

CERTIFICATE OF TRUE COPY

I HEREBY CERTIFY that the annexed is a true copy of NHTSA New Vehicle Assessment and Standards Enforcement Indicant Testing (FMVSS 212 and 301-75). Mitsubishi Motor Corporation. 1984 Plymouth Conquest 2-door Coupe. NHTSA No. CE0302, Calspan Test No. 7209-8. Final Report DOT668

on file in the Office of Crashworthiness Research, NHTSA, in my custody.

Signed and dated at Washington, D.C.

this 12th day of August, 19 86

by

Dan Cohen,

Acting Chief, Office of Crashworthiness Research
(Title)

I HEREBY CERTIFY that Dan Cohen

signed the foregoing certificate, is now, and was, at the time of signing, Acting-Chief, Office of Crashworthiness search, National Highway Traffic Safety Administration,

official custodian of the subject record, and that full faith and credit should be given his/her certificate as such.

IN WITNESS WHEREOF, I have hereunto subscribed my name,

and caused the seal of the Department of Transportation to be

affixed this 12th day of August

one thousand nine hundred and eighty six

For the SECRETARY OF TRANSPORTATION

Annie M. Robinson
Annie M. Robinson Certifying Officer
Acting NHTSA Records Officer

REPORT NOS. 212-CAL-84-080

301-CAL-84-080

NHTSA NEW VEHICLE ASSESSMENT AND
STANDARDS ENFORCEMENT INDICANT TESTING

FMVSS 212 and 301-75

MITSUBISHI MOTOR CORPORATION

1984 PLYMOUTH CONQUEST

2-DOOR COUPE

NHTSA NO. CE0302

CALSPAN TEST NO. 7209-8

CALSPAN CORPORATION

ADVANCED TECHNOLOGY CENTER

P. O. BOX 400

BUFFALO, NEW YORK 14225

JANUARY 1984



FINAL REPORT

Prepared for:

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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This Final Test Report was prepared for the U. S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-82-C-01140. This document is disseminated under the sponsorship of the U. S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

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1/23/84
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1. Report No. 212-CAL-84-080 301-CAL-84-080		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle NHTSA New Vehicle Assessment and Standards Enforcement Indicant Testing				5. Report Date January 1984	
				6. Performing Organization Code	
7. Author(s)				8. Performing Organization Report No.	
9. Performing Organization Name and Address Calspan Advanced Technology Center P.O. Box 400 Buffalo, NY 14225				10. Work Unit No. 961 Series	
				11. Contract or Grant No. DTNH22-82-C-01140	
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance 400 Seventh Street, S.W., Washington, DC 20590				13. Type of Report and Period Covered Final Report December 1983 - January 1984	
				14. Sponsoring Agency Code	
15. Supplementary Notes					
16. Abstract A frontal load cell barrier test of a 1984 Plymouth Conquest 2-door coupe was performed at Calspan Corporation, Advanced Technology Center, Transportation Research/Physical Sciences Department facility for the New Car Assessment and Standards Enforcement Testing of FMVSS 212, "Windshield Mounting" and FMVSS 301-75, "Fuel System Integrity" for the Office of Vehicle Safety Compliance, the Office of Market Incentives (OMI) and for Research and Development. Impact speed was 35.3 mph. Ambient temperature on the test date was 36°F. The post-test vehicle crush was 23.9 inches and intrusion of the firewall into compartment was 5.3 inches. The test vehicle appeared to comply with the following vehicle performance standards: FMVSS 212 - Windshield Retention FMVSS 301-75 - Fuel System Integrity With regard to occupant injury criteria (FMVSS 208), both the driver and passenger dummy head HIC responses appeared to exceed the 1000 limit. All other injury criteria (femurs, chest) values appeared to be acceptable.					
17. Key Words Load Cell Barrier Frontal Impact FMVSS Compliance Testing FMVSS 212 FMVSS 301-75			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		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages	22. Price

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SECTION 1
PURPOSE AND TEST PROCEDURE

This frontal barrier test is part of the Composite FY83 Vehicle Barrier Impact Testing, sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract DTNH22-82-C-01140. The purpose of this test was to obtain crashworthiness and occupant restraint performance data for impact speeds in excess of the current FMVSS requirements.

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

SECTION 2
SUMMARY OF TEST NO. CE0302

A load cell barrier consisting of 36 load cells (Figure 4) was impacted by a 1984 Plymouth Conquest 2-door coupe at a velocity of 35.3 mph. The test was performed at the Calspan Corporation Advanced Technology Center on December 1, 1983. Pre- and post-test photographs of the vehicle and occupants can be found in Appendix A. Table 1 presents pertinent crash test information.

Two Part 572, 50th percentile male anthropomorphic test devices (ATD's) were placed in the driver and right-front passenger seating positions, according to dummy placement procedures specified in Laboratory Procedure for Vehicle Assessment IP-212-02.

Both ATDs were fully instrumented with femur load cells and triaxial accelerometers in the head and chest areas. These ATDs had been certified prior to the test, and certification details, along with instrumentation calibration data, are found in Appendix C.

The crash event was recorded by one real-time camera and 15 high-speed cameras. All cameras checked out prior to the test. Three of the fifteen high-speed cameras failed at impact. For Camera No. 6 (on-board driver belt) the flash bulb failed. Camera No. 9 (windshield right side) and Camera No. 11 (barrier) failed to run due to film brakeage. Camera locations and other pertinent camera information are found in Section 4 of this report.

The 67 channels of data were recorded on six 14-channel FM tape recorders. There were no data losses experienced during the test. Appendix B contains the vehicle and dummy response data traces. The Injury Criteria Values are presented in summary form in Table 10.

Table 1

CRASH TEST SUMMARY

TEST NO. CE0302 PROJECT: FY-84 New Car Assessment Program
FMVSS No. 208/212/301-75
DATE: 12/1/83 TIME: 1235 hrs. TEMP: 36°F.

VEHICLE 1984 Plymouth Conquest 2-door coupe
TEST WEIGHT (lbs) 3170
IMPACT ANGLE (deg)* 0
IMPACT VELOCITY (mph)** 35.3
MAX. CRUSH (in) static 23.9
MAX. INTRUSION (in) 5.3

DUMMIES

TYPE Hybrid II Part 572 Hybrid II Part 572
LOCATION LF (1) Serial No. 1019 RF (2) Serial No. 1022
RESTRAINT production 3-point production 3-point
belt system belt system
NUMBER OF DATA CHANNELS 67
NUMBER OF HIGH SPEED CAMERAS 15 + 1 real time

*With respect to tow track Centerline

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

GENERAL COMMENTS

The 1984 Plymouth Conquest 2-door coupe was equipped with a 155.9 cubic inch, 4-cylinder inline engine, five-speed manual transmission, power brakes and power steering. The total test weight with two 50th percentile male dummies, instrumentation and two on-board cameras was 3170 pounds.

The 1983 Plymouth Conquest which was involved in a frontal load cell barrier crash at a velocity of 35.3 mph appeared to comply with FMVSS Nos. 212, "Windshield Mounting;" and 301-75, "Fuel System Integrity." There was 100 percent windshield retention and no fuel leakage after impact or any phase of the rollover test.

The vehicle sustained 23.9 inches of static crush and approximately 30 inches of dynamic crush. Maximum load cell barrier force measured by the 36 load cells was 120,000 pounds at 47 milliseconds.

The driver's head struck the dash panel and steering wheel rim (Figure A-24). The driver did not meet the FMVSS 208, "Head Injury Criteria" (HIC of 1118.3). The remaining criteria were satisfactory as indicated by a maximum chest deceleration over 3 milliseconds of 57.2 g's, and femur loads of 360 and 410 pounds.

The right-front passenger head struck the dash panel (Figure A-28) and thus did not meet the FMVSS 208, "Head Injury Criteria" (HIC=1034.8) but did meet all other criteria. A maximum chest deceleration over 3 milliseconds of 44.3 g's and femur loads of 320 and 180 pounds were recorded.

The belt-related data for each occupant are presented in Table 11 of this report.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION

Make/Model Plymouth Conquest Body Style 2-door coupe
Model Year 1984 NHTSA No. CE0302 Color Blue
Engine Data: 4 cylinders, 155.9 cubic inches
Transmission Data: 5 speed, () manual () automatic
Date Rec'd 11/11/83 Air Cond. -- Pw. Str. Pw. Brks.
Dealer's Name & Address Case Chrysler Plymouth, Inc., Hamburg, NY
Odometer Reading 1147

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

Vehicle Manufactured by: Mitsubishi Motors Corporation
Date of Manufacture 7/83 VIN JP3BC44H8EZ401273
GVRW 3937 lbs., GAWR: front 1898 lbs., rear 2039 lbs.

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVE BOX, ETC.

Vehicle Load (up to capacity): front 27 psi
rear 27 psi
Recommended Tire Size P195/70R14 Load Range B C D
Recommended Cold Tire Pressure: front 27 psi, rear 27 psi
Tires on Vehicle P195/70R14
Is Spare Tire a "Space Saver?" yes no
Is Spare Tire Standard Equipment? yes no
Vehicle Capacity: Types of Seats: bench, bucket, split bench
Number of Occupants (Designated Seating Capacity): 2 front
3 rear
5 TOTAL
RCLW Cargo Load: 77 lbs.
VCW TOTAL = 827 lbs.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

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

Right Front = 710 lbs. Right Rear = 660 lbs.
 Left Front = 720 lbs. Left Rear = 660 lbs.
 TOTAL FRONT WEIGHT = 1430 lbs. (52 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 1320 lbs. (48 % of Total Vehicle Weight)
 TOTAL DELIVERY WEIGHT = 2750 lbs.

CALCULATION FOR TARGET TEST WEIGHT

RCLW = Rated Cargo and Luggage Weight
 UDW = Unloaded Delivered Weight (2750 lbs.)
 VCW = Vehicle Capacity Weight (827 lbs.)
 DSC = Designated Seating Capacity (5)
 RCLW = VCW - 150 (DSC) = 77 lbs.
 Target Test Weight = UDW + RCLW + (2 dummies X 164 lbs./dummy)
 Target Test Weight = 3155 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 92 POUNDS CARGO

Right Front = 770 lbs. Right Rear = 800 lbs.
 Left Front = 780 lbs. Left Rear = 820 lbs.
 TOTAL FRONT WEIGHT = 1550 lbs. (48.9 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 1620 lbs. (51.1 % of Total Vehicle Weight)
 TOTAL TEST WEIGHT = 3170 lbs.
 Weight of ballast secured in vehicle trunk area = 0 lbs.

VEHICLE ATTITUDE (all dimensions in inches)

Delivered Attitude:	RF	<u>26</u>	LF	<u>26</u>	RR	<u>27</u>	LR	<u>26.7</u>
Test Attitude:	RF	<u>25.9</u>	LF	<u>25.6</u>	RR	<u>25.3</u>	LR	<u>25.2</u>

Remarks: Wheelbase = 96"
CG = 49.1 inches aft of front wheel C/L

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

POST-IMPACT DATA

Type of Test Frontal Impact Angle 0 °
 Date of Test 12/1/83 Time of Test 1235 hrs.
 Ambient Temperature 36 °F at impact area
 Temperature in Occupant Compartment 70 °F
 Windshield Molding Temperature 54 °F
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: primary = 35.3 mph, secondary 35.25 mph

VEHICLE REBOUND AND CRUSH (inches)

Vehicle Length: Pre-test = R 170.0 C 173.2 L 170.0
 Post-test = R 147.8 C 149.3 L 148.7
 Crush = R 22.2 C 23.9 L 21.3
 Distance from front of test vehicle to point of impact:
 R 10.7 C/L 9.2 L 9.5

VISIBLE DUMMY CONTACT POINTS

	<u>Driver</u>	<u>Passenger</u>
Head	<u>top of dash panel upper wheel rim</u>	<u>top of dash panel</u>
Chest	<u>none</u>	<u>none</u>
Abdomen	<u>none</u>	<u>none</u>
Left Knee	<u>lower dash</u>	<u>glove box</u>
Right Knee	<u>lower dash</u>	<u>glove box</u>

	<u>Front</u>	
	<u>Left</u>	<u>Right</u>
Door Opening	<u>operable</u>	<u>operable</u>

Table 2 (cont'd)

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

	<u>Front</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 _____

Other notable impact effects: Passenger torso belt was released post-impact.
The belt appeared to have been significantly loaded prior to release at the
inboard stalk location. As the driver rolled inboard, the right elbow
struck and released the passenger seat belt. (Figure A-30)

SECTION 3

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

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

Table 3
SUMMARY OF FMVSS 212 AND 301 DATA

PRE-IMPACT DATA

Make/Model: Plymouth Conquest
Body Style: 2-door coupe Model Year: 1984
NHTSA No.: CE0302 Color: blue

DATA FROM CERTIFICATION LABEL

Vehicle Manufacturer: Mitsubishi for Chrysler
Date of Manufacture: 7/83 VIN: JP3BC44H8EZ401273
GVWR: 3937 lbs., GAWR: Front 1898 lbs., Rear 2039 lbs.

POST-IMPACT DATA

Type of Test: Frontal Load Cell Barrier Impact
Date of Test: 12/1/83 Time: 1235 hrs. Temp.: 36° °F
Required Impact Velocity Range: 34.5 to 35.5 mph
Impact Velocity: Primary = 35.3 mph, Secondary = 35.25 mph
Test Weight 3170 lbs., Static Crush Max. 23.9 in., Rebound 9.2 in.

FUEL SYSTEM DATA

Test Fluid Type: Red Stoddard Solvent #2, Spec. Grav.: 0.764
Kinematic Viscosity 0.96 Centistokes
EPA Capacity* 19.8 gal.
Test Volume 18.4 gal. (93% of EPA Capacity)
Fuel System Capacity (data from Owner's Manual) 19.8 gal.
Electric Fuel Pump? X yes ___ no, Fuel Injection? X yes ___ no Throttle
Does electric fuel pump operate with ignition switch "on" and the engine Body Fuel
Injection
not operating? ___ yes X no (Turbo Charged Engine)

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

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

Table 3

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

Details of fuel system: The fuel tank is located aft of rear wheels and held in place with six mounting bolts. The fuel tube is on the left side of vehicle and is sealed by a twist-type cap which is concealed by a hinged door.

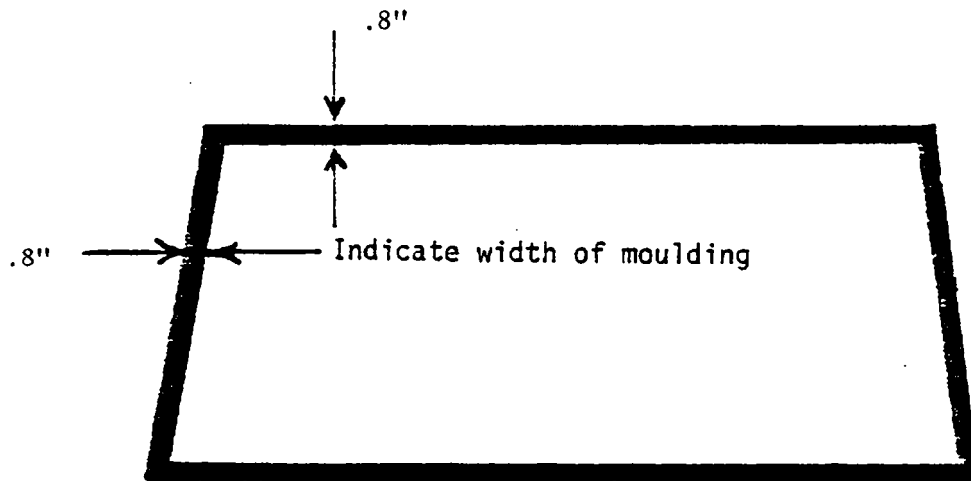
Details of windshield mounting (method of retention, type of trim, etc.):

Windshield is bonded in place and has a .8 inch plastic molding around the top and sides.

	Windshield Periphery		Retention %
	Pre-Test (in.)	Post-Test (in.)	
Right Side	77.35	77.35	100
Left Side	77.35	77.35	100
TOTAL	154.7	154.7	100

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

AREA OF RETENTION FAILURE



FRONT VIEW

Figure 1 WINDSHIELD RETENTION, FMVSS NO. 212 DATA

Table 5

"FUEL SYSTEM INTEGRITY" POST-IMPACT TEST DATA

FMVSS No. 301-75

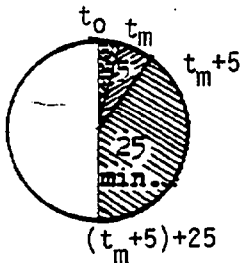
TEST VEHICLE NHTSA NO. CE0302 Test Date 12/1/83
 Vehicle Manufacture/Make/Model 1984 Plymouth Conquest 2-door coupe

Test vehicle fuel tank filled to 90-91% of capacity with Stoddard Solvent and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE

- Frontal (35 mph)
- Oblique (30 mph) with _____° barrier face first contacting
 _____ driver _____ passenger side
- Rear Moving Barrier (35 mph)
- Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT



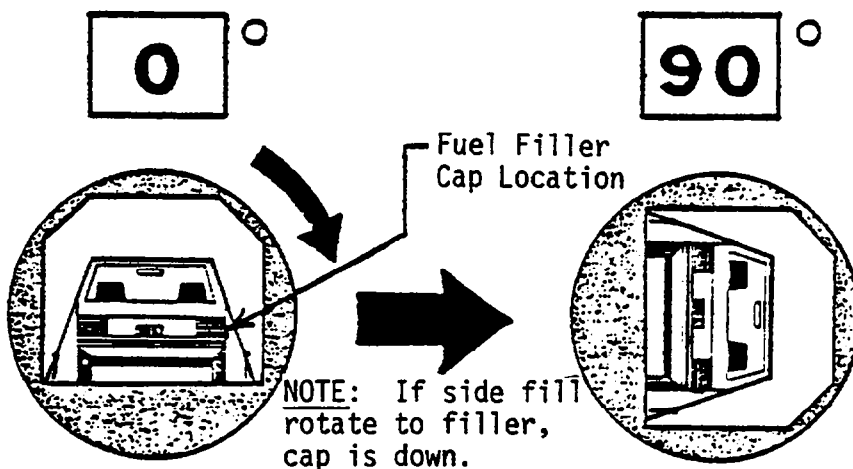
	Actual	Max. Allow.
From impact until vehicle motion ceases	0	1 oz
For 5 min. period after vehicle motion ceases	0	5 oz
For next 25 min.	0	1 oz/1 min

SOLVENT SPILLAGE DETAILS

None

Table 6
FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

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

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. <u>from</u> onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	-------------------

Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
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ACTUAL TEST VEHICLE SOLVENT SPILLAGE

0	0	0	0
---	---	---	---

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

SOLVENT SPILLAGE LOCATION(S)

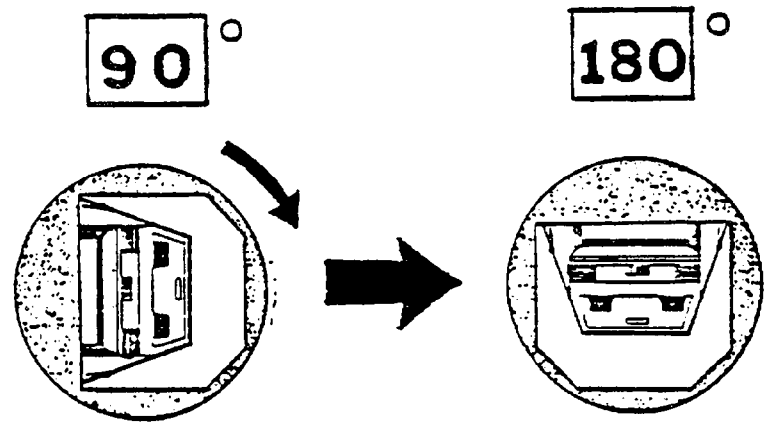
None

VEHICLE NHTSA ID NO. CE0302

Table 6 (cont'd)

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time = 2 minutes 51 seconds
 (Spec. Range = 1 to 3 min.)
 FMVSS 301-75 Position Hold Time = 5 minutes 00 seconds
 TOTAL = 7 minutes 51 seconds
 Next Whole Minute Interval = 8 minutes

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. <u>from</u> onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	-------------------

Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

ACTUAL TEST VEHICLE SOLVENT SPILLAGE

0	0	0	0
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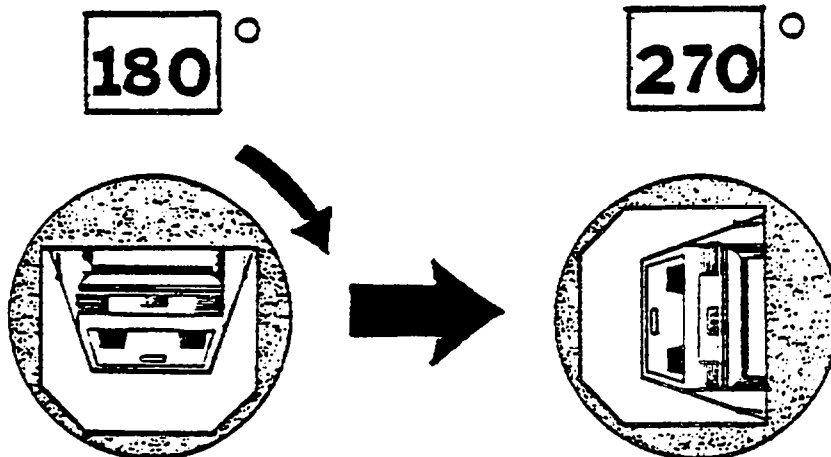
NOTE: Record spillage for whole minute intervals only as determined above.

SOLVENT SPILLAGE LOCATION(S)

None

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

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

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. <u>from</u> onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	-------------------

Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

ACTUAL TEST VEHICLE SOLVENT SPILLAGE

0	0	0	0
---	---	---	---

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

SOLVENT SPILLAGE LOCATION(S)

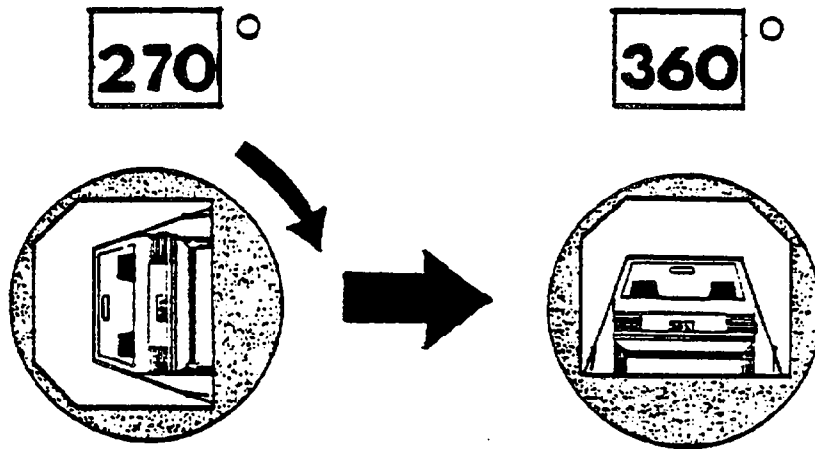
None

VEHICLE NHTSA ID NO. CE0302

Table 6 (cont'd)

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time = 2 minutes 54 seconds
(Spec. Range = 1 to 3 min.)
FMVSS 301-75 Position Hold Time = 5 minutes 00 seconds
TOTAL = 7 minutes 54 seconds
Next Whole Minute Interval = 8 minutes

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. <u>from</u> onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	-------------------

Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

ACTUAL TEST VEHICLE SOLVENT SPILLAGE

0	0	0	0
---	---	---	---

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

SOLVENT SPILLAGE LOCATION(S)

None

SECTION 4

OCCUPANT AND VEHICLE INFORMATION (OMI AND AID DATA)

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

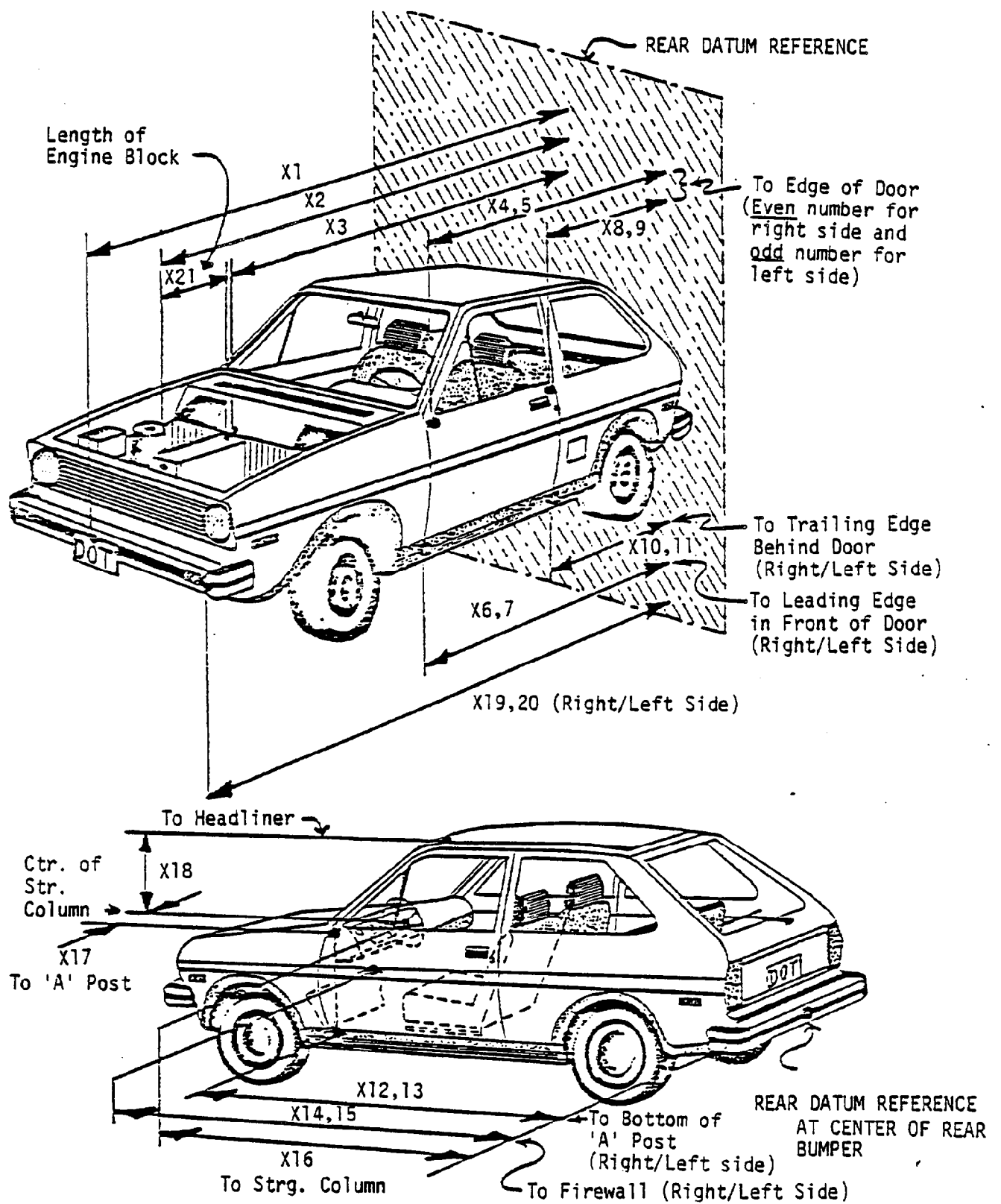
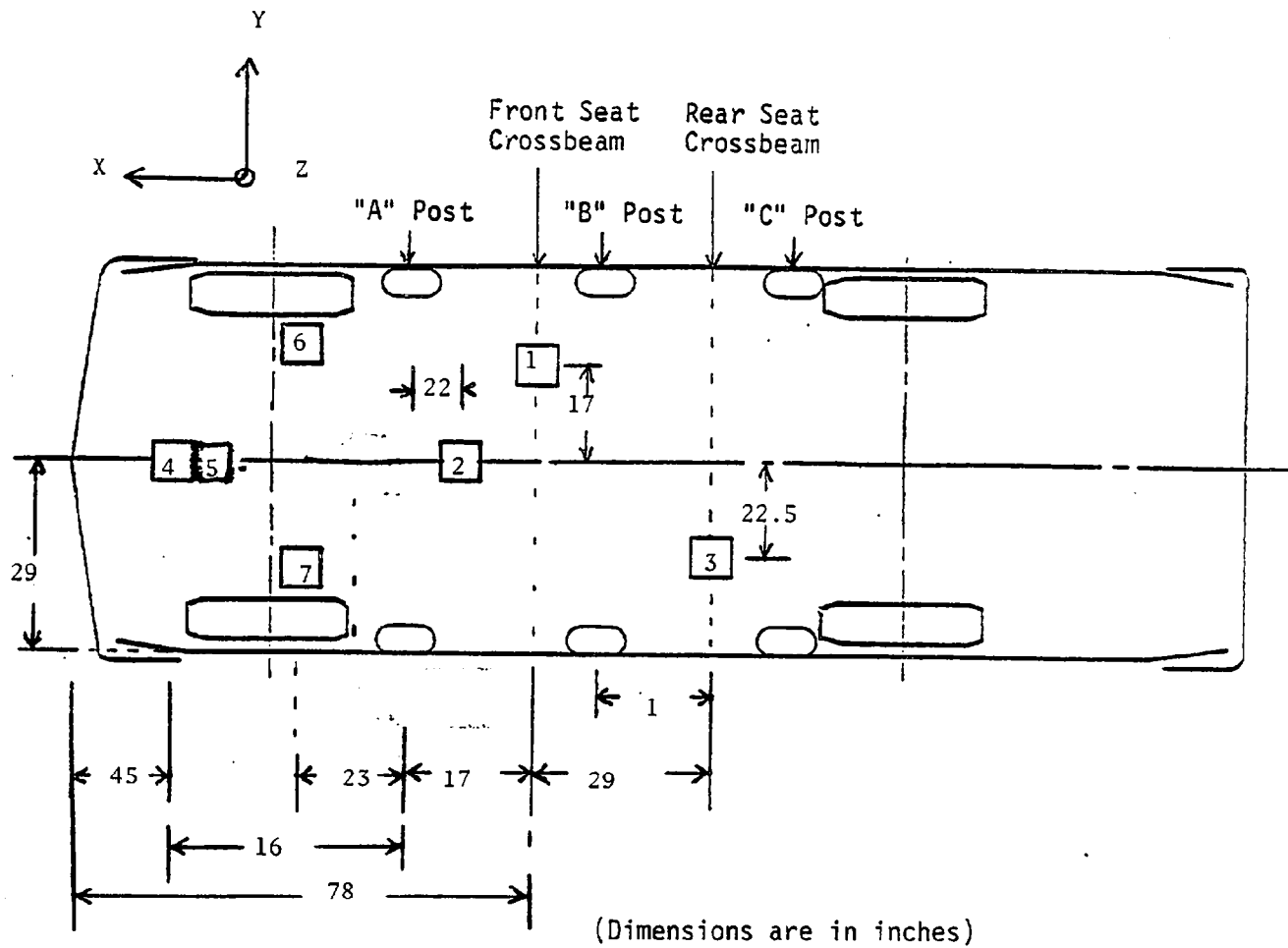


Figure 2 PRE- AND POST-TEST MEASUREMENT POINTS

Table 7

VEHICLE MEASUREMENTS

		All Dimensions in Inches		
No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	173.2	149.3	23.9
X2	Rear Surface of Vehicle to Front of Engine	146.1	139.0	7.1
X3	Rear Surface of Vehicle to Firewall	123.6	118.3	5.3
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	111.0	110.9	.1
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	110.9	110.6	.3
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	111.0	110.9	.1
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	110.9	110.6	.3
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	60.5	60.5	0
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	60.1	60.1	0
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	68.0	68.0	0
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	67.7	67.6	.1
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	111.2	111.2	0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	111.1	111.0	.1
X14	Rear Surface of Vehicle to Firewall, Right Side	121.2	116.0	5.2
X15	Rear Surface of Vehicle to Firewall, Left Side	120.2	117.2	3.0
X16	Rear Surface of Vehicle to Steering Column	95.9	93.0	2.9
X17	Center of Steering Column to "A" Post	15.6	15.0	.6
X18	Center of Steering Column to Headliner	16.5	17.5	-1.0
X19	Rear Surface of Vehicle to Right Side of Front Bumper	170.0	147.8	22.2
X20	Rear Surface of Vehicle to Left Side of Front Bumper	170.0	148.7	21.3
X21	Length of Engine Block	20.0	20.0	0



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

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

FIGURE 3 VEHICLE ACCELEROMETER LOCATIONS

36 LOAD CELLS
 4 ROWS
 9 COLUMNS

FRONT VIEW

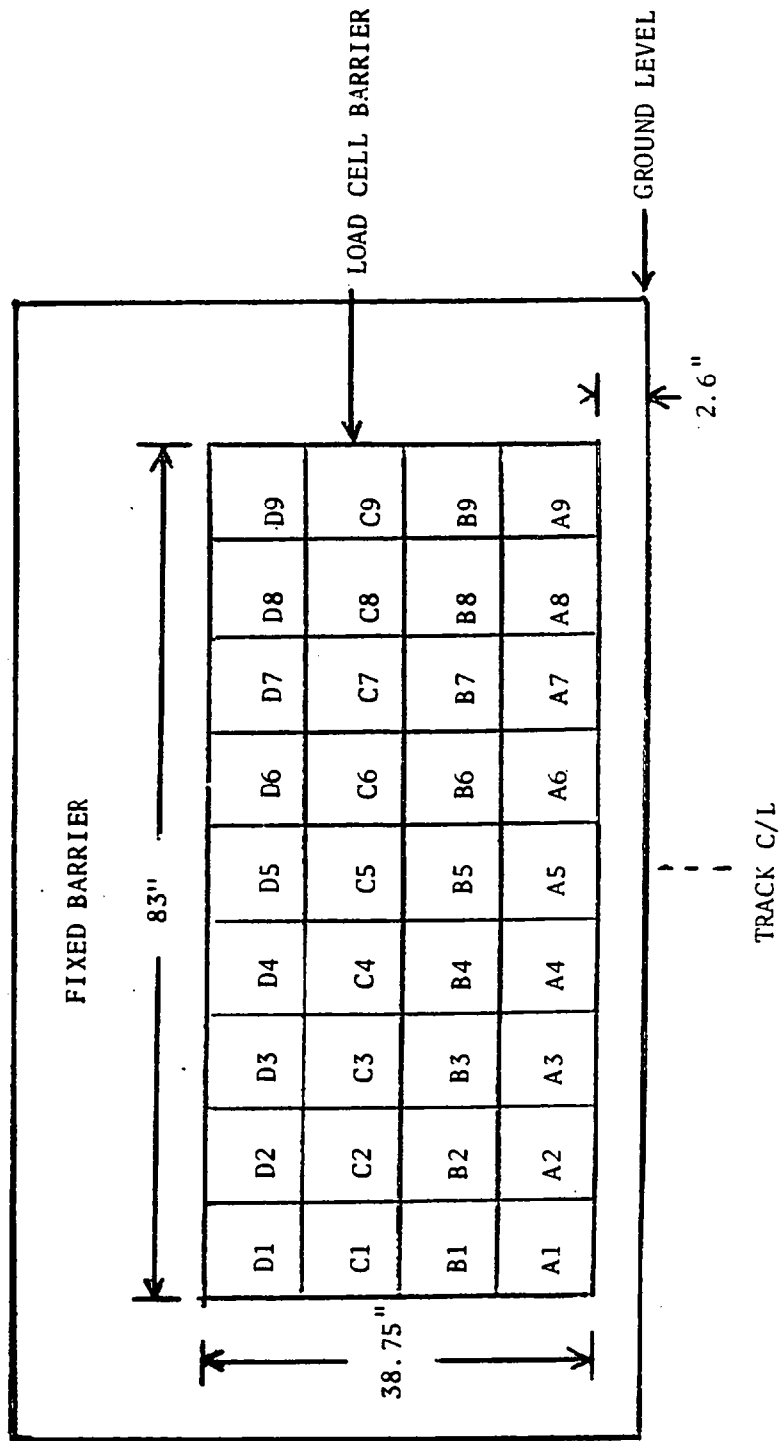


Figure 4 FIXED LOAD CELL BARRIER-LOAD CELL LOCATIONS

Table 8
 ACCIDENT INVESTIGATION DIVISION
Data Summary

Test No. CE0302

Date 12/1/83

Vehicle No. 1

Impact Description	<u>Frontal load cell barrier</u>
Make	<u>Plymouth Conquest</u>
Model	<u>2-door coupe</u>
Year	<u>1984</u>
Size Category	<u>mid-size</u>
Test Weight (lb.)	<u>3170</u>
Wheelbase (in.)	<u>96</u>
Front Overhang (in.)	<u>38.25</u>
Overall Width (in.)	<u>66.3</u>
Accelerometer Location	<u>49.1 inches aft of front wheel C/L</u>
Calibration Procedure	<u>shaker table least squares</u>
Accelerometer Linearity	<u>+ 0.75%</u>
Integration Algorithm	<u>Hybrid Simpson-Newton 3/8</u>
Impact Speed (mph)	<u>35.3</u>
Time of Separation (msec)	<u>162.2</u>
Velocity Change (mph)	<u>40.4</u>
CDC	<u>12 FDEW3</u>
Damage Length (in.)	L: <u>55</u>
Crush Dimensions (in.)	C1: <u>20.95</u>
	C2: <u>22.35</u>
	C3: <u>23.65</u>
	C4: <u>23.95</u>
	C5: <u>23.15</u>
	C6: <u>21.9</u>
Midpoint of Damage	D: <u>0</u>

National Accident Sampling System – Continuous Sampling Subsystem: Vehicle Data

FIELD MEASUREMENTS

1984 PLYMOUTH CONQUEST JP3BC44HBEZ 401273

Complete When Applicable

End Damage	Side Damage
Undeformed end width <u>55"</u>	Bowing: B1 _____ X1 _____
Corner shift: A1 _____	B2 _____ X2 _____
A2 _____	Bowing constant <u>N</u>
End shift at frame (CDC) (check one)	<u>A</u>
< 4 inches _____	$\frac{X1 + X2}{2}$ _____
≥ 4 inches _____	

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

12 EDEW3

Specific Impact Number	Plane* of C-Measurements	Direct Damage		Field L**	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	±D
		Width** (CDC)	Max*** Crush								
1	Bumper	55.0	23.95	55.0	24.25	25.6	24.4	24.7	26.4	25.2	0
	Free/space		∅		3.3	3.25	.75	.75	3.25	3.3	
1	ACTUAL CRUSH		23.95		20.95	22.35	23.65	23.85	23.15	21.9	0

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

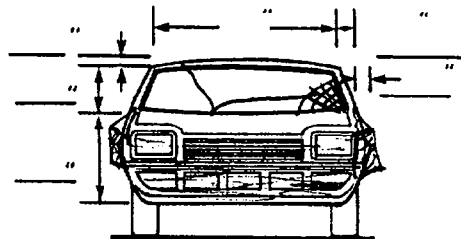
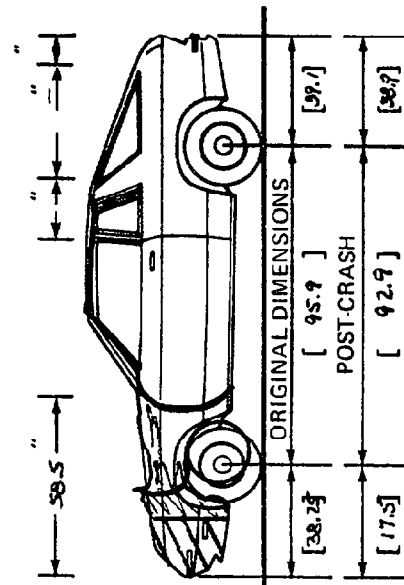
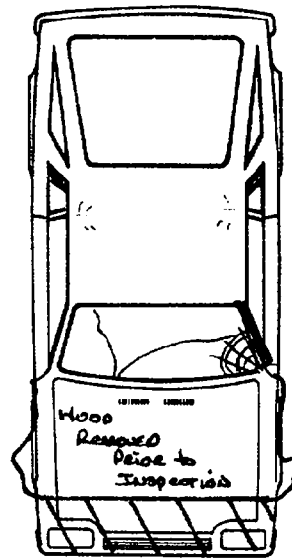
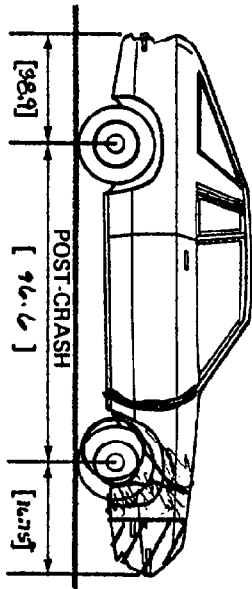
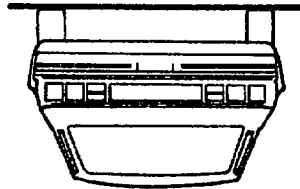
Free space value is defined as the distance between the baseline and the original body contour taken at the individual C locations. This may include the following: bumper lead, bumper taper, side protrusion, side taper, etc. Record the value for each C-measurement and maximum crush.

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

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

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

DAMAGE DESCRIPTION Tire—Wheel Damage a. Rotation physically restricted RF <u>1</u> LF <u>1</u> RR <u>1</u> LR <u>1</u> b. Tire deflated RF <u>2</u> LF <u>2</u> RR <u>2</u> LR <u>2</u> (1) Yes, (2) No, (8) NA, (9) Unk.	TYPE OF TRANSMISSION <u>4spd.</u> <input checked="" type="checkbox"/> Manual <input type="checkbox"/> Automatic Average Track: <u>N/A.</u> Maximum Width: <u>N/A.</u> ^{TEST} Curb Weight: _____ Overall Length: <u>173.25</u> 2.6 liter TURBO	WHEEL STEER ANGLES (For locked front wheels or displaced rear axles only) RF <u>001</u> ° LF <u>001</u> ° RR <u>± 00</u> ° LR <u>± 00</u> ° Within ± 5 degrees
	(1) Yes, (2) No, (8) NA, (9) Unk.	

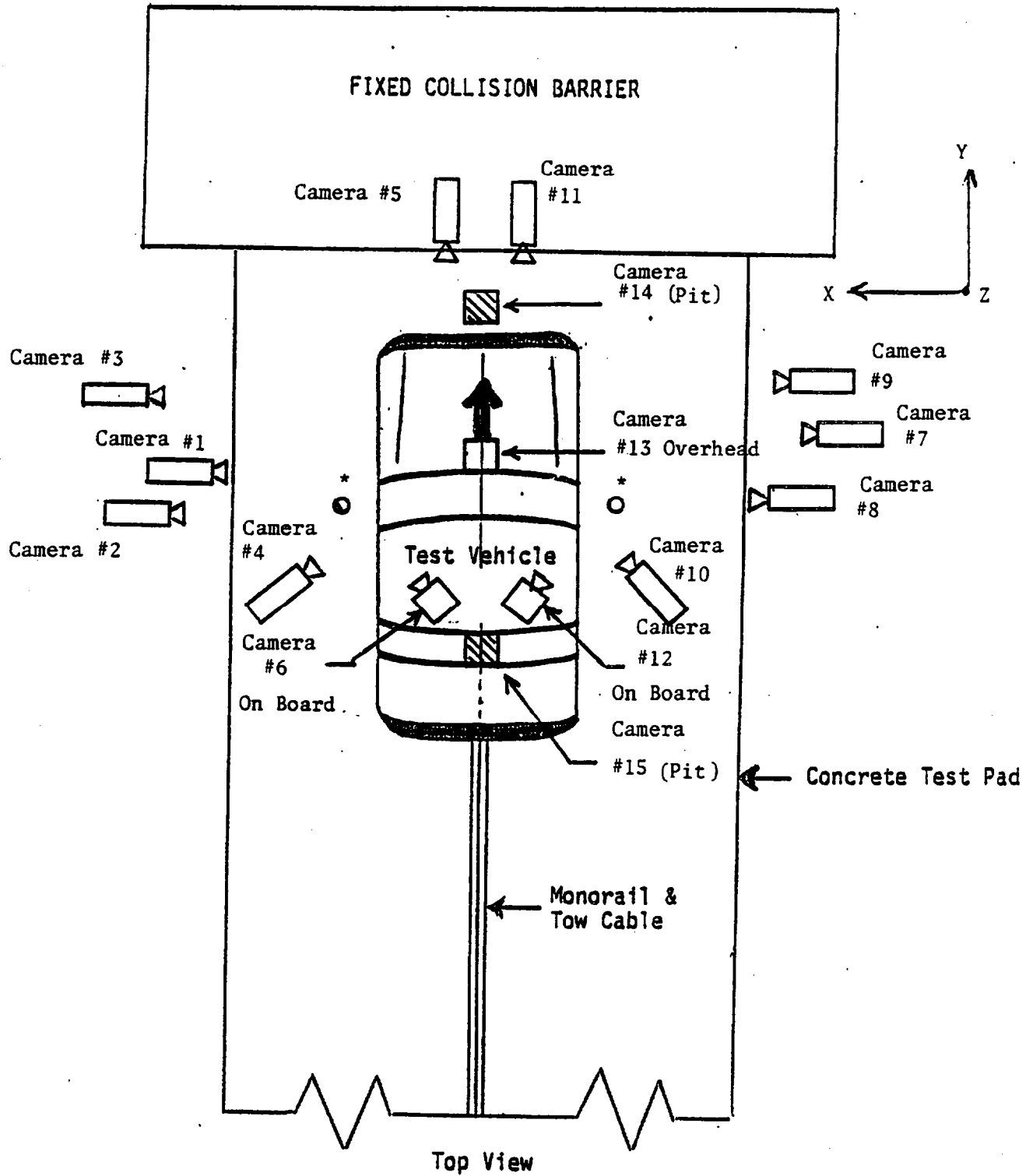


Note: Sketch new perimeter and cross hatch direct damage and single hatch induced damage on all views. Annotate observations which might be useful in reconstructing the accident (e.g., grass in tire bead, direction of striations, scuff on sidewall, etc.)

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

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

NOTE: Camera Information Shown on Table 9



* Stadia Pole 72 inches from Barrier Face

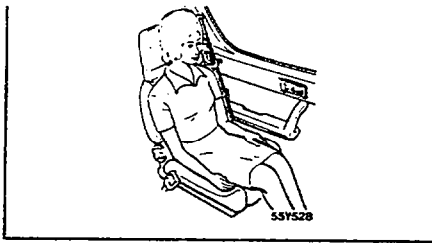
Figure 6 -- CAMERA POSITION FOR FRONTAL IMPACTS

Table 9
HIGH-SPEED CAMERA LOCATIONS

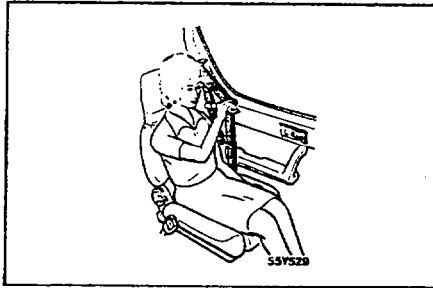
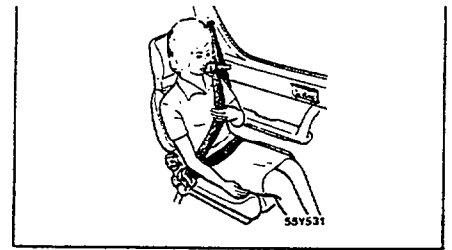
Test No. CE0302 Vehicle 1984 Plymouth Conquest

CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Vehicle Left Side	230	54	56	-6	-	13	890
2	Driver	246	72	48	-0	219	35	890
3	Driver	315	26	59	-3	288	50	900
4	Driver	90	108	72	-22	-	13	890
5	Driver (Barrier)	20	0	70	-30	85	13	NO Timing
6	Left Belt Retractor				FAILED	-	-	-
7	Vehicle Right Side	281	41	48	-2	-	13	880
8	Passenger	268	66	45	-3	241	35	1040
9	Passenger				FAILED	-	-	-
10	Passenger	90	104	69	-21	-	13	NO Timing
11	Passenger (Barrier)				FAILED	-	-	-
12	Right Belt Retractor				-	-	8	NO Timing
13	Overhead	0	40	216	-90	-	25	990
14	Engine (Pit)	0	36	-120	90	-	25	880
15	Fuel Tank (Pit)	0	140	-120	90	-	25	820

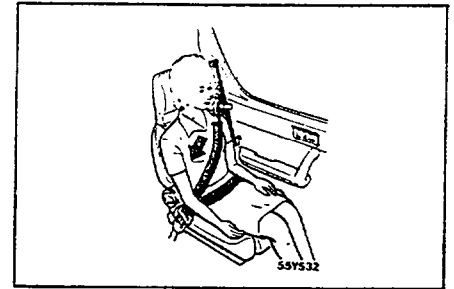
*X = film plane to monorail centerline
 Y = film plane to impact location
 Z = film plane to ground
 ** = referenced to horizontal plane



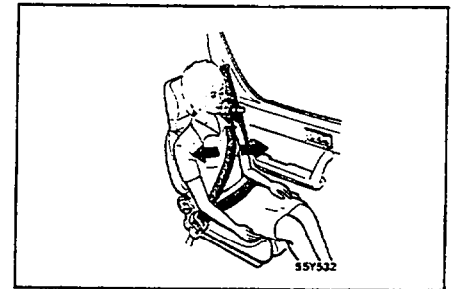
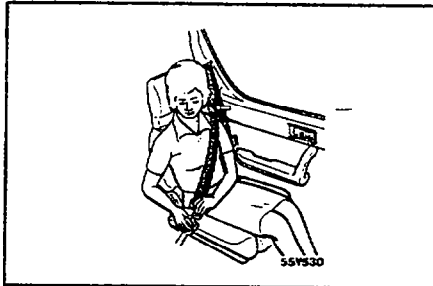
1. Get in the car and adjust the seat.



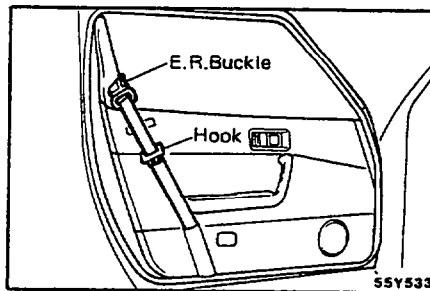
2. Grasp the movable latch plate and slide it up the webbing as far as necessary so that it will be easy to pull across your body. After a couple of tries this will become an automatic one-handed operation.



3. Pull the webbing, and move the movable latch plate toward the buckle. This system will not lock up if you stop or hesitate, so relax and continue to "buckle-up". Push the latch plate into the buckle until a "click" is heard.



4. The lap belt will not tighten during use; therefore you can set it right now to safe, comfortable snugness.

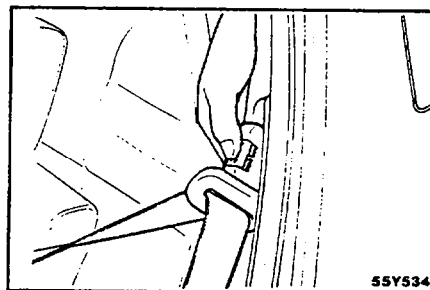


E.R. Buckle (Emergency Release Buckle)

The E.R. Buckle provides access and release to a rescuer in the event of an emergency.

The E.R. Buckle is installed onto the rear sash of the door, and the red button is easily visible from the outside.

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



To rescue, open the door and insert a hand through by pulling the handle of the door, and push the red button to release the E.R. Buckle.

After the E.R. Buckle is released, release the center buckle and remove the occupant.

NOTE

Keep the seat belt retained by the hook. A seat belt adrift from the hook will result in failure of rescue by E.R. Buckle in emergency.

6. The shoulder belt will allow unrestricted movement under normal conditions. The belt will lock in the event of an accident.

To release the belt, push the button on the buckle. To return the belt to its stowed position, pull the shoulder belt down slightly and release immediately.

CAUTION

Do not release the E.R. Buckle except in an emergency.

Figure 7 OWNER'S MANUAL SEAT BELT INSTRUCTIONS

Figure 8
PART 572 DUMMY IN-VEHICLE POSITION

Test No. CE0302

Vehicle 1984 Plymouth Conquest

SEAT TYPE:

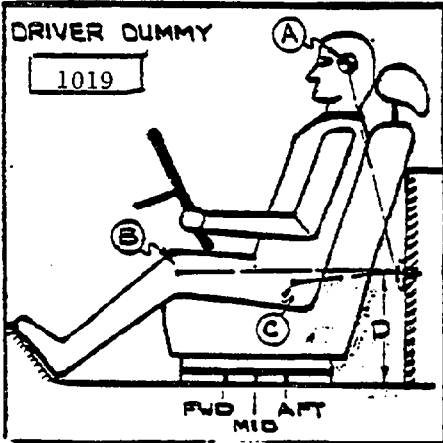
- Bench
- Bucket
- Split Bench

ADJUSTER TYPE:

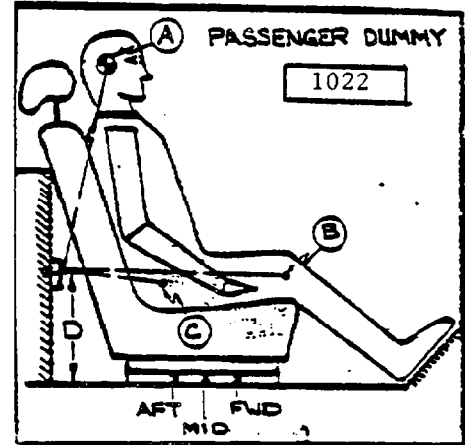
- Manual
- Power

BUCKET SEAT BACK TYPE:

- Fixed
- Adjustable Reclining



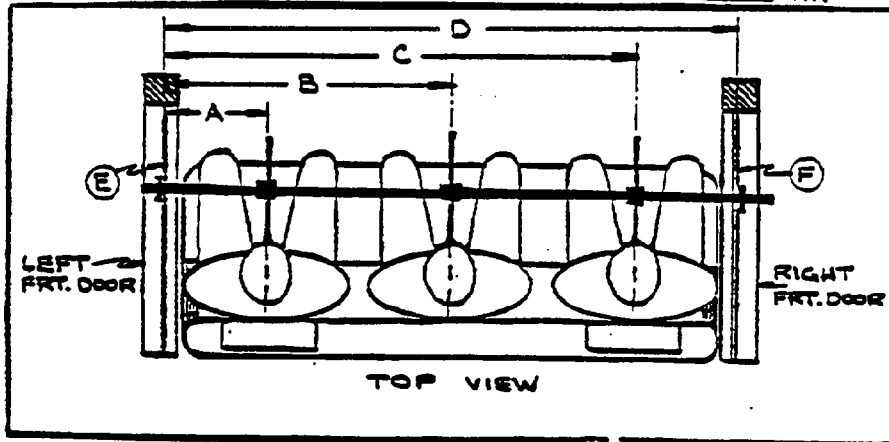
- A = 23 in. 27 Degrees
- B = 34.0 in. 97 Degrees
- C = 16.5 in. 110 Degrees
- D = 14.7 in.



- A = 22.8 in. 26 Degrees
- B = 33.3 in. 97 Degrees
- C = 17.2 in. 113 Degrees
- D = 14.7 in.

MEASUREMENT LOCATION

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



DUMMY ID

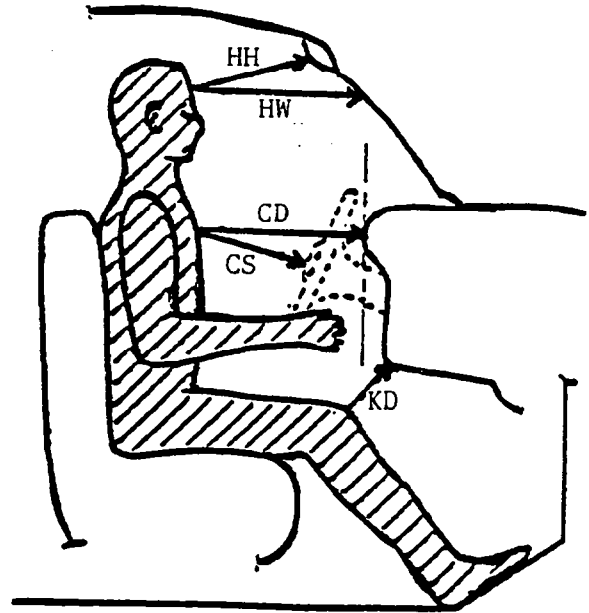
1019

1022

- A = Left Door to Driver Centerline 10.8 in.
- B = Left Door to Center Passenger Centerline - in.
- C = Left Door to Right Passenger Centerline 37.6 in.
- D = Left Door to Right Door 48.7 in.
- E, F = Window Glass Height (Right and Left Must be Equal) 9.7 in.

PASSENGER SEAT BACK ADJUSTED TO THE 5TH NOTCH

	DRIVER	PASSENGER
HH	13.2"	13.5"
HW	19.0"	19.0"
CD	22.2"	22"
CS	16.0"	--
KDL	5.4"	5.0"
KDR	6.0"	6.0"
SA	25°	25°
TA	23°	23°



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

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

	DRIVER	PASSENGER
HR	3.7	3.7
HS	6.5	6.5
AD	2.8	3.1
HD	5.6	5.5

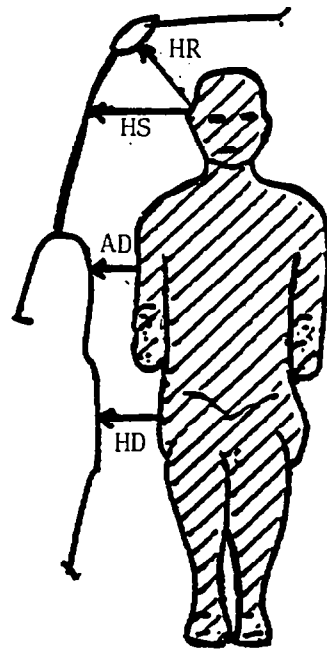


Figure 9 OCCUPANT CLEARANCE DIMENSIONS

Table 10
DUMMY INJURY CRITERIA VALUES

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DUMMY (1)	-89	-16	61	92	-57	-17	27	57.2
DUMMY (2)	-59	44	57	86	-41	32	18	44.3
DUMMY (3)								
DUMMY (4)								

	MAXIMUM FORCE-FEMUR LOAD (LBS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	360	410
DUMMY (2)	320	180
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)	1390	--	1910
DUMMY (2)	1475	1540	--
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**				SEVERITY INDEX
	HIC	t ₁ (SEC)	t ₂ (SEC)	AVE. ACC. (g) t ₁ TO t ₂	HEAD
DUMMY (1)	1118.3	.06712	.11452	56.1	1362.7
DUMMY (2)	1034.8	.06690	.12180	51.3	1236.2
DUMMY (3)					
DUMMY (4)					

*DEFINED AS EXCEEDING 0.003 SEC. DURATION

**AS DEFINED IN FMVSS NO. 208

Table 11
BELT RELATED DATA

	<u>Driver</u>	<u>Passenger</u>
Belt Spool-off (in.)		
film	No Film	4.5
electronic	4.1	4.7
Belt Strain ⁽¹⁾	.76" per ft.	1.3" per ft.
Belt Length Data (in.)		
total length ^{(2)*}	--	--
retractor ^{(2)*}	--	--
torso belt ⁽³⁾	34.9	35
lap belt ⁽³⁾	29.0	29
remainder on spool	33.0	32.5

(1) as measured on the upper shoulder belt

(2) retractor spool to bolt hole anchor point for unibelts

(3) as measured on Part 572 dummy

* This measurement could not be made because the retractor is mounted inside the front door. See Figure A-29.

