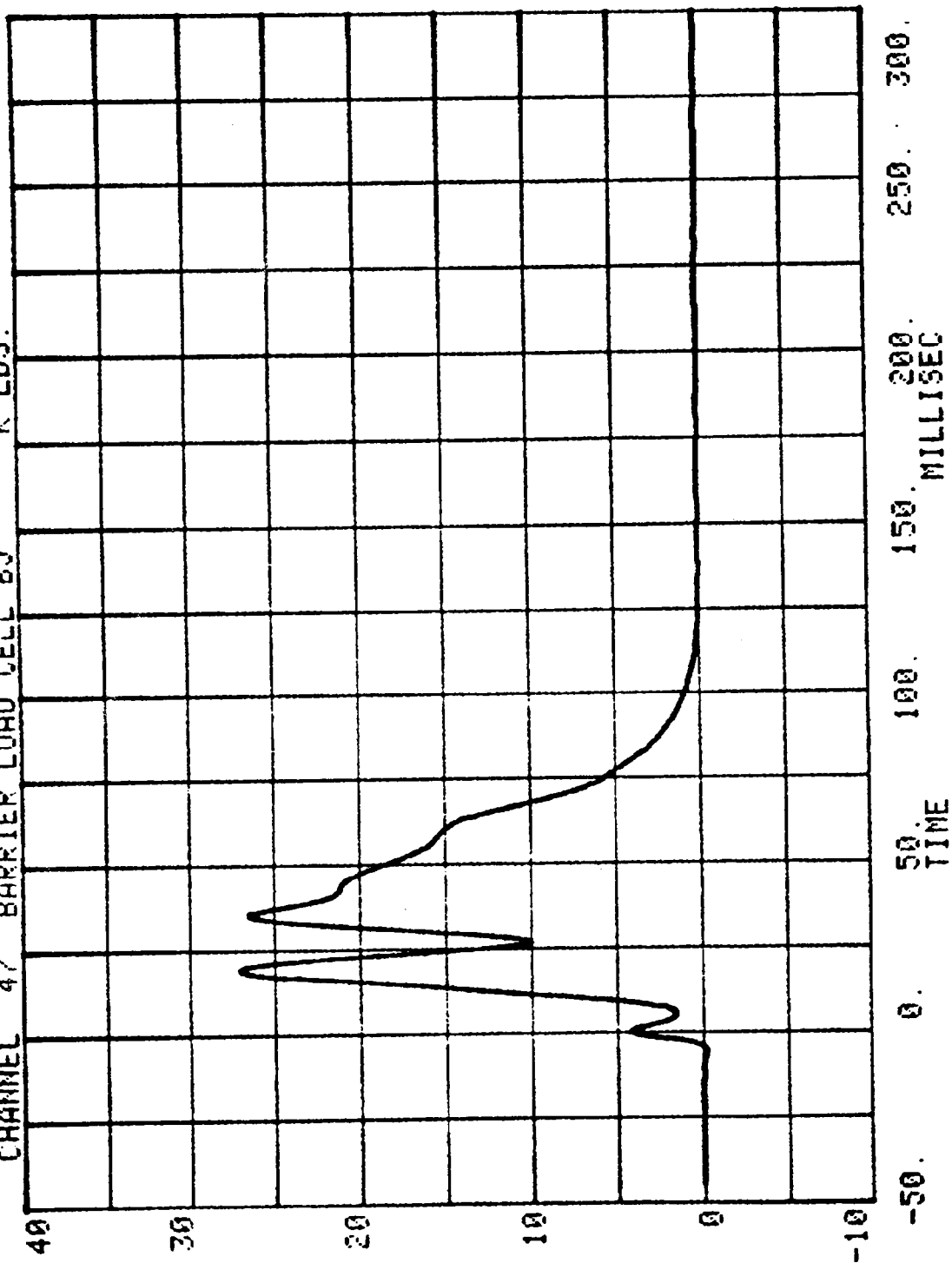
CHANNEL 45 BARRIER LOAD CELL B3 K LBS.  
RUN= 897 SERIES= 5801



RUN= 897 SERIES= 5801  
CHANNEL 46 BARRIER LOAD CELL B4 K LBS.



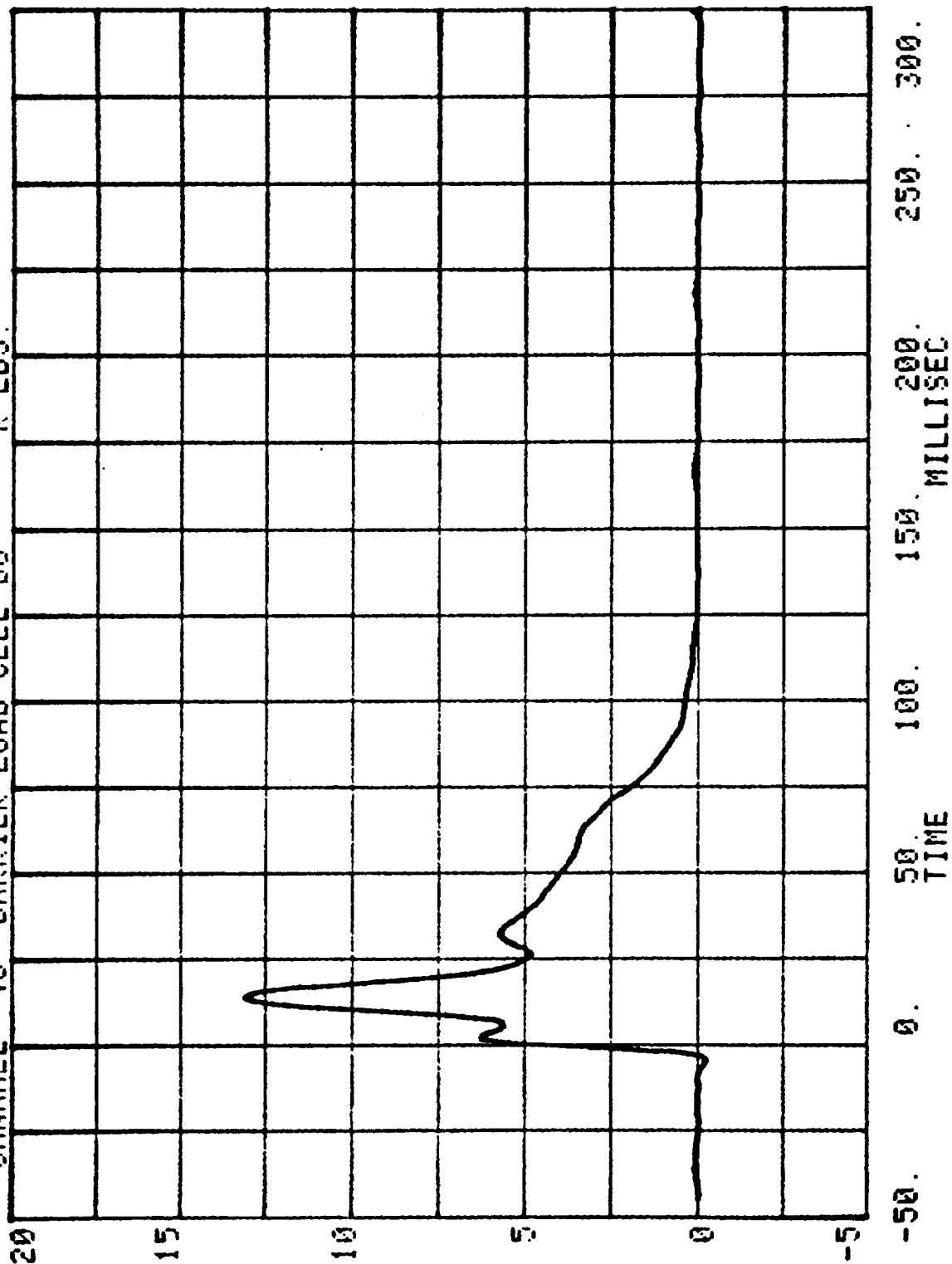
CHANNEL 47 BARRIER LOAD CELL B5  
RUN= 897 SERIES= 5801 K LBS.



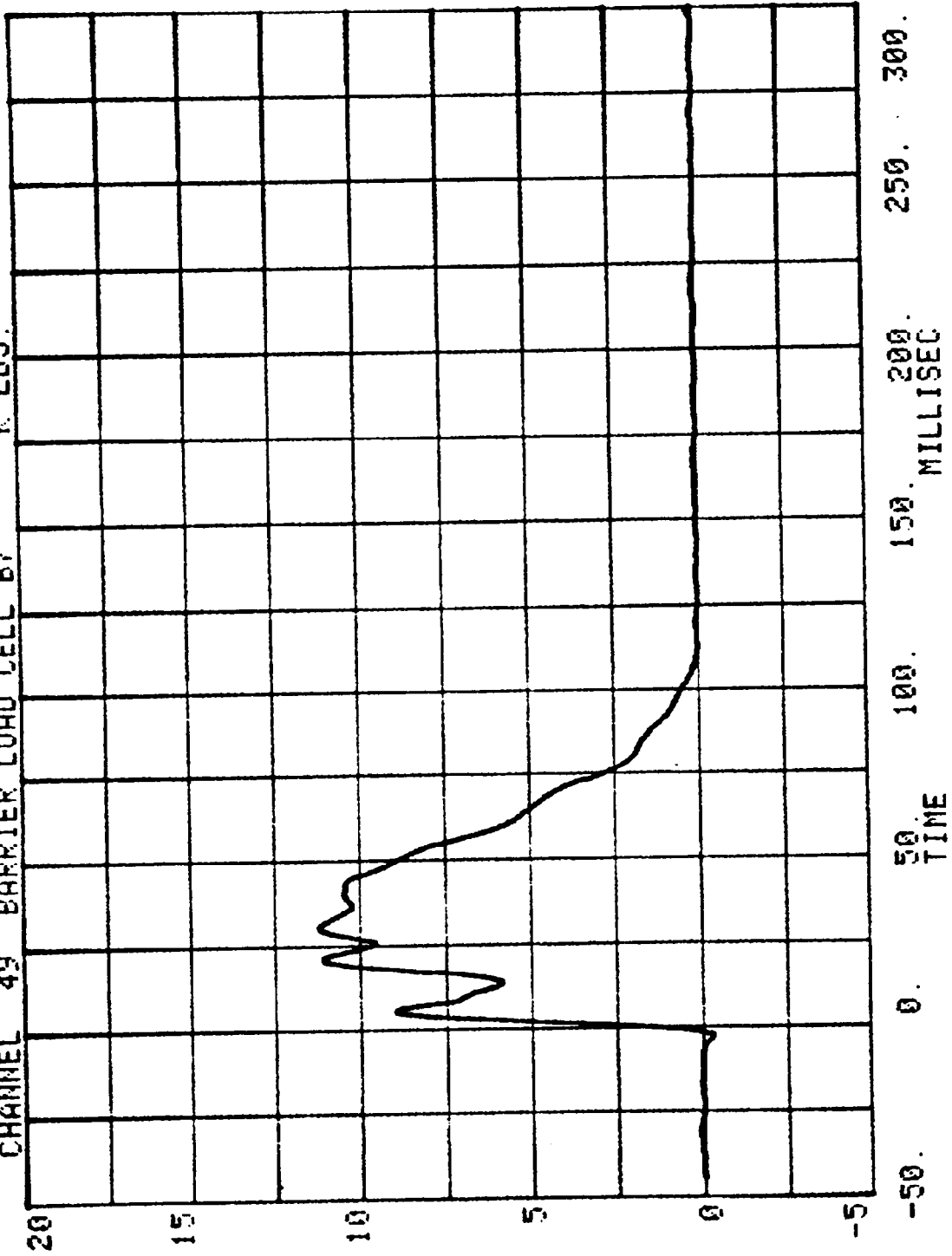
CHANNEL 48 BARRIER LOAD CELL B6

RUN= 897 SERIES= 5801

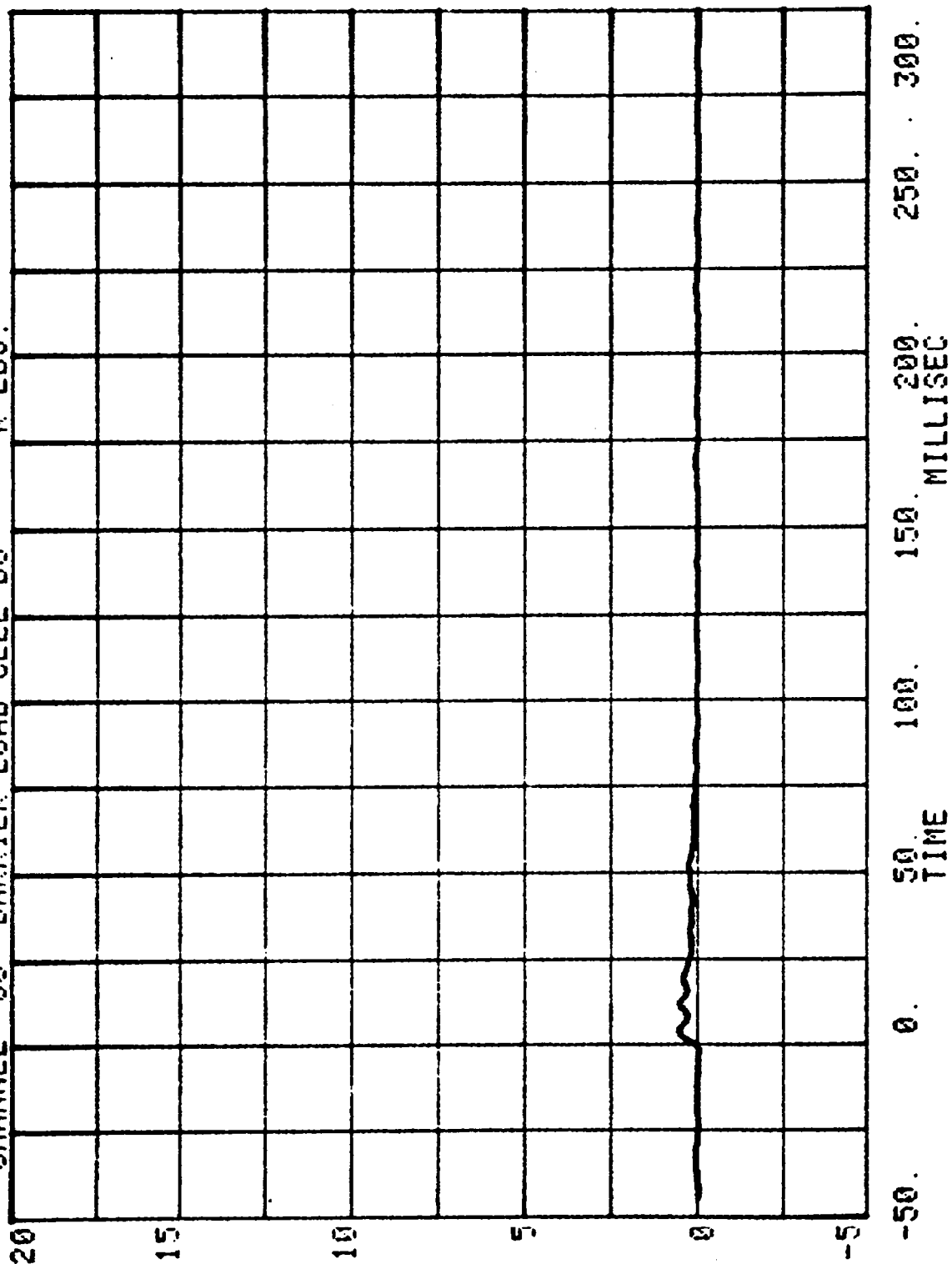
K LBS.



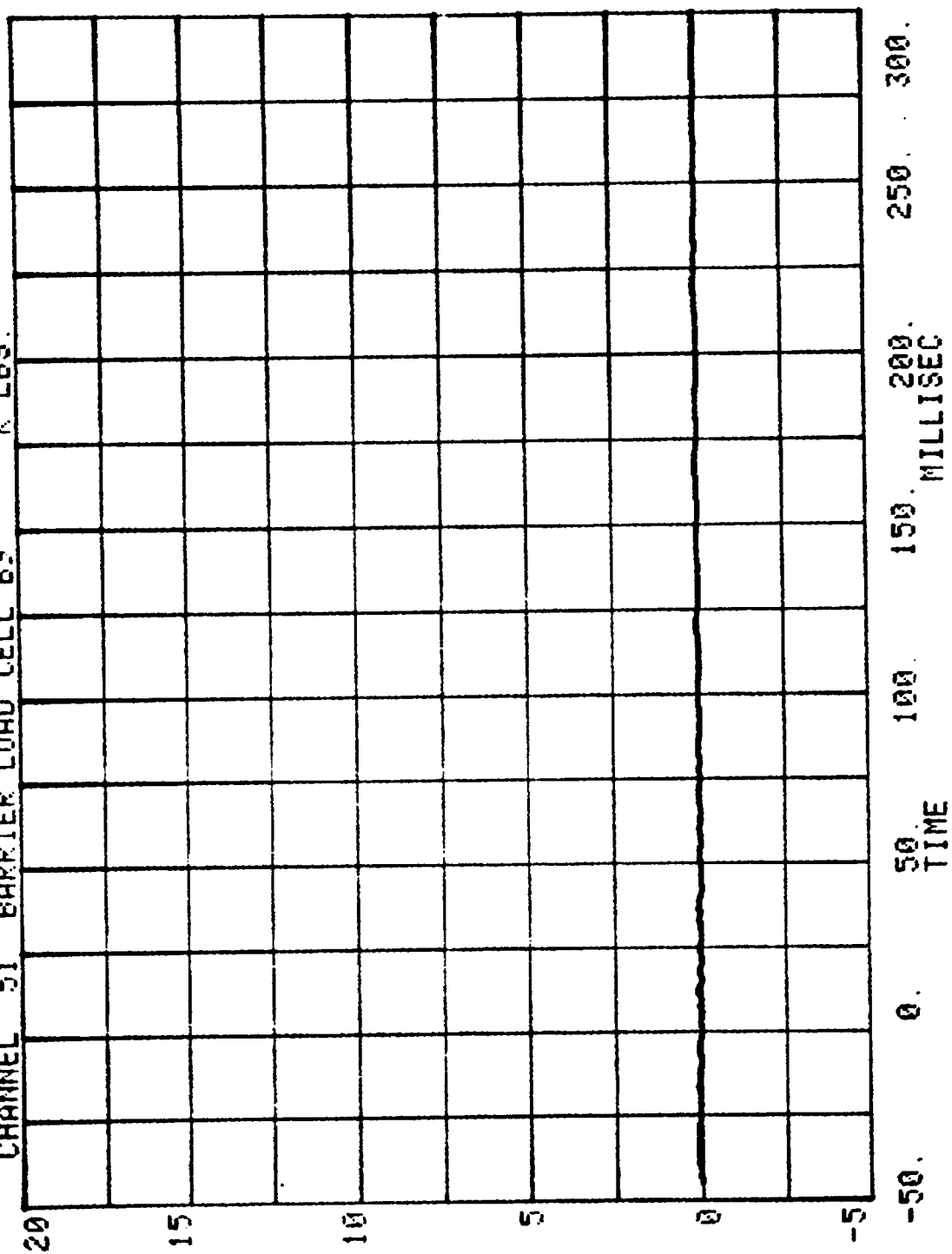
CHANNEL 49 BARRIER LOAD CELL B7  
RUN= 837 SERIES= 5801 K LBS.



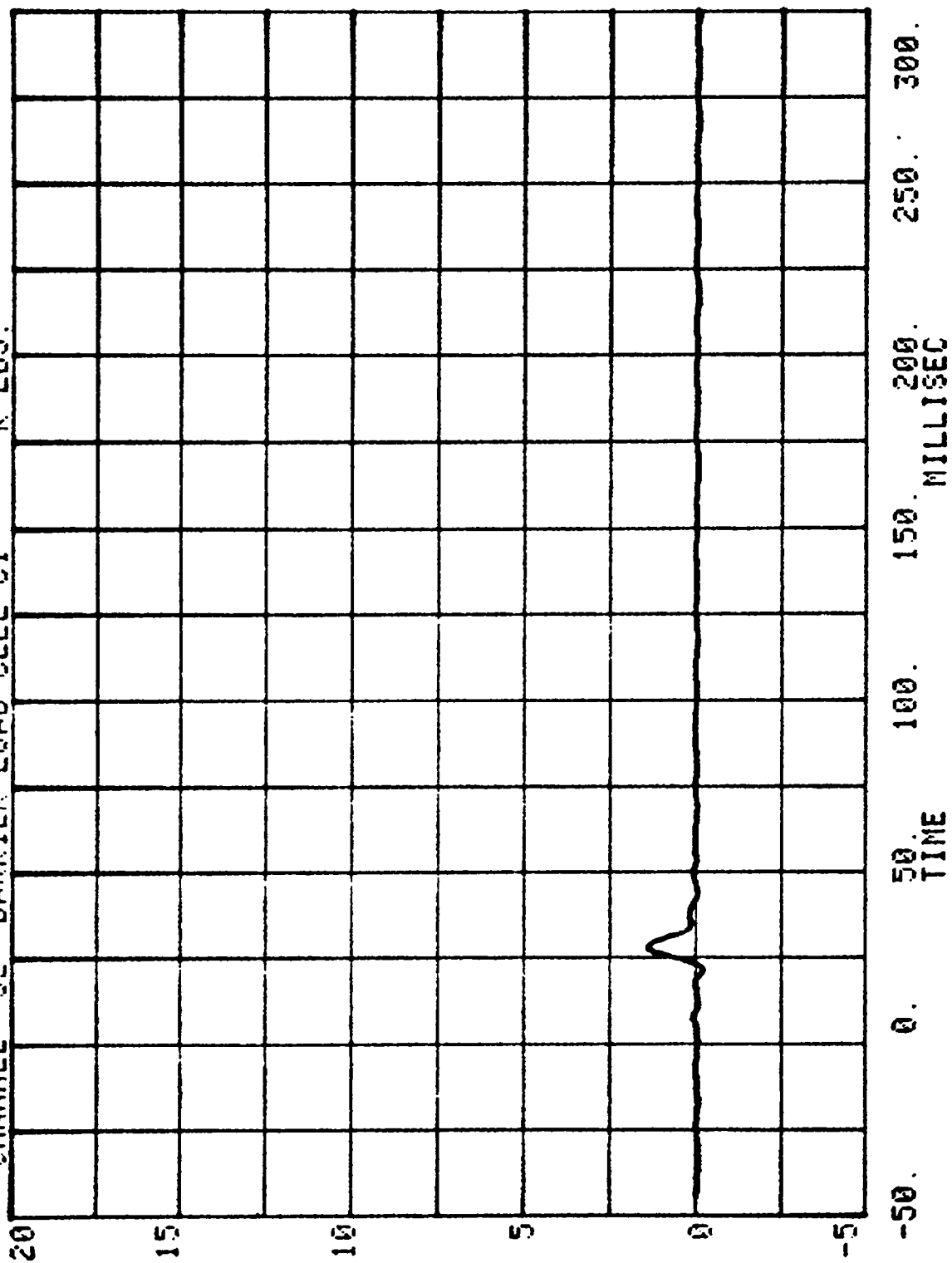
RUN= 897 SERIES= 5801  
CHANNEL 50 BARRIER LOAD CELL B8 K LBS.



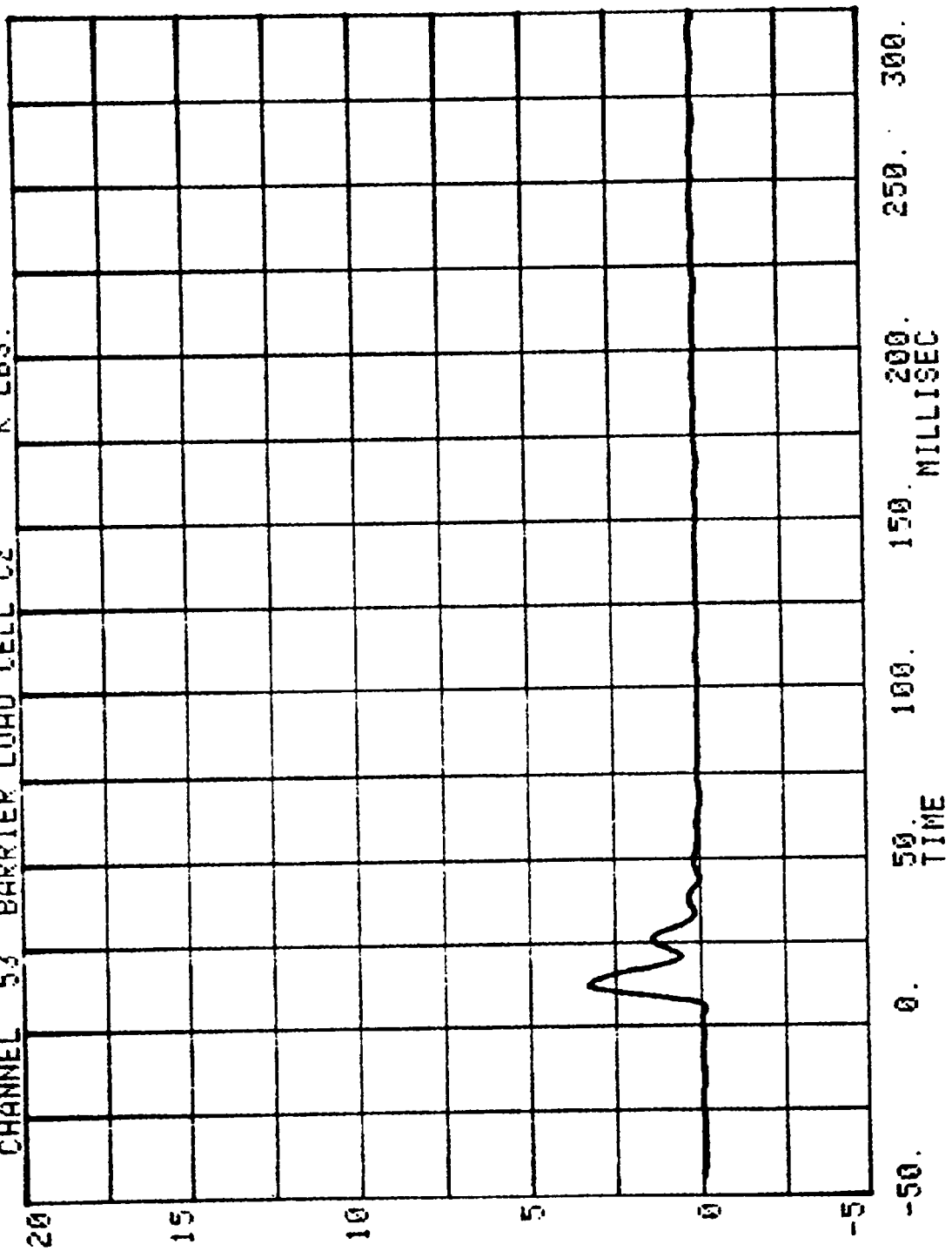
CHANNEL 51 BARRIER LOAD CELL 89 K LBS.  
RUN= 897 SERIES= 5801



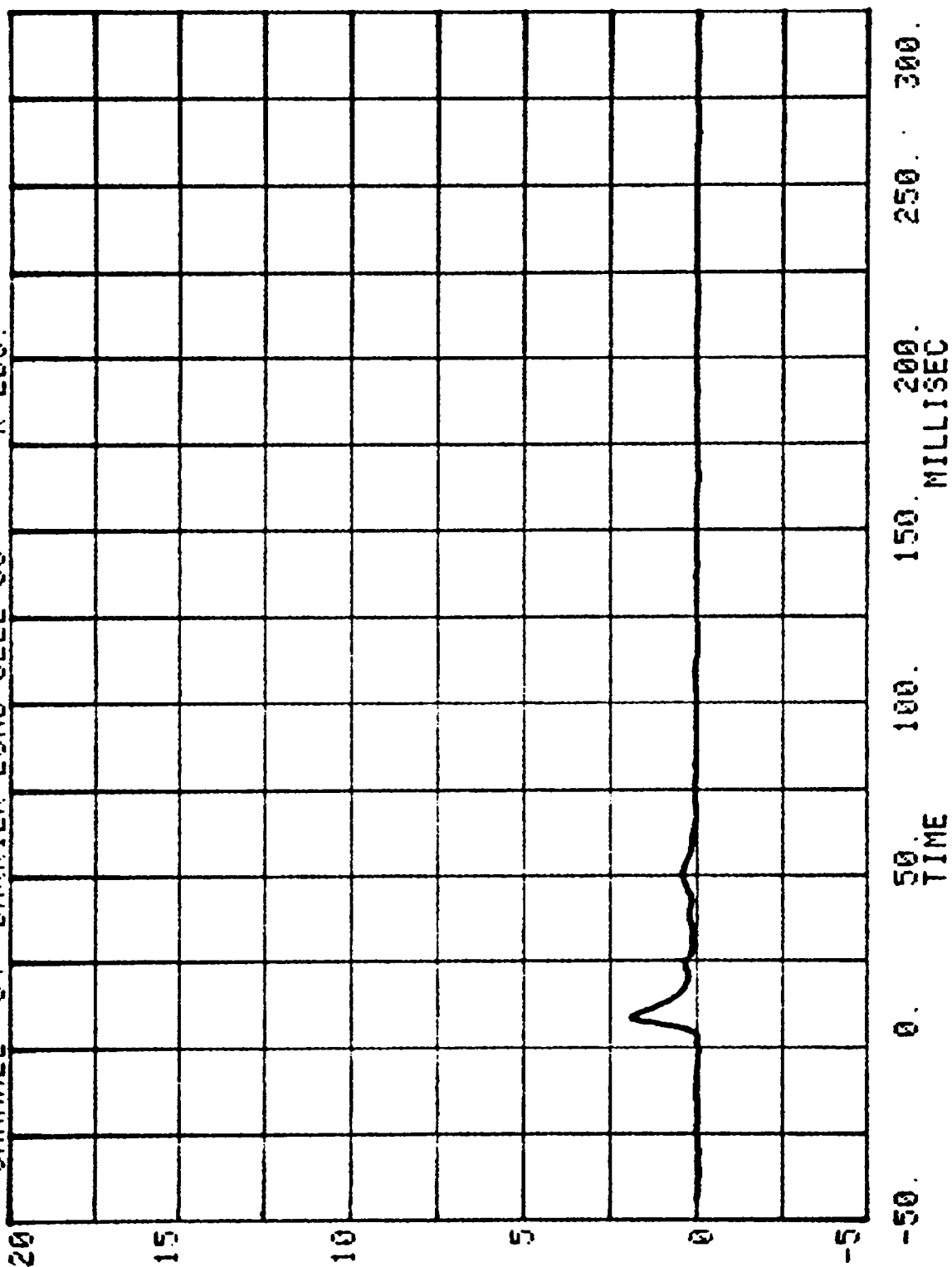
RUN= 897 SERIES= 5801  
CHANNEL 52 BARRIER LOAD CELL C1 K LBS.



