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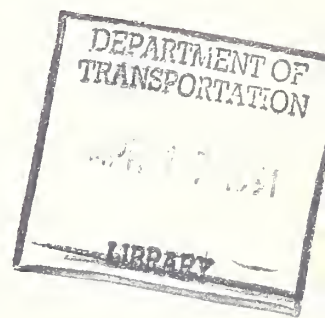
U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

**DOT HS 807 657
Final Report**

July 1990

EVALUATION OF THE BIOSID DUMMY MDB-To-Car Side Impact Test of a 26° Crabbed Moving Deformable Barrier into a 1988 Toyota Tercel 4-door hatchback at 33.5 MPH



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1. Report No. DOT HS 807 657		2. Government Accession No.		3. Recipient's Catalog No.																												
4. Title and Subtitle EVALUATION OF THE BIOSID DUMMY, MDB-To-Car Side Impact Test of a 26° Crabbed Moving Deformable Barrier into a 1988 Toyota Tercel 4-door hatchback at 33.5 MPH				5. Report Date JUNE - JULY, 1990																												
				6. Performing Organization Code																												
7. Author(s) N.A. El-Habash, Project Engineer, TRC				8. Performing Organization Report No. 900613																												
9. Performing Organization Name and Address Vehicle Research and Test Center 10820 State Route 347 East Liberty, Ohio 43319				10. Work Unit No. (TRAIS)																												
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration 400 Seventh St., S.W., Washington, D.C. 20590				11. Contract or Grant No. DTNH22-88-C-07292																												
				13. Type of Report and Period Covered FINAL REPORT JUNE - JULY, 1990																												
				14. Sponsoring Agency Code																												
15. Supplementary Notes This test was conducted as part of VRTC Project No. VRTC-89-0138 Evaluation of the BioSid Dummy																																
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 1988 Toyota Tercel 4-door hatchback 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 33.3 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 13, 1990 and the ambient temperature was 85°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>348</td> <td>428</td> </tr> <tr> <td>Upper Spine Acceleration, g</td> <td>60</td> <td>45</td> </tr> <tr> <td>Left Upper Rib Acceleration, g</td> <td>109</td> <td>51</td> </tr> <tr> <td>Left Center Rib Acceleration, g</td> <td>116</td> <td>51</td> </tr> <tr> <td>Left Lower Rib Acceleration, g</td> <td>123</td> <td>65</td> </tr> <tr> <td>Lower Spine Acceleration, g</td> <td>52</td> <td>59</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td>87</td> <td>62</td> </tr> <tr> <td>Pelvis Acceleration, g</td> <td>90</td> <td>94</td> </tr> </tbody> </table>							DRIVER	PASSENGER	Head Injury Criteria (HIC)	348	428	Upper Spine Acceleration, g	60	45	Left Upper Rib Acceleration, g	109	51	Left Center Rib Acceleration, g	116	51	Left Lower Rib Acceleration, g	123	65	Lower Spine Acceleration, g	52	59	Thoracic Trauma Index (TTI)	87	62	Pelvis Acceleration, g	90	94
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17. Key Words BioSid Dummy Occupant Response Moving Barrier Crash Testing			18. Distribution Statement Available from: National Technical Information Service Springfield, Virginia 22161																													
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 22. Price																												

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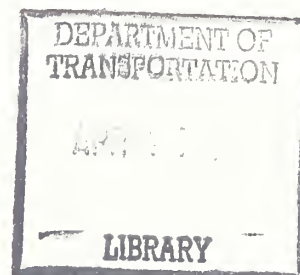
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SECTION 1.0
PURPOSE AND TEST SUMMARY

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 1988 Toyota Tercel 4-door hatchback was impacted on the left side by a Moving Deformable Barrier (MDB) on June 13, 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 Toyota Tercel at 33.5 mph with MDB's wheels crabbed clockwise to 26°. The actual test speed was 33.3 mph and the actual leading edge of contact was 37.2 inches forward of the midpoint of the Toyota Tercel 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: Toyota Motor Corporation

MAKE/MODEL: Toyota/Tercel

VIN: JT2EL32H0J0194623

BODY STYLE: 4-door hatchback

MODEL YEAR: 1988

NHTSA NO.: NA

COLOR: White

ENGINE DATA: TYPE: transverse CYLINDERS: 4 DISPLACEMENT: 1.5 liter

TRANSMISSION DATA: 3 SPEED, MANUAL, X AUTOMATIC, X FWD, RWD, 4WD

DATE VEHICLE RECEIVED: 6/05/90

ODOMETER READING: 34,887

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING Yes
POWER BRAKES Yes
POWER SEATS No
POWER WINDOWS No
TINTED GLASS Yes
RADIO No
CLOCK No
OTHER None

AUTOMATIC TRANSMISSION Yes
AUTOMATIC SPEED CONTROL No
TILTING STEERING WHEEL No
TELESCOPING STEERING WHEEL No
AIR CONDITIONING Yes
ANTI-SKID BRAKE No
REAR WINDOW DEFROSTER Yes

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: Toyota Motor Corporation

DATE OF MANUFACTURE: NA

VIN: JT2EL32H0J0194623

GVWR: NA LBS

GAWR: FRON1: NA LBS., REAR: NA 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/Tiempo P155/80R13

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	664 LBS.	RIGHT REAR	411 LBS.
LEFT FRONT	702 LBS.	LEFT REAR	402 LBS.
TOTAL FRONT WEIGHT	1366 LBS.	(62.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	813 LBS.	(37.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	2179 LBS.		

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF	24.6;	LF	24.1;	RR	23.5;	LR	23.2
PRE-TEST ATTITUDE:	RF	24.1;	LF	23.9;	RR	22.6;	LR	22.5
POST-TEST ATTITUDE:	RF	22.6;	LF	24.0;	RR	21.4;	LR	21.1

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 21 LBS. CARGO:

RIGHT FRONT	744 LBS.	RIGHT REAR	523 LBS.
LEFT FRONT	767 LBS.	LEFT REAR	514 LBS.
TOTAL FRONT WEIGHT	1511 LBS.	(59.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1037 LBS.	(40.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2548 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: P155/80R13 LOAD RANGE X B, C

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT

 3 REAR

CARGO LOAD 25 LBS.

 5 TOTAL

TOTAL 775 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, the exhaust system, battery, air conditioner, rear bumper, radiator, power steering pump, distributor, and air cleaner were 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 2550 pounds was used to duplicate a previous side impact test using a Toyota Tercel.

TEST CONDITIONS

TEST NUMBER: 900613

DATE OF TEST: 6/13/90

TIME OF TEST: 1345

DRIVER DUMMY TEMPERATURE: 76° F

PASSENGER DUMMY TEMPERATURE: 76° F

AMBIENT TEMPERATURE AT IMPACT AREA: 85° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 75° F

MAX. LENGTH = 157.0

MAX. WIDTH = 64.0

TOP WIDTH = 41.1

WHEELBASE = 93.0

C.G. =

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 28 psi; REAR 28 psi

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

TEST CONDITIONS, CONTINUED

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2548	2550
MDB TEST WEIGHT (LBS.)	2903	2900
MDB VELOCITY (MPH)*	33.3	33.5
IMPACT POINT (INCHES)**	37.2	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>Right front door</u> <u>side window sill</u>	<u>Left C-pillar & roof</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:

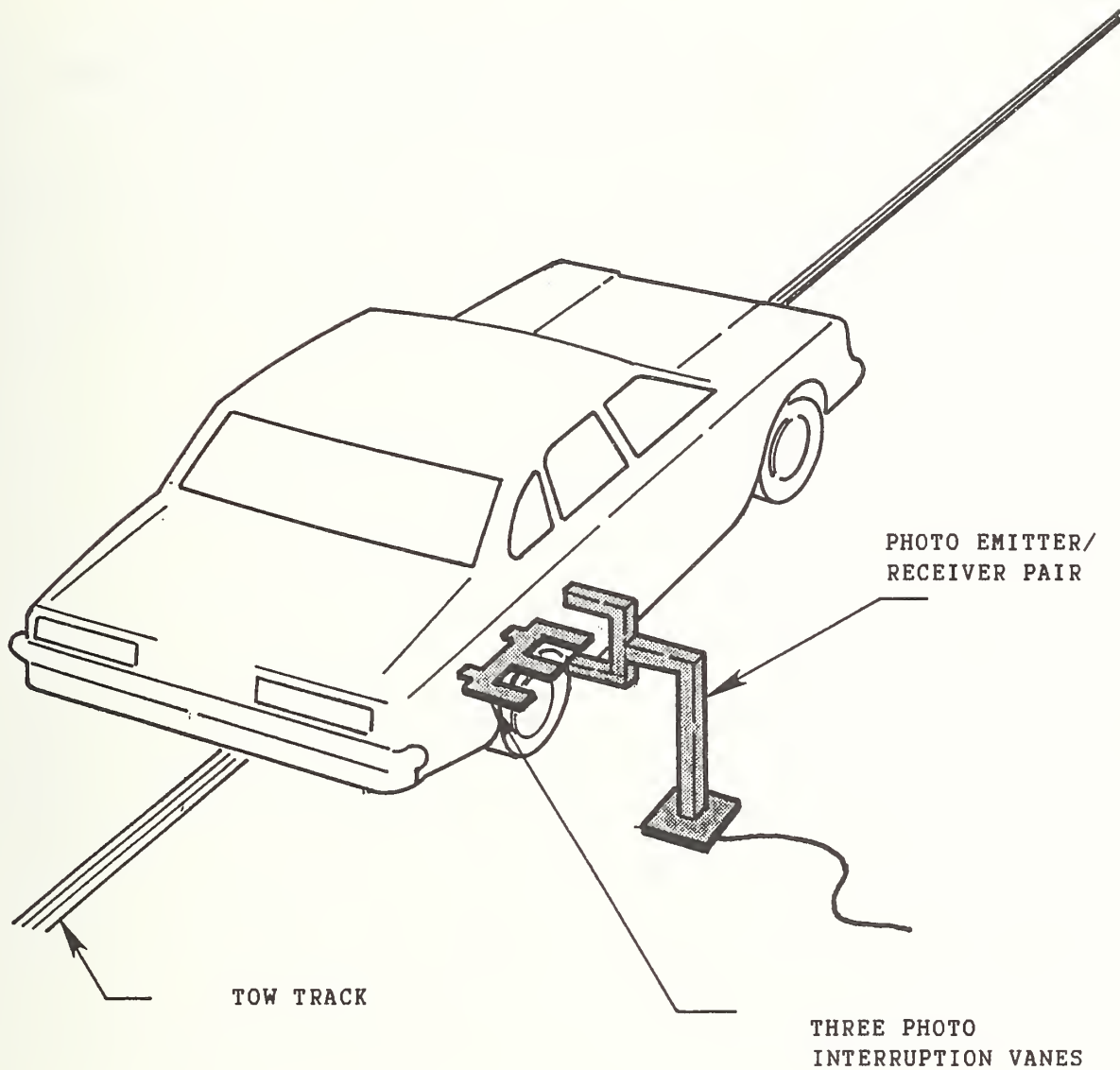
The left side windows were shattered. The windshield
was cracked.

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 left rear passenger left lower abdomen rib displacement, LLAYD4, data is questionable data due to the cable spring tension not being properly adjusted.

The vehicle's left front door (position 9) Y-axis accelerometer, LFDYG3, data is questionable between 22.5 and 54.0 milliseconds.

The vehicle's left front door (position 9) Y-axis velocity, FLDYV3, 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".

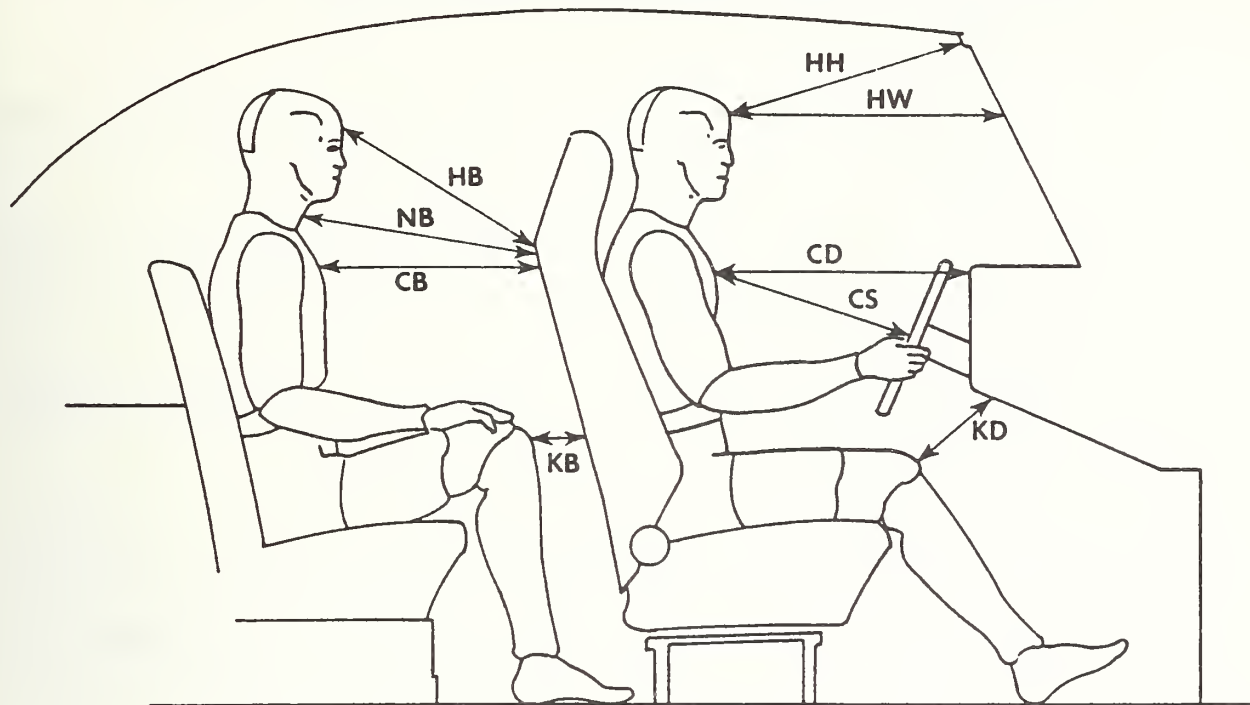
6. Final Dummy Positioning

- 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).



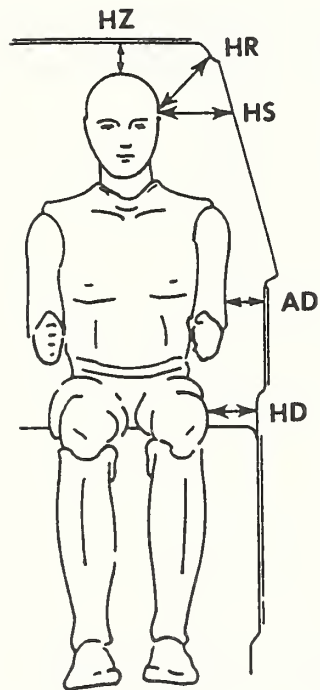
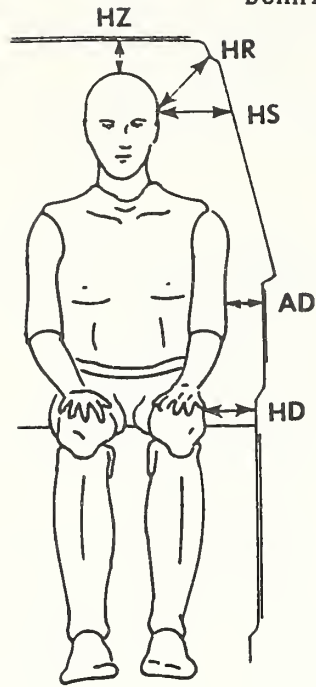
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS



	DRIVER	REAR PASSENGER
HH	12.2	NA
HW	16.9	NA
CD	20.4	NA
CS	13.0	NA
KDL	6.6	NA
KDR	6.6	NA
HB	NA	25.9
NB	NA	23.2
CB	NA	17.1
KBL	NA	2.8
KBR	NA	2.8

ALL MEASUREMENTS ARE IN INCHES.

DUMMY LATERAL CLEARANCE DIMENSIONS



	DRIVER	PASSENGER
HR	5.5	4.1
HS	9.0	7.1
AD	4.4	3.8
HD	5.9	6.6
HZ	3.3	1.8

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 = 8.00	X = 8.90
	Z = -4.55	Z = -9.65
DUMMY H-POINT LOCATION:	X = 8.2	X = 8.9
	Z = -4.8	Z = 9.4
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. The dummy rebounded laterally across the front occupant compartment. The upper torso rotated and the upper back contacted the right front door as the dummy's head contacted the right side front window sill. The left knee contacted the left front door and the right knee contacted the left knee. The dummy came to rest leaning against the right front door.

PASSENGER

During the impact, the dummy's torso contacted the left rear door and the head contacted the left C-pillar and the roof. 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 came to rest seated upright in the right rear seat.

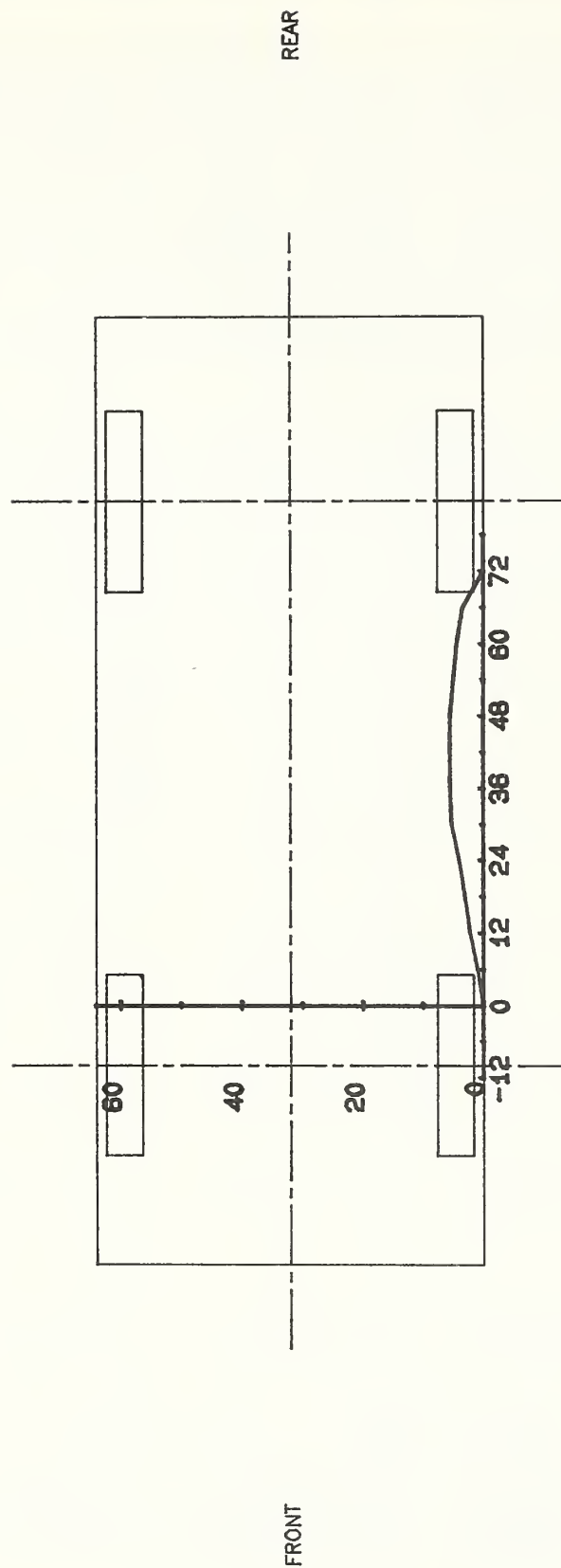
VEHICLE EXTERIOR PROFILES AND STATIC CRUSH
ZERO DISTANCE AT PROJECTED IMPACT POINT*

LOCATION	HEIGHT(IN)	-6	0	6	12	18	24	30	36	42	48	54	60	66	72	78
<u>PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)</u>																
Axle Height	10.8	X	X	X	19.5	19.3	19.2	19.2	19.2	19.2	19.3	19.4	19.4	19.5	X	X
H-Point	19.5	X		X	16.2	16.4	16.2	16.1	16.1	16.2	16.1	16.2	16.2	16.3	16.4	X
Mid Door	22.8	X		X	16.4	16.3	16.1	16.1	16.1	16.1	16.0	16.1	16.2	16.3	16.4	X
Window Sill	33.5	19.8	19.2	18.7	19.1	18.9	18.3	18.2	18.3	18.1	18.1	18.2	18.1	18.2	18.2	18.3
Window Top	51.4	X	X	X	X	X	X	27.8	28.3	28.6	28.7	28.8	28.9	28.9	28.9	29.1
<u>POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)</u>																
Axle Height	10.8	X	X	X	20.4	21.4	22.2	23.2	24.4	24.6	24.6	24.7	24.3	23.8	22.9	X
H-Point	19.5	X		X	18.7	24.2	25.6	26.1	26.6	27.1	27.4	27.9	28.6	26.9	25.1	23.6
Mid Door	22.8	X		X	18.1	22.6	24.2	24.6	25.0	25.8	26.2	26.9	27.5	25.9	24.1	22.5
Window Sill	33.5	19.9	19.6	20.1	22.7	24.2	24.2	24.2	24.6	24.9	25.4	26.9	24.9	23.2	22.0	14.0
Window Top	51.4	X	X	X	X	X	X	X	29.4	30.0	30.7	30.9	30.4	30.1	29.9	29.8
<u>STATIC CRUSH (IN)</u>																
Axle Height	10.8	X	X	X	0.9	2.1	3.0	4.0	5.2	5.4	5.4	5.4	4.9	4.4	3.4	X
H-Point	19.5	X		X	2.5	7.8	9.4	10.0	10.5	11.0	11.3	11.7	12.5	10.7	8.9	7.3
Mid Door	22.8	X		X	1.7	6.3	8.1	8.5	8.9	9.7	10.1	10.9	11.4	9.7	7.9	6.2
Window Sill	33.5	0.1	0.4	1.4	3.6	5.3	5.9	6.4	6.6	7.3	8.8	6.7	5.1	3.8	-0.2	4.3
Window Top	51.4	X	X	X	X	X	X	X	0.6	1.7	2.1	2.2	1.6	1.2	1.0	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.

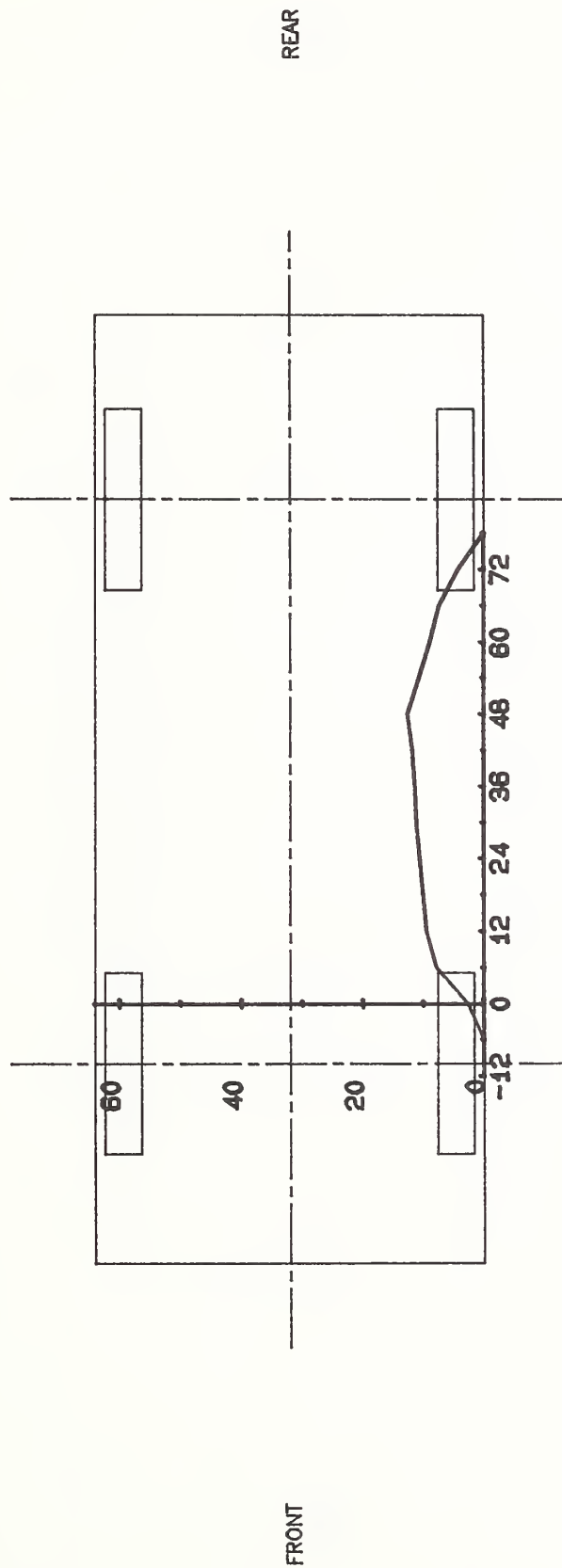
** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



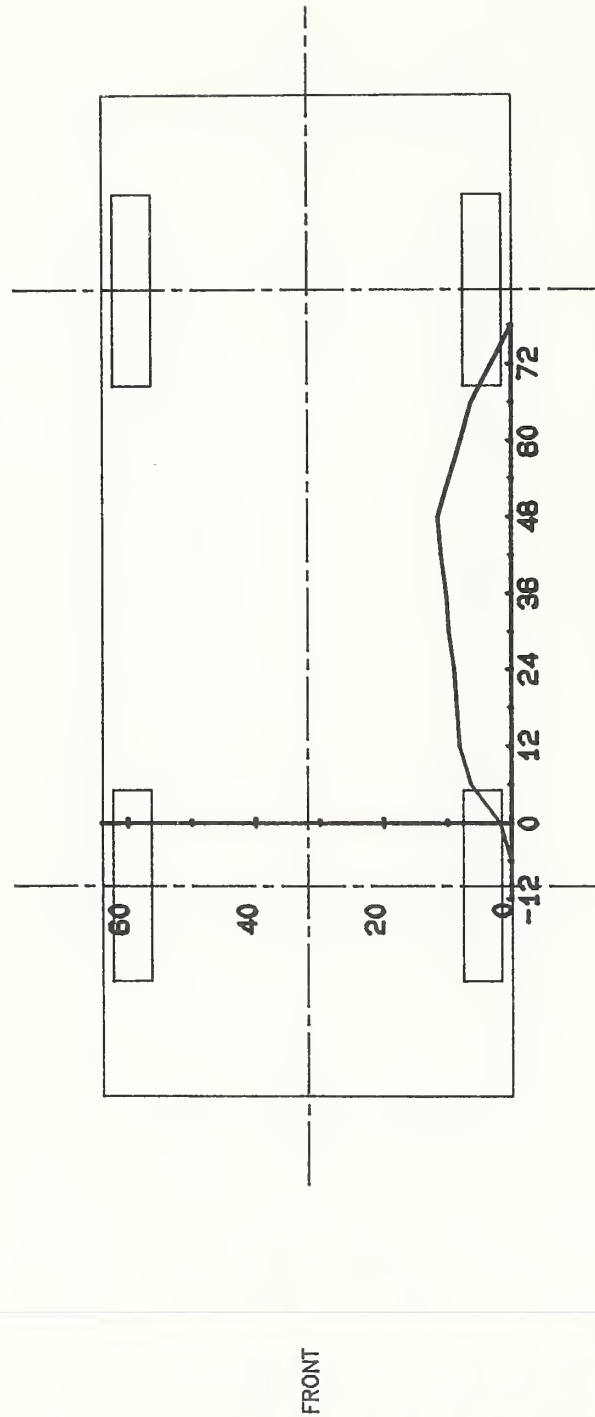
PROFILE LEVEL EQUALS AXLE HEIGHT WHICH IS 10.8" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.036

VEHICLE EXTERIOR STATIC CRUSH PROFILE



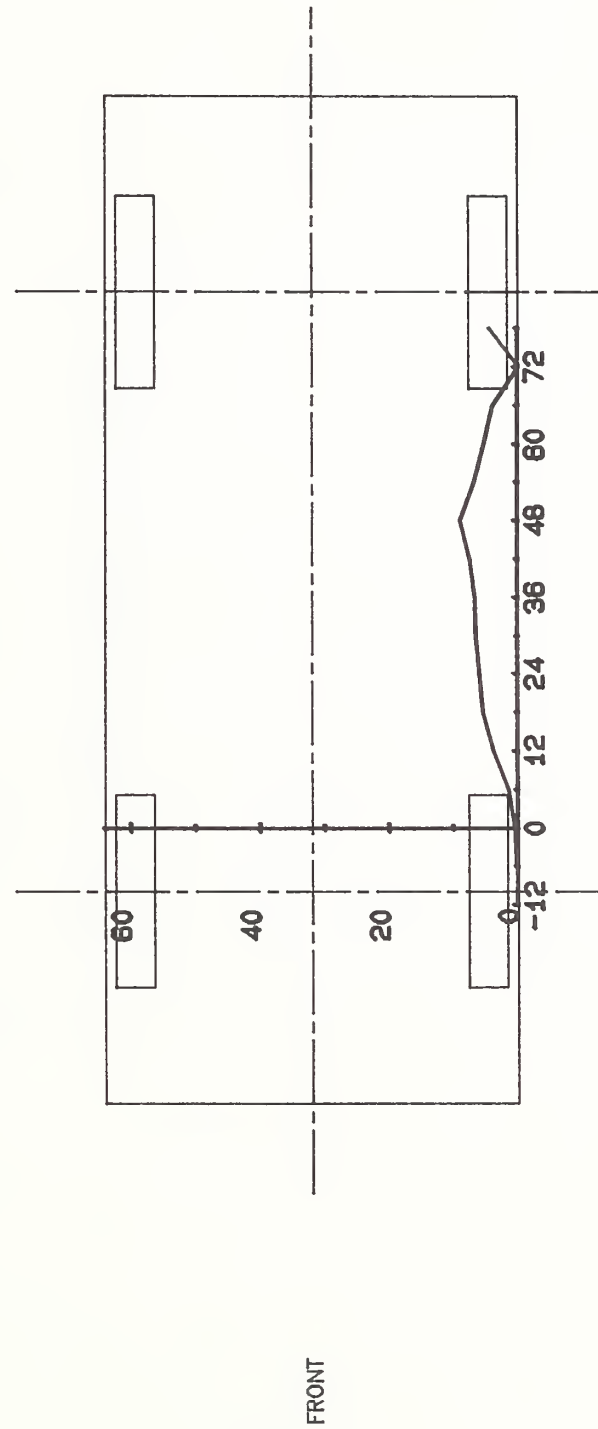
PROFILE LEVEL EQUALS H-POINT HEIGHT WHICH IS 19.5" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.036

VEHICLE EXTERIOR STATIC CRUSH PROFILE



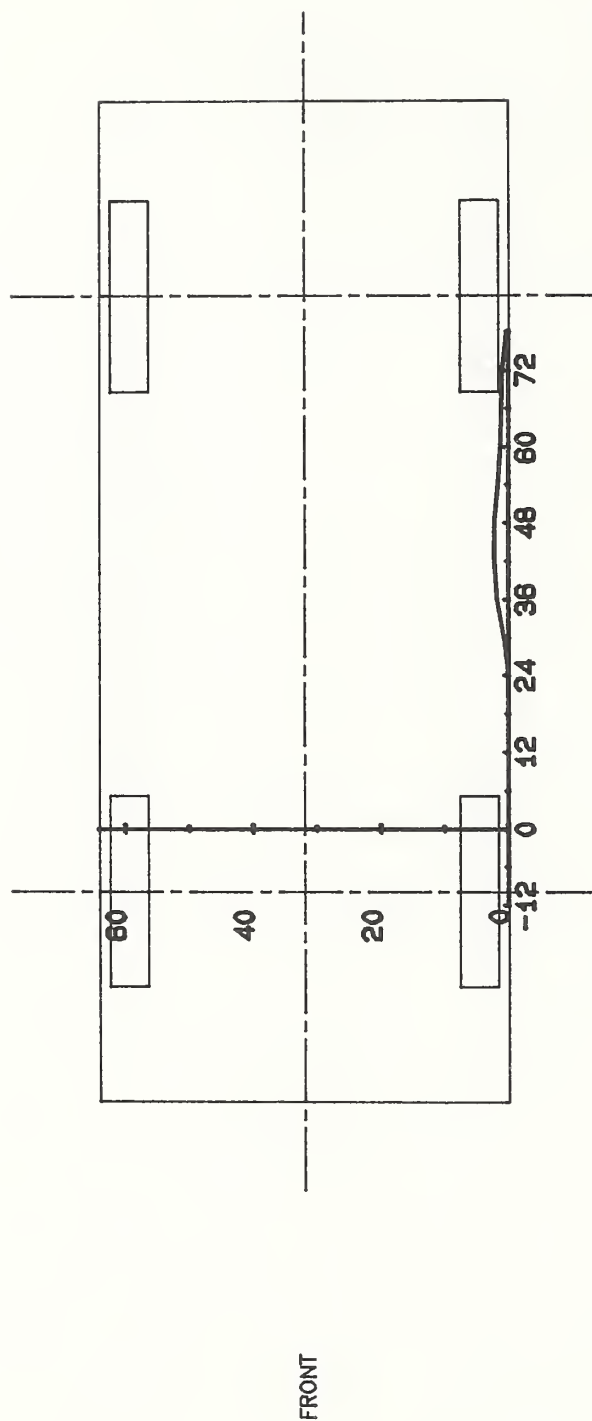
PROFILE LEVEL EQUALS MID DOOR HEIGHT WHICH IS 22.8" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.036

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 0.036

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT WHICH IS 51.4" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.036

DUMMY DATA SUMMARY

TEST NUMBER 900613

DRIVER DUMMY

SN: 001

POSITIVE DIRECTION		NEGATIVE DIRECTION	
MAX	MSEC	MAX	MSEC

HEAD

LONGITUDINAL ACCEL. (g)	29.1	317.9	13.0	67.6
LATERAL ACCEL. (g)	32.7	75.4	31.4	321.0
DELTA V (MPH)	24.5	119.0		
VERTICAL ACCEL. (g)	3.4	149.5	62.3	54.9
RESULTANT ACCEL. (g)	64.7	54.0		
HIC	347.8 FROM 43.5 TO 79.5 MSEC			

LEFT SHOULDER

LATERAL ACCEL. (g)	106.4	34.4	36.8	68.8
DELTA V (MPH)	18.1	38.4		
LONGITUDINAL FORCE (N)	243.9	66.0	266.0	34.6
LATERAL FORCE (N)	3566.3	43.9	550.8	65.9
VERTICAL FORCE (N)	540.9	155.9	490.2	65.9
LATERAL DISPL. (mm)	36.5	45.3	0.7	156.9

UPPER SPINE

LONGITUDINAL ACCEL. (g)	13.4	57.5	13.2	64.4
LATERAL (P) ACCEL. (g)	60.0	41.2	17.9	63.1
DELTA V (MPH)	25.4	55.6		
LATERAL (R) ACCEL. (g)	61.4	41.2	16.6	63.1
DELTA V (MPH)	25.8	55.6		
VERTICAL ACCEL. (g)	4.5	51.3	5.6	71.9
RESULTANT (P) ACCEL. (g)	60.1	41.2		
RESULTANT (R) ACCEL. (g)	61.4	41.2		

LEFT UPPER THORAX RIB

LATERAL (P) ACCEL. (g)	108.7	35.0	45.0	41.9
DELTA V (MPH)	19.9	39.4		
LATERAL (R) ACCEL. (g)	111.2	35.0	42.6	41.9
DELTA V (MPH)	20.8	39.4		
LATERAL DISPL. (mm)	34.4	44.0	0.8	64.9

DUMMY DATA SUMMARY CONTINUED

TEST NUMBER 900613

DRIVER DUMMY

SN: 001

POSITIVE DIRECTION		NEGATIVE DIRECTION	
MAX	MSEC	MAX	MSEC

LEFT CENTER THORAX RIB

LATERAL (P) ACCEL. (g)	116.0	34.4	40.3	42.5
DELTA V (MPH)	20.6	40.0		
LATERAL (R) ACCEL. (g)	118.3	34.4	38.5	70.6
DELTA V (MPH)	21.1	39.4		
LATERAL DISPL. (mm)	36.3	44.1	2.0	65.8

LEFT LOWER THORAX RIB

LATERAL (P) ACCEL. (g)	122.8	34.4	47.0	28.1
DELTA V (MPH)	19.6	40.0		
LATERAL (R) ACCEL. (g)	123.7	34.4	46.1	43.1
DELTA V (MPH)	22.3	40.0		
LATERAL DISPL. (mm)	36.1	44.1	2.3	65.0

THORACIC TRAUMA INDEX

TTI (P)	87.5
TTI (R)	88.0

LOWER SPINE

LONGITUDINAL ACCEL. (g)	19.7	30.6	17.6	48.8
LATERAL (P) ACCEL. (g)	52.2	36.3	7.0	93.1
DELTA V (MPH)	24.1	57.5		
LATERAL (R) ACCEL. (g)	52.4	36.3	6.2	62.5
DELTA V (MPH)	24.0	56.9		
VERTICAL ACCEL. (g)	9.6	33.7	10.4	46.9
RESULTANT (P) ACCEL. (g)	54.4	35.6		
RESULTANT (R) ACCEL. (g)	54.5	35.6		

LEFT UPPER ABDOMEN

LATERAL ACCEL. (g)	116.7	19.4	68.7	26.3
DELTA V (MPH)	13.6	23.1		
LATERAL DISPL. (mm)	66.1	43.0	0.0	11.3

LEFT LOWER ABDOMEN

LATERAL ACCEL. (g)	114.1	19.4	79.6	25.6
DELTA V (MPH)	13.6	23.1		
LATERAL DISPL. (mm)	62.2	42.5	0.7	66.5

DUMMY DATA SUMMARY CONTINUED

TEST NUMBER 900613

DRIVER DUMMY

SN: 001

POSITIVE DIRECTION		NEGATIVE DIRECTION	
MAX	MSEC	MAX	MSEC

PELVIS

LONGITUDINAL ACCEL. (g)	14.9	53.1	11.1	44.4
LATERAL ACCEL. (g)	90.1	30.6	7.1	182.5
DELTA V (MPH)	26.2	53.1		
VERTICAL ACCEL. (g)	11.3	48.1	4.2	24.4
RESULTANT ACCEL. (g)	90.1	30.6		

PELVIS PUBIC SYMPHYSIS

LATERAL FORCE (N)	1650.6	34.1	40.7	65.4
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PELVIS SACRUM

LATERAL FORCE (N)	785.8	56.6	2496.9	30.8
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PELVIS ILIAC

LATERAL FORCE (N)	3269.3	27.3	205.4	56.8
-------------------	--------	------	-------	------

POSITIVE DIRECTION

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

NEGATIVE DIRECTION

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

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

DUMMY DATA SUMMARY

TEST NUMBER 900613

PASSENGER DUMMY

SN: 002

POSITIVE DIRECTION		NEGATIVE DIRECTION	
MAX	MSEC	MAX	MSEC

HEAD

LONGITUDINAL ACCEL. (g)	13.4	202.6	16.2	59.3
LATERAL ACCEL. (g)	98.3	42.4	21.2	203.6
DELTA V (MPH)	20.5	71.9		
VERTICAL ACCEL. (g)	29.6	56.6	19.6	91.6
RESULTANT ACCEL. (g)	98.6	42.4		
HIC	427.7 FROM 39.1 TO 47.4 MSEC			

LEFT SHOULDER

LATERAL ACCEL. (g)	55.4	31.9	18.6	102.5
DELTA V (MPH)	25.1	69.4		
LATERAL DISPL. (mm)	22.6	55.5	0.8	97.4

UPPER SPINE

LONGITUDINAL ACCEL. (g)	6.0	78.1	9.2	58.8
LATERAL (P) ACCEL. (g)	45.5	53.1	7.4	96.3
DELTA V (MPH)	26.3	82.5		
VERTICAL ACCEL. (g)	3.2	33.1	6.5	96.3
RESULTANT (P) ACCEL. (g)	46.4	53.1		

LEFT UPPER THORAX RIB

LATERAL (P) ACCEL. (g)	51.5	30.6	20.9	60.0
DELTA V (MPH)	22.8	58.1		
LATERAL (R) ACCEL. (g)	51.8	30.0	19.0	60.0
DELTA V (MPH)	23.1	58.1		
LATERAL DISPL. (mm)	22.8	53.3	0.5	207.1

LEFT CENTER THORAX RIB

LATERAL (P) ACCEL. (g)	51.5	28.1	8.3	83.7
DELTA V (MPH)	28.1	81.2		
LATERAL (R) ACCEL. (g)	51.7	28.1	7.1	83.1
DELTA V (MPH)	27.4	80.6		
LATERAL DISPL. (mm)	33.8	51.4	0.6	198.9

LEFT LOWER THORAX RIB

LATERAL (P) ACCEL. (g)	64.6	28.1	4.7	53.1
DELTA V (MPH)	21.5	51.2		
LATERAL (R) ACCEL. (g)	68.0	28.1	5.2	53.1
DELTA V (MPH)	21.7	51.2		
LATERAL DISPL. (mm)	37.6	46.1	0.3	261.9

THORACIC TRAUMA INDEX

TTI (P)	61.8
TTI (R)	62.3

DUMMY DATA SUMMARY CONTINUED

TEST NUMBER 900613

PASSENGER DUMMY SN: 002					
POSITIVE DIRECTION			NEGATIVE DIRECTION		
	MAX	MSEC		MAX	MSEC
LOWER SPINE					
LONGITUDINAL ACCEL. (g)	10.2	36.9	10.9	55.0	
LATERAL (P) ACCEL. (g)	59.1	38.8	3.8	66.9	
DELTA V (MPH)	24.1	61.9			
LATERAL (R) ACCEL. (g)	56.6	38.8	3.7	197.5	
DELTA V (MPH)	23.5	62.5			
VERTICAL ACCEL. (g)	22.9	40.0	16.4	59.4	
RESULTANT (P) ACCEL. (g)	63.7	38.8			
RESULTANT (R) ACCEL. (g)	61.4	38.8			
LEFT UPPER ABDOMEN					
LATERAL ACCEL. (g)	141.1	32.5	50.4	27.5	
DELTA V (MPH)	5.8	25.6			
LATERAL DISPL. (mm)	52.9	47.5	0.1	0.0	
LEFT LOWER ABDOMEN					
LATERAL ACCEL. (g)	159.9	21.9	93.5	26.9	
DELTA V (MPH)	12.7	25.0			
LATERAL DISPL. (mm)	65.2	44.6 Y	1.0	226.8 Y	
PELVIS					
LONGITUDINAL ACCEL. (g)	3.5	65.6	25.7	36.9	
LATERAL ACCEL. (g)	94.3	31.9	4.2	176.3	
DELTA V (MPH)	26.9	62.5			
VERTICAL ACCEL. (g)	21.8	36.3	5.4	100.0	
RESULTANT ACCEL. (g)	95.2	31.9			

POSITIVE DIRECTION

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

NEGATIVE DIRECTION

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

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

Y See TEST ANOMALIES

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900613

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX	G MSEC	MAX	G MSEC
1	RIGHT SILL AT FRONT SEAT	97.8	23.1	17.4				
	LONGITUDINAL				3.2	49.1	7.0	14.9
	LATERAL				17.2	10.9	3.6	65.3
	VERTICAL				4.7	11.4	3.6	112.5
	RESULTANT				18.0	11.0		
	Delta VY is 15.1 MPH @ 58.2 MSEC							
2	RIGHT SILL AT REAR SEAT	80.3	23.5	11.5				
	LONGITUDINAL				3.0	49.6	7.2	15.1
	LATERAL				21.6	46.8	3.5	89.5
	VERTICAL				5.8	24.4	4.6	40.3
	RESULTANT				21.7	46.9		
	Delta VY is 18.0 MPH @ 65.0 MSEC							
3	REAR DECK OVER AXLE	33.9	0.0	18.0				
	LONGITUDINAL				4.5	52.8	9.6	12.6
	LATERAL				25.1	47.3	3.6	90.9
	VERTICAL				11.7	21.1	15.0	12.9
	RESULTANT				26.0	12.8		
	Delta VY is 20.9 MPH @ 67.6 MSEC							
4	LEFT SILL AT REAR SEAT	71.0	-23.5	12.1				
	LATERAL				43.8	9.0	23.0	25.1
	Delta VY is 12.3 MPH @ 43.2 MSEC							
5	LEFT SILL AT FRONT SEAT	95.6	-23.0	10.8				
	LATERAL				44.3	15.8	65.8	9.4
	Delta VY is 4.8 MPH @ 106.1 MSEC							
6	LEFT FRONT DOOR CENTERLINE	90.3	-25.6	25.8				
	LATERAL				120.4	14.4	102.1	22.1
	Delta VY is 14.0 MPH @ 15.9 MSEC							
7	RIGHT TRUNK FLOOR	34.0	15.9	18.0				
	LONGITUDINAL				3.0	51.1	8.3	14.9
8	LEFT REAR DOOR	50.8	-26.1	29.5				
	MID REAR LATERAL				94.4	10.0	99.4	28.6
	Delta VY is 23.8 MPH @ 21.1 MSEC							

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY CONTINUED

TEST NUMBER 900613

No. LOCATION	X*	Y*	Z*	POSITIVE		NEGATIVE
				DIRECTION		DIRECTION
				MAX G	MSEC	MAX G
9 UPPER LEFT FRONT DOOR CENTERLINE LATERAL	87.8	-25.4	32.3			
				86.5	18.0 Y	615.6
				Delta VY is 18.5 MPH @ 17.9 MSEC	Y	35.0 Y
10 MIDFRONT OF LEFT FRONT DOOR LATERAL	82.8	-25.4	28.2			
				125.2	17.0	196.7
				Delta VY is 25.0 MPH @ 20.8 MSEC		25.5
11 LEFT REAR DOOR UPPER CENTERLINE LATERAL	55.0	-25.1	32.8			
				106.1	14.3	90.9
				Delta VY is 24.8 MPH @ 23.5 MSEC		30.5

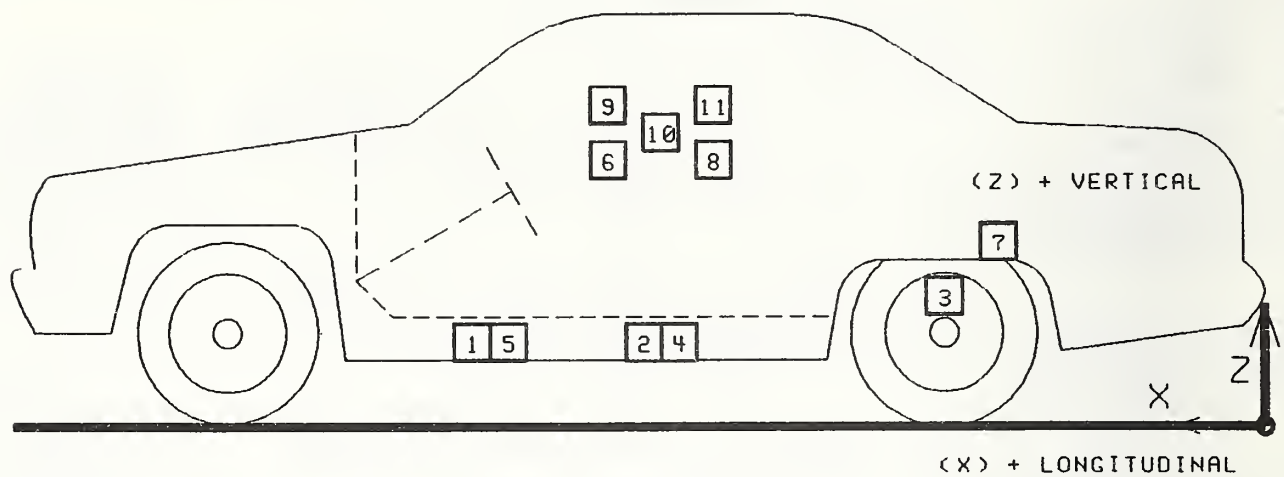
* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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

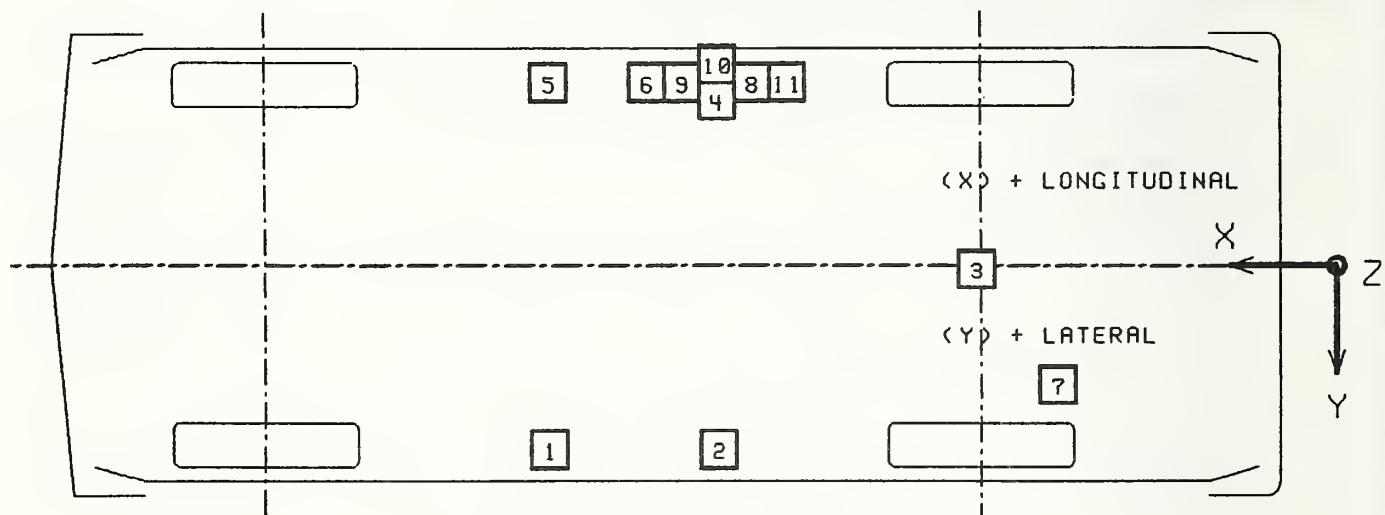
All measurements of accelerometer locations in inches.

Y See TEST ANOMALIES

VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW

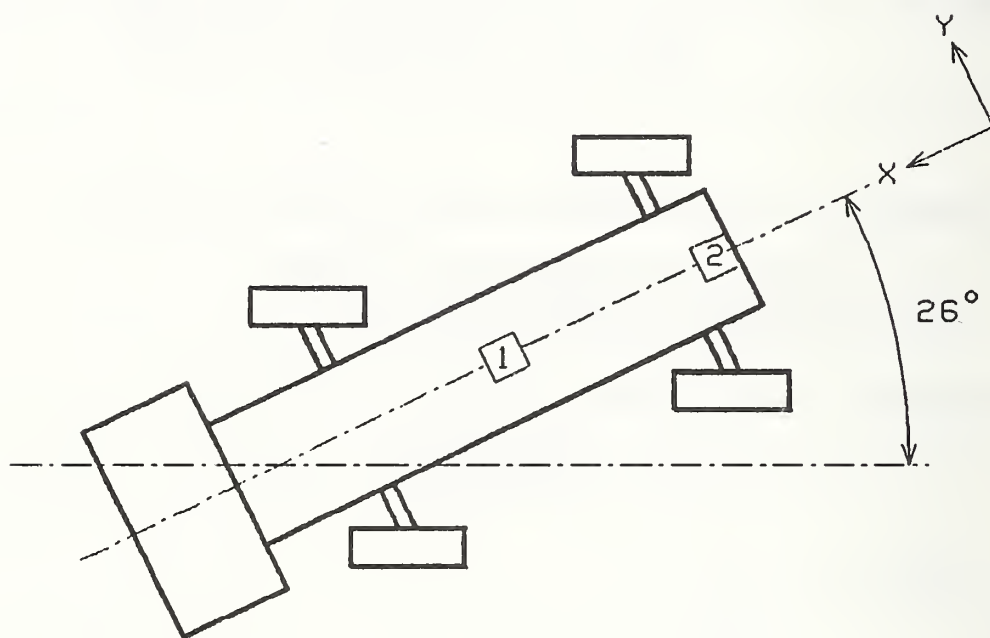


BOTTOM VIEW

TEST NUMBER 900613

3-27

MOVING BARRIER ACCELEROMETER PLACEMENT

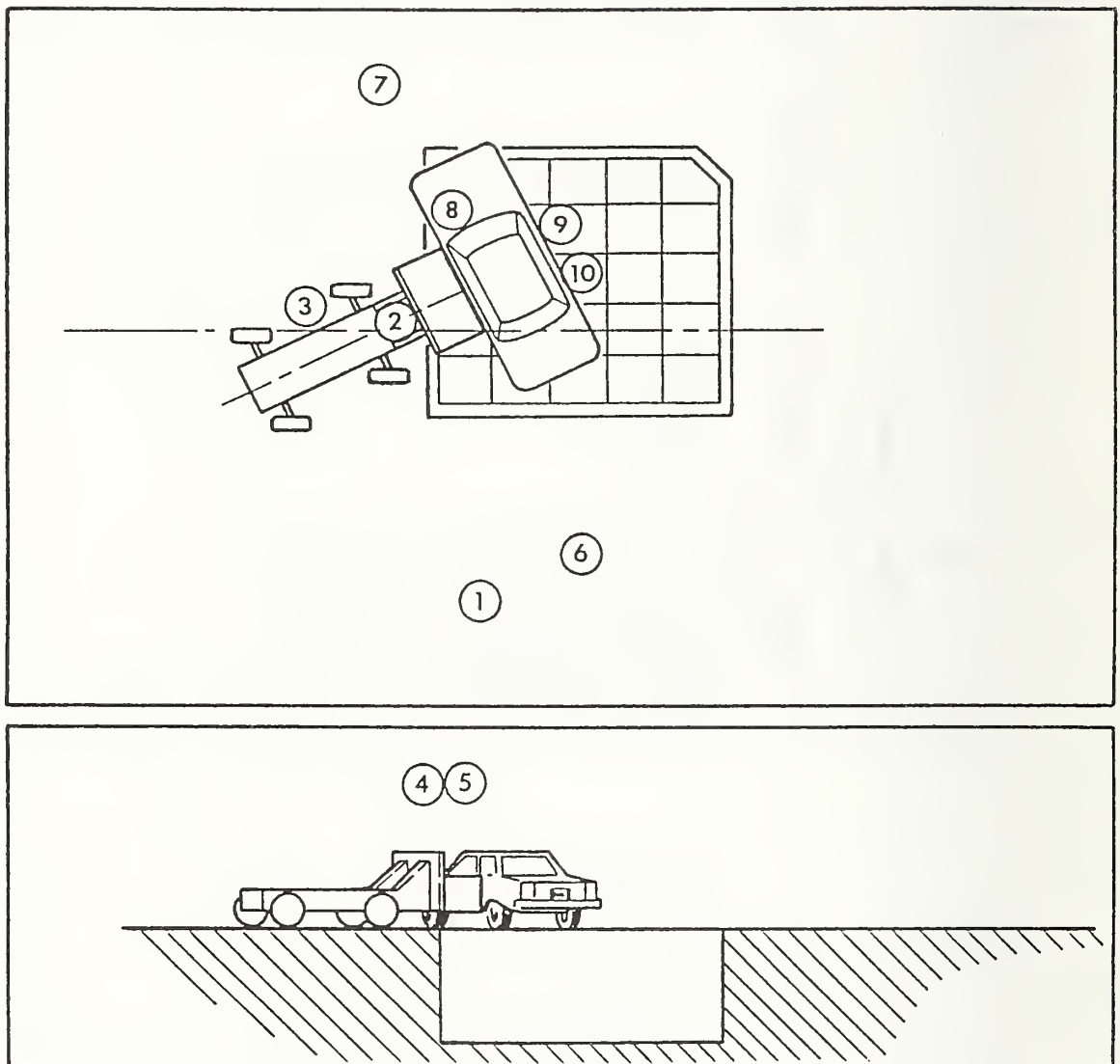


TOP VIEW

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	998	Dummy kinematics
3	Onboard MDB - tight	Photosonic 1B	25	1000	Close-up of impact point
4	Overhead - wide	Photosonic 1B	8.5	930	Vehicle dynamics
5	Overhead - tight	Photosonic 1B	25	998	Close-up vehicle dynamic
6	Ground level - right	Photosonic 1B	25	1000	Overall view
7	Ground level - left	Photosonic 1B	25	1000	Overall view
8	Onboard windshield	Photosonic 1B	8	1000	Driver kinematics - Frt.
10	Onboard driver	Photosonic 1B	8	998	Driver kinematics
11	Onboard passenger	Photosonic 1B	8	1000	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