APPENDIX A
PHOTOGRAPHS



Figure A-1 PRE-TEST FRONT VIEW

A-2

7209-8

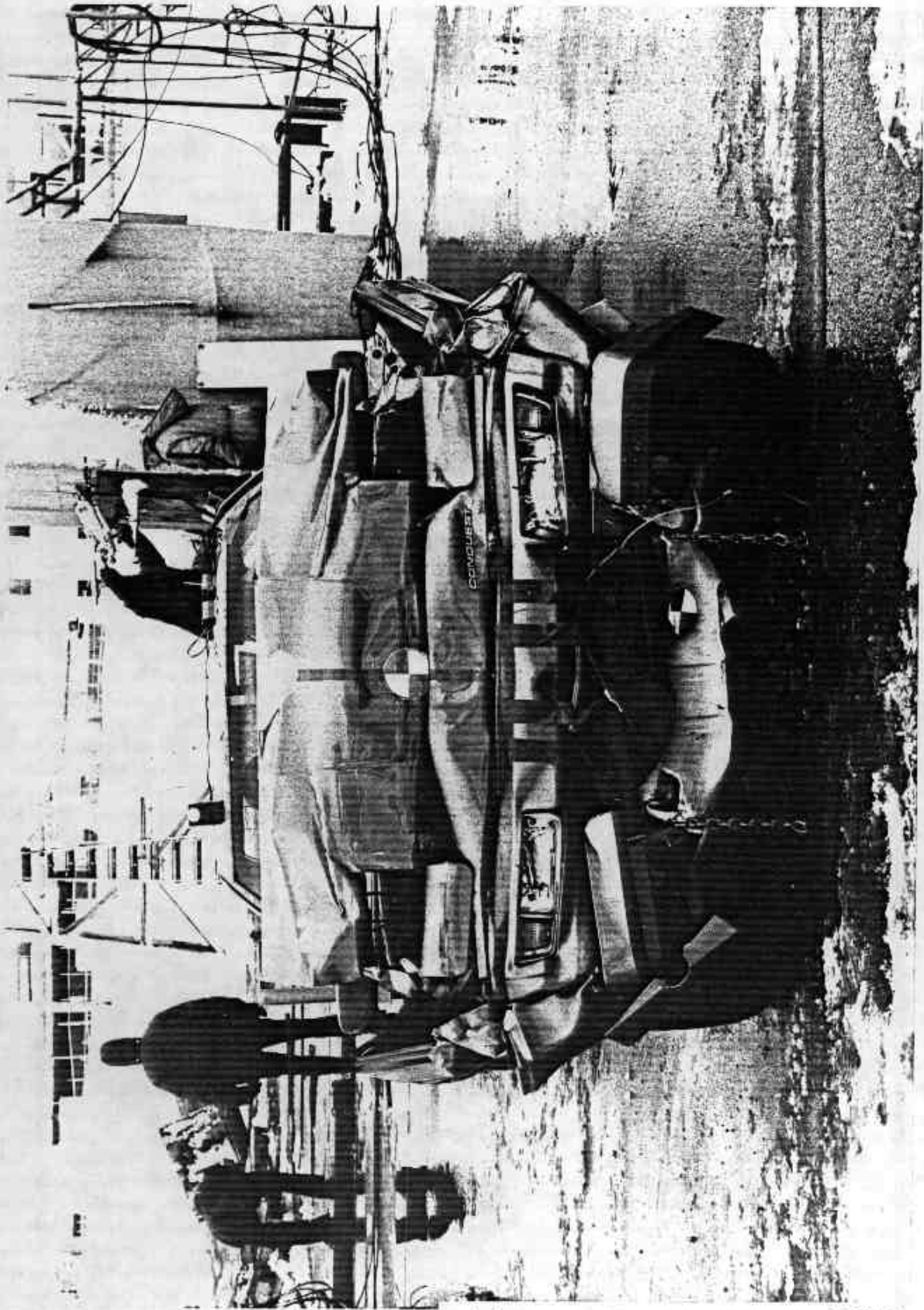


Figure A-2 POST-TEST FRONT VIEW

A-5

7209-8



Figure A-3 PRE-TEST LEFT SIDE VIEW

A-4

7209-8

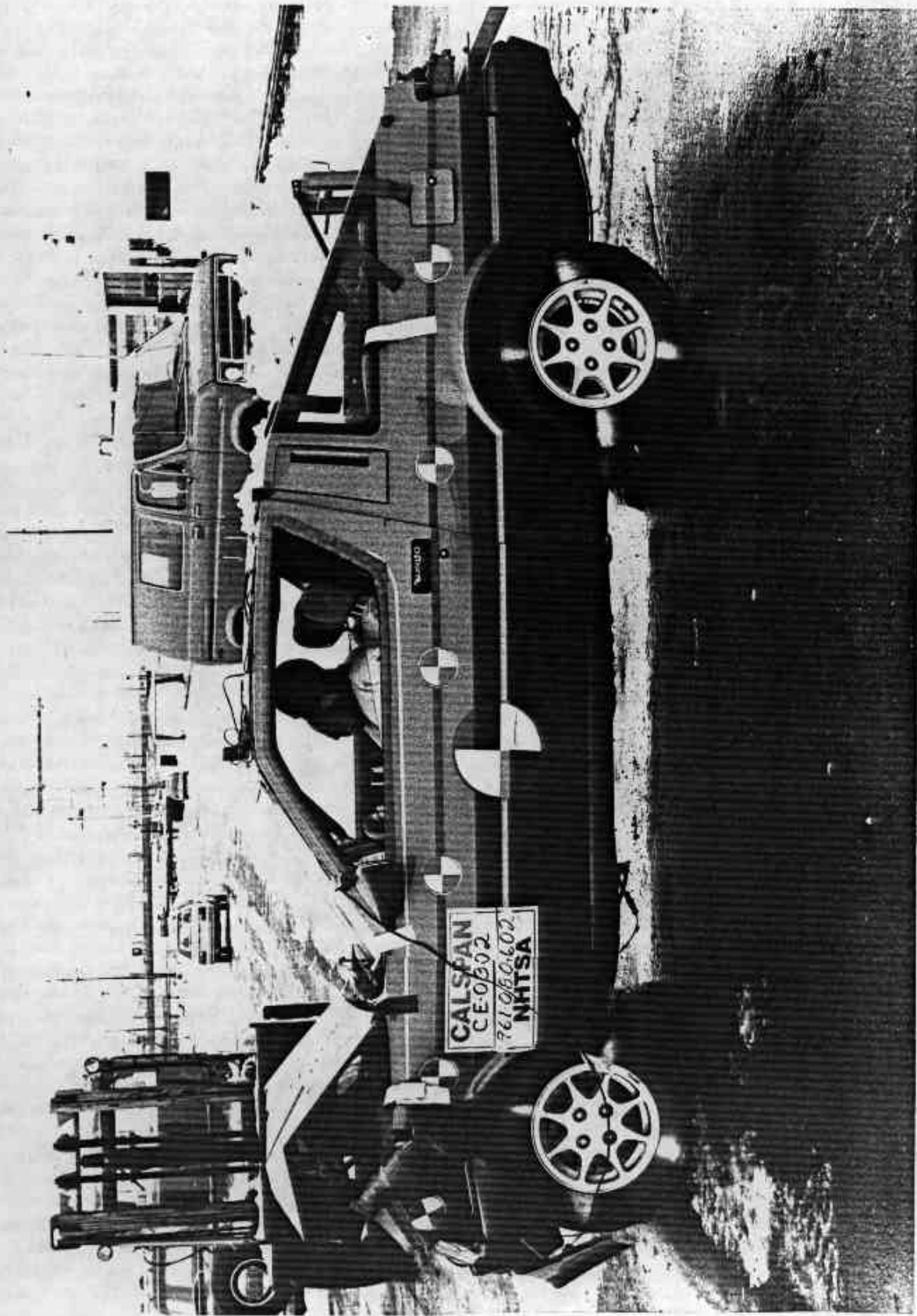
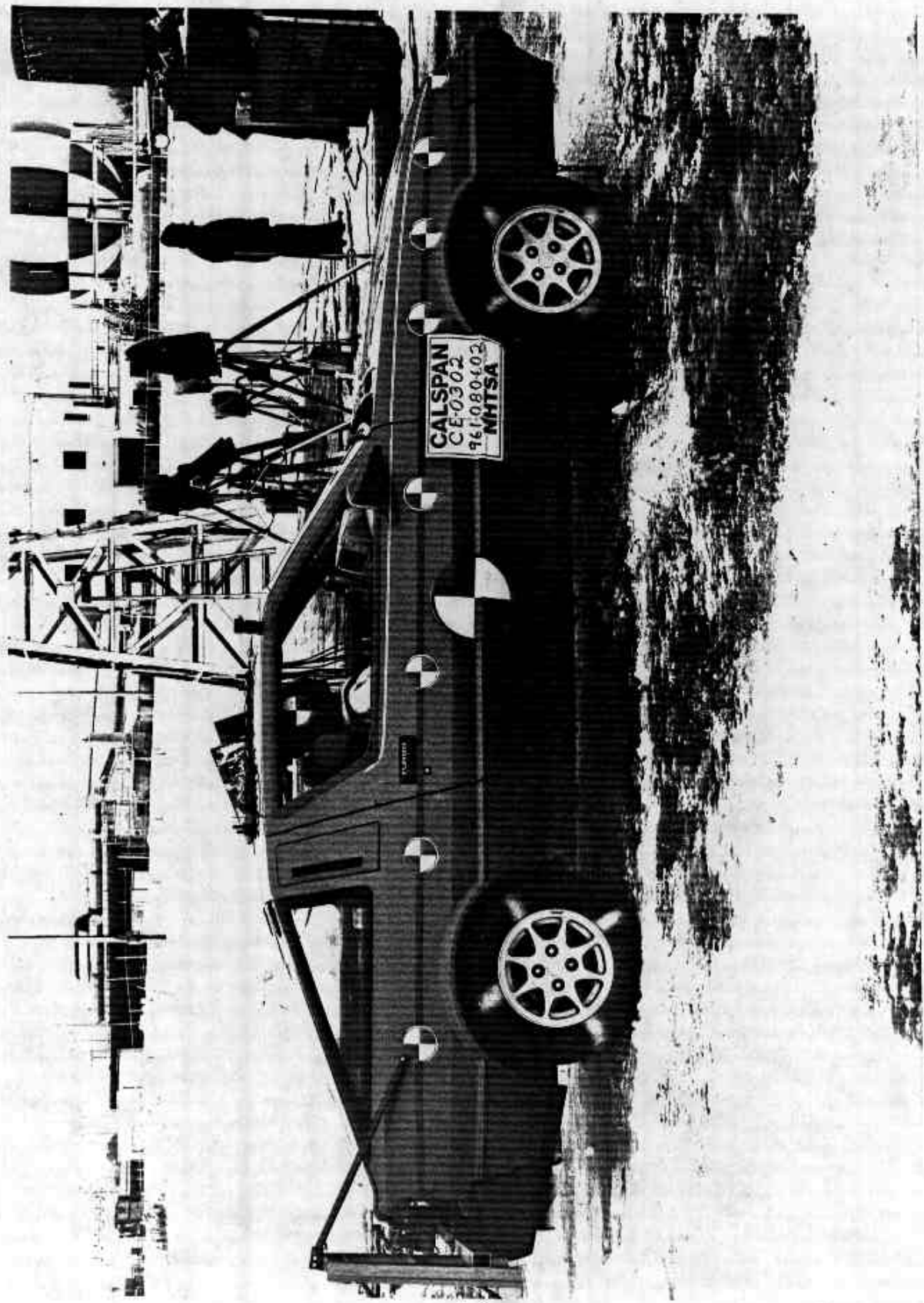


Figure A-4 POST-TEST LEFT SIDE VIEW

A-5

7209-8



A-6

7209-8

Figure A-5 PRE-TEST RIGHT SIDE VIEW

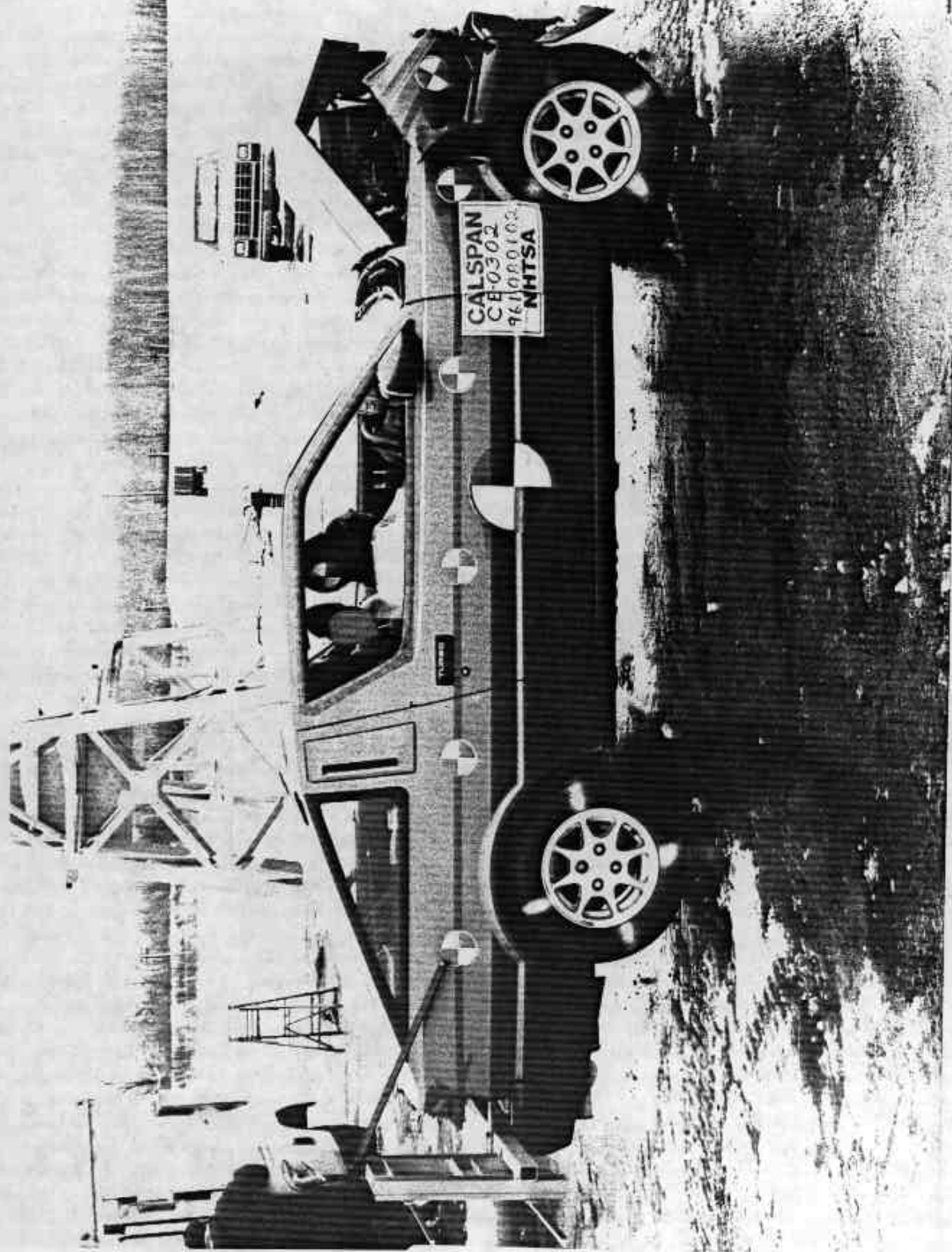


Figure A-6 POST-TEST RIGHT SIDE VIEW

A-7

7209-8



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

A-8

7209-8

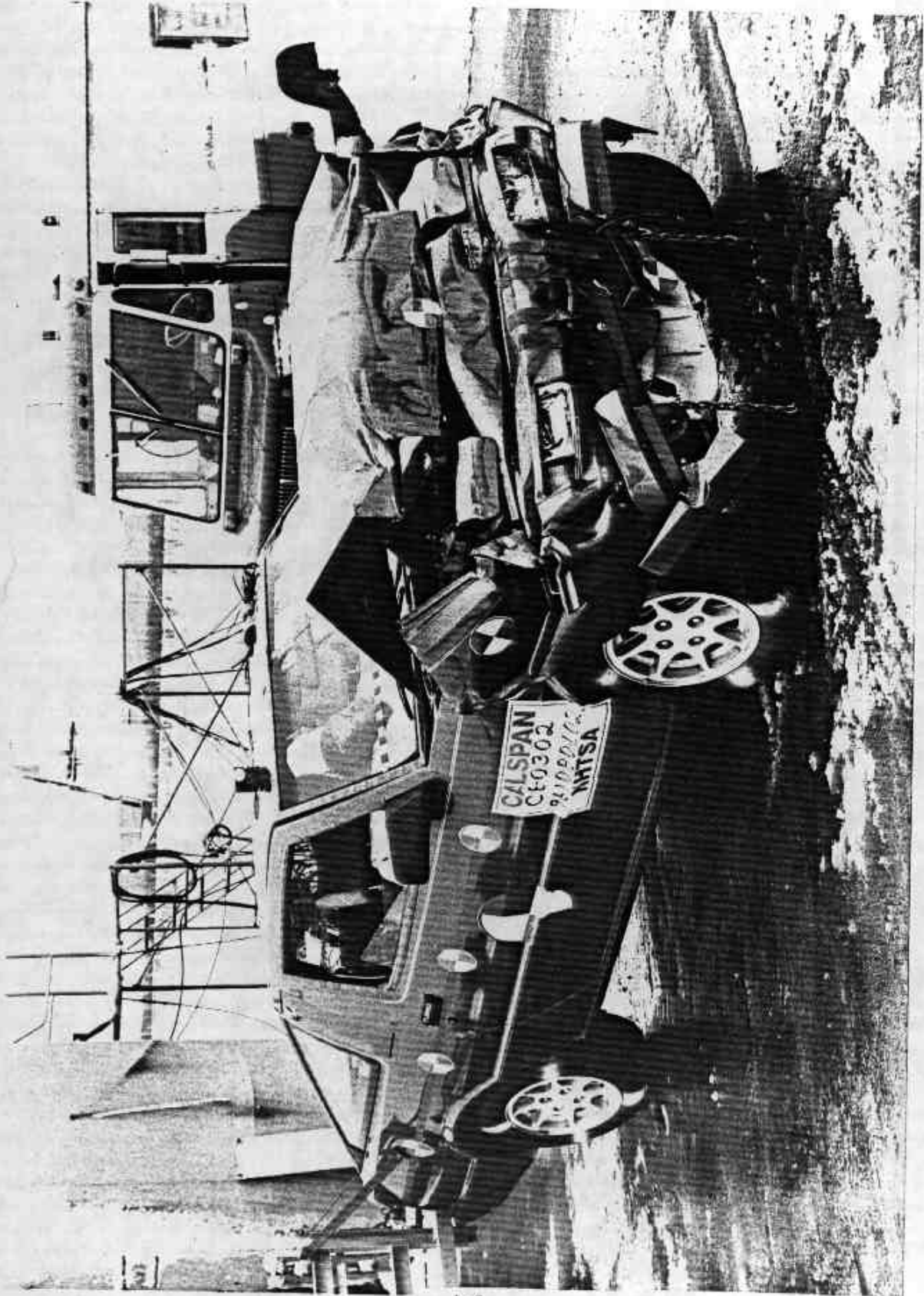


Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW



A-10

7209-8

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

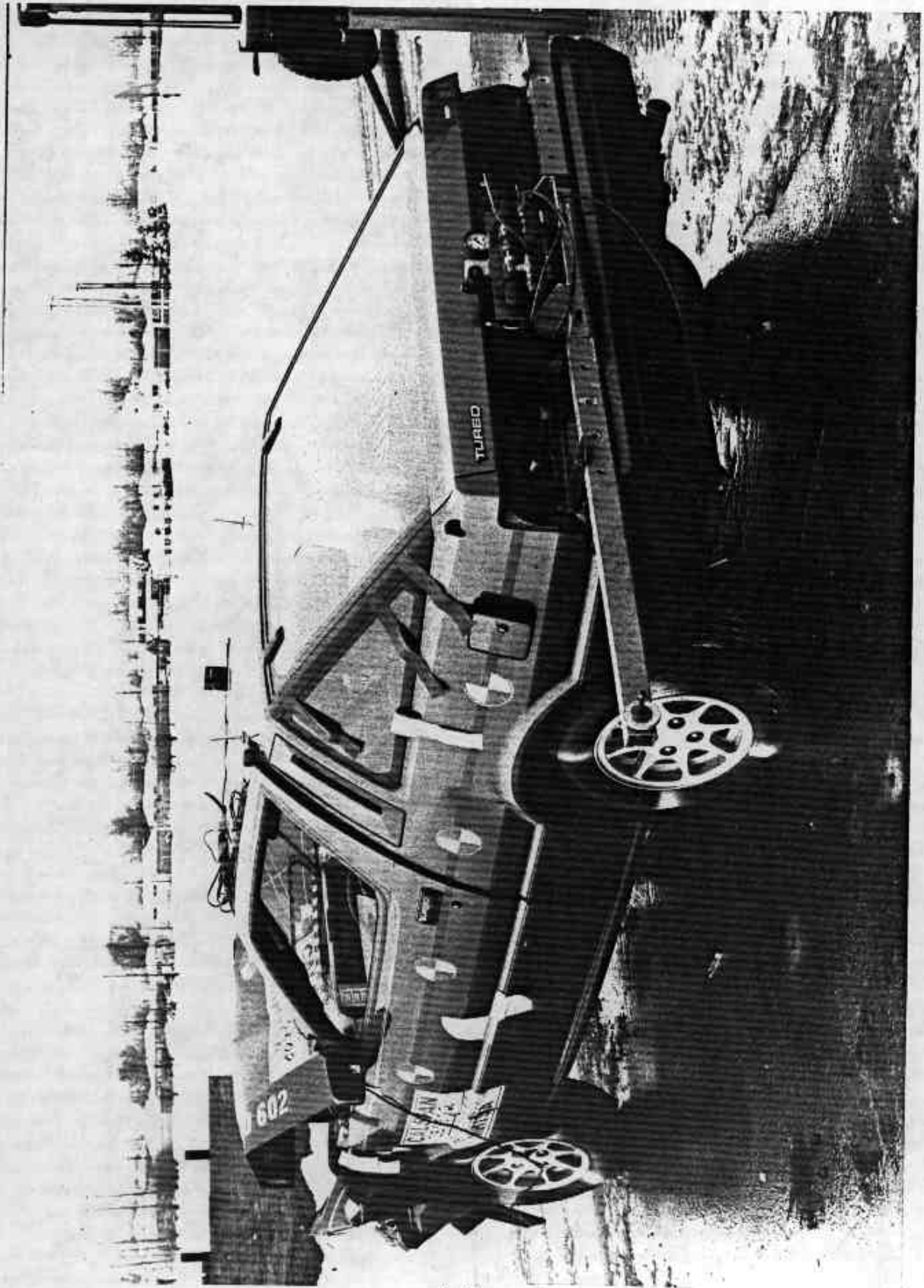
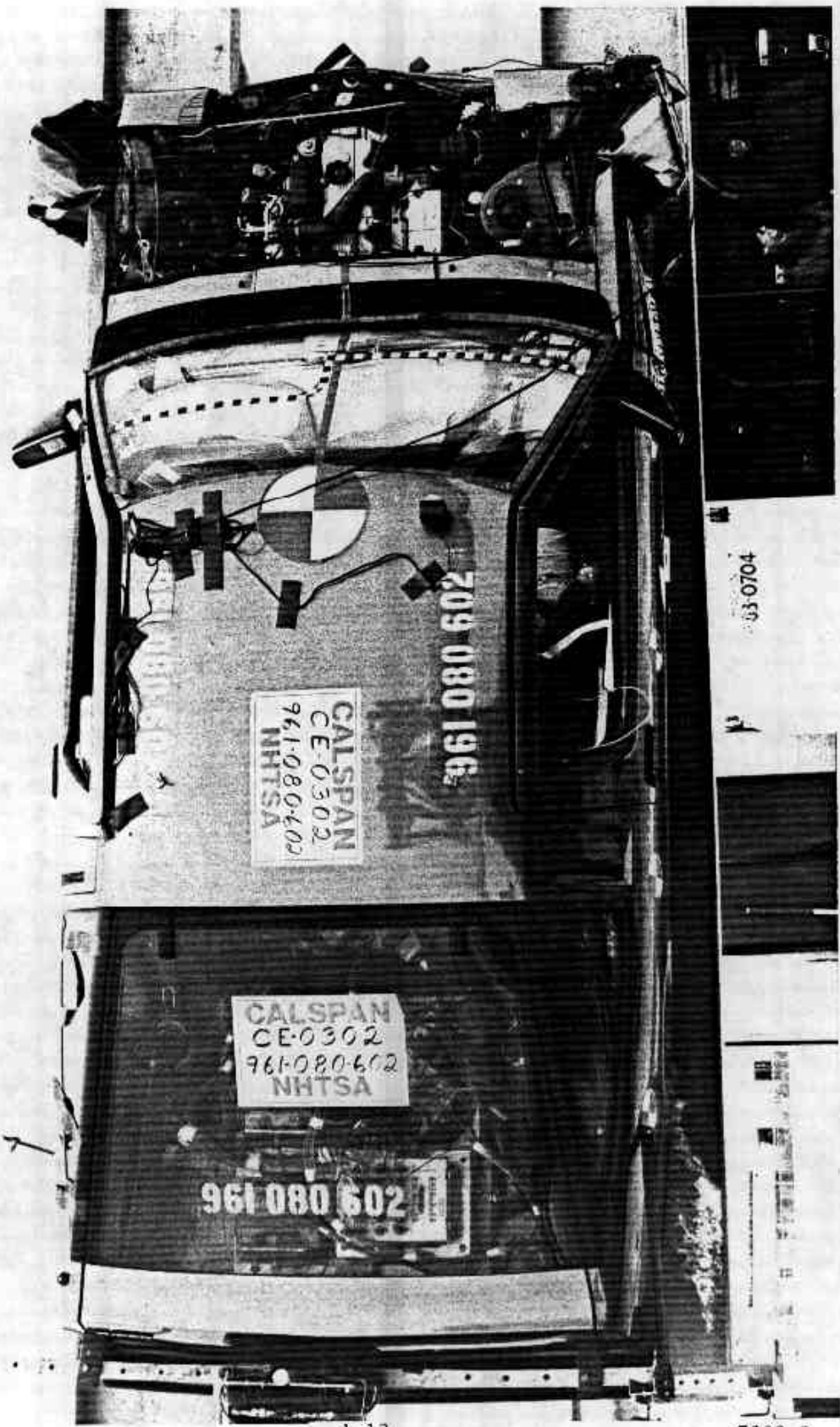


Figure A-10 POST-TEST LEFT REAR THREE-QUARTER VIEW

A-11

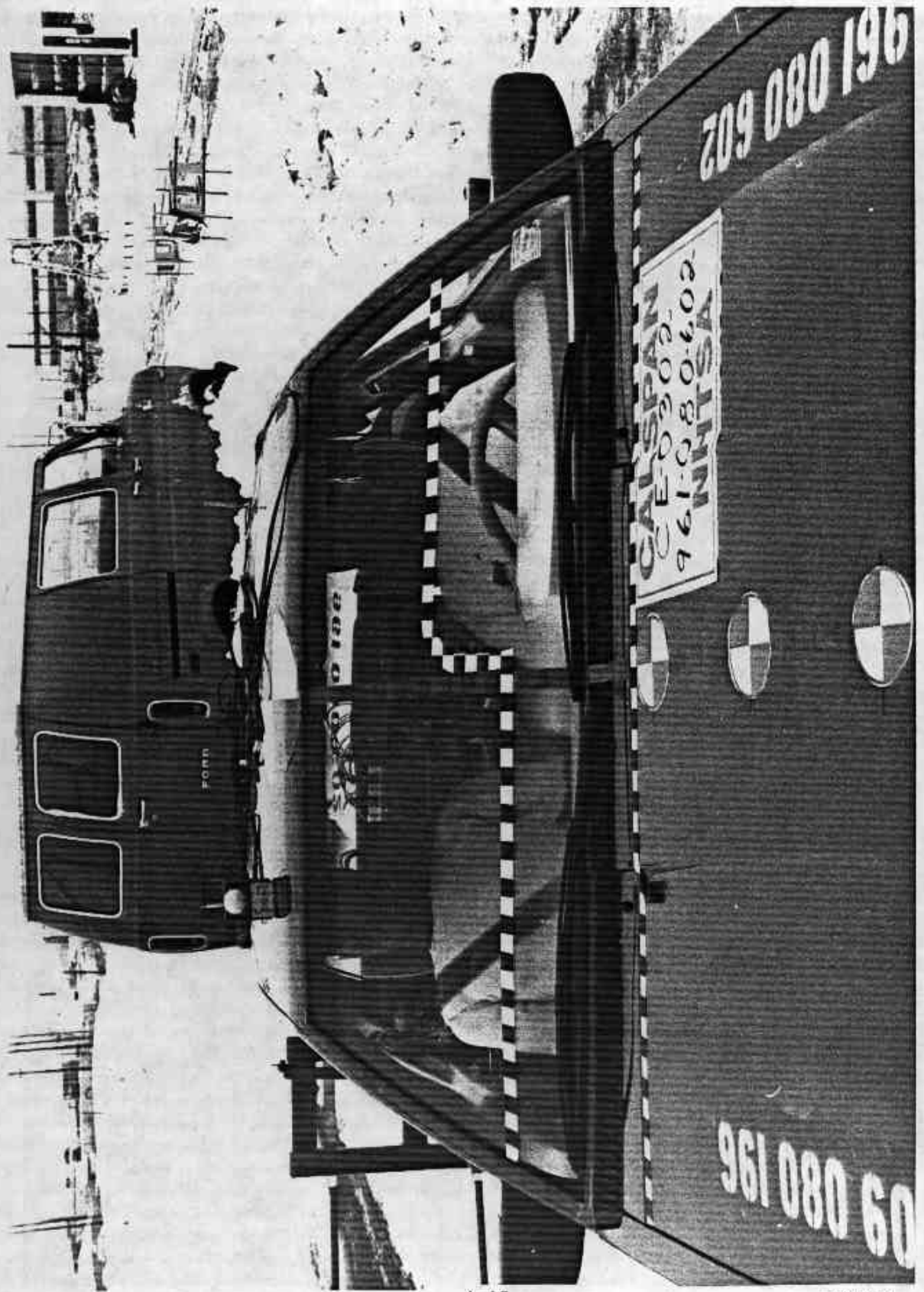
7209-8



A-12

7209-8

Figure A-11 POST-TEST TOP VIEW



A-13

7209-8

Figure A-12 PRE-TEST WINDSHIELD VIEW

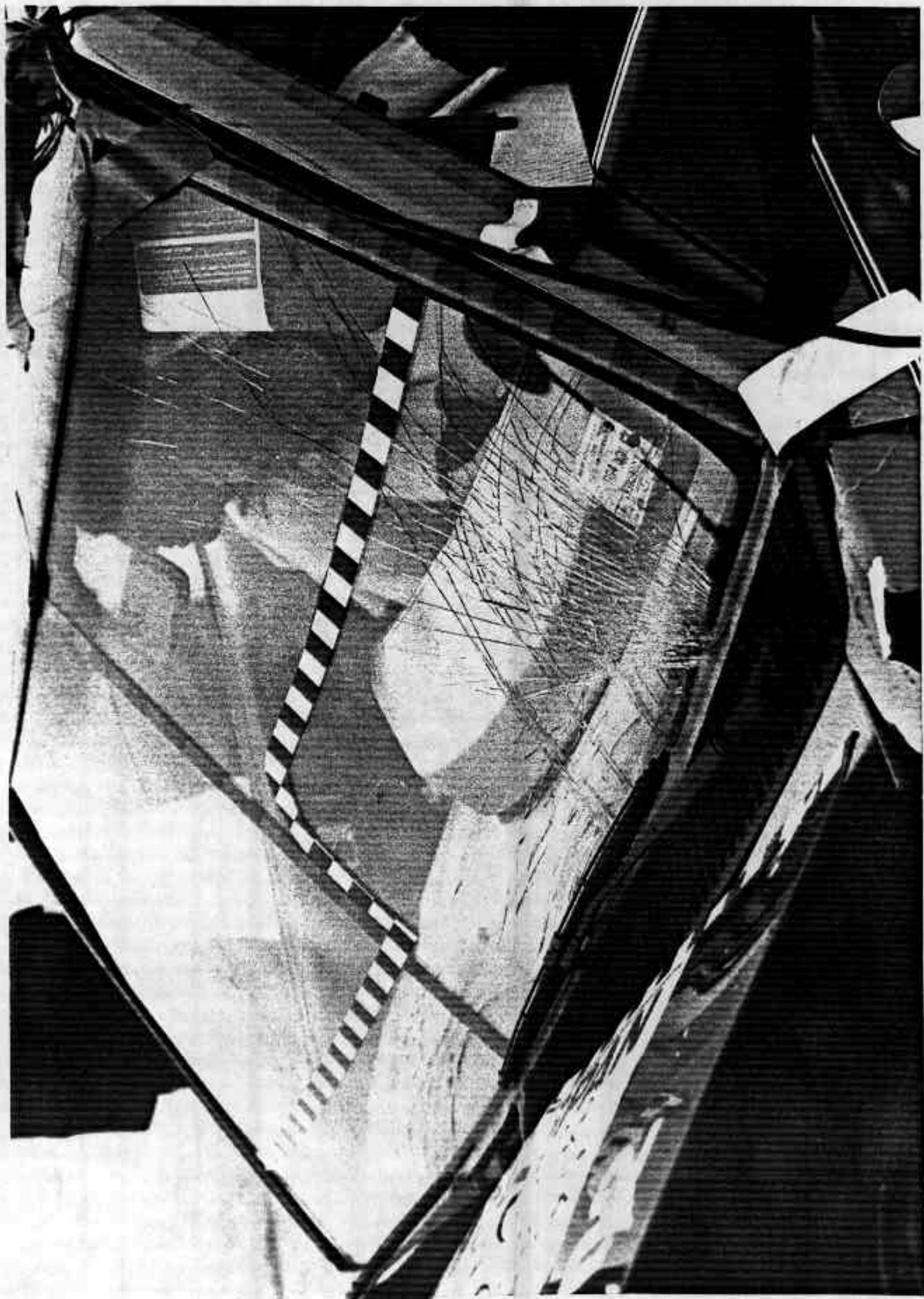


Figure A-13 POST-TEST WINDSHIELD VIEW

A-14

7209-8

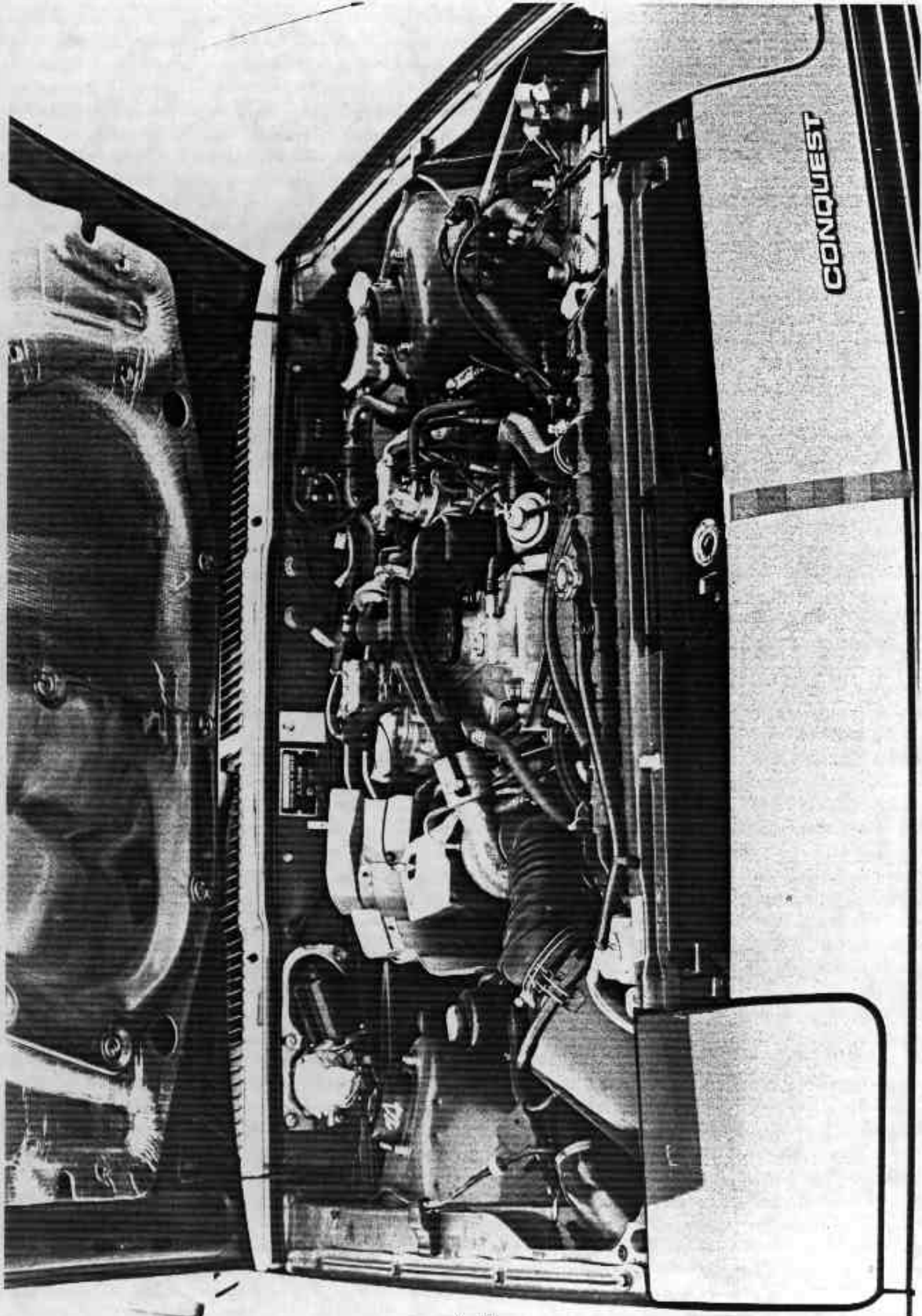
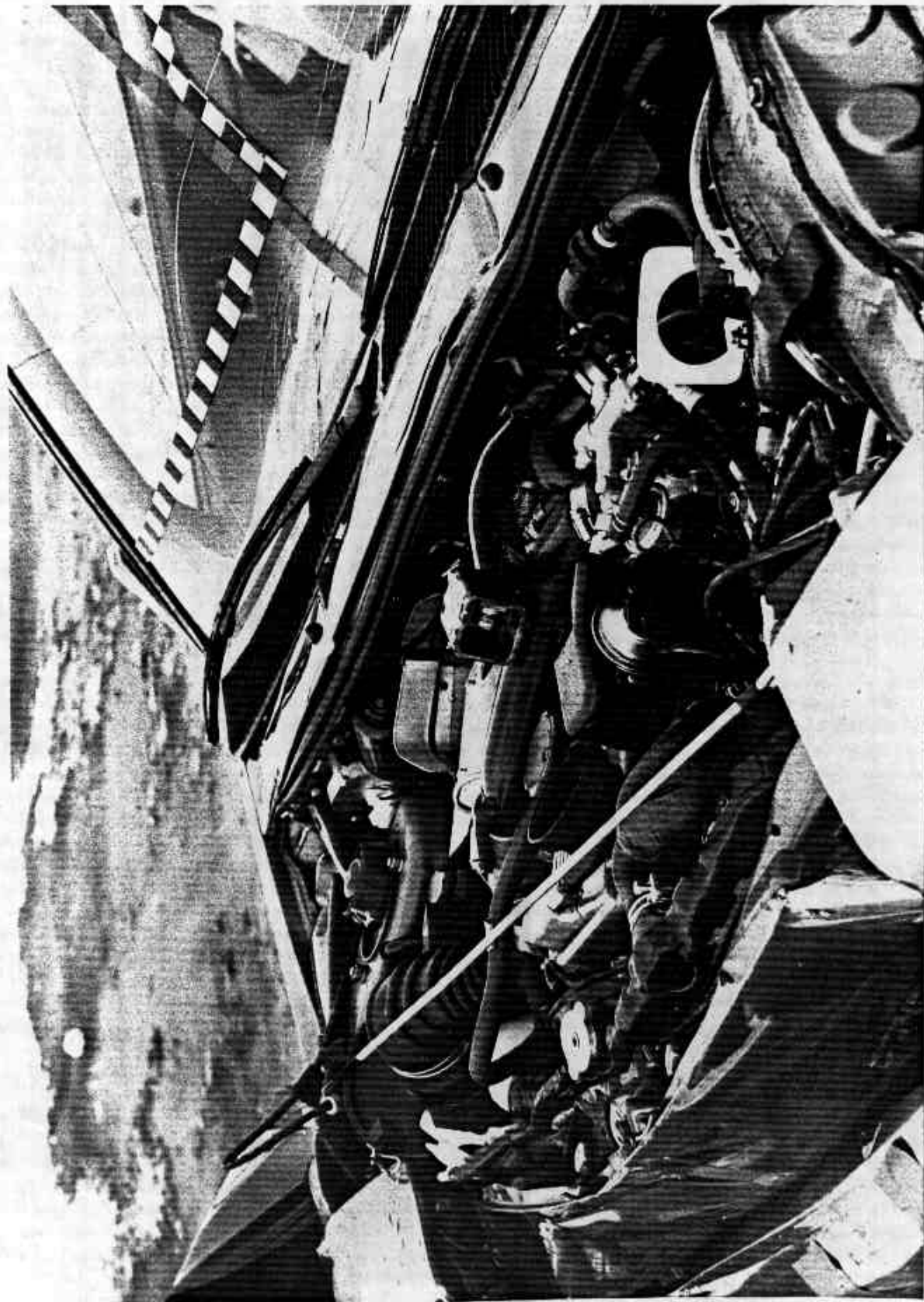