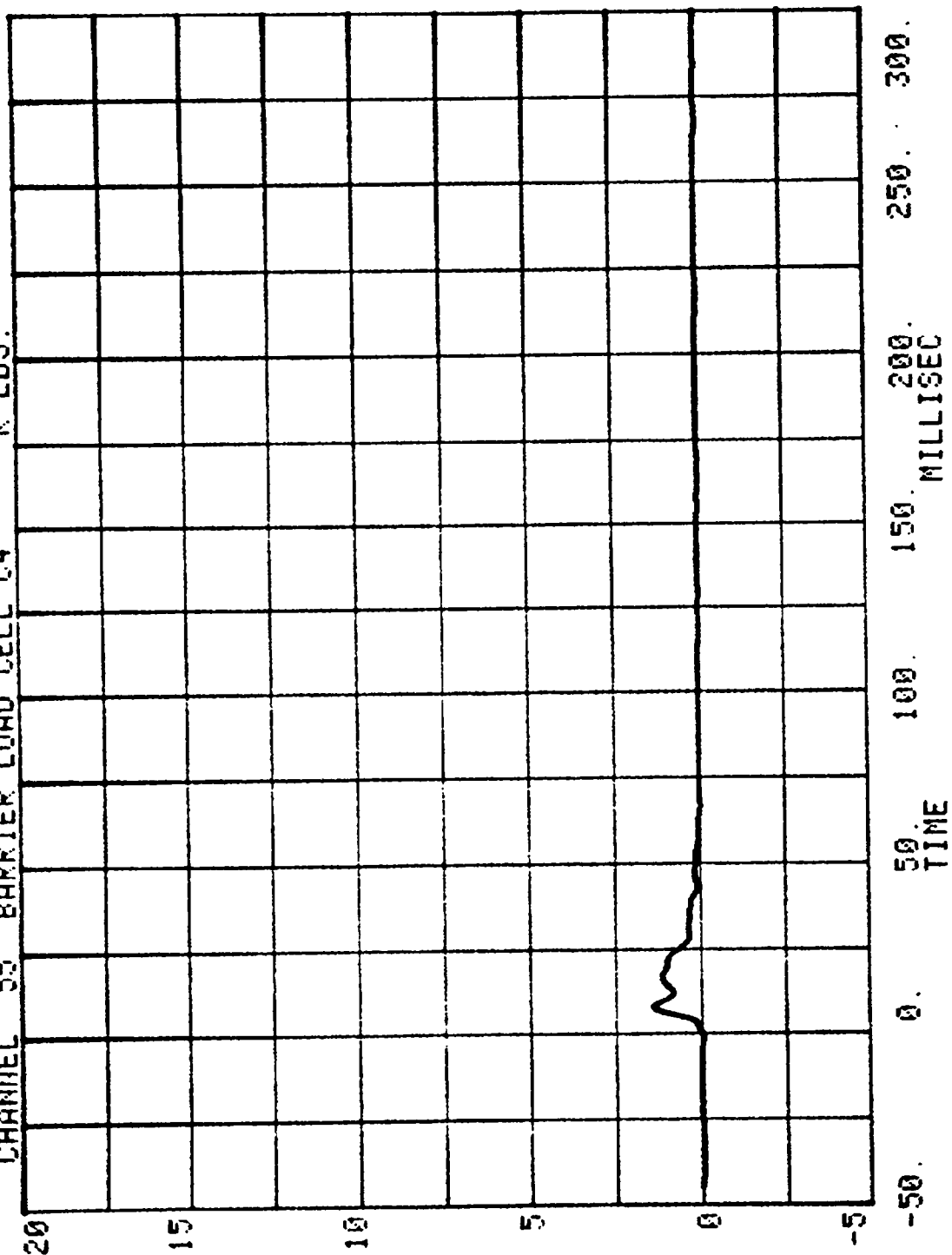
CHANNEL 53 BARRIER LOAD CELL C2 RUN= 897 SERIES= 5801 K LBS.



CHANNEL 54 RUN= 897 SERIES= 5801  
BARRIER LOAD CELL C3 K LBS.



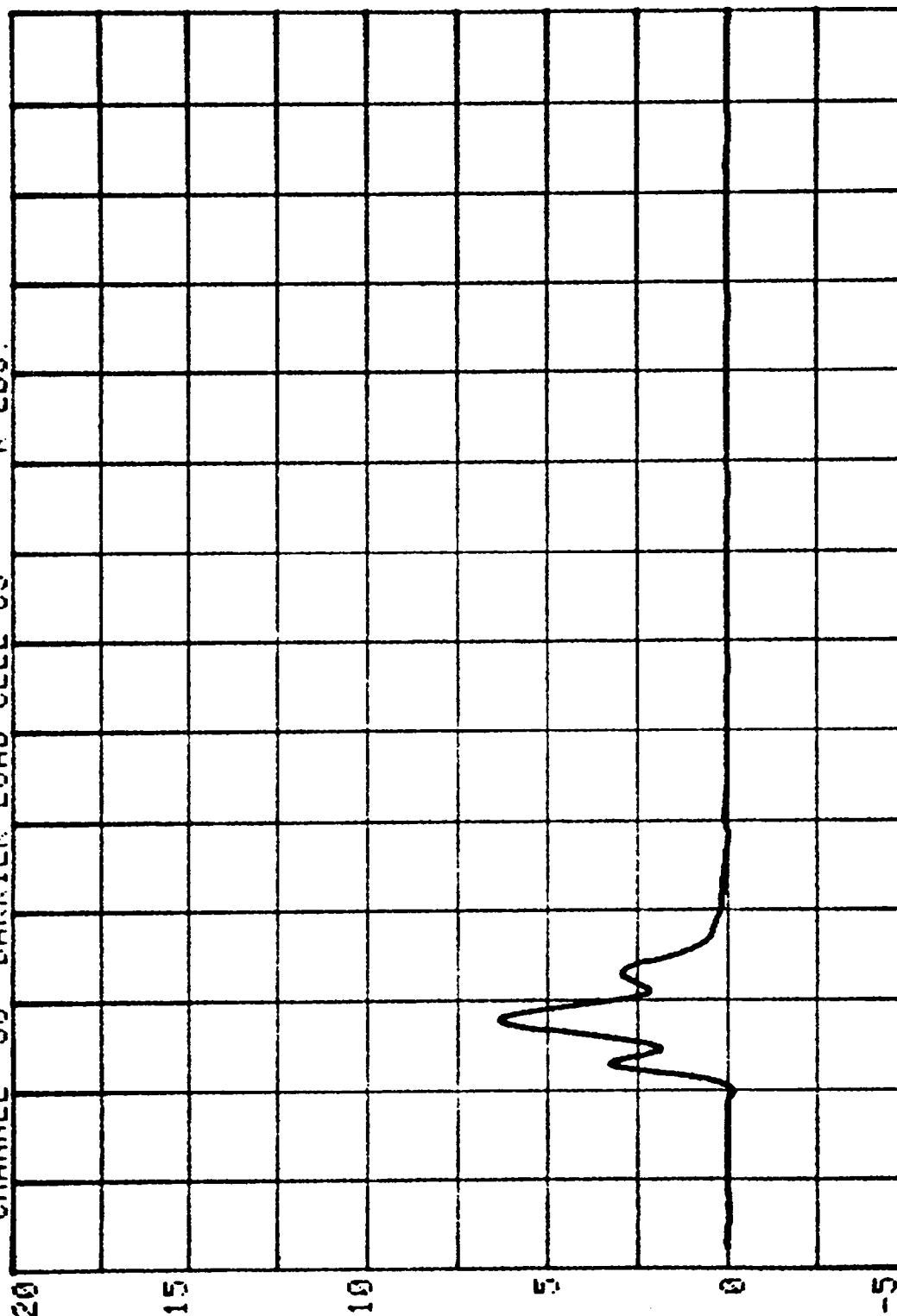
CHANNEL 55 RUN= 897 SERIES= 5801 K LBS.  
BARRIER LOAD CELL C4



CHANNEL 56 BARRIER LOAD CELL C5

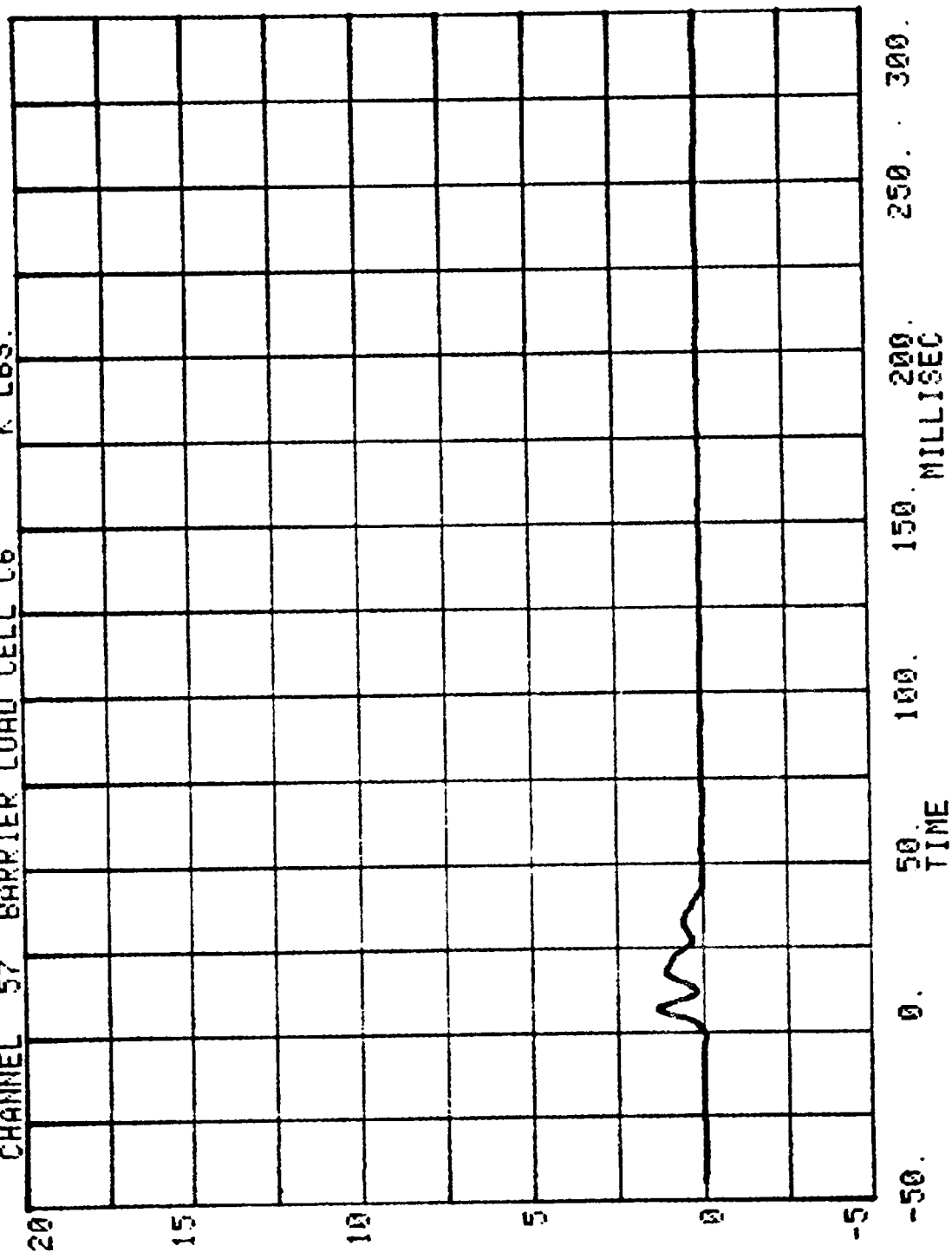
RUN= 897 SERIES= 5801

K LBS.



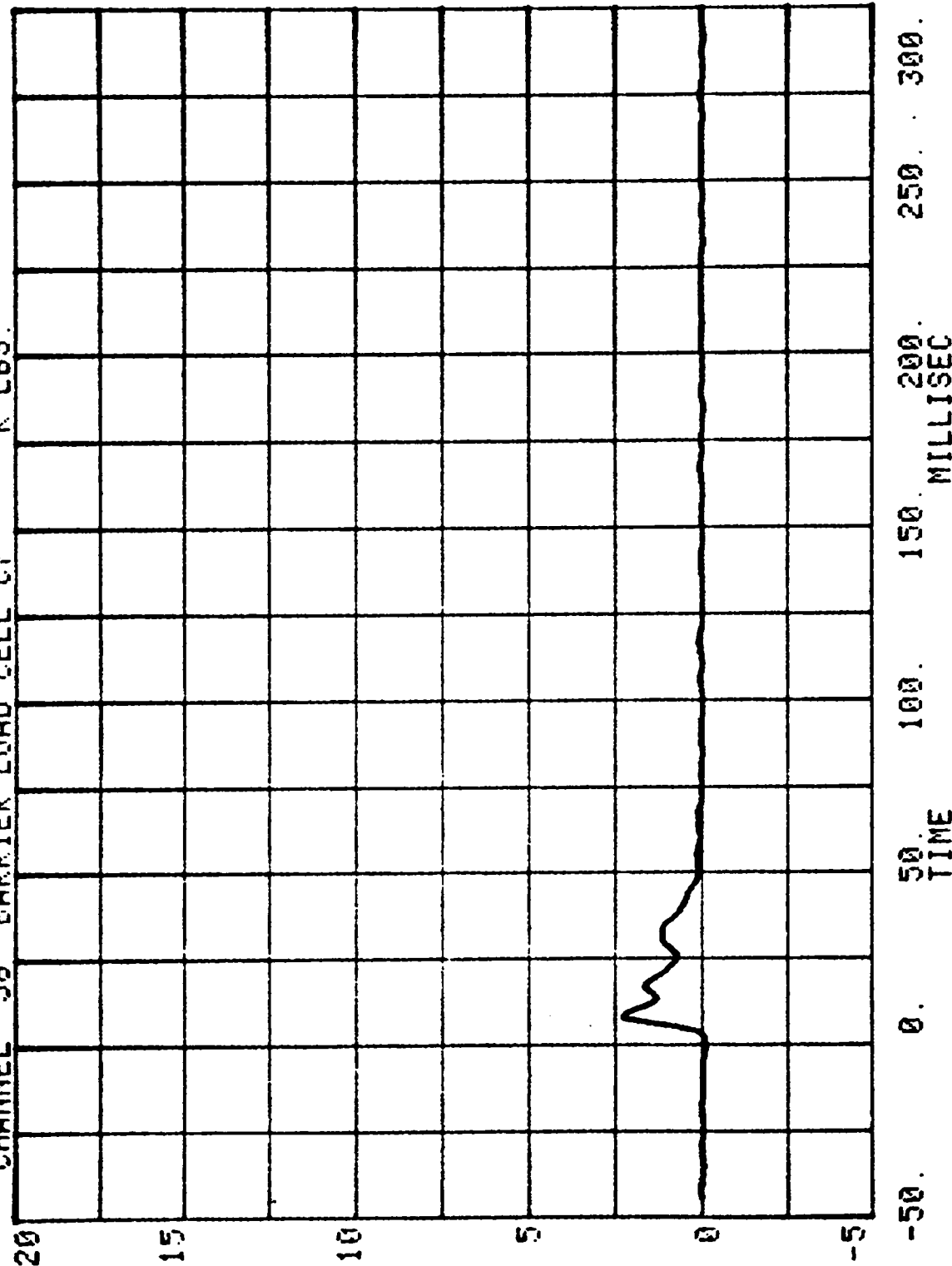
-50. 0. 50. 100. 150. 200. 250. 300.  
TIME MILLISEC

CHANNEL 57 BARRIER LOAD CELL C6 K LBS.

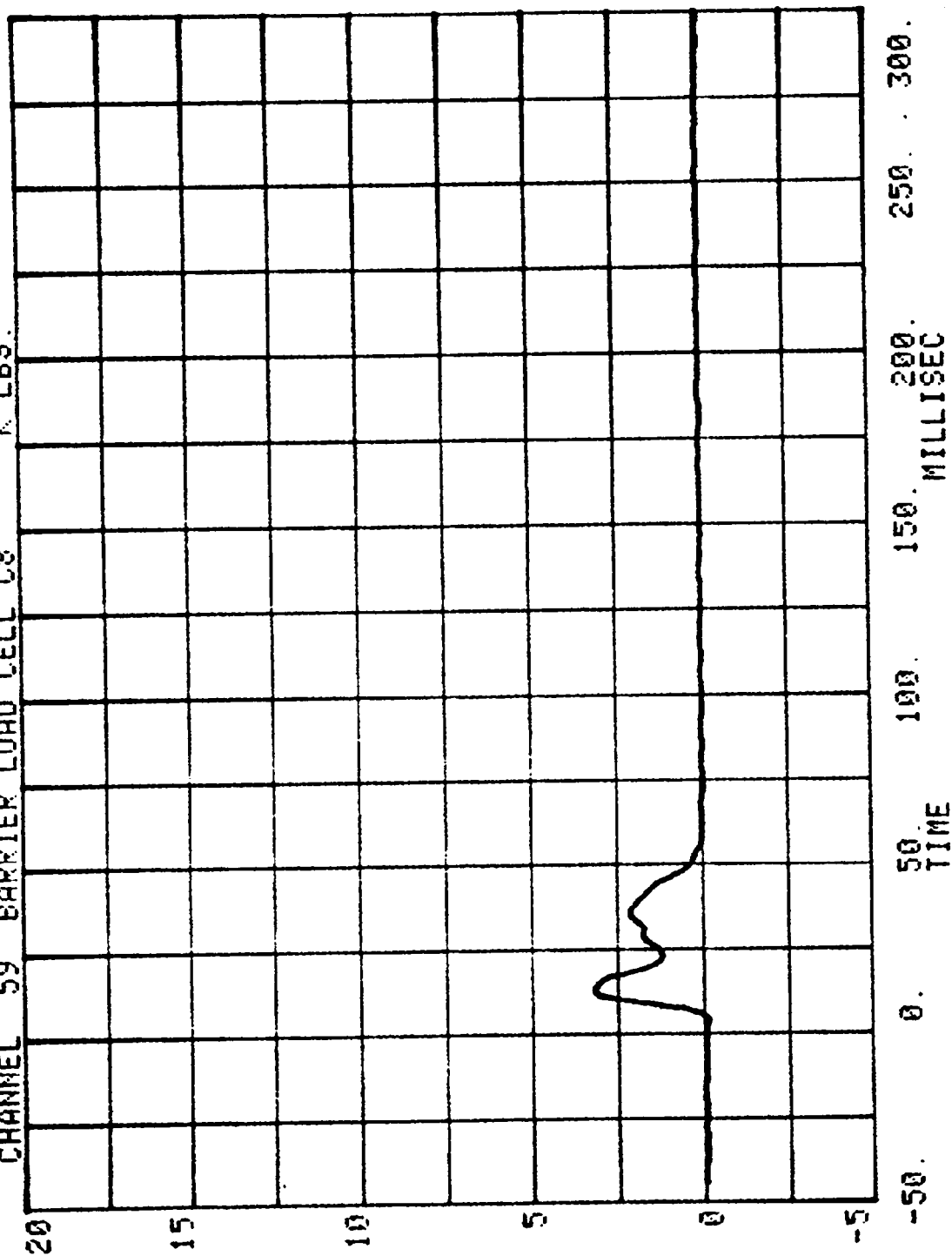


CHANNEL 58 BARRIER LOAD CELL C7 K LBS.

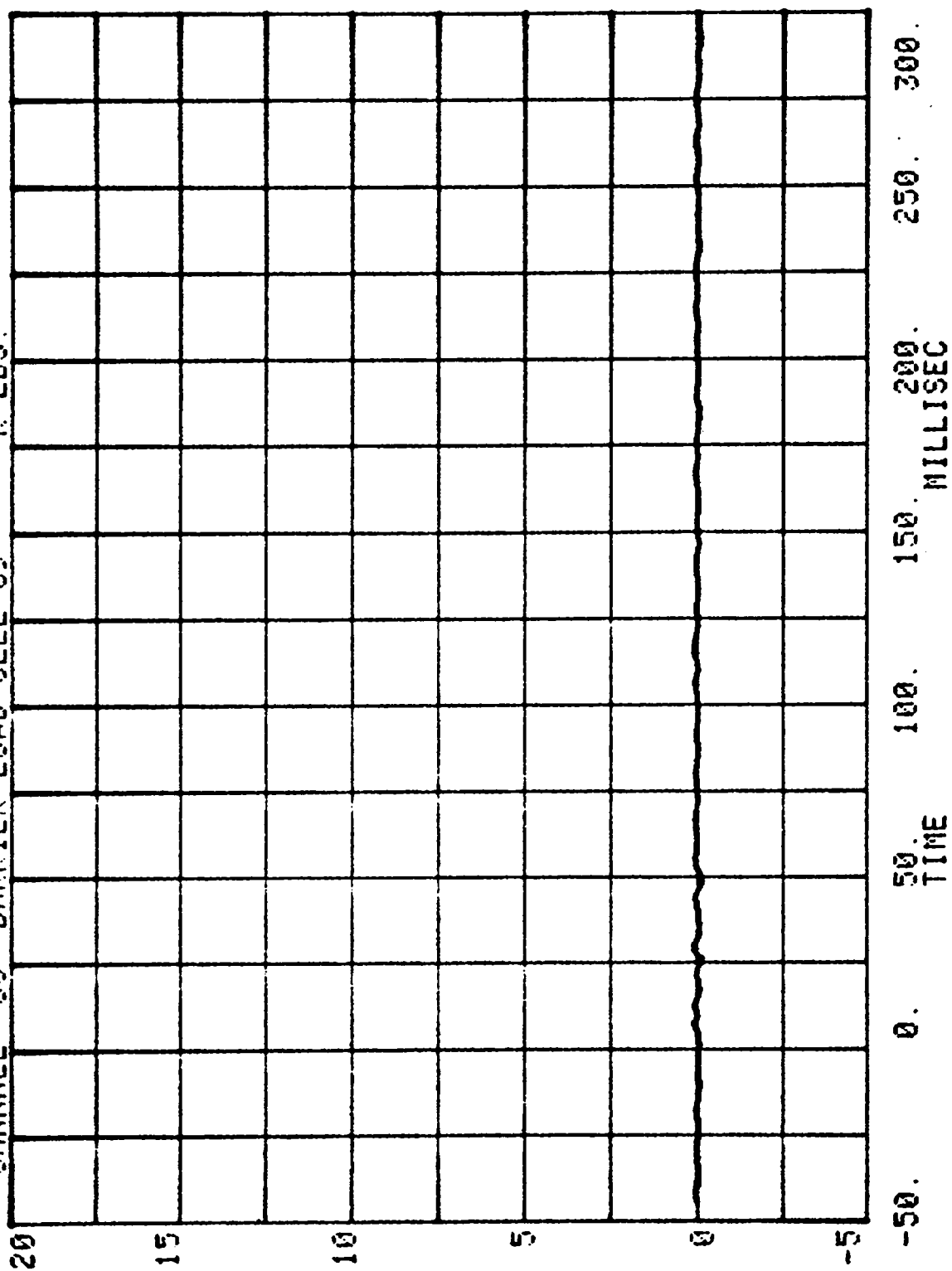
RUN= 897 SERIES= 5801



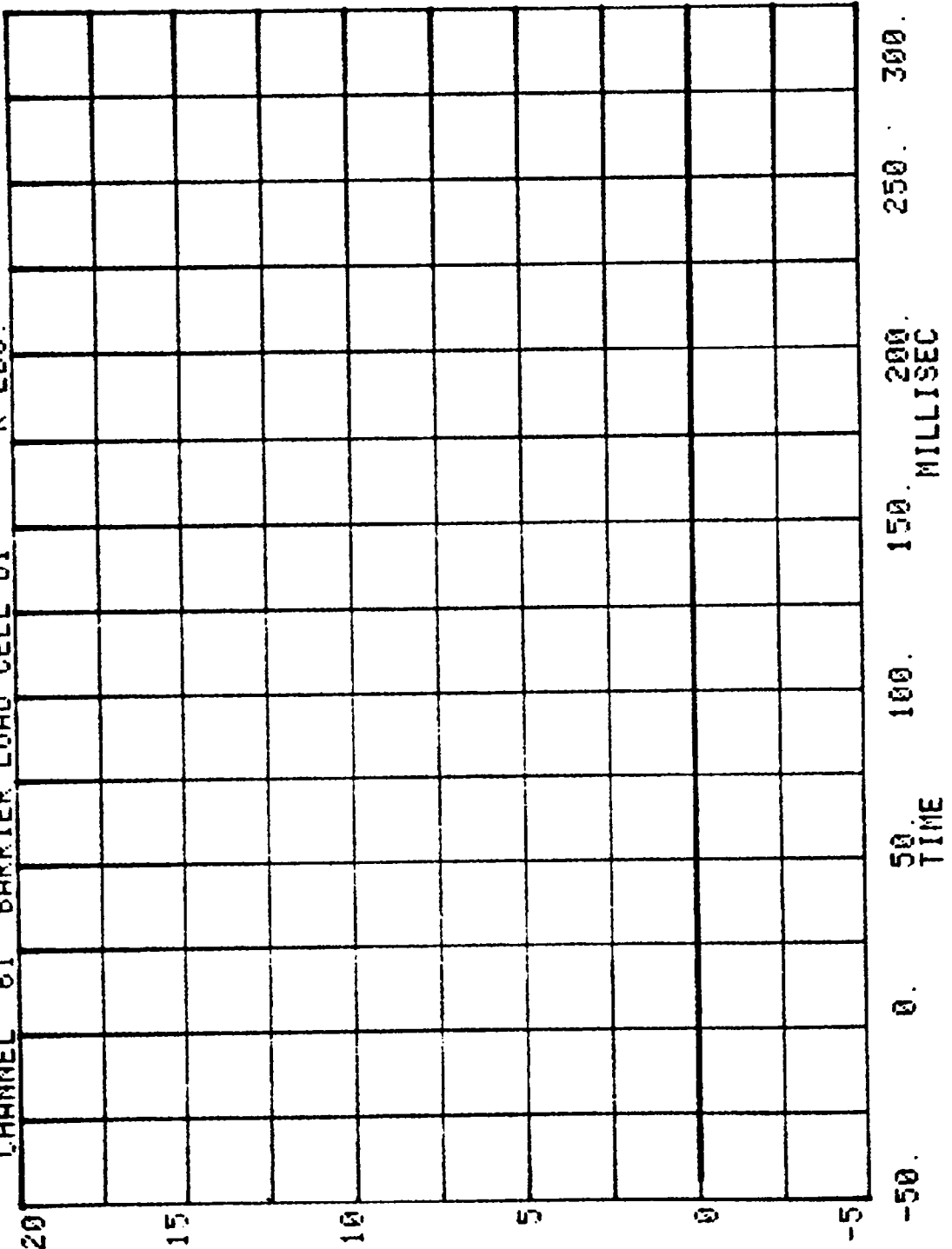
CHANNEL 59 BARRIER LOAD CELL C3 RUN= 897 SERIES= 5801 K LBS.



RUN= 897 SERIES= 5801  
CHANNEL 60 BARRIER LOAD CELL C9 K LBS.

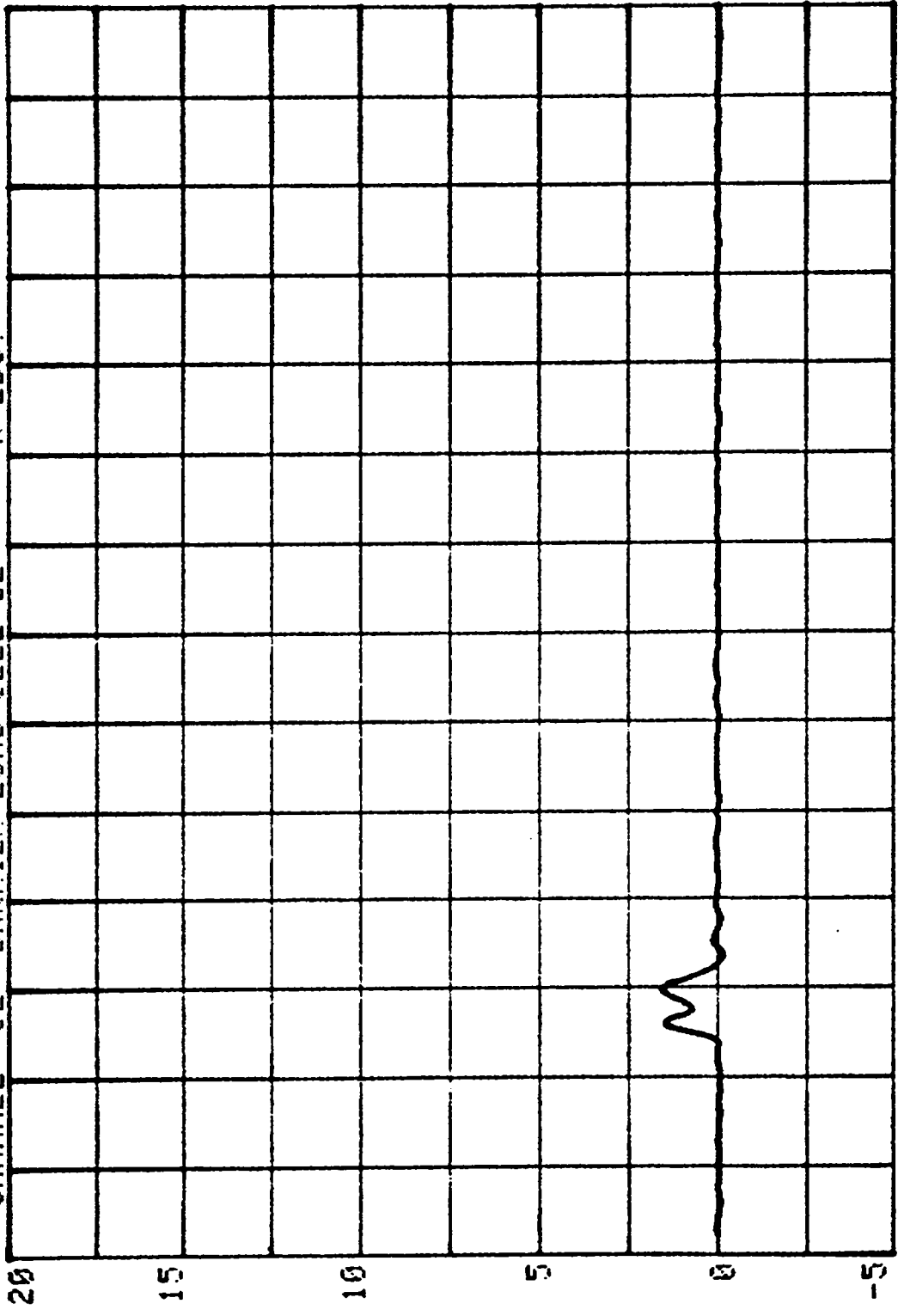


CHANNEL 61 BARRIER LOAD CELL 01 RUN= 897 SERIES= 5801 K LBS.

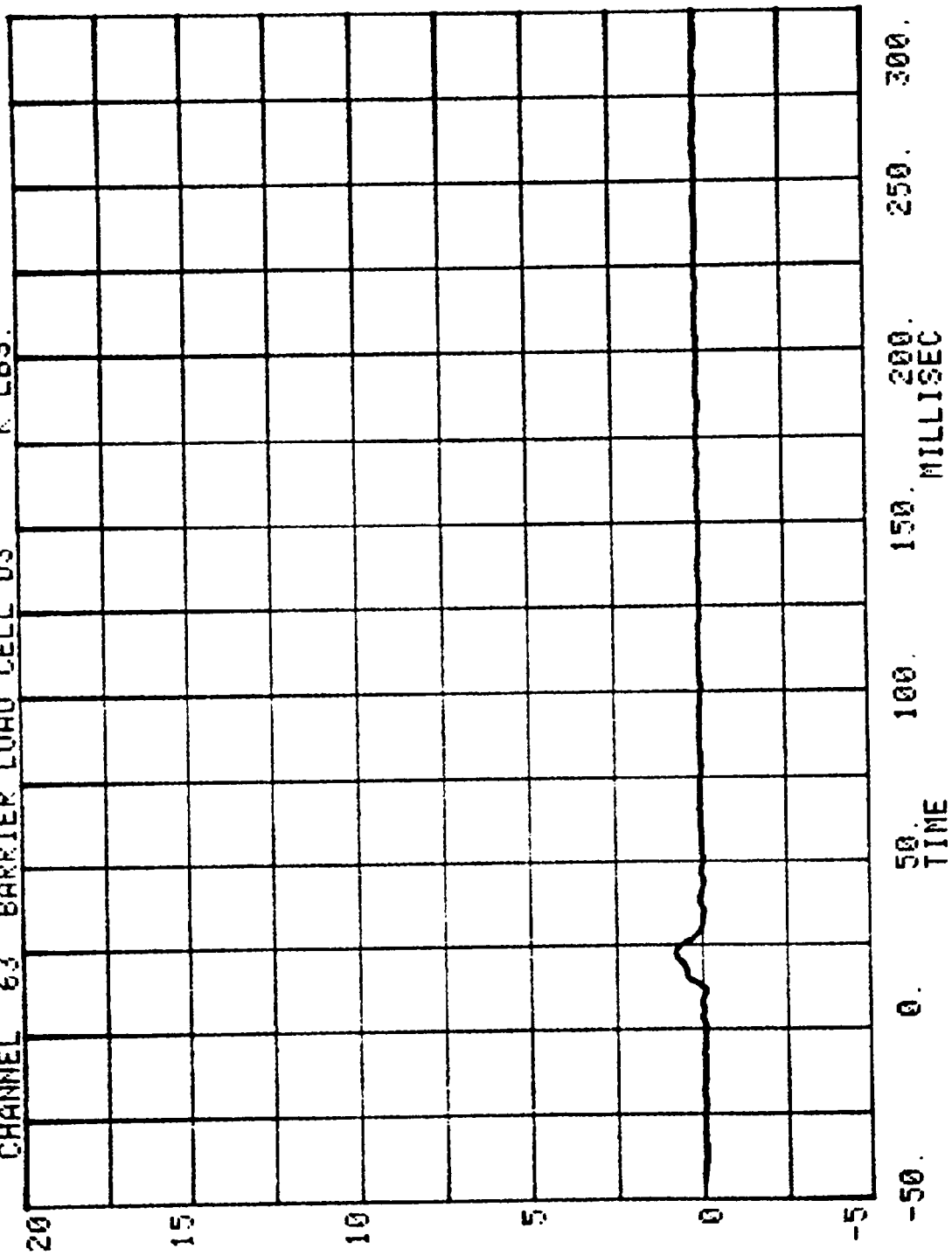


CHANNEL 62 BARRIER LOAD CELL 02 K LBS.

