

REPORT NO. TRC-85-N02

DOT 790

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

MAZDA MOTOR CORPORATION

1985 MAZDA RX-7
2-DOOR COUPE
NHTSA NO. CF5401
TRCO TEST NO. 850123

THE TRANSPORTATION RESEARCH CENTER OF OHIO
ST. RT. 33, LOGAN COUNTY
EAST LIBERTY, OHIO 43319



FEBRUARY 1985
FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF MARKET INCENTIVES
400 SEVENTH STREET, S.W.
ROOM NO. 5313 (NRM-22)
WASHINGTON, DC 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-84-D-11149. 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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MAR 5 1985

Date of Report Acceptance

1. Report No. TRC-85-N02	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle NHTSA NEW CAR ASSESSMENT PROGRAM (NCAP) FRONTAL BARRIER IMPACT TEST ON 1985 MAZDA RX-7 2-DOOR COUPE TO INDICANT REQUIREMENTS OF FMVSS NOS. 208, 212, 219 (PARTIAL), AND 301-75		5. Report Date FEBRUARY 1985
		6. Performing Organization Code TRC
7. Author(s) M.S. Beebe, Project Engineer, TRCO		8. Performing Organization Report No. TRC-OMI-02
9. Performing Organization Name and Address Transportation Research Center of Ohio St. Rt. 33, Logan County East Liberty, Ohio 43319		10. Work Unit No. (TRAIS) TRC-85-DOT-2
		11. Contract or Grant No. DTNH22-84-D11149
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Market Incentives (NRM-20) 400 Seventh St., S.W., Washington, DC 20590		13. Type of Report and Period Covered FINAL REPORT January-February 1985
		14. Sponsoring Agency Code DOT/NHTSA/RM/OMI
15. Supplementary Notes		
16. Abstract A 35 mph frontal barrier impact test using a load cell barrier was conducted on a 1985 Mazda RX-7 2-door Coupe at the Transportation Research Center of Ohio in East Liberty, Ohio on January 23, 1985. The barrier impact velocity was 35.3 mph, and the ambient temperature at the barrier face at the time of impact was 70°F. The post-test vehicle crush maximum was 27.7 inches and intrusion of the firewall into the compartment was 1.7 inches. The test vehicle appeared to comply with the indicant requirements of the following Federal Motor Vehicle Safety Standards: 1. FMVSS No. 212, "Windshield Mounting" 2. FMVSS No. 219 (Partial), "Windshield Zone Intrusion" 3. FMVSS No. 301-75, "Fuel System Integrity" Driver HIC: 921.30 Passenger HIC: 1344.91		
17. Key Words 35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP) FMVSS 212 Indicant Testing FMVSS 219 (Partial) Indicant Testing FMVSS 301-75 Indicant Testing		18. Distribution Statement Available from: Technical Reference Division, National Highway Traffic Safety Administration Nassif Building, Room 5108 400 Seventh Street, S.W. Washington, DC 20590
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 166
		22. Price

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures			
Symbol	When You Know	Multiply by	To Find
LENGTH			
in	inches	2.5	centimeters
ft	feet	30	centimeters
yd	yards	0.9	meters
mi	miles	1.6	kilometers
AREA			
in ²	square inches	6.5	square centimeters
ft ²	square feet	0.09	square meters
yd ²	square yards	0.8	square meters
mi ²	square miles	2.6	square kilometers
acres	acres	0.4	hectares
MASS (weight)			
oz	ounces	28	grams
lb	pounds	0.45	kilograms
short tons	short tons	0.9	metric ton
(2000 lb)			
VOLUME			
tsp	teaspoons	5	milliliters
Tbsp	tablespoons	15	milliliters
in ³	cubic inches	16	milliliters
fl oz	fluid ounces	30	milliliters
c	cups	0.24	liters
pt	pints	0.47	liters
qt	quarts	0.95	liters
gal	gallons	3.8	liters
ft ³	cubic feet	0.03	cubic meters
yd ³	cubic yards	0.76	cubic meters
TEMPERATURE (exact)			
°F	degrees Fahrenheit	5/9 (after subtracting 32)	degrees Celsius

Approximate Conversions from Metric Measures			
Symbol	When You Know	Multiply by	To Find
LENGTH			
mm	millimeters	0.04	inches
cm	centimeters	0.4	inches
m	meters	3.3	feet
m	meters	1.1	yards
km	kilometers	0.6	miles
AREA			
cm ²	square centimeters	0.16	square inches
m ²	square meters	1.2	square yards
km ²	square kilometers	0.4	square miles
ha	hectares	2.5	acres
(10 000 m ²)			
MASS (weight)			
g	grams	0.035	ounces
kg	kilograms	2.2	pounds
metric ton	metric ton	1.1	short tons
(1000 kg)			
VOLUME			
mL	milliliters	0.03	fluid ounces
mL	milliliters	0.06	cubic inches
L	liters	2.1	pints
L	liters	1.06	quarts
L	liters	0.26	gallons
m ³	cubic meters	35	cubic feet
m ³	cubic meters	1.3	cubic yards
TEMPERATURE (exact)			
°C	degrees Celsius	9/5 (then degrees add 32)	degrees Fahrenheit

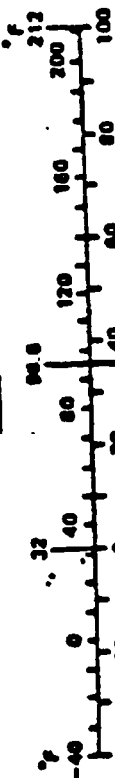


TABLE OF CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
1.0	PURPOSE AND TEST PROCEDURE	1-1
2.0	SUMMARY OF FRONTAL BARRIER IMPACT TEST	2-1
3.0	SUMMARY OF RESULTS FOR FMVSS NOS. 212, 219 AND 301-75	3-1
4.0	OCCUPANT AND VEHICLE INFORMATION	4-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	DATA PLOTS	B-1
APPENDIX C	DUMMY CERTIFICATION	C-1
APPENDIX D	RESTRAINT INSTRUCTIONS FROM OWNER'S MANUAL	D-1

SECTION 1.0
PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is part of the Composite FY'85 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-84-D-11149. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 30 mph FMVSS 212/219/301-75 requirements.

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

SECTION 2.0
SUMMARY OF TEST NUMBER CF5401

A load cell barrier consisting of 36 load cells was impacted by a 1985 Mazda RX-7 2-door Coupe at a velocity of 35.3 mph. The test was performed at the Transportation Research Center of Ohio on January 23, 1985. Pre- and post-test photographs of the vehicle and occupants can be found in Appendix A.

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 procedures specified in Laboratory Indicant Test Procedure dated September 1, 1984.

Both ATDs were instrumented with head and chest triaxial accelerometers and right/left femur load cells. In addition, load cells were placed on the driver's and passenger's lap and shoulder belts to measure dummy upper torso and pelvic section loading. A summary of dummy calibration test data can be found in Appendix C.

The crash event was recorded by one real-time camera and 16 high-speed cameras.

The 67 channels of data were recorded on two 14 track tape drives. Appendix B contains the vehicle and dummy response data plots.

CRASH TEST SUMMARY

TEST NO. 850123

PROJECT: CF5401

DATE: January 23, 1985

TIME: 14:18

TEMP: 70°F

VEHICLE: Mazda RX-7

TEST WEIGHT (LBS): 2873

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (MPH)**: 35.3

MAX CRUSH (IN) STATIC: 27.7

DUMMIES

TYPE: Part 572

Part 572

LOCATION: Front Left

Front Right

RESTRAINT: 3-pt. Production Seat Belt

3-pt. Production Seat Belt

NUMBER OF DATA CHANNELS: 67

NUMBER OF HIGH SPEED CAMERAS: 16 and 1 real-time camera

*With respect to tow track centerline.

**Speed trap measurement ($\pm$.05% accuracy).

GENERAL COMMENTS

The 1985 Mazda RX-7 2-door Coupe was equipped with a 1148 cubic centimeter, 2-rotor rotary engine and five-speed manual transmission. The total test weight with two 50th percentile male dummies, instrumentation and two on-board cameras was 2873 pounds.

The test vehicle impacted the frontal load cell barrier at a velocity of 35.3 mph and appeared to comply with FMVSS Nos. 212, "Windshield Mounting" and 301-75, "Fuel System Integrity". There was 100 percent windshield retention and a total of 4.38 oz of fuel leakage during the rollover test.

The vehicle sustained 27.7 inches of static crush. Maximum load cell barrier force measured by the 36 load cells was 86,480 pounds at 65.88 milliseconds.

The driver's "Head Injury Criteria" was 921.30. The maximum chest deceleration over 3 milliseconds was 40.3 g's, and right and left femur loads were 476 and 369 pounds respectively.

The right-front passenger's HIC was 1344.91, the maximum chest deceleration over 3 milliseconds was 41.6 g's, and the right and left femur loads were 809 and 604 pounds respectively.

The belt-related data for each occupant are presented in Section 4.0 of this report.

TEST ANOMALIES

A cable to the accelerometer on the bottom the engine block, ENGXB2, was cut during the test.

The displacement transducer on the passenger's shoulder belt, SHBD2, broke during the test.

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Mazda Motor Corporation

MAKE/MODEL: Mazda RX-7

VIN: JM1FB3318F0857198

BODY STYLE: 2-door Coupe

MODEL YEAR: 1985

NHTSA NO.: CF5401

COLOR: Silver

ENGINE DATA: TYPE: Rotary ROTORS: 2 DISPLACEMENT: 1148 cc

 X GAS, DIESEL, TURBOCHARGE

TRANSMISSION DATA: 5 SPEED, X MANUAL, AUTOMATIC

DATE VEHICLE RECEIVED: 11/16/84

ODOMETER READING: 225

DEALER'S NAME AND ADDRESS: Carmody Motors, Inc.
Lancaster, Ohio

ACCESSORIES:

POWER STEERING	No	AUTOMATIC TRANSMISSION	No
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	Yes	AIR CONDITIONING	No
RADIO	Yes	ANTI-SKID BRAKE	No
CLOCK	Yes	REAR WINDOW DEFROSTER	Yes
OTHER			

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

VEHICLE MANUFACTURED BY: Mazda Motor Corporation

DATE OF MANUFACTURE: 8/84

GVWR: 2875 LBS.,

GAWR: FRONT 1700 LBS., REAR 1700 LBS.

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 27 PSI; REAR 27 PSI

RECOMMENDED TIRE SIZE: 165 HR 13 LOAD RANGE X B, C, D

TIRES ON VEHICLE (MFGR., LINE, SIZE): Bridgestone RD-207 Steel, 165 HR 13

IS SPARE TIRE A "SPACE SAVER": Yes

IS SPARE TIRE STANDARD EQUIPMENT: Yes

VEHICLE CAPACITY: TYPES OF SEATS Front - Bucket

TYPE OF FRONT SEAT BACKS Adjustable reclining

NUMBER OF OCCUPANTS 2 FRONT 0 REAR 2 TOTAL

CARGO LOAD 40 LBS. TOTAL 340 LBS.

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

RIGHT FRONT 615 LBS. RIGHT REAR 571 LBS.

LEFT FRONT 617 LBS. LEFT REAR 596 LBS.

TOTAL FRONT WEIGHT 1232 LBS. (51.4 % OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 1167 LBS. (48.6 % OF TOTAL VEHICLE WEIGHT)

TOTAL DELIVERED WEIGHT 2399 LBS.

CALCULATION FOR TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (2399 LBS)

VCW = VEHICLE CAPACITY WEIGHT (340 LBS)

DSC = DESIGNATED SEATING CAPACITY (2)

RCLW = VCW - 150 (DSC) =

= 340 - 300 = 40 LBS

TARGET TEST WEIGHT = UDW + RCLW + (2 DUMMIES X 164 LBS/DUMMY)

= 2399 + 40 + 328 LBS

TARGET TEST WEIGHT = 2767 LBS

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 40 LBS. CARGO:

RIGHT FRONT	658	LBS.	RIGHT REAR	768	LBS.
LEFT FRONT	707	LBS.	LEFT REAR	740	LBS.
TOTAL FRONT WEIGHT	1365				LBS. (47.5 % OF TOTAL VEHICLE WEIGHT)
TOTAL REAR WEIGHT	1508				LBS. (52.5 % OF TOTAL VEHICLE WEIGHT)
TOTAL TEST WEIGHT	2873				LBS. (3.8 % OVER TARGET WEIGHT)

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 0 LBS.

COMPONENTS REMOVED TO MEET TARGET WEIGHT: Rear Glass

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 24 3/4	;LF 24 5/8	;RR 25 5/16	;LR 24 7/8
PRE-TEST ATTITUDE:	RF 24 1/2	;LF 24 1/4	;RR 23 1/4	;LR 23 1/4
POST-TEST ATTITUDE:	RF 24 5/8	;LF 23 1/4	;RR 24 7/8	;LR 23
WHEELBASE:	95.5	INCHES		

CG = 50.4 INCHES REARWARD OF FRONT WHEEL CENTERLINE

TEST CONDITIONS

TEST NUMBER: 850123

DATE OF TEST: January 23, 1985

TIME OF TEST: 14:18

TYPE OF TEST: Frontal Load Cell Barrier Impact

IMPACT ANGLE: 0°

AMBIENT TEMPERATURE AT IMPACT AREA: 70°F

TEMPERATURE IN OCCUPANT COMPARTMENT: 76°F

WINDSHIELD MOLDING TEMPERATURE: 70°F

IMPACT VELOCITY: PRIMARY = 35.3 MPH

(SPECIFIED RANGE = 34.5 TO 35.5 MPH)

VEHICLE REBOUND AND CRUSH (ALL DIMENSIONS IN INCHES)

OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: R 165 3/4 ;C 169 5/16 ;L 165 1/2

POST-TEST: R 145 3/4 ;C 141 5/8 ;L 145 1/2

TOTAL CRUSH: R 20 ;C 27 11/16 ;L 20

FOR FRONTAL IMPACTS, DISTANCE FROM FRONT OF TEST VEHICLE TO BARRIER AFTER IMPACT: R: 15 1/2 ;C: 14 3/4 ;L: 15 3/4

VISIBLE DUMMY CONTACT POINTS:

	DRIVER 826	PASSENGER 411
Head	<u>Steering Wheel Rim and Hub, Head Restrataint</u>	<u>Right Knee, Head Restraint</u>
Chest	<u>None</u>	<u>None</u>
Abdomen	<u>None</u>	<u>None</u>
Left Knee	<u>Instrument Panel</u>	<u>Instrument Panel</u>
Right Knee	<u>Instrument Panel</u>	<u>Instrument Panel, Head</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>Difficult</u>	<u>Difficult</u>
Rear	<u>NA</u>	<u>NA</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>No</u>	<u>Forward 3 1/2 Inches</u>
Rear	<u>NA</u>	<u>NA</u>

GLAZING DAMAGE:

No damage to windshield.

OTHER NOTABLE IMPACT EFFECTS:

SECTION 3.0

SUMMARY OF RESULTS FOR - - -

FMVSS 212, "Windshield Mounting"

FMVSS 219 (Partial), "Windshield Zone Intrusion"

FMVSS 301-75, "Fuel System Integrity"

SUMMARY OF FMVSS 212 AND 301 DATA

PRE-IMPACT DATA

MAKE/MODEL: Mazda RX-7

BODY STYLE: 2-door Coupe

NHTSA NO.: CF5401

MODEL YEAR: 1985

COLOR: Silver

DATA FROM CERTIFICATION LABEL

VEHICLE MANUFACTURER: Mazda Motor Corporation

DATE OF MANUFACTURE: 8/84

VIN: JM1FB3318F0857198

GVWR: 2875 LBS., GAWR: FRONT 1700 LBS., REAR 1700 LBS.

POST-IMPACT DATA

TYPE OF TEST: Frontal Load Cell Barrier Impact

DATE OF TEST: 1/23/85

TIME: 14:18

TEMP: 70°F

REQUIRED IMPACT VELOCITY RANGE: 34.5 MPH TO 35.5 MPH

IMPACT VELOCITY: PRIMARY = 35.3 MPH

TEST WEIGHT = 2873 LBS., STATIC CRUSH MAX. = 27.7 IN., REBOUND = 15.8 IN.

FUEL SYSTEM DATA

TEST FLUID TYPE: RED STODDARD SOLVENT #2; SPEC. GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY*: 16.4 GALLONS (FURNISHED BY CTM)

TEST VOLUME: 15.4 GALLONS (92-94% OF USEABLE)

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 16.6 GALLONS

DETAILS OF FUEL SYSTEM: _____

ELECTRIC FUEL PUMP: Yes

FUEL INJECTION: Yes

DOES ELECTRIC FUEL PUMP OPERATE WITH IGNITION SWITCH "ON" AND THE ENGINE NOT OPERATING? Yes

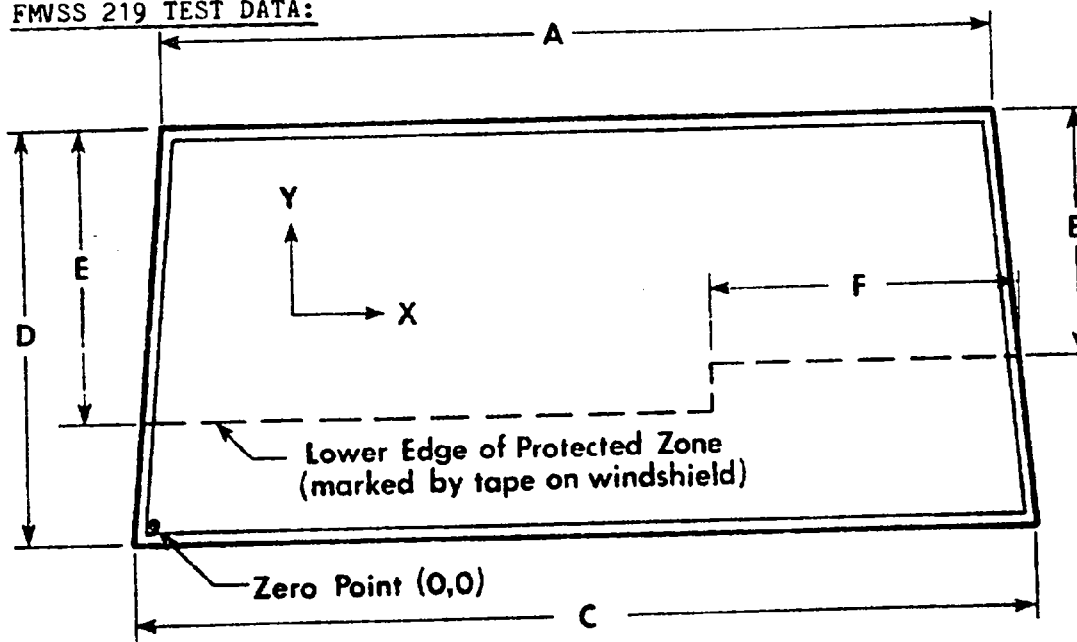
*WITH ENTIRE FUEL SYSTEM FILLED FROM FUEL TANK THROUGH CARBURETOR BOWL.

FMVSS NO. 219, "WINDSHIELD ZONE INTRUSION", DATA SHEET

PROTECTED ZONE LOWER EDGE REQUIREMENT:

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

FMVSS 219 TEST DATA:



FRONT VIEW

A = 44.5

C = 58.0

E = 18.9

B = 19.0

D = 24.8

F = 21.5

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

COORDINATES

X	Y
1.	
2.	
3.	
4.	

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

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

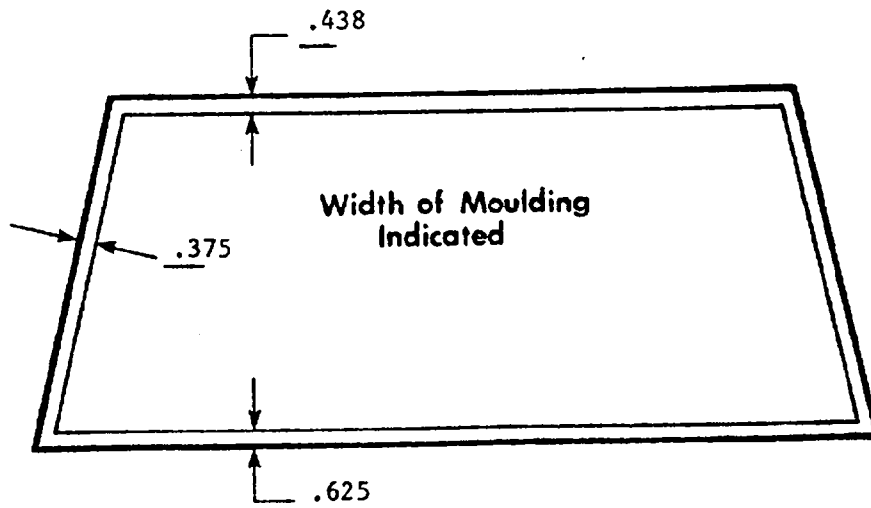
FMVSS 212 REQUIREMENTS: The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

FMVSS 212 TEST DATA:

WINDSHIELD PERIPHERY

	PRE-TEST (in.)	POST-TEST (in.)	PERCENT RETENTION
RIGHT SIDE	76.0	76.0	100%
LEFT SIDE	76.0	76.0	100%
TOTAL	152.0	152.0	100%

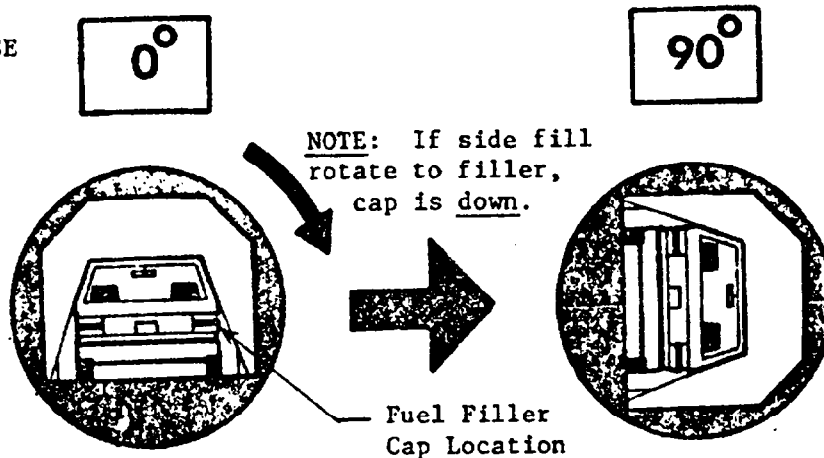
AREA OF RETENTION FAILURE:



FAILURE DETAILS:

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



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

Time req. for machine to rotate 90° = 2 minutes, 00 seconds

FMVSS 301-75 Position Hold Time = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

Next Whole Minute Interval - - - - - = 7:00 minutes

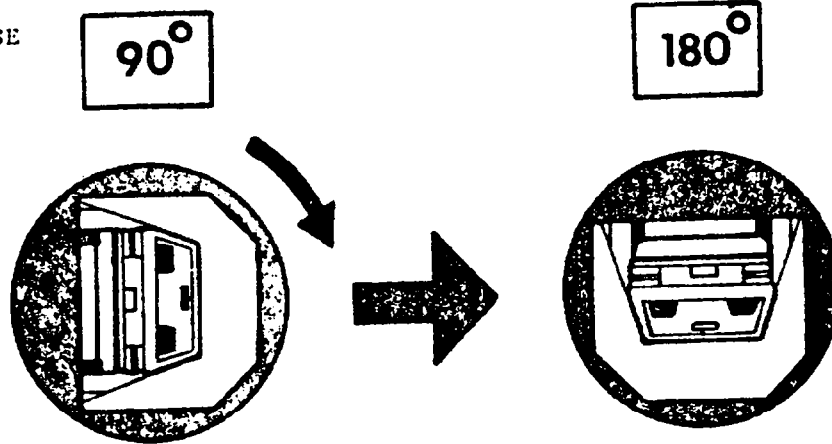
FMVSS 301-75 REQUIREMENTS

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

SOLVENT SPILLAGE LOCATION(S)

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



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

Time req. for machine to rotate 90° = 2 minutes, 00 seconds
 FMVSS 301-75 Position Hold Time = 5 minutes, 00 seconds
 TOTAL - - - - - = 7 minutes, 00 seconds
 Next Whole Minute Interval - - - - = 14:00 minutes

FMVSS 301-75 REQUIREMENTS

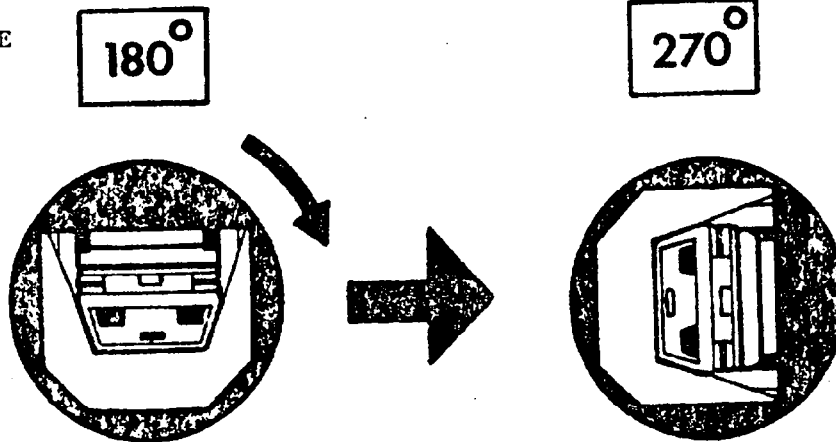
	First 5 Minutes FROM ONSET OF ROTATION	6th Minute	7th Minute
Maximum Allowable Solvent Spillage -	5 oz.	1 oz.	1 oz.
90° to 180° (filler cap down) - - -	3.58	0.40	0.40

SOLVENT SPILLAGE LOCATION(S)

Leaked at carburetor bowl.

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



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

Time req. for machine to rotate 90° = 2 minutes, 00 seconds

FMVSS 301-75 Position Hold Time = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

Next Whole Minute Interval - - - - - = 21:00 minutes

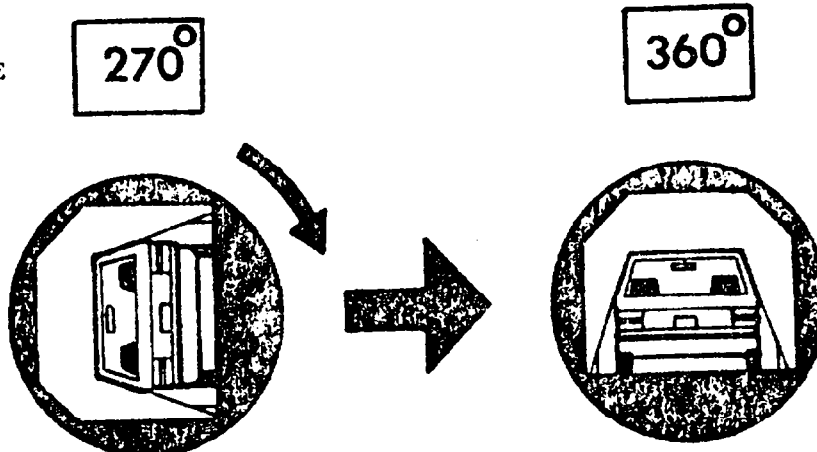
FMVSS 301-75 REQUIREMENTS

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

SOLVENT SPILLAGE LOCATION(S)

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



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

Time req. for machine to rotate 90° = 2 minutes, 00 seconds
 FMVSS 301-75 Position Hold Time = 5 minutes, 00 seconds
 TOTAL - - - - - = 7 minutes, 00 seconds
 Next Whole Minute Interval - - - - = 28:00 minutes

FMVSS 301-75 REQUIREMENTS

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

SOLVENT SPILLAGE LOCATION(S)

VEHICLE STATIC ROLLOVER DATA SUMMARY:

MAXIMUM ALLOWABLE SOLVENT SPILLAGE	FIRST 5 MINUTES FROM ONSET OF ROTATION	6TH MIN.	7TH MIN.
	5 OZ	1 OZ	1 OZ
0 TO 90° (FILLER CAP DOWN) - - - - -	0	0	0
90 TO 180° - - - - -	3.58	0.40	0.40
180 to 270° - - - - -	0	0	0
270 to 360° - - - - -	0	0	0

SECTION 4.0
OCCUPANT, VEHICLE AND LOAD CELL BARRIER INFORMATION

DUMMY INJURY CRITERIA

	MAXIMUM ACCELERATION ('G')							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DRIVER	-98.41	-22.04	-83.28	126.99	-46.23	-30.30	-13.65	40.26
PASSENGER	-217.9	32.08	-173.1	277.6	-37.1	29.6	13.23	41.64

	MAXIMUM FORCE-FEMUR LOAD (LBS)	
	RIGHT FEMUR	LEFT FEMUR
DRIVER	476.5	369.5
PASSENGER	809.1	603.98

	MAXIMUM FORCE-SEAT BELT LOADS (LBS)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DRIVER	1587.97	---	939.6
PASSENGER	1586.50	859.4	---

	HEAD INJURY CRITERIA**		
	HIC	t ₁ (SEC)	t ₂ (SEC)
DRIVER	921.3	69.38	101.63
PASSENGER	1344.9	104.38	106.25

*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No. 208

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the driver leaned forward, striking the head on the steering wheel as the knees moved forward to contact the dash panel. The forehead contacted the upper wheel rim while the mouth and chin area contacted the hub of the wheel. Rebounding from the steering wheel, the dummy rotated back into the seat, striking the back of the head on the headrest as the shoulder belt slipped down the left arm.

PASSENGER

During impact the dummy moved forward in the seat, striking both knees on the dash. As the torso rotated forward, the head came down to hit the right knee. The passenger then returned to an upright position, striking the back of the head on the head rest. Final resting position showed the dummy seated upright.

DUMMY IN-VEHICLE POSITION RECORDING SHEET

VEHICLE NHTSA NO. CP5401

MFR./MAKE/MODEL: Mazda RX-7

SEAT TYPE: Bench
X Bucket
Split Bench

ADJUSTER TYPE: X Manual
Power

BUCKET SEAT BACK TYPE: Fixed
X Adjustable Reclining

TECHNICIANS:

1. D. Carpenter

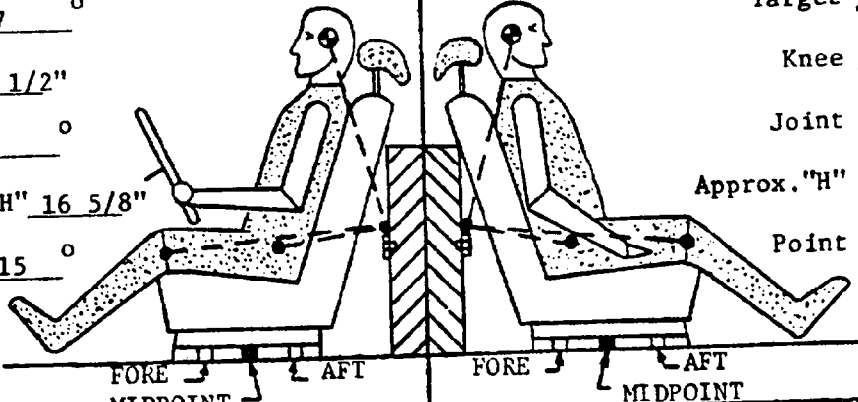
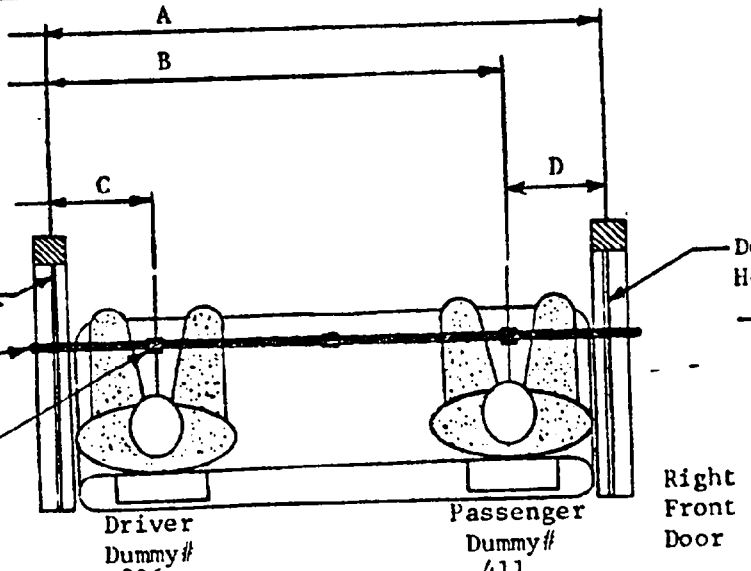
2. N. Echeverria

3. P. Clay

4. _____

POSITIONING DATE: 1/23/85

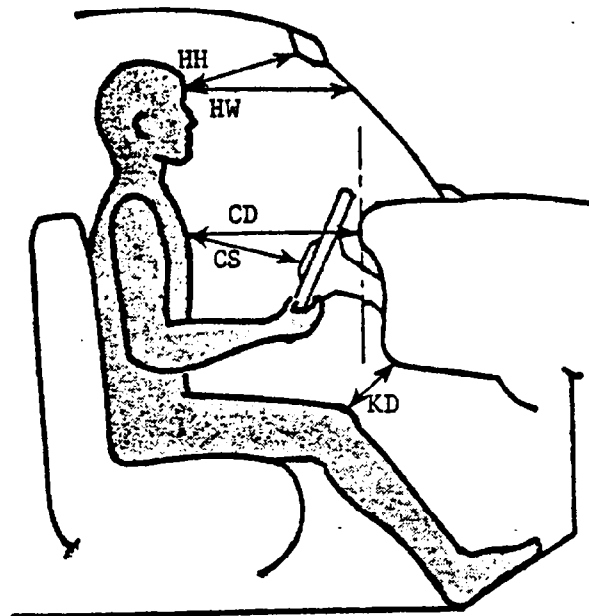
AMBIENT TEMP.: 70° F. TIME: 8:00

DRIVER DUMMY # <u>826</u> TYPE <u>P572</u> Head <u>19 7/8"</u> Target <u>17</u> ° Knee <u>30 1/2"</u> Joint <u>97</u> ° Approx. "H" <u>16 5/8"</u> Point <u>115</u> °	PASSENGER DUMMY # <u>411</u> TYPE <u>P572</u> Head <u>19 5/8"</u> Target <u>25</u> ° Knee <u>30 1/2"</u> Joint <u>95</u> ° Approx. "H" <u>16 1/2"</u> Point <u>119</u> °
	
A = <u>46 1/2"</u> B = <u>37 13/16"</u> C = <u>8 11/16"</u> D = <u>8 11/16"</u> 	

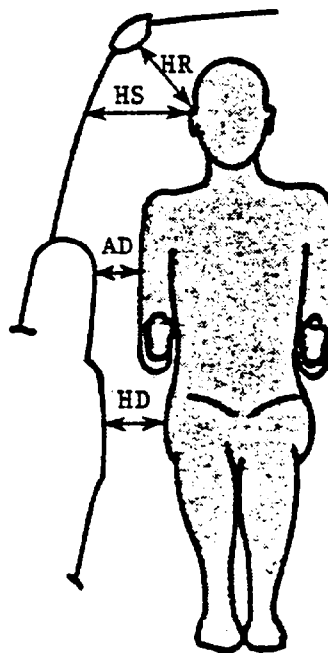
* Door glass height is equal on the right and left side of vehicle.

DUMMY IN-VEHICLE POSITION RECORDING SHEET

	DRIVER 826	PASSENGER 411
HH	12 3/8	12 1/4
HW	16 3/8	16 1/2
CD	22 1/16	23 3/8
CS	15 3/8	DNA
KDL	7	6 1/8
KDR	7	6 1/2

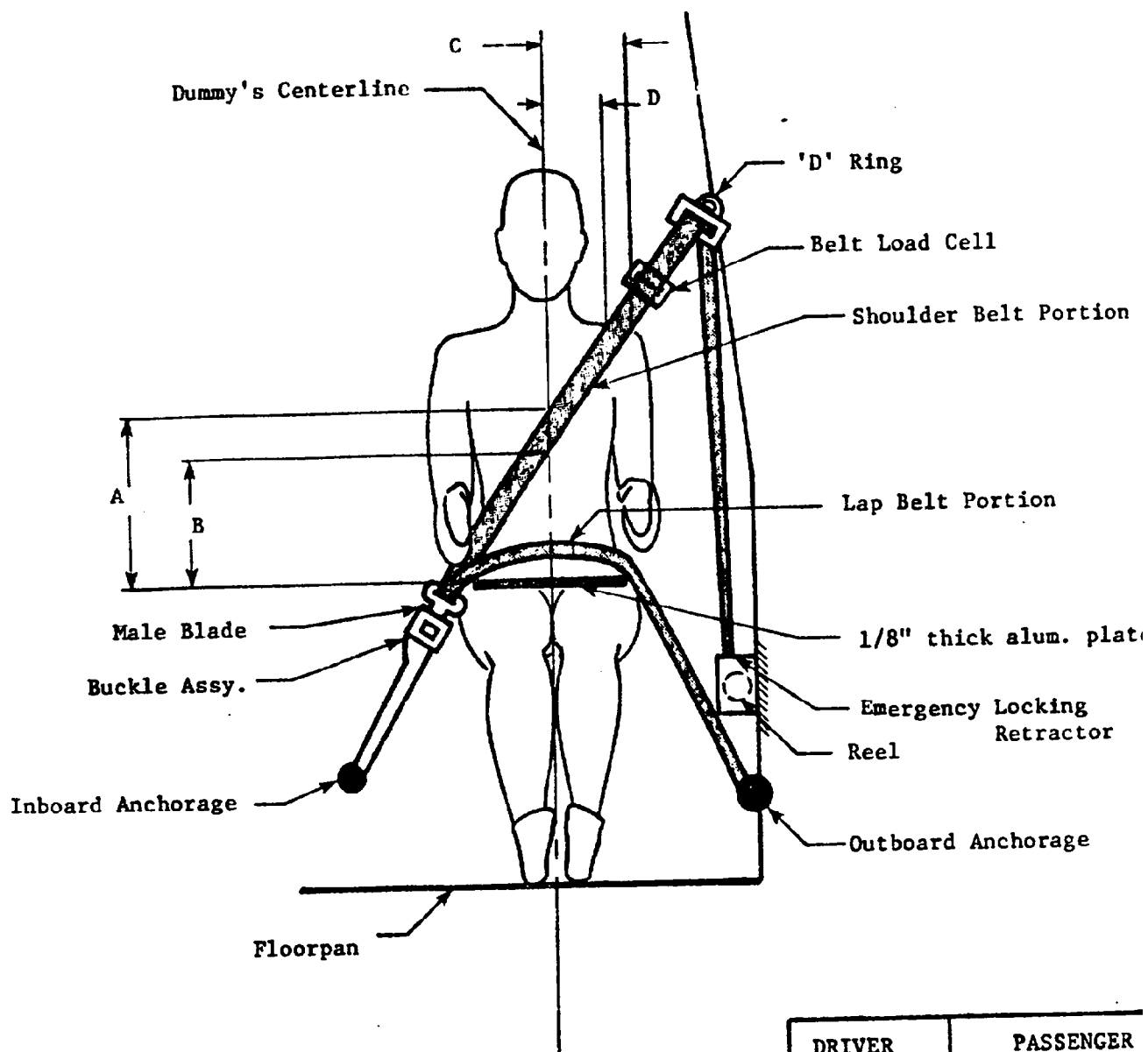


	DRIVER 826	PASSENGER 411
HR	3 1/2	3 9/16
HS	6 11/16	6 3/4
AD	2	3 1/16
HD	5 3/4	4 3/4



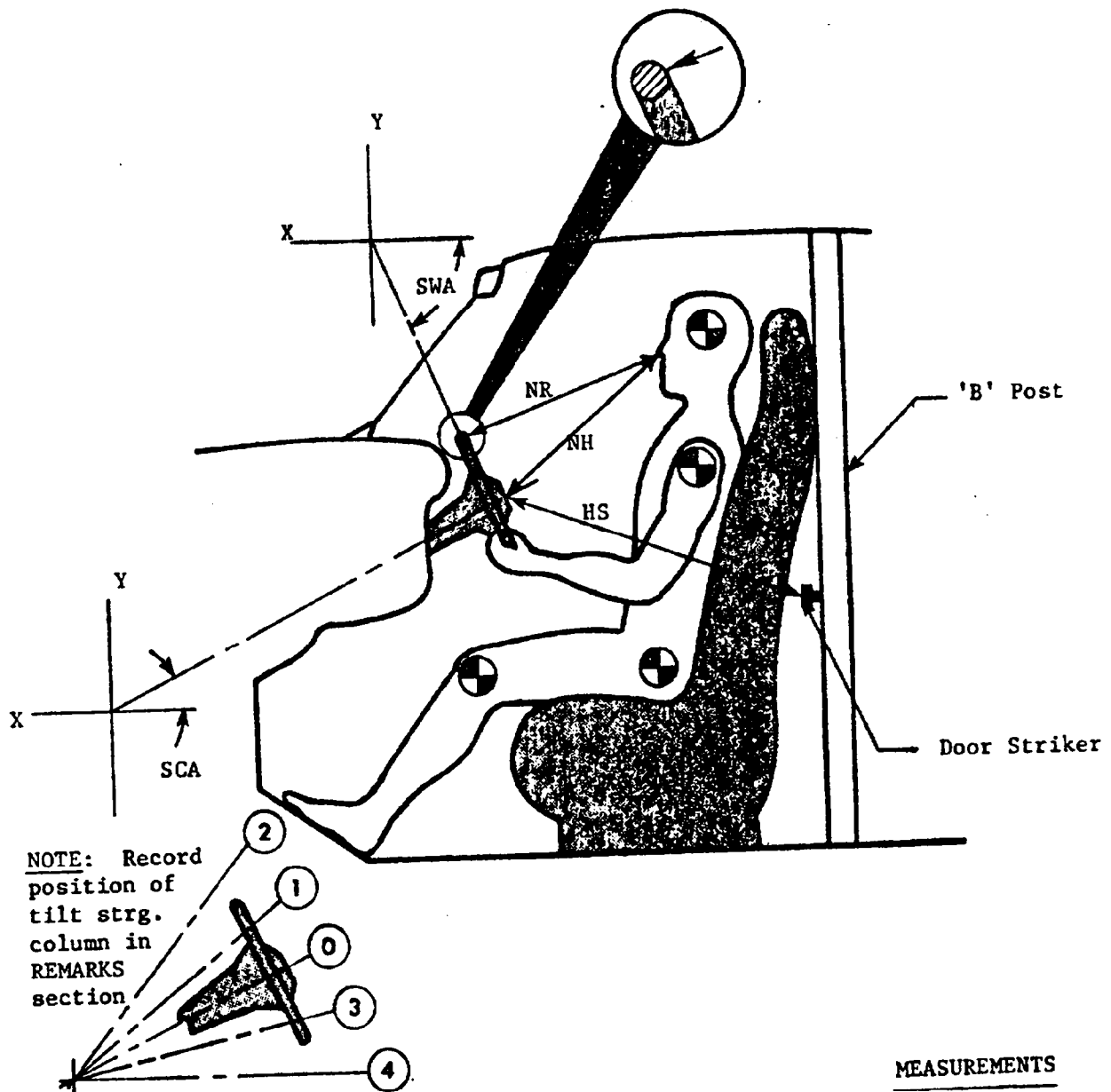
ALL MEASUREMENTS IN INCHES

SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - Top surface of alum. plate to belt upper edge (in)	13 1/4	13 1/2
B - Top surface of alum. plate to belt lower edge (in)	10	10
C - Dummy centerline to outer edge of belt at chest flesh top (in)	5	5 1/2
D - Dummy centerline to inner edge of belt at chest flesh top (in)	3	3
LAP BELT TENSION (lbs)	2	3
SHOULDER BELT TENSION (lbs)	1	1

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



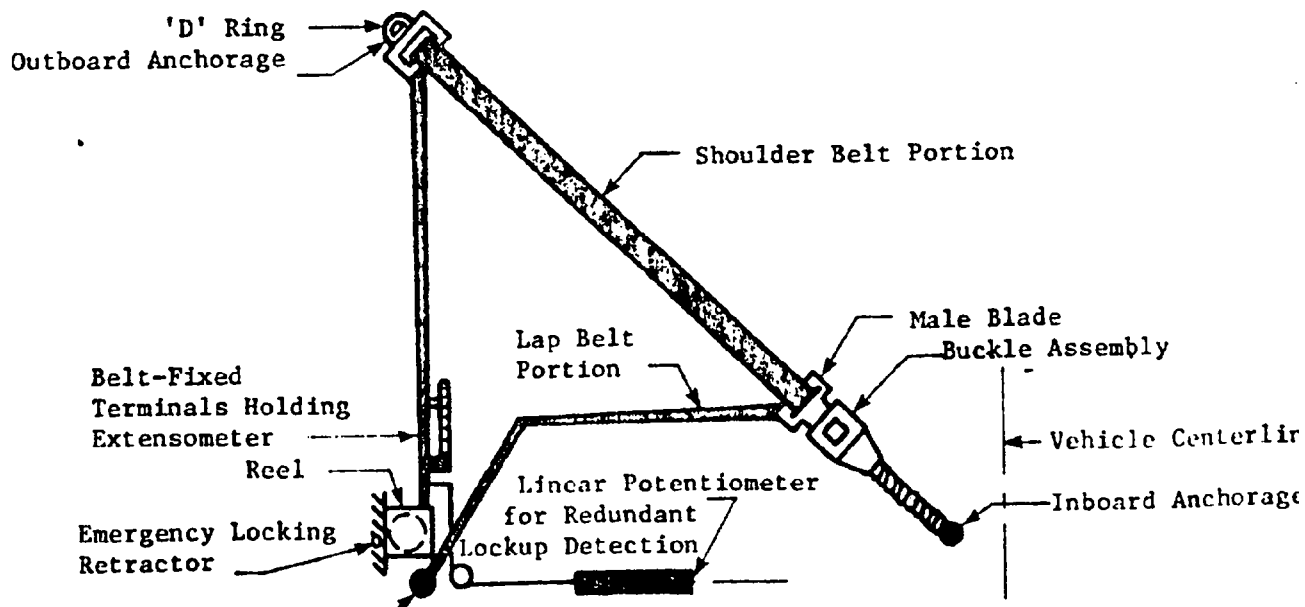
MEASUREMENTS

NR - Distance from tip of dummy's nose to top rear surface of steering wheel rim.	18"
NH - Distance from tip of dummy's nose to center of steering column hub.	19 3/16"
HS - Distance from center of steering column hub to the forward surface of the door lock striker pin.	29 7/8"
SCA - Angle of steering column relative to the horizontal X axis.	29°
SWA - Angle of steering wheel relative to the horizontal X axis.	71°

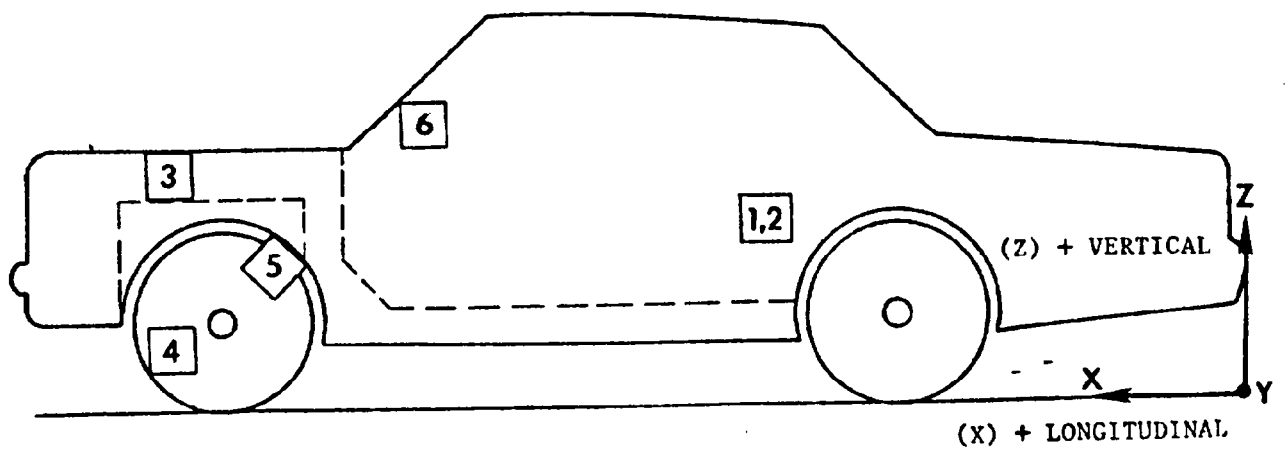
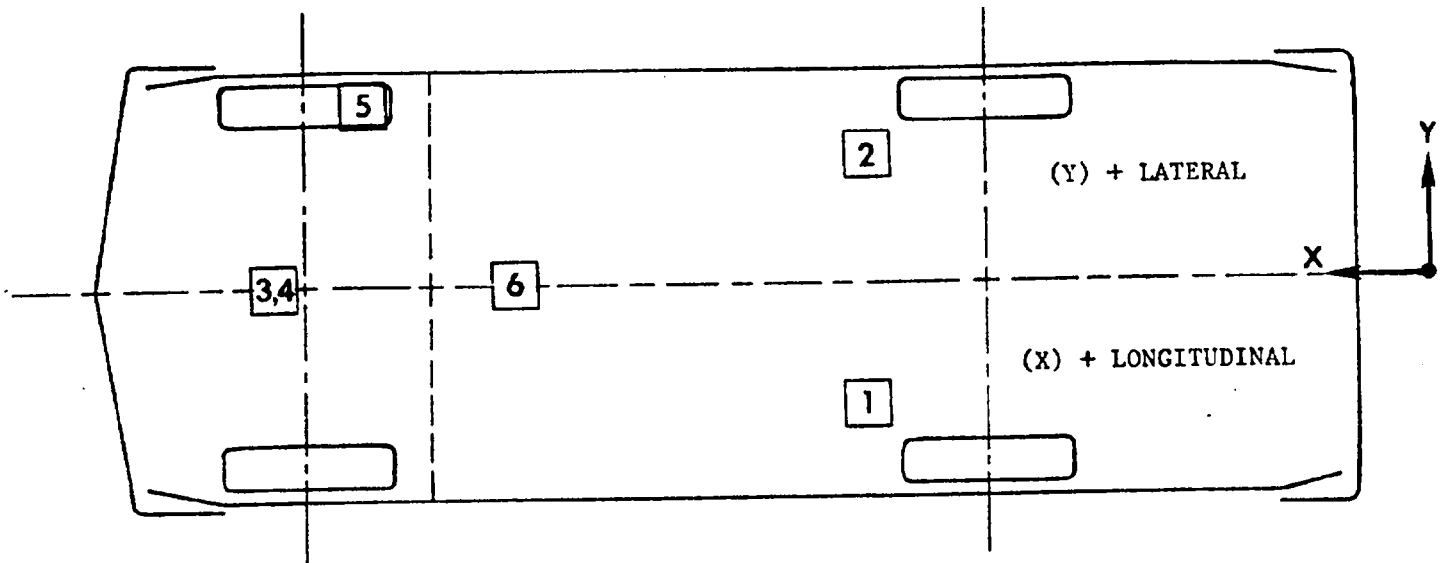
SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

	DRIVER SIDE		PASSENGER SIDE	
	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
Total belt length from retractor reel to bolt hole anchor point for continuous webbing systems.	103.0	109.0	100.0	109.0
Retractor reel to 'D' ring as measured on Part 572 dummy.	20.75	NA	20.5	NA
Shoulder belt length as measured on Part 572 dummy.	36.5	NA	36.0	NA
Lap belt length as measured on Part 572 dummy.	31.0	NA	32.5	NA
Remainder of belt webbing left on retractor reel.	11.75	NA	11.0	NA
<u>BELT SPOOL-OFF DATA:</u>				
Mechanical		---		---
As determined by film analysis	NA	3.25	NA	2.75
As determined electronically	NA	3.50	NA	1.58
<u>BELT STRAIN DATA:</u>				
Measured between retractor reel and 'D' ring.	NA	NA	NA	NA



VEHICLE ACCELEROMETER LOCATIONS



VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

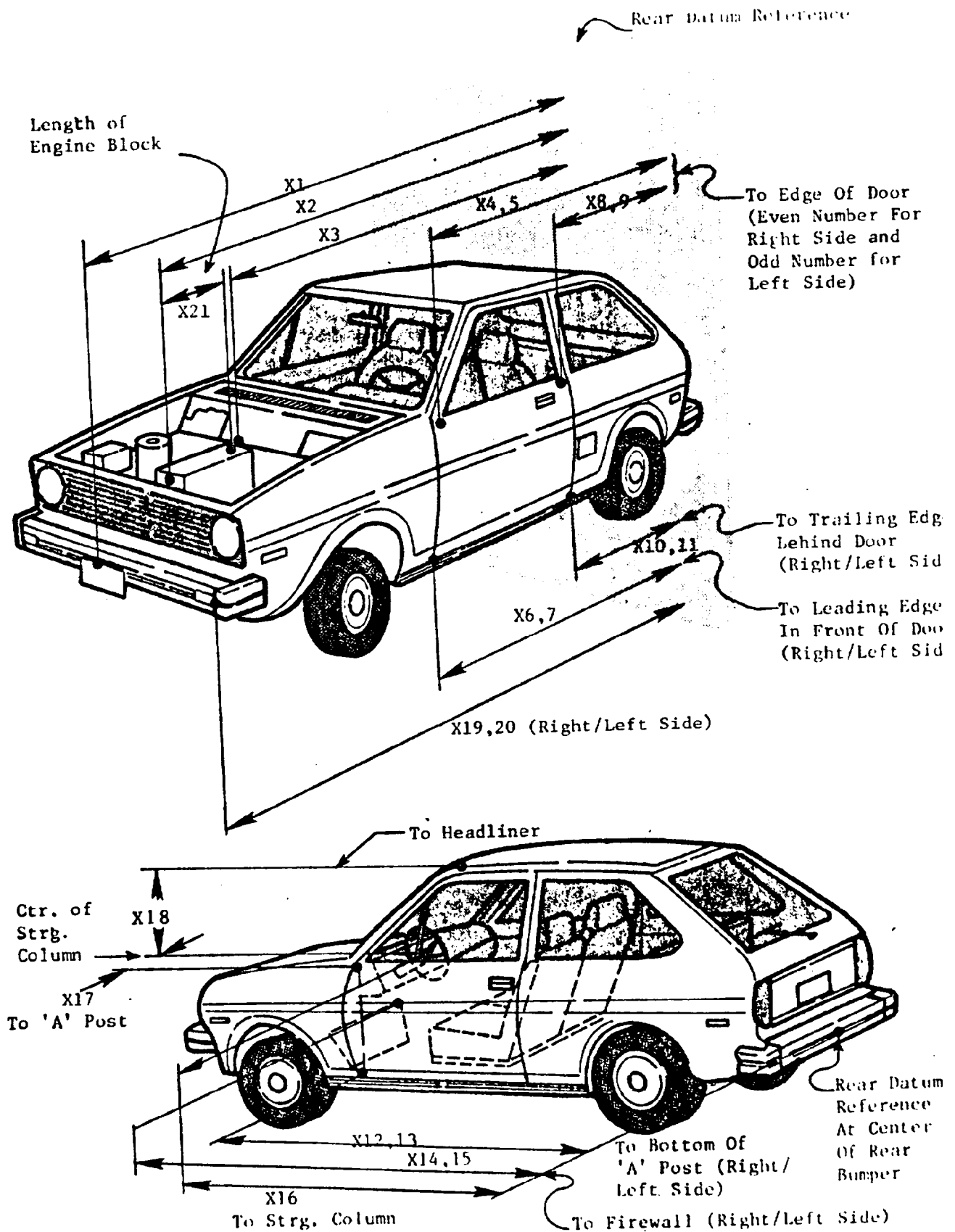
NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	REAR SEAT X-MEMBER AT LEFT SIDE LONGITUDINAL	59.5	17.8	11.3	2.68	121.75	41.61	77.63
2	REAR SEAT X-MEMBER AT RIGHT SIDE LONGITUDINAL	59.5	-17.5	11.0	2.55	123.25	60.03	76.50
3	TOP OF ENGINE BLOCK LONGITUDINAL	119.3	-1.0	23.0	17.81	79.00	65.18	57.38
4	BOTTOM OF ENGINE BLOCK LONGITUDINAL	132.0	0.0	6.0	---	--- Y	---	--- Y
5	BRAKE CALIPER AT RIGHT SIDE LONGITUDINAL	129.5	-24.5	11.1	25.63	74.88	63.28	44.63
6	DASH PANEL LONGITUDINAL	100.8	0.0	36.0	9.16	112.00	48.78	74.13

* LONGITUDINAL: FORWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD

MEASUREMENTS IN INCHES

Y See TEST ANOMALIES

PRE-TEST AND POST-TEST MEASUREMENT POINTS



IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL Mazda RX-7 TEST NUMBER 850123

		DIMENSIONS IN INCHES		
NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X 1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	169.3	141.6	27.7
X 2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	135.1	131.9	3.2
X 3	REAR SURFACE OF VEHICLE TO FIREWALL	117.0	114.9	2.1
X 4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	114.3	103.5	10.8
X 5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	104.4	103.4	1.0
X 6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	103.9	103.0	0.9
X 7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	103.9	103.0	0.9
X 8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	57.4	57.0	0.4
X 9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	57.5	56.8	0.7
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	60.0	59.3	0.7
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE ON LEFT DOOR	60.0	59.1	0.9
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	100.9	100.4	0.5
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	100.8	100.0	0.8
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	117.1	115.8	1.3
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	117.0	115.3	1.7
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	87.6	87.5	0.1
X17	CENTER OF STEERING COLUMN TO "A" POST	13.8	13.8	0.0

IMPACTED VEHICLE MEASUREMENTS CONTD

VEHICLE MAKE/MODEL Mazda RX-7

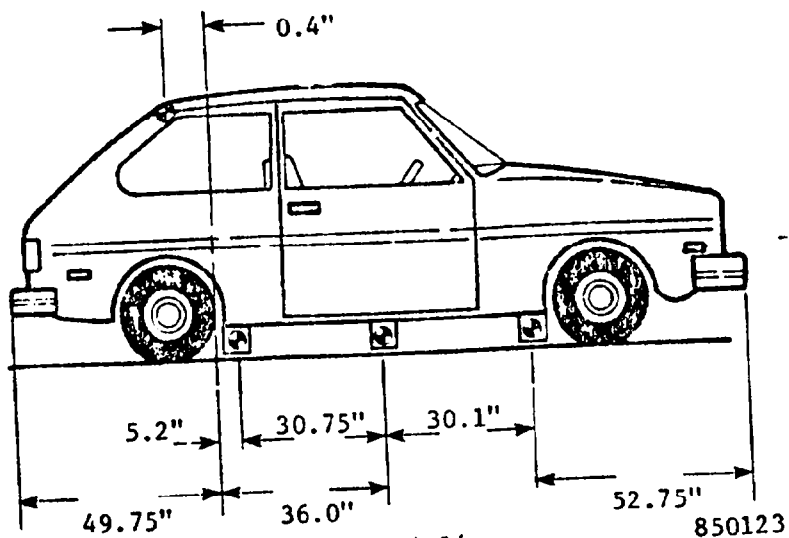
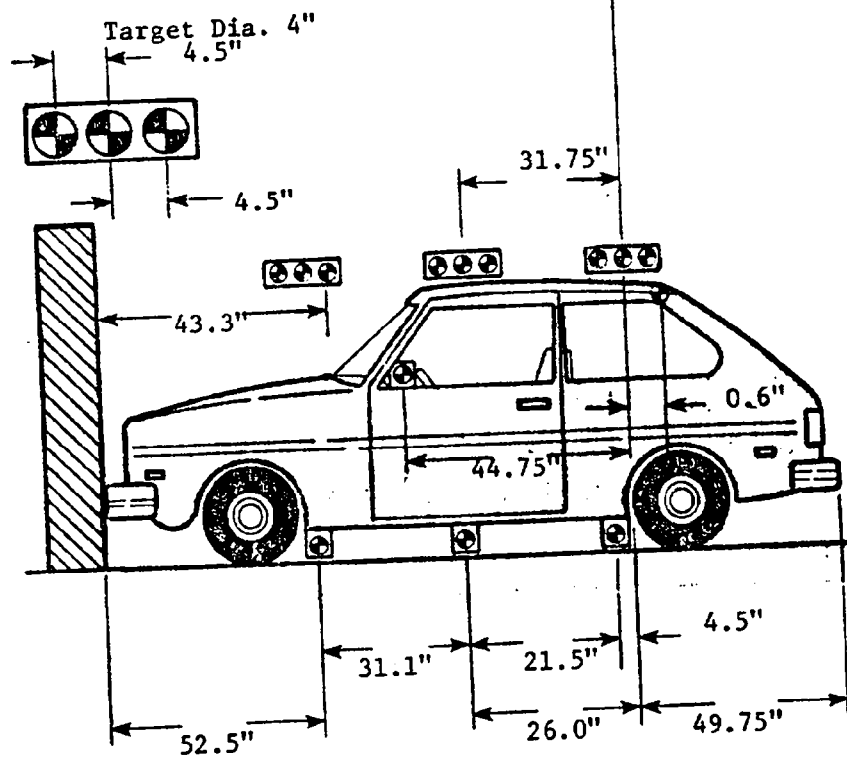
TEST NUMBER 850123

DIMENSIONS IN INCHES

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X18	CENTER OF STEERING COLUMN TO HEADLINING	16.3	17.4	-1.1
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	165.8	145.8	20.0
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	165.5	145.5	20.0
X21	LENGTH OF ENGINE BLOCK	135.1	131.9	3.2

Technical drawing of a cylindrical component, likely a barrel or container, showing internal structure and dimensions. The drawing includes a cross-section view on the left and a side view on the right. Dimensions are indicated in inches:

- Internal diameter (left side): 13.6"
- Internal diameter (right side): 30.1"
- Internal diameter (right side): 30.1"



ACCIDENT INVESTIGATION DIVISION DATA
FOR 35 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Mazda RX-7 2-Door Coupe
VEH. NHTSA NO.: CF5401; VIN: JM1FB3318F0857198
MODEL YEAR: 1985; BUILD DATE: 8/84; TEST DATE 1/23/85
VEH. SIZE CATEGORY: Compact; TEST WEIGHT: 2873 lbs.
VEH. WHEELBASE: 95.5"

COLLISION DEFORMATION CLASSIFICATION (CDC) CODE:

F (Frontal)

CRUSH DEPTH
DIMENSIONS:

