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U.S. Department
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**National Highway
Traffic Safety
Administration**

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December 1984

Side Impact Aggressiveness Attributes: MDB-to-Car Side Impact Test of a 26° Crabbed Moving Deformable Barrier to a 1981 Volkswagen Rabbit at 38.8 mph.



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16. Abstract This test report documents one of a series of twelve crash tests to evaluate the side impact aggressiveness attributes of various deformable barrier face configurations. The configurations to be used are designated as "Lowered Stiffness", "Altered Profile" and "Lowered Bumper". Testing was conducted on a 1981 Volkswagen Rabbit 2-door hatchback at the TRCO Crash Test Facility, East Liberty, Ohio. The test vehicle was impacted on the left side by a moving deformable barrier designated as "Lowered Bumper", crabbled to 26°, at 38.8 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 passenger position. The test date was November 20, 1984 and the ambient temperature was 34° F.					
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SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to evaluate the side impact aggressiveness of a deformable barrier face designated as "Lowered Bumper". In all, there will be twelve crash tests involving deformable barrier faces designated as "Lowered Stiffness", "Altered Profile" and "Lowered Bumper". The vehicle was tested using conditions not currently contained in a Federal Motor Vehicle Safety Standard.

INTRODUCTION

A stationary 1981 Volkswagen Rabbit 2-door hatchback was impacted on the left side by a Moving Deformable Barrier (MDB) on November 20, 1984. The barrier face was designated as "Lowered Bumper" and was assembled from two existing faces in order to obtain the correct dimensions. The test was to simulate an intersection collision with the striking vehicle traveling at 35 mph and the struck vehicle traveling at 17.5 mph. The orientation angle of the striking vehicle was 90° counterclockwise with respect to the longitudinal axis of the struck vehicle. The impact point was to be 37 inches forward of the vehicle center of gravity which is defined by accident investigation to be the midpoint of the wheelbase.

To simulate this collision, the MDB was to be towed into the stationary Volkswagen Rabbit at 39.1 mph with the MDB's wheels crabbed clockwise to 26°. The actual test speed was 38.8 mph and the actual impact point was 35.5 inches forward of the midpoint of the Volkswagen Rabbit's wheelbase.

The vehicle was structurally unmodified, but contained additional padding in the driver's door, the left rear quarter panel and the left rear side header.

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.

SECTION 2.0
GENERAL TEST AND VEHICLE PARAMETER DATA

The following data sheets describe the General Test and Vehicle Parameter Data.

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagen of America, Inc.
MAKE/MODEL: Volkswagen Rabbit VIN: 1VWCB9170BV035597
BODY STYLE: 2-Door Hatchback MODEL YEAR: 1981
NHTSA NO.: R & D COLOR: Grey
ENGINE DATA: TYPE: Transverse CYLINDERS: 4 DISPLACEMENT 1600 cc
TRANSMISSION DATA: 4 Speed Manual
DATE VEHICLE RECEIVED: 11/7/84 ODOMETER READING: 44729
DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

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

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

VEHICLE MANUFACTURED BY: Volkswagen of America, Inc.

DATE OF MANUFACTURE: 11/80

GVWR: 2822 LBS.,

GAWR: FRONT 1609 LBS., REAR 1278 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 27 psi; REAR 31 psi

TIRES ON VEHICLE (MFGR. & LINE, SIZE): Michelin XZX 155 SR 13

BIAS PLY, BELTED, OR RADIAL: Radial

PLY RATING: 4

IS SPARE TIRE "SPACE SAVER"? No

IS SPARE TIRE STANDARD EQUIPMENT? Yes

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

RIGHT FRONT	640	LBS.	RIGHT REAR	390	LBS.
LEFT FRONT	670	LBS.	LEFT REAR	380	LBS.
TOTAL FRONT WEIGHT	1310	LBS.	(63.0 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	770	LBS.	(37.0 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	2080	LBS.			

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 24	;LF 24 1/8	;RR 24 5/16	;LR 24 1/8
PRE-TEST ATTITUDE:	RF 22 5/8	;LF 23 1/8	;RR 21 1/8	;LR 21 5/8
POST-TEST ATTITUDE:	RF 21 5/16	;LF 22 3/4	;RR 20 5/8	;LR 20 5/8

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 185 LBS. CARGO:

RIGHT FRONT	700	LBS.	RIGHT REAR	585	LBS.
LEFT FRONT	720	LBS.	LEFT REAR	605	LBS.
TOTAL FRONT WEIGHT	1420	LBS.	(52.4 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1290	LBS.	(47.6 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	2710	LBS.			

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

TEST FLUID DATA

TEST FLUID TYPE: RED STODDARD SOLVENT #2; SPEC. GRAVITY: 0.764
KINEMATIC VISCOSITY: 0.99 CENTISTOKES
"USEABLE" CAPACITY*: NA GALLONS
TEST VOLUME: 5.0 GALLONS
FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 10.0 GALLONS
DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: Yes FUEL INJECTION: Yes
DOES ELECTRIC FUEL PUMP OPERATE WITH IGNITION SWITCH "ON" AND THE ENGINE NOT OPERATING? No

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 27 psi; REAR 31 psi
RECOMMENDED TIRE SIZE: 155 SR 13 LOAD RANGE X B, C,
VEHICLE CAPACITY: TYPES OF SEATS: Front - Bucket
Rear - Bench
NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT
2 REAR
CARGO LOAD 185 LBS. 4 TOTAL
TOTAL 785 LBS.

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

TEST CONDITIONS

TEST NUMBER: 841120

DATE OF TEST: November 20, 1984

TIME OF TEST: 15:30

WIND VELOCITY: 3-6 mph 342° NW

HUMIDITY: DNA

AMBIENT TEMPERATURE AT IMPACT AREA: 34° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 81° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2610	2613
MDB TEST WEIGHT (LBS.)	2990	3000
MDB VELOCITY (MPH)*	38.8	39.1
IMPACT POINT (INCHES)**	35.5	37.0

DUMMIES

	<u>DRIVER</u>	<u>MIDDLE PASSENGER</u>	<u>RT. FRONT PASSENGER</u>	<u>LEFT REAR PASSENGER</u>	<u>RT. REAR PASSENGER</u>
TYPE:	SID			SID	
SERIAL NO.:	06			U02	
INSTRUMENTATION:					
HEAD ACCEL.:	Yes			Yes	
CHEST ACCEL.:	Yes (Upper/Lower)			Yes (Upper/Lower)	
FEMUR L.C.'S:	No			No	
OTHER:	Pelvis/Ribs			Pelvis/Ribs	
RESTRAINT SYSTEM:	Both dummies were unrestrained				

* As measured over final one foot of travel.

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

VISIBLE DUMMY CONTACT POINTS:

	DRIVER 06	PASSENGER U02
Head	Roof, Left Window Sill, <u>Right B-Pillar & Frame</u>	Window Frame, <u>Roof, Hatchback Frame</u>
Chest	Inner Door Panel, <u>Left Window Sill</u>	<u>Rear Quarter Panel</u>
Abdomen	<u>Inner Door Panel</u>	<u>Rear Quarter Panel</u>
Left Knee	<u>Right Knee</u>	<u>Right Knee</u>
Right Knee	<u>Left Knee</u>	<u>Left Knee</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>Hard*</u>	<u>Easy</u>
Rear	<u>DNA</u>	<u>DNA</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>Yes</u>	<u>No</u>
Rear	<u>Yes</u>	<u>No</u>

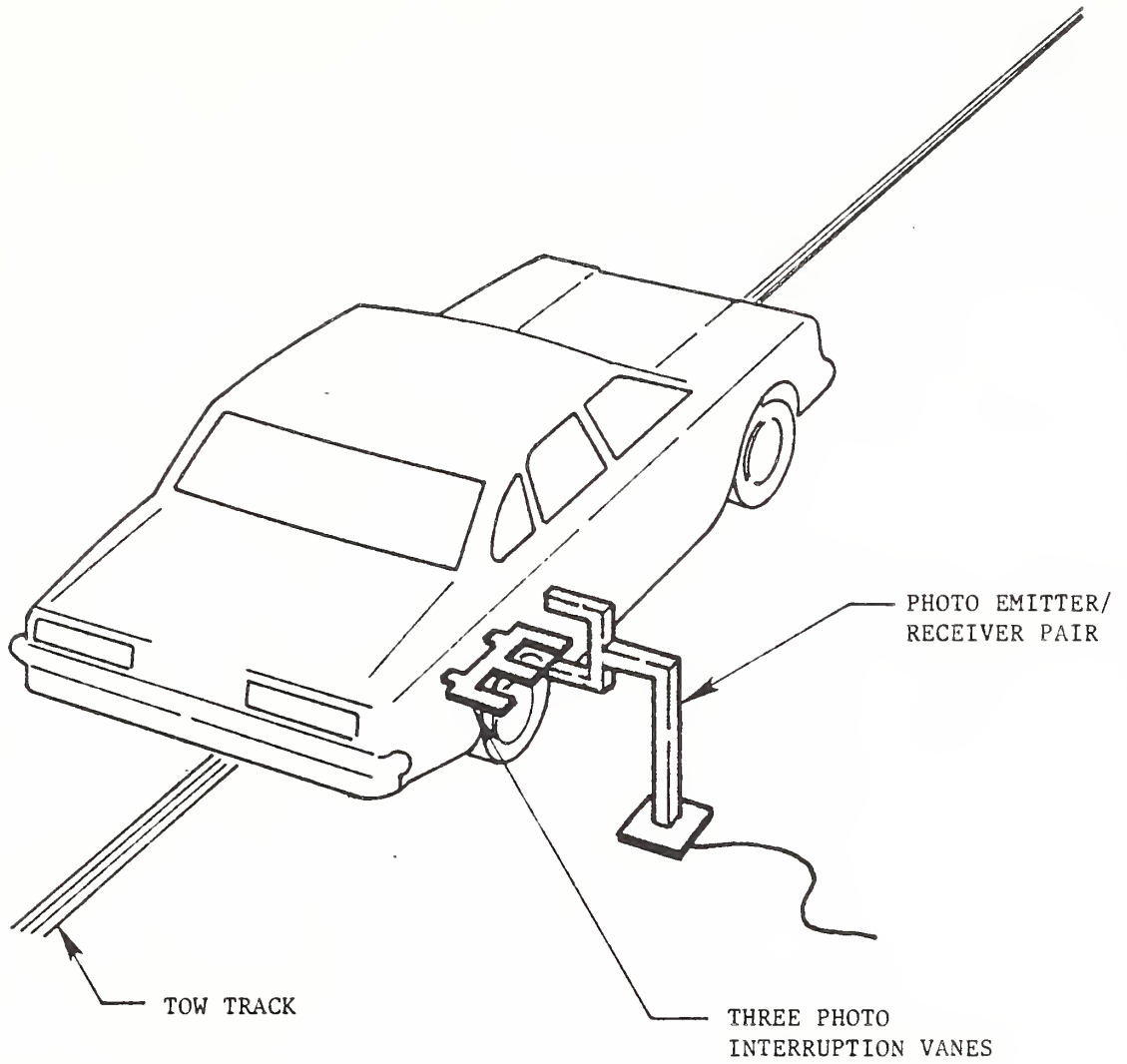
GLAZING DAMAGE:

Windshield cracked

OTHER NOTABLE IMPACT EFFECTS:

*Door had to be opened to remove instrumentation.

IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane is located two inches before impact.

The vanes have one foot spacing.

VEHICLE TEST WEIGHT CALCULATION

$$\begin{aligned} \text{Test Weight} &= \text{Unloaded Delivered Weight}^* + \\ &\quad \text{Number of Dummies X 174 lbs.} + \\ &\quad \text{Cargo Weight} \\ &= 2080 + 2 \times 174 + 185 \text{ lbs.} \\ &= 2613 \text{ lbs.} \end{aligned}$$

To achieve test weight, the battery was removed and 5.0 gallons of Stoddard Solvent were added in the fuel tank. The weight of the test vehicle was measured by placing each wheel on a Loadmeter Corporation Hiway Loadometer.

$$\begin{aligned} \text{*Unloaded Delivered Weight} &= \text{Measured Weight} + \text{Estimated 10 Gallons Fuel} \\ &= 2020 + 60 \text{ lbs} \\ &= 2080 \text{ lbs} \end{aligned}$$

TEST ANOMALIES

The door accelerometer in Position 10, LFDYG4, failed approximately 15 msec after impact.

SECTION 3.0
DATA REQUIRED BY R & D

The following pages are included in this section:

1. Dummy temperature control and position 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 portably until approximately 1 minute prior to the test.

The following table summarizes the steps taken to position the instrumented, calibrated dummies in the test vehicle.

DUMMY PLACEMENT AND POSITIONING

SIDE IMPACT
DUMMY

DRIVER DSP

REAR PASSENGER DSP

HEAD Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.

Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.

UPPER TORSO Placed against seat back. Midsagittal plane is vertical and centered on bucket seat.

Placed against seat back. Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.

LOWER TORSO Midsagittal plane is vertical and centered on bucket seat.

Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.

UPPER LEGS (thighs or femurs) Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.

Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.

KNEES Knees set 14.5" apart between pivot bolt head outer surfaces. Outer surface of right knee pivot bolt is 8.6" from midsagittal plane of dummy. Outer surface of left knee pivot bolt is 5.9" from midsagittal plane of dummy.

Located so that planes defined by femur and tibia centerlines are as close as possible to vertical.

LOWER LEGS Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.

Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.

RIGHT FOOT Placed on undepressed accelerator pedal -- rearmost point of heel on floorplan in plane of pedal.

Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.

LEFT FOOT Placed on toeboard -- rearmost point of heel on floorpan as close as possible to intersection of toeboard and floorpan. Centerline falls in vertical longitudinal plane.

Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.

*NOTE: THE SIDE IMPACT DUMMY DOES NOT INCLUDE ARMS.

DUMMY IN-VEHICLE POSITION RECORDING SHEET

VEHICLE NHTSA NO. R & D

MFR./MAKE/MODEL: Volkswagen Rabbit

FRONT SEAT TYPE: BENCH
 X BUCKET
 SPLIT BENCH

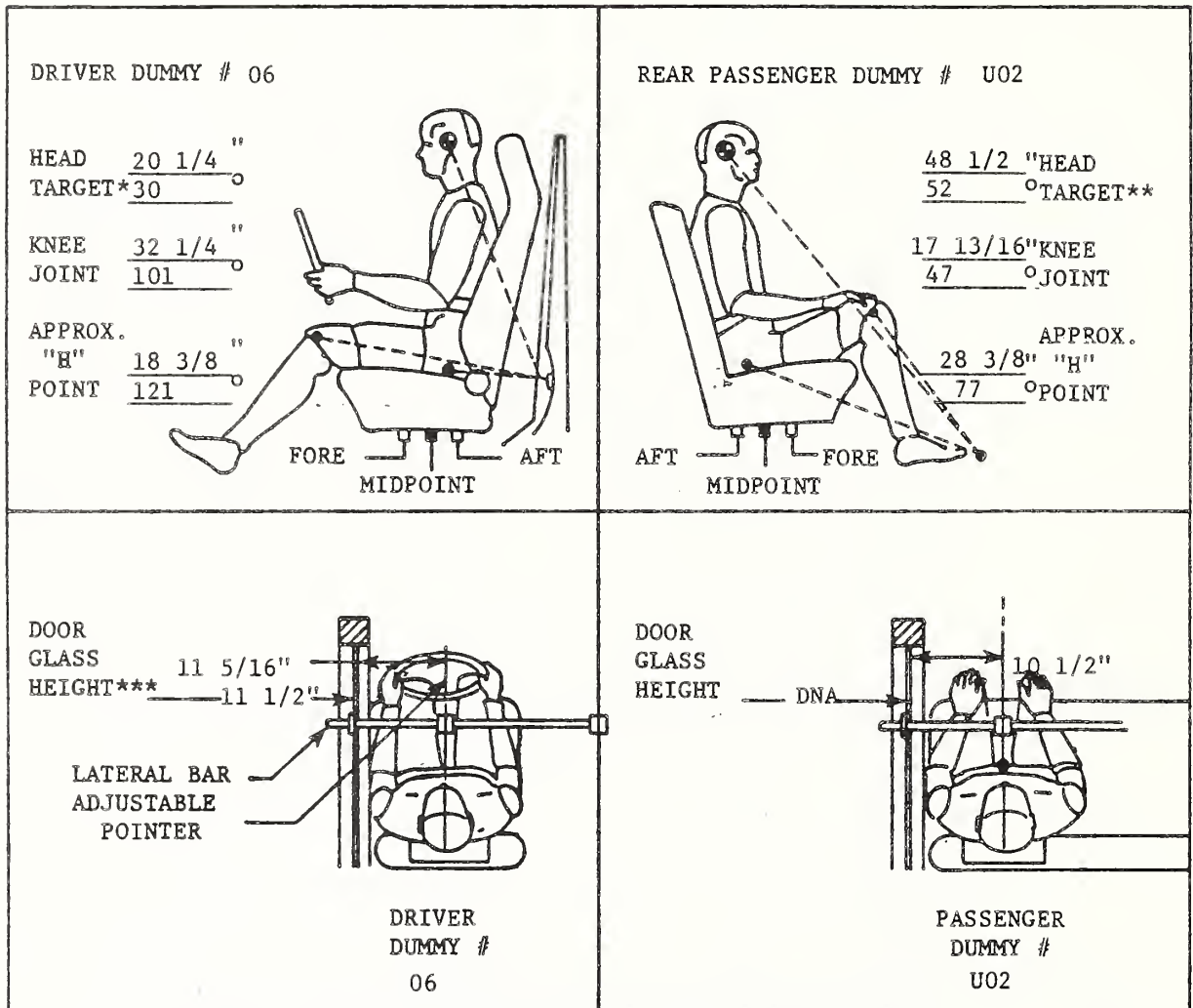
ADJUSTER TYPE: X MANUAL
 POWER

BUCKET SEAT BACK TYPE: FIXED
 X ADJUSTABLE

TECHNICIANS:
 1. B. Miller
 2. R. Benavides
 3. M. Garrison

POSITIONING DATE: 11/20/84

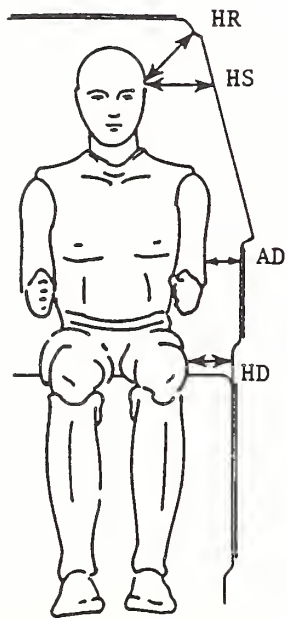
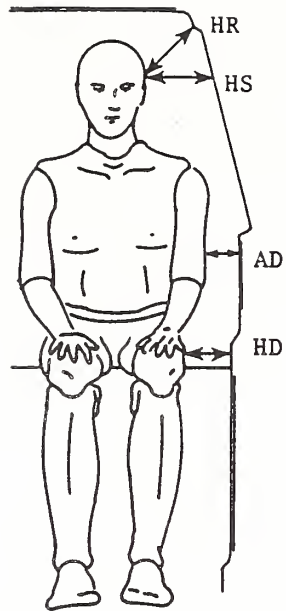
AMBIENT TEMP.: 72° F. TIME: 8:25



*All driver dummy dimensions referenced to top of striker bolt and all angles referenced to vertical.

**All passenger dummy dimensions referenced to front seat back latch bolt with front seat in mid-position and all angles referenced to vertical.

***Door glass height is equal on the right and left side of vehicle at dummy nose level.



DRIVER
06

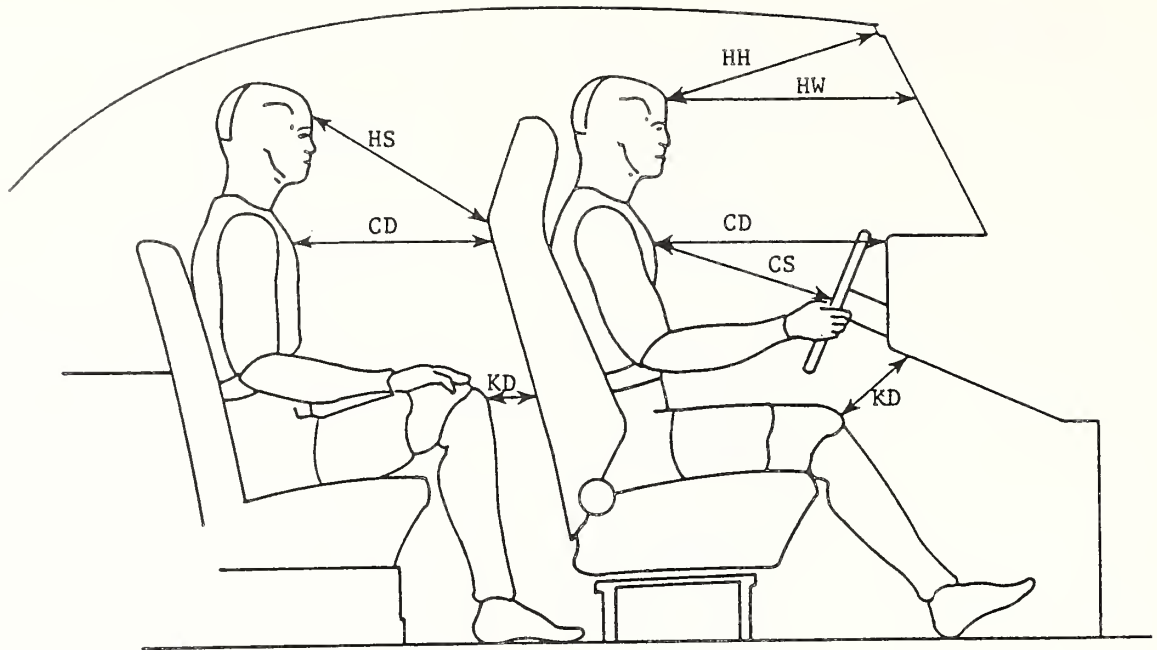
PASSENGER
U02

HR	6 1/2	4 11/16*
HS	8	7 1/2
AD	1/2*	0*
HD	2 3/4*	2 1/8*

ALL MEASUREMENTS IN INCHES

*Measurements were made from the dummy to the modified padding.

DUMMY LATERAL CLEARANCE DIMENSIONS



DRIVER

PASSENGER

06

U02

HH	17 1/8	DNA
HW	21 1/8	DNA
HS	DNA	24 3/4
CD	20 1/16	16 13/16
CS	13 1/2	DNA
KDL	4 1/2	2 1/4
KDR	4 3/8	2 7/8

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the left hip of the dummy contacted the inner panel as the door caved in. As the buttocks swung to the right, the dummy's left shoulder and chest contacted the window sill and the door panel. The head then hit the left window sill. The dummy travelled to the passenger's side of the car as the buttocks lifted. As the back slid down the window sill the head hit the roof, the upper window frame and the B-pillar. The driver came to rest sitting in the passenger's seat, facing left. The legs were extended and the head was resting between the B-pillar and the side of the passenger's head rest.

PASSENGER

During impact, the rear quarter panel caved in contacting the dummy's left leg and hip. The head hit the side header, roof and hatchback frame as the passenger rebounded from the impact. The dummy came to rest in an upright position. His hips were moved to the right while the legs were swung left and the torso was also leaning towards the left.

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

LOCATION	HEIGHT (in)	6	0	6	12	18	24	30	36	42	48	54	60	66	72	78
		PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)														
Axle Height	10.6	X	X	20.1	20.1	20.1	20.1	20.1	20.1	20.2	20.4	20.3	20.3	20.4	X	X
H-Point	20.3	X	16.5	17.9	17.9	17.9	17.9	17.9	17.9	17.9	18.0	18.2	18.3	18.4	X	X
Mid Door	24.8	16.6	17.9	17.8	17.8	17.8	17.8	17.7	17.7	17.8	17.8	17.9	17.9	17.8	18.1	X
Window Sill	35.1	X	20.0	19.6	19.5	19.4	19.0	19.3	19.3	19.2	19.2	19.2	19.4	19.5	19.6	19.8
Window Top	53.3	X	X	X	X	X	27.1	26.9	26.9	26.8	26.8	26.8	26.9	26.9	27.1	27.5

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

Axle Height	10.6	X	X	28.8	32.6	32.7	32.3	32.1	31.4	31.0	30.4	29.7	27.9	26.1	X	X
H-Point	20.3	X	24.0	26.5	30.1	30.3	30.5	30.6	30.6	30.6	30.8	31.5	30.6	29.2	X	X
Mid Door	24.8	22.3	24.2	24.6	29.6	29.6	29.7	29.6	29.6	29.8	29.9	30.5	29.9	29.0	27.2	X
Window Sill	35.1	X	22.6	23.0	27.3	28.8	29.8	30.5	30.6	30.8	31.1	31.6	31.4	30.8	27.4	23.2
Window Top	53.3	X	X	X	X	X	30.1	29.6	29.4	29.2	29.0	29.0	28.8	28.6	28.9	28.6

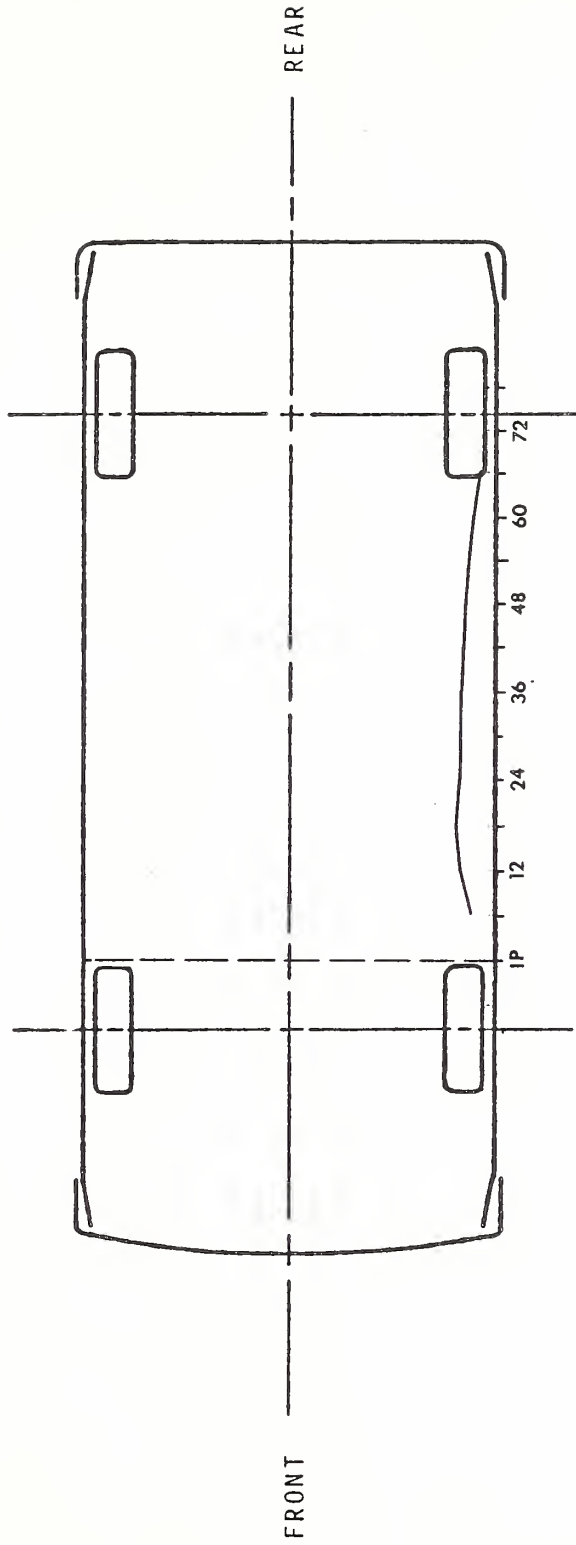
STATIC CRUSH (IN)

Axle Height	10.6	X	X	8.7	12.5	12.6	12.2	12.0	11.3	10.8	10.0	9.4	7.6	5.7	X	X
H-Point	20.3	X	7.5	8.6	12.2	12.4	12.6	12.7	12.7	12.7	12.8	13.3	12.3	10.8	X	X
Mid Door	24.8	5.7	6.3	6.8	11.8	11.8	11.2	11.9	11.9	12.0	12.1	12.6	12.0	11.2	9.1	X
Window Sill	35.1	X	2.6	3.4	7.8	9.4	10.8	11.2	3.7	11.6	11.9	12.4	12.0	11.3	7.8	3.4
Window Top	53.3	X	X	X	X	X	3.0	2.7	2.5	2.4	2.2	2.2	1.9	1.7	1.8	1.1

* 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

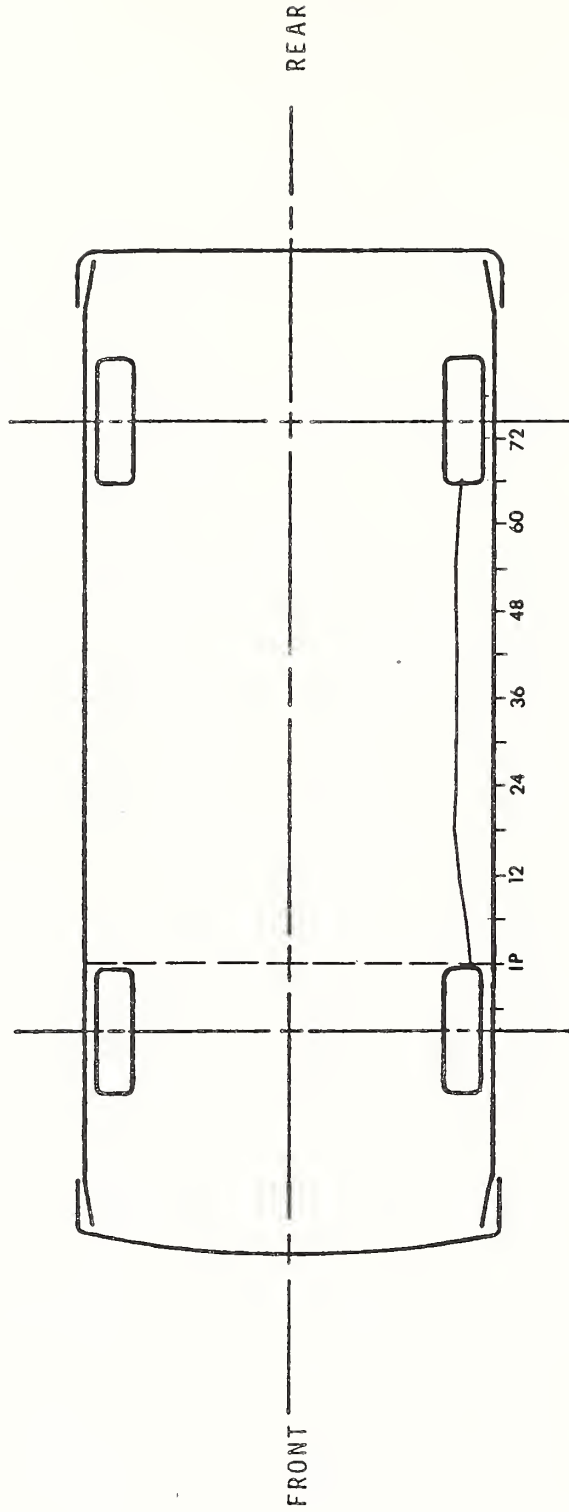


PROFILE LEVEL EQUALS AXLE HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Length of Car = 155.3"
Width of Car = 63.5"

Maximum Crush = 12.6"
Approximate Length of Crush = 60.0"

VEHICLE EXTERIOR STATIC CRUSH PROFILE

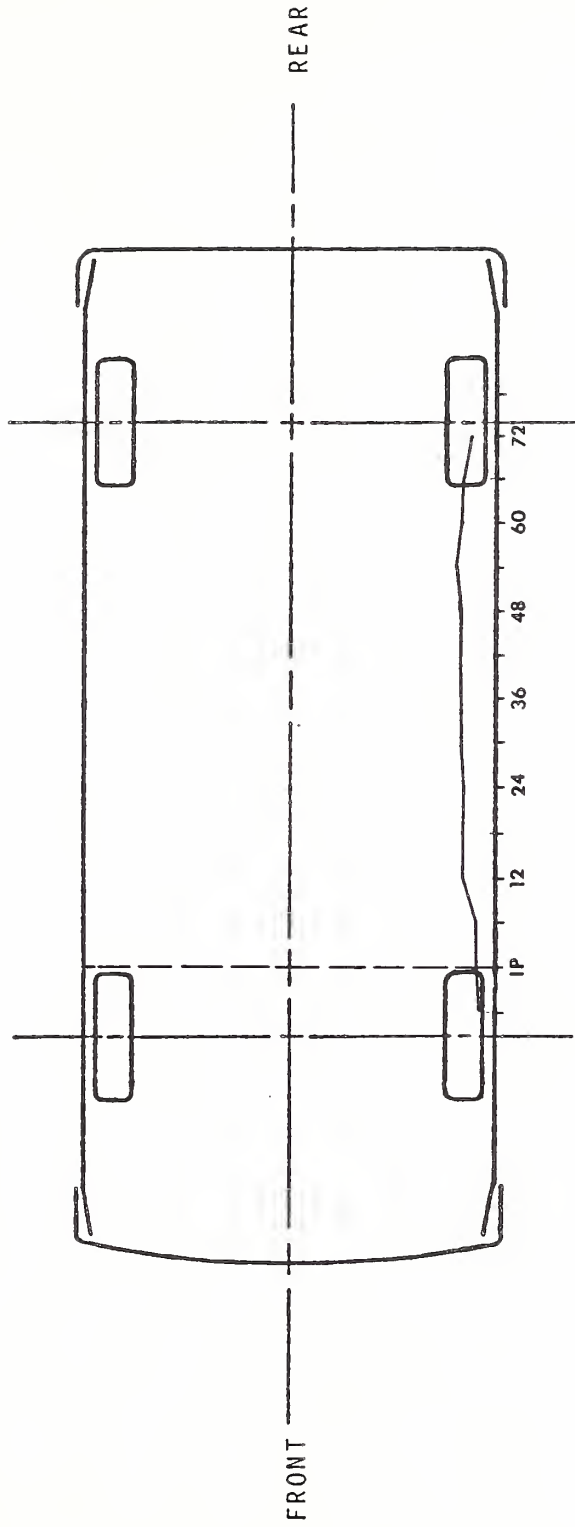


PROFILE LEVEL EQUALS H-POINT HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Length of Car = 155.3"
Width of Car = 63.5"

Maximum Crush = 13.3"
Approximate Length of Crush = 66"

VEHICLE EXTERIOR STATIC CRUSH PROFILE

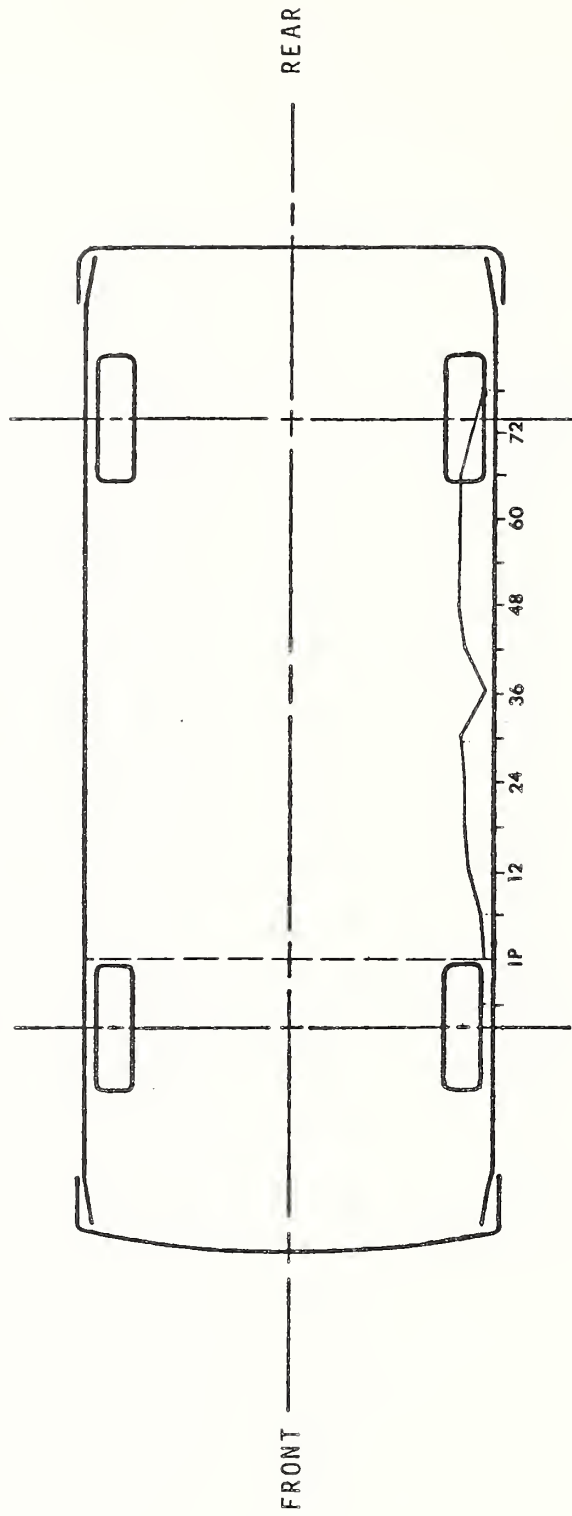


PROFILE LEVEL EQUALS MID-DOOR HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Length of Car = 155.3"
Width of Car = 63.5"

Maximum Crush = 12.6"
Approximate Length of Crush = 78"

VEHICLE EXTERIOR STATIC CRUSH PROFILE

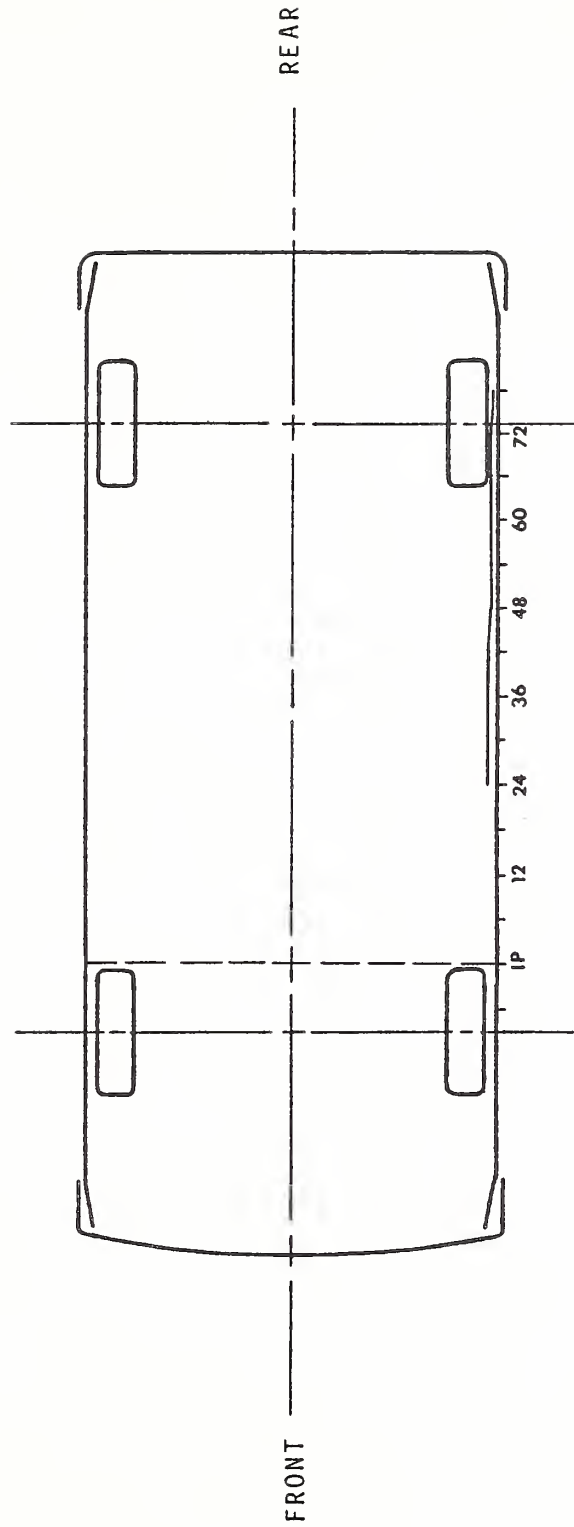


PROFILE LEVEL EQUALS WINDOW SILL HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Length of Car = 155.3"
Width of Car = 63.5"

Maximum Crush = 12.4"
Approximate Length of Crush = 78"

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Length of Car = 155.3"
Width of Car = 63.5"

Maximum Crush = 3.0"
Approximate Length of Crush = 54"

SIDE IMPACT DUMMY DATA SUMMARY

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE DIRECTION*		NEGATIVE DIRECTION**		POSITIVE DIRECTION*		NEGATIVE DIRECTION**	
	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
HEAD ACCELERATION								
LONGITUDINAL	87.90	314.38	79.83	79.38	24.98	155.63	38.31	47.13
LATERAL	47.27	44.00	23.66	276.75	123.81	47.63	22.91	156.00
VERTICAL	35.21	314.25	66.89	62.25	44.26	55.38	34.61	46.25
RESULTANT		101.17 @ 79.38				130.24 @ 47.63		
HIC	852.30	from 37.63 to 89.00			1065.79	from 44.25 to 55.25		
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	38.71	47.50	25.02	57.50	6.35	80.00	21.58	41.87
LATERAL (P)***	103.86	38.75	40.64	55.63	80.65	43.75	2.89	87.50
LATERAL (R)***	107.09	38.75	40.02	55.63	82.82	43.75	2.51	88.13
VERTICAL	12.52	48.13	17.50	39.38	6.76	33.75	13.24	50.63
RESULTANT (P)		108.00 @ 38.75				83.31 @ 43.75		
RESULTANT (R)		111.10 @ 38.75				85.41 @ 43.75		
DELTA V (MPH)****		33.6 @ 51.88 (P)				28.2 @ 83.75 (P)		
		35.1 @ 51.88 (R)				28.9 @ 85.00 (R)		
LOWER SPINE								
LONGITUDINAL	35.40	45.00	24.25	33.13	34.98	55.00	27.47	34.38
LATERAL (P)	128.12	35.63	25.13	53.75	98.05	38.13	26.75	56.87
LATERAL (R)	128.02	35.63	22.11	60.62	99.43	38.13	31.91	56.87
VERTICAL	14.92	30.62	3.21	78.13	10.20	34.38	0.93	64.38
RESULTANT (P)		129.71 @ 35.00				100.79 @ 38.13		
RESULTANT (R)		129.72 @ 35.00				102.13 @ 38.13		
DELTA V (MPH)		39.7 @ 48.13 (P)				35.2 @ 53.12 (P)		
		40.0 @ 49.37 (R)				36.4 @ 53.12 (R)		
LEFT UPPER RIB								
LATERAL (P)	98.69	31.88	8.33	82.50	73.52	35.00	9.25	56.87
LATERAL (R)	106.75	31.88	8.19	83.75	77.51	35.00	12.90	56.87
DELTA V (MPH)		31.2 @ 67.50 (P)				26.4 @ 55.00 (P)		
		31.2 @ 64.38 (R)				28.4 @ 55.00 (R)		
LEFT LOWER RIB								
LATERAL (P)	87.06	31.25	64.65	60.62	122.70	25.00	17.36	19.38
LATERAL (R)	95.48	31.25	66.16	60.62	72.51	25.00	21.40	52.50
DELTA V (MPH)		35.0 @ 56.88 (P)				33.2 @ 50.63 (P)		
		35.0 @ 56.87 (R)				28.5 @ 50.63 (R)		
PELVIS ACCELERATION								
LONGITUDINAL	7.72	61.38	38.57	40.50	---	---	0	---
LATERAL	108.32	27.25	7.40	44.25	---	---	0	8.96
VERTICAL	22.57	56.88	4.67	63.00	---	---	0	---
RESULTANT		108.81 @ 27.25				---	@	---
DELTA V (MPH)		33.4 @ 63.13				---	@	---

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	<u>DRIVER DUMMY</u>				<u>PASSENGER DUMMY</u>			
	<u>POSITIVE</u>		<u>NEGATIVE</u>		<u>POSITIVE</u>		<u>NEGATIVE</u>	
	<u>DIRECTION*</u>		<u>DIRECTION**</u>		<u>DIRECTION*</u>		<u>DIRECTION**</u>	
	<u>MAX</u>	<u>TIME</u>	<u>MAX</u>	<u>TIME</u>	<u>MAX</u>	<u>TIME</u>	<u>MAX</u>	<u>TIME</u>
	<u>(in)</u>	<u>(msec)</u>	<u>(in)</u>	<u>(msec)</u>	<u>(in)</u>	<u>(msec)</u>	<u>(in)</u>	<u>(msec)</u>
RIB DEFLECTION †	1.83	54.38	---	--- ^ε	1.84	50.00	---	--- ^ε

* LONGITUDINAL:	FORWARD	**LONGITUDINAL:	REARWARD
LATERAL:	RIGHTWARD	LATERAL:	LEFTWARD
VERTICAL:	UPWARD	VERTICAL:	DOWNWARD

*** (P) = Primary Sensor, (R) = Redundant Sensor

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

†Compression: Positive

°The CTM has judged that intermittent rattling has occurred in these channels and, therefore, the peak values reported are questionable as are applicable resultants and Delta V's.

εThere were no negative values in the time interval of interest.

