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DOT HS 807 660
Final Report

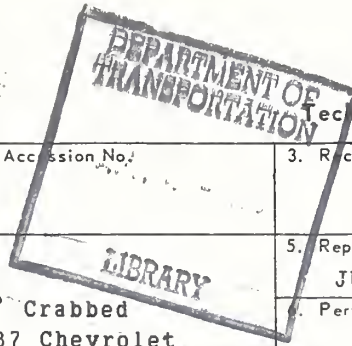
July 1990



EVALUATION OF THE BIOSID DUMMY MDB-To-Car Side Impact Test of a 26° Crabbed Moving Deformable Barrier into a 1987 Chevrolet Cavalier 4-door sedan at 33.5 MPH

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16. Abstract This test report documents a crash test to evaluate the response of BioSid dummies in a moving deformable barrier into stationary vehicle side impact crash test. Testing was conducted on a 1987 Chevrolet Cavalier 4-door Sedan at the TRC Crash Test Facility, East Liberty, Ohio. The test vehicle was impacted on the left side by a moving deformable barrier, crabbed to 26°, at 33.5 mph. The test was a simulation of a 90° intersection collision with the striking vehicle travelling at 30 mph and the struck vehicle travelling at 15 mph. Occupant responses of two side impact dummies were measured. One dummy was located in the driver's designated seating position and one was located in the left rear seating position. The test date was June 4, 1990 and the ambient temperature was 49°F. <table border="1"><thead><tr><th></th><th>DRIVER</th><th>PASSENGER</th></tr></thead><tbody><tr><td>Head Injury Criteria (HIC)</td><td>182</td><td>478</td></tr><tr><td>Upper Spine Acceleration,g</td><td>64</td><td>45</td></tr><tr><td>Left Upper Rib Acceleration,g</td><td>99</td><td>59</td></tr><tr><td>Left Center Rib Acceleration,g</td><td>98</td><td>86</td></tr><tr><td>Left Lower Rib Acceleration,g</td><td>94</td><td>97</td></tr><tr><td>Lower Spine Acceleration,g</td><td>61</td><td>69</td></tr><tr><td>Thoracic Trauma Index (TTI)</td><td>80</td><td>93</td></tr><tr><td>Pelvis Acceleration, g</td><td>109</td><td>97</td></tr></tbody></table>							DRIVER	PASSENGER	Head Injury Criteria (HIC)	182	478	Upper Spine Acceleration,g	64	45	Left Upper Rib Acceleration,g	99	59	Left Center Rib Acceleration,g	98	86	Left Lower Rib Acceleration,g	94	97	Lower Spine Acceleration,g	61	69	Thoracic Trauma Index (TTI)	80	93	Pelvis Acceleration, g	109	97
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TABLE OF CONTENTS

SECTION	TITLE	PAGE
1.0	PURPOSE AND TEST SUMMMARY	1-1
2.0	GENERAL TEST AND VEHICLE PARAMETER DATA	2-1
3.0	DATA REQUIRED BY R&D	3-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	DATA PLOT PRESENTATION	B-1
APPENDIX C	DUMMY CERTIFICATION	C-1

LIST OF PHOTOGRAPHS

<u>DESCRIPTION</u>	<u>FIGURE</u>
PRE-TEST VEHICLE FRONT AND BARRIER VIEW	A-1
POST-TEST VEHICLE FRONT AND BARRIER - VIEW 1	A-2
POST-TEST VEHICLE FRONT AND BARRIER - VIEW 2	A-3
PRE-TEST VEHICLE RIGHT SIDE VIEW	A-4
POST-TEST VEHICLE RIGHT SIDE VIEW	A-5
PRE-TEST VEHICLE REAR AND BARRIER VIEW	A-6
POST-TEST VEHICLE REAR AND BARRIER VIEW	A-7
PRE-TEST VEHICLE LEFT AND BARRIER VIEW	A-8
POST-TEST VEHICLE LEFT AND BARRIER VIEW	A-9
PRE-TEST VEHICLE LEFT SIDE VIEW	A-10
POST-TEST VEHICLE LEFT SIDE - VIEW 1	A-11
POST-TEST VEHICLE LEFT SIDE - VIEW 2	A-12
PRE-TEST VEHICLE LEFT FRONT CLOSE-UP VIEW	A-13
POST-TEST VEHICLE LEFT FRONT CLOSE-UP VIEW	A-14
PRE-TEST VEHICLE LEFT REAR CLOSE-UP VIEW	A-15
POST-TEST VEHICLE LEFT REAR CLOSE-UP VIEW	A-16
PRE-TEST VEHICLE TOP - VIEW 1	A-17
PRE-TEST VEHICLE TOP - VIEW 2	A-18
POST-TEST VEHICLE TOP VIEW	A-19
PRE-TEST LEFT FRONT DOOR ACCELEROMETERS VIEW	A-20
PRE-TEST LEFT REAR DOOR ACCELEROMETERS VIEW	A-21
PRE-TEST LEFT FRONT SILL ACCELEROMETER VIEW	A-22
PRE-TEST LEFT REAR SILL ACCELEROMETER VIEW	A-23
PRE-TEST DRIVER DUMMY - VIEW 1	A-24
PRE-TEST DRIVER DUMMY - VIEW 2	A-25
PRE-TEST DRIVER DUMMY - VIEW 3	A-26
POST-TEST DRIVER DUMMY VIEW	A-27
PRE-TEST PASSENGER DUMMY - VIEW 1	A-28
PRE-TEST PASSENGER DUMMY - VIEW 2	A-29
PRE-TEST PASSENGER DUMMY - VIEW 3	A-30
POST-TEST PASSENGER DUMMY VIEW	A-31

LIST OF PHOTOGRAPHS, CONT'D.

<u>DESCRIPTION</u>	<u>FIGURE</u>
POST-TEST DRIVER DUMMY CONTACT - VIEW 1	A-32
POST-TEST DRIVER DUMMY CONTACT - VIEW 2	A-33
POST-TEST PASSENGER DUMMY CONTACT - VIEW 1	A-34
POST-TEST PASSENGER DUMMY CONTACT - VIEW 2	A-35
POST-TEST BARRIER FACE - VIEW 1	A-36
POST-TEST BARRIER FACE - VIEW 2	A-37

SECTION 1.0
PURPOSE AND TEST SUMMARY

PURPOSE

The purpose of this test was to evaluate the response of BioSid dummies in a moving deformable barrier into stationary vehicle side impact test. The vehicle was tested using conditions not currently contained in a Federal Motor Vehicle Safety Standard.

INTRODUCTION

A stationary 1987 Chevrolet Cavalier 4-door sedan was impacted on the left side by a Moving Deformable Barrier (MDB) on June 4, 1990. The test was to simulate an intersection collision with the striking vehicle travelling at 30 mph and the struck vehicle travelling at 15 mph. The orientation angle of the striking vehicle was 90° counterclockwise with respect to the longitudinal axis of the struck vehicle. The leading edge of contact was to be 37 inches forward of the midpoint of the wheelbase.

To simulate this collision, the MDB was to be towed into the stationary Chevrolet Cavalier at 33.5 mph with MDB's wheels crabbed clockwise to 26°. The actual test speed was 33.5 mph and the actual leading edge of contact was 36.5 inches forward of the midpoint of the Chevrolet Cavalier's wheelbase.

Section 2 contains General Test and Vehicle Parameter Data. Section 3 contains data required by R & D. Appendix A contains pre-test and post-test vehicle and dummy photographs. Appendix B contains Data Plots. Appendix C contains Dummy Certification Data.

SECTION 2.0

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: General Motors, LTD.

MAKE/MODEL: Chevrolet Cavalier

VIN: 1G1JD5116HJ260477

BODY STYLE: 4-door sedan

MODEL YEAR: 1987

NHTSA NO.: NA

COLOR: Black

ENGINE DATA: TYPE: transverse

CYLINDERS: 4

DISPLACEMENT: 2.0 Liters

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

DATE VEHICLE RECEIVED: 5/21/90

ODOMETER READING: 38,900

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 Yes

RADIO No

ANTI-SKID BRAKE No

CLOCK No

REAR WINDOW DEFROSTER No

OTHER None

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? Yes
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? No
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: Good

DATA FROM VEHICLE'S CERTIFICATION LABEL:

VEHICLE MANUFACTURED BY: General Motors, LTD.

DATE OF MANUFACTURE: 6/87

VIN: 1G1JD5116HJ260477

GVWR: 3350 LBS

GAWR: FRONT: 1825 LBS., REAR: 1525 LBS.

TEST VEHICLE INFORMATION CONTINUED

VEHICLE TIRE DATA:

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

TIRES ON VEHICLE (MFR. & LINE, SIZE): Goodyear Ameroway XT P175/80R13 M&S

BIAS PLY, BELTED, OR RADIAL: Radial

PLY RATING: 1

IS SPARE TIRE "SPACE SAVER"? Yes

IS SPARE TIRE STANDARD EQUIPMENT? Yes

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

RIGHT FRONT	761 LBS.	RIGHT REAR	406 LBS.
LEFT FRONT	797 LBS.	LEFT REAR	402 LBS.
TOTAL FRONT WEIGHT	1558 LBS.	(65.8% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	808 LBS.	(34.2% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	2366 LBS.		

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 25.7;	LF 25.8;	RR 25.5;	LR 26.0
PRE-TEST ATTITUDE:	RF 24.6;	LF 24.6;	RR 22.8;	LR 22.9
POST-TEST ATTITUDE:	RF 24.7;	LF 23.1;	RR 22.6;	LR 22.4

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 228 LBS. CARGO:

RIGHT FRONT	878 LBS.	RIGHT REAR	566 LBS.
LEFT FRONT	878 LBS.	LEFT REAR	602 LBS.
TOTAL FRONT WEIGHT	1756 LBS.	(60.0% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1168 LBS.	(40.0% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2924 LBS.		

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

TEST VEHICLE INFORMATION CONTINUED

TEST FLUID TYPE

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

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USABLE" CAPACITY*: NA GALLONS

TEST VOLUME: 0 GALLONS

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

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: DNA

FUEL INJECTION: DNA

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

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

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

RECOMMENDED TIRE SIZE: P175/80R13 LOAD RANGE X B, C

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT

3 REAR

CARGO LOAD 132 LBS.

5 TOTAL

TOTAL 882 LBS.

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

VEHICLE TEST WEIGHT CALCULATION

Test Weight = Unloaded Delivered Weight +
(Number of Dummies X 165 lbs.) +
Cargo Weight*

To achieve test weight battery was removed. The fuel tank was empty. The weight of the test vehicle was measured by placing each wheel on a KJ Law Force Plate.

*A total test weight of 2940 pounds was used to duplicate a previous side impact test using a Chevrolet Cavalier.

TEST CONDITIONS

TEST NUMBER: 900604

DATE OF TEST: 6/4/90

TIME OF TEST: 1444

DRIVER DUMMY TEMPERATURE: 71° F

PASSENGER DUMMY TEMPERATURE: 71° F

AMBIENT TEMPERATURE AT IMPACT AREA: 49° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 69° F

MAX. LENGTH = 174.2

MAX. WIDTH = 66.4

TOP WIDTH = 46.5

WHEELBASE = 101.8

C.G. = 40.7 REARWARD OF FRONT WHEEL CENTERLINE

LEFT FRONT DOOR: UNLOCKED WINDOW: UP

LEFT REAR DOOR: UNLOCKED WINDOW: UP

RIGHT FRONT DOOR: UNLOCKED WINDOW: DOWN

RIGHT REAR DOOR: UNLOCKED WINDOW: DOWN

EMERGENCY BRAKE: OFF

TRANSMISSION: NEUTRAL

STEERING COLUMN: NON-ADJUSTABLE

SEAT TRACKS: MID POSITION

SEAT BACK ANGLE: 24°

TYPES OF SEATS: FRONT - BUCKET; REAR - BENCH

TIRE PRESSURE: FRONT 35 psi; REAR 35 psi

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

TEST CONDITIONS, CONTINUED

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2924	2940
MDB TEST WEIGHT (LBS.)	2903	2900
MDB VELOCITY (MPH)*	33.5	33.5
IMPACT POINT (INCHES)**	36.5	37.0

DUMMY DATA

	<u>DRIVER</u>	<u>LEFT REAR PASSENGER</u>
TYPE:	BioSid	BioSid
SERIAL NO.:	001	002
INSTRUMENTATION:		
HEAD	3 accel.	3 accel
SHOULDER	1 accel., 3 force, & 1 displ.	1 accel. & 1 displ.
UPPER SPINE	4 accel.	3 accel.
LEFT UPPER THORAX RIB	2 accel. & 1 displ.	2 accel. & 1 displ.
LEFT CENTER THORAX RIB	2 accel. & 1 displ.	2 accel. & 1 displ.
LEFT LOWER THORAX RIB	2 accel. & 1 displ.	2 accel. & 1 displ.
LOWER SPINE	4 accel.	4 accel.
LEFT UPPER ABDOMEN	1 accel. & 1 displ.	1 accel. & 1 displ.
LEFT LOWER ABDOMEN	1 accel. & 1 displ.	1 accel. & 1 displ.
PELVIS	3 accel. & 3 force	3 accel.

RESTRAINT SYSTEM: Both dummies were unrestrained.

*As measured over final one foot of travel.

**As measured forward of the midpoint of the test vehicle's wheelbase.

POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #001	PASSENGER #002
HEAD	<u>Left front top window sill</u>	<u>Left C-pillar</u>
CHEST	<u>Left front door</u>	<u>Left rear door</u>
ABDOMEN	<u>Left front door</u>	<u>Left rear door</u>
LEFT KNEE	<u>Left front door</u>	<u>Left rear door</u>
RIGHT KNEE	<u>Left knee</u>	<u>Left knee</u>

DOOR OPENING:

	LEFT	RIGHT
FRONT	<u>* </u>	<u>Easy</u>
REAR	<u>* </u>	<u>Easy</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
FRONT	<u>NA</u>	<u>NA</u>
REAR	<u>NA</u>	<u>NA</u>

GLAZING DAMAGE:

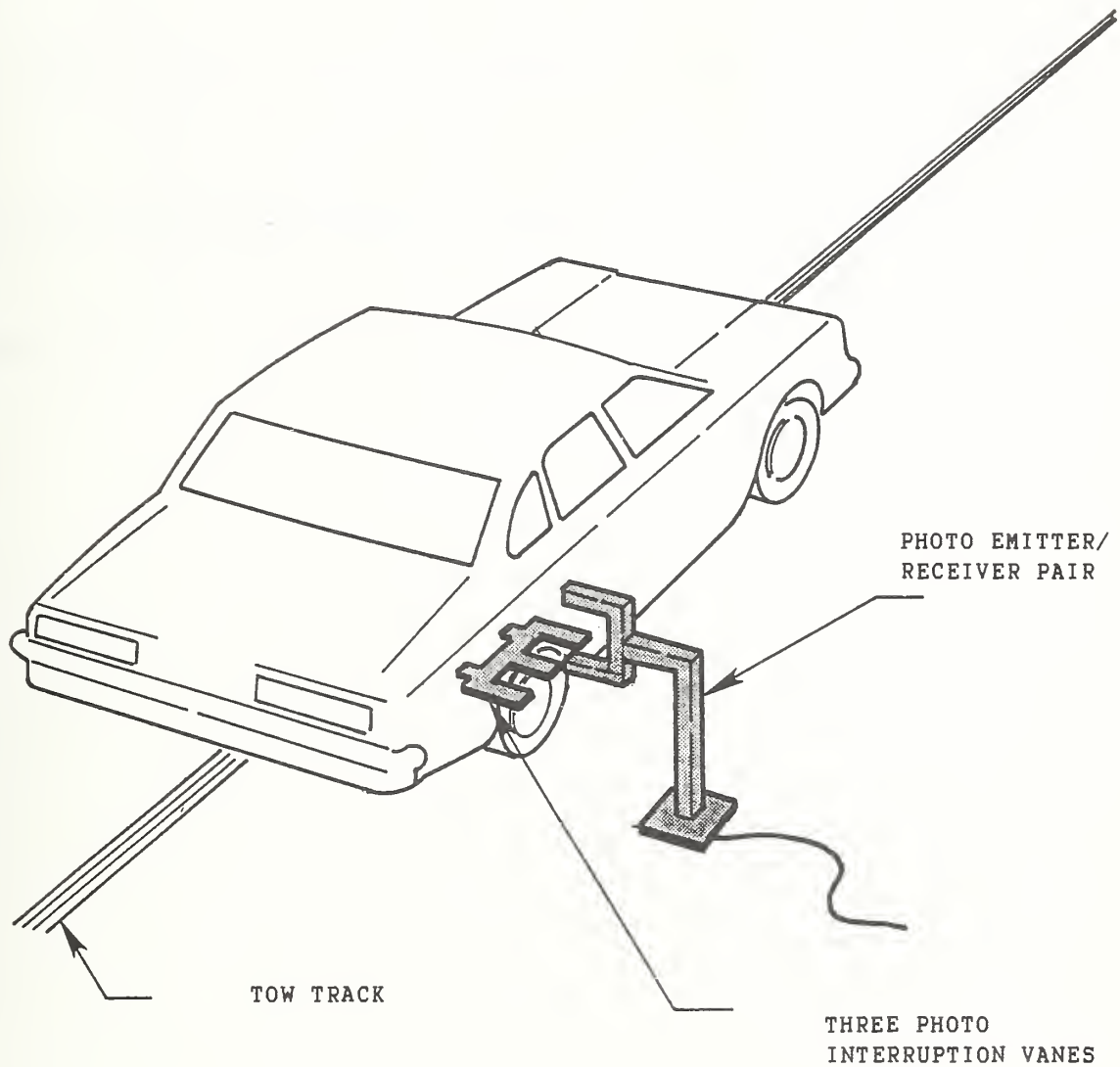
The left side windows were shattered. The windshield
was cracked.

OTHER NOTABLE IMPACT EFFECTS:

None

*The left front door to be opened later by VRTC.

IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane clears emitter/receiver two inches before impact.

The vanes have one foot spacing.

TEST ANOMALIES

The driver left shoulder Y-axis accelerometer, SHLYG1, data contained one spike at 225.25 milliseconds.

The driver left shoulder Y-axis velocity, SHLYV1, data was affected by the above anomaly.

The barrier rear crossmember X-axis accelerometer, BRCXG, data failed during the event.

The barrier rear crossmember X-axis velocity, BRCXV, data was affected by the above anomaly.

SECTION 3.0

DATA REQUIRED BY R&D

The following pages are included in this section:

1. Dummy temperature control and positioning data
2. Dummy kinematic summary
3. Vehicle crush data
4. Dummy and vehicle accelerometer location and data summary
5. High speed camera information
6. Transducer information

DUMMY TEMPERATURE CONTROL AND POSITIONING

The vehicle was kept inside the temperature controlled crash test building until approximately 2 hours prior to the test. Temperature inside the vehicle and ambient temperature at the crash area were recorded. Dummy temperature while outside the crash test building was maintained by portable air conditioning units until approximately 1 minute prior to the test.

The following Side Impact Dummy Seating Procedure summarizes the steps taken to position the instrumented, calibrated dummies in the test vehicle.

SIDE IMPACT DUMMY SEATING PROCEDURE

1. Seat Positioning

- A. Place seat at the longitudinal midpoint of fore to aft adjustment (forward most locking position to rear most locking position). If no locking position is available at mid-travel, use the position immediately rearward of mid-travel.
- B. If the seat back angle is adjustable, place it in the manufacturer's stated nominal design location. If not specified, set it at the first detent rearward of 25°.
- C. Adjustable head restraints are set so that the top surface of the restraint is level with the cg of the dummy's head.
- D. If the seat is equipped with adjustable side or lumbar supports, they are set in their "released" or full back positions.
- E. All other seat adjustments are positioned to their mid-travel locations. If locking positions are not available at these mid-points, use the position immediately rearward, down, left or clockwise of mid-travel. Clockwise is defined looking rear to front or left to right relative to the vehicle. This also applies to adjustable steering columns.

2. H-point Determination

- A. The SAE three-dimensional H-point machine (SAE J826 APR80 - 50th percentile male configuration) is used to locate the H-point for each surrogate.
- B. The H-point machine is positioned on the seat as follows:
 - 1. Bucket or Contoured Seats - The H-point machine is centered on the bucket or contour such that its midsagittal plane is vertical and longitudinal.

2. Bench Seats

- a. driver position - The H-point machine is positioned such that its midsagittal plane is vertical, longitudinal, and contains the steering wheel center point.
- b. outboard passenger positions - The H-point machine is positioned such that its midsagittal plane is vertical, longitudinal, and the same distance from the longitudinal vehicle centerline as that for the driver position.
- c. center passenger positions - The H-point machine is positioned such that its midsagittal plane is vertical and contains the longitudinal vehicle centerline.

- C. Locate the H-point position using the steps outlined in sections 4 through 6 of SAE Standard J826 APR80, unless otherwise specified in section 1 or 2 of this document. Record the coordinates of this point, relative to the vehicle, for use in sections 4 and 5 of this document.

3. Test Dummies

- A. This side impact crash test uses the BioSid side impact dummy.
- B. The arm position is fully down and the end of the arm is 1/4" away from the left side of the dummy.
- C. All dummy joints are inspected for mobility prior to each test usage and reset to hold between 1 and 2 g's. This amount just barely restrains the weight of the individual limb when it is extended horizontally.
- D. Each test dummy is clothed in form-fitting cotton stretch underwear with short sleeves and mid-calf length pants. Each foot of the dummy is equipped with a size 11EE shoe which meets the configuration, size, sole, and heel thickness specifications of MIL-S-13192 and weighs 1.25 ± 0.2 pounds. All the above items are supplied by the contractor.

4. Initial Dummy Placement

The BioSid dummy(s) is placed in the vehicle seat with its pelvis positioned such that a lateral line passing through the dummy H-point is perpendicular to the longitudinal centerplane of the vehicle.

A. Bucket or Contoured Seats. The dummy is centered on the bucket or contoured seat such that its midsagittal plane is vertical and longitudinal. The legs are positioned as follows, keeping the femur and tibia centerlines in a plane that is as near to vertical as possible.

1. driver position placement - The right foot of the dummy is initially placed on the undepressed accelerator pedal, with the heel resting on the floorpan as far forward as possible. The knees of the dummy are initially set 8 1/2 inches apart, measured between the center surfaces of the knee.
2. passenger position placement - The knees of the dummy are initially set 8 1/2 inches apart, measured between the center surfaces of the knee. If a center tunnel prevents this, place the feet on either side of the tunnel.
3. center passenger position - The dummy is positioned in the seat as outlined in section 4.A.2 except that its midsagittal plane is vertical and contains the vehicle centerline.

5. Initial Dummy Positioning

A. H-Point Positioning

1. Determine the dummy's H-point target location which is the point .25-inch below the H-point position determined by using the SAE J826 APR80 manikin in section 2.0.
2. With the dummy laterally positioned as in section 4, insert the pelvis angle indicator bar in the hole provided above, and to the

rear of the dummy H-point. Position the longitudinal pelvis angle between 23° and 25° to the horizontal. This may be accomplished by raising the legs or flexing the upper torso forward and allowing the pelvis to rotate. The lateral pelvis angle is to be horizontal.

3. Apply sufficient force on the lower torso in a horizontal and vertical direction to place the dummy H-point at the coordinates obtained in section 5.A.1.
4. If the H-point cannot be placed at the desired coordinates, adjust the pelvis angle within the 2° band and reposition to the coordinates. After repositioning the H-point, any deviation from the desired coordinates is recorded and used to indicate actual H-point locations. This deviation is not to exceed 1/2".

6. Final Dummy Positioning

- A. Driver Position. Without inducing pelvis or torso movement, the dummy's right foot is maintained on the undepressed accelerator pedal with the heel resting as far forward as possible on the floorpan. The left foot is set perpendicular to the lower leg with the heel resting on the floorpan in the same lateral line as the right heel. If possible within these constraints, the dummy's thighs should be in contact with the seatpan.
- B. Front Passenger Positions. Without inducing pelvis or torso movement, place the dummy's feet on the vehicle's toeboard with the heels resting on the floorpan as close as possible to the intersection of the toeboard and floorpan. If the feet cannot be placed on the toeboard, they are set perpendicular to the lower legs and placed as far forward as possible such that the heels rest on the floorpan.
- C. Rear Passenger Positions. Without inducing pelvis or torso movement, the feet are placed flat on the floorpan and beneath the front seat as far forward as possible without front seat interference. If necessary, change the distance between the knees as required to place the feet beneath the seat. Record the new distance.

- D. Vehicles with wheelhouse projections in the passenger compartment. The foot (feet) in question is placed in the wheel of the floorpan/toeboard and not on the wheelhouse projection. This is done by twisting the foot at the ankle, maintaining the upper and lower leg positions outlined in section 4. If this does not resolve the situation, move the leg of the foot in question just enough to achieve the correct position, keeping the femur and tibia centerlines in a plane that is as near to vertical as possible. Record the new distance between the knees.
- E. The knee positions are to be as outlined in section 4, unless modified as in section 6. The plane containing the femur and tibia centerlines for each leg is to be as near to vertical as possible without inducing pelvis or torso movement. Record the distance between the knees for each dummy.
- F. Prior to conducting the test, the dummy position is visually checked. The dummy is to be properly positioned laterally with its midsagittal plane vertical and longitudinal, and the upper torso resting against the seat back. The H-point and pelvis angle are to be within the specified ranges and the foot, knee, and leg placements are to be as outlined. The COTR is to be satisfied with the final dummy position and any deviations from this procedure are to be approved by the COTR.
- G. The final dummy position is recorded. These measurements are to include, but not be limited to, pelvis and head angles as well as actual H-point and head cg locations relative to the vehicle. The straight-line distance from the H-point to the center of the outer ankle bolt is also recorded for one of the legs (eg. left H-point to left ankle bolt).

DUMMY IN-VEHICLE POSITION RECORDING SHEET

MFR./MAKE/MODEL: General Motors, LTD./Chevrolet/Cavalier

SEAT TYPE: X Bench - Rear
X Bucket - Front
 Split bench

ADJUSTER TYPE: X Manual
 Power
 Non-adjustable

TECHNICIANS:

BUCKET SEAT BACK TYPE: Non-adjustable
 X Adjustable reclining

1. D. Carpenter

2. B. Crabtree

POSITIONING DATE: 6/4/90

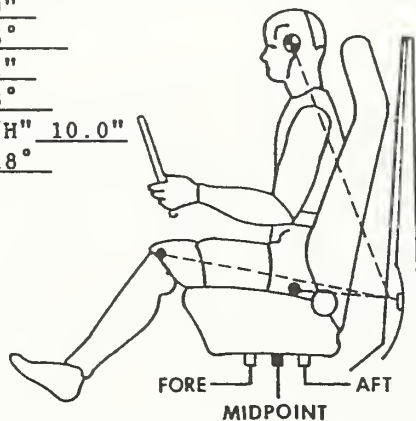
3. R. Cribley

AMBIENT TEMP.: 49° F TIME: 1000

4.

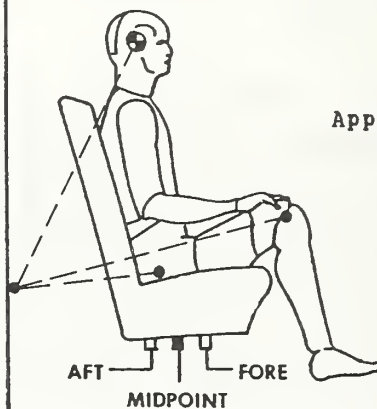
DRIVER DUMMY* # 001 TYPE: BioSid

Head 21.9"
Target 5°
Knee 24.1"
Joint 88°
Approx. "H" 10.0"
Point 118°

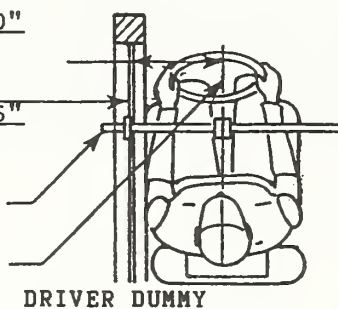


PASSENGER DUMMY** # 002 TYPE: BioSid

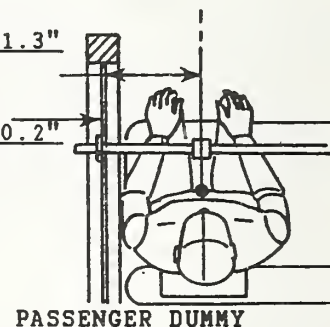
Head 16.2"
Target 8°
Knee 26.2"
Joint 102°
Approx. "H" 15.4"
Point 137°



12.0"
DOOR GLASS
HEIGHT = 11.5"
LATERAL BAR
ADJUSTABLE
POINTER



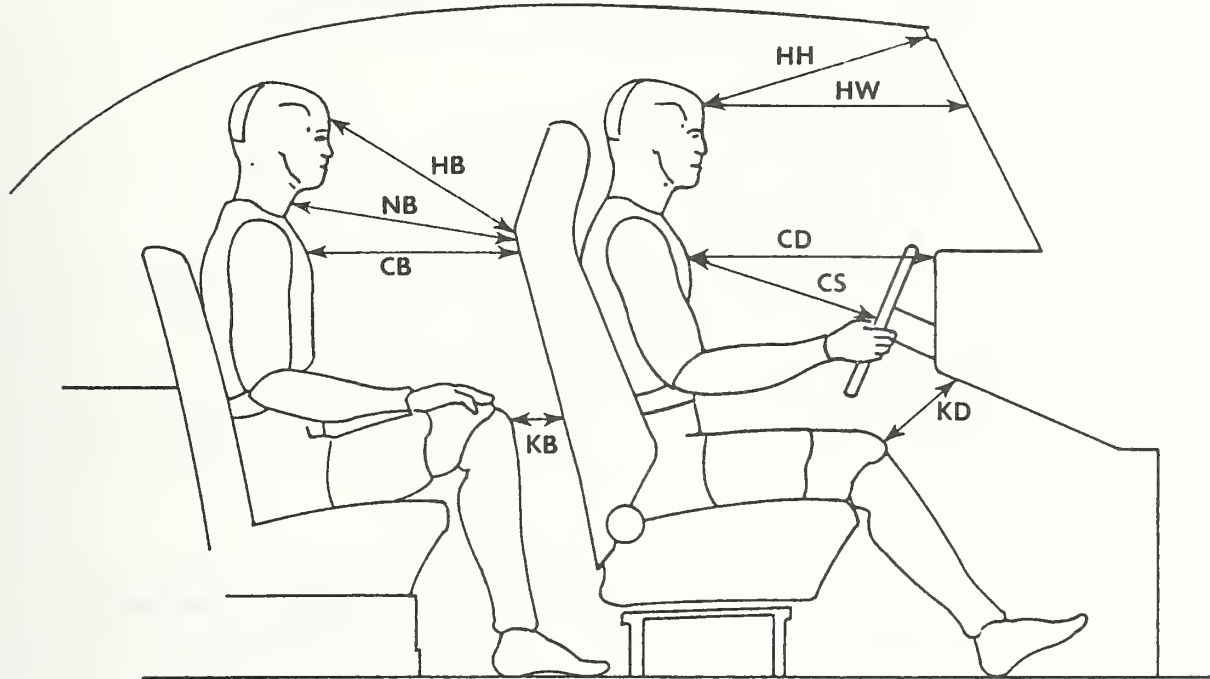
11.3"
DOOR GLASS
HEIGHT = 10.2"



*Driver dummy measurements are referenced to top of left front door striker bolt and all angles referenced to vertical.

**Passenger dummy measurements are referenced to top of left rear door striker bolt and all angles are referenced to vertical.

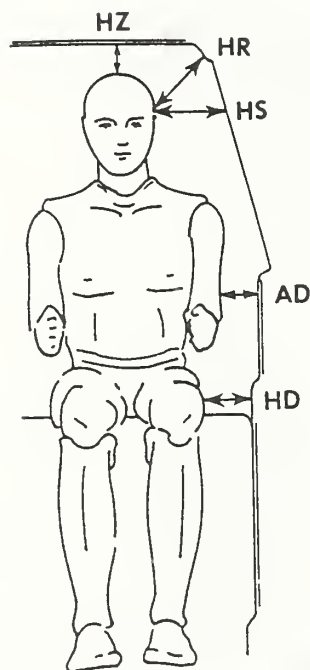
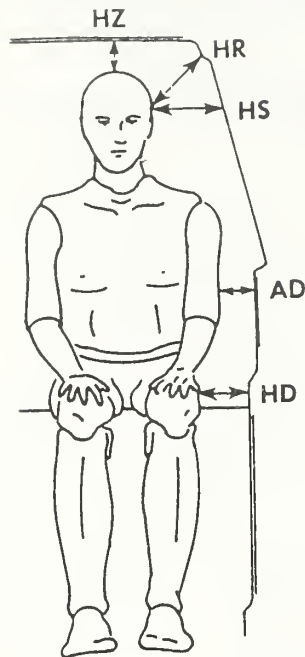
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS



	DRIVER	REAR PASSENGER
HH	13.8	NA
HW	18.5	NA
CD	18.0	NA
CS	13.9	NA
KDL	2.9	NA
KDR	2.8	NA
HB	NA	25.9
NB	NA	23.3
CB	NA	18.2
KBL	NA	4.4
KBR	NA	4.4

ALL MEASUREMENTS ARE IN INCHES.

DUMMY LATERAL CLEARANCE DIMENSIONS



	DRIVER	PASSENGER
HR	6.2	6.0
HS	8.8	8.4
AD	3.7	3.2
HD	6.2	6.0
HZ	3.4	1.6

ALL DISTANCE MEASUREMENTS ARE
IN INCHES.

SAE 3D H-POINT MACHINE LOCATION AND DUMMY LOCATION DATA

	DRIVER #001	PASSENGER #002
SAE 3D H-POINT MACHINE LOCATION:	X = 7.20	X = 9.90
	Z = -3.75	Z = -9.60
DUMMY H-POINT LOCATION:	X = 7.40	X = 9.90
	Z = -4.00	Z = -9.80
DUMMY PELVIC ANGLE:	24°	25°

*The driver location measurements referenced to the left front door striker bolt and the passenger location measurements referenced to the left rear door striker bolt in two dimensional rectangular coordinates: +X = forward, +Z = upward

All dimensions in inches except as noted.

All angles referenced to horizontal, positive is upward.

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the dummy's torso contacted the driver's door and the head contacted the left front door top window sill. The dummy rebounded laterally across the front occupant compartment. The upper torso rotated and contacted the windshield. The left knee contacted the left front door and the right knee contacted the left knee. The dummy's pelvis came to rest against the right front door and the upper torso was leaning to the center of the vehicle.

PASSENGER

During impact, the dummy's torso contacted the left rear door and the head contacted the left C-pillar. The dummy rebounded laterally across the rear occupant compartment. The left knee contacted the left rear door and the right knee contacted the left knee. The dummy's pelvis came to rest against the right rear door and the upper torso was leaning to the center of the vehicle.

VEHICLE EXTERIOR PROFILES AND STATIC CRUSH
ZERO DISTANCE AT PROJECTED IMPACT POINT*

LOCATION	HEIGHT(IN)	-6	0	6	12	18	24	30	36	42	48	54	60	66	72	78
PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Axle Height	11.5	X	X	X	18.6	18.6	18.6	18.7	18.7	18.7	18.7	18.8	18.8	18.8	X	X
H-Point	17.9	X	X	16.5	16.3	16.2	16.2	16.1	16.2	16.1	16.1	16.1	16.1	16.1	16.2	X
Mid Door	22.1	X	X	15.8	15.5	15.4	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	X
Window Sill	33.5	18.7	18.4	18.2	18.2	18.1	18.0	18.0	17.9	17.9	17.9	17.8	17.7	17.7	17.8	17.8
Window Top	51.5	X	X	X	X	X	X	26.1	26.4	26.5	26.4	26.4	26.5	26.4	26.5	26.6

POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)

Axle Height	11.5	X	X	21.8	25.2	26.1	26.8	27.2	27.8	28.4	28.5	25.9	23.2	21.2	X	X
H-Point	17.9	X	X	18.5	29.4	30.2	30.9	31.1	31.2	31.4	30.7	30.2	30.5	28.9	18.1	X
Mid Door	22.1	X	X	18.0	29.5	30.5	30.5	30.6	30.7	30.8	30.8	30.6	30.5	29.1	24.1	X
Window Sill	33.5	19.2	18.9	19.2	26.4	27.6	27.6	27.7	27.9	28.5	33.8	32.6	30.2	28.4	23.4	19.2
Window Top	51.5	X	X	X	X	X	X	28.0	28.6	29.4	29.4	28.5	28.2	27.9	27.6	27.5

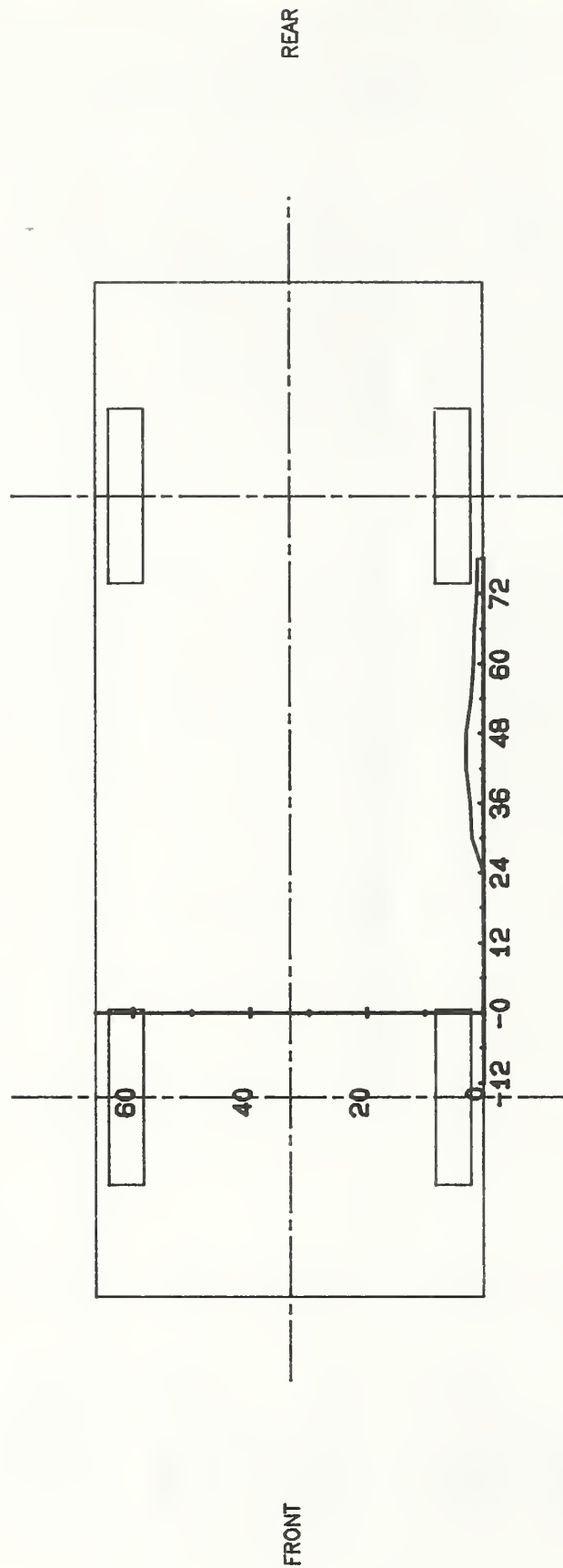
STATIC CRUSH (IN)

Axle Height	11.5	X	X	3.2	6.6	7.5	8.2	8.5	9.7	9.7	9.8	7.1	4.4	2.4	X	X
H-Point	17.9	X	X	2.0	13.1	14.0	14.7	15.0	15.2	14.6	14.1	14.4	14.1	12.8	1.9	X
Mid Door	22.1	X	X	2.2	14.0	15.1	15.2	15.3	15.4	15.5	15.3	15.2	14.8	13.8	8.8	X
Window Sill	33.5	0.5	0.5	1.0	8.2	9.5	9.6	9.7	10.0	10.6	15.9	14.8	12.5	10.7	5.6	1.4
Window Top	51.5	X	X	X	X	X	X	1.9	2.2	2.9	3.0	2.1	1.7	1.5	1.1	0.9

* Projected impact point is 37 inches forward of driver's side wheelbase midpoint. Column readings are front to rear from left to right.

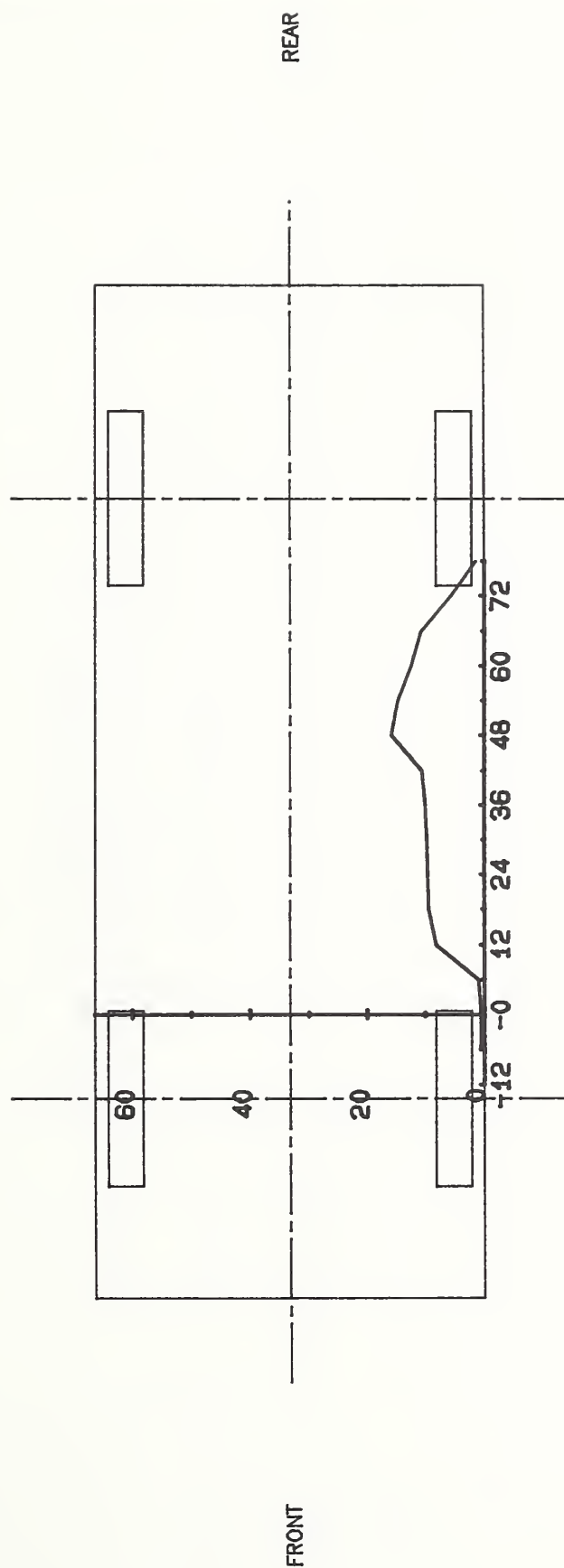
** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



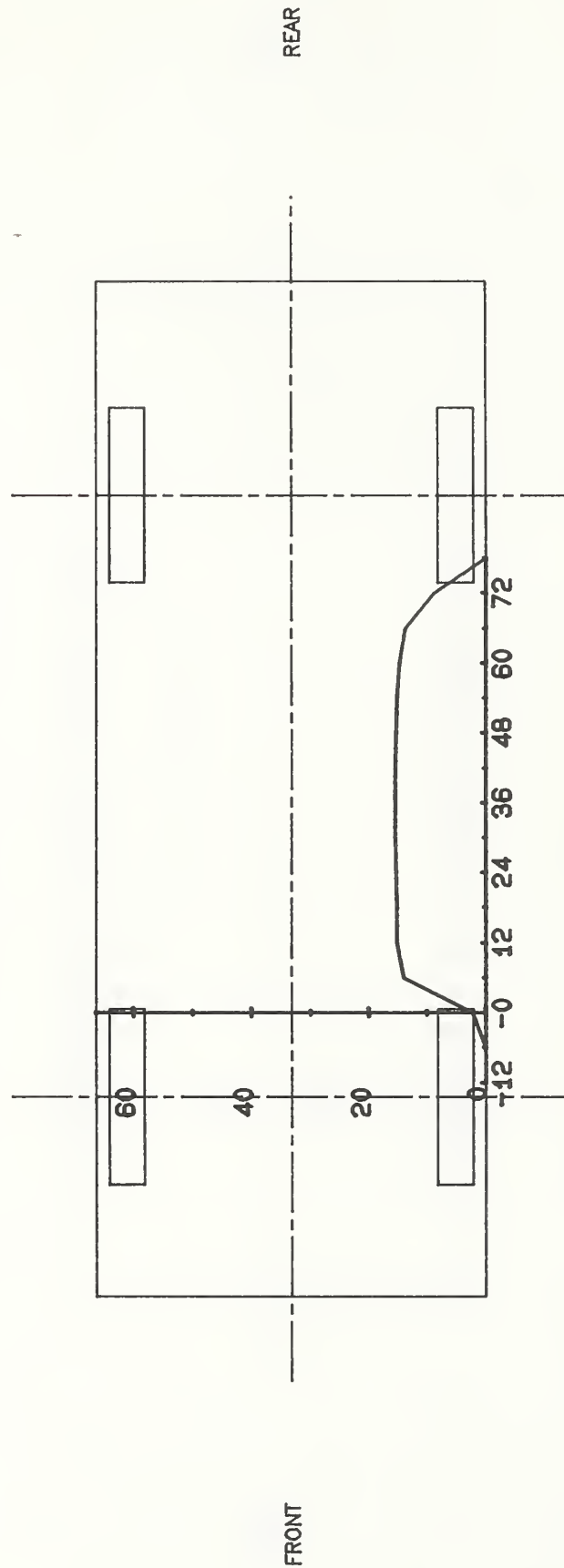
PROFILE LEVEL EQUALS WINDOW TOP HEIGHT WHICH IS 51.5" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.035

VEHICLE EXTERIOR STATIC CRUSH PROFILE



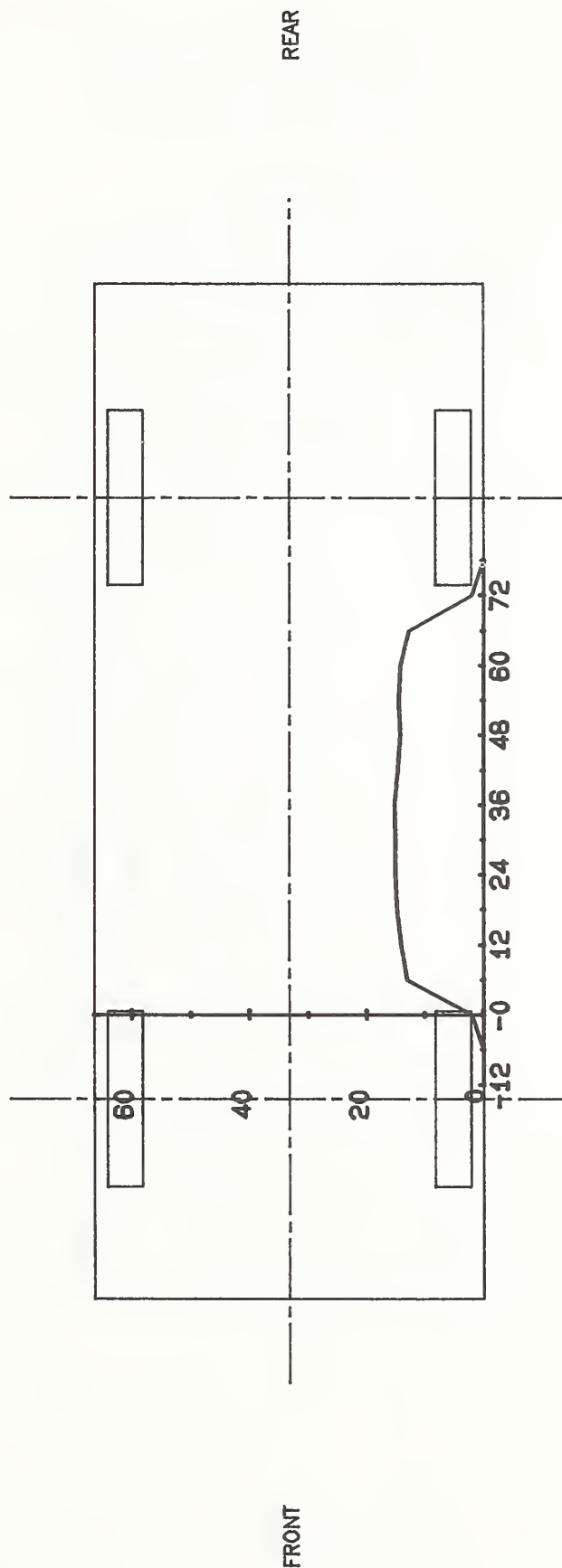
PROFILE LEVEL EQUALS WINDOW SILL HEIGHT WHICH IS 33.5" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.035

VEHICLE EXTERIOR STATIC CRUSH PROFILE



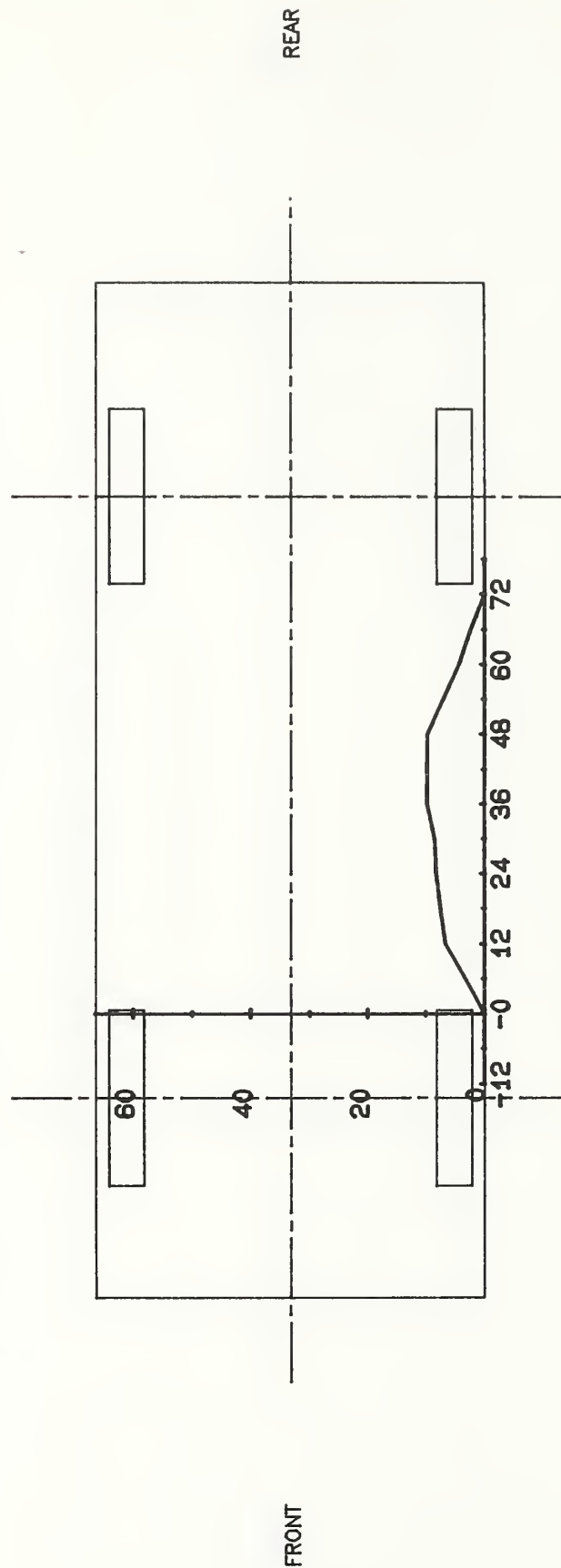
PROFILE LEVEL EQUALS MID DOOR HEIGHT WHICH IS 22.1" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.035

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS H-POINT HEIGHT WHICH IS 17.9" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.035

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS AXLE HEIGHT WHICH IS 11.5" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.035

DUMMY DATA SUMMARY

TEST NUMBER 900604

DRIVER DUMMY

SN: 001

POSITIVE		NEGATIVE	
DIRECTION		DIRECTION	
MAX	MSEC	MAX	MSEC

HEAD

LONGITUDINAL ACCEL. (g)	25.4	243.9	13.3	214.8
LATERAL ACCEL. (g)	36.1	50.1	21.3	182.1
DELTA V (MPH)	19.1	122.4		
VERTICAL ACCEL. (g)	18.7	243.9	49.4	46.6
RESULTANT ACCEL. (g)	58.0	47.9		
HIC	181.9 FROM 40.6 TO 58.9 MSEC			

LEFT SHOULDER

LATERAL ACCEL. (g)	100.8	35.6 Y	29.9	41.2 Y
DELTA V (MPH)	19.6	39.2 Y		
LONGITUDINAL FORCE (N)	941.4	237.8	193.4	55.5
LATERAL FORCE (N)	3034.0	42.8	716.4	226.3
VERTICAL FORCE (N)	549.6	255.8	678.0	37.6
LATERAL DISPL. (mm)	29.5	43.1	1.2	243.3

UPPER SPINE

LONGITUDINAL ACCEL. (g)	15.6	52.5	5.5	74.4
LATERAL (P) ACCEL. (g)	63.5	38.8	14.9	62.5
DELTA V (MPH)	24.9	52.5		
LATERAL (R) ACCEL. (g)	64.1	38.8	14.4	62.5
DELTA V (MPH)	25.1	52.5		
VERTICAL ACCEL. (g)	11.7	36.9	6.9	70.6
RESULTANT (P) ACCEL. (g)	64.3	38.8		
RESULTANT (R) ACCEL. (g)	64.9	38.8		

LEFT UPPER THORAX RIB

LATERAL (P) ACCEL. (g)	98.5	36.9	28.2	309.4
DELTA V (MPH)	20.7	40.6		
LATERAL (R) ACCEL. (g)	97.4	36.3	37.6	56.3
DELTA V (MPH)	21.5	40.6		
LATERAL DISPL. (mm)	32.5	43.6	1.2	65.1

DUMMY DATA SUMMARY CONTINUED

TEST NUMBER 900604

DRIVER DUMMY

SN: 001

POSITIVE DIRECTION	NEGATIVE DIRECTION
MAX MSEC	MAX MSEC

LEFT CENTER THORAX RIB

LATERAL (P) ACCEL. (g)	97.9	36.3	39.5	42.5
DELTA V (MPH)	21.7	40.6		
LATERAL (R) ACCEL. (g)	97.0	36.3	38.5	309.4
DELTA V (MPH)	22.4	40.6		
LATERAL DISPL. (mm)	40.3	43.8	0.8	65.8

LEFT LOWER THORAX RIB

LATERAL (P) ACCEL. (g)	93.6	23.8	50.9	42.5
DELTA V (MPH)	20.5	40.0		
LATERAL (R) ACCEL. (g)	100.0	23.8	45.6	310.0
DELTA V (MPH)	23.4	40.6		
LATERAL DISPL. (mm)	45.0	43.5	0.0	16.5

THORACIC TRAUMA INDEX

TTI (P)	79.7
TTI (R)	80.5

LOWER SPINE

LONGITUDINAL ACCEL. (g)	26.7	30.6	19.0	51.3
LATERAL (P) ACCEL. (g)	60.9	33.7	6.7	96.3
DELTA V (MPH)	24.0	51.8		
LATERAL (R) ACCEL. (g)	61.1	33.7	6.9	93.8
DELTA V (MPH)	23.8	51.8		
VERTICAL ACCEL. (g)	21.4	34.4	5.0	48.8
RESULTANT (P) ACCEL. (g)	67.0	33.1		
RESULTANT (R) ACCEL. (g)	67.1	33.1		

LEFT UPPER ABDOMEN

LATERAL ACCEL. (g)	94.5	55.0	31.3	60.6
DELTA V (MPH)	9.2	23.8		
LATERAL DISPL. (mm)	44.5	38.1	0.7	57.4

LEFT LOWER ABDOMEN

LATERAL ACCEL. (g)	151.3	16.9	59.0	25.6
DELTA V (MPH)	13.9	23.1		
LATERAL DISPL. (mm)	67.6	45.5	0.3	16.5

DUMMY DATA SUMMARY CONTINUED

TEST NUMBER 900604

DRIVER DUMMY

SN: 001

POSITIVE DIRECTION		NEGATIVE DIRECTION	
MAX	MSEC	MAX	MSEC

PELVIS

LONGITUDINAL ACCEL. (g)	6.3	191.9	20.5	37.5
LATERAL ACCEL. (g)	108.7	27.5	5.8	268.7
DELTA V (MPH)	27.4	46.2		
VERTICAL ACCEL. (g)	18.3	31.3	7.3	25.6
RESULTANT ACCEL. (g)	109.3	27.5		

PELVIS PUBIC SYMPHYSIS

LATERAL FORCE (N)	2924.0	37.3	140.1	294.1
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PELVIS SACRUM

LATERAL FORCE (N)	761.9	99.6	2317.4	33.5
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PELVIS ILIAC

LATERAL FORCE (N)	5509.8	28.1	141.1	60.8
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POSITIVE DIRECTION

LONGITUDINAL:	FORWARD
LATERAL:	RIGHTWARD
VERTICAL:	UPWARD
FORCE:	COMPRESSION

NEGATIVE DIRECTION

LONGITUDINAL:	REARWARD
LATERAL:	LEFTWARD
VERTICAL:	DOWNWARD
FORCE:	EXTENSION

NOTES:

For dummy channels Delta V is the velocity change at the approximate time of separation from the contact area.

(P) Primary Sensor
(R) Redundant Sensor

γ See TEST ANOMALIES

DUMMY DATA SUMMARY

TEST NUMBER 900604

PASSENGER DUMMY

SN: 002

POSITIVE DIRECTION		NEGATIVE DIRECTION	
MAX	MSEC	MAX	MSEC

HEAD

LONGITUDINAL ACCEL. (g)	8.1	189.1	26.6	53.8
LATERAL ACCEL. (g)	84.2	58.8	14.8	73.6
DELTA V (MPH)	19.3	68.5		
VERTICAL ACCEL. (g)	10.2	34.5	34.4	51.8
RESULTANT ACCEL. (g)	87.6	58.8		
HIC	478.3 FROM 51.6 TO 61.5 MSEC			

LEFT SHOULDER

LATERAL ACCEL. (g)	44.5	37.5	5.4	94.4
DELTA V (MPH)	22.4	57.1		
LATERAL DISPL. (mm)	9.8	44.8	0.9	28.6

UPPER SPINE

LONGITUDINAL ACCEL. (g)	1.8	237.5	14.2	46.3
LATERAL (P) ACCEL. (g)	45.3	42.5	2.9	196.2
DELTA V (MPH)	20.6	60.0		
VERTICAL ACCEL. (g)	9.8	40.0	6.5	77.5
RESULTANT (P) ACCEL. (g)	47.3	43.1		

LEFT UPPER THORAX RIB

LATERAL (P) ACCEL. (g)	58.9	35.6	4.8	85.6
DELTA V (MPH)	21.2	54.4		
LATERAL (R) ACCEL. (g)	59.1	35.6	6.5	55.6
DELTA V (MPH)	22.0	53.8		
LATERAL DISPL. (mm)	18.6	45.9	0.3	177.5

LEFT CENTER THORAX RIB

LATERAL (P) ACCEL. (g)	86.4	35.0	4.0	96.9
DELTA V (MPH)	21.6	53.1		
LATERAL (R) ACCEL. (g)	83.1	35.6	3.8	106.9
DELTA V (MPH)	21.8	53.1		
LATERAL DISPL. (mm)	28.6	44.4	0.1	25.0

LEFT LOWER THORAX RIB

LATERAL (P) ACCEL. (g)	97.1	35.0	8.0	53.7
DELTA V (MPH)	18.4	40.0		
LATERAL (R) ACCEL. (g)	97.2	35.0	8.4	53.7
DELTA V (MPH)	18.4	40.0		
LATERAL DISPL. (mm)	32.8	44.0	0.8	143.6

THORACIC TRAUMA INDEX

TTI (P)	83.1
TTI (R)	82.8

DUMMY DATA SUMMARY CONTINUED

TEST NUMBER 900604

PASSENGER DUMMY

SN: 002

	POSITIVE DIRECTION		NEGATIVE DIRECTION	
	MAX	MSEC	MAX	MSEC
LOWER SPINE				
LONGITUDINAL ACCEL. (g)	13.5	33.1	16.4	41.9
LATERAL (P) ACCEL. (g)	69.1	39.4	6.0	96.9
DELTA V (MPH)	24.5	58.8		
LATERAL (R) ACCEL. (g)	68.5	40.0	5.7	102.5
DELTA V (MPH)	23.8	58.8		
VERTICAL ACCEL. (g)	32.7	39.4	9.5	73.1
RESULTANT (P) ACCEL. (g)	77.7	40.0		
RESULTANT (R) ACCEL. (g)	77.2	40.0		
LEFT UPPER ABDOMEN				
LATERAL ACCEL. (g)	143.3	31.9	41.1	36.9
DELTA V (MPH)	19.2	35.6		
LATERAL DISPL. (mm)	49.4	45.3	3.7	154.9
LEFT LOWER ABDOMEN				
LATERAL ACCEL. (g)	160.6	20.0	91.1	25.0
DELTA V (MPH)	13.6	23.1		
LATERAL DISPL. (mm)	65.8	49.4	0.1	4.3
PELVIS				
LONGITUDINAL ACCEL. (g)	10.9	61.2	38.0	32.5
LATERAL ACCEL. (g)	96.9	31.9	6.6	69.4
DELTA V (MPH)	27.8	58.8		
VERTICAL ACCEL. (g)	25.8	32.5	5.6	73.8
RESULTANT ACCEL. (g)	106.5	32.5		

POSITIVE DIRECTION

LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: UPWARD
FORCE: COMPRESSION

NEGATIVE DIRECTION

LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: DOWNWARD
FORCE: EXTENSION

NOTES:

For dummy channels Delta V is the velocity change at the approximate time of separation from the contact area.

(P) Primary Sensor
(R) Redundant Sensor

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900604

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX	G MSEC	MAX	G MSEC
1	RIGHT SILL AT FRONT SEAT	108.8	24.9	10.5				
	LONGITUDINAL				2.2	60.0	7.3	24.9
	LATERAL				19.3	12.4	3.6	78.9
	VERTICAL				4.4	33.8	5.3	27.0
	RESULTANT				19.3	12.4		
	Delta VY is 13.5 MPH @ 72.6 MSEC							
2	RIGHT SILL AT REAR SEAT	75.2	25.0	10.6				
	LONGITUDINAL				2.0	41.8	7.3	24.6
	LATERAL				16.8	33.0	5.1	78.6
	VERTICAL				3.5	256.4	4.7	71.8
	RESULTANT				18.0	33.1		
	Delta VY is 15.4 MPH @ 74.6 MSEC							
3	REAR DECK OVER AXLE	35.5	-3.0	12.9				
	LONGITUDINAL				4.2	13.4	12.2	25.3
	LATERAL				20.8	32.1	4.4	193.9
	VERTICAL				14.3	19.4	17.2	32.1
	RESULTANT				27.1	32.0		
	Delta VY is 20.6 MPH @ 96.1 MSEC							
4	LEFT SILL AT REAR SEAT	75.8	-24.9	11.0				
	LATERAL				98.0	9.1	144.1	14.8
	Delta VY is 10.9 MPH @ 8.2 MSEC							
5	LEFT SILL AT FRONT SEAT	109.2	-24.9	11.0				
	LATERAL				104.7	9.6	114.8	16.1
	Delta VY is 12.9 MPH @ 9.6 MSEC							
6	LEFT FRONT DOOR CENTERLINE	97.9	-27.1	26.0				
	LATERAL				165.7	13.1	144.3	22.0
	Delta VY is 27.0 MPH @ 17.2 MSEC							
7	RIGHT TRUNK FLOOR	43.0	12.4	17.6				
	LONGITUDINAL				4.1	15.0	9.3	26.1
8	LEFT REAR DOOR MID REAR	59.2	-27.6	25.4				
	LATERAL				190.6	16.5	95.4	24.5
	Delta VY is 30.5 MPH @ 16.0 MSEC							

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY CONTINUED

TEST NUMBER 900604

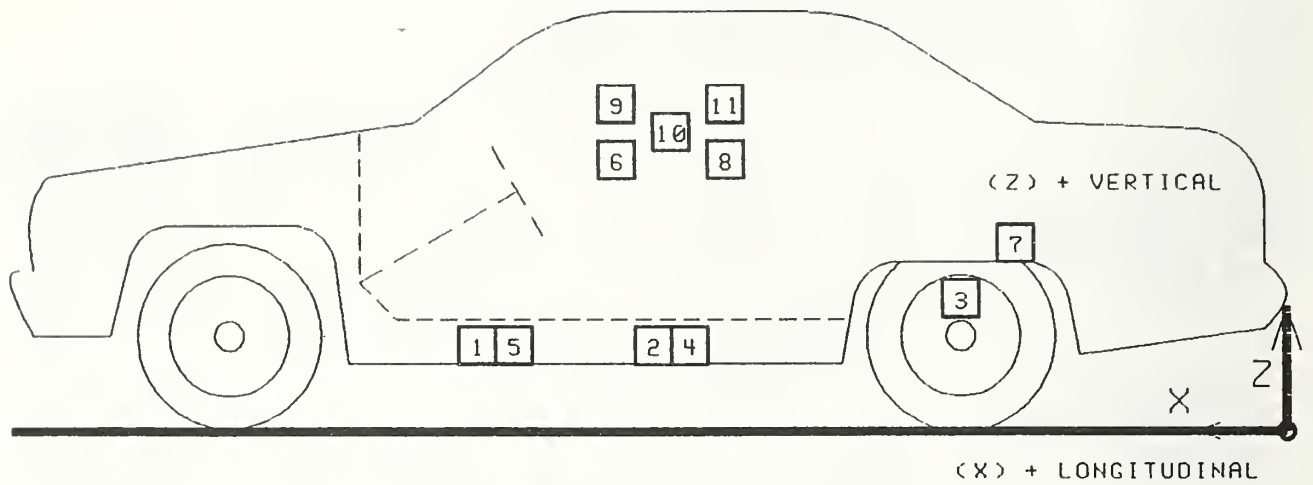
No. LOCATION	X*	Y*	Z*	POSITIVE		NEGATIVE	
				DIRECTION		DIRECTION	
				MAX G	MSEC	MAX G	MSEC
9 UPPER LEFT FRONT DOOR CENTERLINE LATERAL	93.8	-26.6	30.8				
				118.8	14.0	133.3	32.0
	Delta VY is 22.6 MPH @ 18.4 MSEC						
10 MIDFRONT OF LEFT FRONT DOOR LATERAL	89.8	-26.8	26.1				
				199.1	13.3	74.7	23.8
	Delta VY is 28.2 MPH @ 17.6 MSEC						
11 LEFT REAR DOOR UPPER CENTERLINE LATERAL	64.5	-27.4	30.4				
				159.8	13.6	116.6	30.0
	Delta VY is 28.6 MPH @ 17.6 MSEC						

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

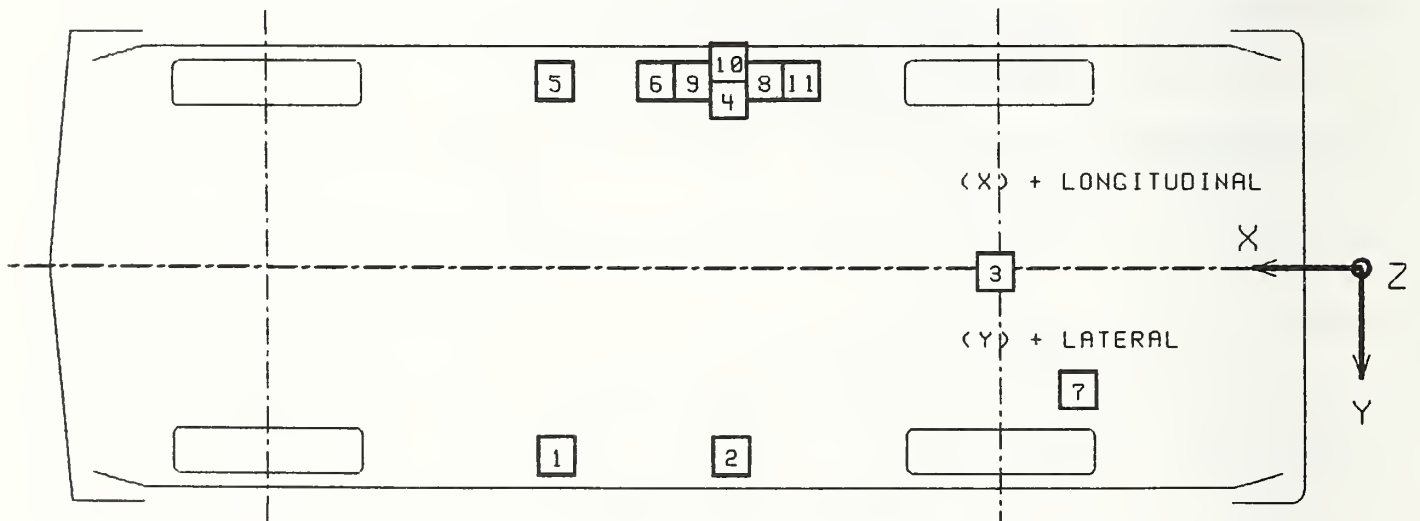
REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + RIGHTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

All measurements of accelerometer locations in inches.

VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900604

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX	G MSEC	MAX	G MSEC
1	CENTER OF GRAVITY	74.2	0.0	12.2				
	LONGITUDINAL				1.5	137.0	16.8	36.6
	LATERAL				2.4	58.8	6.7	41.5
	VERTICAL				3.9	32.5	4.7	37.8
	RESULTANT				18.3	37.1		
		Delta VX is 17.4 MPH @ 106.0 MSEC						
		Delta VY is 3.7 MPH @ 106.0 MSEC						
2	REAR FRAME MEMBER	19.2	0.0	12.0				
	LONGITUDINAL				256.3	212.3 Y	---	---c
	LATERAL				5.9	34.1	2.2	102.3
		Delta VX is ---- MPH @ ---- MSEC Y						
		Delta VY is -2.2 MPH @ 51.8 MSEC						

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

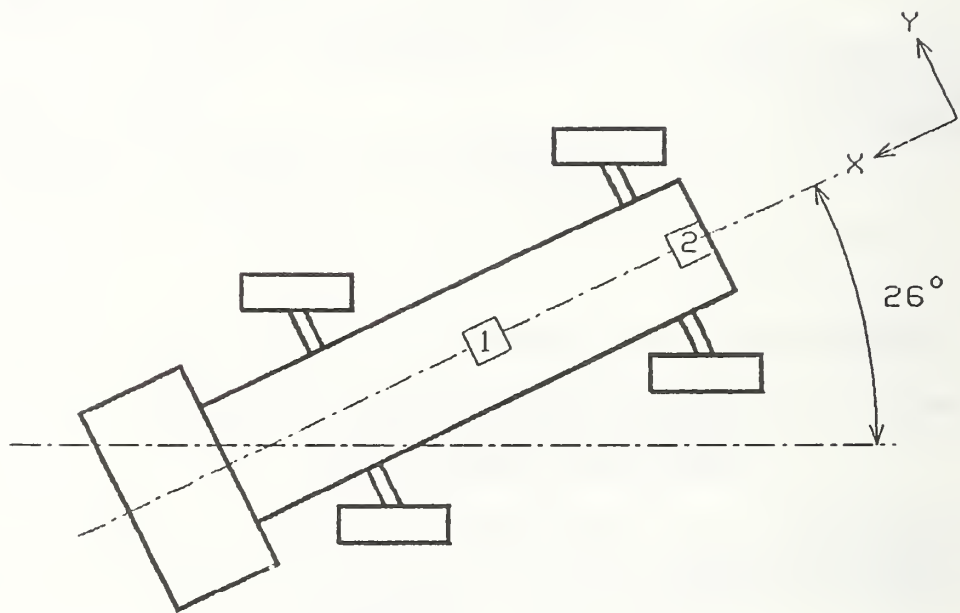
REFERENCE: X: + FORWARD FROM REAR POINT OF FRAME
Y: + RIGHTWARD FROM BARRIER CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

All measurements of accelerometer locations in inches.

Y See TEST ANOMALIES

c There is no negative value in the time interval of interest.