RUN= 897 SERIES= 5801

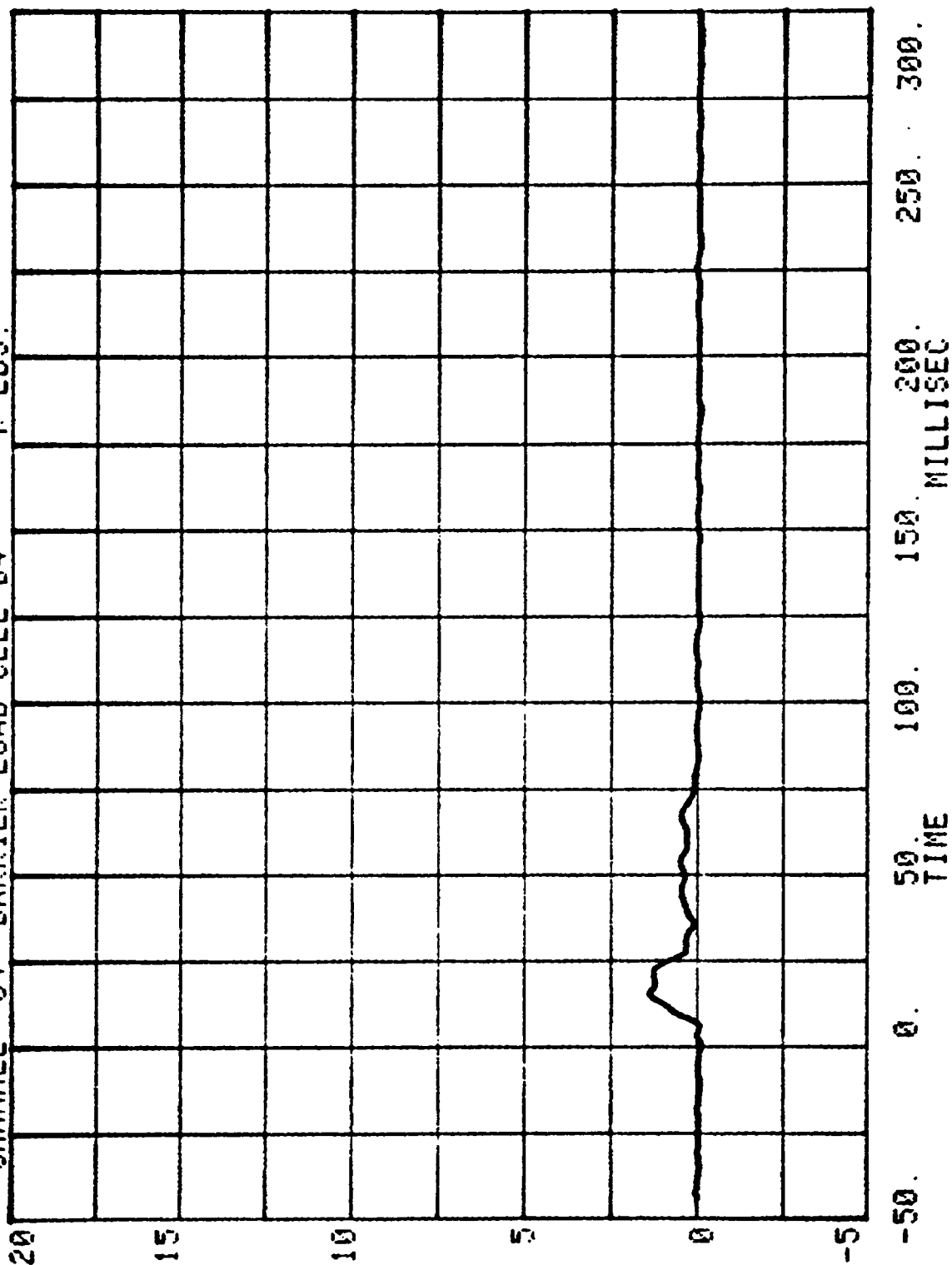


RUN= 897 SERIES= 5801  
CHANNEL 63 BARRIER LOAD CELL D3 K LBS.

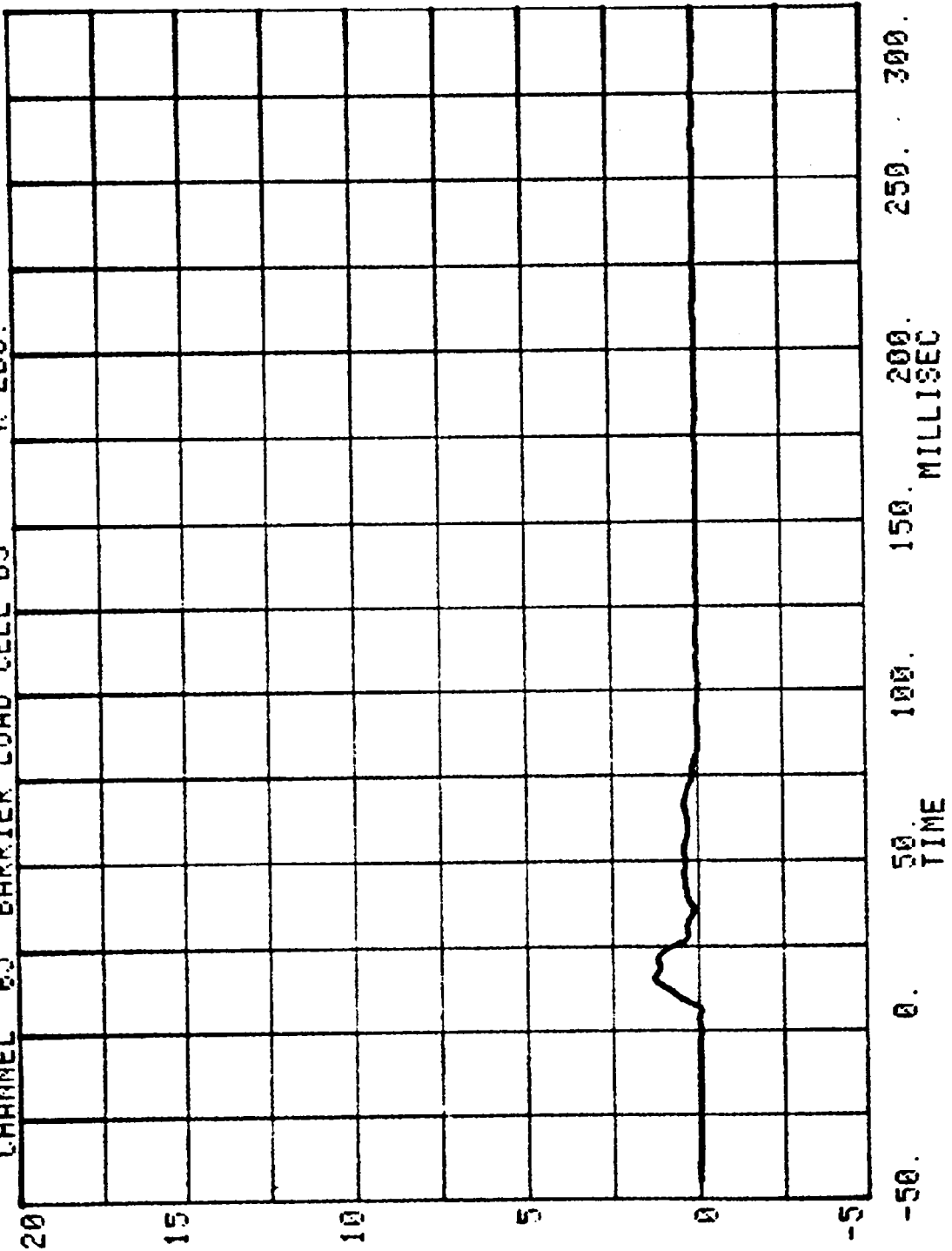


CHANNEL 64 BARRIER LOAD CELL 04 K LBS.

RUN= 897 SERIES= 5801

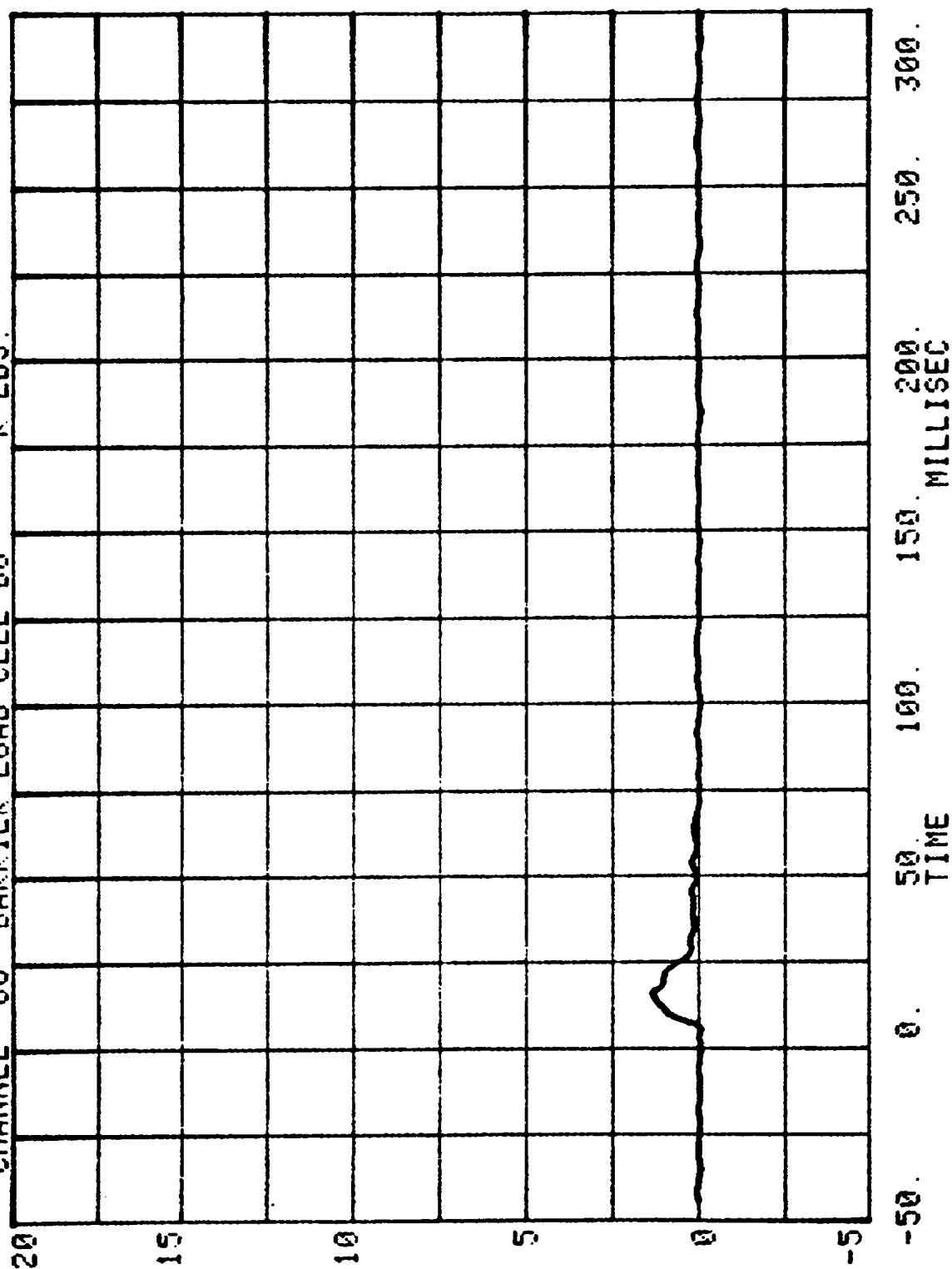


RUN= 897 SERIES= 5801  
CHANNEL 65 BARRIER LOAD CELL D5 K LBS.

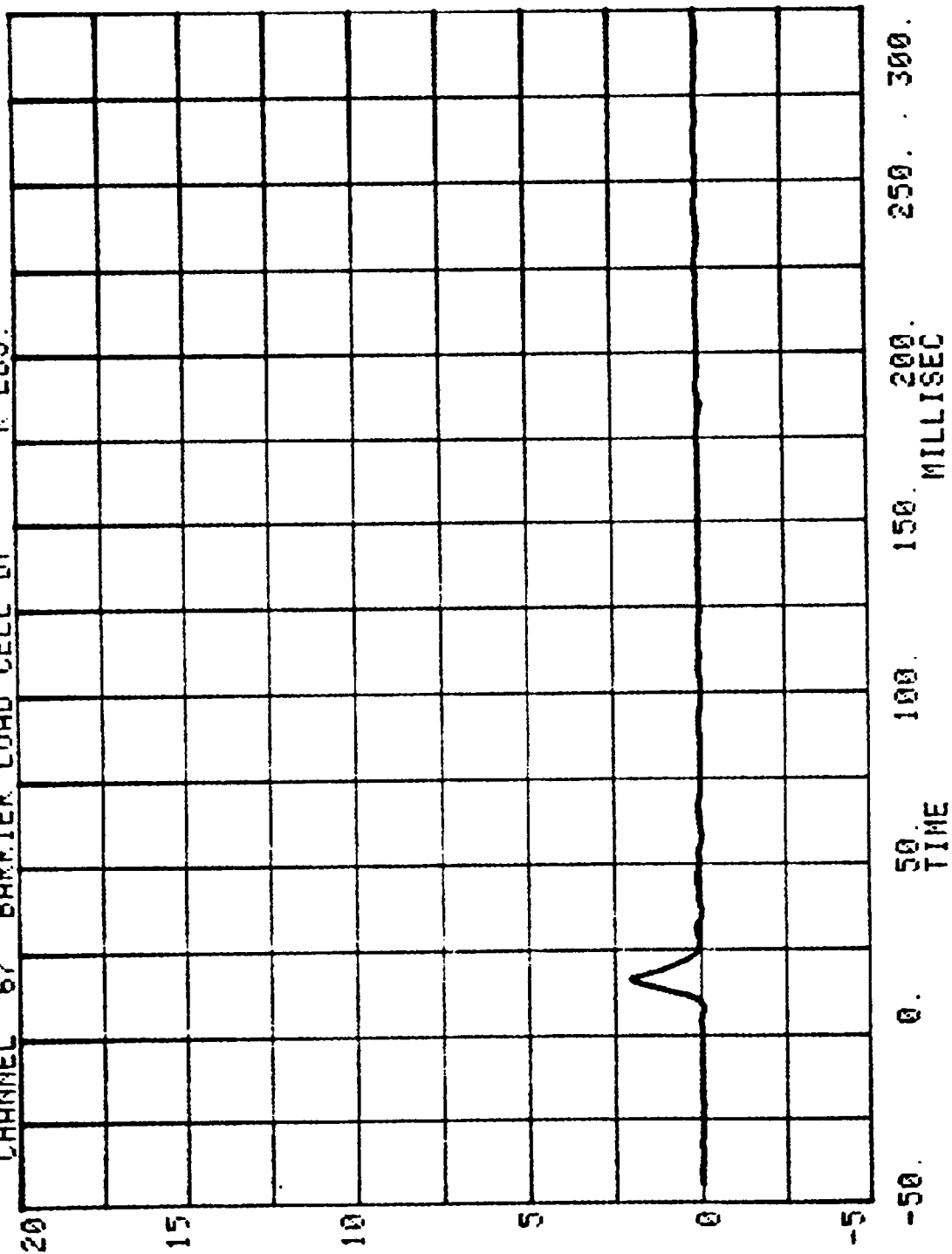


CHANNEL 66 BARRIER LOAD CELL D6 K LBS.

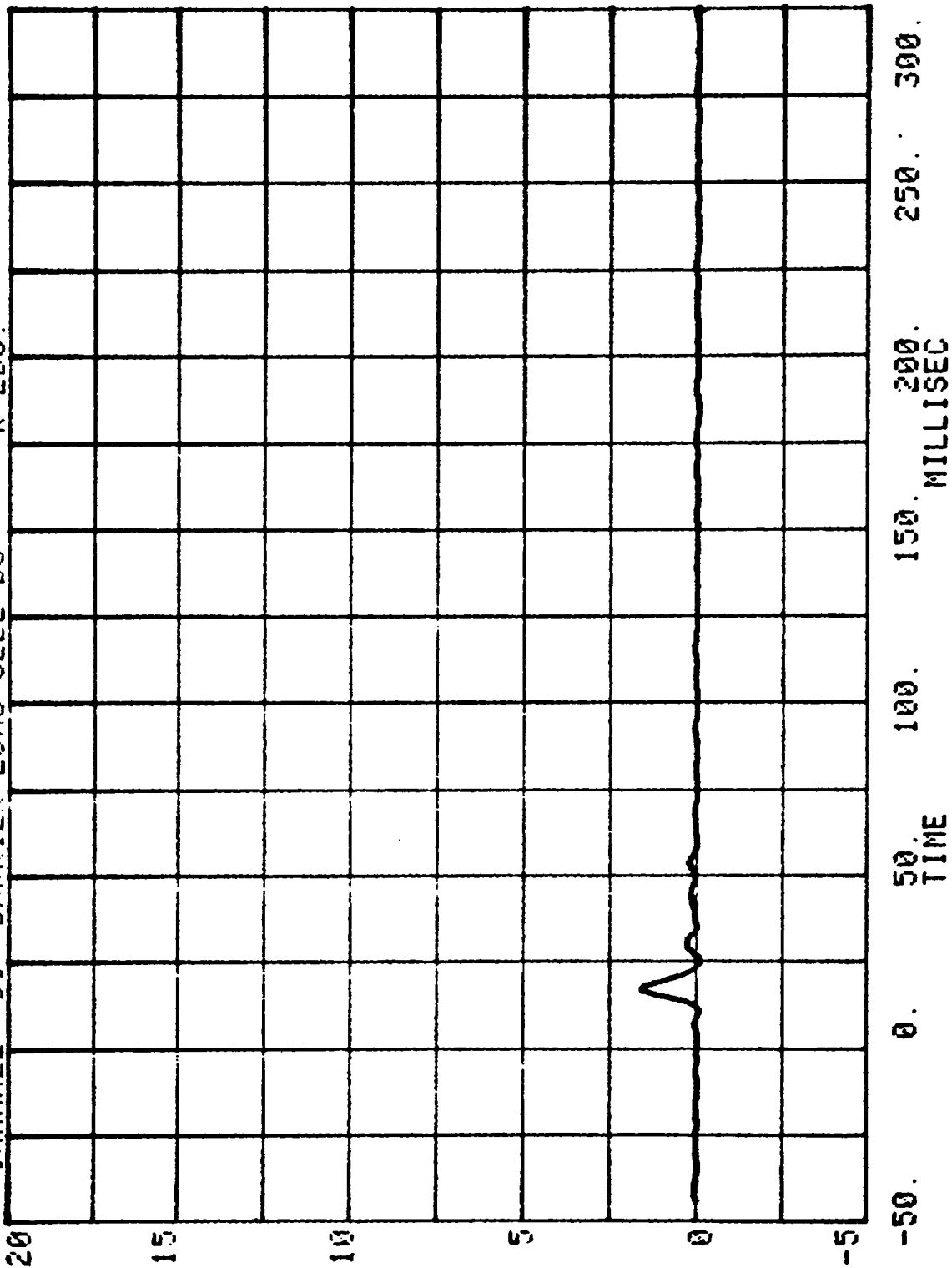
RUN= 897 SERIES= 5801



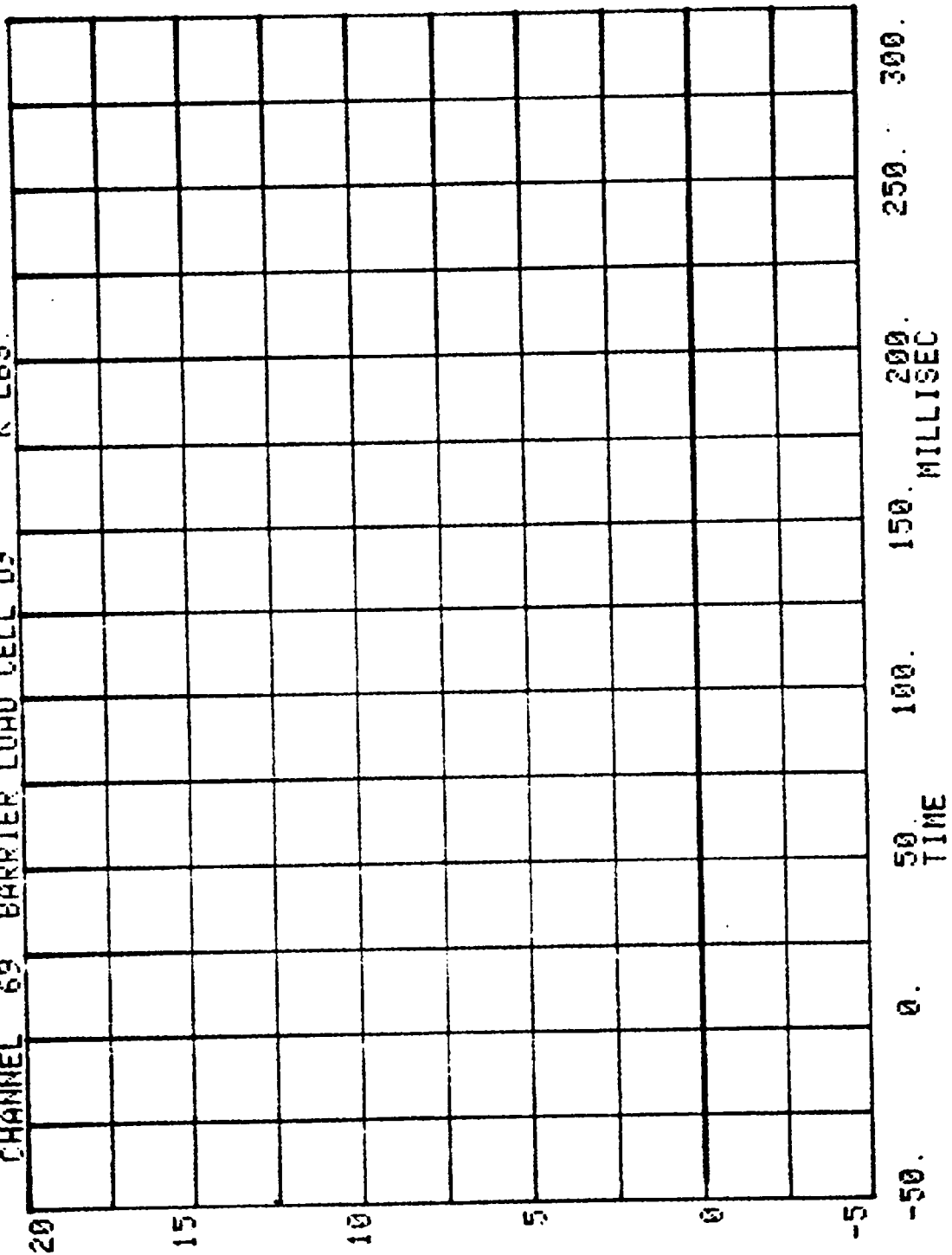
CHANNEL 67 RUN= 897 SERIES= 5801 K LBS.  
BARRIER LOAD CELL D7



CHANNEL 69    RUN= 897    SERIES= 5801    K LBS.



CHANNEL 69 RUN= 897 SERIES= 5801 K LBS.  
 BARRIER LOAD CELL D9



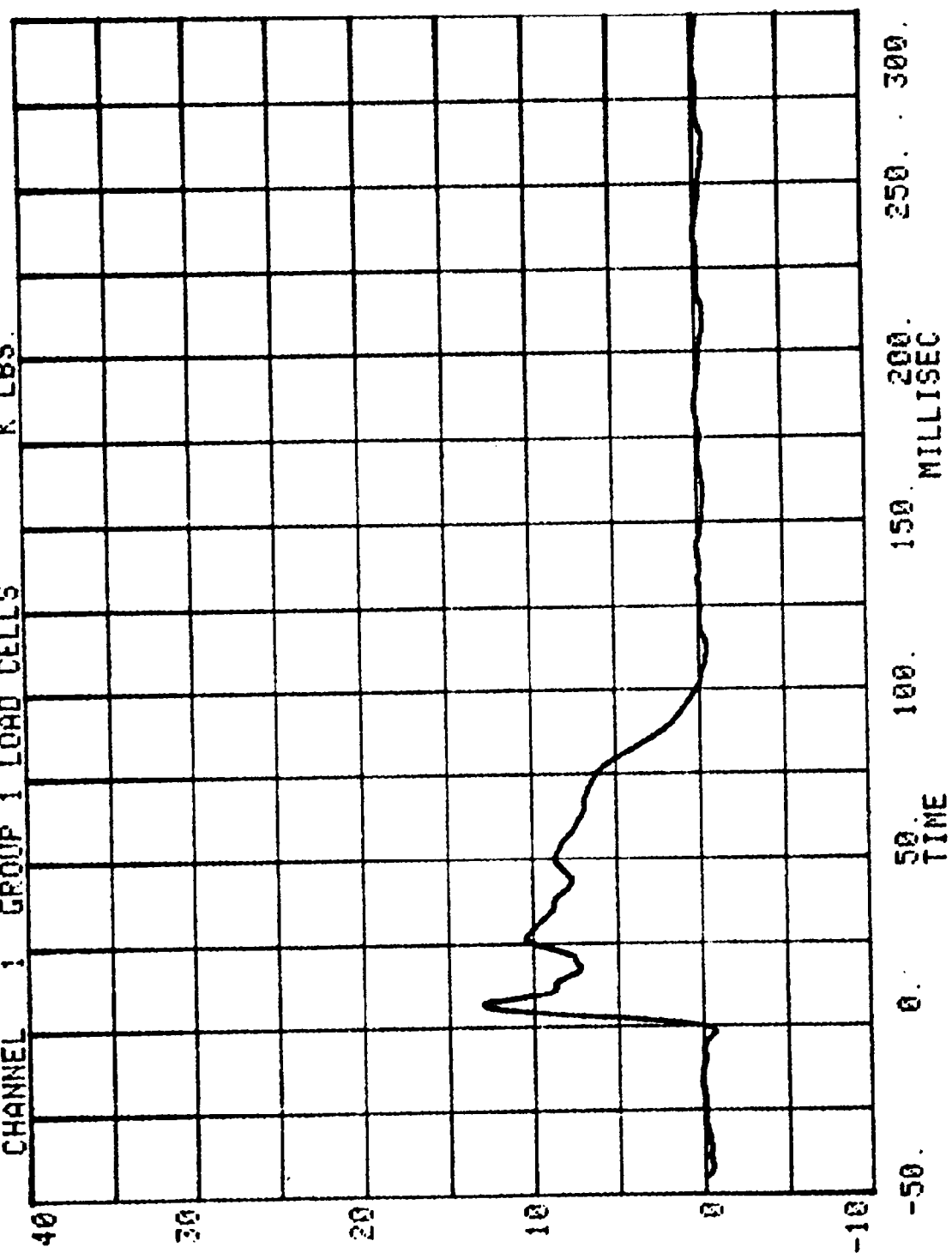
# NEW CAR ASSESSMENT CRASH TEST - 1989

RUN # 897

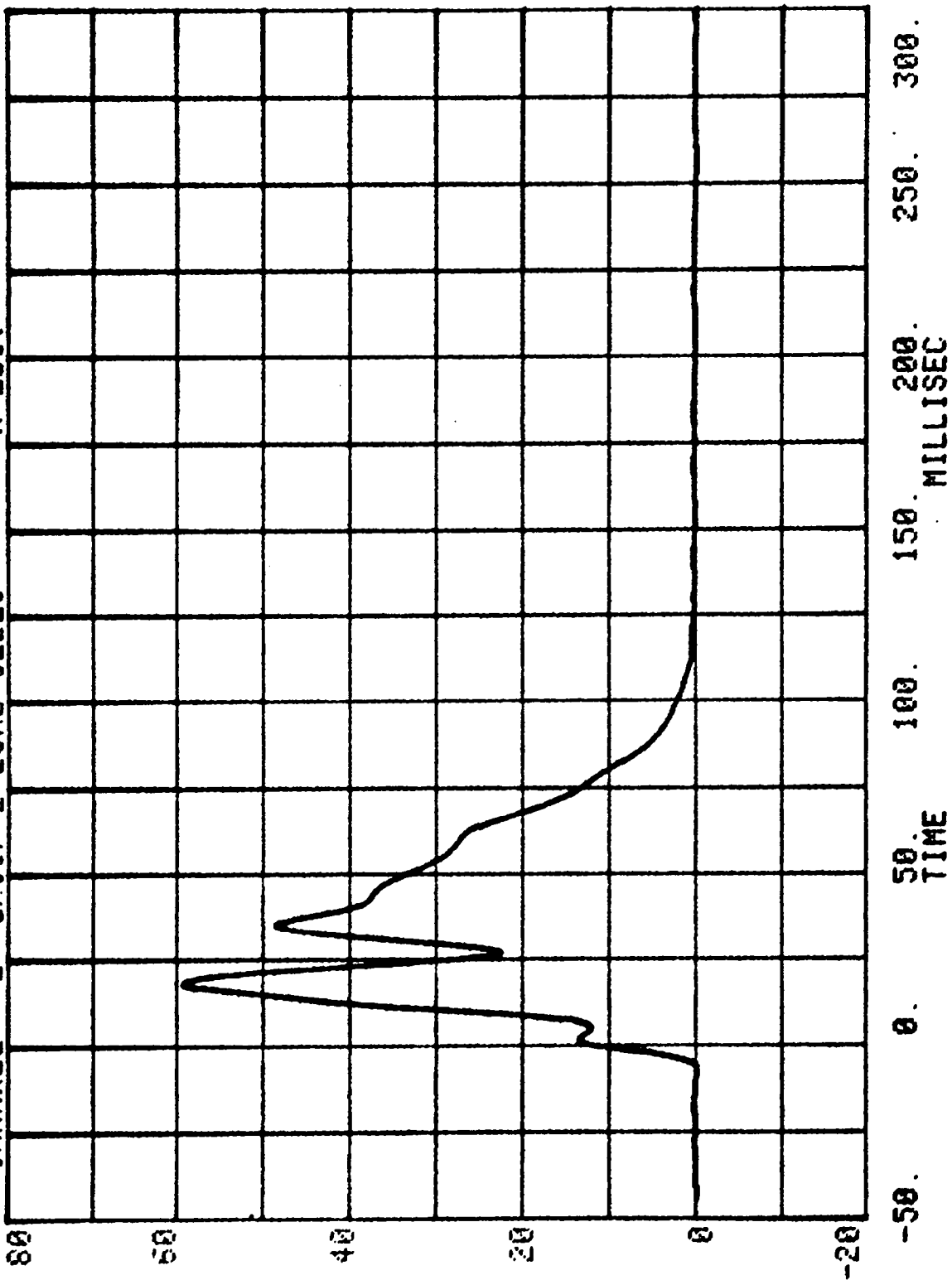
SERIES # 5801

| CHAN | TITLE               | MINIMUM/MAXIMUM               | AT | TIME                    |
|------|---------------------|-------------------------------|----|-------------------------|
| 1    | GROUP 1 LOAD CELLS  | - 641 K LBS.<br>13.021 K LBS. |    | -1.58 MS.<br>6.52 MS.   |
| 2    | GROUP 2 LOAD CELLS  | - 176 K LBS.<br>59.382 K LBS. |    | 258.07 MS.<br>18.30 MS. |
| 3    | GROUP 3 LOAD CELLS  | - 356 K LBS.<br>11.578 K LBS. |    | -2.48 MS.<br>31.42 MS.  |
| 4    | GROUP 4 LOAD CELLS  | - 281 K LBS.<br>5.303 K LBS.  |    | -35.55 MS.<br>14.10 MS. |
| 5    | GROUP 5 LOAD CELLS  | - 406 K LBS.<br>11.798 K LBS. |    | - 38 MS.<br>19.42 MS.   |
| 6    | GROUP 6 LOAD CELLS  | - 328 K LBS.<br>7.865 K LBS.  |    | 184.50 MS.<br>16.57 MS. |
| 7    | TOTAL LOAD CELL SUM | - 742 K LBS.<br>97.727 K LBS. |    | -35.32 MS.<br>18.22 MS. |

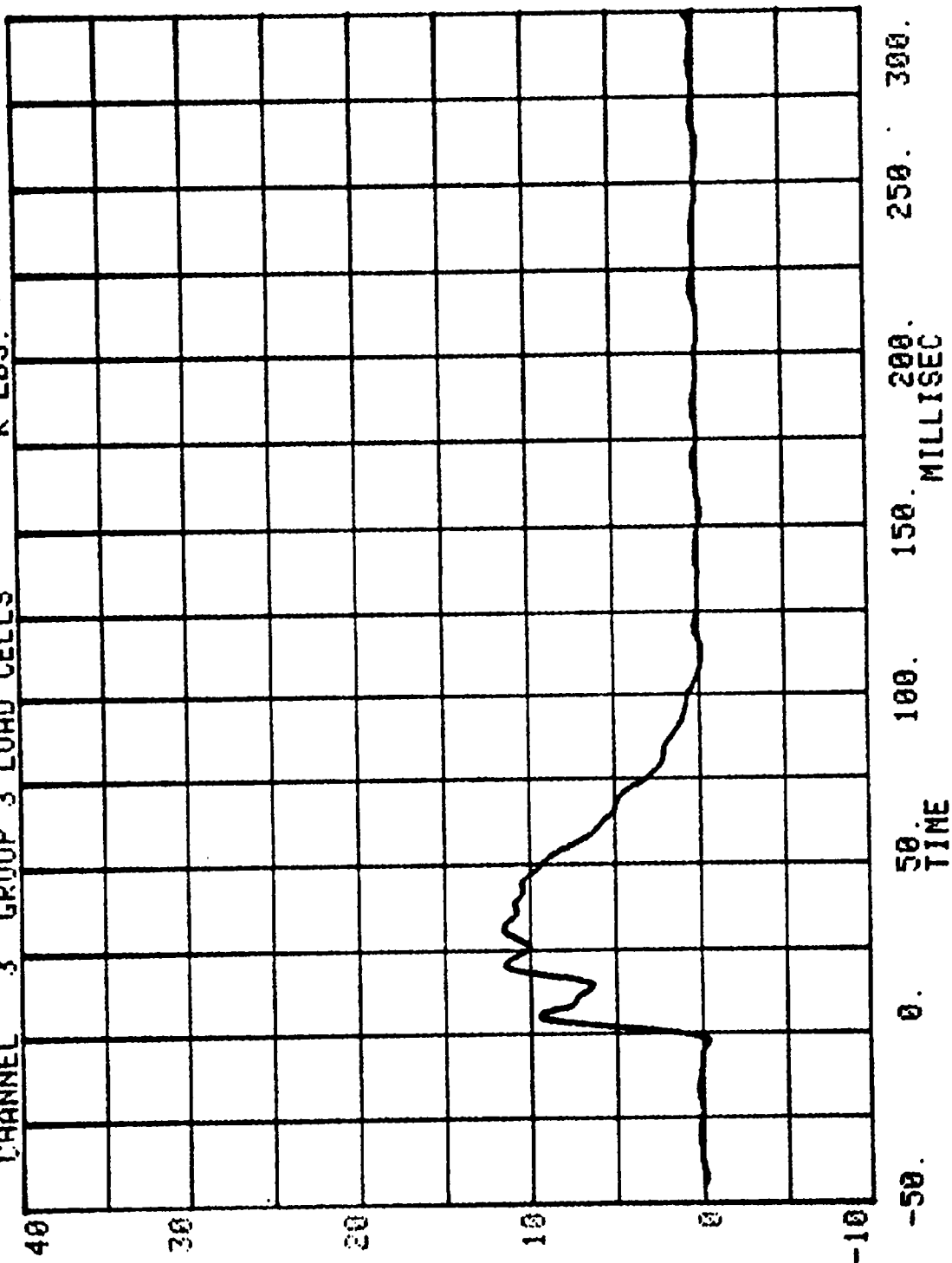
CHANNEL 1 GROUP 1 LOAD CELLS RUN= 897 SERIES= 5801 K LBS.



