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of Transportation
**National Highway
Traffic Safety
Administration**



DOT HS 807 441
Final Report

March 1989

Final Report of 270° Contoured Moving Barrier Impact into a 1983 Honda Prelude 2-Door Coupe in Support of Crash III Damage Algorithm Reformation

The United States Government does not endorse products or manufacturers. Trade or manufacturers' names appear only because they are considered essential to the object of this report.

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15. Supplementary Notes																														
16. Abstract Four 270° contoured moving barrier impact tests were conducted for research and development in support of the crash III damage algorithm reformulation. These tests were conducted on a 1983 Honda Prelude 2-door coupe, VIN AB5226DC011100, at the Transportation Research Center of Ohio. The following four tests were conducted on one vehicle:																														
<table border="1"> <thead> <tr> <th>TEST NO.</th> <th>DATE</th> <th>TIME</th> <th>SPEED (mph)</th> <th>AVERAGE CUMULATIVE CRUSH</th> </tr> </thead> <tbody> <tr> <td>890209-1</td> <td>2/9/89</td> <td>1054</td> <td>18.1</td> <td>6.0</td> </tr> <tr> <td>890209-2</td> <td>2/9/89</td> <td>1322</td> <td>27.0</td> <td>9.7</td> </tr> <tr> <td>890209-3</td> <td>2/9/89</td> <td>1445</td> <td>27.1</td> <td>14.1</td> </tr> <tr> <td>890209-4</td> <td>2/9/89</td> <td>1525</td> <td>35.9</td> <td>18.5</td> </tr> </tbody> </table>						TEST NO.	DATE	TIME	SPEED (mph)	AVERAGE CUMULATIVE CRUSH	890209-1	2/9/89	1054	18.1	6.0	890209-2	2/9/89	1322	27.0	9.7	890209-3	2/9/89	1445	27.1	14.1	890209-4	2/9/89	1525	35.9	18.5
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17. Key Words 270° Contoured Moving Barrier Impact Crash III Damage Algorithm Reformulation.			18. Distribution Statement Document is available to the public from the National Technical Information Service, Springfield, VA 22161																											
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SECTION 1.0
PURPOSE AND TEST SUMMARY

The purpose of the four 270° contoured moving barrier impact tests was for research and development in support of the CRASH III damage algorithm reformulation.

The 1983 Honda Prelude was equipped with a 1.8 liter, 4-cylinder, transverse, gas engine with a 5-speed manual transmission. The intended total test weight of the vehicle was 2096 pounds. The actual weight was 2096 pounds.

The contoured moving barrier actual weight was 2616 pounds, frontal width was 62.5 inches, hood height was 30.0 inches, bumper width was 6.0 inches and centerline bumper height to ground was 17.0 inches. The contoured moving barrier was intended to impact the driver's side of the vehicle at 270°. The leading edge of the contact was to be 27.7 inches forward of the vehicle's center of gravity.

The crash event was recorded by three (3) high-speed cameras.

DEFINITION OF MEASUREMENTS

C1, C2, C3, C4, C5, C6 = crush at 6 points for major (bumper height) penetration.

S1, S2, S3, S4, S5, S6 = crush at 6 points for stiffer member (sill height) penetration.

F = free space distance, measured on the undeformed side of the car, between the surface at major penetration (bumper height) and minor penetration (sill height) locations.

X1, X2 = distances between points C1 and C6, respectively and the vertical plane passing through points at the extreme ends of the car which lay in the plane of the car side before deformation.

B1 = the offset of the trunk centerline from the original body center line.

B2 = the offset of the hood centerline from the original body center line.

If a door hinge or latch or pillar did not fail then:

Average crush = Bumper height crush + $\frac{X1 + X2}{2}$

2

If a door hinge or latch or pillar did fail then:

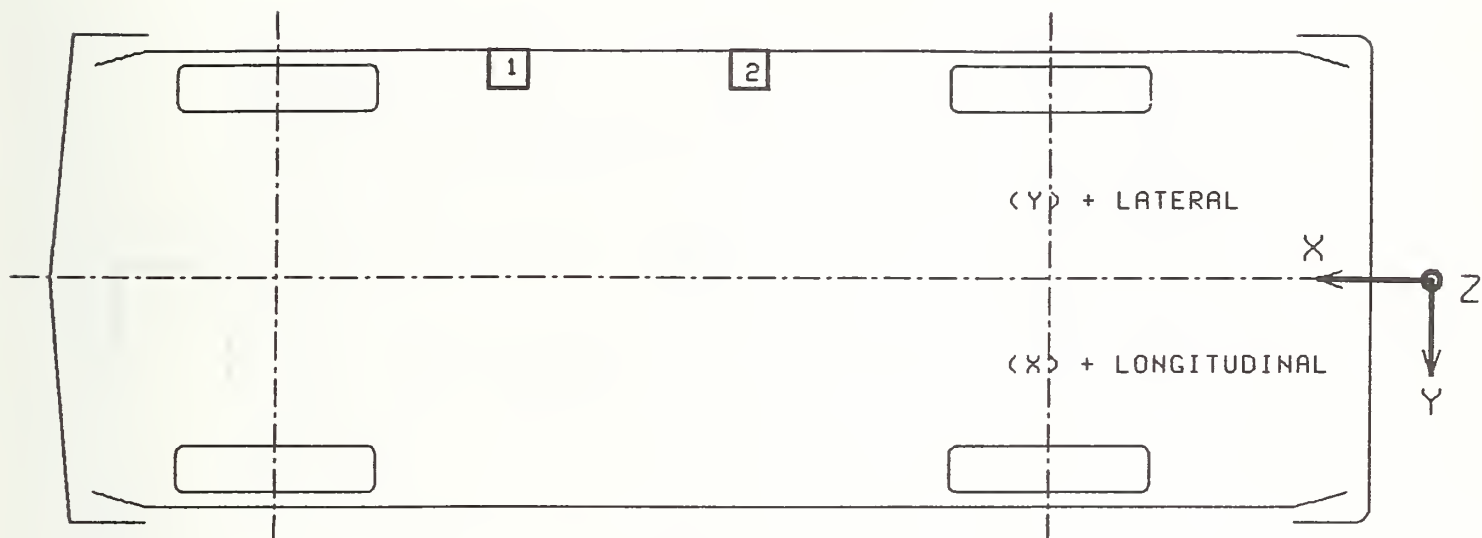
Average crush = $\frac{\text{Bumper height crush} + \text{sill height crush as corrected}}{2} + \frac{X1 + X2}{2}$

2

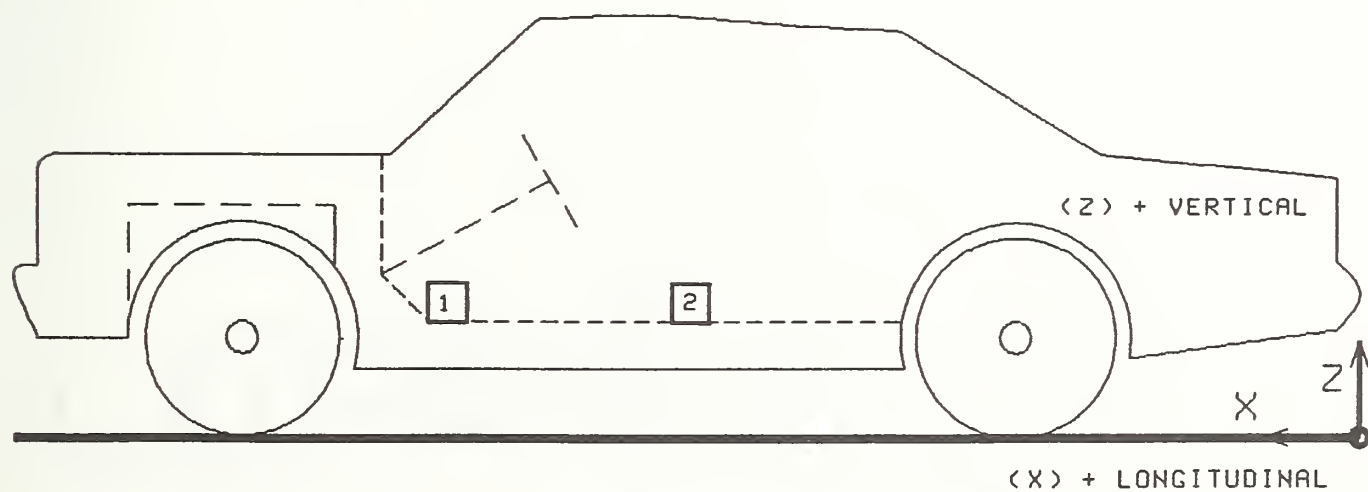
2

Sill height crush as corrected = sill height crush as measured - free space.

VEHICLE ACCELEROMETER PLACEMENT

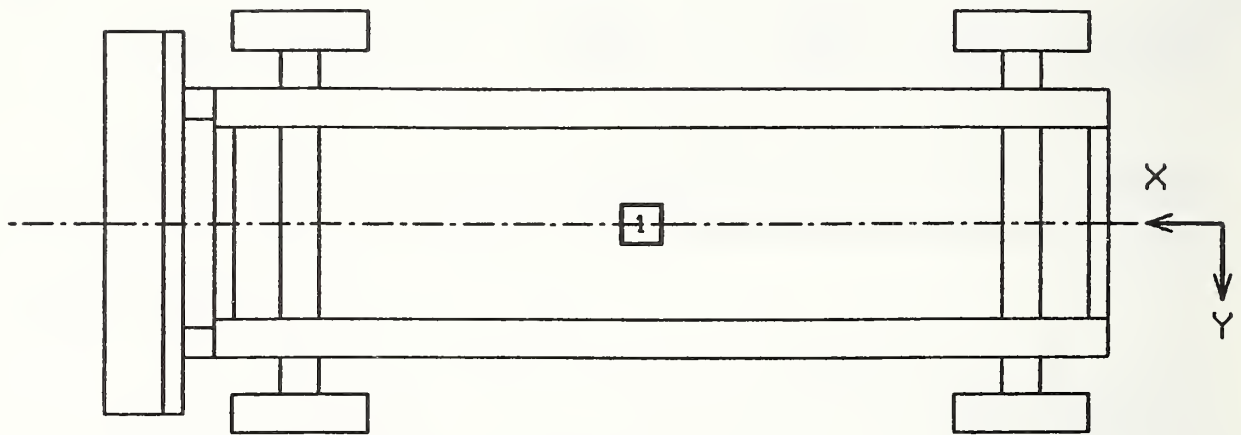


TOP VIEW

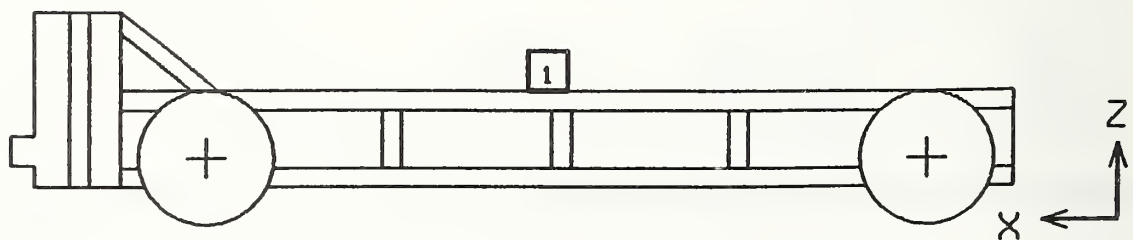


SIDE VIEW

MOVING BARRIER
ACCELEROMETER PLACEMENT



TOP VIEW



SIDE VIEW

SECTION 2.0
VEHICLE INFORMATION

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Honda Motor Company, LTD. VIN: AB5226DC011100

MAKE/MODEL: Honda/Prelude

MODEL YEAR: 1983

BODY STYLE: 2-door coupe

COLOR: gray

ENGINE DATA: TYPE: transverse CYLINDERS: 4 DISPLACEMENT: 1.8 liter

 X GAS, DIESEL, TURBOCHARGE

TRANSMISSION DATA: 5 SPEED, X MANUAL, AUTOMATIC, X FWD, RWD, 4WD

DATE VEHICLE RECEIVED: 2/6/89

ODOMETER READING: 2180

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING	Yes	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	No	ANTI-SKID BRAKE	No
CLOCK	No	REAR WINDOW DEFROSTER	Yes
OTHER	None		

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

VEHICLE MANUFACTURED BY: Honda Motor Co. LTD.

DATE OF MANUFACTURE: 4/83

GVWR: 3230 LBS.

GAWR: FRONT 1710 LBS.; REAR 1550 LBS.

TEST VEHICLE INFORMATION, CONT'D

WHEELBASE: 96.9

MAXIMUM WIDTH: 66.8

WEIGHT OF TEST VEHICLE WITH REQUIRED OCCUPANTS AND LUGGAGE:

RIGHT FRONT	648 LBS.	RIGHT REAR	395 LBS.
LEFT FRONT	635 LBS.	LEFT REAR	418 LBS.
TOTAL FRONT WEIGHT	1283 LBS.	(61.2% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	813 LBS.	(38.8% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2096 LBS.		

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

VEHICLE TIRE DATA:

TIRES ON VEHICLE (MFR. & LINE, SIZE): Bridgestone P185/70R13

RECOMMENDED COLD TIRE PRESSURE: FRONT: 35 psi; REAR: 35 psi

SIDEWALL PLY RATING: 1 ply

BIAS PLY, BELTED OR RADIAL? Radial

IS SPARE TIRE "SPACE SAVER"? Yes

IS SPARE TIRE STANDARD EQUIPMENT? Yes

VEHICLE ATTITUDES:

DELIVERED:	LF: 25.9;	RF: 25.9;	LR: 25.3;	RR: 25.3
PRE-TEST:	LF: 26.1;	RF: 26.3;	LR: 25.3;	RR: 25.6
POST-TEST:	LF: 25.4;	RF: 26.2;	LR: 25.0;	RR: 25.4

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

TEST ANOMALIES

Noise in the form of spikes was observed in the plots for the contact switches OTH1, OTH2, OTH3, OTH4. * The switches were used to record the time of vehicle contact with the moving barrier, as well as the time of vehicle separation from the barrier. The switches were damaged by the crush of the moving contoured barrier against the vehicle. The switches were replaced following each test which contained spikes. This is not the standard use of such switches.

*CONTACT SWITCH MNEMONICS:

OTH1 Vehicle contact switch - Left
OTH2 Vehicle contact switch - Center #1
OTH3 Vehicle contact switch - Center #2
OTH4 Vehicle contact switch - Right

Test #890209-2

Right front sill X-axis accelerometer, RFSXG, data contains possible noise.
Right front sill X-axis velocity, RFSXV, due to above.
Right front sill X-axis displacement, RFSXD, due to above.
Right front sill Y-axis accelerometer, RFSYG, data contains possible noise.
Right front sill Y-axis velocity, RFSYV, due to above.
Right front sill Y-axis displacement, RFSYD, due to above.
Right rear sill Y-axis accelerometer, RRSYG, data contains possible noise.
Right rear sill Y-axis velocity, RRSYV, due to above.
Right rear sill Y-axis displacement, RRSYD, due to above.

Test #890209-4

Right front sill X-axis accelerometer, RFSXG, data contains possible noise.
Right front sill X-axis velocity, RFSXV, due to above.
Right front sill X-axis displacement, RFSXD, due to above.

SECTION 3.0

TEST #890209-1 SUMMARY

TEST CONDITIONS:

TEST NUMBER: 890209-1

DATE OF TEST: 2/9/89

TIME OF TEST: 1054

AMBIENT TEMPERATURE AT IMPACT AREA: 31° F

SUBJECT VEHICLE DATA:

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE WEIGHT (lbs.)	2096	2096
VEHICLE ORIENTATION (deg.)	270	270
MOVING BARRIER VELOCITY (mph.)	18.1	18.0
BARRIER WEIGHT (lbs.)	2616	2616
MAXIMUM CUMULATIVE CRUSH BUMPER HEIGHT (in.)	8.4	
AVERAGE CUMULATIVE CRUSH (in.) = $\frac{\{C1+C6+C2+C3+C4+C5\}}{5}$	6.0	

TEST NUMBER 890209-1

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX	G MSEC	MAX	G MSEC
1	SILL RIGHT FRONT	65.3	-25.4	9.5				
	LONGITUDINAL				4.6	42.4	4.3	17.4
	LATERAL				2.2	135.0	13.7	19.8
2	SILL RIGHT REAR	53.3	-25.6	11.8				
	LATERAL				2.8	125.0	13.9	27.4

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: FORWARD FROM REAR AXLE
Y: LEFTWARD FROM VEHICLE CENTERLINE
Z: UPWARD FROM GROUND LEVEL

TEST NUMBER 890209-1

BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX	G MSEC	MAX	G MSEC
1	BARRIER CG	75.0	0.0	10.5				
	LONGITUDINAL				0.4	334.5	11.2	31.4
	LATERAL				1.0	154.5	1.6	59.8

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + LEFTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

TEST #890209-1

CONTACT SWITCH LOCATIONS AND DATA SUMMARY

LOCATION	SEPARATION TIME (MSEC)
VEHICLE CONTACT SWITCH - LEFT	87.2
VEHICLE CONTACT SWITCH - CENTER #1	90.4
VEHICLE CONTACT SWITCH - CENTER #2	79.5
VEHICLE CONTACT SWITCH - RIGHT	69.4

TEST #890209-1

National Accident Sampling System - Continuous Sampling Subsystem: Vehicle Data

FIELD MEASUREMENTS

Complete When Applicable

End Damage	Side Damage
Undeformed end width _____	Bowing: B1 <u>0</u> X1 <u>0</u>
Corner shift: A1 _____	B2 <u>0</u> X2 <u>0</u>
A2 _____	Bowing constant _____
End shift at frame (CDC) (check one)	$\frac{X1 + X2}{2} = \frac{0}{2}$
<4 inches <u>X</u>	
>4 inches _____	

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

Specific Impact Number	Plane* of C-Measurements	Direct Damage		Field L**	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	±D
		Width** (CDC)	Max*** Crush								
	Bumper height				0.0	7.8	8.4	8.2	5.4	0.0	
	Sill height as measured				0.0	3.0	3.2	3.8	4.1	0.0	
	Sill height as corrected				0.0	1.0	1.2	1.8	2.1	0.0	
	Average Crush			87.9	0.0	7.8	8.4	8.2	5.4	0.0	-6 5

Free space = 2 inches

Door latch, hinge, or pillar did not fail (See Page 1-2).

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

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

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

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

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

TEST #890209-1

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Right side	Photosonic 1B	25	505	Impact overall
2	Overhead wide	Photosonic 1B	13	505	Impact wide
3	Overhead tight	Photosonic 1B	25	500	Impact closeup

SECTION 4.0

TEST #890209-2 SUMMARY

TEST CONDITIONS:

TEST NUMBER: 890209-2

DATE OF TEST: 2/9/89

TIME OF TEST: 1322

AMBIENT TEMPERATURE AT IMPACT AREA: 31° F

SUBJECT VEHICLE DATA:

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE WEIGHT (lbs.)	2096	2096
VEHICLE ORIENTATION (deg.)	270	270
MOVING BARRIER VELOCITY (mph.)	27.0	27.0
BARRIER WEIGHT (lbs.)	2616	2616
MAXIMUM CUMULATIVE CRUSH BUMPER HEIGHT (in.)	15.4	
AVERAGE CUMULATIVE CRUSH (in.) = $\frac{\{C1+C6+C2+C3+C4+C5\}}{5}$	9.7	

VEHICLE ATTITUDES:

POST-TEST: LF: 24.6; RF: 24.9; LR: 25.0; RR: 25.5

TEST NUMBER 890209-2

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G MSEC	NEGATIVE DIRECTION MAX G MSEC
1	SILL RIGHT FRONT	65.3	-25.4	9.5		
	LONGITUDINAL				---	---
	LATERAL				---	---
2	SILL RIGHT REAR	53.3	-25.6	11.8		
	LATERAL				---	---

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: FORWARD FROM REAR AXLE
Y: LEFTWARD FROM VEHICLE CENTERLINE
Z: UPWARD FROM GROUND LEVEL

Y See TEST ANOMALIES

TEST NUMBER 890209-2

BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX	G MSEC	MAX	G MSEC
1	BARRIER CG	75.0	0.0	10.5				
	LONGITUDINAL				5.3	268.1	17.3	3.5
	LATERAL				5.9	260.8	5.5	33.3

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + LEFTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

TEST #890209-2

CONTACT SWITCH LOCATIONS AND DATA SUMMARY

LOCATION	SEPARATION TIME (MSEC)
VEHICLE CONTACT SWITCH - LEFT	99.5 Y
VEHICLE CONTACT SWITCH - CENTER #1	75.8 Y
VEHICLE CONTACT SWITCH - CENTER #2	49.8 Y
VEHCILE CONTACT SWITCH - RIGHT	74.5 Y

Y See TEST ANOMALIES

TEST #890209-2

National Accident Sampling System - Continuous Sampling Subsystem: Vehicle Data

FIELD MEASUREMENTS

Complete When Applicable

End Damage	Side Damage
Undeformed end width _____	Bowing: B1 <u>0</u> X1 <u>0</u>
Corner shift: A1 _____	B2 <u>0</u> X2 <u>0</u>
A2 _____	Bowing constant
End shift at frame (CDC)	
(check one)	$\frac{X1 + X2}{2} = \frac{0}{2}$
<4 inches <u>X</u>	
>4 inches _____	

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

Specific Impact Number	Plane* of C-Measurements	Direct Damage		Field L**	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	±D
		Width** (CDC)	Max*** Crush								
	Bumper height				0.0	8.5	14.4	15.4	10.2	0.0	
	Sill height as measured				0.0	10.8	12.5	13.8	10.2	0.0	
	Sill height as corrected				0.0	8.8	10.5	11.8	8.2	0.0	
	Average Crush			112.6	0.0	8.5	14.4	15.4	10.2	0.0	-9.625
	Free space = 2 inches										
	Door latch, hinge, or pillar did not fail (See Page 1-2).										

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

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

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

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

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

TEST #890209-2

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Right side	Photosonic 1B	25	505	Impact overall
2	Overhead wide	Photosonic 1B	13	498	Impact wide
3	Overhead tight	Photosonic 1B	25	500	Impact closeup

SECTION 5.0

TEST #890209-3 SUMMARY

TEST CONDITIONS:

TEST NUMBER: 890209-3

DATE OF TEST: 2/9/89

TIME OF TEST: 1445

AMBIENT TEMPERATURE AT IMPACT AREA: 31° F

SUBJECT VEHICLE DATA:

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE WEIGHT (lbs.)	2096	2096
VEHICLE ORIENTATION (deg.)	270	270
MOVING BARRIER VELOCITY (mph.)	27.1	27.0
BARRIER WEIGHT (lbs.)	2616	2616
MAXIMUM CUMULATIVE CRUSH BUMPER HEIGHT (in.)	22.1	
AVERAGE CUMULATIVE CRUSH (in.) = $\frac{\{C1+C6+C2+C3+C4+C5\}}{5}$	14.1	

VEHICLE ATTITUDES:

POST-TEST: LF: 25.2; RF: 25.2; LR: 24.3; RR: 26.1

TEST NUMBER 890209-3

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX	G MSEC	MAX	G MSEC
1	SILL RIGHT FRONT	65.3	-25.4	9.5				
	LONGITUDINAL				8.8	13.4	3.7	33.5
	LATERAL				3.0	37.6	47.0	7.5
2	SILL RIGHT REAR	53.3	-25.6	11.8				
	LATERAL				2.6	155.6	46.9	7.5

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: FORWARD FROM REAR AXLE
Y: LEFTWARD FROM VEHICLE CENTERLINE
Z: UPWARD FROM GROUND LEVEL

TEST NUMBER 890209-3

BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX	G MSEC	MAX	G MSEC
1	BARRIER CG	75.0	0.0	10.5				
	LONGITUDINAL				0.7	99.9	20.0	4.4
	LATERAL				3.6	4.6	8.4	17.1

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + LEFTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

TEST #89020981017-3

CONTACT SWITCH LOCATIONS AND DATA SUMMARY

LOCATION	SEPARATION TIME (MSEC)
VEHICLE CONTACT SWITCH - LEFT	98.4
VEHICLE CONTACT SWITCH - CENTER #1	83.2
VEHICLE CONTACT SWITCH - CENTER #2	115.7 Y
VEHICLE CONTACT SWITCH - RIGHT	75.4 Y

Y See TEST ANOMALIES

TEST #890209-3

National Accident Sampling System - Continuous Sampling Subsystem: Vehicle Data

FIELD MEASUREMENTS

Complete When Applicable

End Damage Undeformed end width _____ Corner shift: A1 _____ A2 _____ End shift at frame (CDC) (check one) <4 inches _____ ≥4 inches <u>X</u> _____	Side Damage Bowing: B1 <u>3.0</u> X1 <u>1.5</u> B2 <u>5.8</u> X2 <u>0.2</u> Bowing constant $\frac{X1 + X2}{2} = \underline{0.8}$
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NOTE: Measure C1 to C6 from Driver to Passenger side in Front or Rear impacts -
 Rear to Front in Side impacts.

Specific Impact Number	Plane* of C-Measurements	Direct Damage		Field L**	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	±D
		Width** (CDC)	Max*** Crush								
	Bumper height				0.0	16.2	21.0	22.1	7.2	0.0	
	Sill height as measured				0.0	13.5	15.5	14.8	9.2	0.0	
	Sill height as corrected				0.0	11.5	13.5	12.8	7.2	0.0	
	Average Crush			116.5	0.8	17.0	21.8	22.9	8.0	0.8	-6.6

Free space = 2 inches

Door latch, hinge, or pillar did not fail (See Page 1-2).

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

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

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

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

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

TEST #890209-3

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Right side	Photosonic 1B	25	505	Impact overall
2	Overhead wide	Photosonic 1B	13	498	Impact wide
3	Overhead tight	Photosonic 1B	25	500	Impact closeup

SECTION 6.0

TEST #890209-4 SUMMARY

TEST CONDITIONS:

TEST NUMBER: 890209-4

DATE OF TEST: 2/9/89

TIME OF TEST: 1525

AMBIENT TEMPERATURE AT IMPACT AREA: 29° F

SUBJECT VEHICLE DATA:

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE WEIGHT (lbs.)	2096	2096
VEHICLE ORIENTATION (deg.)	270	270
MOVING BARRIER VELOCITY (mph.)	35.9	36.0
BARRIER WEIGHT (lbs.)	2616	2616
MAXIMUM CUMULATIVE CRUSH BUMPER HEIGHT (in.)	40.0	
AVERAGE CUMULATIVE CRUSH (in.) = $\frac{\{C1+C6+C2+C3+C4+C5\}}{5}$	18.5	

VEHICLE ATTITUDES:

POST-TEST: LF: 24.4; RF: 22.1; LR: 22.5; RR: 24.4

TEST NUMBER 890209-4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX G MSEC		MAX G MSEC	
1	SILL RIGHT FRONT	65.3	-25.4	9.5				
	LONGITUDINAL				11.8	14.3	---	---
	LATERAL				3.3	202.5	49.2	10.8
2	SILL RIGHT REAR	53.3	-25.6	11.8				
	LATERAL				3.6	202.5	43.8	11.0

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: FORWARD FROM REAR AXLE
Y: LEFTWARD FROM VEHICLE CENTERLINE
Z: UPWARD FROM GROUND LEVEL

Y See TEST ANOMALIES

TEST NUMBER B90209-4

BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX	G MSEC	MAX	G MSEC
1	BARRIER CG	75.0	0.0	10.5				
	LONGITUDINAL				1.2	211.1	25.7	8.6
	LATERAL				5.3	30.8	12.6	16.9

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + LEFTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

TEST #890209-4

CONTACT SWITCH LOCATIONS AND DATA SUMMARY

LOCATION	SEPARATION TIME (MSEC)
VEHICLE CONTACT SWITCH - LEFT	138.2
VEHICLE CONTACT SWITCH - CENTER #1	--- Y
VEHICLE CONTACT SWITCH - CENTER #2	146.0
VEHICLE CONTACT SWITCH - RIGHT	38.8 Y

Y See TEST ANOMALIES

TEST #890209-4

National Accident Sampling System - Continuous Sampling Subsystem: Vehicle Data

FIELD MEASUREMENTS

Complete When Applicable

End Damage Undeformed end width _____ Corner shift: A1 _____ A2 _____ End shift at frame (CDC) (check one) <4 inches _____ ≥4 inches <u>X</u> _____	Side Damage Bowing: B1 <u>3.5</u> X1 <u>0.0</u> B2 <u>7.5</u> X2 <u>1.4</u> Bowing constant $\frac{X1 + X2}{2} = \frac{0.7}{2}$
---	---

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

Specific Impact Number	Plane* of C-Measurements	Direct Damage		Field L**	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	±D
		Width** (CDC)	Max*** Crush								
	Bumper height				0.0	35.2	36.6	40.0	5.8	0.0	
	Sill height as measured				0.0	13.0	24.5	23.2	7.8	0.0	
	Sill height as corrected				0.0	11.0	22.5	21.2	5.8	0.0	
	Average Crush			121.2	0.7	23.8	30.3	31.3	6.5	0.7	-8.6

Free space = 2 inches

Door latch, hinge, or pillar did fail (See Page 1-2).

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

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

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

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

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

TEST #890209-4

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Right side	Photosonic 1B	25	505	Impact overall
2	Overhead wide	Photosonic 1B	13	499	Impact wide
3	Overhead tight	Photosonic 1B	25	502	Impact closeup

APPENDIX A
PHOTOGRAPHS

TEST #890209-1
LIST OF PHOTOGRAPHS

1. PRE-TEST OVERALL FRONT VIEW
2. POST-TEST OVERALL FRONT VIEW
3. PRE-TEST OVERALL LEFT SIDE - VIEW 1
4. POST-TEST OVERALL LEFT SIDE - VIEW 1
5. PRE-TEST OVERALL LEFT SIDE - VIEW 2
6. POST-TEST OVERALL LEFT SIDE - VIEW 2
7. PRE-TEST CLOSEUP LEFT SIDE VIEW
8. POST-TEST CLOSEUP LEFT SIDE VIEW
9. PRE-TEST OVERALL REAR VIEW
10. POST-TEST OVERALL REAR VIEW
11. PRE-TEST CLOSEUP LEFT REAR VIEW
12. POST-TEST CLOSEUP LEFT REAR VIEW
13. POST-TEST OVERALL RIGHT SIDE VIEW



Figure A-1. PRE-TEST OVERALL FRONT VIEW



Figure A-2. POST-TEST OVERALL FRONT VIEW



Figure A-3. PRE-TEST OVERALL LEFT SIDE - VIEW 1



Figure A-4. POST-TEST OVERALL LEFT SIDE - VIEW 1



Figure A-5. PRE-TEST OVERALL LEFT SIDE - VIEW 2



Figure A-6. POST-TEST OVERALL LEFT SIDE - VIEW 2



Figure A-7. PRE-TEST CLOSEUP LEFT SIDE VIEW



Figure A-8. POST-TEST CLOSEUP LEFT SIDE VIEW



Figure A-9. PRE-TEST OVERALL REAR VIEW



Figure A-10. POST-TEST OVERALL REAR VIEW



Figure A-11. PRE-TEST CLOSEUP LEFT REAR VIEW



Figure A-12. POST-TEST CLOSEUP LEFT REAR VIEW



Figure A-13. POST-TEST OVERALL RIGHT SIDE VIEW

TEST #890209-2

LIST OF PHOTOGRAPHS

14. POST-TEST FRONT VIEW
15. POST-TEST OVERALL LEFT SIDE - VIEW 1
16. POST-TEST OVERALL LEFT SIDE - VIEW 2
17. POST-TEST CLOSEUP LEFT SIDE VIEW
18. POST-TEST OVERALL REAR VIEW
19. POST-TEST CLOSEUP LEFT REAR VIEW
20. POST-TEST OVERALL RIGHT SIDE VIEW



Figure A-14. POST-TEST FRONT VIEW



Figure A-15. POST-TEST OVERALL LEFT SIDE - VIEW 1



Figure A-16. POST-TEST OVERALL LEFT SIDE - VIEW 2



Figure A-17. POST-TEST CLOSEUP LEFT SIDE VIEW



Figure A-18. POST-TEST OVERALL REAR VIEW



Figure A-19. POST-TEST CLOSEUP LEFT REAR VIEW



Figure A-20. POST-TEST OVERALL RIGHT SIDE VIEW

TEST #890209-3

LIST OF PHOTOGRAPHS

- 21. POST-TEST OVERALL FRONT VIEW
- 22. POST-TEST OVERALL LEFT SIDE - VIEW 1
- 23. POST-TEST OVERALL LEFT SIDE - VIEW 2
- 24. POST-TEST CLOSEUP LEFT SIDE VIEW
- 25. POST-TEST OVERALL REAR VIEW
- 26. POST-TEST CLOSEUP LEFT REAR VIEW
- 27. POST-TEST OVERALL RIGHT VIEW



Figure A-21. POST-TEST OVERALL FRONT VIEW



Figure A-22. POST-TEST OVERALL LEFT SIDE - VIEW 1



Figure A-23. POST-TEST OVERALL LEFT SIDE - VIEW 2



Figure A-24. POST-TEST CLOSEUP LEFT SIDE VIEW



Figure A-25. POST-TEST OVERALL REAR VIEW



Figure A-26. POST-TEST CLOSEUP LEFT REAR VIEW



Figure A-27. POST-TEST OVERALL RIGHT VIEW

TEST #890209-4
LIST OF PHOTOGRAPHS

- 28. POST-TEST OVERALL FRONT VIEW
- 29. POST-TEST OVERALL LEFT SIDE - VIEW 1
- 30. POST-TEST OVERALL LEFT SIDE - VIEW 2
- 31. POST-TEST CLOSEUP LEFT SIDE VIEW
- 32. POST-TEST OVERALL REAR VIEW
- 33. POST-TEST CLOSEUP LEFT REAR VIEW
- 34. POST-TEST OVERALL RIGHT SIDE VIEW



Figure A-28. POST-TEST OVERALL FRONT VIEW



Figure A-29. POST-TEST OVERALL LEFT SIDE - VIEW 1



Figure A-30. POST-TEST OVERALL LEFT SIDE - VIEW 2

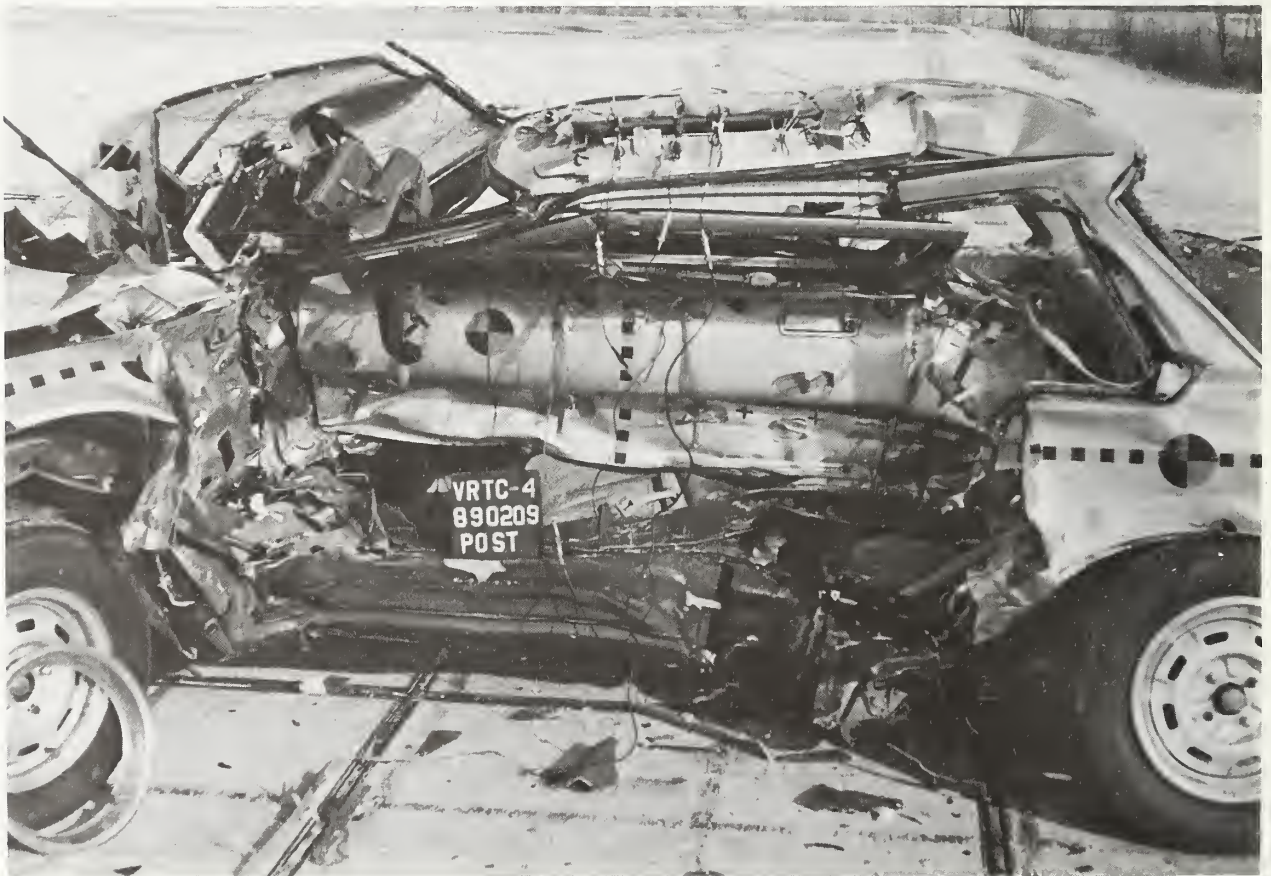


Figure A-31. POST-TEST CLOSEUP LEFT SIDE VIEW



Figure A-32. POST-TEST OVERALL REAR VIEW



Figure A-33. POST-TEST CLOSEUP LEFT REAR VIEW



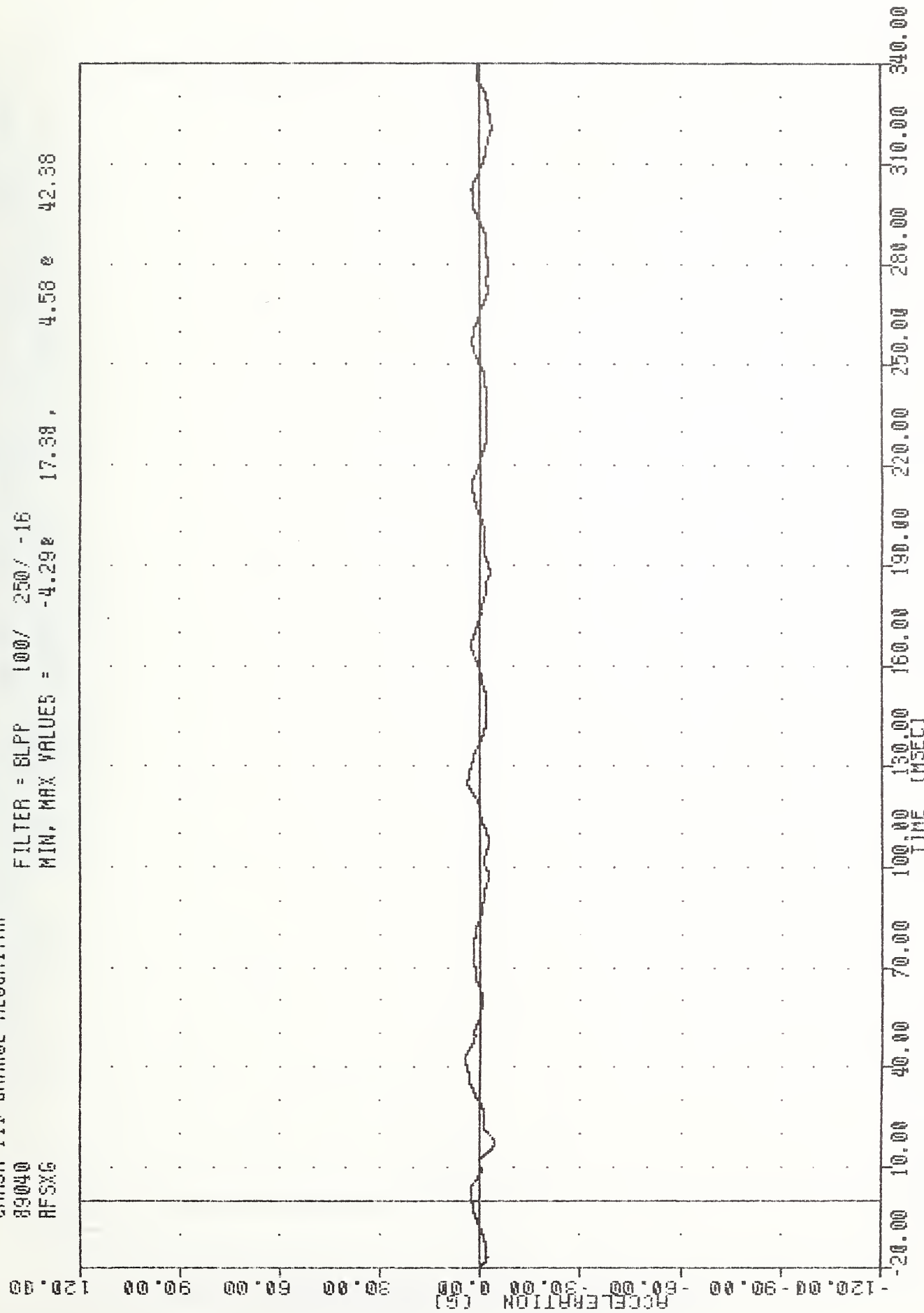
Figure A-34. POST-TEST OVERALL RIGHT SIDE VIEW