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION			
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)		
1	RIGHT SILL AT FRONT SEAT	83.5	23.6	10.0						
	(LONGITUDINAL)						5.57	60.50	8.98	20.00
	(LATERAL)				$\Delta V = -0.9 \text{ mph @ } 90.25 \text{ msec}$	25.65	29.38	2.91	73.38	
	(VERTICAL)				$\Delta V = 18.5 \text{ mph @ } 90.25 \text{ msec}$	12.44	24.75	7.58	37.00	
	(RESULTANT)				27.10 @ 20.25					
2	RIGHT SILL AT REAR SEAT	61.6	23.6	8.5						
	(LONGITUDINAL)						6.10	59.13	9.76	21.13
	(LATERAL)				$\Delta V = -0.3 \text{ mph @ } 90.25 \text{ msec}$	30.74	40.88	0.59	85.88	
	(VERTICAL)				$\Delta V = 22.9 \text{ mph @ } 90.25 \text{ msec}$	13.18	27.00	7.88	40.13	
	(RESULTANT)				31.84 @ 40.75					
3	REAR DECK OVER AXLE	32.0	0.0	6.7						
	(LONGITUDINAL)						8.15	22.13	17.79	40.25
	(LATERAL)				$\Delta V = -6.2 \text{ mph @ } 90.25 \text{ msec}$	35.96	41.13	2.05	90.25	
	(VERTICAL)				$\Delta V = 26.5 \text{ mph @ } 90.25 \text{ msec}$	8.55	52.00	9.27	26.25	
	(RESULTANT)				40.08 @ 40.88					
4	LEFT SILL AT REAR SEAT (LATERAL)	62.2	-23.6	8.5						
					$\Delta V = 10.2 \text{ mph @ } 39.25 \text{ msec}$	81.13	21.38	27.15	13.00	
5	LEFT SILL AT FRONT SEAT (LATERAL)	83.5	-23.5	10.0						
					$\Delta V = 7.4 \text{ mph @ } 21.13 \text{ msec}$	46.40	21.25	56.51	26.63	
6	LEFT FRONT DOOR CENTERLINE (LATERAL)	82.6	-25.6	23.5						
					$\Delta V = 30.4 \text{ mph @ } 22.75 \text{ msec}$	254.28	17.88	38.80	24.88	
7	RIGHT REAR COMPARTMENT (LONGITUDINAL)	31.0	15.2	13.8						
						4.88	58.38	6.79	44.63	
8	MIDREAR OF LEFT FRONT DOOR (LATERAL)	62.3	-26.0	24.2						
					$\Delta V = 24.5 \text{ mph @ } 21.13 \text{ msec}$	149.47	13.00	37.20	39.75	
9	UPPER LEFT FRONT DOOR CENTERLINE (LATERAL)	83.5	-26.0	32.7						
					$\Delta V = 33.4 \text{ mph @ } 19.88 \text{ msec}$	314.77	20.75	193.51	27.63	
10	MIDFRONT OF LEFT FRONT DOOR (LATERAL)	101.4	-25.8	21.9						
					$\Delta V = \text{---}$	---	---Y	---	---Y	
11	UPPER REAR OF LEFT REAR DOOR (LATERAL)	72.2	25.8	32.9						
					$\Delta V = 36.4 \text{ mph @ } 23.88 \text{ msec}$	251.67	21.00	105.07	90.00	

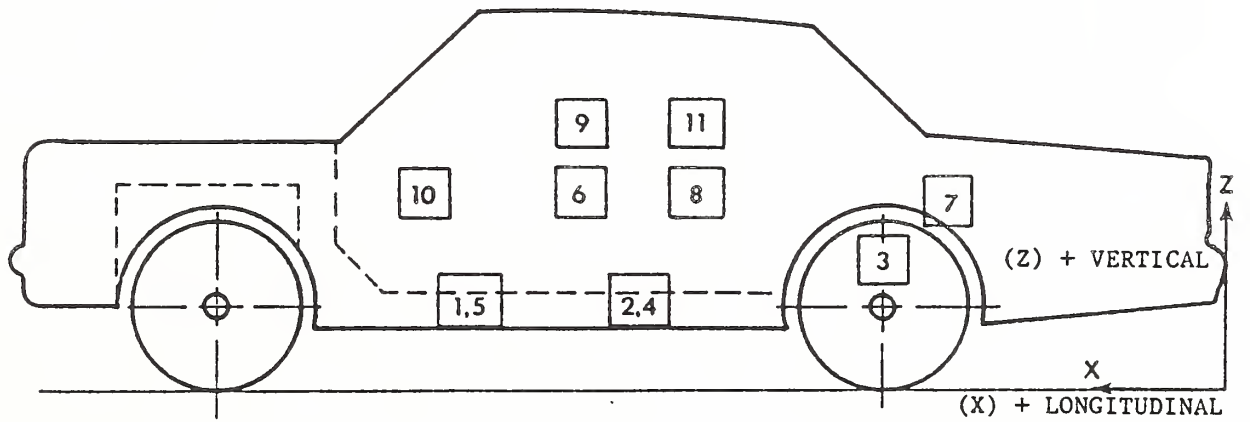
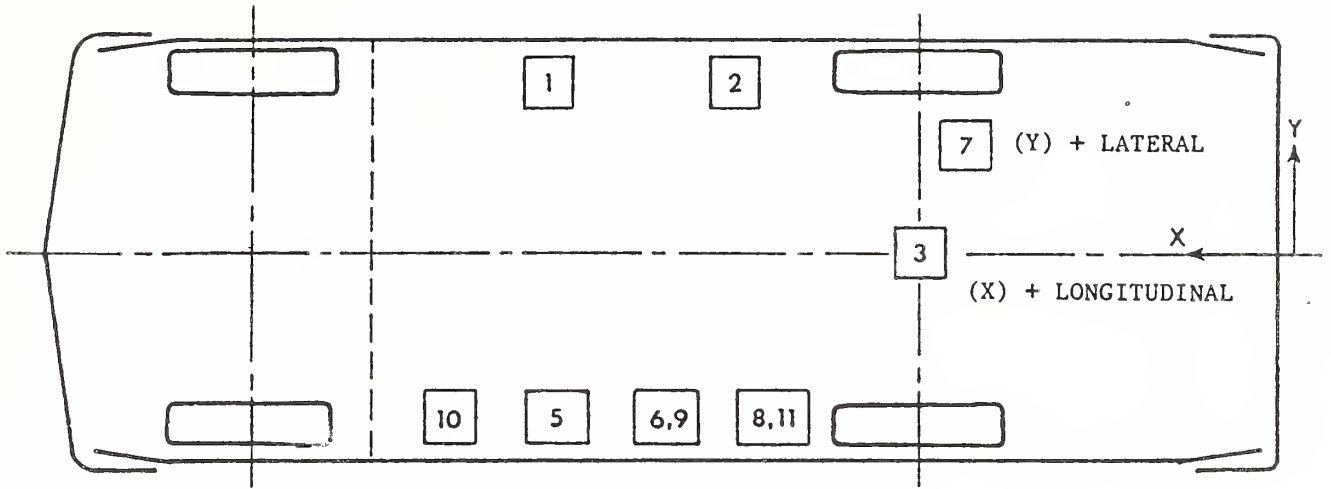
* Reference: X - Rear Bumper (+ Forward), Y - Vehicle Centerline (+ To Right), Z - Ground Level (+ Up)

All measurements of accelerometer locations in inches.

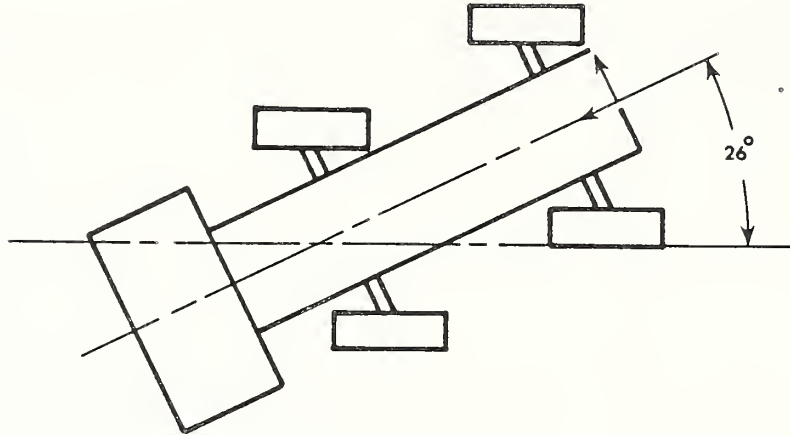
† This Delta V appears unrealistic

Y See TEST ANOMALIES

VEHICLE ACCELEROMETER LOCATIONS



MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY



NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	CENTER OF GRAVITY	74.5	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -17.9 \text{ mph @ } 90.25 \text{ msec}$			0.78	81.13	21.10	42.88
	(LATERAL)	$\Delta V = -3.8 \text{ mph @ } 90.25 \text{ msec}$			4.50	63.25	10.36	45.50
	(VERTICAL)				21.69	56.13	17.12	62.25
	(RESULTANT)					26.61 @	33.75	
2	FRONT FRAME MEMBER	130.3	0.0	11.3				
	(LONGITUDINAL)	$\Delta V = -18.9 \text{ mph @ } 90.25 \text{ msec}$			0.74	0.88	21.45	43.25
3	REAR FRAME MEMBER	23.3	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -16.5 \text{ mph @ } 90.25 \text{ msec}$			1.43	89.50	20.91	42.88

* Reference: X - Rear Most Point of Frame (+ To Forward), Y - Barrier Centerline (+ To Right), Z - Ground Level (+ To Up)

All measurements of accelerometer locations in inches.

HIGH SPEED CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead	Photosonic 1B	8	470	Vehicle dynamics
2	Overhead	Photosonic 1B	25	450	Close-up of impact point
3	Onboard MDB	Photosonic 1B	25	505	Close-up of impact point
4	Onboard MDB	Photosonic 1B	13	510	Driver kinematics
5	Ground level - right	Photosonic 1B	25	503	Overall view
6	Ground level - left	Photosonic 1B	17	500	Overall view
7	Onboard vehicle	Photosonic 1B	8	805	Driver kinematics - front view
8	Onboard vehicle	Photosonic 1B	8	815	Driver kinematics
9	Onboard vehicle	Photosonic 1B	8	810	Passenger kinematics

NOTE: CAMERAS ARE NUMBERED ACCORDING TO SPLICING SEQUENCE OF FILM.
 (24 fps) REAL TIME MOVIE FILM COVERAGE OF PRE-CRASH, POST-CRASH
 AND CRASH EVENT SPLICED AT START AND END OF FILM.

LOCATIONS OF OFFBOARD HIGH SPEED CAMERAS

CAMERA NO.	X	Y	Z
1	0	0	25'
2	0	0	25'
5	24'10"	58'8"	45"
6	-20'11"	-11'	45"

Origin of Coordinate System is Point of Impact

- +X = Forward with Respect to Striking Vehicle's Velocity Vector
- +Y = Rightward with Respect to Striking Vehicle's Velocity Vector
- +Z = Upward with Respect to Striking Vehicle's Velocity Vector

NON-GOVERNMENT FURNISHED TRANSDUCER INFORMATION

PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NUMBER	SERIAL NUMBER	MEGR.	DATE OF LAST CALIBRATION	SENSITIVITY	DESIRED FULL SCALE (ENGR. UNITS)
BOGXG	Accel	4-202-0001	18845	Bell Howell	11/8/84	0.237 MV/G	50 G
BOGYG	Accel	4-202-0001	18858	Bell Howell	11/8/84	0.238 MV/G	50 G
BOGZG	Accel	4-202-0001	18857	Bell Howell	11/8/84	0.240 MV/G	50 G
BFCXG	Accel	4-202-0001	18240	Bell Howell	11/8/84	0.239 MV/G	50 G
BRCXG	Accel	4-202-0001	19022	Bell Howell	11/8/84	0.220 MV/G	50 G

All dummy and struck vehicle accelerometers were Government Furnished Equipment and were Endevco 2264 Accelerometers.