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

A-15

7209-8



A-16

7209-8

Figure A-15 POST-TEST ENGINE COMPARTMENT VIEW

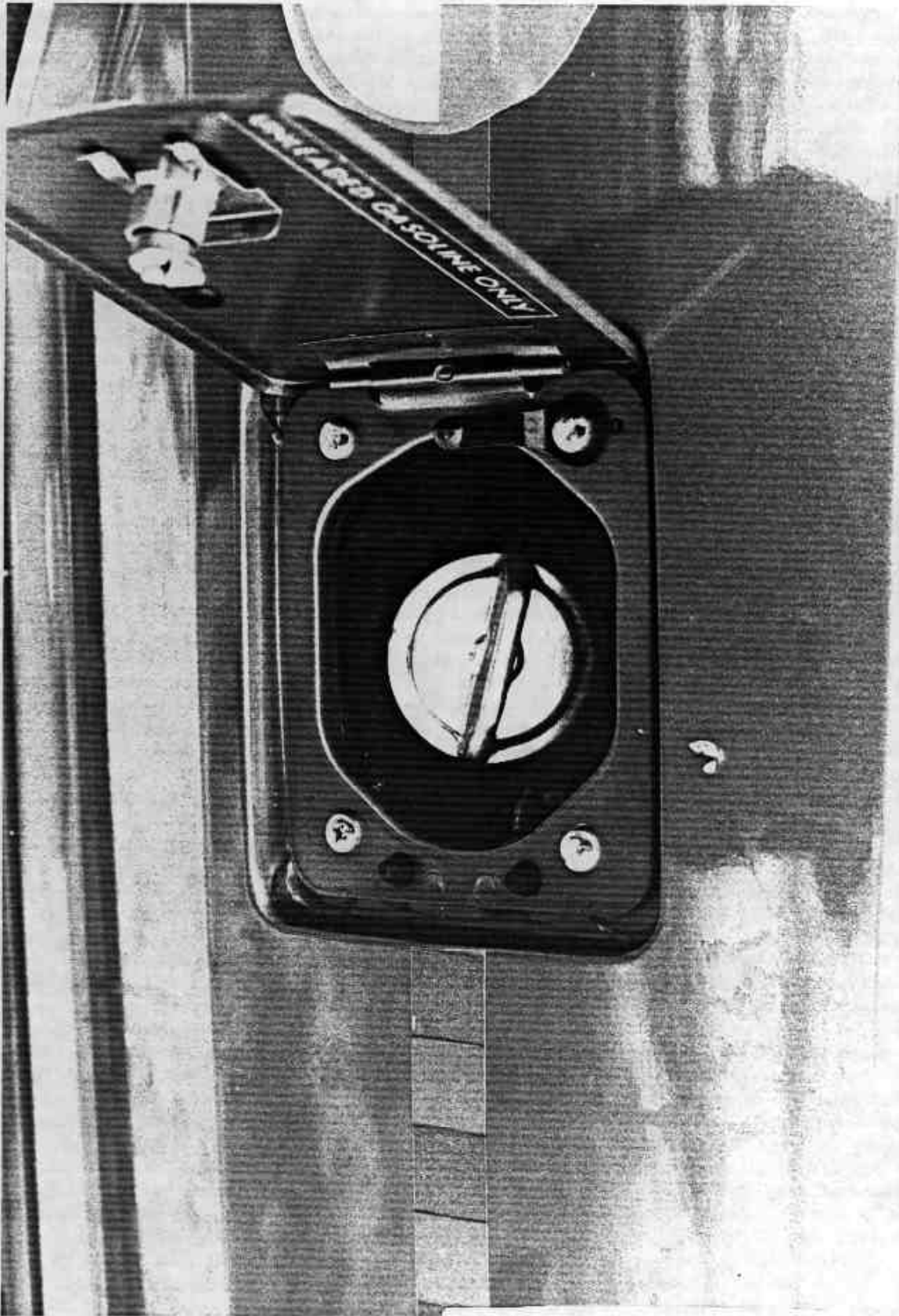


Figure A-16 PRE-TEST FILLER CAP VIEW

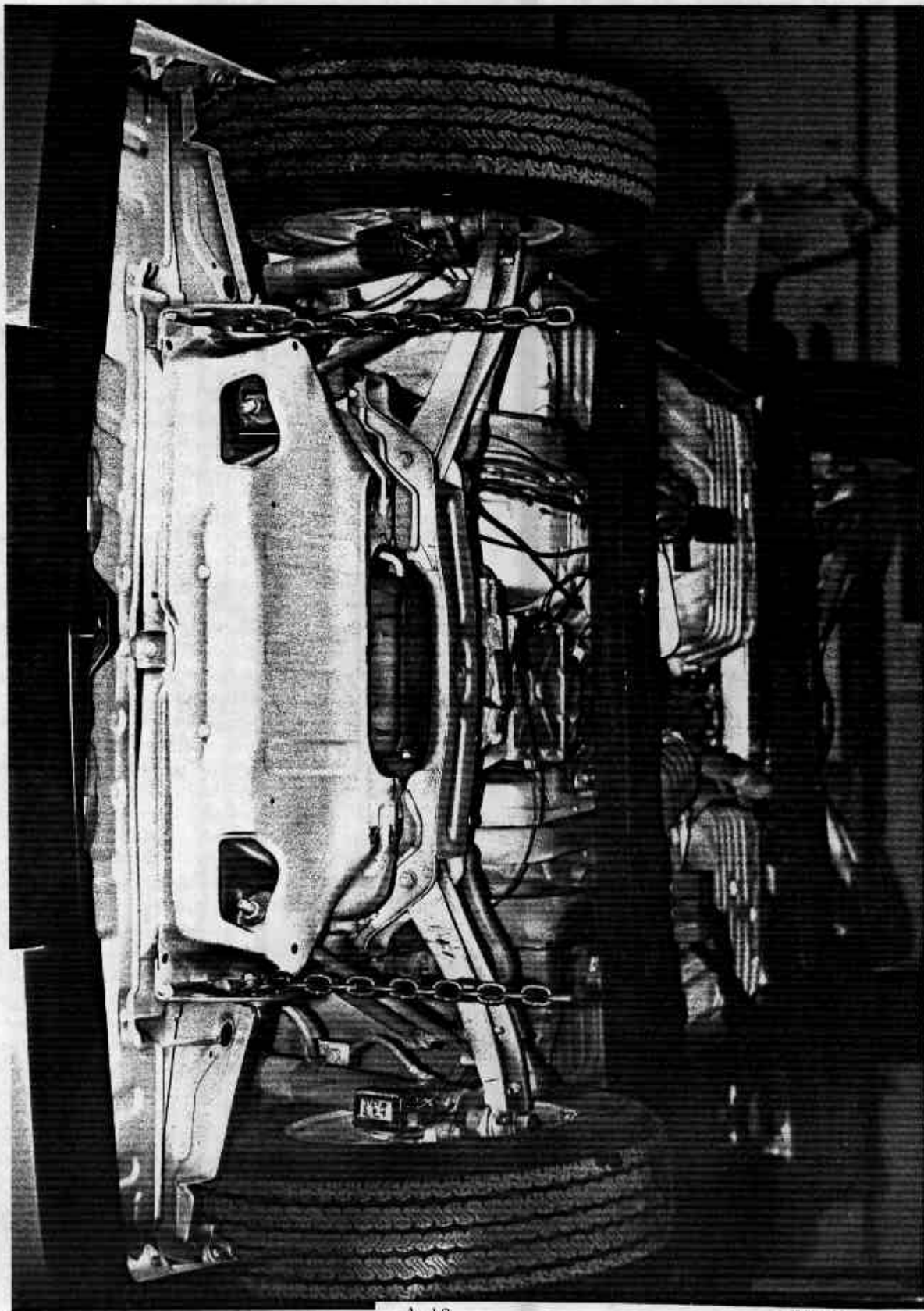


Figure A-17 PRE-TEST FRONT UNDERBODY VIEW

A-18

7209-8

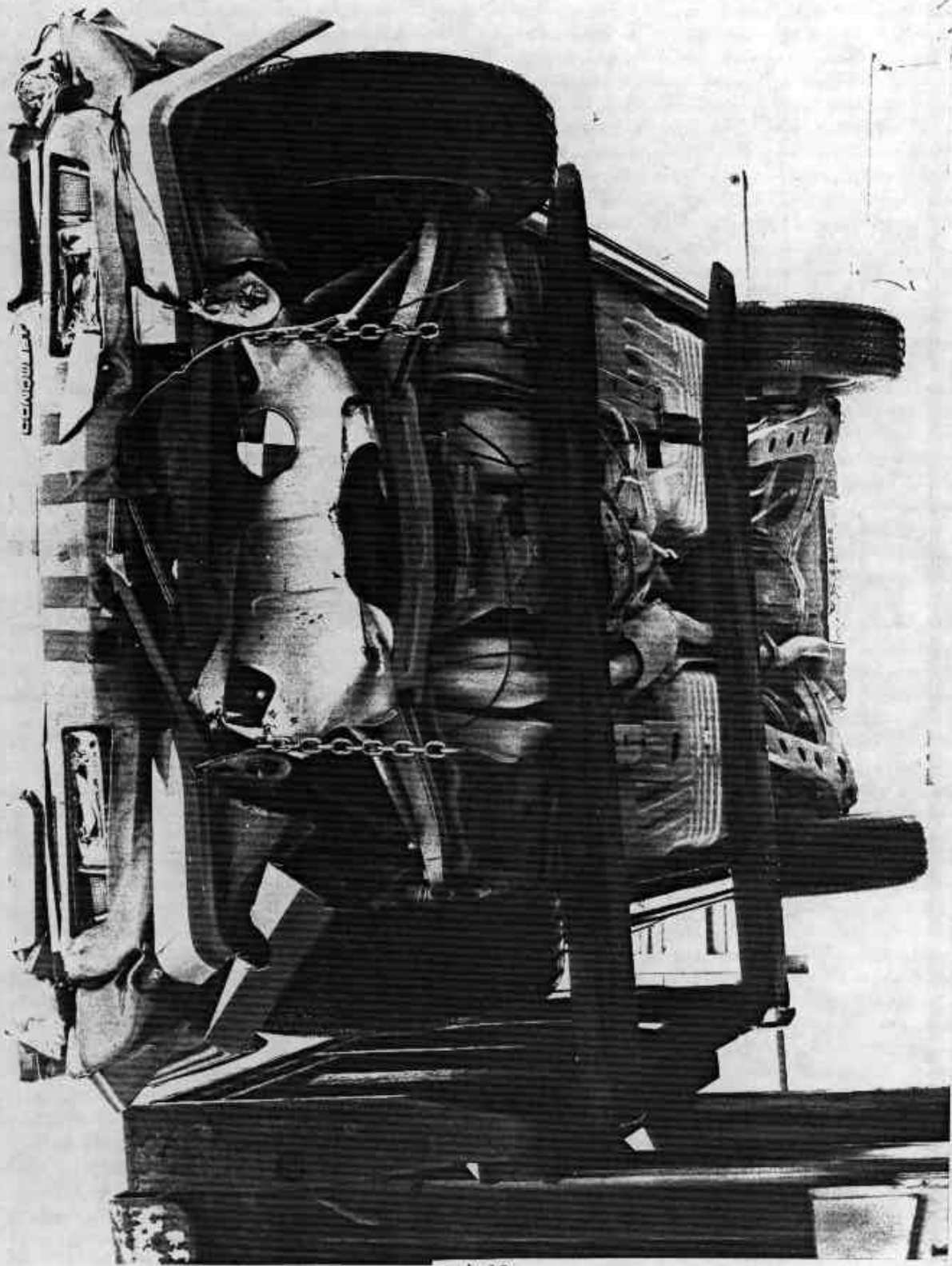


Figure A-18 POST-TEST FRONT UNDERBODY VIEW

A-19

7209-8

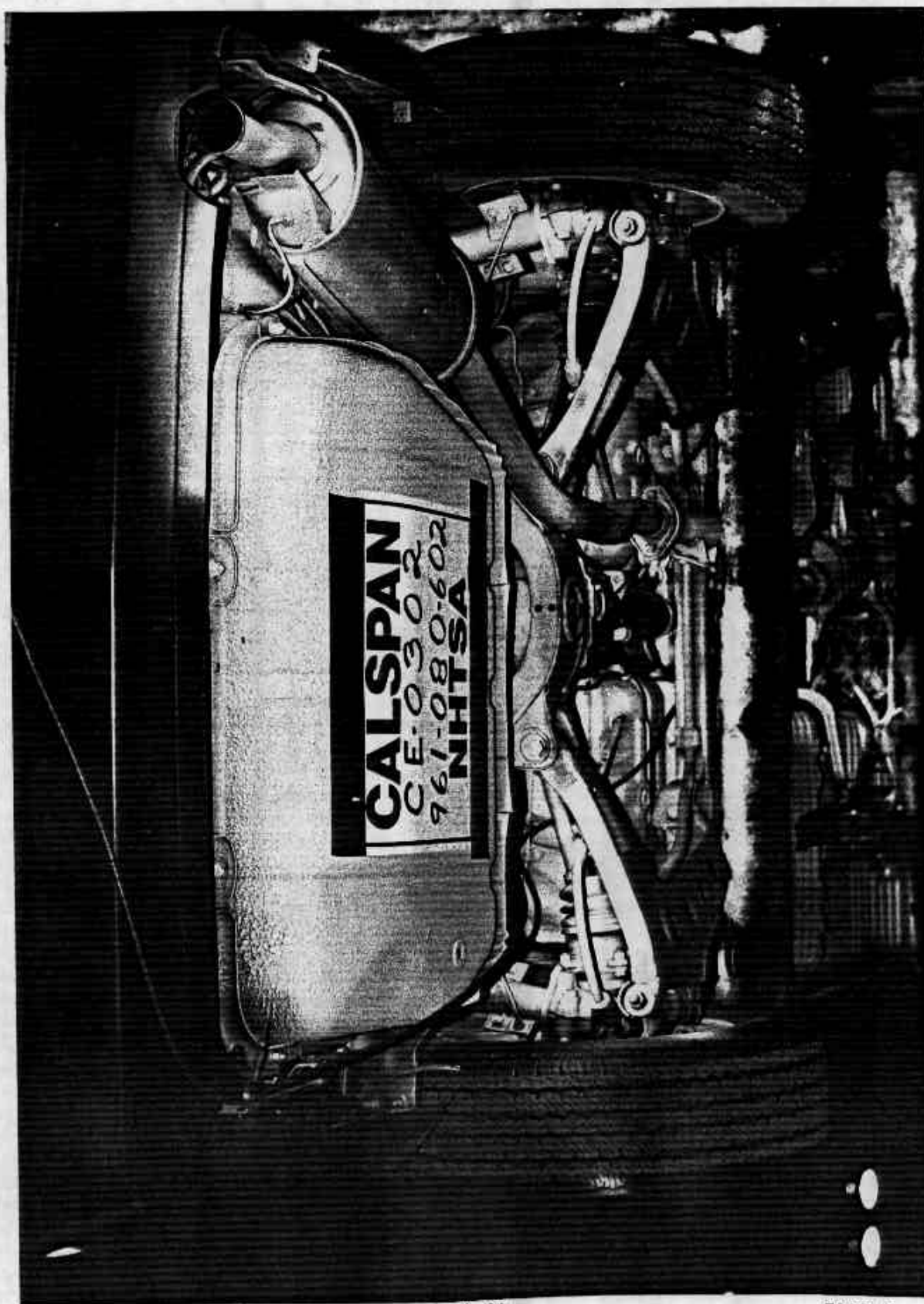


Figure A-19 PRE-TEST REAR UNDERBODY VIEW

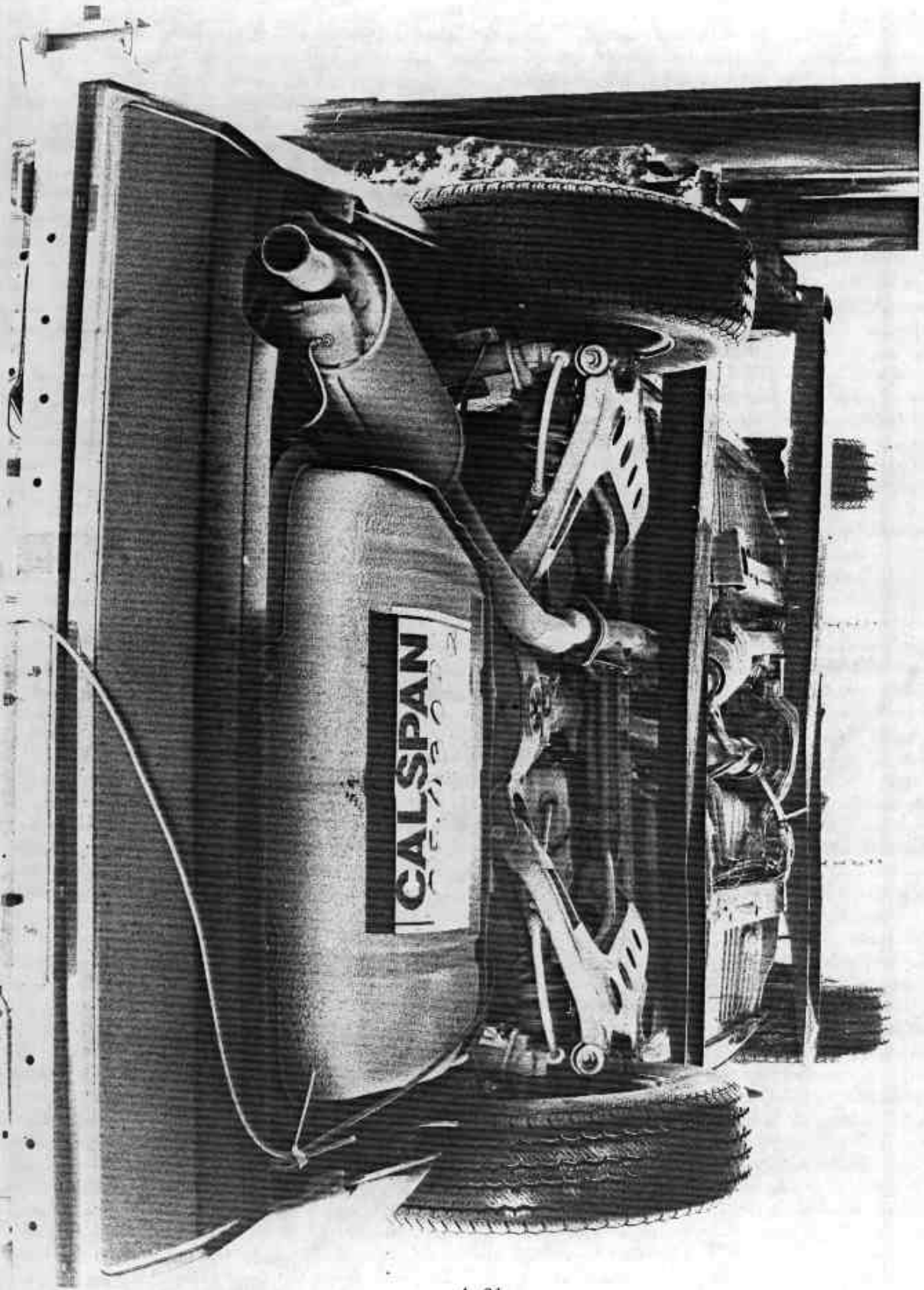


Figure A-20 POST-TEST REAR UNDERBODY VIEW

CALSPAN
CORPORATION



Figure A-21 PRE-TEST DRIVER POSITION VIEW

A-22

7209-8



Figure A-22 POST-TEST DRIVER POSITION VIEW

A-23

7209-8

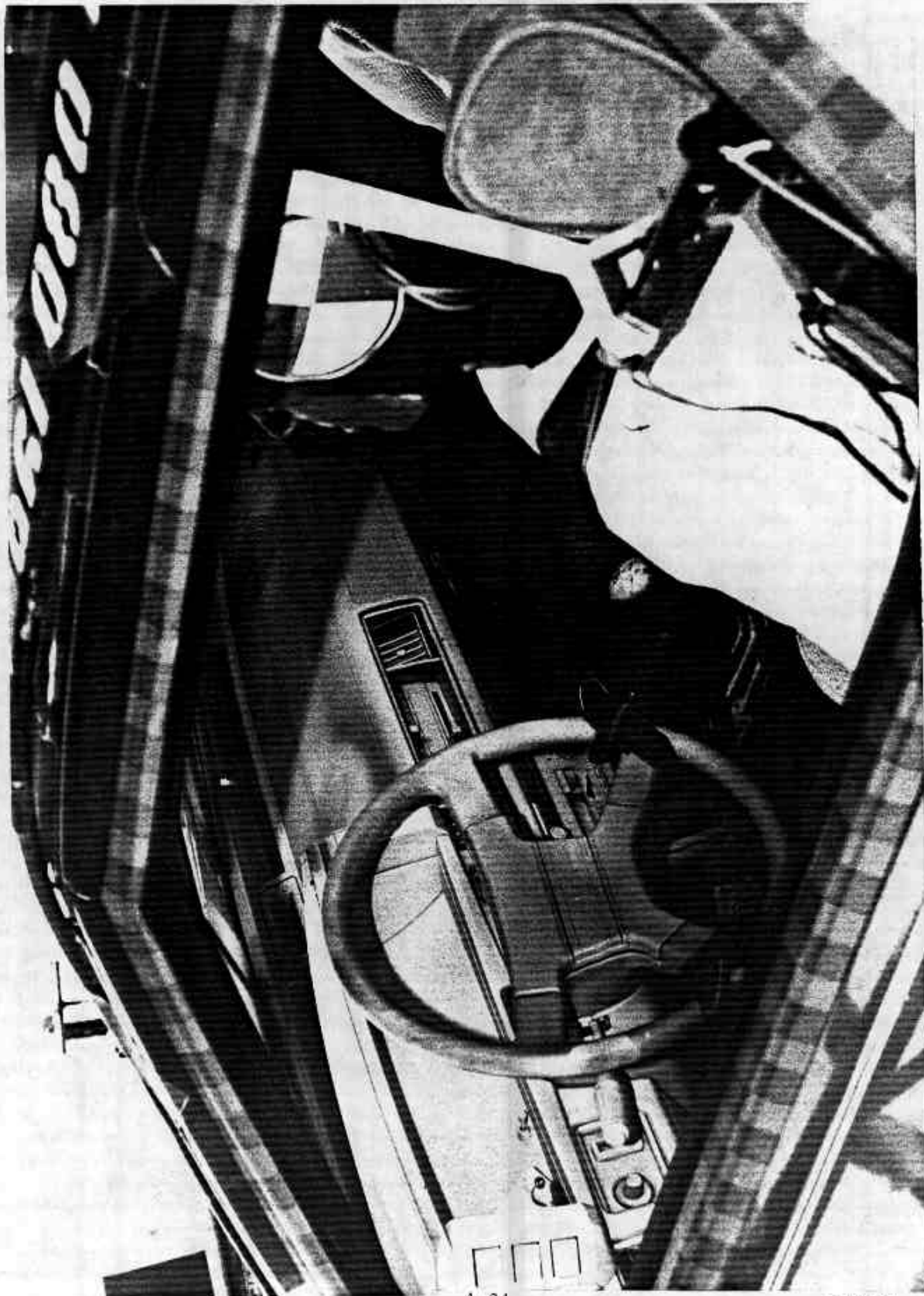


Figure A-23 PRE-TEST DRIVER AND INTERIOR VIEW

A-24

7209-8

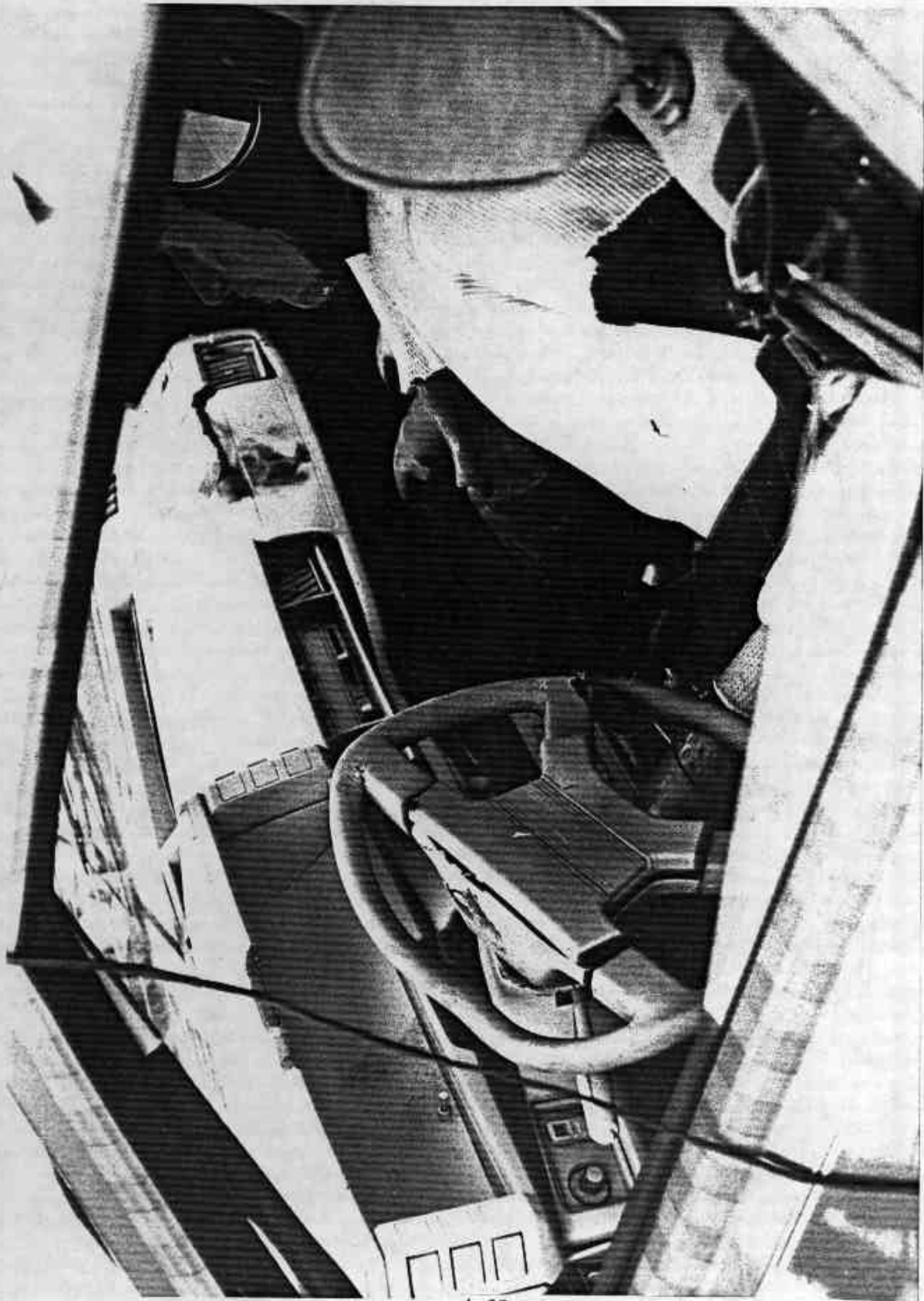


Figure A-24 POST-TEST DRIVER AND INTERIOR VIEW

A-25

7209-8



A-26

7209-8

Figure A-25 PRE-TEST PASSENGER POSITION VIEW



Figure A-26 POST-TEST PASSENGER POSITION VIEW

A-27

7209-8



Figure A-27 PRE-TEST PASSENGER AND INTERIOR VIEW

A-28

7209-8

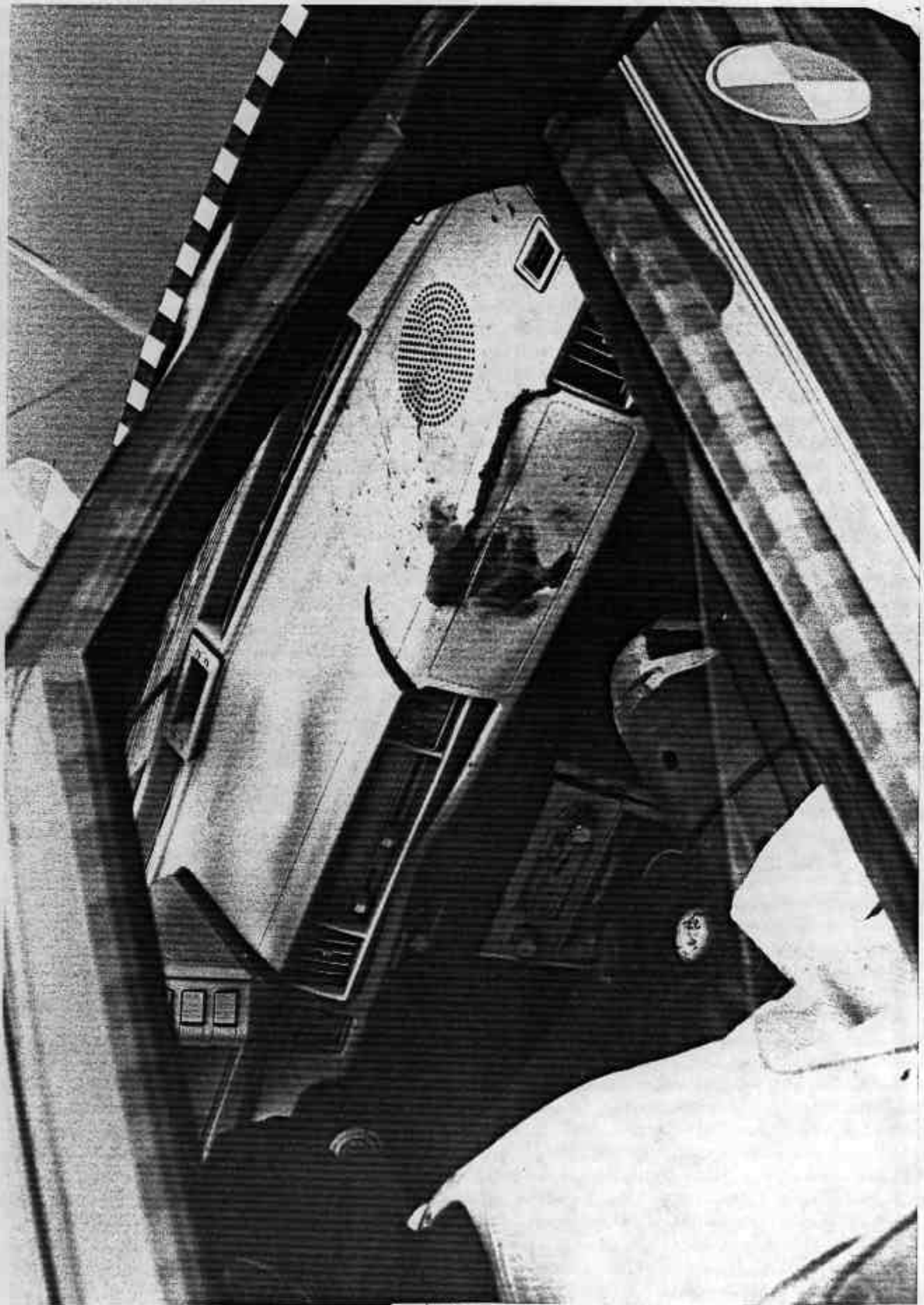


Figure A-28 POST-TEST PASSENGER AND INTERIOR VIEW

A-29

7209-8



Figure A-29 PRE-TEST SEAT BELT SYSTEM VIEW

A-30

7209-8



Figure A-30 POST-TEST DRIVER RIGHT ELBOW AND STALK VIEW

A-31

7209-8

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CE0302

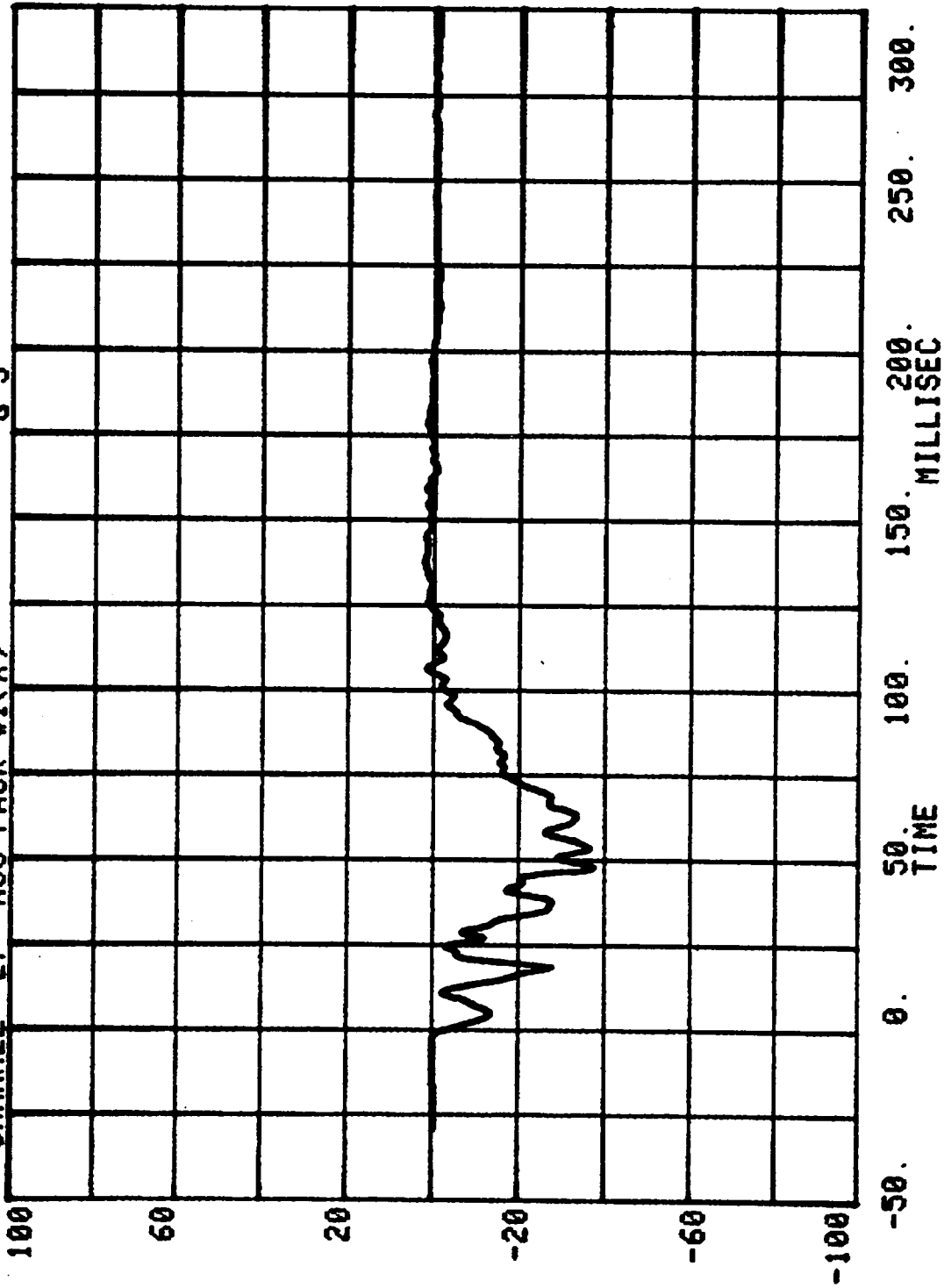
VEHICLE DATA

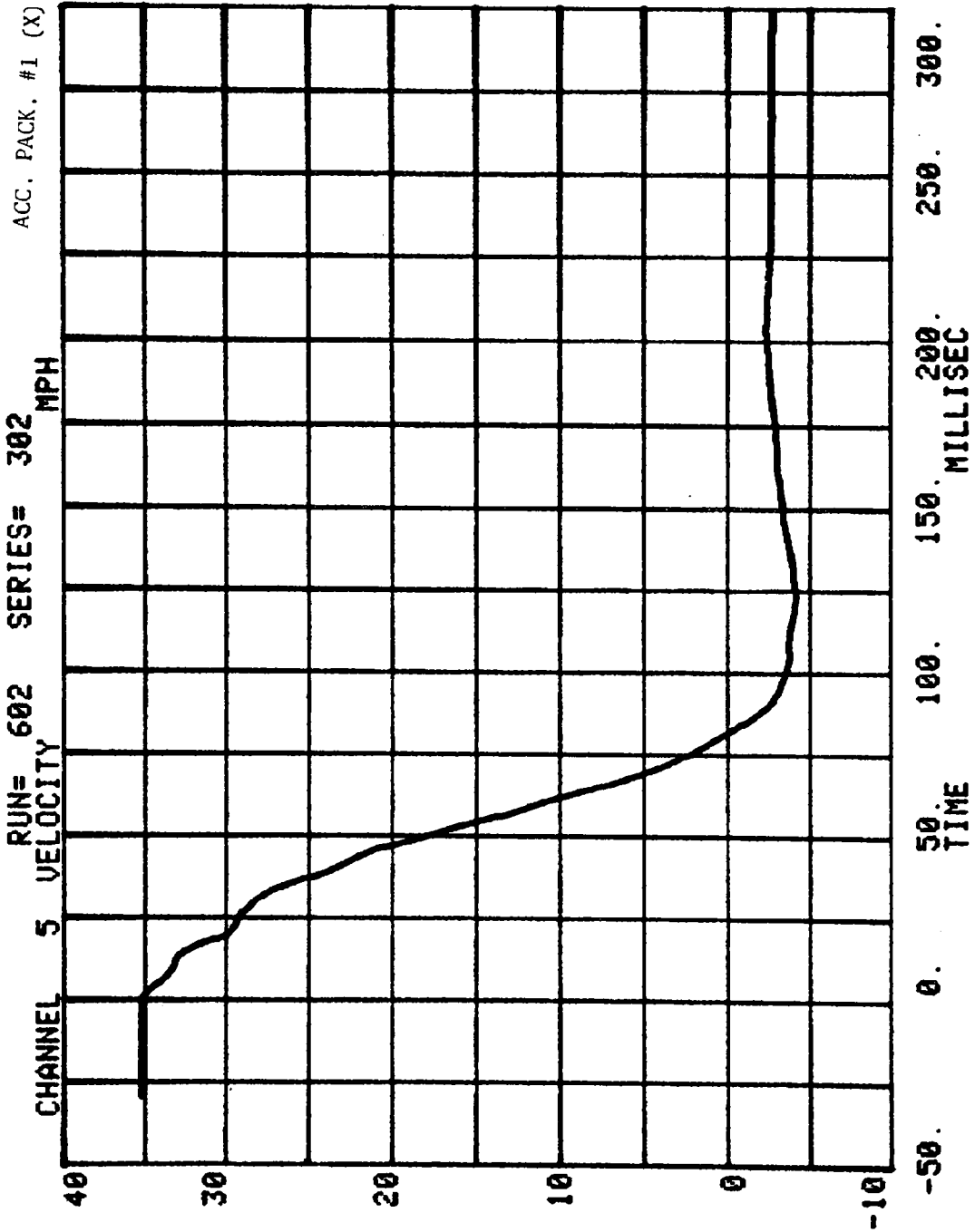
FILTER CHANNEL CLASS

60

CHANNEL 27 ACC PACK #1(X) G'S

RUN= 602 SERIES= 302



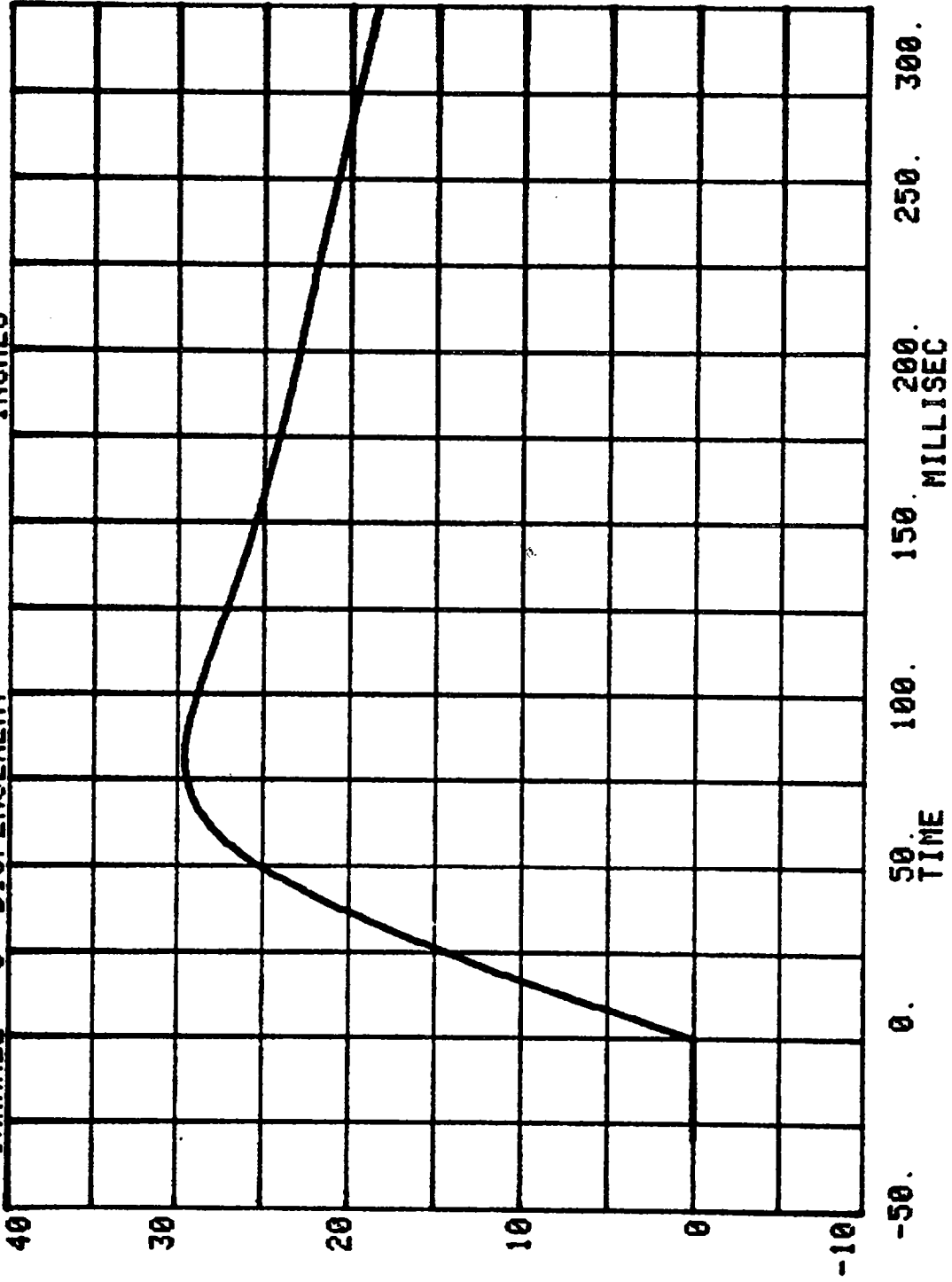


ACC. PACK. #1 (X)

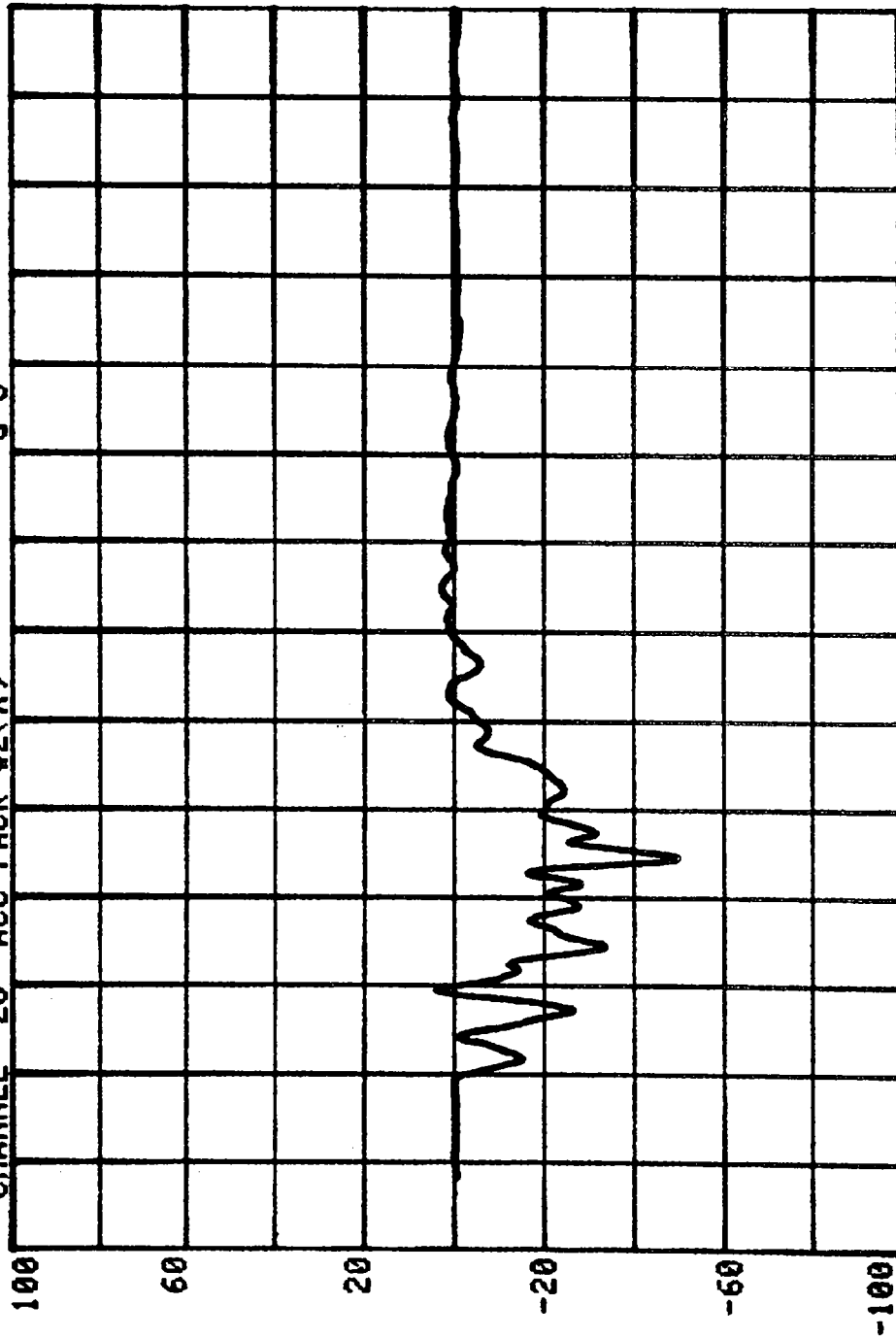
SERIES= 302 INCHES

RUN= 602

CHANNEL 6 DISPLACEMENT



CHANNEL 28 ACC PACK #2(X) RUN= 602 SERIES= 302 G'S

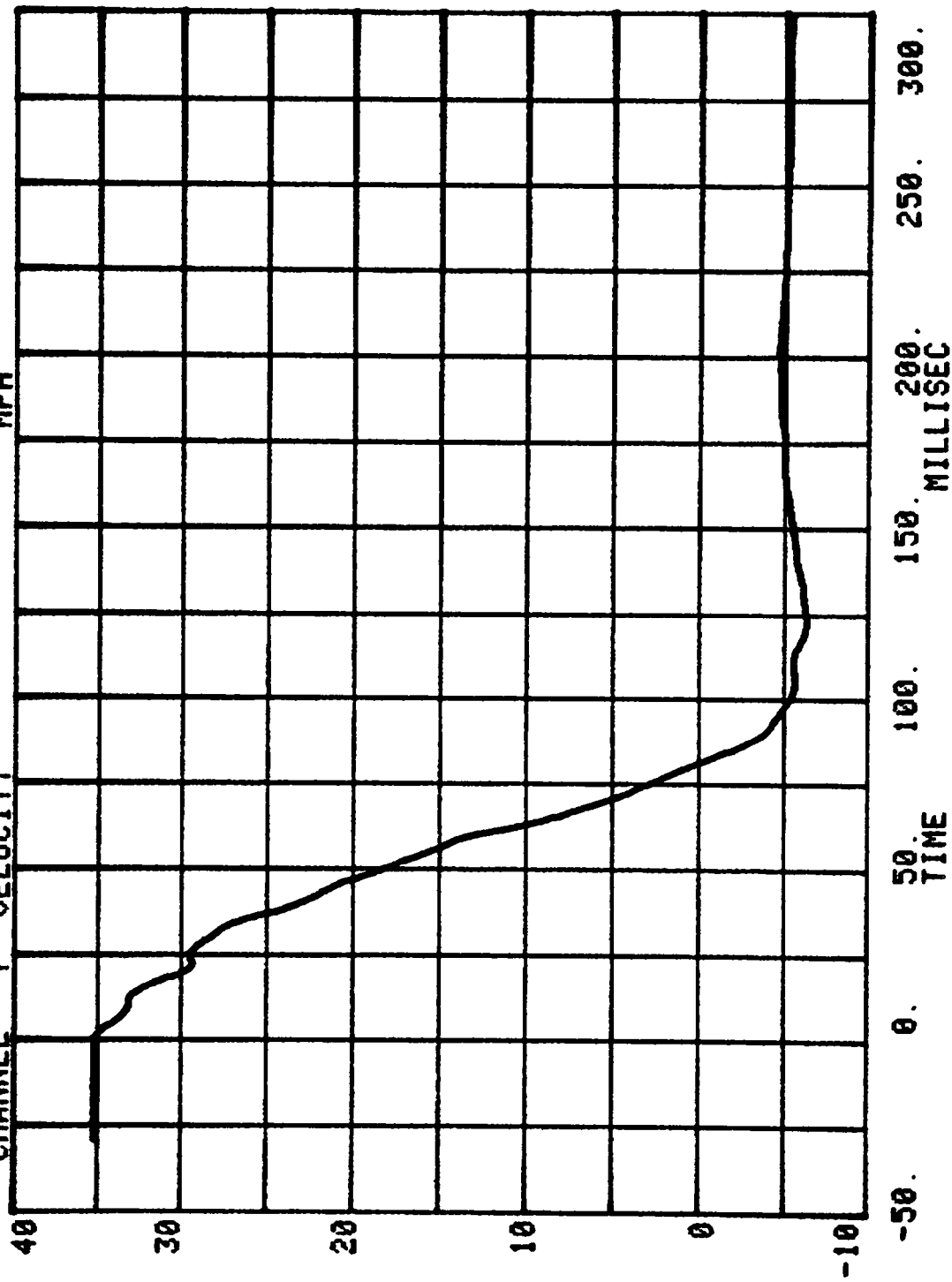


ACC. PACK. #2 (X)

CHANNEL 7 VELOCITY 302 MPH

RUN= 602

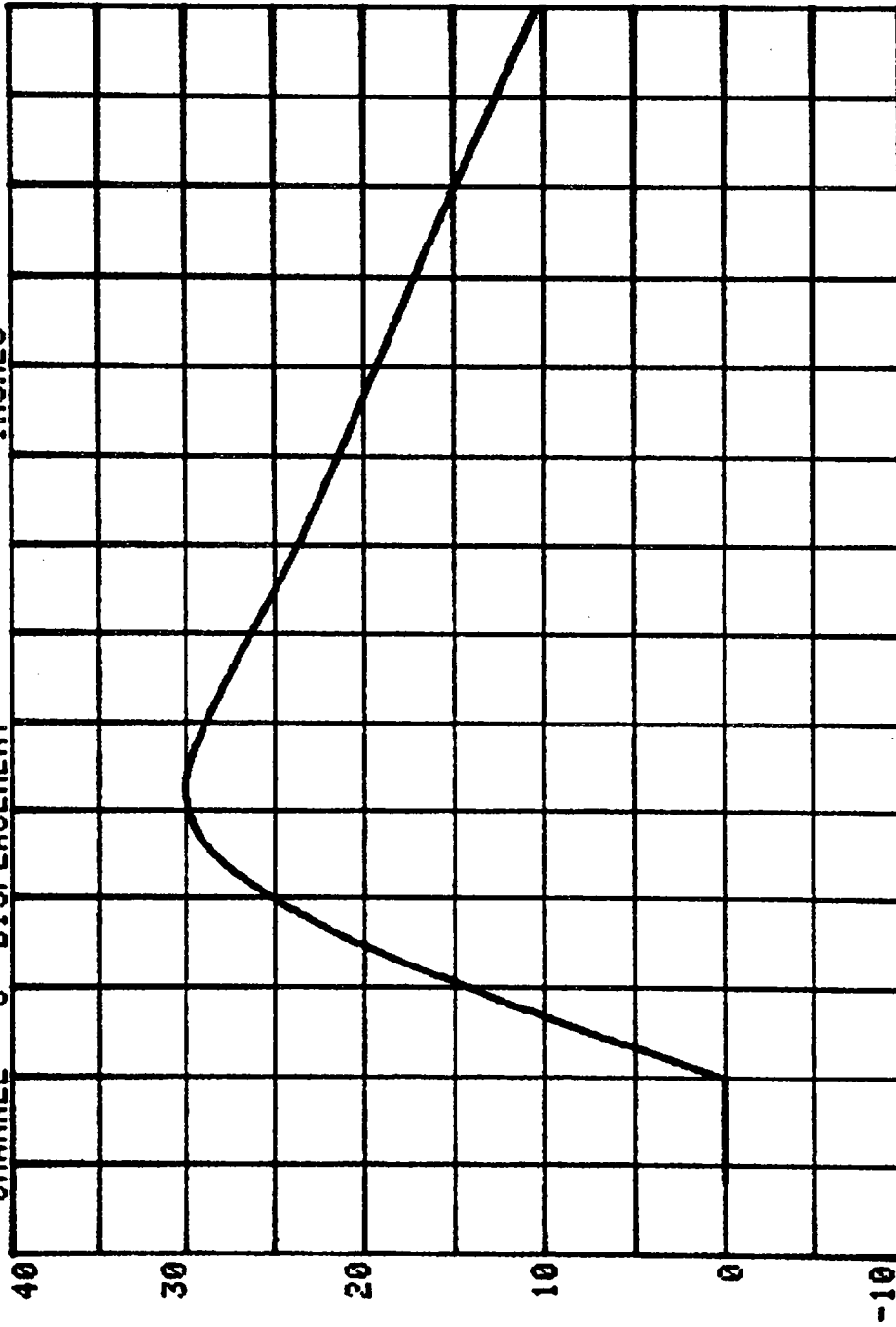
SERIES= 302



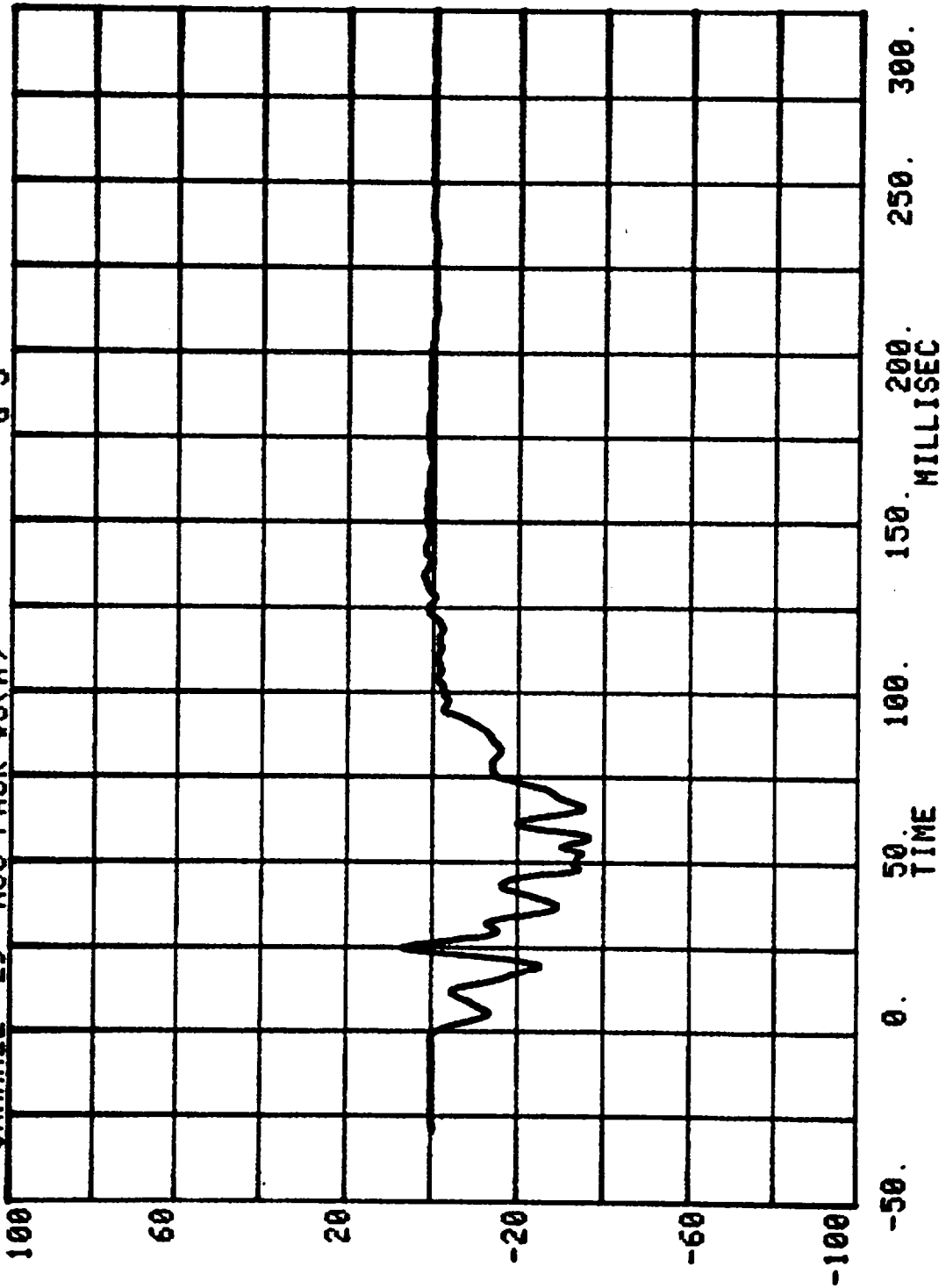
ACC. PACK. #2 (X)

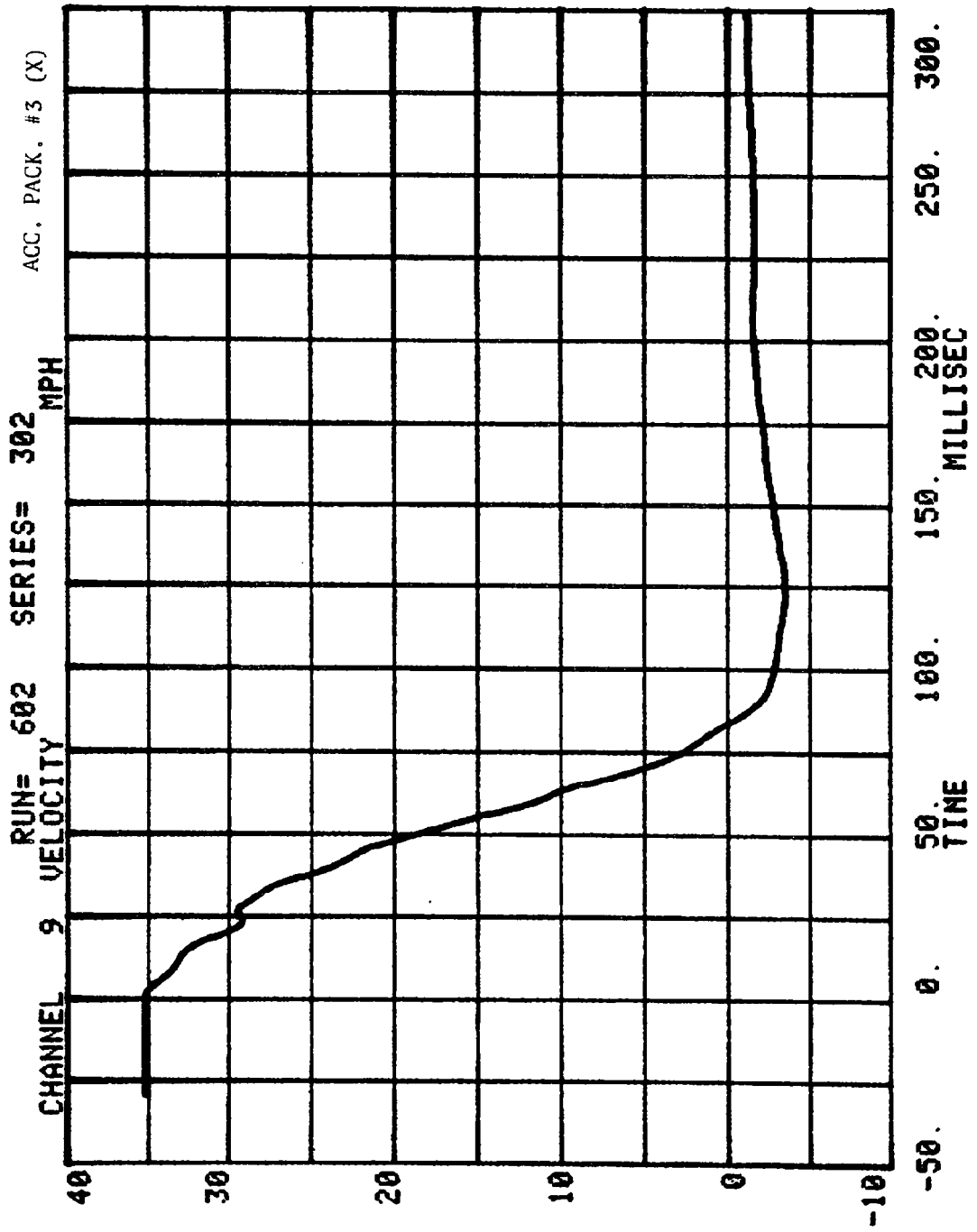
CHANNEL 8 DISPLACEMENT SERIES= 302 INCHES

RUN= 602

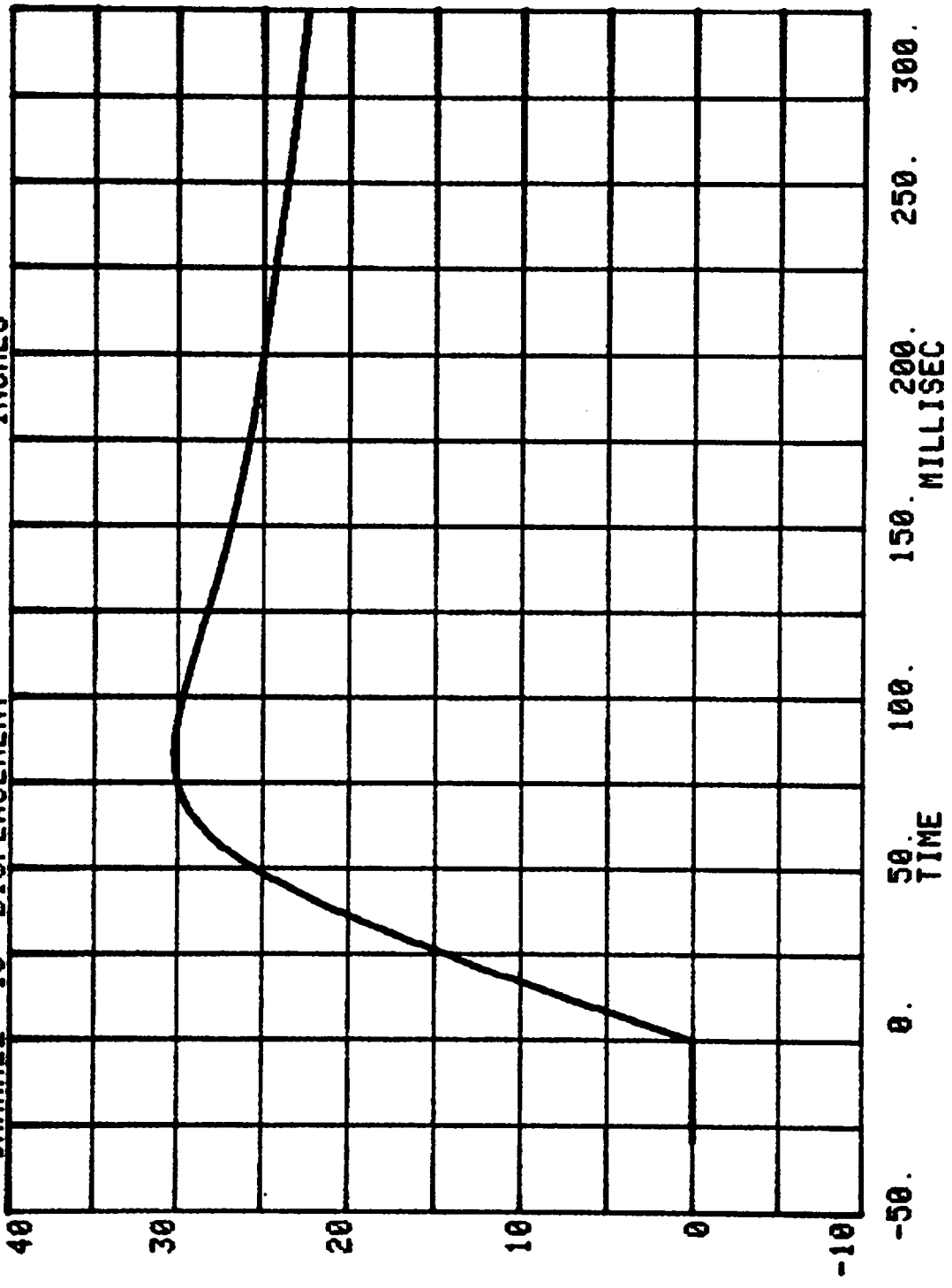


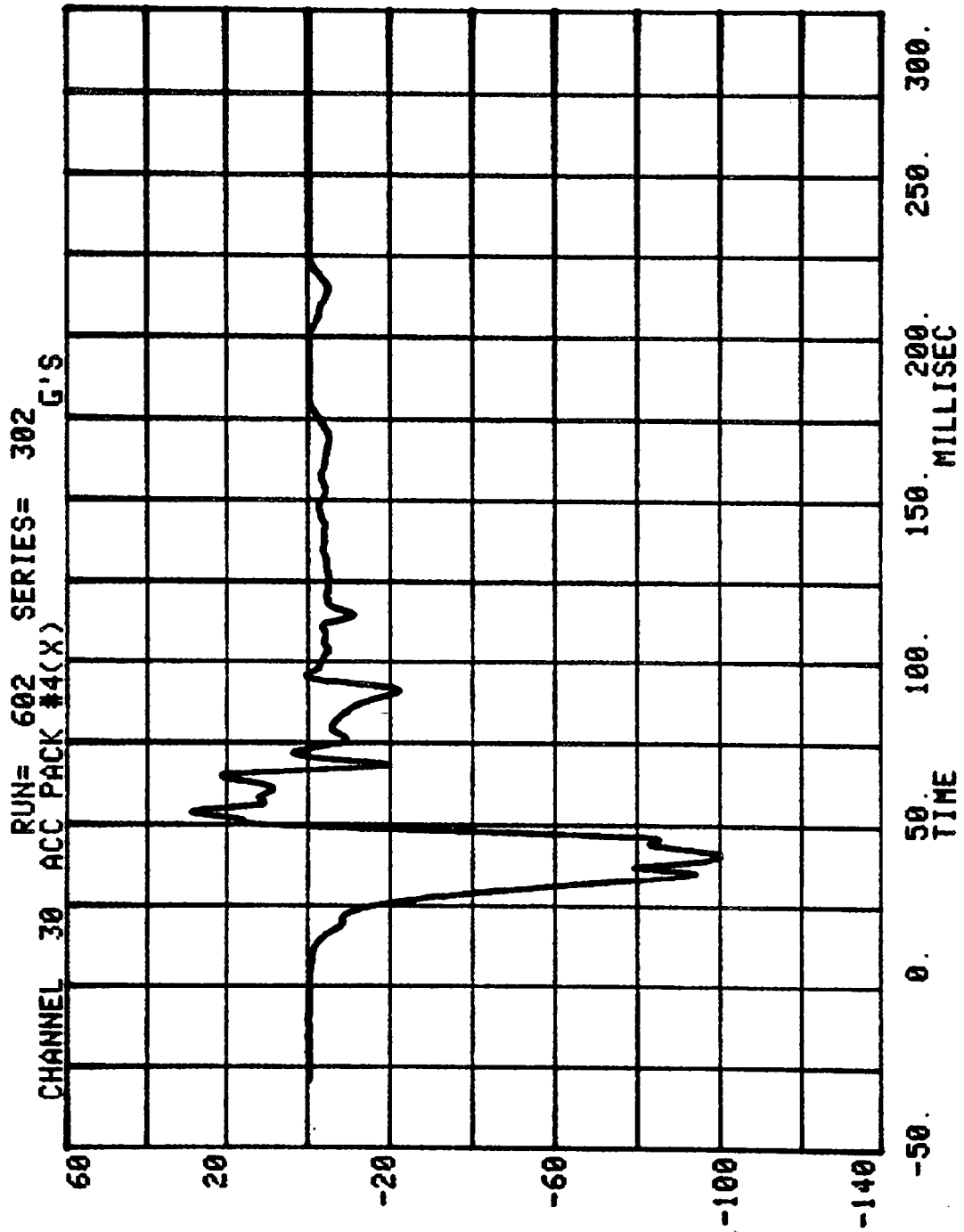
CHANNEL 29 ACC PACK #3(X) RUN= 602 SERIES= 302 G'S





CHANNEL 10 DISPLACEMENT RUN= 602 SERIES= 302 INCHES ACC. PACK. #3 (X)

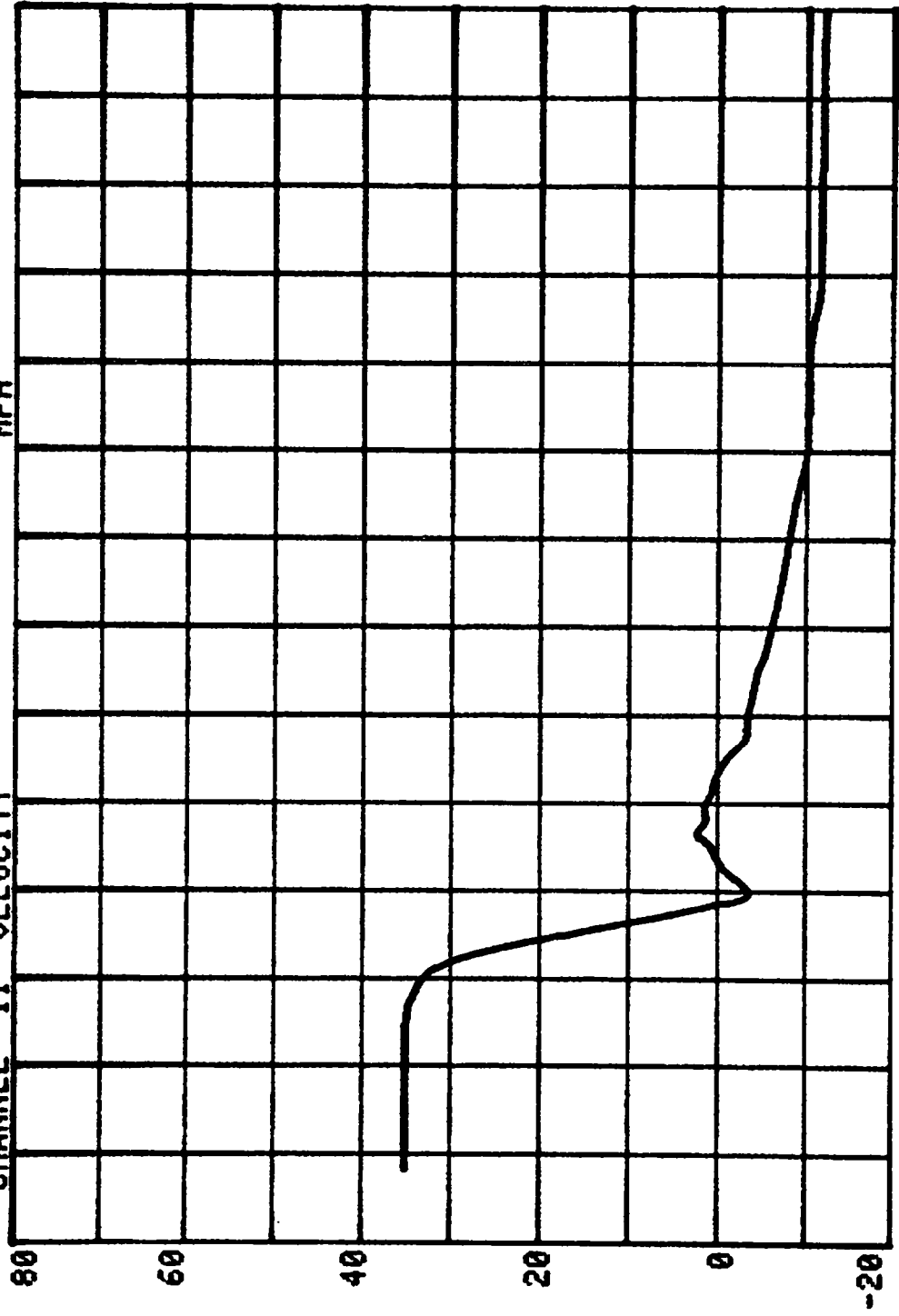




ACC. PACK. #4 (X)

CHANNEL 11 VELOCITY SERIES= 302 MPH

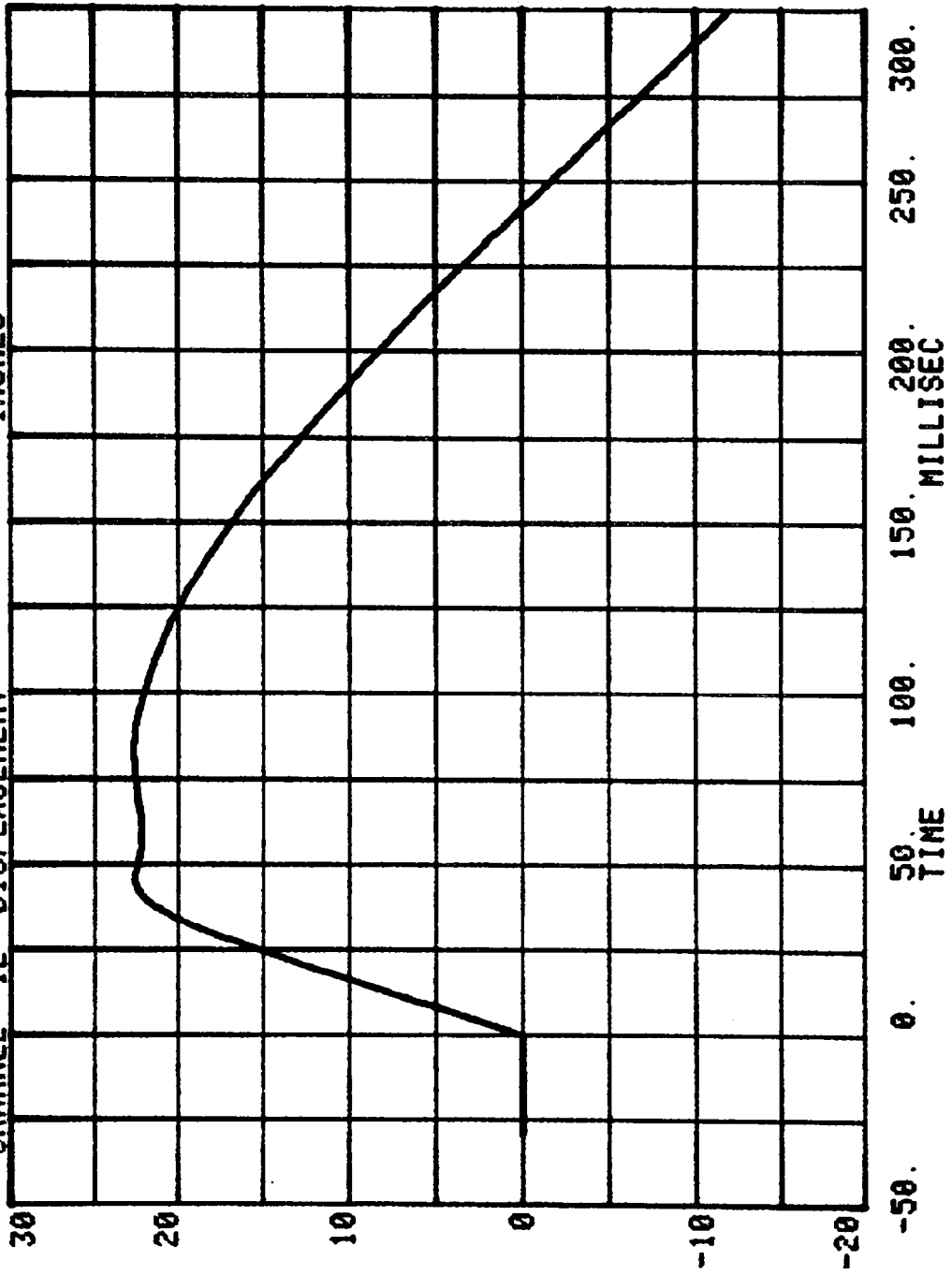
RUN= 602



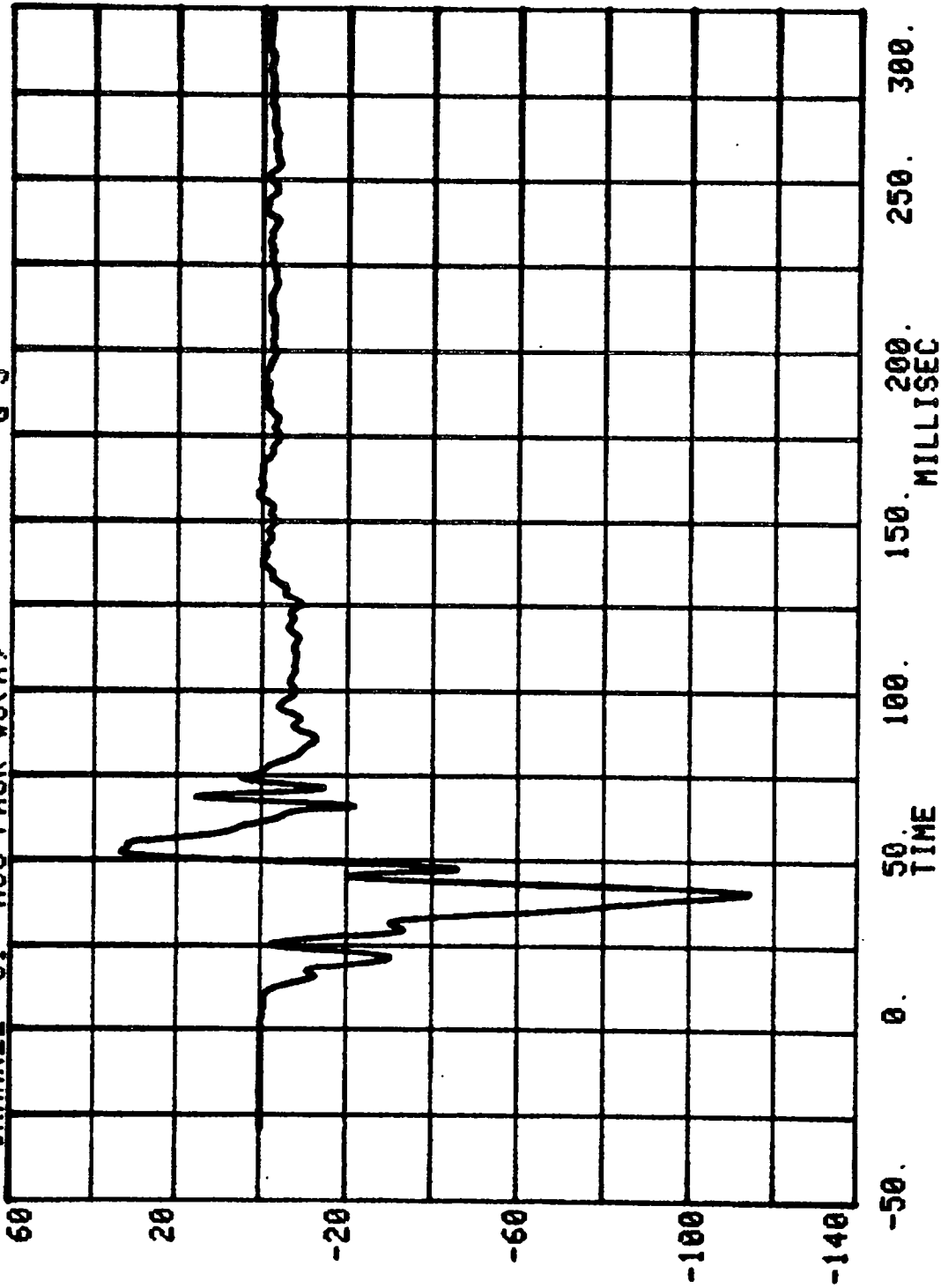
ACC. PACK. #4 (X)