APPENDIX B
DATA PLOTS

TEST #890209-1

VRTC-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 AFSXG

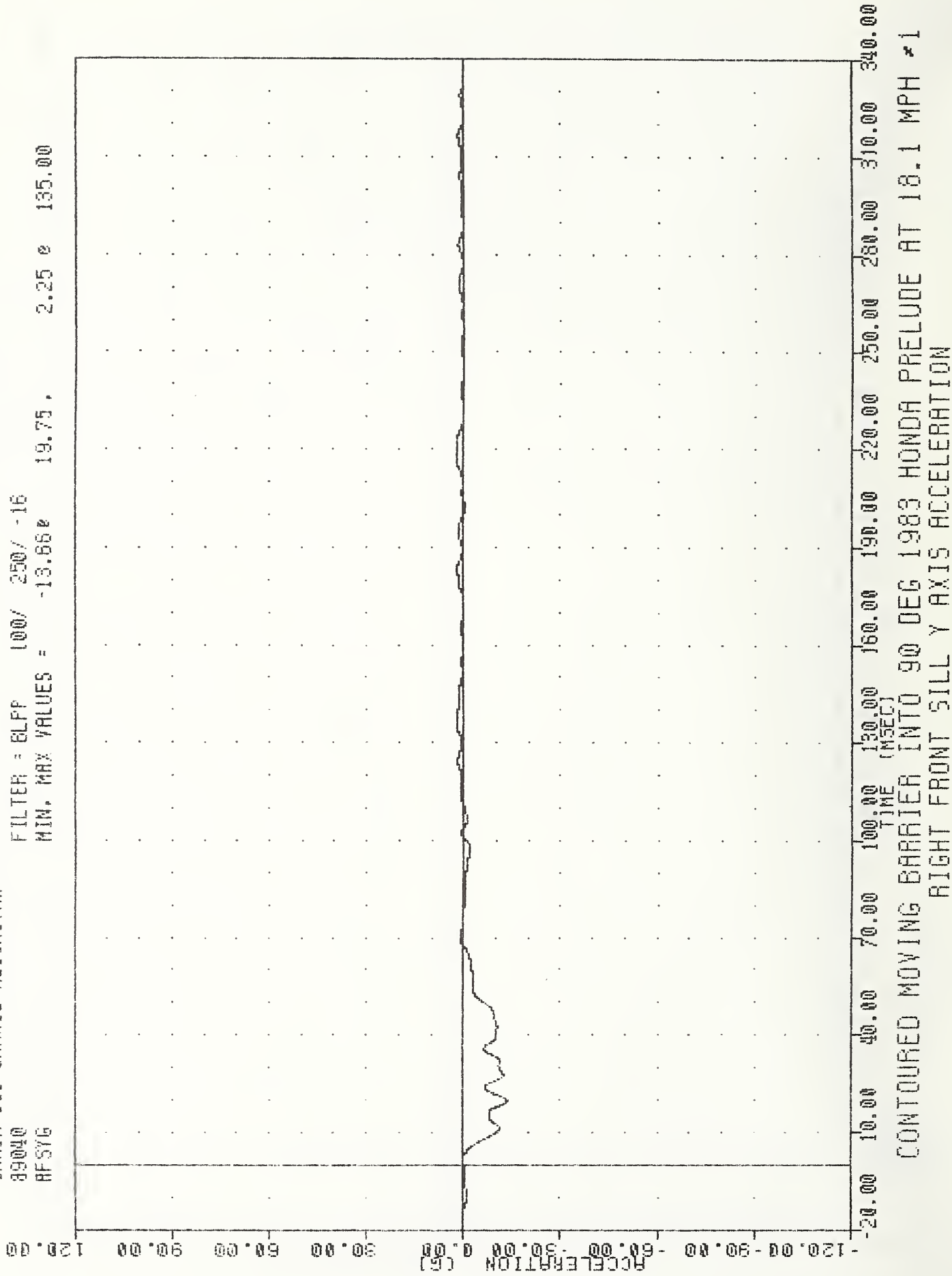
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -4.29e 4.58 e 42.38



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 RIGHT FRONT SILL X AXIS ACCELERATION

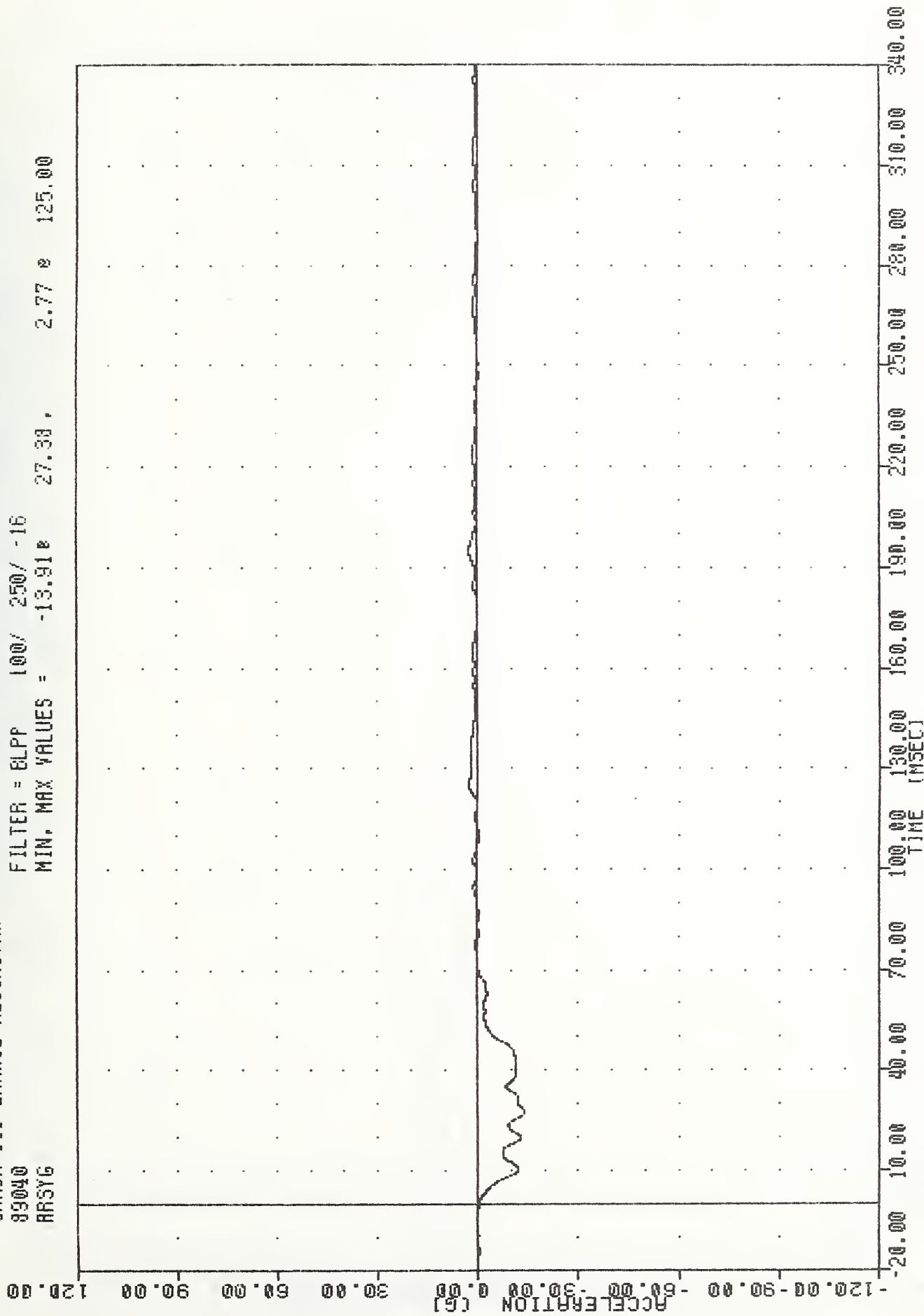
VRTO-1 , 890209-1
CRASH III DAMAGE ALGORITHM
89040
RFSYG

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -13.860 19.75 , 2.25 0 135.00



VRTC-1 , 890203-1
 CRASH III DAMAGE ALGORITHM
 89040
 ARSYG

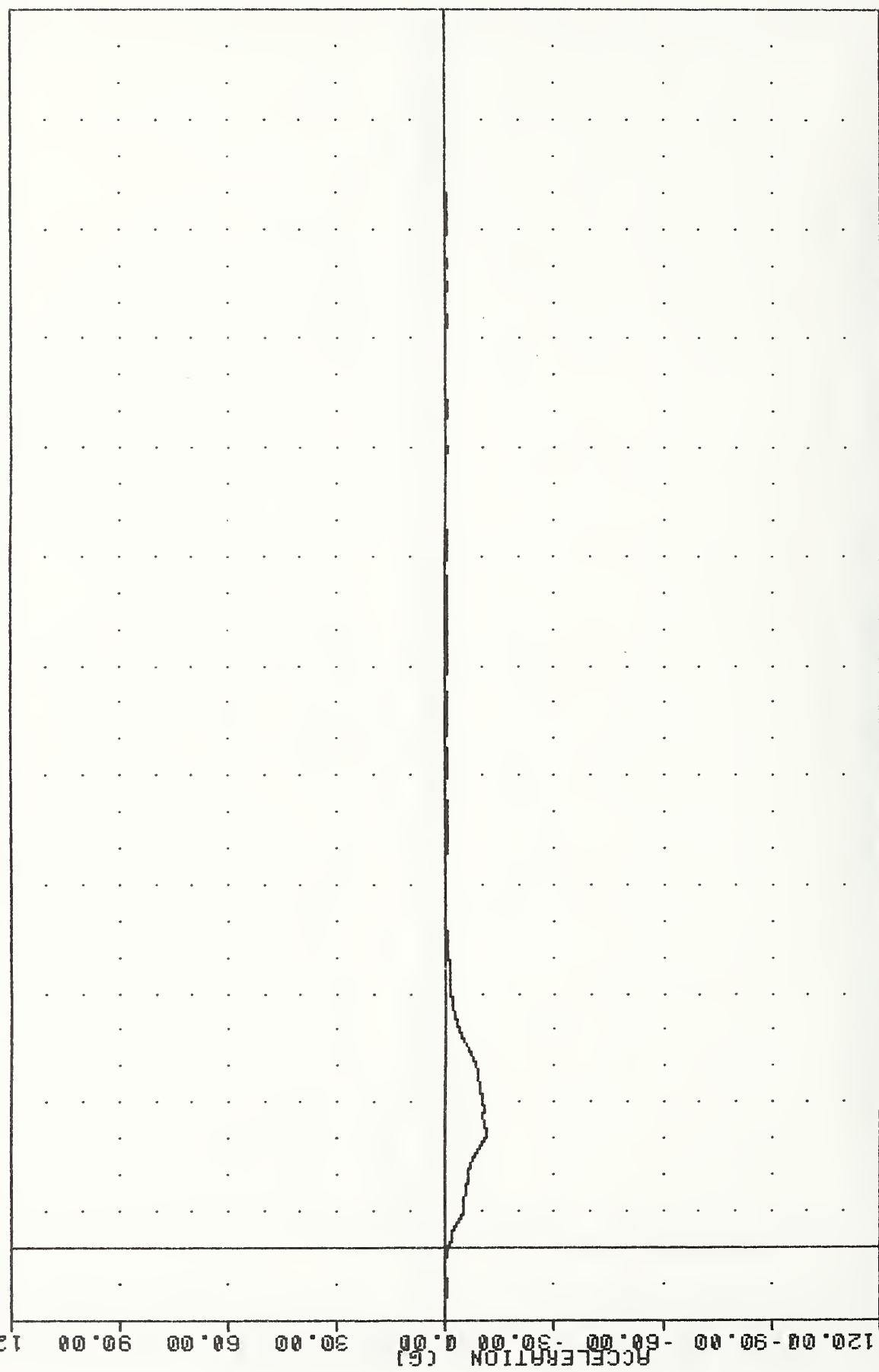
FILTER = ELPP 100/ 250/ -16
 MIN. MAX VALUES = -13.91e 27.38 , 2.77 e 125.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 RIGHT REAR SILL Y AXIS ACCELERATION

VRTC-1 , 890209-1
CRASH III DAMAGE ALGORITHM
89040
BCGXG

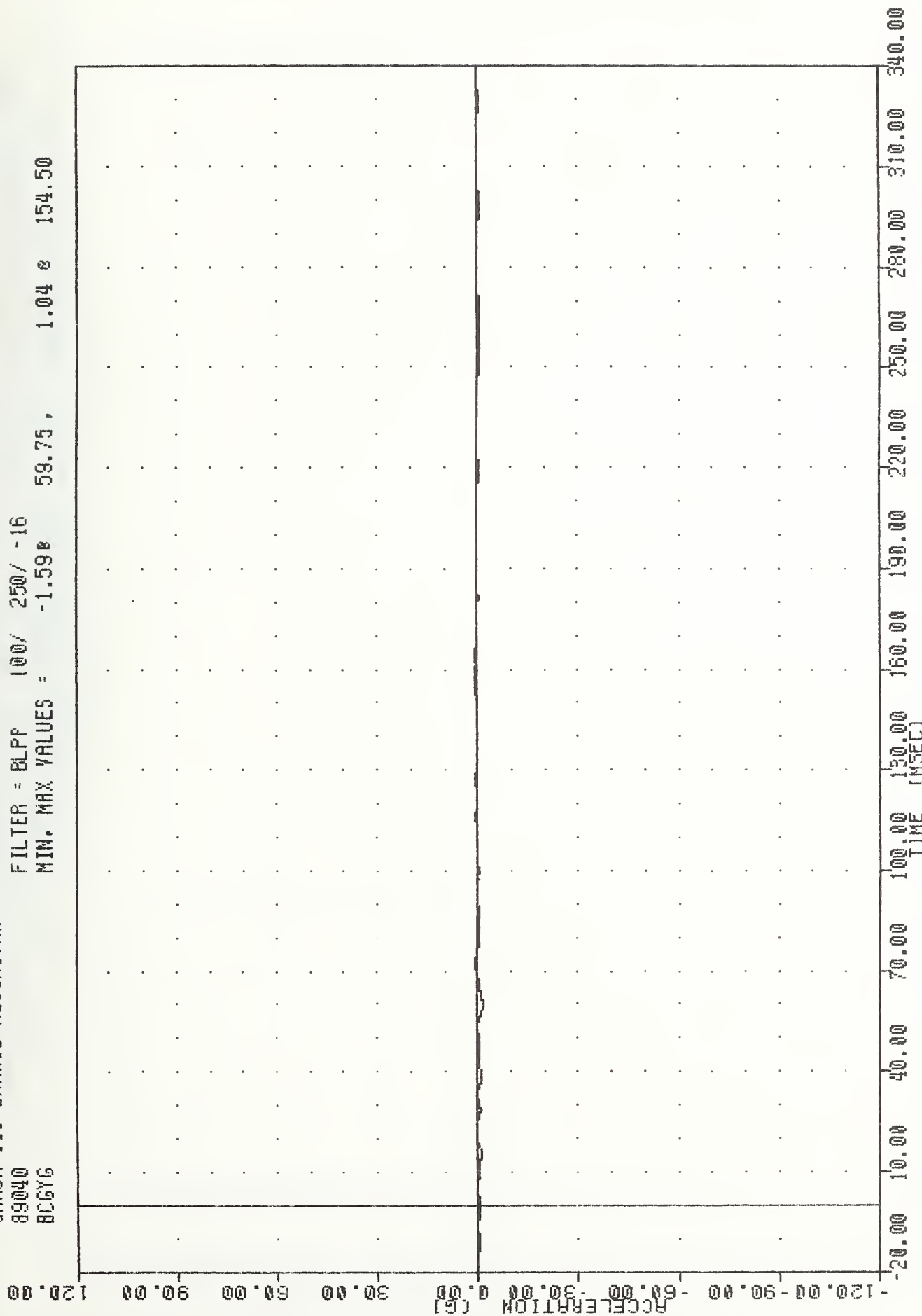
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -11.17% 31.38 , 0.45 % 334.50



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
CONTOURED MOVING BARRIER CENTER OF GRAVITY X AXIS ACCELERATION

VRTC-1 , 890209-1
CRASH III DAMAGE ALGORITHM
89040
BCCYG

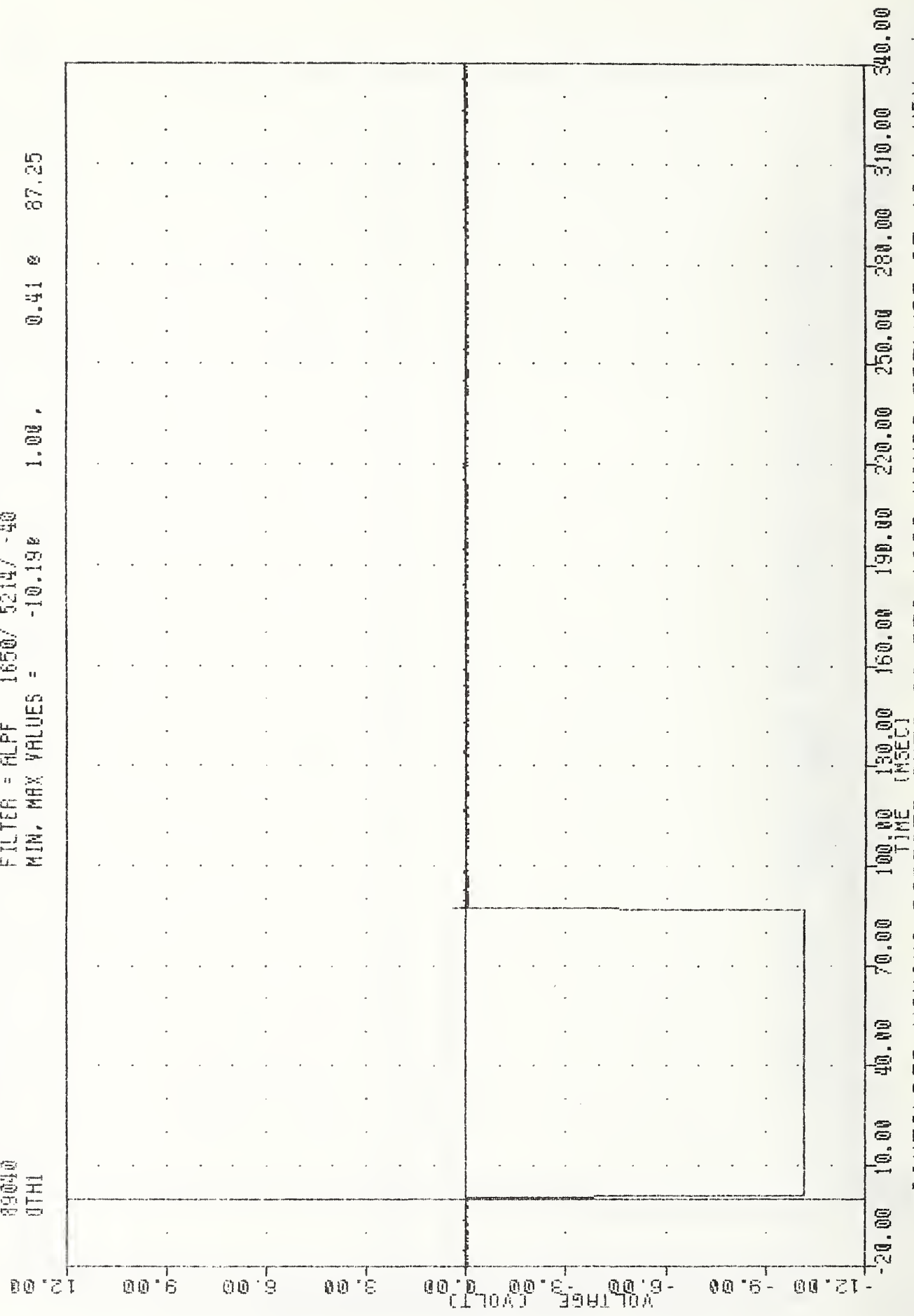
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -1.59 59.75, 1.04 154.50



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
CONTOURED MOVING BARRIER CENTER OF GRAVITY Y AXIS ACCELERATION

VR7C-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 0TH1

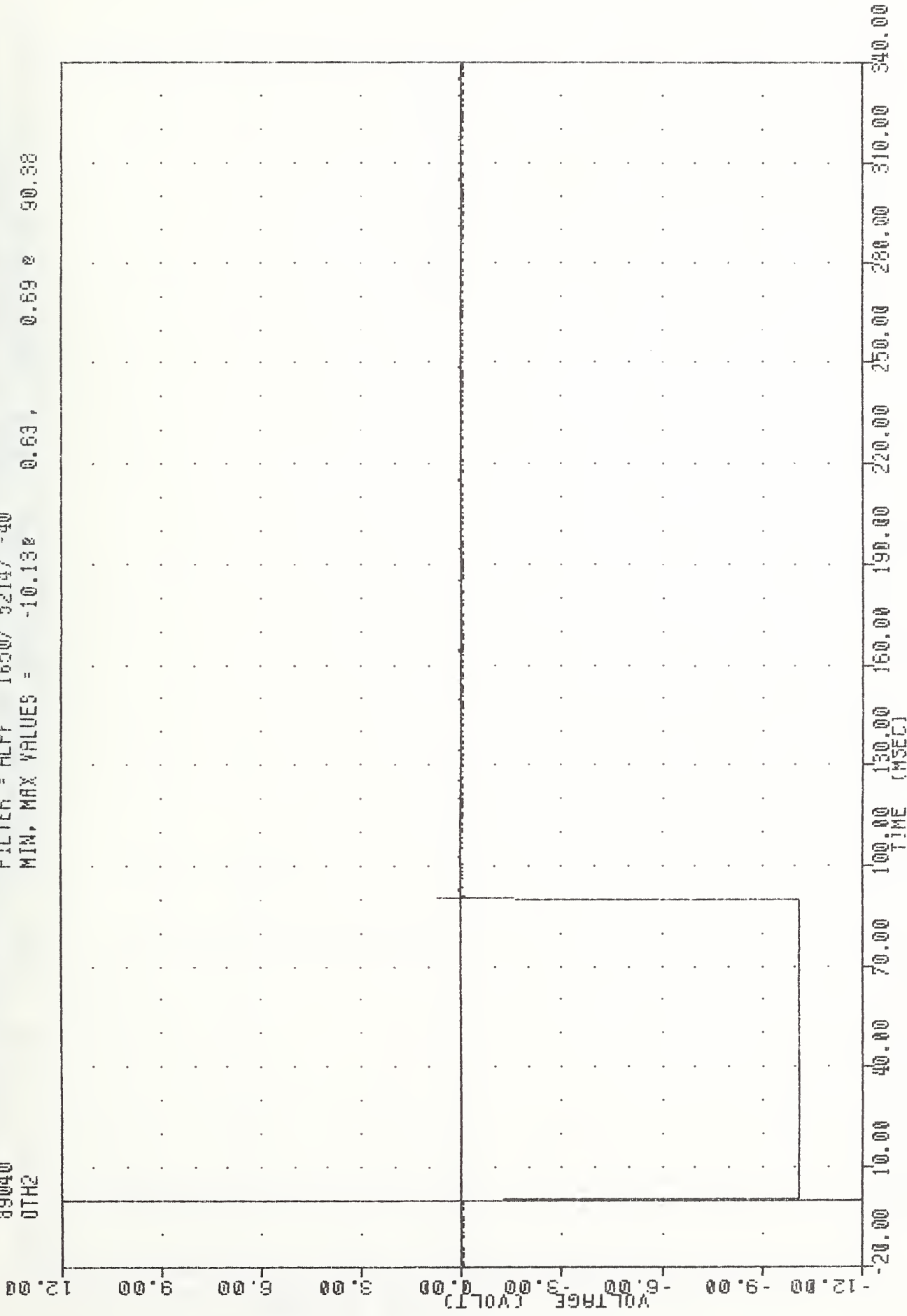
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -10.190 1.00, 0.41 0 87.25



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 VEHICLE CONTACT SWITCH - LEFT

VRTC-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 0TH2

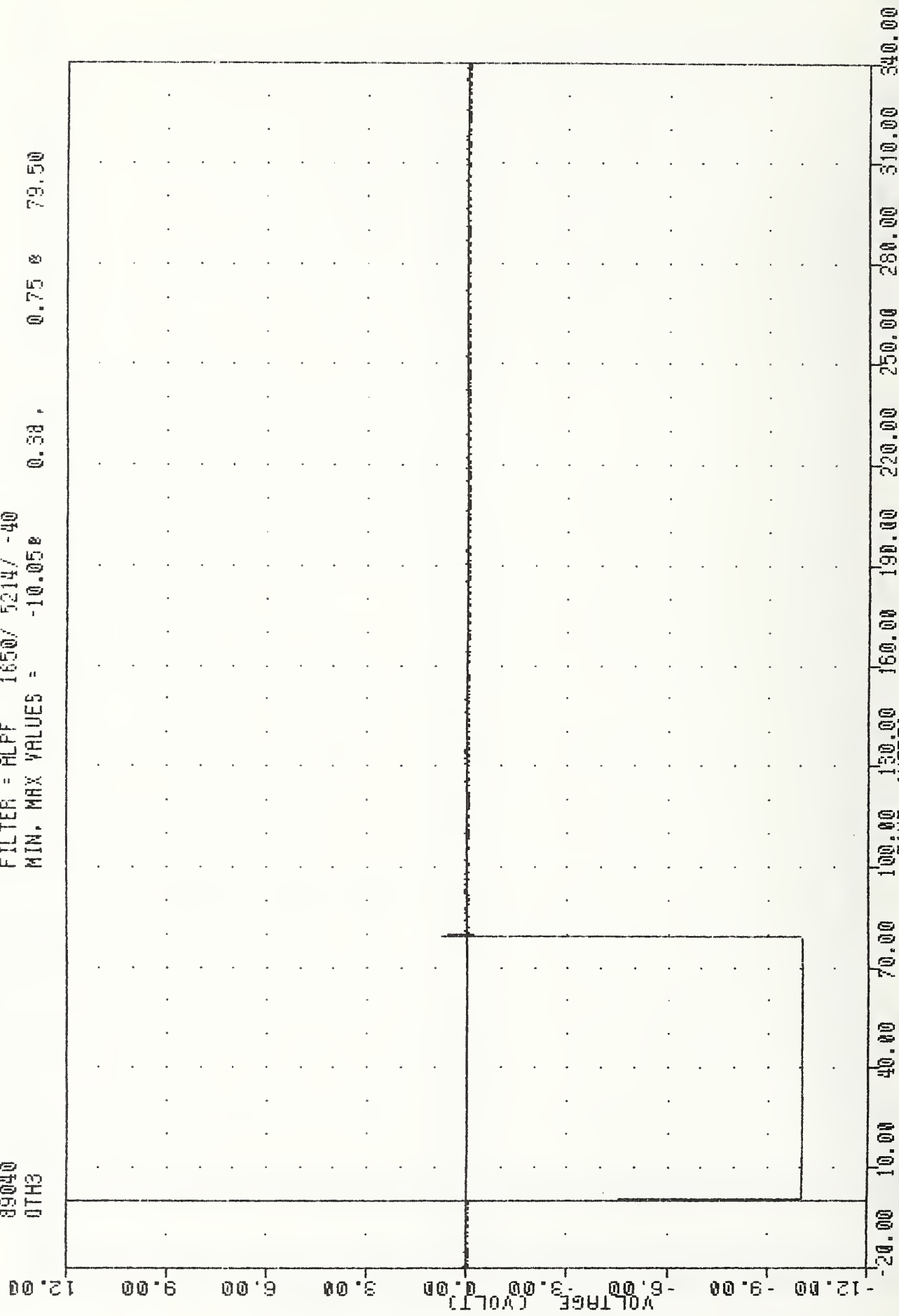
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -10.13% 0.63 , 0.59 % 90.38



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 VEHICLE CONTACT SWITCH - CENTER - 1

VRTC-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 0TH3

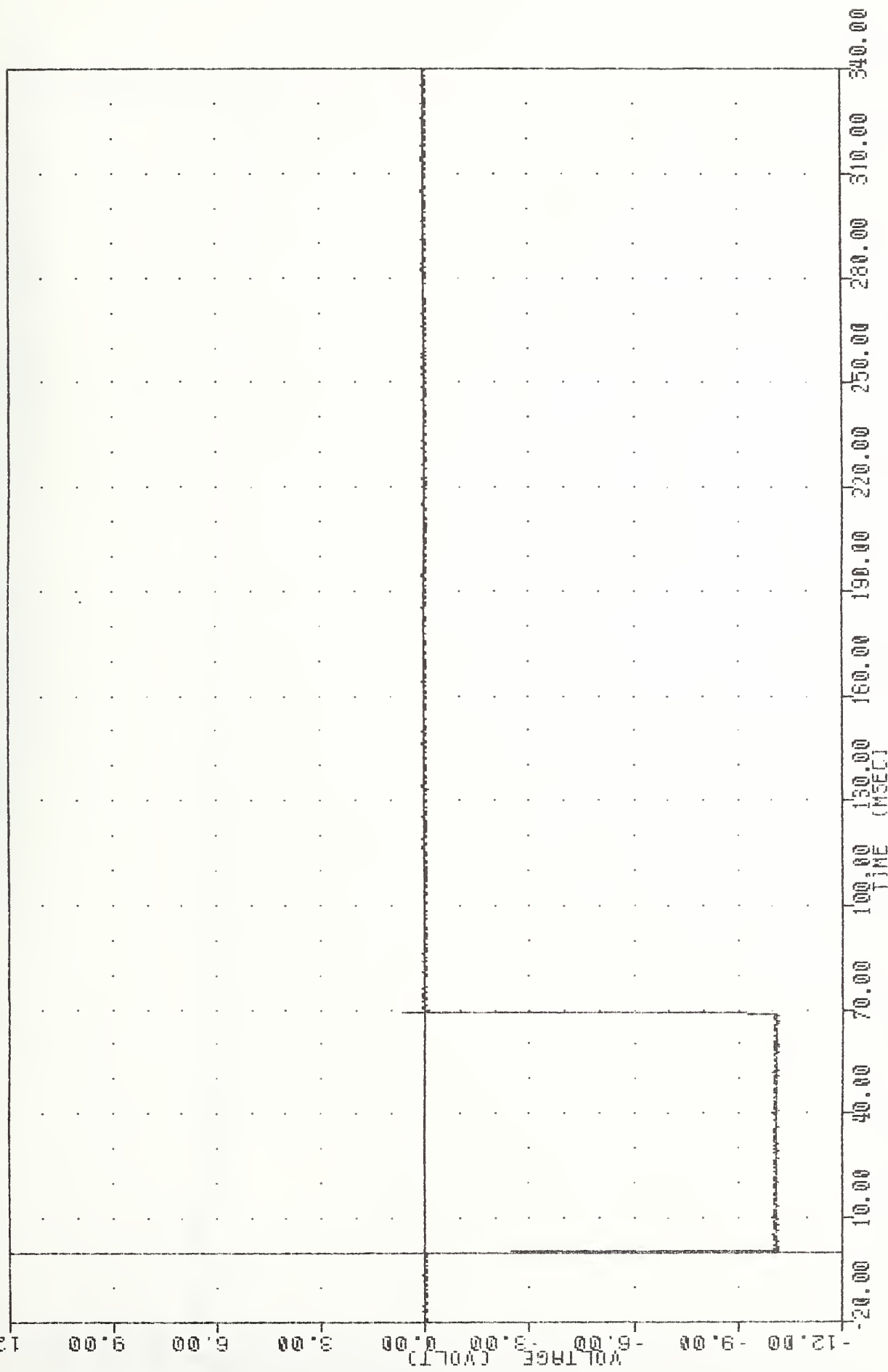
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -10.05e 0.38 , 0.75 e 79.50



CONToured MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 VEHICLE CONTACT SWITCH - CENTER - 2

VRTC-1 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 0TH4

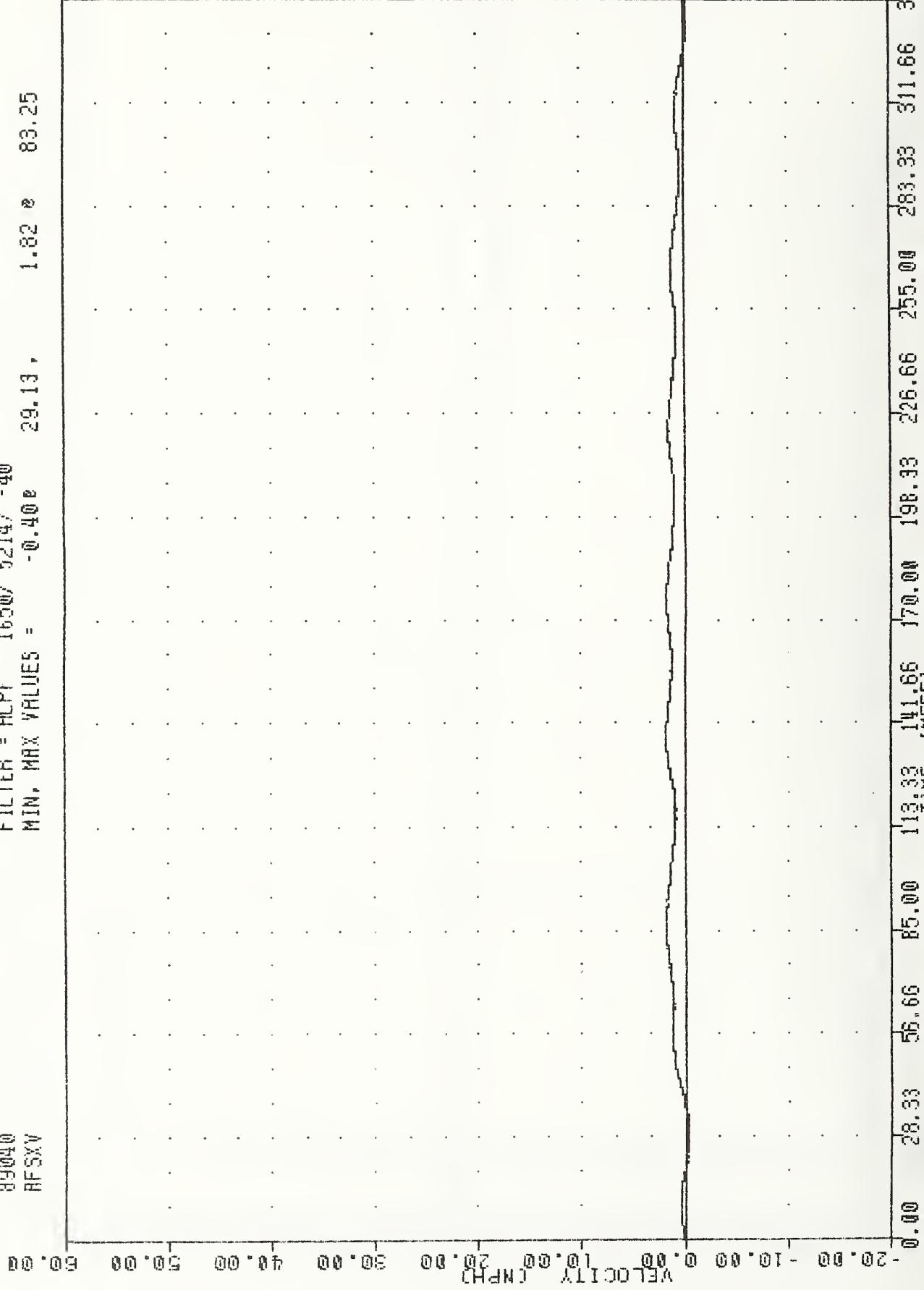
FILTER = HLPF 1650/ 5214/ -40
 MIN. MAX VALUES = -10.16 0.63 0.67 69.38



0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00
 TIME (MSEC)
 CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 VEHICLE CONTACT SWITCH - RIGHT

VRTC-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 RFSXV

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -0.40e 29.13 , 1.82 e 83.25



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 RIGHT FRONT SILL X AXIS VELOCITY

VRTC-1 , 890209-1
CRASH III DAMAGE ALGORITHM
89040
AFSXD

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.00e 0.00 , 5.68 e 324.88

100.00

75.00

50.00

25.00

0.00 (IN)

-25.00

-50.00

-75.00

-100.00

0.00

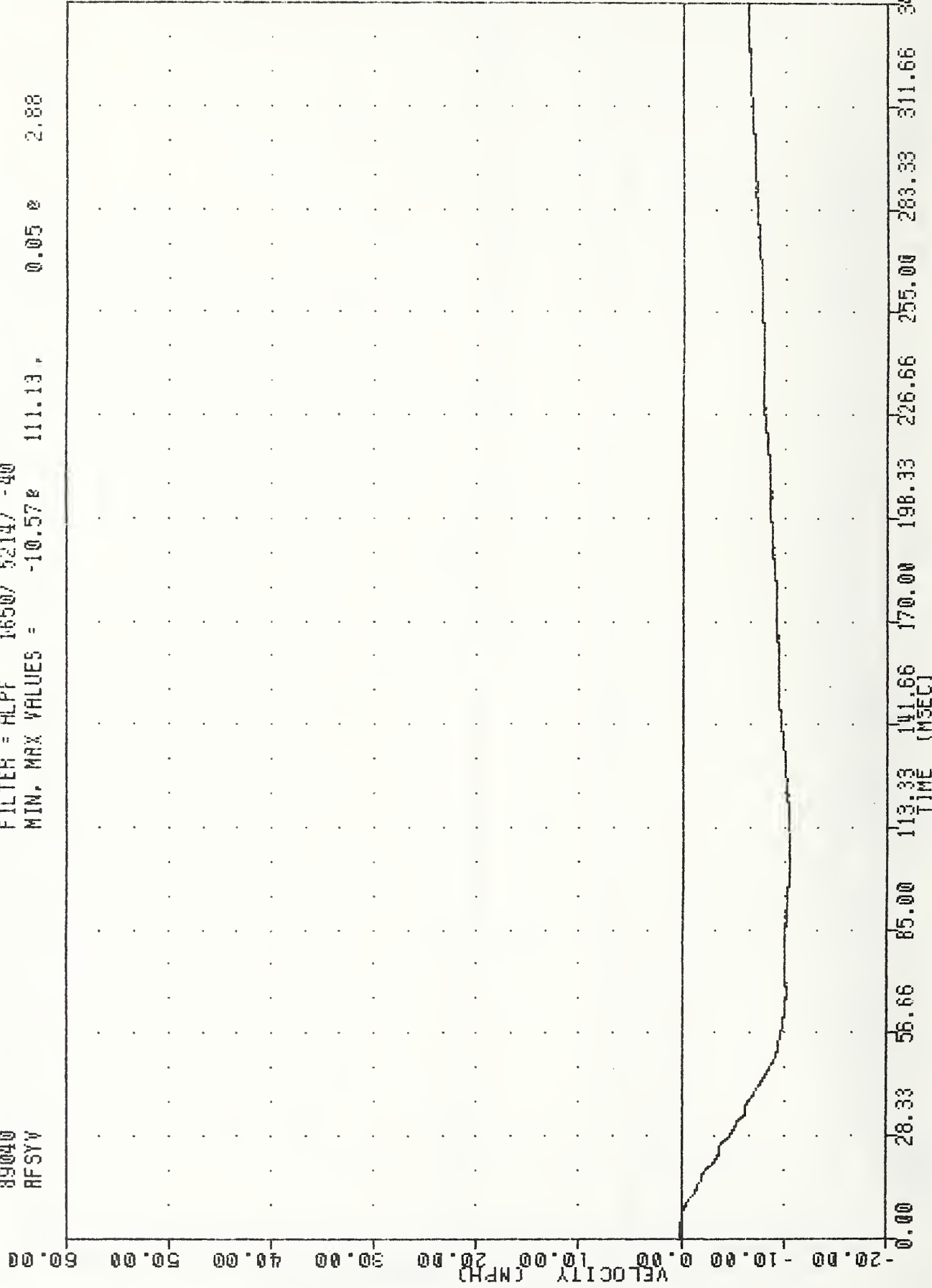
28.33 56.66 85.00 113.33 141.66 170.00 198.33 226.66 255.00 283.33 311.66 340.00

TIME (MSEC)

CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
RIGHT FRONT SILL X AXIS DISPLACEMENT