Figure A-3. POST-TEST VEHICLE RIGHT SIDE VIEW



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



Figure A-5. PRE-TEST VEHICLE REAR AND BARRIER VIEW



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



Figure A-7. PRE-TEST VEHICLE LEFT AND BARRIER VIEW



Figure A-8. PRE-TEST VEHICLE LEFT SIDE VIEW



Figure A-9. POST-TEST VEHICLE LEFT SIDE - VIEW 1



Figure A-10. POST-TEST VEHICLE LEFT SIDE - VIEW 2



Figure A-11. PRE-TEST LEFT FRONT CLOSE-UP VIEW

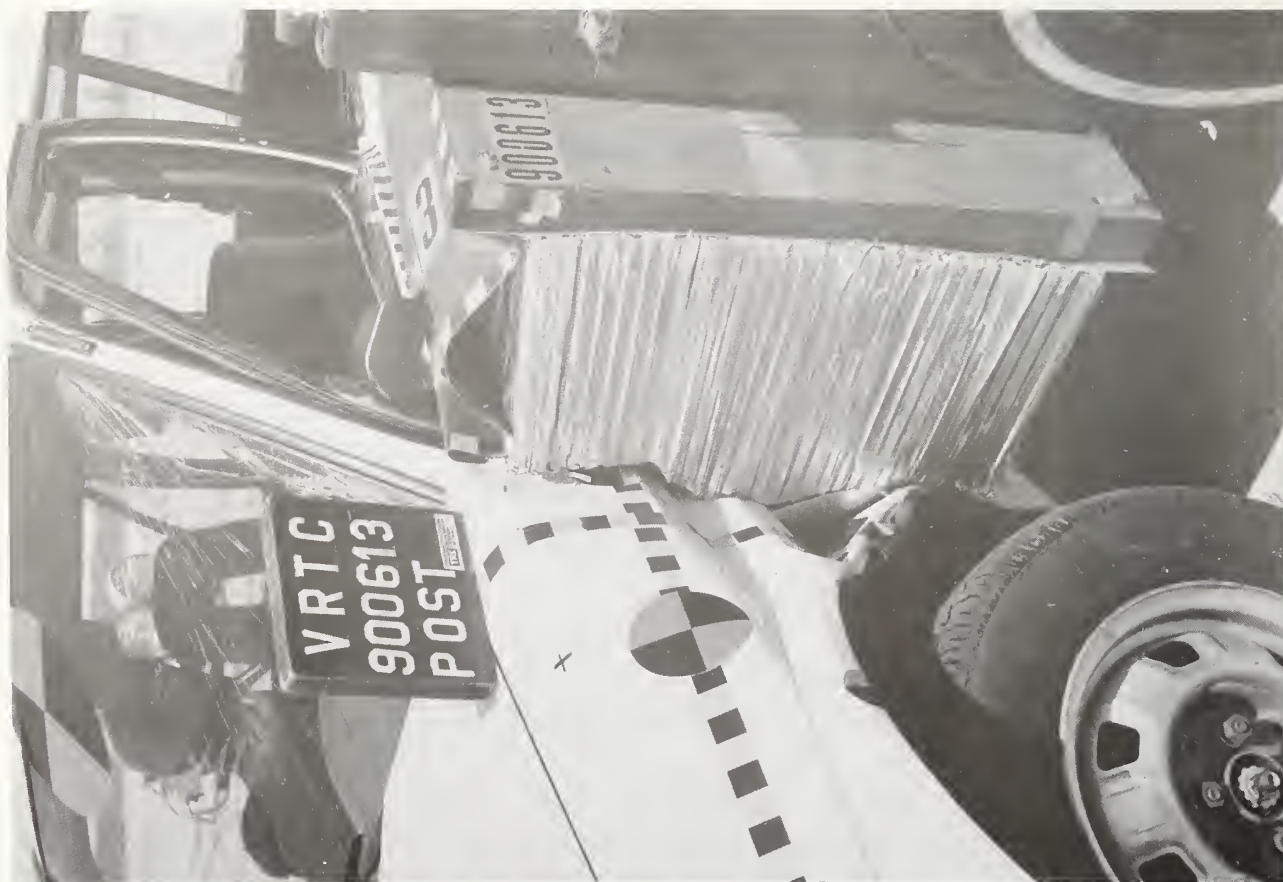


Figure A-12. POST-TEST VEHICLE LEFT FRONT CLOSE-UP VIEW



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

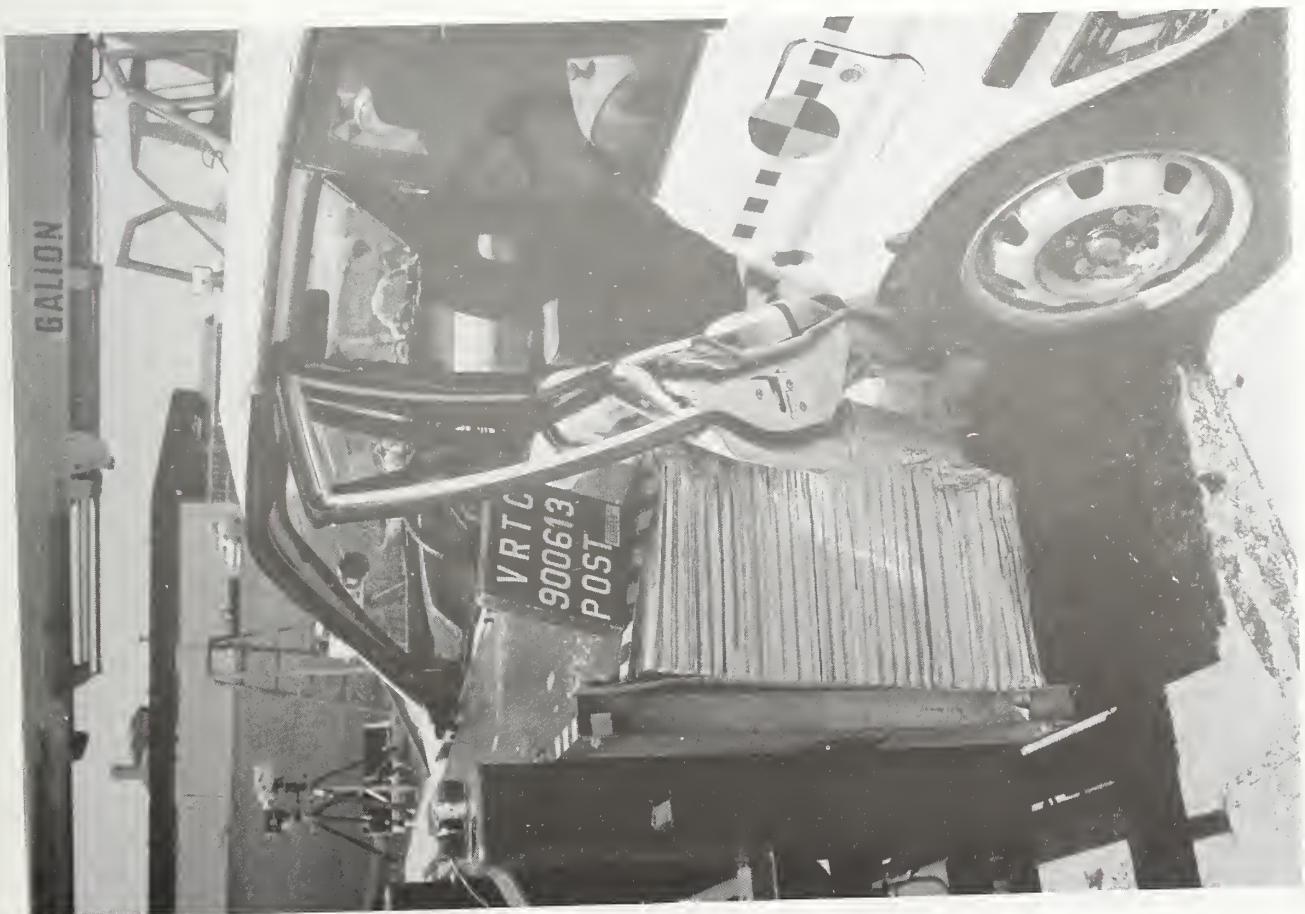


Figure A-14. POST-TEST VEHICLE LEFT REAR CLOSE-UP - VIEW 1

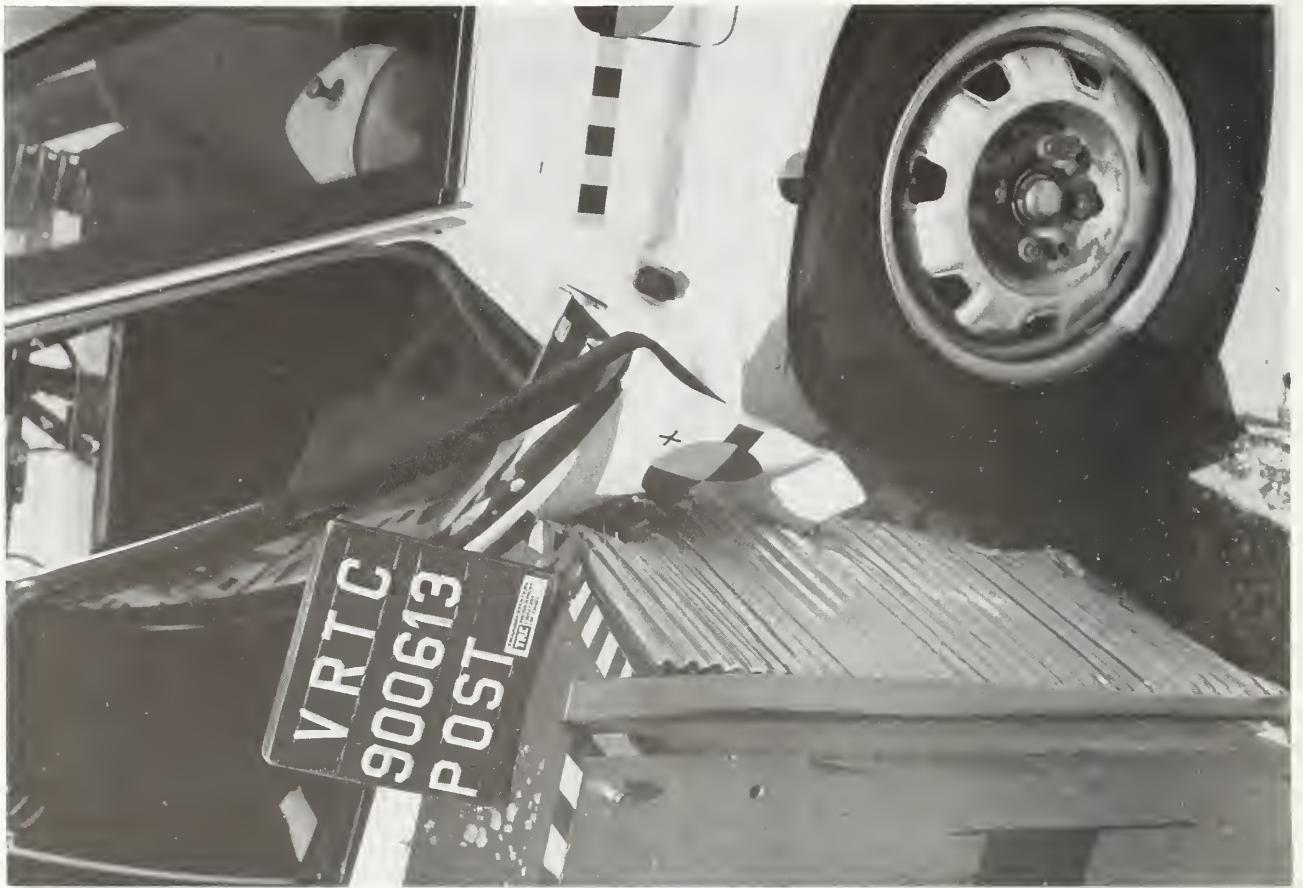


Figure A-15. POST-TEST LEFT REAR CLOSE-UP - VIEW 2

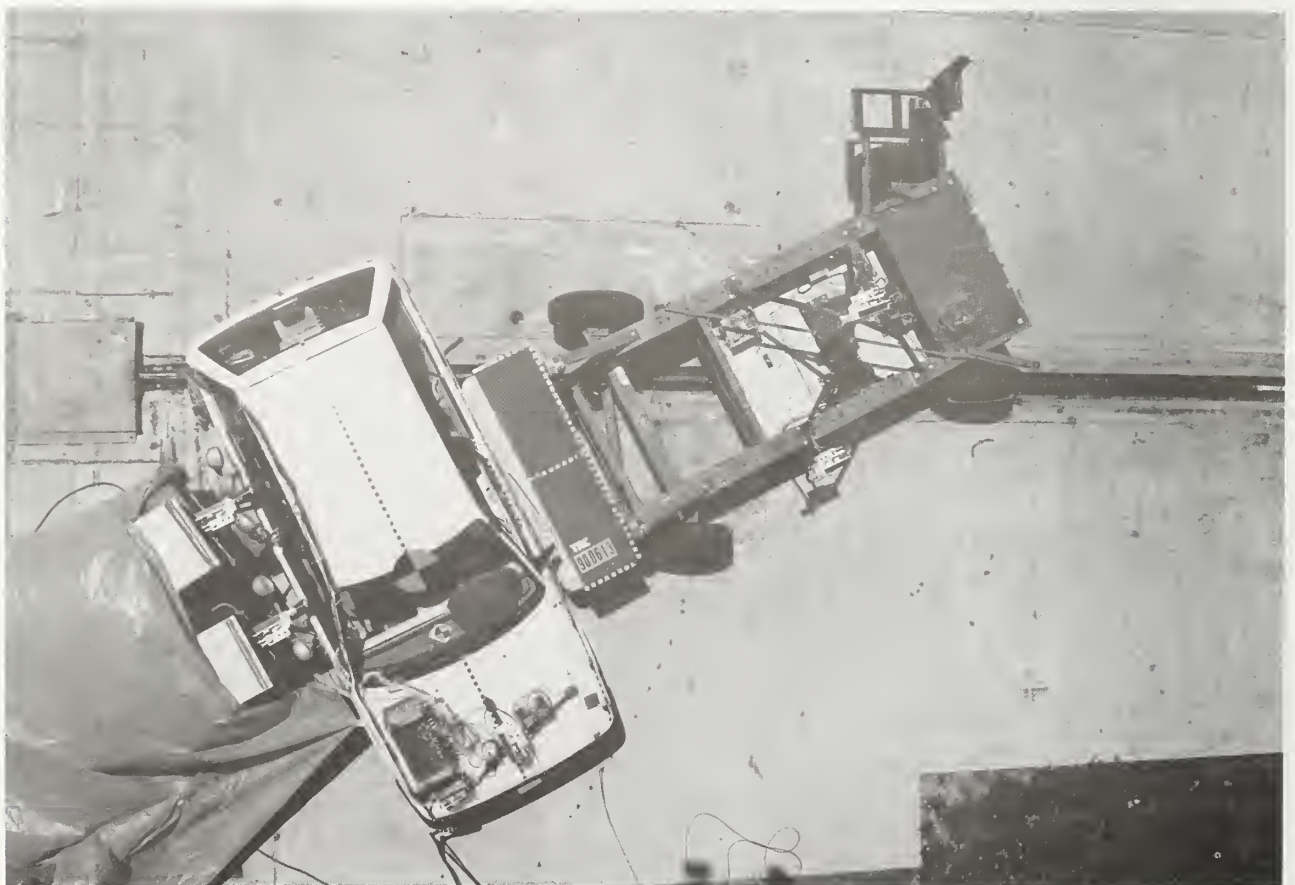


Figure A-16. PRE-TEST VEHICLE TOP AND BARRIER - VIEW 1

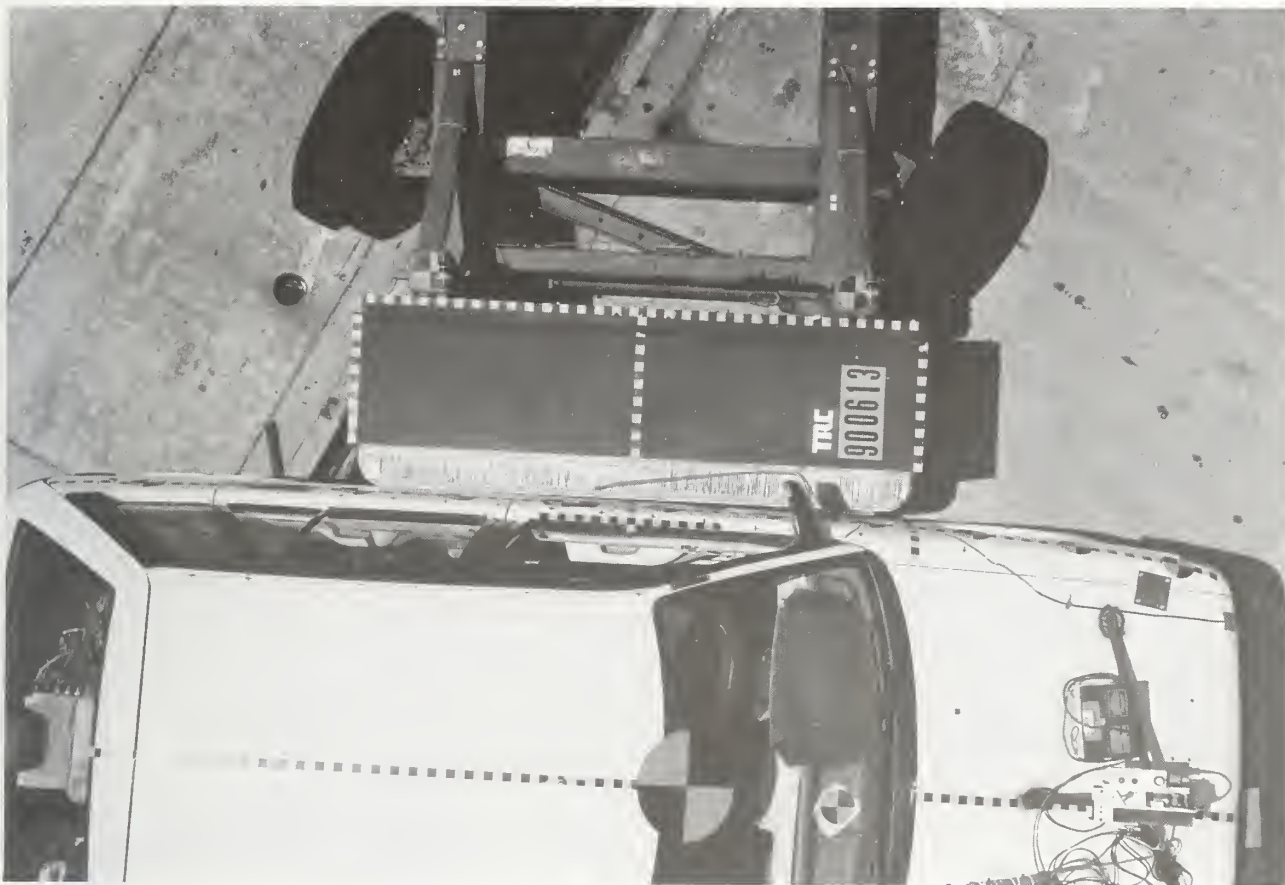


Figure A-17. PRE-TEST VEHICLE TOP AND BARRIER - VIEW 2

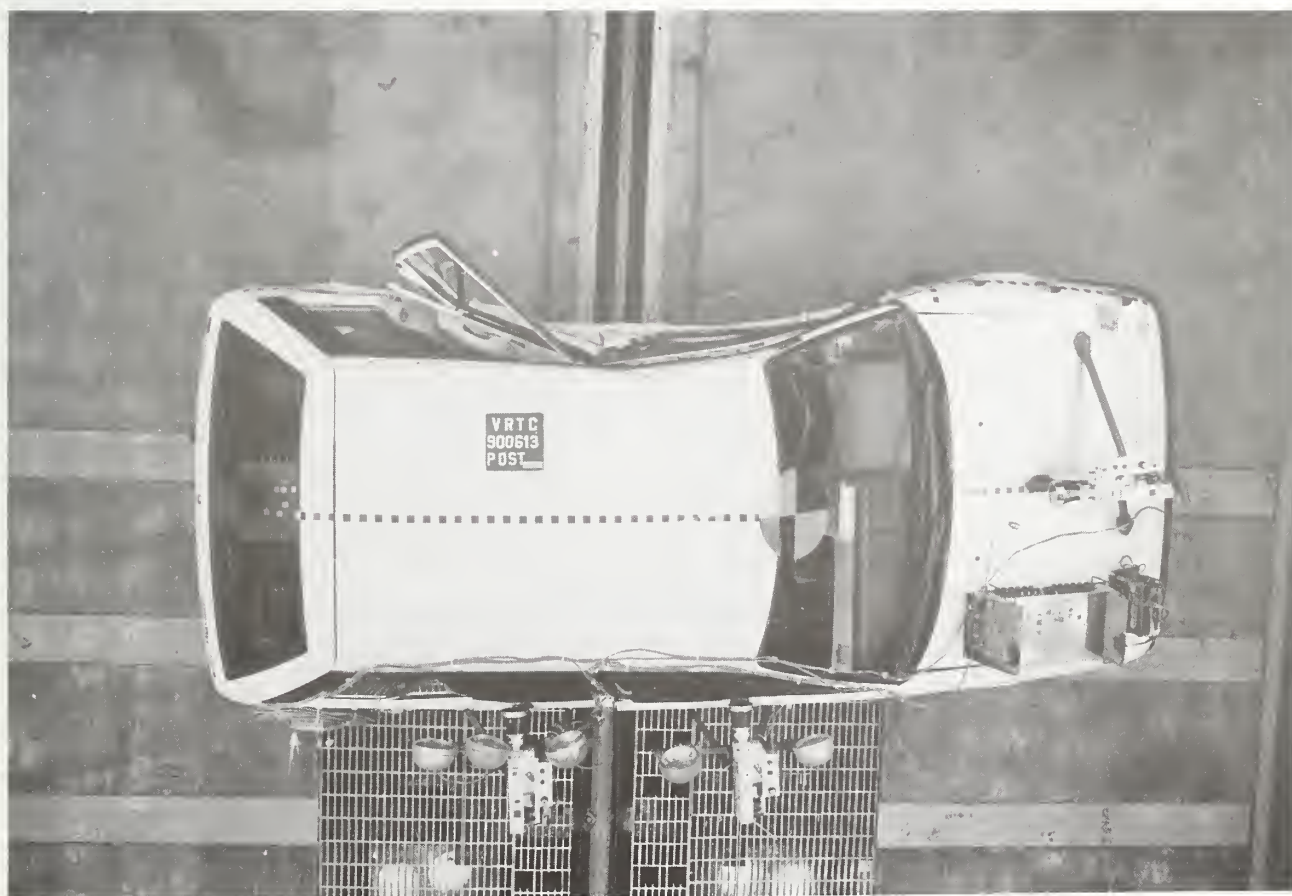


Figure A-18. POST-TEST VEHICLE TOP - VIEW 1



Figure A-19. POST-TEST VEHICLE TOP - VIEW 2



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

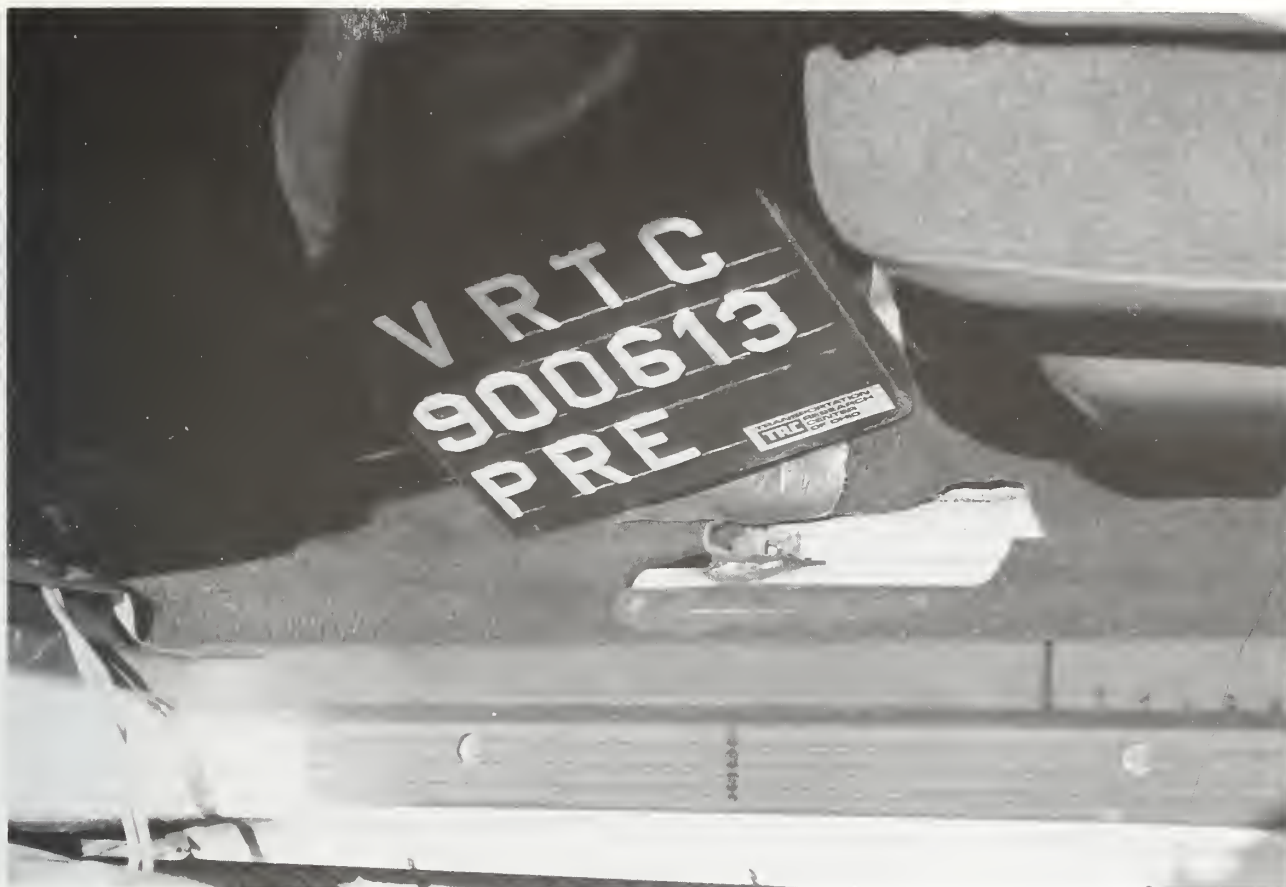


Figure A-21. PRE-TEST LEFT FRONT SILL ACCELEROMETER VIEW



Figure A-22. PRE-TEST RIGHT REAR DOOR ACCELEROMETERS VIEW



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



Figure A-24. PRE-TEST RIGHT FRONT SILL ACCELEROMETER VIEW



Figure A-25. PRE-TEST RIGHT REAR SILL ACCELEROMETER VIEW



Figure A-26. PRE-TEST TRUNK AREA ACCELEROMETER VIEW



Figure A-27. PRE-TEST DRIVER DUMMY - VIEW 1

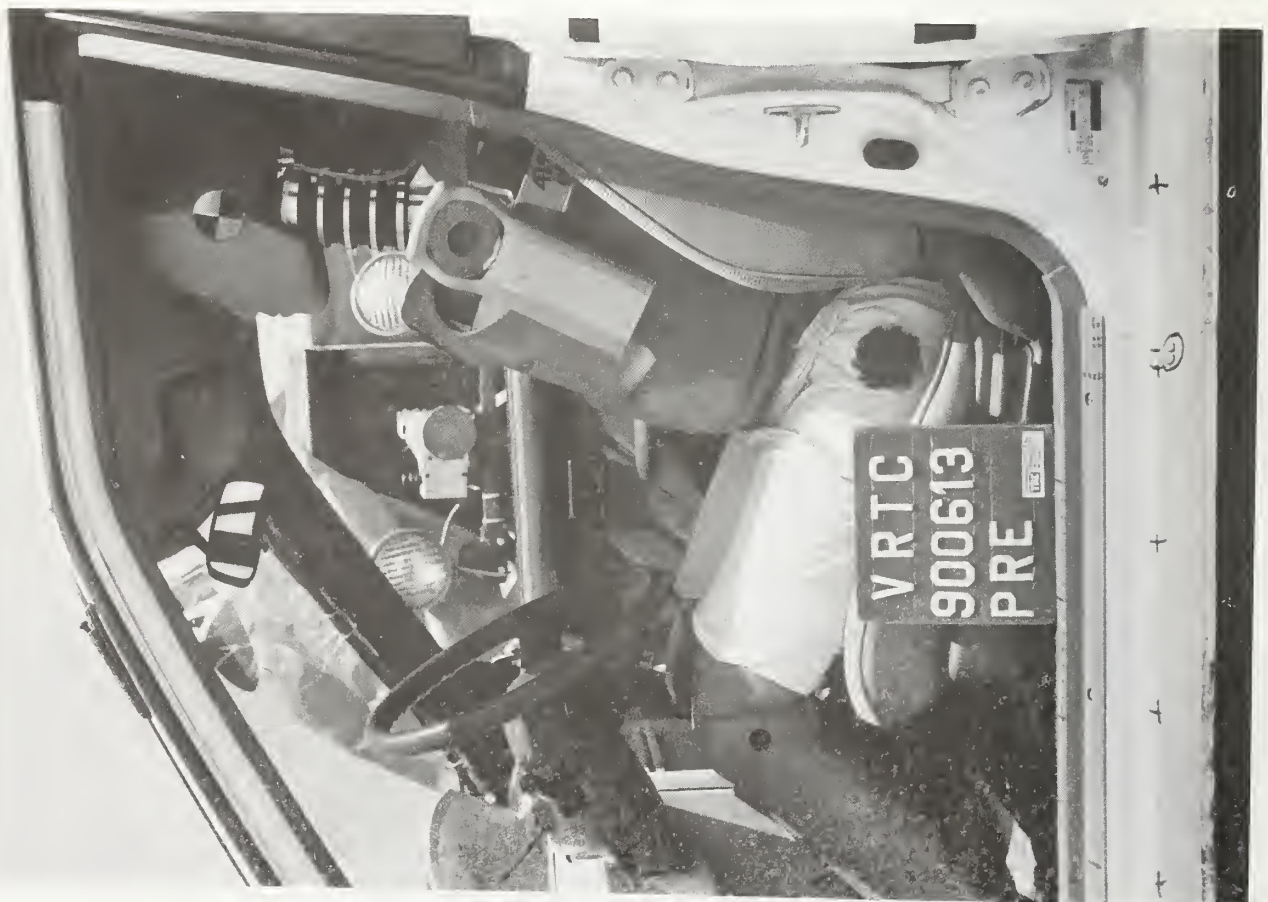


Figure A-28. PRE-TEST DRIVER DUMMY - VIEW 2

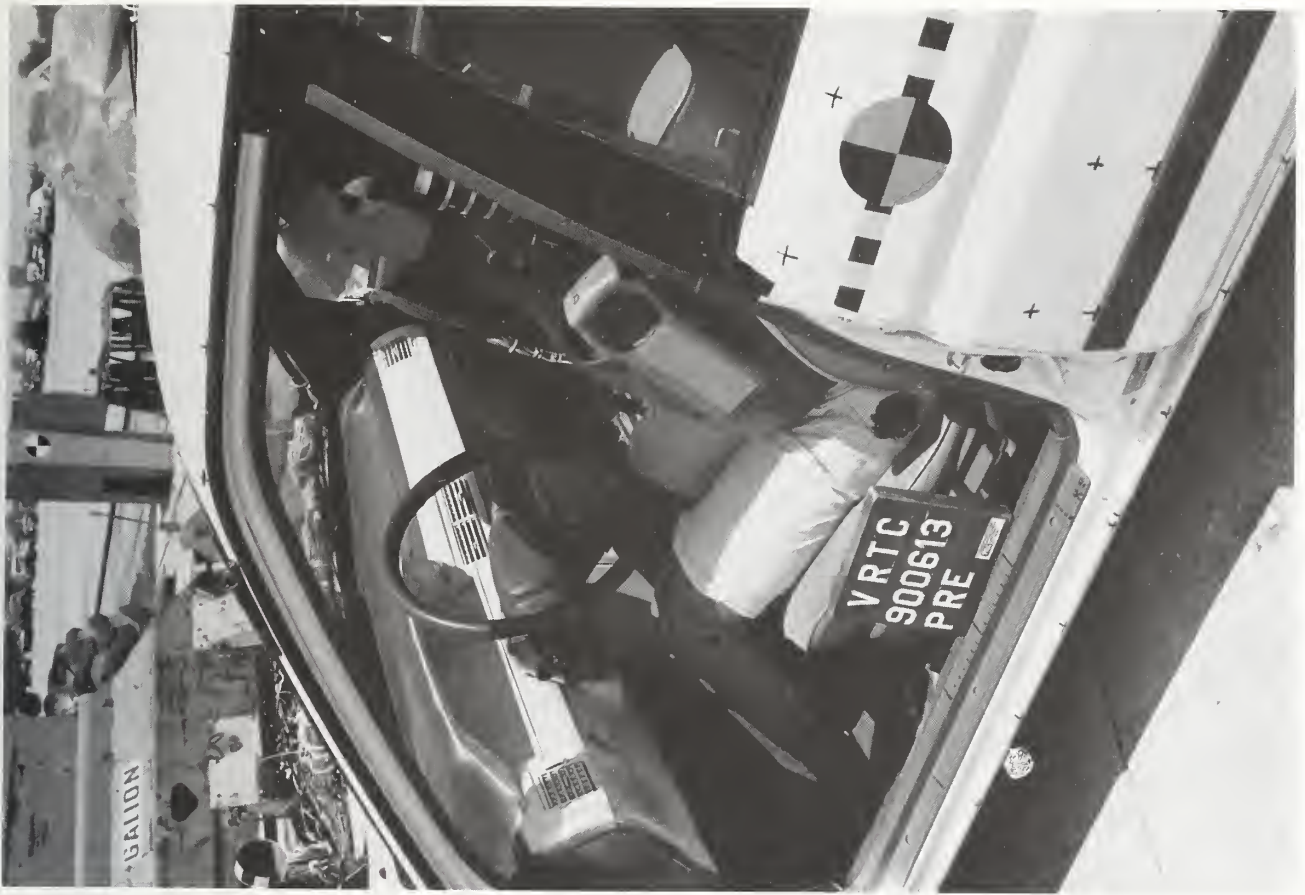


Figure A-29. PRE-TEST DRIVER DUMMY - VIEW 3



Figure A-30. POST-TEST DRIVER DUMMY VIEW



Figure A-31. PRE-TEST PASSENGER DUMMY - VIEW 1



Figure A-32. PRE-TEST PASSENGER DUMMY - VIEW 2



Figure A-33. PRE-TEST PASSENGER DUMMY - VIEW 3



Figure A-34. POST-TEST PASSENGER DUMMY VIEW



Figure A-35. POST-TEST DRIVER AND PASSENGER DUMMIES RIGHT SIDE VIEW



Figure A-36. POST-TEST DRIVER DUMMY CONTACT - VIEW 1



Figure A-37. POST-TEST DRIVER DUMMY CONTACT - VIEW 2



Figure A-38. POST-TEST PASSENGER DUMMY CONTACT - VIEW 1



Figure A-39. POST-TEST PASSENGER DUMMY CONTACT - VIEW 2



Figure A-40. POST-TEST PASSENGER DUMMY CONTACT - VIEW 3



Figure A-41. POST-TEST BARRIER FACE - VIEW 1

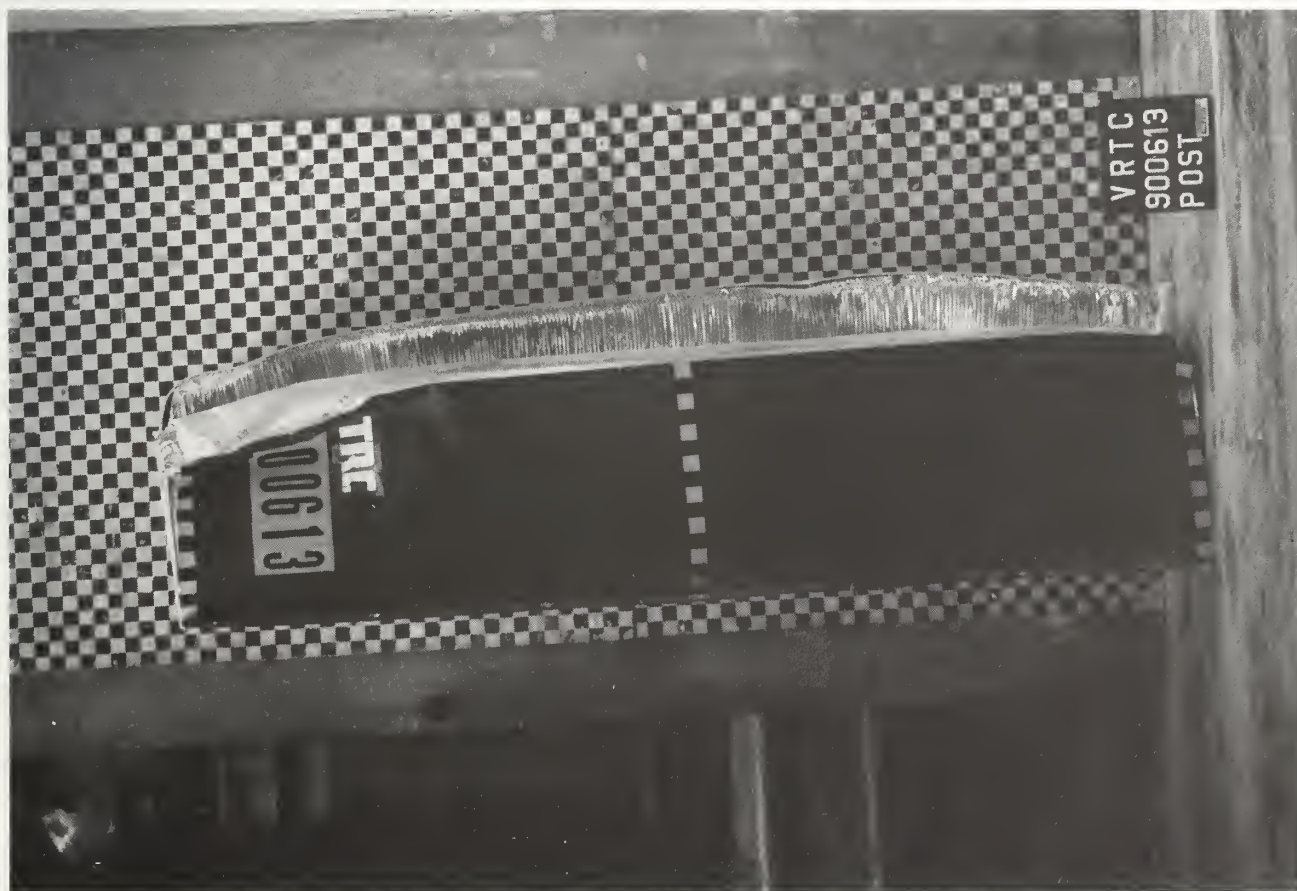


Figure A-42. POST-TEST BARRIER FACE - VIEW 2



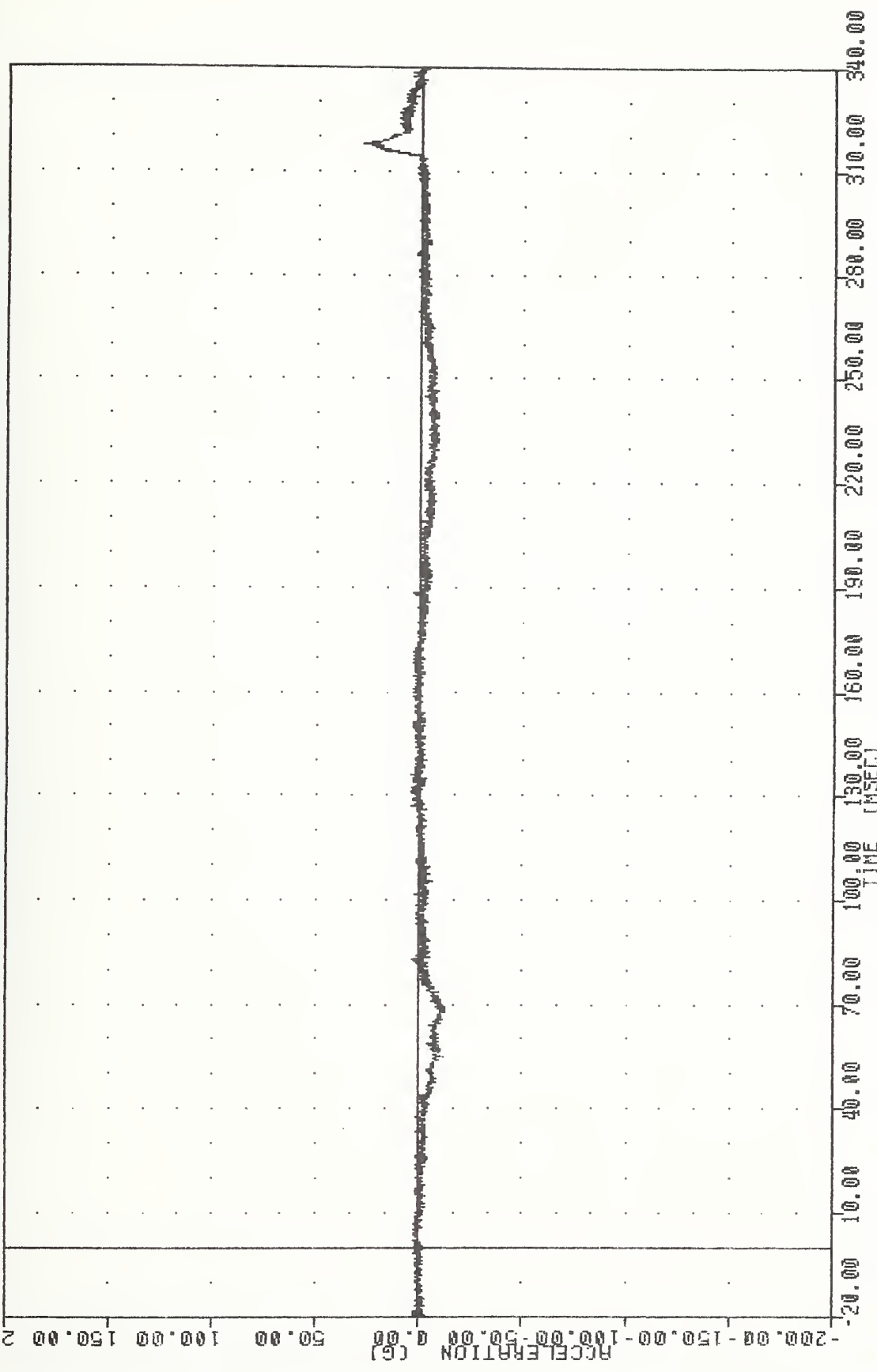
APPENDIX B

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.

VRIC , 900513
SI PROTECTION PROD VEHICLE
90154
HEDX61

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -12.98e 67.63, 29.11 e 317.88

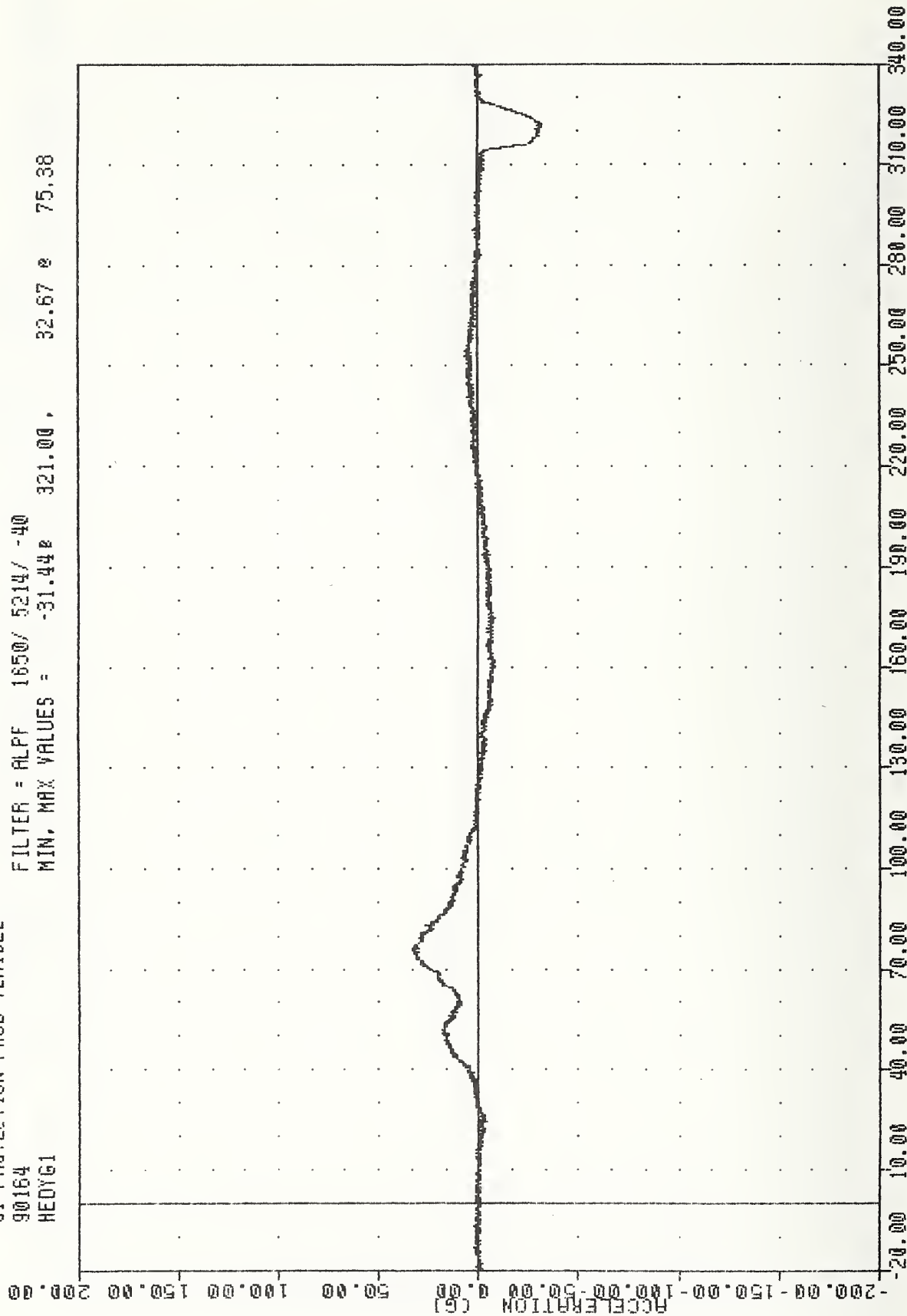


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER HEAD X-AXIS ACCELERATION

VRTC
SI PROTECTION PROD VEHICLE
90164
HEDYG1

900613

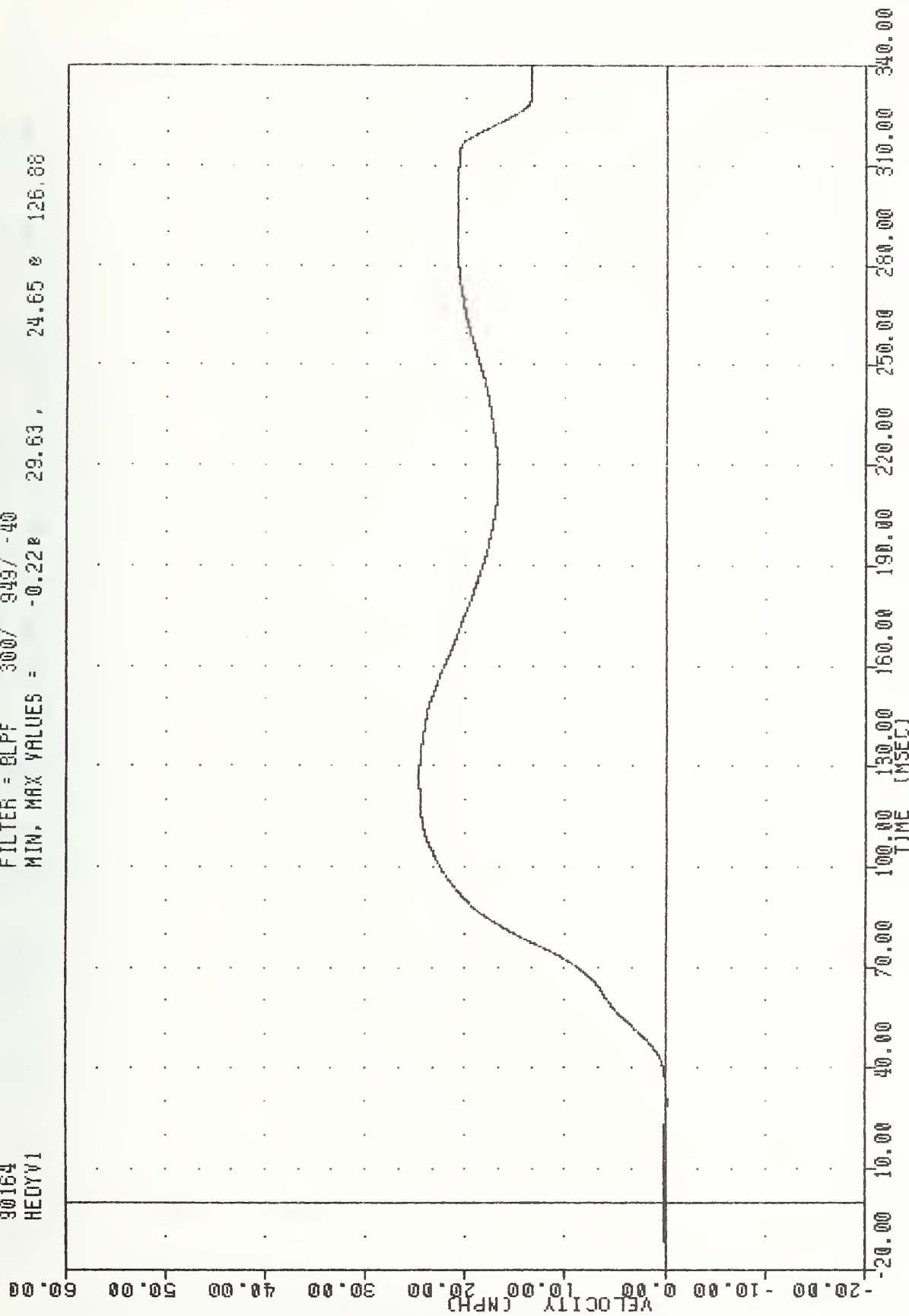
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -31.44 321.00 32.67 75.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER HEAD Y-AXIS ACCELERATION

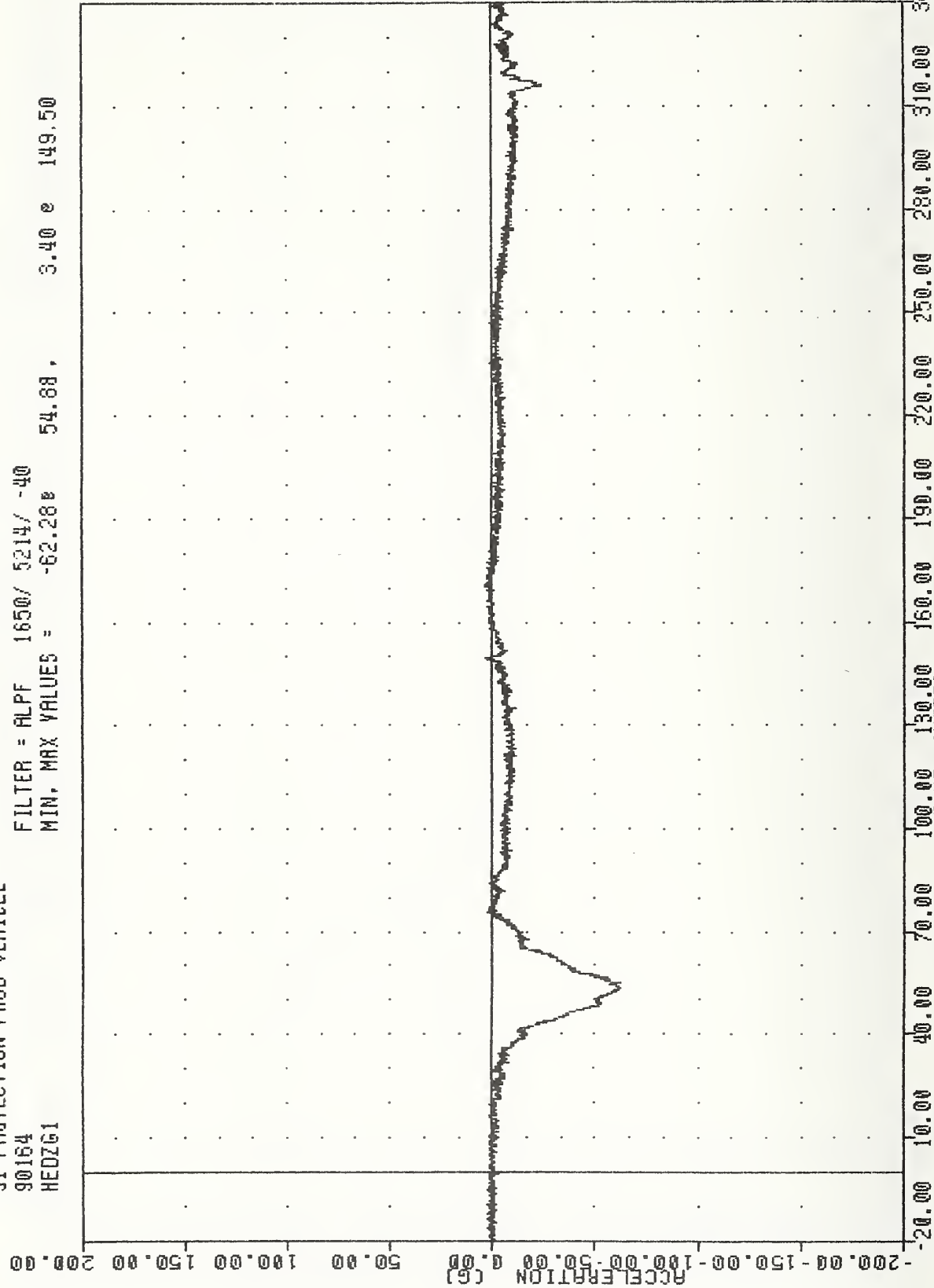
VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
HEDYV1

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.228 29.63 , 24.65 126.88



VRTC . 900613
 SI PROTECTION PROD VEHICLE
 90164
 HEDZG1

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 54.88 , 3.40 e 149.50



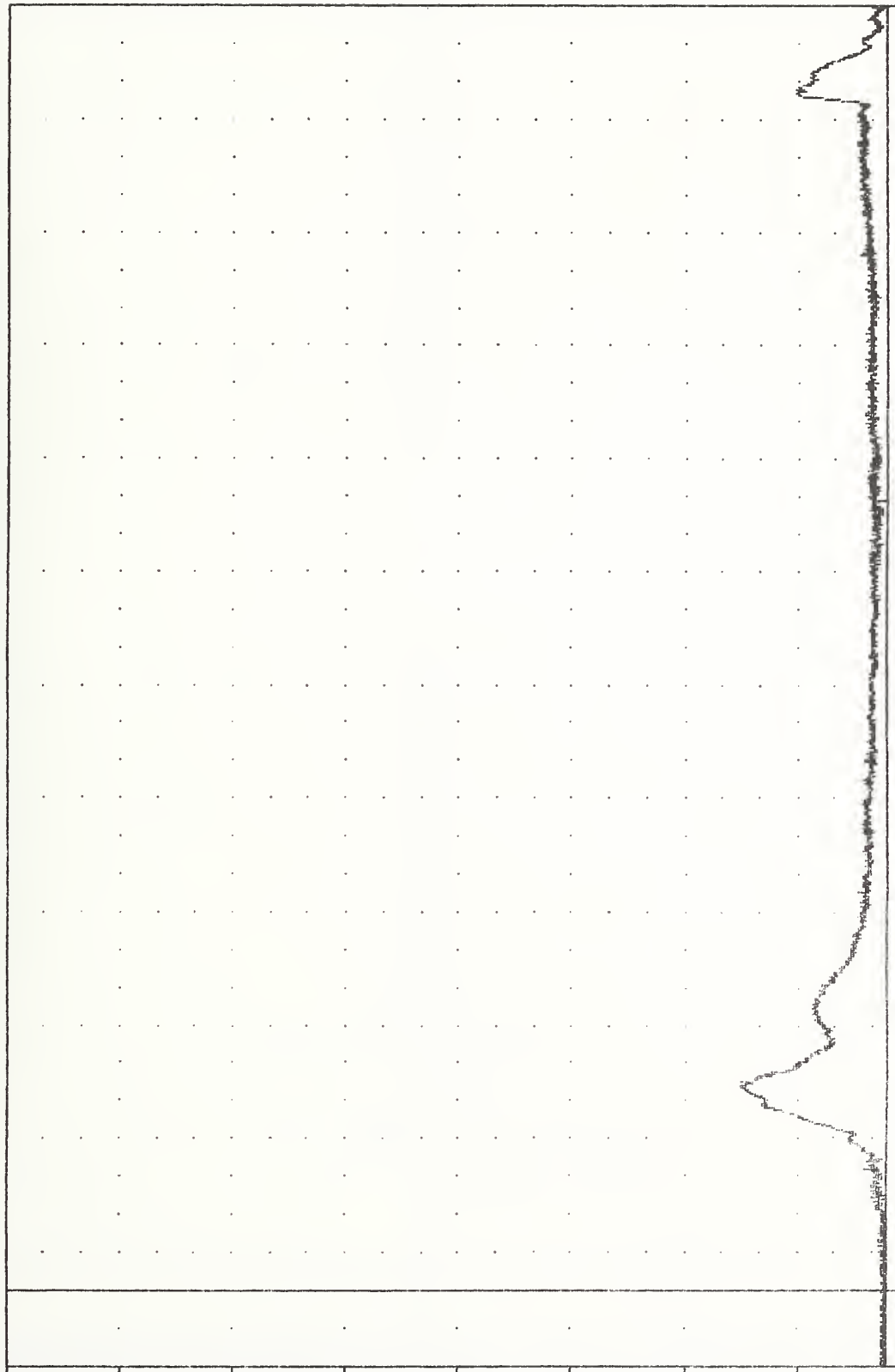
MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER HEAD Z-AXIS ACCELERATION

VRTC 900613
 SI PROTECTION PROD VEHICLE
 90164
 HEAD61

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 0.25%

11.88, 64.70 s 54.00

ACCELERATION (G)

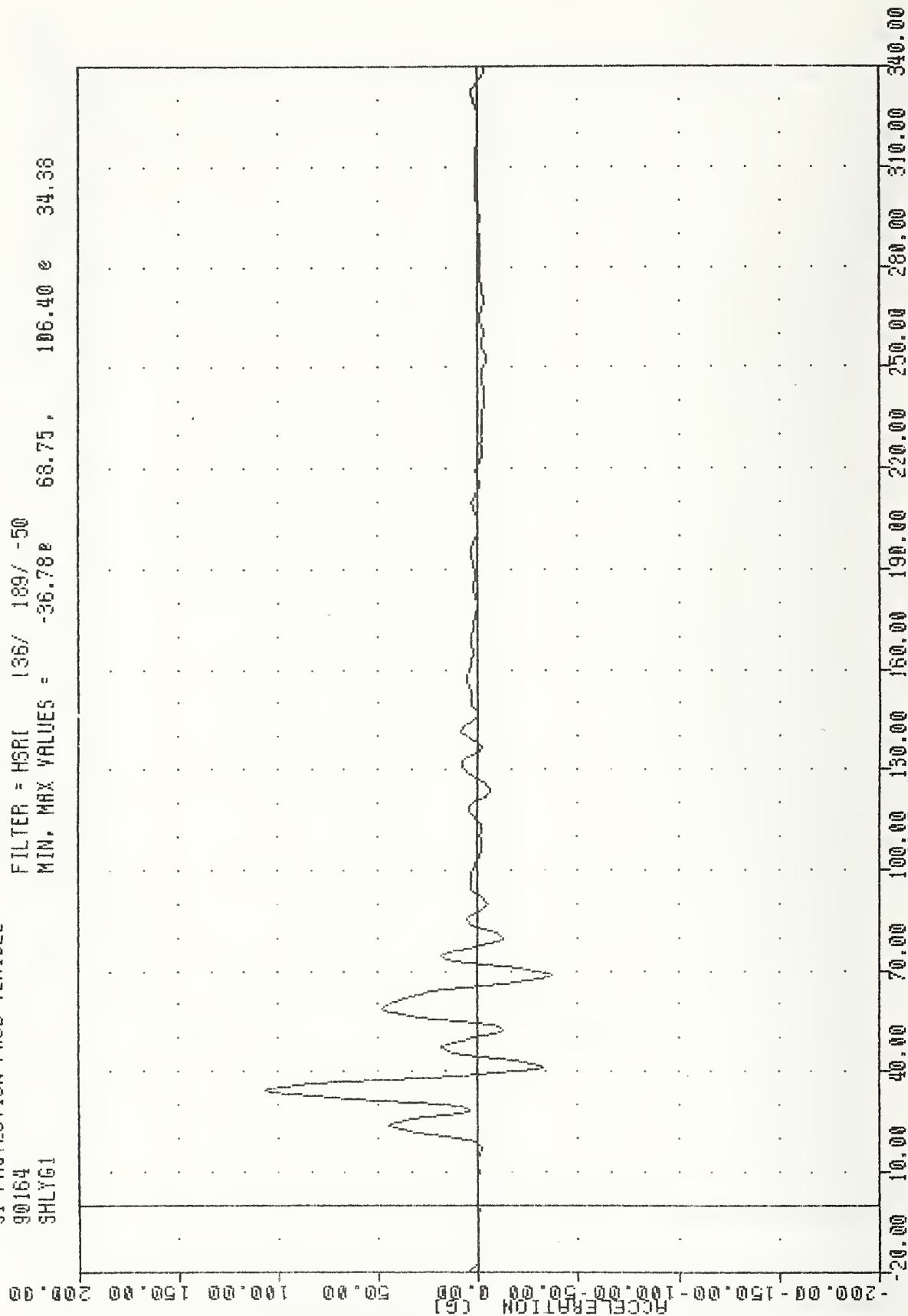


-10.00 40.00 90.00 140.00 190.00 240.00 290.00 340.00
 TIME (msec)

MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER HEAD RESULTANT ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 3HLYG1

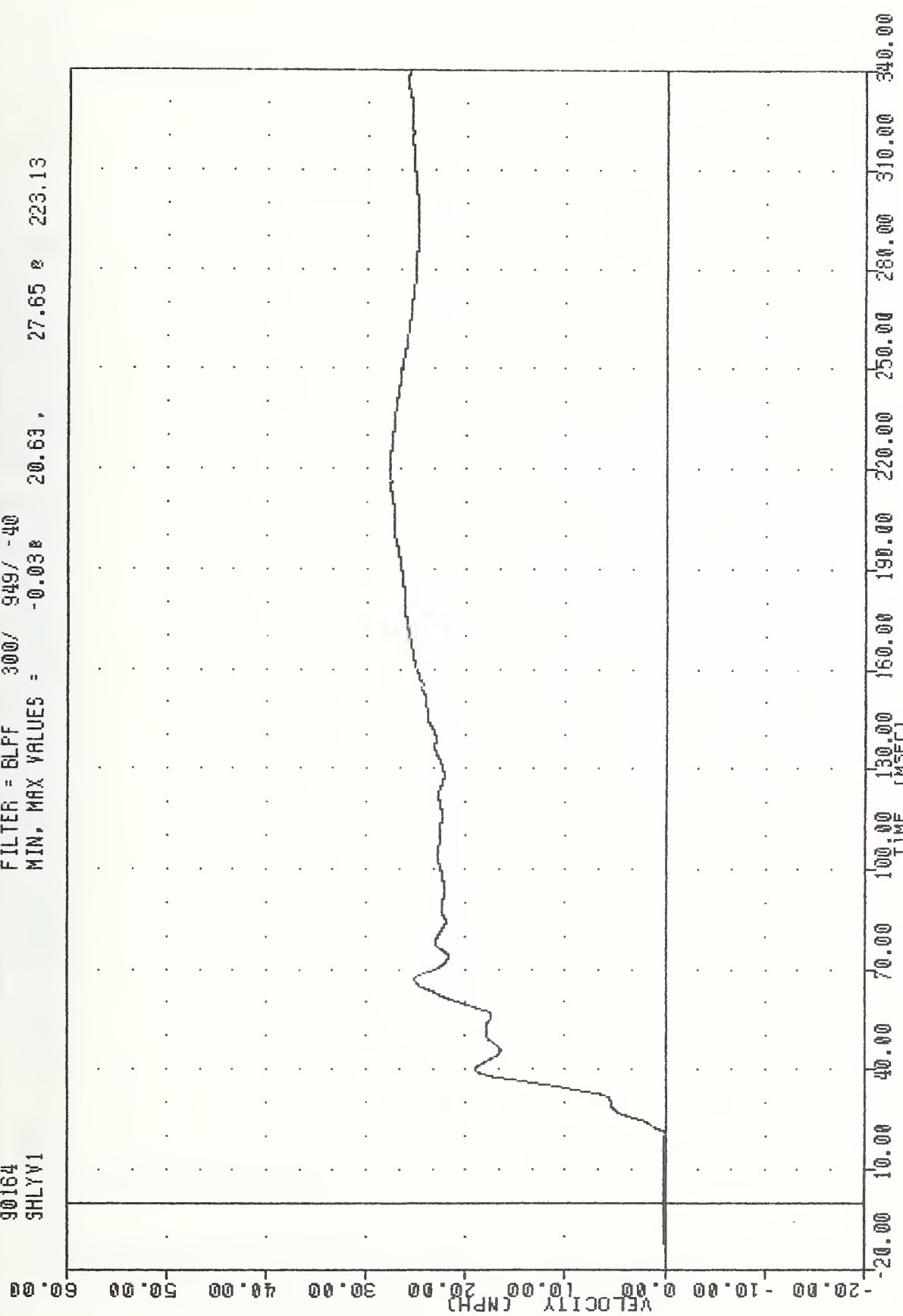
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -36.78e 68.75 , 106.40 e 34.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER LEFT SHOULDER Y AXIS ACCELERATION

VRTC
SI PROTECTION PROD VEHICLE
90164
SHLYV1

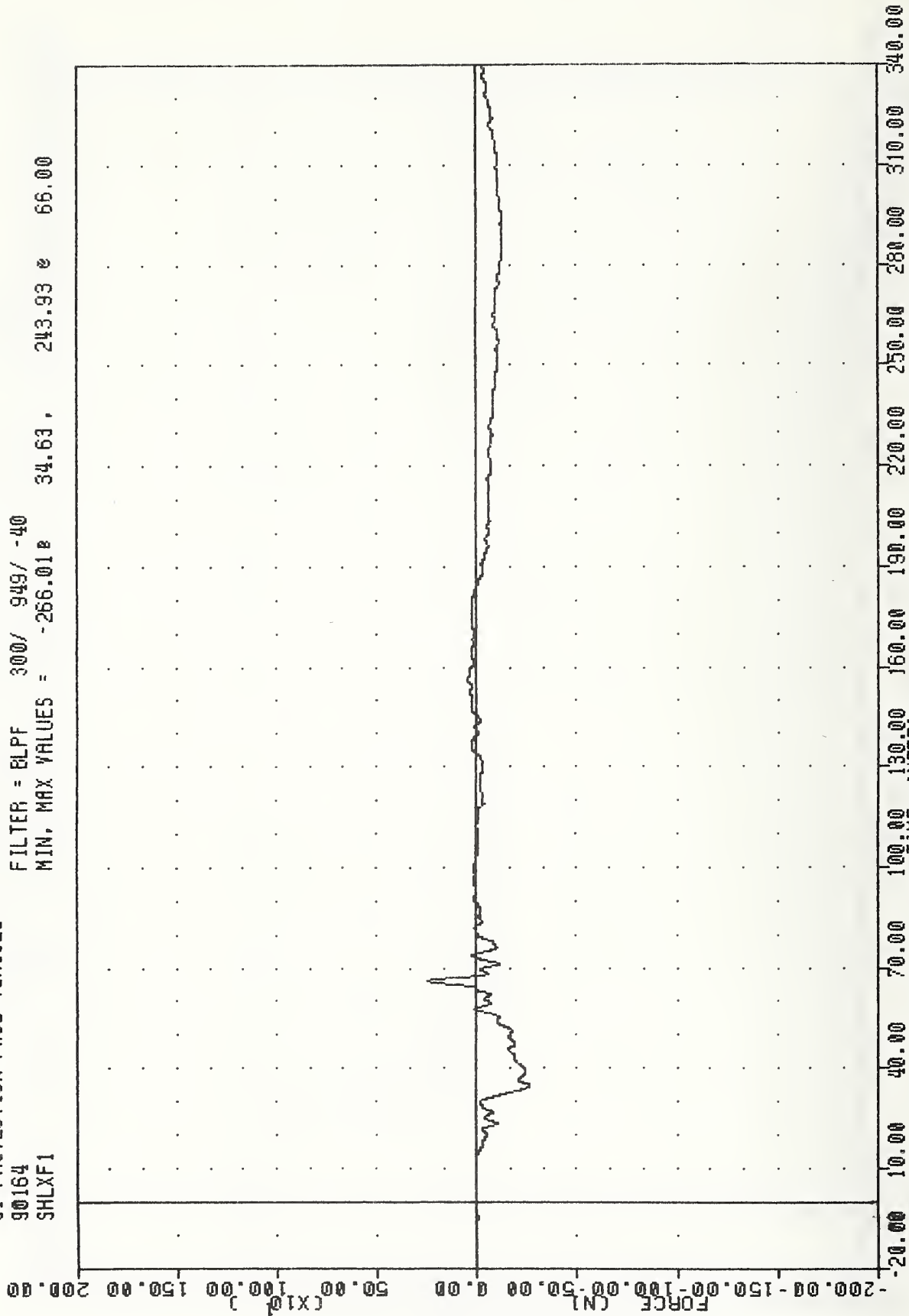
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.038 20.63, 27.65 223.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT SHOULDER Y-AXIS VELOCITY

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
SHLXF1

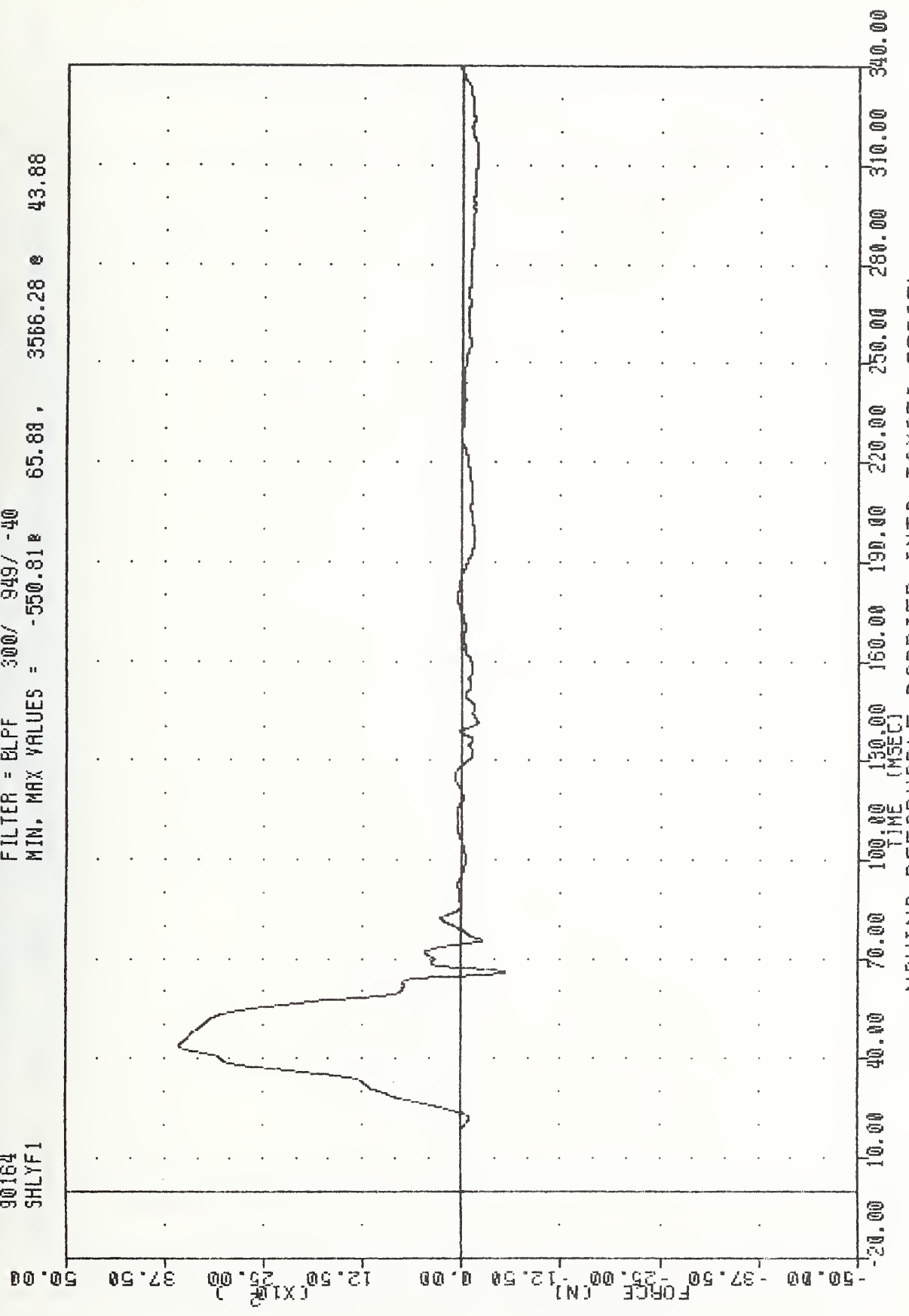
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -266.018 34.63, 243.93 e 66.00



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT SHOULDER X-AXIS FORCE

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
SHLYF1

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -550.81 3566.28 43.88



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT SHOULDER Y-AXIS FORCE

VRTC , 900613

SI PROTECTION PROD VEHICLE

90164

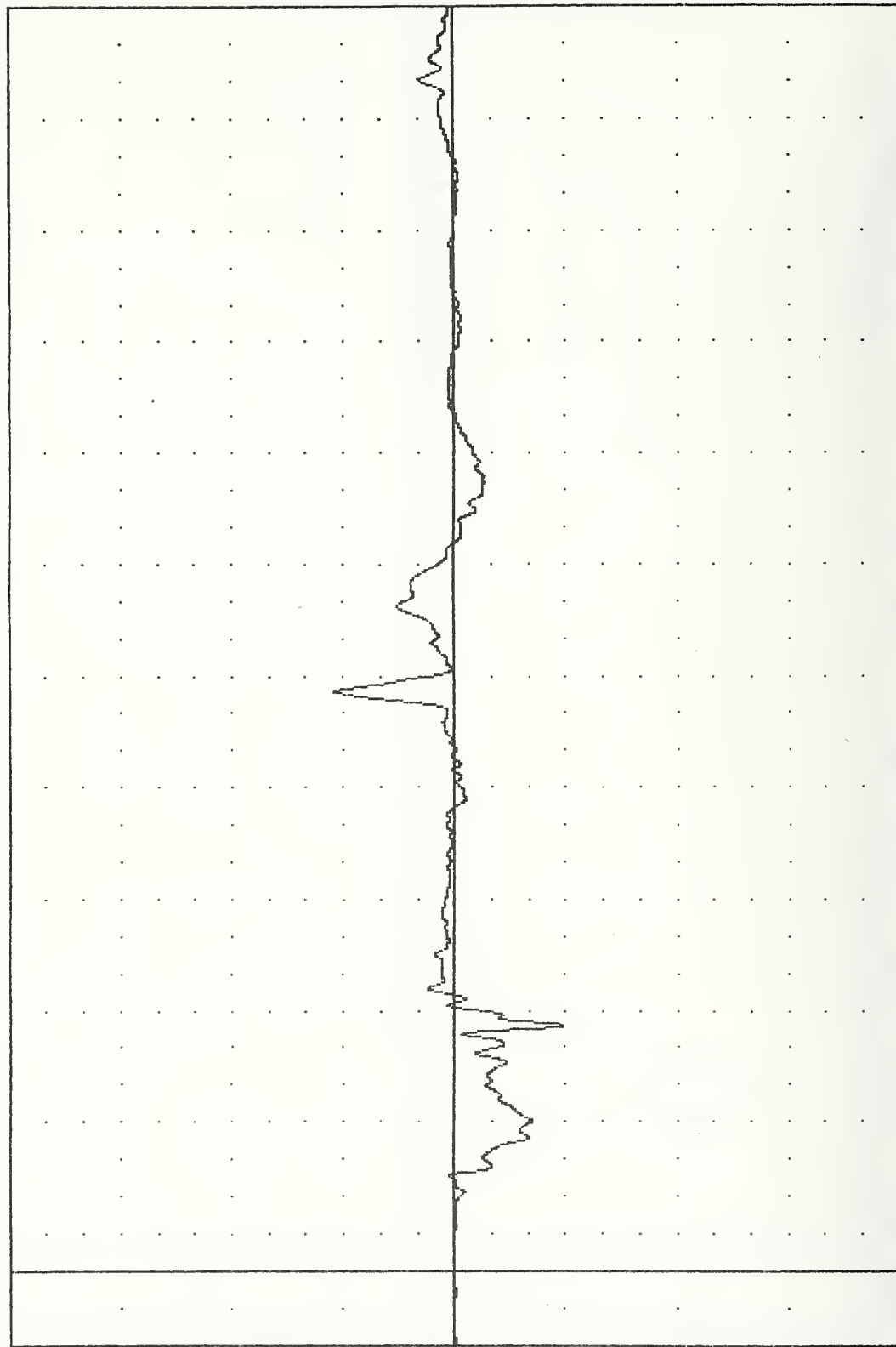
SHLZF1

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -490.250

65.88, 540.91 0 155.88

FORCE (N) $\times 10^4$



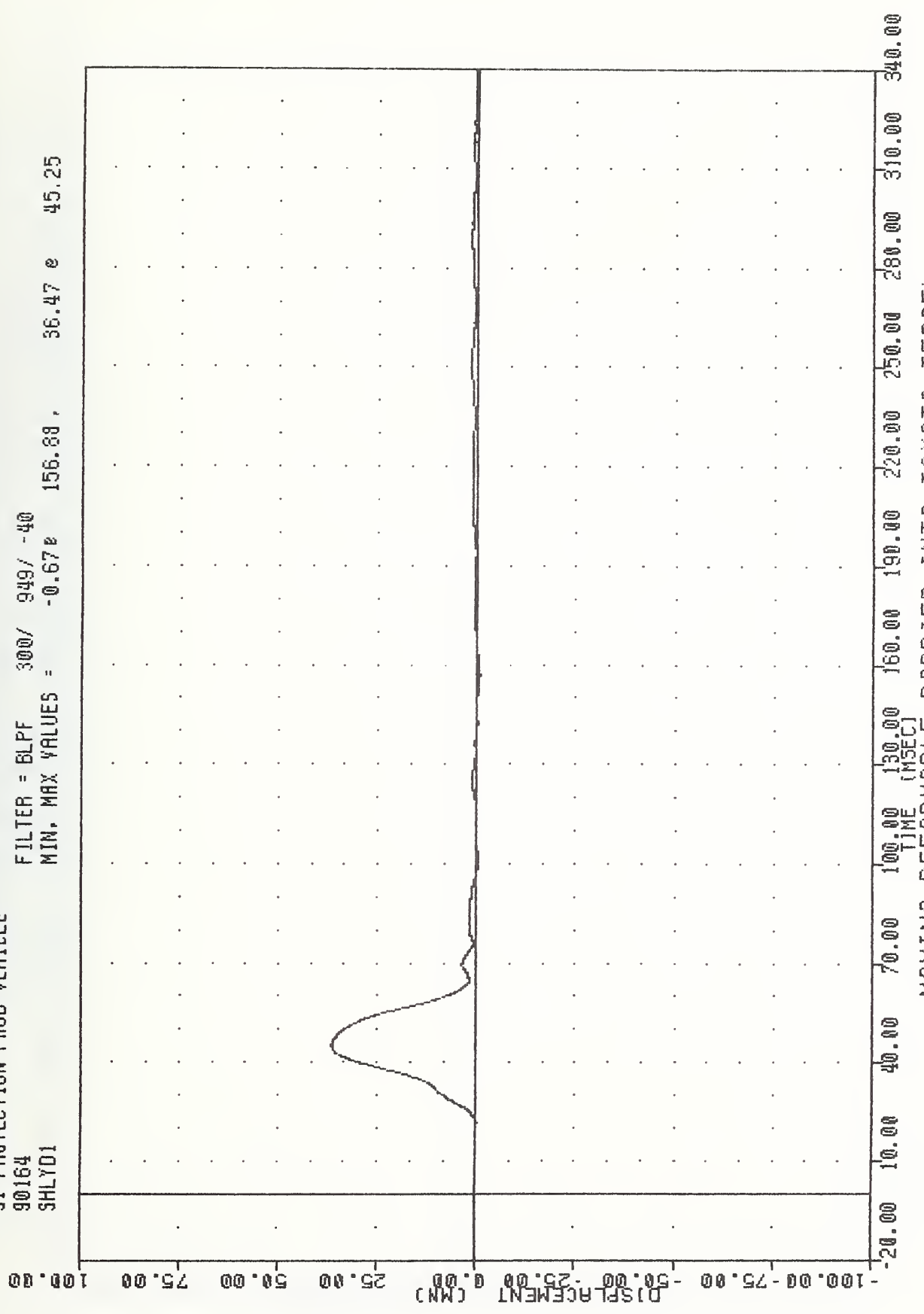
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT SHOULDER Z-AXIS FORCE

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 SHLYD1

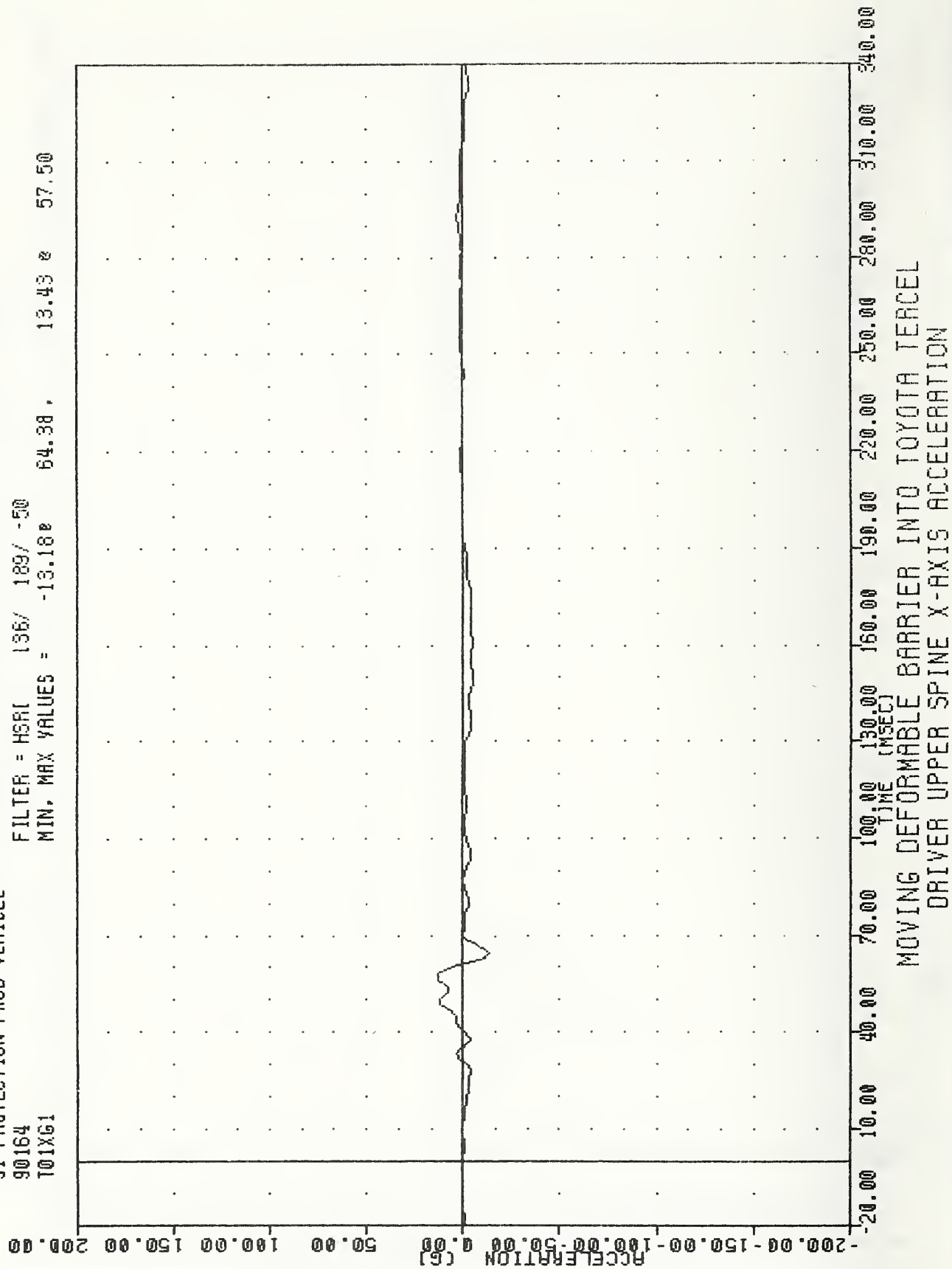
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.670 156.88 , 36.47 e 45.25



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER LEFT SHOULDER TO SPINE DISPLACEMENT

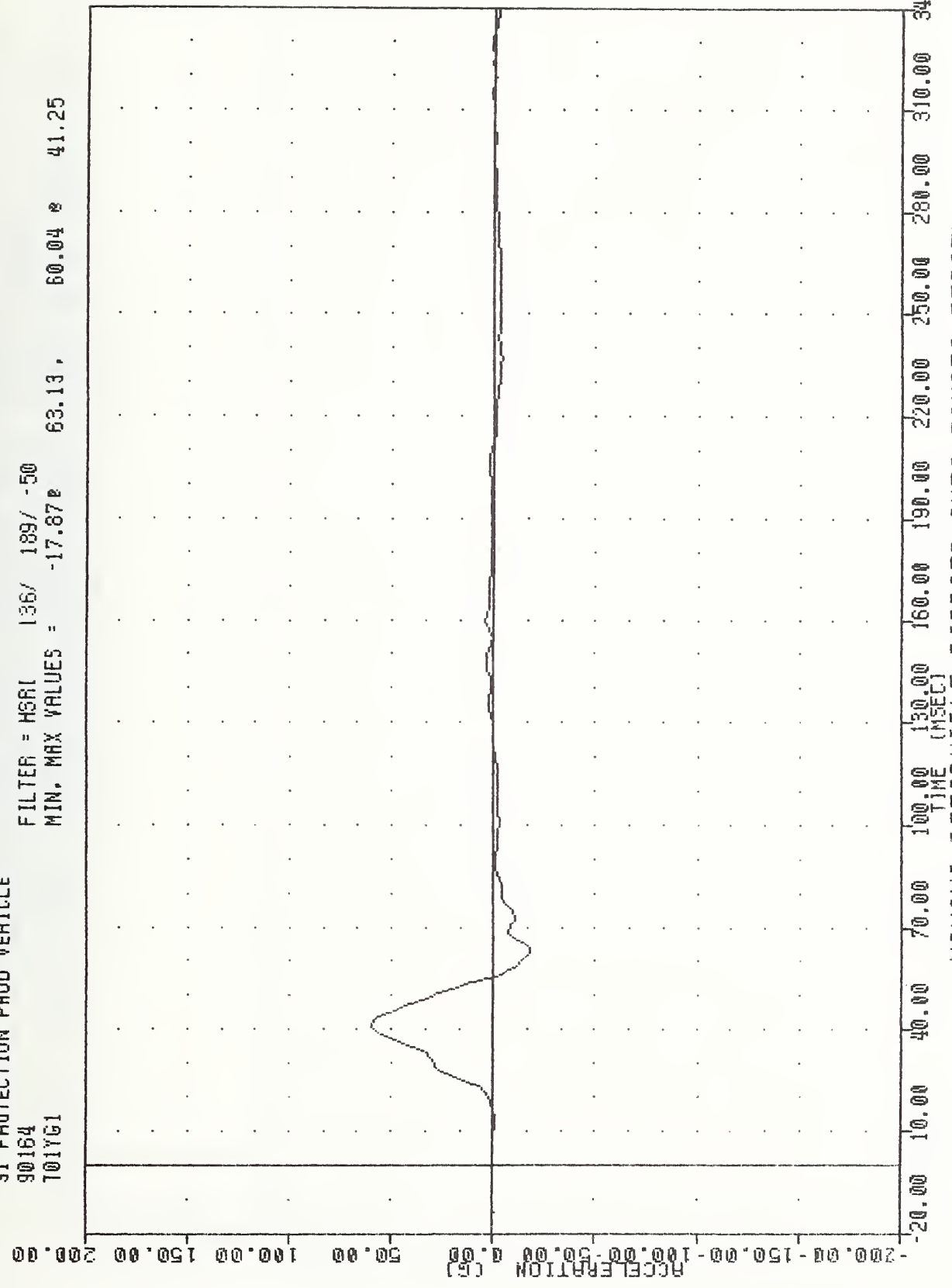
VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 101XG1

FILTER = HSR1 136/ 189/ -50
 MIN, MAX VALUES = -13.18 64.38 13.43 57.50



VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 701YG1

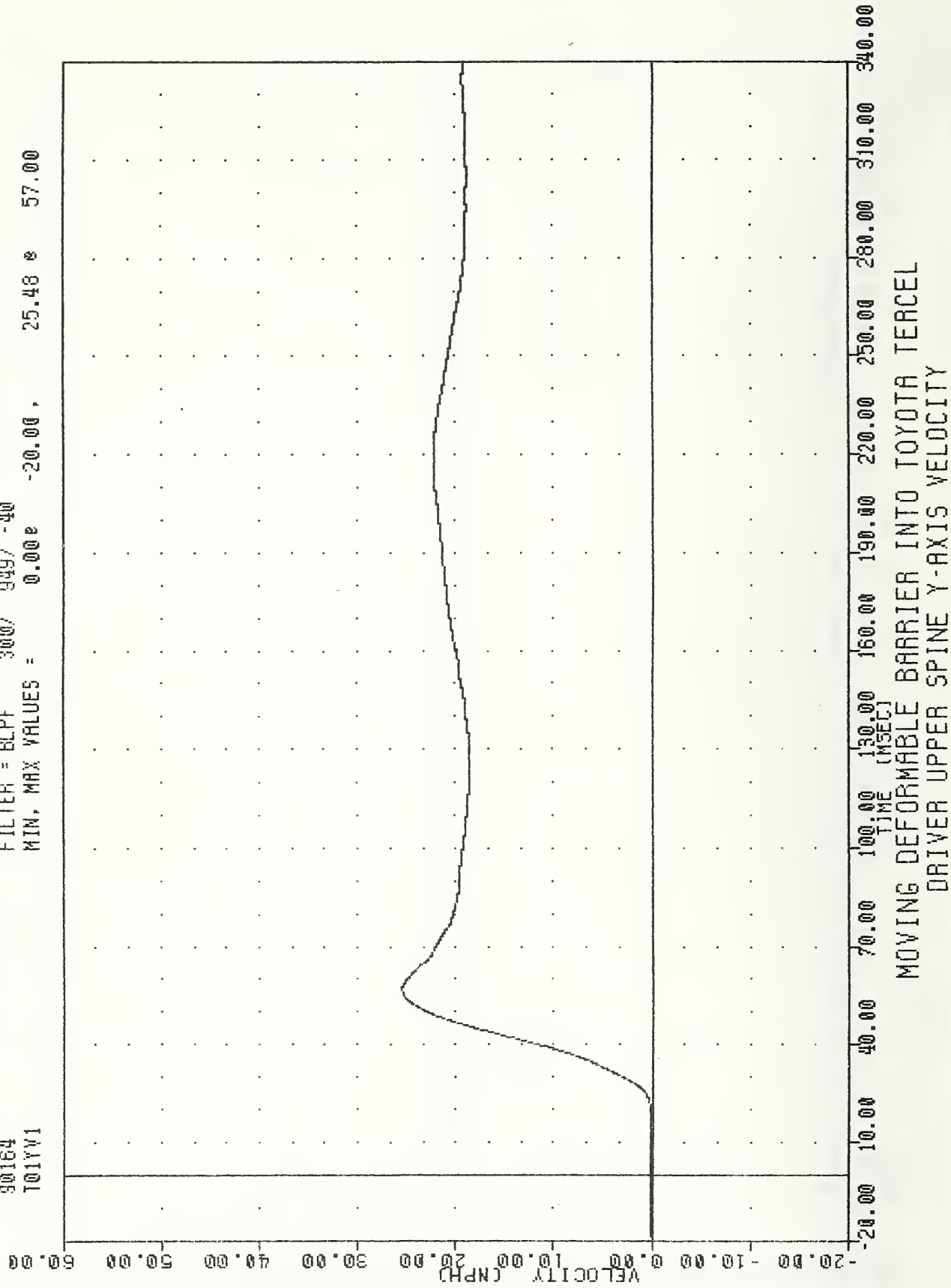
FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = -17.87 63.13 , 50.04 41.25



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER UPPER SPINE Y-AXIS ACCELERATION

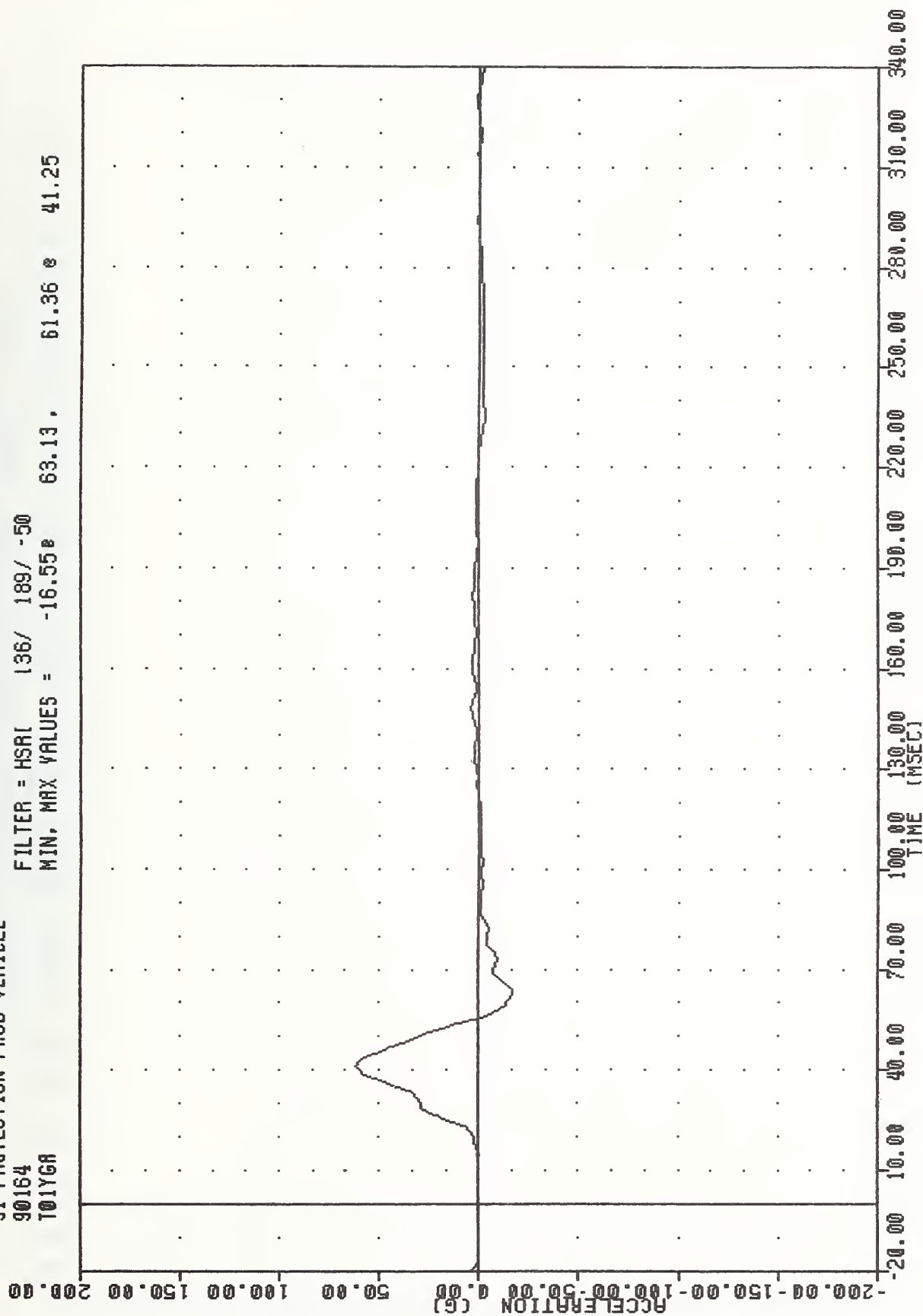
VRTC 900613
 SI PROTECTION PAD VEHICLE
 90164
 T01YV1

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 0.00e -20.00, 25.48 e 57.00



VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
TOYOTA

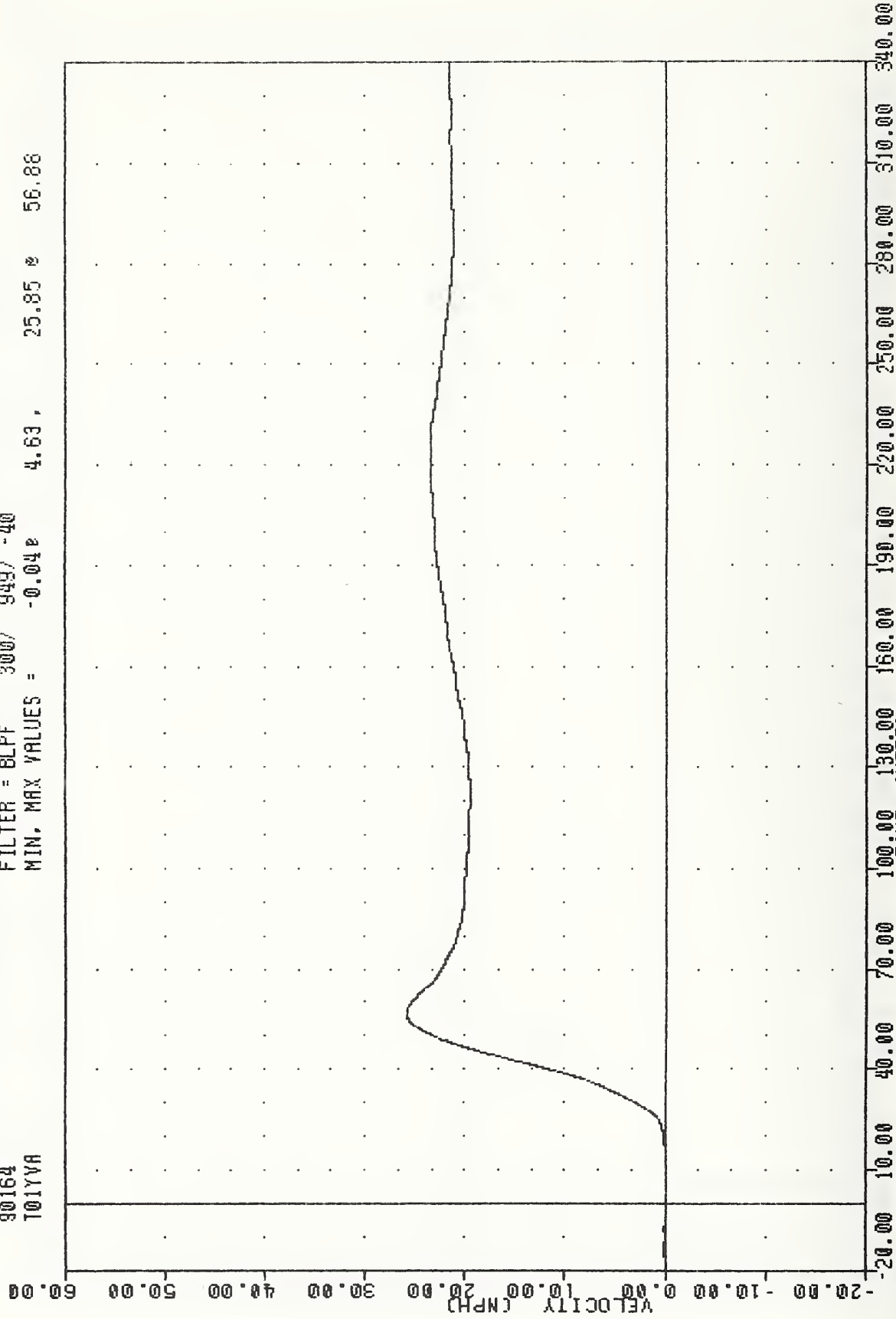
FILTER = HSAI 136/ 189/ -50
MIN, MAX VALUES = -16.55e 63.13 , 61.36 e 41.25



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER UPPER SPINE Y-AXIS REDUNDANT ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 T01YVA

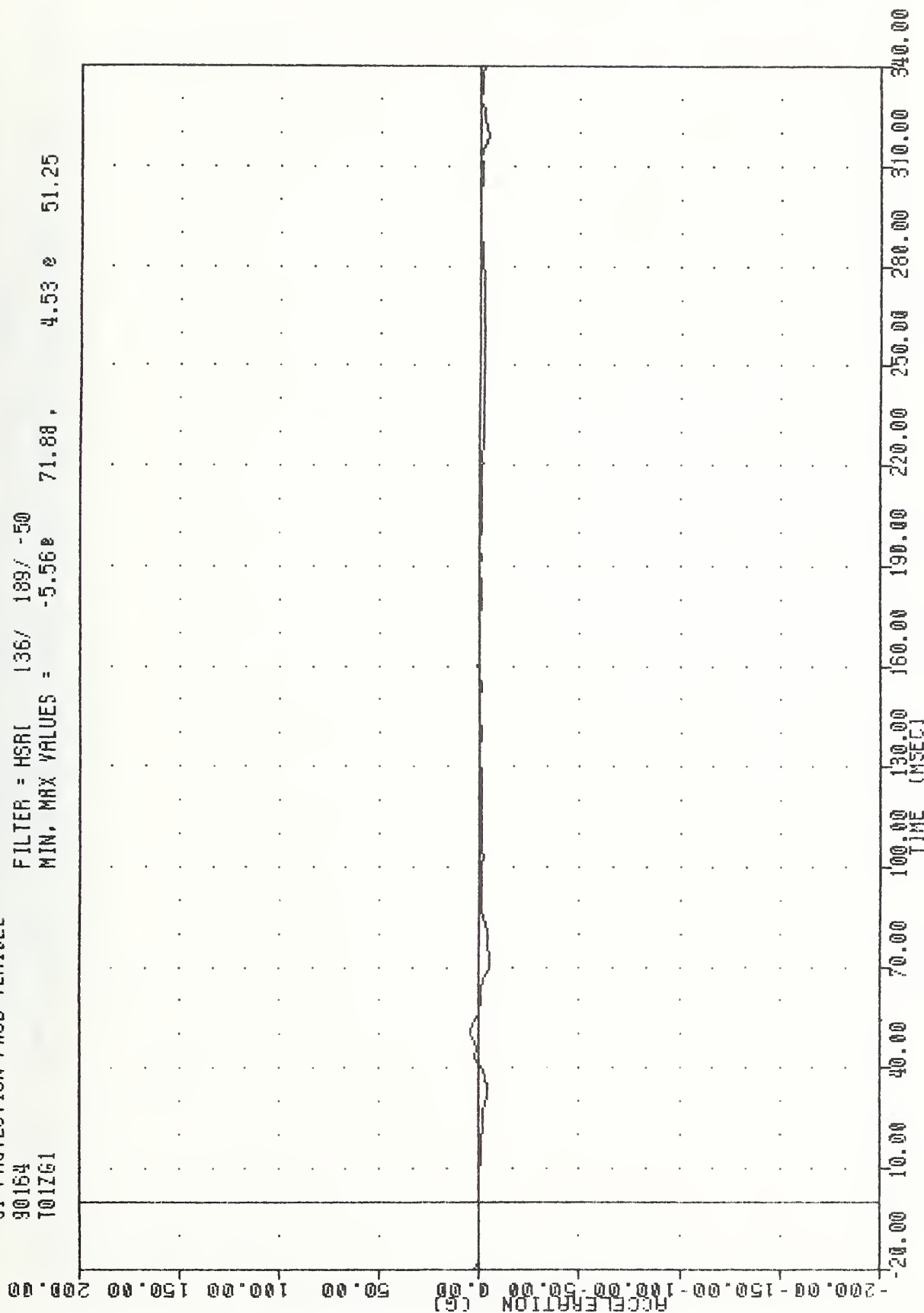
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.048 4.63, 25.85 56.88



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER UPPER SPINE Y-AXIS REDUNDANT VELOCITY

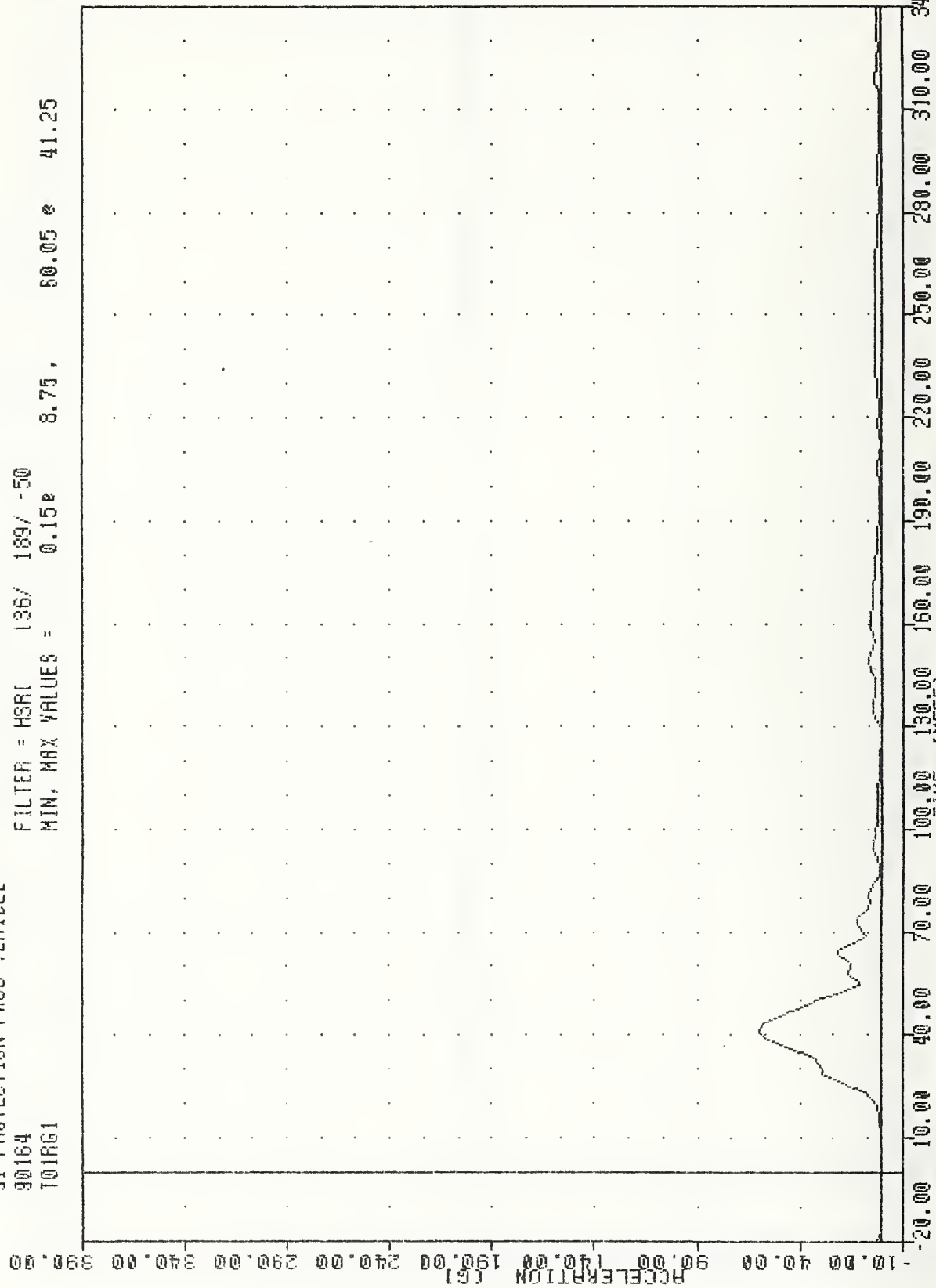
VRTC 300613
 SI PROTECTION PROD VEHICLE
 30164
 T01761