C1 = 20.0 inches

C2 = 27.1 inches

C3 = 27.7 inches

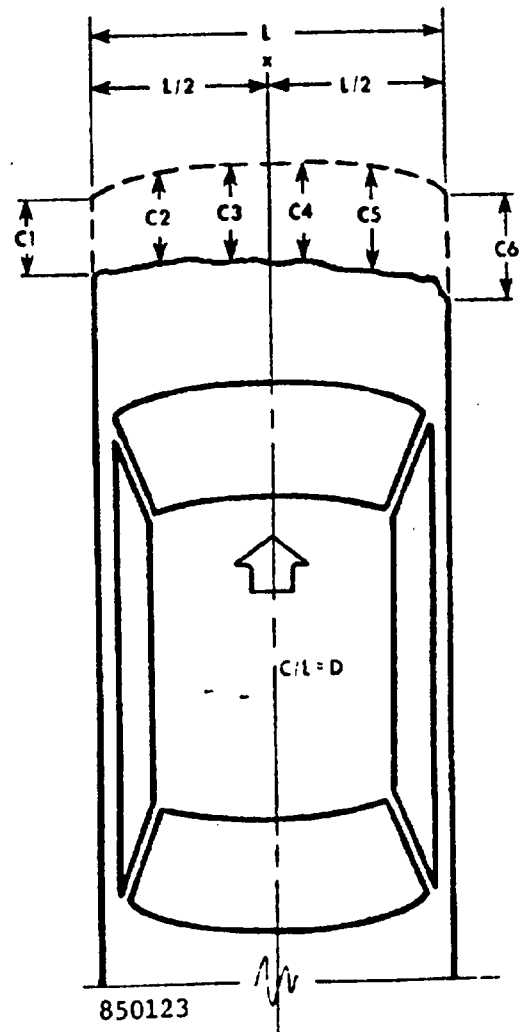
C4 = 27.4 inches

C5 = NA inches

C6 = 20.0 inches

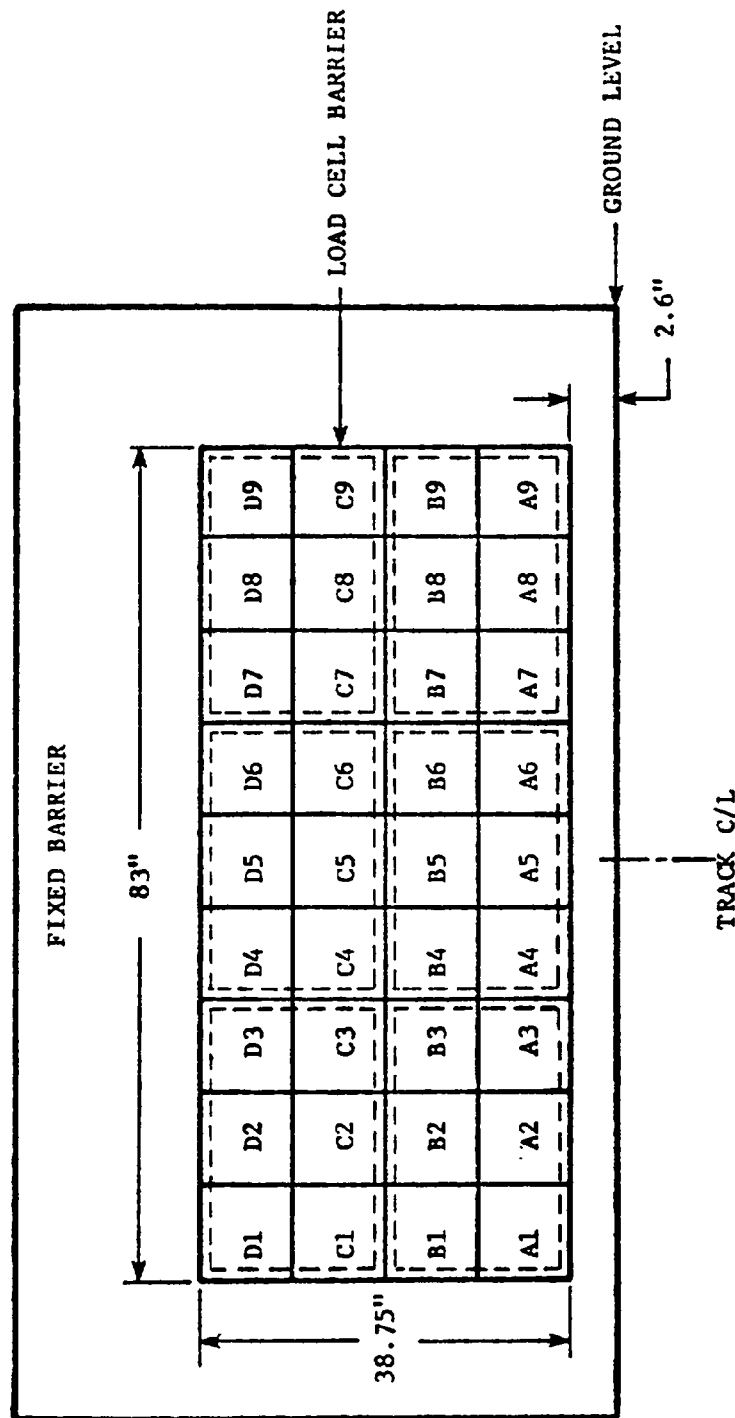
MIDPOINT OF DAMAGE: D = Vehicle Centerline
(Longitudinal)

LENGTH OF DAMAGED
REGION: L = 53.0 inches



36 LOAD CELLS
4 ROWS
9 COLUMNS

FRONT VIEW



BARRIER LOAD CELL CONFIGURATION

- GROUP 1: D1 thru C3
- GROUP 2: D4 thru C6
- GROUP 3: D7 thru C9
- GROUP 4: B1 thru A3
- GROUP 5: B4 thru A6
- GROUP 6: B7 thru A9

LOAD CELL BARRIER SUMMARY

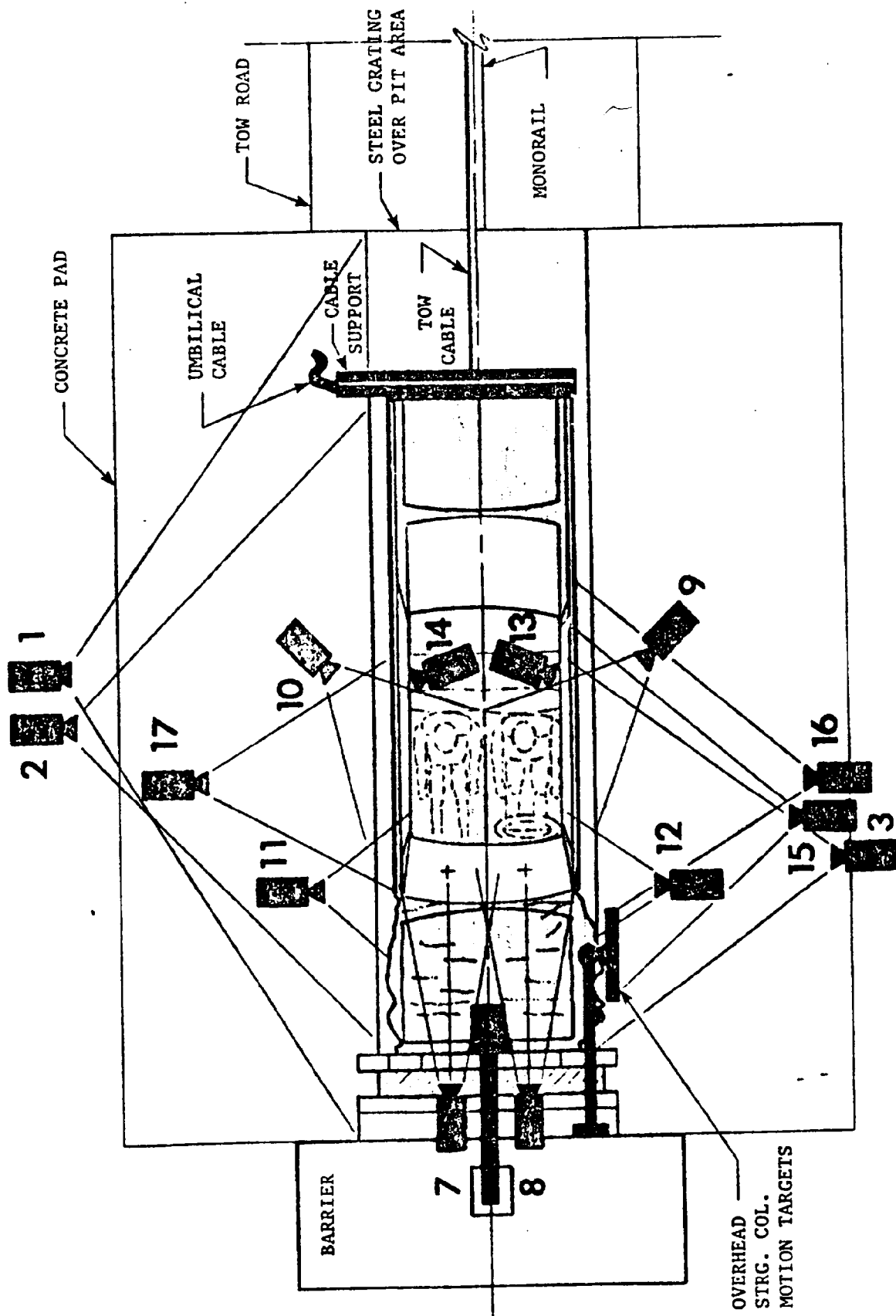
POSITION	POSITIVE DIRECTION*		NEGATIVE DIRECTION*	
	MAX (lb)	TIME (msec)	MIN (lb)	TIME (msec)
D1	129.46	36.00	133.64	76.25
D2	130.74	19.25	26.88	30.13
D3	136.91	11.88	92.45	15.75
C1	491.50	72.13	90.65	94.13
C2	3290.79	54.38	39.02	6.00
C3	6373.46	29.25	42.64	6.38
TOTAL GROUP 1	8244.99	54.50	113.13	178.38
D4	142.70	11.63	168.47	15.75
D5	153.72	11.75	127.16	29.75
D6	138.69	25.50	141.11	43.00
C4	924.38	62.75	40.28	6.50
C5	2050.46	63.88	63.72	6.50
C6	2857.61	70.63	70.64	6.50
TOTAL GROUP 2	5831.43	64.00	197.99	183.25
D7	85.87	11.88	97.20	29.38
D8	68.10	19.00	104.64	43.13
D9	109.37	19.38	132.96	29.38
C7	3850.18	71.88	148.57	36.25
C8	6386.96	73.63	83.43	137.75
C9	1372.70	61.88	95.04	13.38
TOTAL GROUP 3	10775.61	72.38	160.00	280.88
B1	103.88	13.13	95.86	17.25
B2	2971.58	30.13	30.02	185.50
B3	4622.50	31.25	66.25	243.63
A1	109.67	21.88	149.07	17.63
A2	392.27	47.38	37.82	333.25
A3	934.93	33.63	46.88	6.38
TOTAL GROUP 4	8287.03	31.00	61.44	143.50

LOAD CELL BARRIER SUMMARY CONTD

POSITION	POSITIVE DIRECTION*		NEGATIVE DIRECTION*	
	MAX (lb)	TIME (msec)	MIN (lb)	TIME (msec)
B4	16612.75	30.88	---	--- E
B5	11504.22	69.75	---	--- E
B6	9382.44	10.00	---	--- E
A4	12883.37	43.00	133.40	226.38
A5	278.37	10.88	85.01	21.00
A6	1036.50	38.50	95.67	6.63
TOTAL GROUP 5	44151.56	69.13	---	--- E
B7	10105.88	12.88	173.21	154.63
B8	2945.24	66.88	47.69	175.25
B9	2499.56	28.38	89.29	13.00
A7	14186.28	42.75	50.59	6.50
A8	383.87	49.38	40.21	193.63
A9	90.30	29.75	110.98	33.63
TOTAL GROUP 6	20940.13	65.88	179.28	143.00
TOTAL LOAD CELL FORCE	86480.48	65.88	---	--- E

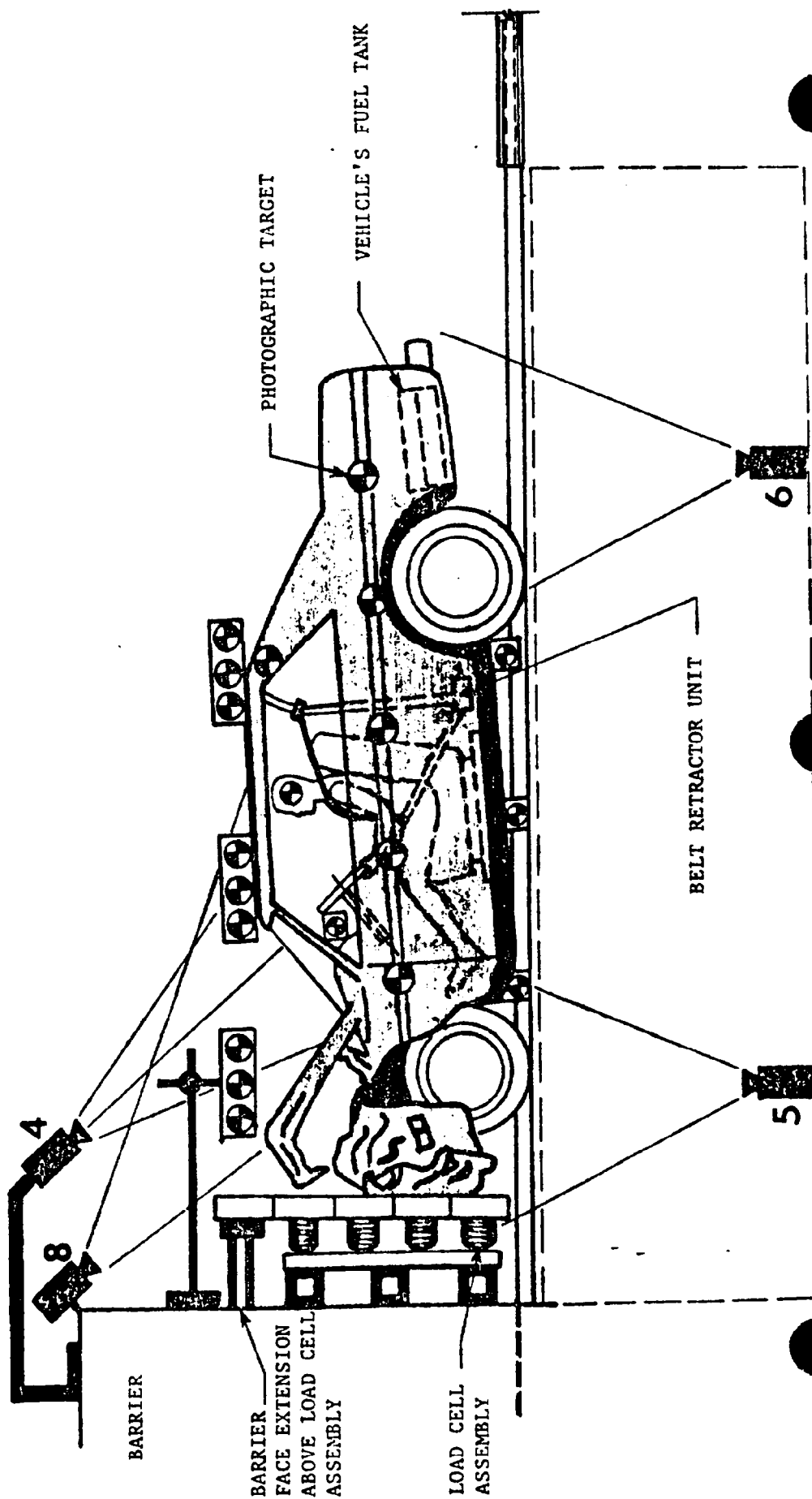
*REFERENCE: COMPRESSION IS POSITIVE
TENSION IS NEGATIVE

E There were no negative values in the time interval of interest.



CAMERA POSITIONS

CAMERA POSITIONS



HIGH SPEED CAMERA LOCATIONS

TEST NO.: 850123 VEHICLE: Mazda RX-7

CAMERA NO.	VIEW	CAMERA POSITIONS (IN)*			ANGLE ** (DEG)	FILM PLANE TO HEAD TARGET	LENS (MM)	SPEED (FPS)
		X	Y	Z				
1	Real-time Panning	-142	504	61	NA	NA	16	24
2	Vehicle Crush	-81.3	266.4	37.1	-2	NA	13	502
3	Dummy Kinematics	-41.5	-295	44	-12	282 1/4"	25	505
4	Windshield Damage	-36.4	0	120	-80	NA	13	542
5	Crush & Fluid Spillage	-50.5	0	-92.4	90	NA	13	500
6	Fluid Spillage	-99.3	0	-99	90	NA	13	403
7	Passenger Kinematics	4.5	13.8	115	-50	NA	17	562
8	Driver Kinematics	6.8	-14.5	113.3	-50	NA	17	488
9	Driver Kinematics	-157.3	-166.9	74.1	-14	151 7/16"	25	495
10	Passenger Kinematics	-152.1	167.9	76	-15	148 1/4"	25	502
11	Windshield Intrusion	-53.9	306.1	44	0	NA	50	405
12	Windshield Intrusion	-53	-309.4	42.3	0	NA	50	502
13	Driver Seatbelt Movement	NA	NA	NA	NA	NA	13	500
14	Passenger Seatbelt Movement	NA	NA	NA	NA	NA	13	507
15	Column Movement	-98	-286	99.5	-15	NA	25	---***
16	Column Movement	-98	-286	70.6	-10	NA	25	488
17	Passenger Kinematics	-38.8	210.8	45.3	7	198"	13	507

***Camera did not run.

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

APPENDIX A
PHOTOGRAPHS

1. PRE-TEST FRONT VIEW
2. POST-TEST FRONT VIEW
3. PRE-TEST LEFT SIDE VIEW
4. POST-TEST LEFT SIDE VIEW
5. PRE-TEST RIGHT SIDE VIEW
6. POST-TEST RIGHT SIDE VIEW
7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW
8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
9. PRE-TEST LEFT REAR THREE-QUARTER VIEW
10. POST-TEST LEFT REAR THREE-QUARTER VIEW
11. POST-TEST TOP VIEW (VEHICLE ON ROLLOVER MACHINE)
12. PRE-TEST ENGINE COMPARTMENT VIEW
13. POST-TEST ENGINE COMPARTMENT VIEW
14. PRE-TEST FRONT UNDERBODY VIEW
15. POST-TEST FRONT UNDERBODY VIEW
16. PRE-TEST REAR UNDERBODY VIEW
17. POST-TEST REAR UNDERBODY VIEW
18. PRE-TEST DRIVER DUMMY POSITION VIEW
19. POST-TEST DRIVER DUMMY POSITION VIEW
20. PRE-TEST PASSENGER DUMMY POSITION VIEW
21. POST-TEST PASSENGER DUMMY POSITION VIEW
22. SOLVENT SPILLAGE LOCATION VIEW
23. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (DOOR OPEN)
24. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (DOOR OPEN)
25. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (DOOR OPEN)
26. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (DOOR OPEN)
27. POST-TEST DRIVER DUMMY HEAD CONTACT AREA
28. POST-TEST STEERING COLUMN HUB/RIM CONTACT BY DRIVER DUMMY
29. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT
30. POST-TEST PASSENGER DUMMY HEAD/IP CONTACT AREA

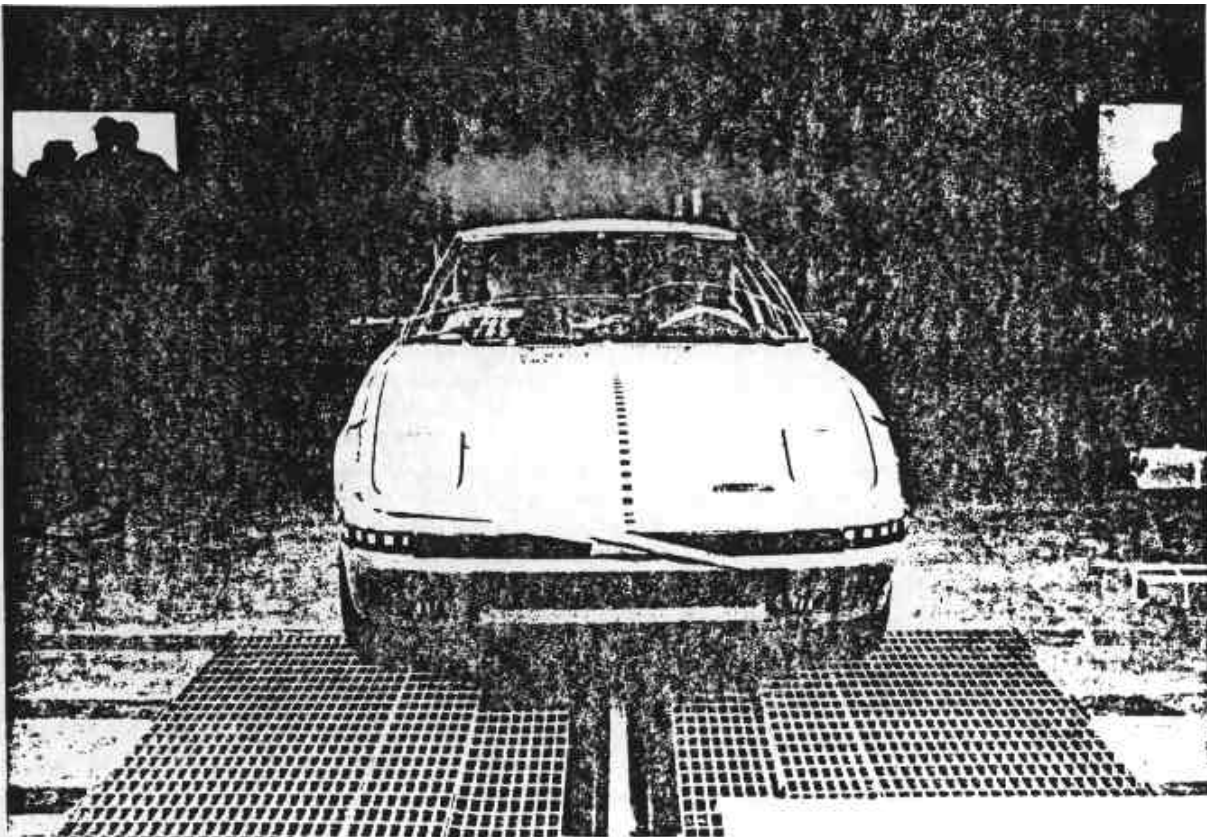


Figure 1. PRE-TEST FRONT VIEW

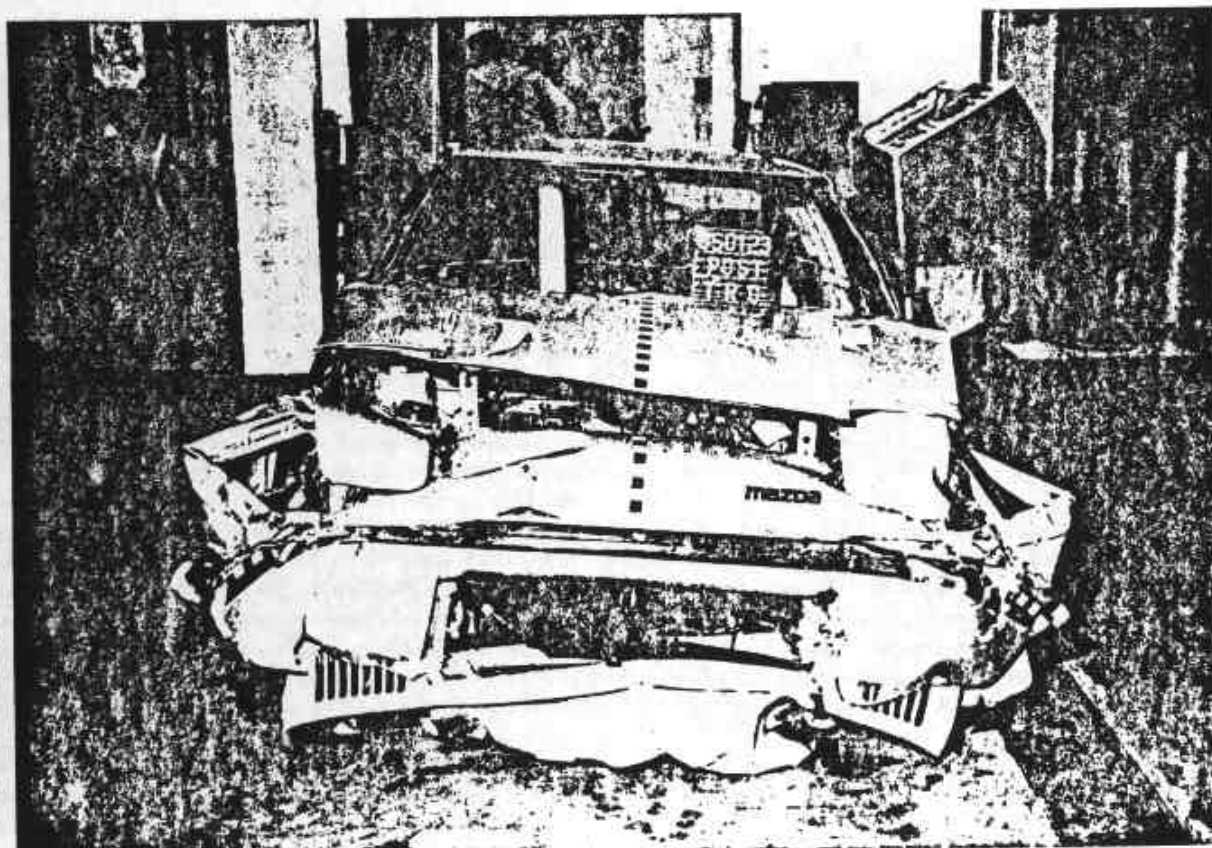


Figure 2. POST-TEST FRONT VIEW

A-2

050107

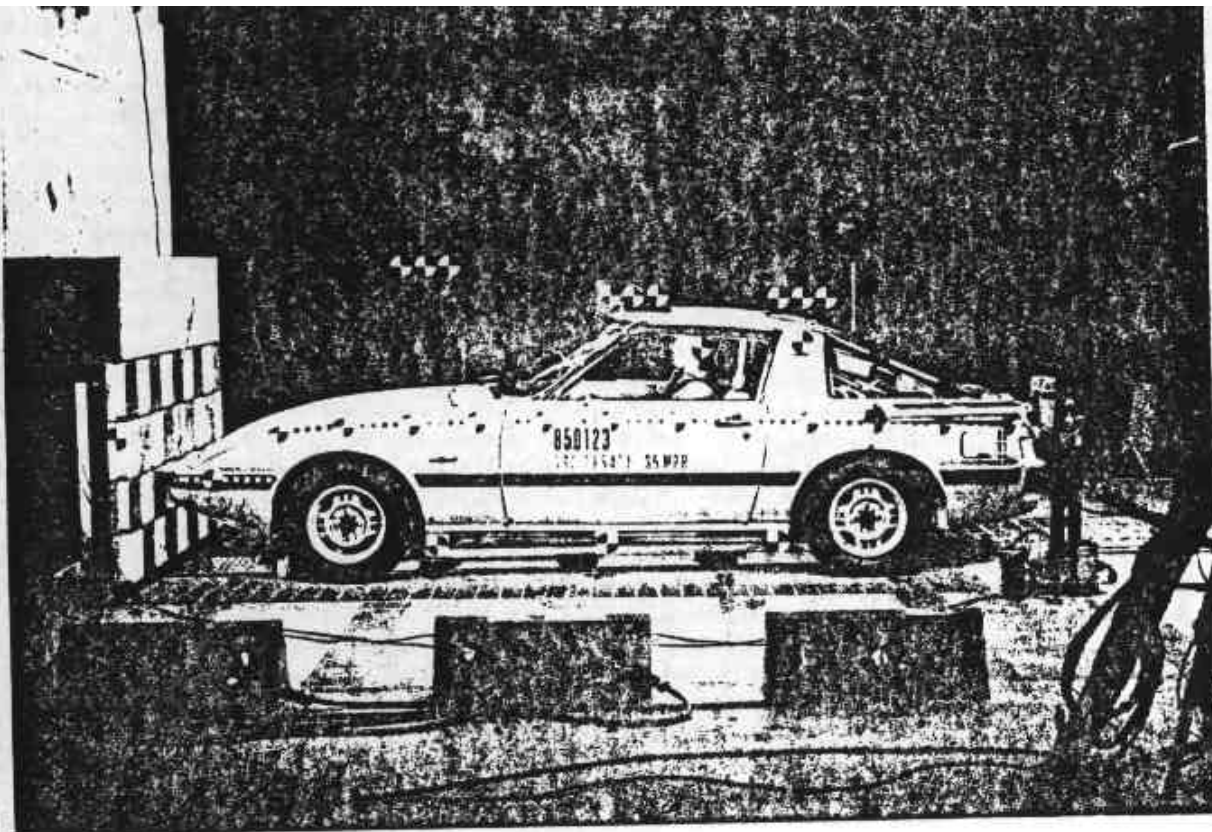


Figure 3. PRE-TEST LEFT SIDE VIEW

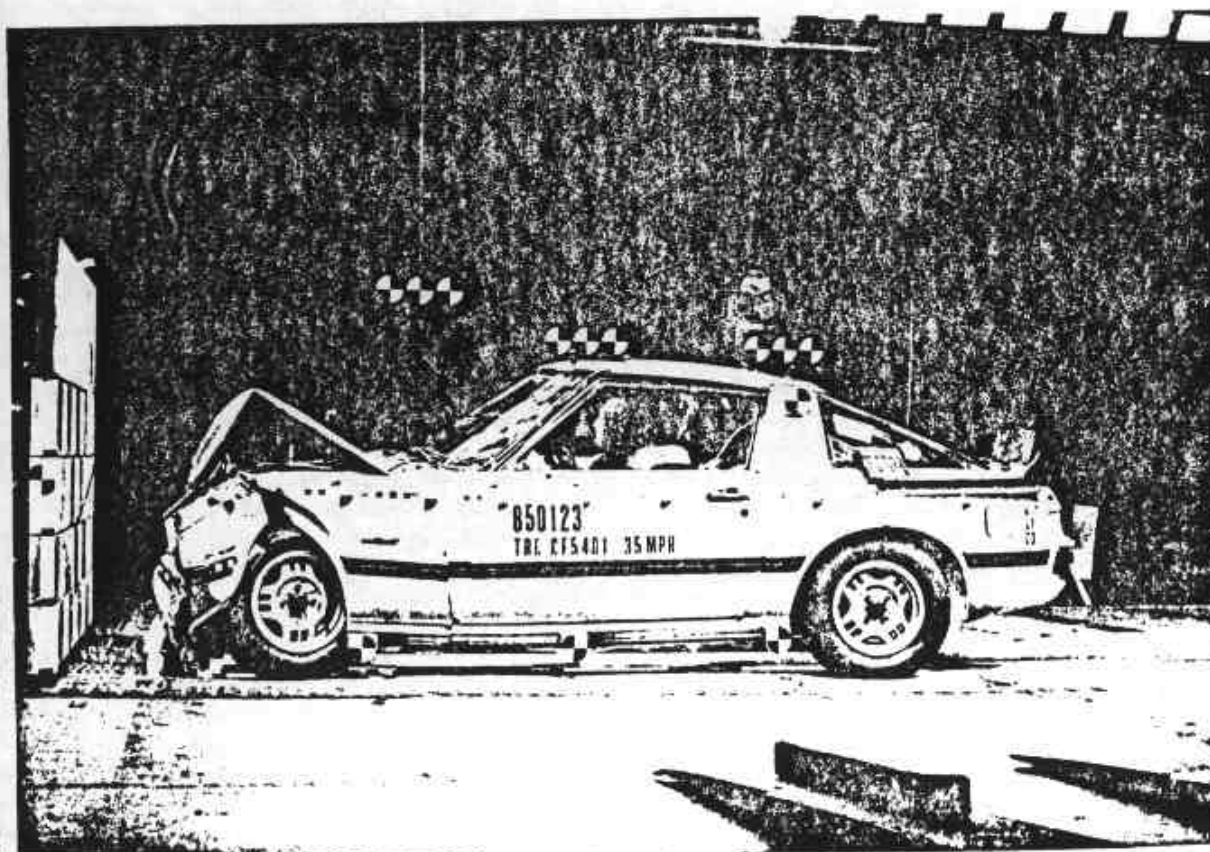


Figure 4. POST-TEST LEFT SIDE VIEW
A-3 850123

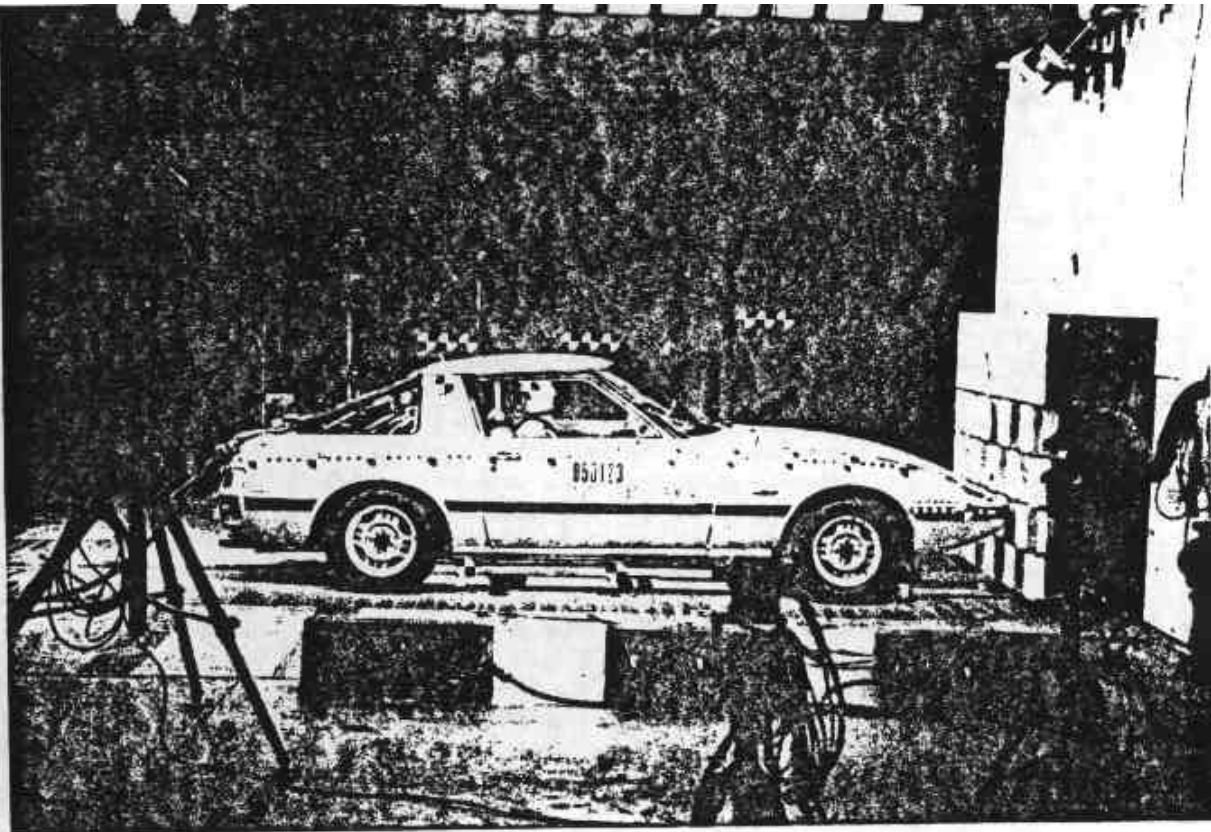


Figure 5. PRE-TEST RIGHT SIDE VIEW

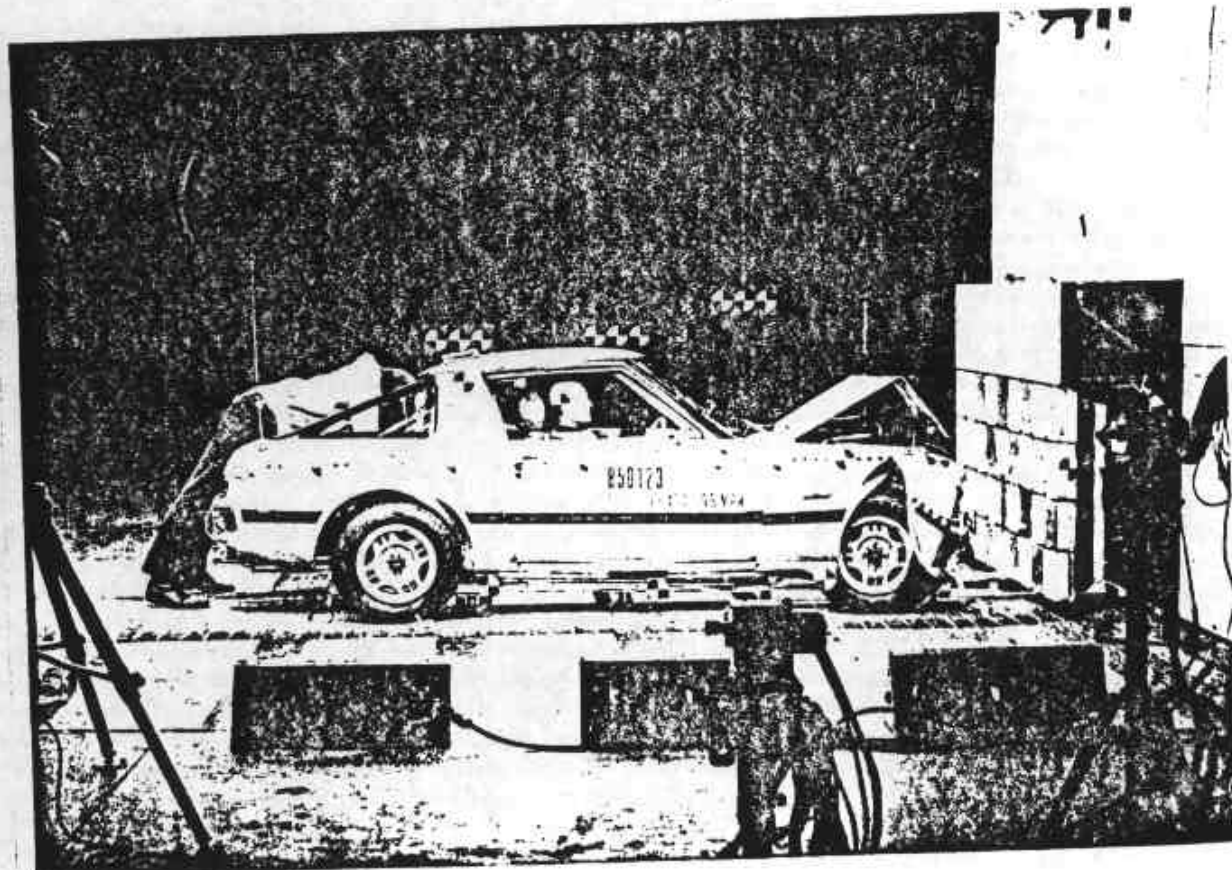


Figure 6. POST-TEST RIGHT SIDE VIEW
A-4 850123

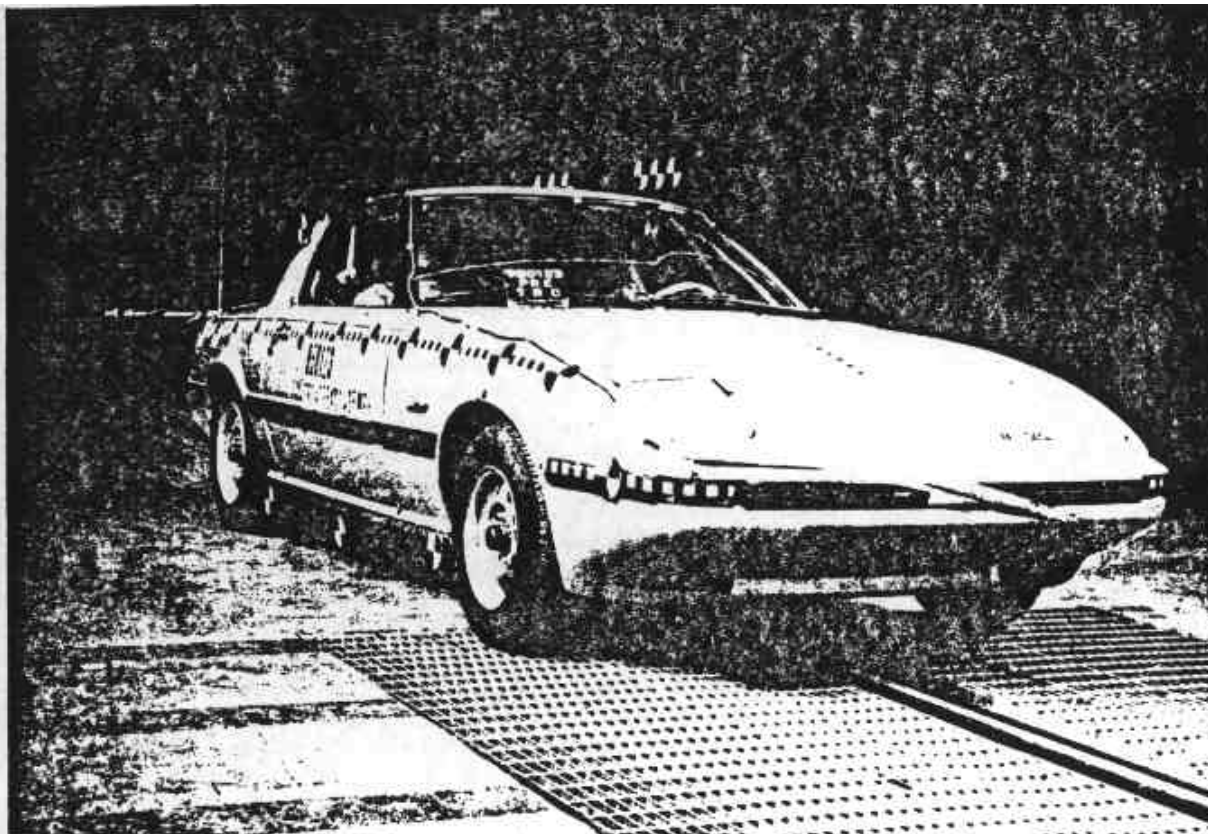


Figure 7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

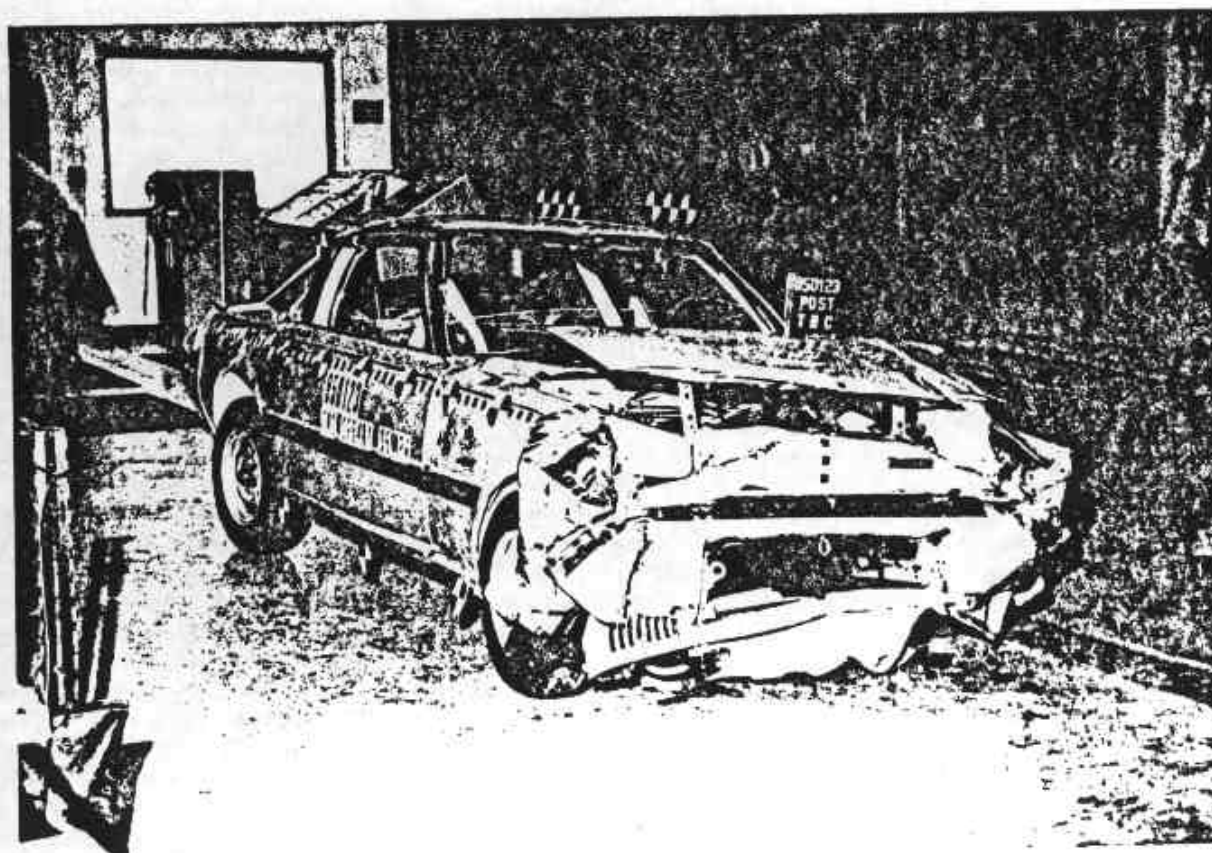


Figure 8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-5

850123



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

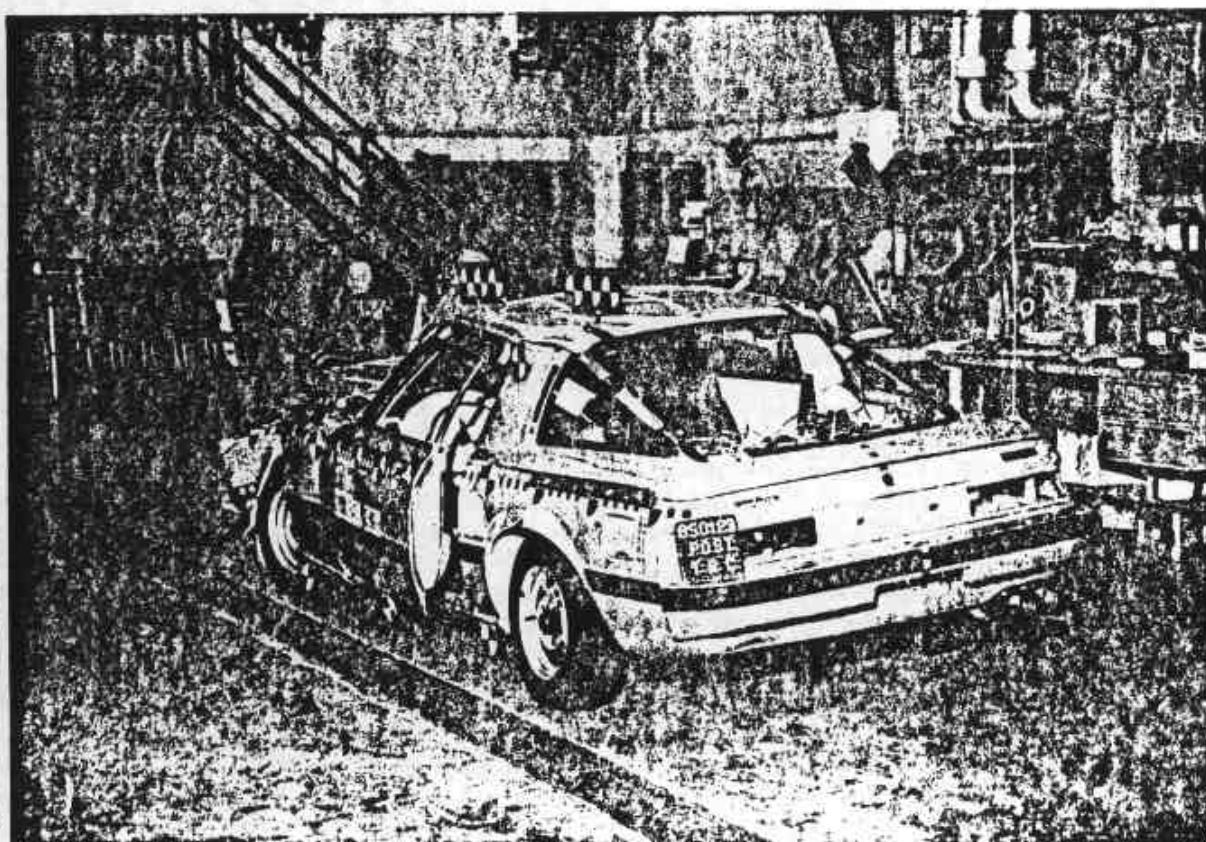


Figure 10. POST-TEST LEFT REAR THREE-QUARTER VIEW

A-6

000100

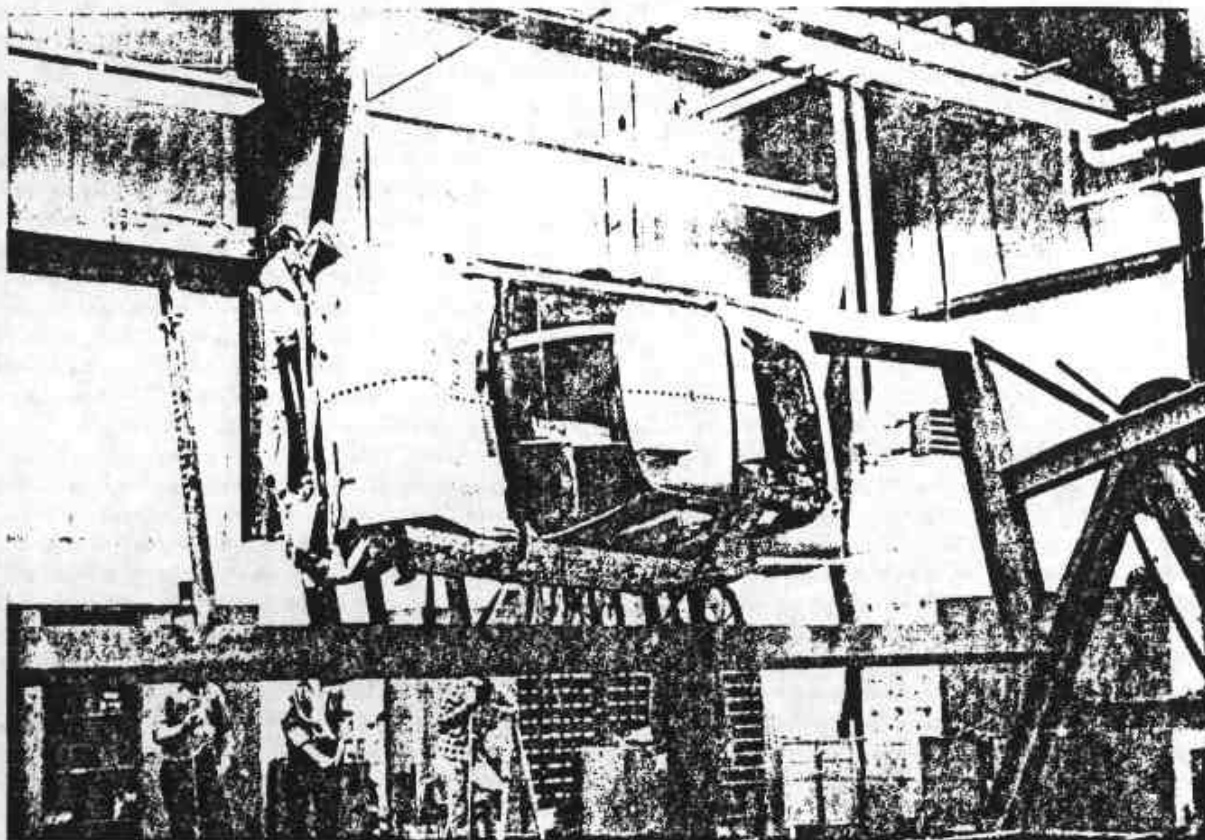


Figure 11. POST-TEST TOP VIEW (VEHICLE ON ROLLOVER MACHINE)