VRTC-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 RFSYV

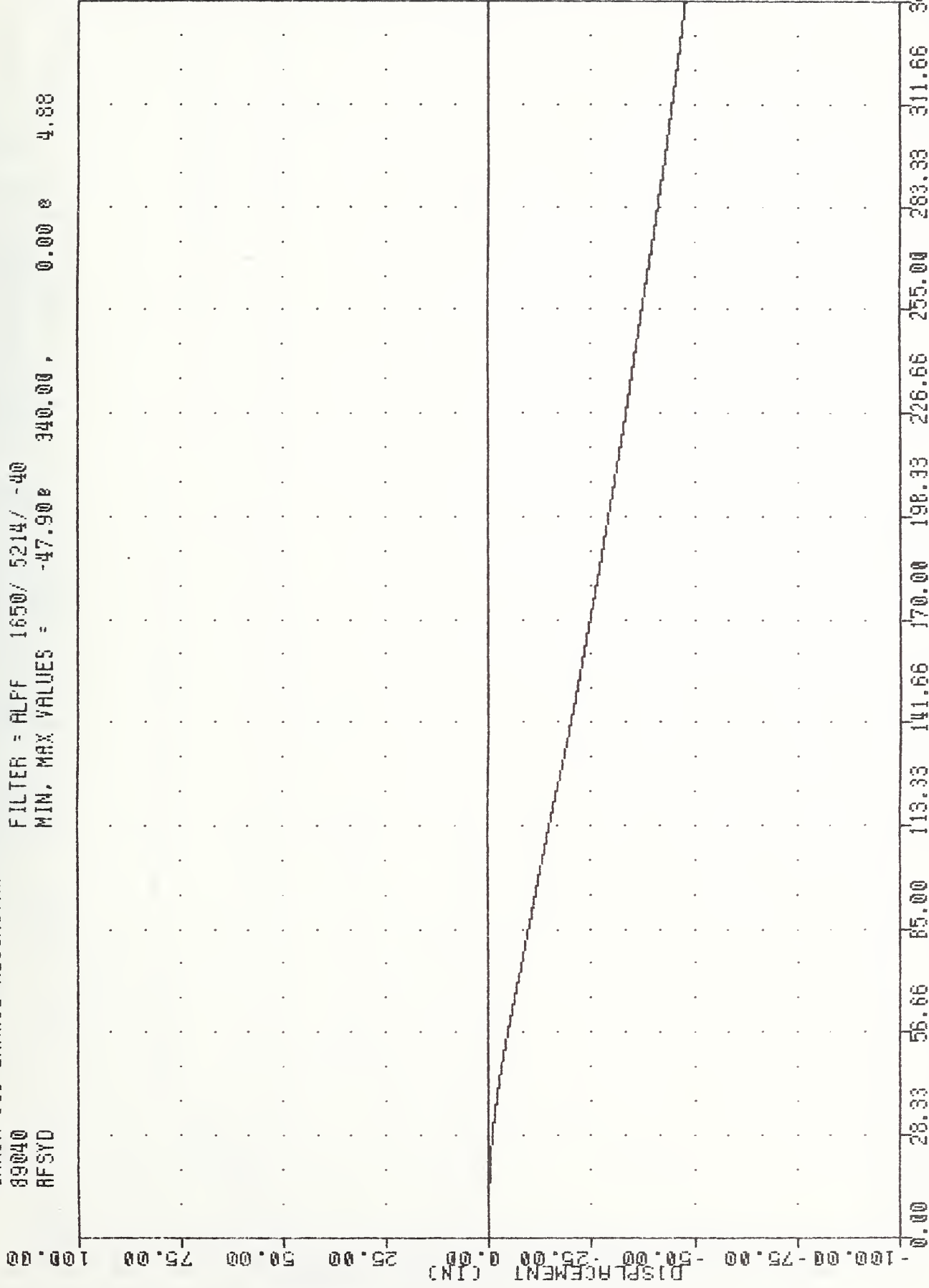
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -10.57E 111.13 , 0.05 E 2.88



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 RIGHT FRONT SILL Y AXIS VELOCITY

VRTC-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 RFSYD

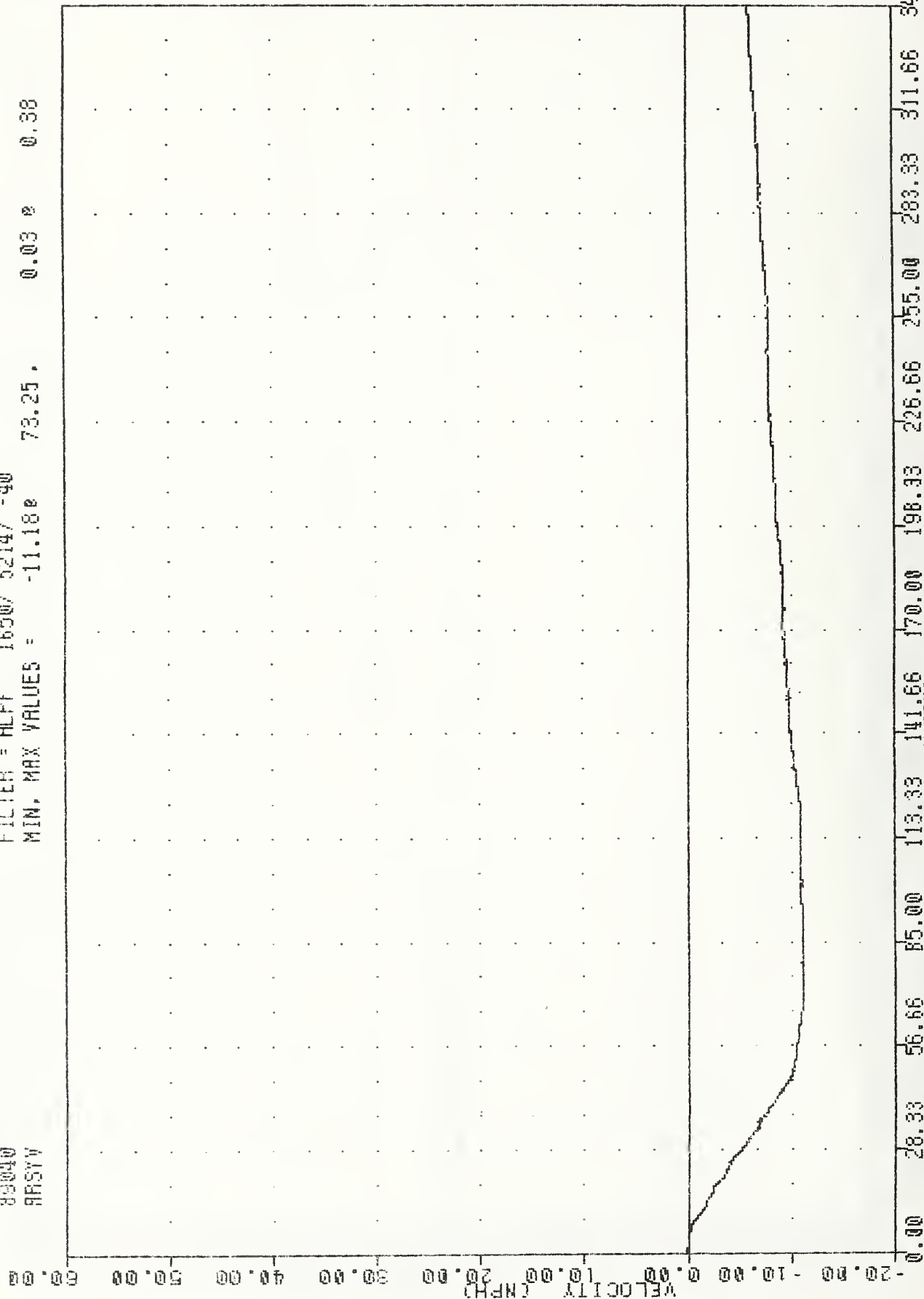
FILTER = ALFF 1650/ 5214/ -40
 MIN. MAX VALUES = -47.908 340.00 , 0.00 8 4.88



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 RIGHT FRONT SILL Y AXIS DISPLACEMENT

VRTC-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 ARSYV

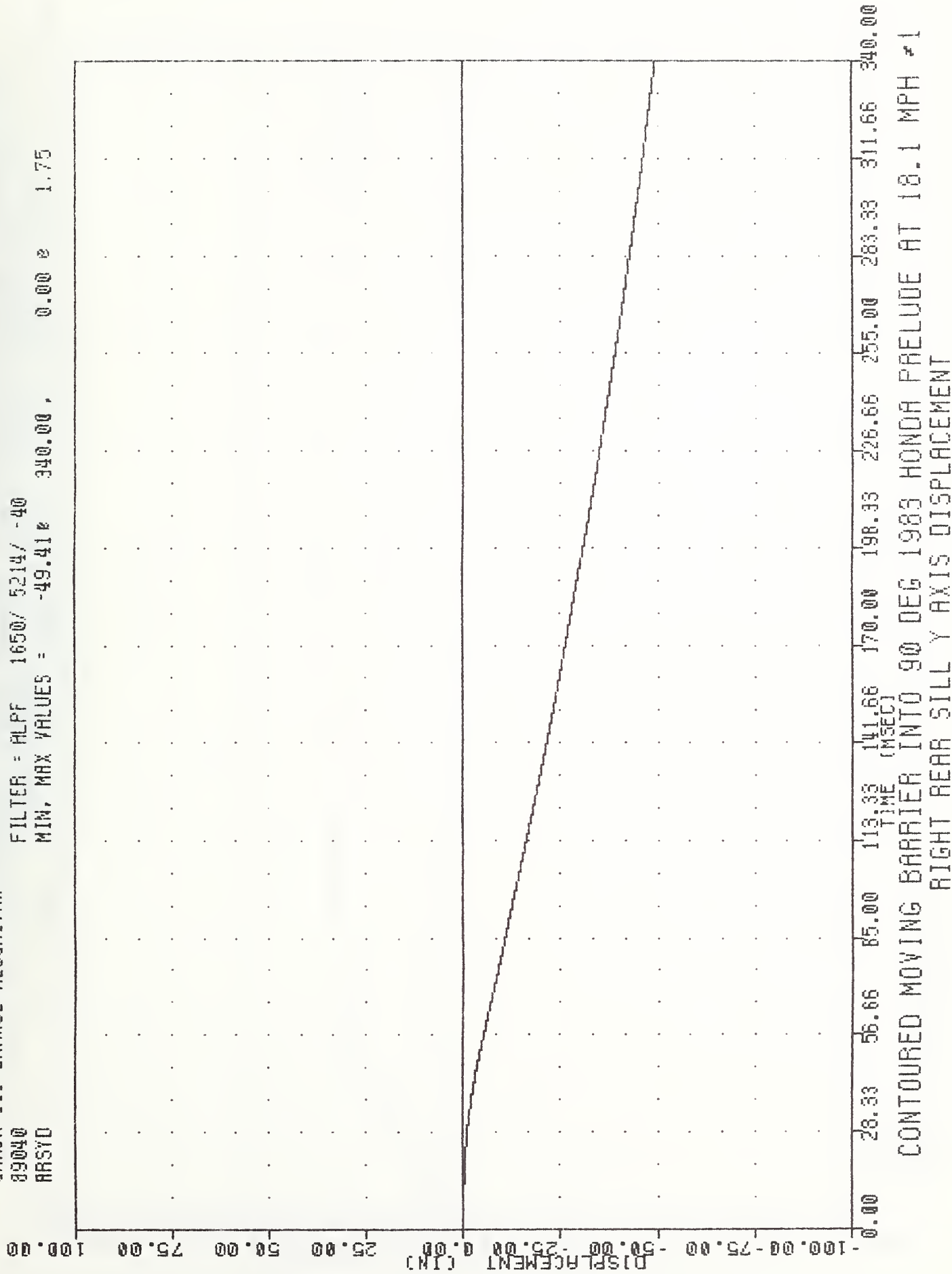
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -11.180 73.25. 0.03 0.38



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH ±1
 RIGHT REAR SILL Y AXIS VELOCITY

VRTC-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 ARSYD

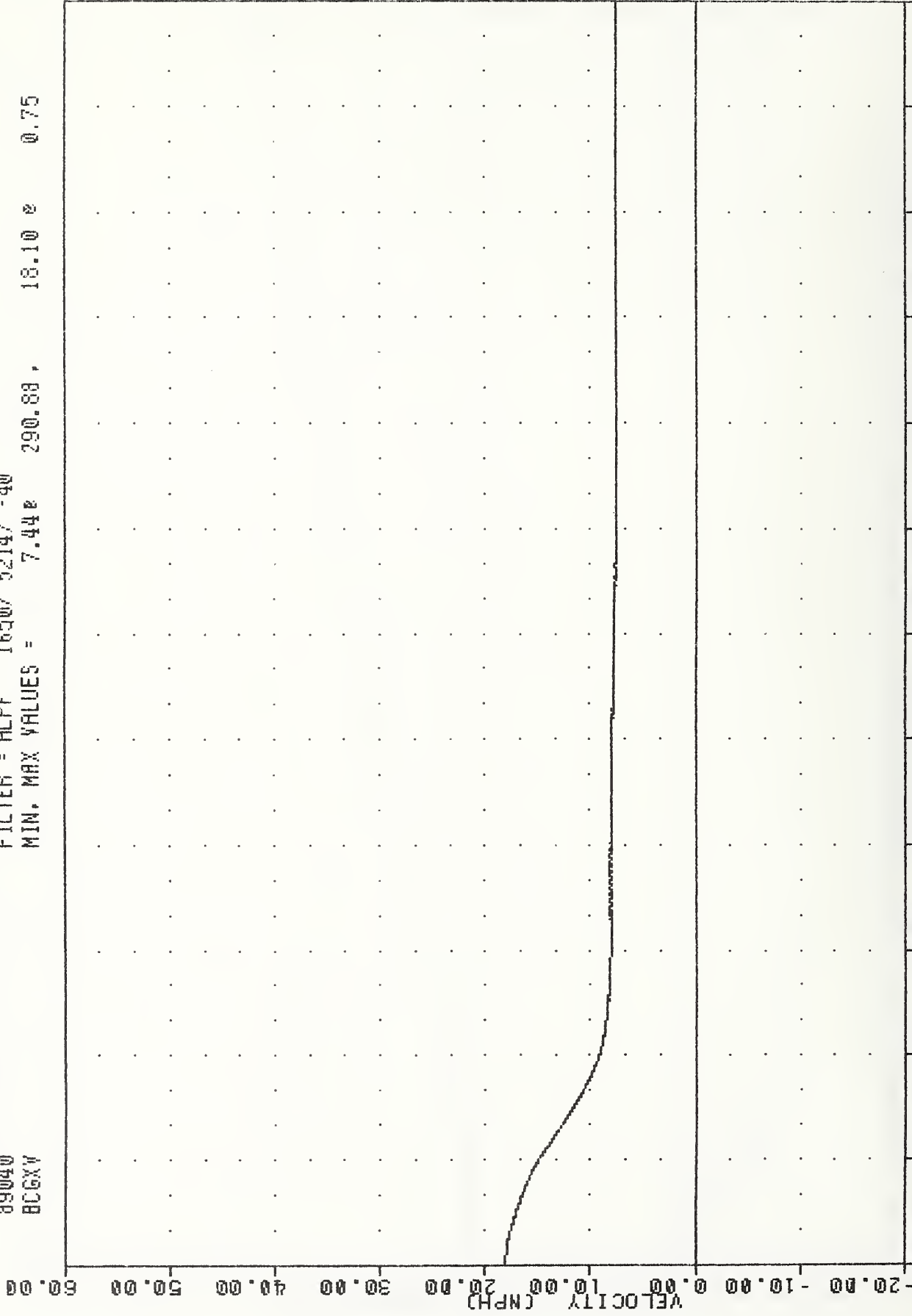
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -49.41 340.00 , 0.00 1.75



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 RIGHT REAR SILL Y AXIS DISPLACEMENT

VRTC-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 BCGXY

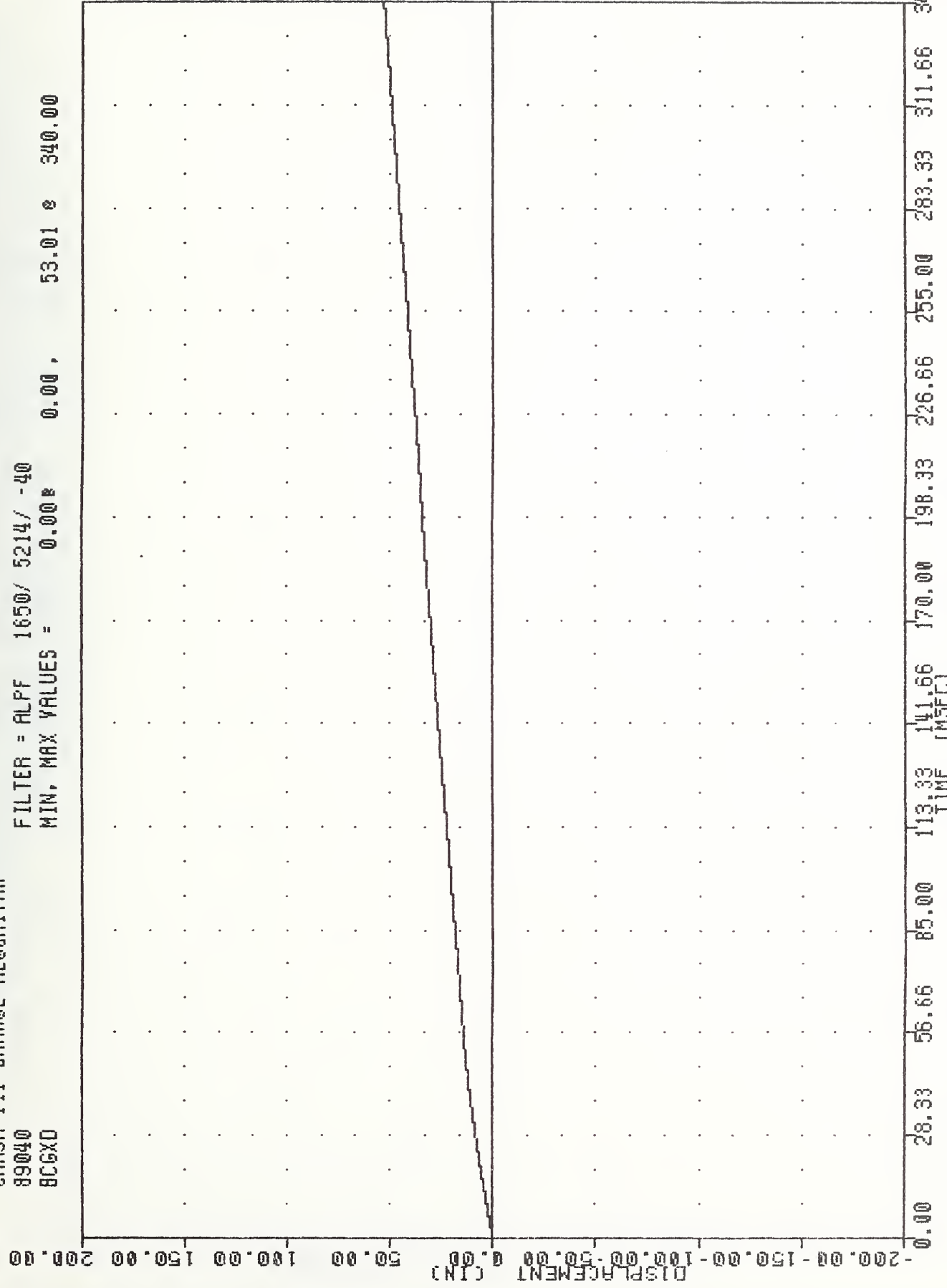
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 7.44e 290.88 , 18.10 e 0.75



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 CONTOURED MOVING BARRIER CENTER OF GRAVITY X AXIS VELOCITY

VRTC-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 BCGXD

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 0.00 53.01 340.00



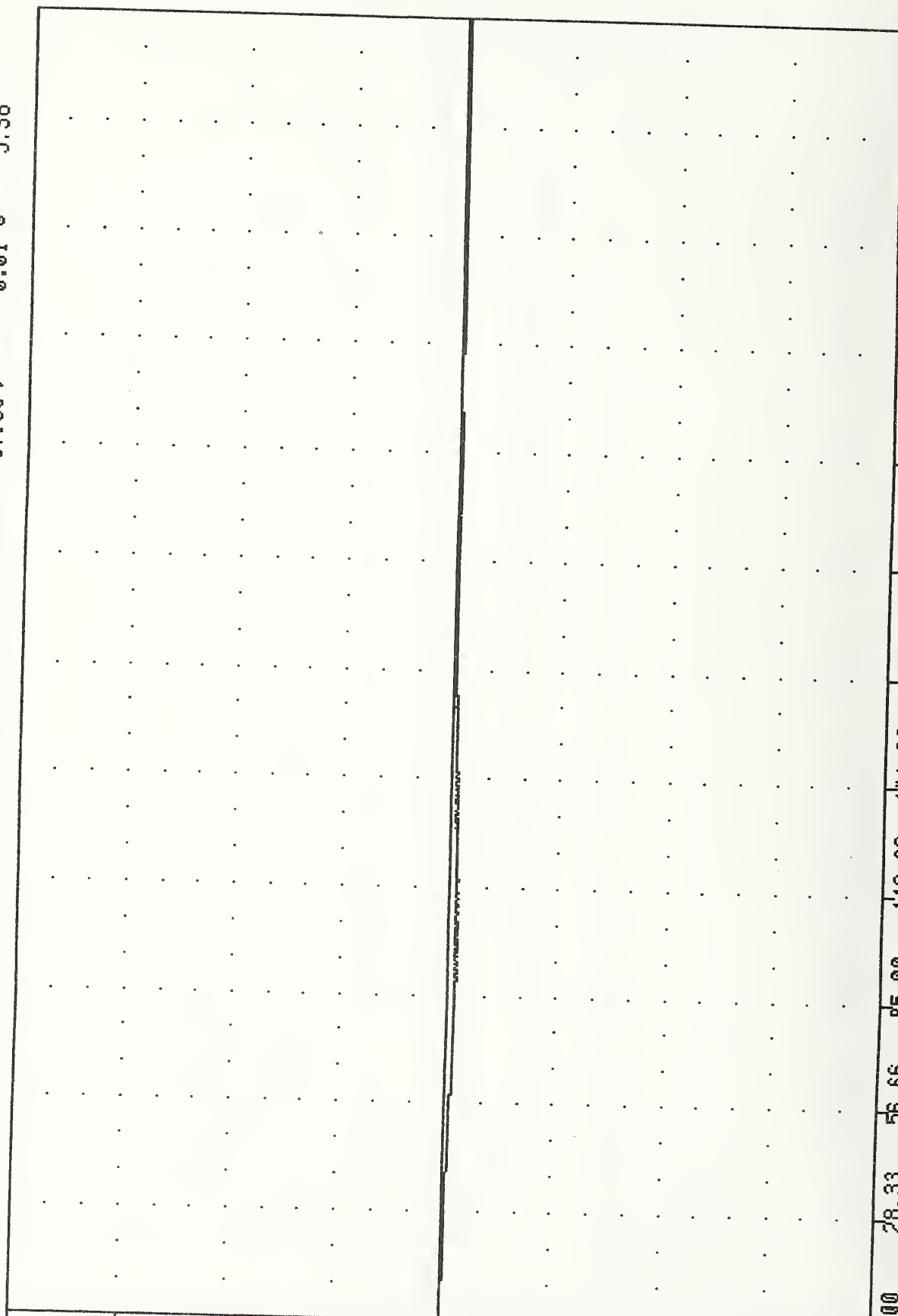
CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 CONTOURED MOVING BARRIER CENTER OF GRAVITY X AXIS DISPLACEMENT

VRTC-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 BCGYV

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -0.77e

97.88 , 0.01 e 5.38

40.00
 30.00
 20.00
 10.00
 0.00
 -10.00
 -20.00
 -30.00
 -40.00



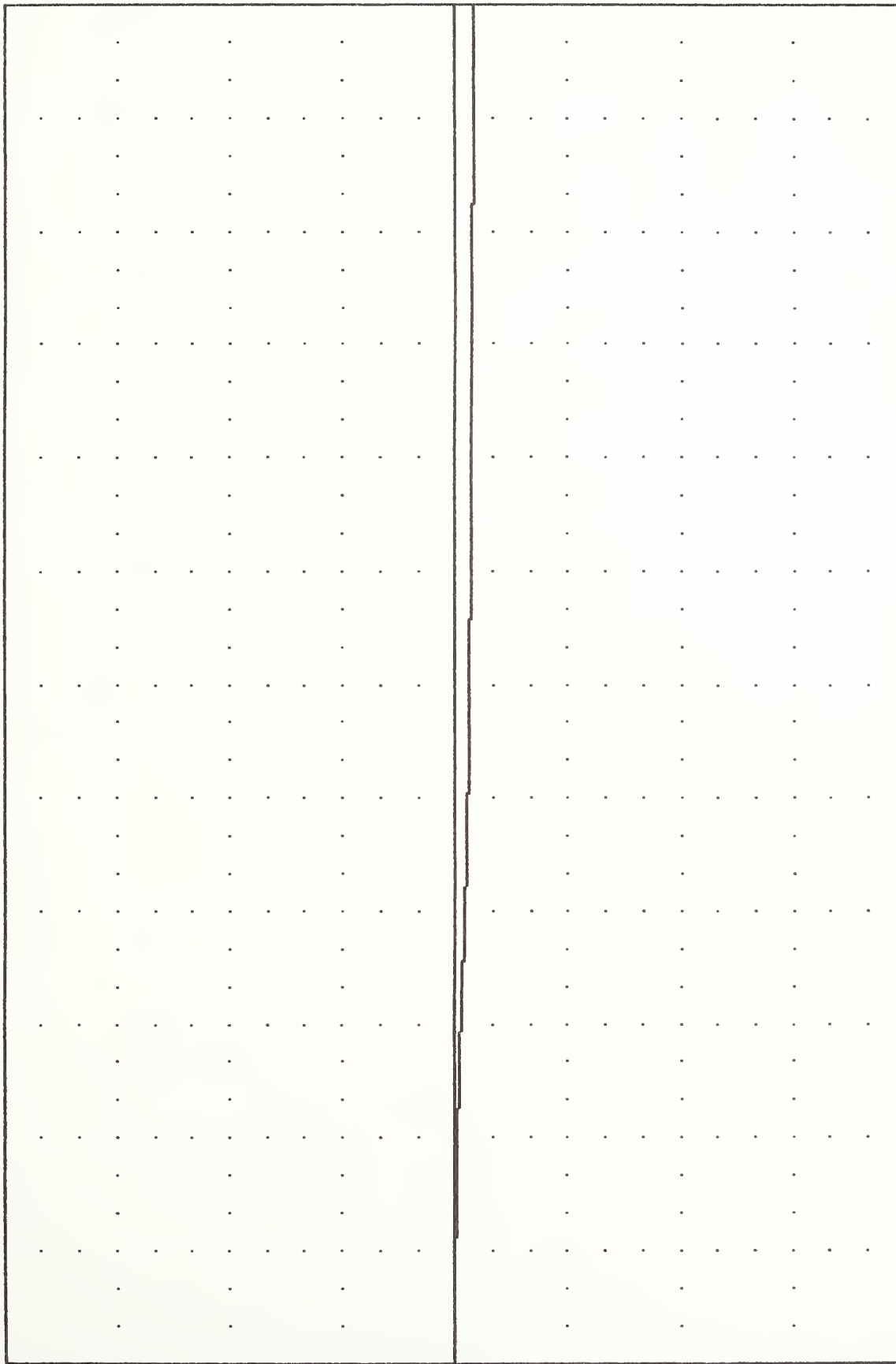
28.33 56.66 85.00 113.33 141.66 170.00 198.33 226.66 255.00 283.33 311.66 340.00
 TIME (MSEC)
 CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 CONTOURED MOVING BARRIER CENTER OF GRAVITY Y AXIS VELOCITY

VRTC-1 , 890209-1
 CRASH III DAMAGE ALGORITHM
 89040
 BCGYD

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -1.718 340.00 , 0.00 0.00

DISPLACEMENT (IN)

40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
-40.00

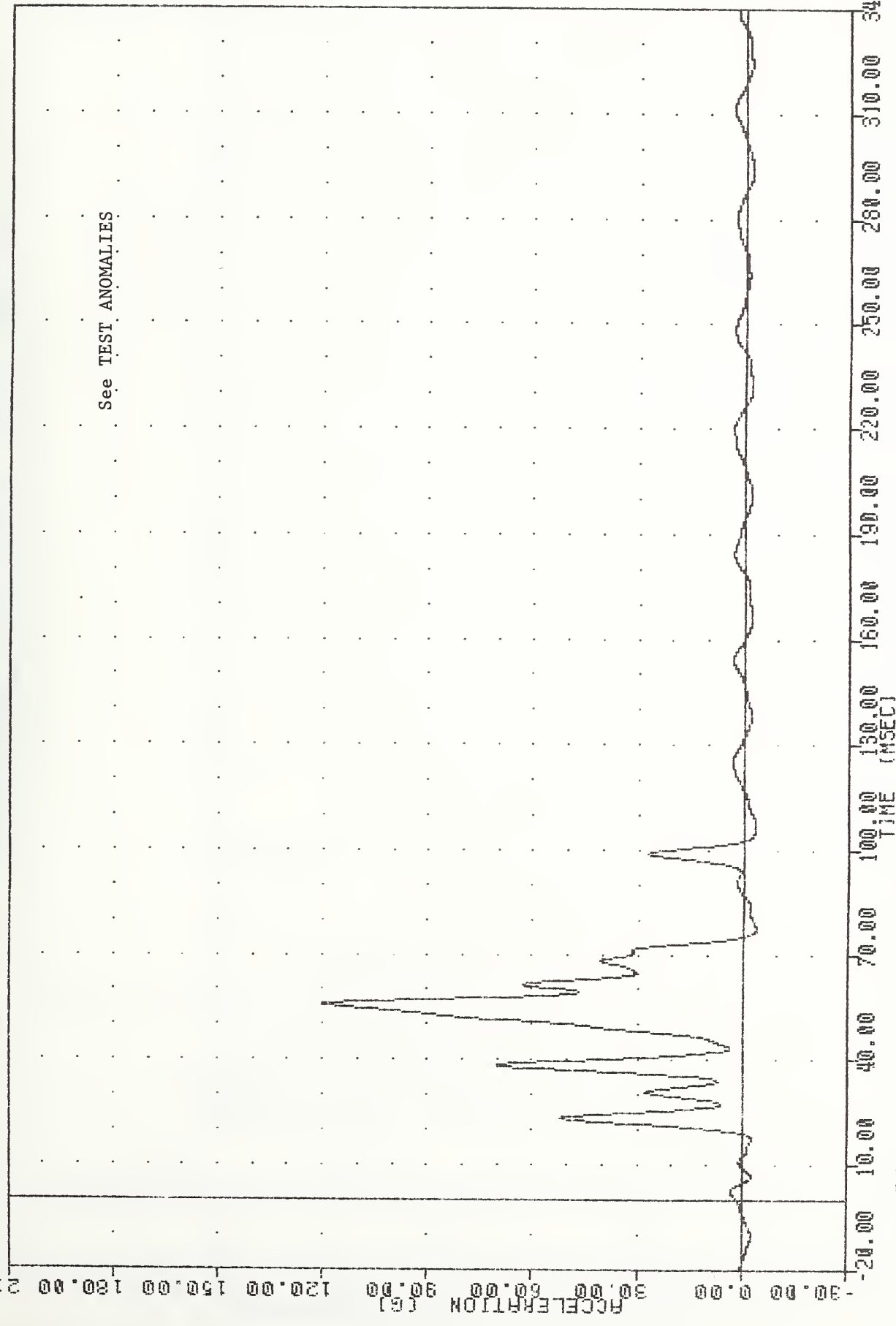


CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 18.1 MPH #1
 CONTOURED MOVING BARRIER CENTER OF GRAVITY Y AXIS DISPLACEMENT

TEST #890209-2

VRTC-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 RFSXG

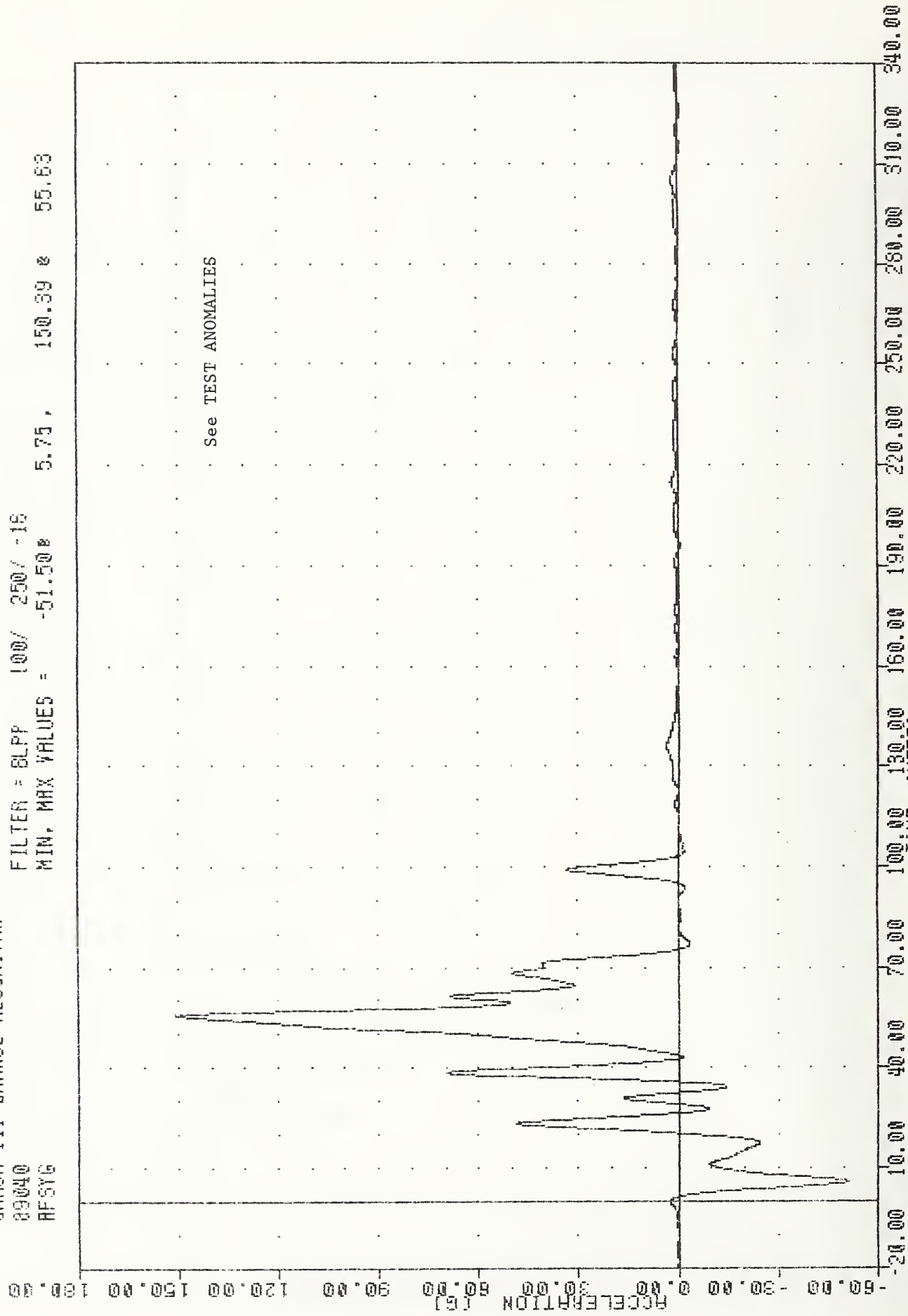
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -3.92e 77.50 , 120.30 * 55.75



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 RIGHT FRONT SILL X AXIS ACCELERATION

VRTC-2 , 890209-2
CRASH III DAMAGE ALGORITHM
89040
RFSYG

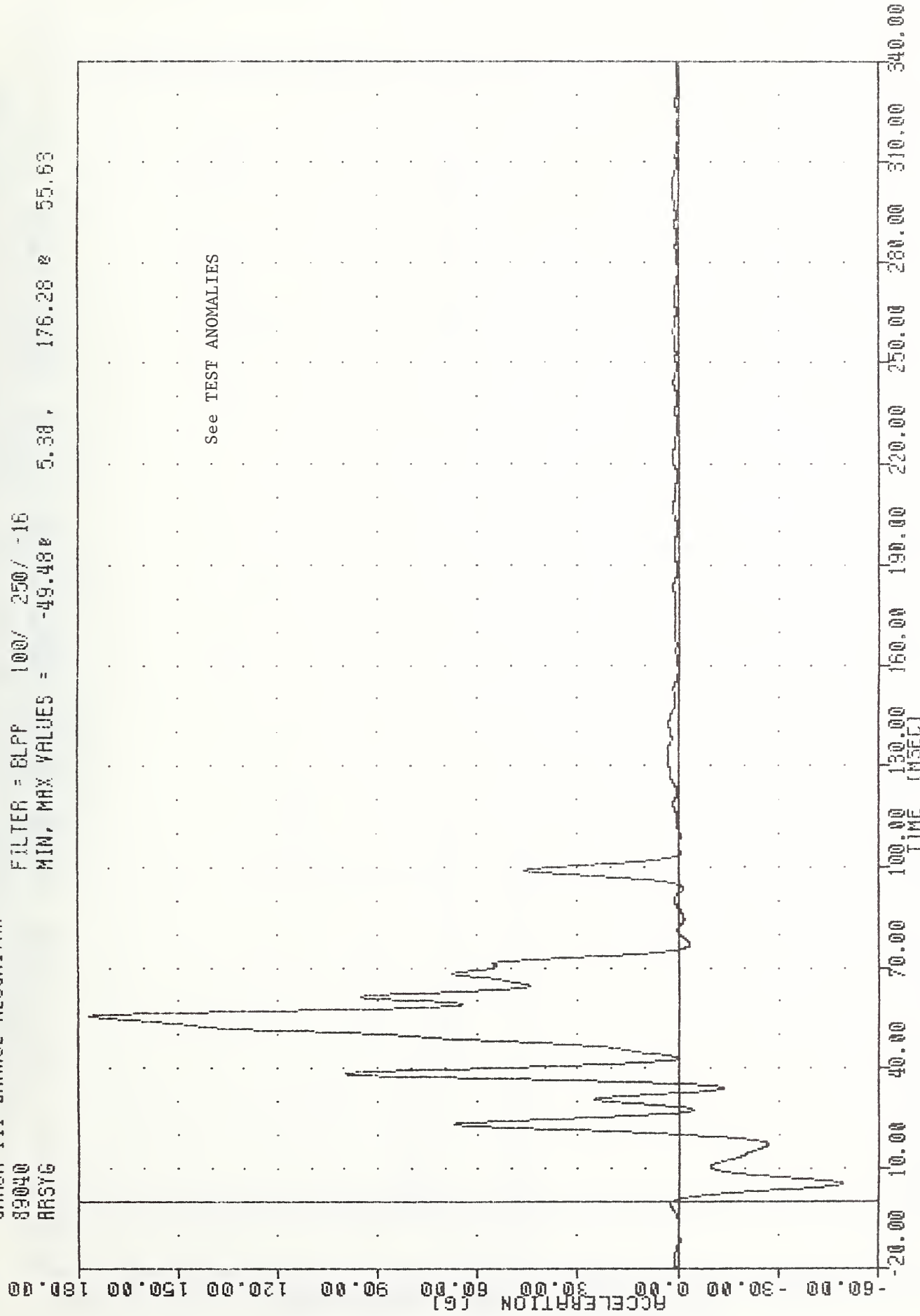
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -51.508 5.75, 150.39 & 55.63



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
RIGHT FRONT SILL Y AXIS ACCELERATION

WRTC-2 , 890209-2
CRASH III DAMAGE ALGORITHM
89040
RRSYG

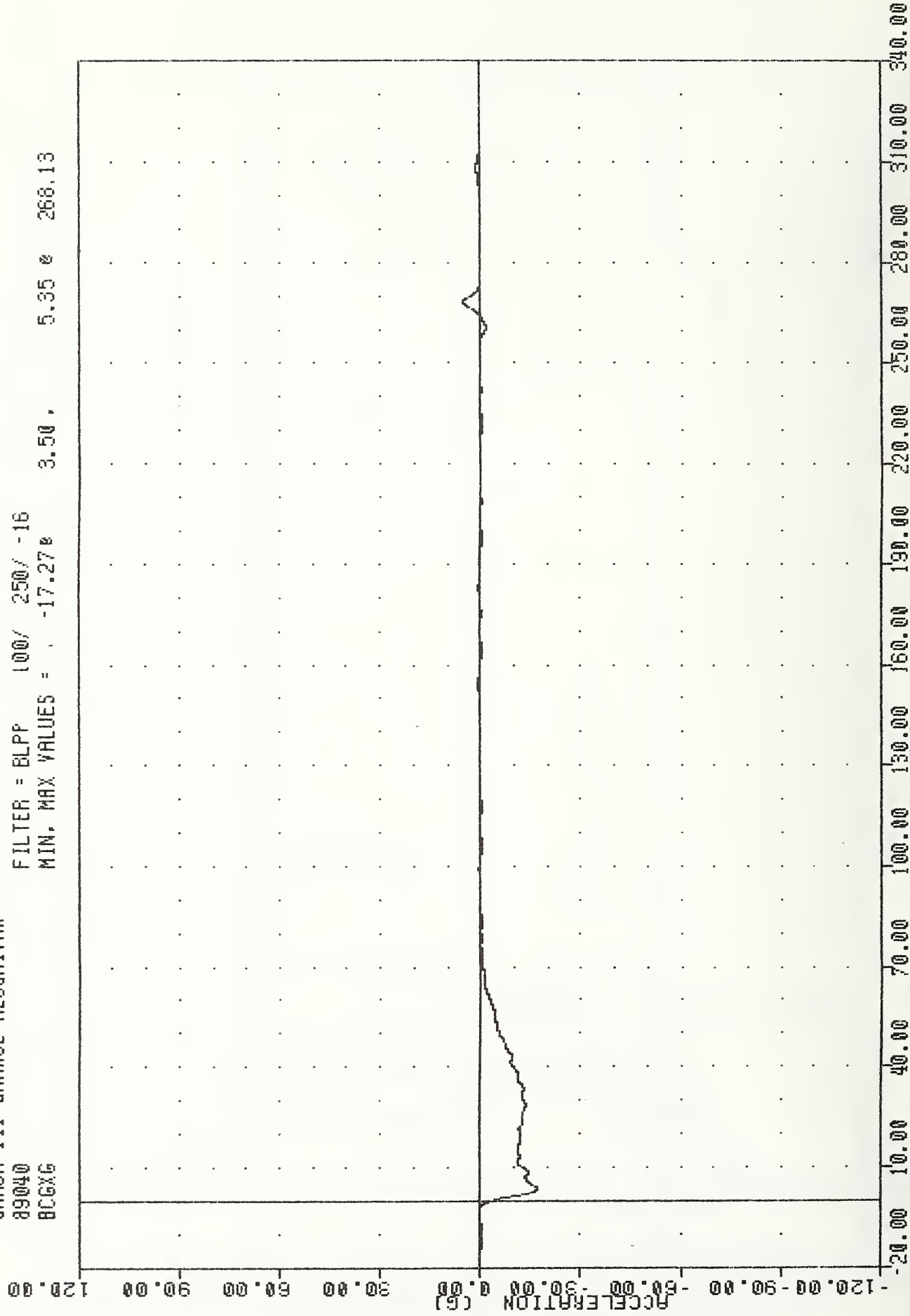
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -49.48 5.38 , 176.28 55.63