APPENDIX A
PHOTOGRAPHS



Figure A-1. PRE-TEST OVERALL - VIEW 1



Figure A-2. PRE-TEST OVERALL - VIEW 2
A-2

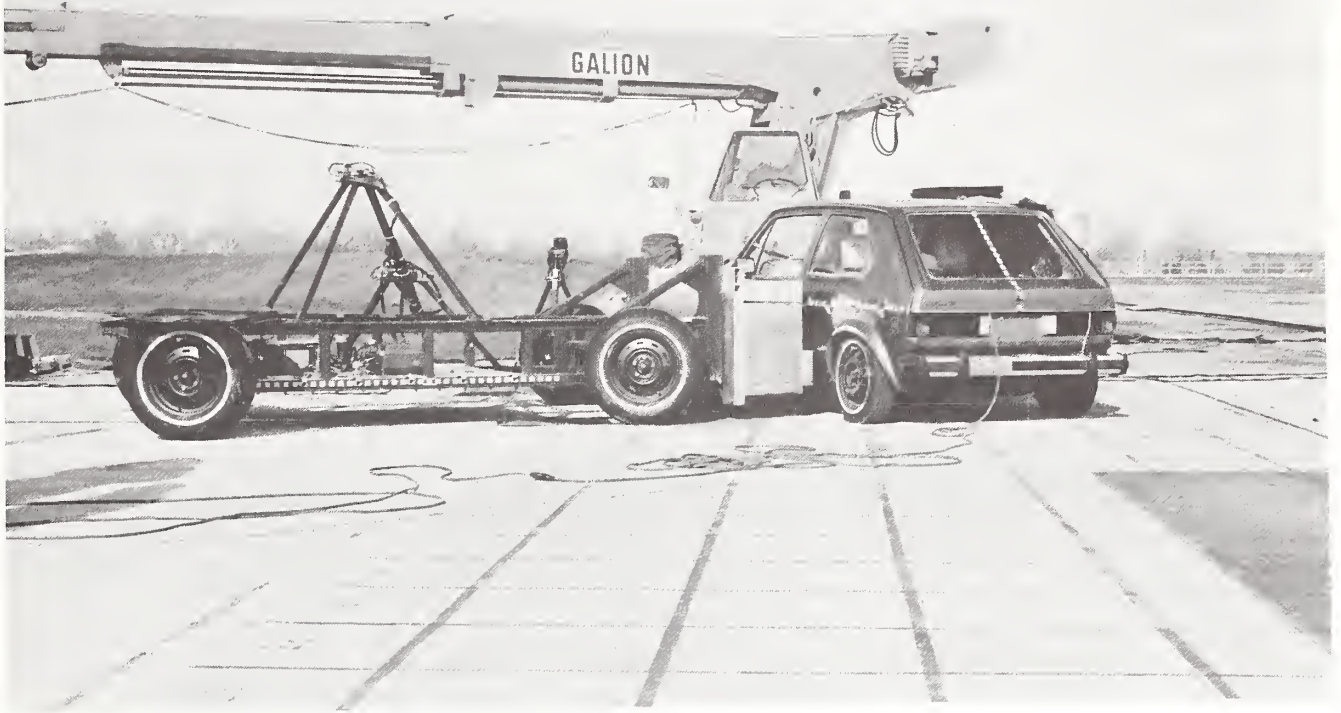


Figure A-3. PRE-TEST OVERALL - VIEW 3



Figure A-4. PRE-TEST OVERALL - VIEW 4
A-3

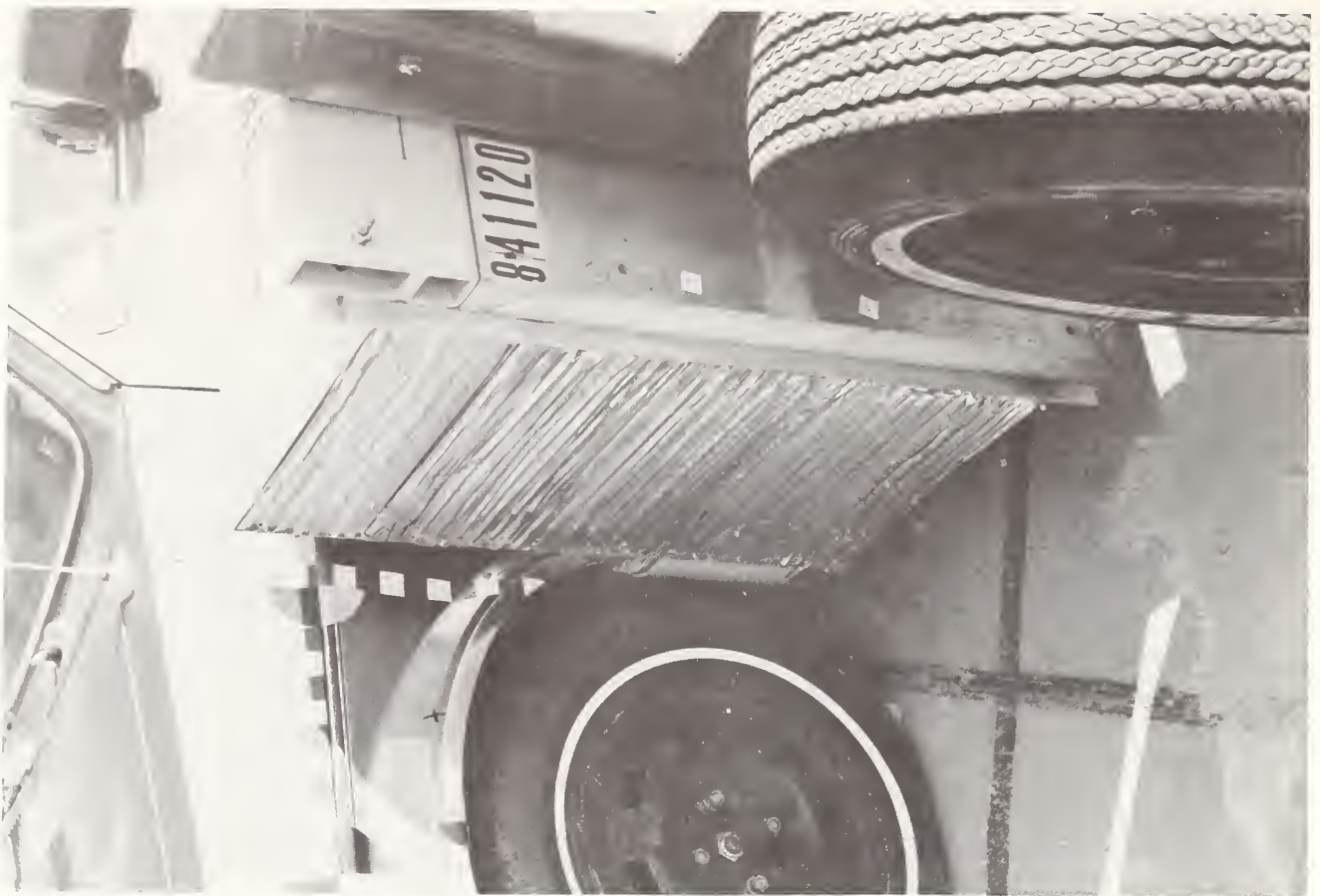


Figure A-5. PRE-TEST CLOSEUP - VIEW 1



Figure A-6. PRE-TEST CLOSEUP - VIEW 2

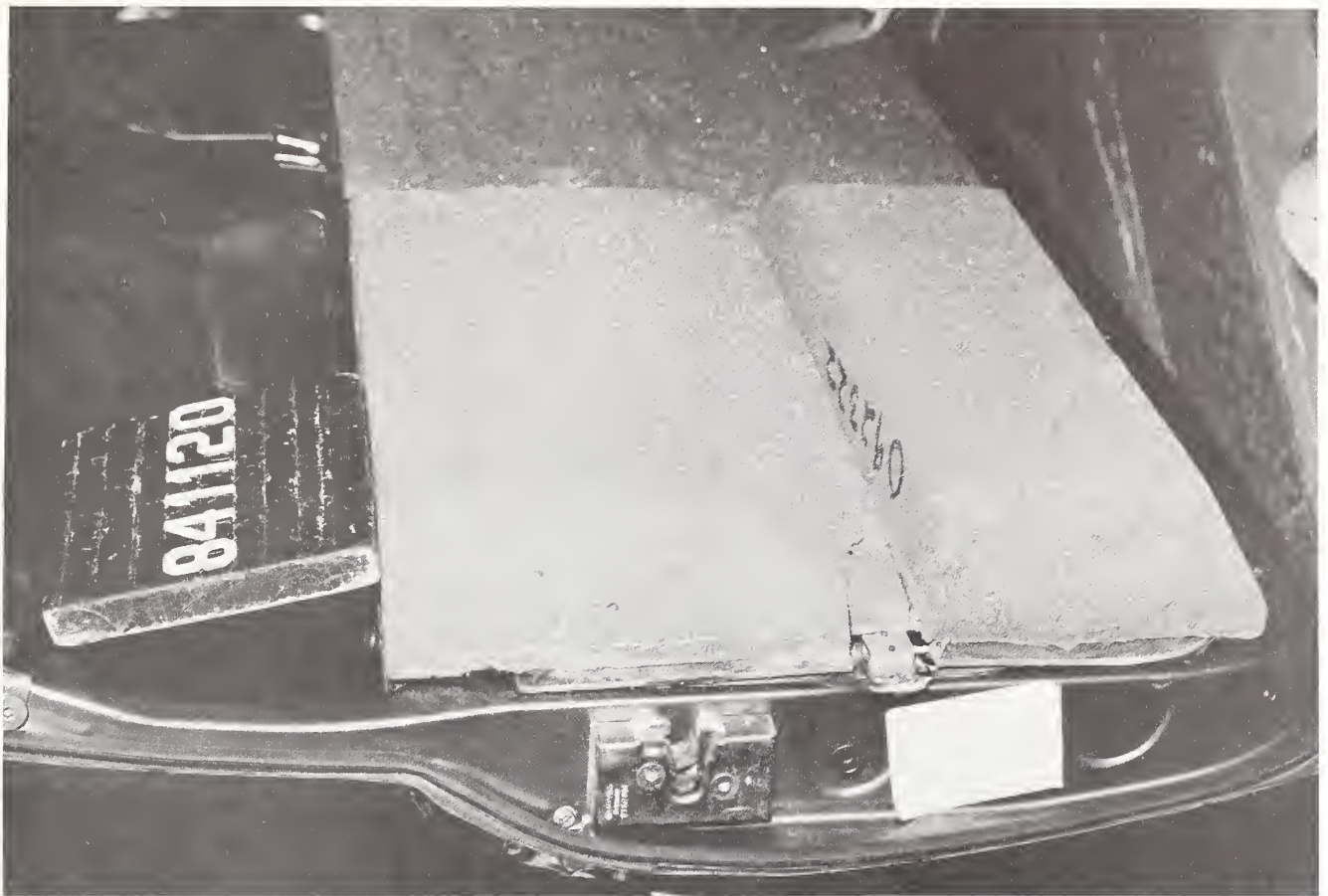


Figure A-7. PADDING MODIFICATION



Figure A-8. PRE-TEST DRIVER DUMMY - VIEW 1
A-5



Figure A-9. PRE-TEST DRIVER DUMMY - VIEW 2



Figure A-10. PRE-TEST PASSENGER DUMMY - VIEW 1
A-6



Figure A-11. PRE-TEST PASSENGER DUMMY - VIEW 2

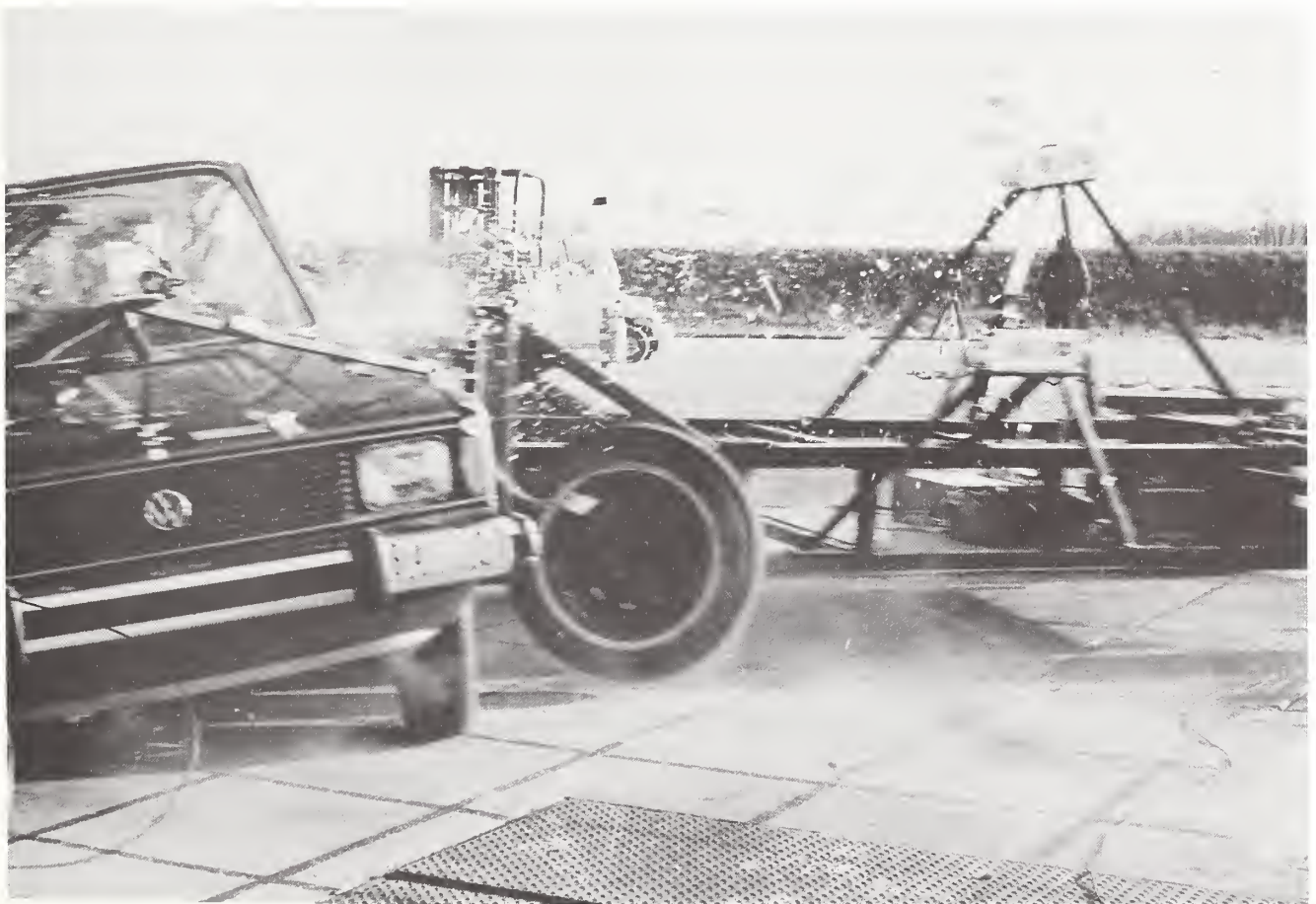


Figure A-12. CRASH EVENT PHOTOGRAPH
A-7

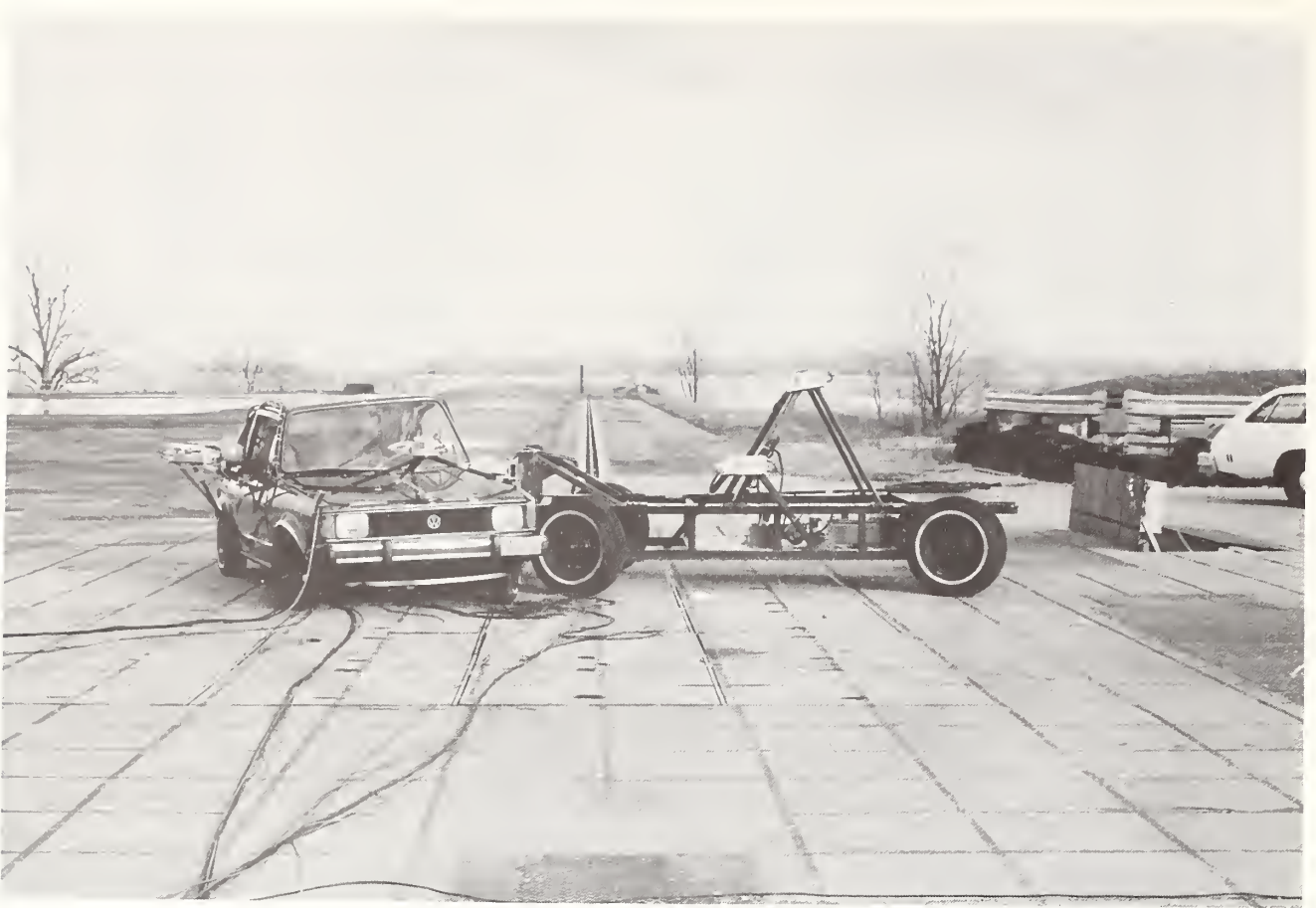


Figure A-13. POST-TEST OVERALL - VIEW 1



Figure A-14. POST-TEST OVERALL - VIEW 2
A-8



Figure A-15. POST-TEST OVERALL - VIEW 3



Figure A-16. POST-TEST OVERALL - VIEW 4
A-9



Figure A-17. POST-TEST DRIVER DUMMY - VIEW 1



Figure A-18. POST-TEST DRIVER DUMMY - VIEW 2
A-10



Figure A-19. POST-TEST PASSENGER DUMMY - VIEW 1

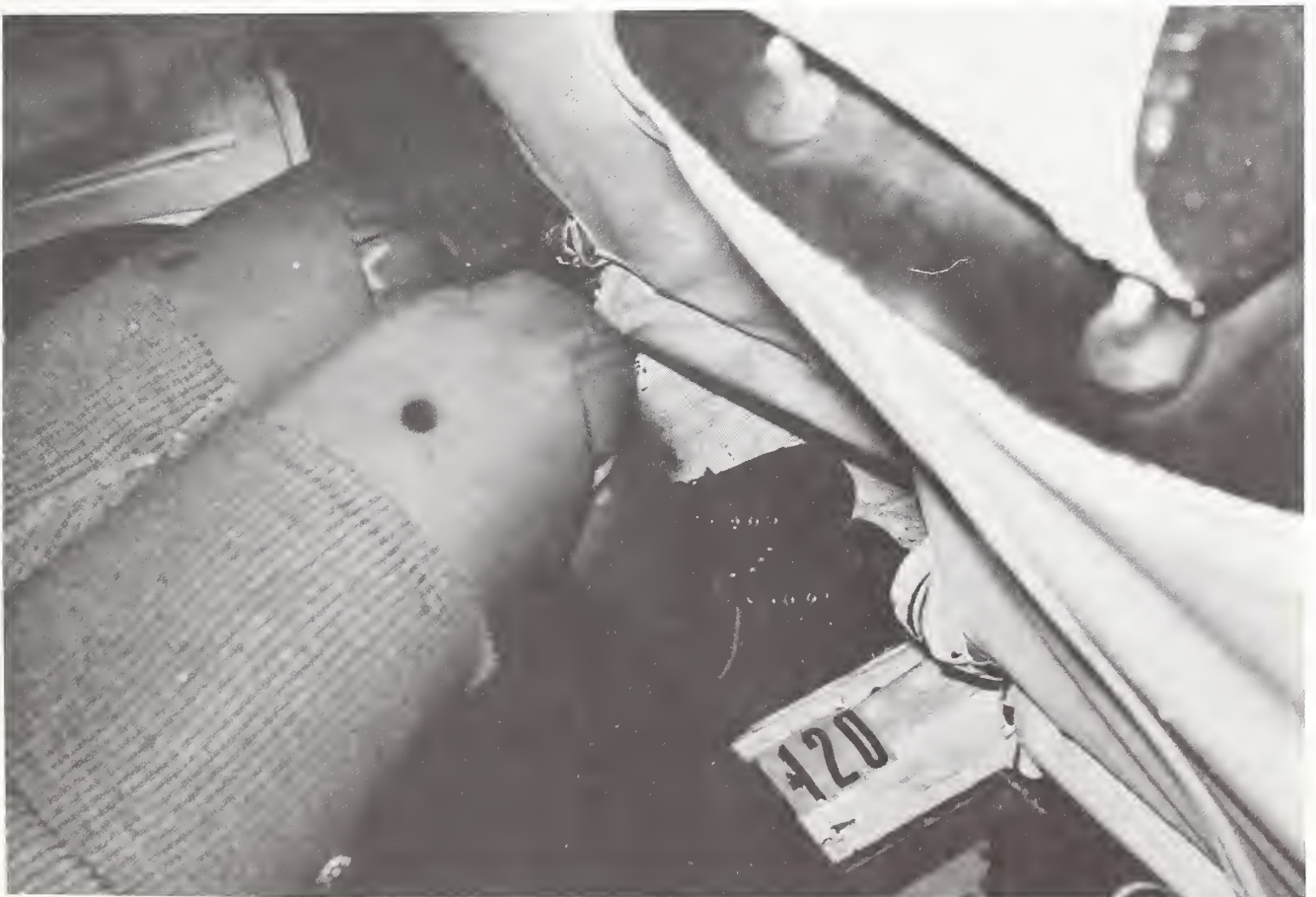


Figure A-20. POST-TEST PASSENGER DUMMY - VIEW 2
A-11



Figure A-21. POST-TEST DUMMIES OVERALL

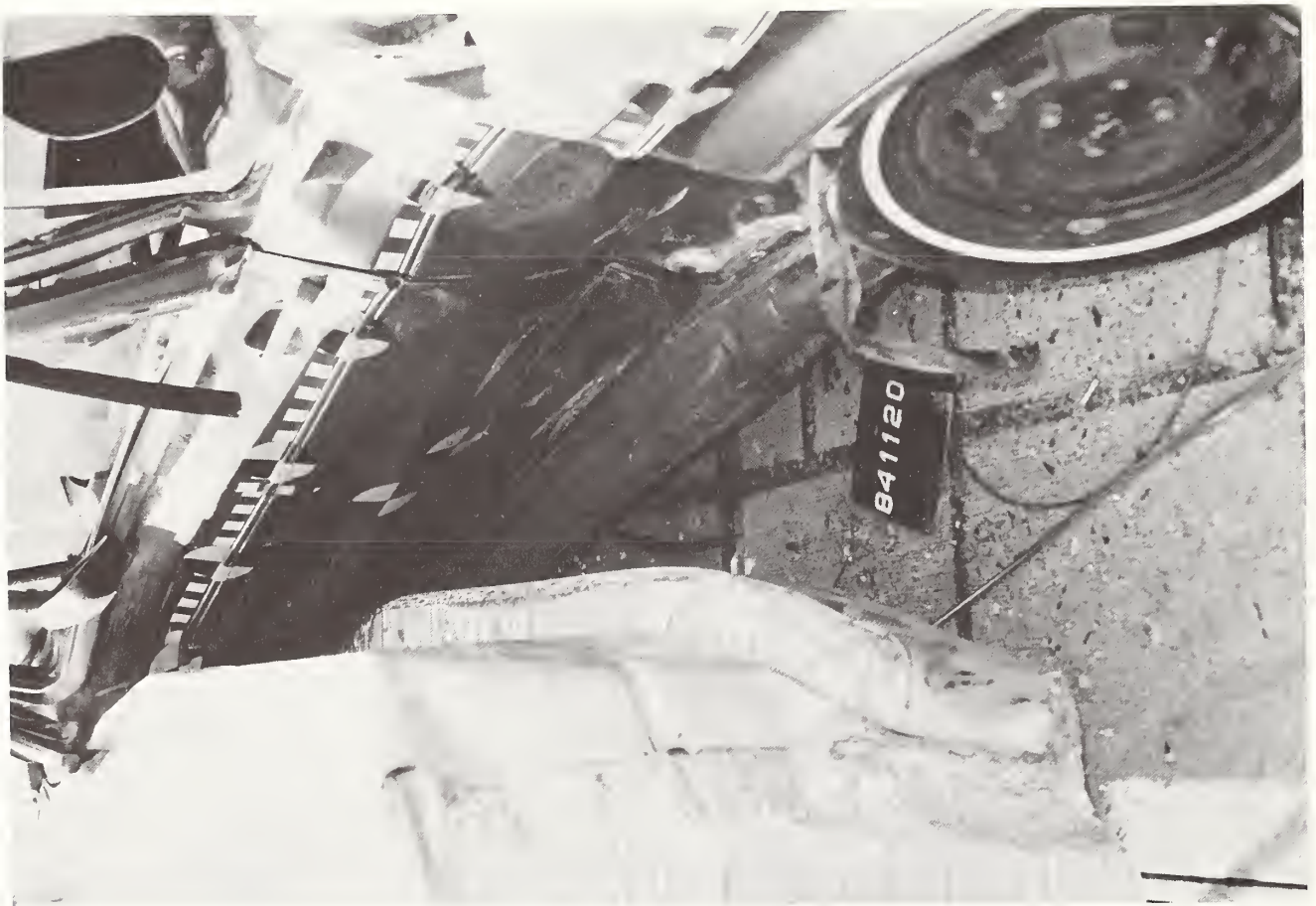


Figure A-22. VEHICLE DAMAGE
A-12

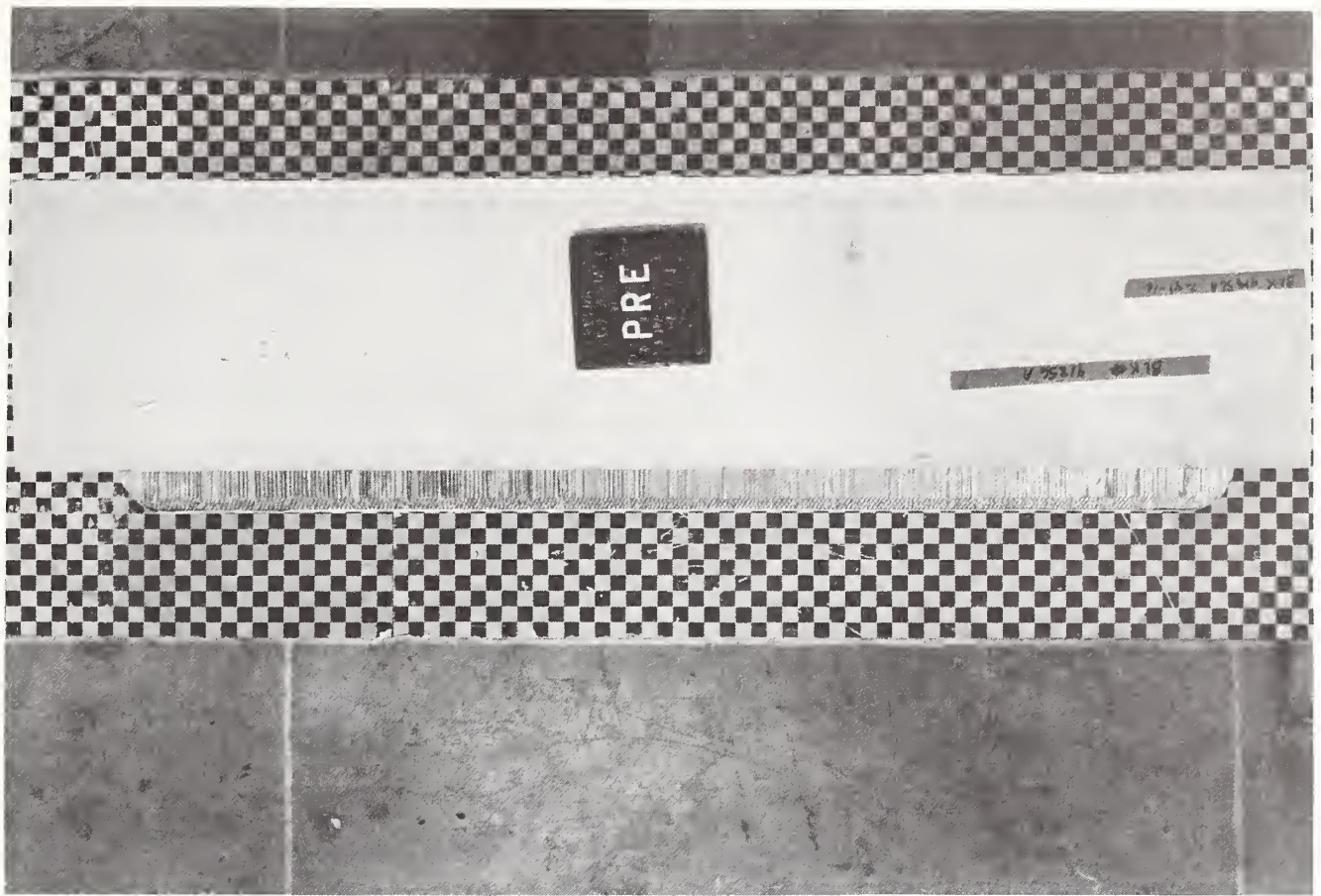


Figure A-23. PRE-TEST MDB FACE - VIEW 1

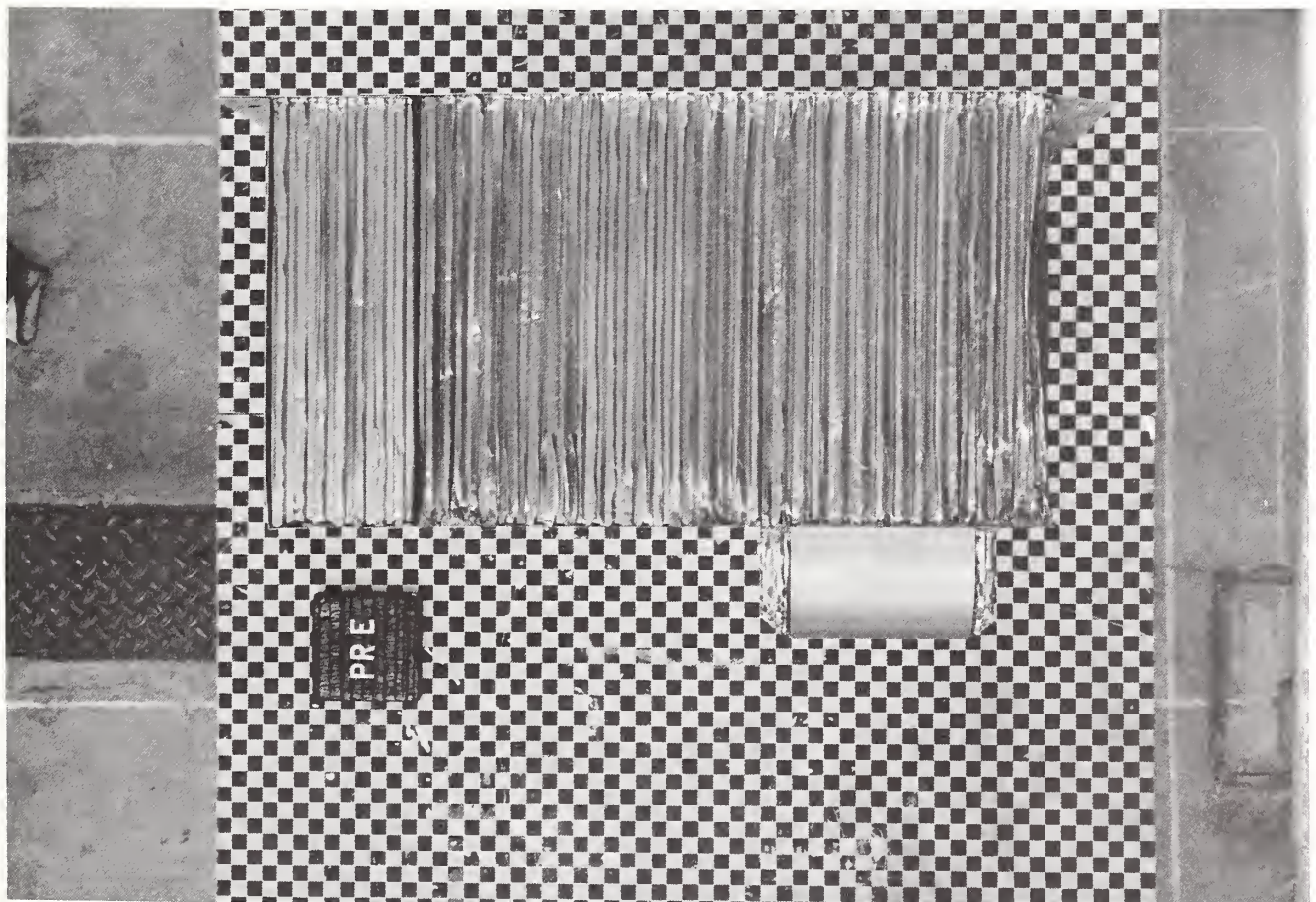


Figure A-24. PRE-TEST MDB FACE - VIEW 2
A-13

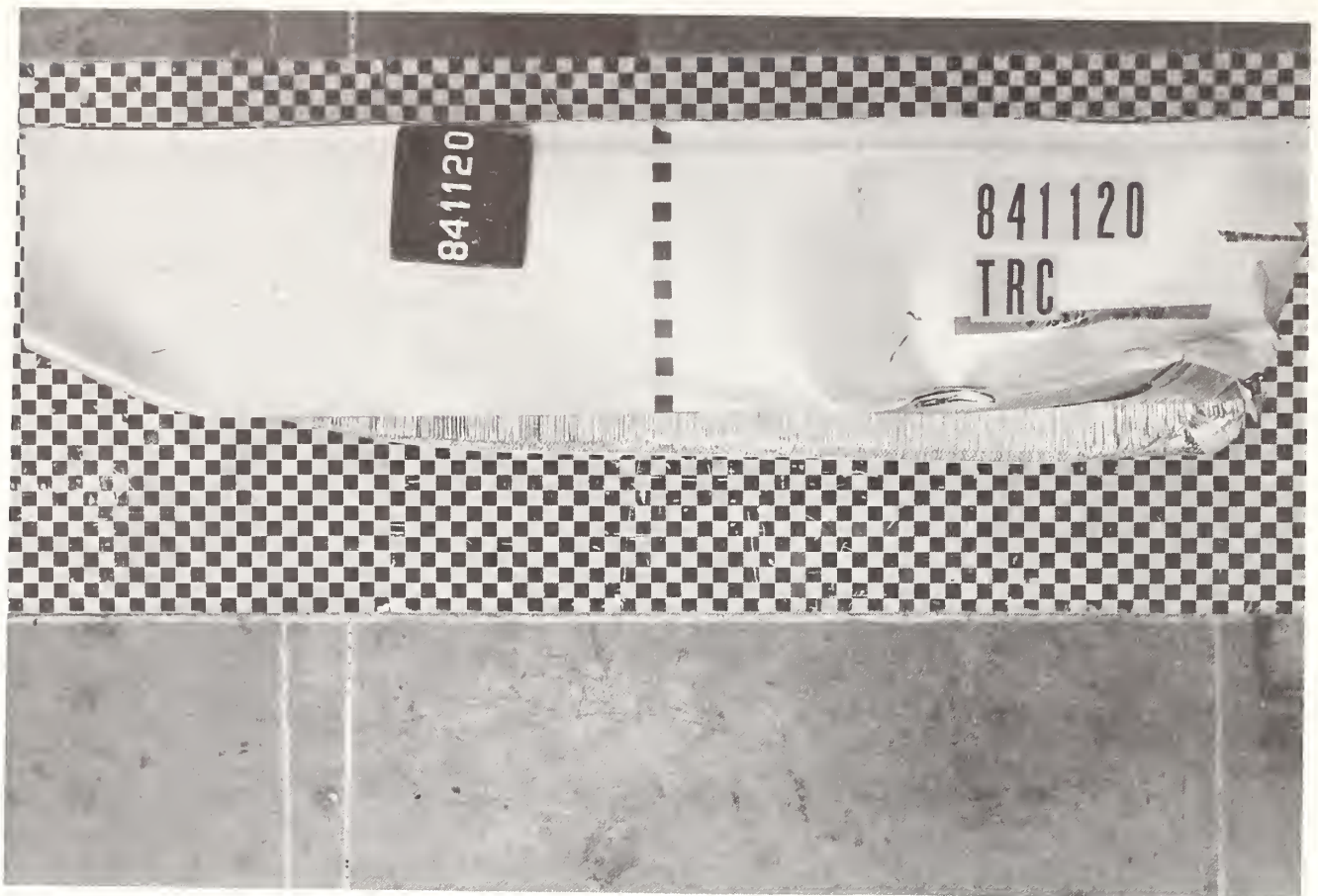


Figure A-25. POST-TEST MDB FACE - VIEW 1

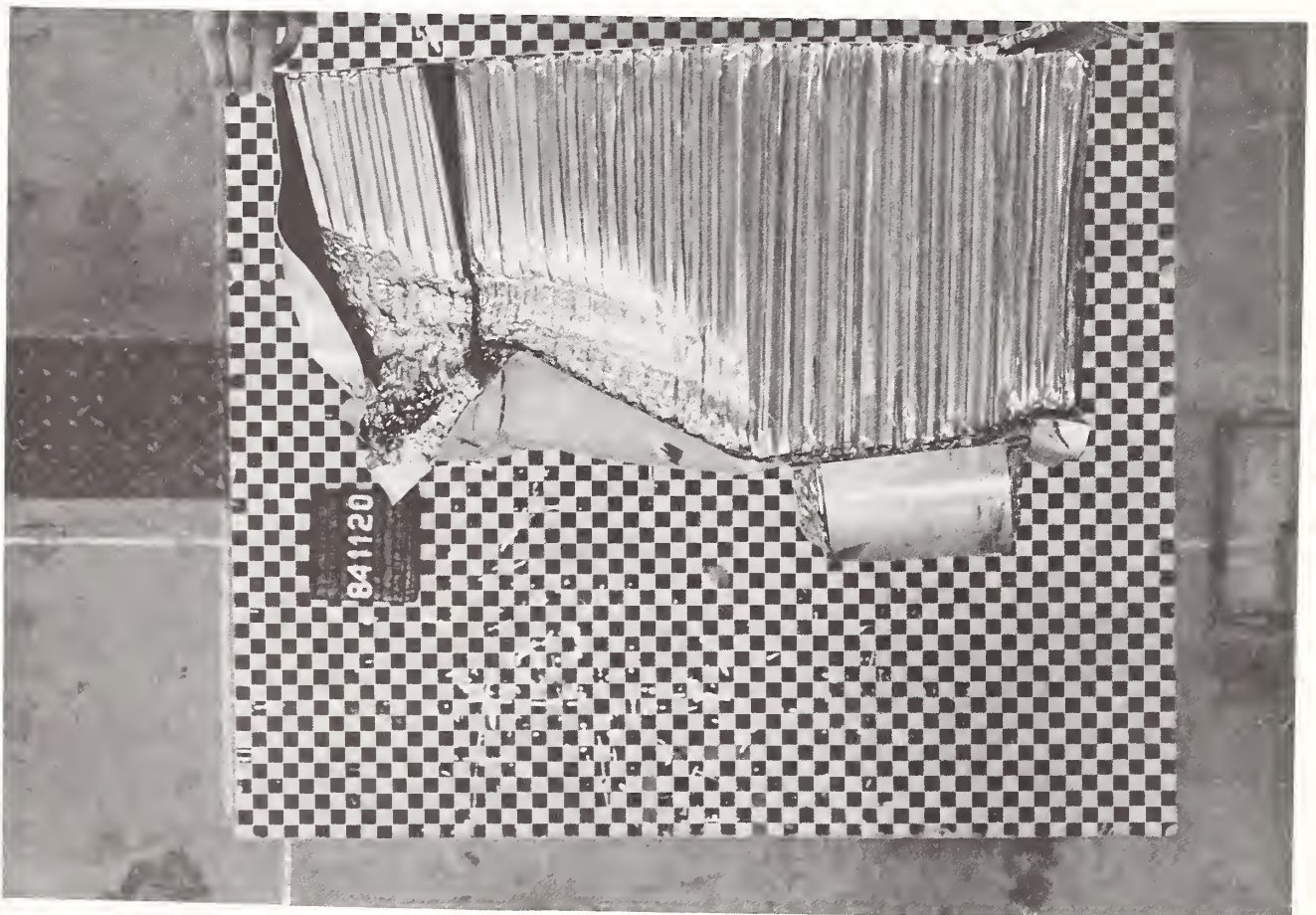


Figure A-26. POST-TEST MDB FACE - VIEW 2
A-14

APPENDIX B
DATA PLOT PRESENTATION

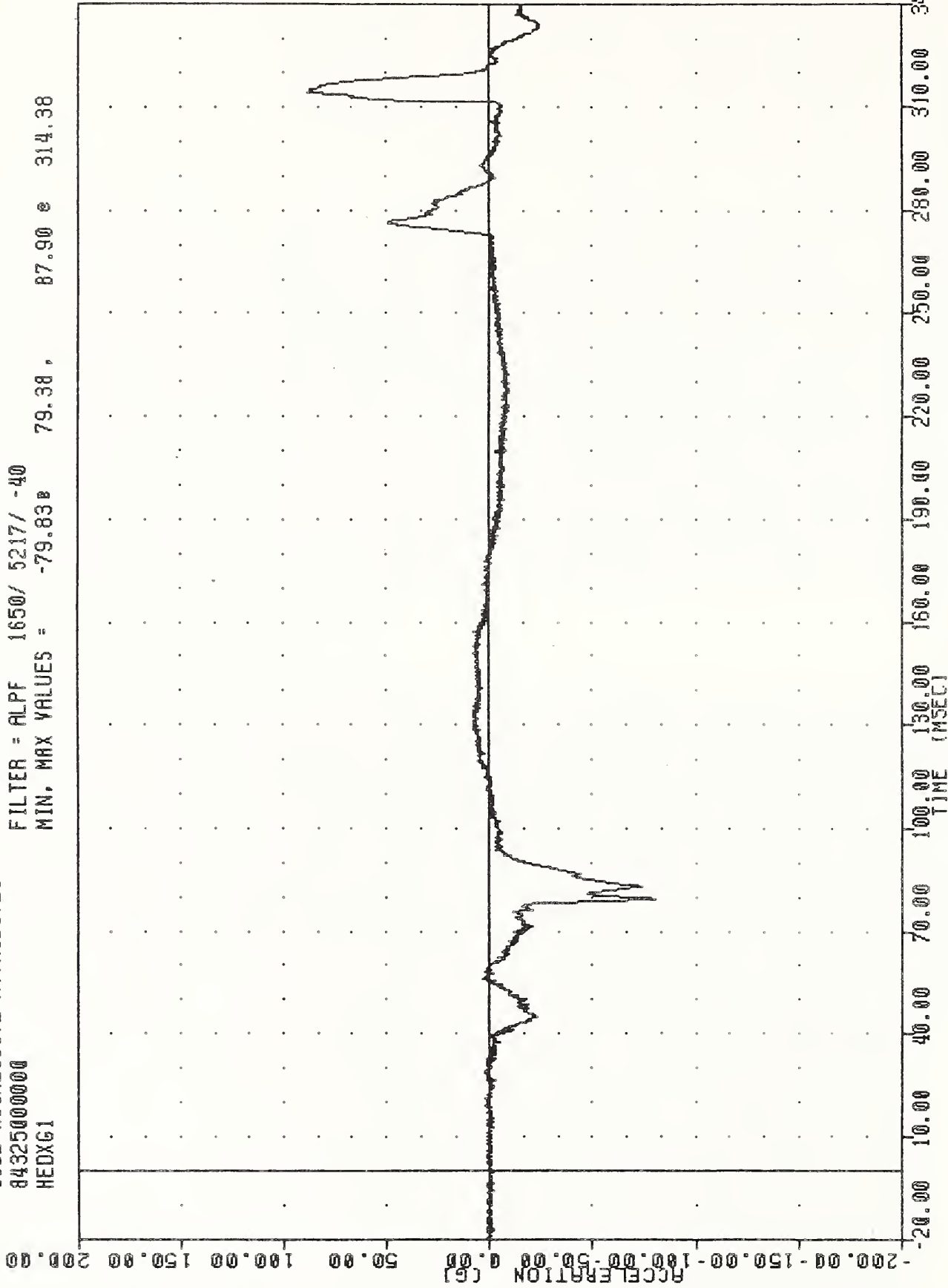
Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. The data was filtered according to SAE J211, except dummy thorax data which was filtered using the HSRI filter.

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
HEDXG1

PLOT DATE 27-NOV-84 16:22:35

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -79.83B 79.38 , 87.90 e 314.38



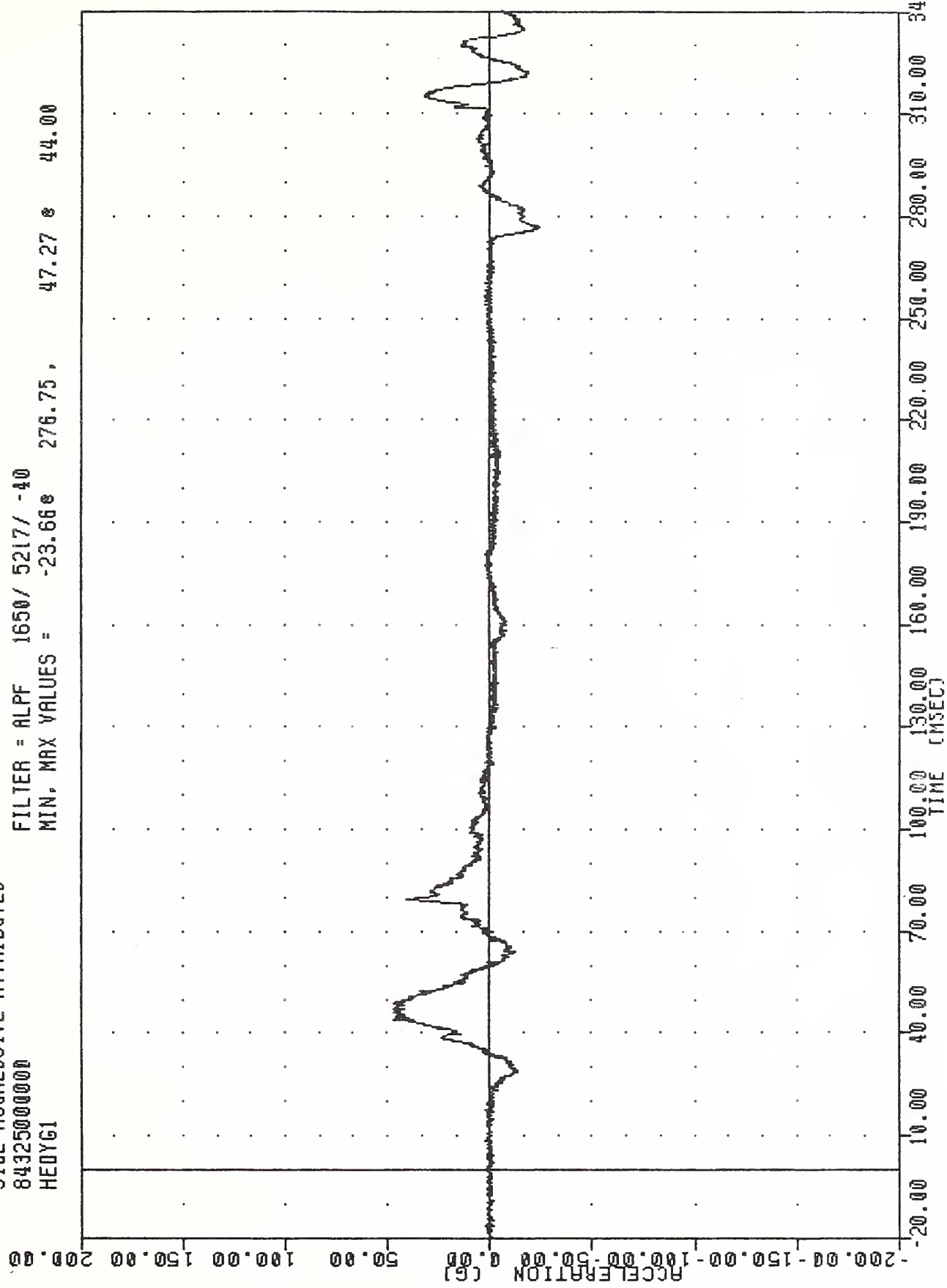
B-2

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION X AXIS

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
HEDYGI

PLOT DATE 27-NOV-84 16:22:35

FILTER = ALPF 1650/ 5217/ -40
MIN. MAX VALUES = -23.66 276.75 , 47.27 44.00



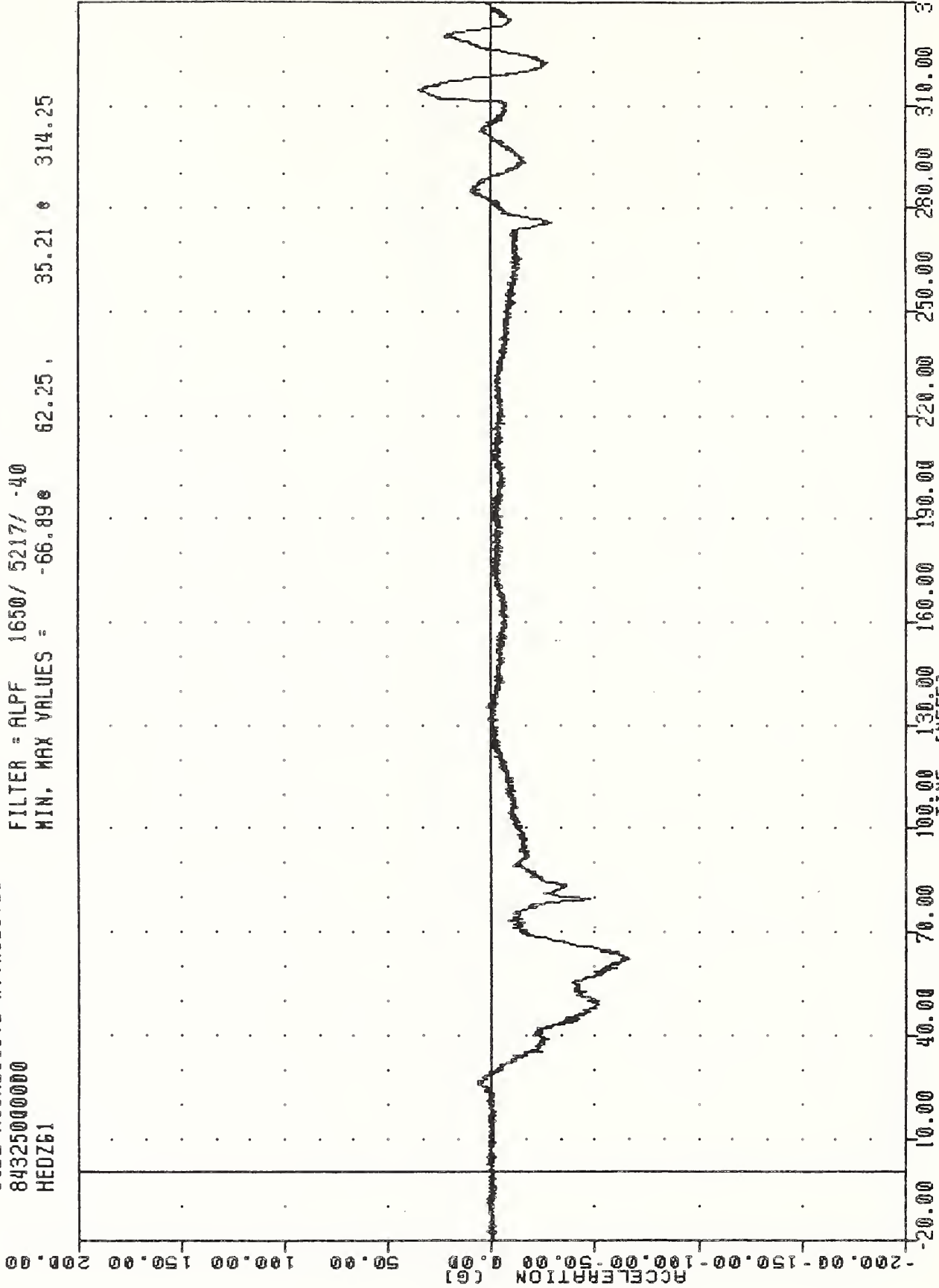
B-3

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION Y AXIS

TAC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
HEDZ61

PLOT DATE 27-NOV-84 16:22:35

FILTER = ALPF 1650/ 5217/ -40
MIN. MAX VALUES = -66.89e 62.25 , 35.21 e 314.25

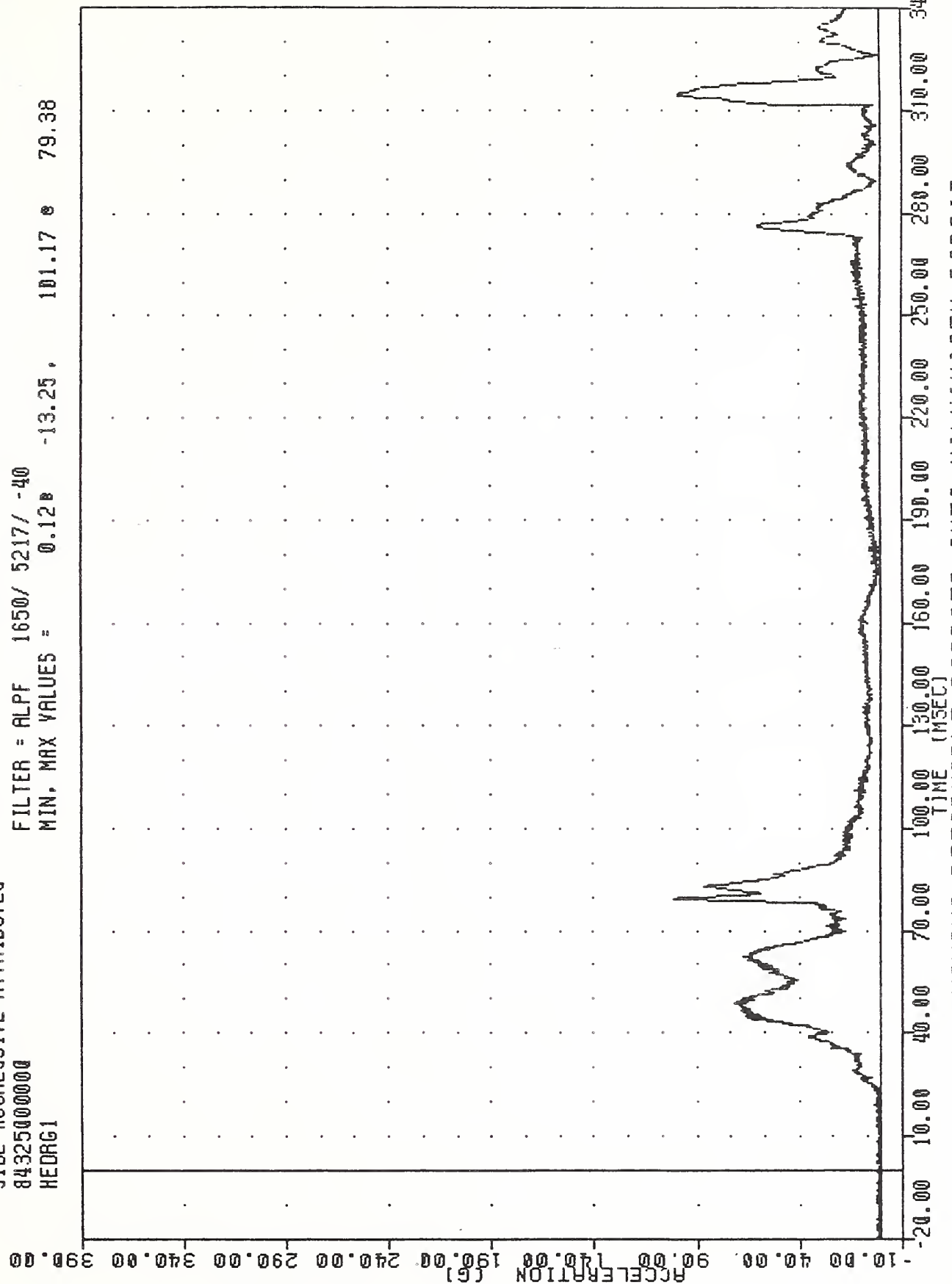


B-4

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION Z AXIS

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
HEDRG1

PLOT DATE 27-NOV-84 16:22:35
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = 0.12B -13.25, 101.17 e 79.38

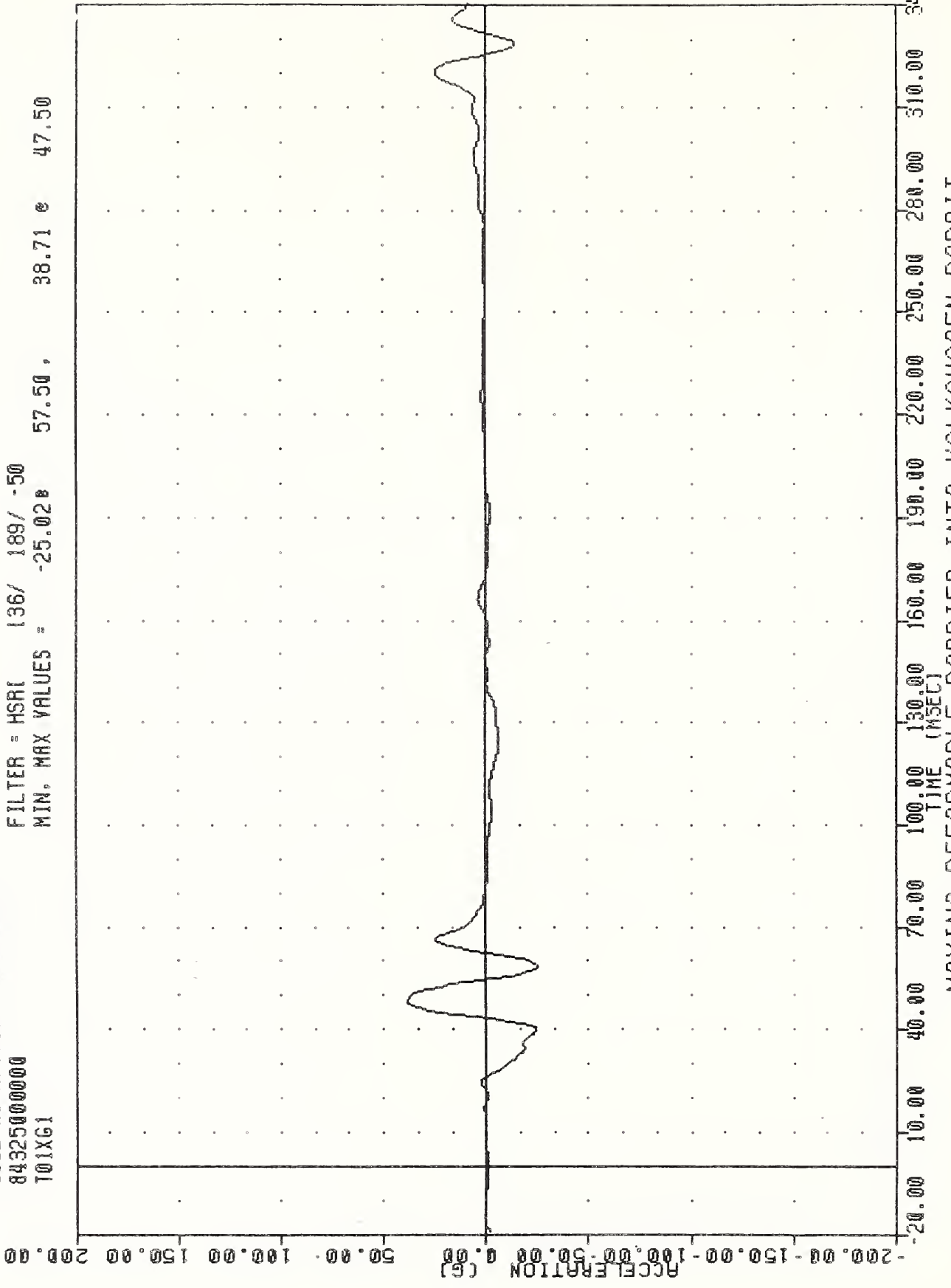


B-5

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD RESULTANT

IHC 841120
SIDE AGGRESSIVE ATTRIBUTES
8432500000
T01XG1

FLUI DATE 27-MOV-84 16:24:11
FILTER = HSR1 136/ 189/ -50
MIN. MAX VALUES = -25.028 57.50 , 38.71 e 47.50

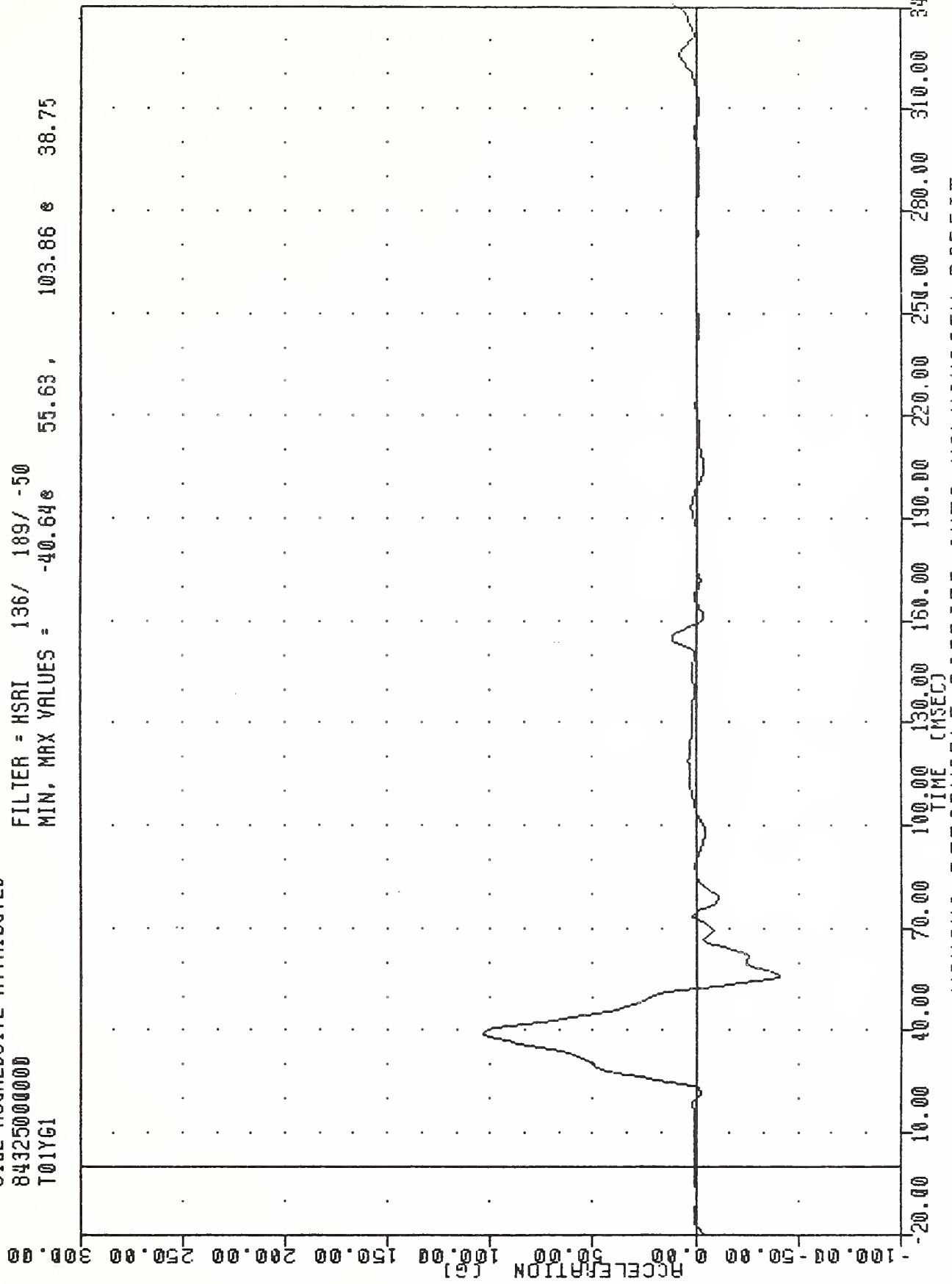


B-9

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION X AXIS

INC , 841120
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 T01Y61

FLUI DRIE 27-NOV-84 16:24:11
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -40.64e 55.63, 103.86 e 38.75



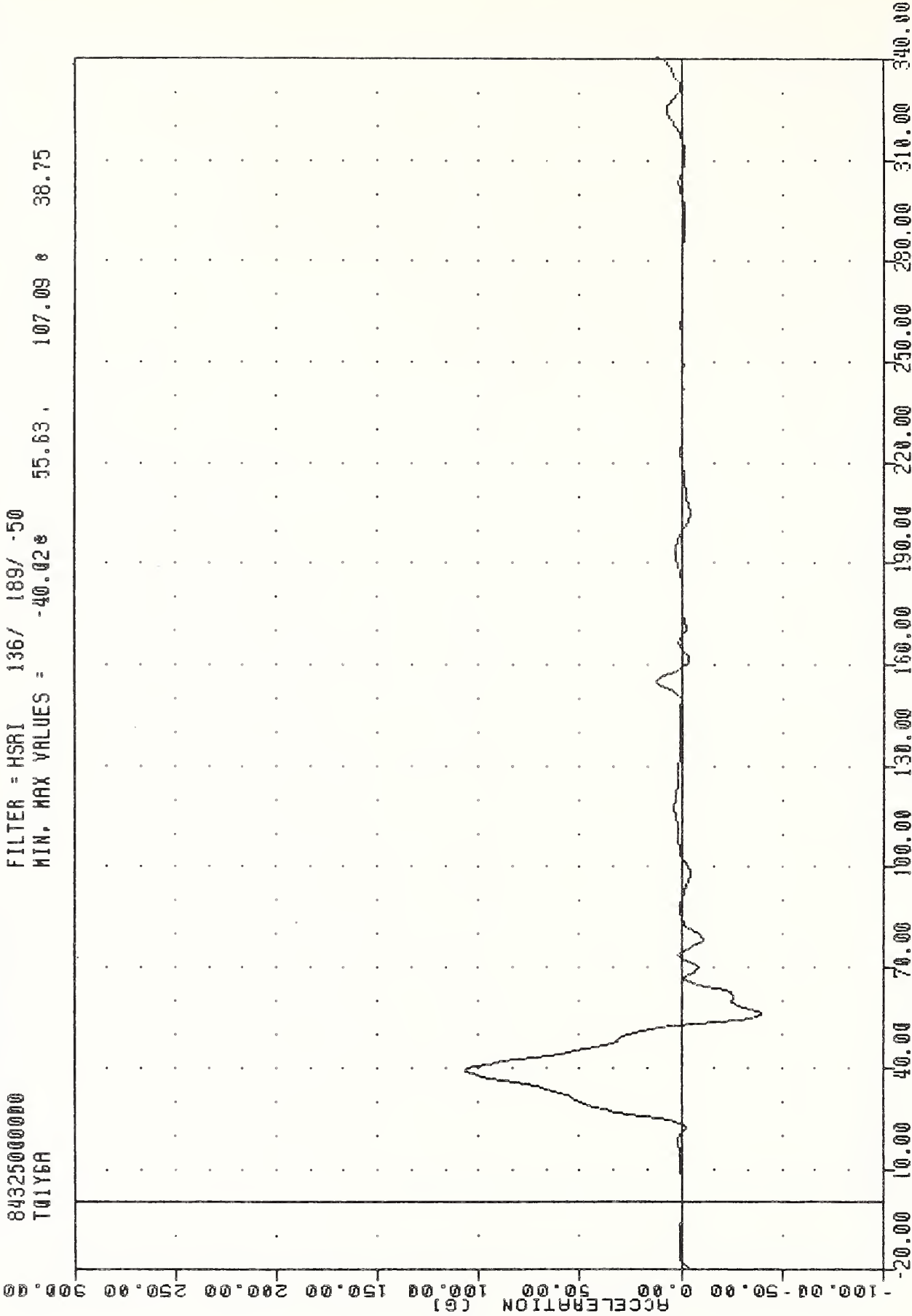
B-7

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE ACCELERATION Y AXIS

THC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T01Y6A

PLU1 DR1E 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -40.02 55.63 , 107.09 38.75



B-8

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION -2 Y AXIS

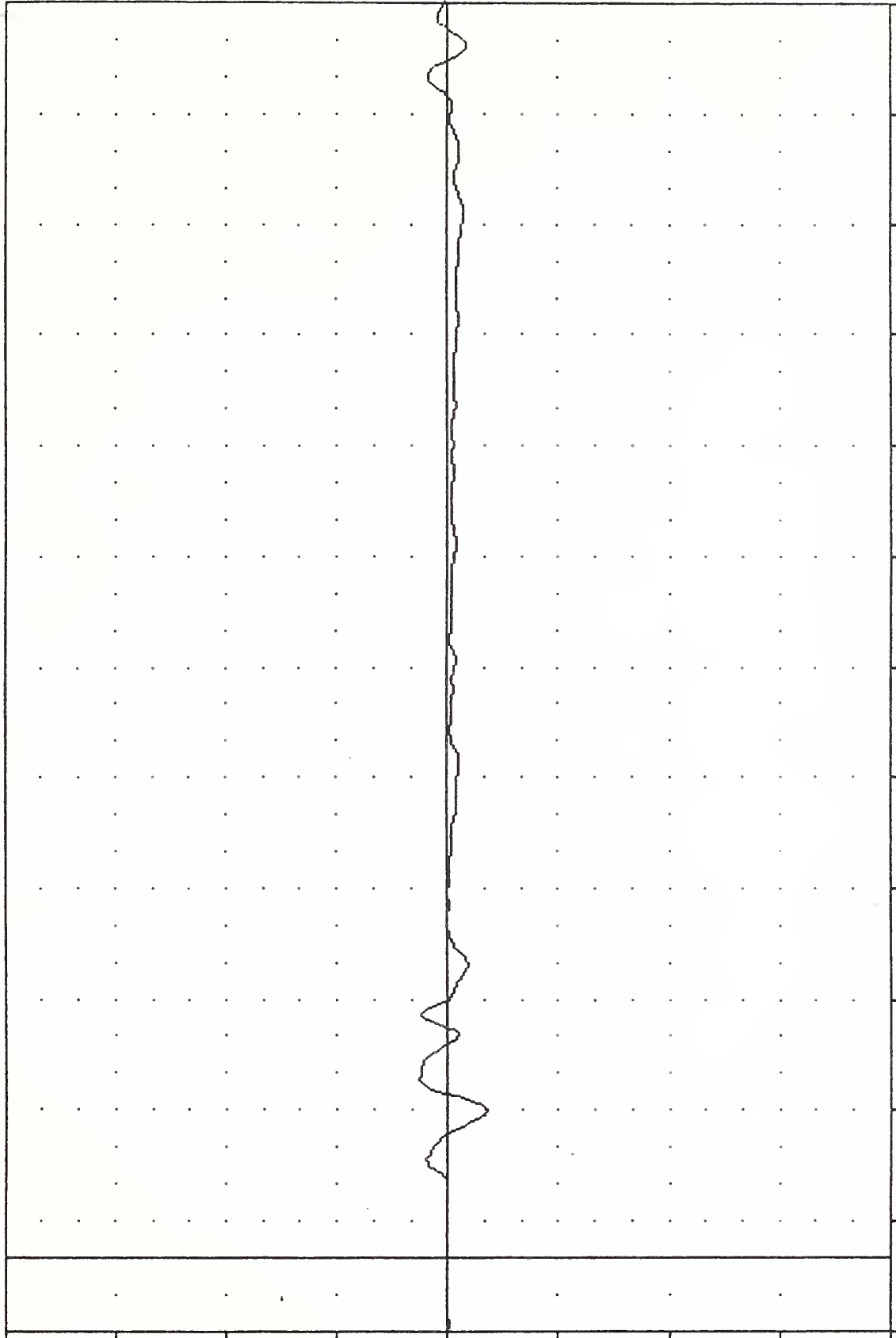
IHC , 841120
SIDE AGGRESSIVE ATTRIBUTES
8432500000
T01ZG1

PLUI DATE 27-NOV-84 16:24:11

FILTER = HSR(136/ 189/ -50

MIN. MAX VALUES = -17.50 39.38 , 12.52 48.13

ACCELERATION (G)

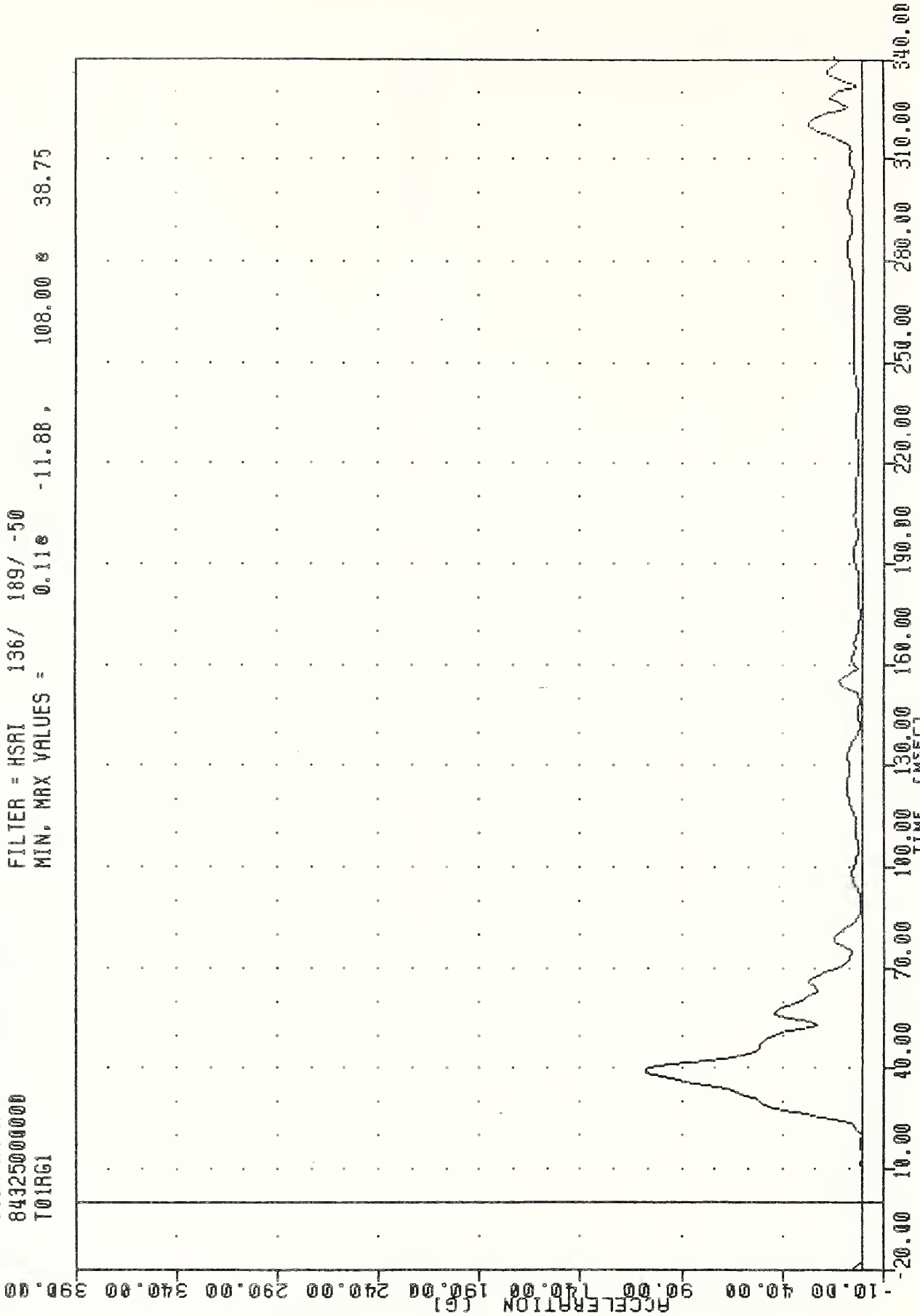


B-9

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION Z AXIS

INC 84112W
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 T01RG1

PLU1 DR1E 2/ NOV-84 16:24:11
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.11e -11.88, 108.00 8 38.75



B-10

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE RESULTANT

IHL , 84112W

SIDE AGGRESSIVE ATTRIBUTES

84325000000

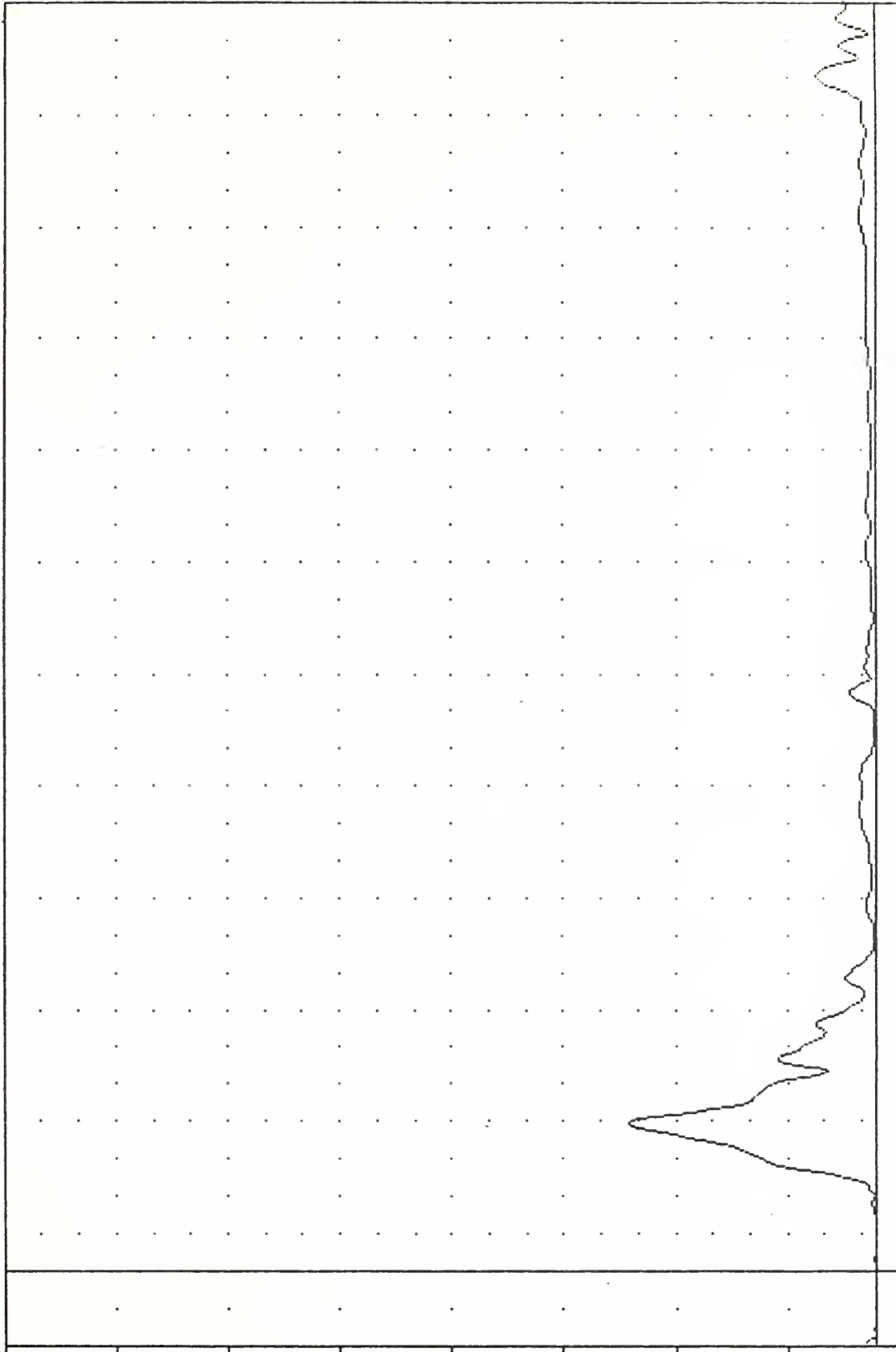
T01RGA

FLUI DATE 27-NOV-84 10:25:20

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.21 7.50 111.10 38.75

ACCELERATION (G)