MOVING BARRIER ACCELEROMETER PLACEMENT

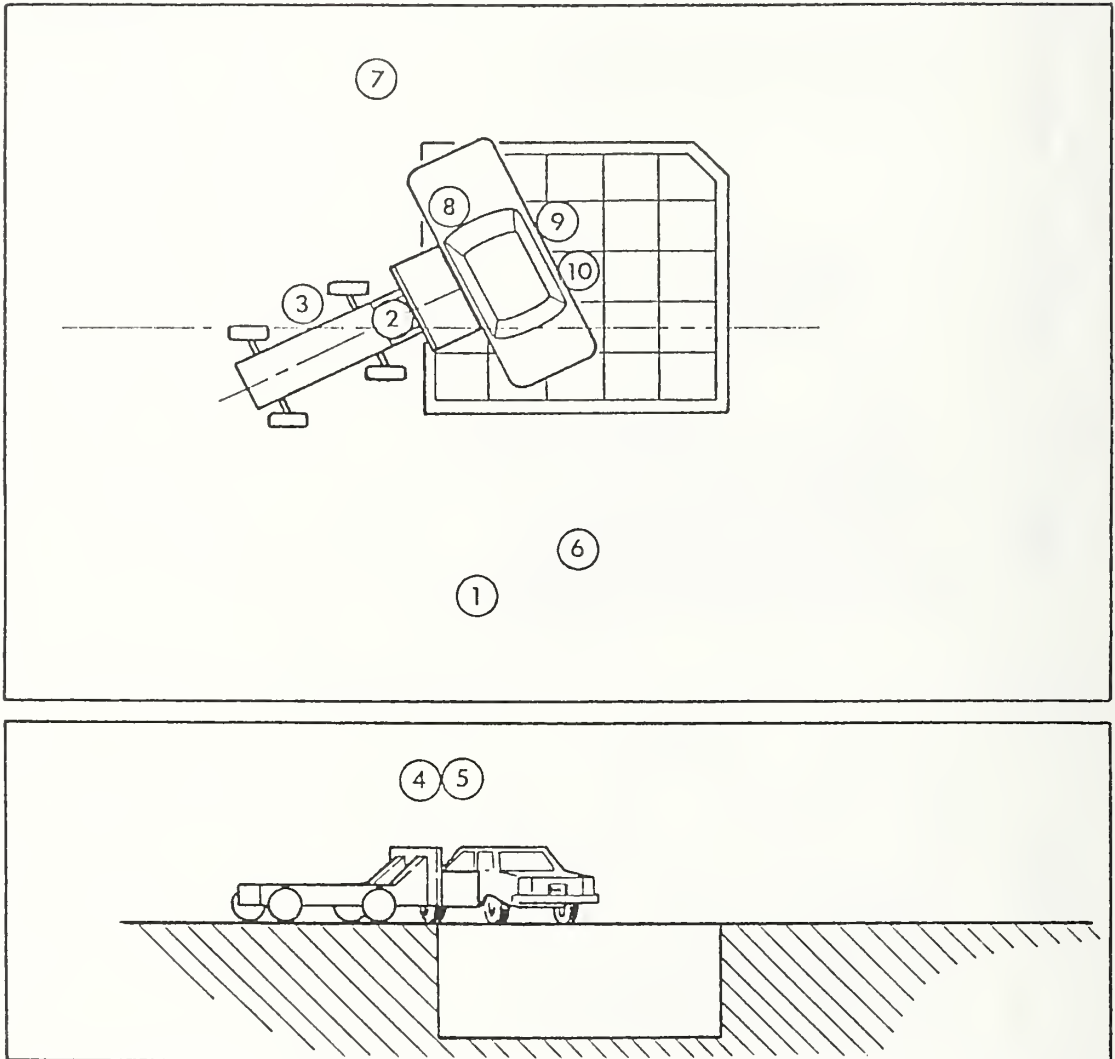


TOP VIEW

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Right side panning	Kodak	25	24	Real time documentation
2	Onboard MDB - wide	Photosonic 1B	13	500	Dummy kinematics
3	Onboard MDB - tight	Photosonic 1B	25	500	Close-up of impact point
4	Overhead - wide	Photosonic 1B	8.5	502	Vehicle dynamics
5	Overhead - tight	Photosonic 1B	25	500	Close-up vehicle dynamic
6	Ground level - right	Photosonic 1B	25	502	Overall view
7	Ground level - left	Photosonic 1B	13	502	Overall view
8	Onboard windshield	Photosonic 1B	8	1000	Driver kinematics - Frt.
9	Onboard driver	Photosonic 1B	8	1000	Driver kinematics
10	Onboard passenger	Photosonic 1B	8	955	Passenger kinematics

CAMERA LOCATION



APPENDIX A

PHOTOGRAPHS

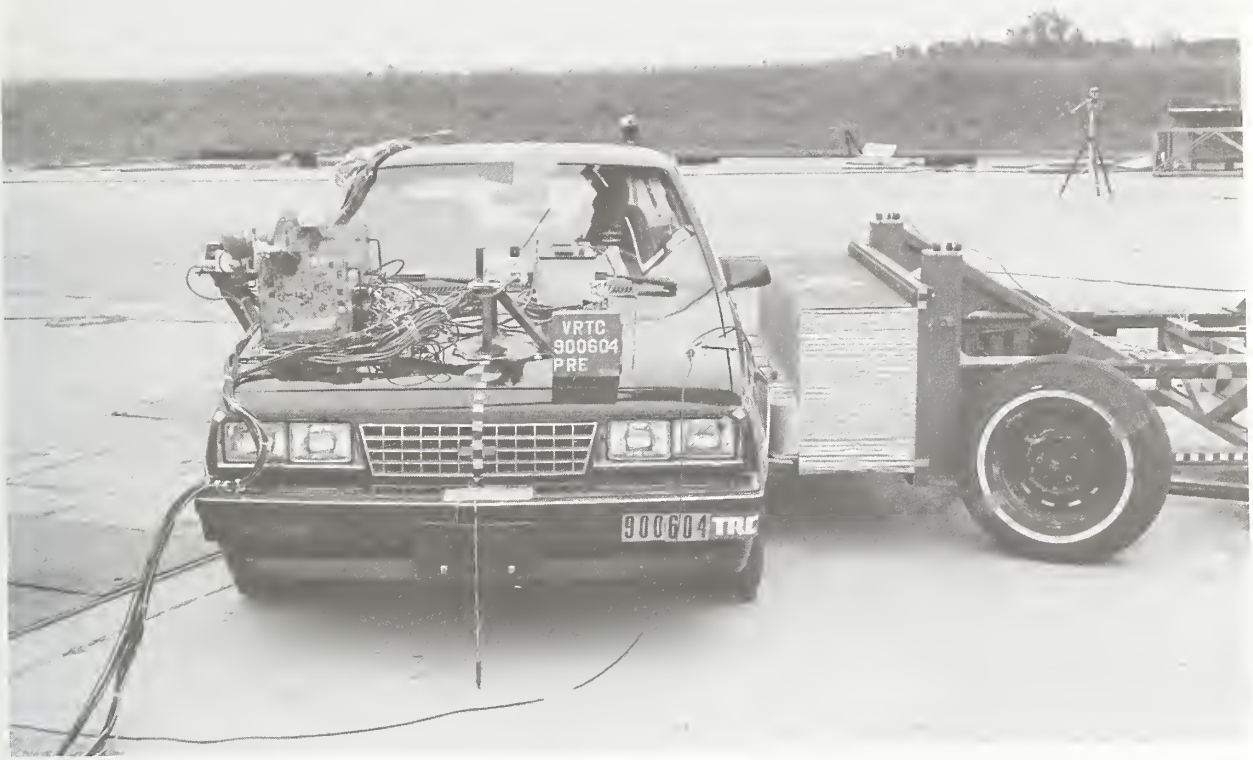


Figure A-1. PRE-TEST VEHICLE FRONT AND BARRIER VIEW

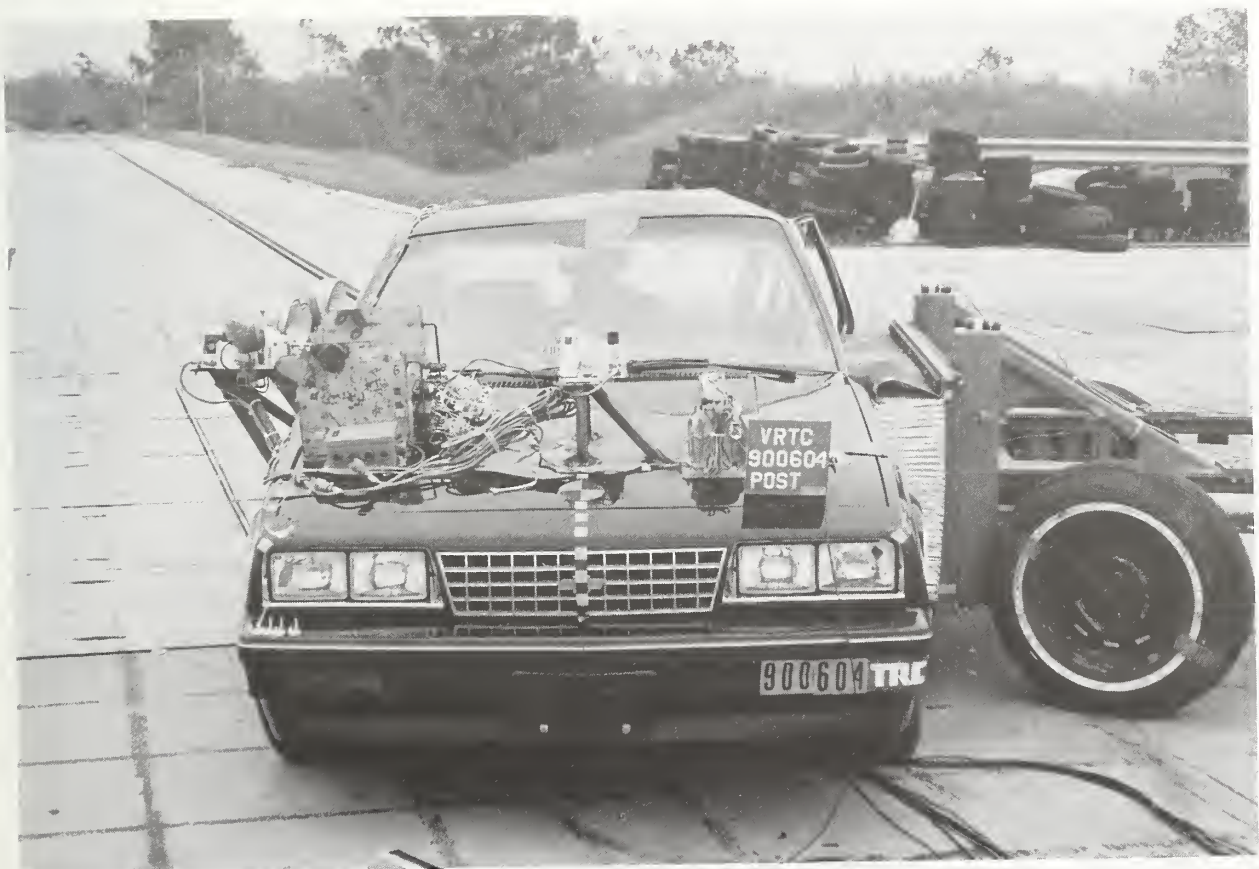


Figure A-2. POST-TEST VEHICLE FRONT AND BARRIER - VIEW 1

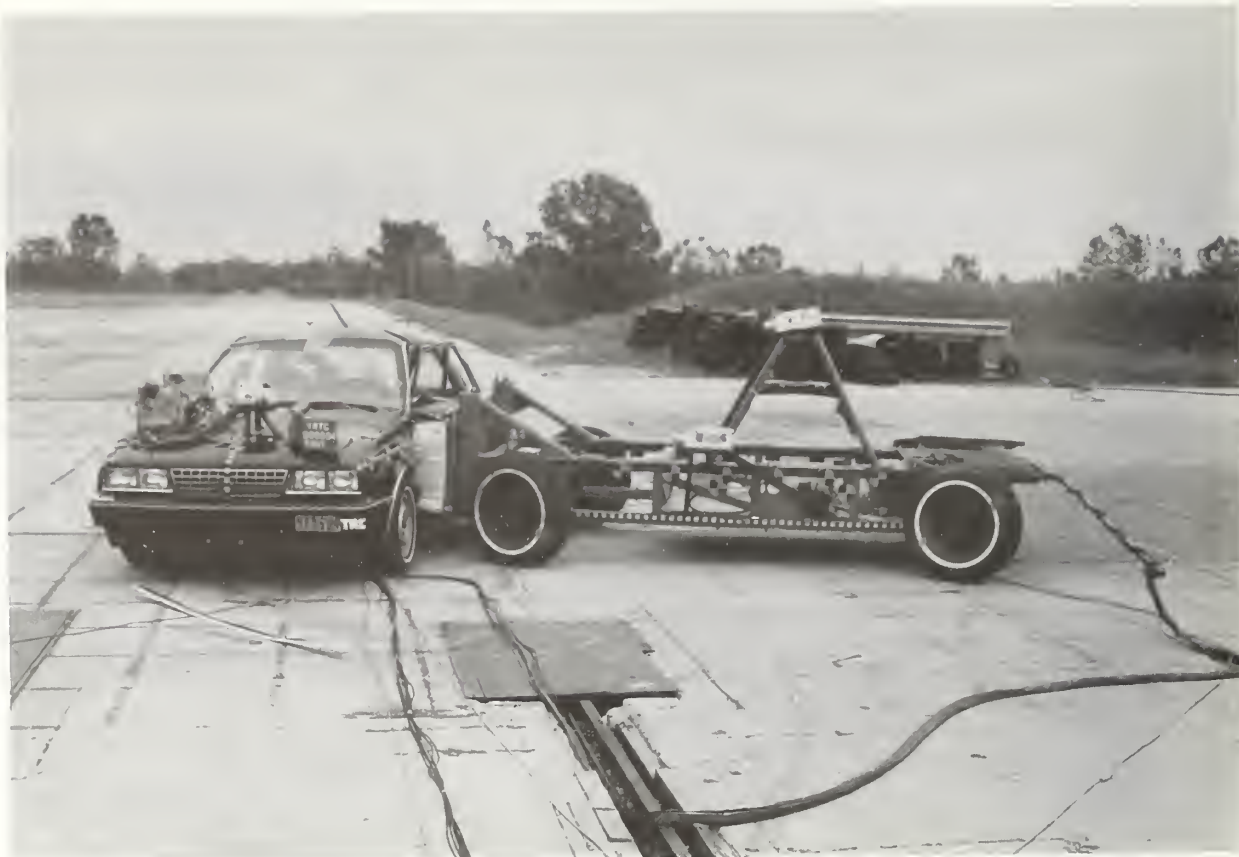


Figure A-3. POST-TEST VEHICLE FRONT AND BARRIER - VIEW 2

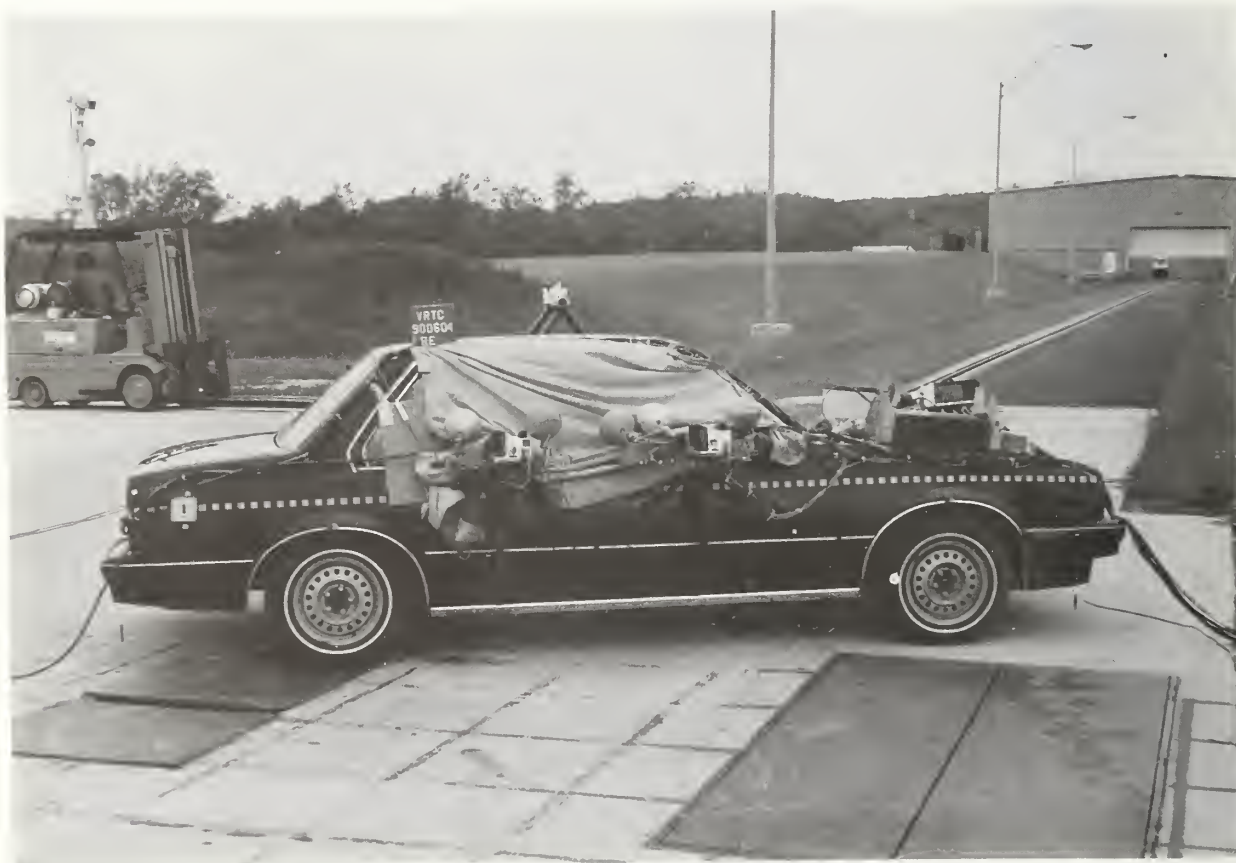


Figure A-4. PRE-TEST VEHICLE RIGHT SIDE VIEW



Figure A-5. POST-TEST VEHICLE RIGHT SIDE VIEW



Figure A-6. PRE-TEST VEHICLE REAR AND BARRIER VIEW



Figure A-7. POST-TEST VEHICLE REAR AND BARRIER VIEW



Figure A-8. PRE-TEST VEHICLE LEFT AND BARRIER VIEW



Figure A-9. POST-TEST VEHICLE LEFT AND BARRIER VIEW



Figure A-10. PRE-TEST VEHICLE LEFT SIDE VIEW



Figure A-11. POST-TEST VEHICLE LEFT SIDE - VIEW 1



Figure A-12. POST-TEST VEHICLE LEFT SIDE - VIEW 2



Figure A-13. PRE-TEST VEHICLE LEFT FRONT CLOSE-UP VIEW

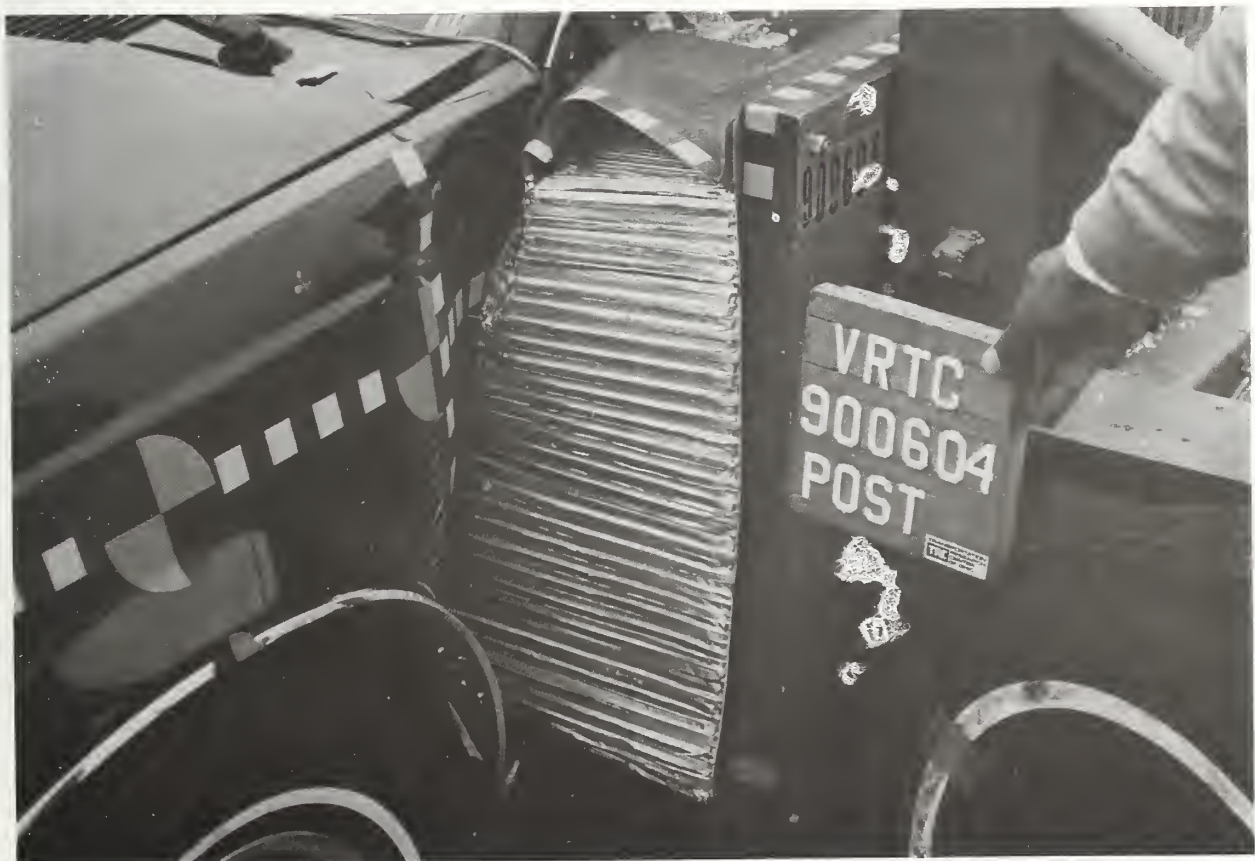


Figure A-14. POST-TEST VEHICLE LEFT FRONT CLOSE-UP VIEW



Figure A-15. PRE-TEST LEFT REAR CLOSE-UP VIEW



Figure A-16. POST-TEST VEHICLE LEFT REAR CLOSE-UP VIEW

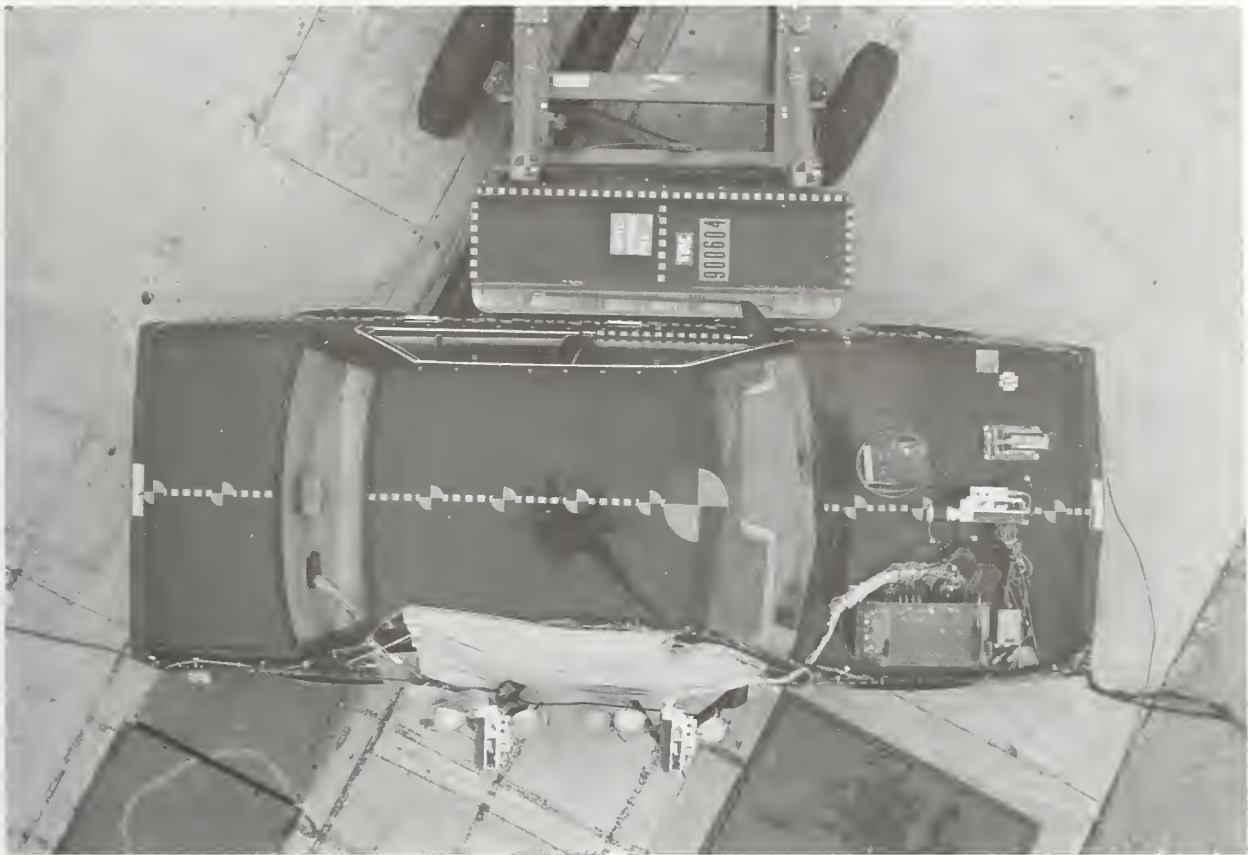


Figure A-17. PRE-TEST VEHICLE TOP - VIEW 1

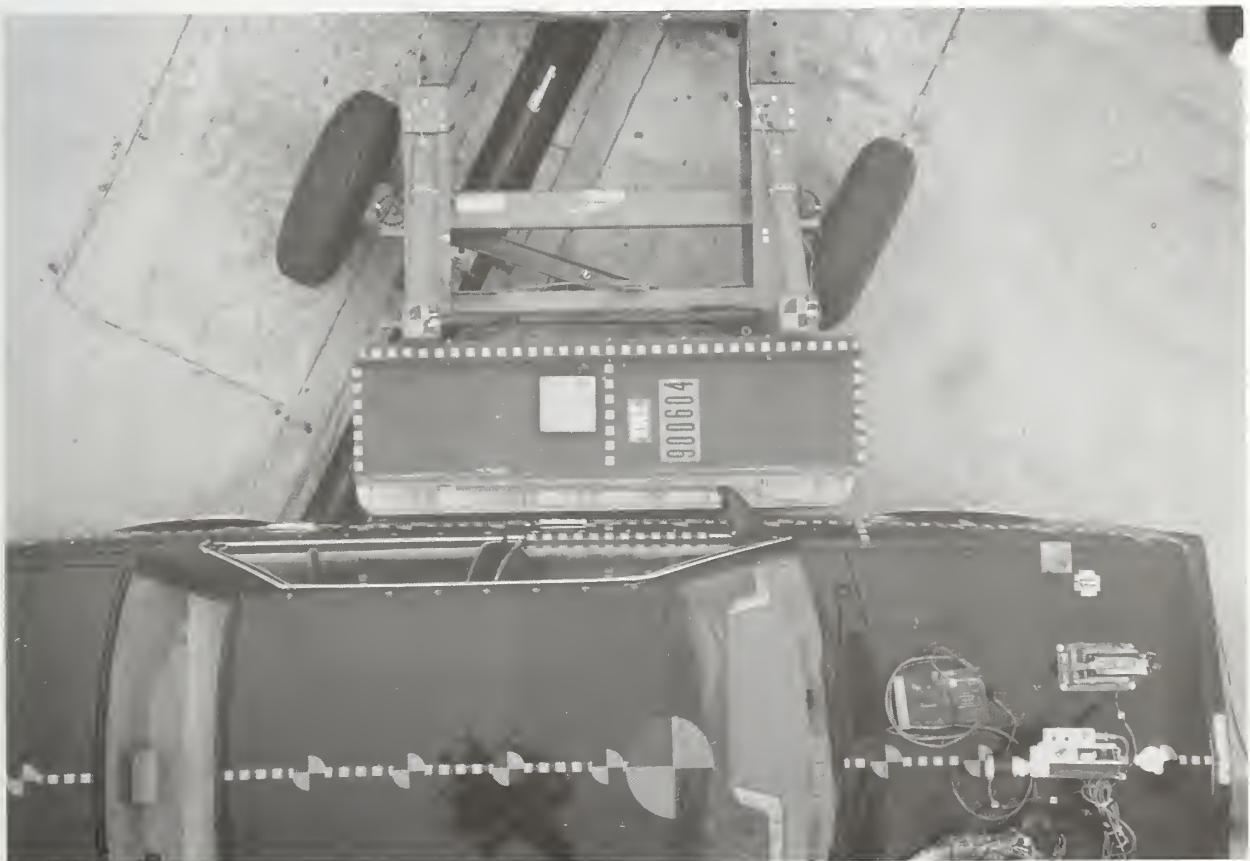


Figure A-18. PRE-TEST VEHICLE TOP - VIEW 2

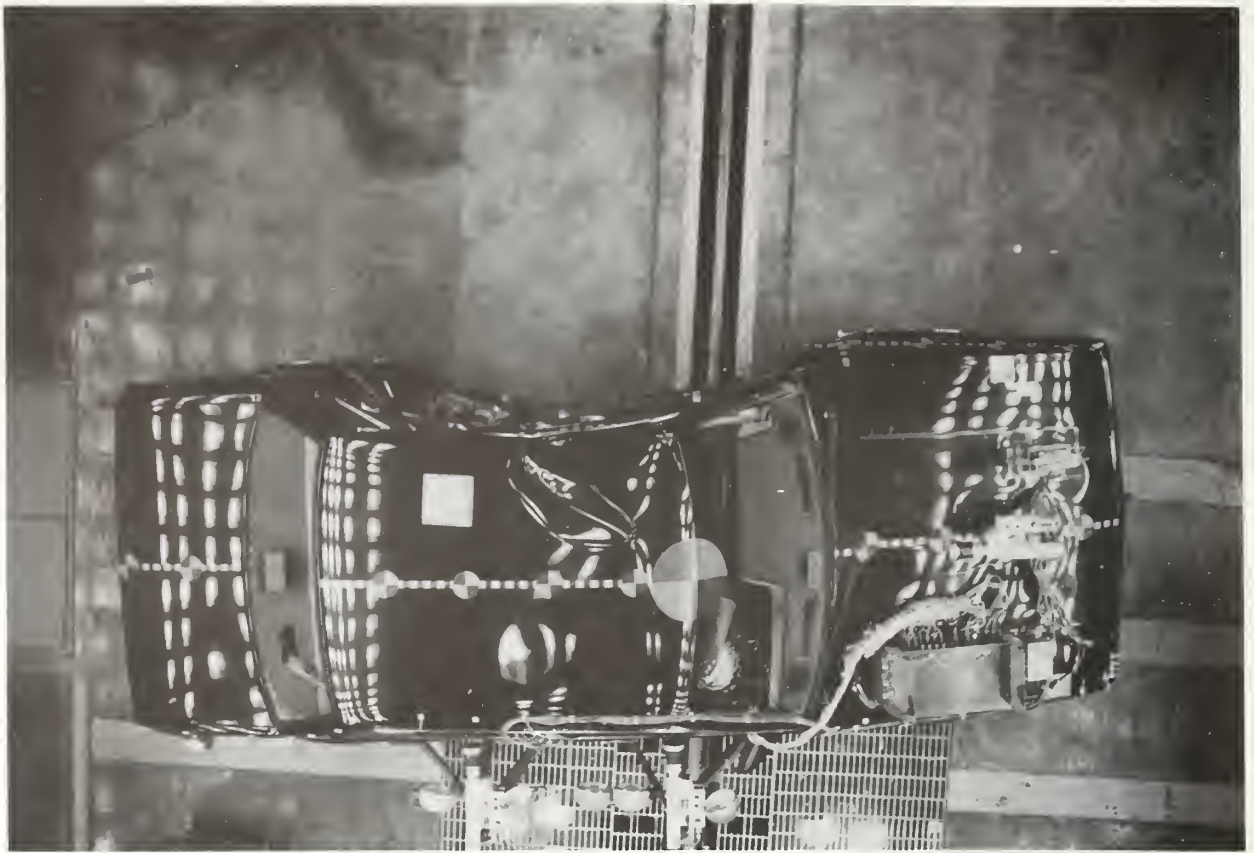


Figure A-19. POST-TEST VEHICLE TOP VIEW



Figure A-20. PRE-TEST LEFT FRONT DOOR ACCELEROMETERS VIEW



Figure A-21. PRE-TEST LEFT REAR DOOR ACCELEROMETERS VIEW



Figure A-22. PRE-TEST RIGHT FRONT SILL ACCELEROMETER VIEW



Figure A-23. PRE-TEST LEFT REAR SILL ACCELEROMETER VIEW



Figure A-24. PRE-TEST DRIVER DUMMY - VIEW 1



Figure A-25. PRE-TEST DRIVER DUMMY - VIEW 2



Figure A-26. PRE-TEST DRIVER DUMMY - VIEW 3



Figure A-27. POST-TEST DRIVER DUMMY VIEW



Figure A-28. PRE-TEST PASSENGER DUMMY - VIEW 1



Figure A-29. PRE-TEST PASSENGER DUMMY - VIEW 2



Figure A-30. POST-TEST PASSENGER DUMMY - VIEW 3



Figure A-31. POST-TEST PASSENGER DUMMY VIEW



Figure A-32. POST-TEST DRIVER DUMMY - VIEW 1



Figure A-33. POST-TEST DRIVER DUMMY - VIEW 2



Figure A-34. PRE-TEST PASSENGER DUMMY CONTACT VIEW 1



Figure A-35. POST-TEST PASSENGER DUMMY CONTACT - VIEW 2

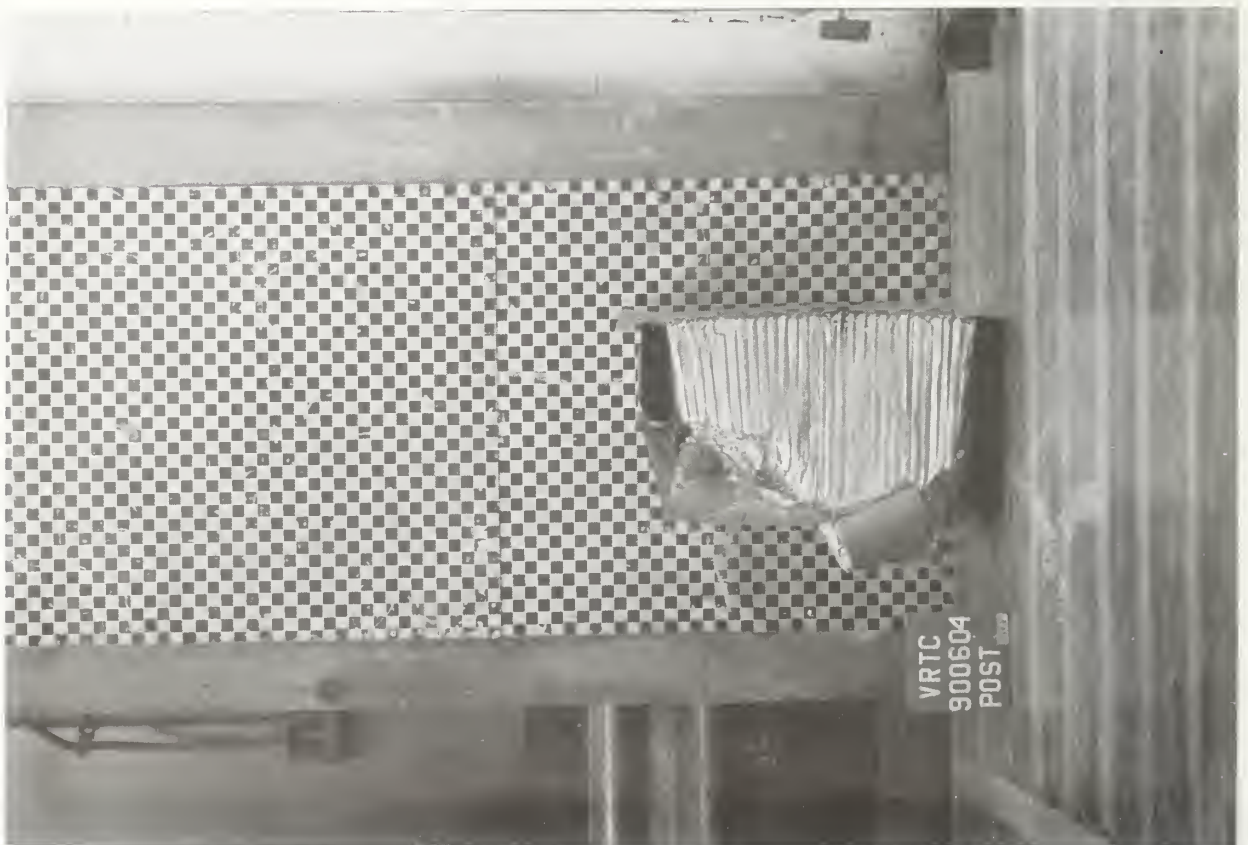


Figure A-36. POST-TEST BARRIER FACE - VIEW 1

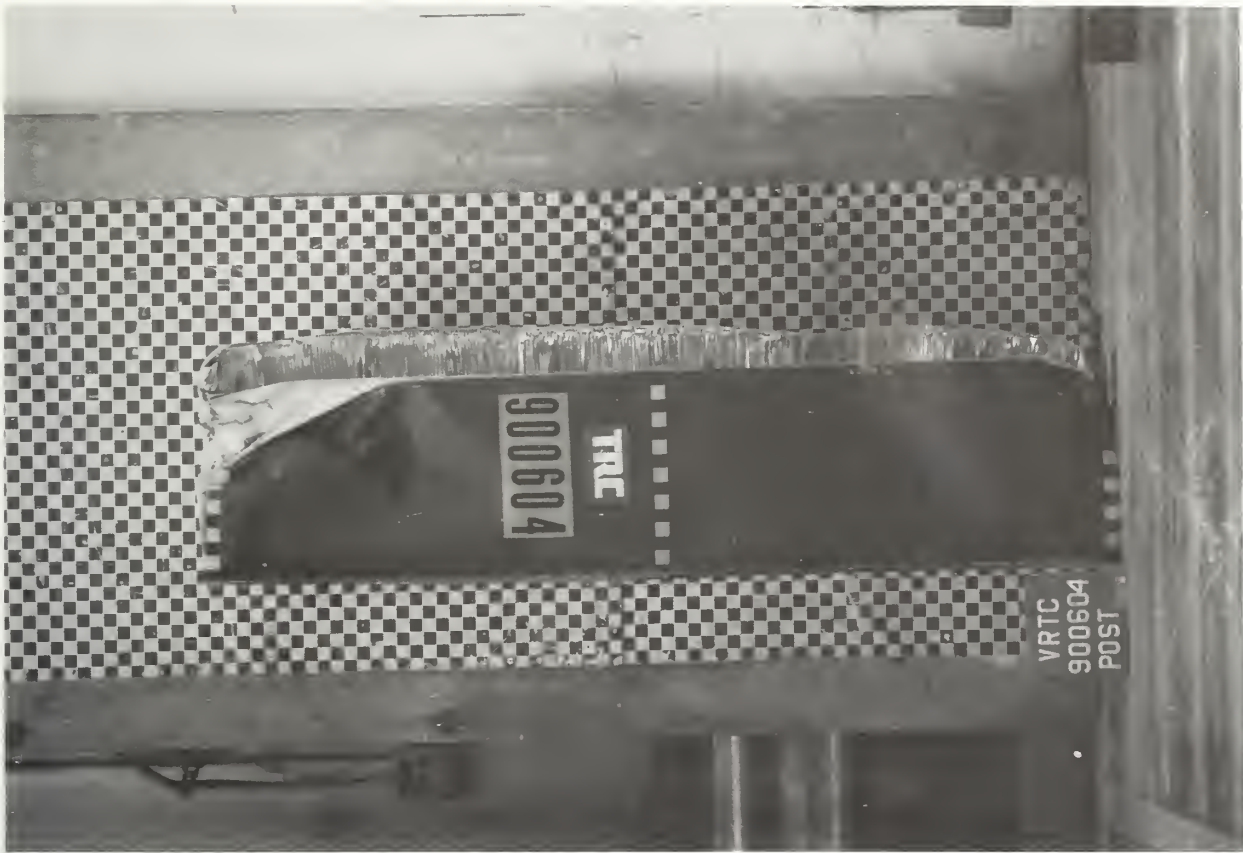


Figure A-37. POST-TEST BARRIER FACE - VIEW 2

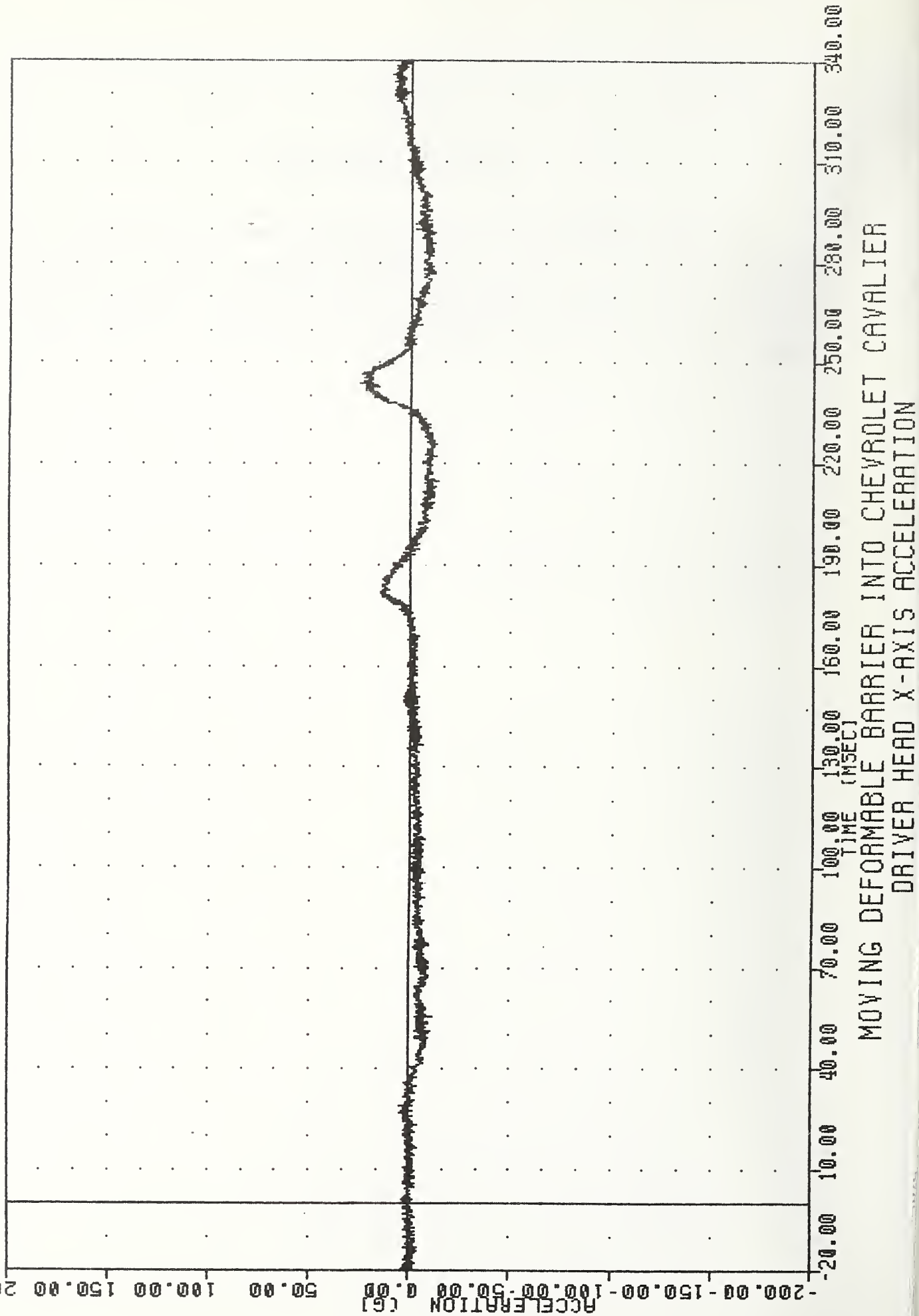
APPENDIX B

DATA PLOT PRESENTATION

Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data were filtered according to SAE J211b, except that dummy thorax and pelvis data were filtered using the HSRI filter.

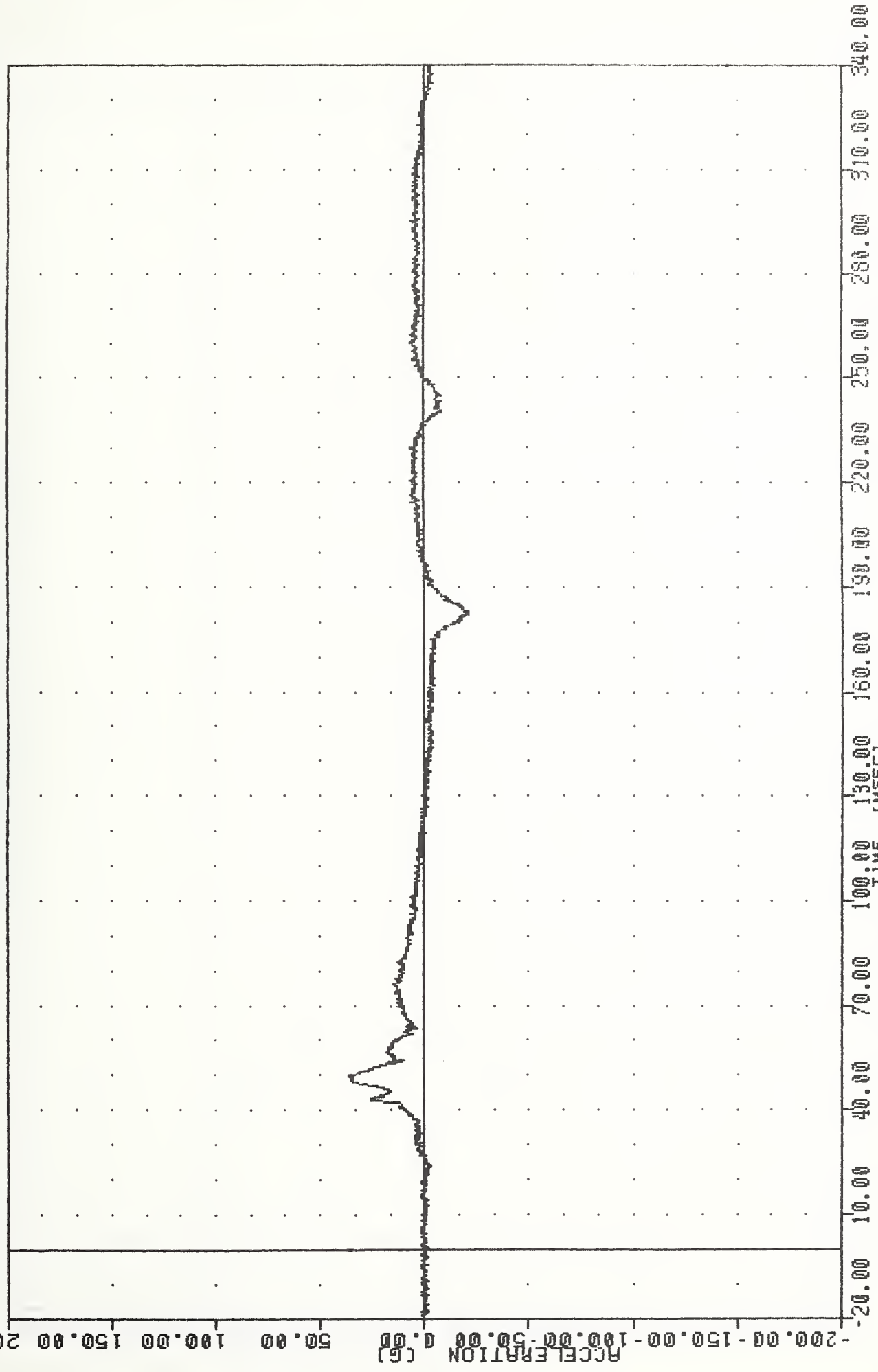
VRTC .900604
SI PROTECTION PROD VEHICLE
90154
HEDXG1

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -13.348 214.75, 25.42 243.88



VRTC
SI PROTECTION PROD VEHICLE
90154
HEOY61

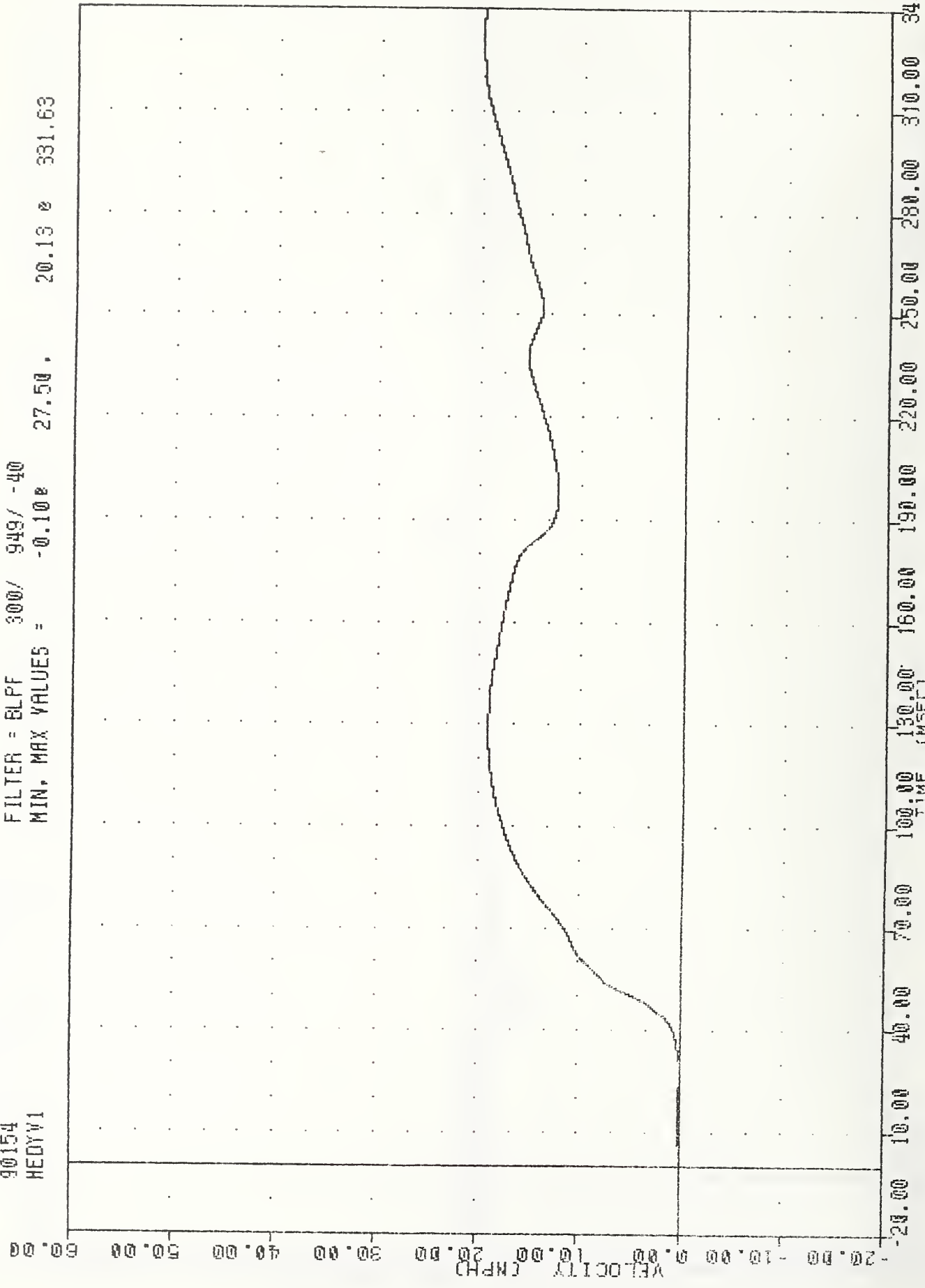
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -21.27g 182.13, 36.09 g 50.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER HEAD Y-AXIS ACCELERATION

VRIC , 500504
 SI PROTECTION PROD VEHICLE
 90154
 HEDYV1

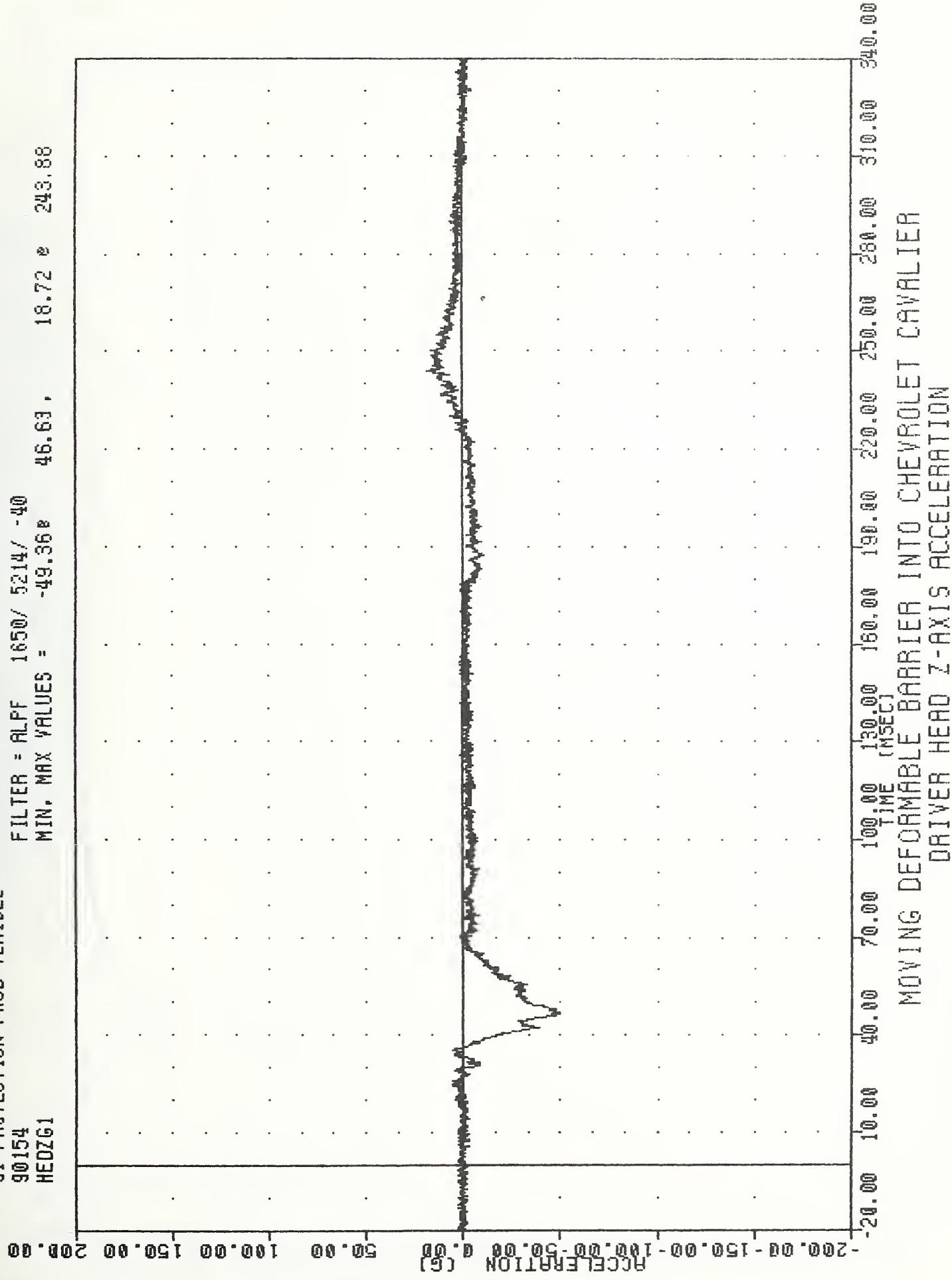
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.10e 27.50 . 20.13 e 331.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER HEAD Y-AXIS VELOCITY

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
HE0261

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -49.368 46.63 , 18.72 e 243.88



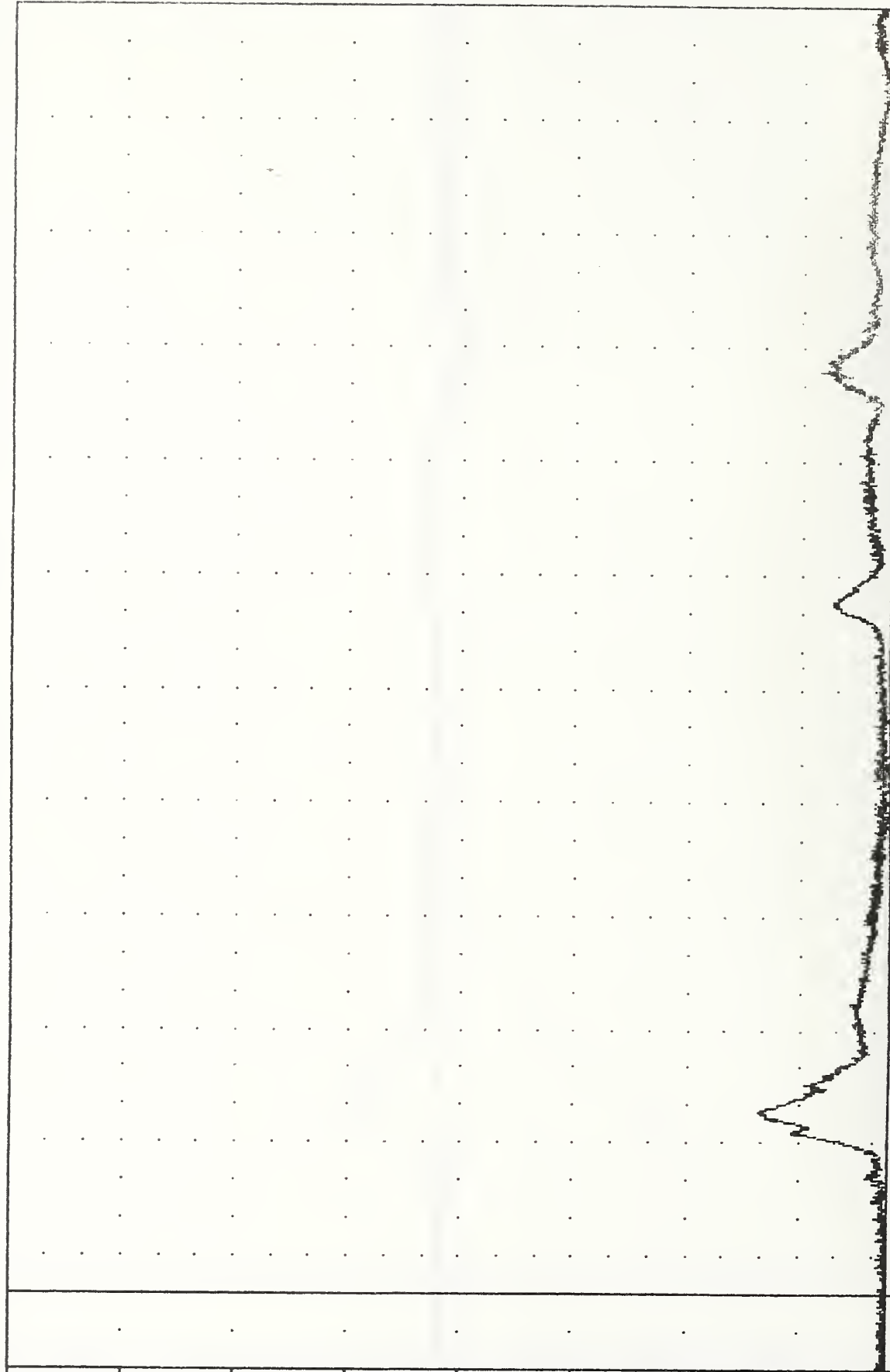
MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER HEAD Z-AXIS ACCELERATION

VRTC
SI PROTECTION PROD VEHICLE
90154
HEDRG1

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.42e

-1.75, 57.98 e 47.68

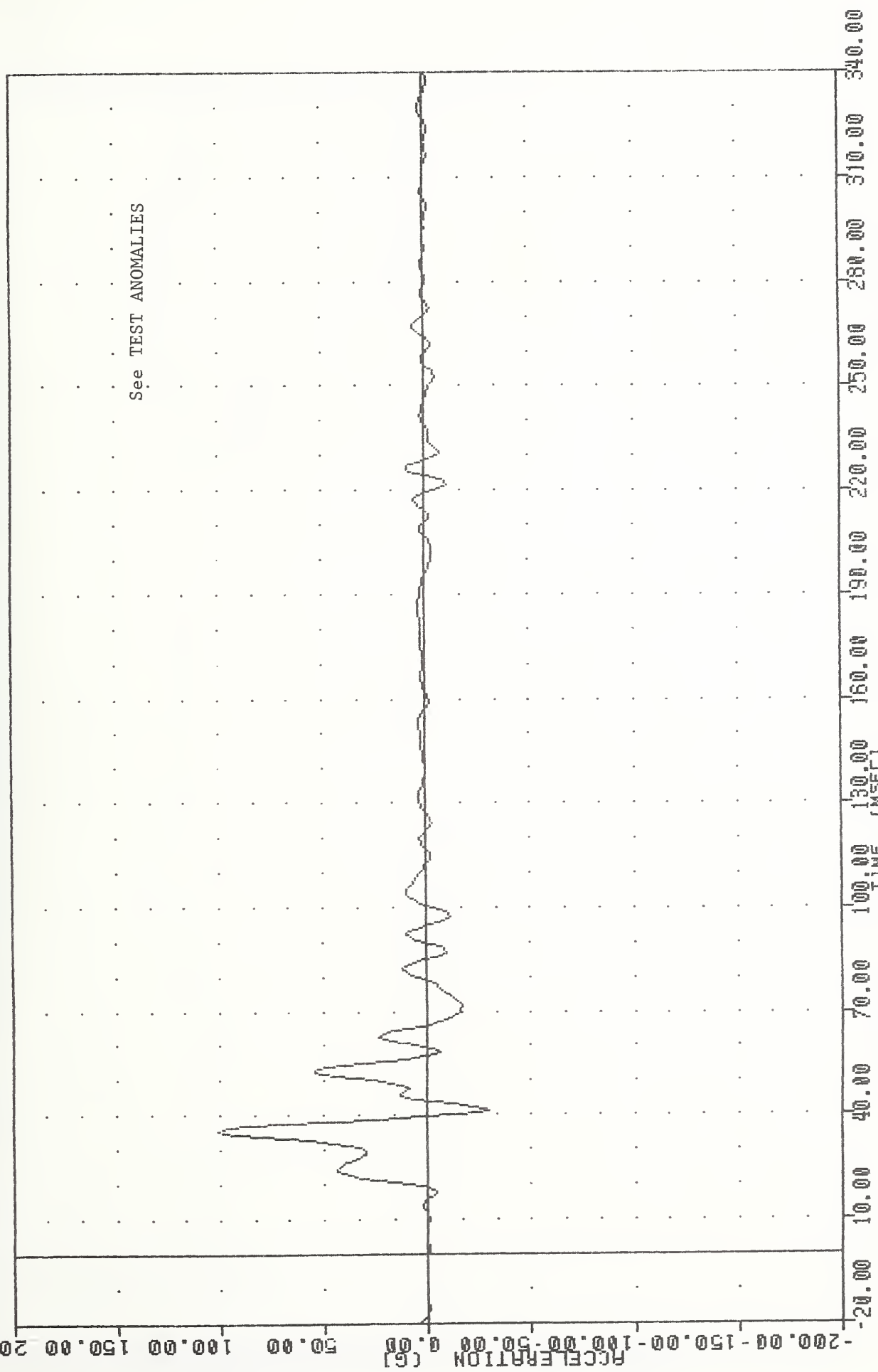
ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER HEAD RESULTANT ACCELERATION

VRTC 900504
SI PROTECTION PROD VEHICLE
90154
SHLYG1

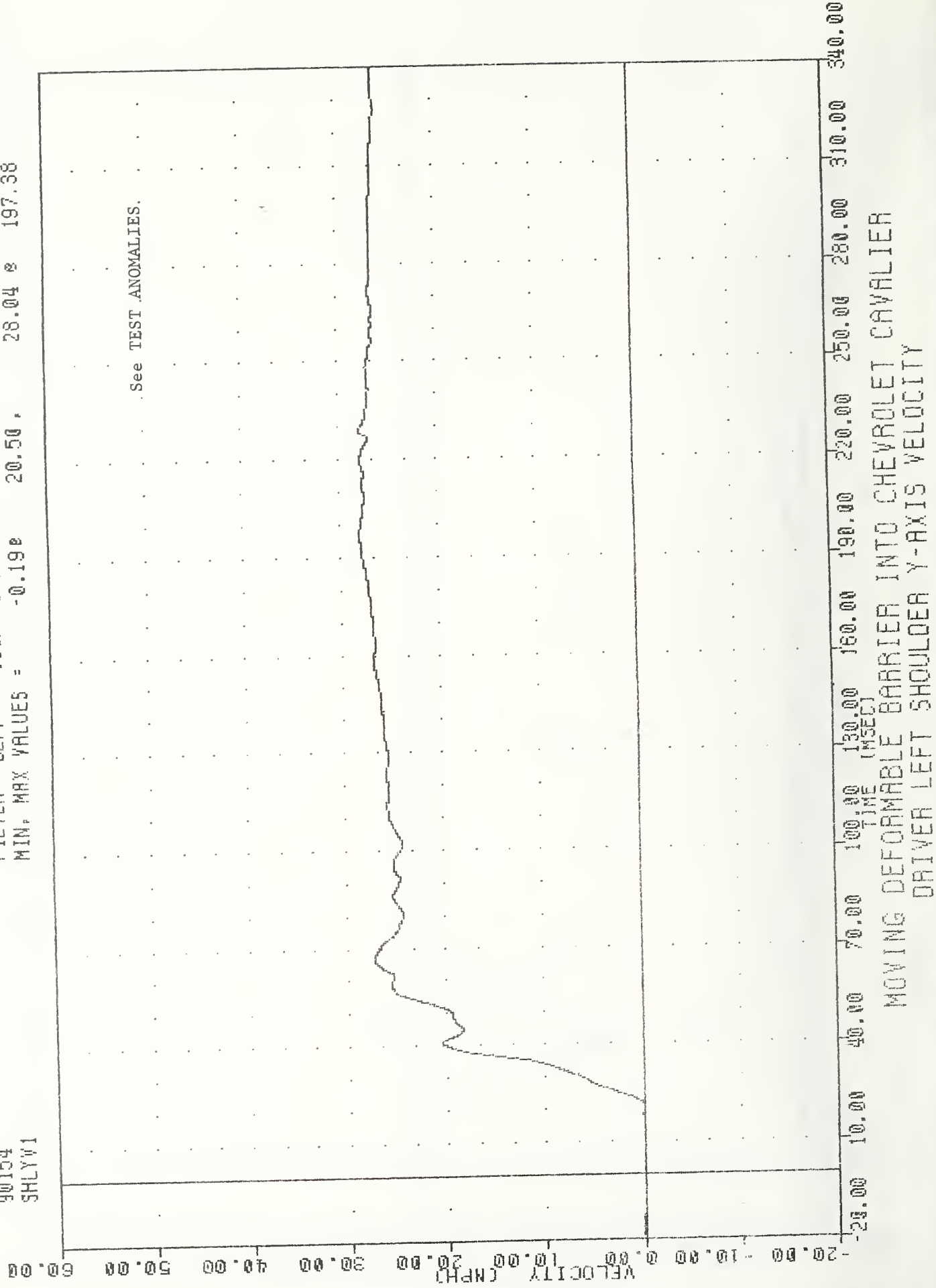
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -29.86 100.78 35.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT SHOULDER Y AXIS ACCELERATION

NRIC , 300604
SI PROTECTION PROD VEHICLE
90154
SHLYV1

FILTER = ELFF 300/ 949/ -40
MIN, MAX VALUES = -0.19e 20.50 , 28.04 e 197.38



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT SHOULDER Y-AXIS VELOCITY

VRTC , 900604

SI PROTECTION PROD VEHICLE

90154

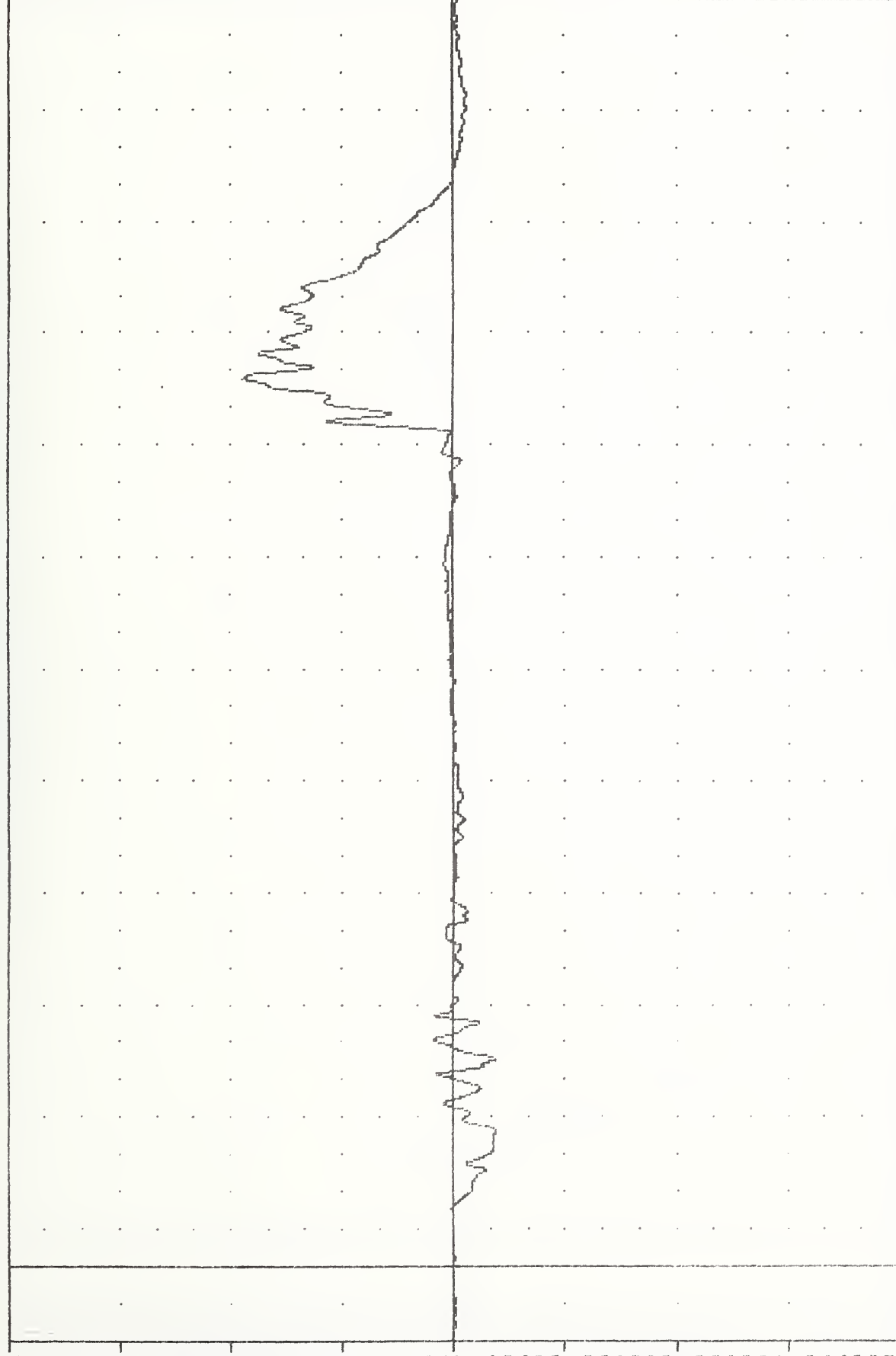
SHLXF1

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -193.38 55.50

941.40 8 237.75

FORCE (N1)
(X10⁴)

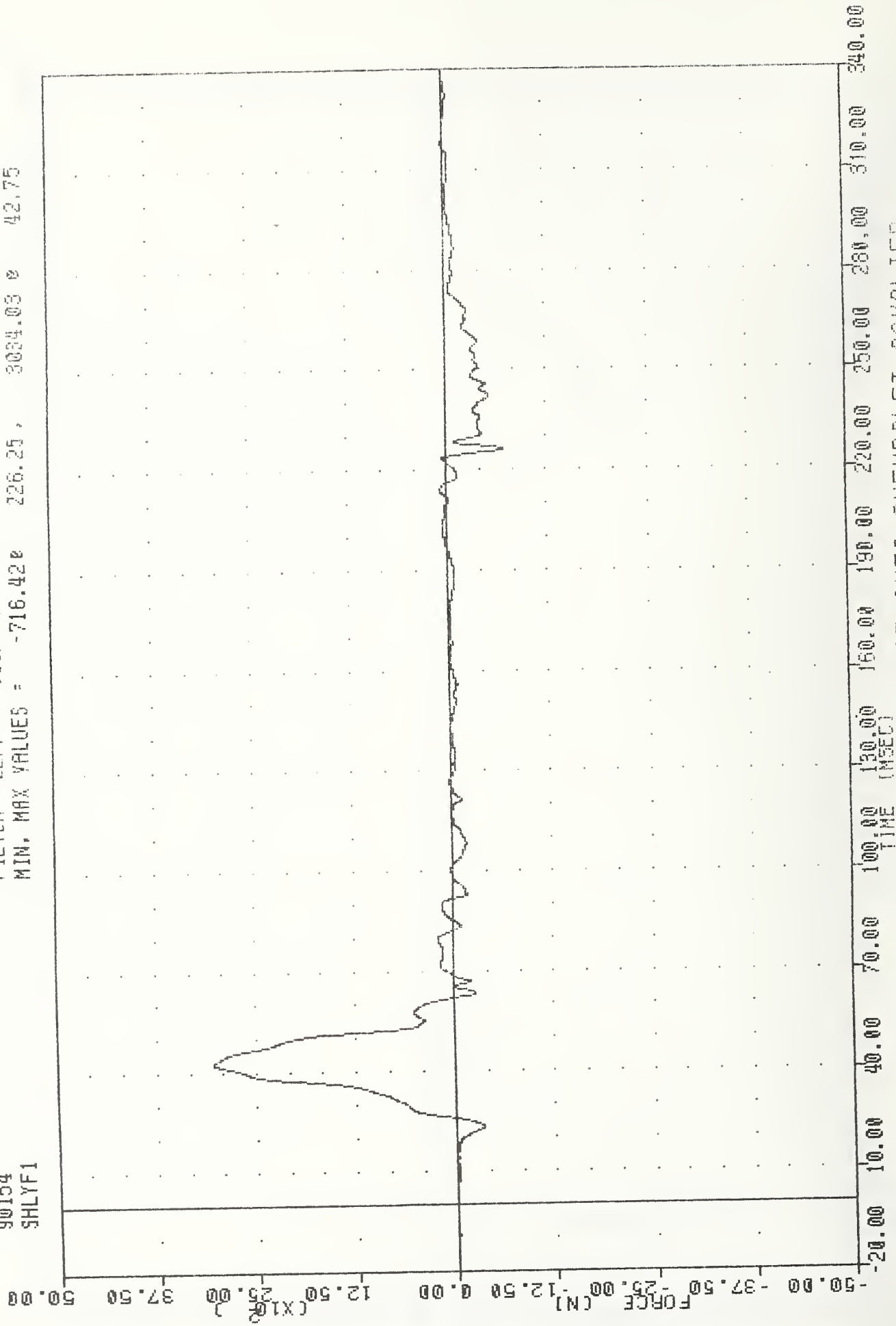


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER, LEFT SHOULDER X-AXIS FORCE

WRTC , 900504
 SI PROTECTION PROO VEHICLE
 90154
 SHLYF1

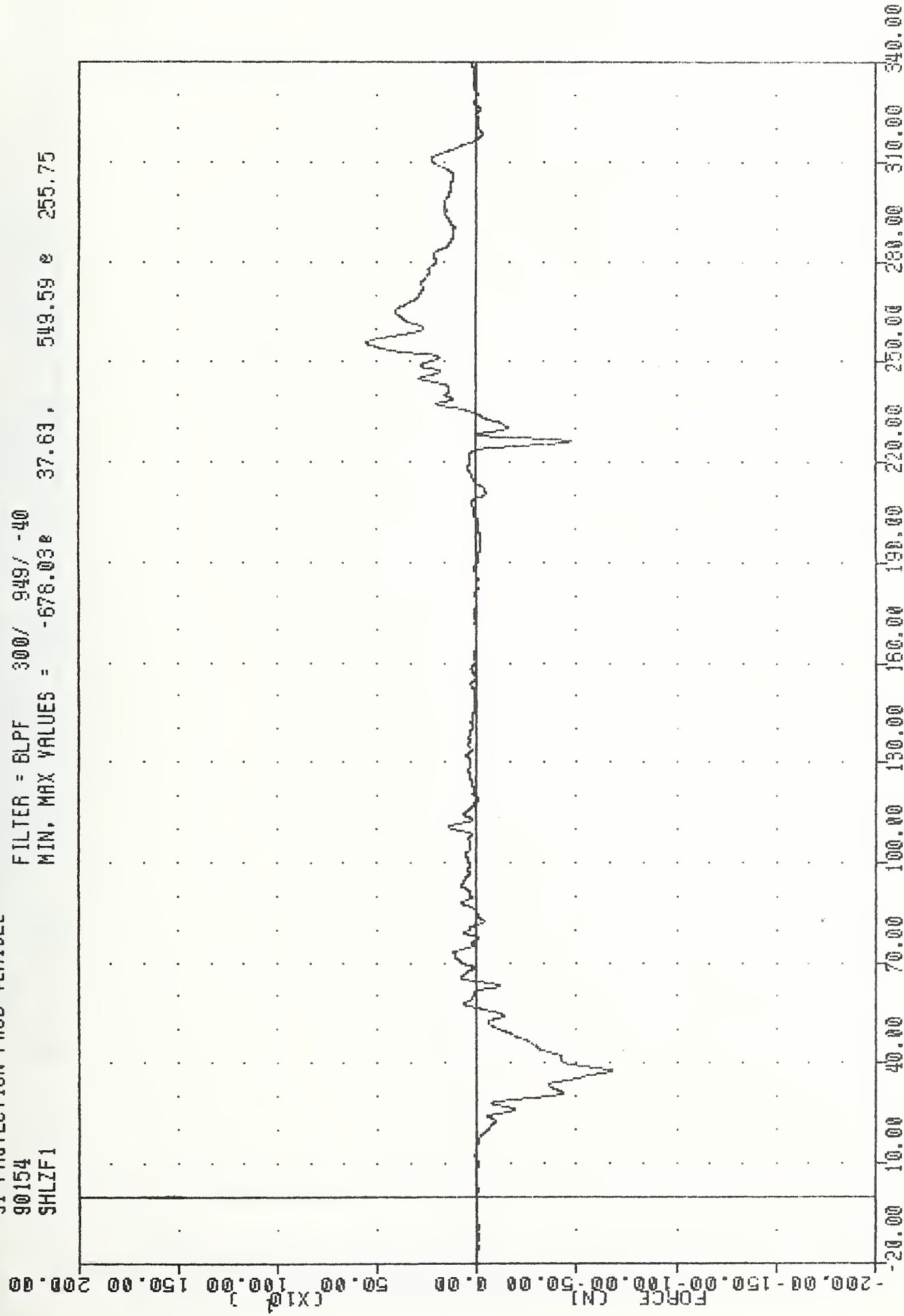
FILTER = BLFF 300/ 949/ -40
 MIN. MAX VALUES = -716.42e 226.25, 3034.03 e 42.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER LEFT SHOULDER Y-AXIS FORCE

YRTC , 900604
SI PROTECTION PROD VEHICLE
90154
SHLZF1

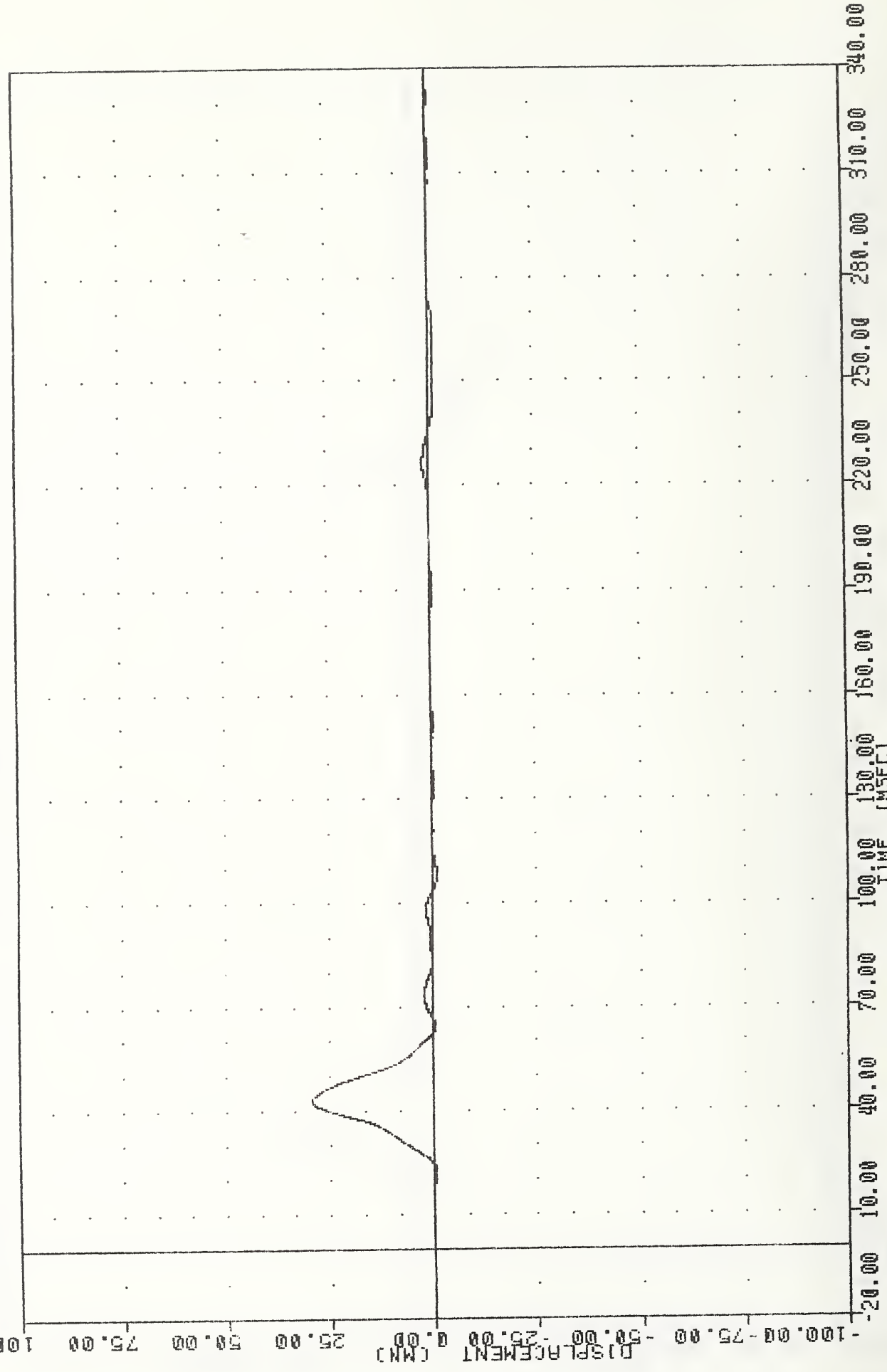
FILTER = 6LPF 300/ 949/ -40
MIN. MAX VALUES = -678.038 37.63 , 549.59 e 255.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT SHOULDER Z-AXIS FORCE

VRTC
 SI PROTECTION PROD VEHICLE
 90154
 SHLY01

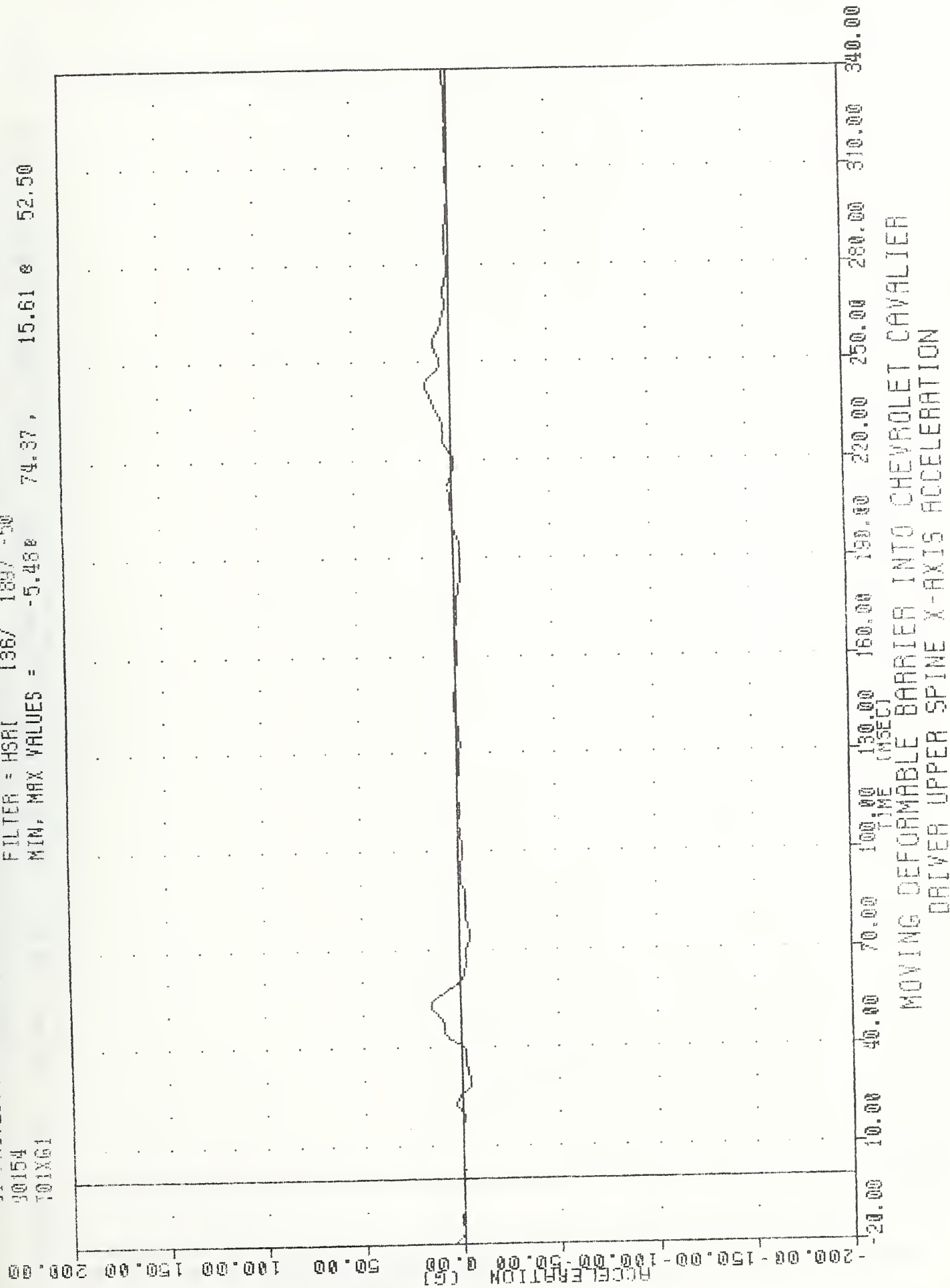
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -1.15e 243.25, 29.51 e 43.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER LEFT SHOULDER TO SPINE DISPLACEMENT

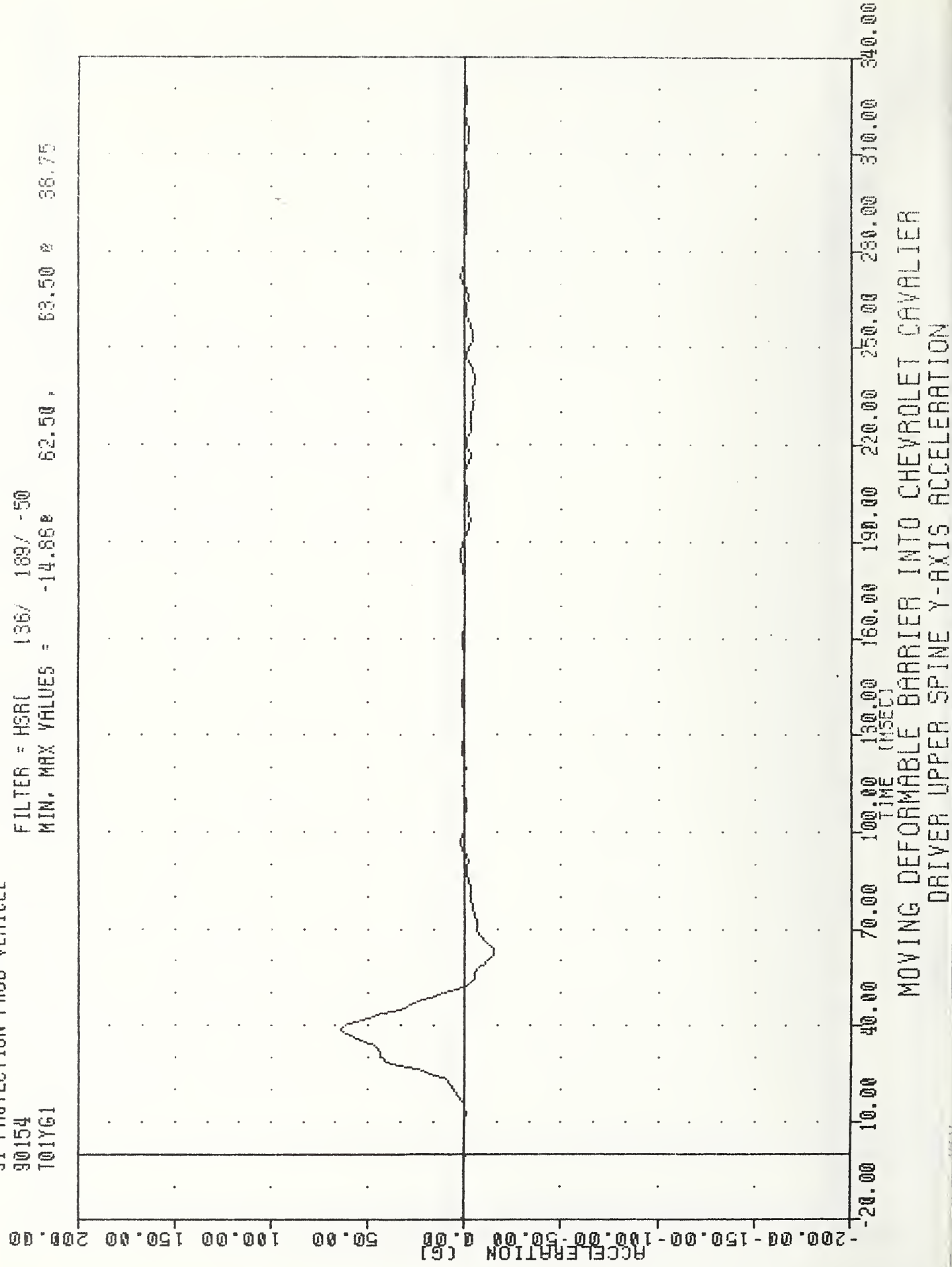
VRTC , 900504
 31 PROTECTION PROD VEHICLE
 30154
 T01XG1

FILTER = HSR1 136/ 189/ -50
 MIN, MAX VALUES = -5.48 74.37, 15.61 52.50



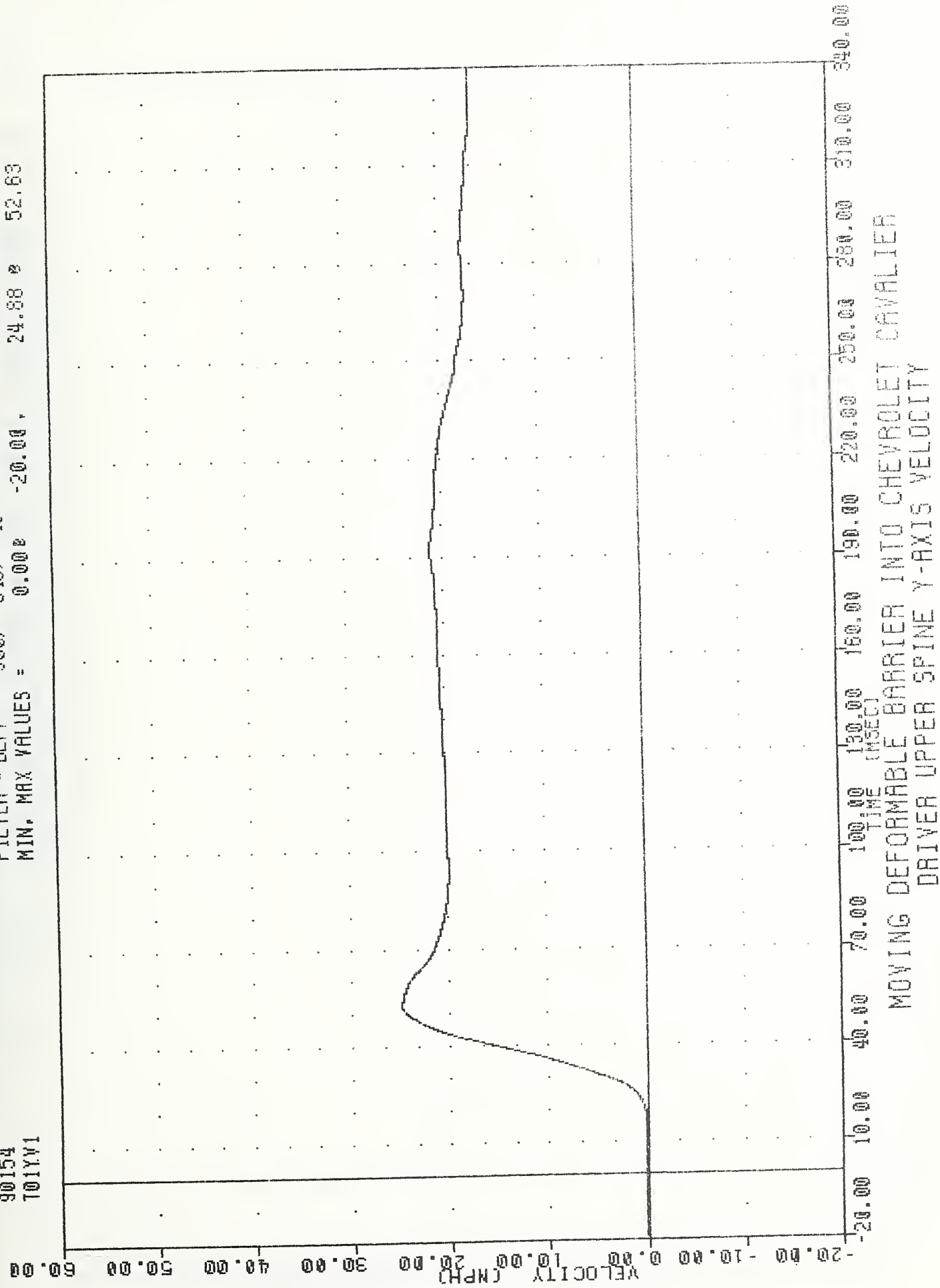
VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 101Y61