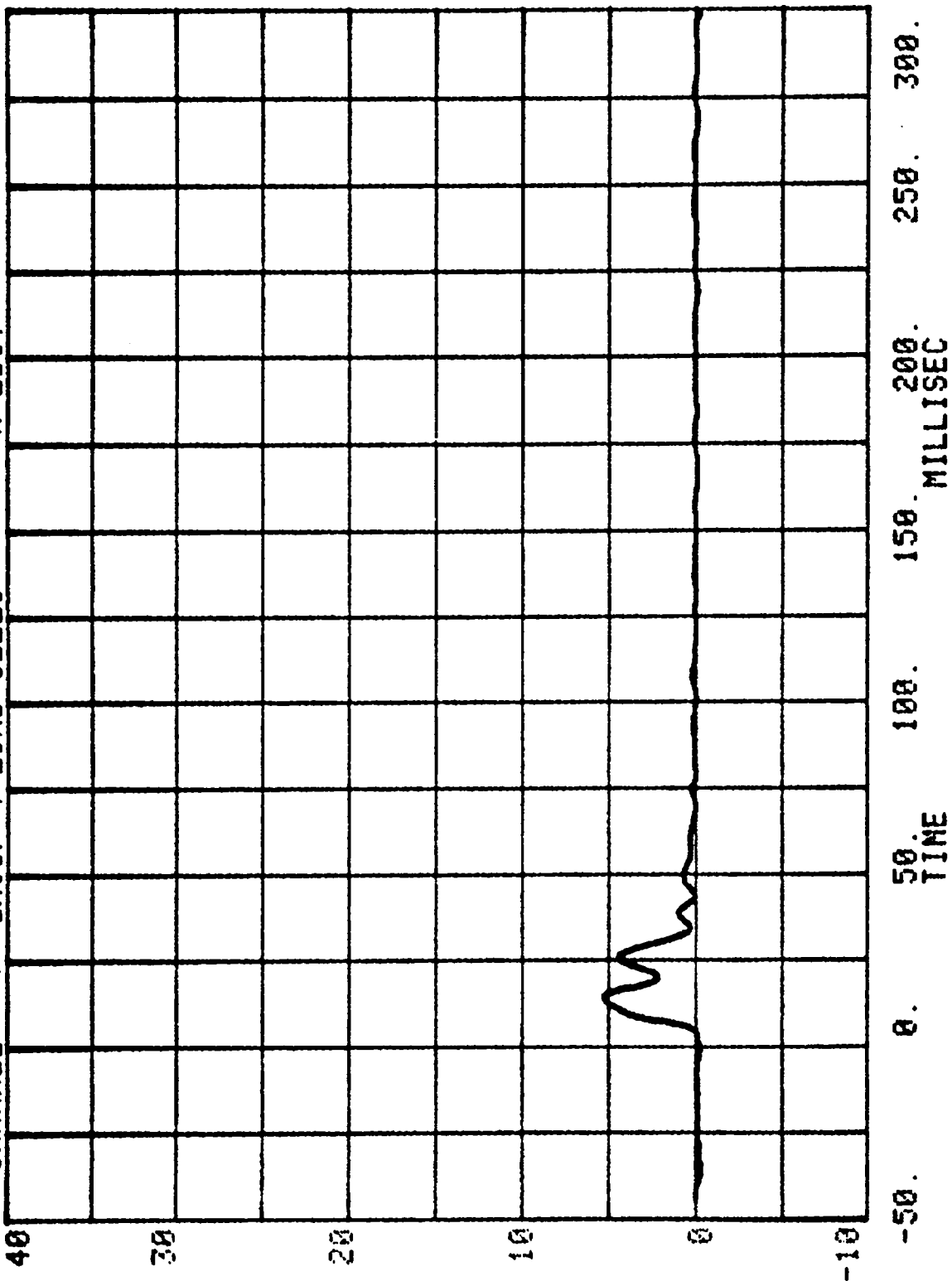
RUN= 897 SERIES= 5801 K LBS.  
CHANNEL 2 GROUP 2 LOAD CELLS



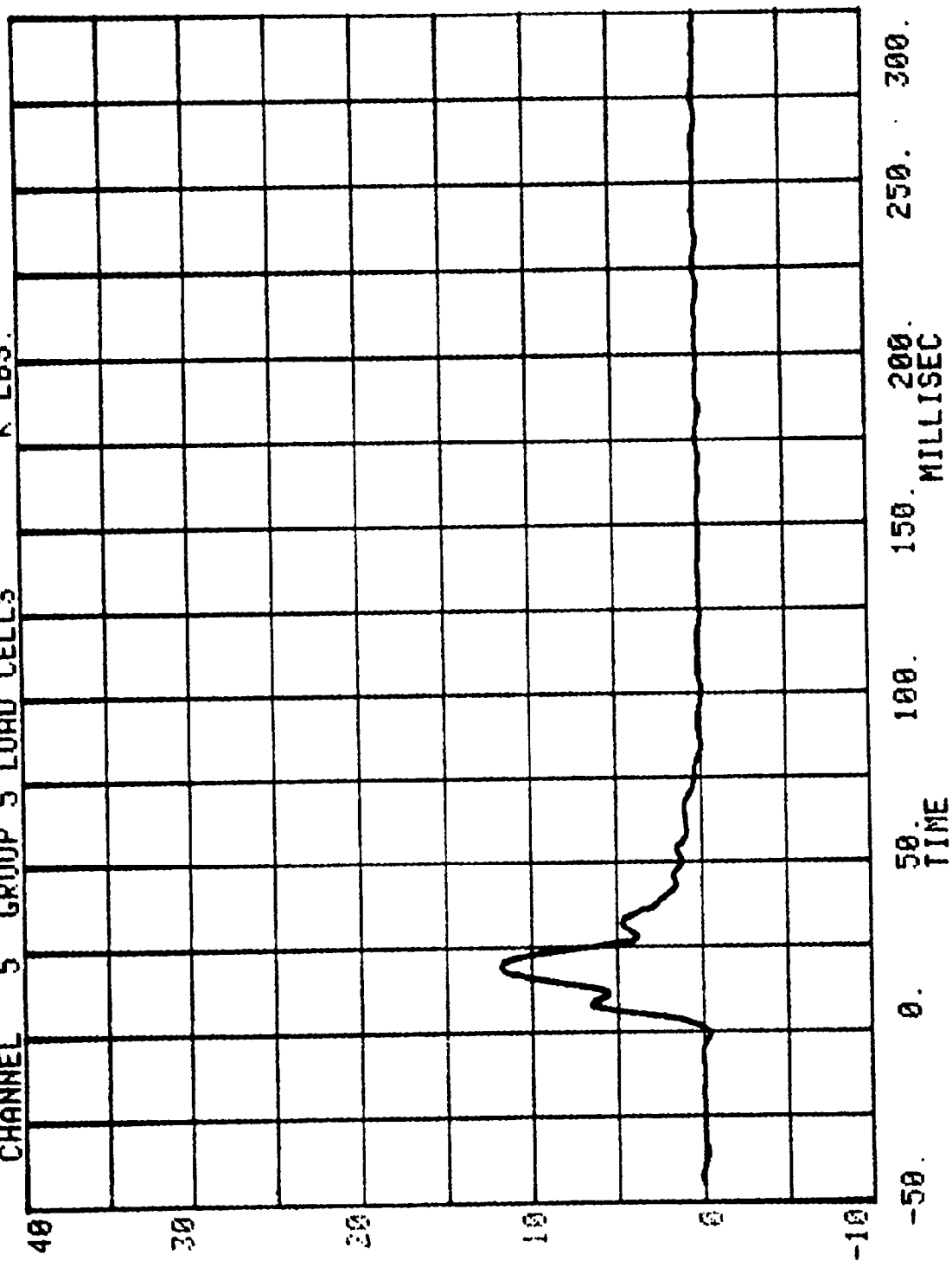
CHANNEL 3 GROUP 3 LOAD CELLS  
RUN= 897 SERIES= 5801 K LBS.



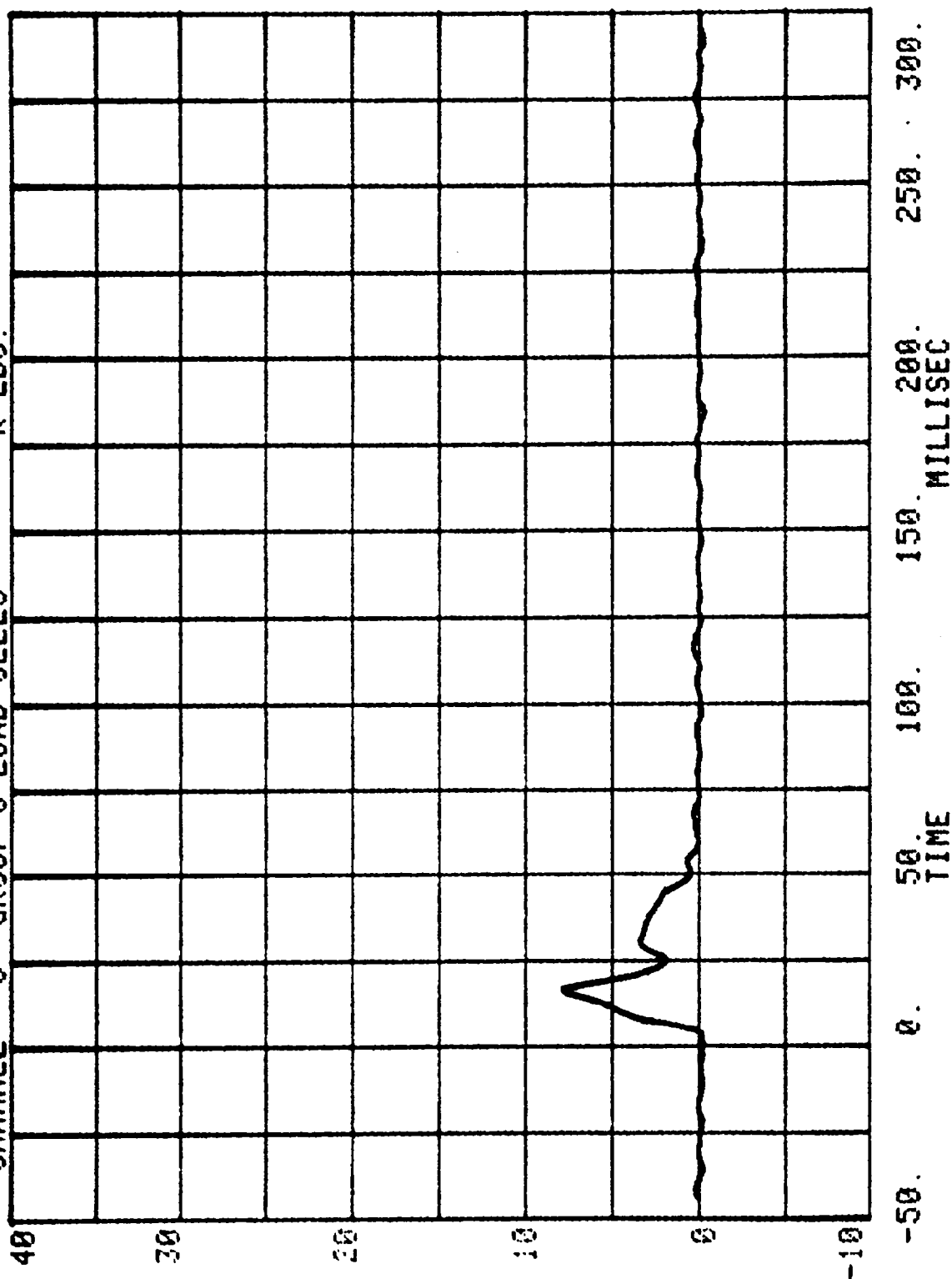
RUN= 897 SERIES= 5801  
CHANNEL 4 GROUP 4 LOAD CELLS K LBS.



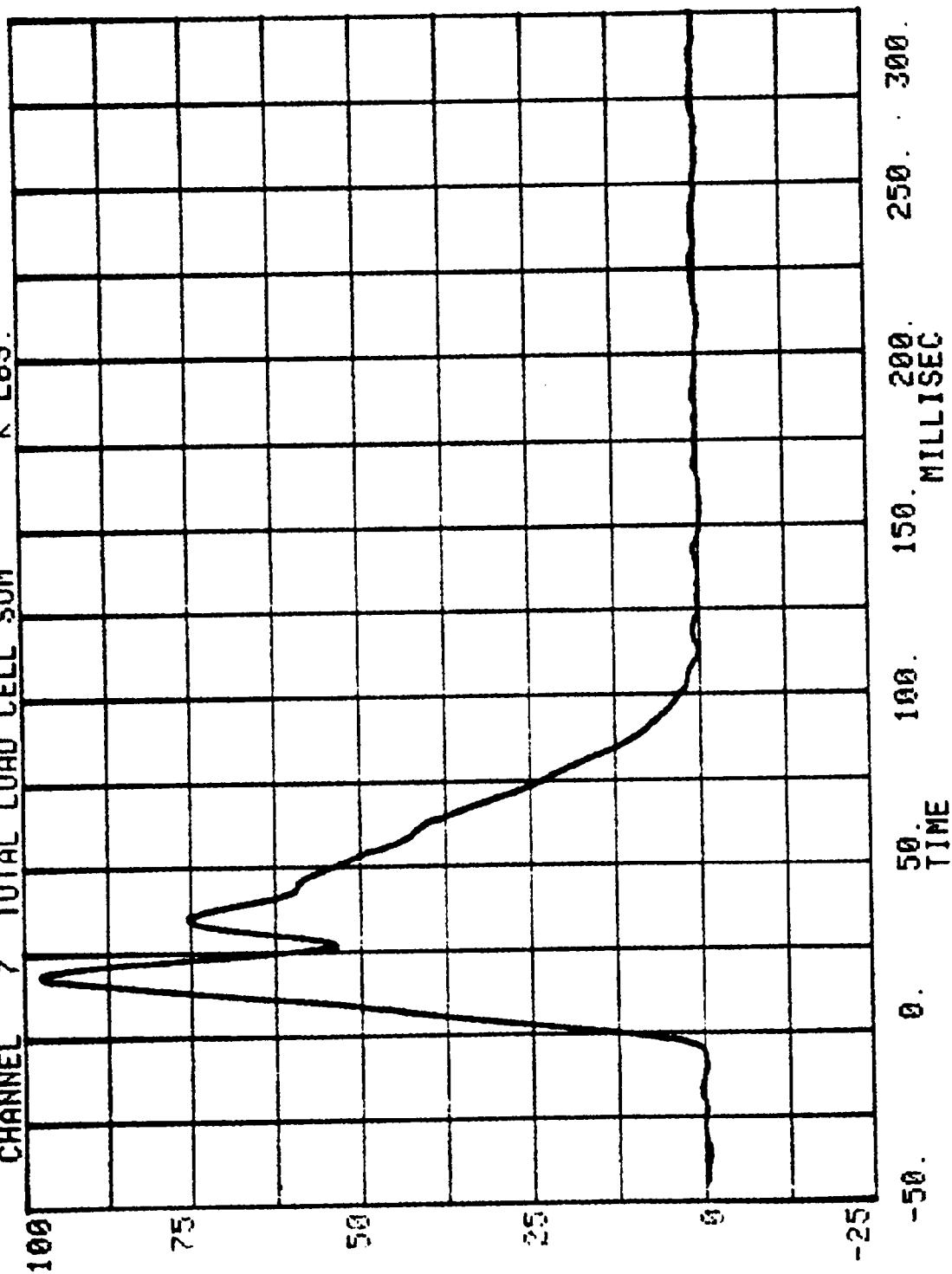
CHANNEL 5 GROUP 5 LOAD CELLS  
RUN= 897 SERIES= 5801 K LBS.



RUN= 897 SERIES= 5801 K LBS.  
CHANNEL 6 GROUP 6 LOAD CELLS



CHANNEL 7 TOTAL LOAD CELL SUM RUN= 897 SERIES= 5801 K LBS.



TEST NO. MK5801

DUMMY DATA

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

HEAD INJURY CRITERION  
HEAD SEVERITY INDEX  
35MS. MAXIMUM DURATION

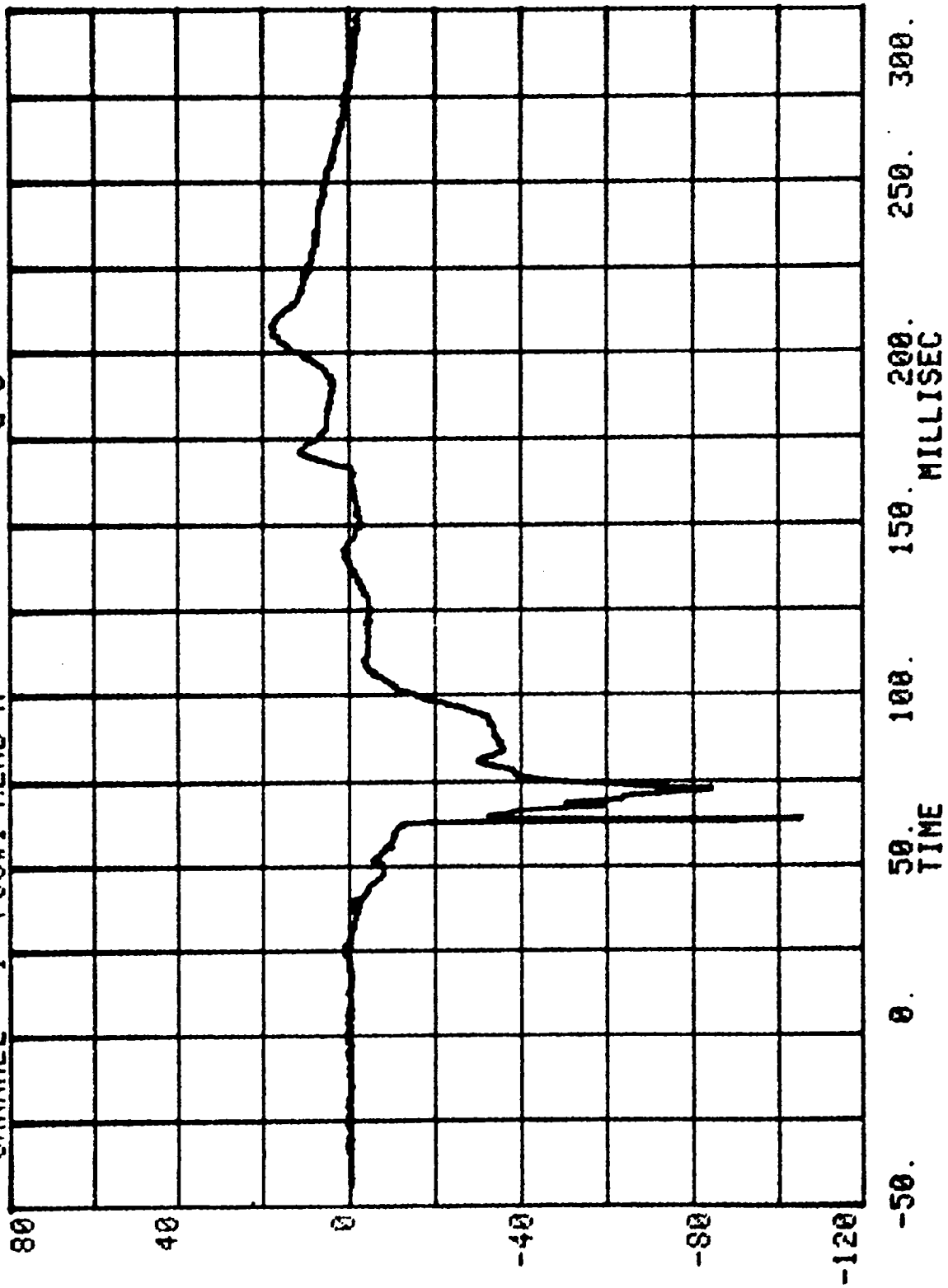
NEW CAR ASSESSMENT CRASH TEST - 1989

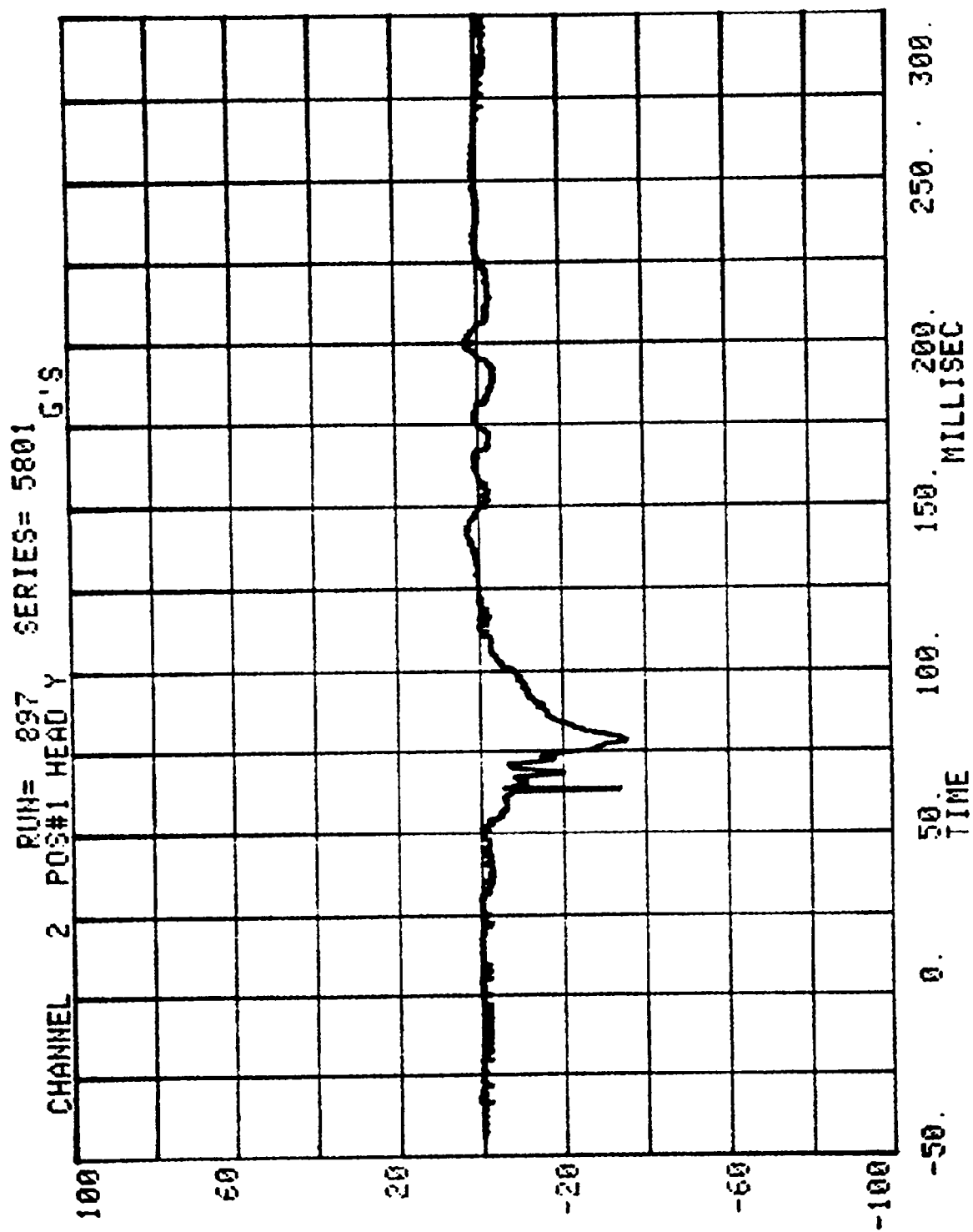
RUN= 897

FOS#1 HEAD R

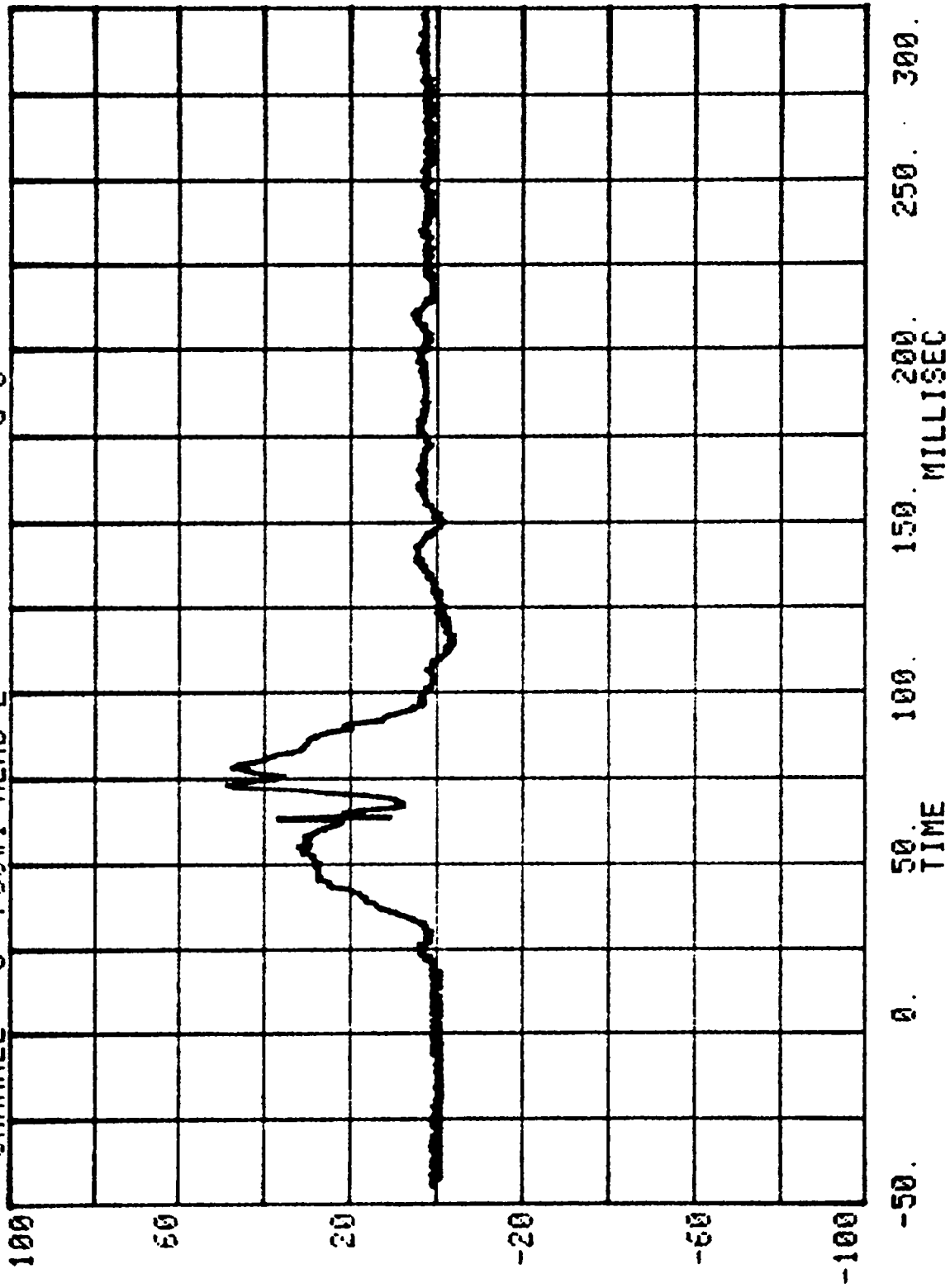
HIC= 786.9 FROM T1= .06232 TO T2= .09435  
AVERAGE ACCELERATION BETWEEN T1 AND T2= 57.5G'S  
EVENT TIME= 300.0 MSEC  
SEVERITY INDEX=1084.1

