

DOT 1103

CAL REPORT NO. 7621-1

OPTIONAL NEW CAR ASSESSMENT PROGRAM (OPTIONAL NCAP)

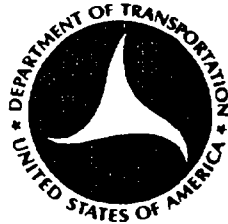
FRONTAL BARRIER IMPACT TEST

1988 FORD TAURUS 4-DOOR SEDAN

TEST NO. 294-010-798

NOVEMBER 17, 1987

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



FINAL REPORT OF OPTIONAL RETEST

Sponsored by:

FORD MOTOR COMPANY  
and  
CONDUCTED UNDER THE AUSPICES OF

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, D.C. 20590

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Prepared: Michael J. Kilgallon  
Michael J. Kilgallon, Test Engineer

Approved: Walter E. Levan  
Walter E. Levan, Program Manager  
Transportation Research/  
Physical Sciences Department

Reviewed: Larry L. Fikes  
Ford Motor Company

FINAL REPORT ACCEPTED BY:

A. D. Swarler  
Manager, Optional New Car Assessment Program (Optional NCAP)

\_\_\_\_\_  
Date of Report Acceptance

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16. Abstract  A frontal load cell Barrier test of a 1988 Ford Taurus 4-Door Sedan was performed at the Calspan Corporation, Advanced Technology Center crash test facility in Buffalo, New York on November 17, 1987.  Impact speed was 35.1 mph and the ambient temperature at the barrier face at the time of impact was 62° F. The maximum post-test vehicle crush was 20.6 inches.  With regard to FMVSS No. 208 "Occupant Crash Protection," injury criteria, the driver and passenger dummies appear to satisfy the head, chest and femur requirements.					
17. Key Words 35 mph Frontal Barrier Impact Test Optional New Car Assessment Program (Optional NCAP)			18. Distribution Statement <u>Copies of this report are available from:</u> Technical Reference Division National Highway Traffic Safety Admin. Nassif Building, Room 5108 400 Seventh St., S.W., Washington, DC 20590		
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Section 1  
PURPOSE AND TEST PROCEDURE

This 35-mph frontal barrier impact test was conducted as part of the Optional New Car Assessment Program (Optional NCAP). The program provides manufacturers with an opportunity to retest any of their vehicles that have been tested in the New Car Assessment Program (NCAP) and subsequently modified with production changes to improve occupant protection. These Optional NCAP test results will be published by NHTSA in a regular NCAP press release.

This Optional NCAP test was conducted in accordance with the current "Laboratory Indicant Test Procedures for the New Car Assessment Program" prepared by the Office of Market Incentives.

Section 2  
SUMMARY OF TEST

A load cell barrier consisting of 36 load cells was impacted by a 1988 Ford Taurus 4-Door Sedan at a velocity of 35.1 mph. The test was performed at the Calspan Corporation Advanced Technology Center on November 17, 1987. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

Both ATDs were fully instrumented with head and chest triaxial accelerometers and right/left femur load cells. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver ATD (Serial No. 320) and the right-front passenger ATD (Serial No. 749) had been certified prior to the test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 31 channels of data were recorded in six 14-channel FM tape recorders. Appendix B contains the vehicle and dummy response data traces. All load cell barrier data was lost because the power was accidentally disconnected prior to impact. The data for position #1 left femur and position #2 belt elongation is questionable.

The driver's head struck the sunvisor, steering wheel rim and hub; the HIC was 707.4. The maximum chest deceleration over 3 milliseconds was 38 g's and the right femur load was 775 pounds.

The right-front passenger HIC was 358.9 and maximum chest deceleration over 3 milliseconds was 47 g's. Femur loads were 438 and 455 pounds.

**Table 1**

**GENERAL TEST AND VEHICLE DATA**

**VEHICLE YEAR/MAKE/MODEL/BODY STYLE:** 1988 Ford Taurus 4-Dr. Sedan

**NHTSA NO.:** N/A                      **VIN.:** 1FABP50V1JA114987

**BODY COLOR:** Lt. Blue                      **DATE OF MANUFACTURE:** 9-87

**Engine:** 6 cylinders; - C.I.D.; 3 Liters; - CC  
X Gas; - Diesel; - Turbocharged  
- Longitudinal; X Transverse

**Transmission:** 4 Speed - Manual; X Automatic; X Overdrive  
**Final Drive:** X Front Wheel; - Rear Wheel; - Four Wheel

**Date Received:** 10/30/87                      **Odometer Reading:** 41  
X A/C; X P/S; X P/B; - P/wdo.; - Tilt Wheel  
- P/seats; - Cruise Control

**Type of Occupant Restraint:** 3 point continuous belt system

**DATA RECORDED FROM VEHICLE'S TIRE PLACARD:**

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

**Recommended Tire Size:** P205/75R14 - P205/65R/15

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

**Tires on Vehicle:** P205-75R14 ; **Manufacturer:** Firestone

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

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

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

**Vehicle Capacity Weight (VCW) =** 1100 lbs. (A)

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

**Rated Cargo and Luggage Weight (RCLW) A-B =** 200 lbs.

**GVWR** 4615 lbs.                      **GAWR:** Front 2594 lbs.                      Rear 2135 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>1060</u> lbs.	Right Rear = <u>510</u> lbs.
Left Front = <u>1020</u> lbs.	Left Rear = <u>550</u> lbs.
TOTAL FRONT WEIGHT = <u>2080</u> lbs. ( <u>66</u> % of Total Vehicle Weight)	
TOTAL REAR WEIGHT = <u>1060</u> lbs. ( <u>34</u> % of Total Vehicle Weight)	
TOTAL DELIVERY WEIGHT = <u>3140</u> lbs.	

**CALCULATION FOR TARGET TEST WEIGHT:**

UDW = Unloaded Delivered Weight ( 3140 lbs.)  
 VCW = Vehicle Capacity Weight ( 1100 lbs.)  
 DSC = Designated Seating Capacity (6)  
 RCLW = VCW - 150 (DSC) = 200 lbs.  
 Target Test Weight = UDW + RCLW + (2 dummies x 164 lbs./dummy)  
 Target Test Weight = 3668 lbs.

**WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 192 POUNDS CARGO:**

Right Front = <u>1100</u> lbs.	Right Rear = <u>700</u> lbs.
Left Front = <u>1100</u> lbs.	Left Rear = <u>760</u> lbs.
TOTAL FRONT WEIGHT = <u>2200</u> lbs. ( <u>60</u> % of Total Vehicle Weight)	
TOTAL REAR WEIGHT = <u>1460</u> lbs. ( <u>40</u> % of Total Vehicle Weight)	
TOTAL TEST WEIGHT = <u>3660</u> lbs.	
Weight of ballast secured in vehicle trunk area = <u>30</u> lbs.	

**VEHICLE ATTITUDE (all dimensions in inches):**

Delivered Attitude:	RF <u>27.5</u>	LF <u>27.6</u>	RR <u>26.6</u>	LR <u>25.8</u>
Test Attitude:	RF <u>27.8</u>	LF <u>27.9</u>	RR <u>23.8</u>	LR <u>24.0</u>
Wheel Base: <u>106.0</u> in.; C.G. = <u>42.3</u> in. rearward of front wheel C/L				

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

POST-IMPACT DATA:

Type of Test: Frontal Barrier Impact Angle: 0 °  
 Date of Test: 11/17/87 Time of Test: 12:25  
 Ambient Temperature: 62 °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 = 35.1 mph, secondary = 35.2 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>183.9</u>	C <sub>L</sub>	<u>188.5</u>	L	<u>183.8</u>
	Post-test	= R	<u>165.1</u>	C <sub>L</sub>	<u>167.9</u>	L	<u>165.9</u>
	Crush	= R	<u>18.8</u>	C <sub>L</sub>	<u>20.6</u>	L	<u>17.9</u>

Distance from front of test vehicle to point of impact:

R 20.3      C/L 19.1      L 20.2

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Contacted Sunvisor, Steering Rim and Hub</u>	<u>Sunvisor</u>
Chest	<u>No Contact</u>	<u>No Contact</u>
Abdomen	<u>No Contact</u>	<u>No Contact</u>
Left Knee	<u>Dash</u>	<u>Dash</u>
Right Knee	<u>Dash</u>	<u>Dash</u>

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

	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Door Opening	<u>Operable</u>	<u>Operable</u>	<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>

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)	-206	-39	130	246	-41	-12	-14	38
DUMMY (2)	-28	17	52	55	-42	28	-23	47
DUMMY (3)								
DUMMY (4)								

	MAXIMUM FORCE - FEMUR LOAD (LBS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	786	See Note 1
DUMMY (2)	438	468
DUMMY (3)		
DUMMY (4)		

	MAXIMUM FORCE - SEAT BELTS LOADS (LBS)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)	2014	-	868
DUMMY (2)	1187	1177	-
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**			
	HIC	t <sub>1</sub> (SEC)	t <sub>2</sub> (SEC)	AVE. ACC. (g) t <sub>1</sub> TO t <sub>2</sub>
DUMMY (1)	707.4	.06547	.09990	53.1
DUMMY (2)	358.9	.06352	.09952	39.8
DUMMY (3)				
DUMMY (4)				

\*DEFINED AS EXCEEDING 0.003 SEC. DURATION

\*\*AS DEFINED IN FMVSS NO. 208

NOTE 1: No data available for Position #1 left femur.

Figure 1

**PART 572 DUMMY IN-VEHICLE POSITION**

TEST NO.: 294-010-798

VEHICLE: 1988 Ford Taurus 4-Door Sedan

**SEAT TYPE:**

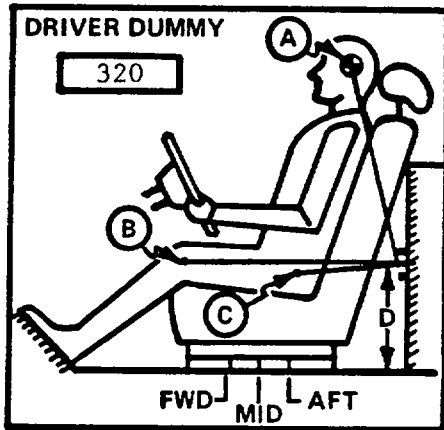
- Bench
- Bucket
- Split Bench

**ADJUSTER TYPE:**

- Manual
- Power

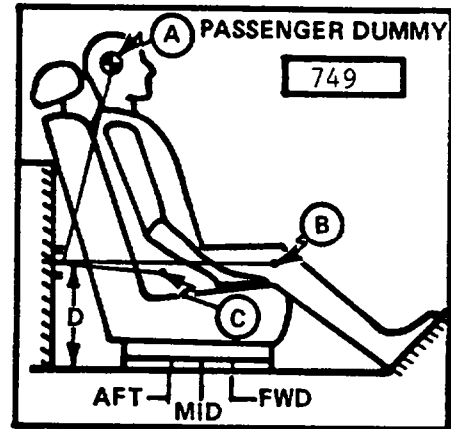
**BUCKET SEAT BACK TYPE:**

- Fixed
- Adjustable Reclining



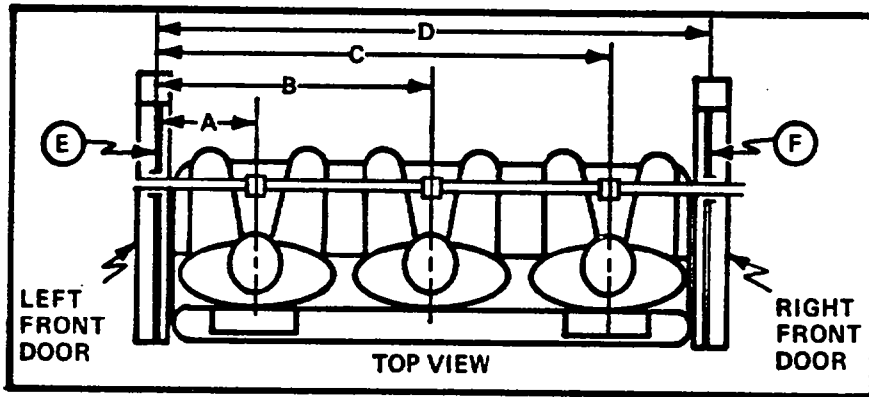
**MEASUREMENT LOCATION**

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



A =	<u>21.2</u>	in.	<u>8</u>	Degrees
B =	<u>22.3</u>	in.	<u>99</u>	Degrees
C =	<u>8.8</u>	in.	<u>133</u>	Degrees
D =	<u>14.0</u>	in.		

A =	<u>21.3</u>	in.	<u>5</u>	Degrees
B =	<u>21.9</u>	in.	<u>97</u>	Degrees
C =	<u>9.0</u>	in.	<u>136</u>	Degrees
D =	<u>14.2</u>	in.		



DUMMY ID

320

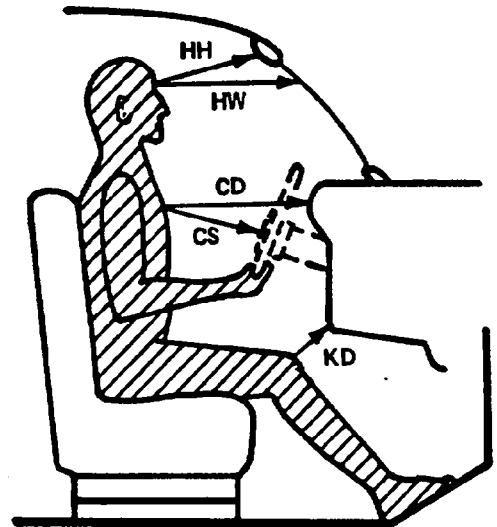
749

A =	Left Door to Driver Centerline	<u>12.8</u>	in.
B =	Left Door to Center Passenger Centerline	<u>-</u>	in.
C =	Left Door to Right Passenger Centerline	<u>41.6</u>	in.
D =	Left Door to Right Door	<u>54.0</u>	in.
E, F =	Window Glass Height (Right and Left Must Be Equal)	<u>11.5</u>	in.

Figure 2

OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	13.5	13.5
HW	19.9	18.8
CD	22.0	25.2
CS	13.3	-
KDL	5.5	9.5
KDR	6.6	9.2
SA	21°	21°
TA	20°	19°



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

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

	DRIVER	PASSENGER
HR	5.2	5.2
HS	9.2	9.0
AD	4.0	5.0
HD	7.1	7.8
KK	9.1	6.7

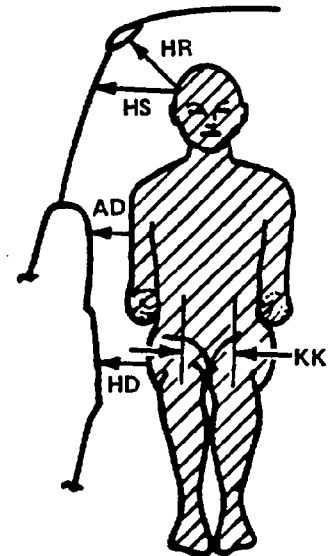
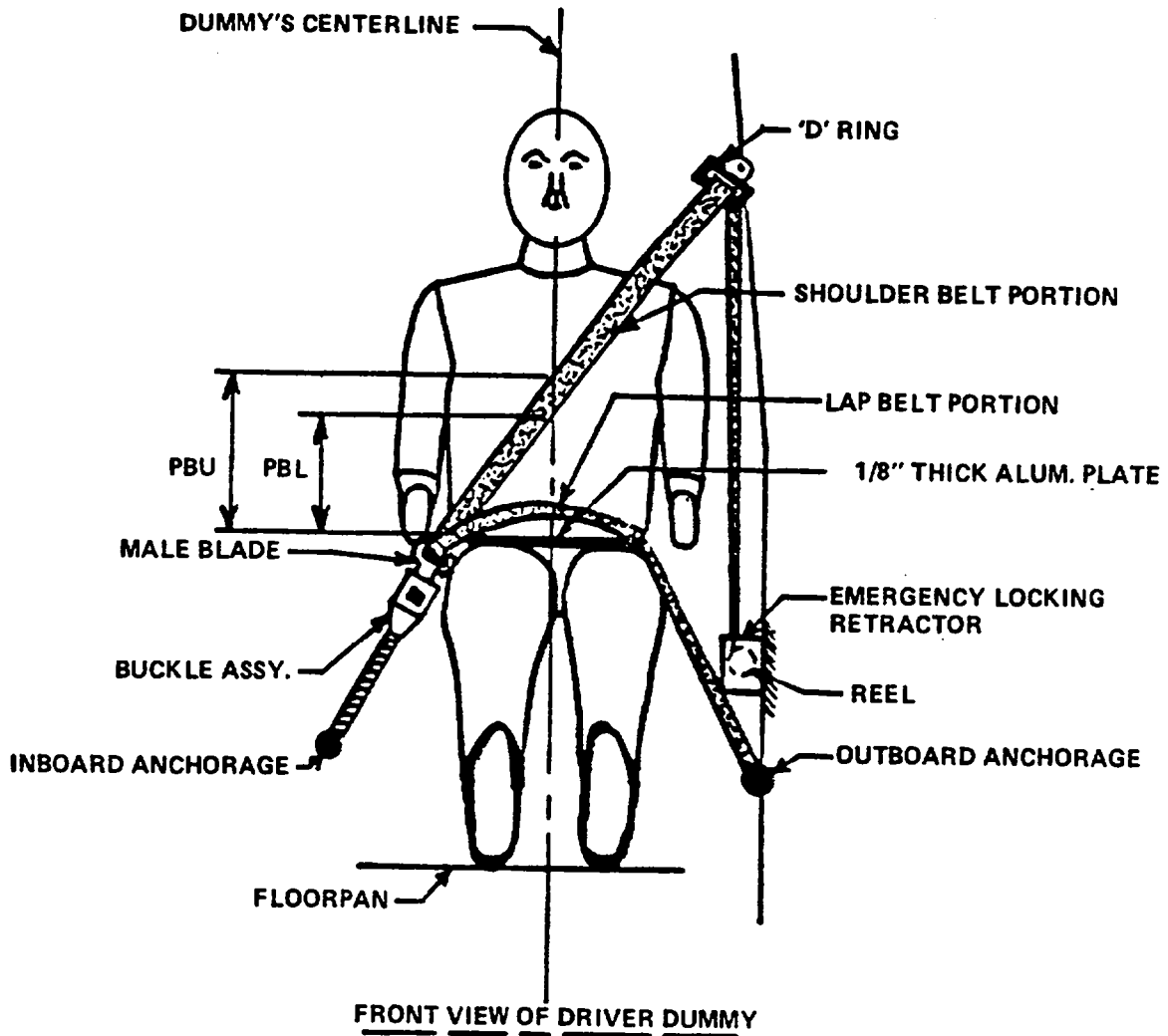


Figure 3  
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	13.9	13.8
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	10.1	10.1
<u>LAP BELT TENSION</u>	2.0	2.0
<u>SHOULDER BELT TENSION</u>	2.0	2.0

Table 3

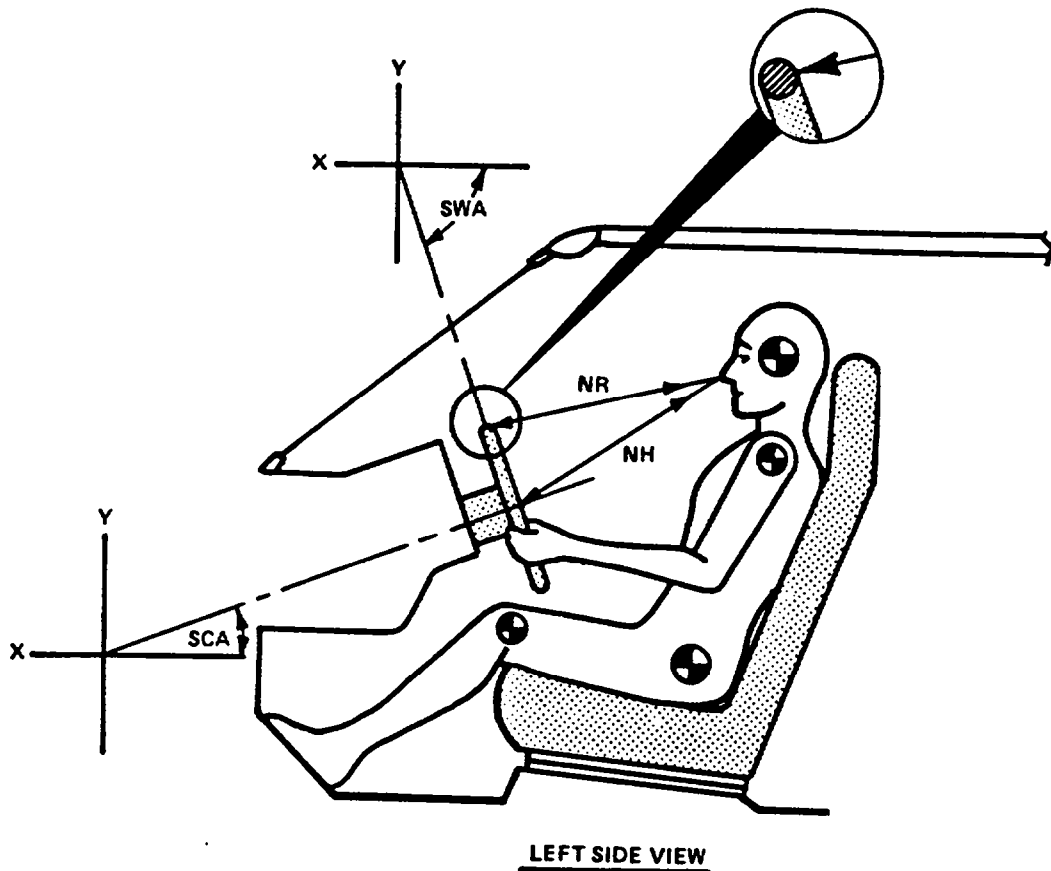
**SEAT BELT PERFORMANCE ASSESSMENT TEST DATA**

<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>70.0"</u>	<u>69.8"</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>32.5"</u>	<u>32.3"</u>
Lap belt length as measured on Part 572 Dummy.	<u>26.0"</u>	<u>26.0"</u>
<u>BELT SPOOL-OFF DATA:</u>		
As determined by film analysis.	<u>2.5"</u>	<u>2.5"</u>
As determined mechanically.	<u>2.2"</u>	<u>1.8"</u>
As determined electronically.	<u>2.2"</u>	<u>1.7"</u>
<u>BELT STRETCH DATA:</u>		
Measured electronically between shoulder belt load cell and the "D" ring.	<u>.88 in/ft</u>	<u>See Note</u>
Measured Mechanically	<u>0.0"</u>	<u>0.0"</u>

## Note:

Passenger belt stretch data is not accurate

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	16.7	Inches
<u>NH</u>	-- Distance from tip of dummy's nose to center of steering column hub	17.8	Inches
<u>SCA</u>	-- Angle of steering column relative to the horizontal X axis	21°	Degrees
<u>SWA</u>	-- Angle of steering wheel relative to the horizontal X axis	-69°	Degrees

Steering Column is not adjustable.

Figure 5

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 4

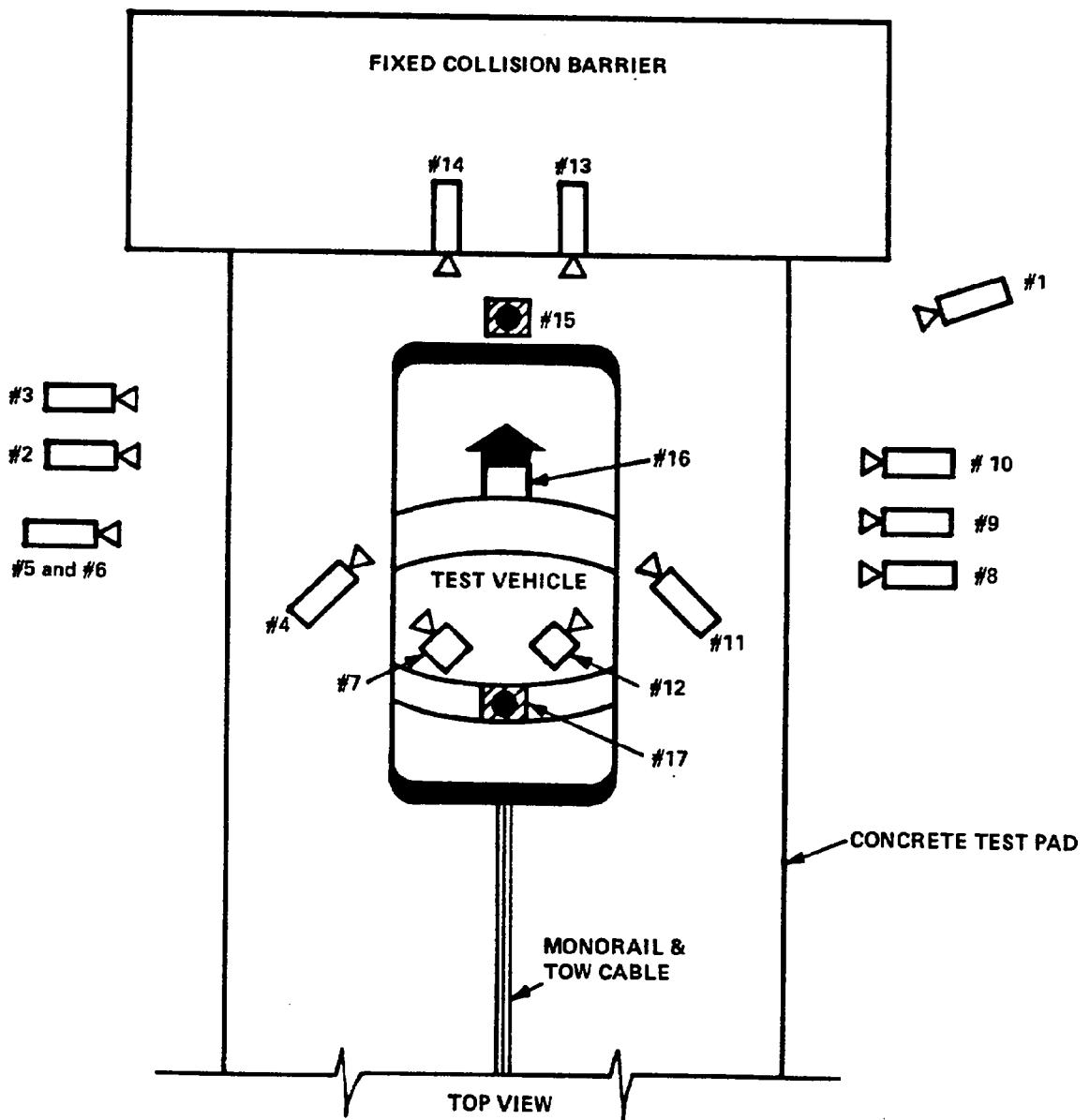


Table 4  
HIGH-SPEED CAMERA LOCATIONS

Test No. 294-010-798

Vehicle 1988 Ford Taurus 4-Door Sedan

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	204	19	41	-4	-	640	
3	Left Side View	278	38	43	-4	-	650	
4	Driver and Interior View	100	99	70	-18	110	800	
5	Steering Column (Bottom)	278	77	50	-3	80	660	
6	Steering Column (Top)	278	77	74	-10	80	680	
7	Left Belt	-	-	-	-	-	800	
8	Overall Right Side	250	37	44	-3	-	800	
9	Right Side View	270	58	55	-4	-	740	
10	Right Passenger View	241	71	47	-3	260	720	
11	Passenger and Interior View	92	95	68	-15	100	690	
12	Right Belt	-	-	-	-	-	720	
13	Passenger Front View	26	0	71	-32	100	640	
14	Driver Front View	26	0	71	-32	100	650	
15	Windshield View	0	0	126	-45	-	630	
16	Pit View of Engine	0	38	-120	90	-	700(1)	
17	Pit View of Fuel Tank	0	130	-120	90	-	770	

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

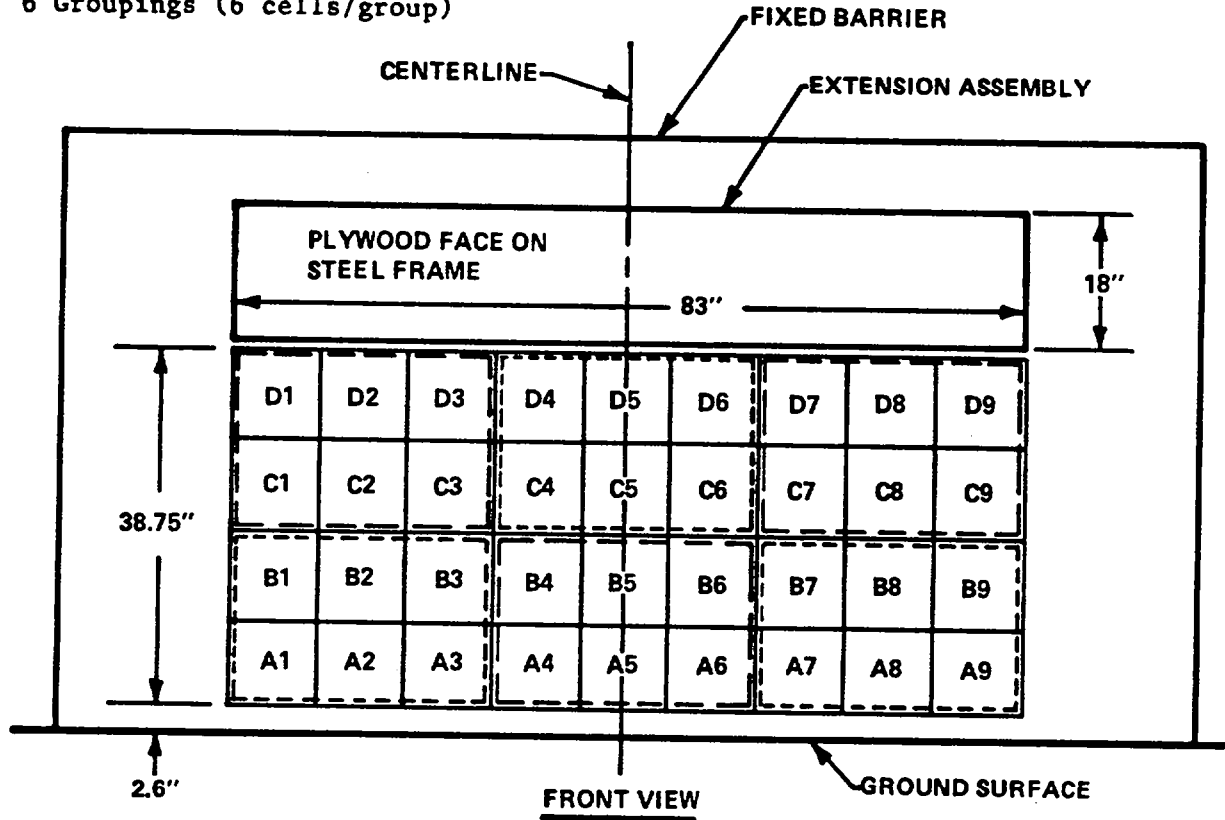
Note 1: Speed is an estimate



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

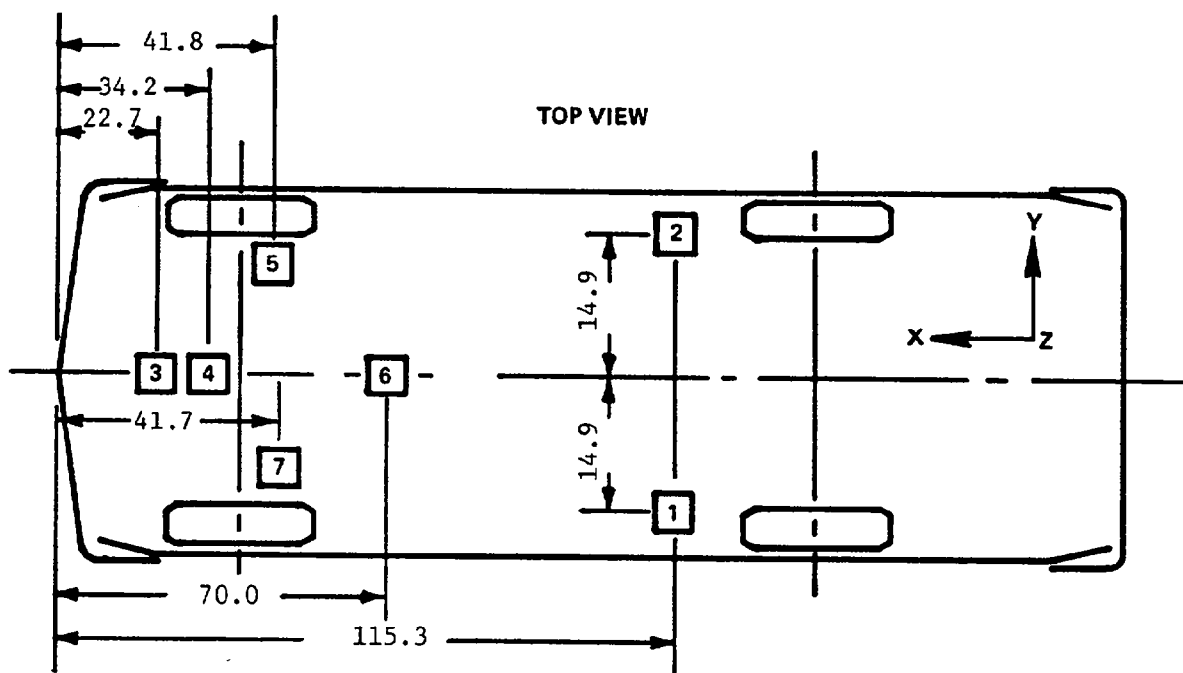
Group 4 C1 thru D3	Group 5 C4 thru D6	Group 6 C7 thru D9
Group 1 A1 thru B3	Group 2 A4 thru B6	Group 3 A7 thru B9

The following data is presented in Appendix B:

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

Figure 8

VEHICLE ACCELEROMETER LOCATIONS



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

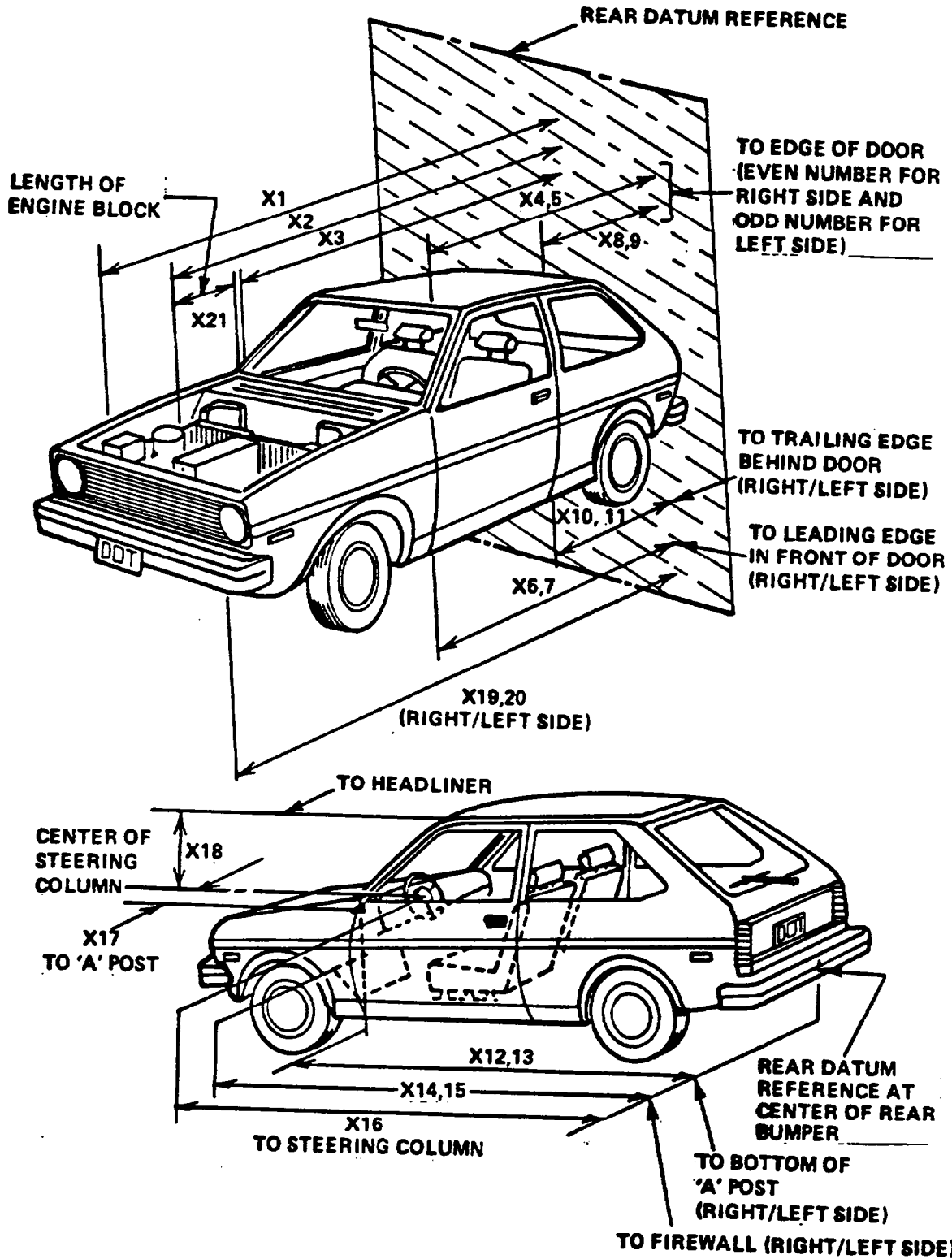


Table 5

## VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	188.5	167.9	20.6
X2	Rear Surface of Vehicle to Front of Engine	166.9	156.0	10.9
X3	Rear Surface of Vehicle to Firewall	141.9	137.6	4.3
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	130.0	129.3	0.7
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	129.9	129.7	0.2
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	127.5	127.5	0.0
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	127.5	127.5	0.0
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	87.1	86.7	0.4
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	87.2	86.8	0.4
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	86.4	86.4	0.0
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	86.5	87.0	-0.5
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	127.5	127.5	0.0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	127.5	127.5	0.0
X14	Rear Surface of Vehicle to Firewall, Right Side	137.7	131.1	6.6
X15	Rear Surface of Vehicle to Firewall, Left Side	137.5	133.6	3.9
X16	Center of Steering Column to "A" Post	110.9	109.2	1.7
X17	Center of Steering Column to Headliner	16.0	15.5	0.5
X18	Rear Surface of Vehicle to Right Side of Front Bumper	16.1	16.0	0.1
X19	Rear Surface of Vehicle to Left Side of Front Bumper	183.9	165.1	18.8
X20	Length of Engine Block	183.8	165.9	17.9
X21		15.1	15.1	0.0