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -5.56e 71.88, 4.53 e 51.25



VRTC * 900513
 SI PROTECTION PROD VEHICLE
 90164
 T01RG1

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.15e 8.75, 50.05 e 41.25



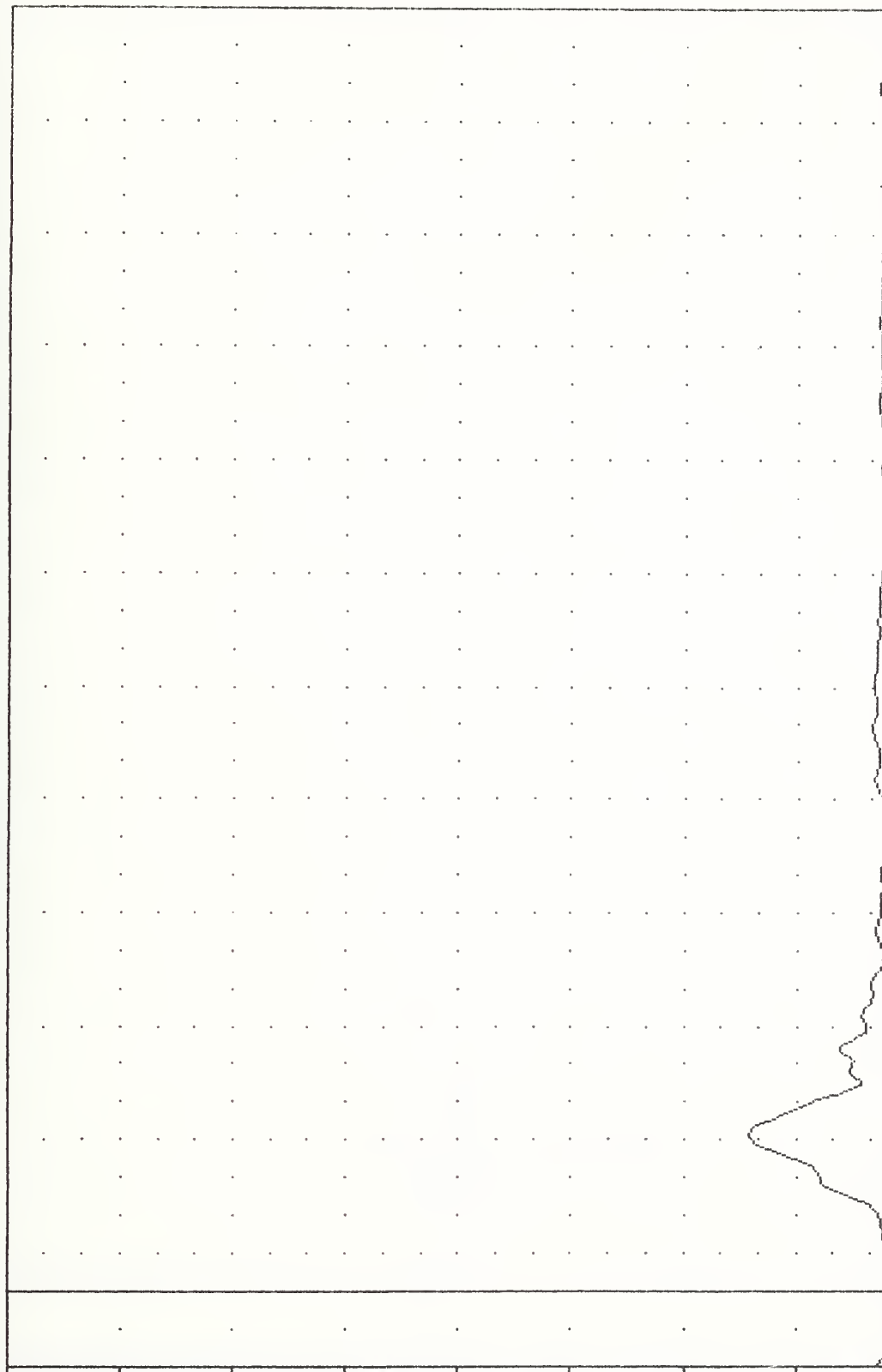
MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER UPPER SPINE RESULTANT ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 T01RGA

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.19%

8.75, 61.38 e 41.25

ACCELERATION (G)

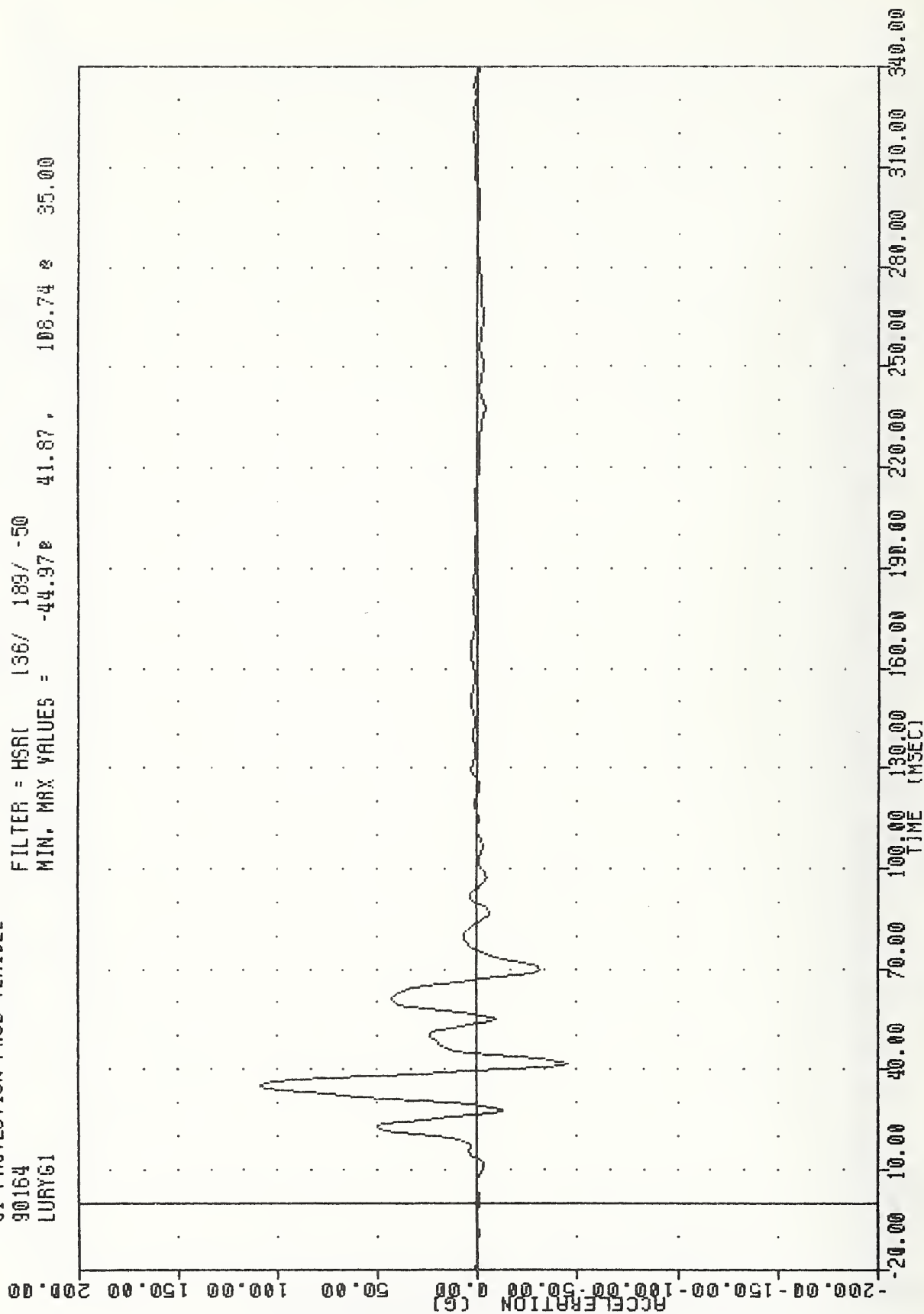


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (msec)

MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER UPPER SPINE REDUNDANT RESULTANT ACCELERATION

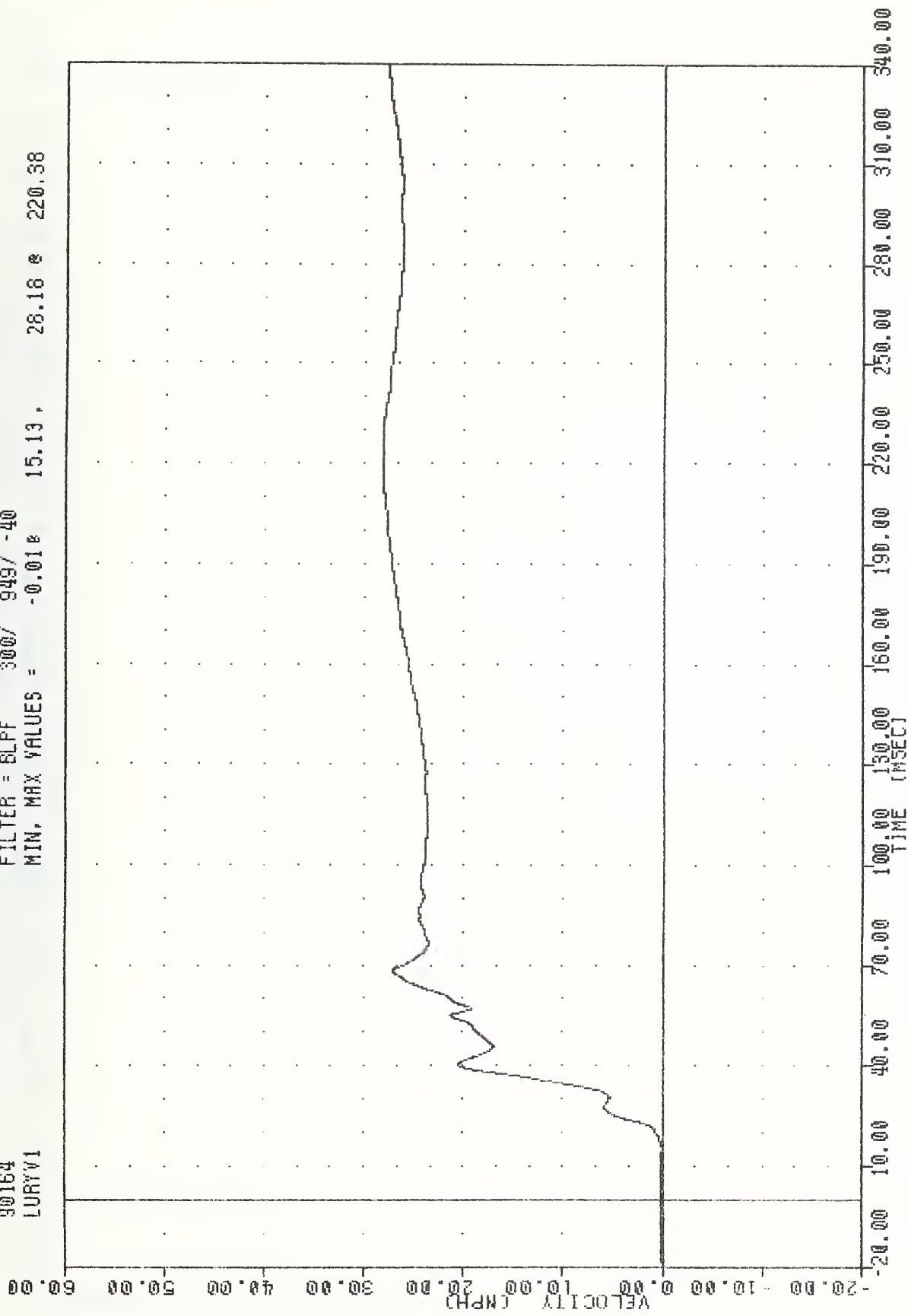
VRTC • 900613
SI PROTECTION PROD VEHICLE
90164
LURY61

FILTER = HSRI 136/ 183/ -50
MIN. MAX VALUES = -44.97 41.87 108.74 35.00



VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LURYV1

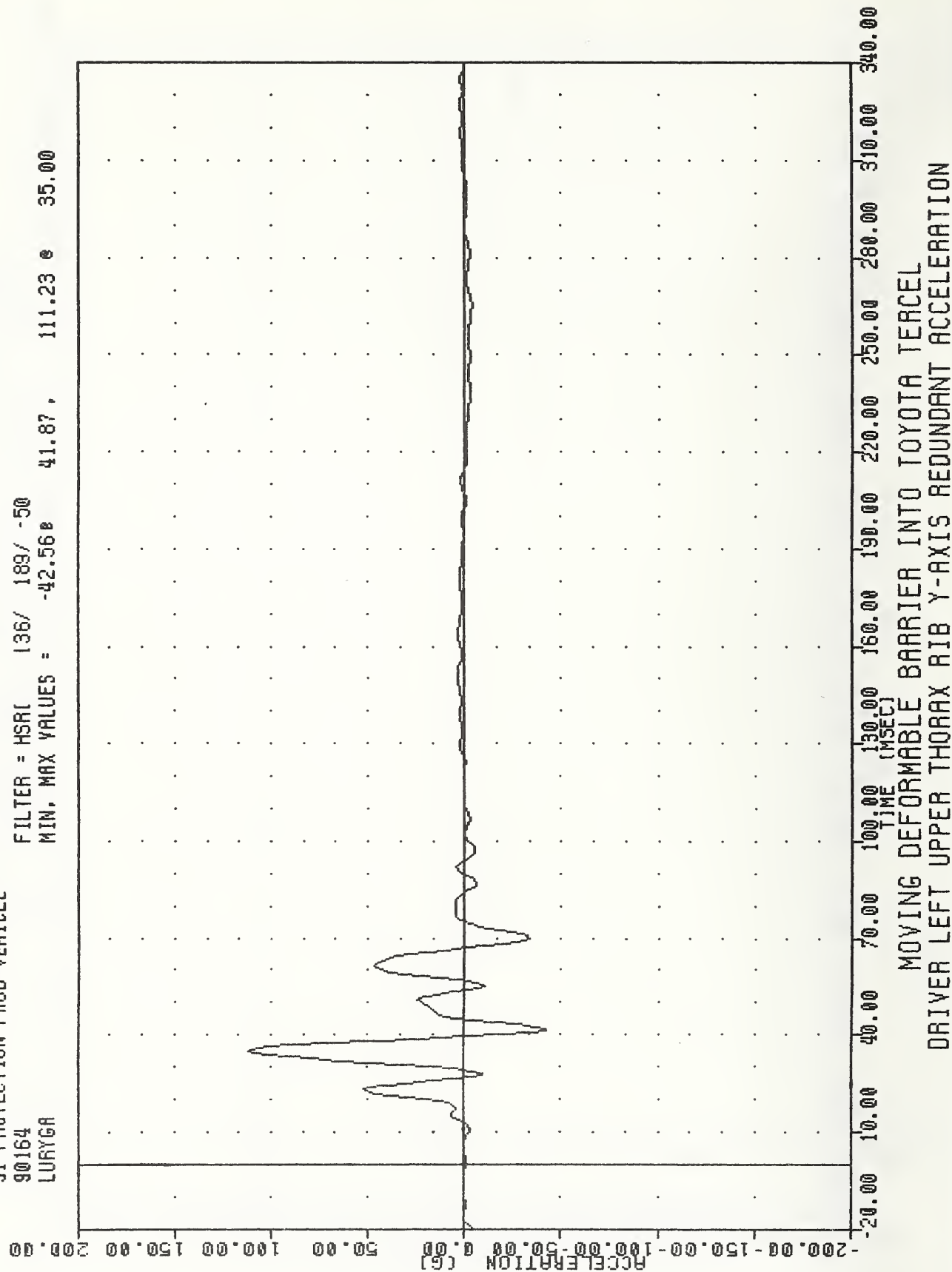
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.018 15.13 , 28.18 e 220.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT UPPER THORAX RIB Y-AXIS VELOCITY

VRTC • 900613
SI PROTECTION PROD VEHICLE
90164
LURYGA

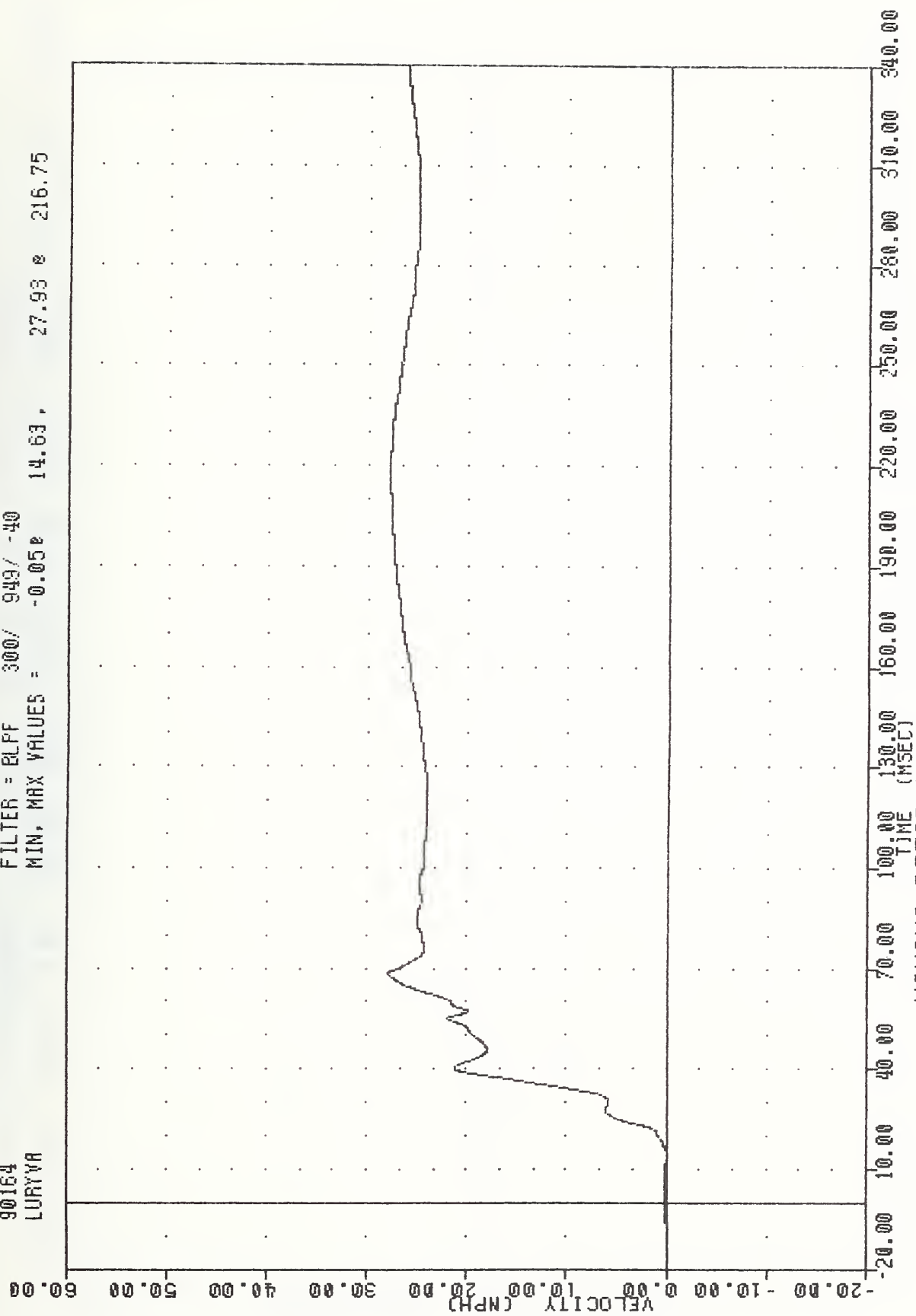
FILTER = HSR1 136/ 189/ -50
MIN. MAX VALUES = 41.87, 111.23 e 35.00



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT UPPER THORAX RIB Y-AXIS REDUNDANT ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LURYVA

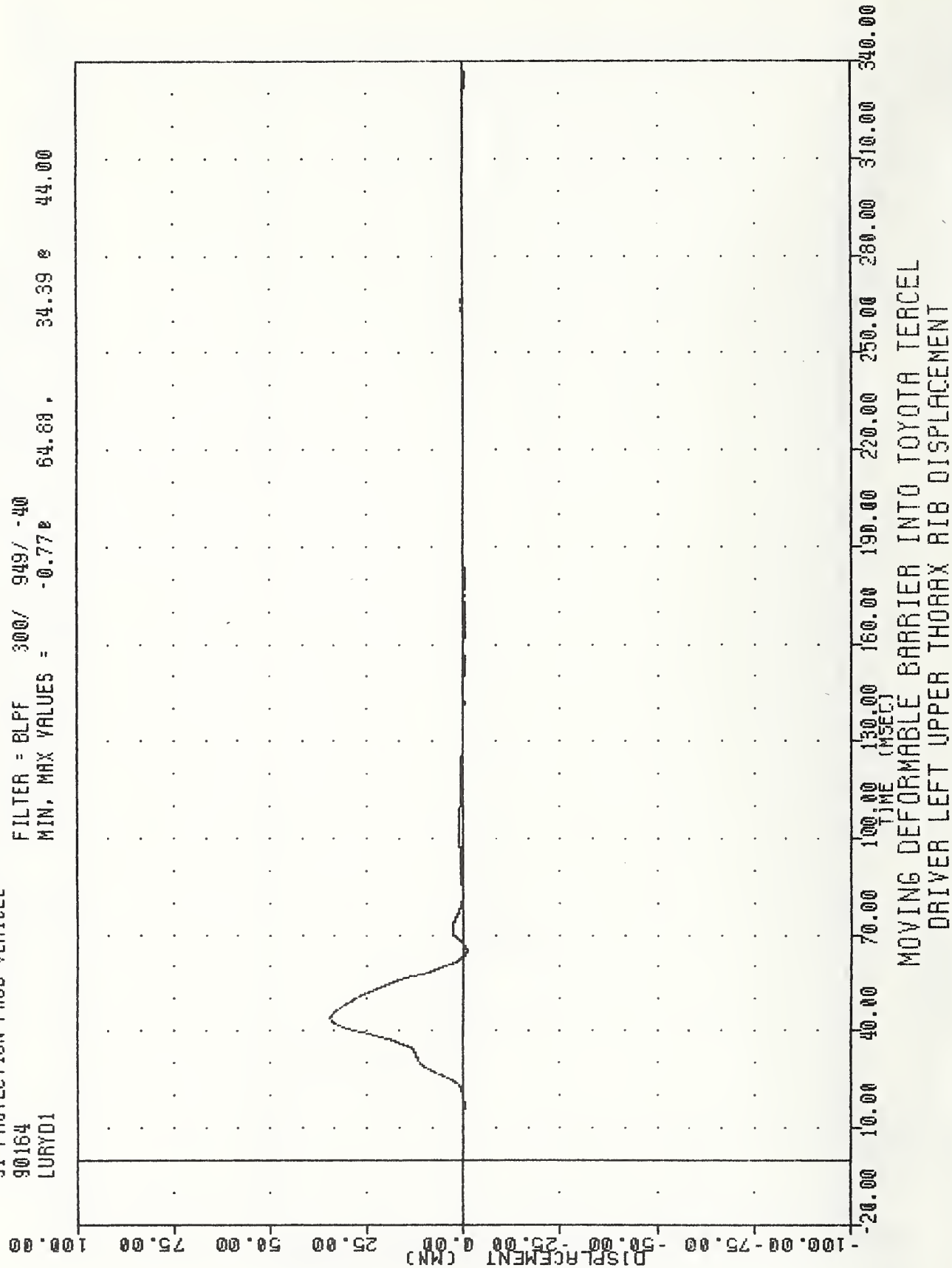
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.05e 14.63, 27.93 e 216.75



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER LEFT UPPER THORAX RIB Y-AXIS REDUNDANT VELOCITY

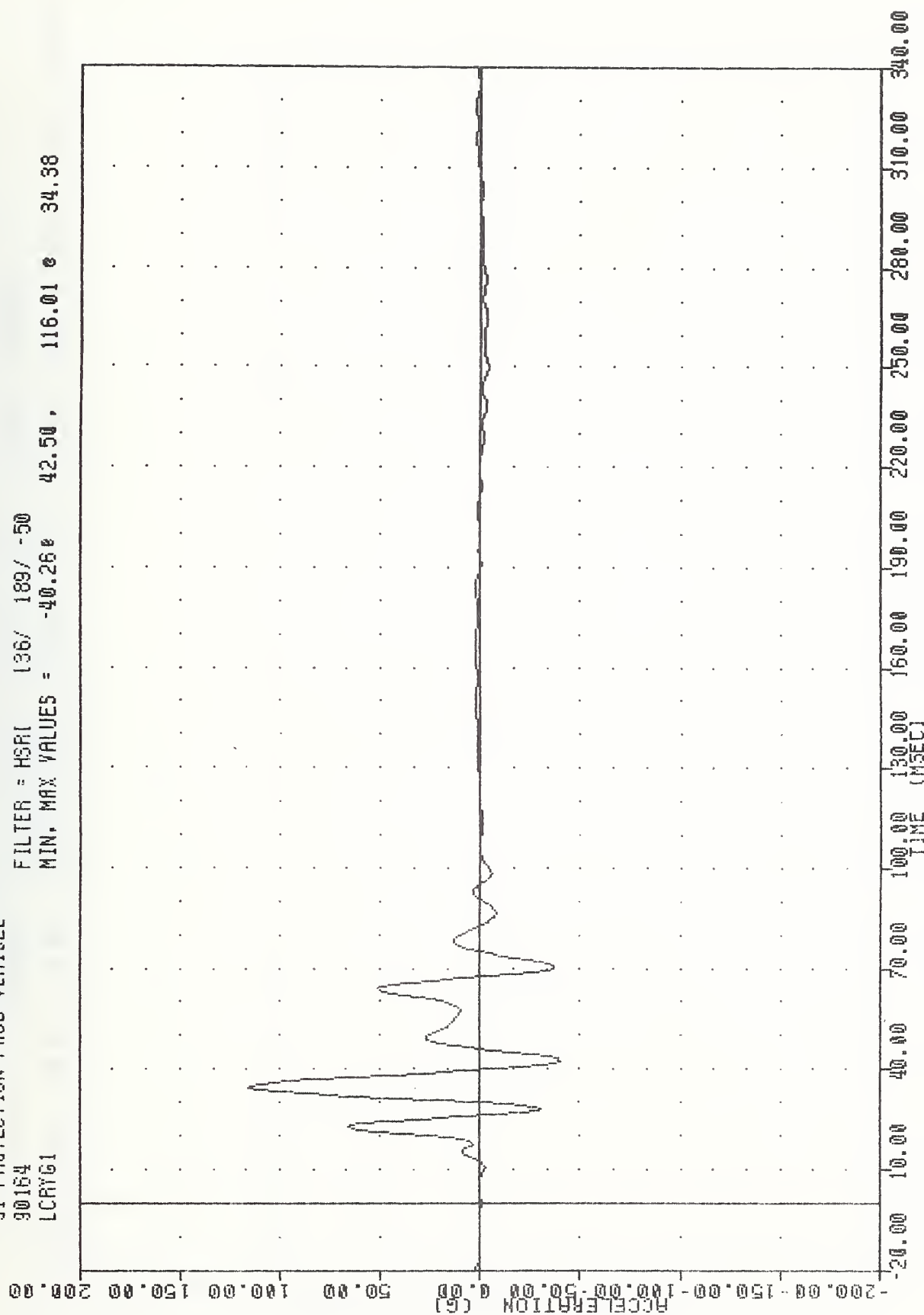
VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LURYD1

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.770 64.88 34.39 44.00



VRIC , 900613
SI PROTECTION PROD VEHICLE
90164
LCRYG1

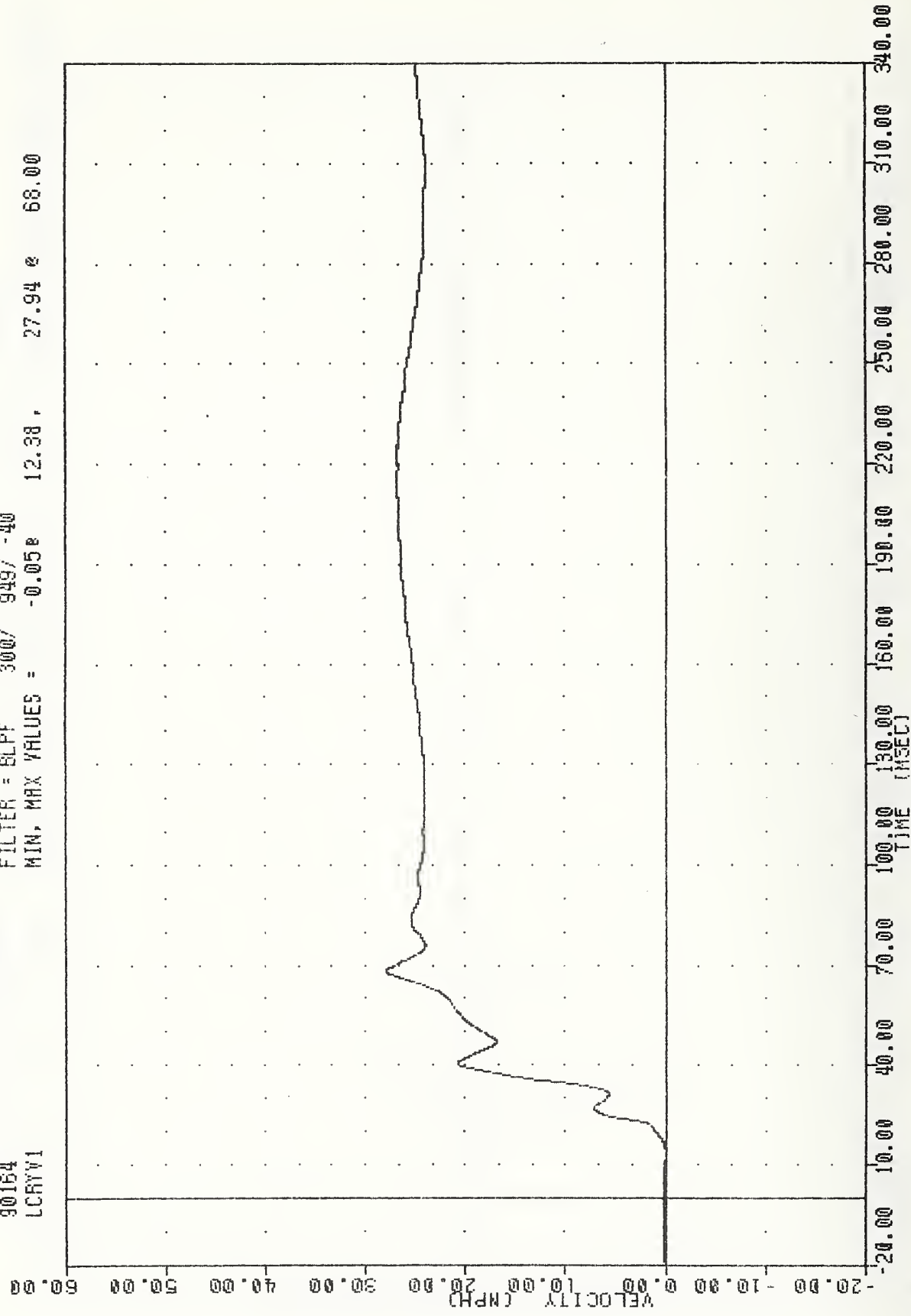
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -40.26 42.50 , 116.01 34.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT CENTER THORAX RIB Y-AXIS ACCELERATION

WRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LCRYV1

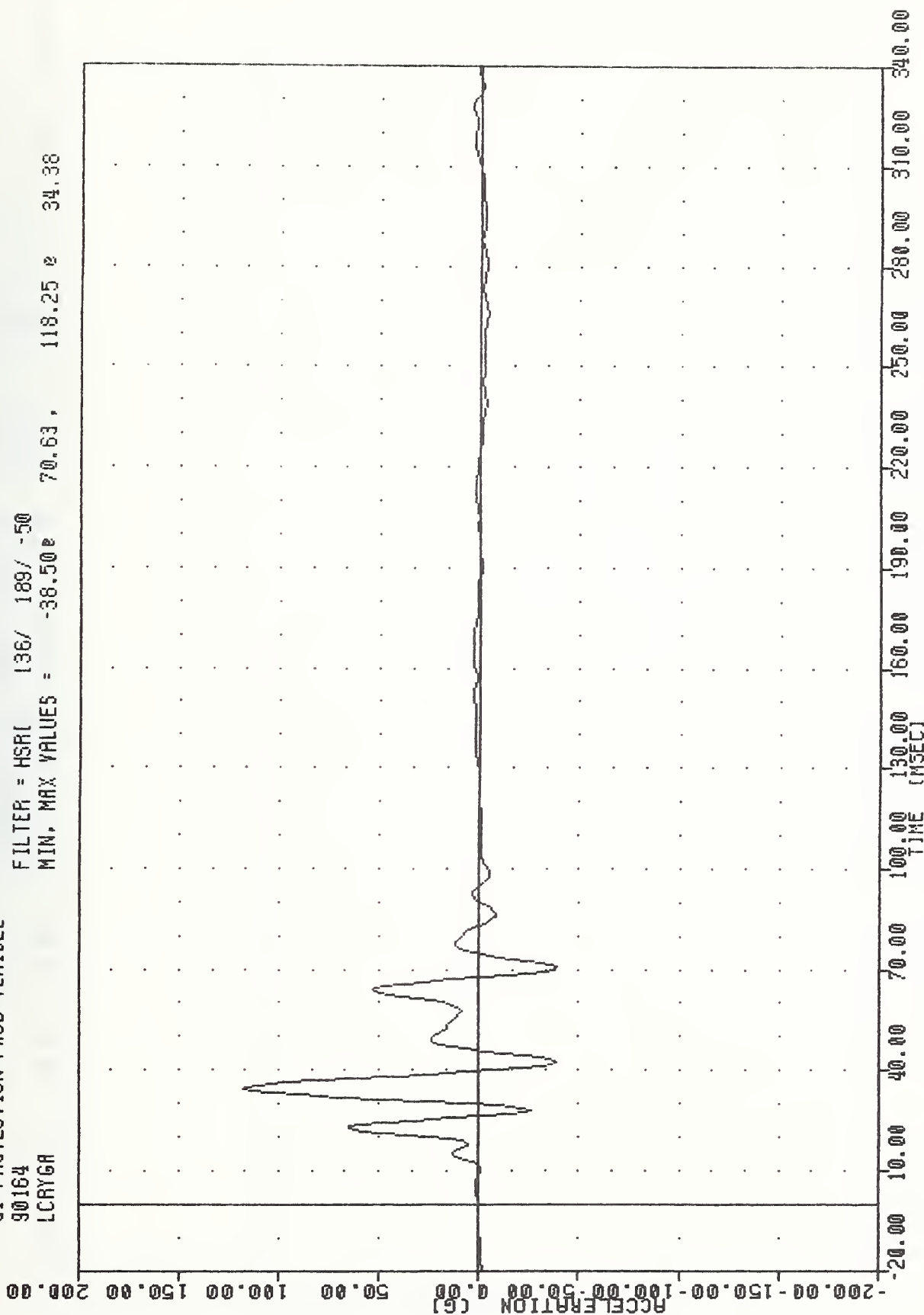
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.05e 12.38 , 27.94 e 68.00



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER LEFT CENTER THORAX RIB Y-AXIS VELOCITY

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LCRYGA

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -38.50e 70.63, 118.25 e 34.38

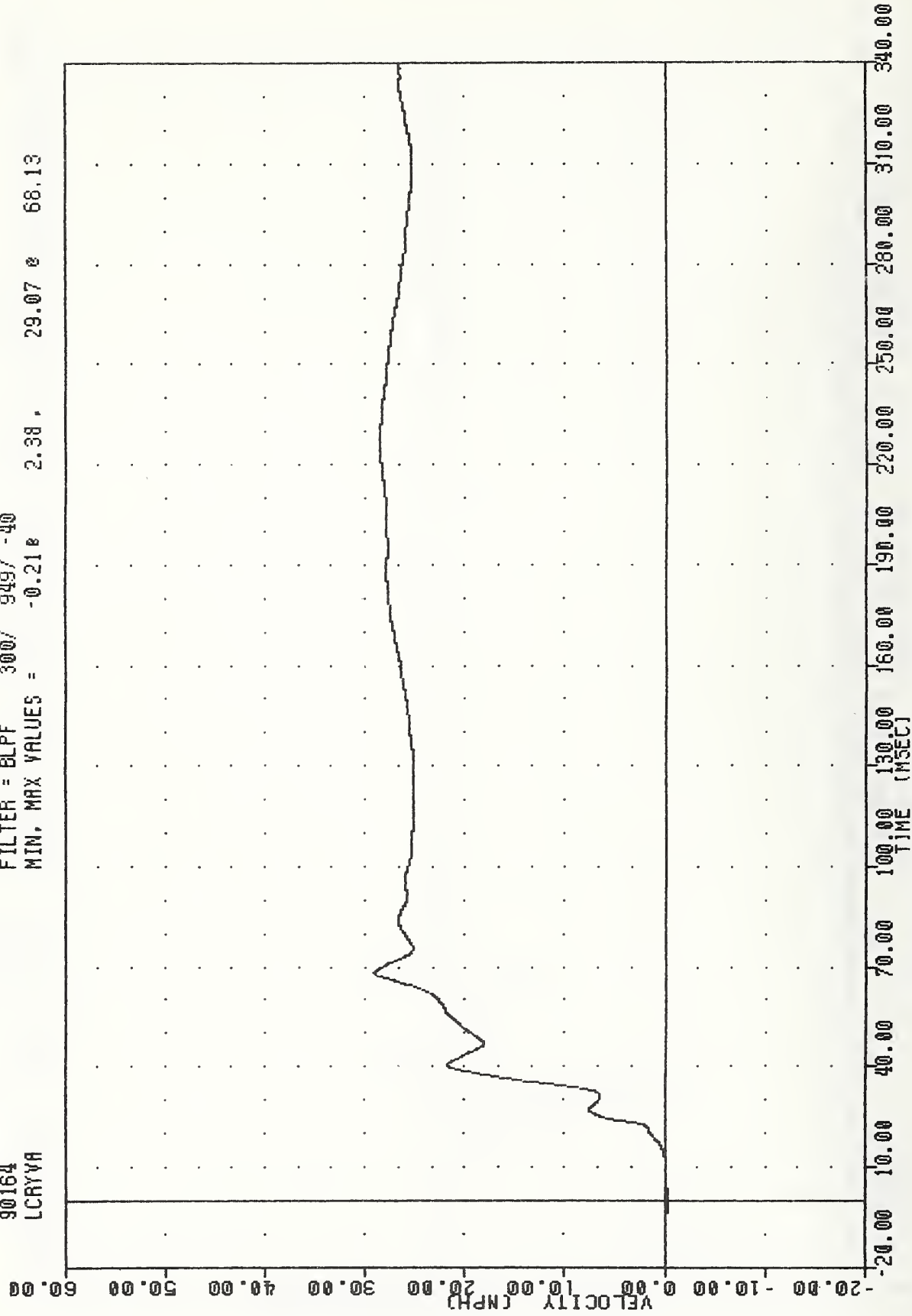


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT CENTER THORAX RIB Y-AXIS REDUNDANT ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LCRYVA

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.210 2.38 .

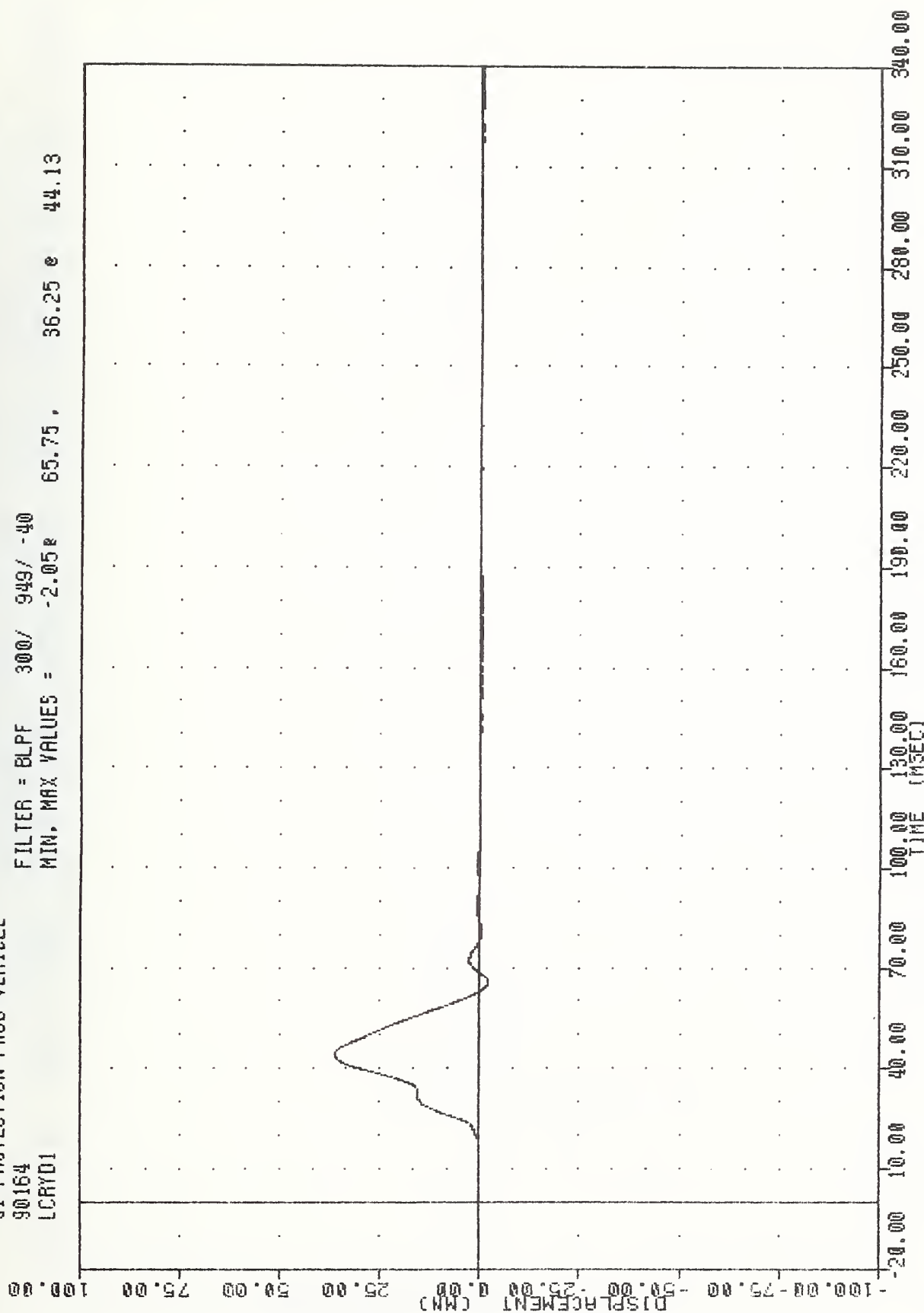
29.07 68.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT CENTER THORAX RIB Y-AXIS REDUNDANT VELOCITY

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LCRYD1

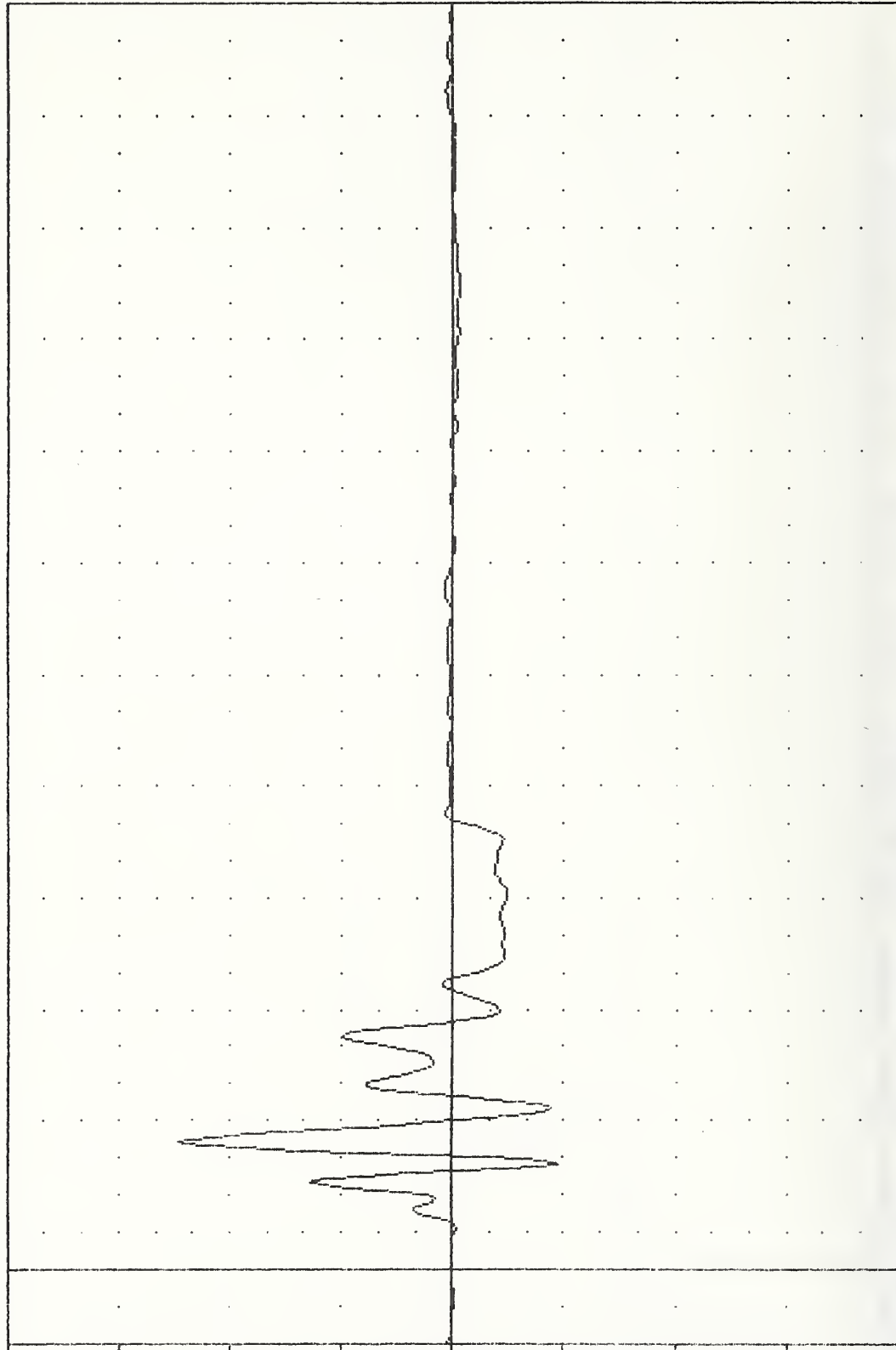
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -2.05 65.75, 36.25 e 44.13



VRTC 900613
 SI PROTECTION PASS VEHICLE
 90164
 LLRY61

FILTER = HSRI 136/ 183/ 50
 MIN. MAX VALUES = -48.96e 28.13, 122.80 e 34.38

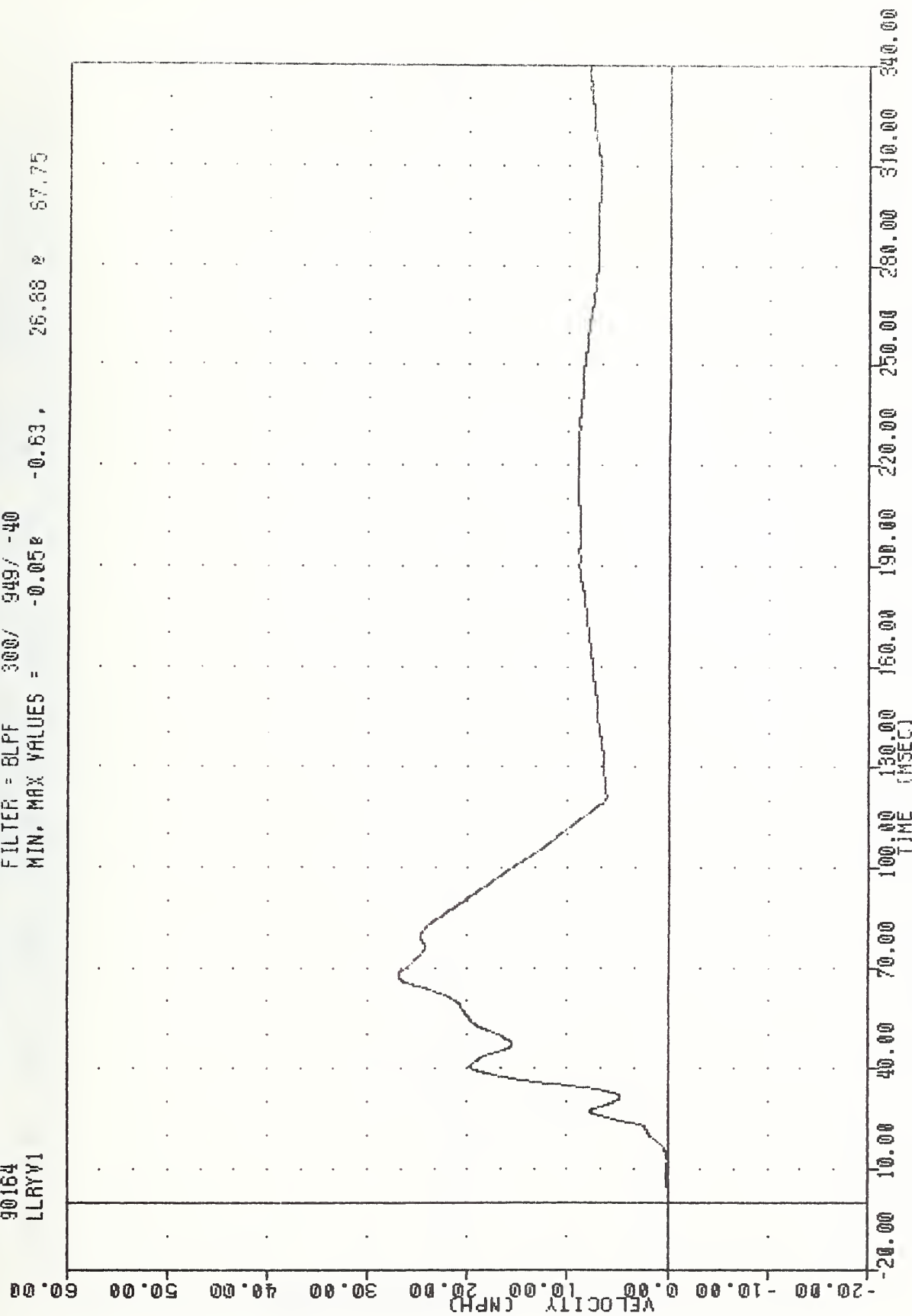
ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER LEFT LOWER THORAX RIB Y-AXIS ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LLRYV1

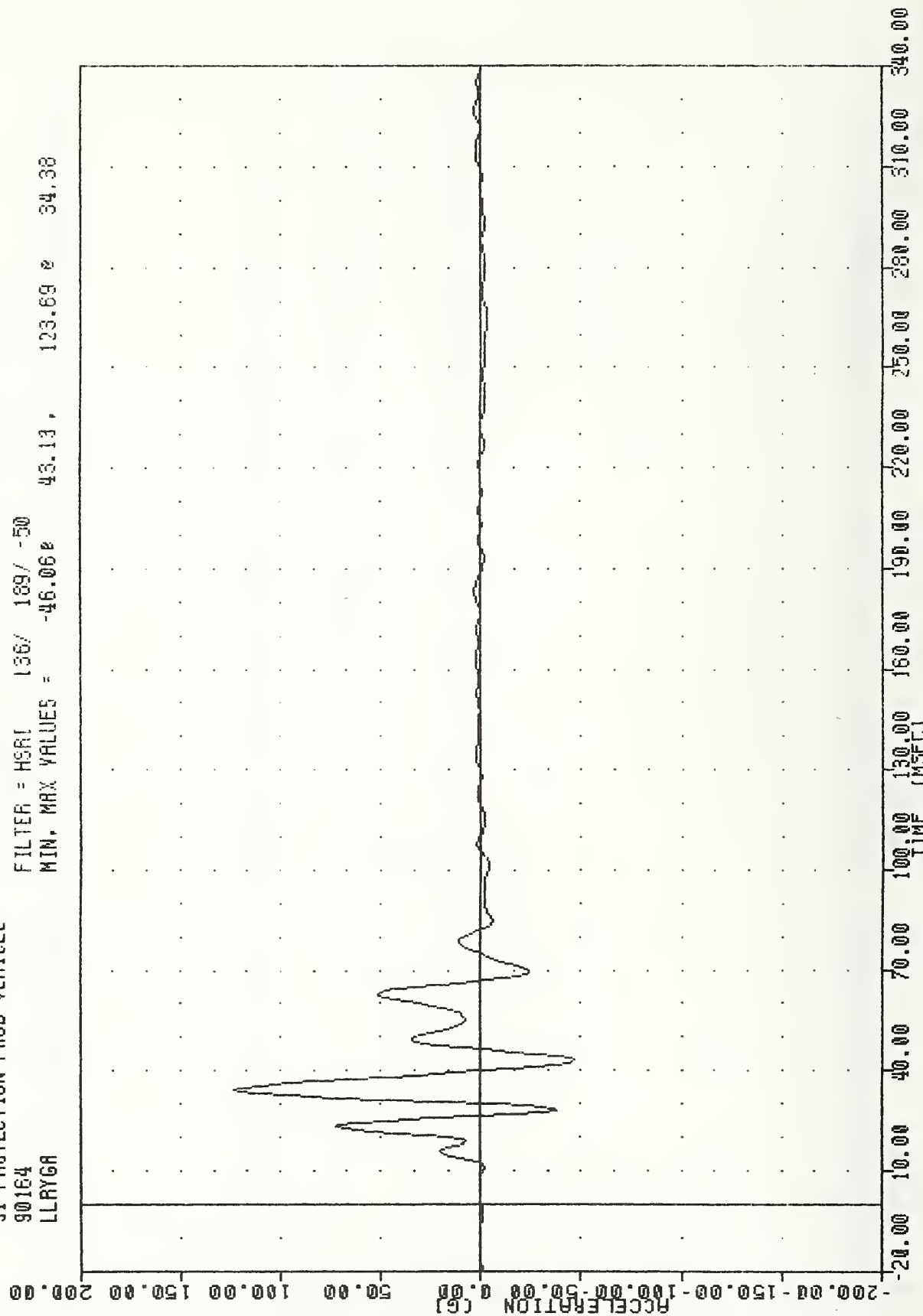
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.058 -0.63, 26.88 87.75



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER LEFT LOWER THORAX RIB Y-AXIS VELOCITY

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LLY6A

FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = -46.06 43.13 , 123.69 34.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER LEFT LOWER THORAX RIB Y-AXIS REDUNDANT ACCELERATION

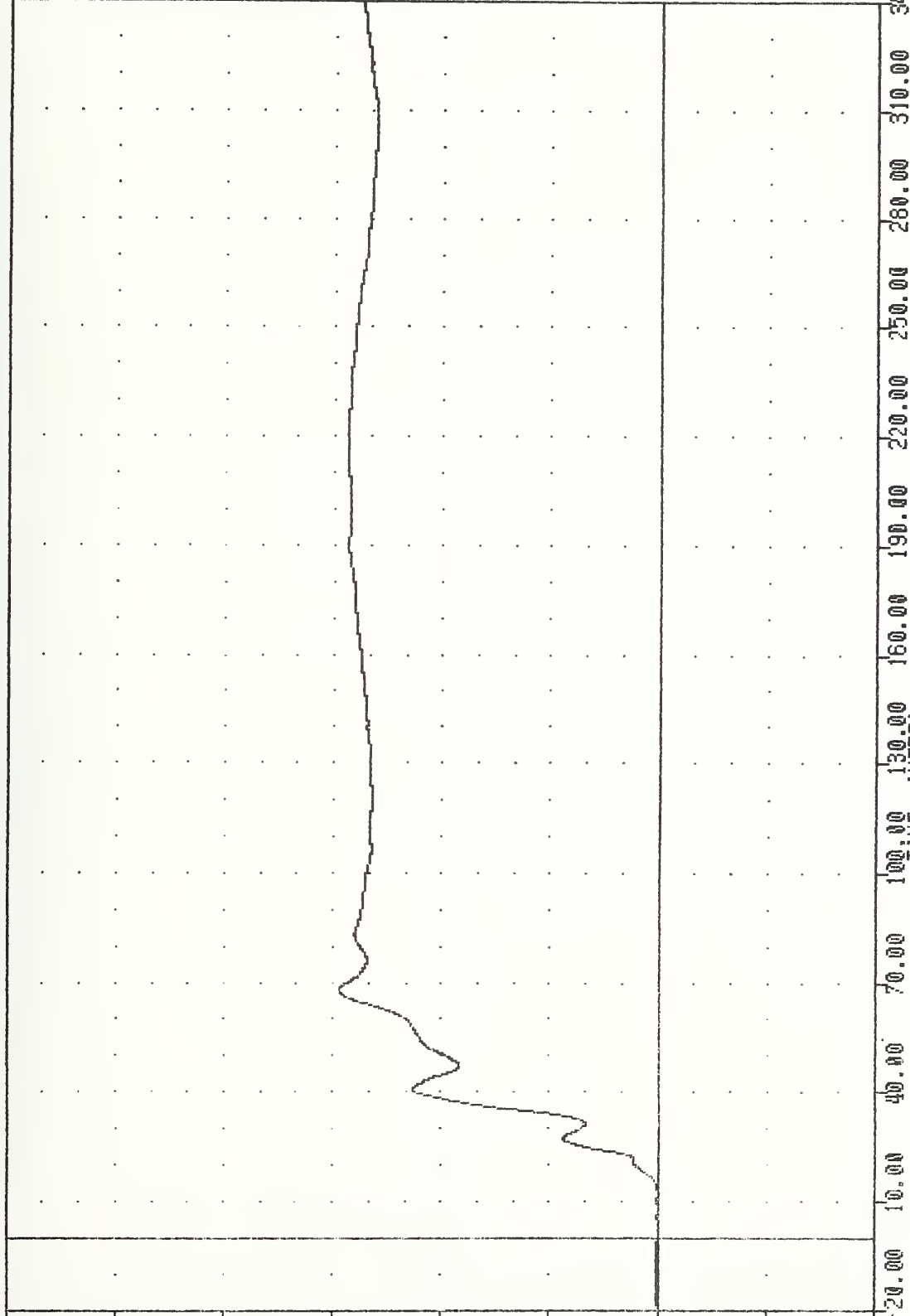
VPIC 900613
SI PROTECTION PROD VEHICLE

90164
LLRYVR

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.03e

8.13, 29.43 e 68.00

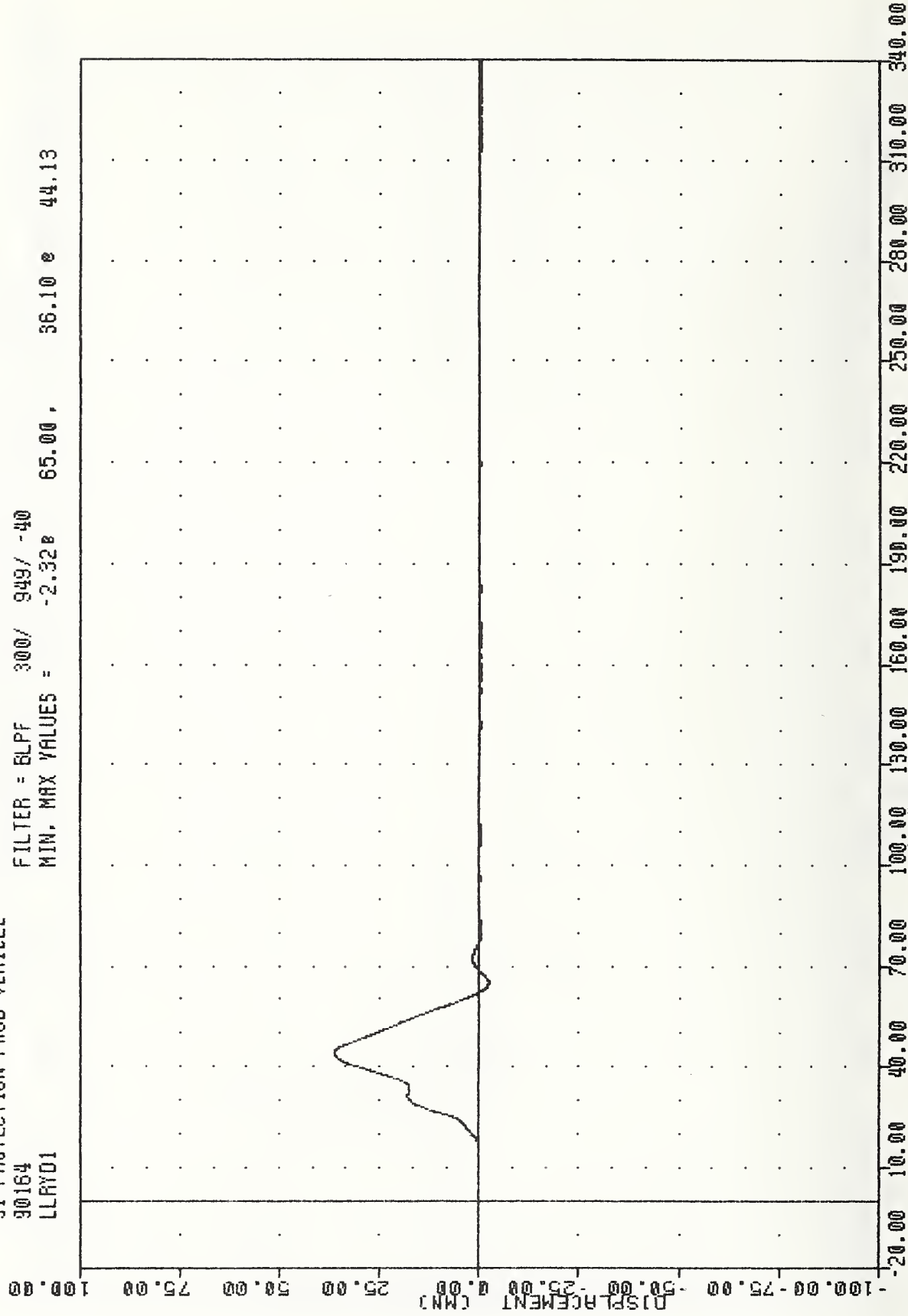
VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT LOWER THORAX RIB Y-AXIS REDUNDANT VELOCITY

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LLAYD1

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 65.00 , 36.10 e 44.13

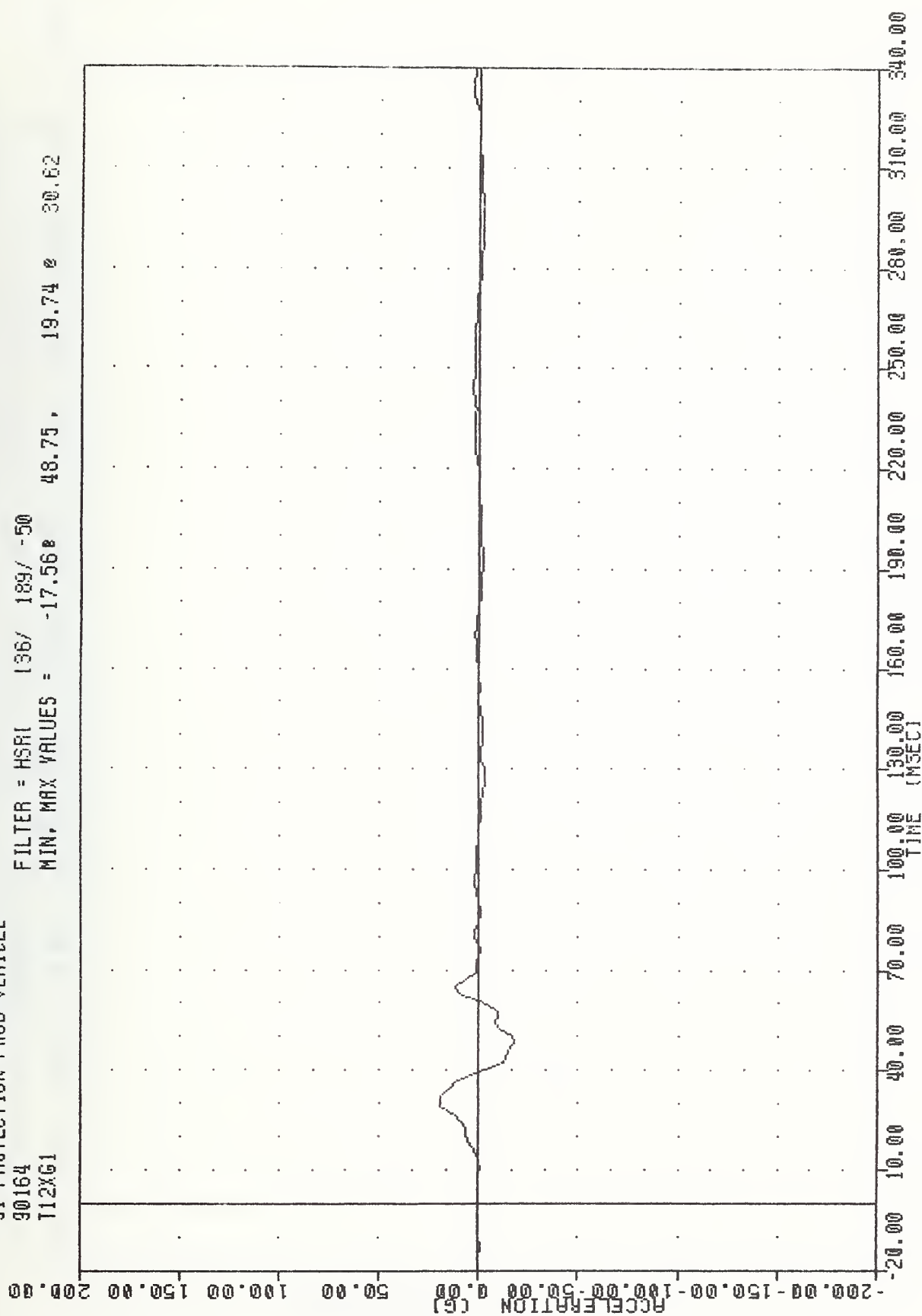


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT LOWER THORAX RIB DISPLACEMENT

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
T12XG1

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -17.56e 48.75 ,

19.74 e 30.62



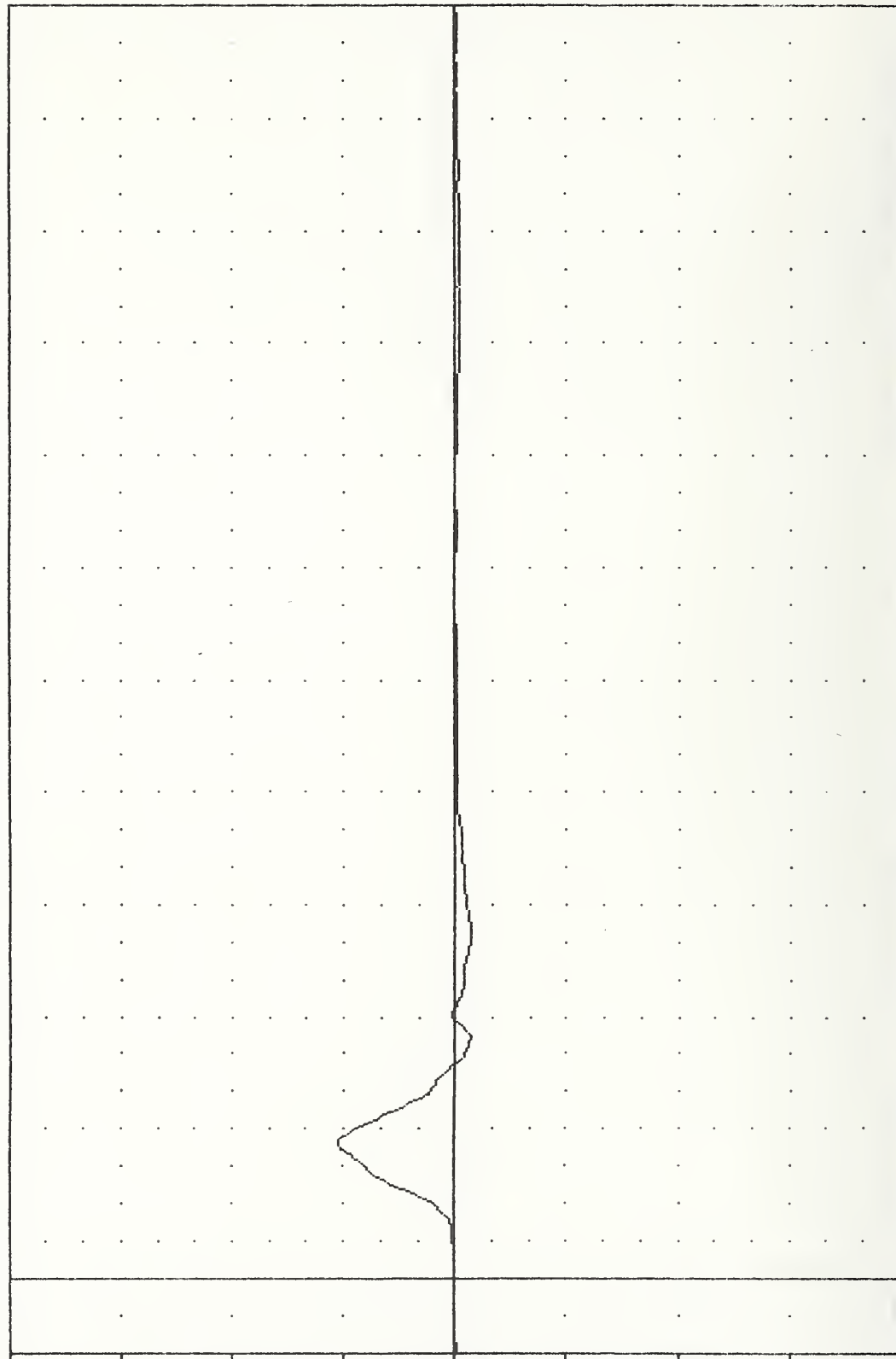
VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 T12Y61

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -6.99# 93.13 ,

52.19 # 36.25

ACCELERATION (G)

-200.00 -150.00 -100.00 -50.00 0.00 50.00 100.00 150.00 200.00

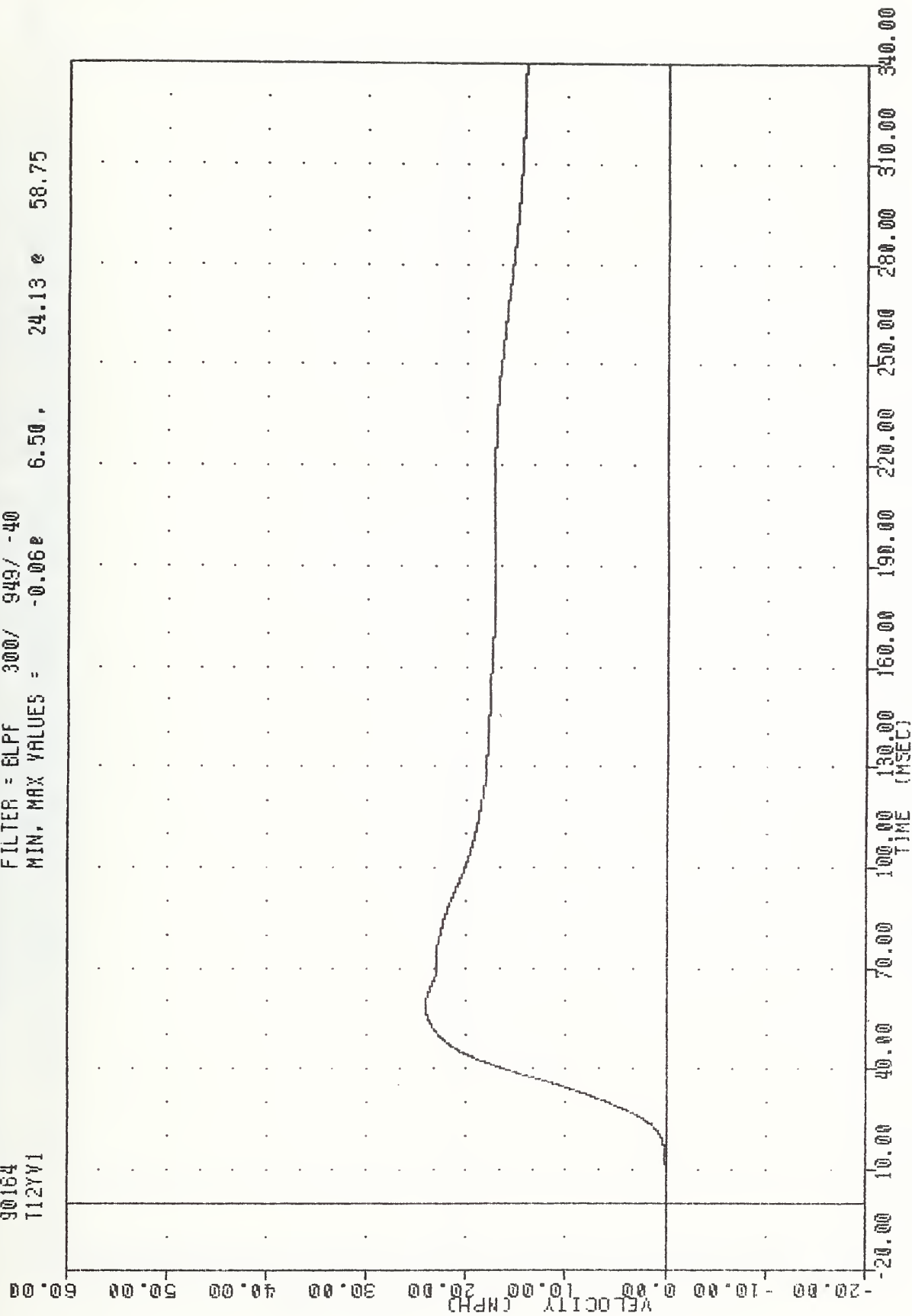


TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER LOWER SPINE Y-AXIS ACCELERATION

VRIC , 900613
SI PROTECTION PROD VEHICLE
90164
T12YV1

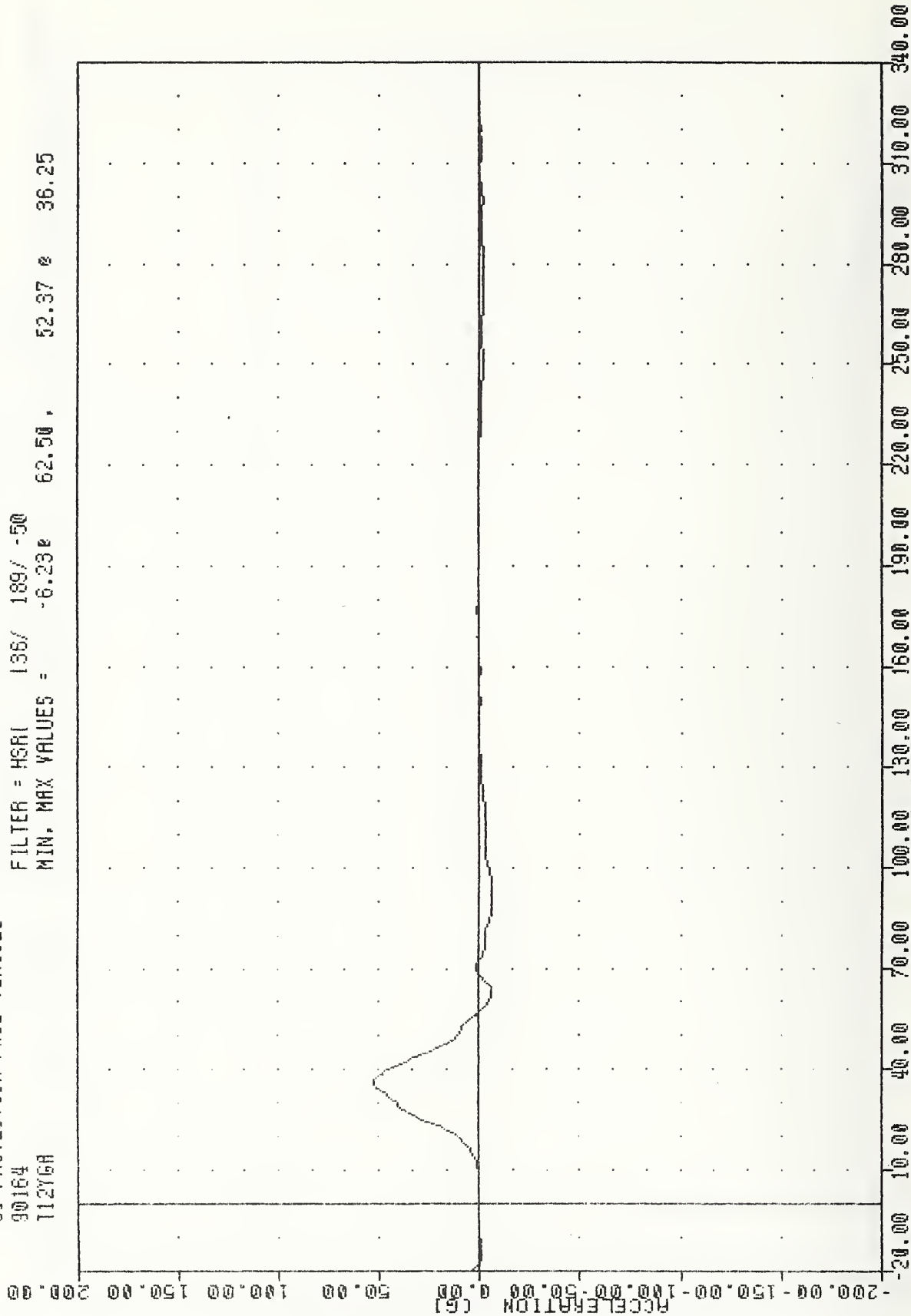
FILTER = 6LPF 300/ 949/ -40
MIN, MAX VALUES = -0.06e 6.50 , 24.13 e 58.75



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LOWER SPINE Y-AXIS VELOCITY

VRTC , 900613
 SI PROTECTION PRDD VEHICLE
 90164
 T12Y6R

FILTER = HSR(136/ 189/ -50
 MIN. MAX VALUES = -6.23e 62.50 , 52.37 e 36.25

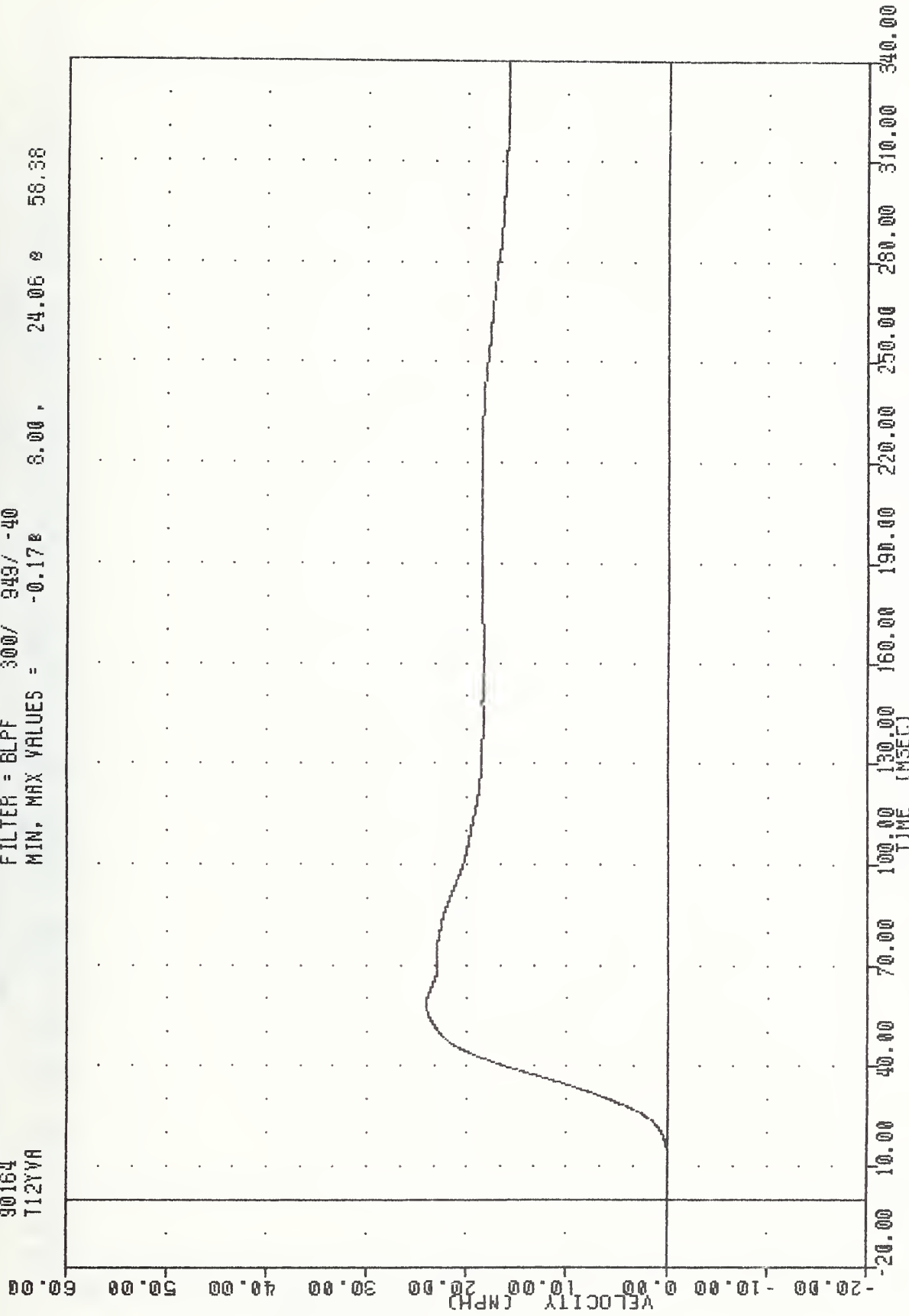


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
T12YVA

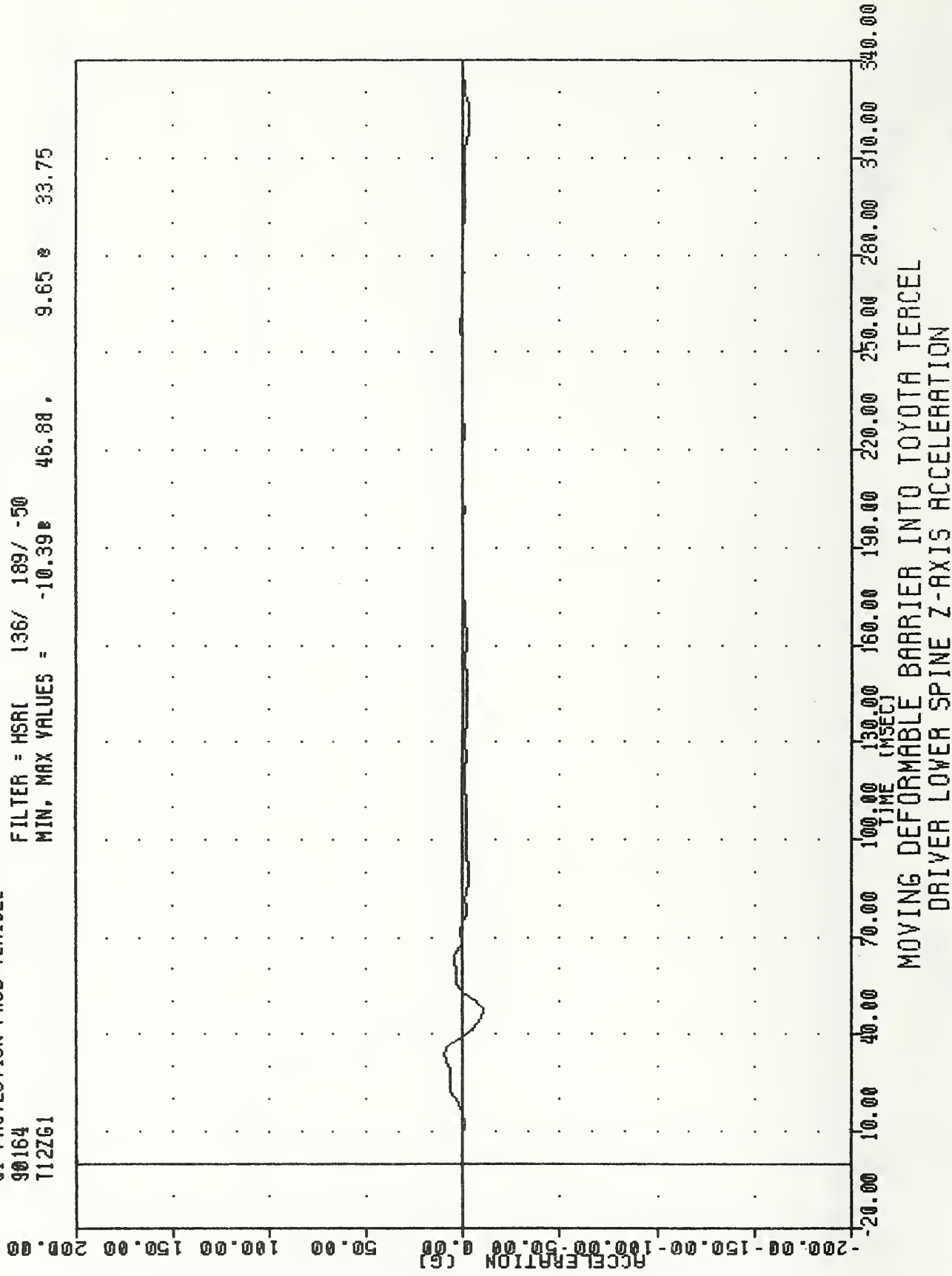
FILTER = BLPF 300/ 343/ -40
MIN, MAX VALUES = -0.178