CHANNEL 1 POS#1 HEAD X RUN= 897 SERIES= 5801 G'S

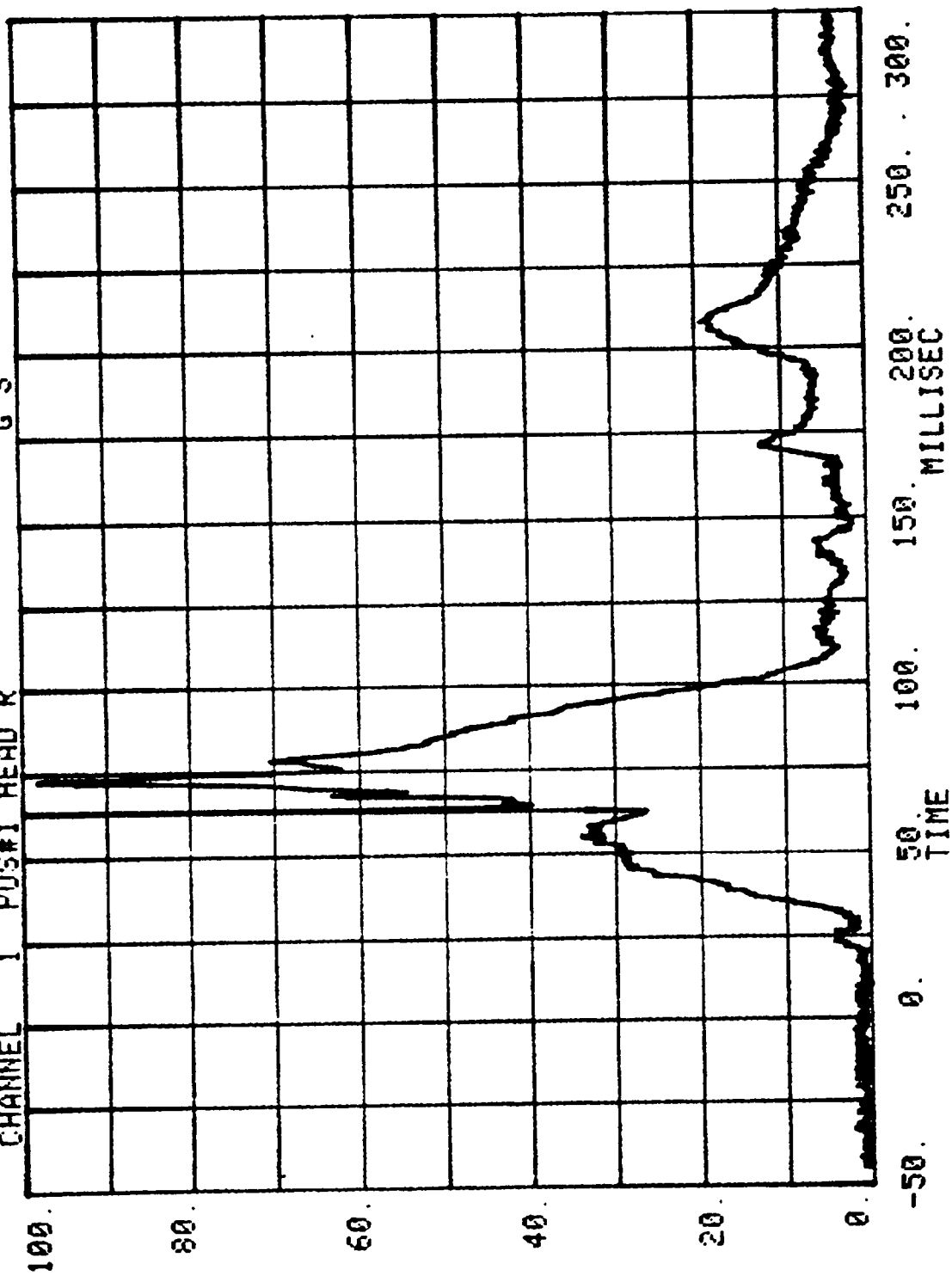


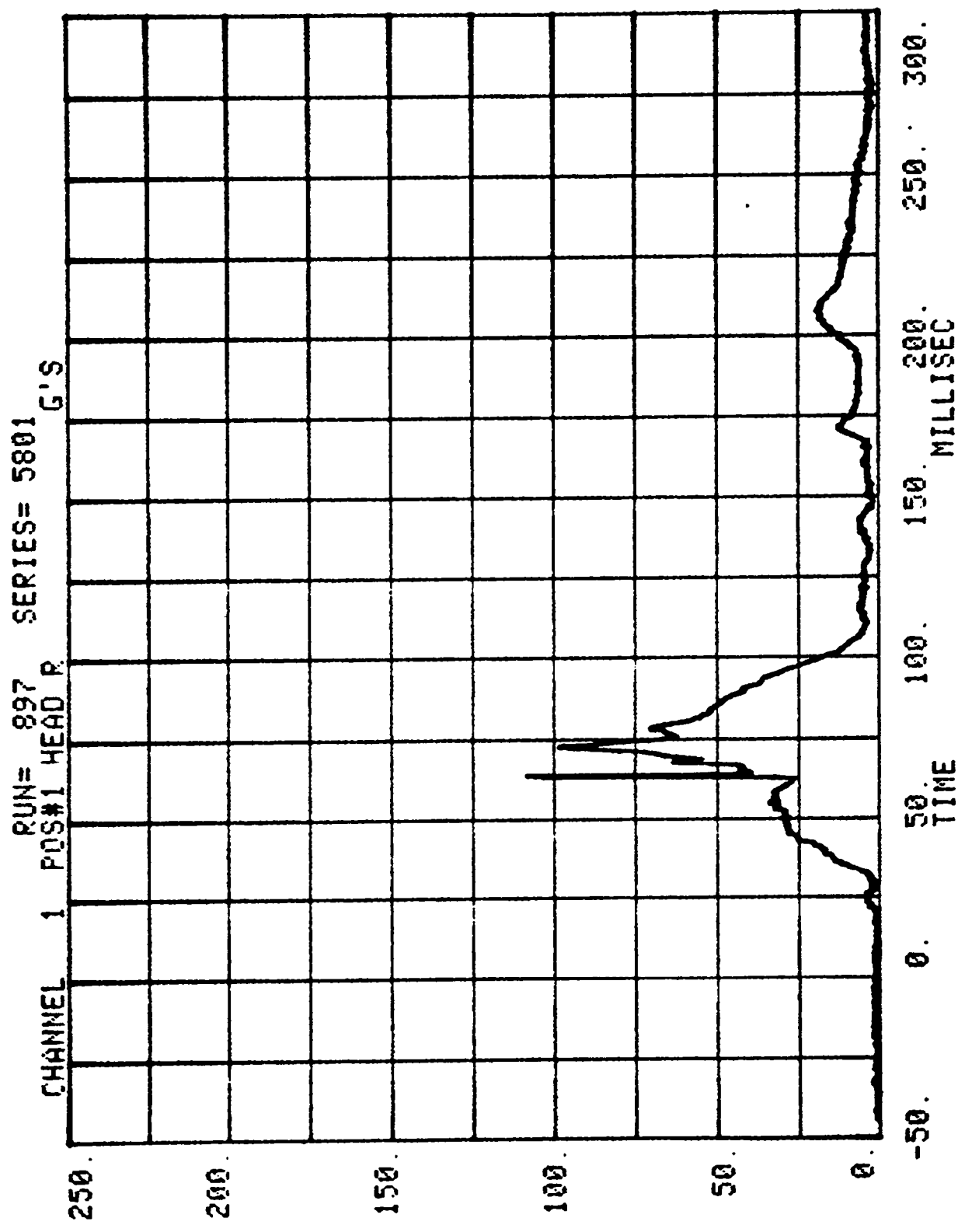


CHANNEL 3 POS#1 HEAD Z RUN= 897 SERIES= 5801 G'S

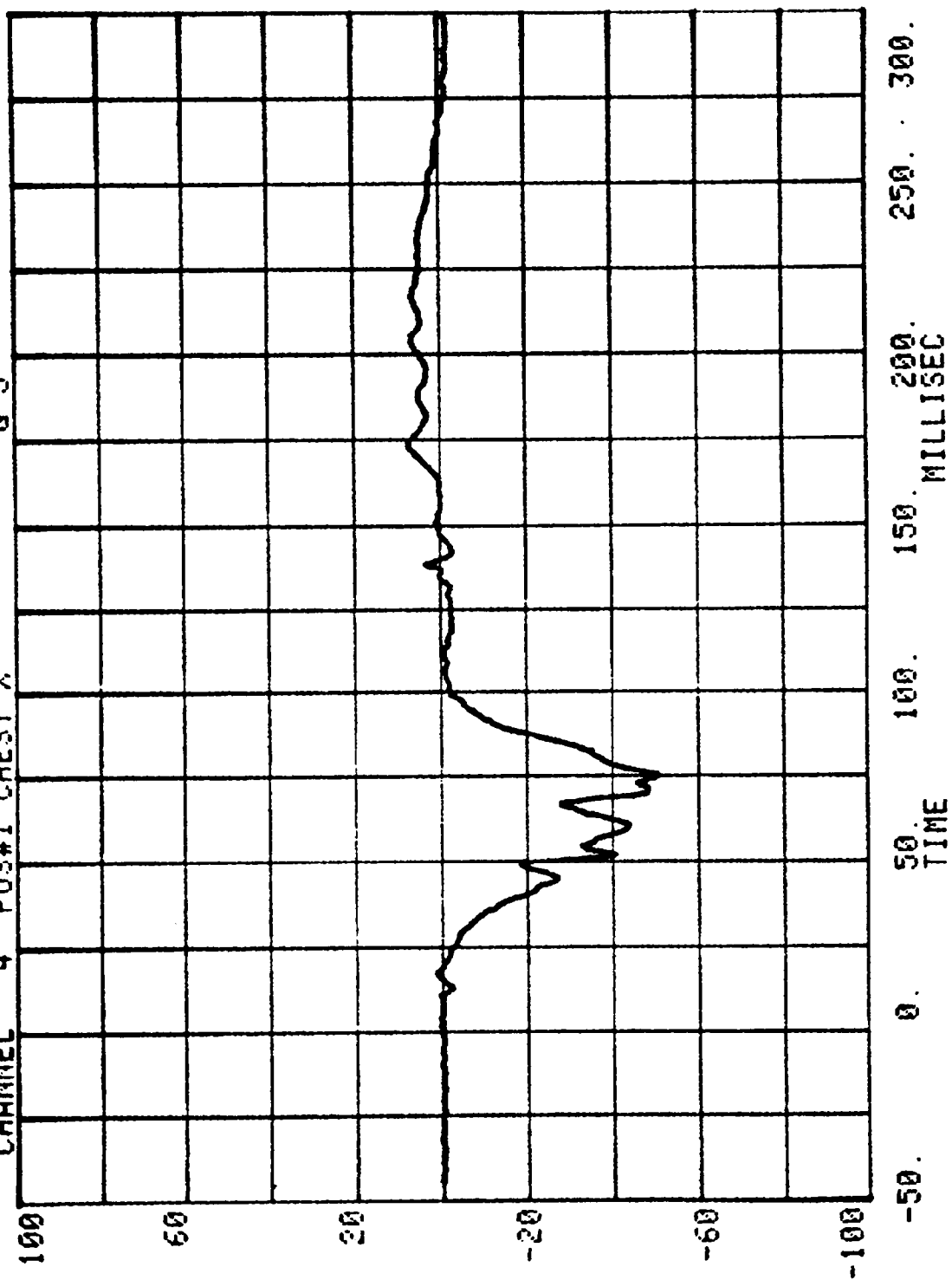


CHANNEL 1 POS#1 HEAD R RUN= 897 SERIES= 5801 G'S

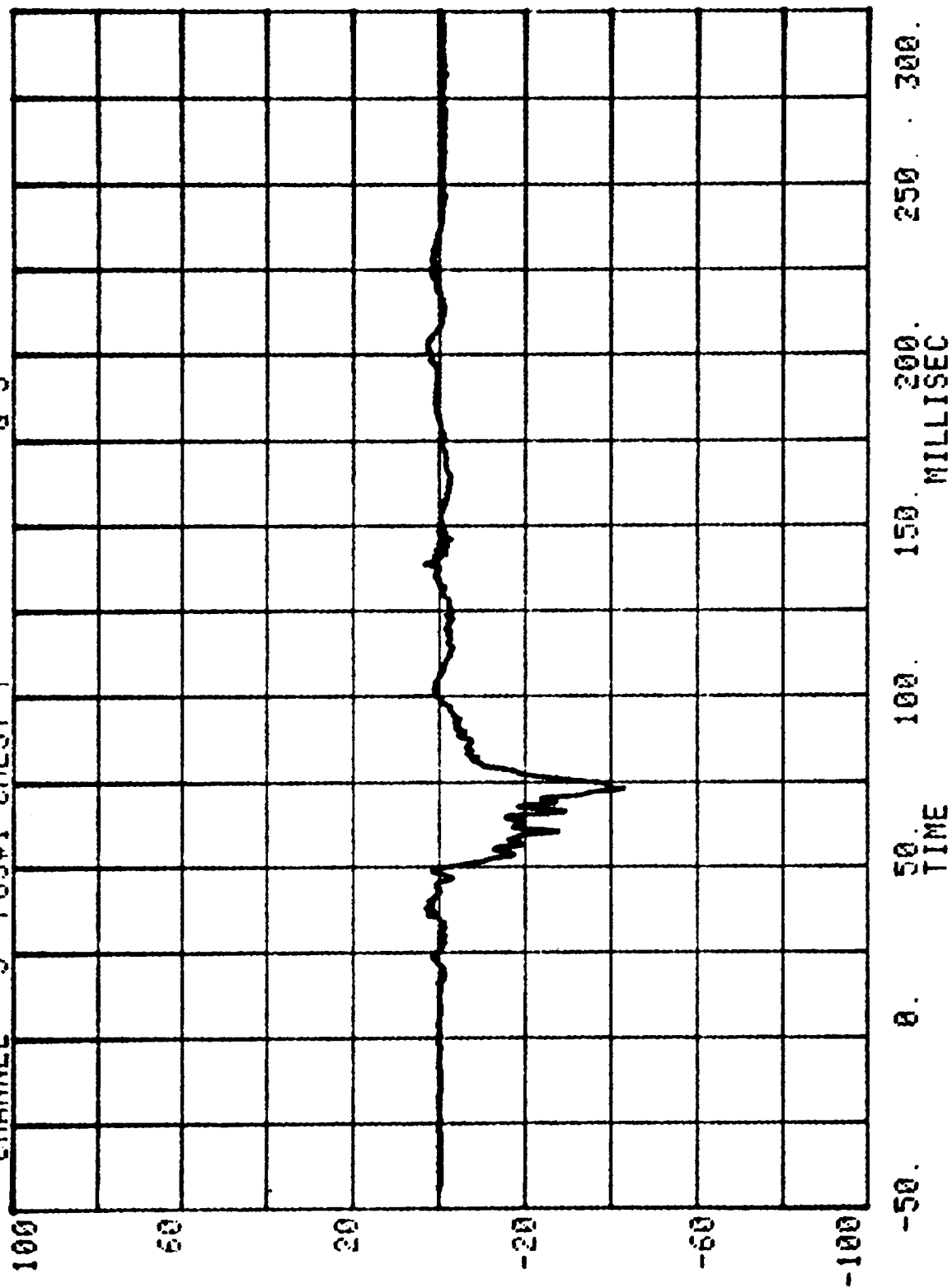




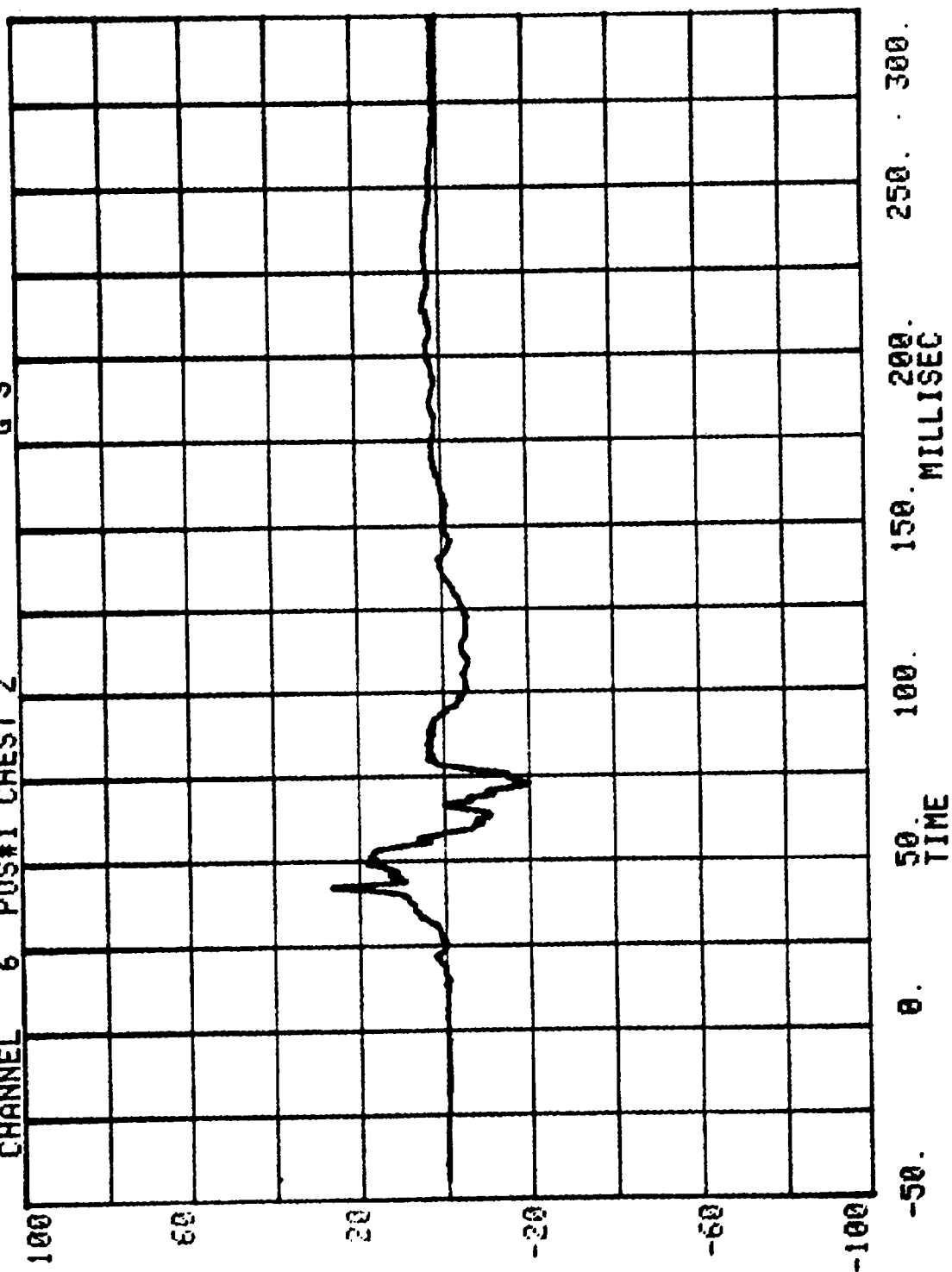
CHANNEL 4 POS#1 CHEST X RUN= 297 SERIES= 5801 G'S



CHANNEL 5 POS#1 CHEST Y  
PUN= 897 SERIES= 5801 G'S

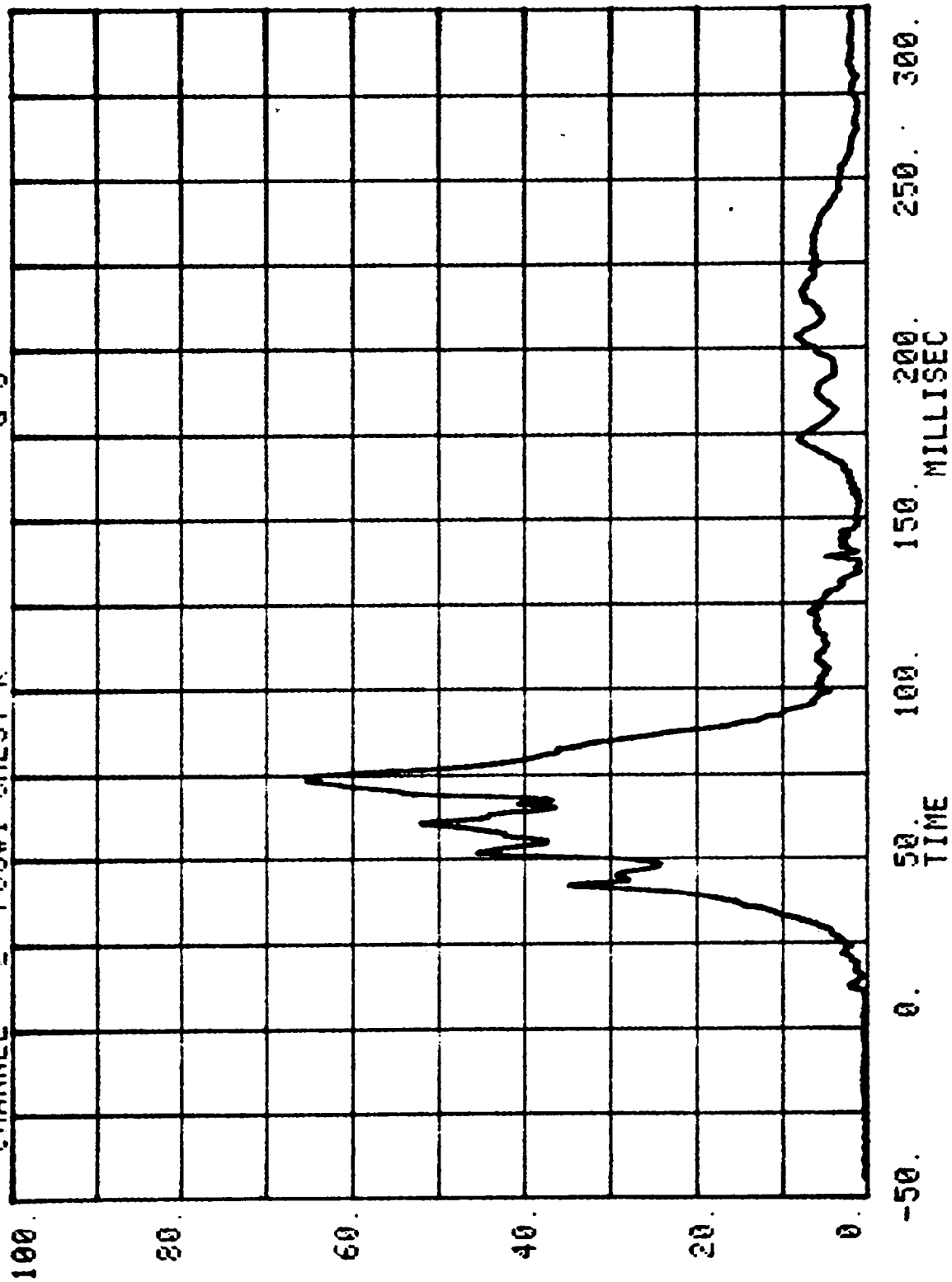


CHANNEL 6 POS#1 CHEST 2 RUN= 897 SERIES= 5801 G'S

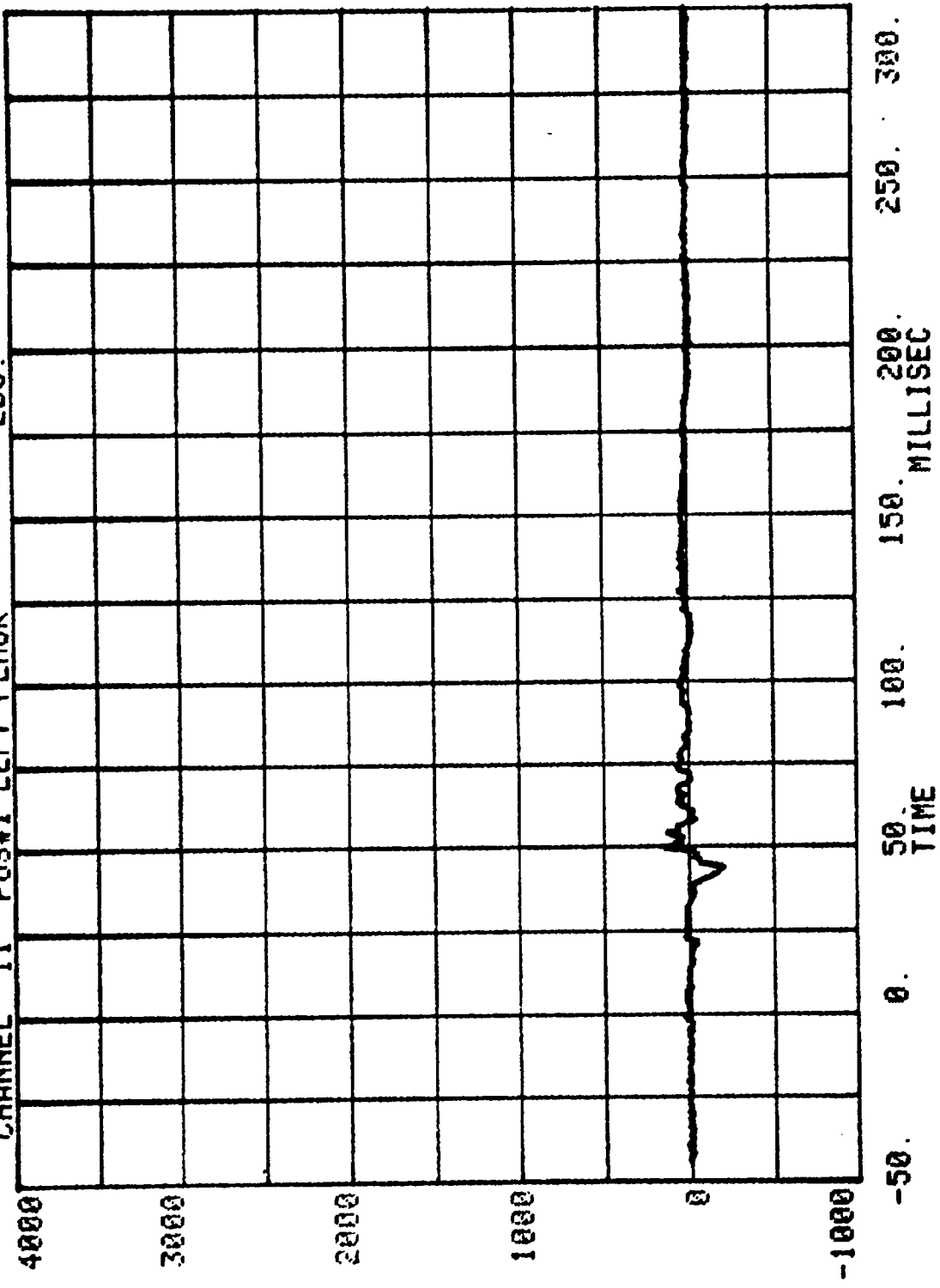


CHANNEL 2 POS#1 CHEST R G'S

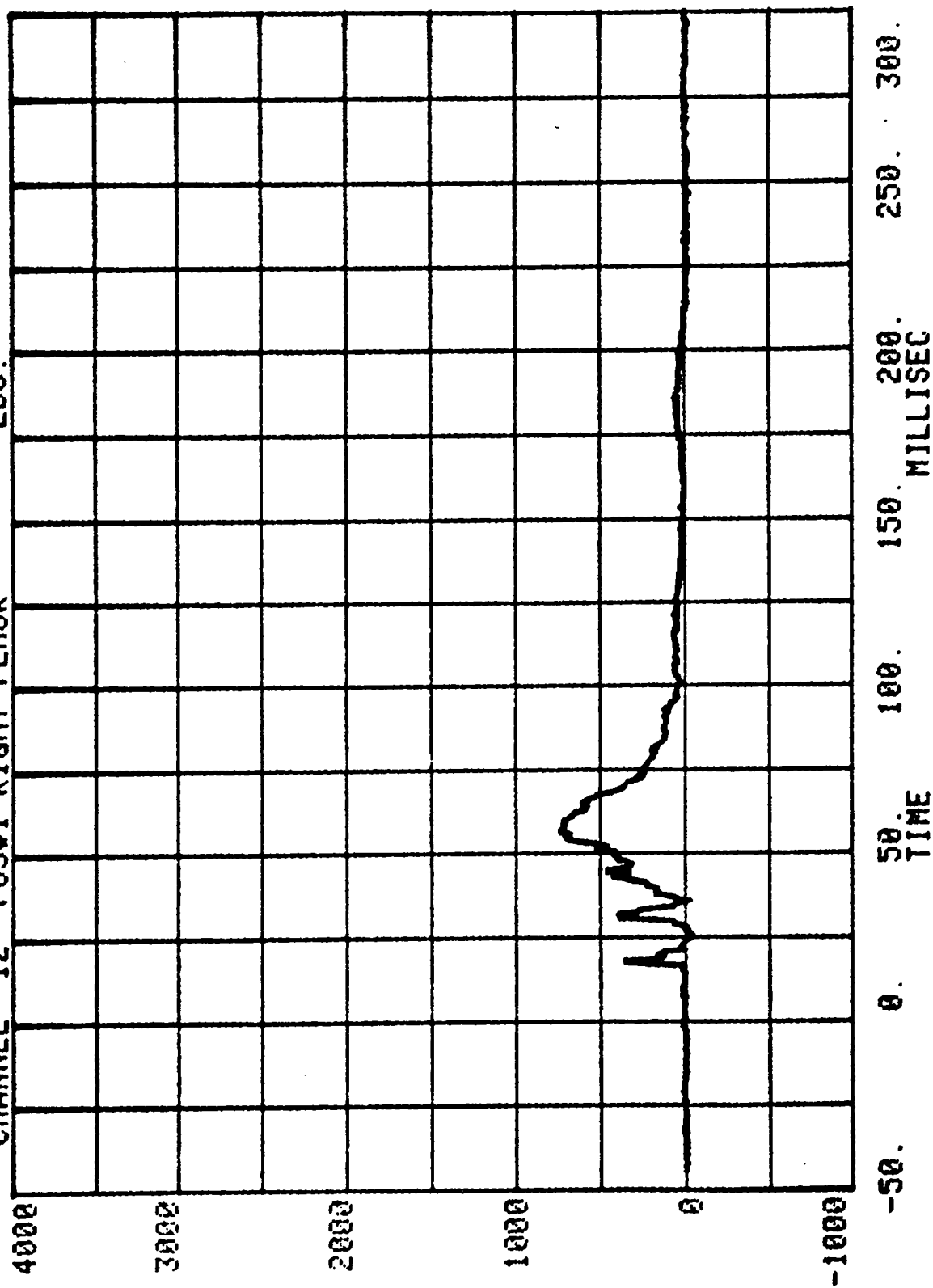
RUN= 897 SERIES= 5801



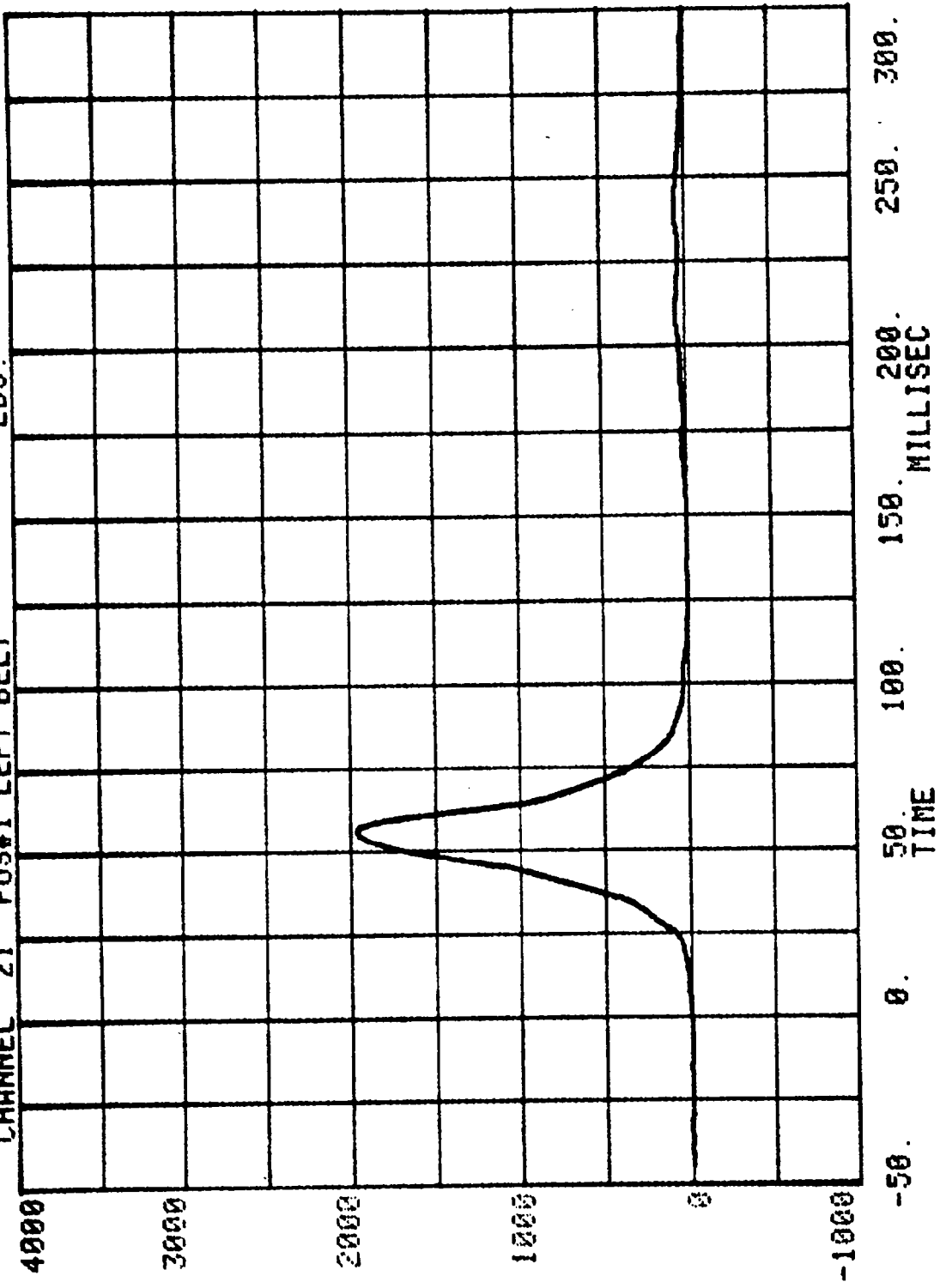
RUN= 897 SERIES= 5801 LBS.  
CHANNEL 11 POS#1 LEFT FEMUR