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
RIGHT REAR SILL Y AXIS ACCELERATION

VRTC-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 BCGXG

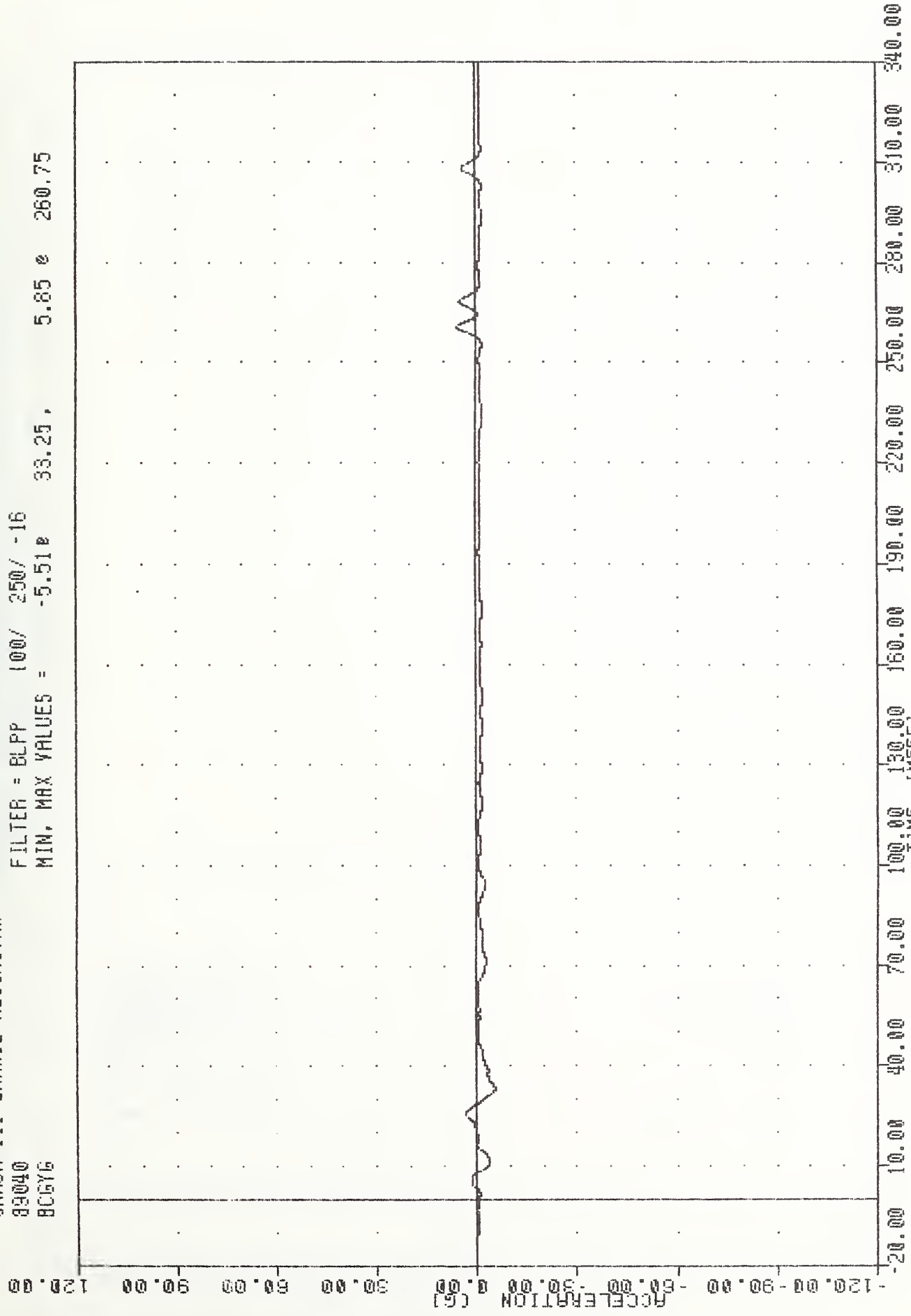
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = , -17.27e 3.50 , 5.35 e 268.13



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH *2
 CONTOURED MOVING BARRIER CENTER OF GRAVITY X AXIS ACCELERATION

WRTC-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 BCGYG

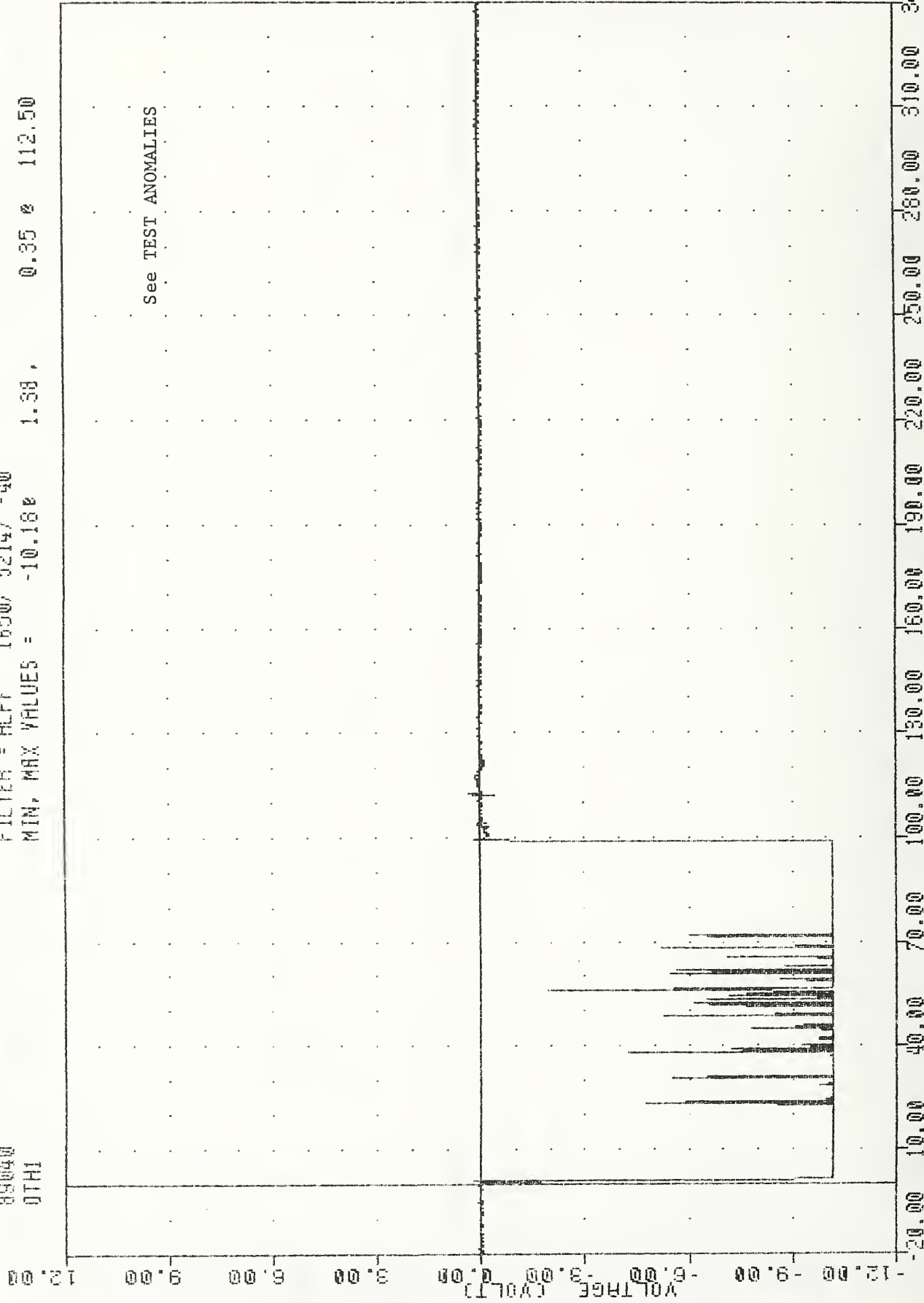
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -5.51e 33.25 , 5.85 e 260.75



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 CONTOURED MOVING BARRIER CENTER OF GRAVITY Y AXIS ACCELERATION

VRTC-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 0TH1

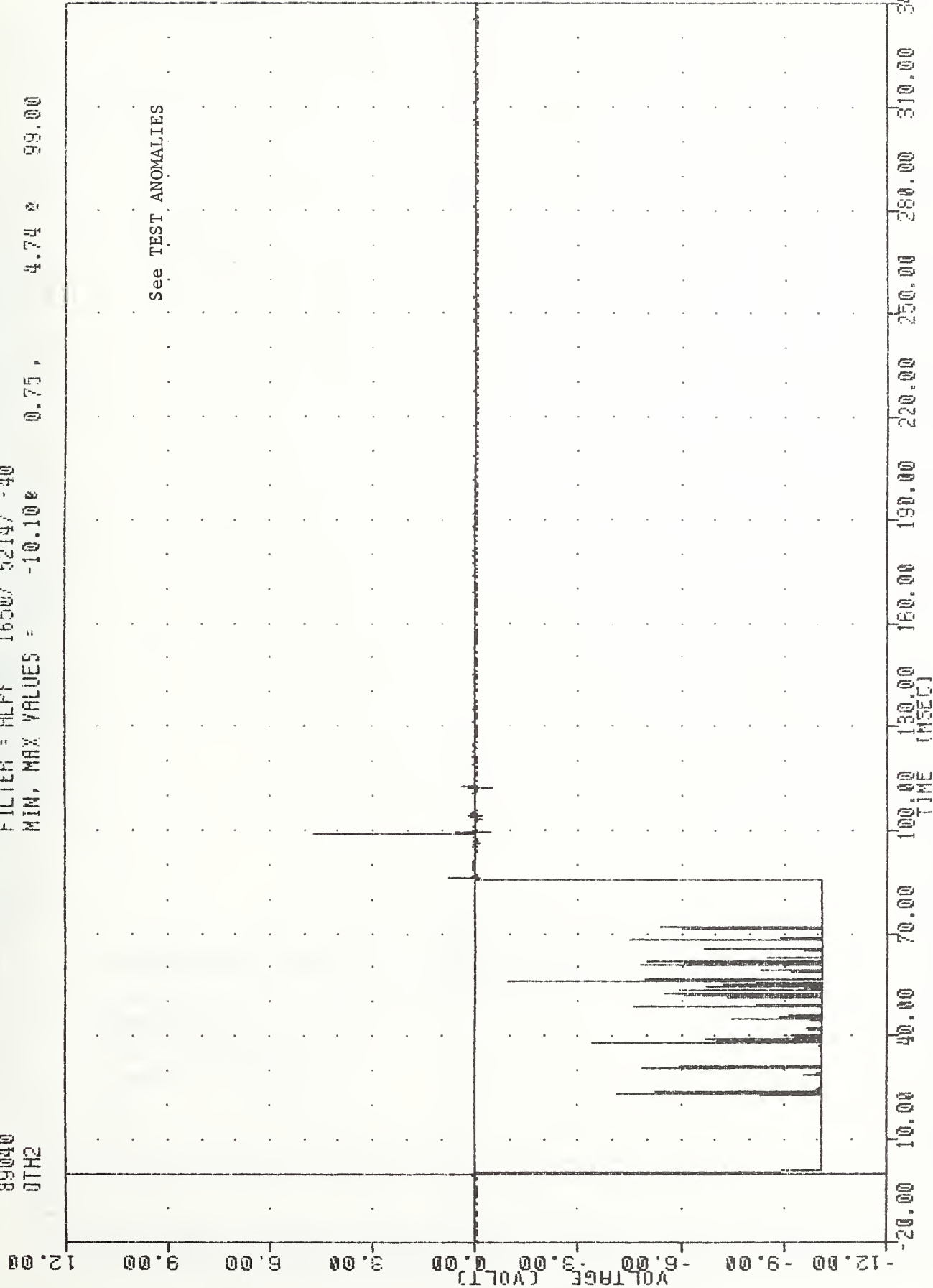
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -10.18e 1.38 , 0.35 e 112.50



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 VEHICLE CONTACT SWITCH - LEFT

WRTC-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 0TH2

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -10.10e 0.75 , 4.74 e 99.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH *2
 VEHICLE CONTACT SWITCH - CENTER - 1

VRTC-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 0TH3

FILTER = ALFF 1650/ 5214/ -40
 MIN. MAX VALUES = -10.068 0.88 , 6.51 8 68.25

12.00

9.00

6.00

3.00

0.00

-3.00

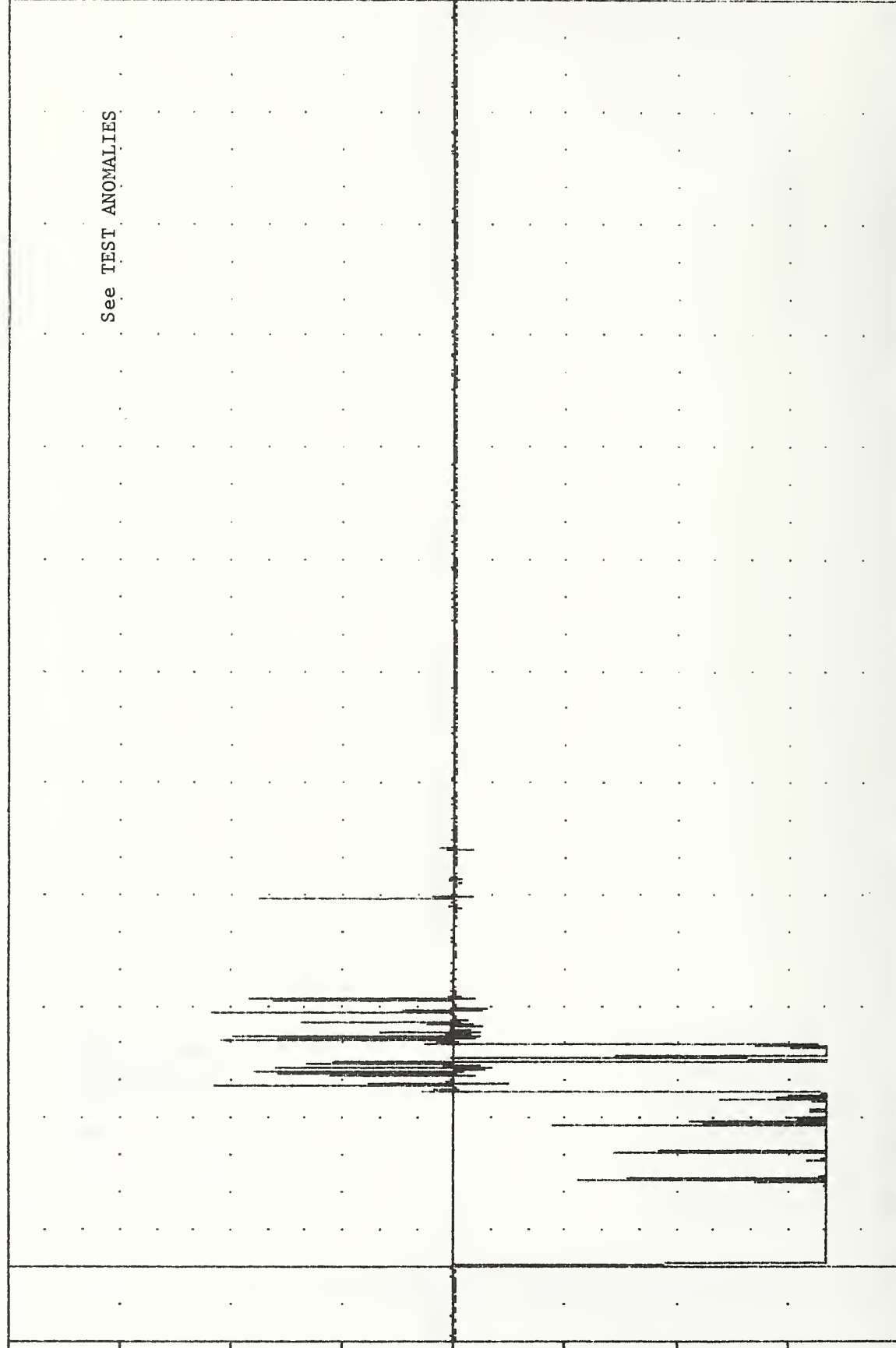
-6.00

-9.00

-12.00

VOLTAGE (VOLT)

See TEST ANOMALIES

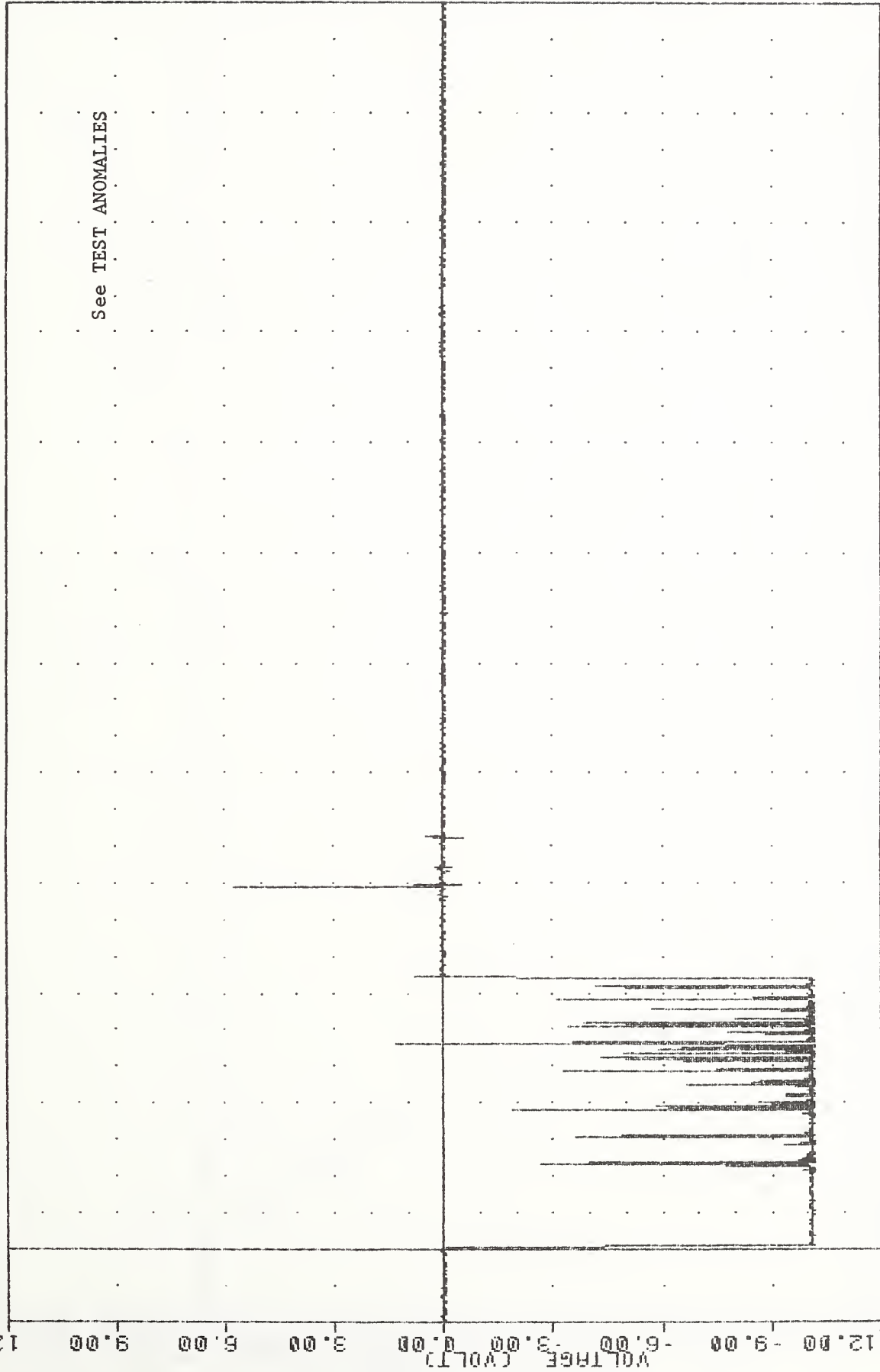


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 VEHICLE CONTACT SWITCH - CENTER - 2

VRTO-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 0TH4

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -10.17e 0.88 , 5.76 e 99.00

12.00

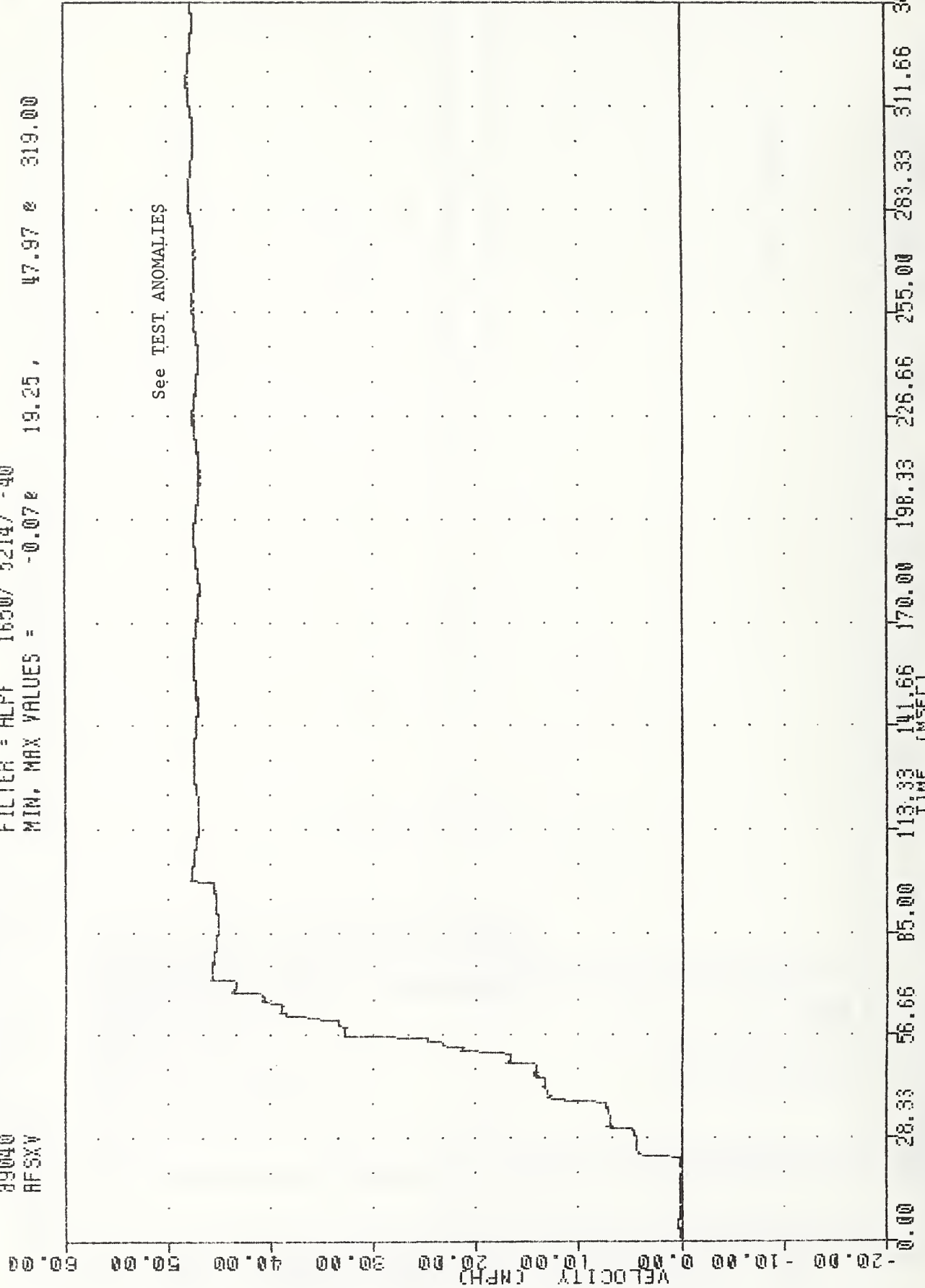


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)

CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 VEHICLE CONTACT SWITCH - RIGHT

VRIC-2
 CRASH III DAMAGE ALGORITHM
 89040
 AFSXV

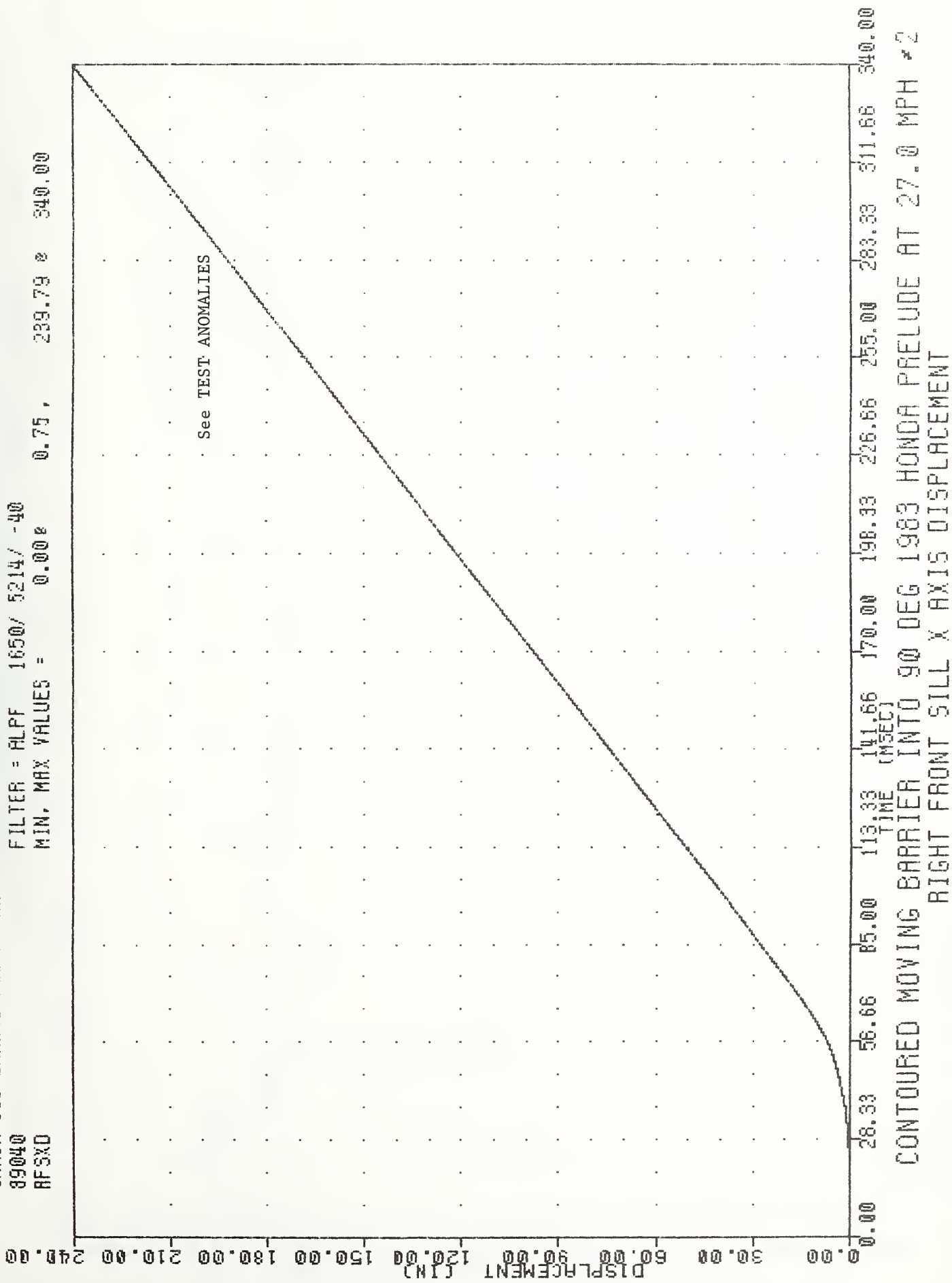
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -0.078 19.25, 47.97 319.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 RIGHT FRONT SILL X AXIS VELOCITY

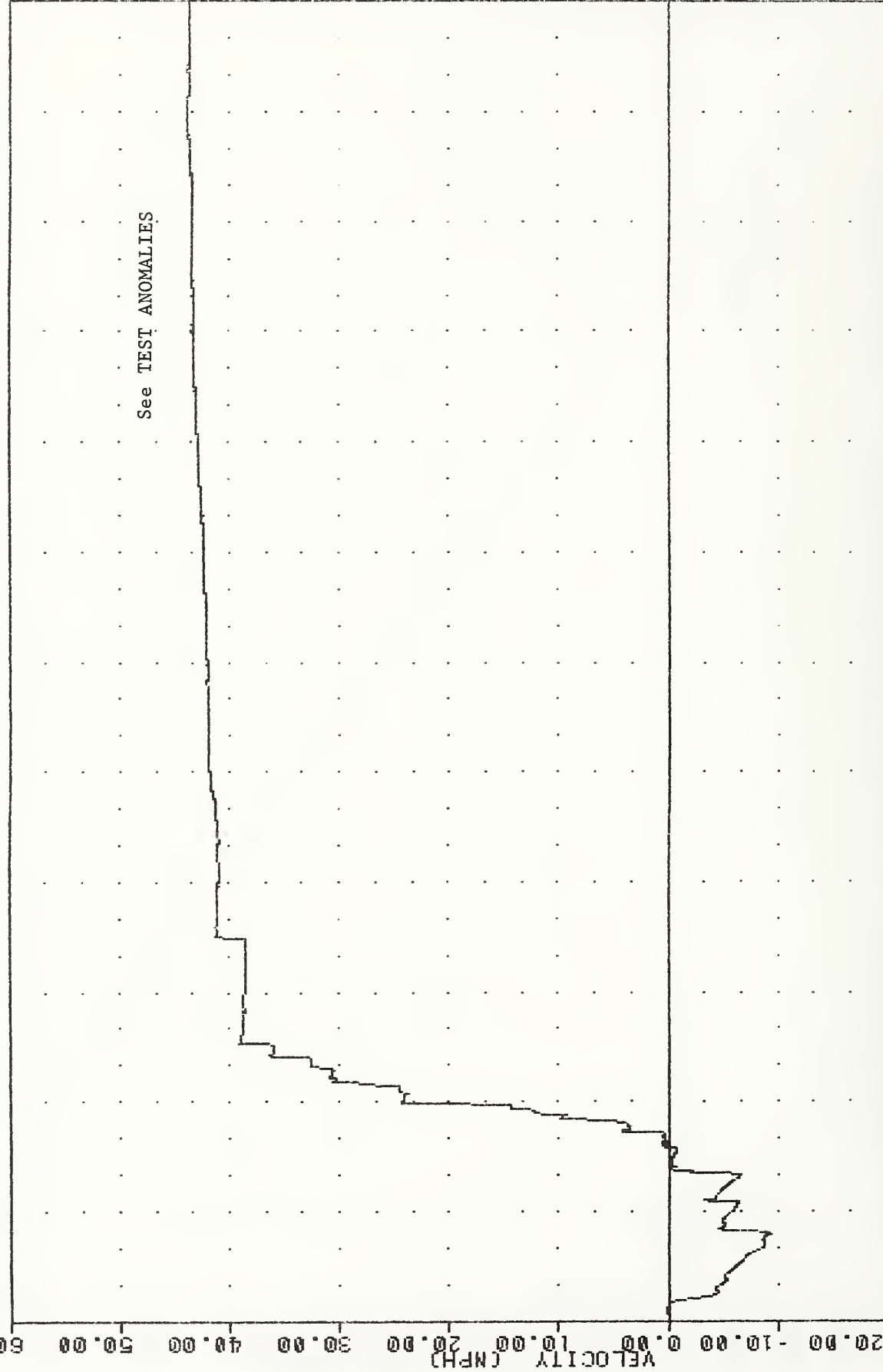
VRIC-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 RFSXD

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 0.000 0.75, 239.79 0 340.00



VRTC-2 , 890209-2
CRASH III DAMAGE ALGORITHM
89040
RFSYV

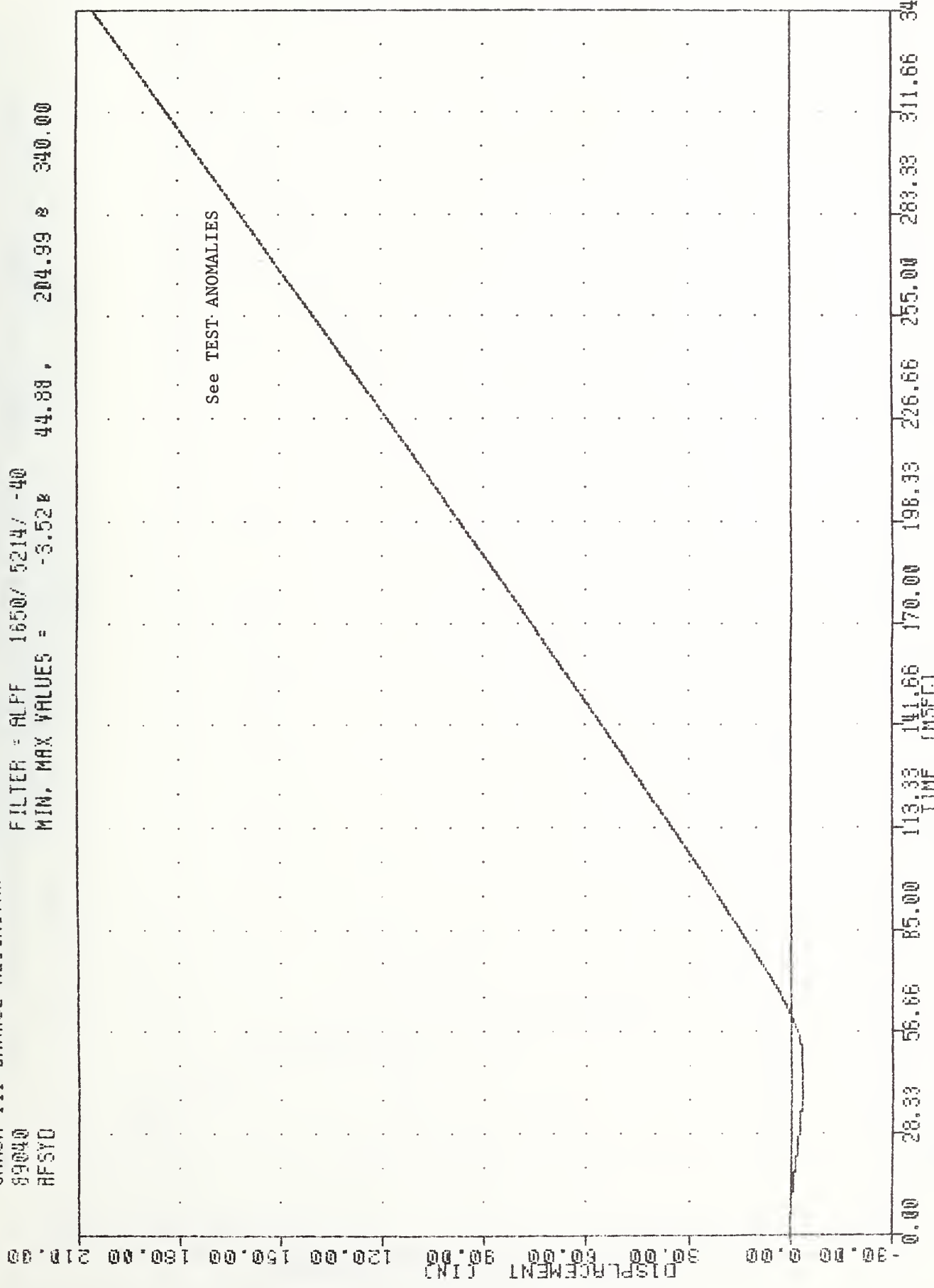
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -9.35% 22.50 , 43.82 @ 308.38



0.00 28.33 56.66 85.00 113.33 141.66 170.00 198.33 226.66 255.00 283.33 311.66 340.00
TIME (MSEC)
CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
RIGHT FRONT SILL Y AXIS VELOCITY

VRIC-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 RFSYD

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -3.52% 44.88, 204.99 & 340.00



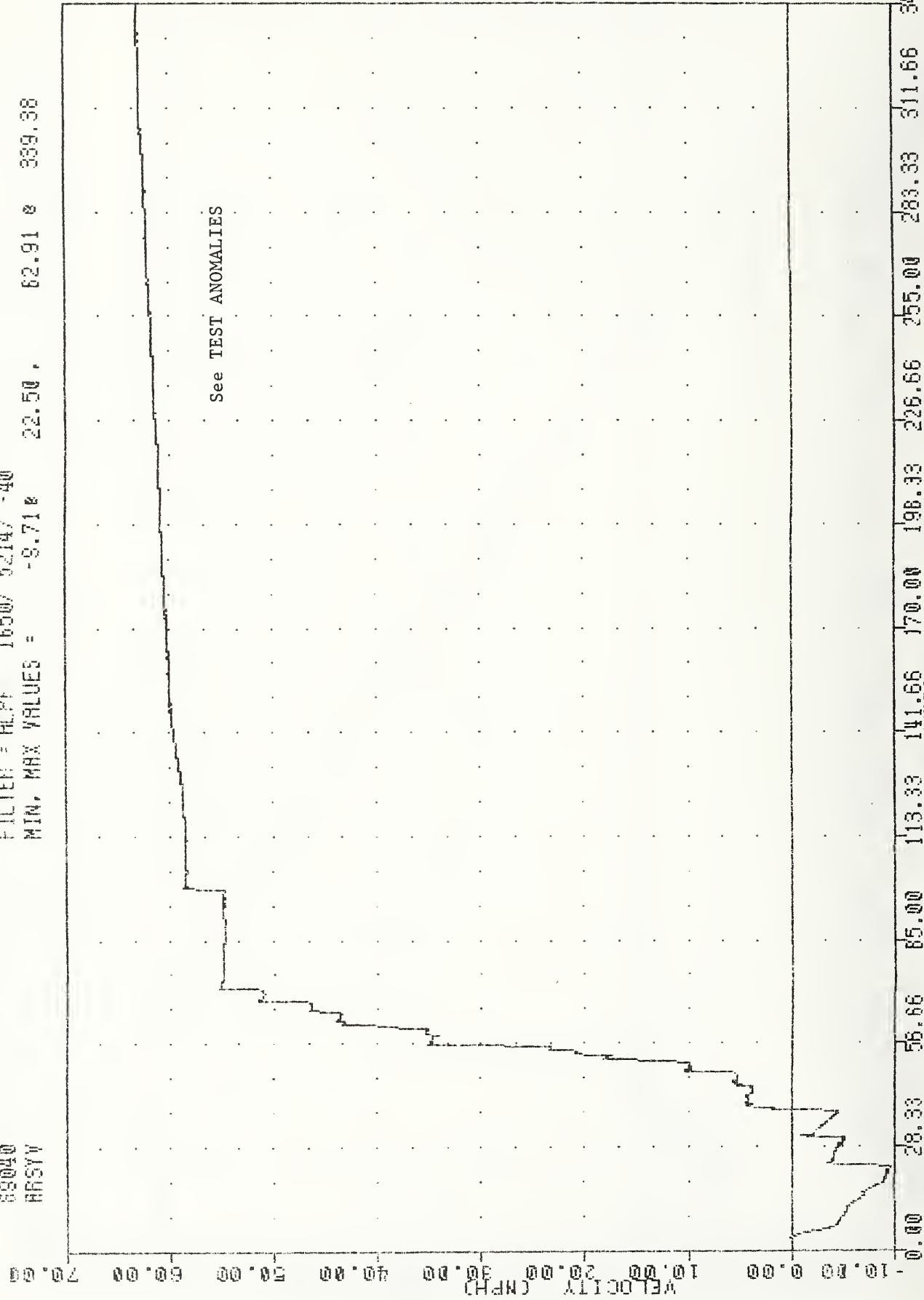
TIME (MSEC)	DISPLACEMENT (IN)
0.00	-30.00
28.33	56.66
85.00	113.33
141.66	170.00
198.33	226.66
255.00	283.33
311.66	340.00

CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 RIGHT FRONT SILL Y AXIS DISPLACEMENT