24.06 s 58.38



VRIC , 900613
SI PROTECTION PROD VEHICLE
90164
T12ZG1

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -10.39 46.88 9.65 33.75

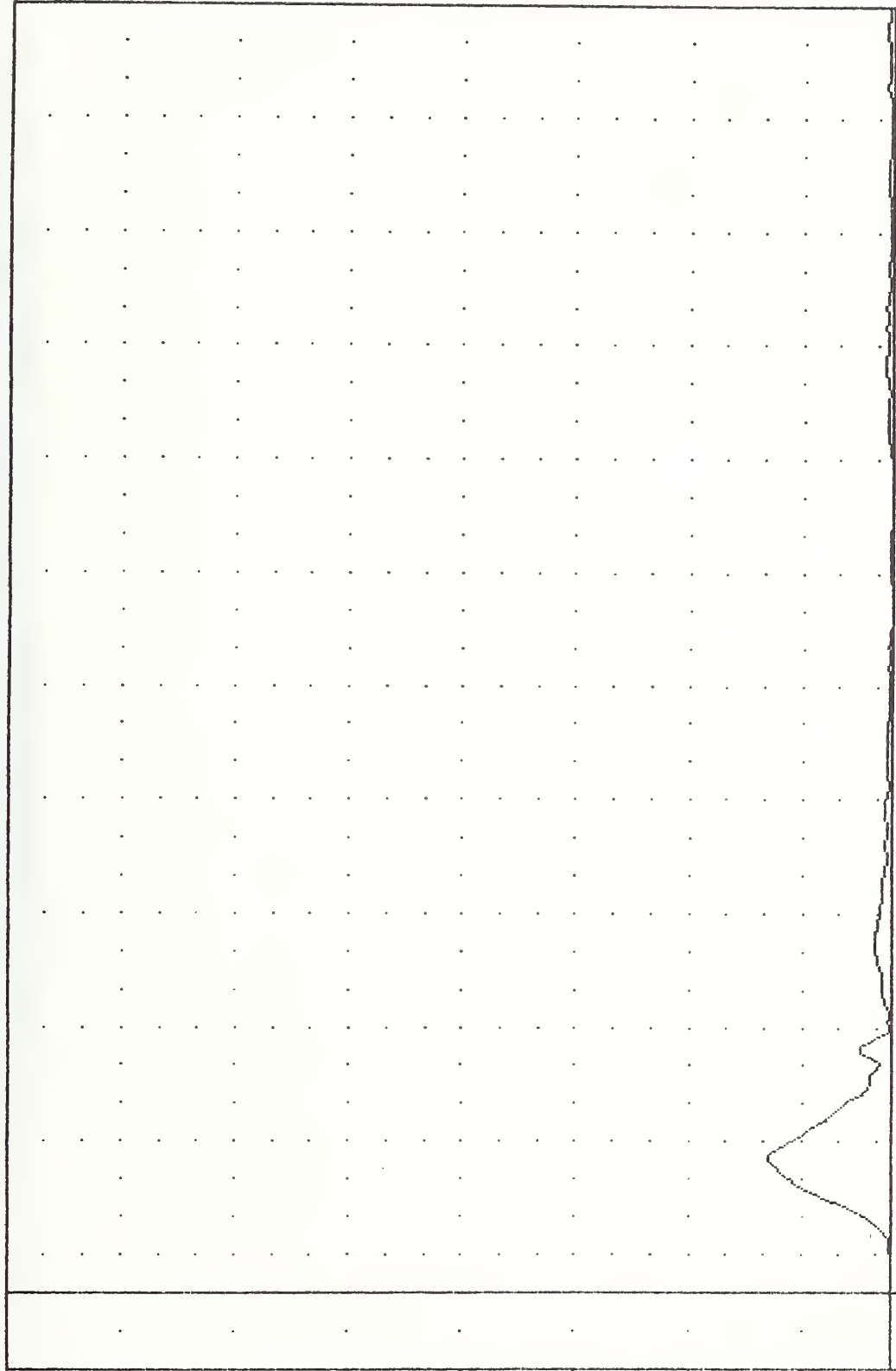


VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
T12R61

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.05e

0.63 , 54.42 e 35.63

ACCELERATION [G]



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

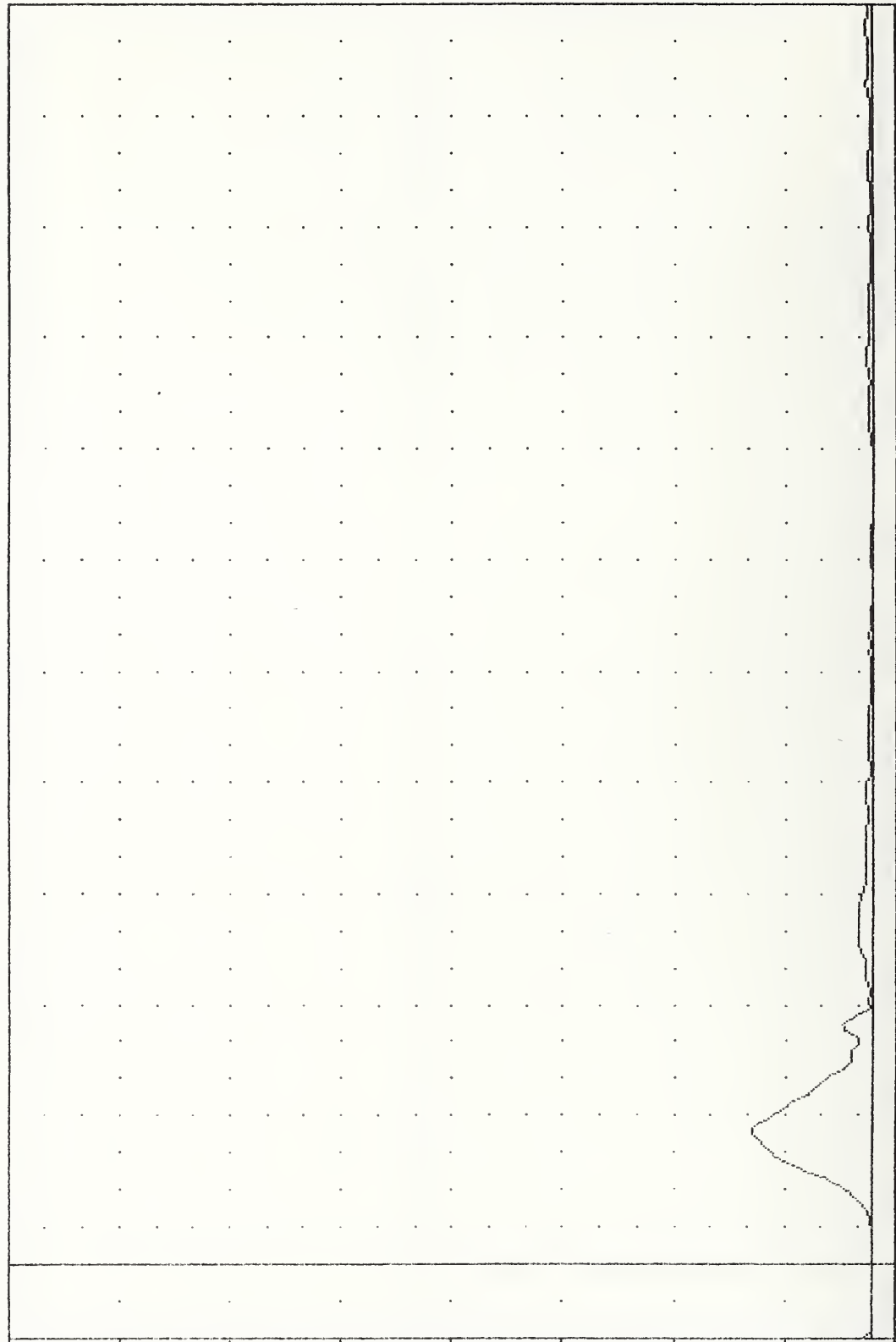
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LOWER SPINE RESULTANT ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
T126GR

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = 0.04e 1.25, 54.50 e 35.63

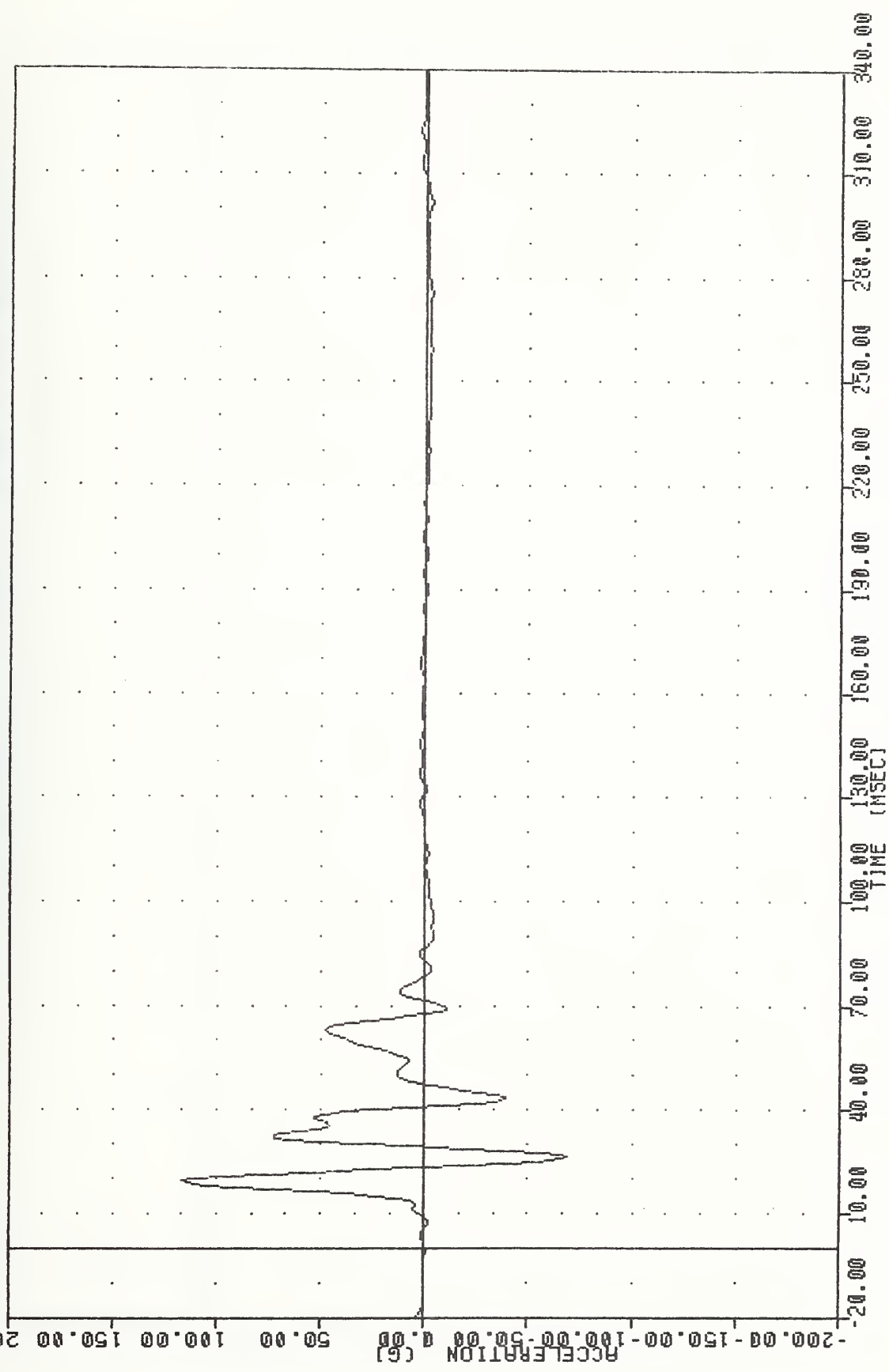
ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LOWER SPINE REDUNDANT RESULTANT ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LUYG1

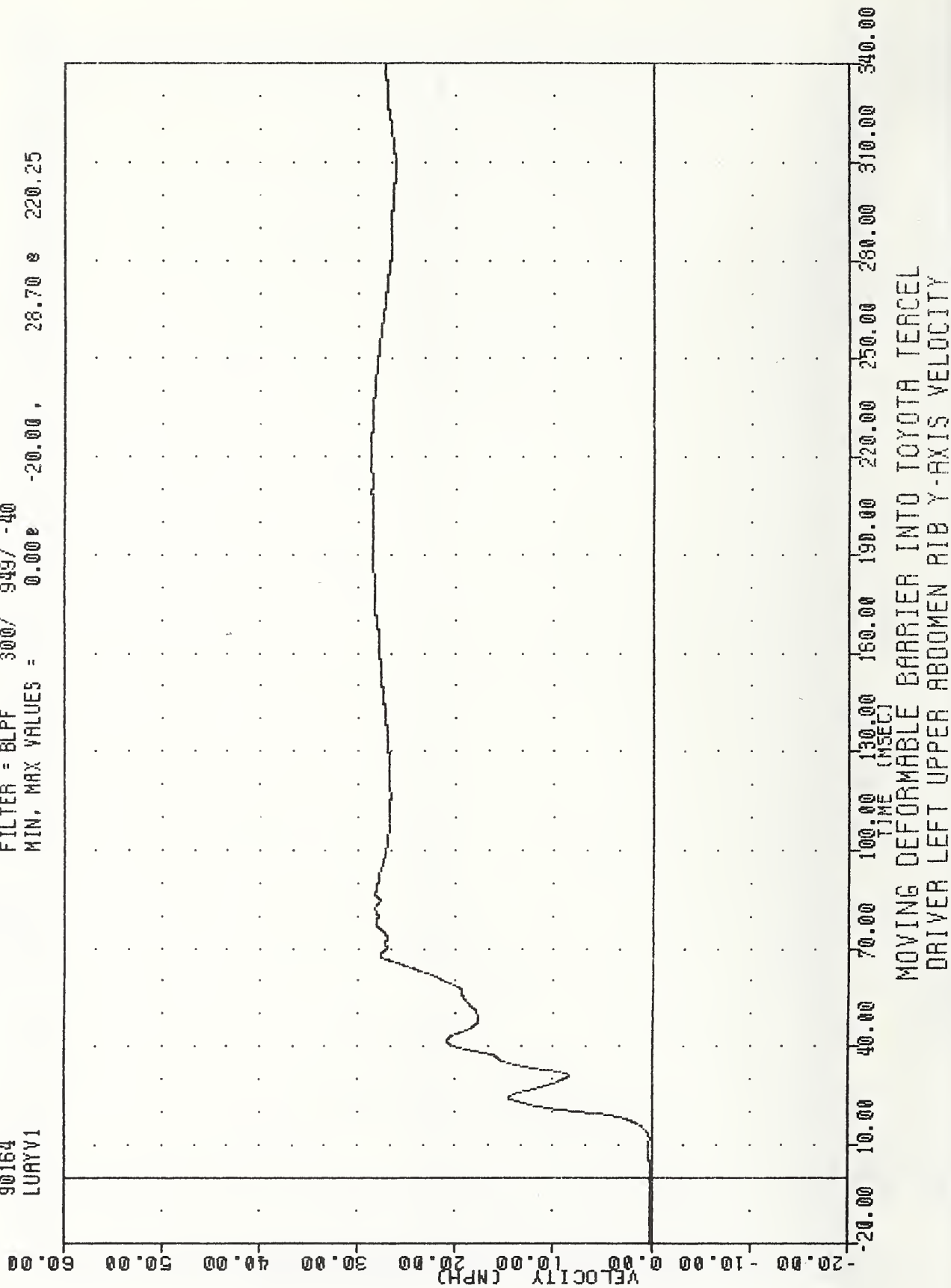
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -68.68 26.25 , 116.67 19.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER LEFT UPPER ABDOMEN RIB Y-AXIS ACCELERATION

VRTC
SI PROTECTION PROD VEHICLE
90164
LUAYV1

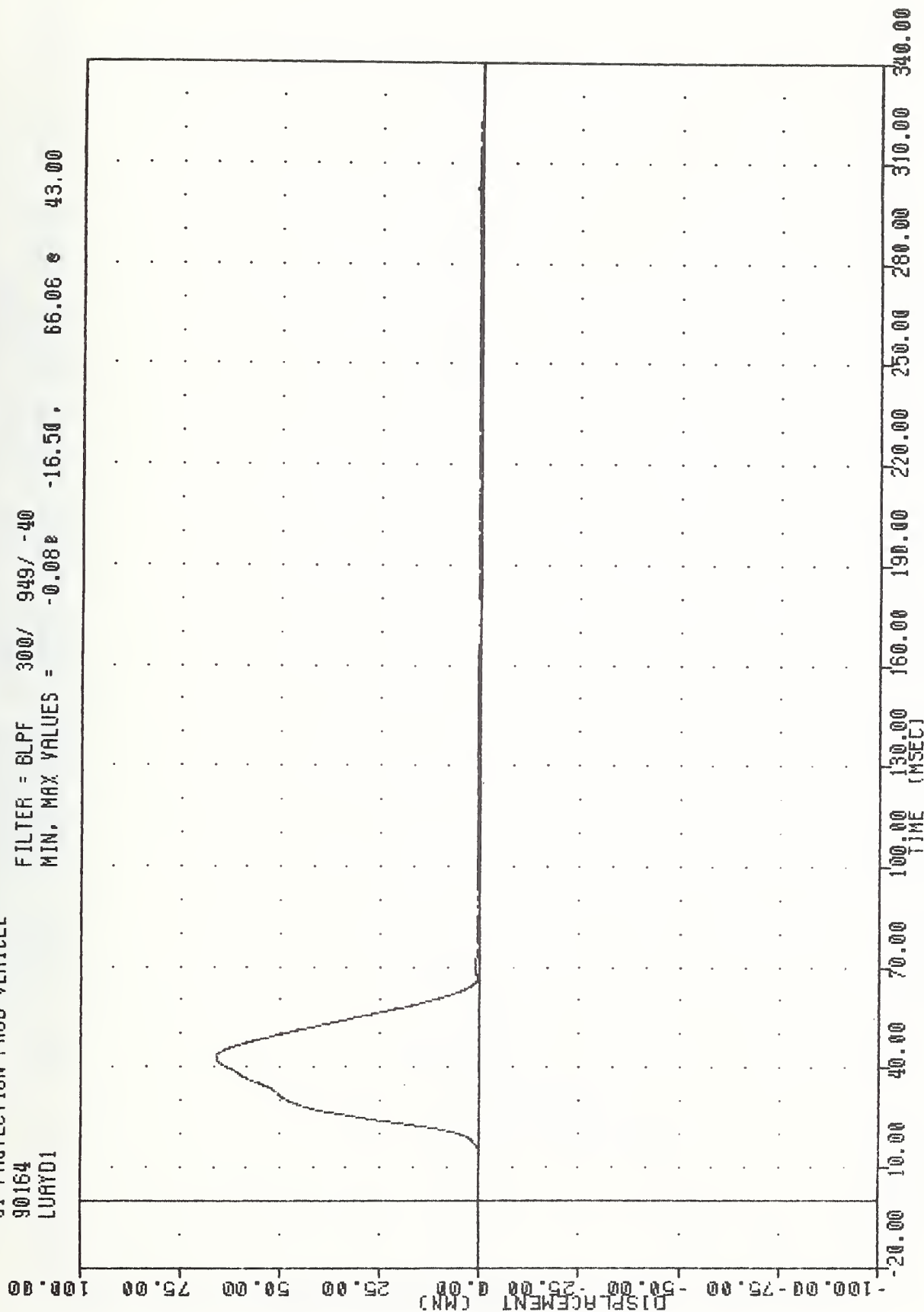
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.00e -20.00, 28.70 e 220.25



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT UPPER ABDOMEN RIB Y-AXIS VELOCITY

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LURYD1

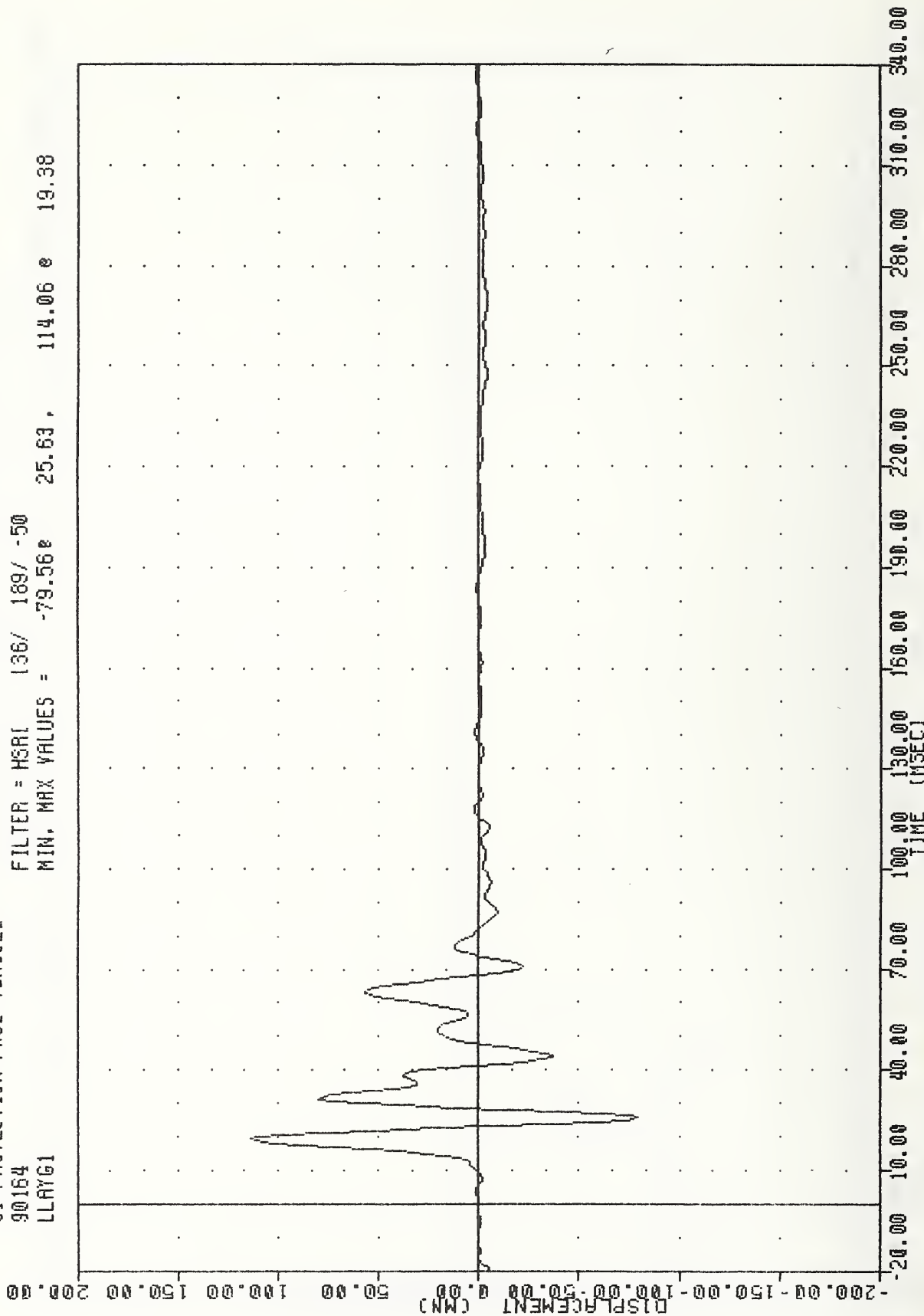
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.082 -16.50. 66.06 43.00



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT UPPER ABDOMEN RIB DISPLACEMENT

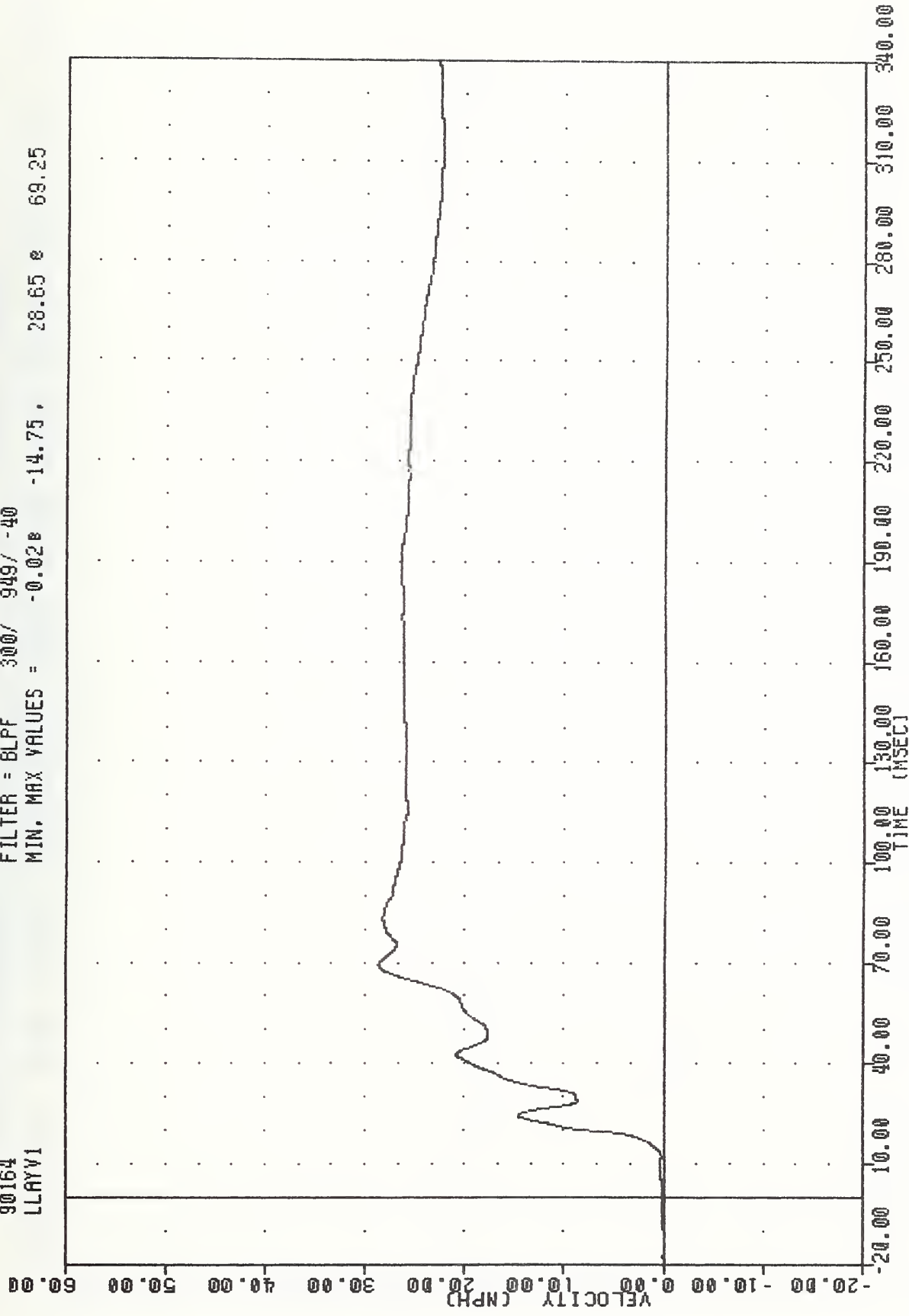
VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LLAGG1

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -79.56e 25.63, 114.06 e 19.38



VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LLAYV1

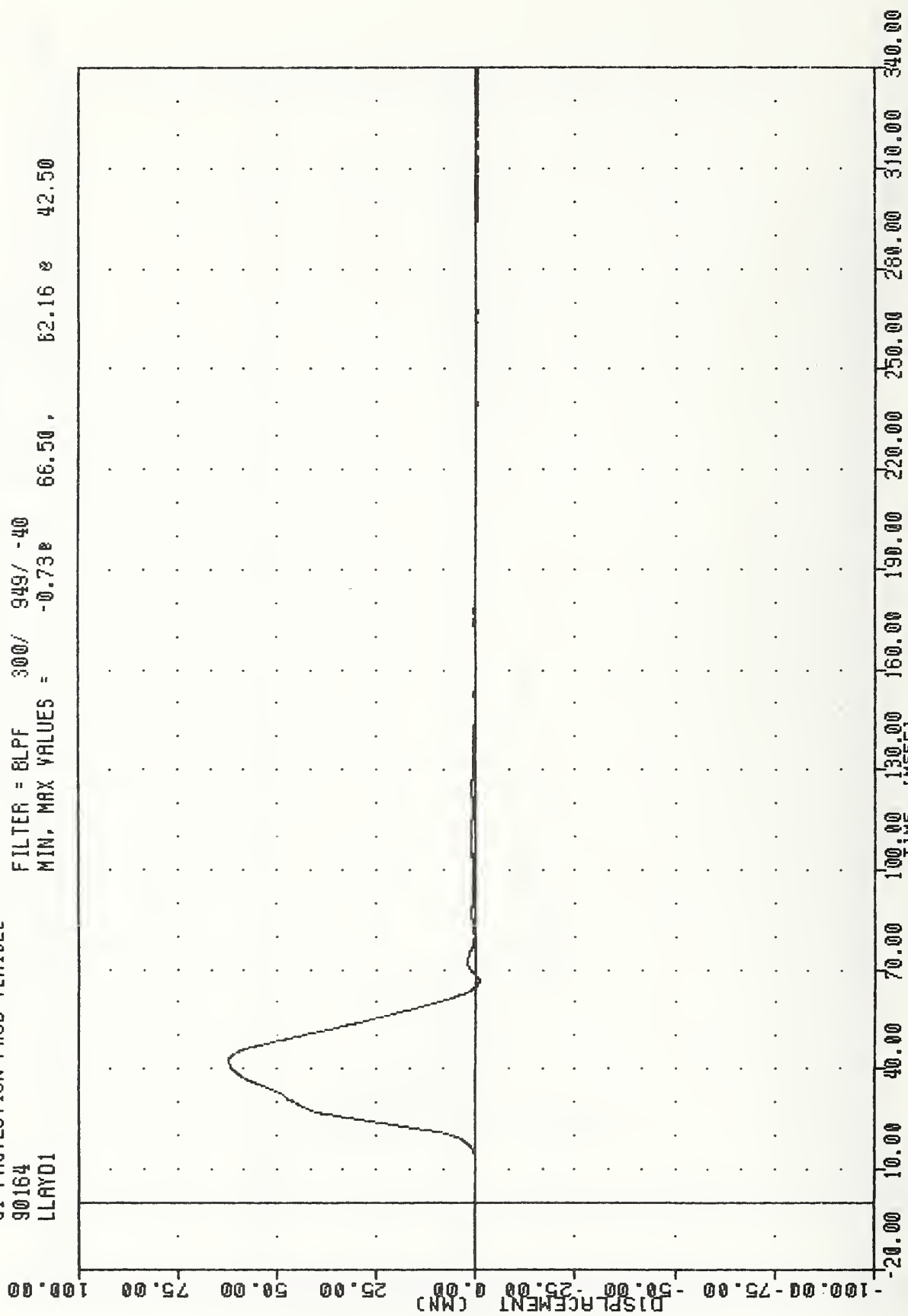
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.028 -14.75, 28.65 69.25



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER LEFT LOWER ABDOMEN RIB Y-AXIS VELOCITY

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LLOYD1

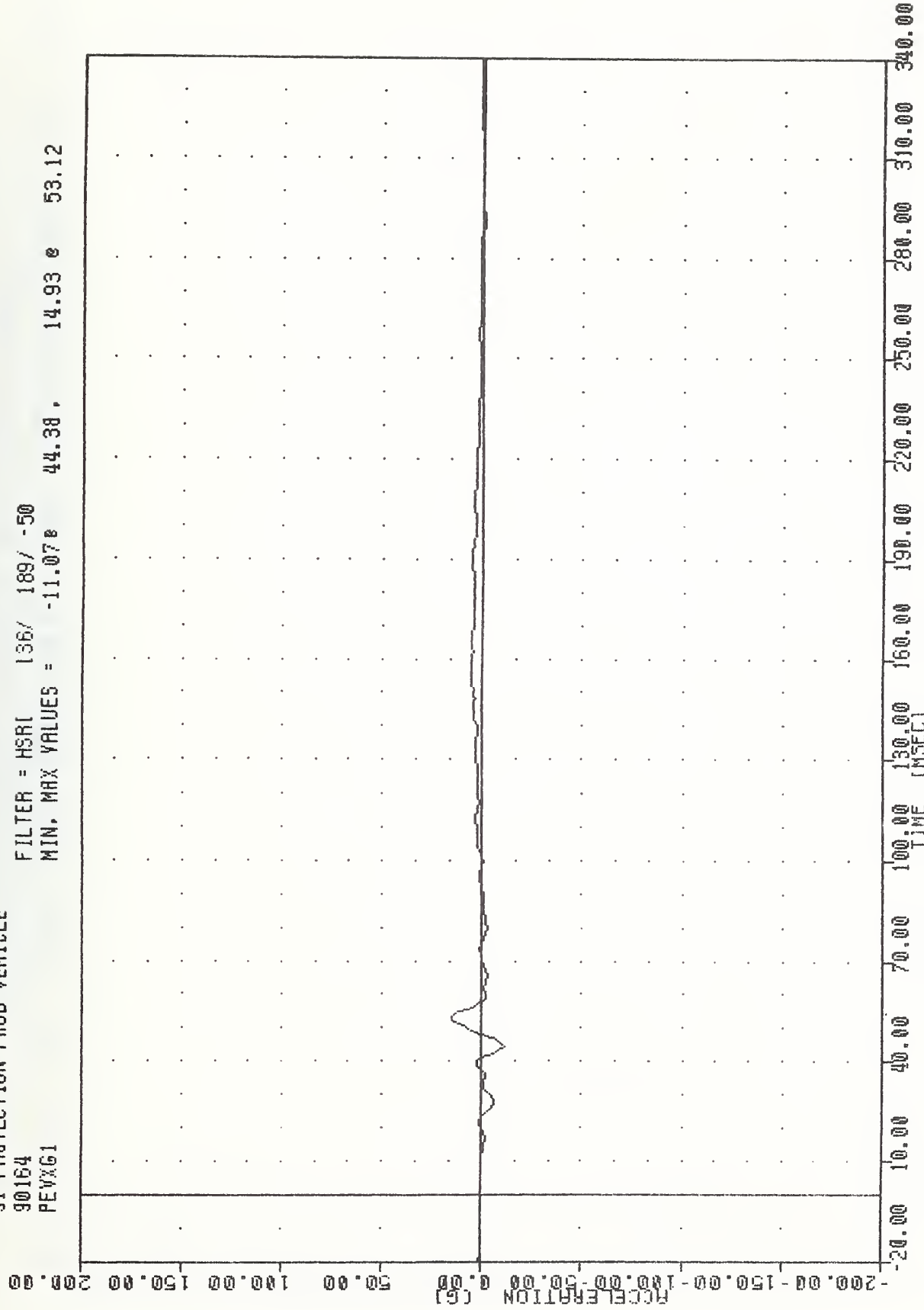
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.730 66.50 , 62.16 42.50



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER LEFT LOWER ABDOMEN RIB DISPLACEMENT

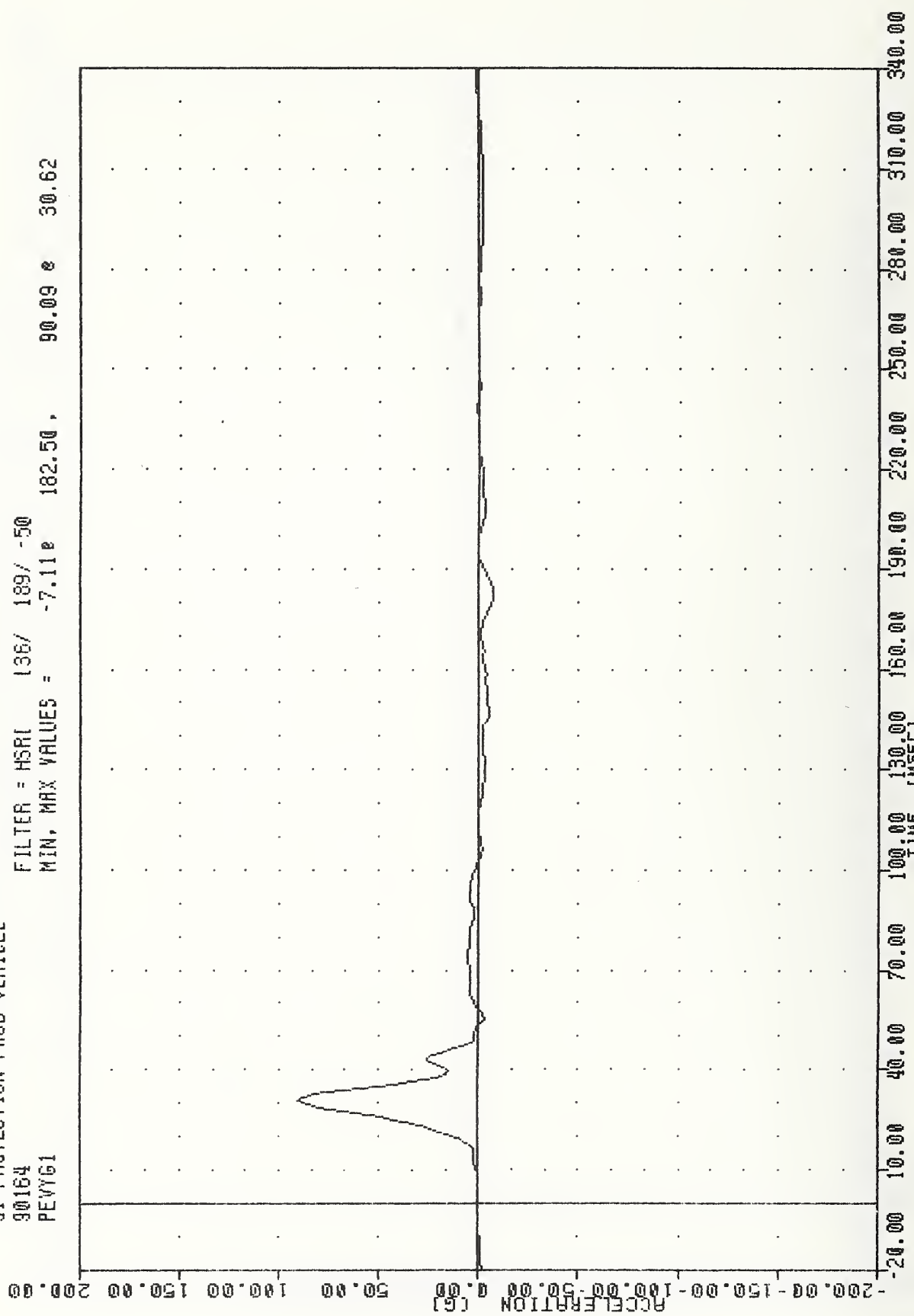
VRIC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 PEVXG1

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -11.07e 44.38 , 14.93 e 53.12



VRTC
 SI PROTECTION PROD VEHICLE
 90164
 PEVY61

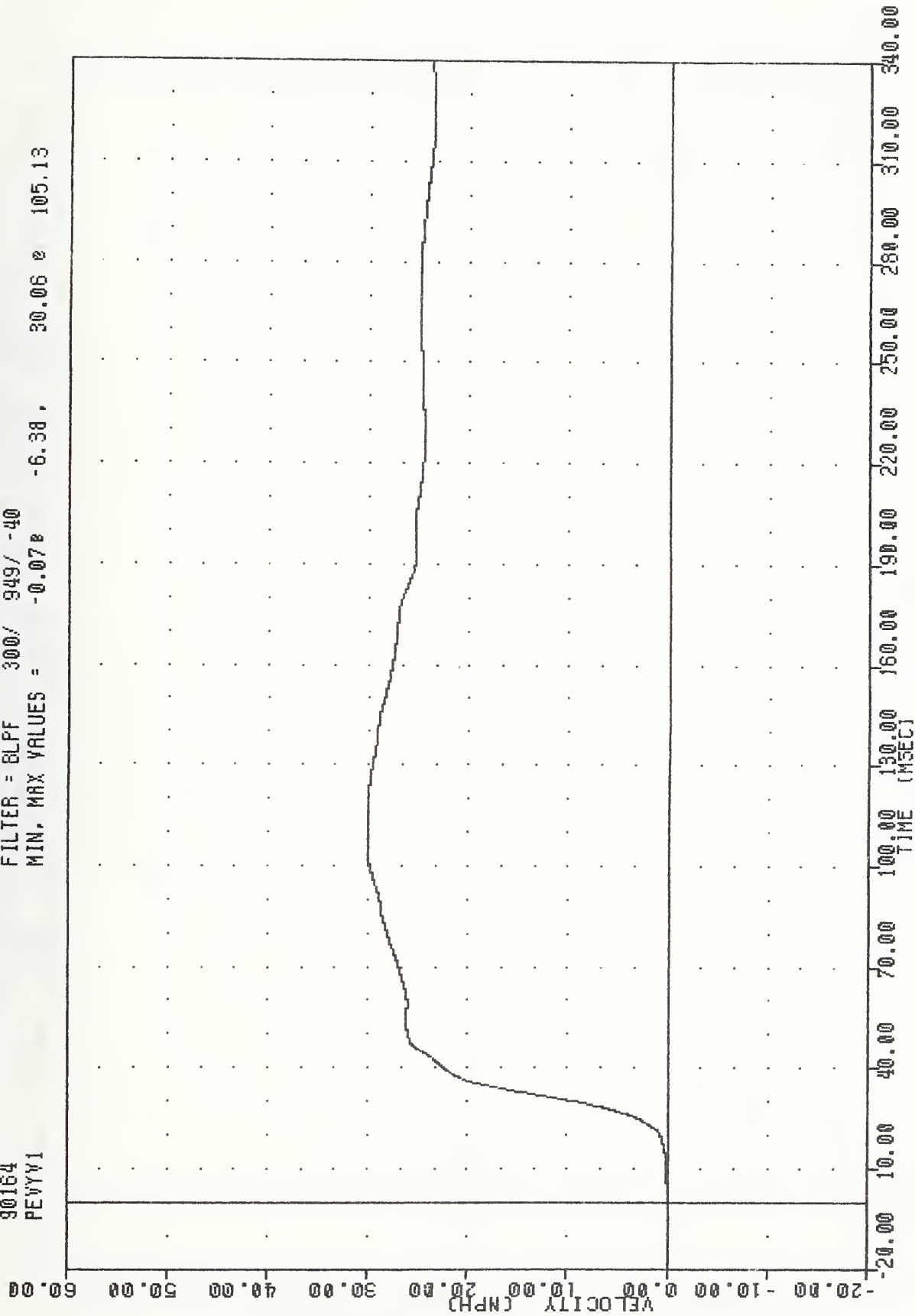
FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = -7.11e 182.50 , 90.09 e 30.62



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER PELVIS Y-AXIS ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
PEVYV1

FILTER = 8LFF 300/ 949/ -40
MIN, MAX VALUES = -0.07 30.06 105.13
-6.38

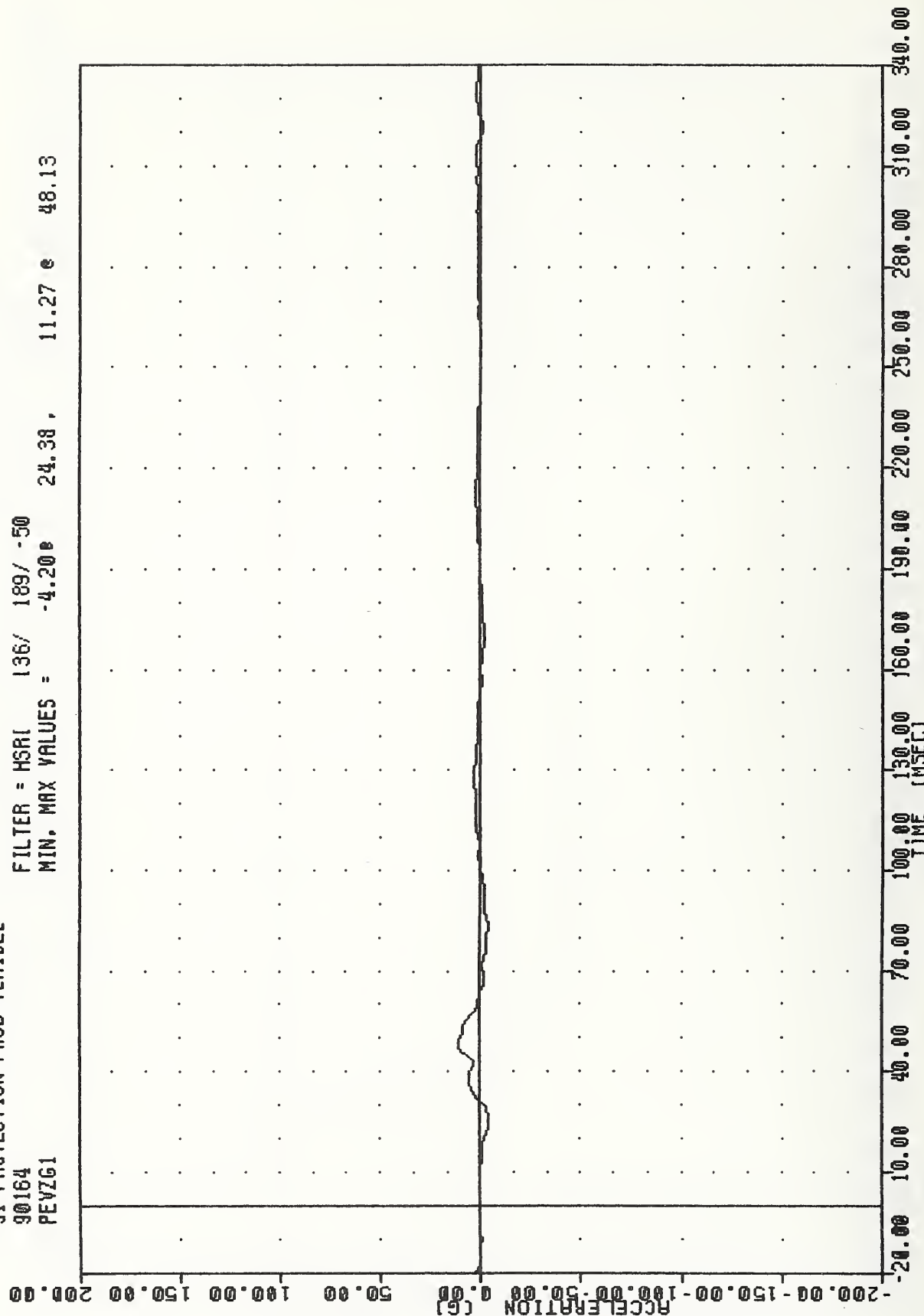


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER PELVIS Y-AXIS VELOCITY

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 PEVZ61

FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = -4.20e

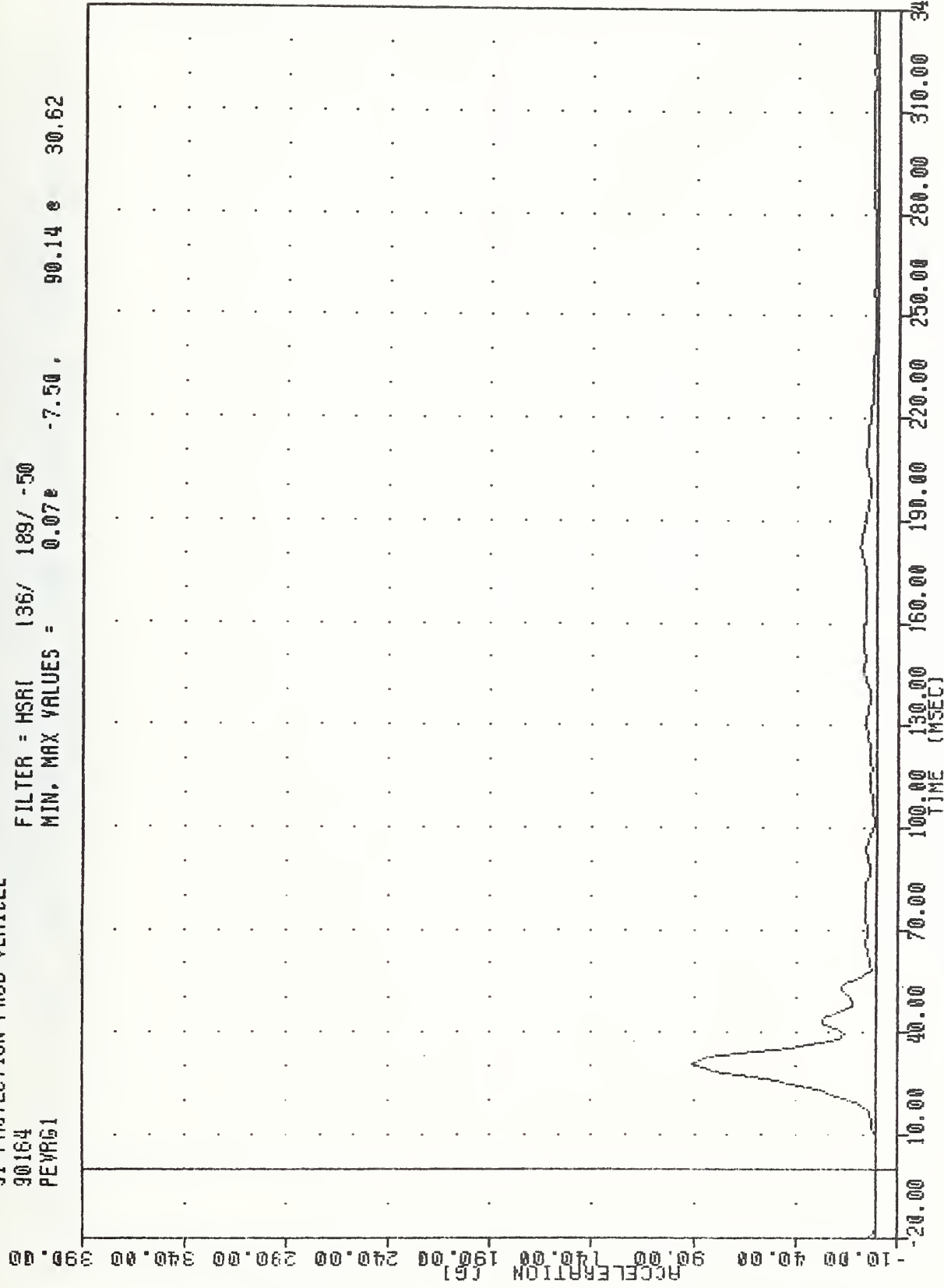
24.38 , 11.27 e 48.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER PELVIS Z-AXIS ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 PEVR61

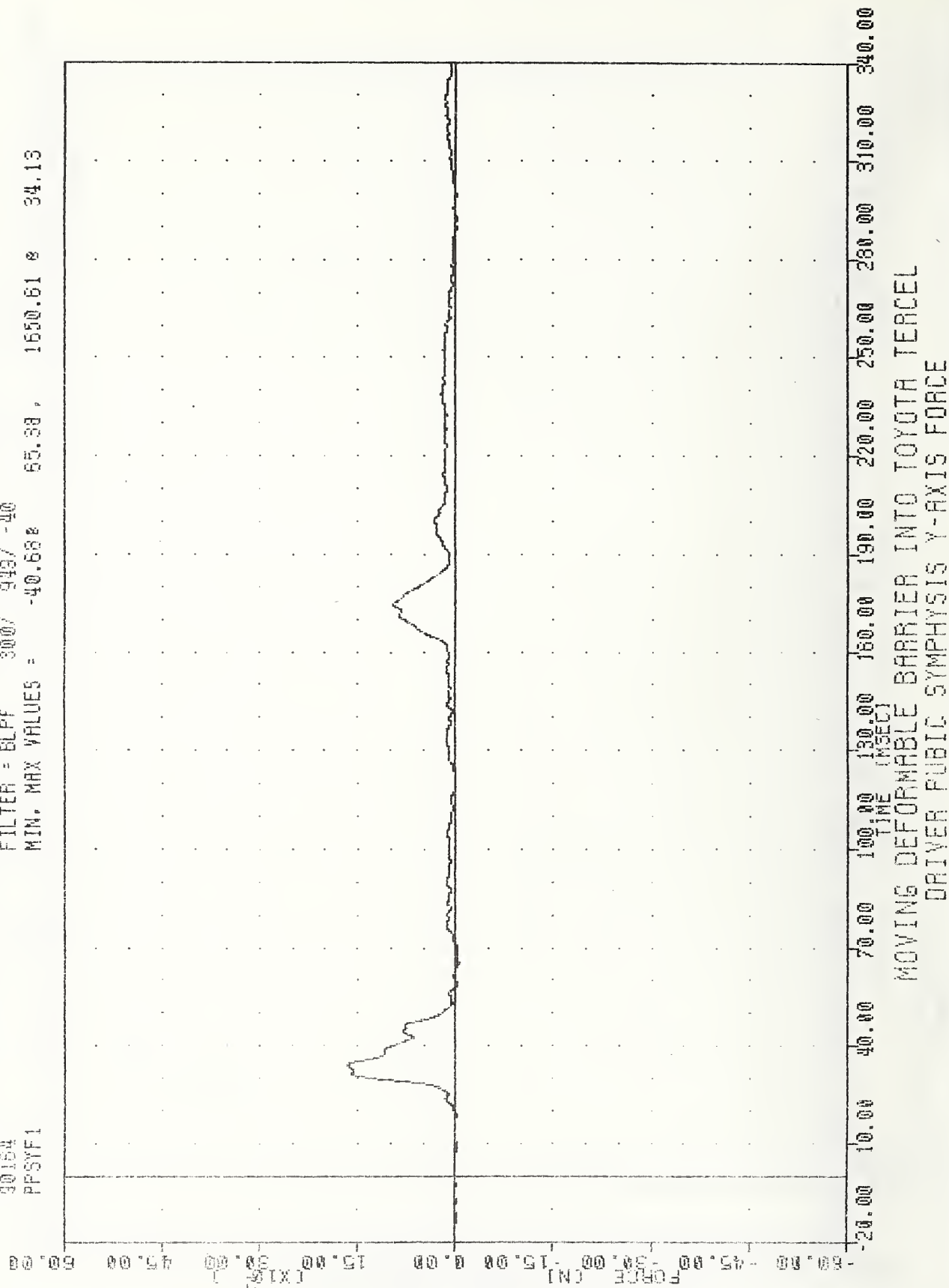
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.07e -7.50 , 90.14 e 30.62



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER PELVIS RESULTANT ACCELERATION

VRTC , 900613
 SI PROTECTION PASS VEHICLE
 90154
 PPSVF1

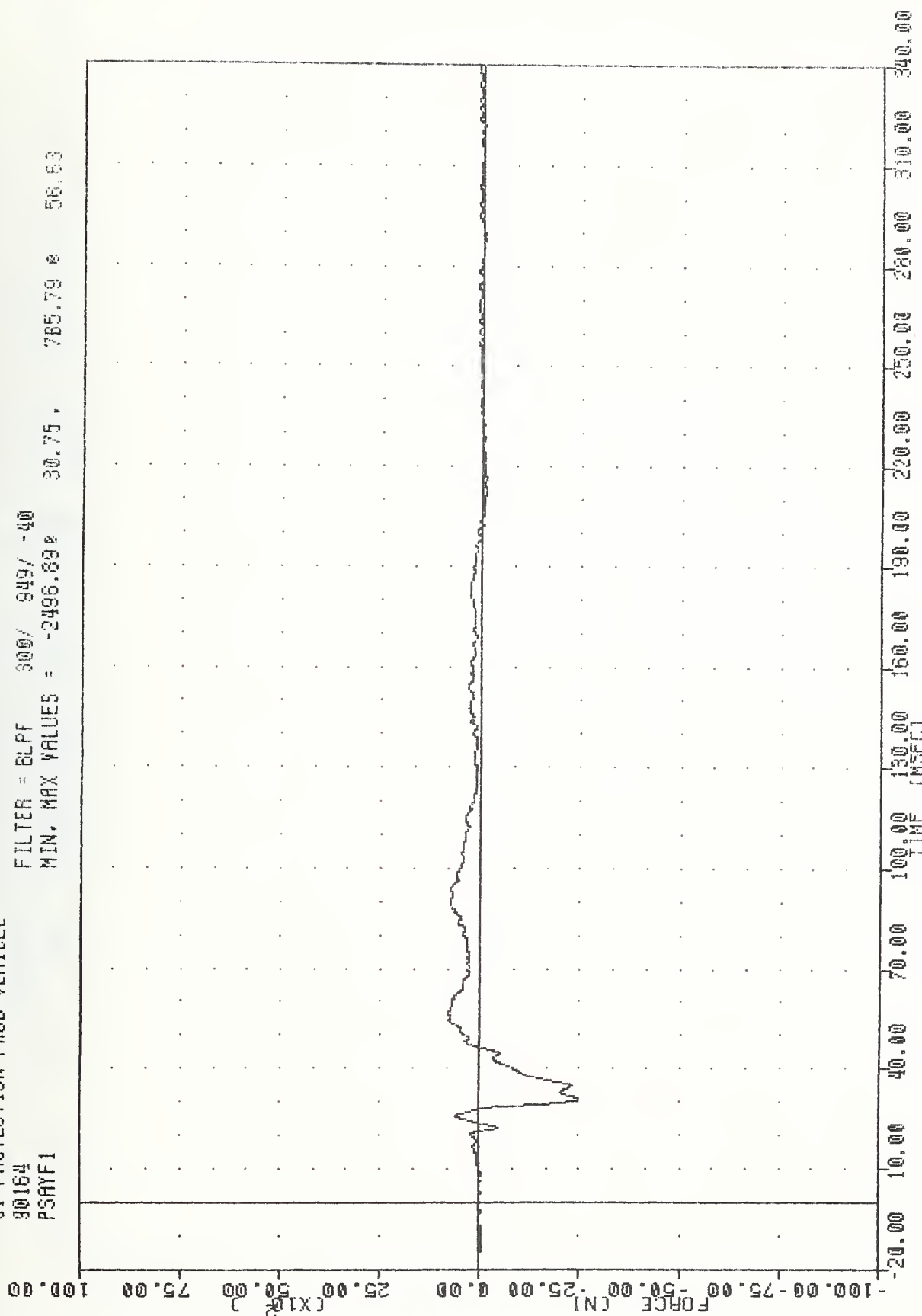
FILTER = BLPF 300/ 948/ -40
 MIN. MAX VALUES = -40.632 65.38 1650.61 34.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER PUBIC SYMPHYSIS Y-AXIS FORCE

NRIC 900613
SI PROTECTION PROD VEHICLE
90164
PSAYF1

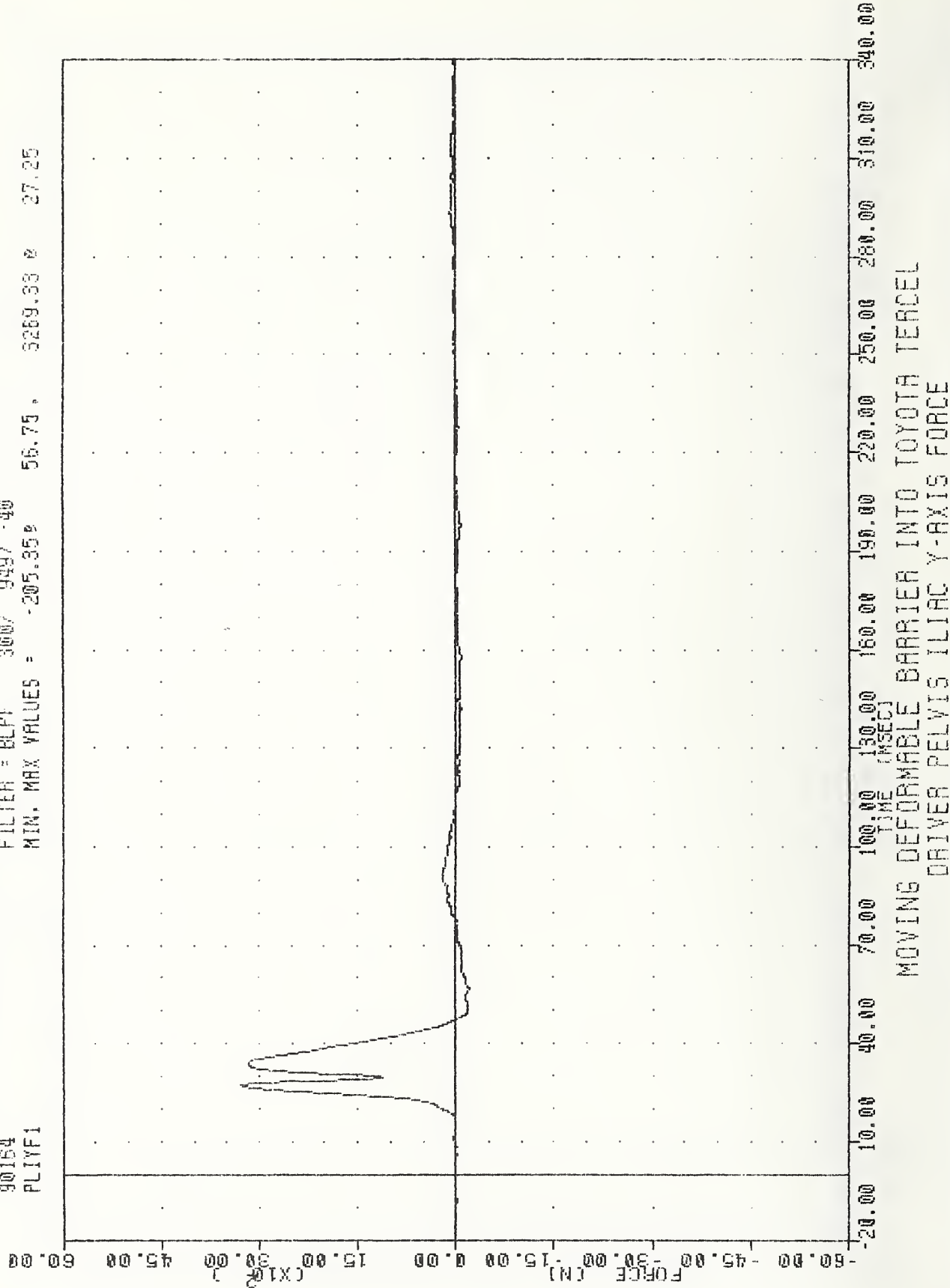
FILTER = 6LFF 300/ 949/ -40
MIN. MAX VALUES = -2496.69 30.75 785.79 56.63



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
DRIVER PELVIS SACRUM Y-AXIS FORCE

VRTC , 900613
 SI PROTECTION PROO VEHICLE
 90164
 PLYF1

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -205.35 56.75 3269.33 27.25

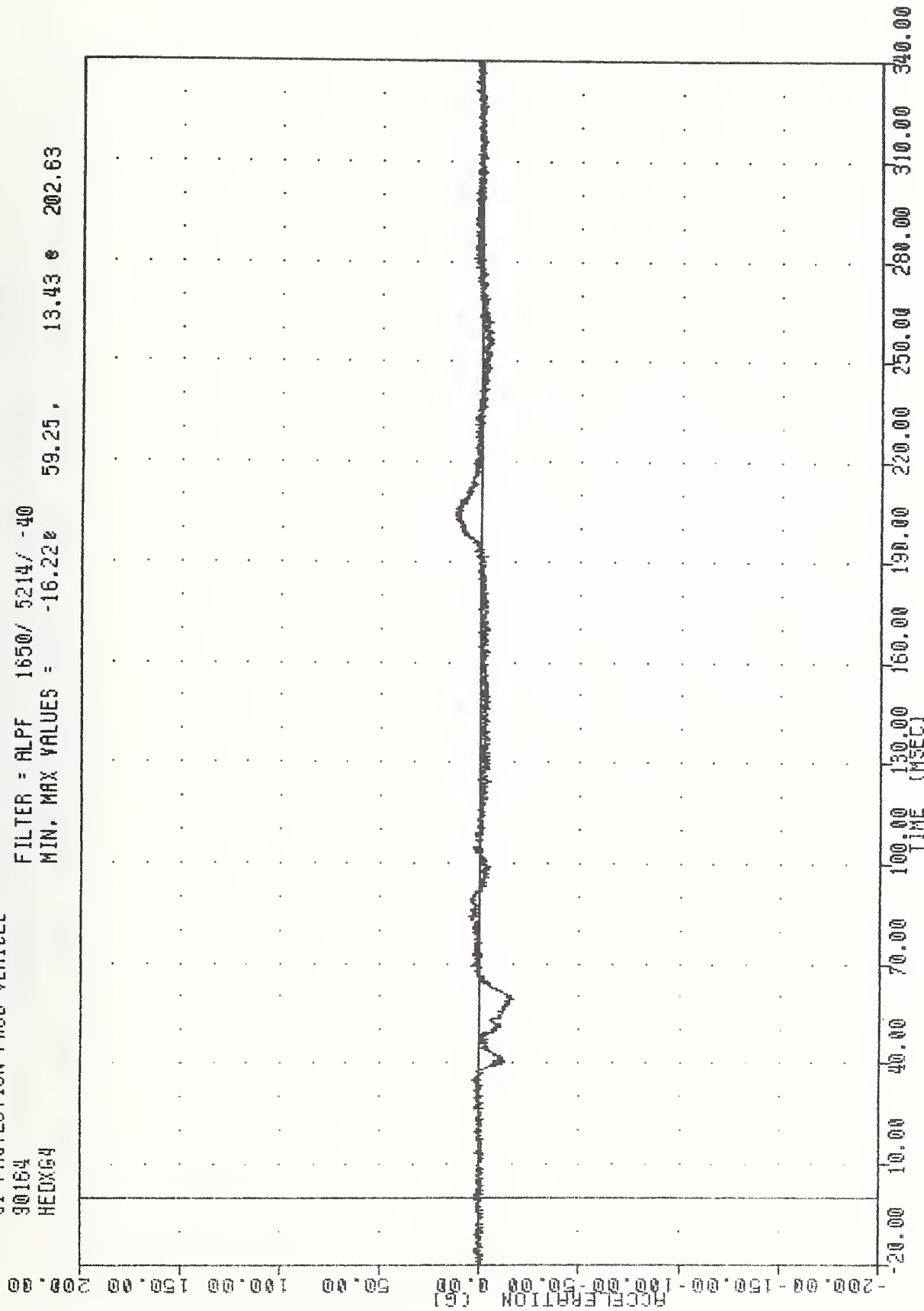


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 DRIVER PELVIS ILIAC Y-AXIS FORCE

VRTC , 900613
SI PROTECTION PROD VEHICLE
90184
HEDXG4

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -16.22e

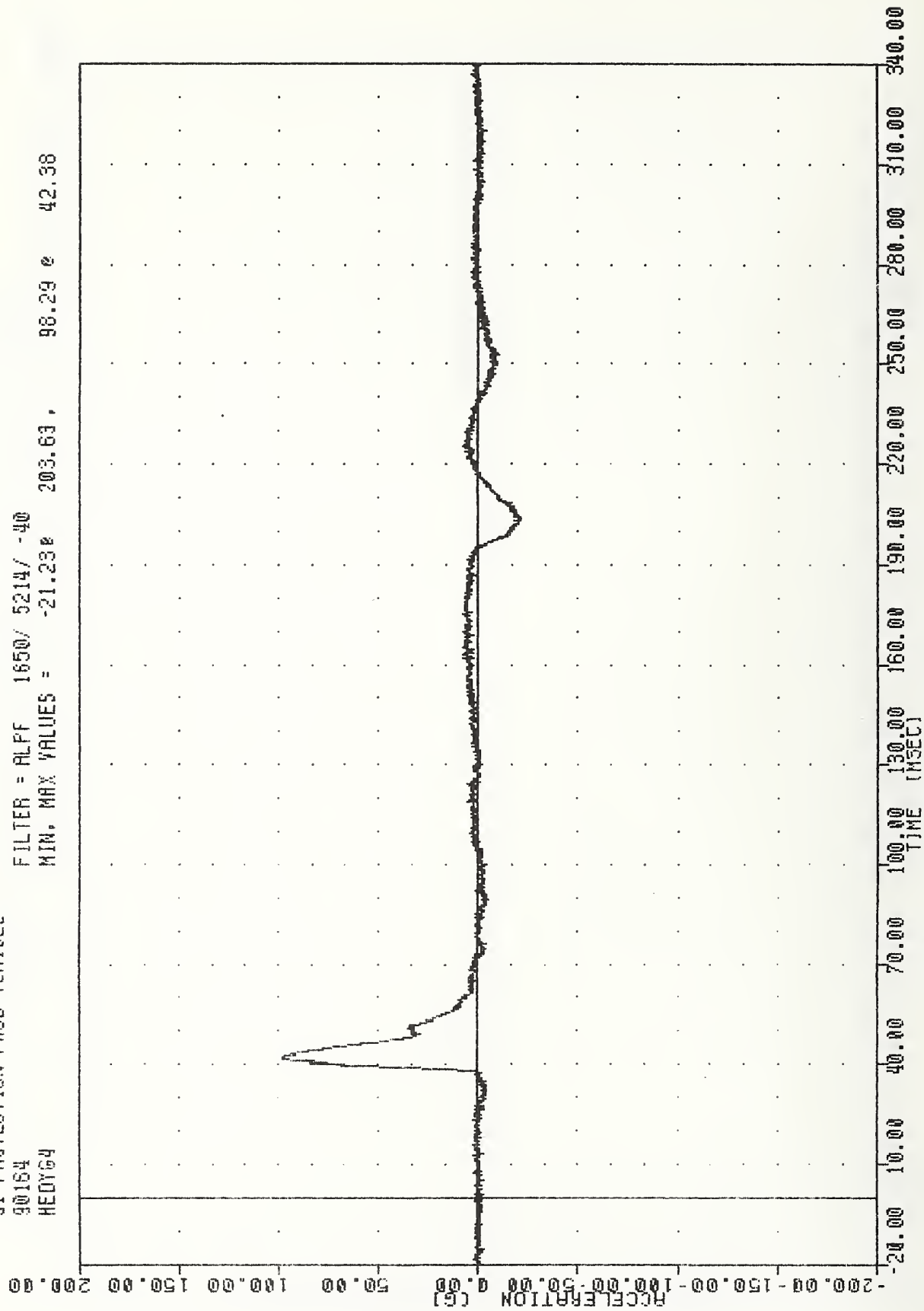
59.25 , 13.43 e 202.63



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER HEAD X-AXIS ACCELERATION

VRTC 900613
 SI PROTECTION PROO VEHICLE
 90164
 HEDY64

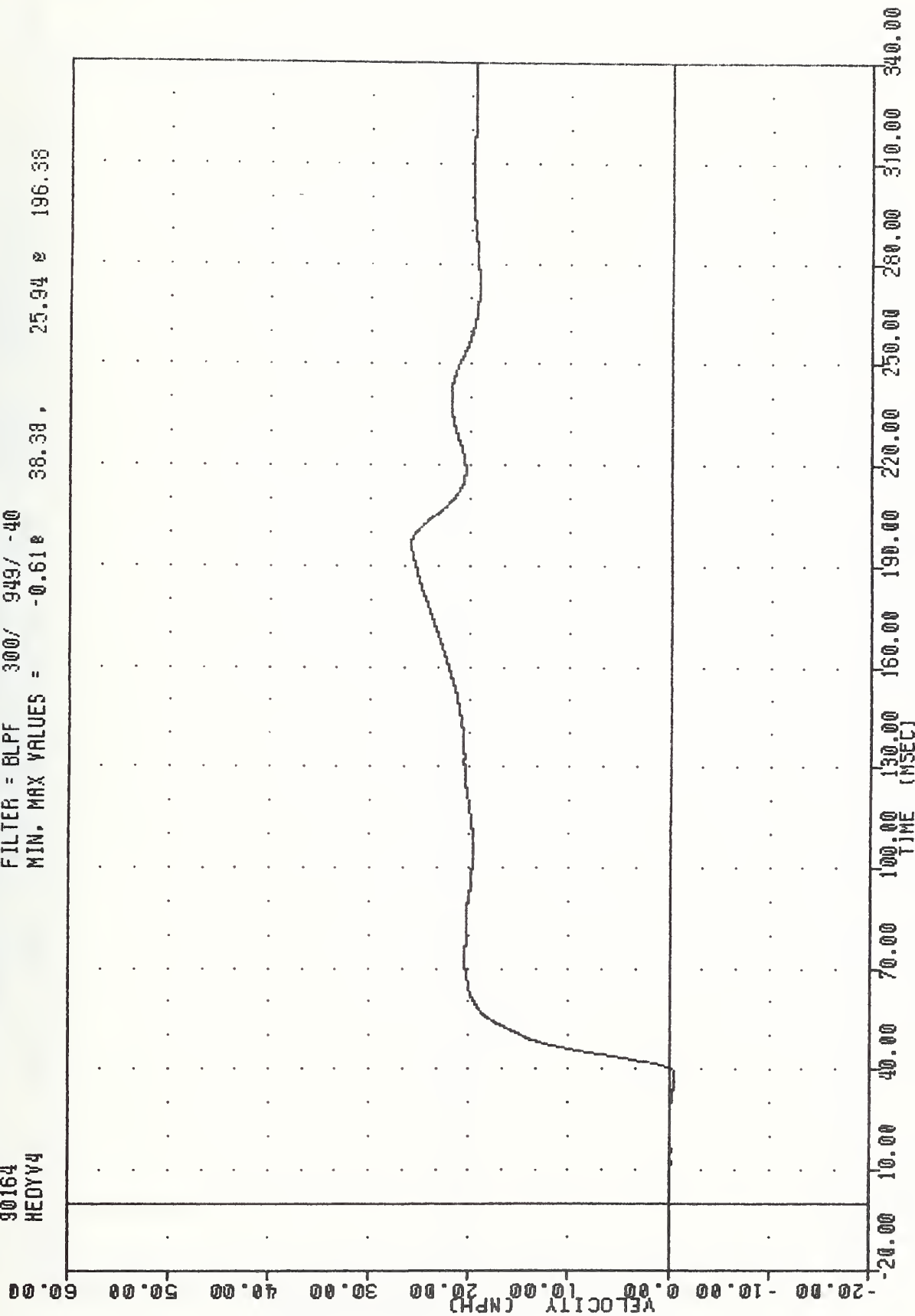
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -21.23e 203.63, 98.29 e 42.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER HEAD Y-AXIS ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 HEDYV4

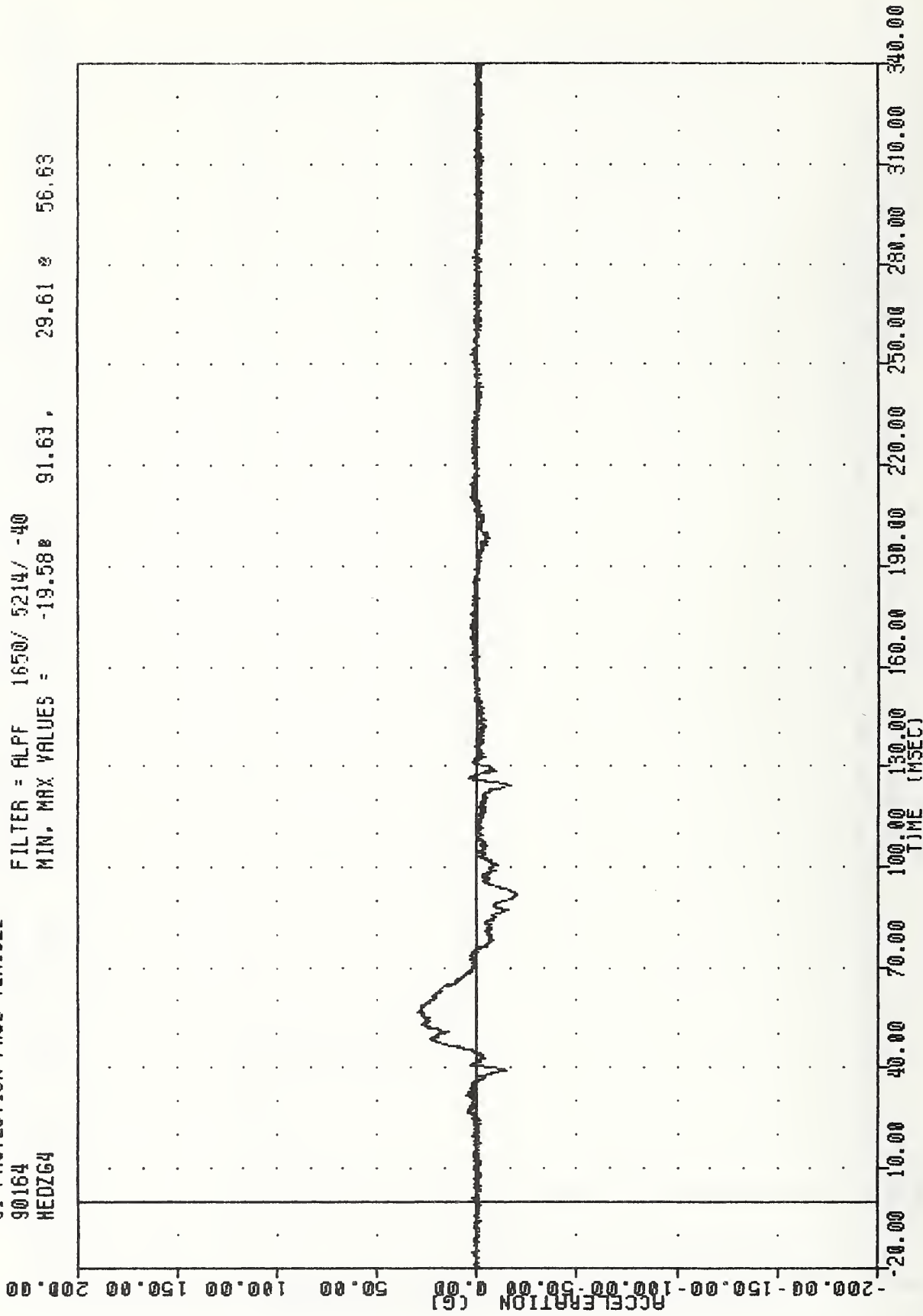
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.618 38.38 , 25.94 196.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER HEAD Y-AXIS VELOCITY

VRTC , 900613
SI PROTECTION PROO VEHICLE
90164
HEDZ64

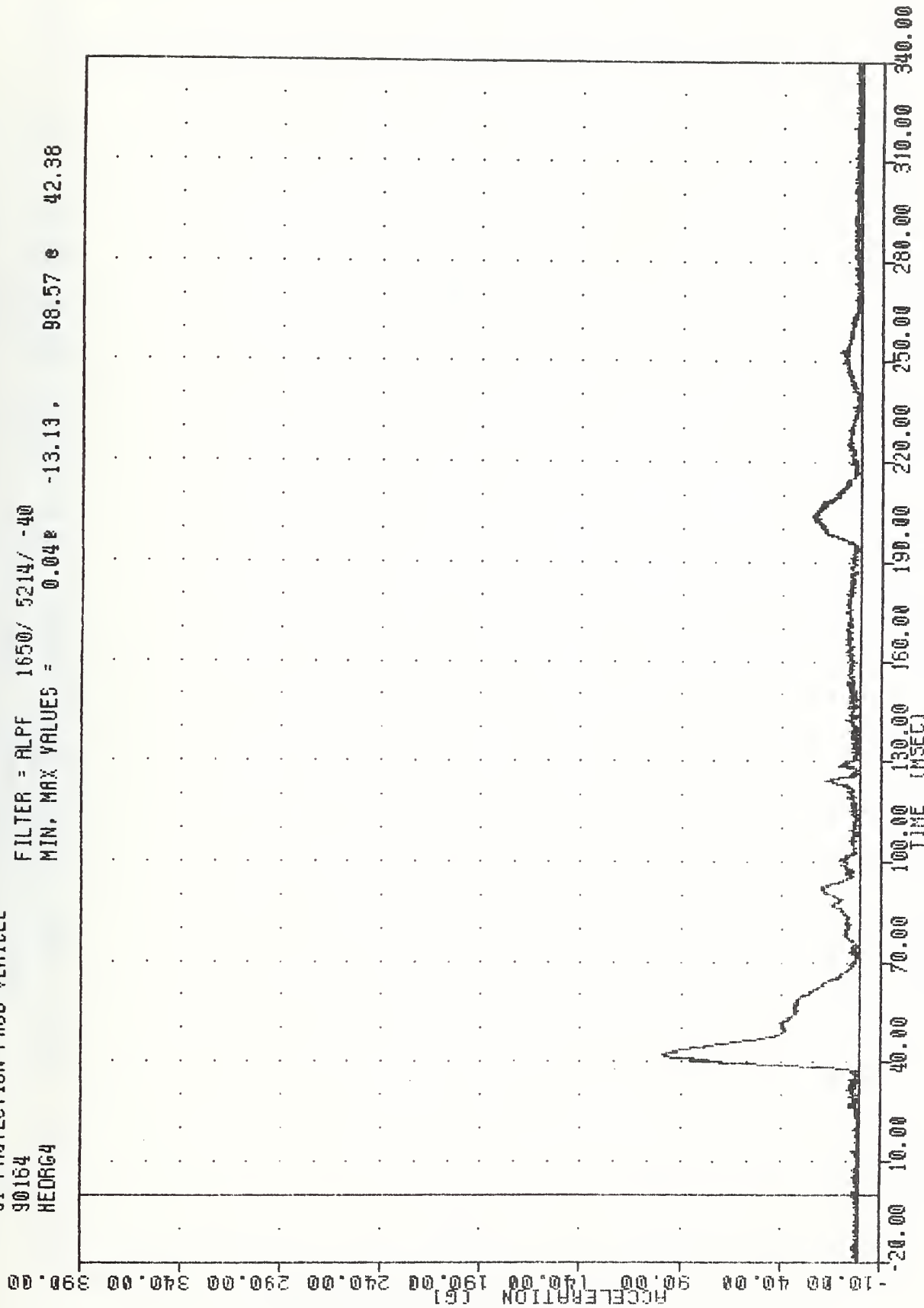
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 91.63, 29.61 56.63