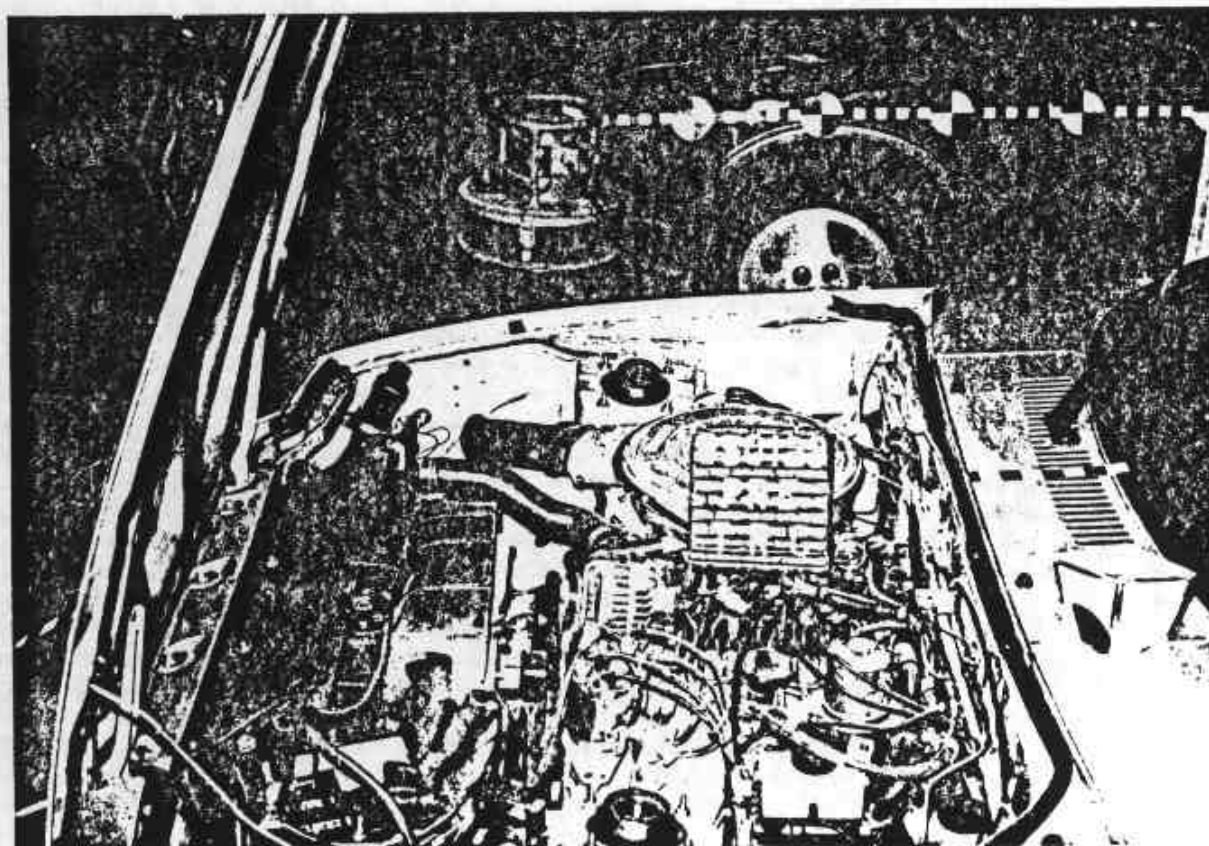


Figure 12. PRE-TEST ENGINE COMPARTMENT VIEW

A-7

850123

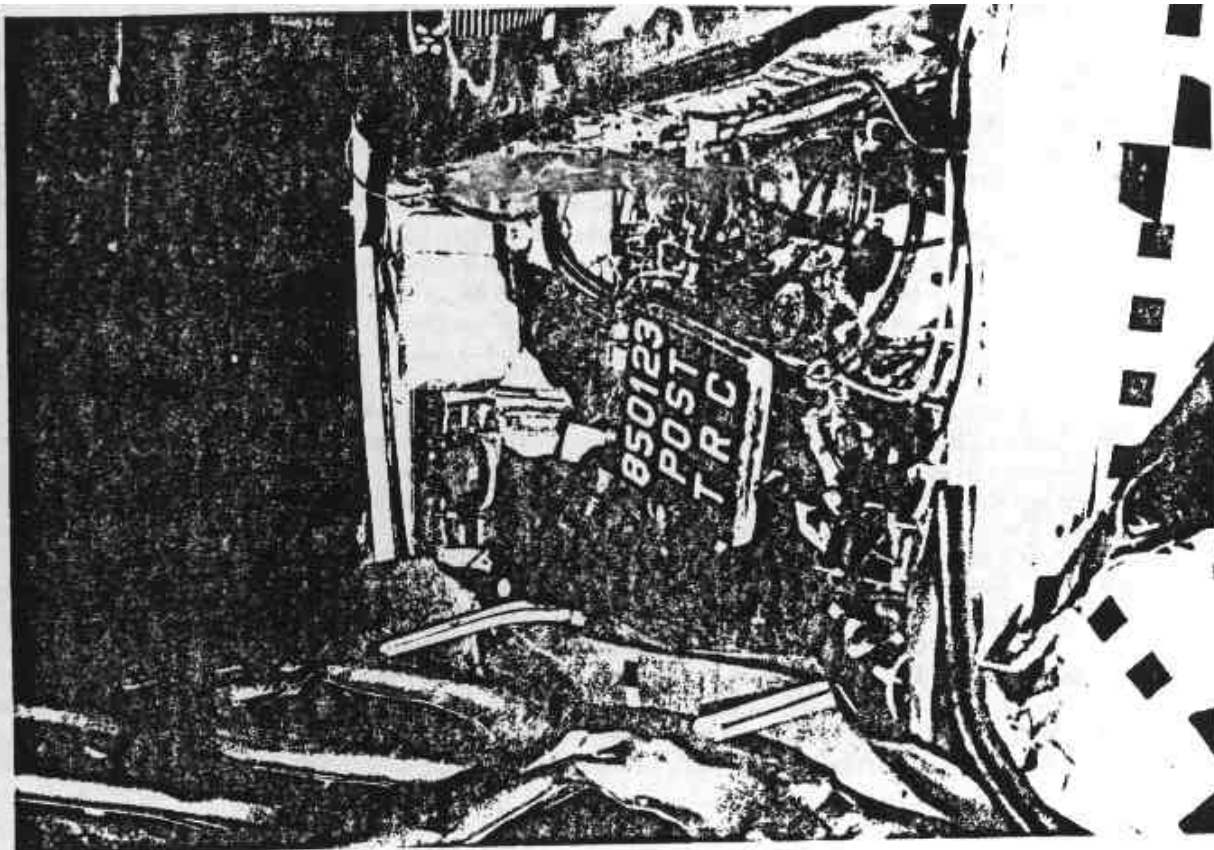


Figure 13. POST-TEST ENGINE COMPARTMENT VIEW

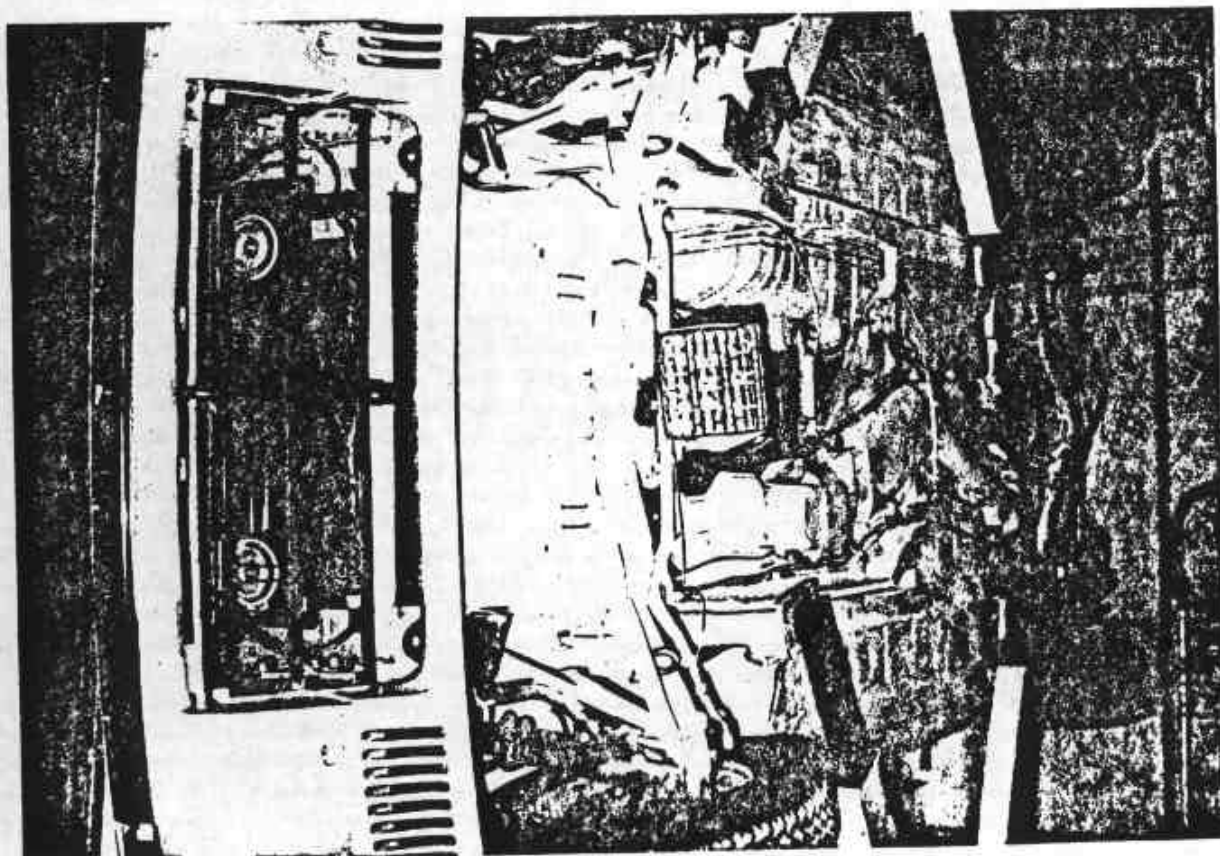


Figure 14. PRE-TEST FRONT UNDERBODY VIEW
A-8 850123

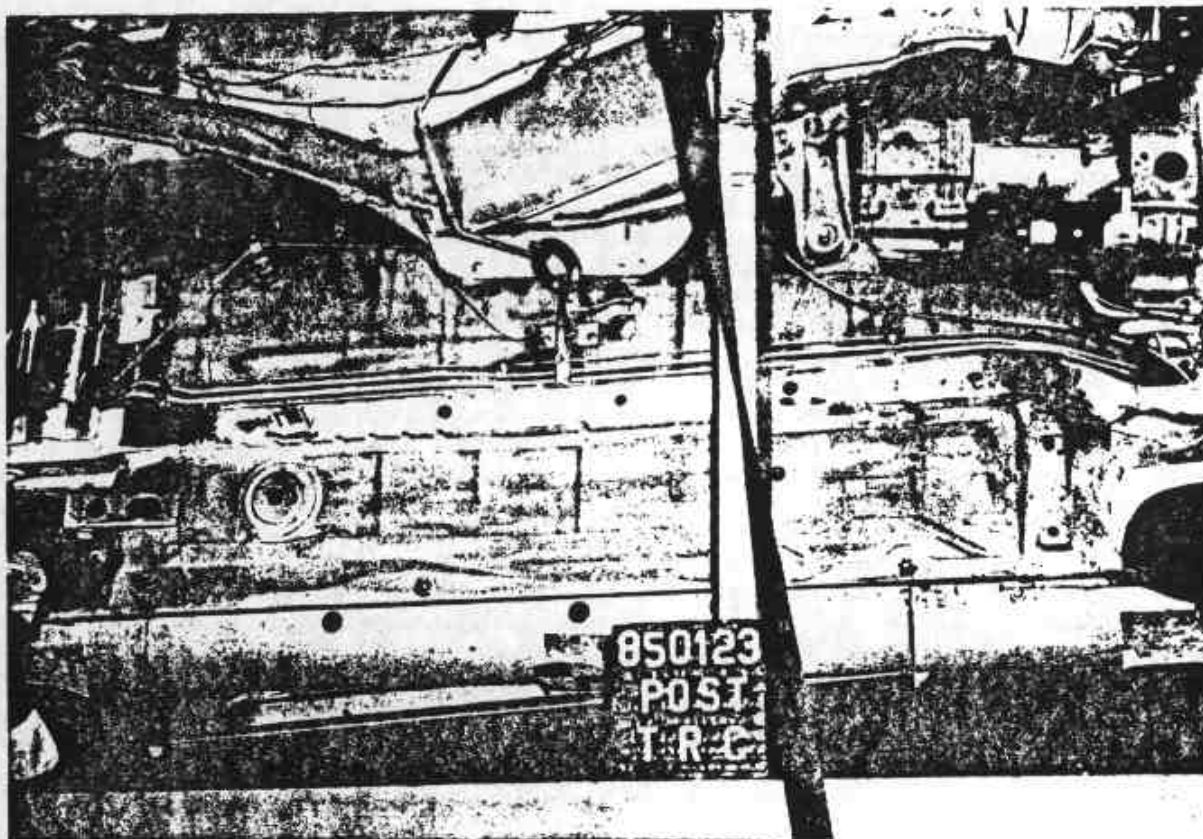


Figure A-15. POST-TEST FRONT UNDERBODY VIEW

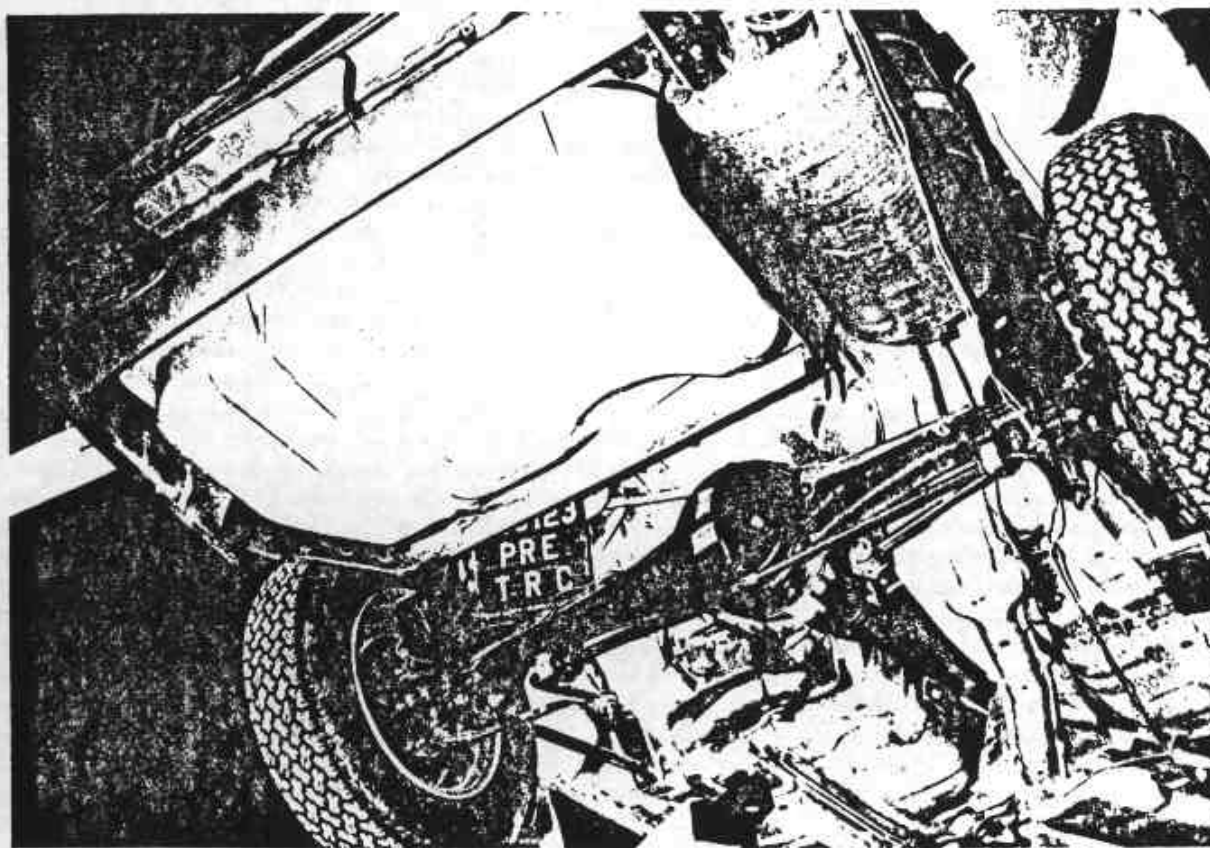


Figure A-16. PRE-TEST REAR UNDERBODY VIEW

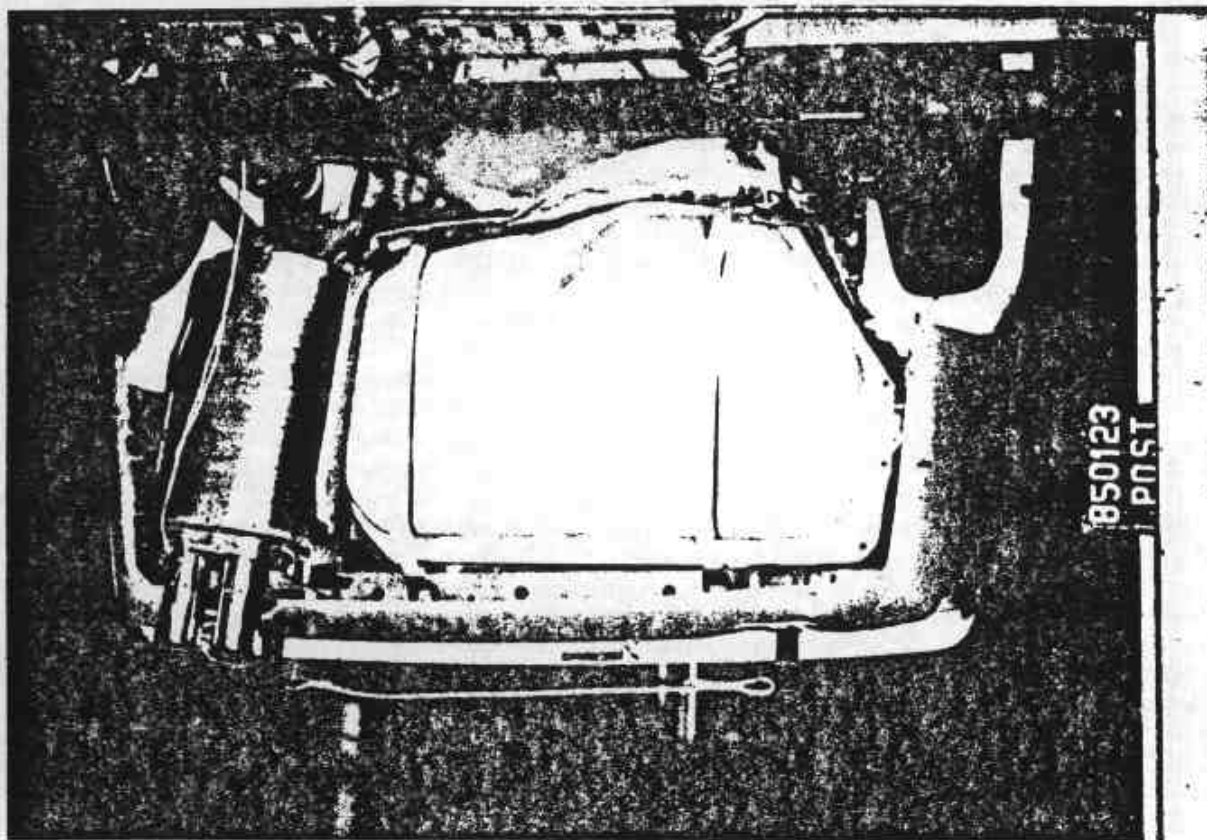


Figure 17. POST-TEST REAR UNDERBODY VIEW



Figure 18. PRE-TEST DRIVER DUMMY POSITION VIEW
A-10 850123

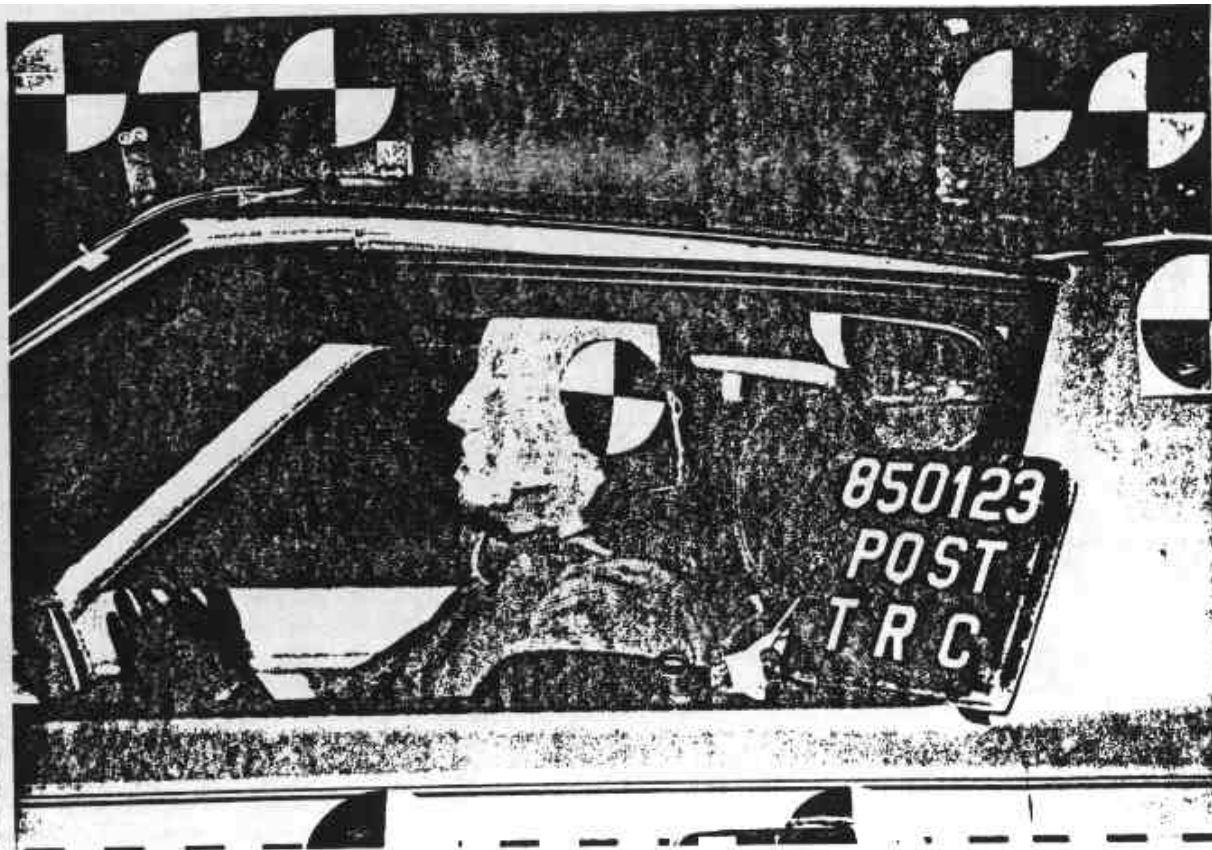


Figure 19. POST-TEST DRIVER DUMMY POSITION VIEW



Figure 20. PRE-TEST PASSENGER DUMMY POSITION VIEW
A-11 850123

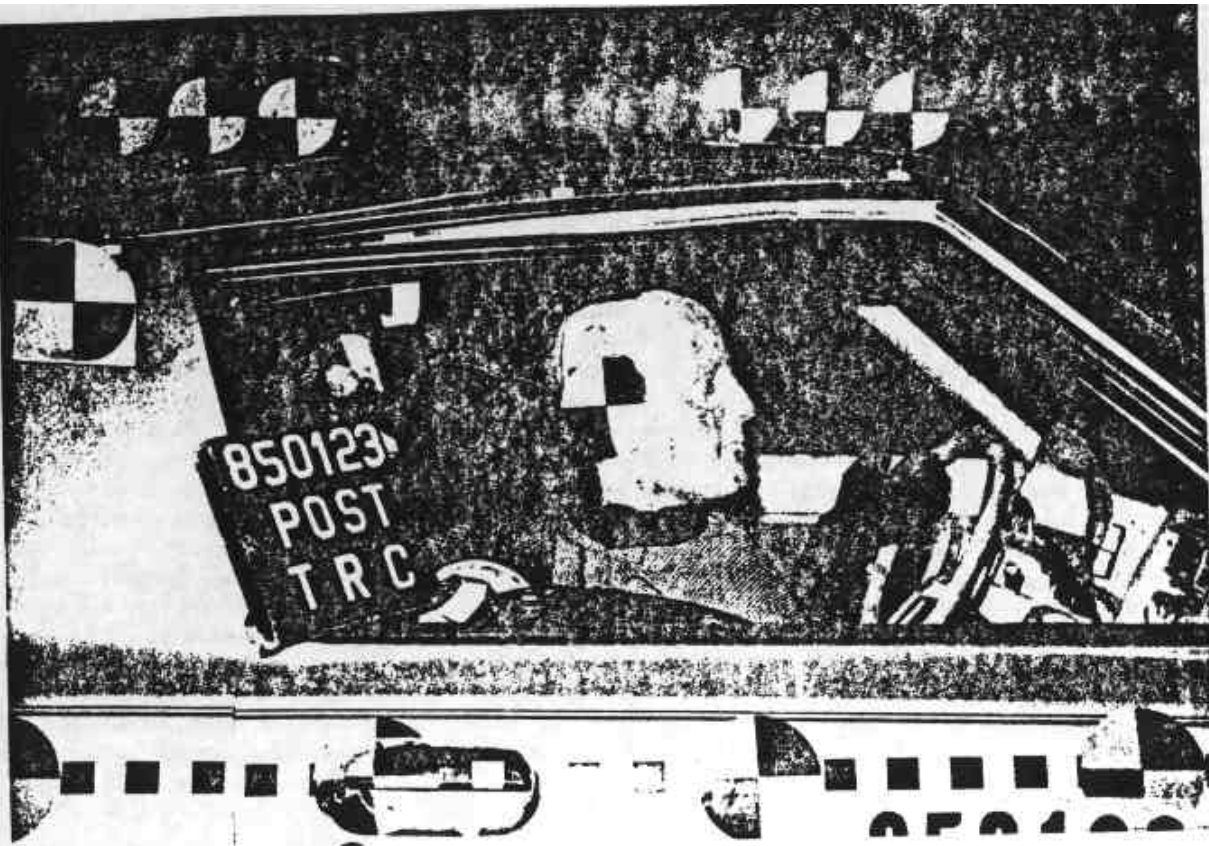


Figure 21. POST-TEST PASSENGER DUMMY POSITION VIEW

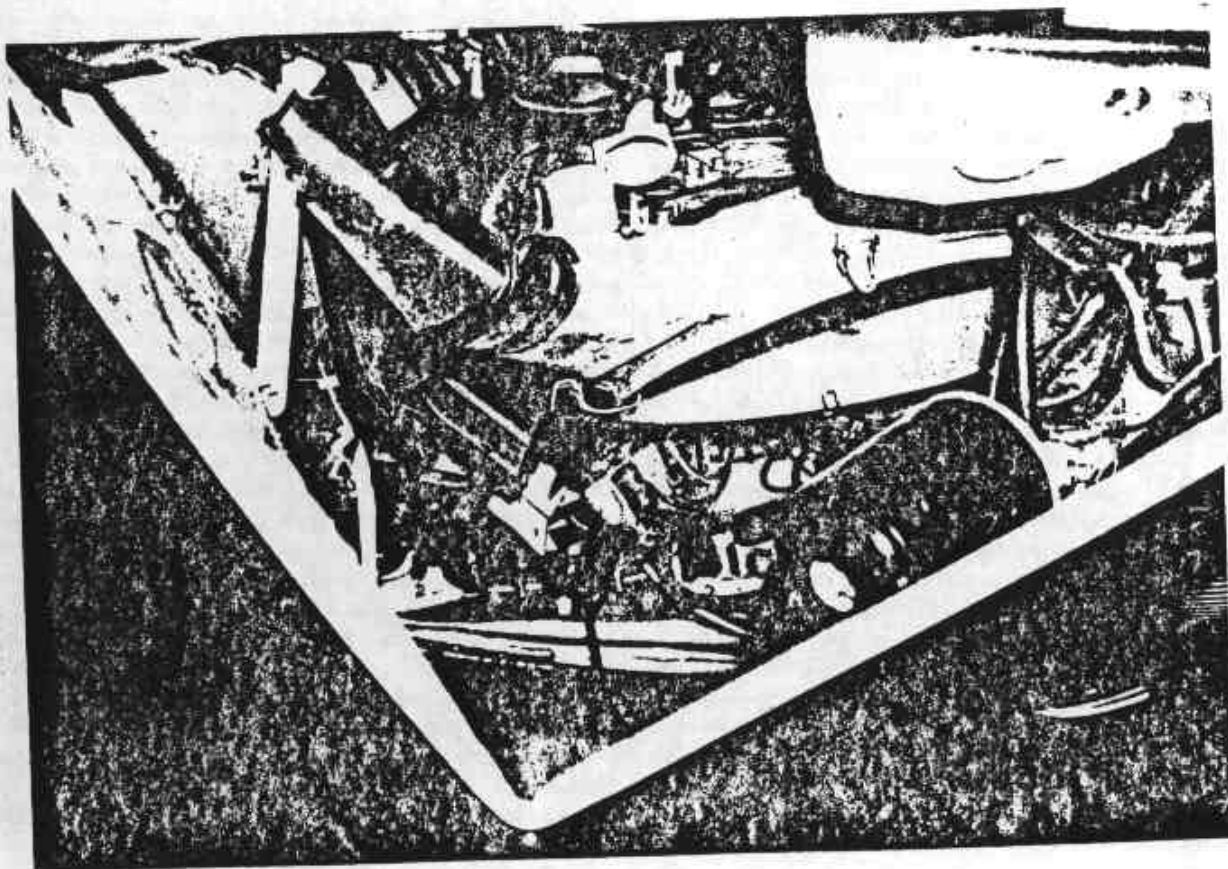


Figure 22. SOLVENT SPILLAGE LOCATION VIEW
A-12

850123

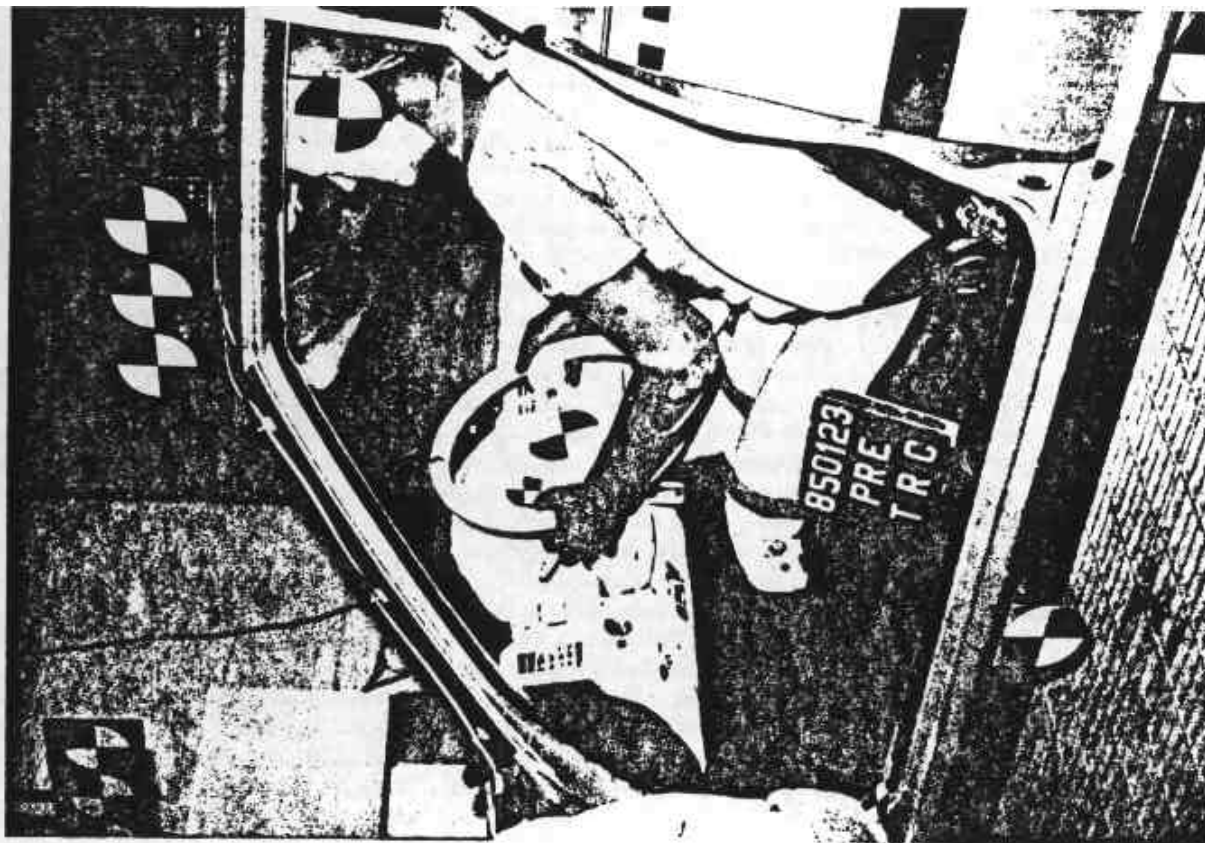


Figure 23. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (DOOR OPEN)

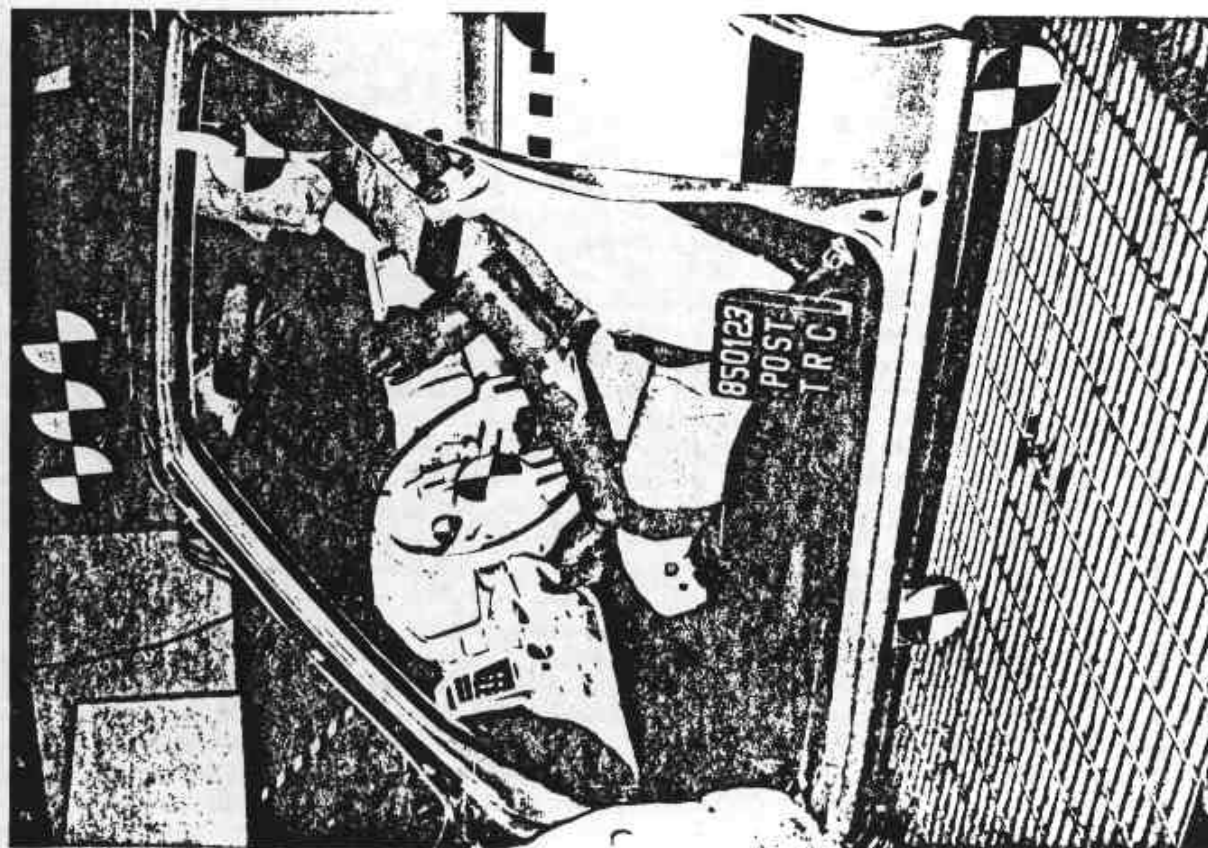


Figure A-24. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (DOOR OPEN)

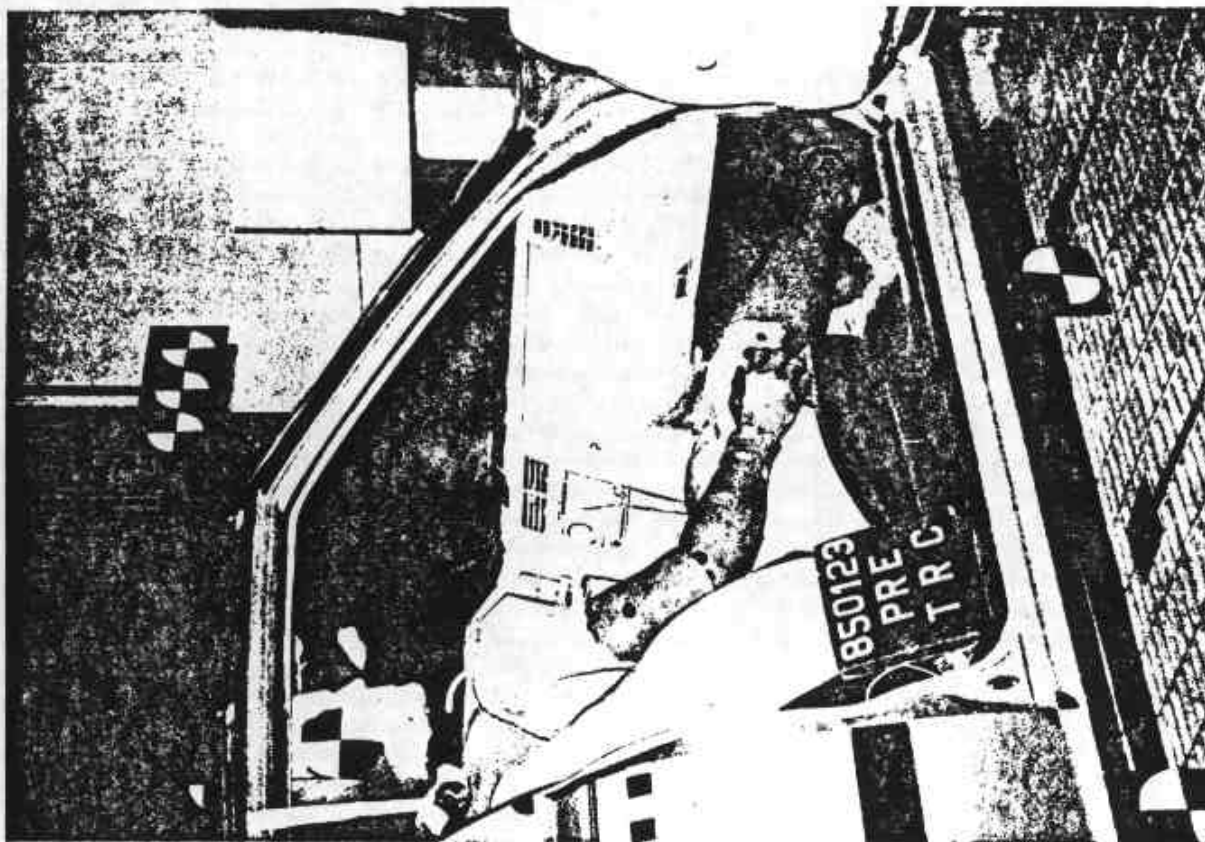


Figure 25. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR (DOOR OPEN)

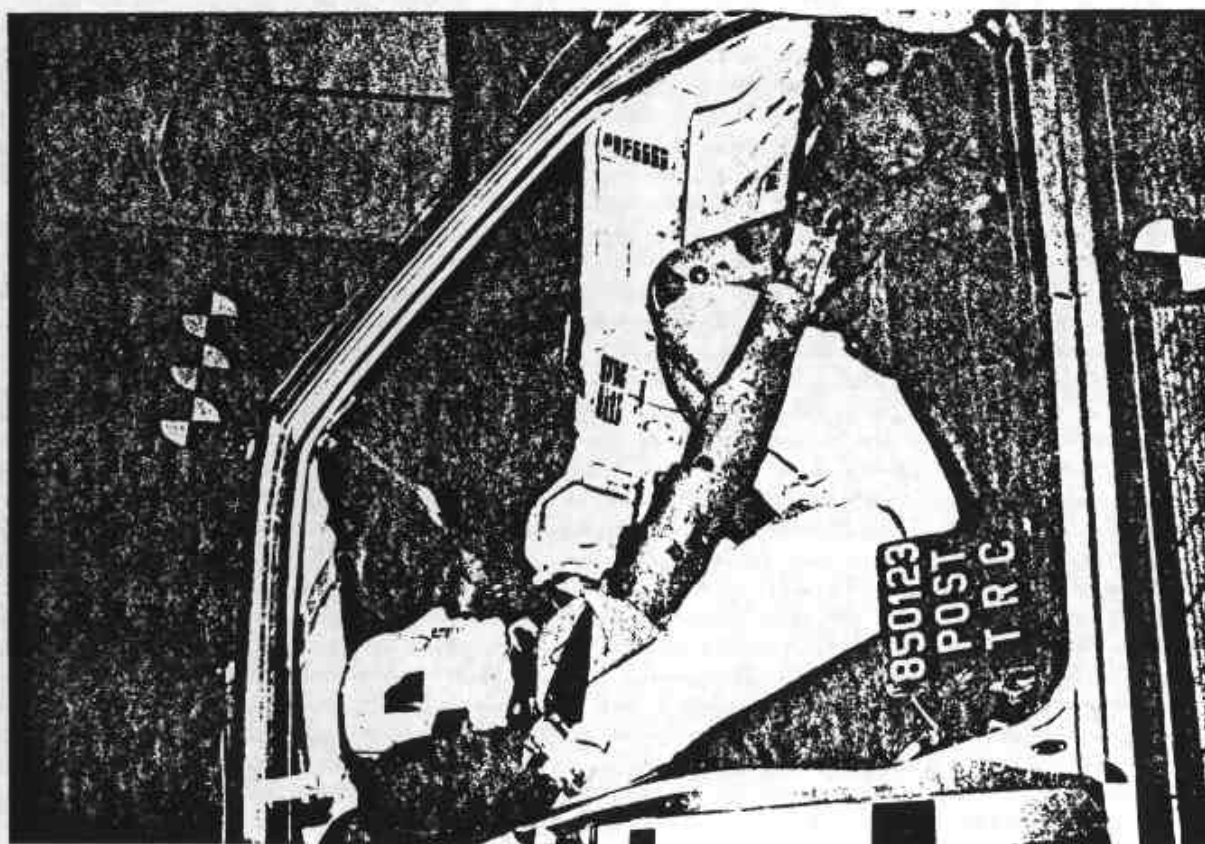


Figure 26. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR (DOOR OPEN)



Figure 27. POST-TEST DRIVER DUMMY HEAD CONTACT AREA

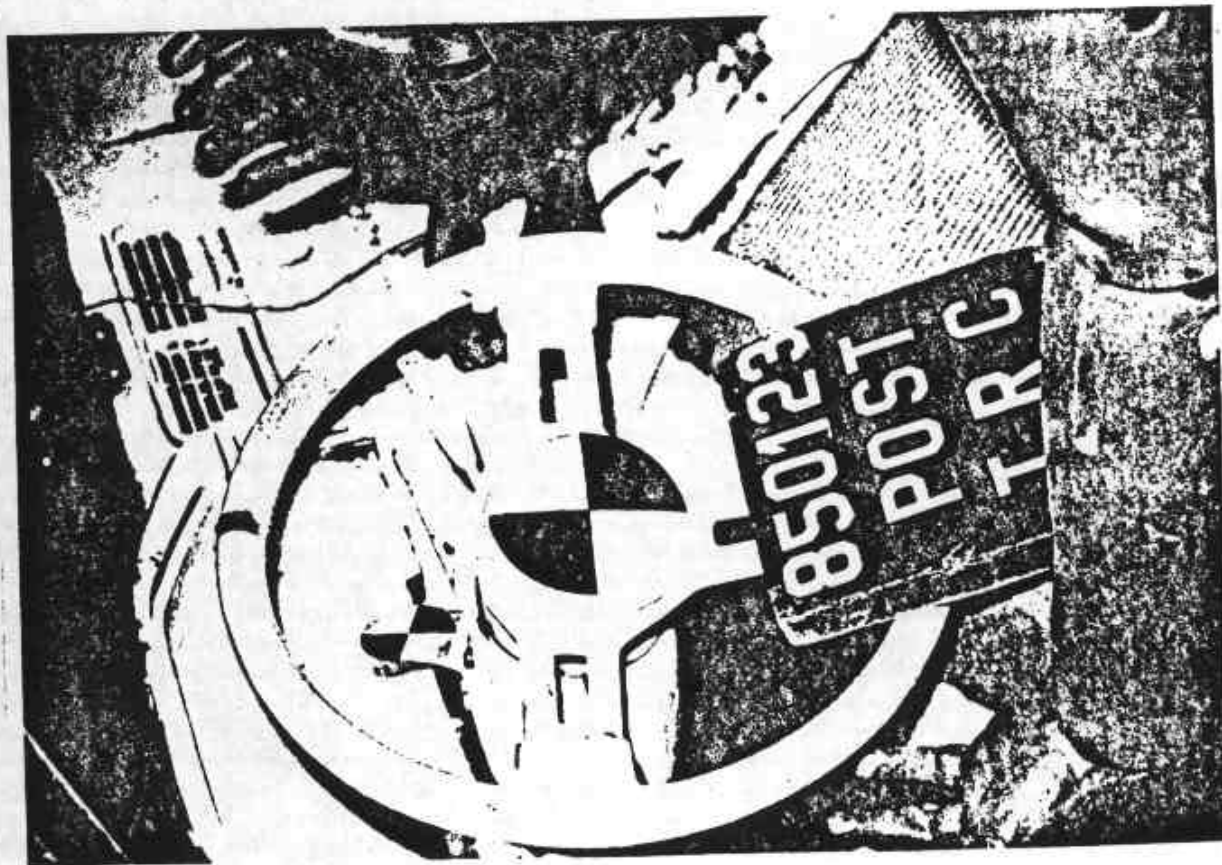


Figure 28. POST-TEST STEERING COLUMN HUB/RIM CONTACT BY DRIVER DUMMY

A-15

850123

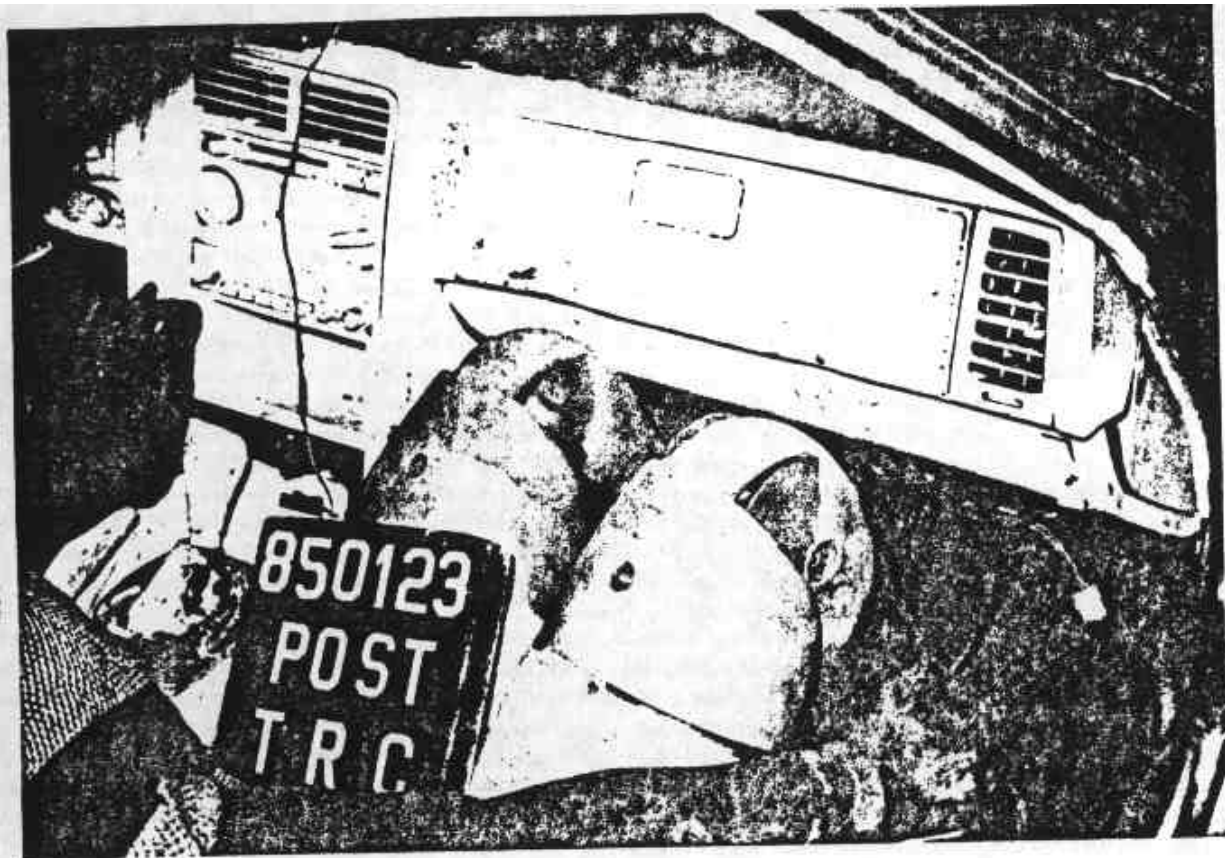


Figure 29. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT

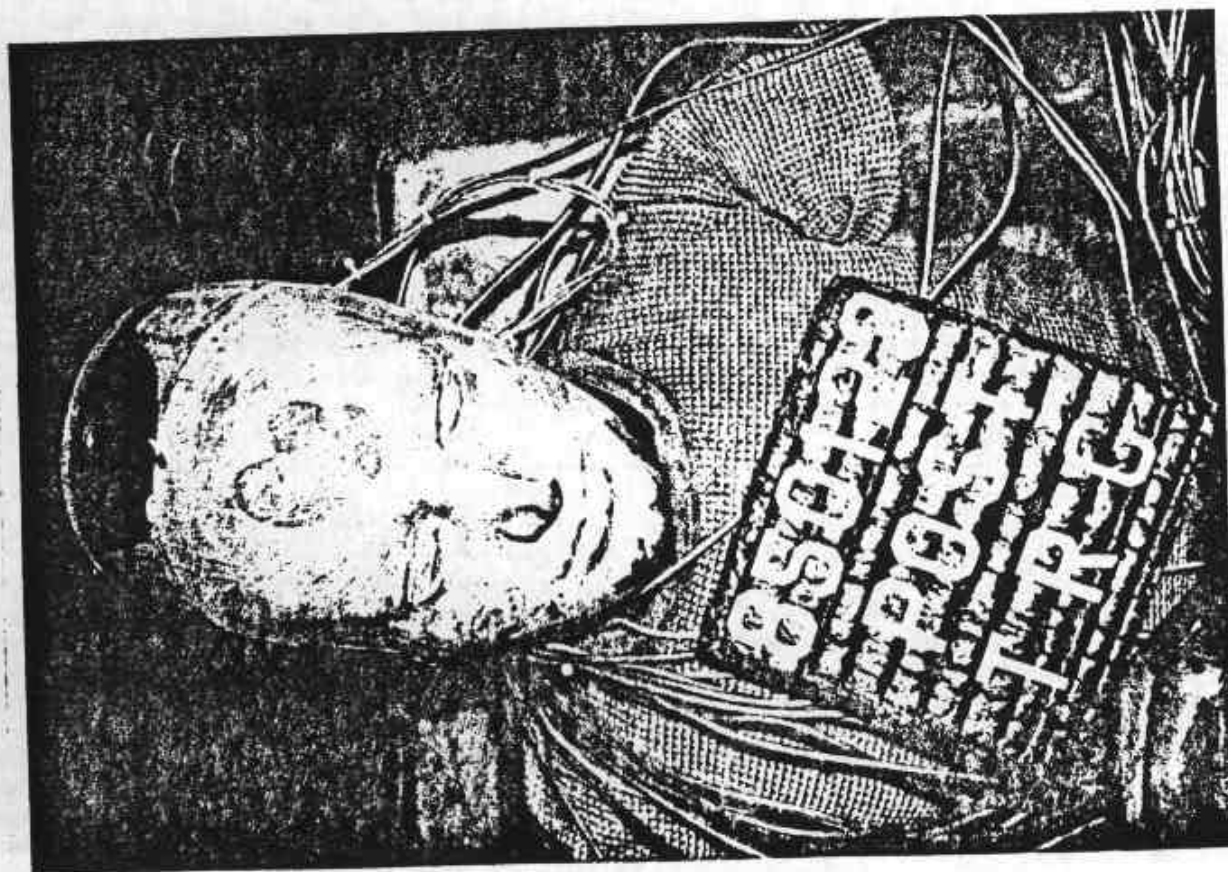


Figure 30. POST-TEST PASSENGER DUMMY HEAD/IP CONTACT AREA
A-16 850123

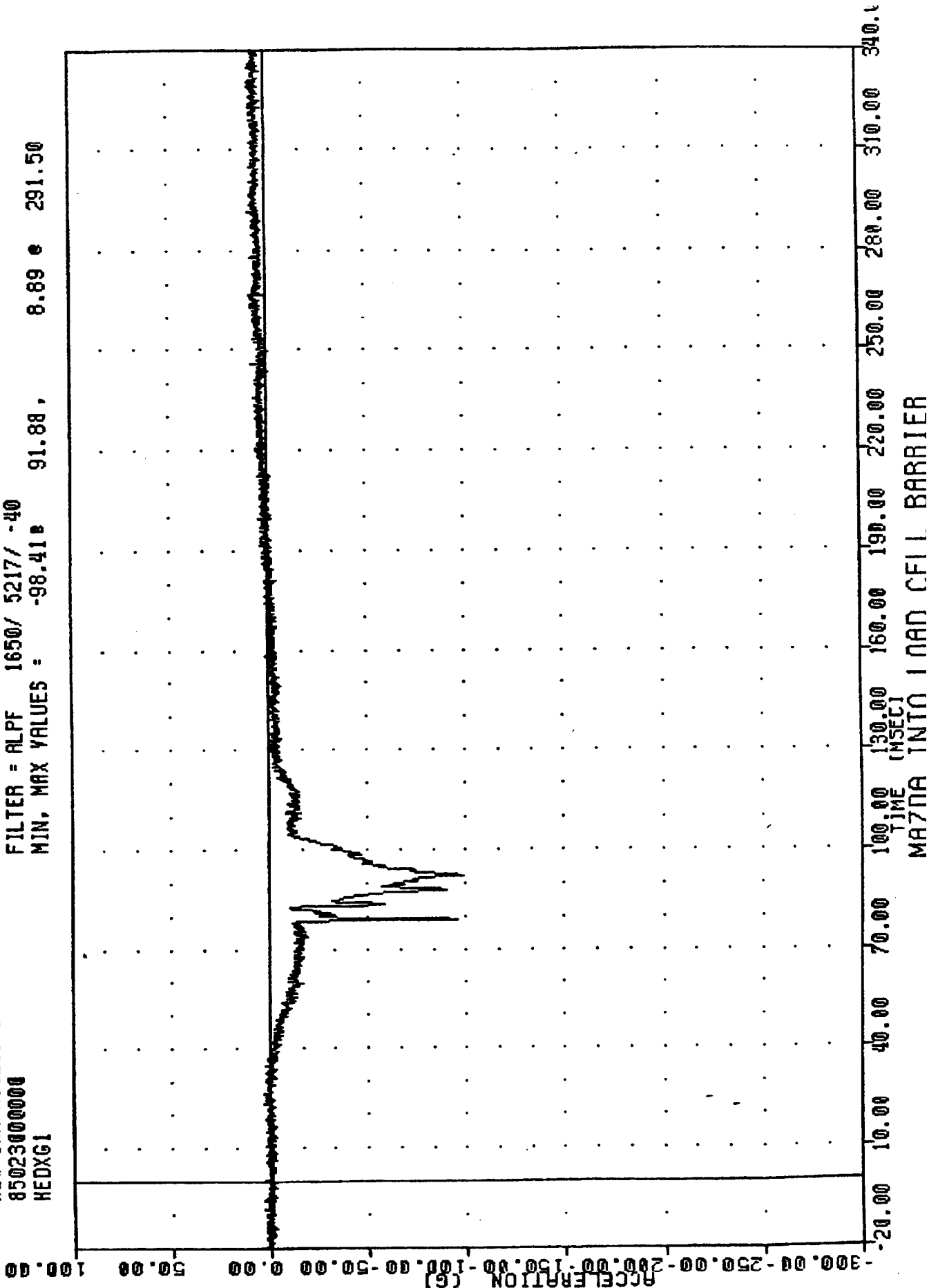
APPENDIX B
DATA PLOTS

IRC , 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 HEDXG1

PLOT DATE 31-JUN-85 10:36:48

FILTER = ALPF 1650/ 5217/ -40

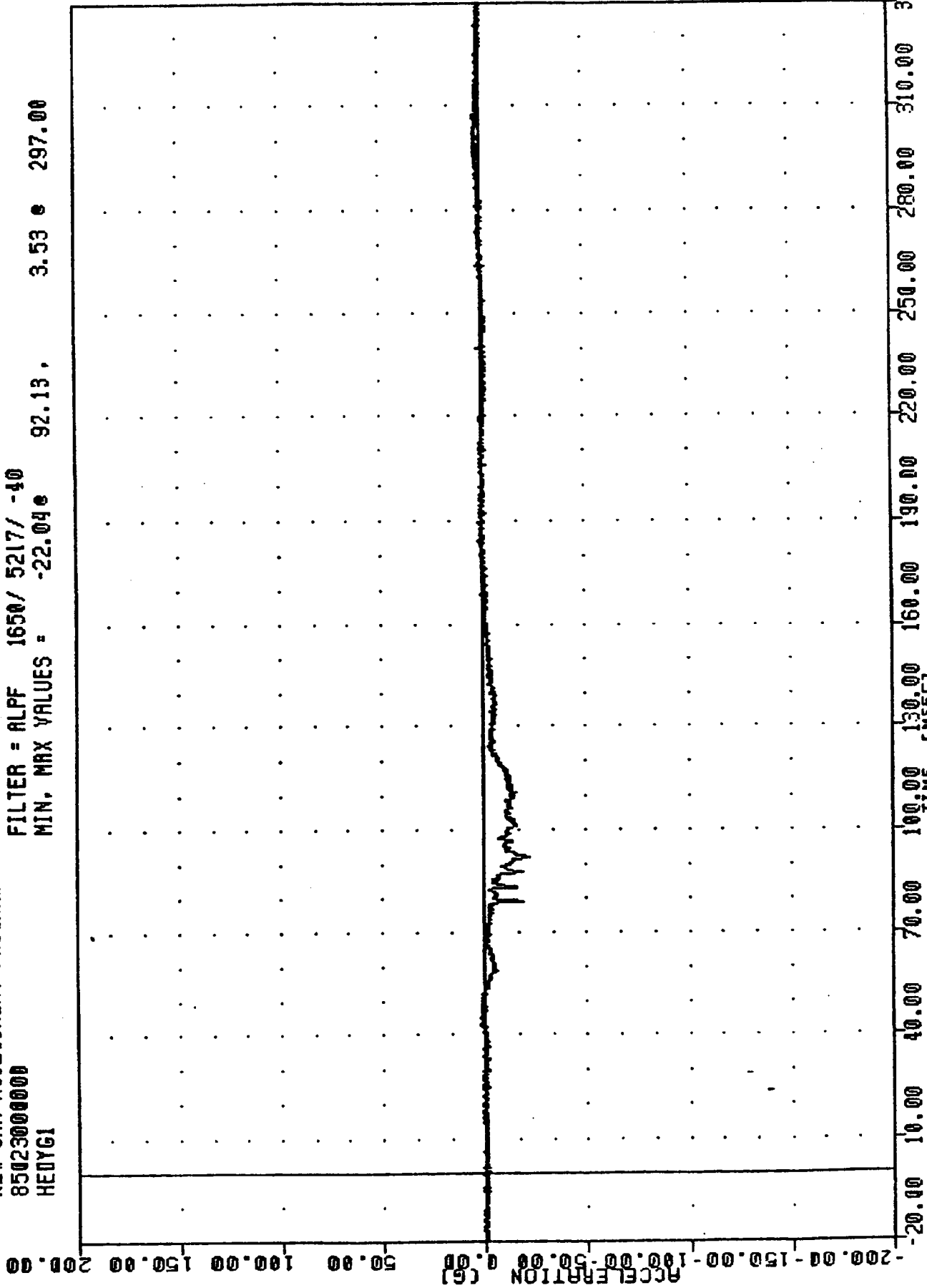
MIN, MAX VALUES = -98.41 91.88, 8.89 291.50



850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 HEDYGI

PLU DATE 31-3-85 10:36:48

FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -22.04e 92.13, 3.53 e 297.00

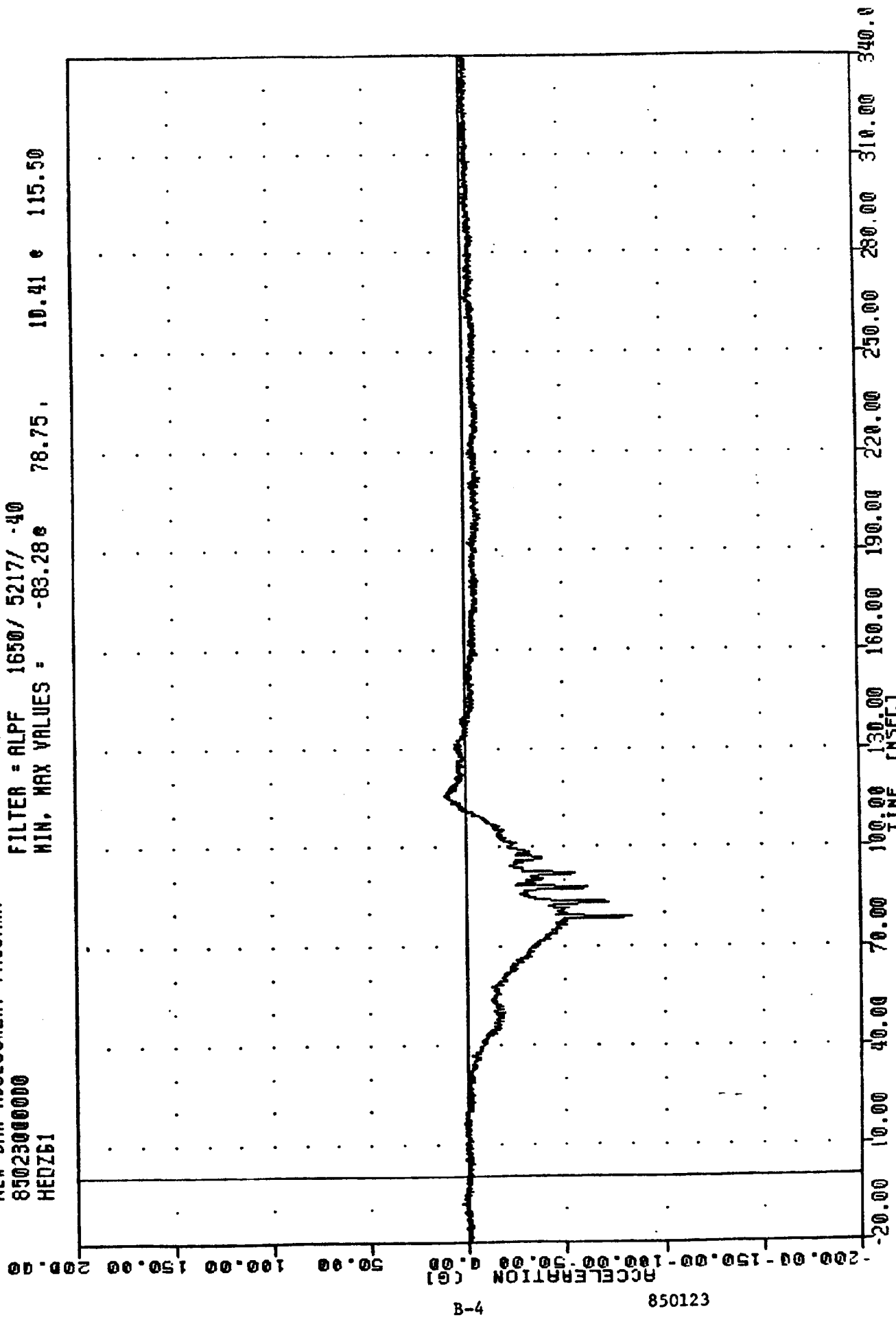


MAZDA INTO LOAD CELL BARRIER

850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 HEDZ61

PLOT DATE 31-85 10:36:48

FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -83.28 78.75 10.41 115.50



MAZDA INTO LOAD CELL BARRIER

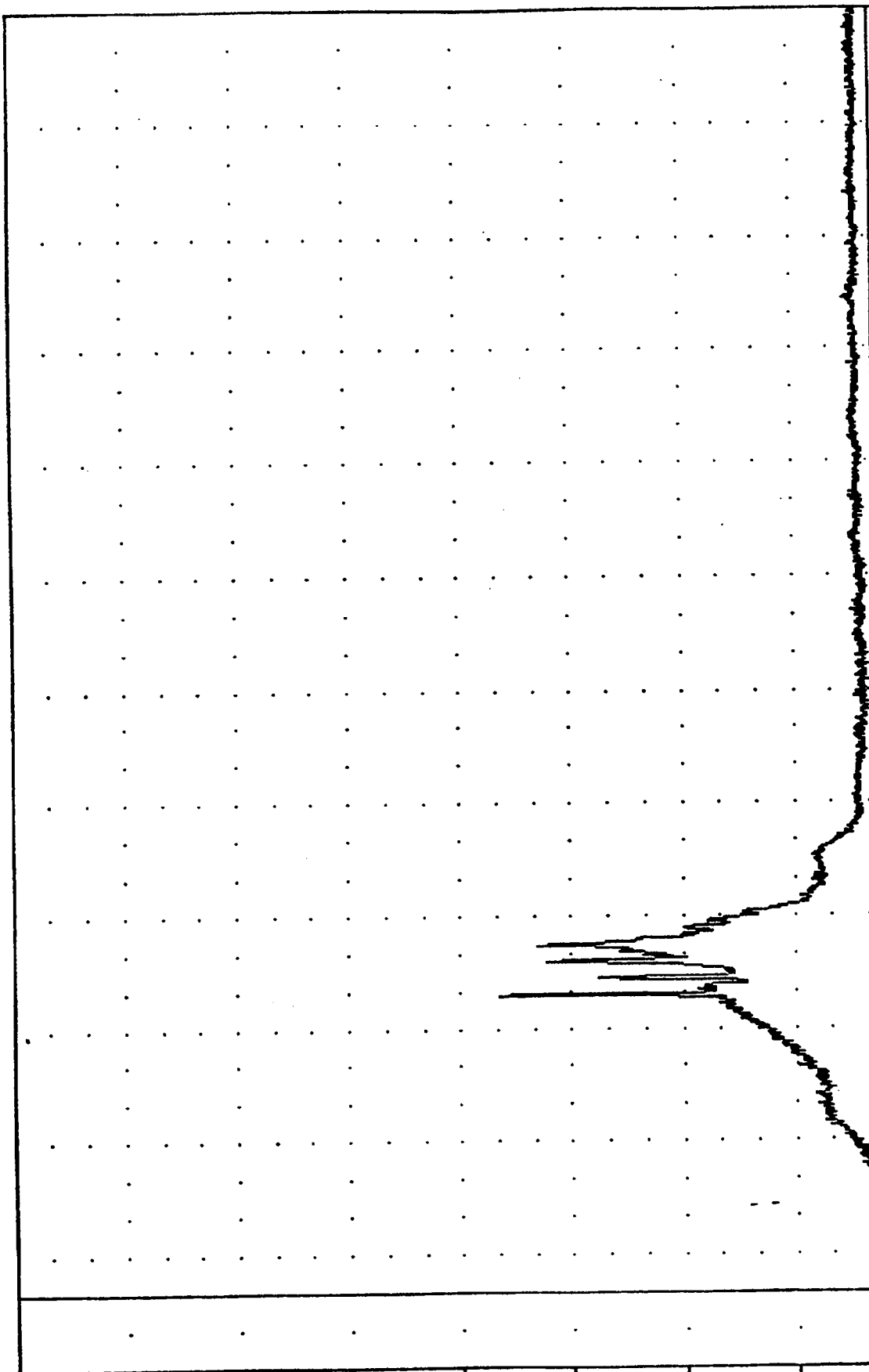
ARC 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 HEORG1

PLOT DATE 31 JAN-85 10:36:48

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = 0.118 -6.88, 126.99 78.88

ACCELERATION (G)



TIME (MSEC)

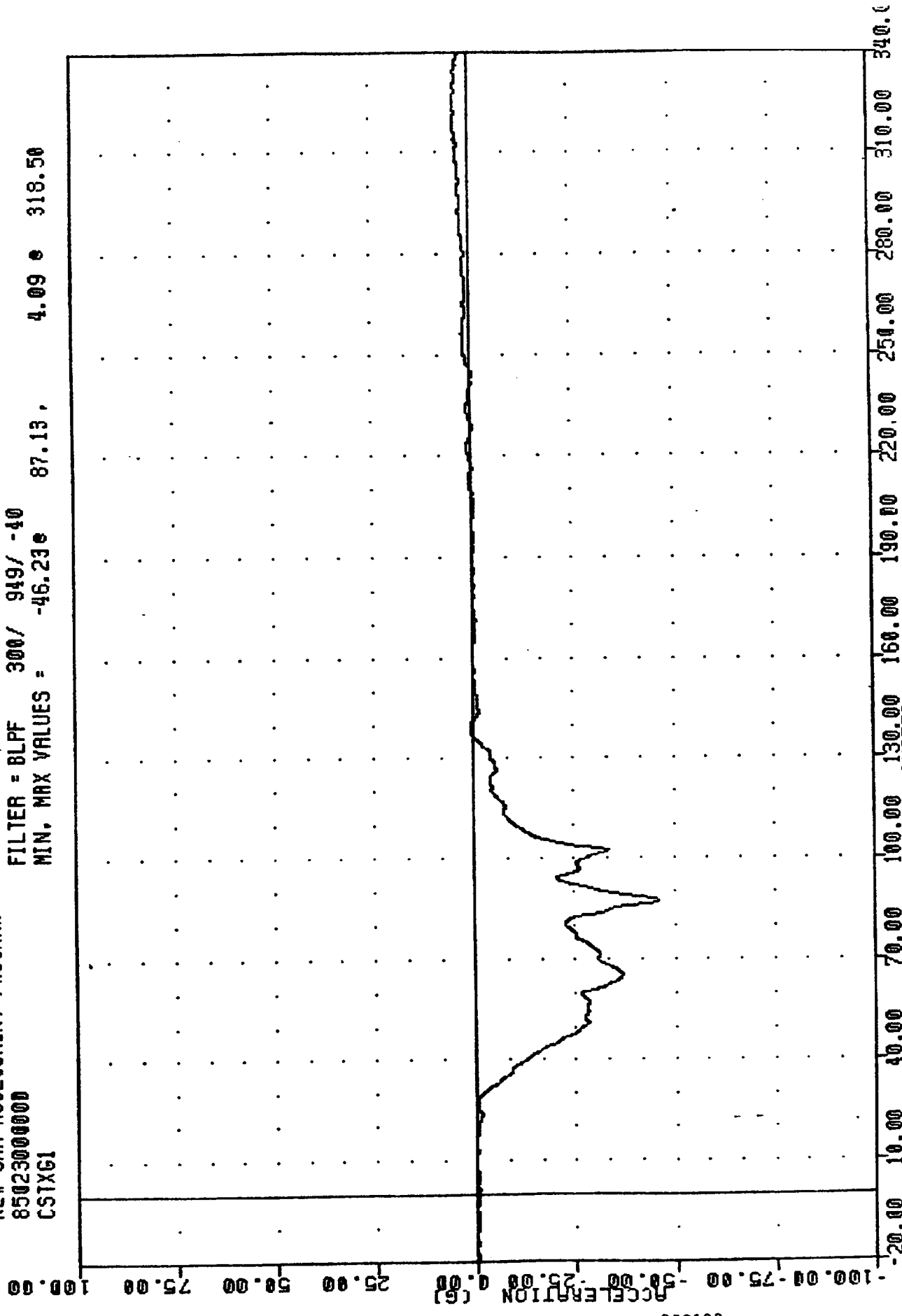
MAZDA INTO LOAD CELL BARRIER

CRASH TEST REPORT

INC 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 CSTXG1

PLU1 DATE 31 JAN 80 10:56:40

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -46.23e 87.13, 4.09 e 318.50



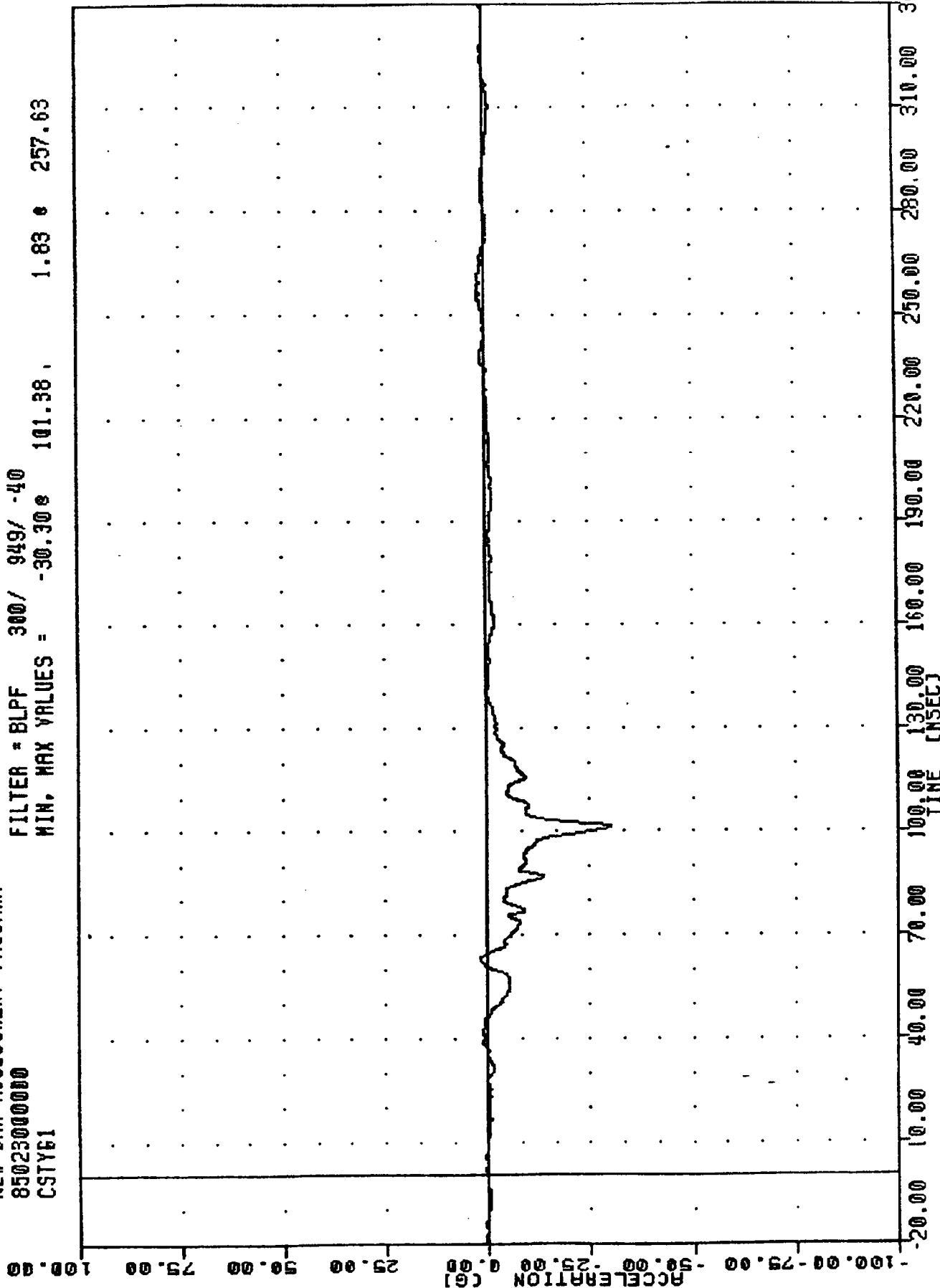
MAZDA INTO LOAD CELL BARRIER
 - - - - - IMPACT OCCURRENCE Y DATE