CHANNEL 12 DISPLACEMENT SERIES= 302 INCHES

RUN= 602

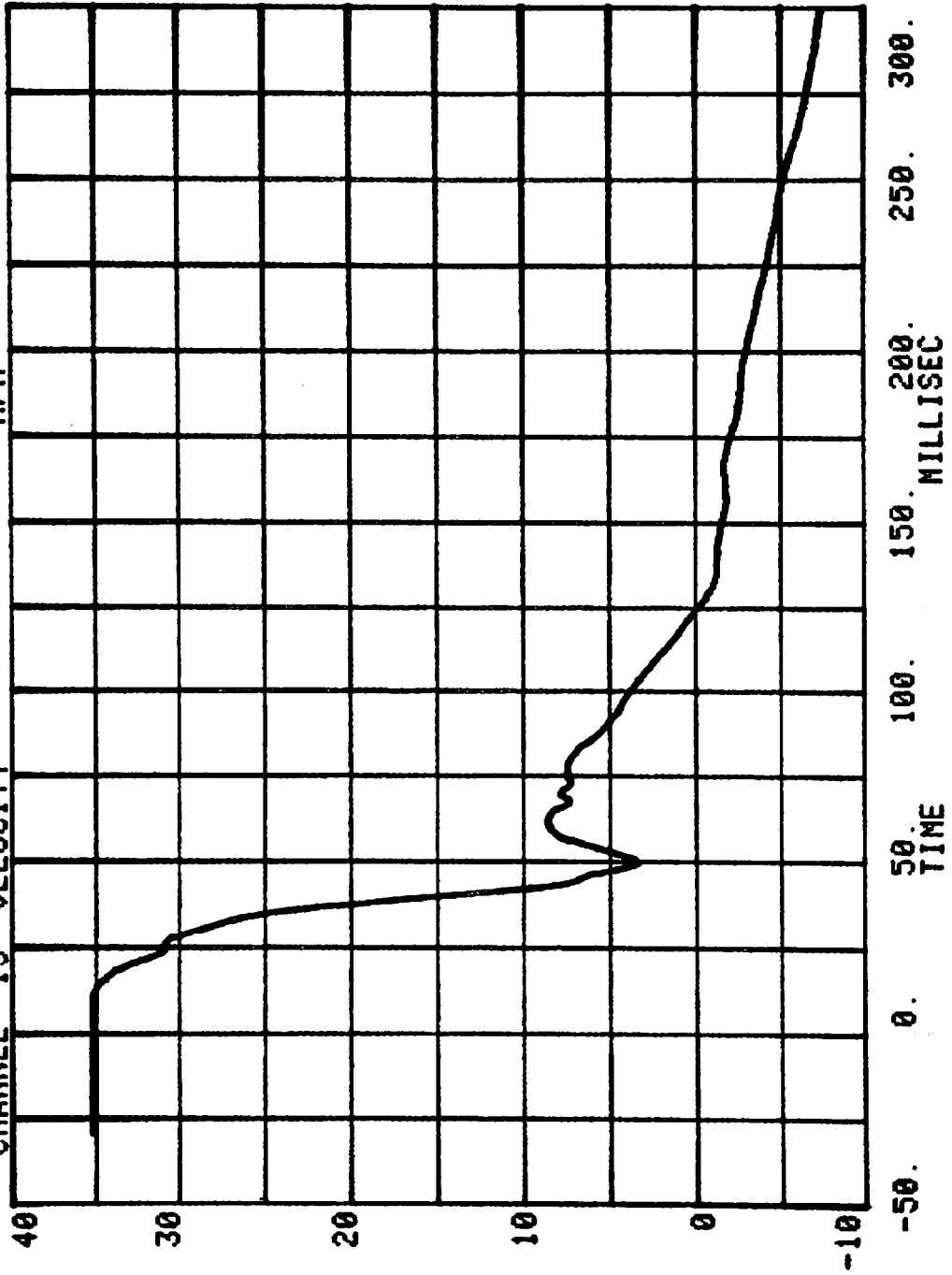


CHANNEL 31 ACC PACK #5(X) RUN= 602 SERIES= 302 G'S

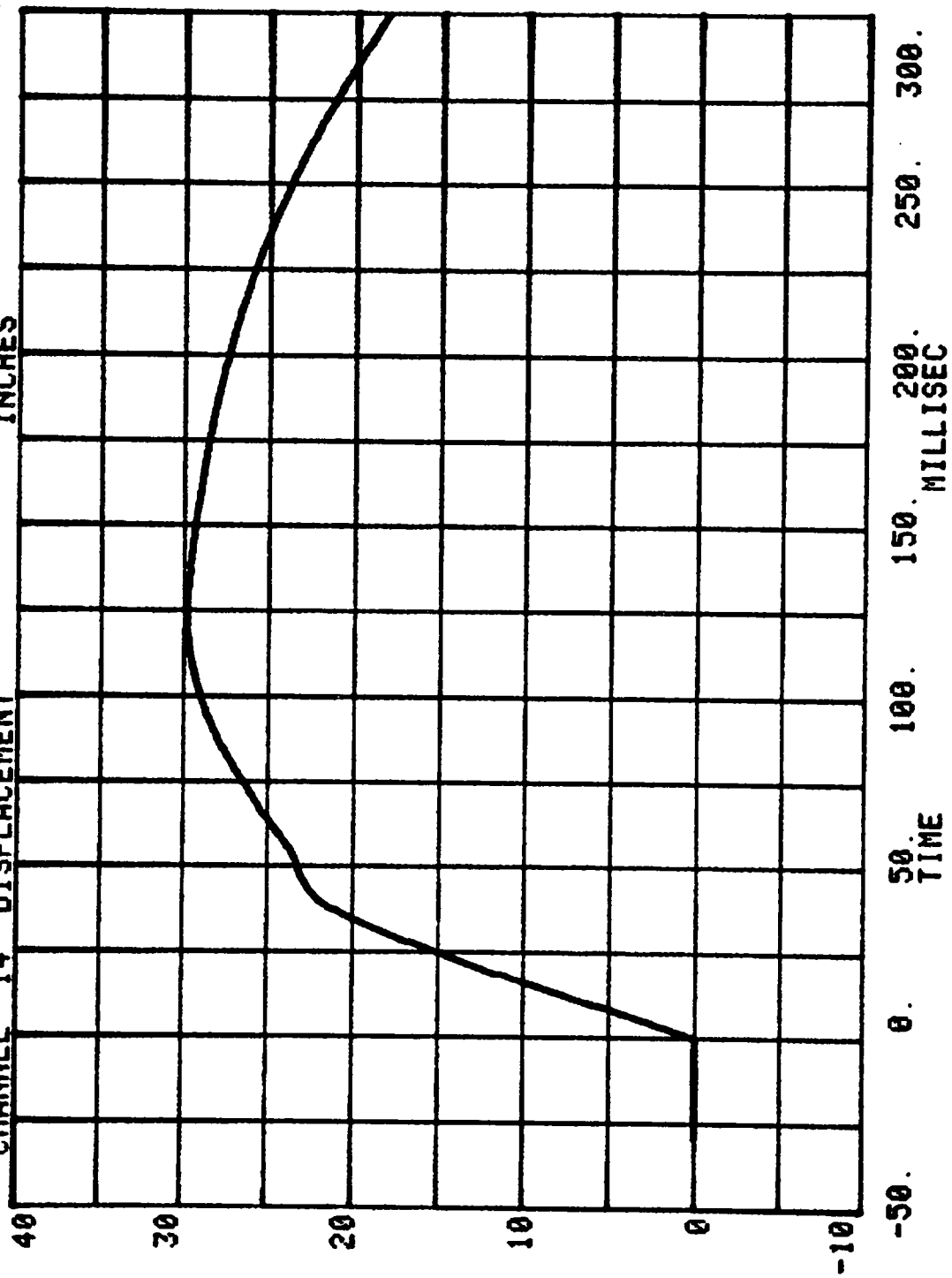


ACC. PACK. #5 (X)

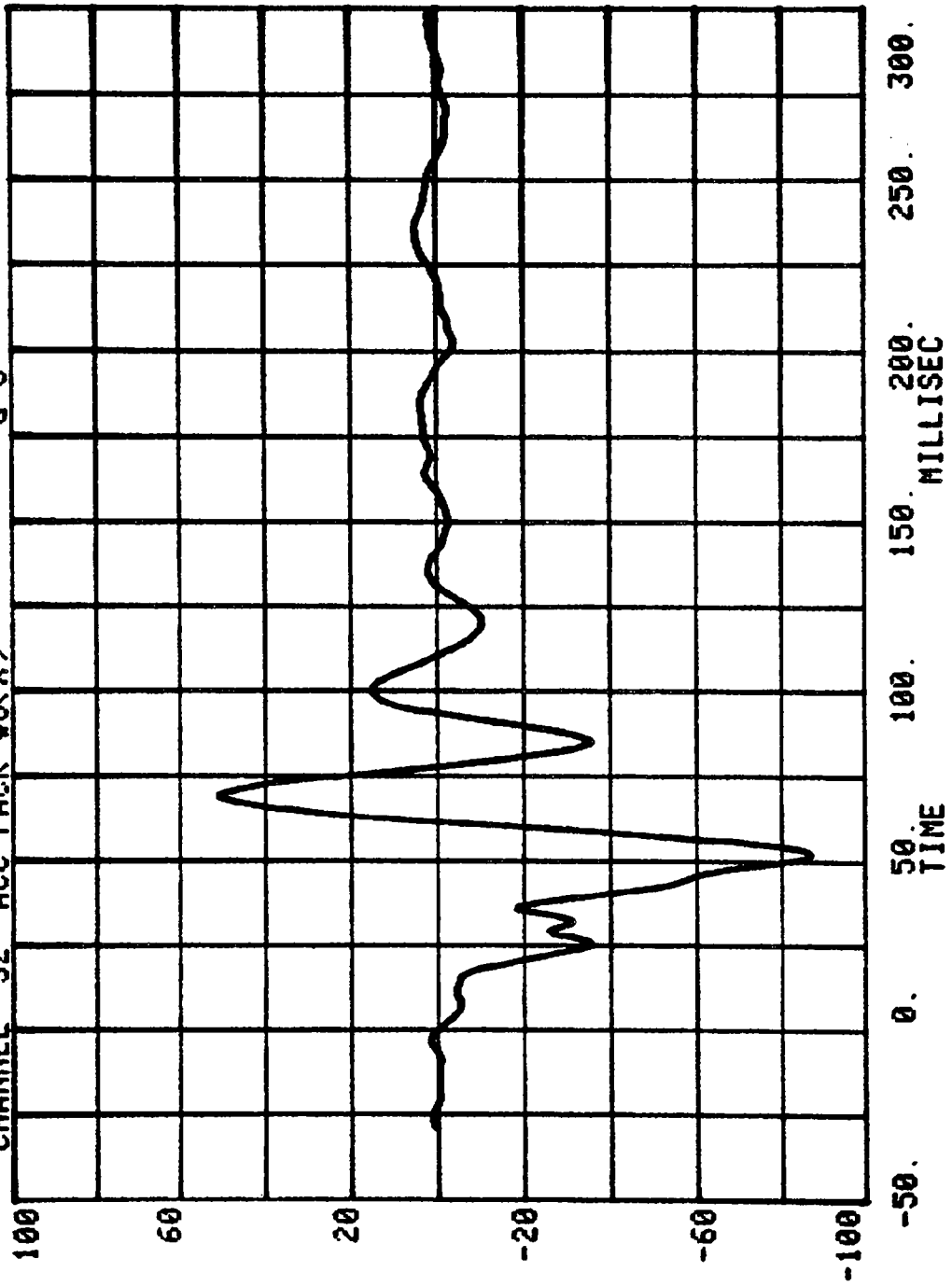
CHANNEL 13 VELOCITY
RUN= 602 SERIES= 302 MPH



CHANNEL 14 DISPLACEMENT
RUN= 602 SERIES= 302 INCHES
ACC. PACK. #5 (X)

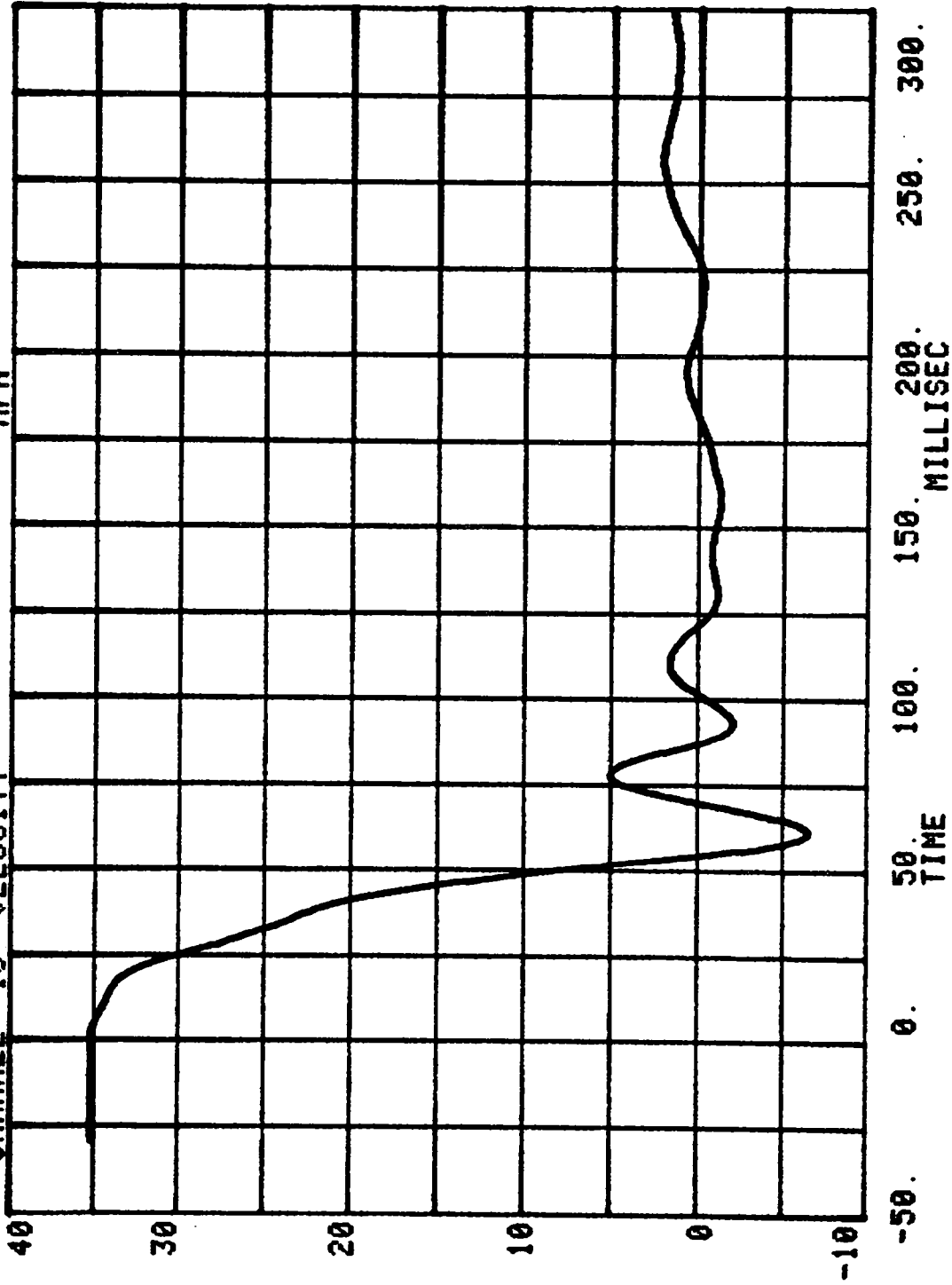


CHANNEL 32 ACC PACK #6(X) RUN= 602 SERIES= 302 G'S

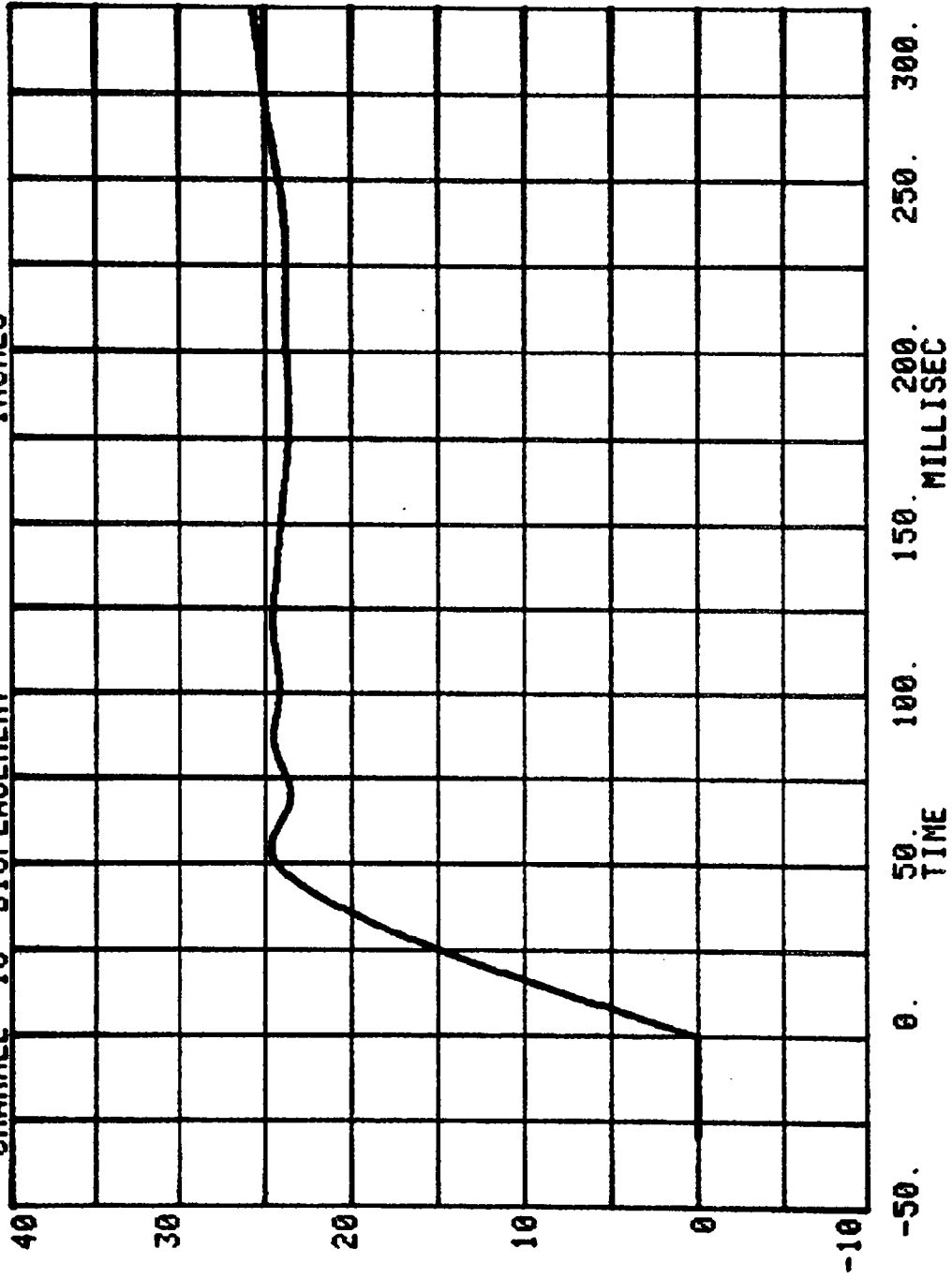


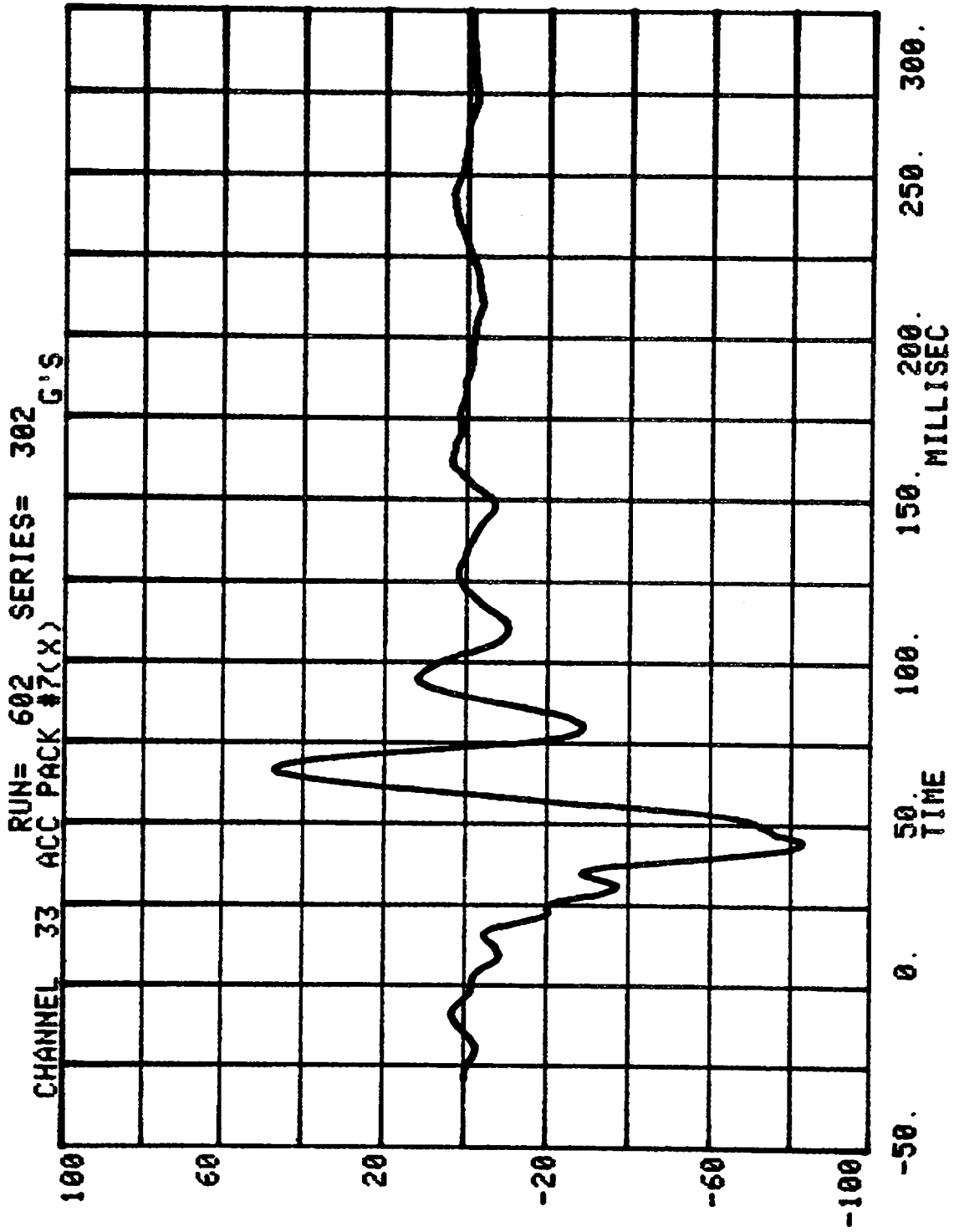
ACC. PACK. #6 (X)

CHANNEL 15 VELOCITY
RUN= 602 SERIES= 302 MPH



CHANNEL 16 DISPLACEMENT RUN= 602 SERIES= 302 INCHES ACC. PACK. #6 (X)

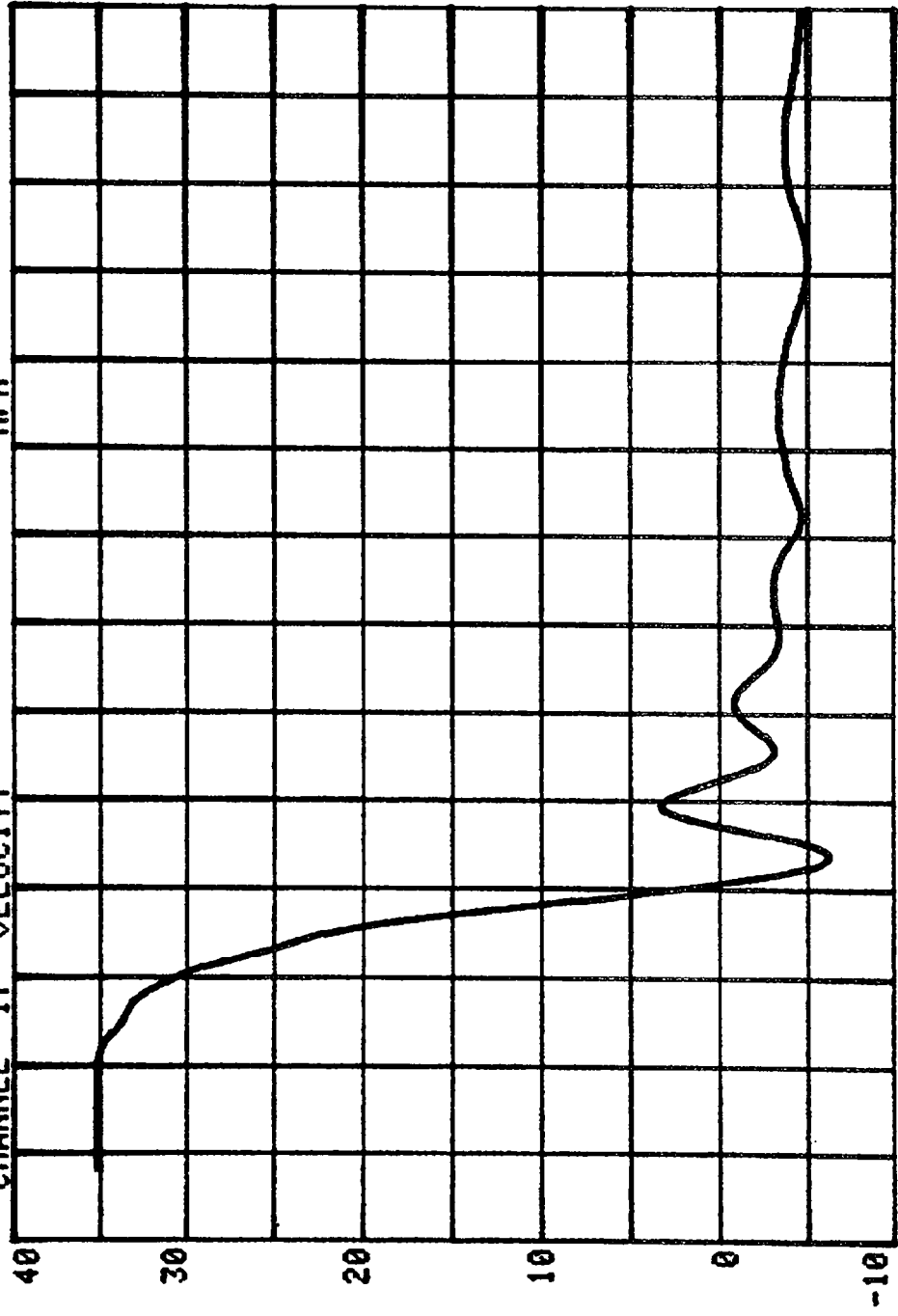




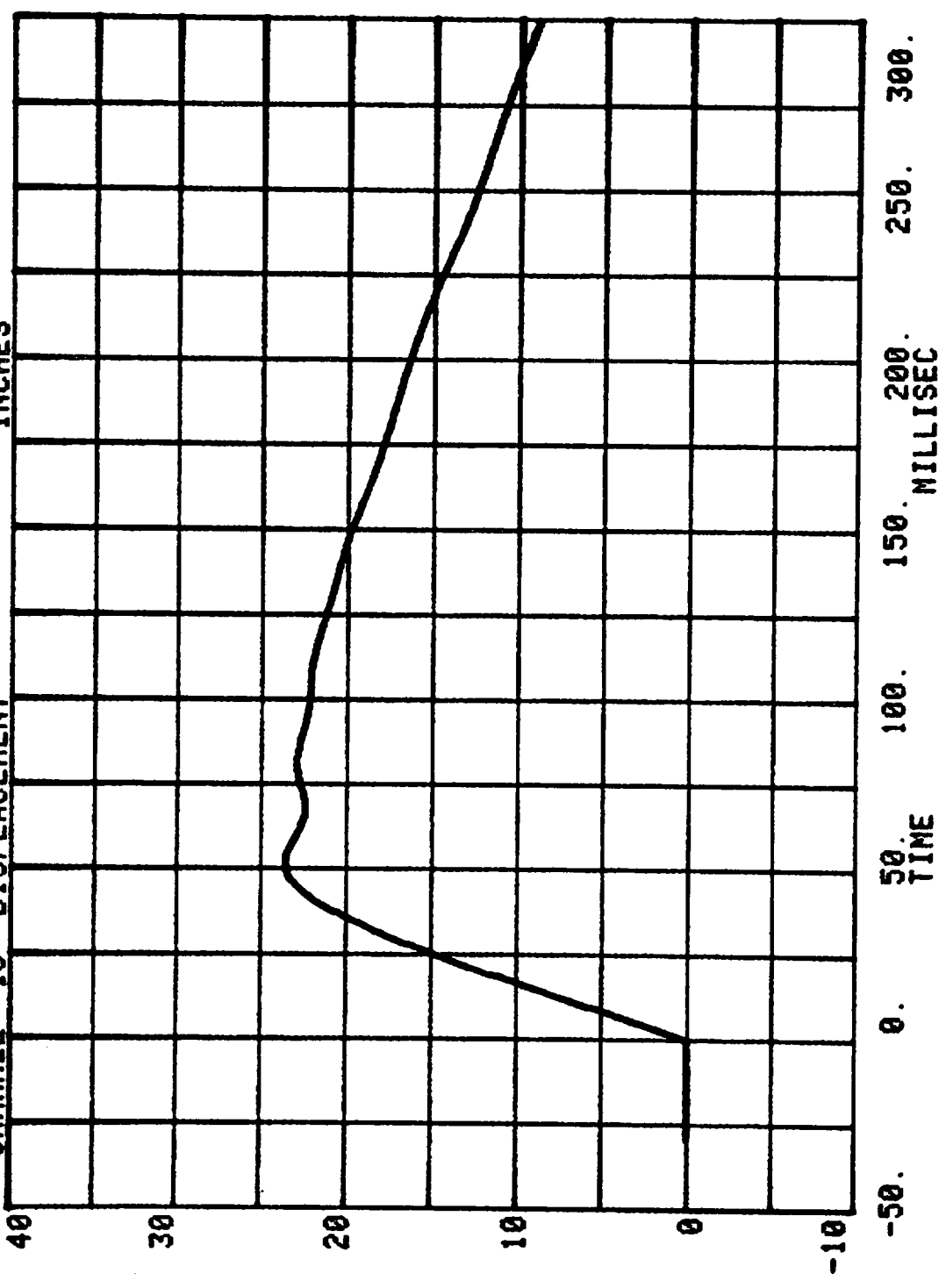
ACC. PACK. #7 (X)

CHANNEL 17 VELOCITY SERIES= 302 MPH

RUN= 602



CHANNEL 18 DISPLACEMENT RUN= 602 SERIES= 302 INCHES ACC. PACK. #7 (X)



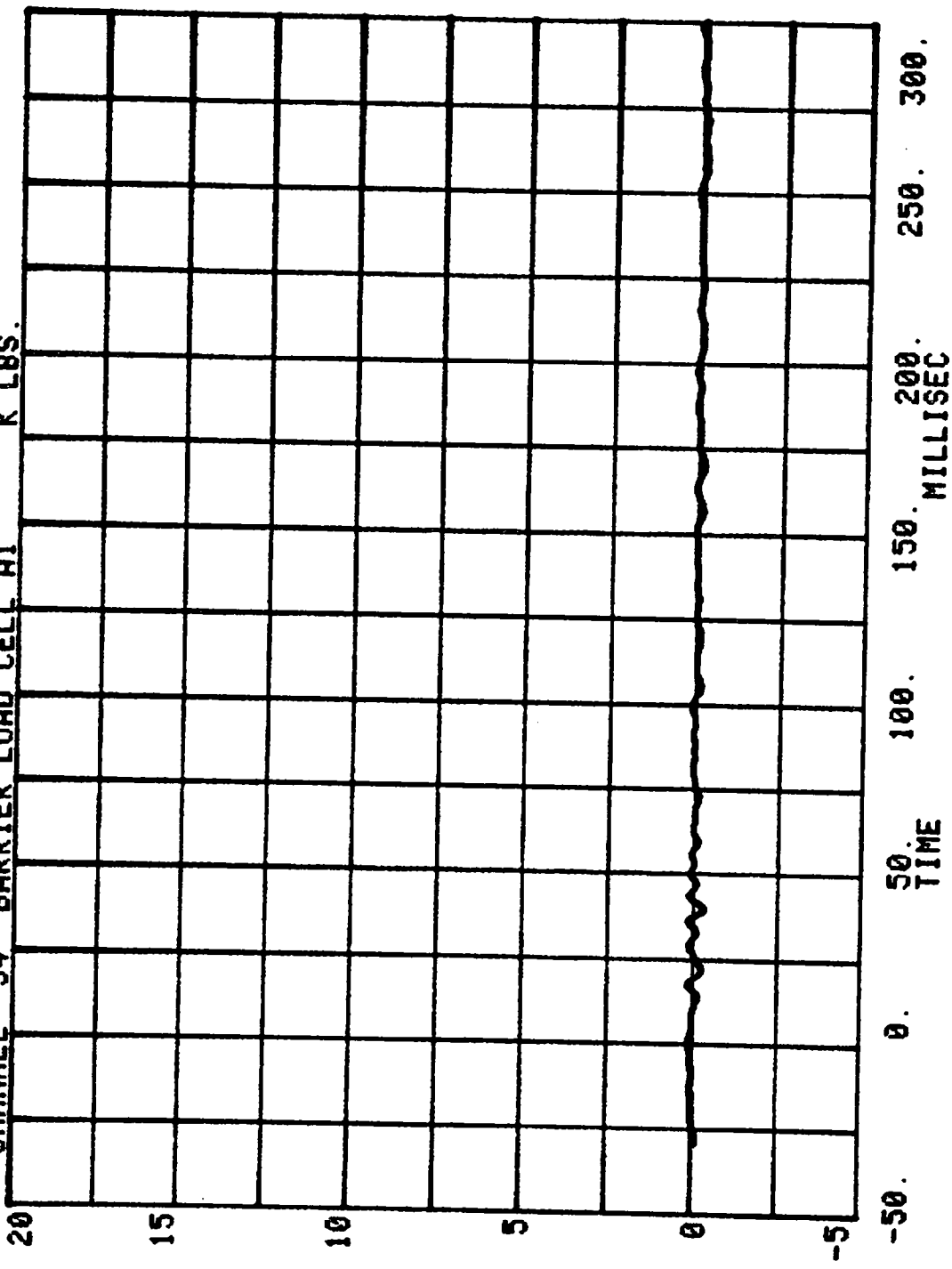
TEST NO. CE0302

LOAD CELL BARRIER DATA

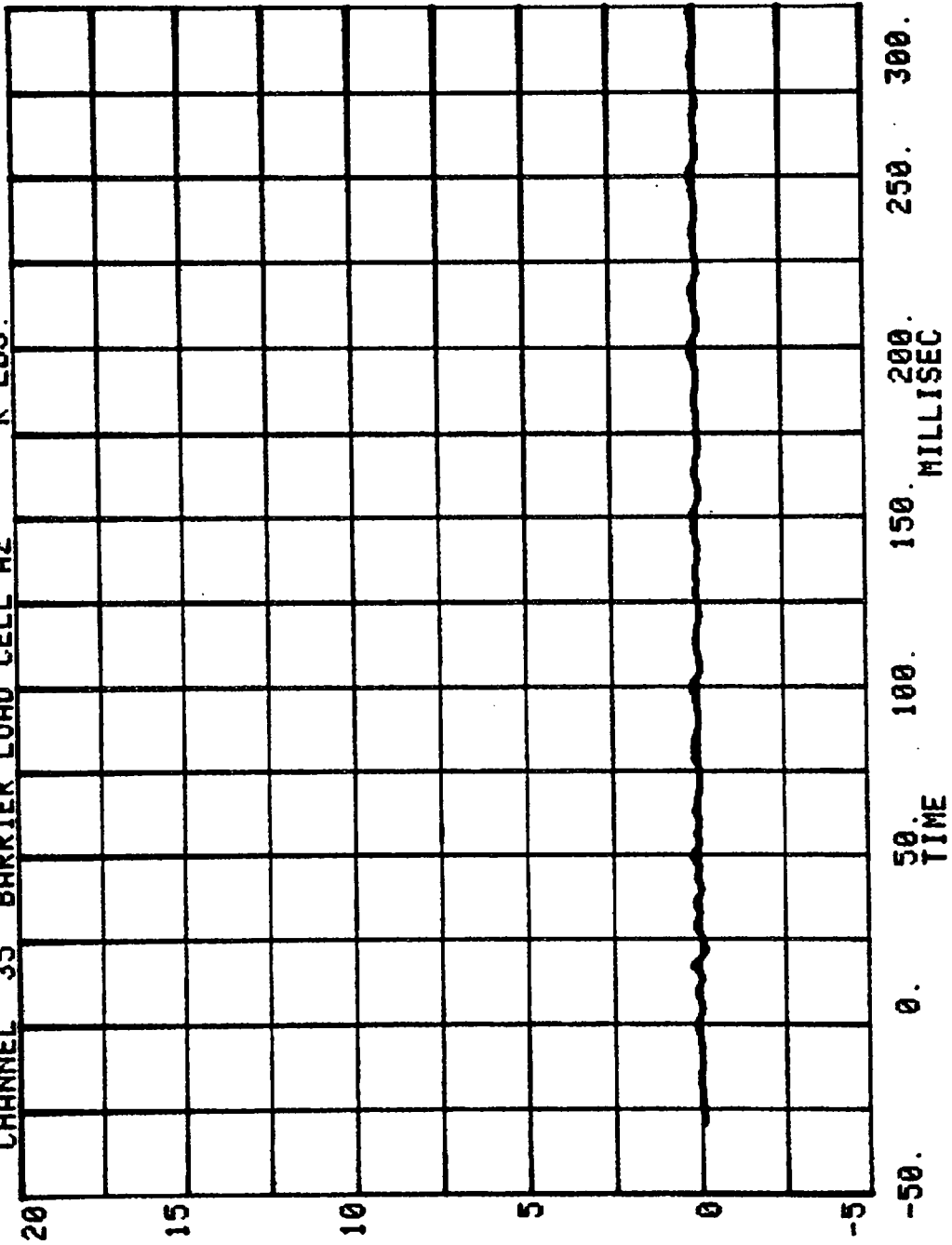
FILTER CHANNEL CLASS

60

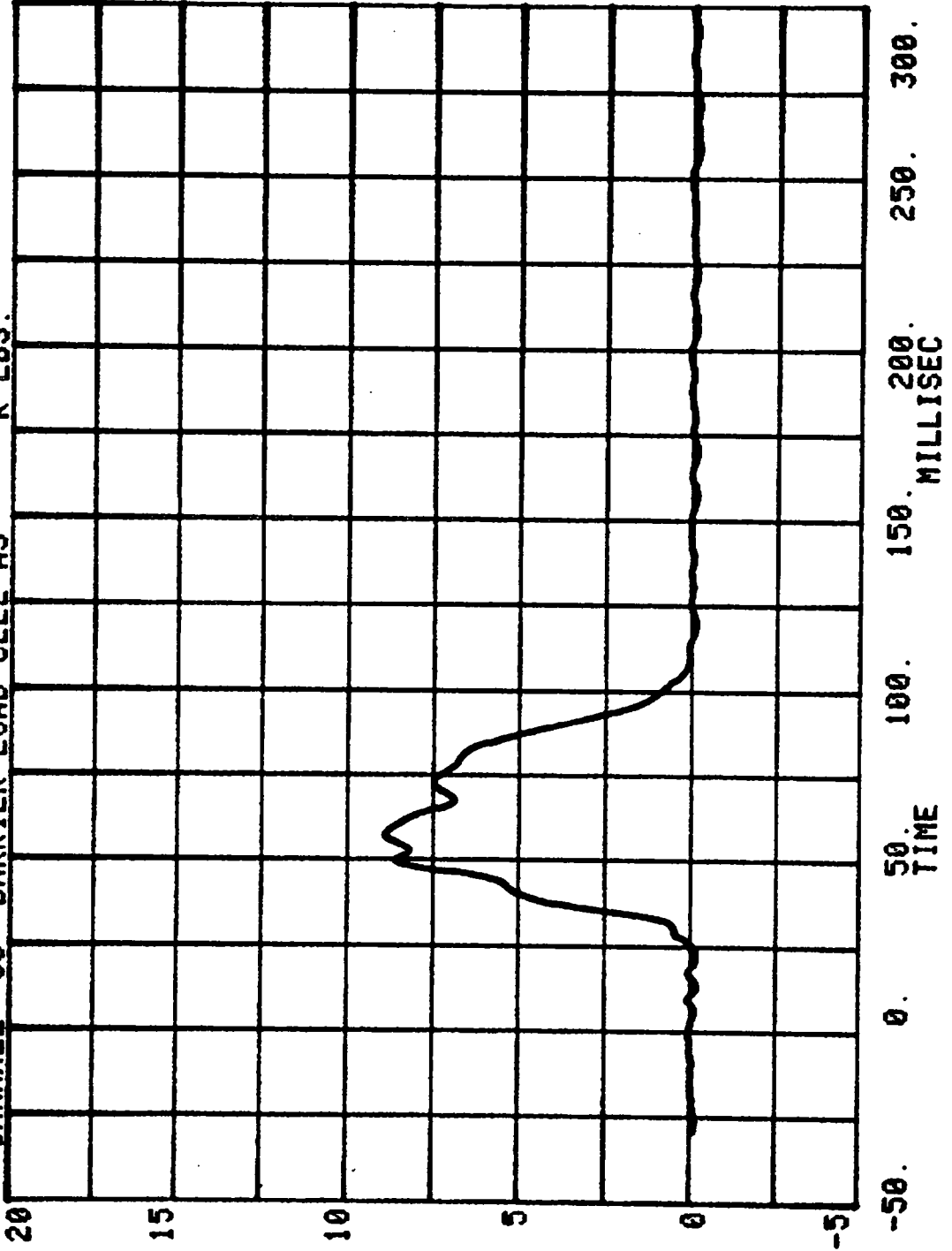
CHANNEL 34 BARRIER LOAD CELL A1
RUN= 602 SERIES= 302 K LBS.



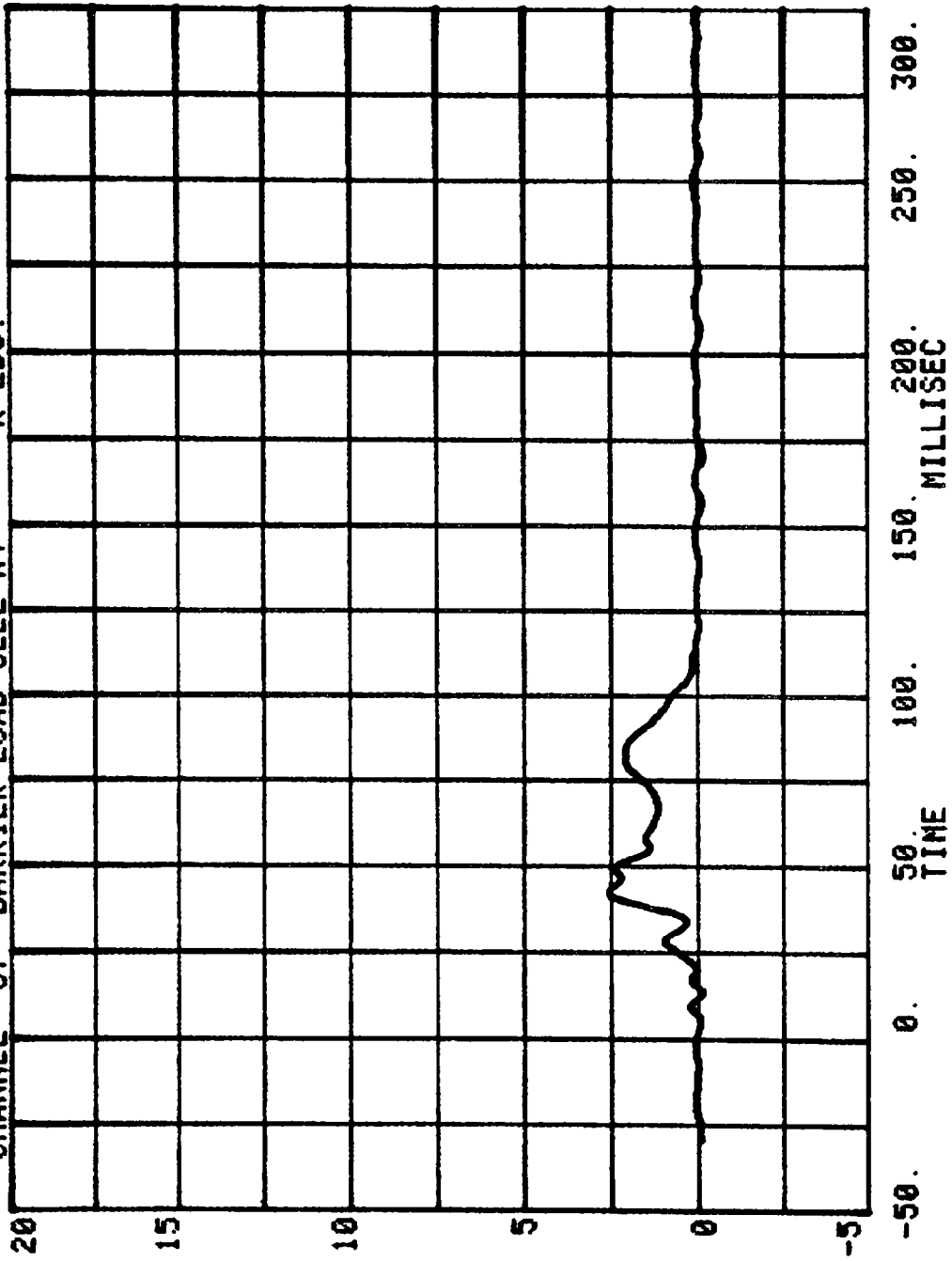
CHANNEL 35 BARRIER LOAD CELL A2
RUN= 602 SERIES= 302 K LBS.



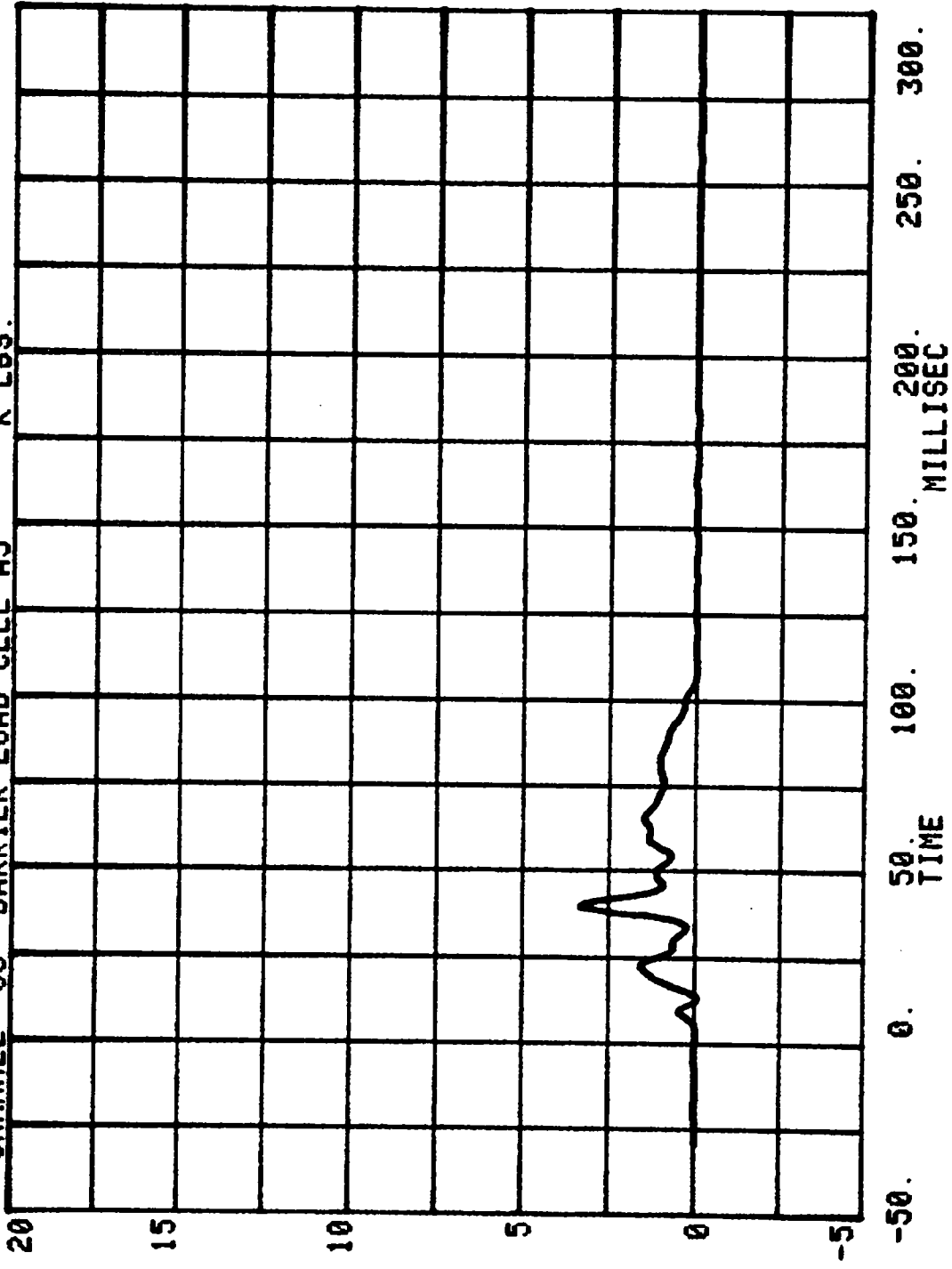
CHANNEL 36 BARRIER LOAD CELL A3
RUN= 602 SERIES= 302 K LBS.

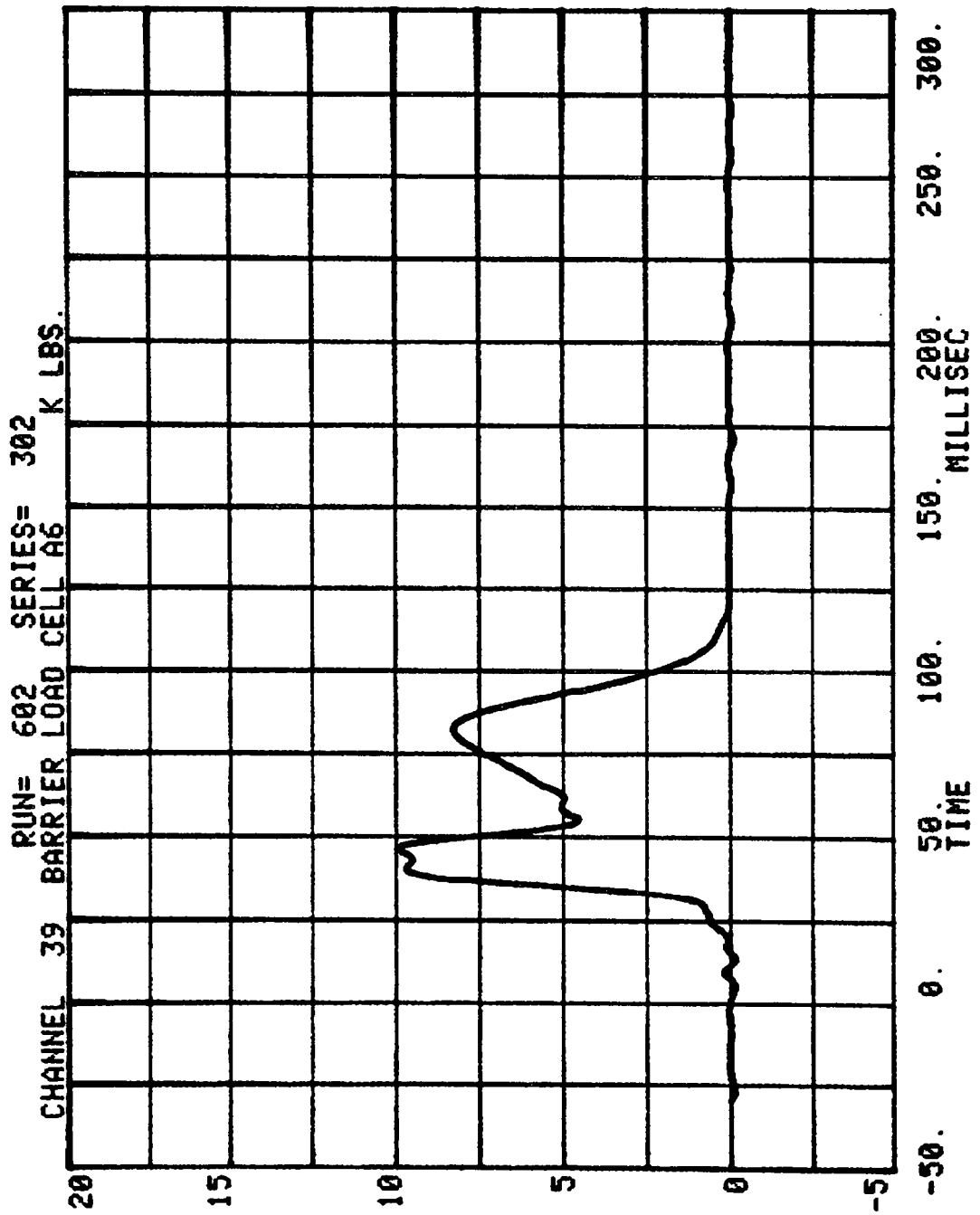


CHANNEL 37 BARRIER LOAD CELL A4 RUN= 602 SERIES= 302 K LBS.

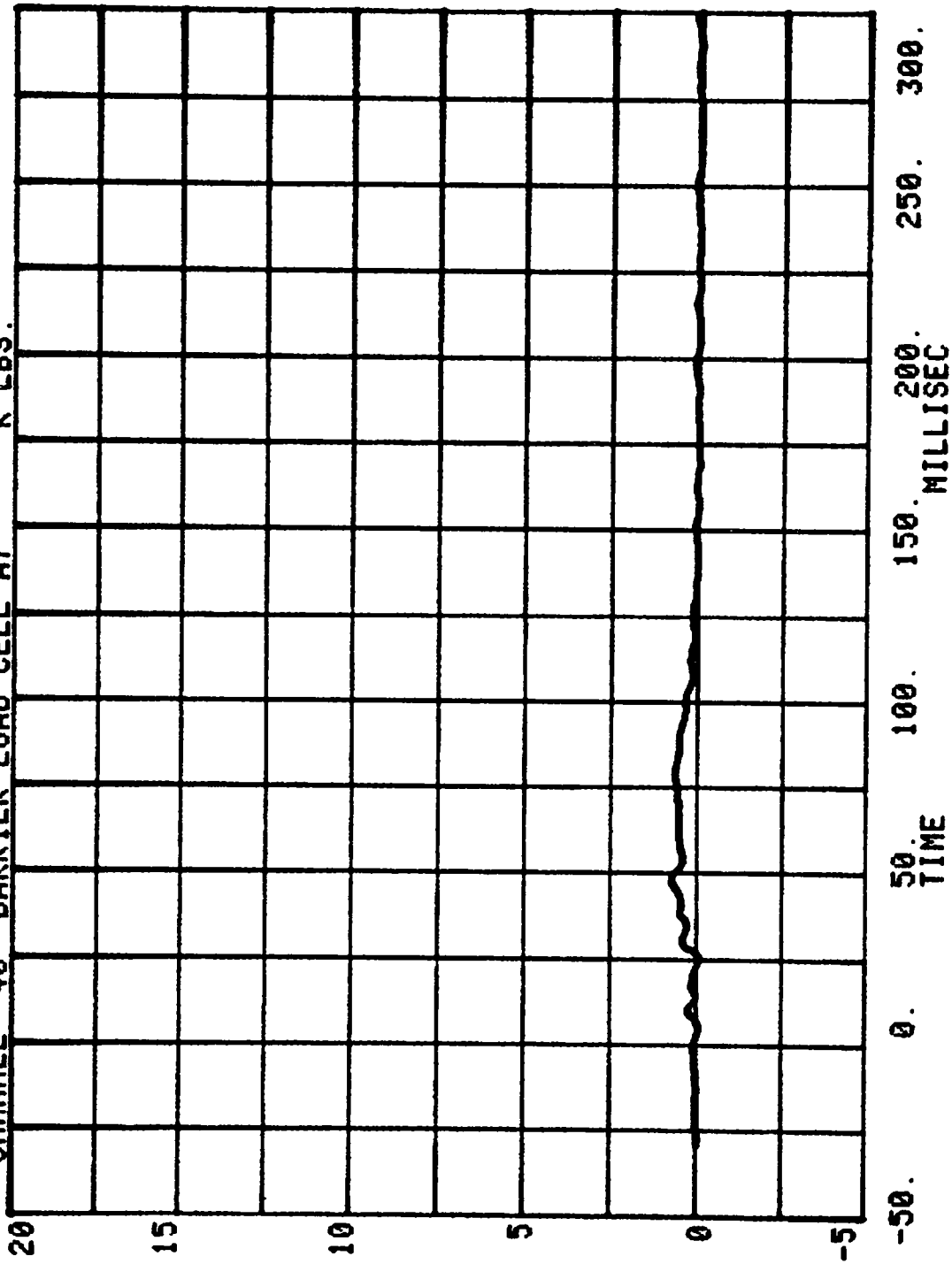


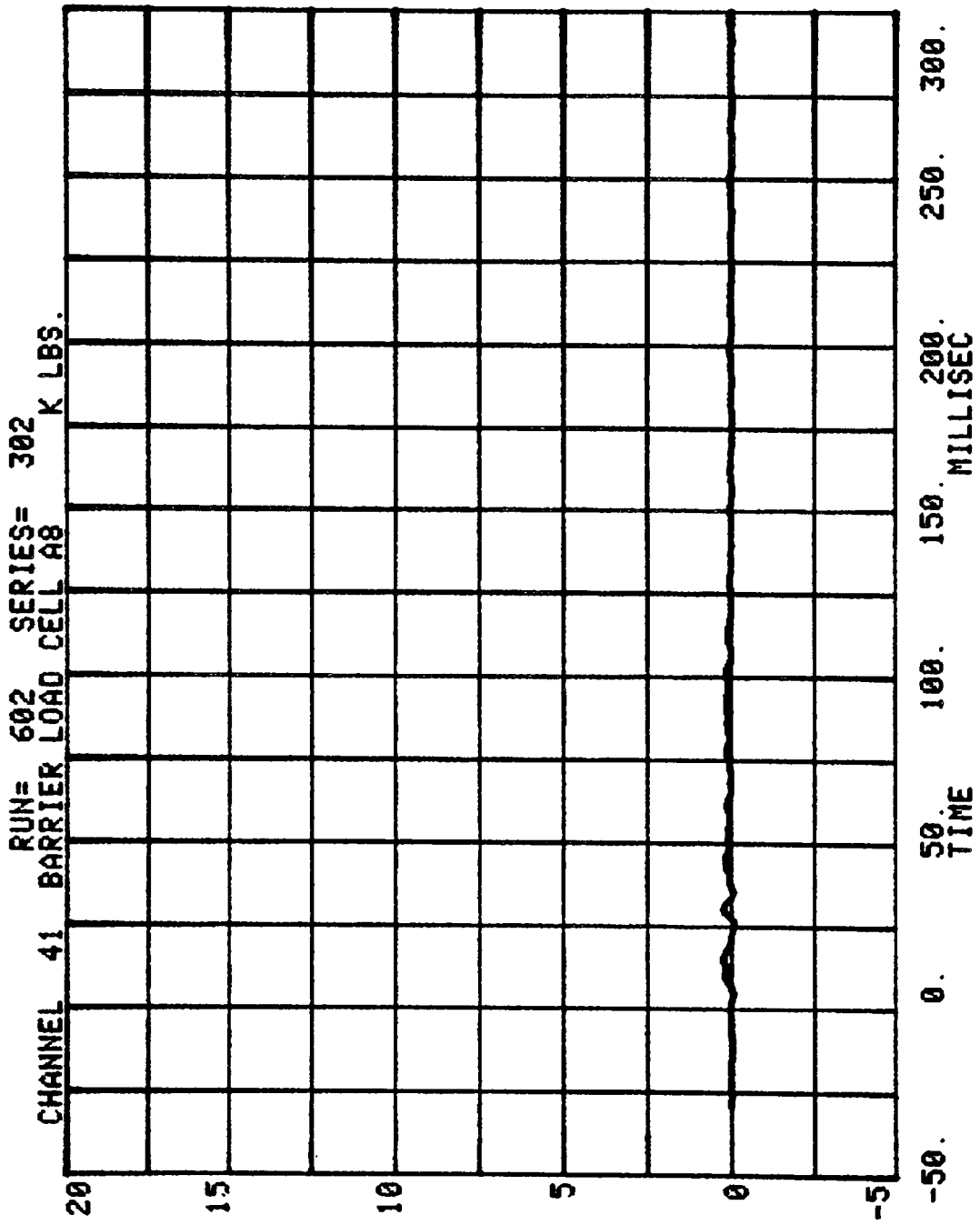
CHANNEL 38 BARRIER LOAD CELL A5
RUN= 602 SERIES= 302 K LBS.