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER HEAD Z-AXIS ACCELERATION

VRTC , 900613
S1 PROTECTION PASS VEHICLE
90164
HEDRG4

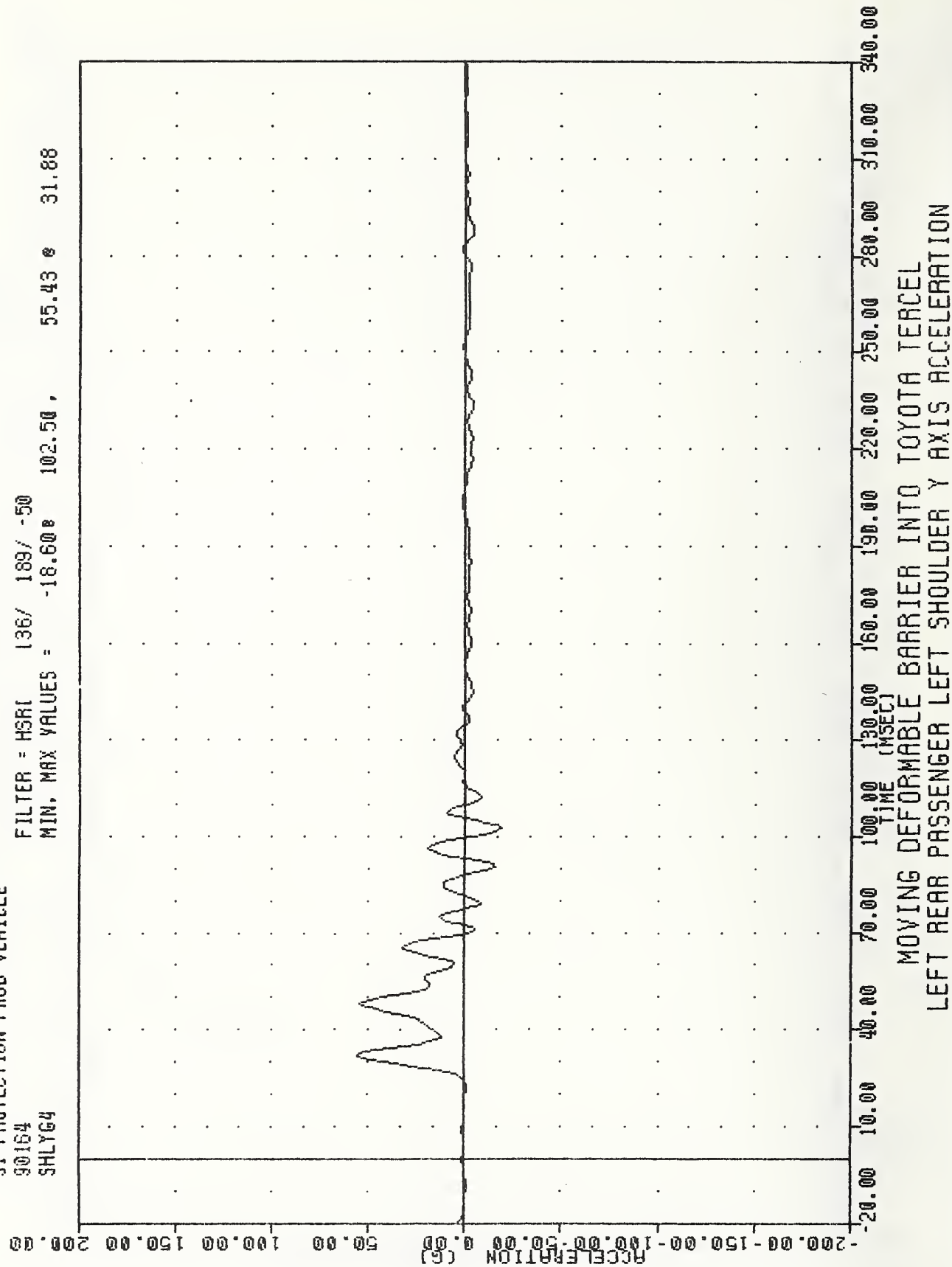
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.04e -13.13, 98.57 e 42.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER HEAD RESULTANT ACCELERATION

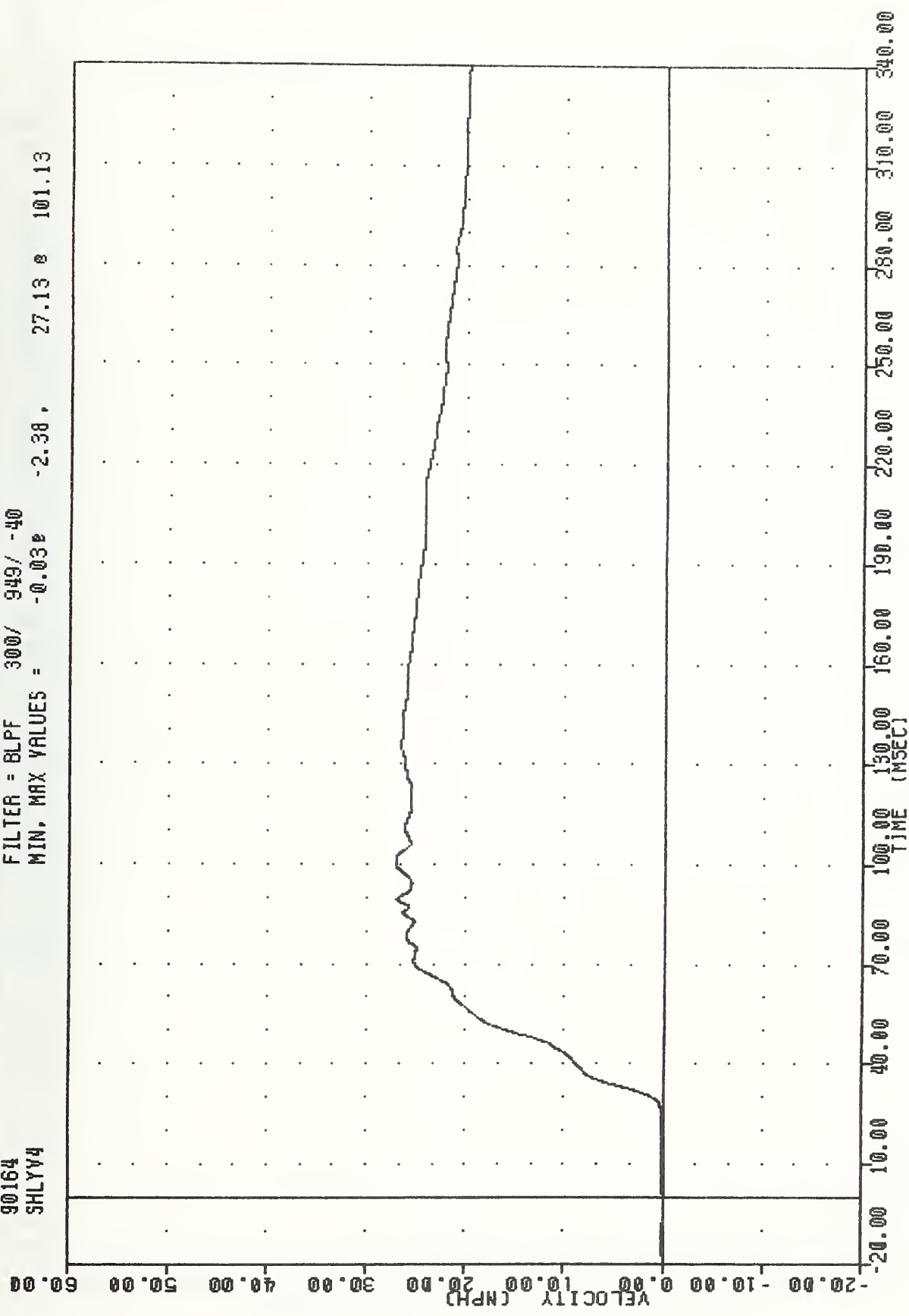
VRTC , 900613
 S1 PROTECTION PROD VEHICLE
 90164
 SHLYG4

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -18.60e 102.50 , 55.43 e 31.88



VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
SHLYV4

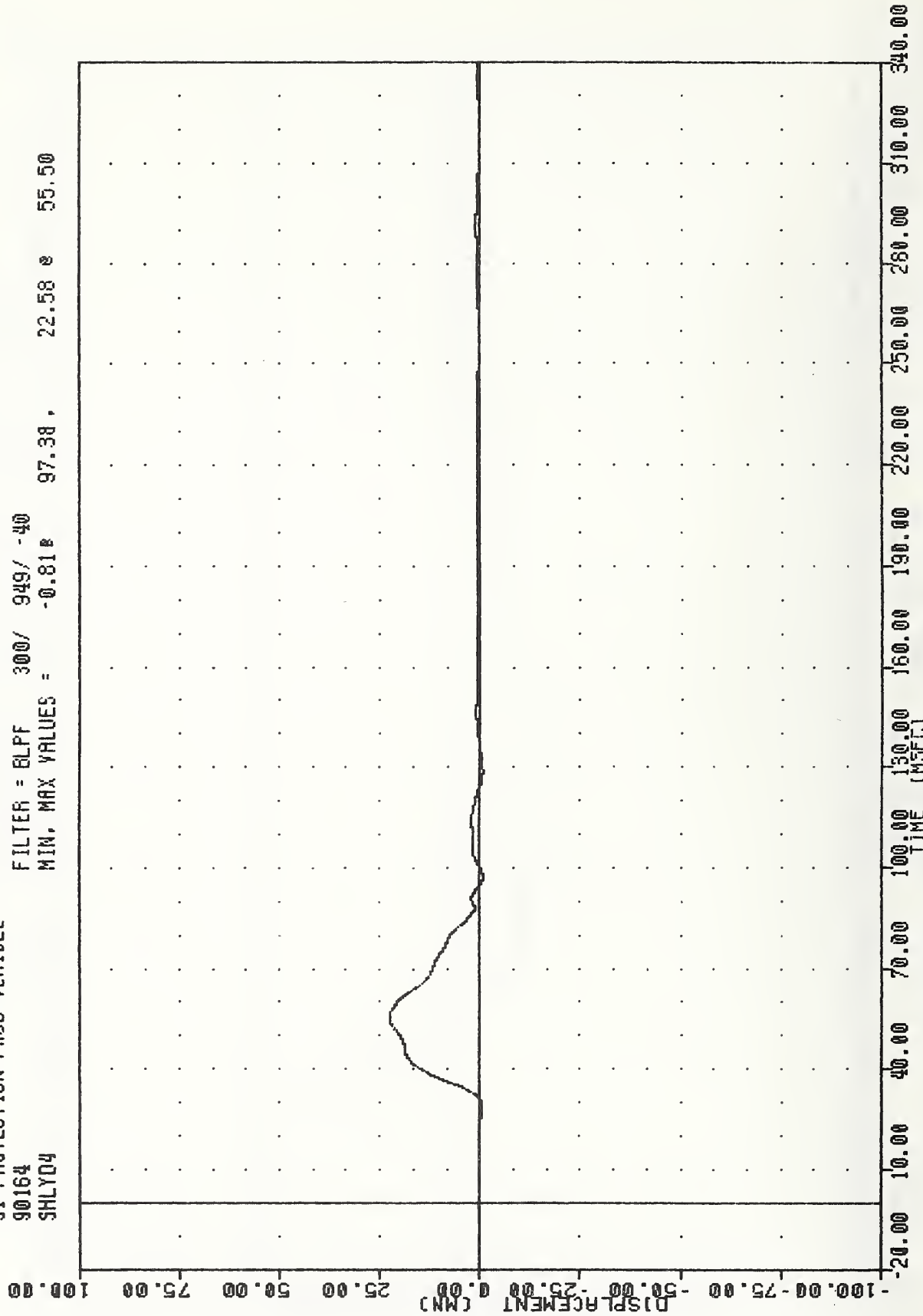
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.038 -2.38 , 27.13 8 101.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER LEFT SHOULDER Y-AXIS VELOCITY

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 SHLY04

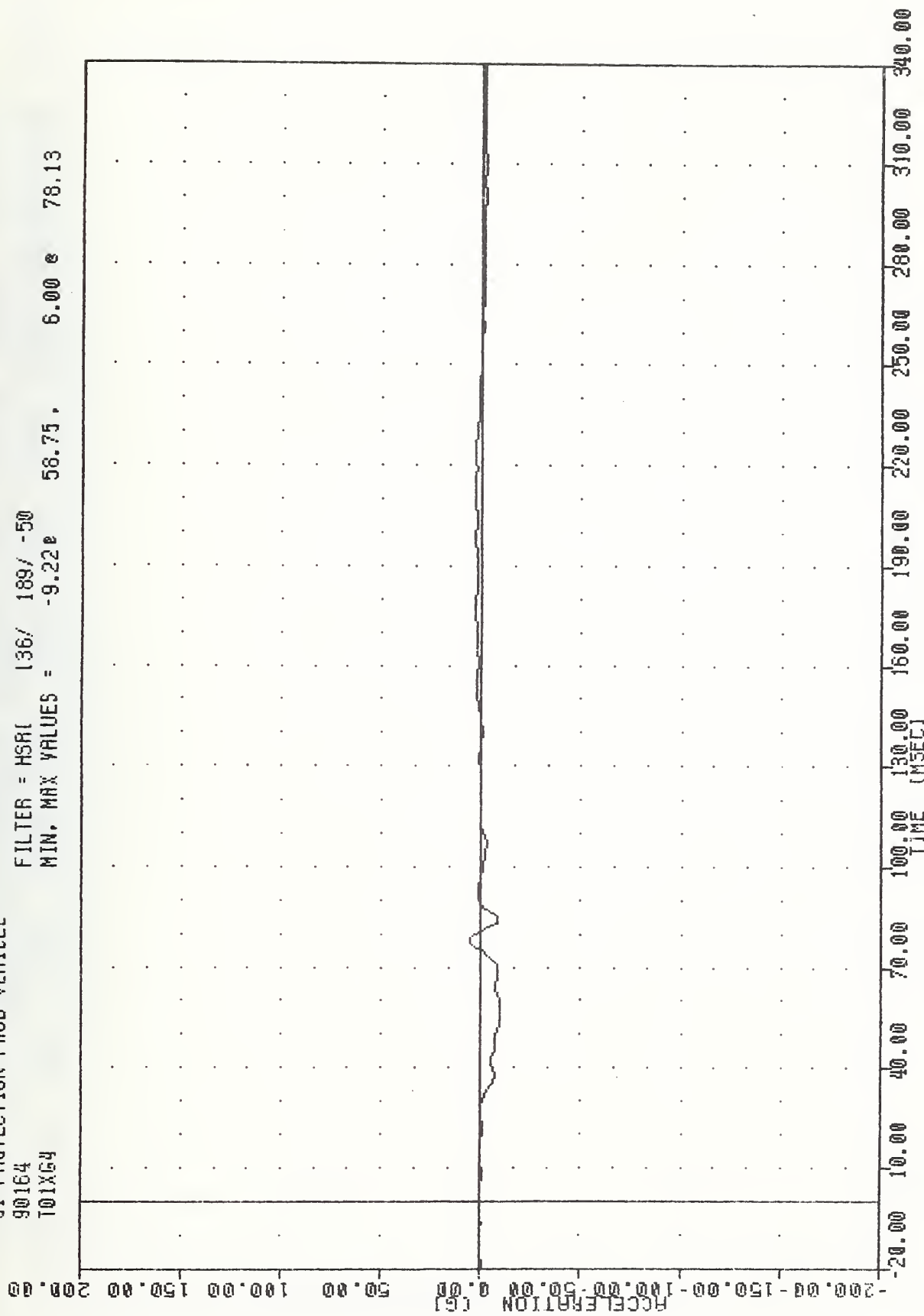
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.818 97.38 22.58 55.50



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT SHOULDER TO SPINE DISPLACEMENT

VRTC 900613
SI PROTECTION PROD VEHICLE
90164
T01X54

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 58.75, 6.00 e 78.13



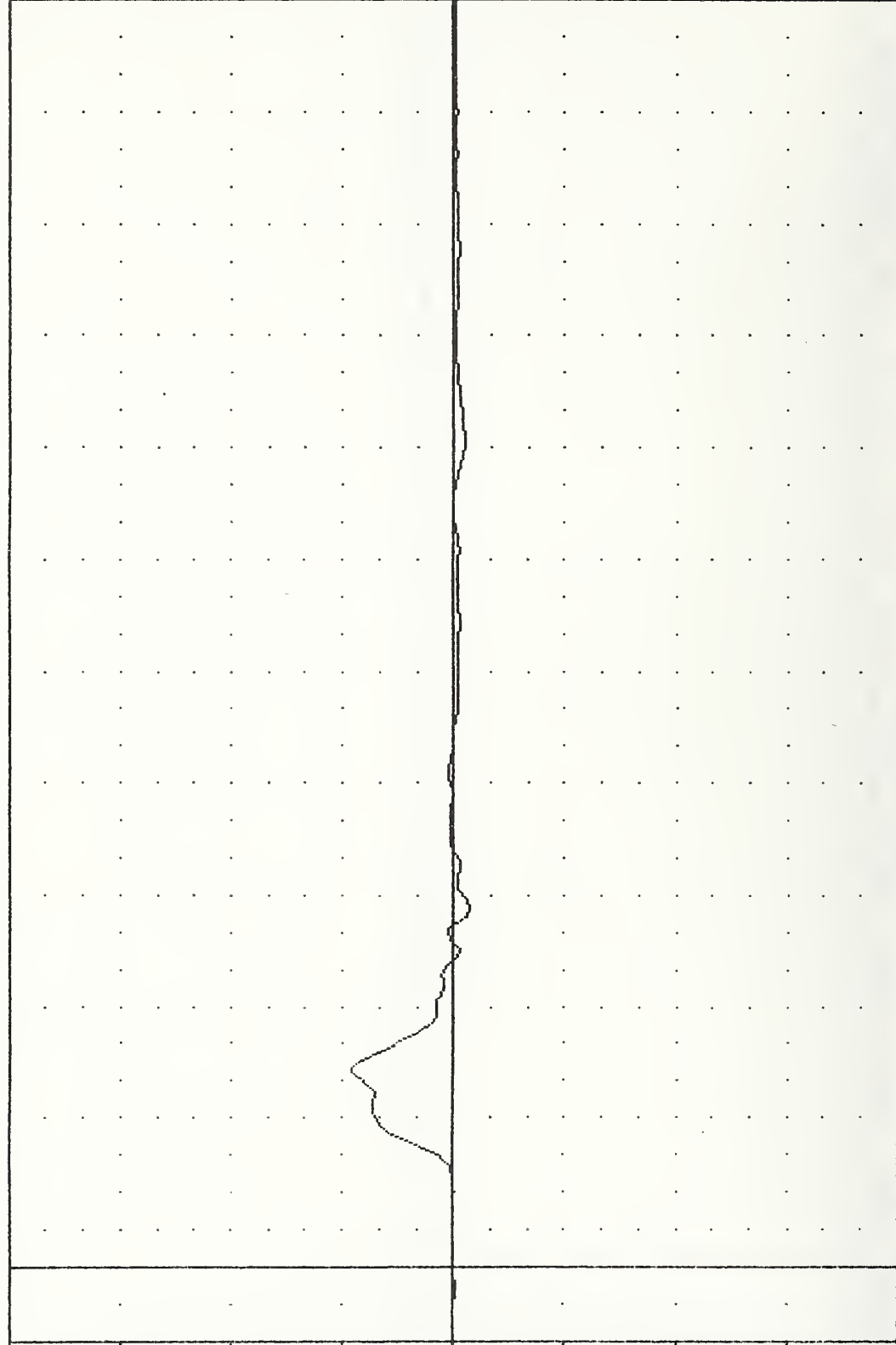
MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER UPPER SPINE X-AXIS ACCELERATION

VRTC , 300613
 SI PROTECTION PROO VEHICLE
 90164
 T01Y64

FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = -7.378 96.25 ,

45.46 53.12

ACCELERATION (G)

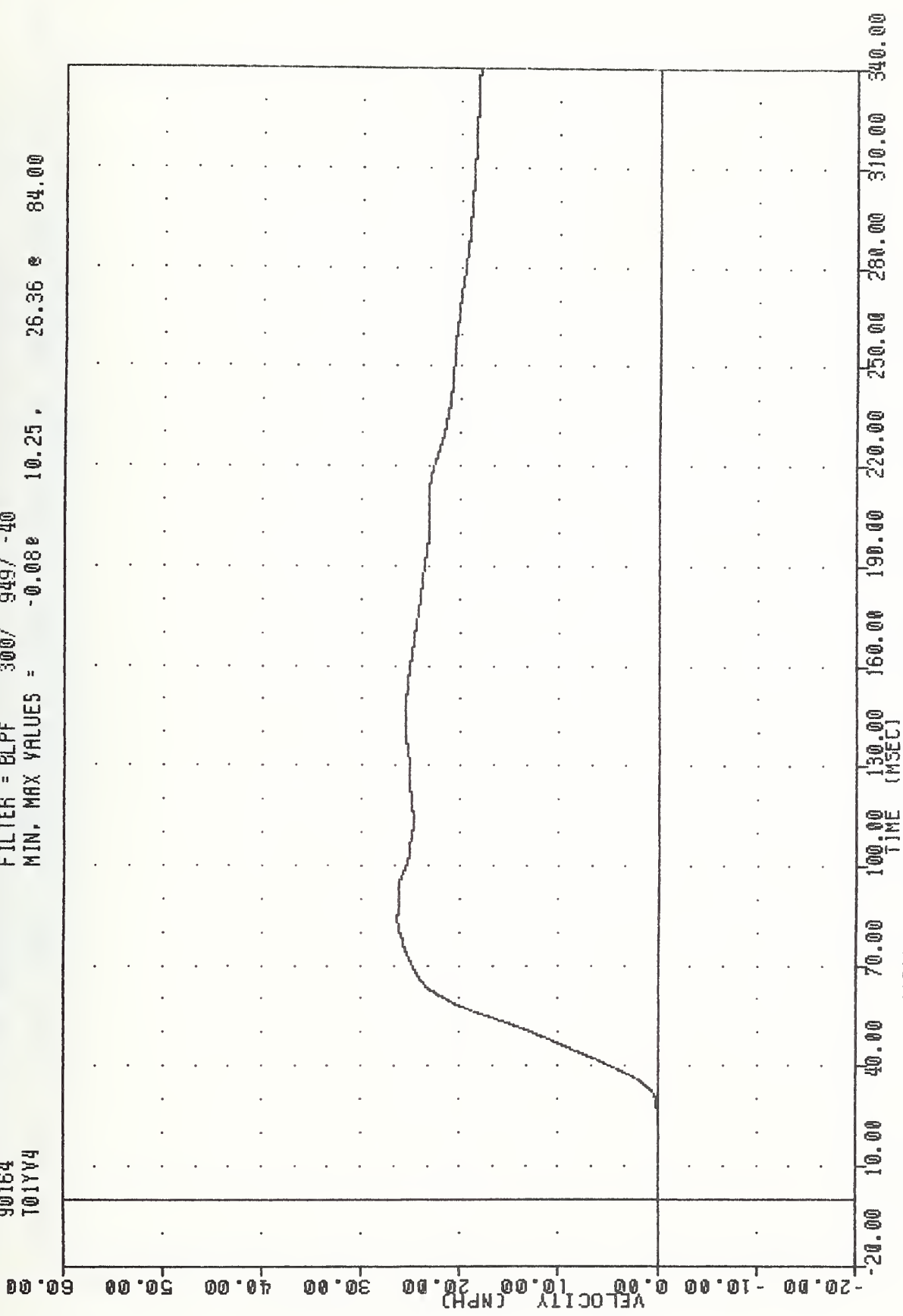


TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER UPPER SPINE Y-AXIS ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 T01YV4

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.08e 10.25 , 26.36 e 84.00

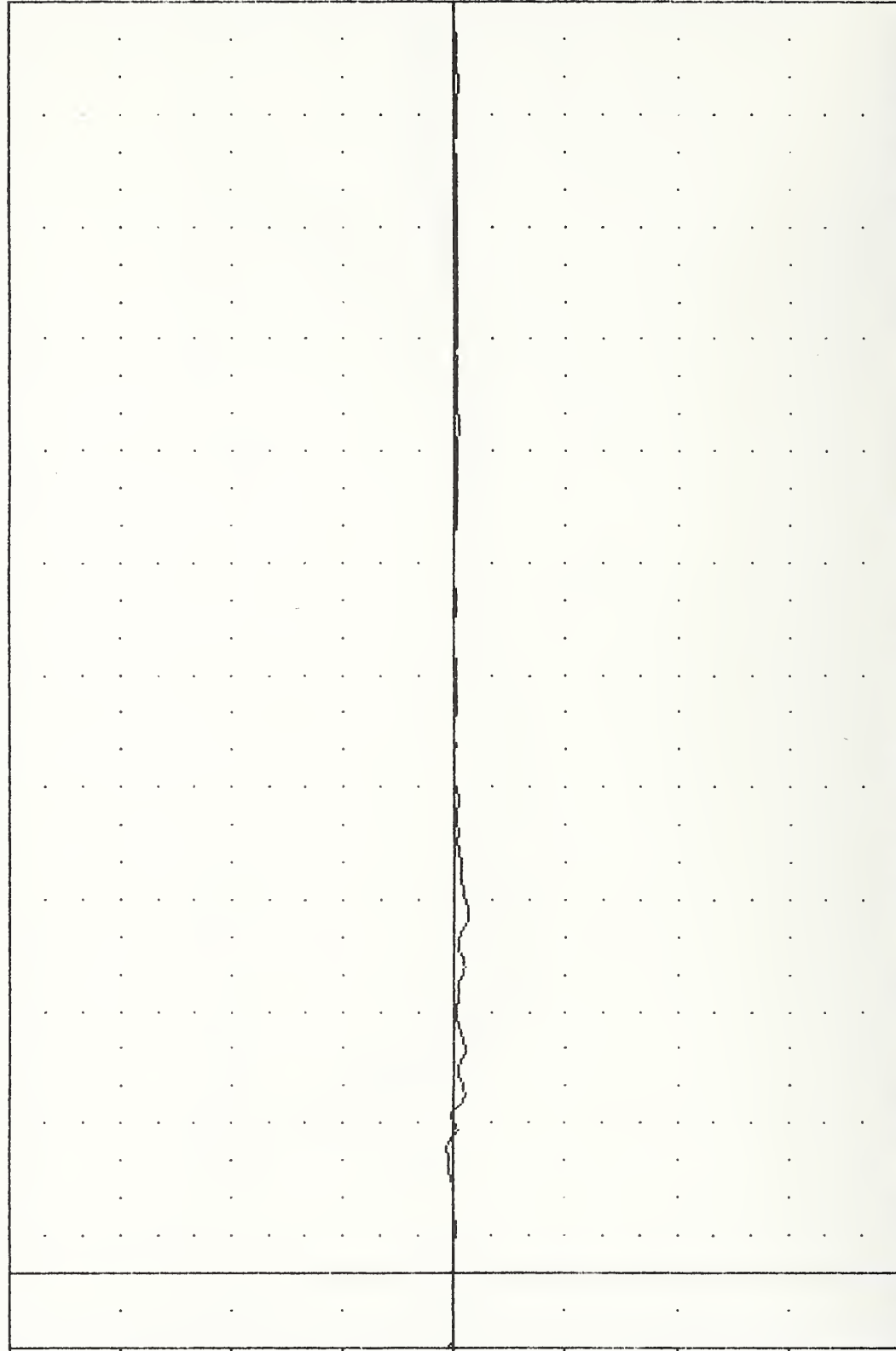


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER UPPER SPINE Y-AXIS VELOCITY

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 701764

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -6.54 96.25, 3.24 33.13

ACCELERATION (G)

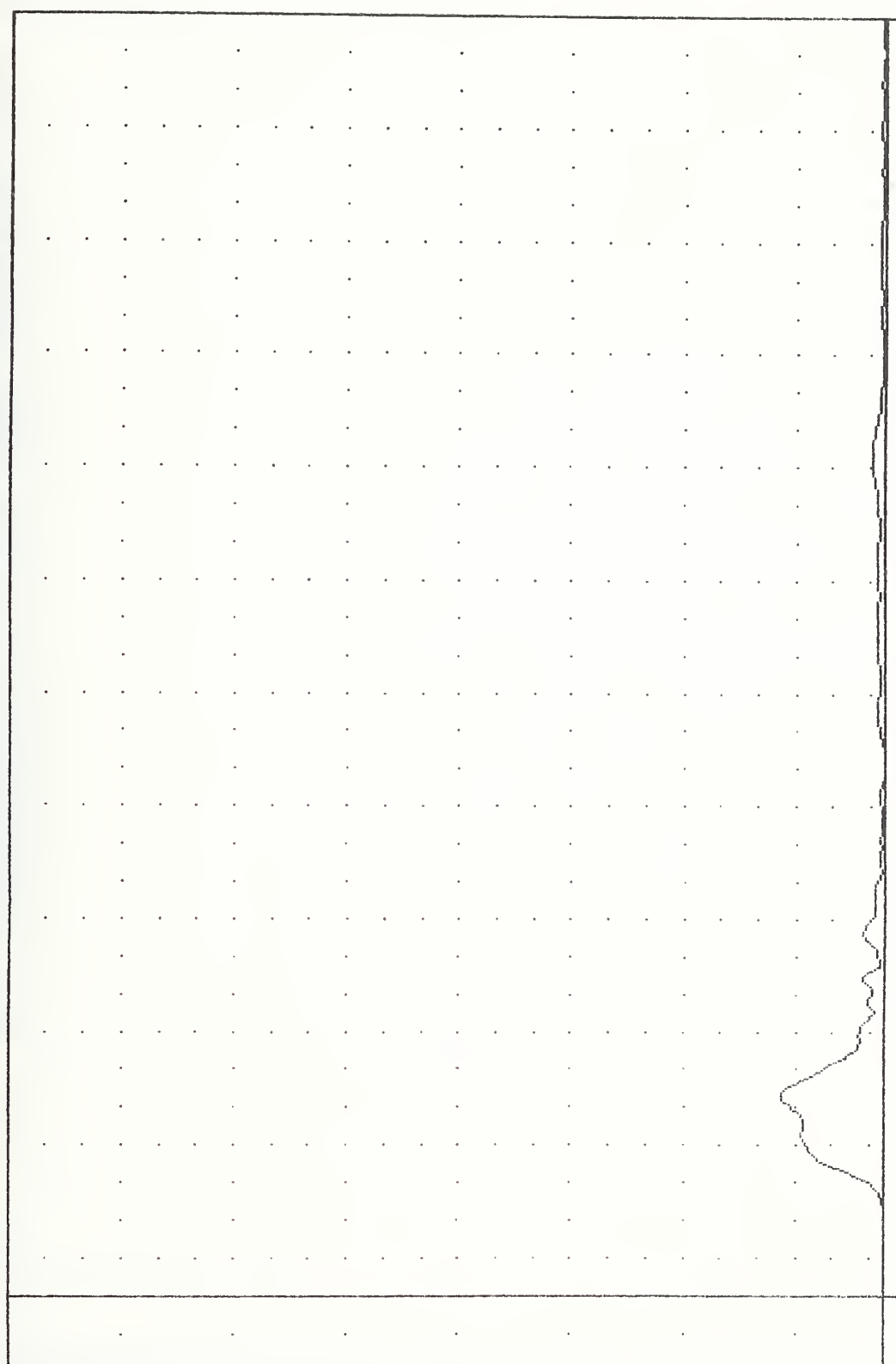


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER UPPER SPINE Z-AXIS ACCELERATION

NRTC , 900613
SI PROTECTION PROD VEHICLE
90164
T01R64

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.14e -15.63, 46.40 e 53.12

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

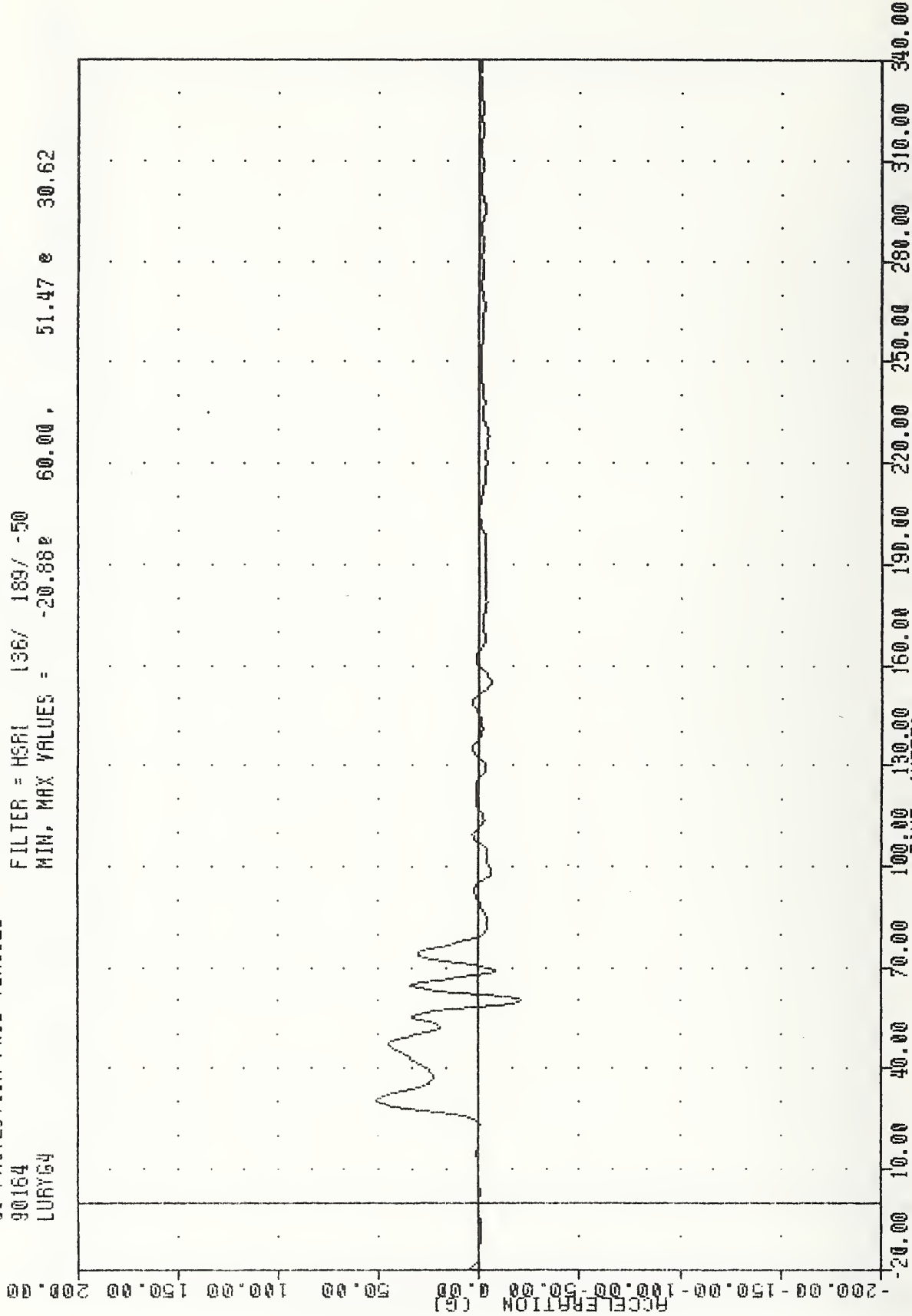


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER UPPER SPINE RESULTANT ACCELERATION

VRTC , 900613
 S1 PROTECTION PROD VEHICLE
 90164
 LURY64

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -20.88e 60.00, 51.47 e 30.62

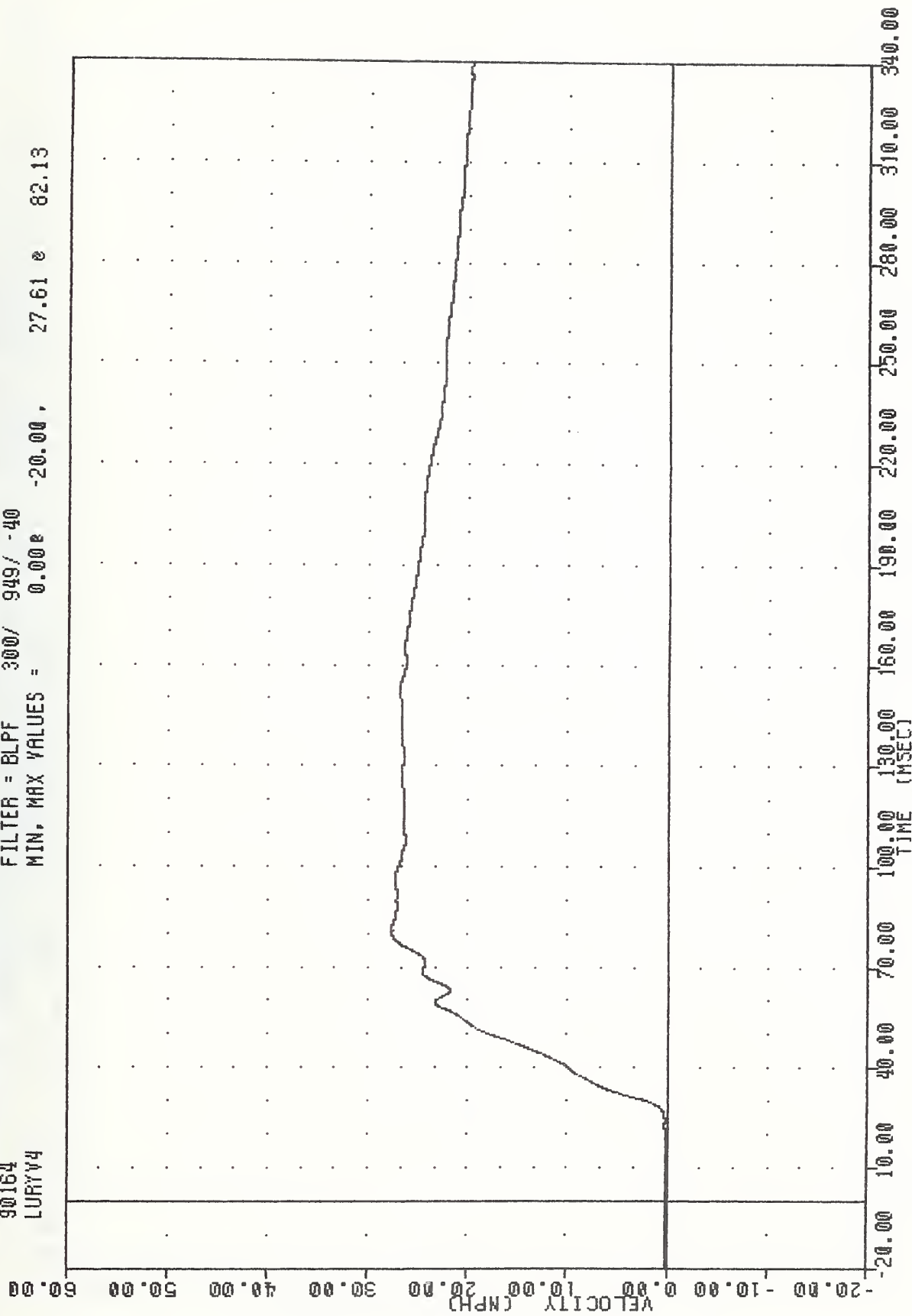


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT UPPER THORAX RIB Y-AXIS ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LURYV4

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

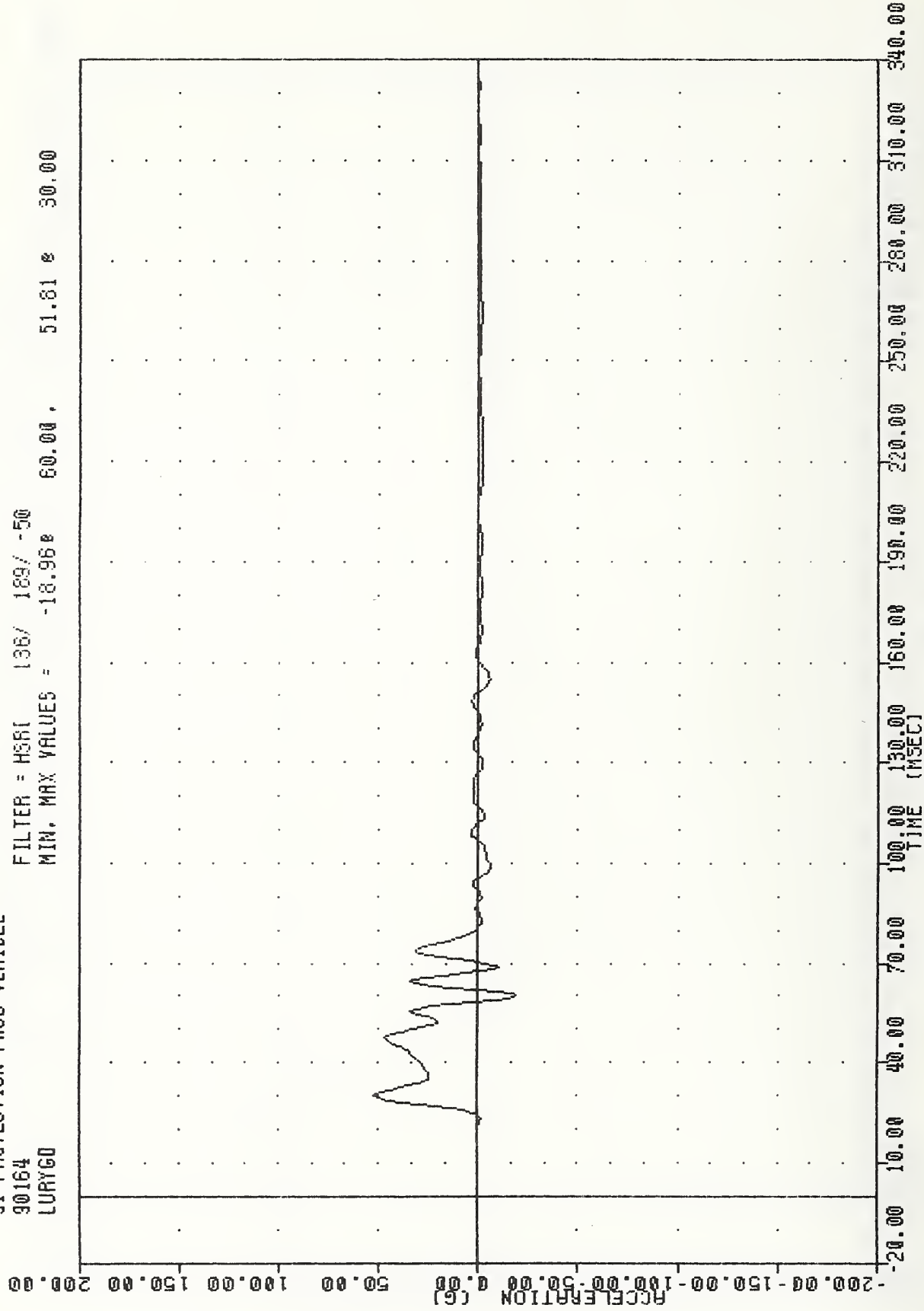
27.61 e 82.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER LEFT UPPER THORAX RIB Y-AXIS VELOCITY

VRTC '900613
 SI PROTECTION PROD VEHICLE
 90164
 LURY60

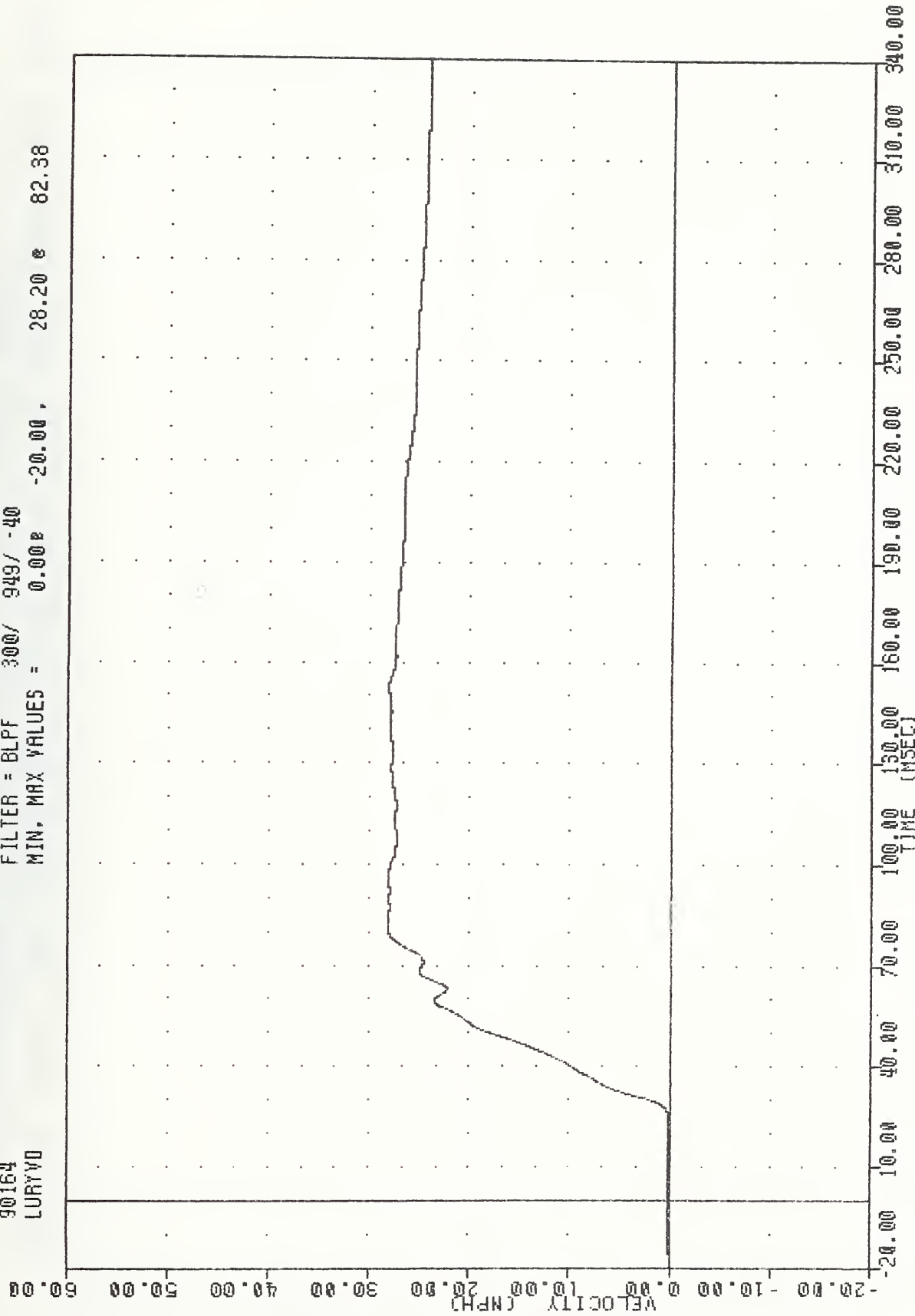
FILTER = H381 136/ 189/ -50
 MIN. MAX VALUES = -18.96e 60.00, 51.81 e 30.00



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT UPPER THORAX R18 Y-AXIS REDUNDANT ACCELERATION

VRTC , 900613
 SI PROTECTION PHOD VEHICLE
 90164
 LURYVO

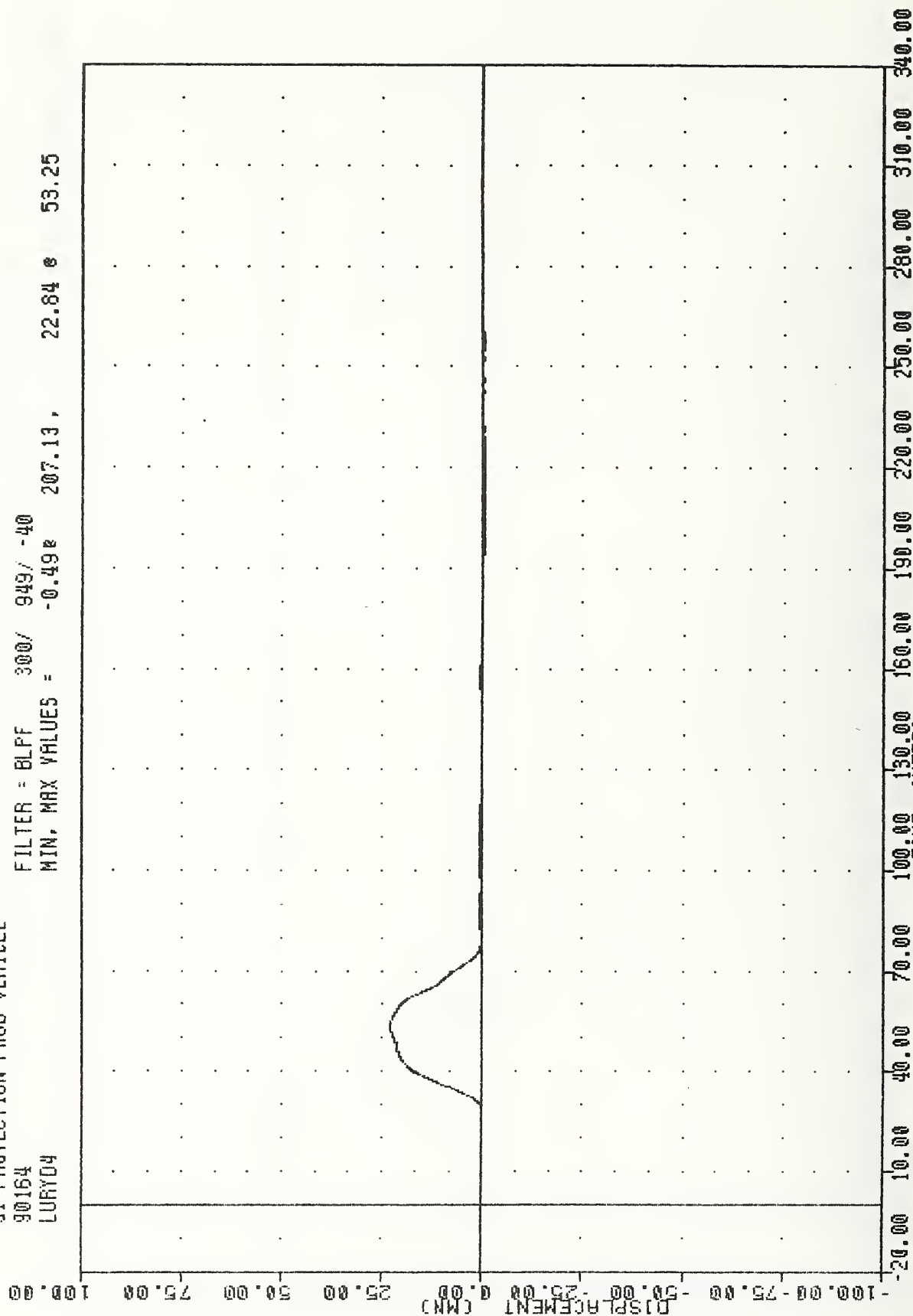
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 0.00e -20.00 , 28.20 e 82.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT UPPER THORAX RIB Y-AXIS REDUNDANT VELOCITY

VRIC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LURYD4

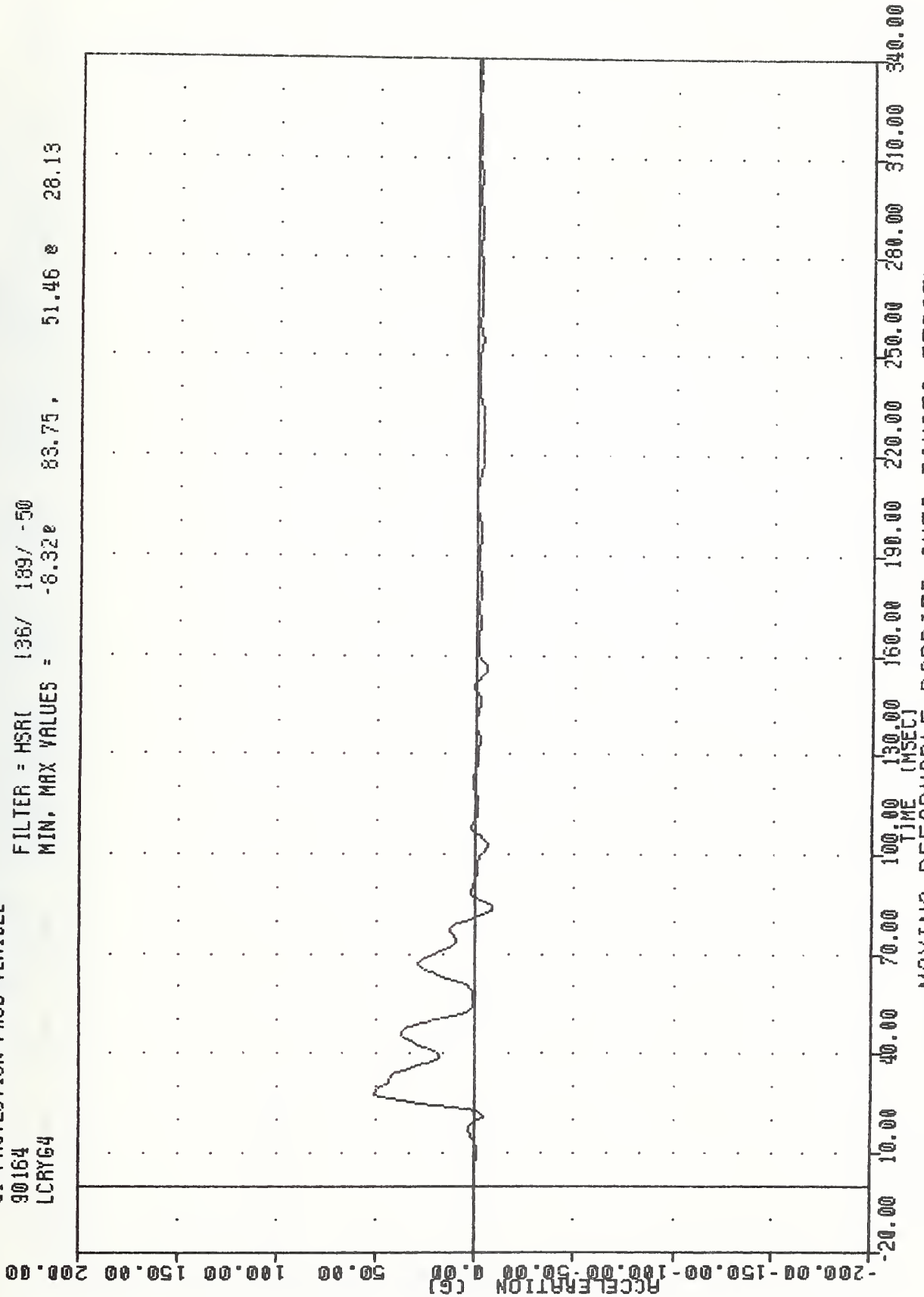
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.49e 207.13, 22.84 e 53.25



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT UPPER THORAX RIB DISPLACEMENT

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LCRY64

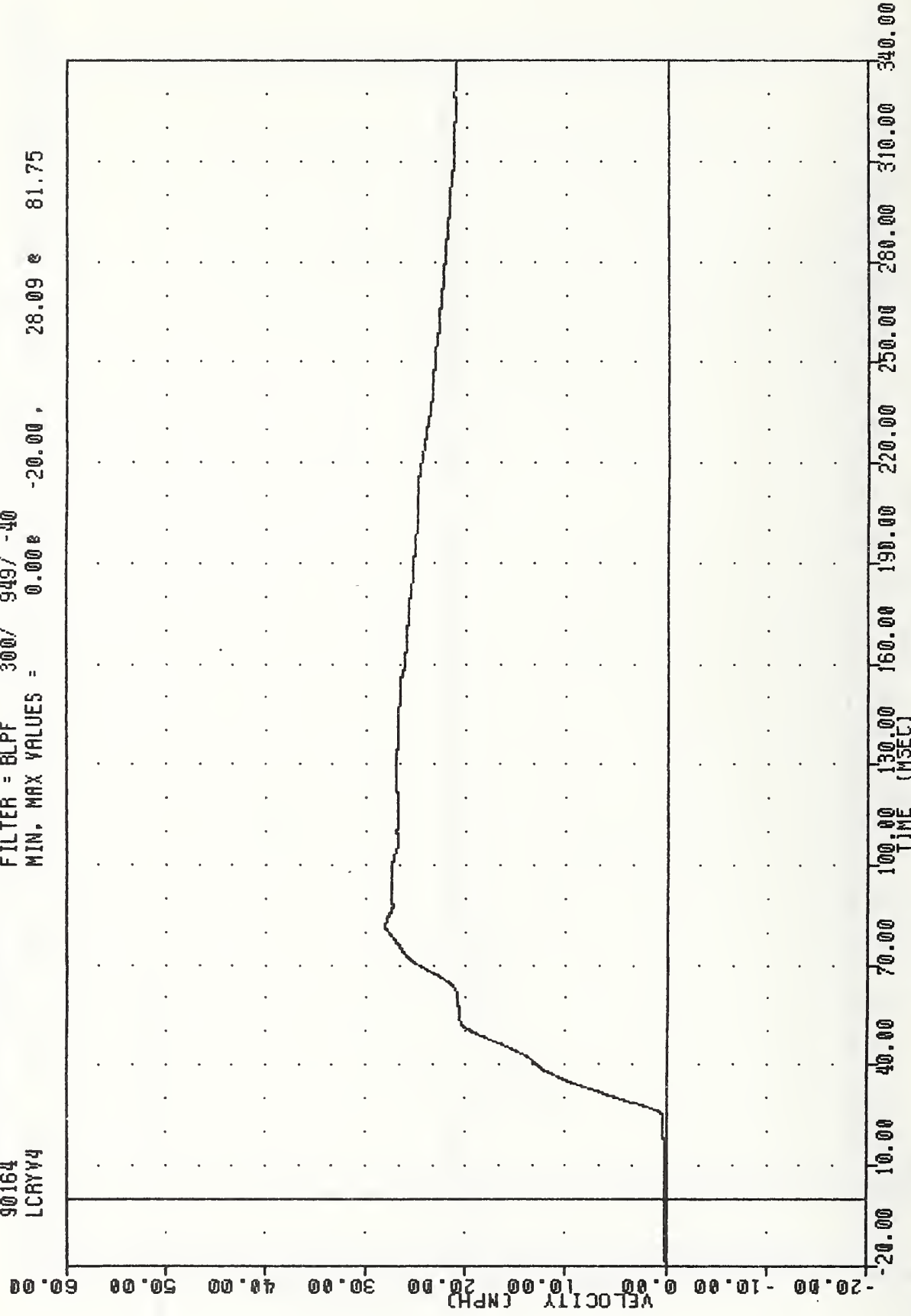
FILTER = HSR(136/ 189/ -50
 MIN. MAX VALUES = -6.32e 83.75, 51.46 e 28.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT CENTER THORAX RIB Y-AXIS ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LCRYV4

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.00e -20.00 , 28.09 e 81.75

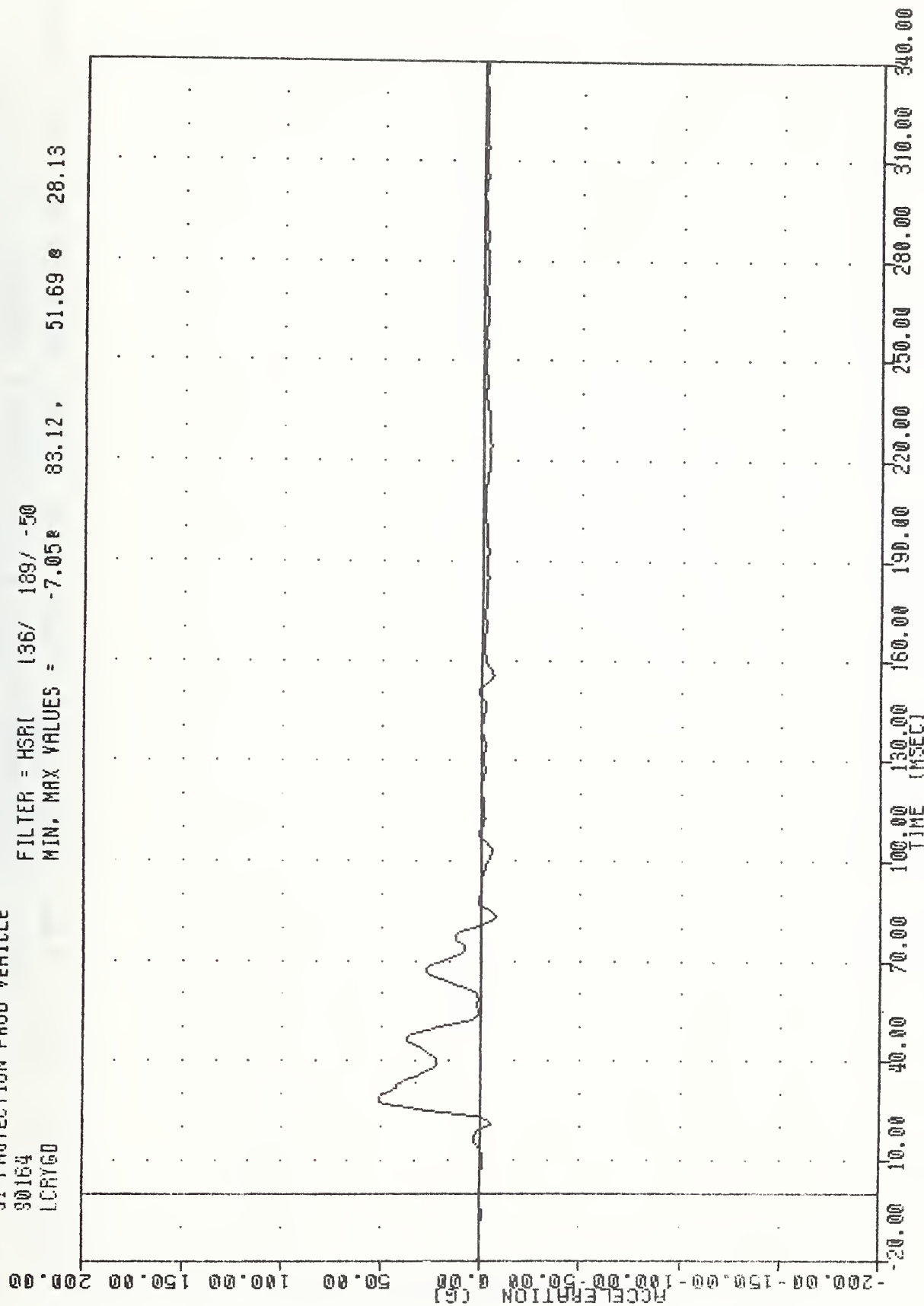


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER LEFT CENTER THORAX RIB Y-AXIS VELOCITY

VRIC , 900613
SI PROTECTION PROD VEHICLE
90164
LCRYGD

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -7.05e 83.12 ,

51.69 e 28.13

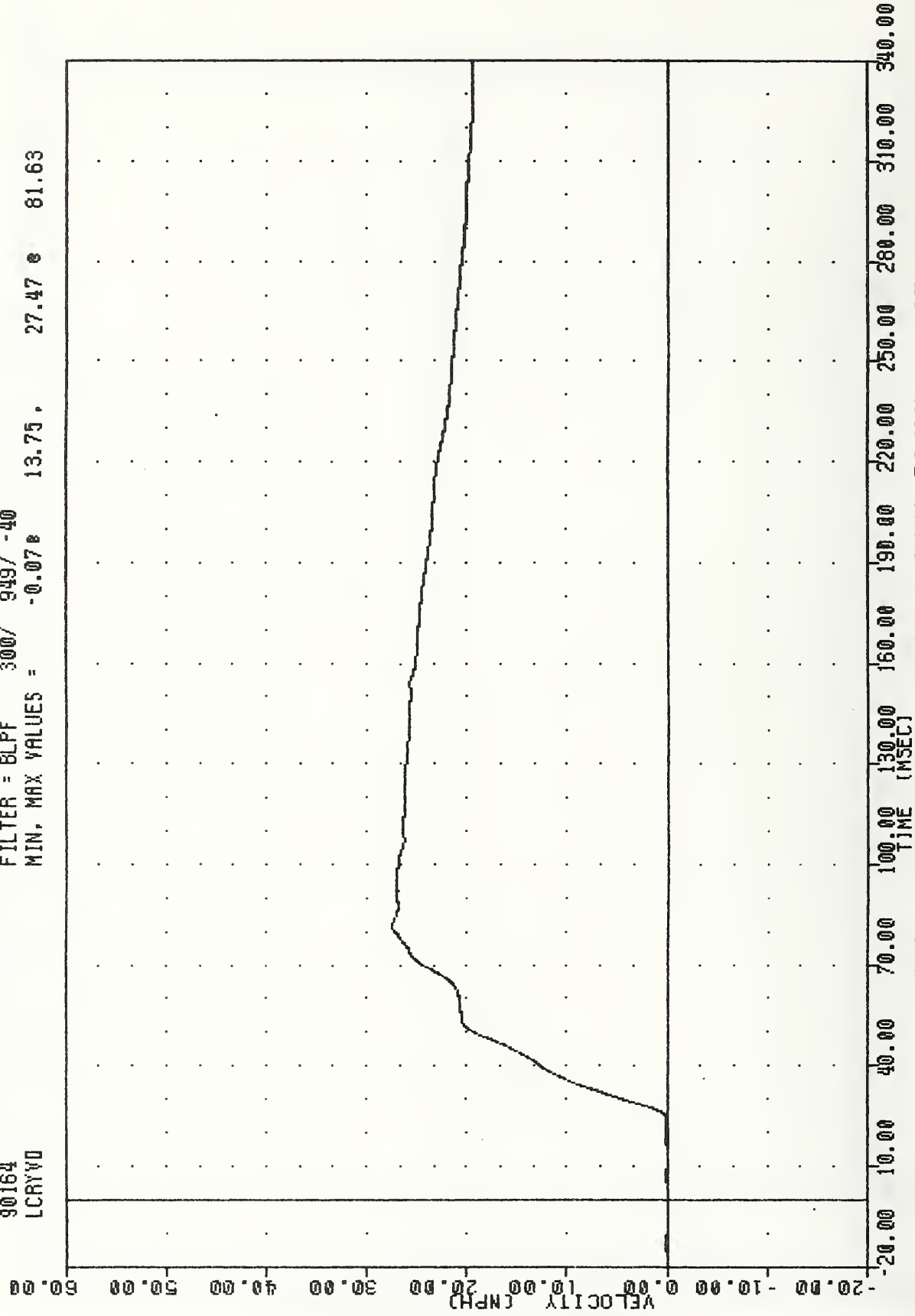


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER LEFT CENTER THORAX RIB Y-AXIS REDUNDANT ACCEL

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LCRIYD

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.078 13.75.

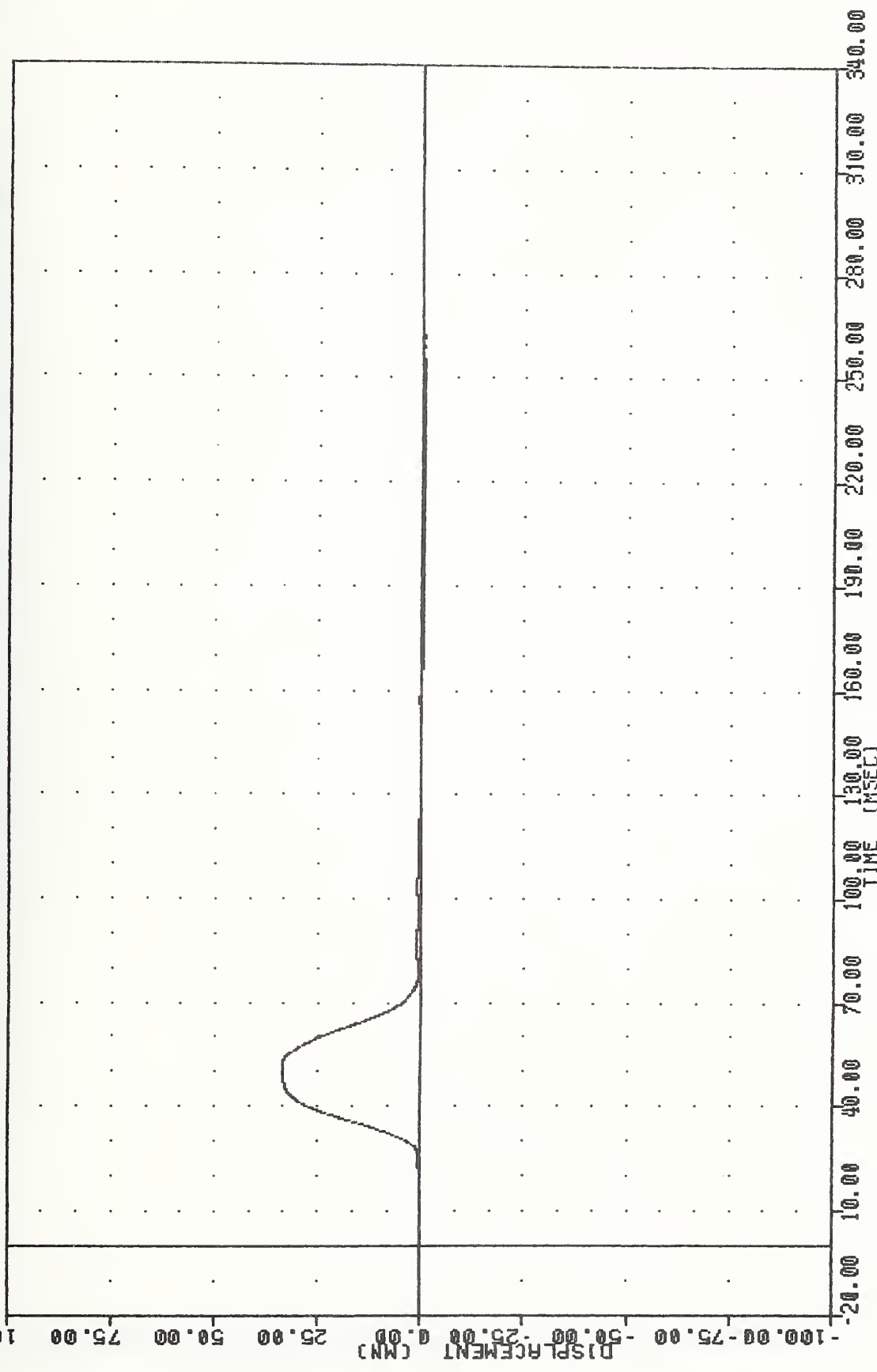
27.47 e 81.63



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT CENTER THORAX RIB Y-AXIS REDUNDANT VELOCITY

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LCRYD4

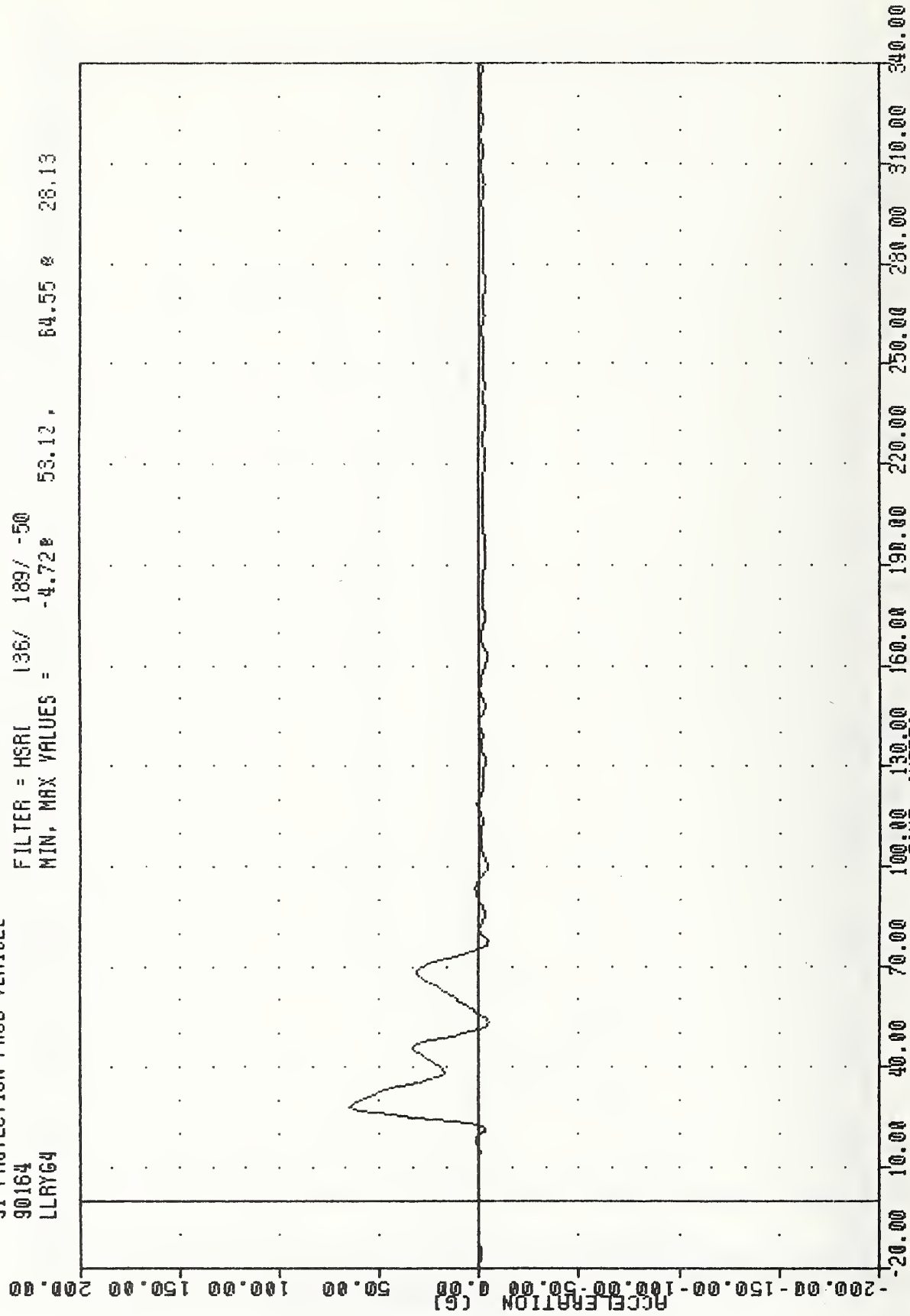
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.55e 198.88 , 33.77 e 51.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER LEFT CENTER THORAX RIB DISPLACEMENT

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LLRY64

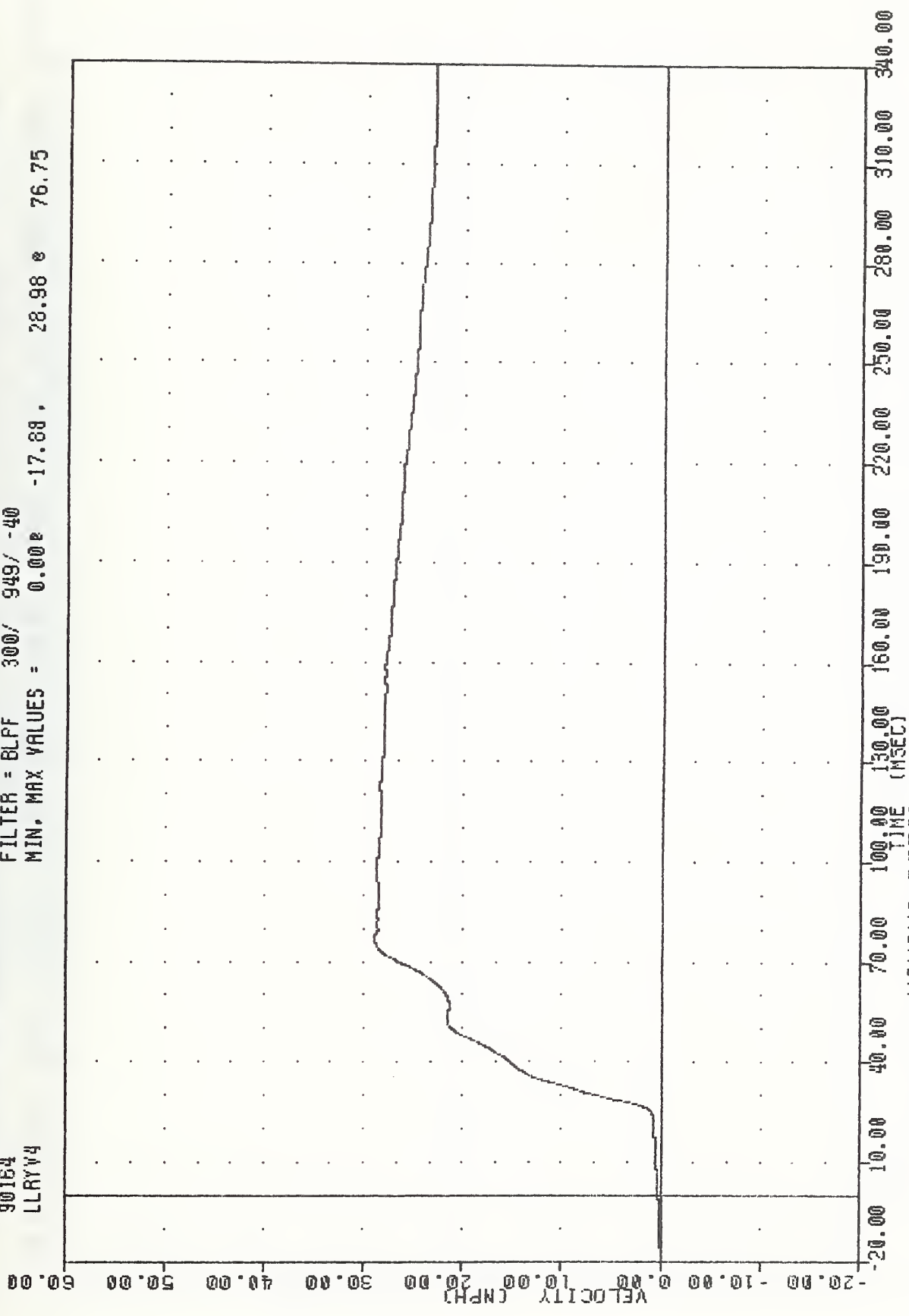
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -4.720 53.12 , 64.55 0 28.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT LOWER THORAX RIB Y-AXIS ACCELERATION

VRTC • 900613
SI PROTECTION PROD VEHICLE
90164
LLRYV4

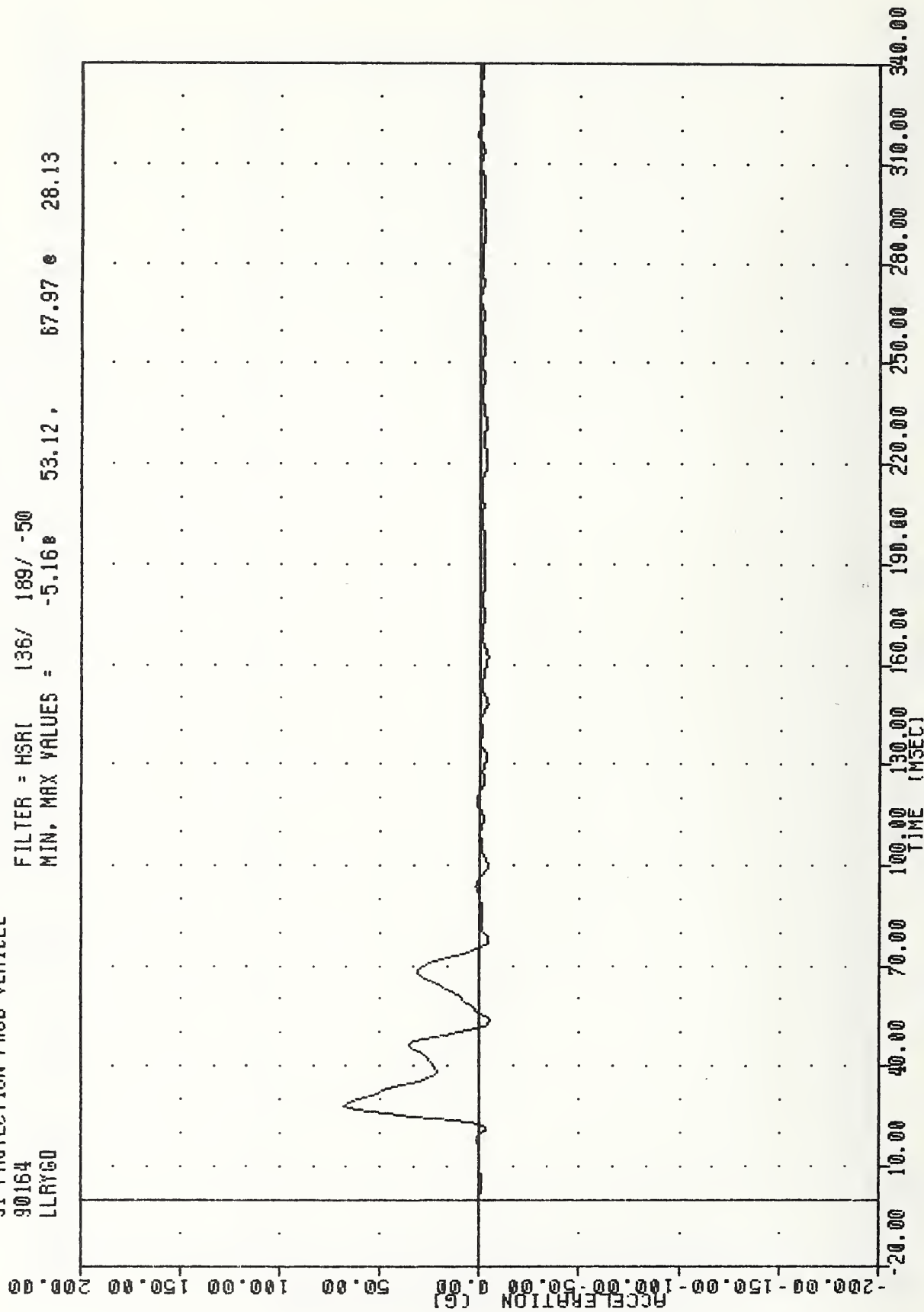
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.00e -17.88 . 28.98 e 76.75