**Appendix A**  
**PHOTOGRAPHS**

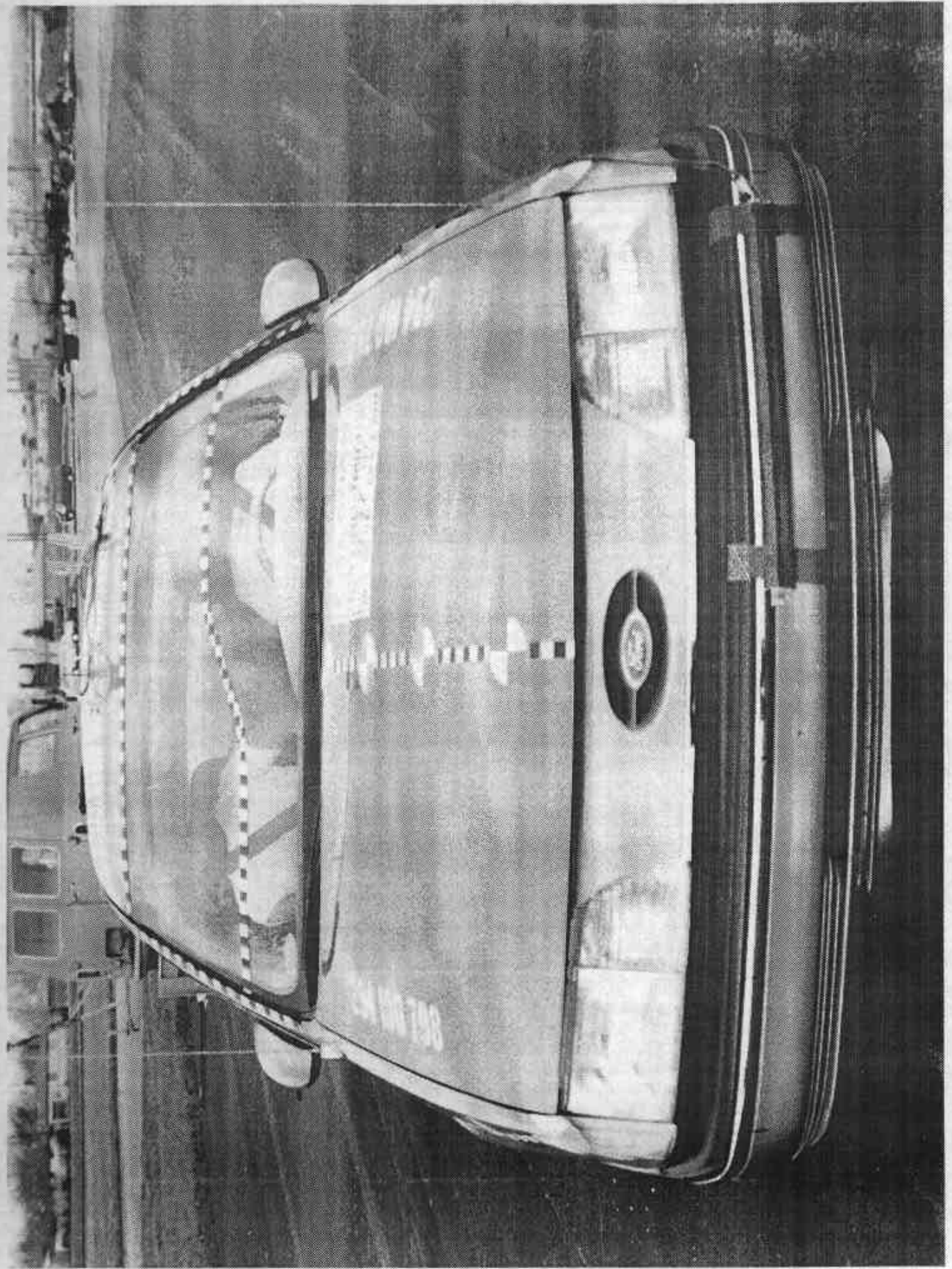


Figure A-1 PRE-TEST FRONT VIEW

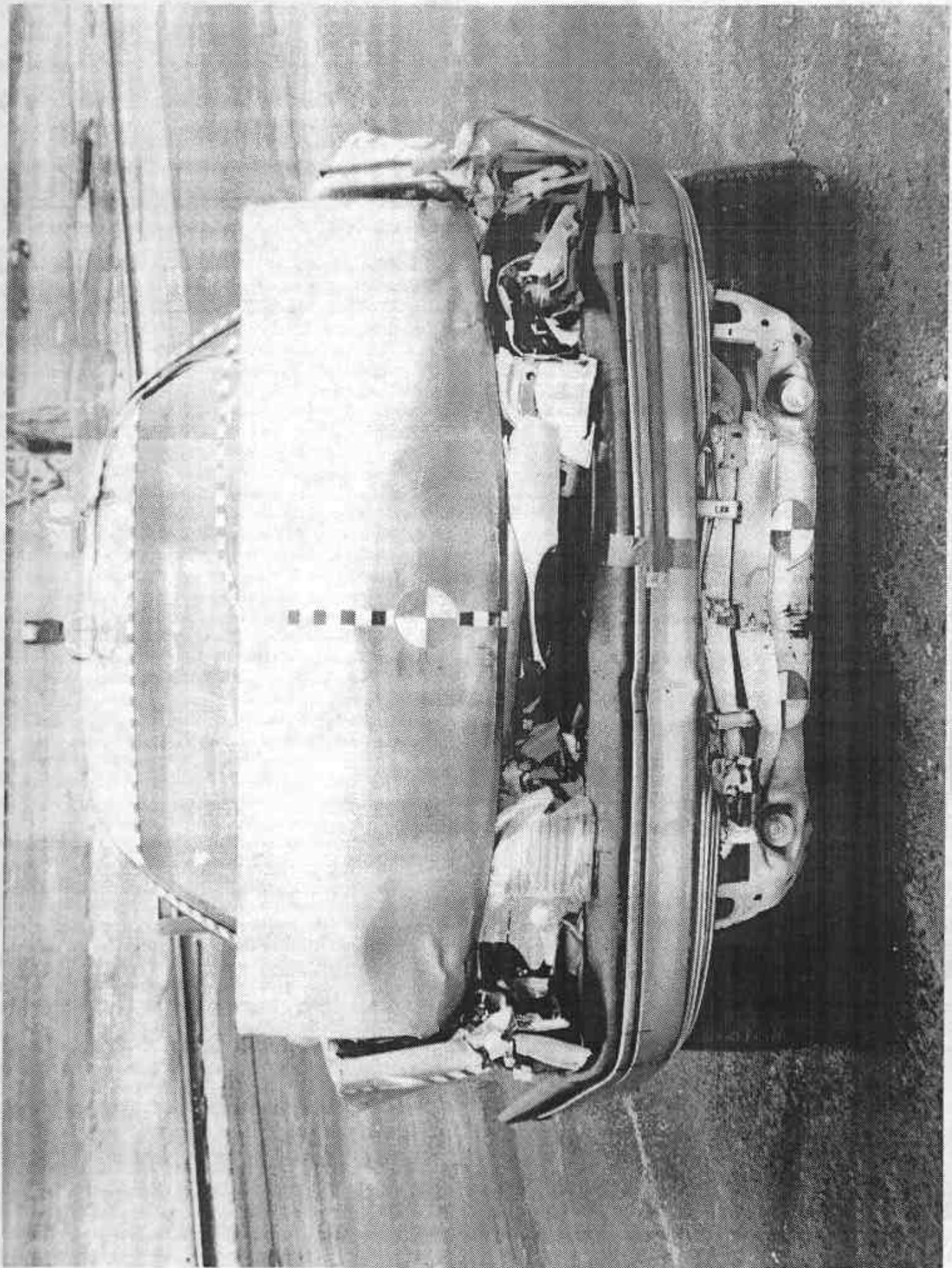


Figure A-2 POST-TEST FRONT VIEW

A-3

7621-1

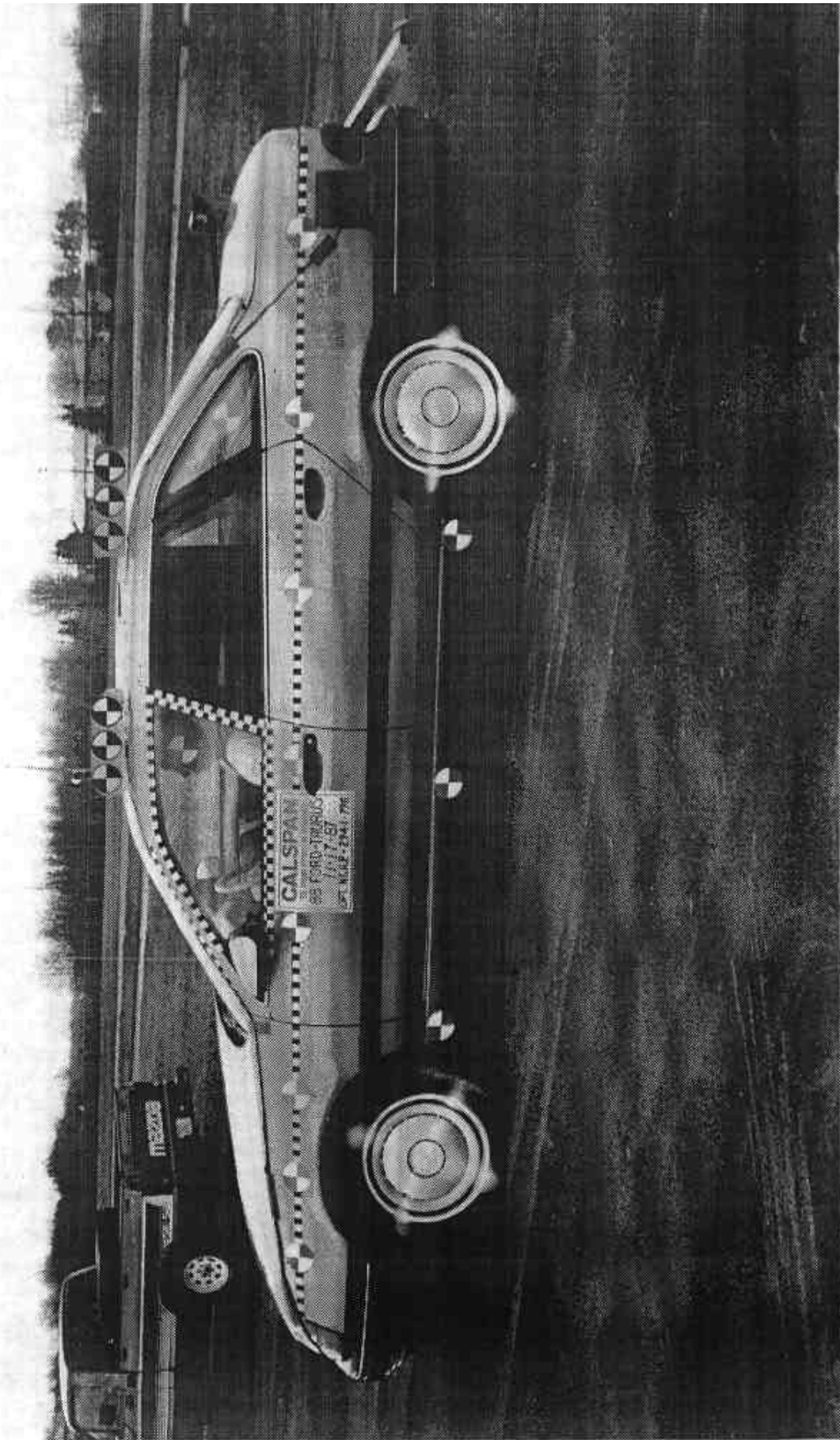


Figure A-3 PRE-TEST LEFT SIDE VIEW

A-4

7621-1

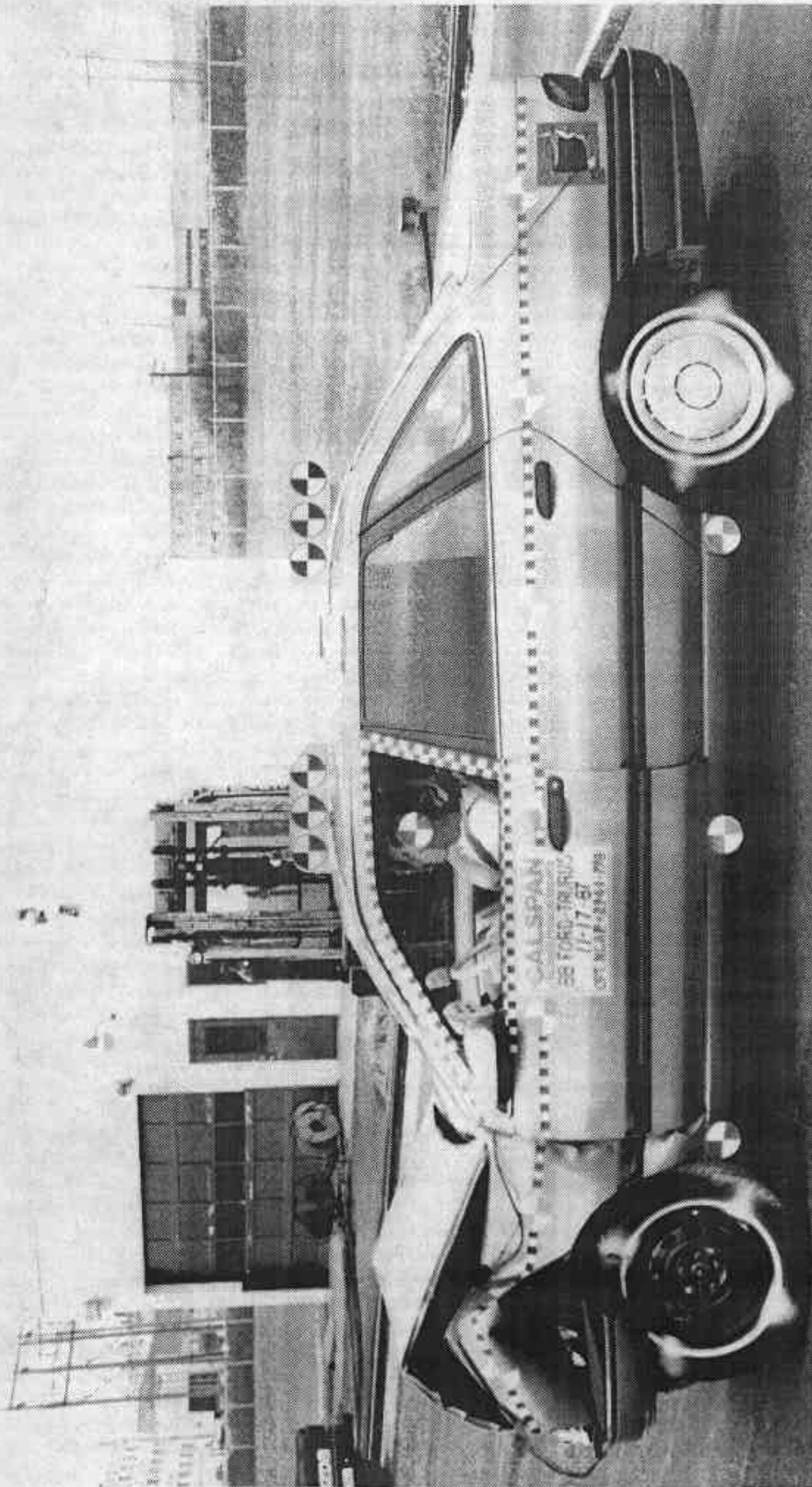
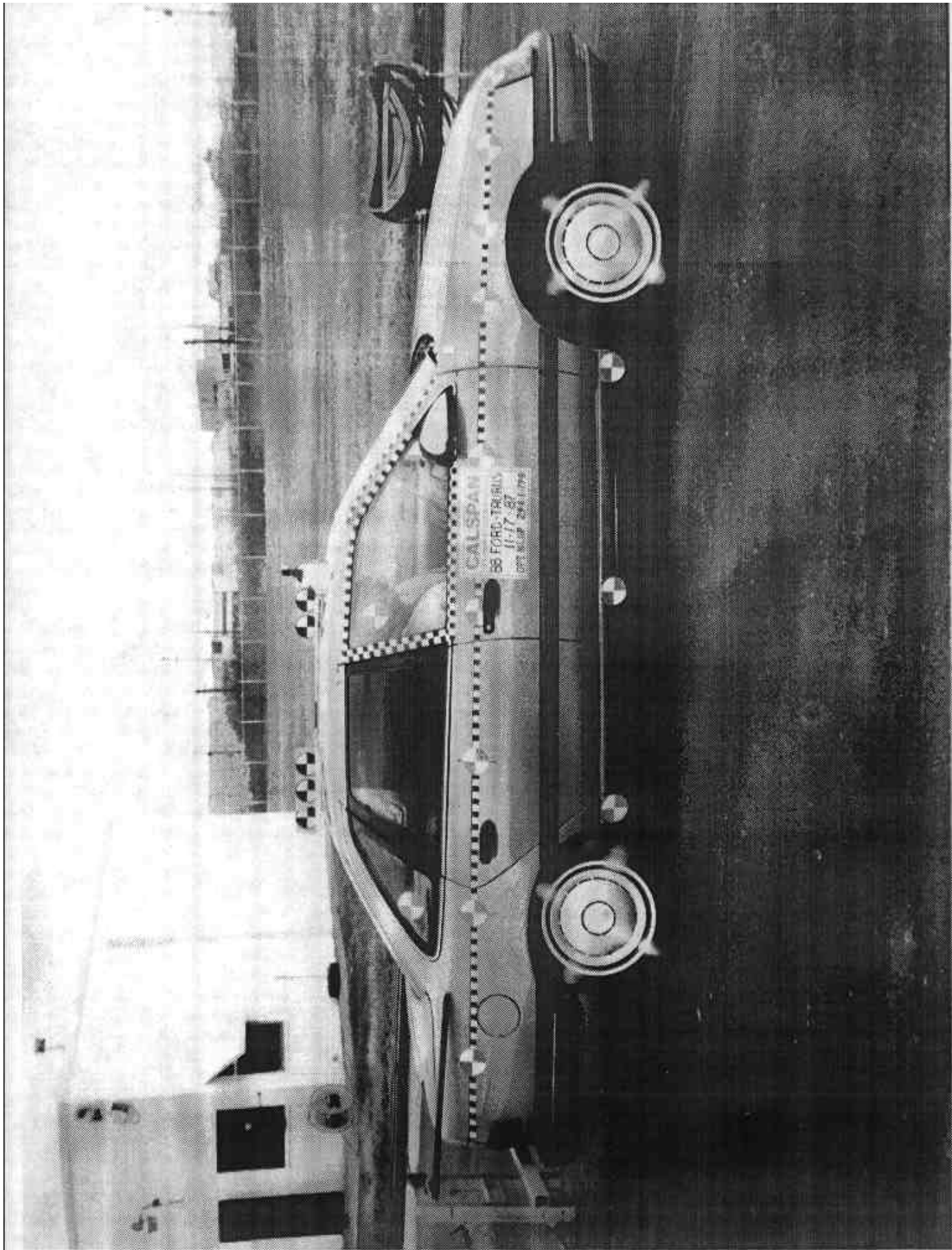


Figure A-4 POST-TEST LEFT SIDE VIEW

A-5

7621-1



A-6

7621-1

Figure A-5 PRE-TEST RIGHT SIDE VIEW

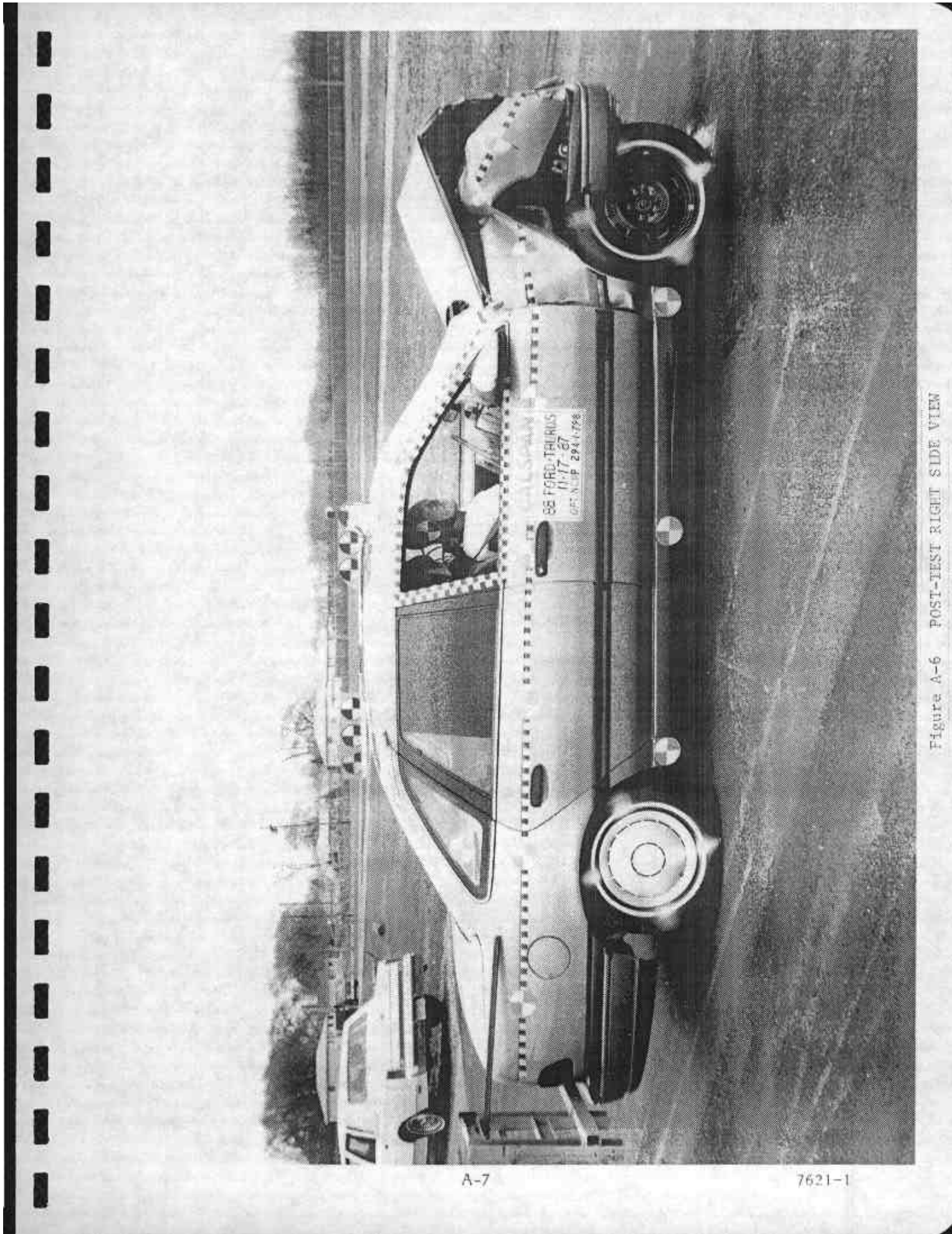


Figure A-6 POST-TEST RIGHT SIDE VIEW

A-7

7621-1

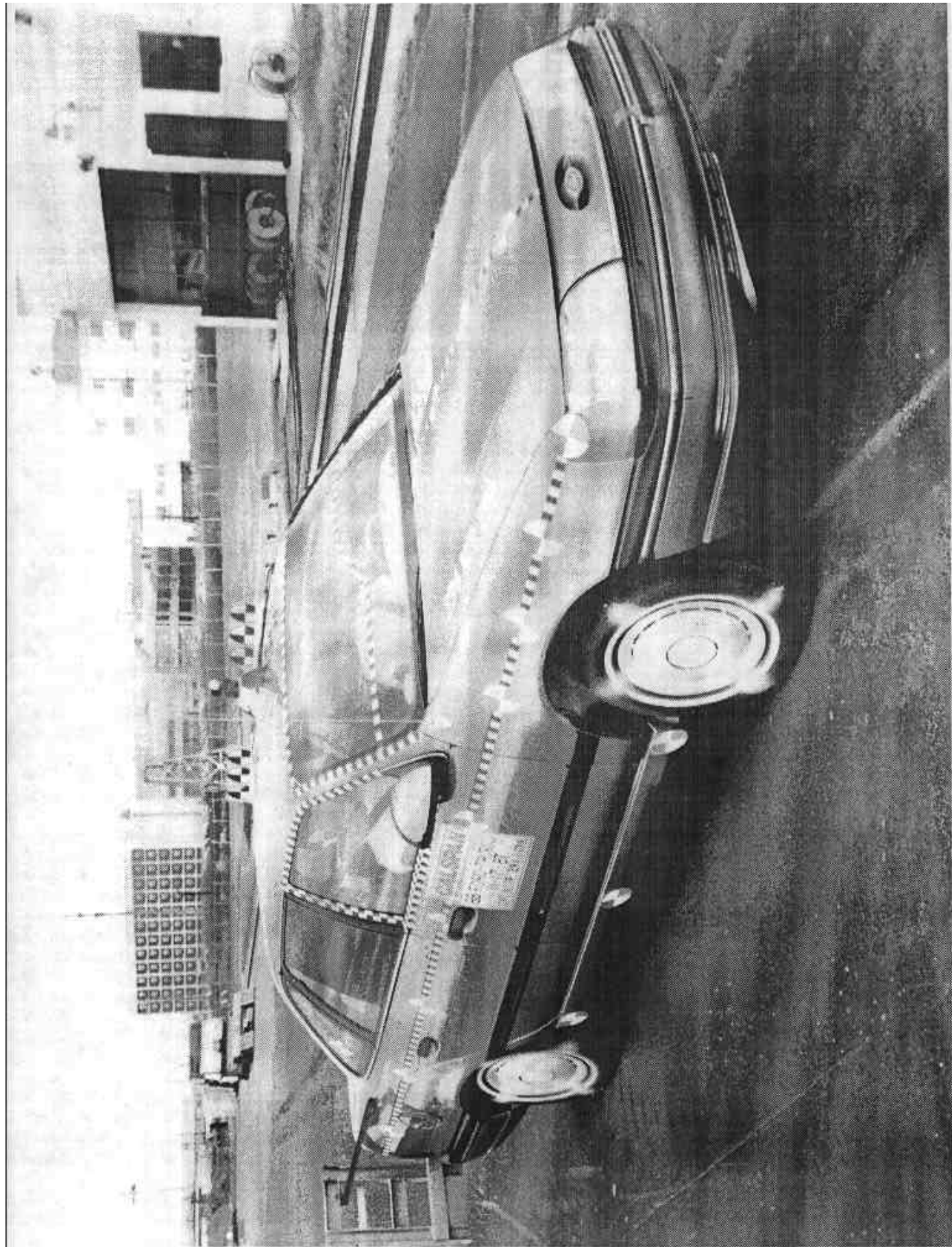


Figure A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-8

7621-1

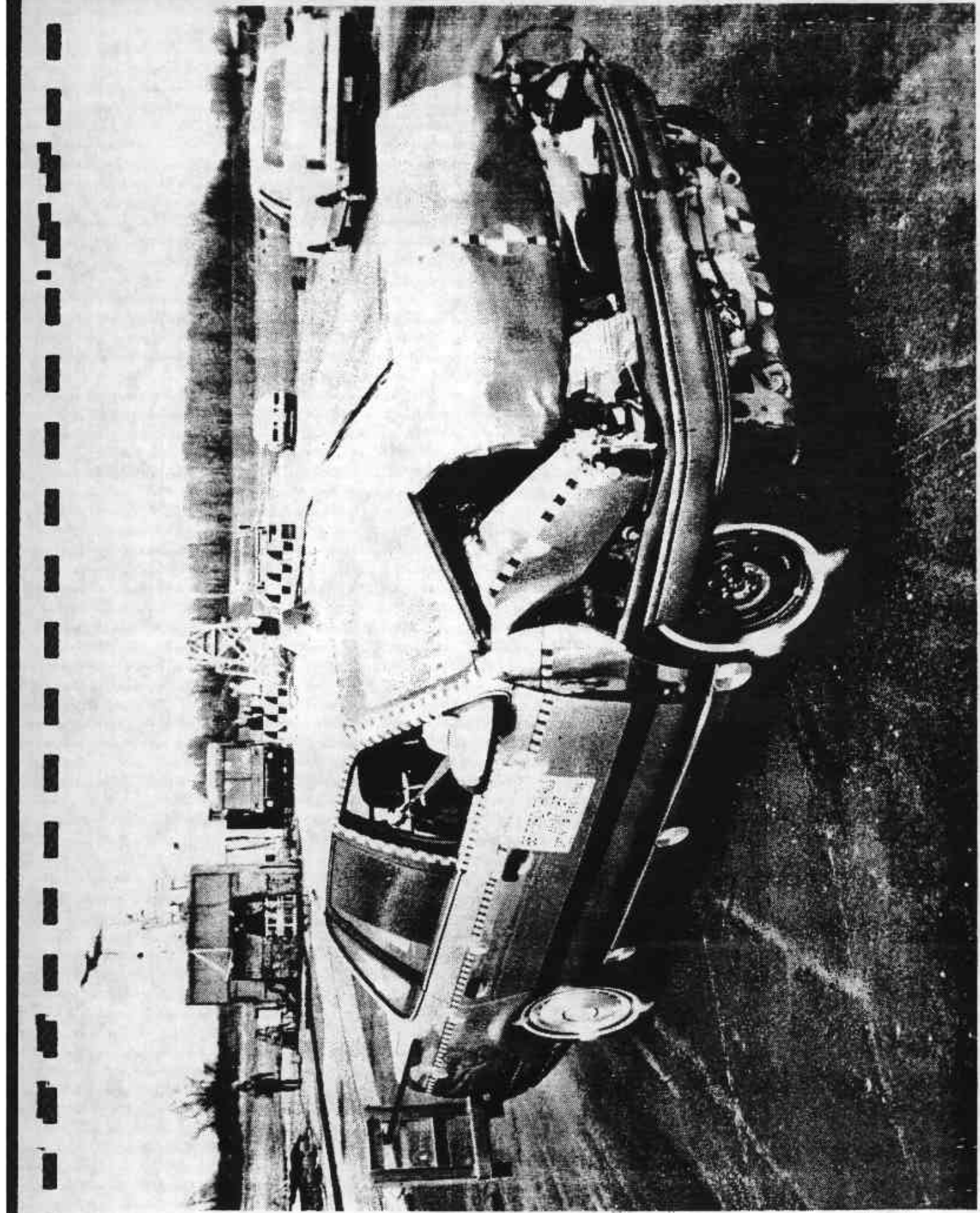
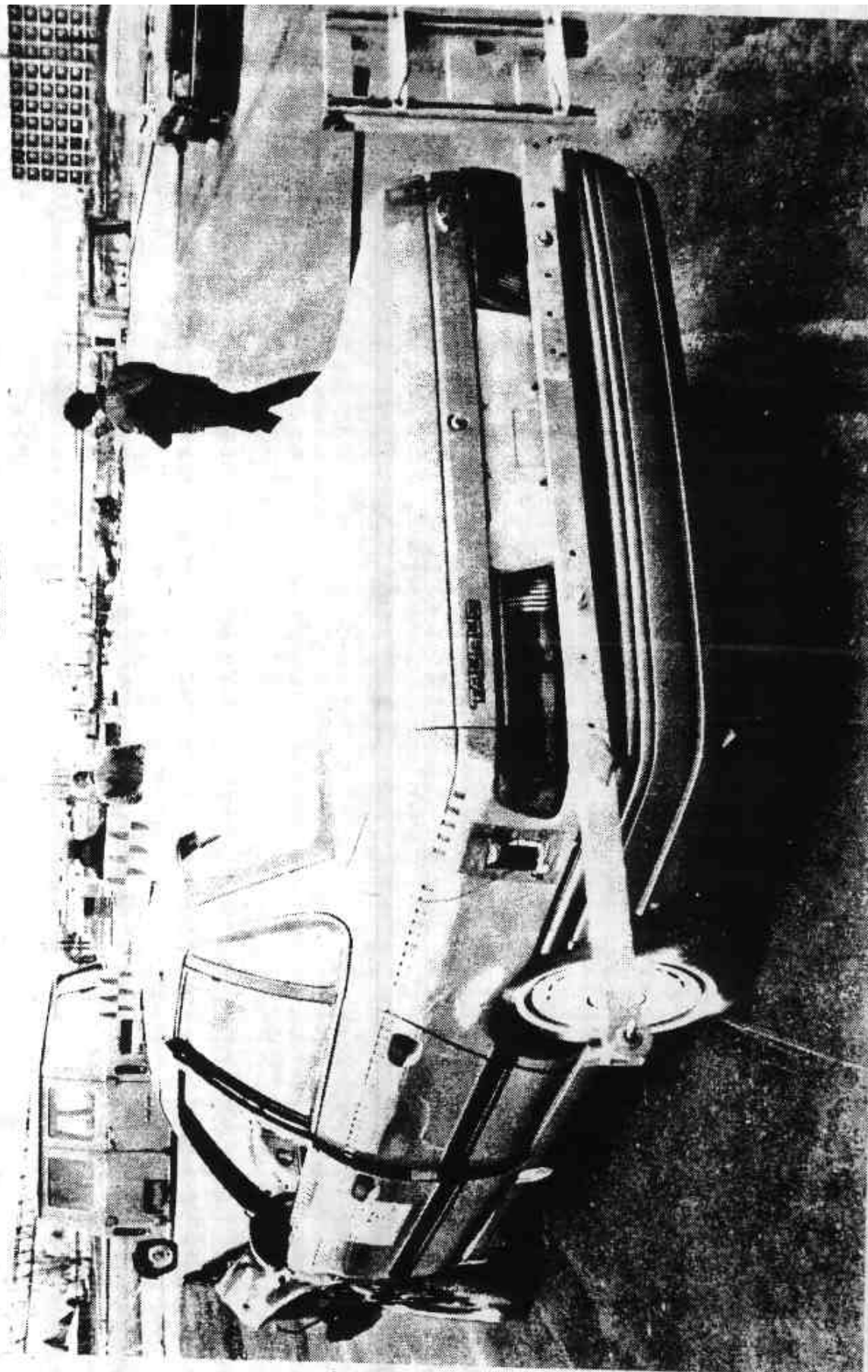