FILTER = HSR(136/ 189/ -50
 MIN, MAX VALUES = -14.86 62.50 , 63.50 2 38.75



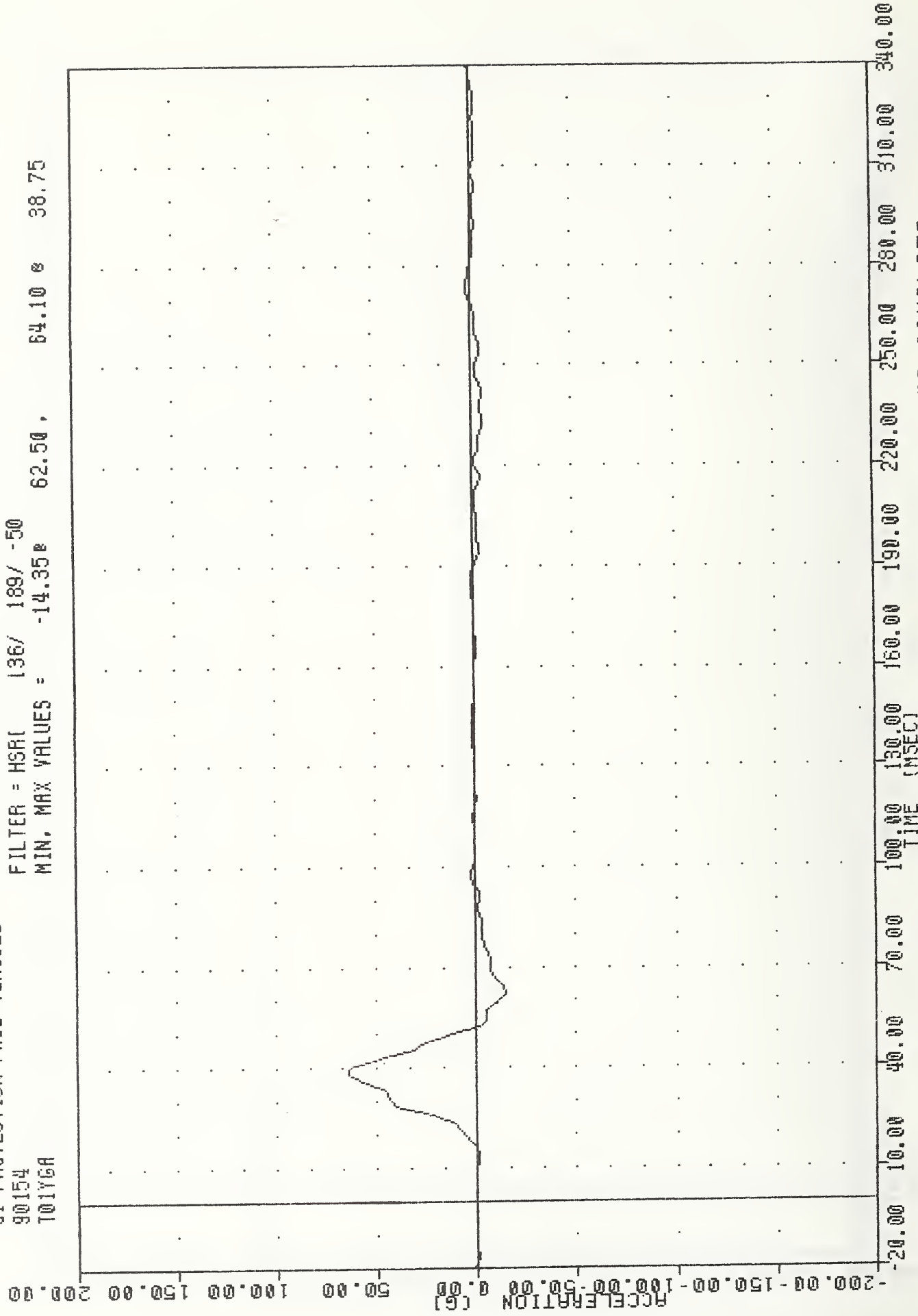
WRTC , 900604
SI PROTECTION PROD VEHICLE
90154
T01YV1

FILTER = BLFF 300/ 949/ -40
MIN, MAX VALUES = 0.00e -20.00 , 24.88 e 52.63



VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 T01Y6A

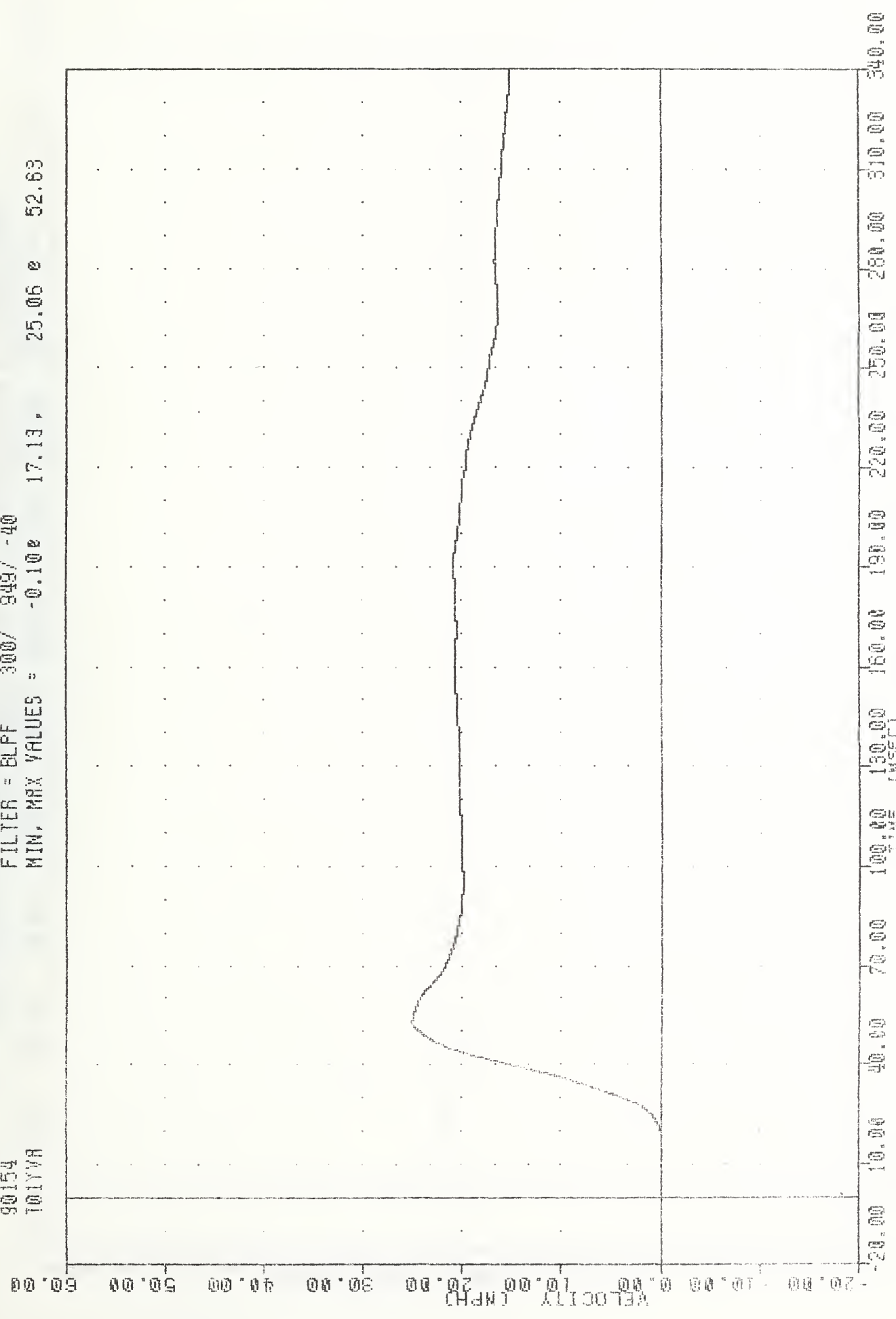
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -14.35 62.50 64.10 38.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER UPPER SPINE Y-AXIS REDUNDANT ACCELERATION

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 T01YVR

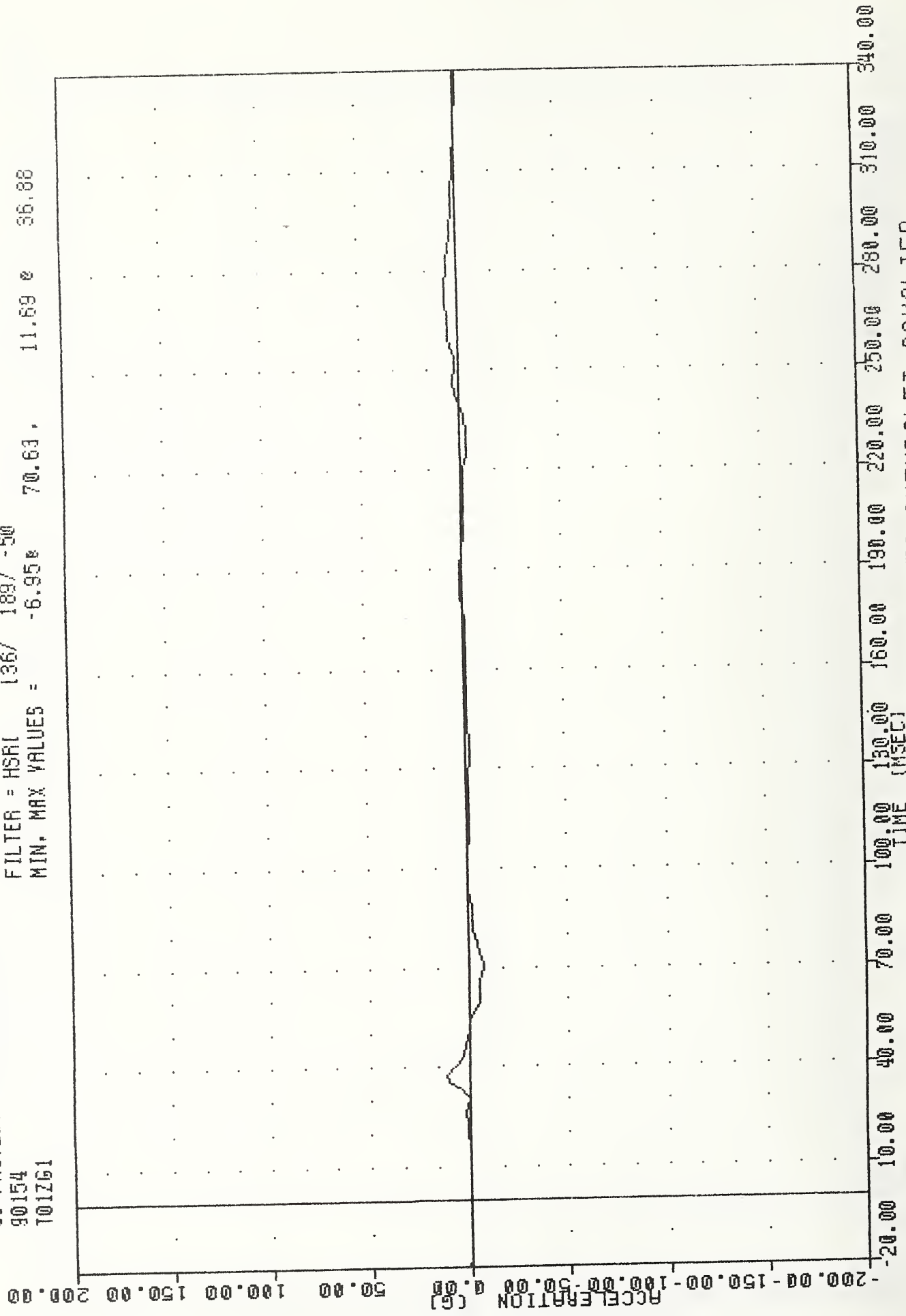
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.10e 17.13, 25.06 e 52.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER UPPER SPINE Y-AXIS REDUNDANT VELOCITY

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 701261

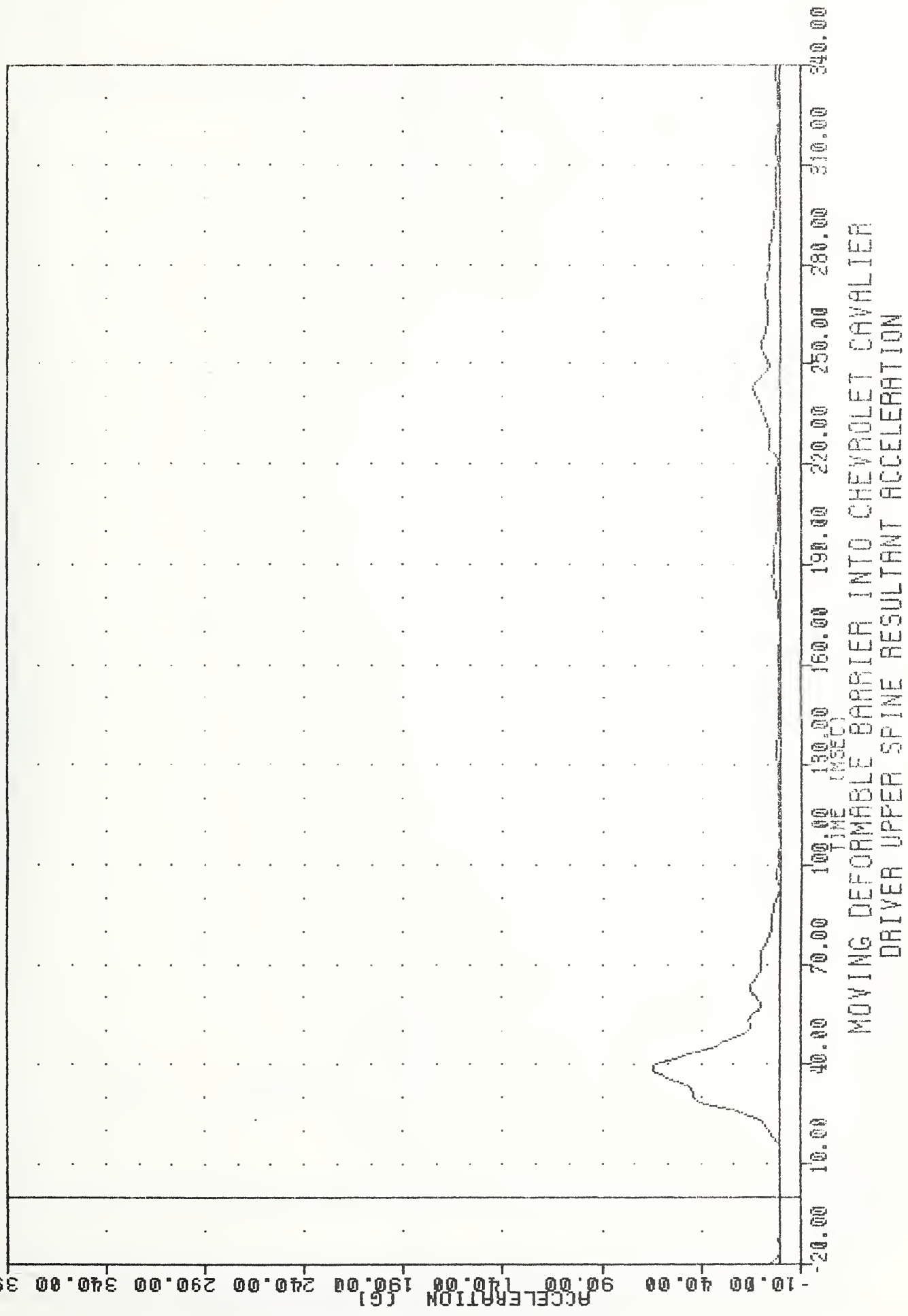
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -6.95 70.63 , 11.69 36.88



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER UPPER SPINE Z-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
T01R61

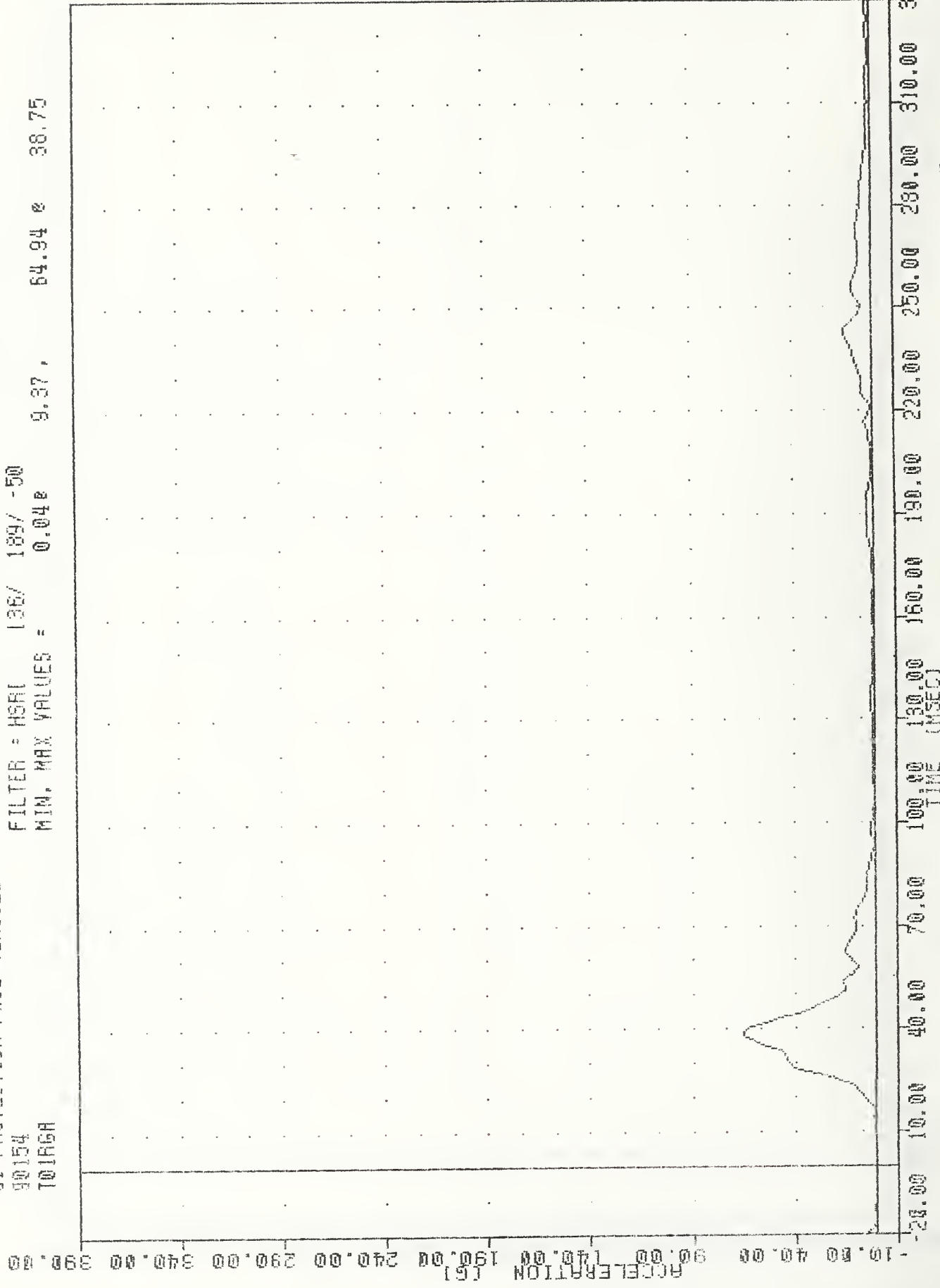
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = 0.058 8.75, 64.34 0 38.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER UPPER SPINE RESULTANT ACCELERATION

VRIC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 TOURGA

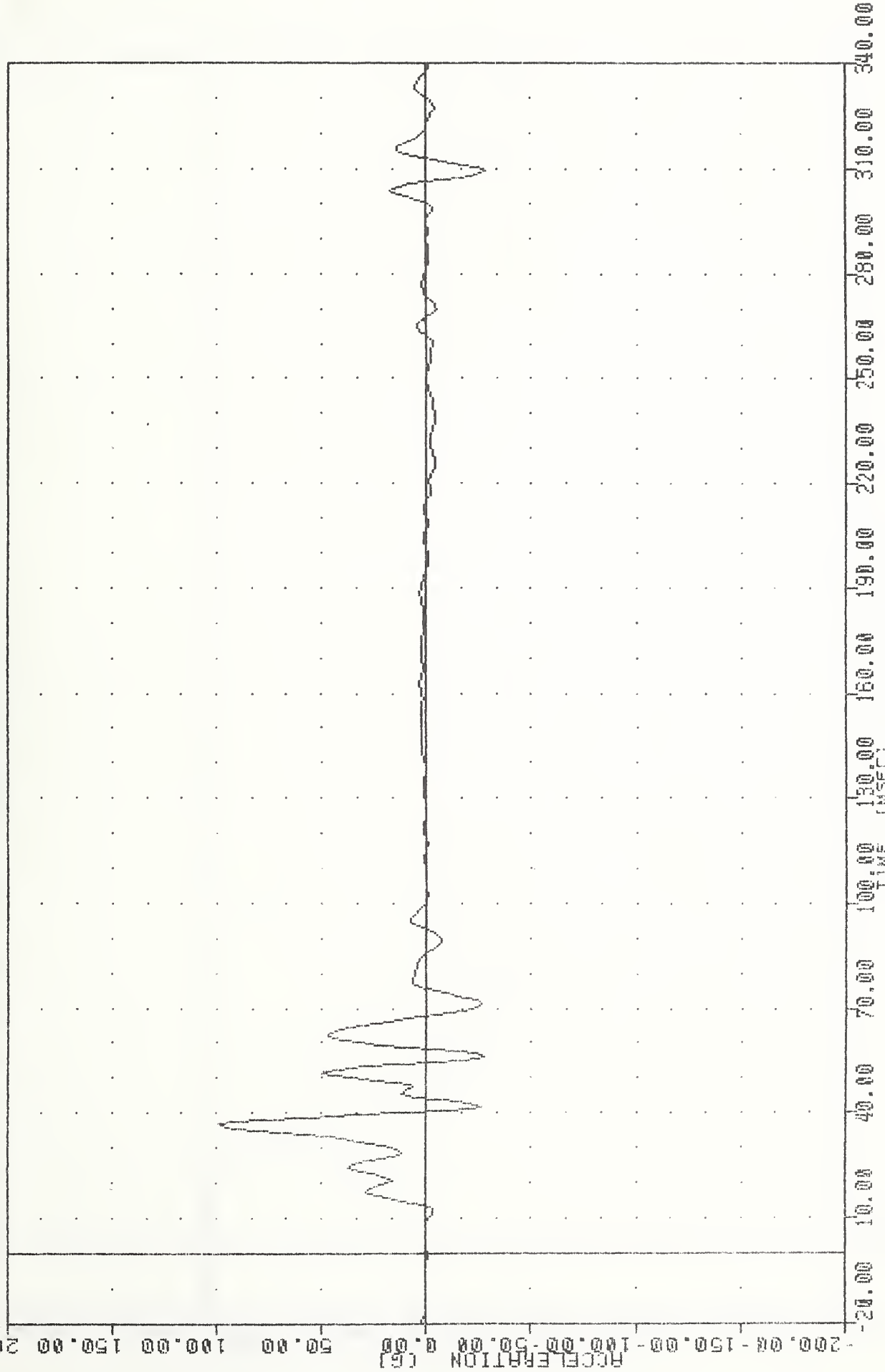
FILTER = HSRL 136/ 189/ -50
 MIN. MAX VALUES = 0.04e 9.37 , 64.94 e 38.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER UPPER SPINE REDUNDANT RESULTANT ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LURY61

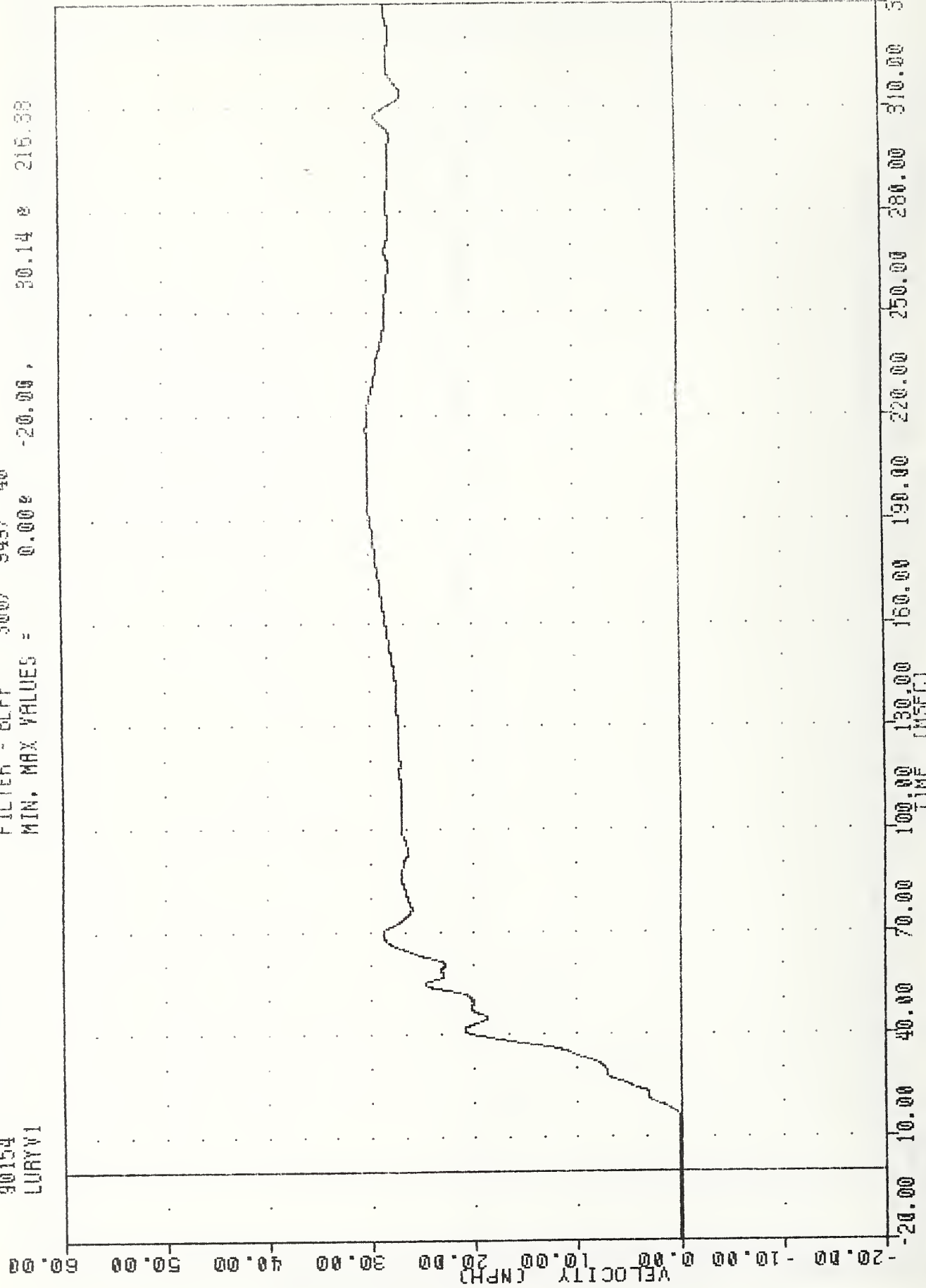
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -28.24 309.38 , 98.52 36.88



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT UPPER THORAX RIB Y-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PROO VEHICLE
90154
LURYV1

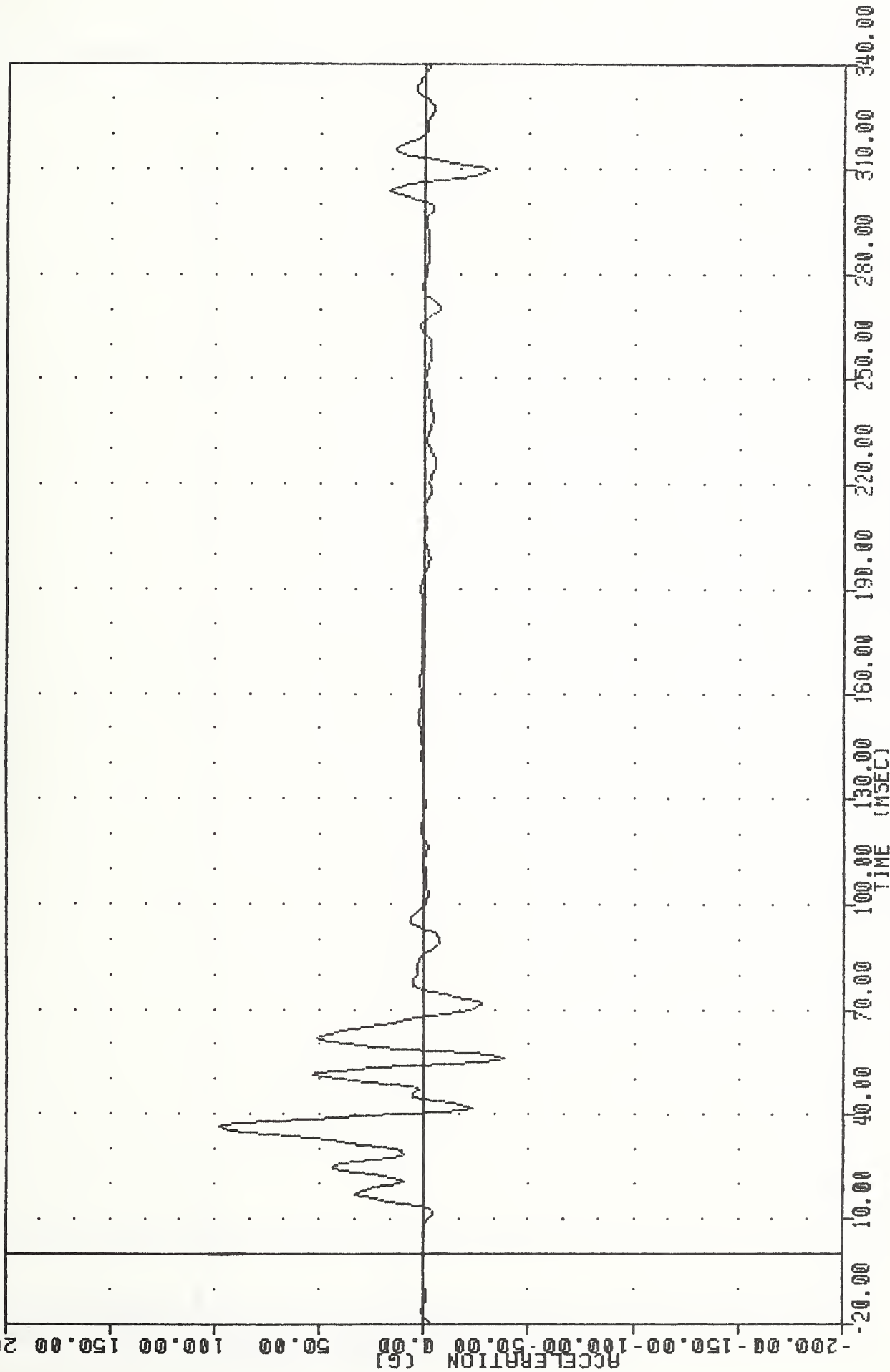
FILTER = BLFF 300/ 949/ -40
MIN. MAX VALUES = 0.00e -20.00 , 30.14 e 215.39



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT UPPER THORAX RIB Y-AXIS VELOCITY

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LURY6A

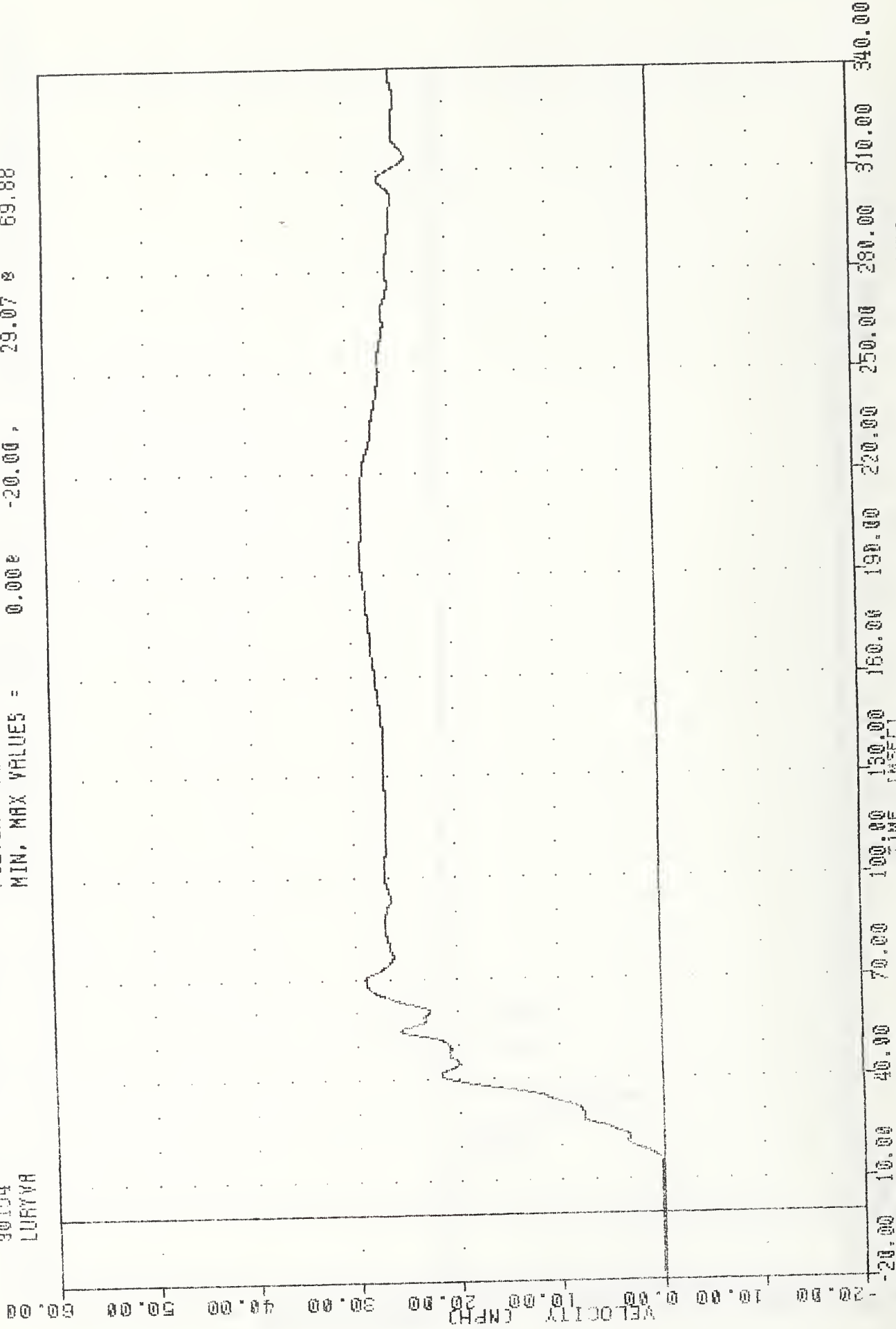
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -37.61e 56.25 , 97.40 e 36.25



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT UPPER THORAX RIB Y-AXIS REDUNDANT ACCELERATION

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 LURYVA

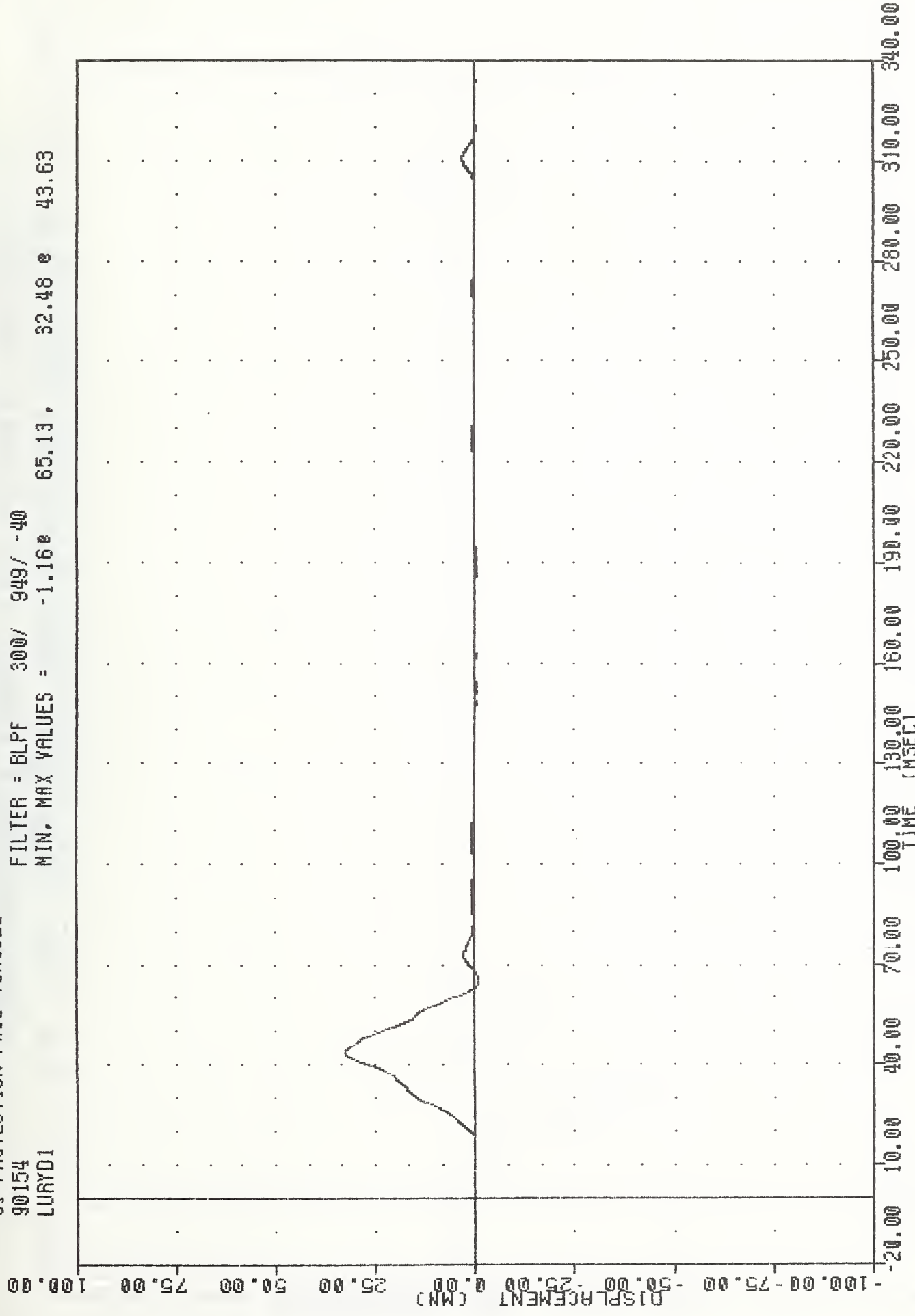
FILTER = BLFF 300/ 949/ -40
 MIN, MAX VALUES = 0.00e -20.00 , 29.07 s 69.88



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER LEFT UPPER THORAX AIB Y-AXIS REDUNDANT VELOCITY

VRTC
SI PROTECTION PROD VEHICLE
90154
LURYD1

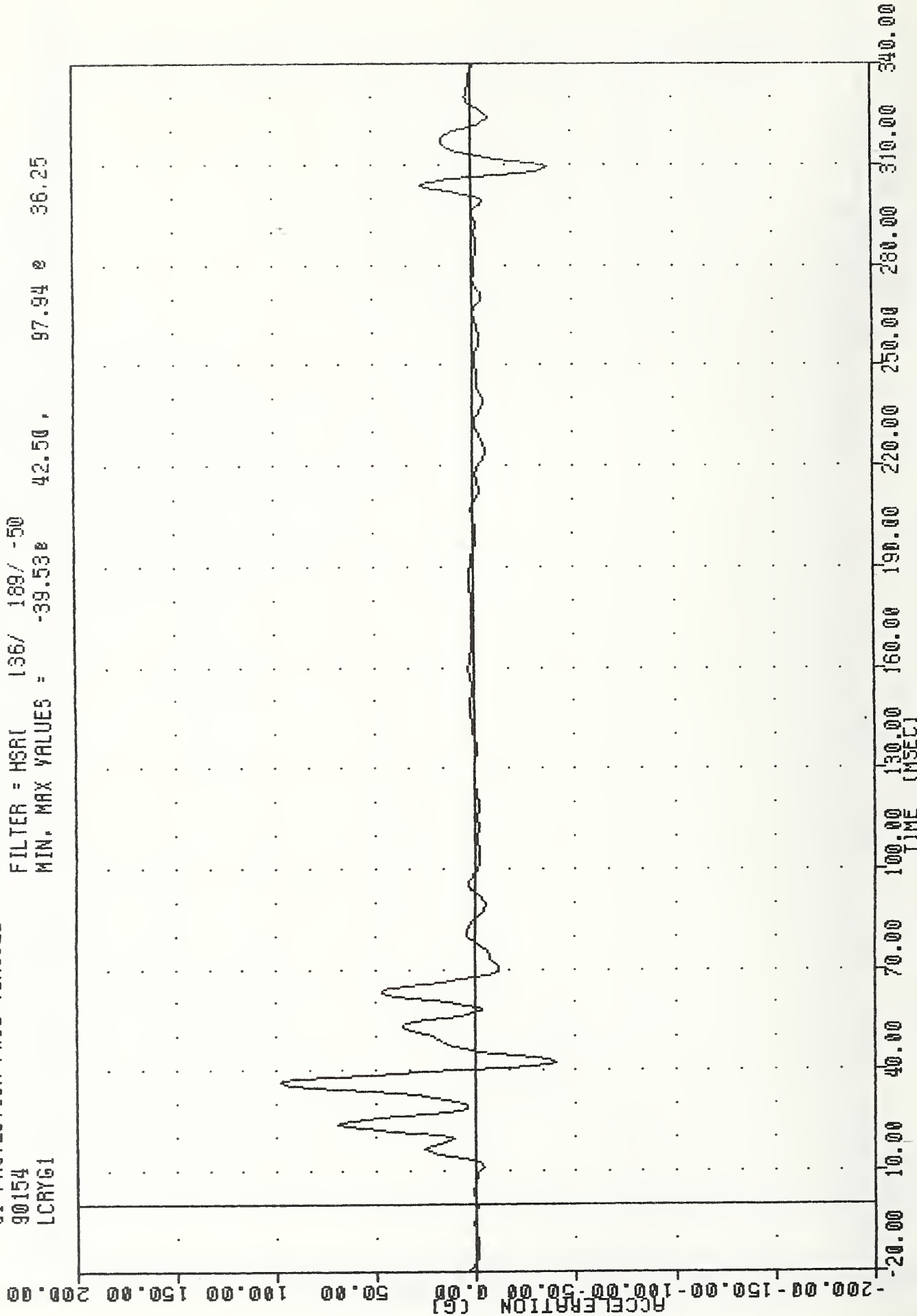
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -1.16e 65.13, 32.48 e 43.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT UPPER THORAX RIB DISPLACEMENT

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LCRY61

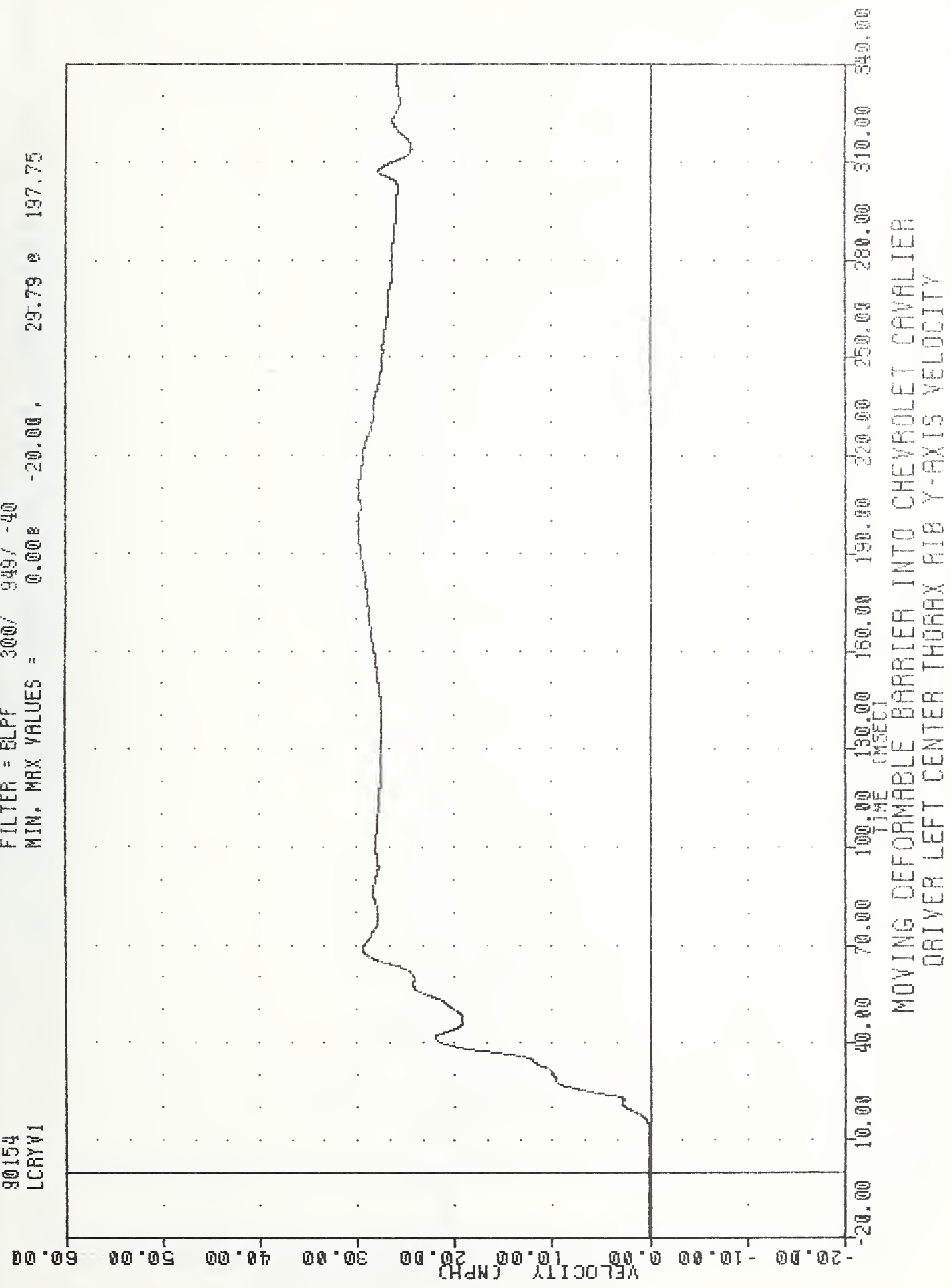
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -39.53 42.50 97.94 36.25



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT CENTER THORAX RIB Y-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PASO VEHICLE
90154
LCRYV1

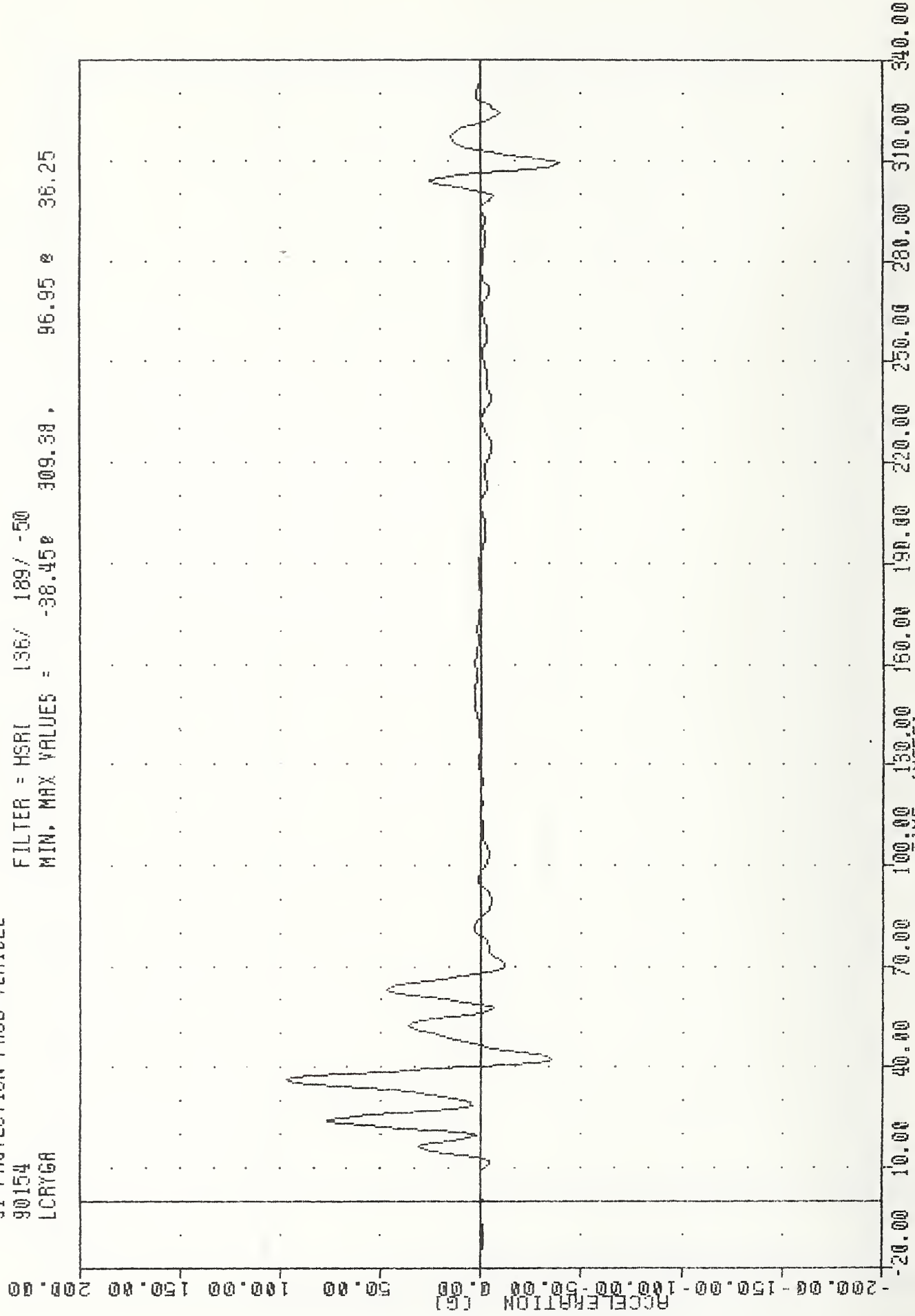
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.000 -20.00 , 29.79 0 197.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT CENTER THORAX AIB Y-AXIS VELOCITY

VRIC , 900604
SI PROTECTION PASS VEHICLE
90154
LCRYGA

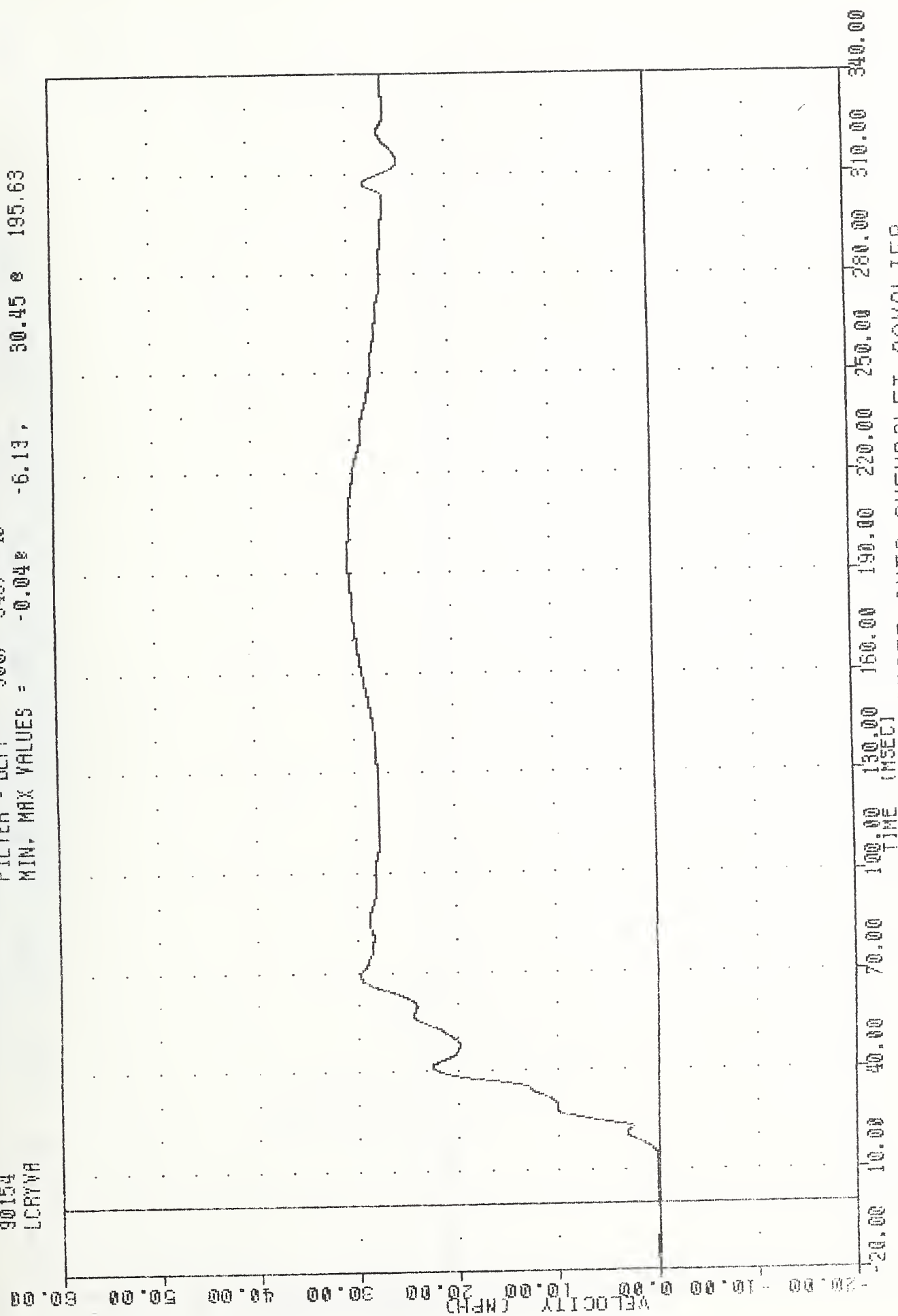
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -38.45e 309.38 , 96.95 e 36.25



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT CENTER THORAX RIB Y-AXIS REDUNDANT ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LCRYVA

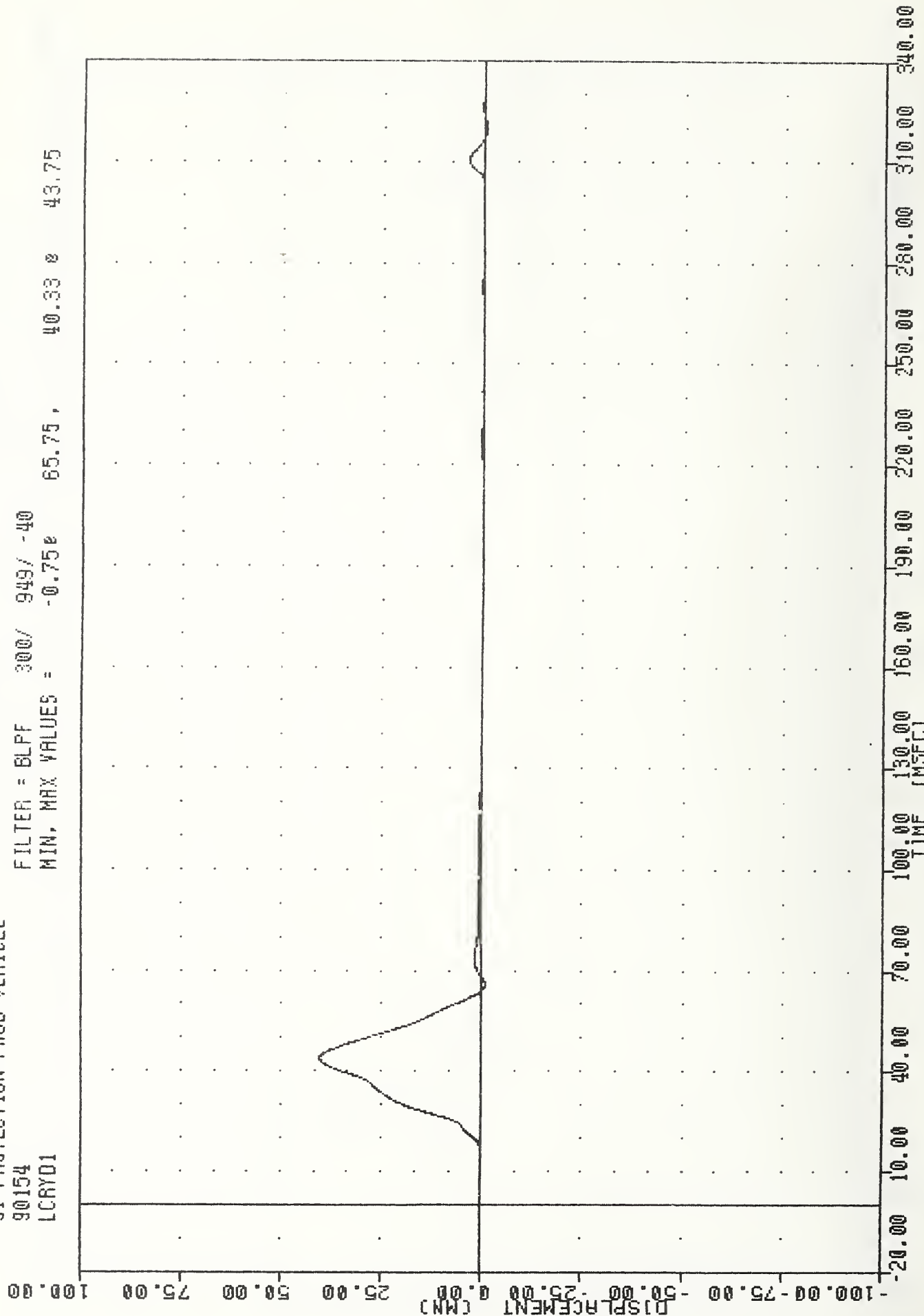
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -6.13, 30.45 & 195.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT CENTER THORAX RIB Y-AXIS REDUNDANT VELOCITY

VRTC , 900504
SI PROTECTION PASS VEHICLE
90154
LCRYD1

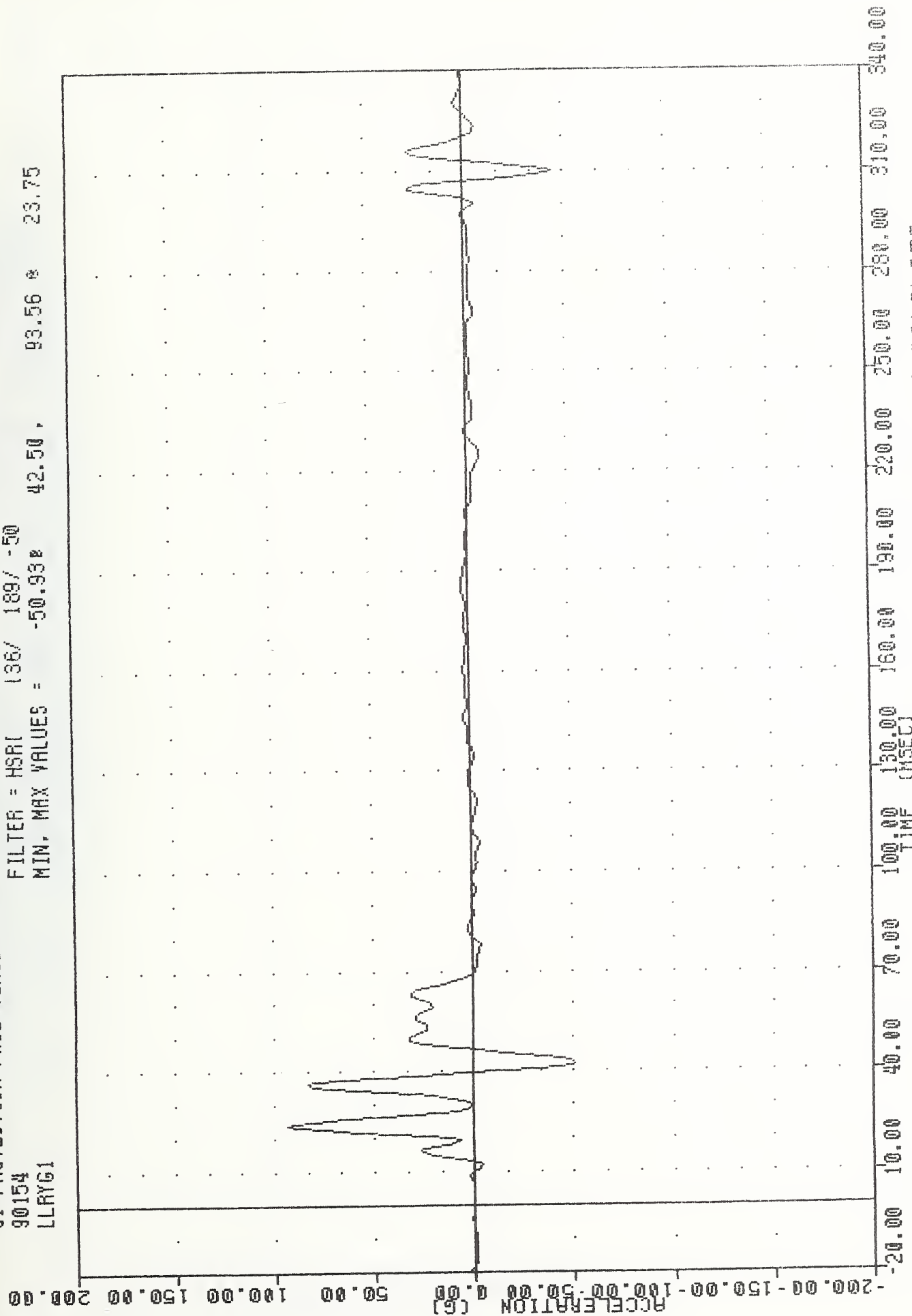
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.75e 65.75, 40.33 e 43.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT CENTER THORAX RIB DISPLACEMENT

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LLRY61

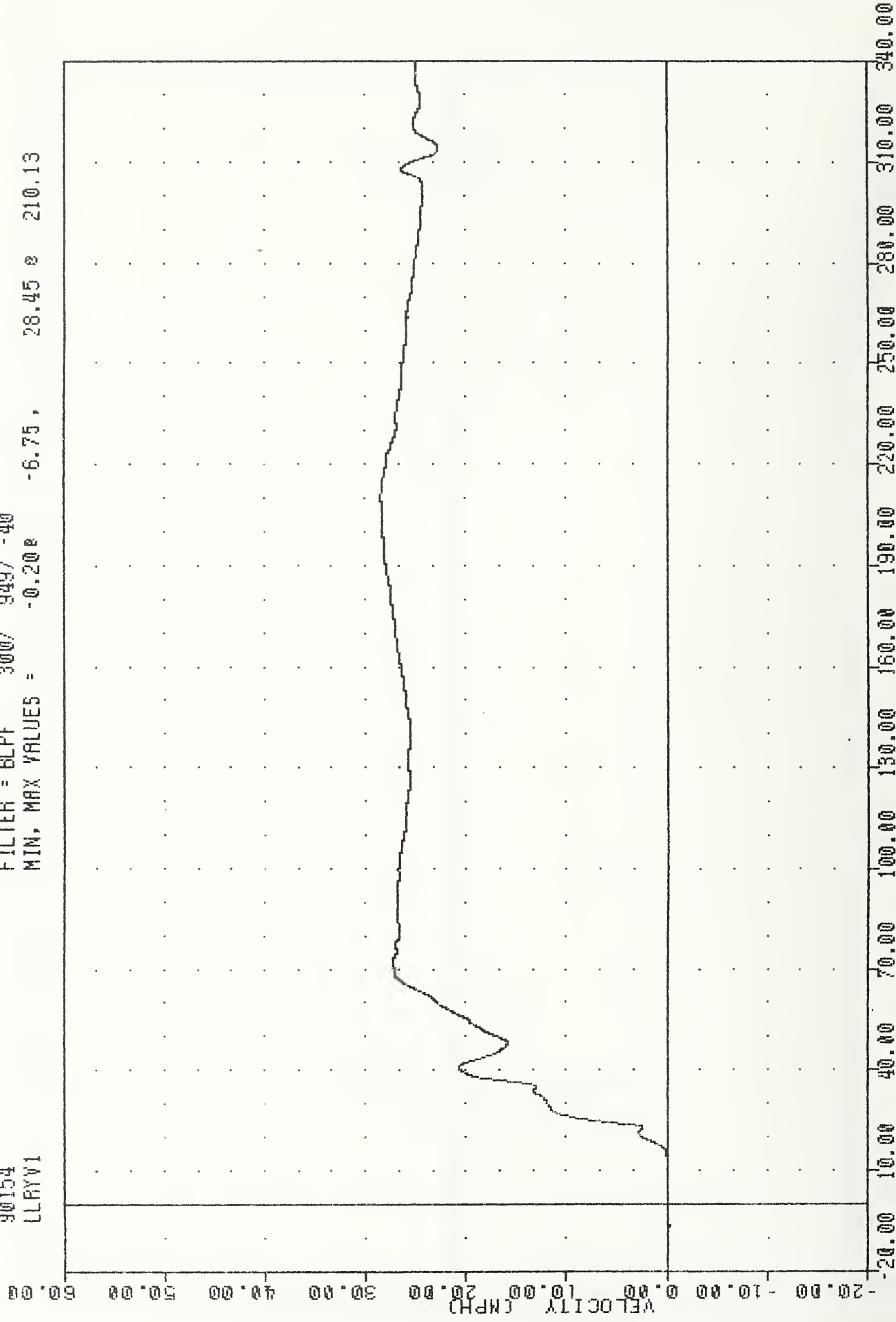
FILTER = HSR(136/ 189/ -50
MIN. MAX VALUES = -50.930 42.50 93.56 23.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT LOWER THORAX RIB Y-AXIS ACCELERATION

YRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 LLRYV1

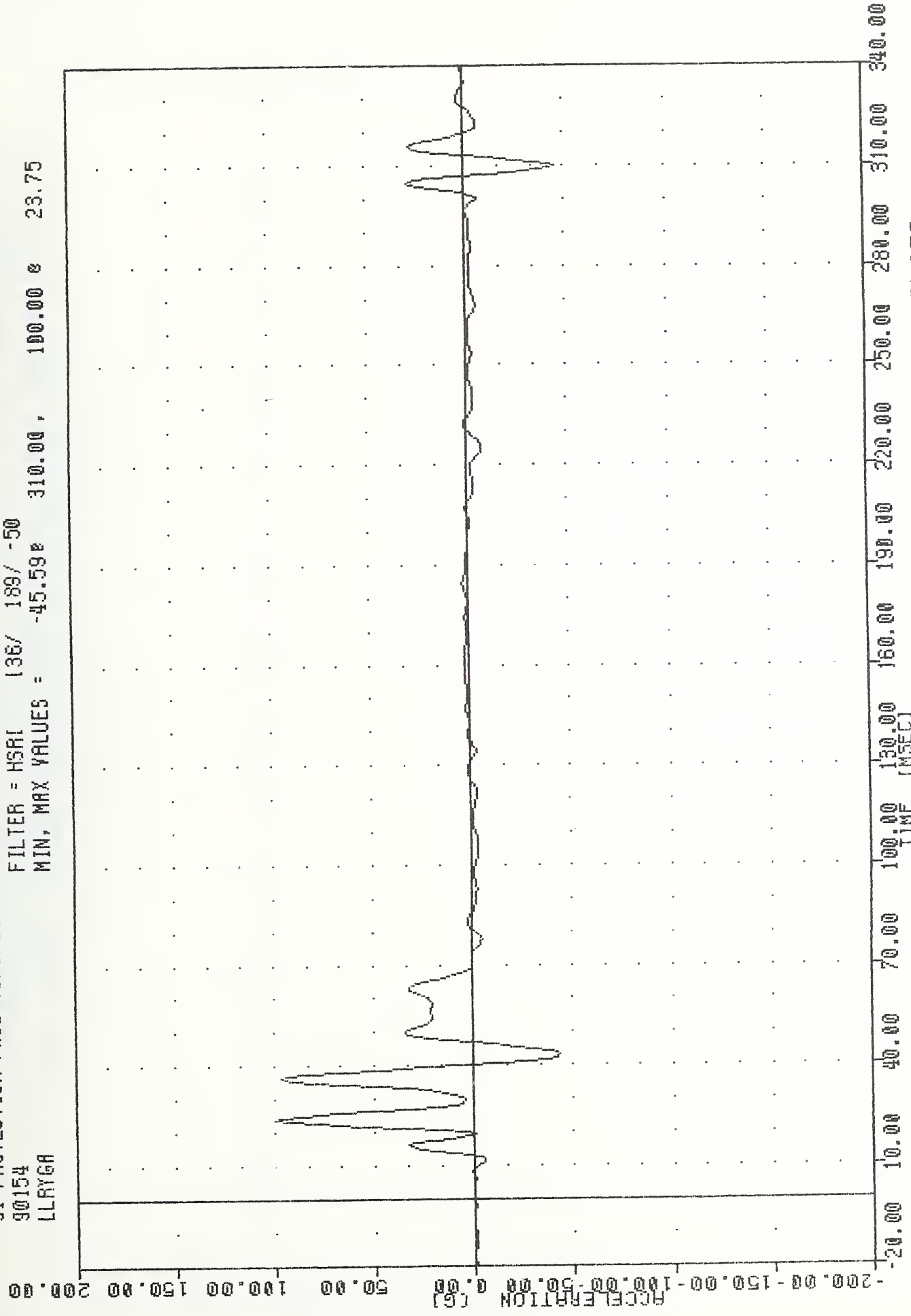
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.20e -6.75 , 28.45 e 210.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER LEFT LOWER THORAX RIB Y-AXIS VELOCITY

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LLAY6A

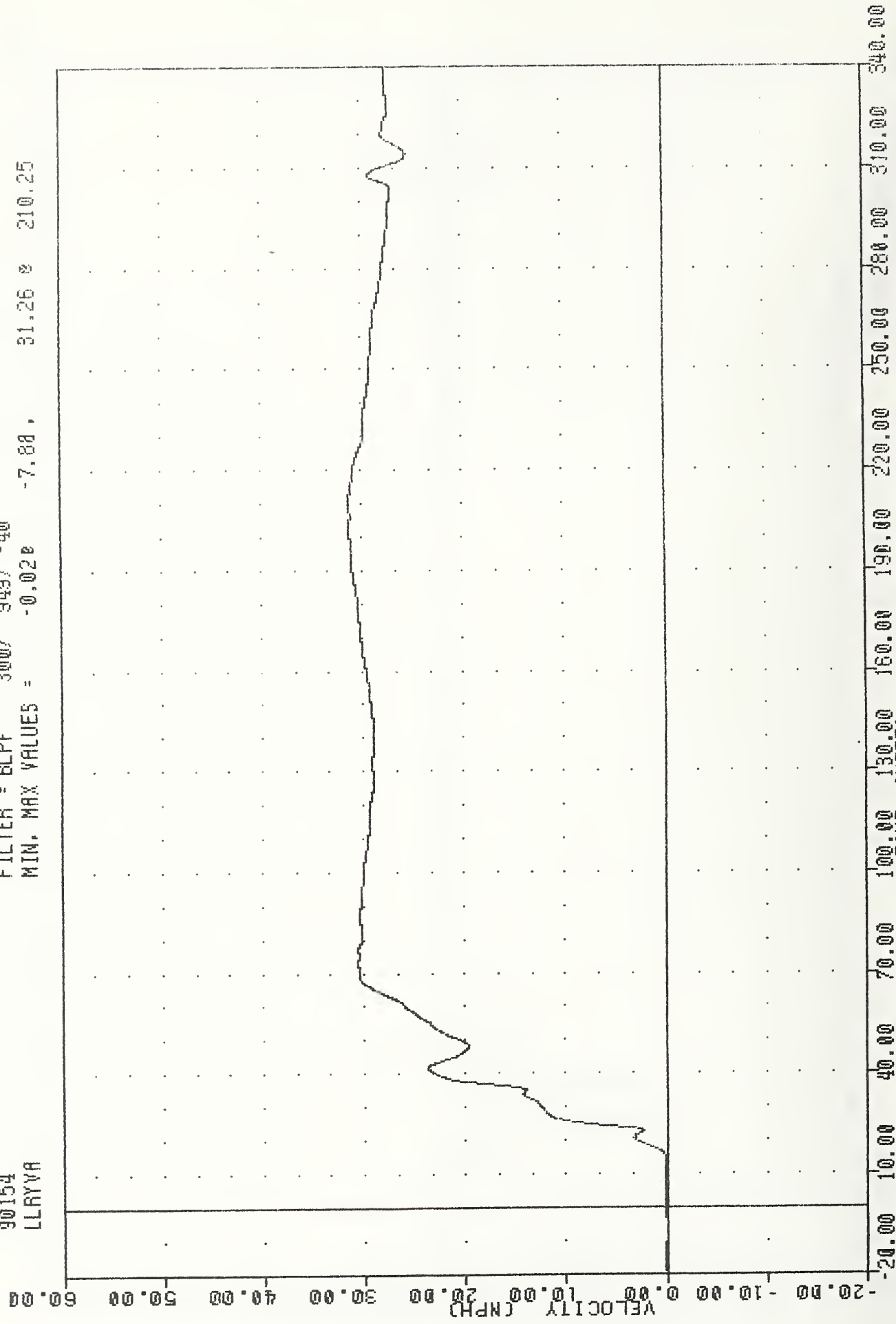
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -45.59e 310.00 , 100.00 e 23.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT LOWER THORAX RIB Y-AXIS REDUNDANT ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LLRYVA

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.020 -7.88 , 31.26 210.25



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT LOWER THORAX RIB Y-AXIS REDUNDANT VELOCITY

VRTC , 900604

SI PROTECTION PROD VEHICLE

90154

LLRYD1

FILTER = BLPF 300/ 949/ -40

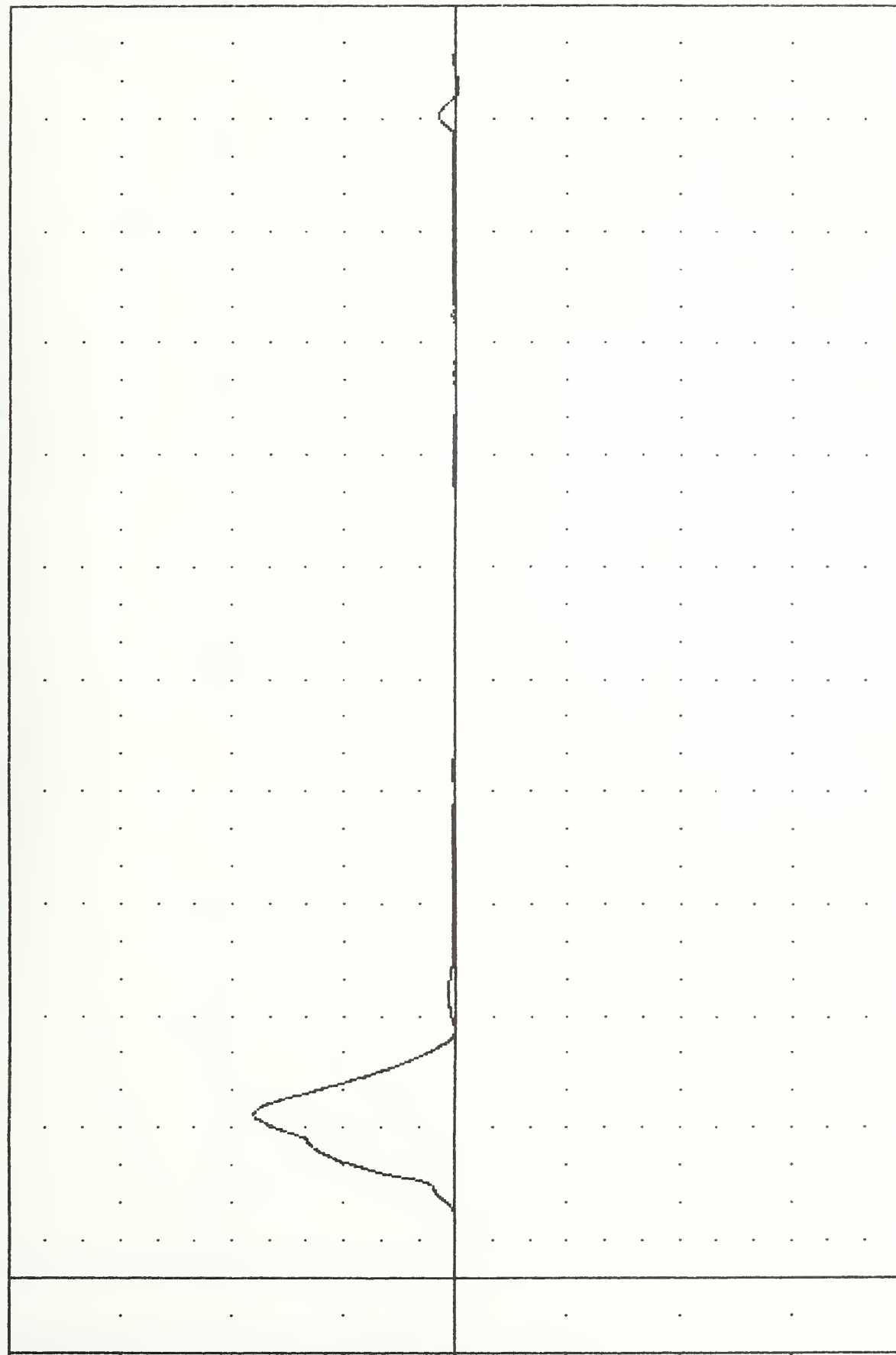
MIN. MAX VALUES = -0.66e

318.00 ,

45.04 e

43.50

DISPLACEMENT (CMN)



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT LOWER THORAX RIB DISPLACEMENT

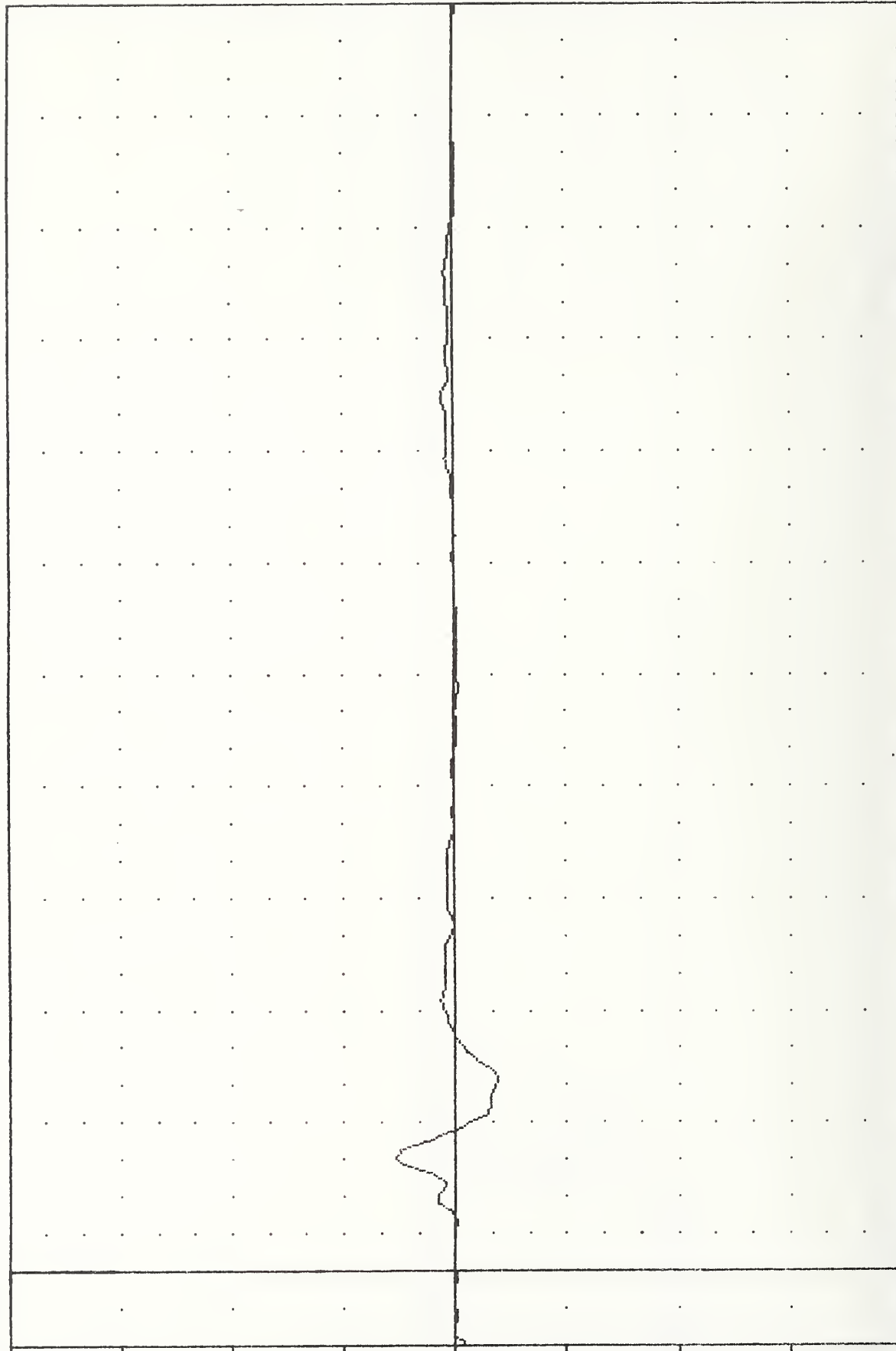
VRTC
SI PROTECTION PROD VEHICLE
90154
T12XG1

, 900604

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -19.028 51.25,

26.74 e 30.62

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LOWER SPINE X-AXIS ACCELERATION

WRTC , 900604

SI PROTECTION PROD VEHICLE

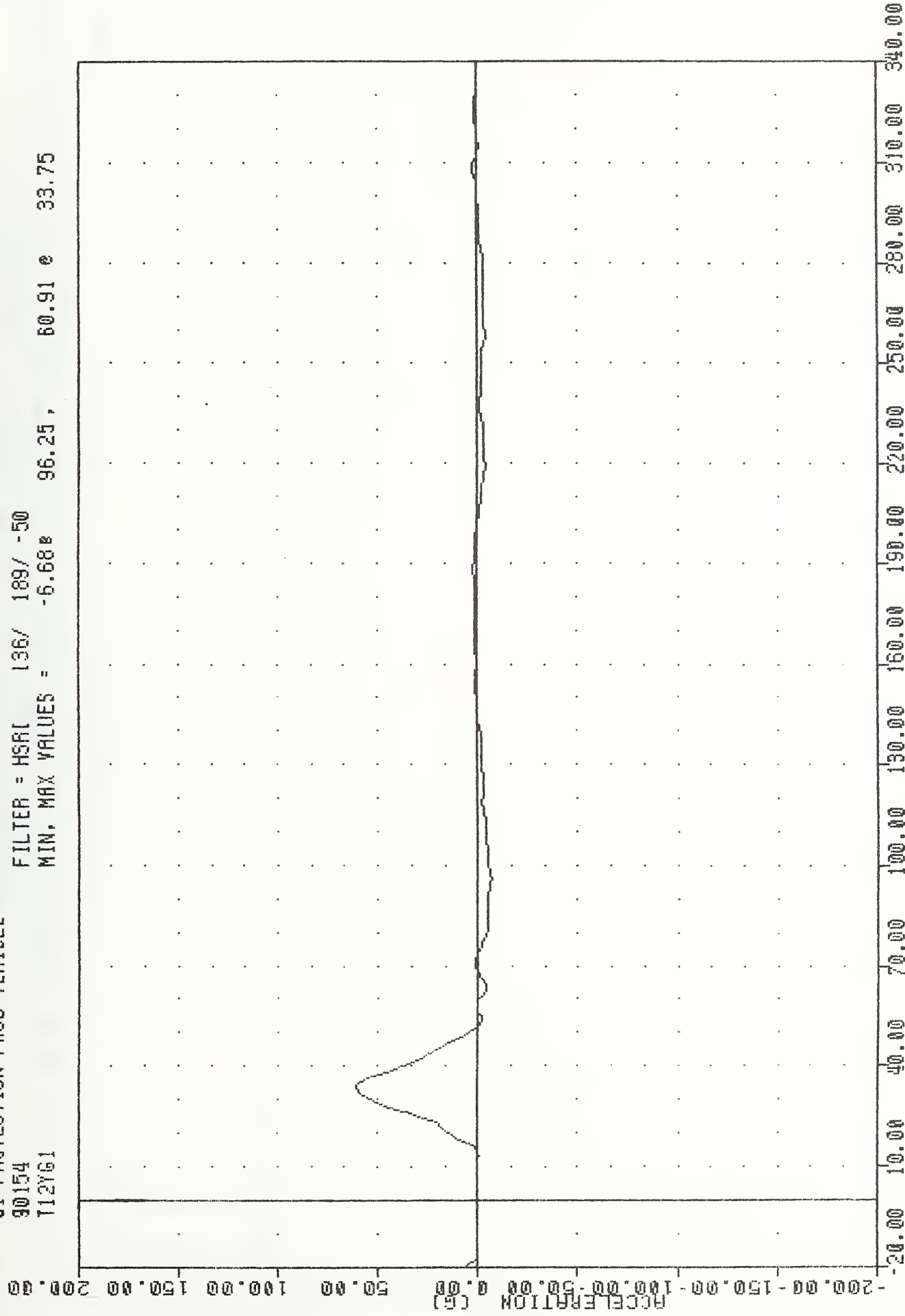
90154

112Y61

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -6.68 96.25 ,

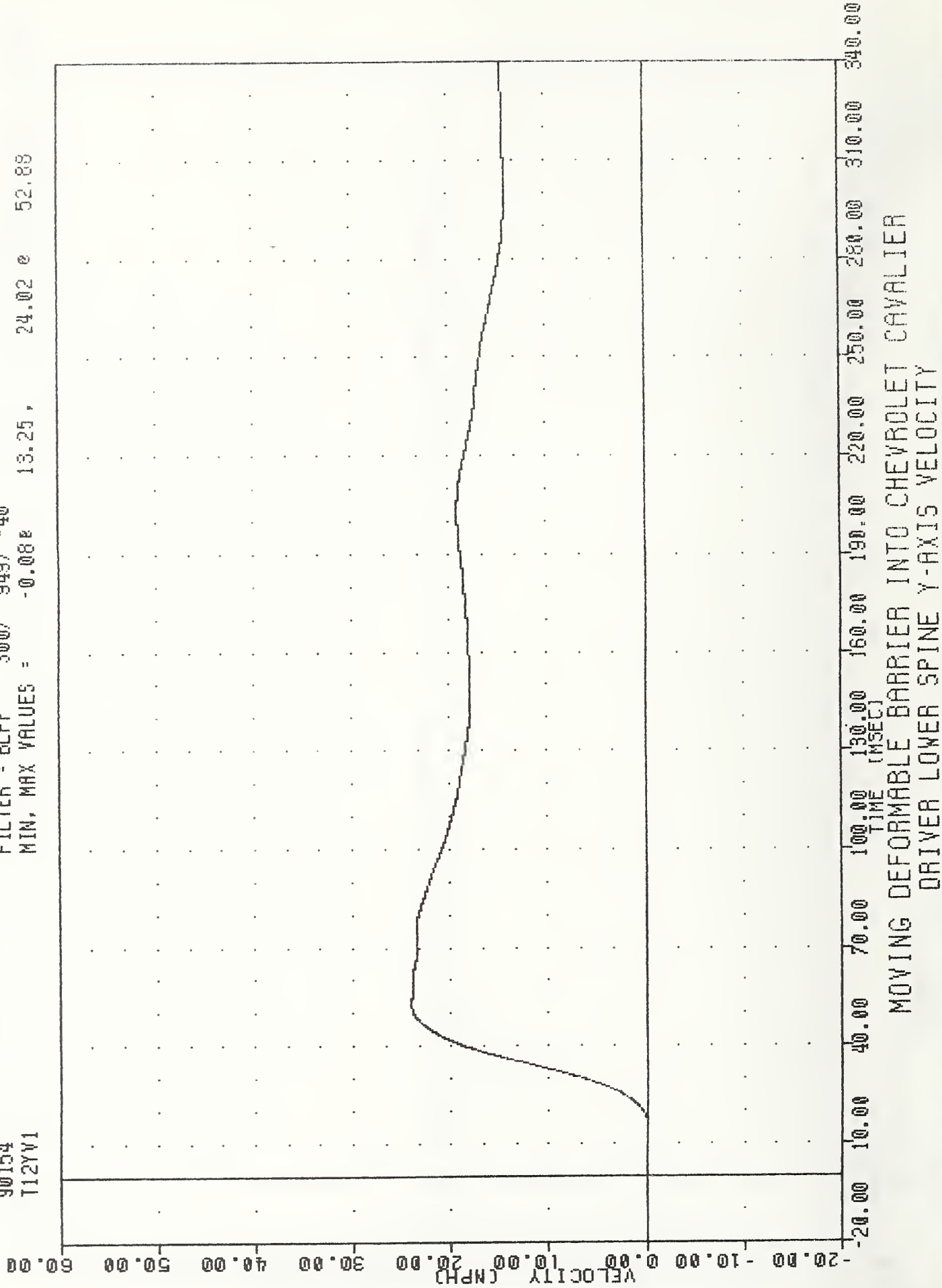
60.91 33.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LOWER SPINE Y-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
T12YV1