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER LEFT LOWER THORAX RIB Y-AXIS VELOCITY

YRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LLRY60

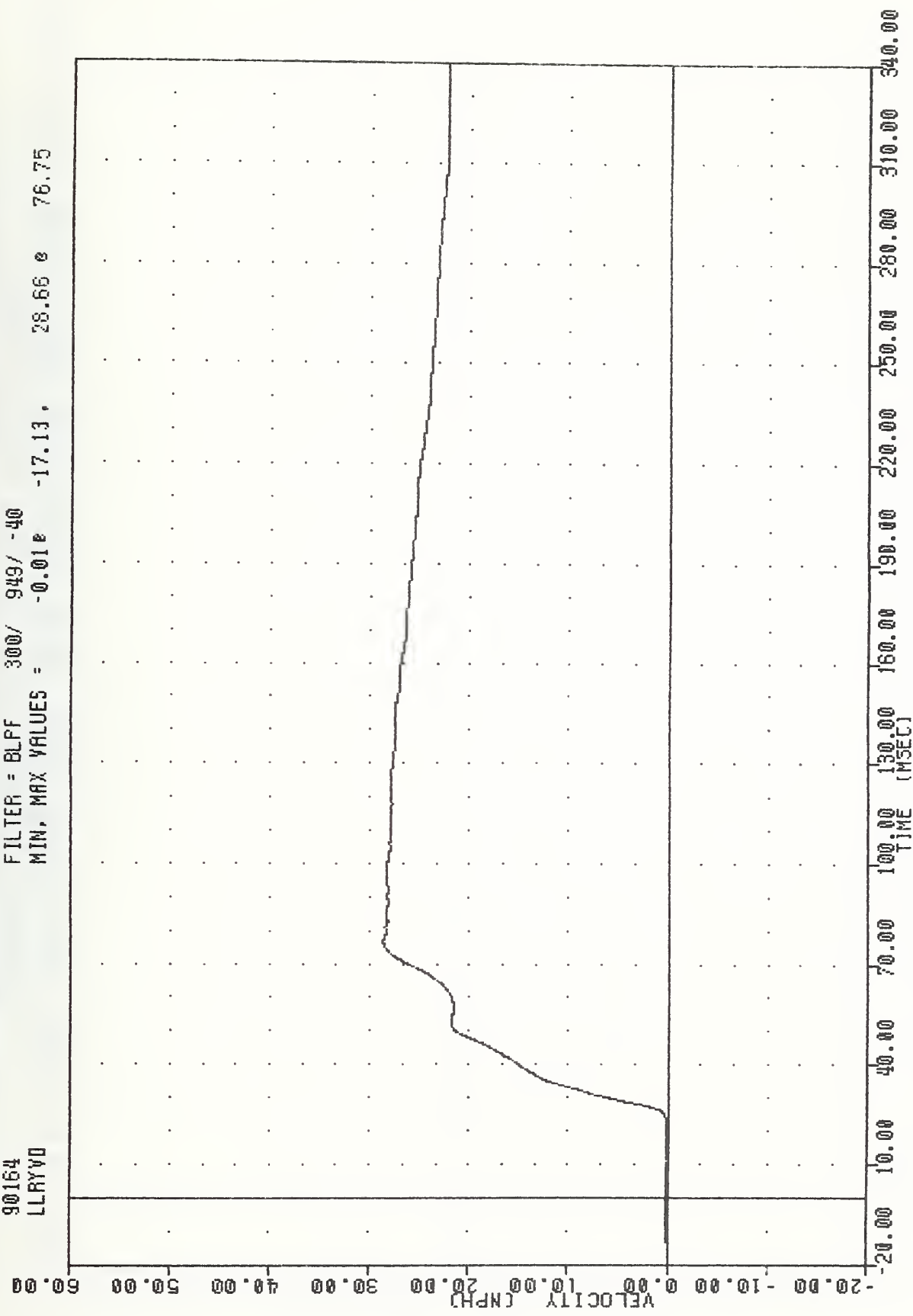
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 53.12, 67.97 e 28.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT LOWER THORAX RIB Y-AXIS REDUNDANT ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LLRYVD

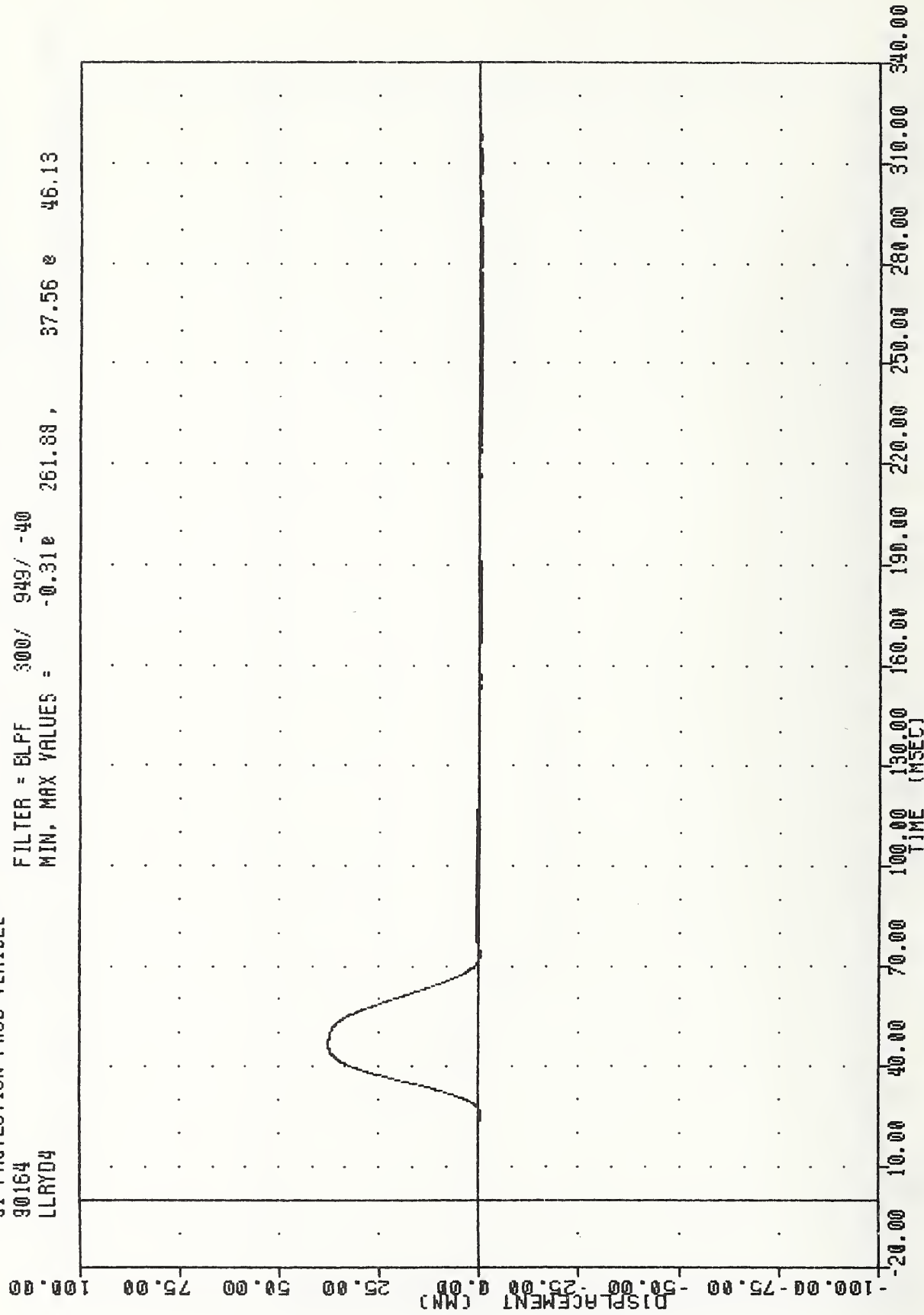
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.010 -17.13, 28.66 0 76.75



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT LOWER THORAX RIB Y-AXIS REDUNDANT VELOCITY

VRTC . 900613
 SI PROTECTION PROD VEHICLE
 90164
 LLRYD4

FILTER = BLFF 300/ 949/ -40
 MIN. MAX VALUES = -0.31e 261.88, 37.56 e 46.13

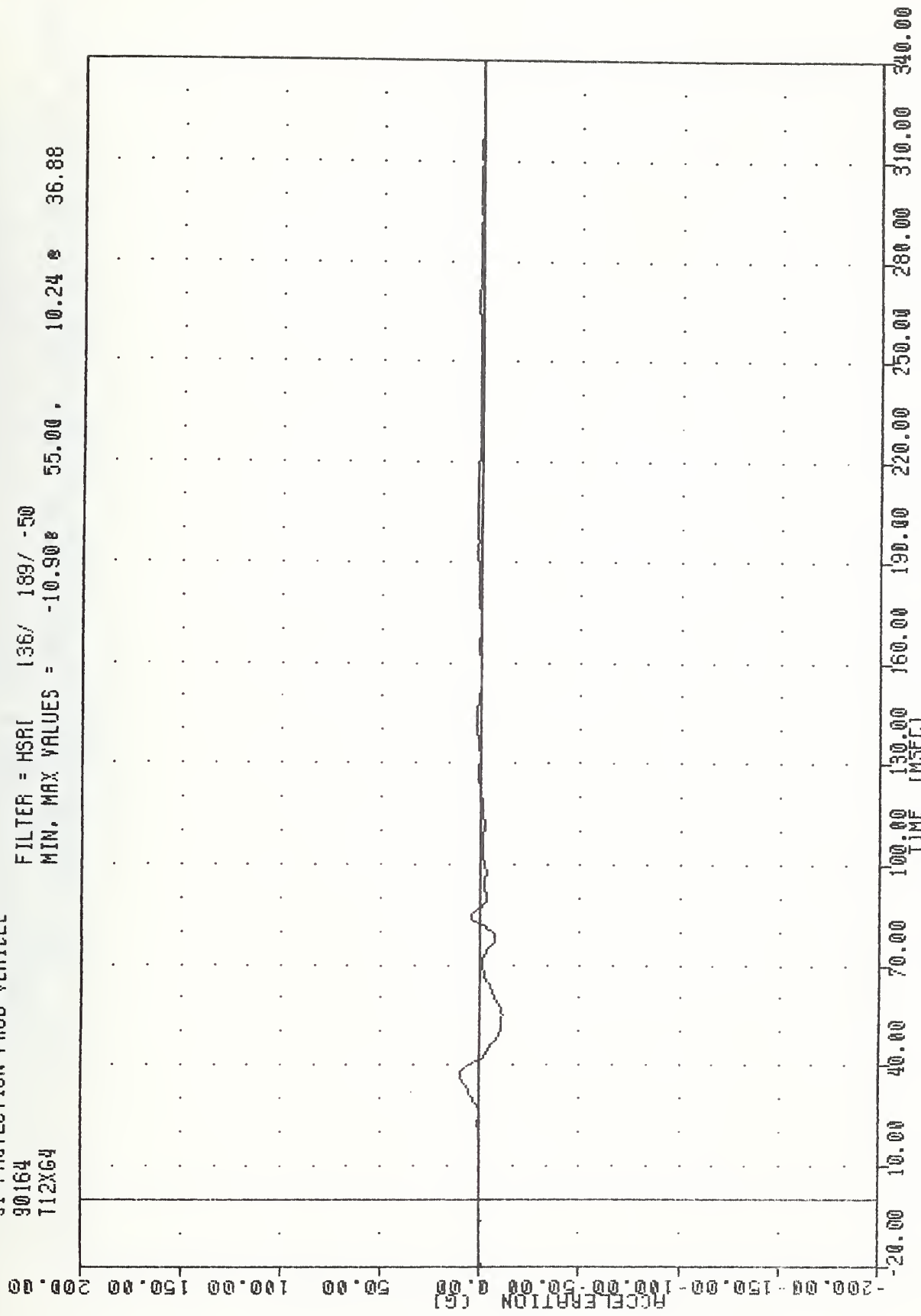


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT LOWER THORAX RIB DISPLACEMENT

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
T12X64

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -10.90 55.00

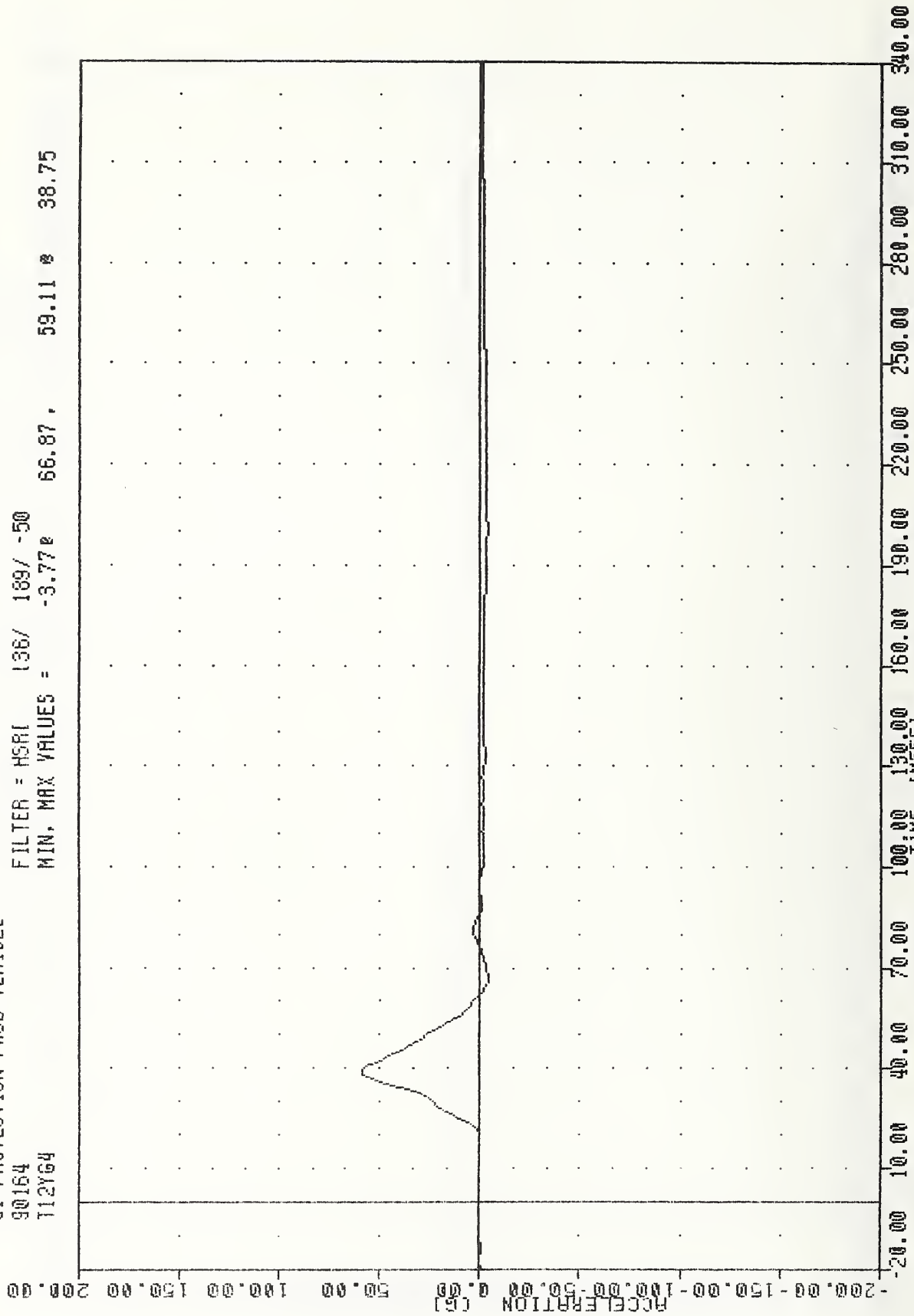
10.24 s 36.88



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER LOWER SPINE X-AXIS ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 112Y64

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -3.77 66.87, 59.11 38.75

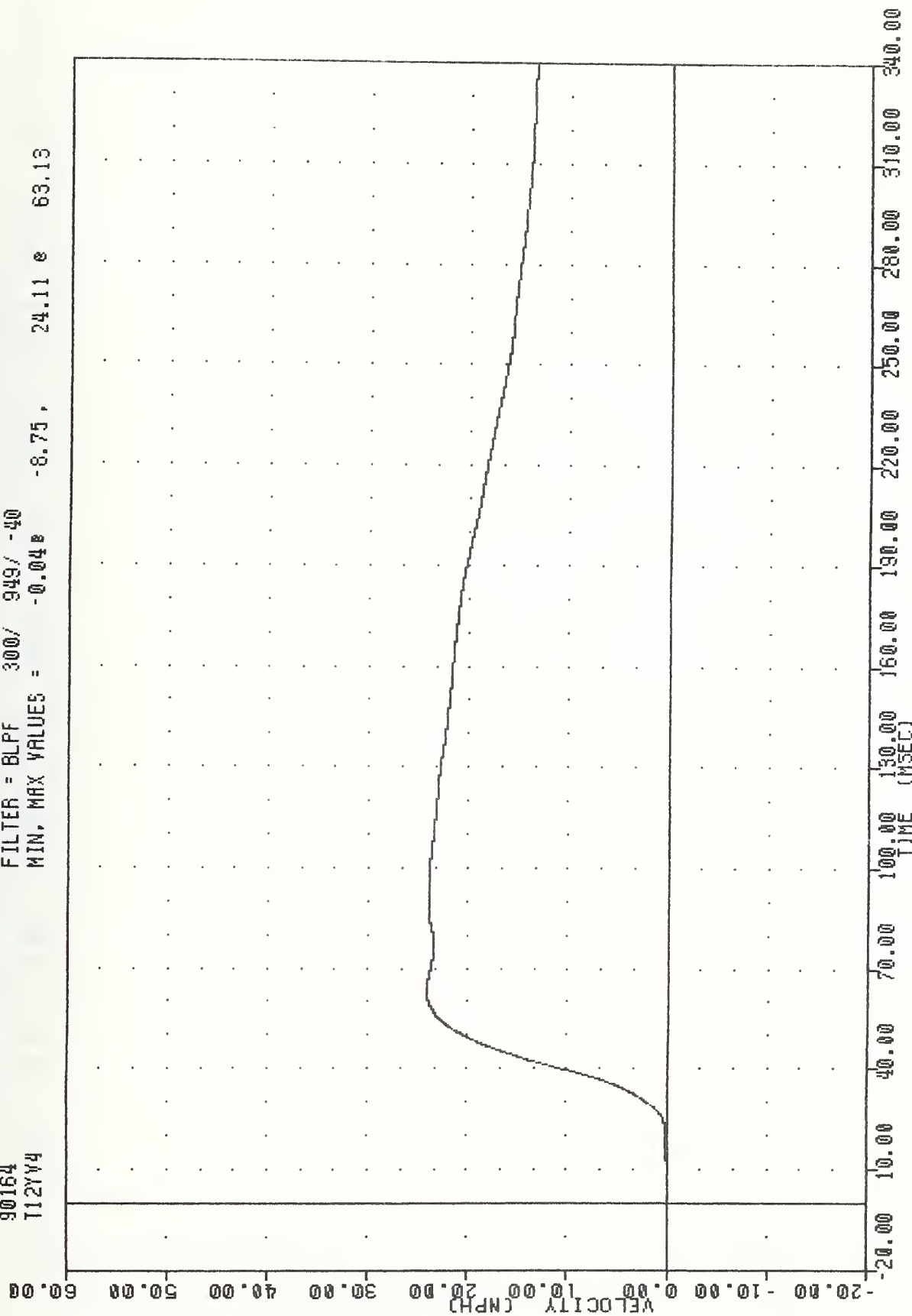


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
T12YV4

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.04 8

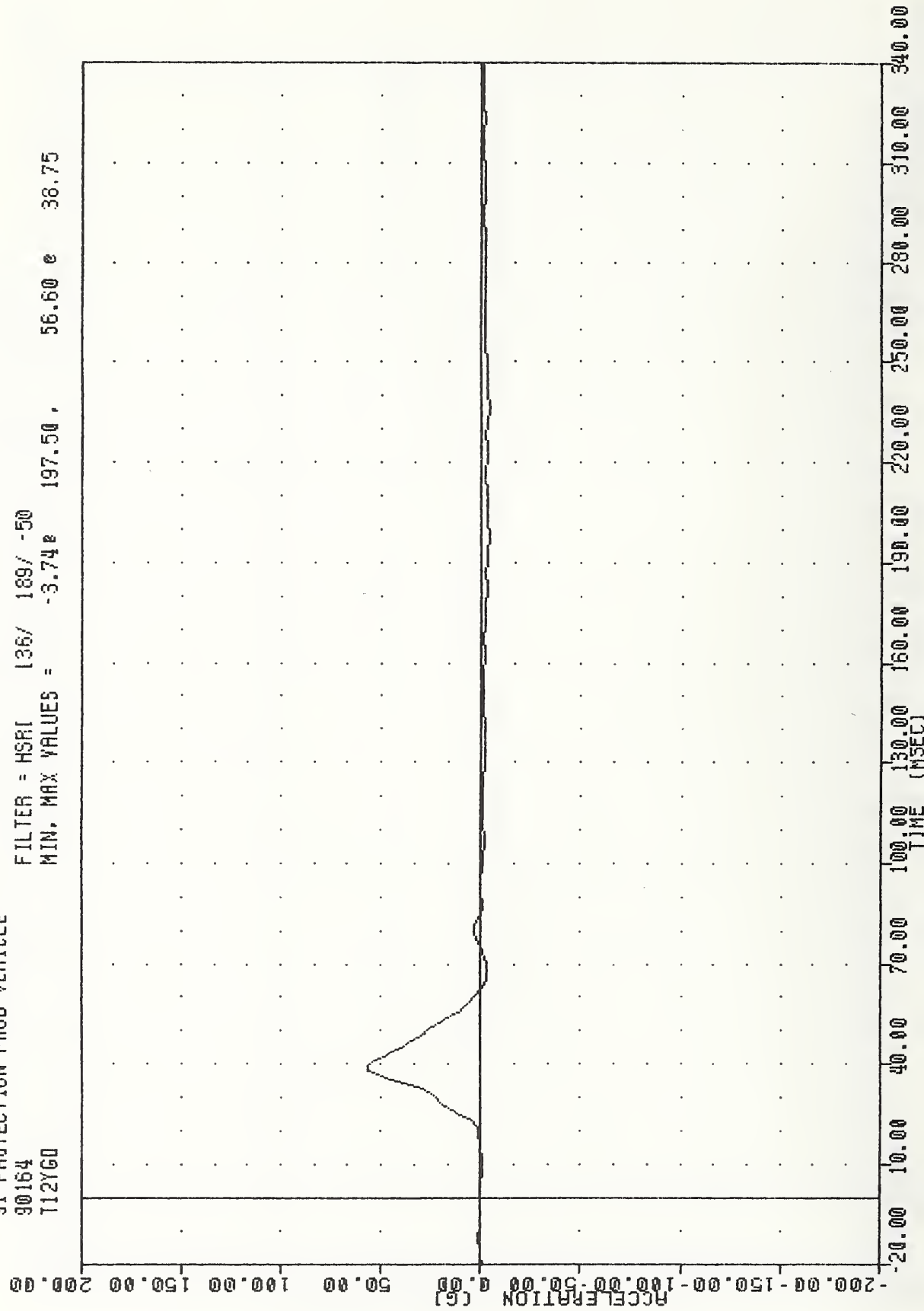
-8.75 , 24.11 8 63.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER LOWER SPINE Y-AXIS VELOCITY

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 T12YGD

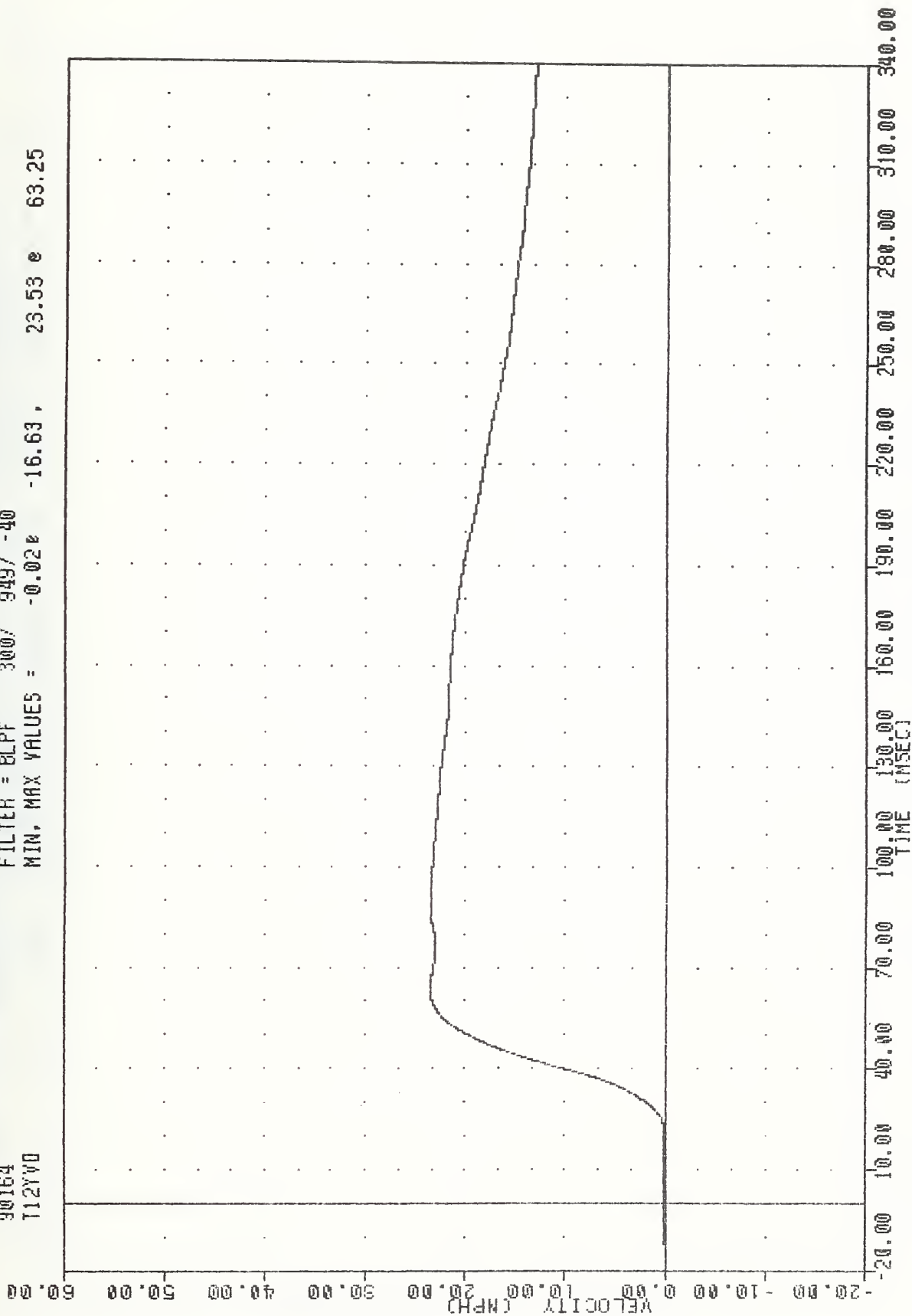
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -3.74e 197.50, 56.60 e 38.75



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
112YV0

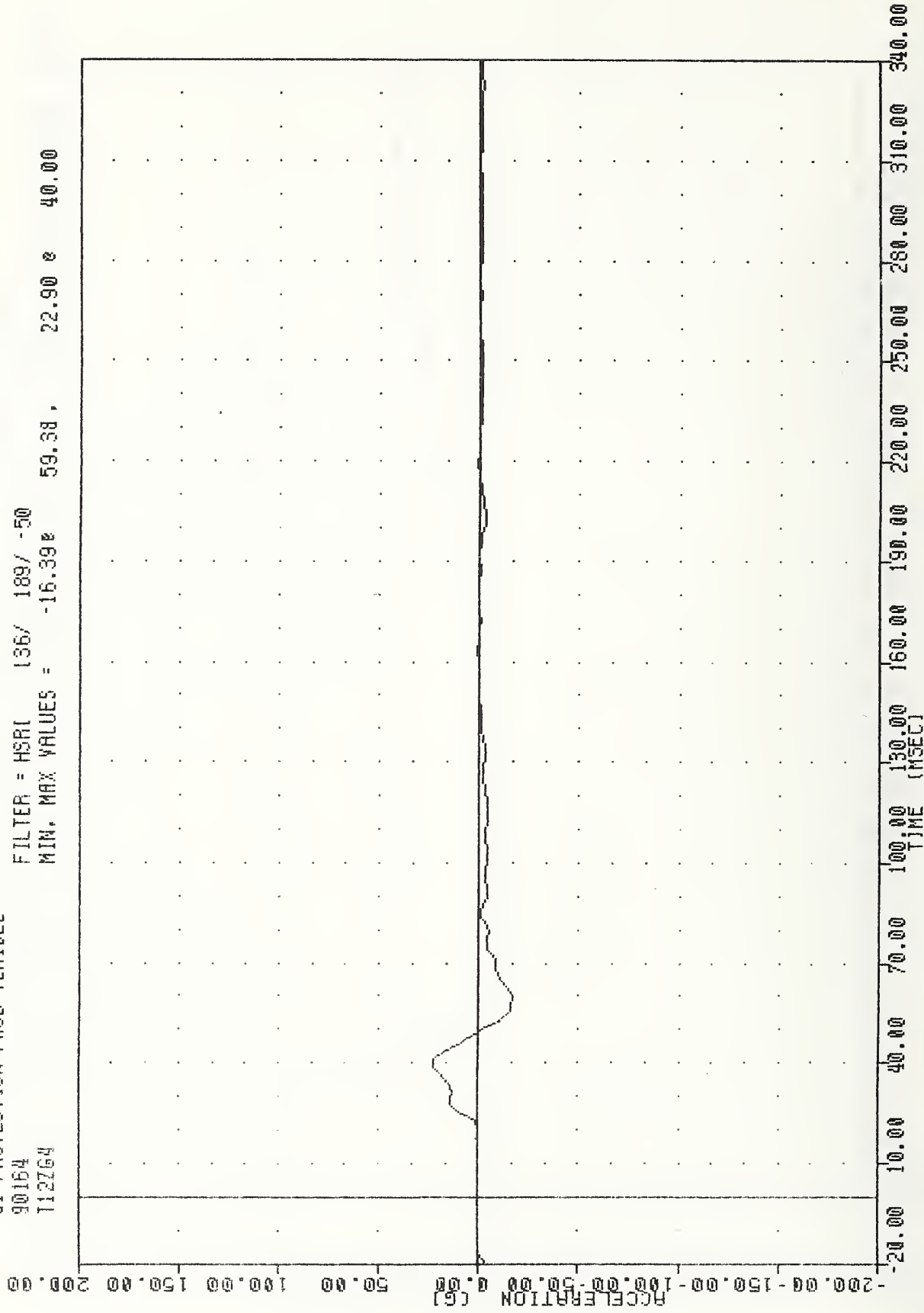
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.02% -16.63, 23.53 e 63.25



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT VELOCITY

WRTC , 900613
 SI PROTECTION PROD VEHICLE
 90154
 T12764

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -16.39e 59.38 , 22.90 e 40.00

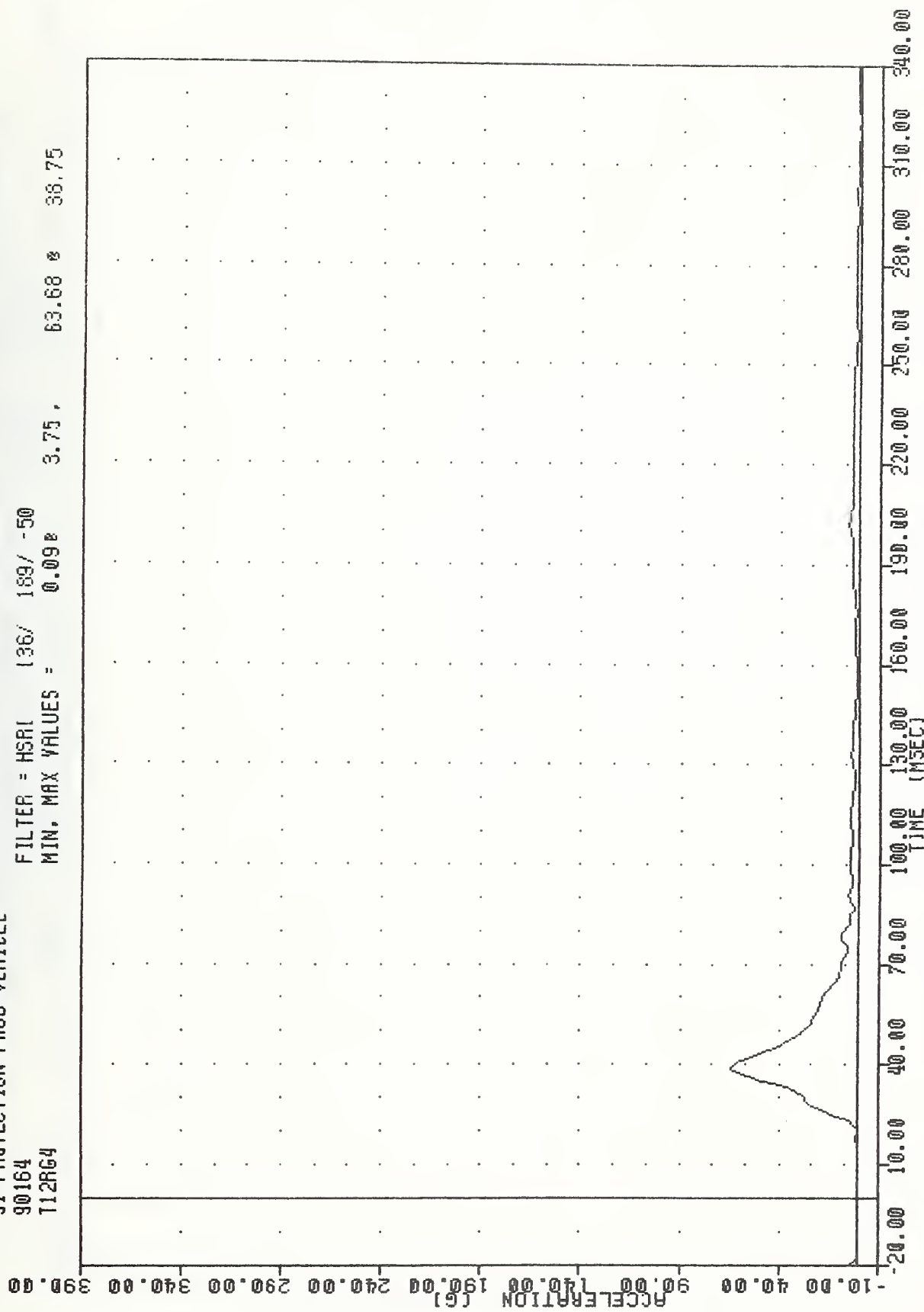


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LOWER SPINE Z-AXIS ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
T12RG4

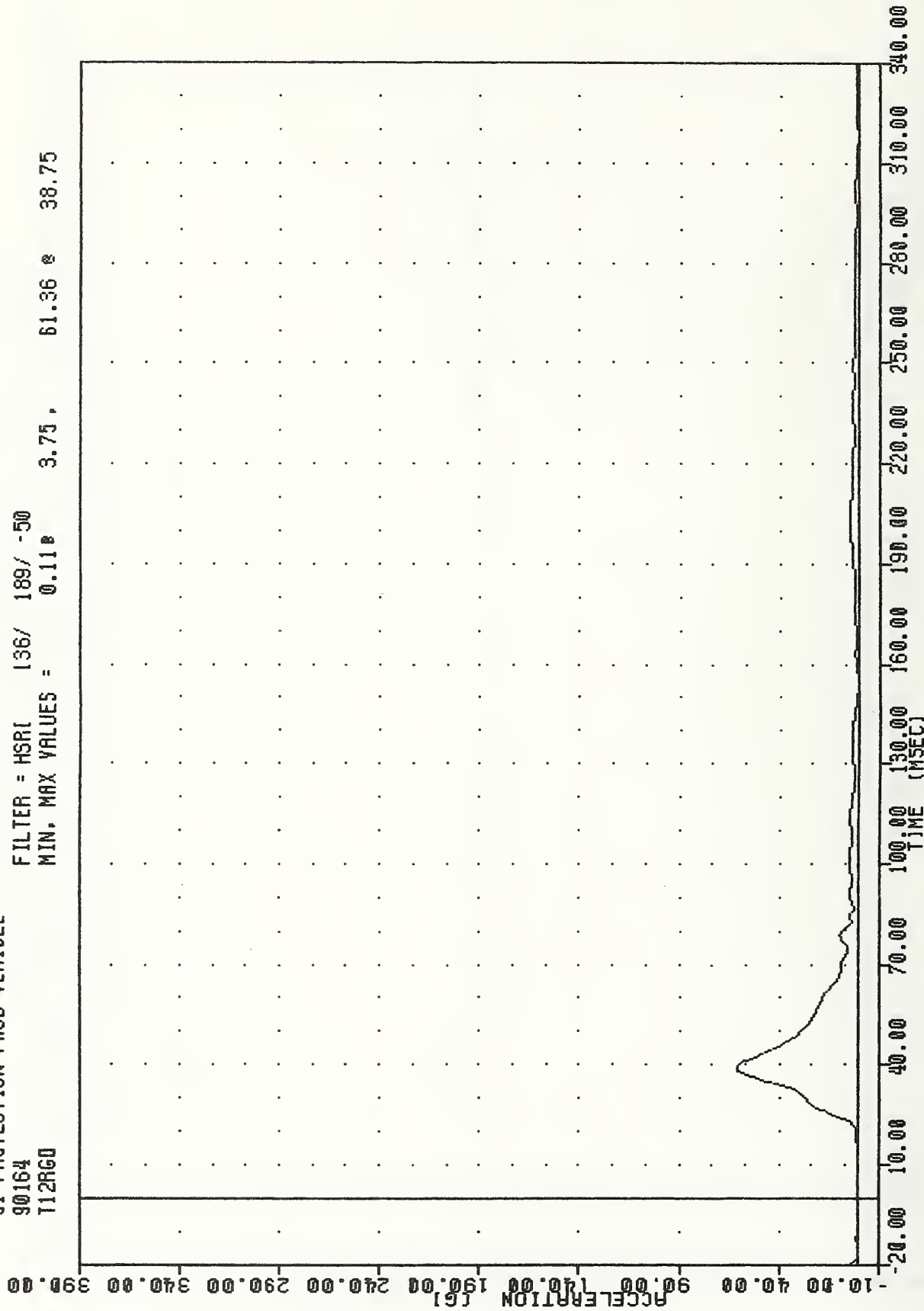
FILTER = HSAI 136/ 189/ -50
MIN. MAX VALUES = 0.098 3.75 ,

63.68 38.75



VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 T12RG0

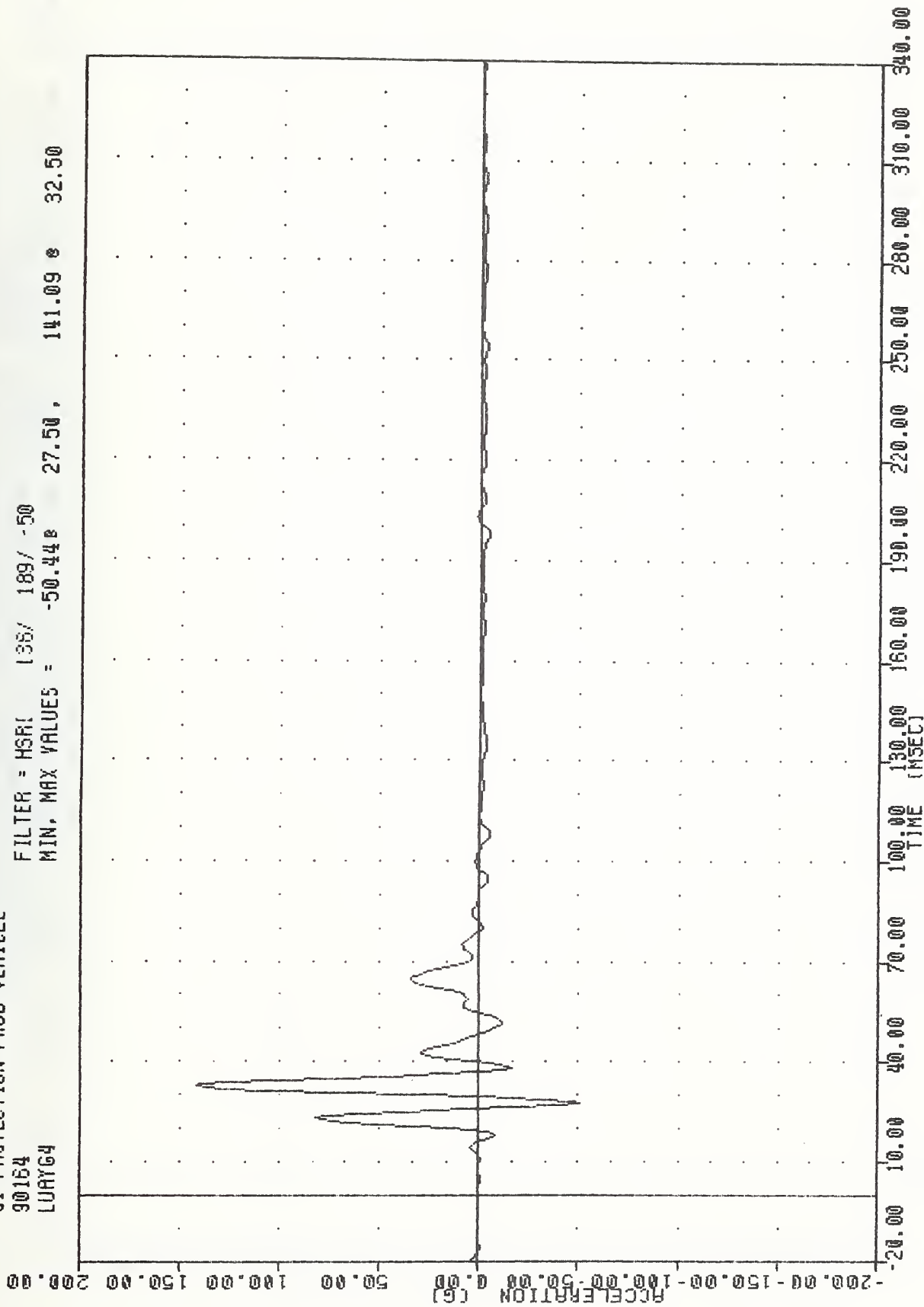
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.118 3.75 , 61.36 38.75



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LOWER SPINE REDUNDANT RESULTANT ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90154
LWAY64

FILTER = HSR(136/ 189/ -50
MIN, MAX VALUES = -50.448 27.50 , 141.09 8 32.50

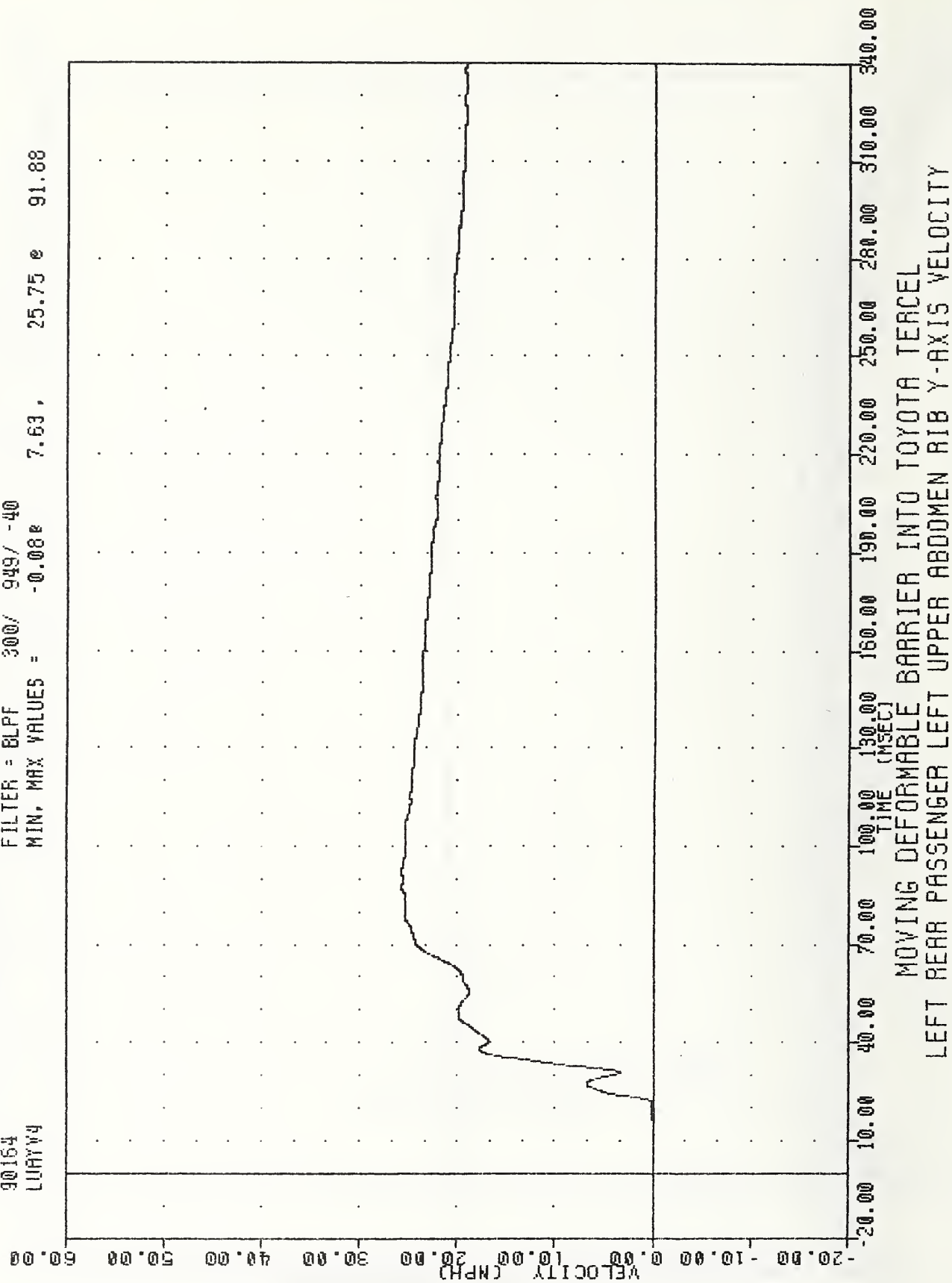


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER LEFT UPPER ABDOMEN RIB Y-AXIS ACCELERATION

VRIC . 900613
 SI PROTECTION PROD VEHICLE
 90164
 LUAYW4

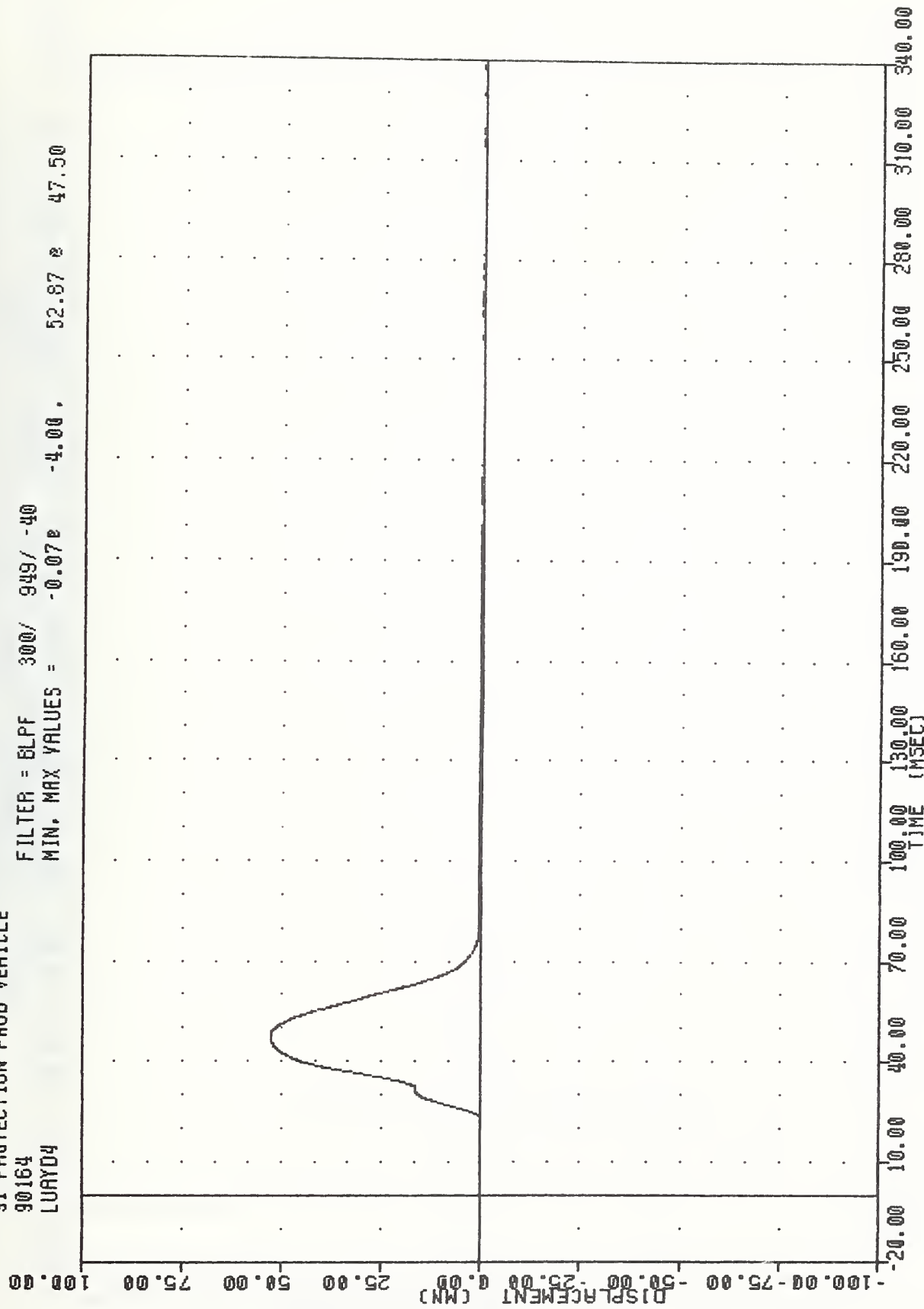
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.088

7.63, 25.75 e 91.88



VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LUAYD4

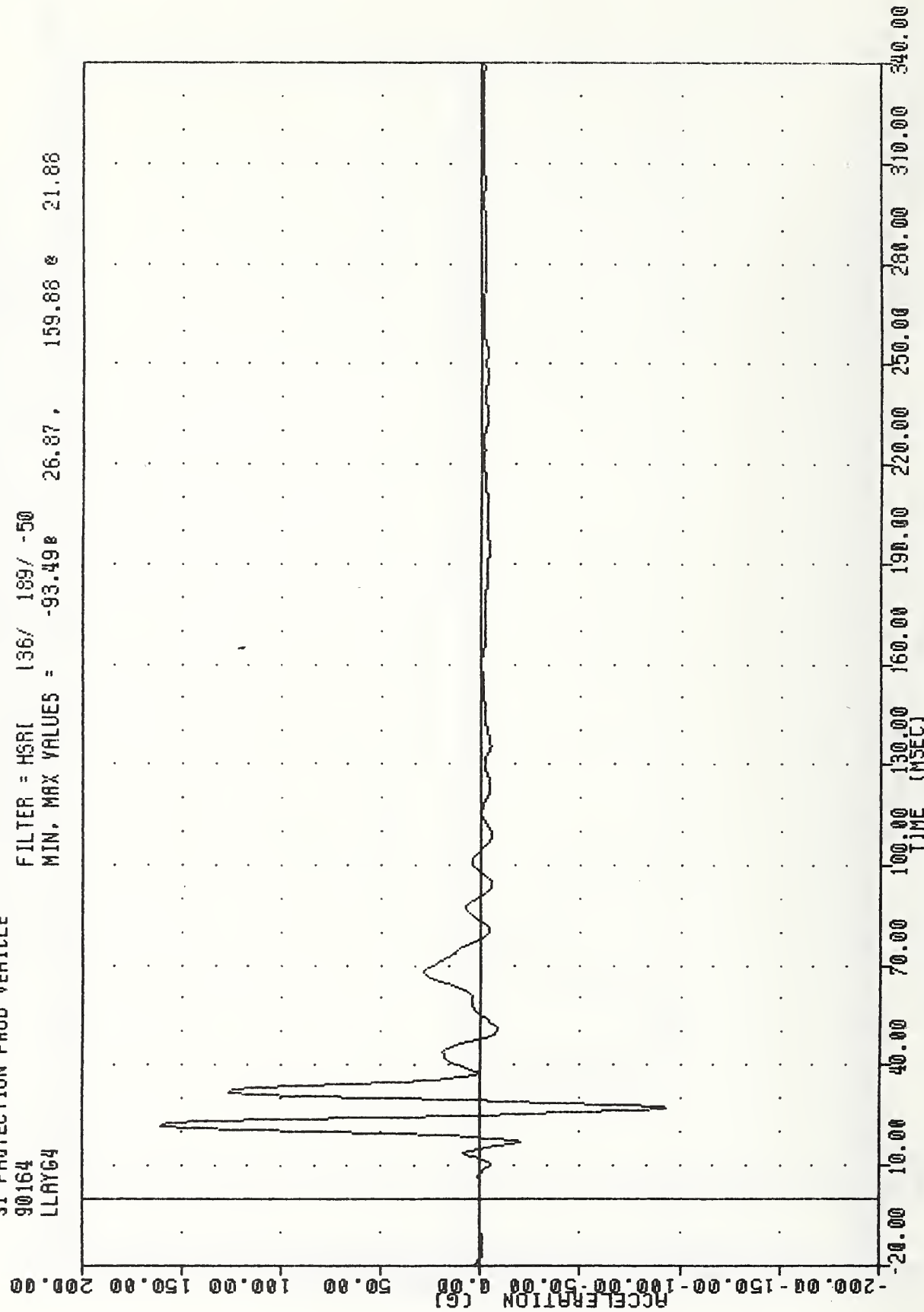
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.07e -4.00 , 52.87 e 47.50



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT UPPER ABDOMEN RIB DISPLACEMENT

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LLAY64

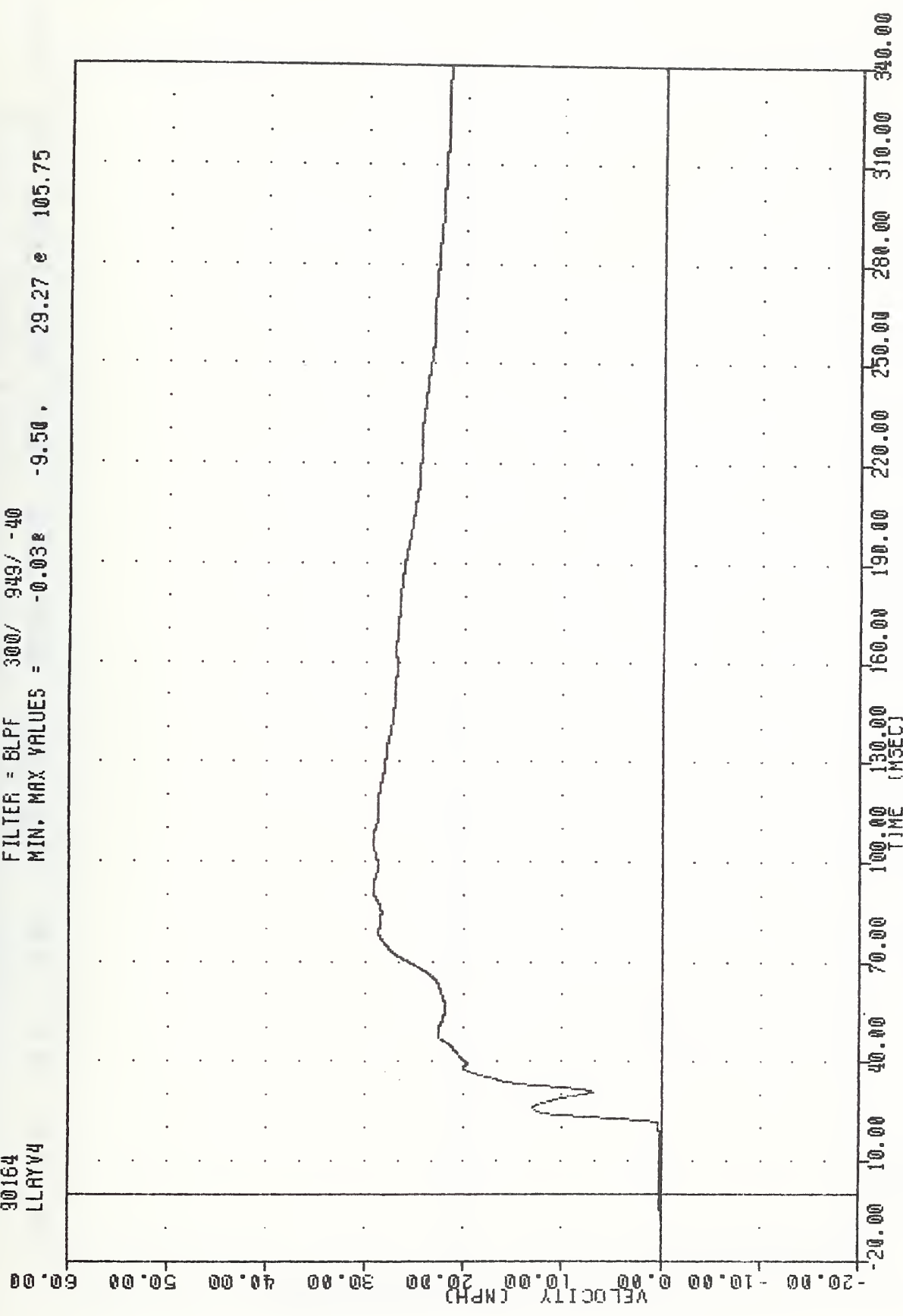
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -93.49e 26.87, 159.88 e 21.86



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER LEFT LOWER ABDOMEN RIB Y-AXIS ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LLAYV4

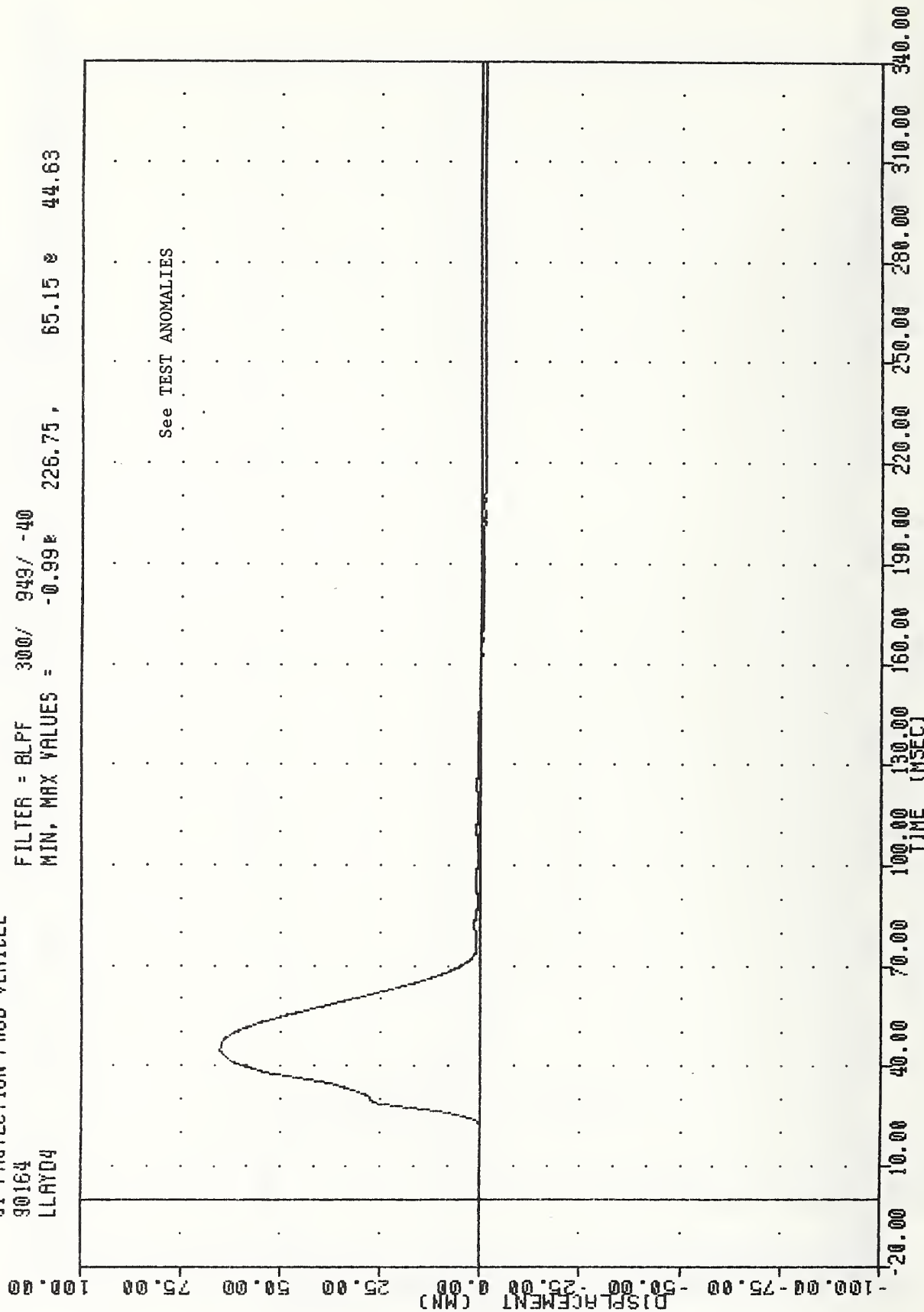
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.038 -9.50, 29.27 e 105.75



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER LEFT LOWER ABDOMEN RIB Y-AXIS VELOCITY

VRTC .900613
 SI PROTECTION PROD VEHICLE
 90164
 LLAYD4

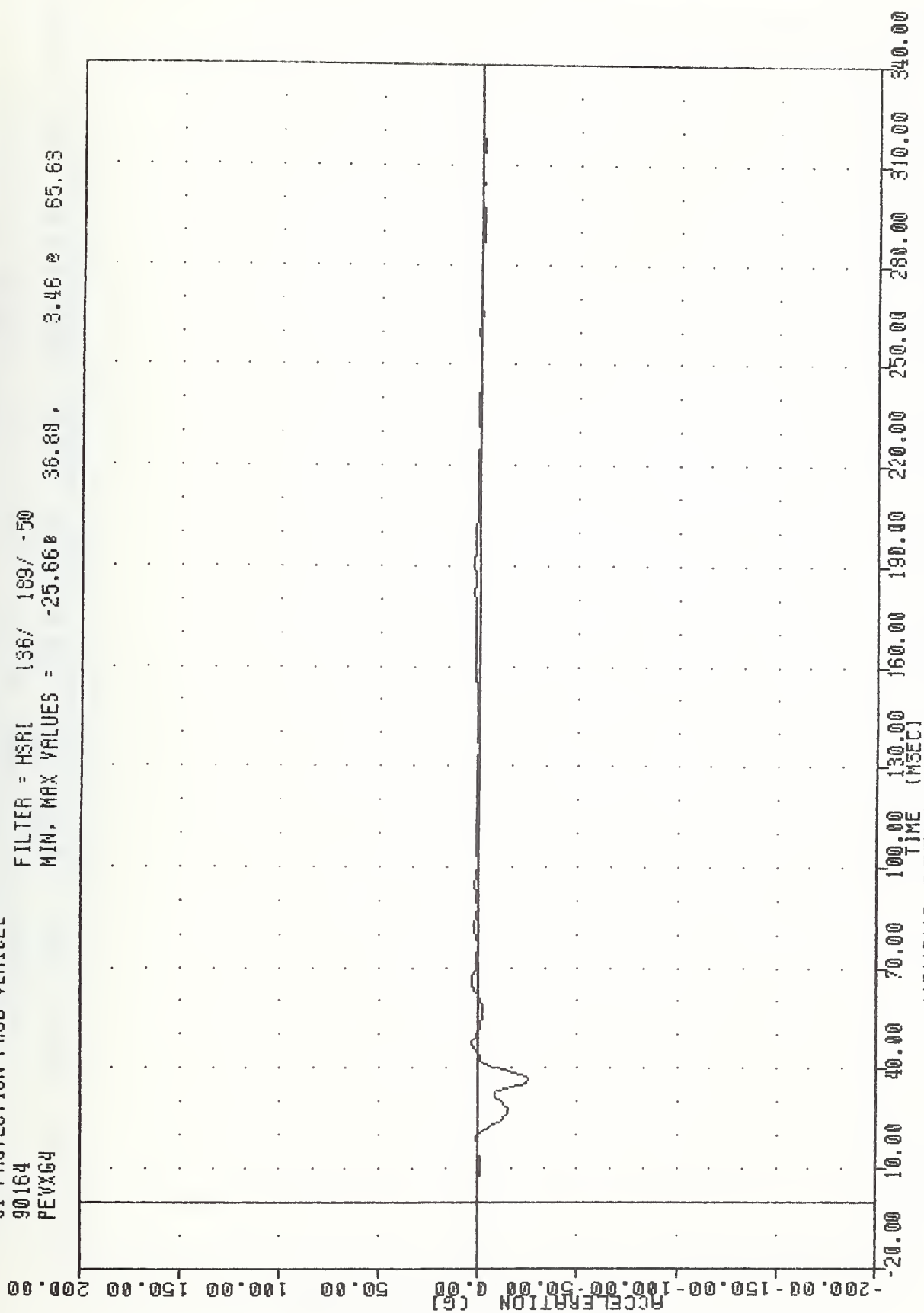
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.99# 226.75 , 65.15 @ 44.63



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER LEFT LOWER ABDOMEN RIB DISPLACEMENT

WATC , 900613
SI PROTECTION PROD VEHICLE
90164
PEVX64

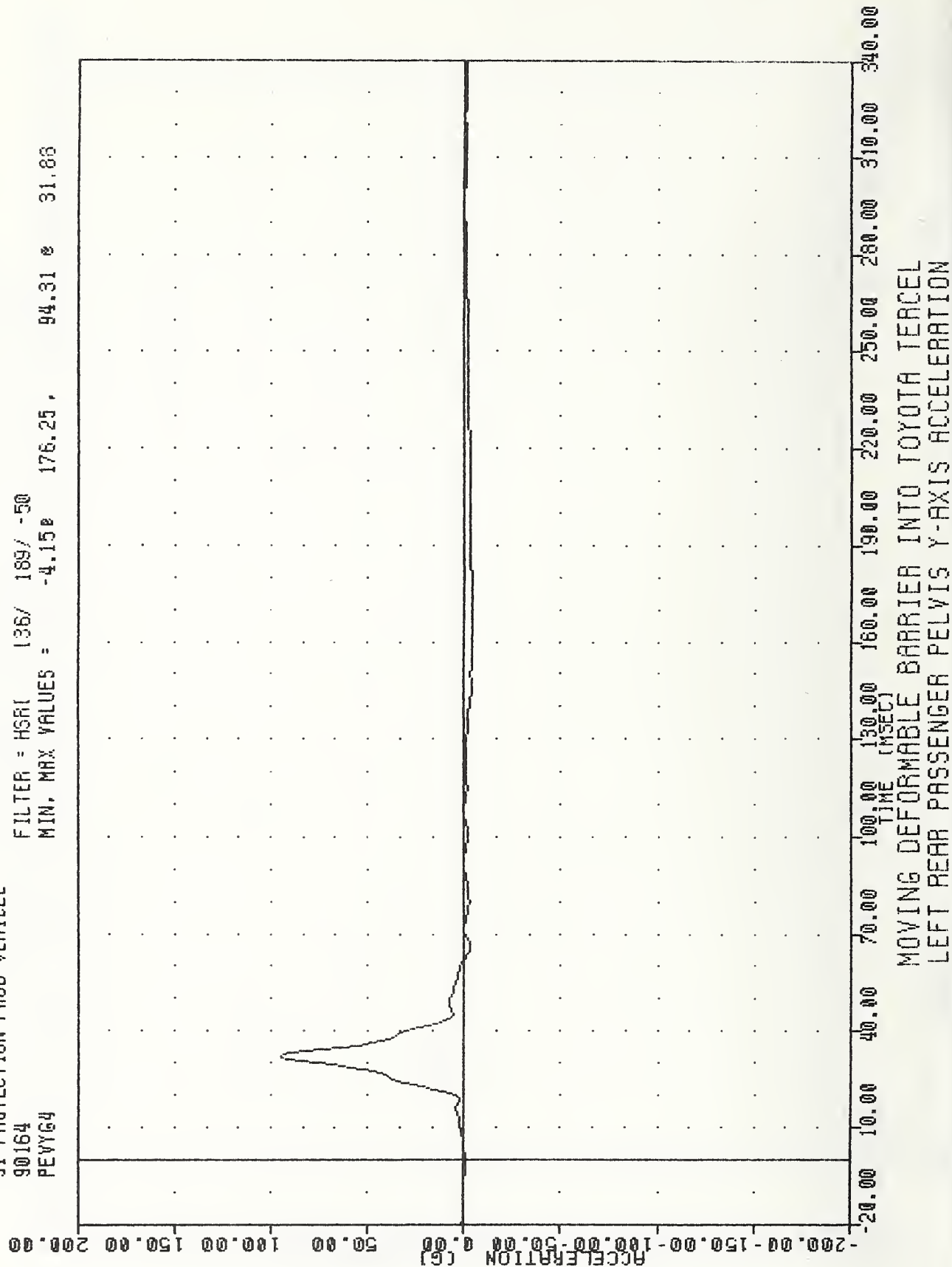
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -25.66 36.88 , 3.46 65.63



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER PELVIS X-AXIS ACCELERATION

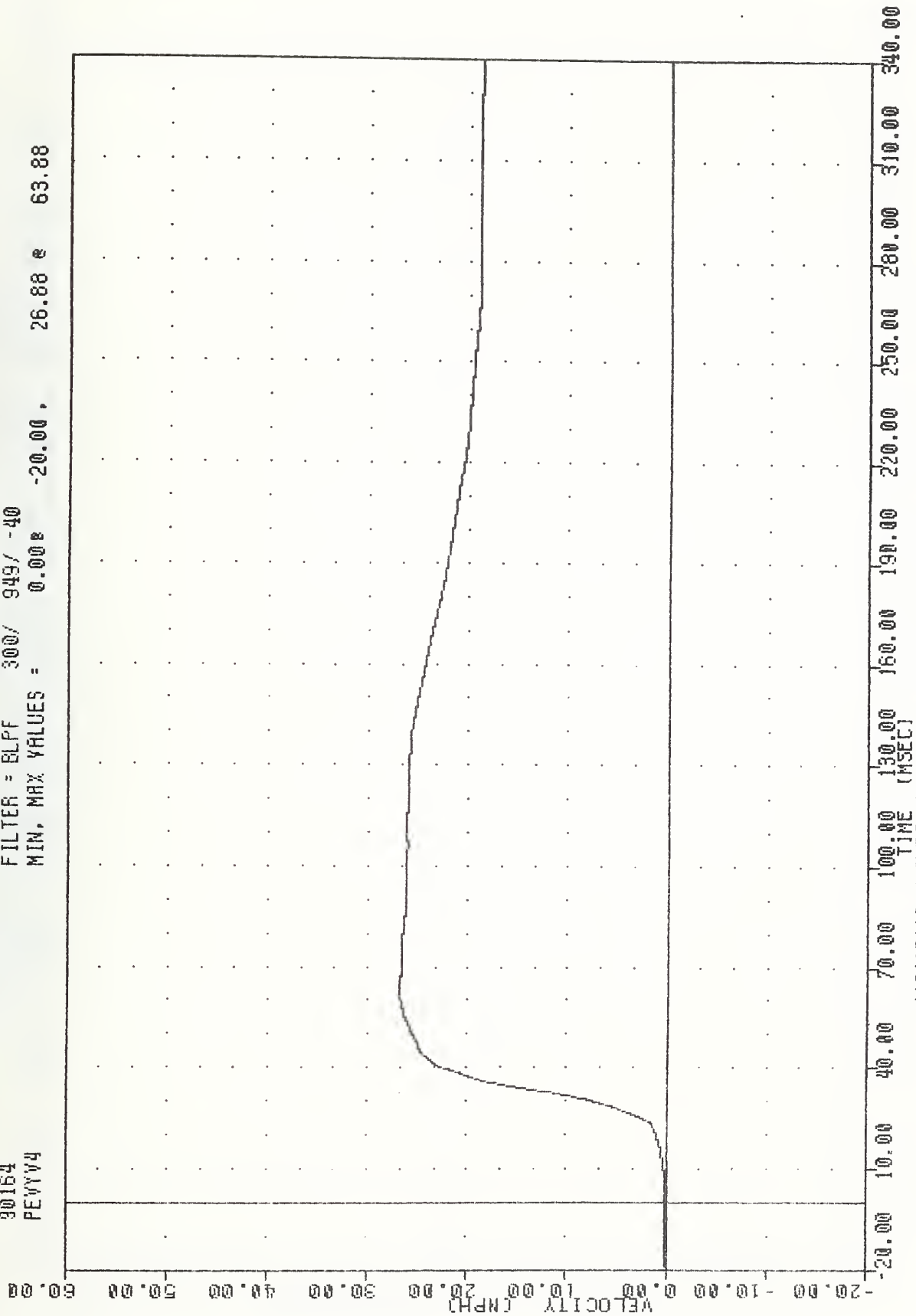
VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
PEVYG4

FILTER = HSR1 136/ 189/ -50
MIN. MAX VALUES = -4.150 176.25 , 94.31 e 31.83



VRTC 900613
SI PROTECTION PROD VEHICLE
90164
PEVYV4

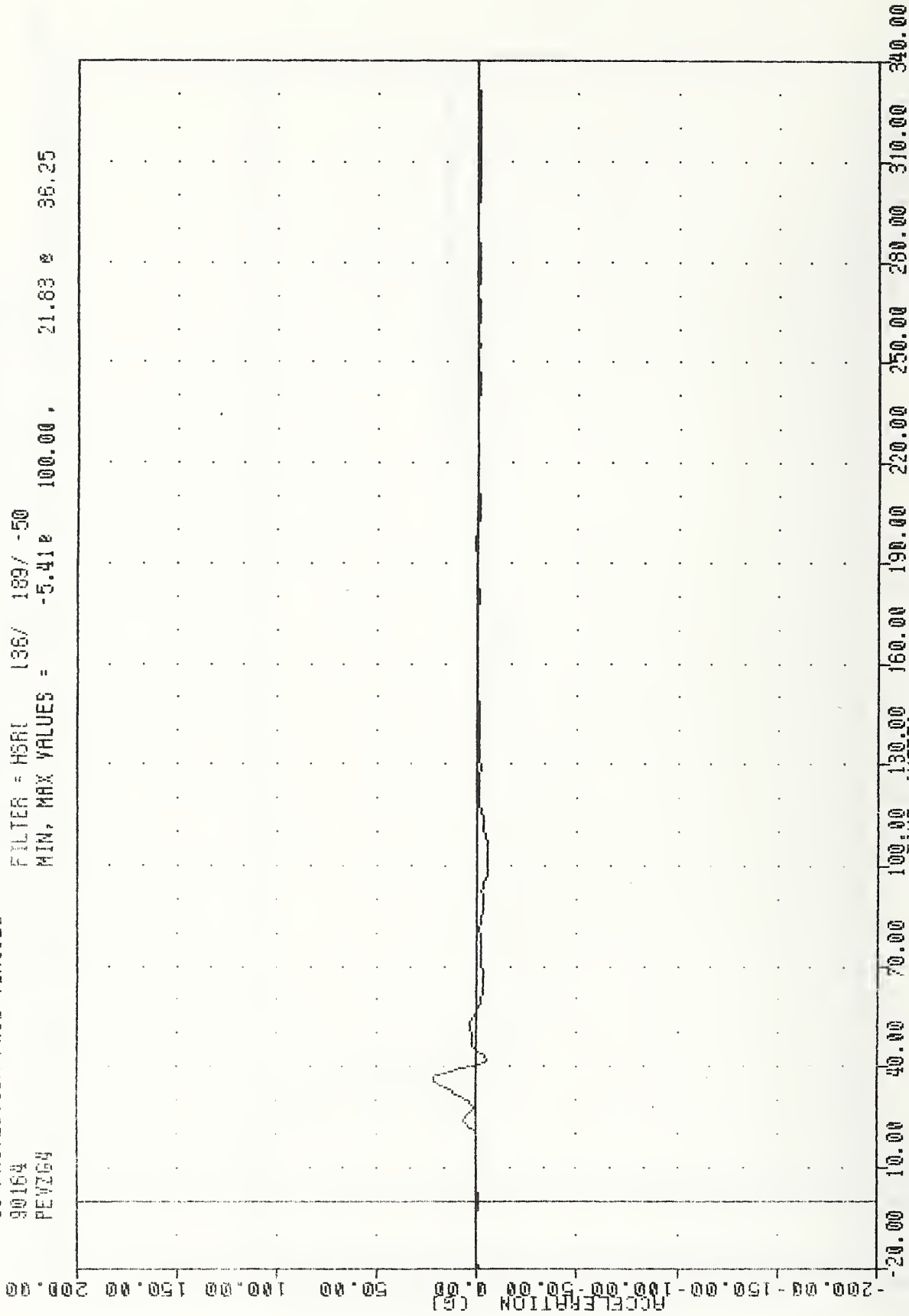
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.00e -20.00, 26.88 e 63.88



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER PELVIS Y-AXIS VELOCITY

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 PEVZ64

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -5.41e 100.00 , 21.83 e 36.25