PHOTO A 8 DIRECT RECT PLANT FRONT THREE-QUARTER VIEW

A-9

7621-1



A-10

7621-1

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

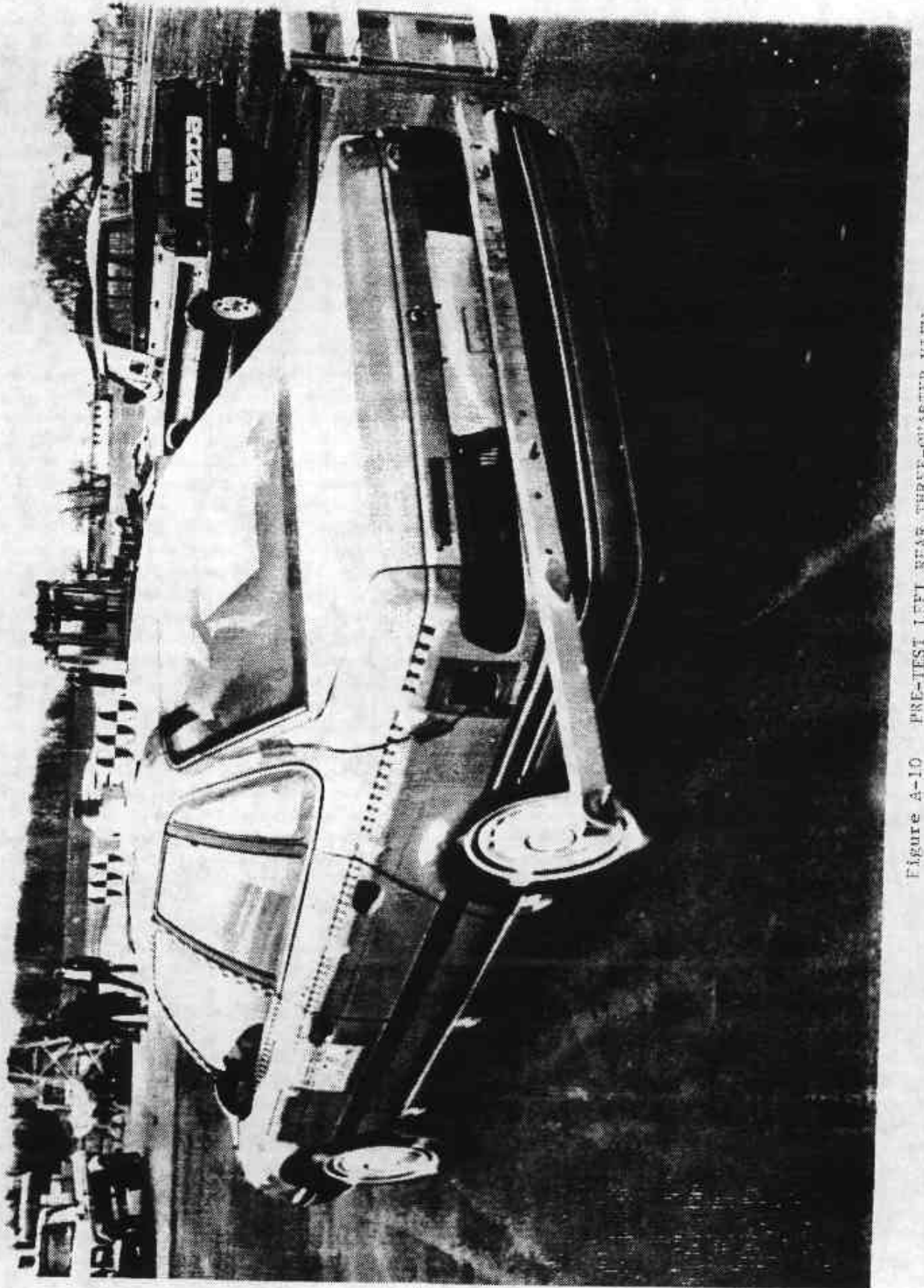


Figure A-10 PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-11

7621-1

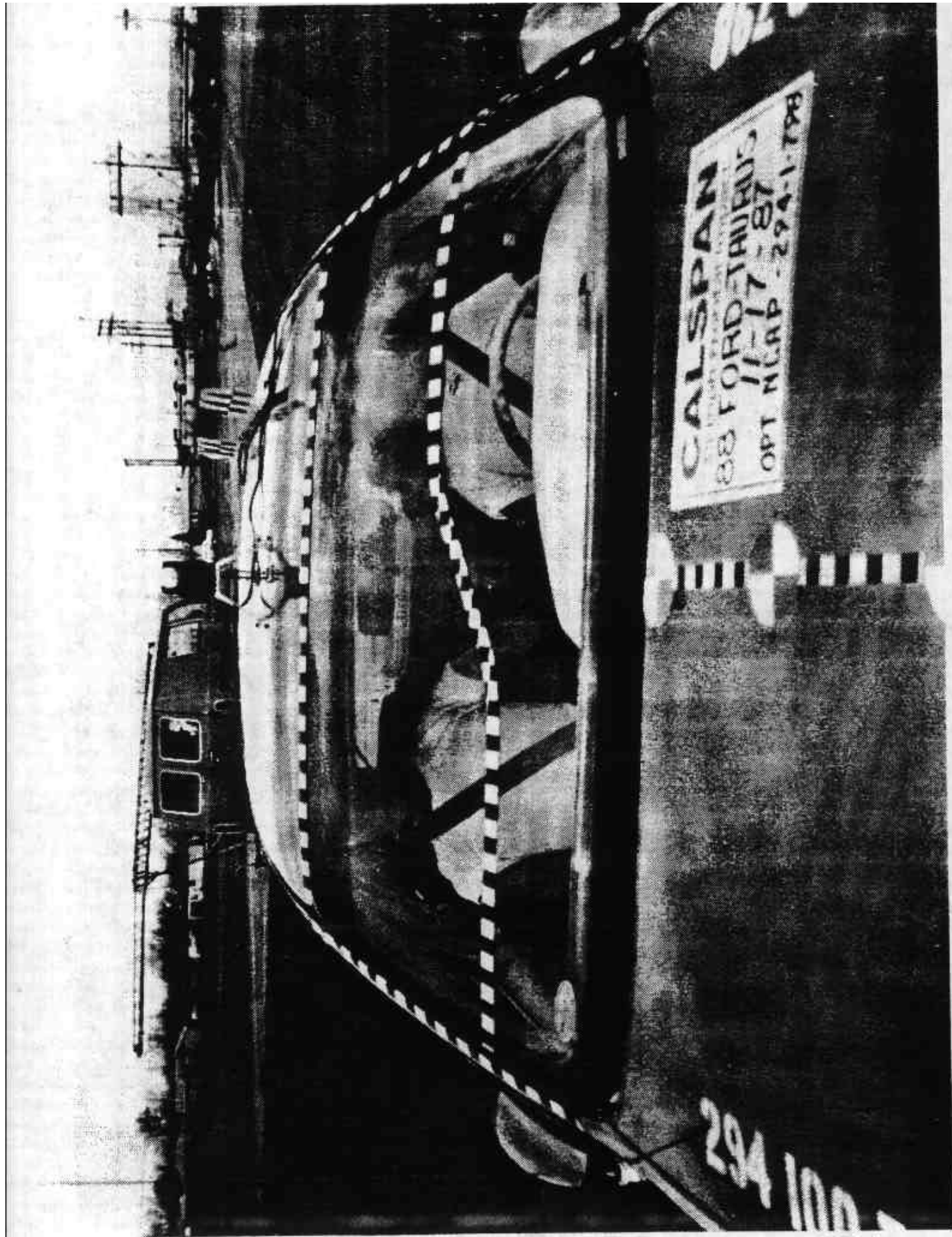


Figure A-11. PRE-TEST WINDSHIELD VIEW

A-12

7621-1

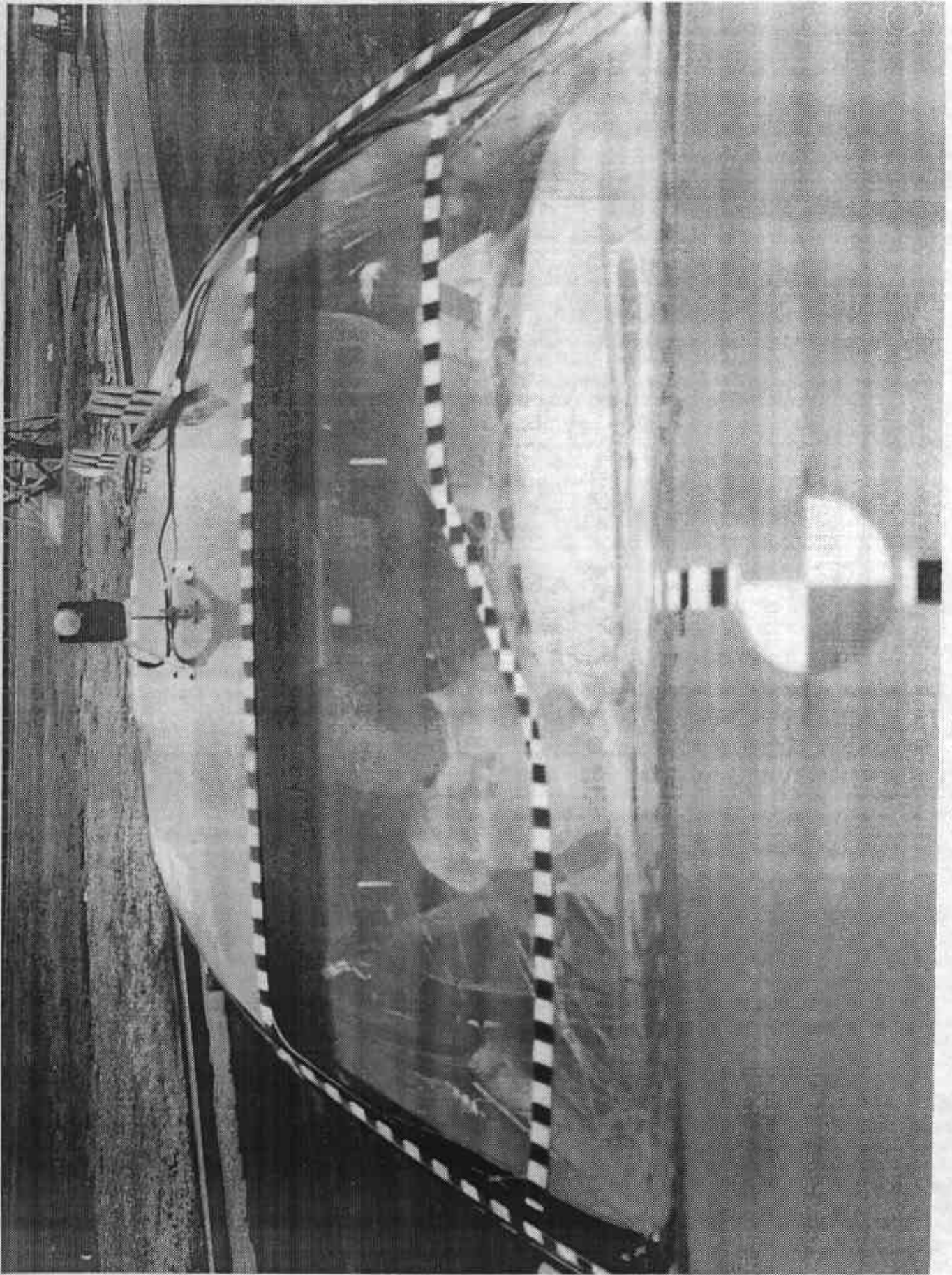


Figure A-12 POST-TEST WINDSHIELD VIEW



Figure A-13 PRE-TEST FUEL FILTER CAP VIEW

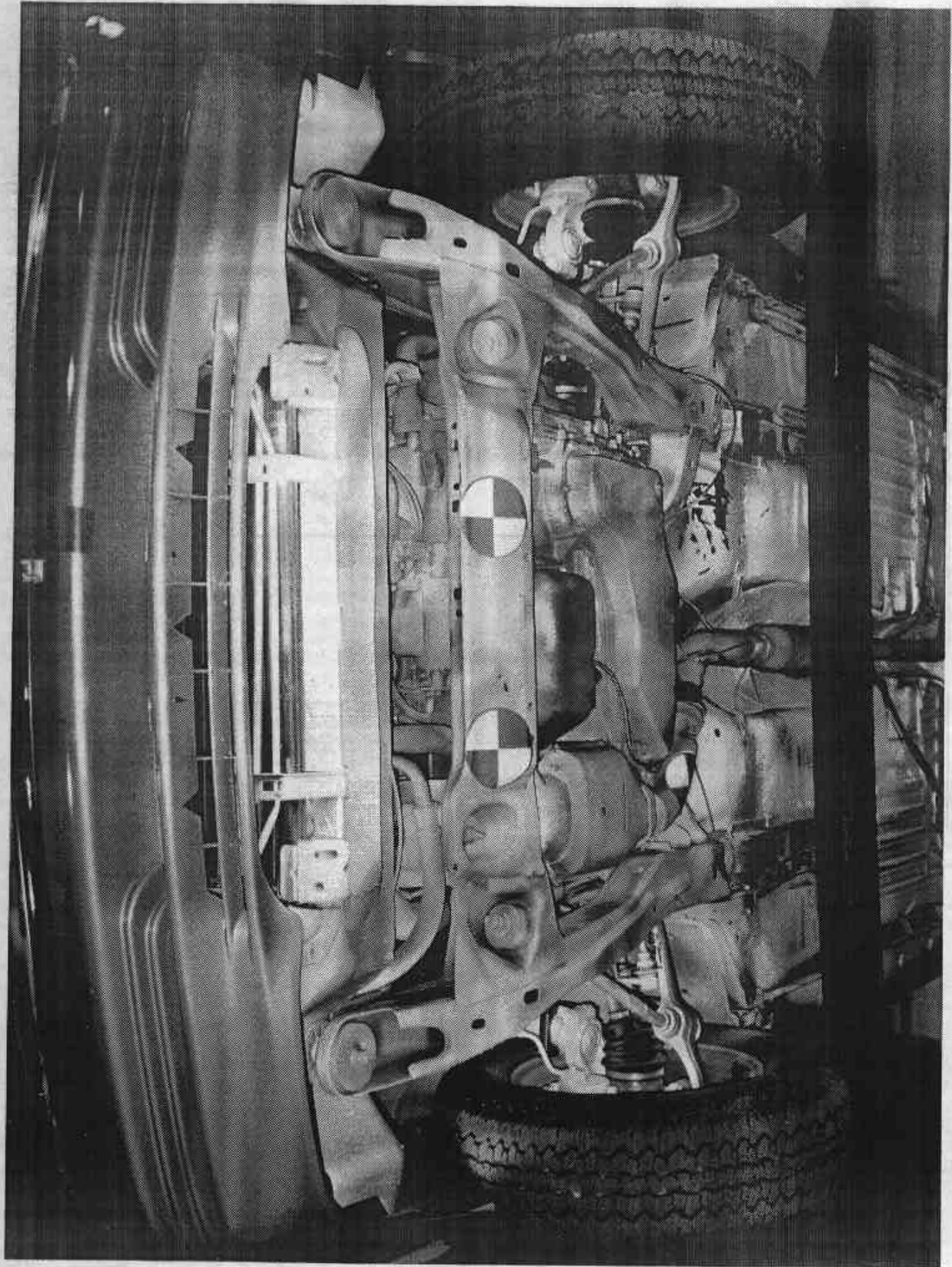


Figure A-14 PRE-TEST FRONT UNDERBODY VIEW

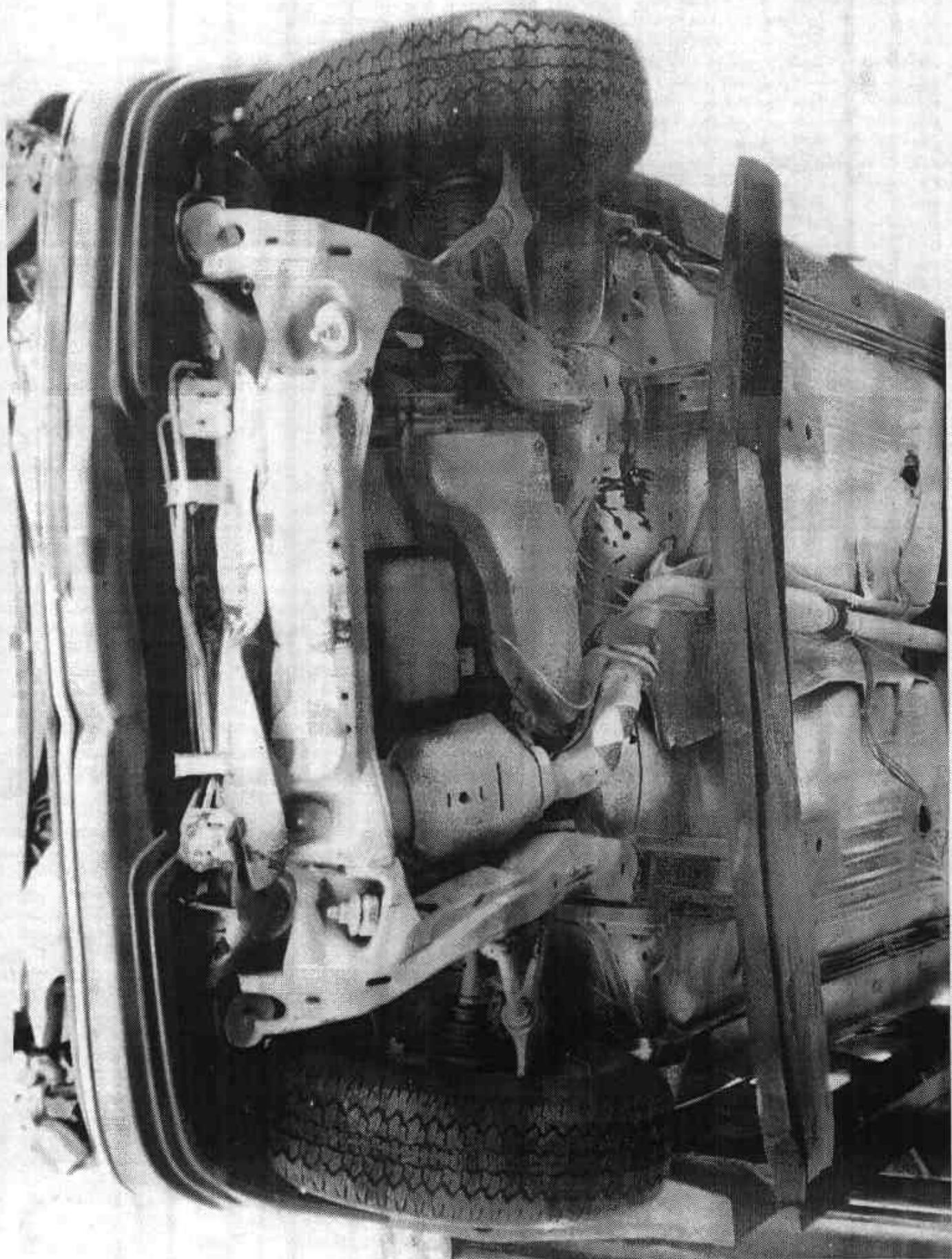


Figure A-15 POST-TEST FRONT UNDERBODY VIEW

A-16

7621-1

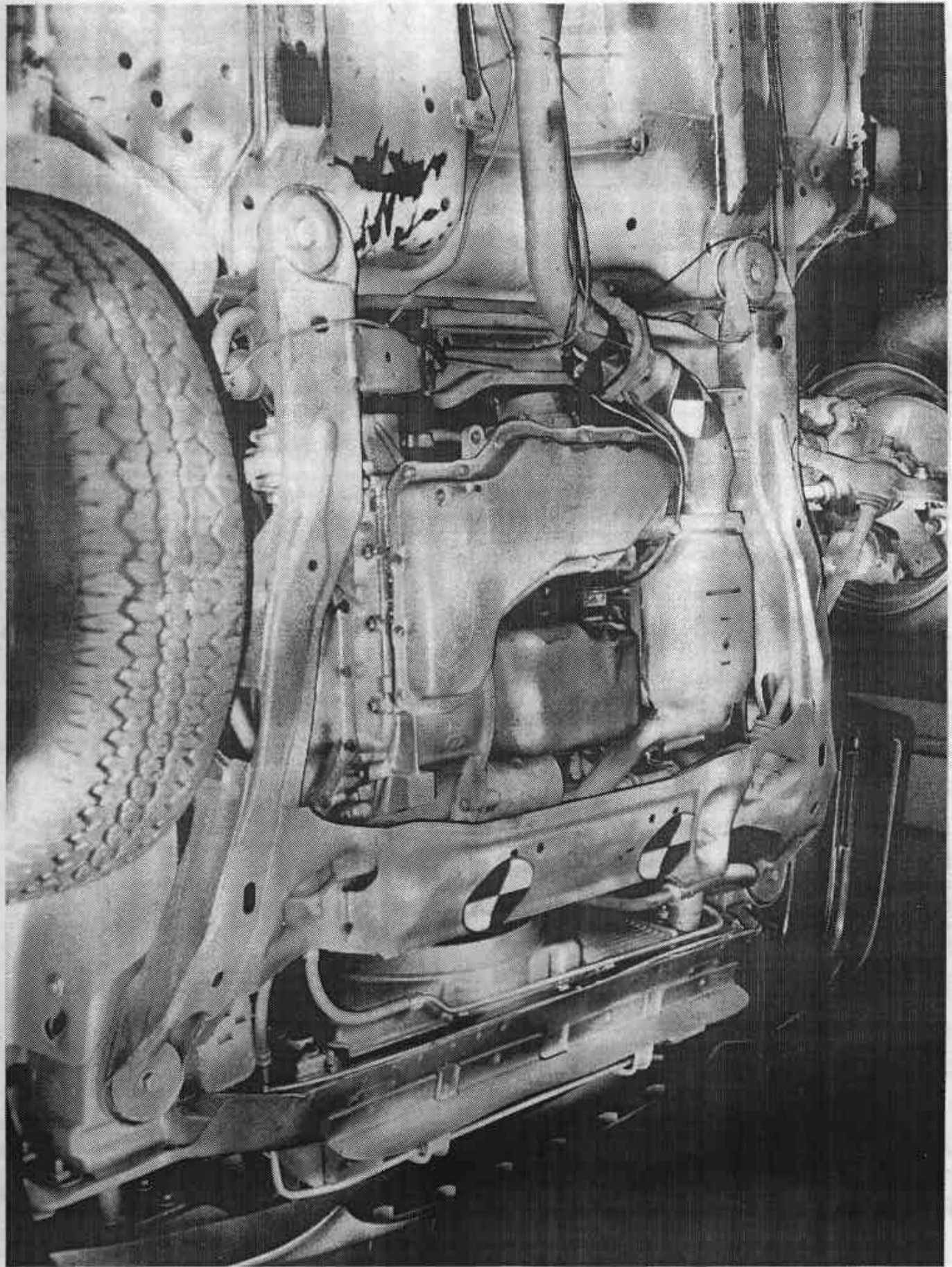


Figure A-16 PRE-TEST FRONT-SIDE UNDERBODY VIEW



Figure A-17 POST-TEST FRONT SIDE UNDERBODY VIEW

A-18

7621-1

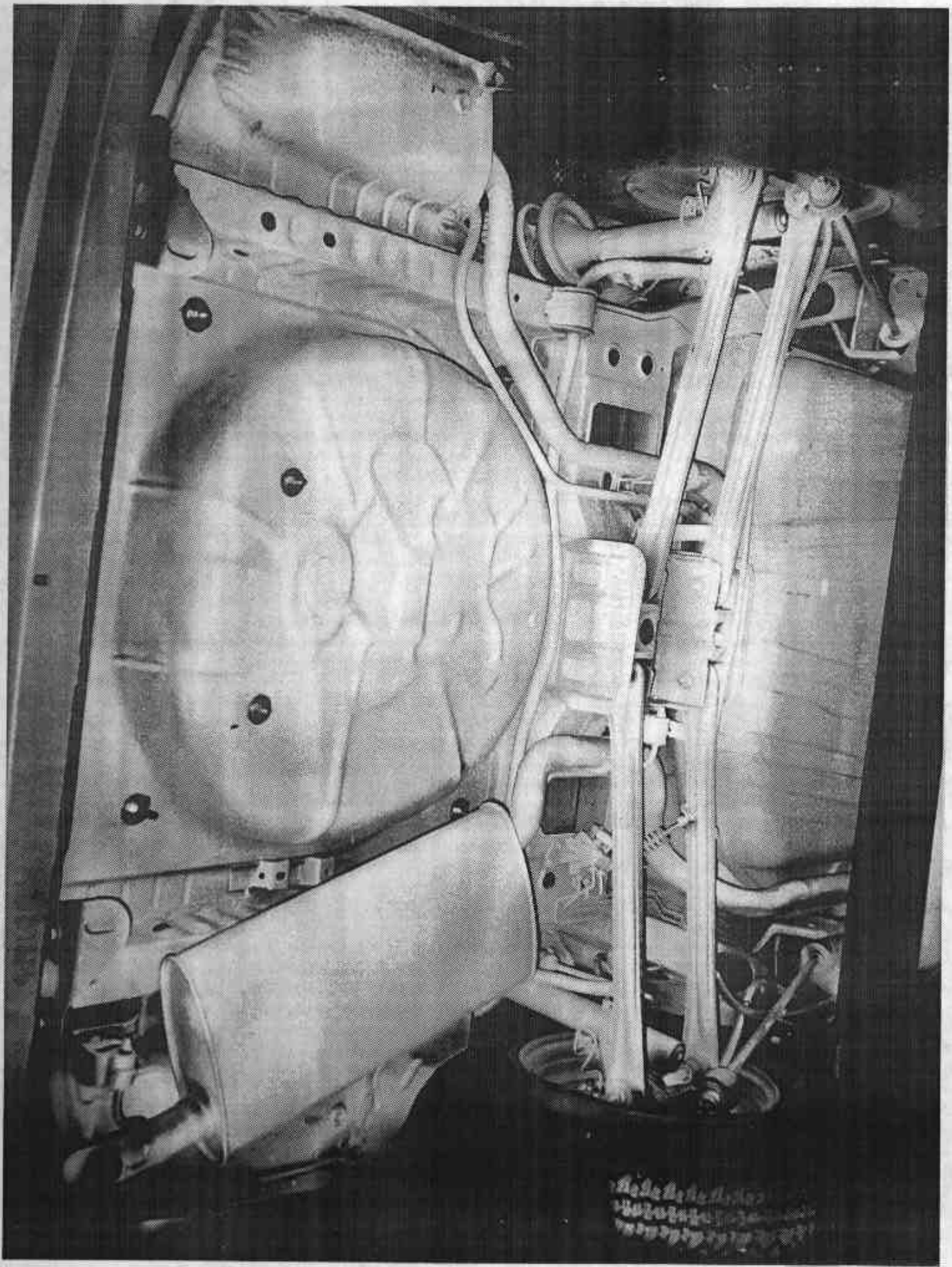


Figure A-18 PRE-TEST REAR UNDERBODY VIEW

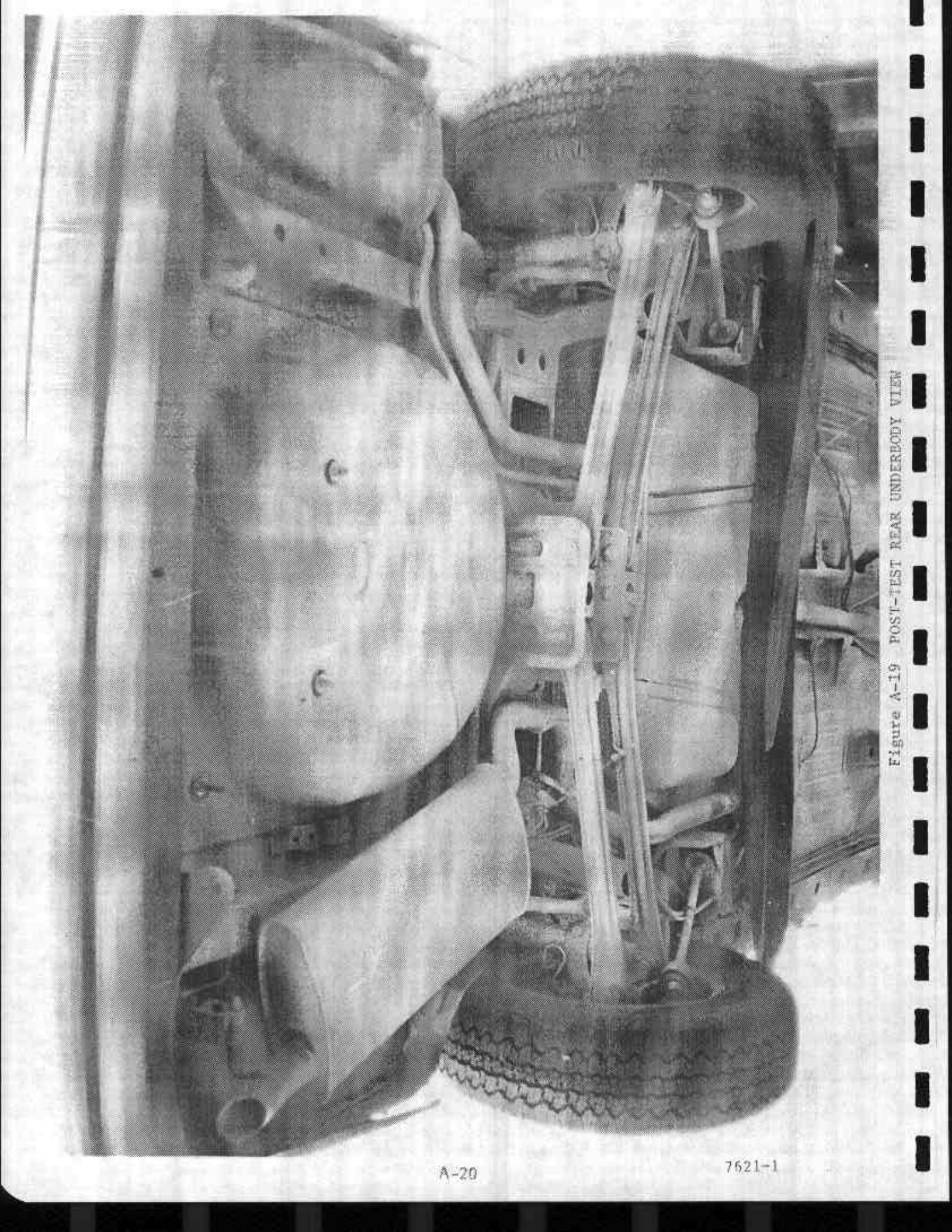


Figure A-19 POST-TEST REAR UNDERBODY VIEW

A-20

7621-1

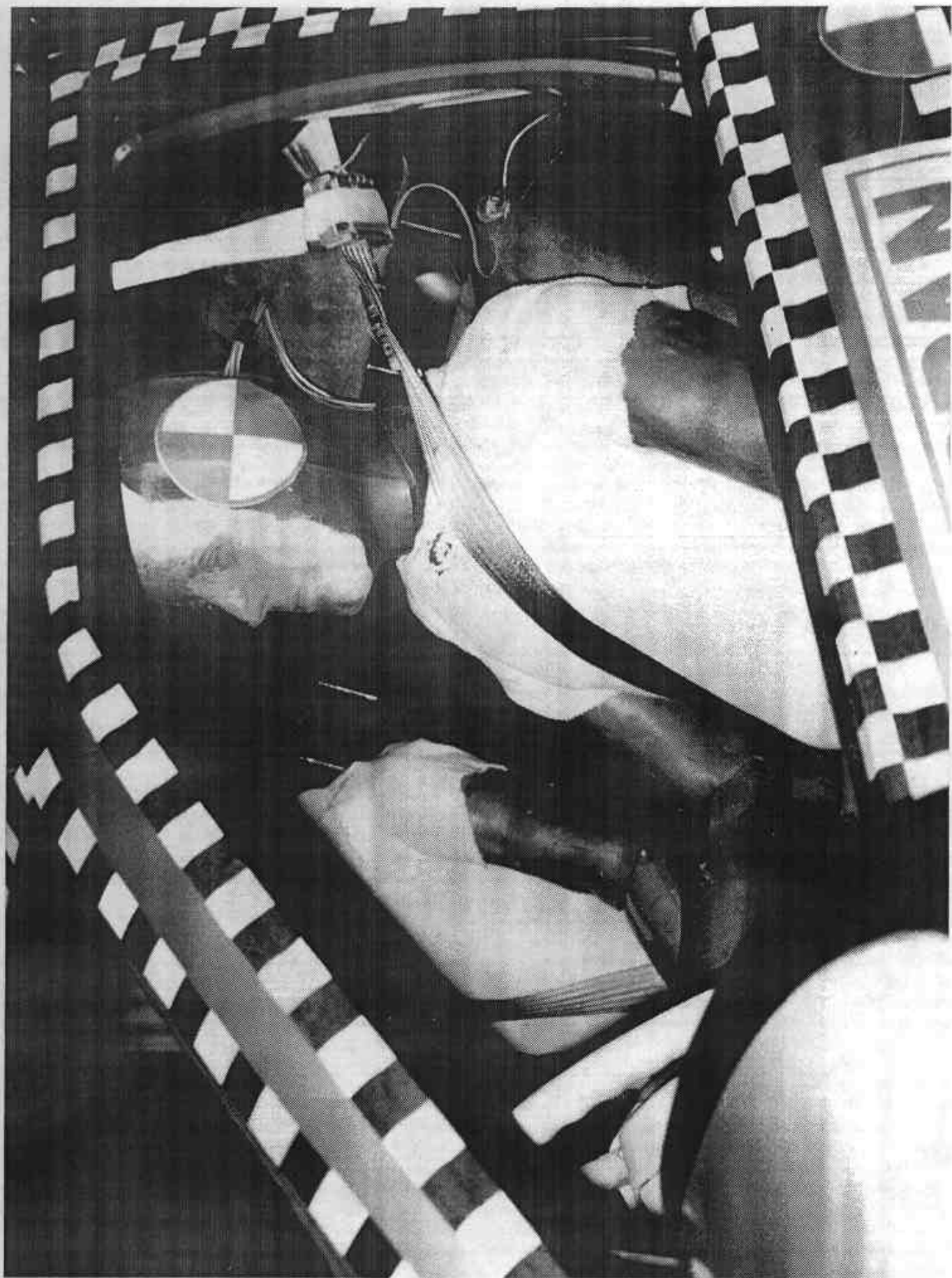


Figure A-20 PRE-TEST DRIVER POSITION VIEW

A-21

7621-1



Figure A-21 POST-TEST DRIVER POSITION VIEW

A-22

7621-1

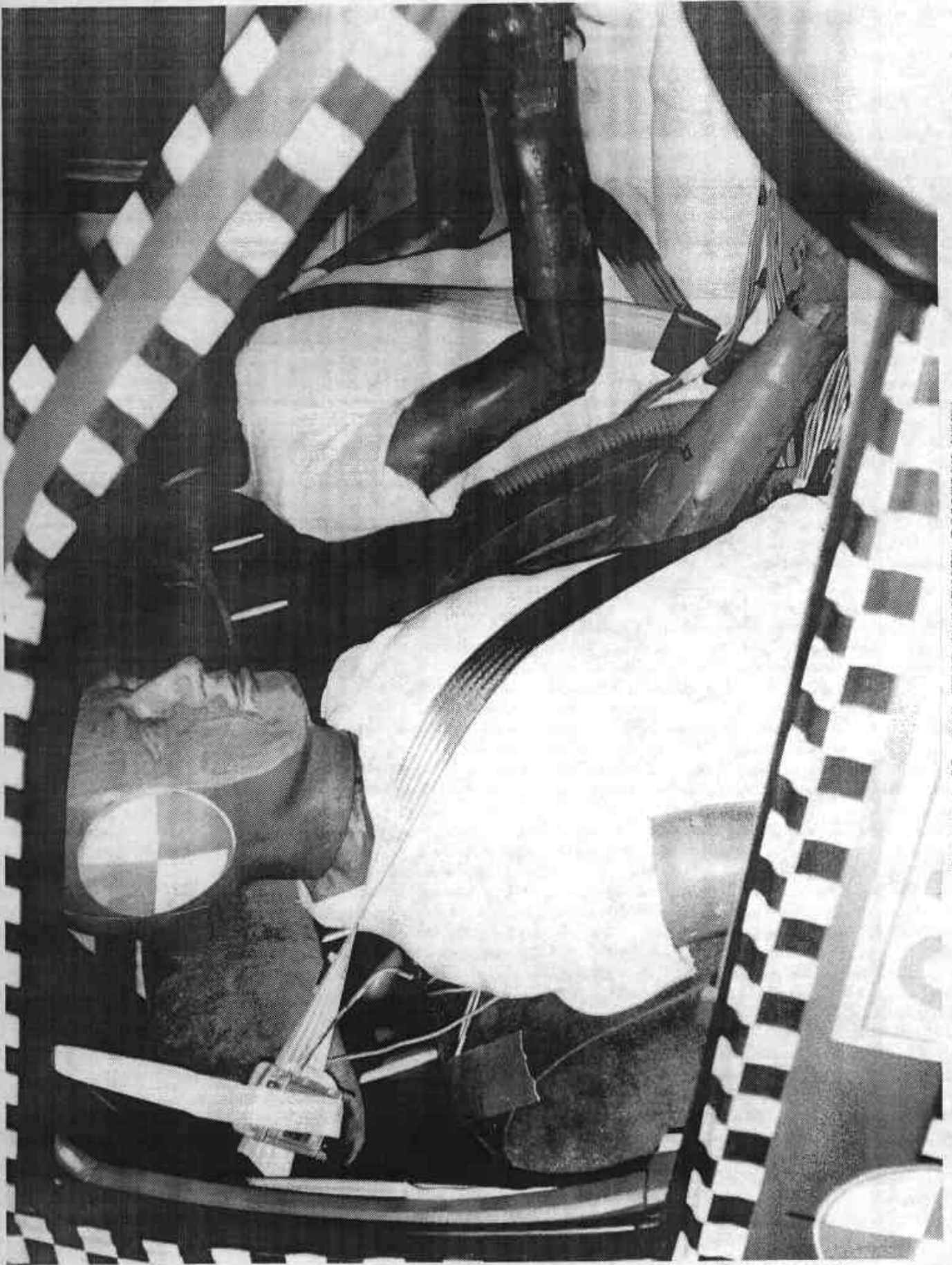


Figure A-22 PRE-TEST PASSENGER POSITION VIEW

A-23

7621-1



Figure A-23 POST-TEST PASSENGER POSITION VIEW

A-24

7621-1