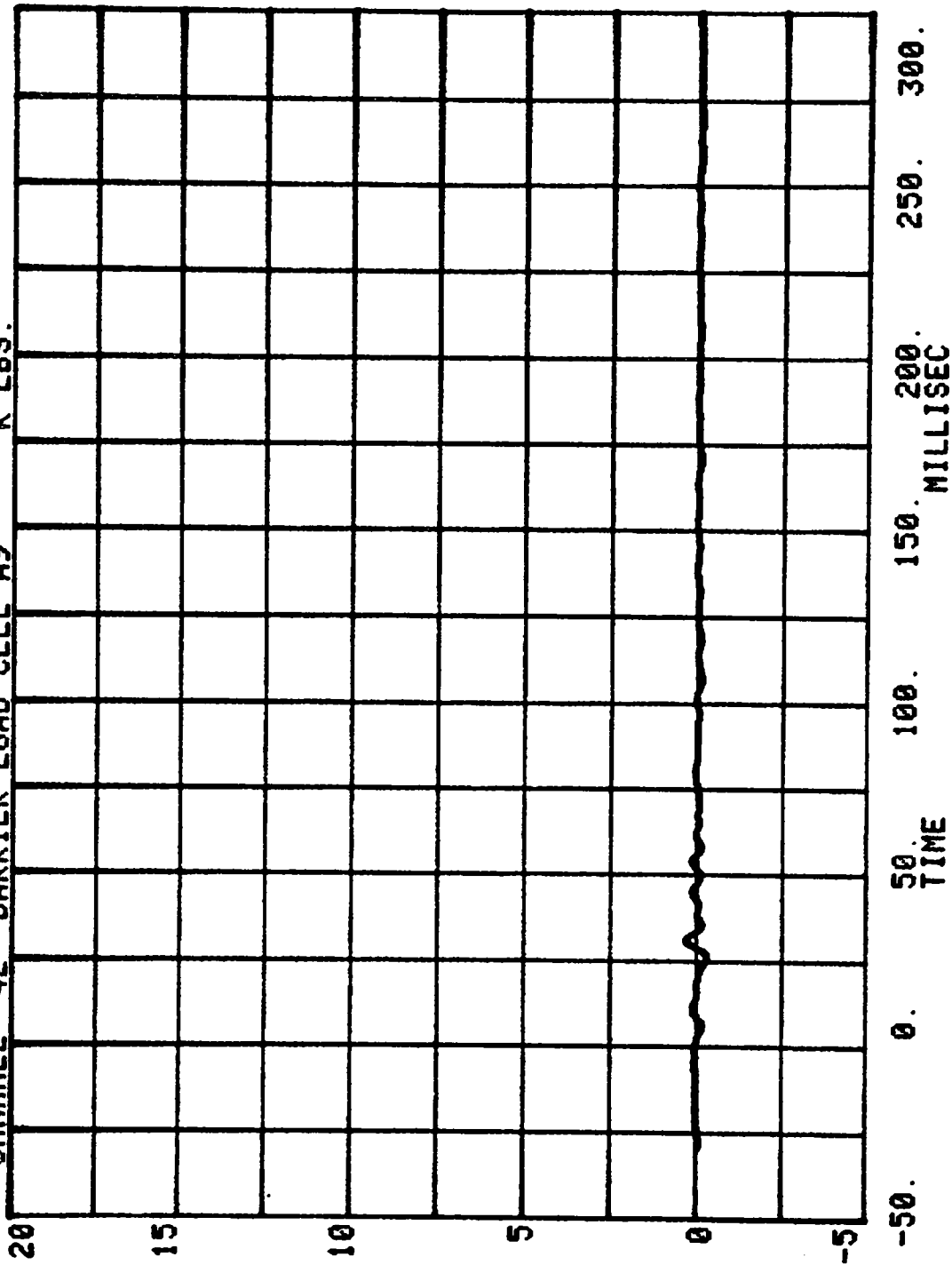


CHANNEL 40 BARRIER LOAD CELL A7
RUN= 602 SERIES= 302 K LBS.

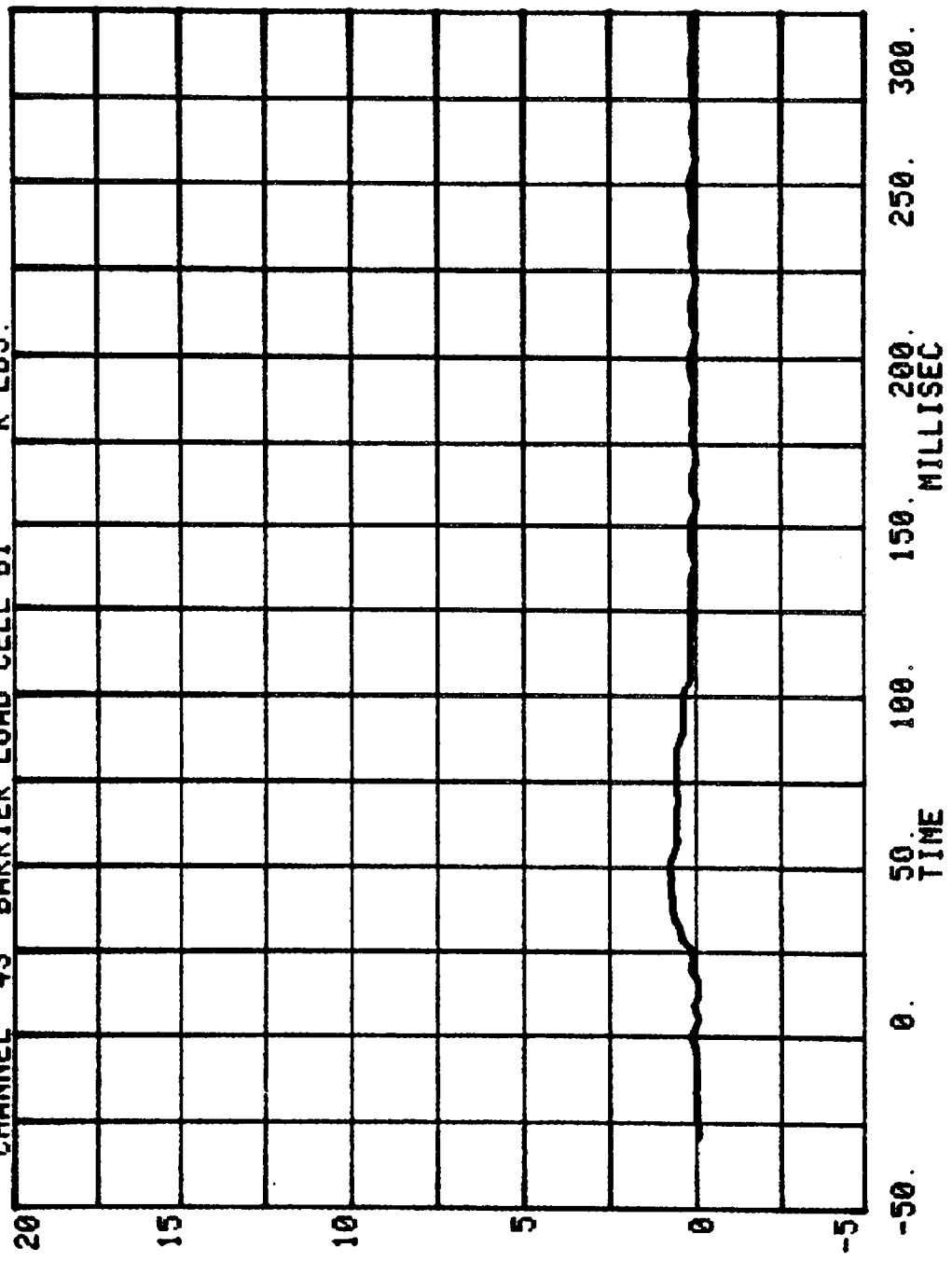




CHANNEL 42 BARRIER LOAD CELL A9
RUN= 602 SERIES= 302
K LBS.



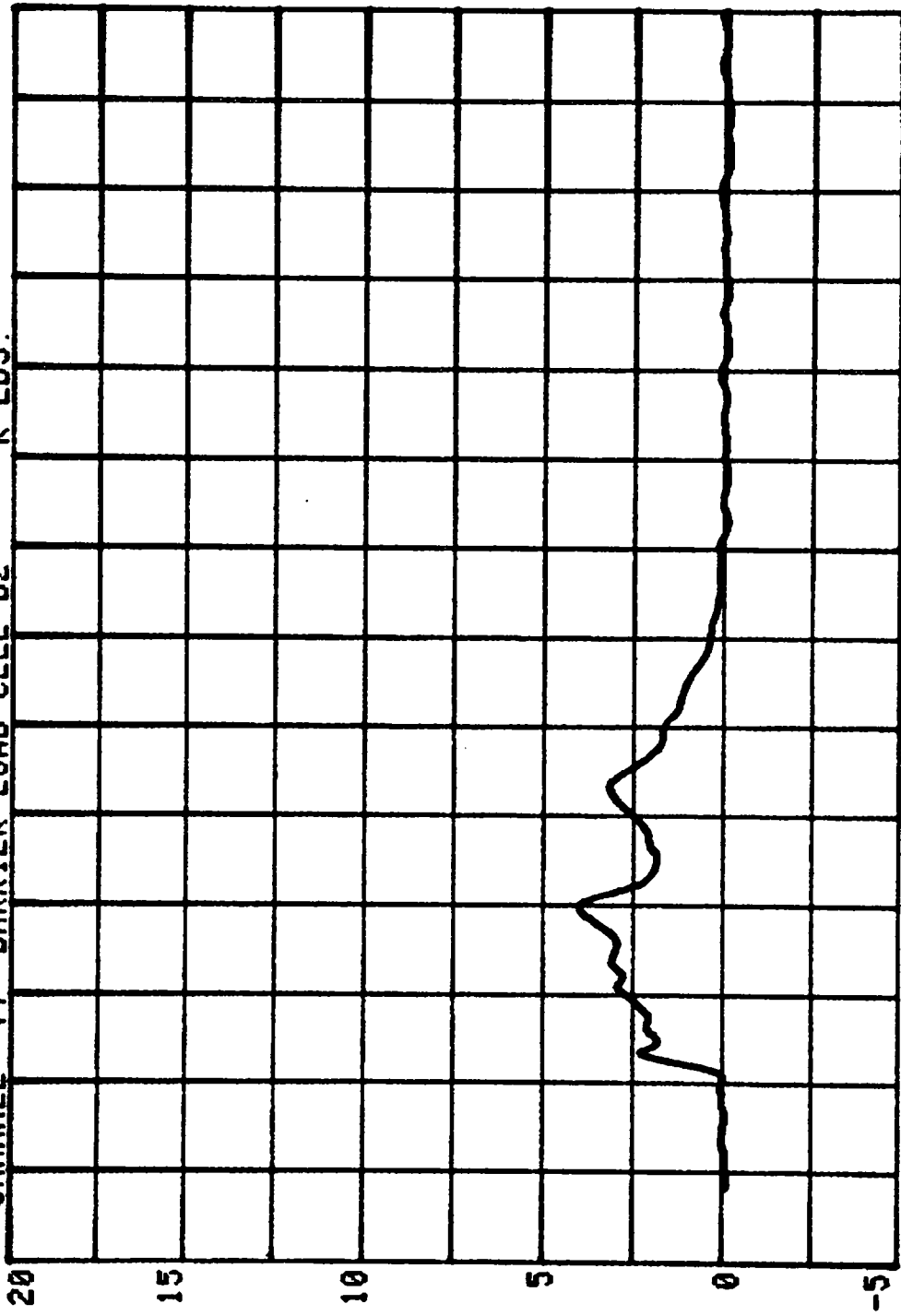
CHANNEL 43 BARRIER LOAD CELL B1 RUN= 602 SERIES= 302 K LBS.



CHANNEL 44 BARRIER LOAD CELL B2

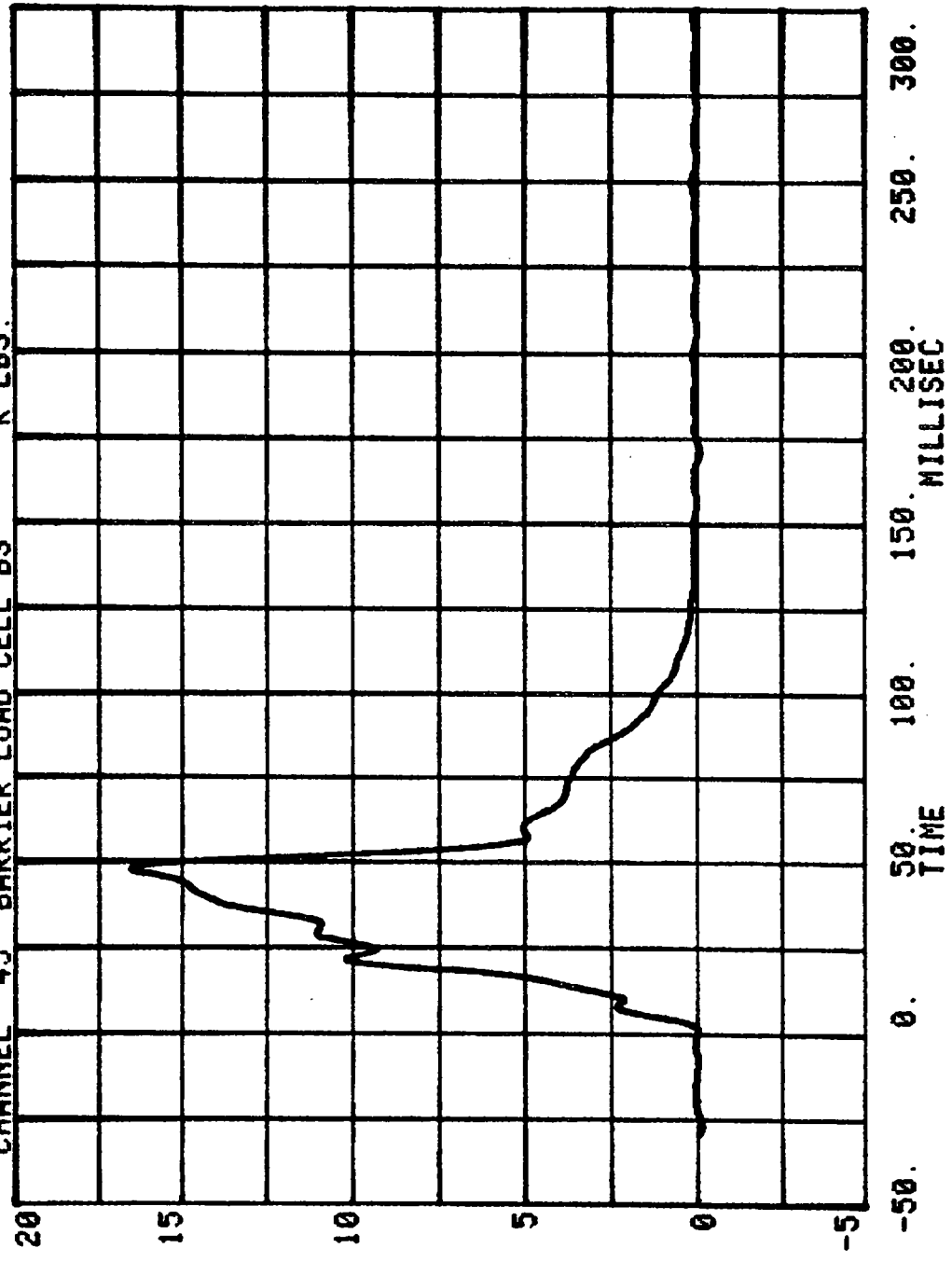
RUN= 602 SERIES= 302

K LBS.

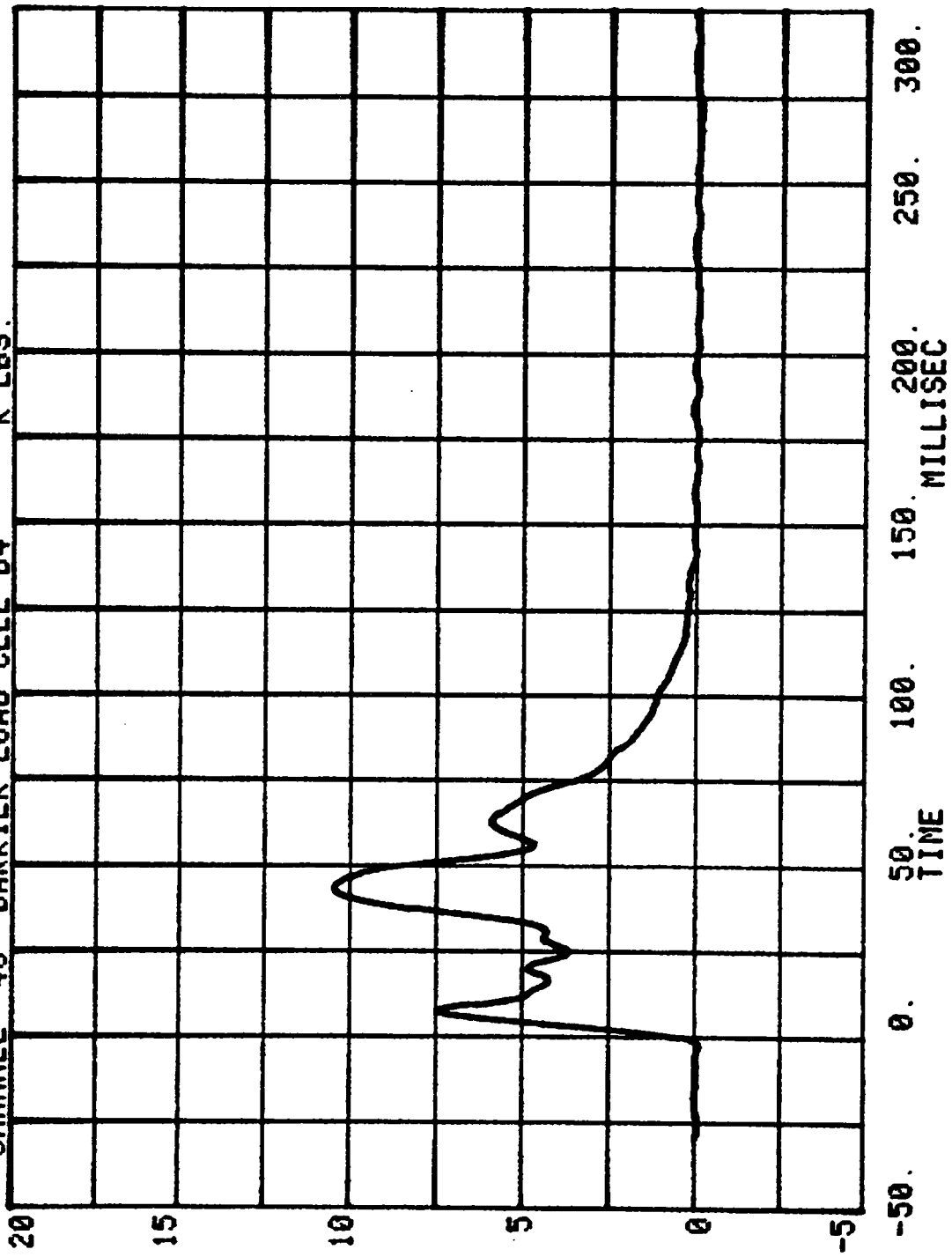


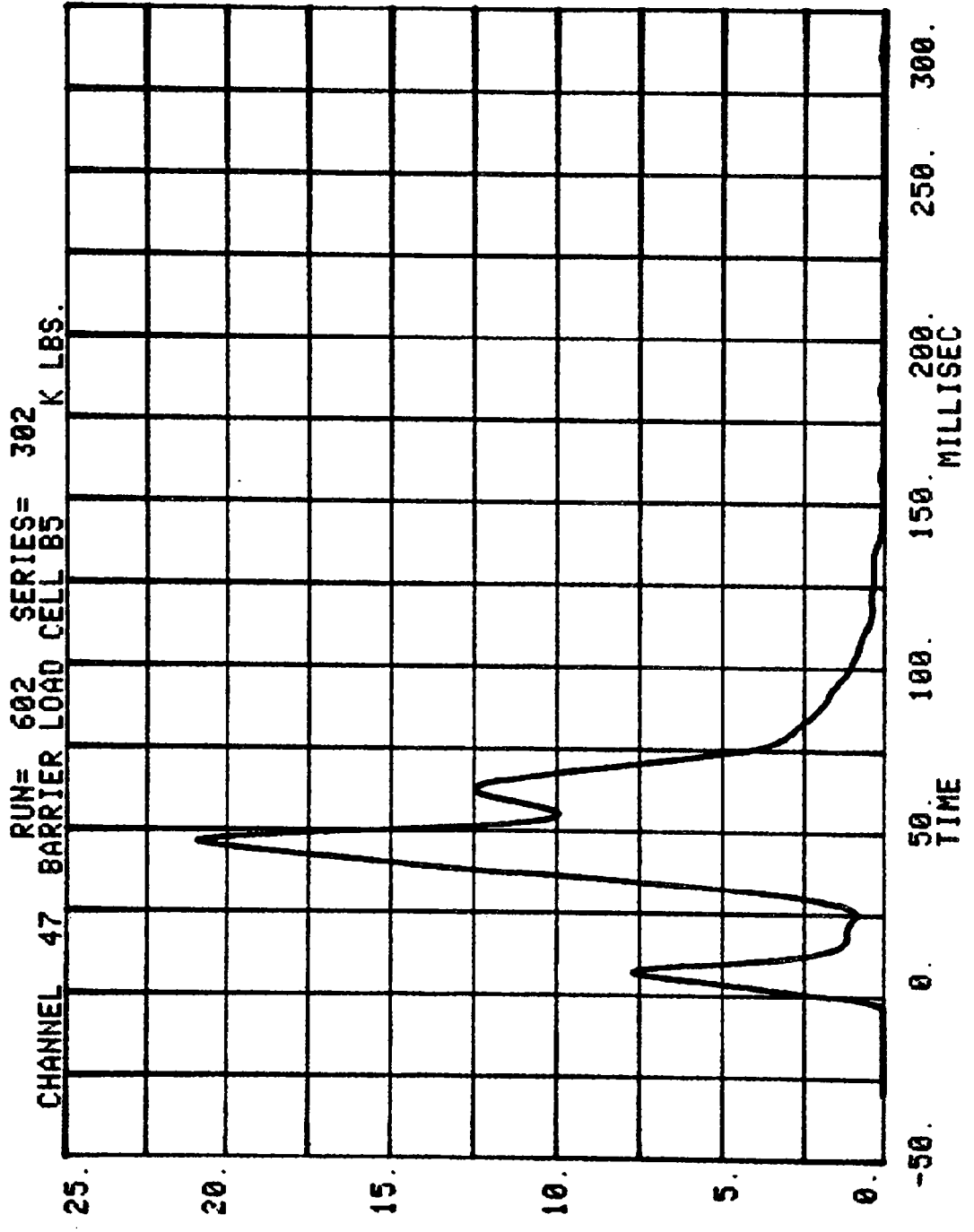
-50. 0. 50. 100. 150. 200. 250. 300.
TIME MILLISEC

CHANNEL 45 BARRIER LOAD CELL B3
RUN= 602 SERIES= 302 K LBS.

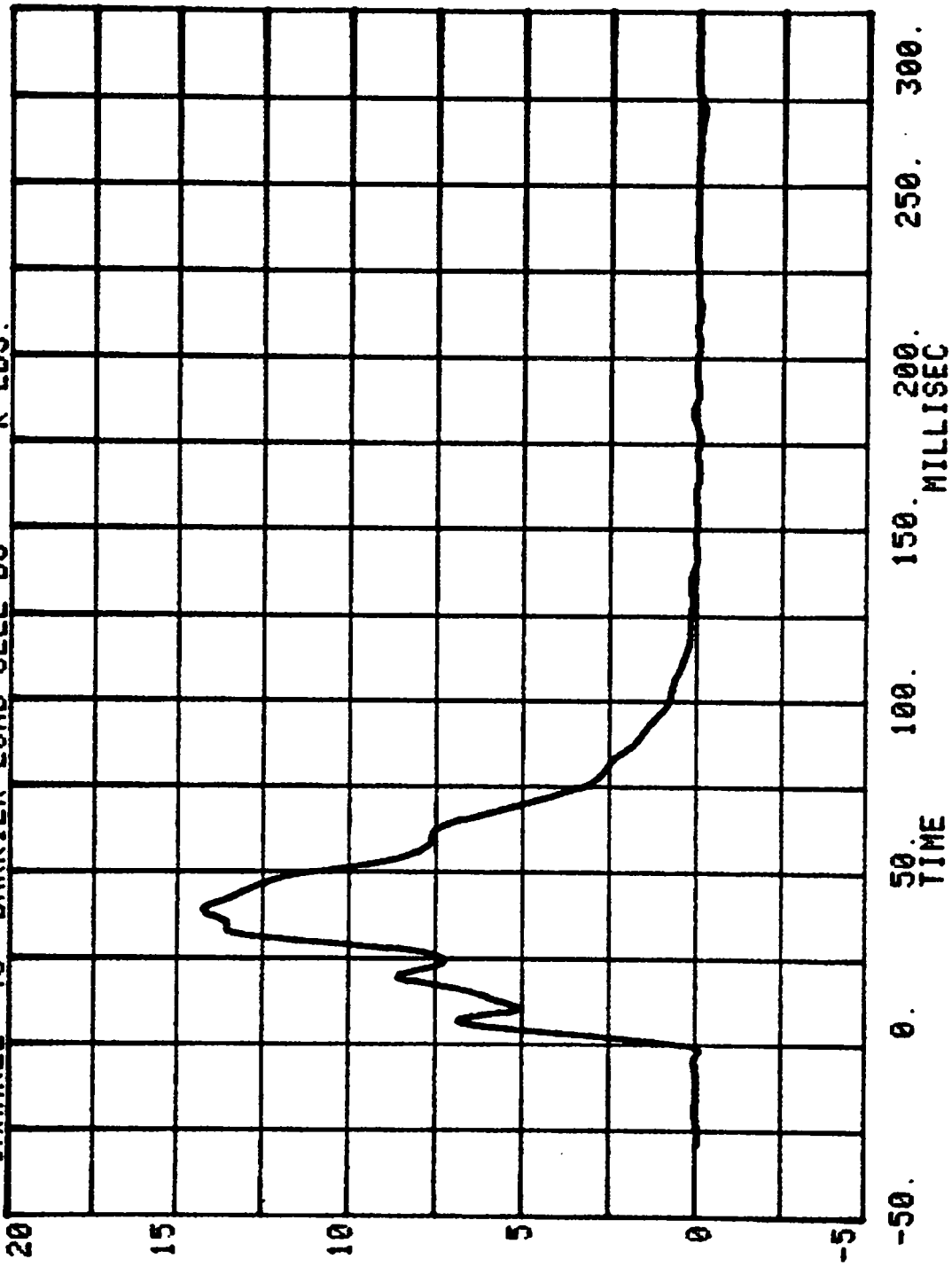


CHANNEL 46 BARRIER LOAD CELL 84 K LBS.
RUN= 602 SERIES= 302

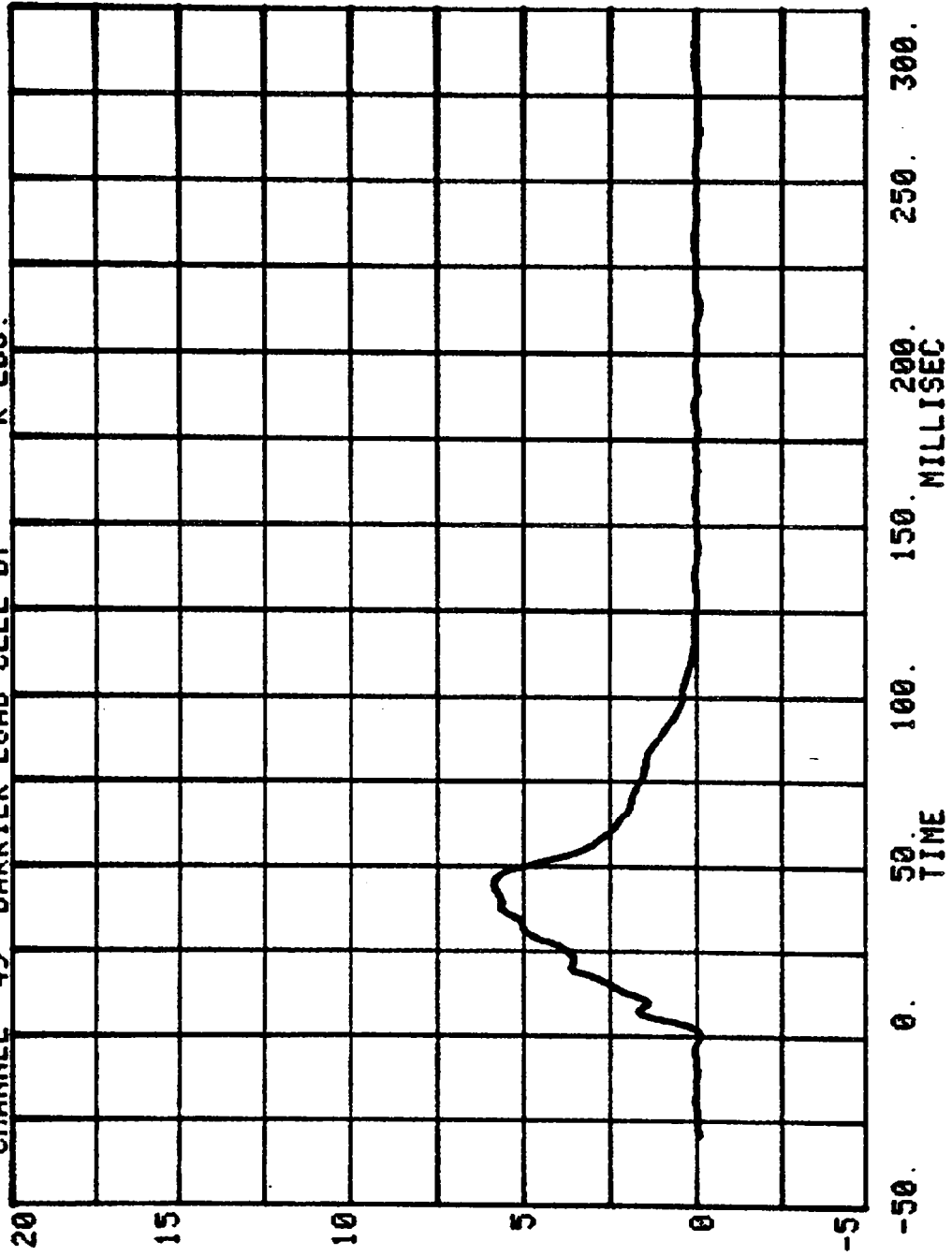




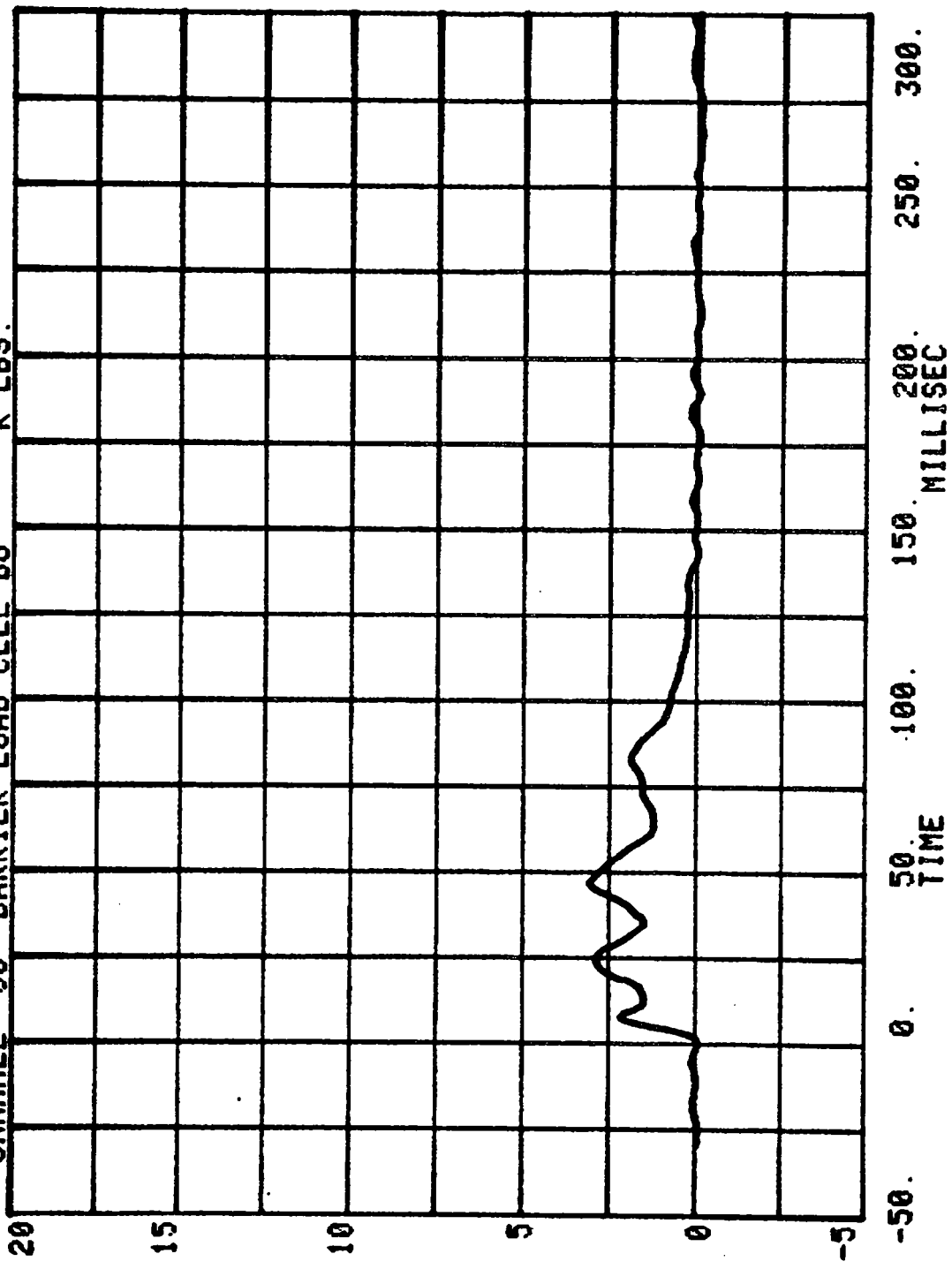
CHANNEL 48 BARRIER LOAD CELL B6
RUN= 602 SERIES= 302 K LBS.



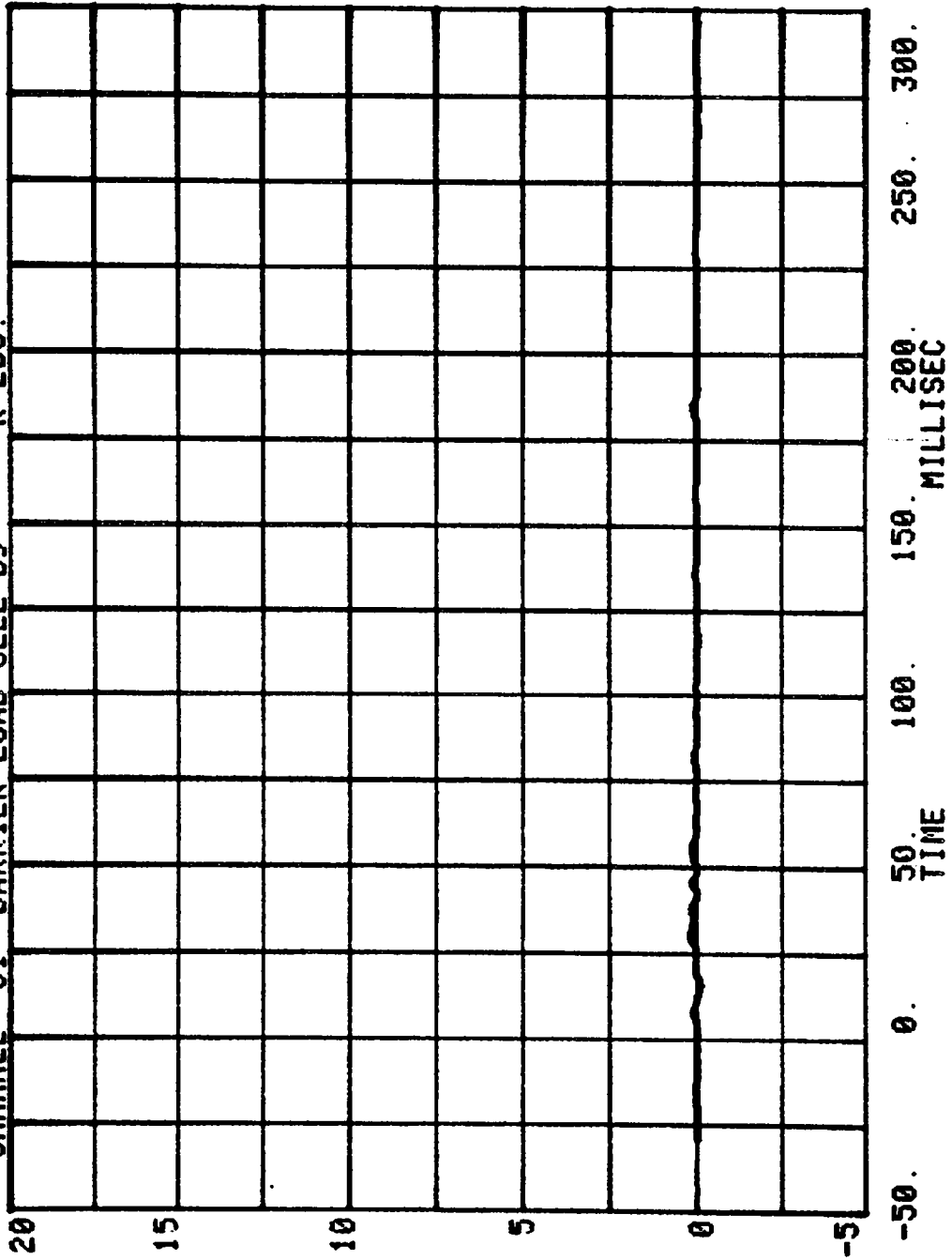
CHANNEL 49 BARRIER LOAD CELL B7
RUN= 602 SERIES= 302 K LBS.



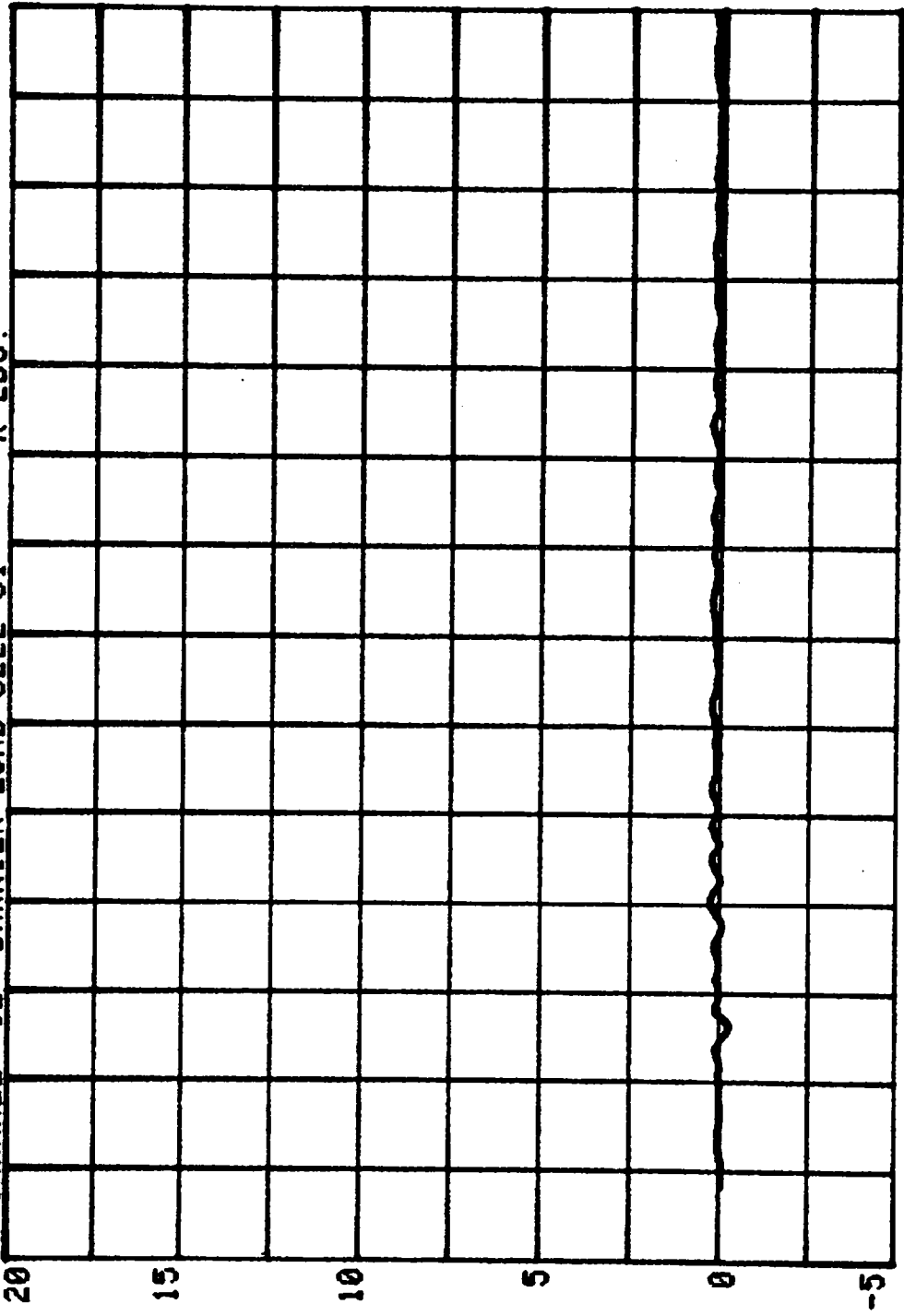
CHANNEL 50 BARRIER LOAD CELL 88 K LBS.
RUN= 602 SERIES= 302



CHANNEL 51 BARRIER LOAD CELL B9
RUN= 602 SERIES= 302
K LBS.

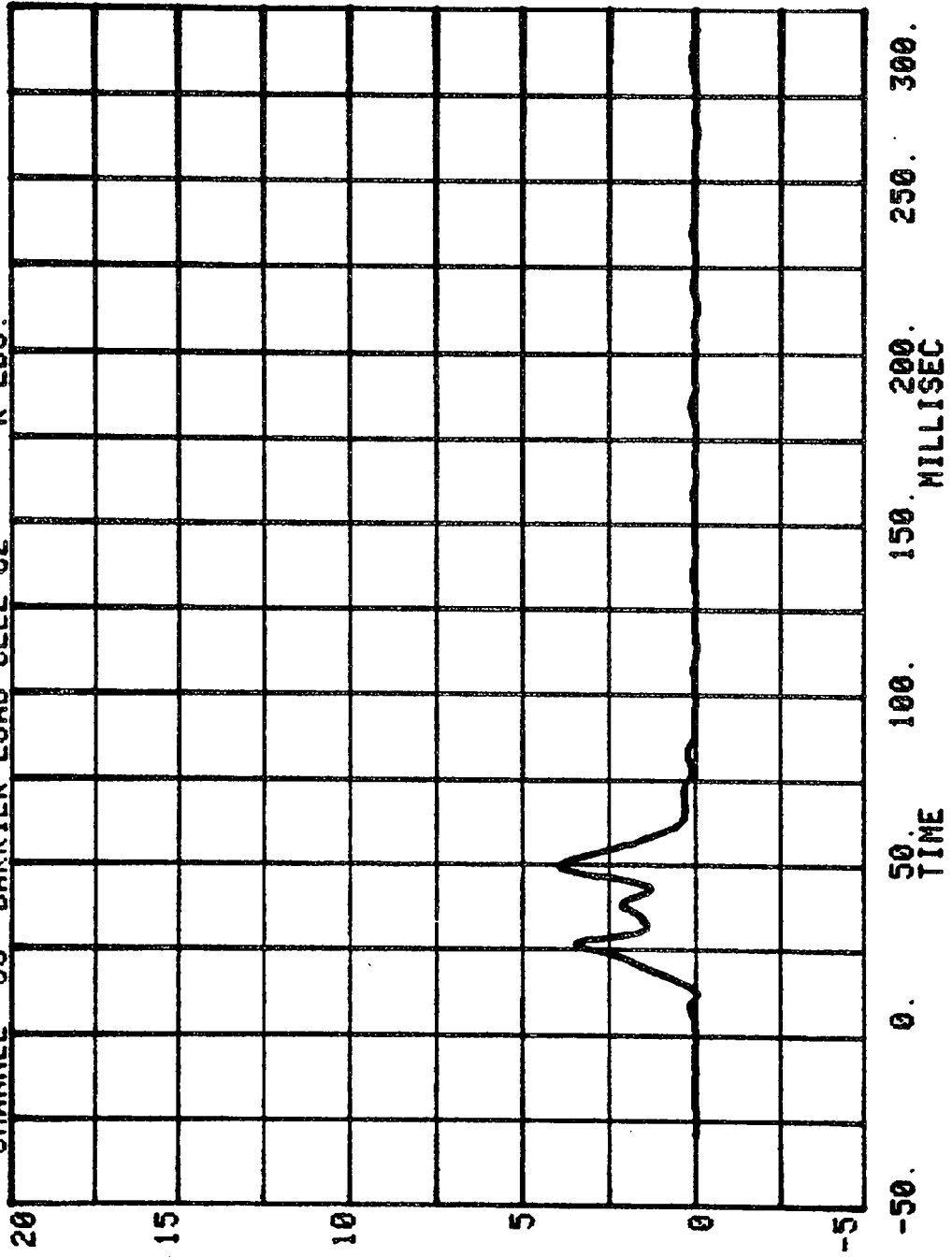


CHANNEL 52 BARRIER LOAD CELL C1
RUN= 602 SERIES= 302 K LBS.

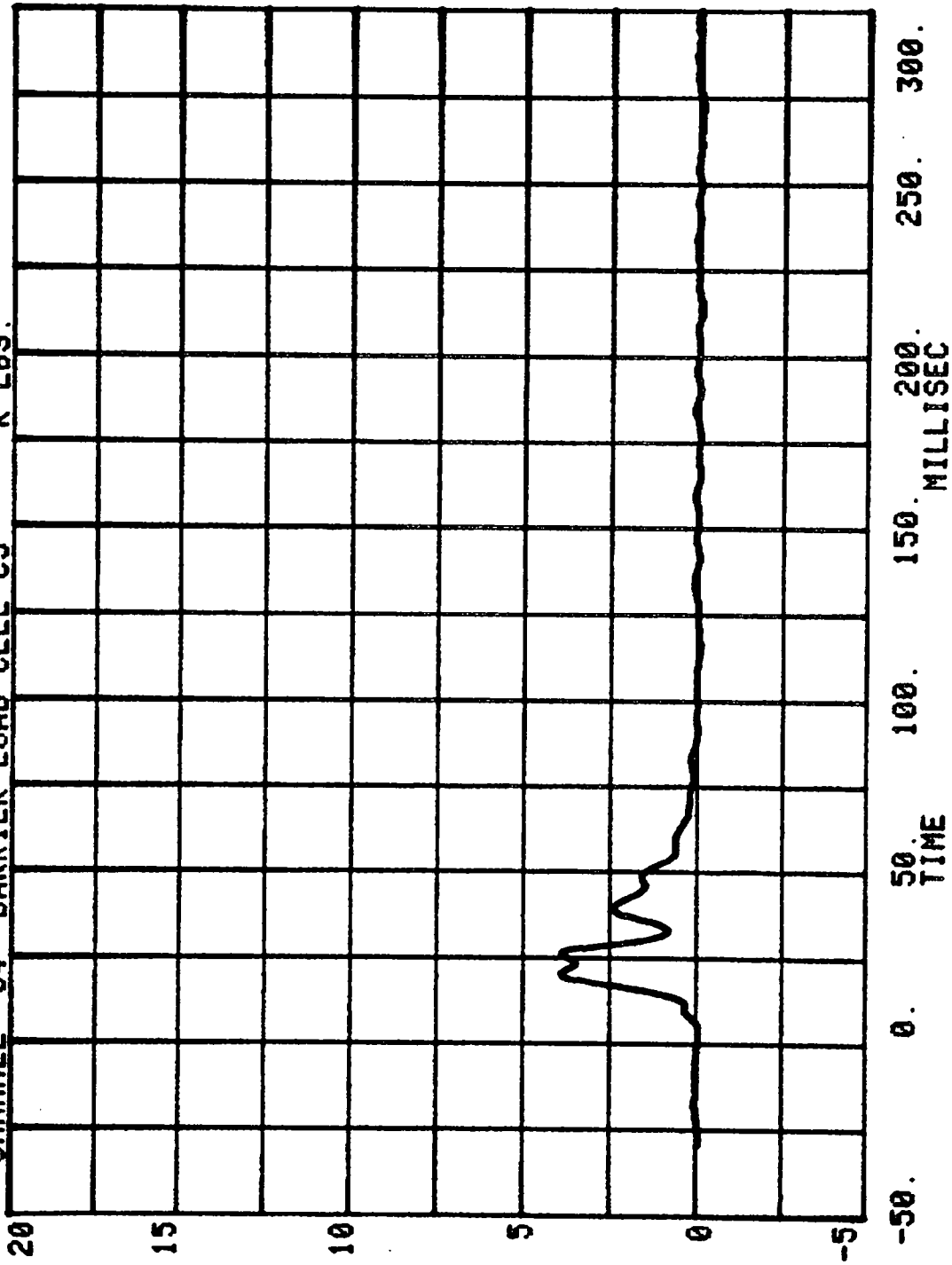


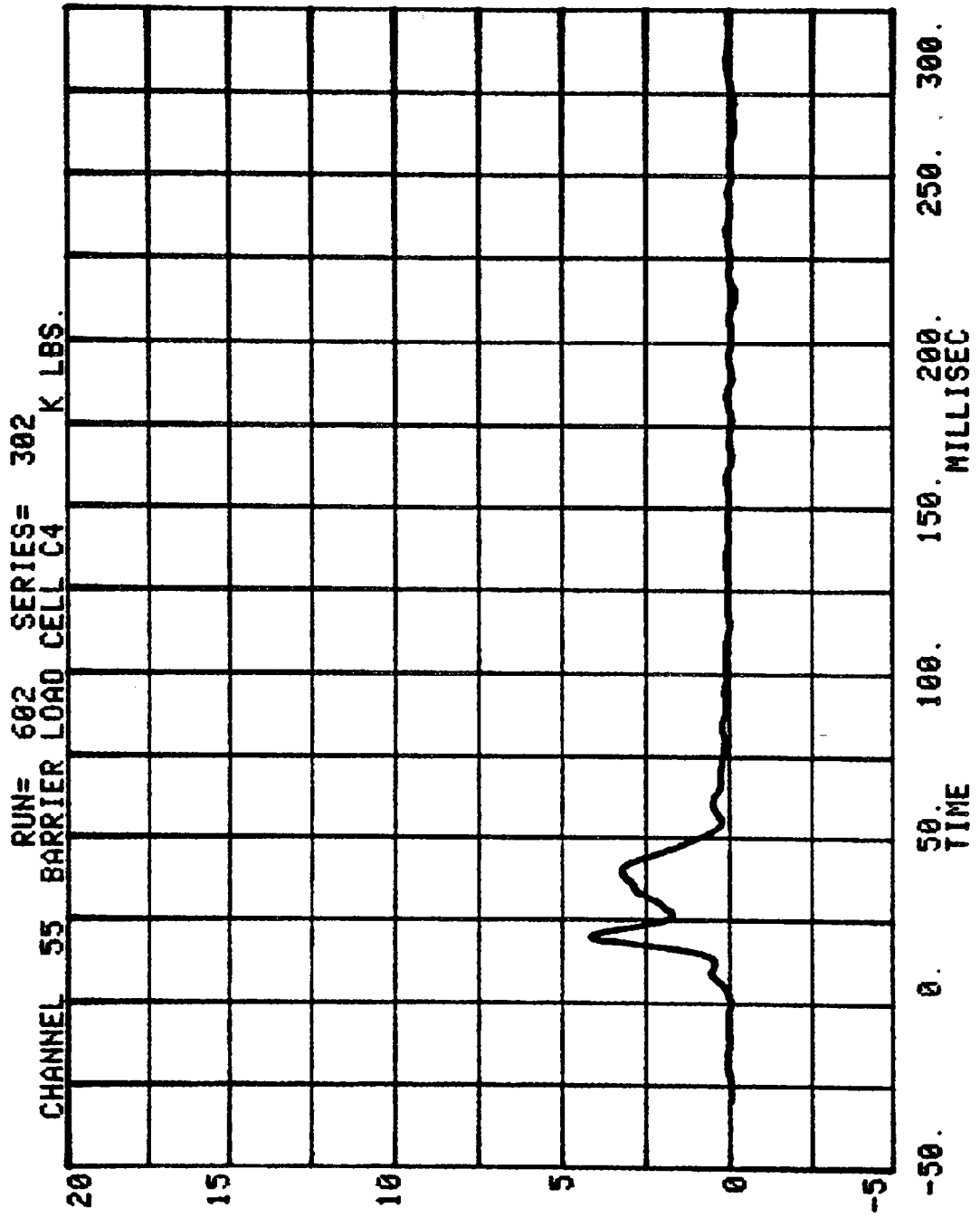
-50. 0. 50. 100. 150. 200. 250. 300.
MILLISEC
TIME

CHANNEL 53 BARRIER LOAD CELL C2
RUN= 602 SERIES= 302 K LBS.

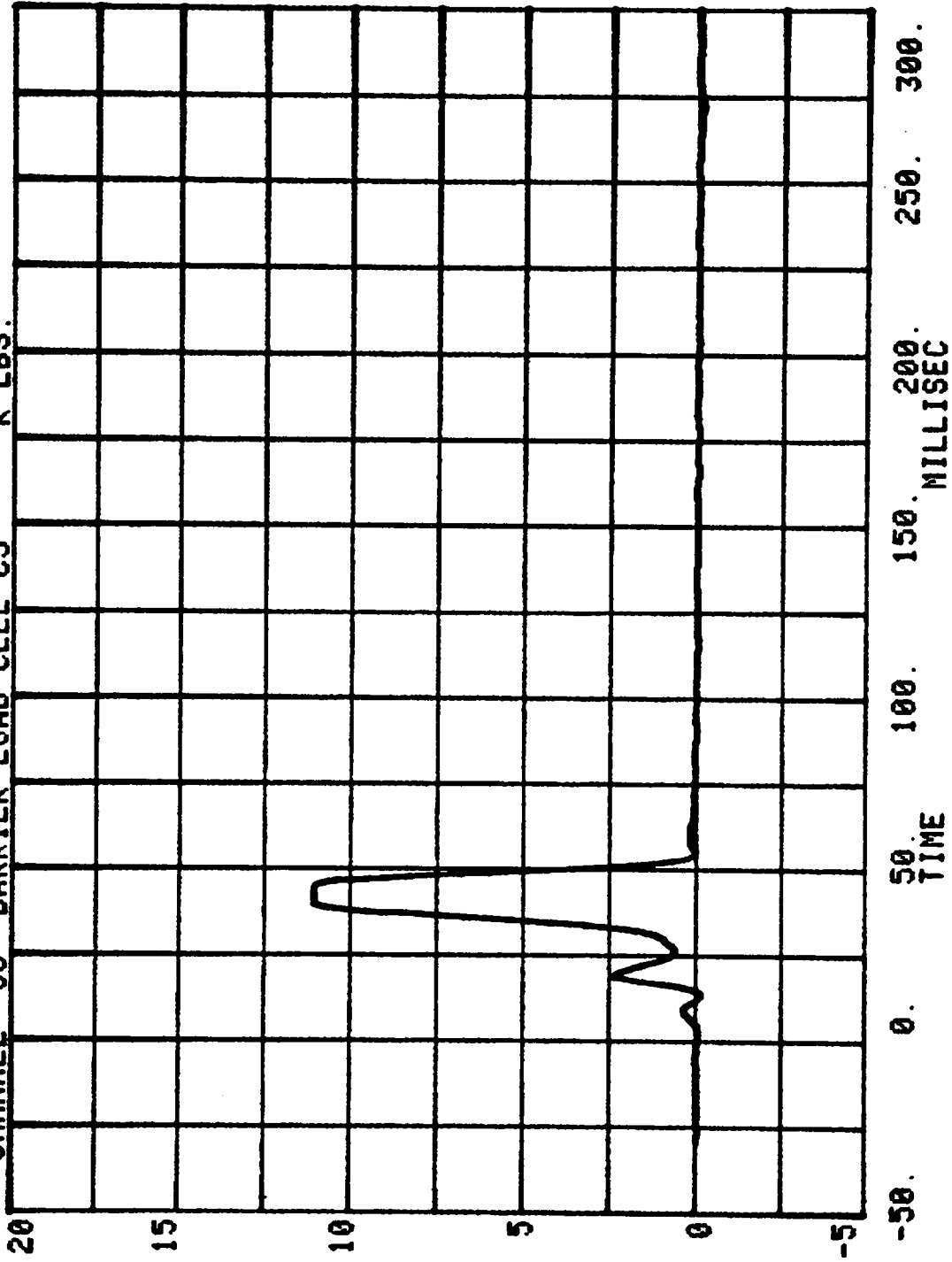


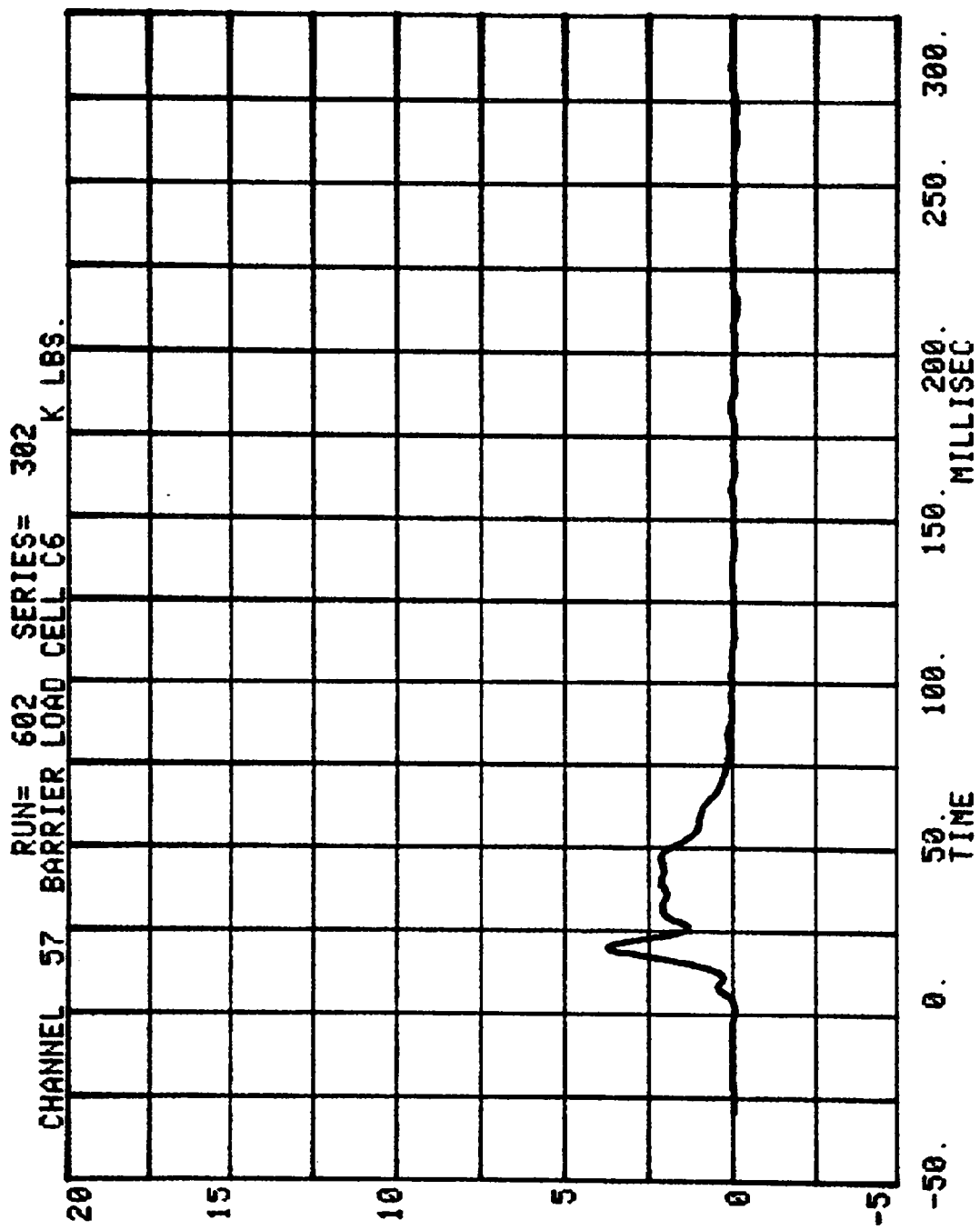
CHANNEL 54 BARRIER LOAD CELL C3
RUN= 602 SERIES= 302 K LBS.