THC .850123
NEW CAR ASSESSMENT PROGRAM
850230000000
CSTY61

PLOT DATE 31-JUN-85 10:36:48

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -30.30 101.38 1.83 257.63



MAZDA INTO LOAD CELL BARRIER

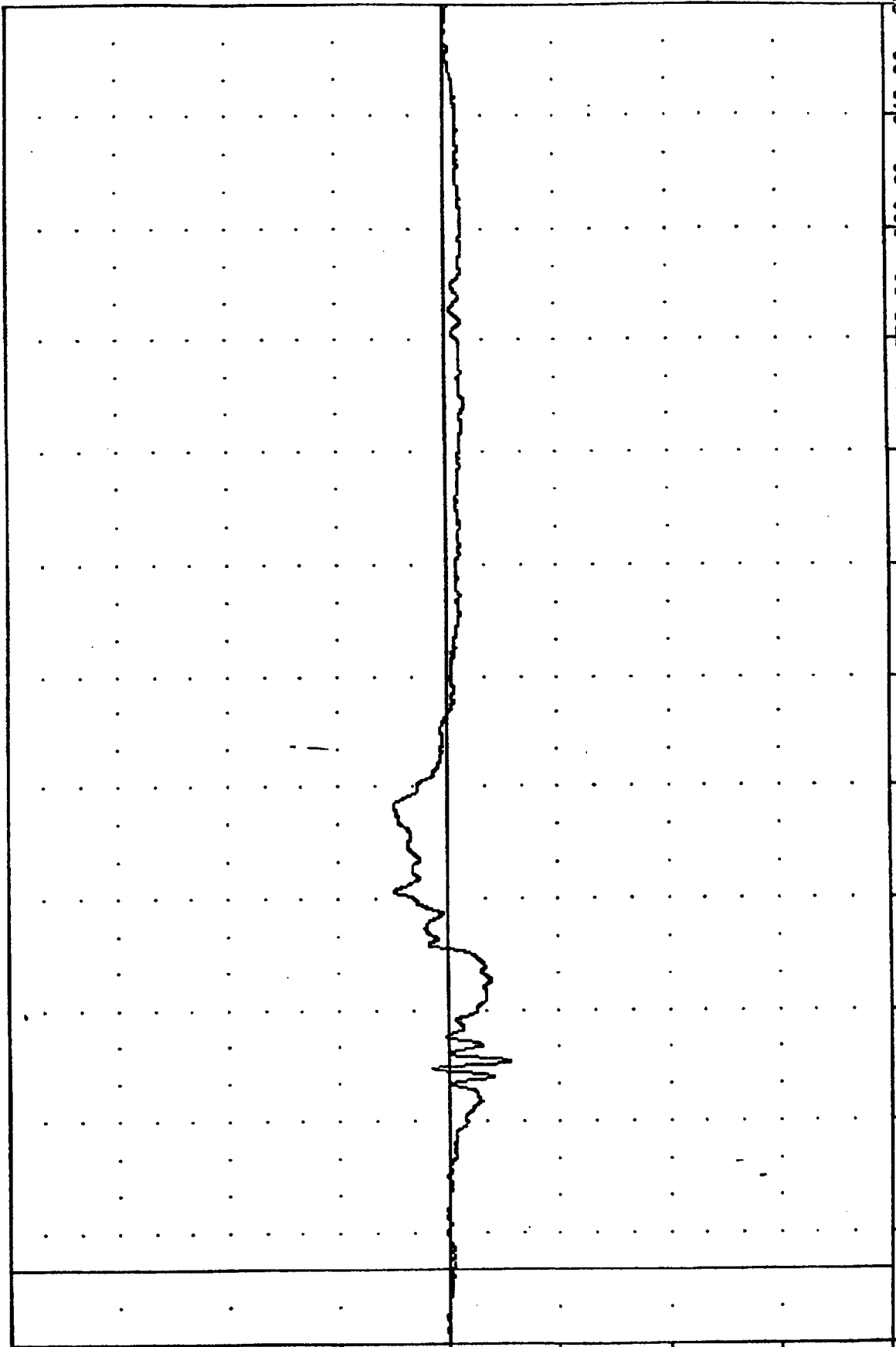
NEW CAR ASSESSMENT PROGRAM
 850230000000
 CSTZG1

PLU1 DATE 31-06-80 14:06:40

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -13.650 56.25 12.59 124.63

ACCELERATION (G)



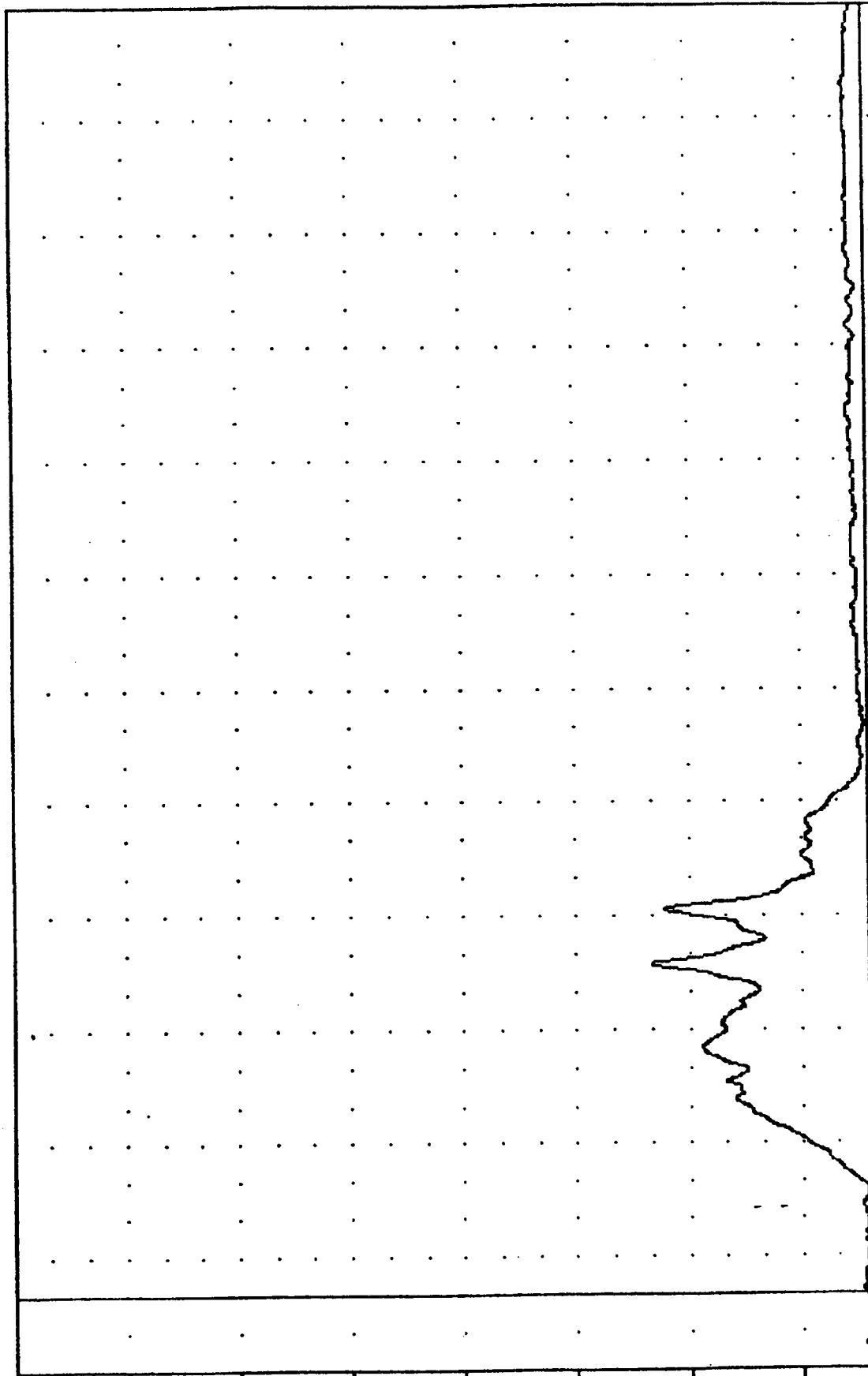
MAZDA INTO LOAD CELL BARRIER

NEW CAR ASSESSMENT PROGRAM
 85023000000
 CSTRG1

PLU1 DATE 3 N-6J 10-06:40

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 0.148 11.75, 48.38 87.13

ACCELERATION (G)



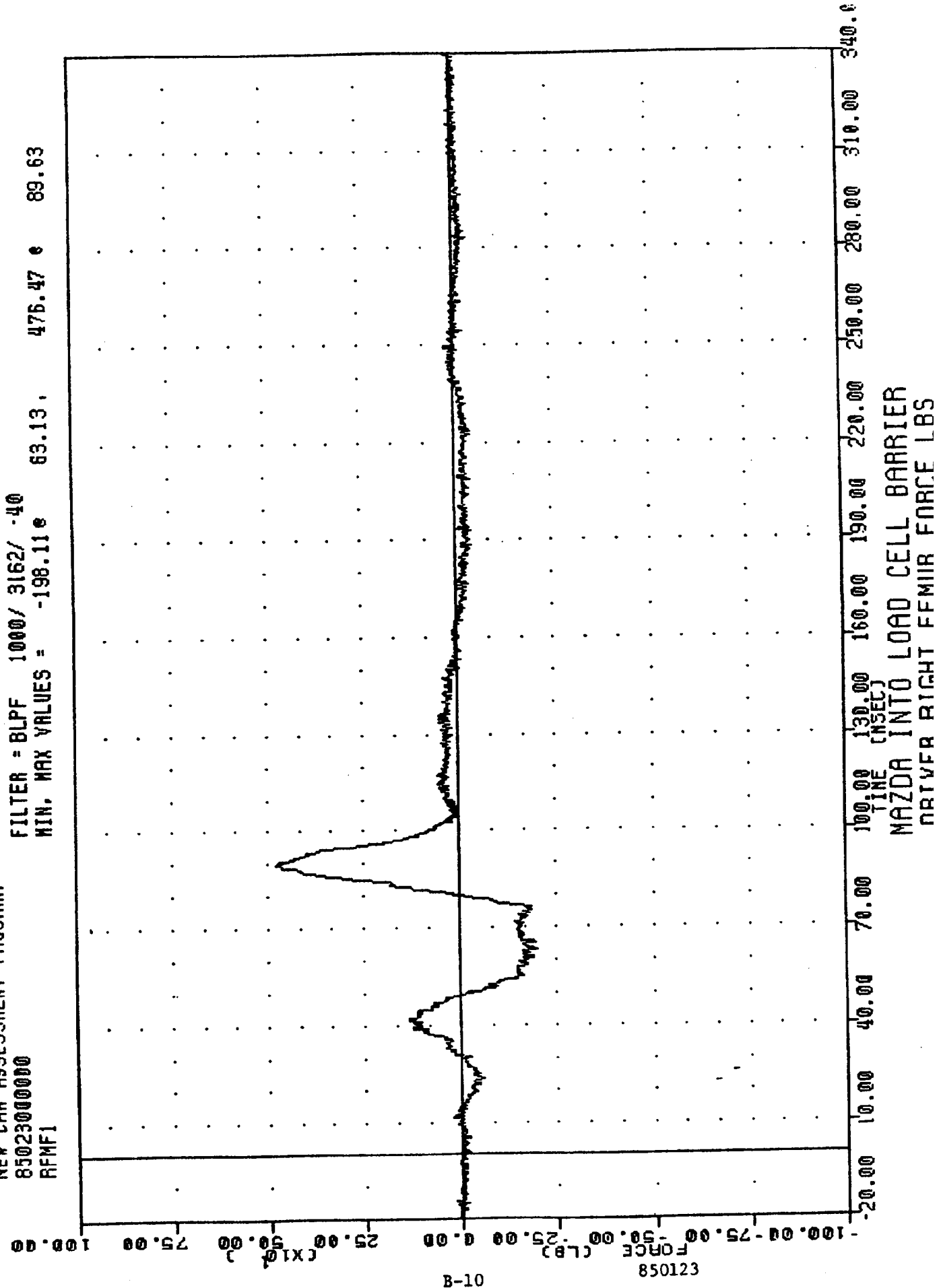
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MAZDA INTO LOAD CELL BARRIER
 DRIVER SURFECT RECUIT TONT

NEW CAR ASSESSMENT PROGRAM
 85023000000
 RFMF1

PLU, JATL 31-6J 1w.06:40

FILTER = BLPF 1000/ 3162/ .40
 MIN, MAX VALUES = -198.11e 63.13, 475.47 e 89.63



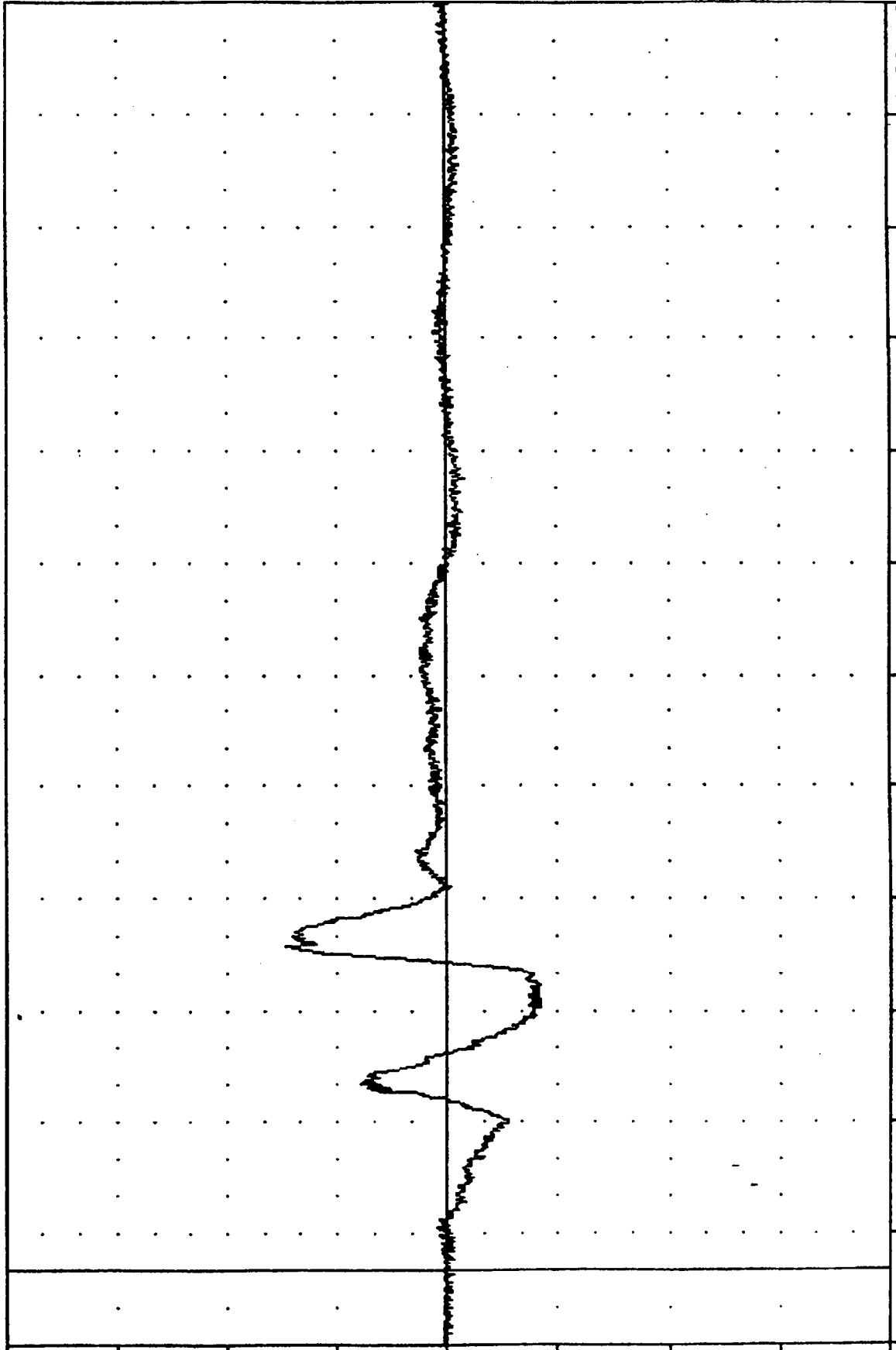
850123
NEW CAR ASSESSMENT PROGRAM
85023000000
LFMF1

PLOT DATE 31-08-85 10:36:48

FILTER = BLPF 1000/ 3162/ -40

MIN. MAX VALUES = -211.55 70.88 369.46 87.13

850123
B-11
FORCE (LB)
(X10³)
100.00
75.00
50.00
25.00
0.00
-25.00
-50.00
-75.00
-100.00



MAZDA INTO LOAD CELL BARRIER

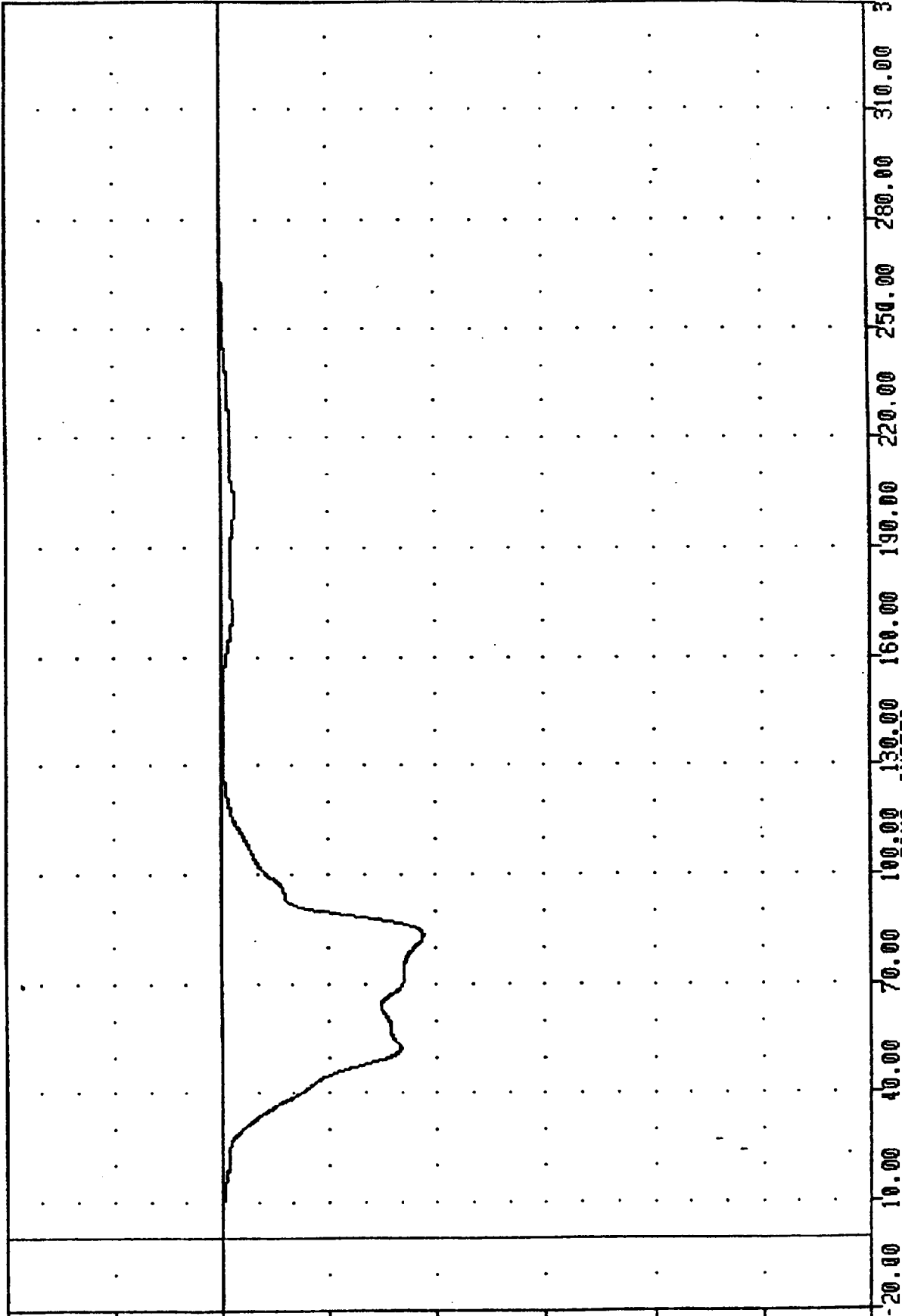
850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 LB0F1

PLU1 DATE 31 83 10:36:40

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -939.630 83.25, 1.370 -11.38

850123
 B-12
 FORCE (LB)
 (X10)



MAZDA INTO LOAD CELL BARRIER
 FOR CRASH TEST FORCE 1.1 DC

850123

NEW CAR ASSESSMENT PROGRAM

850230000000

SHBF1

PLU1 DATE 31-03-80 10:36:48

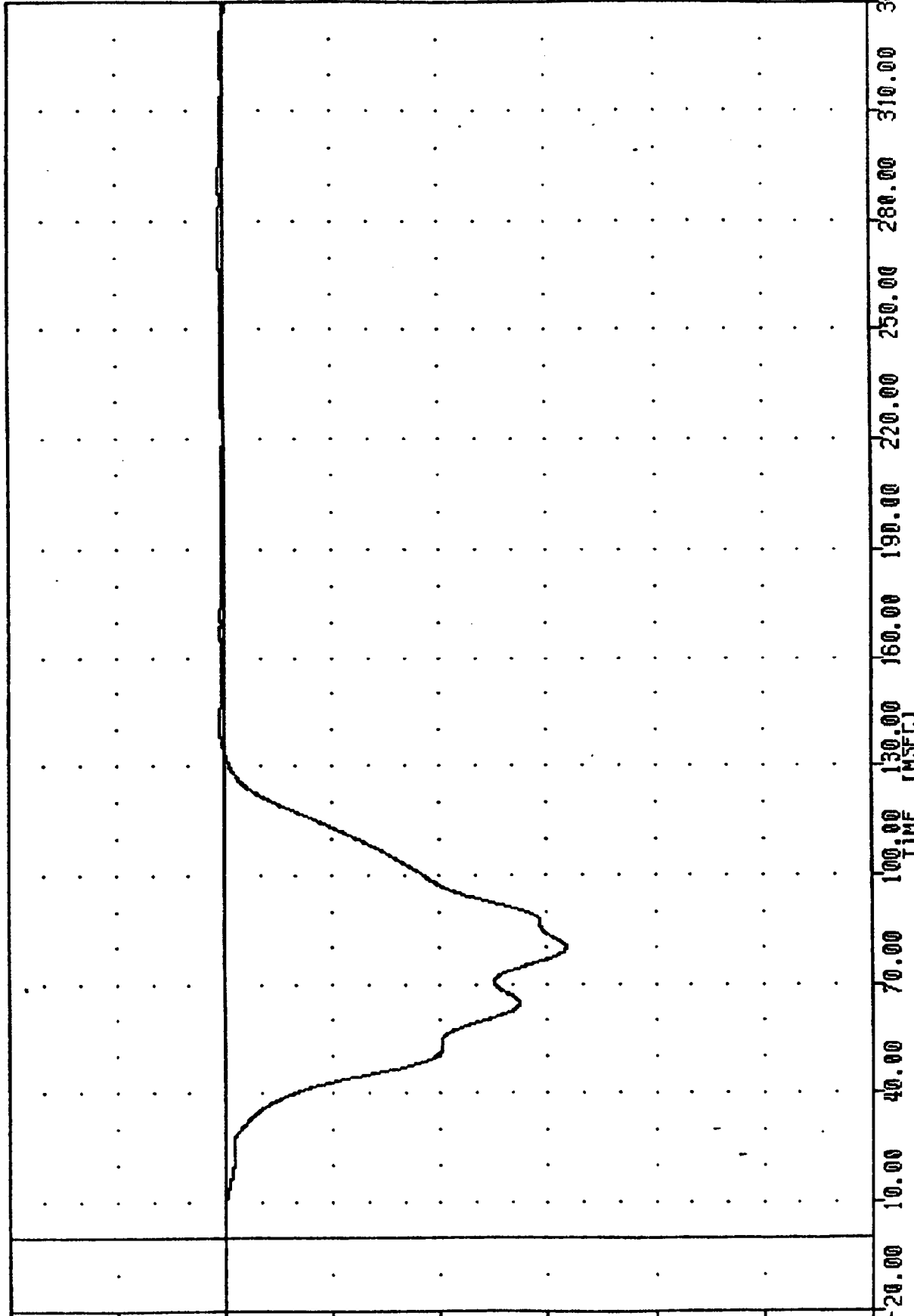
FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -1587.97 79.50, 21.50 141.38

FORCE (LB)
(X10³)

B-13

850123

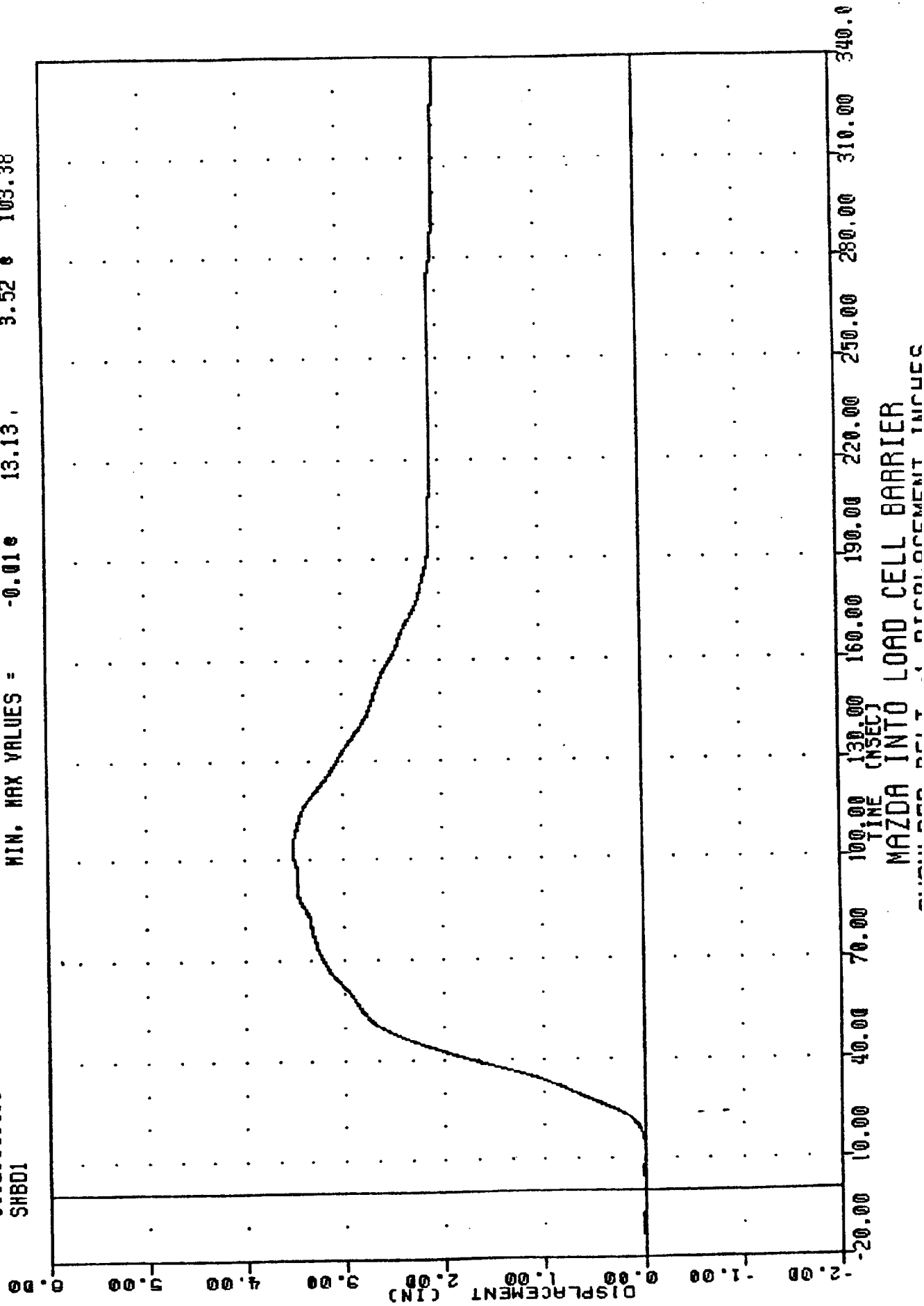


MAZDA INTO LOAD CELL BARRIER

NEW CAR ASSESSMENT PROGRAM
 85023000000
 SHBD1

PLU1 DATE 31-08-80 10:56:40

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -0.01e 13.13, 3.52 e 103.38

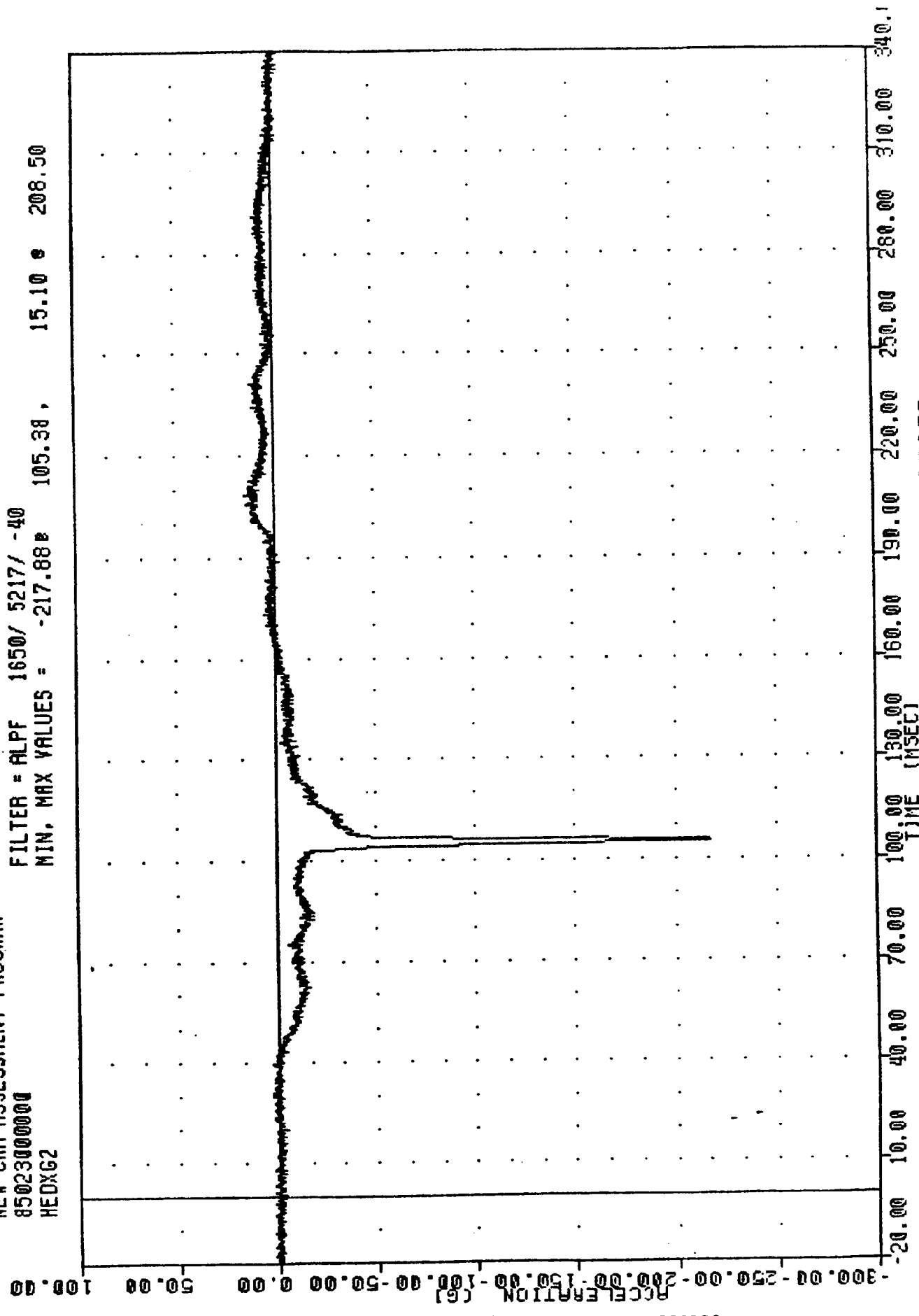


MAZDA INTO LOAD CELL BARRIER
 DISPLACEMENT INCHES

850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 HEDXG2

PLU1 DATE 30 JUN 83 13:44:44

FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -217.88 105.38, 15.10 208.50



B-15

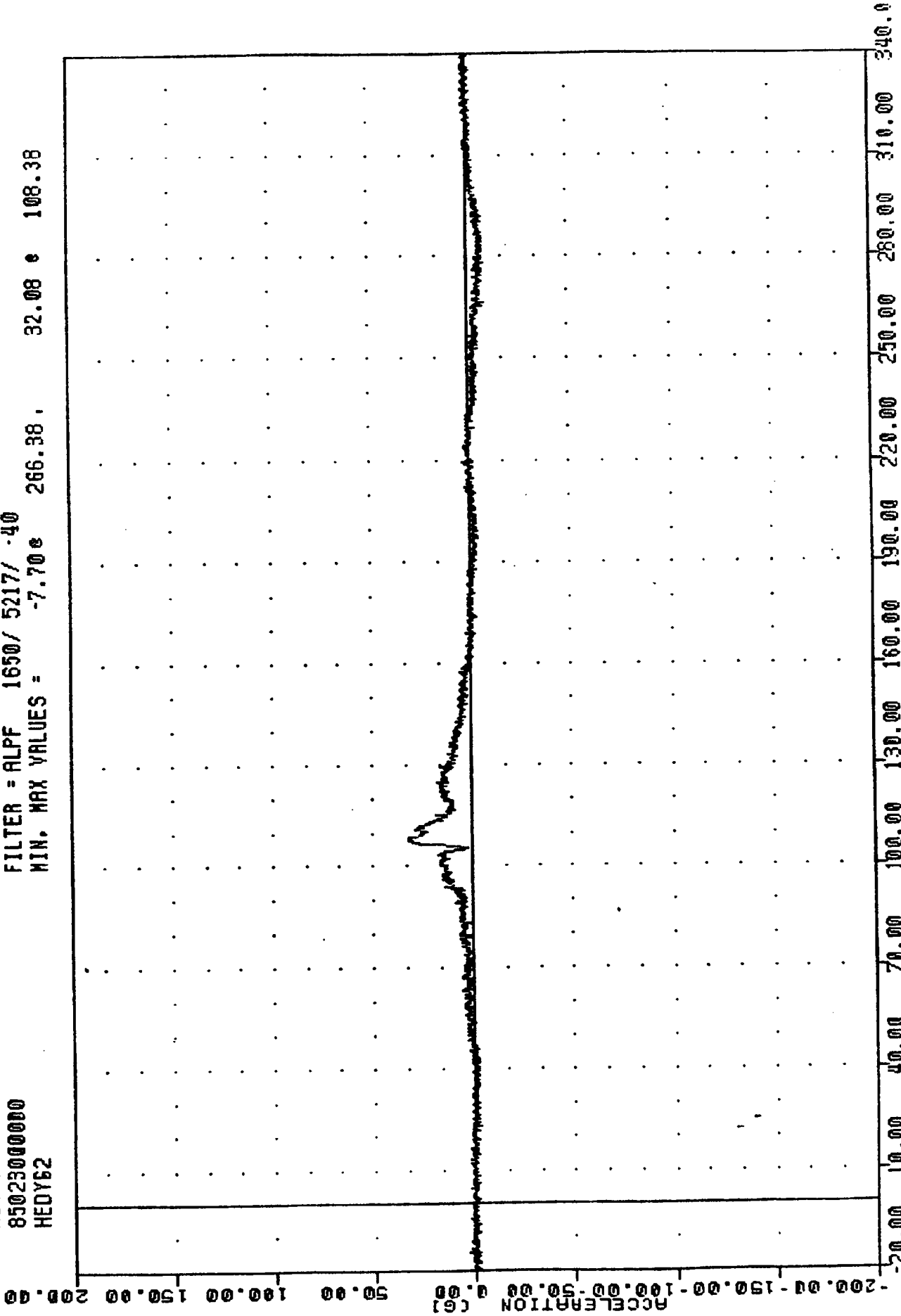
850123

MAZDA INTO LOAD CELL BARRIER
 SECTION V OVER

ALC , 850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 HEDY62

PLU1 DATE 3 14-80 10:36:48

FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = -7.70e 266.38 , 32.08 e 108.38

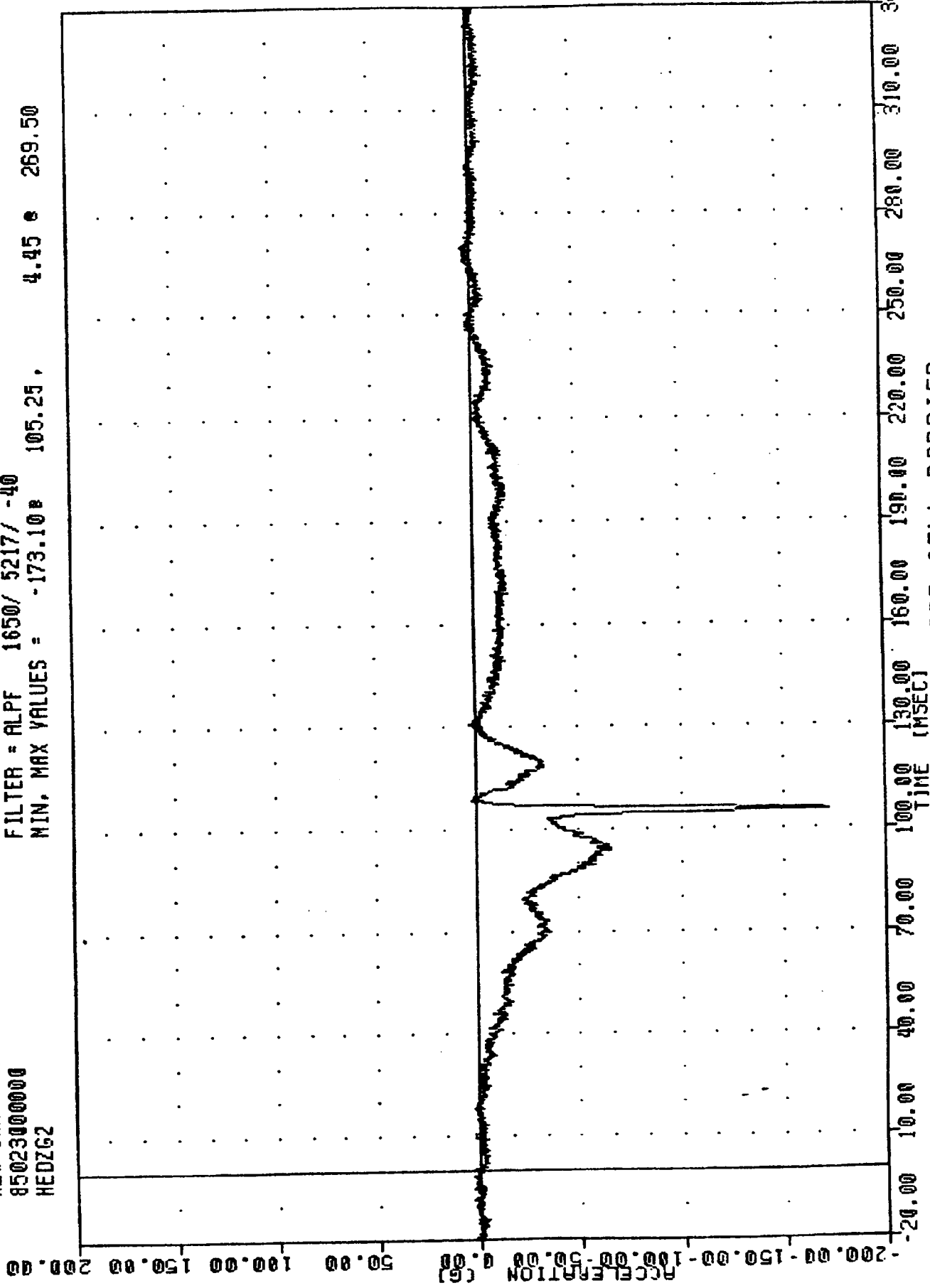


MAZDA INTO LOAD CELL BARRIER
 ACCIDENTAL HEAD ACCELERATION Y AXIS

850123
NEW CAR ASSESSMENT PROGRAM
85023000000
HEDZG2

PLUI DATE 30-N-80 10:36:48

FILTER = ALPF 1650/ 5217/ -40
MIN. MAX VALUES = -173.10 105.25, 4.45 269.50

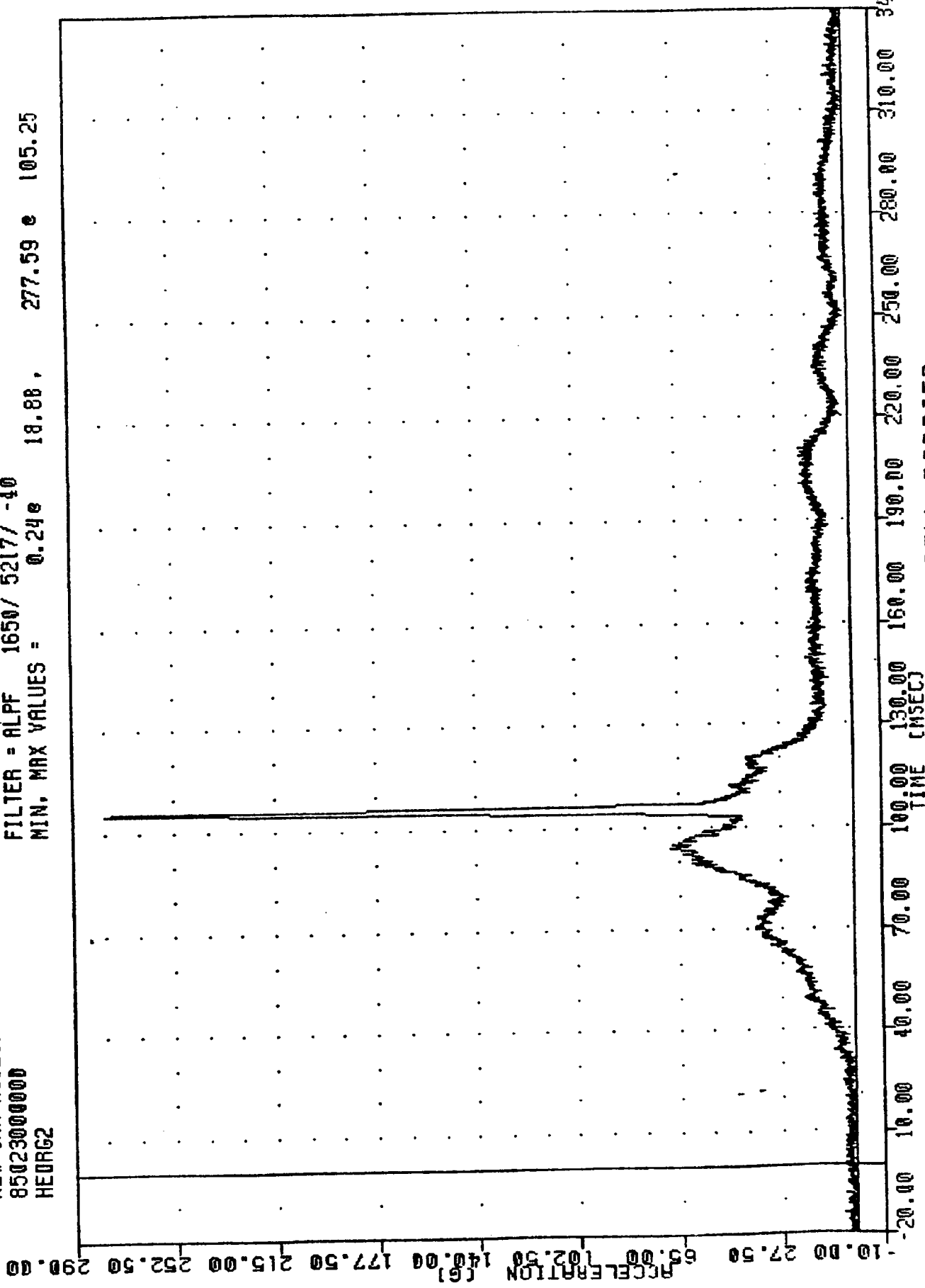


MAZDA INTO LOAD CELL BARRIER
ACCELERATION 7.0VTC

FILE 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 HEDRG2

PLU1 DATE 31-N-83 13:44:44

FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = 0.24e 18.88, 277.59 e 105.25



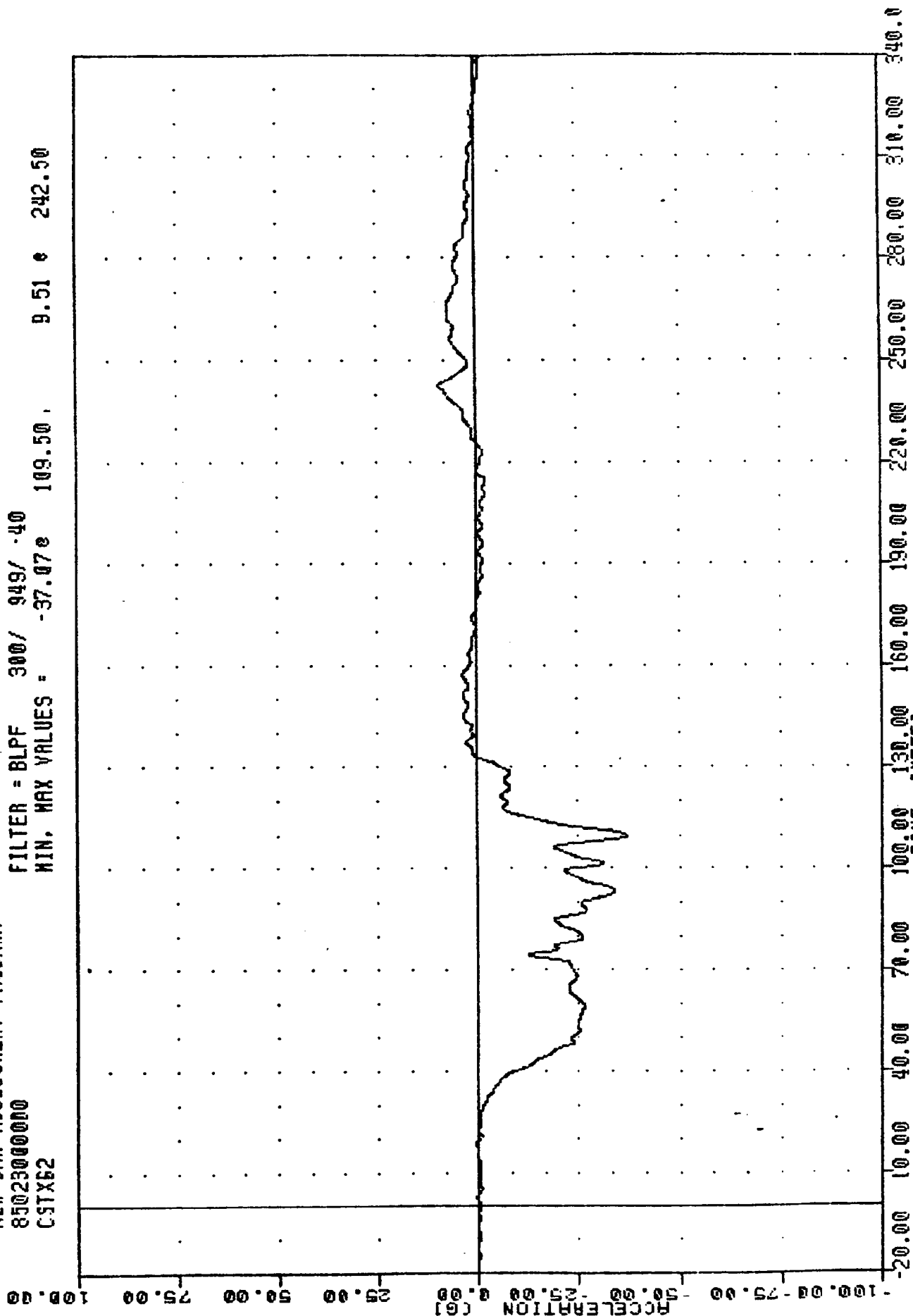
MAZDA INTO LOAD CELL BARRIER
 TEST FOR FRONT

850123
NEW CAR ASSESSMENT PROGRAM
850230000000
CSTX62

PLU1 DATE 31-85 10:36:48

FILTER = BLPF 300/ 949/ .40

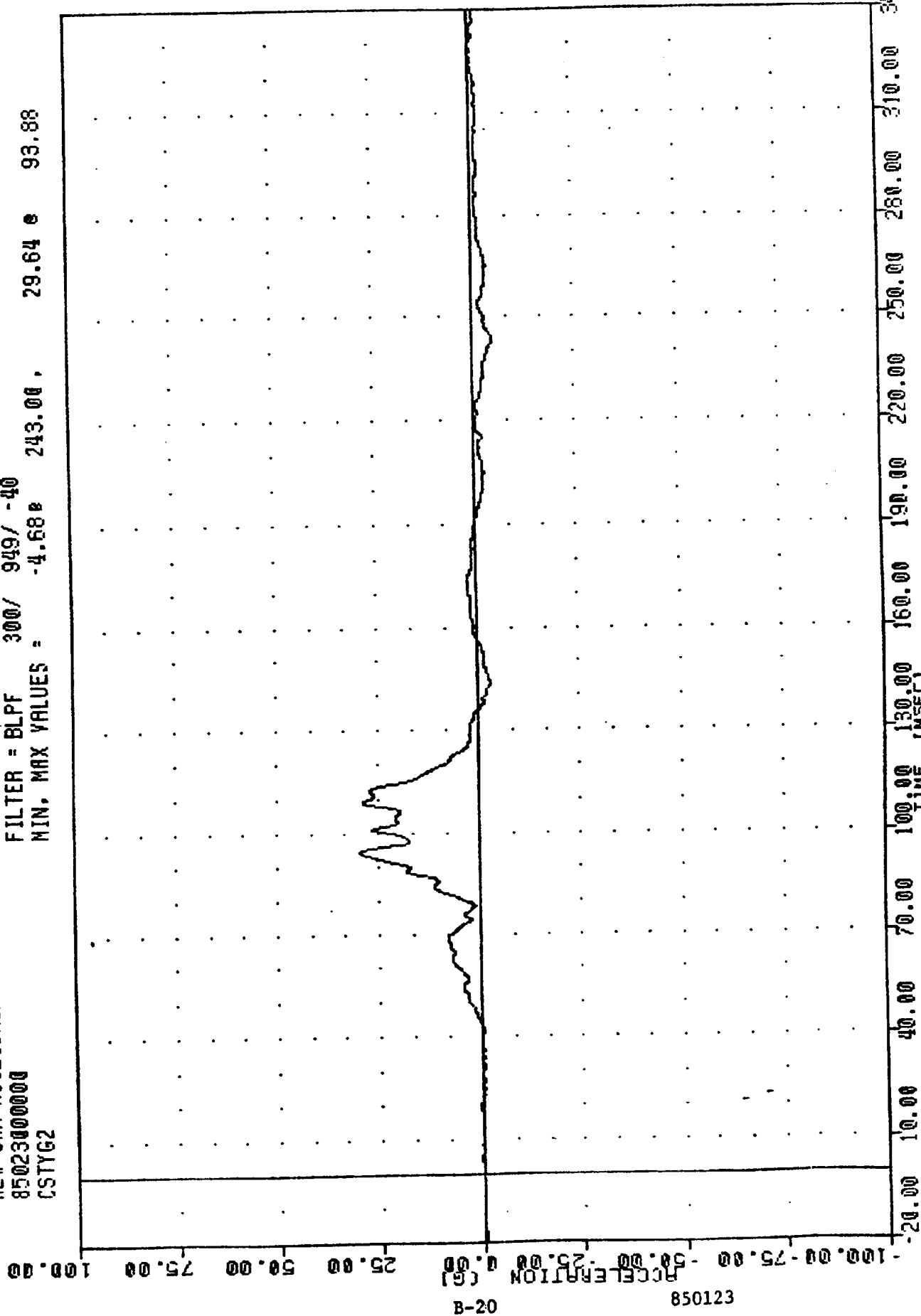
MIN. MAX VALUES = -37.07e 109.50, 9.51 e 242.50



NEW CAR ASSESSMENT PROGRAM
 85023000000
 CSTYG2

PLU1 DATE 30 JUN 80 10:06:40

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -4.688 243.00 29.64 93.88

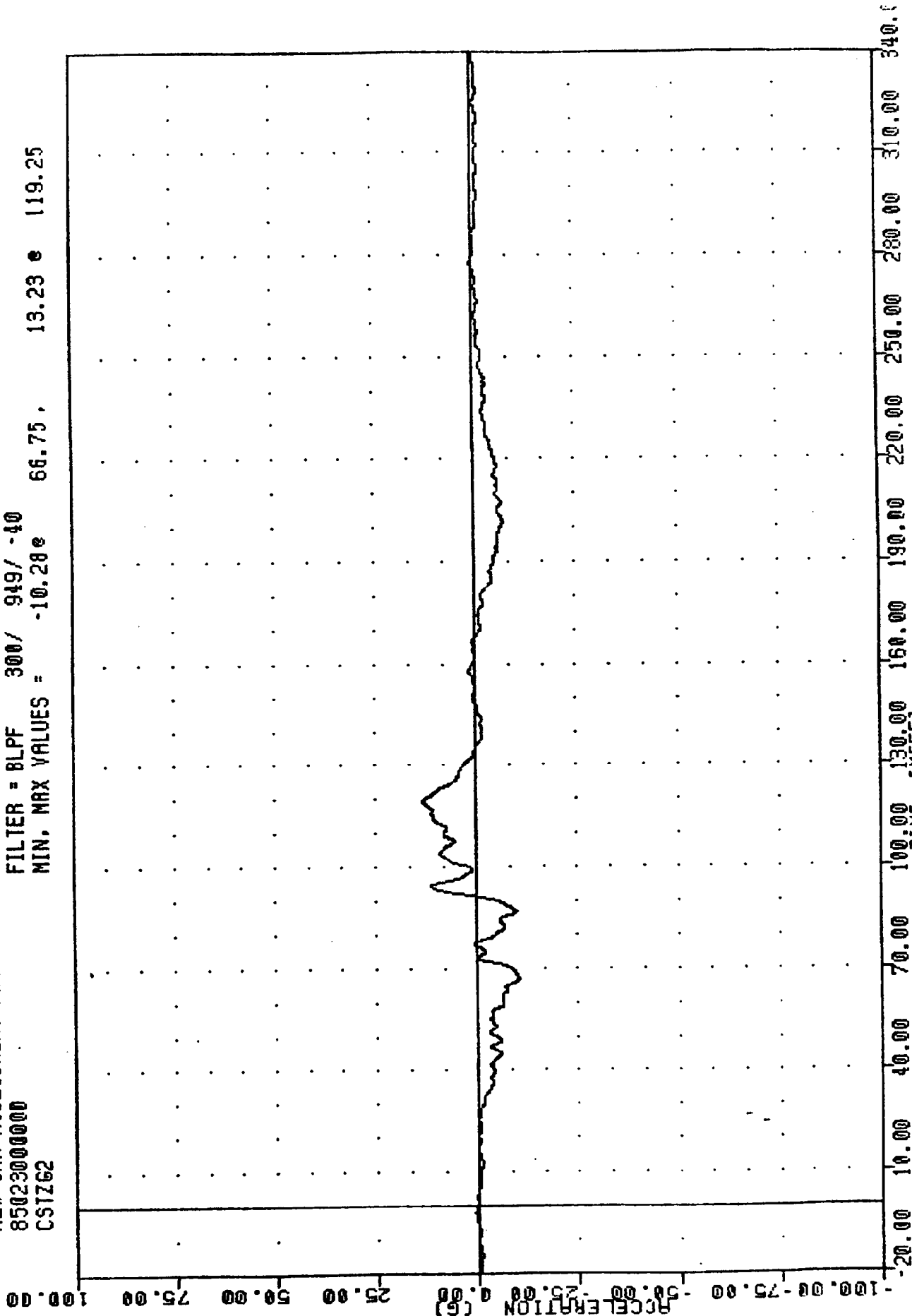


MAZDA INTO LOAD CELL BARRIER
 RESEARCH CENTER ACCIDENTATION V. 0.10

NEW CAR ASSESSMENT PROGRAM
850230000000
CS1Z62

PLT, DTL 3, 10.36:40

FILTER = BLPF 300/ 919/ -40
MIN. MAX VALUES = -10.28e 66.75, 13.23 e 119.25



850123
NEW CAR ASSESSMENT PROGRAM
850230000000
CSTR62

PLOT DATE 31-08-85 10:36:48

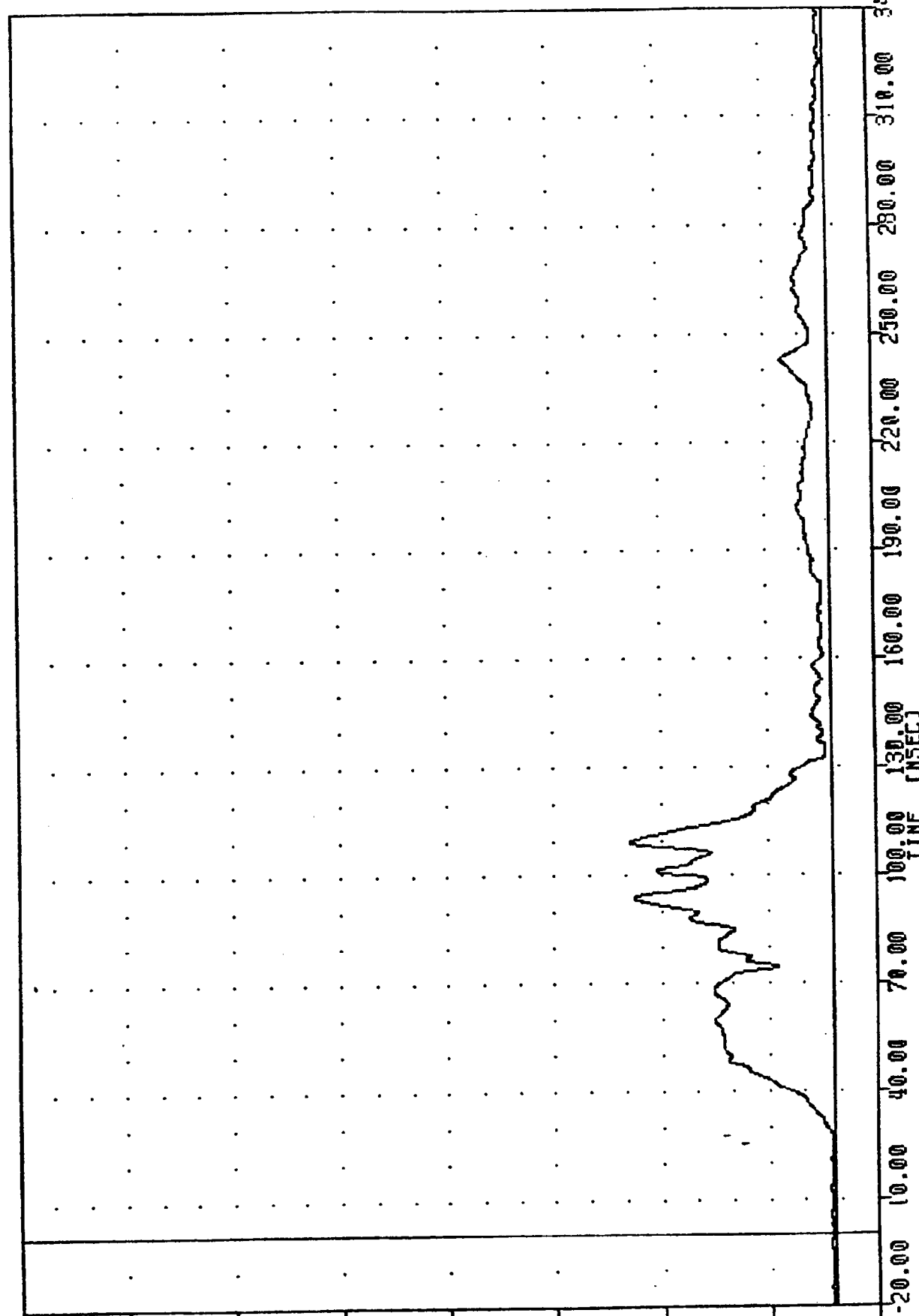
FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = 0.08 15.50 47.27 109.38

ACCELERATION (G)