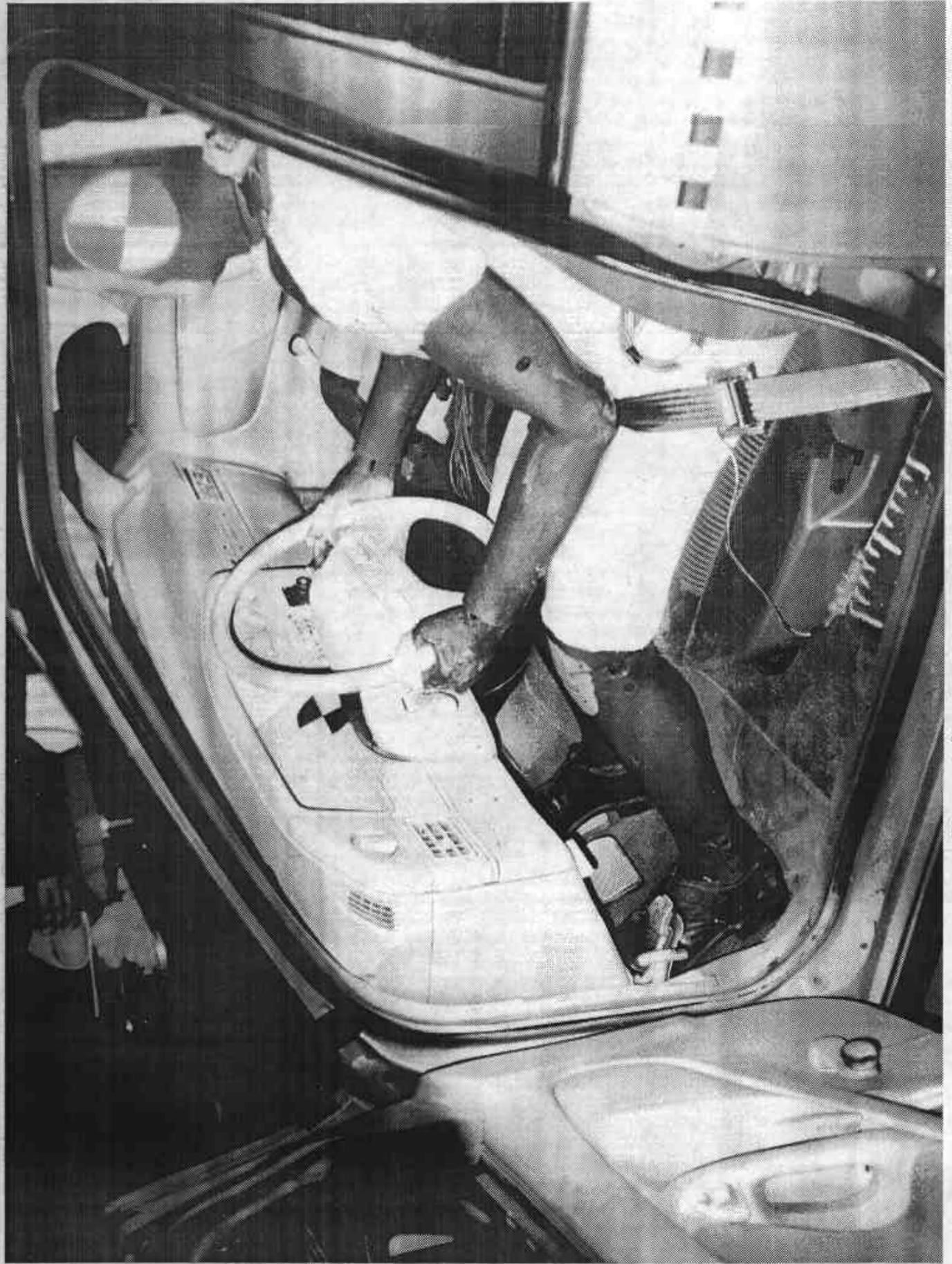


Figure A-24 PRE-TEST DRIVER AND INTERIOR VIEW

A-25

7621-1

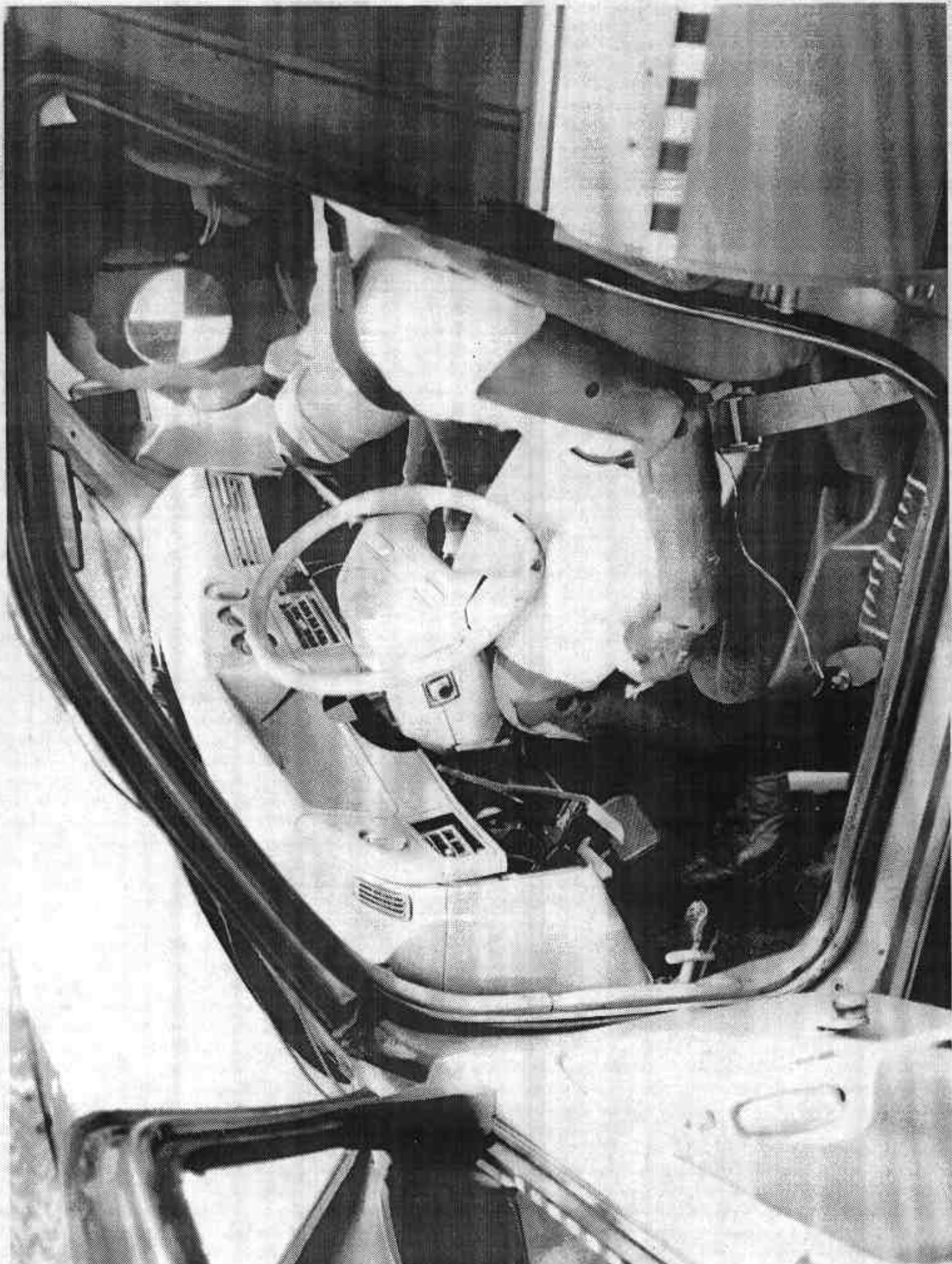


Figure A-25 POST-TEST DRIVER AND INTERIOR VIEW

A-26

7621-1



Figure A-26 PRE-TEST PASSENGER AND INTERIOR VIEW

A-27

7621-1



Figure A-27 POST-TEST PASSENGER AND INTERIOR VIEW

**Appendix B**

**VEHICLE, DEFORMABLE MOVING BARRIER AND DUMMY RESPONSE DATA**

TEST NO. 294-010-798

VEHICLE DATA

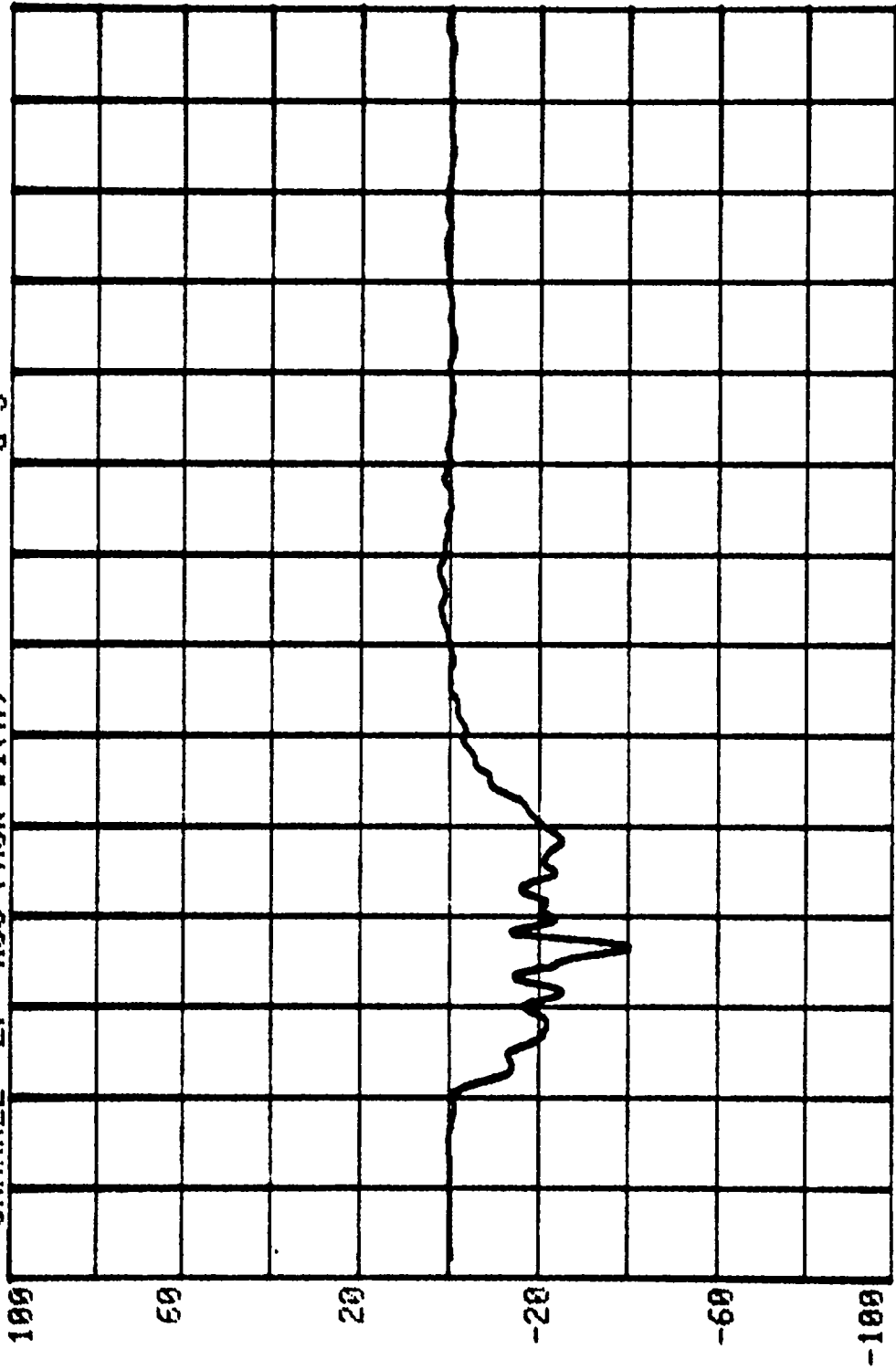
FILTER CHANNEL CLASS

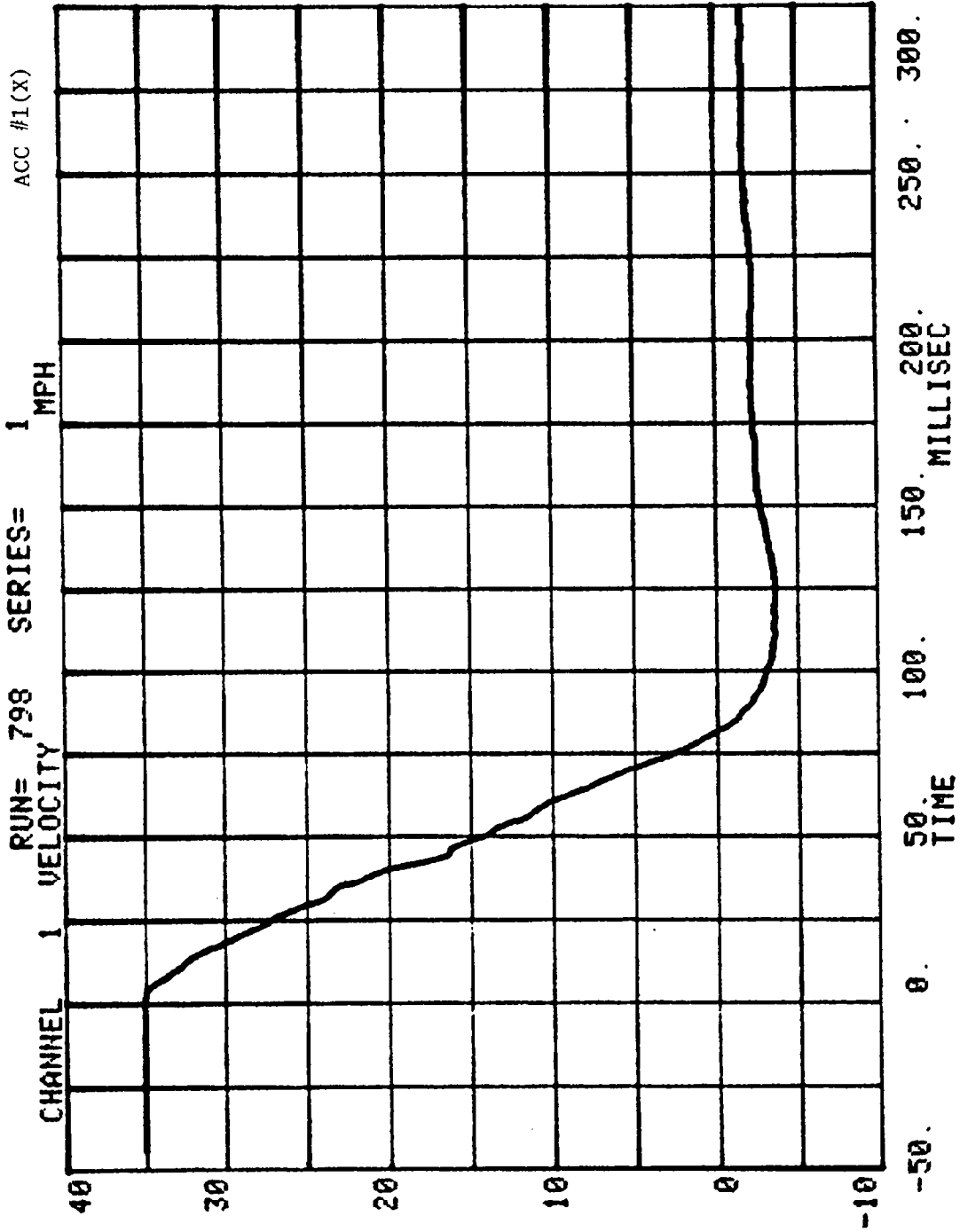
60

B-2

7621-1

CHANNEL 27 ACC PACK #1(X) RUN= 798 SERIES= 1 G'S





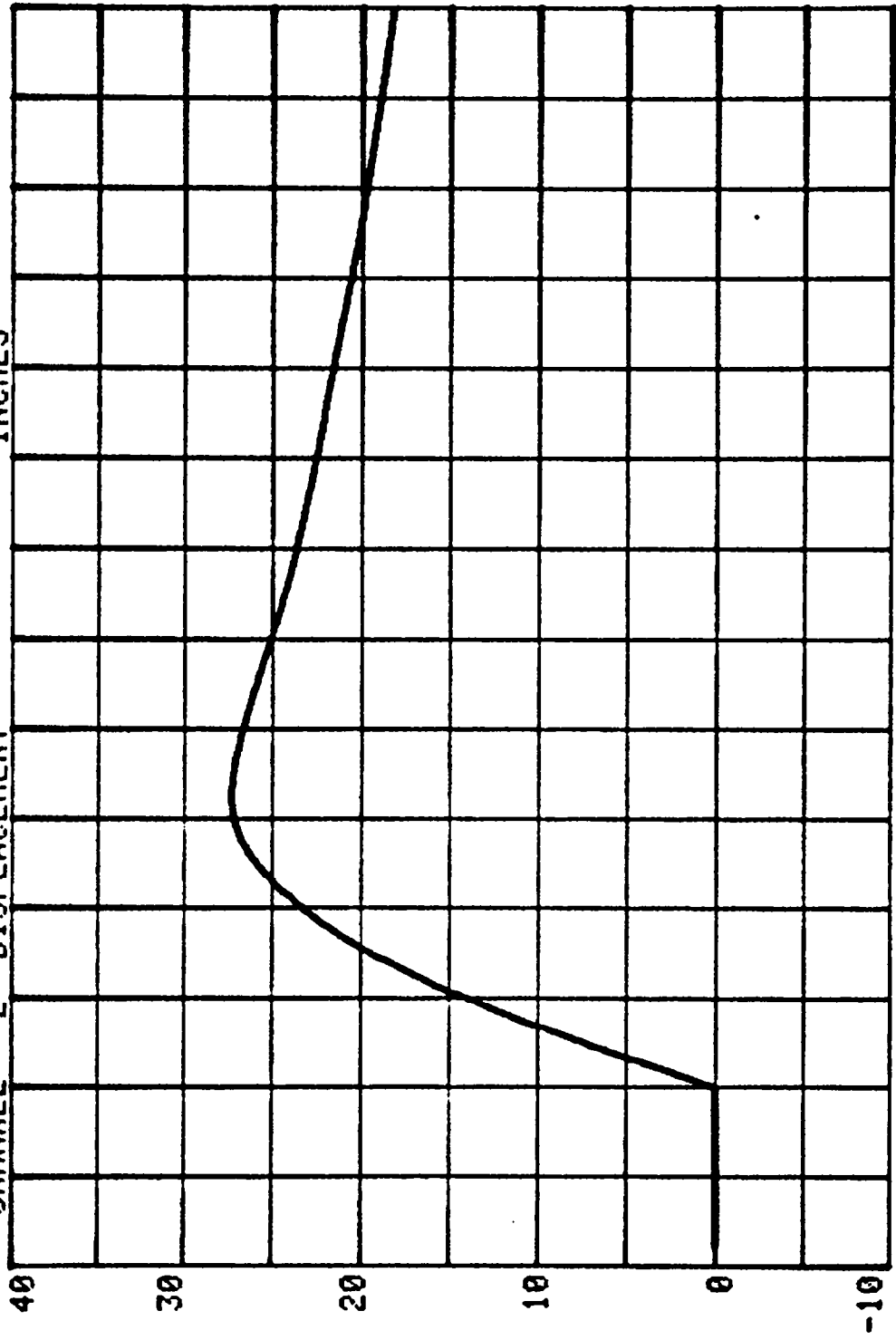
CHANNEL 2 DISPLACEMENT

RUN= 798

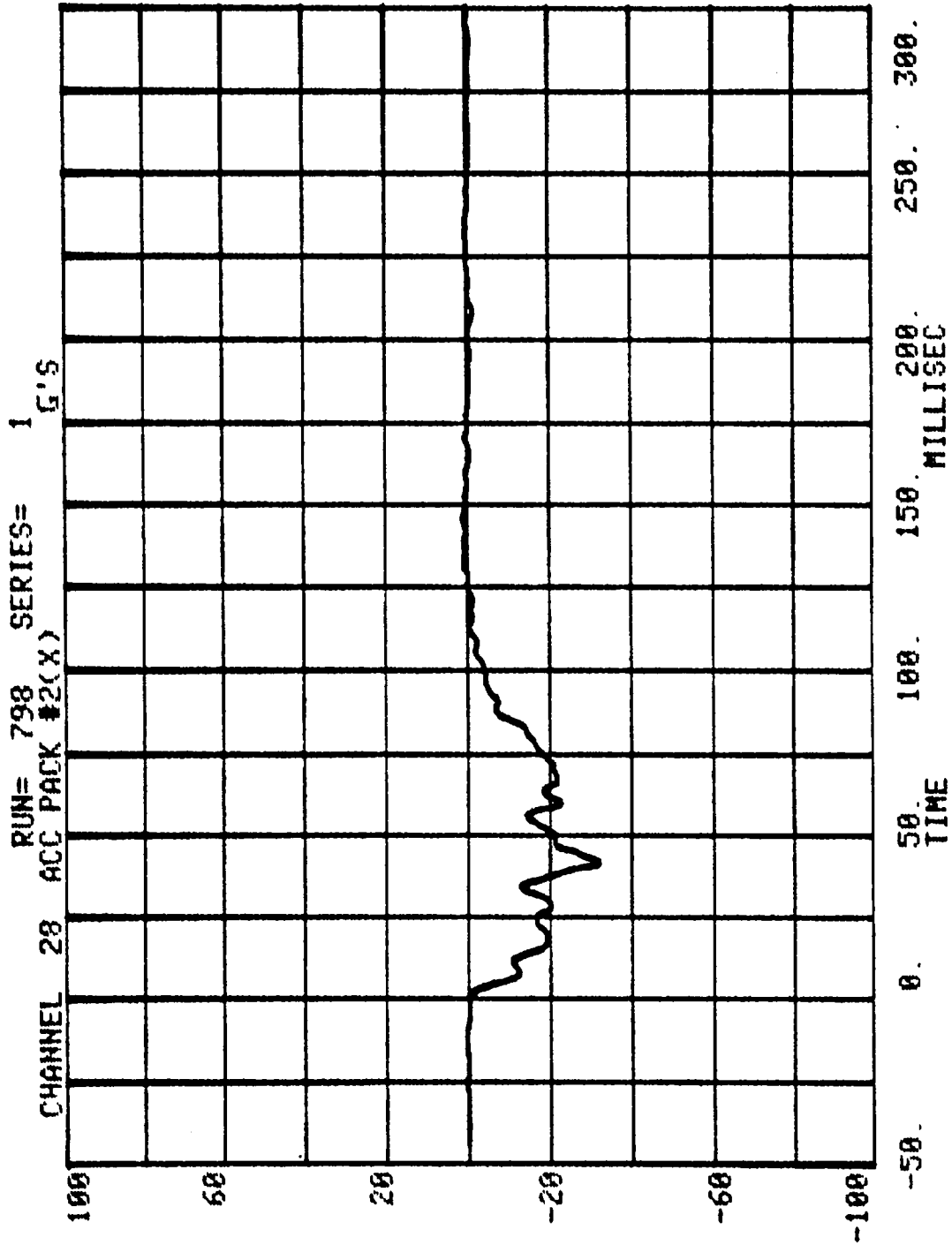
SERIES=

1 INCHES

ACC #1(X)



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



ACC #2(X)

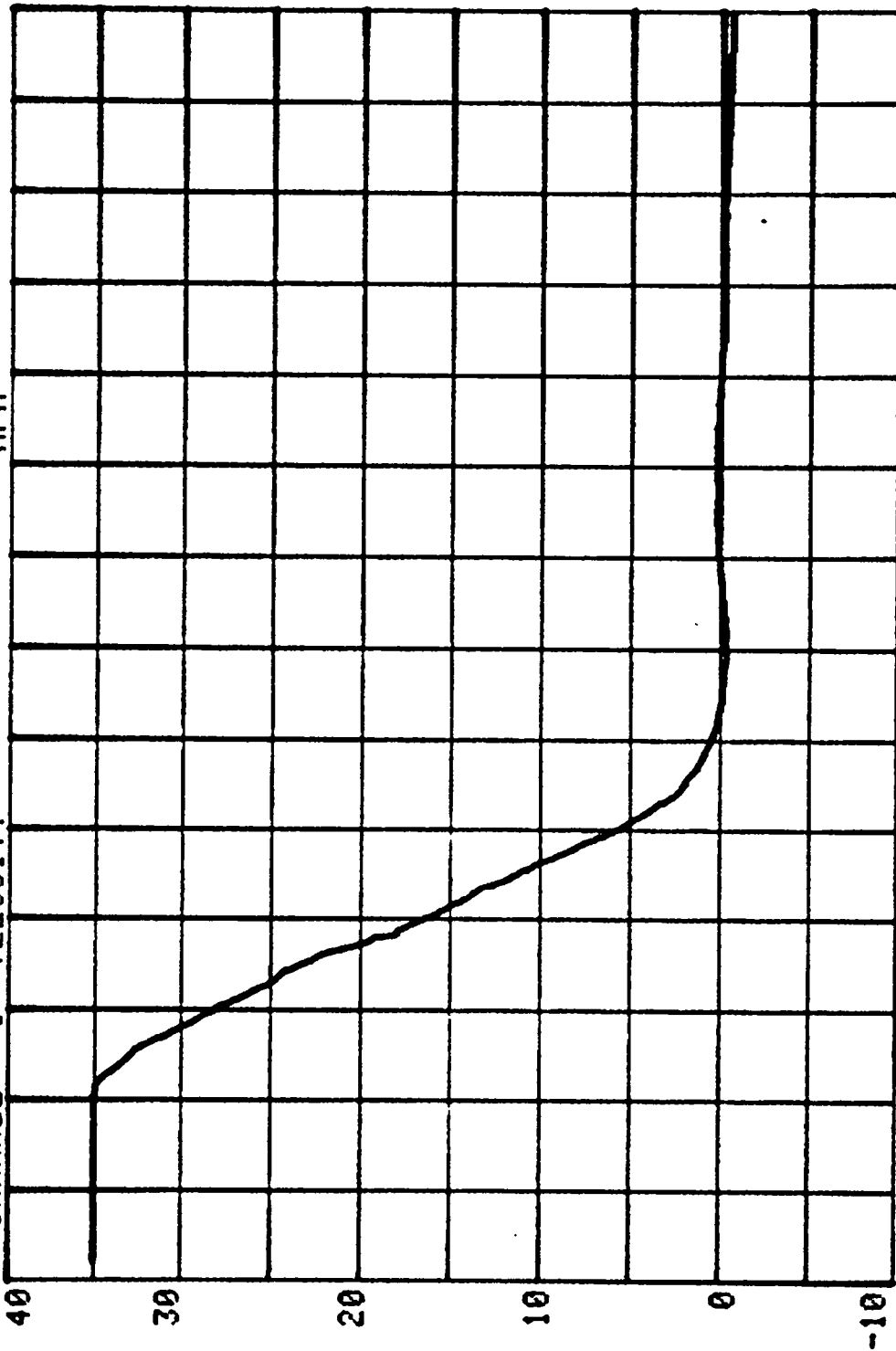
1 MPH

SERIES=

RUN= 798

3

CHANNEL VELOCITY

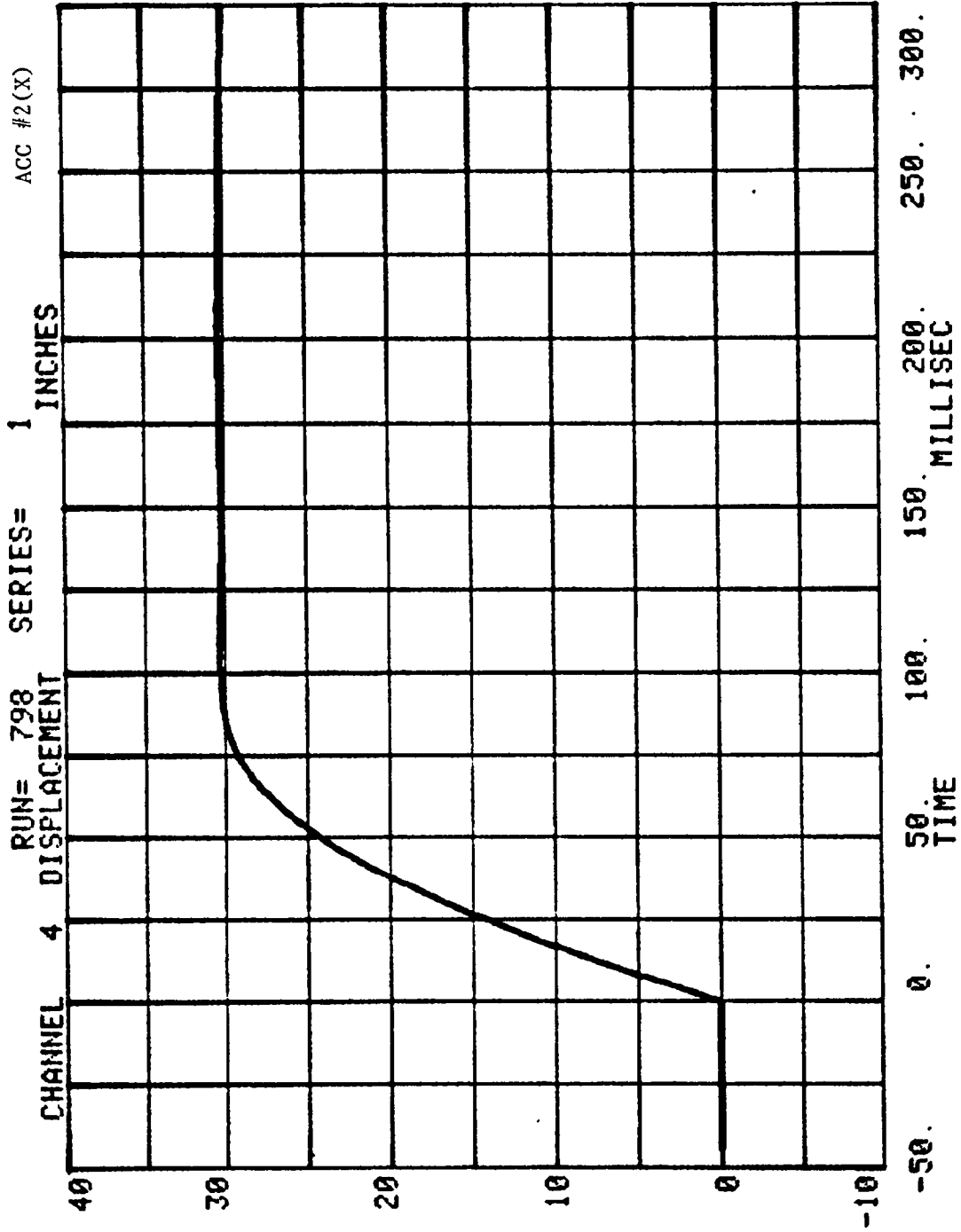


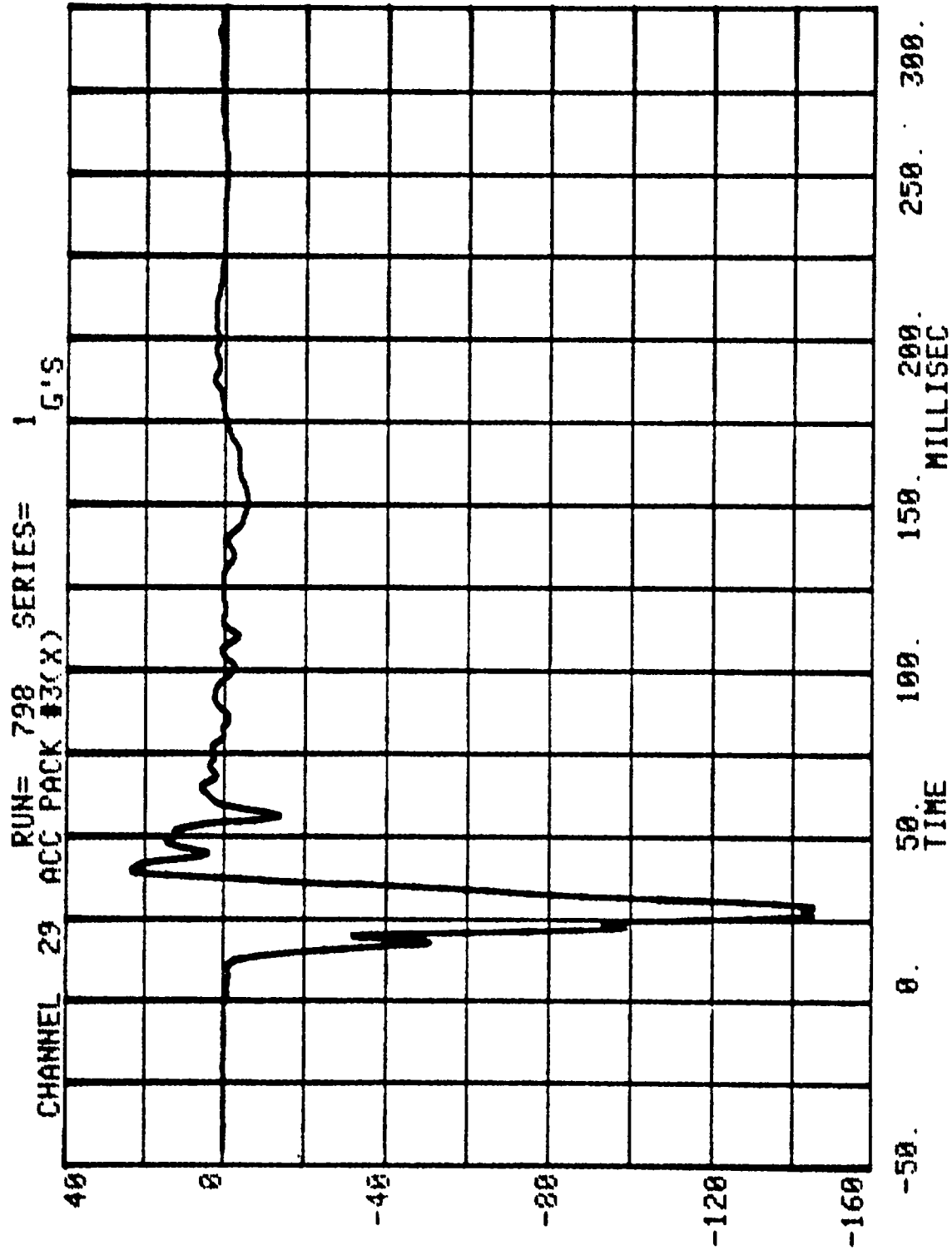
250. 300.

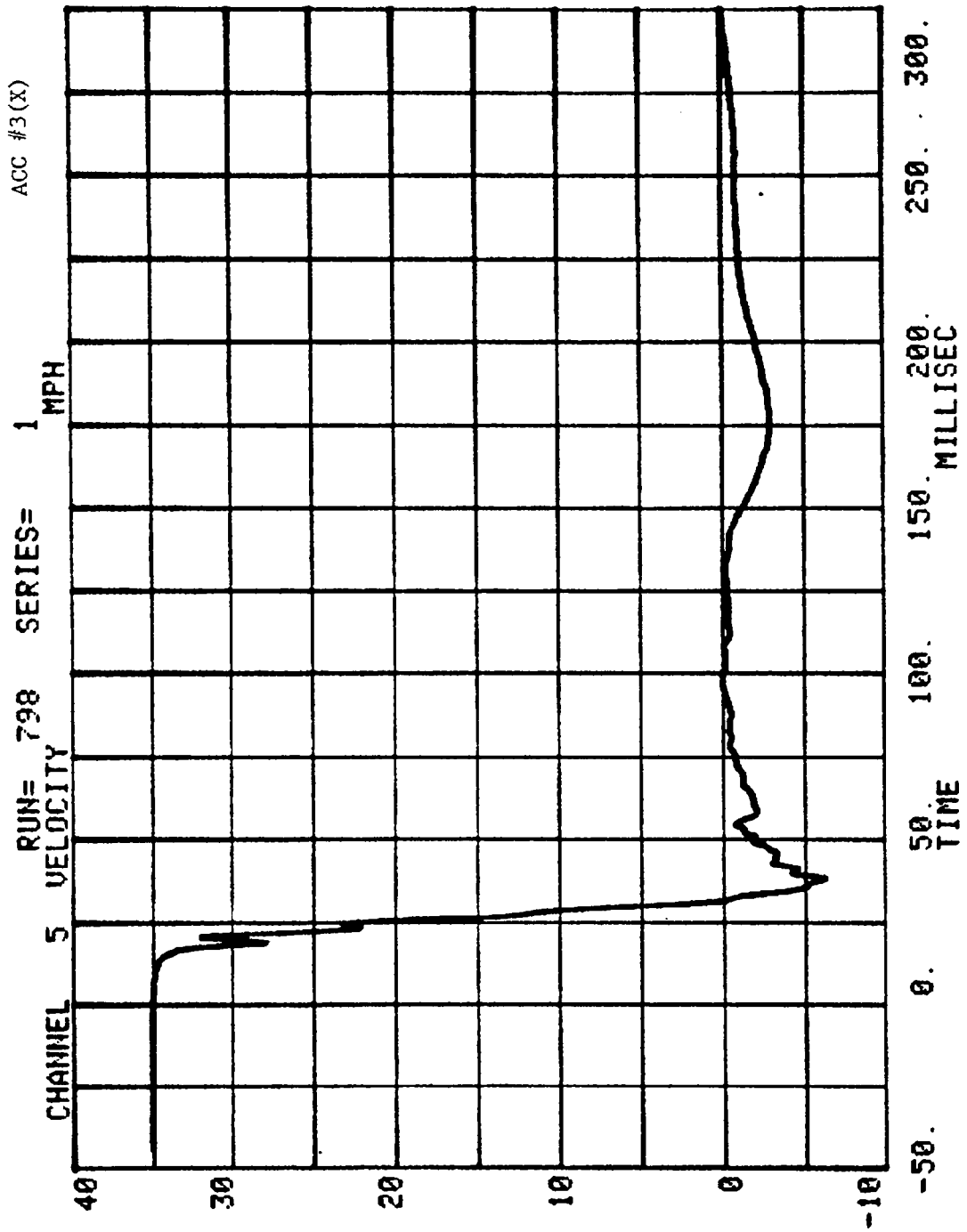
150. 200. MILLISEC

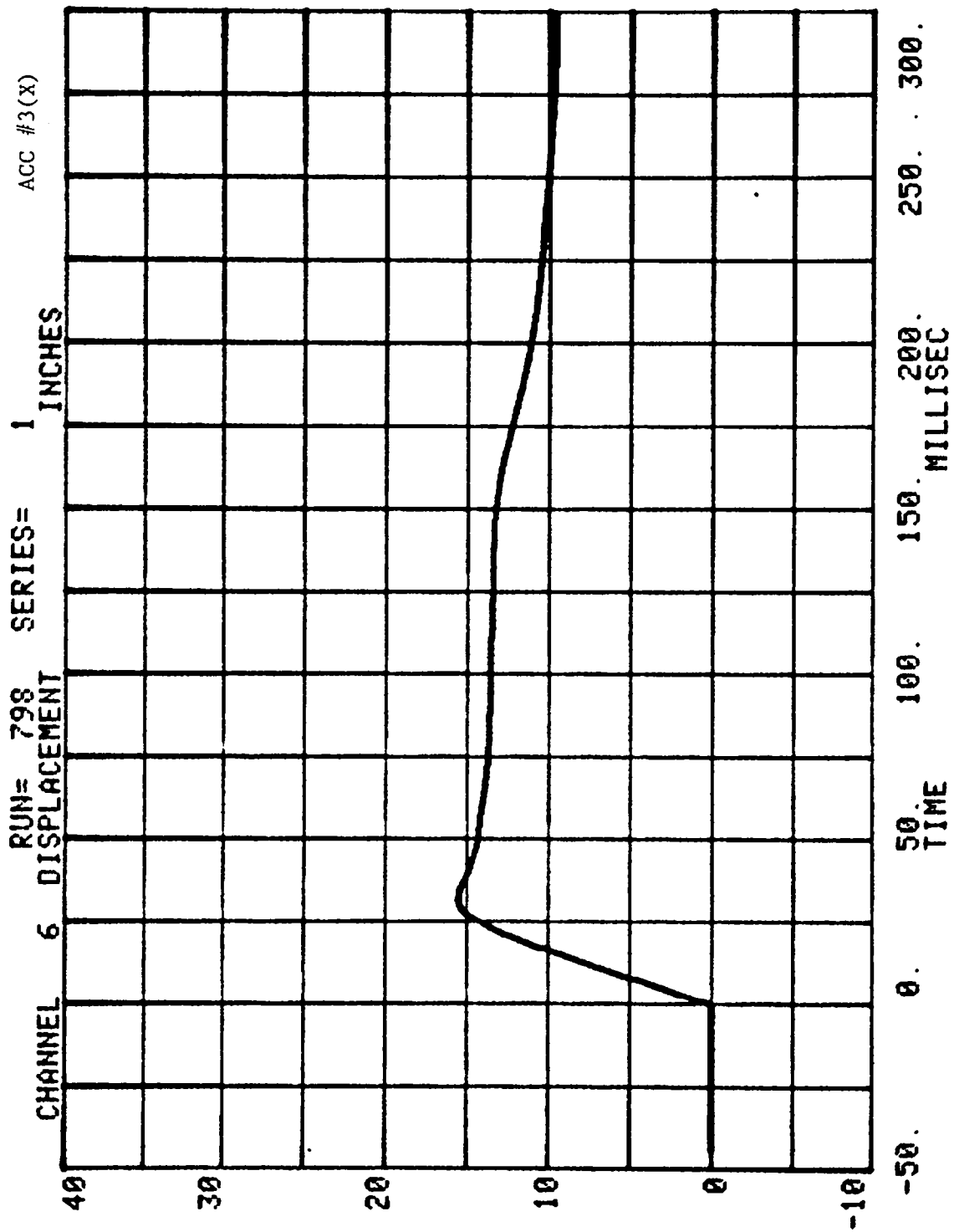
100. 50. TIME

0. -50.

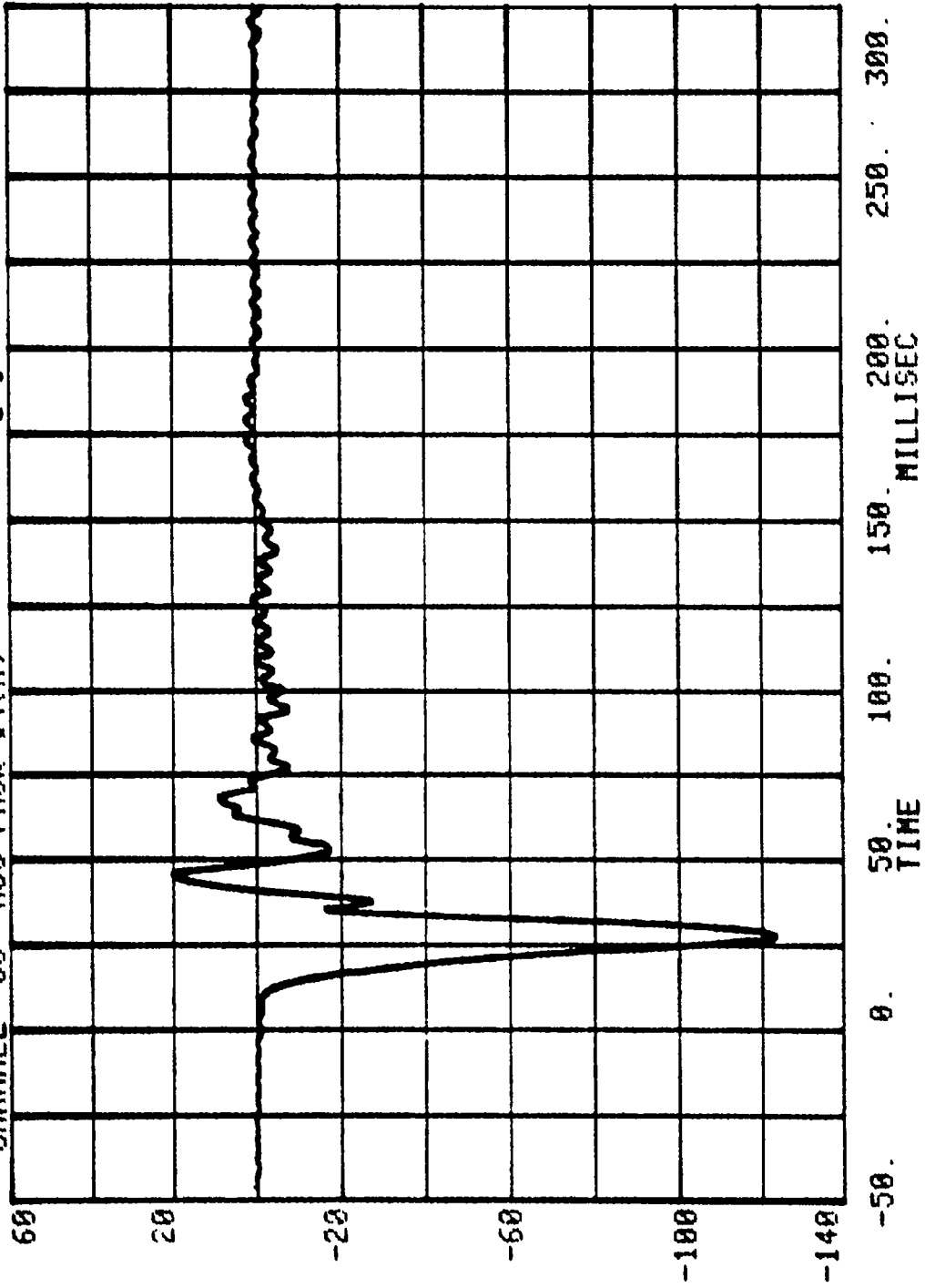


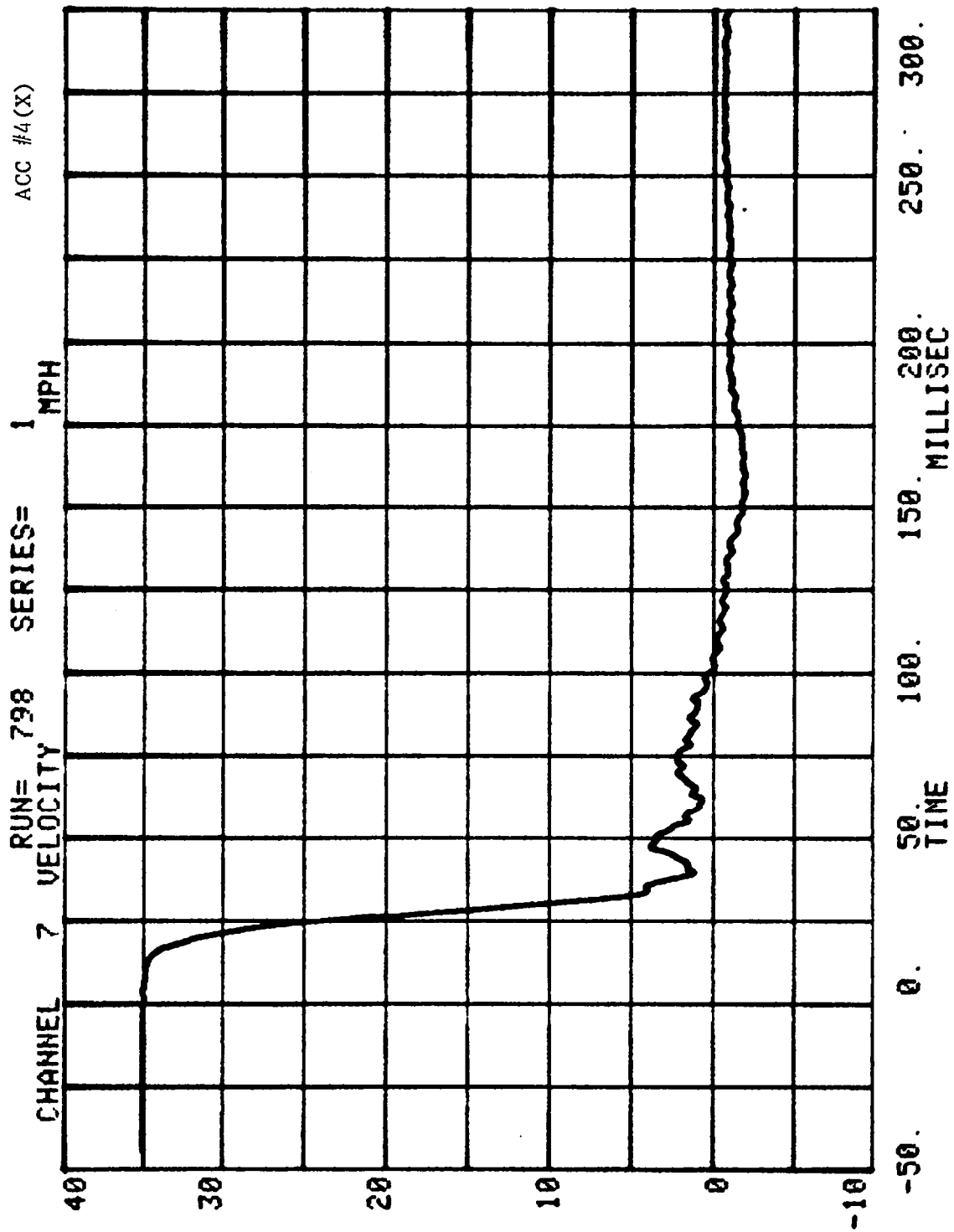


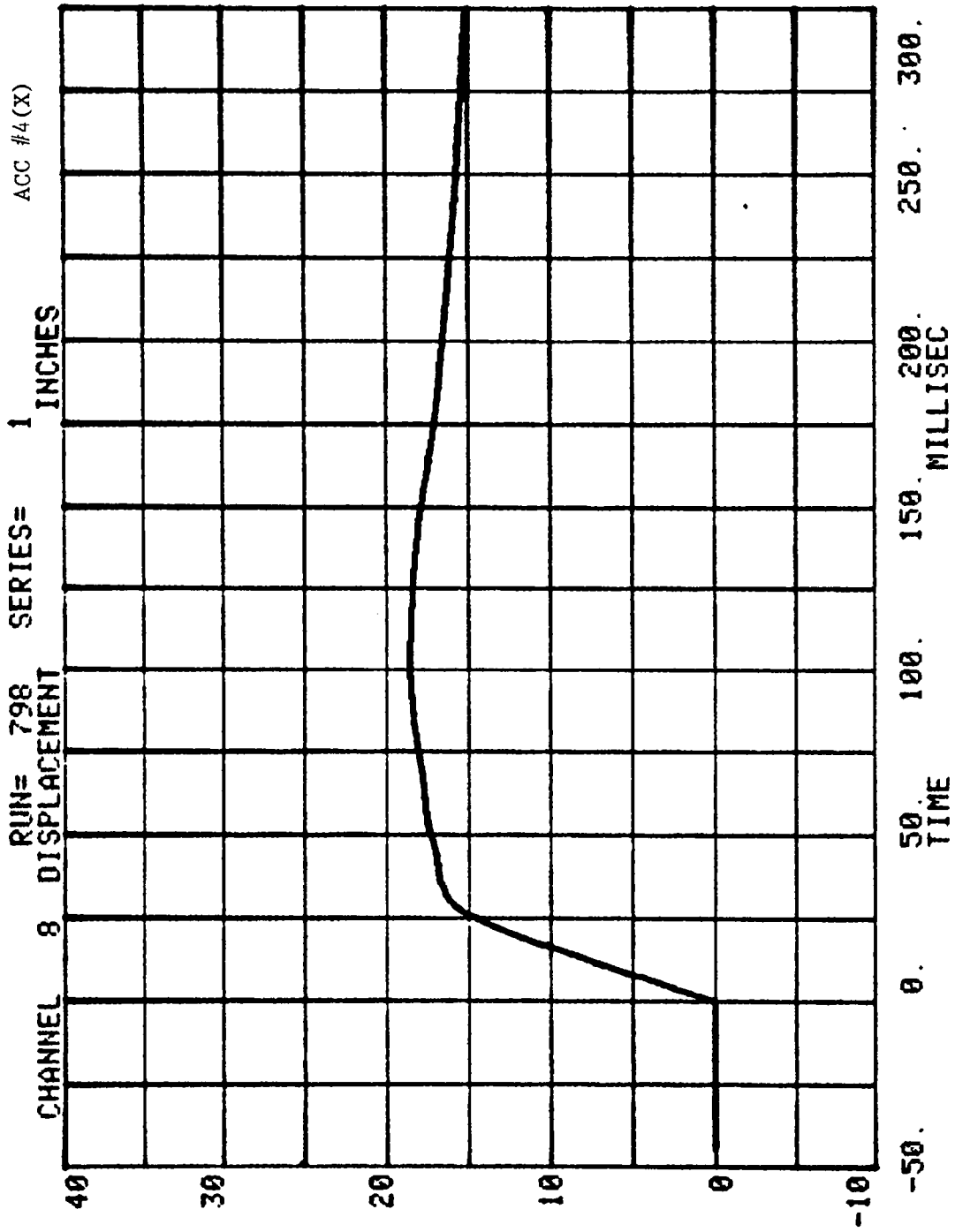




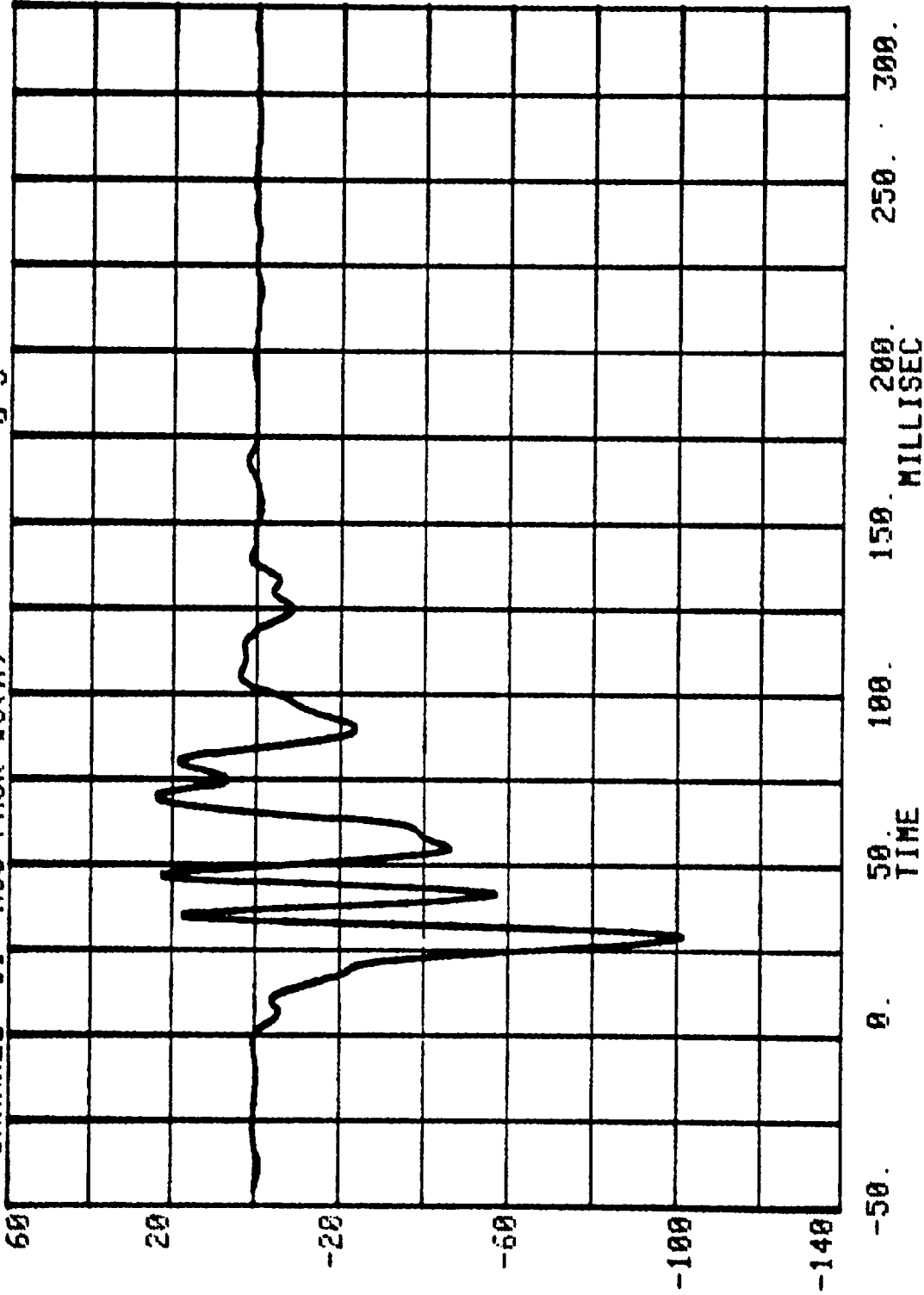
RUN= 798 SERIES= 1 G'S  
CHANNEL 30 ACC PACK #4(X)