VRTC-2
 CRASH III DAMAGE ALGORITHM
 89040
 BR5V

890209-2

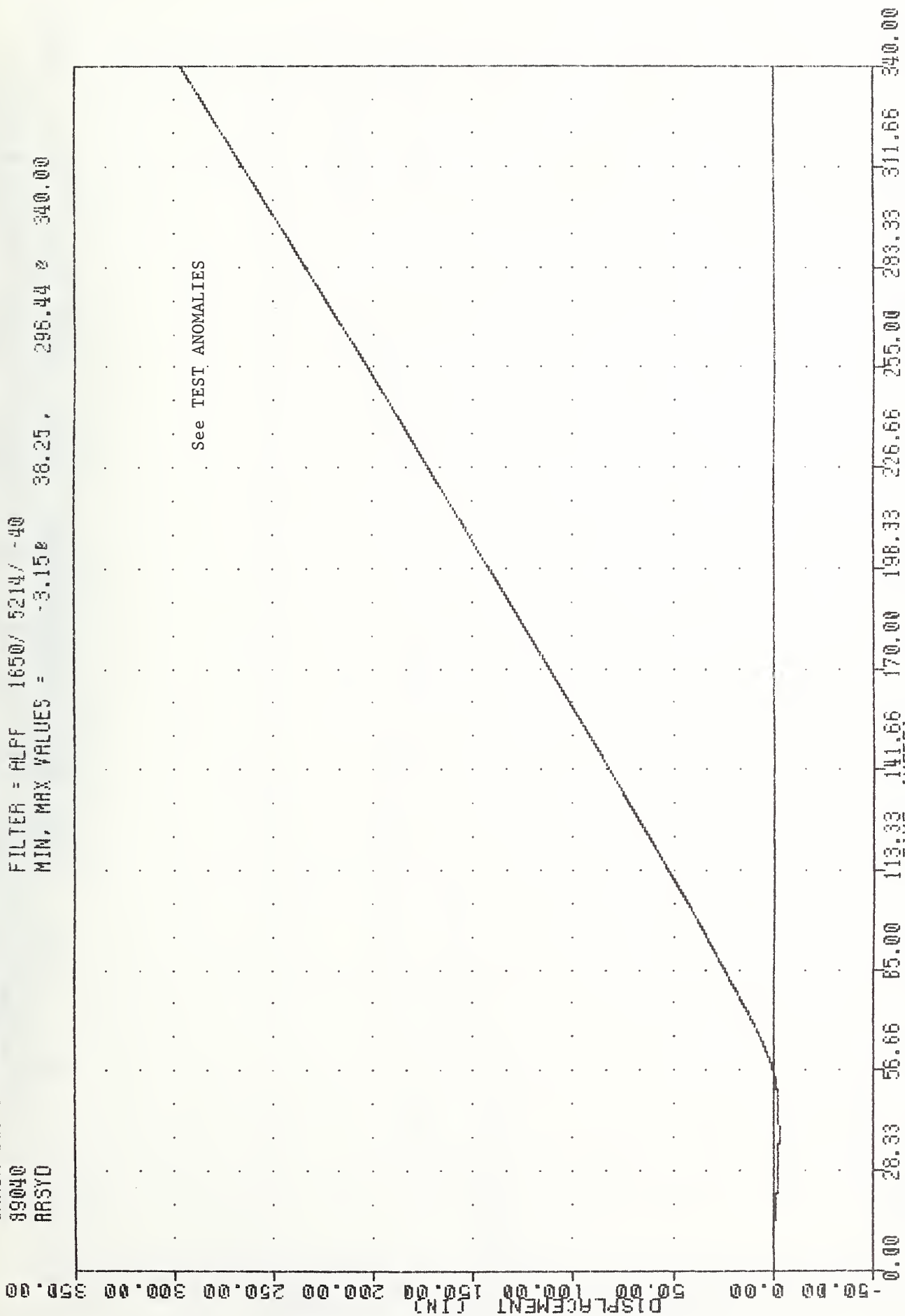
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -8.718 22.50 82.91 8 339.38



CONToured MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 RIGHT REAR SILL Y AXIS VELOCITY

VRTC-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 ARSYD

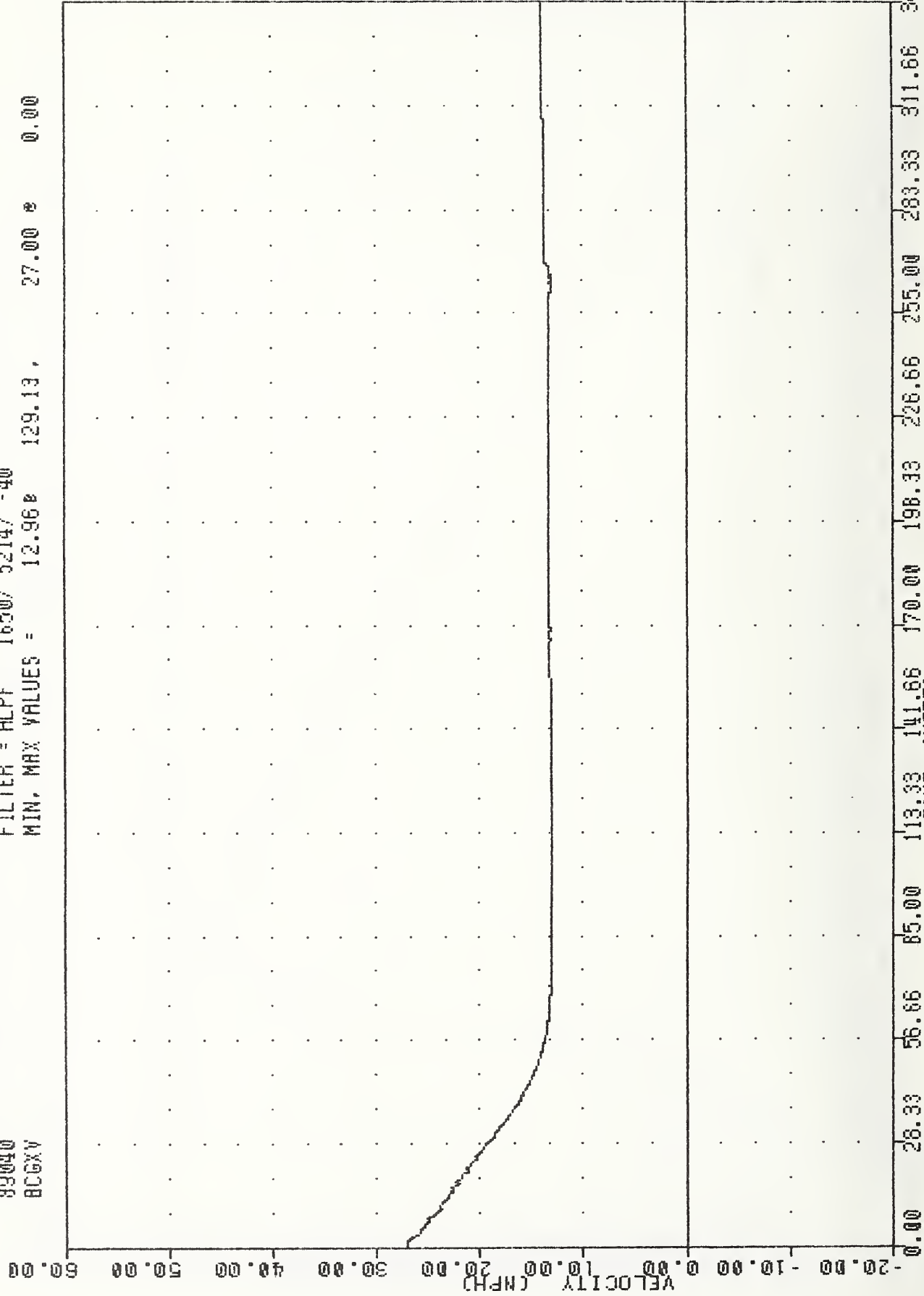
FILTER = ALFF 1650/ 5214/ -40
 MIN. MAX VALUES = -3.150 38.25, 296.44 0 340.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 RIGHT REAR SILL Y AXIS DISPLACEMENT

VRTC-2 , 890203-2
 CRASH III DAMAGE ALGORITHM
 89040
 BCGXV

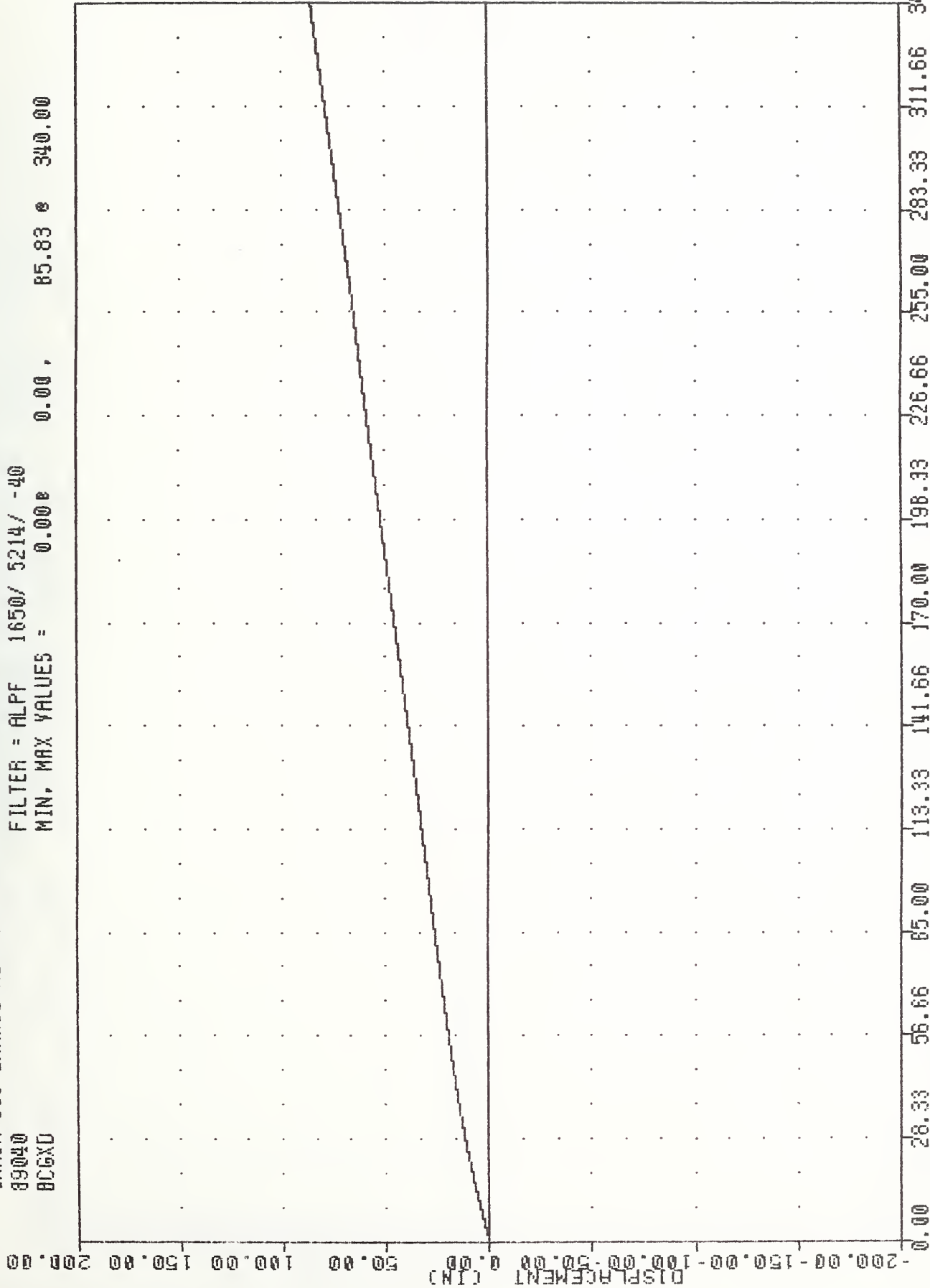
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 12.96 129.13 , 27.00 0.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 CONTOURED MOVING BARRIER CENTER OF GRAVITY X AXIS VELOCITY

VRTC-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 BCGXD

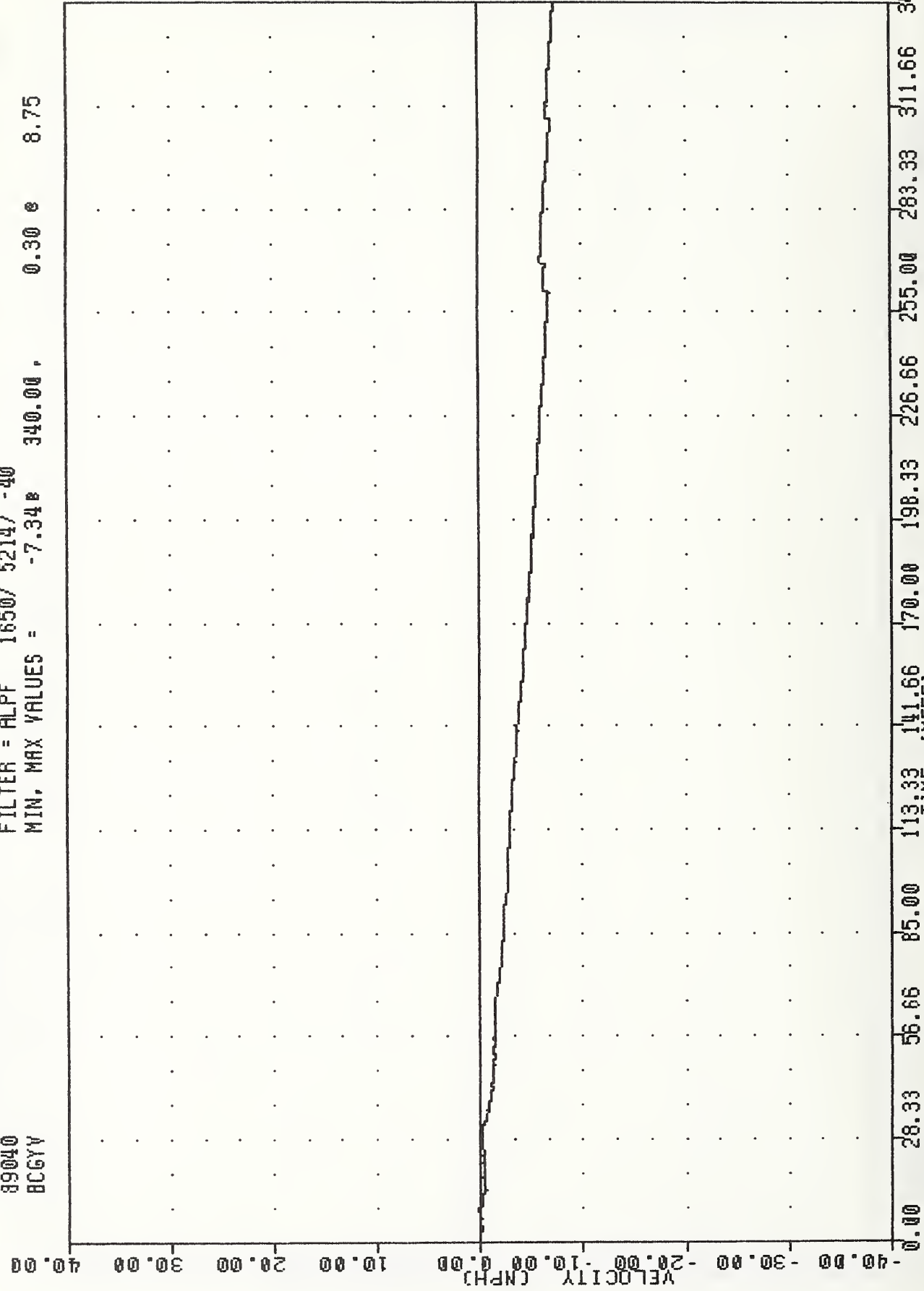
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 0.00e 0.00 , 85.83 e 340.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 CONTOURED MOVING BARRIER CENTER OF GRAVITY X AXIS DISPLACEMENT

VRTC-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 BCGYV

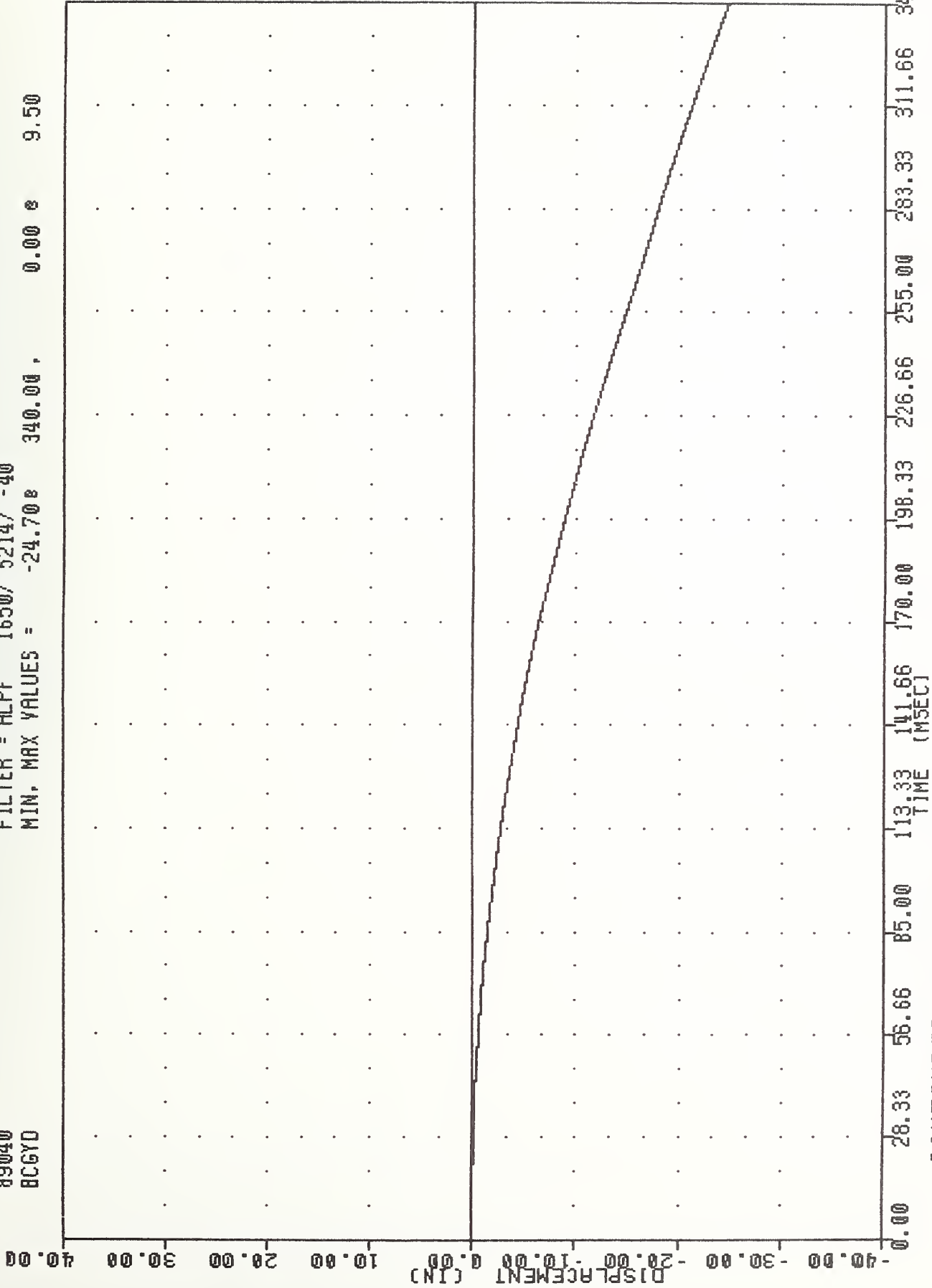
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -7.34 340.00 0.30 8.75



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 CONTOURED MOVING BARRIER CENTER OF GRAVITY Y AXIS VELOCITY

YRTC-2 , 890209-2
 CRASH III DAMAGE ALGORITHM
 89040
 BCGYD

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -24.70 340.00 0.00 9.50



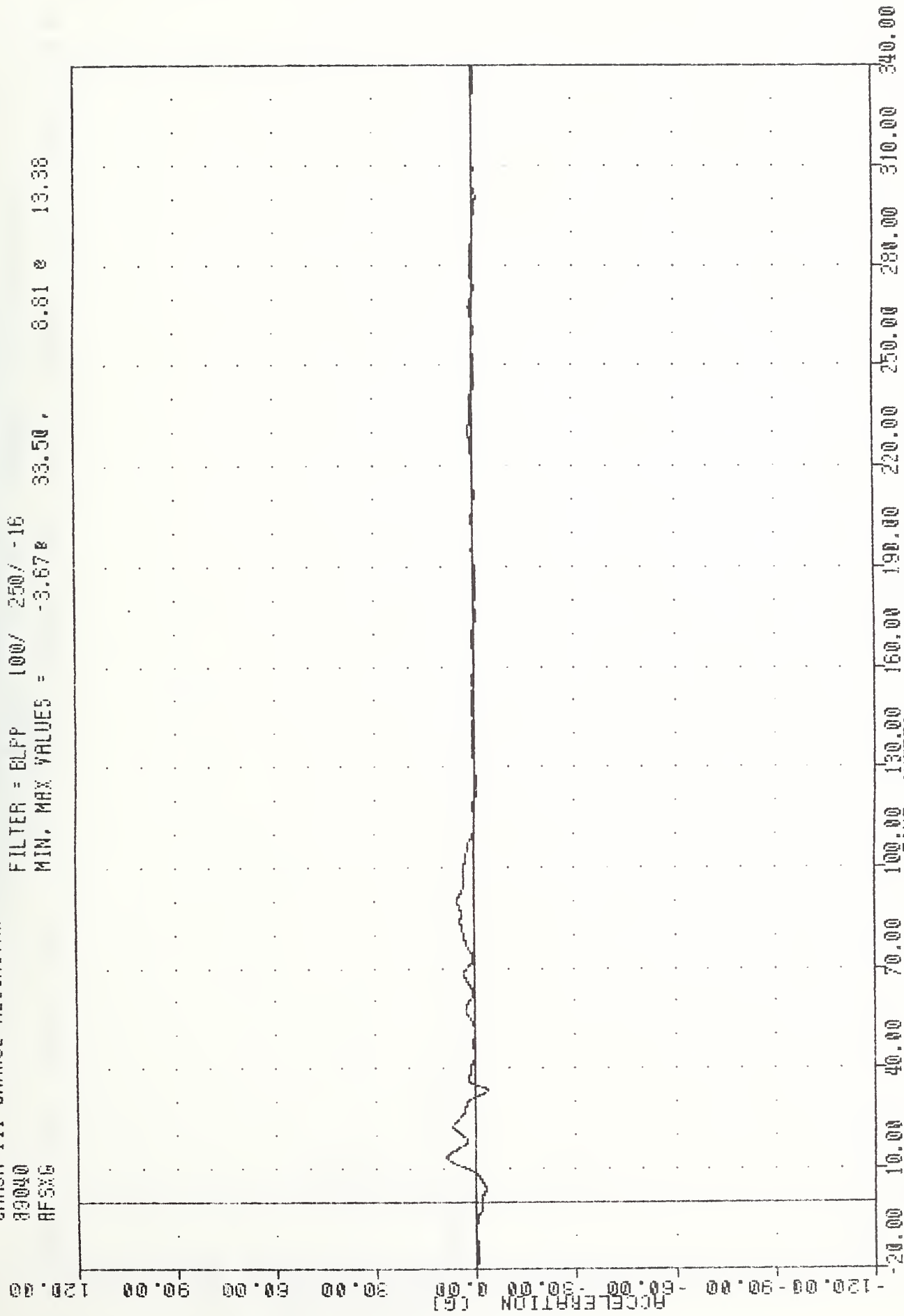
CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.0 MPH #2
 CONTOURED MOVING BARRIER CENTER OF GRAVITY Y AXIS DISPLACEMENT



TEST #890209-3

VRTC-3
 CRASH III DAMAGE ALGORITHM
 89040
 RFSXG

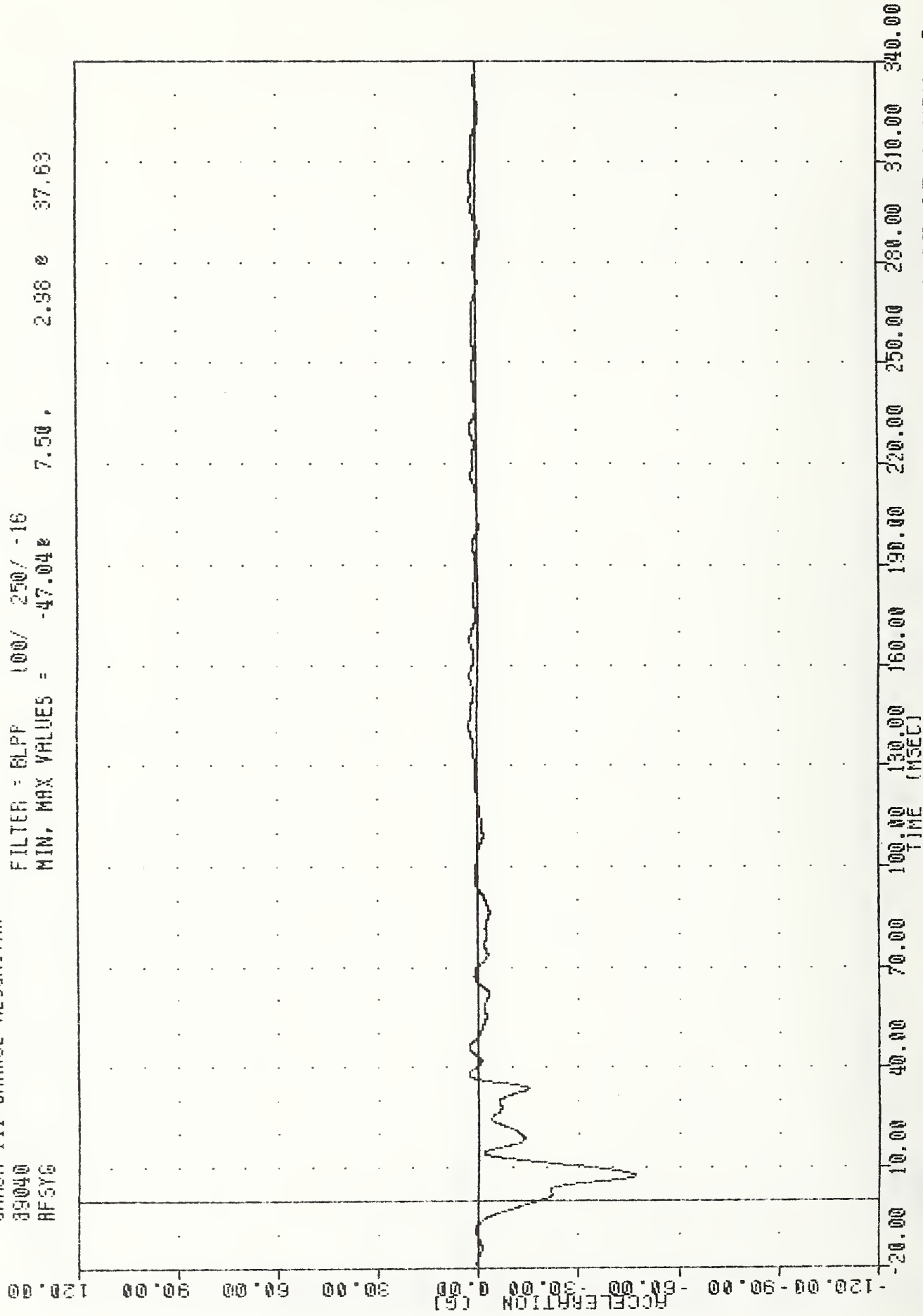
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -3.67 0.81 0 13.38



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH *3
 RIGHT FRONT SILL X AXIS ACCELERATION

VRIC-3 , 890209-3
CRASH III DAMAGE ALGORITHM
89040
AFSYG

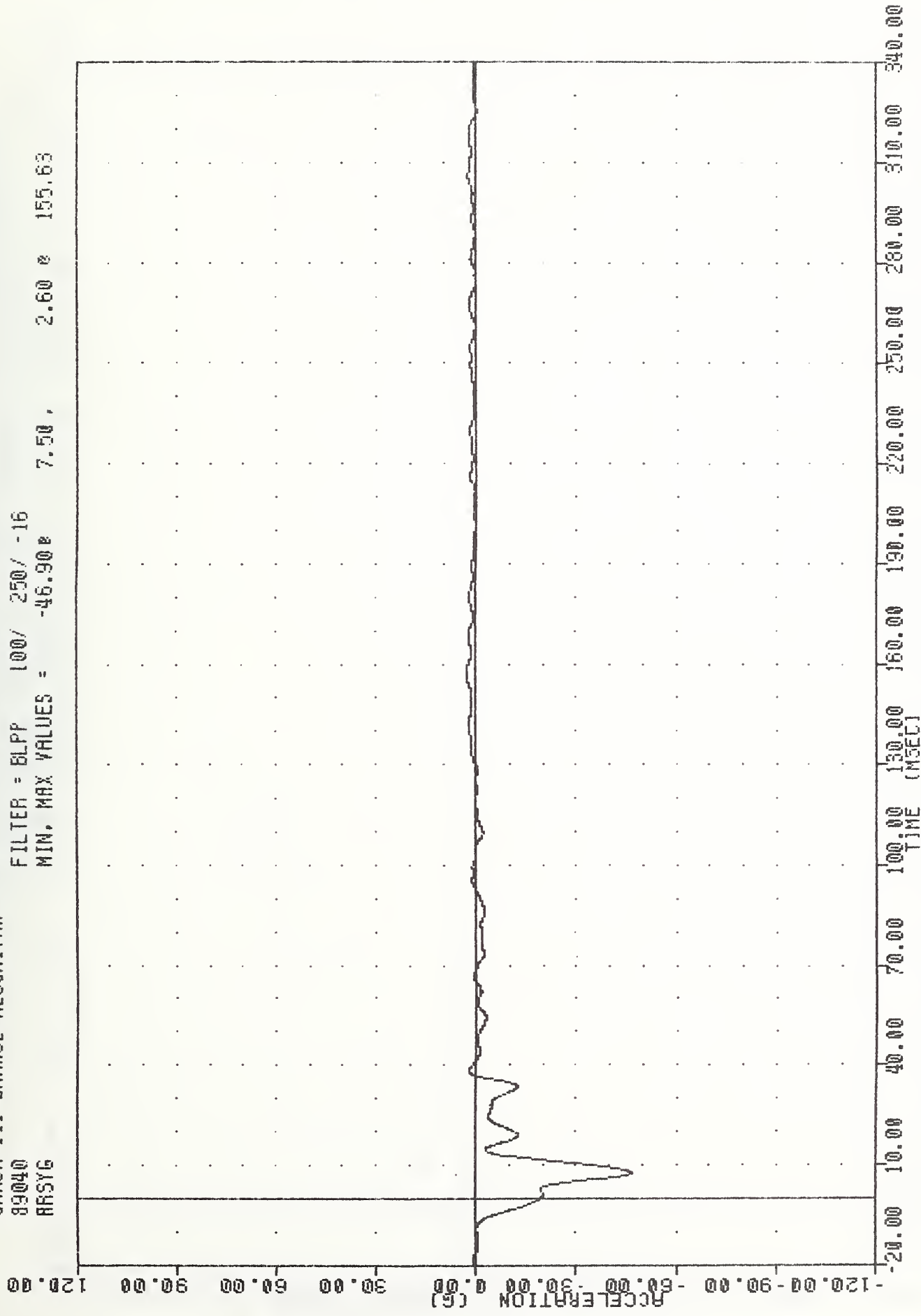
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -47.04g 7.50g 2.98g 37.63



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH ±3
RIGHT FRONT SILL Y AXIS ACCELERATION

VRTC-3 , 890209-3
CRASH III DAMAGE ALGORITHM
89040
RRSYG

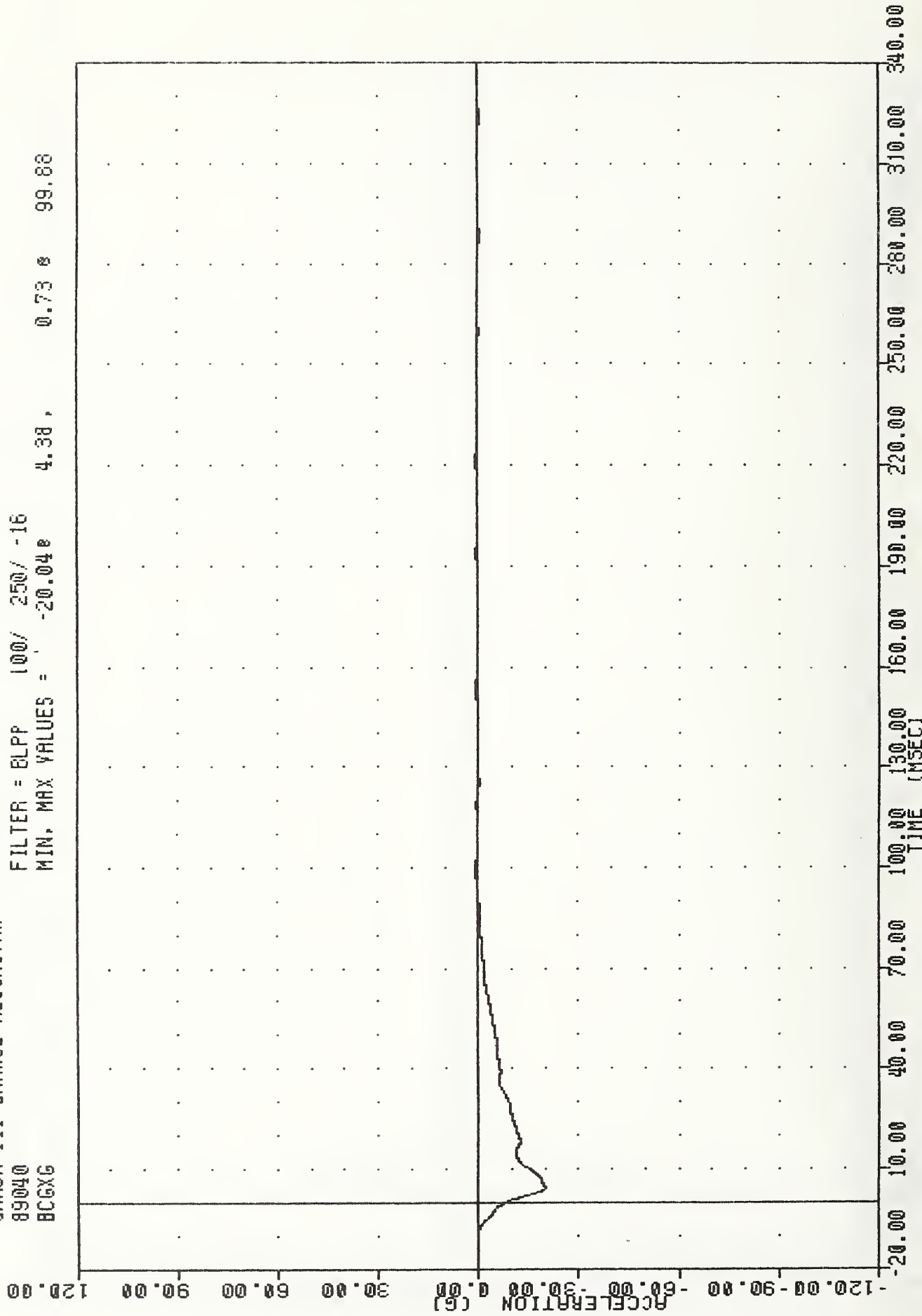
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -46.90 7.50 , 2.60 155.63



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
RIGHT REAR SILL Y AXIS ACCELERATION

VRTC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM
 89040
 BCGXG

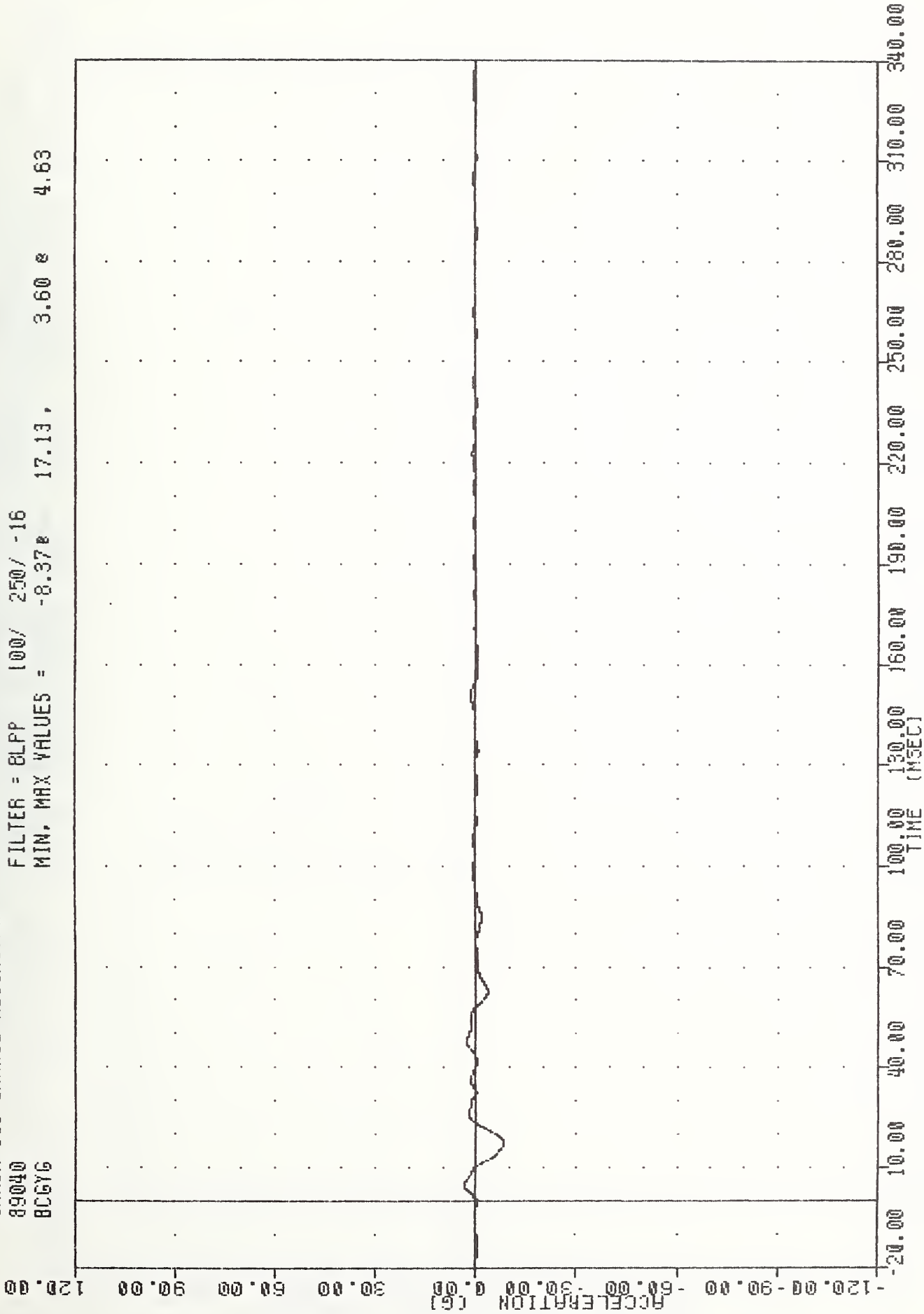
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -20.04e 4.38 , 0.73 s 99.88



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 CONTOURED MOVING BARRIER CENTER OF GRAVITY X AXIS ACCELERATION

VRTC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM
 89040
 BCGYG

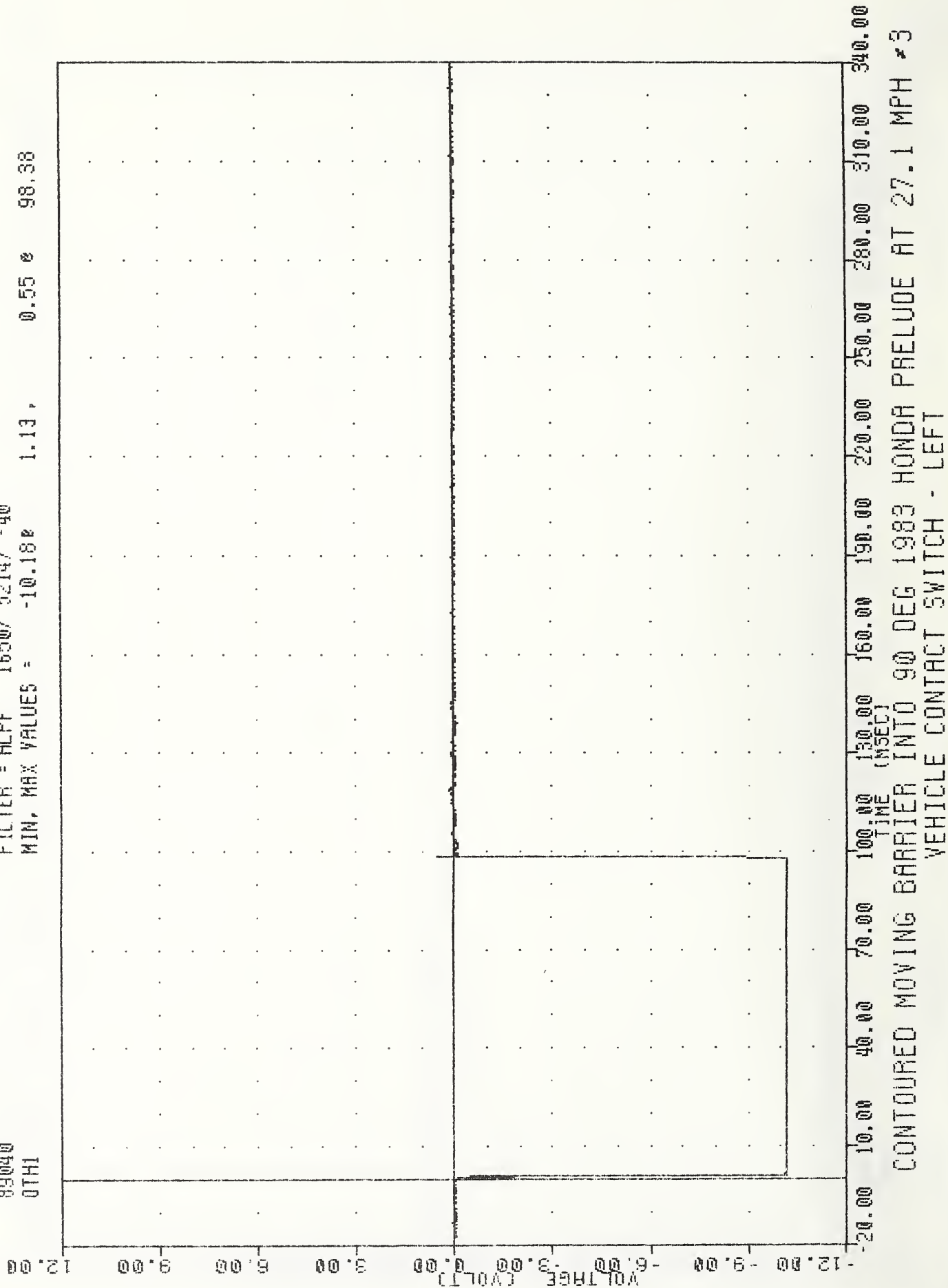
FILTER = 8LPP 100/ 250/ -16
 MIN. MAX VALUES = -8.37e 17.13, 3.60 e 4.63