B-22

850123

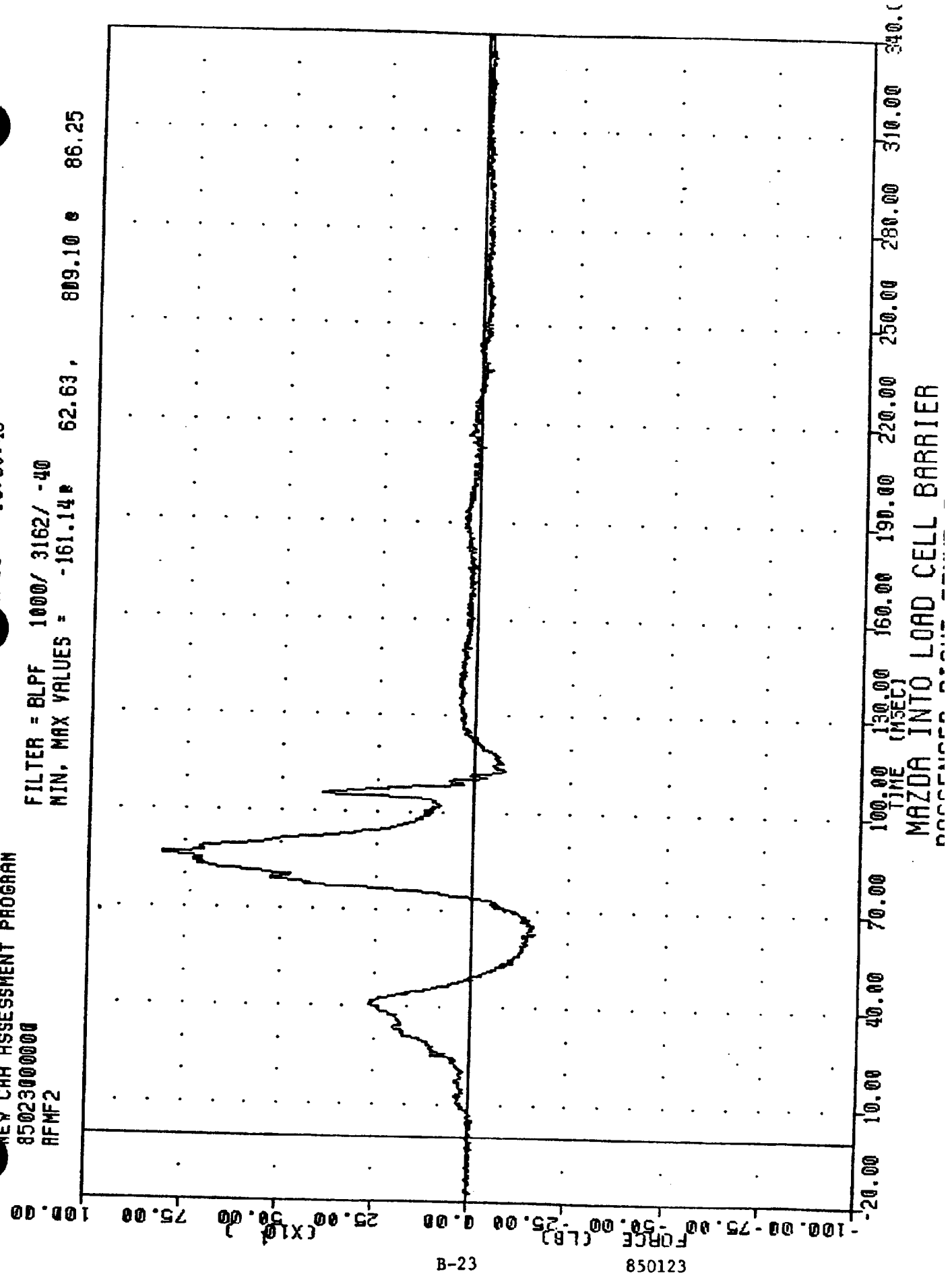


MAZDA INTO LOAD CELL BARRIER

HCU , 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 AFMF2

PLU1 DATE 3 N-83 10:36:48

FILTER = BLPF 1000/ 3162/ -40
 MIN, MAX VALUES = -161.14 62.63, 809.10 86.25



B-23

850123

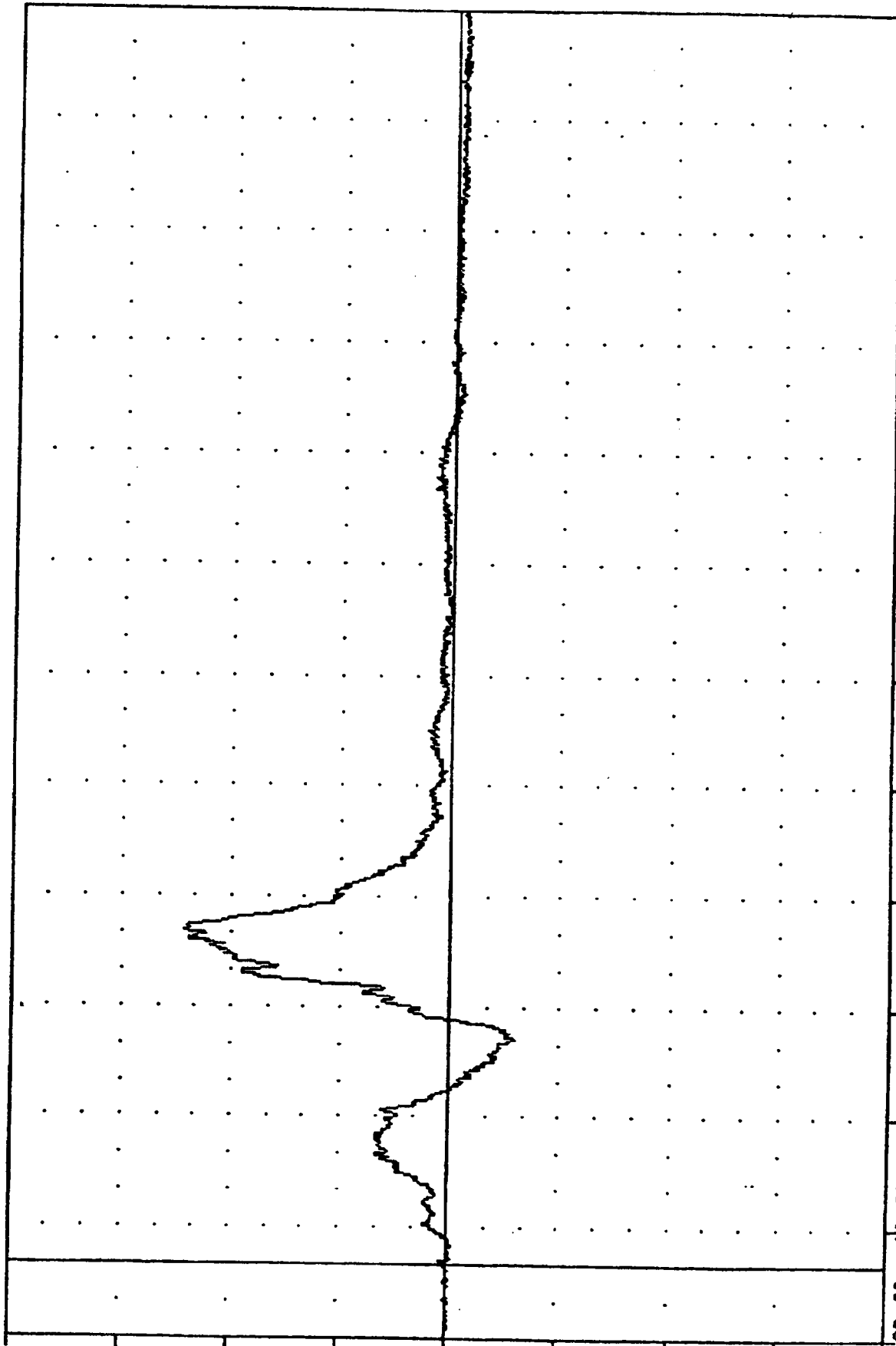
MAZDA INTO LOAD CELL BARRIER
 PROGRAM

THU 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 LFN2

PLU1 DATE 10:36:48

FILTER = BLPF 1000/ 3162/ -40
 MIN, MAX VALUES = -146.47e 61.38, 603.98 e 90.38

100.00
 75.00
 50.00
 25.00
 0.00
 -25.00
 -50.00
 -75.00
 -100.00



B-24

850123

340.00
 310.00
 280.00
 250.00
 220.00
 190.00
 160.00
 130.00
 100.00
 70.00
 40.00
 10.00
 -20.00

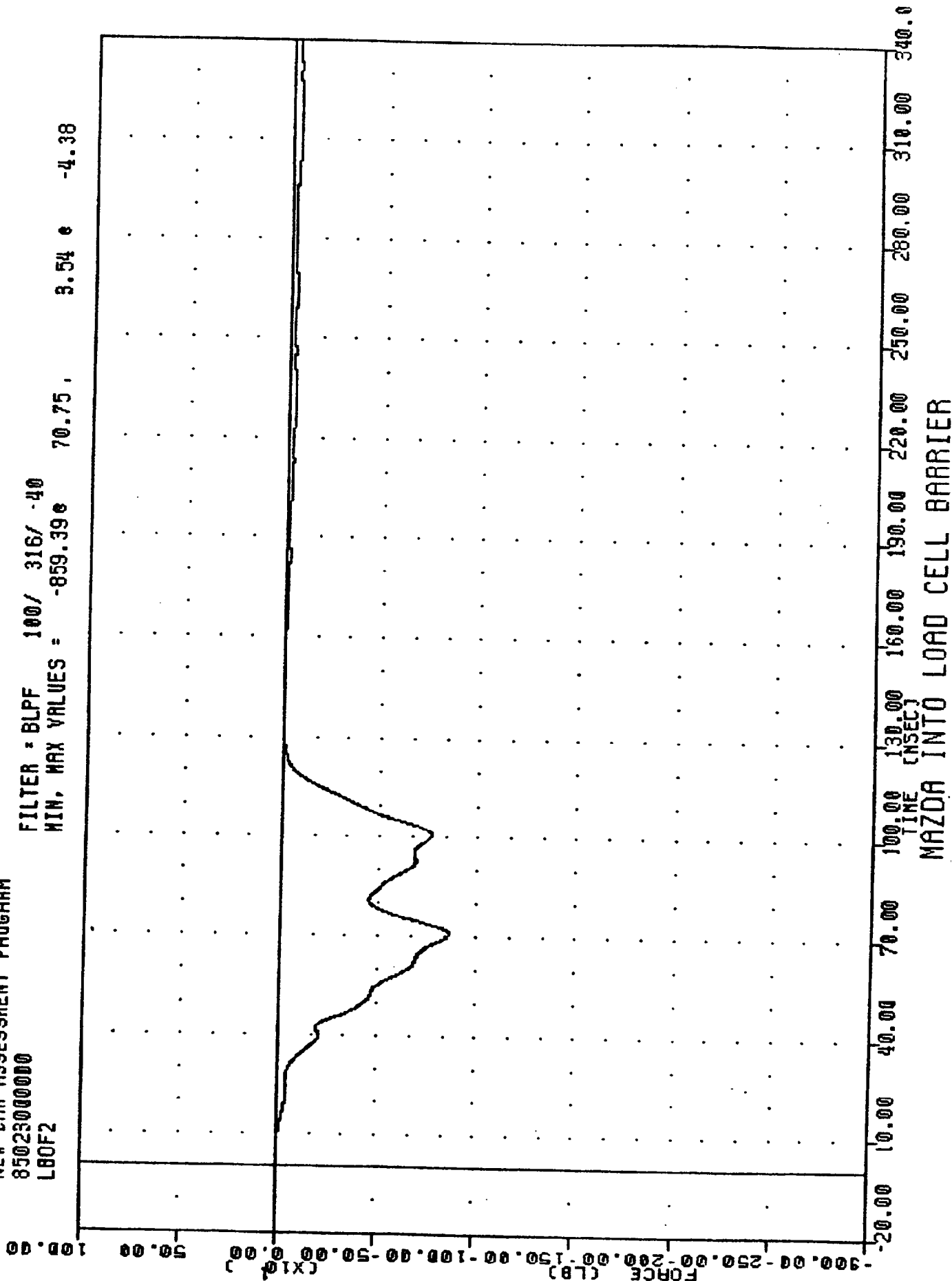
TIME (MSEC)

MAZDA INTO LOAD CELL BARRIER
 PROCESSED LEFT SEMIN FORCE INC

RC , 850123
NEW CAR ASSESSMENT PROGRAM
850230000000
L80F2

PLOT DATE 5 JAN-85 10:36:48

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -859.39 70.75 , 3.54 -4.38



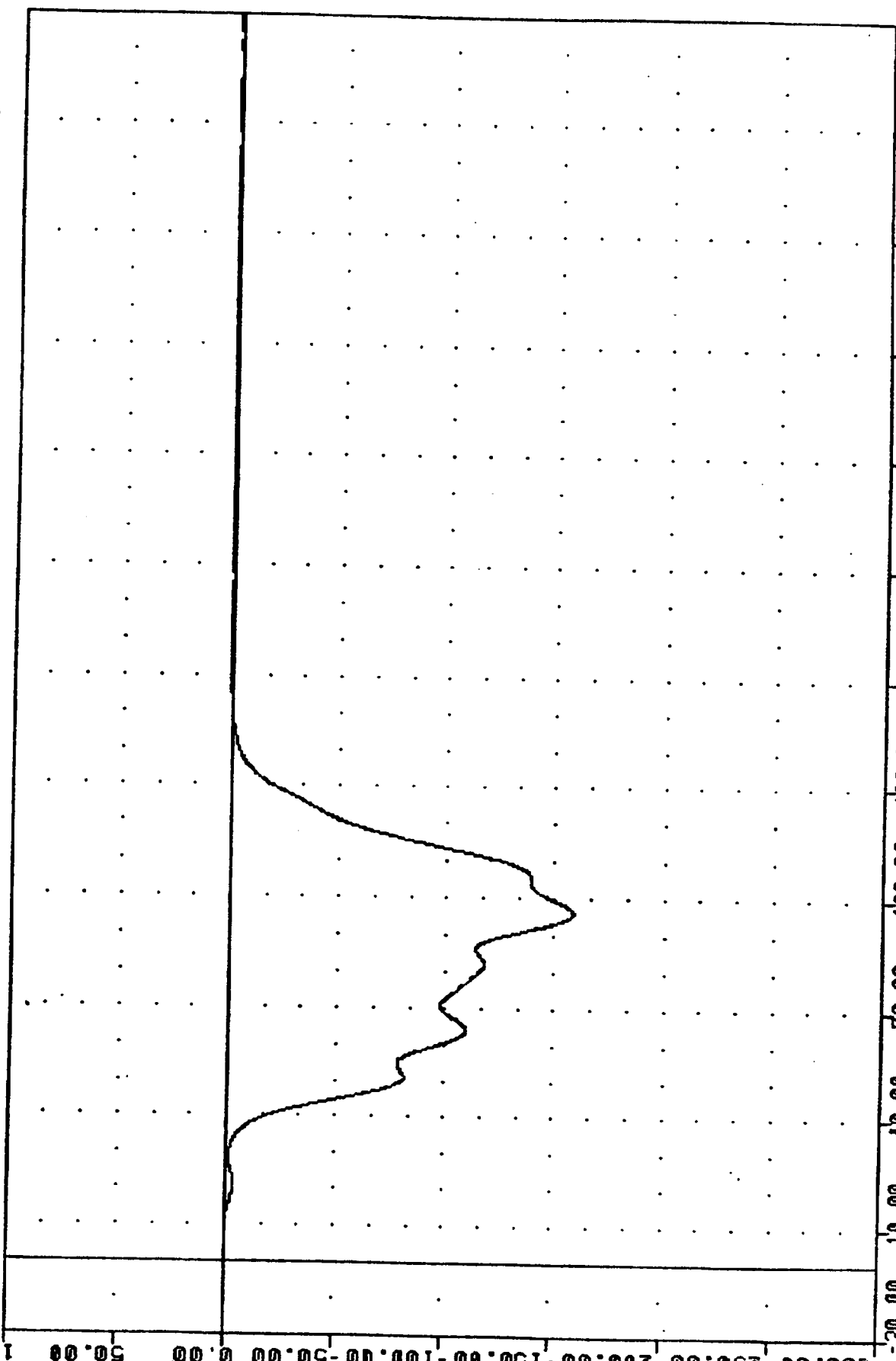
RC 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 SHBF2

PLOT DATE JUN-85 10:36:48

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -1586.50e 96.00, 14.40 e 159.25

FORCE (LB) (x10³)



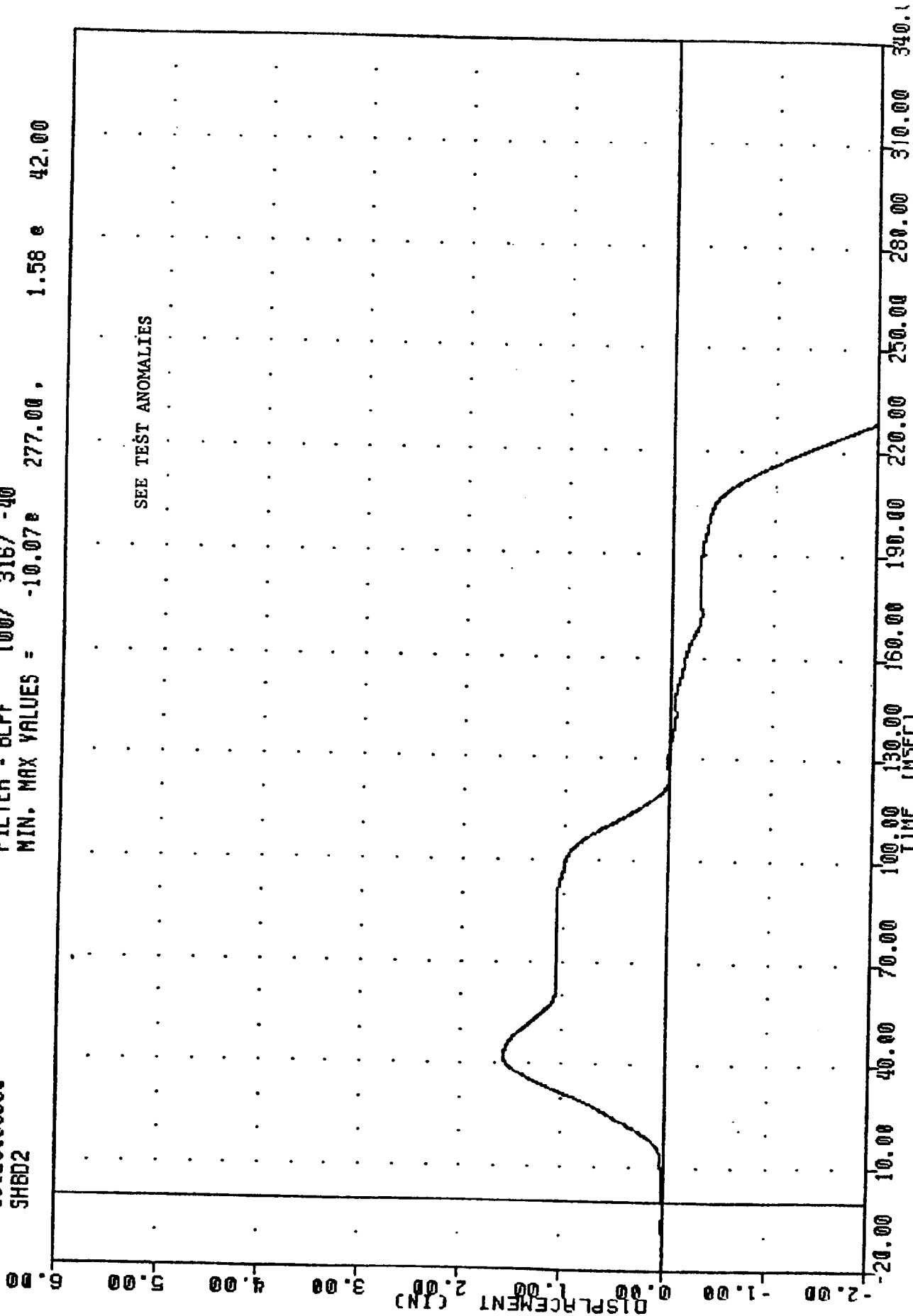
MAZDA INTO LOAD CELL BARRIER

TRC , 850123
NEW CAR ASSESSMENT PROGRAM
85023000000
SHBD2

PLOT DATE AN-85 10:36:48

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -10.07e 277.00. 1.58 e 42.00



MAZDA INTO LOAD CELL BARRIER

CHASSIS NEW BELT SYSTEM COMPONENT FAILURE

TRC , 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 TLXG1

PLOT DATE AN-85 10:36:48

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -41.61e 77.63, 2.68 e 121.75

80.00

60.00

40.00

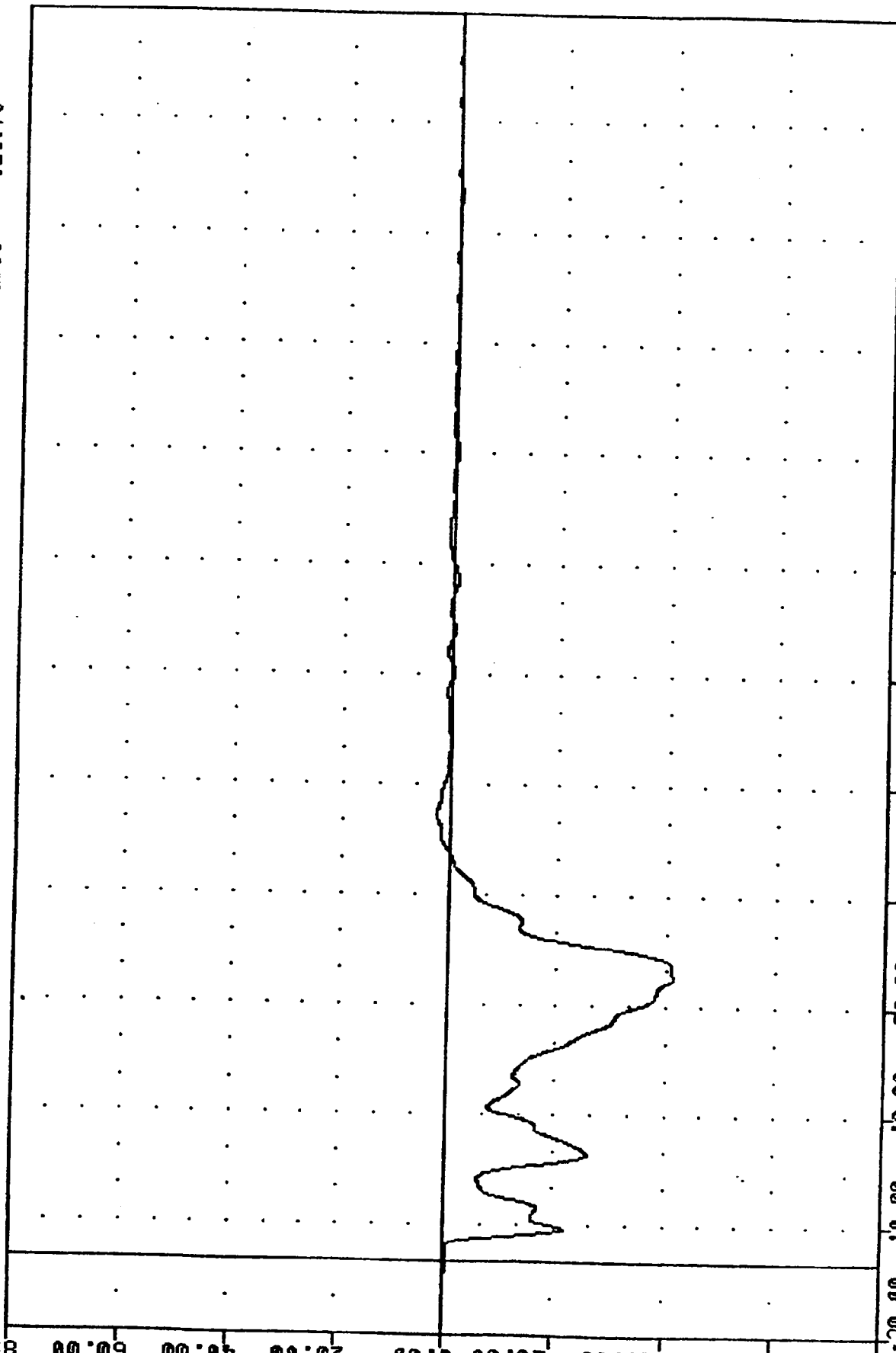
20.00

0.00

ACCELERATION (G)

B-28

850123



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)

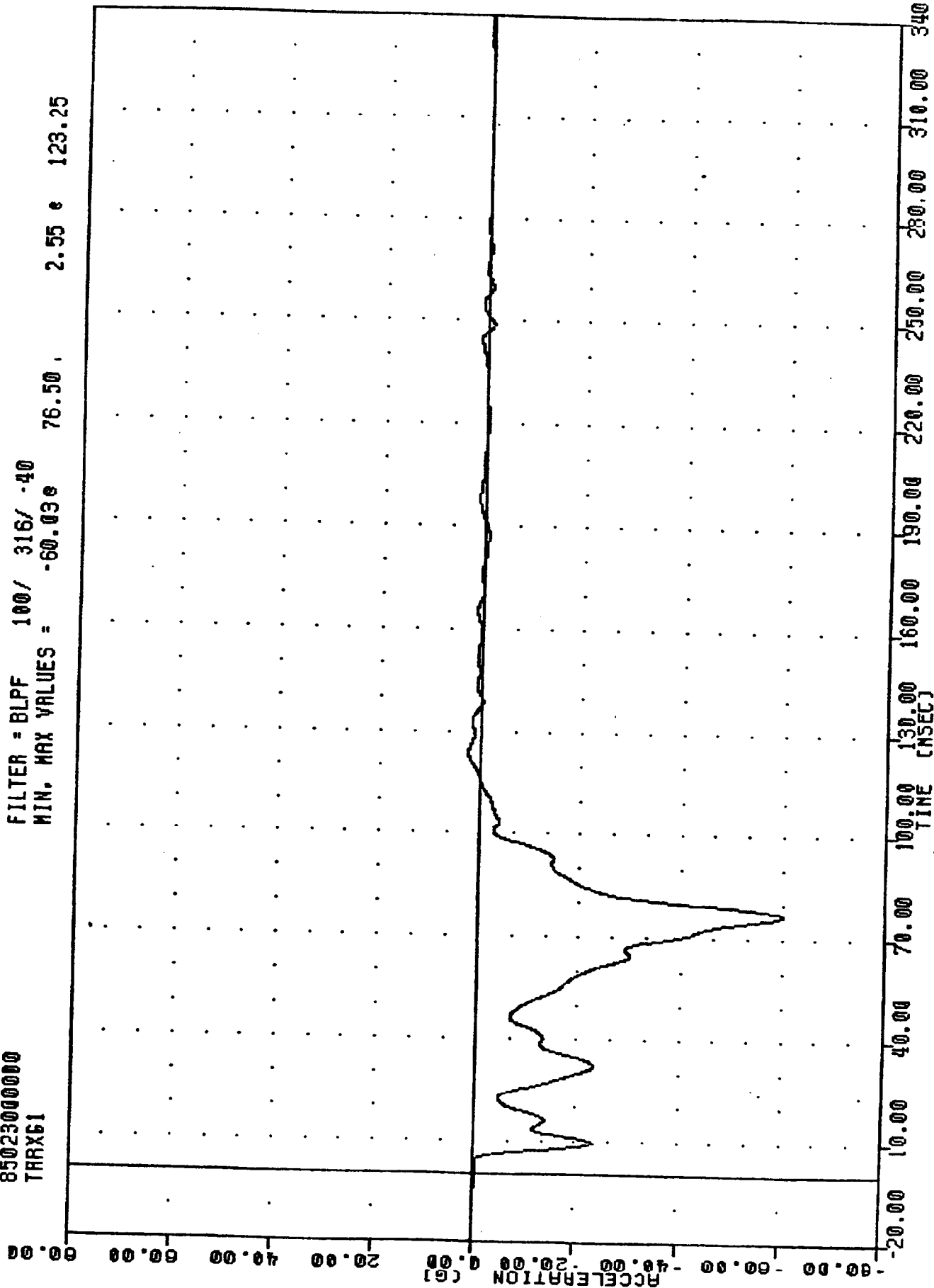
MAZDA INTO LOAD CELL BARRIER

THL , 850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 TRAX61

PLU1 DATE HN-63 10:56:40

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -60.03e 76.50, 2.55 e 123.25



MAZDA INTO LOAD CELL BARRIER
 RIGHT DECK CRASH

850123
 KEY CAR ASSESSMENT PROGRAM
 850230000000
 ENG X61

PLU DATE

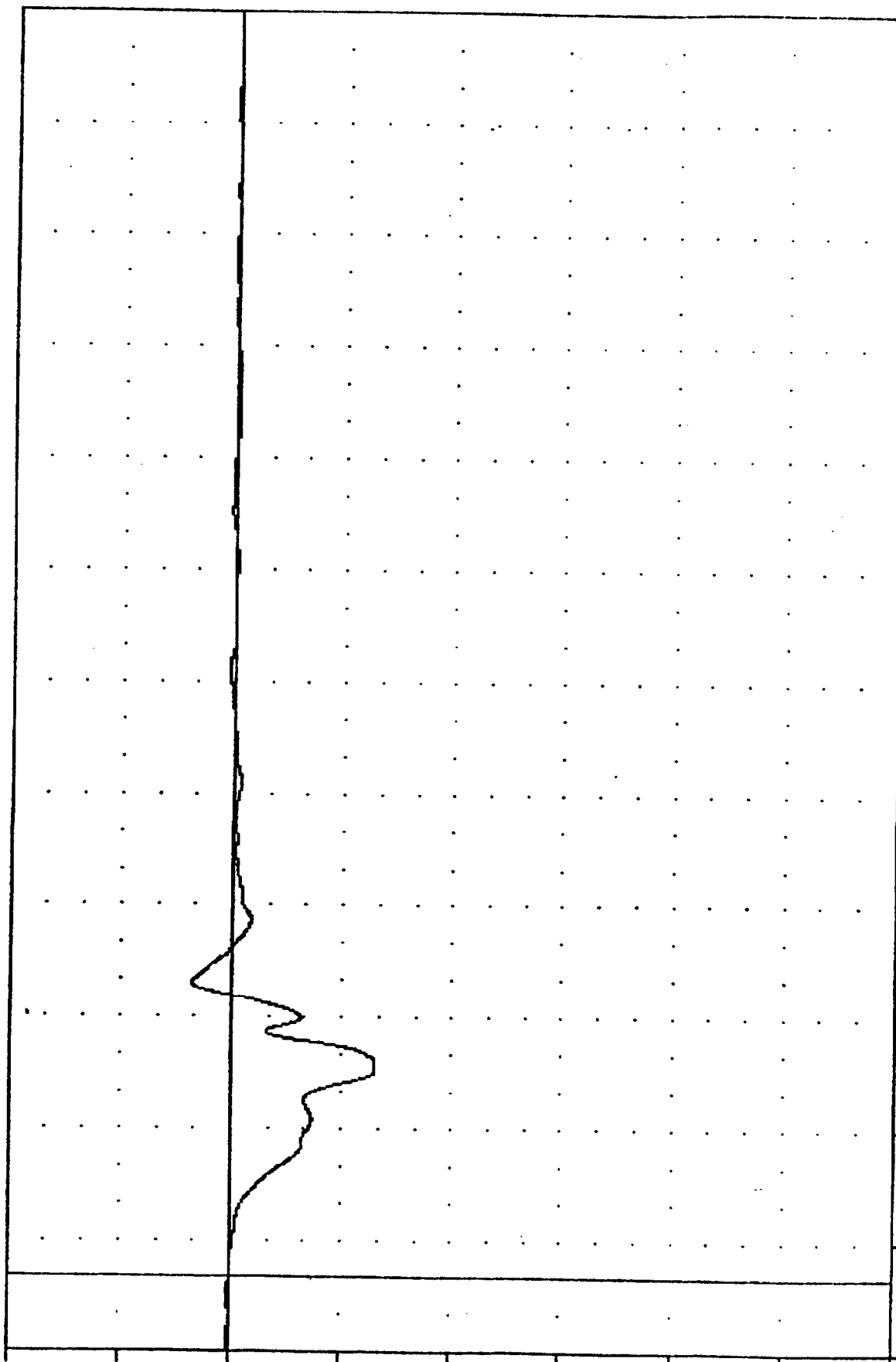
11-60

10:44:44

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -65.18 57.38 17.81 79.00

ACCELERATION (G)



MAZDA INTO LOAD CELL BARRIER

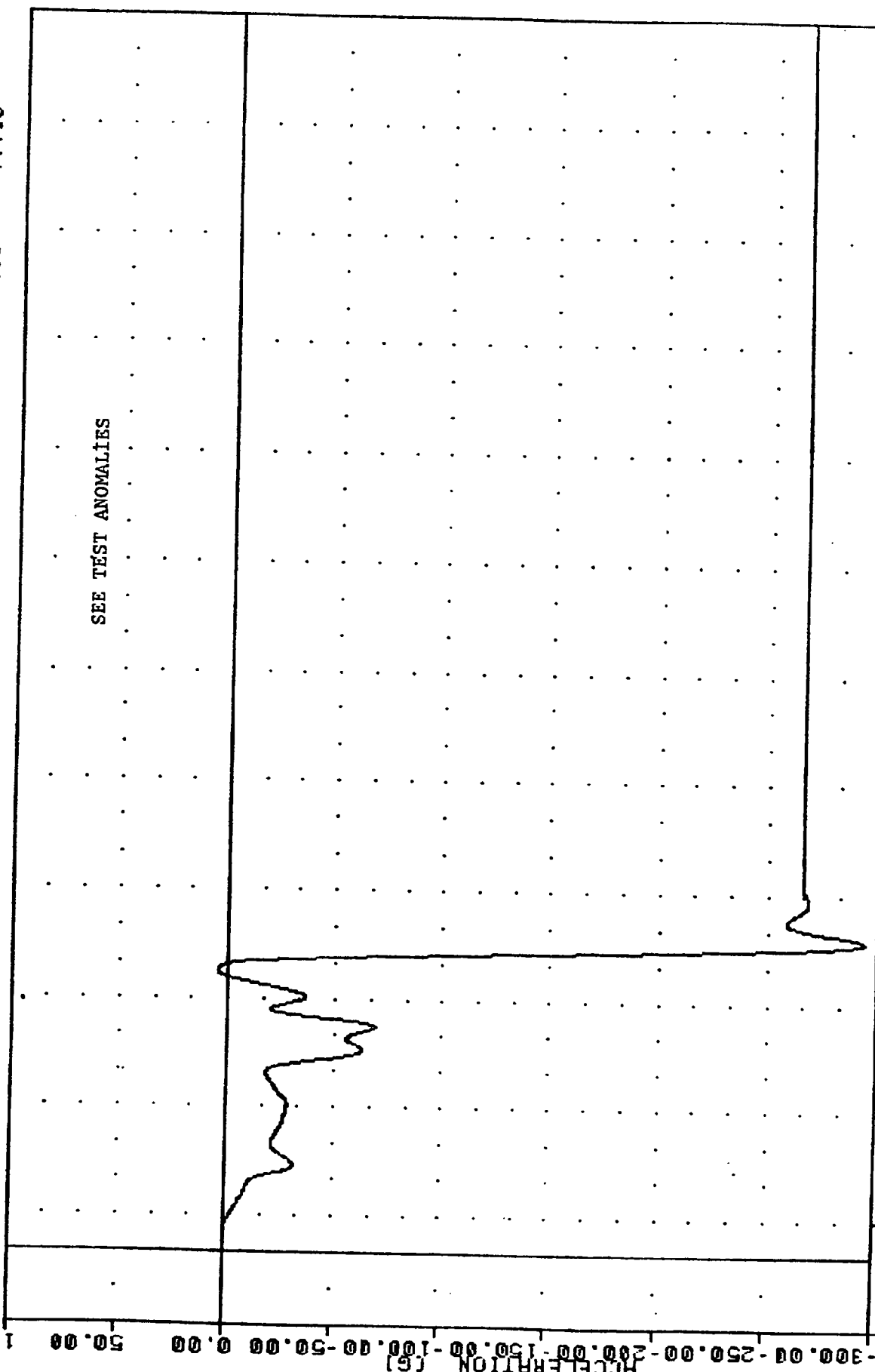
ENGINE RINCK ACCELERATION 1 V DVC

RC 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 ENGCG2

PLOT DATE 3 JAN-85 10:36:48

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -294.79e 87.13, 4.69 e 77.13



ACCELERATION (G)
 -300.00 -250.00 -200.00 -150.00 -100.00 -50.00 0.00 50.00 100.00
 -20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (msec)

MAZDA INTO LOAD CELL BARRIER

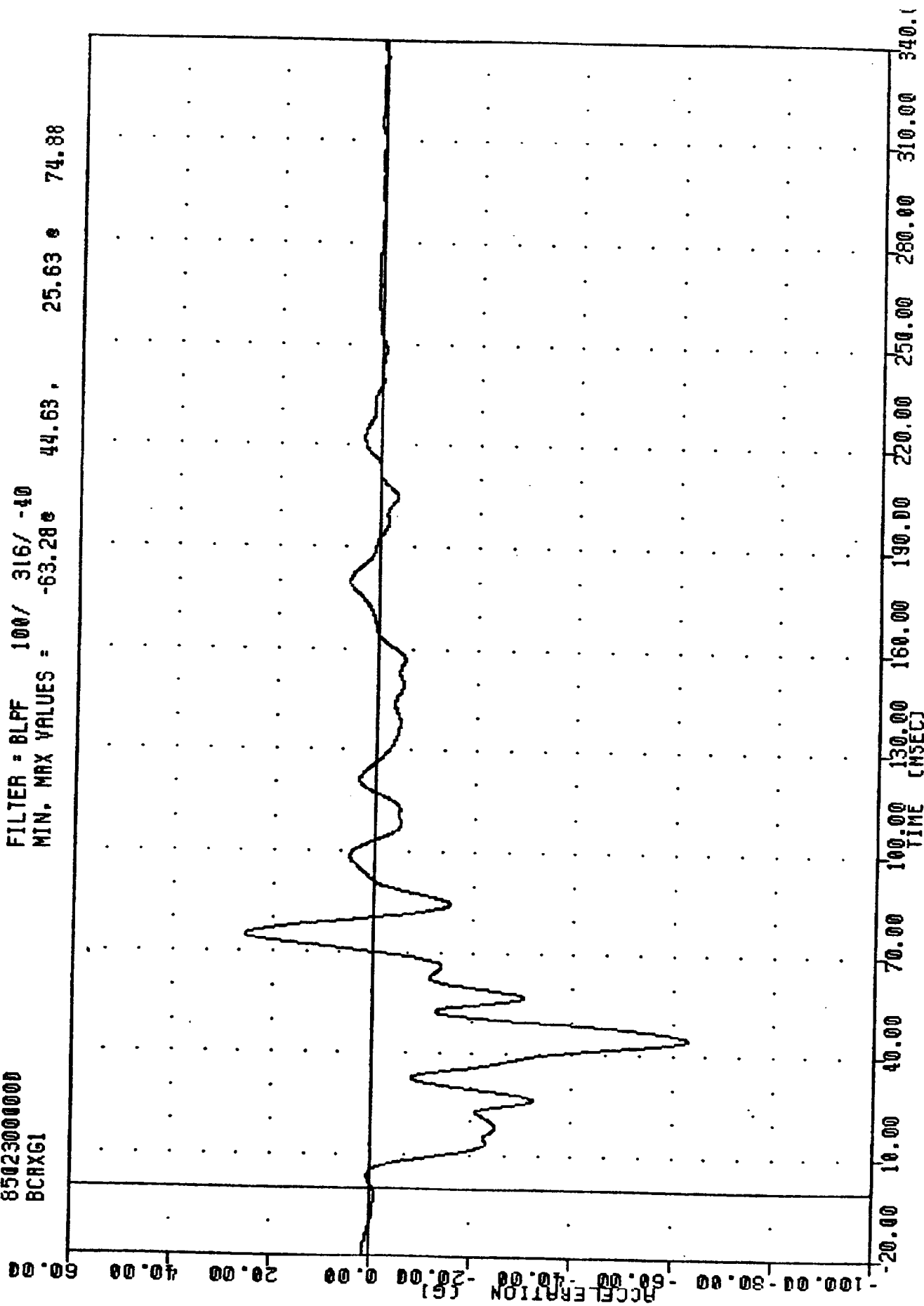
ENGINE DISCONNECTED

INU , 000123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 BCXG1

PLU1 DATE AN-80 10:36:40

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -63.28e 44.63 , 25.63 e 74.88



MAZDA INTO LOAD CELL BARRIER
 PLUT ABOVE CALIBRATION

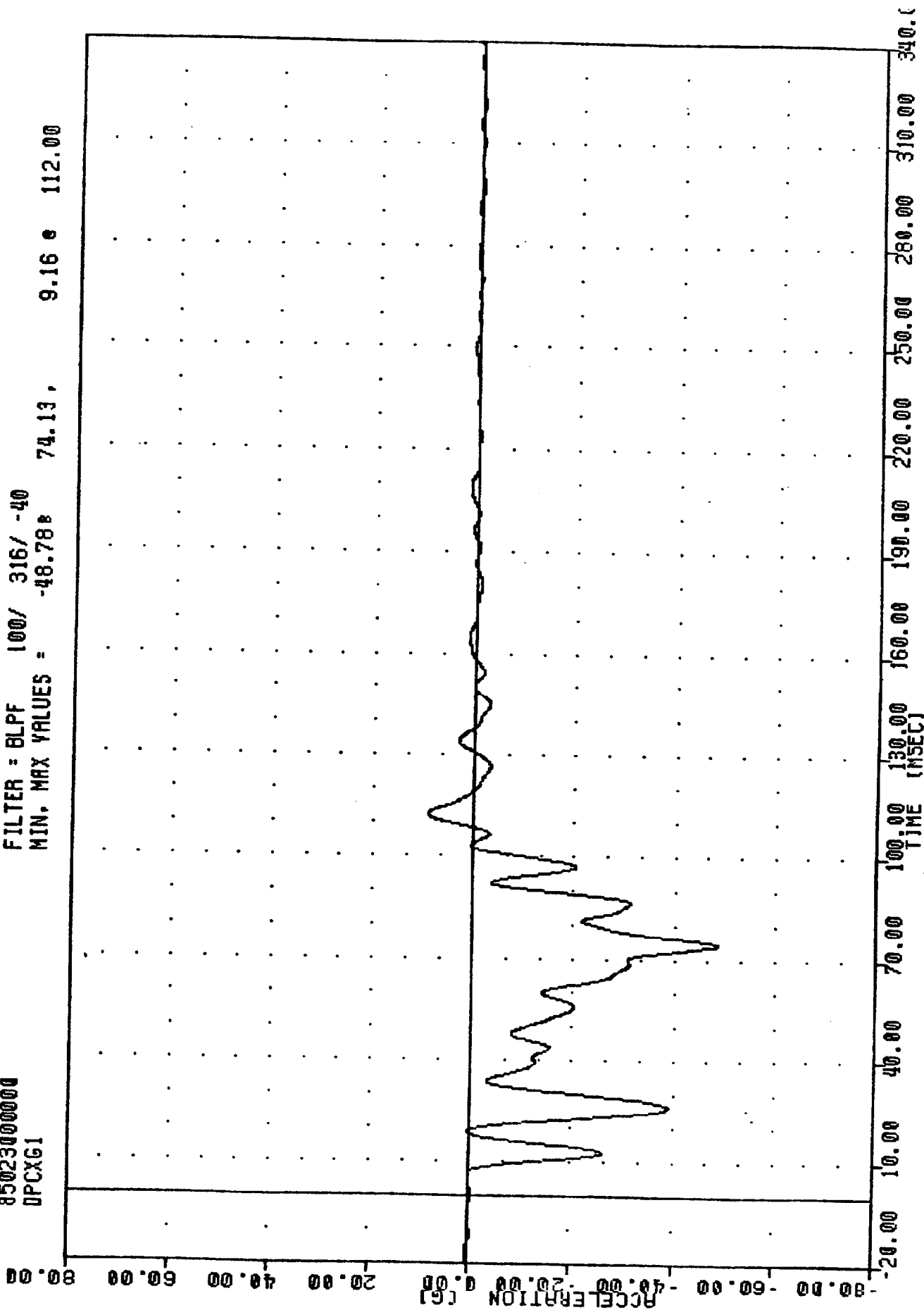
NEW CAR ASSESSMENT PROGRAM
85023000000
DPCXG1

850123

PLU1 DATE 01N-83 13:30:50

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -48.78 74.13, 9.16 112.00



B-33

850123

MAZDA INTO LOAD CELL BARRIER
NASH PANFI CENTER ACCELERATION V OVIC

THU 850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 801F

PLUI DATE AN-85 10:30:54

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -133.64 76.25, 129.46 36.00

120.00

90.00

60.00

30.00

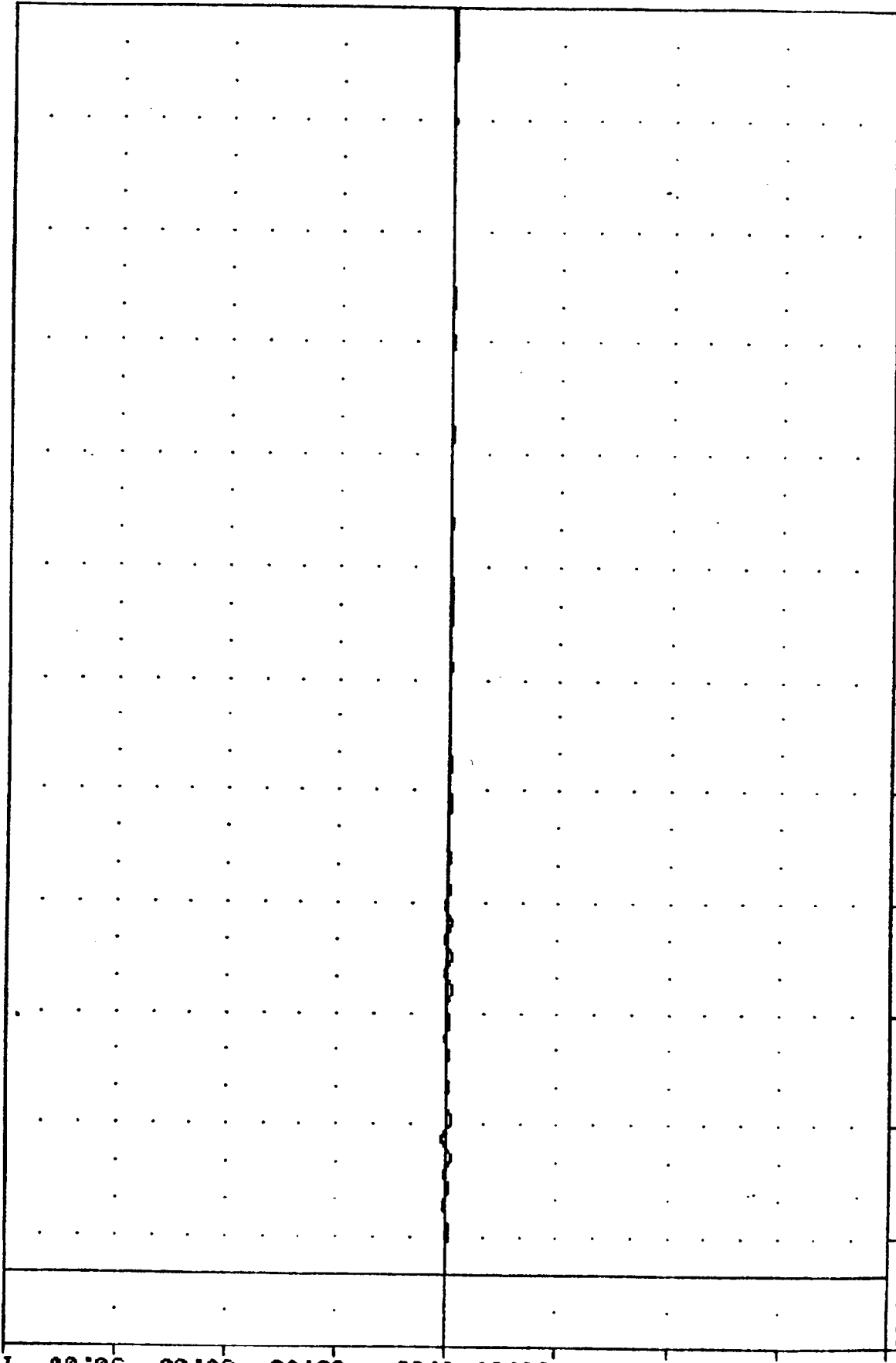
0.00

-30.00

FORCE (LB)

B-34

850123



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MAZDA INTO LOAD CELL BARRIER
 IN AN CELL BARRIER POSITION 01100

TRC 850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 BD2F

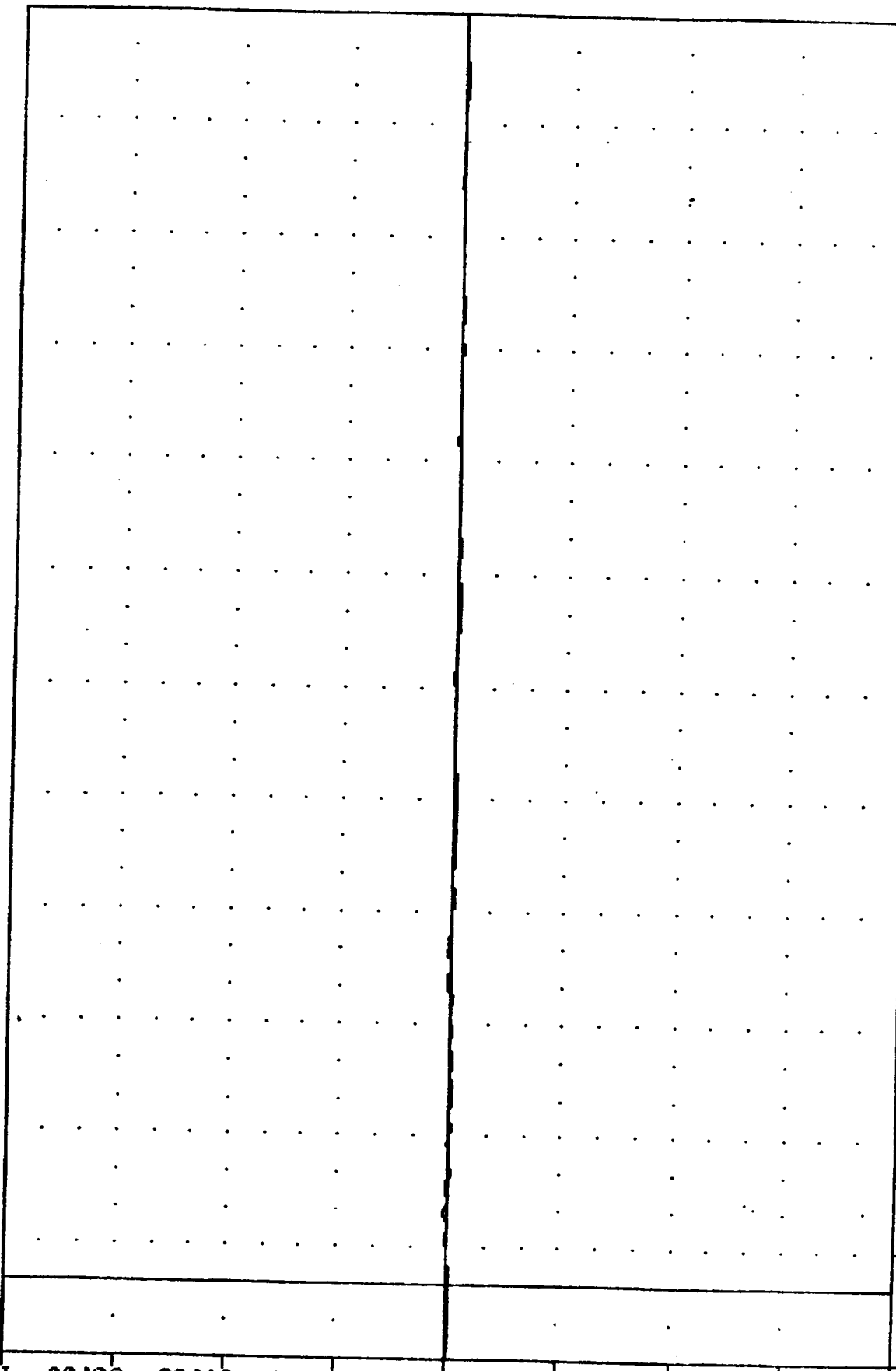
PLOT DATE JAN-85 10:30:54

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -66.73 130.74 19.25

120.00
 90.00
 60.00
 30.00
 0.00
 -30.00
 -60.00
 -90.00
 -120.00

B-35

850123



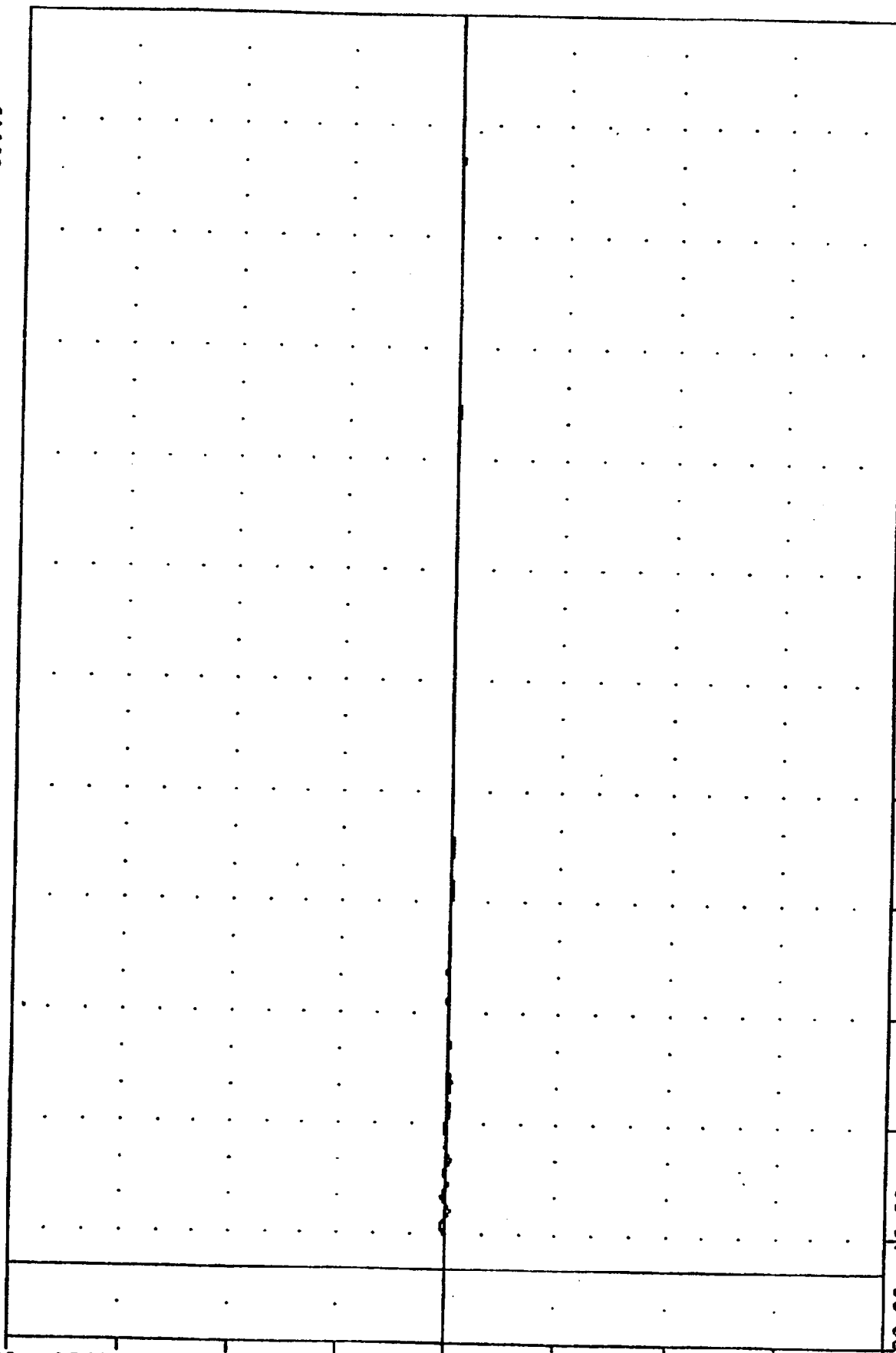
20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MAZDA INTO LOAD CELL BARRIER

850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 B03F

PLOT DATE 5/1/85 10:30:54

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -92.45e 15.75, 136.91 e 11.88

-120.00 -90.00 -60.00 -30.00 0.00 30.00 60.00 90.00 120.00
 FORCE (LB)
 (X10²)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MAZDA INTO LOAD CELL BARRIER

RC 850123
NEW CAR ASSESSMENT PROGRAM
85023000000
BC1F

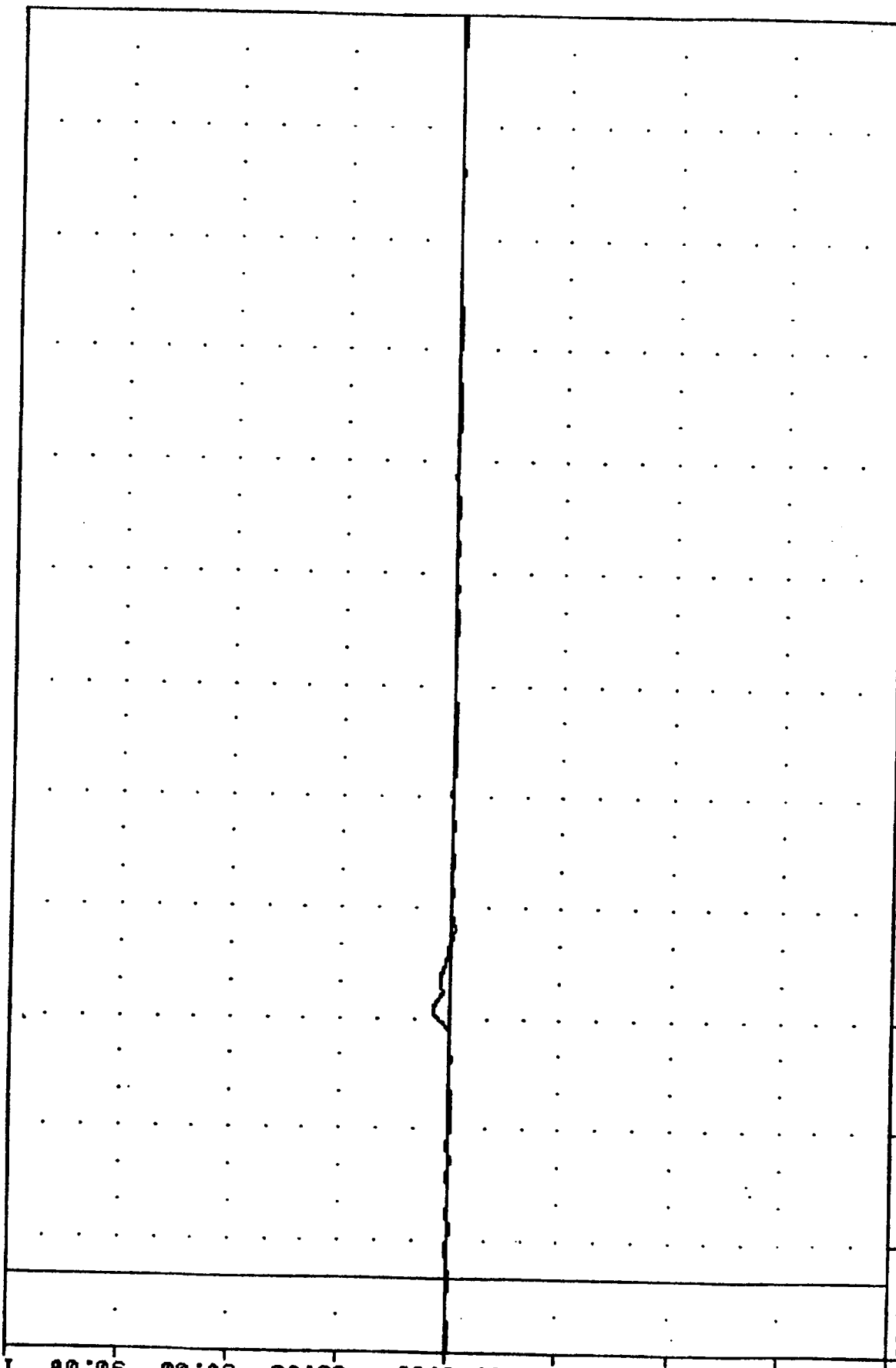
PLOT DATE 3-N-85 10:30:54

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -90.65 94.13, 491.50 72.13

120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00

B-37

850123



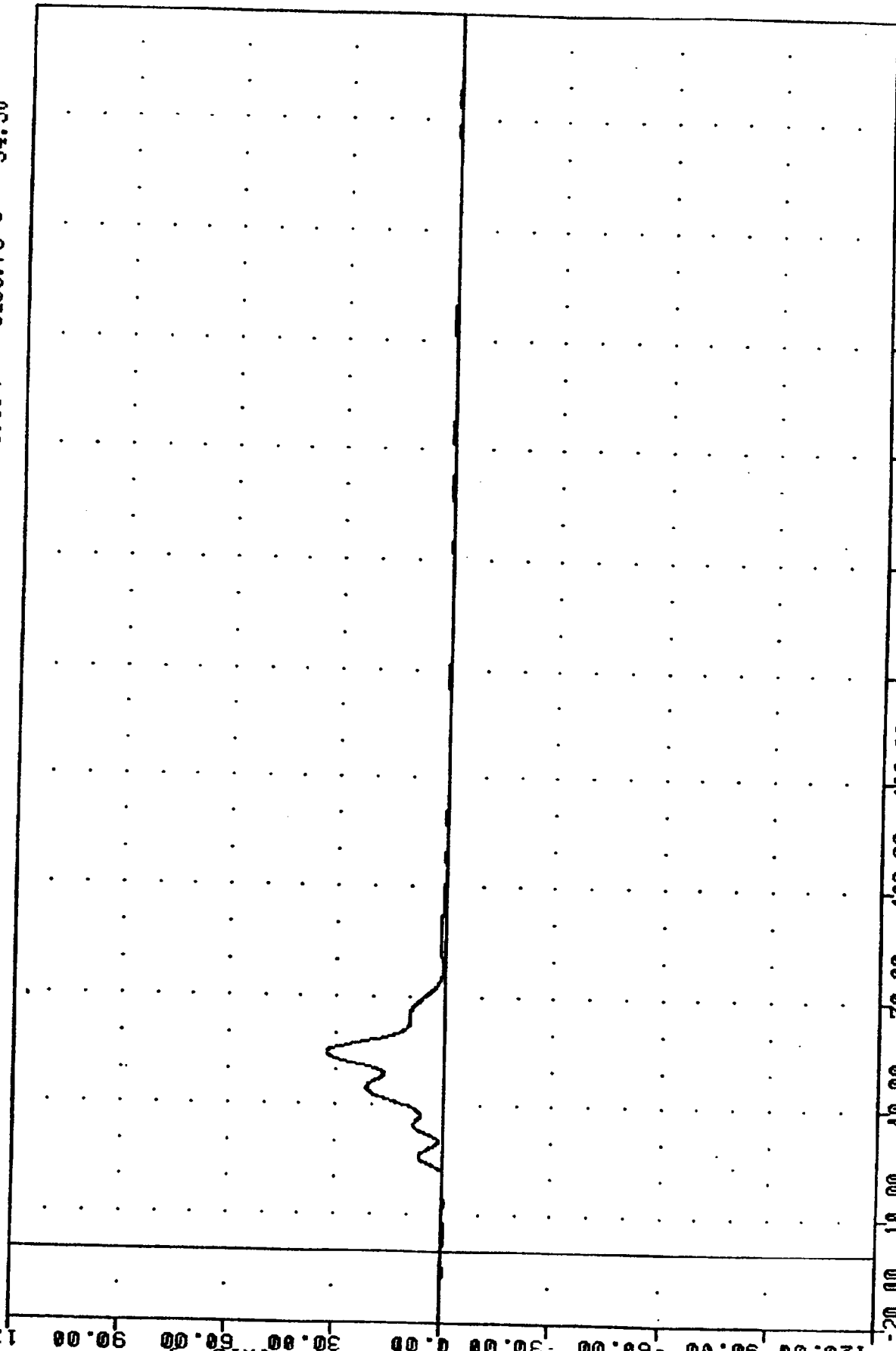
MAZDA INTO LOAD CELL BARRIER
IN CAR CELL DODDIED POSITION 21.100

RC 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 BC2F

PLOT DATE 31 JAN-85 10:30:54

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -39.02 6.00, 3290.79 54.38

-120.00 -90.00 -60.00 -30.00 0.00 30.00 60.00 90.00 120.00
 (X10²)



B-38

850123

100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MA7DA INTN 1000 CFI 1 BARRED

HC 850123
NEW CAR ASSESSMENT PROGRAM
85023000000
BC3F

PLU1 DATE 30 JUN 85 10:30:54

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -42.64 6.38

6373.46 29.25

120.00

90.00

60.00

(X10²)