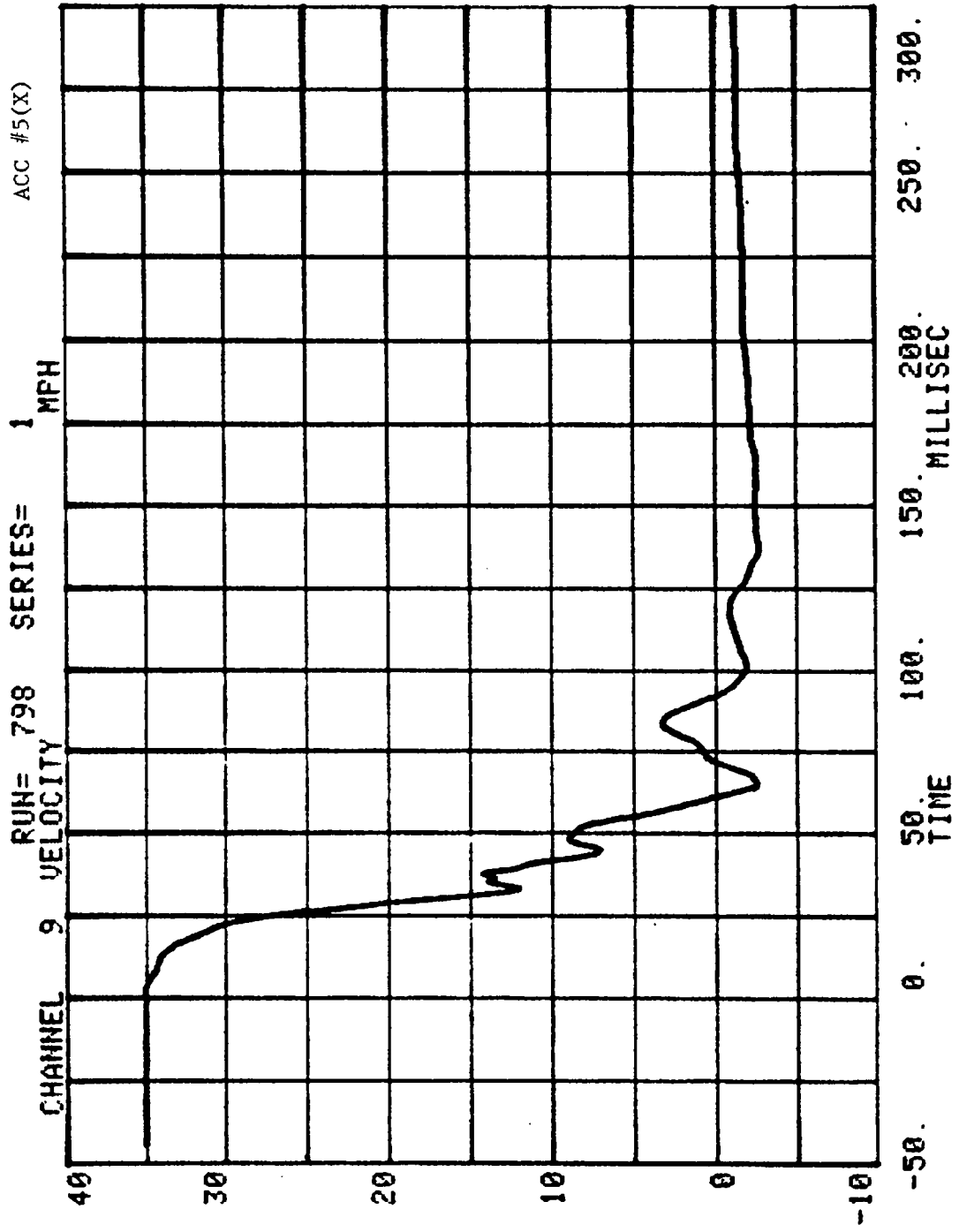


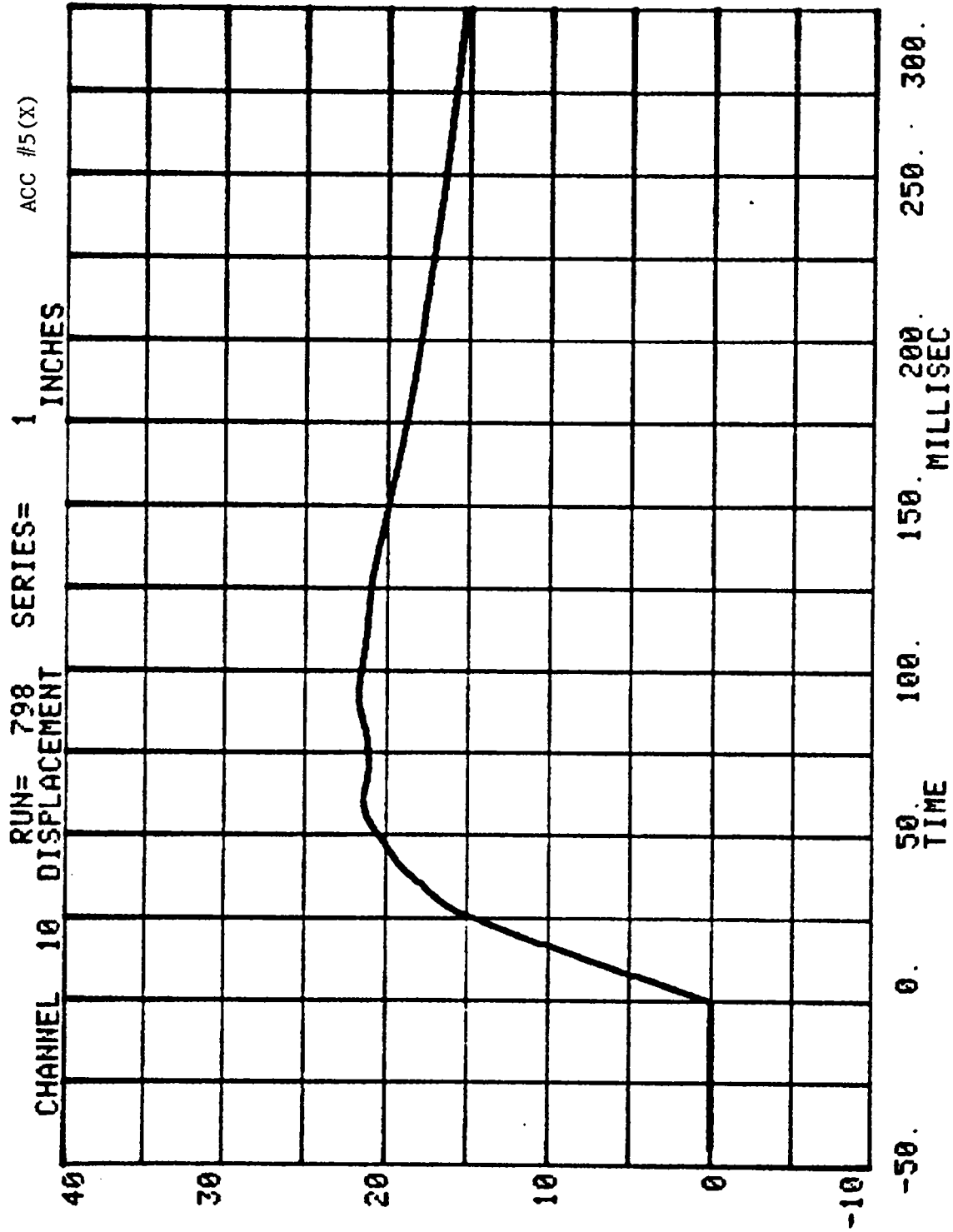


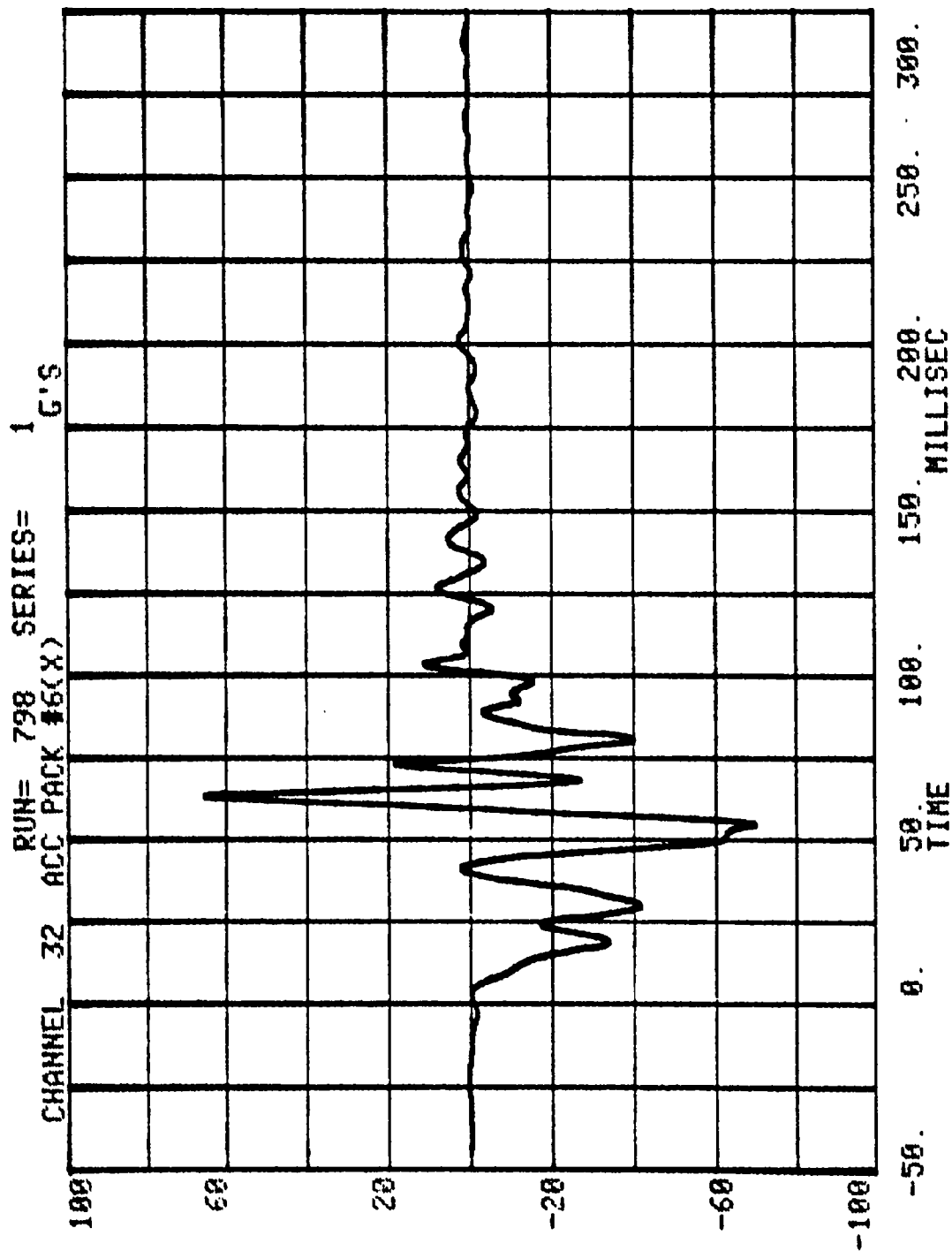


CHANNEL 31 ACC PACK #5(X) RUN= 798 SERIES= 1 G'S









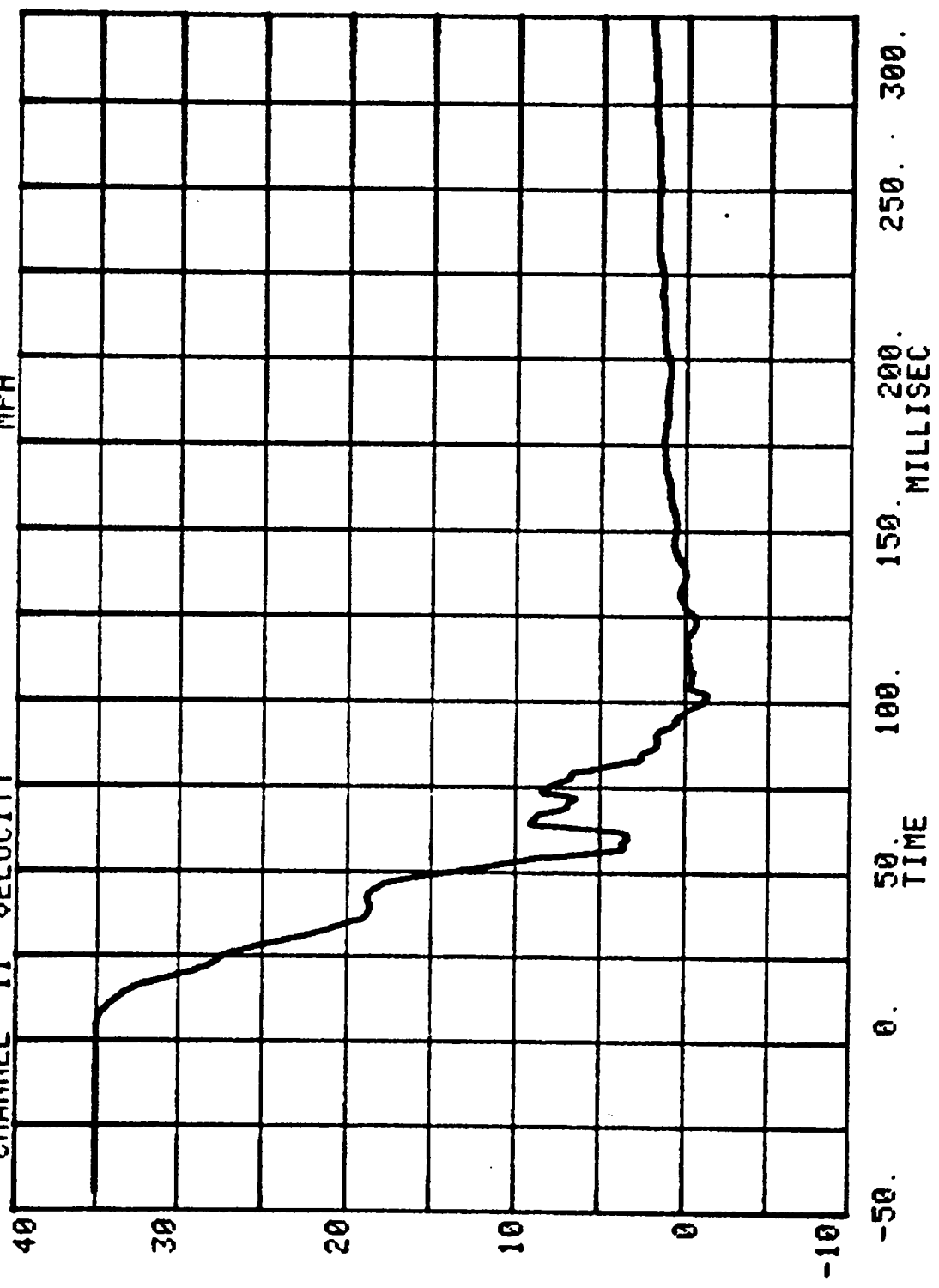
ACC #6(X)

1 MPH

SERIES=

RUN= 798

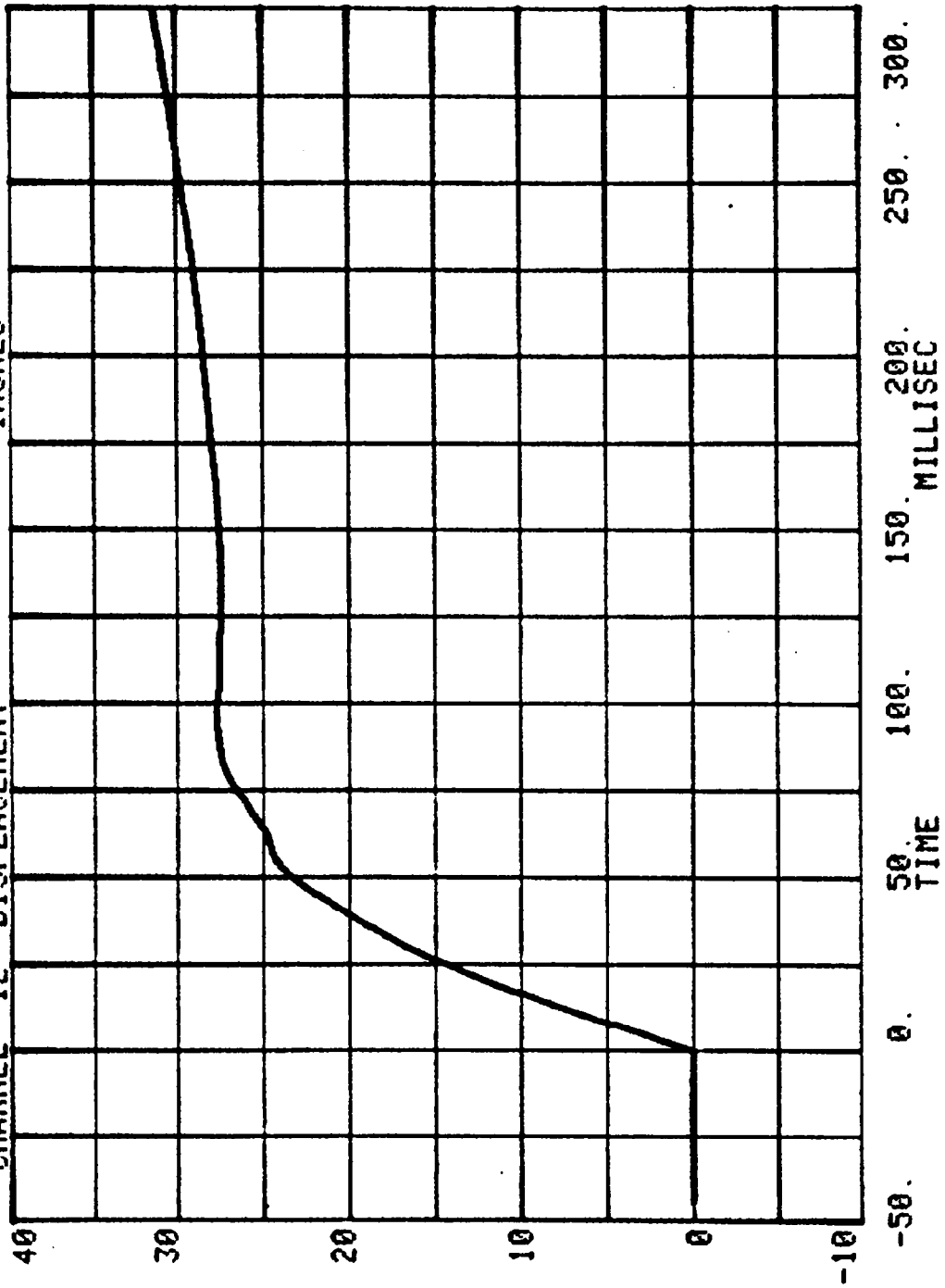
CHANNEL 11 VELOCITY



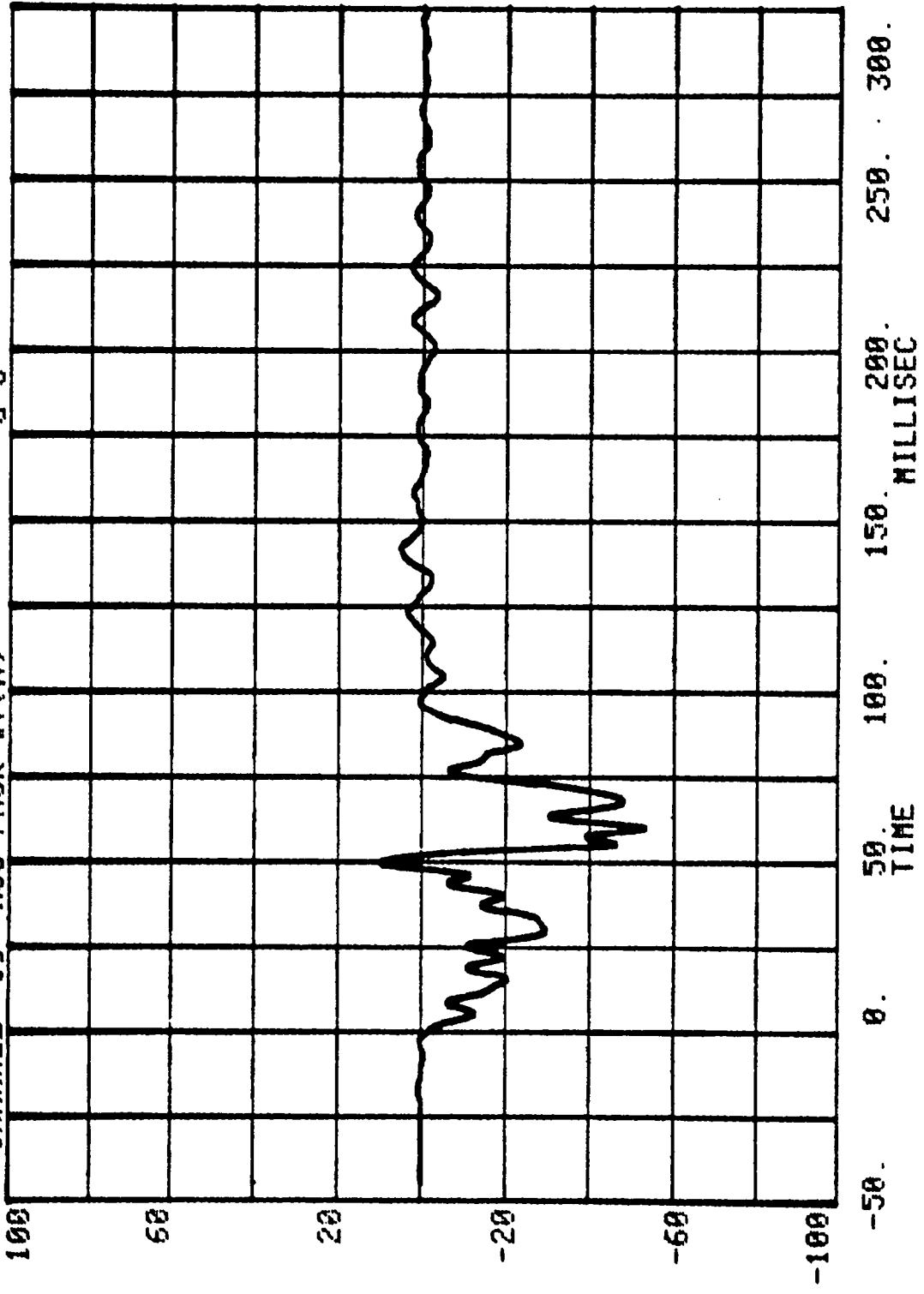
ACC #6(X)

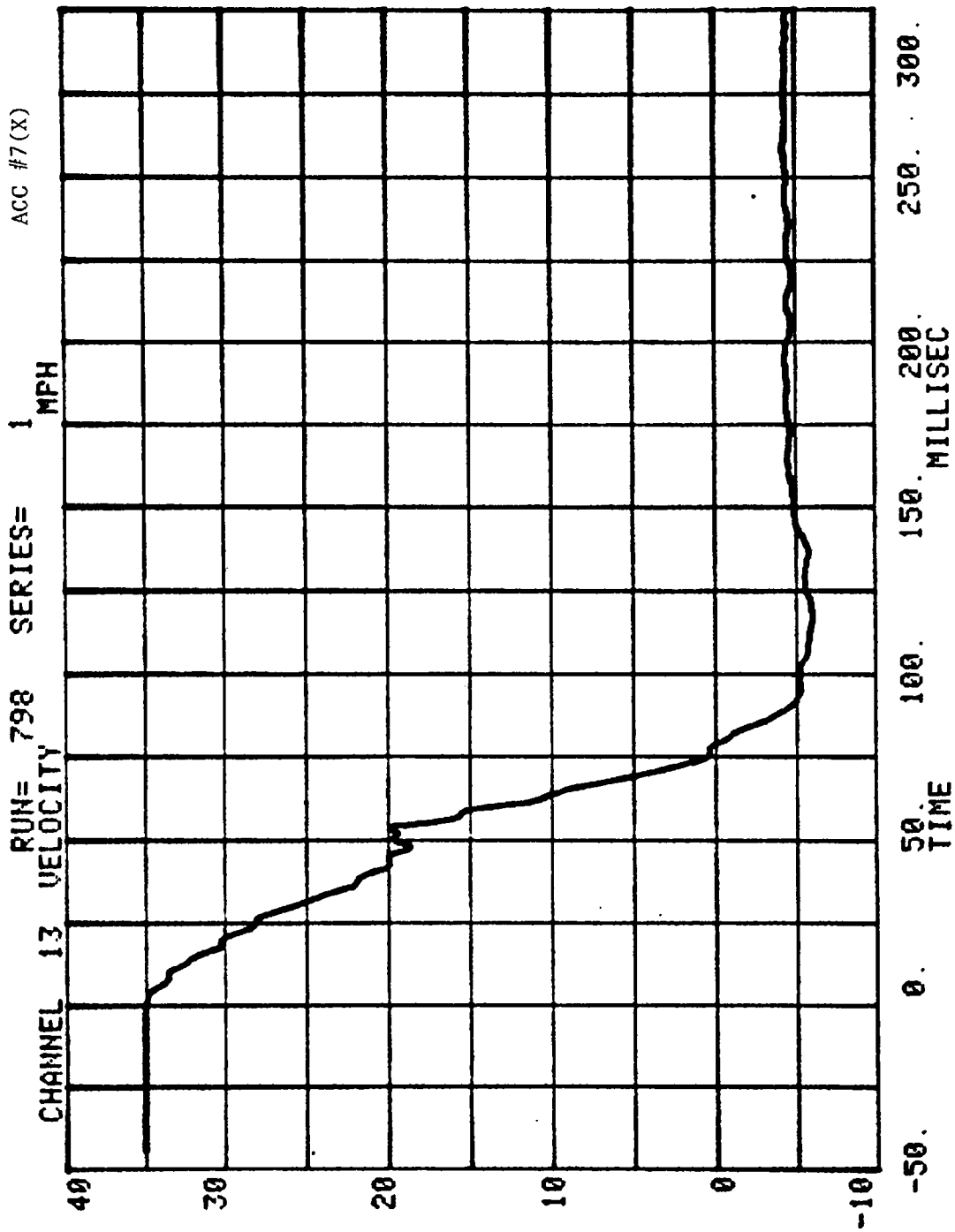
SERIES= 1 INCHES

RUN= 798  
CHANNEL 12 DISPLACEMENT



CHANNEL 33 ACC PACK #7(X) RUN= 798 SERIES= 1 G'S



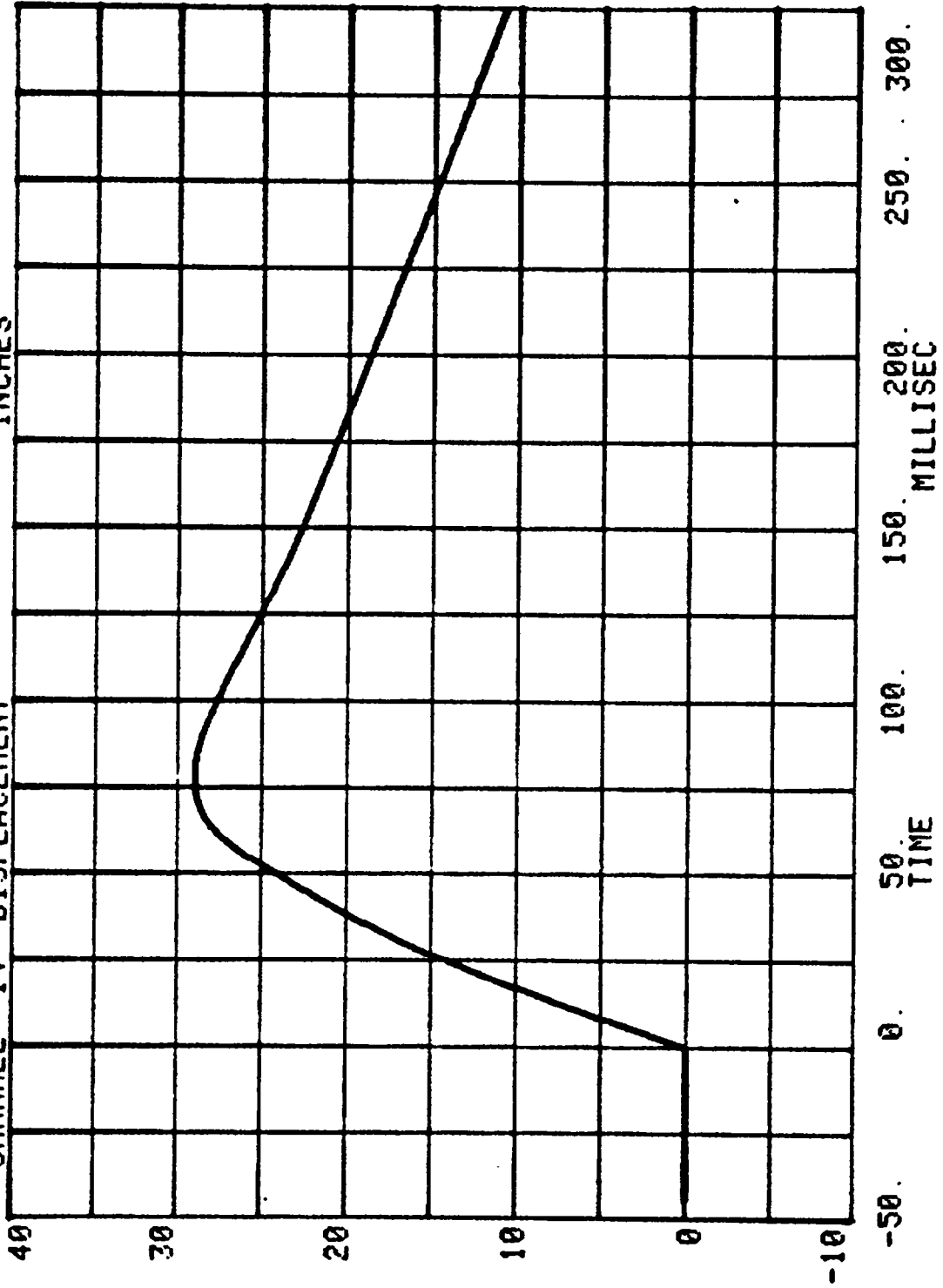


ACC #7(X)

SERIES= 1 INCHES

RUN= 798

CHANNEL 14 DISPLACEMENT



TEST NO. 294-010-798

DUMMY DATA

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

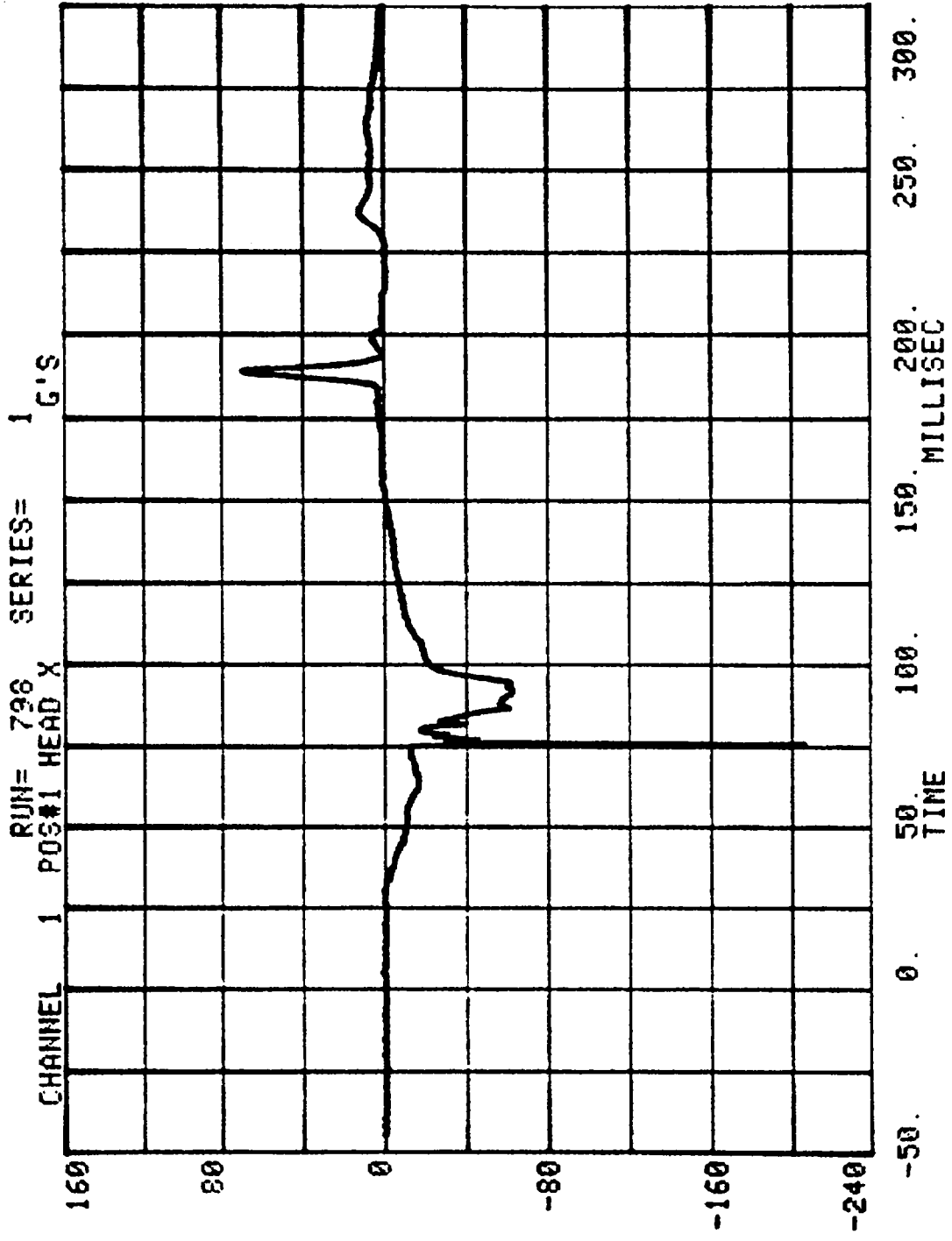
HEAD INJURY CRITERION  
HEAD SEVERITY INDEX  
36MS. MAXIMUM DURATION

NEW CAR ASSESSMENT BARRIER TEST - 1987

RUN= 798

POS#1 HEAD R

HIC= 707.4 FROM T1= .06547 TO T2= .09990  
AVERAGE ACCELERATION BETWEEN T1 AND T2= 53.16'S  
EVENT TIME= 300.0 MSEC  
SEVERITY INDEX=1167.3