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.088 13.25, 24.02 @ 52.88



VRIC, 900604

SI PROTECTION PROD VEHICLE

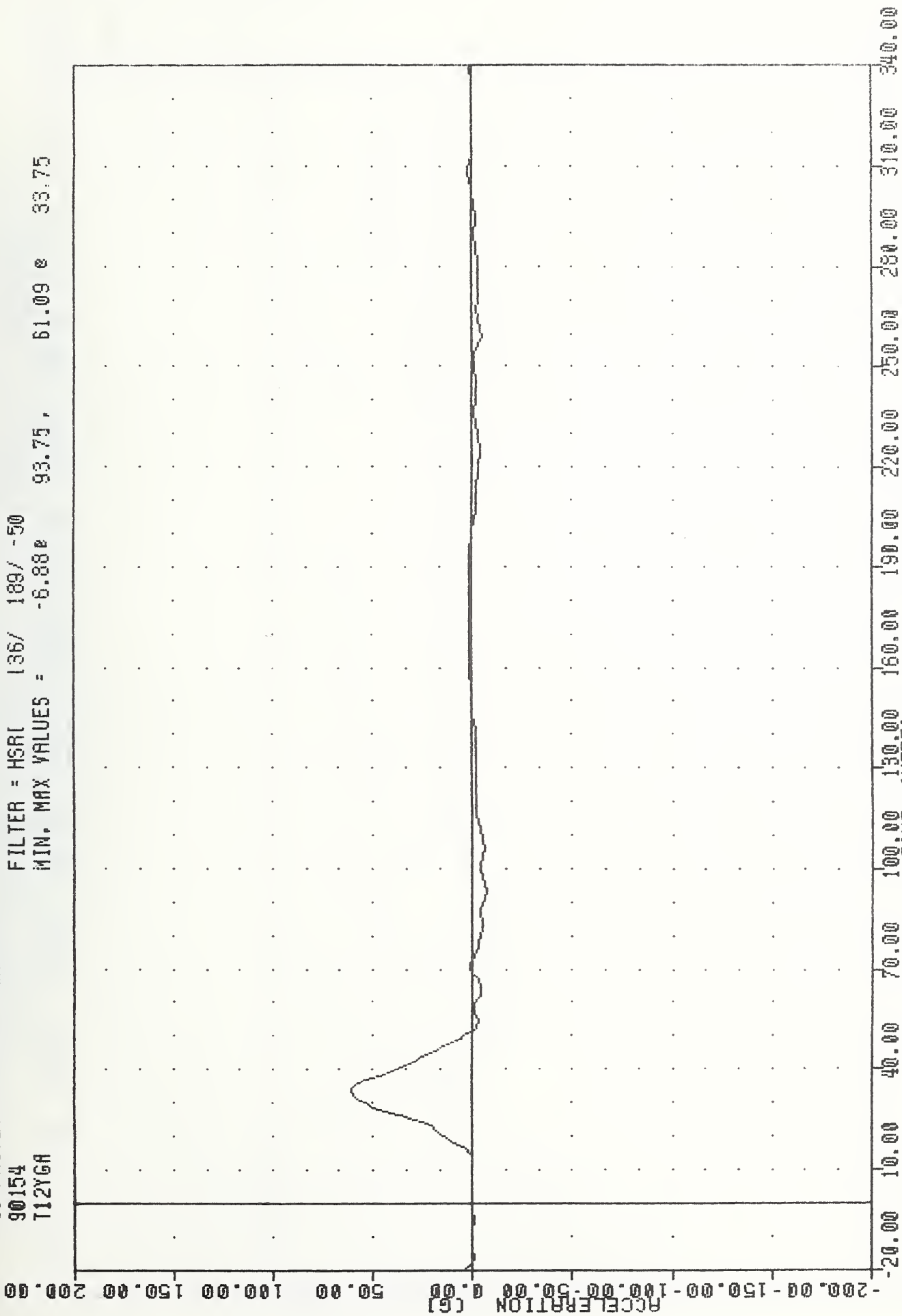
90154

T12Y6A

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -6.88e 93.75,

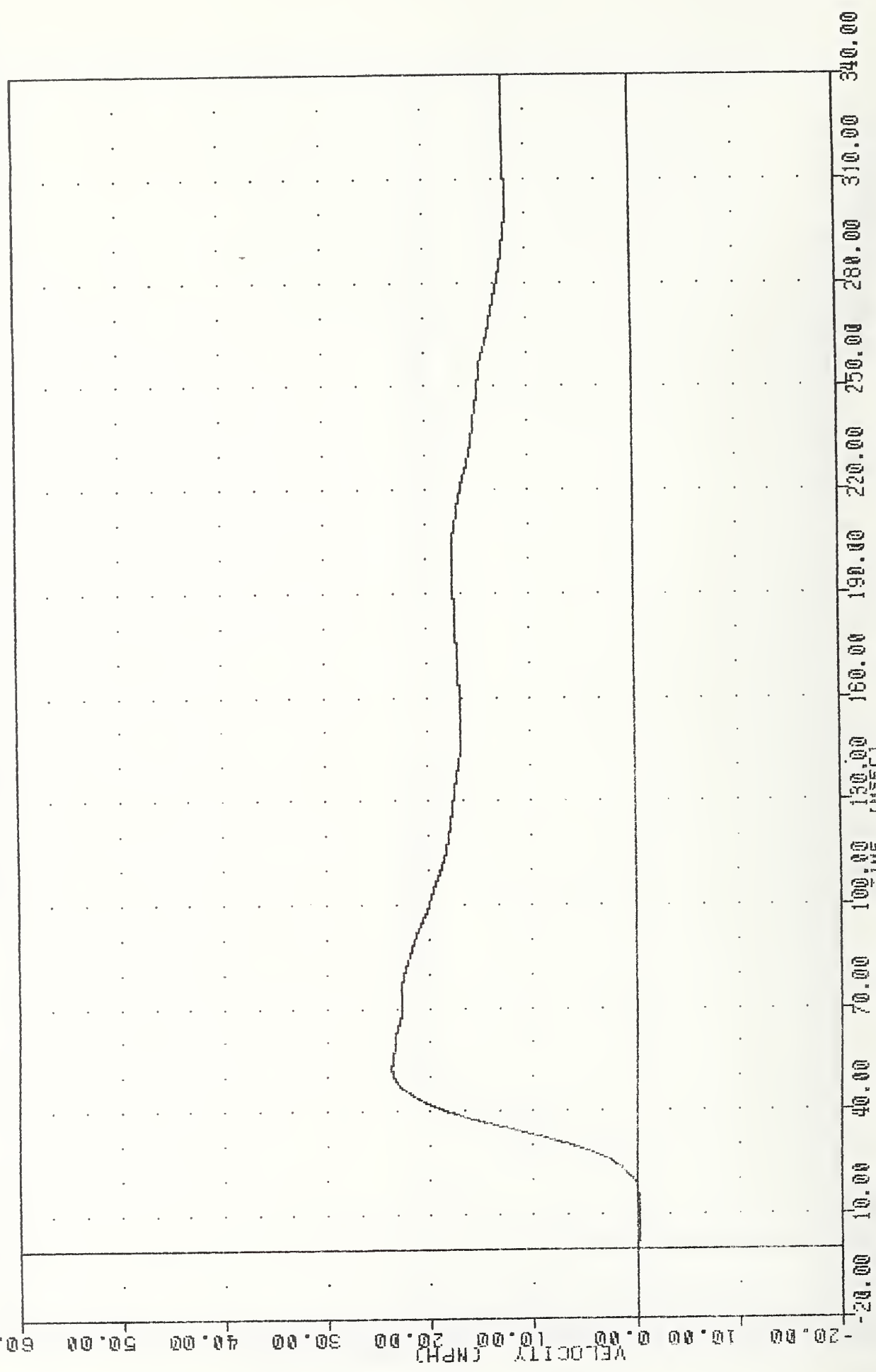
61.09 e 33.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

VRTC , 900804
 SI PROTECTION PROD VEHICLE
 90154
 T12YVA

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.26 9.88 , 23.78 52.50

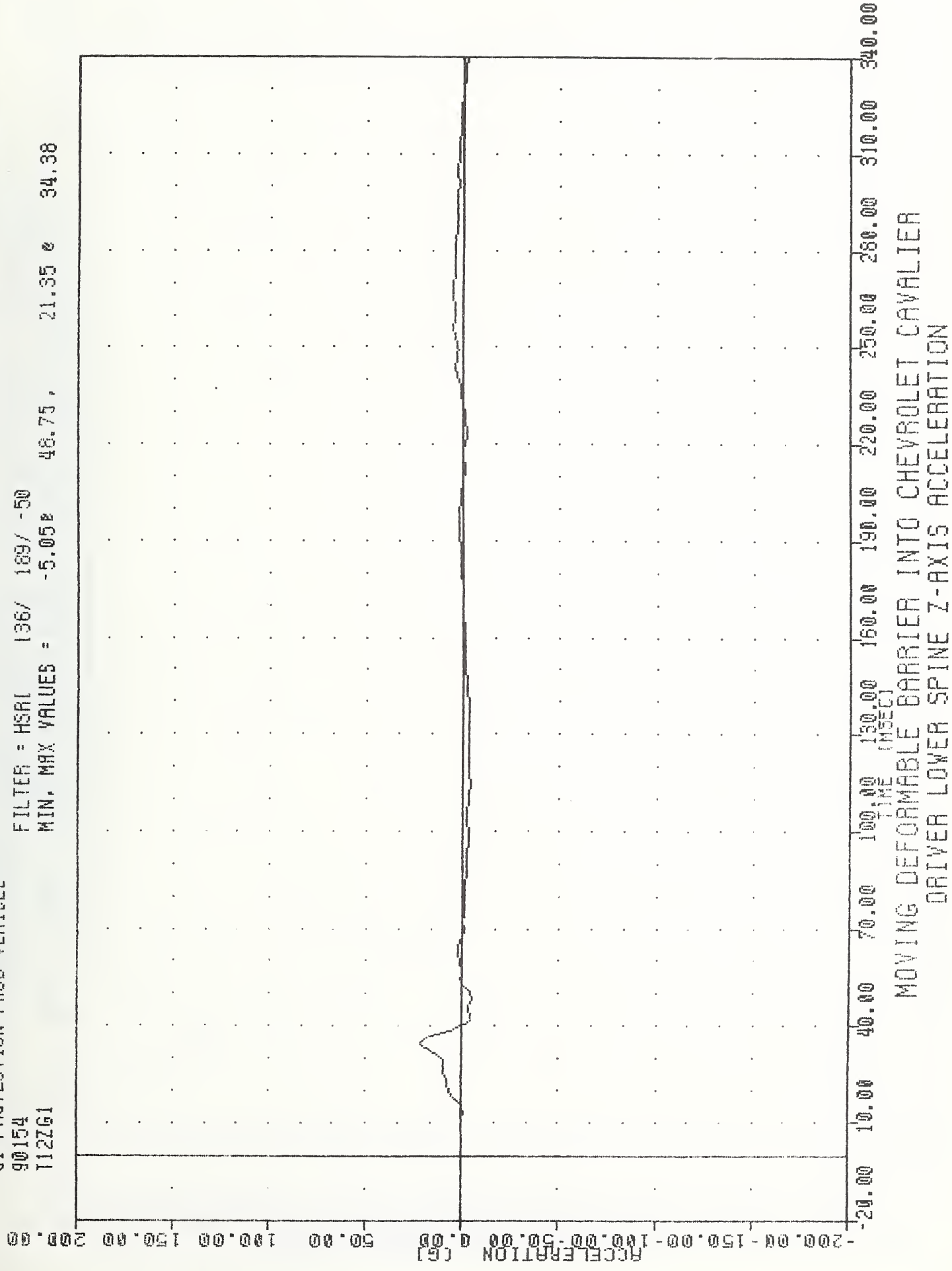


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER LOWER SPINE Y-AXIS REDUNDANT VELOCITY

VRTC 900604
SI PROTECTION PROD VEHICLE
90154
112761

FILTER = HSRL 136/ 189/ -50
MIN. MAX VALUES = -5.05E

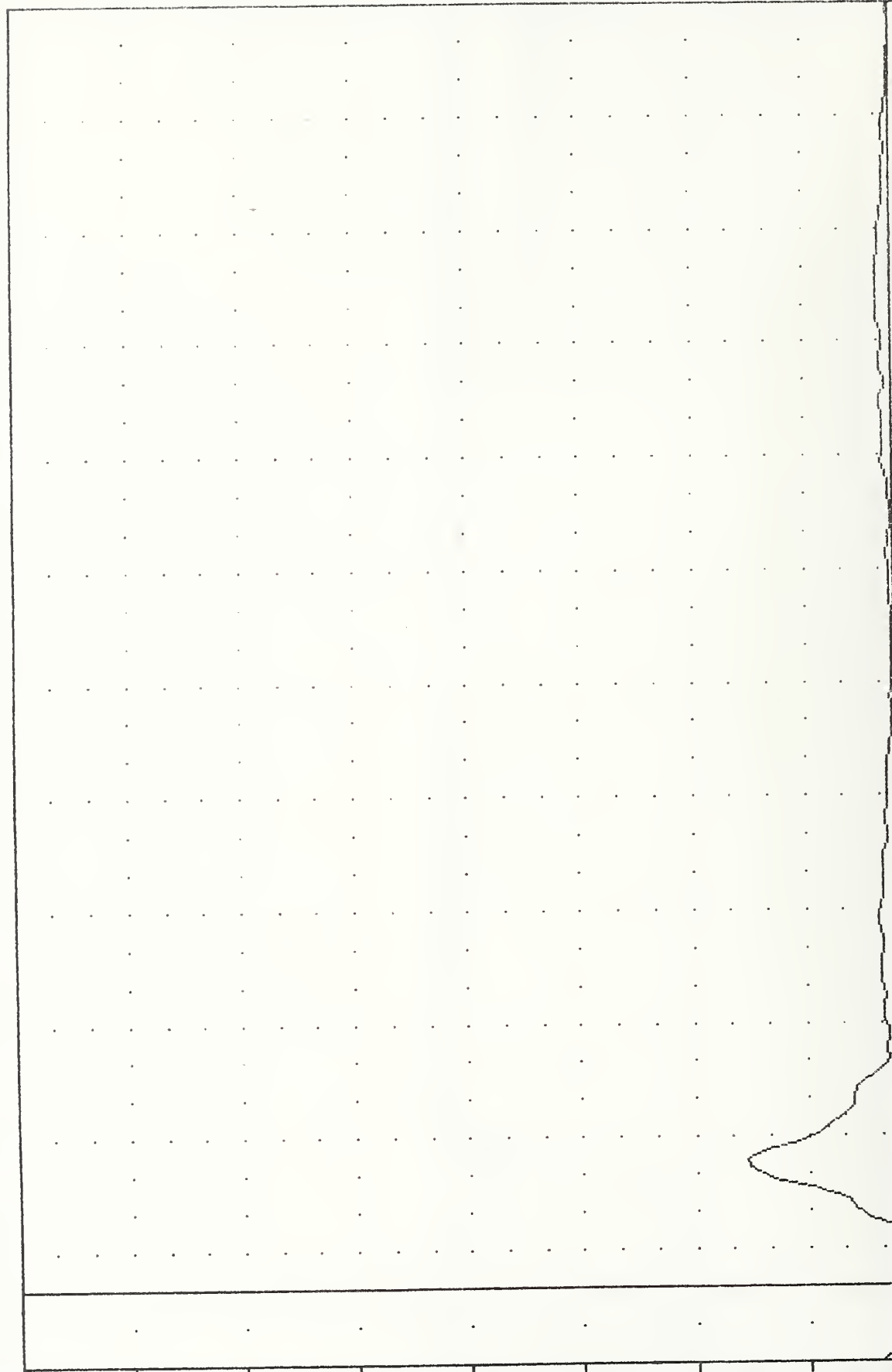
48.75, 21.35 e 34.38



VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 T12RG1

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.020 6.25 , 66.97 0 33.13

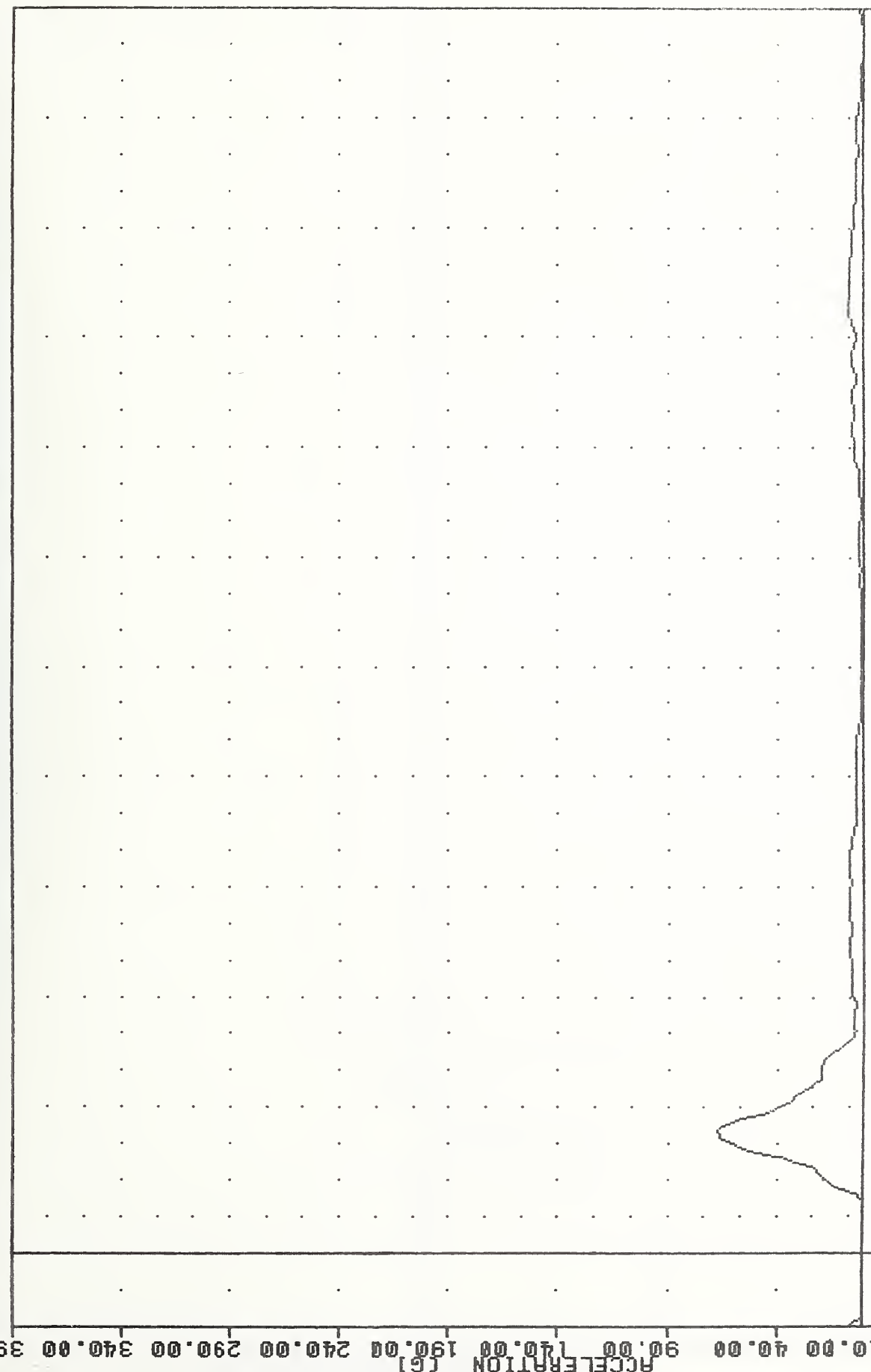
ACCELERATION (G)
 390.00
 340.00
 290.00
 240.00
 190.00
 140.00
 90.00
 40.00
 -10.00



TIME (MSEC)
 -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
 MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER LOWER SPINE RESULTANT ACCELERATION

VRTC
SI PROTECTION PROD VEHICLE
90154
T12R6A

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.098 1.88 67.06 33.13

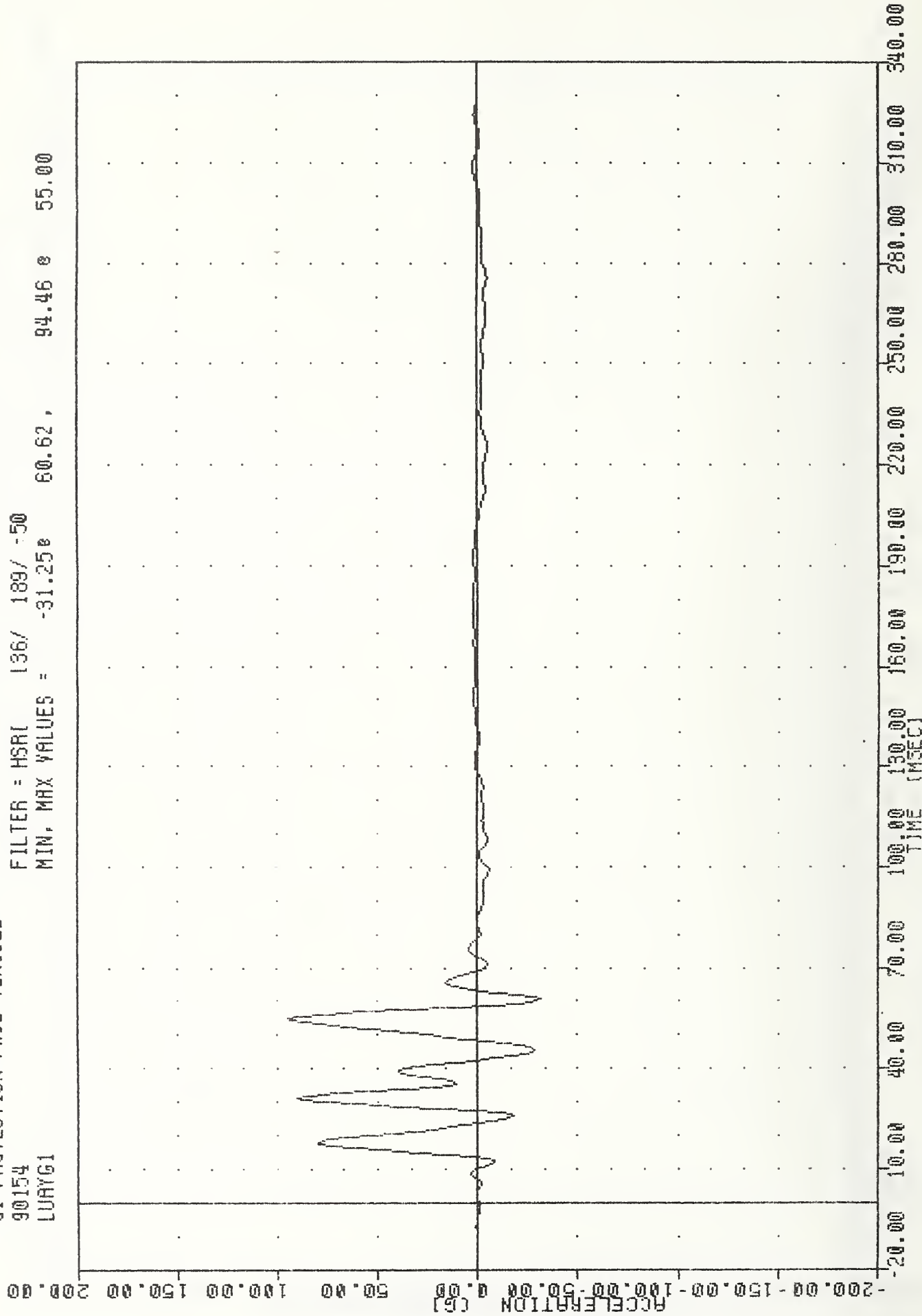


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LOWER SPINE REDUNDANT RESULTANT ACCELERATION

VRTC
SI PROTECTION PROD VEHICLE
90154
LWAYG1

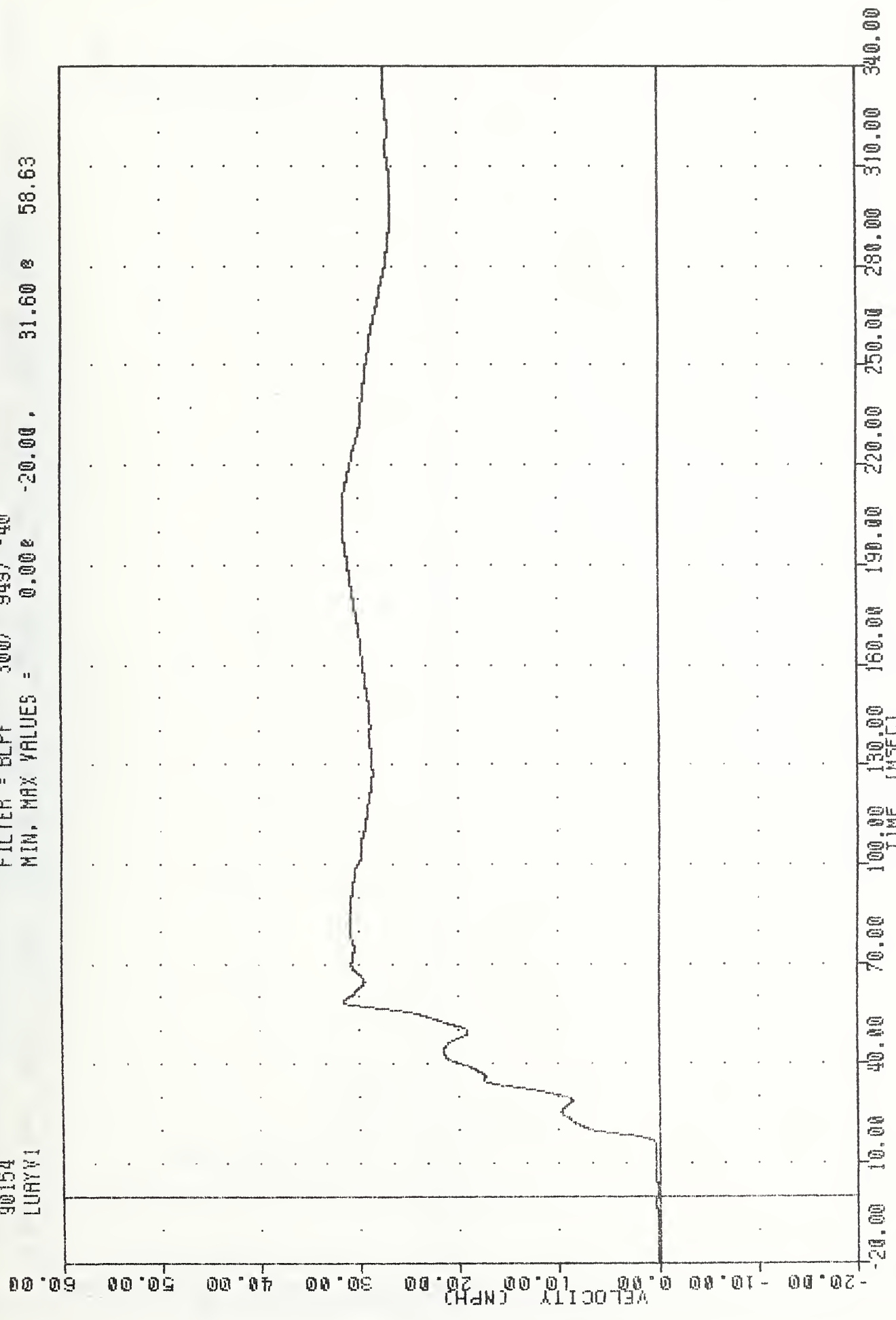
900604

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -31.250 60.62, 94.46 0 55.00



VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LURYV1

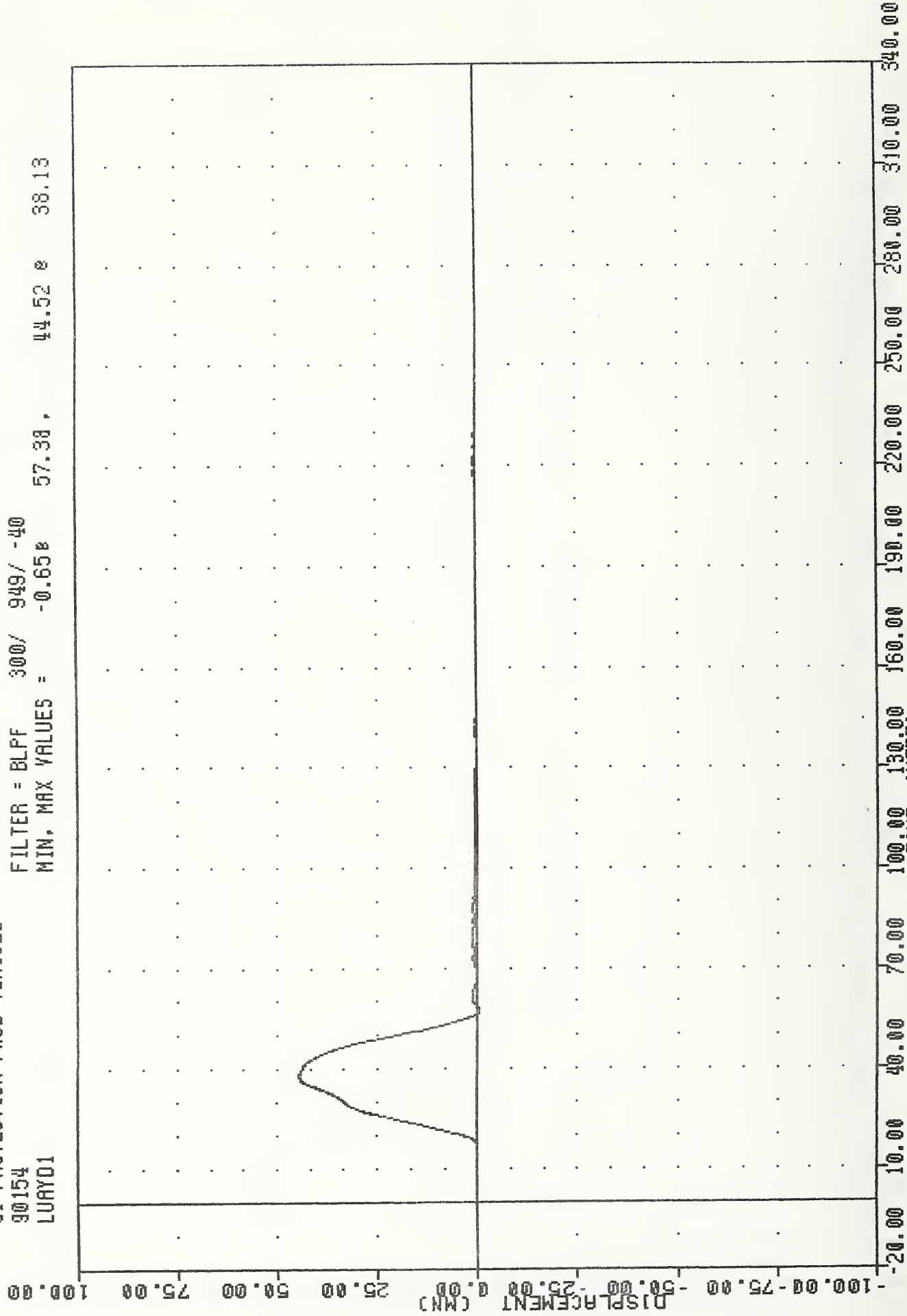
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.00e -20.00, 31.60 e 58.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT UPPER ABDOMEN RIB Y-AXIS VELOCITY

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LUAY01

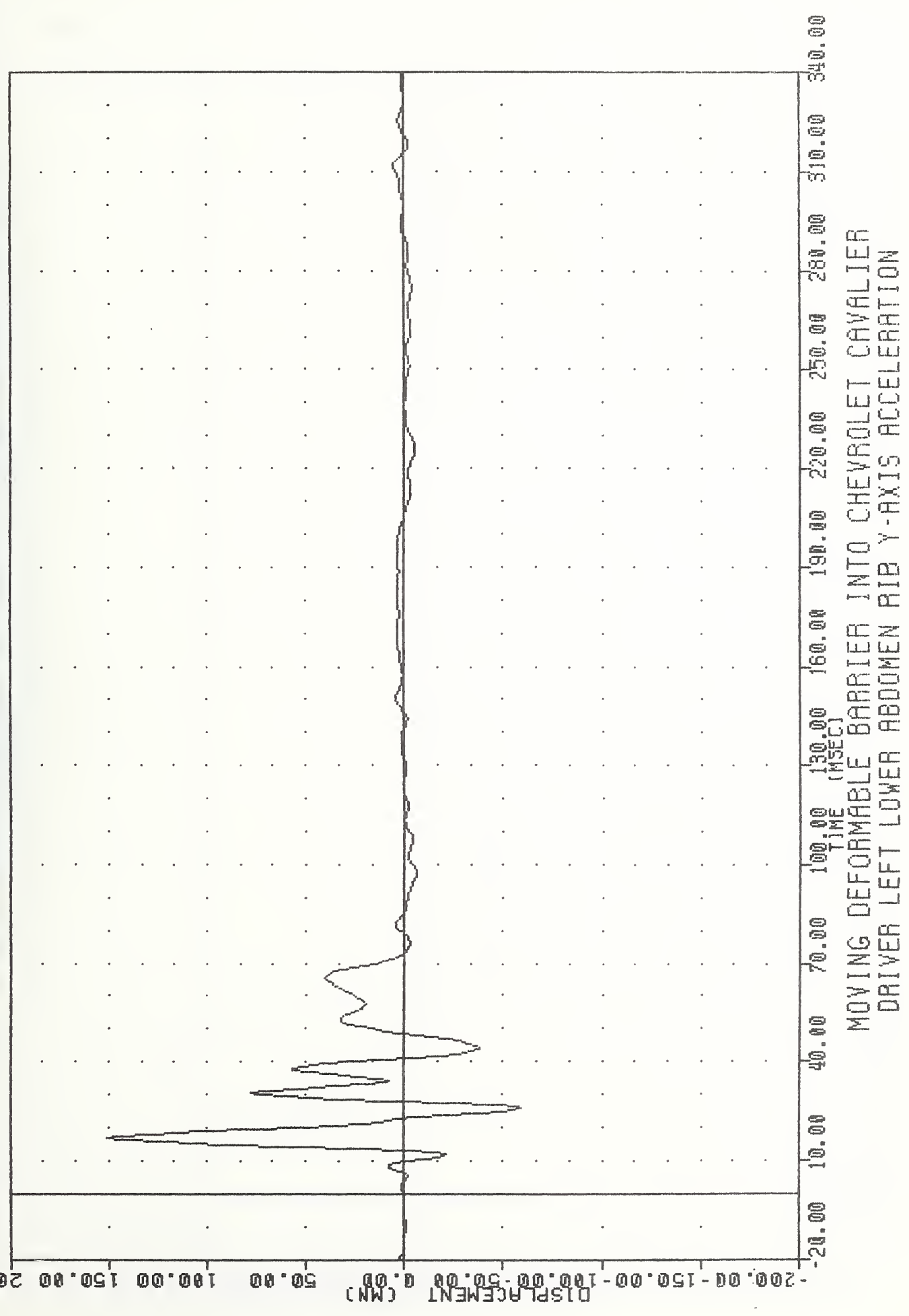
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.658 57.38 , 44.52 @ 38.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT UPPER ABDOMEN RIB DISPLACEMENT

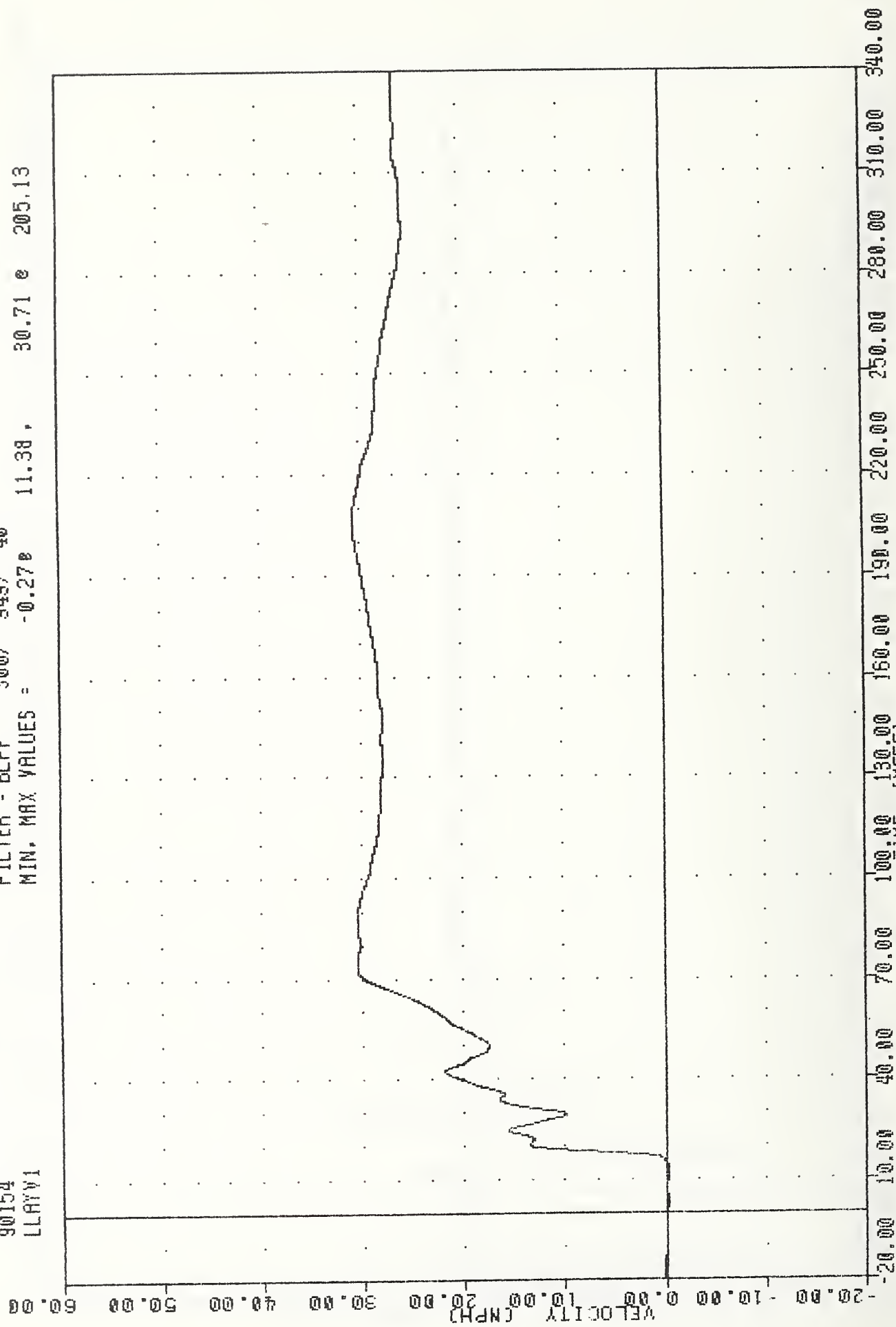
VRTC
SI PROTECTION PROD VEHICLE
90154
LLAY61

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -59.04 25.63 151.28 16.87



VRTC
SI PROTECTION PROD VEHICLE
90154
LLAYV1

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.270 11.38, 30.71 @ 205.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT LOWER ABDOMEN RIB Y-AXIS VELOCITY

VRTC , 900604

SI PROTECTION PROD VEHICLE

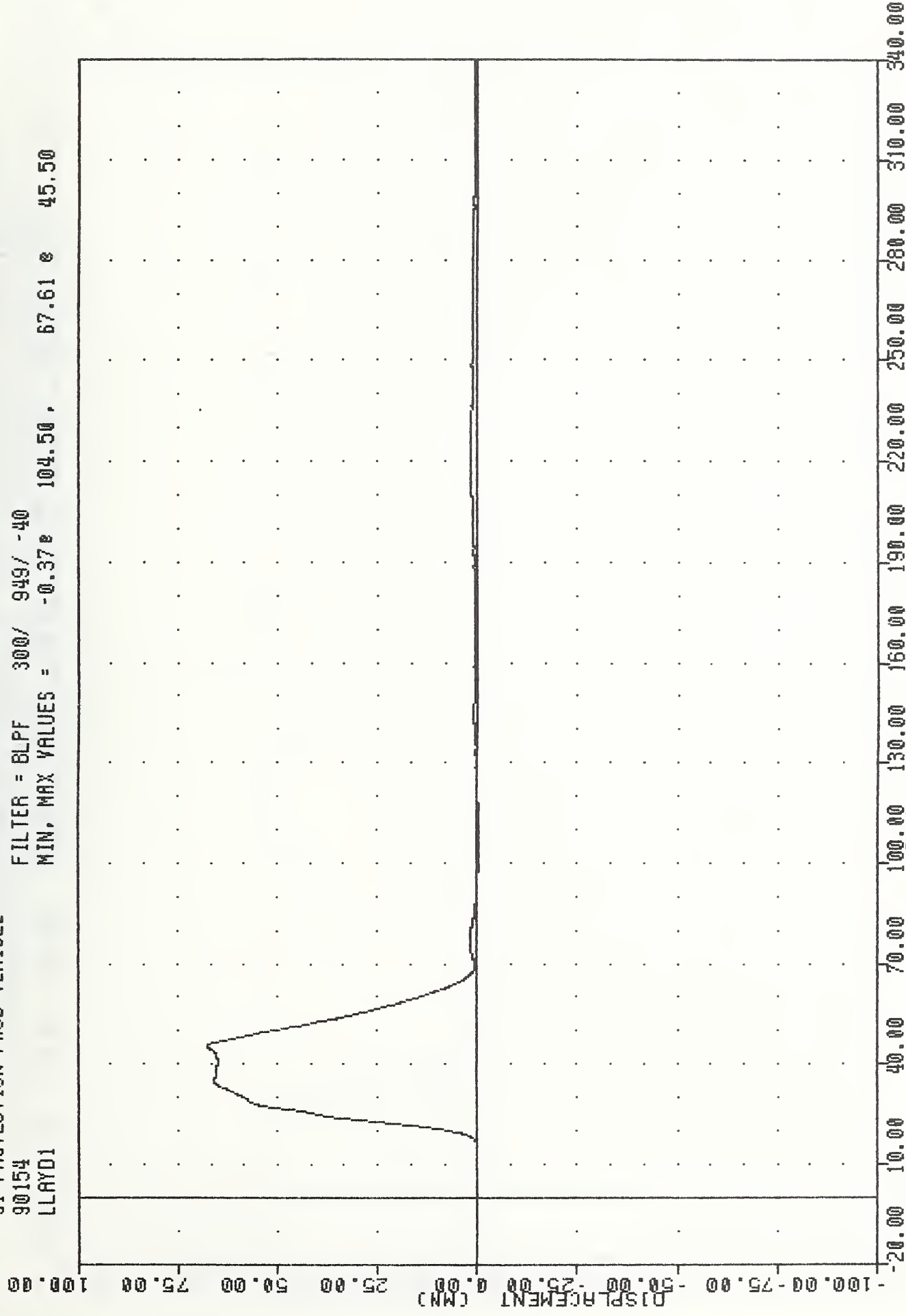
90154

LLAYD1

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -0.37e 104.50 ,

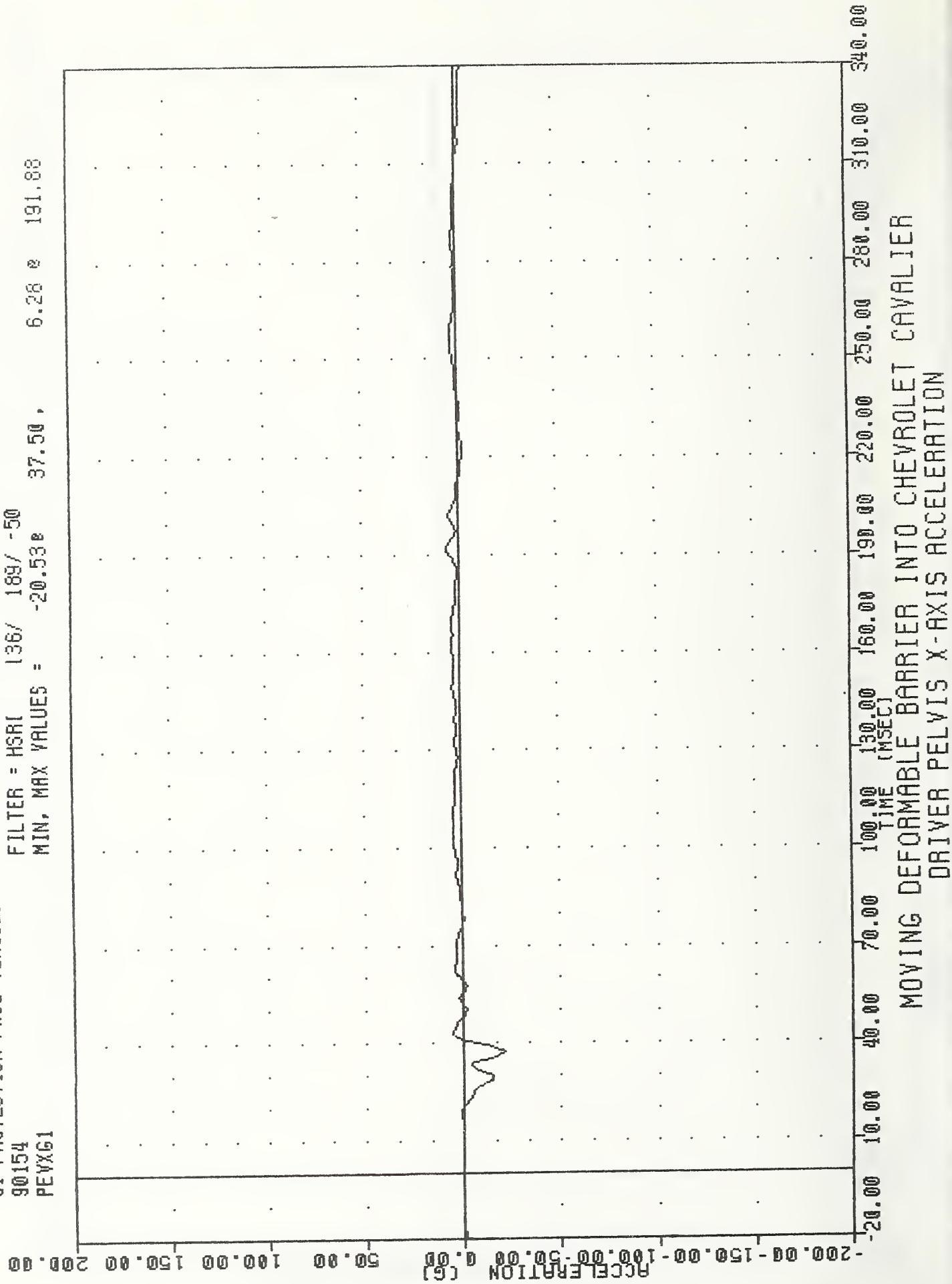
67.61 e 45.50



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER LEFT LOWER ABDOMEN RIB DISPLACEMENT

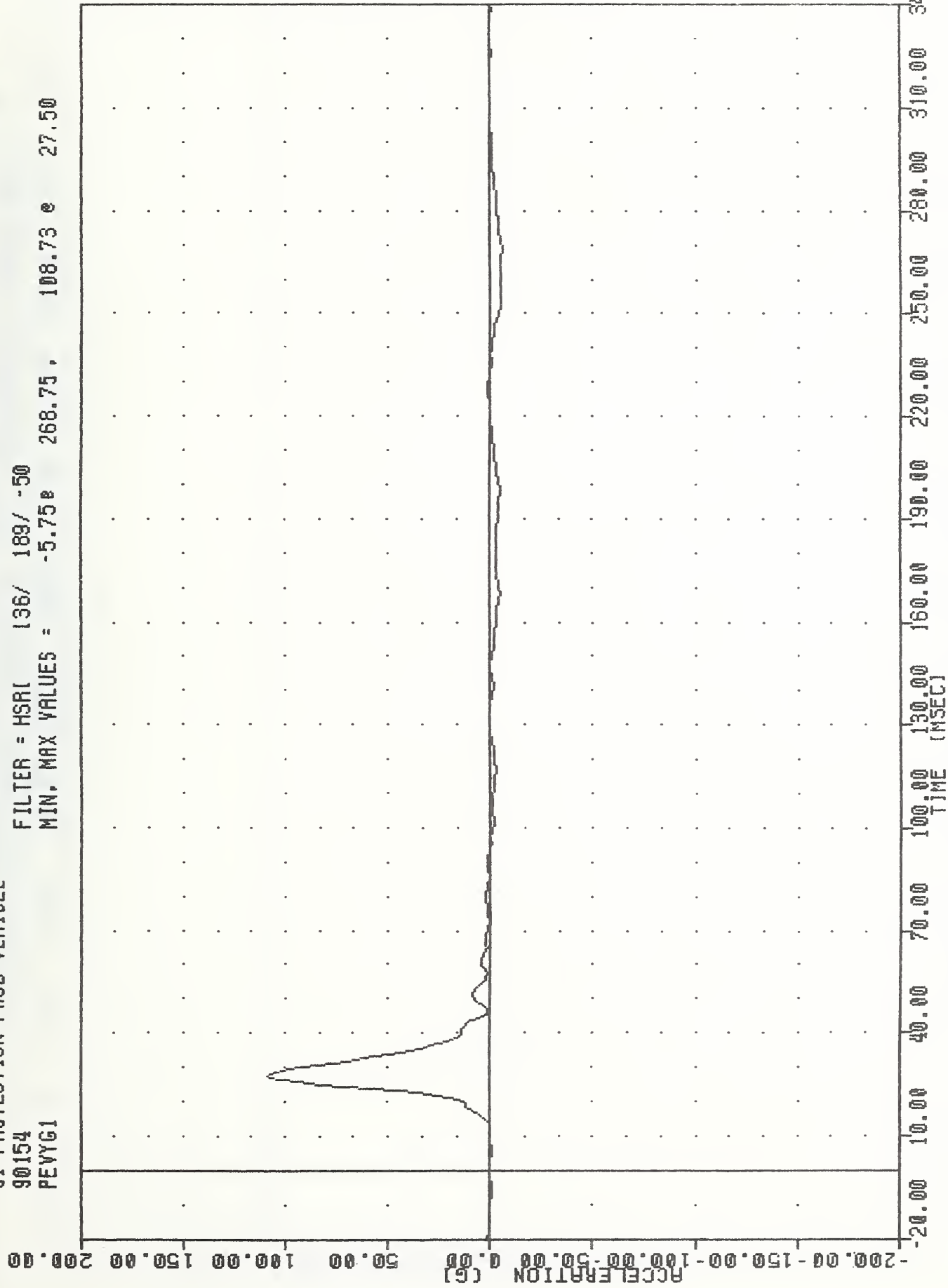
VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 PEVXG1

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -20.53e 37.50 , 6.28 e 191.88



VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
PEVYG1

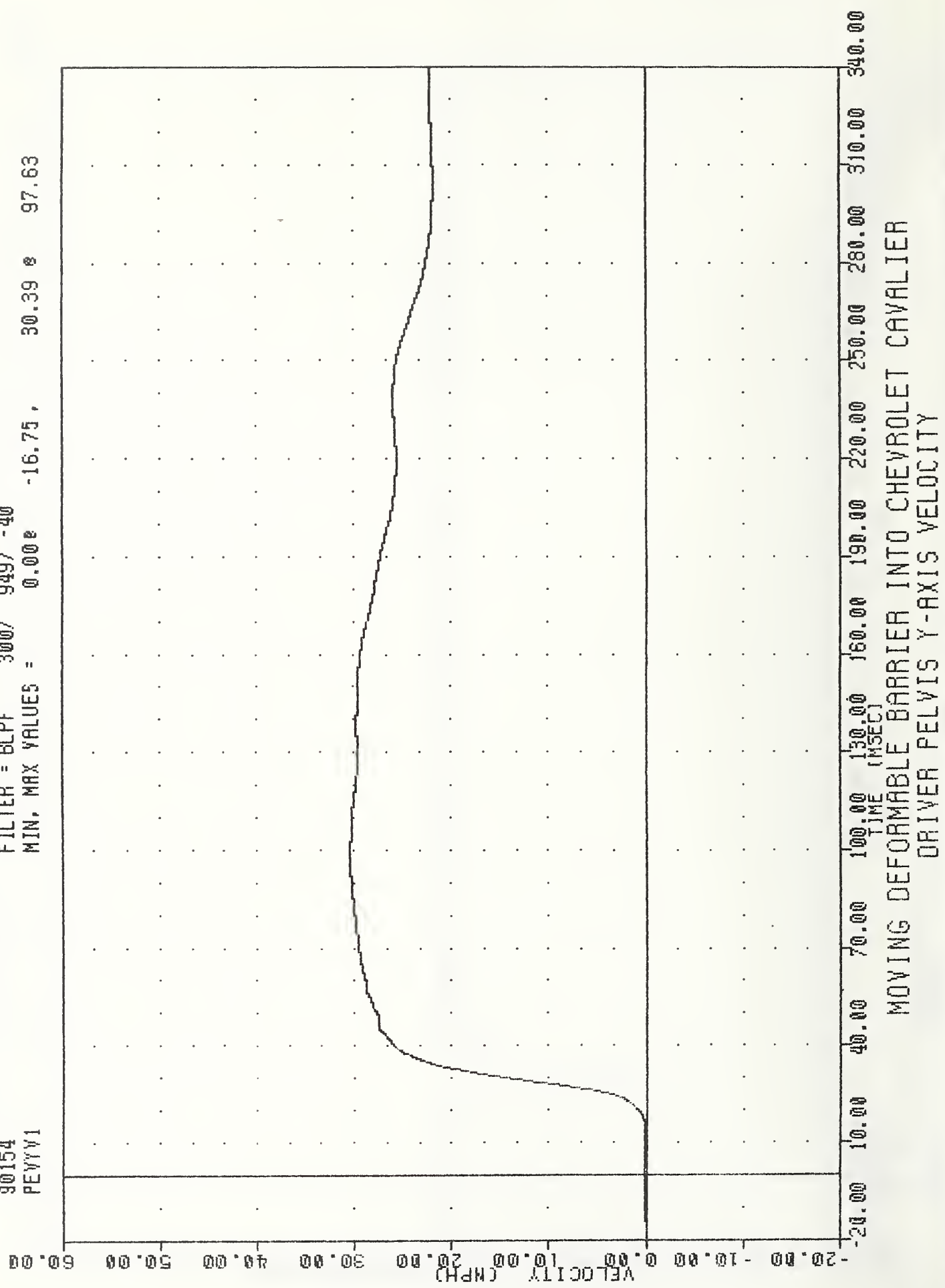
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -5.75e 268.75 , 108.73 e 27.50



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER PELVIS Y-AXIS ACCELERATION

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 PEVYV1

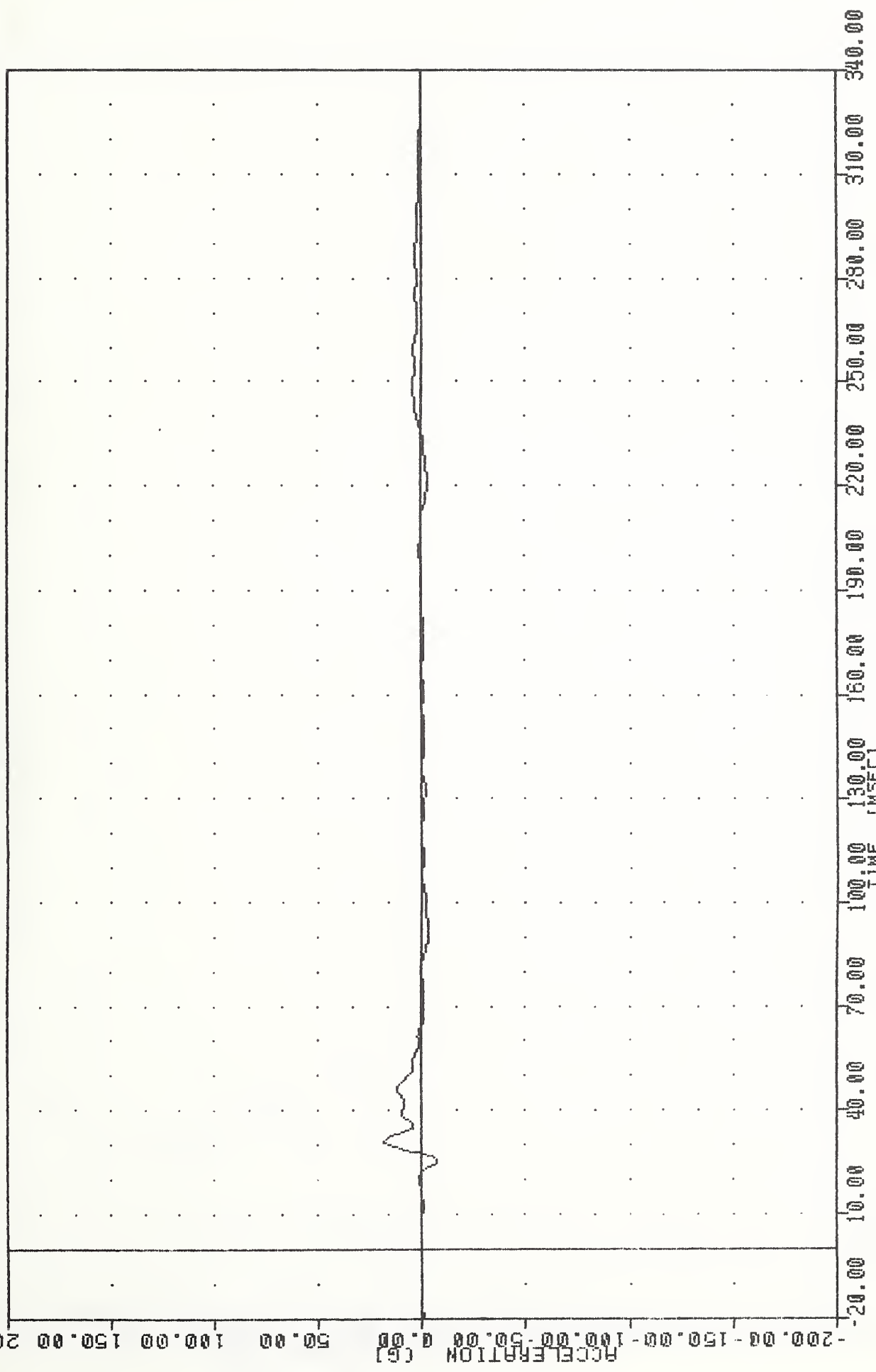
FILTER = 6LPP 300/ 949/ -40
 MIN, MAX VALUES = 0.00e -16.75, 30.39 e 97.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER PELVIS Y-AXIS VELOCITY

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 PEVZG1

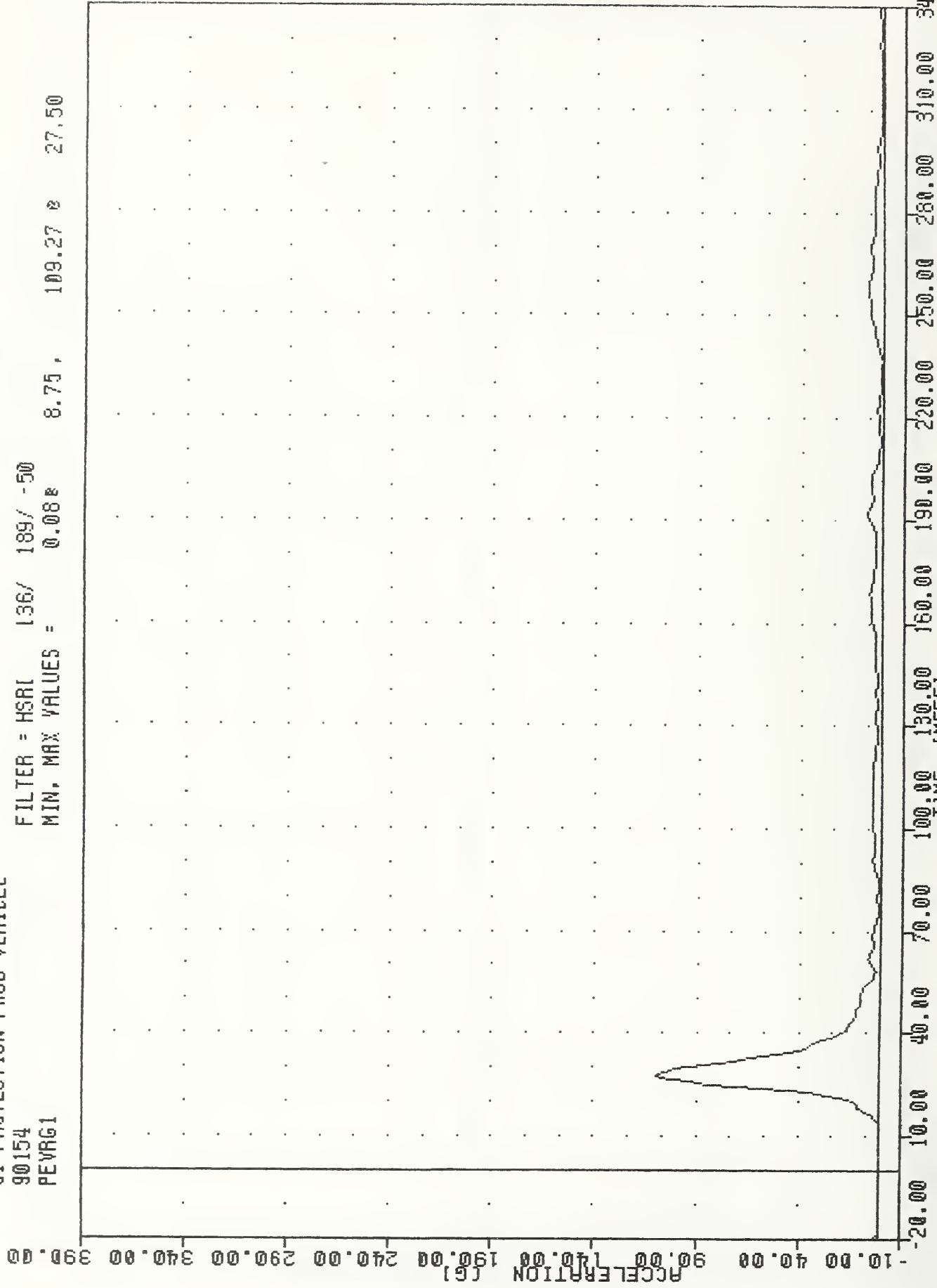
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -7.35e 25.63 , 18.30 e 31.25



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 DRIVER PELVIS Z-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
PEVRG1

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.08 8.75 , 109.27 27.50

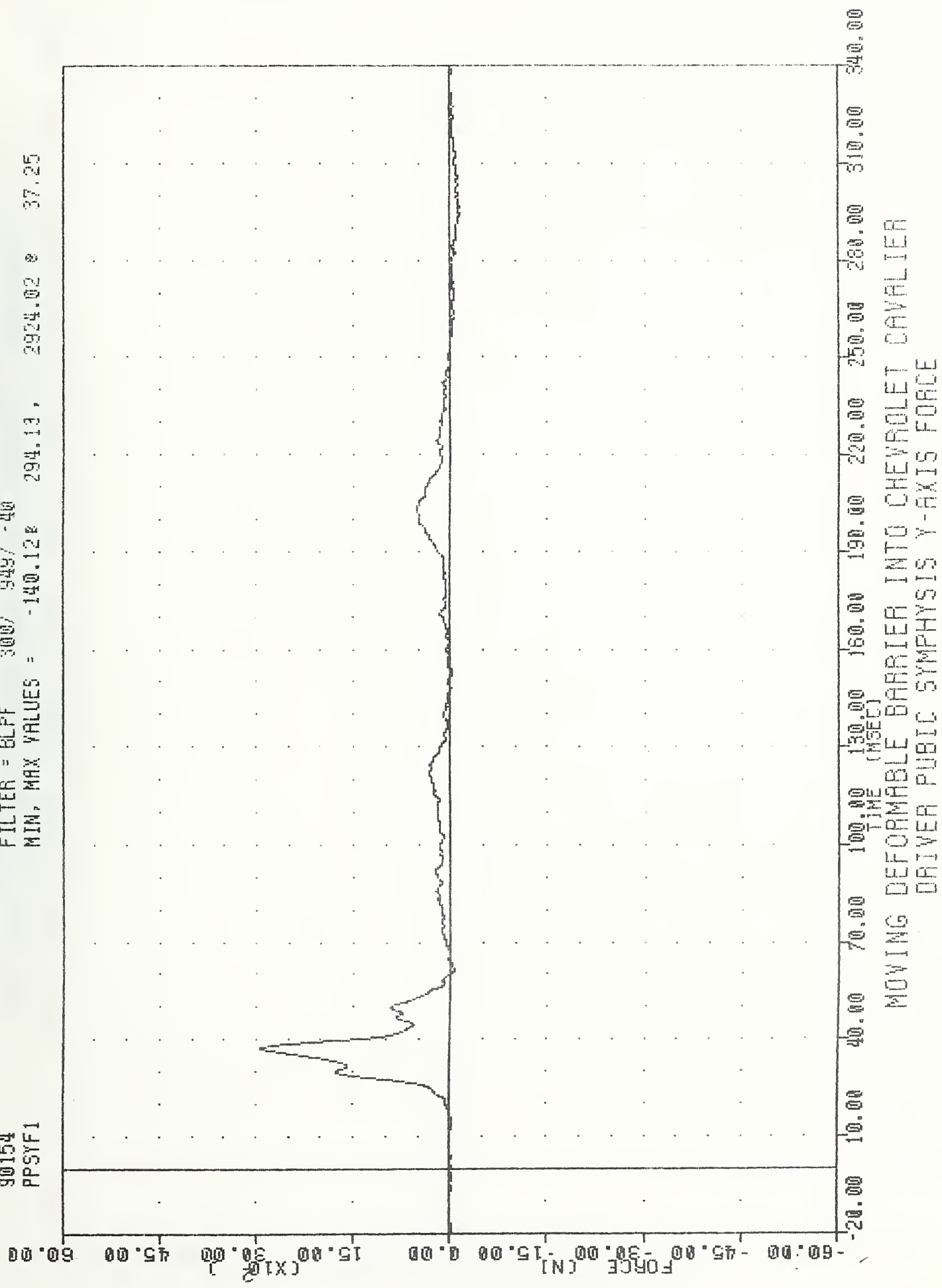


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER PELVIS RESULTANT ACCELERATION

VRTC
SI PROTECTION PROD VEHICLE
90154
PPSYF1

900604

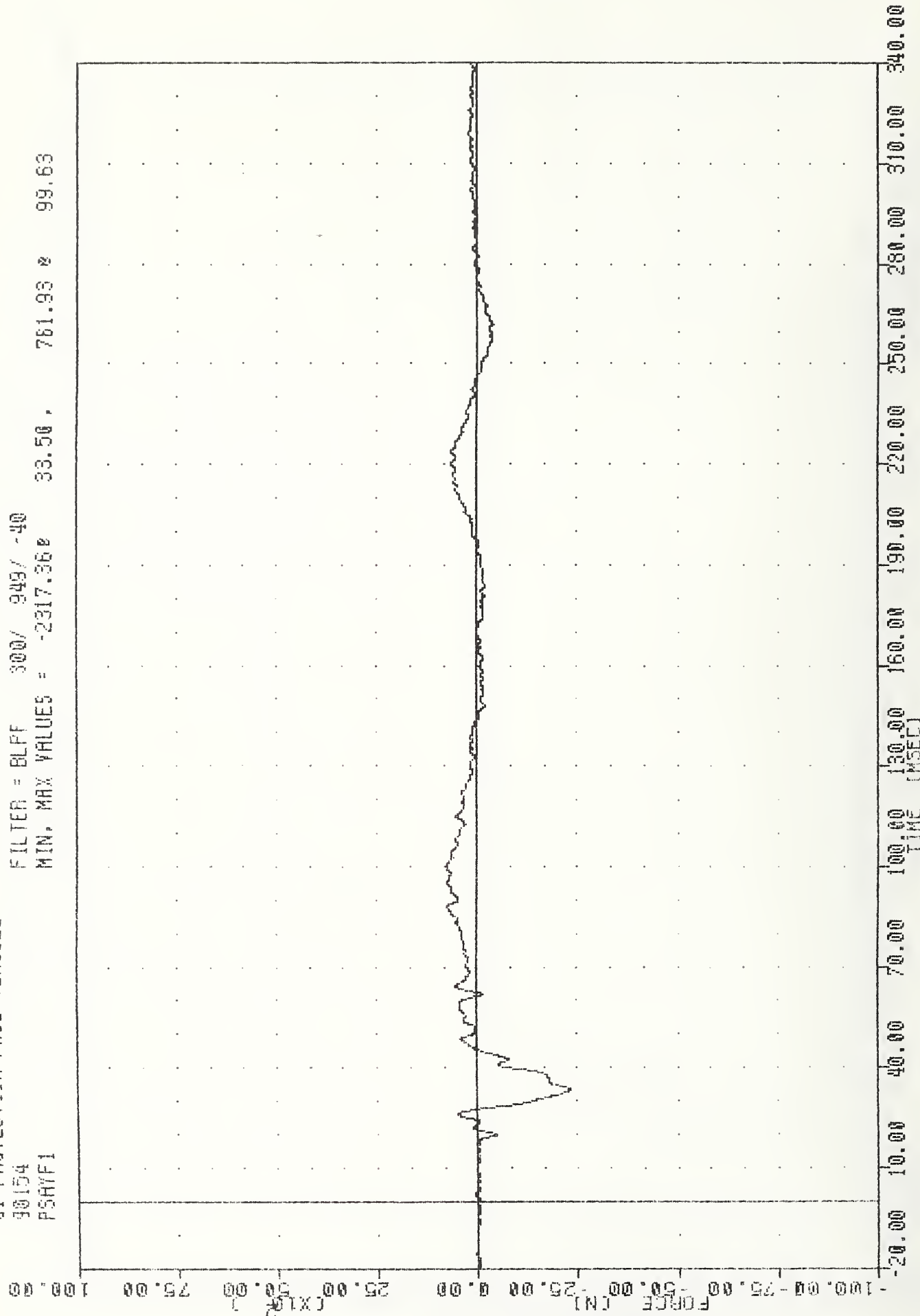
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -140.128 294.13, 2924.02 8 37.25



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER PUBIC SYMPHYSIS Y-AXIS FORCE

VRIC 900604
SI PROTECTION FROM VEHICLE
38154
PSAYF1

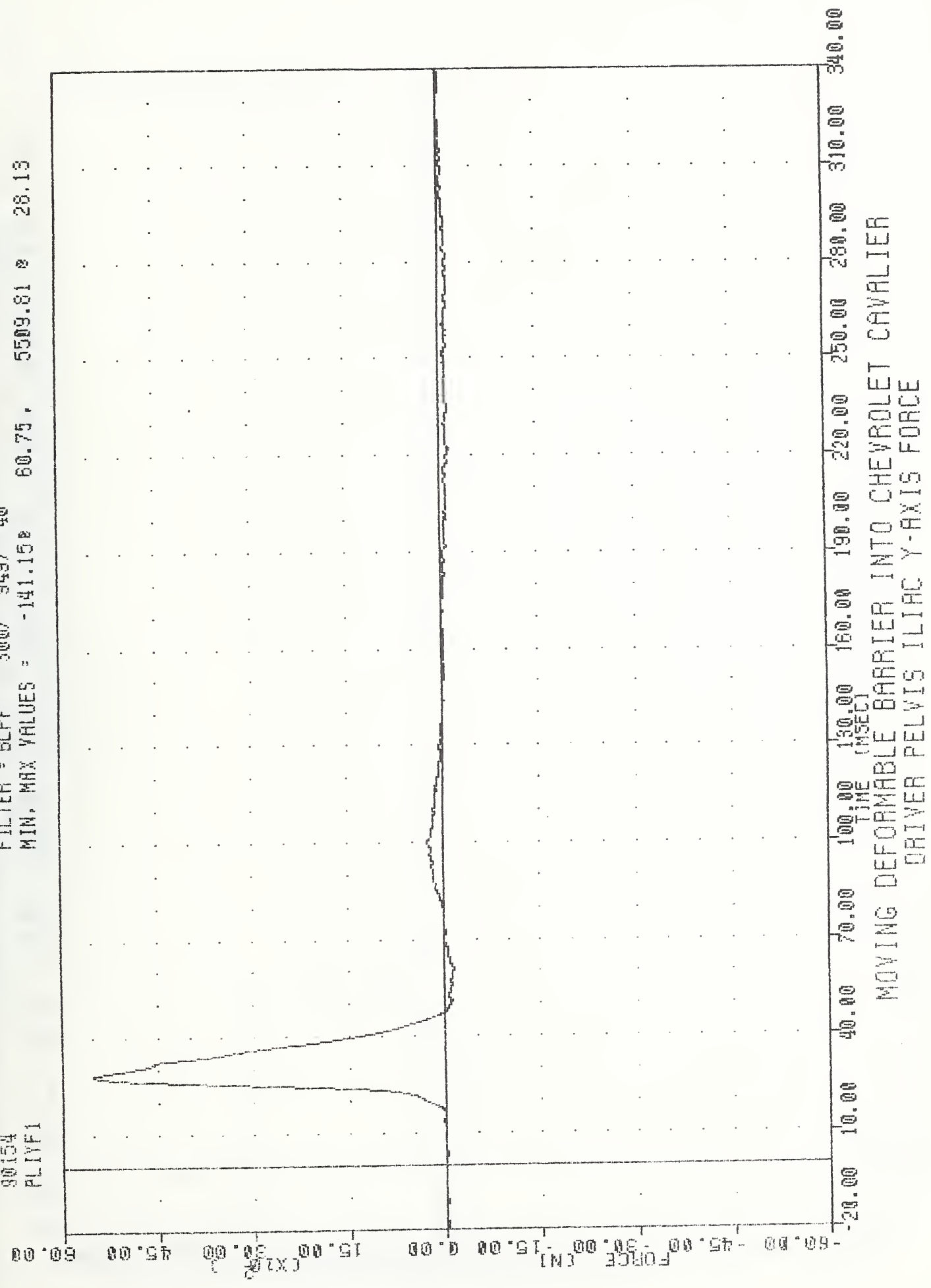
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -2317.360 33.50 761.93 99.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER PELVIS SACRUM Y-AXIS FORCE

VRIC , 900604
SI PROTECTION PROD VEHICLE
90154
PLIYF1

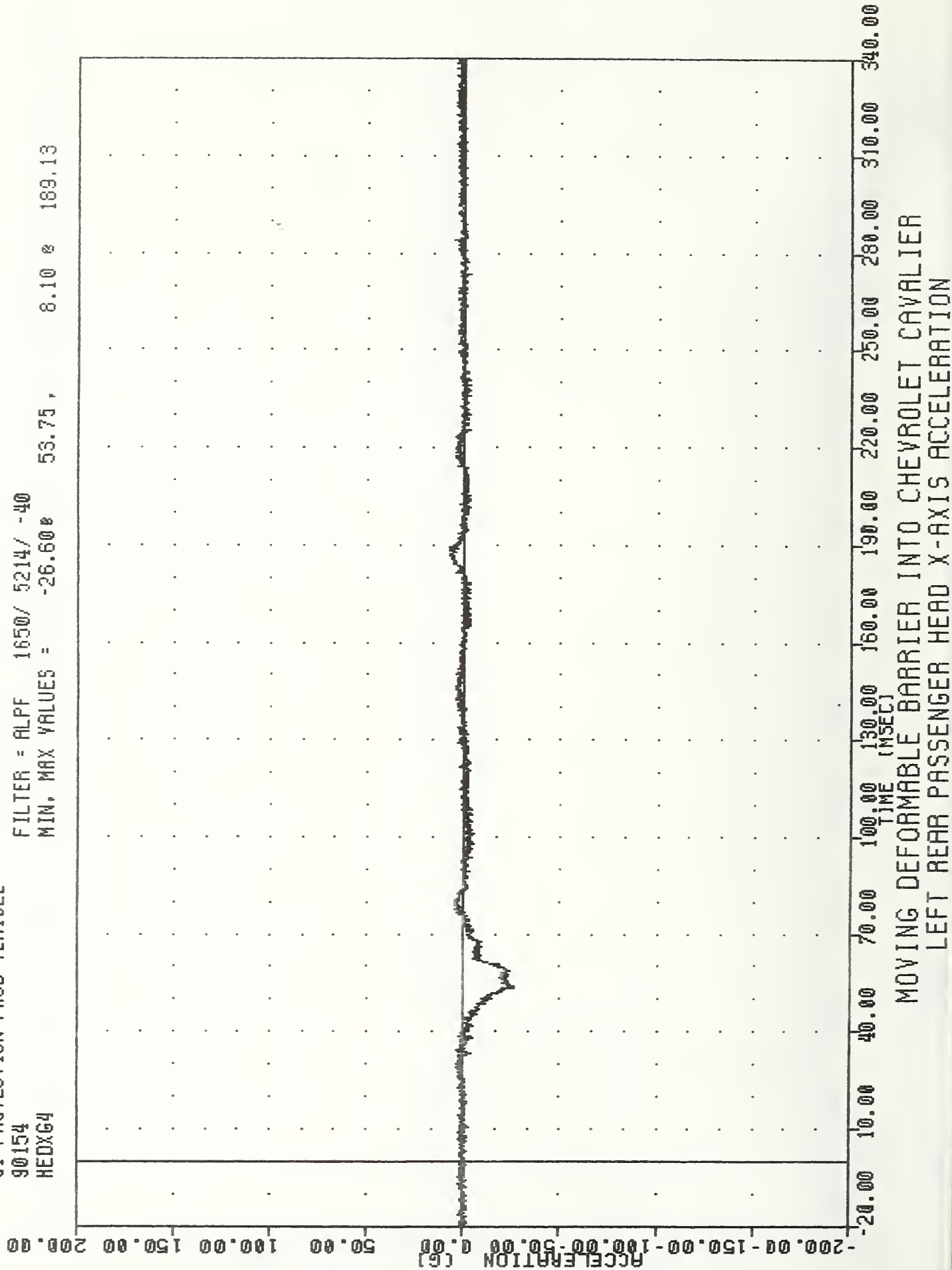
FILTER = 6LFF 300/ 949/ -40
MIN. MAX VALUES = -141.15 60.75, 5509.81 28.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
DRIVER PELVIS ILIAC Y-AXIS FORCE

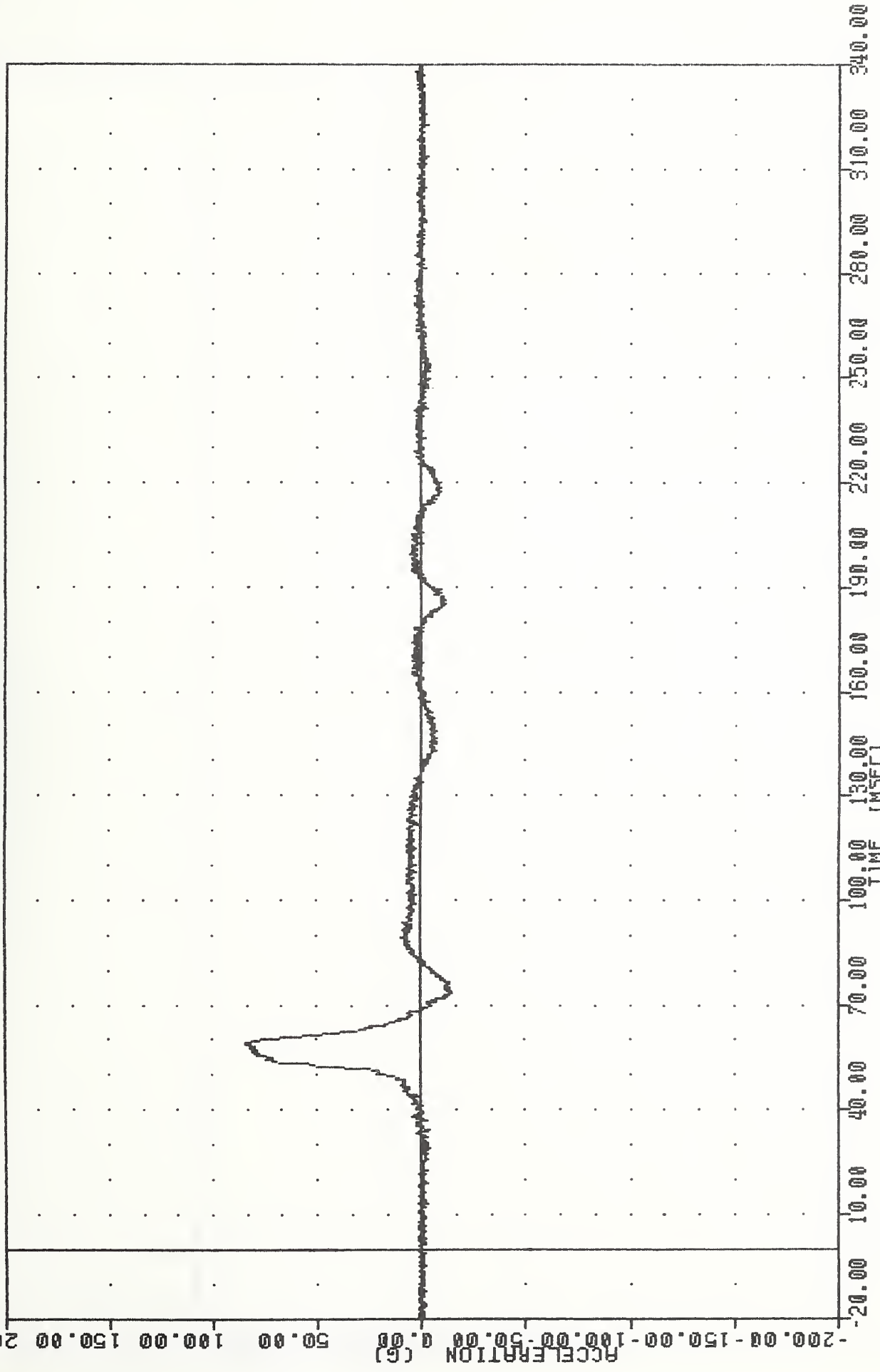
VRTC
SI PROTECTION PROD VEHICLE
90154
HEDXG4