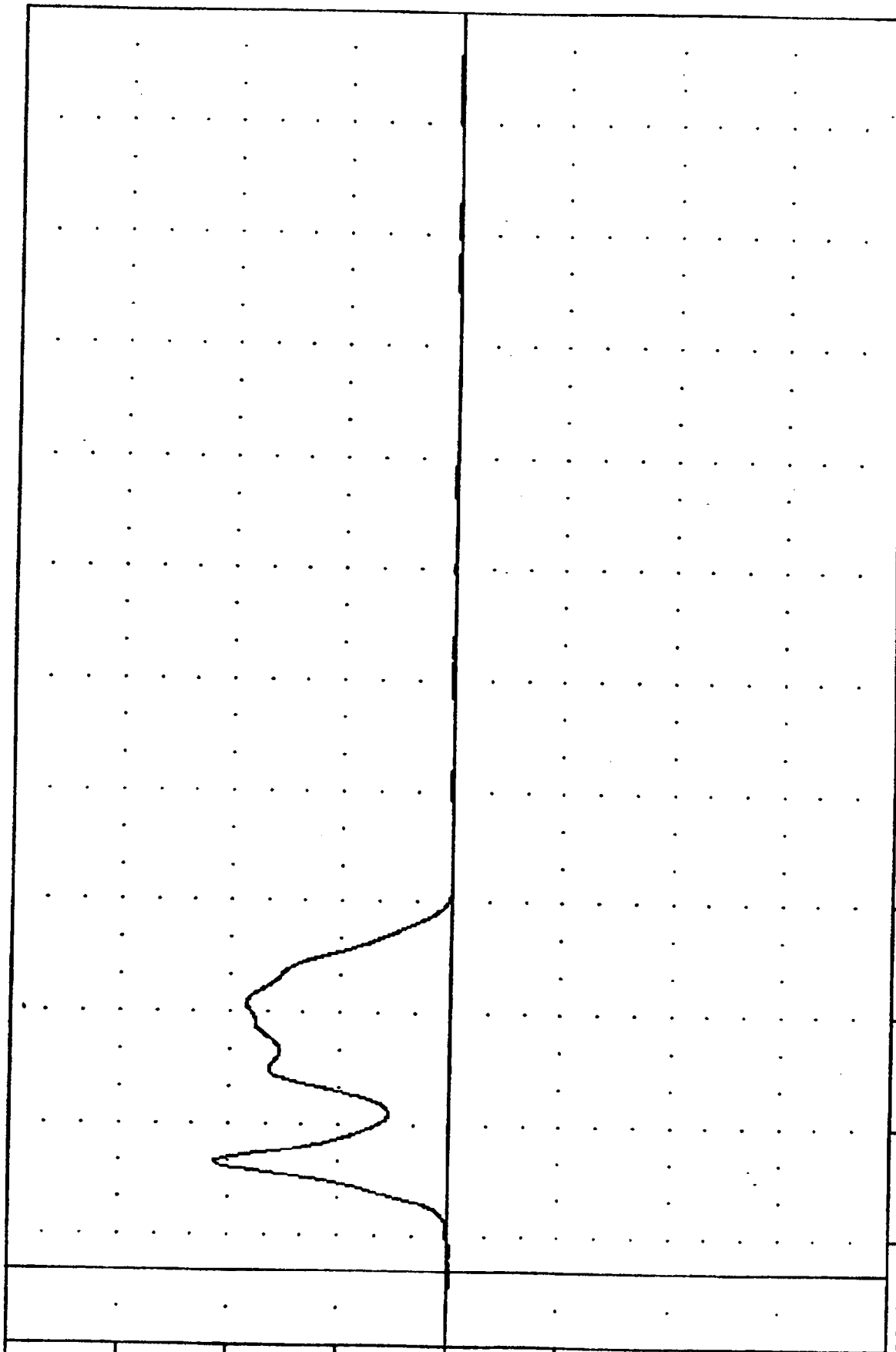
30.00

0.00

FORCE (LB)

850123

B-39



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

MAZDA INTO LOAD CELL BARRIER

1 IN AN REEL DROPPED DIRECTION 00.00

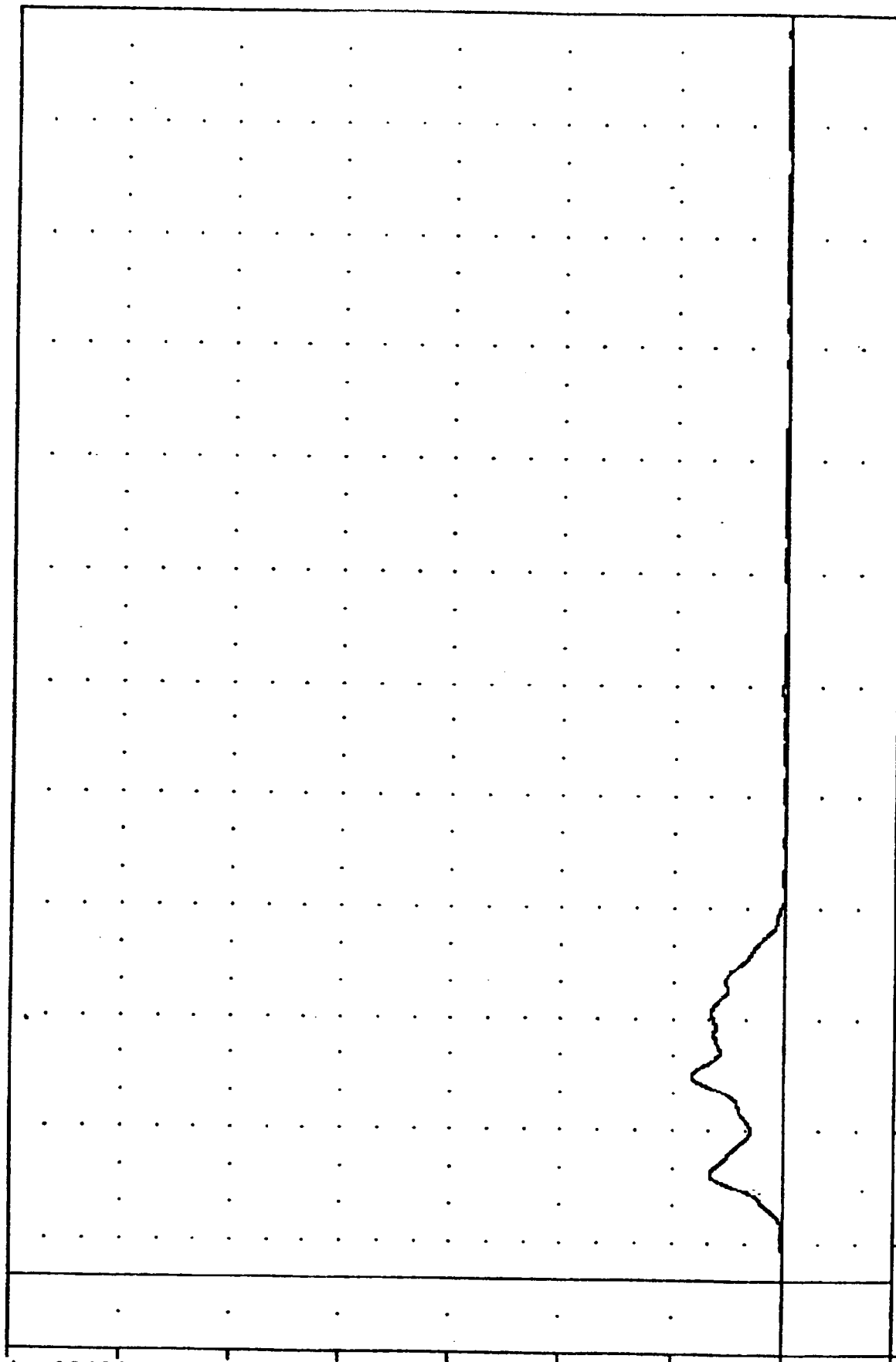
FILE 850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 LCBG1F

PLUI DATE 85-03 11:56:59

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -113.13 178.38 8244.99 54.50

70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00



B-40

850123

MAZDA INTO LOAD CELL BARRIER
 1 NON CELL BARRIER CROSS, FORCE TOTAL

INC , 850123
NEW CAR ASSESSMENT PROGRAM
850230000000
804F

PLU1 DATE JAN-03 10:30:54

FILTER = BLPF 100/ 316/ -40

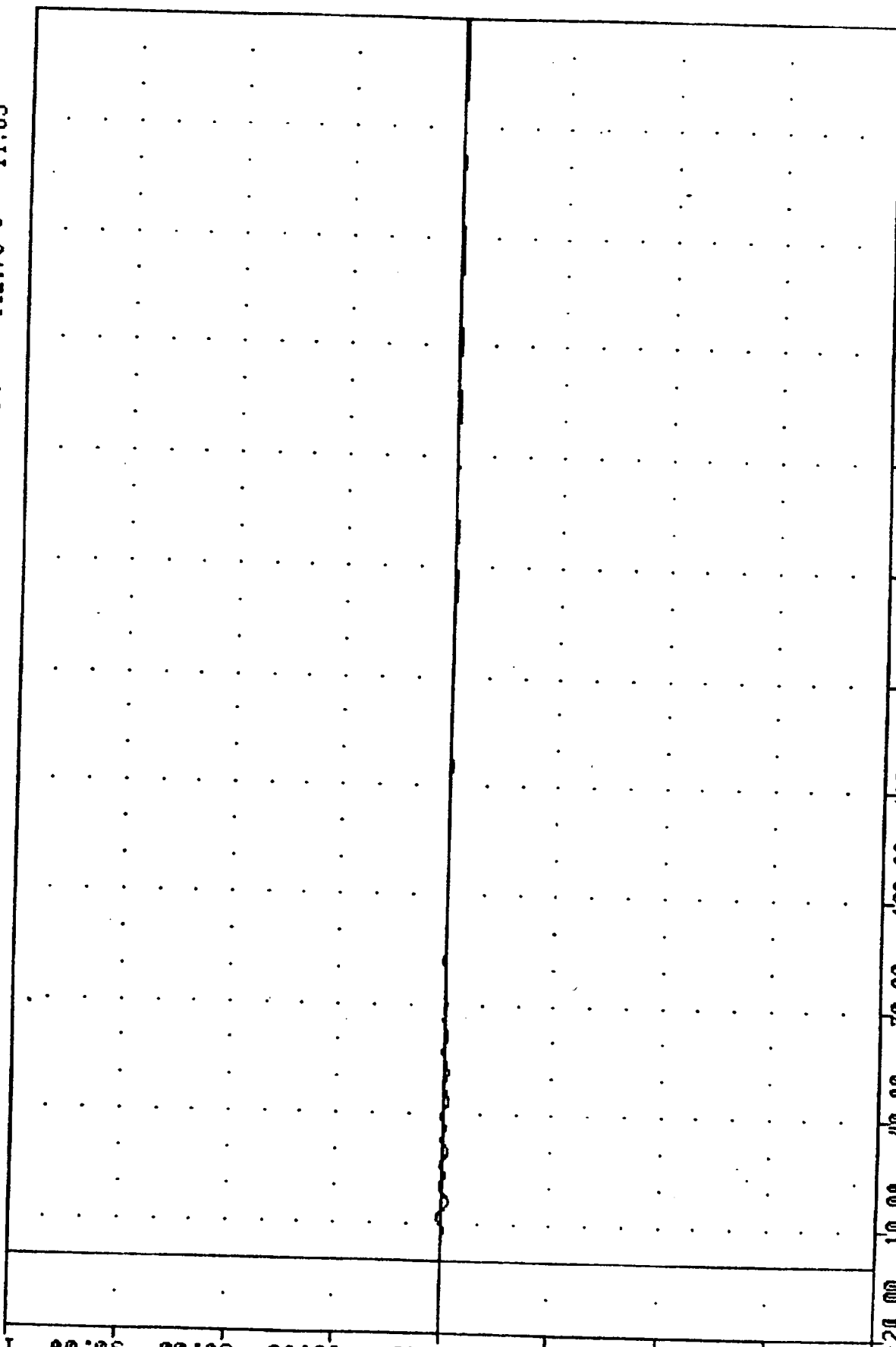
MIN, MAX VALUES = -168.47 15.75, 142.70 11.63

120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00

(X10²)

B-41

850123



20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 805F

PLUT DATE 3 JUN-85 10:30:54

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -127.16e 29.75. 153.72 e 11.75

120.00

90.00

60.00

(x10²)

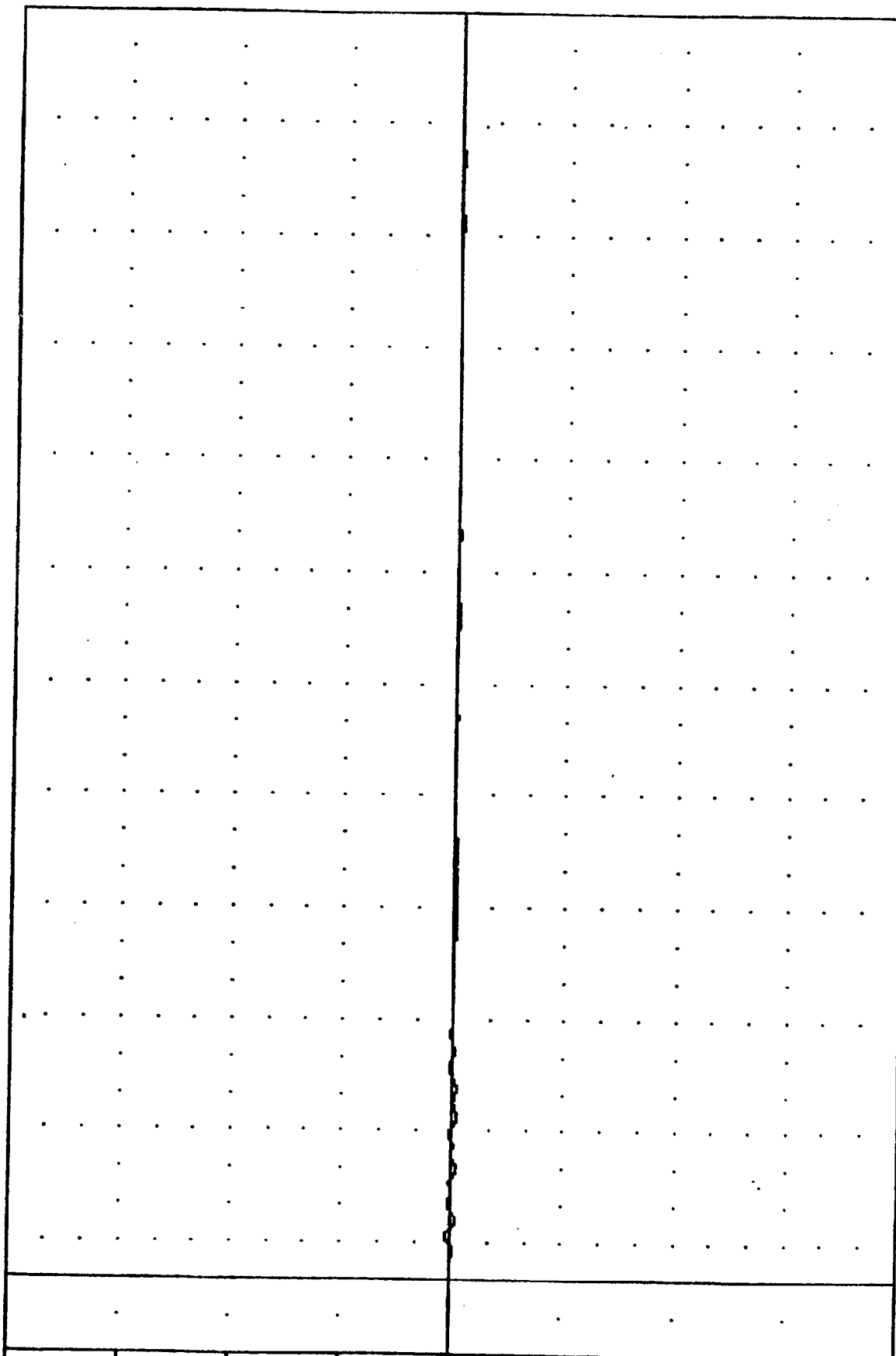
30.00

0.00

FORCE (LB)

850123

B-42



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (msec)

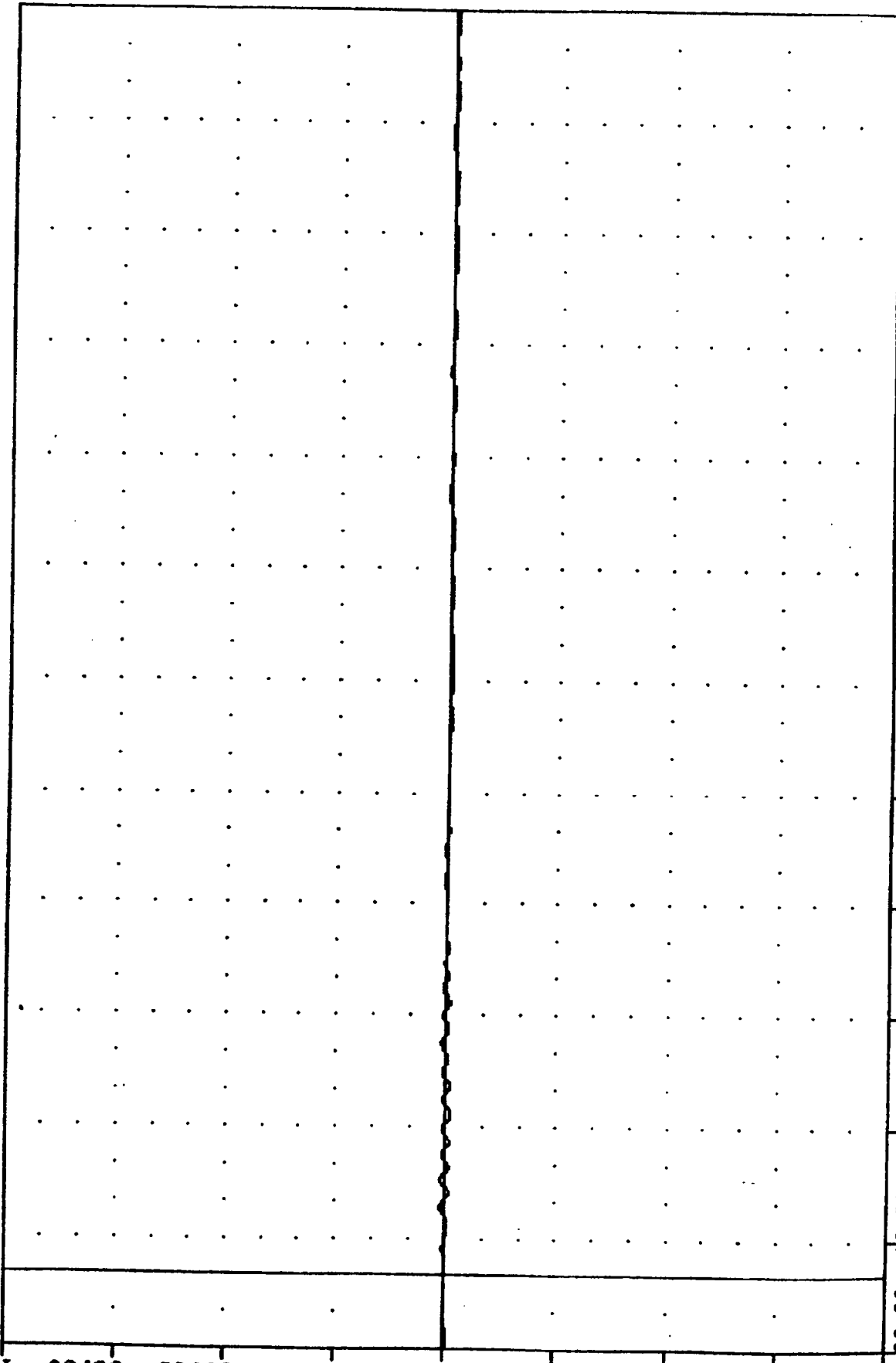
MAZDA INTO LOAD CELL BARRIER

RC , 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 B06F

PLUI DATE 85-01-08 10:50:54

FILTER = 8LPP 100/ 316/ -40
 MIN, MAX VALUES = -141.11e 43.00 , 138.69 e 25.50

-120.00 -90.00 -60.00 -30.00 0.00 30.00 60.00 90.00 120.00
 FORCE (LB)
 (X10³)



B-43

850123

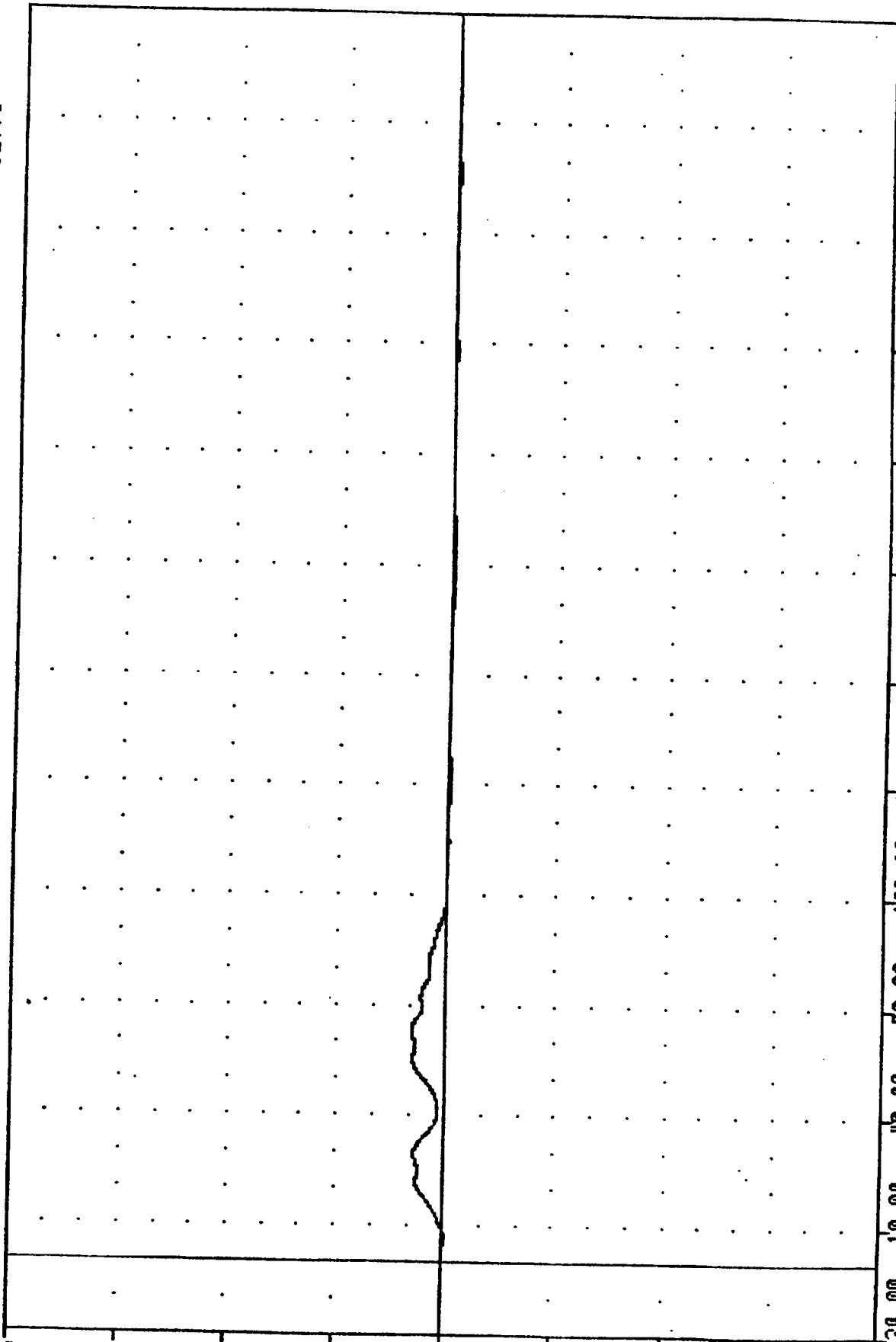
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (msec)
 MAZDA INTO LOAD CELL BARRIER

THU, 850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 BC4F

PLUI DATE JAN-85 10:30:54

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -40.28 6.50, 924.38 62.75

120.00
 90.00
 60.00
 30.00
 0.00
 -30.00
 -60.00
 -90.00
 -120.00



B-44

850123

20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

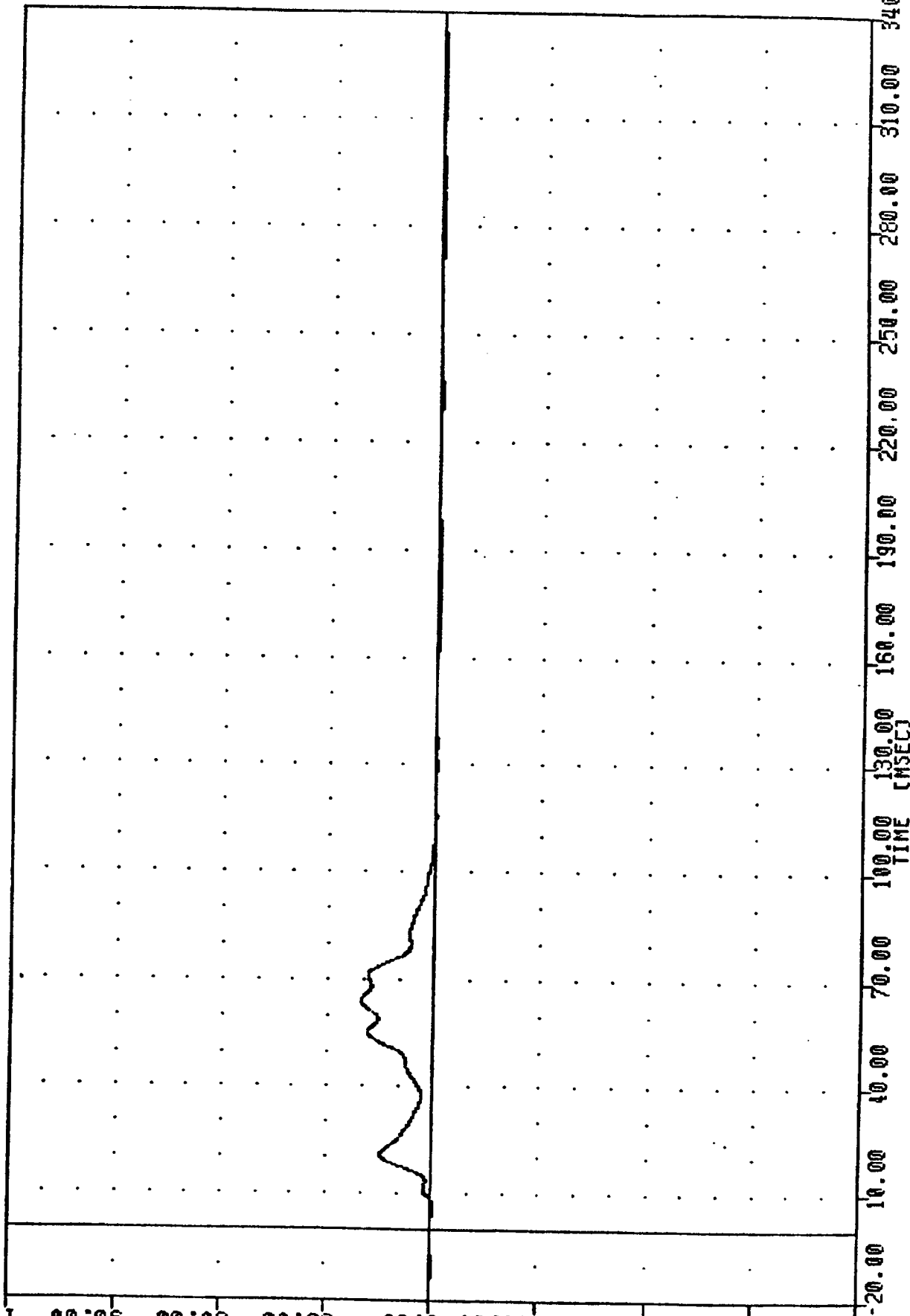
MAZDA INTO LOAD CELL BARRIER

TRC , 850123
NEW CAR ASSESSMENT PROGRAM
850230000000
BC5F

PLOT DATE AN-85 10:30:54

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -63.72 6.50, 2050.46 63.88

850123
B-45
FORCE (LBS)
(X10²)



MAZDA INTO LOAD CELL BARRIER

TC 850123
KEY CAR ASSESSMENT PROGRAM
85023000000
BC6F

PLOT DATE 3 JUN-85 10:30:54

FILTER = BLPF 100/ 316/ -40

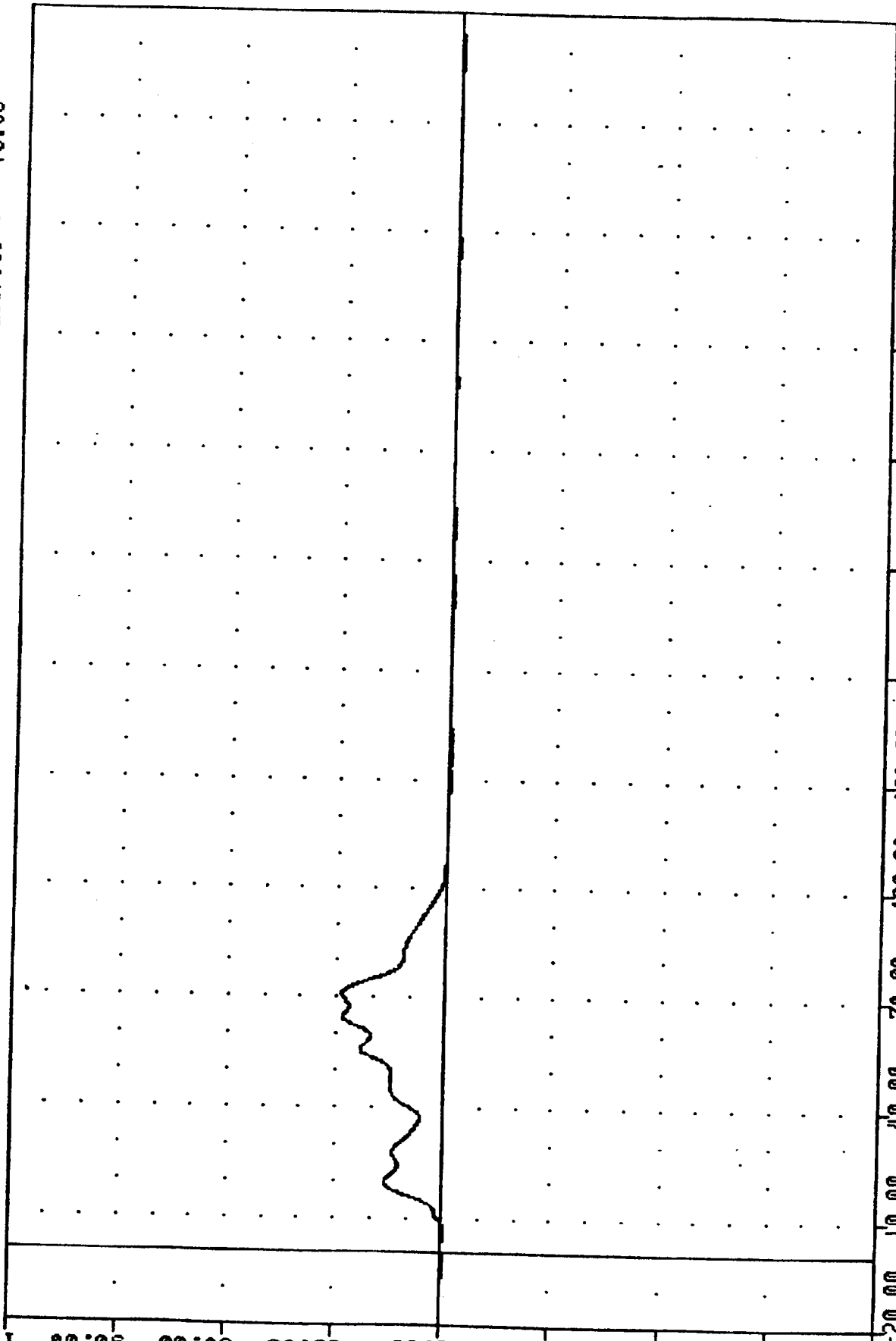
MIN. MAX VALUES = -70.64 6.50, 2857.61 70.63

120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00

(X10³)

B-46

850123



20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (NSEC)

MAZDA INTO LOAD CELL BARRIER

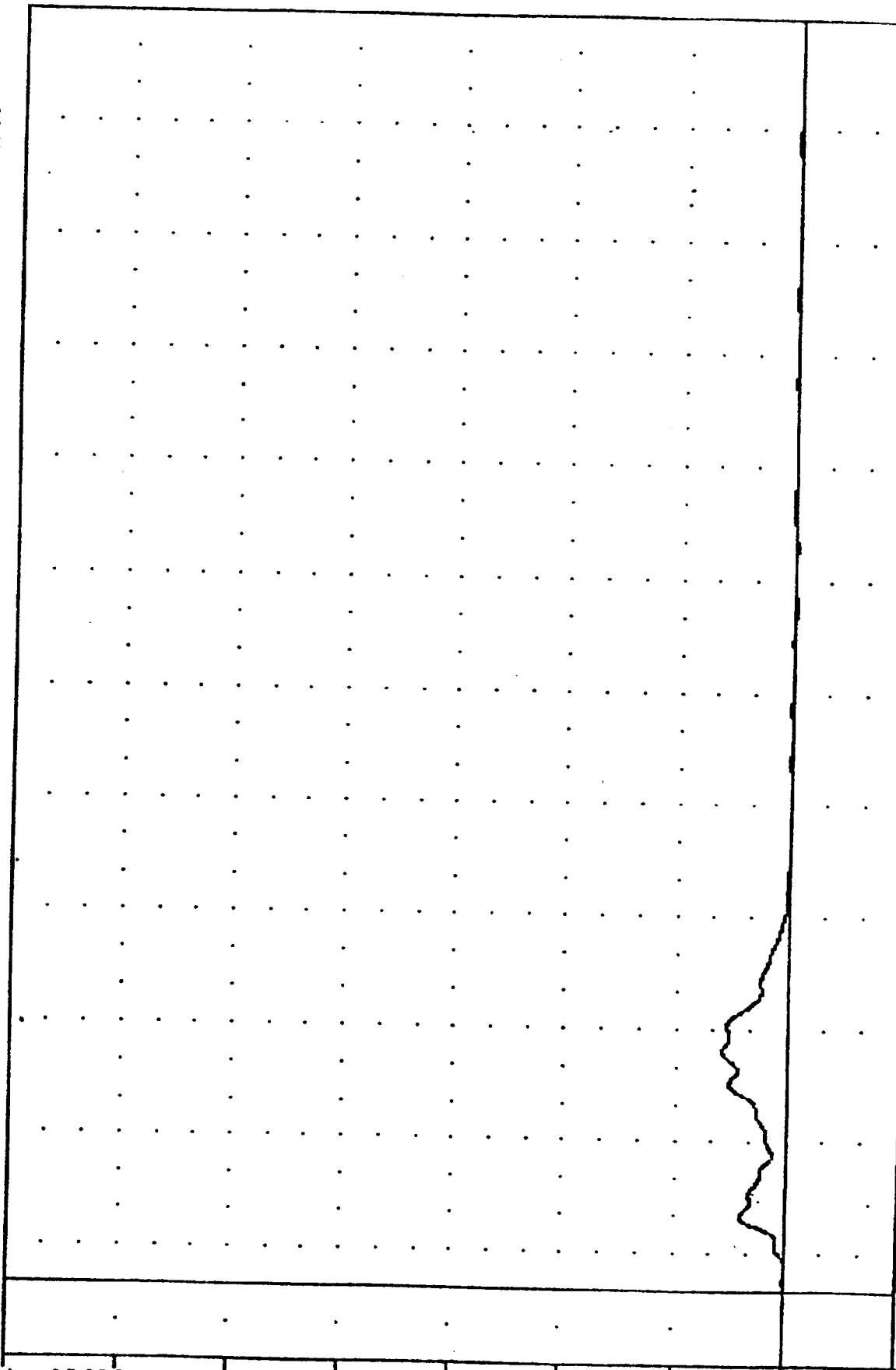
TRC , 850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 LC8G2F

PLU1 DATE HN-85 11:56:59

FILTER = 8LPF 100/ 316/ -40

MIN, MAX VALUES = -197.99 183.25, 5831.43 64.00

FORCE (LB) (X10³)



B-47

850123

-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MAZDA INTO LOAD CELL BARRIER

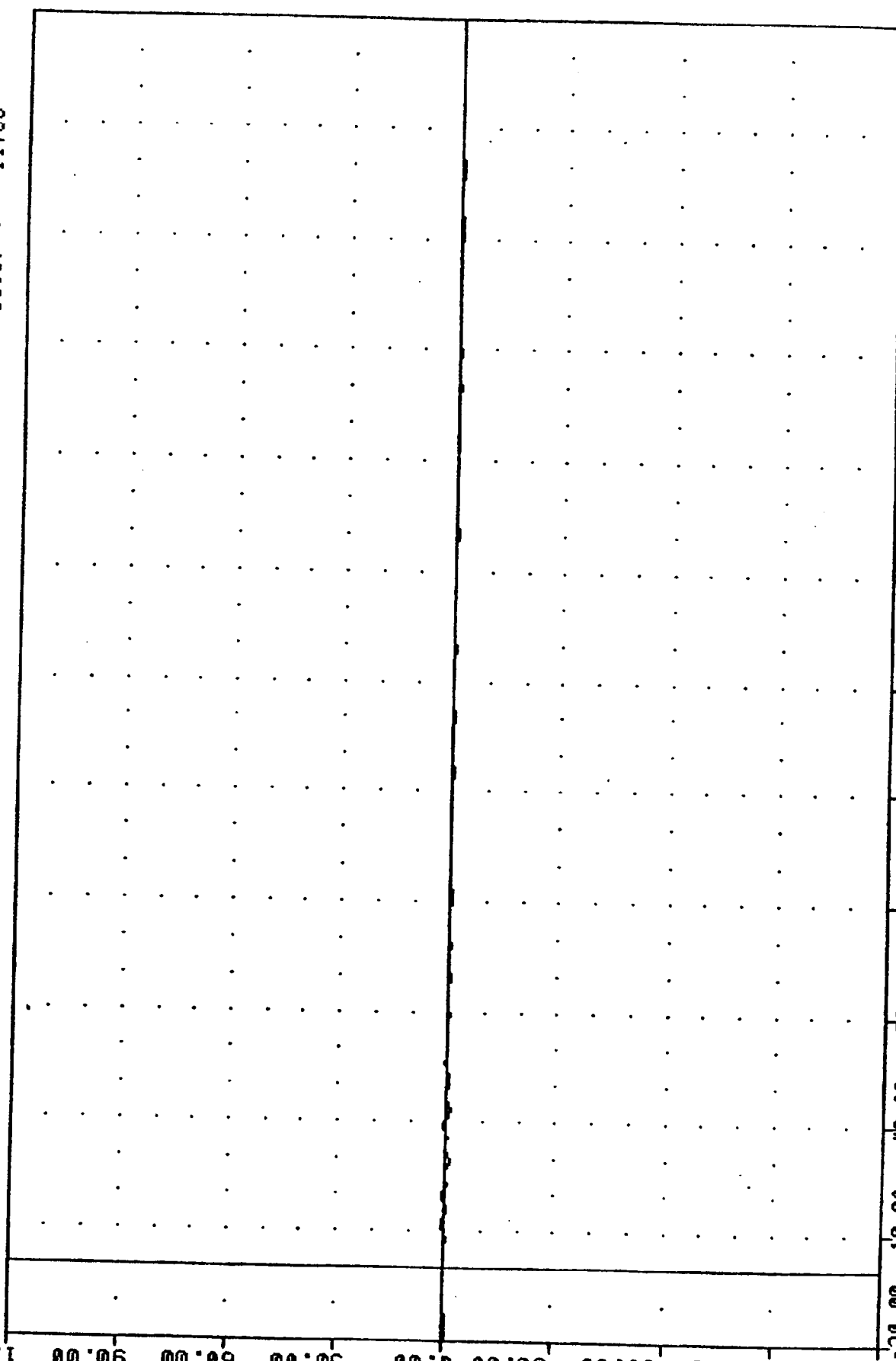
HL 850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 807F

PLUI DATE 3 JAN-85 10:50:54

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -97.20 29.38, 85.87 11.88

120.00
 90.00
 60.00
 30.00
 0.00
 -30.00
 -60.00
 -90.00
 -120.00



B-48

850123

-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MAZDA INTO LOAD CELL BARRIER

TC , 850123
NEW CAR ASSESSMENT PROGRAM
850230000000
B08F

PLOT DATE 30-1-85 13:46:30

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -104.64e 43.13, 68.10 e 19.00

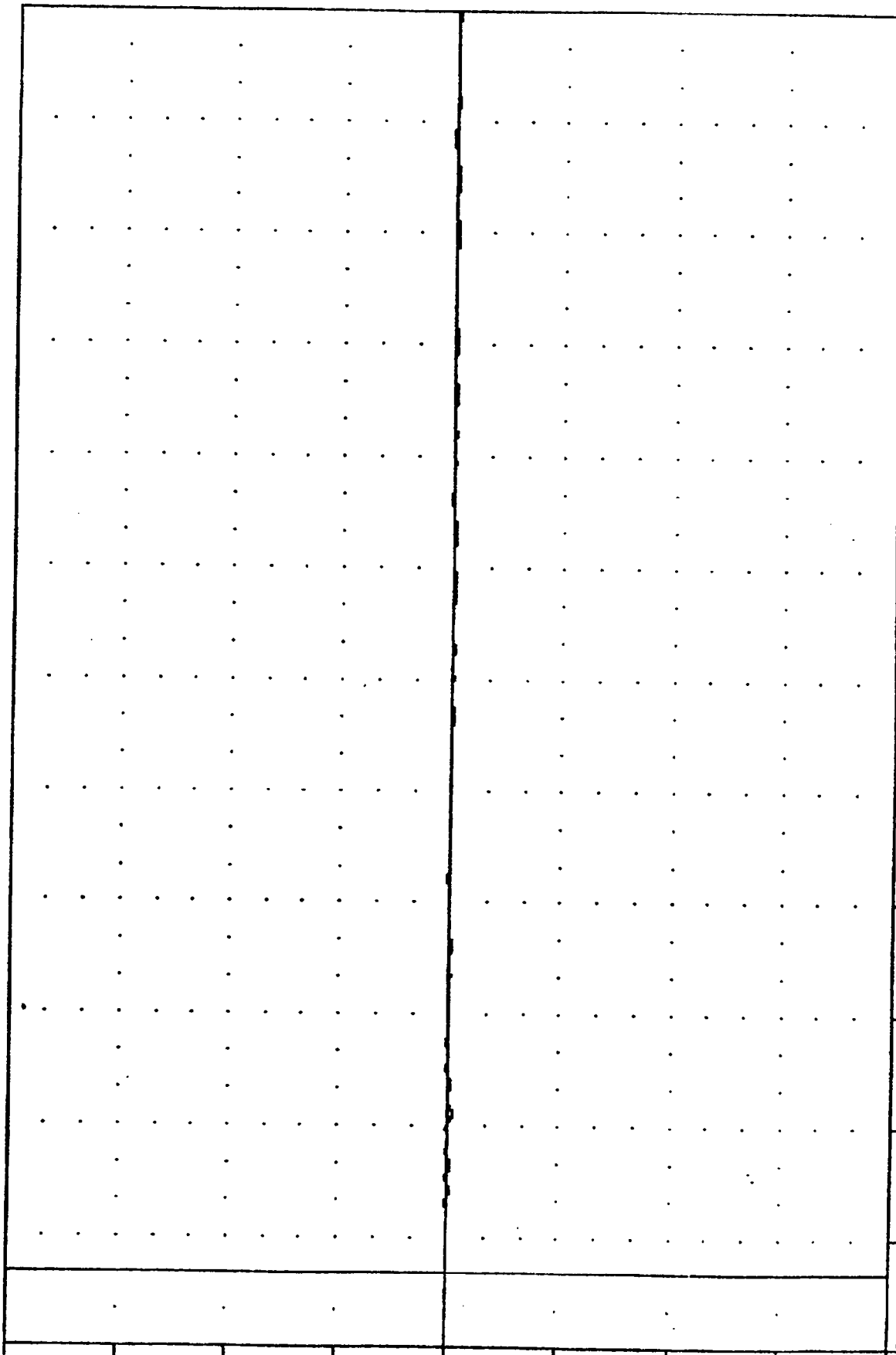
120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00

(X10²)

FORCE (LB)

B-49

850123



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

MAZDA INTO LOAD CELL BARRIER

1000 CELL DEFORMATION NO. 100

HC 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 809F

PLOT DATE 5 JAN-85 10:30:54

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -132.96e 29.38, 109.37 e 19.38

120.00

90.00

(X10²)

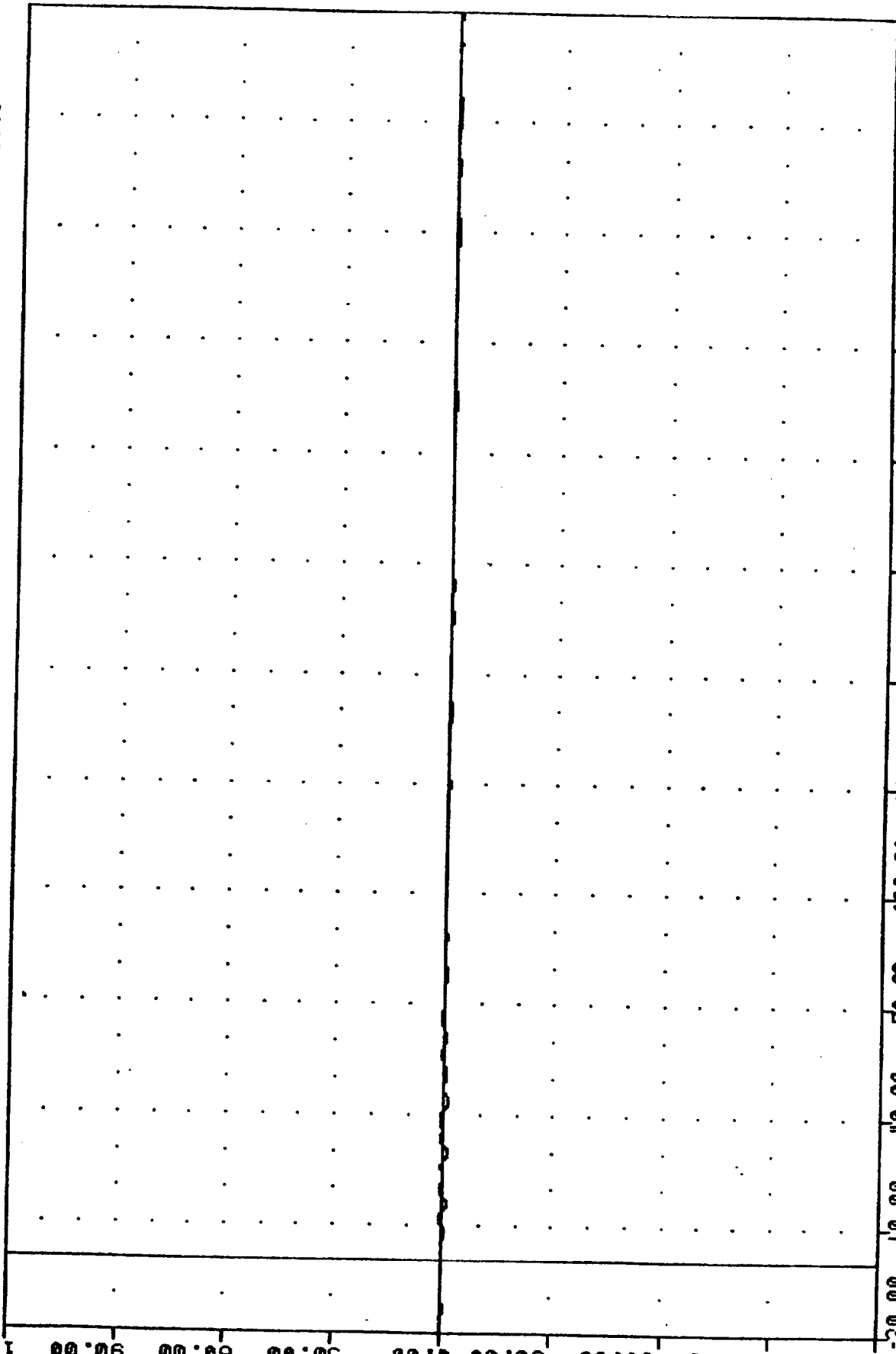
0.00

(LB)

FORCE

B-50

850123



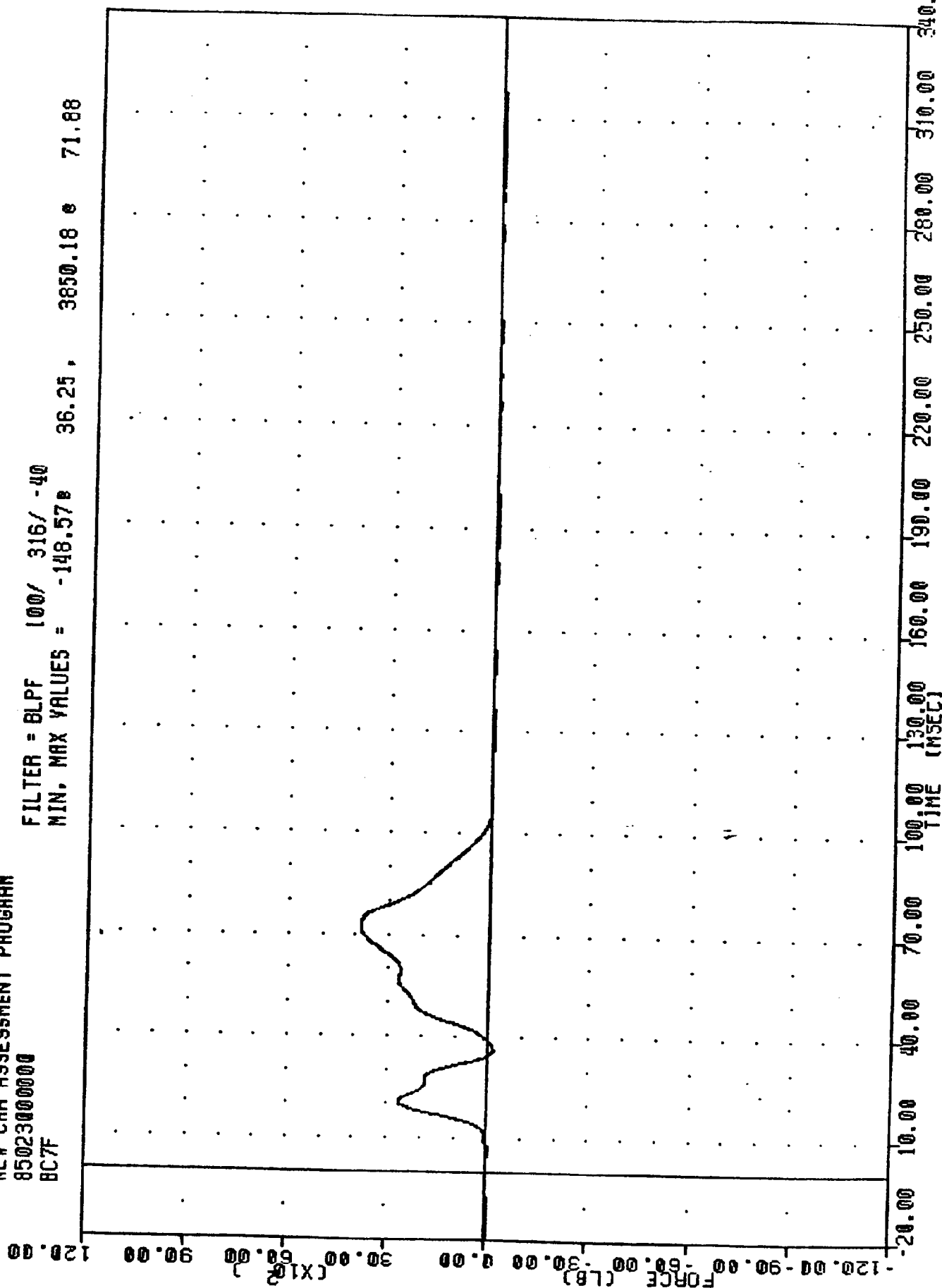
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (msec)

MAZDA INTO LOAD CELL BARRIER

RC , 850123
NEW CAR ASSESSMENT PROGRAM
85023000000
BC7F

PLOT DATE 31 JAN-85 10:30:54

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -148.578 36.25, 3850.18 e 71.88



MAZDA INTO LOAD CELL BARRI

INL 050123
NEW CAR ASSESSMENT PROGRAM
850230000000
BC8F

PLUI DATE IN-85 10:30:54

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -83.43 137.75, 6386.96 73.63

120.00

90.00

60.00

(x10²)

30.00

0.00

-30.00

-60.00

-90.00

-120.00

-150.00

-180.00

-210.00

-240.00

-270.00

-300.00

-330.00

-360.00

-390.00

-420.00

-450.00

-480.00

-510.00

-540.00

-570.00

-600.00

-630.00

-660.00

-690.00

-720.00

-750.00

-780.00

-810.00

-840.00

-870.00

-900.00

-930.00

-960.00

-990.00

-1020.00

-1050.00

-1080.00

-1110.00

-1140.00

-1170.00

-1200.00

-1230.00

-1260.00

-1290.00

-1320.00

-1350.00

-1380.00

-1410.00

-1440.00

-1470.00

-1500.00

-1530.00

-1560.00

-1590.00

-1620.00

-1650.00

-1680.00

-1710.00

-1740.00

-1770.00

-1800.00

-1830.00

-1860.00

-1890.00

-1920.00

-1950.00

-1980.00

-2010.00

-2040.00

-2070.00

-2100.00

-2130.00

-2160.00

-2190.00

-2220.00

-2250.00

-2280.00

-2310.00

-2340.00

-2370.00

-2400.00

-2430.00

-2460.00

-2490.00

-2520.00

-2550.00

-2580.00

-2610.00

-2640.00

-2670.00

-2700.00

-2730.00

-2760.00

-2790.00

-2820.00

-2850.00

-2880.00

-2910.00

-2940.00

-2970.00

-3000.00

-3030.00

-3060.00

-3090.00

-3120.00

-3150.00

-3180.00

-3210.00

-3240.00

-3270.00

-3300.00

-3330.00

-3360.00

-3390.00

-3420.00

-3450.00

-3480.00

-3510.00

-3540.00

-3570.00

-3600.00

-3630.00

-3660.00

-3690.00

-3720.00

-3750.00

-3780.00

-3810.00

-3840.00

-3870.00

-3900.00

-3930.00

-3960.00

-3990.00

-4020.00

-4050.00

-4080.00

-4110.00

-4140.00

-4170.00

-4200.00

-4230.00

-4260.00

-4290.00

-4320.00

-4350.00

-4380.00

-4410.00

-4440.00

-4470.00

-4500.00

-4530.00

-4560.00

-4590.00

-4620.00

-4650.00

-4680.00

-4710.00

-4740.00

-4770.00

-4800.00

-4830.00

-4860.00

-4890.00

-4920.00

-4950.00

-4980.00

-5010.00

-5040.00

-5070.00

-5100.00

-5130.00

-5160.00

-5190.00

-5220.00

-5250.00

-5280.00

-5310.00

-5340.00

-5370.00

-5400.00

-5430.00

-5460.00

-5490.00

-5520.00

-5550.00

-5580.00

-5610.00

-5640.00

-5670.00

-5700.00

-5730.00

-5760.00

-5790.00

-5820.00

-5850.00

-5880.00

-5910.00

-5940.00

-5970.00

-6000.00

-6030.00

-6060.00

-6090.00

-6120.00

-6150.00

-6180.00

-6210.00

-6240.00

-6270.00

-6300.00

-6330.00

-6360.00

-6390.00

-6420.00

-6450.00

-6480.00

-6510.00

-6540.00

-6570.00

-6600.00

-6630.00

-6660.00

-6690.00

-6720.00

-6750.00

-6780.00

-6810.00

-6840.00

-6870.00

-6900.00

-6930.00

-6960.00

-6990.00

-7020.00

-7050.00

-7080.00

-7110.00

-7140.00

-7170.00

-7200.00

-7230.00

-7260.00

-7290.00

-7320.00

-7350.00

-7380.00

-7410.00

-7440.00

-7470.00

-7500.00

-7530.00

-7560.00

-7590.00

-7620.00

-7650.00

-7680.00

-7710.00

-7740.00

-7770.00

-7800.00

-7830.00

-7860.00

-7890.00

-7920.00

-7950.00

-7980.00

-8010.00

-8040.00

-8070.00

-8100.00

-8130.00

-8160.00

-8190.00

-8220.00

-8250.00

-8280.00

-8310.00

-8340.00

-8370.00

-8400.00

-8430.00

-8460.00

-8490.00

-8520.00

-8550.00

-8580.00

-8610.00

-8640.00

-8670.00

-8700.00

-8730.00

-8760.00

-8790.00

-8820.00

-8850.00

-8880.00

-8910.00

-8940.00

-8970.0

HC 850123
NEW CAR ASSESSMENT PROGRAM
850230000000
BC9F

PLUI DATE HN-85 10:30:54

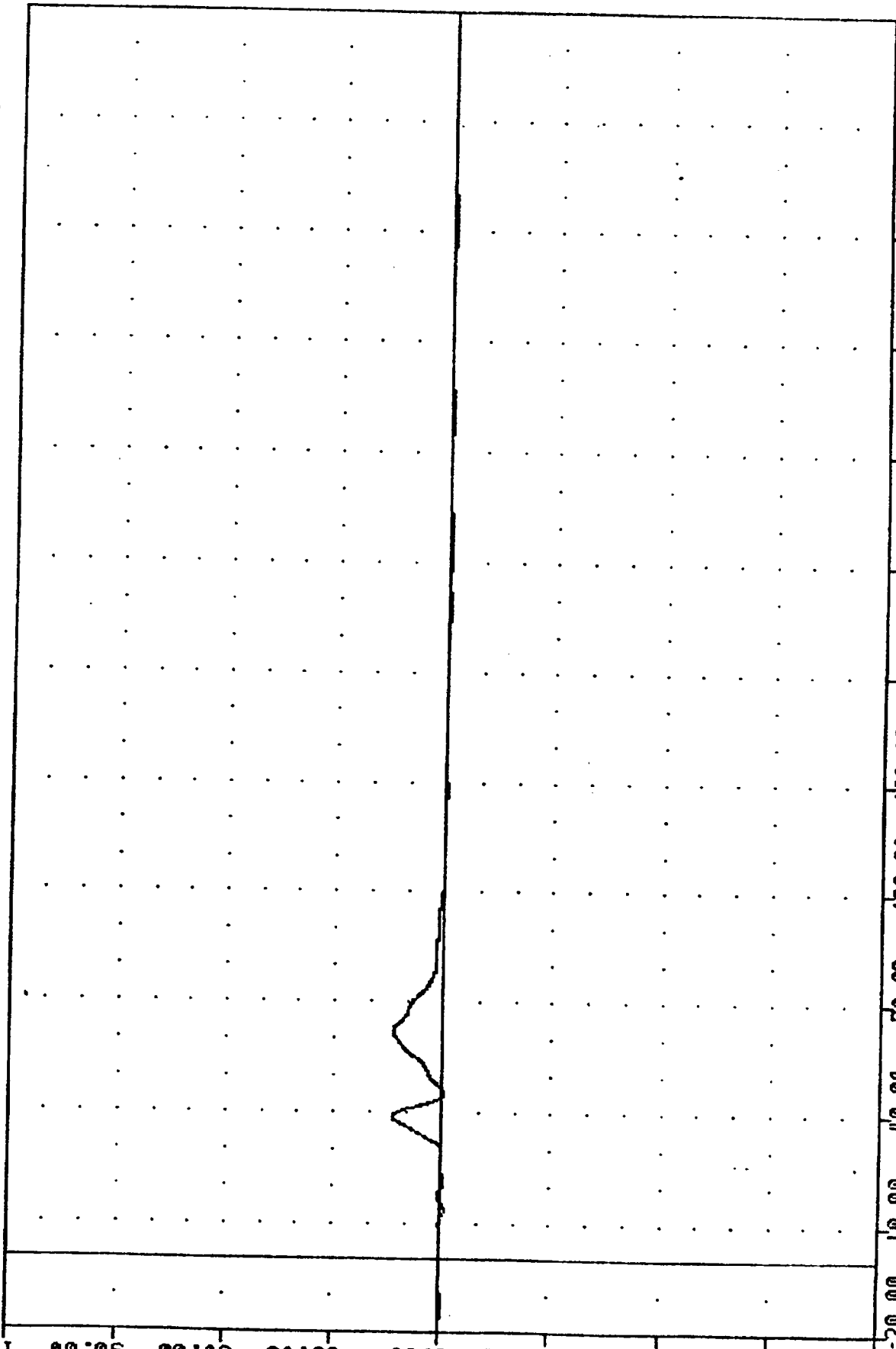
FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -95.04 13.38, 1372.70 61.88

120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00

B-53

850123

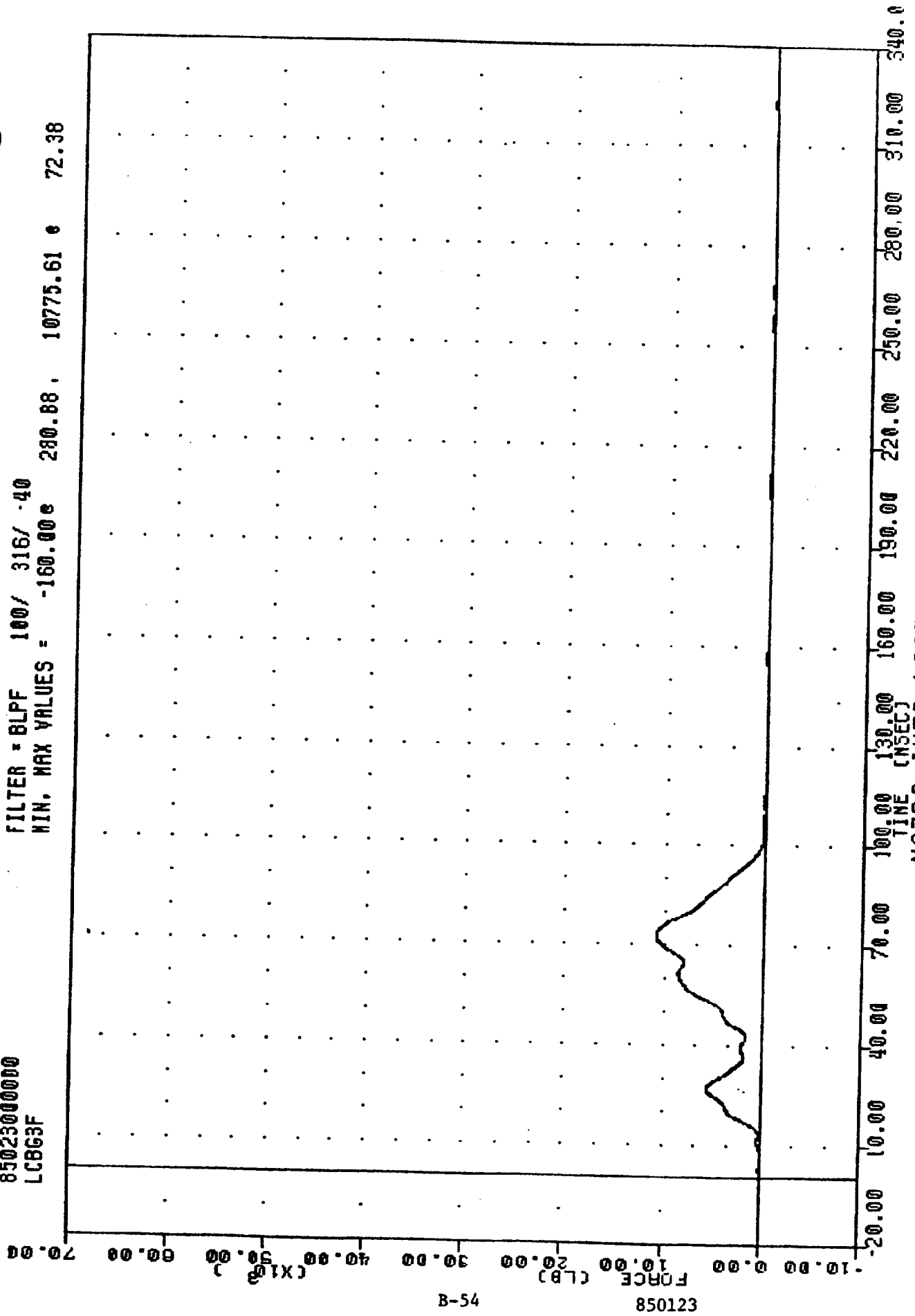


MAZDA INTO LOAD CELL BARRIER

850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 LC8G3F

PLU1 DATE 11-06-59

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -160.00 280.88, 10775.61 72.38