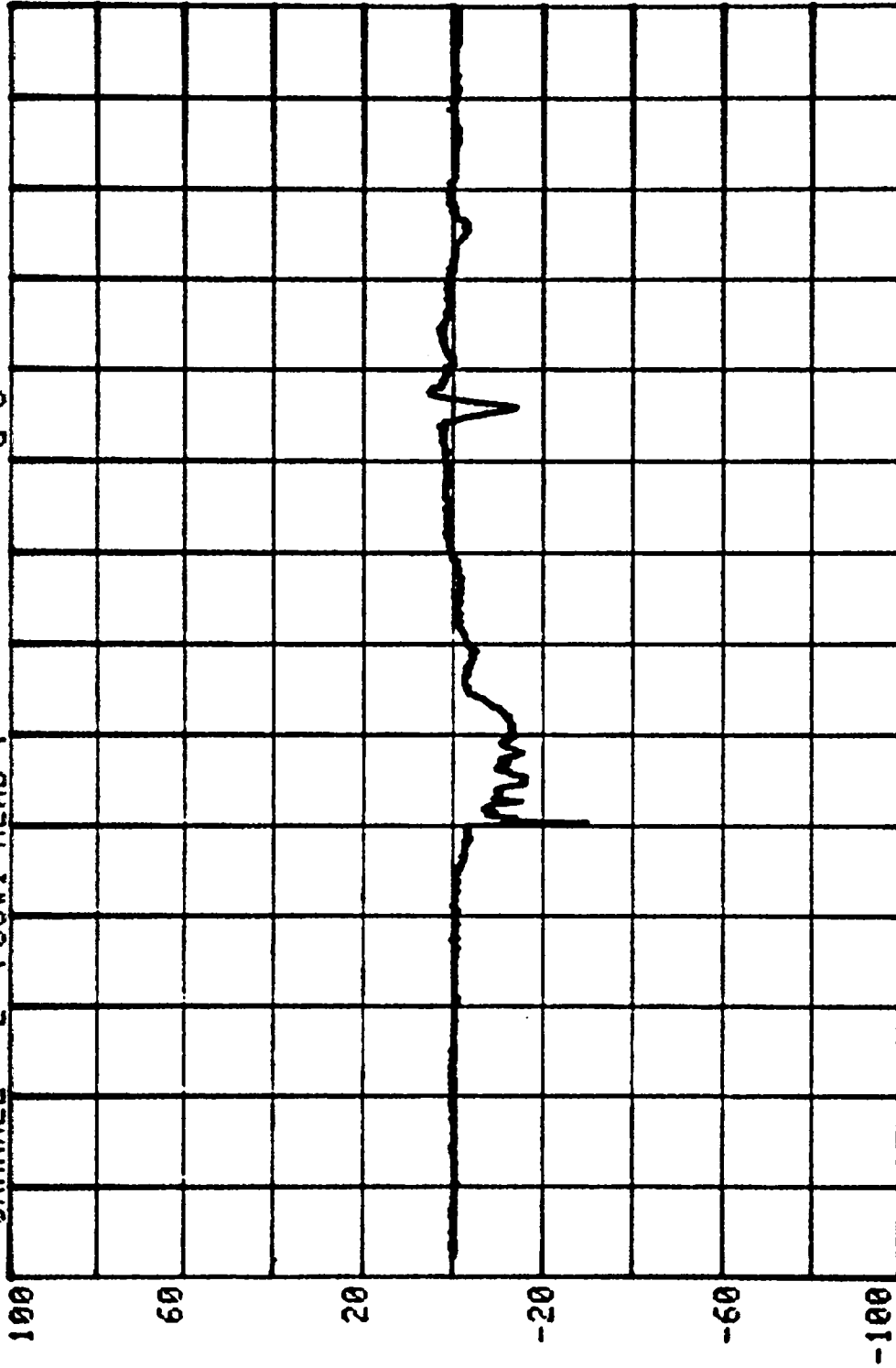


CHANNEL 2 POS#1 HEAD Y

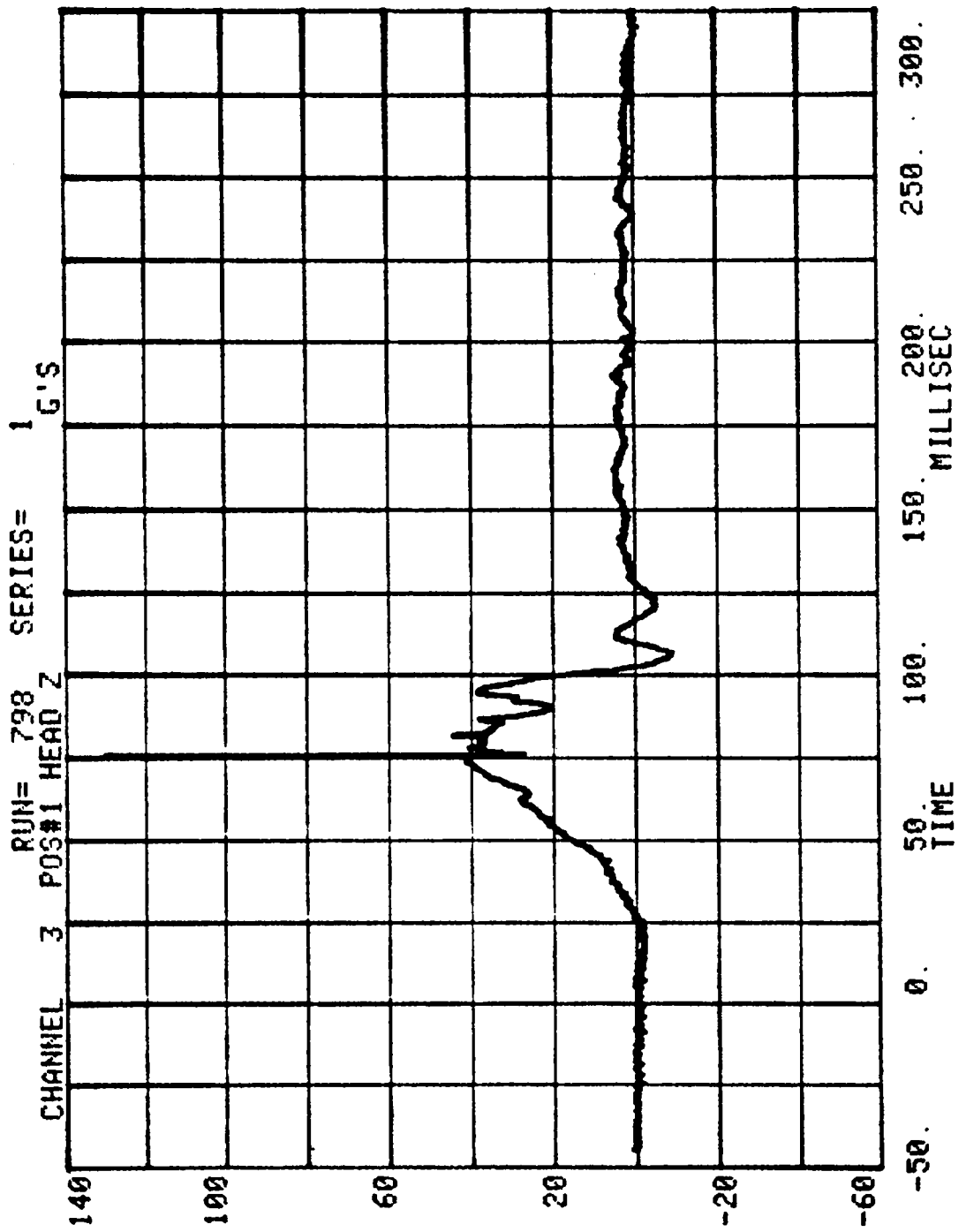
RUN= 738

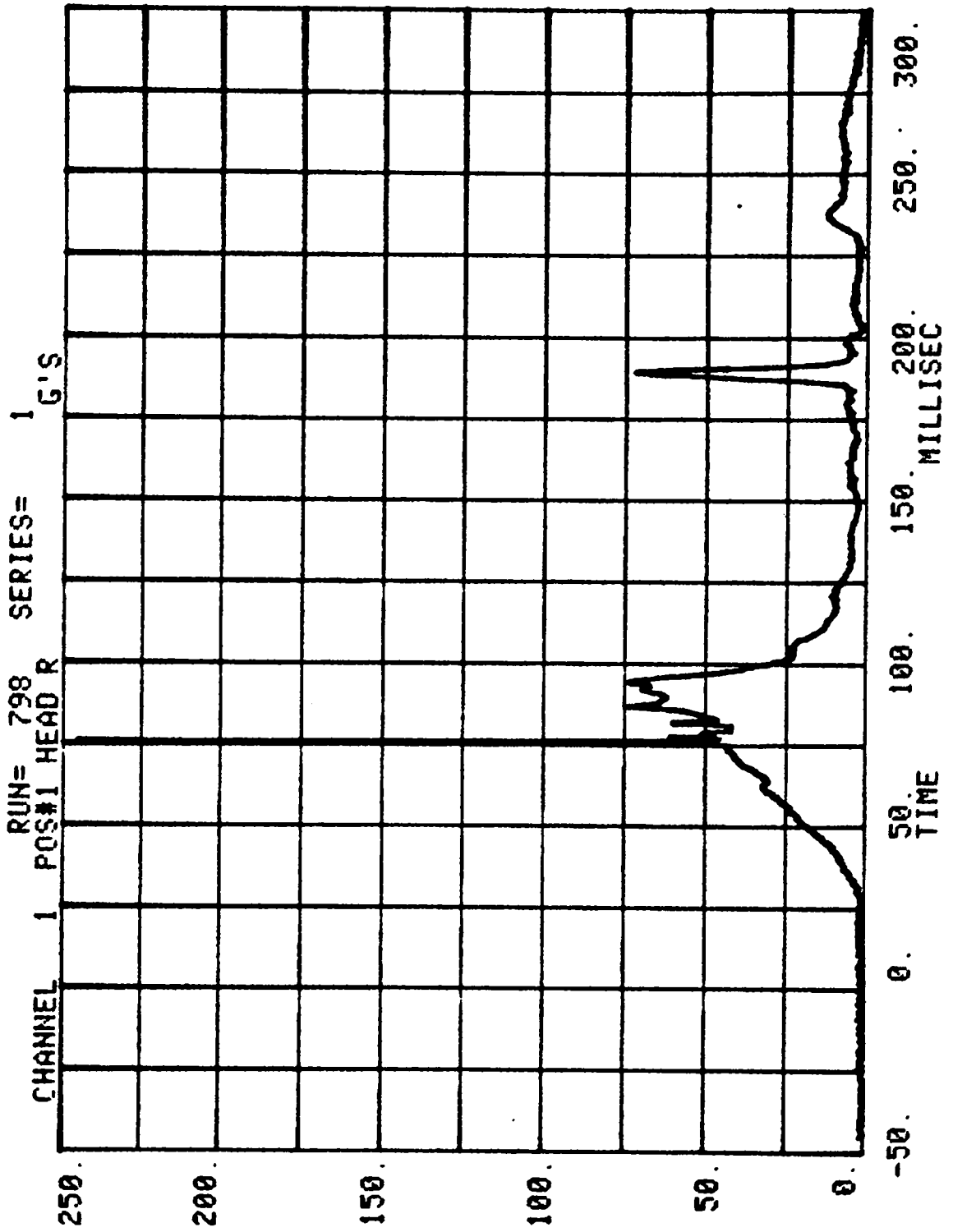
SERIES=

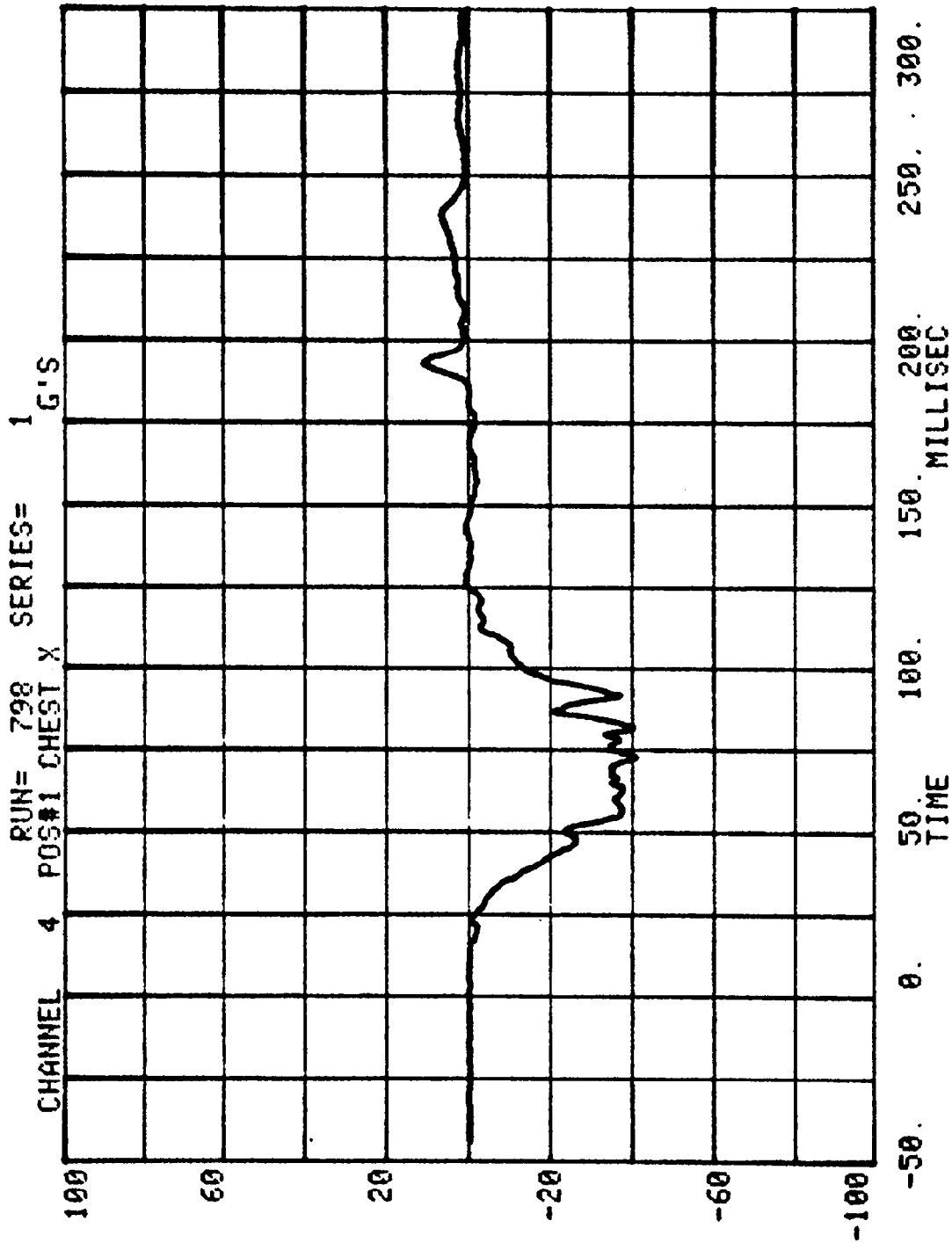
1 G'S

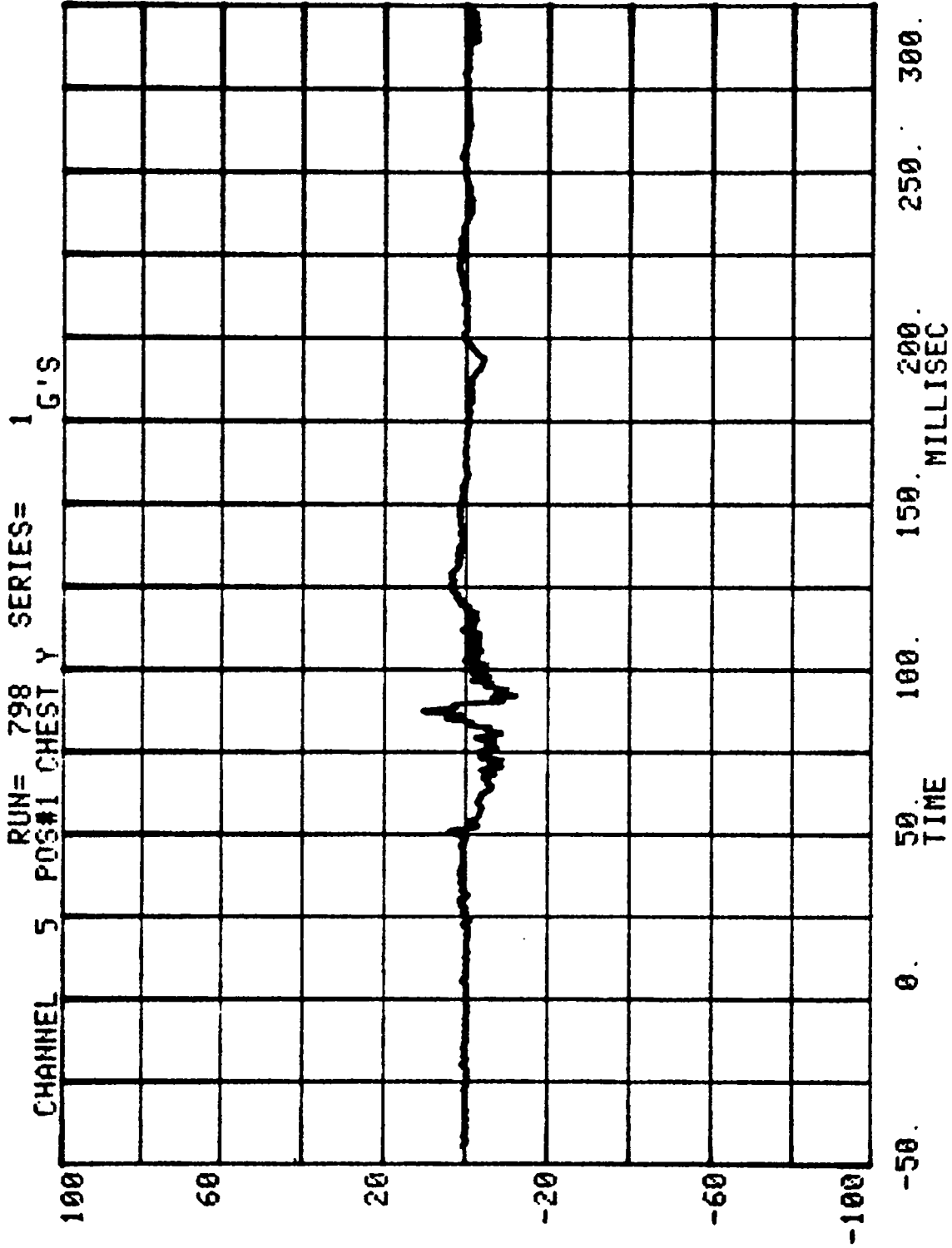


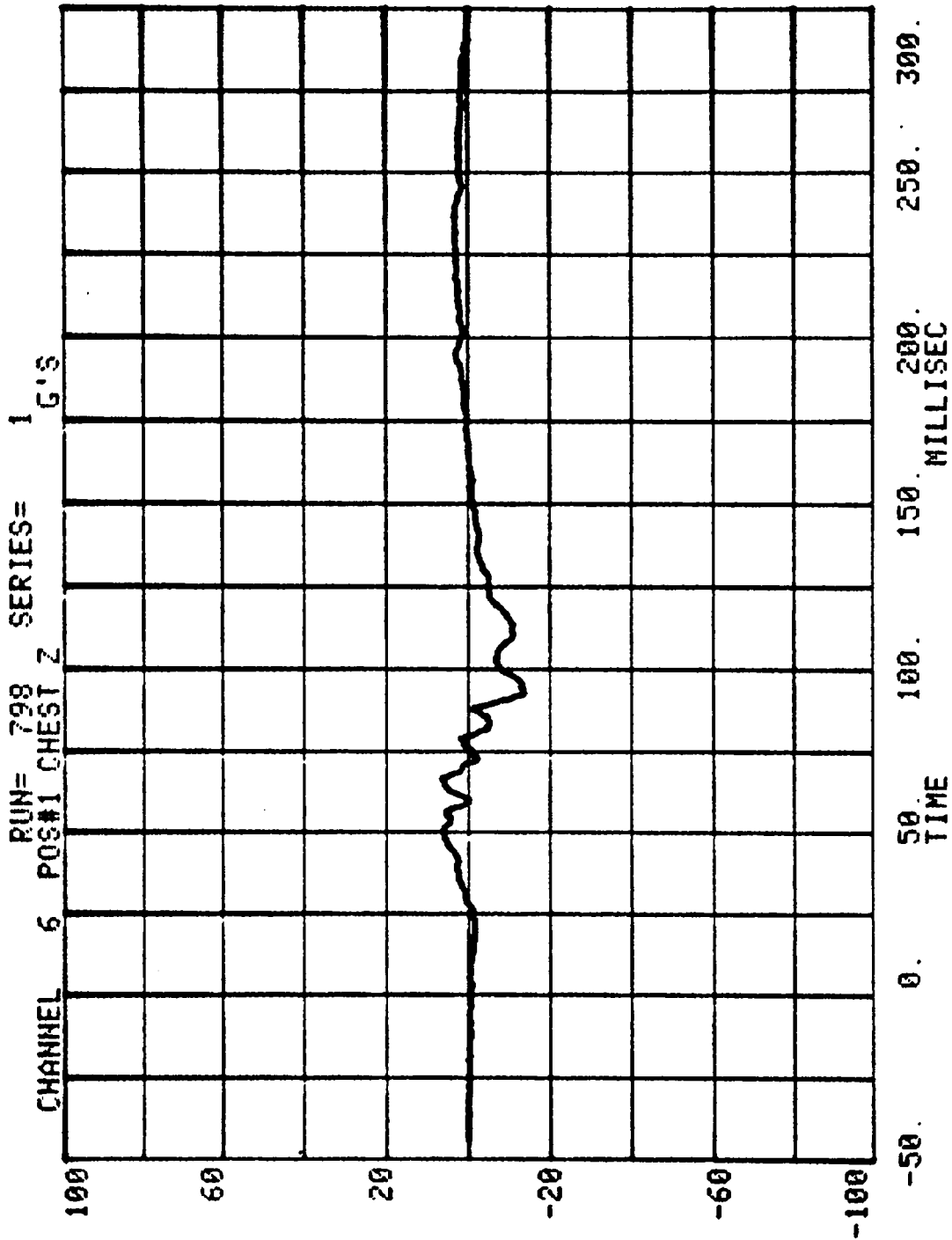
-50. 0. 50. 100. 150. 200. 250. 300.  
TIME MILLISEC

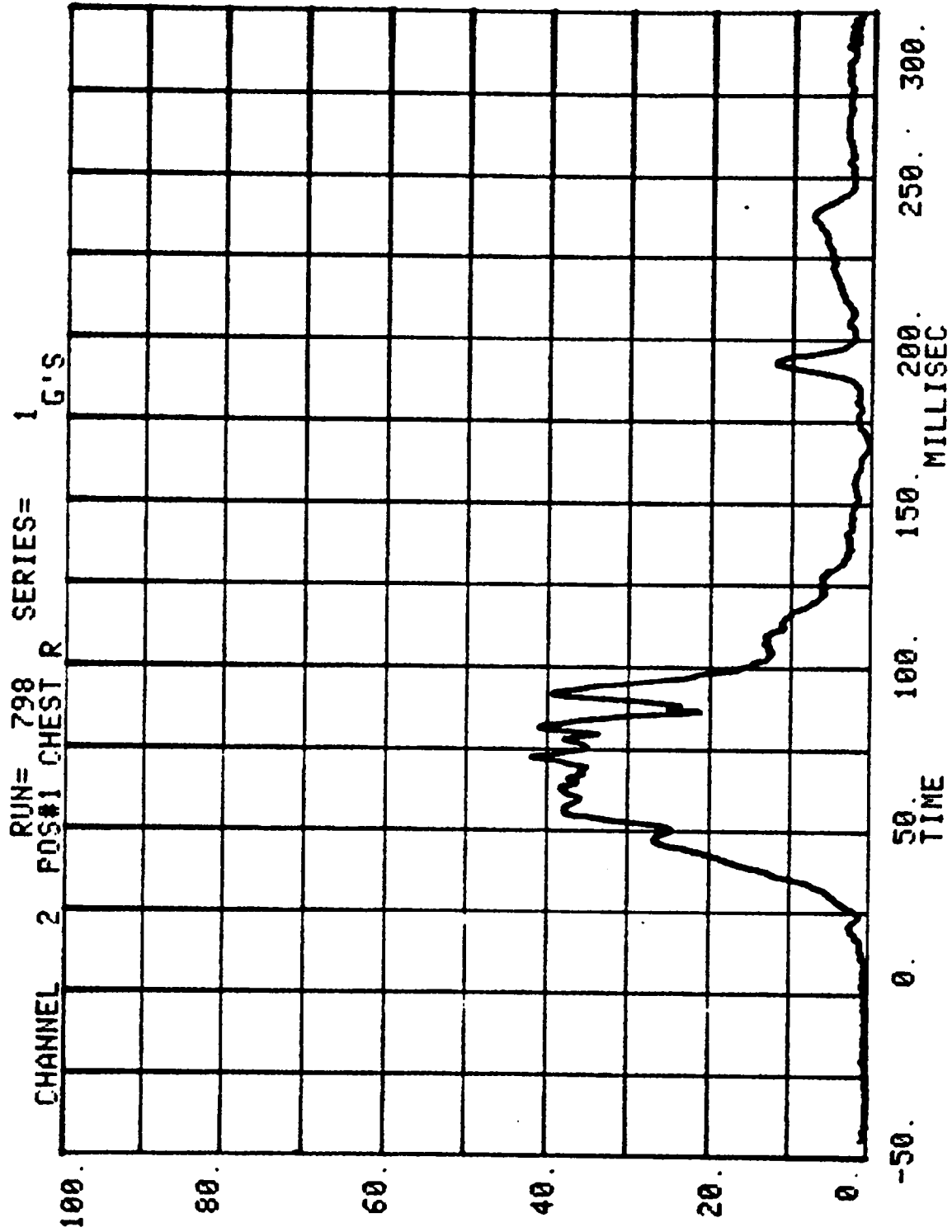


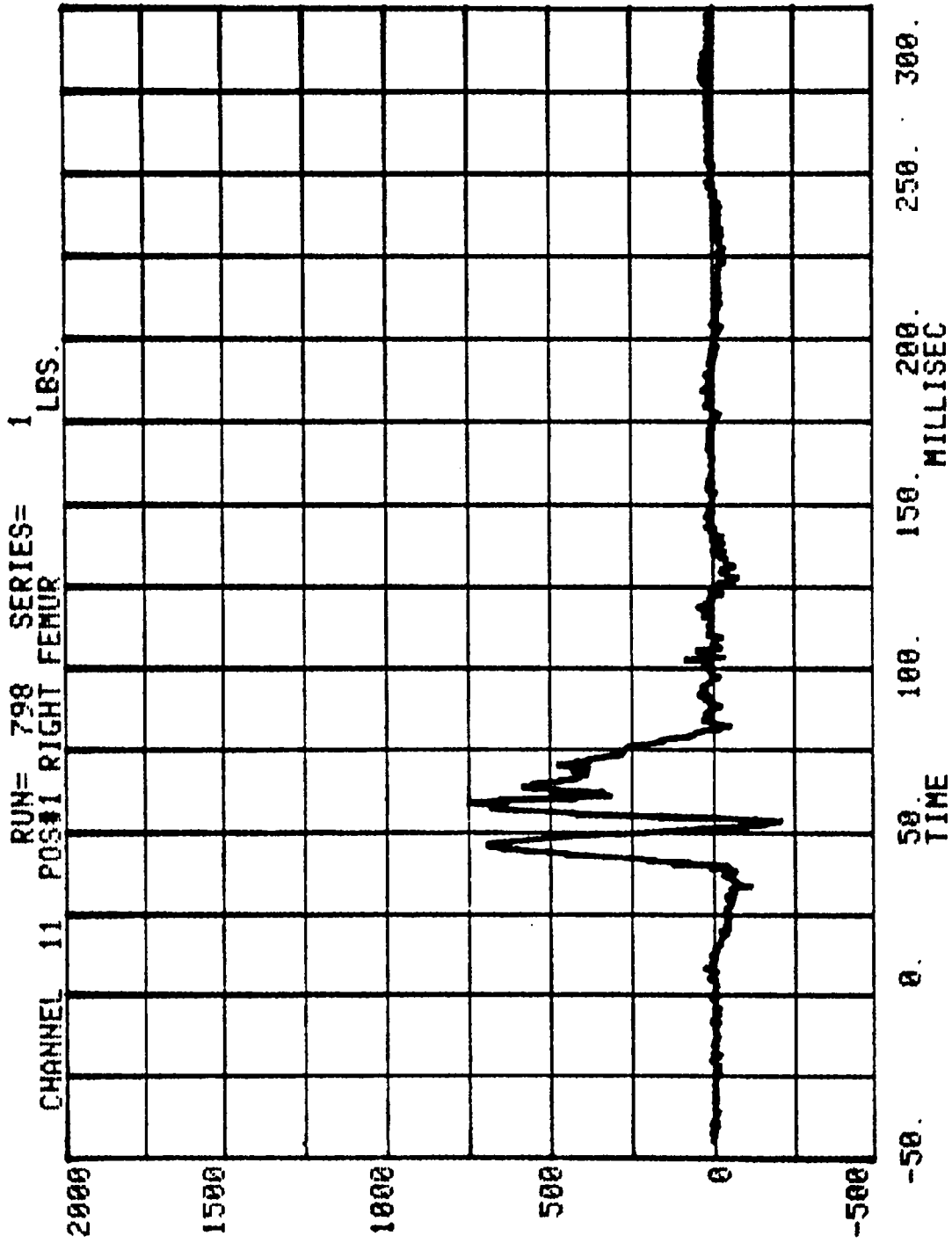








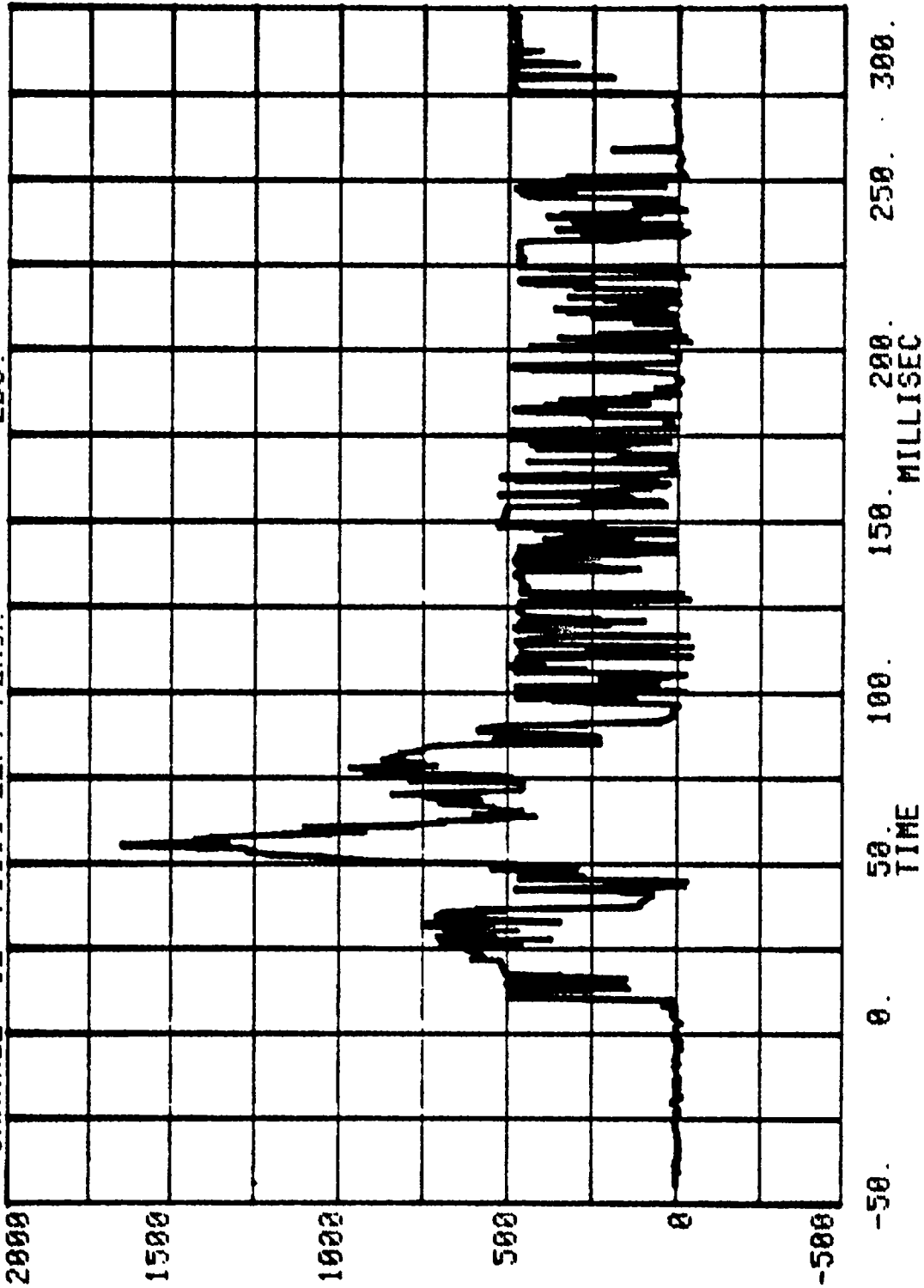


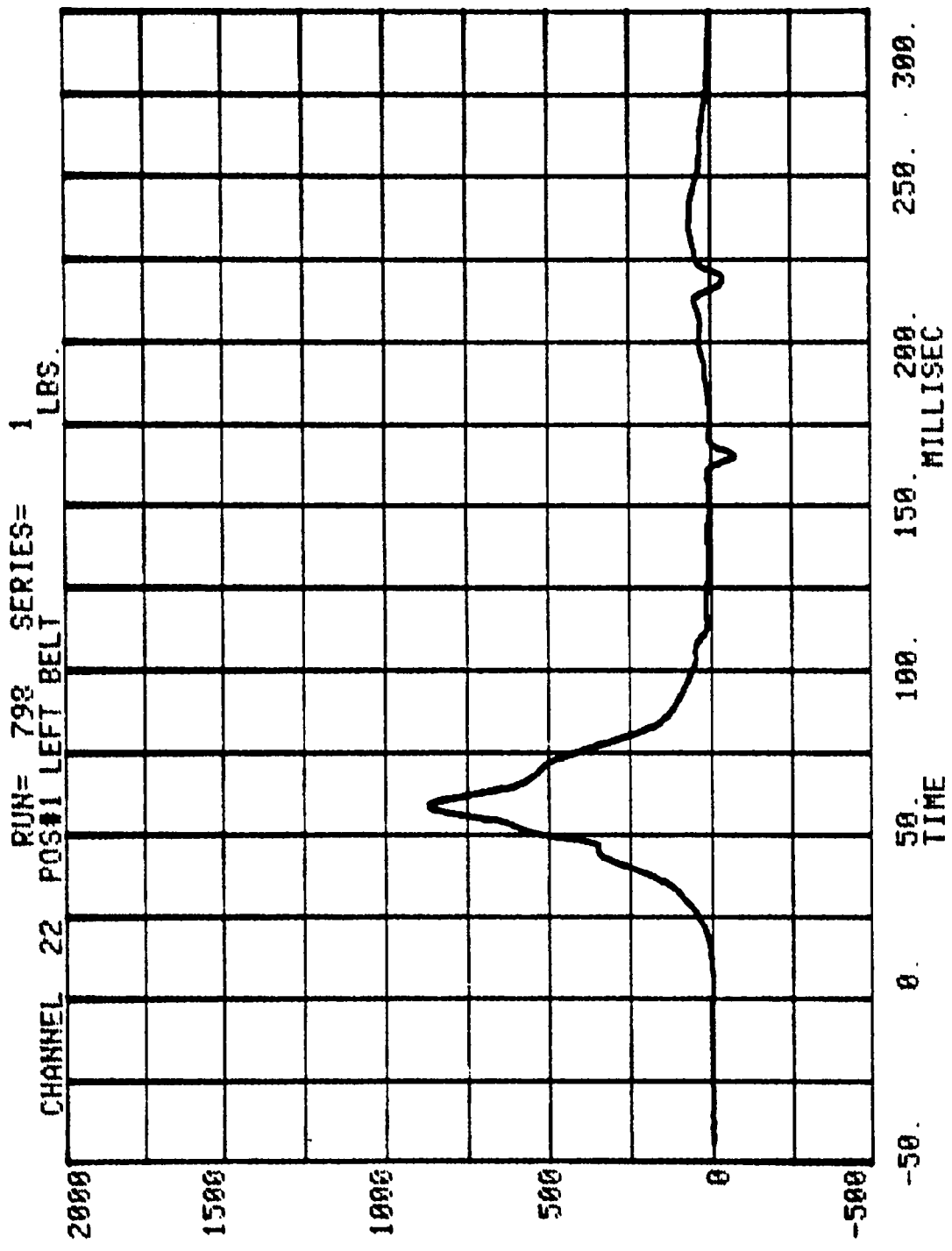


CHANNEL 12 POS#1 LEFT FEMUR

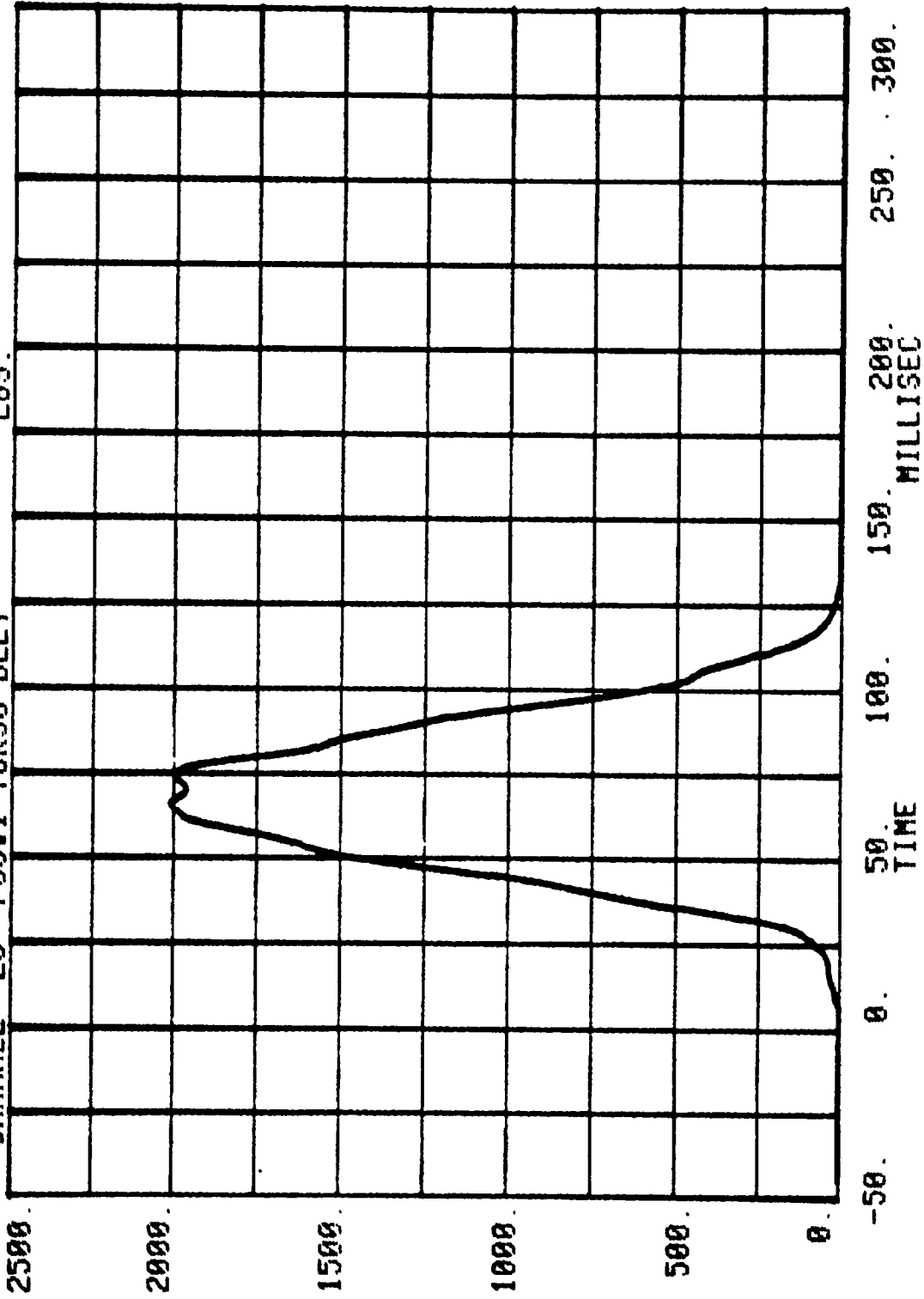
RUN= 798 SERIES= 1

LBS.



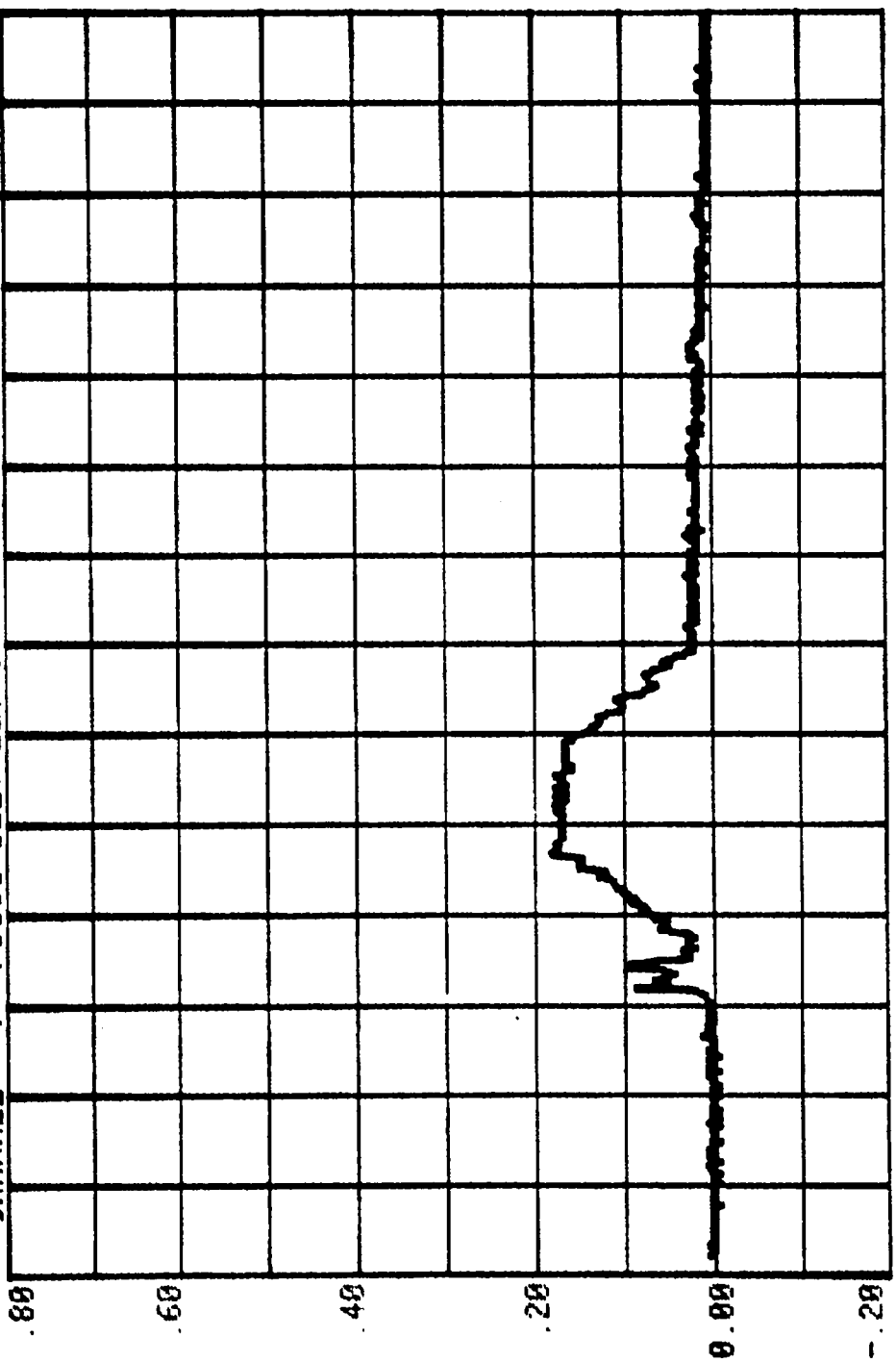


CHANNEL 23 POS#1 TORSO BELT  
RUN= 798 SERIES= 1 LBS.