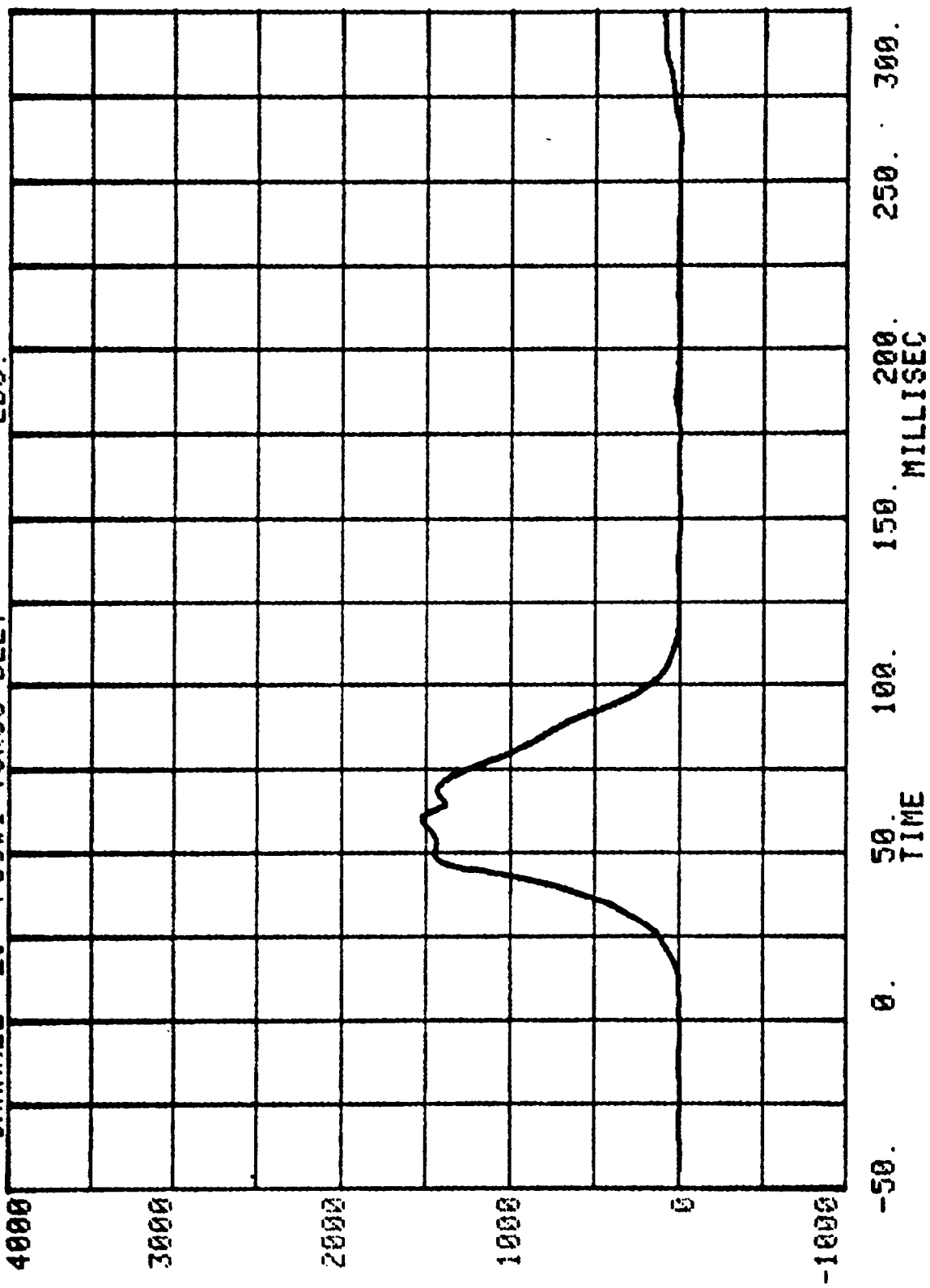
RUN= 897 SERIES= 5801 LBS.  
CHANNEL 12 POS#1 RIGHT FEMUR

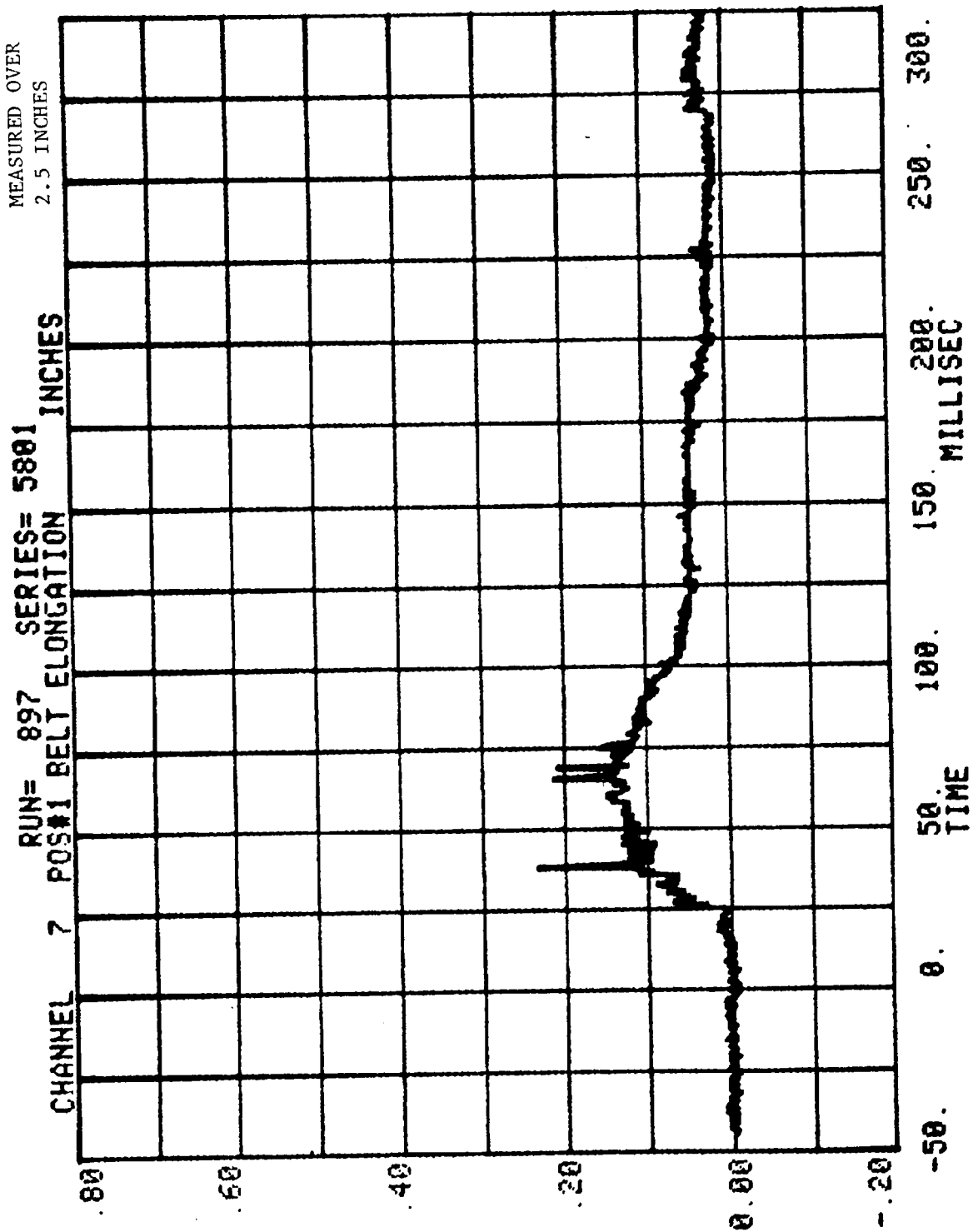


RUN= 897 SERIES= 5901 LBS.  
CHANNEL 21 POS#1 LEFT BELT

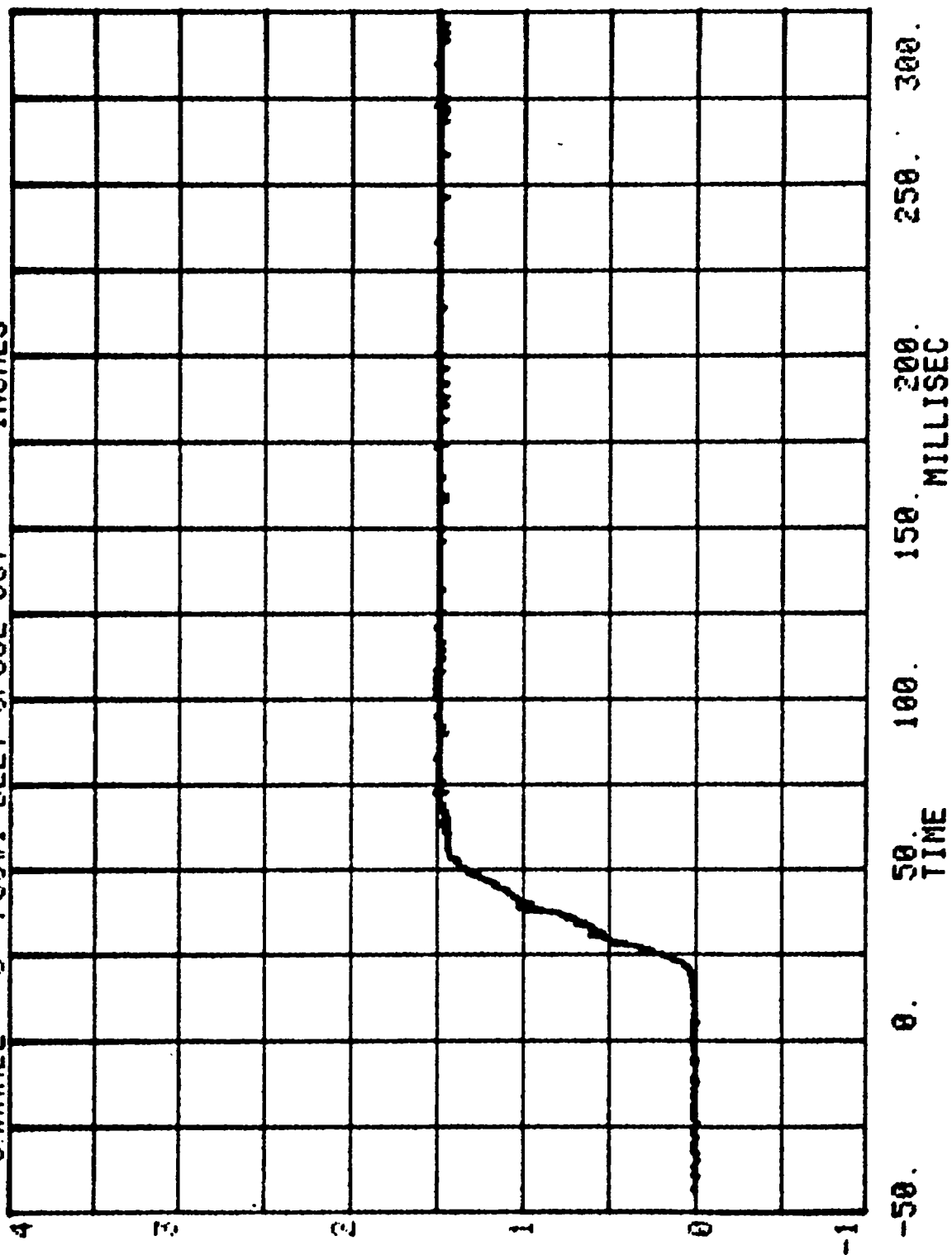


RUN= 897 SERIES= 5801 LBS.  
CHANNEL 23 POS#1 TORSO BELT





RUN= 897 SERIES= 5801  
CHANNEL 8 POS#1 BELT SPOOL OUT INCHES



HEAD INJURY CRITERION  
HEAD SEVERITY INDEX  
26MS. MAXIMUM DURATION

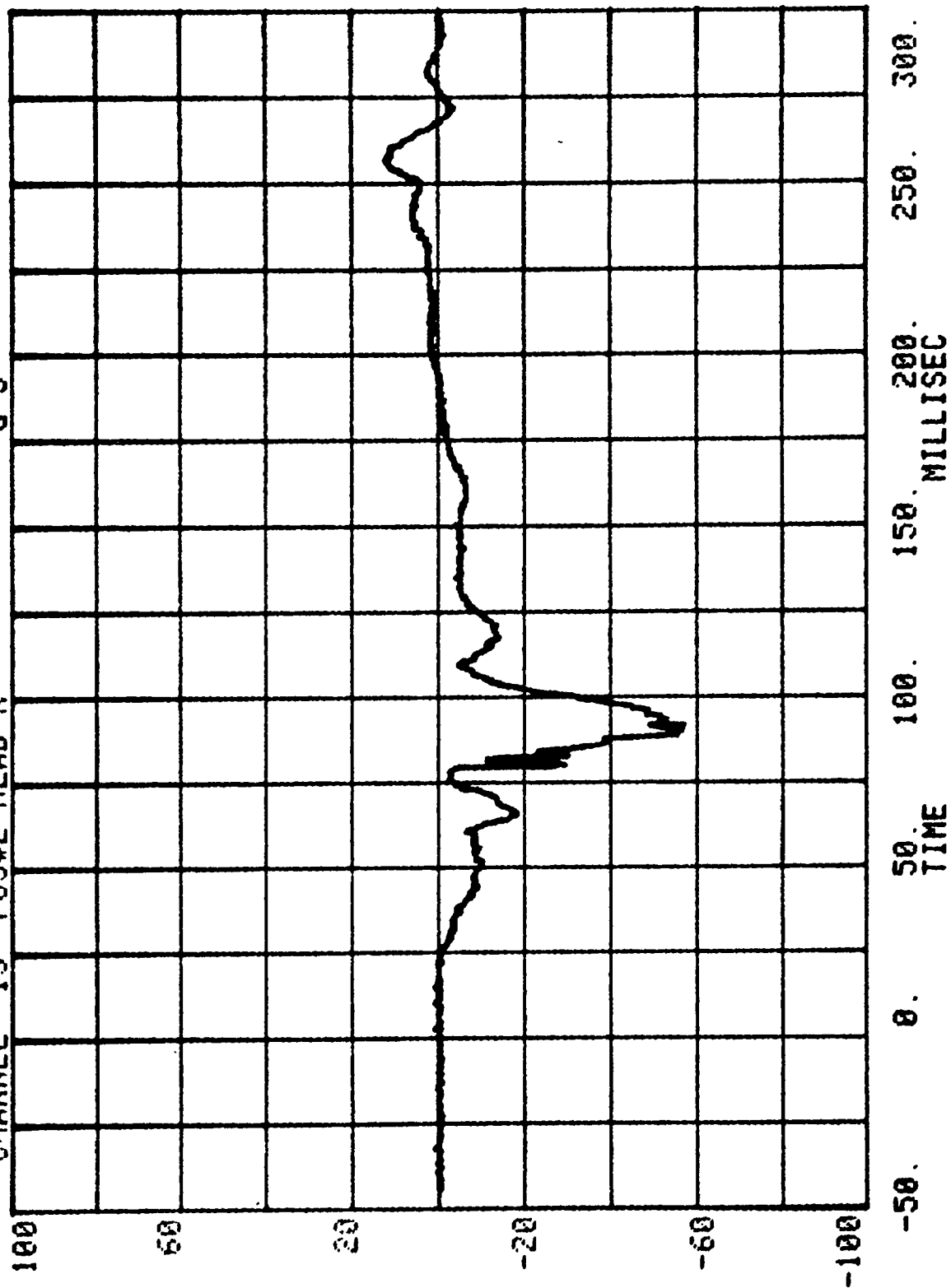
NEW CAR ASSESSMENT CRASH TEST - 1989

RUN= 897

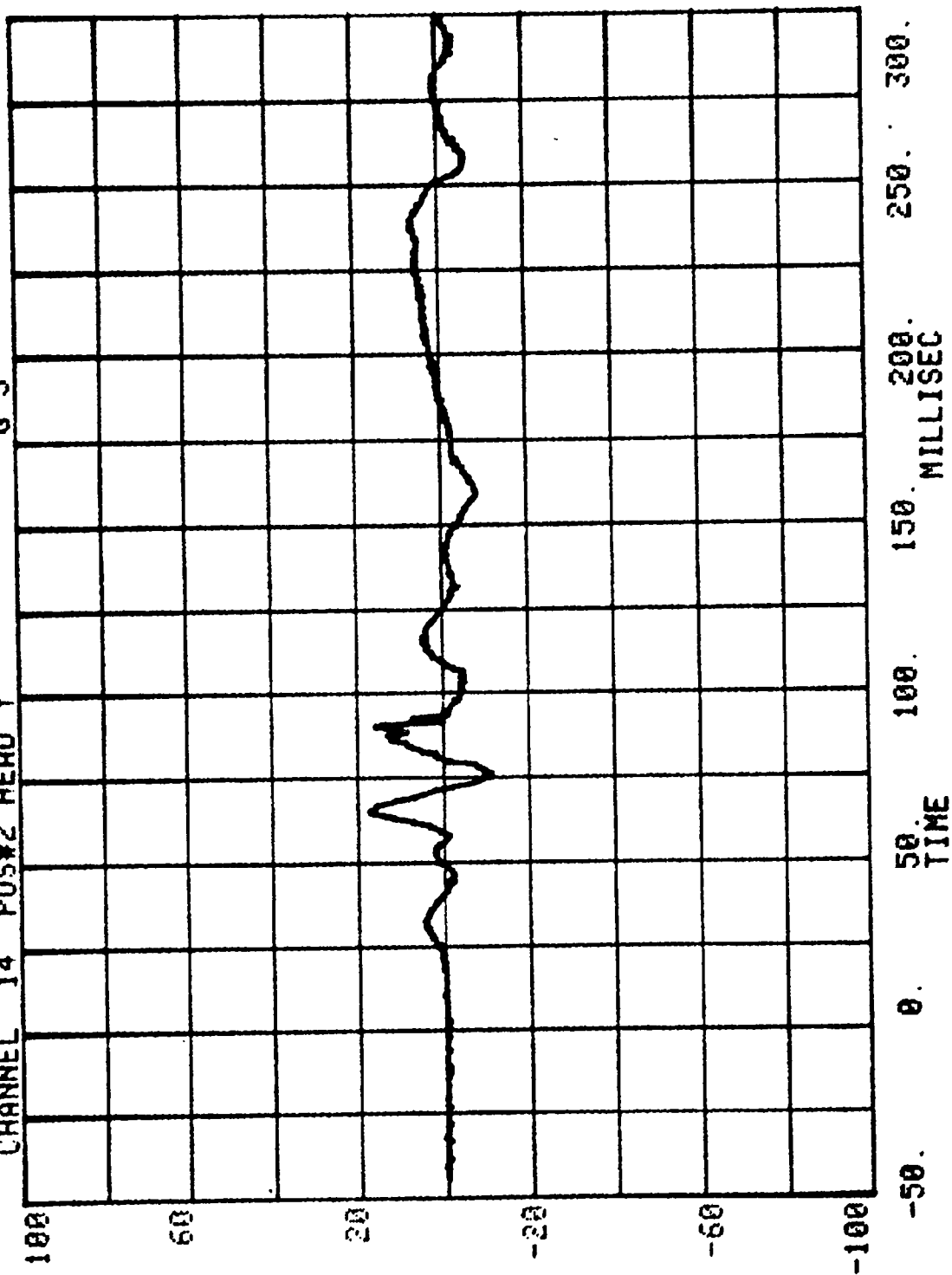
POS#2 HEAD R

HIC= 818.1 FROM T1= .06450 TO T2= .09990  
AVERAGE ACCELERATION BETWEEN T1 AND T2= 55.7G'S  
EVENT TIME= 300.0 MSEC  
SEVERITY INDEX=1070.2

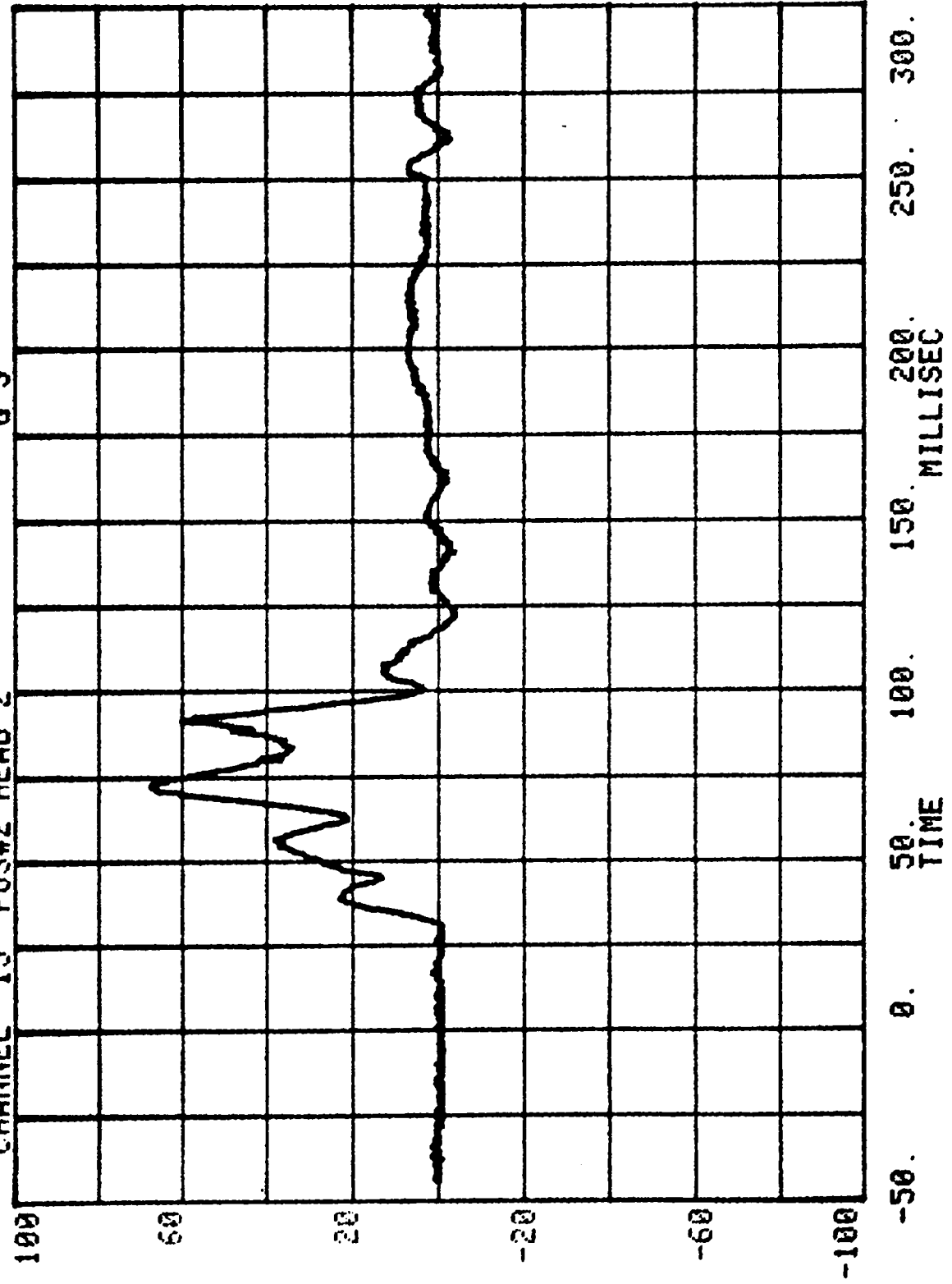
CHANNEL 13 POS#2 HEAD X  
RUN= 897 SERIES= 5801 G'S



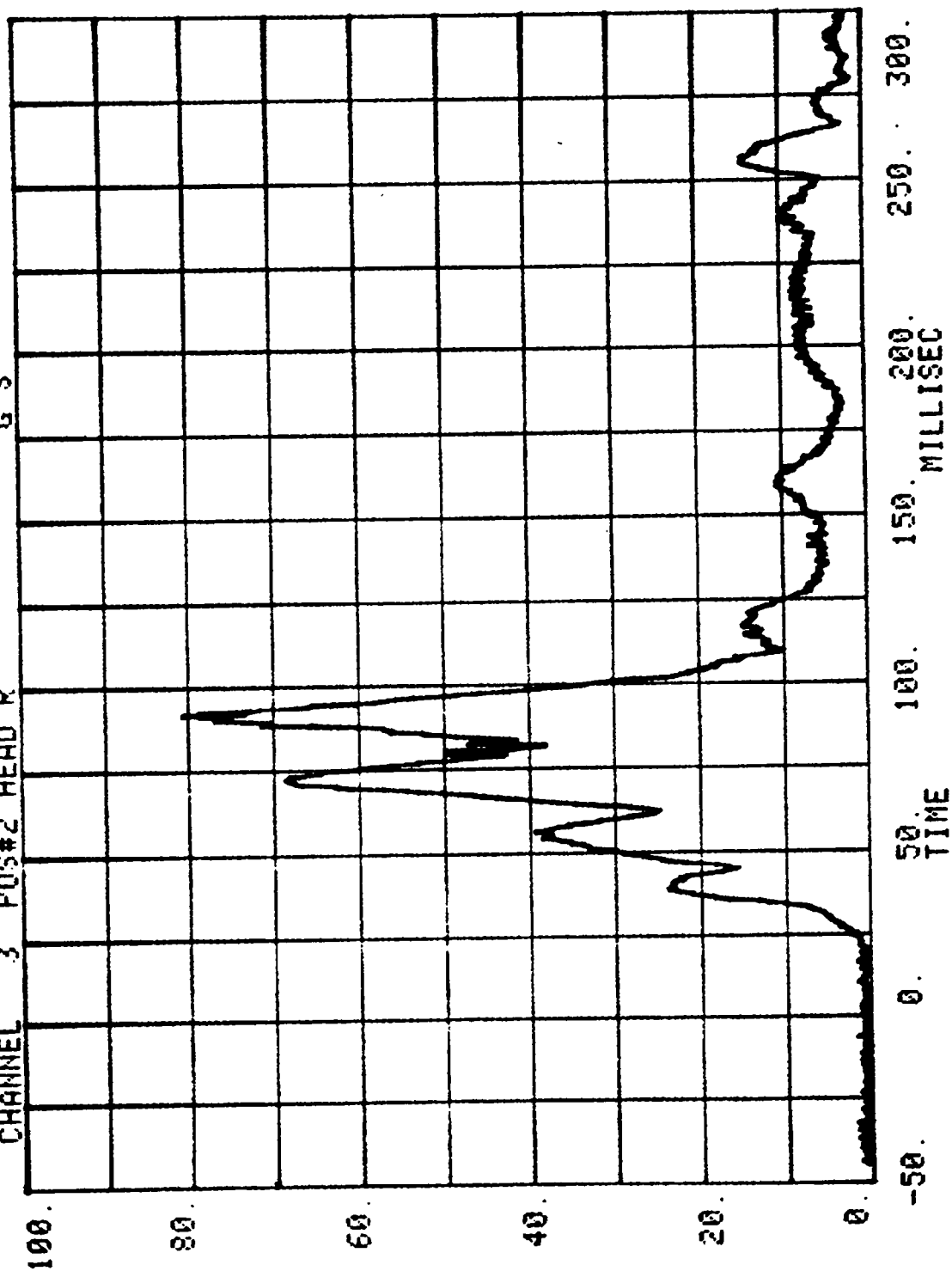
CHANNEL 14 POS#2 HEAD Y RUN= 897 SERIES= 5801 G'S



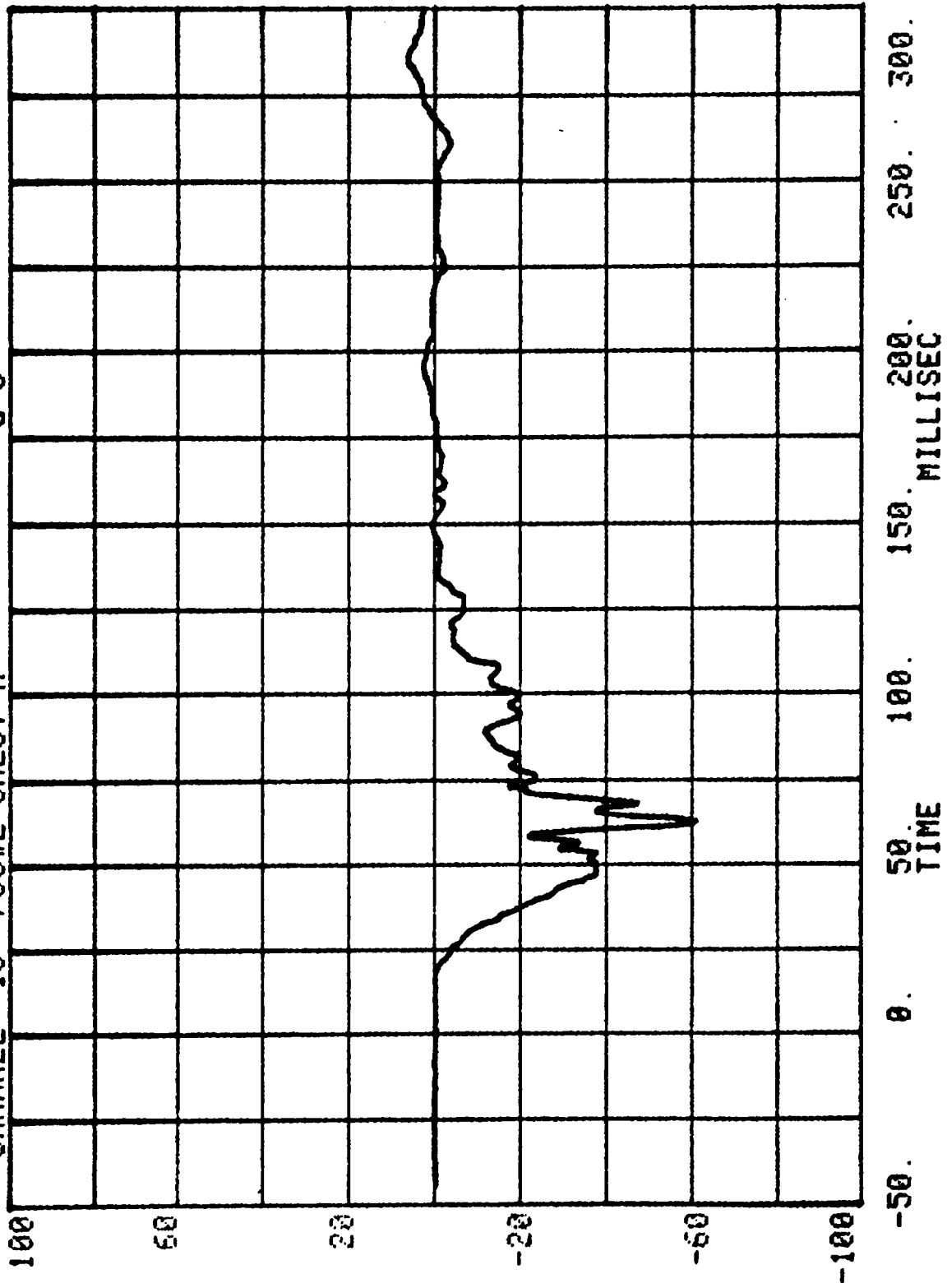
RUN= 897 SERIES= 5801 G'S  
CHANNEL 15 POS#2 HEAD 2