B-11

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE RESULTANT USING T01YGA

TRC 841120
SIDE AGGRESSIVE ATTRIBUTES
8432500000
T01YV1

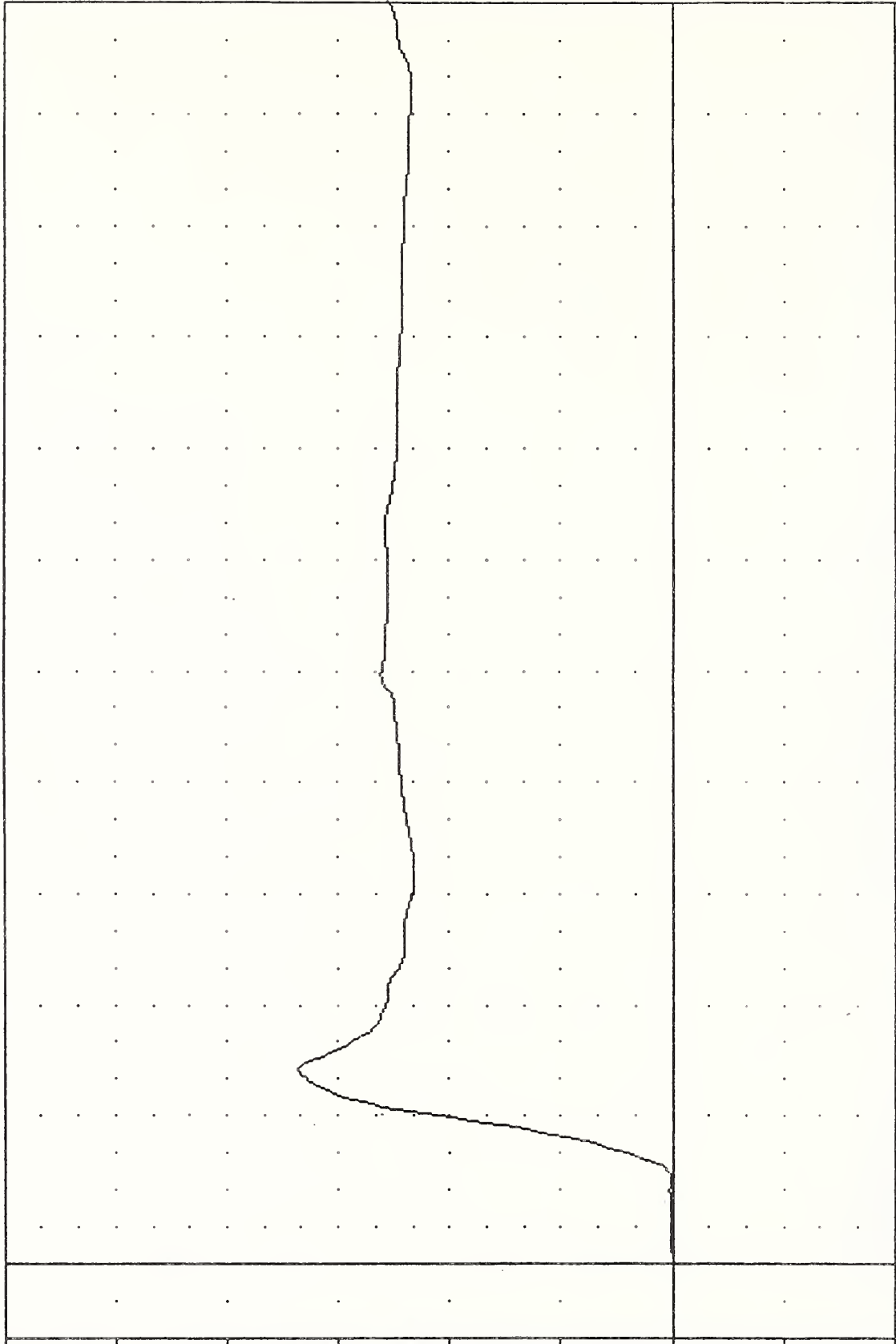
PLU1 DR1E 27-NOV-84 16:26:00

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.088 -17.50, 33.55 @ 51.88

VELOCITY (MPH)

60.00
50.00
48.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00



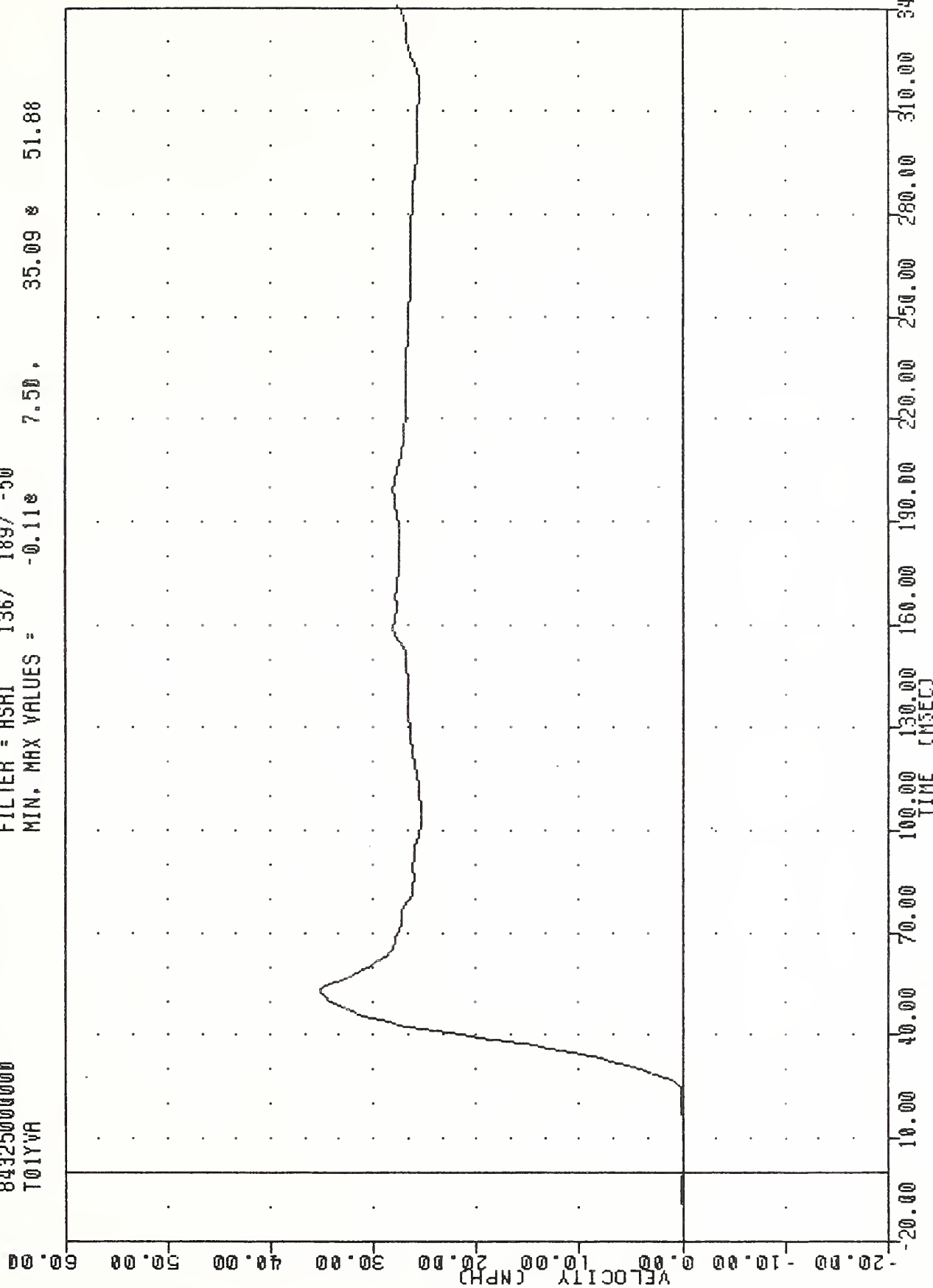
340.00 310.00 280.00 250.00 220.00 190.00 160.00 130.00 100.00 70.00 40.00 10.00 -20.00
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T01YGI

IRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T01Y6A

PLUI DRIE 27-NOV-84 16:26:00

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -0.11e 7.50, 35.09 e 51.88



B-13

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T01Y6A

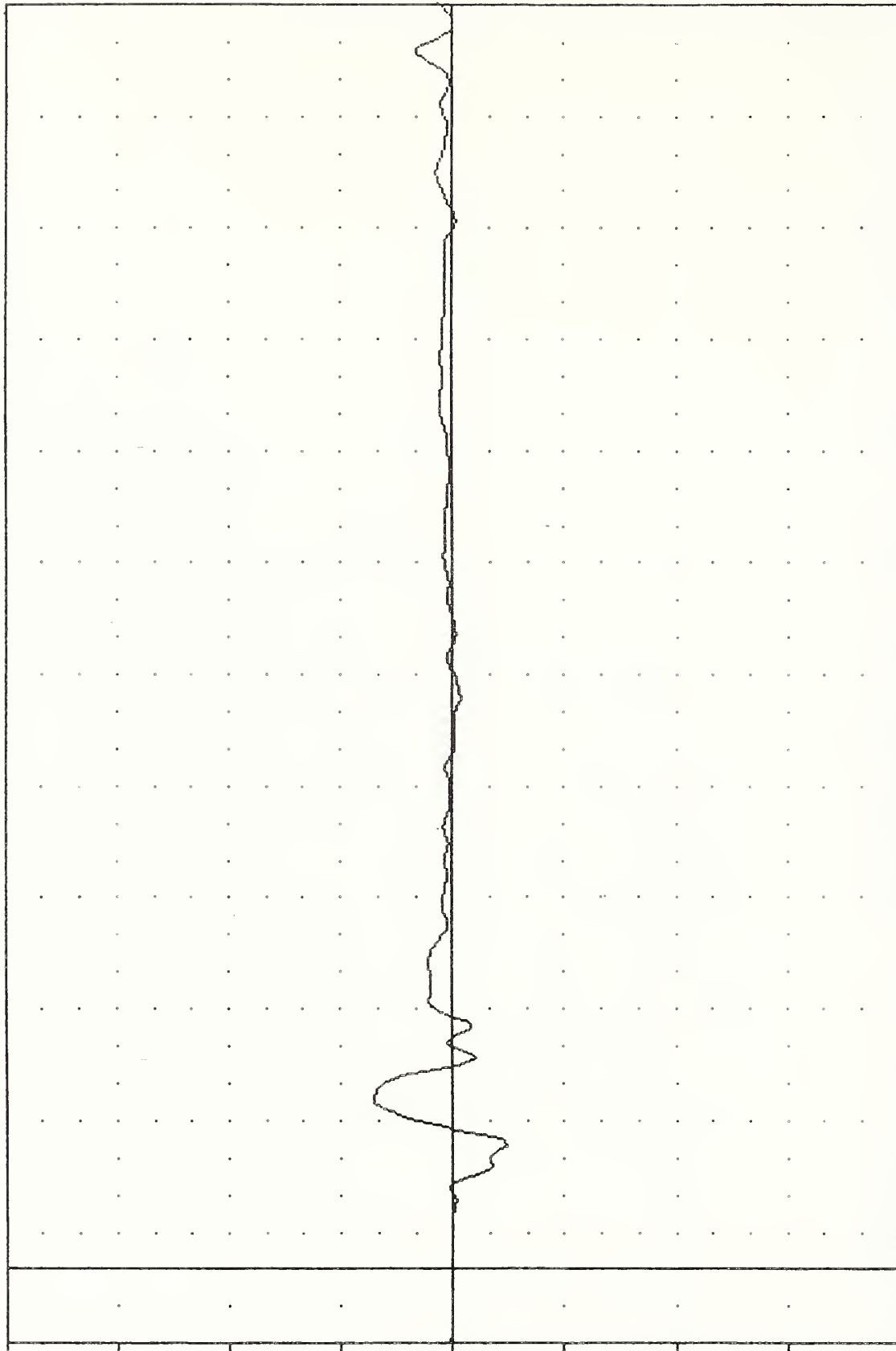
TRC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T12X61

PLUI DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ .50

MIN, MAX VALUES = -24.25 33.13 35.40 45.00

ACCELERATION (G)



B-14

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION X AXIS

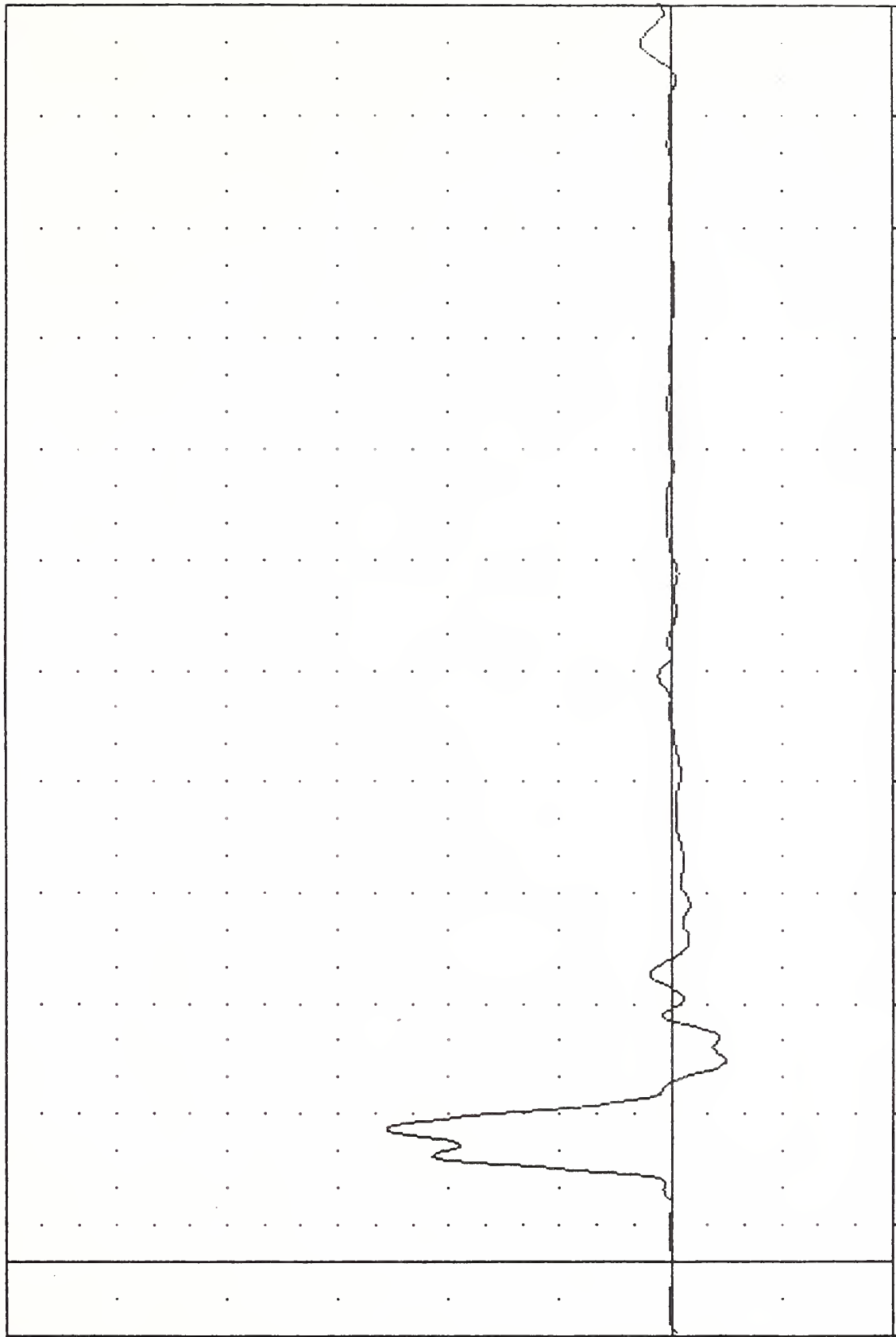
TAC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T12YG1

PLUI DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -25.13B 53.75, 128.12 S 35.63

ACCELERATION (G)



B-15

TIME (MSEC) 100.00 130.00 150.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION Y AXIS

TRC 841120

PLUI DRIT 27 NOV 84 16:24:11

SIDE AGGRESSIVE ATTRIBUTES

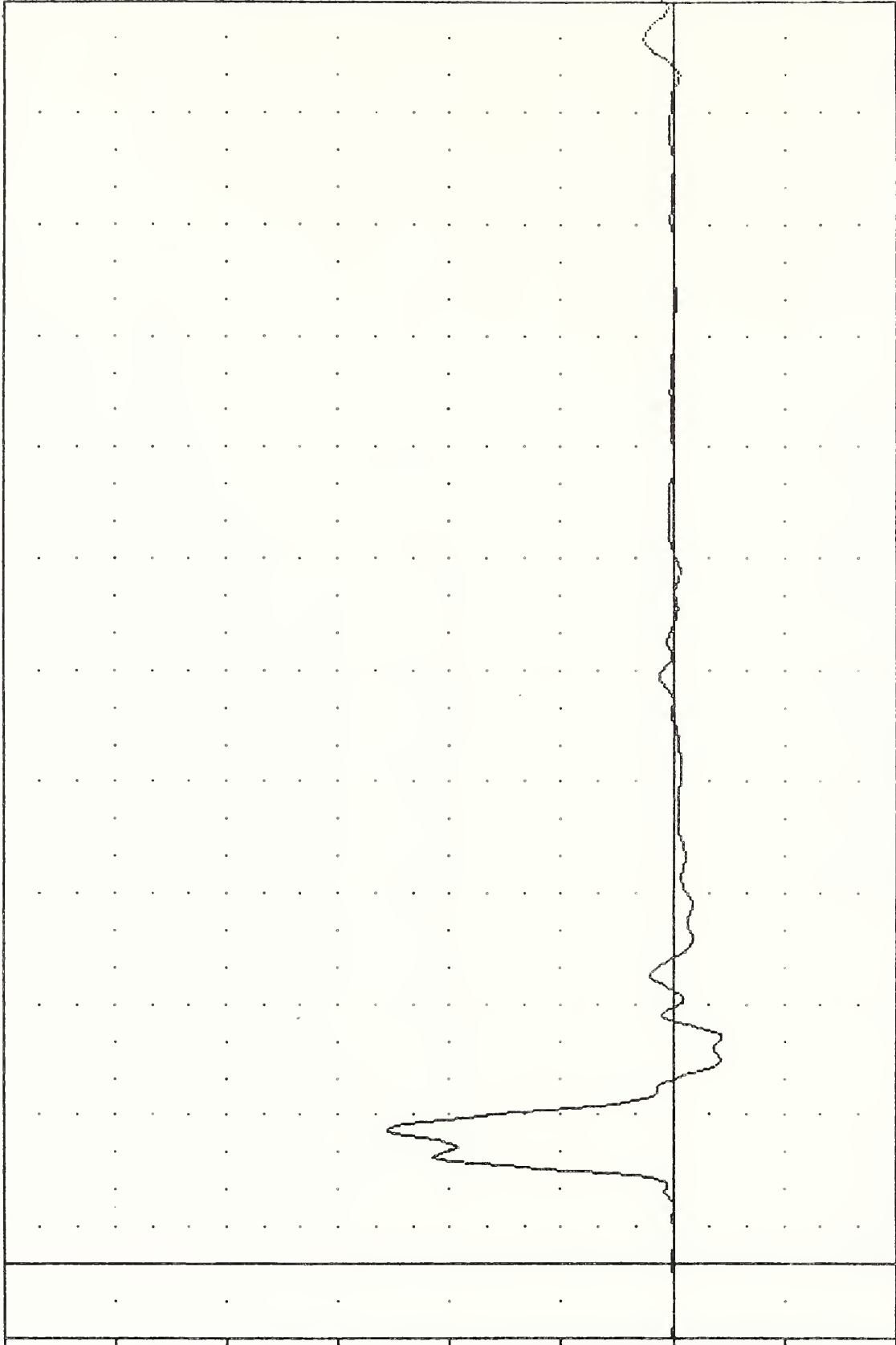
84325000000

FILTER = HSRI 136/ 189/ -50

T12YGA

MIN. MAX VALUES = -22.11 60.62, 128.02 35.63

ACCELERATION (G)



B-16

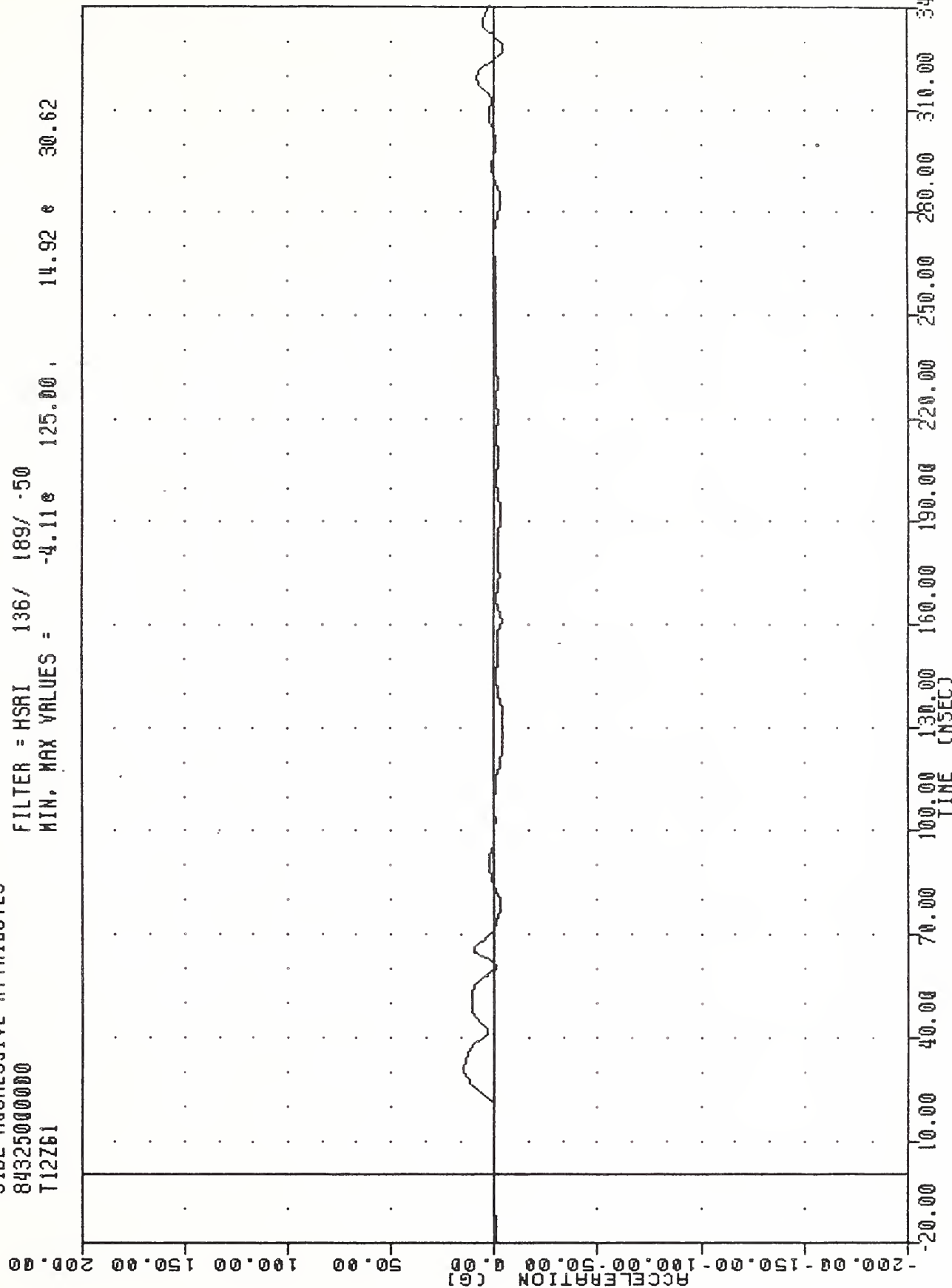
TIME (MSEC) 20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION -2 Y AXIS

TAC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T12Z61

PLUJ DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -4.11e 125.00 , 14.92 e 30.62



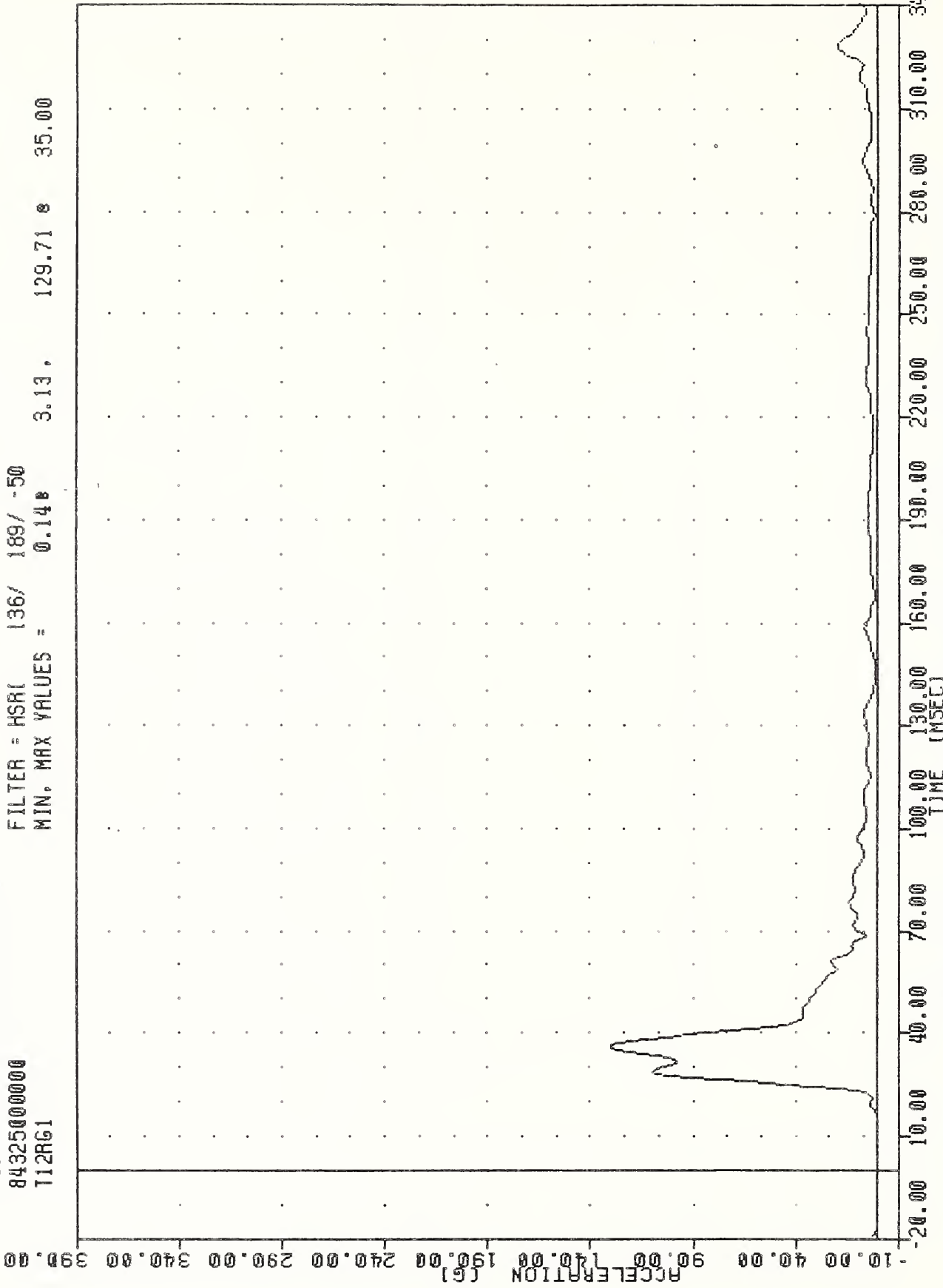
B-17

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION Z AXIS

INC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T12RG1

PLUI DATE 27-NOV-84 16:24:11

FILTER = HSR(136/ 189/ -50
MIN. MAX VALUES = 0.14B 3.13, 129.71 e 35.00



81-B

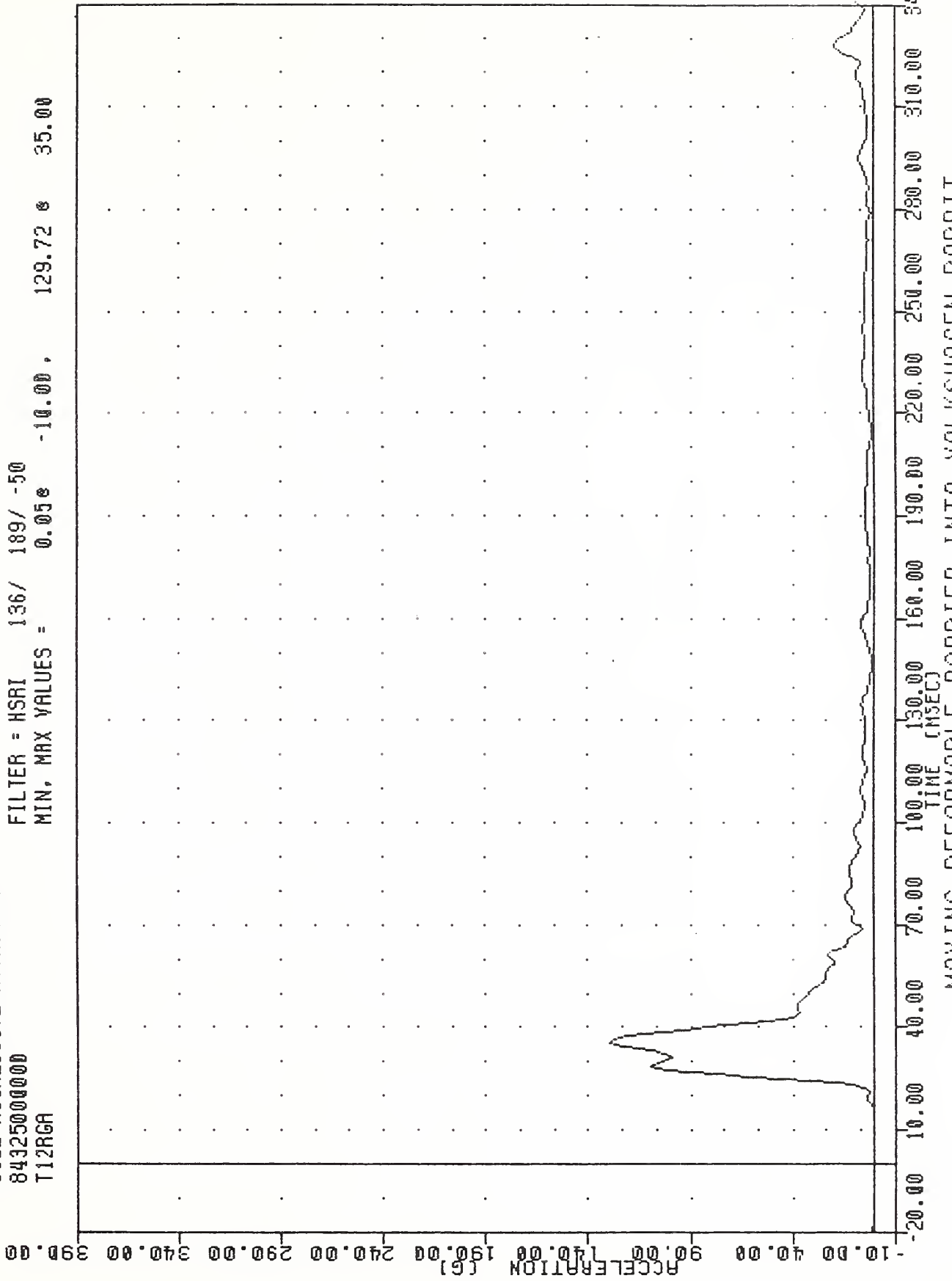
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE RESULTANT

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T12RGA

PLOT DATE 27-NOV-84 16:25:26

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.05e -10.00, 129.72 e 35.00

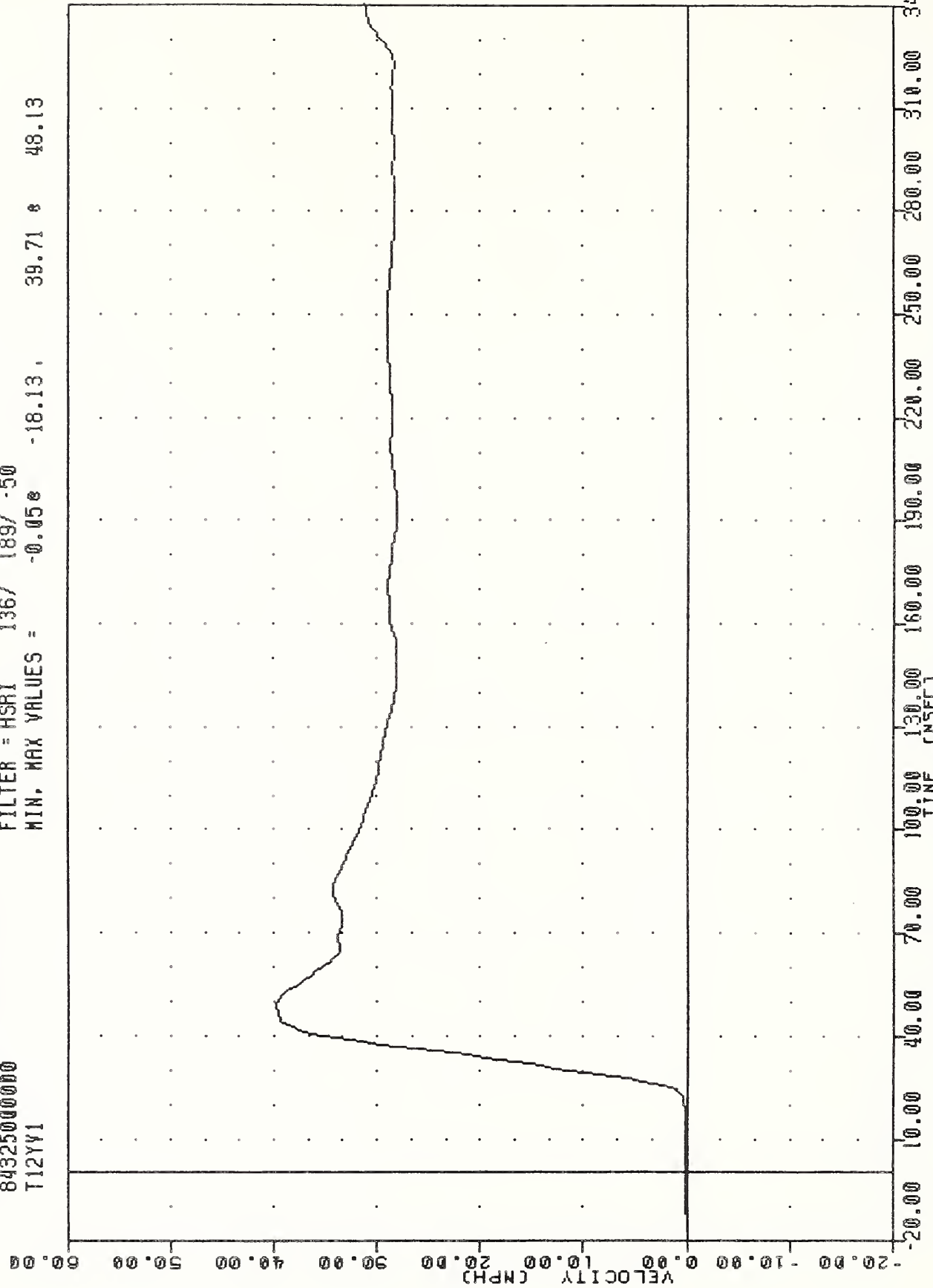


B-19

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE RESULTANT USING T12YGA.

INC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T12YV1

PLUI DATE 27-NOV-84 16:26:00
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -0.05e -18.13, 39.71 e 48.13



B-20

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12YGI

IHC 841120
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 T12YVA

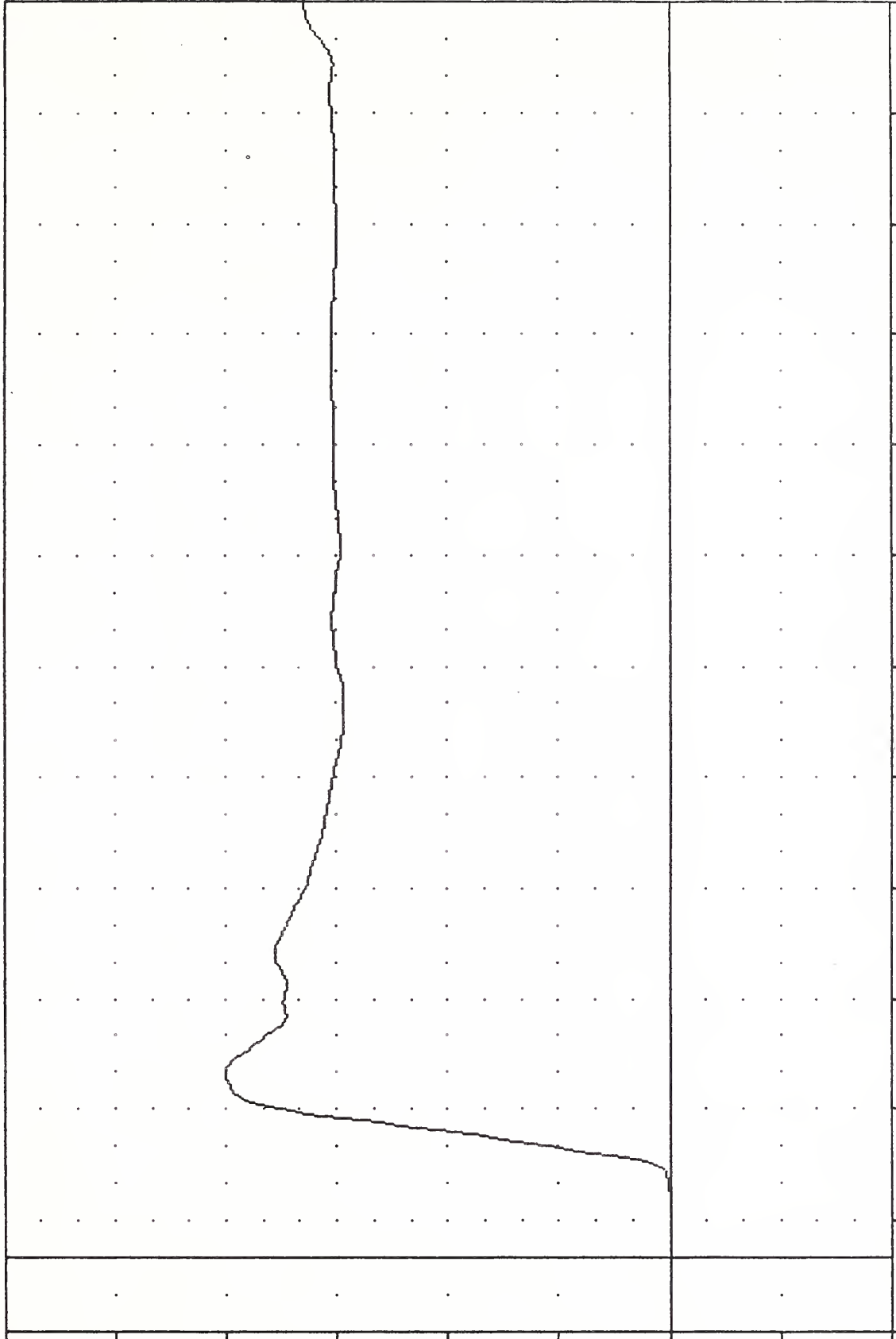
PLUI DATE 27-NOV-84 16:26:00

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.028 40.03 e 49.37

60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00

B-21



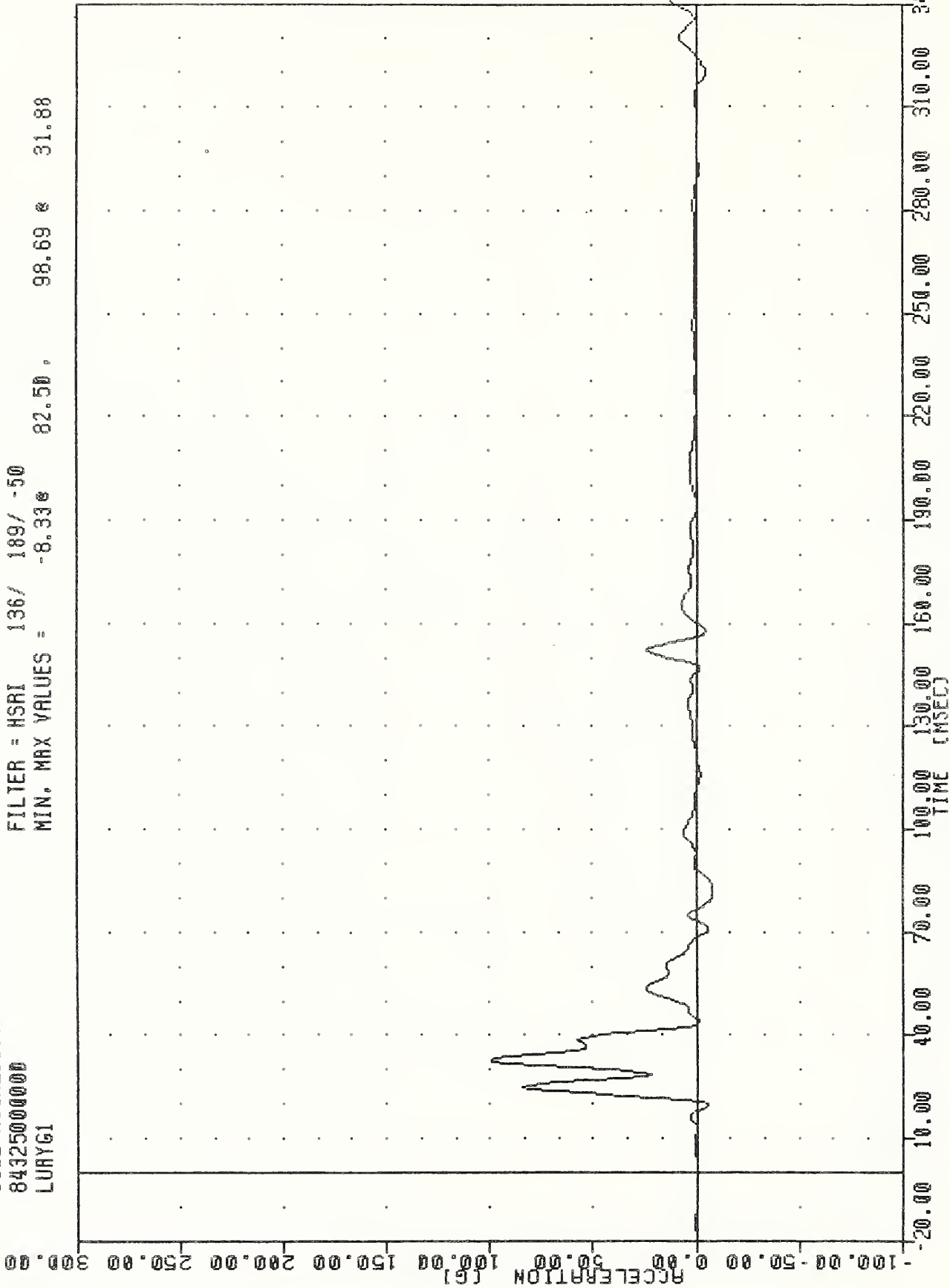
20.00 30.00 40.00 50.00 60.00 10.00 20.00 30.00 40.00 50.00 60.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YGA

7HC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LURYG1

PLUI DR1E 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -8.33e 82.50, 98.69 e 31.88

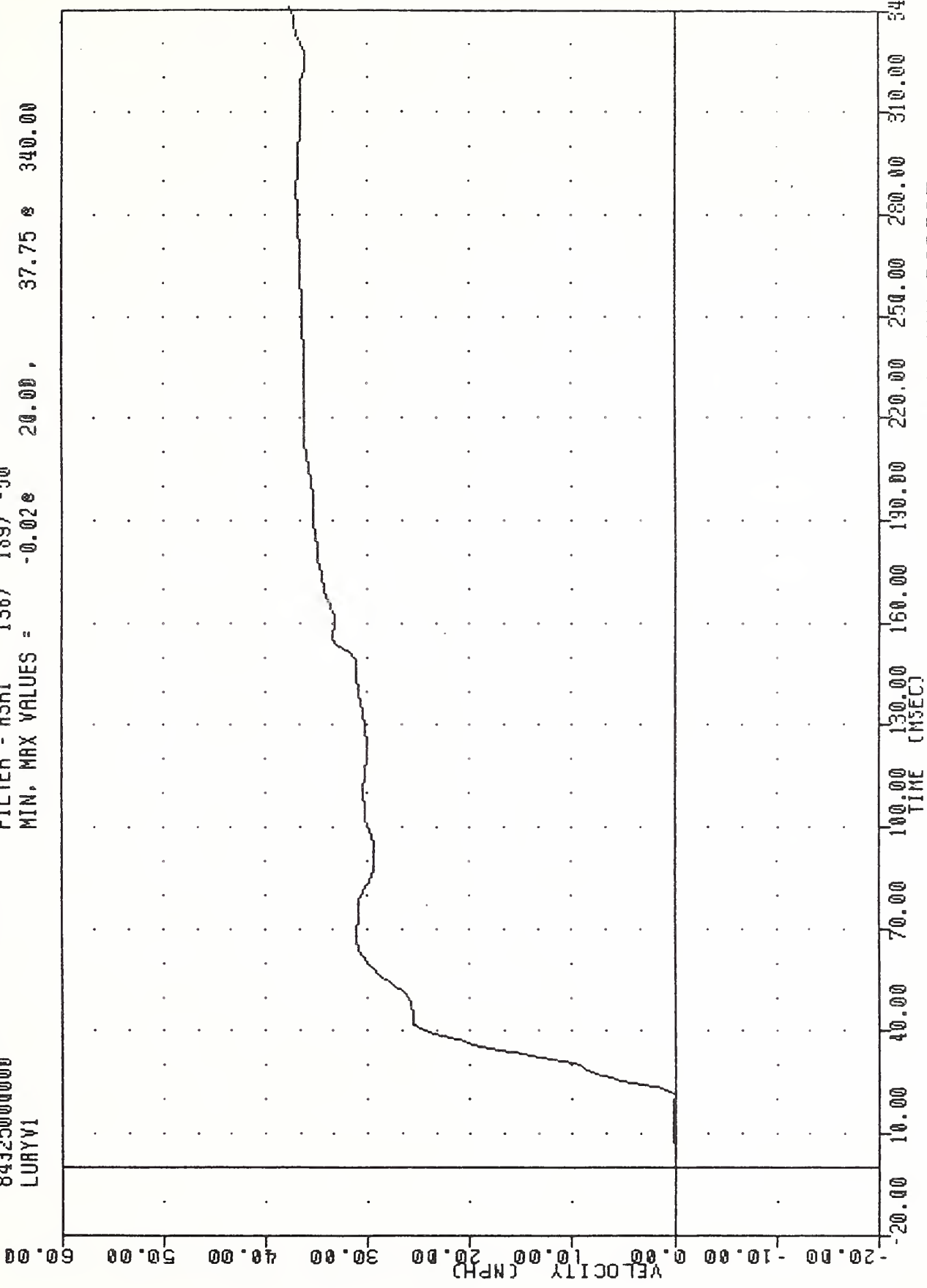


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT UPPER RIB ACCELERATION Y AXIS,