MEASURED OVER 2.5 INCHES

CHANNEL 7 POS#1 BELT ELONGATION SERIES= 1 INCHES



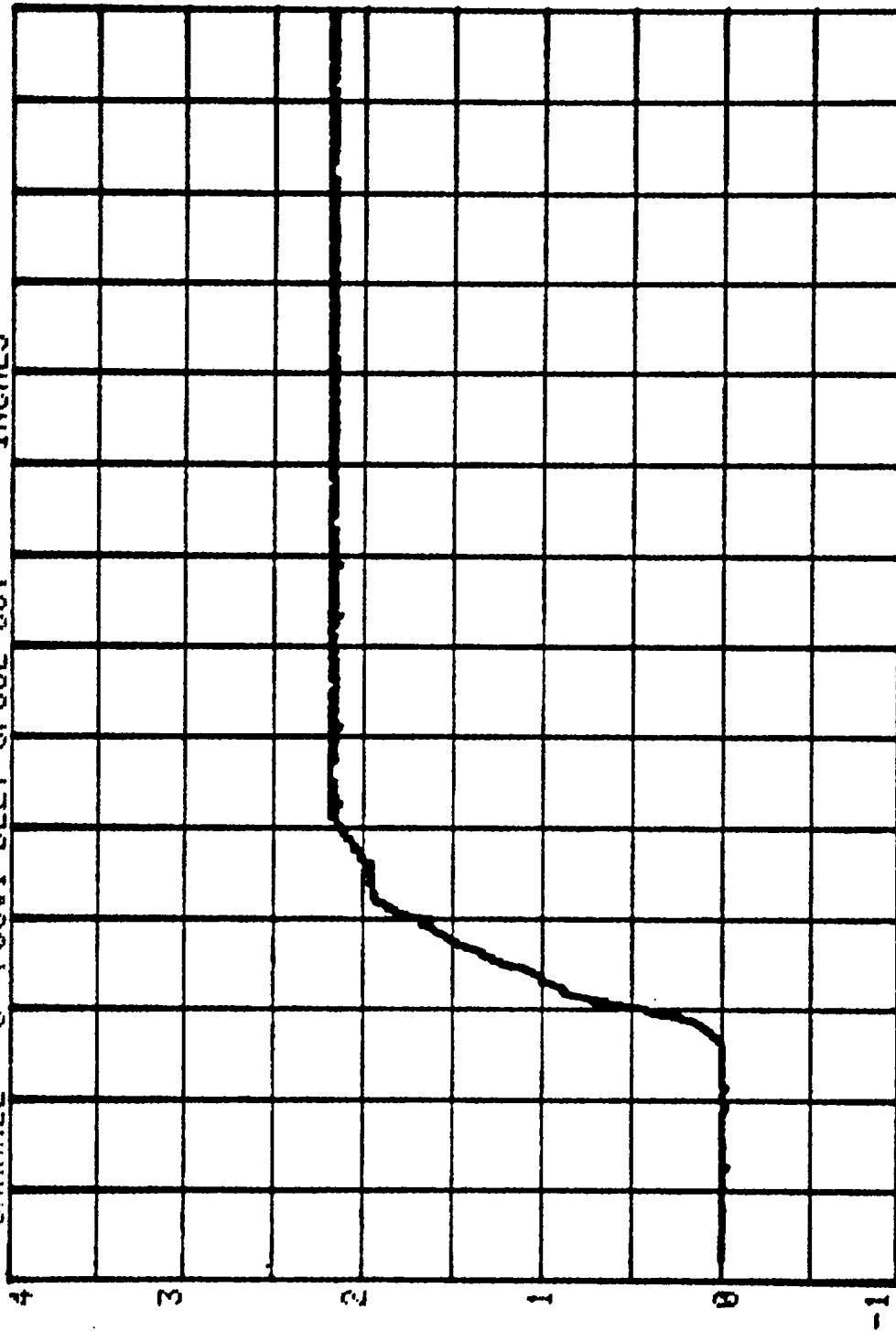
RUN= 798

POS#1 BELT ELONGATION

0.80  
0.60  
0.40  
0.20  
0.00  
-0.20  
-50. 0. 50. 100. 150. 200. 250. 300.  
TIME MILLISEC

CHANNEL 8 POS#1 BELT SPOOL OUT 1 INCHES

RUN= 798 SERIES=



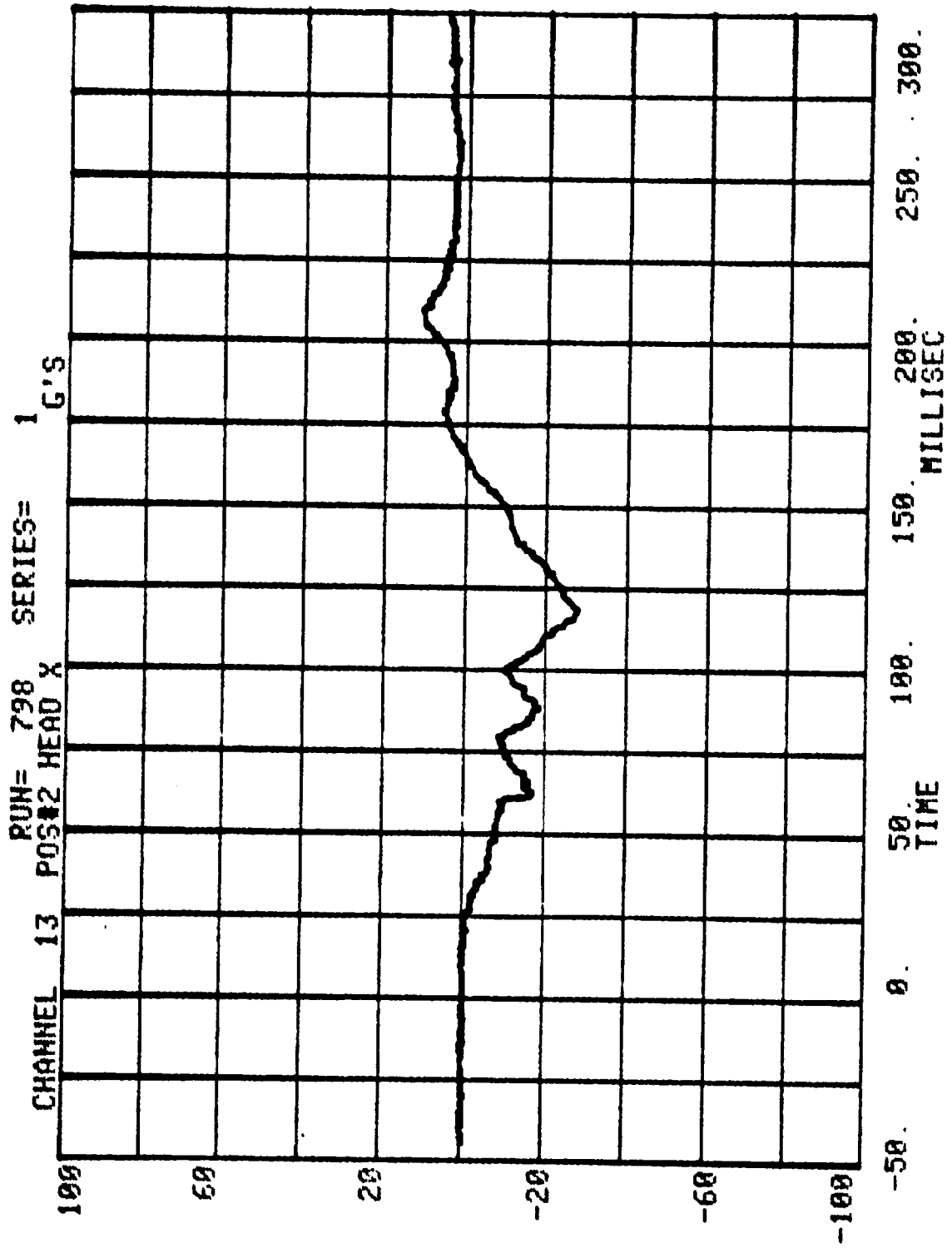
HEAD INJURY CRITERION  
HEAD SEVERITY INDEX  
36MS. MAXIMUM DURATION

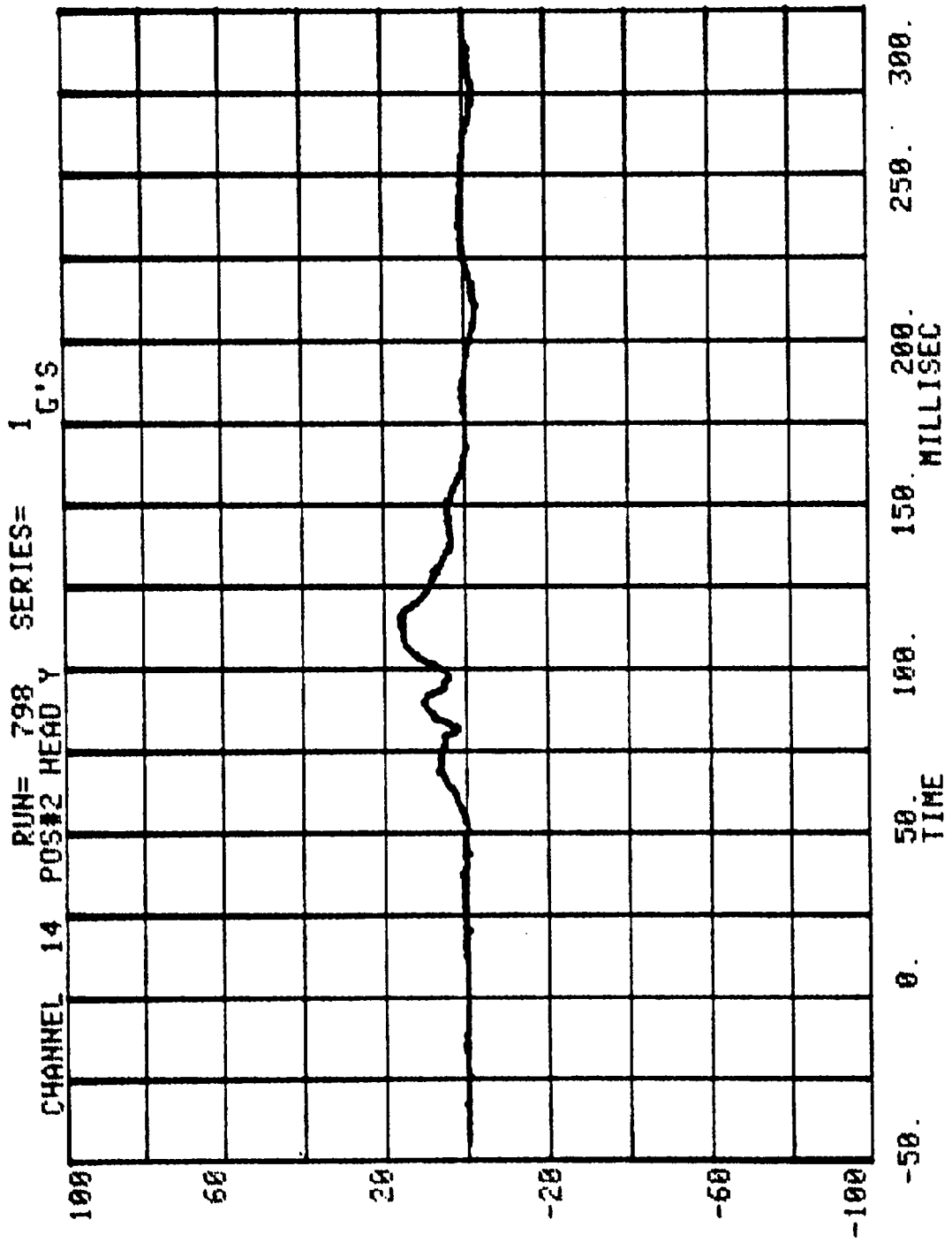
NEW CAR ASSESSMENT BARRIER TEST - 1987

RUN= 798

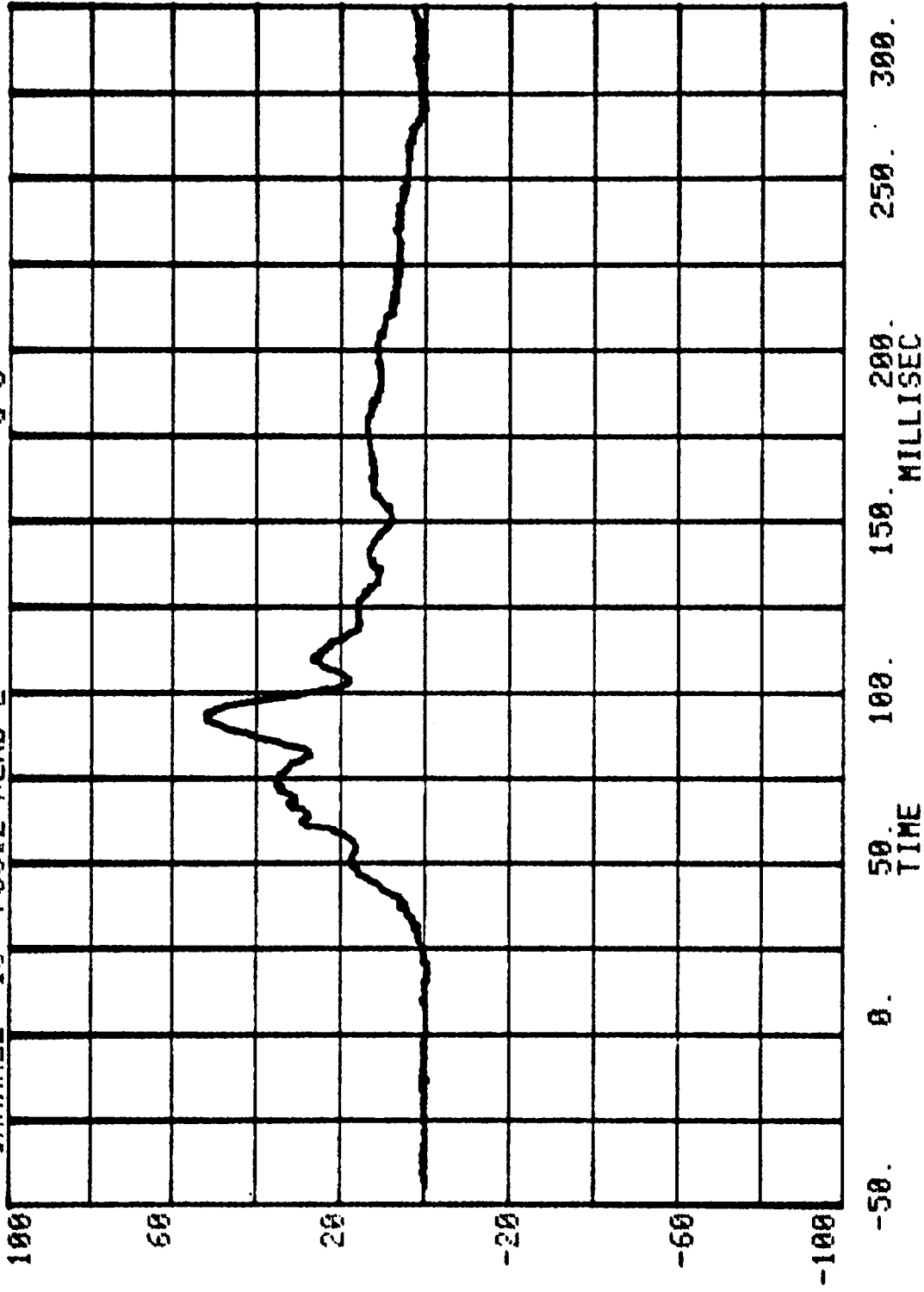
POS#2 HEAD R

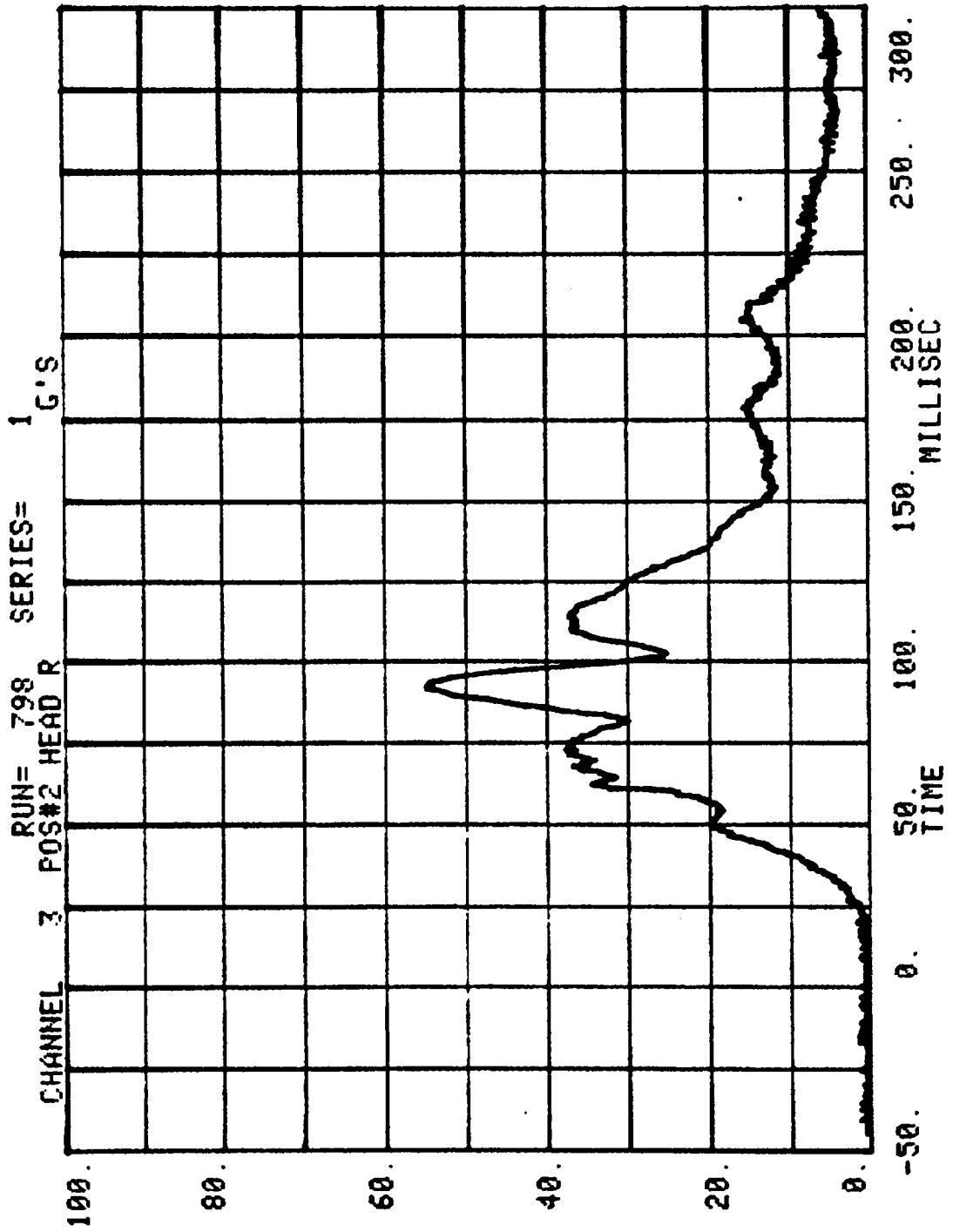
HIC= 358.9 FROM T1= .06352 TO T2= .09952  
AVERAGE ACCELERATION BETWEEN T1 AND T2= 39.8G'S  
EVENT TIME= 300.0 MSEC  
SEVERITY INDEX= 696.9





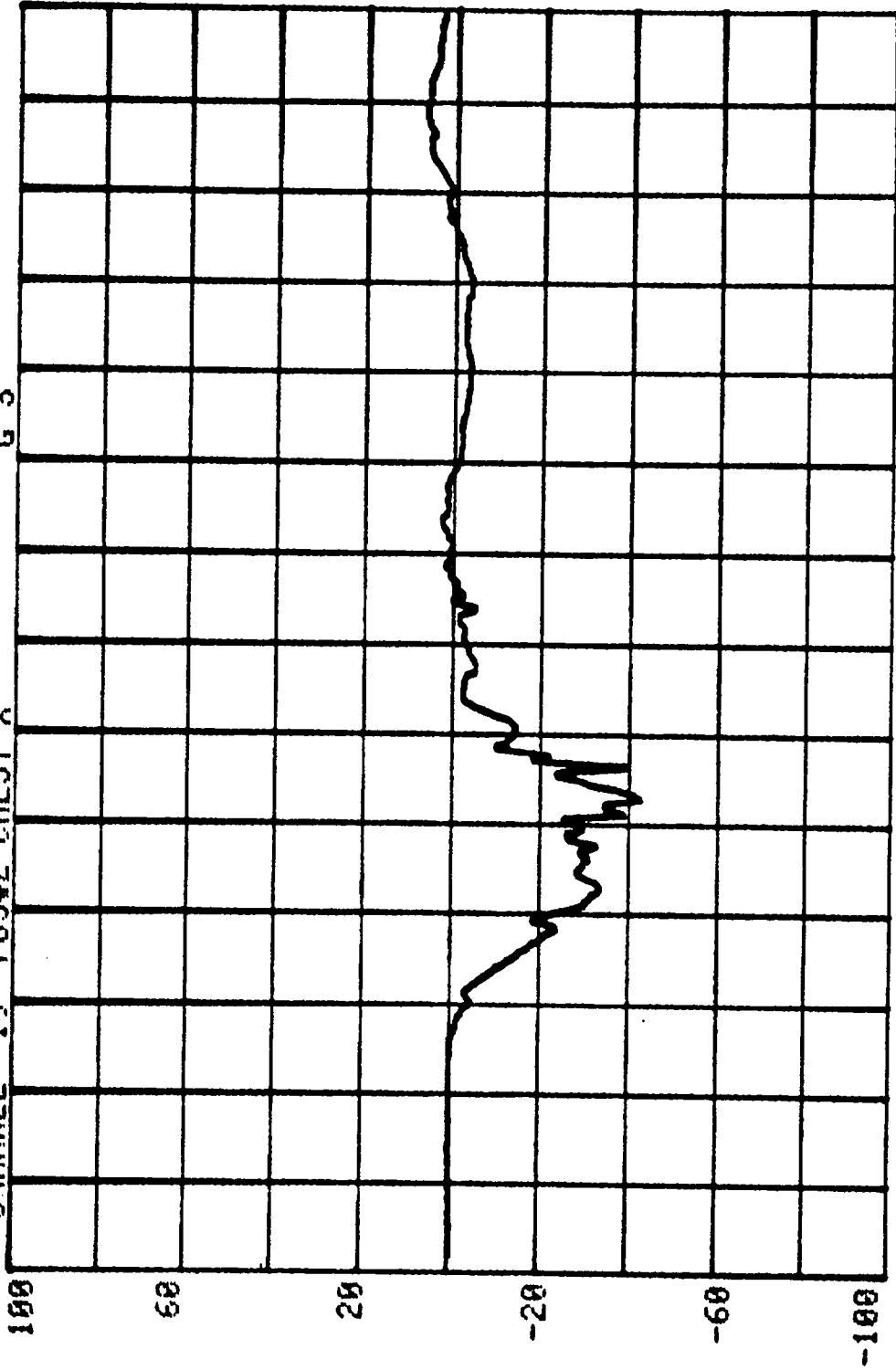
CHANNEL 15 POS#2 HEAD Z  
RUN= 798 SERIES= 1 G'S

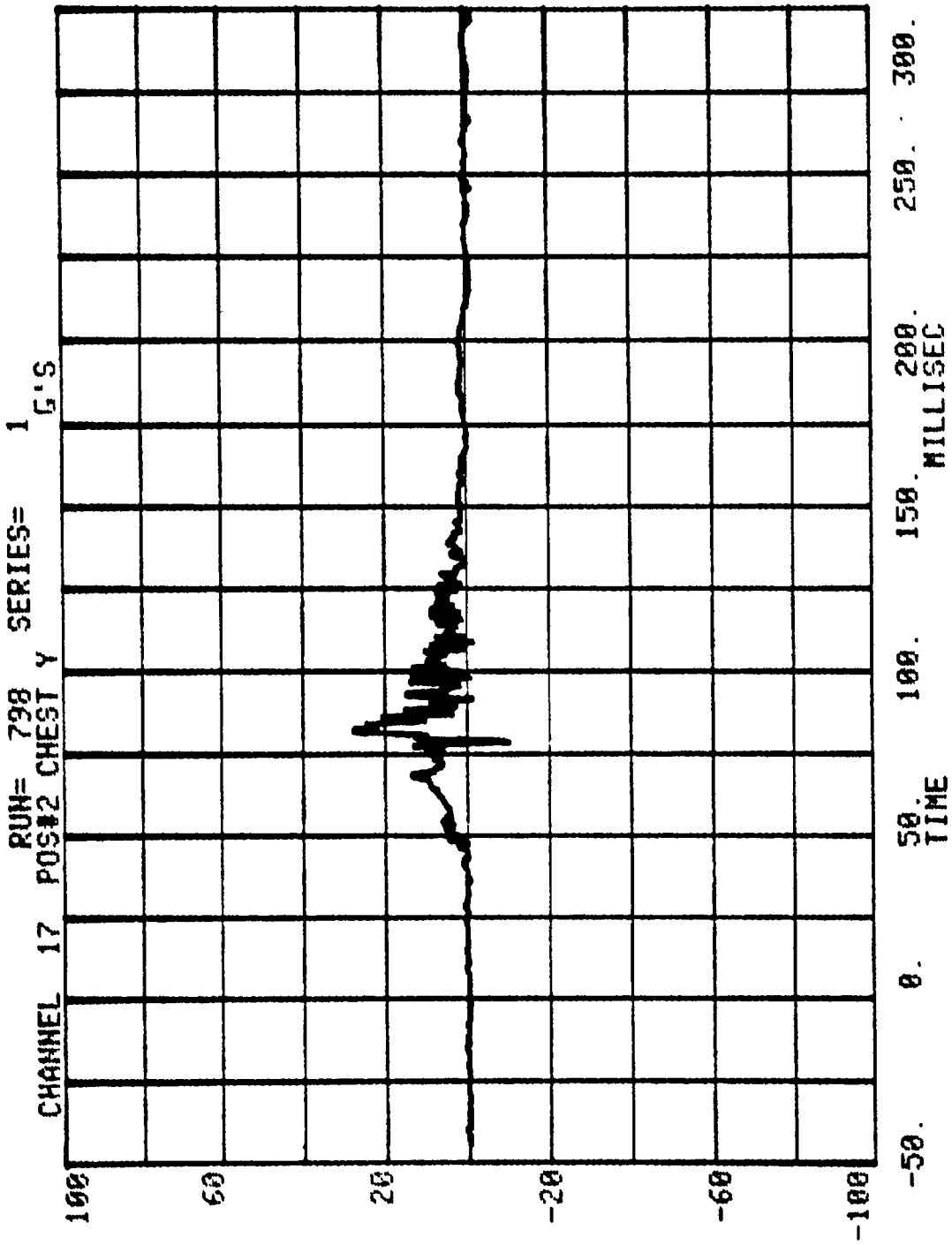




CHANNEL 15 POS#2 CHEST X SERIES= 1 G'S

RUN= 798



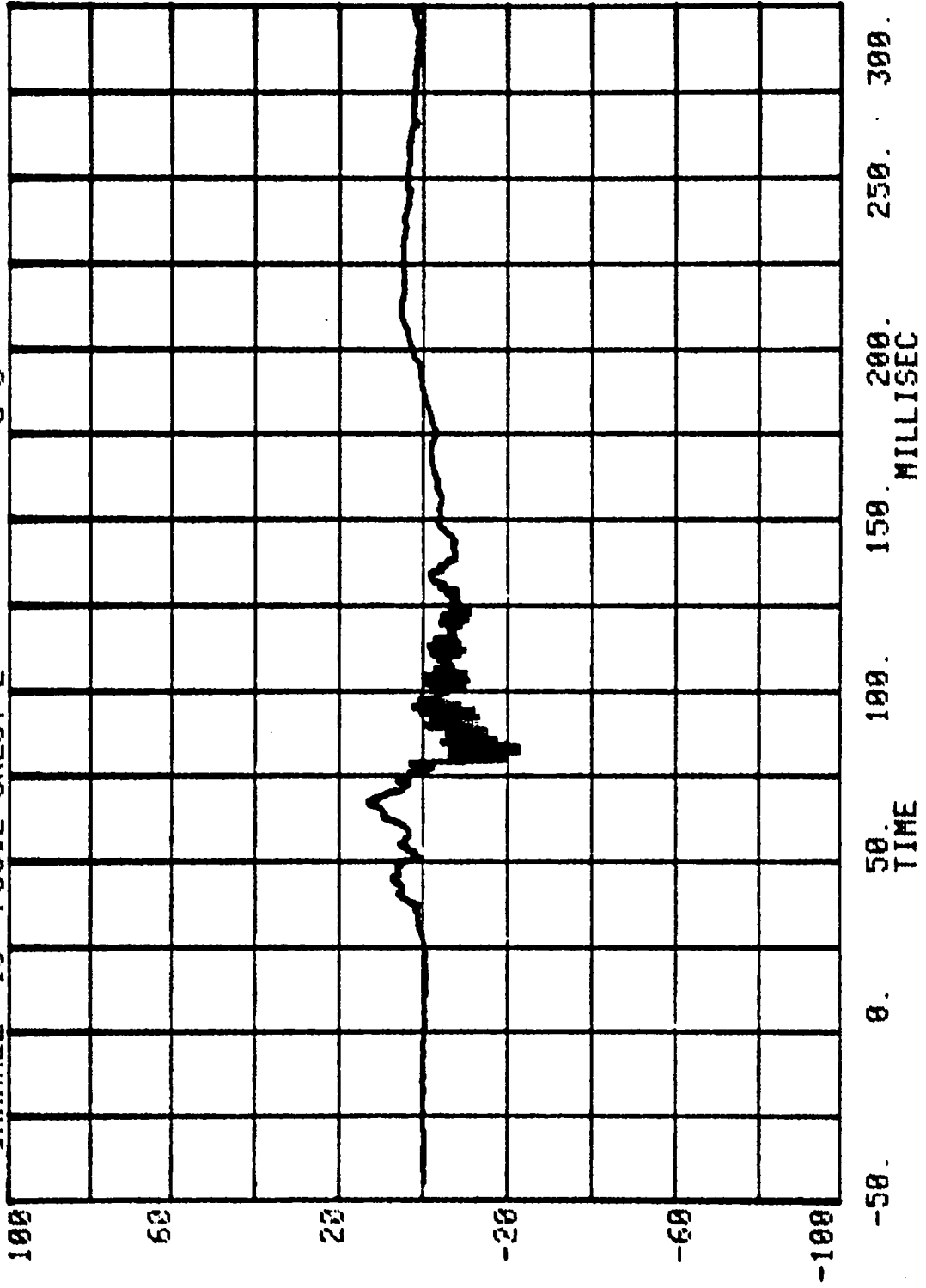


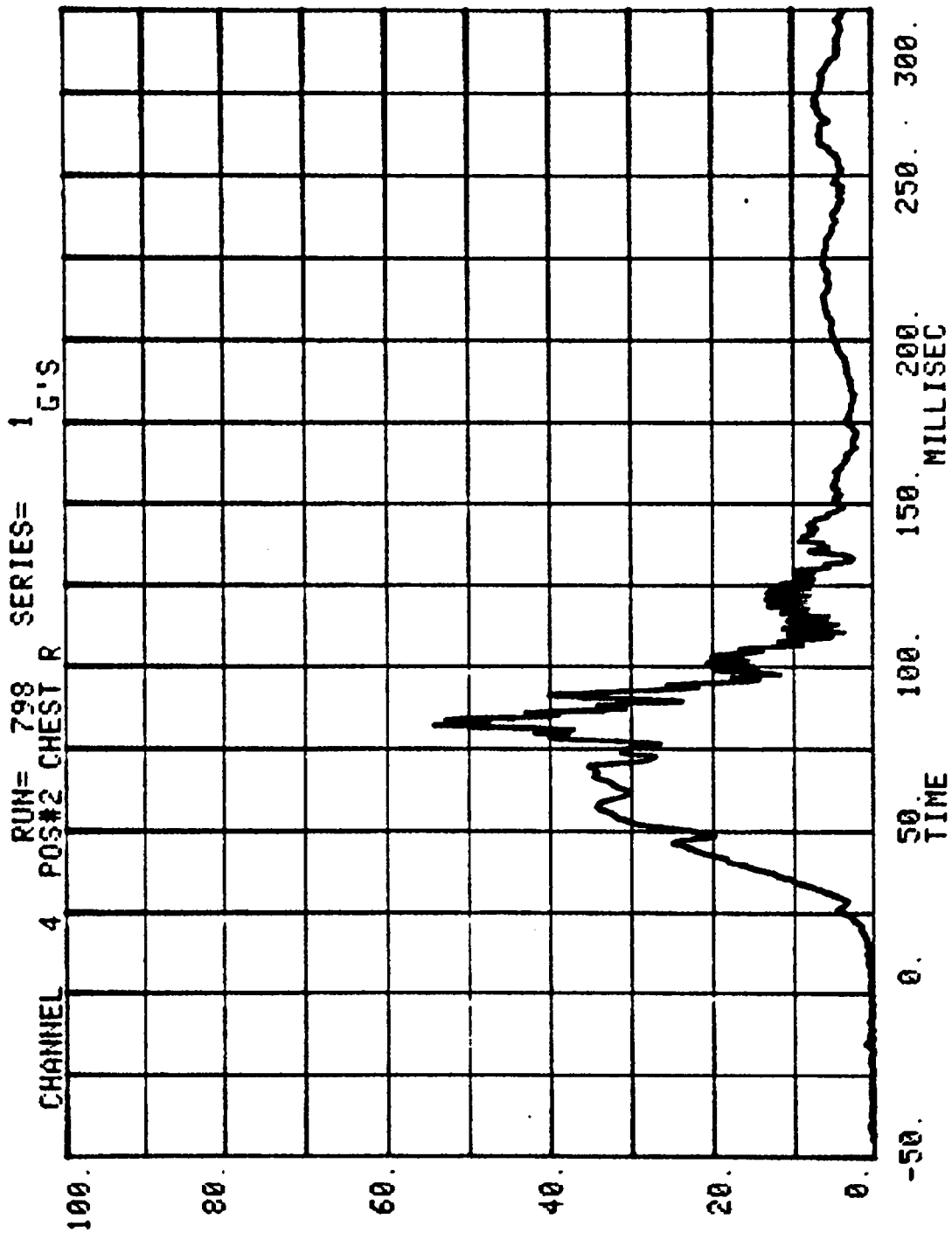
CHANNEL 18 POS#2 CHEST Z SERIES= 1 G'S

RUN= 798

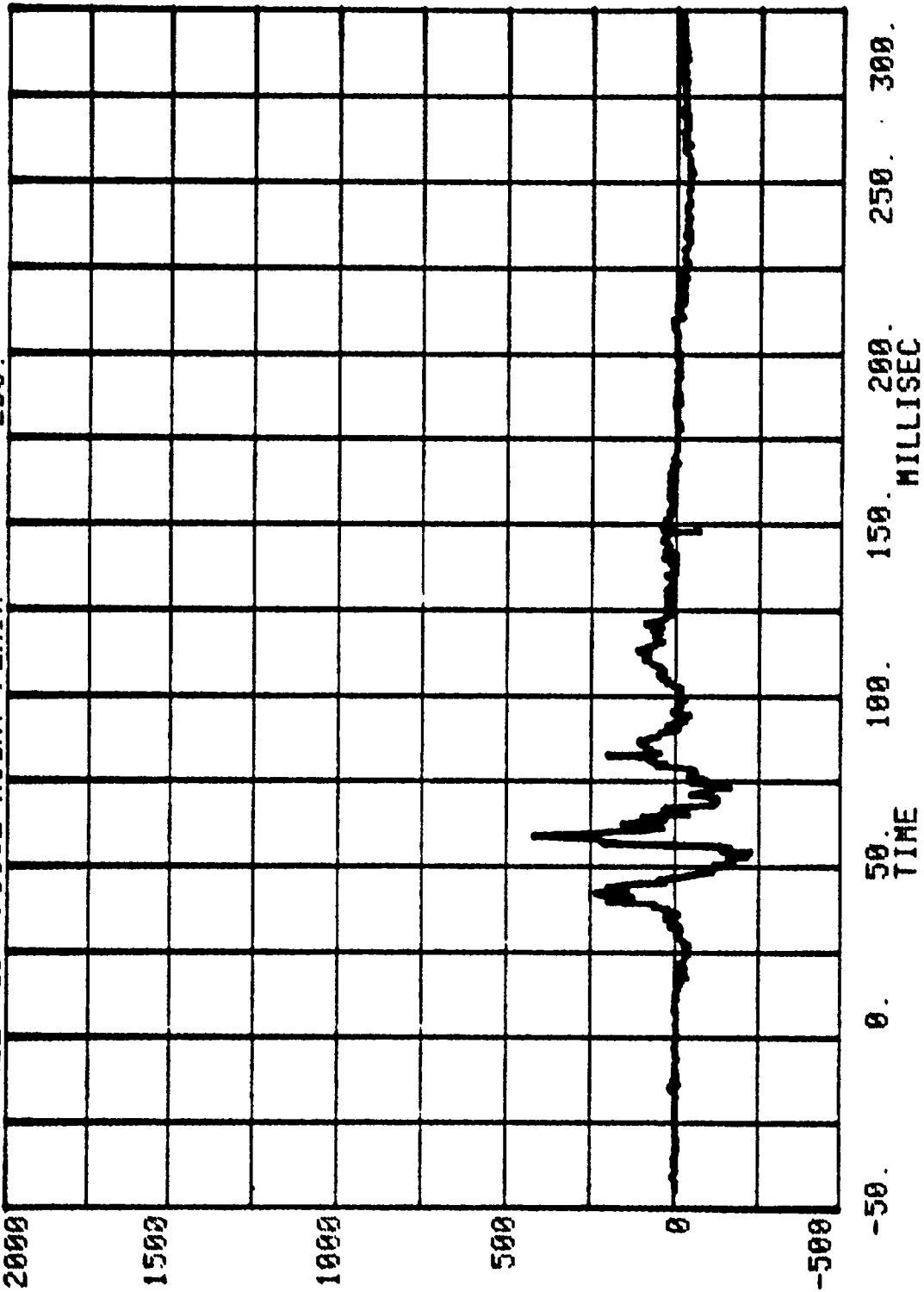
SERIES= 1

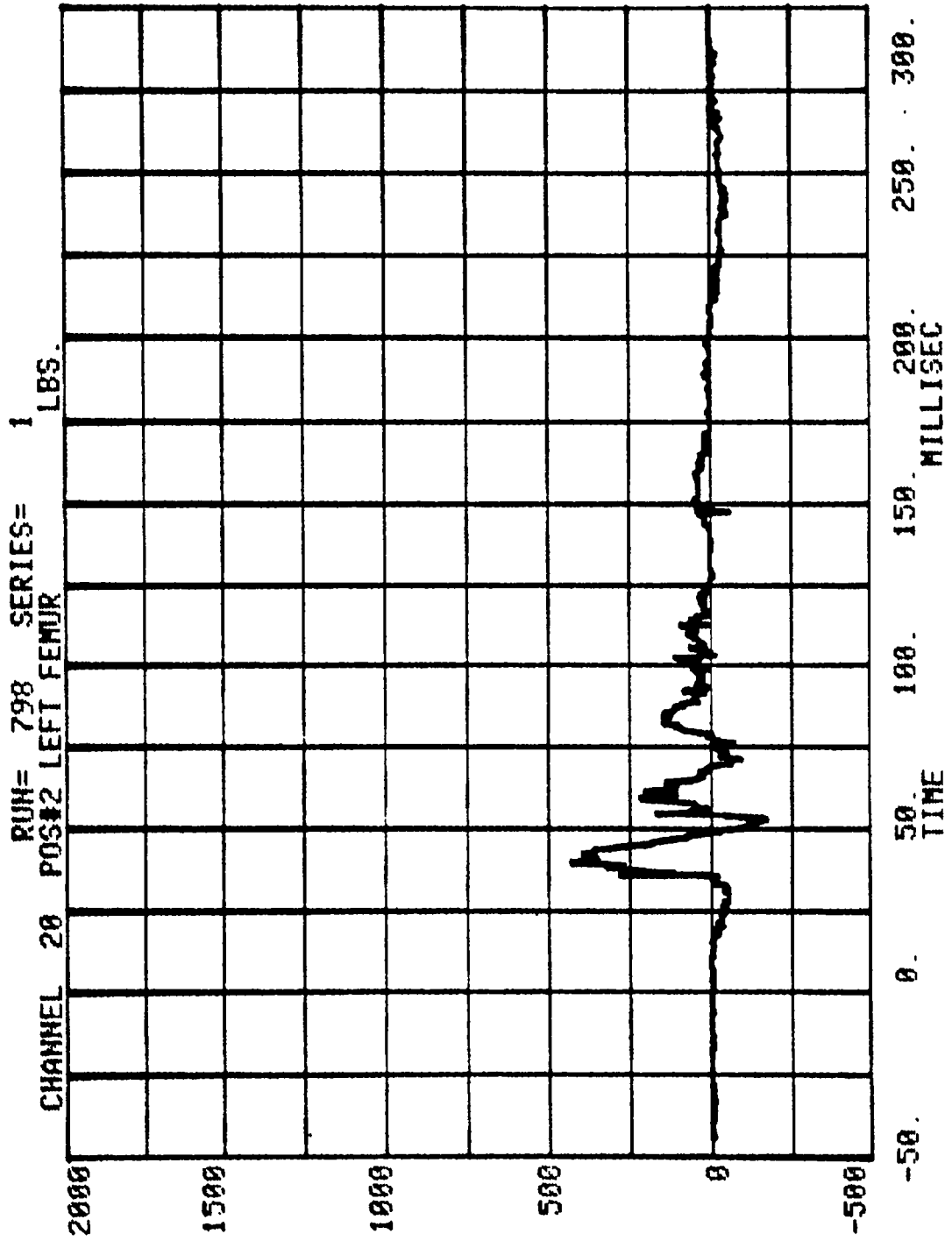
G'S





CHANNEL 19 PDS#2 RIGHT FEMUR SERIES= 1 LBS.