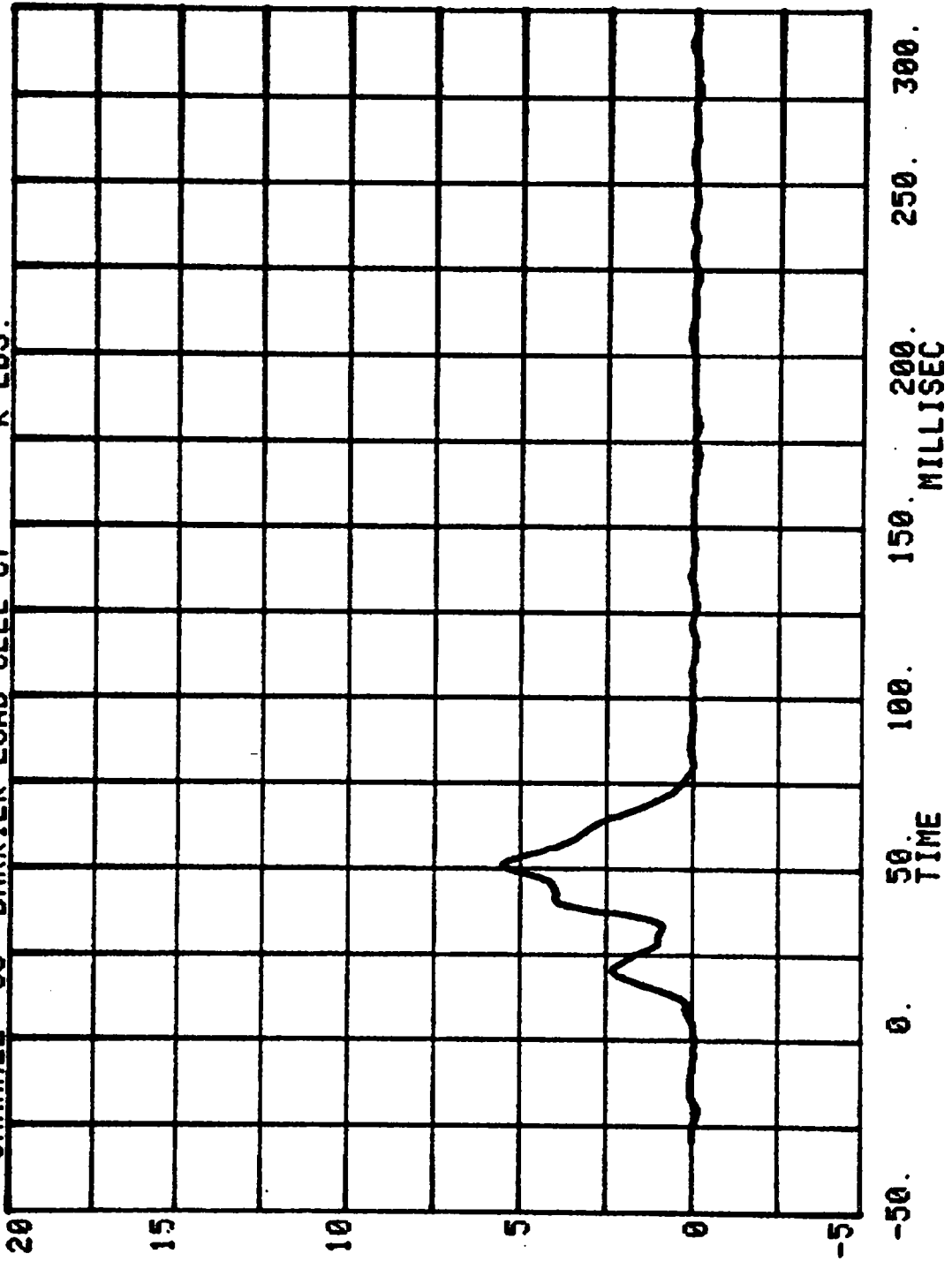


CHANNEL 56 BARRIER LOAD CELL C5
RUN= 602 SERIES= 302 K LBS.

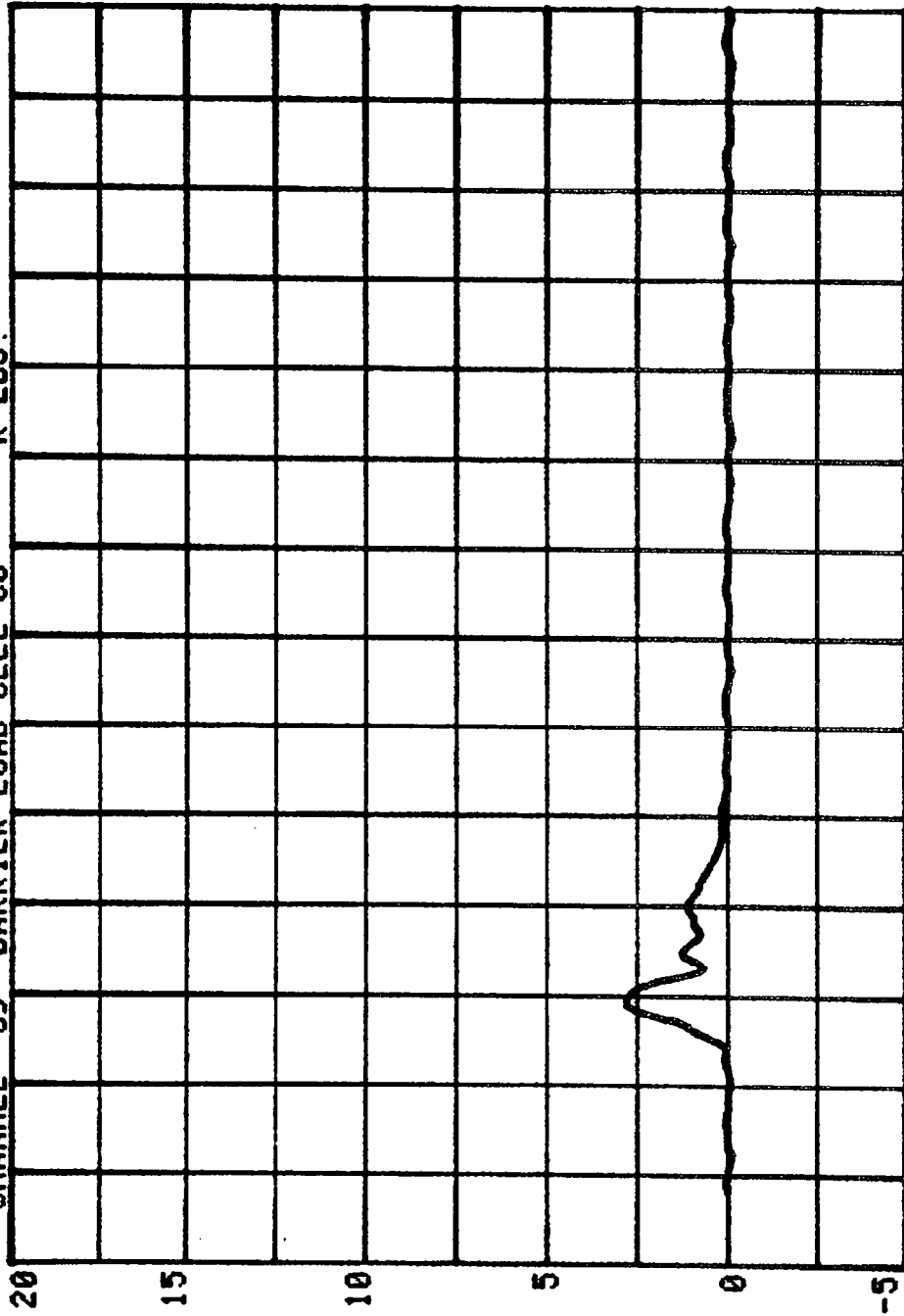




CHANNEL 58 BARRIER LOAD CELL C7
RUN= 602 SERIES= 302
K LBS.



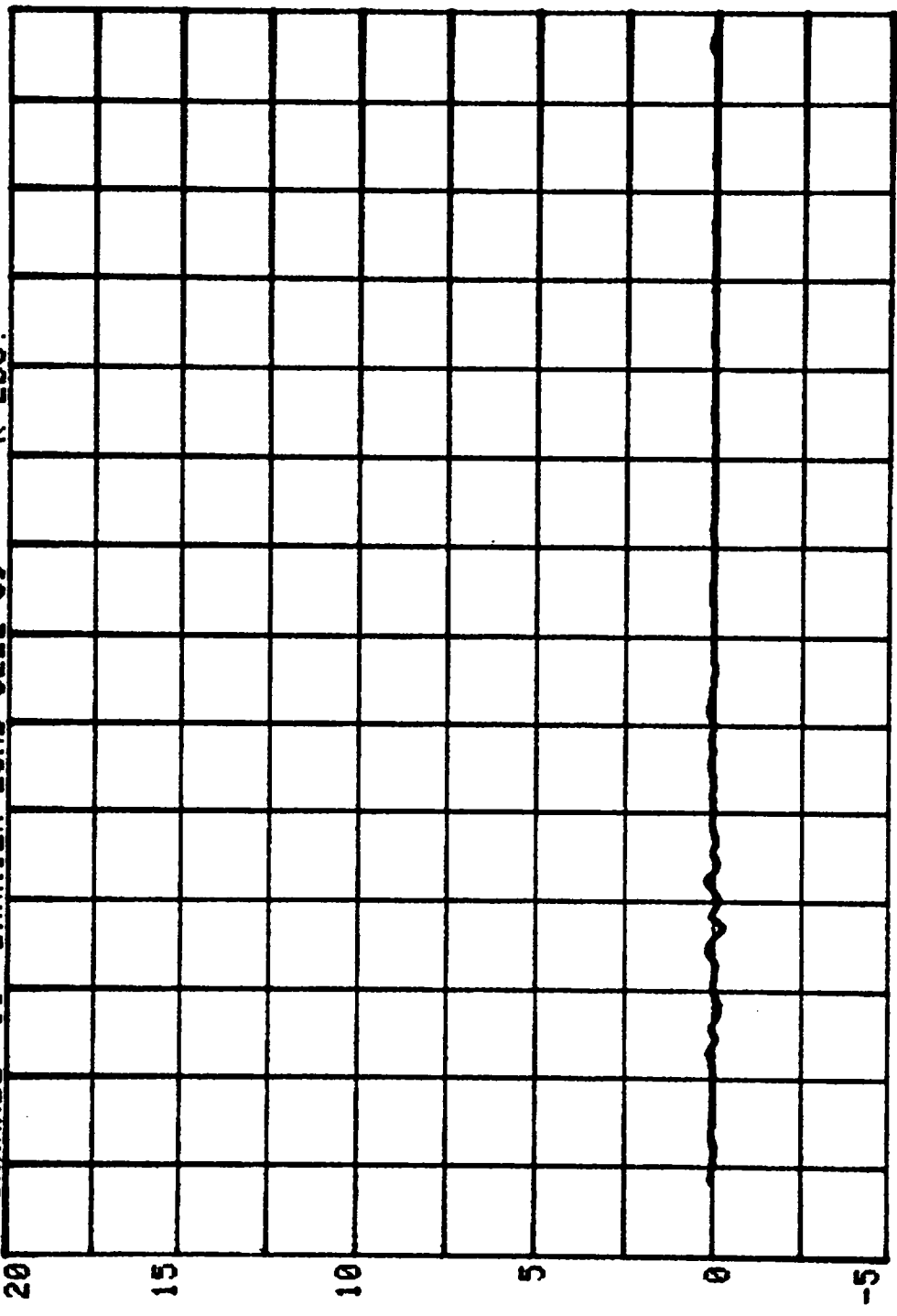
CHANNEL 59 BARRIER LOAD CELL C8 K LBS.
RUN= 602 SERIES= 302



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

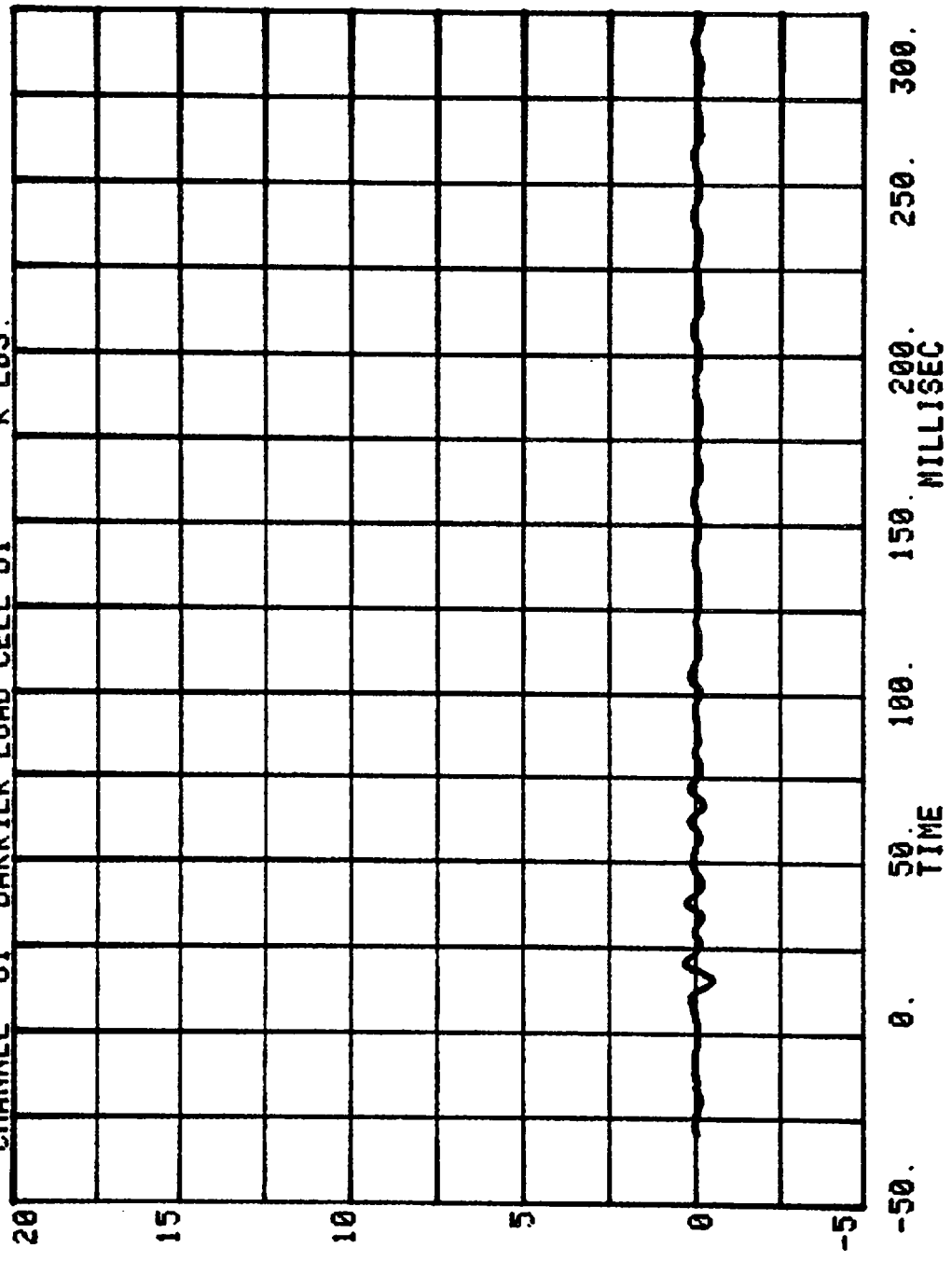
CHANNEL 60 BARRIER LOAD CELL C9 K LBS.

RUN= 602 SERIES= 302

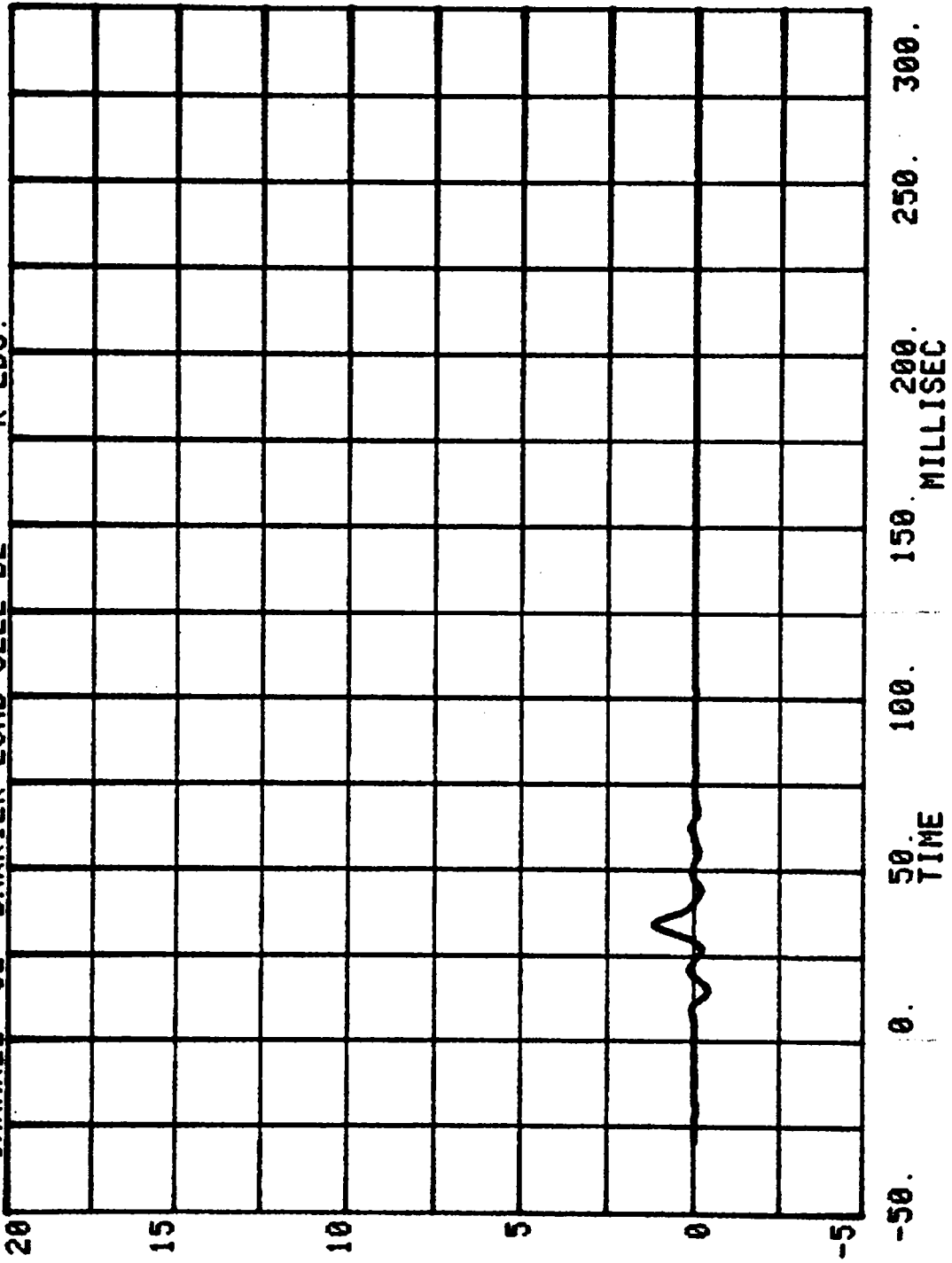


-50. 0. 50. 100. 150. 200. 250. 300.
TIME MILLISEC

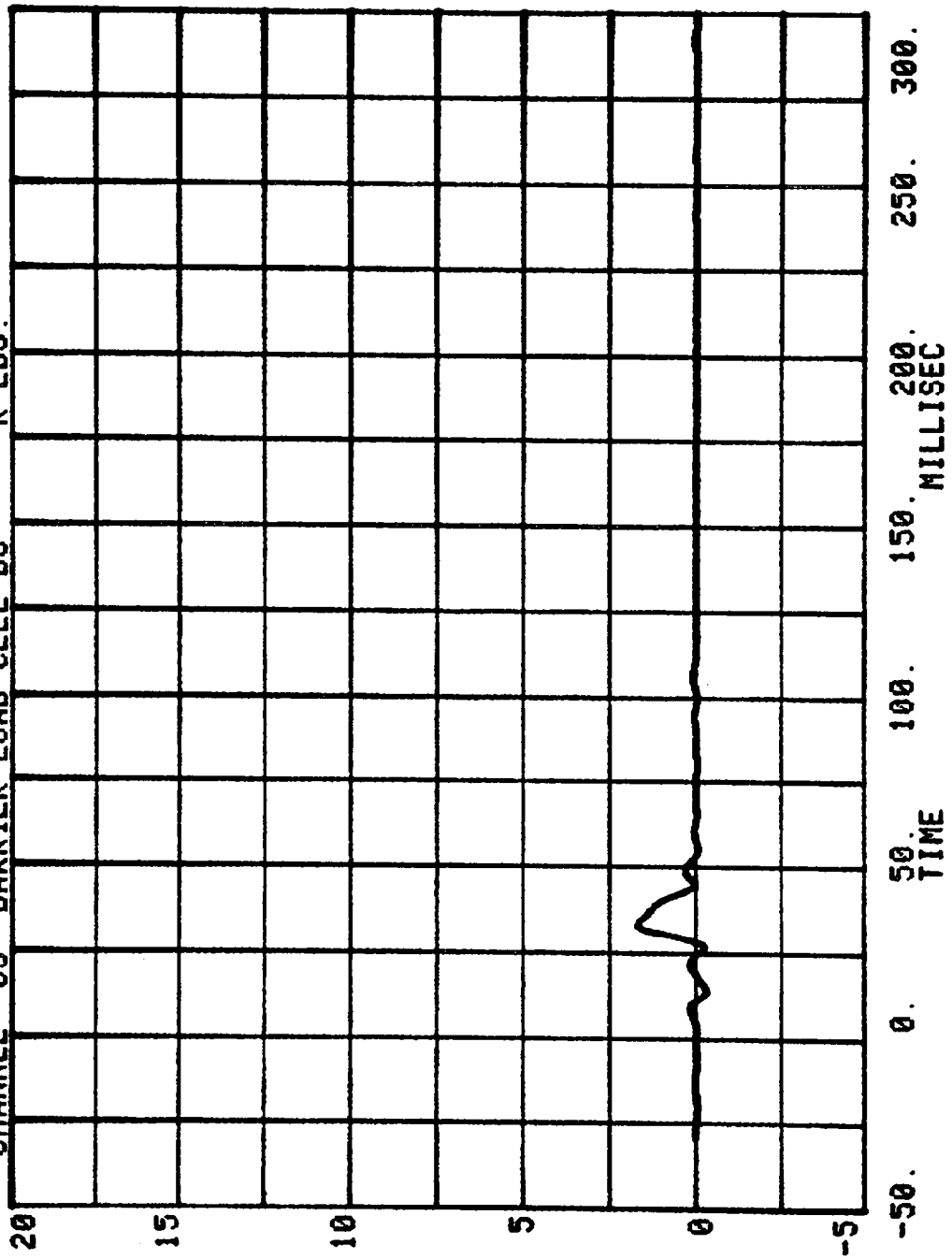
CHANNEL 61 BARRIER LOAD CELL 01 SERIES= 302 K LBS.



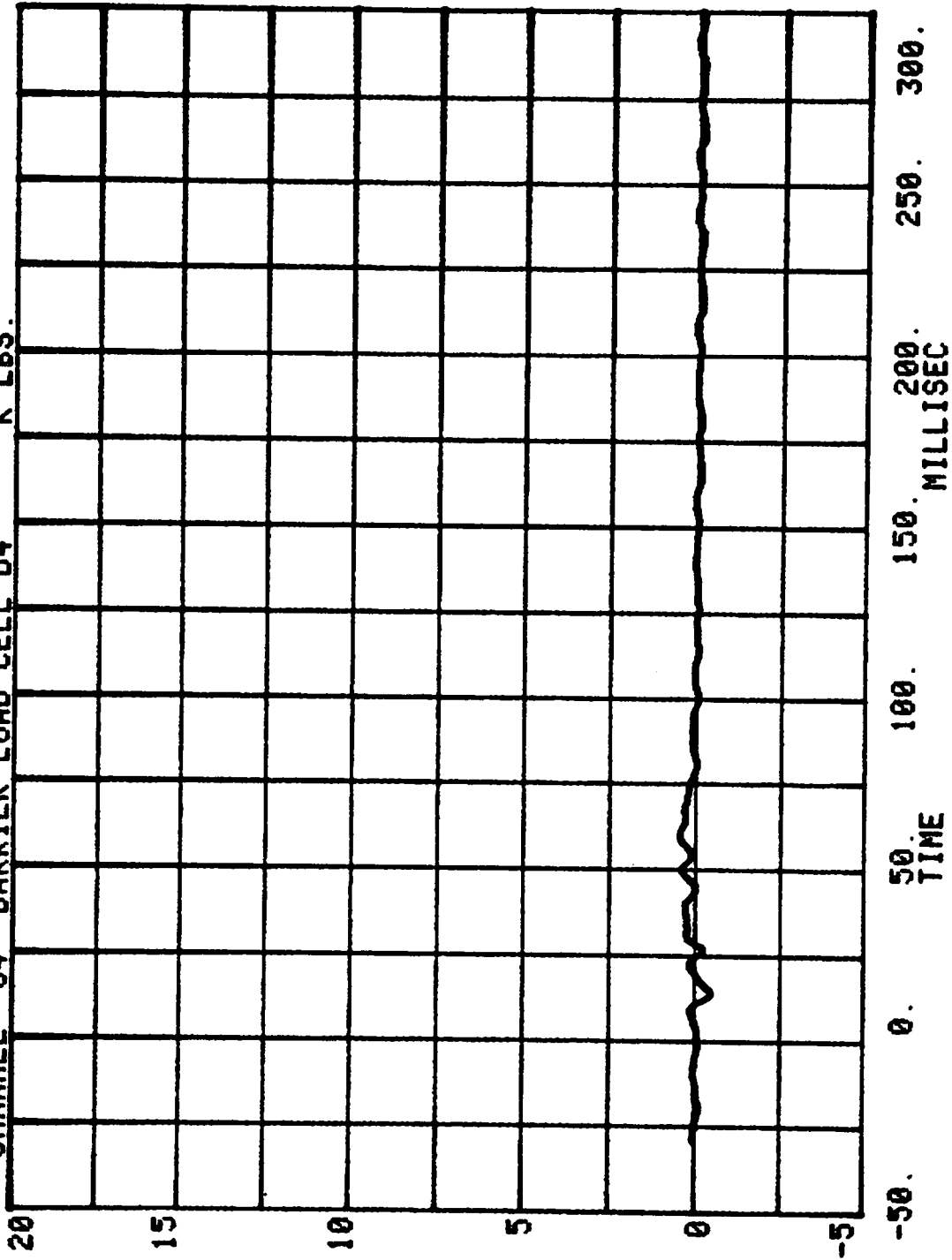
CHANNEL 62 BARRIER LOAD CELL 02
RUN= 602 SERIES= 302 K LBS.

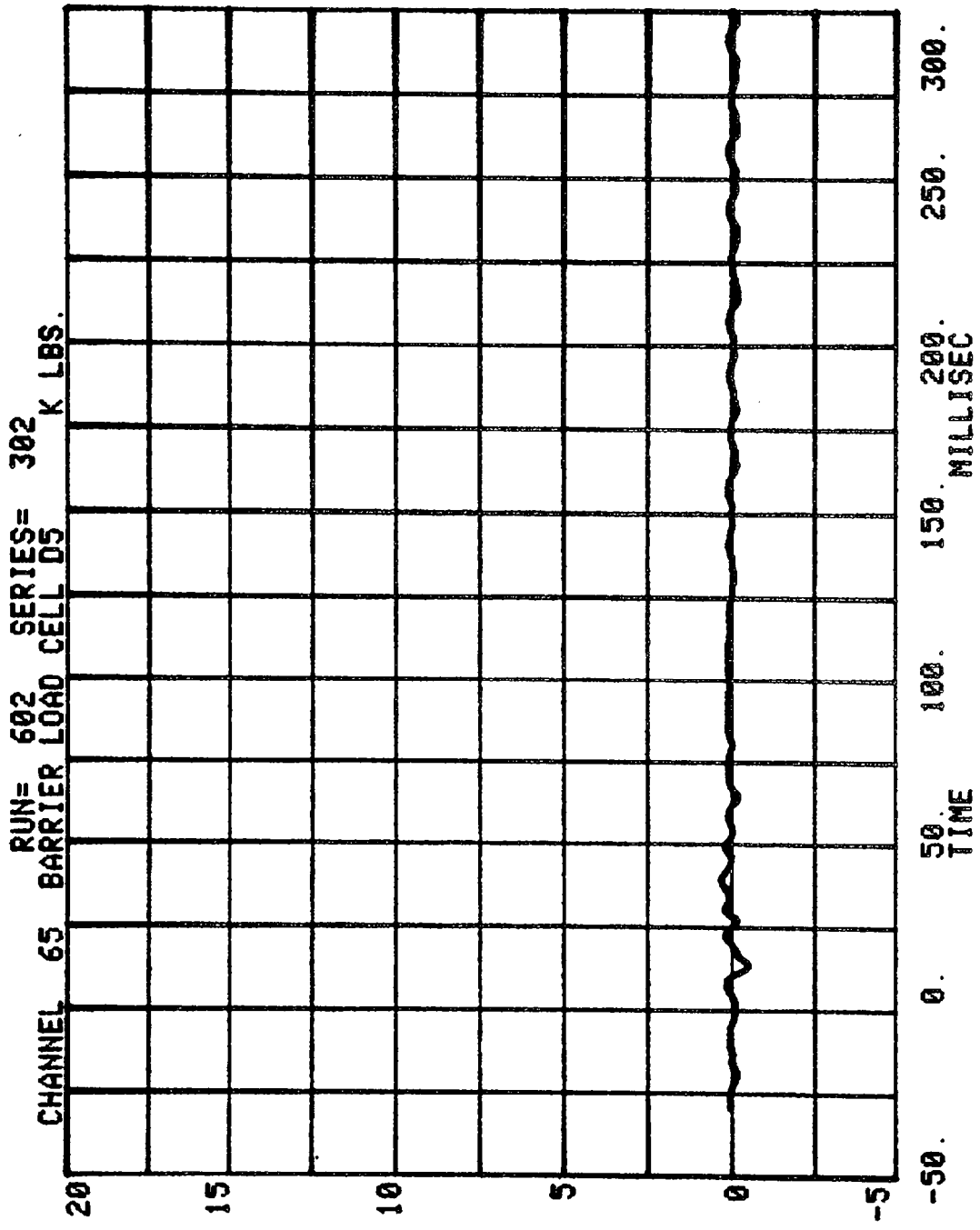


CHANNEL 63 BARRIER LOAD CELL 03
RUN= 602 SERIES= 302 K LBS.

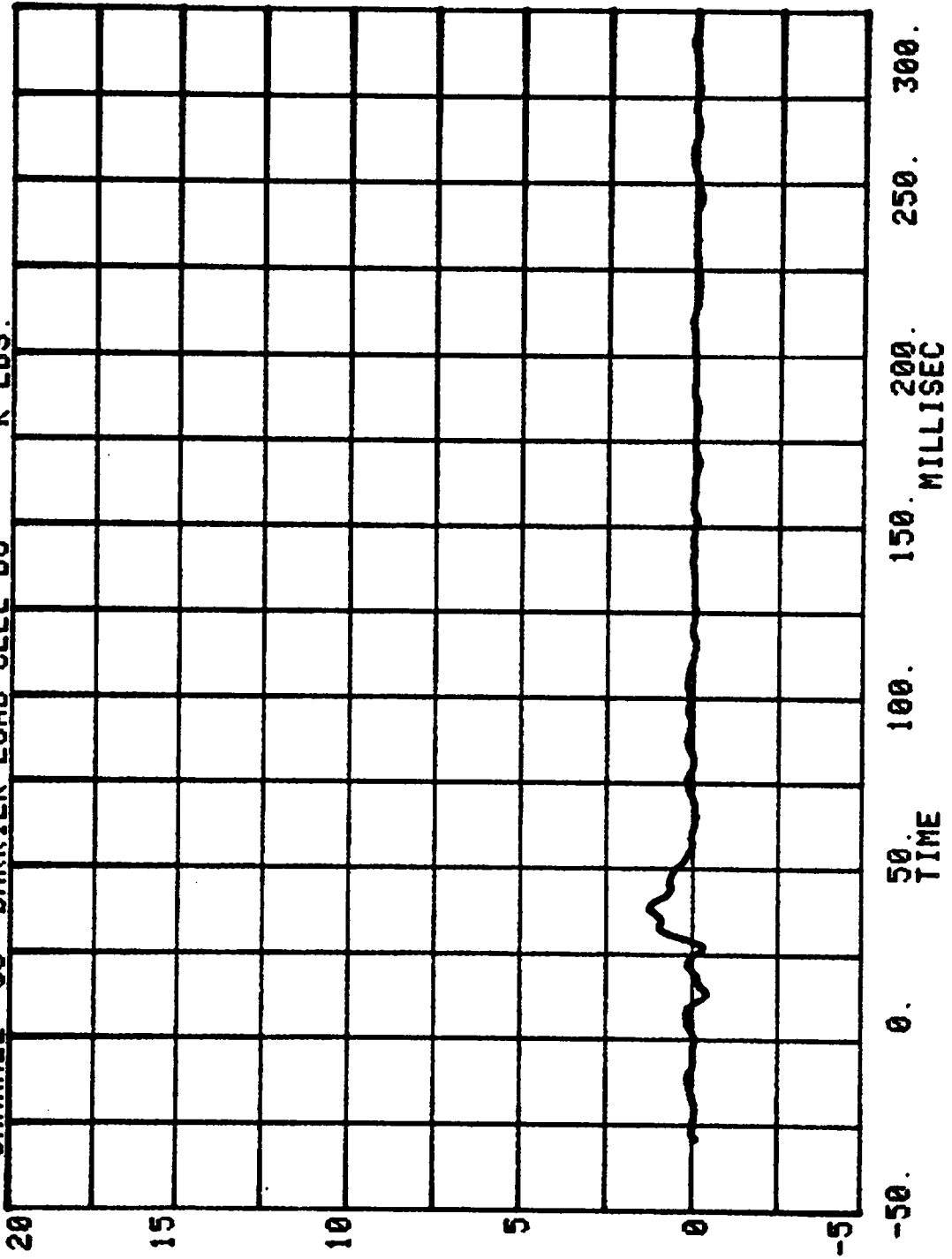


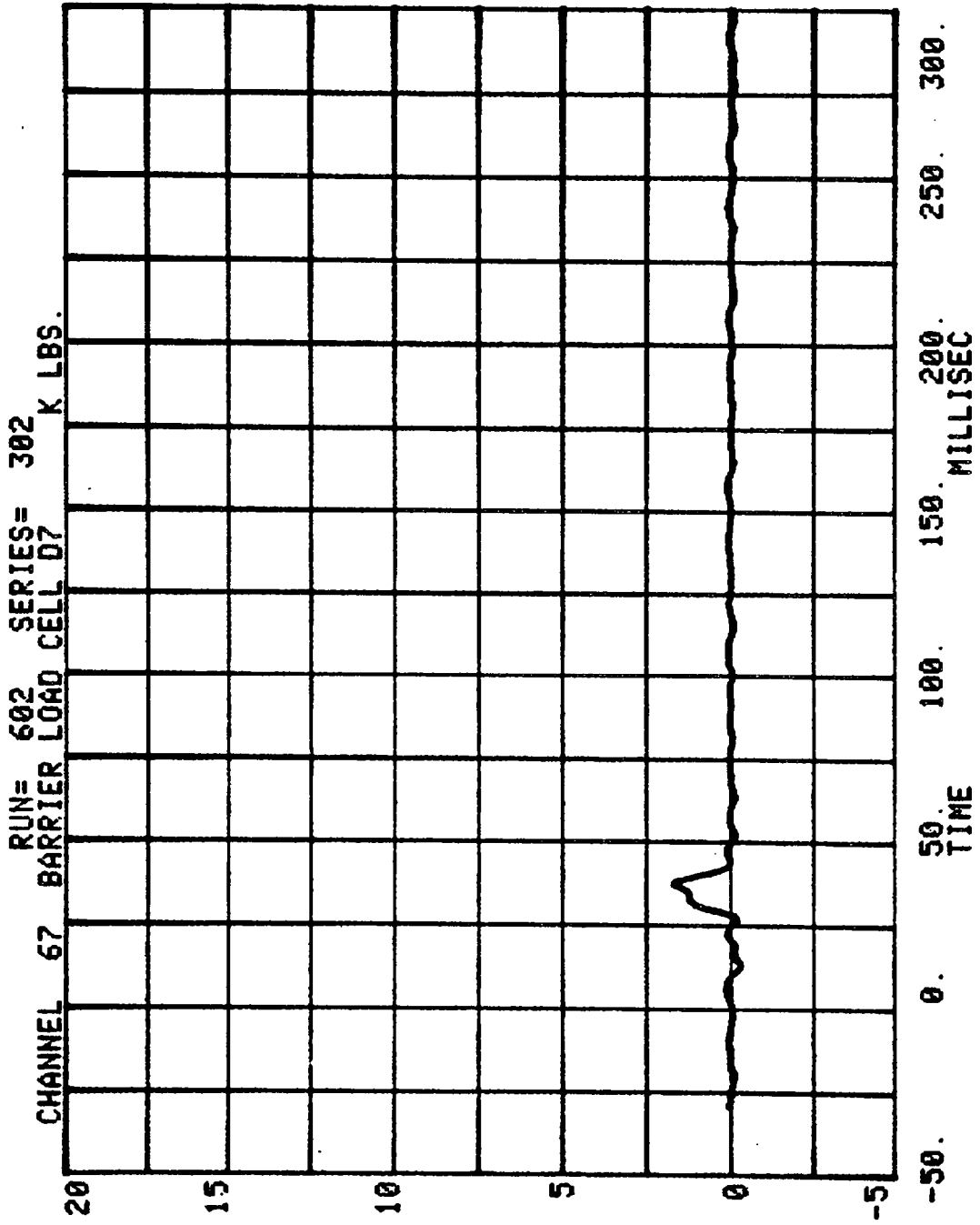
CHANNEL 64 BARRIER LOAD CELL D4
RUN= 602 SERIES= 302 K LBS.



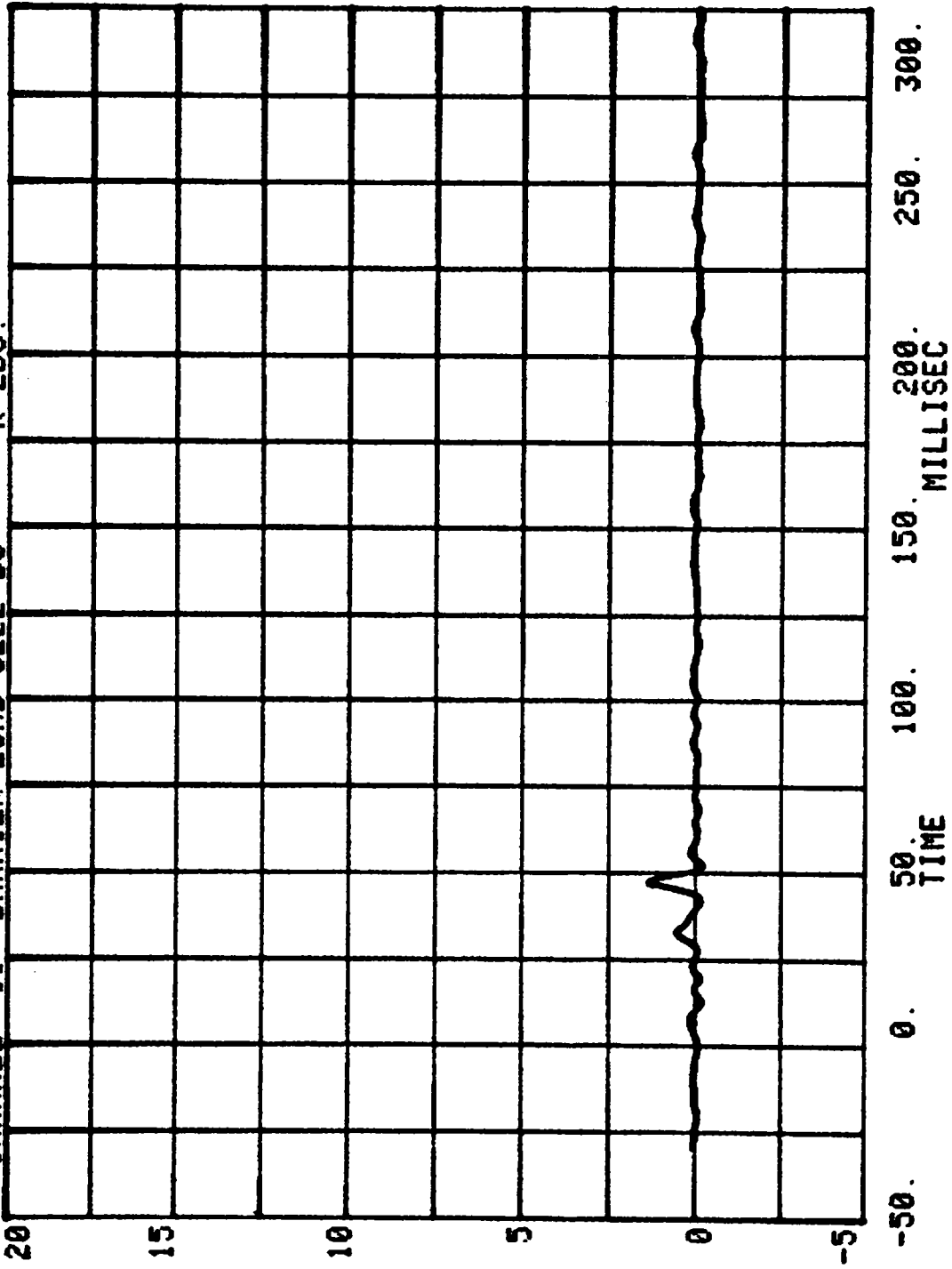


CHANNEL 66 BARRIER LOAD CELL D6
RUN= 602 SERIES= 302
K LBS.

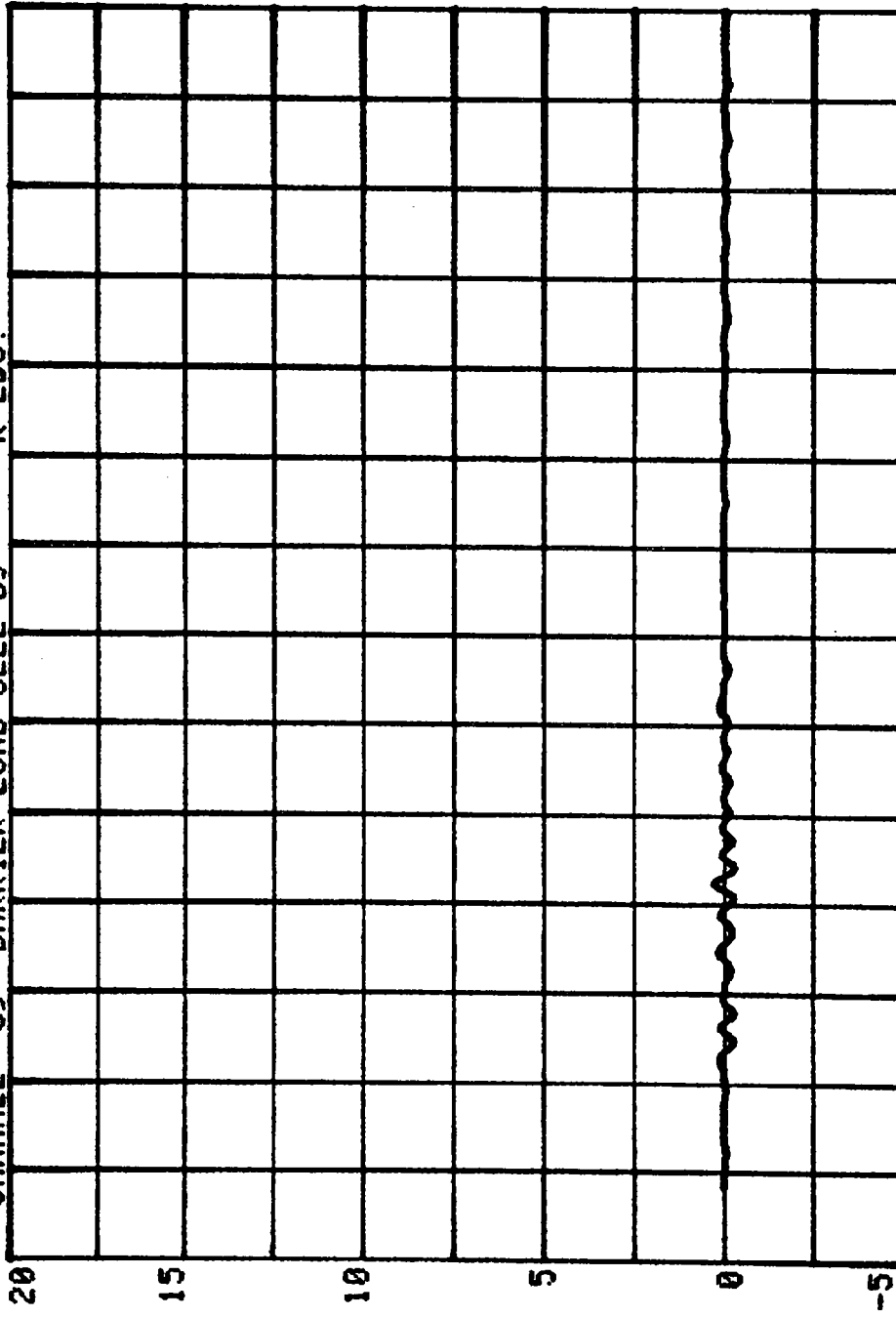




CHANNEL 68 BARRIER LOAD CELL D8
RUN= 602 SERIES= 302 K LBS.



RUN= 602 SERIES= 302
CHANNEL 69 BARRIER LOAD CELL D9 K LBS.

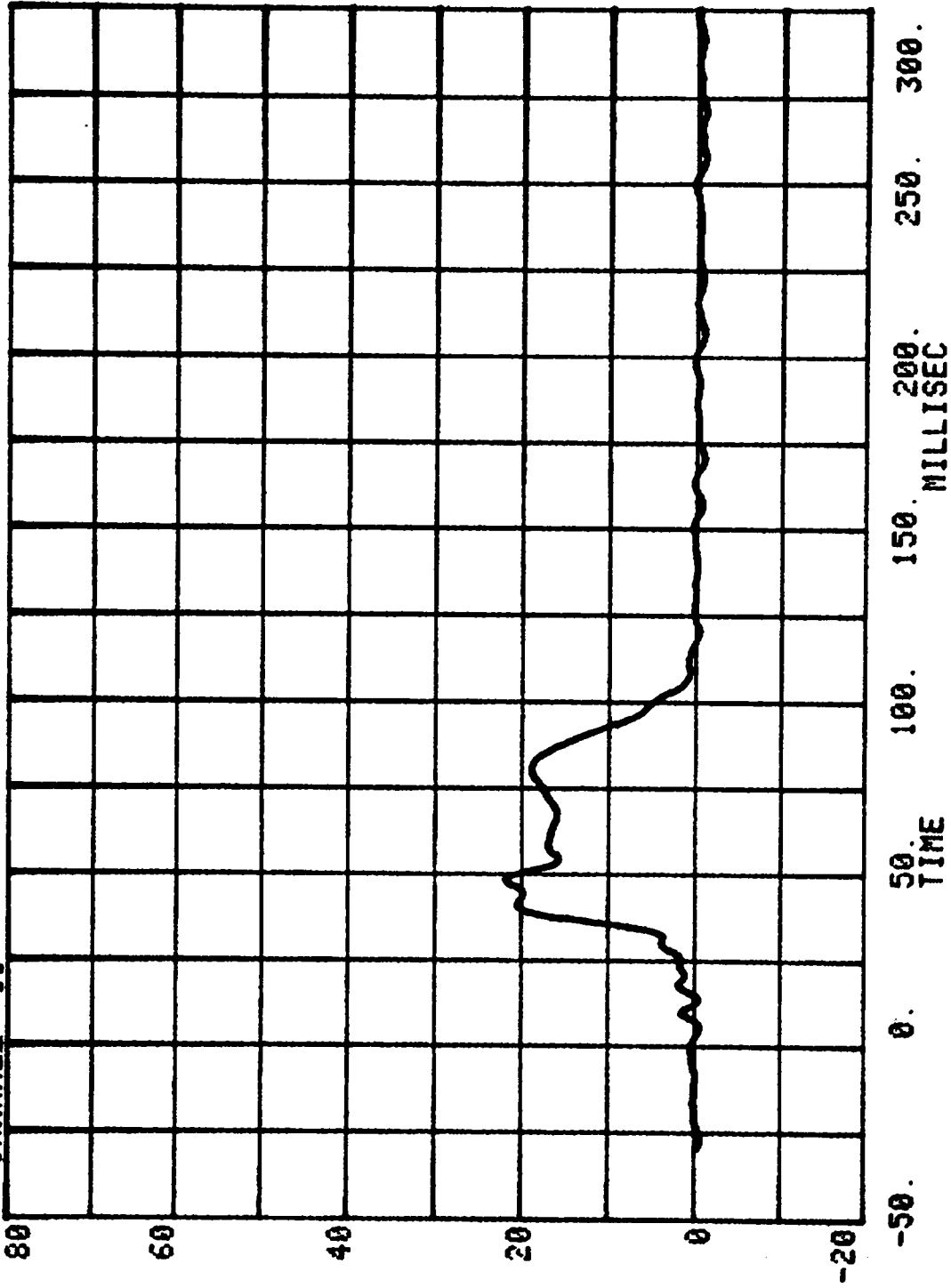


-50. 0. 50. 100. 150. 200. 250. 300.
TIME MILLISEC

TOTAL ROW A

RUN= 602 SERIES= 302

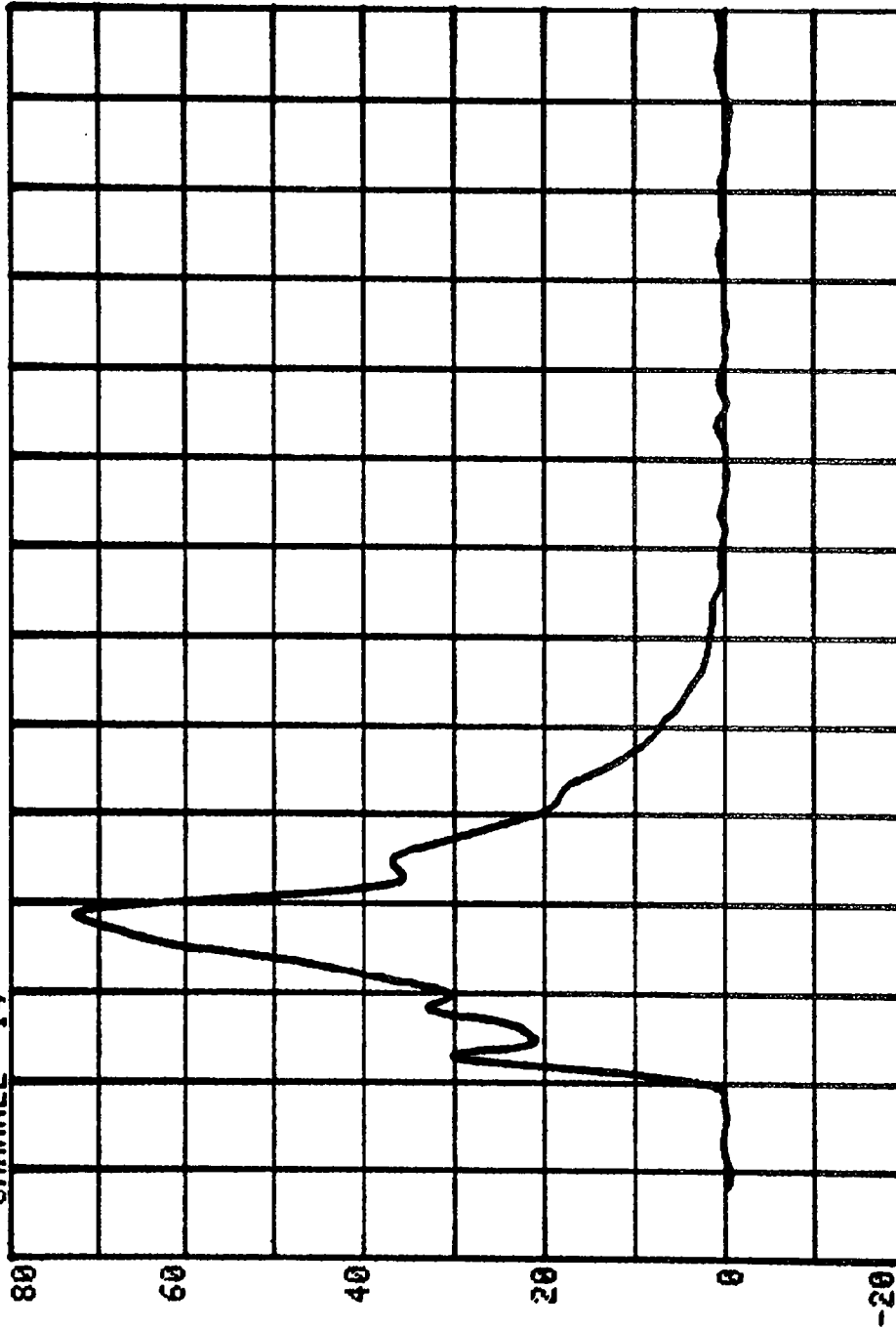
CHANNEL 13



TOTAL ROW B

RUN= 602 SERIES= 302

CHANNEL 14

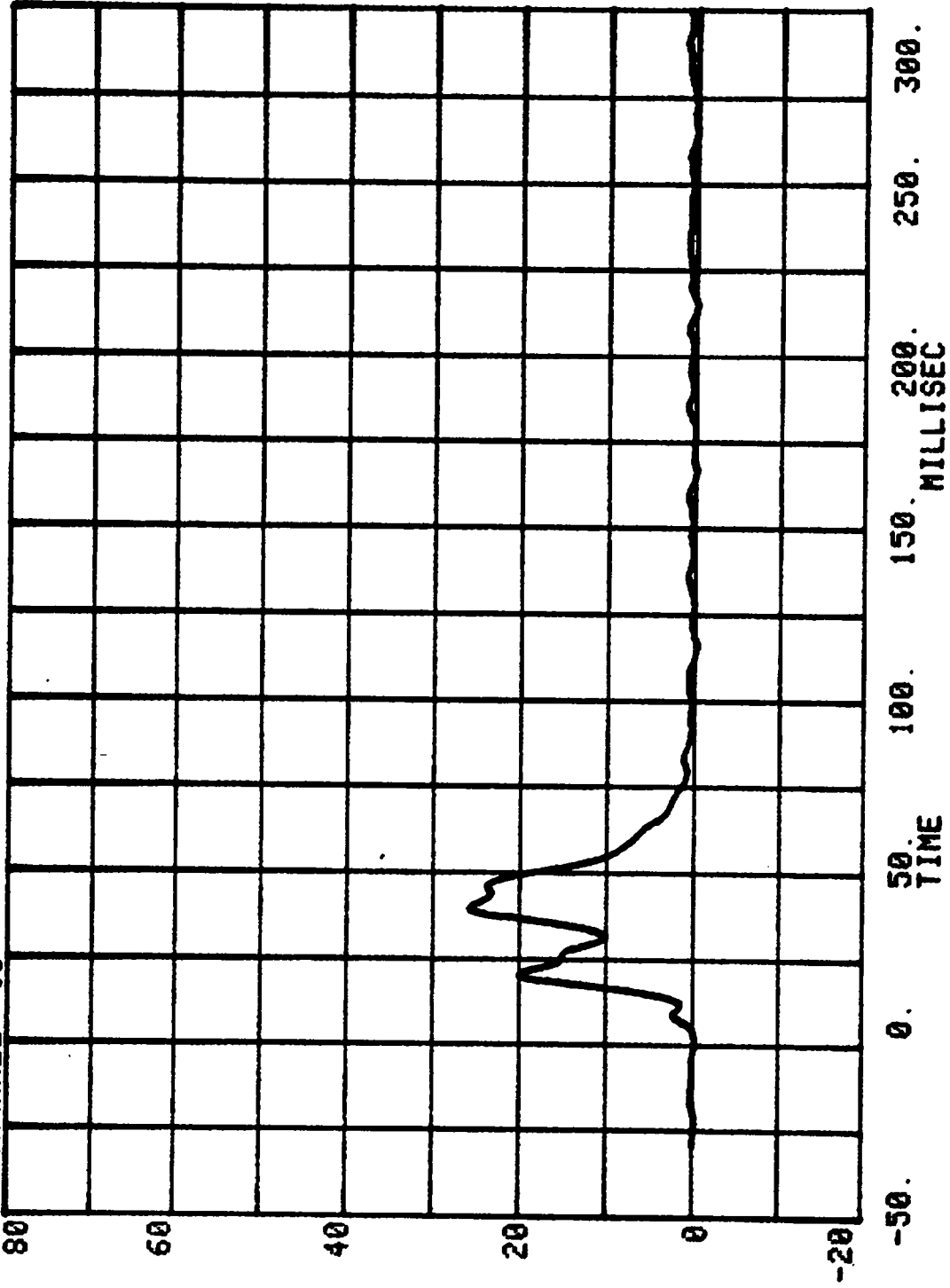


-50. 0. 50. 100. 150. 200. 250. 300.
TIME MILLISEC

TOTAL ROW C

RUN= 602 SERIES= 302

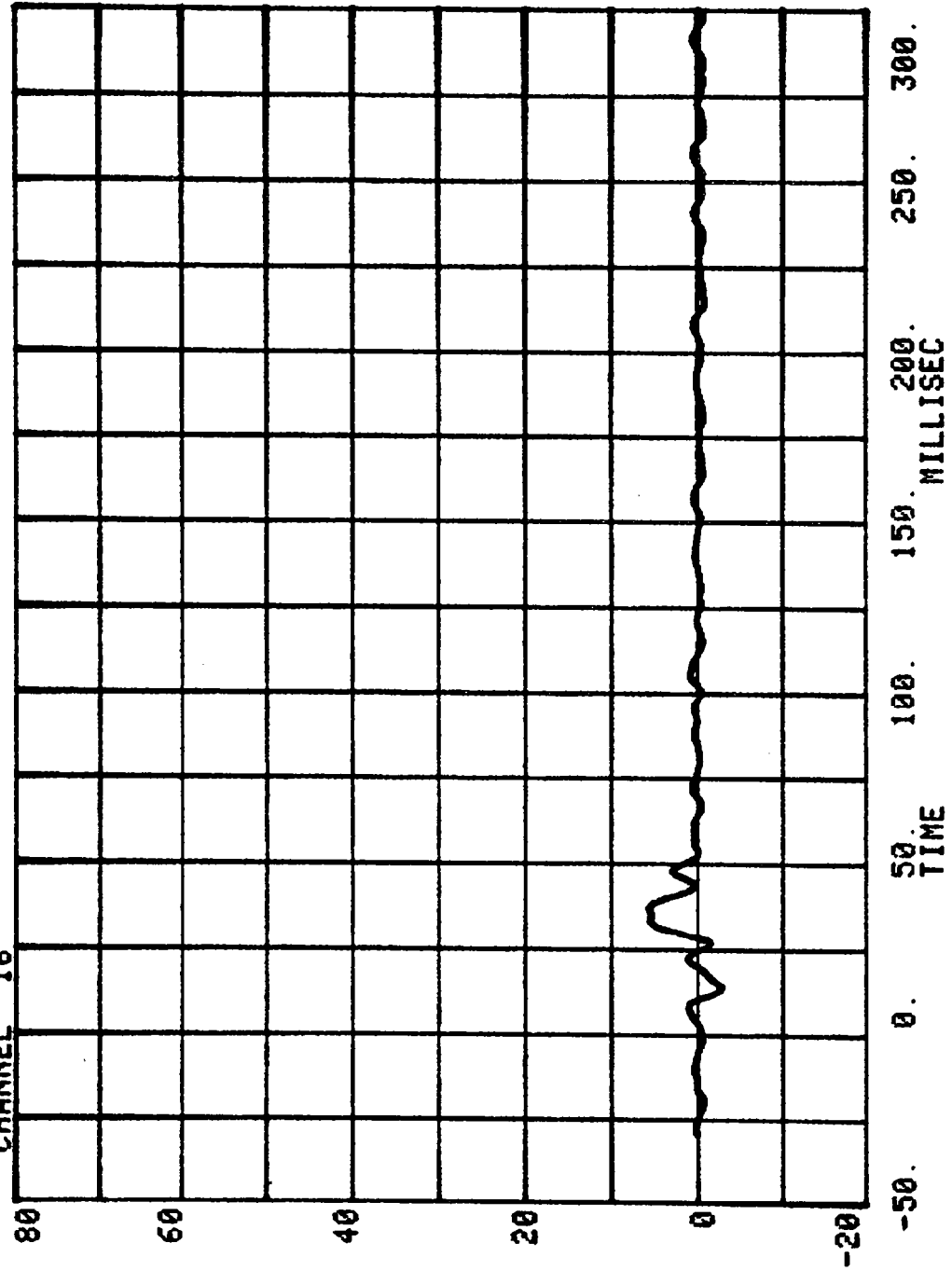
CHANNEL 15



TOTAL ROW D

RUN= 602 SERIES= 302

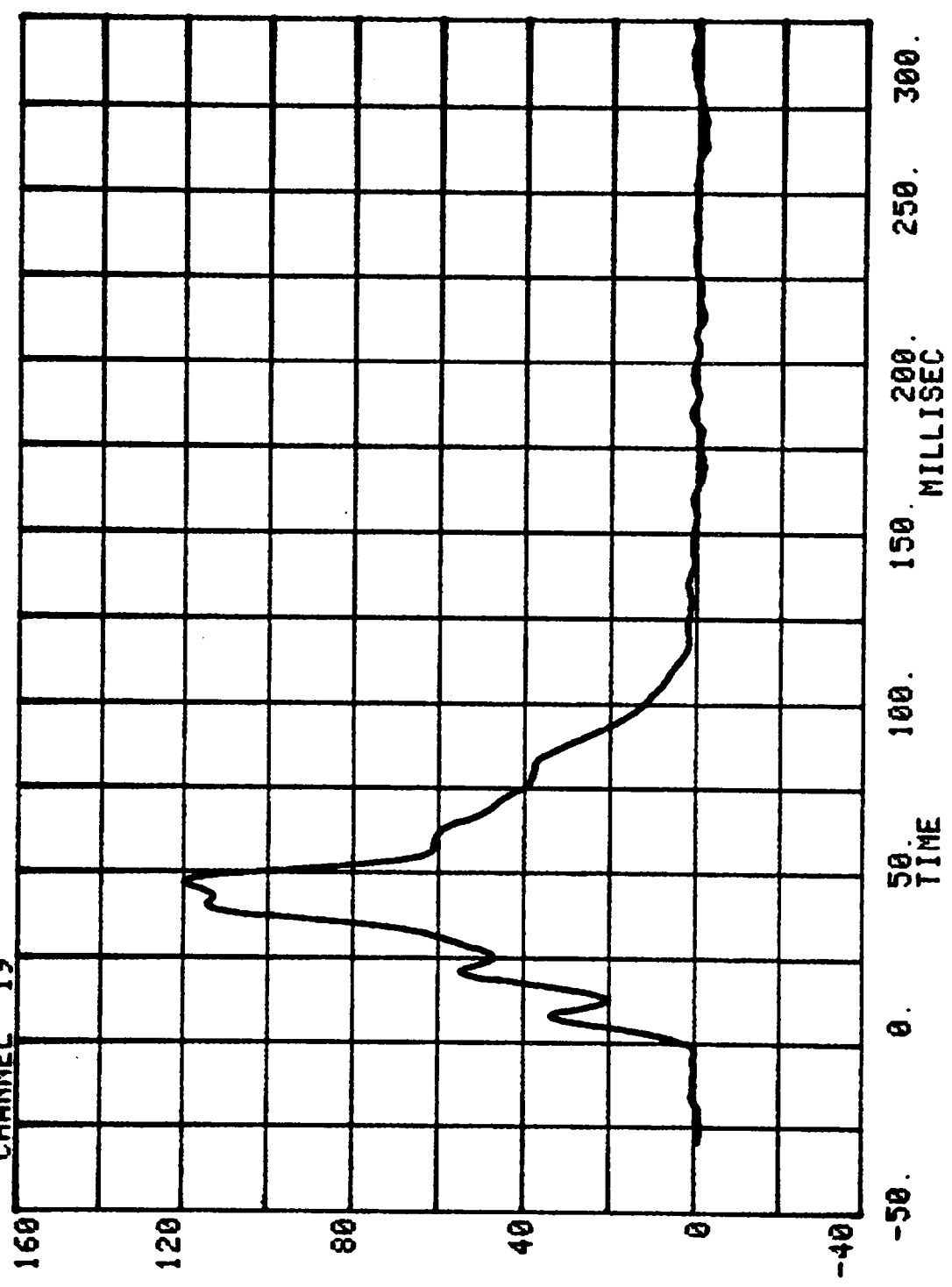
CHANNEL 16



TOTAL ROW A+B+C+D

RUN= 602 SERIES= 302

CHANNEL 19



TEST NO. CE0302

DUMMY DATA

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

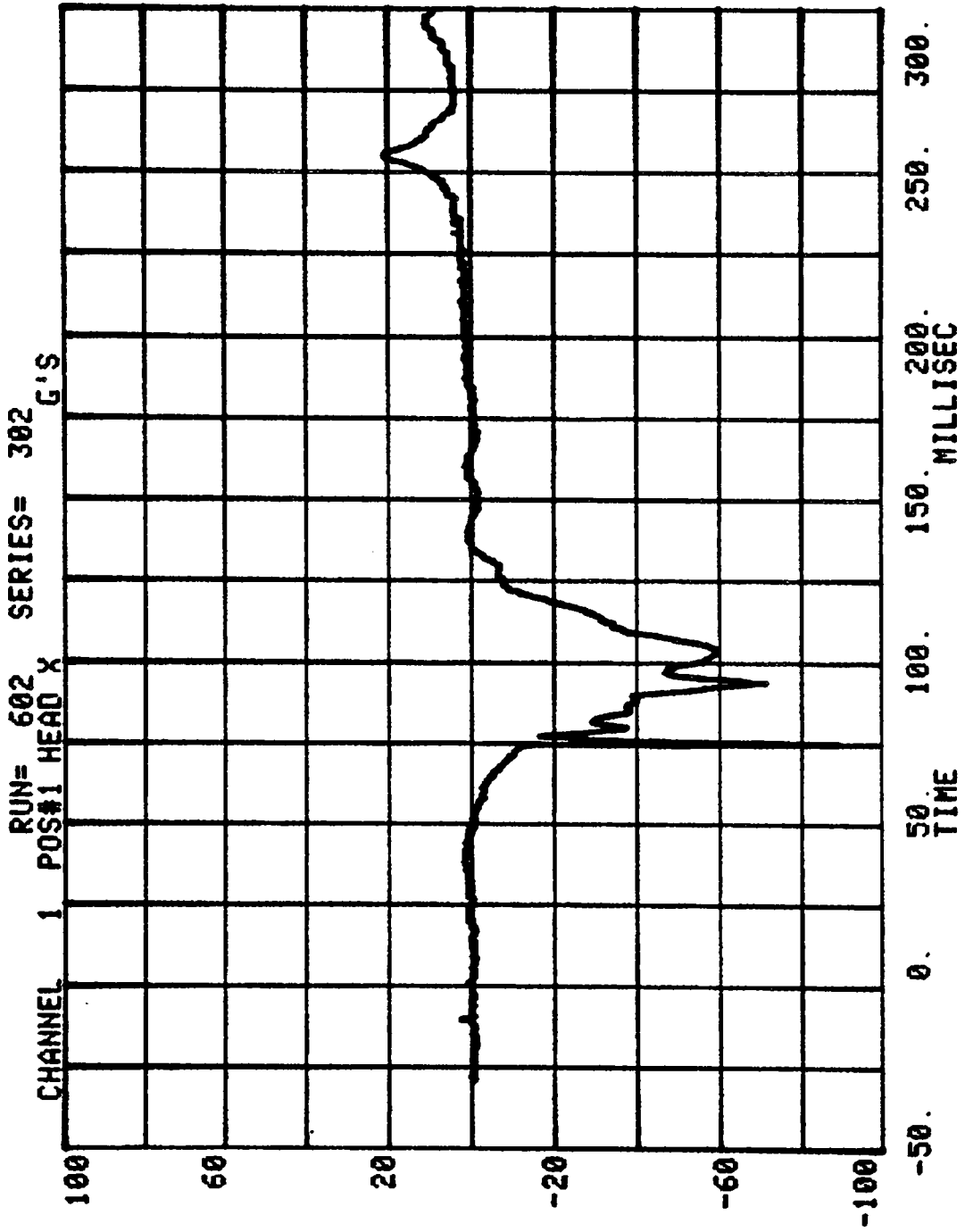
HEAD INJURY CRITERION
HEAD SEVERITY INDEX