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LURYVI

PLOT DATE 27-NOV-84 16:26:00

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -0.02e 20.00, 37.75 e 340.00



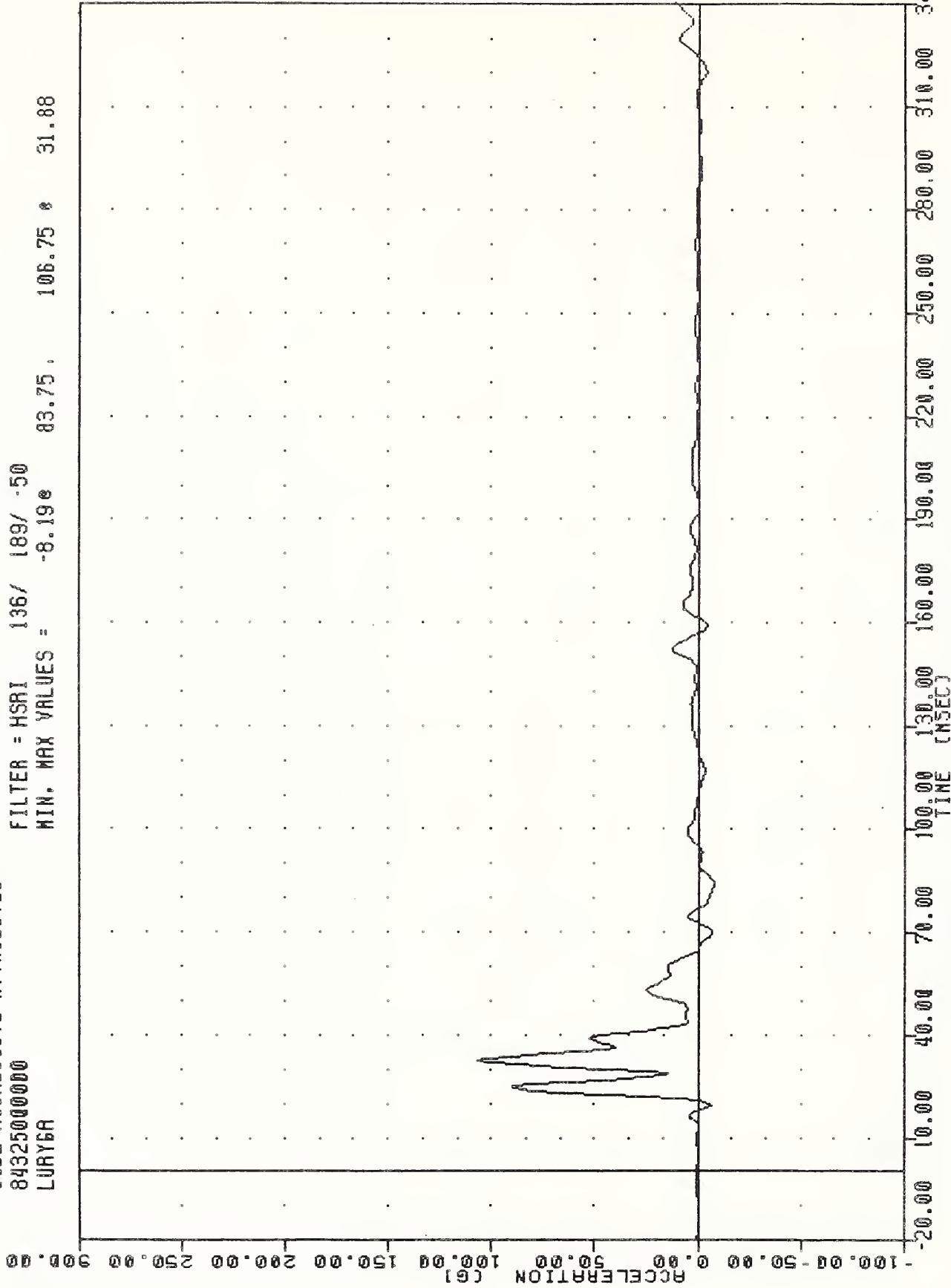
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LURYGI

TAC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LURY6A

PLOT DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -8.19e 83.75 , 106.75 * 31.88



B-24

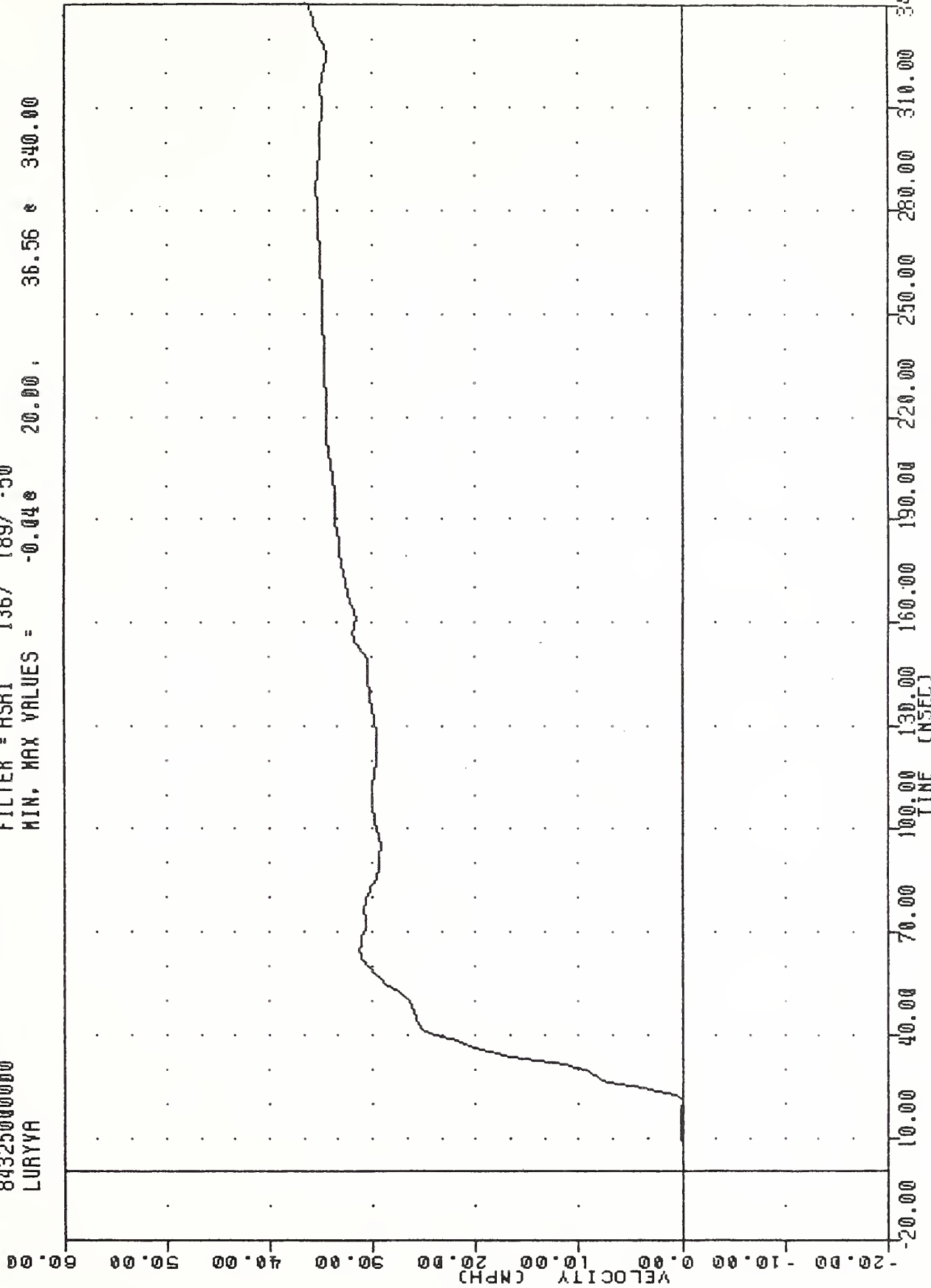
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT UPPER RIB ACCELERATION - 2 Y AXIS

THC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LURYVA

PLOT DATE 27-NOV-84 16:26:00

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.04e 20.00, 36.56 e 340.00

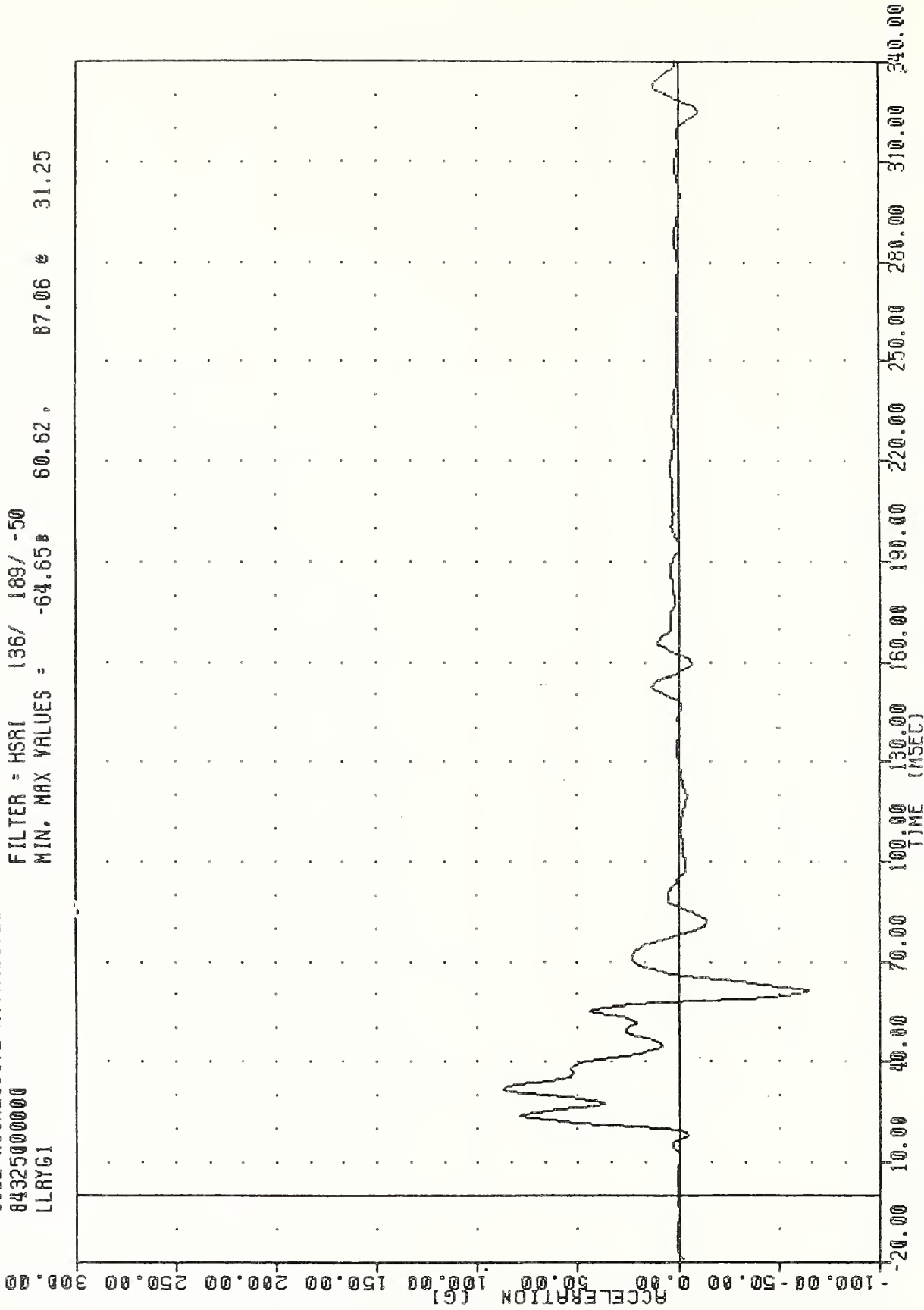


B-25

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LURYGA

IML 841120
SIDE AGGRESSIVE ATTRIBUTES
8432500000
LLRYG1

PLUI DATE 27-NOV-84 16:24:11
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -64.65 60.62, 87.06 31.25



B-26

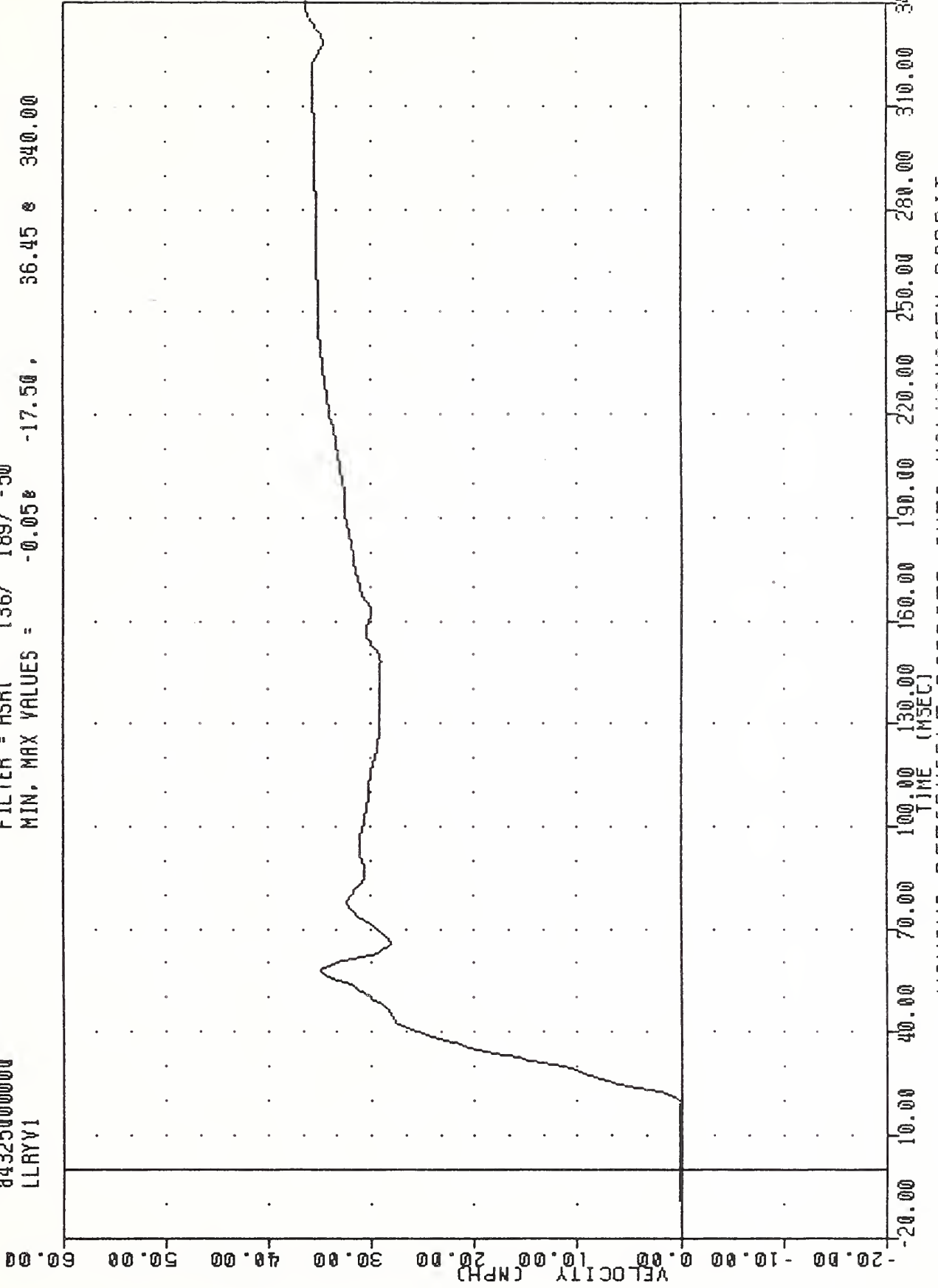
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT LOWER RIB ACCELERATION Y AXIS

IHL , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LLRYV1

PLUI DAIE 27-NDV-84 16:26:00

FILTER = HSAI 136/ 189/ -50

MIN, MAX VALUES = -0.05e -17.50 , 36.45 e 340.00



B-27

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLRYG1

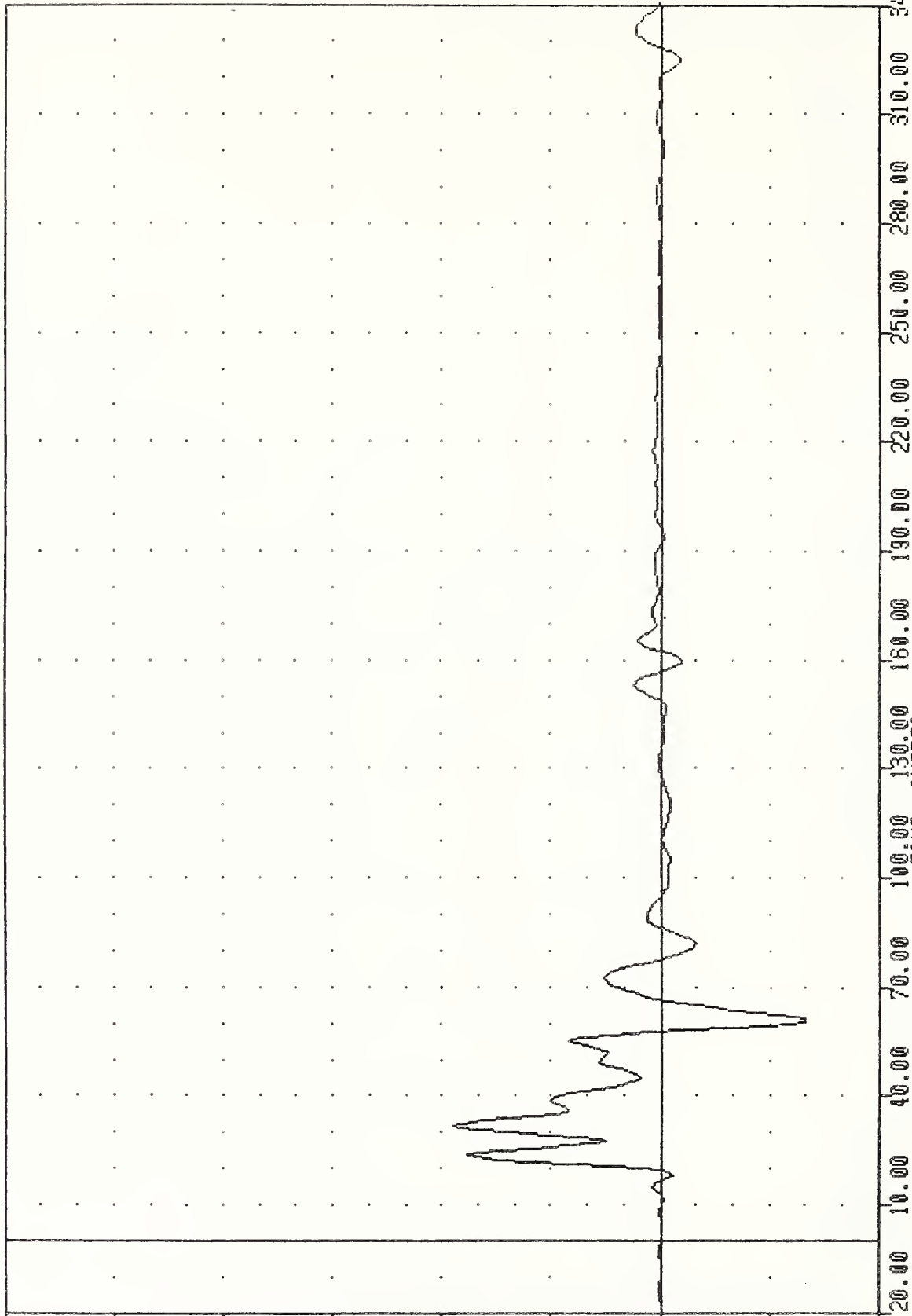
THC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LLRYGR

PLUI DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -66.16e 60.62e 95.48e 31.25

ACCELERATION (G)



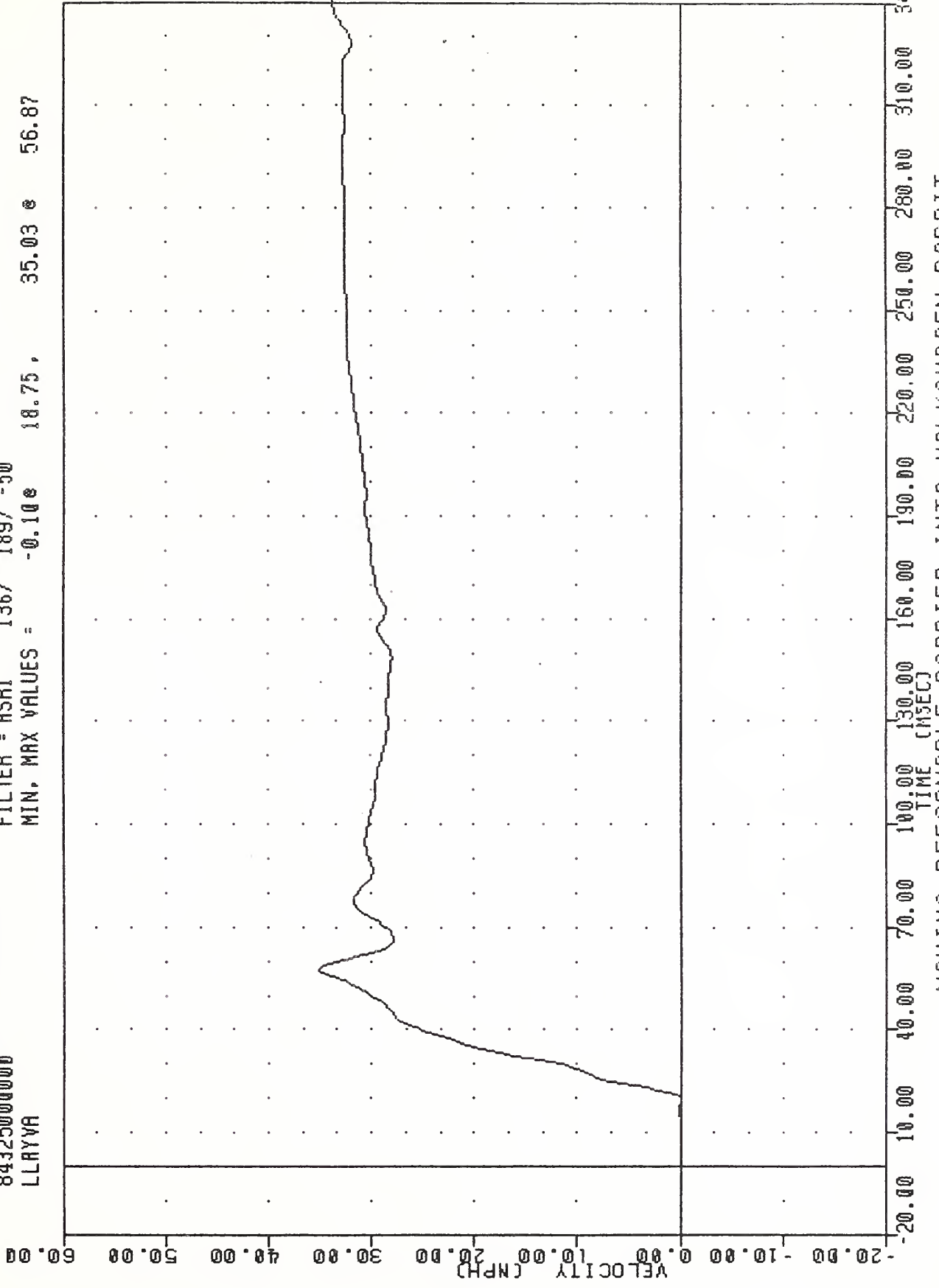
B-28

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT LOWER RIB ACCELERATION -2 Y AXIS

TMC , 841120
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 LLYVA

PLUI DRIE 2/-NOV-84 16:26:00

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.10e 18.75 , 35.03 e 56.87



B-29

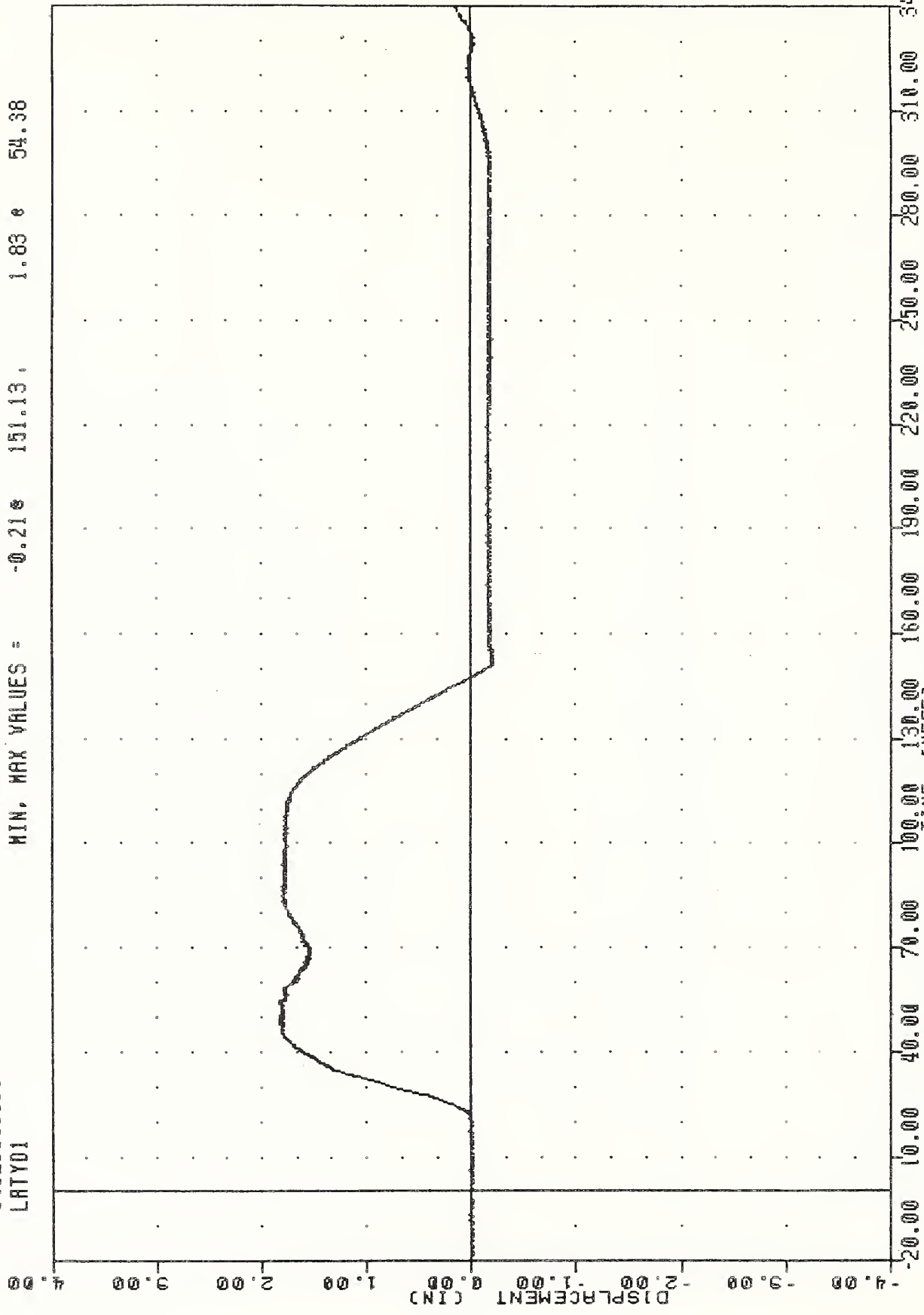
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LLYVA

THC 84112W
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LATYD1

PLUI DR1E 27-NOV-84 16:22:50

FILTER = ALPF 1650/ 5217/ .40

MIN, MAX VALUES = -0.21e 151.13, 1.83 e 54.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT RIB TO SPINE DISPLACEMENT INCHES

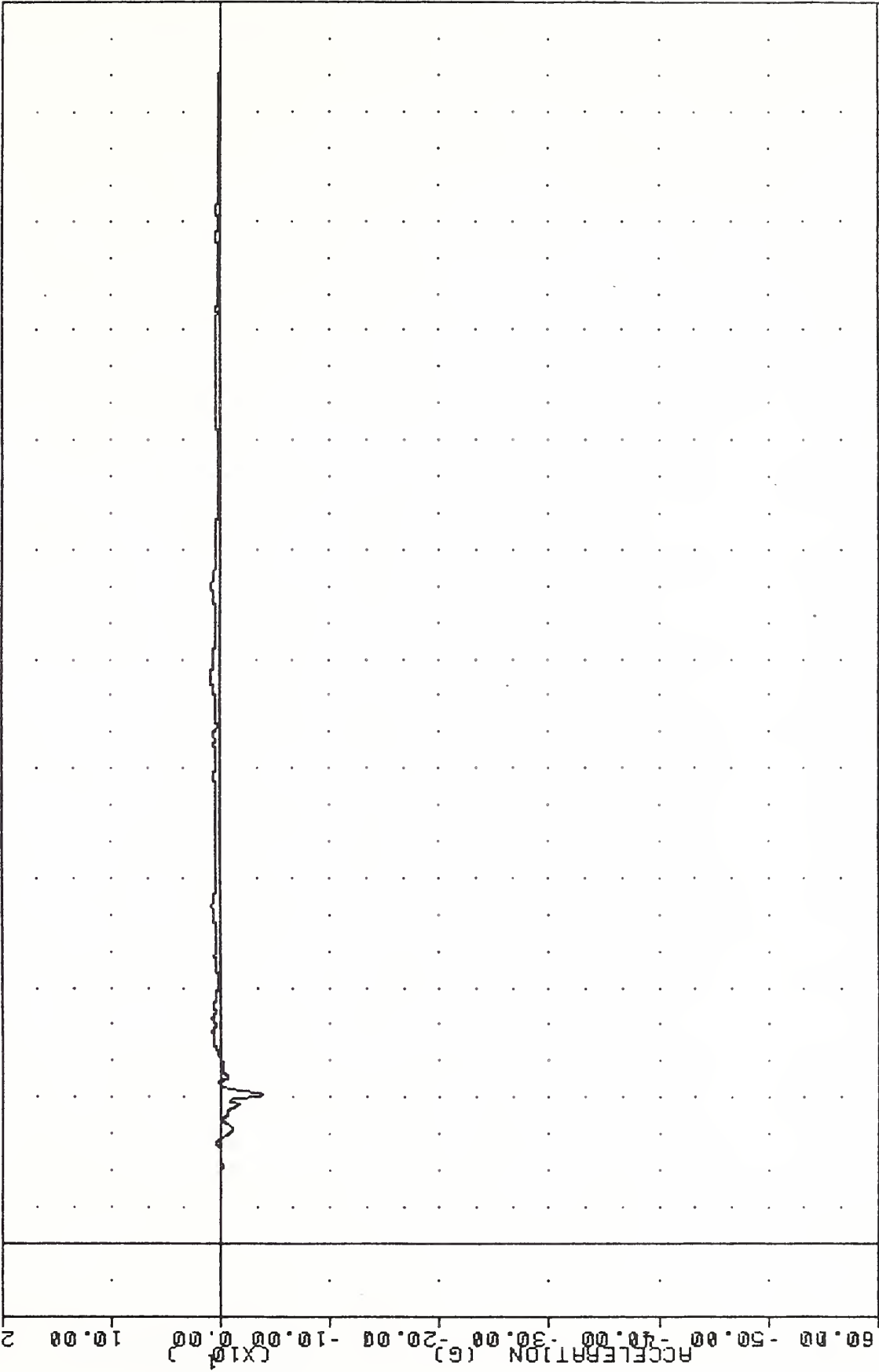
IHC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
PEVXG1

PLU1 DATE 27-NOV-84 16:22:35

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -38.57 40.50 8.32 153.88

20.00



B-31

-60.00
-50.00
-40.00
-30.00
-20.00
-10.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00
110.00
120.00
130.00
140.00
150.00
160.00
170.00
180.00
190.00
200.00
210.00
220.00
230.00
240.00
250.00
260.00
270.00
280.00
290.00
300.00
310.00
320.00
330.00
340.00
TIME (MSEC)

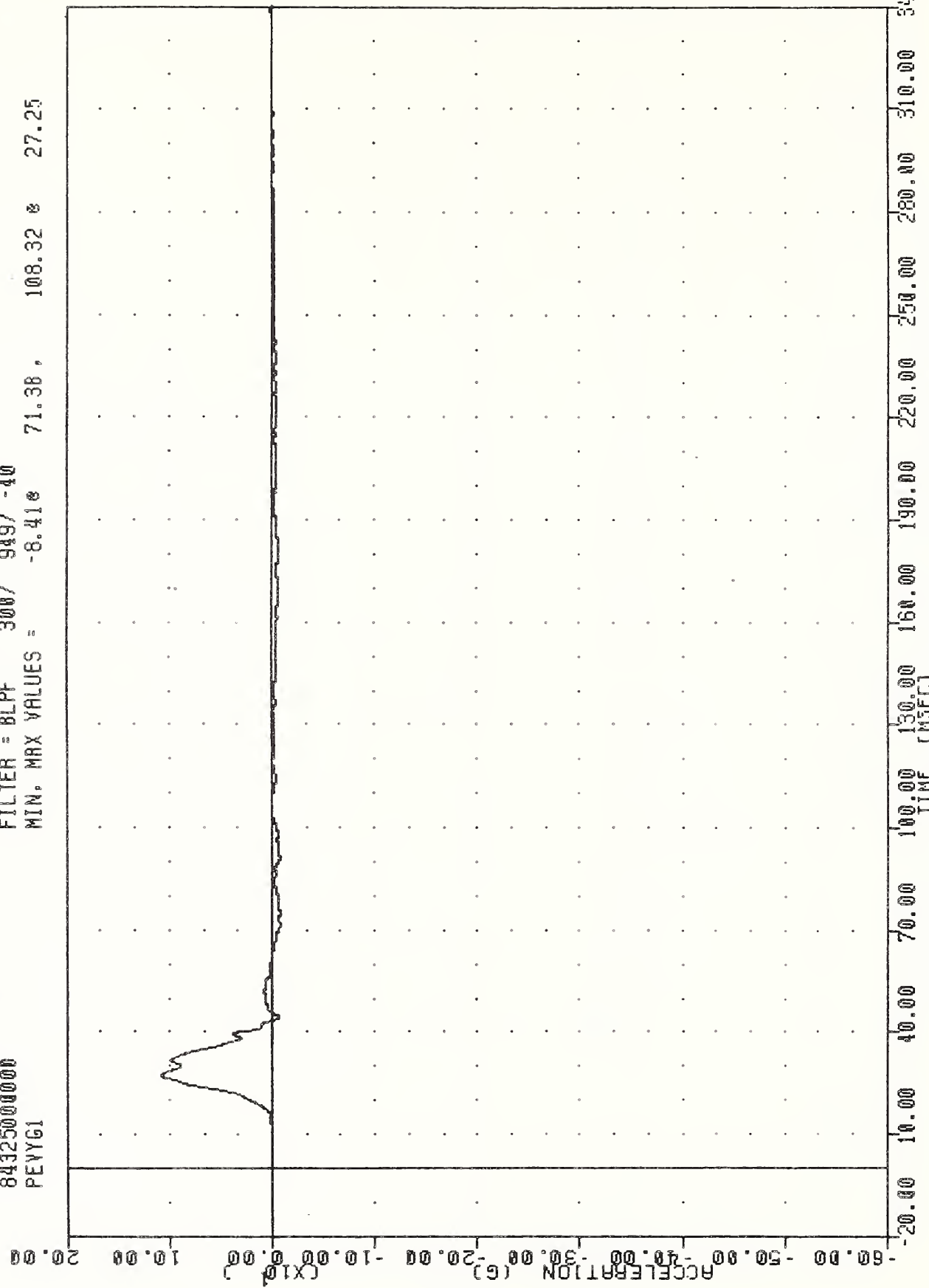
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS ACCELERATION X AXIS

TRC , 841120
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 PEVYGI

PLUI DATE 27-NOV-84 16:22:30

FILTER = 8LPF 300/ 949/ -40

MIN, MAX VALUES = -8.41e 71.38, 108.32 e 27.25

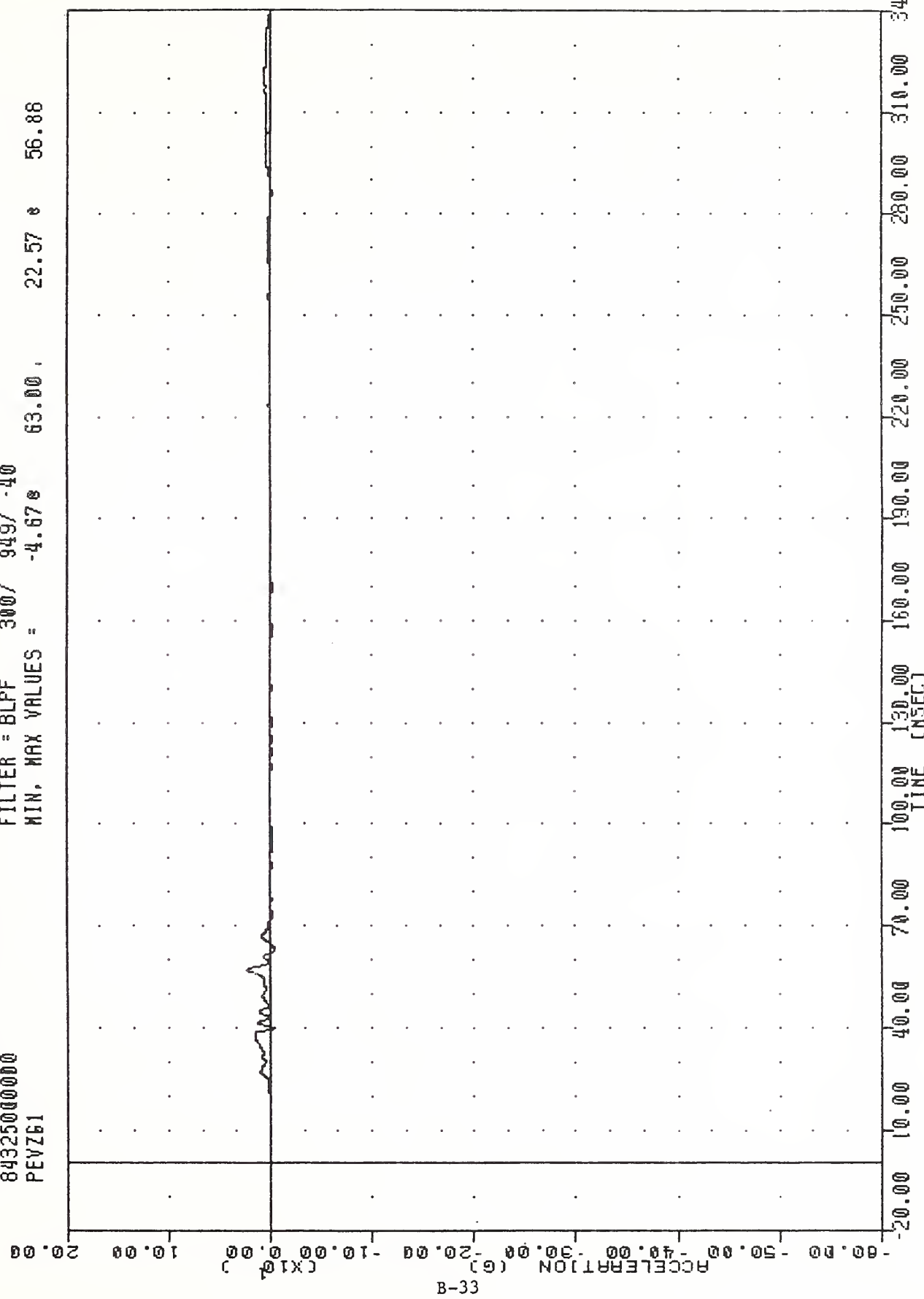


B-32

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS ACCELERATION Y AXIS

TAC
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 PEVZ61

PL01 DATE 27-NOV-84 16:22:35
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -4.678 63.00 , 22.57 56.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS ACCELERATION Z AXIS

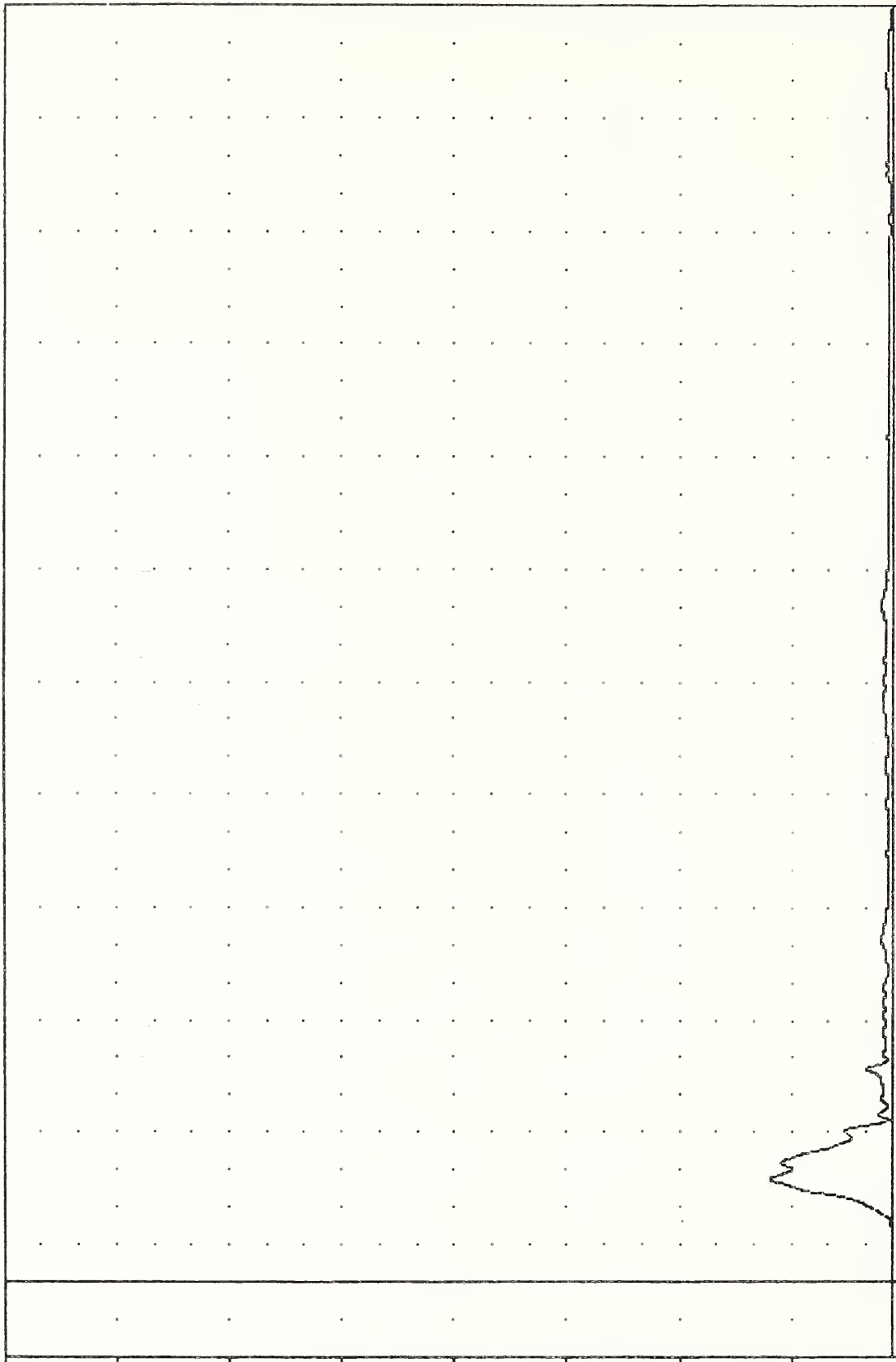
IHC
84325000000
PEVRG1

PLUI DATE 27-NDV-84 16:22:30

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 0.058 -8.63, 108.81 & 27.25

ACCELERATION (G) (X10⁴)



-1.00 9.00 19.00 29.00 39.00 49.00 59.00 69.00 79.00

10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

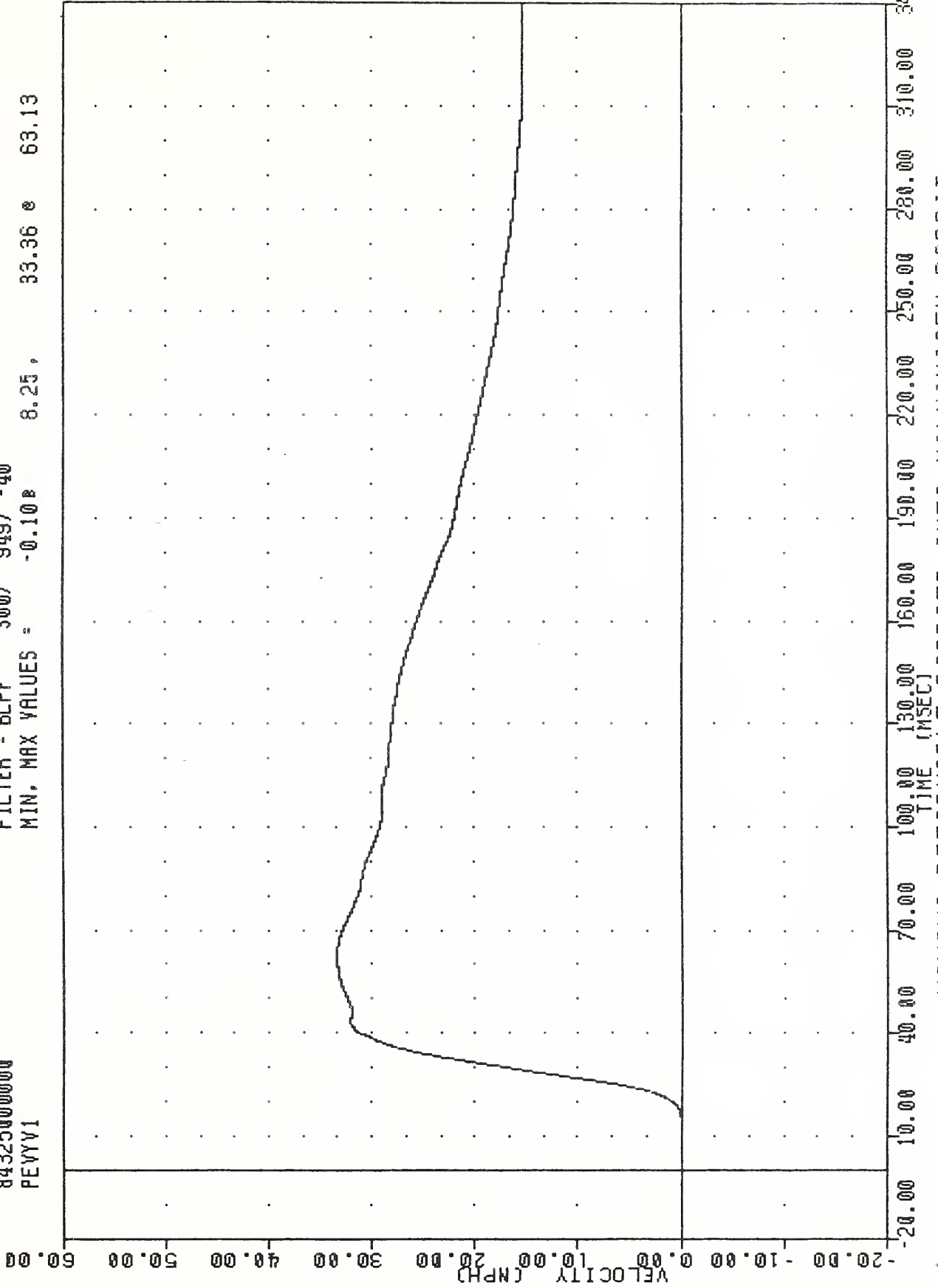
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS RESULTANT