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -26.60 53.75, 8.10 189.13



VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
HEDYG4

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -14.80e 73.63, 84.16 e 58.75

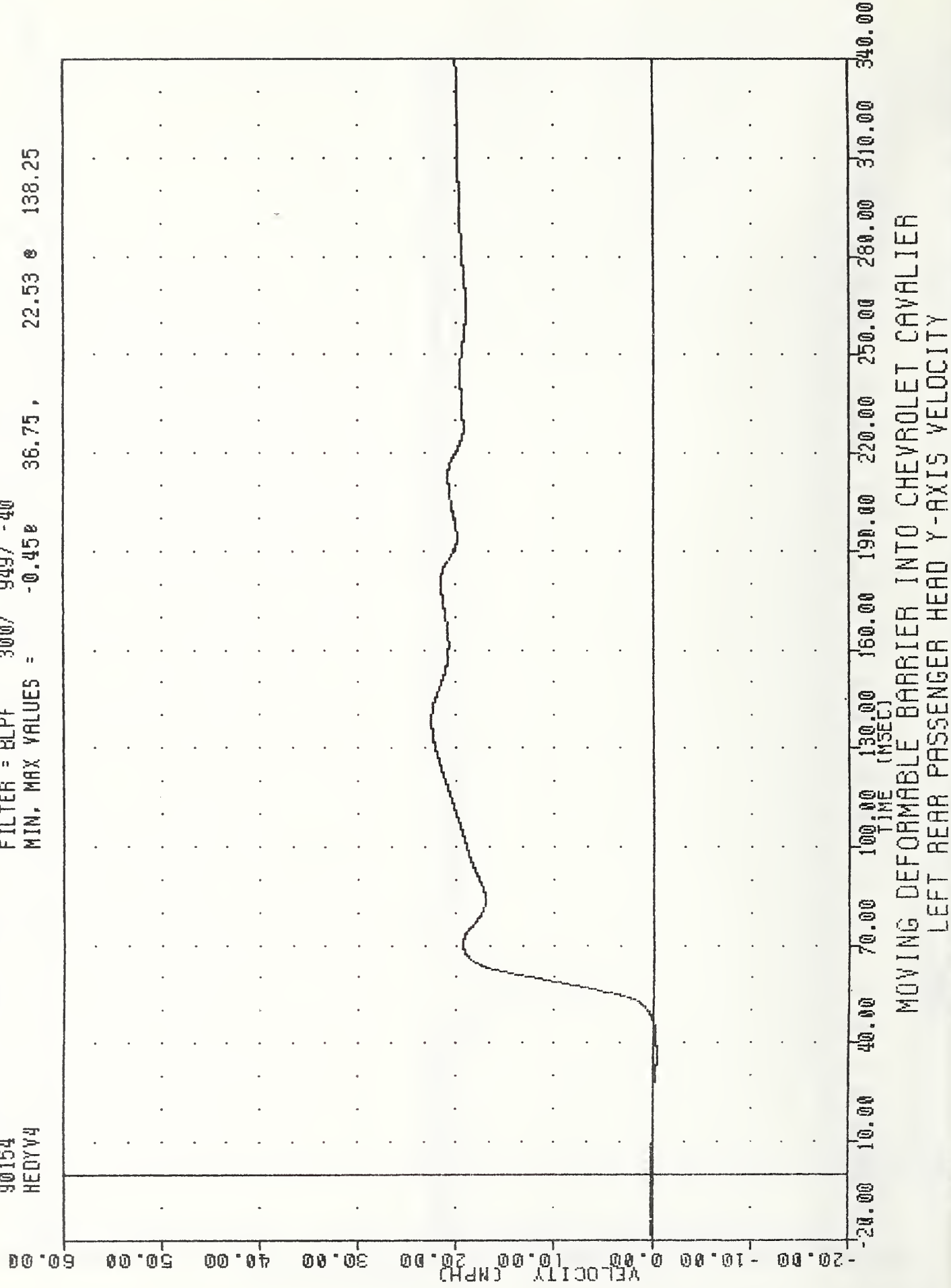


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER HEAD Y-AXIS ACCELERATION

VRTC
SI PROTECTION PROD VEHICLE
90154
HEDYV4

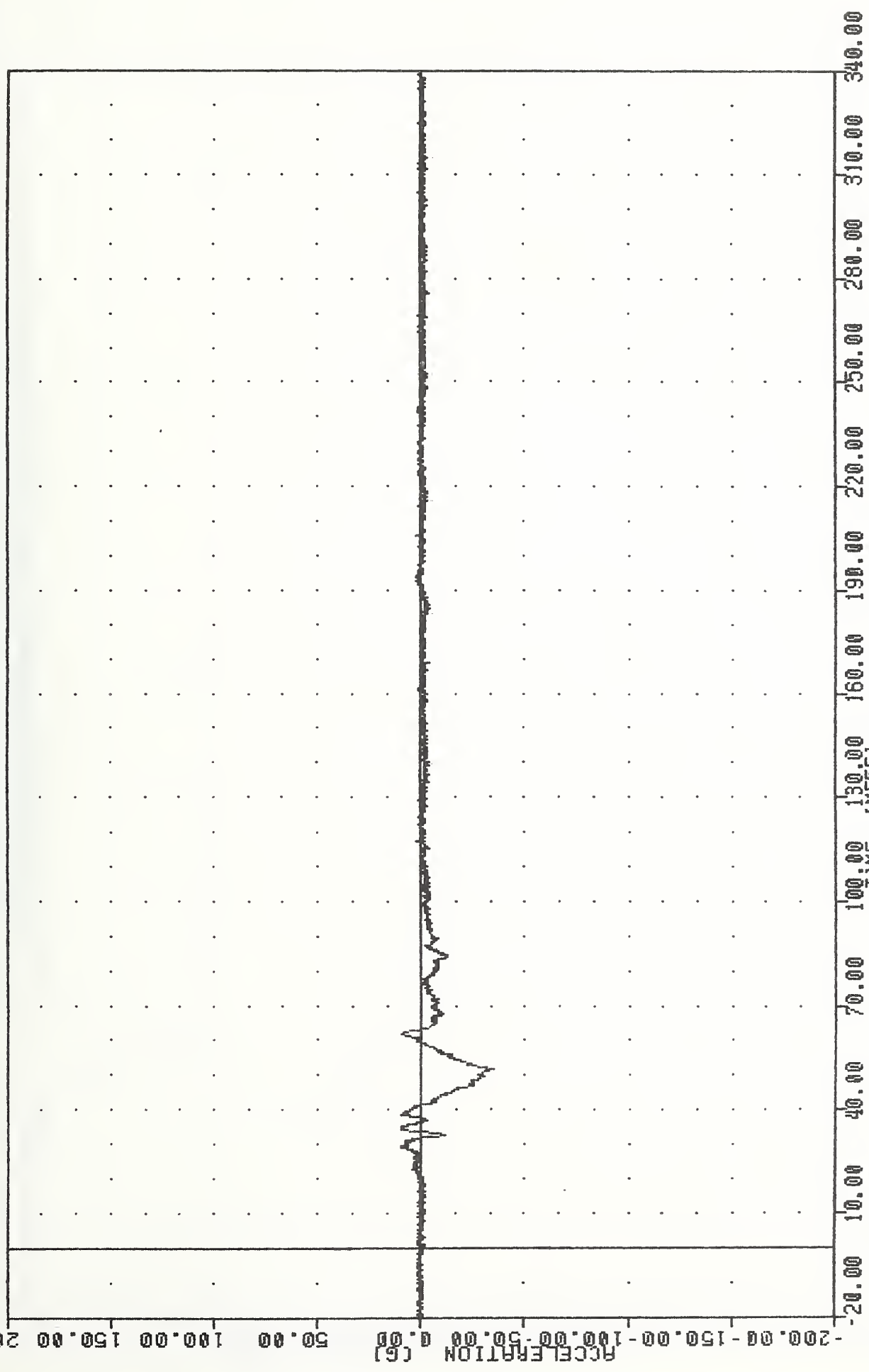
, 900604

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.450 36.75, 22.53 0 138.25



YRTC , 9006004
SI PROTECTION PROD VEHICLE
90154
HEDZG4

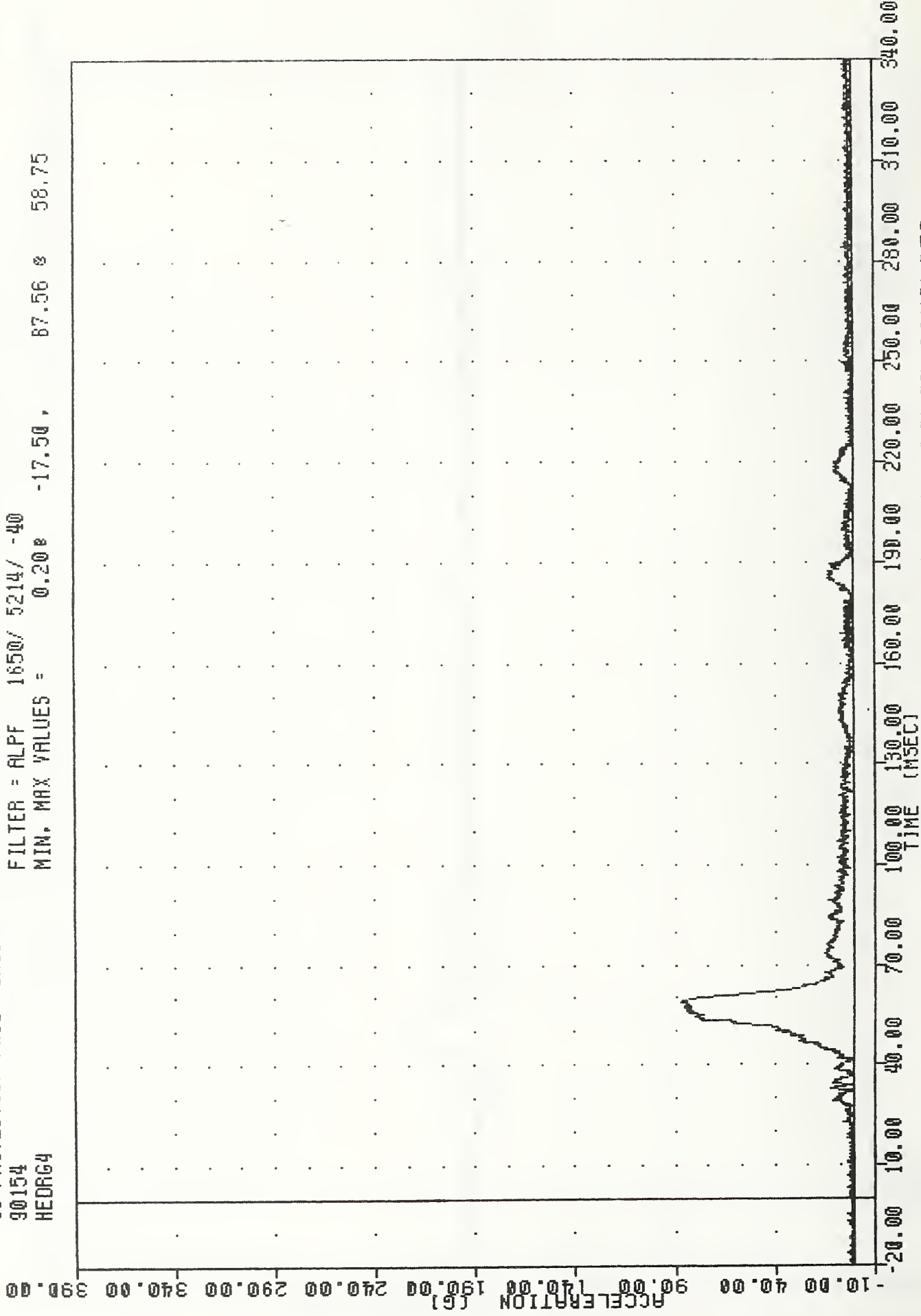
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -34.430 51.75 , 10.23 0 34.50



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER HEAD Z-AXIS ACCELERATION

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 HEDRG4

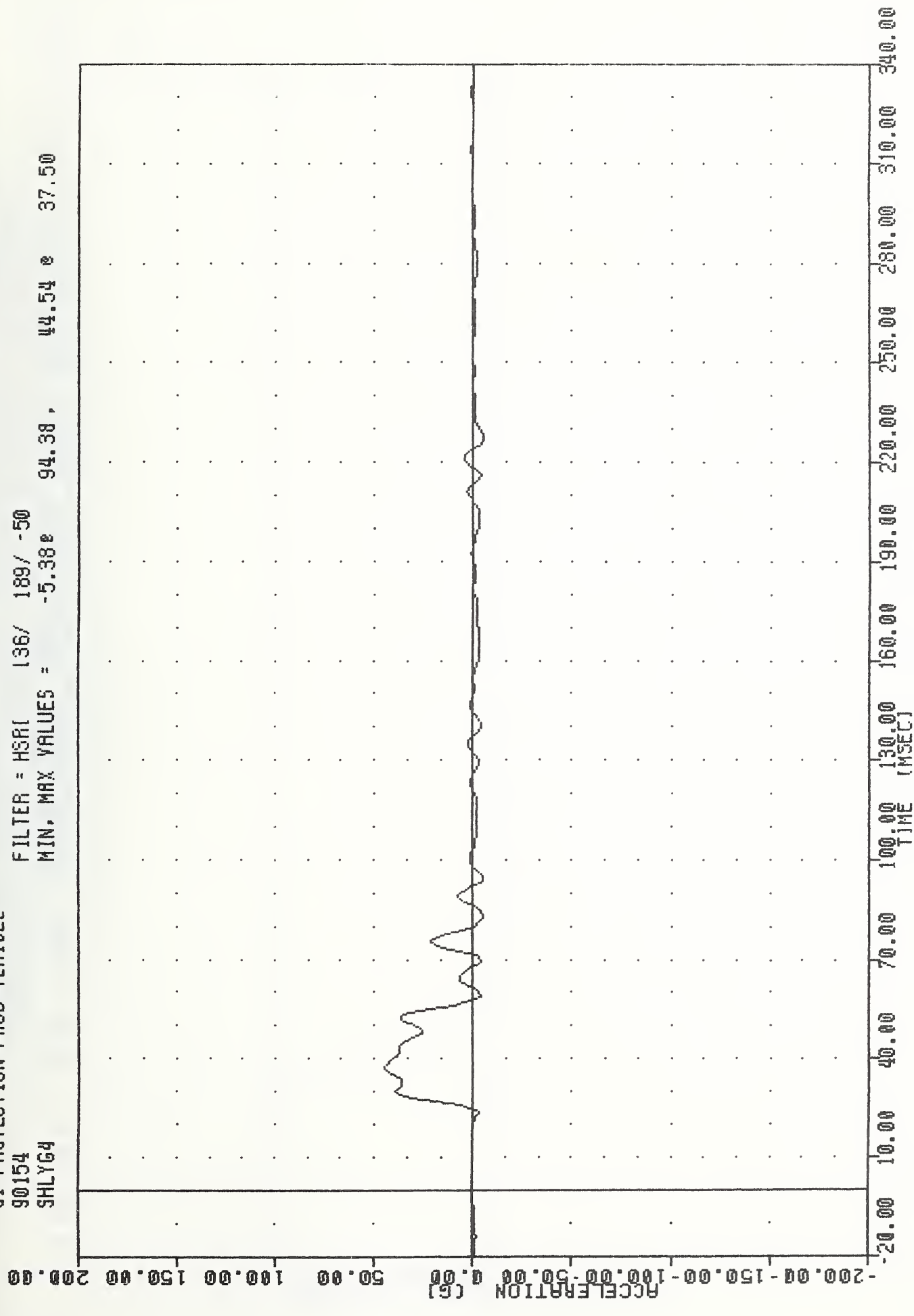
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 0.20e -17.50 , 87.56 e 58.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER HEAD RESULTANT ACCELERATION

VRIC , 900604
SI PROTECTION PROD VEHICLE
90154
SHLYG4

FILTER = HSR1 136/ 189/ -50
MIN. MAX VALUES = -5.38e 94.38 , 44.54 e 37.50

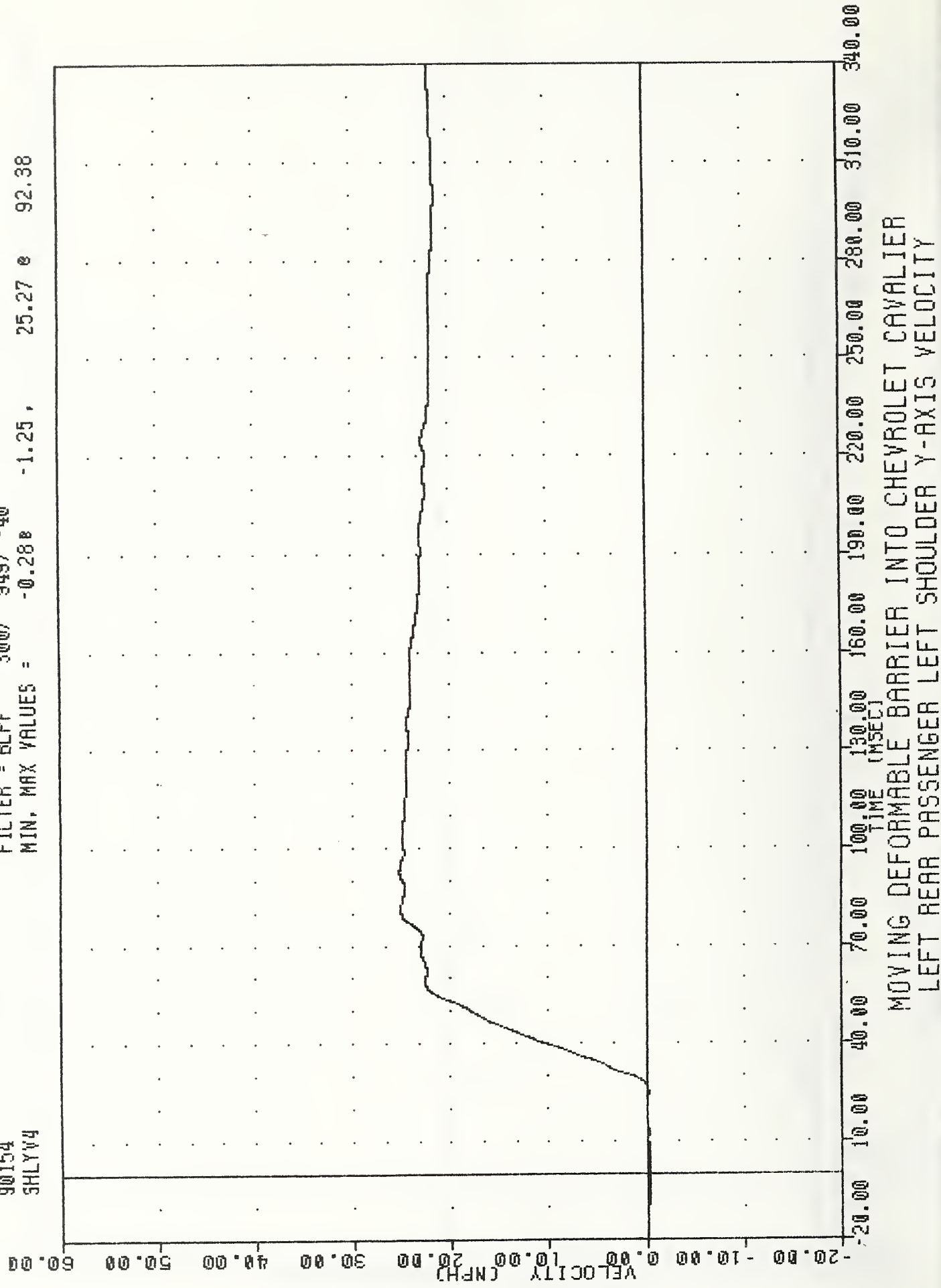


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT SHOULDER Y AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
SHLYV4

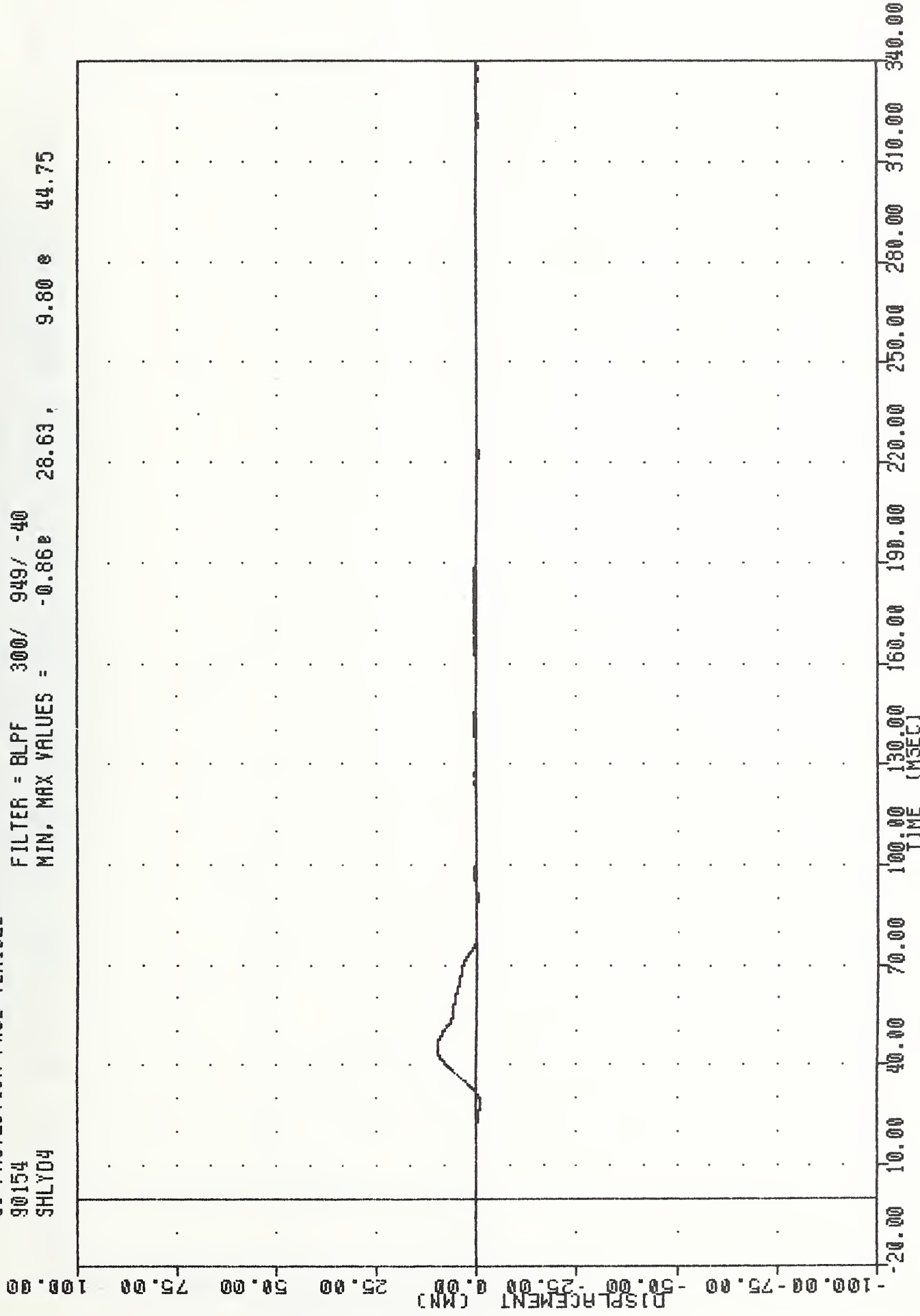
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.288

-1.25 , 25.27 8 92.38



VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
SHLYD4

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.86e 28.63, 9.80 e 44.75

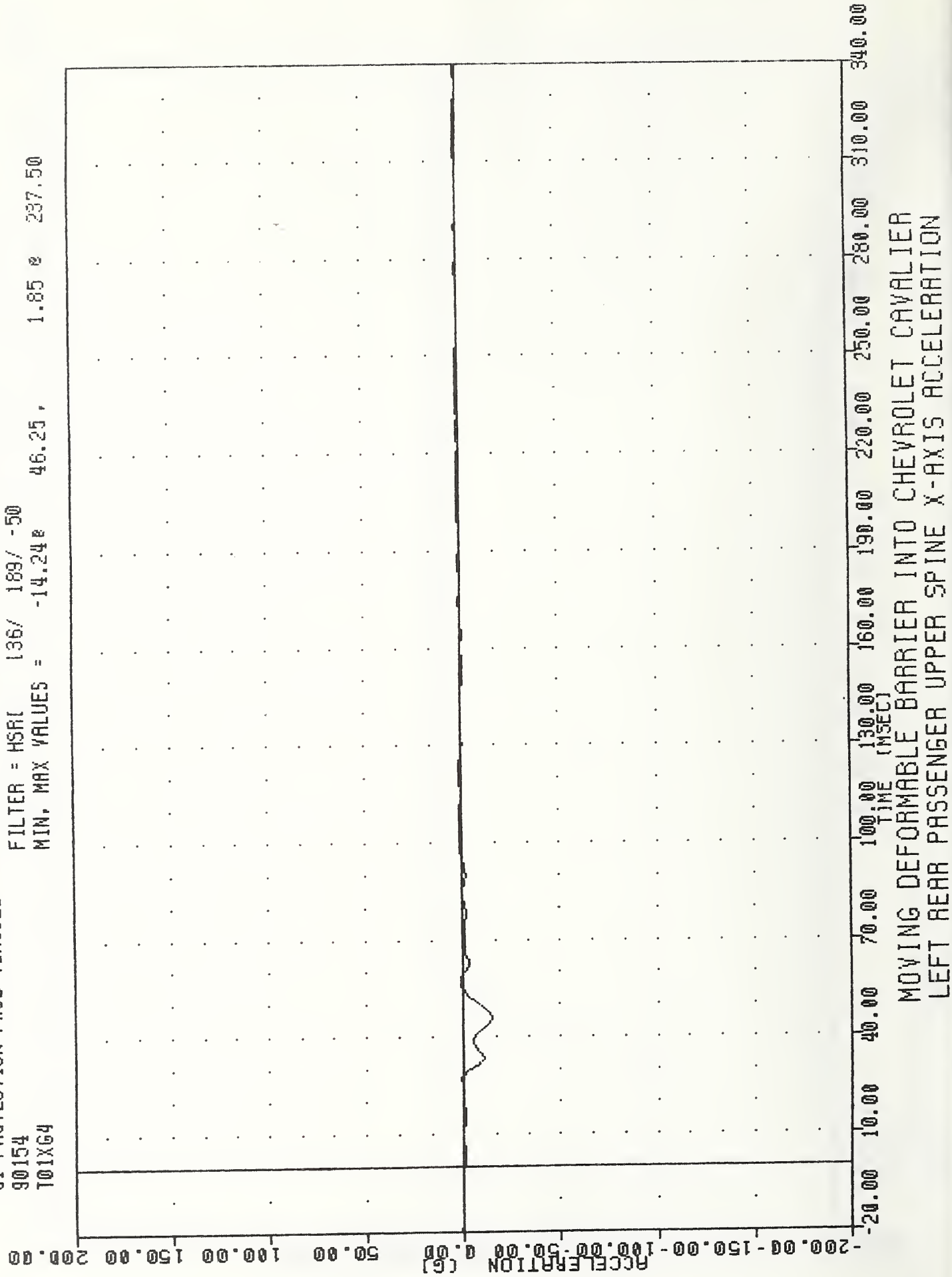


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT SHOULDER TO SPINE DISPLACEMENT

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
T01XG4

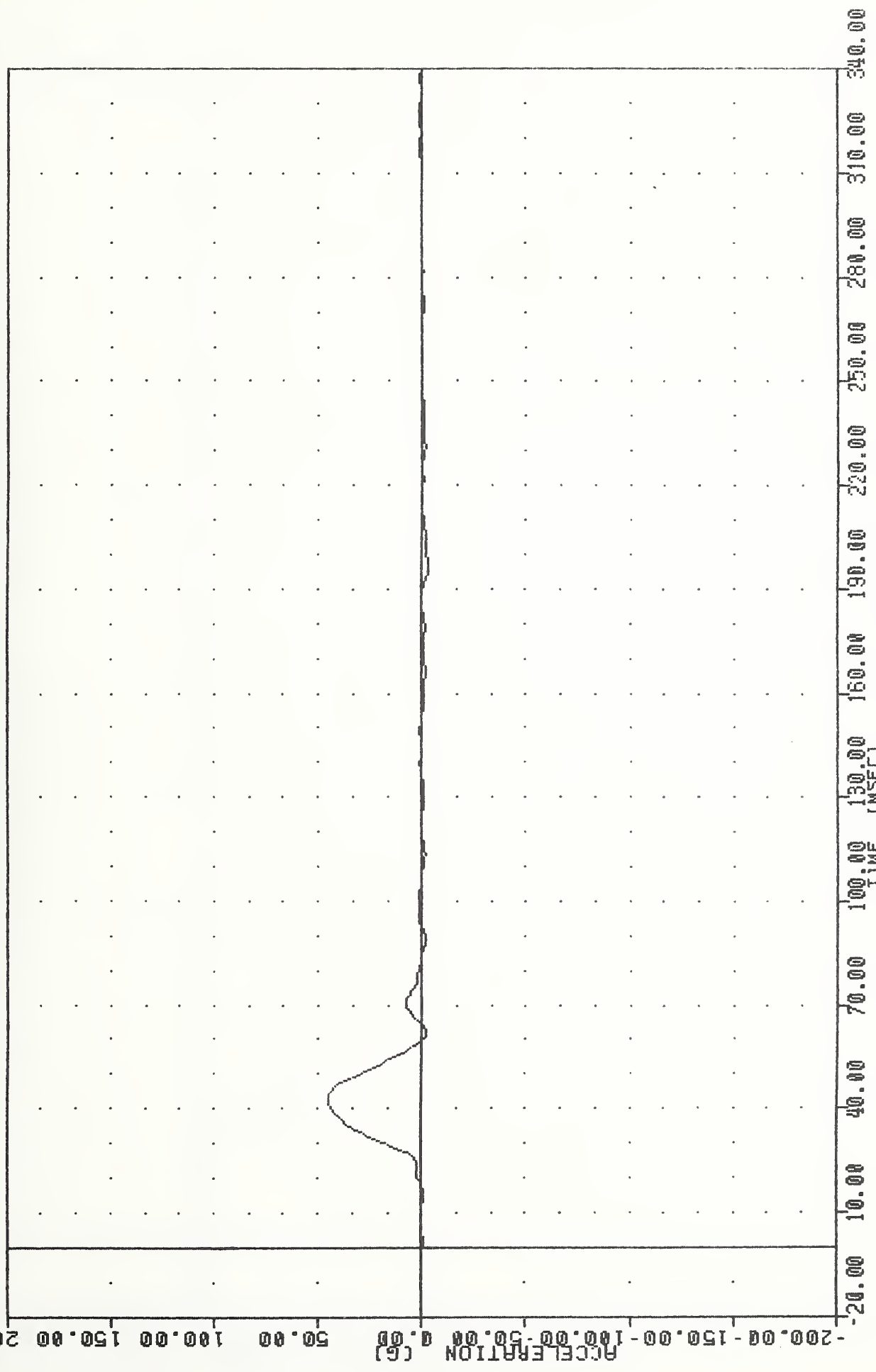
FILTER = HSR1 136/ 189/ -50
MIN. MAX VALUES = -14.24e

46.25 , 1.85 e 237.50



VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 701Y64

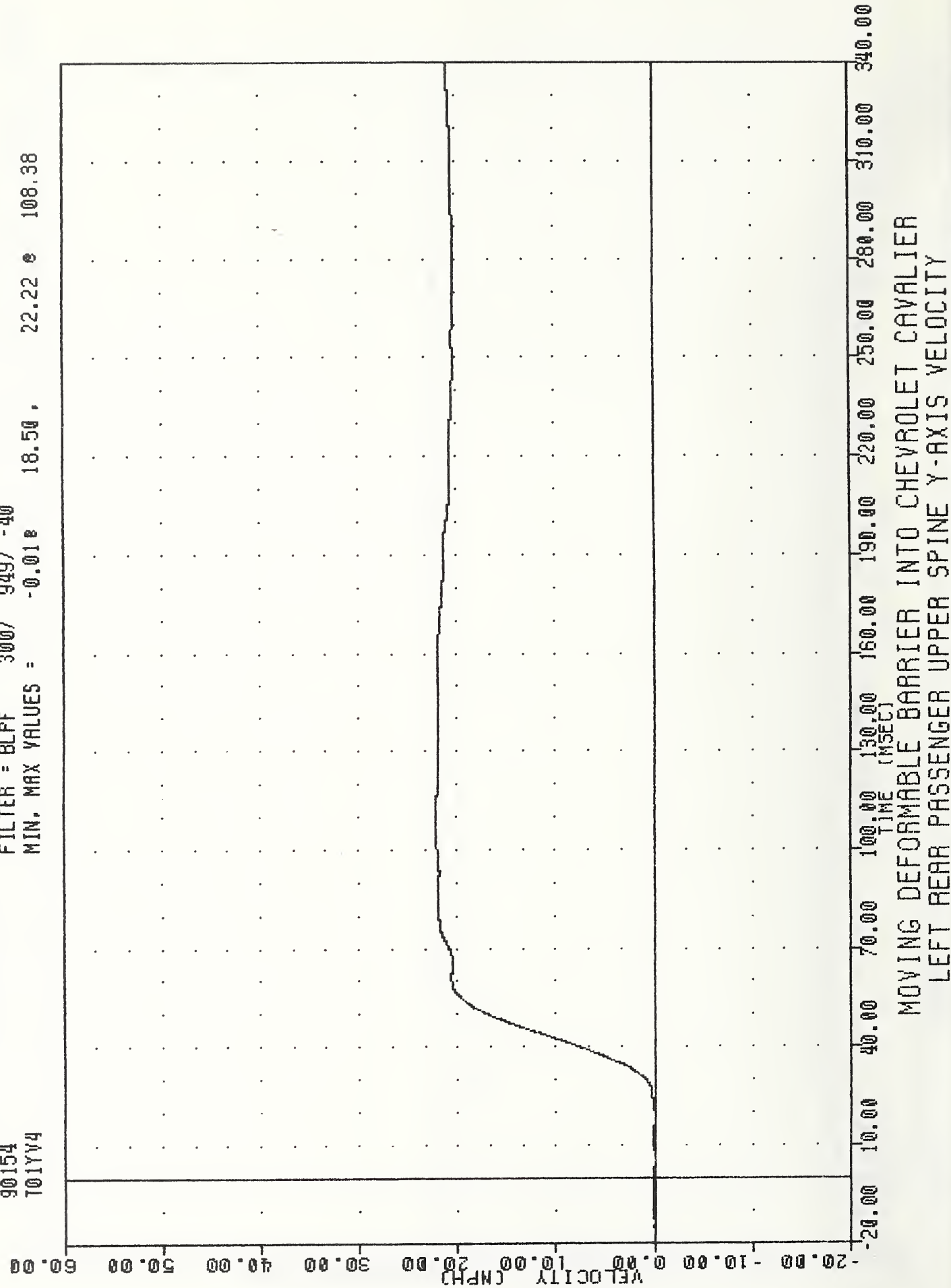
FILTER = HSR1 136/ 189/ -50
 MIN, MAX VALUES = -2.87e 196.25, 45.32 e 42.50



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER UPPER SPINE Y-AXIS ACCELERATION

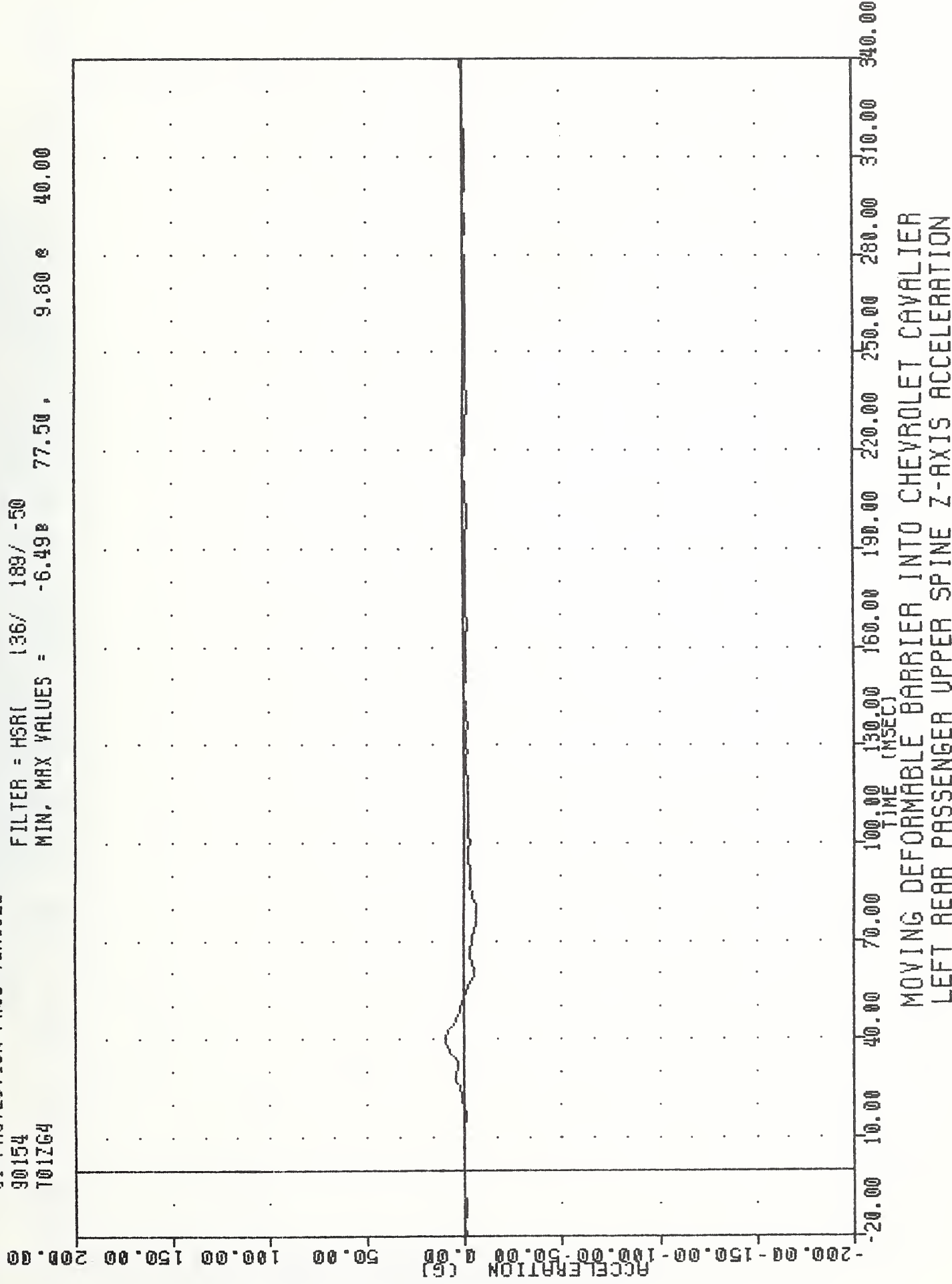
VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
T01YV4

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.018 18.50 , 22.22 e 108.38



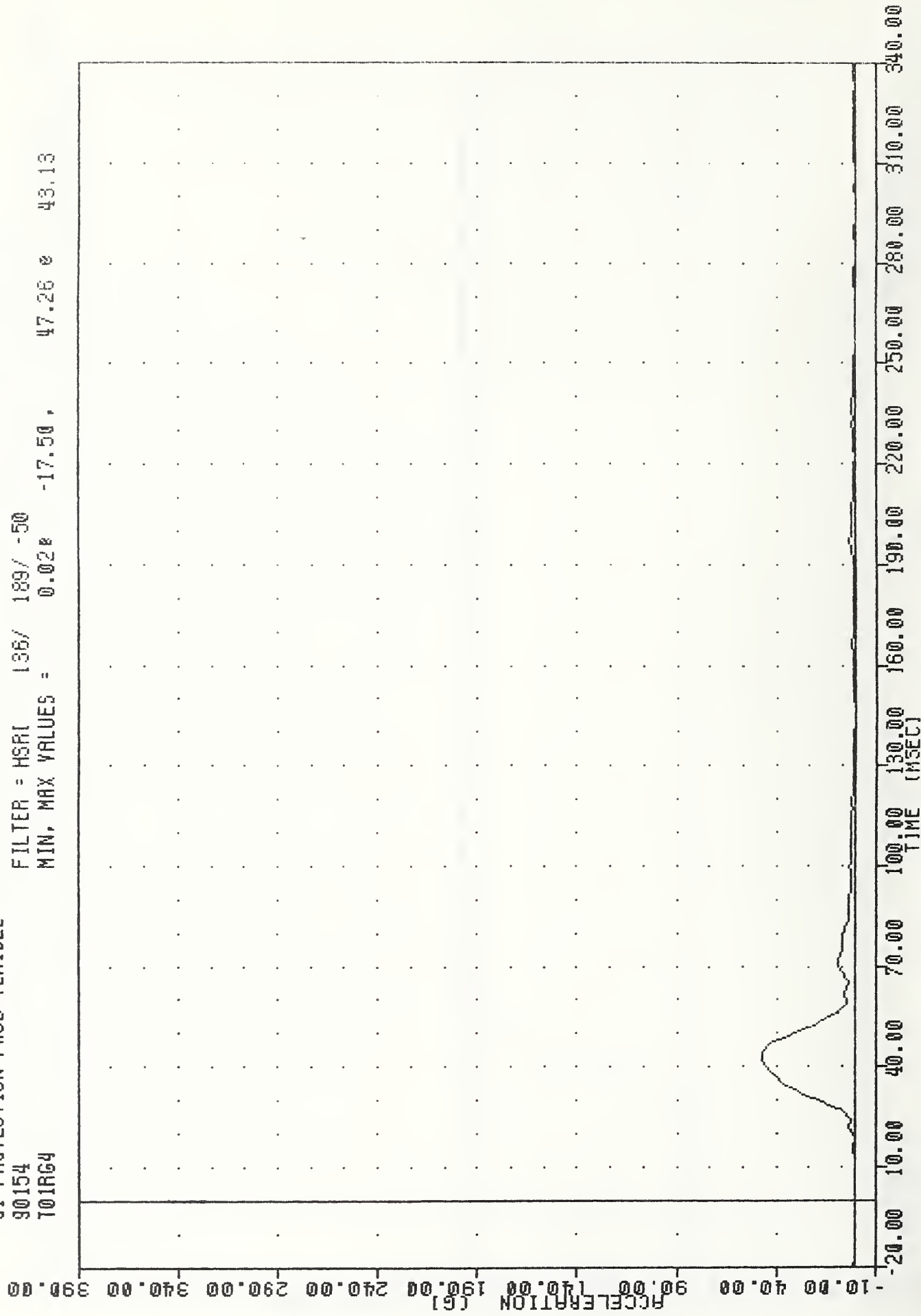
VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 T01ZG4

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -6.49e 77.50 , 9.80 e 40.00



VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 T01RG4

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.02e -17.50 , 47.26 e 43.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER UPPER SPINE RESULTANT ACCELERATION

VRTC , 900604

SI PROTECTION PROO VEHICLE

90154

LURY64

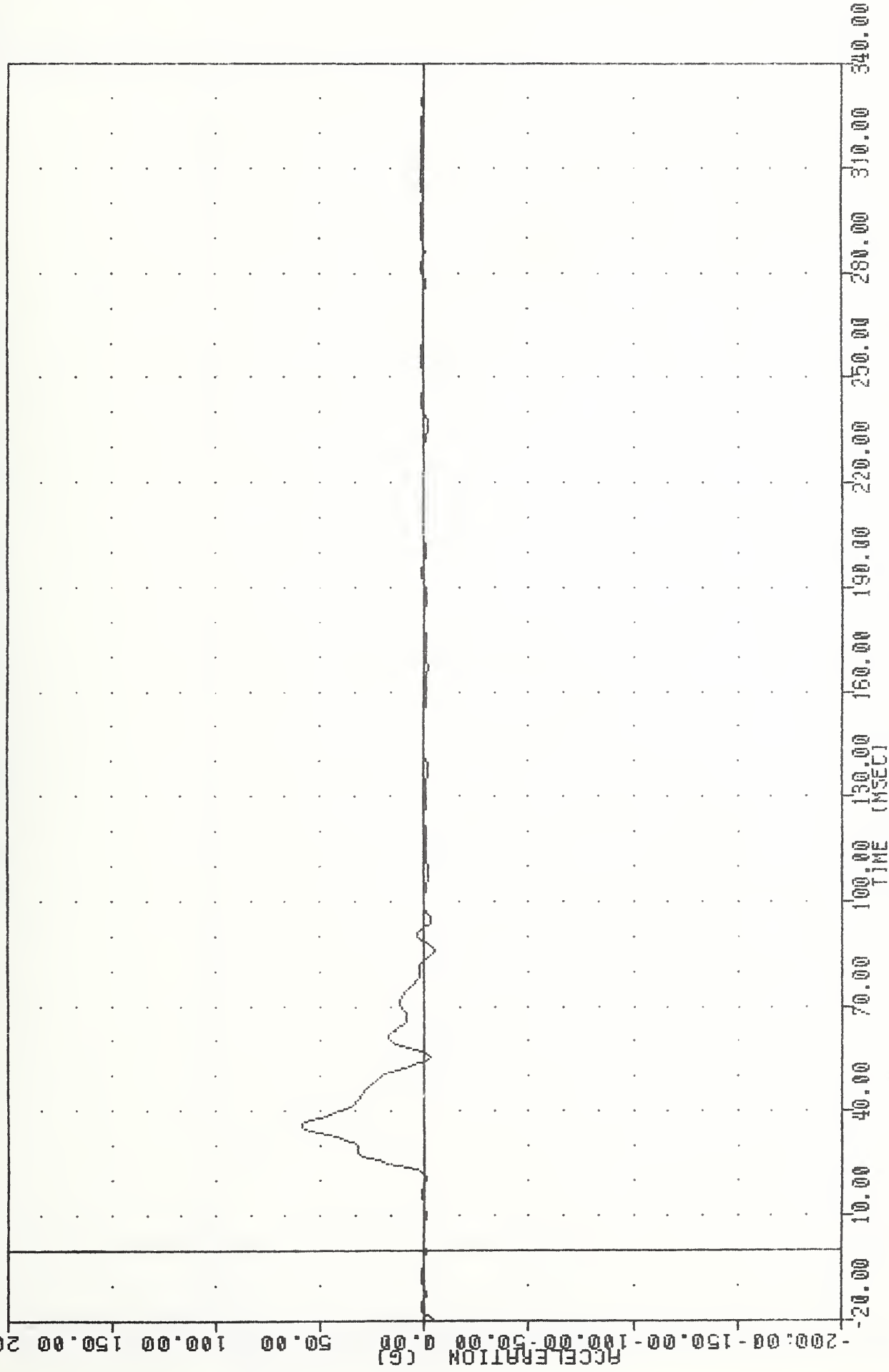
FILTER = HSRI 136/ 129/ -50

MIN. MAX VALUES =

-20.00 ,

58.88 %

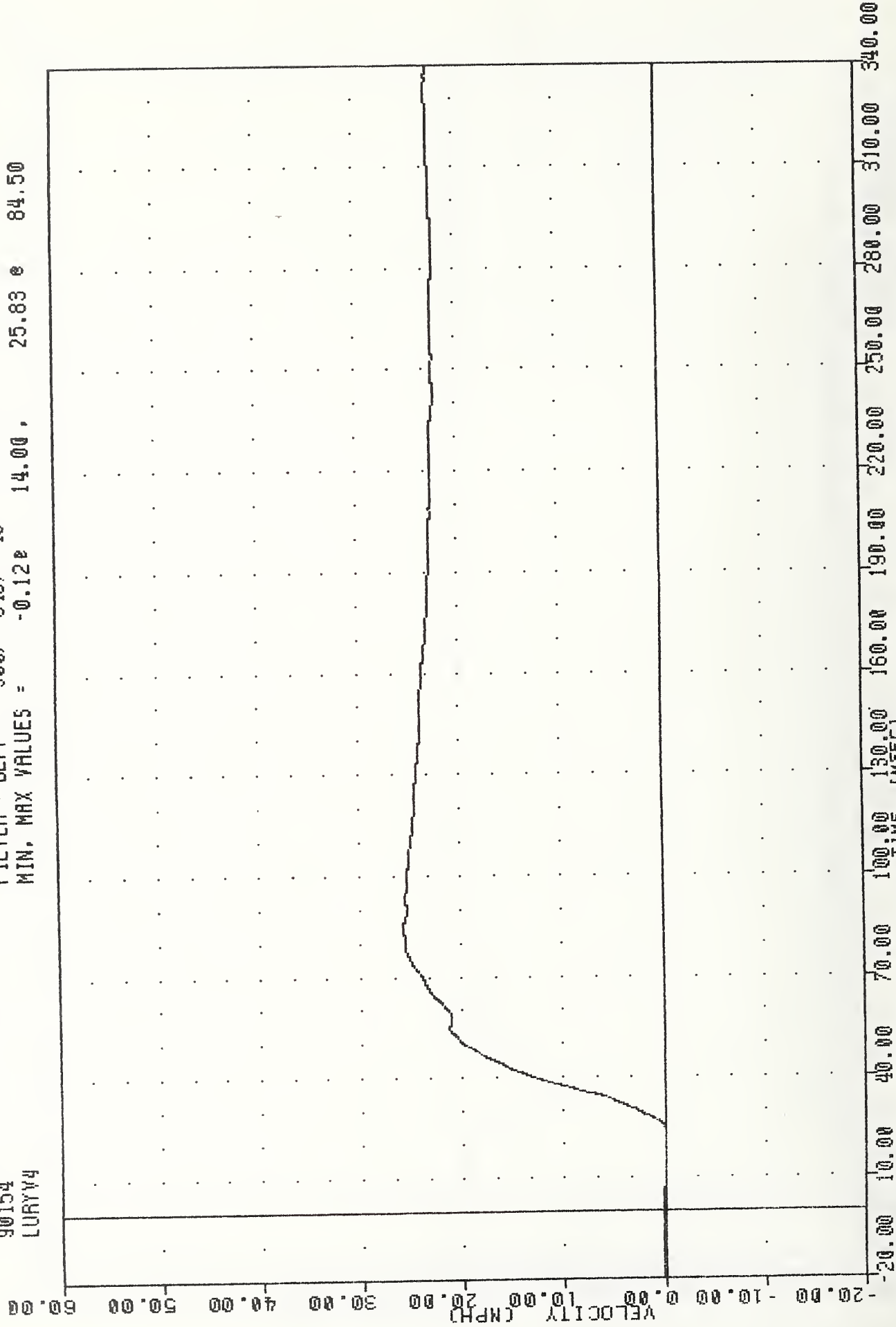
35.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT UPPER THORAX RIB Y-AXIS ACCELERATION

YRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 LURYV4

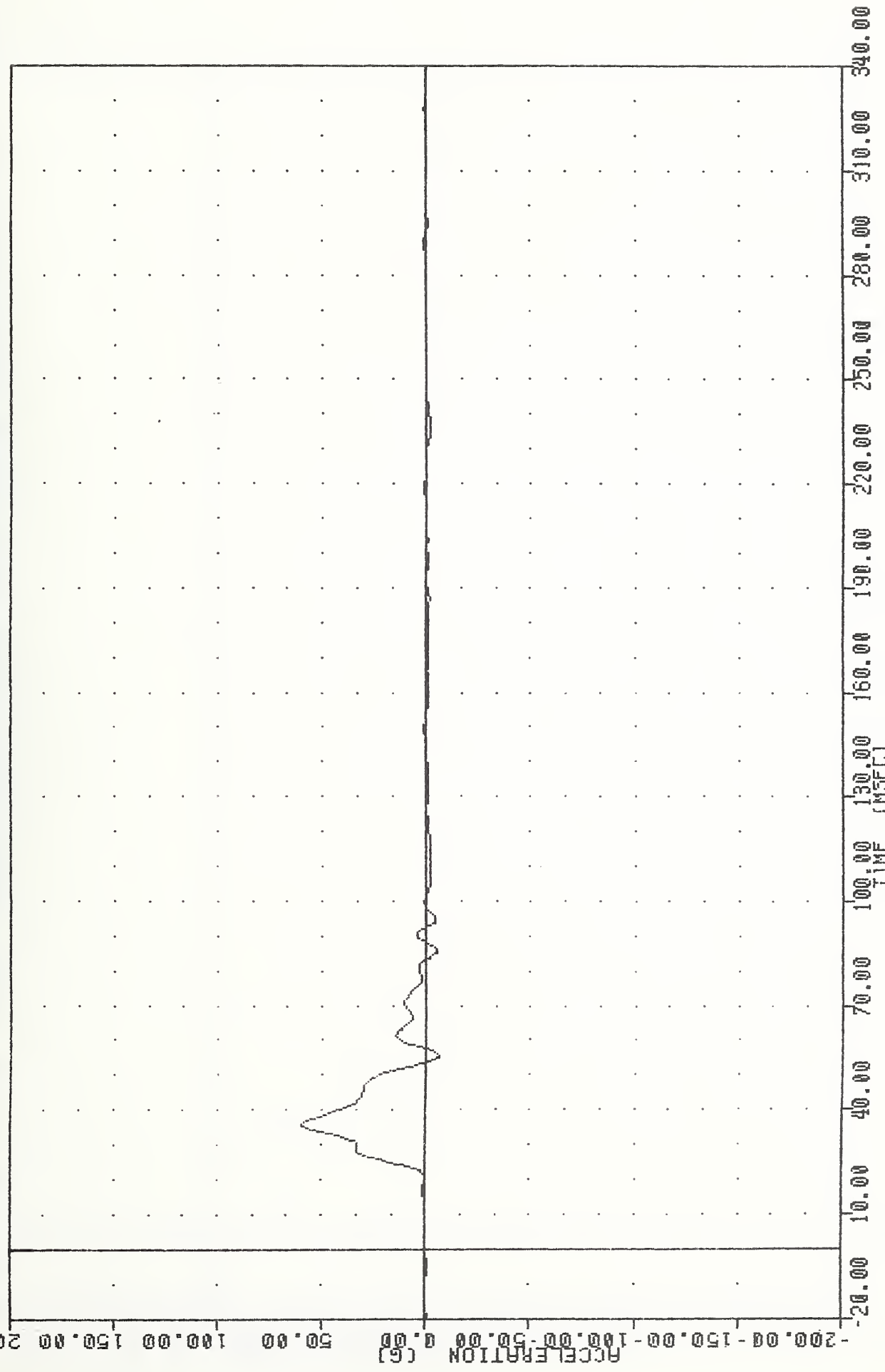
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.120 14.00 , 25.83 0 84.50



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER LEFT UPPER THORAX RIB Y-AXIS VELOCITY

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 LURY60

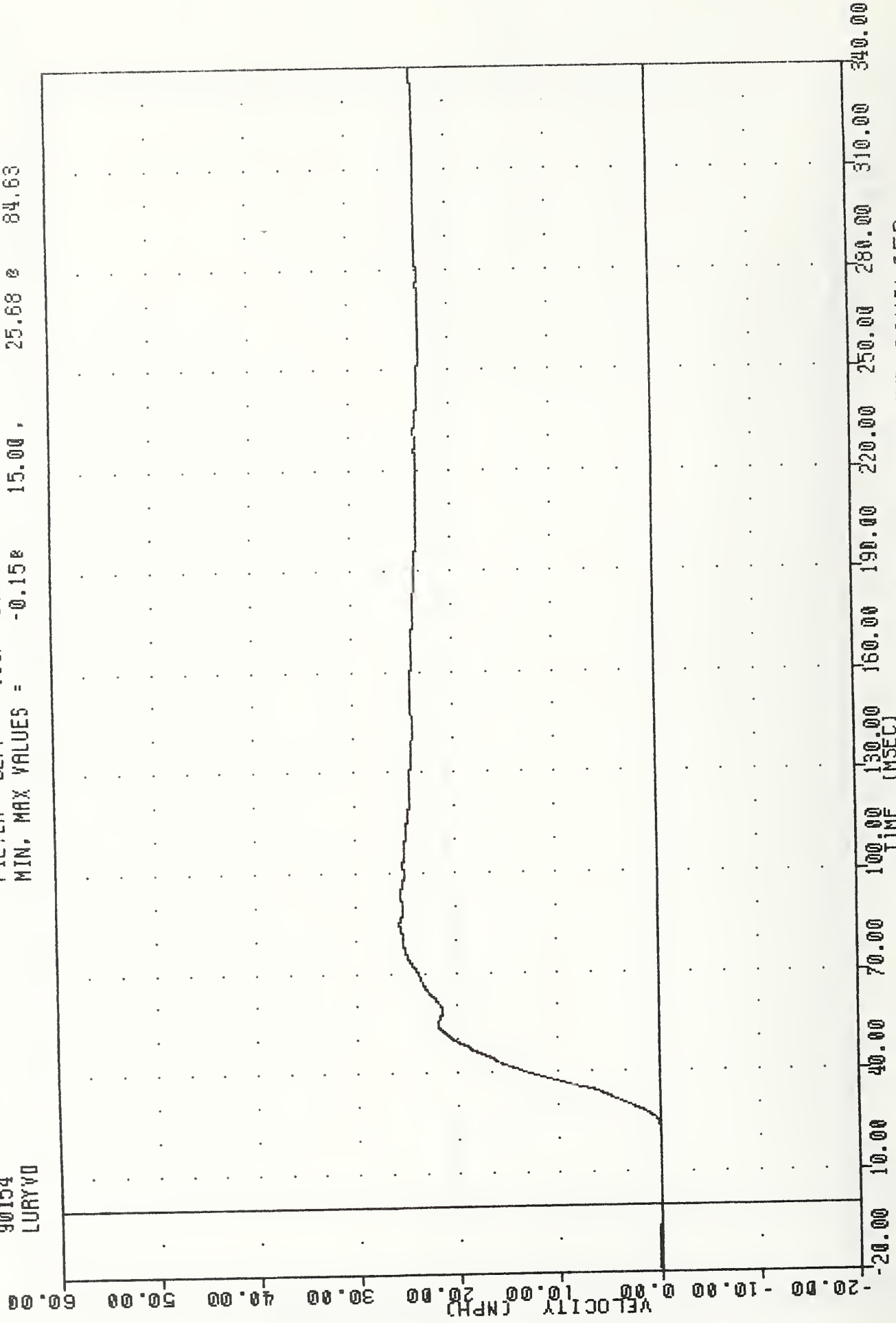
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -6.54 55.63, 59.12 35.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER LEFT UPPER THORAX RIB Y-AXIS REDUNDANT ACCELERATION

VRTC , 900604
SI PROTECTION PRAD VEHICLE
90154
LURYVO

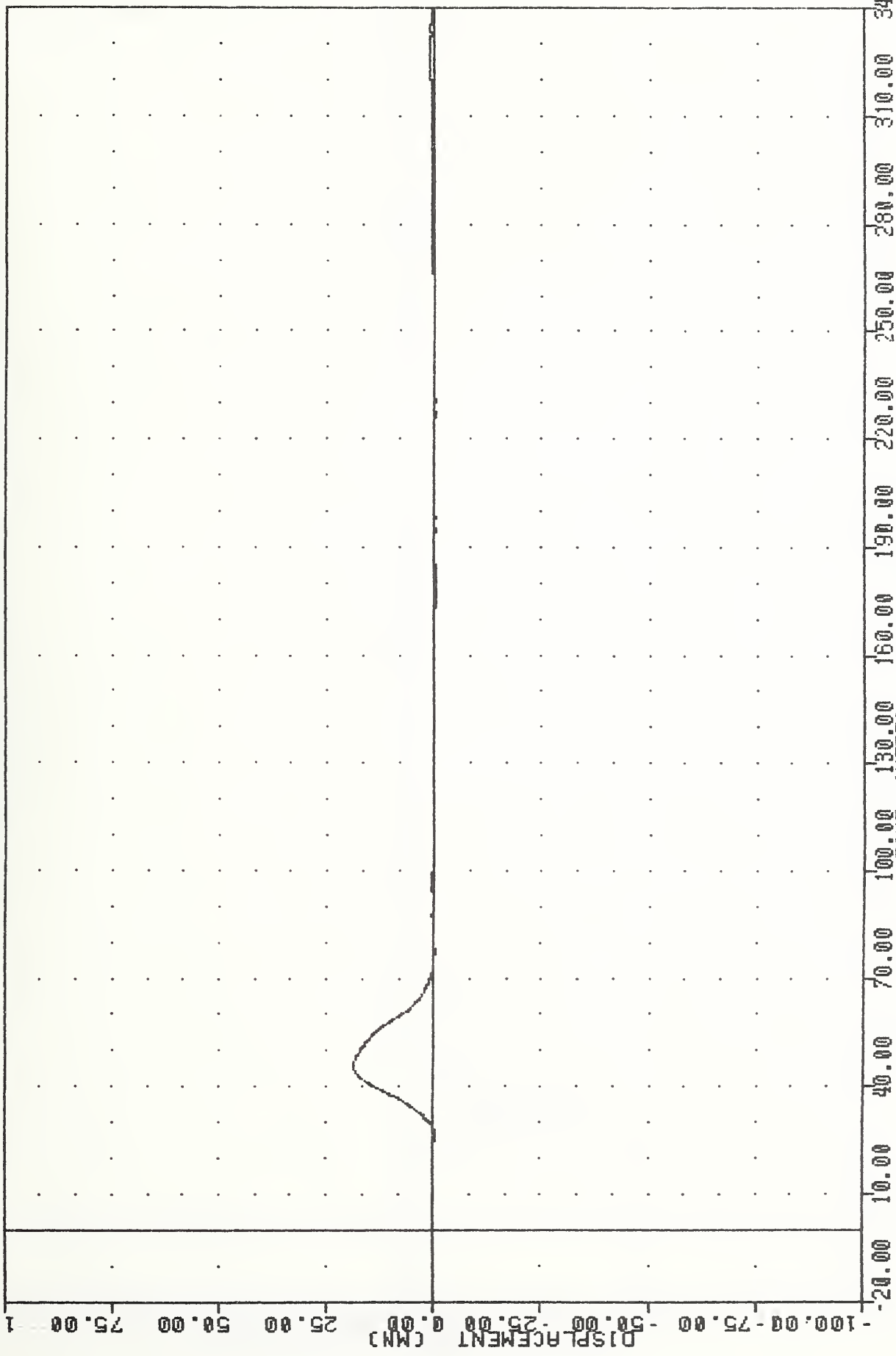
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.15e 15.00, 25.68 e 84.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT UPPER THORAX RIB Y-AXIS REDUNDANT VELOCITY

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 LURYD4

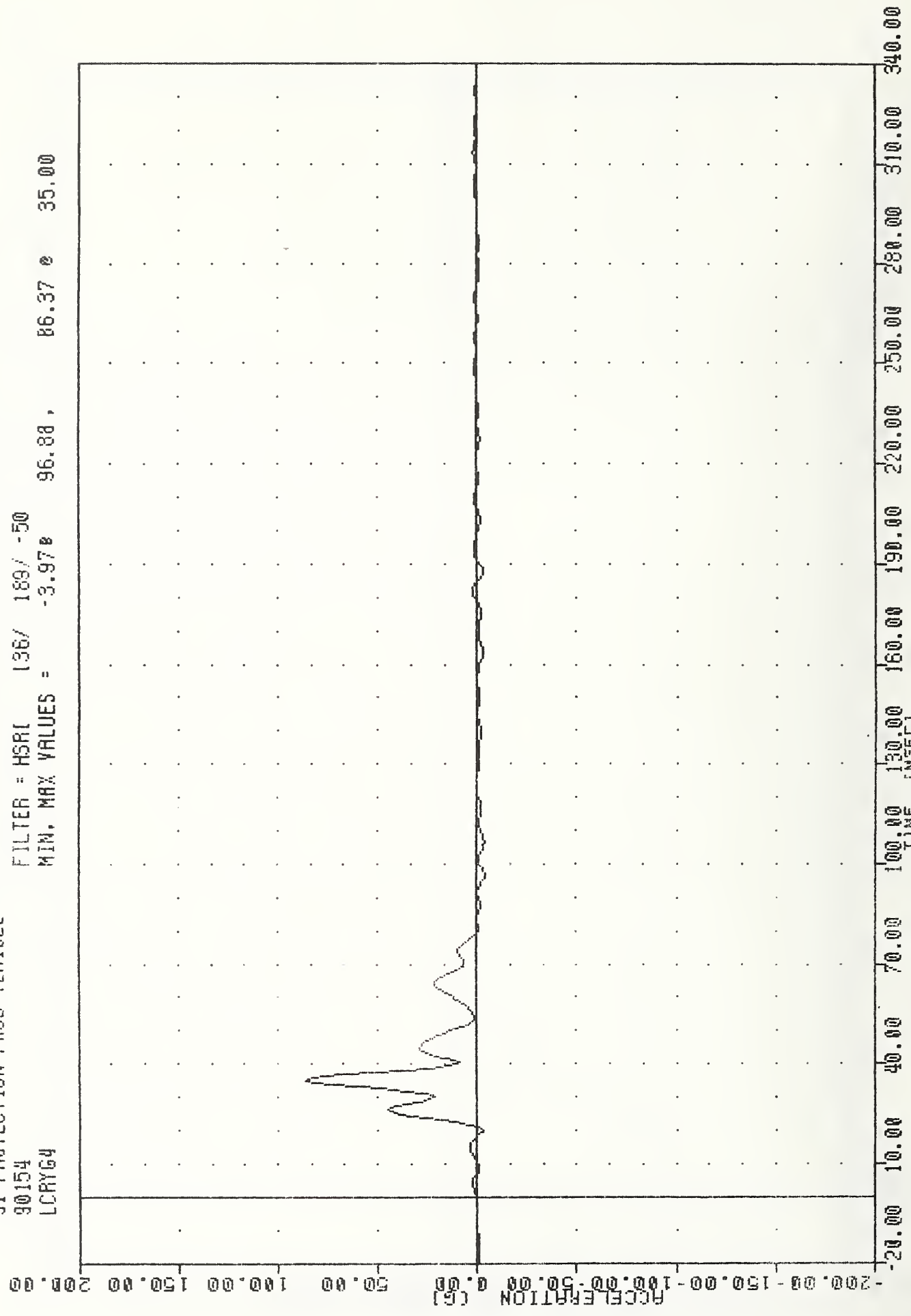
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.268 177.50 , 18.62 45.88



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER LEFT UPPER THORAX RIB DISPLACEMENT

VRTC
 SI PROTECTION PROD VEHICLE
 90154
 LCRYG4

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -3.97 96.88, 86.37 35.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER LEFT CENTER THORAX RIB Y-AXIS ACCELERATION

VRTC , 900604

SI PROTECTION PROD VEHICLE

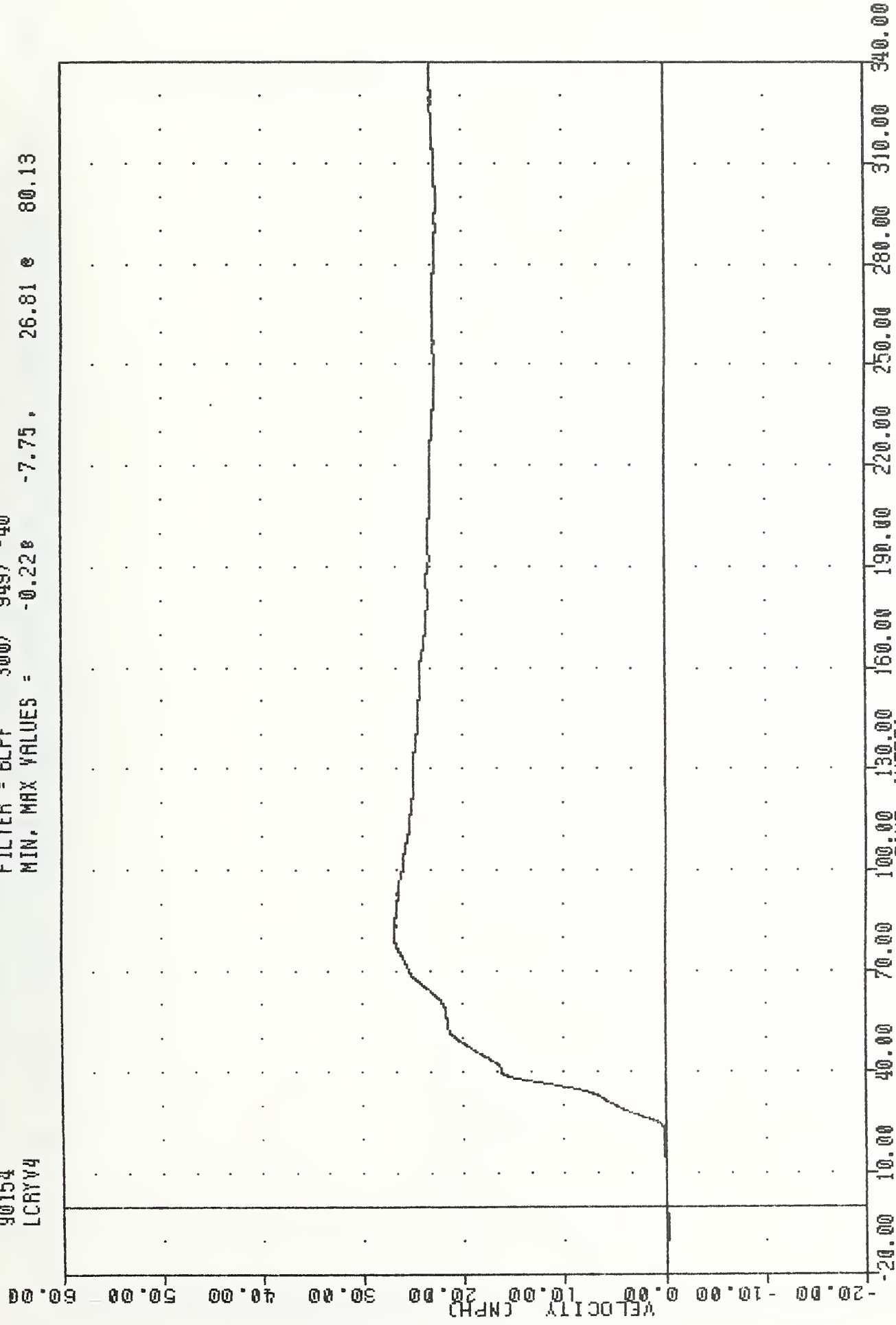
90154

LCRYV4

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.228

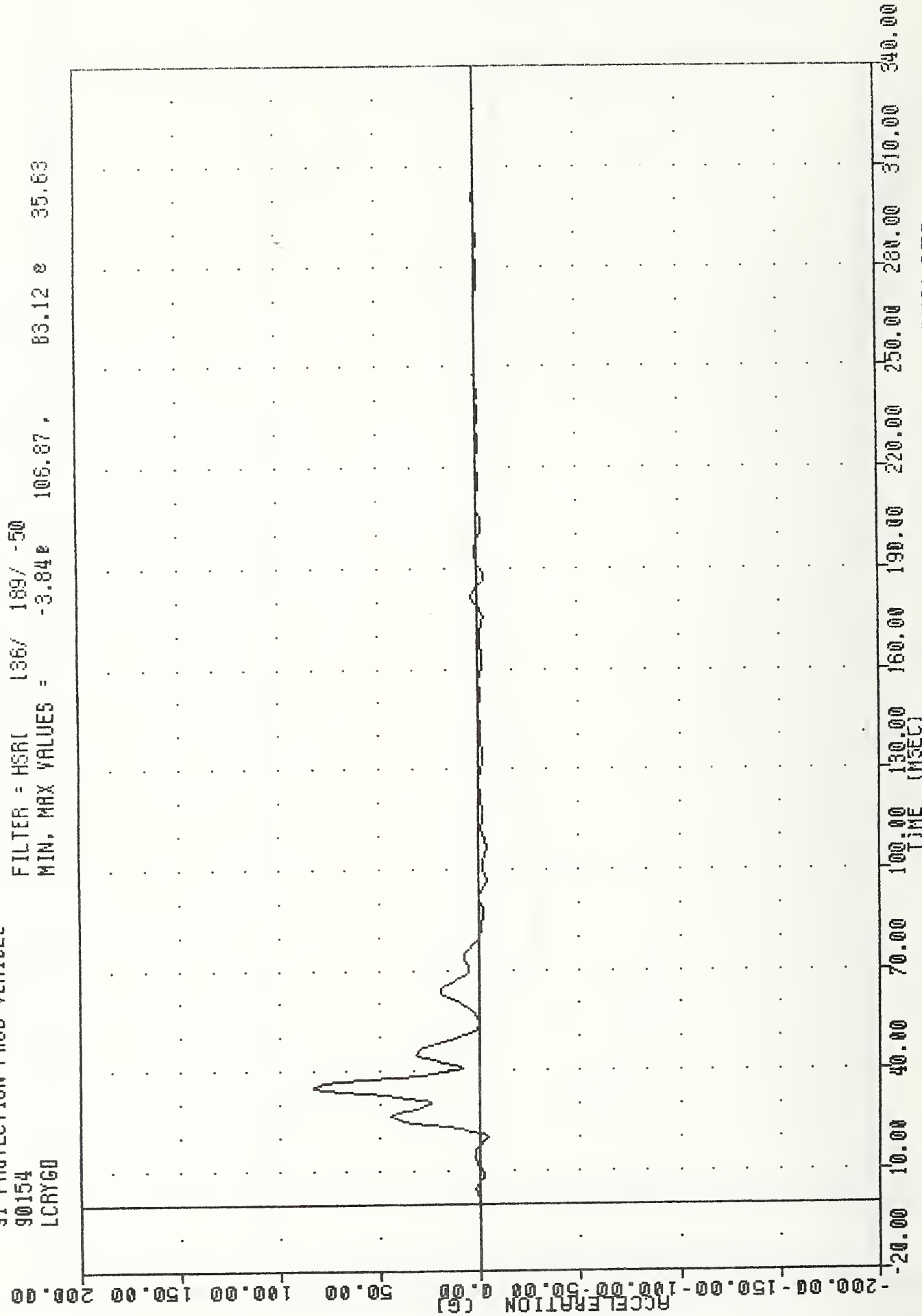
-7.75, 26.81 e 80.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT CENTER THORAX RIB Y-AXIS VELOCITY

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LCRY60

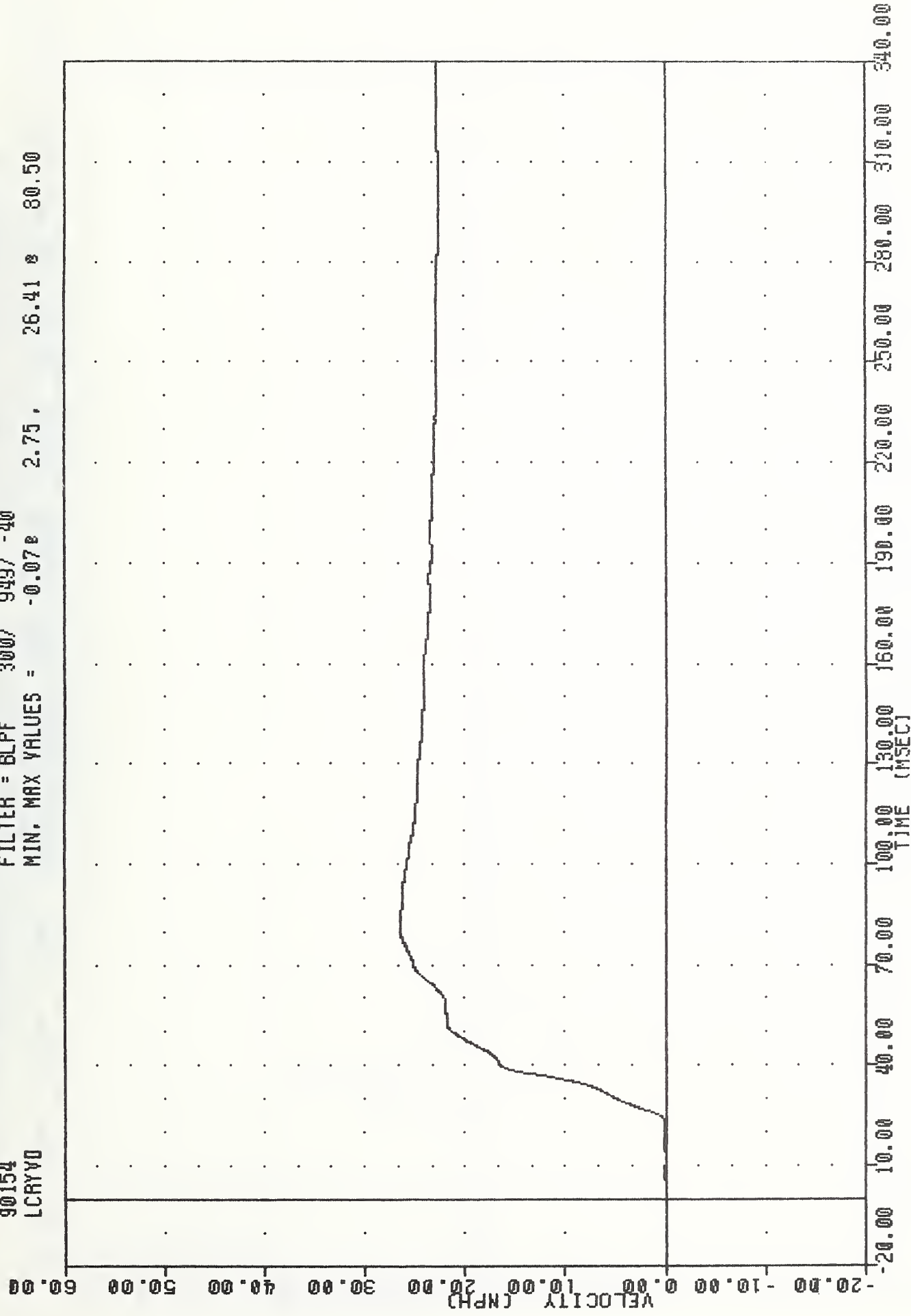
FILTER = HSR1 136/ 189/ -50
MIN. MAX VALUES = -3.84e 106.87 , 83.12 e 35.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT CENTER THORAX RIB Y-AXIS REDUNDANT ACCEL

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LCRYV0

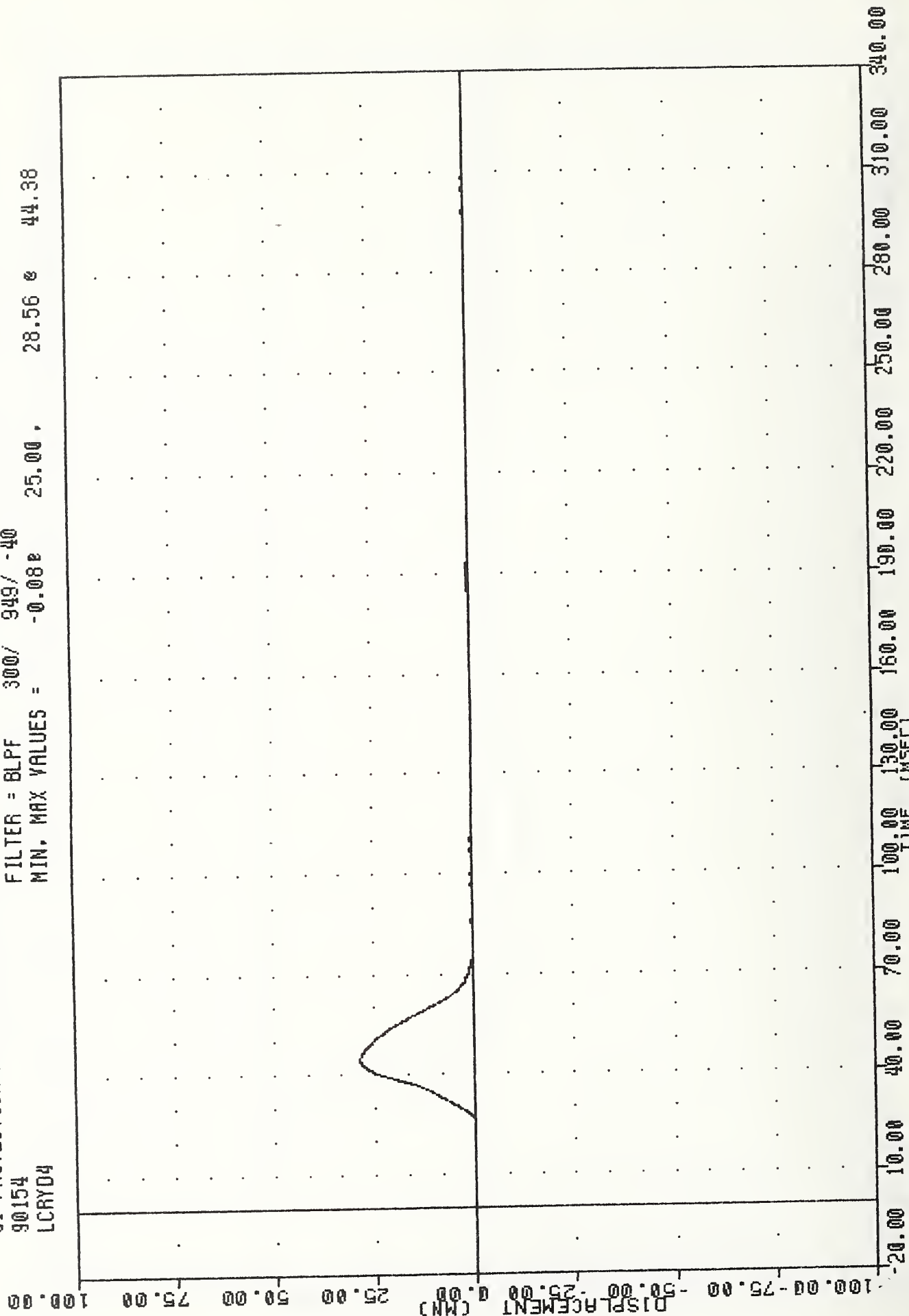
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.07e 2.75, 26.41 e 80.50



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT CENTER THORAX RIB Y-AXIS REDUNDANT VELOCITY

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 LCRYD4

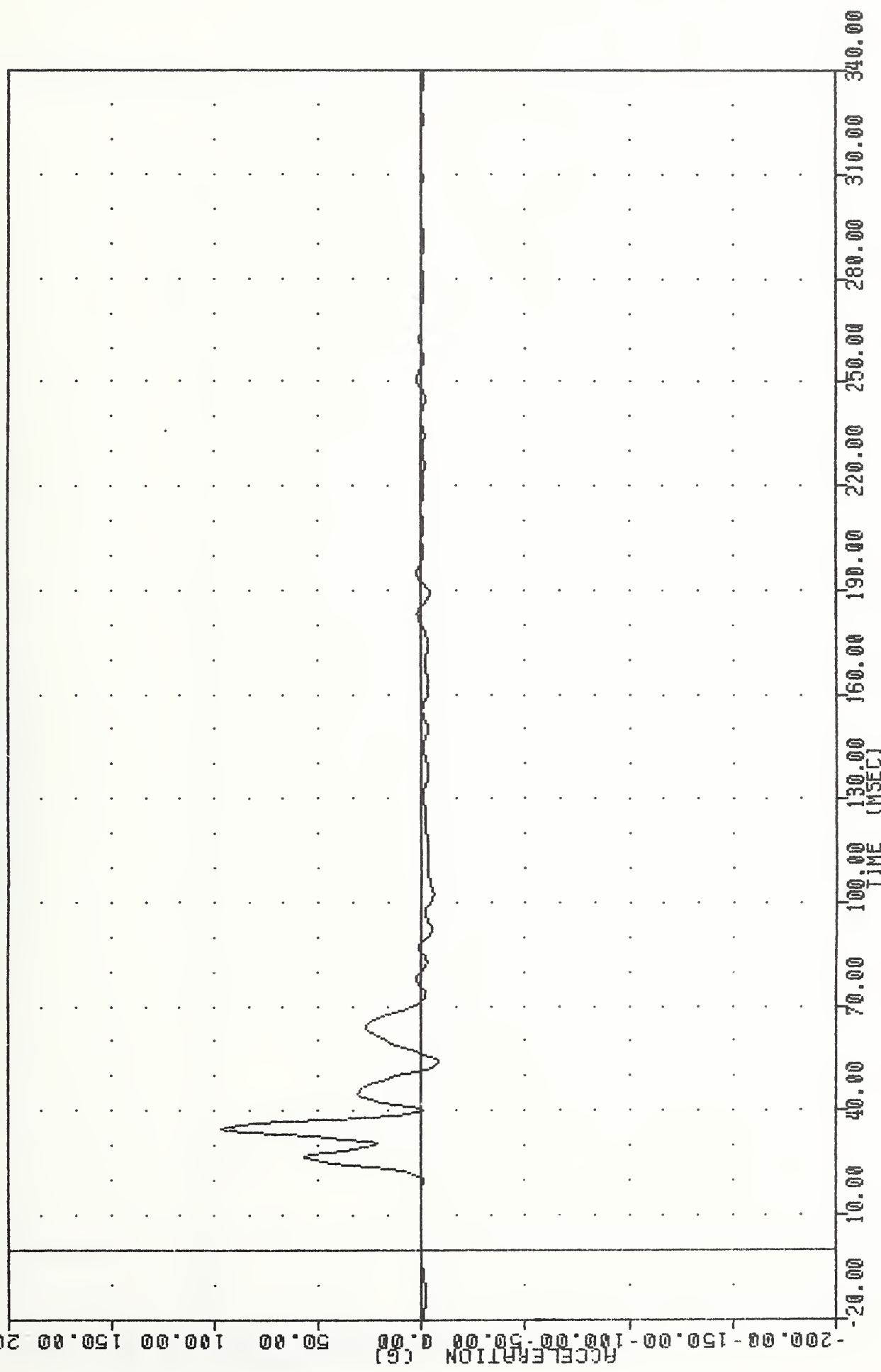
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.08e 25.00 , 28.56 e 44.38