CAR TO LOAD CELL BARRIER

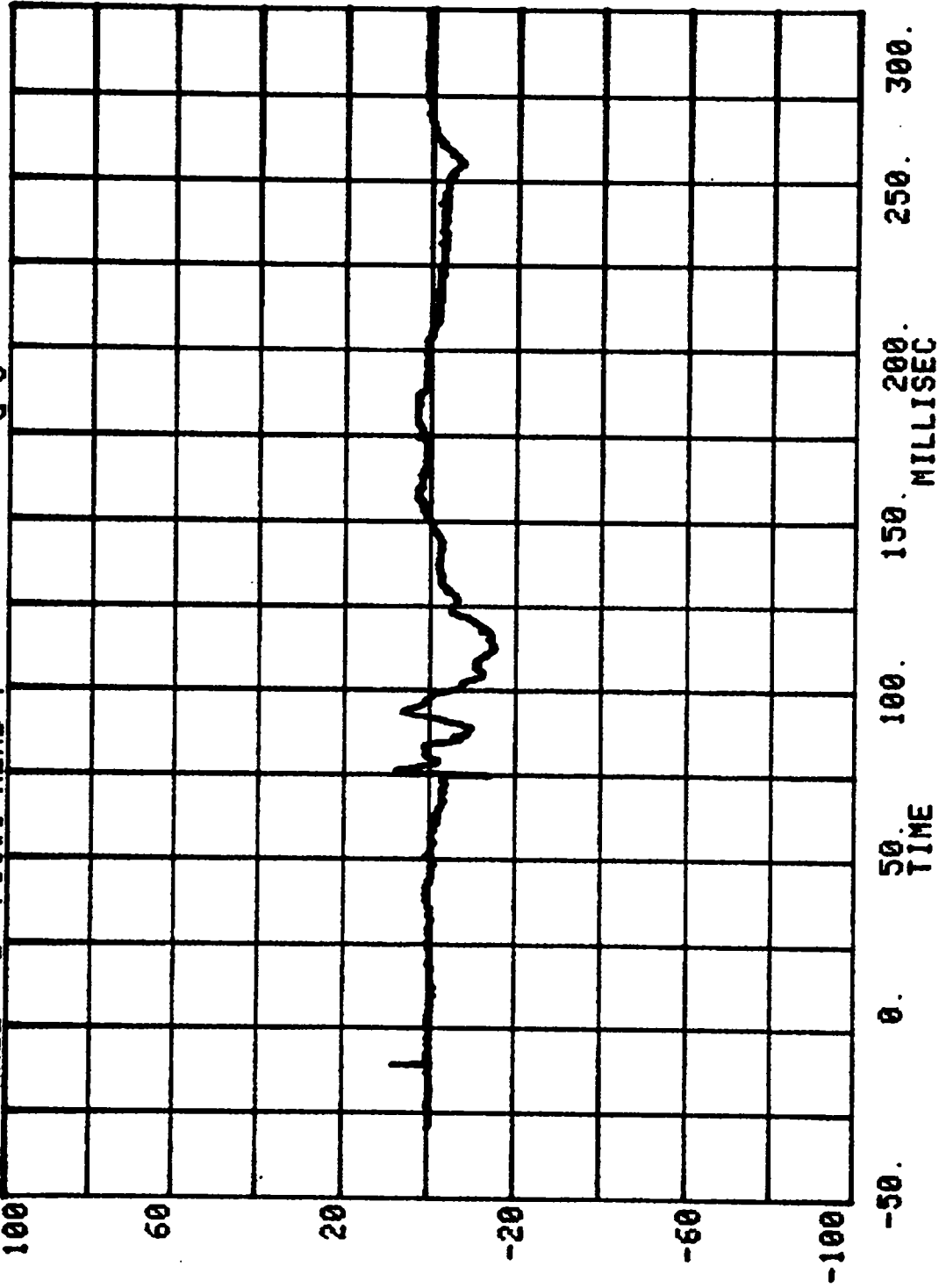
RUN= 602

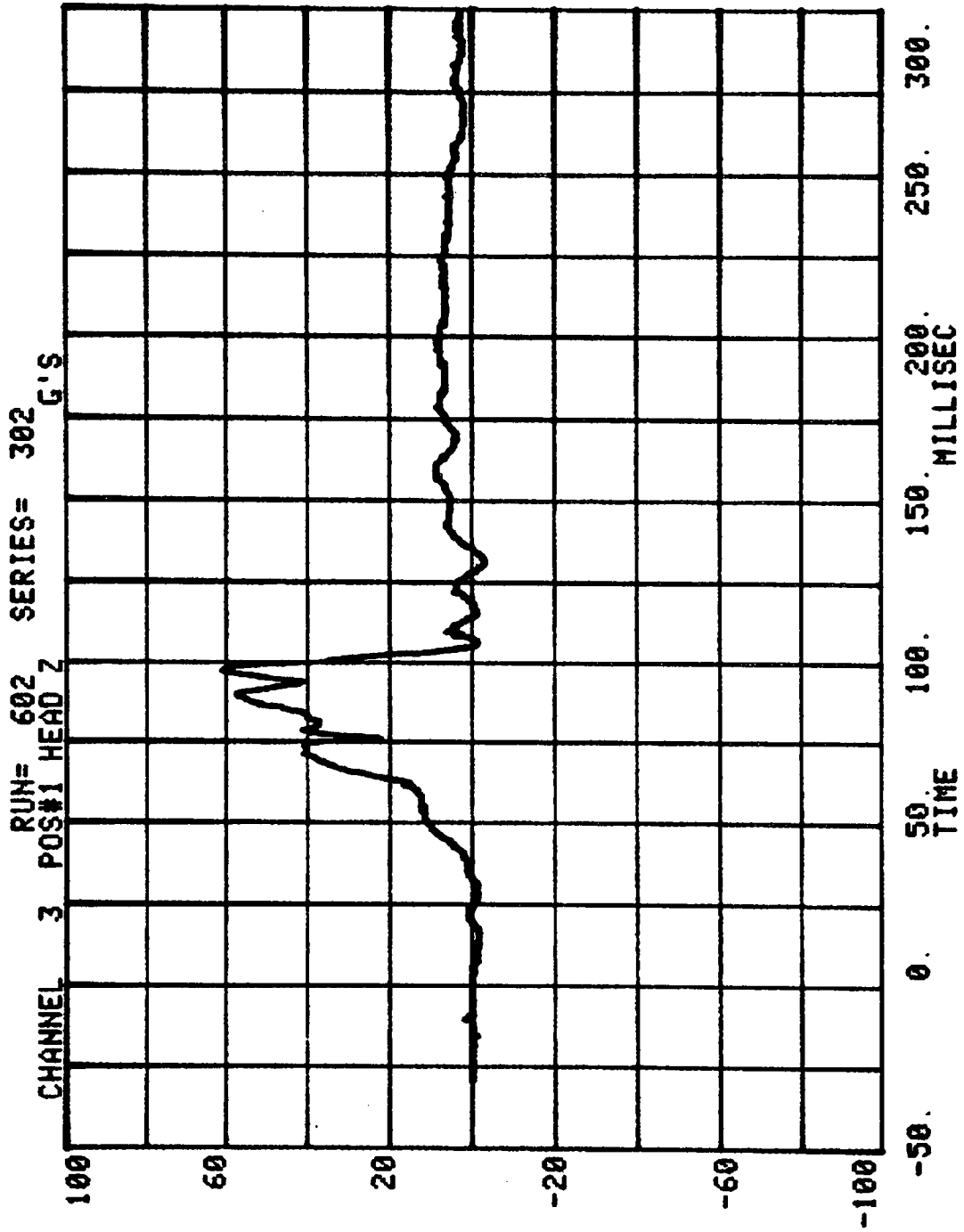
PDS#1 HEAD RESULTANT

HIC=1118.3 FROM T1= .06712 TO T2= .11452
AVERAGE ACCELERATION BETWEEN T1 AND T2= 56.1G'S
EVENT TIME= 300.0 MSEC
SEVERITY INDEX=1362.7



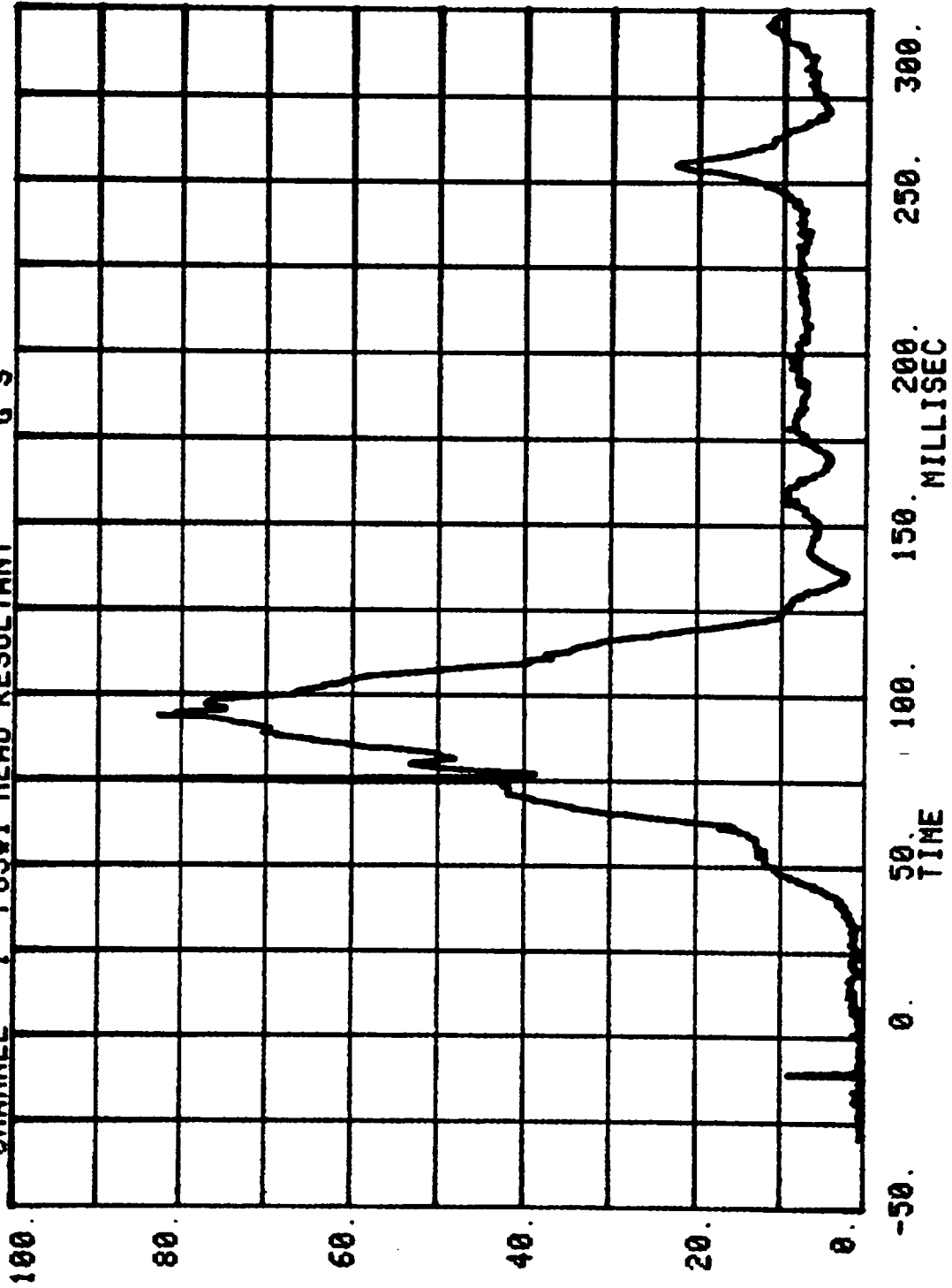
CHANNEL 2 POS#1 HEAD Y
RUN= 602 SERIES= 302 G'S

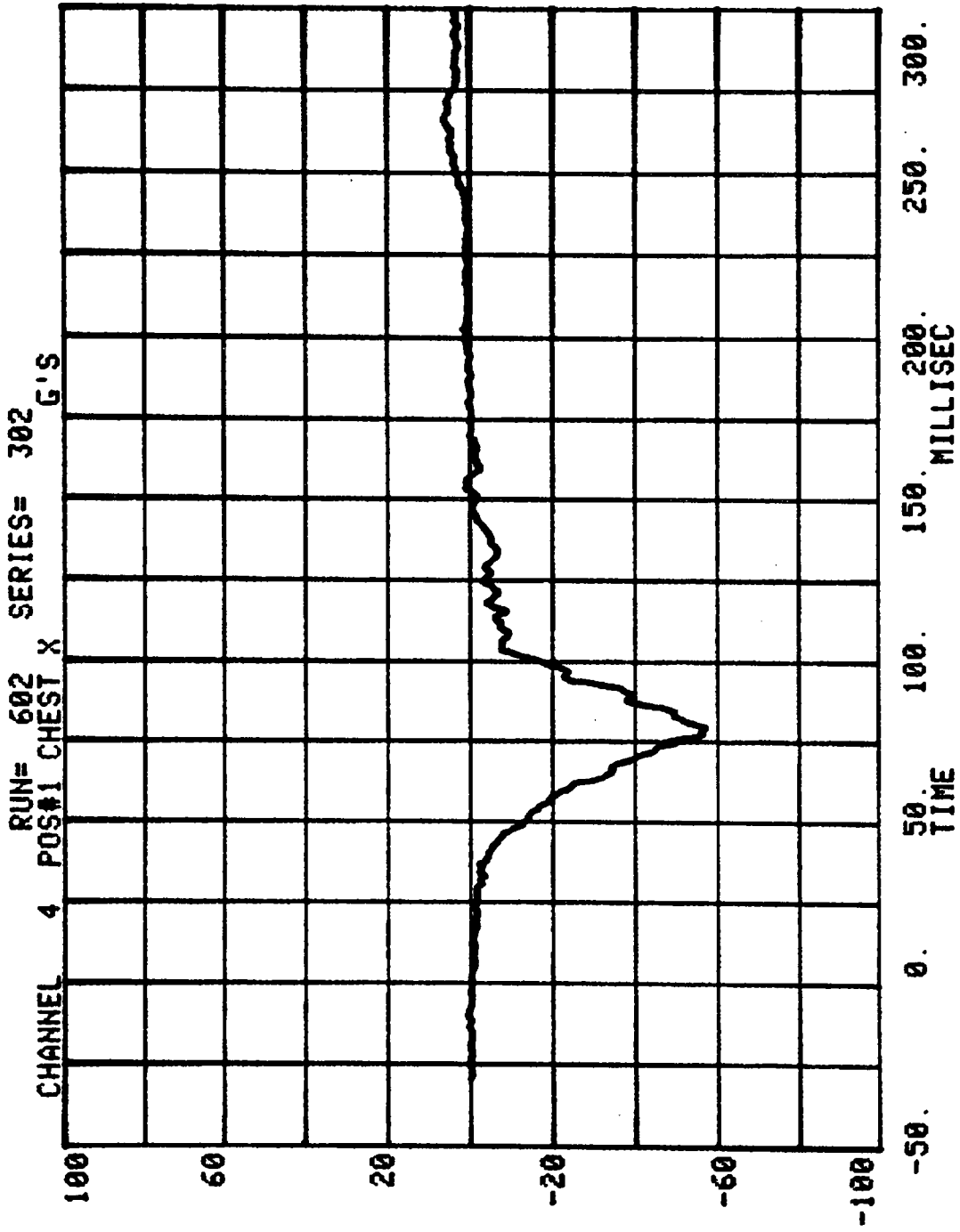




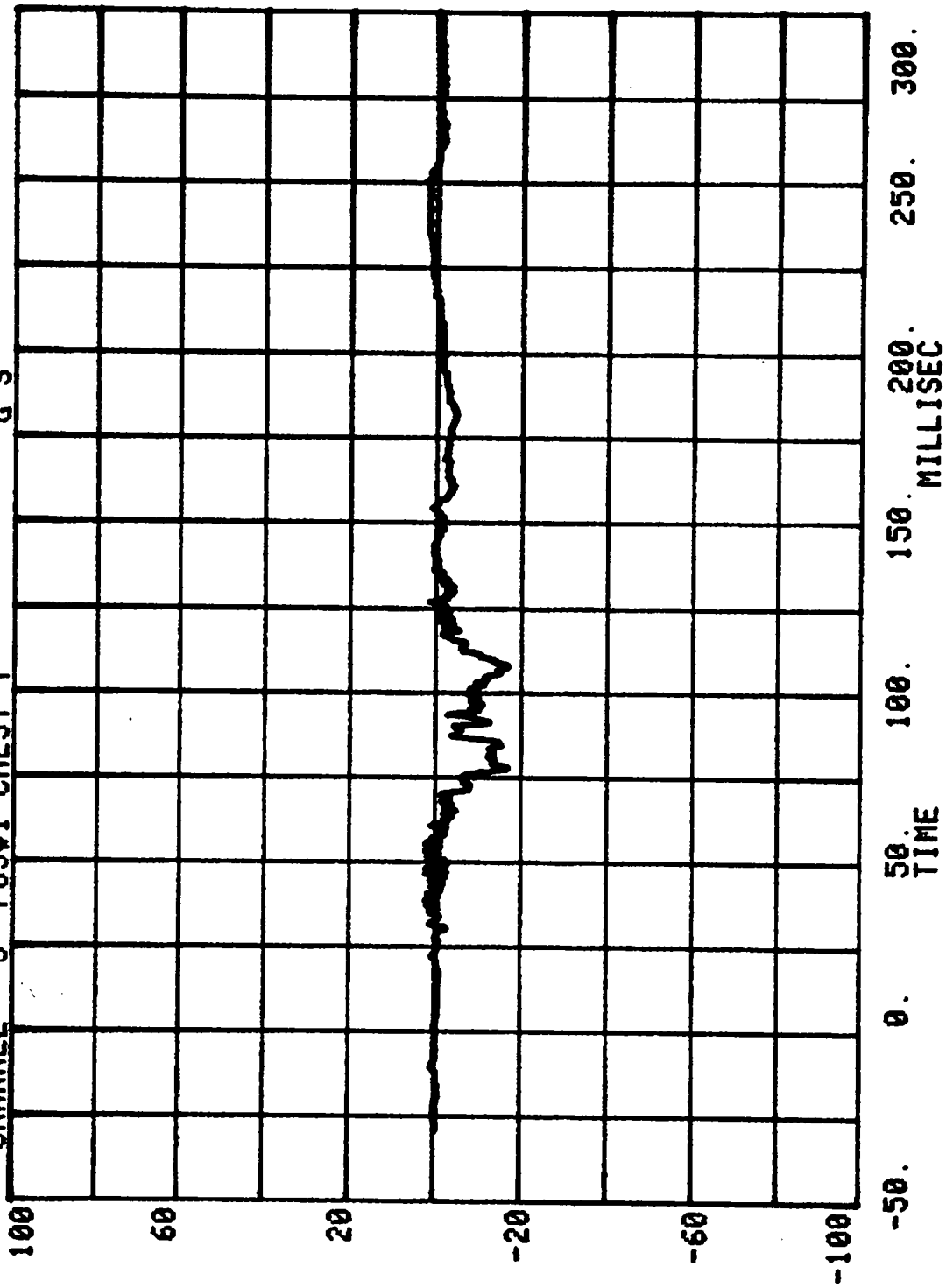
CHANNEL 1 POS#1 HEAD RESULTANT

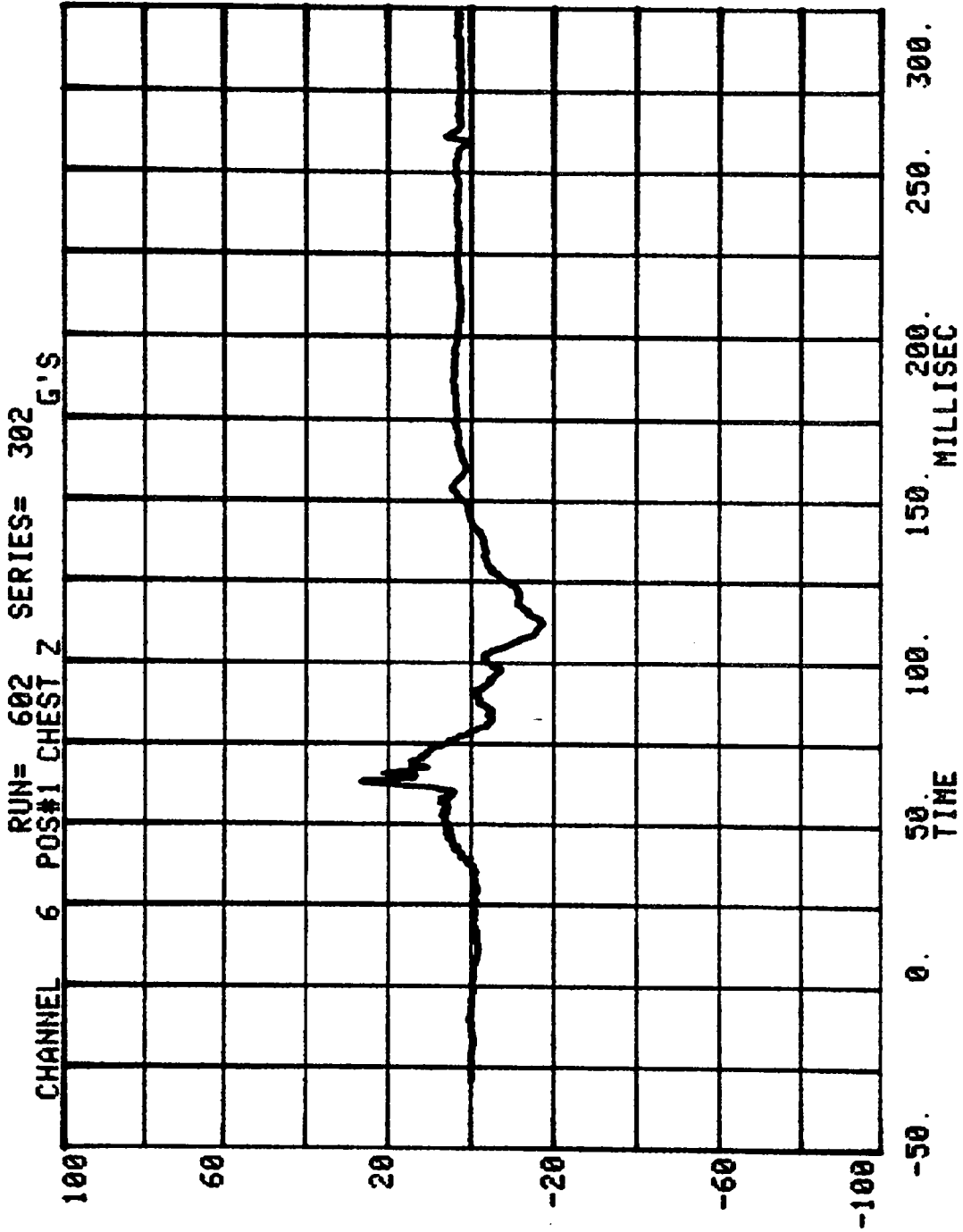
RUN= 602 SERIES= 302 G'S



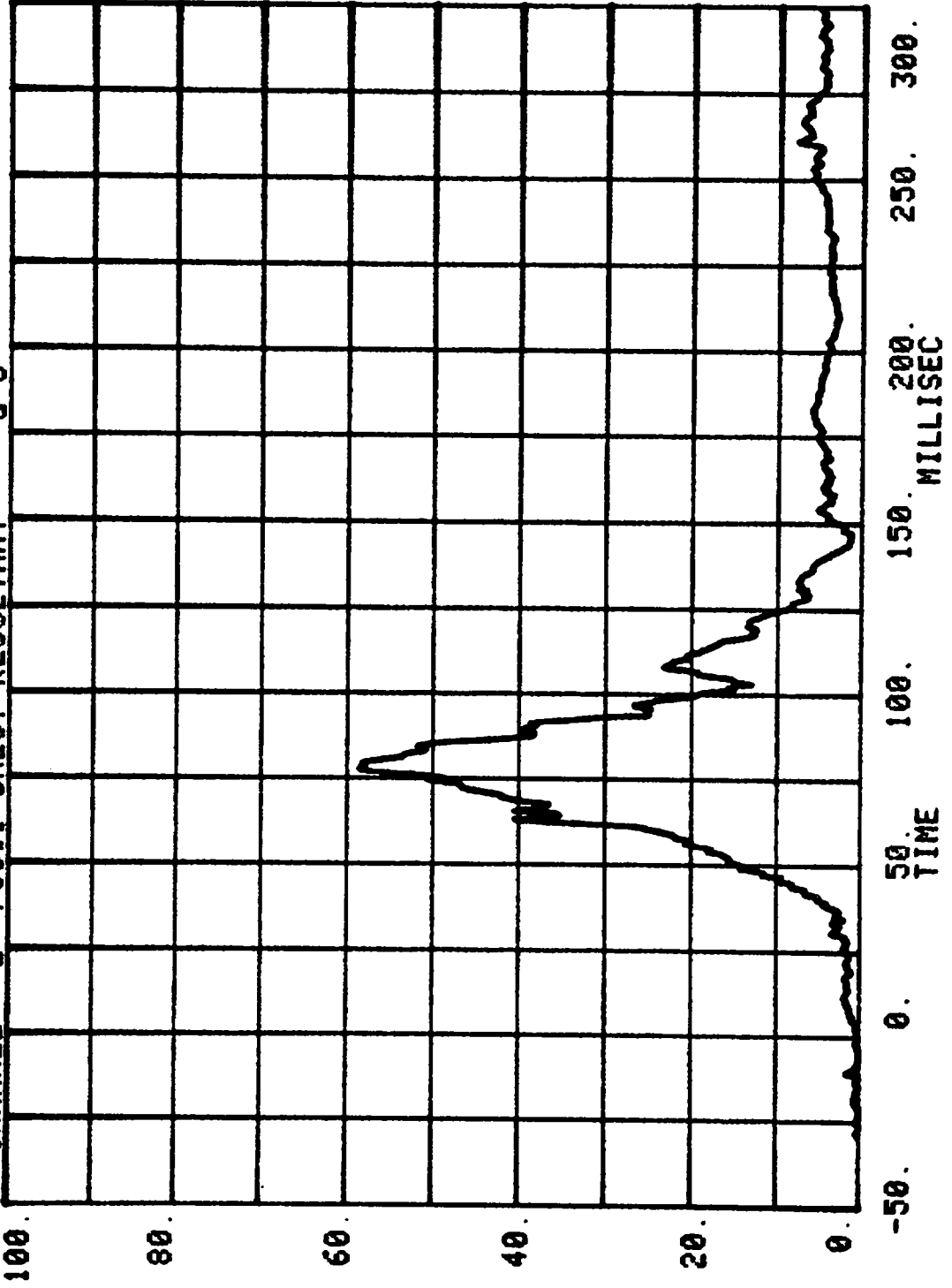


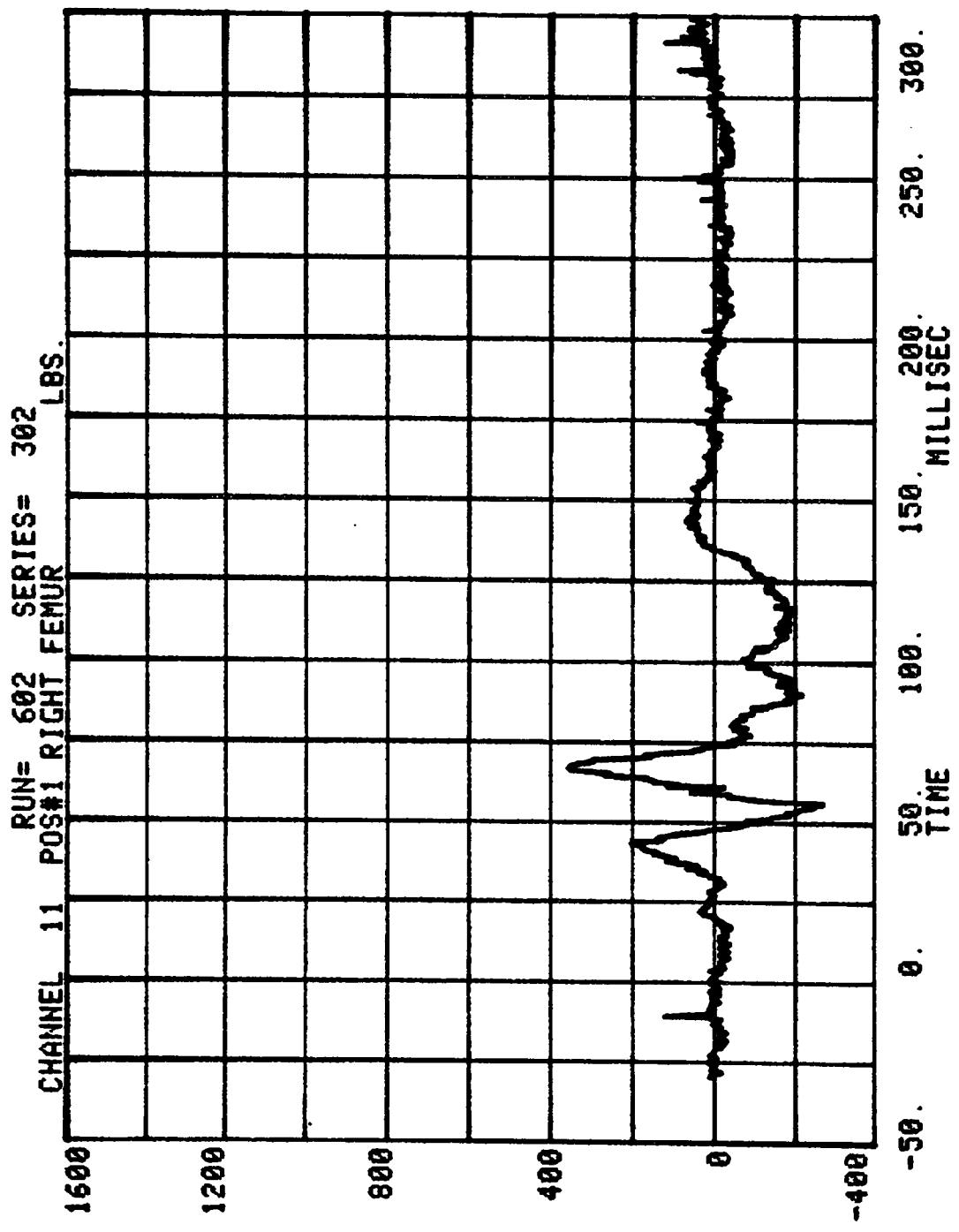
CHANNEL 5 POS#1 CHEST Y SERIES= 302 G'S



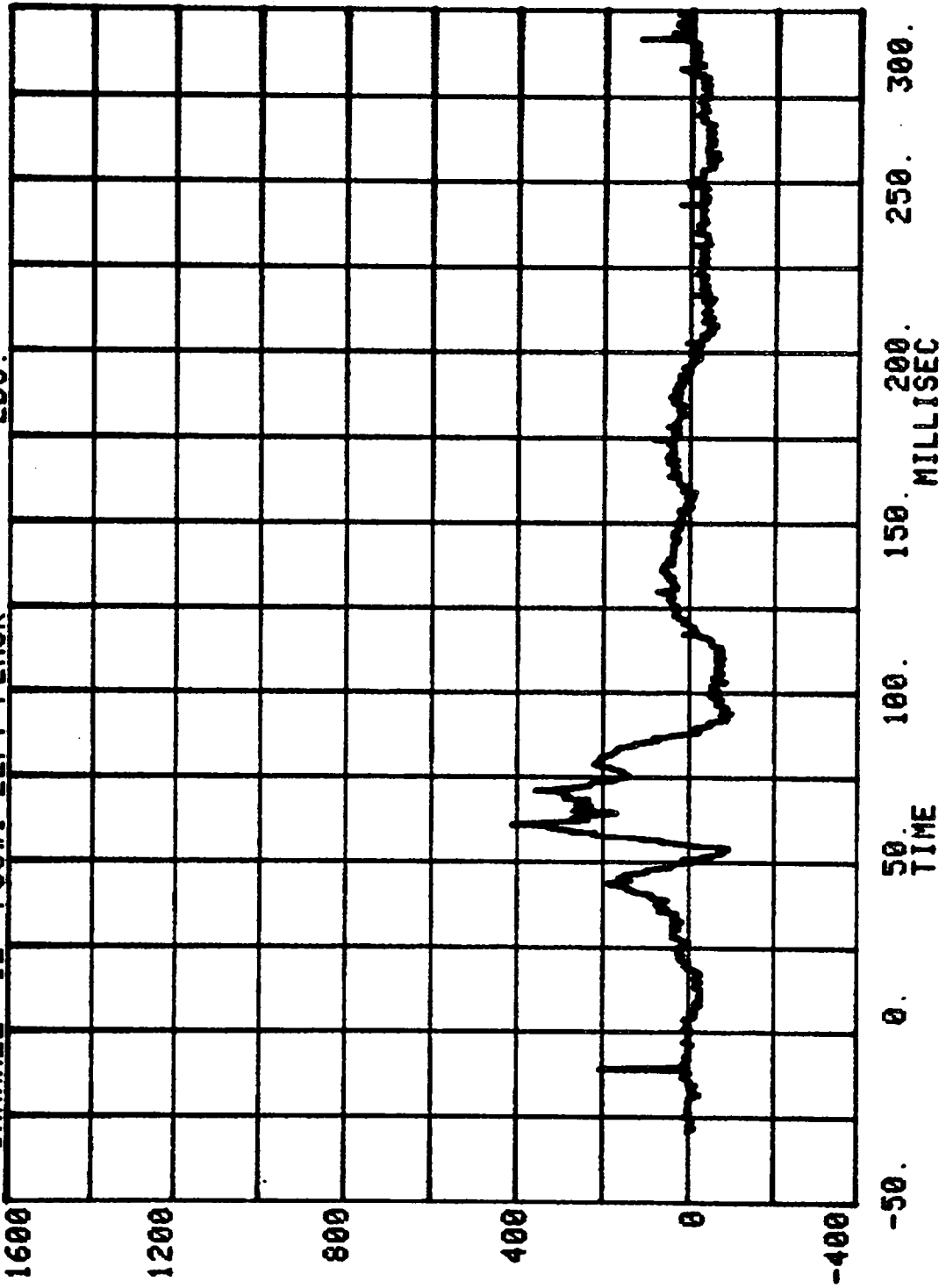


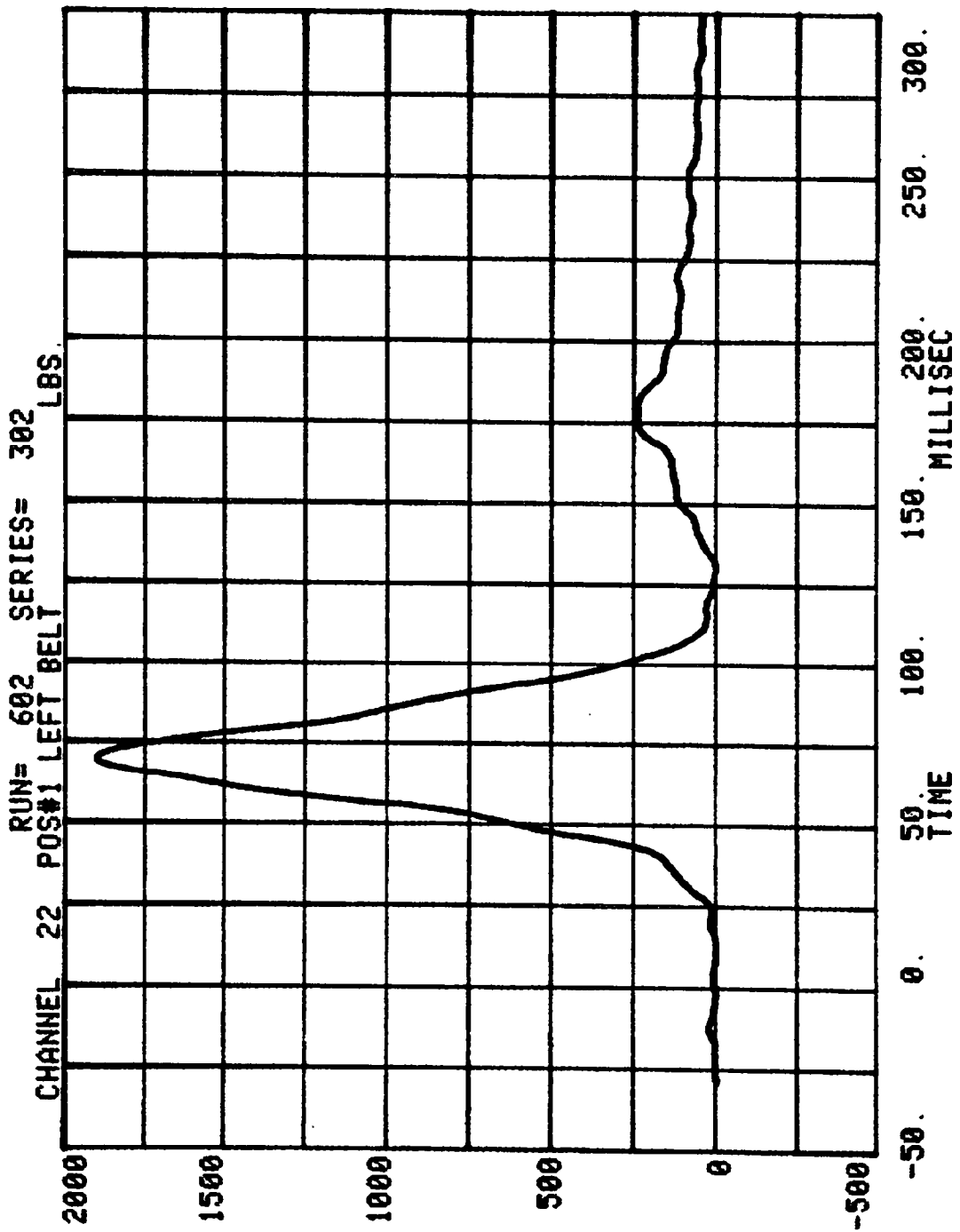
CHANNEL 2 POS#1 CHEST RESULTANT SERIES= 302 G'S





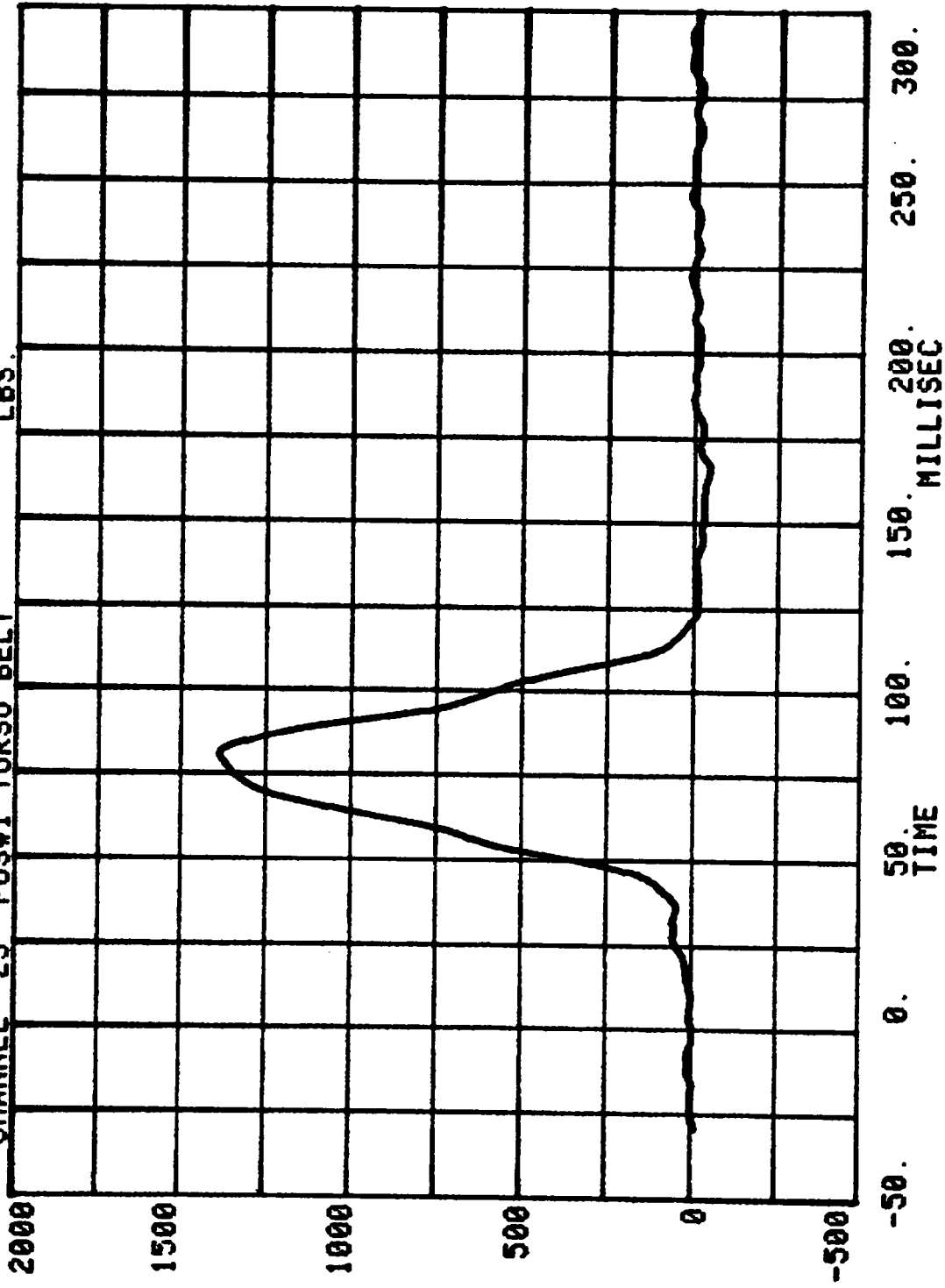
CHANNEL 12 POS#1 LEFT FEMUR
RUN= 602 SERIES= 302 LBS.





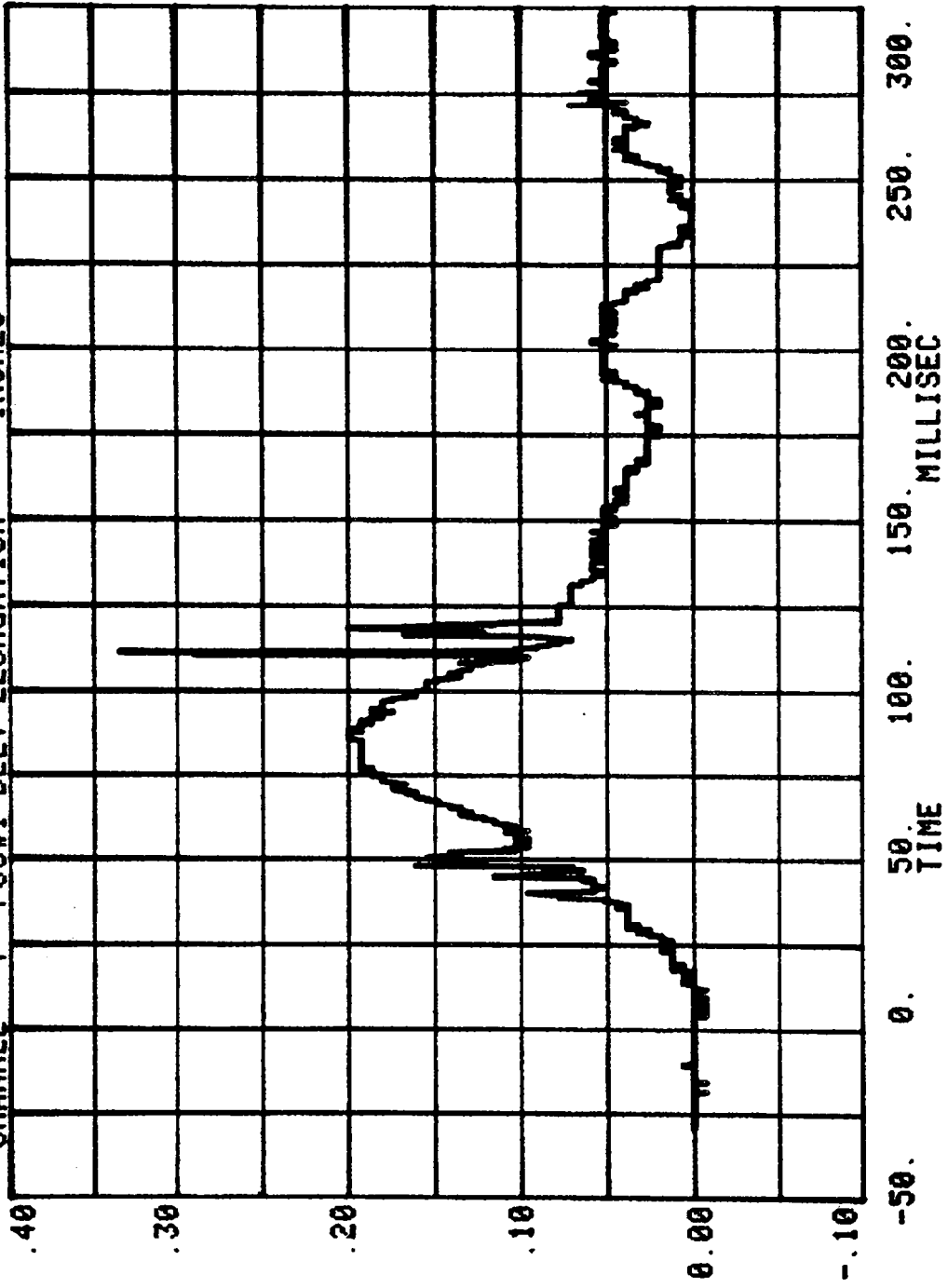
CHANNEL 23 POS#1 TORSO BELT

RUN= 602 SERIES= 302 LBS.