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
PEVYV1

PLUI DRIE 27-NDV-84 16:28:26

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.10 8.25 , 33.36 e 63.13



B-35

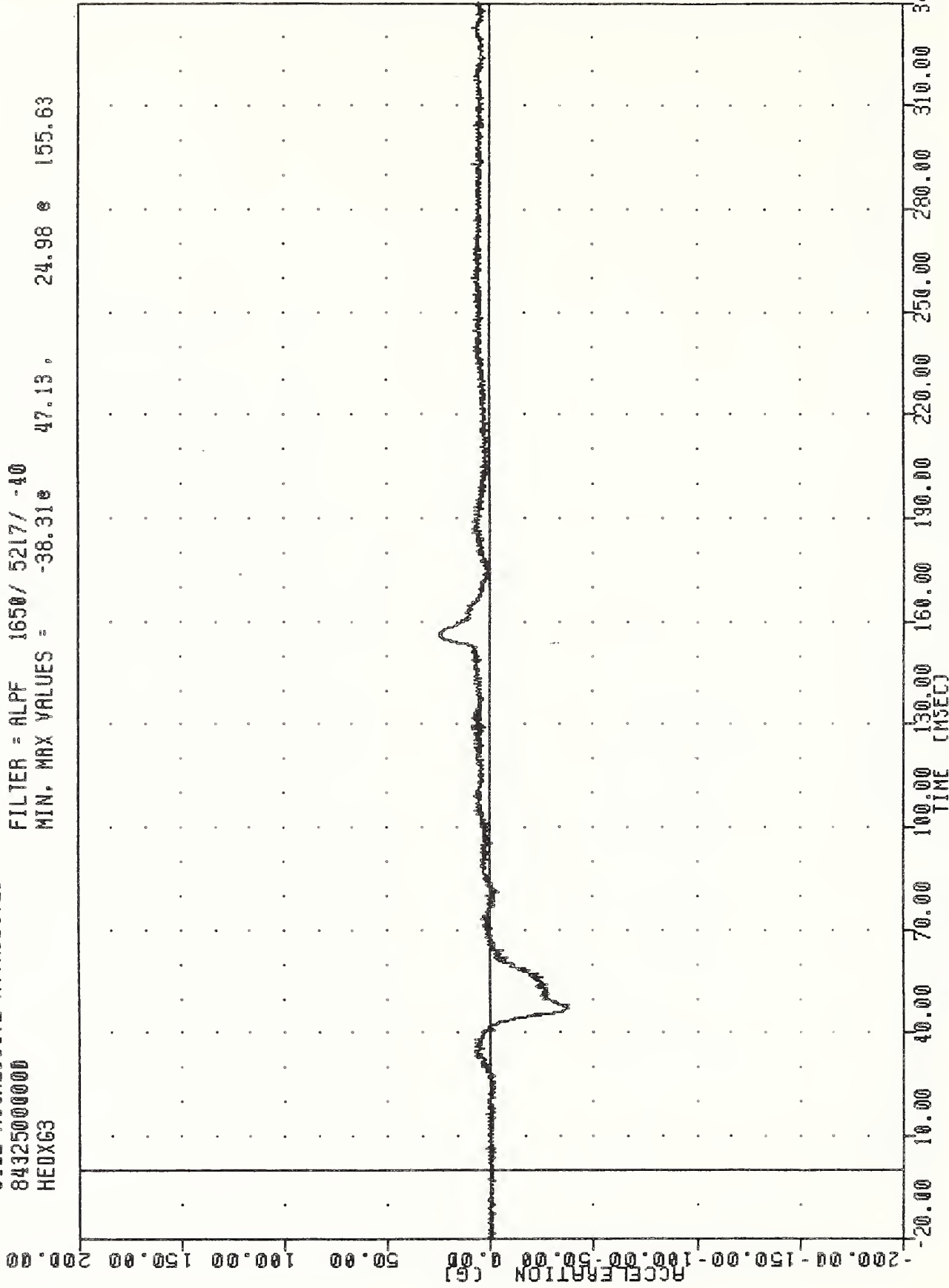
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING PEVYGI

TAC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
HEDXG3

PLUI DATE 27-NOV-84 16:22:35

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -38.31 47.13 , 24.98 155.63



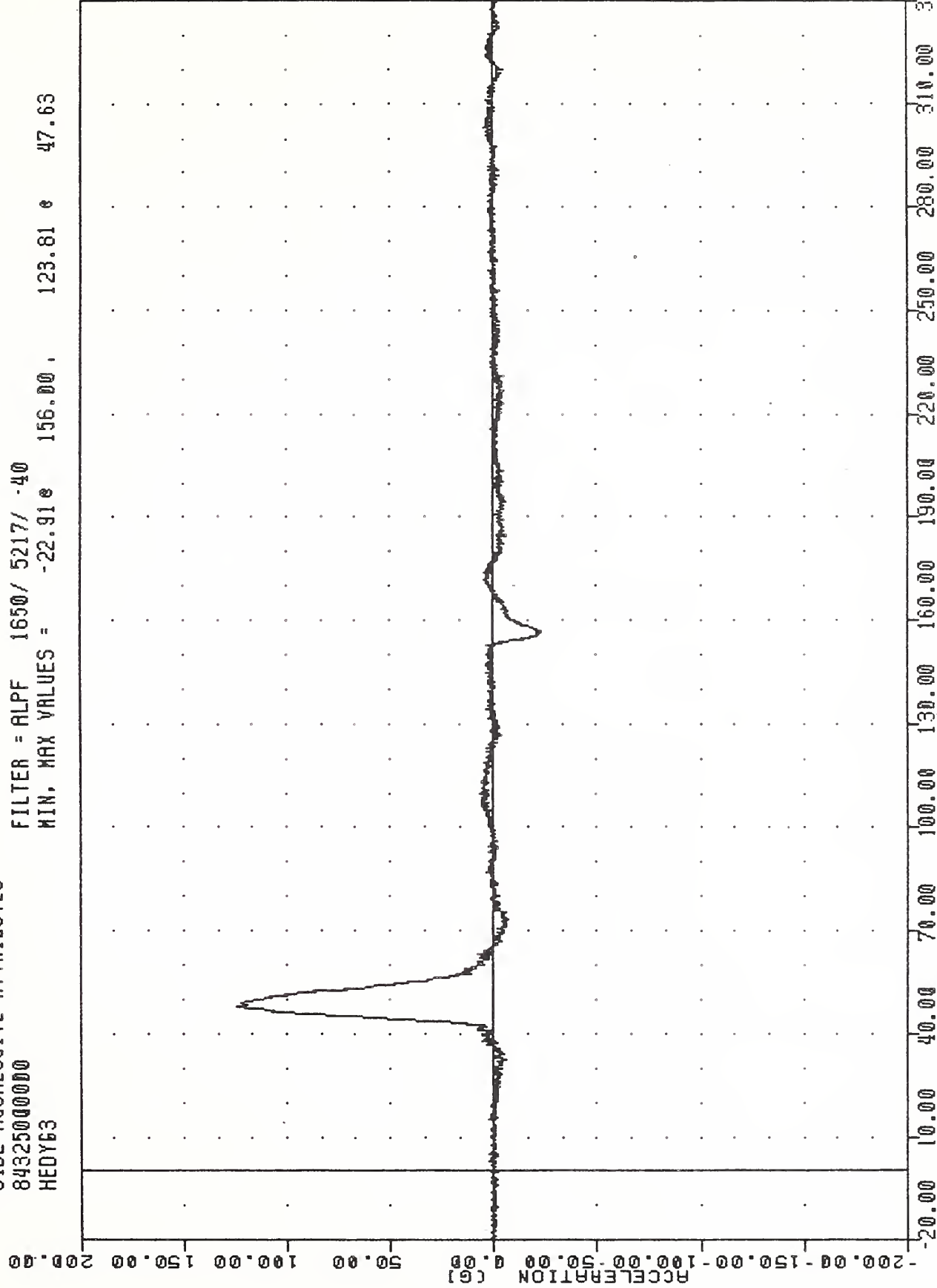
B-36

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION X AXIS

TAC , 84J120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
HEDY63

PLOT DATE 27-NOV-84 16:22:35

FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -22.91e 156.00 , 123.81 e 47.63



B-37

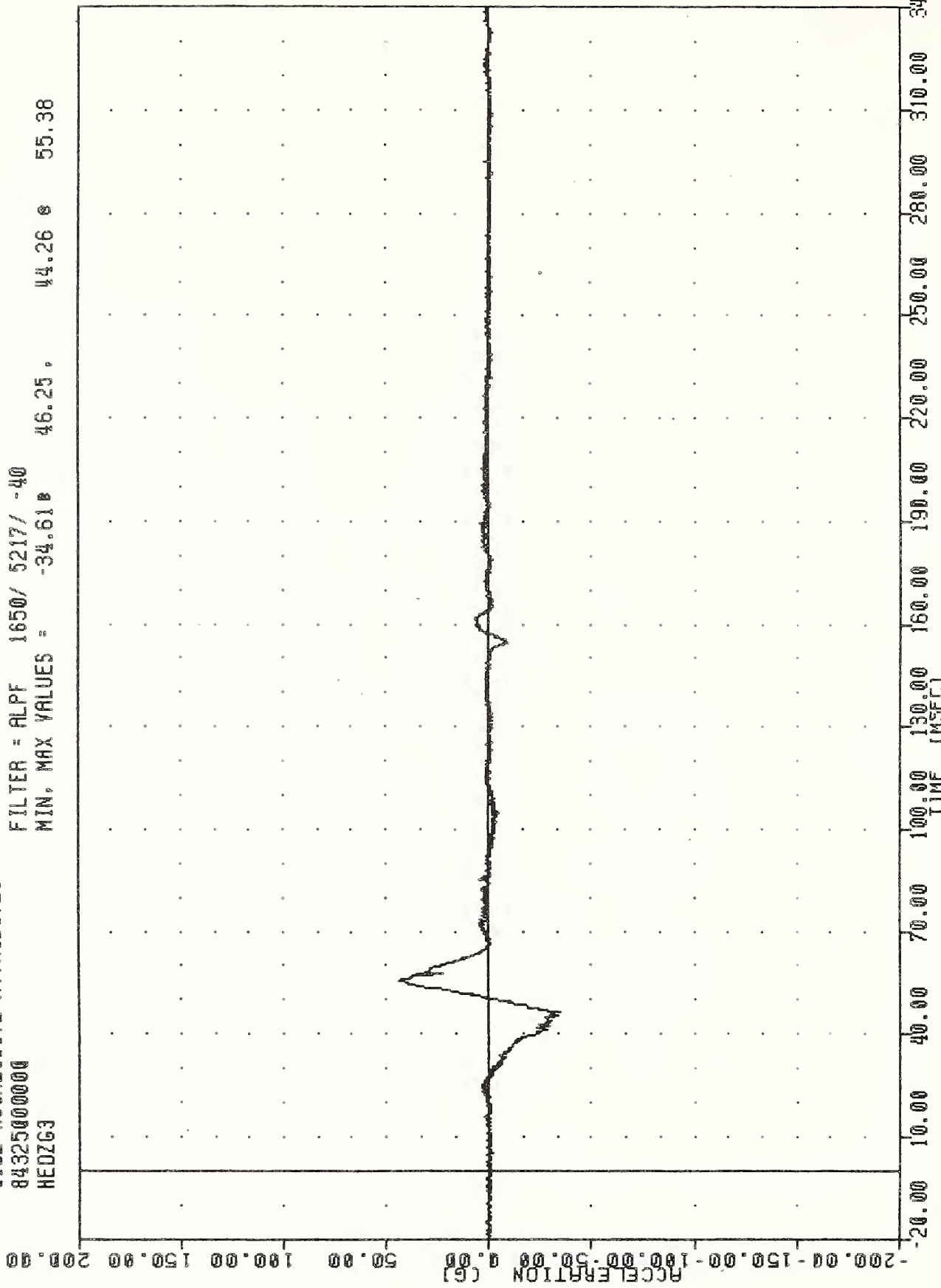
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION Y AXIS

TRC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
HEDZG3

PLUI DATE 27-NDV-84 16:22:35

FILTER = ALPF 1650/ 5217/ -40

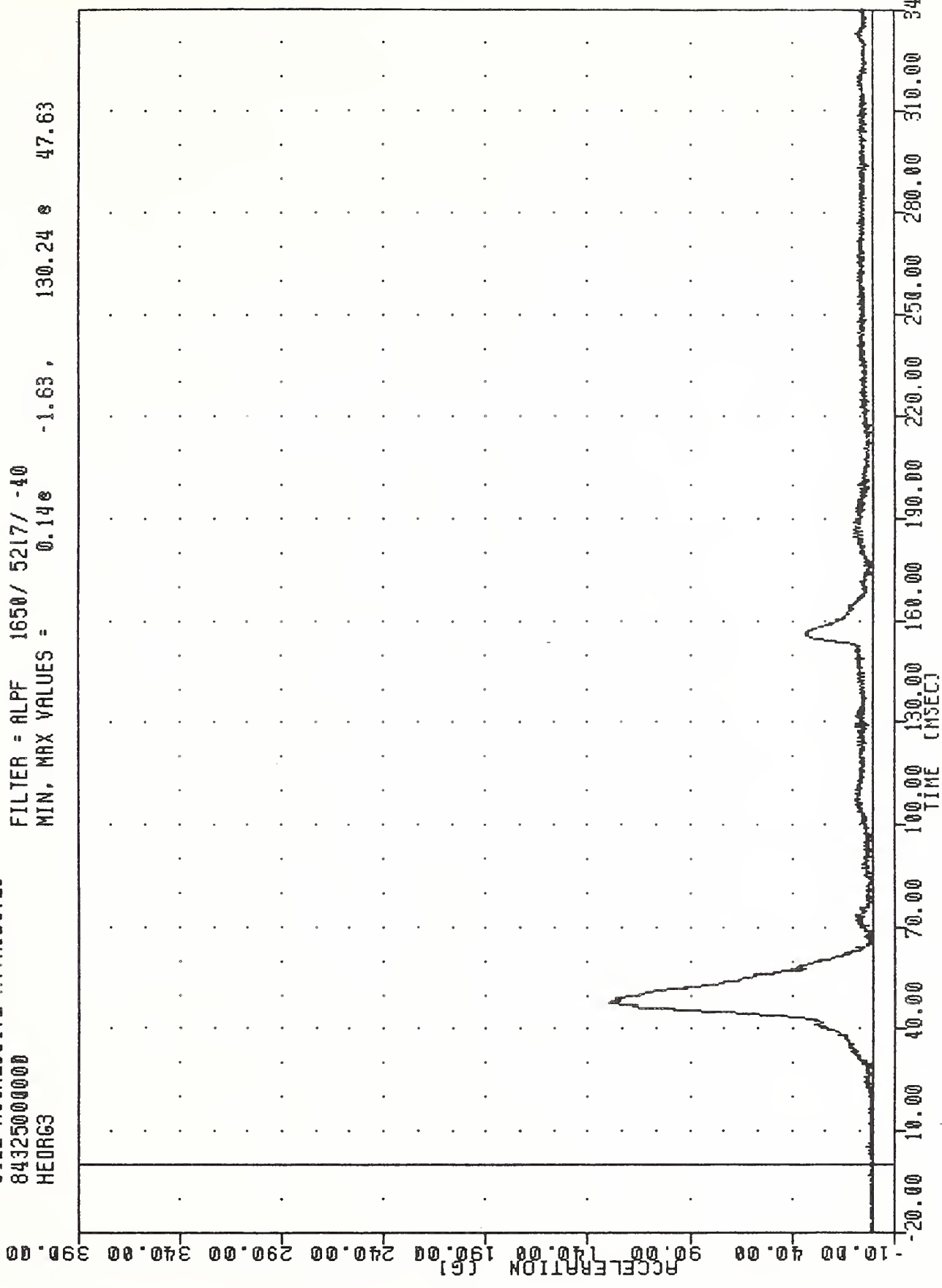
MIN, MAX VALUES = -34.61 46.25 44.26 55.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION Z AXIS

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
HEOR63

PLUI DRIE 27-NOV-84 16:22:35
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = 0.14e -1.63, 130.24 e 47.63



B-39

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD RESULTANT

TAC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T01X63

PLUI DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -21.58e 41.87 . 6.35 e 80.00

200.00

150.00

100.00

50.00

0.00

-50.00

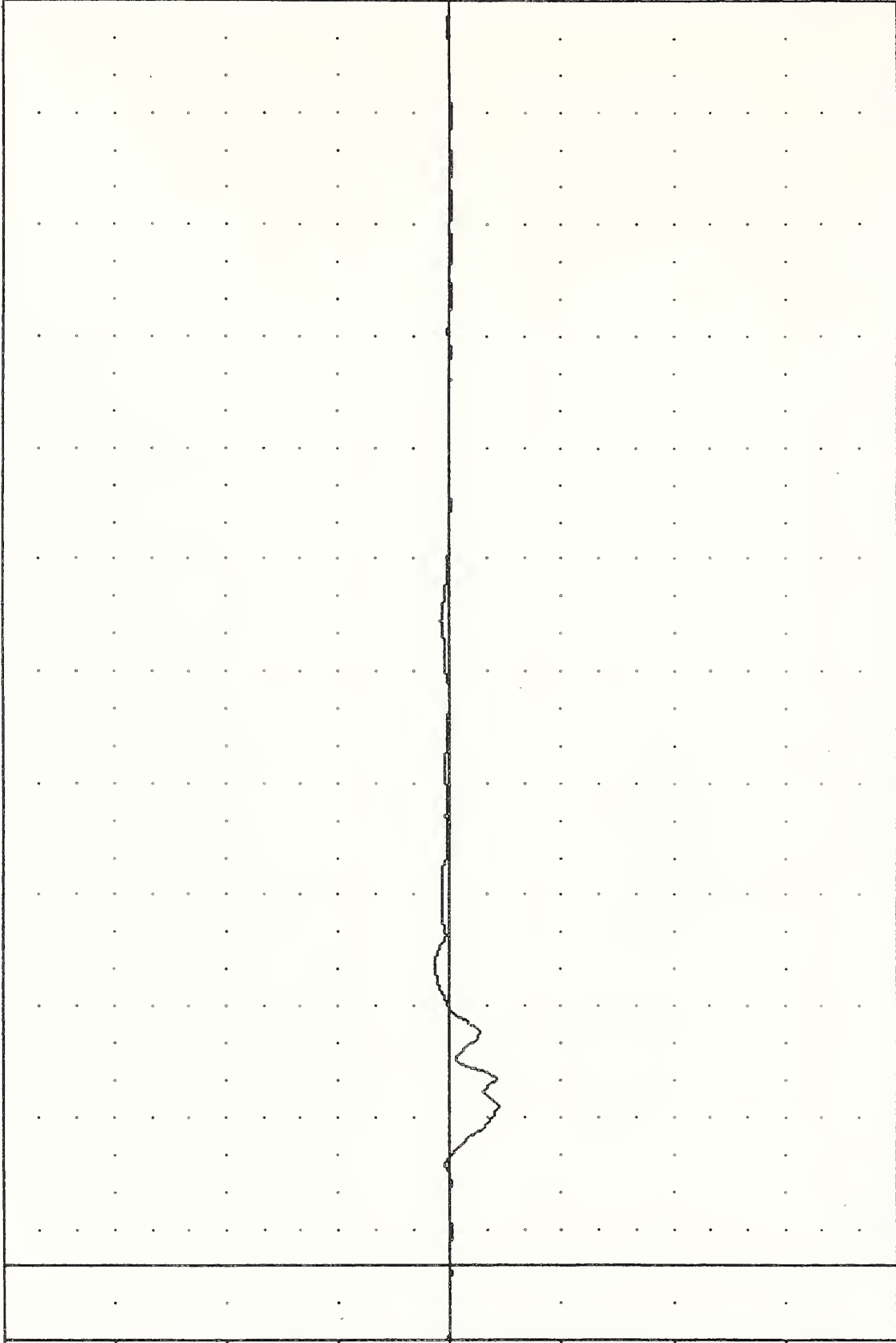
-100.00

-150.00

-200.00

B-40

ACCELERATION (G)



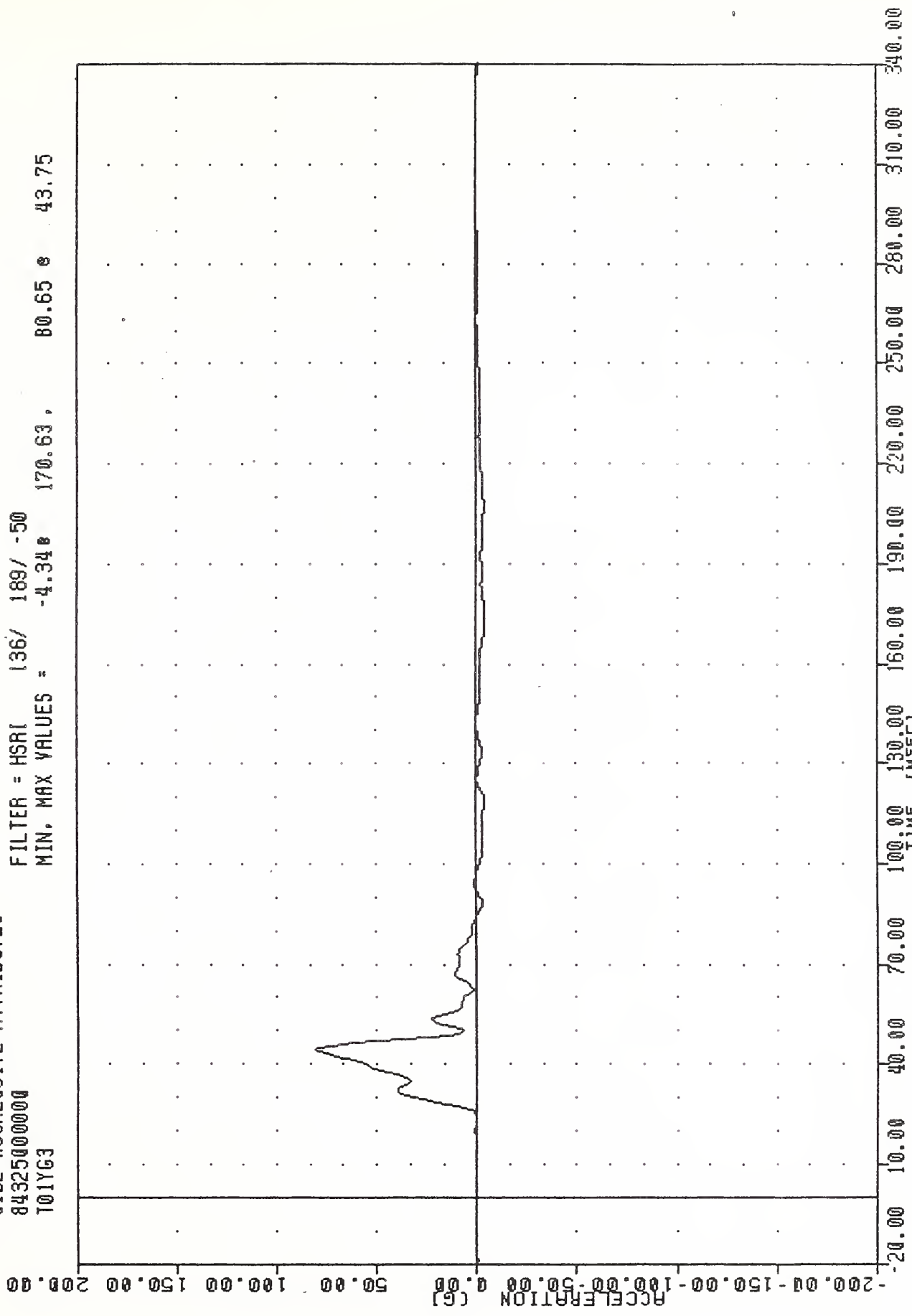
340.00
310.00
280.00
250.00
220.00
190.00
160.00
130.00
100.00
70.00
40.00
10.00
-20.00

TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE ACCELERATION X AXIS

TAC , 841120
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 T01Y63

PLUI DATE 27-NDV-84 16:24:11
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -4.34 80.65 43.75



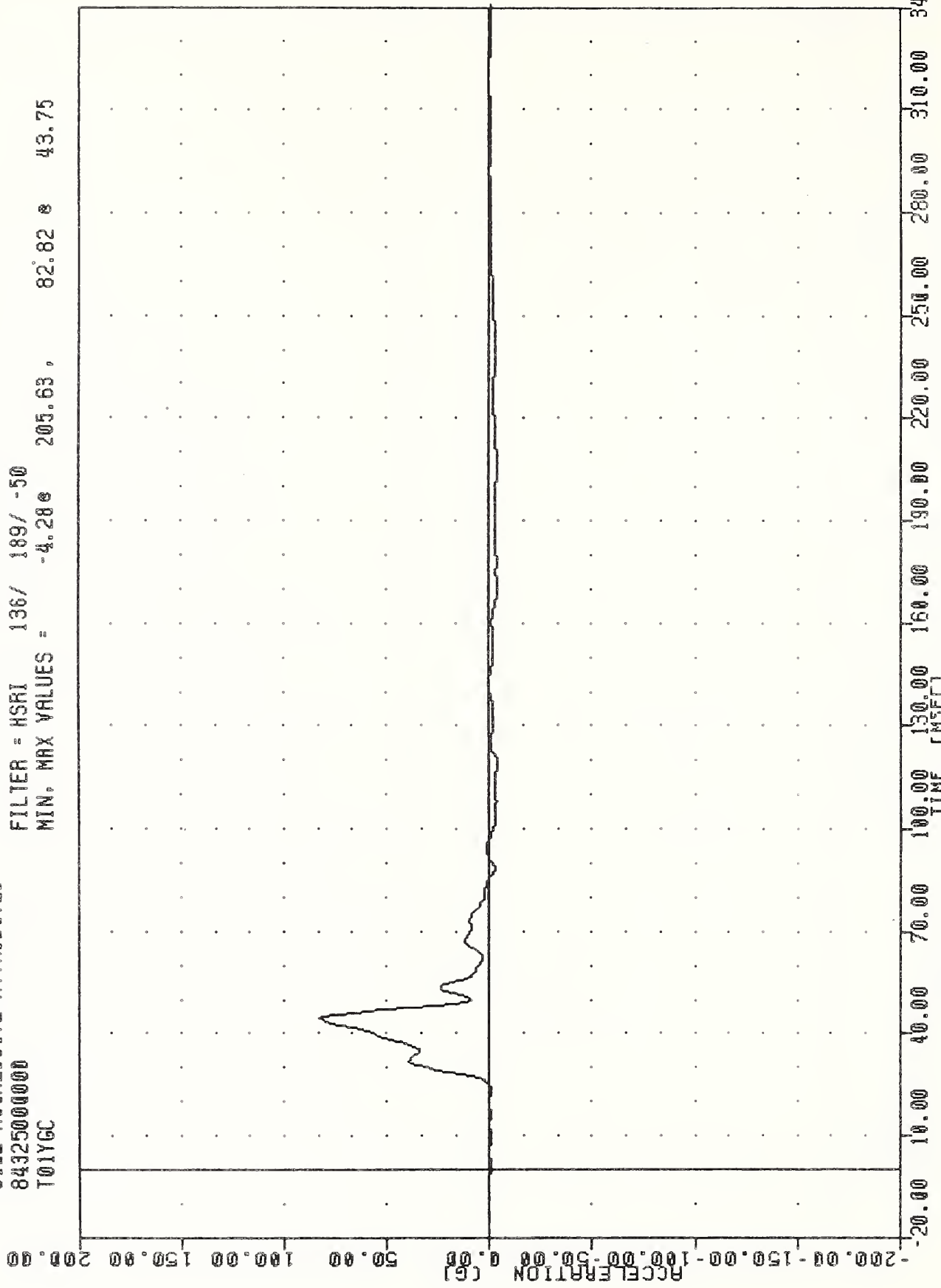
B-41

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE ACCELERATION Y AXIS

INC 84112W
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 T01Y6C

PLUI DATE 27-NOV-04 10:24:11

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -4.28e 205.63, 82.82 e 43.75

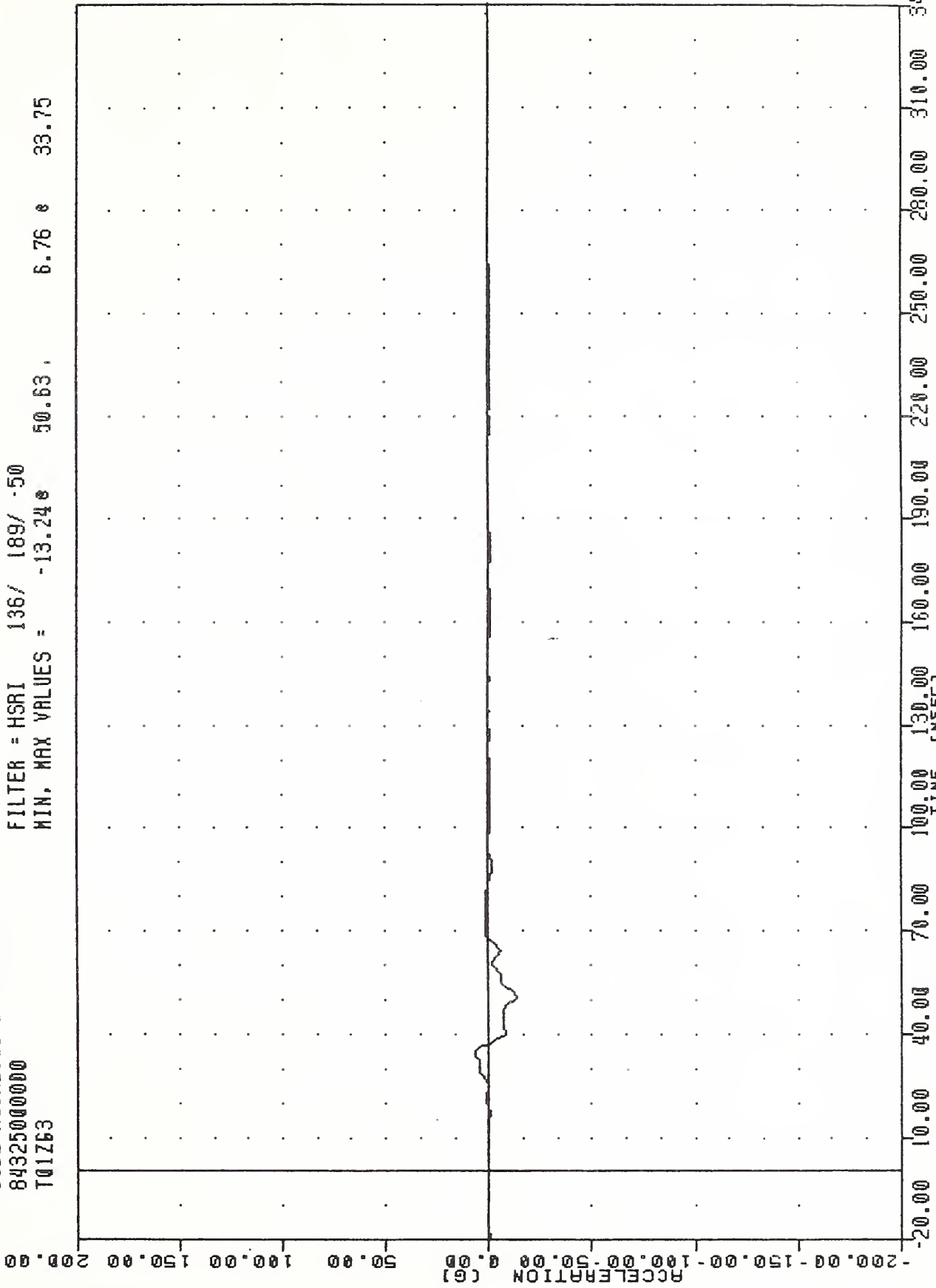


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE ACCELERATION -2 Y AXIS

TMC , 841120
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 T01Z63

PLU1 DR1E 2/NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -13.24e 50.63 , 6.76 e 33.75



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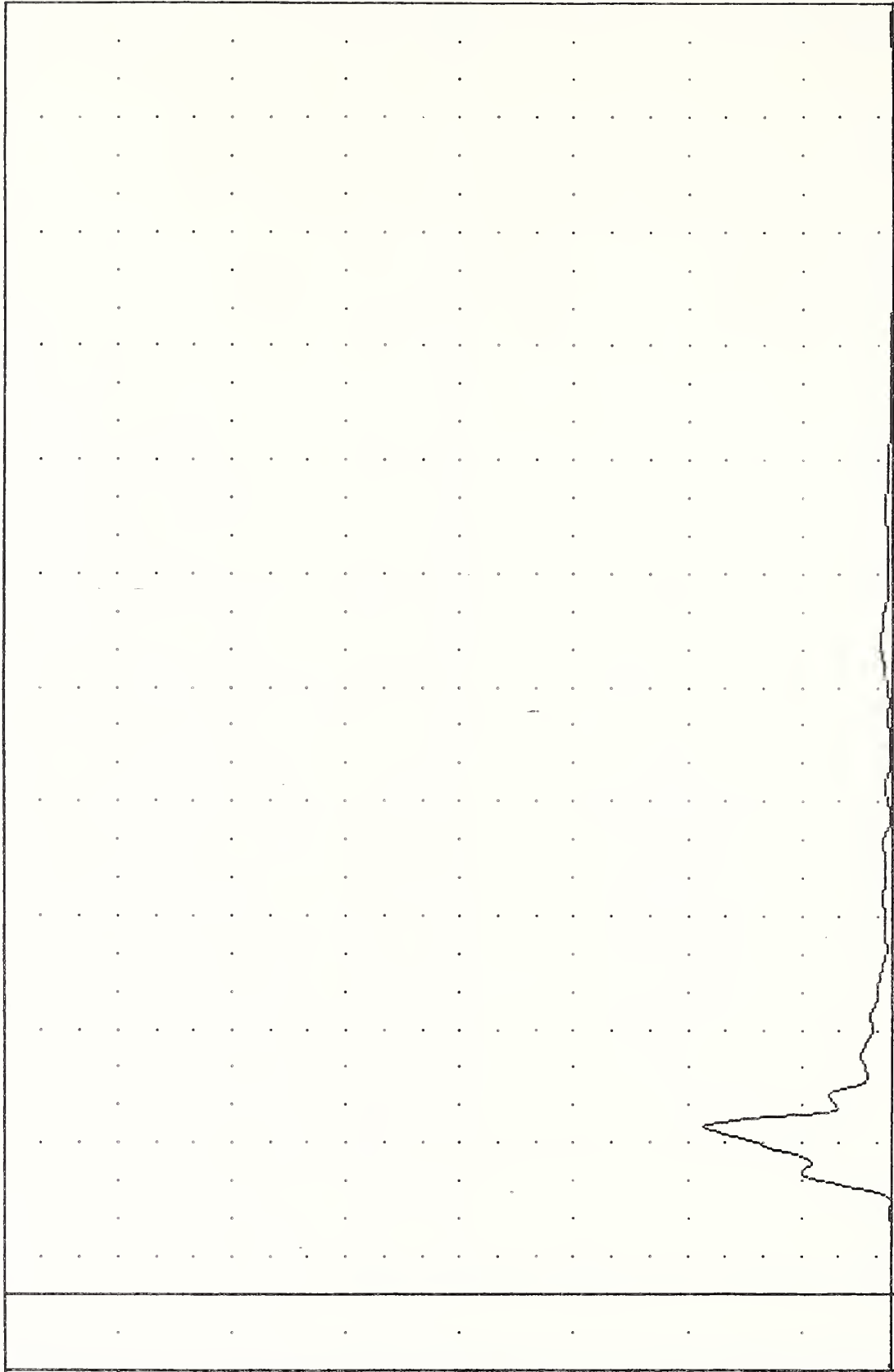
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE ACCELERATION Z AXIS

IML , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T01RG3

PLUI DRIC 27-NOV-84 10:24:11

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.068 -5.00 , 83.31 @ 43.75

ACCELERATION (G)

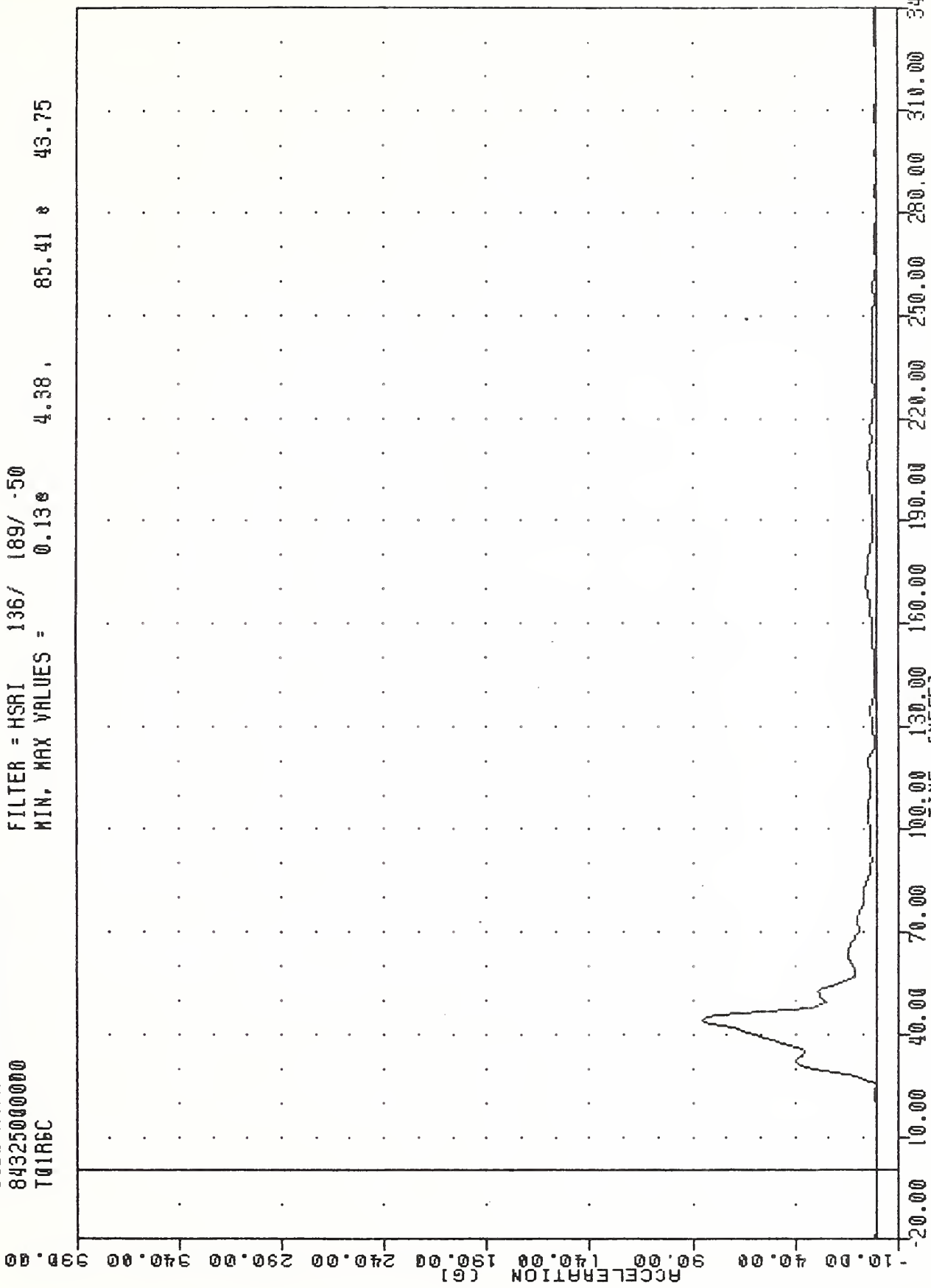


TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE RESULTANT

TML
84325000000
T01R6C
SIDE AGGRESSIVE ATTRIBUTES

PLUI DR1E 2/NOV-84 16:25:26
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = 0.13e 4.38, 85.41 e 43.75

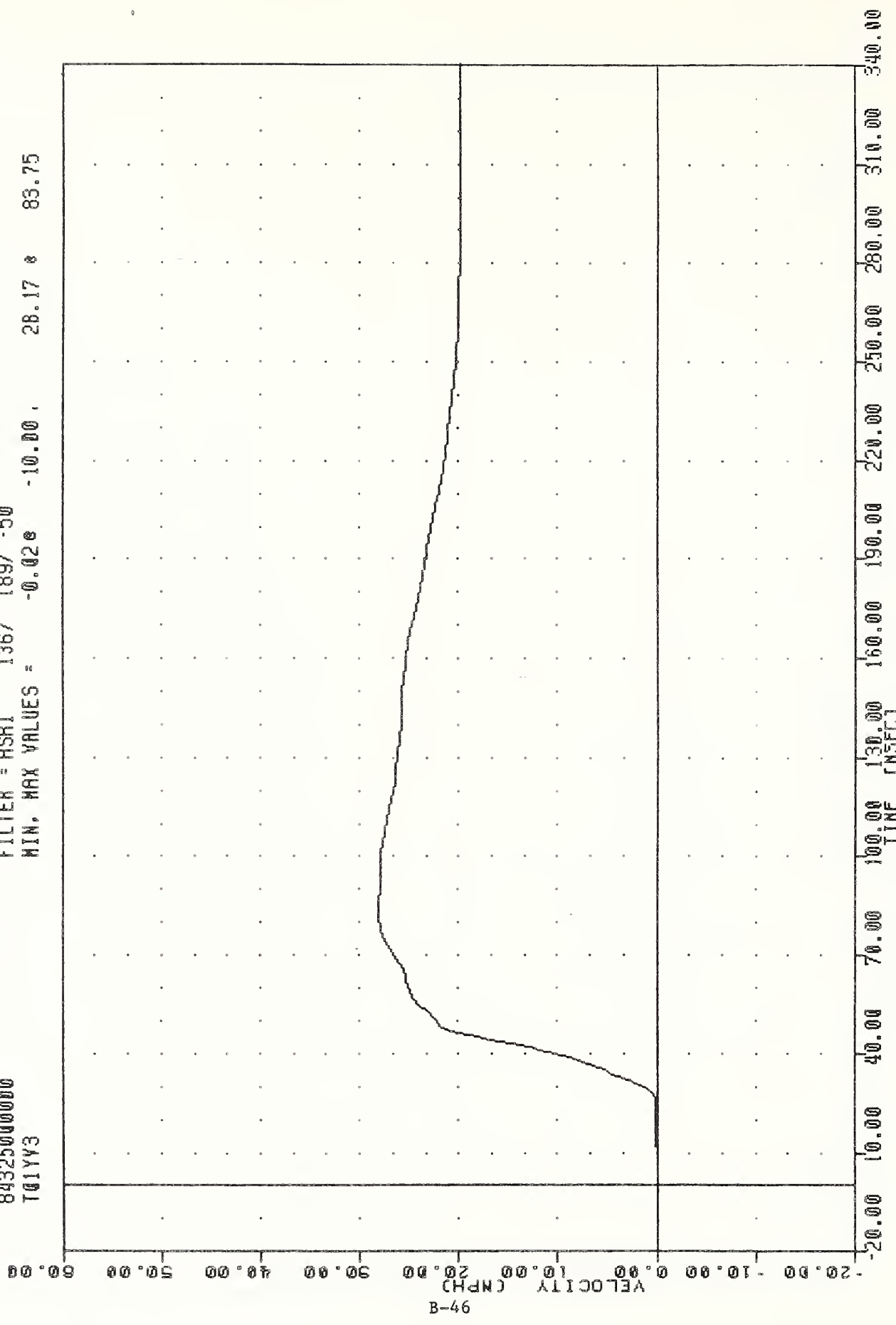


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MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE RESULTANT USING T01YGC