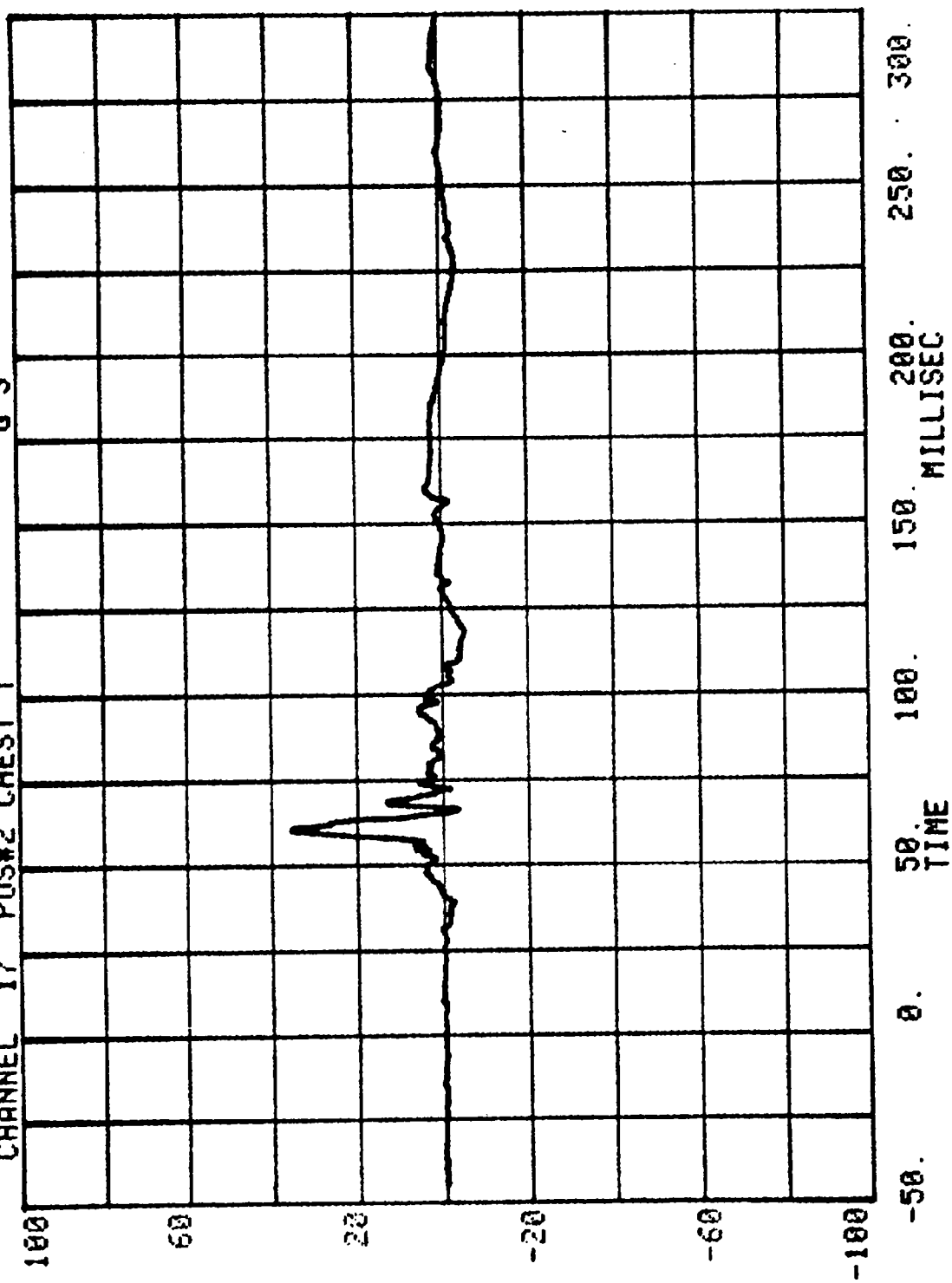
CHANNEL 3 POS#2 HEAD R RUN= 897 SERIES= 5801 G'S



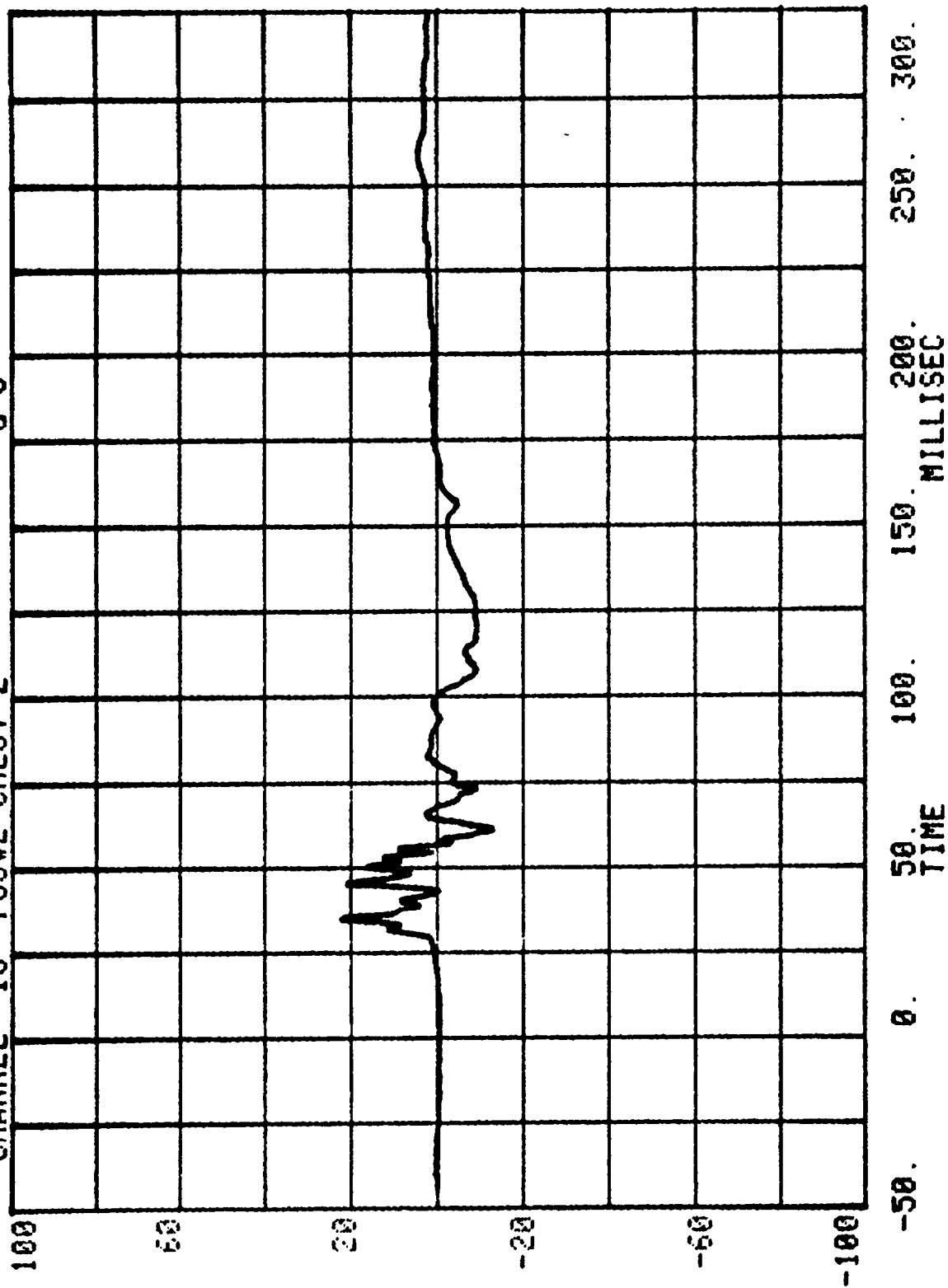
RUN= 897 SERIES= 5801 G'S  
CHANNEL 16 POS#2 CHEST X



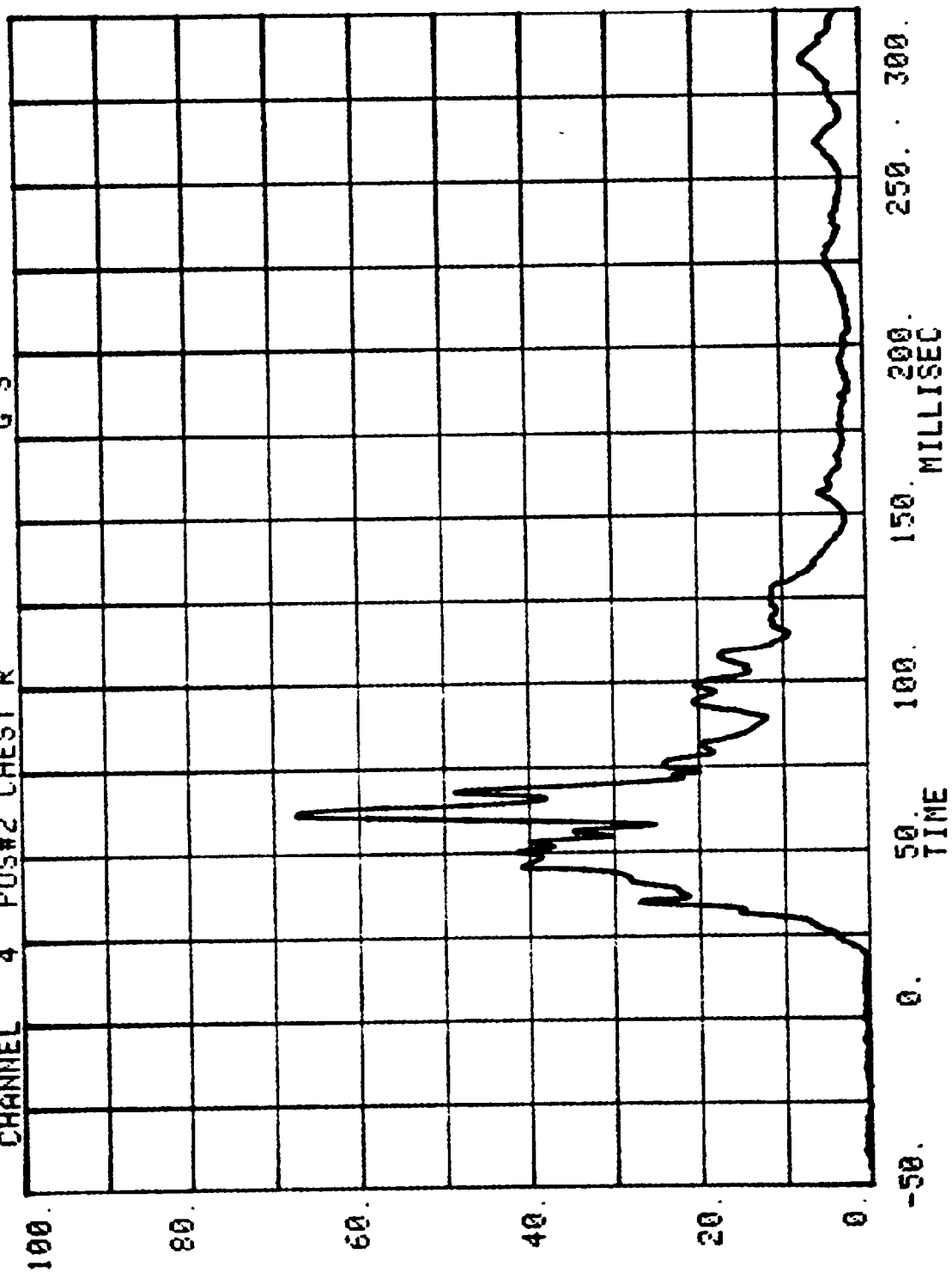
CHANNEL 17 RUN= 897 SERIES= 5801 G'S  
POS#2 CHEST Y



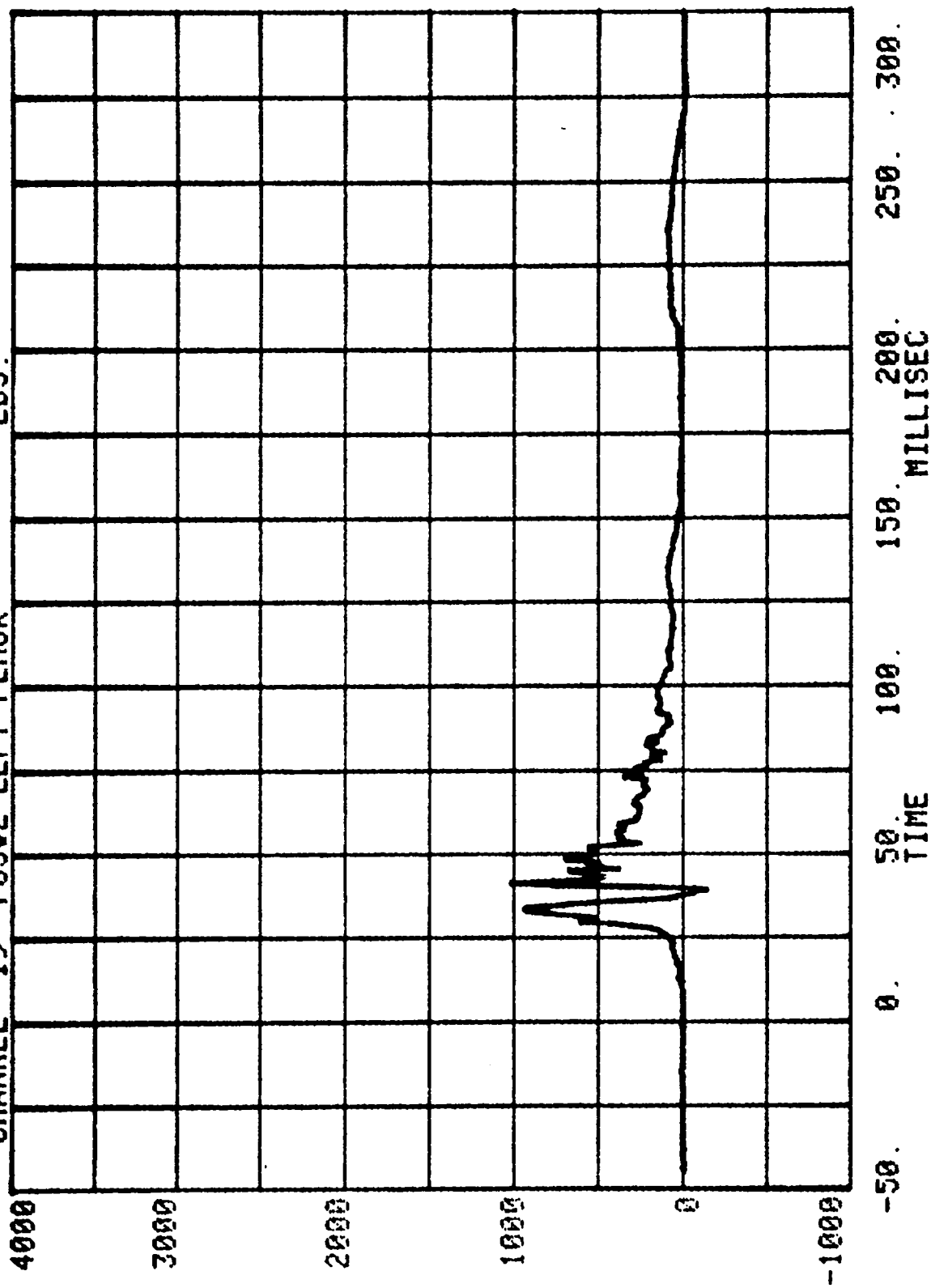
CHANNEL 18 POS#2 CHEST Z RUN= 897 SERIES= 5801 G'S



CHANNEL 4 POS#2 CHEST R RUN= 897 SERIES= 5801 G'S

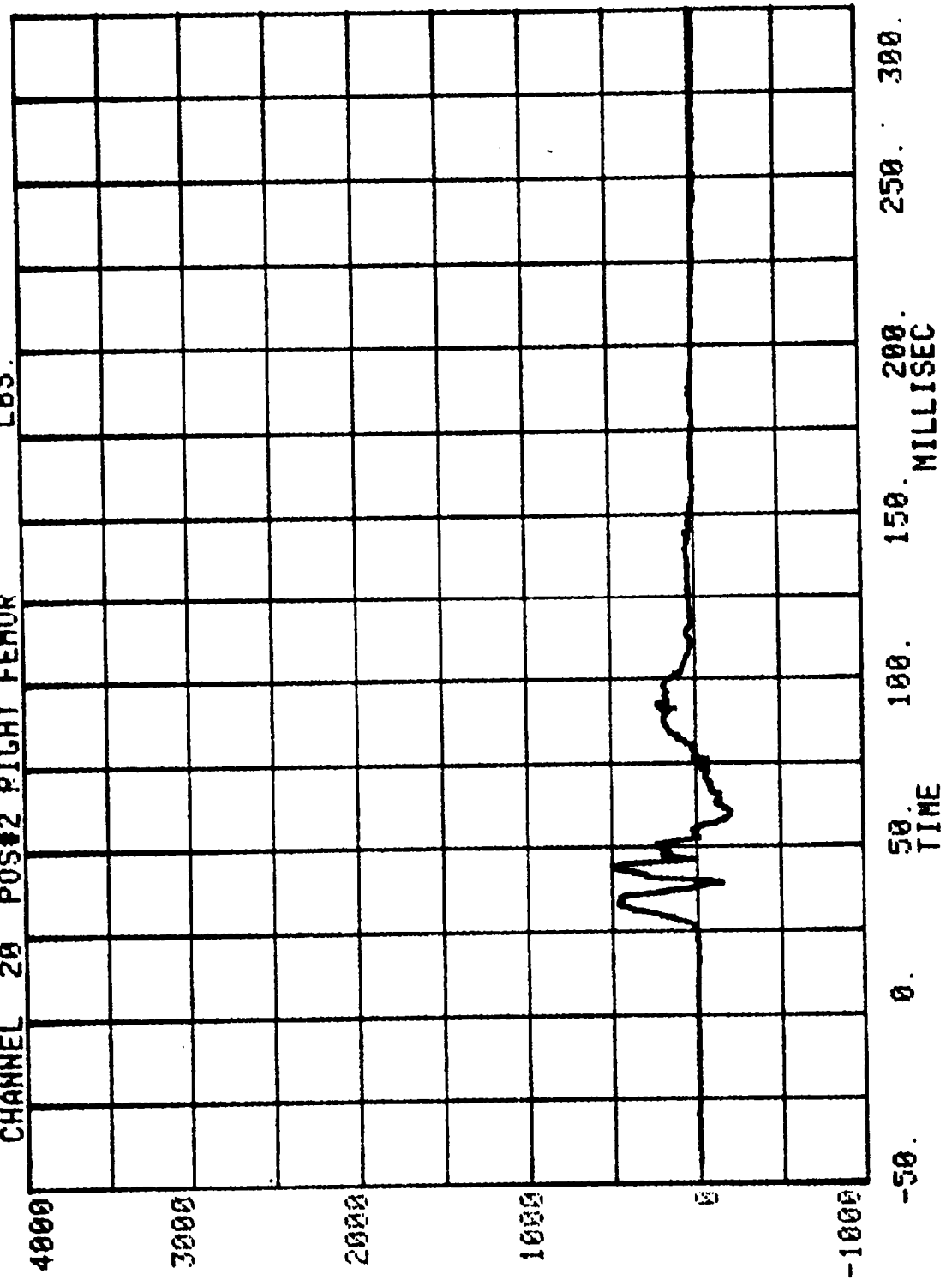


RUN= 897 SERIES= 5801 LBS.  
CHANNEL 19 POS#2 LEFT FEMUR

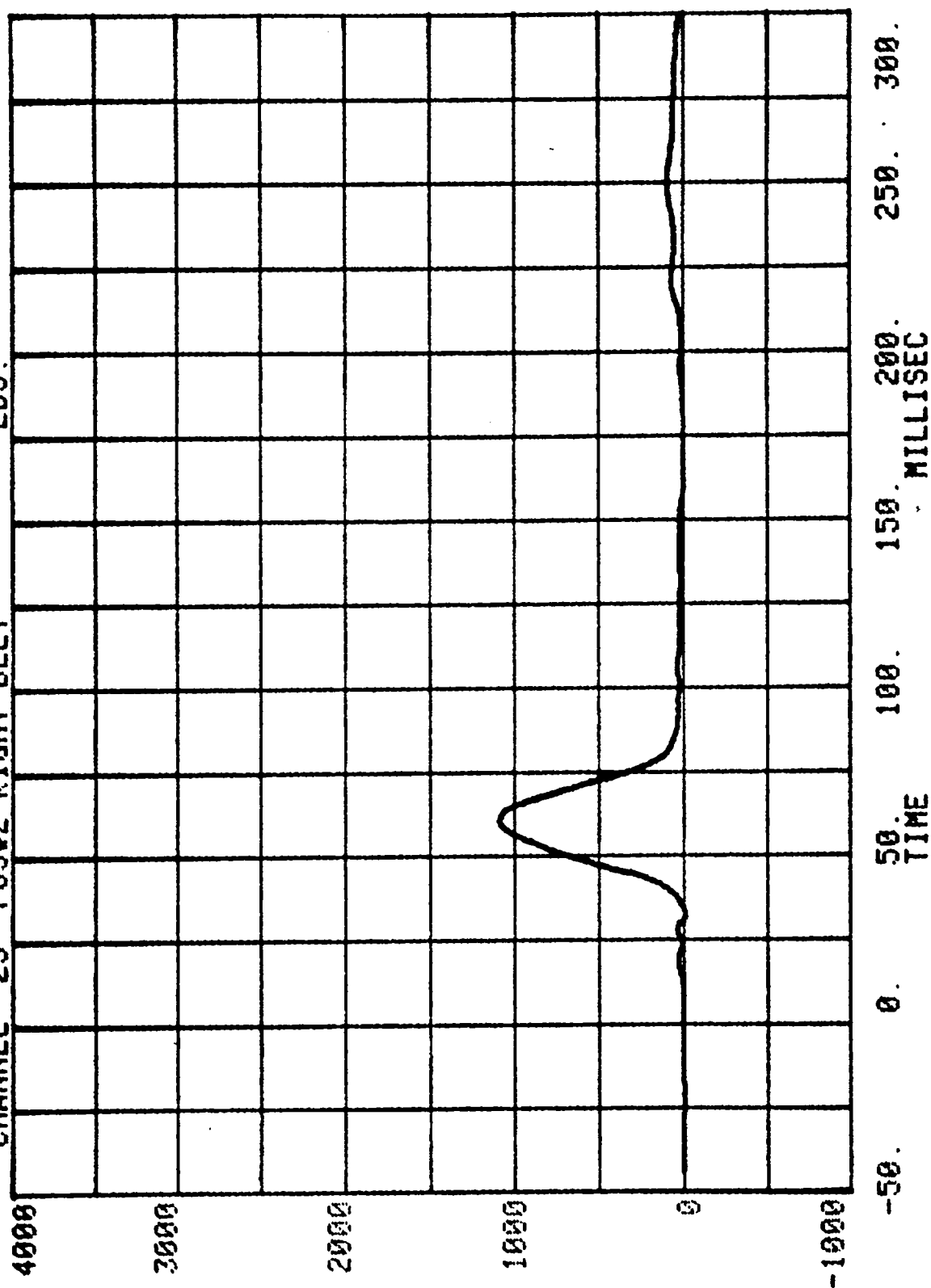


CHANNEL 20 POS#2 RIGHT FEMUR LBS.

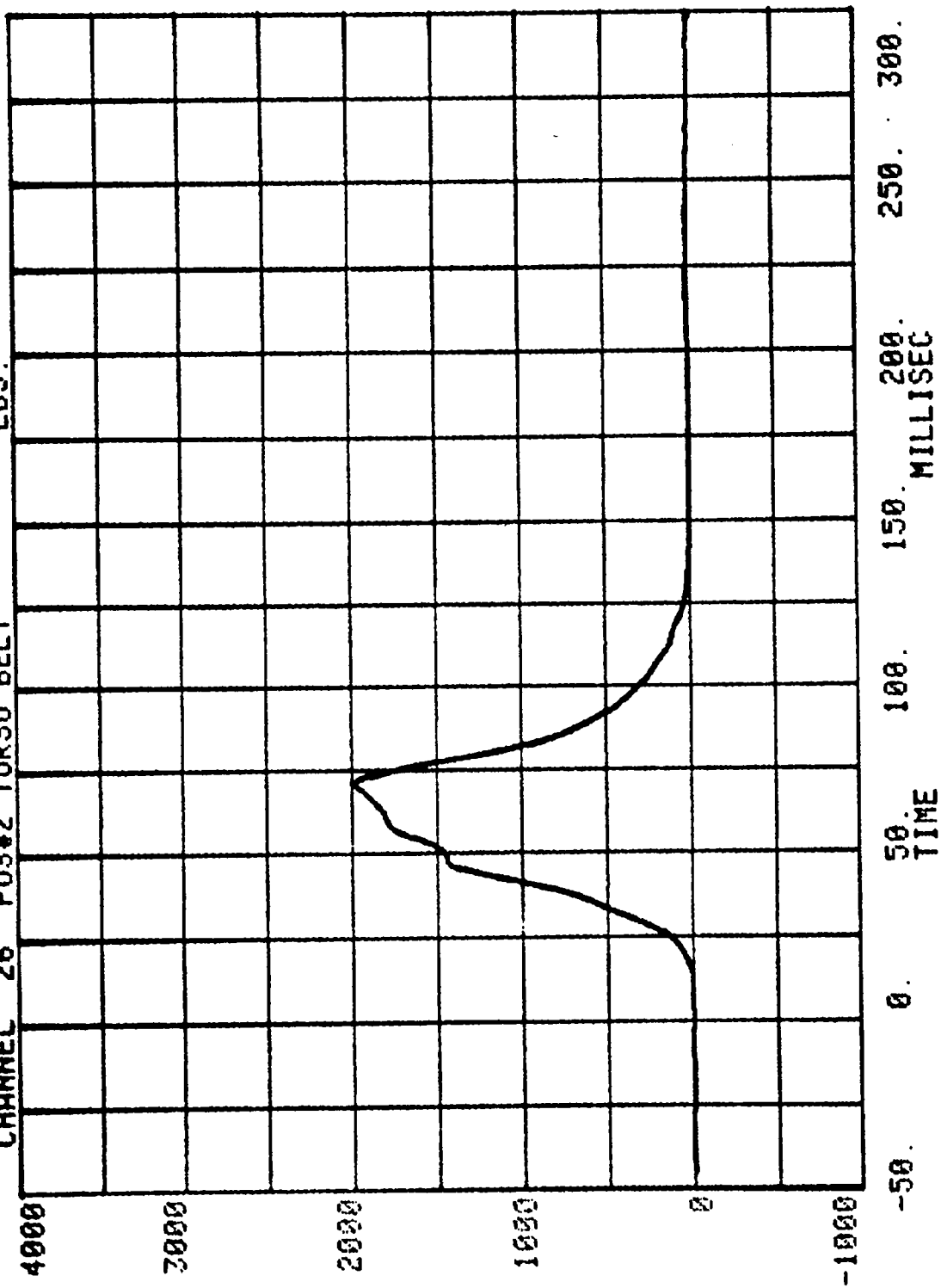
RUN= 897 SERIES= 5801



RUN= 897 SERIES= 5801 LBS.  
CHANNEL 25 POS#2 RIGHT BELT

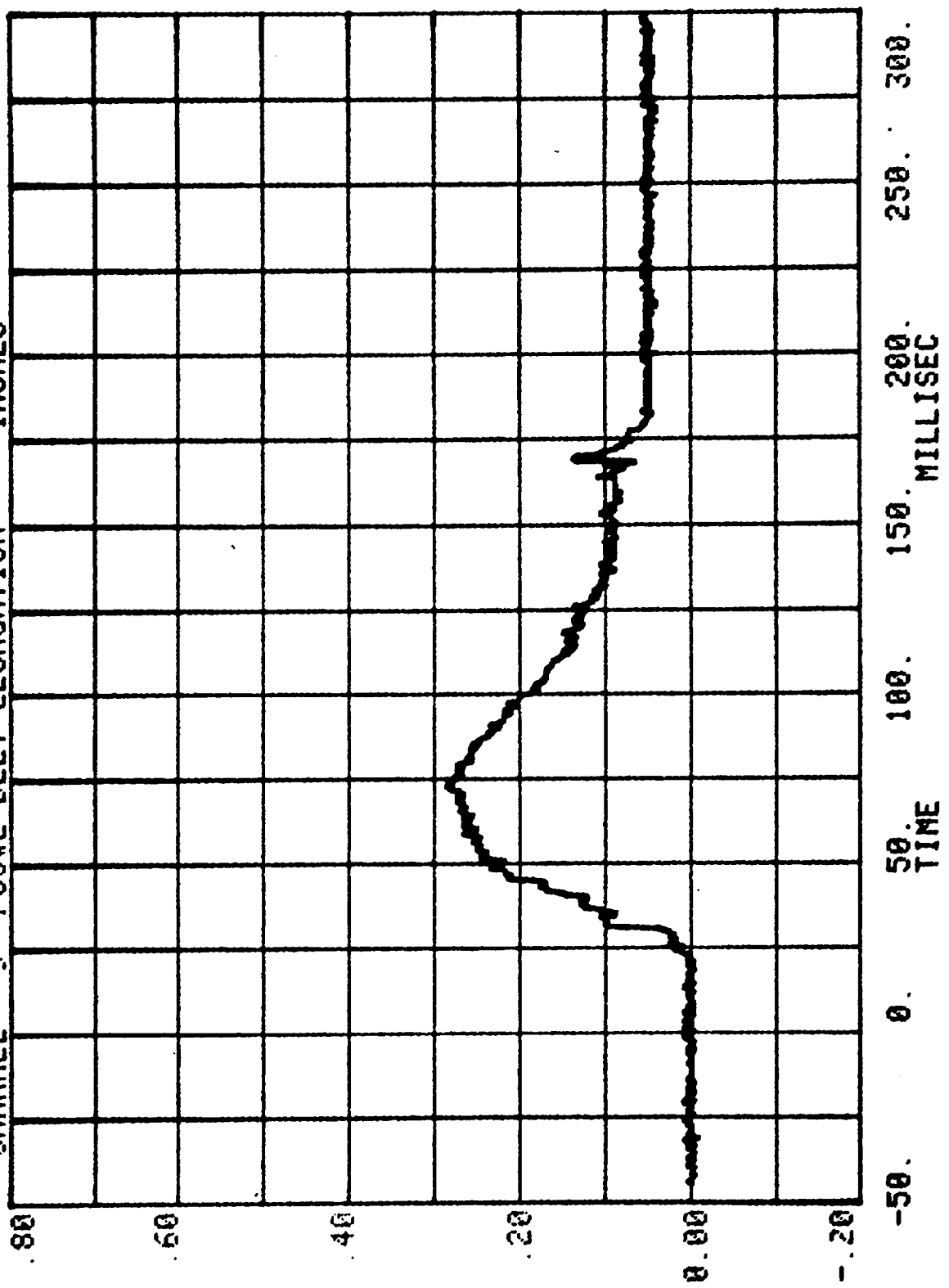


CHANNEL 26 POS#2 TORSO BELT  
RUN= 897 SERIES= 5801 LBS.