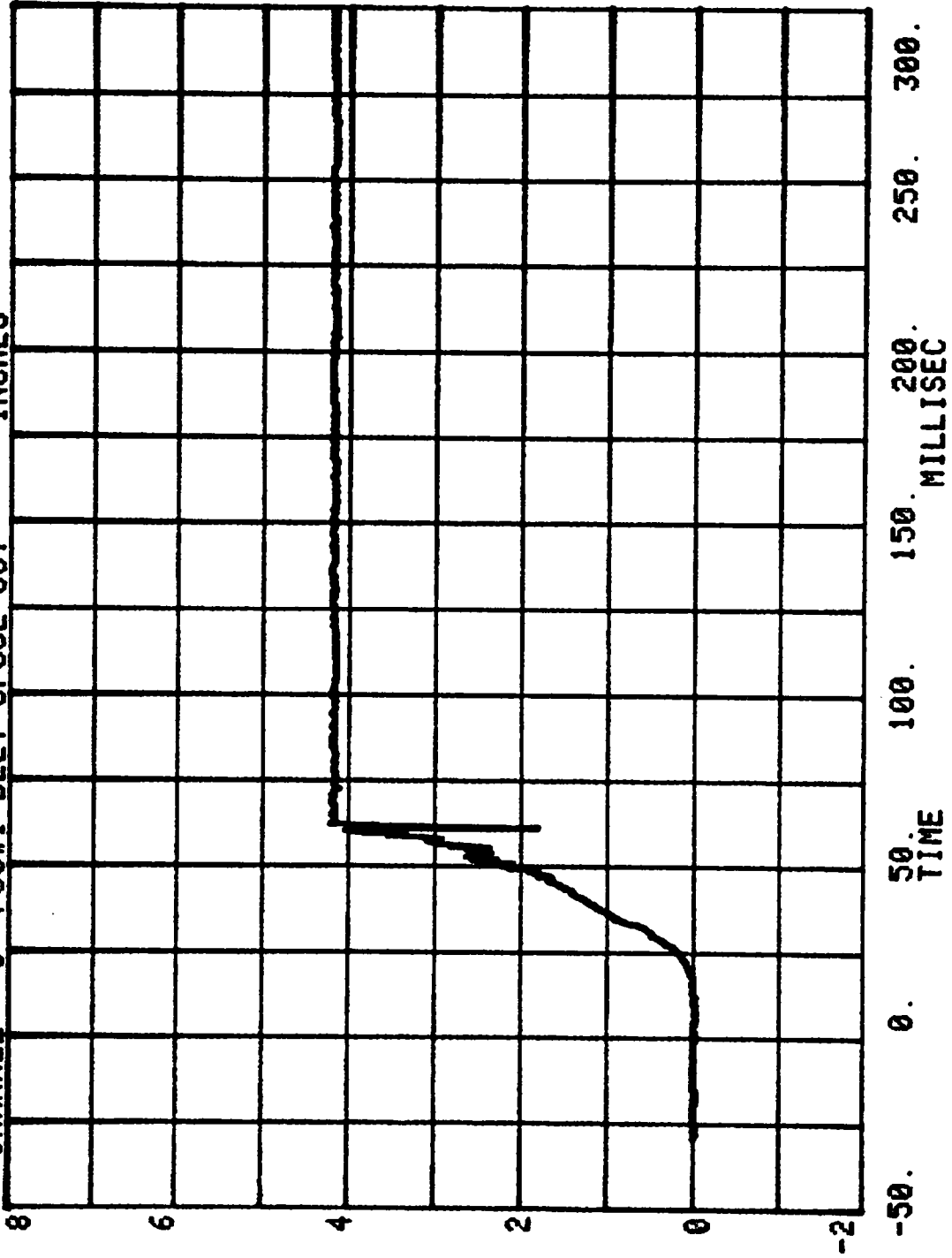
(MEASURED OVER 3 INCHES)

CHANNEL 7 POS#1 BELT ELONGATION SERIES= 302 INCHES



CHANNEL 8 POS#1 BELT SPOOL OUT

RUN= 602 SERIES= 302



HEAD INJURY CRITERION
HEAD SEVERITY INDEX

CAR TO LOAD CELL BARRIER

RUN= 602

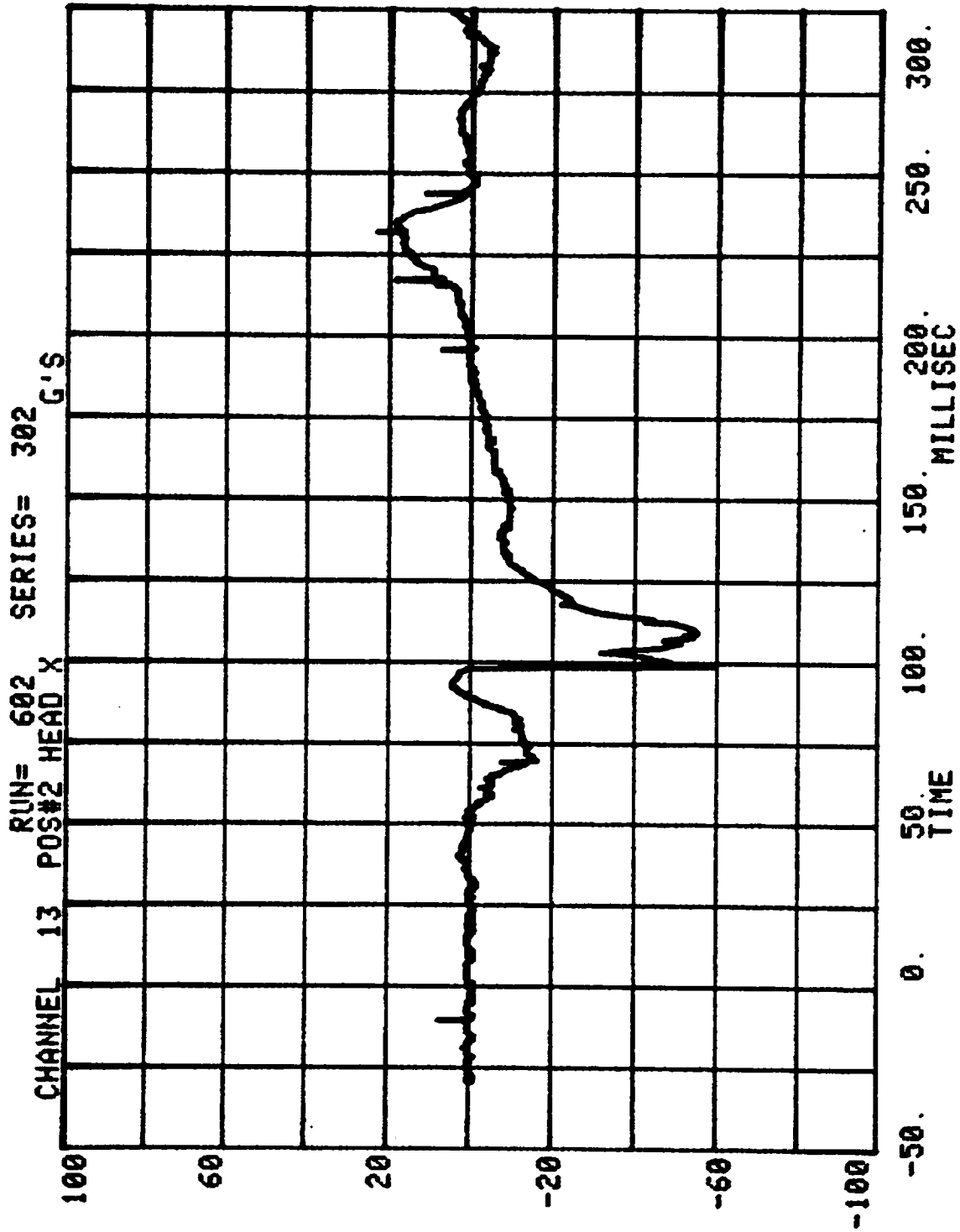
POS#2 HEAD RESULTANT

HIC=1034.8 FROM T1= .06690 TO T2= .12180

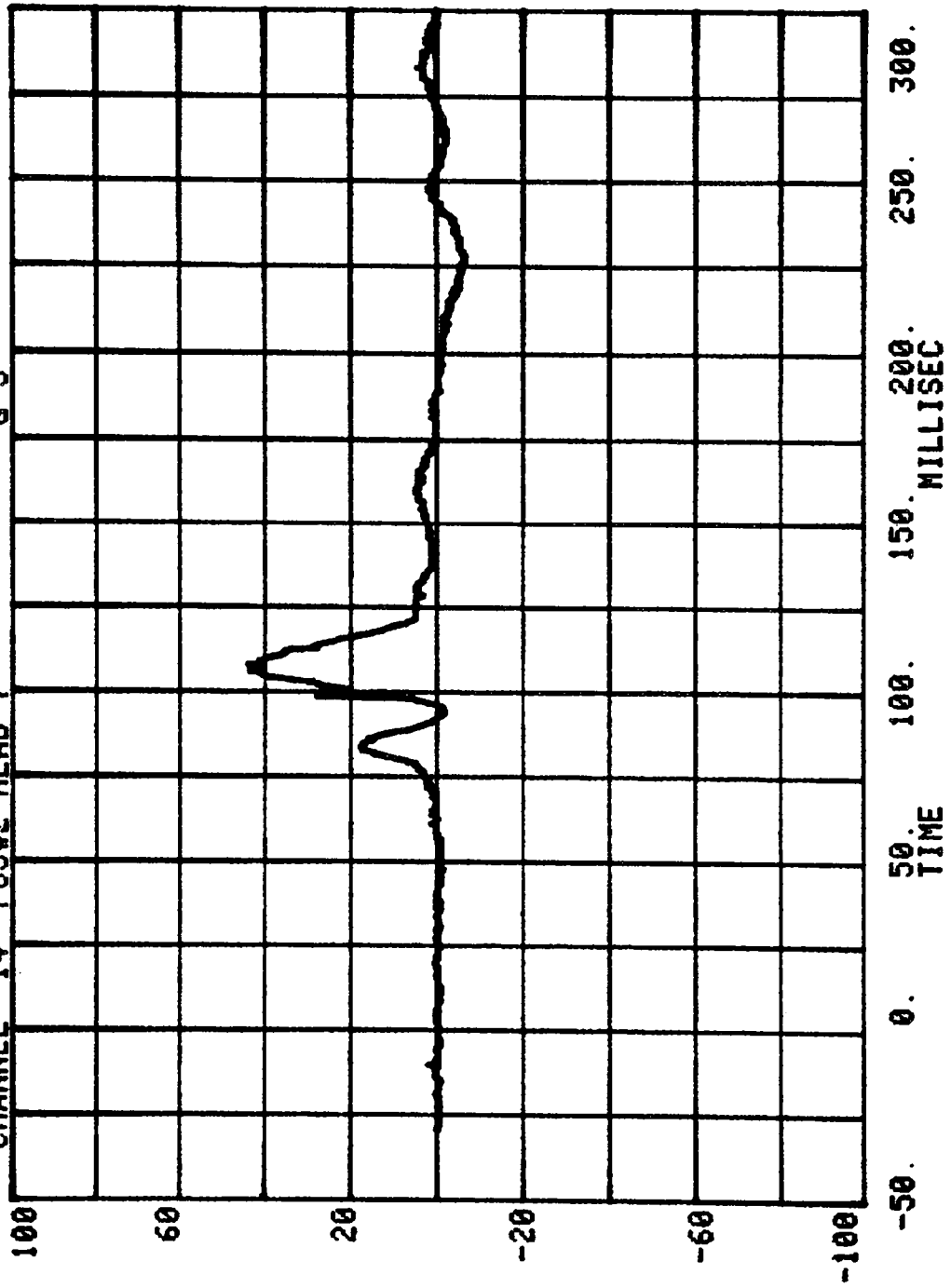
AVERAGE ACCELERATION BETWEEN T1 AND T2= 51.3G'S

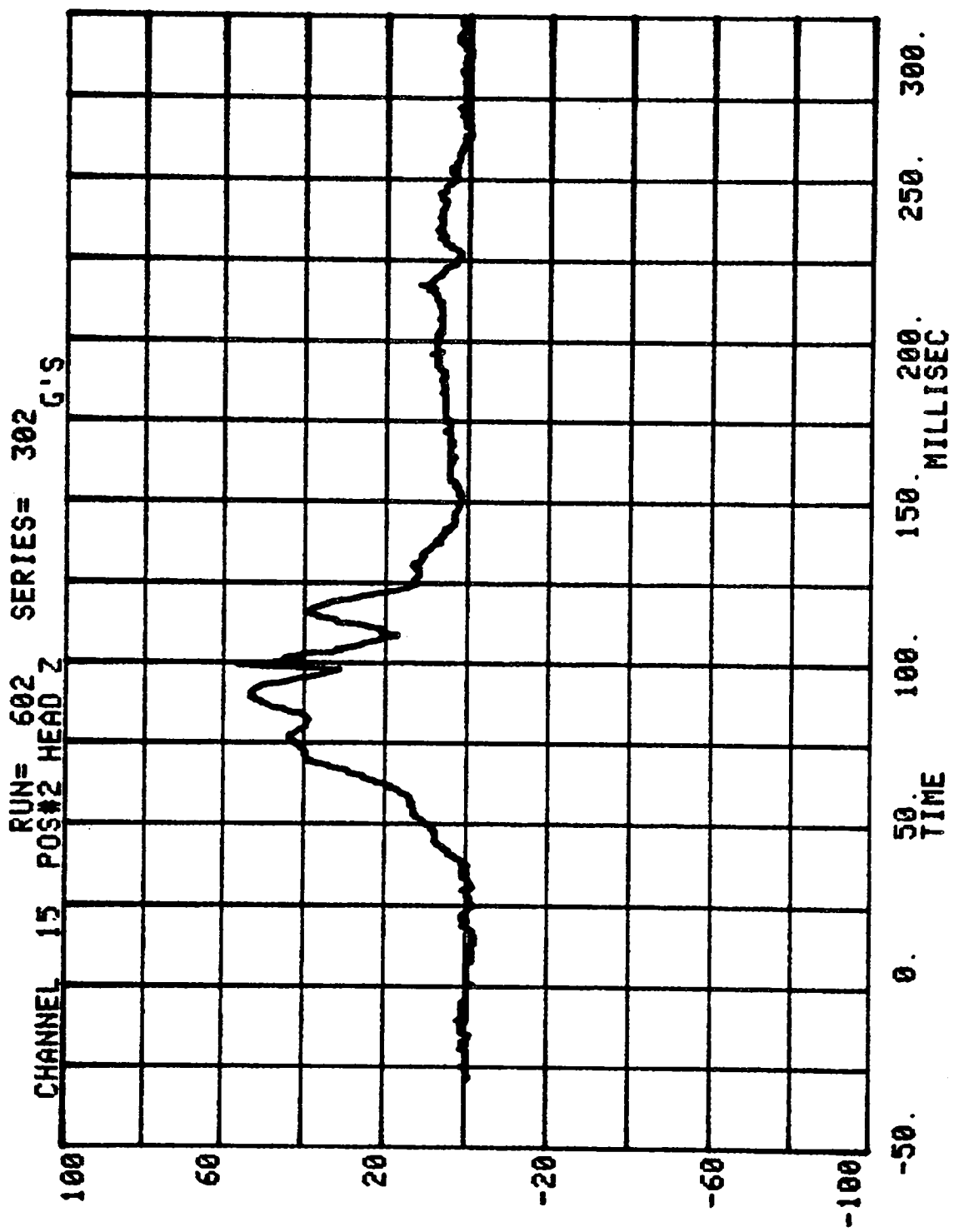
EVENT TIME= 300.0 MSEC

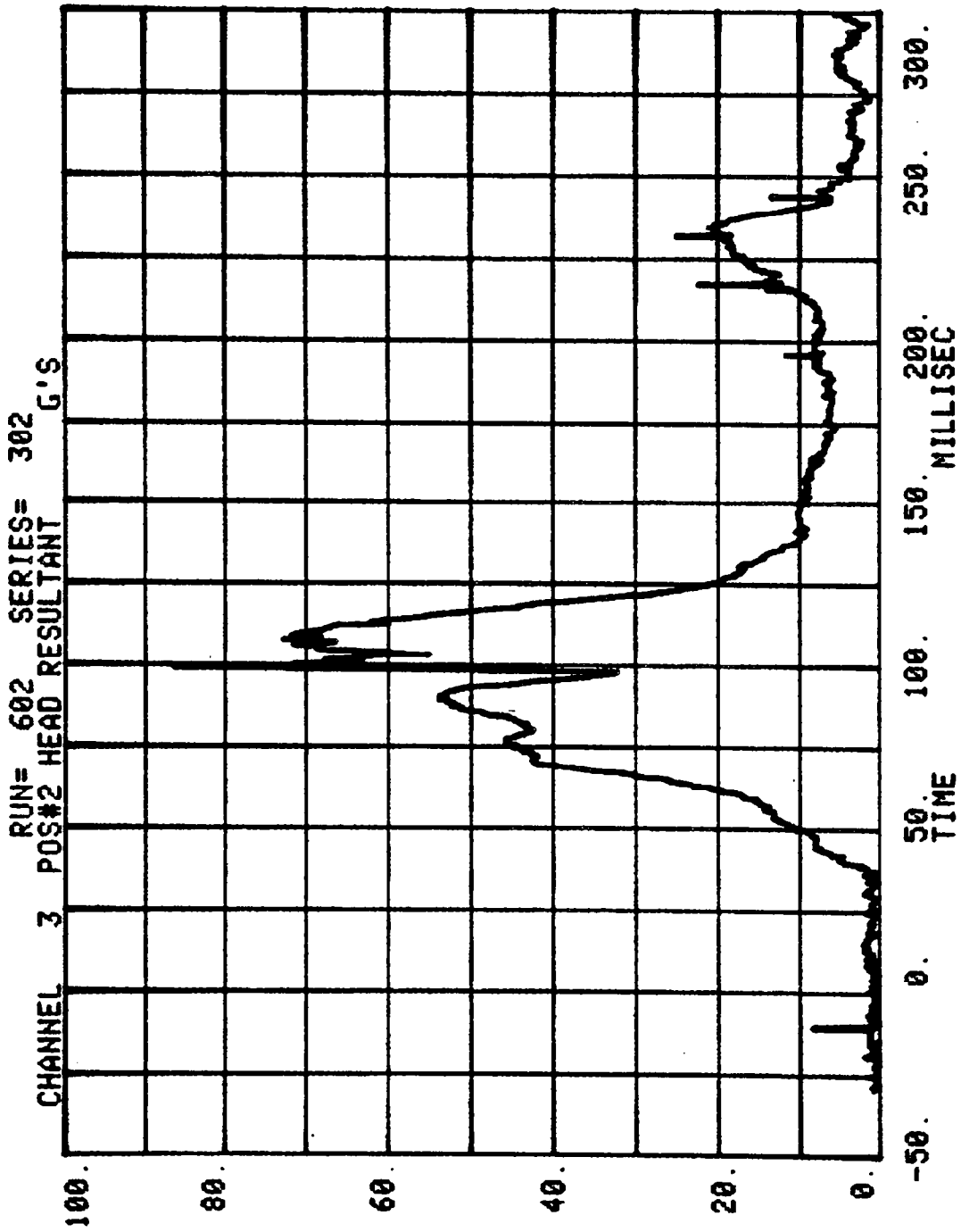
SEVERITY INDEX=1236.2



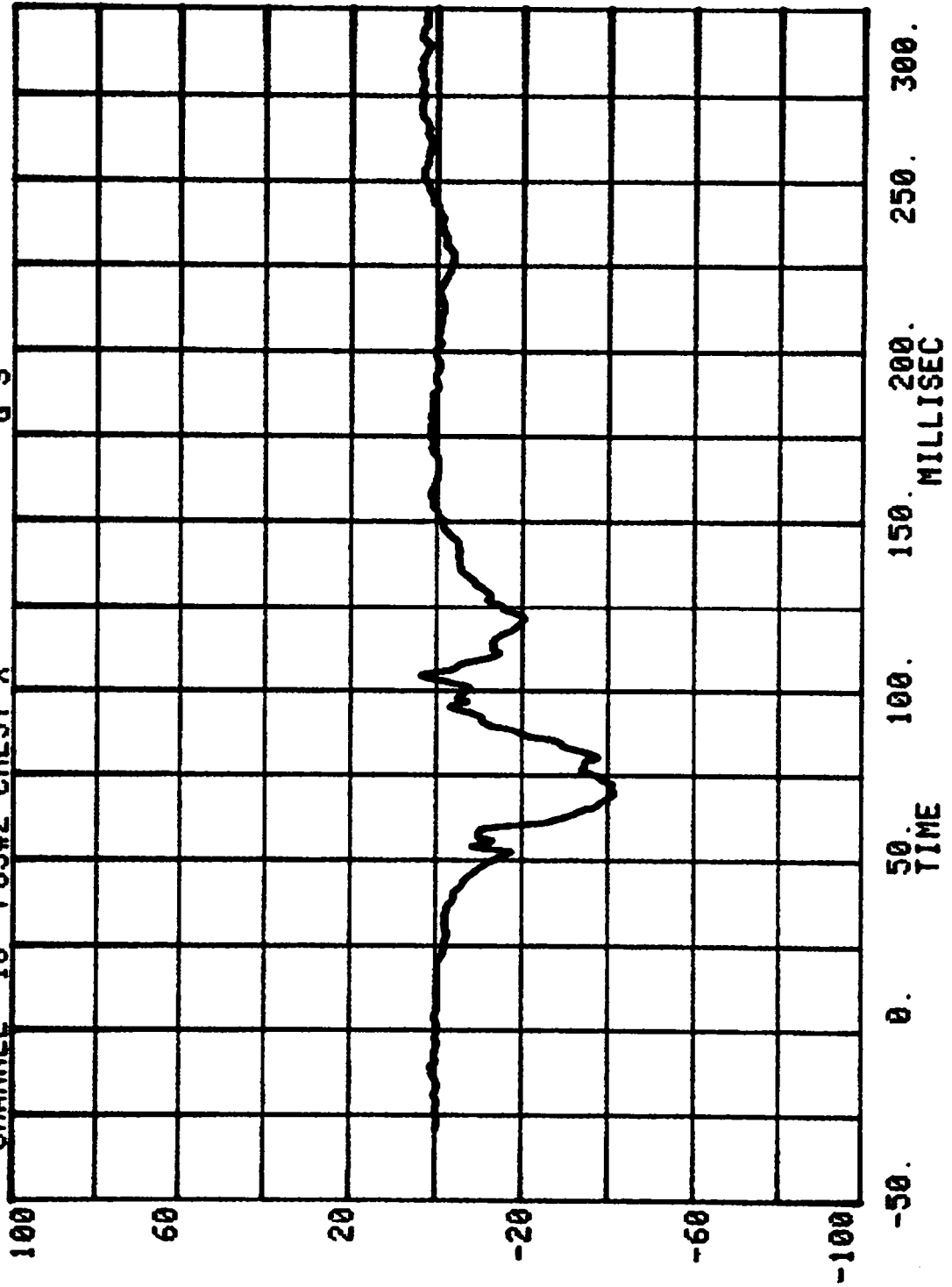
CHANNEL 14 POS#2 HEAD Y
RUN= 602 SERIES= 302 G'S

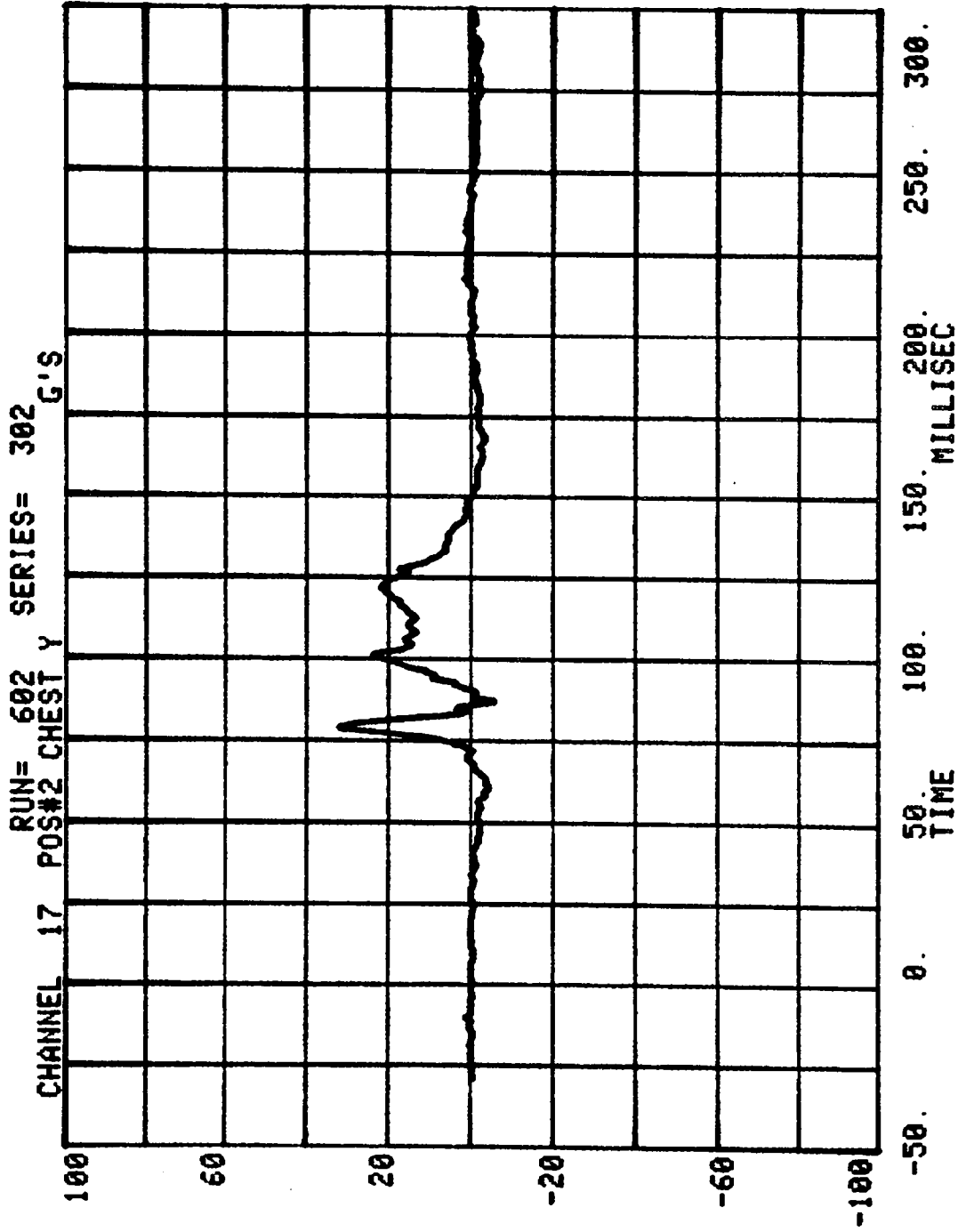




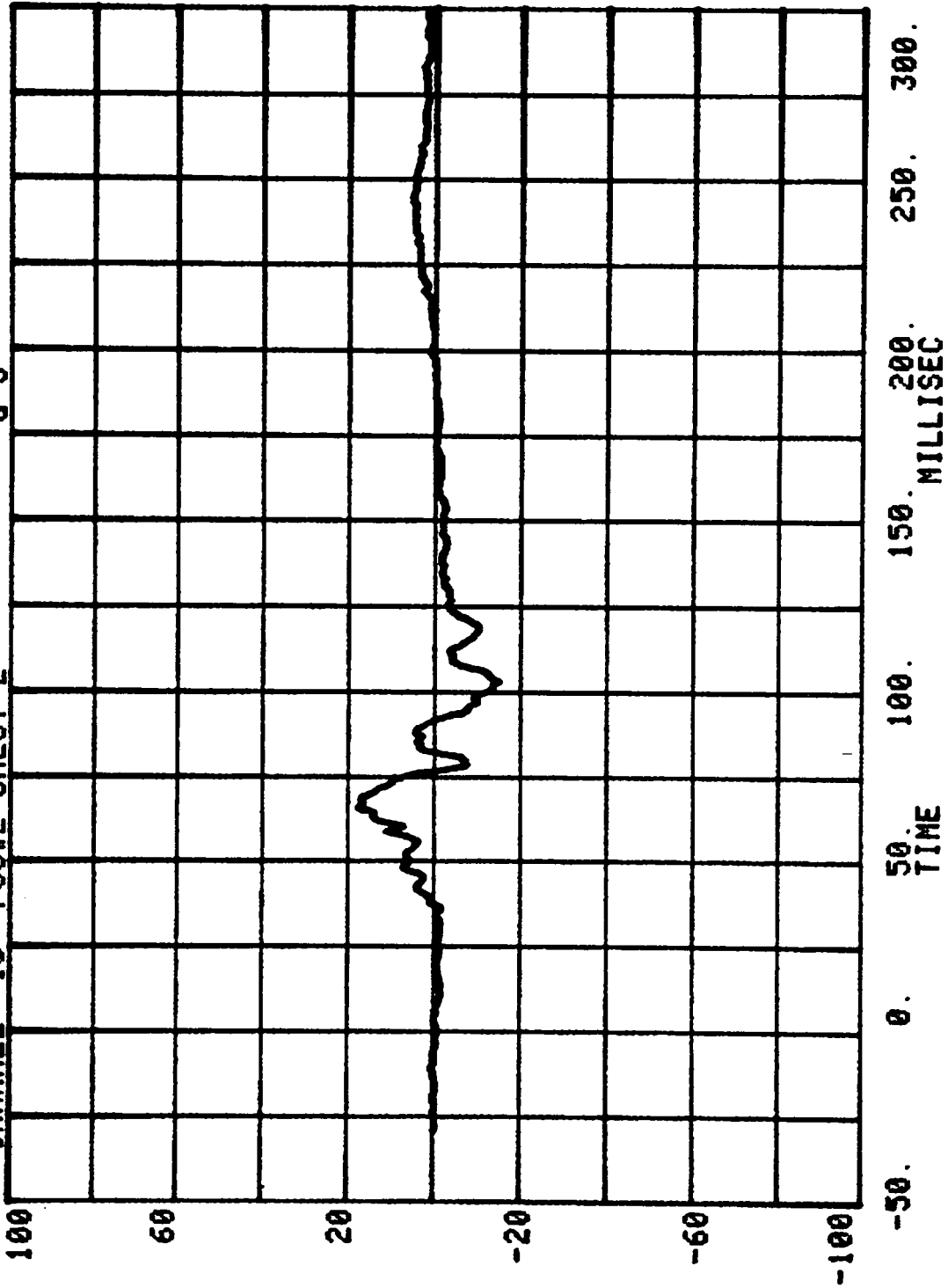


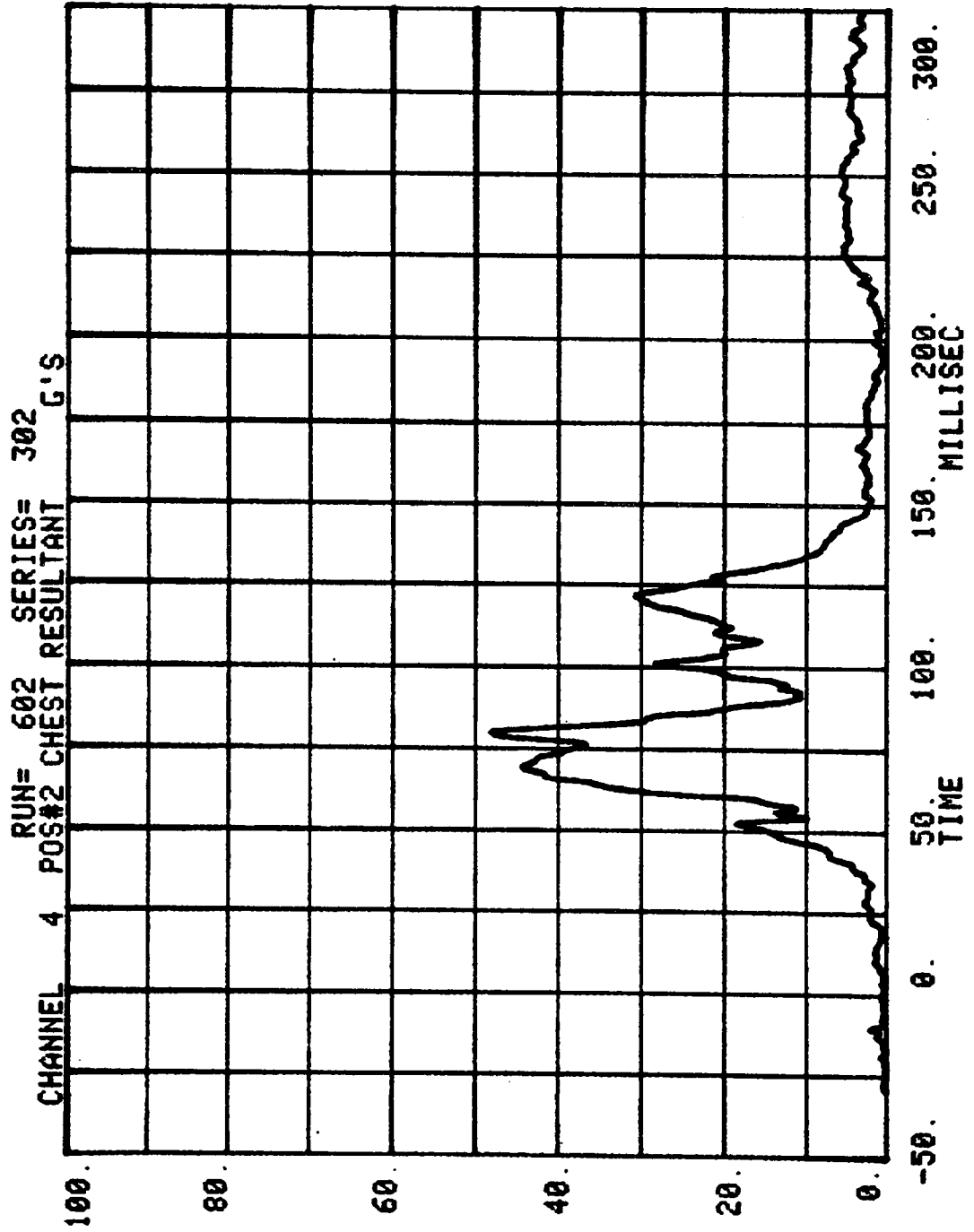
CHANNEL 16 POS#2 CHEST X
RUN= 602 SERIES= 302 G'S





CHANNEL 18 POS#2 CHEST Z
RUN= 602 SERIES= 302 G'S

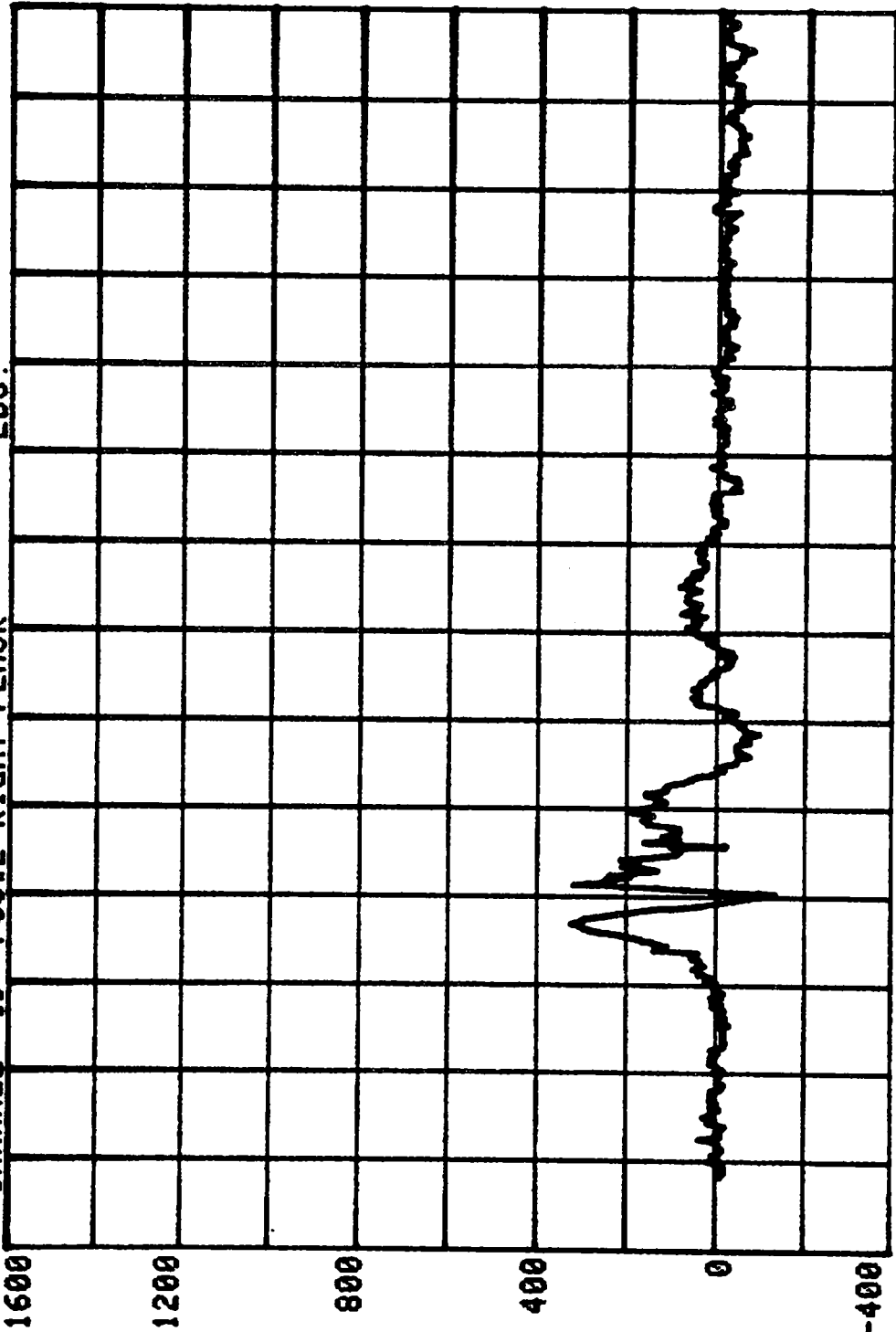




CHANNEL 19 POS#2 RIGHT FEMUR LBS.

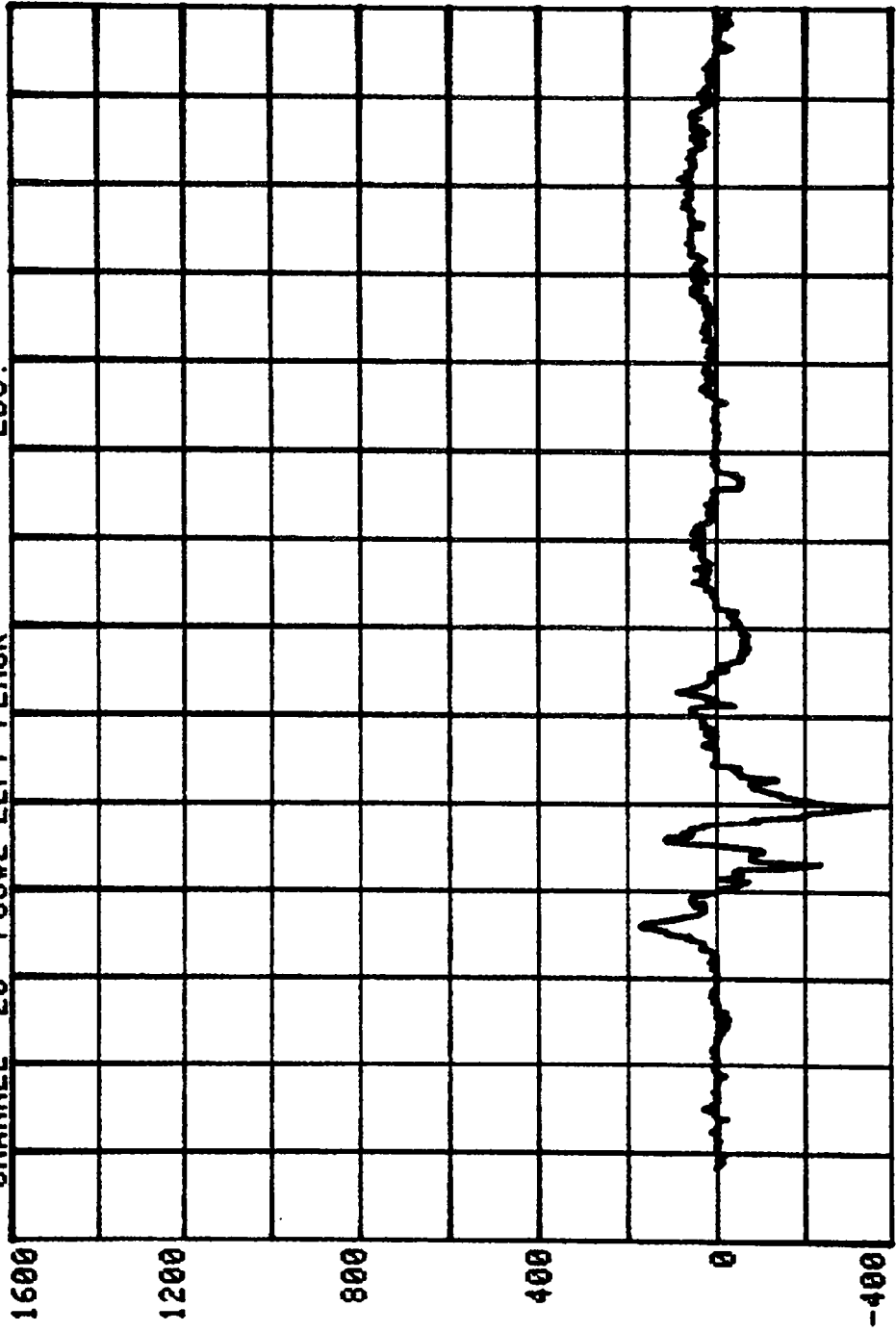
RUN= 602

SERIES= 302



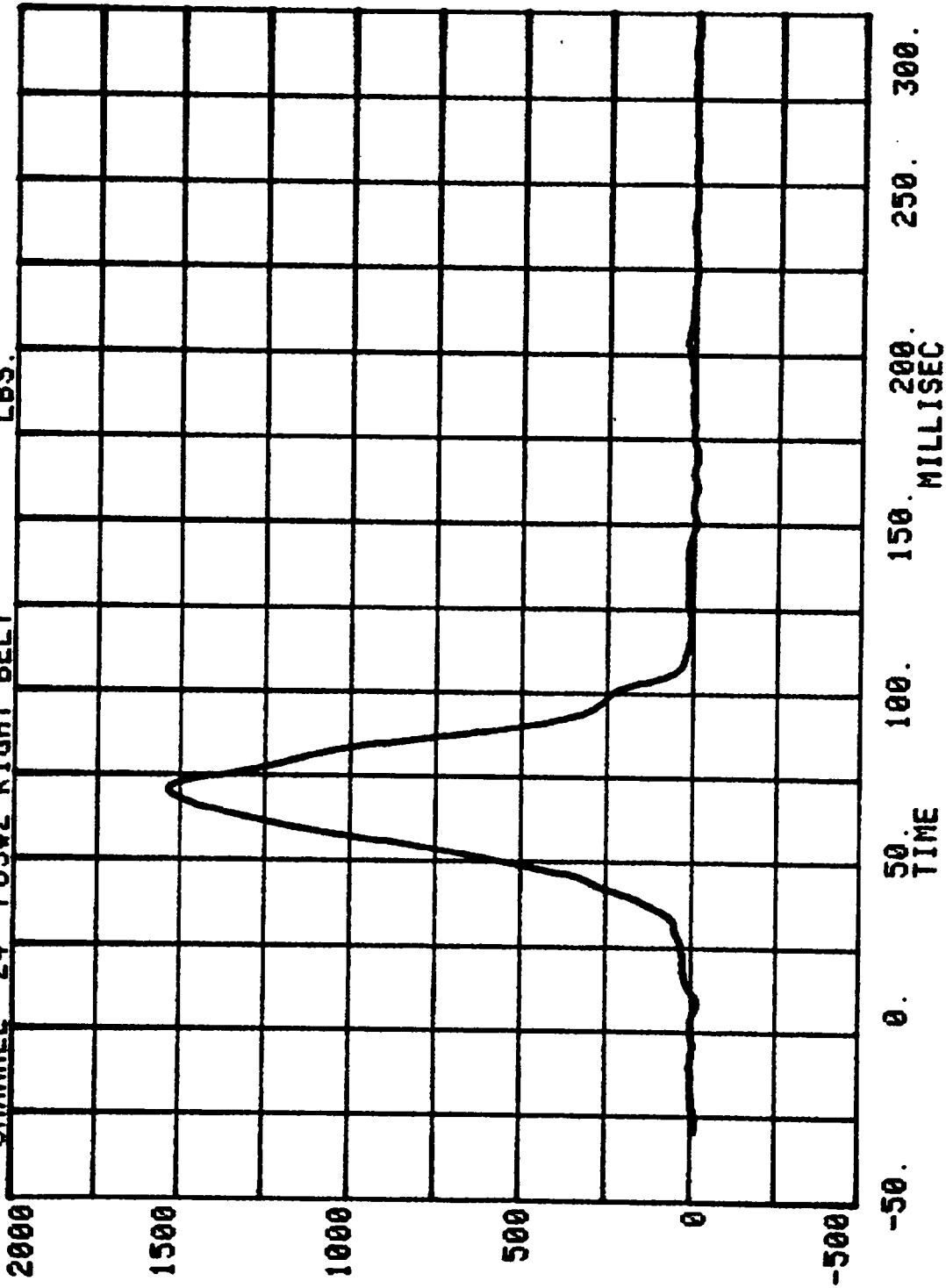
CHANNEL 20 POS#2 LEFT FEMUR LBS.

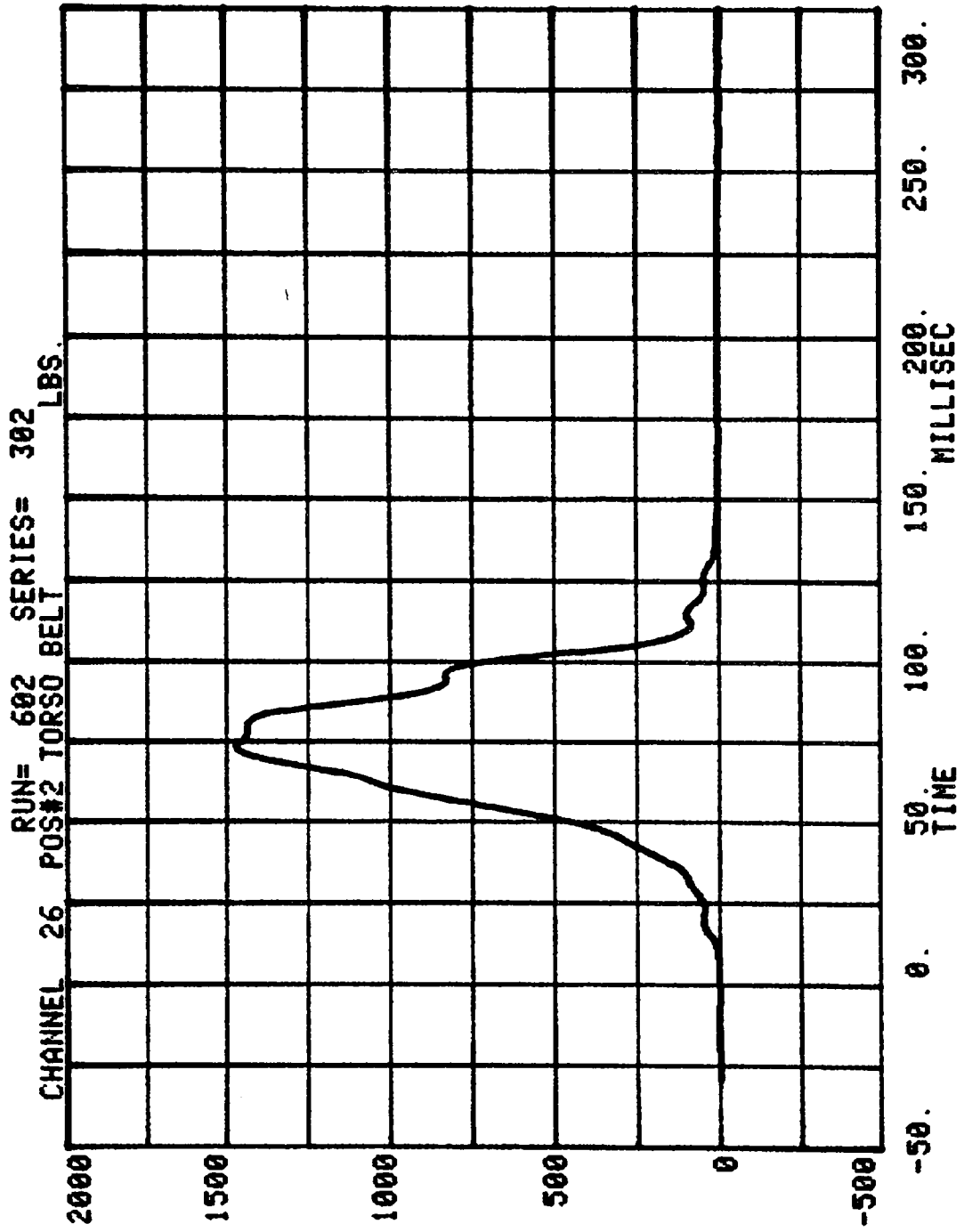
RUN= 602 SERIES= 302



CHANNEL 24 POS#2 RIGHT BELT

RUN= 602 SERIES= 302 LBS.

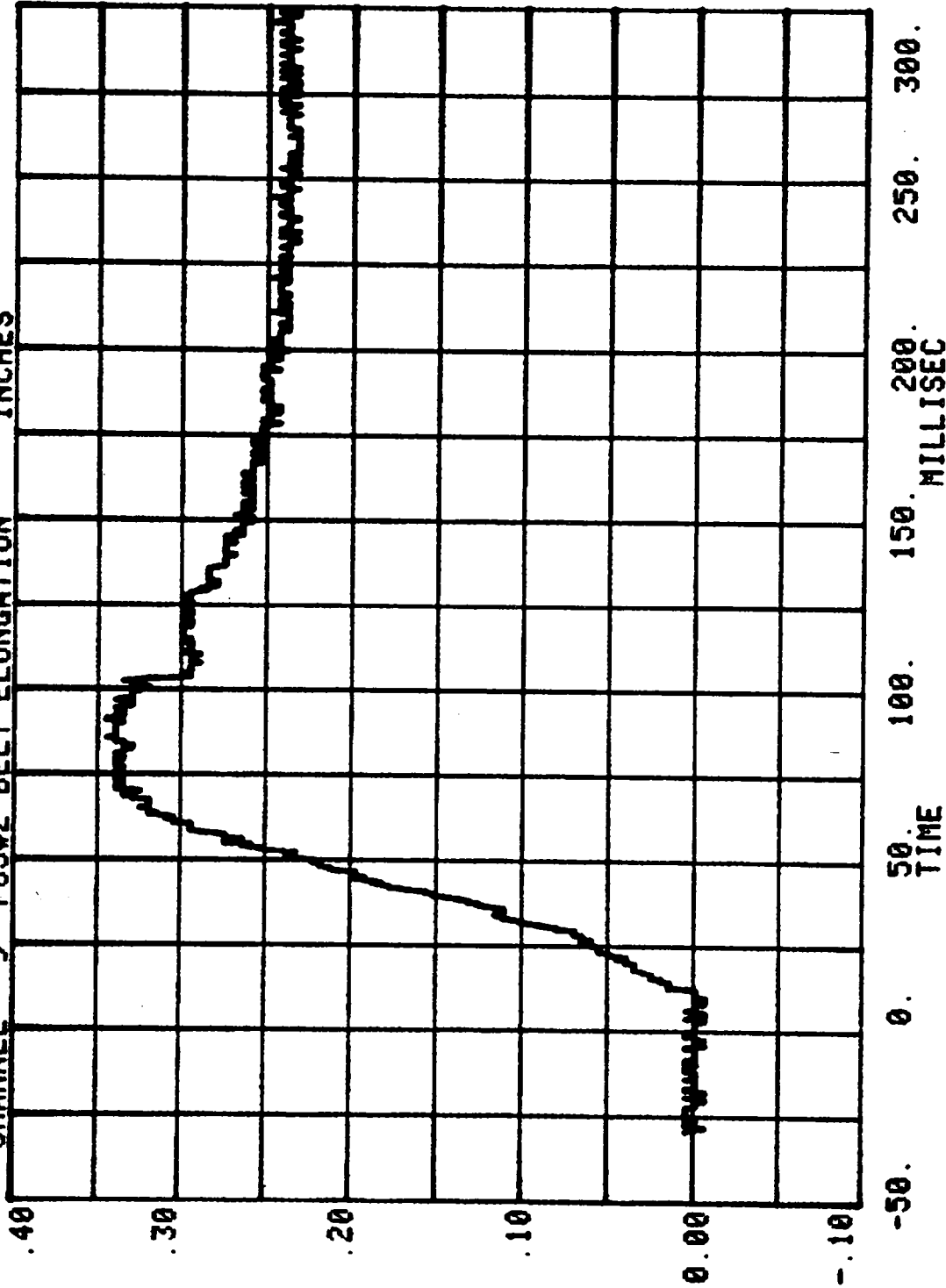


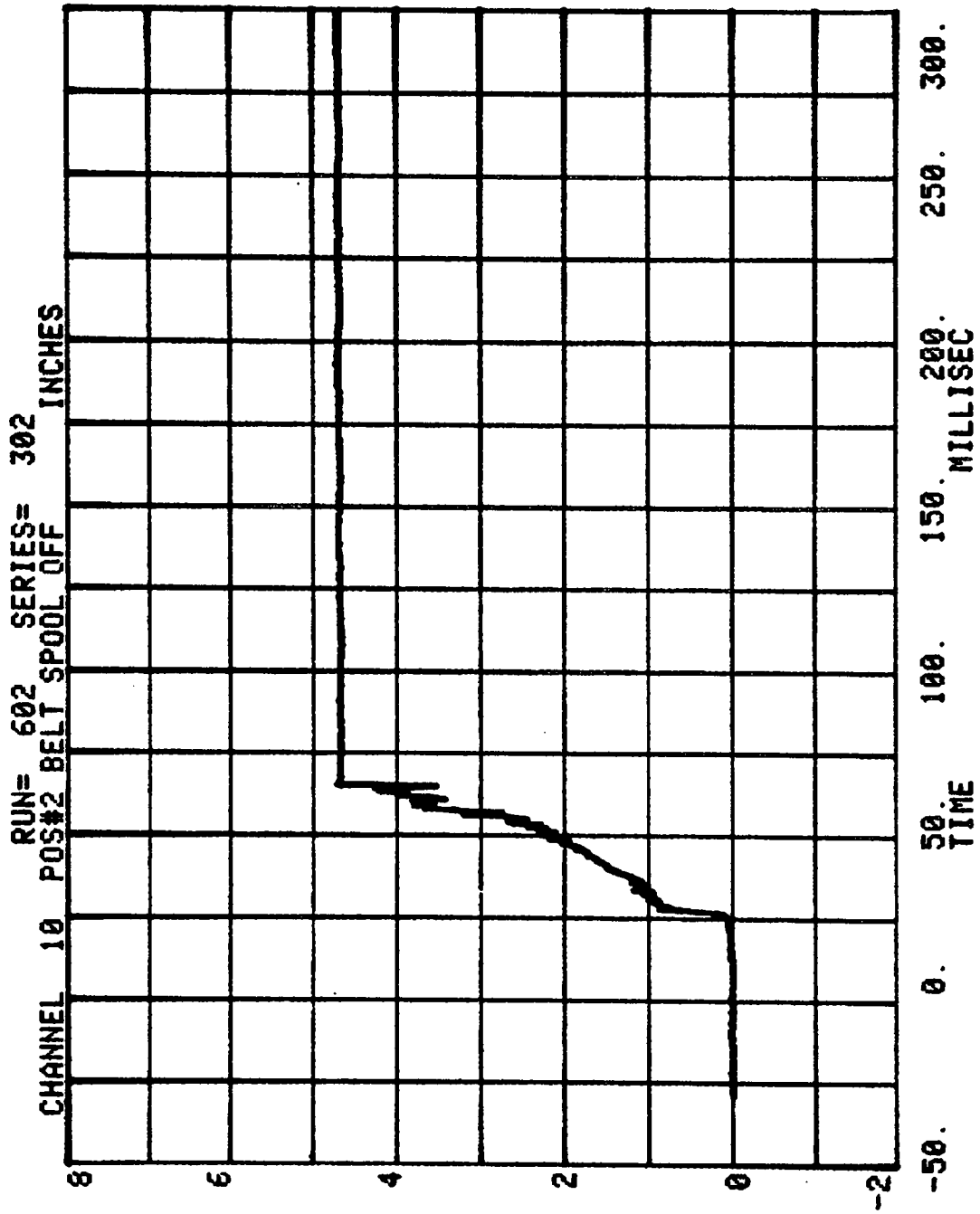


CHANNEL 9 POS#2 BELT ELONGATION

RUN= 602 SERIES= 302 INCHES

(MEASURED OVER 3 INCHES)





APPENDIX C
DUMMY CERTIFICATION TESTS

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

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

Dummy serial numbers and certification dates are:

<u>Serial No.</u>	<u>Completion Date</u>
1019	11/9/83
-1022	11/9/83

Electronic Test Equipment

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

P.572 DUMMY CALIBRATION TEST DATA

NHTSA DUMMY ID NO. 1019

LABORATORY TECHNICIAN: Gary Gestwick

APPROVED BY: *Saverio J. Pugliese*

	Pre-Test Calibration	Post-Test Calibration
Date of Dummy Calibration - - - - -	11/7/83 - 11/9/83	
Calibration Sequential Number for Dummy - - - -	3	
Temperature in Lab. (Spec. = 66 to 78°F)- - - -	72° - 76°	
Relative Humidity in Lab. (Spec. = 10 to 70%) -	34% - 45%	

TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST:			
a. Peak Resultant Accel. -	210 to 260G	260 g	
b. Peak Lateral Accel. - -	≤10G	7 g	
c. Time above 100G - - - -	0.9 to 1.5 ms	1.12 ms.	
2. NECK BENDING TEST:			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	23.0 fps	
b. Pendulum Avg. Decel. (over t ₃ - t ₂) - - - -	20 to 24G	23.5 g	
c. Peak Resultant Head Acceleration - - - -	26G maximum	25 g	
d. Pendulum Decel. (t ₂ -t ₁)	≤3 ms	2.5 ms.	
e. Pendulum Decel. (t ₃ -t ₂)	25 to 30 ms	27.5 ms.	
f. Pendulum Decel. (t ₄ -t ₃)	≤10 ms	5.6 ms.	
g. Pendulum Direction Reversal Time - - - -		115 ms.	
h. Max. Head Rotation - -	63 to 73°	72°	
i. Chordal Displacement:			
Head Rotation Angle - -			
0°	Time	-2 to 2 ms	0 ms.
	Displ.	-.5 to .5 in	0.0 in.
30°	Time	25.6 to 34.4 ms	29.5 ms.
	Displ.	2.1 to 3.1 in.	3.0 in.
60°	Time	40.3 to 51.7 ms	44 ms.
	Displ.	4.3 to 5.3 in.	4.8 in.
Maximum (72°)	Time	53.2 to 66.8 ms	56.5 ms.
	Displ.	5.0 to 6.0 in.	5.6 in.

TEST PARAMETER	SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
2.. NECK BENDING TEST			
<u>Continued</u>			
i. Chordal Displacement:			
Head Rotation Angle --			
60°	Time	67.0 to 83.0 ms	79 ms.
	Displ.	4.3 to 5.3 in.	4.5 in.
30°	Time	85.4 to 104.6 ms	94.5 ms.
	Displ.	2.1 to 3.1 in.	2.6 in.
0°	Time	101.0 to 123.0 ms	109.5 ms.
	Displ.	-.5 to 0.5 in.	0.0 in.
3. ABDOMINAL COMPRESSION TEST:			
(Preload = 10 pounds)			
a. Force @ 1" - - - - -	50 to 63 lbs.	54 lbs.	
b. Force @ 1.3" - - - - -	73 to 88 lbs.	74 lbs.	
4. LUMBAR FLEXION TEST:			
a. Force @ 20° - - - - -	22 to 34 lbs.	33.5 lbs.	
b. Force @ 30° - - - - -	34 to 46 lbs.	40.0 lbs.	
c. Force @ 40° - - - - -	46 to 58 lbs.	48 lbs.	
d. Return Angle - - - - -	12° maximum	5°	
5. CHEST IMPACT TESTS:			
a. High Speed			
(1) Probe Speed - - - - -	21.78-22.22 fps	22.10 fps	
(2) Peak Deflection - - - - -	1.7" maximum	1.68 in.	
(3) Peak Resistive Force - - - - -	2250 lbs. maximum	1910 lbs.	
(4) Internal Hysteresis - - - - -	50 to 70%	54.0%	
b. Low Speed			
(1) Probe Speed - - - - -	13.86-14.14 fps	14.09 fps	
(2) Peak Deflection - - - - -	1.1" maximum	1.08 in.	
(3) Peak Resistive Force - - - - -	1450 lbs. maximum	1240 lbs.	
(4) Internal Hysteresis - - - - -	50 to 70%	54.6%	

P.572 DUMMY CALIBRATION TEST DATAContinued:

NHTSA DUMMY ID NO. 1019

TEST PARAMETER	SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
6. <u>KNEE IMPACT TESTS:</u>			
a. Right Side --			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.99 fps	
(2) Maximum Force - -	1850 to 2500 lbs	2400 lbs.	
(3) Time Above 1000#	1.7 ms minimum	1.84 ms.	
b. Left Side --			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.87 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2200 lbs.	
(3) Time Above 1000#	1.7 ms minimum	1.7 ms.	

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NO. 1019

CALIB. SEQ. NOS. FOR DUMMY: 3 & _____

A. DUMMY INSTRUMENTS:

1. Head Accelerometers--
 - a. Triaxial unit - - - -
 - b. Uniaxial units
 - (1) Longitudinal (A_x) -
 - (2) Lateral (A_y) - - -
 - (3) Vertical (A_z) - - -
2. Chest Accelerometers--
(Vehicle Crash Test Usage)
 - a. Triaxial unit - - - -
 - b. Uniaxial units
 - (1) Longitudinal (A_x) -
 - (2) Lateral (A_y) - - -
 - (3) Vertical (A_z) - - -

3. Chest Potentiometer - - -
4. Femur Load Cells--
 - a. Right Side - - - - -
 - b. Left Side

B. CALIB. LAB. INSTRUMENTS:

1. Pendulum Accelerometer - -
2. Test Probe Accelerometer -
3. Lumbar Flexion Test Push
Force Gauge - - - - -
4. Abdominal Compression Test
Force Gauge - - - - -
5. Abdominal Compression Test
Displacement Gauge - - - -

MANUFACTURER	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
ENDEVCO	DB47	7/83	1/84
ENDEVCO	CX05	7/83	1/84
ENDEVCO	CJ54	7/83	1/84
GSE	312	7/83	1/84
GSE	311	7/83	1/84
CEC	22707	7/83	1/84
CEC	22958	7/83	1/84
TRANSDUCER INC	20051	7/83	1/84
BLH	72952	7/83	1/84
CIC	567-11	7/83	1/84

P.572 DUMMY CALIBRATION TEST DATA

NHTSA DUMMY ID NO. 1022

LABORATORY TECHNICIAN: Gary Gestwick

APPROVED BY: *Saverio P. Pignone*

	Pre-Test Calibration	Post-Test Calibration
Date of Dummy Calibration - - - - -	11/7/83 - 11/9/83	
Calibration Sequential Number for Dummy - - - -	2	
Temperature in Lab. (Spec. = 66 to 78°F) - - - -	72° - 76°	
Relative Humidity in Lab. (Spec. = 10 to 70%) -	34% - 45%	

TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST:			
a. Peak Resultant Accel. -	210 to 260G	240 g	
b. Peak Lateral Accel. - -	≤10G	8 g	
c. Time above 100G - - - -	0.9 to 1.5 ms	1.2 ms.	
2. NECK BENDING TEST:			
a. Pendulum Speed - - - -	21.5 to 25.5 fps		
b. Pendulum Avg. Decel. (over t ₃ - t ₂) - - - -	20 to 24G	22.5 g	
c. Peak Resultant Head Acceleration - - - -	26G maximum	24 g	
d. Pendulum Decel. (t ₂ -t ₁)	≤3 ms	2.5 ms.	
e. Pendulum Decel. (t ₃ -t ₂)	25 to 30 ms	26.3 ms.	
f. Pendulum Decel. (t ₄ -t ₃)	≤10 ms	6.9 ms.	
g. Pendulum Direction Reversal Time - - - -		115 ms.	
h. Max. Head Rotation - -	63 to 73°	73°	
i. Chordal Displacement:			
Head Rotation Angle - -			
0°	Time	-2 to 2 ms	0 ms.
	Displ.	-.5 to .5 in	0.0 in.
30°	Time	25.6 to 34.4 ms	29.5 ms.
	Displ.	2.1 to 3.1 in.	2.9 in.
60°	Time	40.3 to 51.7 ms	44 ms.
	Displ.	4.3 to 5.3 in.	4.8 in.
Maximum (73°)	Time	53.2 to 66.8 ms	58.5 ms.
	Displ.	5.0 to 6.0 in.	5.6 in.

Continued

TEST PARAMETER	SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
2. NECK BENDING TEST			
<u>Continued</u>			
i. Chordal Displacement:			
Head Rotation Angle --			
60°	Time	67.0 to 83.0 ms	79 ms.
	Displ.	4.3 to 5.3 in.	4.5 in.
30°	Time	85.4 to 104.6 ms	94 ms.
	Displ.	2.1 to 3.1 in.	2.5 in.
0°	Time	101.0 to 123.0 ms	109.5 ms.
	Displ.	-.5 to 0.5 in.	0.0 in.
3. ABDOMINAL COMPRESSION TEST:			
(Preload = 10 pounds)			
a. Force @ 1" - - - - -	50 to 63 lbs.	55 lbs.	
b. Force @ 1.3" - - - - -	73 to 88 lbs.	80 lbs.	
4. LUMBAR FLEXION TEST:			
a. Force @ 20° - - - - -	22 to 34 lbs.	33.5 lbs.	
b. Force @ 30° - - - - -	34 to 46 lbs.	45.5 lbs.	
c. Force @ 40° - - - - -	46 to 58 lbs.	56.5 lbs.	
d. Return Angle - - - - -	12° maximum	7°	
5. CHEST IMPACT TESTS:			
a. High Speed			
(1) Probe Speed - - - - -	21.78-22.22 fps	22.03 fps	
(2) Peak Deflection - - - - -	1.7" maximum	1.62 in.	
(3) Peak Resistive Force - - - - -	2250 lbs. maximum	1940 lbs.	
(4) Internal Hysteresis - - - - -	50 to 70%	56.2%	
b. Low Speed			
(1) Probe Speed - - - - -	13.86-14.14 fps	13.97 fps	
(2) Peak Deflection - - - - -	1.1" maximum	.96 in.	
(3) Peak Resistive Force - - - - -	1450 lbs. maximum	1240 lbs.	
(4) Internal Hysteresis - - - - -	50 to 70%	52.1%	

P.572 DUMMY CALIBRATION TEST DATAContinued:

NHTSA DUMMY ID NO. 1022

TEST PARAMETER	SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
6. KNEE IMPACT TESTS:			
a. Right Side --			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.96 fps	
(2) Maximum Force - -	1850 to 2500 lbs	2300 lbs.	
(3) Time Above 1000#	1.7 ms minimum	2.0 ms.	
b. Left Side --			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.90 fps	
(2) Maximum Force - -	1850 to 2500 lbs.	2000 lbs.	
(3) Time Above 1000#	1.7 ms minimum	2.08 ms.	

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NO. 1022

CALIB. SEQ. NOS. FOR DUMMY: 2 & _____

A. DUMMY INSTRUMENTS:

1. Head Accelerometers--

a. Triaxial unit - - - -

b. Uniaxial units

(1) Longitudinal (A_x) -

(2) Lateral (A_y) - - -

(3) Vertical (A_z) - - -

2. Chest Accelerometers--
(Vehicle Crash Test Usage)

a. Triaxial unit - - - -

b. Uniaxial units

(1) Longitudinal (A_x) -

(2) Lateral (A_y) - - -

(3) Vertical (A_z) - - -

3. Chest Potentiometer - - -

4. Femur Load Cells--

a. Right Side - - - - -

b. Left Side

B. CALIB. LAB. INSTRUMENTS:

1. Pendulum Accelerometer - -

2. Test Probe Accelerometer -

3. Lumbar Flexion Test Push
Force Gauge - - - - -

4. Abdominal Compression Test
Force Gauge - - - - -

5. Abdominal Compression Test
Displacement Gauge - - - -

MANUFACTURER	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
ENDEVCO	DB47	7/83	1/84
ENDEVCO	CX05	7/83	1/84
ENDEVCO	CJ54	7/83	1/84
GSE	312	7/83	1/84
GSE	311	7/83	1/84
CEC	22707	7/83	1/84
CEC	22958	7/83	1/84
TRANSDUCER INC	20051	7/83	1/84
BLH	72952	7/83	1/84
CIC	567-11	7/83	1/84