TMC 841120
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 T01YV3

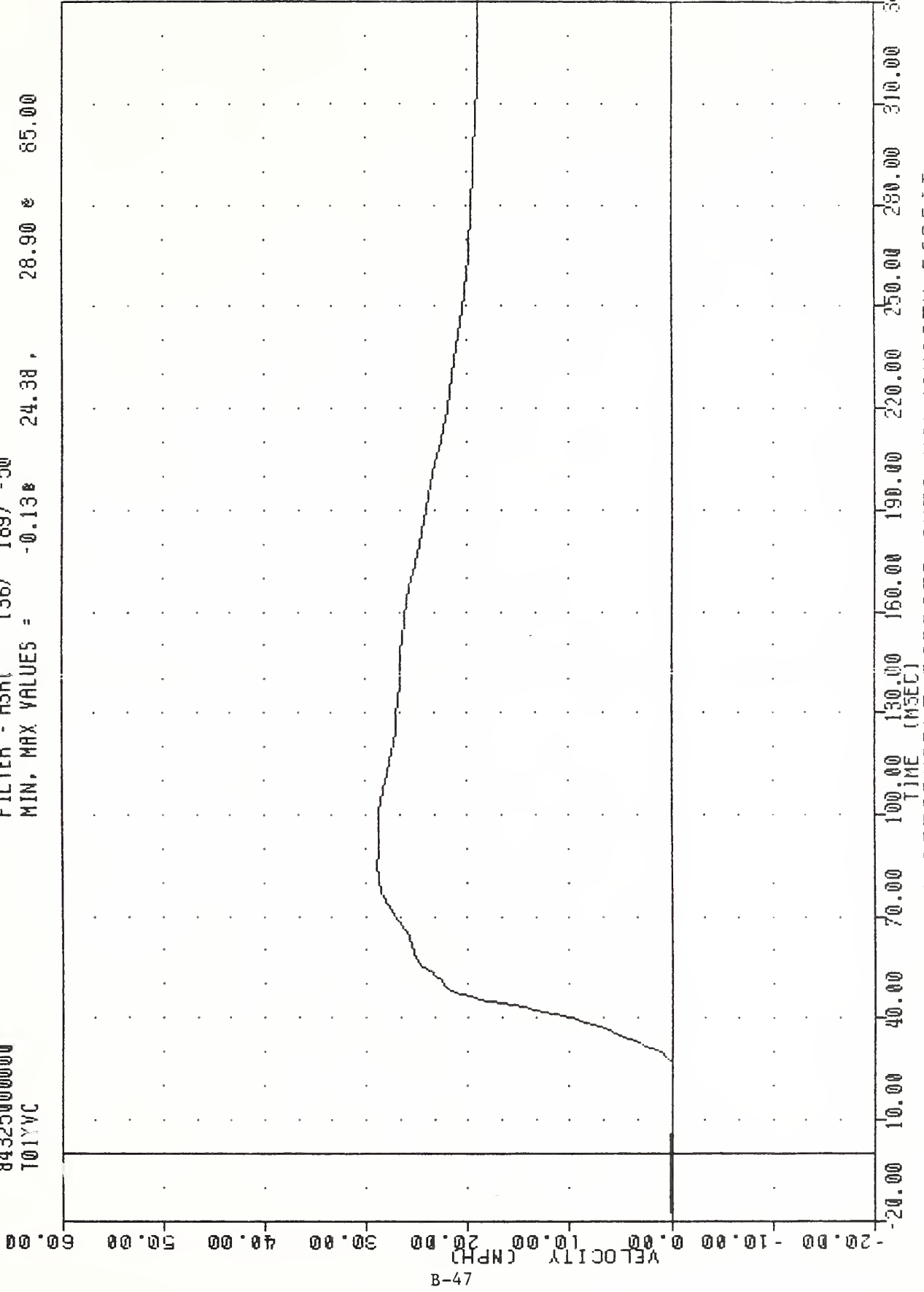
PLUI DATE 27-NOV-84 16:26:00
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.02e -10.00 , 28.17 e 83.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T01YV3

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T01YVC

PLUI DATE 27-NOV-84 16:26:00
FILTER = HSR(136/ 189/ -50
MIN, MAX VALUES = -0.13* 24.38, 28.90 * 85.00



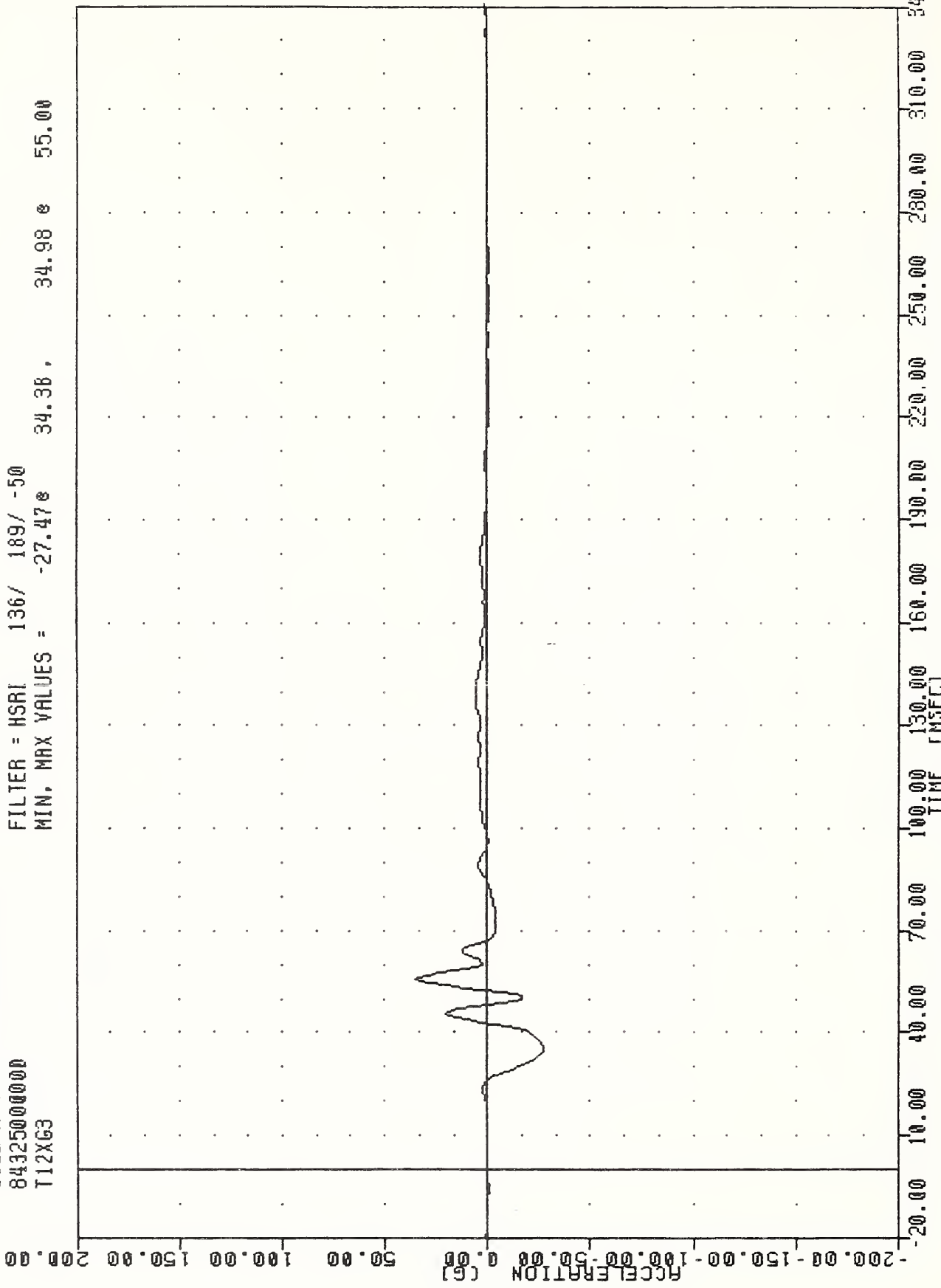
B-47

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T01YGC

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
8432500000
T12X63

PLOT DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -27.47e 34.36 , 34.98 e 55.00

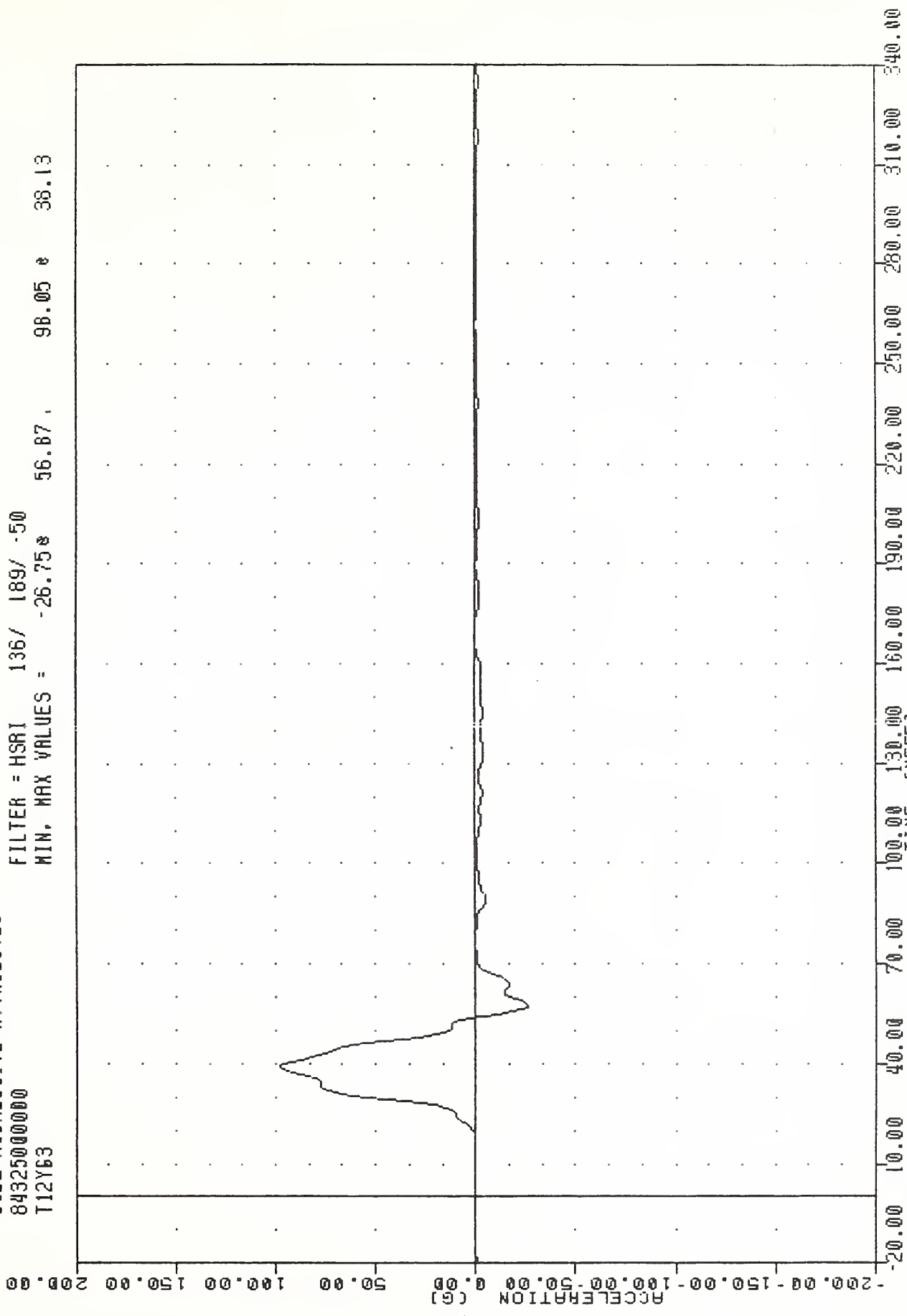


B-48

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE ACCELERATION X AXIS

TAC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T12Y63

PLOT DATE 27-NOV-84 16:24:11
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -26.75* 56.87, 96.05 * 36.13

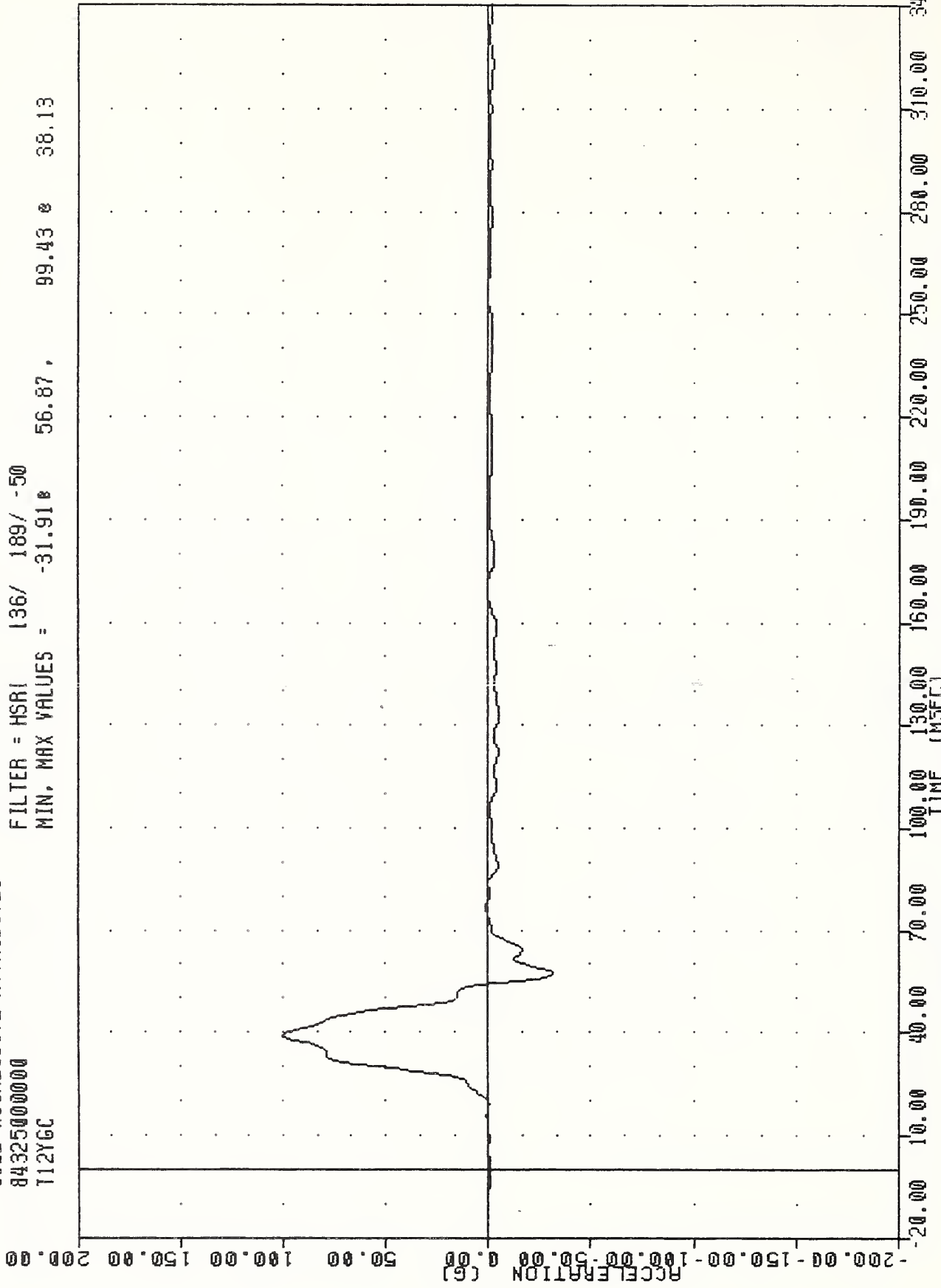


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE ACCELERATION Y AXIS

IML , 84112W
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T12YGC

PLU1 DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -31.91B 56.87, 99.43 e 38.13



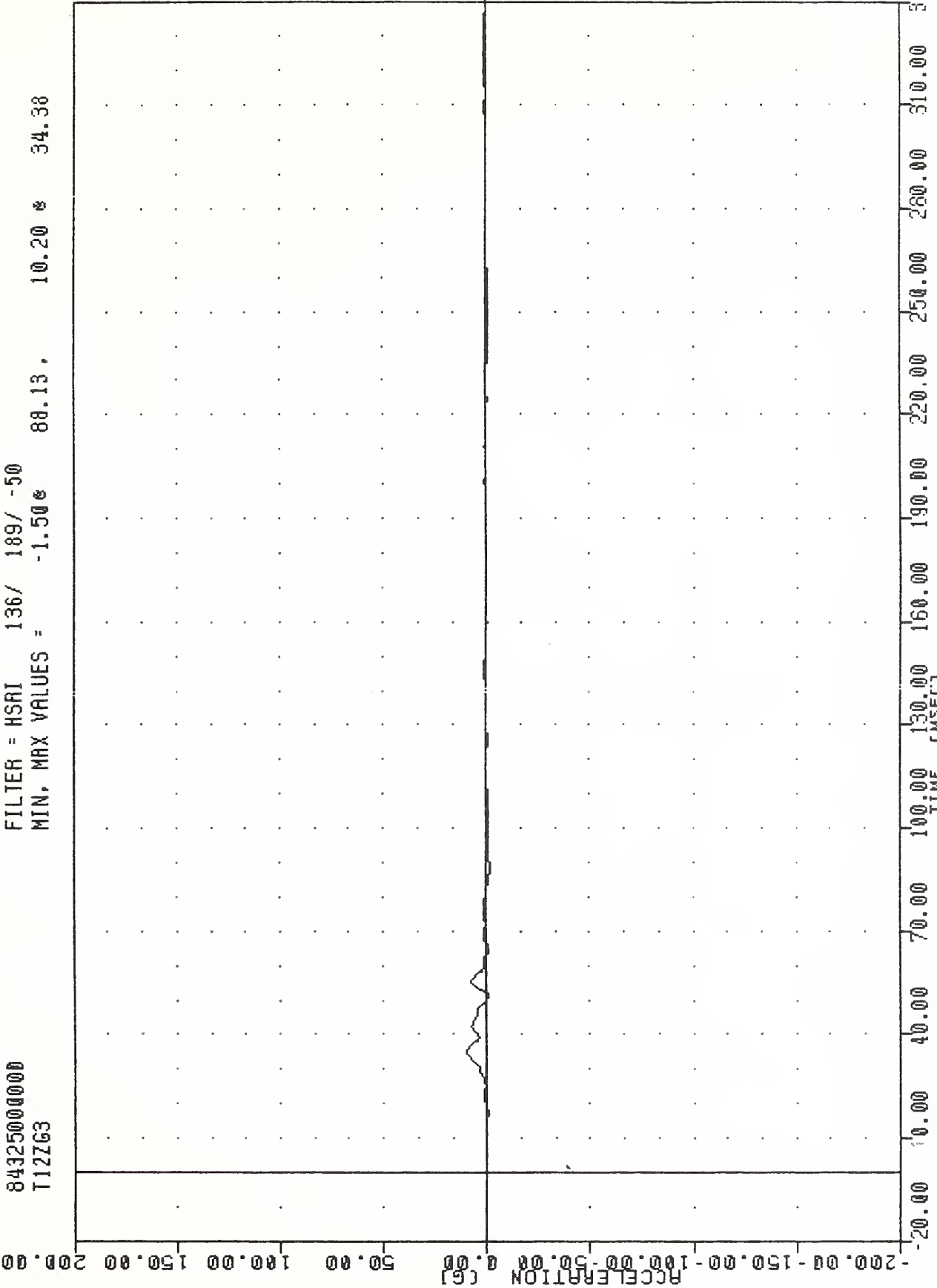
B-50

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE ACCELERATION -2 Y AXIS

1HC , 841120
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 T12ZG3

PLUI DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -1.50 88.13, 10.20 34.38



B-51

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE ACCELERATION Z AXIS

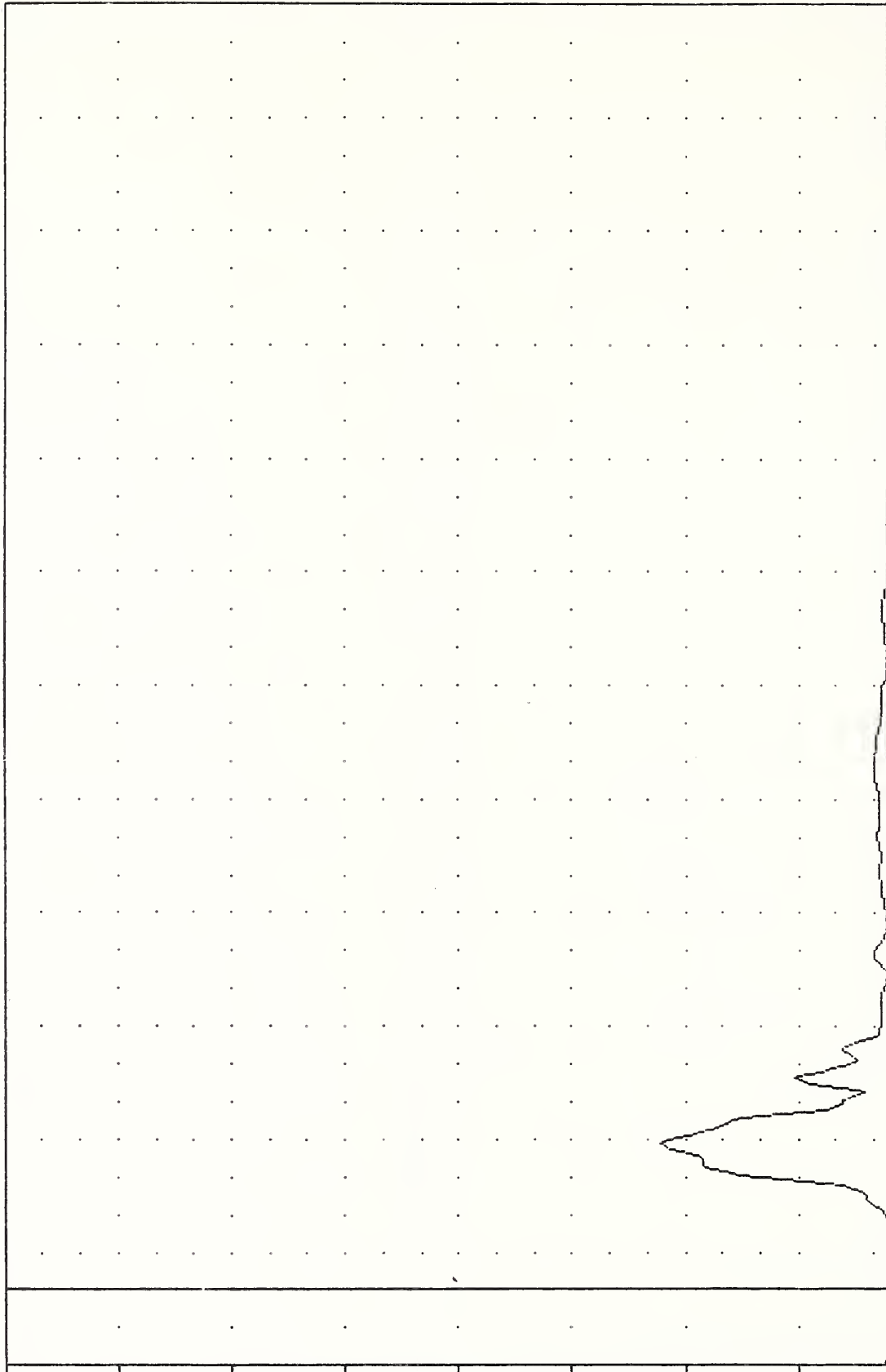
TAC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T12R63

PLOT DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.12e -2.50 , 100.79 e 38.13

ACCELERATION (G)



B-52

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE RESULTANT

PLOT DATE 27-NOV-84 16:25:26

IHC , 841120

SIDE AGGRESSIVE ATTRIBUTES

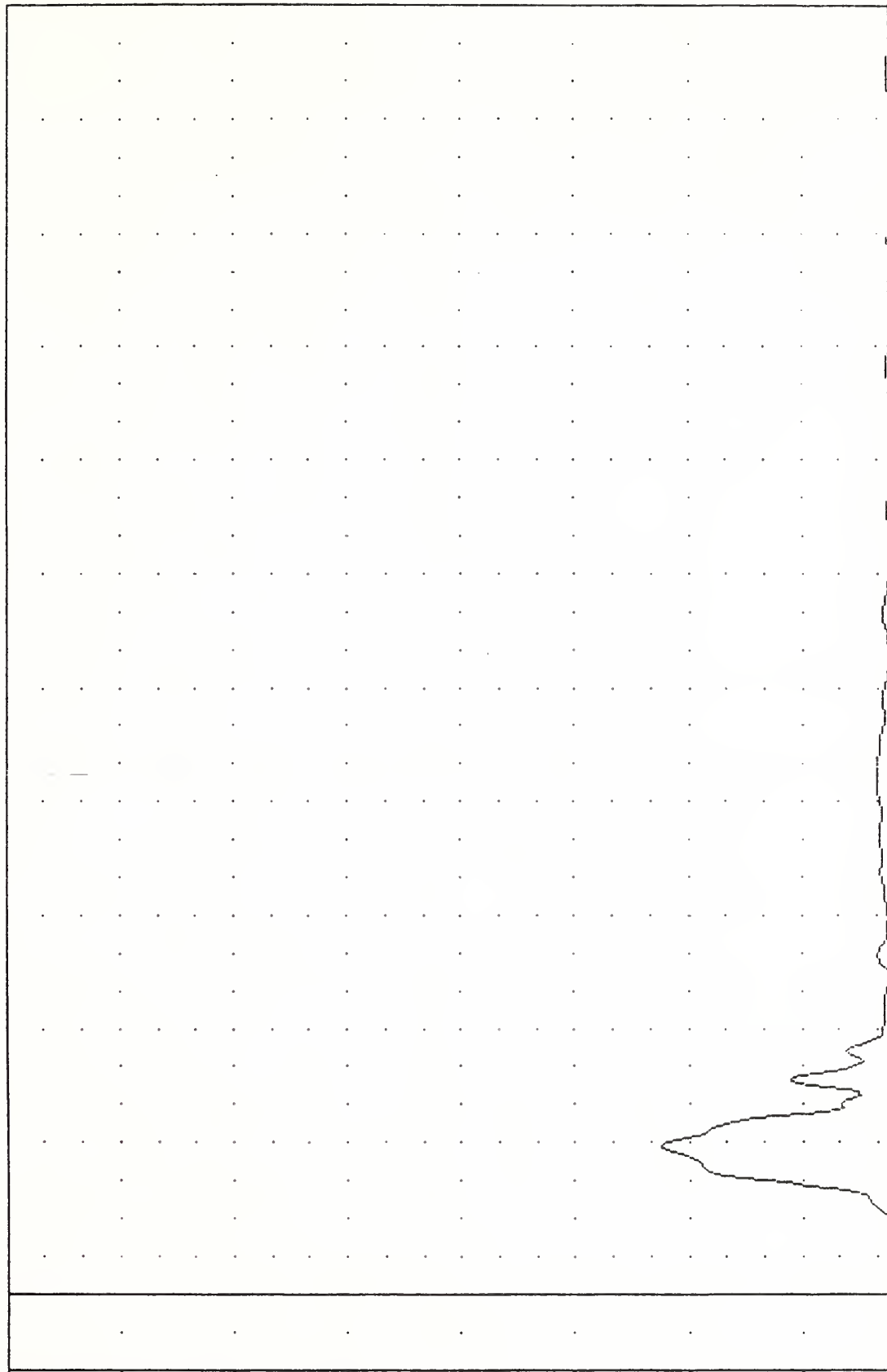
84325000000

FILTER = HSR1 136/ 189/ -50

T12RGC

MIN. MAX VALUES = 0.18# 5.62, 102.13 e 36.13

ACCELERATION (G)



B-53

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE RESULTANT USING T12YGC

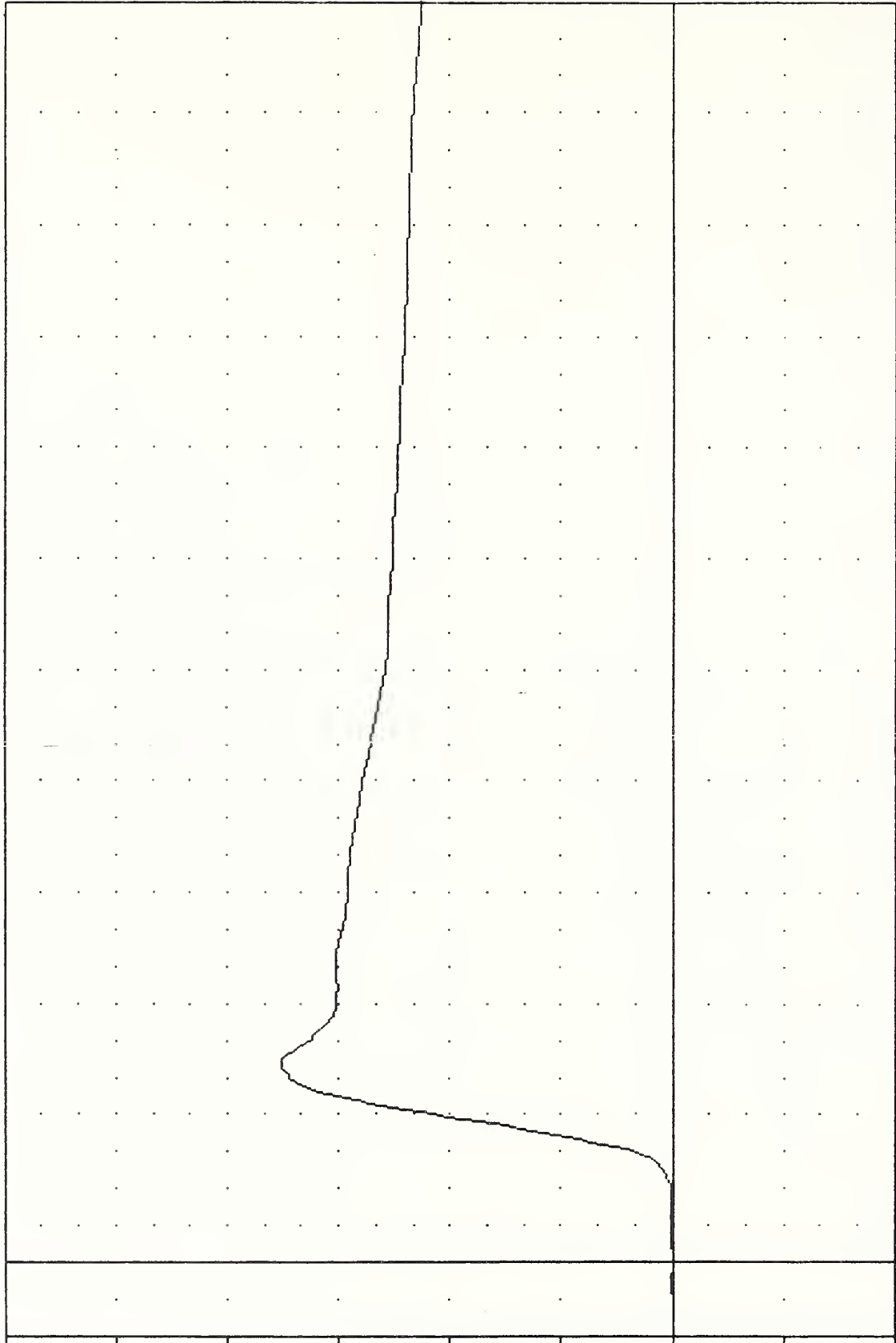
INL
84325000000
T12YV3

PLUI DRIT 27-NOV-84 16:26:00

FILTER = HSFI 136/ 189/ -50

MIN, MAX VALUES = -0.03% -17.50, 35.20% 53.12

VELOCITY (MPH)

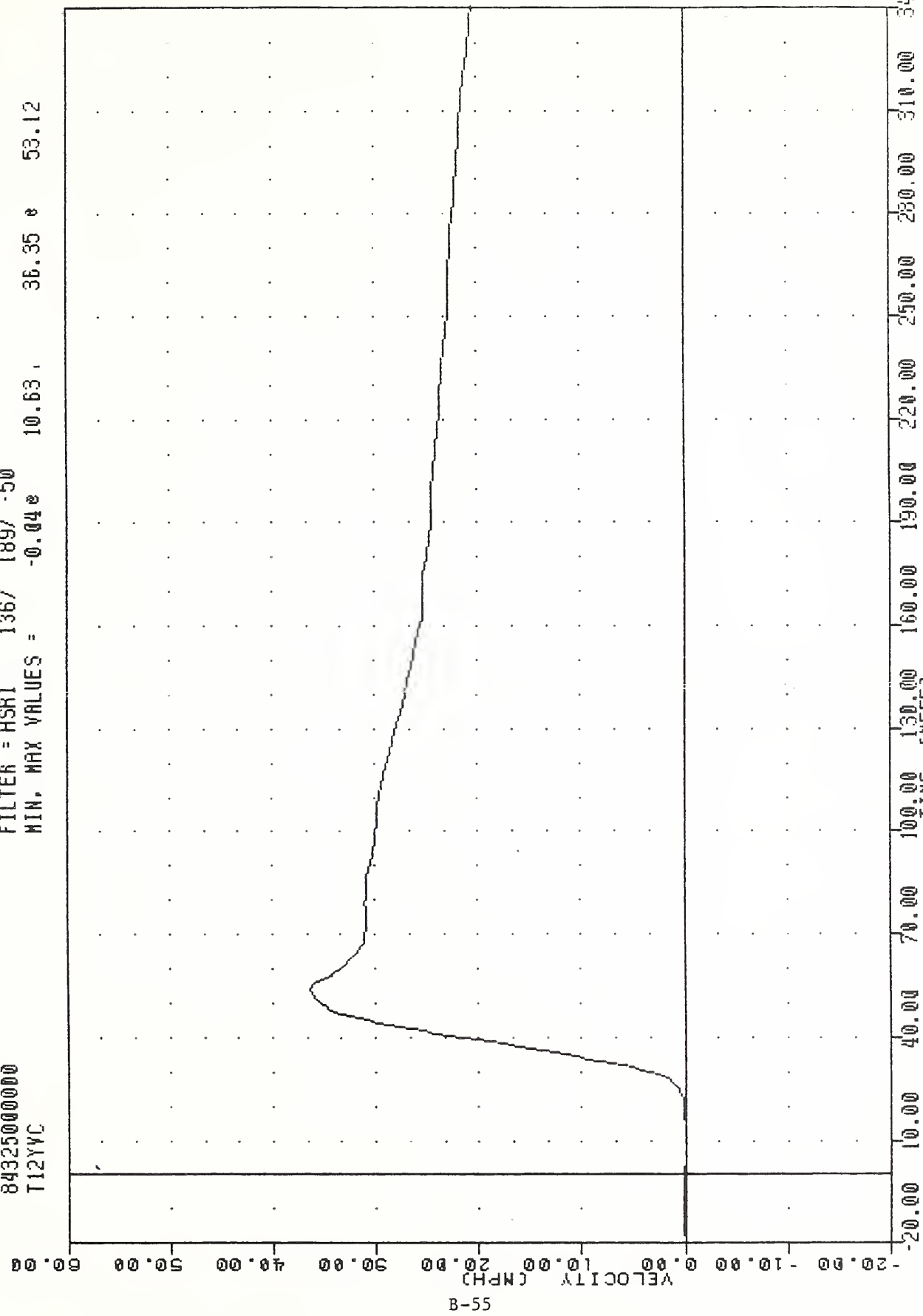


B-54

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12Y63

7HC
841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
T12YVC

PLUI DATE 27-NOV-84 16:26:00
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -0.04e 10.63 , 36.35 e 53.12



B-55

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12YVC

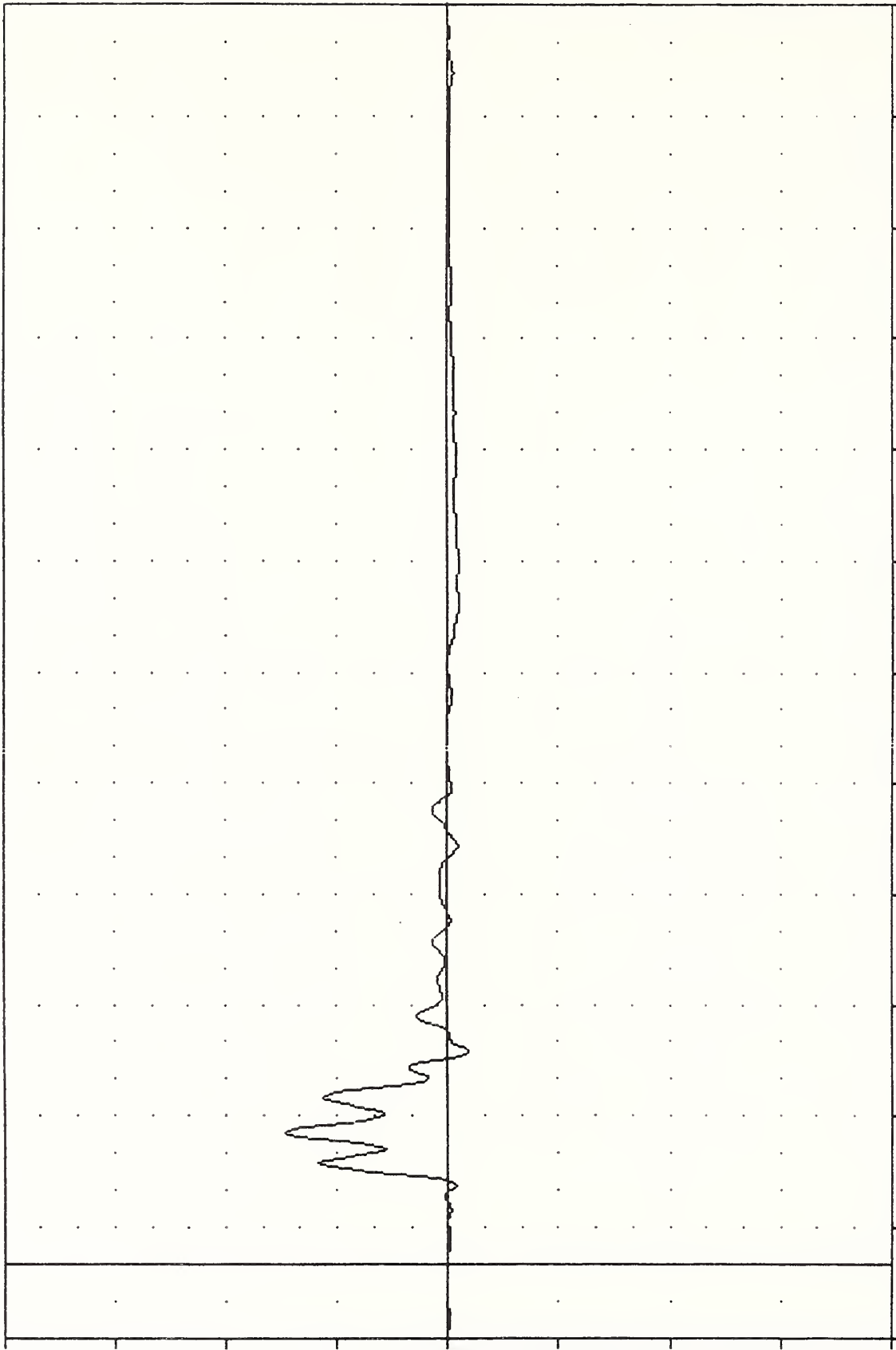
INC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LURY63

PLUI DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -9.25 56.87, 73.52 35.00

ACCELERATION (G)



B-56

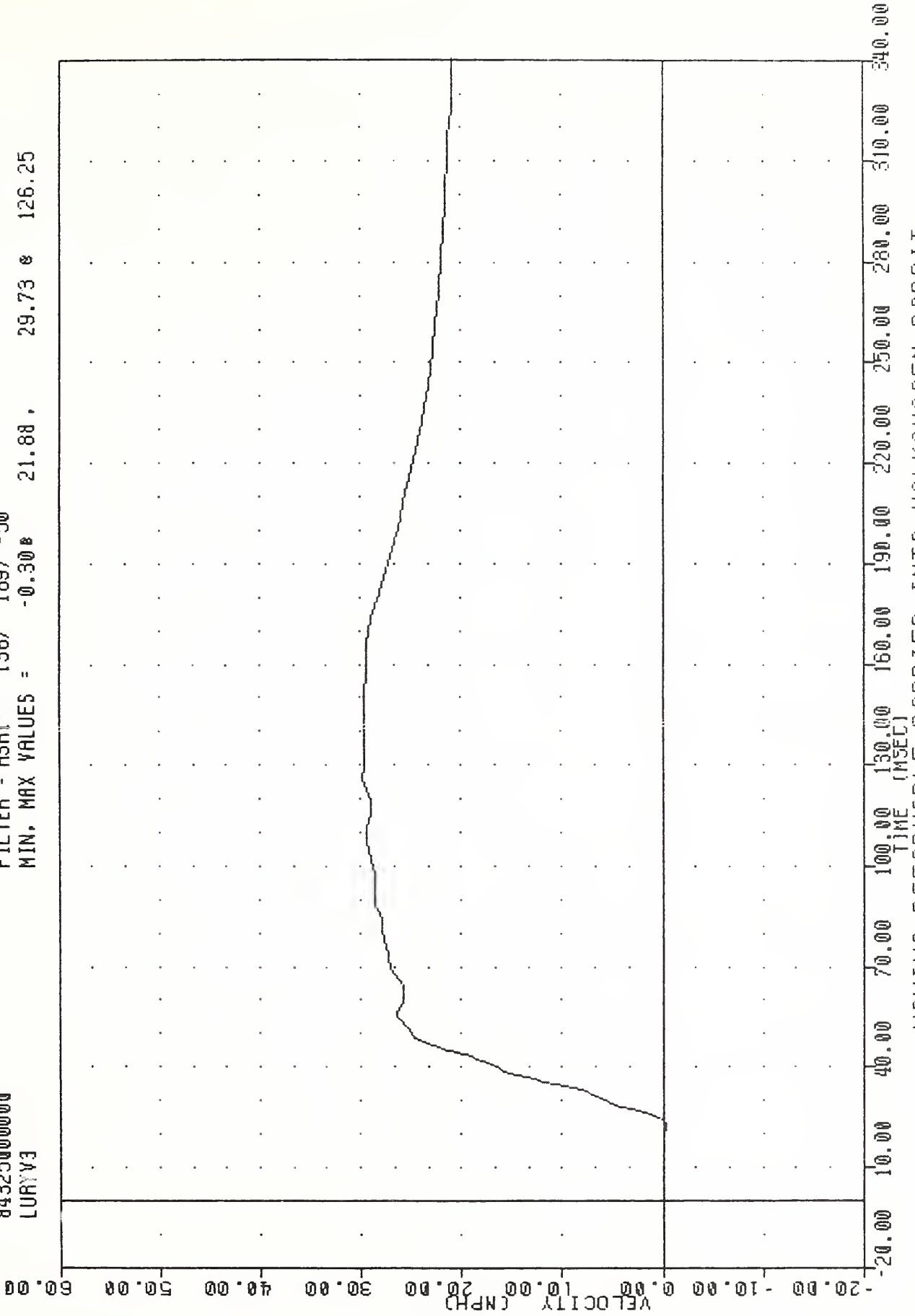
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT UPPER RIB ACCELERATION Y AXIS

IHC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LURYV3

FLUI DATE 27-NDY-84 16:26:00

FILTER = HSR 136/ 189/ -50

MIN. MAX VALUES = -0.30 21.88 , 29.73 126.25



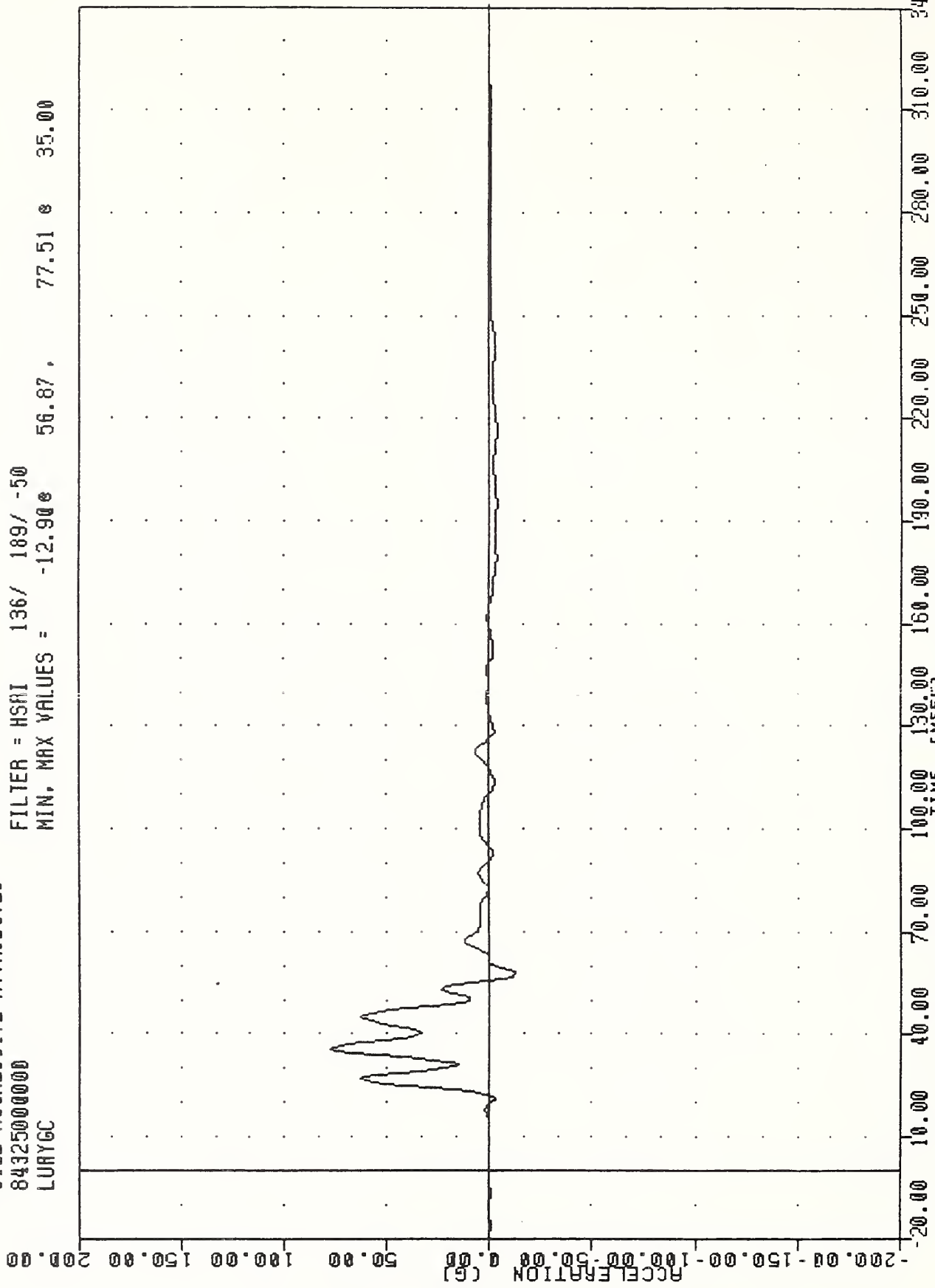
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LURY63