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 CONTOURED MOVING BARRIER CENTER OF GRAVITY Y AXIS ACCELERATION

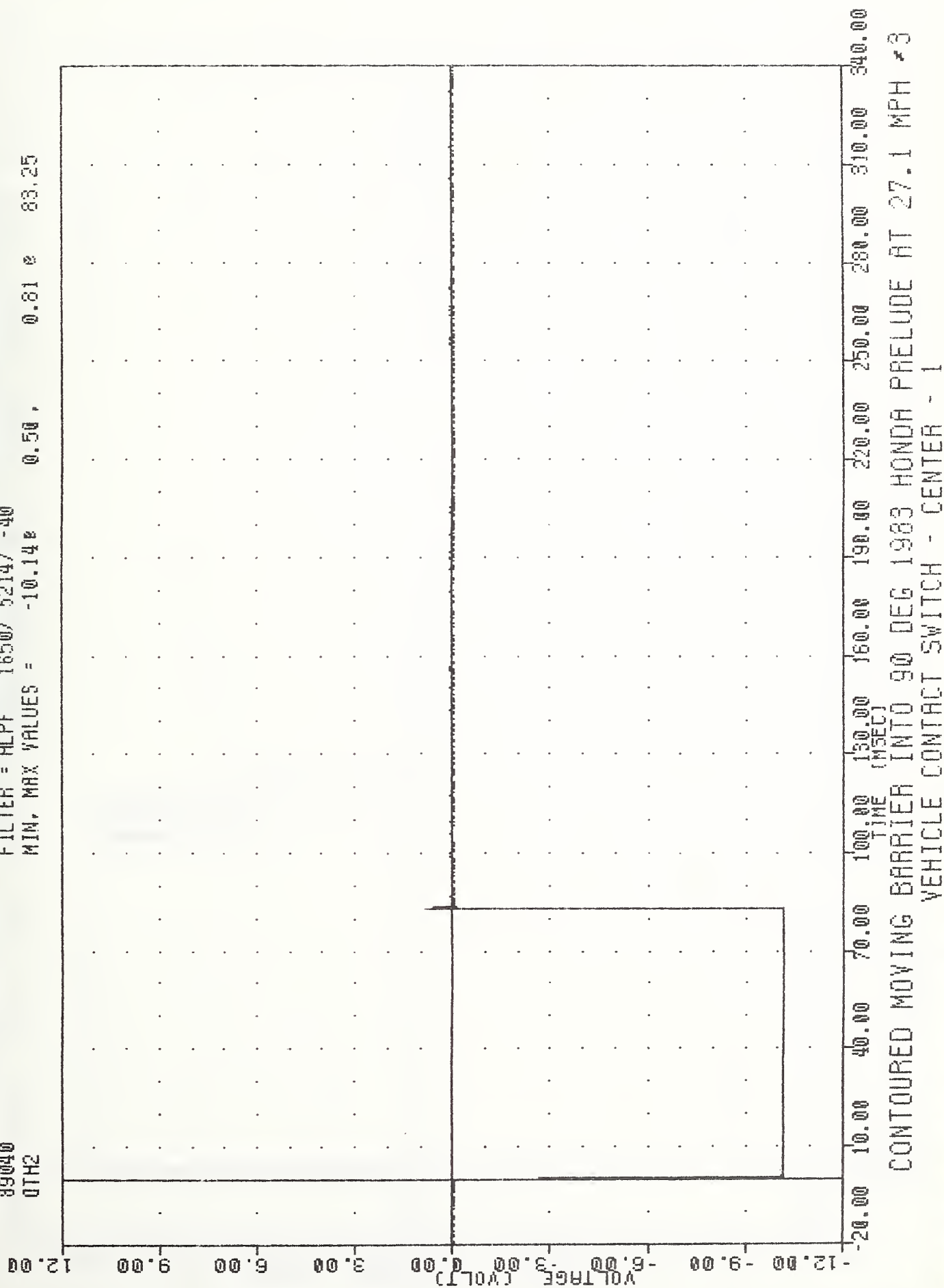
WRTC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM
 89040
 0TH1

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -10.18 1.13 , 0.55 98.38



VRTC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM
 89040
 QTH2

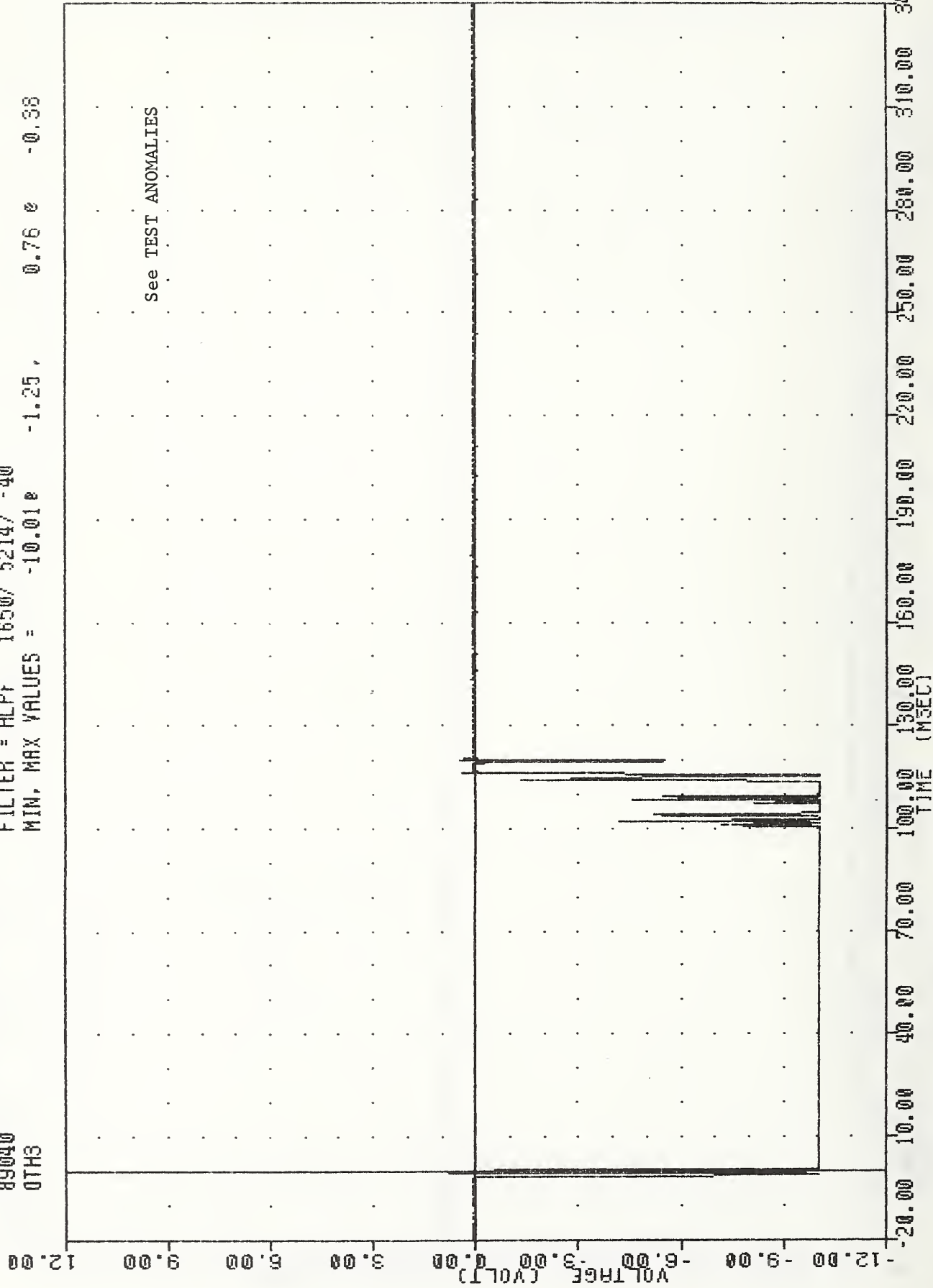
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -10.148 0.50 , 0.81 8 83.25



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 VEHICLE CONTACT SWITCH - CENTER - 1

VRTC-3 , 890209-3
CRASH III DAMAGE ALGORITHM
89040
0TH3

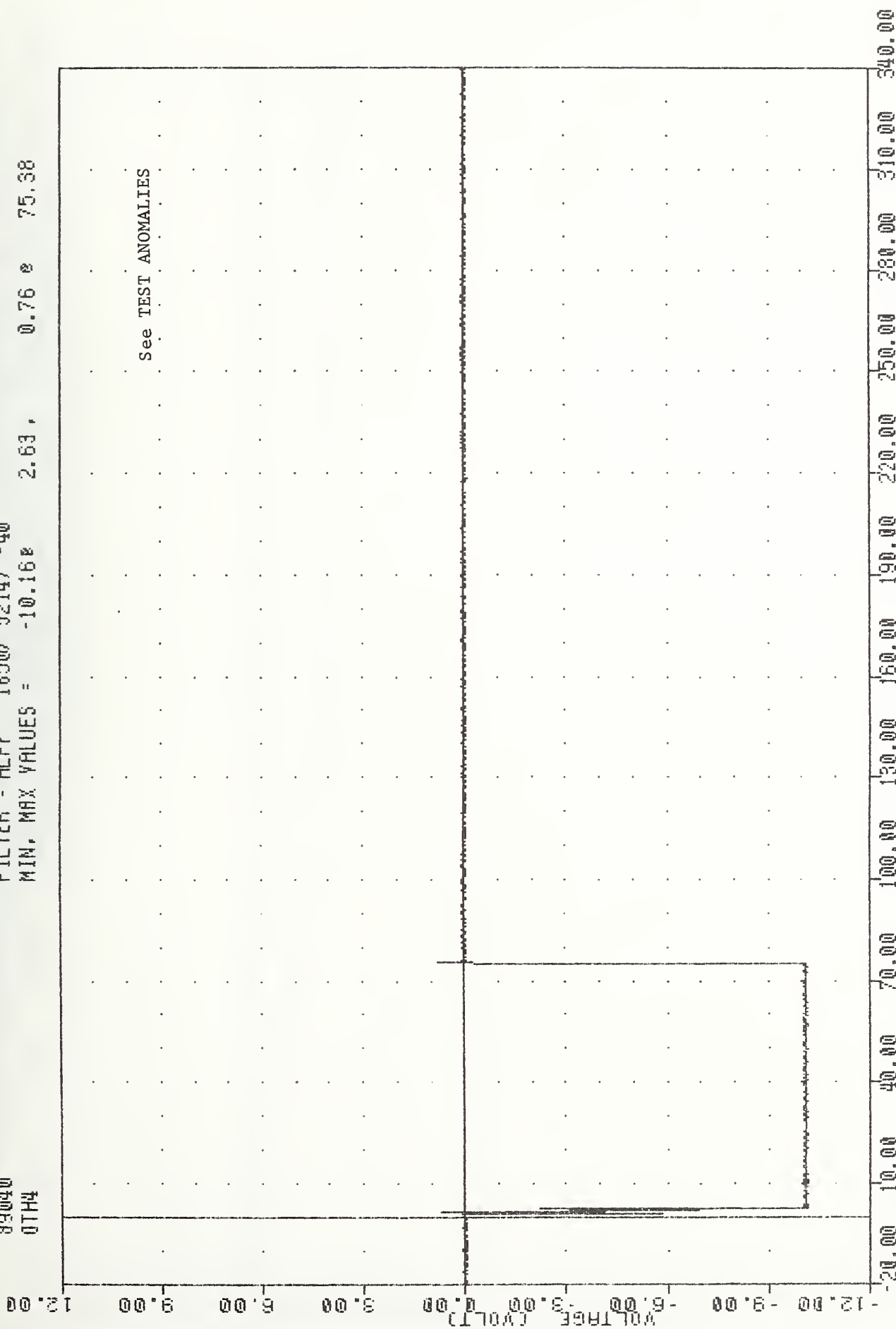
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -10.018 0.768 -0.38



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
VEHICLE CONTACT SWITCH - CENTER - 2

VRTC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM
 89040
 0TH4

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -10.16E 2.63, 0.76 E 75.38

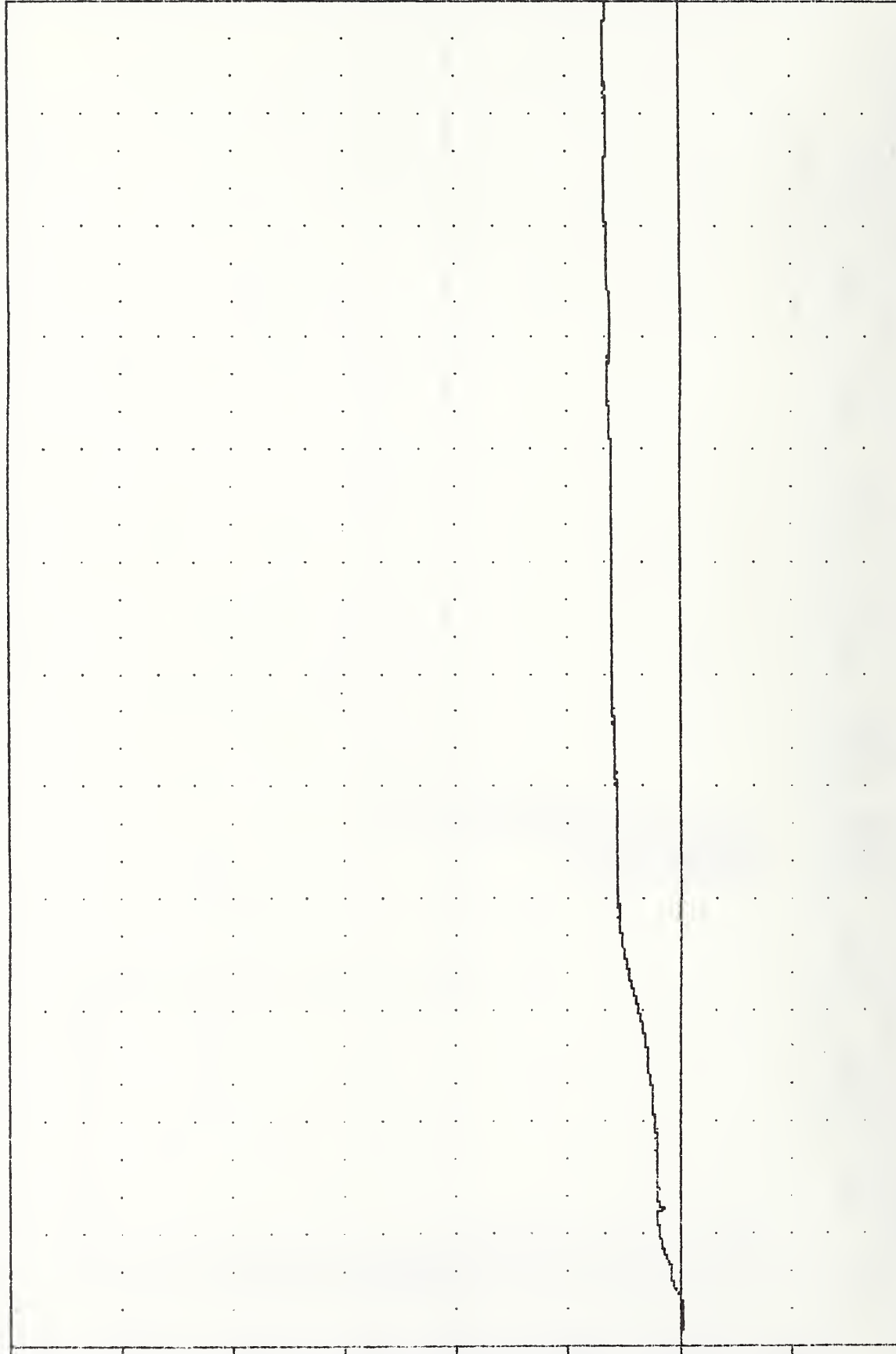


CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 VEHICLE CONTACT SWITCH - RIGHT

VRTC-3 , 880209-3
 CRASH III DAMAGE ALGORITHM
 89040
 RFSXV

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -0.38 8.63 , 6.69 295.50

VELOCITY (MPH)

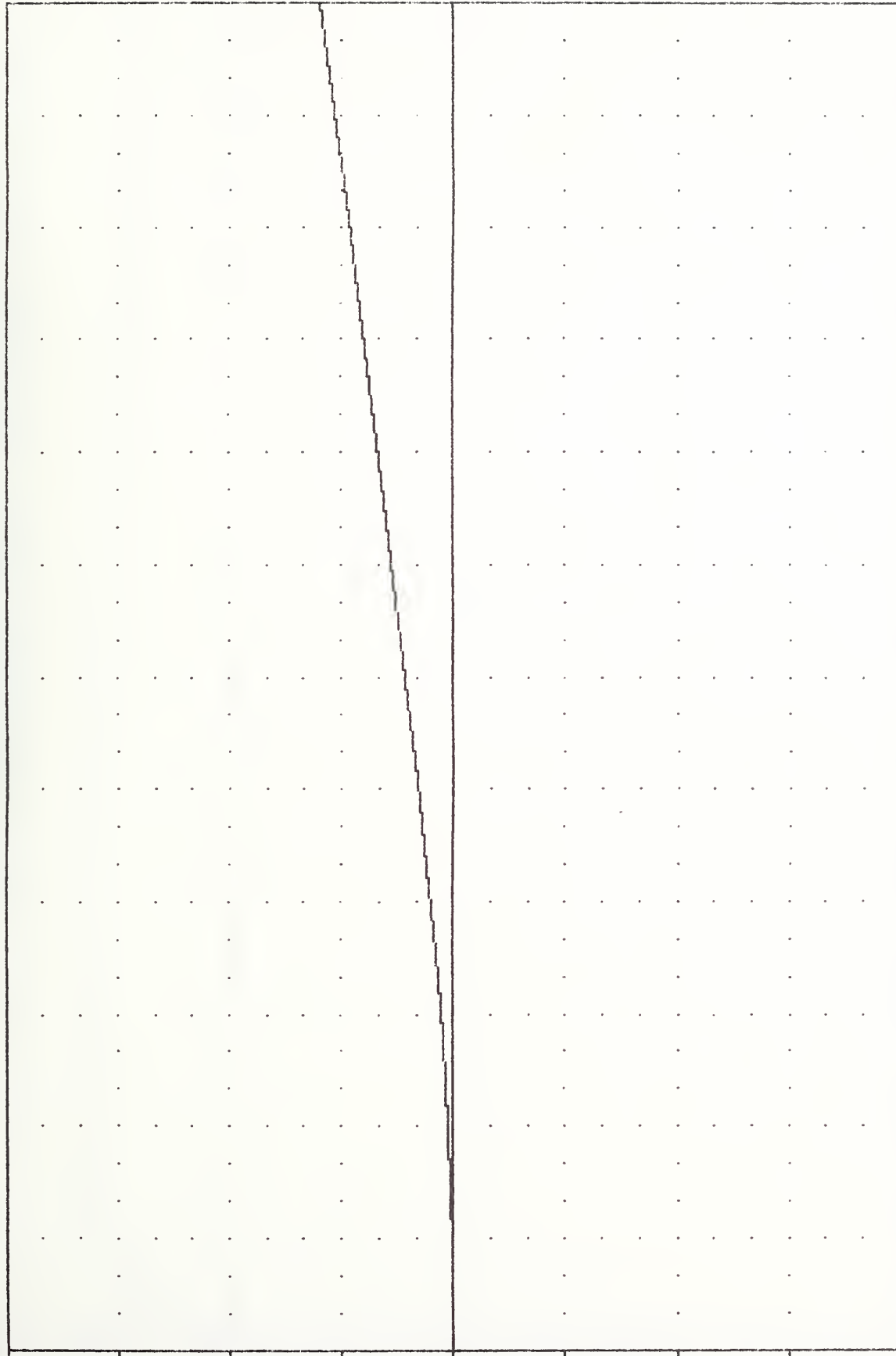


CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 RIGHT FRONT SILL X AXIS VELOCITY

VRTC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM
 89040
 RFSXD

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -0.058 12.50 , 29.79 0 340.00

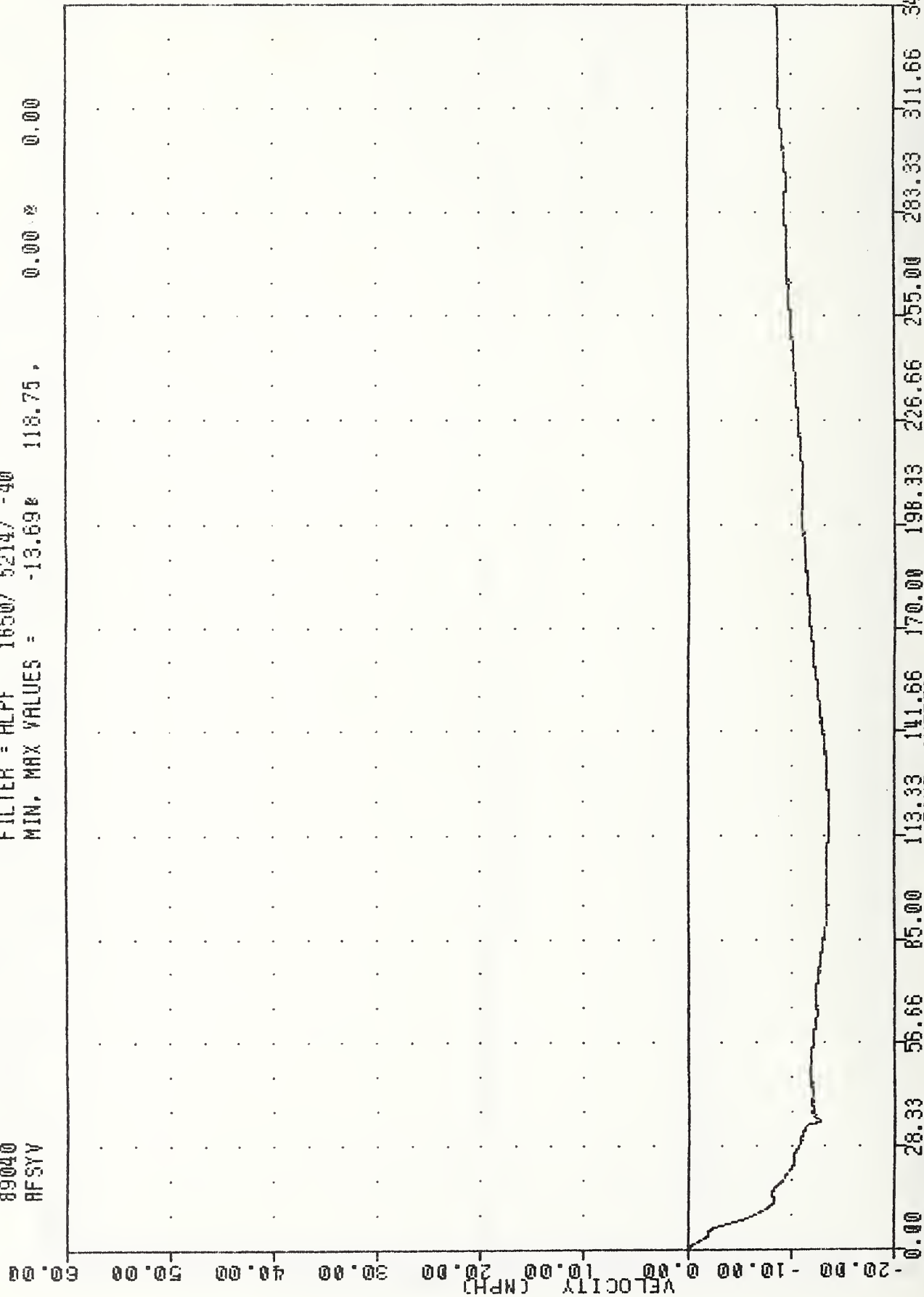
DISPLACEMENT (IN)



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 RIGHT FRONT SILL X AXIS DISPLACEMENT

NRIC-3
 CRASH III DAMAGE ALGORITHM
 89040
 RFSYV

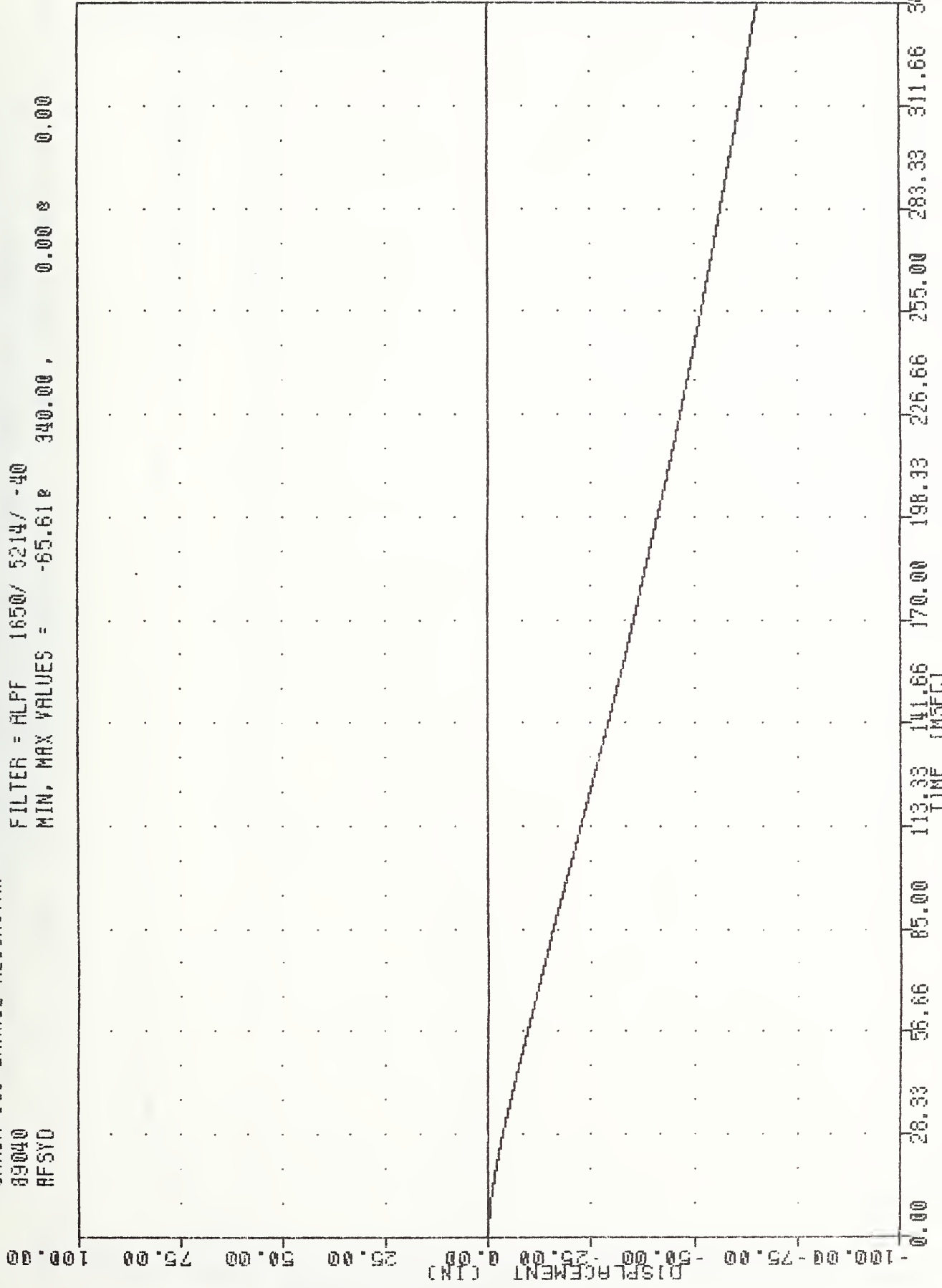
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -13.69 118.75, 0.00 0.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH *3
 RIGHT FRONT SILL Y AXIS VELOCITY

WRTC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM
 89040
 AFSYD

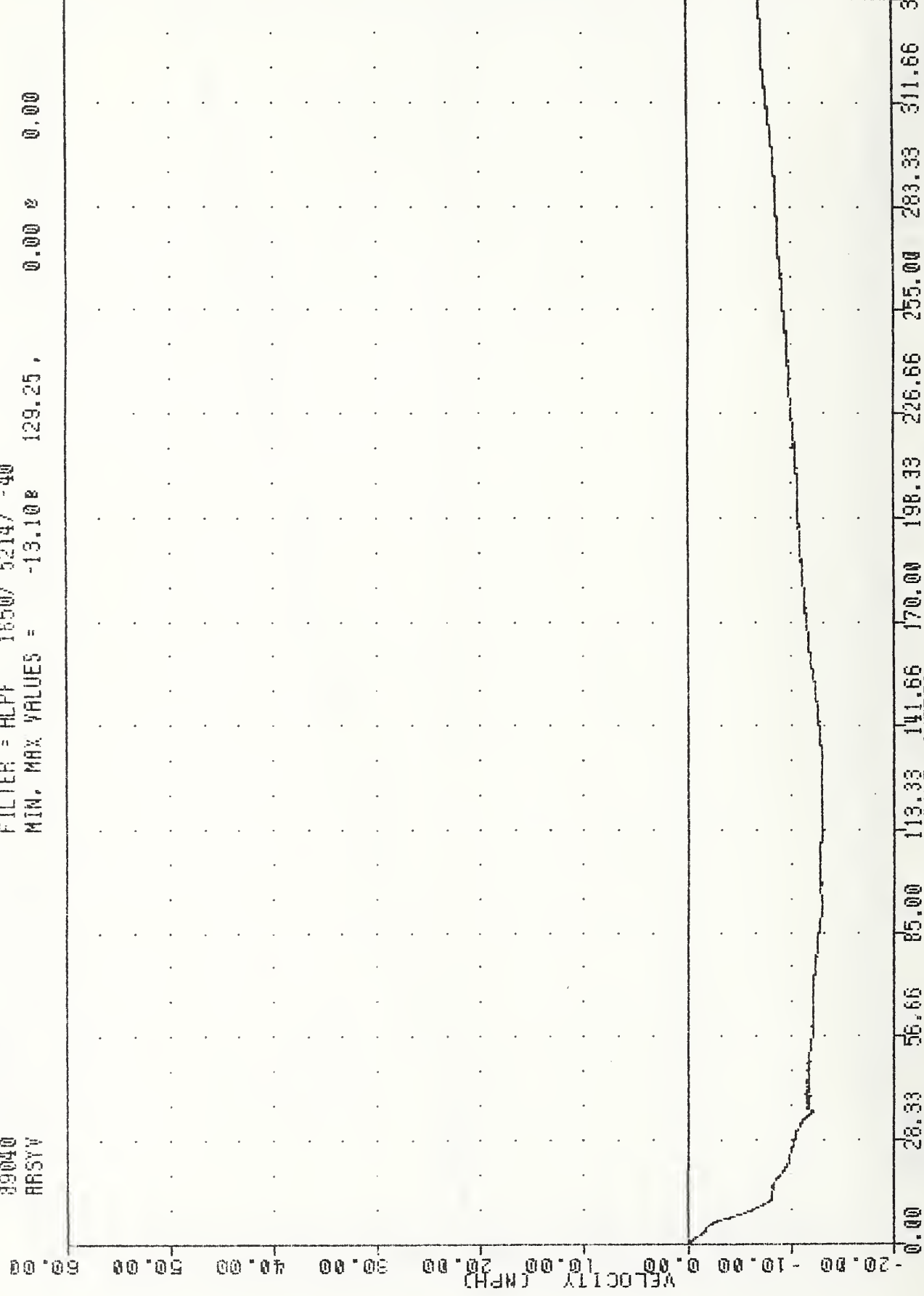
FILTER = HLPF 1650/ 5214/ -40
 MIN, MAX VALUES = -65.618 340.00 , 0.00 8 0.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 RIGHT FRONT SILL Y AXIS DISPLACEMENT

VRTC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM
 89040
 ARSYV

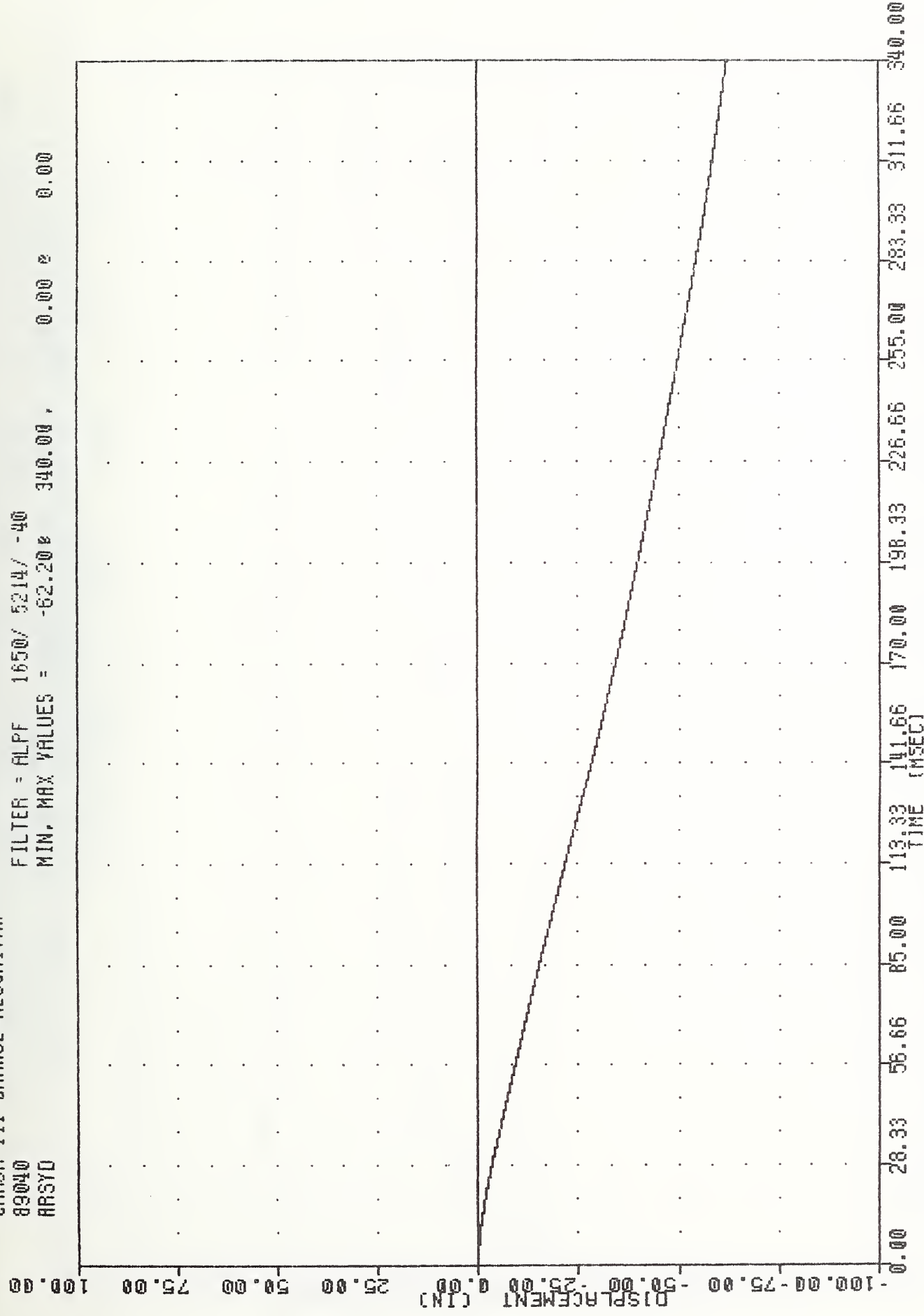
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -13.10E 129.25 , 0.00 E 0.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 RIGHT REAR SILL Y AXIS VELOCITY

VRTC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM
 89040
 ARSYD

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -62.20 340.00 , 0.00 0.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 RIGHT REAR SILL Y AXIS DISPLACEMENT

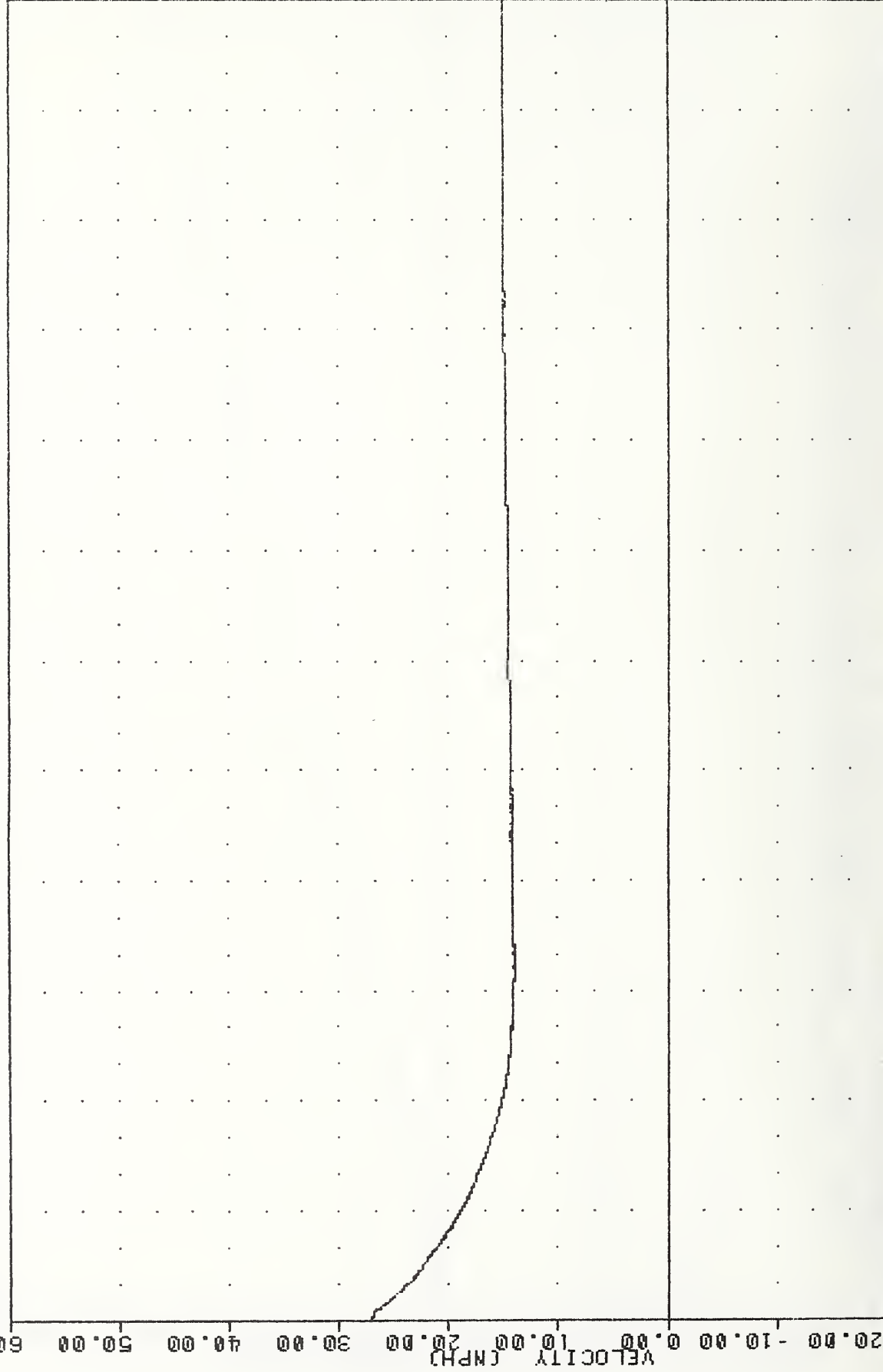
VRIC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM

89040
 BCGXV

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = , 13.98%

88.75 , 27.10 % 0.00

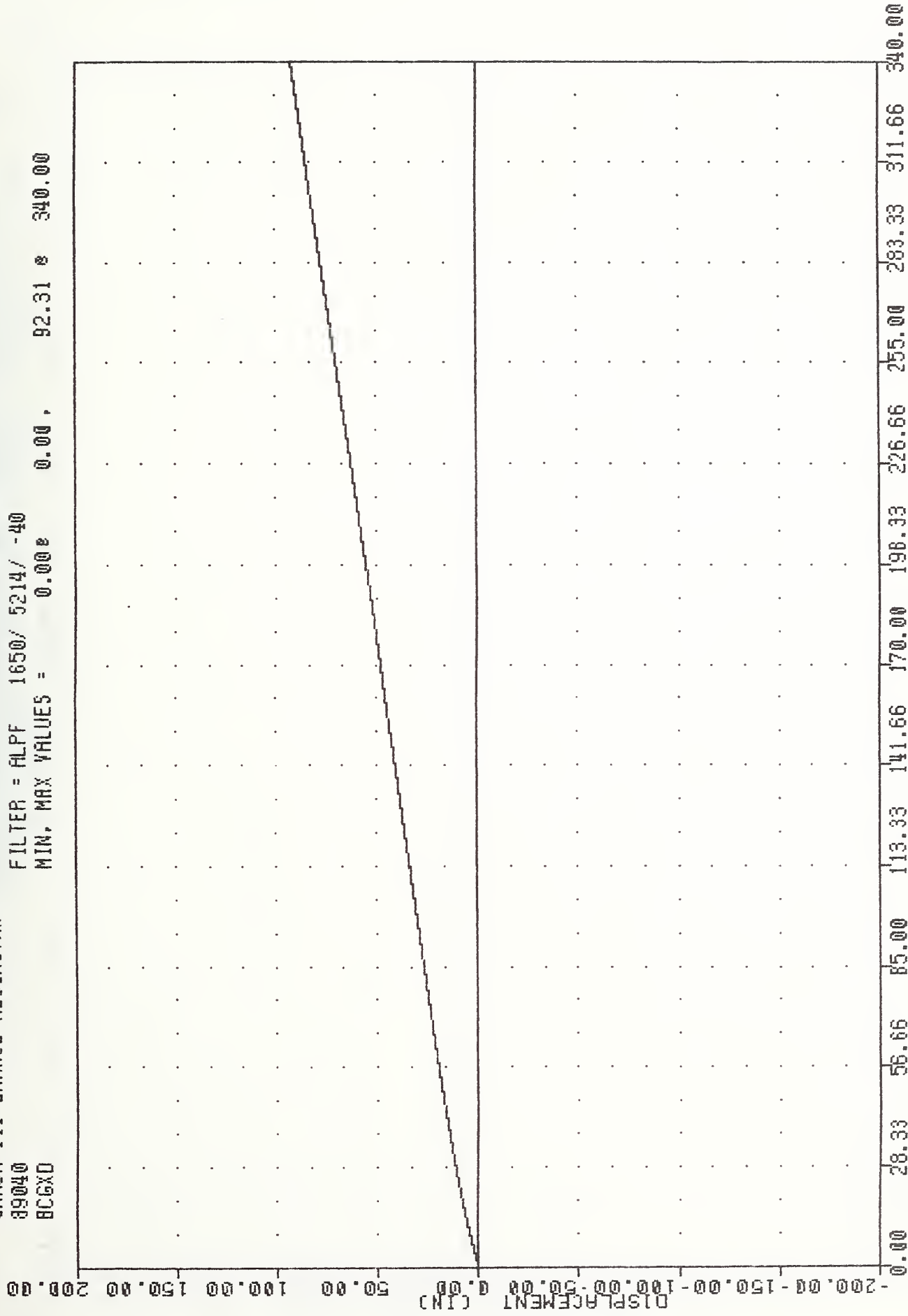
60.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 CONTOURED MOVING BARRIER CENTER OF GRAVITY X AXIS VELOCITY

VRTC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM
 89040
 BCGXD

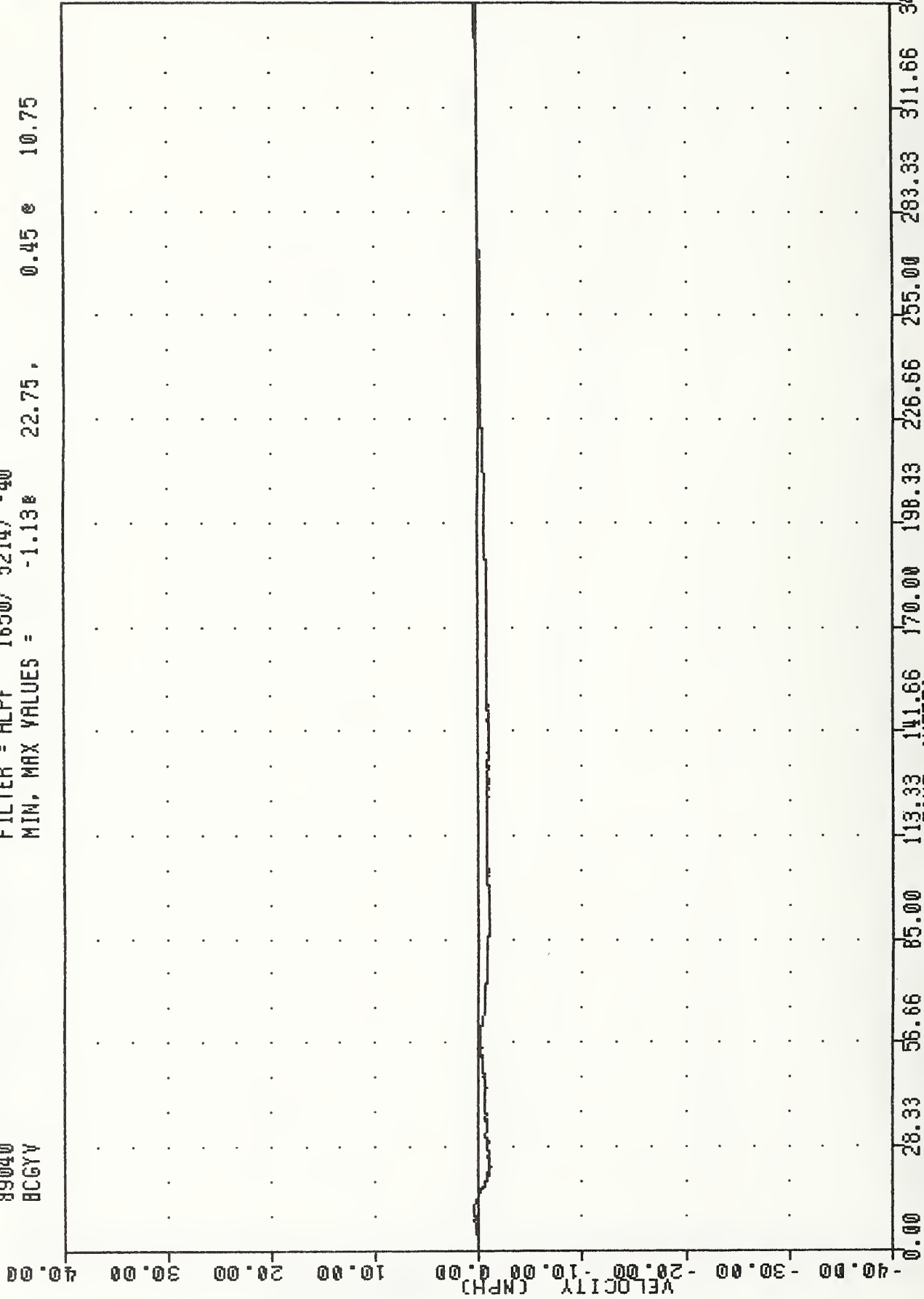
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 0.00e 0.00 , 92.31 e 340.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 CONTOURED MOVING BARRIER CENTER OF GRAVITY X AXIS DISPLACEMENT

VRTC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM
 89040
 BCGYV

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -1.13e 22.75, 0.45 e 10.75

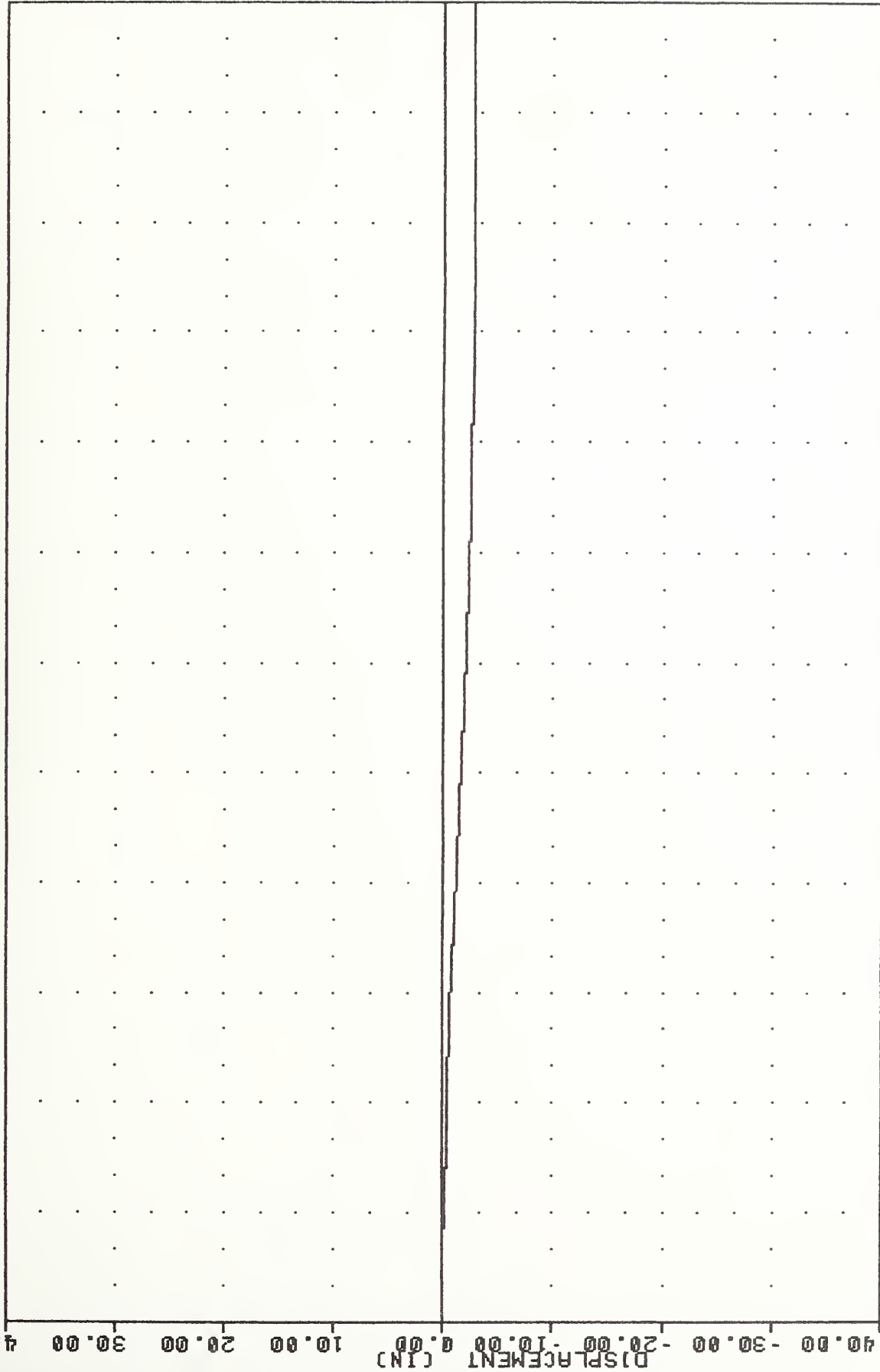


CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 CONTOURED MOVING BARRIER CENTER OF GRAVITY Y AXIS VELOCITY

VRTC-3 , 890209-3
 CRASH III DAMAGE ALGORITHM
 89040
 BCGYO

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -2.70 303.38 , 0.06 14.63

40.00



0.00 28.33 56.66 85.00 113.33 141.66 170.00 198.33 226.66 255.00 283.33 311.66 340.00

CONToured MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 27.1 MPH #3
 CONTOURED MOVING BARRIER CENTER OF GRAVITY Y AXIS DISPLACEMENT

TEST #890209-4

VRTC-4 , 890209-4
 CRASH III DAMAGE ALGORITHM
 89040
 RFSXG

FILTER = BLPF 100/ 250/ -16
 MIN. MAX VALUES = 51.38 , 11.57 @ 14.25

120.00

90.00

60.00

30.00

ACCELERATION (G)

-30.00

-60.00

-90.00

-120.00

See TEST ANOMALIES

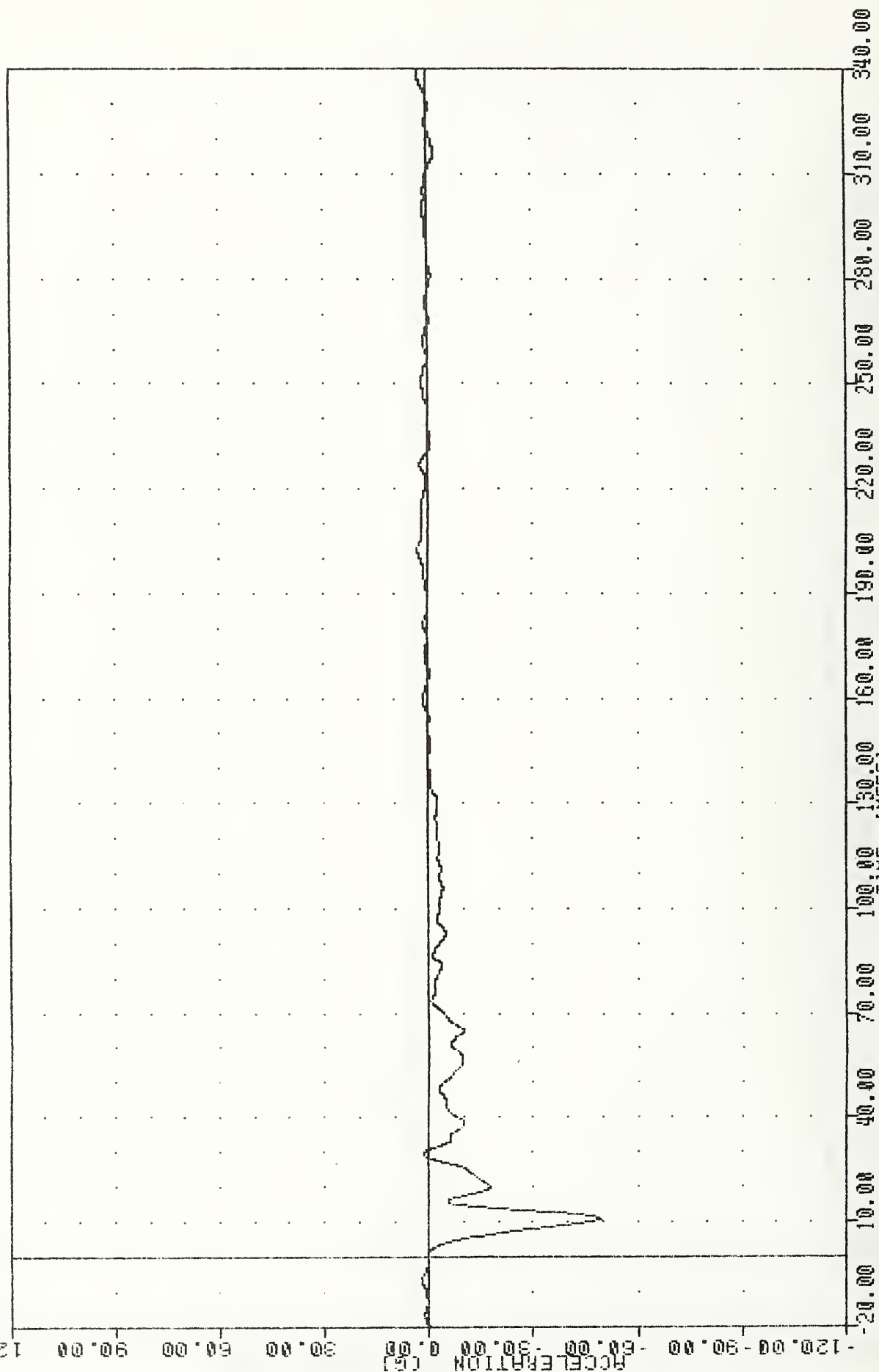
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 RIGHT FRONT SILL X AXIS ACCELERATION

VRTC-4 , 890203-4
 CRASH III DAMAGE ALGORITHM
 89040
 RFSYG

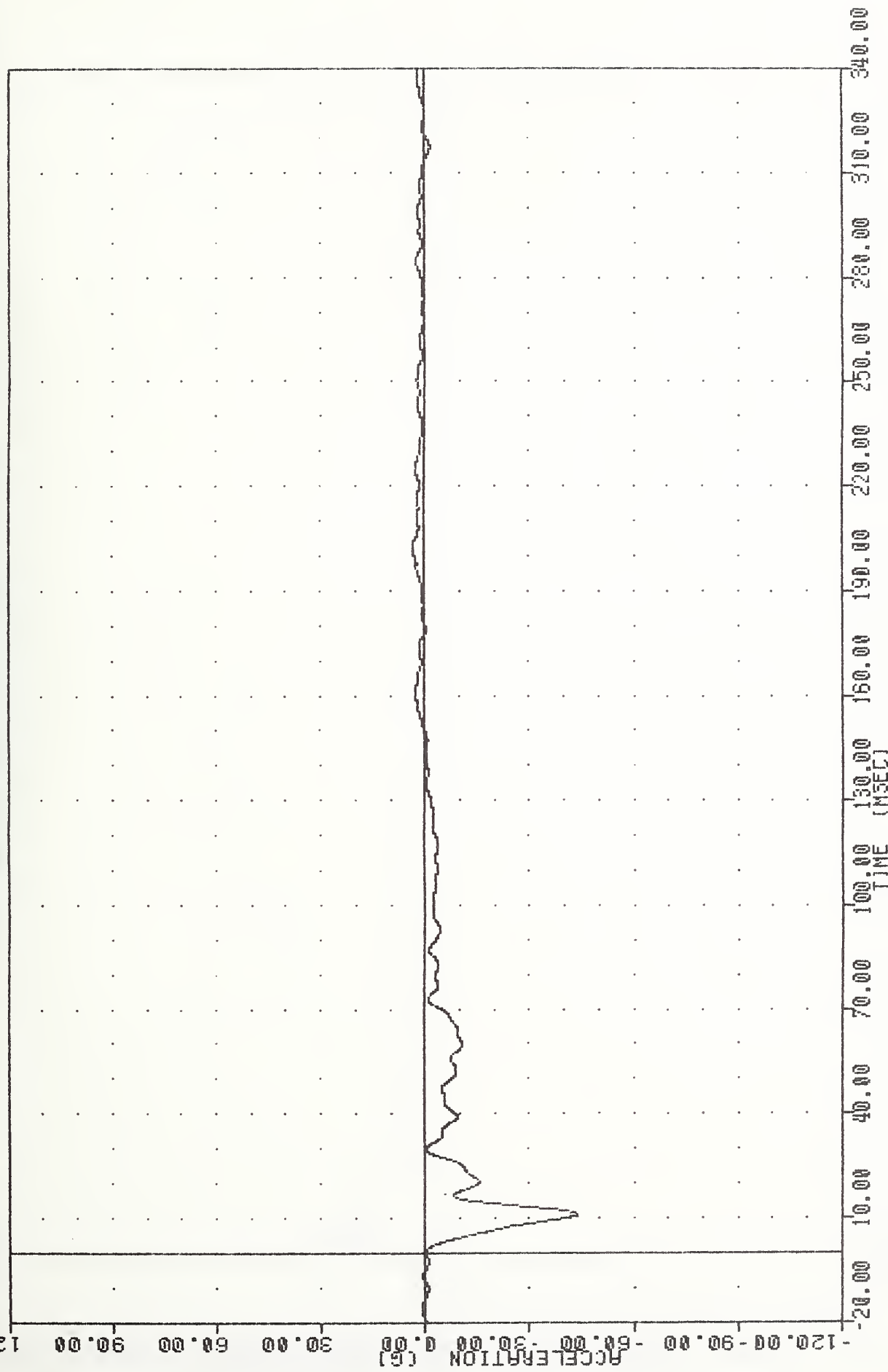
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -49.16e 10.75 , 3.27 e 202.50



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 RIGHT FRONT SILL Y AXIS ACCELERATION

VRTC-4 , 890209-4
CRASH III DAMAGE ALGORITHM
89040
ARSYS

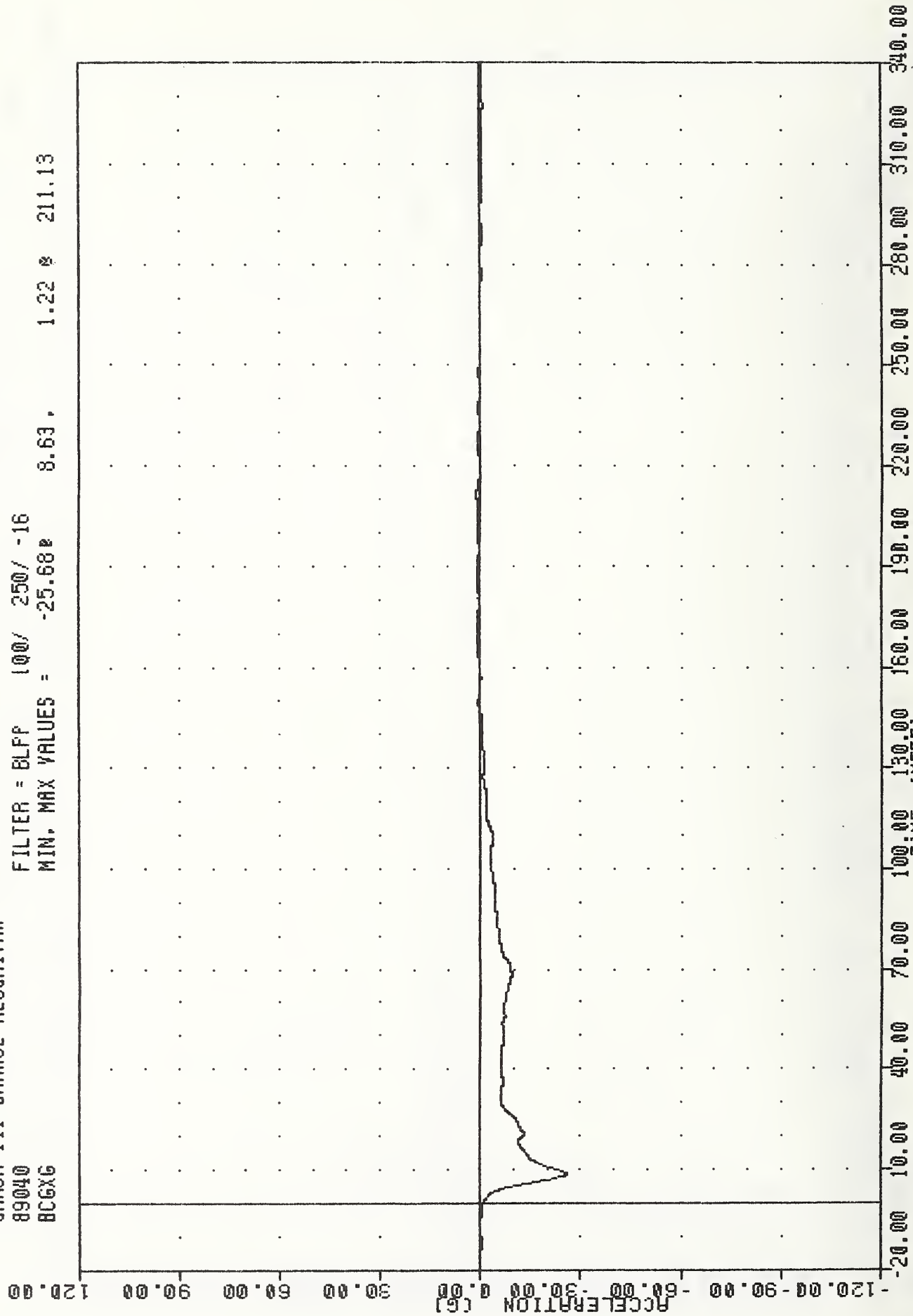
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -43.79e 11.00 , 3.65 e 202.50



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH -4
RIGHT REAR SILL Y AXIS ACCELERATION

VRTC-4 , 890209-4
 CRASH III DAMAGE ALGORITHM
 89040
 RC6XG

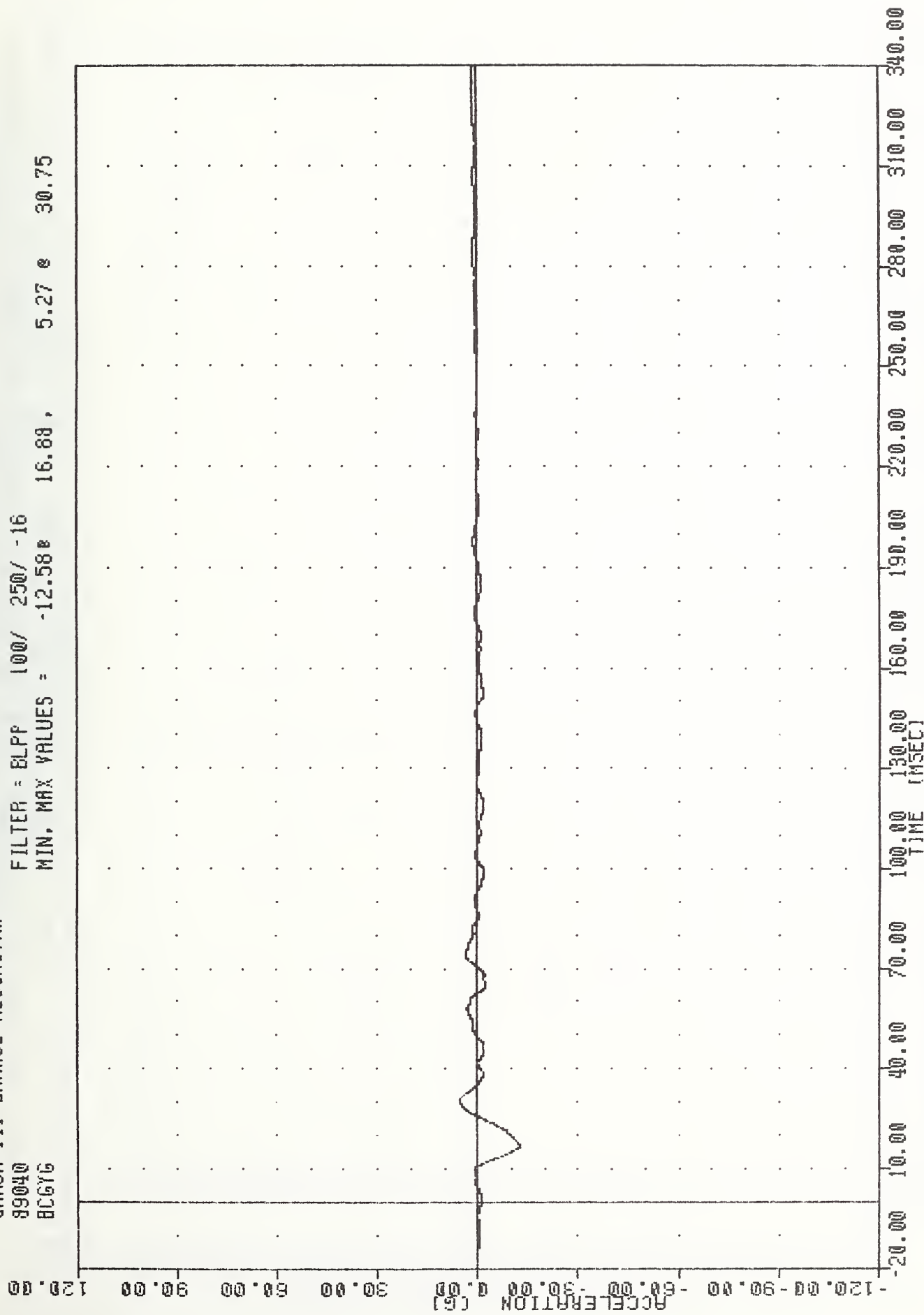
FILTER = BLFF 100/ 250/ -16
 MIN. MAX VALUES = -25.68 8.63 1.22 211.13



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 CONTOURED MOVING BARRIER CENTER OF GRAVITY X AXIS ACCELERATION

VRTC-4 , 890209-4
 CRASH III DAMAGE ALGORITHM
 89040
 BCGYG

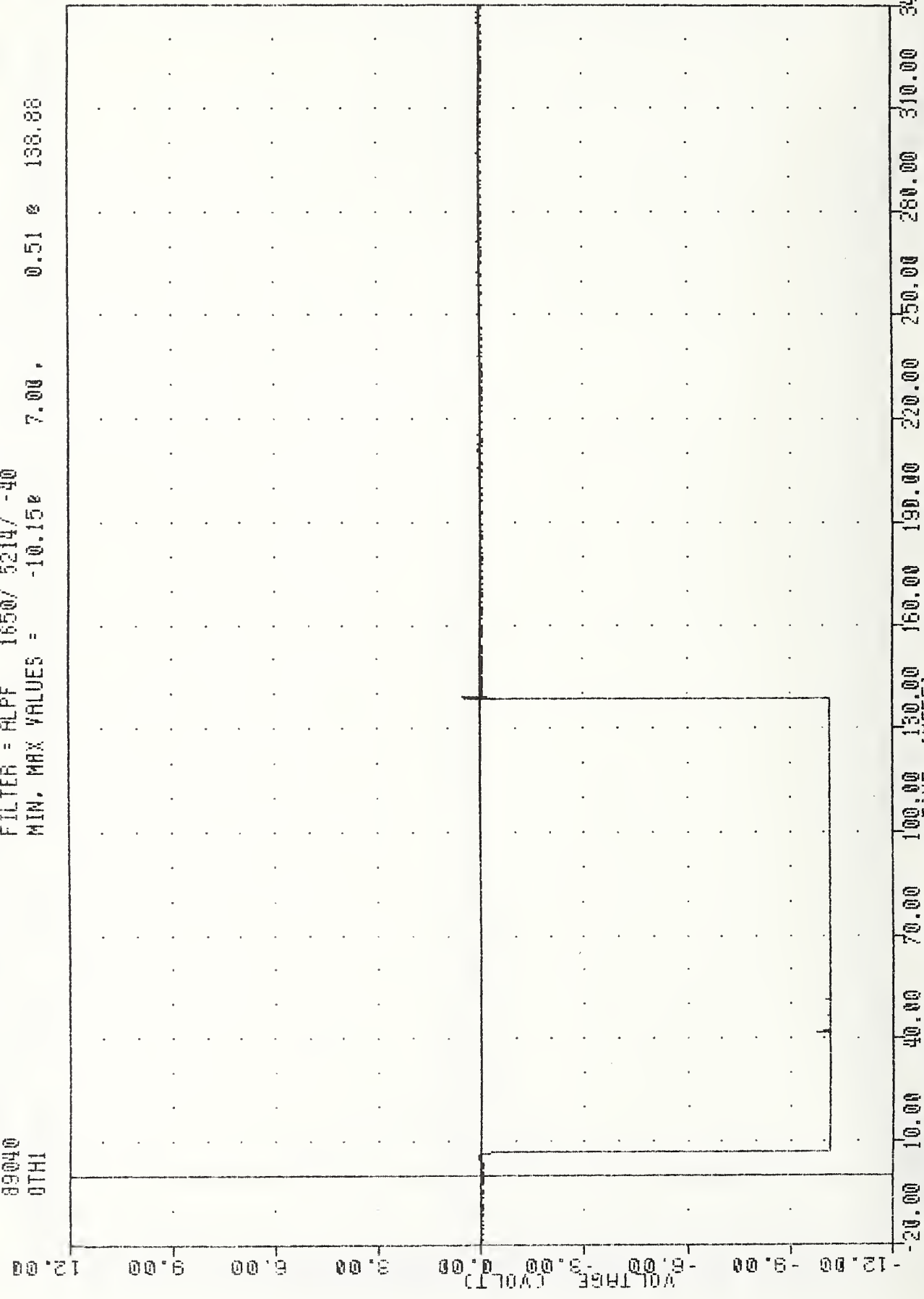
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -12.58e 16.88 , 5.27 e 30.75



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 CONTOURED MOVING BARRIER CENTER OF GRAVITY Y AXIS ACCELERATION

VRTC-4
 CRASH III DAMAGE ALGORITHM
 89040
 0TH1

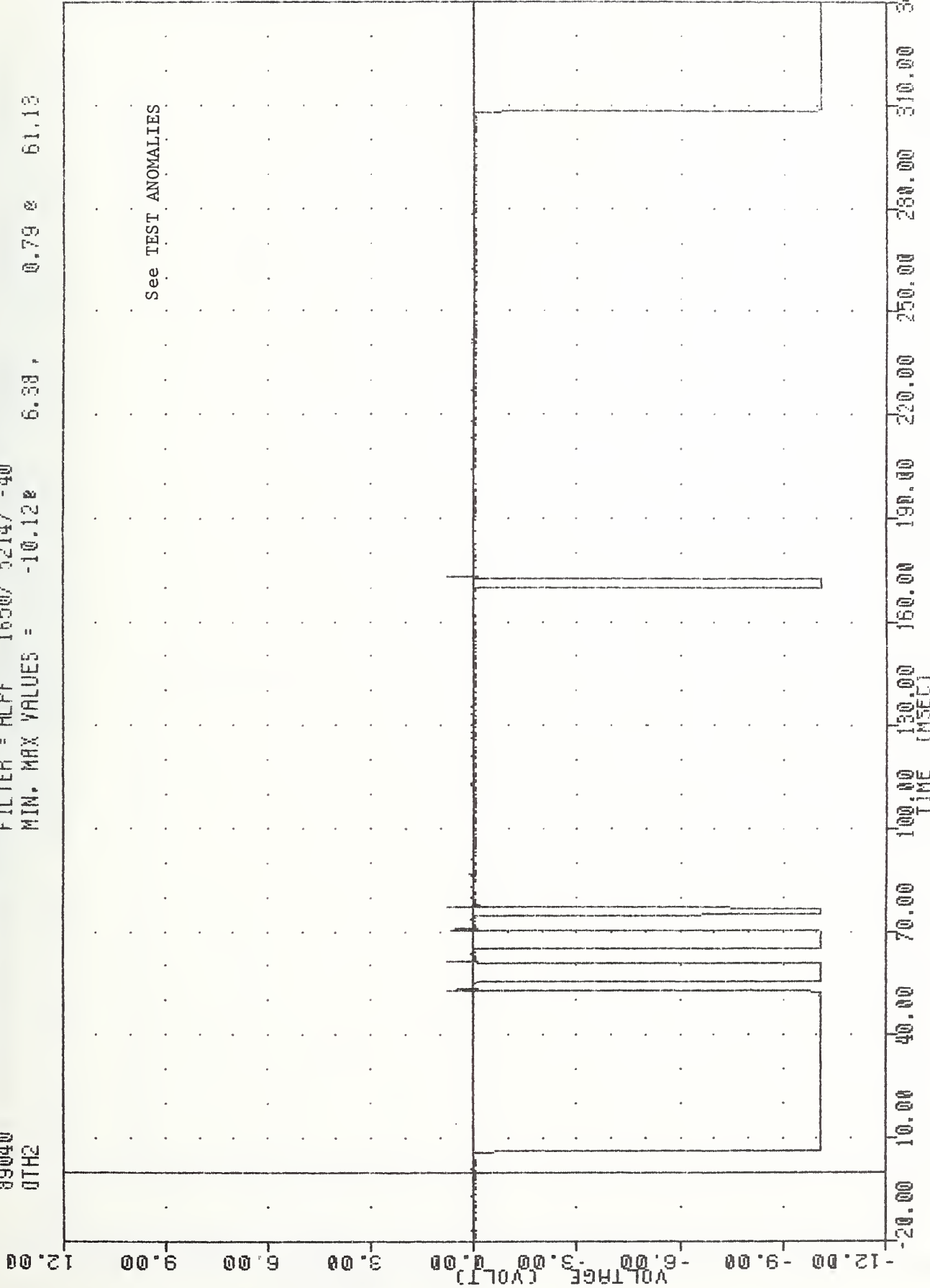
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -10.150 7.00, 0.51 0 138.88



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 VEHICLE CONTACT SWITCH - LEFT

VRTC-4 . 890209-4
 CRASH III DAMAGE ALGORITHM
 89040
 0TH2

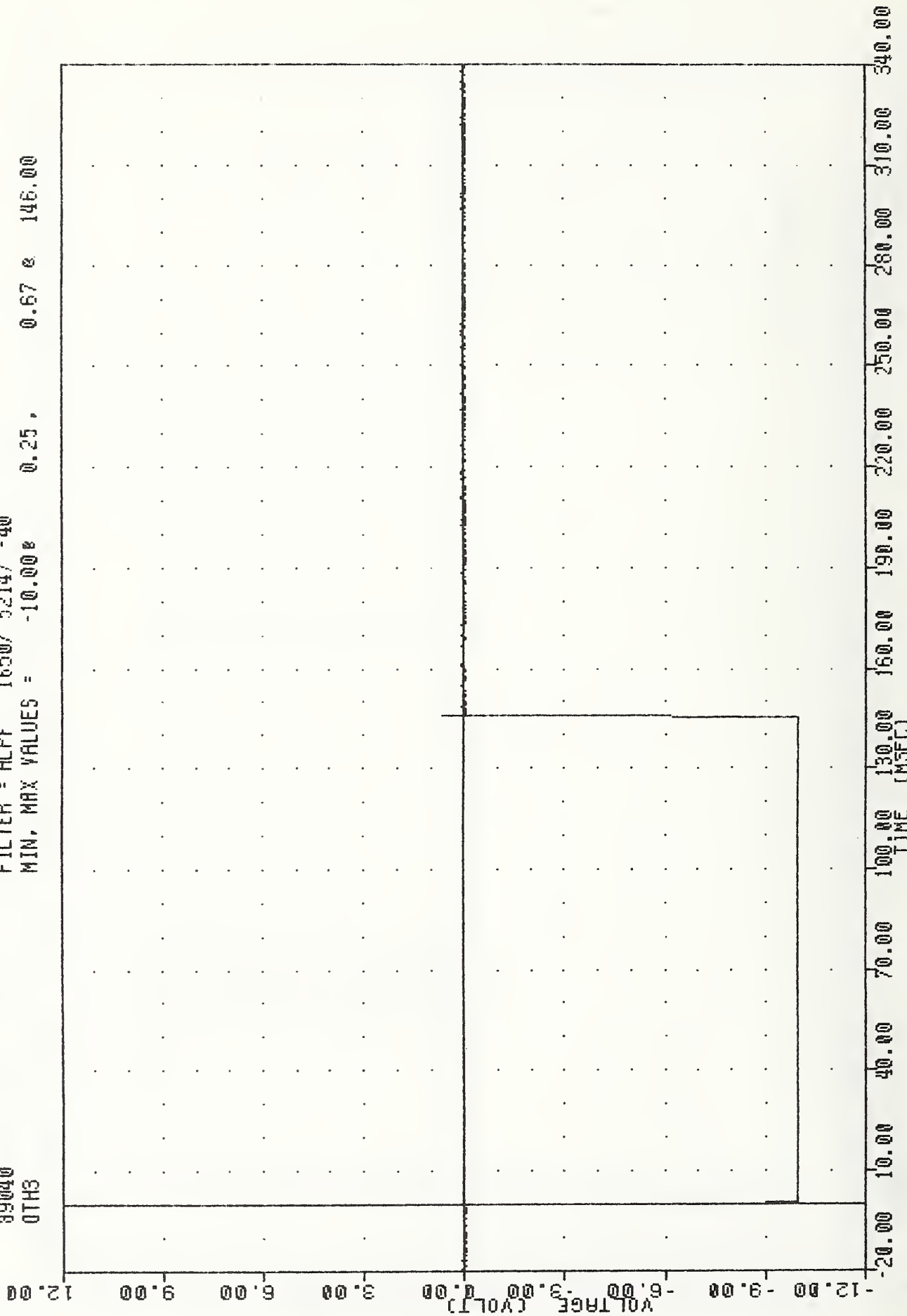
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -10.12v 6.38v 0.79v 61.13



CONToured MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 VEHICLE CONTACT SWITCH - CENTER - 1

NRTC-4 , 890209-4
 CRASH III DAMAGE ALGORITHM
 89040
 0TH3

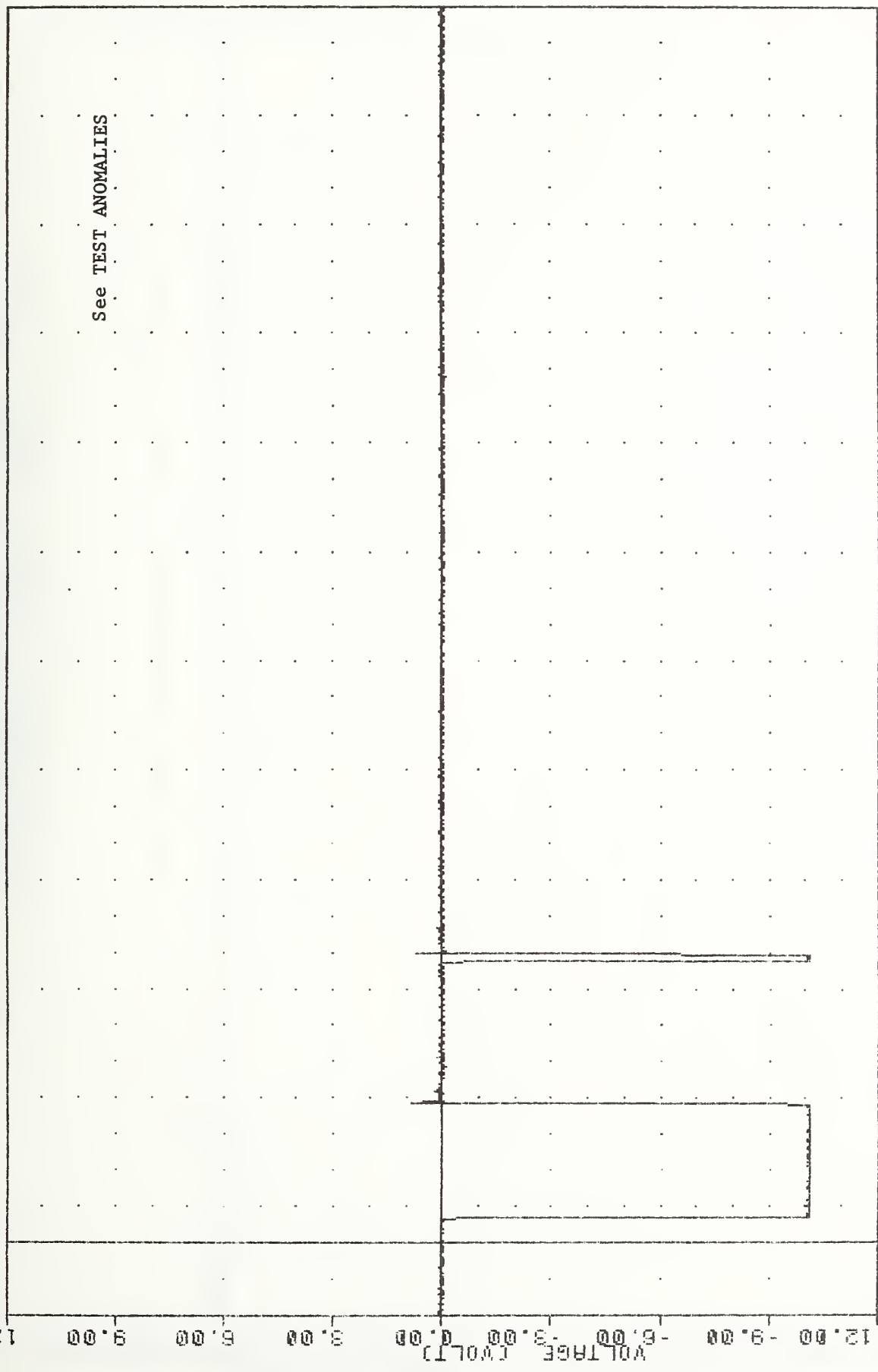
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -10.000 0.25 , 0.67 & 146.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 VEHICLE CONTACT SWITCH - CENTER - 2