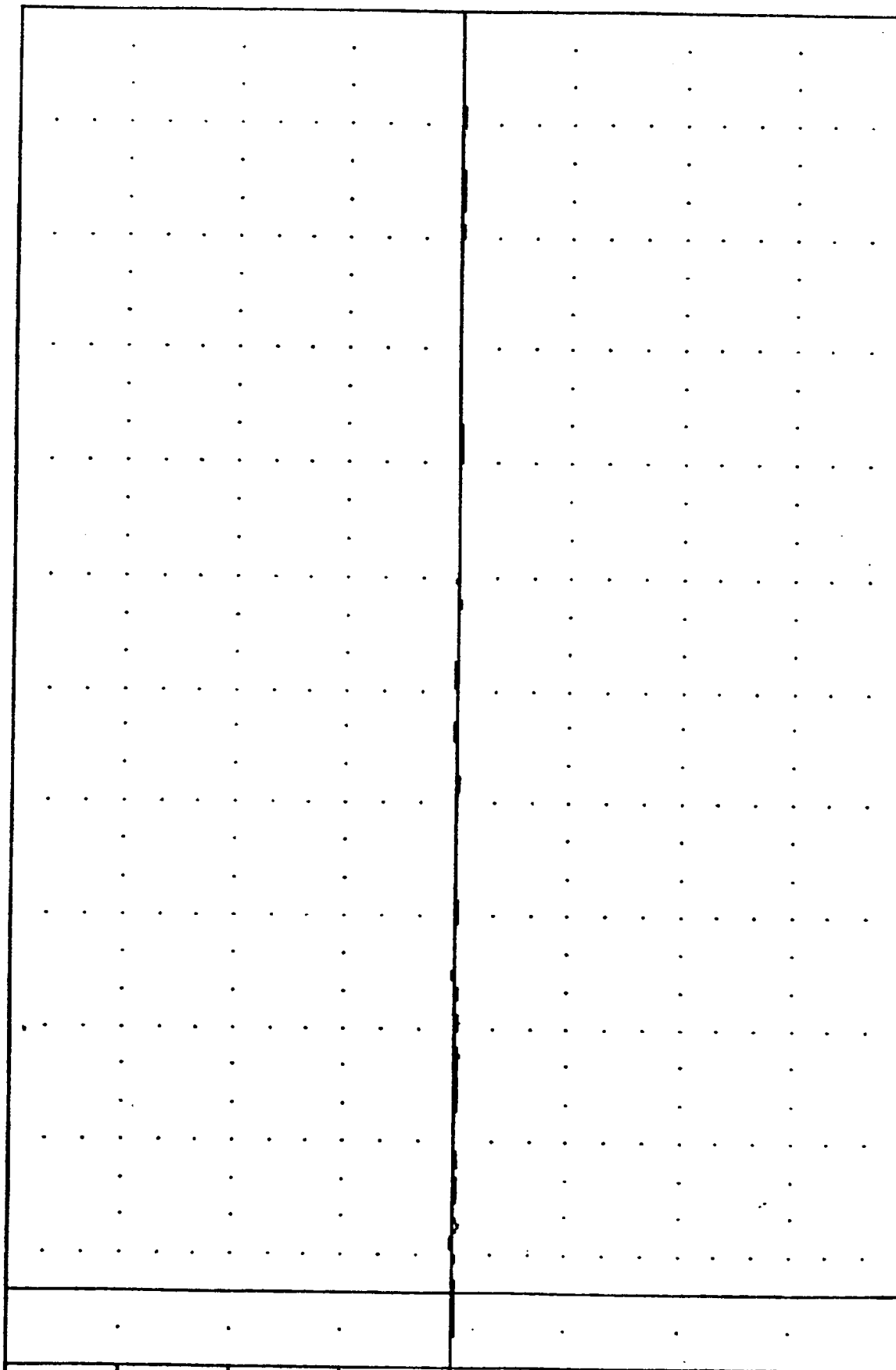
MAZDA INTO LOAD CELL BARRIER
 LOAD CELL BARRIER CRUID 23 CODE TOTAL

TRC , 850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 BB1F

PLUT DATE AN-85 10:30:54

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -95.86 17.25, 103.88 13.13

120.00
 90.00
 60.00
 30.00
 0.00
 -30.00
 -60.00
 -90.00
 -120.00



B-55

850123

-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)
 MAZDA INTO LOAD CELL BARRIER
 INAN FEEL BARRED POSITION 01 100

THC , 850123
NEW CAR ASSESSMENT PROGRAM
850230000000
BB2F

PLU1 DATE 31-JAN-83 10:30:54

FILTER = 8LPF 100/ 316/ -40

MIN, MAX VALUES = -30.02e 185.50, 2971.58 e 30.13

120.00

90.00

60.00

30.00

0.00

-30.00

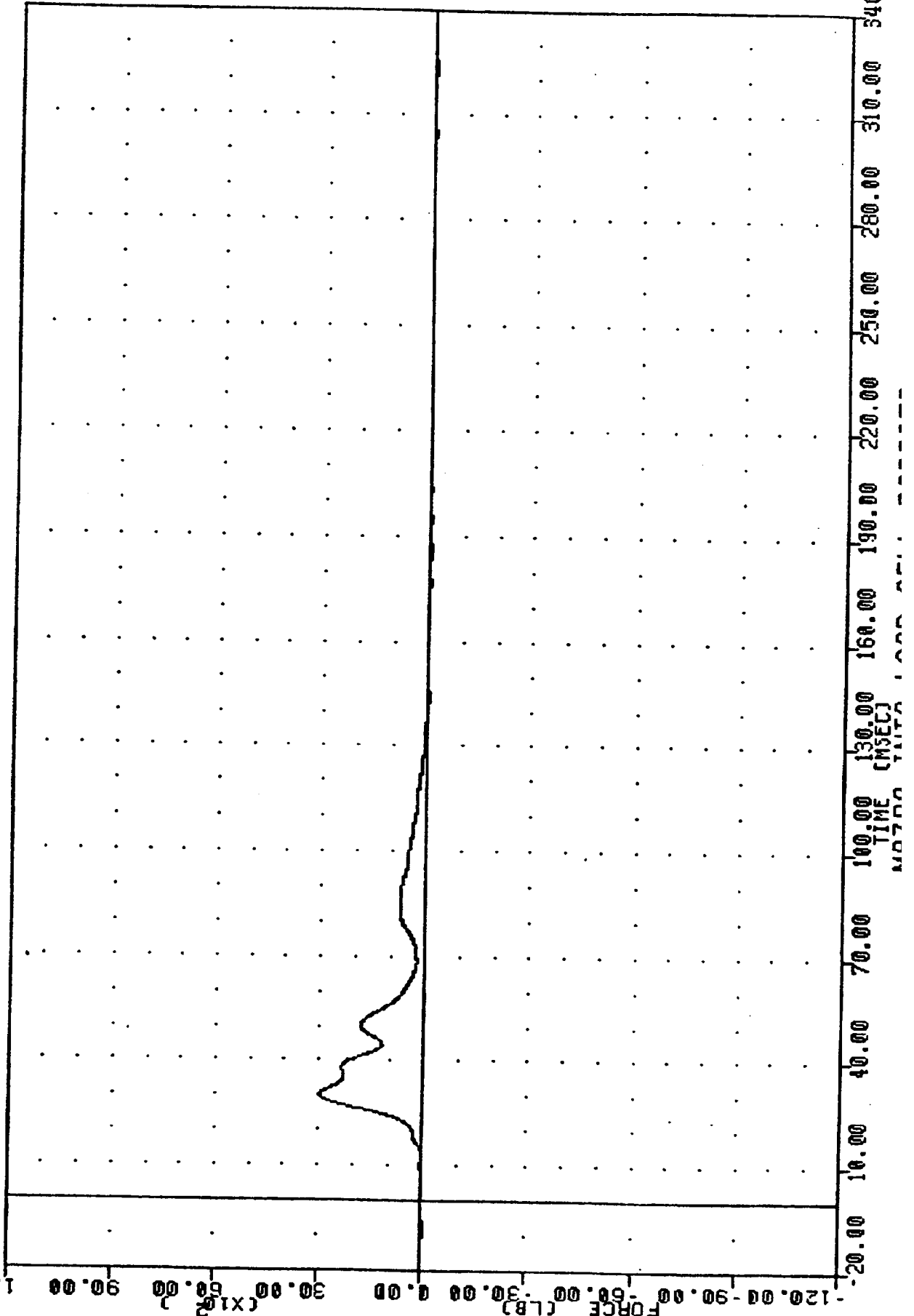
-60.00

-90.00

-120.00

B-56

850123



The
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 BB3F

PLU: JATE IN-6J 10.30:54

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -66.25e 243.63 4622.50 e 31.25

120.00

90.00

60.00

30.00

0.00

-30.00

-60.00

-90.00

-120.00

-20.00

(X10²)

FORCE (LB)

TIME (MSEC)

100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MAZDA INTO LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION R31RS

THU 850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 BA1F

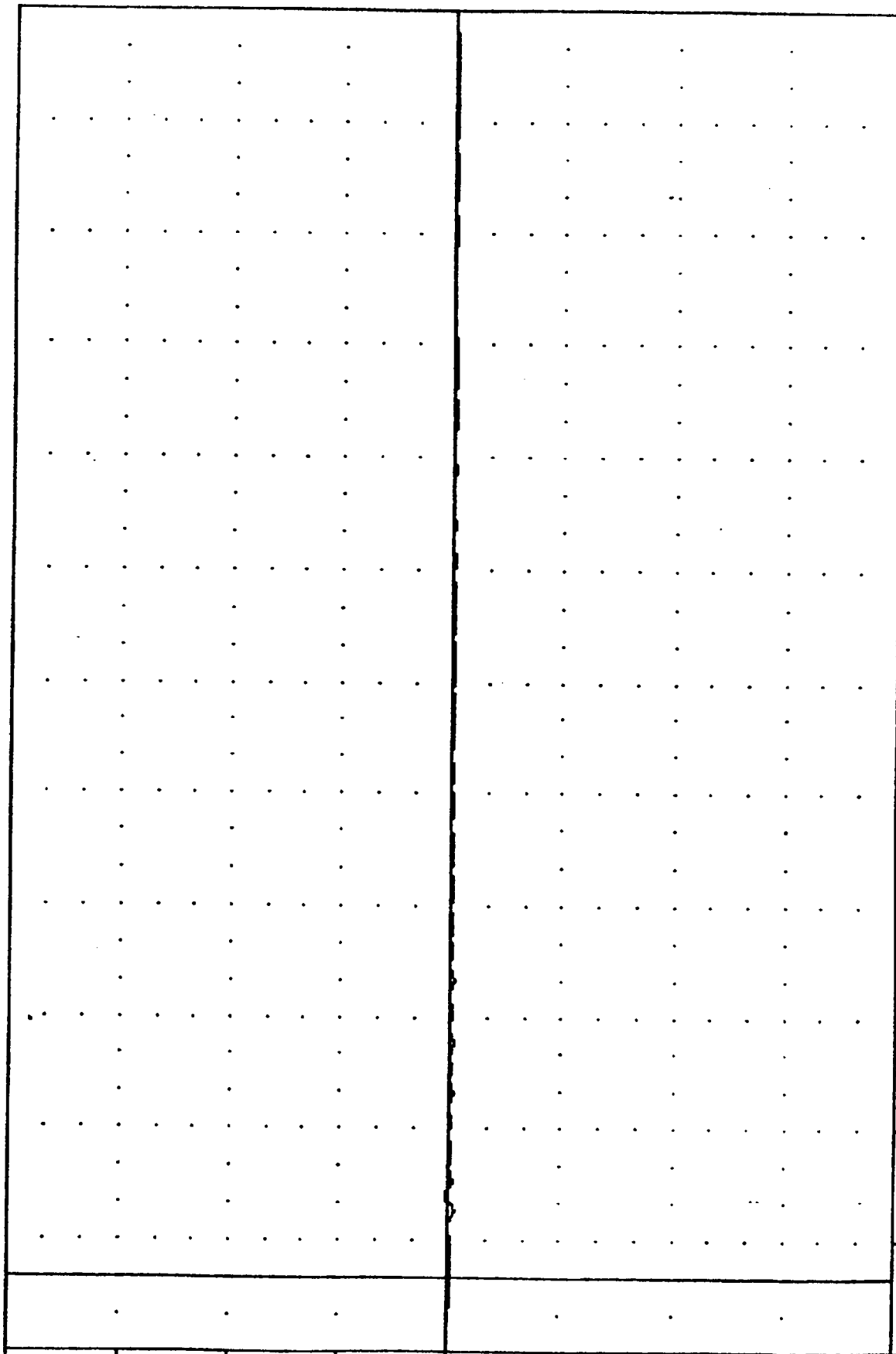
PLUI DATE JAN-85 10:30:54

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -149.07e 17.63, 109.67 e 21.88

120.00
 90.00
 60.00
 30.00
 0.00
 -30.00
 -60.00
 -90.00
 -120.00

B-58

850123



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

MAZDA INTO LOAD CELL BARRIER

NEW CAR ASSESSMENT PROGRAM
 85023000000
 BA2F

PLU: DATL

IN-UJ 10:30:54

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -37.82e 333.25, 392.27 e 47.38

120.00

90.00

60.00

30.00

0.00

-30.00

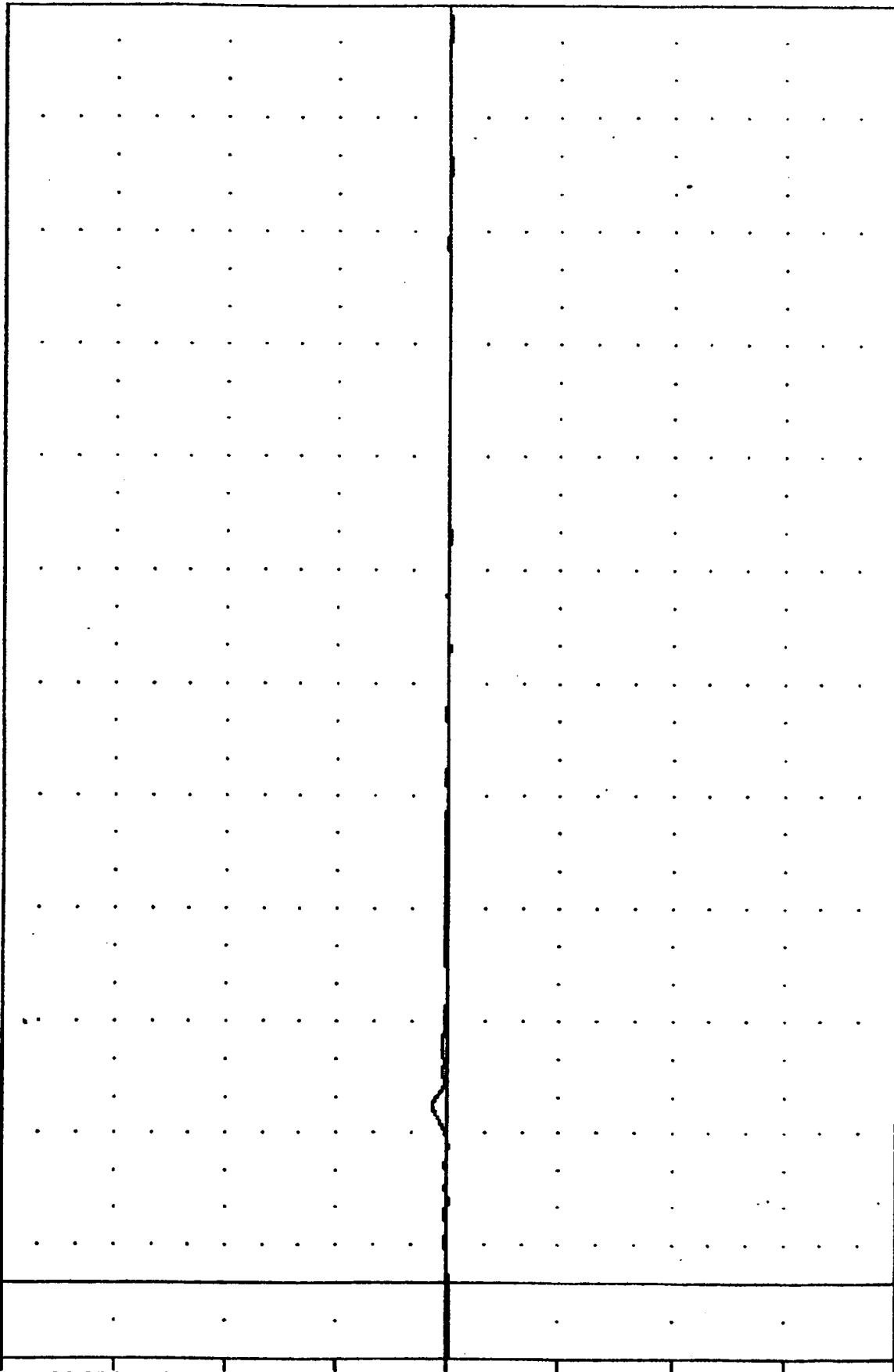
-60.00

-90.00

-120.00

B-59

850123



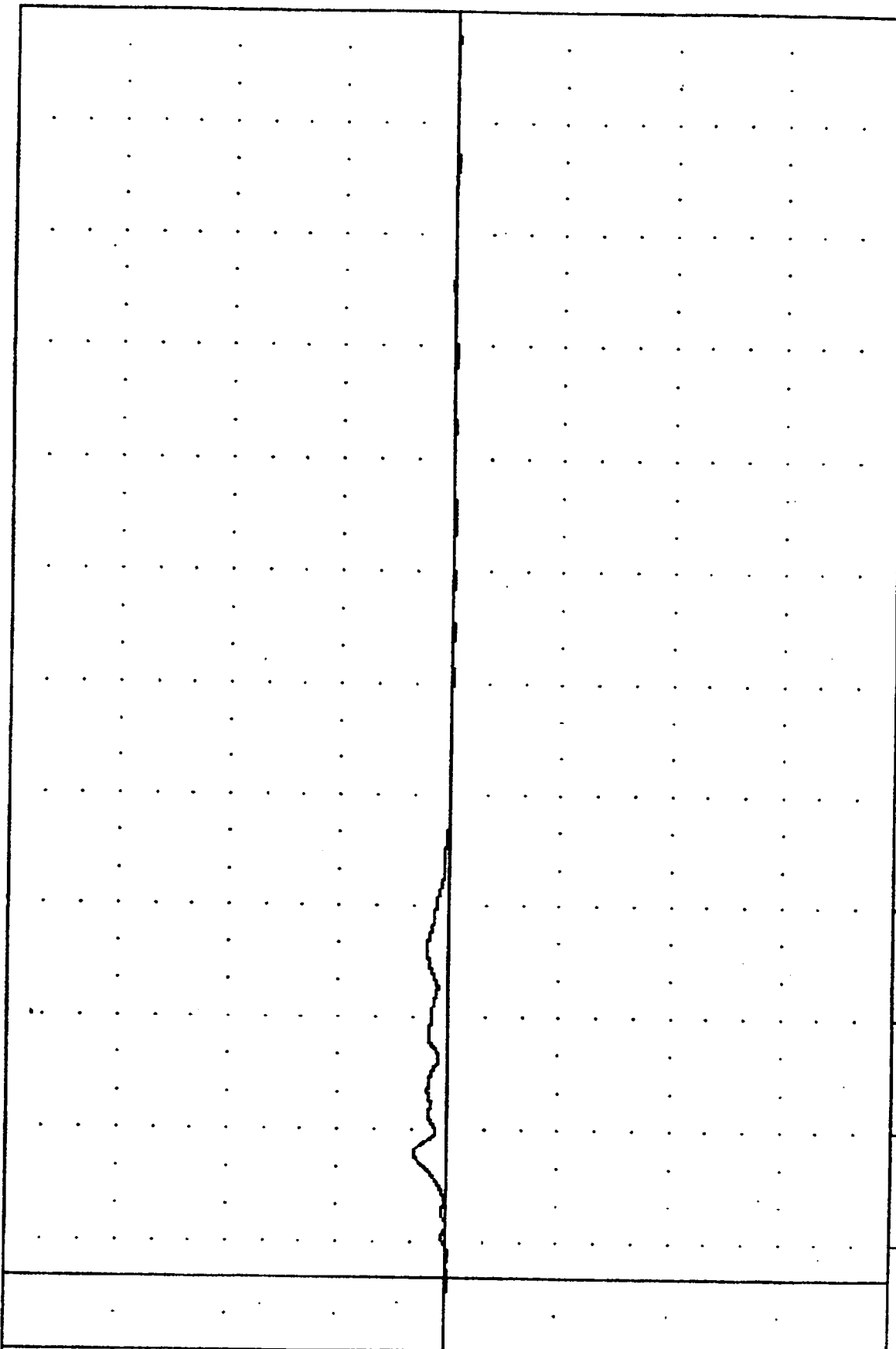
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MAZDA INTO LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A2 LRS

THE NEW CAR ASSESSMENT PROGRAM
 85023000000
 BASF

PLU DATE JUN-80 10:50:54
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -46.88 934.93 33.63

120.00
 90.00
 60.00
 30.00
 0.00
 -30.00
 -60.00
 -90.00
 -120.00



B-60

850123

MAZDA INTO LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION R3 LBS

TRC 850123
NEW CAR ASSESSMENT PROGRAM
85023000000
LCB64F

PLUI DATE JAN-85 11:56:59

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -157.61 8287.03 31.00

70.00

60.00

50.00

(X10³)

40.00

30.00

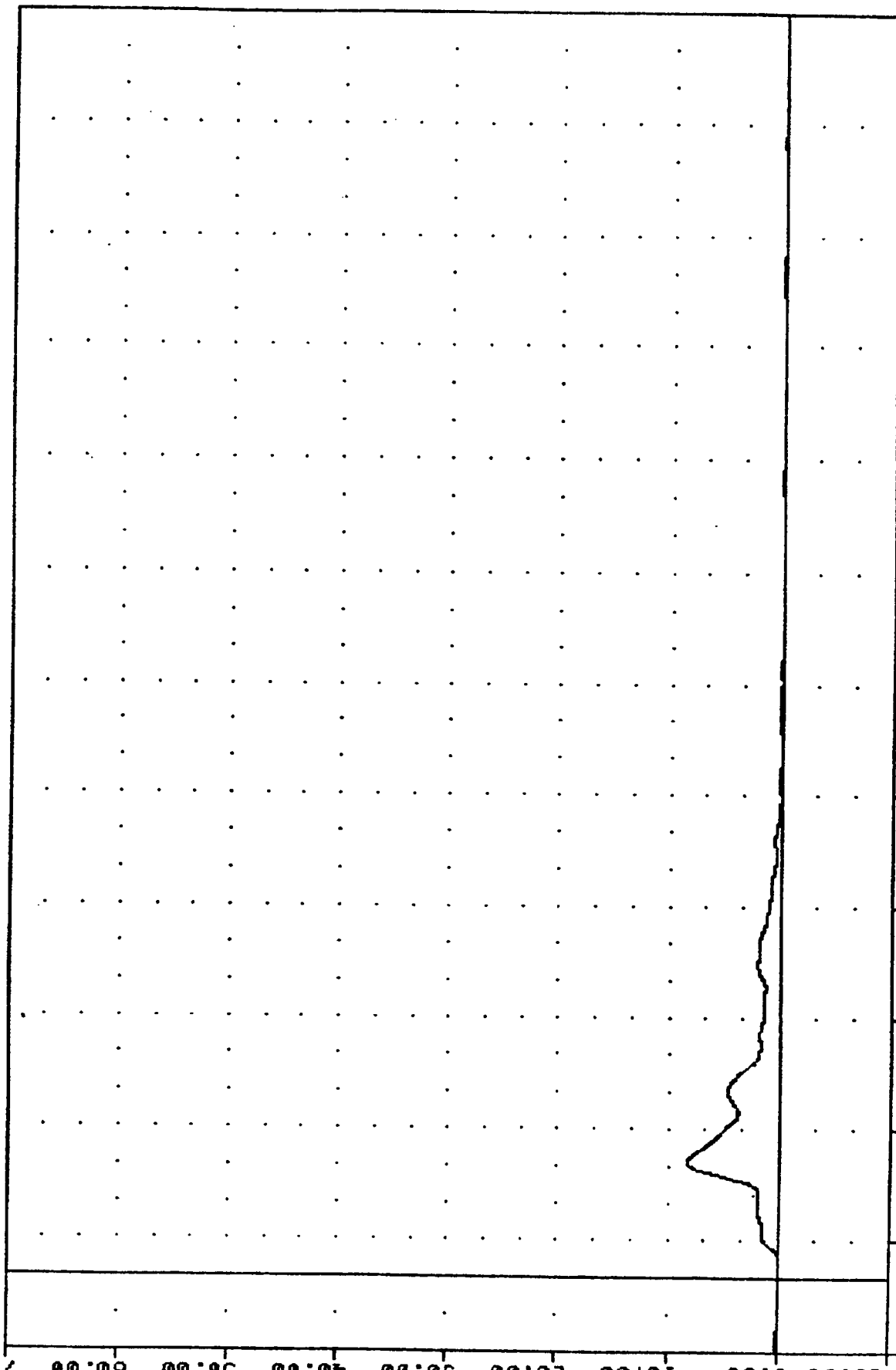
20.00

(LB)

10.00

850123

B-61



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

MAZDA INTO LOAD CELL BARRIER
LOAD CELL BARRIER GROUP #4 FORCE TOTAL

THU 850123
NEW CAR ASSESSMENT PROGRAM
85023000000
884F

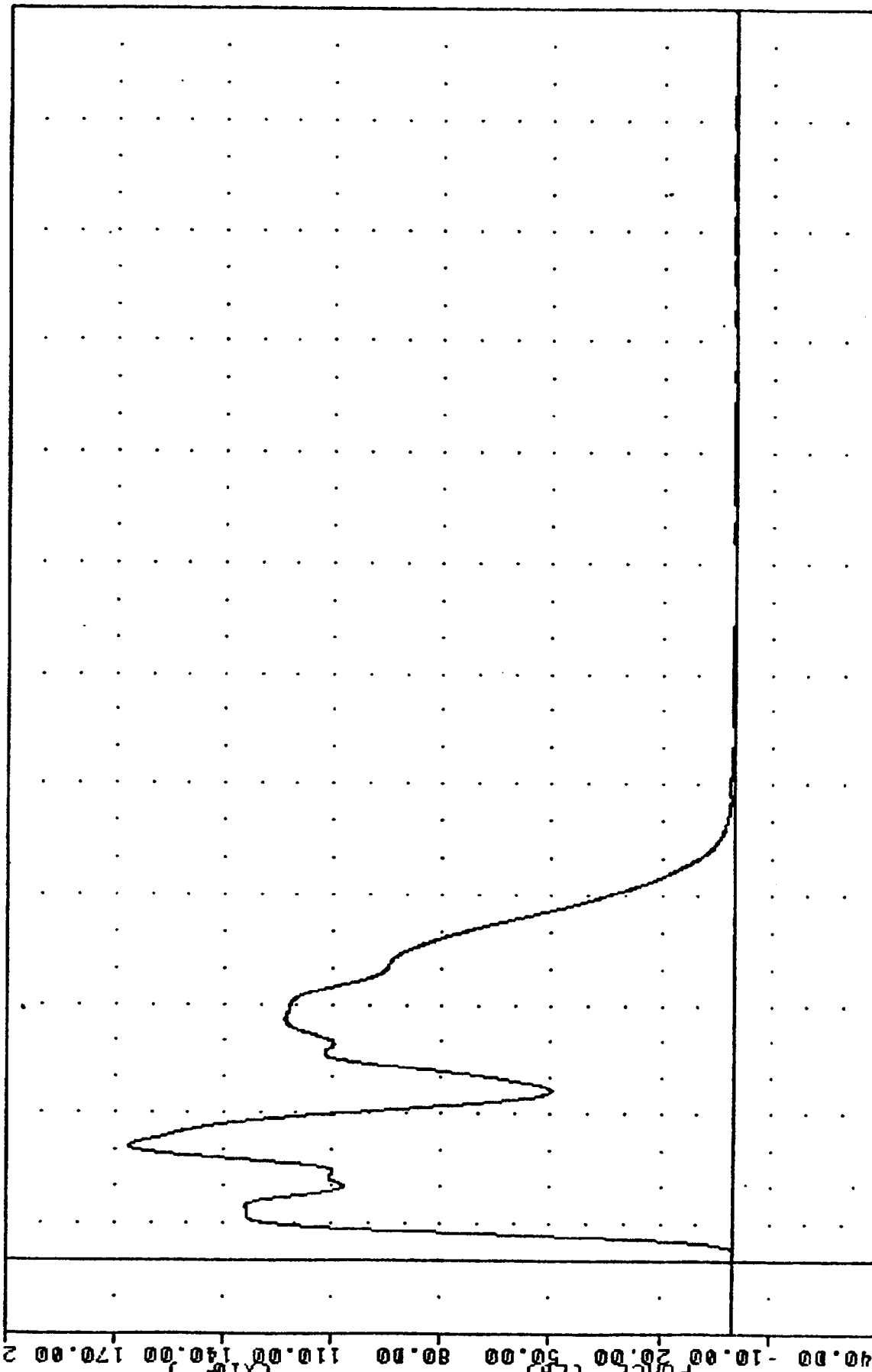
PLUI DATE 850123 10:50:54

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -28.03 16612.75 30.88

850123
FORCE (LB)
(X10²)

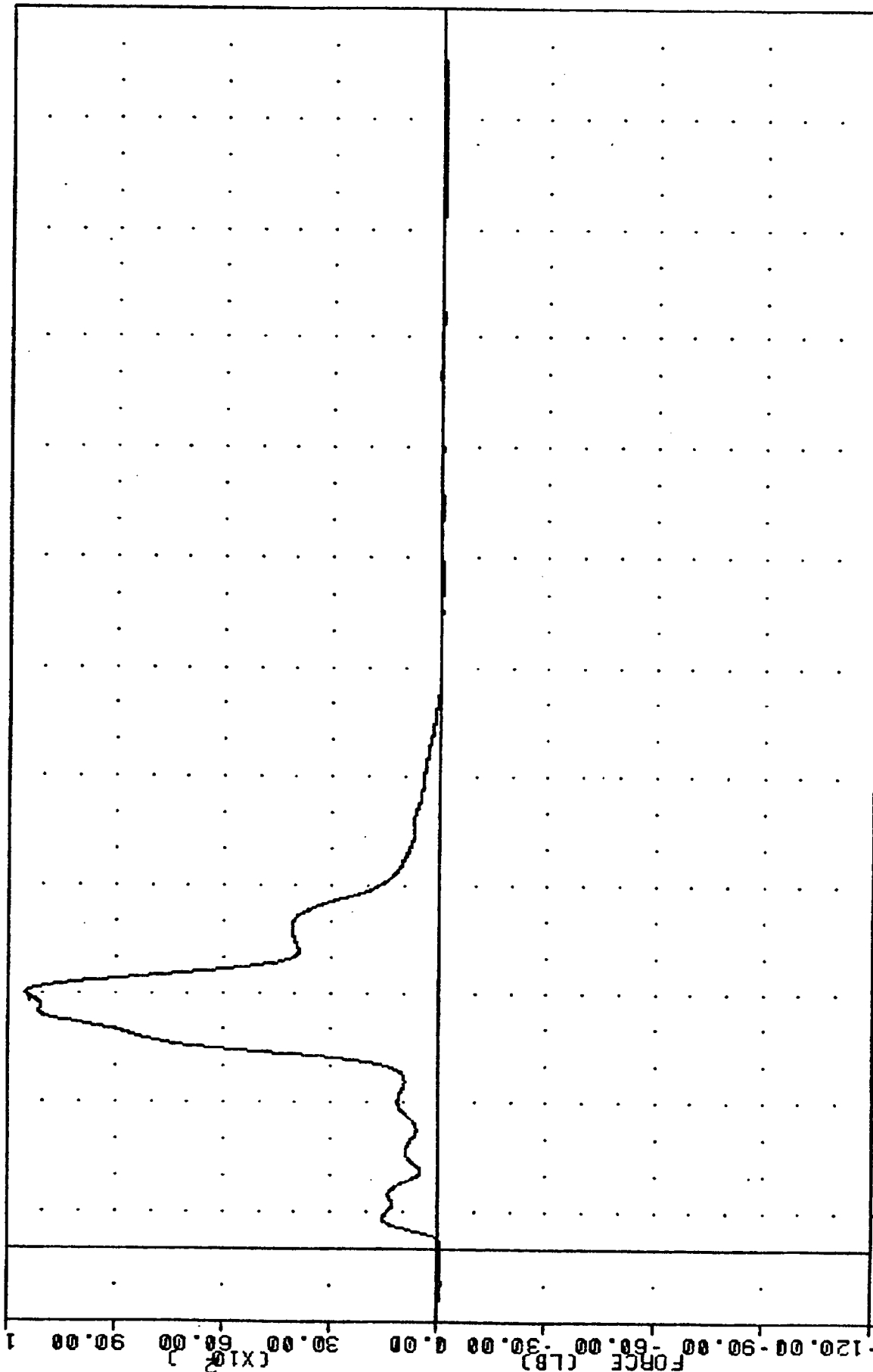
B-62



MAZDA INTO LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 84 LBS

NEW CAR ASSESSMENT PROGRAM
 850230000000
 885F

PLU: DRIL EB-00 100/ 316/ -40
 FILTER = BLPF
 MIN, MAX VALUES = -80.40 11504.22 69.75



MAZDA INTO LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 85 LBS

RC 850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 886F

PLOT DATE 8-85 15:00:28

FILTER = 8LPF 100/ 316/ -40

MIN. MAX VALUES = -22.36e -3.88, 9382.44 e 10.00

120.00

90.00

60.00

30.00

0.00

-30.00

-60.00

-90.00

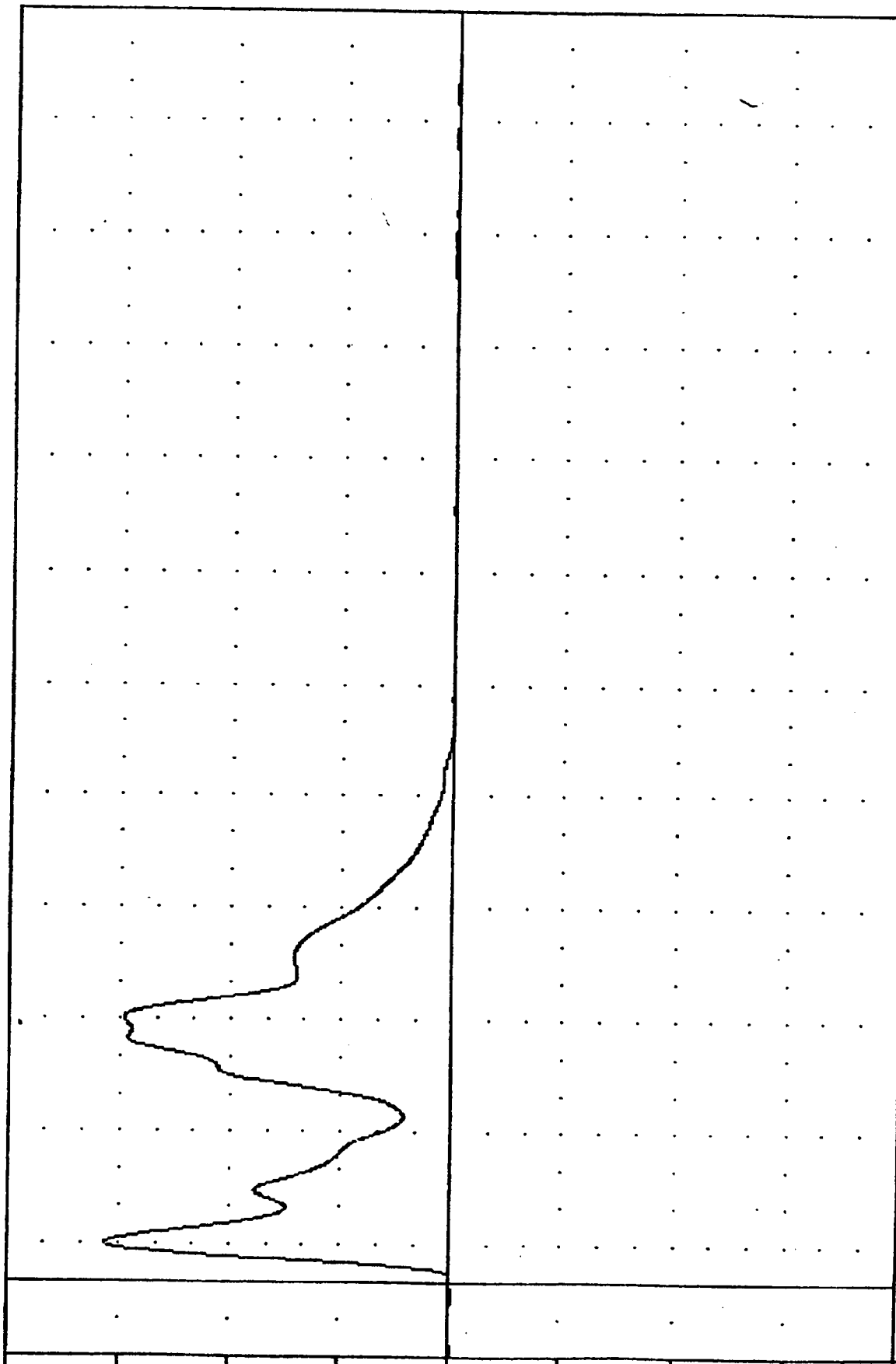
-120.00

FORCE (LB)

(X10³)

B-64

850123



TIME (MSEC) 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MAZDA INTO LOAD CELL BARRIER
 IN AN CELL BARRIER POSITION RE IRS

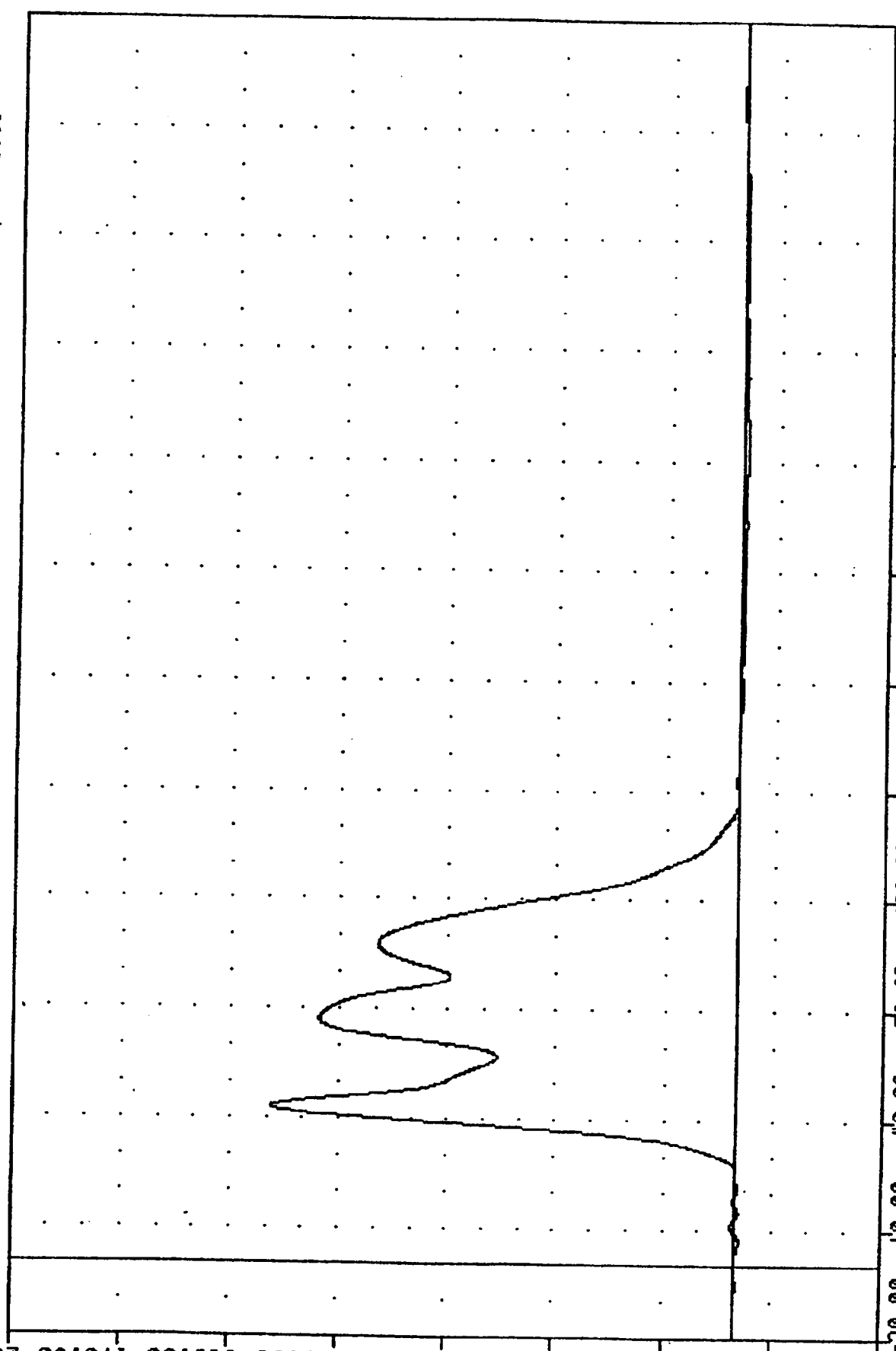
ARC , 850123
 NEW CAR ASSESSMENT PROGRAM
 850230000000
 8A4F

PLOT DATE 8-85 15:00:28

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -133.40e 226.38, 12883.37 e 43.00

850123
 FORCE (LB)
 (X10²)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MAZDA INTO LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 841RS

850123
NEW CAR ASSESSMENT PROGRAM
85023000000
BA5F

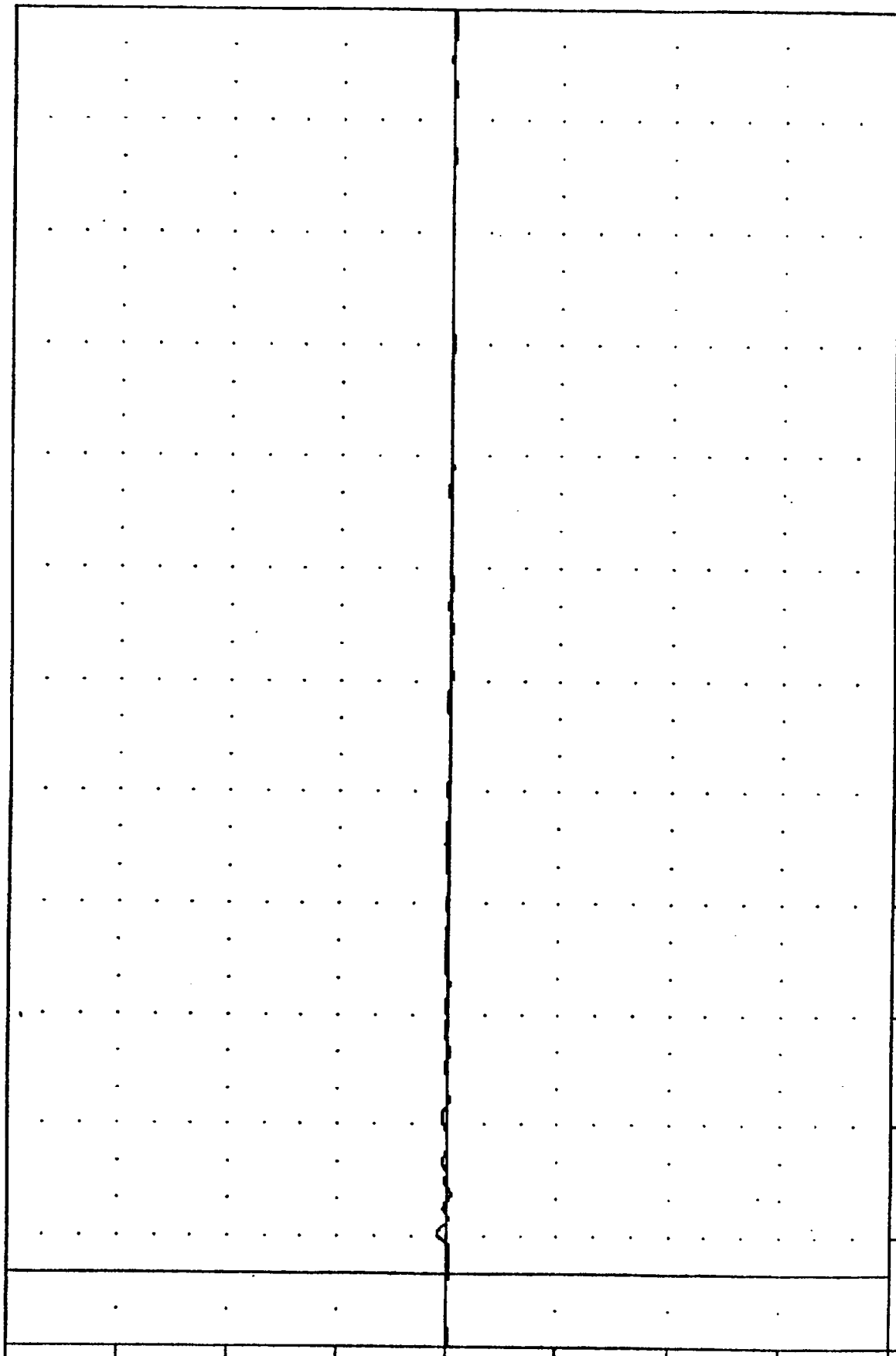
PLU1 DATE 3 N-80 10:30:54

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -85.01e 21.00, 278.37 e 10.88

120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00

B-66

850123



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)
MAZDA INTO LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A5 LBS

850123
NEW CAR ASSESSMENT PROGRAM
8502500000
BASF

PLOT DATE 3-85 10:30:54

FILTER = BLPF 100/ 316/ .40

MIN, MAX VALUES = -95.67e 6.63, 1036.50 e 38.50

120.00

90.00

60.00
(X10²)

30.00

0.00

-30.00
(LB)

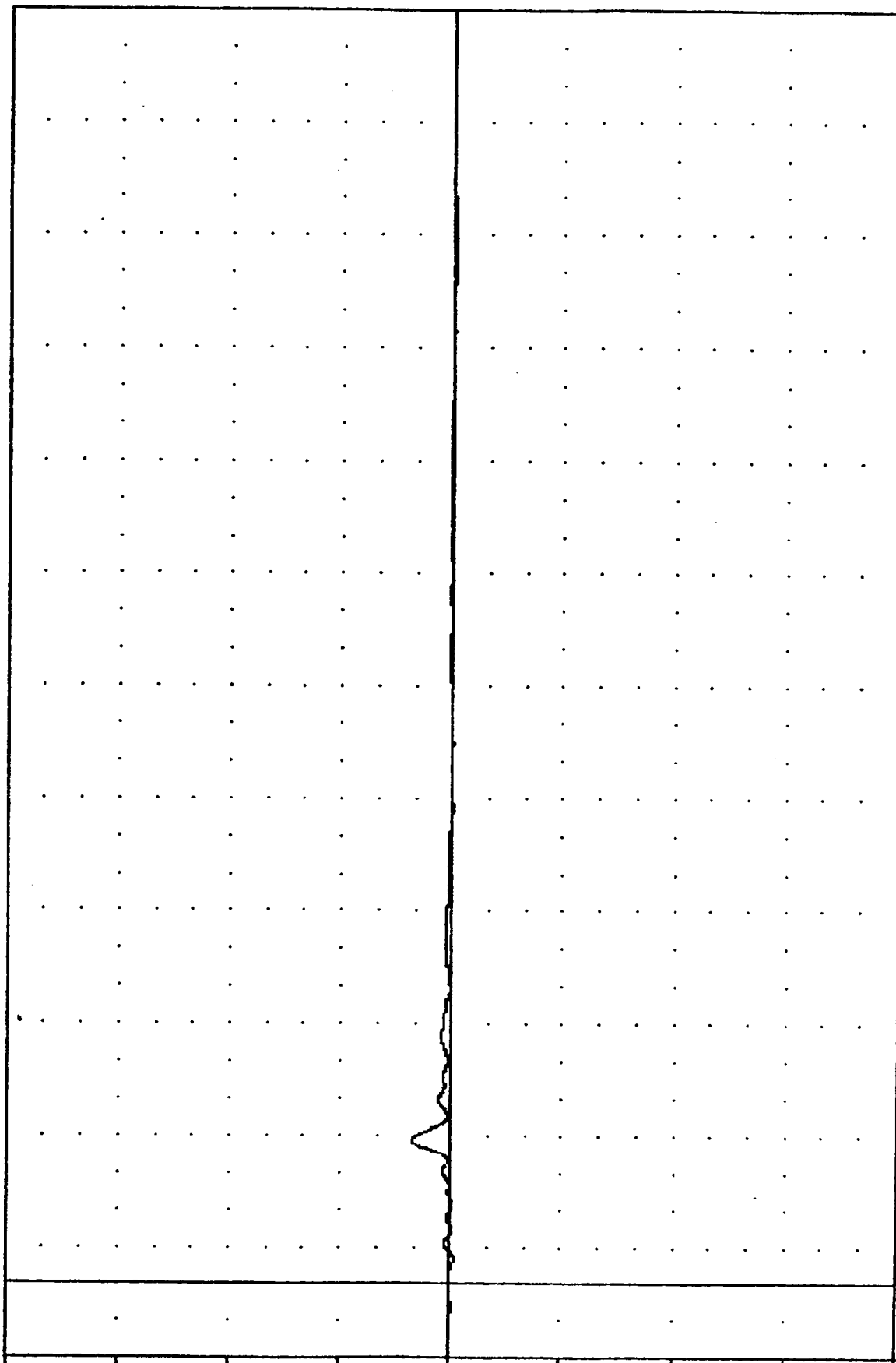
-60.00
FORCE

-90.00

-120.00

B-67

850123



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

MAZDA INTO LOAD CELL BARRIER
LOAD CELL BARRIER POSITION AIRS

NEW CAR ASSESSMENT PROGRAM
 85023000000
 LC8G5F

PLAN DATE 85-03-03 11:36:59

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -145.15 5.75 44151.56 69.13

70.00

60.00

50.00

40.00

30.00

20.00

10.00

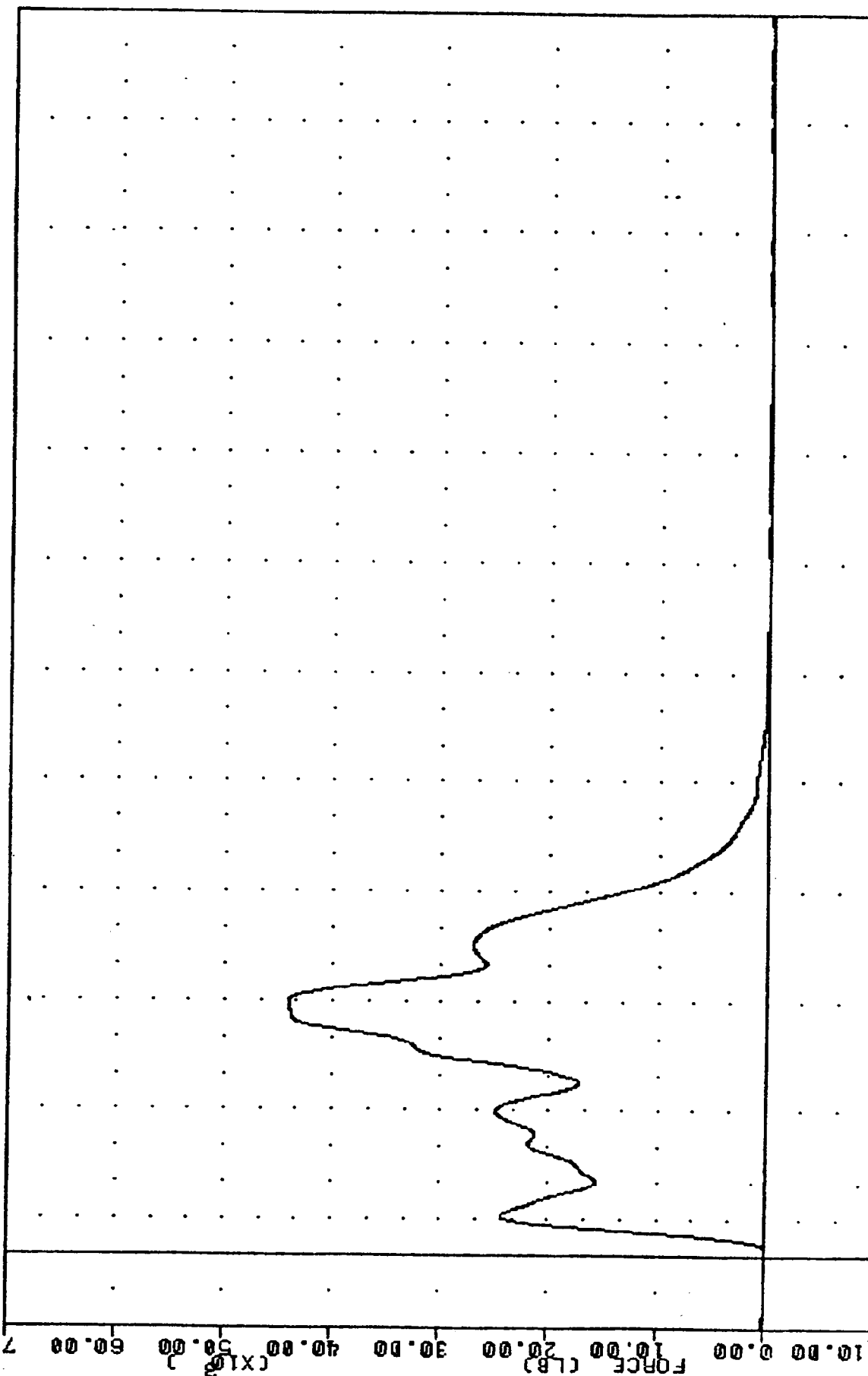
0.00

-10.00

-20.00

B-68

850123



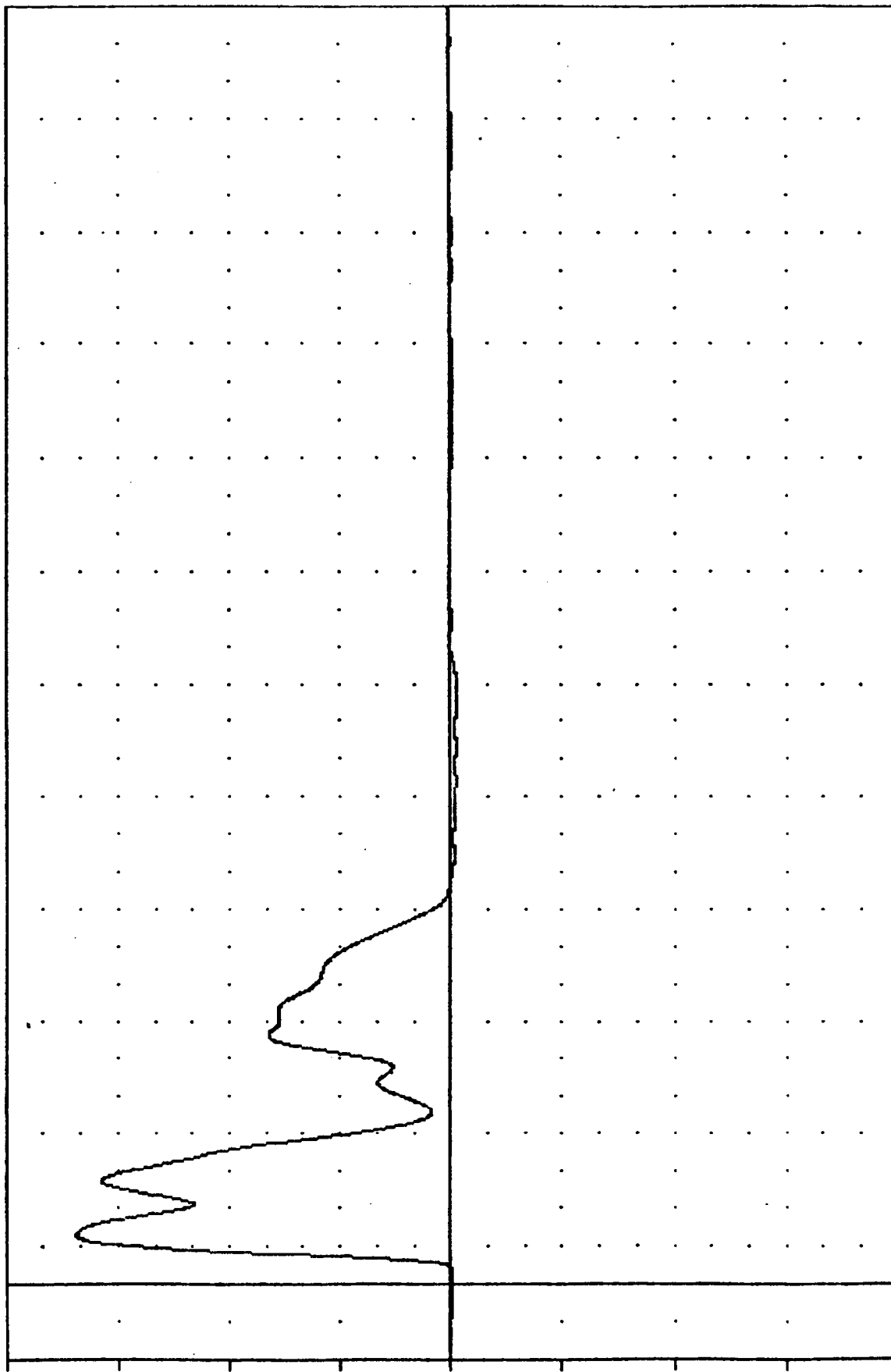
-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00
 0.00 100.00 150.00 200.00 250.00 300.00 340.00
 TIME (MSEC)

MAZDA INTO LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP #5 FORCE TOTAL

ML
NEW CAR ASSESSMENT PROGRAM
85023000000
887F

PLU: DATE 850123 10:30:54
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -173.21 154.63, 10105.88 12.88

120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00



B-69

8501023

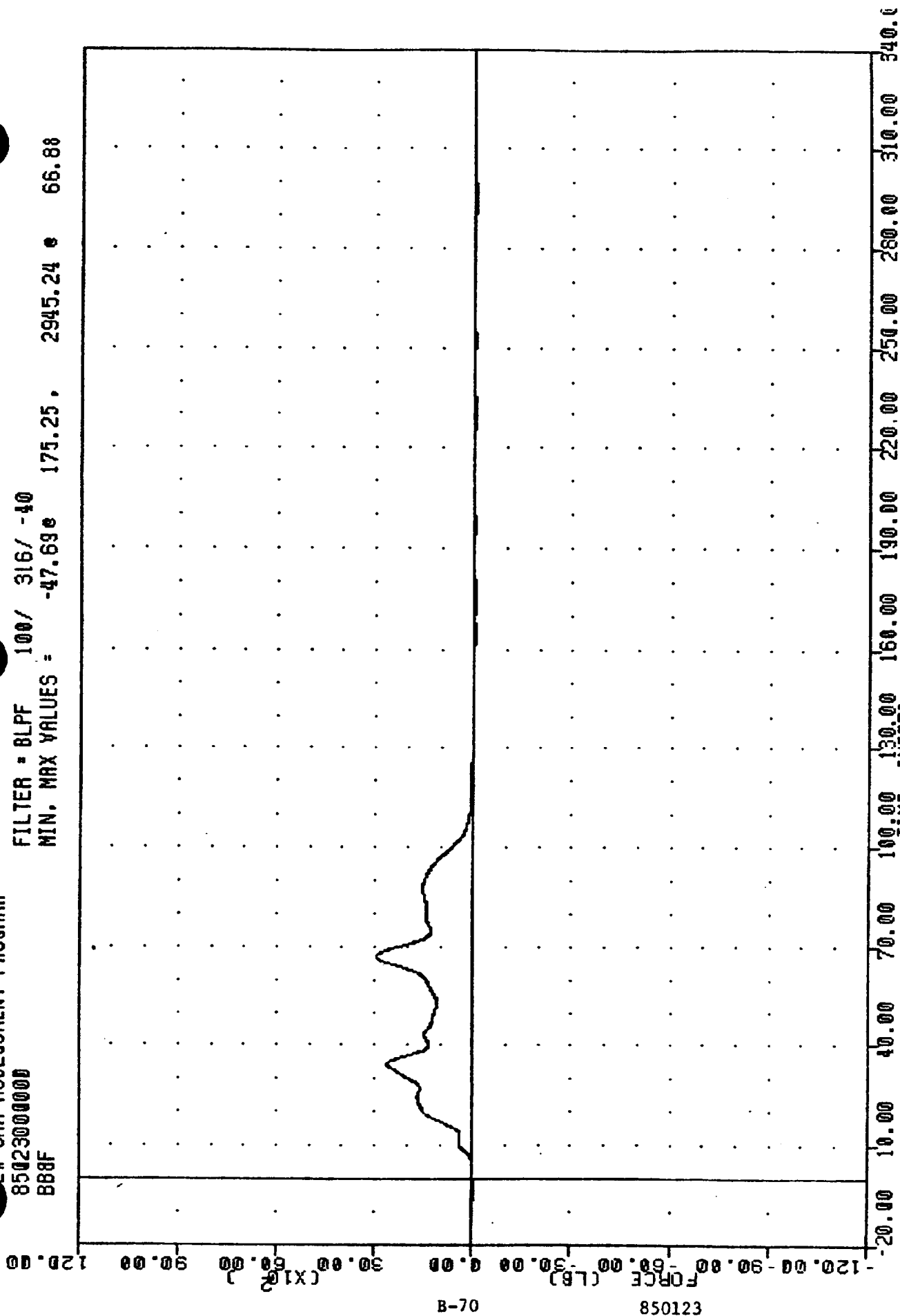
MAZDA INTO LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 87 LBS