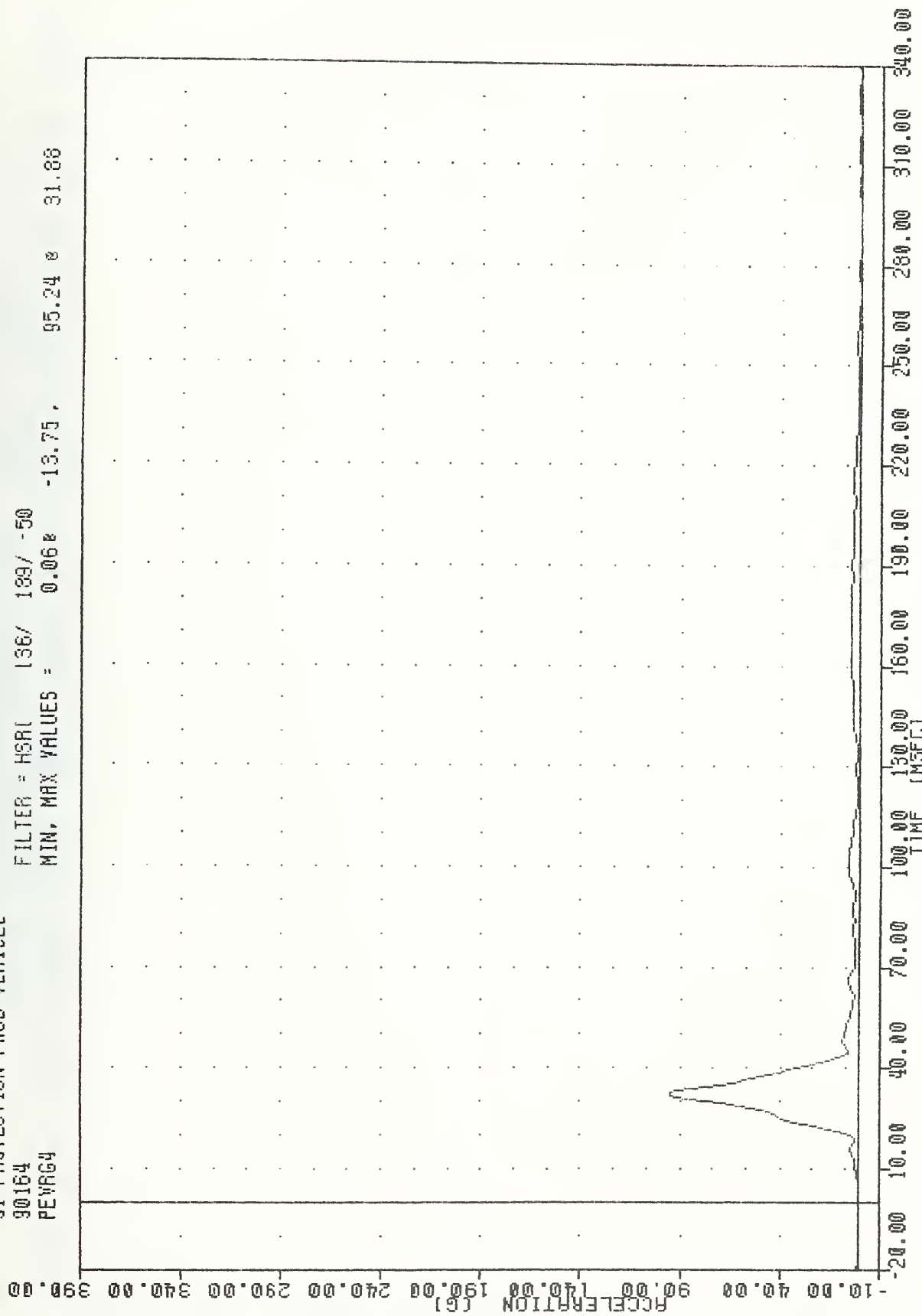


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 LEFT REAR PASSENGER PELVIS Z-AXIS ACCELERATION

VHTC , 900613
SI PROTECTION PROD VEHICLE
90164
PEVRG4

FILTER = HSRI 136/ 136/ -50
MIN, MAX VALUES = 0.068 -13.75 ,

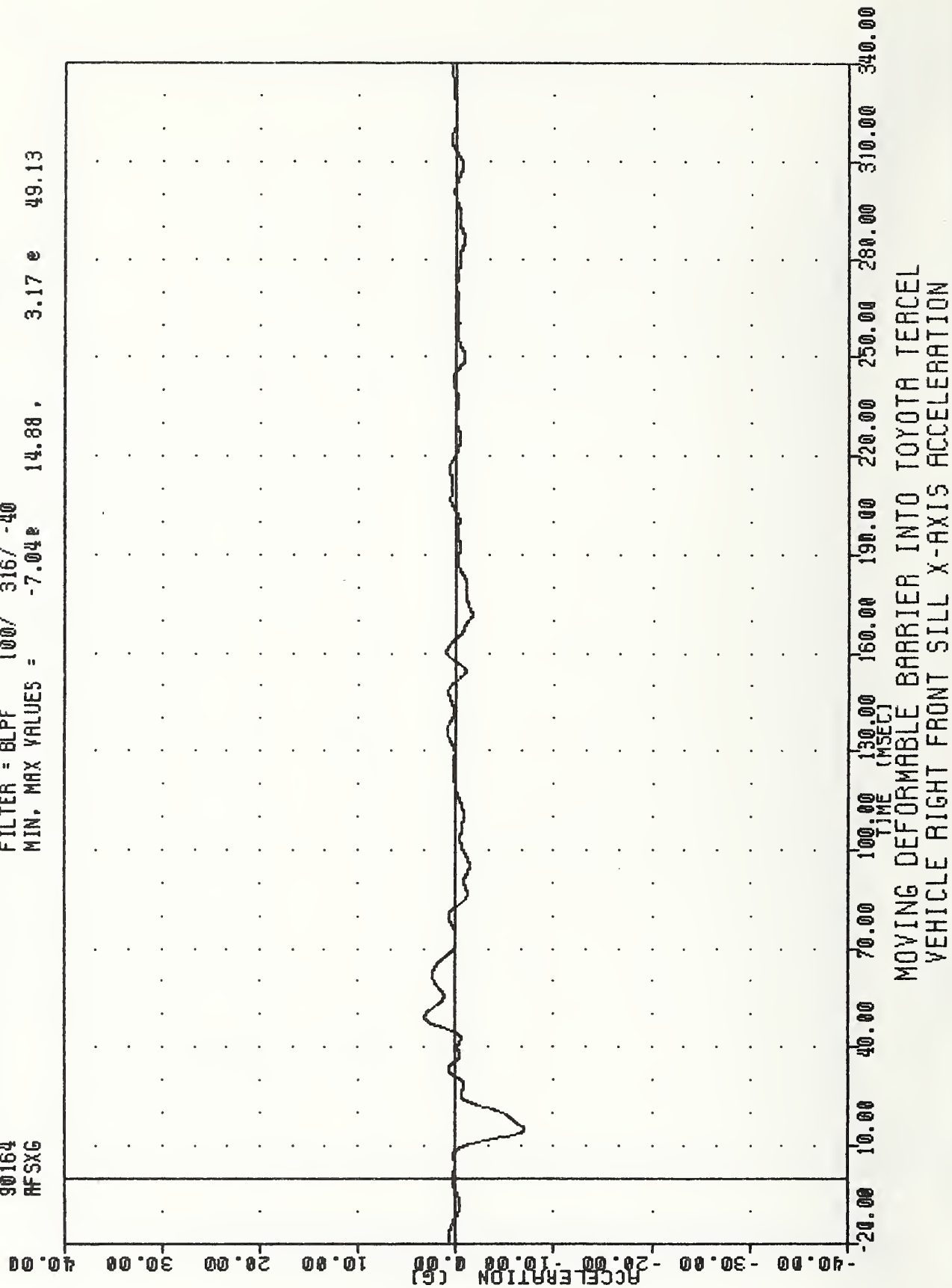
95.24 31.88



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
LEFT REAR PASSENGER PELVIS RESULTANT ACCELERATION

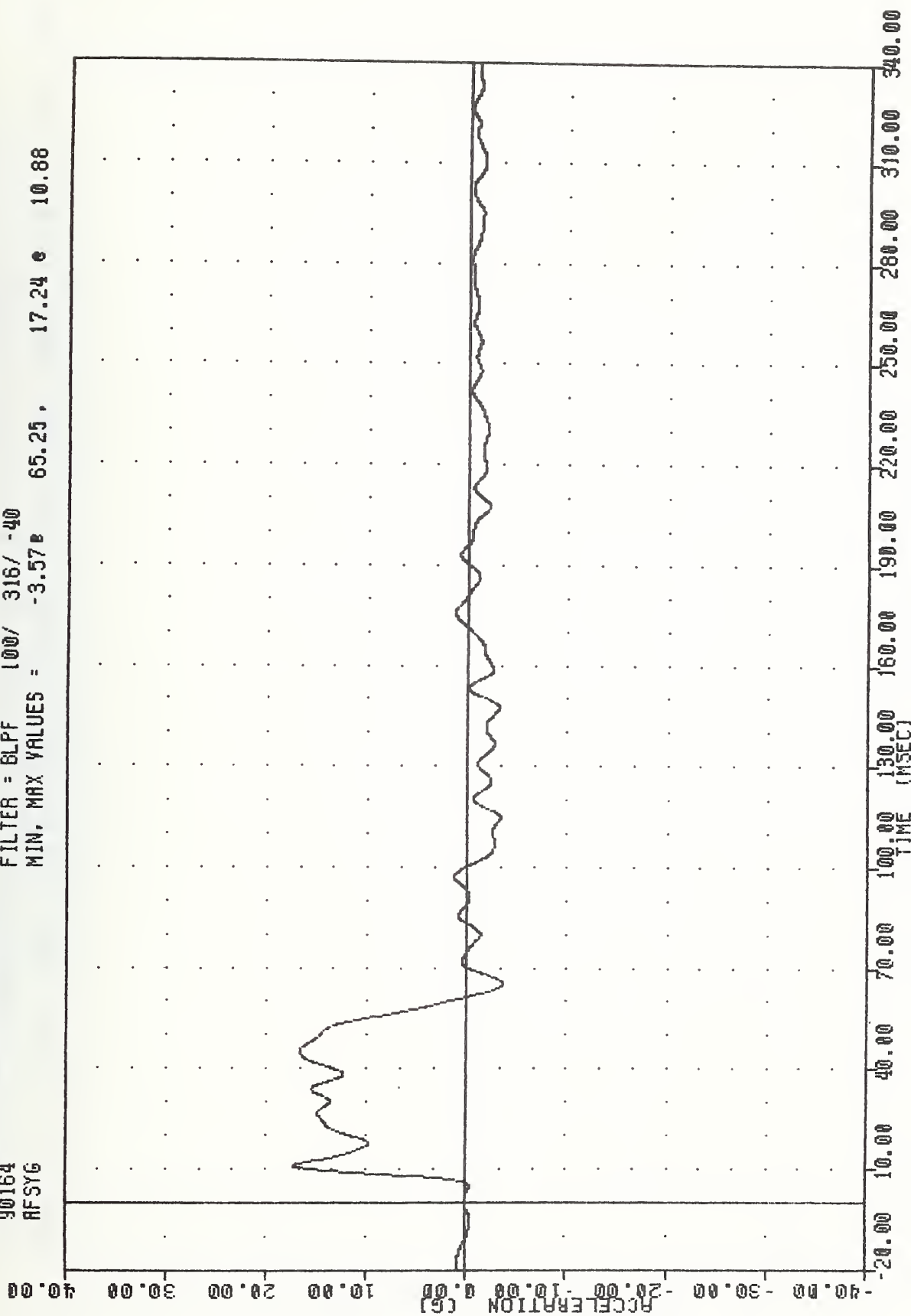
VRTC
SI PROTECTION PROD VEHICLE
90164
AFSXC

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -7.04e 14.88, 3.17 e 49.13



VRTC .900613
SI PROTECTION PROD VEHICLE
90164
AFSYG

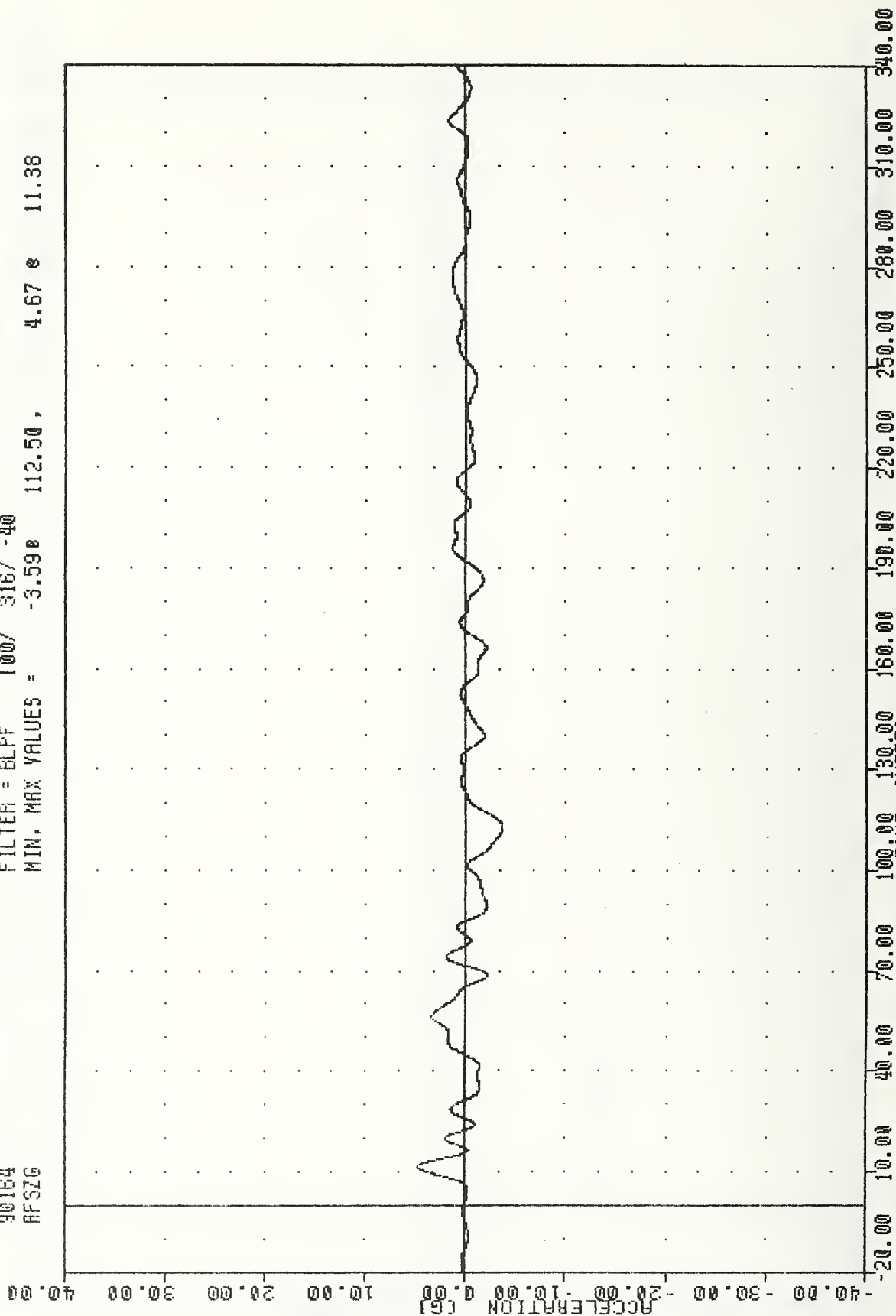
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -3.57 65.25 17.24 e 10.88



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
VEHICLE RIGHT FRONT SILL Y-AXIS ACCELERATION

WRTC, 900613
 SI PROTECTION PROD VEHICLE
 90164
 RFSZG

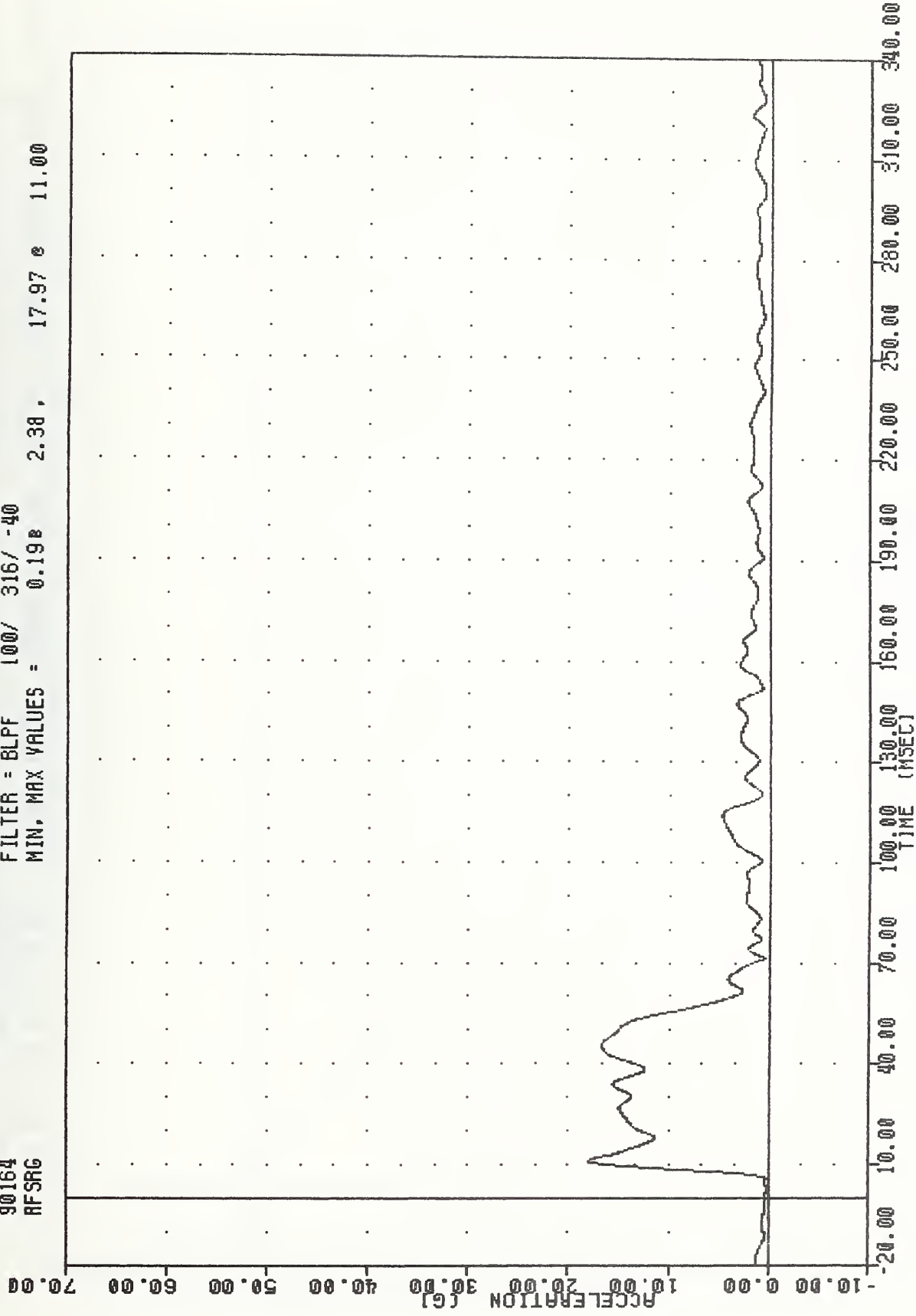
FILTER = ELFF 100/ 316/ -40
 MIN. MAX VALUES = -3.59e 112.50, 4.67 e 11.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 VEHICLE RIGHT FRONT SILL Z-AXIS ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
RFSRG

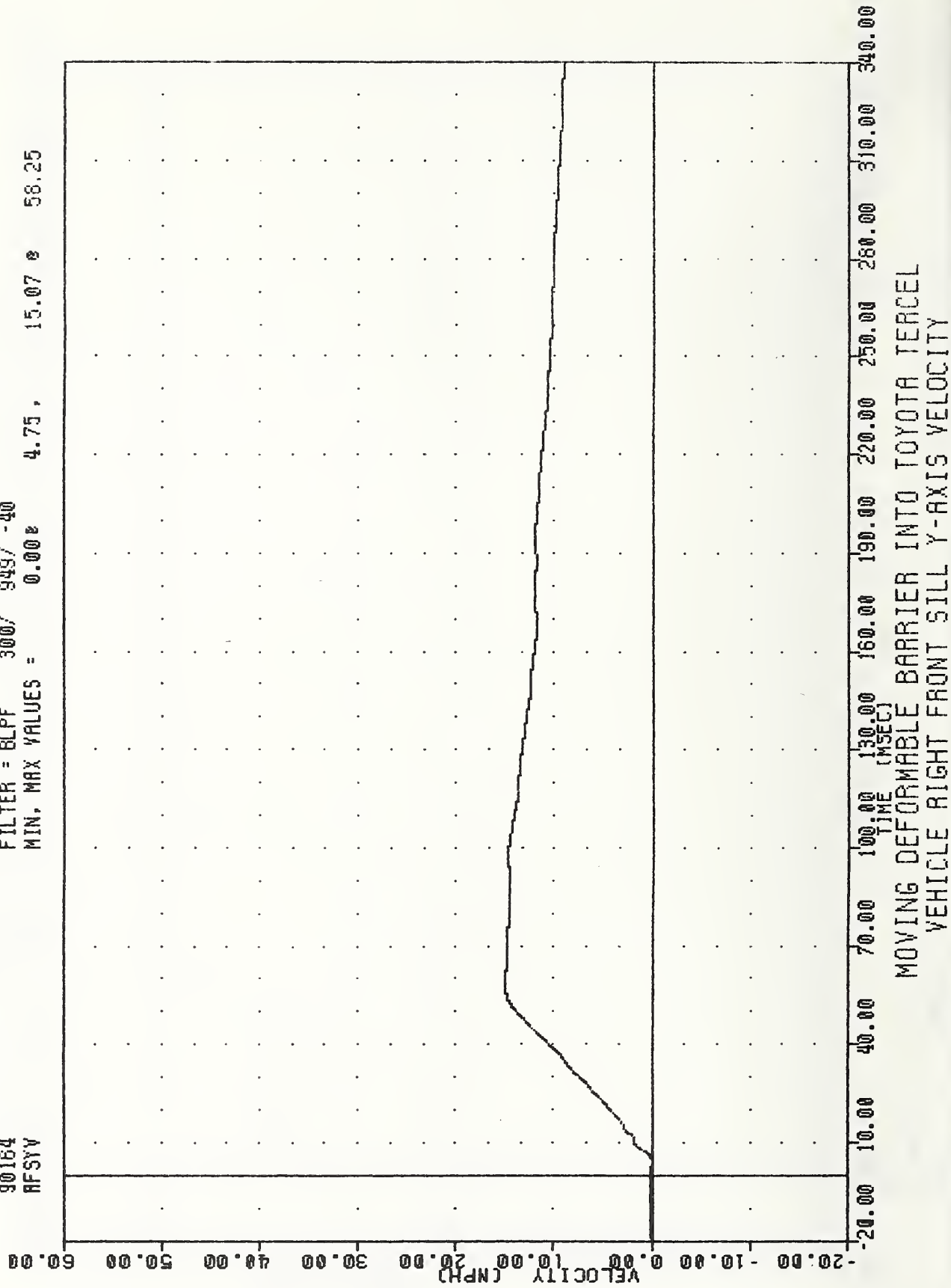
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = 0.198 2.38 , 17.97 e 11.00



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
VEHICLE RIGHT FRONT SILL RESULTANT ACCELERATION

NRIC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 RFSYV

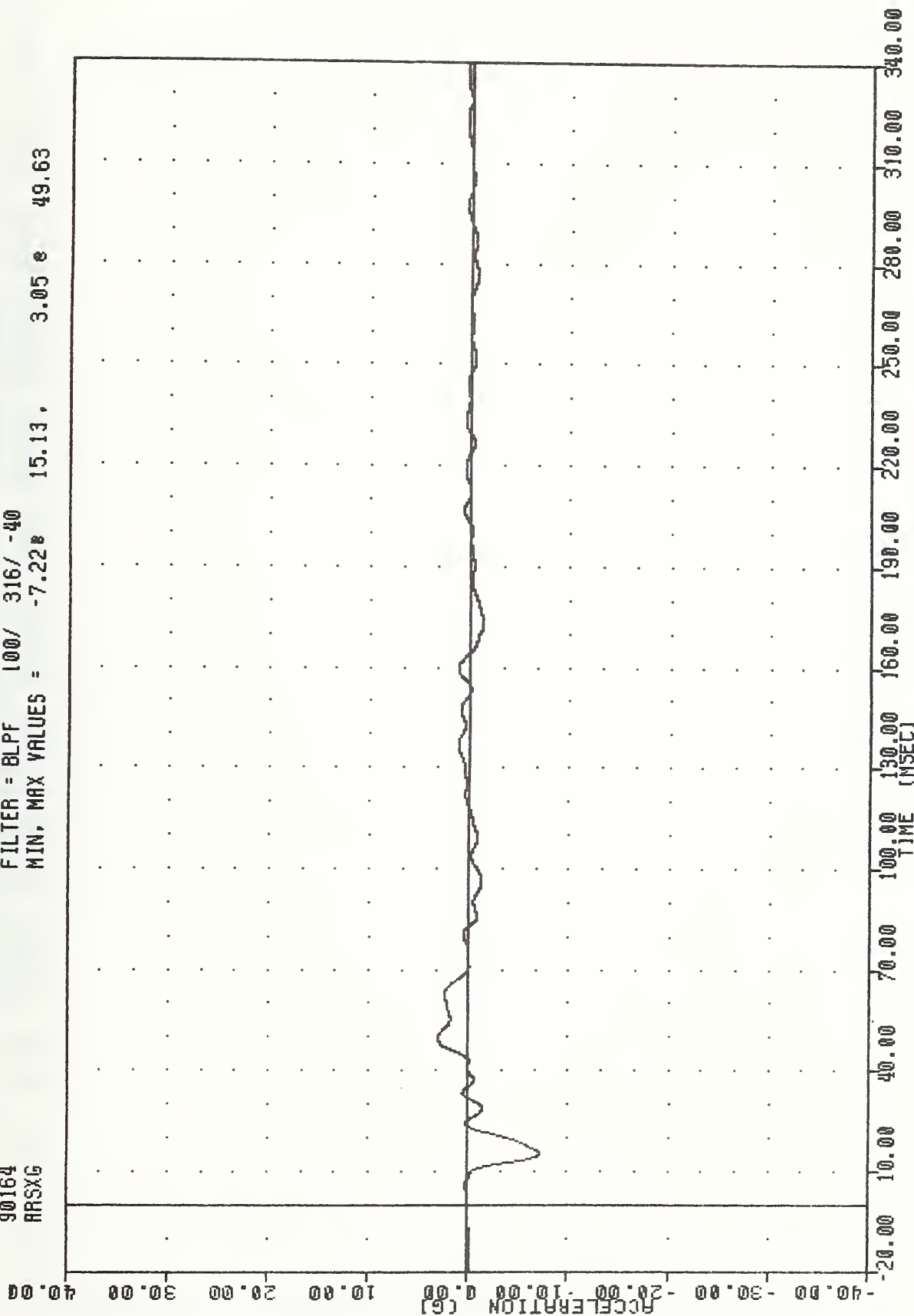
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 0.00% 4.75, 15.07% 58.25



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 VEHICLE RIGHT FRONT SILL Y-AXIS VELOCITY

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
ARSXG

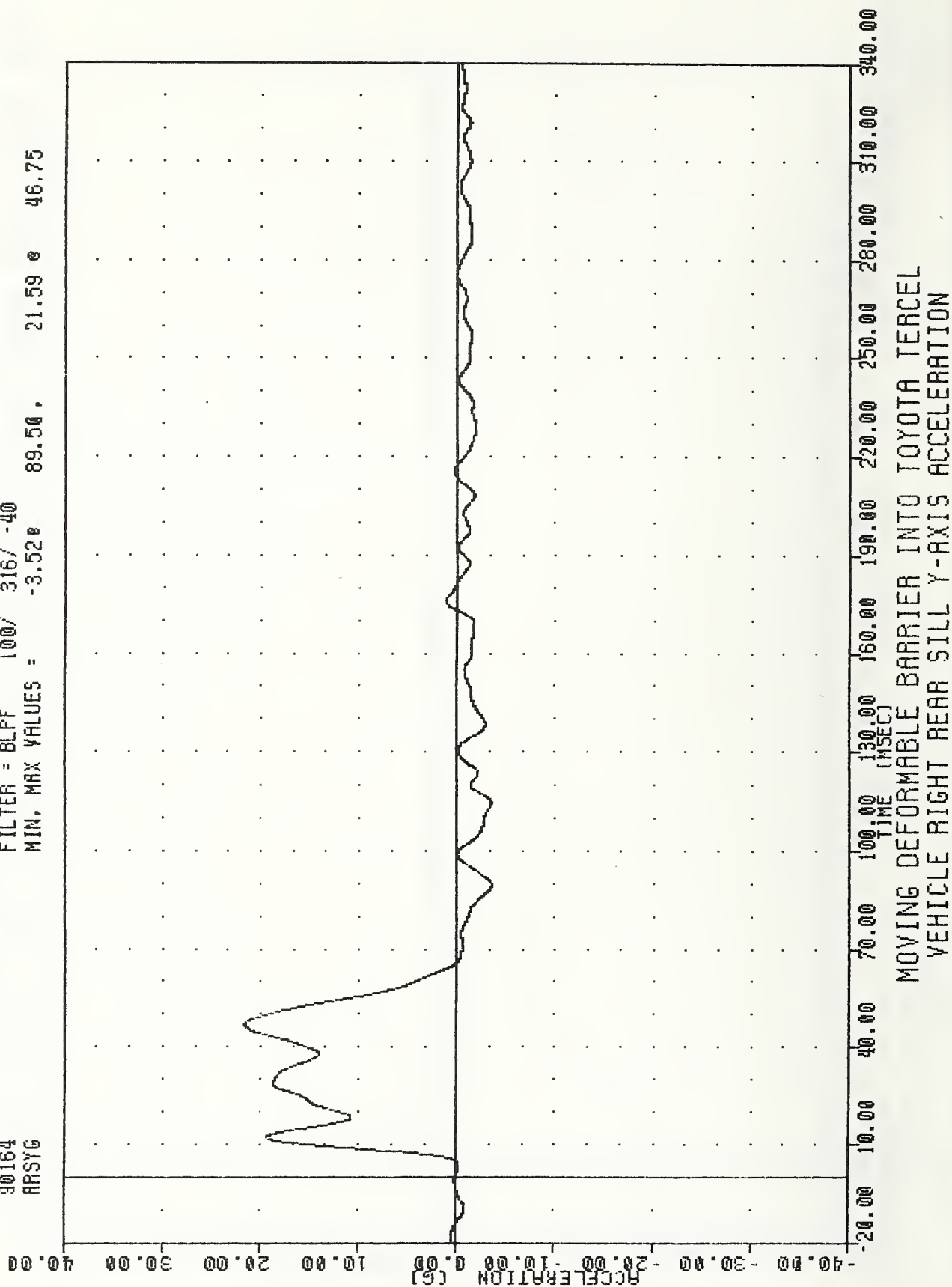
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -7.22 15.13, 3.05 e 49.63



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
VEHICLE RIGHT REAR SILL X-AXIS ACCELERATION

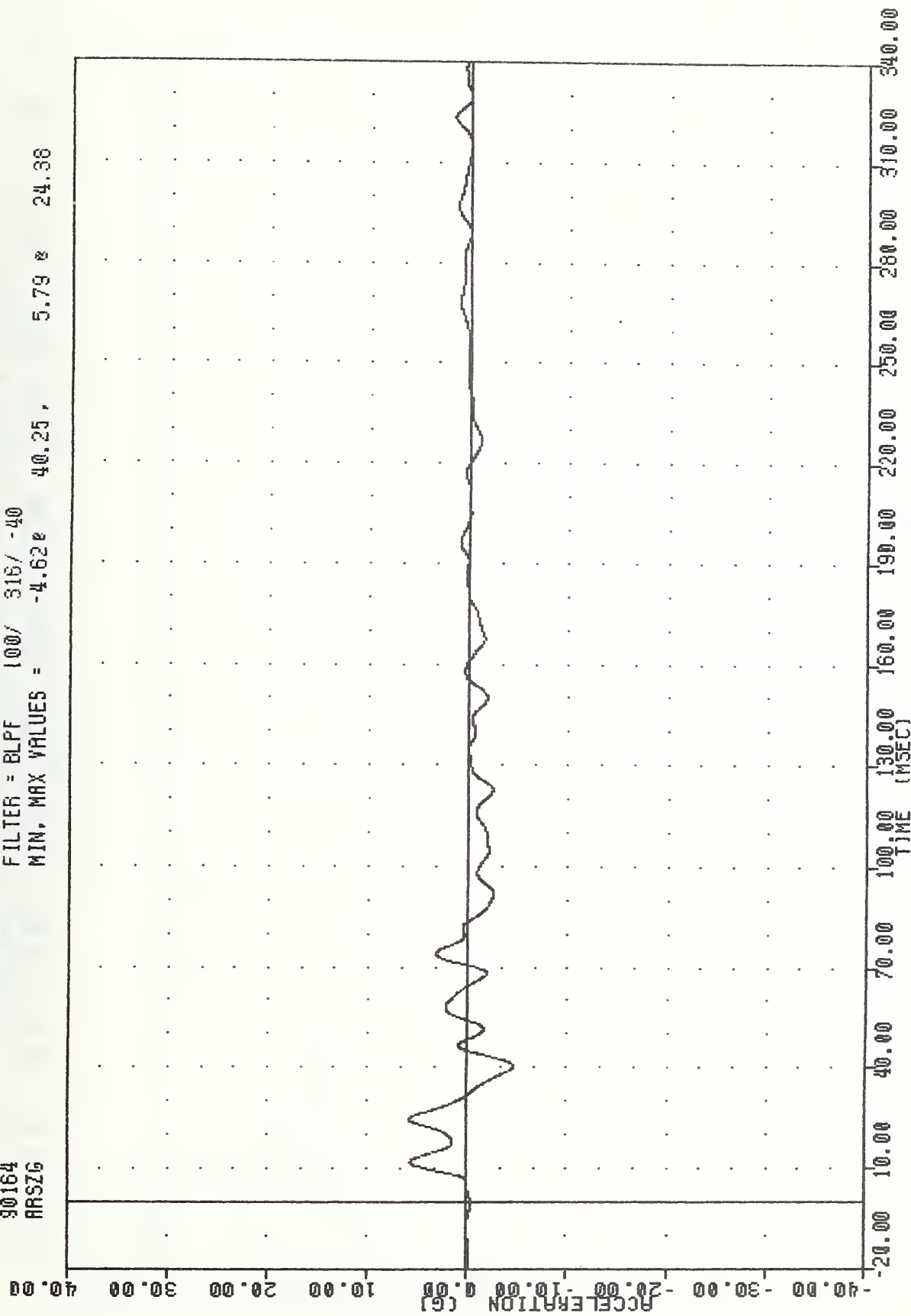
VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 ARSYG

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = 89.50 , 21.59 @ 46.75



VRTC 900613
SI PROTECTION PROD VEHICLE
90164
ARSZG

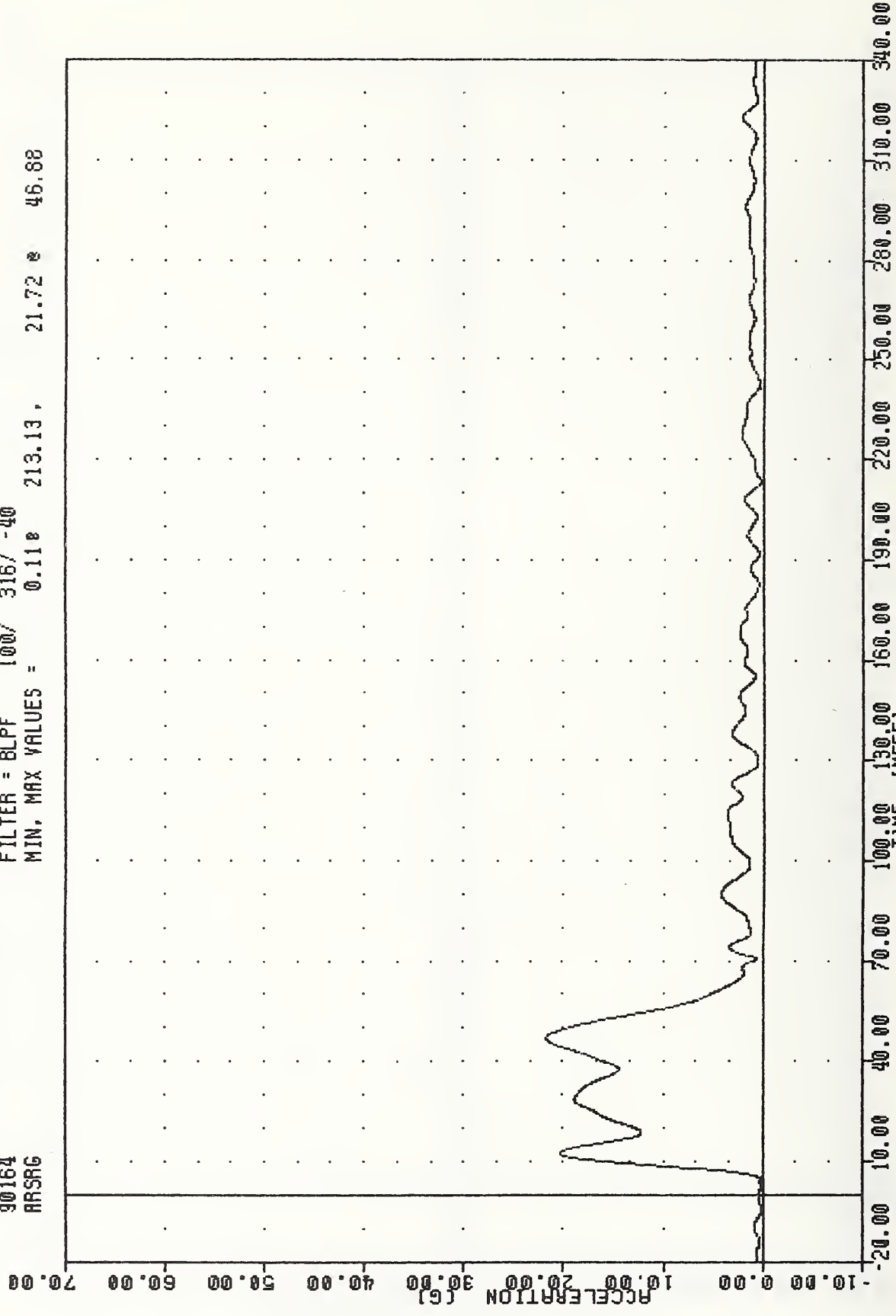
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = 40.25, 5.79 24.36



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
VEHICLE RIGHT REAR SILL Z-AXIS ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 ARSRG

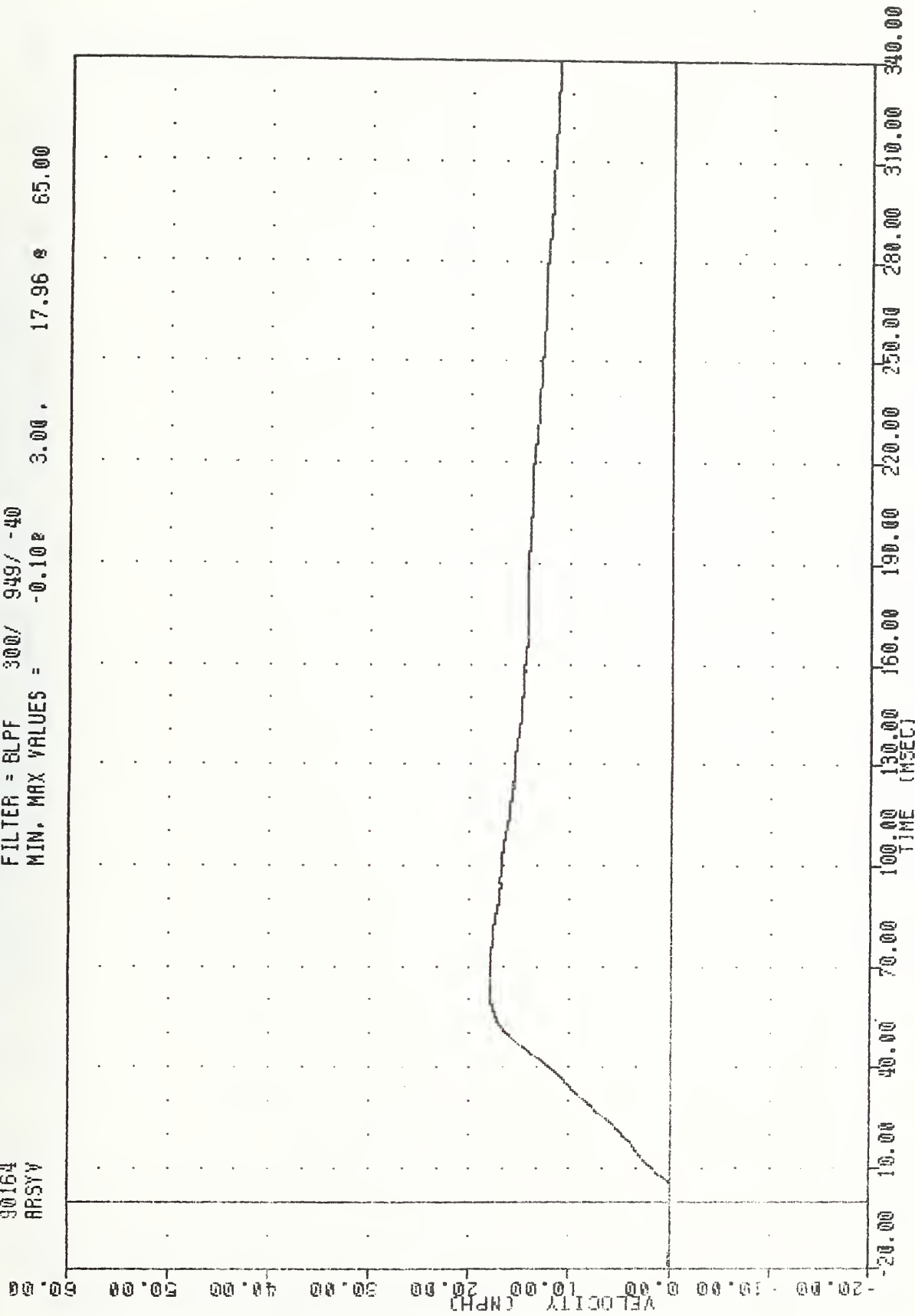
FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = 0.11e 213.13, 21.72 e 46.88



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 VEHICLE RIGHT REAR SILL RESULTANT ACCELERATION

NRIC , 900613
SI PROTECTION PROD VEHICLE
90164
AR5YV

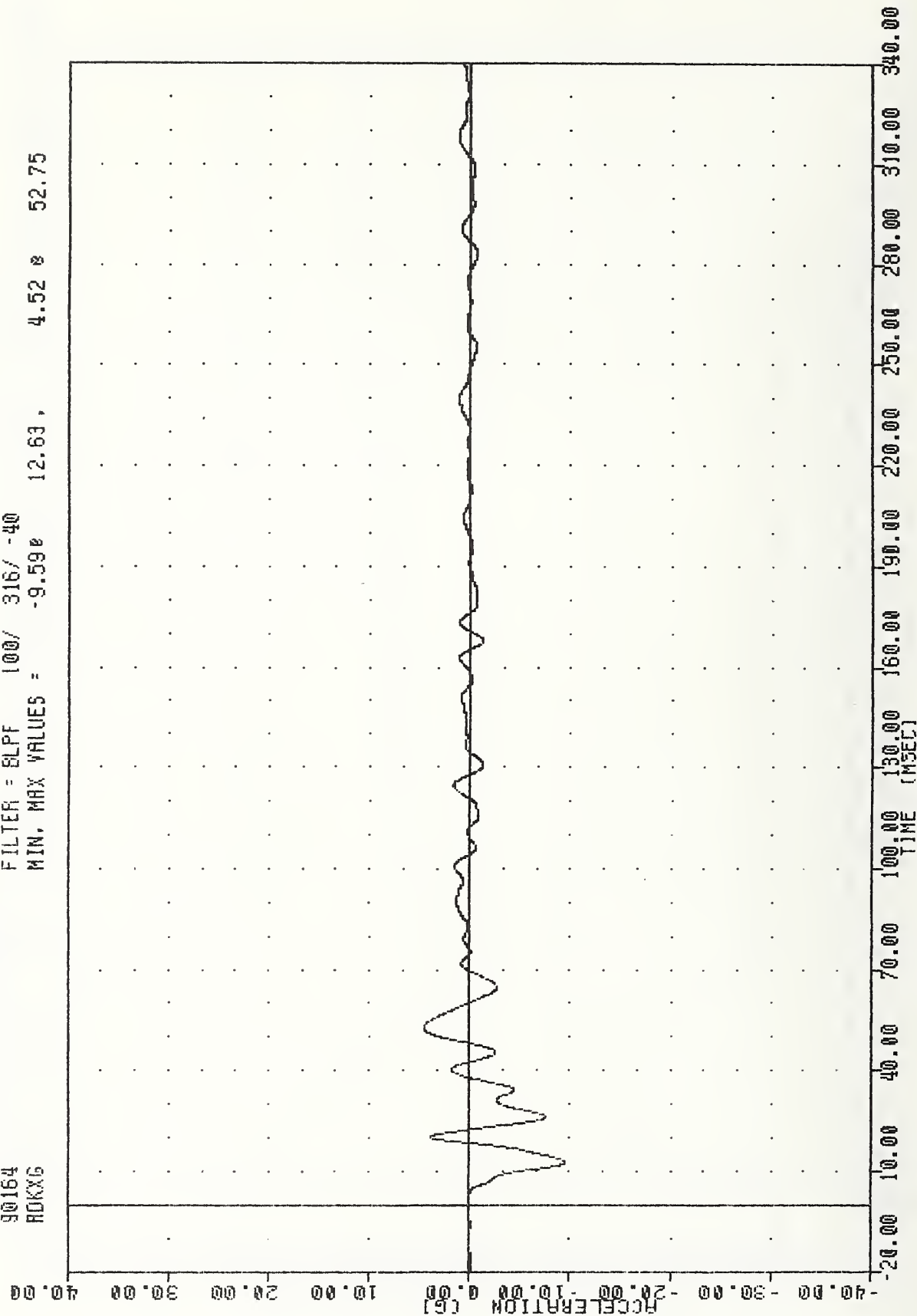
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.10e 3.00 . 17.96 s 65.00



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
VEHICLE RIGHT REAR SILL Y-AXIS VELOCITY

NRIC 900613
 SI PROTECTION PROD VEHICLE
 90164
 ROKXG

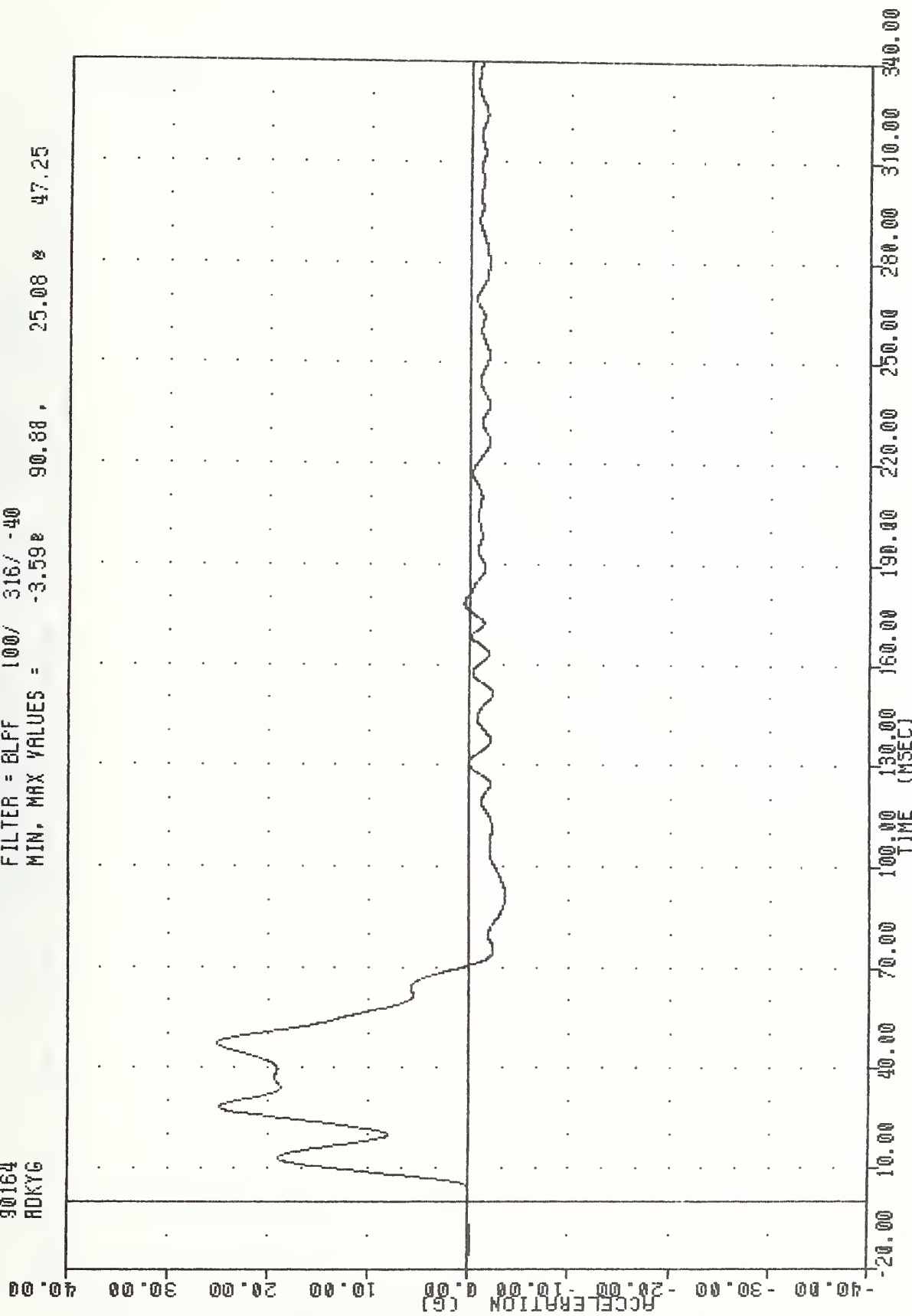
FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -9.59e 12.63, 4.52 e 52.75



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 VEHICLE REAR DECK X-AXIS ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
ADKYG

FILTER = BLFF 100/ 316/ -40
MIN, MAX VALUES = -3.59e 90.88 , 25.08 e 47.25



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
VEHICLE REAR DECK Y-AXIS ACCELERATION

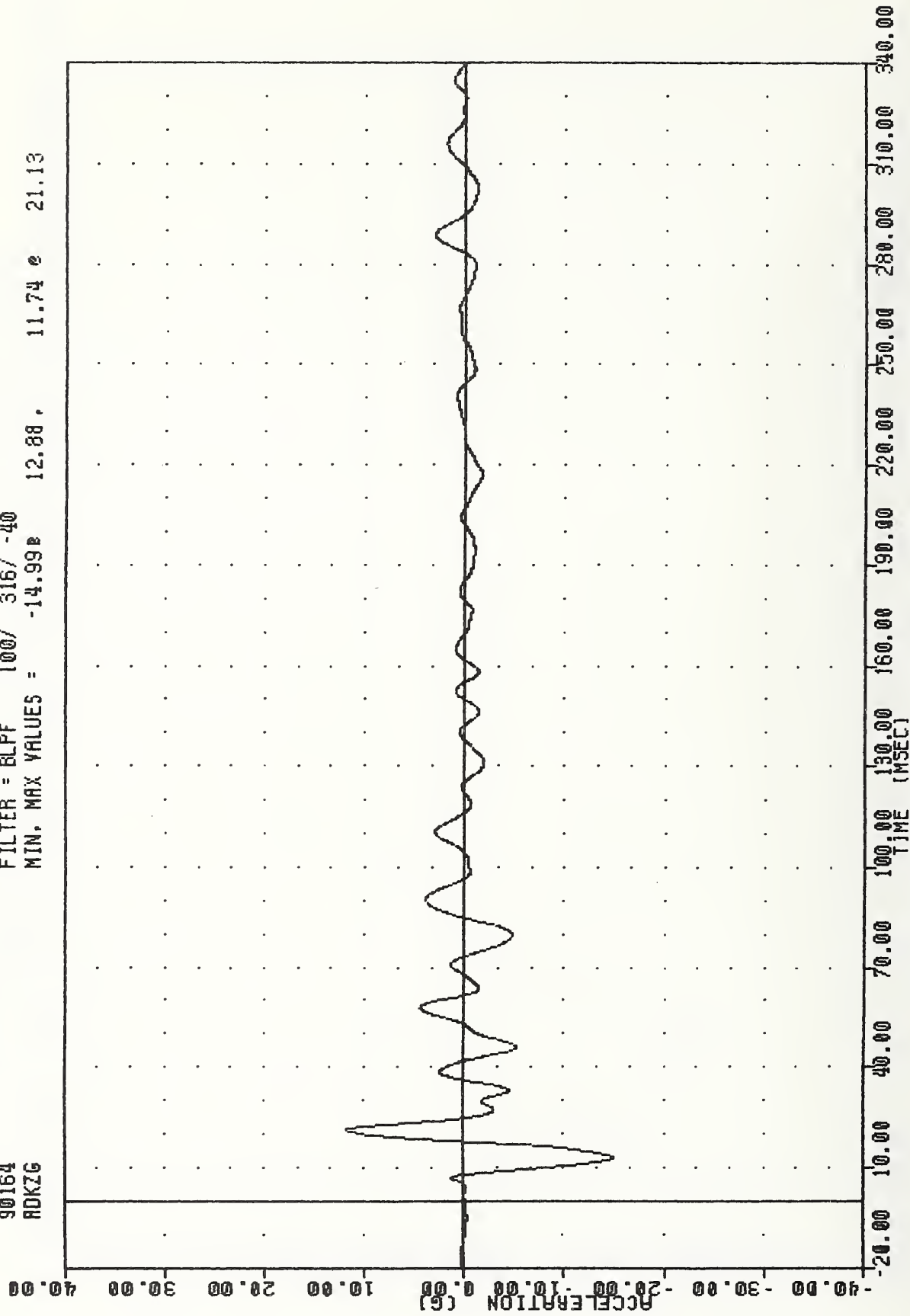
VRTC
SI PROTECTION PROD VEHICLE
90164
ADKZG

900613

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -14.99E

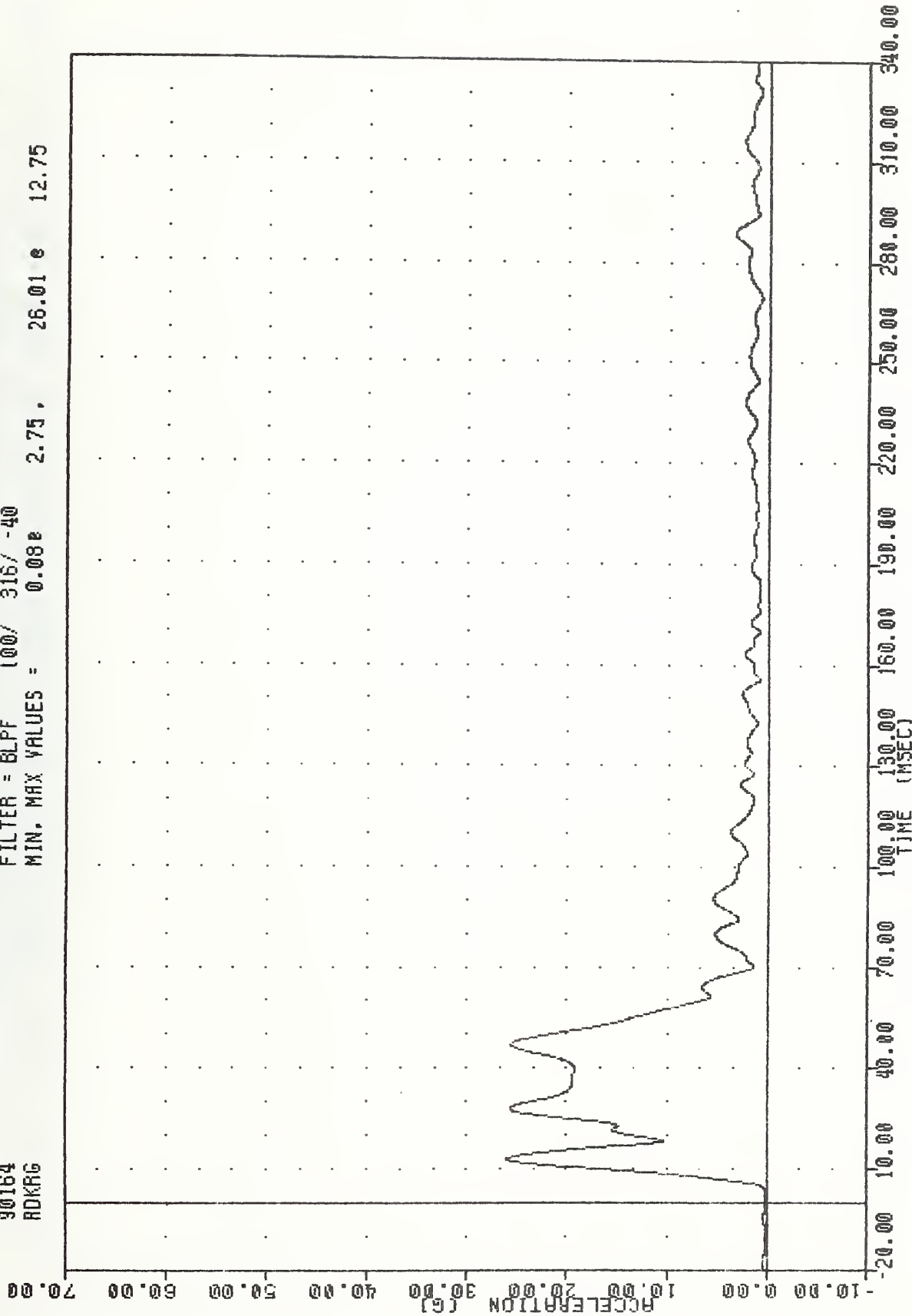
12.88, 11.74 e 21.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
VEHICLE REAR DECK Z-AXIS ACCELERATION

VRTC
SI PROTECTION PROD VEHICLE
90164
RDKRG

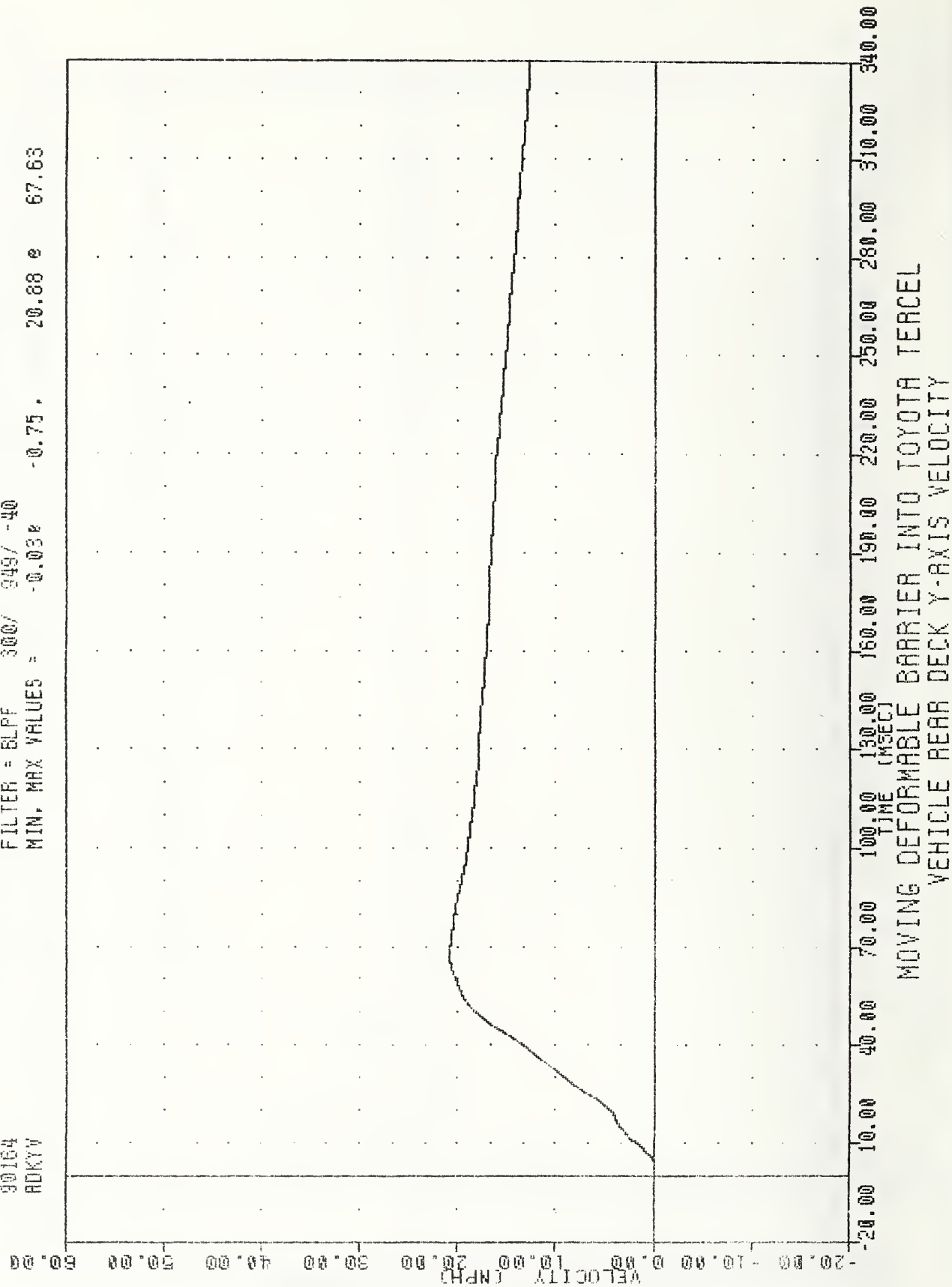
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = 2.75, 26.01 e 12.75



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
VEHICLE REAR DECK RESULTANT ACCELERATION

YRTC , 500613
 SI PROTECTION PROD VEHICLE
 90164
 RDKYW

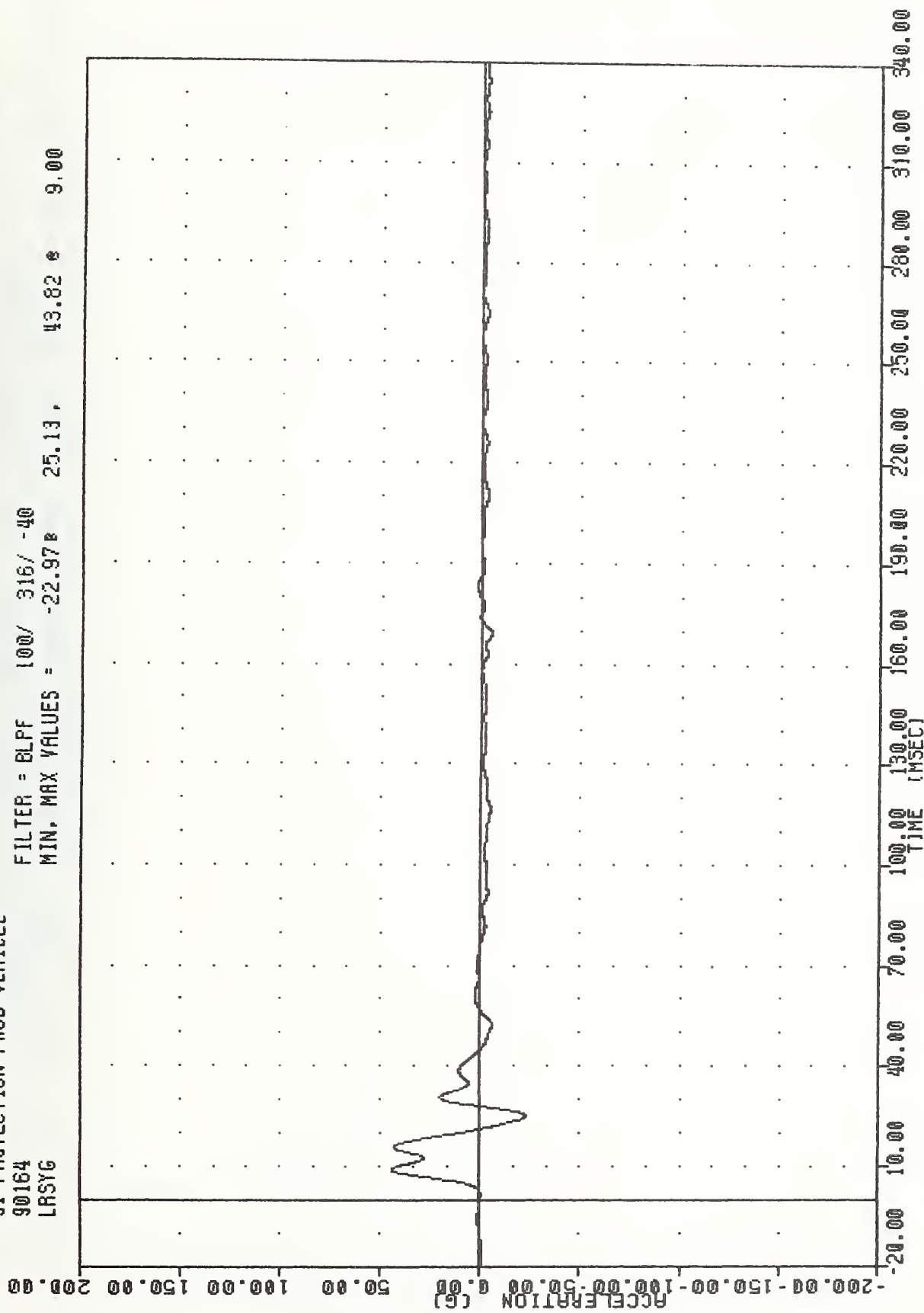
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.03% -0.75 . 20.88 e 67.63



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 VEHICLE REAR DECK Y-AXIS VELOCITY

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LRSYG

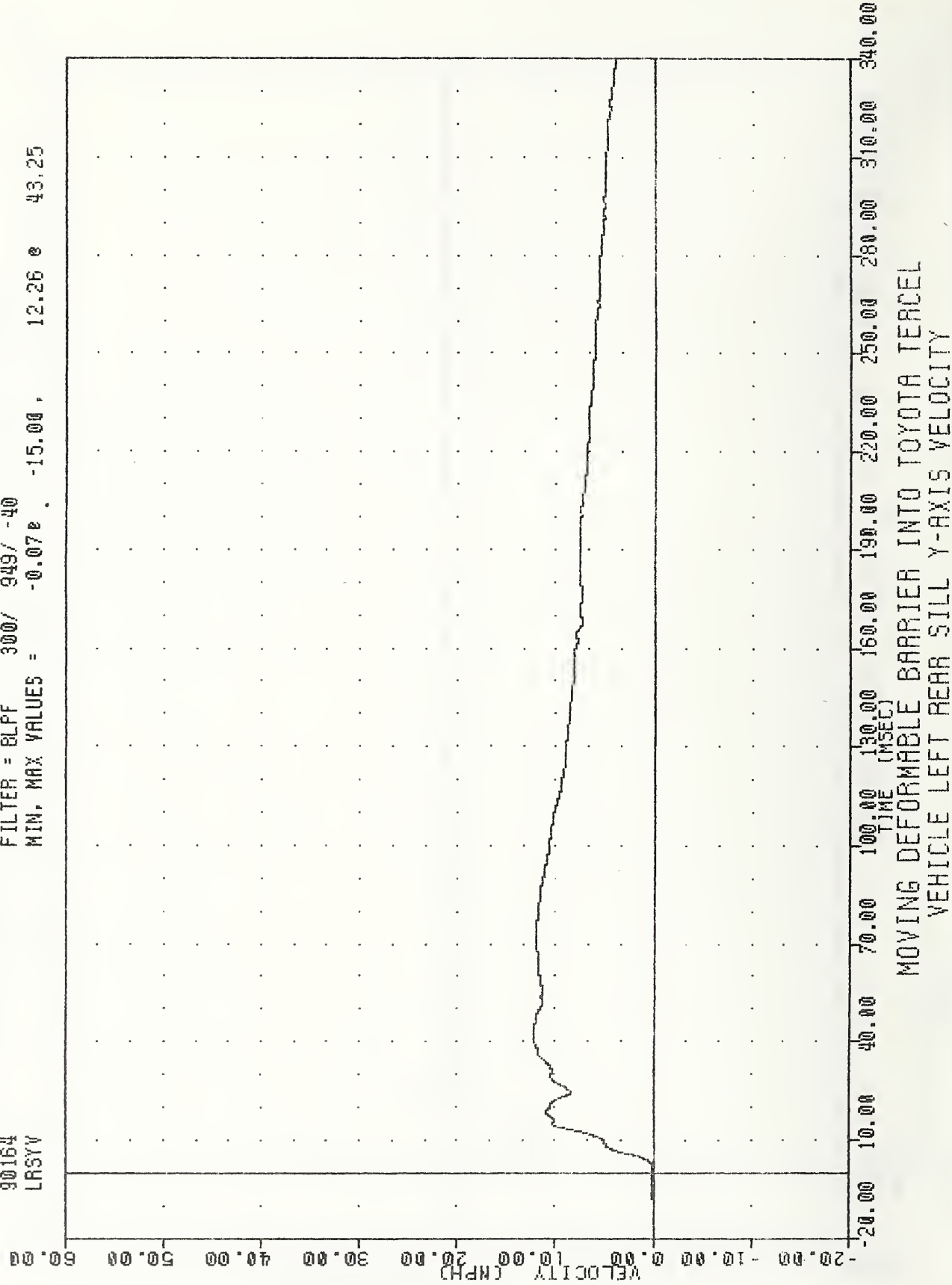
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -22.97 25.13, 43.82 9.00



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
VEHICLE LEFT REAR SILL Y-AXIS ACCELERATION

WRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LRSYV

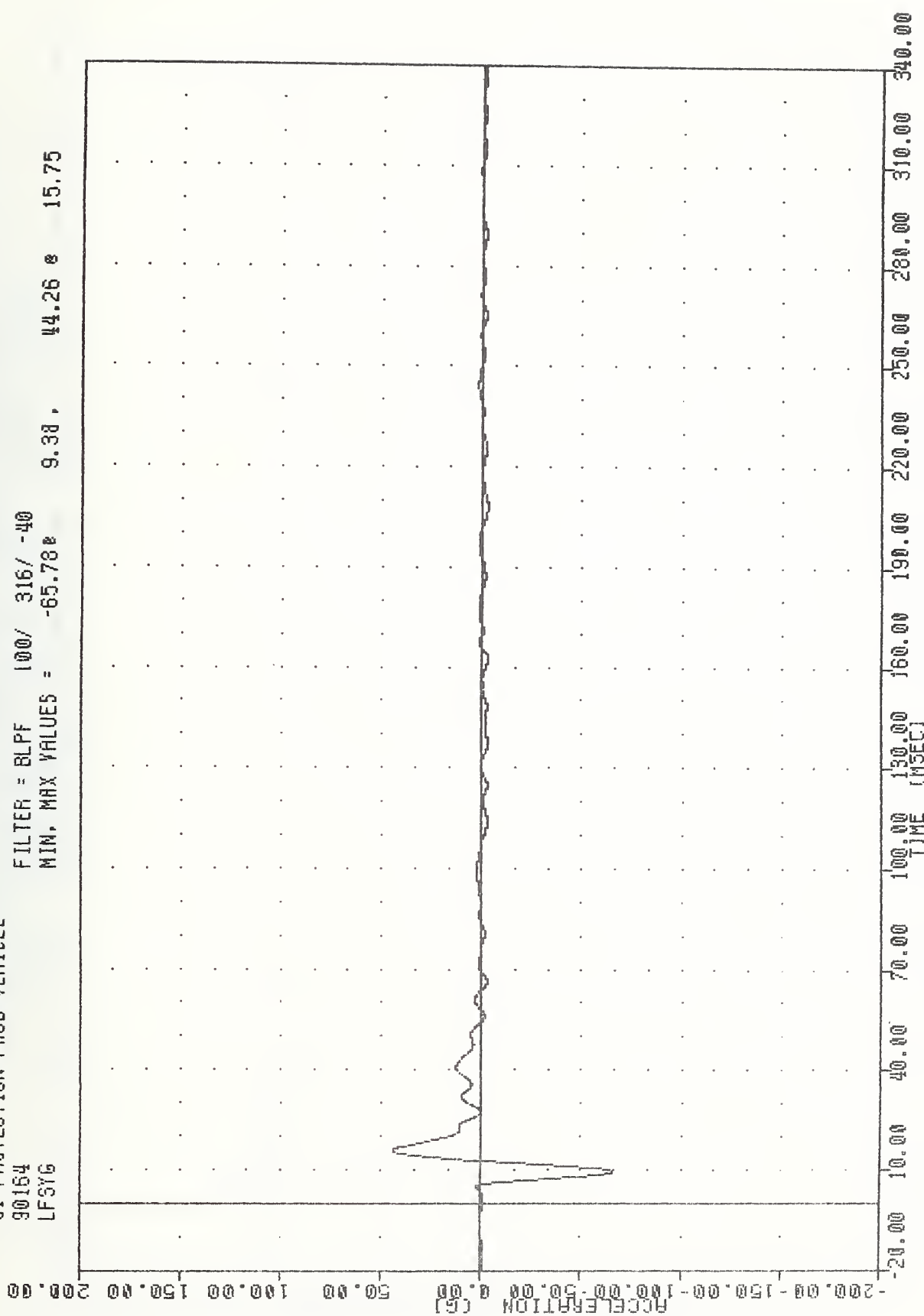
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.07e , -15.00 , 12.26 e 43.25



WRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LFSYG

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -65.78#

9.38 , 44.26 # 15.75

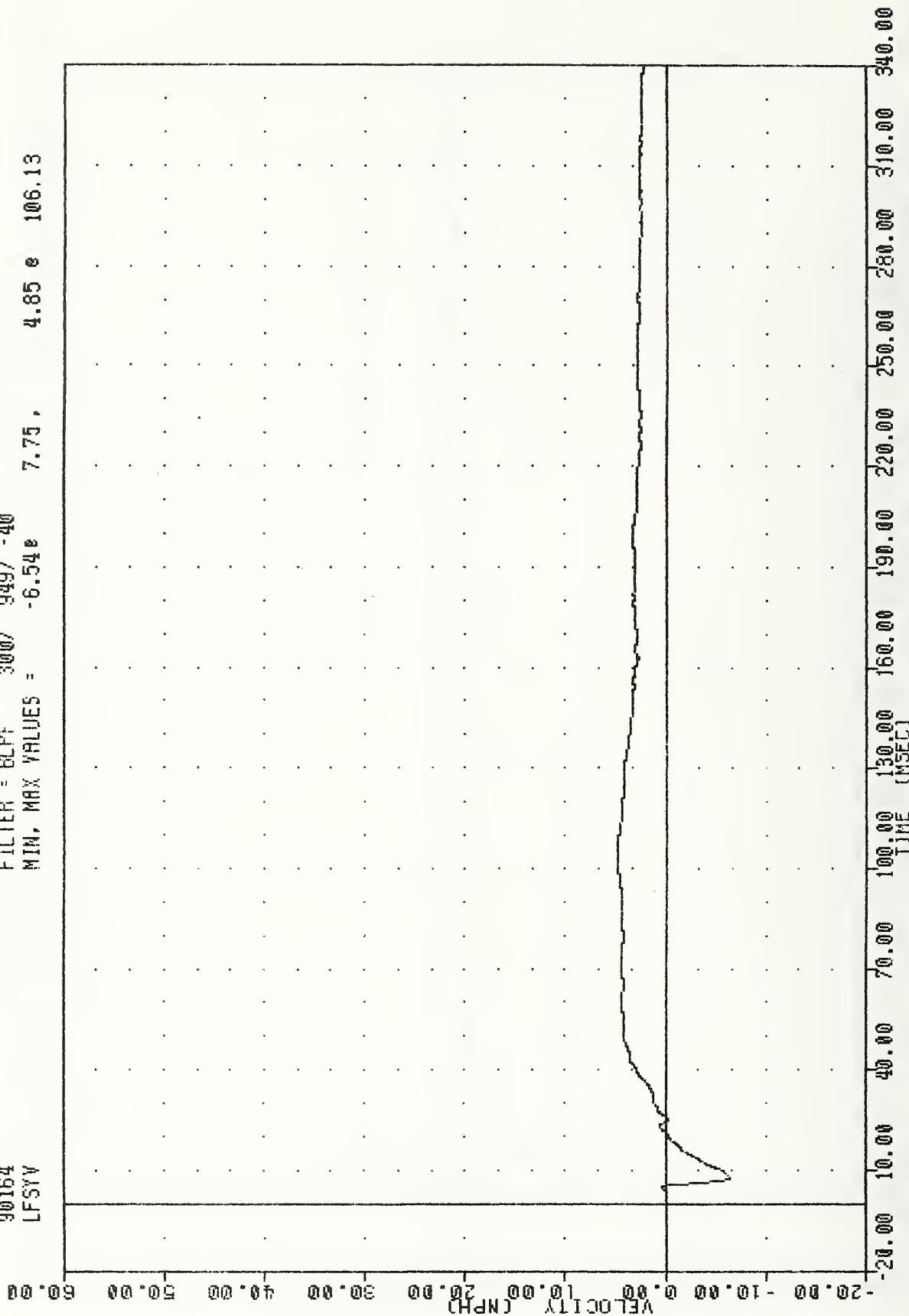


MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 VEHICLE LEFT FRONT SILL Y-AXIS ACCELERATION

YRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LFSYV

FILTER = 8LFF 300/ 949/ -40
 MIN, MAX VALUES = -6.54e

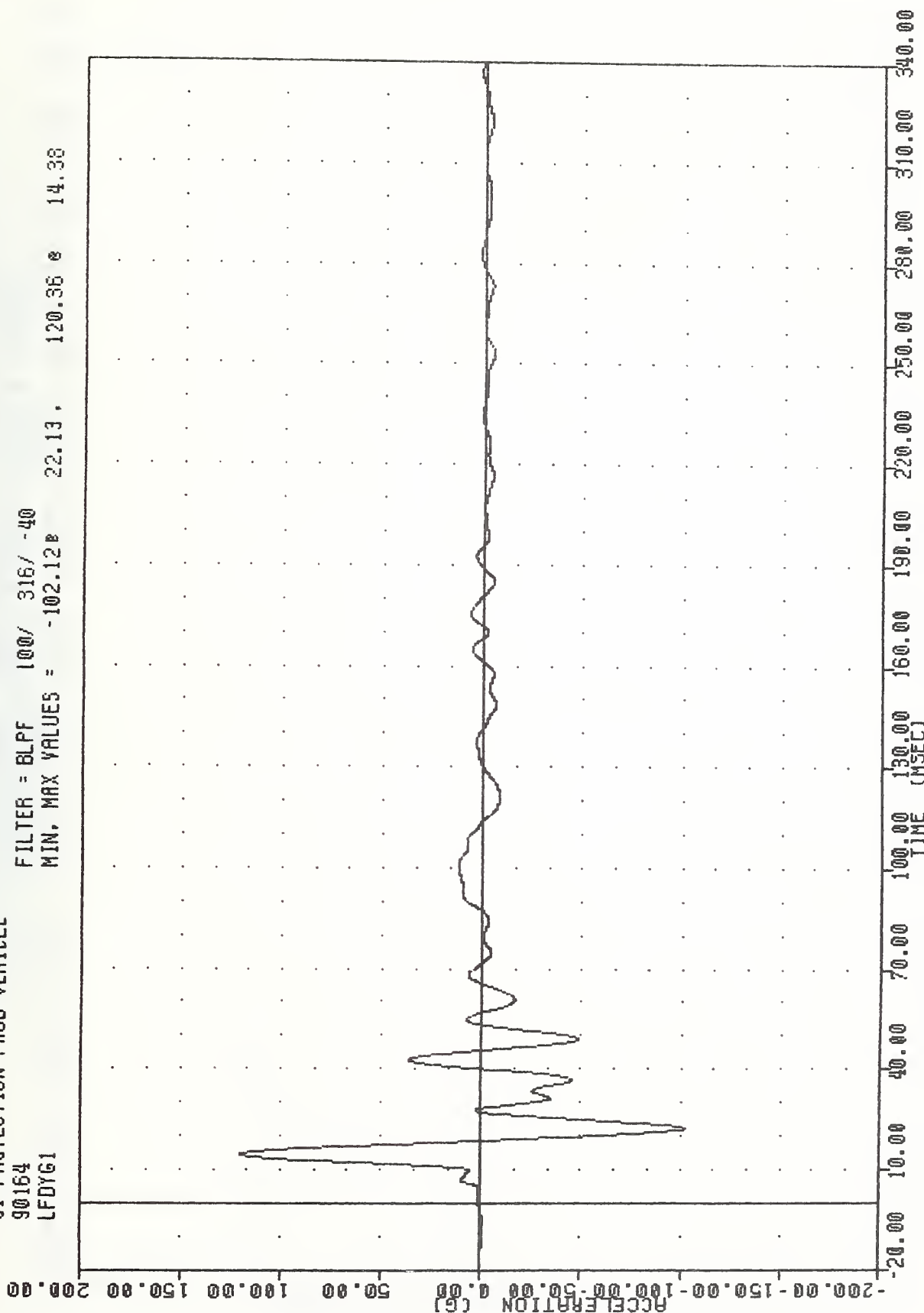
7.75 , 4.85 e 106.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 VEHICLE LEFT FRONT SILL Y-AXIS VELOCITY

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LFDY61

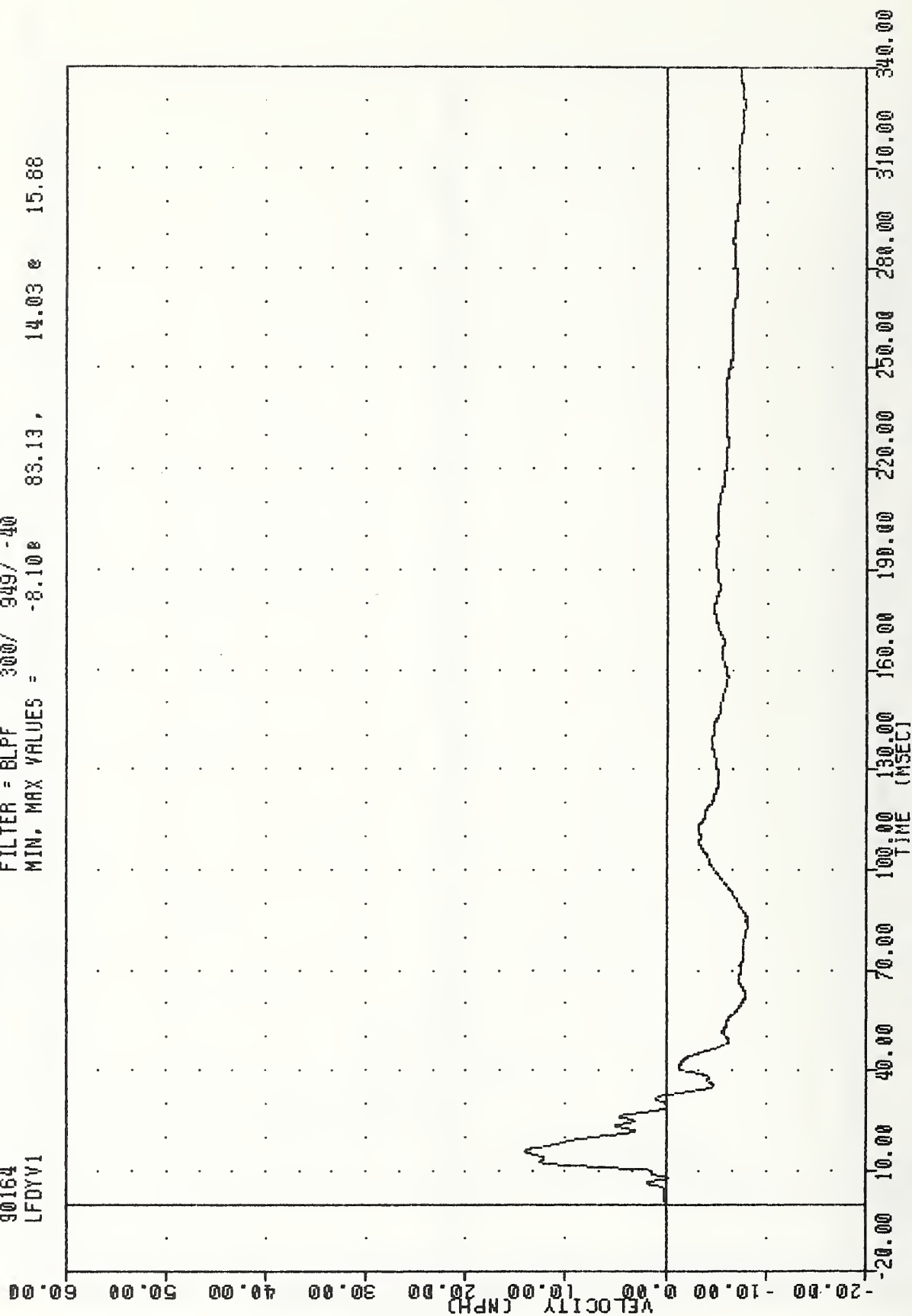
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -102.128 22.13, 120.36 14.38



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

VRTC , 900613
SI PROTECTION PROD VEHICLE
90164
LFDYV1

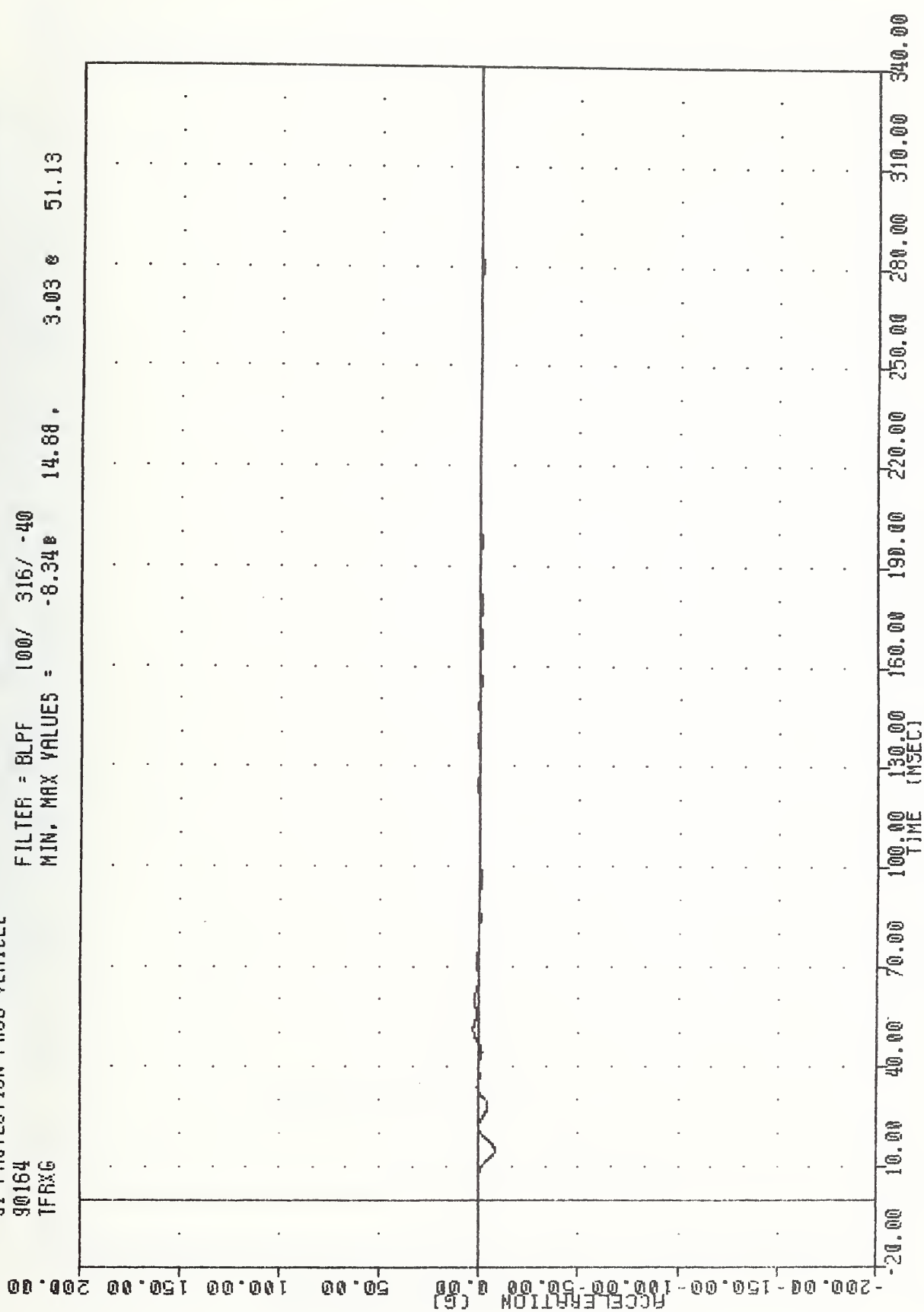
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -8.108 83.13, 14.03 e 15.88