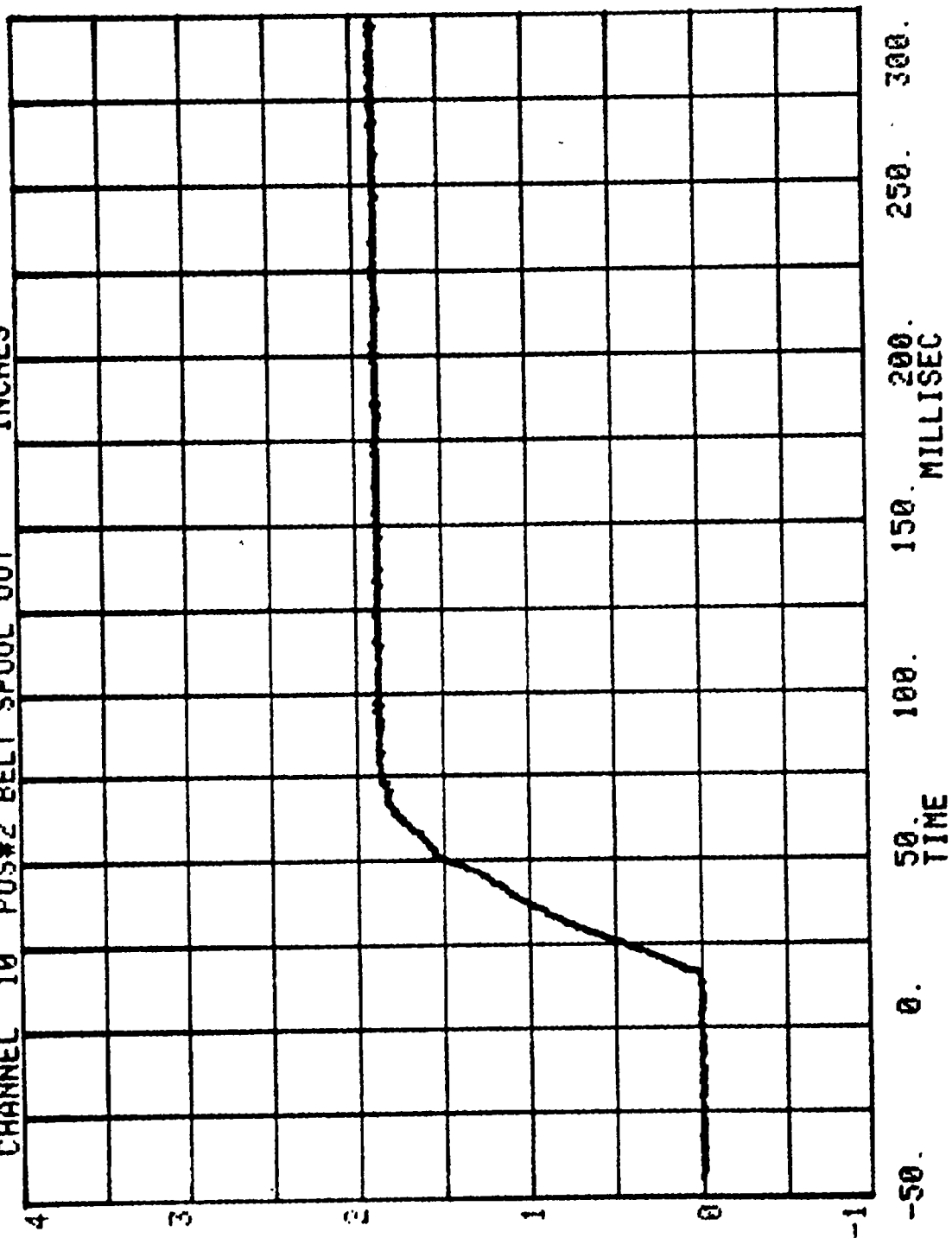


MEASURED OVER  
2.5 INCHES

RUN= 897    SERIES= 5801  
CHANNEL 9    POS#2 BELT ELONGATION    INCHES



CHANNEL 10 POS#2 BELT SPOOL OUT  
RUN= 897 SERIES= 5801 INCHES



**Appendix C**  
**DUMMY CERTIFICATION TESTS**

Appendix C contains the results from certification tests performed on the 50th percentile male anthropomorphic 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.

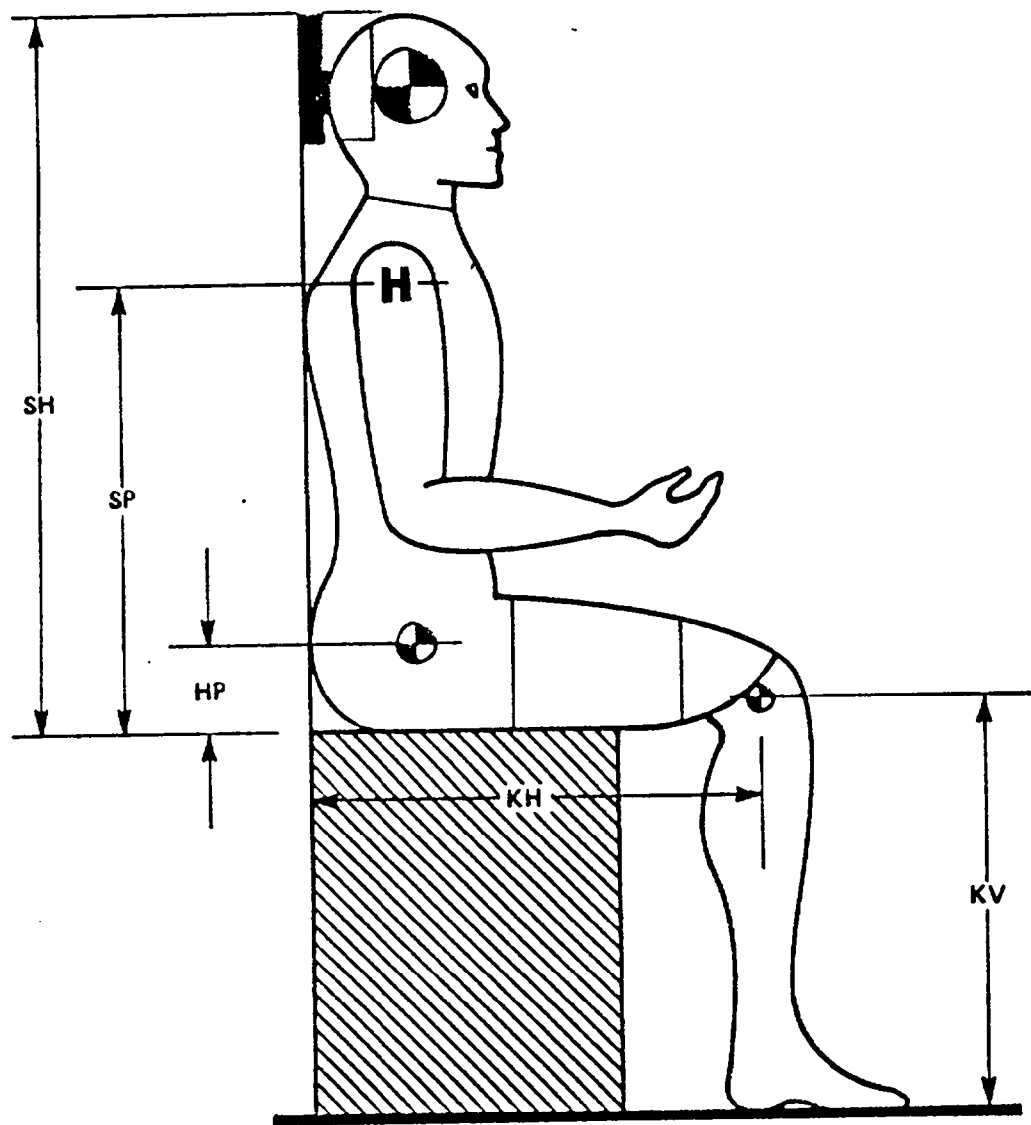
Dummy serial numbers and certification dates are:

| <u>Serial No.</u> | <u>Completion Date</u> |
|-------------------|------------------------|
| 1019              | 4/12/89                |
| 1020              | 4/12/89                |

#### 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.

Figure 10 DUMMY CONFIGURATION DIMENSIONS



# PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER.: 1019

## I. CONFIGURATION VERIFICATION DATA

|                                    | P. 572<br>SPECIFICATION | PRE-TEST<br>if required | POST-TEST<br>if required |
|------------------------------------|-------------------------|-------------------------|--------------------------|
| DATE OF CONFIGURATION VERIFICATION | XXXXXXXXXXXXXX          | 4-12-89                 |                          |
| VERIFICATION NUMBER FOR DUMMY (*)  | XXXXXXXXXXXXXX          | 3                       |                          |
| SH - Seated Height                 | 35.6 to 35.8"           | 35.8 "                  | "                        |
| 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"           | 20.4 "                  | "                        |
| KV - Knee Pivot from floor         | 19.3 to 19.9"           | 19.5 "                  | "                        |
| SW - Shoulder Width                | 17.8 to 18.4"           | 18.3 "                  | "                        |
| HW - Hip Width                     | 14.0 to 15.4"           | 14.9 "                  | "                        |

## II. PERFORMANCE VERIFICATION DATA:

|                                                |                | PRE-TEST<br>(if required) | POST-TEST<br>(if required) |
|------------------------------------------------|----------------|---------------------------|----------------------------|
| DATE OF PERFORMANCE VERIFICATION               |                | 4-12-89                   |                            |
| SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*)   |                | 3                         |                            |
| VERIFICATION LAB TEMPERATURE ( 66 to 78 deg. ) |                | 71 deg                    | deg                        |
| VERIFICATION LAB HUMIDITY (10 TO 70 %)         |                | 29-42 %                   | %                          |
| TEST PARAMETER                                 | SPECIFICATION  |                           |                            |
| 1. HEAD DROP TEST                              |                |                           |                            |
| a. peak resultant accel.                       | 210 to 260 G's | 250 G's                   | G's                        |
| b. peak lateral accel.                         | <= 10 G's      | 4 G's                     | G's                        |
| c. Time above 100 G's                          | 0.9 to 1.5 ms. | 1.2 ms                    | ms                         |

\* Sequential number beginning with "1" at the start of each fiscal years' crash test program.

TECHNICIAN'S NAME: IVAN MINKEWICZ

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## PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA...continued

## II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 1019

| TEST PARAMETER                         |        |  | SPECIFICATION     | PRE-TEST<br>(if required) | POST-TEST<br>(if required) |
|----------------------------------------|--------|--|-------------------|---------------------------|----------------------------|
| 2. NECK BENDING TEST                   |        |  |                   |                           |                            |
| a. Pendulum Speed                      |        |  | 21.5 to 25.5 fps. | 22.2 fps                  |                            |
| b. Pend. Avg. Decel. over<br>t3 to t2  |        |  | 20 to 24 G's      | 23.8 G's                  |                            |
| c. Peak Resultant Head<br>Acceleration |        |  | 26 G's max.       | 23.7 G's                  |                            |
| d. Pendulum Decel. (t2-t1)             |        |  | <= 3 ms.          | 1.9 ms                    |                            |
| e. Pendulum Decel. (t3-t2)             |        |  | 25 to 30 ms.      | 25.9 ms                   |                            |
| f. Pendulum Decel. (t4-t3)             |        |  | <= 10 ms.         | 4.1 ms                    |                            |
| g. Max. Head Rotation                  |        |  | 63 to 73 deg.     | 71 deg                    |                            |
| h. Chordal Displacement                |        |  |                   |                           |                            |
| HEAD ROTATION ANGLE                    |        |  |                   |                           |                            |
| 0 deg.                                 | Time   |  | -2 to 2 ms.       | 0.0 ms                    |                            |
|                                        | Displ. |  | -.5 to .5"        | 0.0 "                     |                            |
| 30 deg.                                | Time   |  | 25.6 to 34.4 ms.  | 26.9 ms                   |                            |
|                                        | Displ. |  | 2.1 to 3.1"       | 2.5 "                     |                            |
| 60 deg.                                | Time   |  | 40.3 to 51.7 ms.  | 41.1 ms                   |                            |
|                                        | Displ. |  | 4.3 to 5.3"       | 4.6 "                     |                            |
| Maximum                                | Time   |  | 53.2 to 66.8 ms.  | 53.9 ms                   |                            |
|                                        | Displ. |  | 5.0 to 6.0"       | 5.4 "                     |                            |
| 60 deg.                                | Time   |  | 67.0 to 83.0 ms.  | 72.2 ms                   |                            |
|                                        | Displ. |  | 4.3 to 5.3"       | 4.6 "                     |                            |
| 30 deg.                                | Time   |  | 85.4 to 104.6 ms. | 89 ms                     |                            |
|                                        | Displ. |  | 2.1 to 3.1"       | 2.4 "                     |                            |
| 0 deg.                                 | Time   |  | 101.0 - 123.0 ms. | 103.1 ms                  |                            |
|                                        | Displ. |  | -.5 to 0.5"       | 0.0 "                     |                            |

TECHNICIANS NAME: IVAN MINKEWICZ

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DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 1019

|                           |                  | PRE-TEST<br>(if required) | POST-TEST<br>(if required) |
|---------------------------|------------------|---------------------------|----------------------------|
| TEST PARAMETER            | SPECIFICATION    |                           |                            |
| 3. ABDOMINAL COMPRESSION  |                  |                           |                            |
| TEST: (preload = 50 lbs.) |                  |                           |                            |
| a. Force @ 0.5"           | 23 to 36 lbs.    | 27 lbs                    |                            |
| b. Force @ 0.75"          | 36 to 50 lbs.    | 43 lbs                    |                            |
| c. Force @ 1.0"           | 50 to 63 lbs.    | 59.5 lbs                  |                            |
| d. Force @ 1.3"           | 73 to 88 lbs.    | 82 lbs                    |                            |
| 4. LUMBAR FLEXION TEST:   |                  |                           |                            |
| a. Force @ 20 deg.        | 22 to 34 lbs.    | 28.5 lbs                  |                            |
| b. Force @ 30 deg.        | 34 to 46 lbs.    | 39.5 lbs                  |                            |
| c. Force @ 40 deg.        | 46 to 58 lbs.    | 54 lbs                    |                            |
| d. Return Angle           | 12 deg. maximum  | 12 deg                    |                            |
| 5. CHEST IMPACT TESTS:    |                  |                           |                            |
| A. High Speed             |                  |                           |                            |
| (1) Probe Speed           | 21.78-22.22 fps. | 21.8 fps                  |                            |
| (2) Peak Deflection       | 1.7" maximum     | 1.46 "                    |                            |
| (3) Peak Resistive Force  | 2250 lbs maximum | 2152 lbs                  |                            |
| (4) Internal Hysteresis   | 50 to 70%        | 55.5 %                    |                            |
| B. Low Speed              |                  |                           |                            |
| (1) Probe Speed           | 13.86-14.14 fps. | 14.0 fps                  |                            |
| (2) Peak Deflection       | 1.1" maximum     | .92 "                     |                            |
| (3) Peak Resistive Force  | 1450 lbs maximum | 1331 lbs                  |                            |
| (4) Internal Hysteresis   | 50 to 70%        | 63.9 %                    |                            |

TECHNICIAN'S NAME: IVAN MINKEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 1019

|                          |                  | PRE-TEST<br>(if required) | POST-TEST<br>(if required) |
|--------------------------|------------------|---------------------------|----------------------------|
| TEST PARAMETER           | SPECIFICATION    |                           |                            |
| 6. KNEE IMPACT TEST      |                  |                           |                            |
| A. Left Knee             |                  |                           |                            |
| (1) Probe Speed          | 6.76 to 7.04 fps | 6.9 fps                   |                            |
| (2) Maximum Force        | 1850 to 2500 lbs | 2380 lbs                  |                            |
| (3) Time above 1000 lbs. | 1.7 ms. minimum  | 1.7 ms                    |                            |
| B. Right Knee            |                  |                           |                            |
| (1) Probe Speed          | 6.76 to 7.04 fps | 6.8 fps                   |                            |
| (2) Maximum Force        | 1850 to 2500 lbs | 2005 lbs                  |                            |
| (3) Time Above 1000 lbs. | 1.7 ms. minimum  | 1.7 ms                    |                            |

REMARKS:

TECHNICIAN'S NAME: IVAN MINKEWICZ

# INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NUMBER 1019

| DUMMY INSTRUMENT--                           | MFG                 | SERIAL<br>NUMBER | DATE LAST<br>CALIBRATED | DATE OF NEXT<br>CALIBRATION |
|----------------------------------------------|---------------------|------------------|-------------------------|-----------------------------|
| 1. HEAD ACCELEROMETER--                      |                     |                  |                         |                             |
| HX LONGITUDINAL--                            | ENDEVCO             | CH83             | 3-89                    | 9-89                        |
| HY LATERAL--                                 | ENDEVCO             | CU62             | 3-89                    | 9-89                        |
| HZ VERTICAL--                                | ENDEVCO             | CM86             | 3-89                    | 9-89                        |
| 2. CHEST ACCELEROMETER-                      |                     |                  |                         |                             |
| CX LONGITUDINAL--                            | CEC                 | A143             | 2-89                    | 8-89                        |
| CY LATERAL--                                 | ENDEVCO             | CE18             | 2-89                    | 8-89                        |
| CZ VERTICAL--                                | CEC                 | A86              | 2-89                    | 8-89                        |
| 3. FEMUR LOAD CELLS                          |                     |                  |                         |                             |
| LEFT SIDE                                    | GSE                 | 80               | 12-88                   | 5-89                        |
| RIGHT SIDE                                   | GSE                 | 81               | 12-88                   | 5-89                        |
| CALIBRATION LABORATORY<br>INSTRUMENTS--      |                     |                  |                         |                             |
| 1. PENDULUM ACC.--                           | CEC                 | A144             | 3-89                    | 9-89                        |
| 2. TEST PROBE<br>ACCELEROMETER--             | CEC                 | A154             | 10-88                   | 4-89                        |
| 3. LUMBAR FLEXION TEST<br>PUSH FORCE GAUGE-- | TRANS-<br>DUCER INC | 20051            | 11-88                   | 5-89                        |
| 4. ABDOMINAL COMPRESS.<br>TEST FORCE GAUGE-- | BLH                 | 72952            | 11-88                   | 5-89                        |
| 5. ABDOMINAL COMPRESS.<br>TEST FORCE GAUGE-- | CIC                 | 567-11           | 11-88                   | 5-89                        |

NHTSA DUMMY I.D. NUMBER.: 1020

## I. CONFIGURATION VERIFICATION DATA

|                                    | P. 572<br>SPECIFICATION | PRE-TEST<br>if required | POST-TEST<br>if required |
|------------------------------------|-------------------------|-------------------------|--------------------------|
| DATE OF CONFIGURATION VERIFICATION | XXXXXXXXXXXXXX          | 4-12-89                 |                          |
| VERIFICATION NUMBER FOR DUMMY (*)  | XXXXXXXXXXXXXX          | 3                       |                          |
| 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"           | 20.4 "                  | "                        |
| KV - Knee Pivot from floor         | 19.3 to 19.9"           | 19.8 "                  | "                        |
| SW - Shoulder Width                | 17.8 to 18.4"           | 18.1 "                  | "                        |
| HW - Hip Width                     | 14.0 to 15.4"           | 14.8 "                  | "                        |

## II. PERFORMANCE VERIFICATION DATA:

|                                                |                | PRE-TEST<br>(if required) | POST-TEST<br>(if required) |
|------------------------------------------------|----------------|---------------------------|----------------------------|
| DATE OF PERFORMANCE VERIFICATION               |                | 4-12-89                   |                            |
| SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*)   |                | 3                         |                            |
| VERIFICATION LAB TEMPERATURE ( 66 to 78 deg. ) |                | 71 deg                    | deg                        |
| VERIFICATION LAB HUMIDITY (10 TO 70 %)         |                | 29-42 %                   | %                          |
| TEST PARAMETER                                 | SPECIFICATION  |                           |                            |
| 1. HEAD DROP TEST                              |                |                           |                            |
| a. peak resultant accel.                       | 210 to 260 G's | 253 G's                   | G's                        |
| b. peak lateral accel.                         | <= 10 G's      | 4.2 G's                   | G's                        |
| c. Time above 100 G's                          | 0.9 to 1.5 ms. | 1.1 ms                    | ms                         |

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

TECHNICIAN'S NAME: IVAN MINKEWICZ

## PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA...continued

## II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 1020

| TEST PARAMETER                         |        | SPECIFICATION     | PRE-TEST<br>(if required) | POST-TEST<br>(if required) |
|----------------------------------------|--------|-------------------|---------------------------|----------------------------|
| 2. NECK BENDING TEST                   |        |                   |                           |                            |
| a. Pendulum Speed                      |        | 21.5 to 25.5 fps. | 22.1 fps                  |                            |
| b. Pend. Avg. Decel. over<br>t3 to t2  |        | 20 to 24 G's      | 23.9 G's                  |                            |
| c. Peak Resultant Head<br>Acceleration |        | 26 G's max.       | 25 G's                    |                            |
| d. Pendulum Decel. (t2-t1)             |        | <= 3 ms.          | 1.9 ms                    |                            |
| e. Pendulum Decel. (t3-t2)             |        | 25 to 30 ms.      | 26 ms                     |                            |
| f. Pendulum Decel. (t4-t3)             |        | <= 10 ms.         | 3.4 ms                    |                            |
| g. Max. Head Rotation                  |        | 63 to 73 deg.     | 70 deg                    |                            |
| h. Chordal Displacement                |        |                   |                           |                            |
| HEAD ROTATION ANGLE                    |        |                   |                           |                            |
| 0 deg.                                 | Time   | -2 to 2 ms.       | 0.0 ms                    |                            |
|                                        | Displ. | -.5 to .5"        | 0.0 "                     |                            |
| 30 deg.                                | Time   | 25.6 to 34.4 ms.  | 27.7 ms                   |                            |
|                                        | Displ. | 2.1 to 3.1"       | 2.5 "                     |                            |
| 60 deg.                                | Time   | 40.3 to 51.7 ms.  | 42.1 ms                   |                            |
|                                        | Displ. | 4.3 to 5.3"       | 4.65 "                    |                            |
| Maximum                                | Time   | 53.2 to 66.8 ms.  | 53.8 ms                   |                            |
|                                        | Displ. | 5.0 to 6.0"       | 5.45 "                    |                            |
| 60 deg.                                | Time   | 67.0 to 83.0 ms.  | 73.5 ms                   |                            |
|                                        | Displ. | 4.3 to 5.3"       | 4.65 "                    |                            |
| 30 deg.                                | Time   | 85.4 to 104.6 ms. | 89.9 ms                   |                            |
|                                        | Displ. | 2.1 to 3.1"       | 2.35 "                    |                            |
| 0 deg.                                 | Time   | 101.0 - 123.0 ms. | 104 ms                    |                            |
|                                        | Displ. | -.5 to 0.5"       | 0.0 "                     |                            |

TECHNICIANS NAME: IVAN MINKEWICZ

## II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 1020

|                           |                  | PRE-TEST<br>(if required) | POST-TEST<br>(if required) |
|---------------------------|------------------|---------------------------|----------------------------|
| TEST PARAMETER            | SPECIFICATION    |                           |                            |
| 3. ABDOMINAL COMPRESSION  |                  |                           |                            |
| TEST: (preload = 50 lbs.) |                  |                           |                            |
| a. Force @ 0.5"           | 23 to 36 lbs.    | 25 lbs                    |                            |
| b. Force @ 0.75"          | 36 to 50 lbs.    | 37.5 lbs                  |                            |
| c. Force @ 1.0"           | 50 to 63 lbs.    | 52 lbs                    |                            |
| d. Force @ 1.3"           | 73 to 88 lbs.    | 75 lbs                    |                            |
| 4. LUMBAR FLEXION TEST:   |                  |                           |                            |
| a. Force @ 20 deg.        | 22 to 34 lbs.    | 28 lbs                    |                            |
| b. Force @ 30 deg.        | 34 to 46 lbs.    | 36 lbs                    |                            |
| c. Force @ 40 deg.        | 46 to 58 lbs.    | 47.5 lbs                  |                            |
| d. Return Angle           | 12 deg. maximum  | 10 deg                    |                            |
| 5. CHEST IMPACT TESTS:    |                  |                           |                            |
| A. High Speed             |                  |                           |                            |
| (1) Probe Speed           | 21.78-22.22 fps. | 21.8 fps                  |                            |
| (2) Peak Deflection       | 1.7" maximum     | 1.64 "                    |                            |
| (3) Peak Resistive Force  | 2250 lbs maximum | 2048 lbs                  |                            |
| (4) Internal Hysteresis   | 50 to 70%        | 53.6 %                    |                            |
| B. Low Speed              |                  |                           |                            |
| (1) Probe Speed           | 13.86-14.14 fps. | 13.9 fps                  |                            |
| (2) Peak Deflection       | 1.1" maximum     | 1.1 "                     |                            |
| (3) Peak Resistive Force  | 1450 lbs maximum | 1216 lbs                  |                            |
| (4) Internal Hysteresis   | 50 to 70%        | 50.4 %                    |                            |

TECHNICIAN'S NAME: IVAN MINKEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 1020

|                          |                  | PRE-TEST<br>(if required) | POST-TEST<br>(if required) |
|--------------------------|------------------|---------------------------|----------------------------|
| TEST PARAMETER           | SPECIFICATION    |                           |                            |
| 6. KNEE IMPACT TEST      |                  |                           |                            |
| A. Left Knee             |                  |                           |                            |
| (1) Probe Speed          | 6.76 to 7.04 fps | 6.9 fps                   |                            |
| (2) Maximum Force        | 1850 to 2500 lbs | 2335 lbs                  |                            |
| (3) Time above 1000 lbs. | 1.7 ms. minimum  | 1.75 ms                   |                            |
| B. Right Knee            |                  |                           |                            |
| (1) Probe Speed          | 6.76 to 7.04 fps | 6.9 fps                   |                            |
| (2) Maximum Force        | 1850 to 2500 lbs | 2205 lbs                  |                            |
| (3) Time Above 1000 lbs. | 1.7 ms. minimum  | 1.75 ms                   |                            |

REMARKS:

TECHNICIAN'S NAME: IVAN MINKEWICZ

# INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NUMBER 1020

| DUMMY INSTRUMENT--                           | MFG                 | SERIAL<br>NUMBER | DATE LAST<br>CALIBRATED | DATE OF NEXT<br>CALIBRATION |
|----------------------------------------------|---------------------|------------------|-------------------------|-----------------------------|
| 1. HEAD ACCELEROMETER--                      |                     |                  |                         |                             |
| HX LONGITUDINAL--                            | ENDEVCO             | CL60             | 10-88                   | 4-89                        |
| HY LATERAL--                                 | ENDEVCO             | FK57             | 10-88                   | 4-89                        |
| HZ VERTICAL--                                | ENDEVCO             | FL03             | 10-88                   | 4-89                        |
| 2. CHEST ACCELEROMETER--                     |                     |                  |                         |                             |
| CX LONGITUDINAL--                            | CEC                 | A129             | 2-89                    | 8-89                        |
| CY LATERAL--                                 | ENDEVCO             | CN64             | 2-89                    | 8-89                        |
| CZ VERTICAL--                                | CEC                 | A56              | 2-89                    | 8-89                        |
| 3. FEMUR LOAD CELLS                          |                     |                  |                         |                             |
| LEFT SIDE                                    | GSE                 | 1707             | 12-88                   | 5-89                        |
| RIGHT SIDE                                   | GSE                 | 1926             | 12-88                   | 5-89                        |
| CALIBRATION LABORATORY<br>INSTRUMENTS--      |                     |                  |                         |                             |
| 1. PENDULUM ACC.---                          | CEC                 | A144             | 3-89                    | 9-89                        |
| 2. TEST PROBE<br>ACCELEROMETER--             | CEC                 | A154             | 10-88                   | 4-89                        |
| 3. LUMBAR FLEXION TEST<br>PUSH FORCE GAUGE-- | TRANS-<br>DUCER INC | 20051            | 11-88                   | 5-89                        |
| 4. ABDOMINAL COMPRESS.<br>TEST FORCE GAUGE-- | BLH                 | 72952            | 11-88                   | 5-89                        |
| 5. ABDOMINAL COMPRESS.<br>TEST FORCE GAUGE-- | CIC                 | 567-11           | 11-88                   | 5-89                        |

APPENDIX D

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

## CONTROLS AND EQUIPMENT

### SAFETY BELTS

#### WARNING

Safety belts have been shown to be the single most effective means available for reducing the potential for serious injury and death in automobile accidents. Therefore for your own protection as well as that of your passengers always properly wear safety belts when the vehicle is in motion. Also, pregnant women should always use safety belts.

In order to provide the maximum level of protection safety belts must be properly positioned on the body. Improperly positioned safety belts can cause serious personal injury in case of an accident. Therefore read and always observe all of the following instructions and warnings pertaining to the use of safety belts installed in your vehicle.

- When fastening the lap/shoulder belt, the shoulder belt should be positioned midway over the shoulder — It must never rest against the neck. See illustration on page 14.

- The combination lap/shoulder belt on the front seats can be adjusted to fit comfortably — see page 14.

- Do not use comfort clips or devices which create slack in the shoulder belt portion and can increase the risk of injury in an accident. However, such clips may be required in the proper use of some child restraint systems.

- 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 pelvis. 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 risk 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 and reduce the overall effectiveness of the system.

- 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.

- Belts must not rub against sharp objects.

- Do not allow safety belts to become damaged by becoming caught in door or seat hardware.

- Inspect your belts periodically. If belts show damage to webbing, bindings, buckles or retractors, they must be replaced.

## CONTROLS AND EQUIPMENT

#### WARNING continued

- 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 52).

- Never bleach or dye safety belts.

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

#### Child Safety

##### WARNING

All vehicle occupants and especially children should be restrained whenever riding in cars. Holding a child in your arms is not a substitute for a child restraint system. In an accident, a child held in a person's arms can be struck or crushed by any unrestrained rider. An unrestrained child could also be injured by striking the interior, or by being ejected from the vehicle during a sudden maneuver or impact. Do not allow children to stand or kneel

on the seat. A child restraint system can help protect a child in a car.

Accident statistics have shown that children are generally safer in the rear seat area than in the front seating positions.

A suitable child restraint properly installed and used in one of the rear seating positions provides the highest degree of protection for infants and small children in most accident situations.

Commercially available child seats complying with U.S. Federal Standard FMVSS 213 (or in Canada CMVSS 213) are required to be capable of being installed with a lap belt or with the lap belt portion of a combination lap-shoulder belt.

Because improperly or inadequately installed child restraint systems can increase the risk of injury to children in accidents, always carefully read and follow all instructions on installation and use that come with the system.

Children must be positioned so that the shoulder belt does not contact or remain in front of the face, chin, neck or throat. Failure to follow this precaution can increase the risk or severity of injury in the event of a collision.

In summary:

Children who are less than 12 years old should sit in the rear.

For reasons of safety, a child should only occupy the front seat if all of the rear seating positions are already occupied by other children.

The children 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.

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

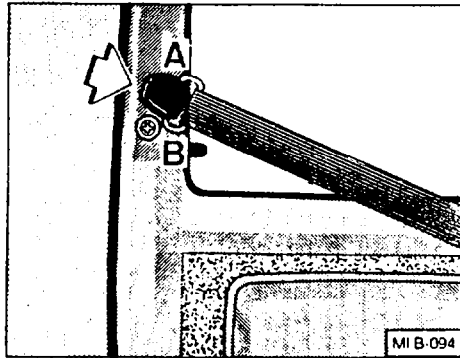
- If the child is big enough to wear a combination lap/shoulder belt, make sure that the shoulder belt is positioned midway over the shoulder — never across the neck of the child. See illustration on next page.

## Belt Warning System

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

Every time the ignition is turned on, the safety belt 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.

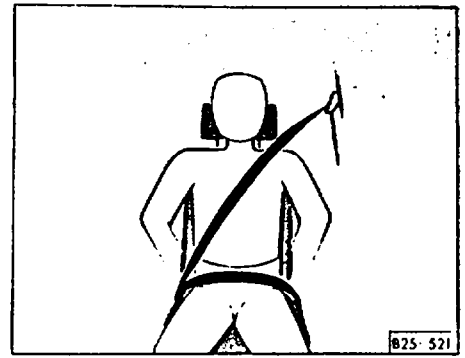
**Always heed warnings on pages 12-13.**



## Adjusting the Shoulder Seatbelt

There are two fastening points on the center pillar for the front safety belts to accommodate the height of the driver and the front passenger. On your vehicle, the belts are attached at the upper point (A).

- To lower the belt, remove cap at belt anchor (arrow) and remove hexagon bolt.
- Remove plug and washer at point (B).
- Place belt at lower point and fasten with hexagon bolt.
- Tighten bolt and replace cap.
- Install plug and washer at point (A).



## Lap-Shoulder Belt

The combination lap-shoulder belt is equipped with a locking retractor. The system adjusts automatically to your size and movements as long as the pull on the belt is slow.

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 pelvis.
- The shoulder belt must be positioned midway over the shoulder — **it must never rest against the neck.** See illustration.
- Belts should fit snugly across the pelvis and chest. **Make sure any slack is wound up on the retractor.**
- Adjust height of belt anchorage is necessary. 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.

**Always heed WARNINGS on page 12-13.**

- 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.

## WARNING

**To reduce the risk of injury in an accident, position the lap belt as low as possible on the pelvis.**

## During Pregnancy

Pregnant women should always wear safety belts. The lap belt must be worn snugly and as low as possible across the pelvis. To avoid pressure on the abdomen the belt must never pass over the waist.