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER LEFT CENTER THORAX RIB DISPLACEMENT

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LLRYG4

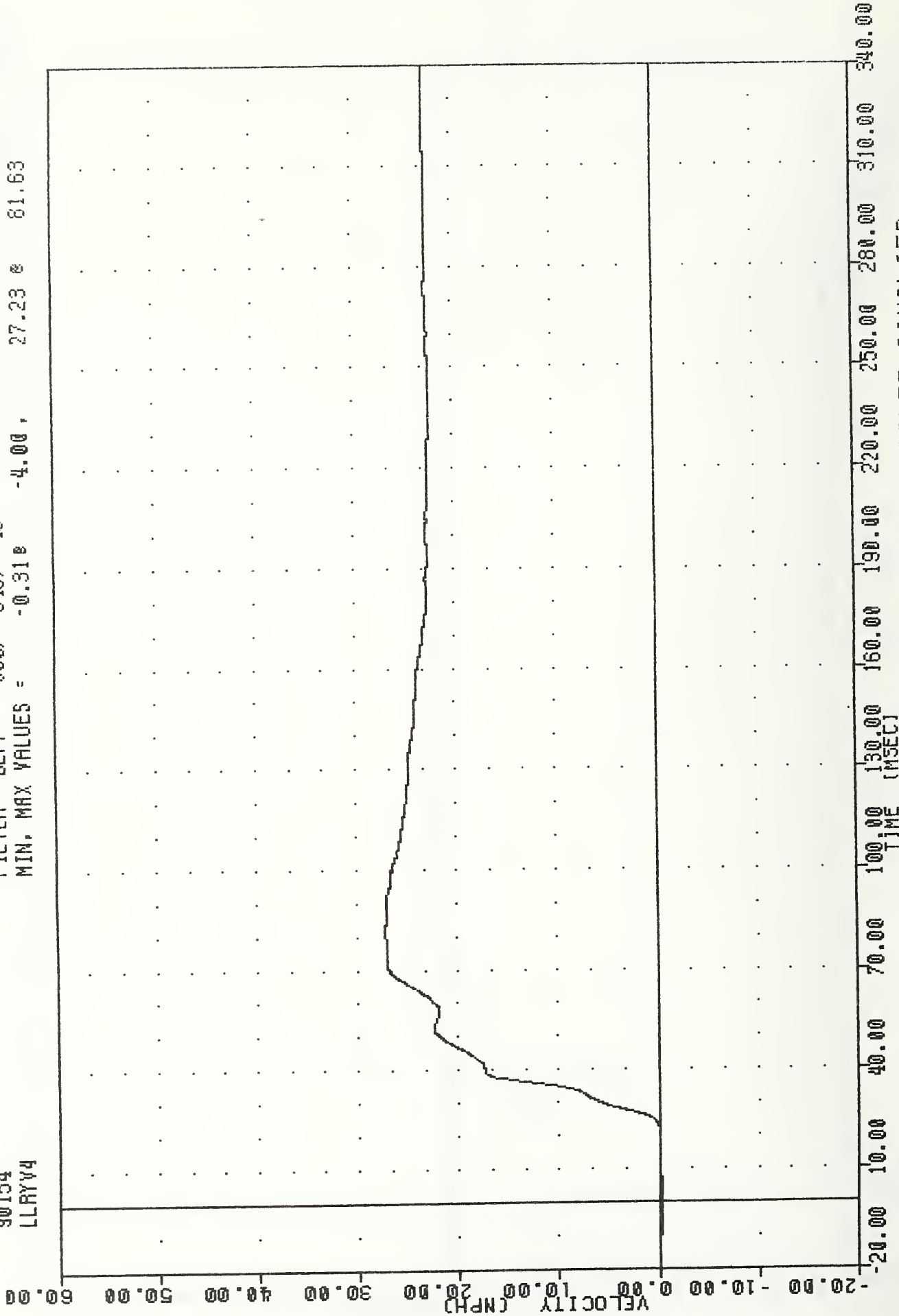
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -8.04 53.75 , 97.12 35.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT LOWER THORAX RIB Y-AXIS ACCELERATION

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 LLRYV4

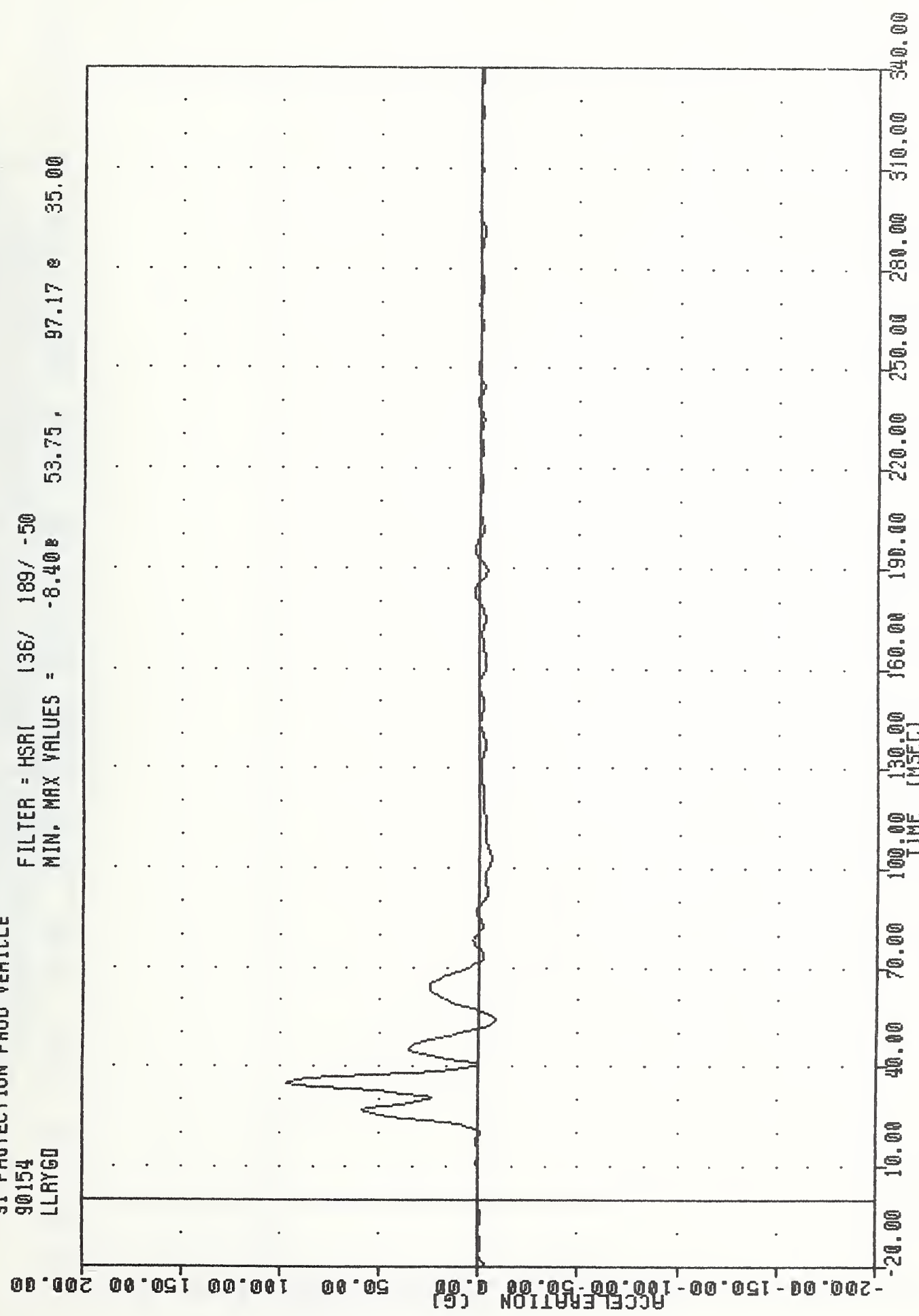
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.31e -4.00 , 27.23 e 81.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER LEFT LOWER THORAX RIB Y-AXIS VELOCITY

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LLRYGD

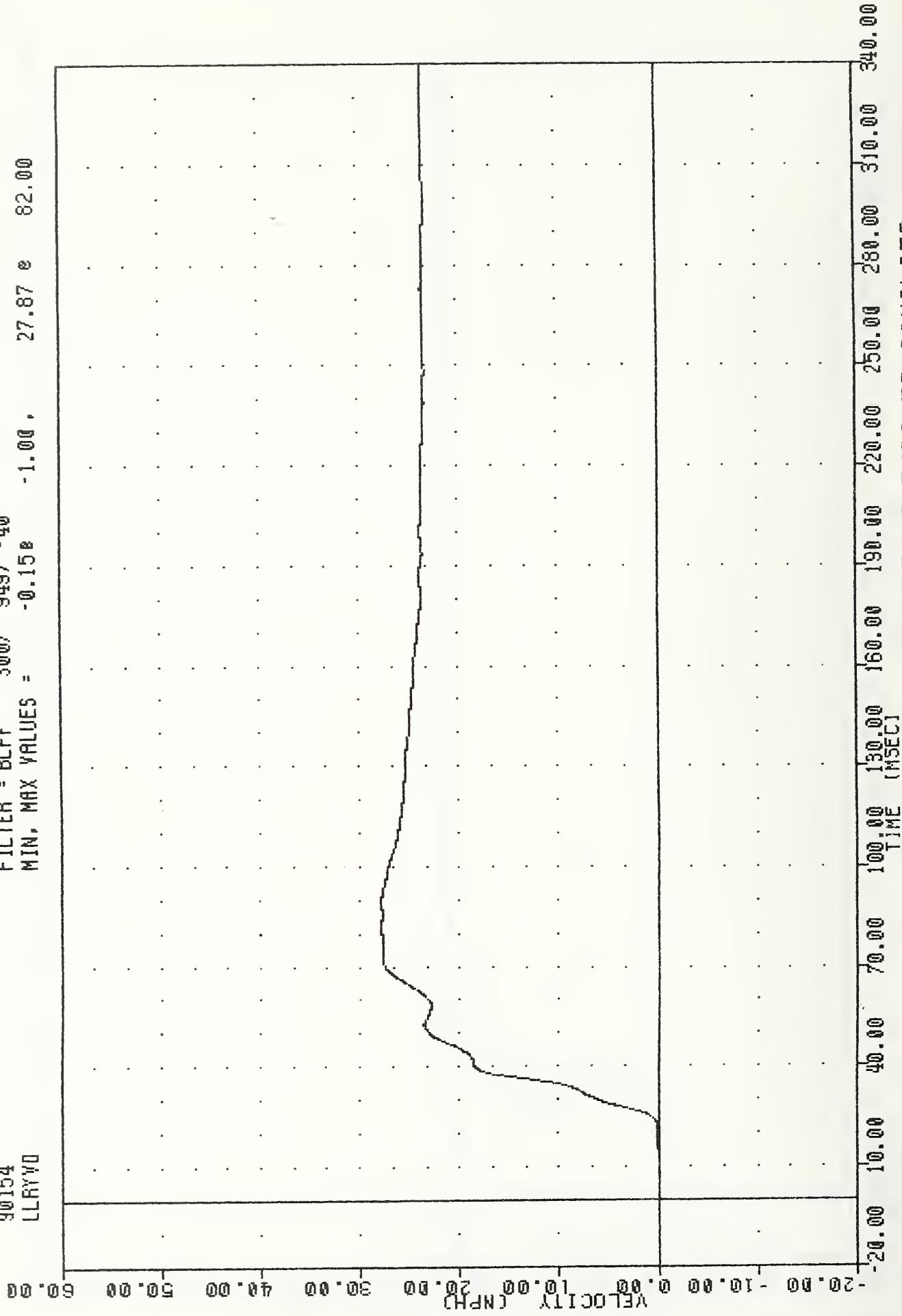
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -8.40E 53.75 , 97.17 @ 35.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT LOWER THORAX AIB Y-AXIS REDUNDANT ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LLRYVQ

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.158 -1.00 , 27.87 e 82.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT LOWER THORAX RIB Y-AXIS REDUNDANT VELOCITY

VRTC , 900604

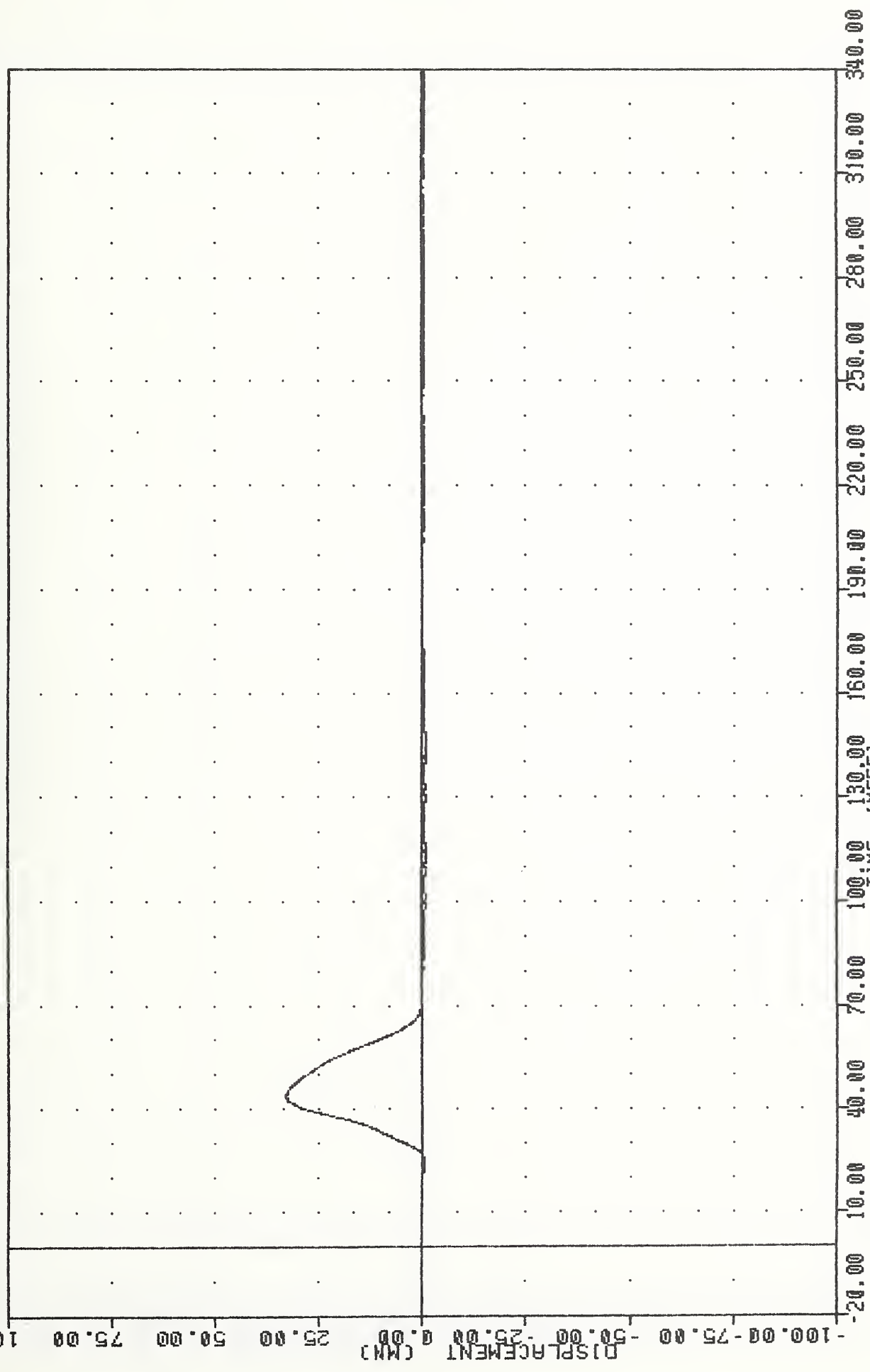
SI PROTECTION PROD VEHICLE

90154

LLRY04

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.798 143.63 ,

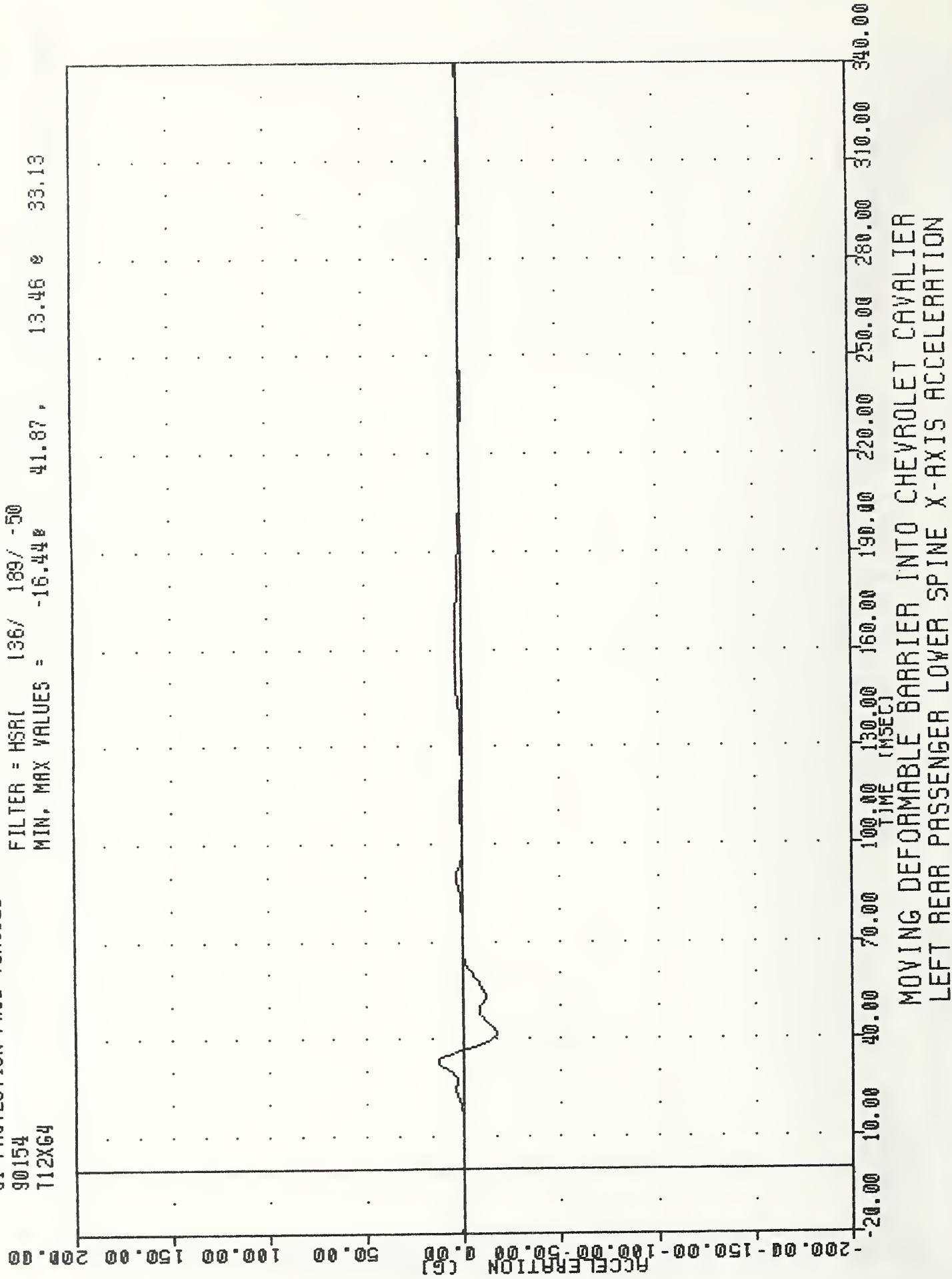
32.83 e 44.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT LOWER THORAX RIB DISPLACEMENT

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
712X64

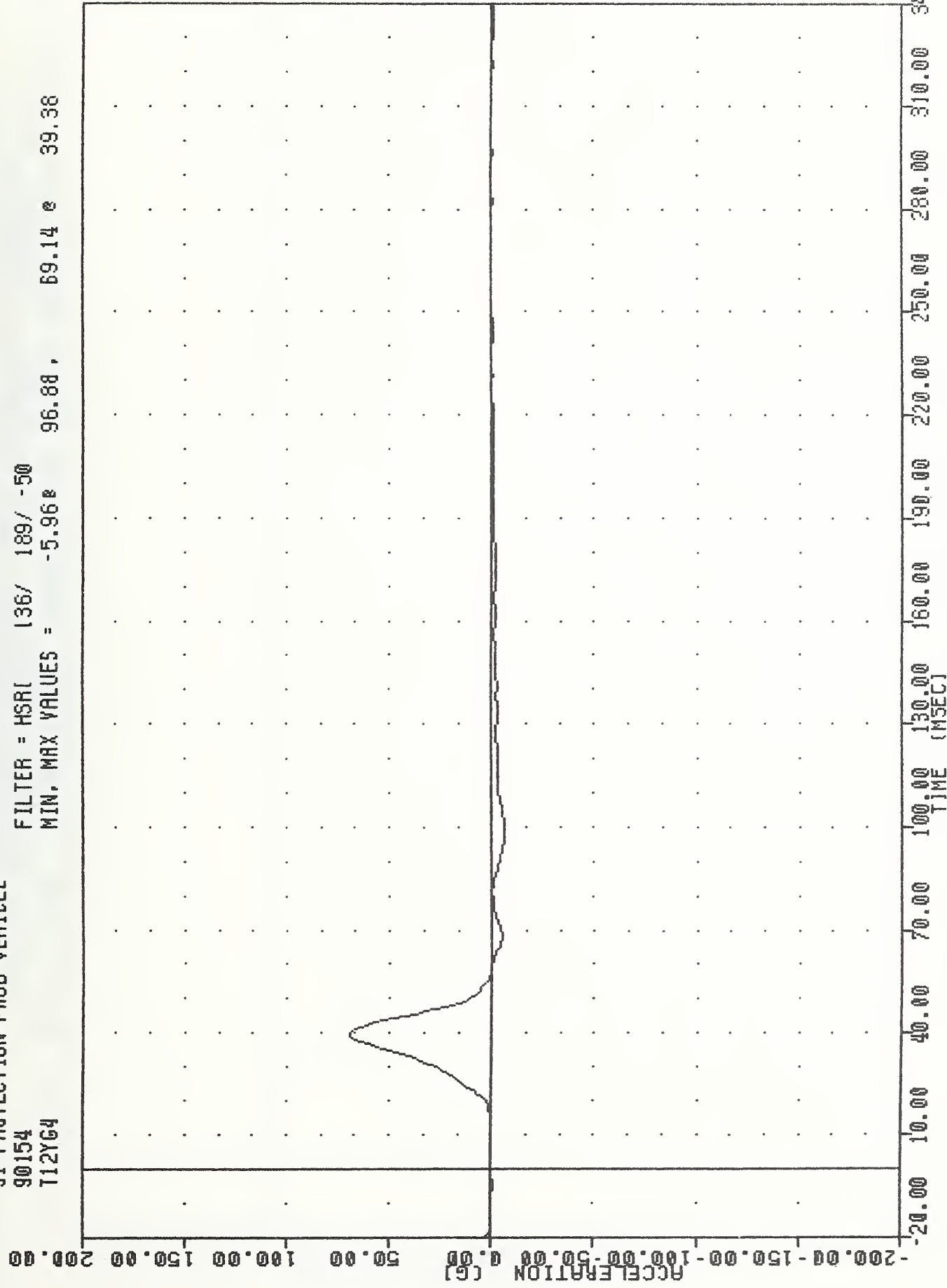
FILTER = HSR(136/ 189/ -50
MIN, MAX VALUES = -16.448 41.87, 13.46 33.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LOWER SPINE X-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PAD VEHICLE
90154
T12Y64

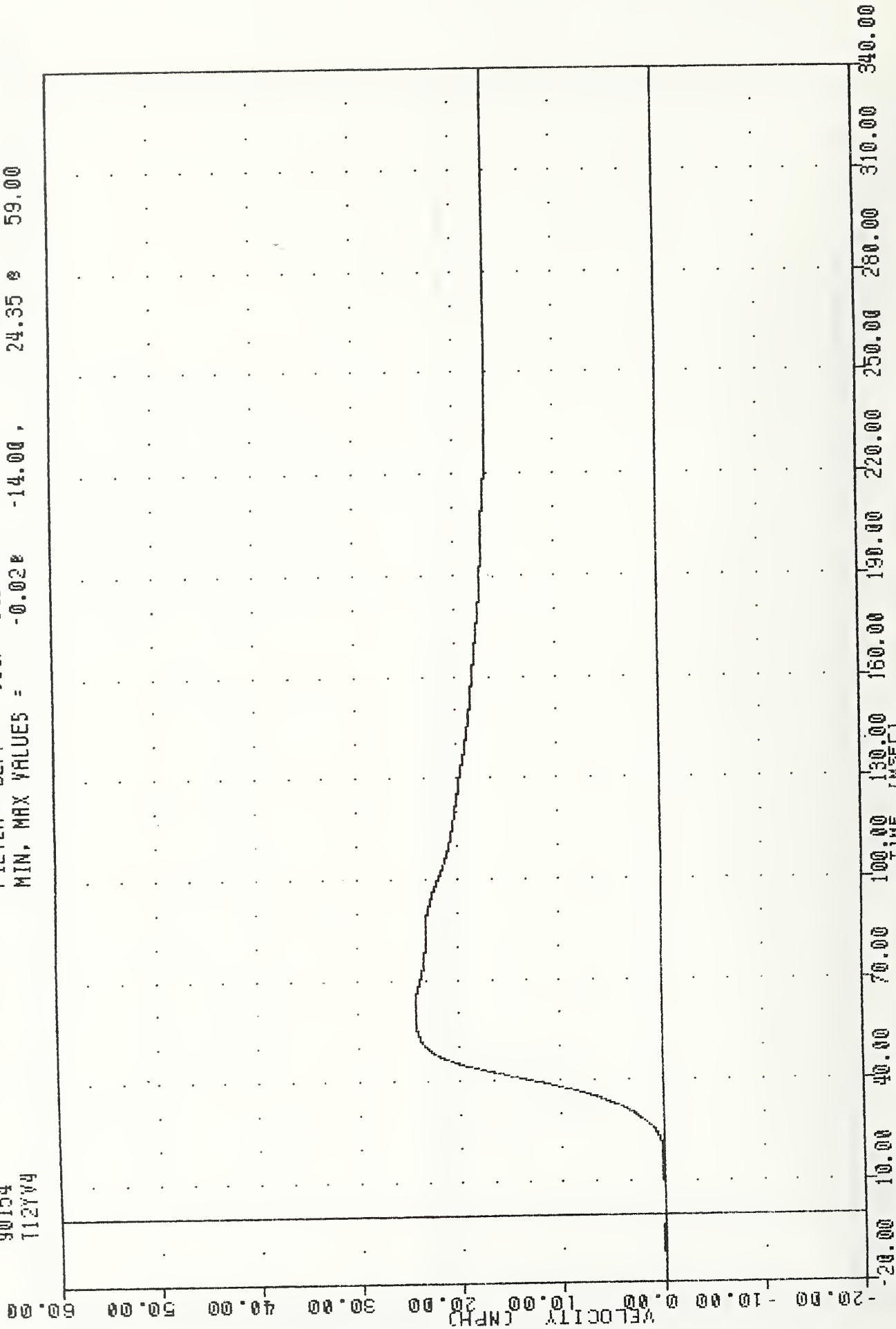
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -5.968 96.88 , 69.14 e 39.38



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 T12YV4

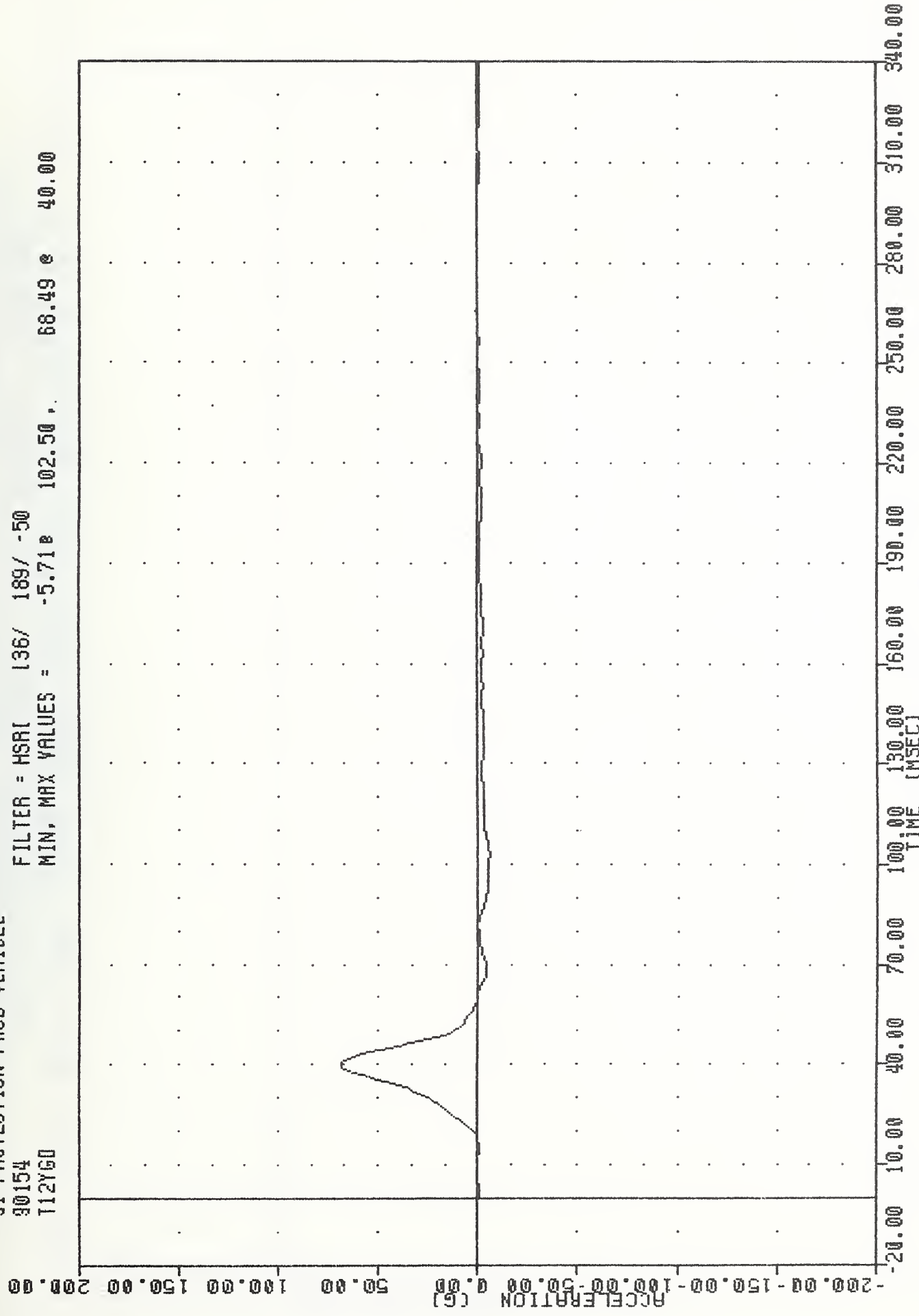
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.028 -14.00 , 24.35 8 59.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER LOWER SPINE Y-AXIS VELOCITY

VRTC
SI PROTECTION PROD VEHICLE
90154
112Y60

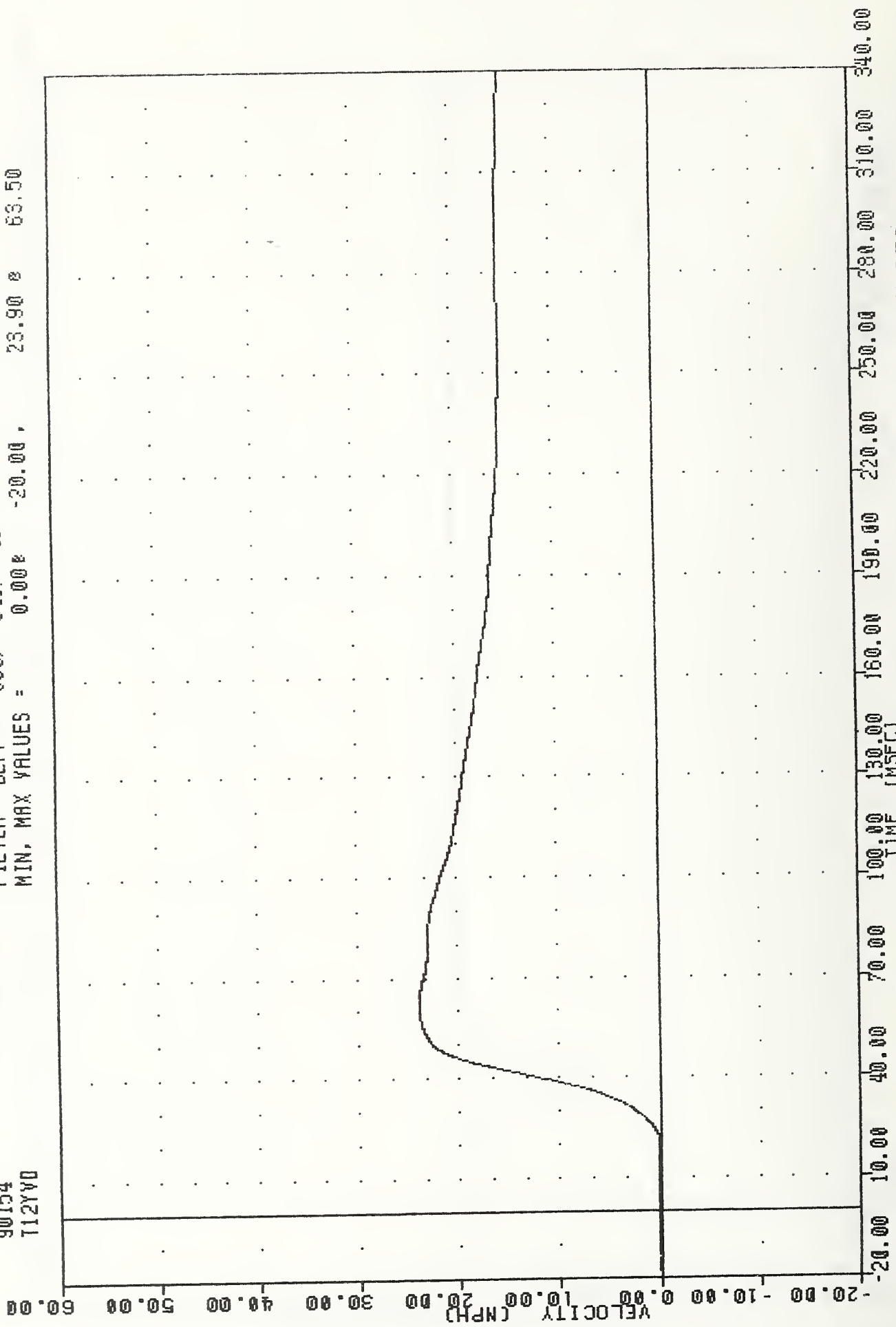
FILTER = HSR1 136/ 189/ -50
MIN, MAX VALUES = -5.71e 102.50 e 68.49 e 40.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 T12YV0

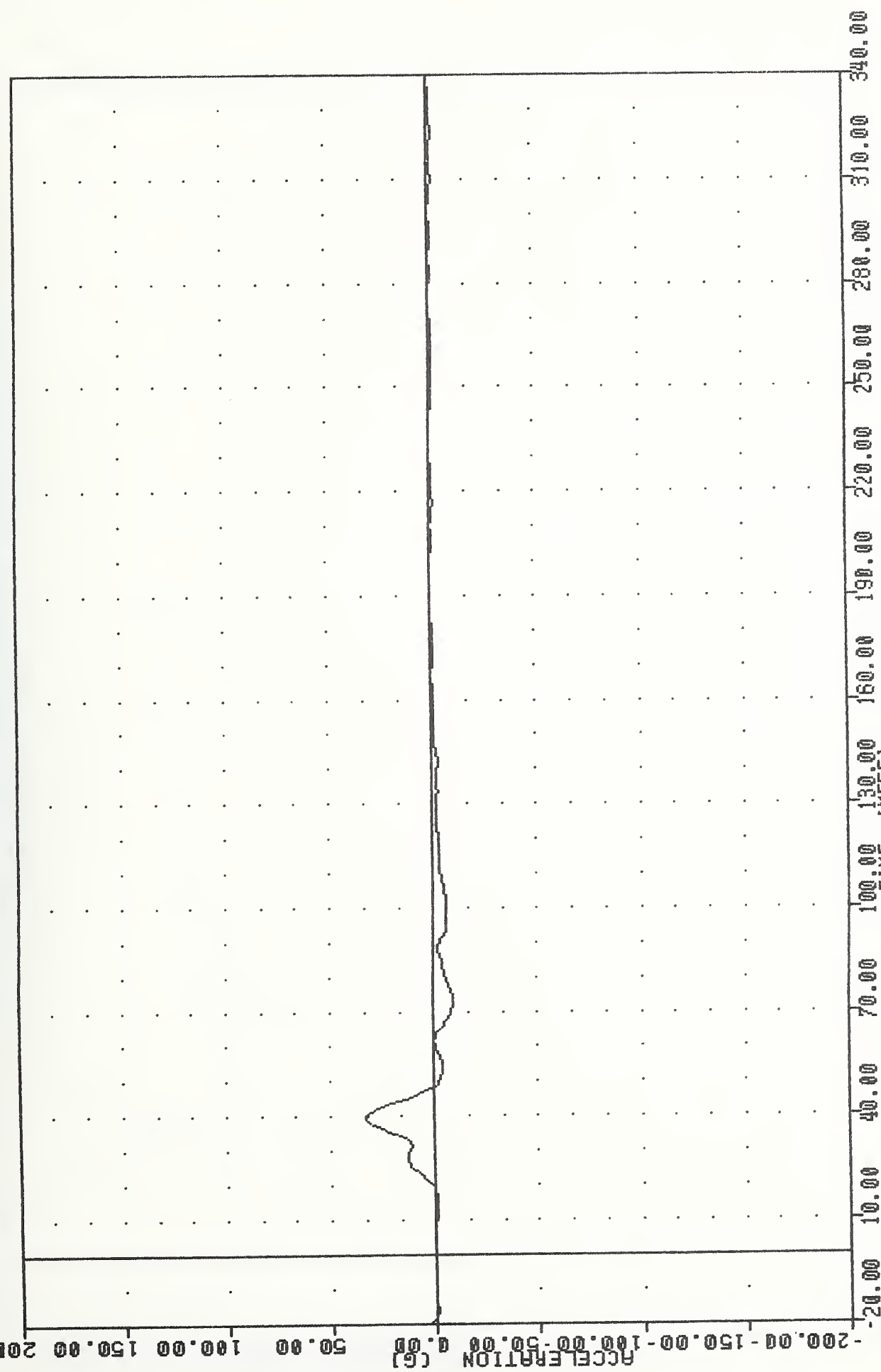
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 0.00% -20.00, 23.90 8 63.50



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT VELOCITY

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
712Z64

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -9.48 73.13 , 32.69 39.38

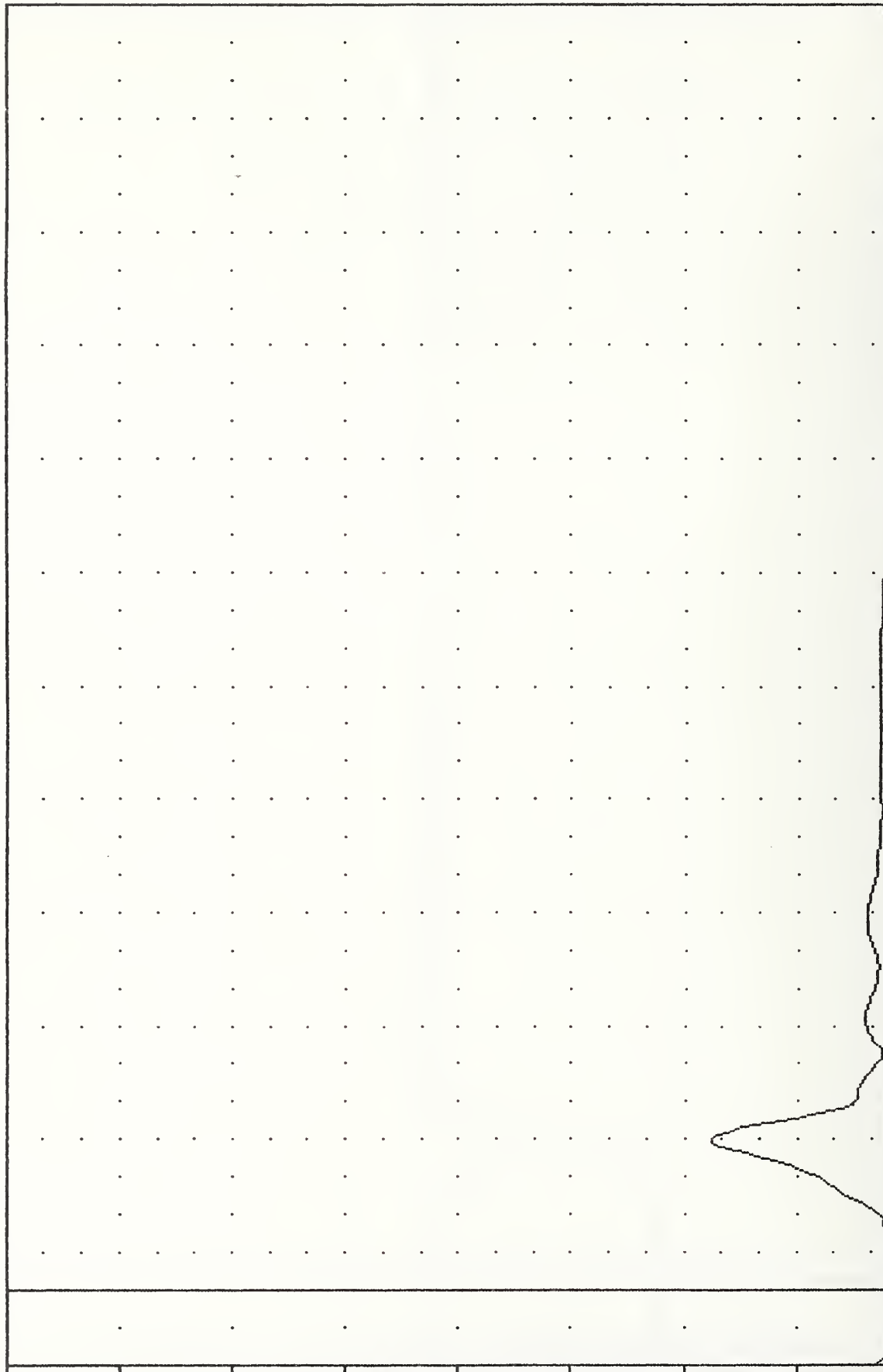


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LOWER SPINE Z-AXIS ACCELERATION

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 T12R64

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.13e -15.00, 77.70 e 40.00

ACCELERATION (G)

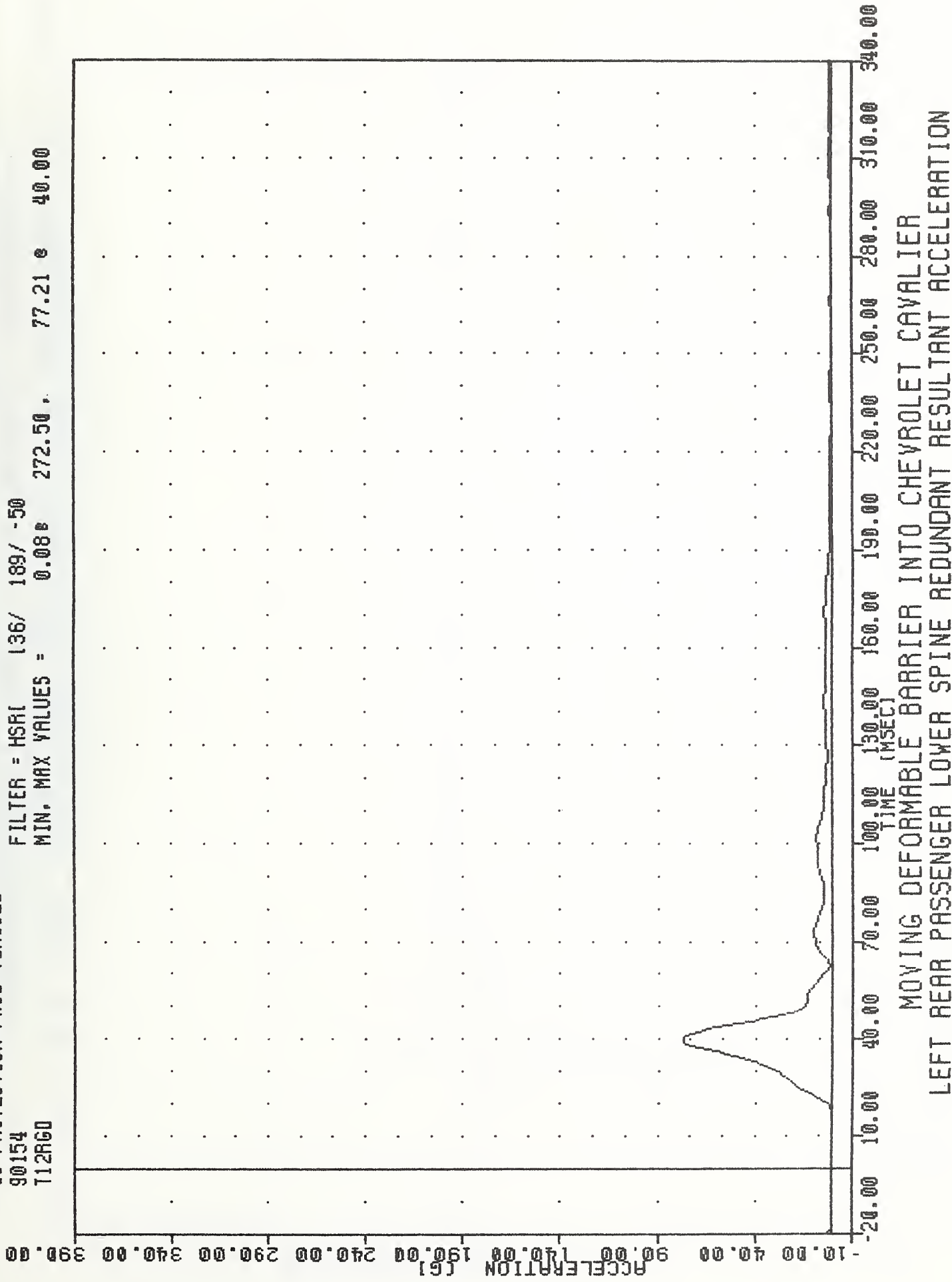


TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER LOWER SPINE RESULTANT ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
T12R60

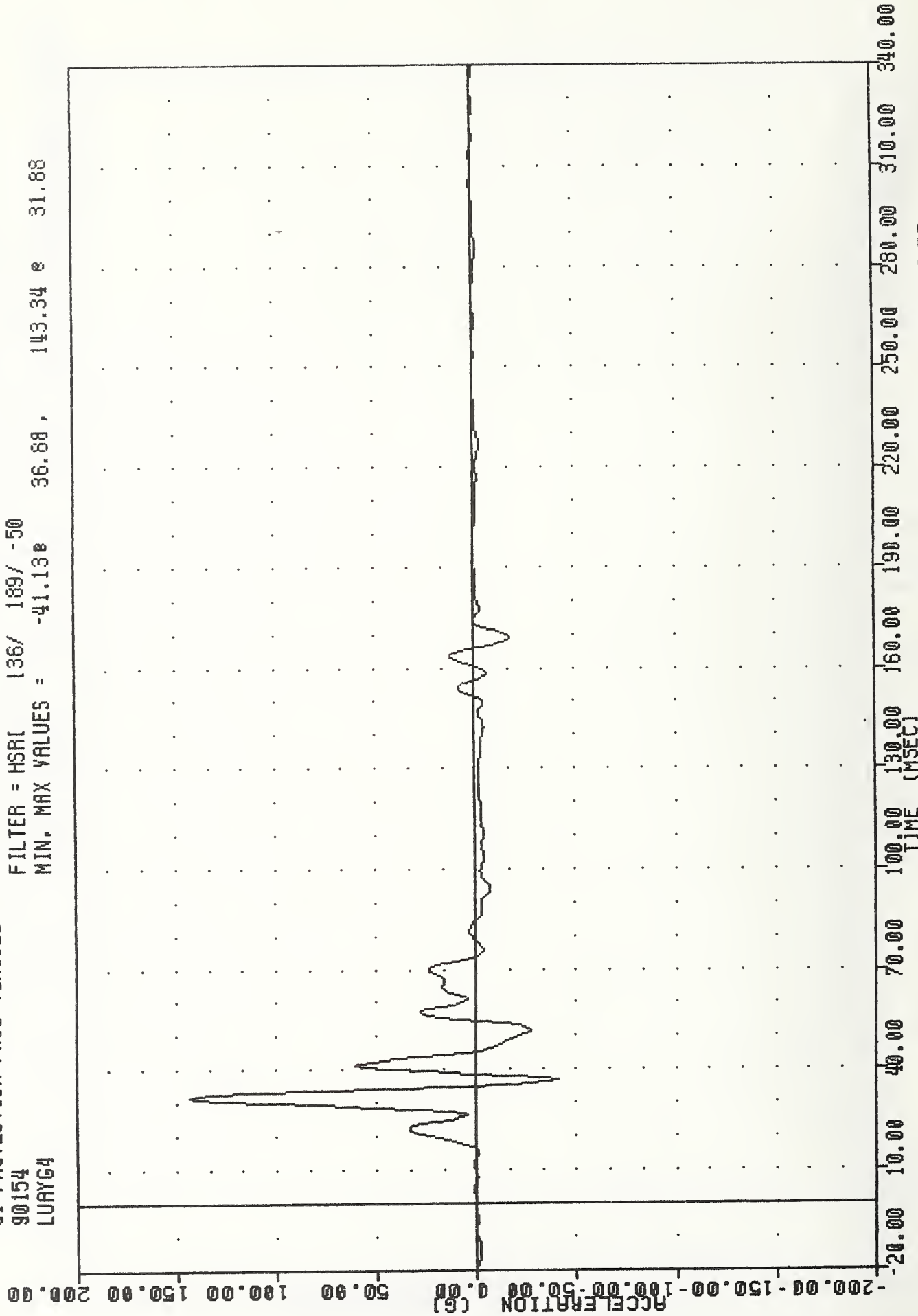
FILTER = HSAI 136/ 189/ -50
MIN. MAX VALUES = 0.088 272.50 , 77.21 @ 40.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LOWER SPINE REDUNDANT RESULTANT ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LWAY64

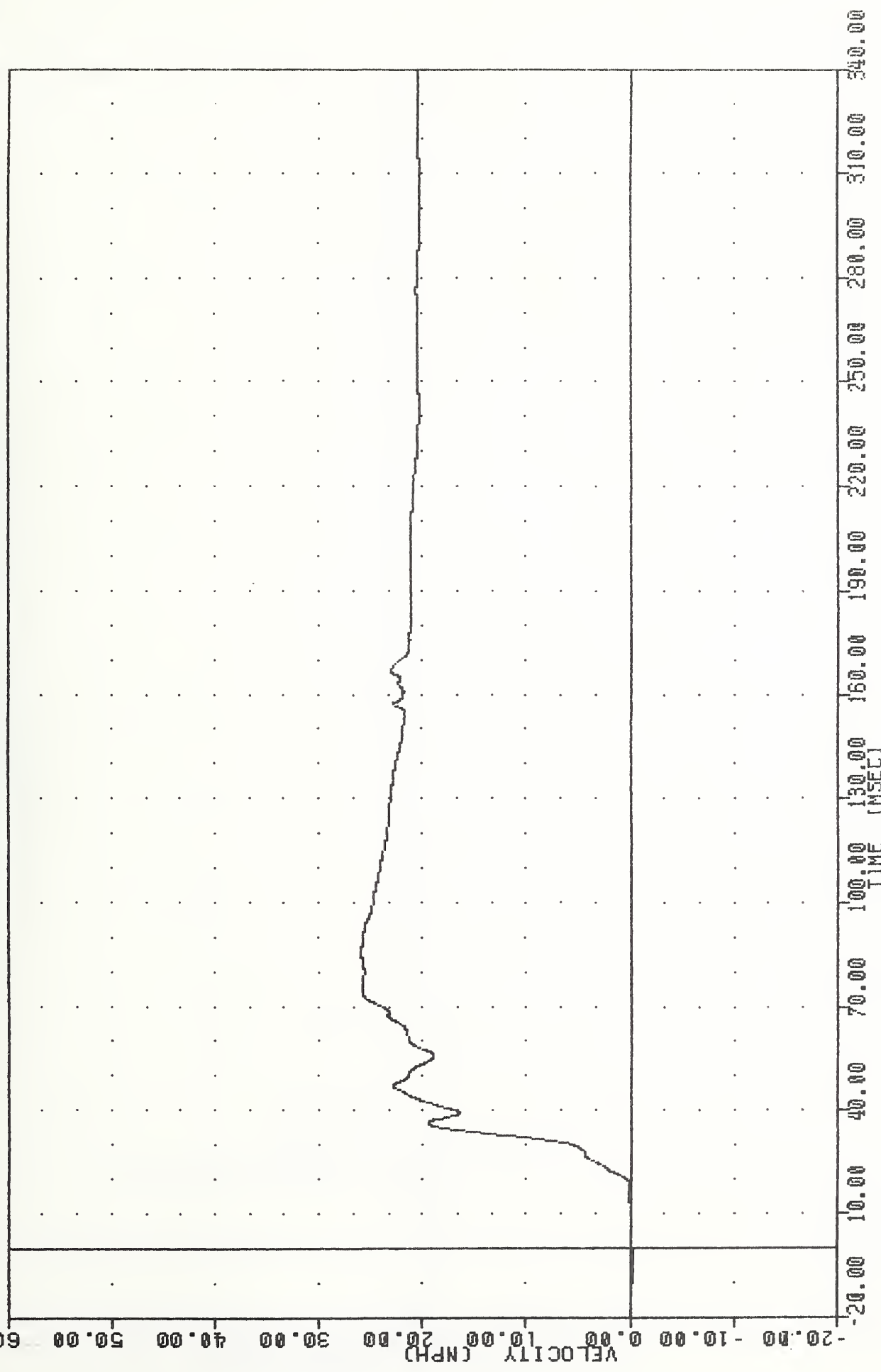
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -41.13e 36.88, 143.34 e 31.88



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT UPPER ABDOMEN RIB Y-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LURAYV4

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.220 -7.88 , 26.00 0 86.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT UPPER ABDOMEN RIB Y-AXIS VELOCITY

VRTC , 900604

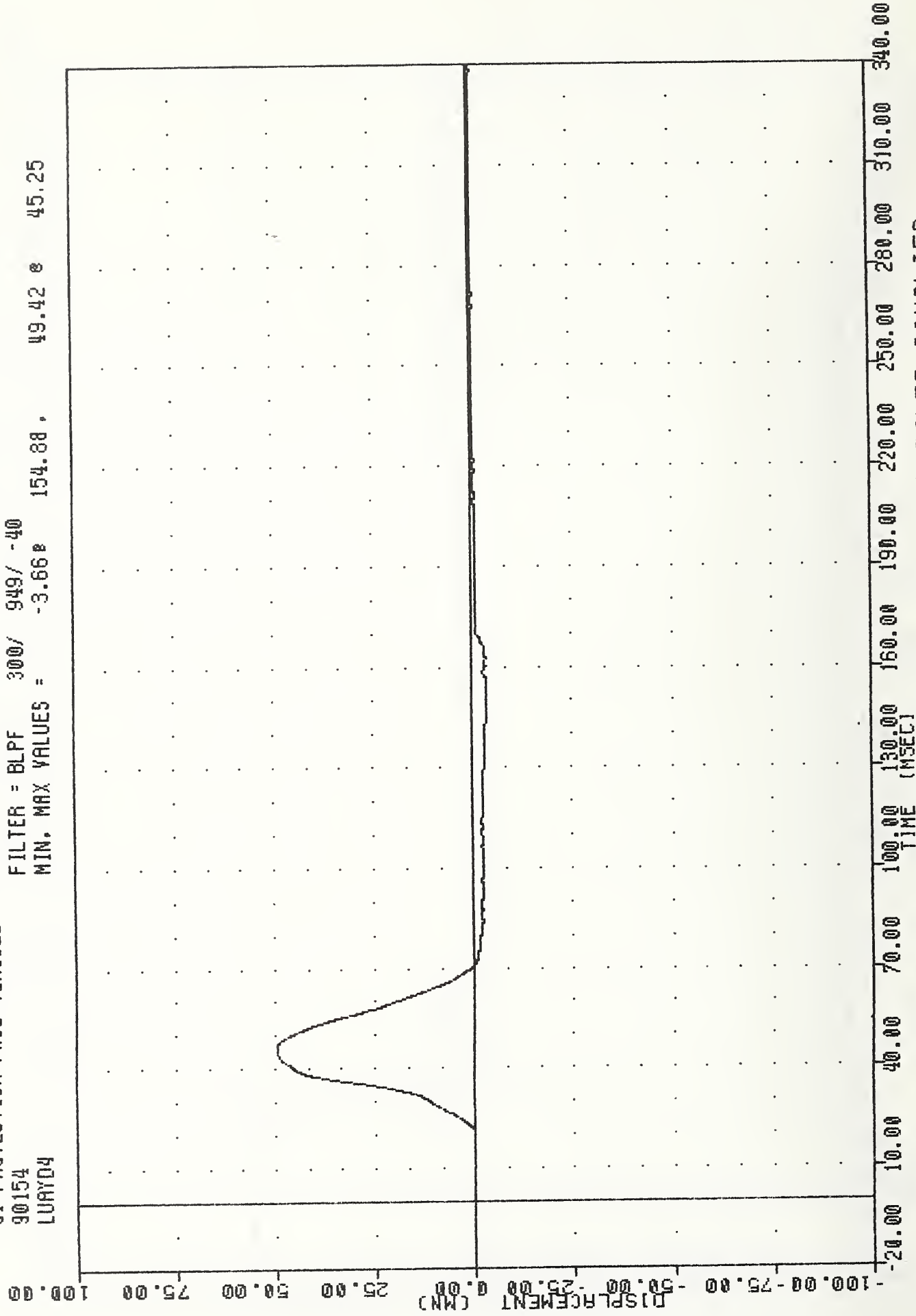
SI PROTECTION PROD VEHICLE

90154

LWAY04

FILTER = BLPF 300/ 949/ -40

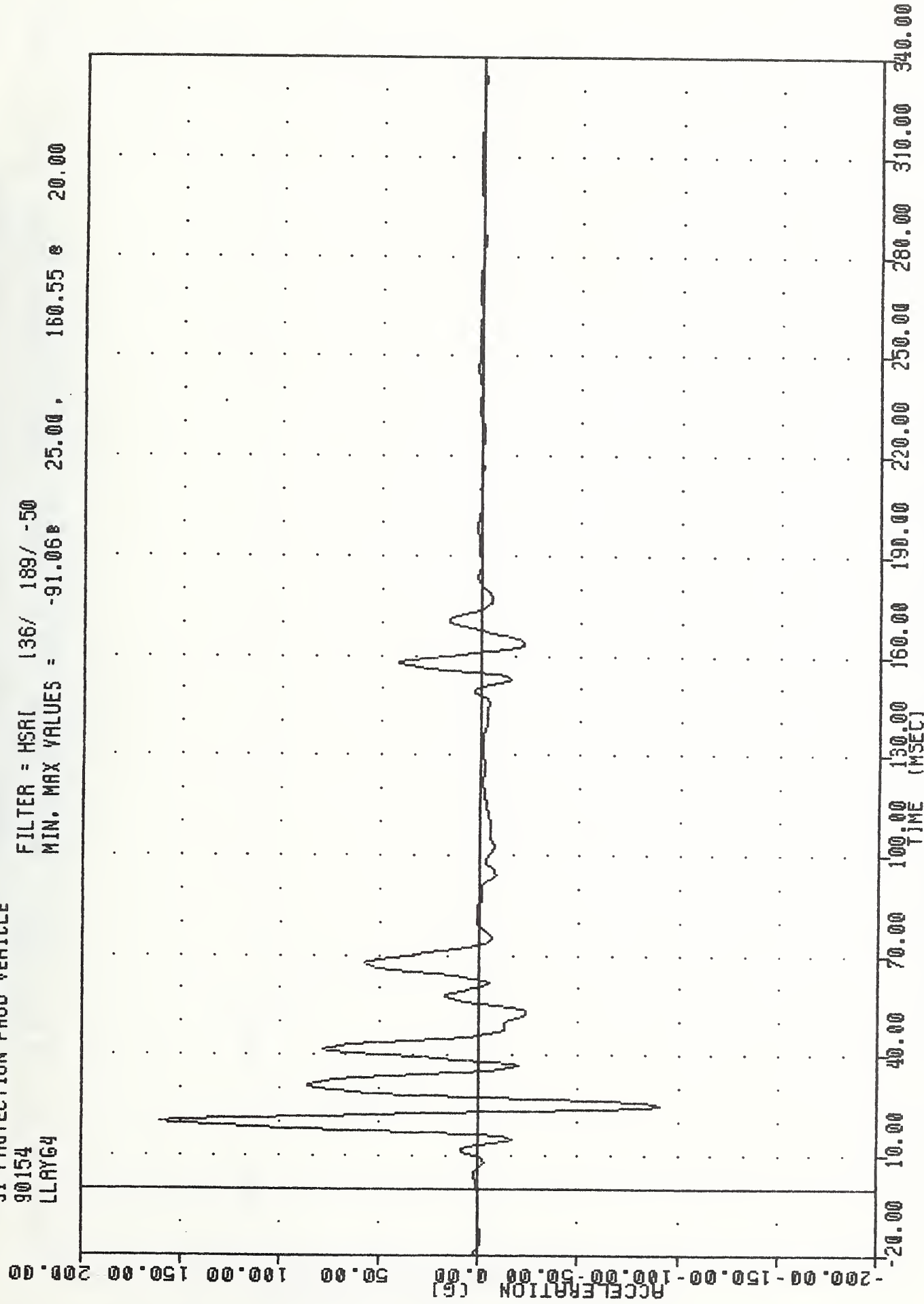
MIN. MAX VALUES = 154.88 , 49.42 @ 45.25



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT UPPER ABDOMEN RIB DISPLACEMENT

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LLAYG4

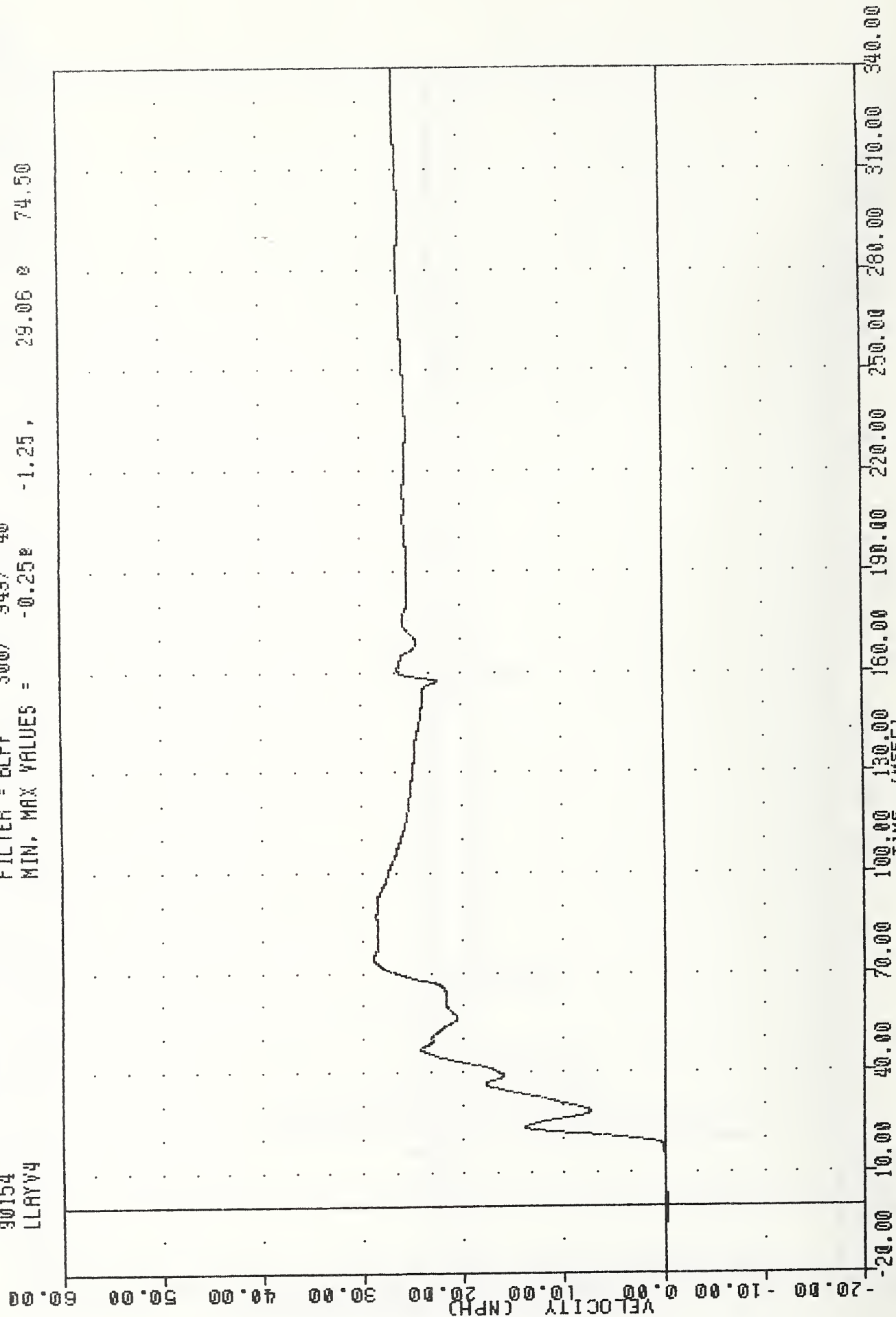
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -91.068 25.00, 160.55 20.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT LOWER ABDOMEN RIB Y-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LLAYV4

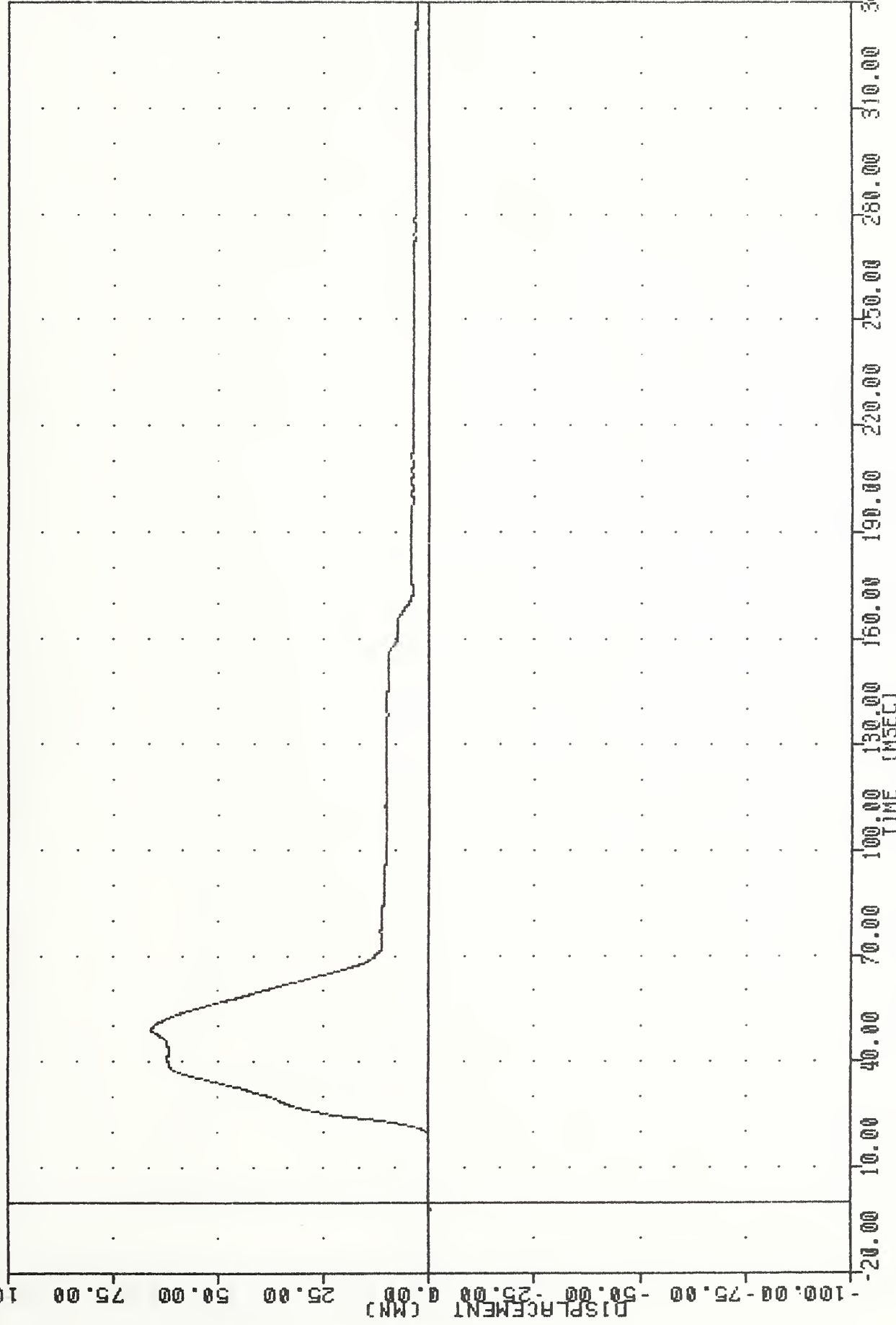
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.25 29.06 74.50
-1.25 ,



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT LOWER ABDOMEN RIB Y-AXIS VELOCITY

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LLAYD4

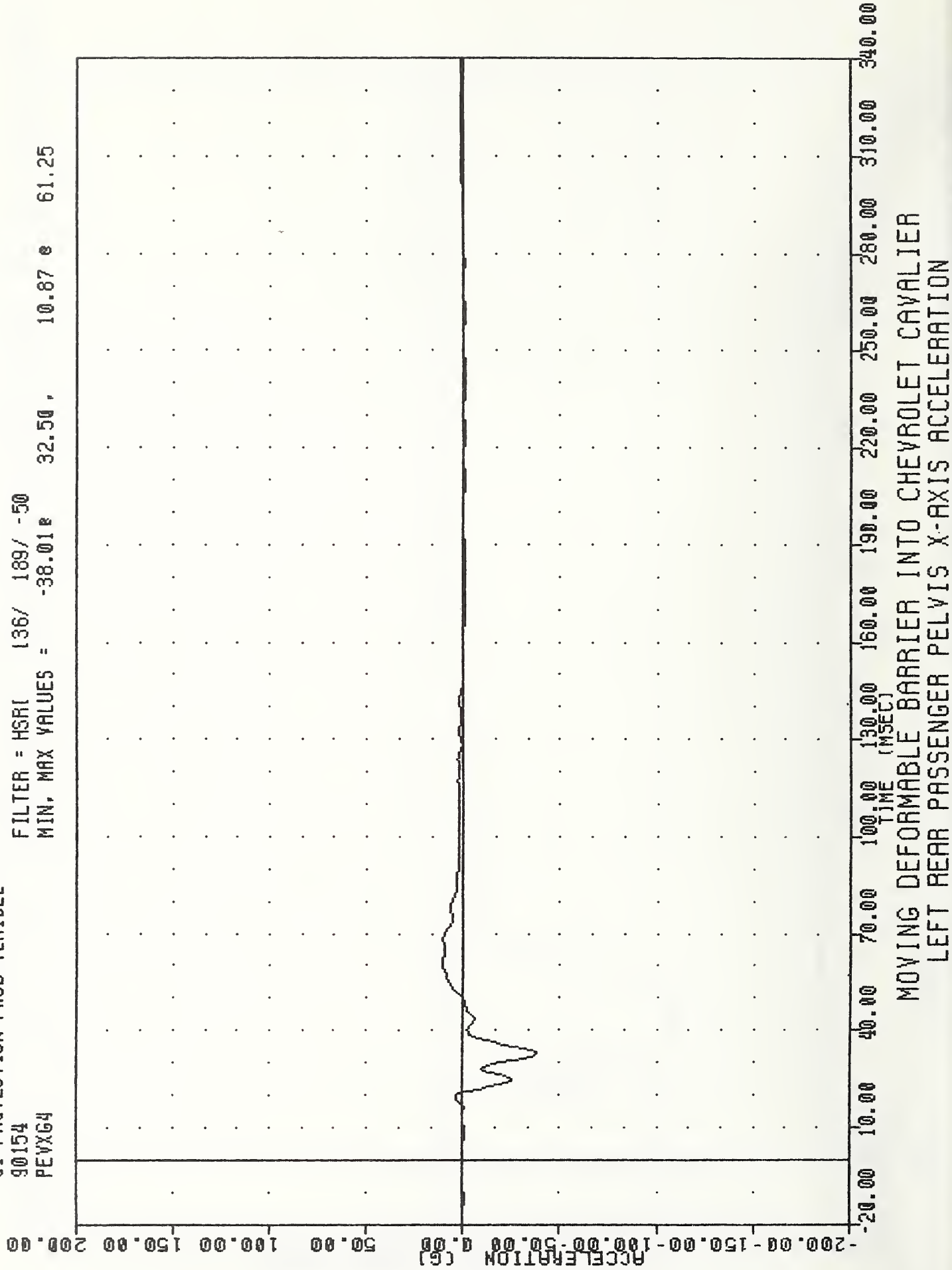
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.150 -2.00, 65.79 49.38



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER LEFT LOWER ABDOMEN RIB DISPLACEMENT

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
PEVXG4

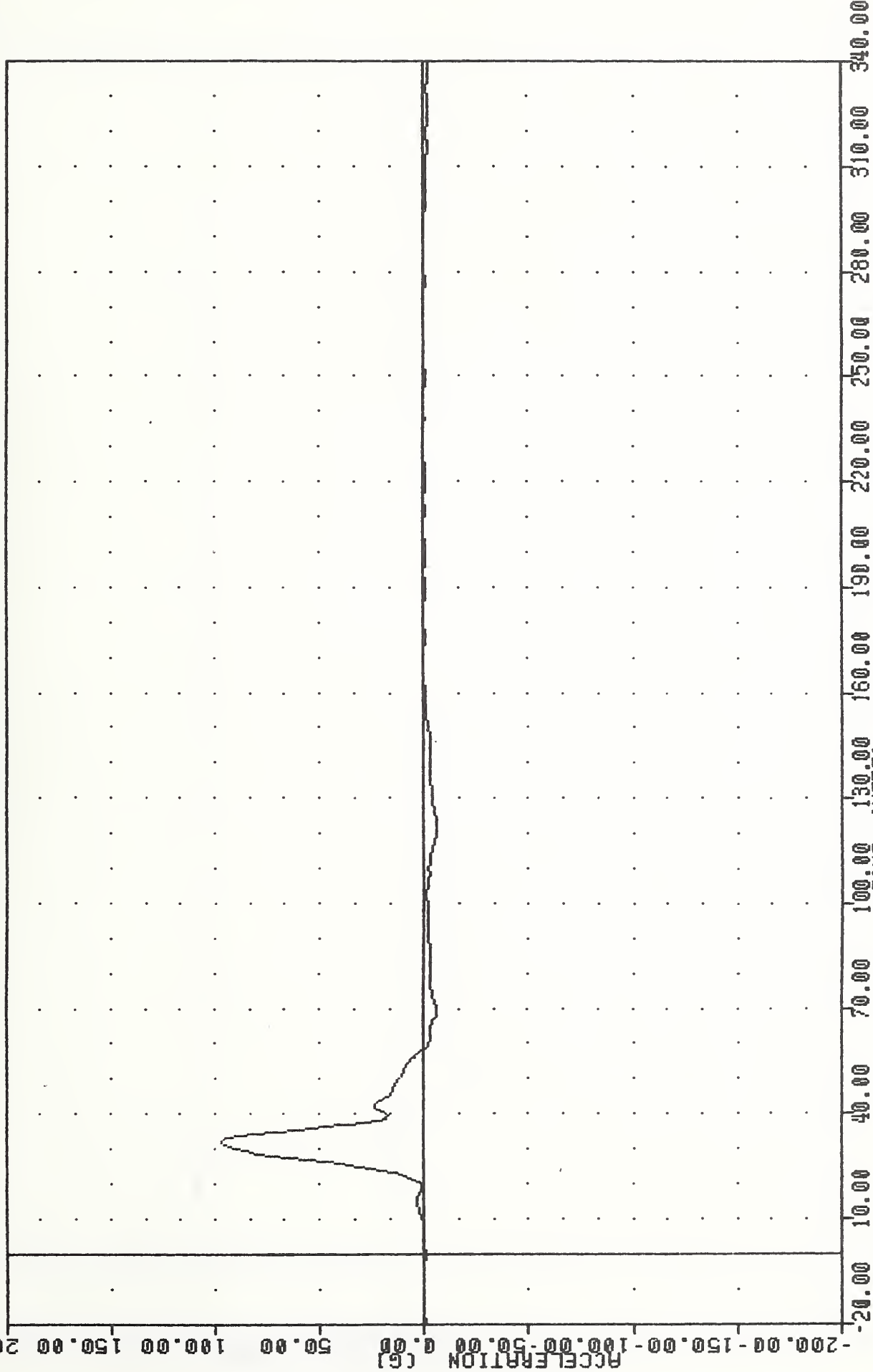
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -38.01g 32.50 , 10.87 g 61.25



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER PELVIS X-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
PEVYG4

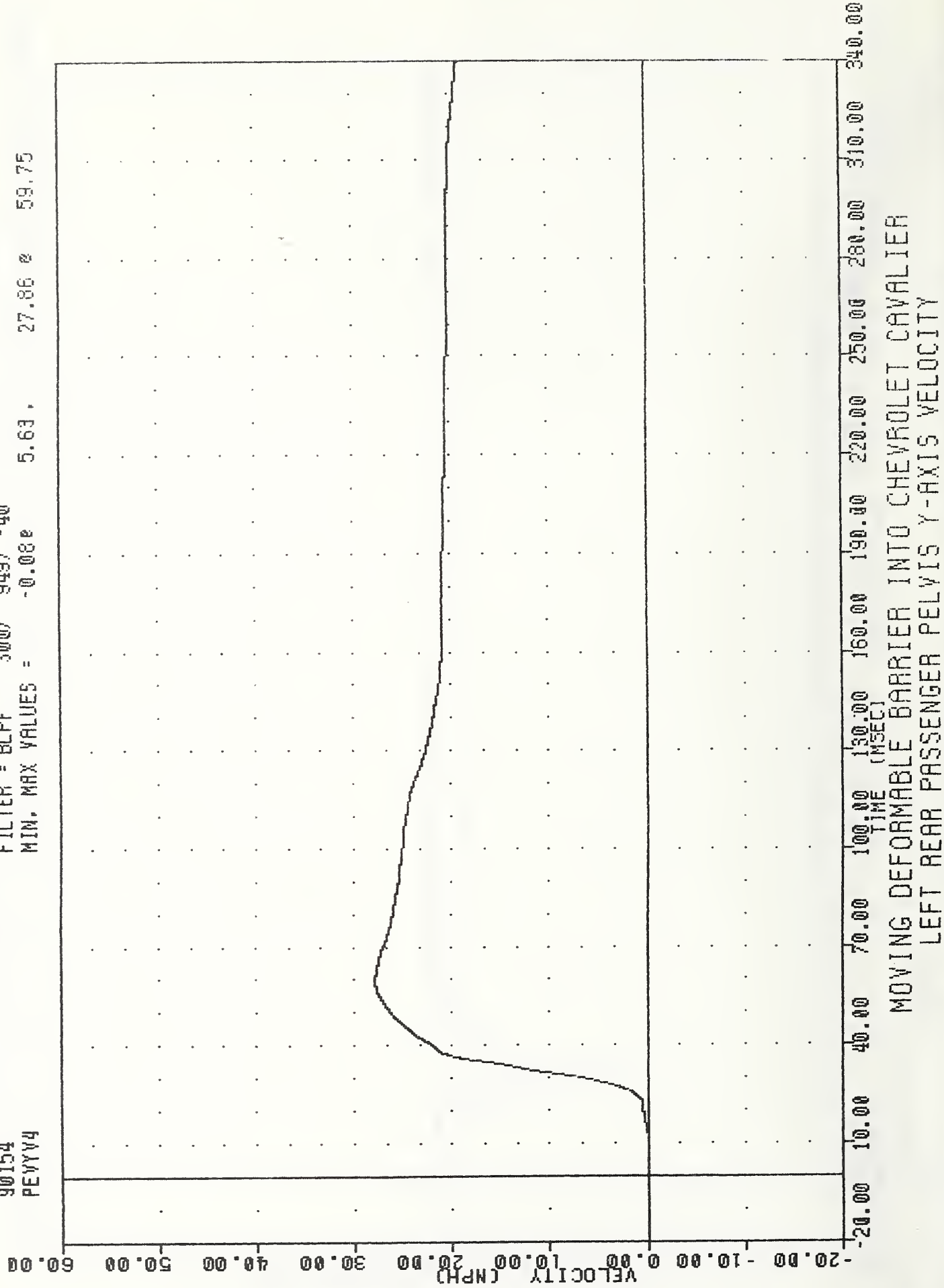
FILTER = HSAI 136/ 189/ -50
MIN. MAX VALUES = -6.58e 69.38 , 96.89 e 31.88