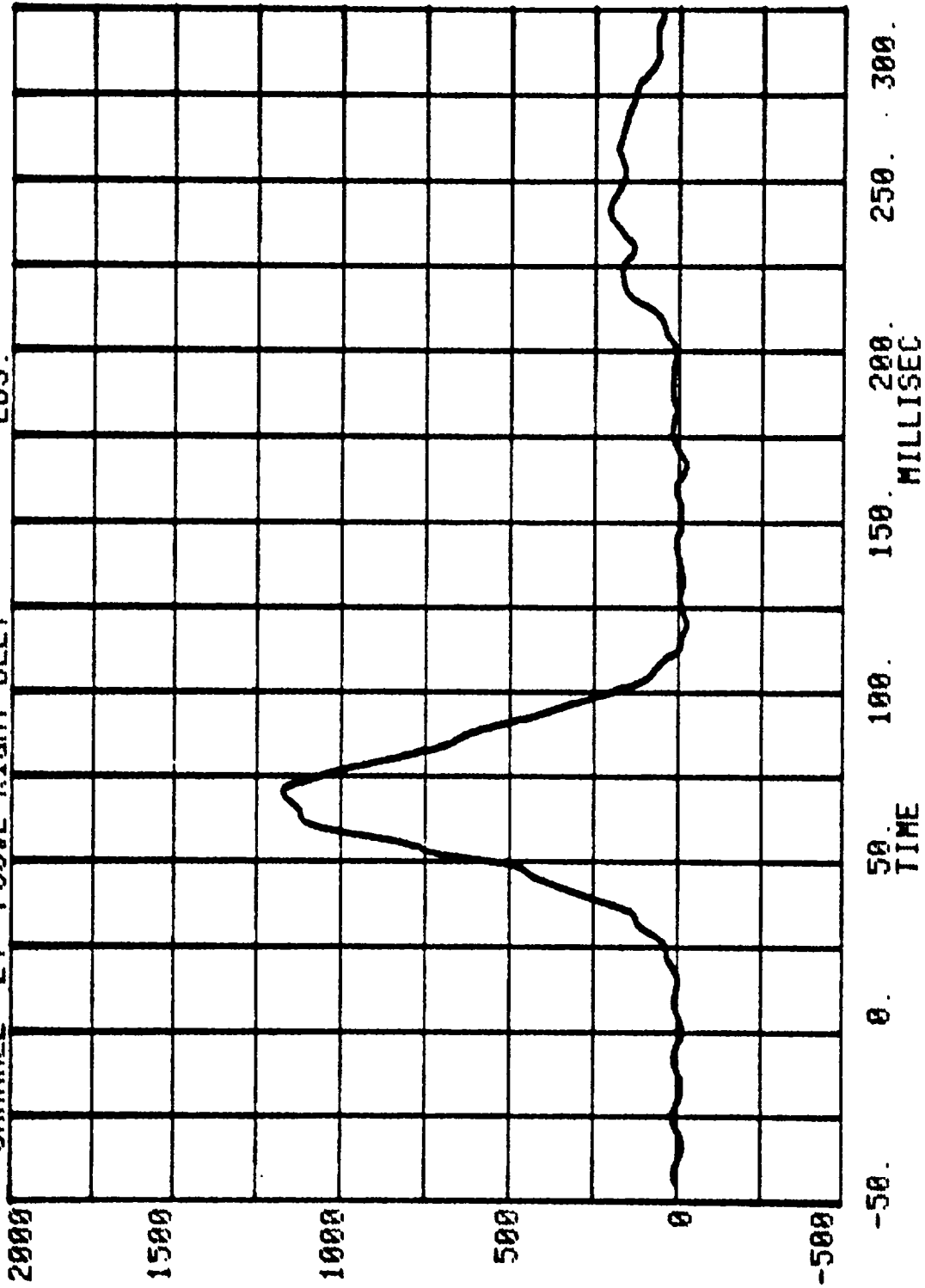


CHANNEL 24 POS#2 RIGHT BELT

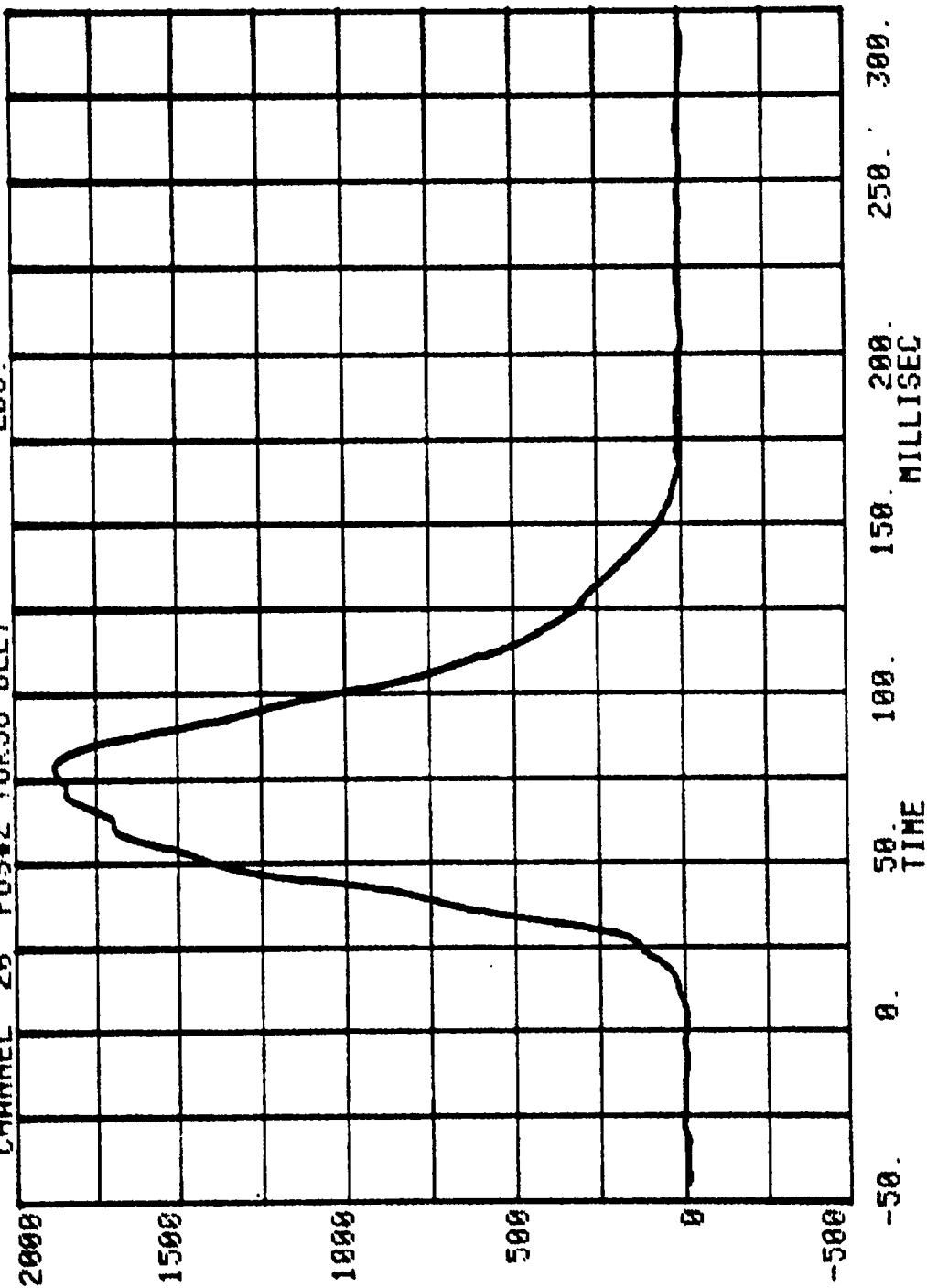
RUN= 798

SERIES= 1

LBS.



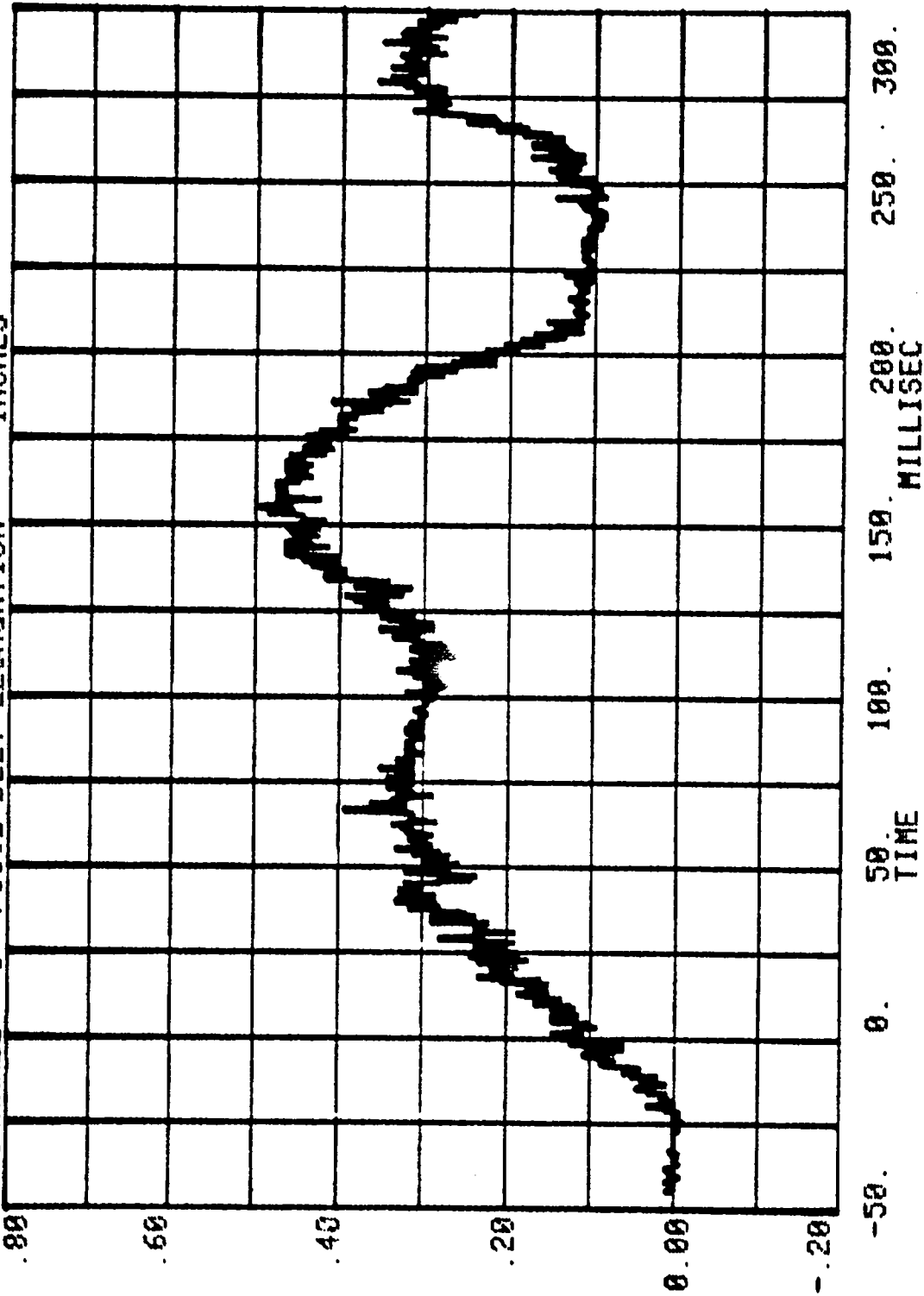
CHANNEL 26 POS#2 TORSO BELT  
RUN= 798 SERIES= 1 LBS.

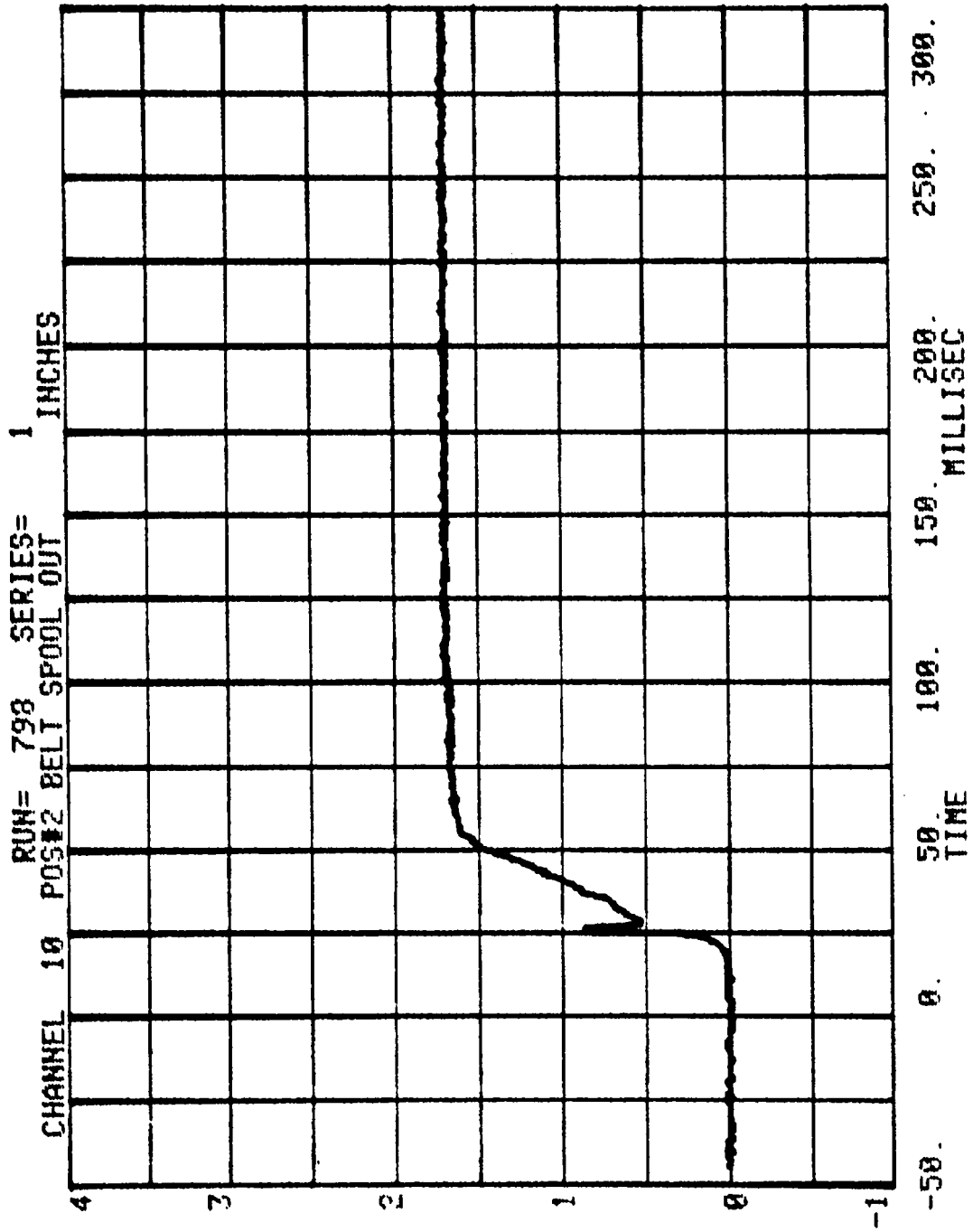


MEASURED OVER 2.5 INCHES

CHANNEL 9 POS#2 BELT ELONGATION 1 INCHES

RUN= 798 SERIES=





**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>
320	11-12-87
749	11-12-87

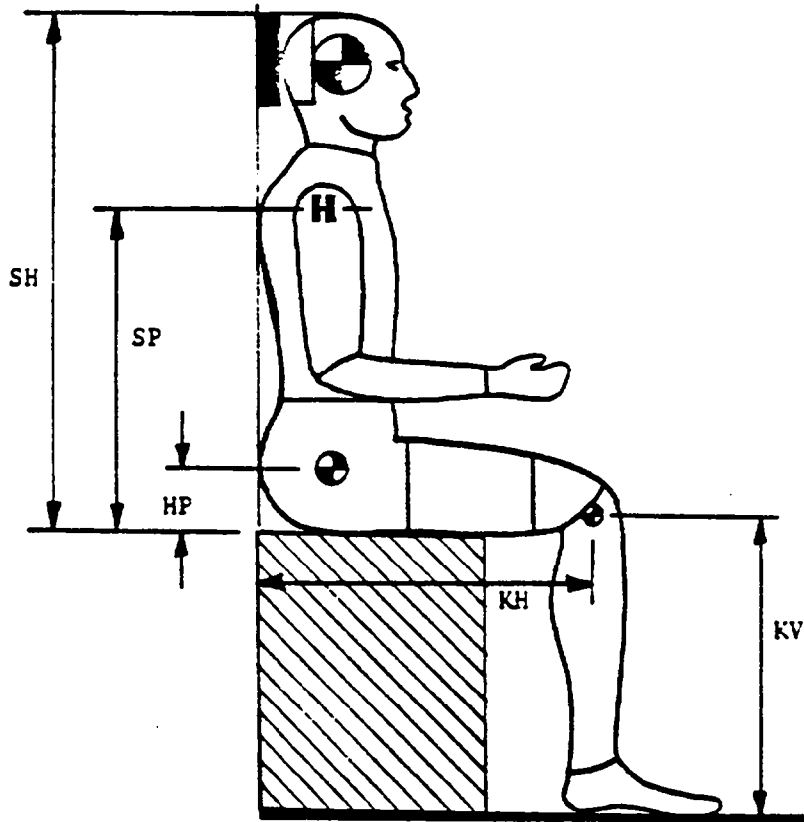
#### Electronic Test Equipment

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

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.: 320

I. CONFIGURATION VERIFICATION DATA:



	P.572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		11-12-87	
VERIFICATION NUMBER FOR DUMMY*		1	
SH - Seated Height- - - - -	35.6 to 35.8"	35.7	
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"	20.5	
KV - Knee Pivot from floor- - -	19.3 to 19.9"	19.5	
SW - Shoulder Width - - - - -	17.8 to 18.4"	18.0	
HW - Hip Width- - - - -	14.0 to 15.4"	14.6	

TECHNICIAN'S NAME: D.W. Hess

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

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

II. PERFORMANCE VERIFICATION DATA:

NHTSA DUMMY I.D. NO.: 320

TECHNICIAN'S NAME: DWH

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION-----		11-12-87	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		1	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		69-70 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		30-40 %	%
TEST PARAMETER	SPECIFICATION		
<b>1. HEAD DROP TEST--</b>			
a. Peak Resultant Accel.-	210 to 260G	255g	
b. Peak Lateral Accel.-	≤ - 10G	10g	
c. Time above 100G- - -	0.9 to 1.5ms	1.16 ms	
<b>2. NECK BENDING TEST--</b>			
a. Pendulum Speed - - -	21.5 to 25.5 fps	23.1 fps	
b. Pend. Avg. Decel. over t <sub>3</sub> - t <sub>2</sub>	20 to 24G	22.5g	
c. Peak Resultant Head Acceleration - - - -	26G max.	25g	
d. Pendulum Decel.(t <sub>2</sub> -t <sub>1</sub> )	≤ - 3ms	2 ms	
e. Pendulum Decel.(t <sub>3</sub> -t <sub>2</sub> )	25 to 30 ms	27 ms	
f. Pendulum Decel.(t <sub>4</sub> -t <sub>3</sub> )	≤ - 10ms	4.5 ms	
g. Max. Head Rotation - -	63 to 73°	69°	
<b>h. Chordal Displacement--</b>			
<b>Head Rotation Angle-</b>			
0°	Time- -	-2 to 2 ms	0 ms
	Displ.-	-.5 to .5"	0"
30°	Time- -	25.6 to 34.4ms	28 ms
	Displ.-	2.1 to 3.1"	2.7"
60°	Time- -	40.3 to 51.7ms	43 ms
	Displ.-	4.3 to 5.3"	5.0"
Maximum ( 69 °)	Time- -	53.2 to 66.8ms	58.5 ms
	Displ.-	5.0 to 6.0"	5.8"

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

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

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.: 320

TECHNICIAN'S NAME: DWH

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
<b>2. NECK BENDING TEST....</b>			
Continued:			
h. Chordal Displacement:			
Head Rotation Angle--			
60°	Time	67.0 to 83.0 ms	73.5 ms
	Displ.	4.3 to 5.3 in.	4.8 "
30°	Time	85.4 to 104.6 ms	92 ms
	Displ.	2.1 to 3.1 in.	2.1"
0°	Time	101.0 to 123.0 ms	107 ms
	Displ.	-.5 to 0.5 in.	0.0 "
<b>3. ABDOMINAL COMPRESSION TEST:</b>			
(Preload = 10 pounds)			
a. Force @ .5" - - - -	23 to 36 lbs.	24.5#	
b. Force @ .75" - - - -	36 to 50 lbs.	38#	
c. Force @ 1.0" - - - -	50 to 63 lbs.	55#	
d. Force @ 1.3" - - - -	73 to 88 lbs.	81.5#	
<b>4. LUMBAR FLEXION TEST:</b>			
a. Force @ 20° - - - -	22 to 34 lbs.	30#	
b. Force @ 30° - - - -	34 to 46 lbs.	39.5#	
c. Force @ 40° - - - -	46 to 58 lbs.	49.5#	
d. Return Angle - - - -	12° maximum	9.5°	
<b>5. CHEST IMPACT TESTS:</b>			
a. High Speed			
(1) Probe Speed- - -	21.78-22.22 fps	21.85 fps	
(2) Peak Deflection-	1.7" maximum	1.46"	
(3) Peak Resistive Force- - - - -	2250 lbs. maximum	1976#	
(4) Internal Hysteresis - - -	50 to 70%	51.3%	
b. Low Speed			
(1) Probe Speed- - -	13.86-14.14 fps	14.14 fps	
(2) Peak Deflection-	1.1" maximum	.93"	
(3) Peak Resistive Force- - - - -	1450 lbs. maximum	1144#	
(4) Internal Hyster.	50 to 70%	61.6%	

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

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.: 320

TECHNICIAN'S NAME: DWH

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
<b>6. KNEE IMPACT TESTS:</b>			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.89 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2250#	
(3) Time Above 1000g-	1.7 ms minimum	1.76 ms	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.92 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2170#	
(3) Time Above 1000g-	1.7 ms minimum	1.72 ms	

REMARKS:

INSTRUMENT CALIBRATION INFORMATION

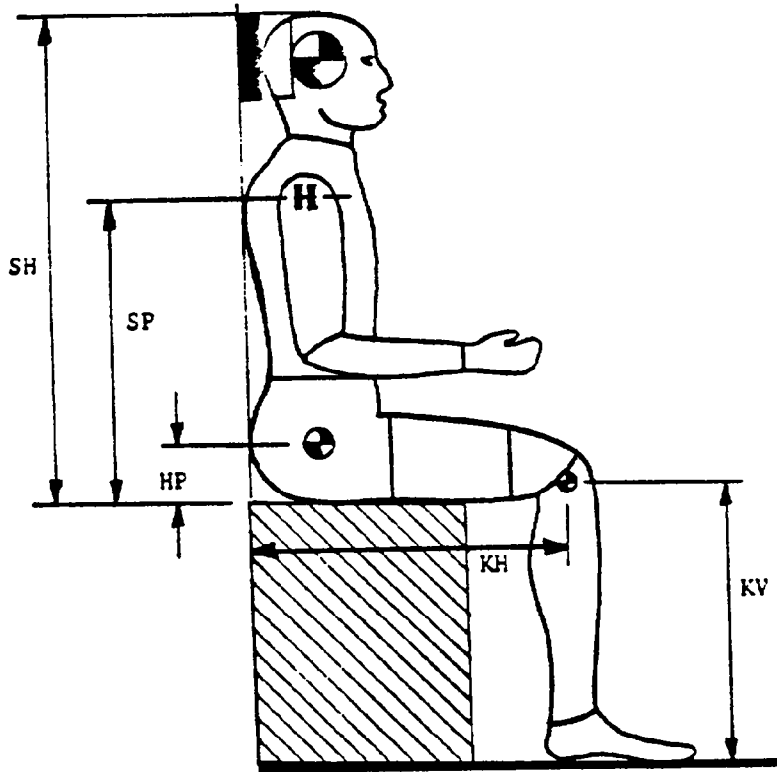
NHTSA DUMMY ID NO. 320 CALIB. SEQ. NOS. FOR DUMMY: 1

<u>A. DUMMY INSTRUMENTS:</u>	<u>MANUFACTURER</u>	<u>SERIAL NUMBER</u>	<u>DATE LAST CALIBRATED</u>	<u>DATE OF NEXT CALIBRATION</u>
1. Head Accelerometers --				
a. Triaxial unit - - - - -				
b. Uniaxial units				
(1) Longitudinal ( $A_x$ ) -	Endevco	CH83	8-87	2-88
(2) Lateral ( $A_y$ ) - - -	Endevco	CU62	8-87	2-88
(3) Vertical ( $A_z$ ) - - -	Endevco	CM86	8-87	2-88
2. Chest Accelerometers --				
(Vehicle Crash Test Usage)				
a. Triaxial unit - - - - -				
b. Uniaxial units				
(1) Longitudinal ( $A_x$ ) -	CEC	A74	8-87	2-88
(2) Lateral ( $A_y$ ) - - -	Endevco	CE76	8-87	2-88
(3) Vertical ( $A_z$ ) - - -	CEC	A72	8-87	2-88
3. Chest Potentiometer - - -	Ohmite	7915	8-87	2-88
4. Femur Load Cells --				
a. Right Side - - - - -	GSE	306	8-87	2-88
b. Left Side - - - - -	GSE	310	8-87	2-88
<u>B. CALIB. LAB. INSTRUMENTS:</u>				
1. Pendulum Accelerometer - - -	CED	18259	8-87	2-88
2. Test Probe Accelerometer - - -	"	17815	8-87	2-88
3. Lumbar Flexion Test Push Force Gauge - - - - -	Transducer Inc.	20051	8-87	2-88
4. Abdominal Compression Test Force Gauge - - - - -	BLH	72952	8-87	2-88
5. Abdominal Compression Test Displacement Gauge - - - - -	CIC	567-11	8-87	2-88

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.: 749

I. CONFIGURATION VERIFICATION DATA:



	P. 572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		11-12-87	
VERIFICATION NUMBER FOR DUMMY*		1	
SH - Seated Height- - - - -	35.6 to 35.8"	35.7	
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"	19.6	
SW - Shoulder Width - - - - -	17.8 to 18.4"	18.1	
HW - Hip Width- - - - -	14.0 to 15.4"	14.5	

TECHNICIAN'S NAME: D.W. Hess

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

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

II. PERFORMANCE VERIFICATION DATA:

NHTSA DUMMY I.D. NO.: 749

TECHNICIAN'S NAME: DWH

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION-----		11-12-87	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		1	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		67-70 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		30-40 %	%
TEST PARAMETER	SPECIFICATION		
<b>1. HEAD DROP TEST--</b>			
a. Peak Resultant Accel.-	210 to 260G	240g	
b. Peak Lateral Accel.- -	≤ - 10G	9g	
c. Time above 100G- - - -	0.9 to 1.5ms	1.2 ms	
<b>2. NECK BENDING TEST--</b>			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	24.1 fps	
b. Pend. Avg. Decel. over t <sub>3</sub> - t <sub>2</sub>	20 to 24G	24g	
c. Peak Resultant Head Acceleration - - - - -	26G max.	26g	
d. Pendulum Decel.(t <sub>2</sub> -t <sub>1</sub> )	≤ - 3ms	2 ms	
e. Pendulum Decel.(t <sub>3</sub> -t <sub>2</sub> )	25 to 30 ms	28 ms	
f. Pendulum Decel.(t <sub>4</sub> -t <sub>3</sub> )	≤ - 10ms	5 ms	
g. Max. Head Rotation - -	63 to 73°	66°	
h. Chordal Displacement-- Head Rotation Angle-			
0°	Time- - -2 to 2 ms	0 ms	
	Displ.- -.5 to .5"	0.0"	
30°	Time- - 25.6 to 34.4ms	28.5 ms	
	Displ.- 2.1 to 3.1"	2.8"	
60°	Time- - 40.3 to 51.7ms	45 ms	
	Displ.- 4.3 to 5.3"	5.3"	
Maximum ( 66 °)	Time- - 53.2 to 66.8ms	58 ms	
	Displ.- 5.0 to 6.0"	6.0"	

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

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

11. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.: 749

TECHNICIAN'S NAME: DWH

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
<b>2. NECK BENDING TEST....</b>			
<u>Continued:</u>			
h. Chordal Displacement:			
Head Rotation Angle--			
60°	Time	67.0 to 83.0 ms	68 ms
	Displ.	4.3 to 5.3 in.	5.3"
30°	Time	85.4 to 104.6 ms	89.5 ms
	Displ.	2.1 to 3.1 in.	2.2"
0°	Time	101.0 to 123.0 ms	104 ms
	Displ.	-.5 to 0.5 in.	0.0
<b>3. ABDOMINAL COMPRESSION TEST:</b>			
(Preload = 10 pounds)			
a. Force @ .5" - - - -	23 to 36 lbs.	23.5#	
b. Force @ .75" - - - -	36 to 50 lbs.	37.5#	
c. Force @ 1.0" - - - -	50 to 63 lbs.	55.5#	
d. Force @ 1.3" - - - -	73 to 88 lbs.	87#	
<b>4. LUMBAR FLEXION TEST:</b>			
a. Force @ 20° - - - -	22 to 34 lbs.	33.5#	
b. Force @ 30° - - - -	34 to 46 lbs.	44.5#	
c. Force @ 40° - - - -	46 to 58 lbs.	57#	
d. Return Angle - - - -	12° maximum	5.5°	
<b>5. CHEST IMPACT TESTS:</b>			
a. High Speed			
(1) Probe Speed- - -	21.78-22.22 fps	22.02fps	
(2) Peak Deflection-	1.7" maximum	1.70"	
(3) Peak Resistive Force- - - - -	2250 lbs. maximum	1924#	
(4) Internal Hysteresis - - -	50 to 70%	60.2%	
b. Low Speed			
(1) Probe Speed- - -	13.86-14.14 fps	14.09fps	
(2) Peak Deflection-	1.1" maximum	.89"	
(3) Peak Resistive Force- - - - -	1450 lbs. maximum	1248#	
(4) Internal Hyster.-	50 to 70%	66.9%	

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

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.: 749

TECHNICIAN'S NAME: DWH

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
<b>6. KNEE IMPACT TESTS:</b>			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.94 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	1850#	
(3) Time Above 1000#-	1.7 ms minimum	1.96 ms	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.85 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	1875#	
(3) Time Above 1000#-	1.7 ms minimum	1.88 ms	

REMARKS:

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NO. 749 CALIB. SEQ. NOS. FOR DUMMY: 1

A. <u>DUMMY INSTRUMENTS:</u>	<u>MANUFACTURER</u>	<u>SERIAL NUMBER</u>	<u>DATE LAST CALIBRATED</u>	<u>DATE OF NEXT CALIBRATION</u>
1. Head Accelerometers --				
a. Triaxial unit - - - - -				
b. Uniaxial units				
(1) Longitudinal ( $A_x$ ) -	Endevco	CL60	8-87	2-88
(2) Lateral ( $A_y$ ) - - -	Endevco	CG34	8-87	2-88
(3) Vertical ( $A_z$ ) - - -	Endevco	CN24	8-87	2-88
2. Chest Accelerometers -- (Vehicle Crash Test Usage)				
a. Triaxial unit - - - - -				
b. Uniaxial units				
(1) Longitudinal ( $A_x$ ) -	CEC	A129	8-87	2-88
(2) Lateral ( $A_y$ ) - - -	Endevco	CN64	8-87	2-88
(3) Vertical ( $A_z$ ) - - -	CEC	A56	8-87	2-88
3. Chest Potentiometer - - -	Ohmite	7915	8-87	2-88
4. Femur Load Cells --				
a. Right Side - - - - -	GSE	74	8-87	2-88
b. Left Side - - - - -	GSE	75	8-87	2-88
B. <u>CALIB. LAB. INSTRUMENTS:</u>				
1. Pendulum Accelerometer - - -	CED	18259	8-87	2-88
2. Test Probe Accelerometer - - -	"	17815	8-87	2-88
3. Lumbar Flexion Test Push Force Gauge - - - - -	Transducer "	20051	8-87	2-88
4. Abdominal Compression Test Force Gauge - - - - -	BLH	72952	8-87	2-88
5. Abdominal Compression Test Displacement Gauge - - - - -	CIC	567-11	8-87	2-88

APPENDIX D

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

**TAURUS SAFETY FEATURES**

Your vehicle was designed with you and your passenger's safety in mind and is a product of our dedication to providing a secure, safe and enjoyable driving experience. Optimum driver comfort with precise communication and accessibility of controls for reduced driver distraction were prime design objectives.

To allow the driver to concentrate on his prime objective of driving, the controls in your vehicle have been located and designed to be easily actuated. Many of the switches are "tactile-type" to allow the driver to operate a control by touch without taking his or her eyes off the road. All controls are placed in easy-to-reach locations.

**OCCUPANT RESTRAINT SYSTEMS**

**WARNING — Be sure to LOCK ALL DOORS before driving away. Locking the doors, along with using the safety belts provided, will minimize the risk of injury or ejection in an accident.**

Ford Motor Company recommends that you always "buckle up." In a growing number of areas restraint system use is required by law.

**WARNING — Passengers should not be allowed to ride in the cargo area of any vehicle. Persons who are not riding in a seat with a fastened safety belt are much more likely to suffer serious bodily injury in the event of a collision.**

**WARNING — All vehicle occupants, including pregnant women, should wear their safety belts for maximum protection in the event of a collision. All vehicle occupants, including pregnant women, should be sure the lap belt or lap belt portion of the lap-shoulder belt is fitted snugly and as low as possible around the hips, not the waist. Shoulder belts should also be properly adjusted for minimum slack. Failure to properly utilize the safety belts may increase the chance and/or severity of injury in the event of a collision.**

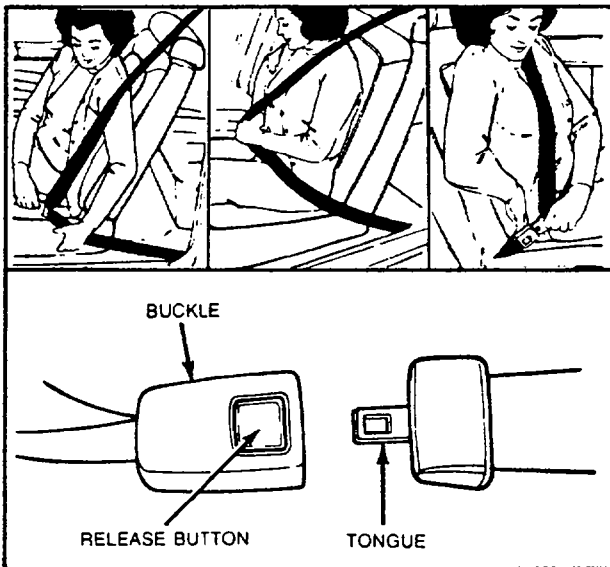
**According to accident statistics, properly restrained children are safer in the rear seat than in the front seat. For young children, infant and child restraints should be obtained and used in accordance with the instructions**

**provided by the manufacturer of the infant and child restraint. See Infant and Child Restraints in this section. Child restraints are required by law.**

**Front Lap-Shoulder Belts**

The belt system allows freedom of movement, locking only on hard braking or impacts of approximately 5 mph (8 km/h) or more. The system cannot be made to lock by jerking on the belt.

After entering your vehicle, close the door and adjust the front seat to obtain the best position for your driving comfort, access to controls, and visibility. Then pull the lap-shoulder belt from the retractor so the shoulder portion of the belt crosses your outboard shoulder and chest and insert the belt tongue into the proper buckle until you hear a snap and feel it latch.



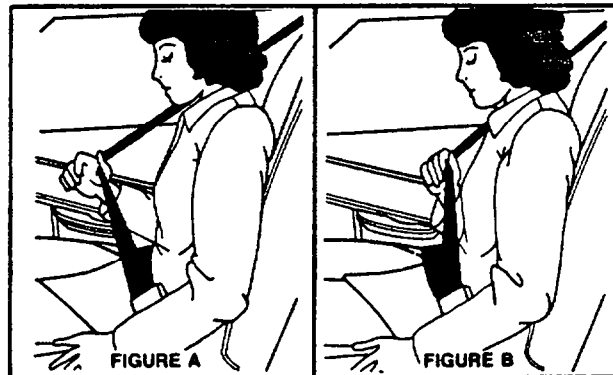
Pull up on the shoulder portion of the belt to tighten the lap portion to a snug fit. Be sure the belt is as low on your hips as possible. If the shoulder belt is uncomfortably tight, a comfort regulator is provided in the shoulder belt retractor to reduce belt pressure against your chest. The shoulder belt can be adjusted much like a window shade to maintain a small amount of slack in the belt. The adjacent door must be closed to use this comfort regulator feature.

#### Adjustment Procedure (Front Lap-Shoulder Belts Only)

To set the comfort regulator, the shoulder belt initially should be positioned snugly against the chest. If the belt is not positioned snugly, the comfort regulator may already be engaged. Disengagement is accomplished by the following procedure:

Figure A — Pull the shoulder belt outward 4 or 5 inches (10 to 13 cm), then release it and allow belt to fully retract. Repeat procedure if belt is not snug to the chest.

Figure B — Now the belt tension may be adjusted by pulling down slightly on the shoulder belt and releasing. The least amount of slack needed to release tension, but not more than 1-1/2 inches (3.8 cm), should be pulled out when using the comfort regulator system as the belt does not retract at a sudden stop, but "locks" in its current adjusted position.



- If the desired setting is not achieved or excess slack develops as you change seat position, repeat the above procedure.
- When the door is opened, the comfort regulator will release automatically, permitting the lap-shoulder belt to retract. After unbuckling the belt it is recommended that you guide the tongue during retraction to prevent it from striking you or the vehicle.

**WARNING — Never allow more than 1-1/2 inches (3.8 cm) of slack to be introduced into your safety belt system because the belt locks upon impact where it is positioned. Wearing the belt too loosely will negate any real safety protection. Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around your neck over the inside shoulder. Never use a single belt for more than one person. Be sure the lap**

**portion of the belt is fitted snugly and as low as possible around the hips, not on the waist. Failure to follow these precautions could increase the chance and/or severity of injury in an accident.**

#### **Rear Lap-Shoulder Belts**

Pull the lap-shoulder belt from the retractor so the shoulder portion of the belt crosses your shoulder and chest and insert the belt tongue into the proper buckle until you hear a snap and feel it latch (see illustration). Pull up on the shoulder portion of the belt to tighten the lap portion to a snug fit. Be sure the belt is as low on your hips as possible.

**WARNING — Be sure the lap portion of the belt is fitted snugly and as low as possible around the hips, not around the waist. Failure to do so may increase the chance of injury in the event of a collision.**