850123
 NEW CAR ASSESSMENT PROGRAM
 85023000000
 B88F

PLU1 DATE 3 11-00 10:30:54

FILTER = 8LPF 100/ 316/ -40

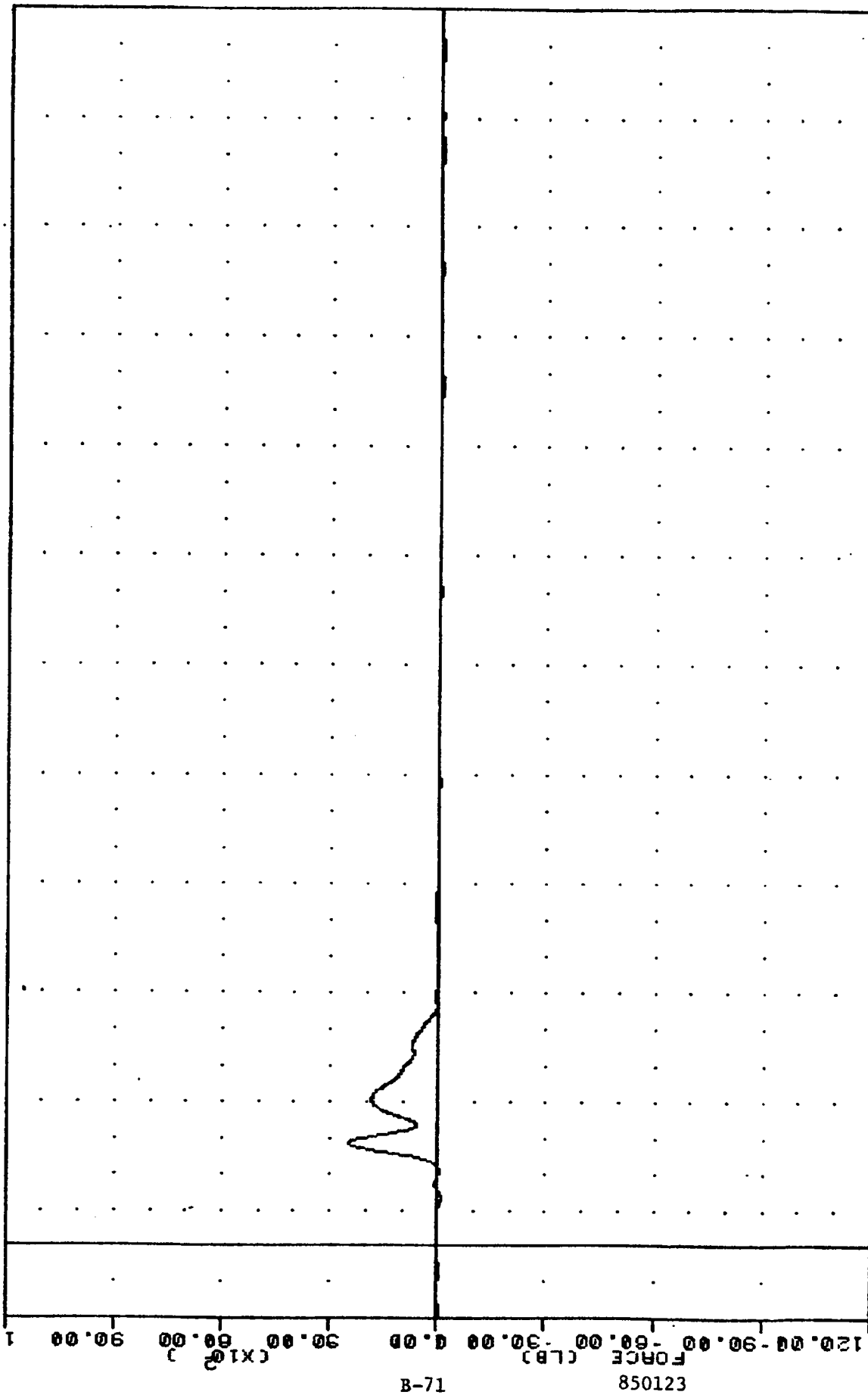
MIN. MAX VALUES = -47.69 175.25 2945.24 66.88



MAZDA INTO LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION RAIRS

THE NEW CAR ASSESSMENT PROGRAM
 850230000000
 889F

PLU: DATL 10-00 10:00:54
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -89.29 13.00 2499.56 28.38



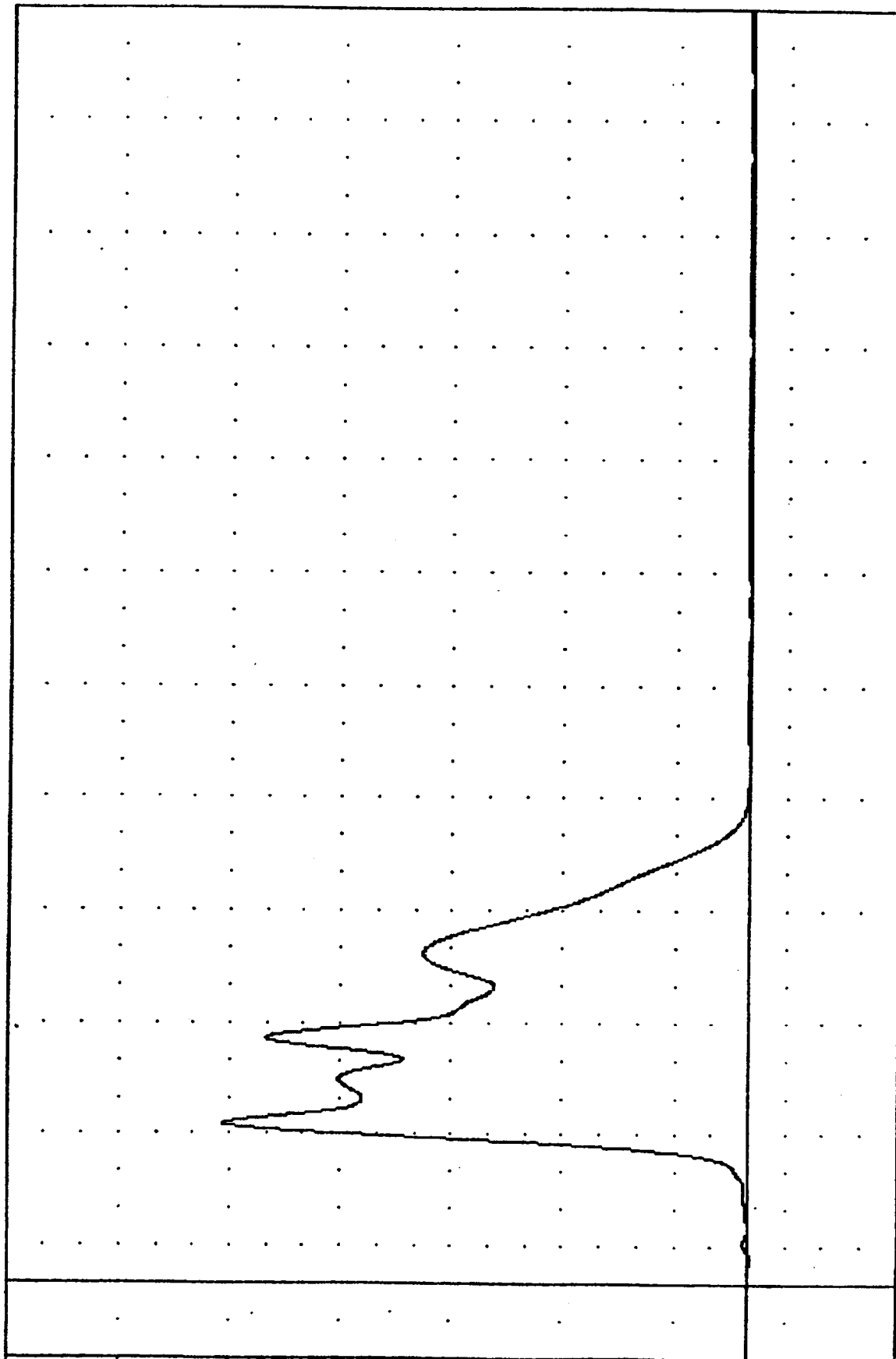
MAZDA INTO LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B9 LBS

TRC 850123
NEW CAR ASSESSMENT PROGRAM
85023000000
BA7F

PLOT DATE FEB-85 15:00:28

FILTER = 8LPF 100/ 316/ -40
MIN. MAX VALUES = -50.59e 6.50, 14186.28 e 42.75

FORCE (LB) (X10²)



B-72

850123

MAZDA INTO LOAD CELL BARRIER
1 MAN CELL BARRIER POSITION AT IRS

RC , 850123
 KEY CAR ASSESSMENT PROGRAM
 850230000000
 BR8F

PLOT DATE 3 N-85 10:30:54

FILTER = BLPF 100/ 316/ -40

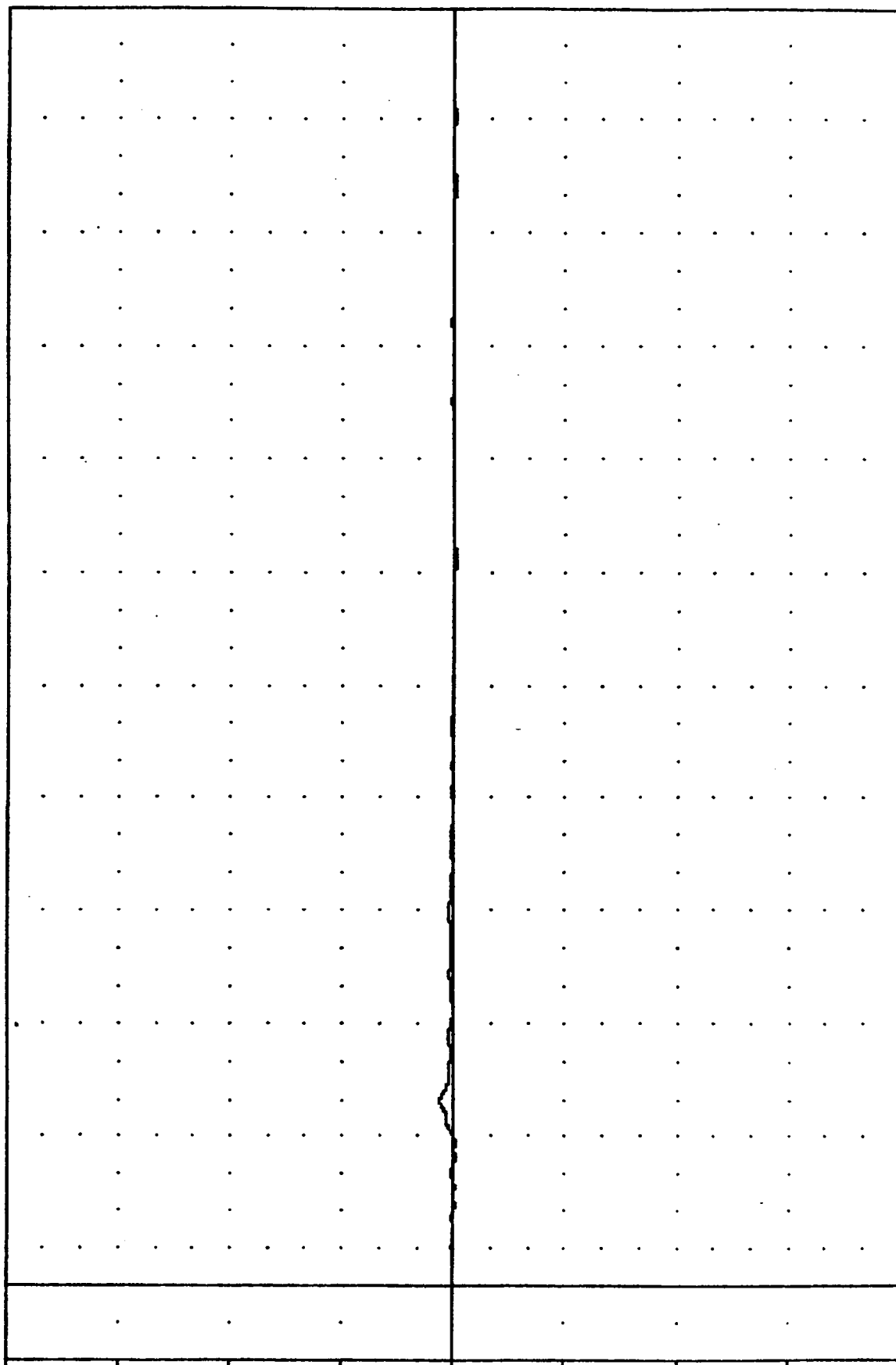
MIN. MAX VALUES = -40.21e 193.63, 383.87 e 49.38

120.00
 90.00
 60.00
 30.00
 0.00
 -30.00
 -60.00
 -90.00
 -120.00

(X10²)

B-73

850123



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

MAZDA INTO LOAD CELL BARRIER
 INAN CFI BARRIER POSITION AR IRS

HC 850123
NEW CAR ASSESSMENT PROGRAM
850230000000
BA9F

PLOT DATE 85N-85 10:30:54

FILTER = 8LPP 100/ 316/ -40

MIN. MAX VALUES = -110.98 33.63 90.30 29.75

120.00

90.00

60.00
(x10²)

30.00

0.00

-30.00
FORCE (LB)

-60.00

-90.00

-120.00

-

-20.00

10.00

40.00

70.00

100.00

130.00

160.00

190.00

220.00

250.00

280.00

310.00

340.00

TIME (NSEC)

MAZDA INTO LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A91RS

TRC
NEW CAR ASSESSMENT PROGRAM
85023000000
LCBGSF

850123

PLU1 DATE

JUN-60

11:36:59

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -179.28e 143.00, 20940.13 e 65.88

70.00

60.00

50.00
(X10³)

40.00

30.00

20.00

10.00

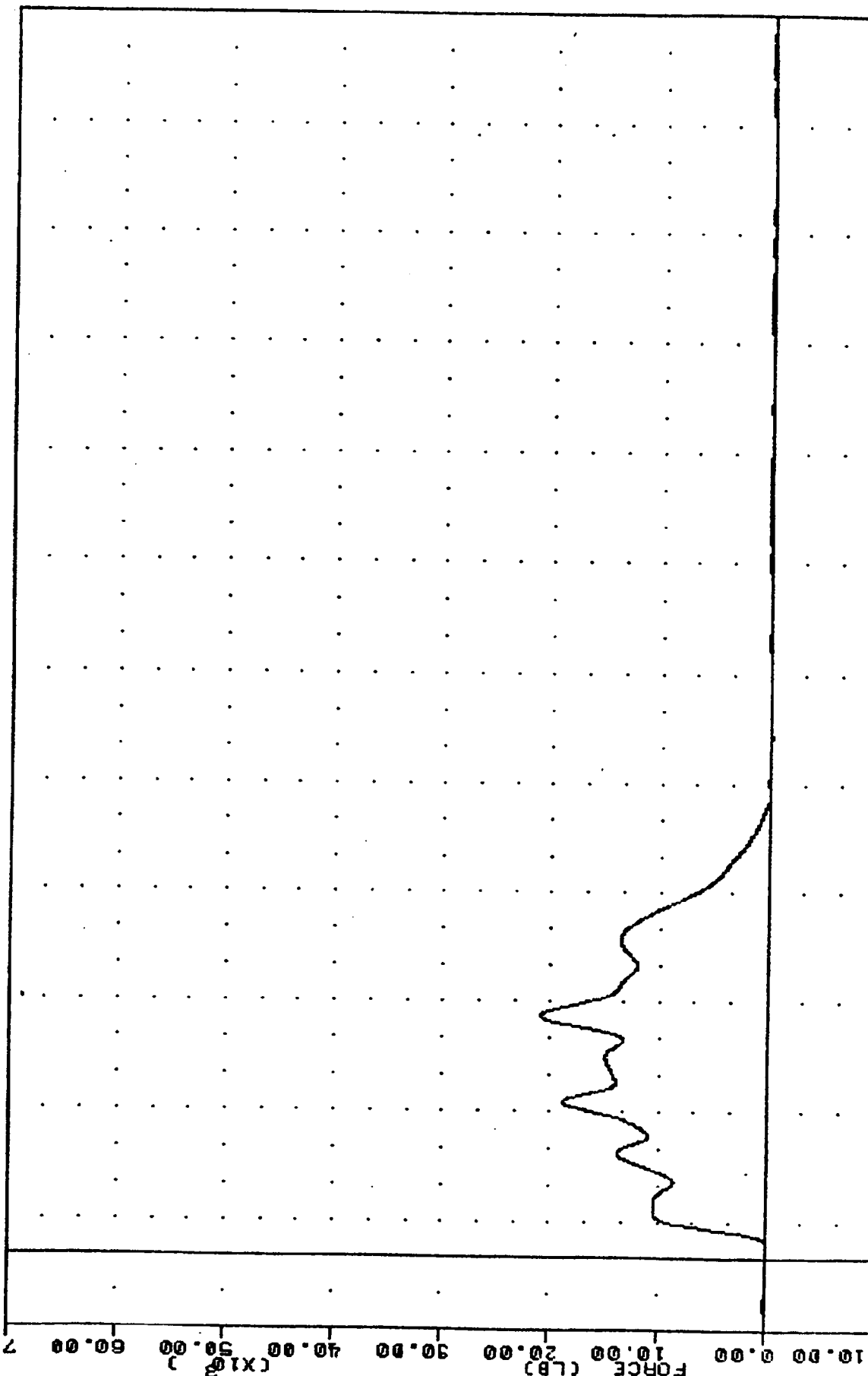
0.00

-10.00

-20.00

B-75

850123



TIME (msec)

MAZDA INTO LOAD CELL BARRIER

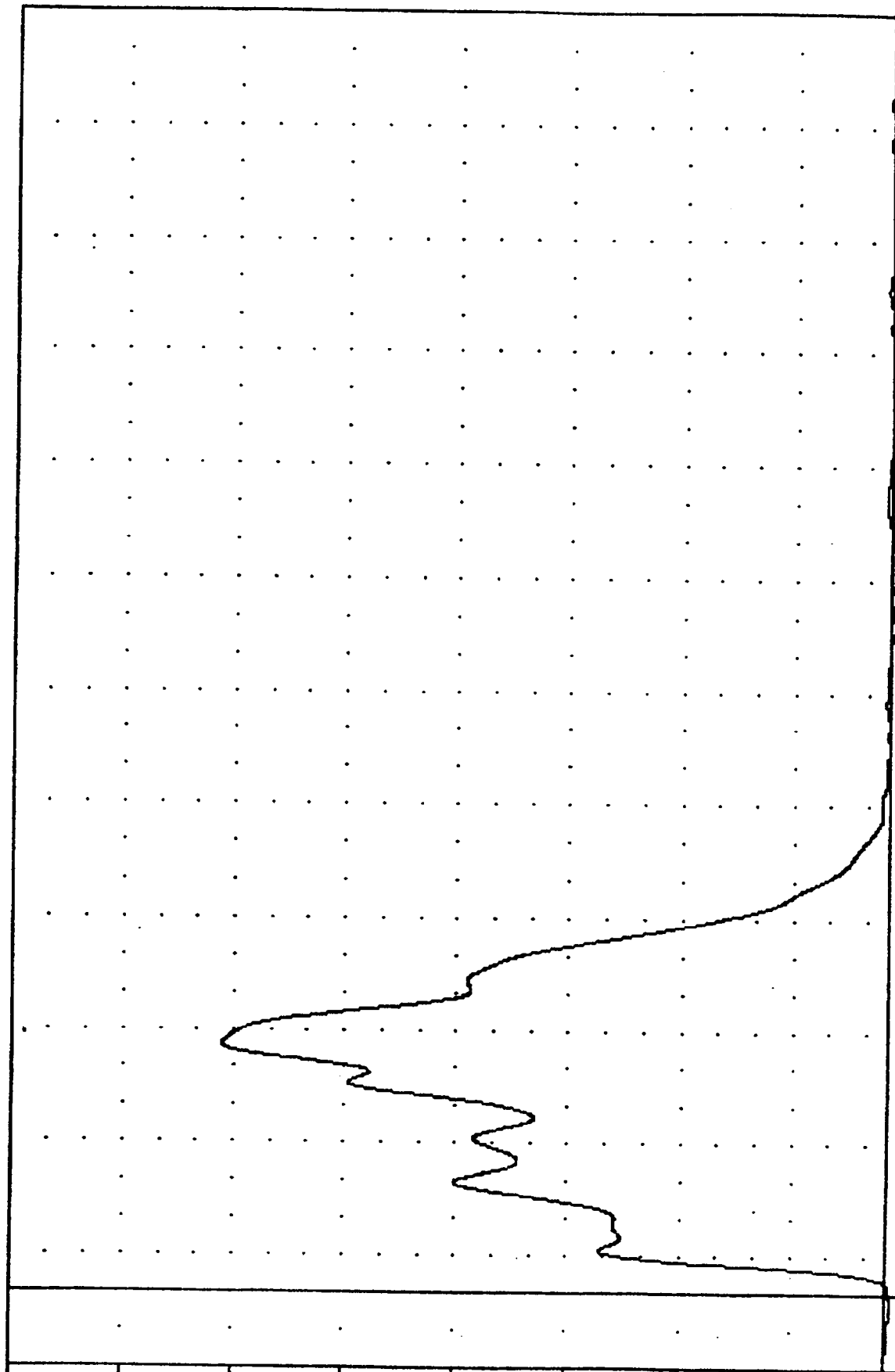
LOAD CELL BARRIER GROUP #6 FORCE TOTAL

TAC , 850123
NEW CAR ASSESSMENT PROGRAM
85023000000
LCBGT

PLOT DATE JAN-85 11:56:59

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -456.47 86480.48 e 65.88

114.00
99.50
95.00
90.50
86.00
81.50
77.00
72.50
68.00
63.50
59.00
54.50
50.00
45.50
41.00
36.50
32.00
27.50
23.00
18.50
14.00
9.50
5.00
0.50
-2.00
-7.50
-13.00
-18.50
-24.00
-29.50
-35.00
-40.50
-46.00
-51.50
-57.00
-62.50
-68.00
-73.50
-79.00
-84.50
-90.00
-95.50
-101.00
-106.50
-112.00
-117.50
-123.00
-128.50
-134.00
-139.50
-145.00
-150.50
-156.00
-161.50
-167.00
-172.50
-178.00
-183.50
-189.00
-194.50
-200.00



MAZDA INTO LOAD CELL BARRIER

20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

APPENDIX C
DUMMY CERTIFICATION

TRANSPORTATION RESEARCH CENTER OF OHIO

EXTERNAL DIMENSIONS

PART 572

TEMPERATURE 71.00 F
VRTC SRL98 ED82617

RELATIVE HUMIDITY 28.00 %
572 SN 826 EXT. DIMENSIONS 17

DESCRIPTION	SPECIFICATION	TEST RESULTS
SN ALDERSON RESEARCH LAB 826		
Sitting Height	35.6 - 35.8IN	35.7 INS
Shoulder Pivot Height	21.8 - 22.4IN	22.3 INS
Hip Pivot Height	3.9 IN (ref.)	3.9 INS
Hip Pivot From Backline	4.8 IN (ref.)	4.8 INS
Knee Pivot From Backline	20.1 - 20.7IN	20.4 INS
Rear of Head From Backline	1.7 IN (ref)	1.7 INS
Chest Depth	9.1 - 9.6IN	9.4 INS
Shoulder Width	17.8 - 18.4IN	17.9 INS
Chest Circumference Over Nipples	36.8 - 40.0IN	37.5 INS
Waist Circumference at Min. Girth	31.4 - 32.6IN	32.4 INS
Hip Width	14.0 - 15.4IN	15.2 INS
Knee Pivot From Floor	19.3 - 19.9IN	19.5 INS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN K. L. Watters

TEST SUPERVISOR A. E. L. L. L.

TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572

TEMPERATURE 71.00 F
VRTC SRL98 LFB2617

RELATIVE HUMIDITY 19.00 %
572 SN826 LUMBAR FLEX CAL17

DEFLECTION	SPECIFICATION	TEST RESULTS
0 Deg.	0 LBS	0.00 LBS
20 Deg	22.00 - 34.00 LBS	30.00 LBS
30 Deg	34.00 - 46.00 LBS	40.00 LBS
40 Deg	46.00 - 58.00 LBS	52.00 LBS
NET RETURN ANGLE	< 12 DEG	7.00 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN V.L. Watter
TEST SUPERVISOR R.E. L. Van

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMINAL COMPRESSION TEST

PART 572

TEMPERATURE 71.00 F
VRTC SRL9B AB82617

RELATIVE HUMIDITY 20.00 %
572 SN 826 ABDOM COMPR CAL 17

TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0 IN.	10 LBS	10 LBS
.50 IN.	23.00 - 36.00 LBS	34.51 LBS
.75 IN.	36.00 - 50.00 LBS	47.23 LBS
1.00 IN.	50.00 - 63.00 LBS	61.99 LBS
1.30 IN.	73.00 - 88.00 LBS	82.75 LBS

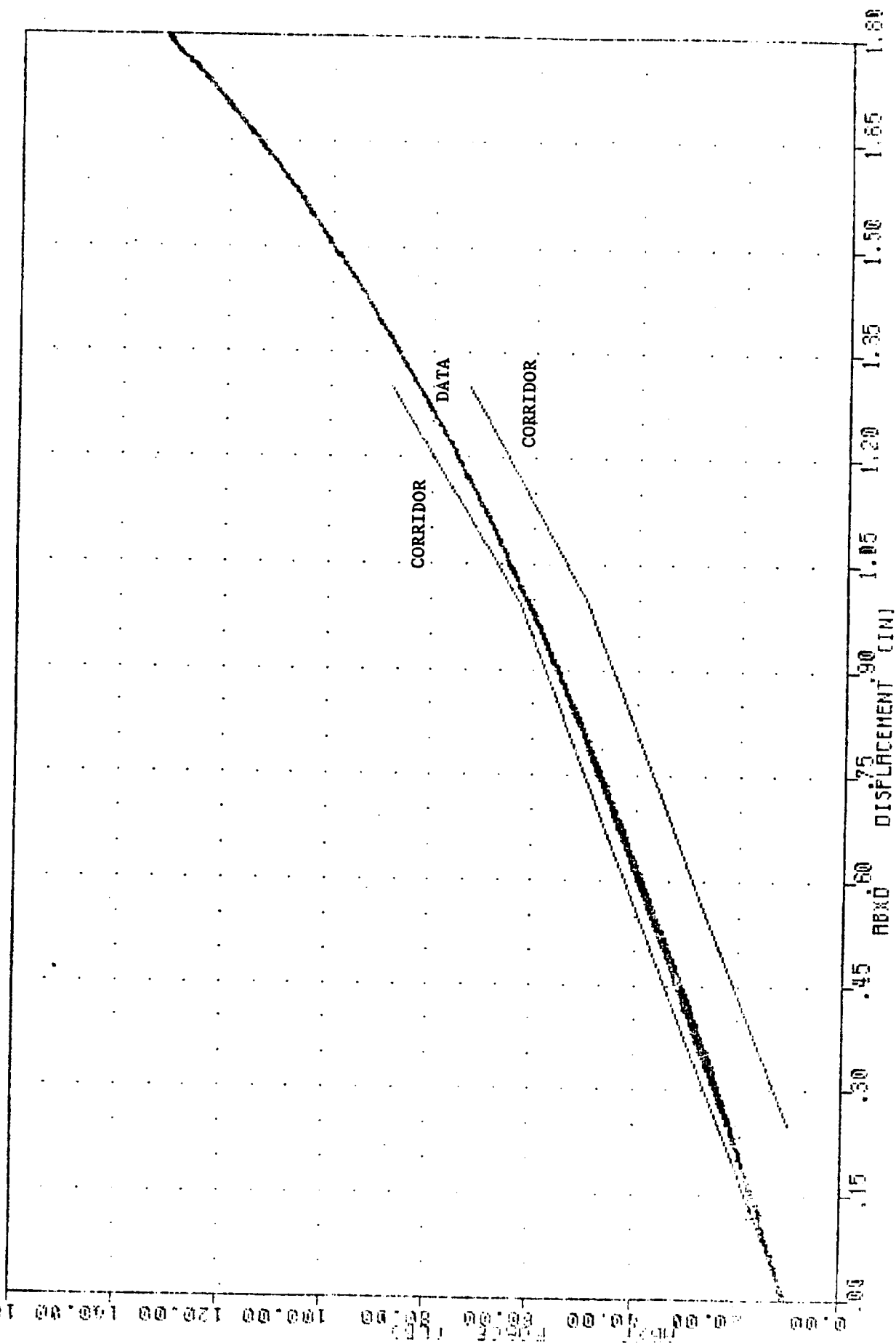
DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Harry L. Phelps*
TEST SUPERVISOR *V.L. Watters*

OR, AR22617
 LTLN - ALTF
 FILTER = ALPF

[illegible]

00



PROBONUM COMPRESSOR

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

PART 572

TEMPERATURE 71 F
VRTC SRL98 HD82617

RELATIVE HUMIDITY 20 %
572 SN 826 HEAD DROP CAL 17

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	222.63 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MS	1.29 MS
PEAK LATERAL ACCELERATION	10 G MAX	-5.09 G
IS ACCELERATION CURVE UNIMODAL?		YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN V.L. Watters

TEST SUPERVISOR R.E. Larkin

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572

TEMPERATURE 71.00 F
VRTC SRL98 HW82617

RELATIVE HUMIDITY 20.00 %
572 SN 826 HEAD/NECK CAL 17

Test Parameter	Specification	Test Results
Pendulum velocity	21.5 to 25.5 fps	23.53 fps
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 ms. max	1.83 ms.
T2 - T3: 20 - 20 G	25 - 30 ms.	28.42 ms.
T3 - T4: 20 - 5 G	10 ms. max	5.88 ms.
Avg. G level T2 - T3	20 - 24 G	22.50 G
Maximum Rotation Angle	63 - 73 deg.	72.24 deg.
Peak Head Resultant Accel	26 G max	24.03 G

Test Parameter	Specification	Test Results
Rotation Angle	Time Chordal Disp.	Time Chordal Disp.
(degrees)	(ms.) (in.)	(ms.) (in.)
0	-2.0 - +2.0 -0.5 - +0.5	0.13 0.00
30	25.6 - 34.4 2.1 - 3.1	29.64 2.54
60	40.3 - 51.7 4.3 - 5.3	44.08 4.65
max	53.2 - 66.8 5.0 - 6.0	61.88 5.76
60	67.0 - 83.0 4.3 - 5.3	77.93 4.83
30	85.4 - 104.6 2.1 - 3.1	95.67 2.35
0	101.0 - 123.0 -0.5 - +0.5	109.23 0.16

* DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Harry L. Phelps*

TEST SUPERVISOR *V. L. Witter*

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

TEMPERATURE 71 F
VRTC SRL98 TL82617B

RELATIVE HUMIDITY 57 %
572 SN 826 L.S.THORAX CAL 17B

TEST PARAMETER	LOW SPEED TEST	TEST RESULTS
	SPECIFICATION	
PENDULUM VELOCITY	13.86-14.14 FT/SEC	14.14 FT/SEC
PEAK DEFLECTION	1.1 INCHES MAX.	0.88 INCHES
PEAK RESISTIVE FORCE	1,450. POUNDS MAX.	1306. POUNDS
INTERNAL HYSTERESIS	50% - 70%	54.1%

DUMMY MEETS SPECIFICATIONS

TECHNICIAN K. L. Watters

TEST SUPERVISOR R. E. Livan

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

TEMPERATURE 70 F
VRTC SKL98 TH82617B

RELATIVE HUMIDITY 57 %
572 SN 826 H.S.THORAX CAL 17B

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
PENDULUM VELOCITY	21.78-22.22 FT/SEC	22.22 FT/SEC
PEAK DEFLECTION	1.7 INCHES MAX.	1.31 INCHES
PEAK RESISTIVE FORCE	2,250. POUNDS MAX.	2016. POUNDS
INTERNAL HYSTERESIS	50% - 70%	55.2%

DUMMY MEETS SPECIFICATIONS

TECHNICIAN V.L. Watter

TEST SUPERVISOR R.E. Levan

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

TEMPERATURE 72 F
RIGHT KNEE
VRTC SRL98 RK82617

RELATIVE HUMIDITY 54 %
572 SN 826 R.KNEE IMP CAL 17

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.96 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LBS.	1932.87 LBS.
DURATION ABOVE 1000 LBS.	≥ 1.7 MS.	1.84 MS.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Gary S. Phelps

TEST SUPERVISOR

V.L. Waters

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

TEMPERATURE 72 F
LEFT KNEE
VRTC SRL98 LK82617

RELATIVE HUMIDITY 54 %
572 SN 826 L.KNEE IMP CAL 17

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.96 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LBS.	1877.20 LBS.
DURATION ABOVE 1000 LBS.	≥ 1.7 MS.	1.88 MS.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Harry L. Phelps
TEST SUPERVISOR V. J. Watters

TRANSPORTATION RESEARCH CENTER OF HRID

EXTERNAL DIMENSIONS

PART 112

TEMPERATURE 70.00 F
NHTSA NCA ED41101

RELATIVE HUMIDITY 29.00 %
572 SN 411 EXT. DIMENSIONS 01

DESCRIPTION SN HUMANOID 411	SPECIFICATION	TEST RESULTS
Sitting Height	35.6 - 35.8IN	35.7 INS
Shoulder Pivot Height	21.8 - 22.4IN	22.3 INS
Hip Pivot Height	3.9 IN (ref.)	3.9 INS
Hip Pivot From Backline	4.8 IN (ref.)	4.8 INS
Knee Pivot From Backline	20.1 - 20.7IN	20.5 INS
Rear of Head From Backline	1.7 IN (ref.)	1.7 INS
Chest Depth	9.1 - 9.6IN	9.5 INS
Shoulder Width	17.8 - 18.4IN	17.9 INS
Chest Circumference Over Nipples	36.8 - 40.0IN	37.2 INS
Waist Circumference at Min Girth	31.4 - 32.6IN	32.6 INS
Hip Width	14.0 - 15.4IN	14.3 INS
Knee Pivot From Floor	19.3 - 19.9IN	19.5 INS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN J. M. Walters

TEST SUPERVISOR R. E. LeVan

TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572

TEMPERATURE 70.00 F
NHTSA NCA LF41101

RELATIVE HUMIDITY 36.00 %
572 SN 411 LUMBAR FLEX CAL01

DEFLECTION	SPECIFICATION	TEST RESULTS
0 Deg.	0 LBS	0.00 LBS
20 Deg	22.00 - 34.00 LBS	30.00 LBS
30 Deg	34.00 - 46.00 LBS	43.00 LBS
40 Deg	46.00 - 58.00 LBS	51.00 LBS
NET RETURN ANGLE	0 12 DEG	11.60 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN V. J. Watters

TEST SUPERVISOR R. E. LeVan

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMINAL COMPRESSION TEST

PART 572

TEMPERATURE 70.00 F
NHTSA NCA AB41101

RELATIVE HUMIDITY 29.00 %
572 SN 411 ABDOM COMPR CAL 01

TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0 IN.	10 LBS	10 LBS
.50 IN.	23.00 - 36.00 LBS	27.64 LBS
.75 IN.	36.00 - 50.00 LBS	40.04 LBS
1.00 IN.	50.00 - 63.00 LBS	56.83 LBS
1.30 IN.	73.00 - 88.00 LBS	83.53 LBS

DUMMY MEETS SPECIFICATIONS

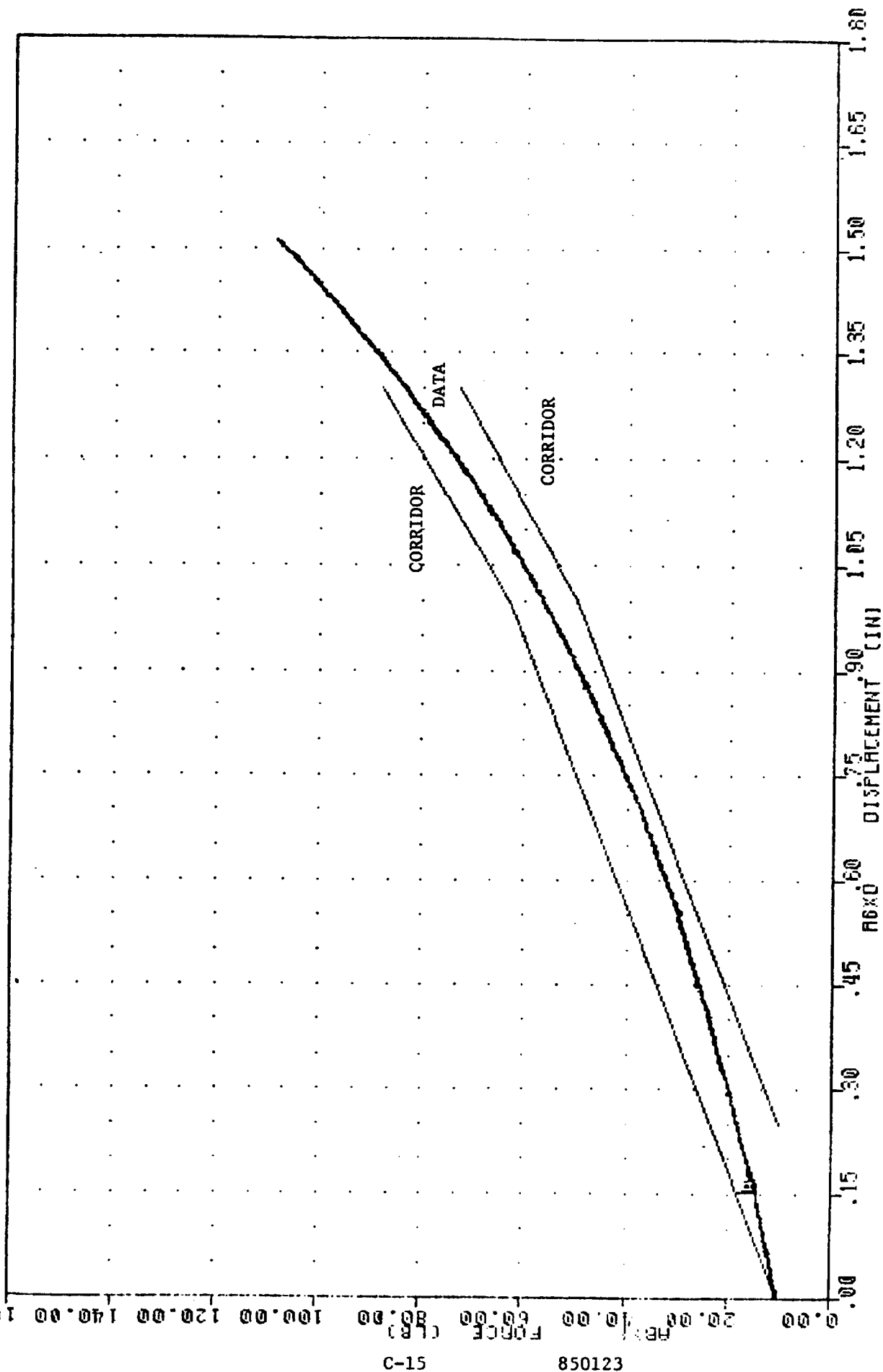
TECHNICIAN

Mary L. Phelps

TEST SUPERVISOR

V.L. Watters

1, HEAT 1001
FILTER = ALPF
FILTER = ALPF



ABDOMINAL COMPRESSION VS DISPLACEMENT

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

PART 072

TEMPERATURE 70 F
NHTSA NCA HD41101

RELATIVE HUMIDITY 24 %
072 SN 411 HEAD DROP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	254.75 G
TIME ABOVE 100 G LEVEL	0.9 - 1.9 MS	1.25 MS
PEAK LATERAL ACCELERATION	10 G MAX	5.00 G
IS ACCELERATION CURVE UNIMODAL?		YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN V. J. Watters

TEST SUPERVISOR R. E. LeVan

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572

TEMPERATURE 70.00 F
NHTSA NCA HN41101

RELATIVE HUMIDITY 25.00 %
572 SN 411 HEAD/NECK CAL 01

Test Parameter	Specification	Test Results
Pendulum velocity	21.5 to 25.5 fps	22.22 fps
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 ms. max	1.97 ms.
T2 - T3: 20 - 20 G	25 - 30 ms.	25.49 ms.
T3 - T4: 20 - 5 G	10 ms. max	9.91 ms.
Avg. G level T2 - T3	20 - 24 G	21.46 G
Maximum Rotation Angle	63 - 73 deg.	68.57 deg.
Peak Head Resultant Accel	26 G max	21.39 G

Test Parameter	Specification		Test Results	
Rotation Angle (degrees)	Time (ms.)	Chordal Disp. (in.)	Time (ms.)	Chordal Disp. (in.)
0	-2.0 - +2.0	-0.5 - +0.5	0.13	0.02
30	25.6 - 34.4	2.1 - 3.1	30.28	2.44
60	40.3 - 51.7	4.3 - 5.3	47.03	4.55
max	53.2 - 66.8	5.0 - 6.0	61.63	5.38
60	67.0 - 83.0	4.3 - 5.3	76.67	4.65
30	85.4 - 104.6	2.1 - 3.1	96.99	2.23
0	101.0 - 123.0	-0.5 - +0.5	110.86	0.16

4 DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Harry L. Phelps

DATE

10/11/77

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

TEMPERATURE 71 F
NHTSA NCA TL41101RELATIVE HUMIDITY 25 %
572 SN 411 L. S. THORAX CAL 01

TEST PARAMETER	LOW SPEED TEST	TEST RESULTS
	SPECIFICATION	
PENDULUM VELOCITY	13.35-14.14 FT/SEC	14.04 FT/SEC
PEAK DEFLECTION	1.1 INCHES MAX	0.93 INCHES
PEAK RESISTIVE FORCE	1,450 POUNDS MAX.	1293. POUNDS
INTERNAL HYSTERESIS	50% - 70%	55.9%

DUMMY MEETS SPECIFICATIONS

TECHNICIAN K. J. W. AllenTEST SUPERVISOR R. E. LeVan

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

TEMPERATURE 71 F
NHTSA NCA TH41101

RELATIVE HUMIDITY 27 %
572 SN 411 H. S. THORAX CAL 01

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
PENDULUM VELOCITY	21.78-22.22 FT/SEC	22.22 FT/SEC
PEAK DEFLECTION	1.7 INCHES MAX.	1.39 INCHES
PEAK RESISTIVE FORCE	2,250. POUNDS MAX	2036. POUNDS
INTERNAL HYSTERESIS	50% - 70%	58.8%

DUMMY MEETS SPECIFICATIONS

TECHNICIAN V.L. Walters

TEST SUPERVISOR R.E. LeVan

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

TEMPERATURE 71 F
LEFT KNEE
NHTSA NCA LK41101

RELATIVE HUMIDITY 38 %
572 SN 411 L.KNEE IMP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.96 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LBS.	1947.49 LBS.
DURATION ABOVE 1000 LBS.	≥ 1.7 MS.	1.75 MS.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Harry P. Phelps

TEST SUPERVISOR

V. L. Watters

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

TEMPERATURE 70 F
RIGHT KNEE
NHTSA NCA RK41101

RELATIVE HUMIDITY 38 %
572 SN 411 R.KNEE IMP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.96 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LBS.	1852.93 LBS.
DURATION ABOVE 1000 LBS.	>=1.7 MS.	1.81 MS.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Harry L. Phelps

TEST SUPERVISOR

V.L. Watters

POST-TEST CALIBRATION

TRANSPORTATION RESEARCH CENTER OF OHIO

EXTERNAL DIMENSIONS

PART 572

TEMPERATURE 71.00 F
NHTSA NCA ED41102RELATIVE HUMIDITY 39.00 %
572 SN411 EXT. DIMENSIONS 02

DESCRIPTION	SPECIFICATION	TEST RESULTS
SN HUMANOID 411		
Sitting Height	35.6 - 35.8IN	35.7 INS
Shoulder Pivot Height	21.8 - 22.4IN	22.4 INS
Hip Pivot Height	3.9 IN (ref.)	3.9 INS
Hip Pivot From Backline	4.8 IN (ref.)	4.8 INS
Knee Pivot From Backline	20.1 - 20.7IN	20.4 INS
Rear of Head From Backline	1.7 IN (ref)	1.7 INS
Chest Depth	9.1 - 9.6IN	9.3 INS
Shoulder Width	17.8 - 18.4IN	17.9 INS
Chest Circumference Over Nipples	36.8 - 40.0IN	37.7 INS
Waist Circumference at Min. Girth	31.4 - 32.6IN	31.7 INS
Hip Width	14.0 - 15.4IN	14.9 INS
Knee Pivot From Floor	19.3 - 19.9IN	19.6 INS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Larry L. Phelps

TEST SUPERVISOR

V.L. Withers

TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572

TEMPERATURE 72.00 F
NHTSA NCA LF41102

RELATIVE HUMIDITY 39.00 %
572 SN 411 LUMBAR FLEX CAL02

DEFLECTION	SPECIFICATION	TEST RESULTS
0 Deg.	0 LBS	0.00 LBS
20 Deg	22.00 - 34.00 LBS	32.00 LBS
30 Deg	34.00 - 46.00 LBS	40.00 LBS
40 Deg	46.00 - 58.00 LBS	51.00 LBS
NET RETURN ANGLE	< 12 DEG	8.70 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Nancy L. Phelps

TEST SUPERVISOR V.L. Watters

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMINAL COMPRESSION TEST

PART 572

TEMPERATURE 71.00 F
NHTSA NCA AB41102

RELATIVE HUMIDITY 39.00 %
572 SN411 ABDOM COMPR CAL 02

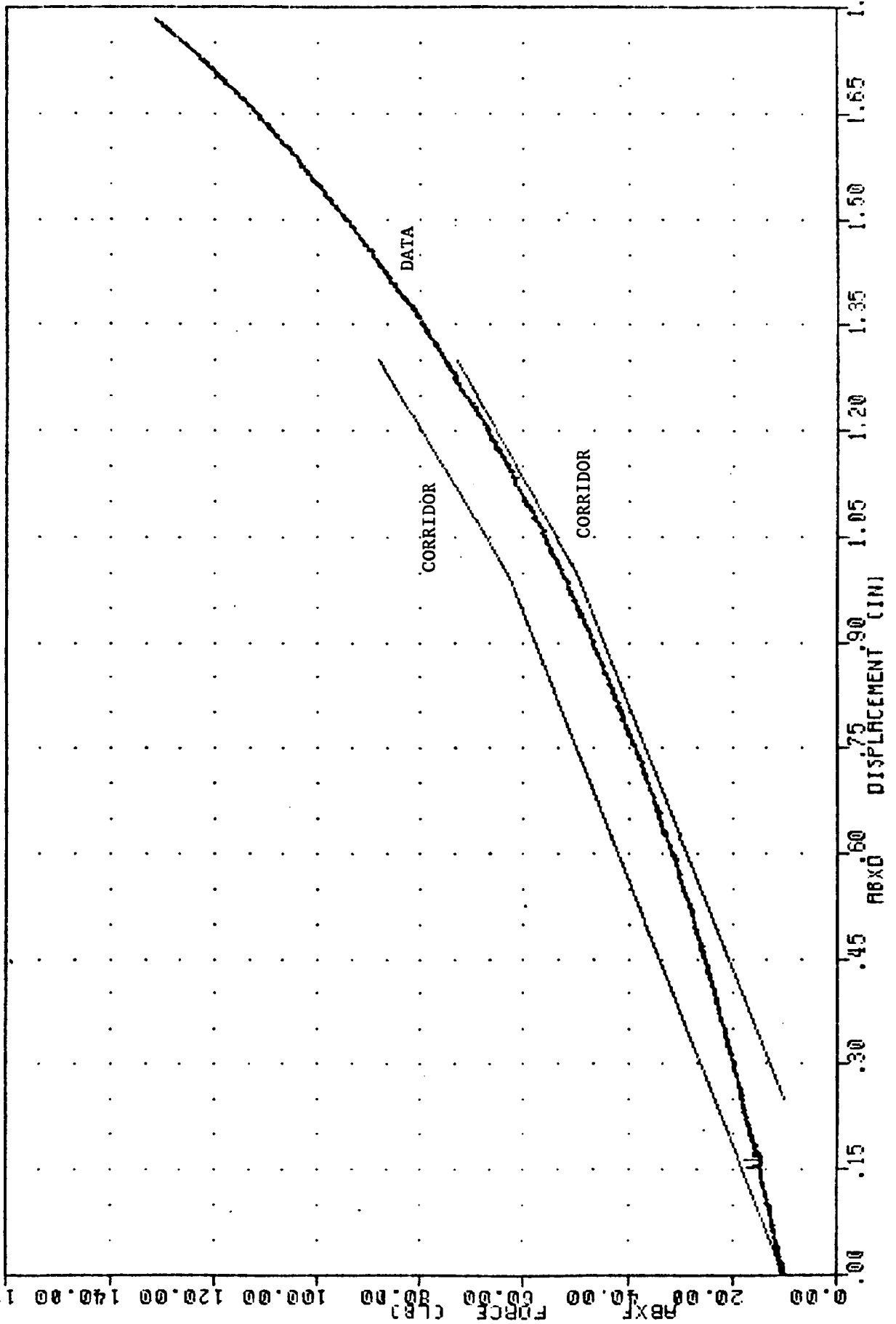
TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0 IN.	10 LBS	10 LBS
.50 IN.	23.00 - 36.00 LBS	27.24 LBS
.75 IN.	36.00 - 50.00 LBS	38.52 LBS
1.00 IN.	50.00 - 63.00 LBS	53.02 LBS
1.30 IN.	73.00 - 88.00 LBS	75.14 LBS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Mary L. Phelps*
TEST SUPERVISOR *J. W. Watter*

NCA : AB41102
 FILTER = ALPF
 FILTER = ALPF
 572 SN411 AB00M COMPR 85035
 1650/ 5214/ -40 MIN. 0.00
 1650/ 5214/ -40 MIN. MAX = 9.81
 PLOT DATE 21-FEB-85 13:23:25
 0.00 ; 1.78
 0.00 ; 131.39
 0.00 ; 1.78

ABXF
 0.00
 20.00
 40.00
 60.00
 80.00
 100.00
 120.00
 140.00
 160.00



TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

PART 572

TEMPERATURE 71 F
NHTSA NCA HD41102

RELATIVE HUMIDITY 39 %
572 SN 411 HEAD DROP CAL 0.2

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	241.91 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MS	1.25 MS
PEAK LATERAL ACCELERATION	10 G MAX	5.80 G
IS ACCELERATION CURVE UNIMODAL?		YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Harry J. Phelps

TEST SUPERVISOR

R. L. Witter

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572

TEMPERATURE 72.00 F
NHTSA NCA HN41102

RELATIVE HUMIDITY 40.00 %
572 SN 411 HEAD/NECK CAL 02

Test Parameter	Specification	Test Results
Pendulum velocity	21.5 to 25.5 fps	22.41 fps
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 ms. max	1.59 ms.
T2 - T3: 20 - 20 G	25 - 30 ms.	26.83 ms.
T3 - T4: 20 - 5 G	10 ms. max	6.38 ms.
Avg. G level T2 - T3	20 - 24 G	23.24 G
Maximum Rotation Angle	63 - 73 deg.	68.30 deg.
Peak Head Resultant Accel	26 G max	25.34 G

Test Parameter	Specification	Test Results
Rotation Angle	Time	Chordal Disp.
(degrees)	(ms.)	(in.)
0	-2.0 - +2.0	-0.5 - +0.5
30	25.6 - 34.4	2.1 - 3.1
60	40.3 - 51.7	4.3 - 5.3
max	53.2 - 66.8	5.0 - 6.0
60	67.0 - 83.0	4.3 - 5.3
30	85.4 - 104.6	2.1 - 3.1
0	101.0 - 123.0	-0.5 - +0.5

* DUMMY MEETS SPECIFICATIONS

TECHNICIAN

TEST SUPERVISOR

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART-572

TEMPERATURE 72 F
NHTSA NCA TL41102

RELATIVE HUMIDITY 40 %
572 SN 411 L.S.THORAX CAL 02

TEST PARAMETER	LOW SPEED TEST	
	SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	13.86-14.14 FT/SEC	14.04 FT/SEC
PEAK DEFLECTION	1.1 INCHES MAX.	0.91 INCHES
PEAK RESISTIVE FORCE	1,450. POUNDS MAX.	1350. POUNDS
INTERNAL HYSTERESIS	50% - 70%	63.6%

DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Mary L. Bulpo*

TEST SUPERVISOR *K. L. Withers*

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

TEMPERATURE 72 F
NHTSA NCA TH41102

RELATIVE HUMIDITY 40 %
572 SN 411 H.S.THORAX CAL 02

TEST PARAMETER	HIGH SPEED TEST	
	SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	21.78-22.22 FT/SEC	21.78 FT/SEC
PEAK DEFLECTION	1.7 INCHES MAX.	1.41 INCHES
PEAK RESISTIVE FORCE	2,250. POUNDS MAX.	1996. POUNDS
INTERNAL HYSTERESIS	50% - 70%	59.9%

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Mary L. Phelps

TEST SUPERVISOR V. J. W. Hays

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

TEMPERATURE 72 F

RELATIVE HUMIDITY 41 %

RIGHT KNEE

NHTSA NCA RK41102

572 SN 411 R.KNEE IMP CAL 02

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.96 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LBS.	1910.24 LBS.
DURATION ABOVE 1000 LBS.	1.7 MS.	1.74 MS.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Larry L. Phelps

TEST SUPERVISOR

V. A. Watter

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

TEMPERATURE 71 F
LEFT KNEE
NHTSA.NCA LR41102

RELATIVE HUMIDITY 41 %
572 SN 411 L.KNEE IMP CAL 02

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.90 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LBS.	2115.61 LBS.
DURATION ABOVE 1000 LBS.	≥ 1.7 MS.	1.77 MS.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Harry L. Phelps

TEST SUPERVISOR

K.F. Wooten

APPENDIX D
RESTRAINT INSTRUCTION FROM OWNER'S MANUAL

SEAT BELT RESTRAINT SYSTEM

To help decrease the possibility or severity of injury in accidents or sudden stops, we recommend that you and your passengers in the vehicle be properly restrained at all times, using the seat belts provided. The seat lap-shoulder belts have retractors with inertia locks.

The retractors keep the belts out of the way while passengers enter or exit the vehicle. Inertia locks allow the belts to remain slack on the passengers for comfort until a deceleration force occurs (such as a sudden stop or collision). At that time the belts will automatically lock in position, and the passengers will not be thrown forward. Before fastening the seat belts, the driver should always adjust the seat to the most comfortable driving position.

CAUTION

Replace seat and shoulder belt assemblies that have undergone stress by occupants in a collision.

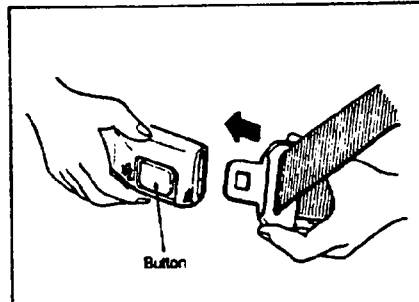
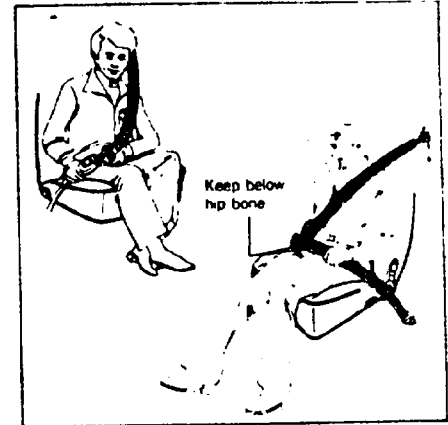
To Fasten Seat Belt:

1. Grasp the buckle end and tongue plate.
2. Slowly pull out the lap-shoulder belt.
3. Insert the tongue plate into the open end of the buckle. An audible click will indicate the belt is securely locked.

CAUTION

Do not wear the shoulder belt under the arm, across the neck or over the inside shoulder. Any of these practices can reduce effectiveness of the restraint system.

Position the lap belt across your lap as LOW ON THE HIPS as possible to reduce the risk of sliding under it during an accident. Adjust it to a **SNUG FIT** by pulling the belt through the tongue plate. The belt retractor is designed to take up excess webbing automatically and maintain tension on the belt.



To Unfasten Seat Belts:

Depress the button on the buckle.

NOTE

If the belt does not fully retract, pull it out and check for kinks or twists. Then make sure that it remains untwisted as it retracts.

2-6

Restraint of Infants or Small Children

Any number of companies manufacture safety seats for infants and small children. An acceptable child restraint system should always satisfy local motor vehicle safety standards.

Moreover, it should be chosen to fit both the size of the child and of the vehicle seat.

Be sure to follow any instructions provided by the manufacturer when installing the child restraint system.

CAUTION

- Do not select a child restraint system which requires an anchor, because your vehicle is not so equipped.
- Since a safety belt or child restraint can become very hot if it is left in a closed vehicle, be sure and check the seat cover and buckles before placing a child there.
- When the child restraint system is not in use, store it in the trunk or fasten it with a safety belt so that it will not be thrown forward in the case of a sudden stop or accident.

Installation on Front Seat:

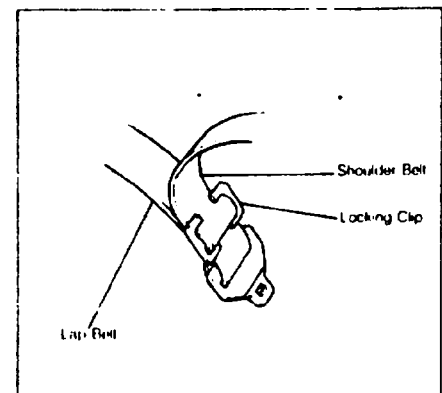
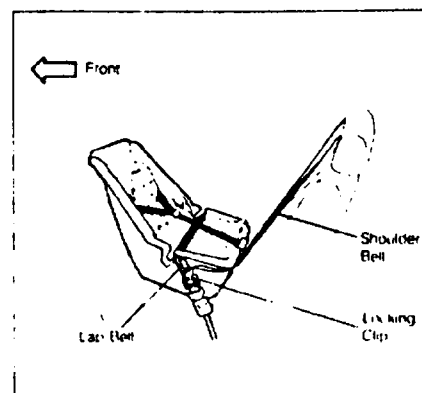
To install a child restraint system in the front of your vehicle a seat belt locking clip is required.

Secure the child restraint with the lap belt, as shown in the example illustration.

To prevent looseness of the lap belt, use a genuine Mazda locking clip (part number FA55 57 999, available from your Mazda dealer) or one of equivalent dimensions and strength. To install the locking clip, insert the lap and shoulder webbing through the recesses of the locking clip near the top of the lap and shoulder belt, as shown in the example illustration. (Follow the instructions attached to the locking clip for its use.) After

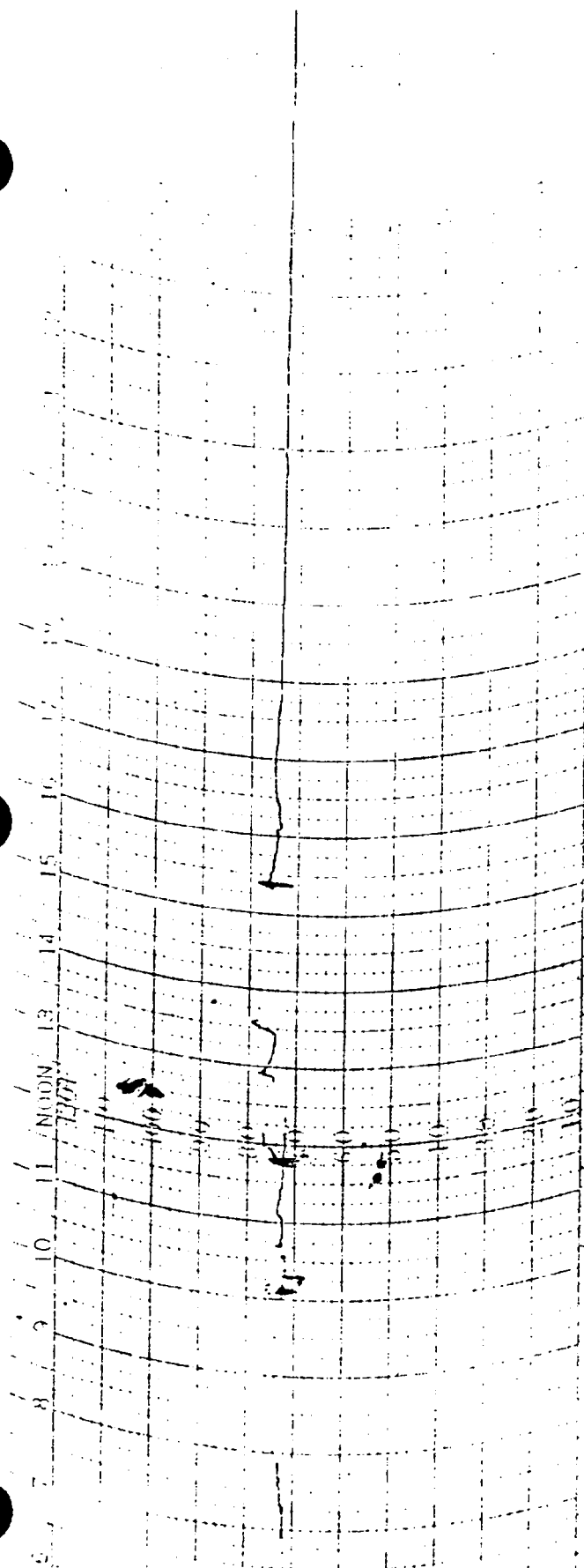
securing the belt by use of the locking clip, tuck the shoulder portion of the belt between the child restraint and the seatback.

When your child restraint system is not installed, the locking clip should be stored in the glove box to prevent it from being lost.



D-2

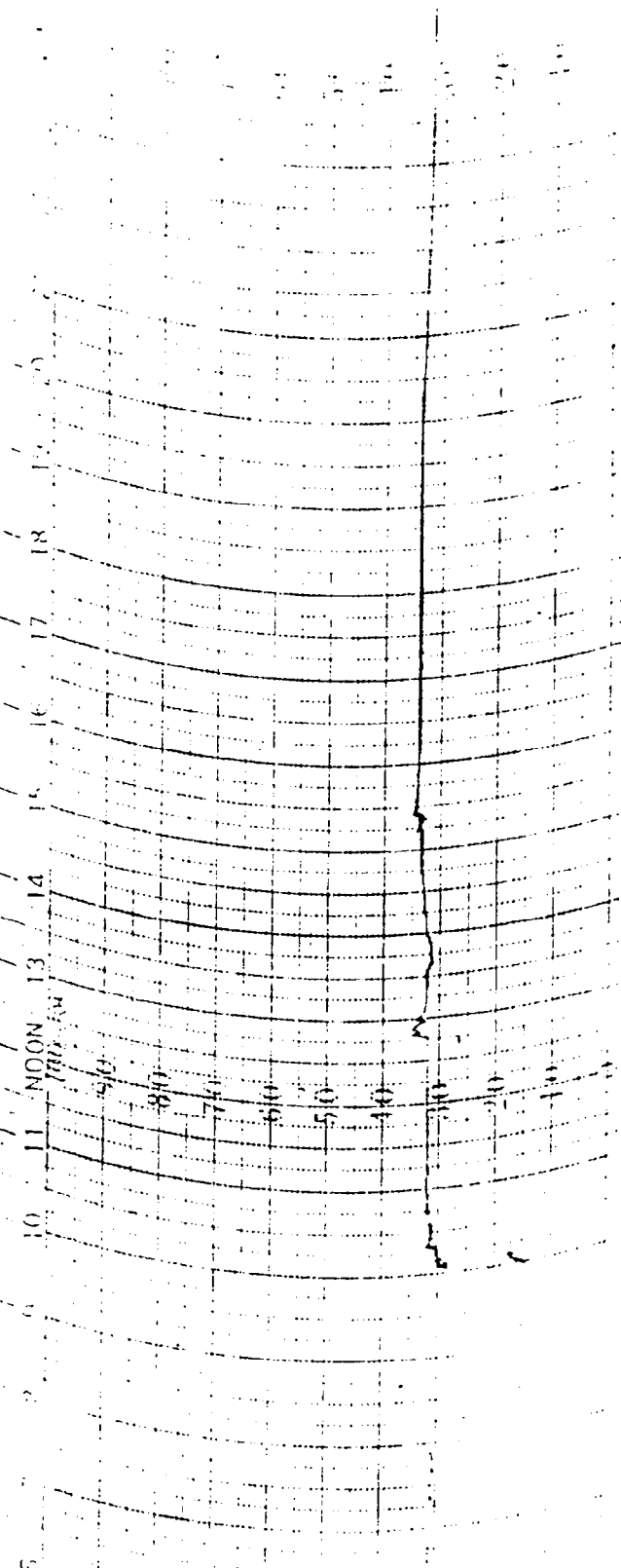
850123



CRASH BARRING
BUILDING

1-22-85
3:00 PM

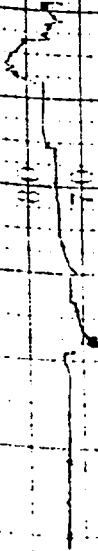
D-3



1-23-85
8:00 AM

850123

23 JAN 1985



1-23-85

1-23-85