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION

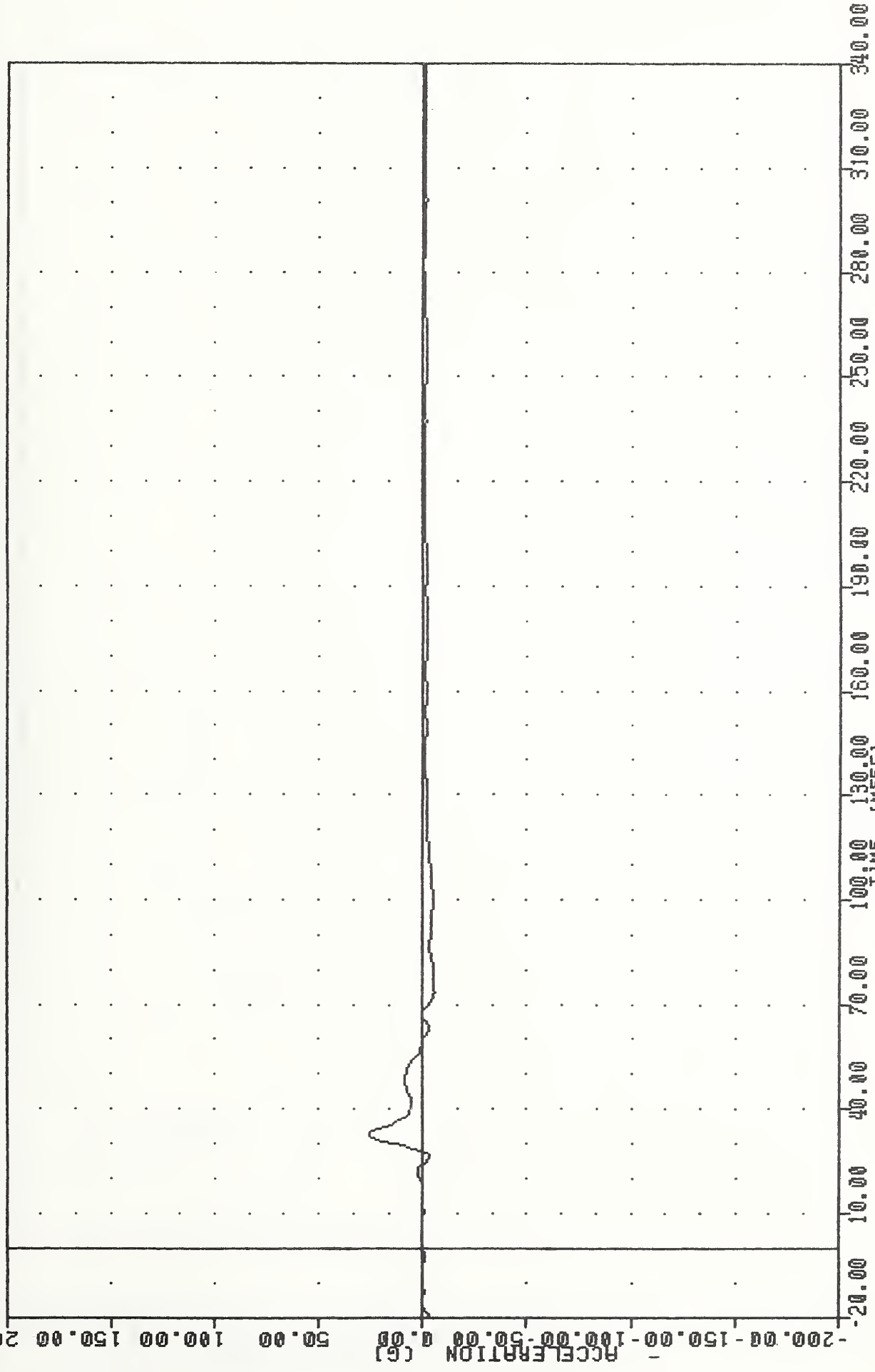
VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
PEVVV4

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.08e 5.63, 27.86 e 59.75



VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 PEVZ64

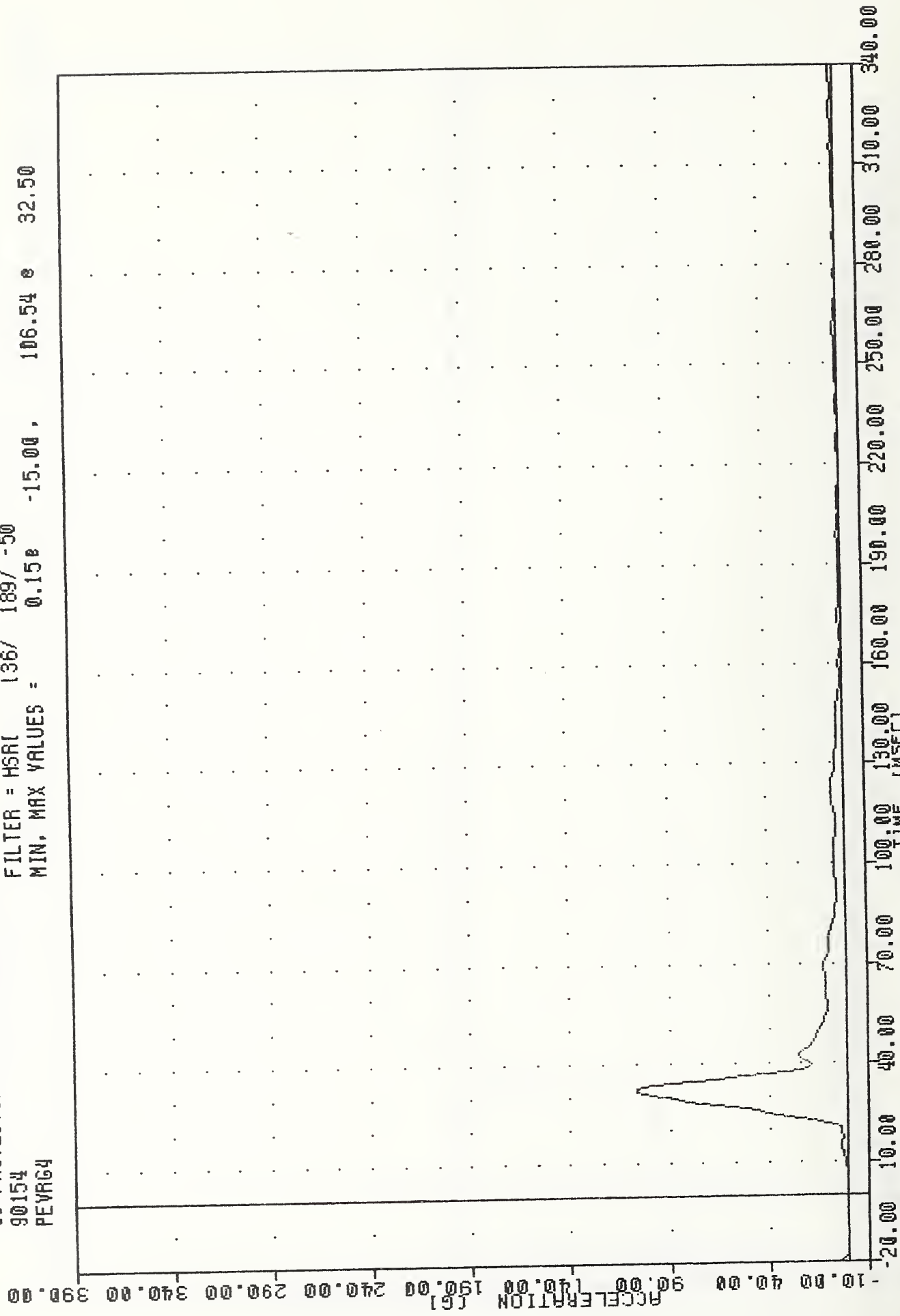
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -5.58 73.75 , 25.81 32.50



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER PELVIS Z-AXIS ACCELERATION

YRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 PEVRG4

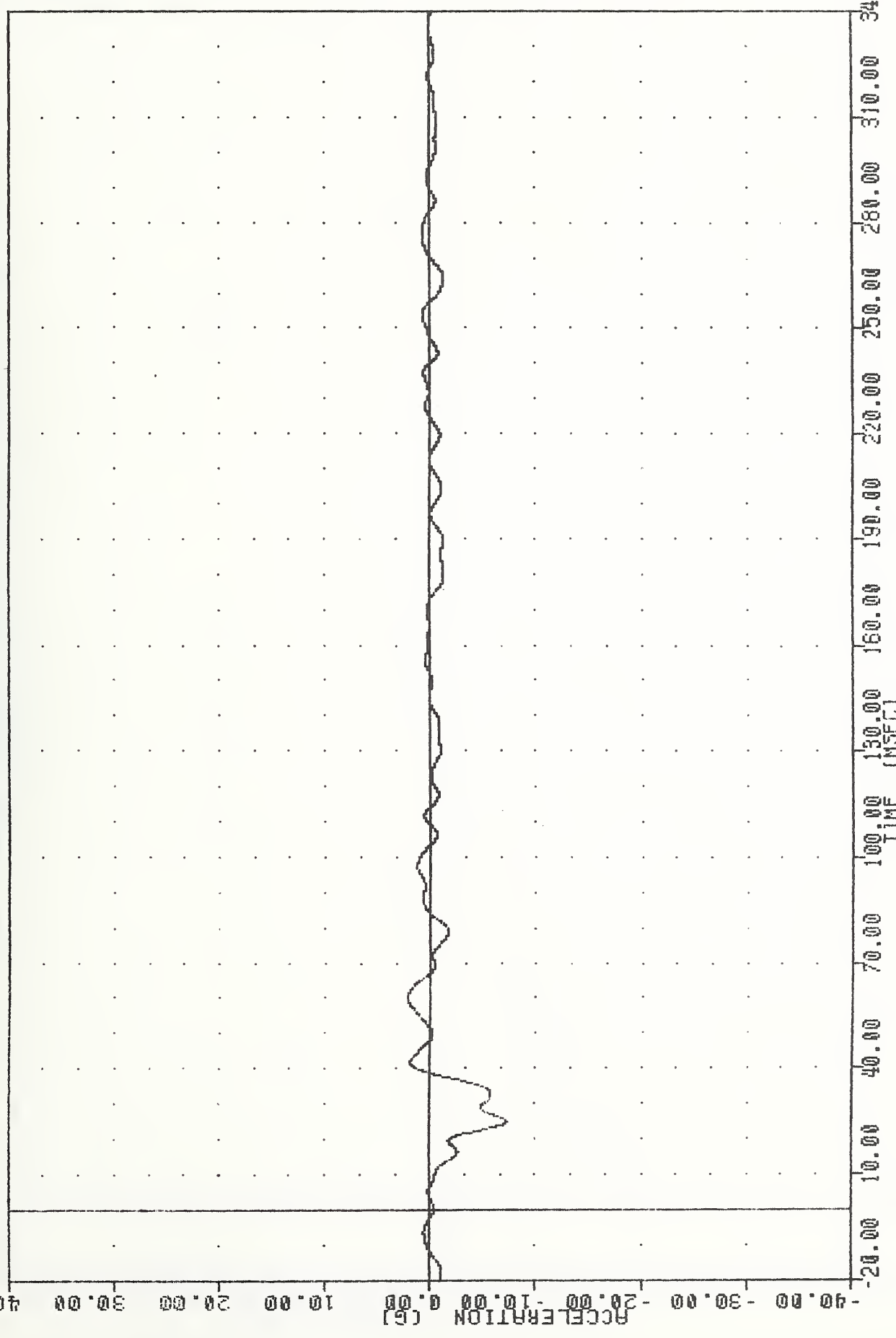
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.15e -15.00 , 106.54 e 32.50



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 LEFT REAR PASSENGER PELVIS RESULTANT ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
AFSXS

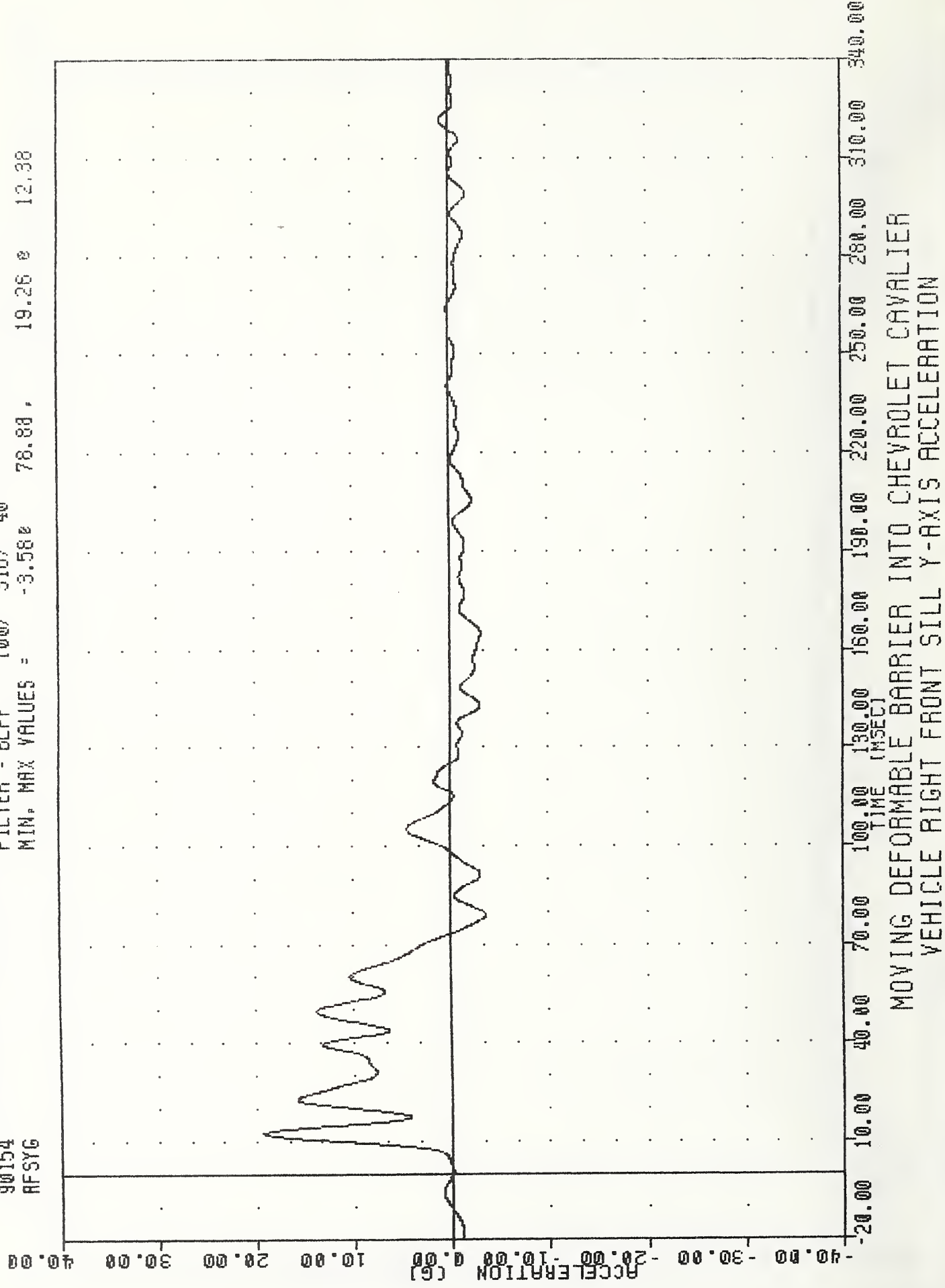
FILTER = 6LPF 100/ 316/ -40
MIN, MAX VALUES = -7.29e 24.88, 2.24 s 60.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE RIGHT FRONT SILL X-AXIS ACCELERATION

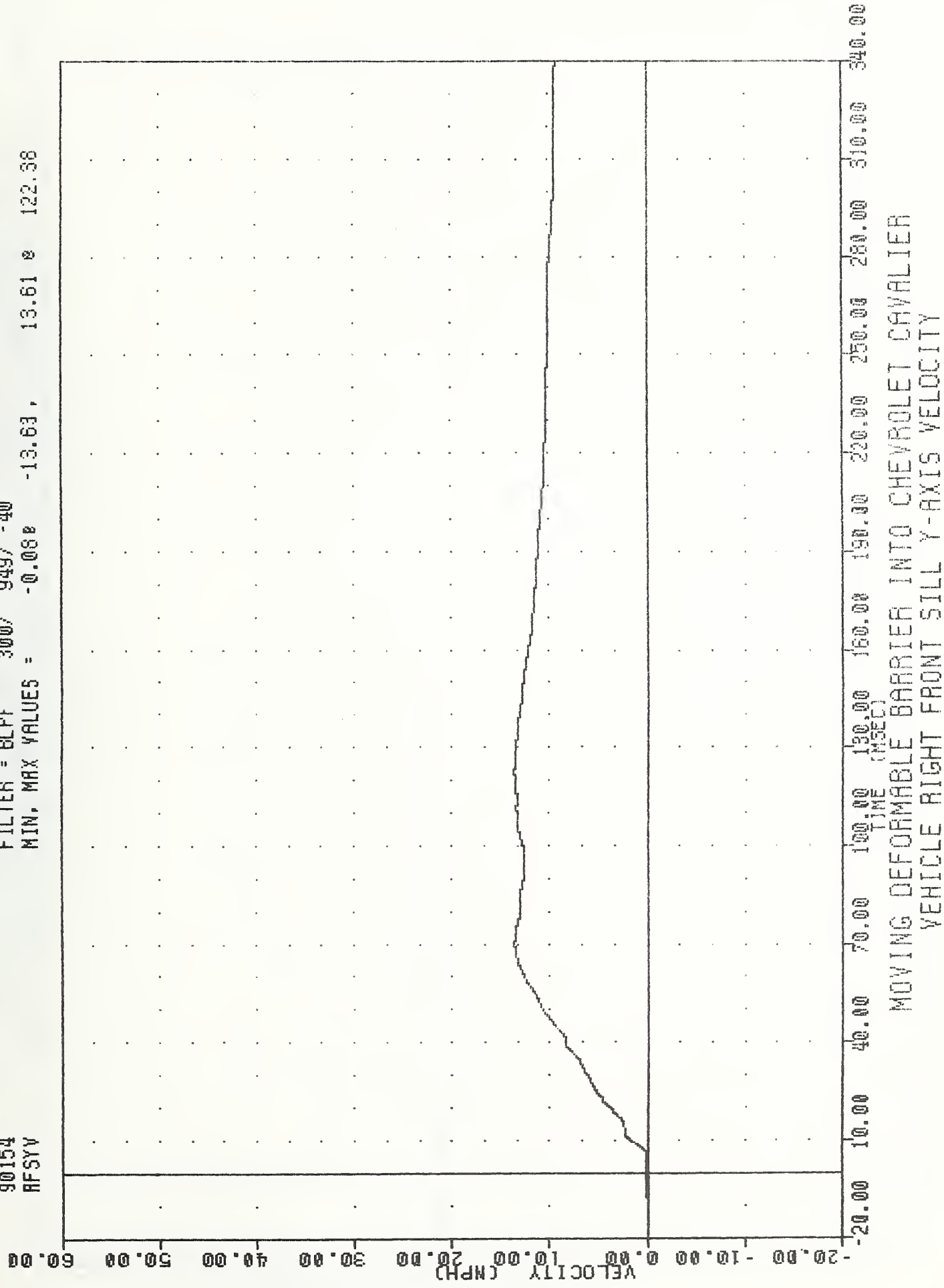
VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
AFSYG

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -3.580 78.88 , 19.26 0 12.38



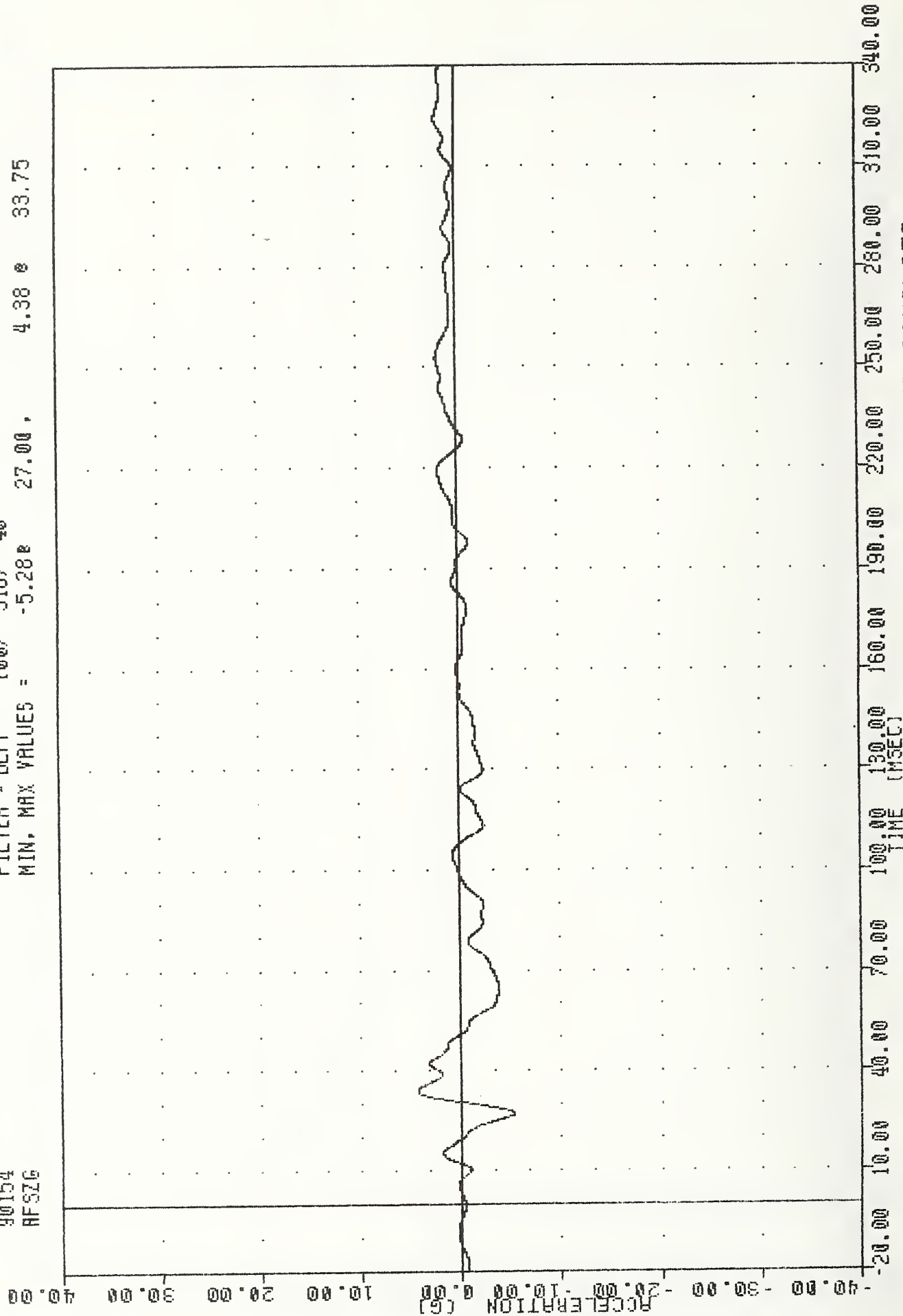
VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
AFSYV

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.088 -13.63 , 13.61 & 122.38



VRTC , 900804
SI PROTECTION PROD VEHICLE
90154
RFSZG

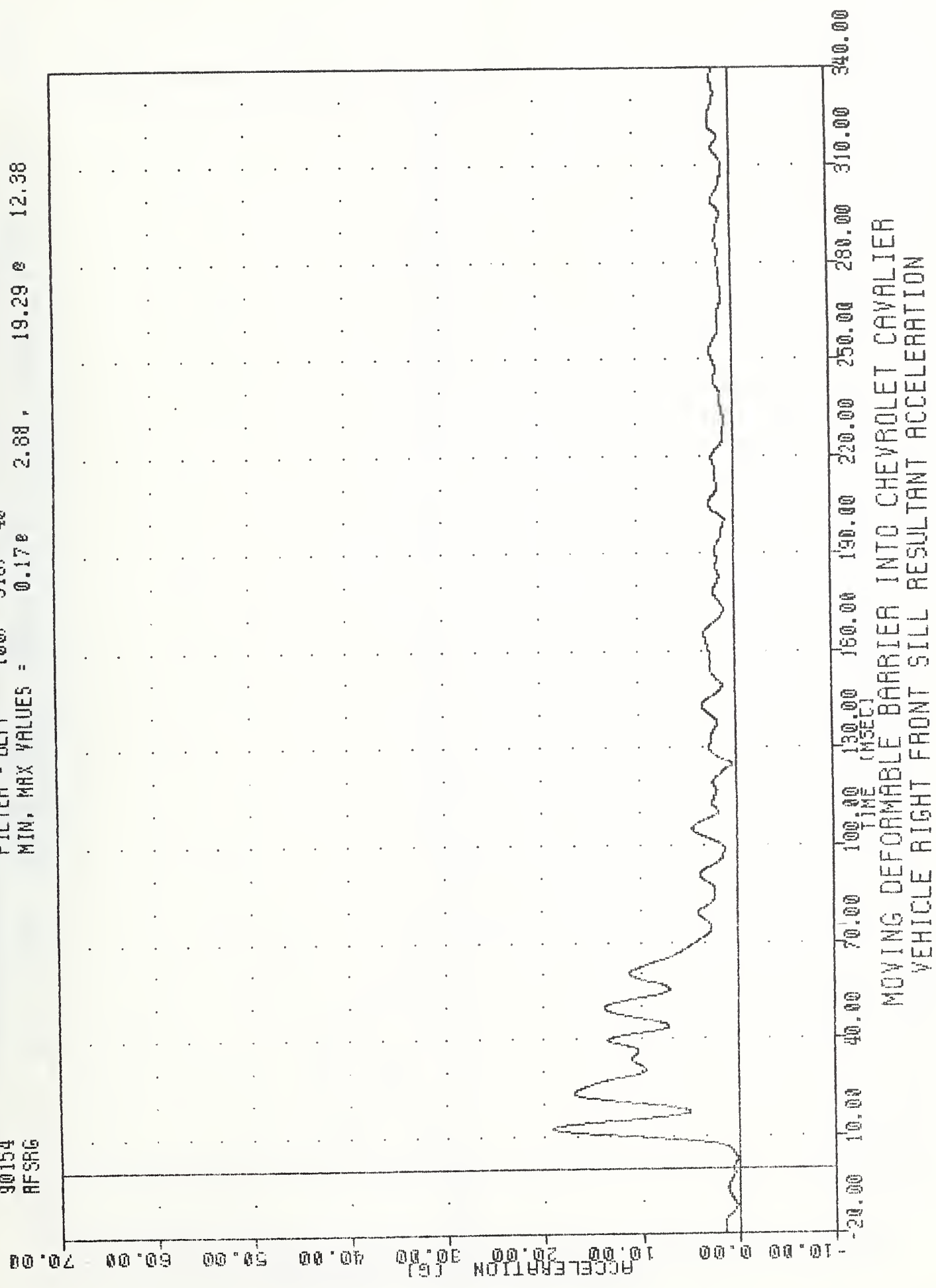
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -5.28 4.38 33.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE RIGHT FRONT SILL Z-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
AFSRG

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = 0.17e 2.88e 19.29e 12.38

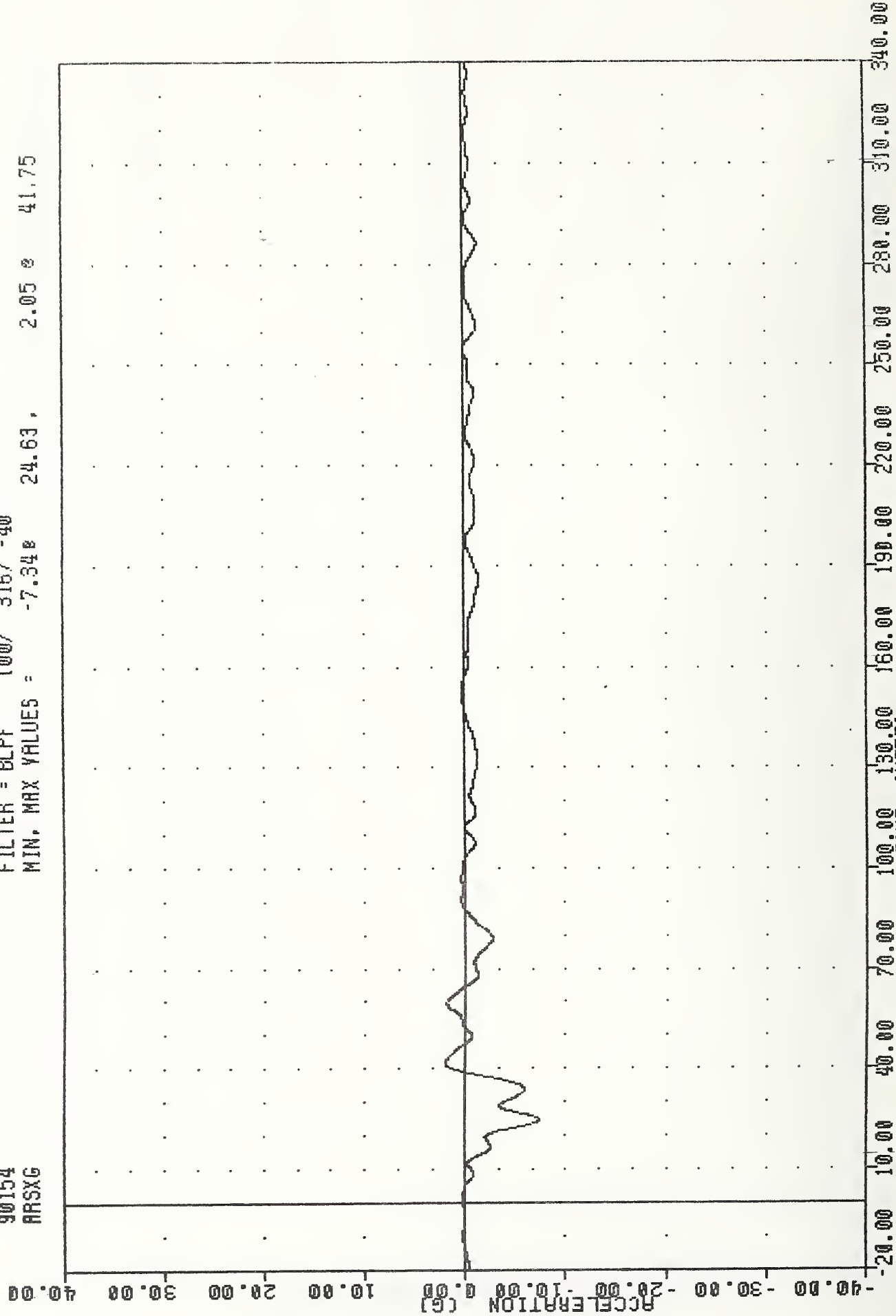


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE RIGHT FRONT SILL RESULTANT ACCELERATION

VRTC
 91 PROTECTION PROD VEHICLE
 90154
 ARSXC

, 900604

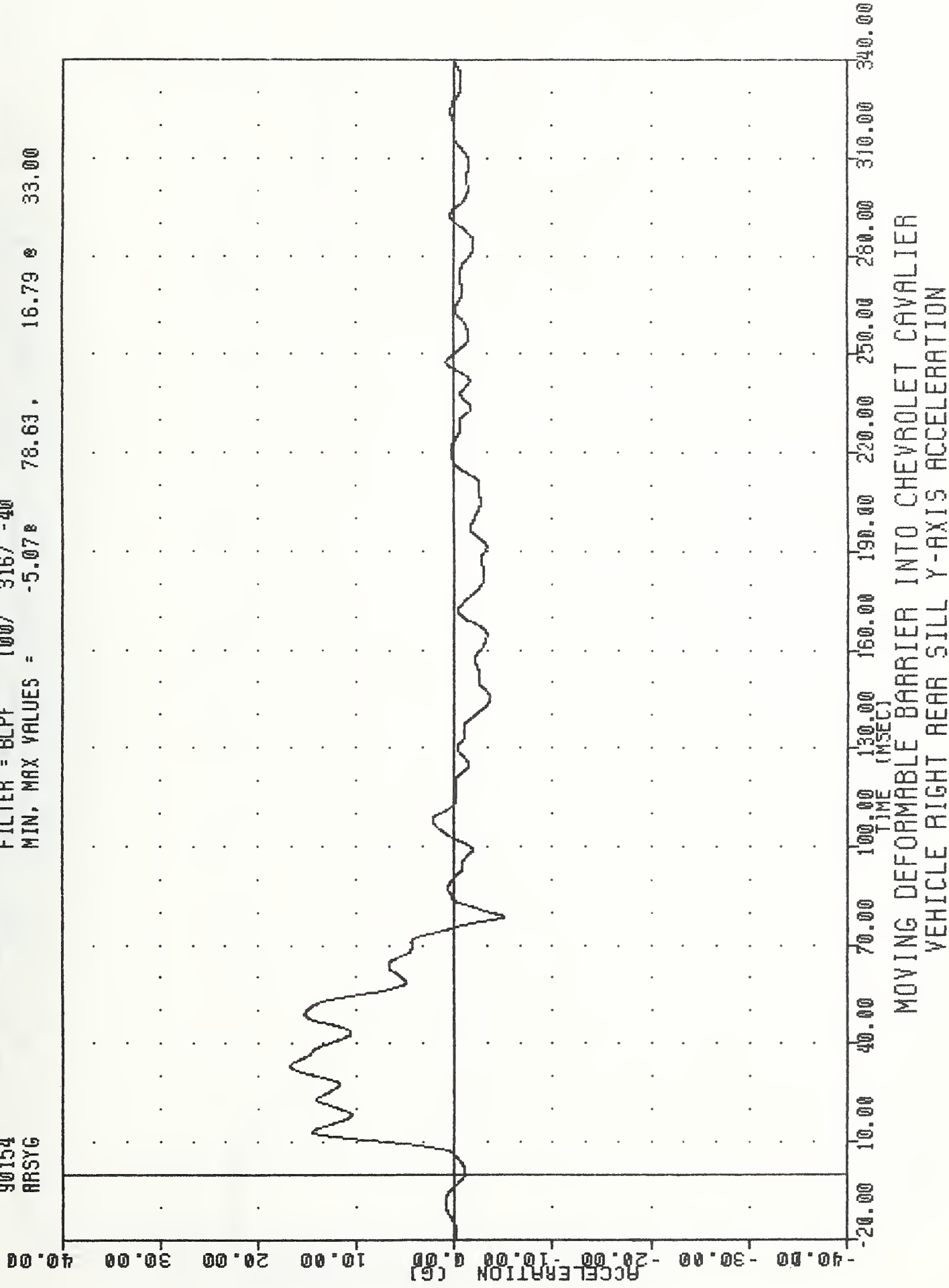
FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -7.348 24.63, 2.05 41.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 VEHICLE RIGHT REAR SILL X-AXIS ACCELERATION

YRTC , 900604
SI PROTECTION PROD VEHICLE
90154
AR5YG

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -5.078 78.63, 16.79 33.00



VRTC
SI PROTECTION PROD VEHICLE
90154
ARSYV

900604

FILTER = BLFF 300/ 949/ -40
MIN, MAX VALUES = -0.010 -16.75, 15.53 0 71.63

VELOCITY (MPH)

60.00

50.00

40.00

30.00

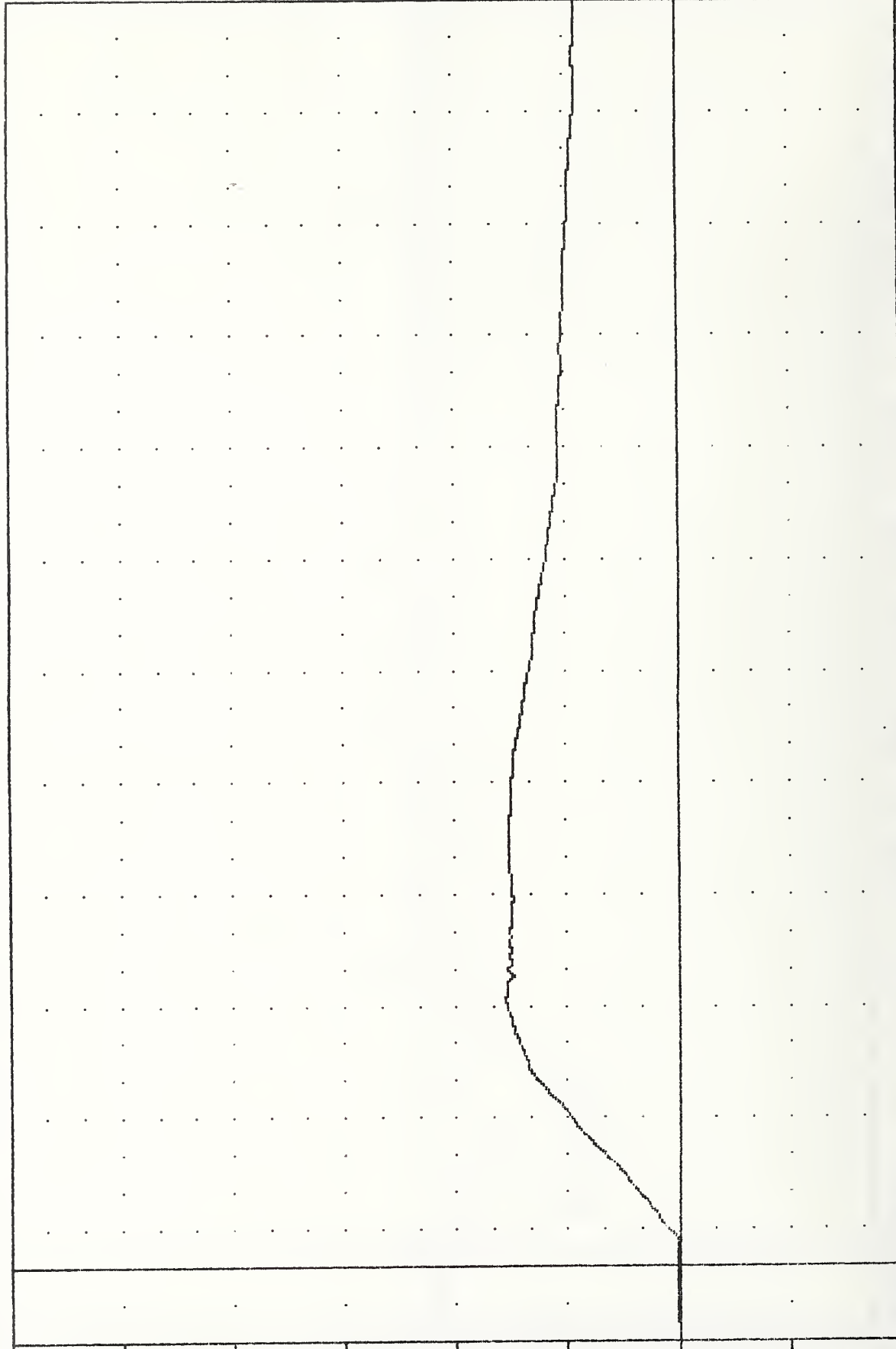
20.00

10.00

0.00

-10.00

-20.00



-20.00

-10.00

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

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220.00

230.00

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260.00

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280.00

290.00

300.00

310.00

320.00

330.00

340.00

350.00

360.00

370.00

380.00

390.00

400.00

410.00

420.00

430.00

440.00

450.00

460.00

470.00

480.00

490.00

500.00

510.00

520.00

530.00

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550.00

560.00

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580.00

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660.00

670.00

680.00

690.00

700.00

710.00

720.00

730.00

740.00

750.00

760.00

770.00

780.00

790.00

800.00

810.00

820.00

830.00

840.00

850.00

860.00

870.00

880.00

890.00

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970.00

980.00

990.00

1000.00

1010.00

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1030.00

1040.00

1050.00

1060.00

1070.00

1080.00

1090.00

1100.00

1110.00

1120.00

1130.00

1140.00

1150.00

1160.00

1170.00

1180.00

1190.00

1200.00

1210.00

1220.00

1230.00

1240.00

1250.00

1260.00

1270.00

1280.00

1290.00

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1490.00

1500.00

1510.00

1520.00

1530.00

1540.00

1550.00

1560.00

1570.00

1580.00

1590.00

1600.00

1610.00

1620.00

1630.00

1640.00

1650.00

1660.00

1670.00

1680.00

1690.00

1700.00

1710.00

1720.00

1730.00

1740.00

1750.00

1760.00

1770.00

1780.00

1790.00

1800.00

1810.00

1820.00

1830.00

1840.00

1850.00

1860.00

1870.00

1880.00

1890.00

1900.00

1910.00

1920.00

1930.00

1940.00

1950.00

1960.00

1970.00

1980.00

1990.00

2000.00

2010.00

2020.00

2030.00

2040.00

2050.00

2060.00

2070.00

2080.00

2090.00

2100.00

2110.00

2120.00

2130.00

2140.00

2150.00

2160.00

2170.00

2180.00

2190.00

2200.00

2210.00

2220.00

2230.00

2240.00

2250.00

2260.00

2270.00

2280.00

2290.00

2300.00

2310.00

2320.00

2330.00

2340.00

2350.00

2360.00

2370.00

2380.00

2390.00

2400.00

2410.00

2420.00

2430.00

2440.00

2450.00

2460.00

2470.00

2480.00

2490.00

2500.00

2510.00

2520.00

2530.00

2540.00

2550.00

2560.00

2570.00

2580.00

2590.00

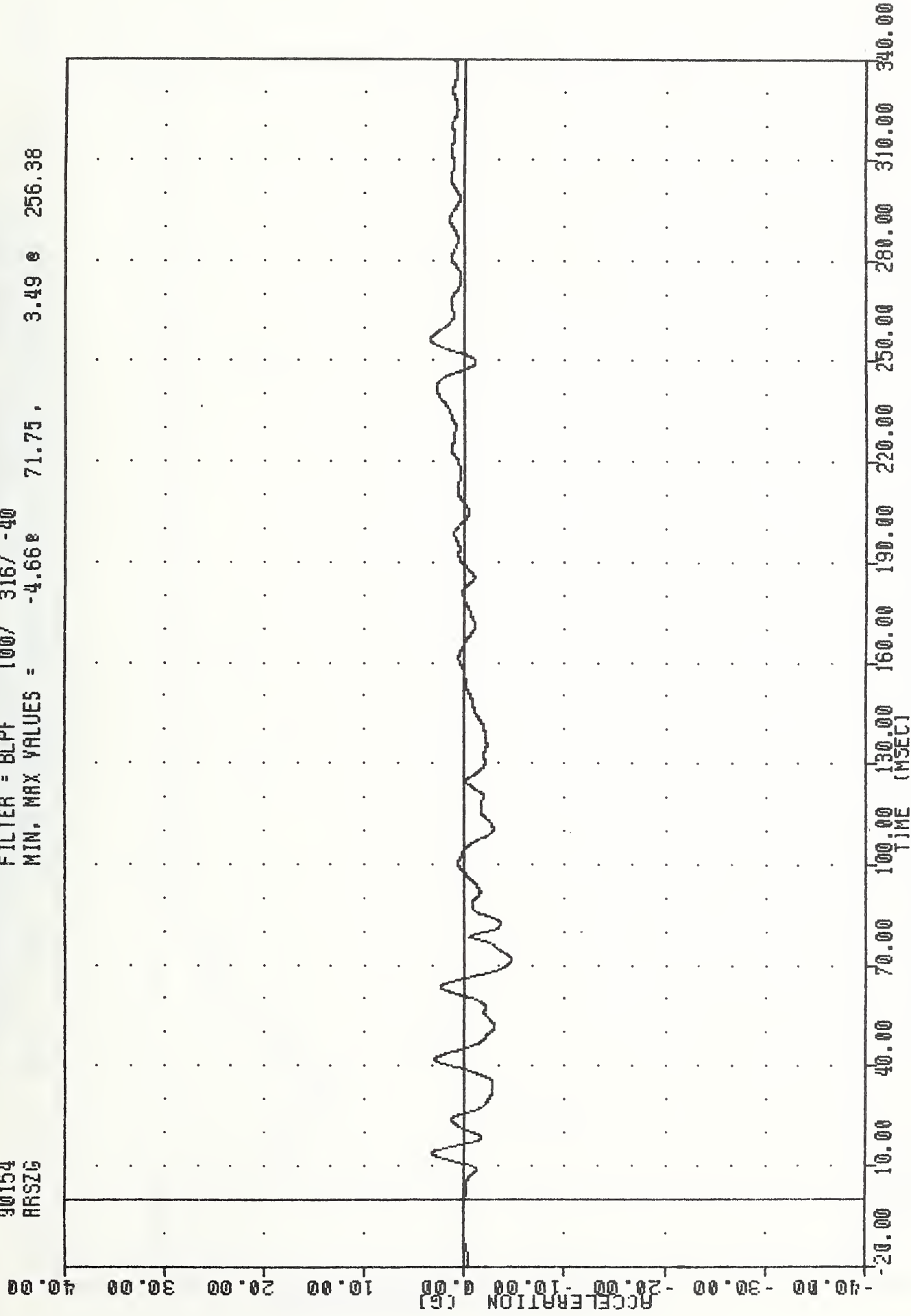
2600.00

2610.00

2620.00

VRTC , 900604
SI PROTECTION PROD VEHICLE
30154
ARSZG

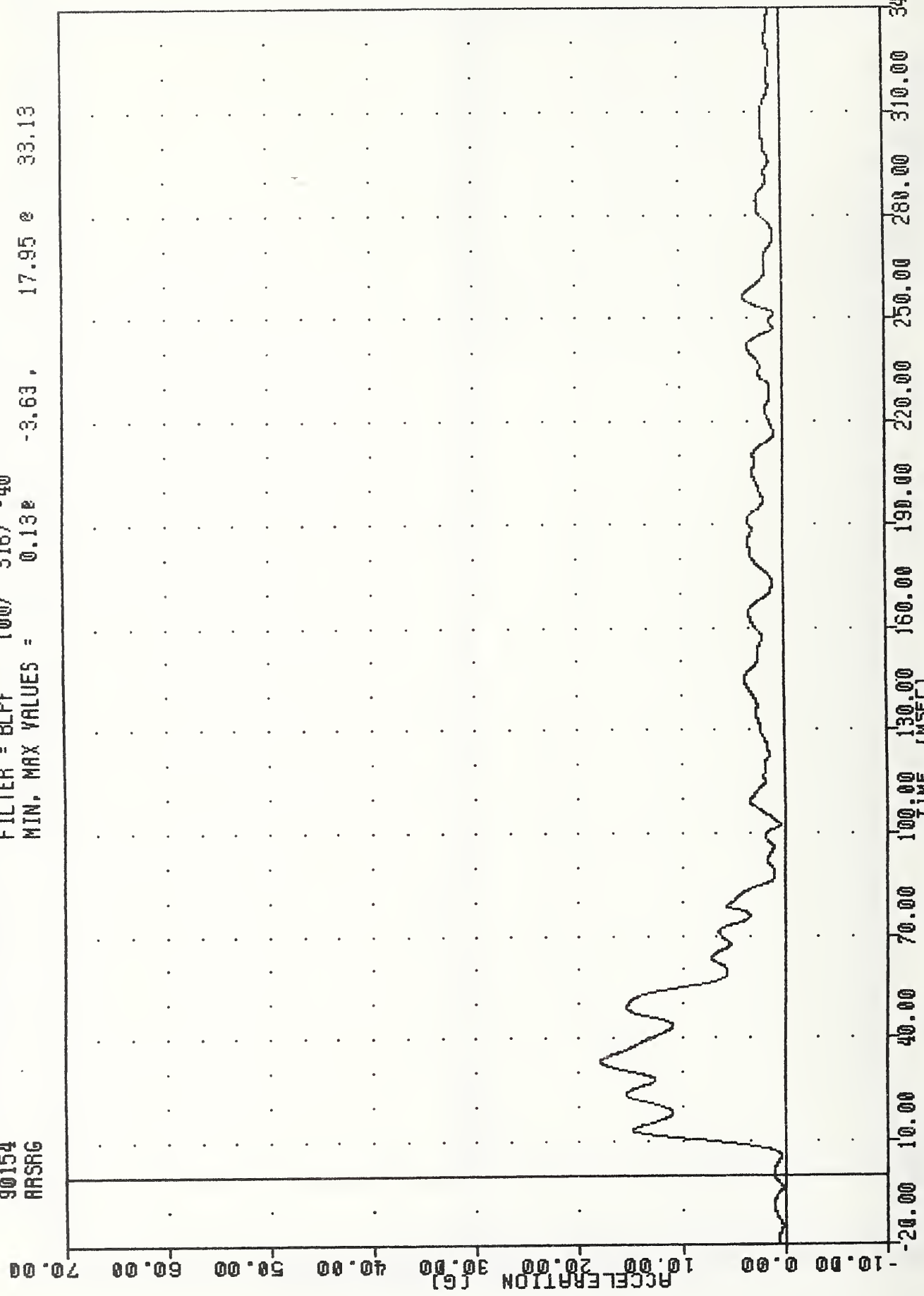
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -4.66 71.75, 3.49 256.38



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE RIGHT REAR SILL Z-AXIS ACCELERATION

VRTC
 SI PROTECTION PROD VEHICLE
 90154
 RRSRG

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = 0.13e -3.63, 17.95 e 33.13

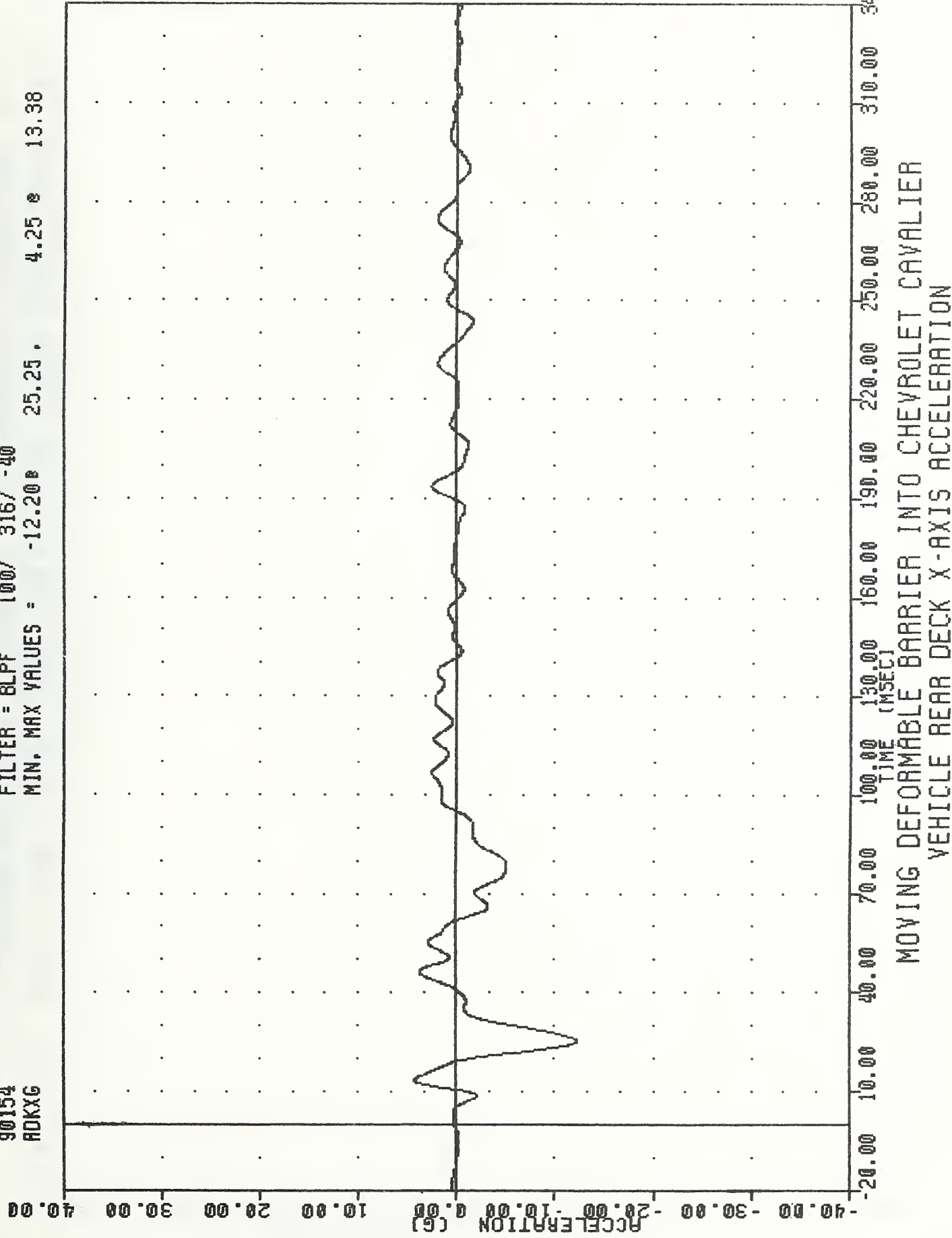


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 VEHICLE RIGHT REAR SILL RESULTANT ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
ADKXG

FILTER = 8LPF 100/ 316/ -40
MIN. MAX VALUES = -12.20 25.25

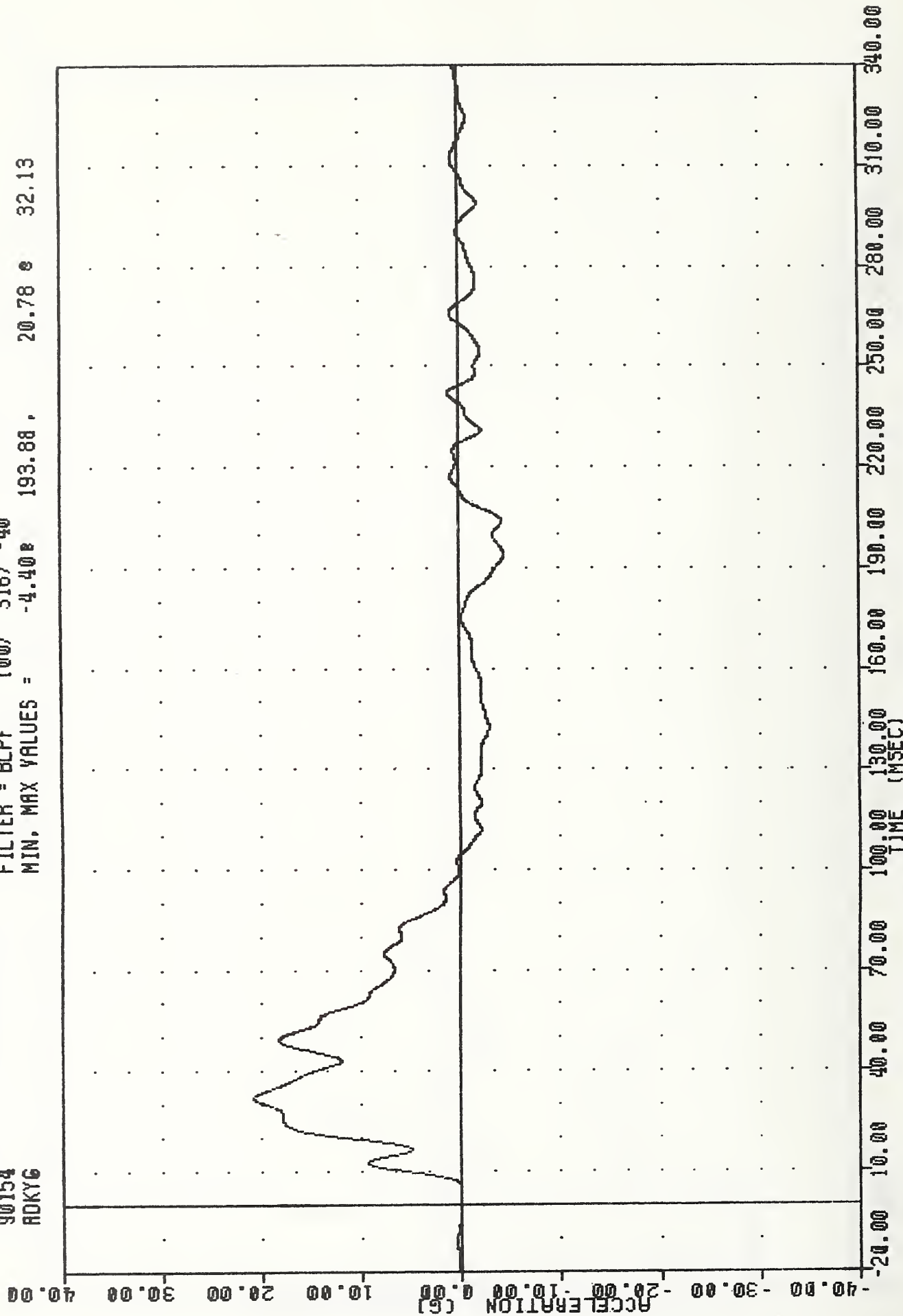
4.25 13.38



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE REAR DECK X-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
ADKY6

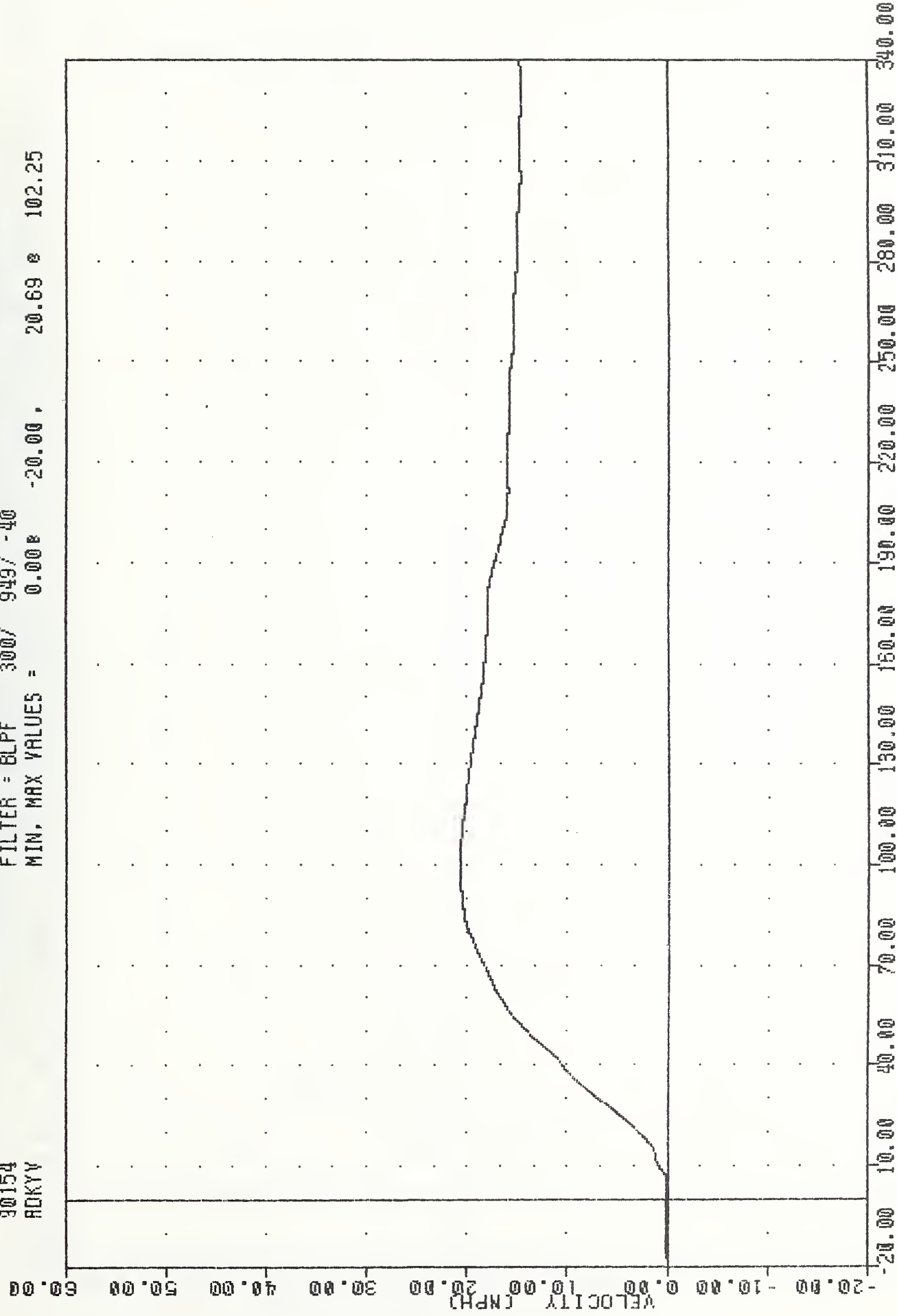
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -4.40e 193.88 , 20.78 e 32.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE REAR DECK Y-AXIS ACCELERATION

WRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 ADKYY

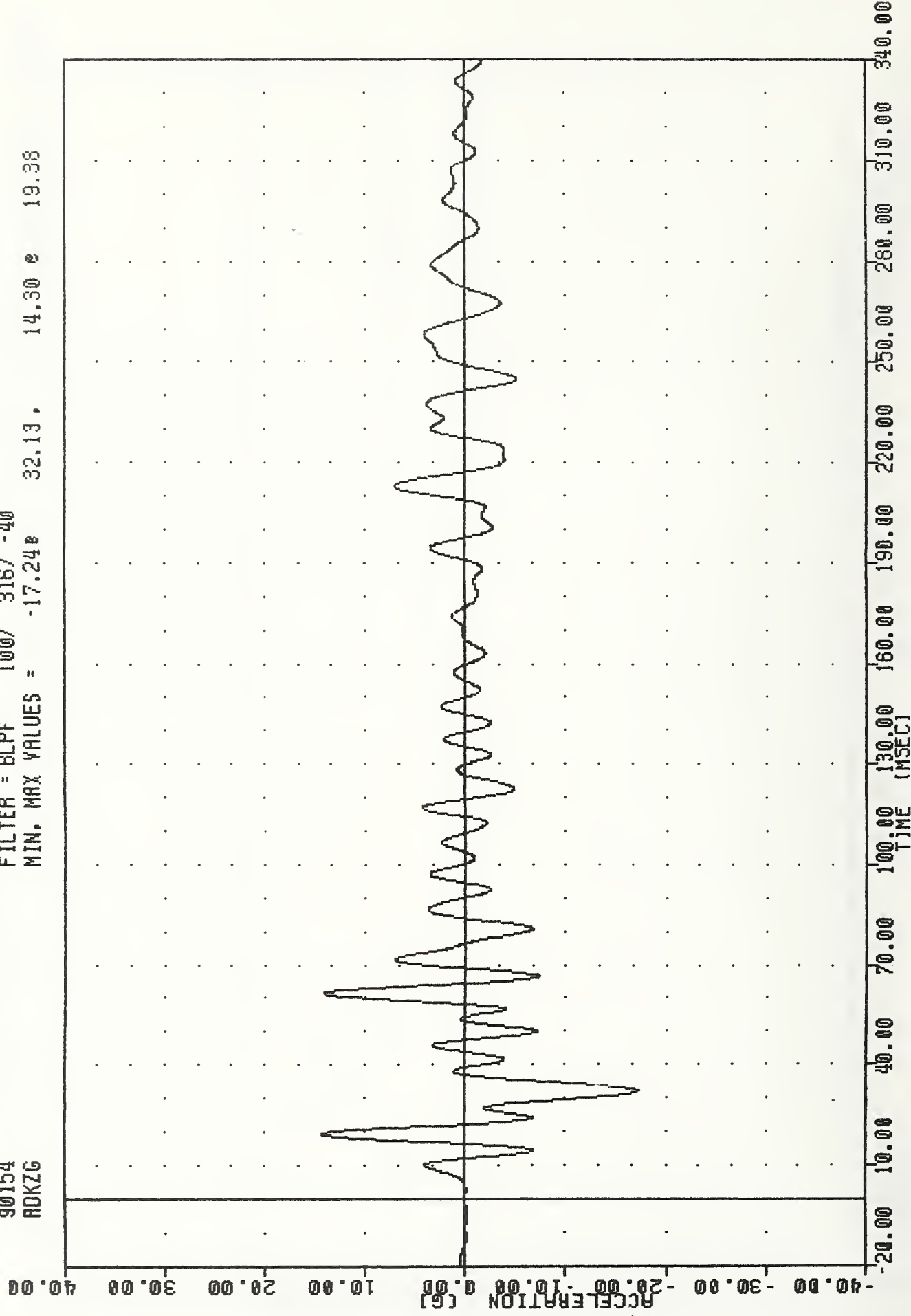
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 0.000 -20.00, 20.69 @ 102.25



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 VEHICLE REAR DECK Y-AXIS VELOCITY

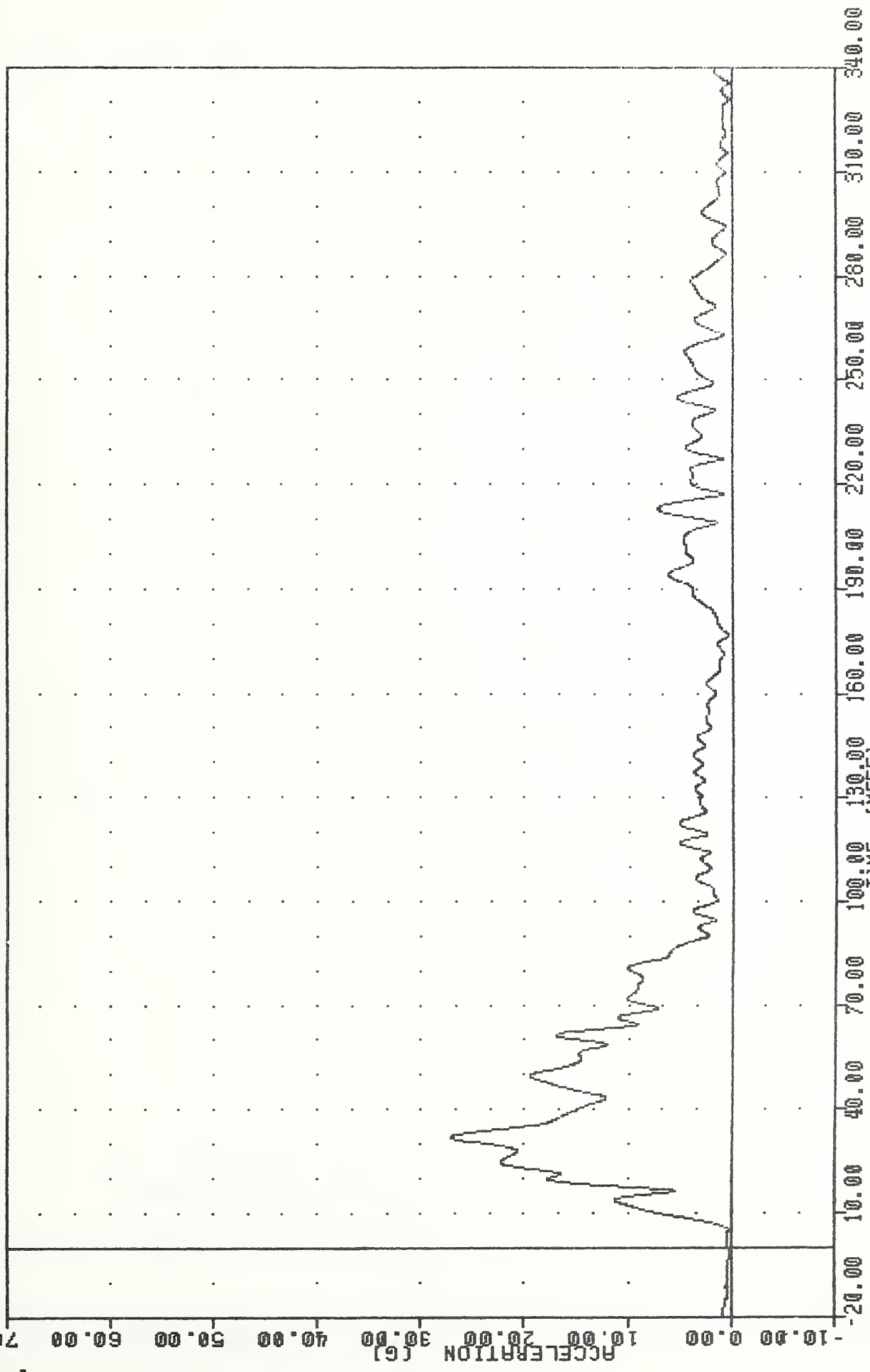
VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
ADKZG

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -17.24e 32.13, 14.30 e 19.38



YRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 RDKRG

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = 0.038 -1.88, 27.11 e 32.00

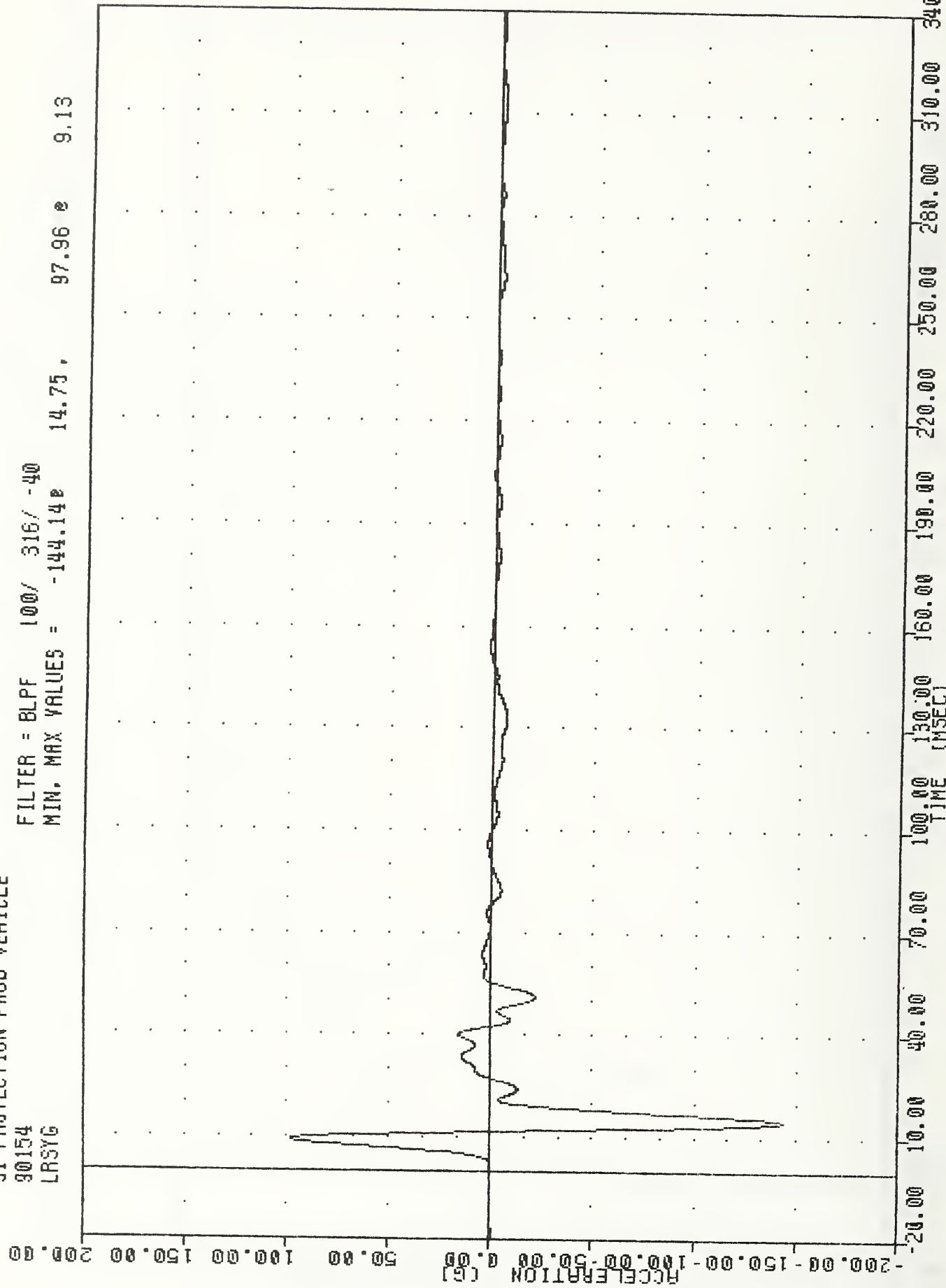


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 VEHICLE REAR DECK RESULTANT ACCELERATION

VRTC
SI PROTECTION PROD VEHICLE
90154
LRSYG

900604

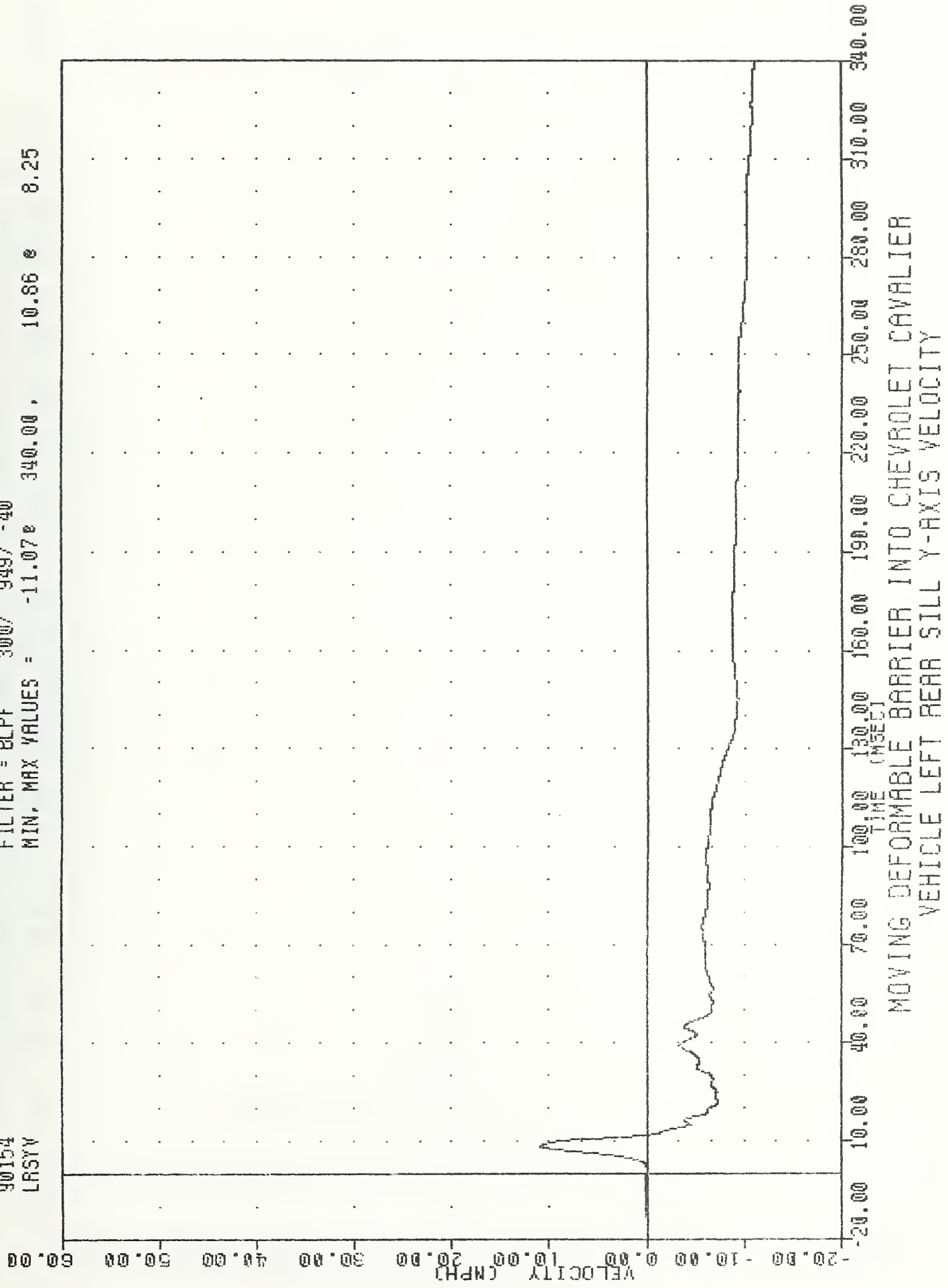
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -144.14e 14.75, 97.96 e 9.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE LEFT REAR SILL Y-AXIS ACCELERATION

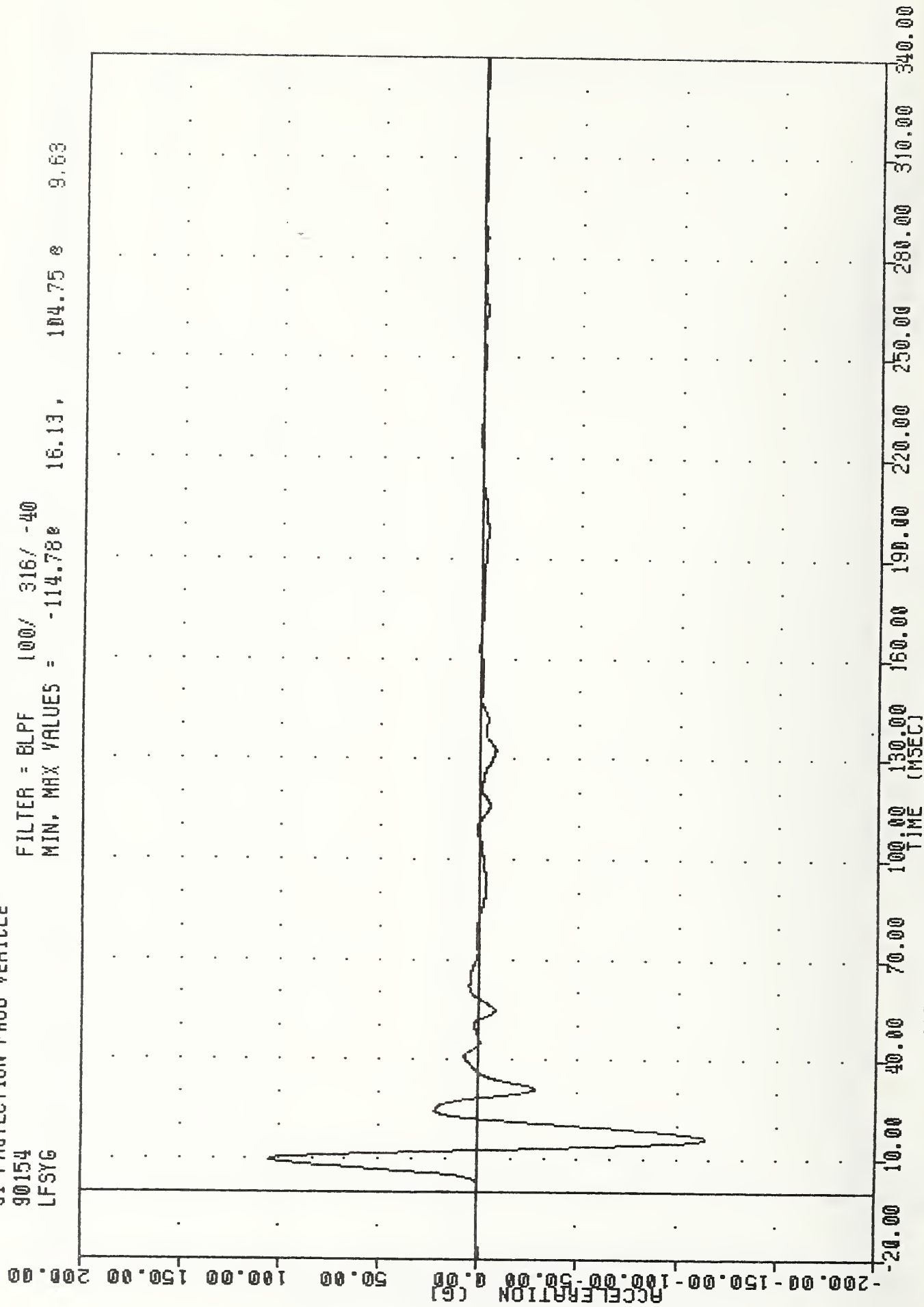
VRTC 800604
SI PROTECTION PROD VEHICLE
90154
LRSYV

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -11.07e 340.00, 10.86 e 8.25



VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LFSYG

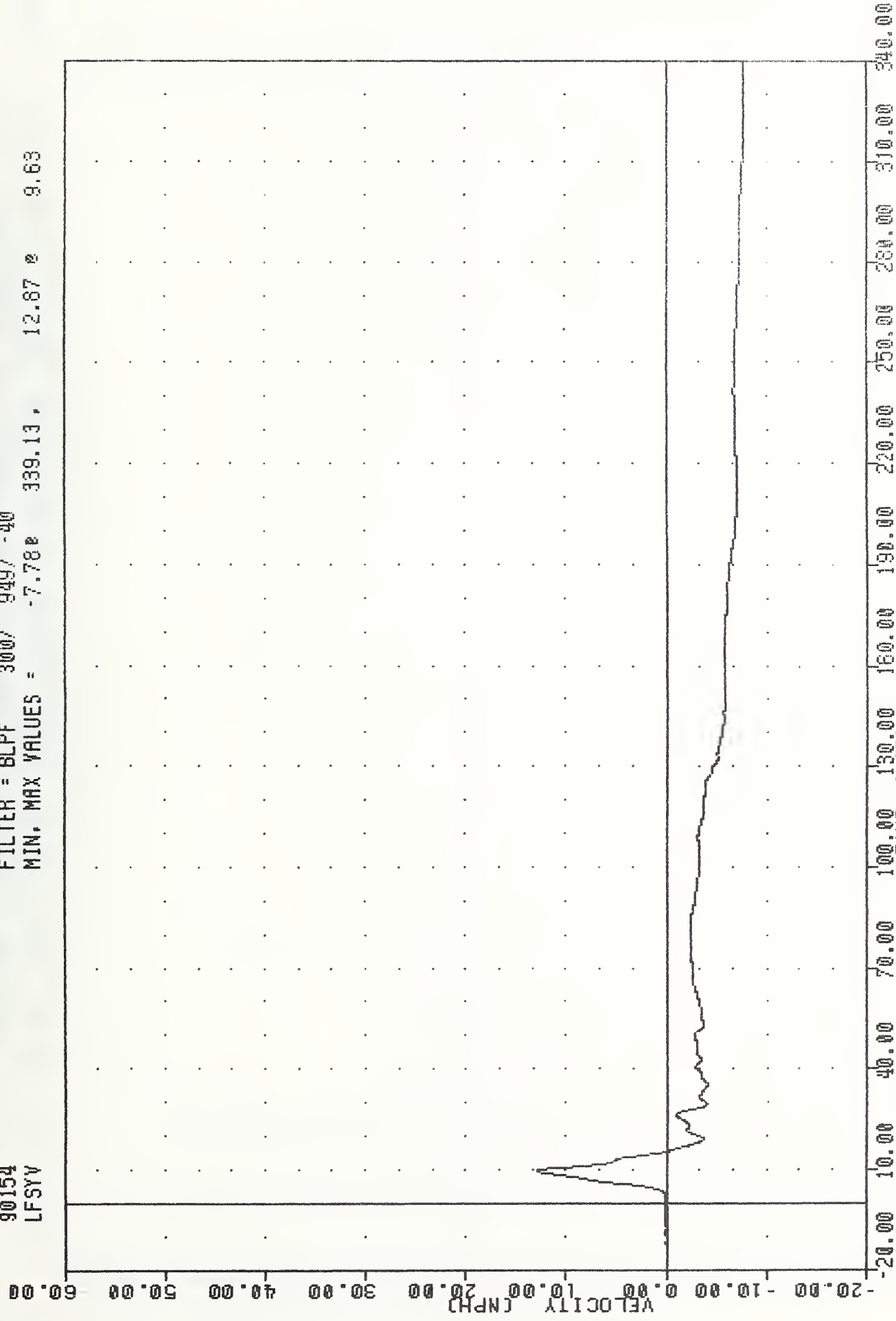
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -114.78e 16.13, 104.75 e 9.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE LEFT FRONT SILL Y-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LFSYV

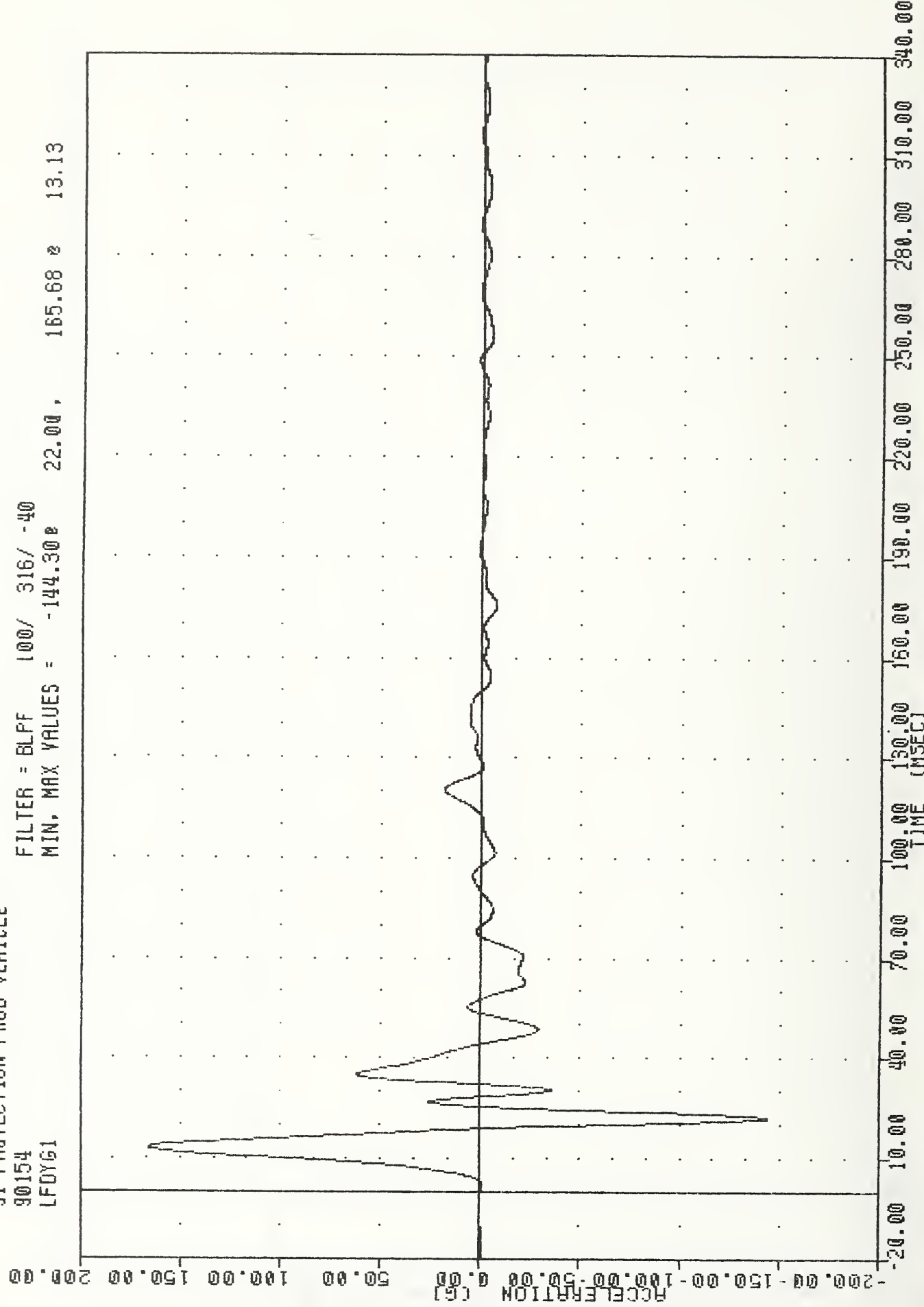
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -7.78e 339.13 , 12.87 e 9.63