WRTC-4 , 890209-4
 CRASH III DAMAGE ALGORITHM
 89040
 0TH4

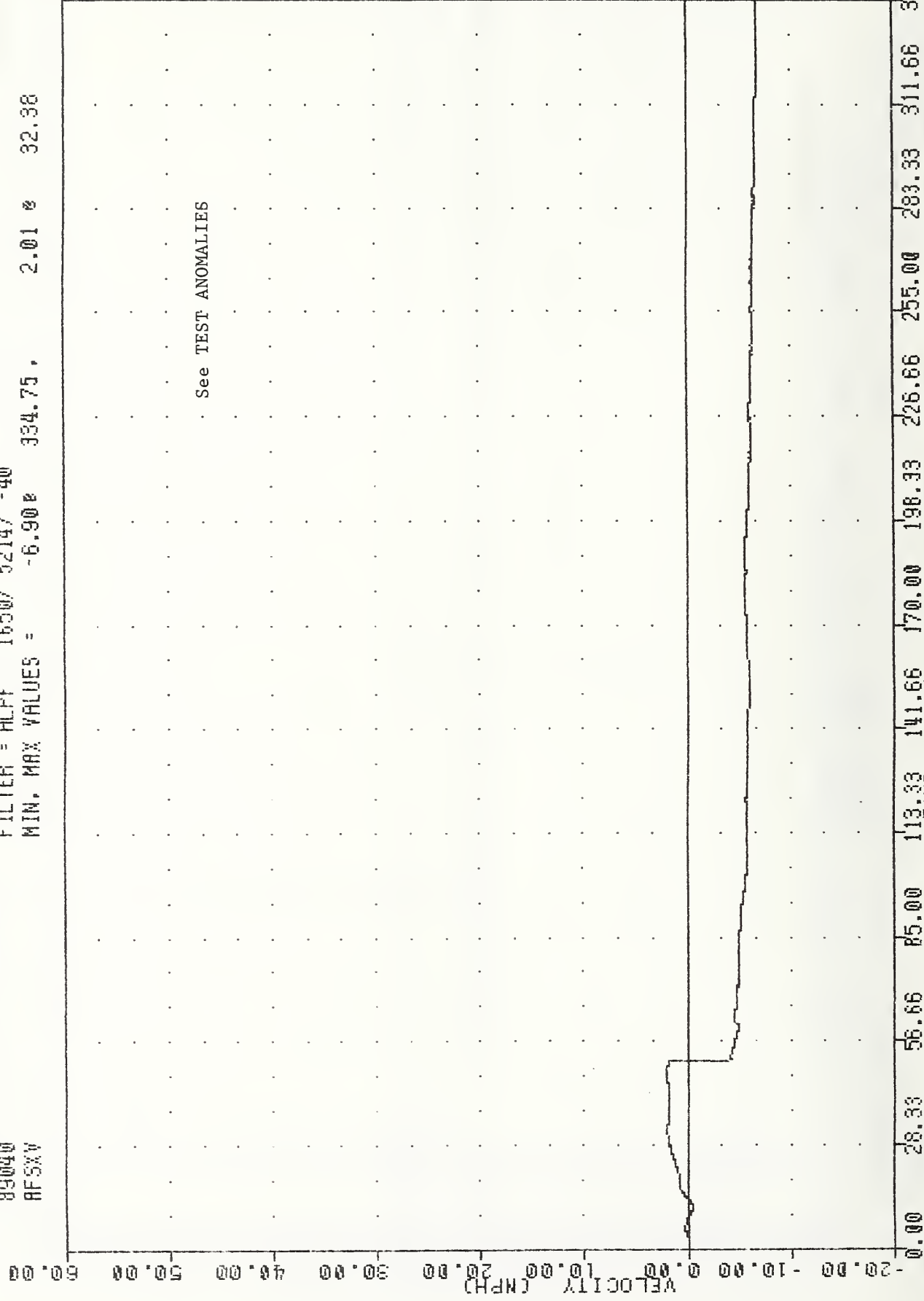
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -10.10e 7.00, 0.82 e 38.75



-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)
 CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 VEHICLE CONTACT SWITCH - RIGHT

VRTC-4
 CRASH III DAMAGE ALGORITHM
 89040
 RFSXV

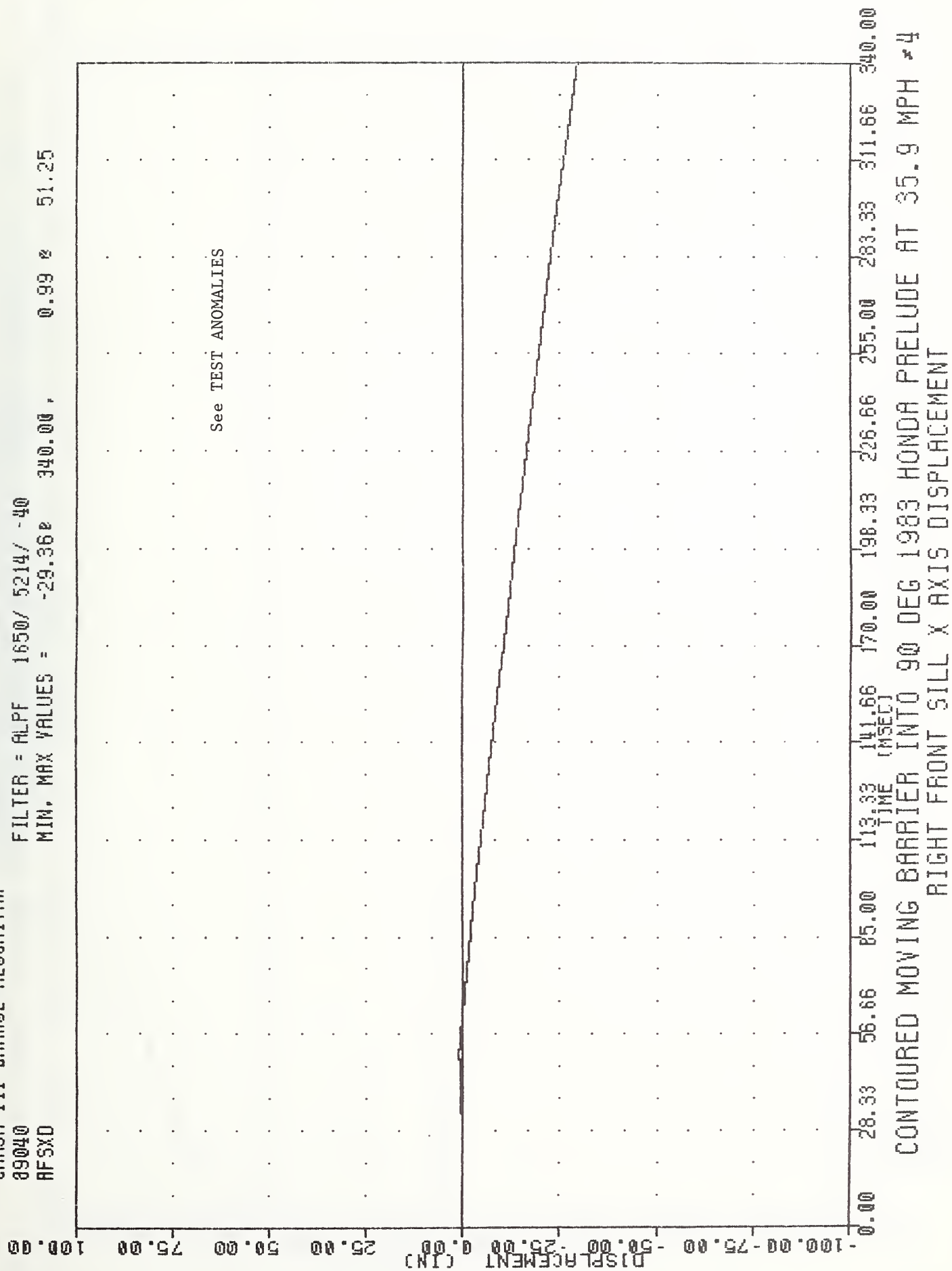
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -6.90e 334.75, 2.01 e 32.38



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 RIGHT FRONT SILL X AXIS VELOCITY

WRTC-4
 CRASH III DAMAGE ALGORITHM
 89040
 AFSXD

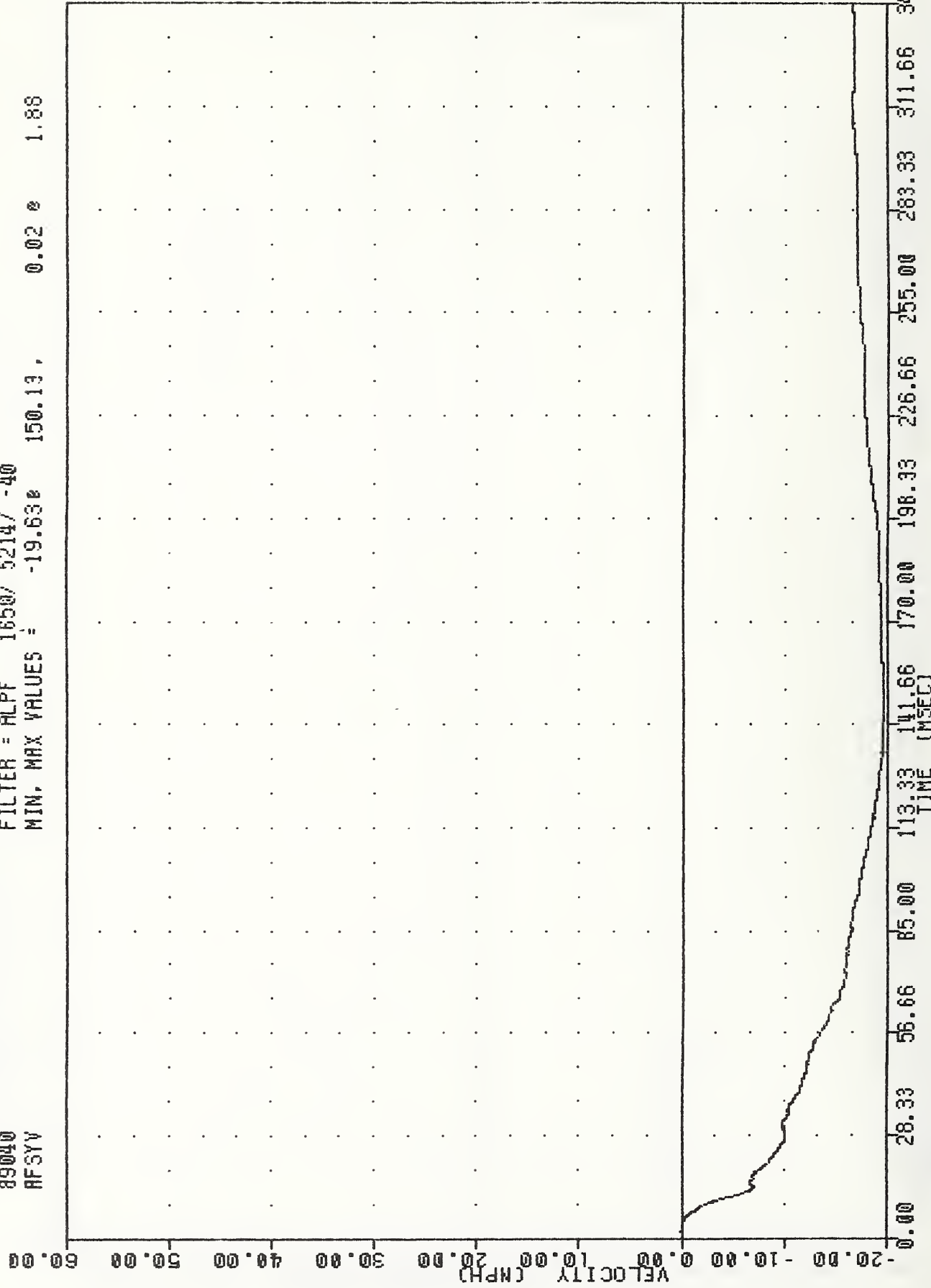
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -29.36e 340.00, 0.99 e 51.25



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 RIGHT FRONT SILL X AXIS DISPLACEMENT

VRTC-4 , 890209-4
 CRASH III DAMAGE ALGORITHM
 89040
 RFSYV

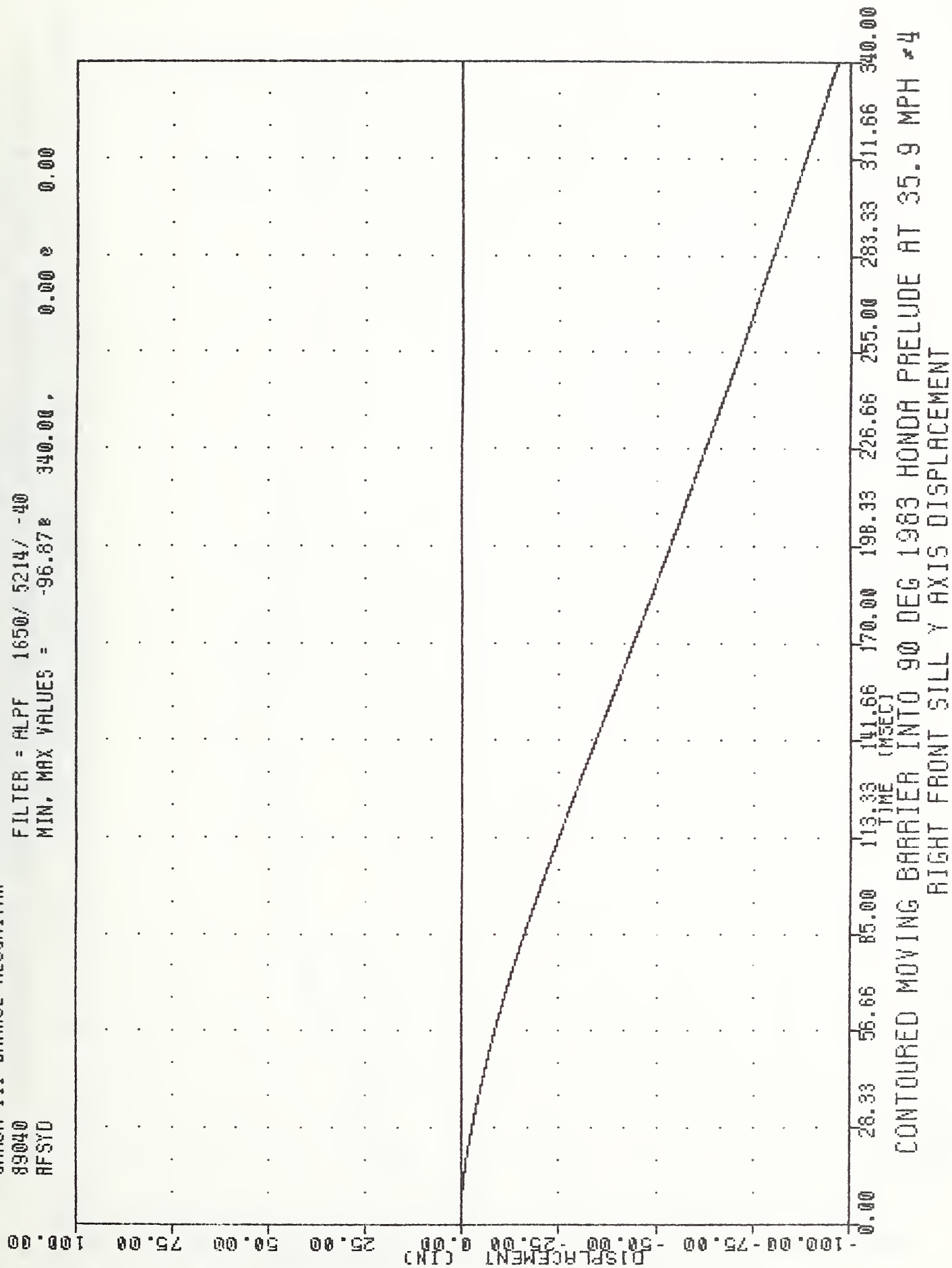
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -19.63 150.13, 0.02 1.88



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 RIGHT FRONT SILL Y AXIS VELOCITY

VRTC-4 , 890203-4
 CRASH III DAMAGE ALGORITHM
 89040
 RFSYD

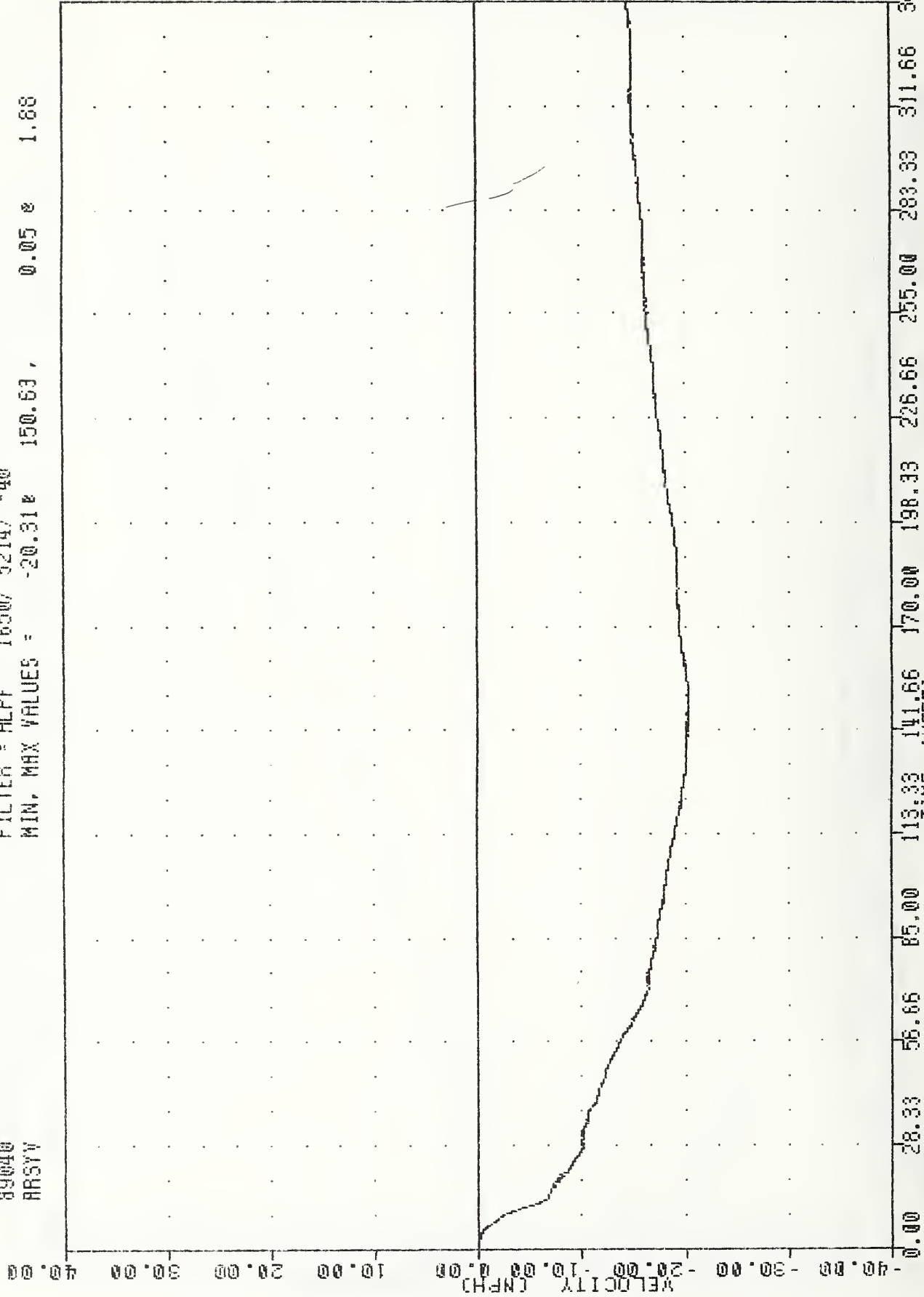
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -96.87 340.00 0.00 0.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH *4
 RIGHT FRONT SILL Y AXIS DISPLACEMENT

VRTC-4
 CRASH III DAMAGE ALGORITHM
 89040
 RRSYV

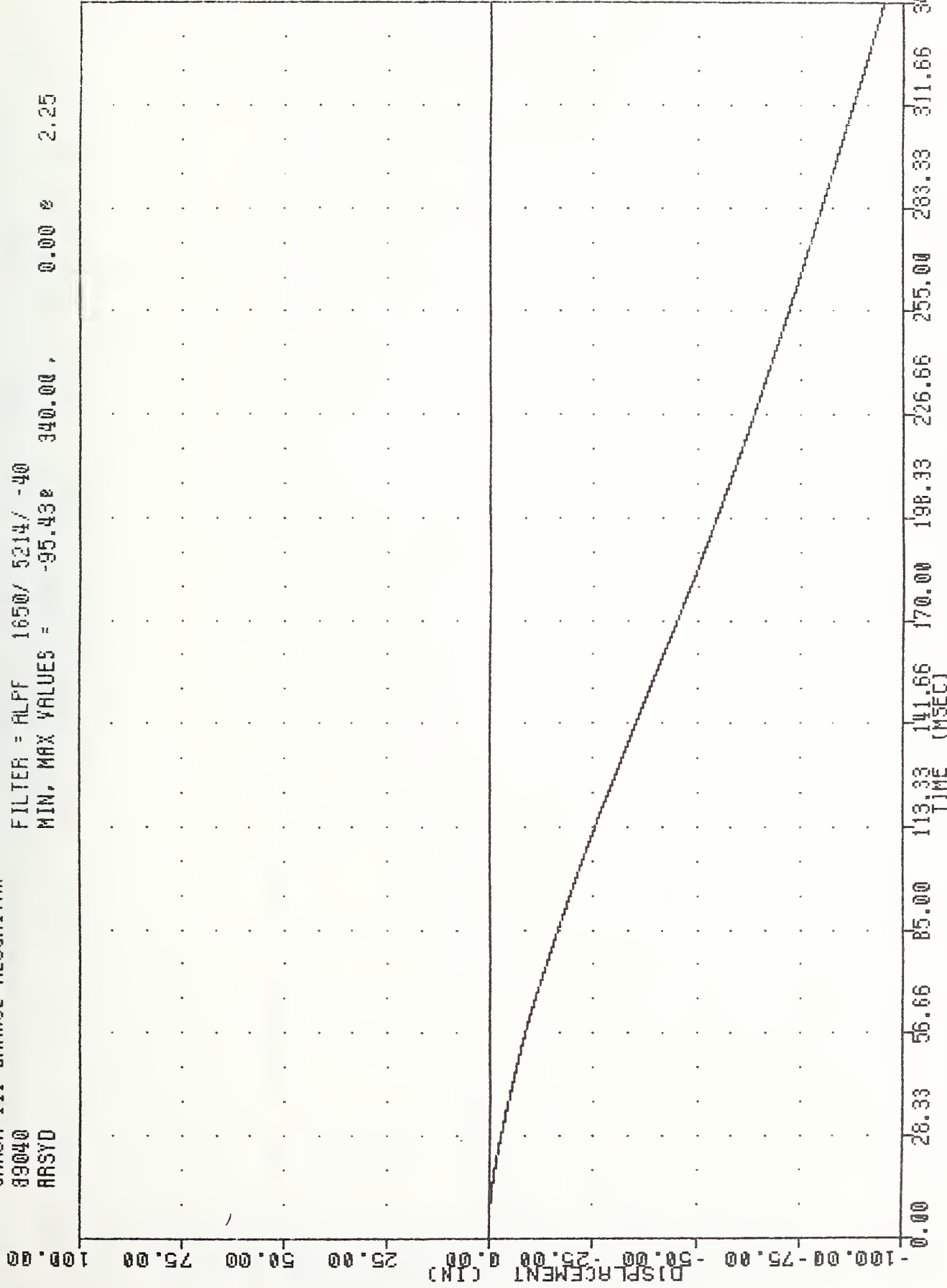
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -20.31e 150.63, 0.05 e 1.88



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 RIGHT REAR SILL Y AXIS VELOCITY

VRTC-4 , 890209-4
 CRASH III DAMAGE ALGORITHM
 89040
 ARSYD

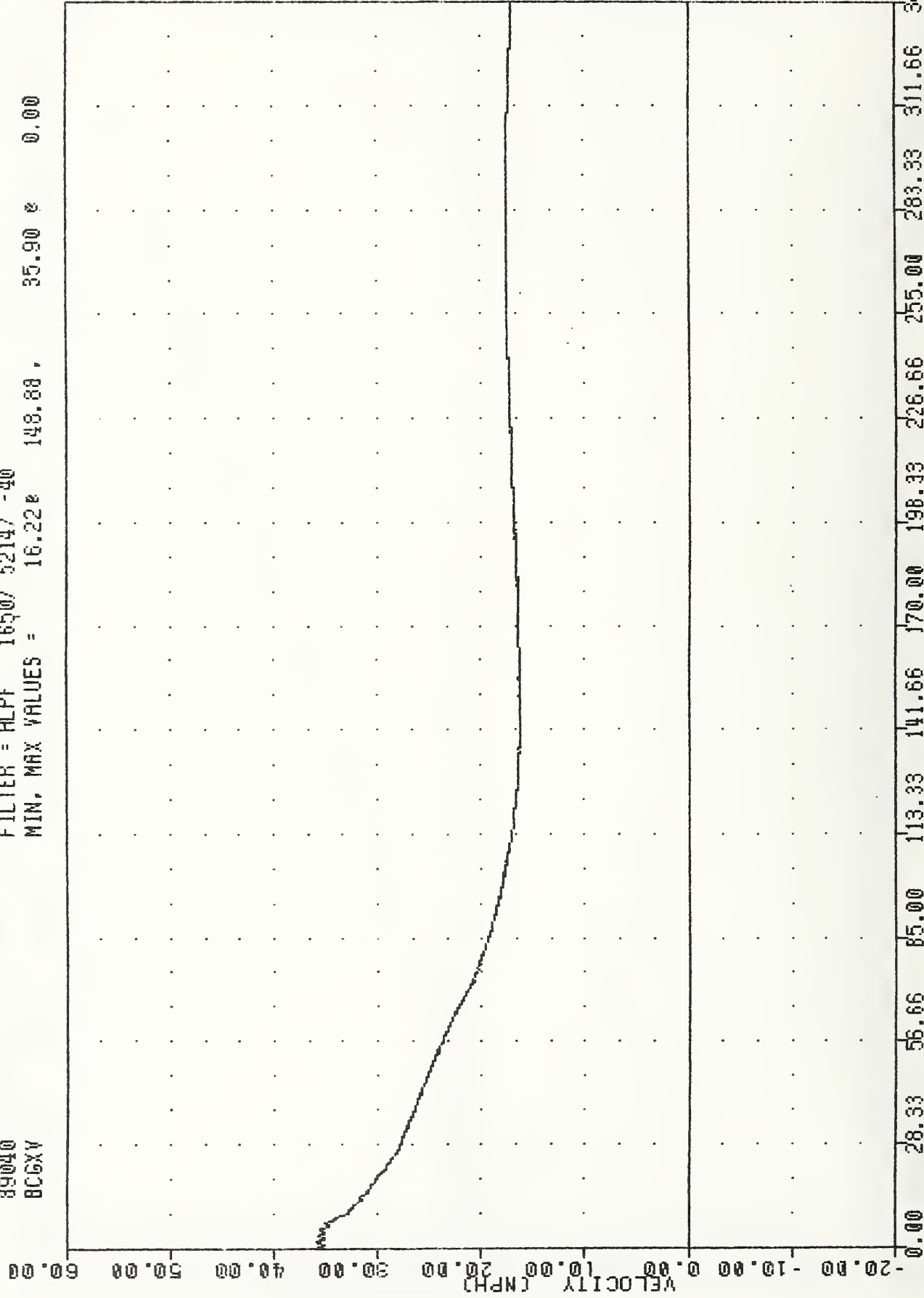
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -95.43e 340.00 , 0.00 e 2.25



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 RIGHT REAR SILL Y AXIS DISPLACEMENT

VRIC-4 890209-4
 CRASH III DAMAGE ALGORITHM
 89040
 BCGXV

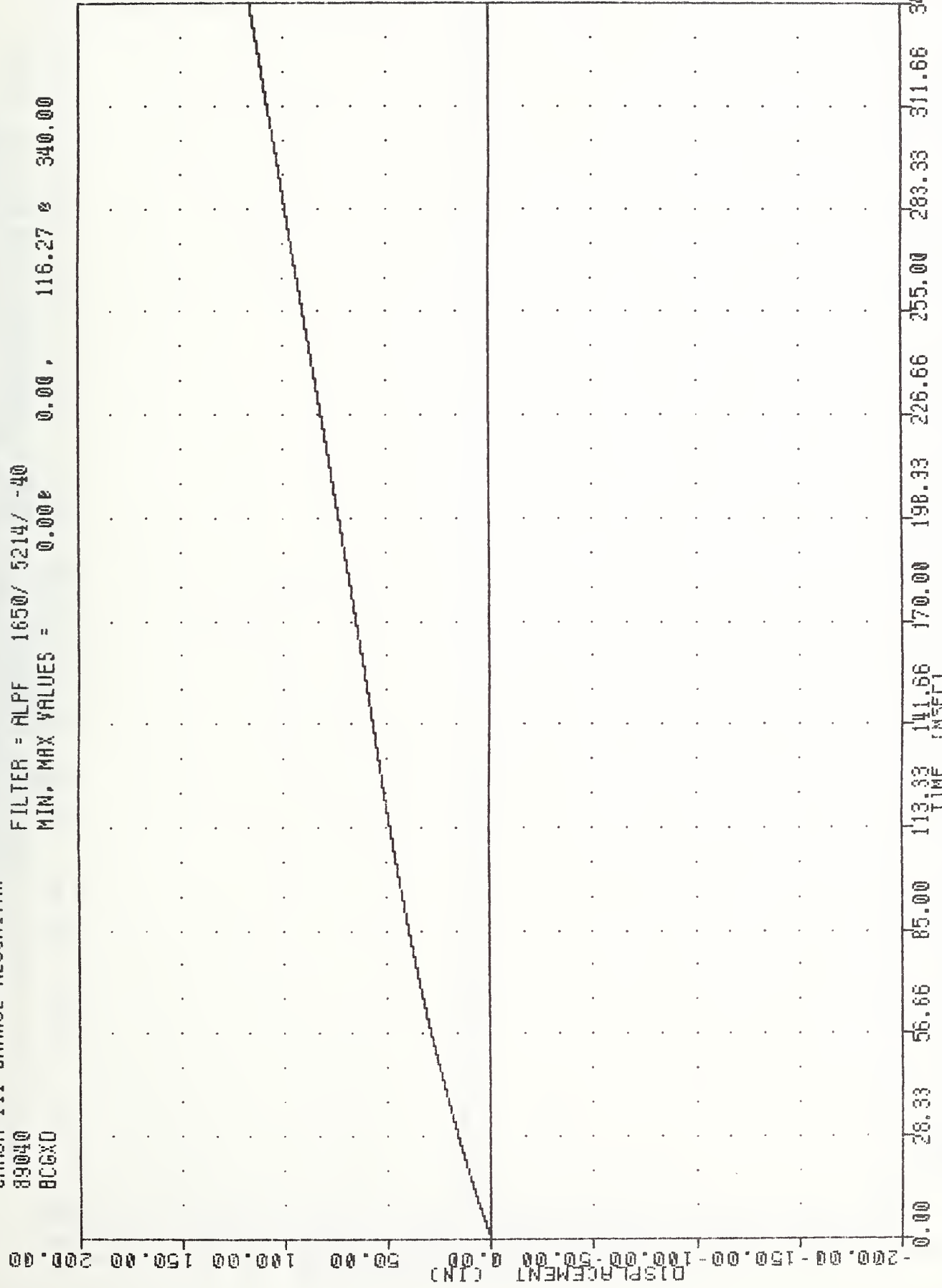
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 16.22% 148.88, 35.90% 0.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 CONTOURED MOVING BARRIER CENTER OF GRAVITY X AXIS VELOCITY

YRTC-4
 CRASH III DAMAGE ALGORITHM
 89040
 BCGXD

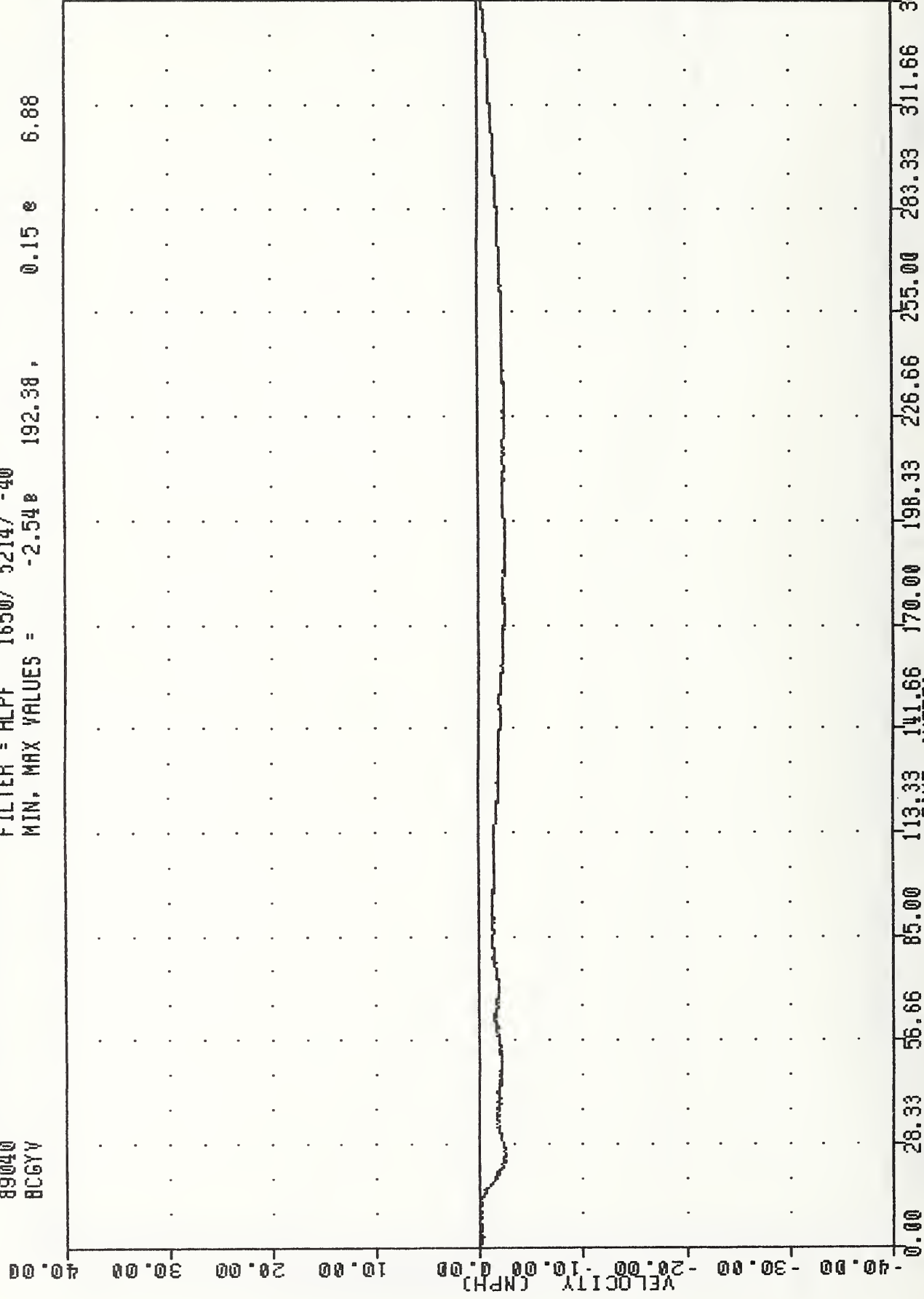
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 0.00e 0.00, 116.27 e 340.00



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 CONTOURED MOVING BARRIER CENTER OF GRAVITY X AXIS DISPLACEMENT

VRTC-4 , 890209-4
 CRASH III DAMAGE ALGORITHM
 89040
 BCGYV

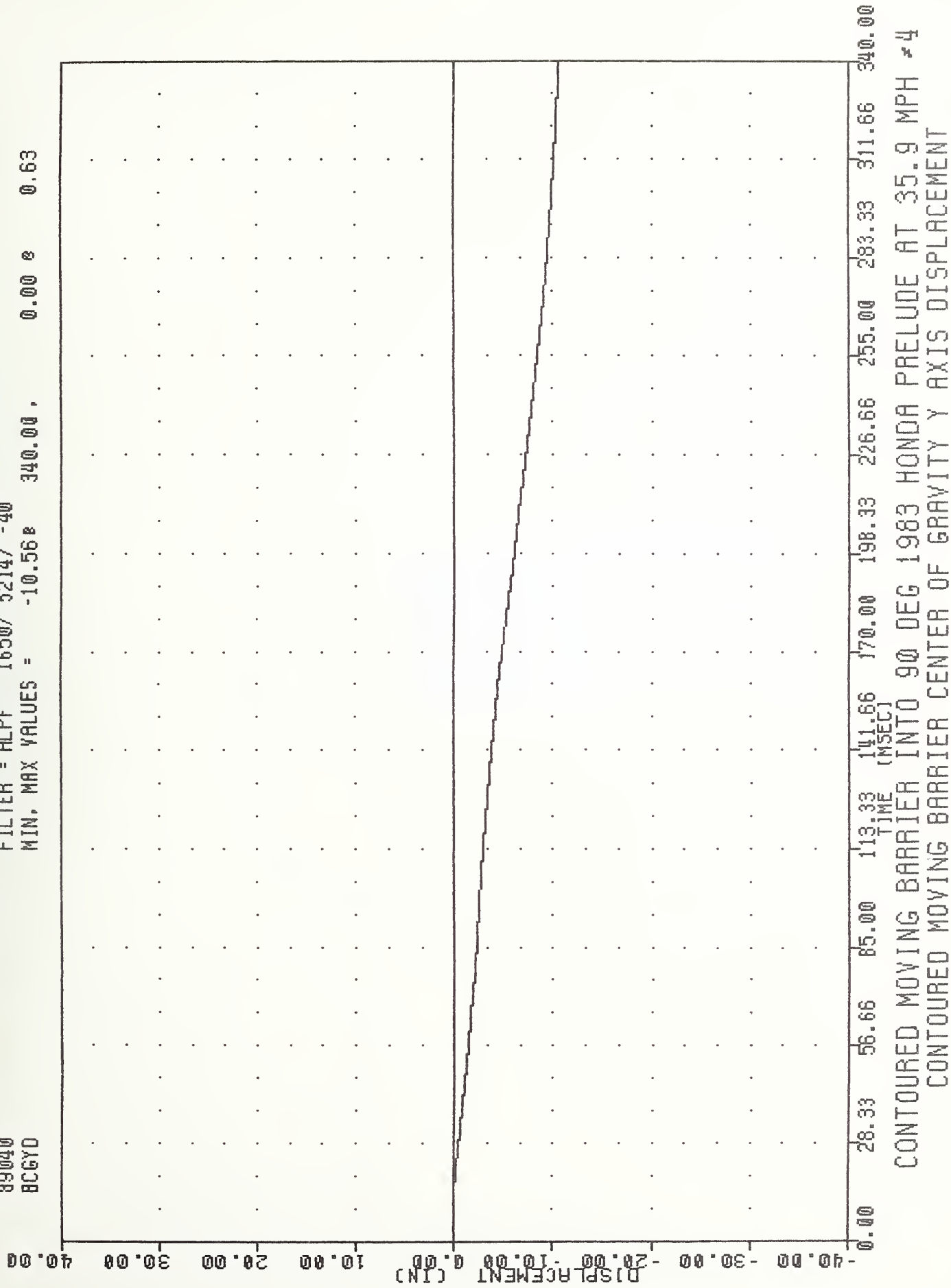
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -2.548 192.38 , 0.15 6.88



CONTOURED MOVING BARRIER INTO 90 DEG 1983 HONDA PRELUDE AT 35.9 MPH #4
 CONTOURED MOVING BARRIER CENTER OF GRAVITY Y AXIS VELOCITY

VRTC-4 , 890209-4
 CRASH III DAMAGE ALGORITHM
 89040
 BCCYD

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -10.56 340.00 0.00 0.63



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