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
VEHICLE LEFT FRONT DOOR (POSITION 6) Y-AXIS VELOCITY

WRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 TFRXG

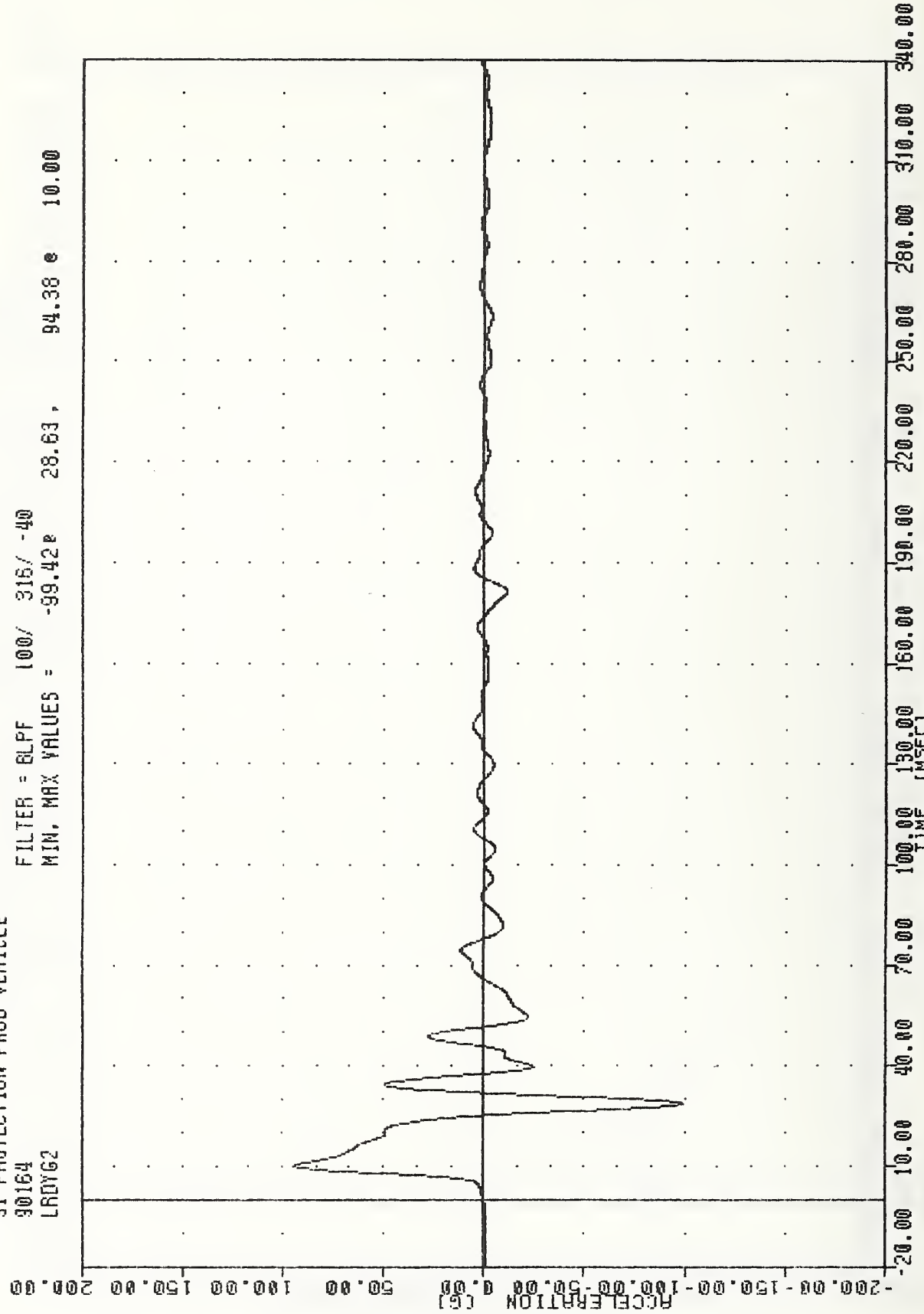
FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -8.34e 14.88 , 3.03 e 51.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 VEHICLE TRUNK FLOOR RIGHT X-AXIS ACCELERATION

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LRDY62

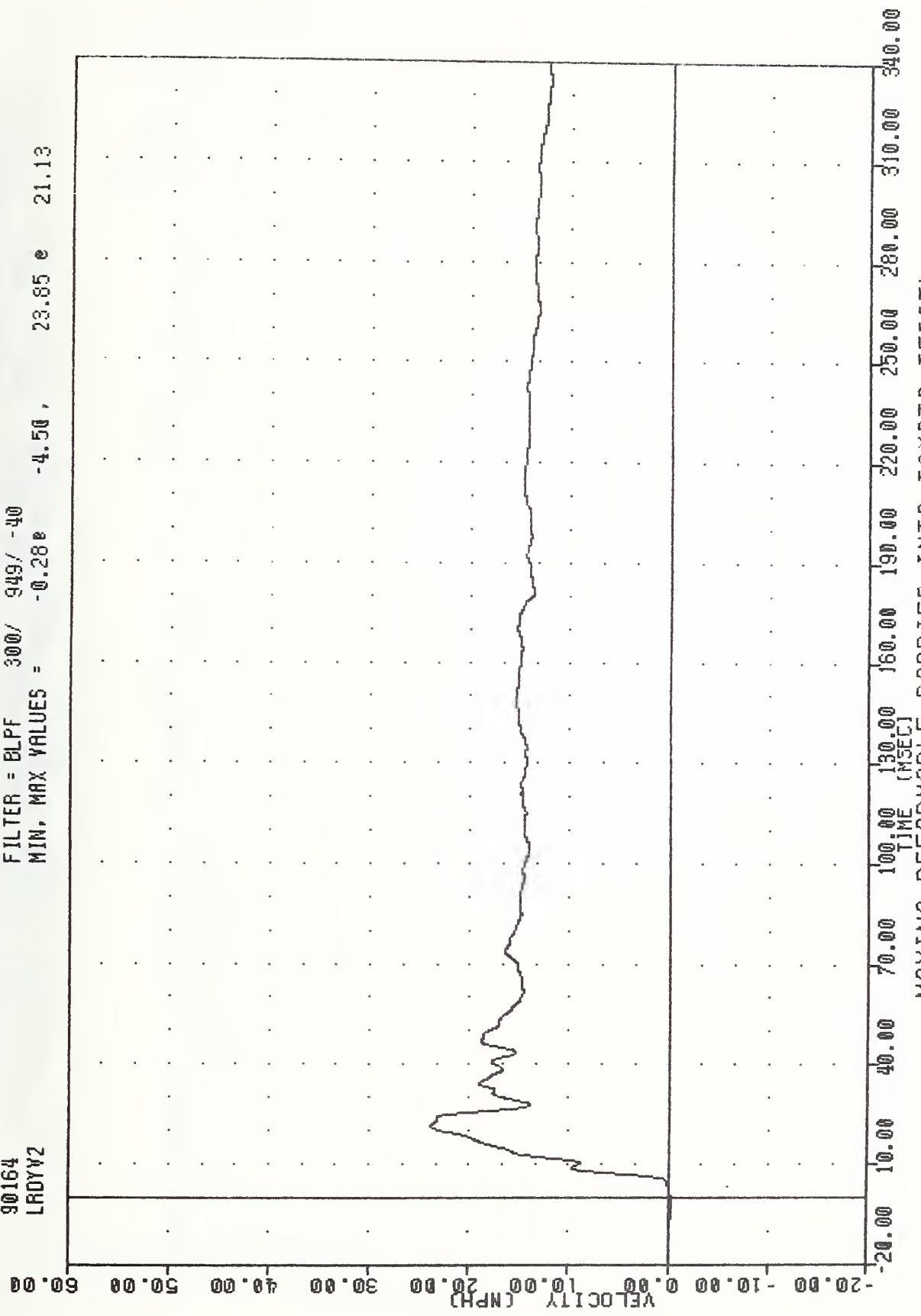
FILTER = 8LPF 100/ 315/ -40
 MIN, MAX VALUES = -99.42e 28.63, 94.38 e 10.00



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

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LR0YV2

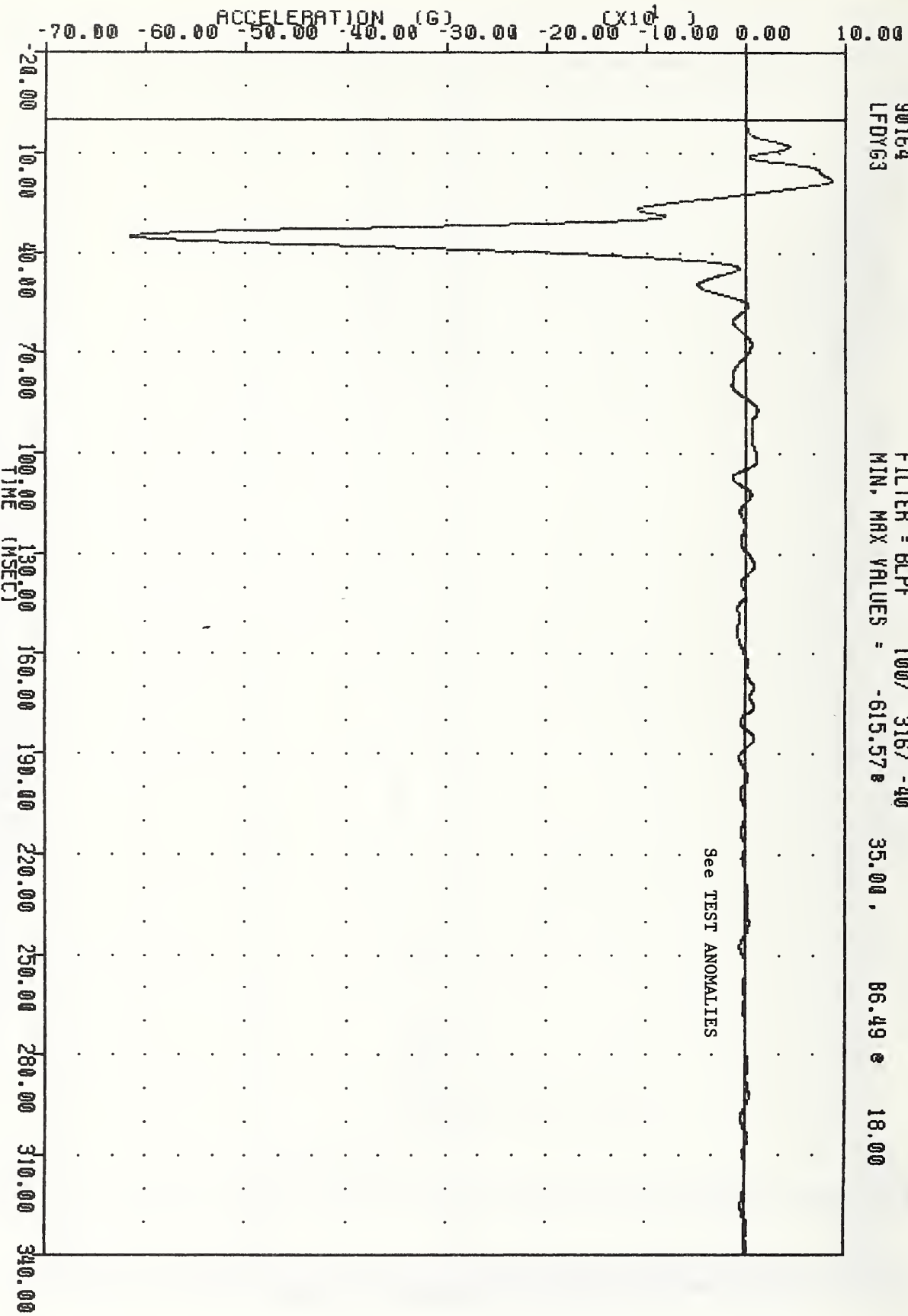
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.280 -4.50, 23.85 e 21.13



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

VRTC
 SI PROTECTION PROD VEHICLE
 90164
 LFDY63

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -615.57 35.00 , 86.49 18.00



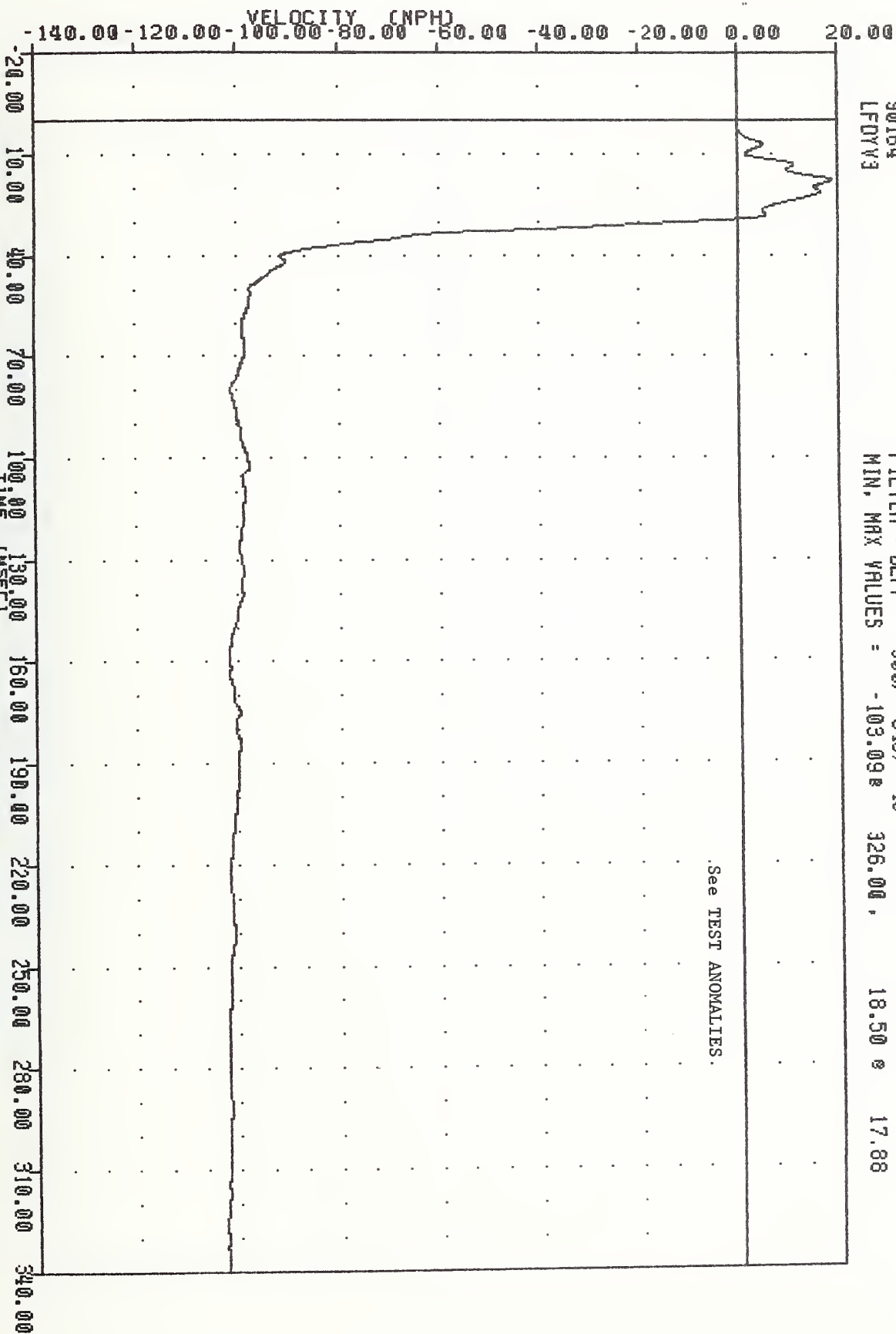
See TEST ANOMALIES

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

VRTC , 900613
 SI PROTECTION PROD VEHICLE
 90184
 LFDYV3

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -103.09 326.00 , 18.50 17.88

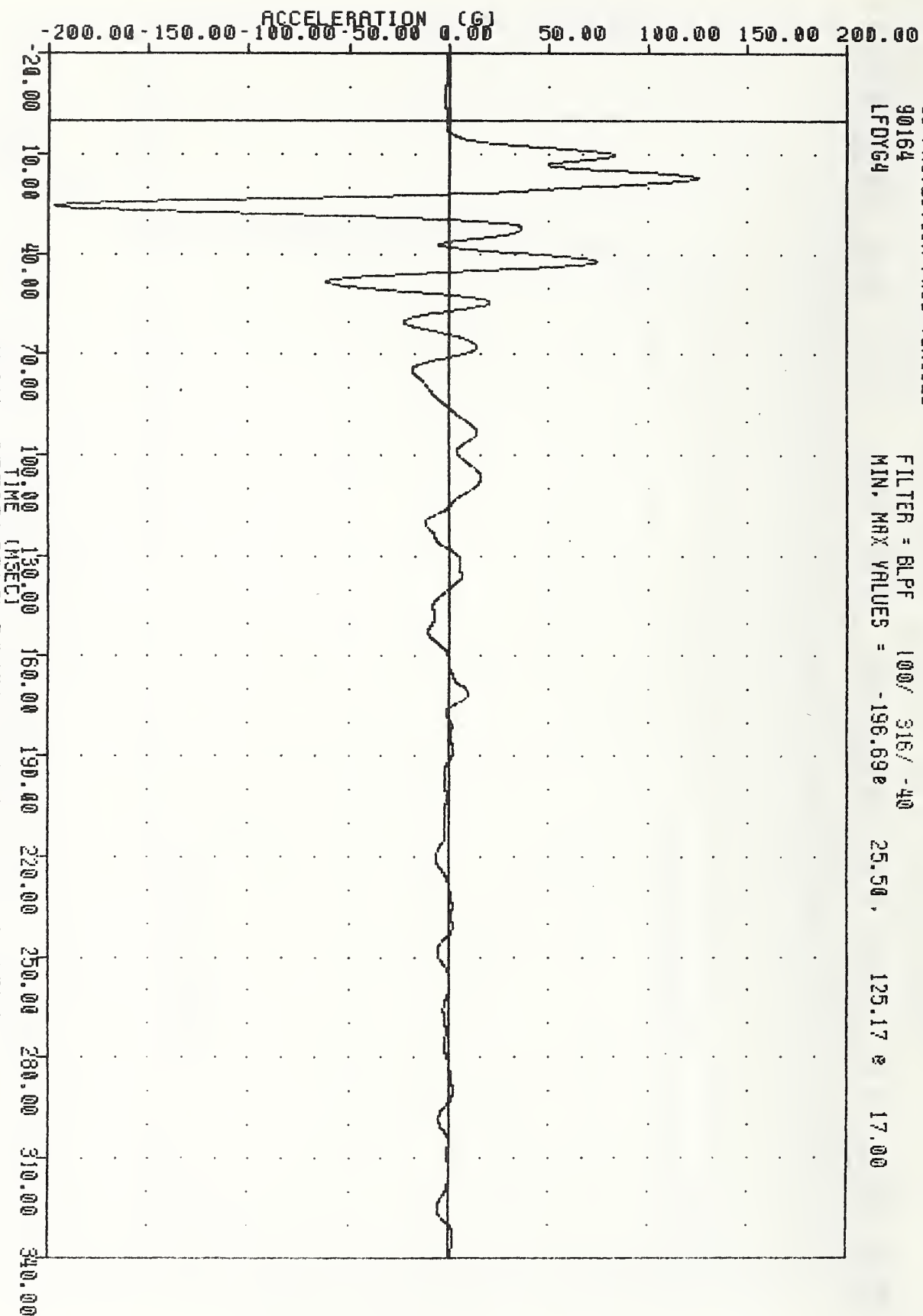
.See TEST ANOMALIES.



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

VRIC 900613
 SI PROTECTION PROD VEHICLE
 90164
 LFDY64

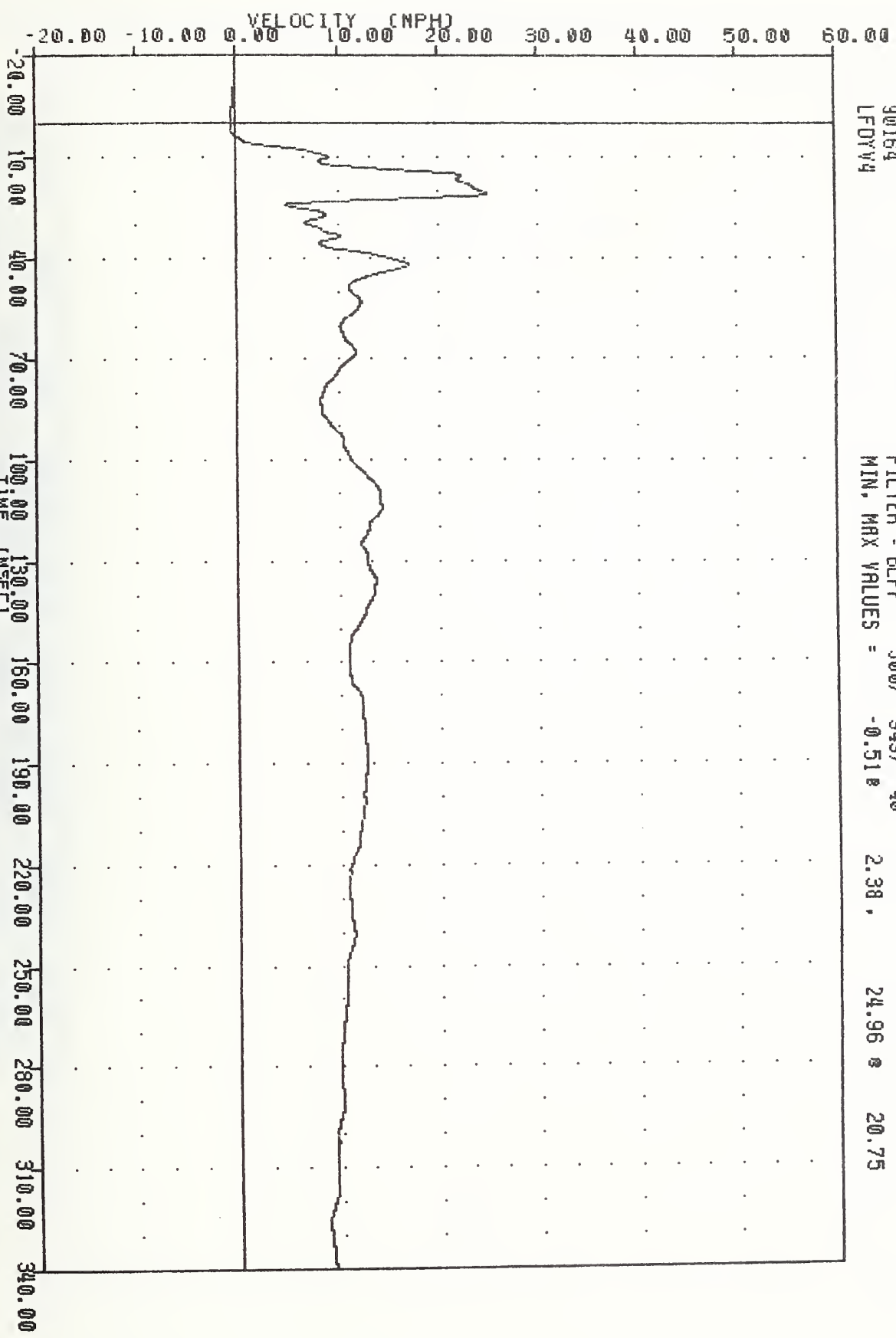
FILTER = 6LPF 100/ 316/ -40
 MIN, MAX VALUES = -196.69e 25.50 , 125.17 e 17.00



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

VRIC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 LFOYV4

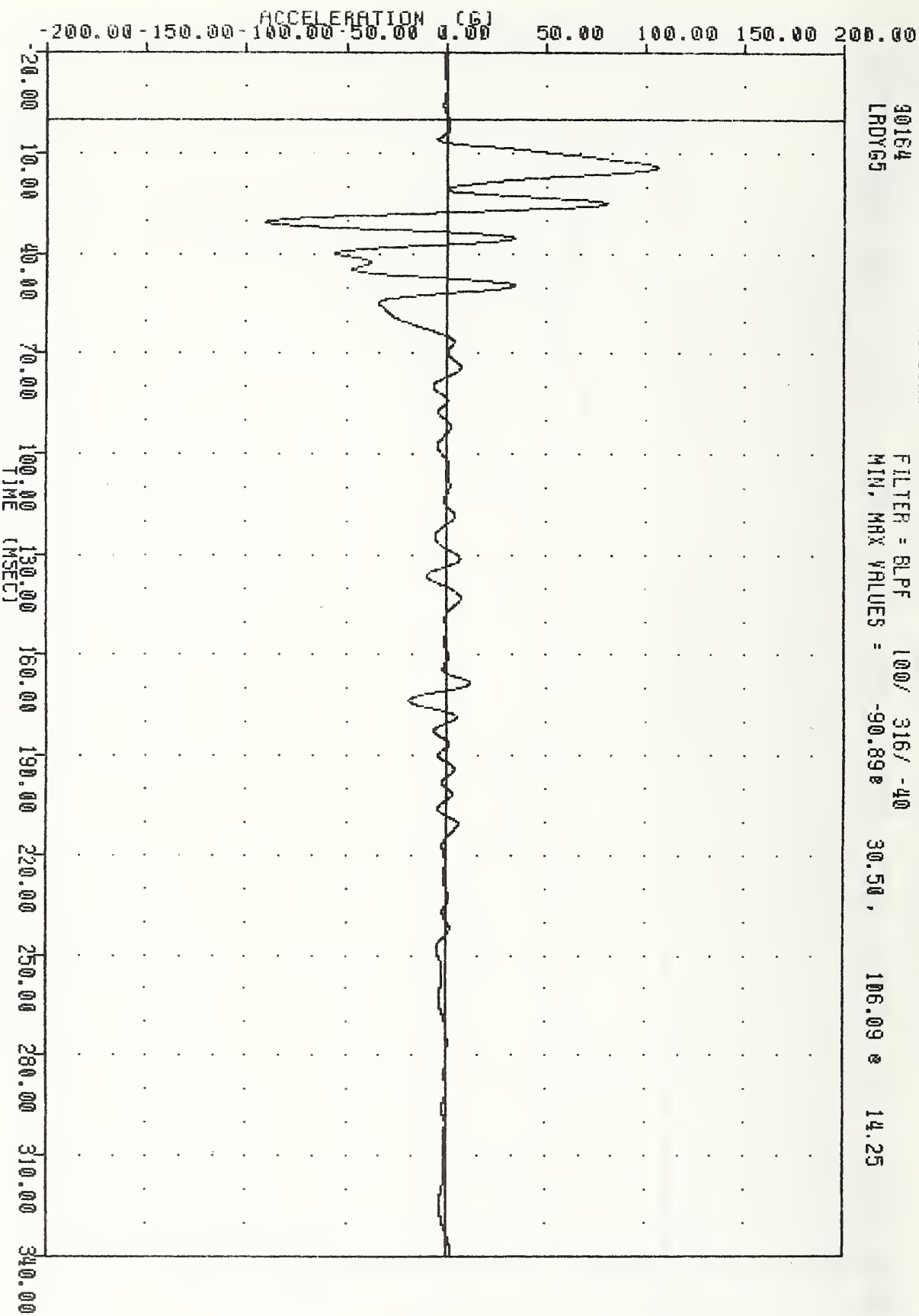
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.518 2.38 , 24.96 20.75



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

VRTC 900613
 S1 PROTECTION PROD VEHICLE
 30164
 LRDY65

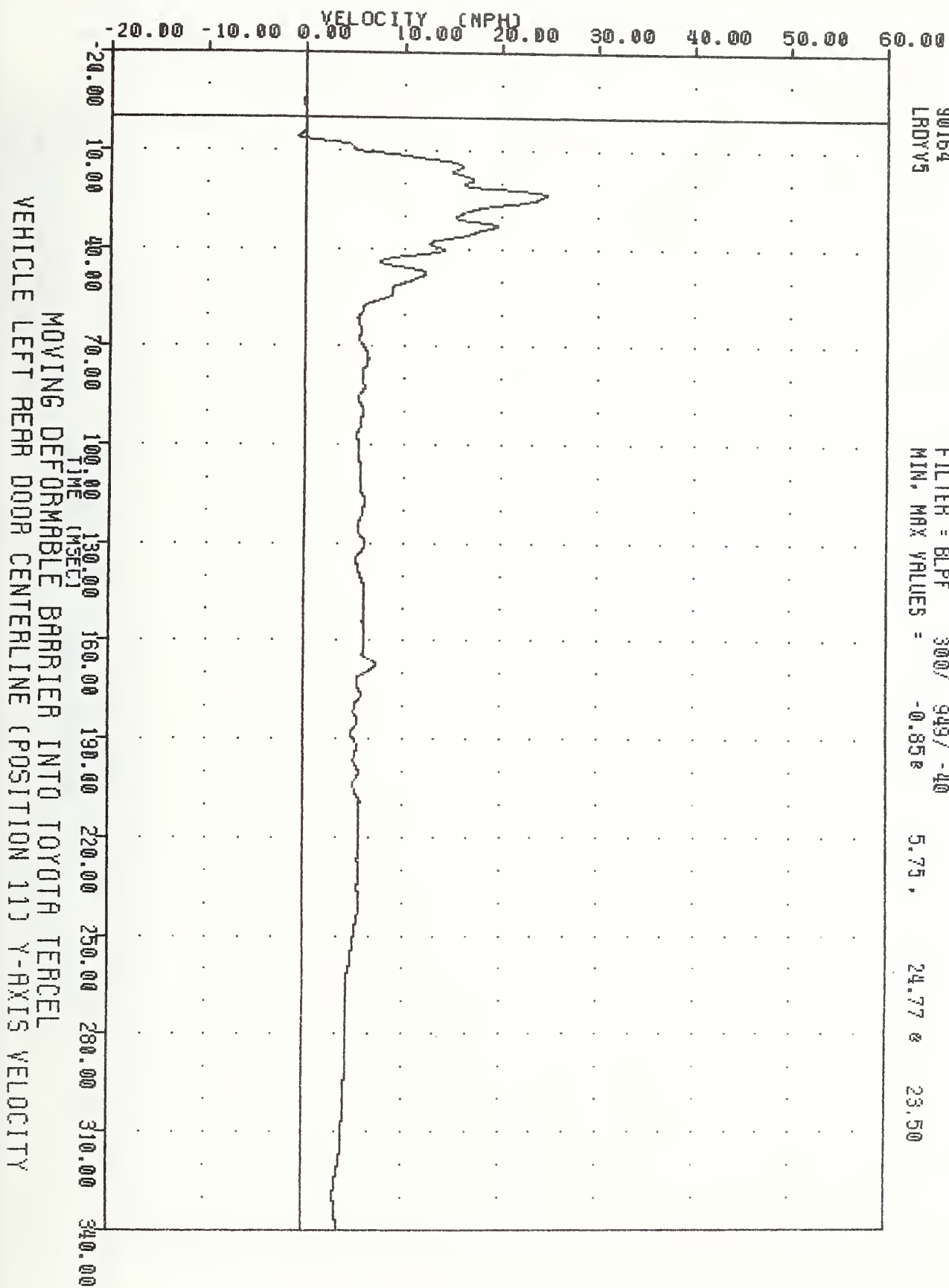
FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -90.89g 30.50 , 106.09 g 14.25



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

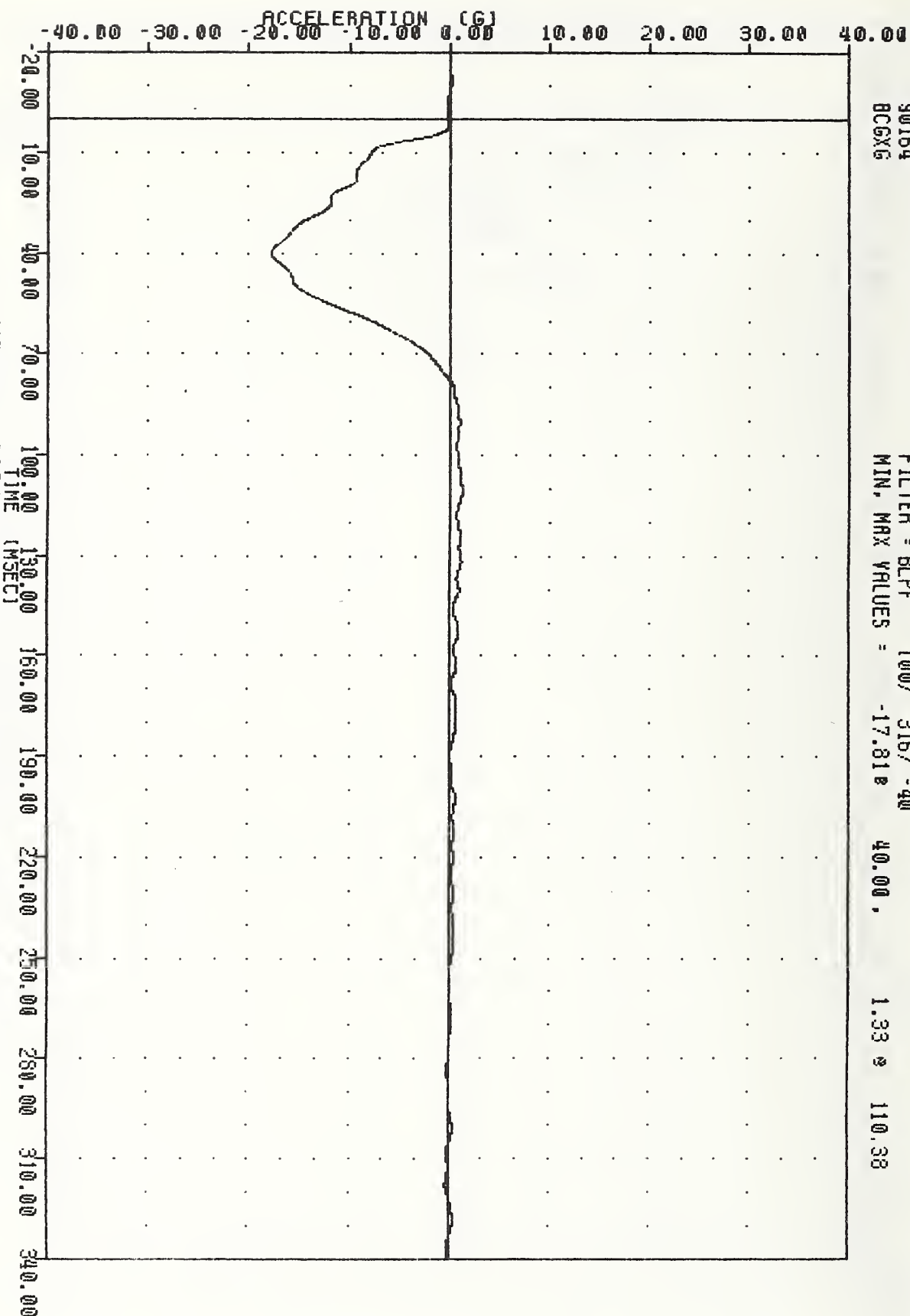
VRTC '900613
 SI PROTECTION PROD VEHICLE
 90164
 LRDYV5

FILTER = BLPF 300/ 943/ -40
 MIN, MAX VALUES = -0.85e 5.75, 24.77 @ 23.50



WRTC
 SI PROTECTION PROD VEHICLE
 90164
 BC6X6

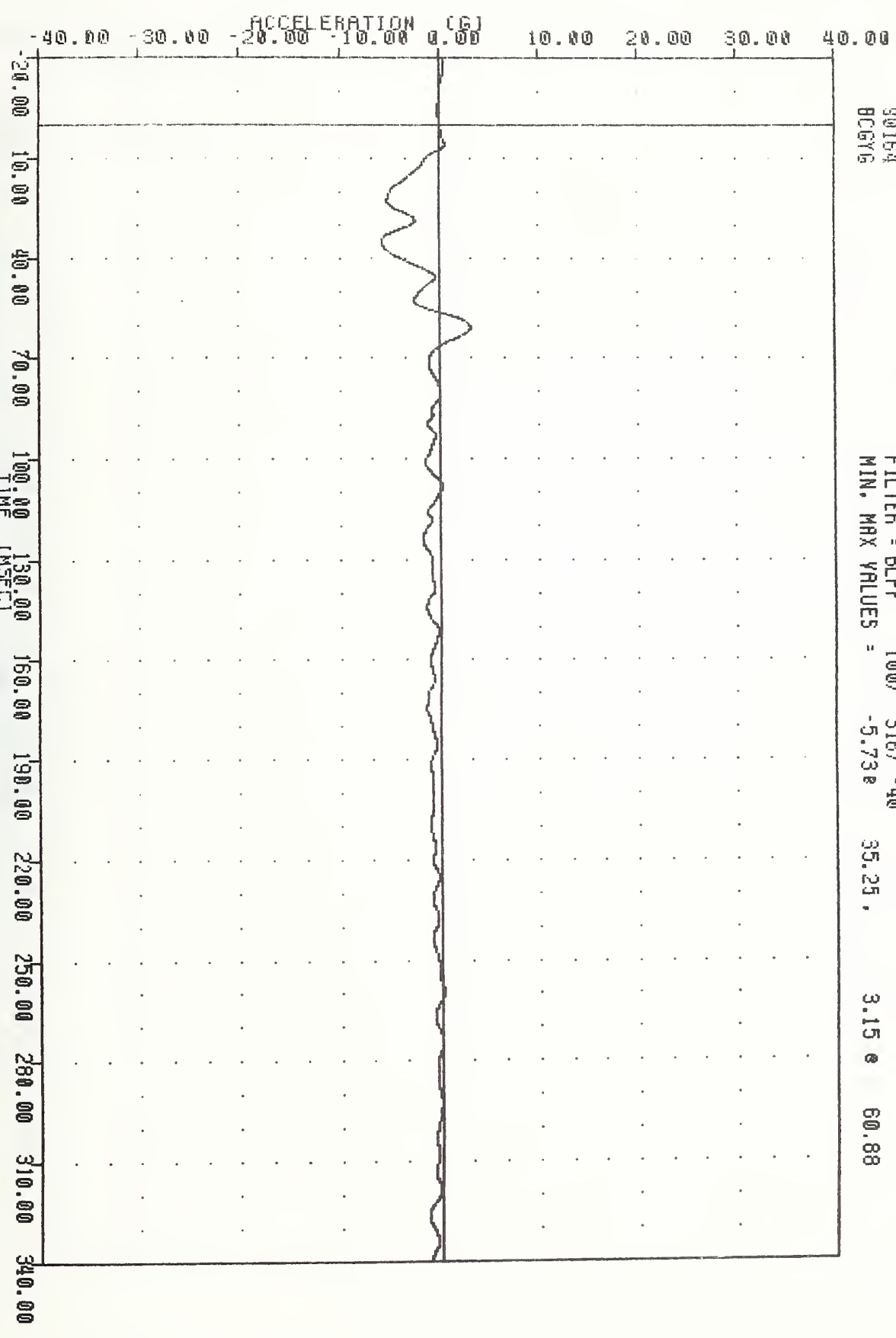
FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -17.81 40.00
 1.33 110.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION

WRTC
 SI PROTECTION PROD VEHICLE
 90154
 BC6Y6

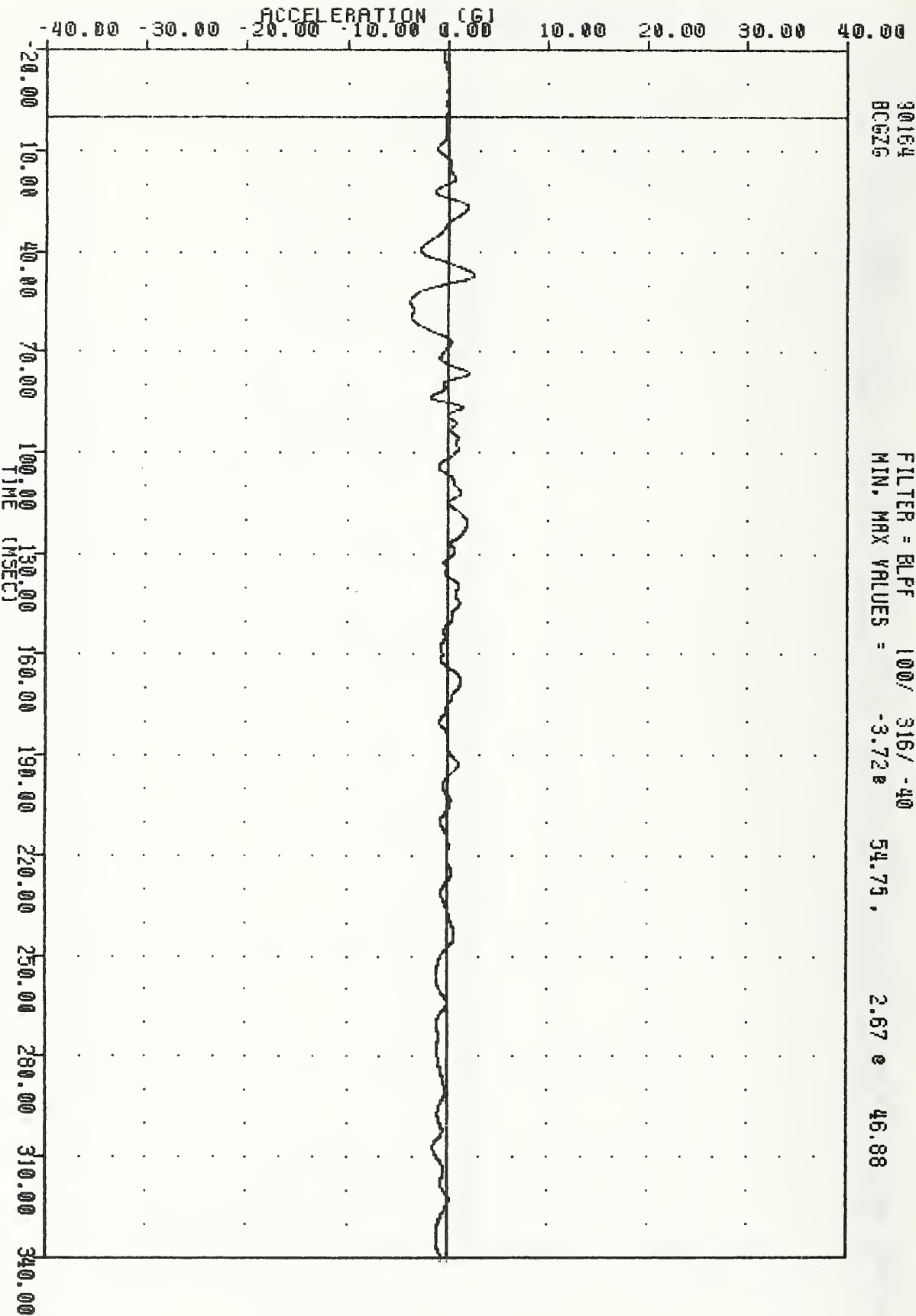
FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -5.73e 35.25 , 3.15 e 60.88



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION

VRIC 900613
 SI PROTECTION PROD VEHICLE
 90164
 BCGZ6

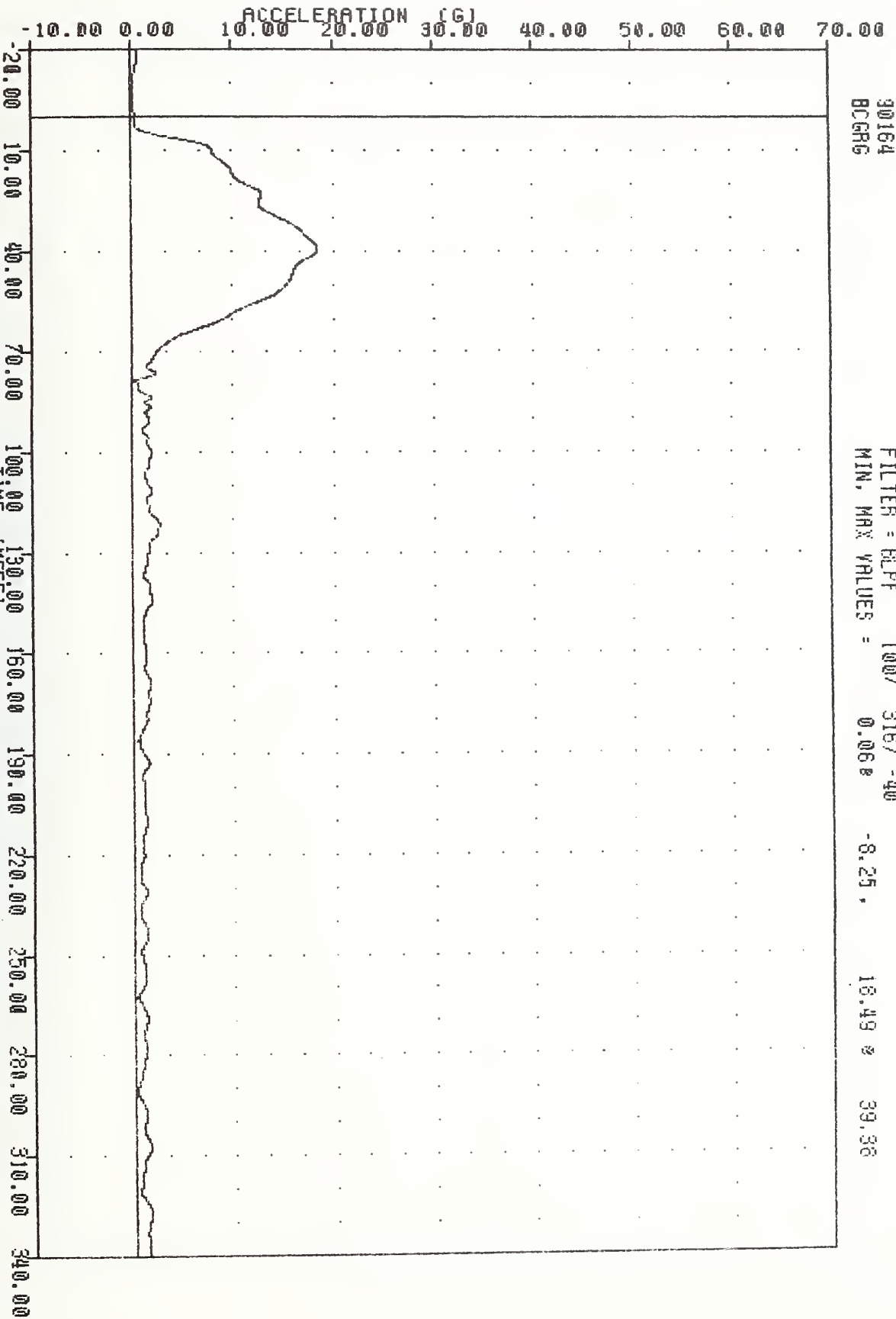
FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -3.72e 54.75 , 2.67 e 46.88



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 BARRIER CENTER OF GRAVITY Z-AXIS ACCELERATION

VRTC , 900613
SI PROTECTION PROD VEHICLE
30164
BCGR6

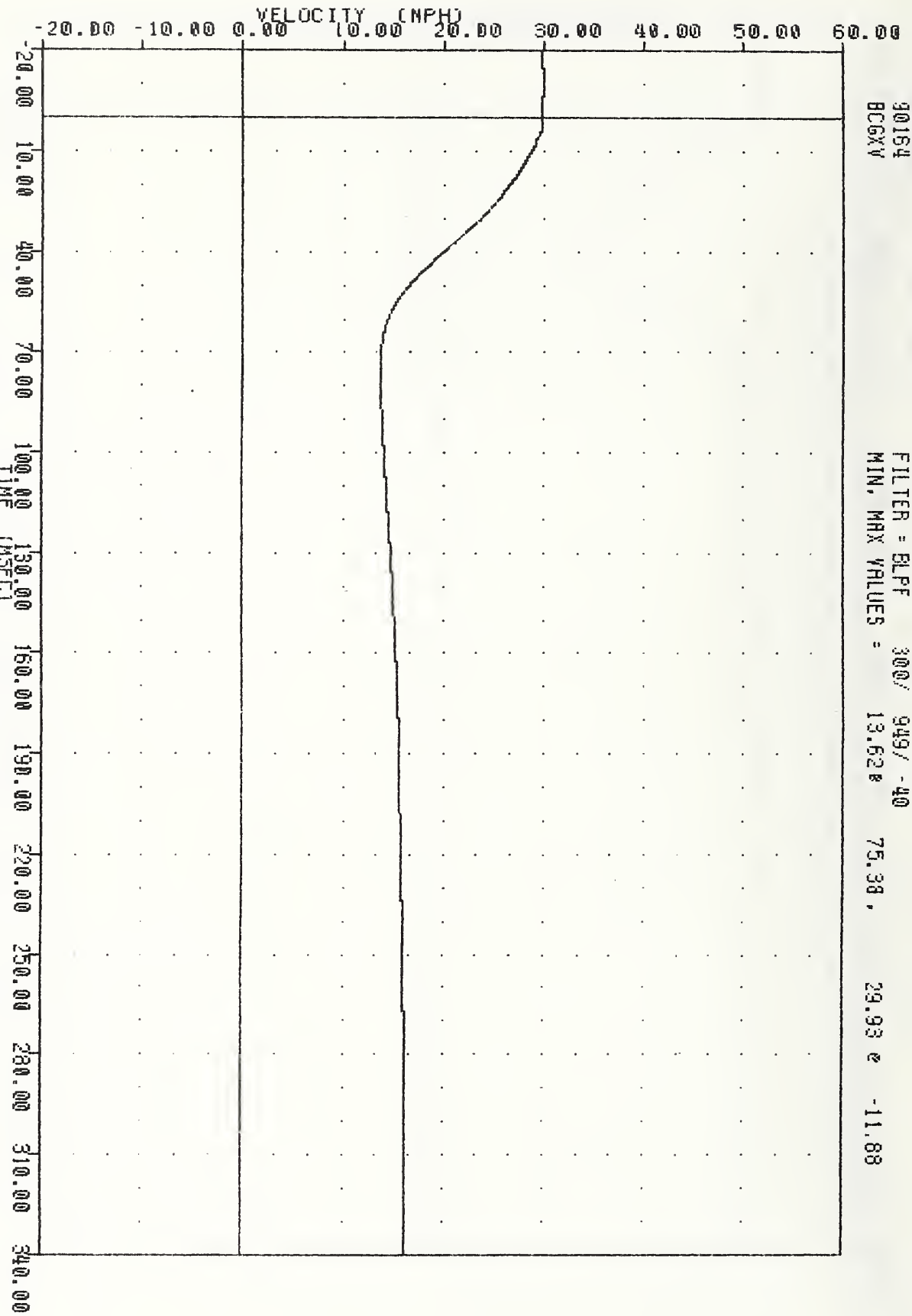
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = 0.06g -8.25 , 18.49 g 39.36



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

WRTC 300613
 SI PROTECTION PROD VEHICLE
 90154
 BCGXV

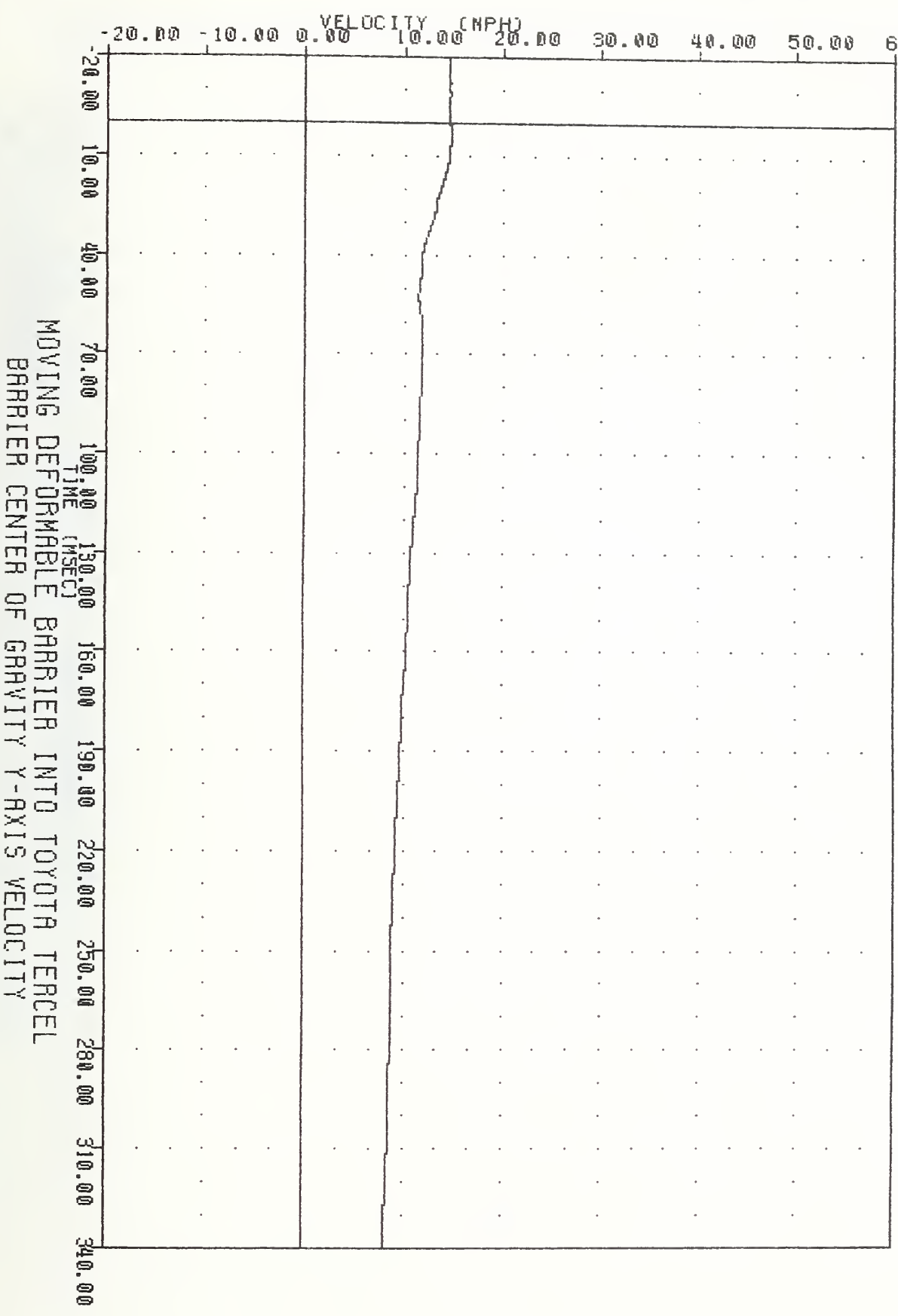
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 13.62 75.38 29.93 -11.88



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 BARRIER CENTER OF GRAVITY X-AXIS VELOCITY

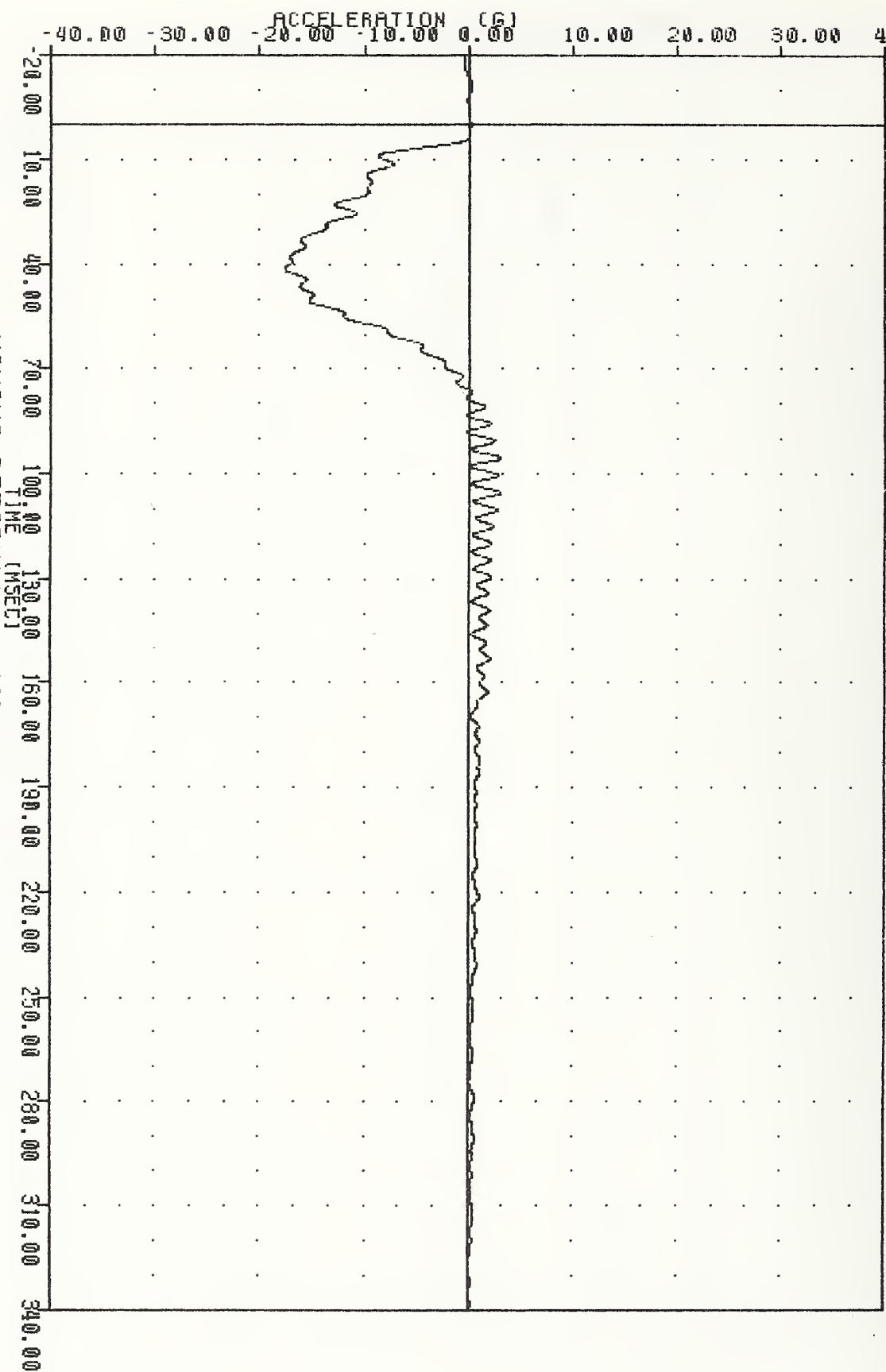
WRIC * 900613
 SI PROTECTION PROD VEHICLE
 90164
 BCGIV

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 8.07e 340.00 , 14.73 e 5.50



VRTC ' 900613
 SI PROTECTION PROD VEHICLE
 90164
 BRXG

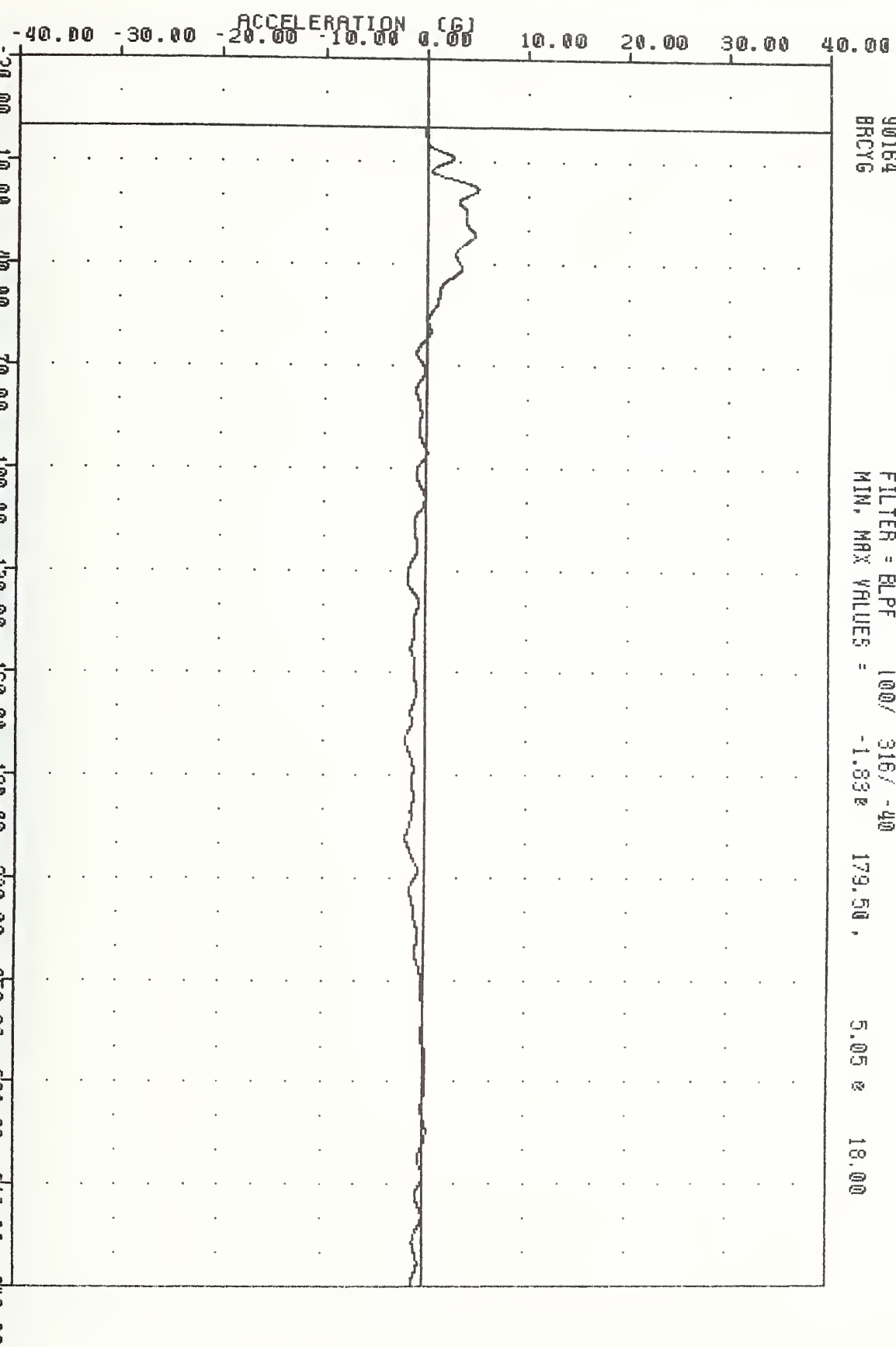
FILTER = ELPF 100/ 316/ -40
 MIN. MAX VALUES = -17.61e 41.50 , 3.08 e 95.38



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 BARRIER PEAR CROSSMEMBER X-AXIS ACCELERATION

VRTC
 SI PROTECTION PROD VEHICLE
 90164
 BR016

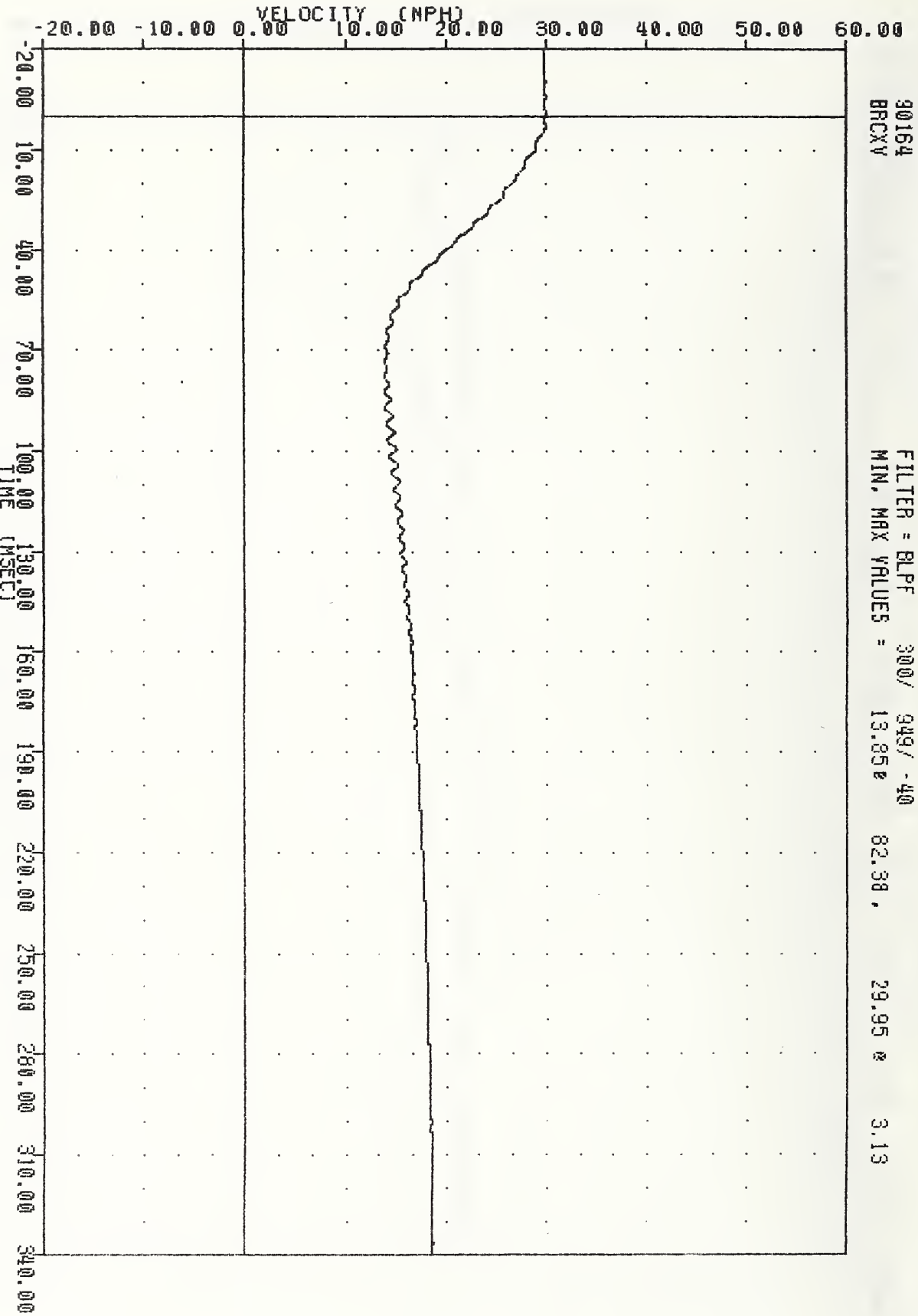
FILTER = RLPF 100/ 316/ -40
 MIN, MAX VALUES = -1.83e 179.50 , 5.05 e 18.00



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 BARRIER REAR CROSSMEMBER Y-AXIS ACCELERATION

WRTC , 900613
 SI PROTECTION PROD VEHICLE
 90164
 BRXY

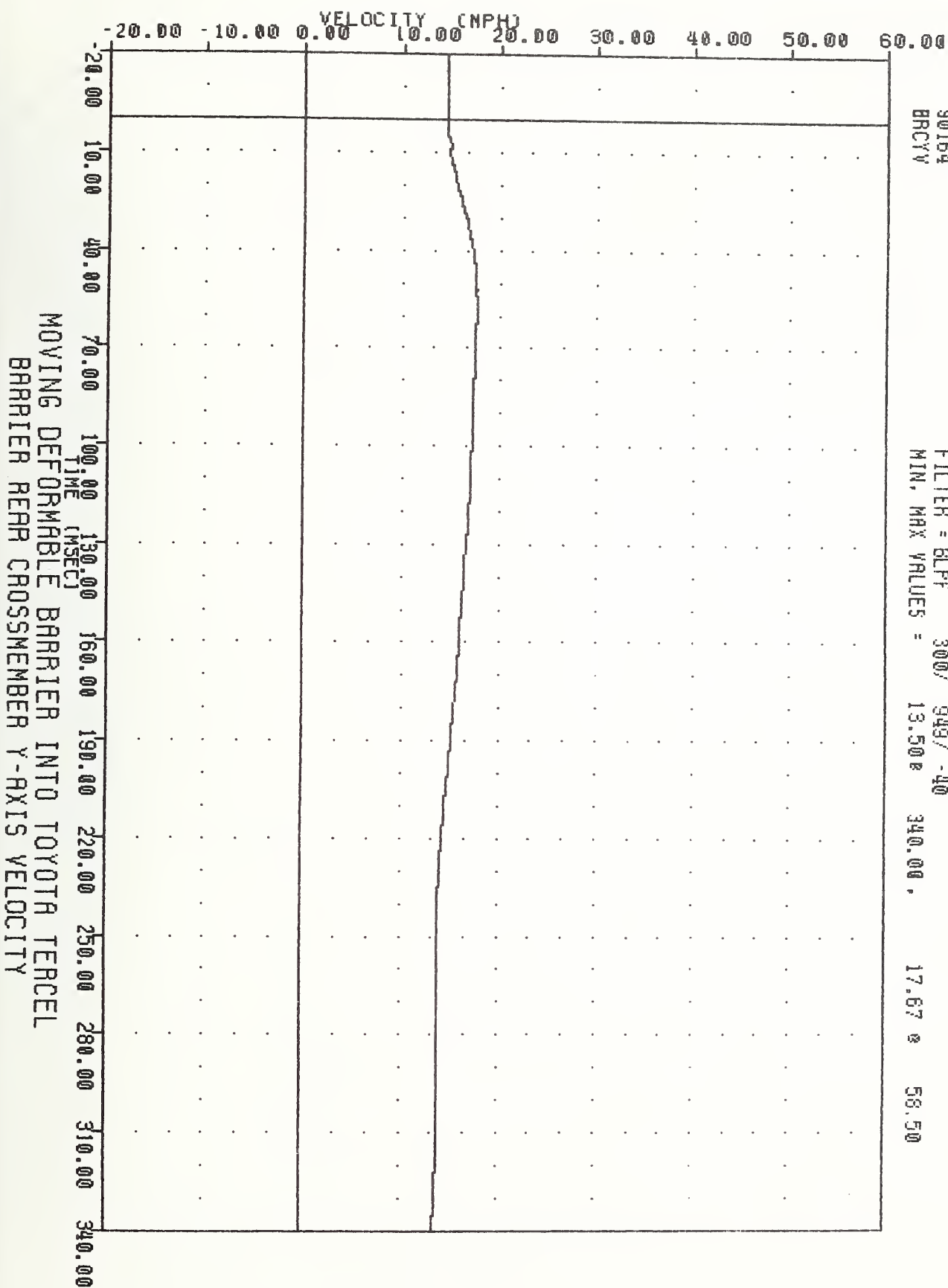
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 13.05 82.38 , 29.95 3.13



MOVING DEFORMABLE BARRIER INTO TOYOTA TERCEL
 BARRIER REAR CROSSMEMBER X-AXIS VELOCITY

VRIC 300613
 SI PROTECTION PROD VEHICLE
 90164
 BRVY

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 13.50 340.00 , 17.67 58.50





APPENDIX C

DUMMY CERTIFICATION

PRE-TEST DRIVER DUMMY

DUMMY NO.: 01

BIOSID CALIBRATION RESULTS

PRE-TEST CALIBRATION FOR TEST #900613

DUMMY NO. 01 SERIES NO. TRC-CAL 11 DATE 06/06/90

CALIBRATION TEST	SAE* CORRIDOR	RESULTS
SHOULDER		
IMPACT FORCE (kN)	3.7 - 4.6	4.09
SHOULDER ACCEL. (g)	NA	87.2
SHOULDER DISPL. (mm)	21 - 31	25.3
THORAX - NO ARM		
IMPACT FORCE (kN)	5.4 - 6.7	5.78
UPPER RIB ACCEL. (g)	120 - 180	158.4
CENTER RIB ACCEL. (g)	120 - 180	158.8
LOWER RIB ACCEL. (g)	120 - 180	164.7
UPPER RIB DISPL. (mm)	50 - 70	58.0
CENTER RIB DISPL. (mm)	50 - 70	62.1
LOWER RIB DISPL. (mm)	50 - 70	62.9
UPPER SPINE ACCEL. (g)	16 - 24	20.5
LOWER SPINE ACCEL. (g)	11 - 17	14.9
THORAX - ARM DOWN		
IMPACT FORCE (kN)	6.2 - 7.9	6.52
SHOULDER ACCEL. (g)	NA	60.4
UPPER RIB ACCEL. (g)	52 - 78	65.4
CENTER RIB ACCEL. (g)	66 - 99	88.6
LOWER RIB ACCEL. (g)	85 - 128	112.9
SHOULDER DISPL. (mm)	17 - 27	20.2
UPPER RIB DISPL. (mm)	20 - 30	26.9
CENTER RIB DISPL. (mm)	30 - 44	37.5
LOWER RIB DISPL. (mm)	40 - 55	48.8
UPPER SPINE ACCEL. (g)	34 - 46	36.9
LOWER SPINE ACCEL. (g)	14 - 21	15.8
ABDOMEN		
IMPACT FORCE (kN)	2.9 - 3.6	3.26
UPPER ABDOMEN ACCEL. (g)	52 - 80	70.2
LOWER ABDOMEN ACCEL. (g)	55 - 87	73.2
UPPER ABDOMEN DISPL. (mm)	40 - 55	46.5
LOWER ABDOMEN DISPL. (mm)	38 - 52	40.4
UPPER SPINE ACCEL. (g)	5.4 - 8.1	7.6
LOWER SPINE ACCEL. (g)	8 - 12	9.2
PELVIS		
IMPACT FORCE (kN)	7.5 - 9.5	8.61
PELVIS ACCEL. (g)	45 - 63	58.5

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

PRE-TEST RIGHT REAR PASSENGER DUMMY

DUMMY NO.: 02

BIOSID CALIBRATION RESULTS

PRE-TEST CALIBRATION FOR TEST #900613

DUMMY NO. 02 SERIES NO. TRC-CAL 6 DATE 06/07-12/90

CALIBRATION TEST	SAE* CORRIDOR	RESULTS
SHOULDER		
IMPACT FORCE (kN)	3.7 - 4.6	4.15
SHOULDER ACCEL. (g)	NA	83.4
SHOULDER DISPL. (mm)	21 - 31	25.7
THORAX - NO ARM		
IMPACT FORCE (kN)	5.4 - 6.7	5.76
UPPER RIB ACCEL. (g)	120 - 180	165.3
CENTER RIB ACCEL. (g)	120 - 180	157.3
LOWER RIB ACCEL. (g)	120 - 180	164.2
UPPER RIB DISPL. (mm)	50 - 70	58.4
CENTER RIB DISPL. (mm)	50 - 70	64.1
LOWER RIB DISPL. (mm)	50 - 70	62.4
UPPER SPINE ACCEL. (g)	16 - 24	20.5
LOWER SPINE ACCEL. (g)	11 - 17	15.4
THORAX - ARM DOWN		
IMPACT FORCE (kN)	6.2 - 7.9	7.09
SHOULDER ACCEL. (g)	NA	65.5
UPPER RIB ACCEL. (g)	52 - 78	74.7
CENTER RIB ACCEL. (g)	66 - 99	96.8
LOWER RIB ACCEL. (g)	85 - 128	119.3
SHOULDER DISPL. (mm)	17 - 27	22.5
UPPER RIB DISPL. (mm)	20 - 30	23.7
CENTER RIB DISPL. (mm)	30 - 44	36.3
LOWER RIB DISPL. (mm)	40 - 55	44.0
UPPER SPINE ACCEL. (g)	34 - 46	39.0
LOWER SPINE ACCEL. (g)	14 - 21	14.8
ABDOMEN		
IMPACT FORCE (kN)	2.9 - 3.6	3.22
UPPER ABDOMEN ACCEL. (g)	52 - 80	73.7
LOWER ABDOMEN ACCEL. (g)	55 - 87	74.6
UPPER ABDOMEN DISPL. (mm)	40 - 55	47.8
LOWER ABDOMEN DISPL. (mm)	38 - 52	43.7
UPPER SPINE ACCEL. (g)	5.4 - 8.1	8.2**
LOWER SPINE ACCEL. (g)	8 - 12	9.5
PELVIS		
IMPACT FORCE (kN)	7.5 - 9.5	7.96
PELVIS ACCEL. (g)	45 - 63	60.0

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

**TEST DOES NOT MEET PROPOSED SPECIFICATION.

NEW PELVIS FLESH INSTALLED.

POST-TEST DRIVER DUMMY

DUMMY NO.: 01

The post-test calibration was completed after the dummy has been taken apart and put back together at Vehicle Research and Test Center (VRTC).

BIOSID CALIBRATION RESULTS

POST-TEST CALIBRATION FOR TEST #900613

DUMMY NO. 01 SERIES NO. TRC-CAL 12 DATE 06/28/90

CALIBRATION TEST	SAE* CORRIDOR	RESULTS
SHOULDER		
IMPACT FORCE (kN)	3.7 - 4.6	4.11
SHOULDER ACCEL. (g)	NA	86.9
SHOULDER DISPL. (mm)	21 - 31	24.4
THORAX - NO ARM		
IMPACT FORCE (kN)	5.4 - 6.7	5.79
UPPER RIB ACCEL. (g)	120 - 180	161.7
CENTER RIB ACCEL. (g)	120 - 180	161.6
LOWER RIB ACCEL. (g)	120 - 180	166.8
UPPER RIB DISPL. (mm)	50 - 70	57.4
CENTER RIB DISPL. (mm)	50 - 70	61.6
LOWER RIB DISPL. (mm)	50 - 70	62.5
UPPER SPINE ACCEL. (g)	16 - 24	20.2
LOWER SPINE ACCEL. (g)	11 - 17	14.6
THORAX - ARM DOWN		
IMPACT FORCE (kN)	6.2 - 7.9	6.72
SHOULDER ACCEL. (g)	NA	62.4
UPPER RIB ACCEL. (g)	52 - 78	66.5
CENTER RIB ACCEL. (g)	66 - 99	88.3
LOWER RIB ACCEL. (g)	85 - 128	110.9
SHOULDER DISPL. (mm)	17 - 27	21.0
UPPER RIB DISPL. (mm)	20 - 30	27.2
CENTER RIB DISPL. (mm)	30 - 44	37.2
LOWER RIB DISPL. (mm)	40 - 55	47.8
UPPER SPINE ACCEL. (g)	34 - 46	37.2
LOWER SPINE ACCEL. (g)	14 - 21	16.0
ABDOMEN		
IMPACT FORCE (kN)	2.9 - 3.6	3.36
UPPER ABDOMEN ACCEL. (g)	52 - 80	70.5
LOWER ABDOMEN ACCEL. (g)	55 - 87	70.6
UPPER ABDOMEN DISPL. (mm)	40 - 55	45.3
LOWER ABDOMEN DISPL. (mm)	38 - 52	39.8
UPPER SPINE ACCEL. (g)	5.4 - 8.1	7.7
LOWER SPINE ACCEL. (g)	8 - 12	9.6
PELVIS		
IMPACT FORCE (kN)	7.5 - 9.5	8.48
PELVIS ACCEL. (g)	45 - 63	51.6

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

POST-TEST RIGHT REAR PASSENGER DUMMY

DUMMY NO.: 02

The post-test calibration was completed after the dummy has been taken apart and put back together at Vehicle Research and Test Center (VRTC).

BIOSID CALIBRATION RESULTS

POST-TEST CALIBRATION FOR TEST #900613

DUMMY NO. 02 SERIES NO. TRC-CAL 07 DATE 07/06/90

CALIBRATION TEST	SAE* CORRIDOR	RESULTS
SHOULDER		
IMPACT FORCE (kN)	3.7 - 4.6	4.12
SHOULDER ACCEL. (g)	NA	84.7
SHOULDER DISPL. (mm)	21 - 31	25.2
THORAX - NO ARM		
IMPACT FORCE (kN)	5.4 - 6.7	5.71
UPPER RIB ACCEL. (g)	120 - 180	164.2
CENTER RIB ACCEL. (g)	120 - 180	161.1
LOWER RIB ACCEL. (g)	120 - 180	172.7
UPPER RIB DISPL. (mm)	50 - 70	57.9
CENTER RIB DISPL. (mm)	50 - 70	64.3
LOWER RIB DISPL. (mm)	50 - 70	63.1
UPPER SPINE ACCEL. (g)	16 - 24	20.9
LOWER SPINE ACCEL. (g)	11 - 17	14.8
THORAX - ARM DOWN		
IMPACT FORCE (kN)	6.2 - 7.9	7.01
SHOULDER ACCEL. (g)	NA	62.9
UPPER RIB ACCEL. (g)	52 - 78	72.8
CENTER RIB ACCEL. (g)	66 - 99	87.0
LOWER RIB ACCEL. (g)	85 - 128	106.3
SHOULDER DISPL. (mm)	17 - 27	21.6
UPPER RIB DISPL. (mm)	20 - 30	24.1
CENTER RIB DISPL. (mm)	30 - 44	37.5
LOWER RIB DISPL. (mm)	40 - 55	45.6
UPPER SPINE ACCEL. (g)	34 - 46	38.7
LOWER SPINE ACCEL. (g)	14 - 21	15.1
ABDOMEN		
IMPACT FORCE (kN)	2.9 - 3.6	3.21
UPPER ABDOMEN ACCEL. (g)	52 - 80	73.8
LOWER ABDOMEN ACCEL. (g)	55 - 87	73.3
UPPER ABDOMEN DISPL. (mm)	40 - 55	48.0
LOWER ABDOMEN DISPL. (mm)	38 - 52	42.7
UPPER SPINE ACCEL. (g)	5.4 - 8.1	7.4
LOWER SPINE ACCEL. (g)	8 - 12	9.6
PELVIS		
IMPACT FORCE (kN)	7.5 - 9.5	8.20
PELVIS ACCEL. (g)	45 - 63	56.2

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



TL 242 - E6

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