VRTC
SI PROTECTION PROD VEHICLE
90154
LFOYG1

, 900604

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -144.30e 22.00, 165.68 e 13.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE LEFT FRONT DOOR (POSITION 6) Y-AXIS ACCELERATION

VRTC , 900604

SI PROTECTION PROD VEHICLE

90154

LFDYV1

FILTER = BLPF 300/ 949/ -40

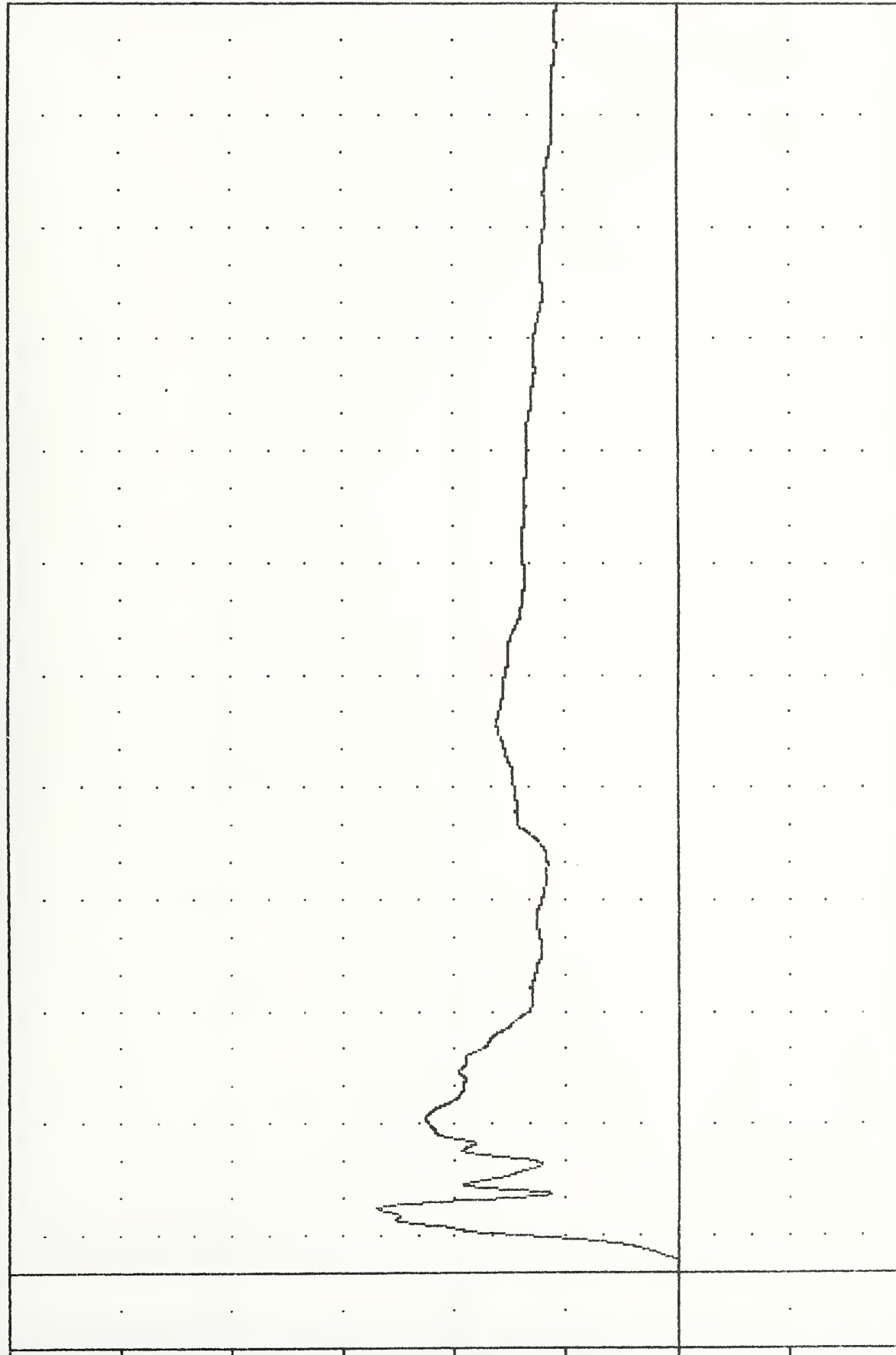
MIN, MAX VALUES = -0.12e

-13.75 ,

26.95 e

17.25

VELOCITY (MPH)

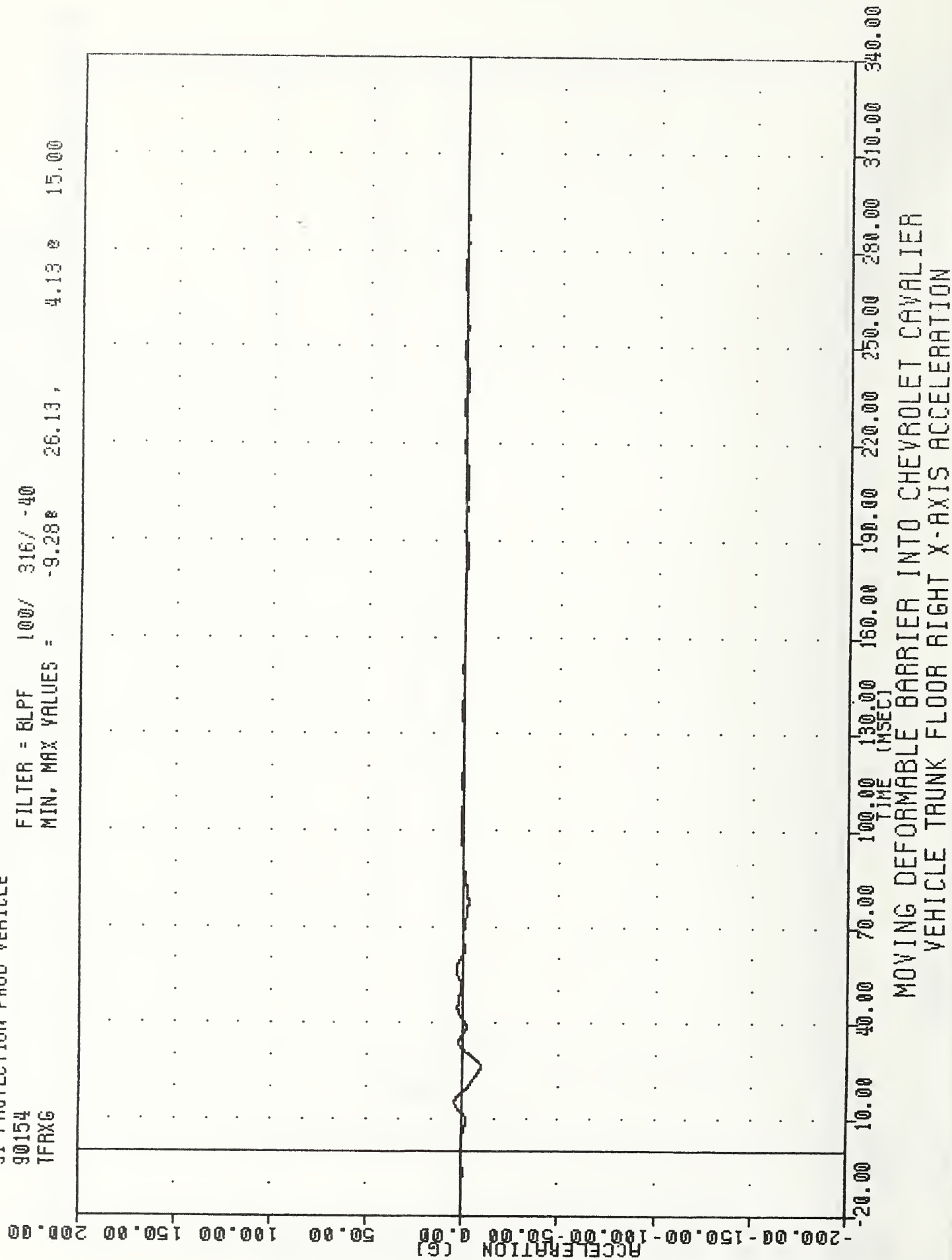


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER

VEHICLE LEFT FRONT DOOR (POSITION 6) Y-AXIS VELOCITY

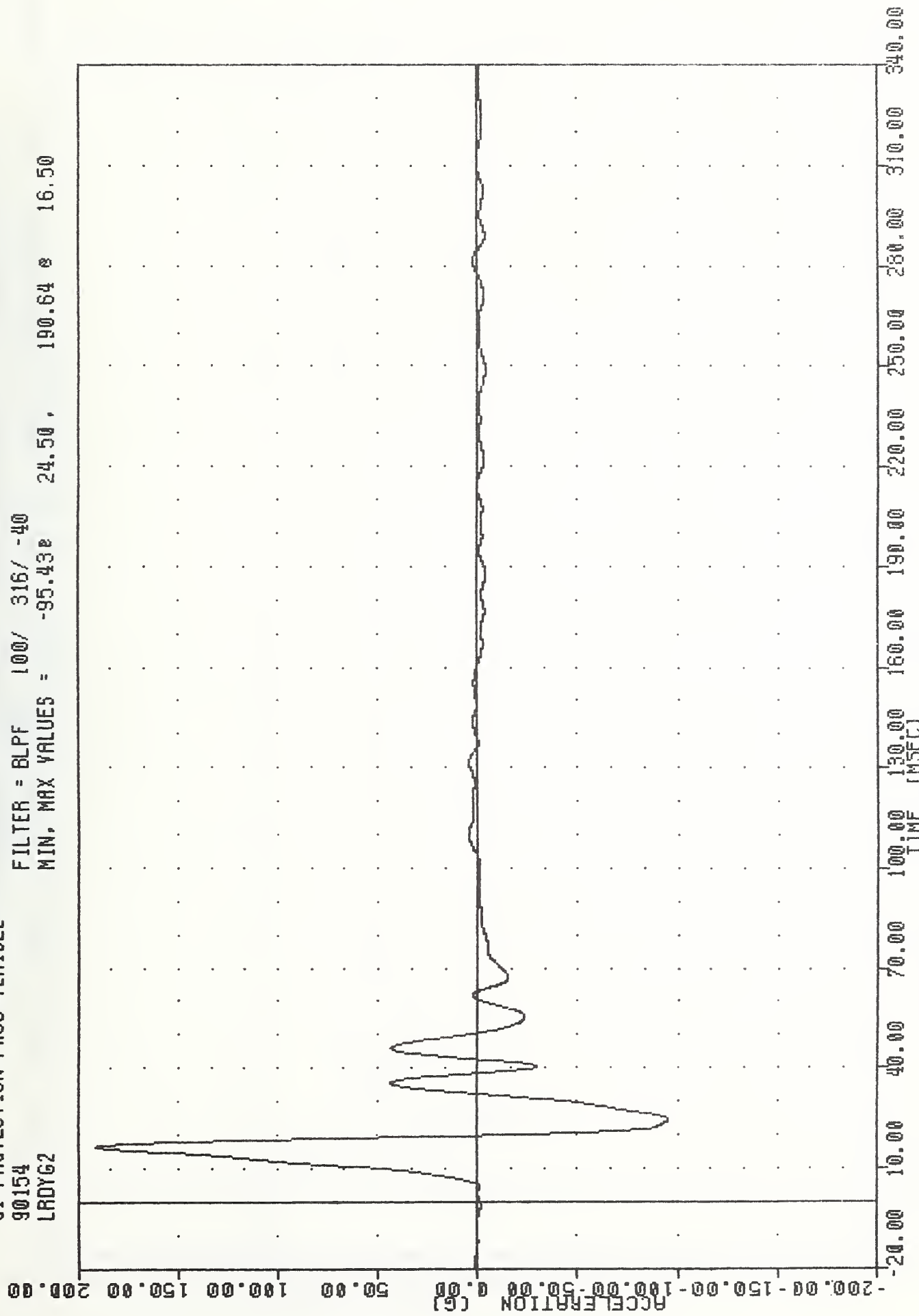
VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 TFRXG

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -9.28 26.13 , 4.13 15.00



VRTC , 900604
SI PROTECTION PROO VEHICLE
90154
LADY62

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -95.43e 24.50 , 190.64 e 16.50

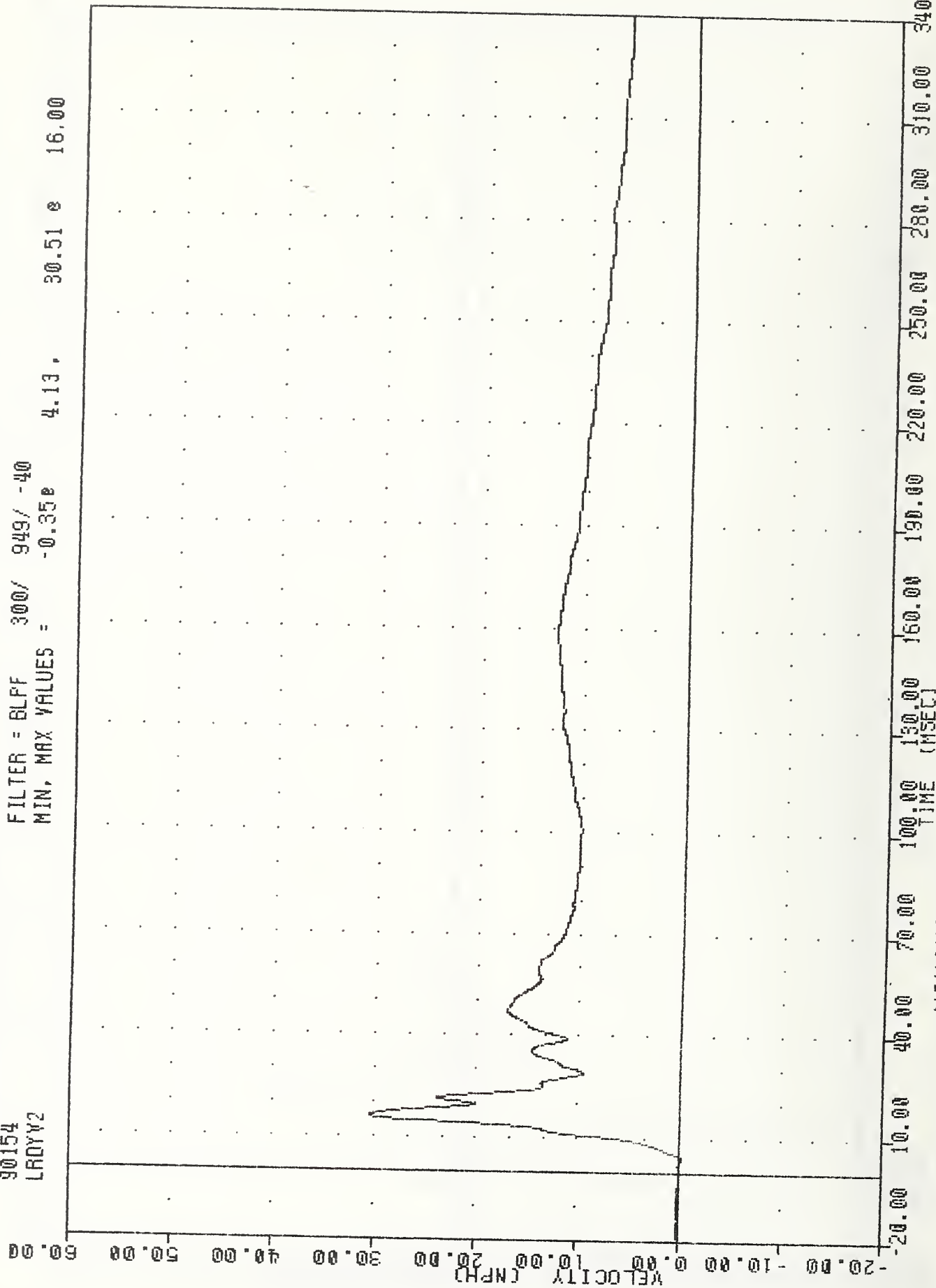


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE LEFT REAR DOOR MID REAR (POSITION 8) Y-AXIS ACCELERATION

VRTC
 SI PROTECTION PROD VEHICLE
 90154
 LADYV2

* 900504

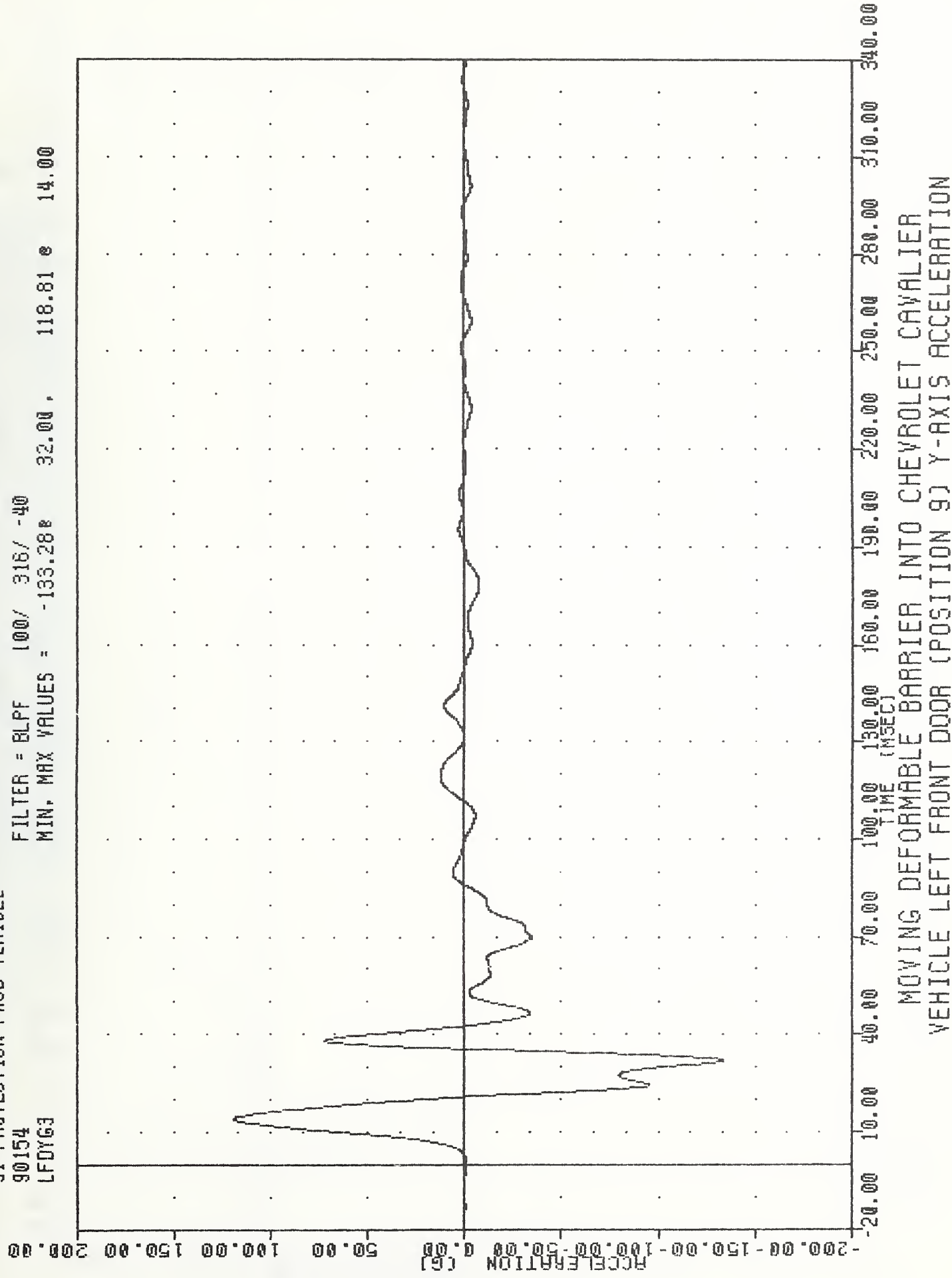
FILTER = BLFF 300/ 949/ -40
 MIN, MAX VALUES = -0.35 e 4.13 , 30.51 e 16.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 VEHICLE LEFT REAR DOOR MID REAR (POSITION 8) Y-AXIS VELOCITY

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LFDY63

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -133.288 32.00 , 118.81 e 14.00

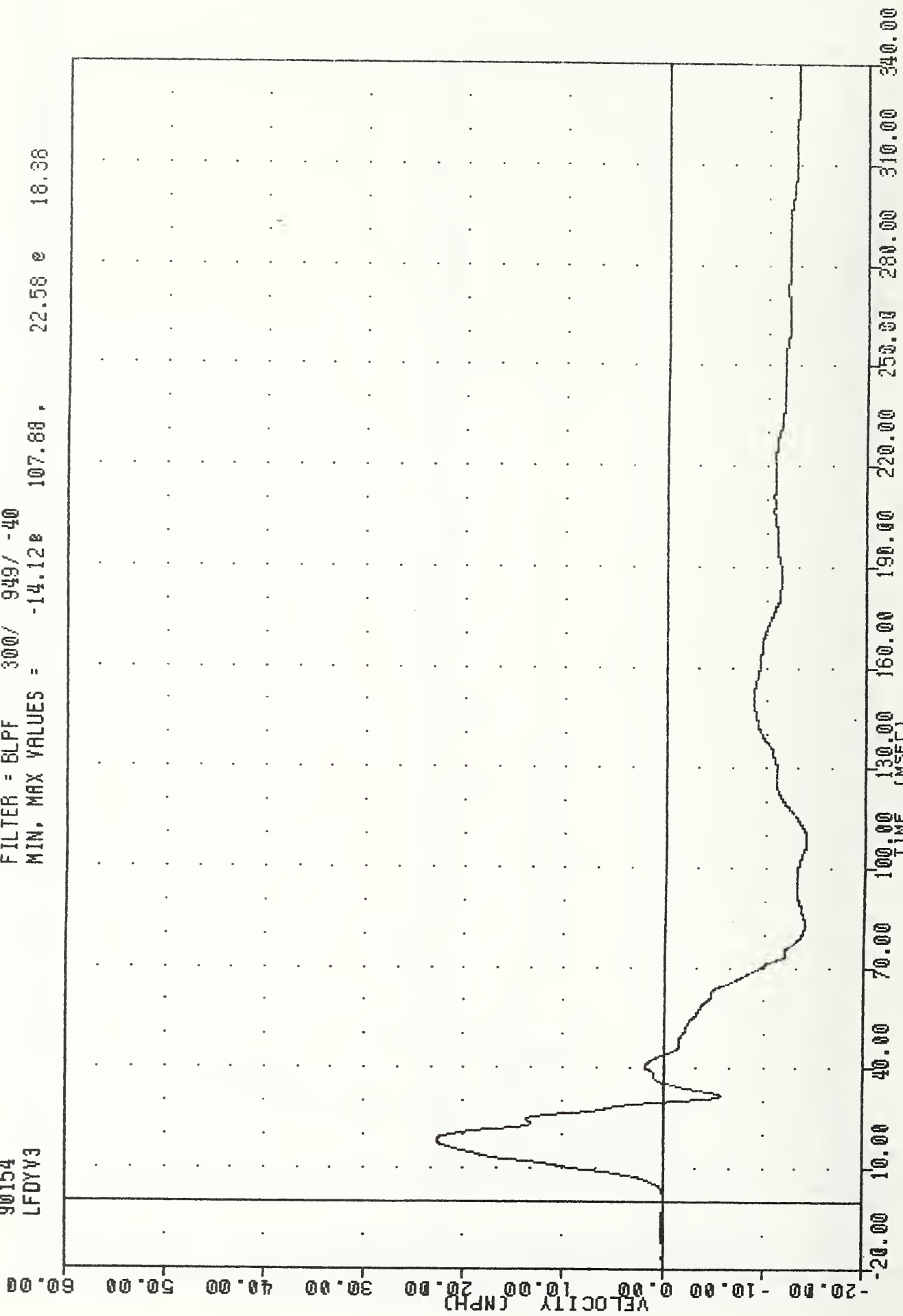


MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE LEFT FRONT DOOR (POSITION 9) Y-AXIS ACCELERATION

VRTC
SI PROTECTION PROD VEHICLE
90154
LFDYV3

, 900604

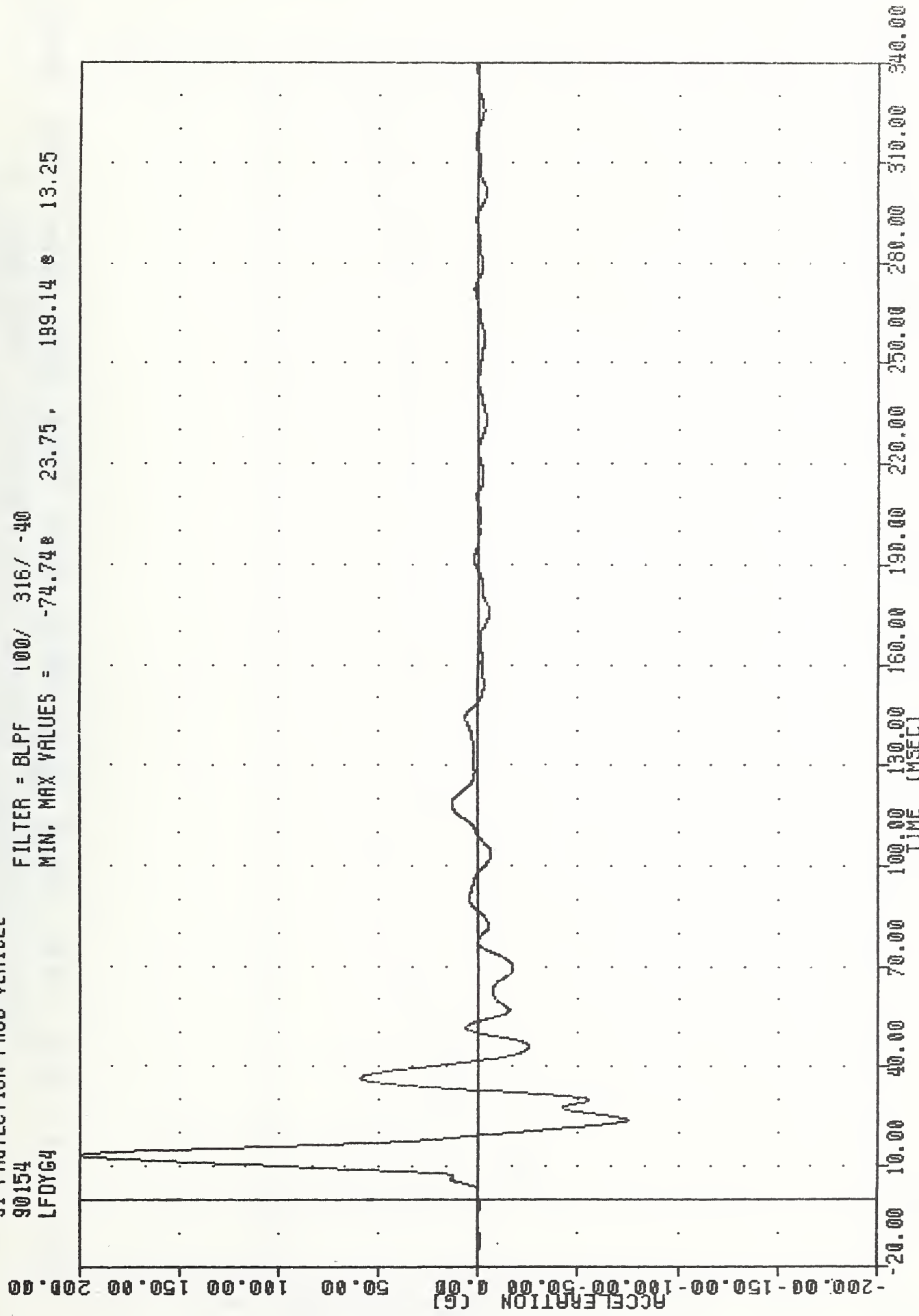
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -14.128 107.88, 22.58 18.38



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE LEFT FRONT DOOR (POSITION 9) Y-AXIS VELOCITY

YRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LFDY64

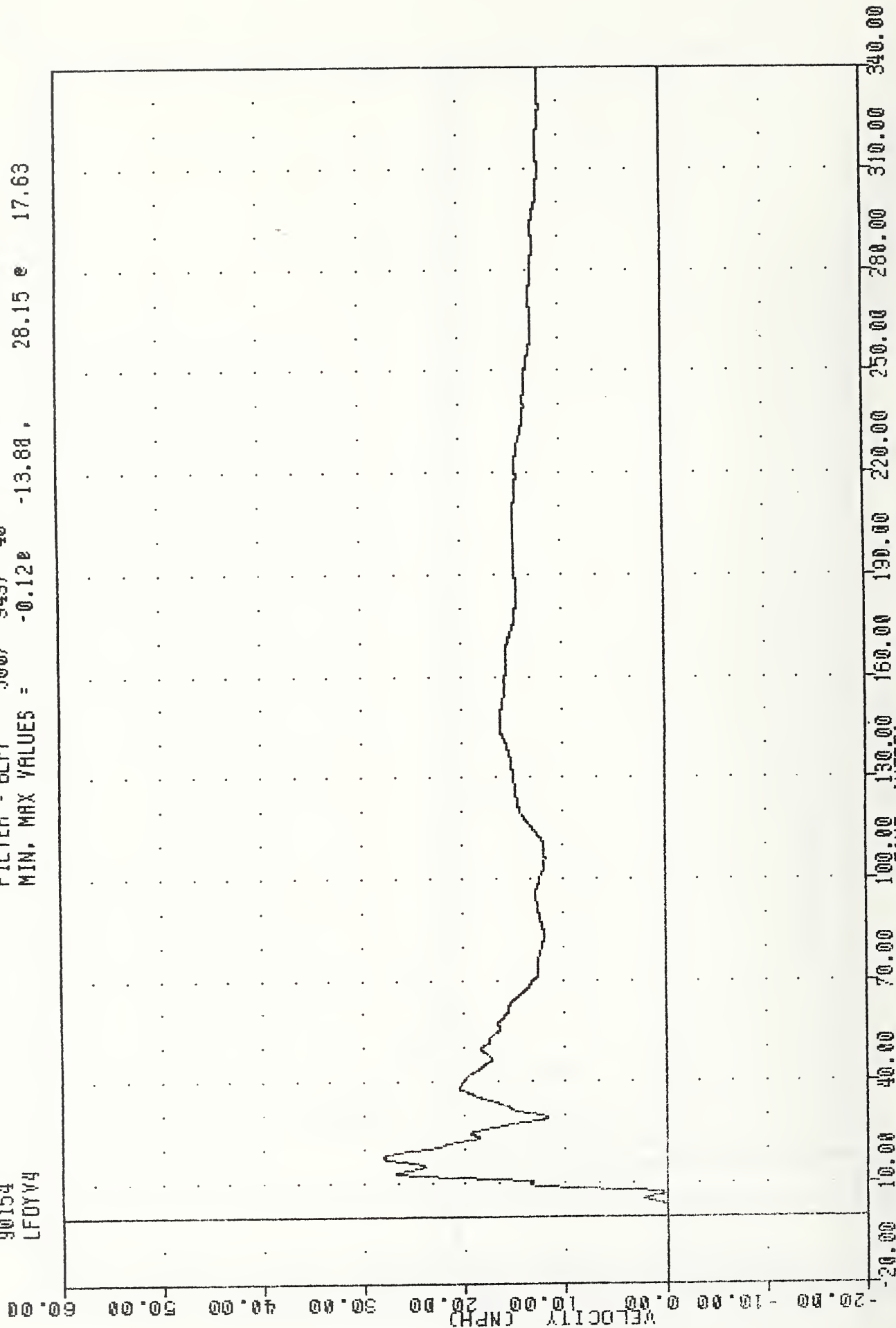
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -74.74e 23.75, 199.14 e 13.25



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE LEFT FRONT DOOR (POSITION 10) Y-AXIS ACCELERATION

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 LFOYV4

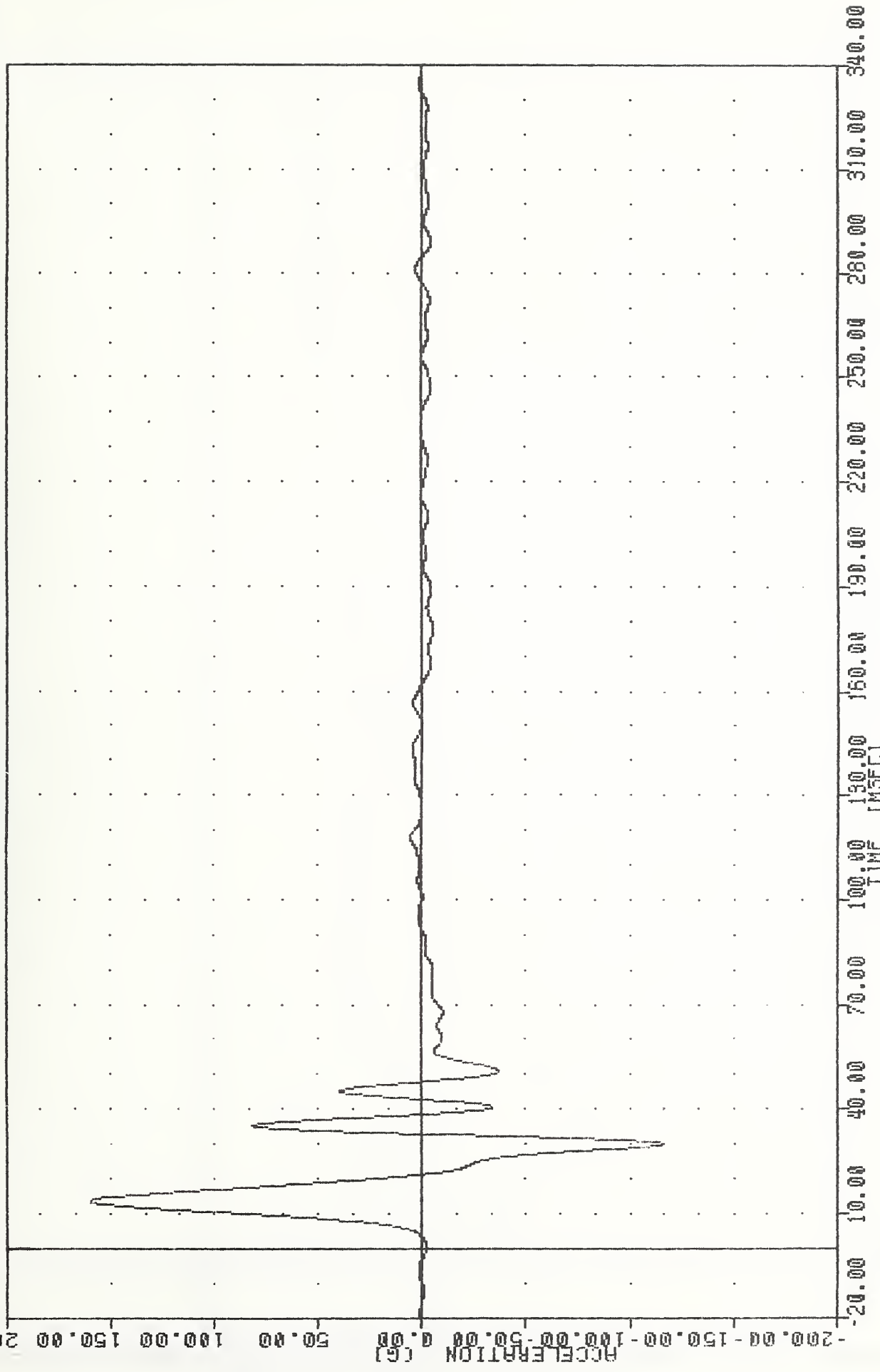
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.120 -13.80 , 28.15 e 17.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 VEHICLE LEFT FRONT DOOR (POSITION 10) Y-AXIS VELOCITY

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LRDY65

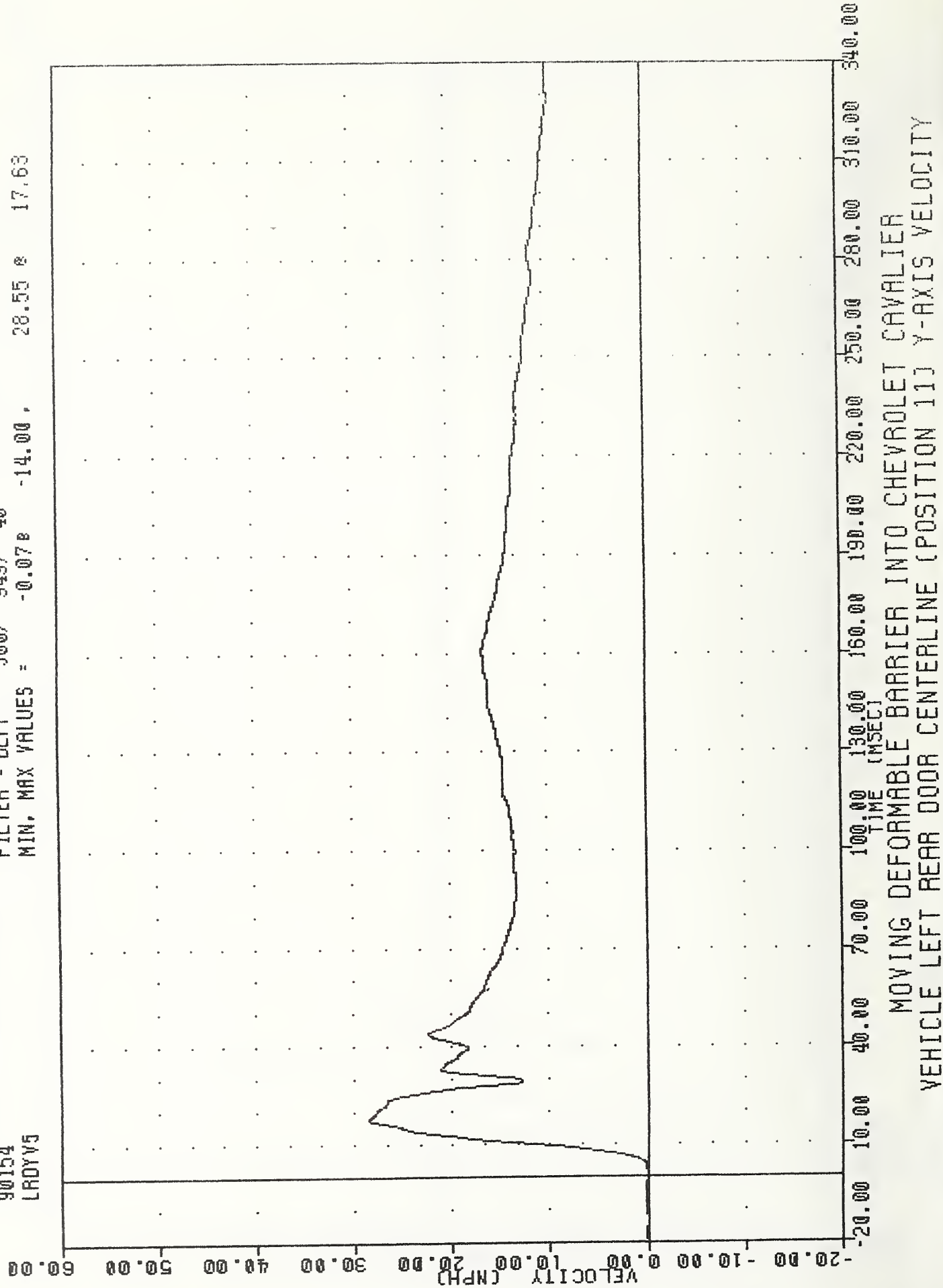
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -116.61 30.00, 159.77 13.63



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
VEHICLE LEFT REAR DOOR CENTERLINE (POSITION 11) Y-AXIS ACCELERATION

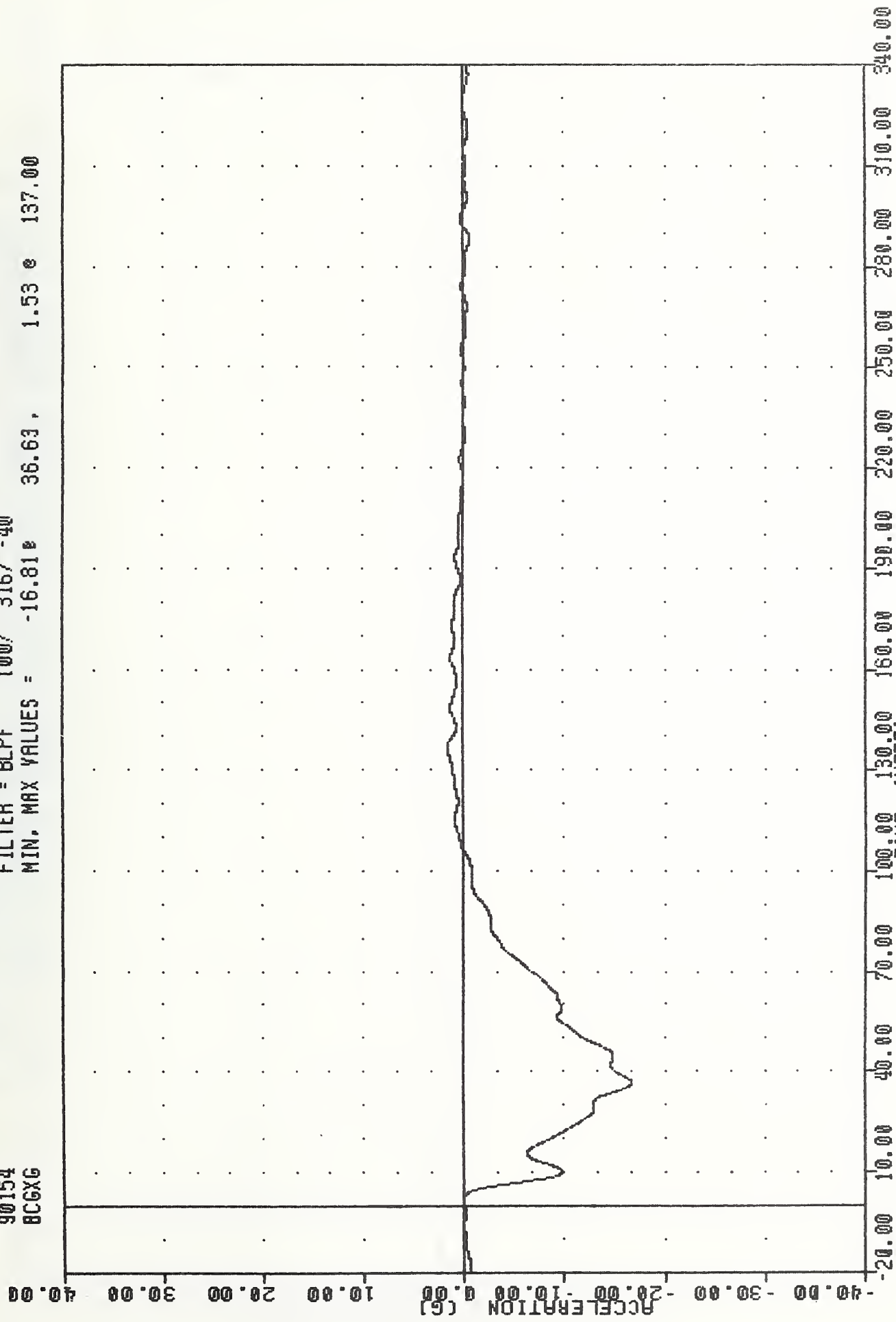
VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
LRDYV5

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.07E -14.00 , 28.55 E 17.63



VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
BCGXG

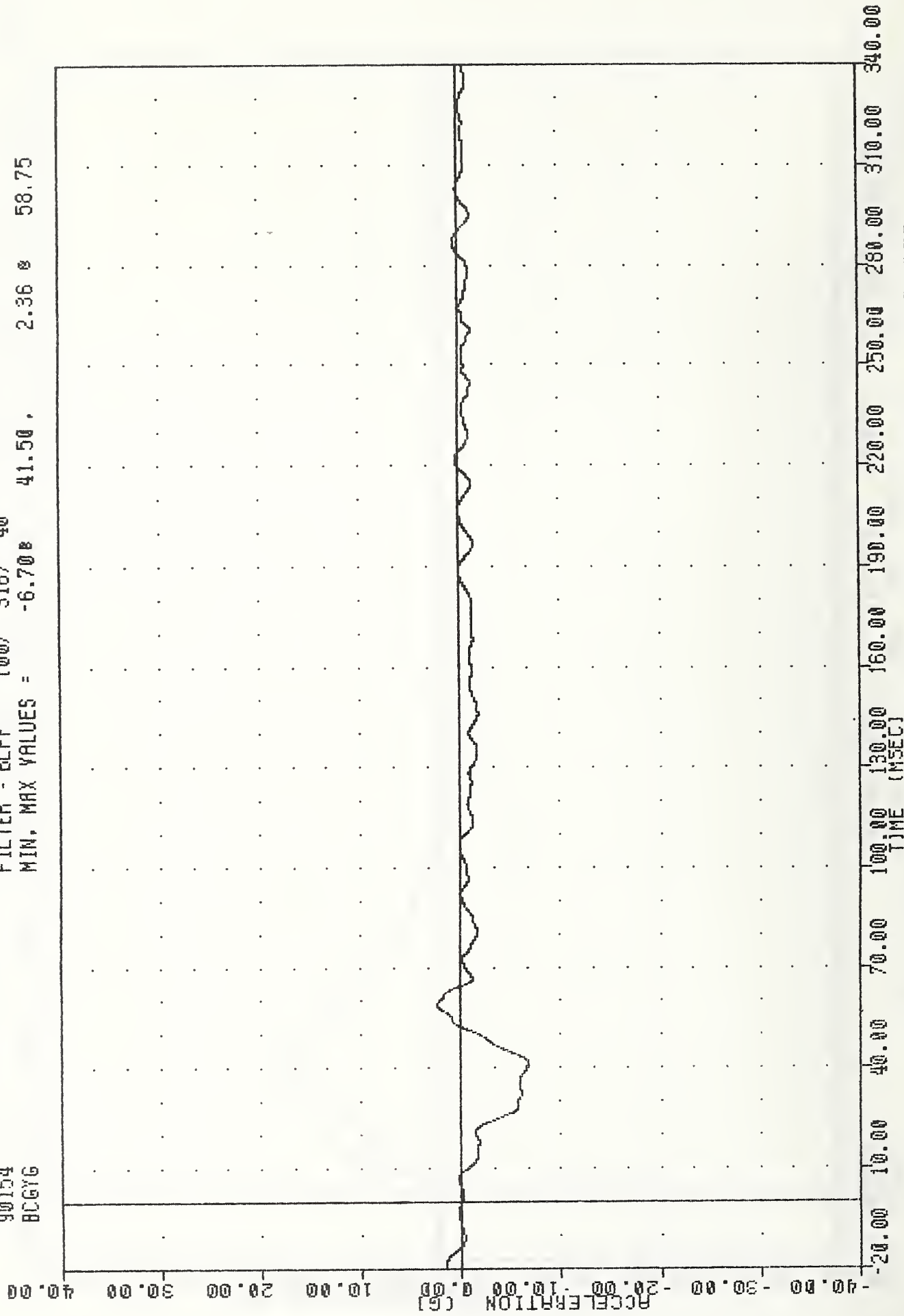
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -16.81e 36.63, 1.53 e 137.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
BCGYG

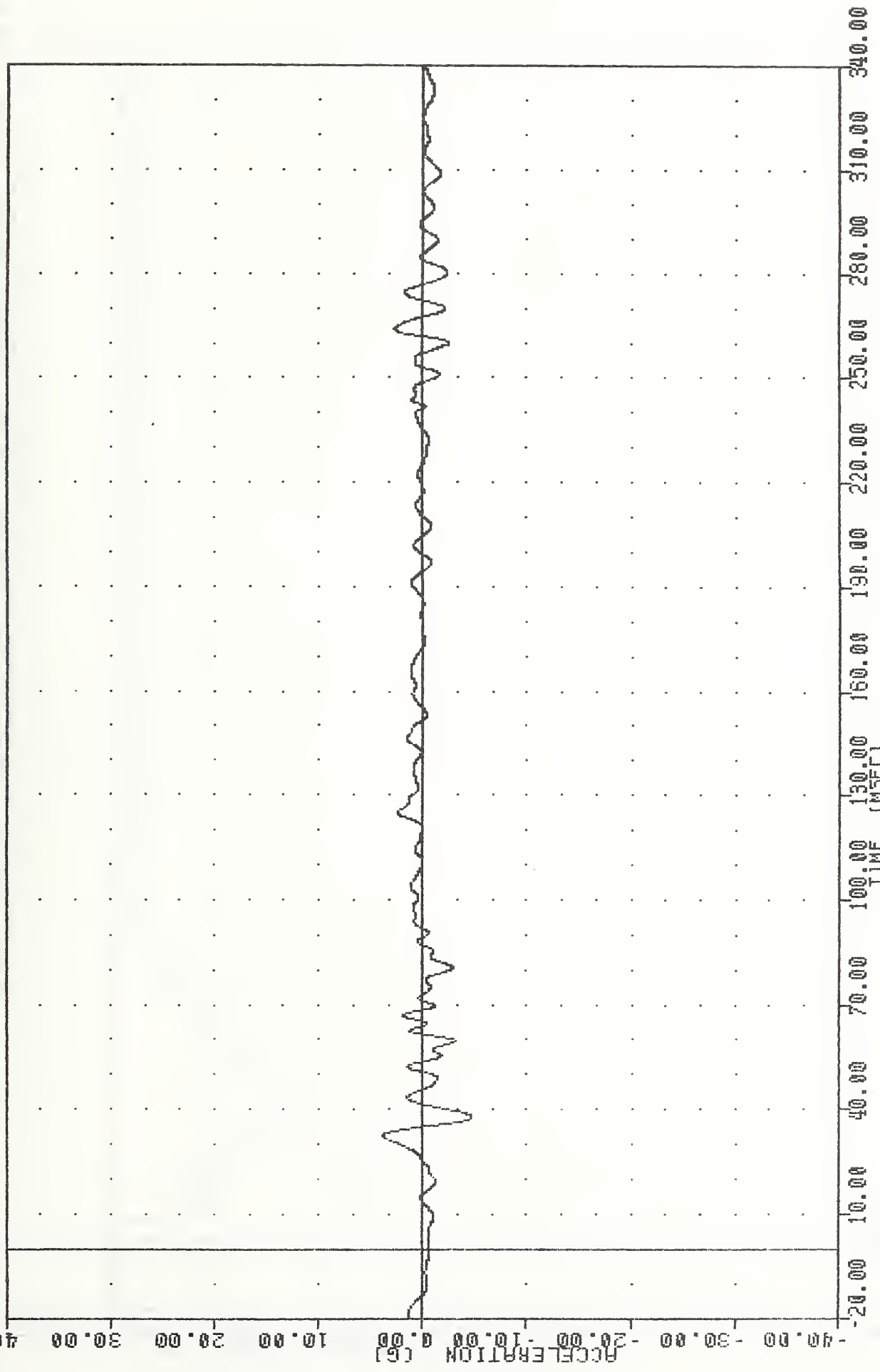
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -6.70e 41.50 , 2.36 e 58.75



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION

VRTC , 900604
SI PROTECTION PR00 VEHICLE
90154
BCGZG

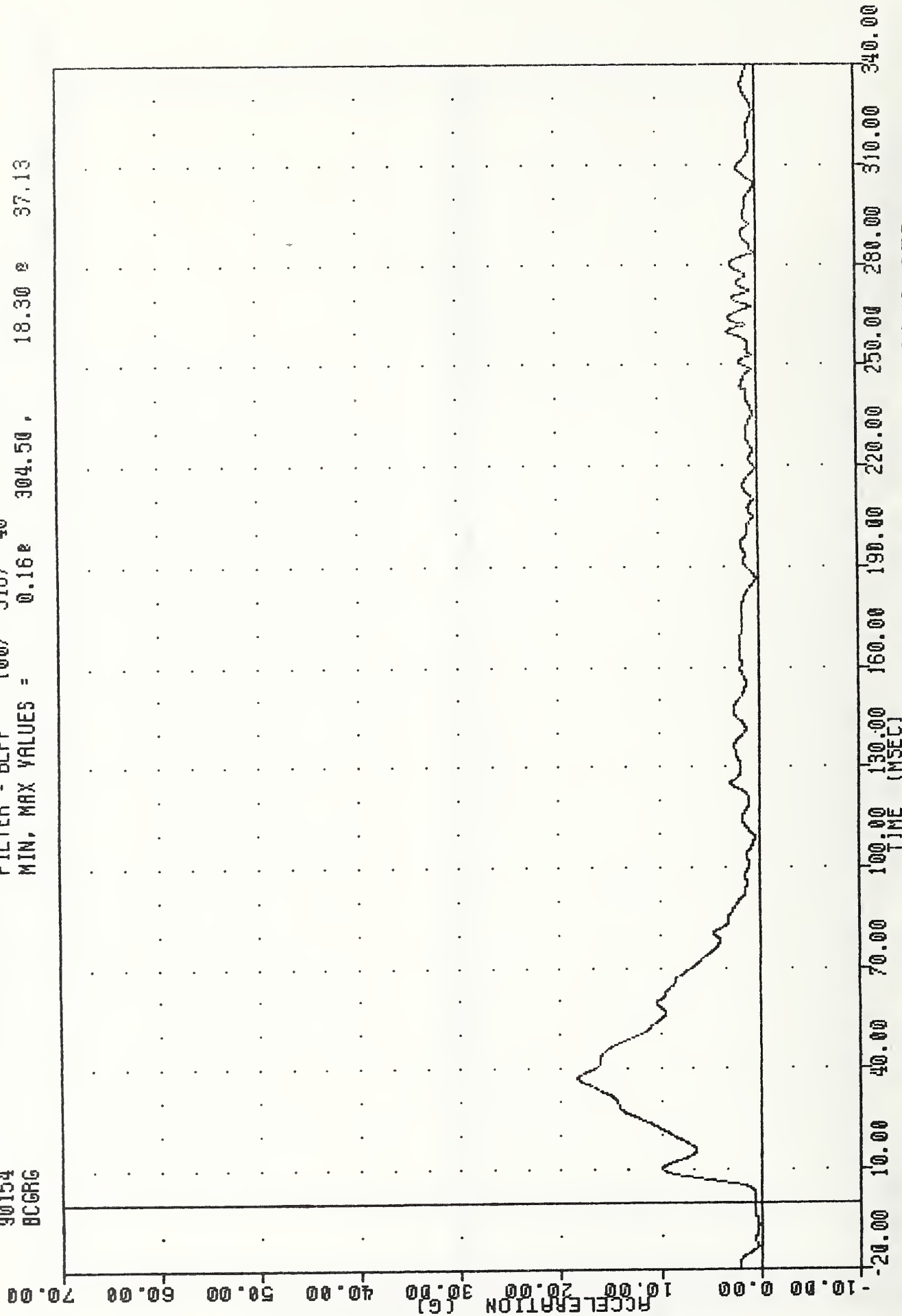
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -4.71e 37.75, 3.87 e 32.50



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
BARRIER CENTER OF GRAVITY Z-AXIS ACCELERATION

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 30154
 BCGRG

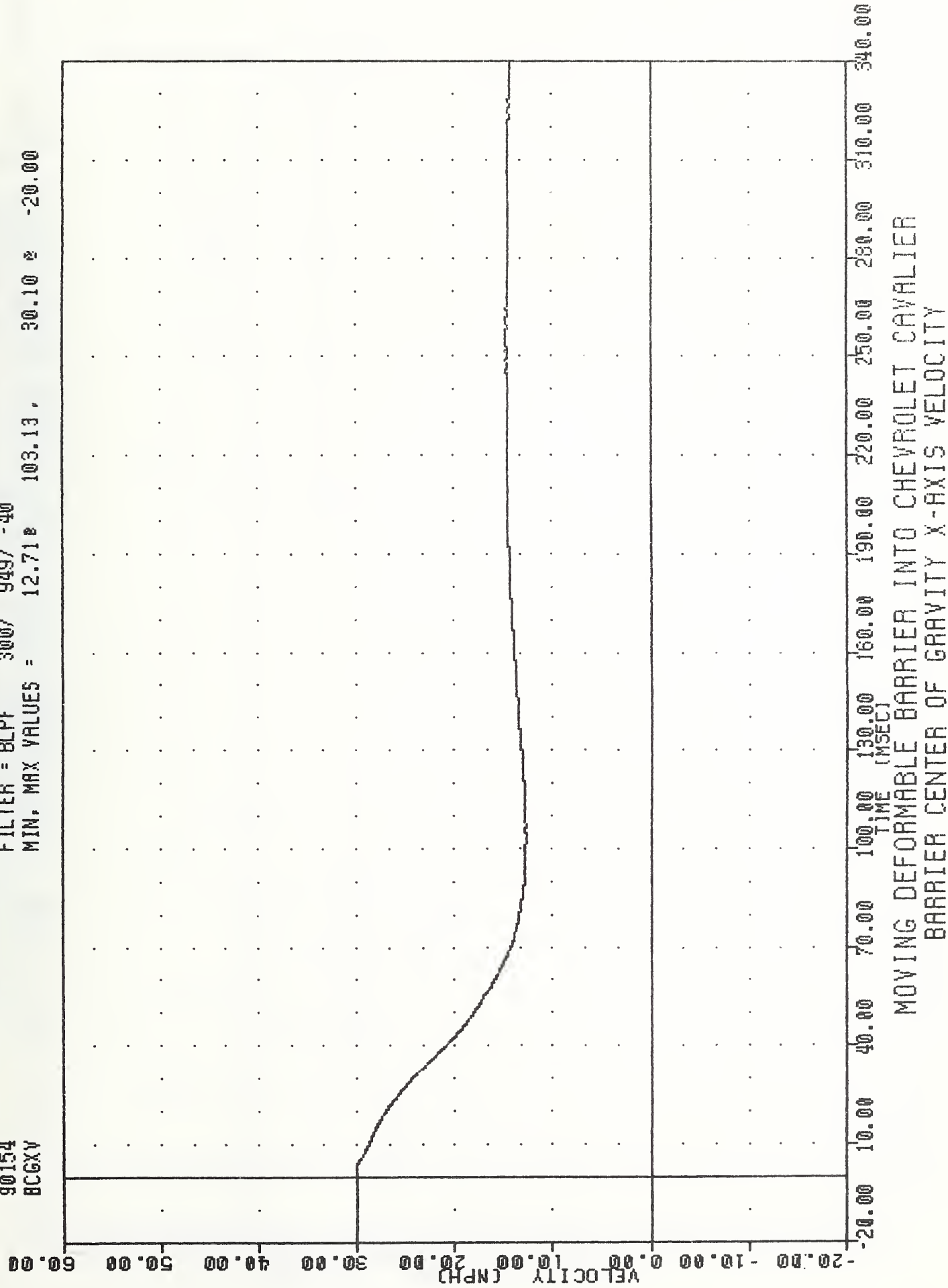
FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = 0.16e 304.50 , 18.30 e 37.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

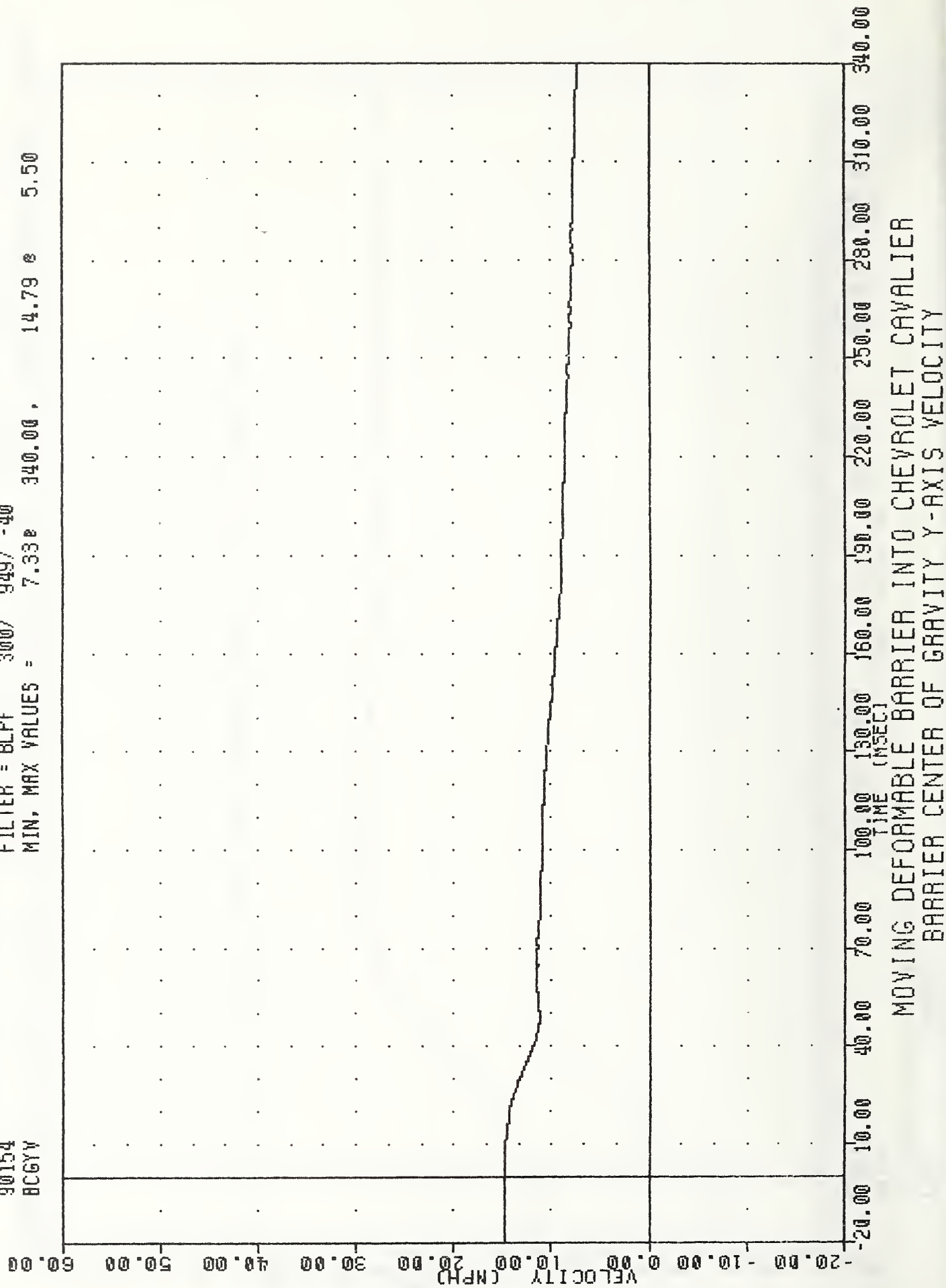
YRTC , 900604
SI PROTECTION PROD VEHICLE
90154
BCGXV

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 12.71 103.13, 30.10 2 -20.00



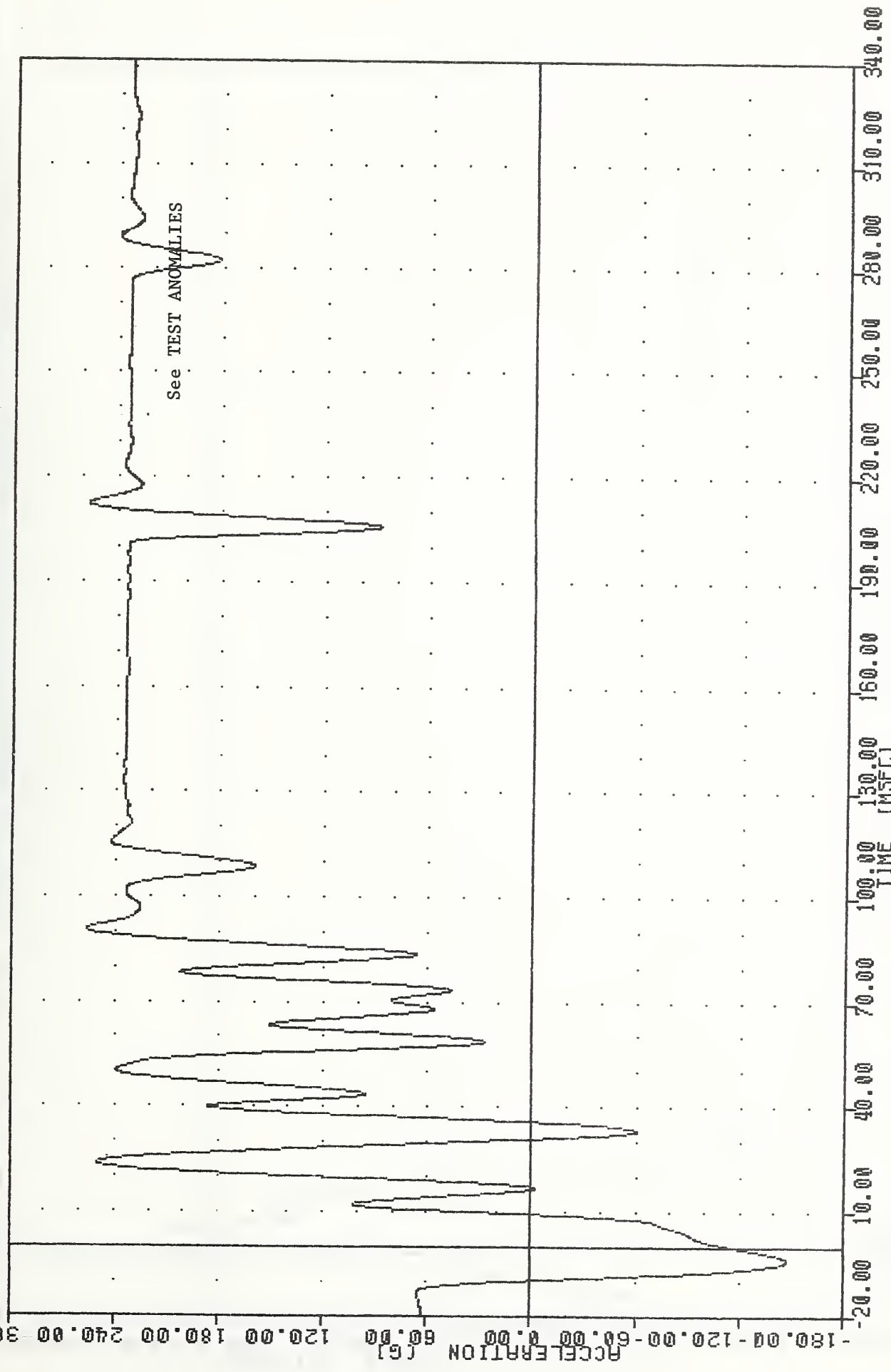
VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 BCGYV

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 7.33e 340.00 , 14.79 e 5.50



VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
BRXG

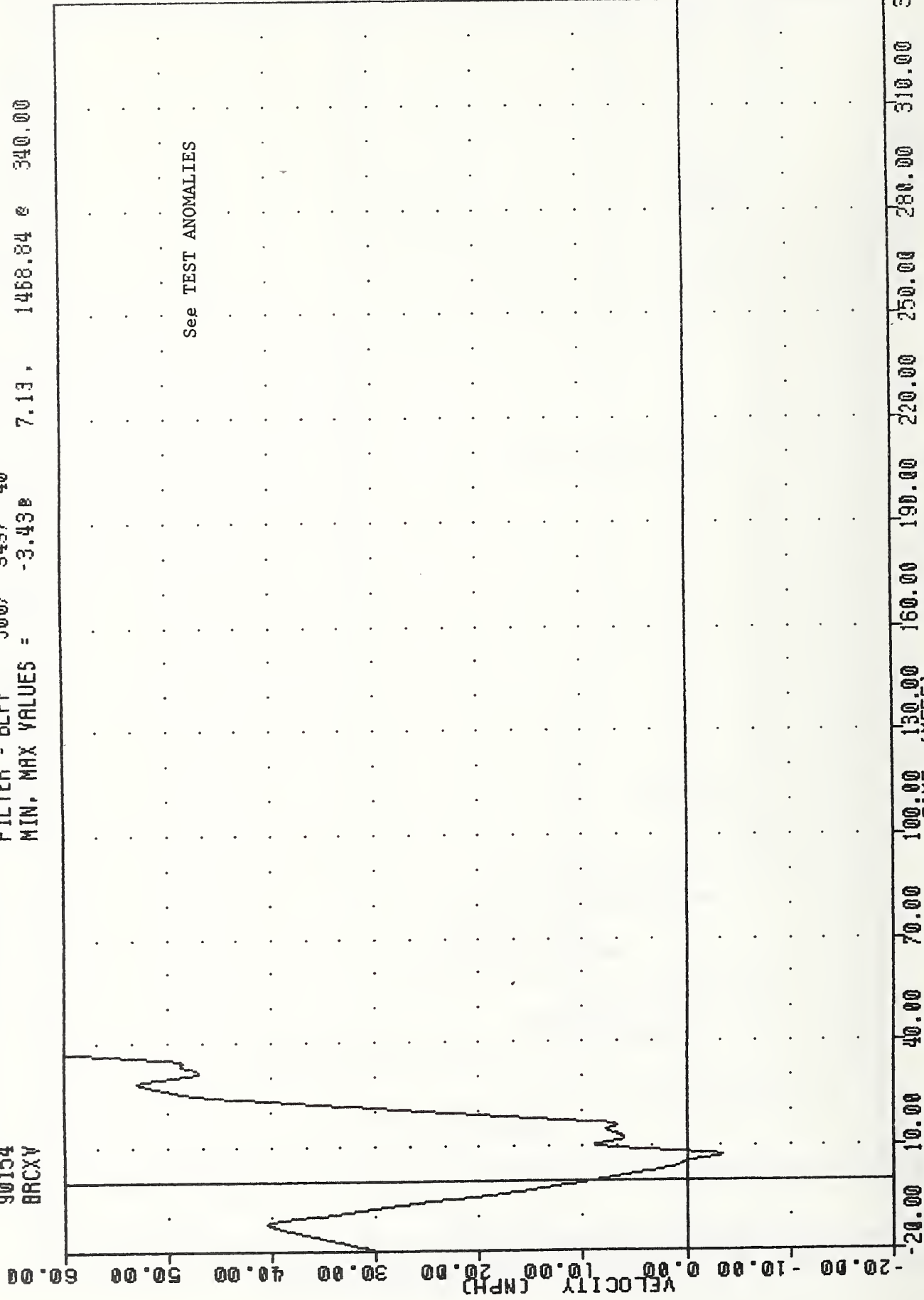
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -147.51e -3.88 , 256.32 e 212.25



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
BARRIER REAR CROSSMEMBER X-AXIS ACCELERATION

YRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 BRCXV

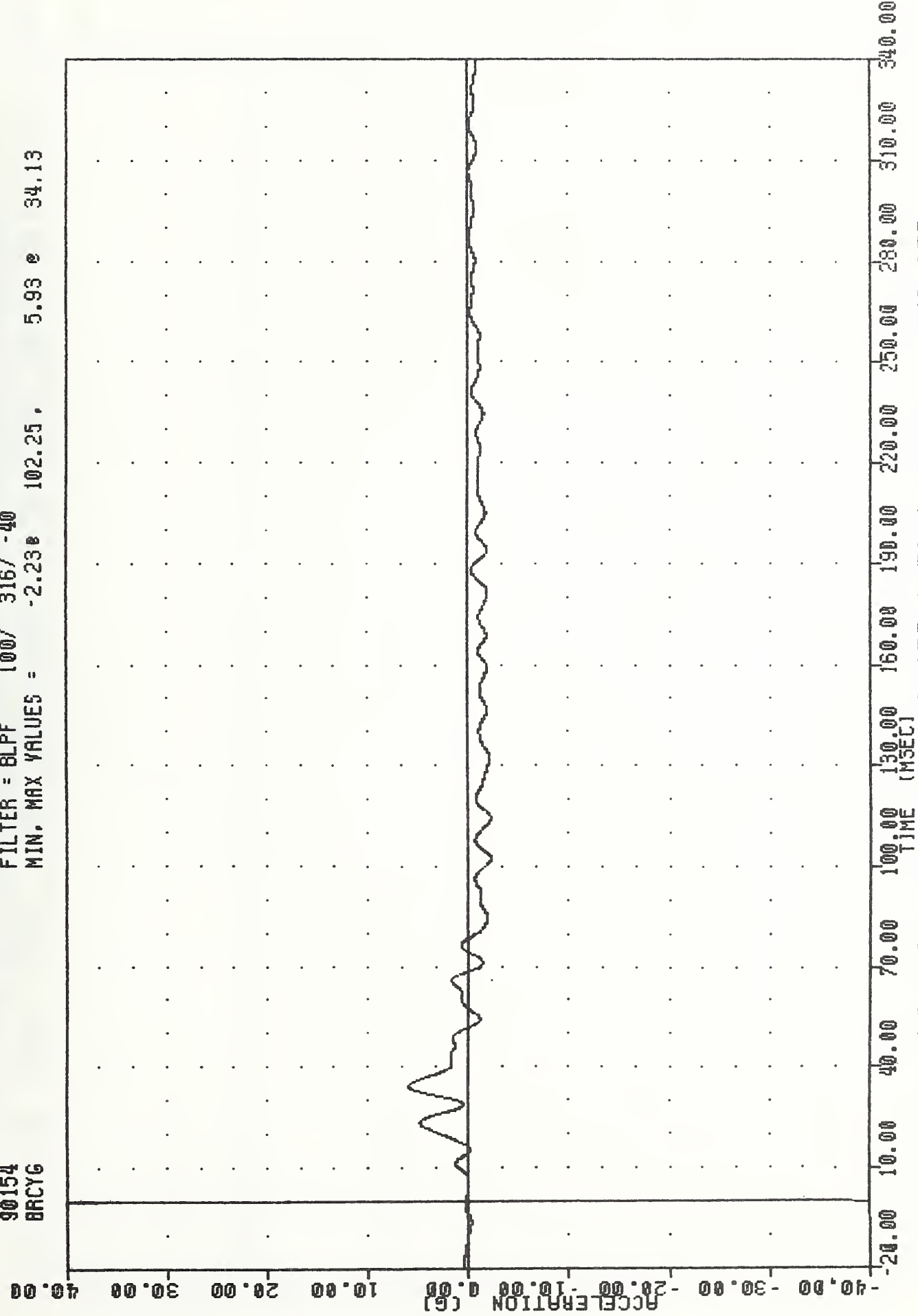
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -3.43e 7.13, 1458.84 e 340.00



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
 BARRIER REAR CROSSMEMBER X-AXIS VELOCITY

VRTC , 900604
SI PROTECTION PROD VEHICLE
90154
BRCYG

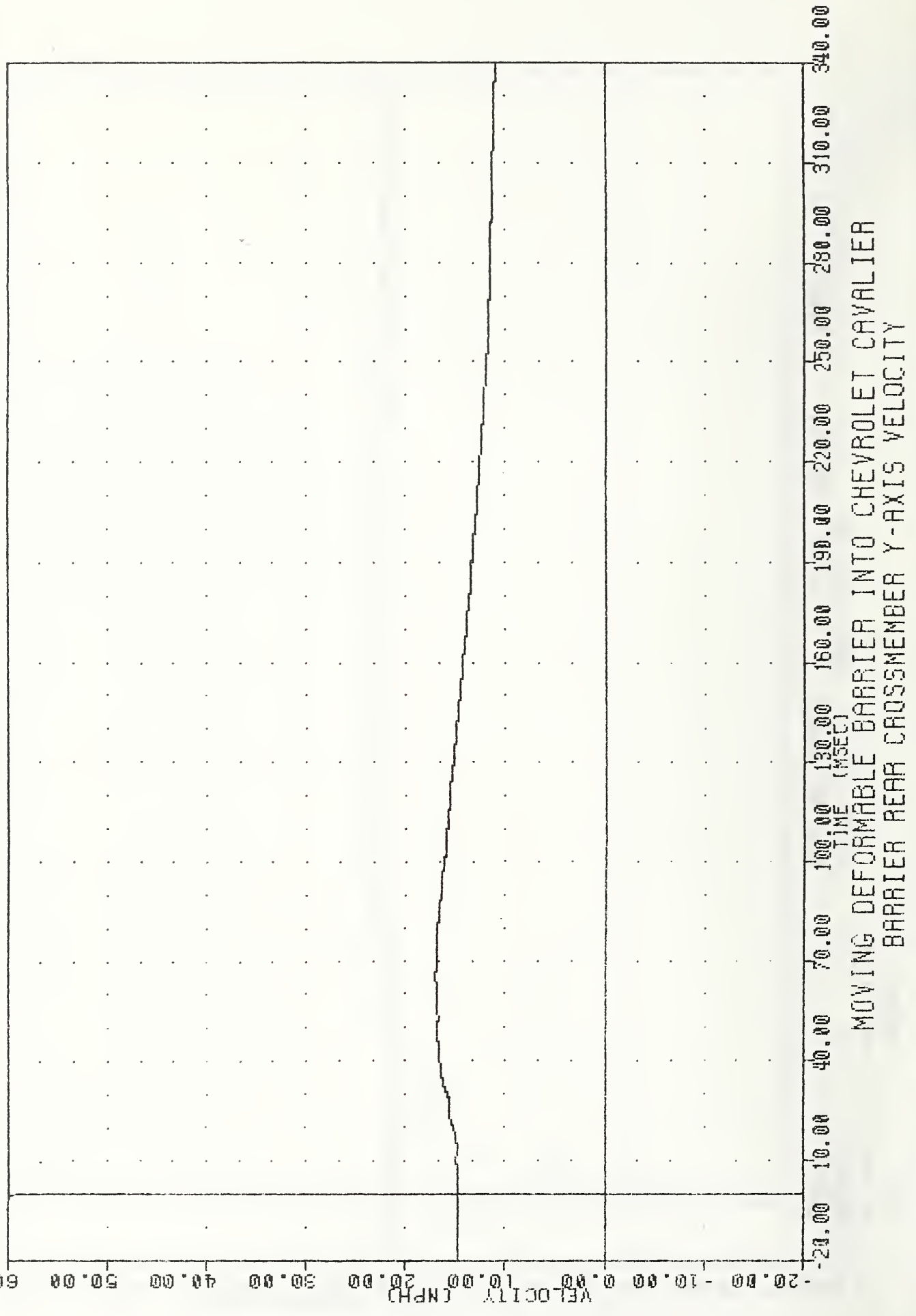
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -2.23e 102.25, 5.93 e 34.13



MOVING DEFORMABLE BARRIER INTO CHEVROLET CAVALIER
BARRIER REAR CROSSMEMBER Y-AXIS ACCELERATION

VRTC , 900604
 SI PROTECTION PROD VEHICLE
 90154
 BRCCY

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 10.96e 340.00 , 17.03 e 65.13



APPENDIX C

DUMMY CERTIFICATION

DRIVER DUMMY

DUMMY NO.: 01

BIOSID CALIBRATION RESULTS

PRE-TEST CALIBRATION FOR TEST #900509

DUMMY NO. 01 SERIES NO. TRC-CAL 10 DATE 05/22/90

CALIBRATION TEST	SAE* CORRIDOR	RESULTS
SHOULDER		
IMPACT FORCE (kN)	3.7 - 4.6	4.16
SHOULDER ACCEL. (g)	NA	84.1
SHOULDER DISPL. (mm)	21 - 31	25.6
THORAX - NO ARM		
IMPACT FORCE (kN)	5.4 - 6.7	5.77
UPPER RIB ACCEL. (g)	120 - 180	157.3
CENTER RIB ACCEL. (g)	120 - 180	155.1
LOWER RIB ACCEL. (g)	120 - 180	161.2
UPPER RIB DISPL. (mm)	50 - 70	60.4
CENTER RIB DISPL. (mm)	50 - 70	63.6
LOWER RIB DISPL. (mm)	50 - 70	64.0
UPPER SPINE ACCEL. (g)	16 - 24	20.4
LOWER SPINE ACCEL. (g)	11 - 17	14.5
THORAX - ARM DOWN		
IMPACT FORCE (kN)	6.2 - 7.9	6.52
SHOULDER ACCEL. (g)	NA	61.5
UPPER RIB ACCEL. (g)	52 - 78	67.9
CENTER RIB ACCEL. (g)	66 - 99	89.7
LOWER RIB ACCEL. (g)	85 - 128	114.0
SHOULDER DISPL. (mm)	17 - 27	21.5
UPPER RIB DISPL. (mm)	20 - 30	27.4
CENTER RIB DISPL. (mm)	30 - 44	37.5
LOWER RIB DISPL. (mm)	40 - 55	48.7
UPPER SPINE ACCEL. (g)	34 - 46	37.5
LOWER SPINE ACCEL. (g)	14 - 21	15.5
ABDOMEN		
IMPACT FORCE (kN)	2.9 - 3.6	3.16
UPPER ABDOMEN ACCEL. (g)	52 - 80	64.7
LOWER ABDOMEN ACCEL. (g)	55 - 87	68.8
UPPER ABDOMEN DISPL. (mm)	40 - 55	47.8
LOWER ABDOMEN DISPL. (mm)	38 - 52	41.7
UPPER SPINE ACCEL. (g)	5.4 - 8.1	6.8
LOWER SPINE ACCEL. (g)	8 - 12	9.5
PELVIS		
IMPACT FORCE (kN)	7.5 - 9.5	8.95
PELVIS ACCEL. (g)	45 - 63	50.6

*PROPOSED SAE CORRIDORS; DRAFT BIOSID USER'S MANUAL, MAY 1990.

RIGHT REAR PASSENGER DUMMY

DUMMY NO.: 02

BIOSID CALIBRATION RESULTS

PRE-TEST CALIBRATION FOR TEST #900509

DUMMY NO. 02 SERIES NO. TRC-CAL 10 DATE 05/23/90

CALIBRATION TEST	SAE* CORRIDOR	RESULTS
SHOULDER		
IMPACT FORCE (kN)	3.7 - 4.6	4.06
SHOULDER ACCEL. (g)	NA	82.8
SHOULDER DISPL. (mm)	21 - 31	24.1
THORAX - NO ARM		
IMPACT FORCE (kN)	5.4 - 6.7	5.77
UPPER RIB ACCEL. (g)	120 - 180	161.4
CENTER RIB ACCEL. (g)	120 - 180	162.9
LOWER RIB ACCEL. (g)	120 - 180	162.2
UPPER RIB DISPL. (mm)	50 - 70	58.6
CENTER RIB DISPL. (mm)	50 - 70	64.7
LOWER RIB DISPL. (mm)	50 - 70	63.2
UPPER SPINE ACCEL. (g)	16 - 24	20.7
LOWER SPINE ACCEL. (g)	11 - 17	15.3
THORAX - ARM DOWN		
IMPACT FORCE (kN)	6.2 - 7.9	7.37
SHOULDER ACCEL. (g)	NA	84.0
UPPER RIB ACCEL. (g)	52 - 78	73.8
CENTER RIB ACCEL. (g)	66 - 99	92.9
LOWER RIB ACCEL. (g)	85 - 128	116.3
SHOULDER DISPL. (mm)	17 - 27	23.5
UPPER RIB DISPL. (mm)	20 - 30	23.5
CENTER RIB DISPL. (mm)	30 - 44	36.0
LOWER RIB DISPL. (mm)	40 - 55	44.0
UPPER SPINE ACCEL. (g)	34 - 46	38.8
LOWER SPINE ACCEL. (g)	14 - 21	14.0
ABDOMEN		
IMPACT FORCE (kN)	2.9 - 3.6	3.17
UPPER ABDOMEN ACCEL. (g)	52 - 80	72.9
LOWER ABDOMEN ACCEL. (g)	55 - 87	75.4
UPPER ABDOMEN DISPL. (mm)	40 - 55	45.6
LOWER ABDOMEN DISPL. (mm)	38 - 52	41.2
UPPER SPINE ACCEL. (g)	5.4 - 8.1	7.2
LOWER SPINE ACCEL. (g)	8 - 12	9.3
PELVIS		
IMPACT FORCE (kN)	7.5 - 9.5	8.57
PELVIS ACCEL. (g)	45 - 63	50.0

*PROPOSED SAE CORRIDORS; DRAFT BIOSID USER'S MANUAL, MAY 1990.

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