INL , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LURYGC

FLUI DATE 27-NOV-04 10:24:11

FILTER = HSRI 136/ 189/ -50

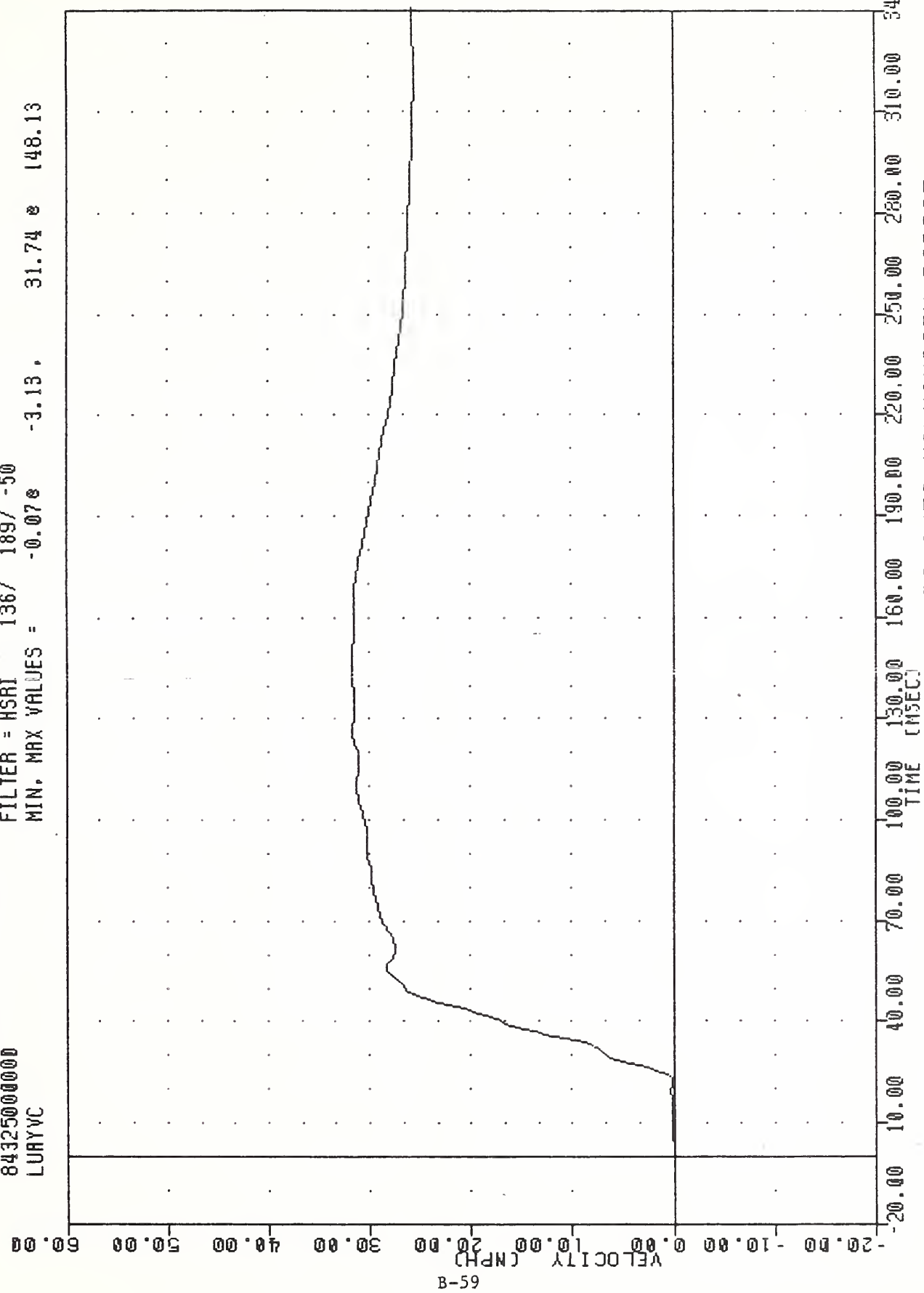
MIN, MAX VALUES = -12.90e 56.87, 77.51 e 35.00



B-58

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT UPPER RIB ACCELERATION -Z Y AXIS

1HC , 841120 PLUI DATE 27-NOV-84 16:26:00
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000 FILTER = HSRI 136/ 189/ -50
 LURYVC MIN. MAX VALUES = -0.078 -3.13, 31.74 148.13

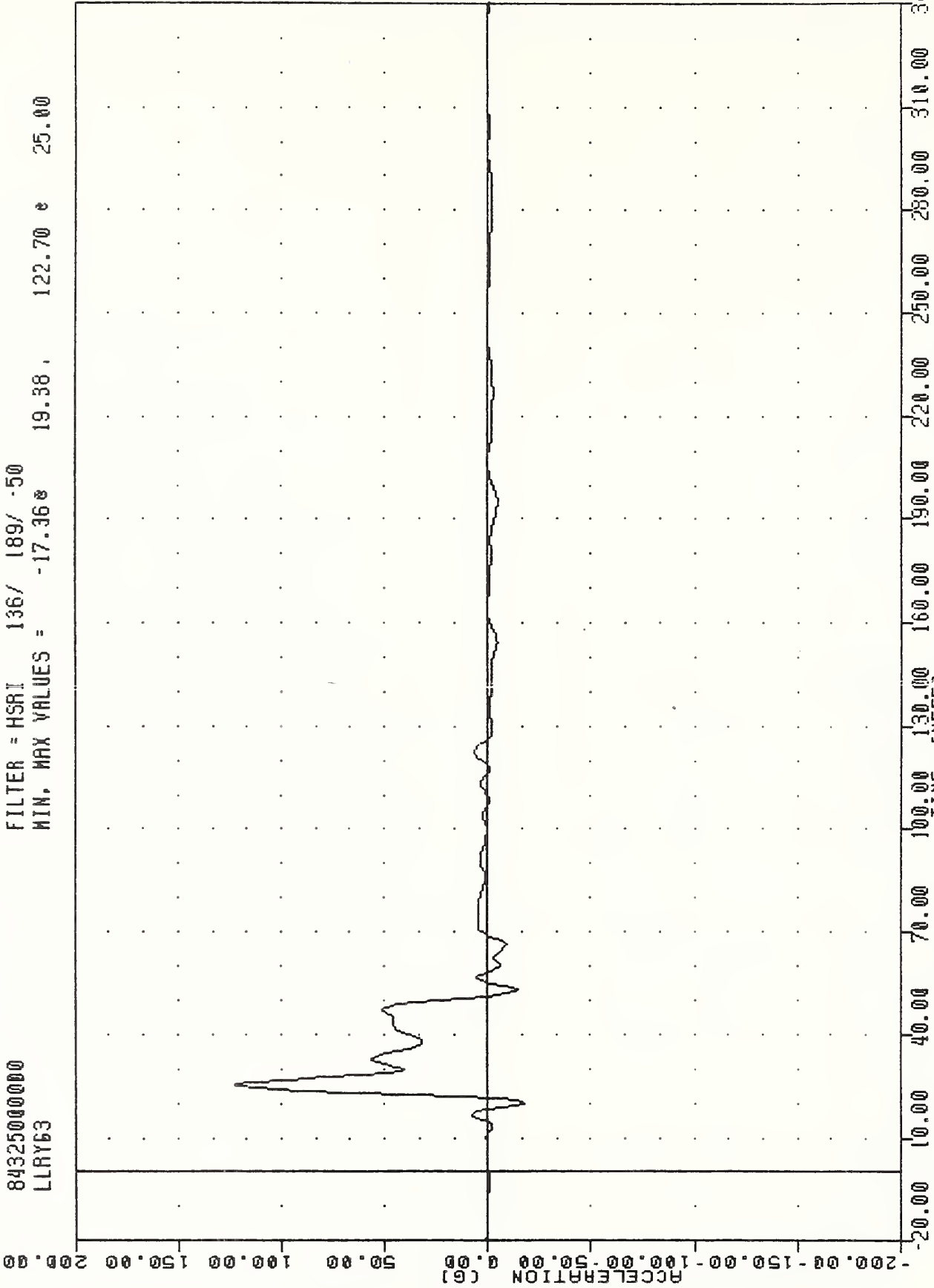


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LURYGC

THC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LLRY63

PLUI DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ .50
MIN. MAX VALUES = -17.36 122.70 e 25.00



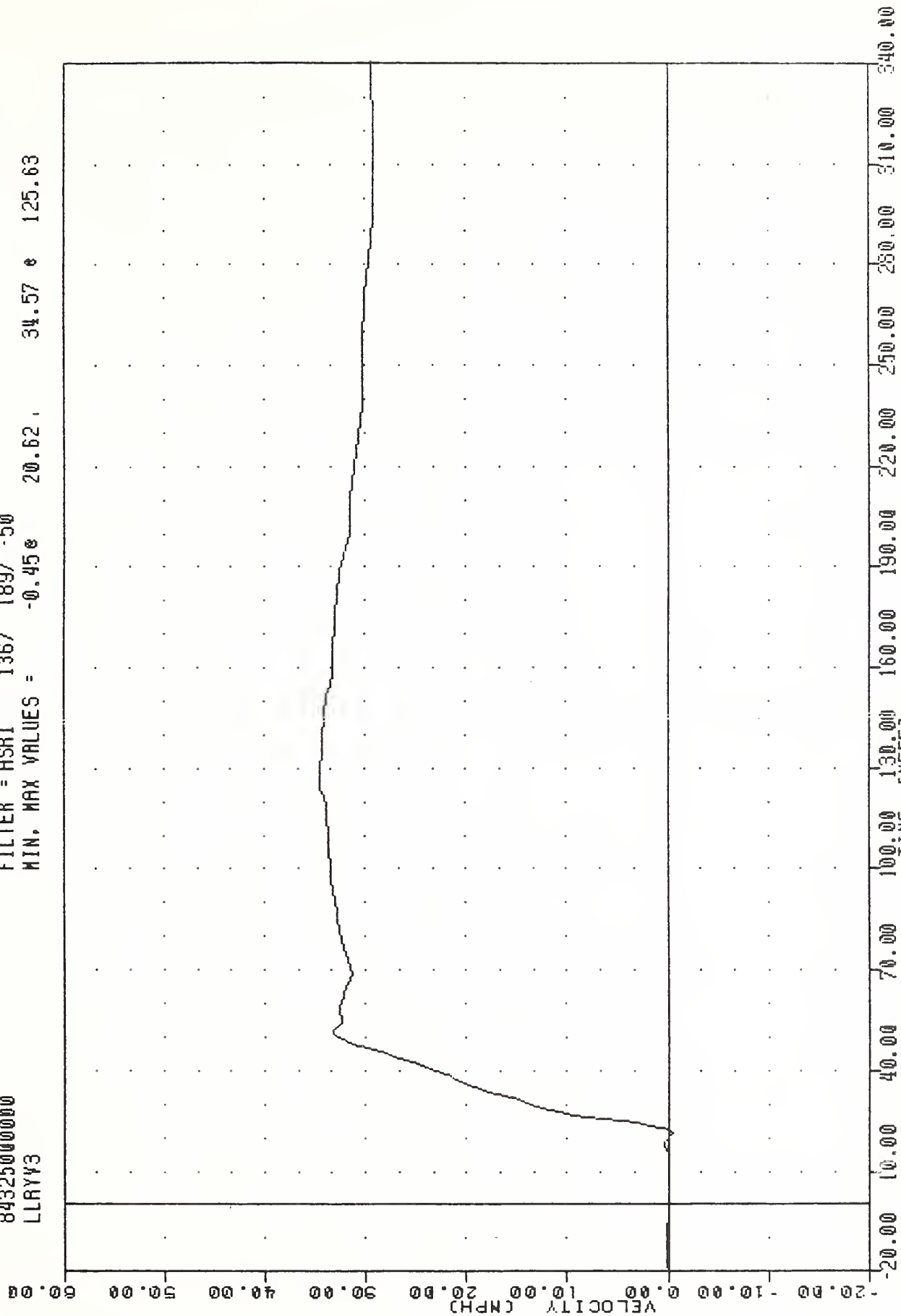
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT LOWER RIB ACCELERATION Y AXIS

THC , 84J120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LLRYV3

PLUI DATE 27-NOV-84 16:26:00

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.45e 20.62, 34.57 e 125.63



B-61

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLRYG3

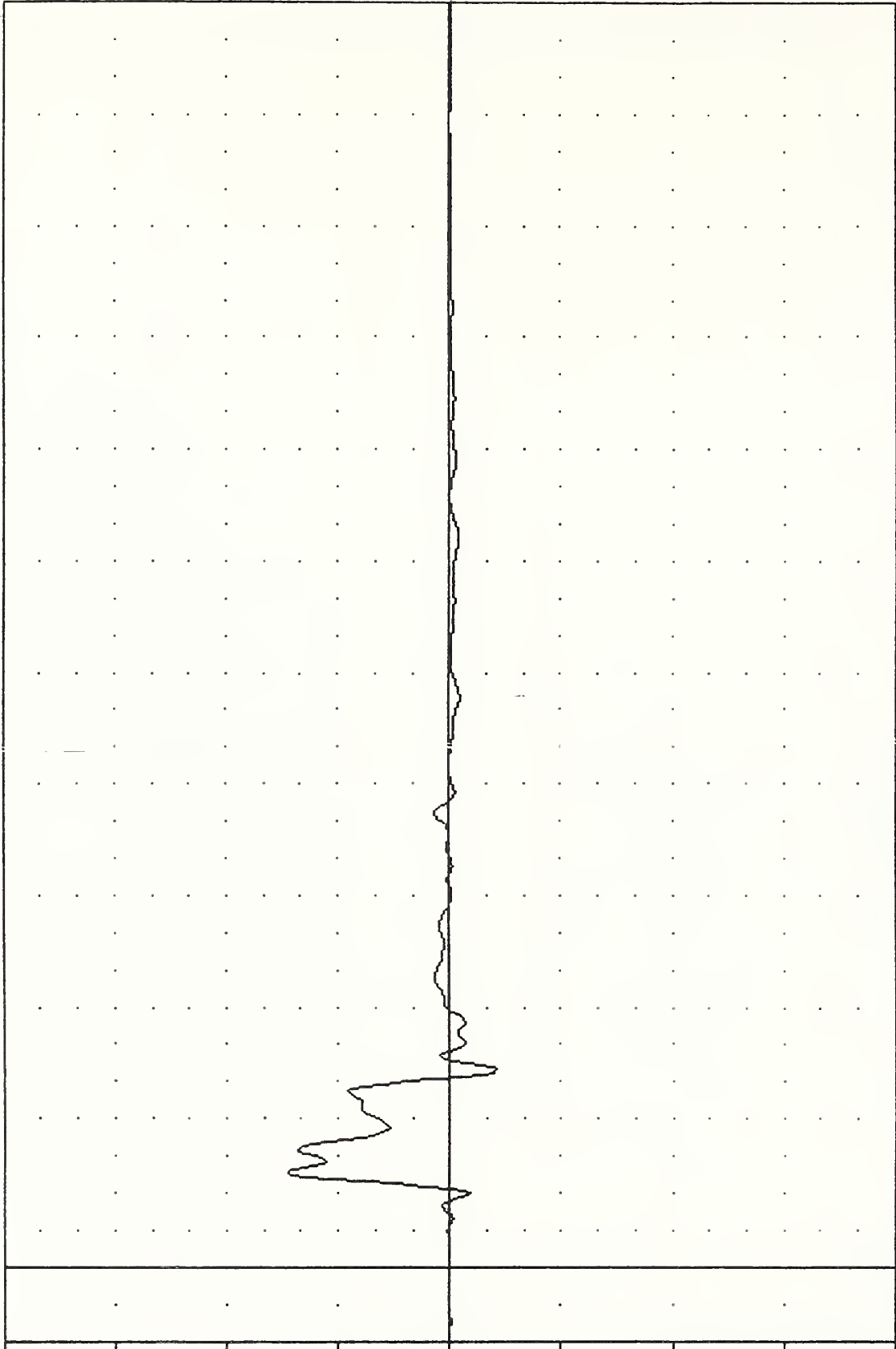
TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LLRYGC

PLOT DATE 27-NOV-84 16:24:11

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -21.40 52.50 72.51 25.00

ACCELERATION (G)



B-62

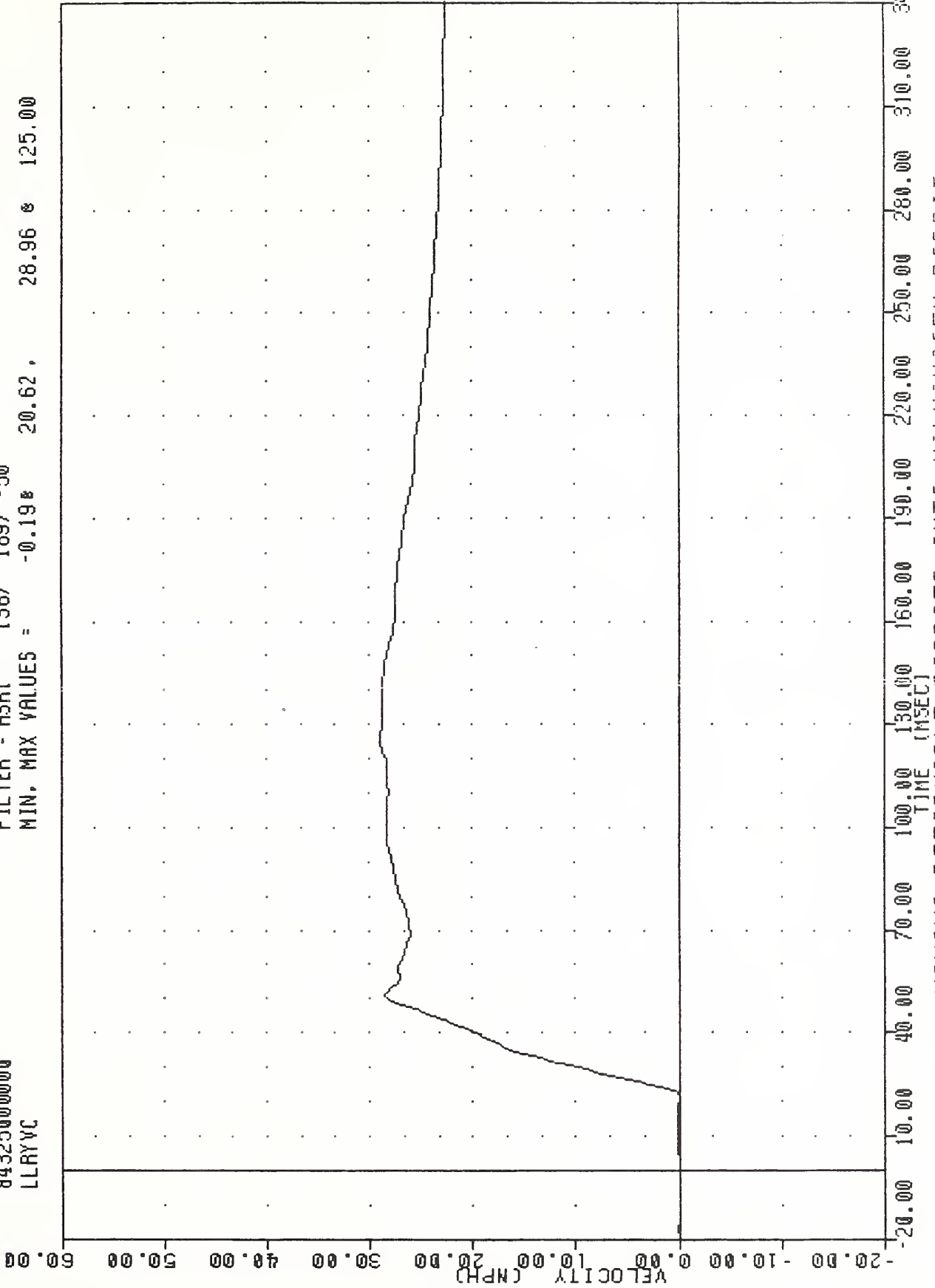
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT LOWER RIB ACCELERATION -2 Y AXIS

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
8432500000
LLRYVC

PLOT DATE 27-NOV-84 16:26:00

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.19 20.62, 28.96 125.00



B-63

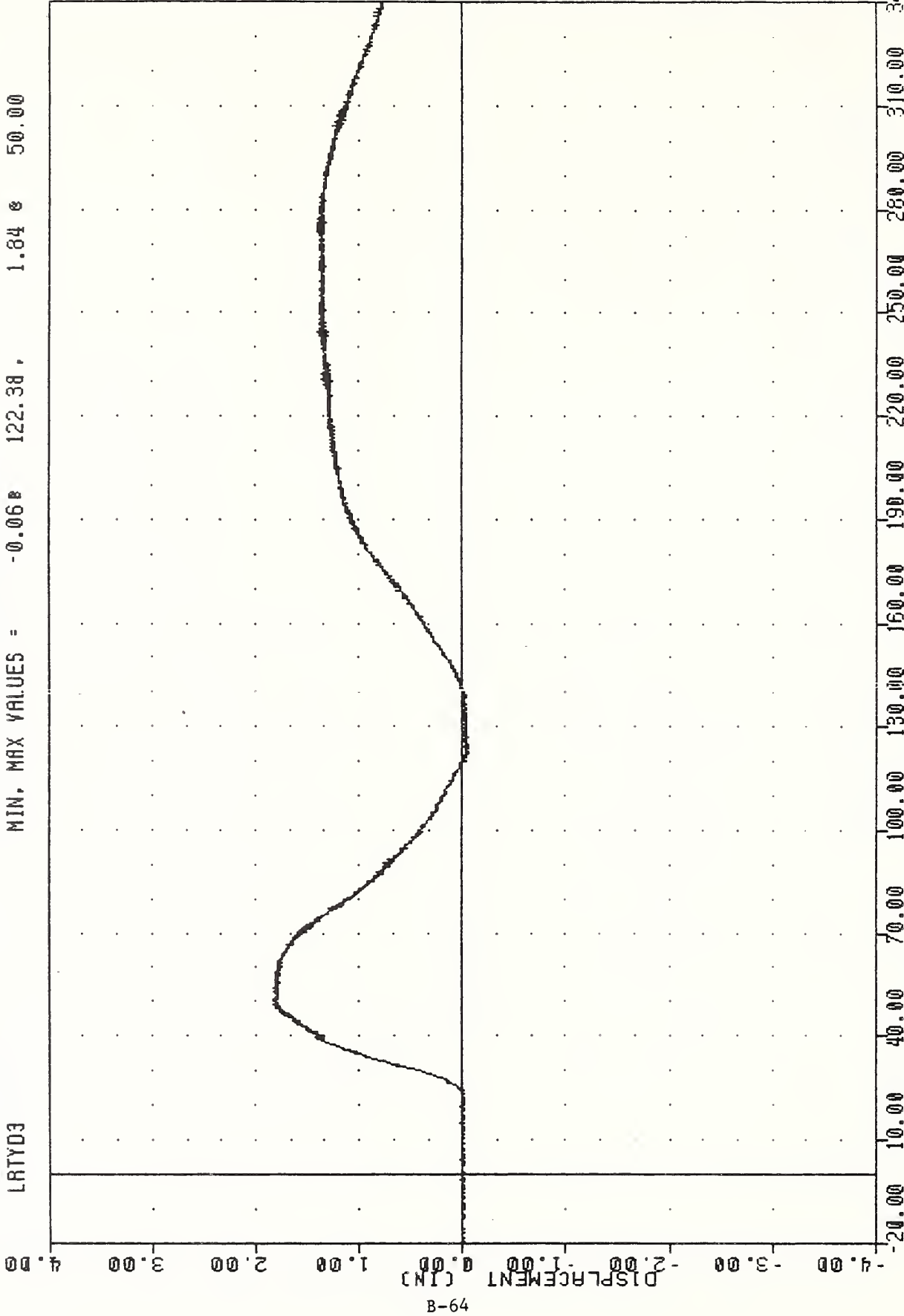
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLRYVC

TRC 841120
SIDE AGGRESSIVE ATTRIBUTES
8432500000
LRTYD3

PLOT DATE 27-NOV-84 16:29:52

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -0.068 122.38, 1.84 @ 50.00



B-64

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT RIB TO SPINE DISPLACEMENT INCHES

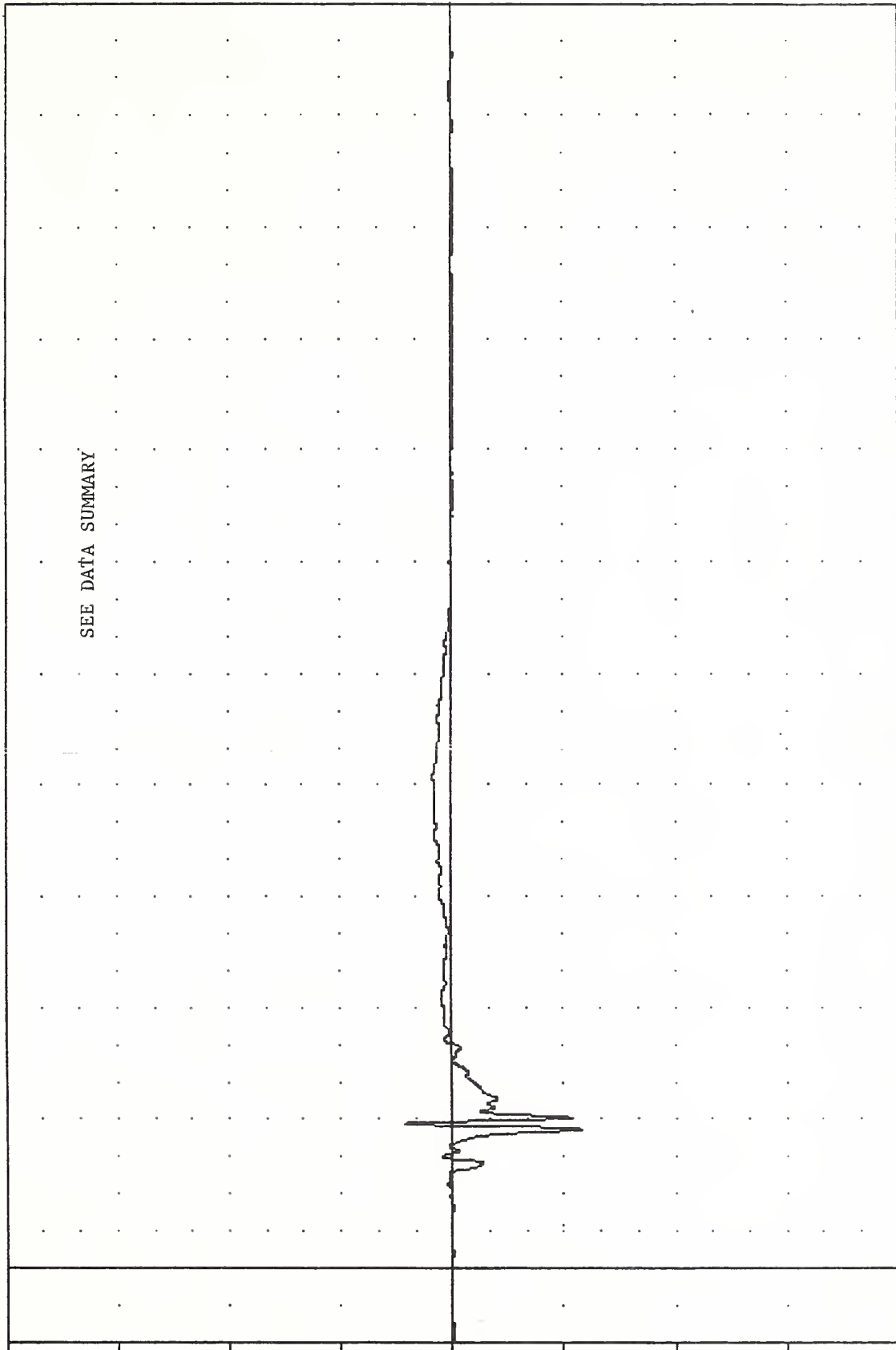
TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
PEYXG3

PLOT DATE 27-NOV-84 16:29:52

FILTER = 8LPF 300/ 949/ -40

MIN, MAX VALUES = -57.70e 37.13, 21.93 e 38.75

ACCELERATION (G)



B-65

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

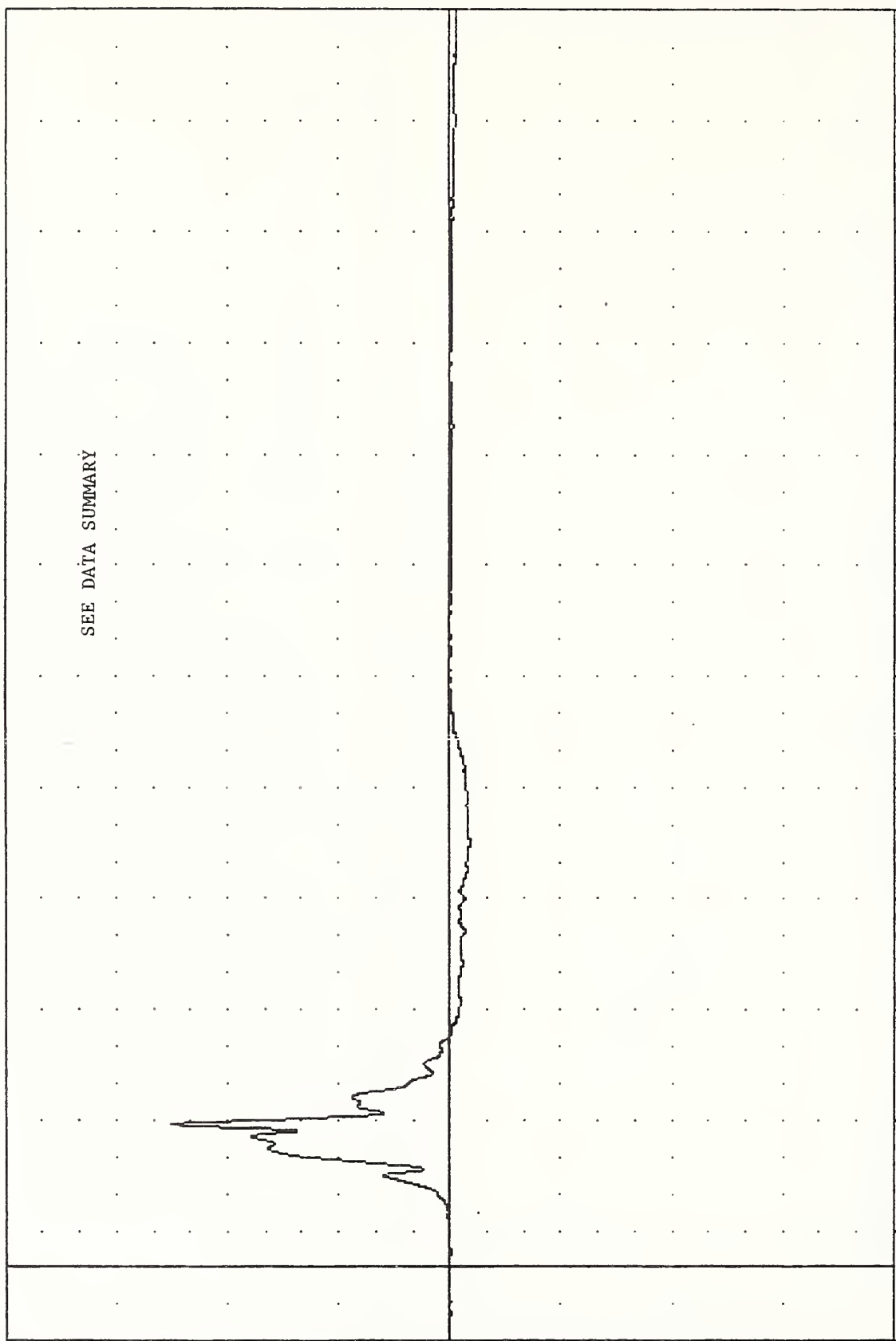
0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS ACCELERATION X AXIS

THC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
PEYY63

PLOT DATE 27-NOV-84 16:29:52
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -8.96e 114.75 , 125.08 e 39.63

99-B
ACCELERATION (G)
-200.00 -150.00 -100.00 -50.00 0.00 50.00 100.00 150.00 200.00



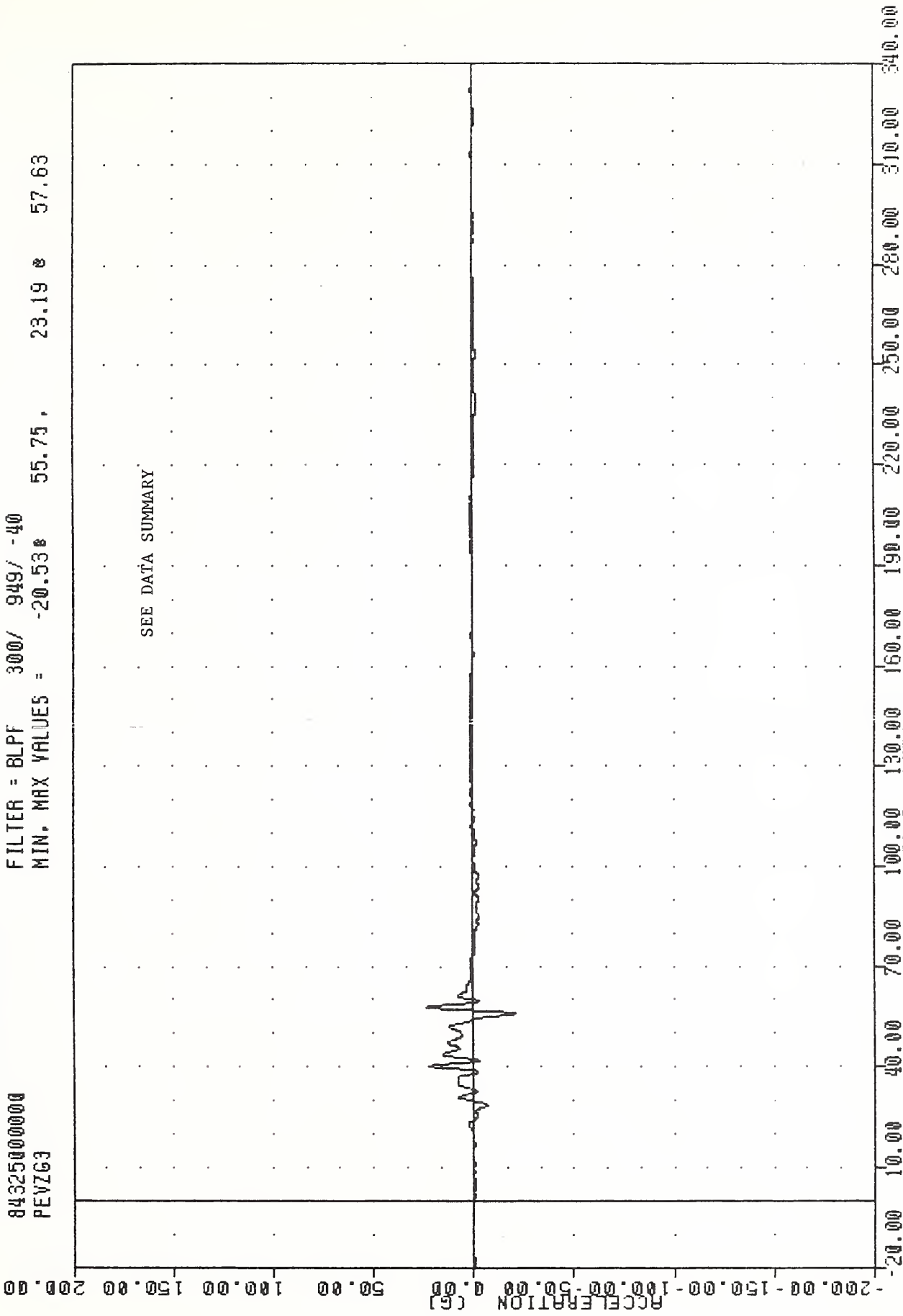
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS ACCELERATION Y AXIS

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
PEVZG3

PLU1 DATE 27-NOV-84 16:29:52

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -20.53g 55.75g 23.19g 57.63



B-67

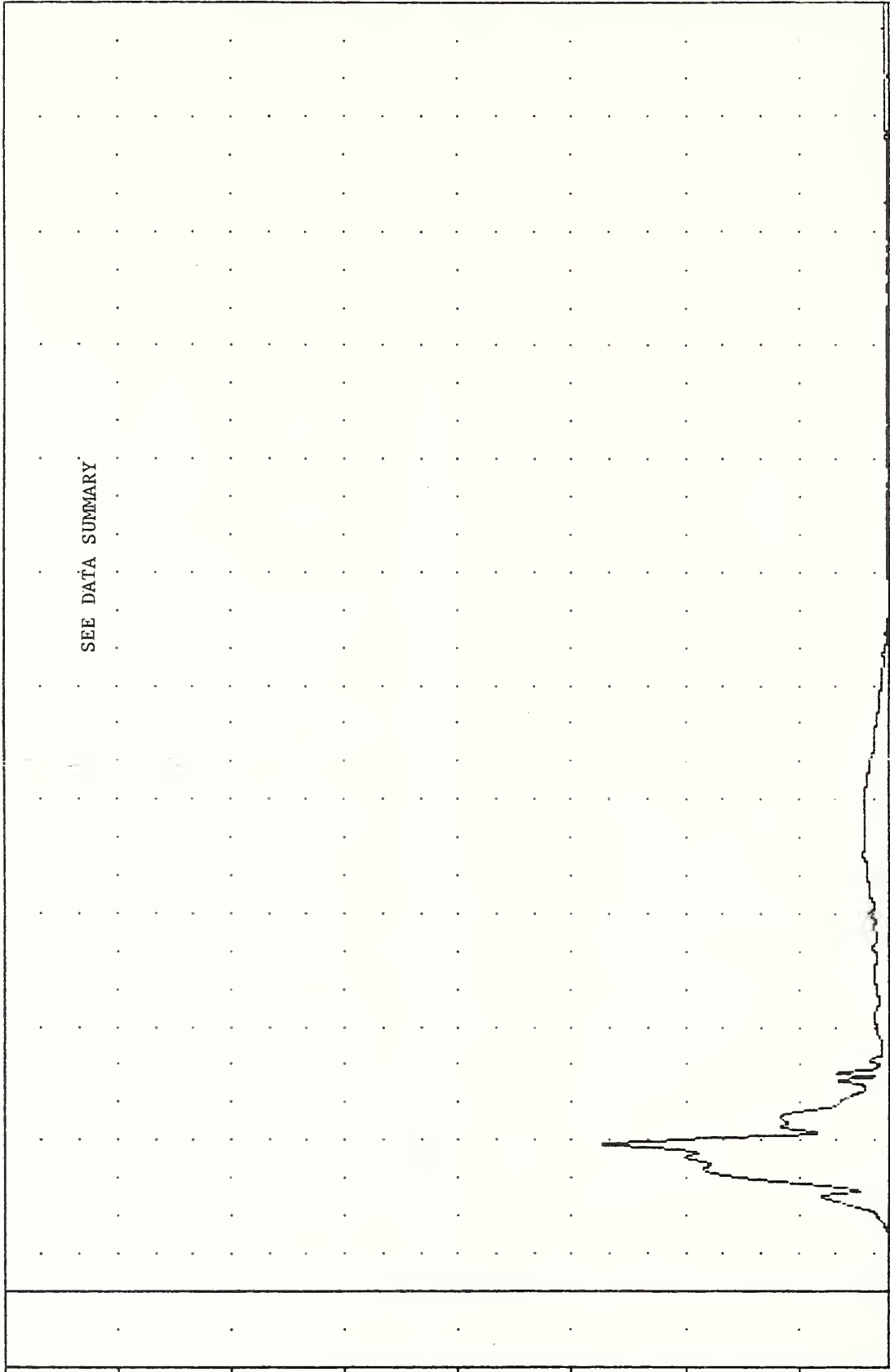
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS ACCELERATION Z AXIS

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
PEVRG3

PLOT DATE 27-NOV-84 16:31:49

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.08 * -3.25 , 126.92 * 38.63

ACCELERATION (G)
-10.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00 350.00 360.00 370.00 380.00 390.00



SEE DATA SUMMARY

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS RESULTANT

THC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
PEVYV3

PLOT DATE 27-NOV-84 16:32:40

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.038 9.13, 34.95 62.75

60.00

50.00

40.00

30.00

20.00

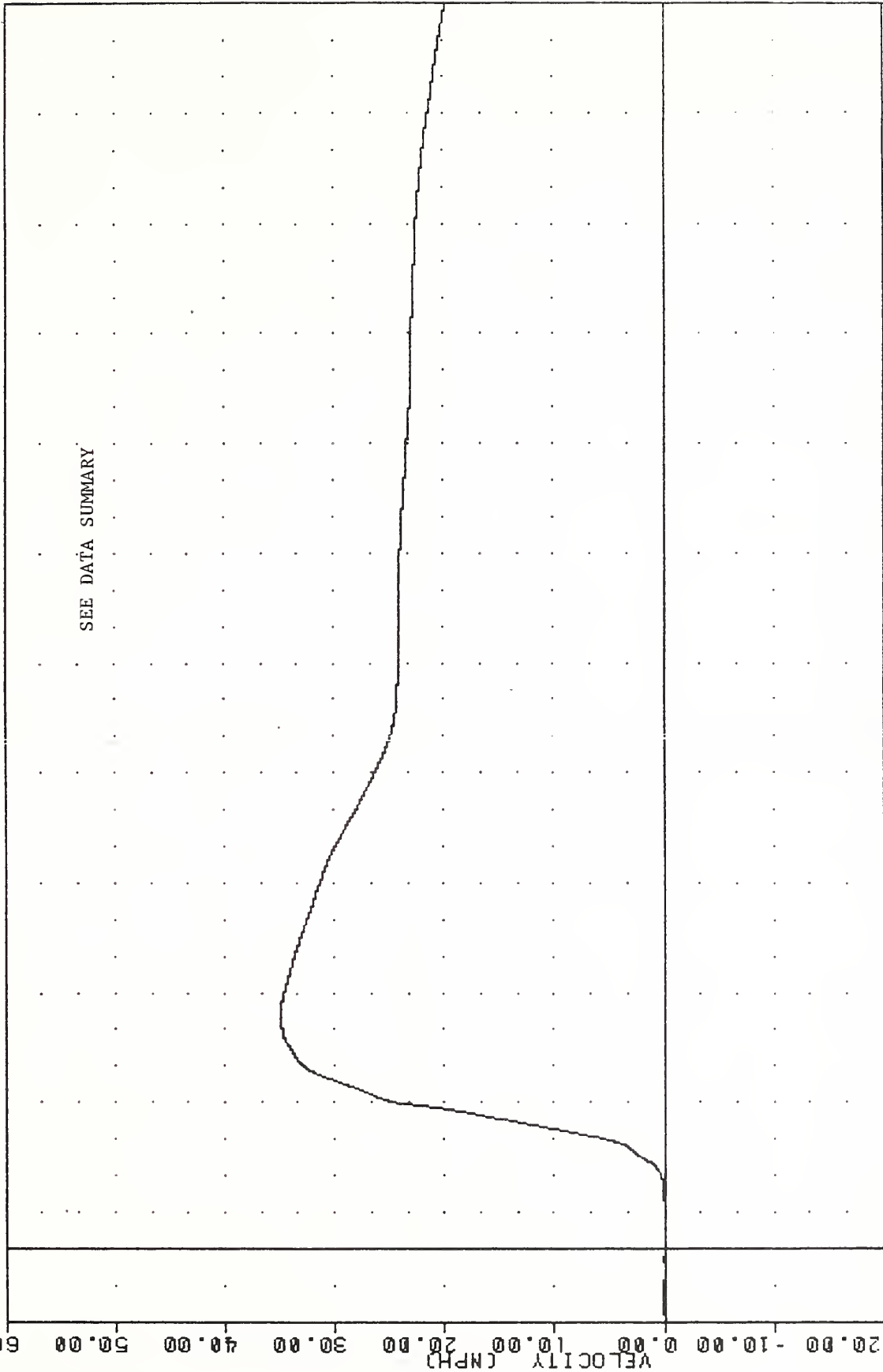
10.00

0.00

-10.00

-20.00

B-69



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

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING PEVYV3

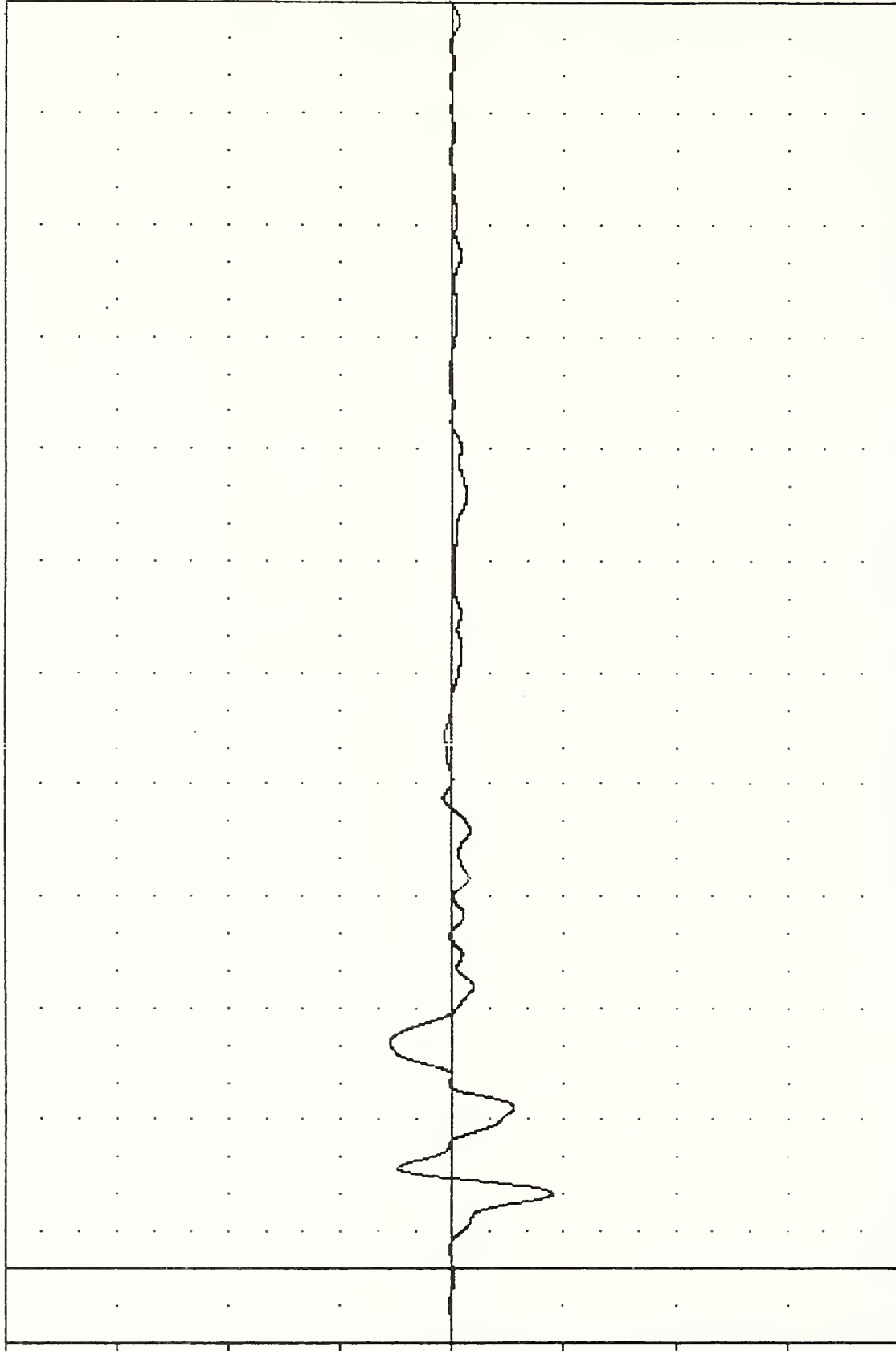
IMC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
RFSXG1

PLUI DRIE 27-NOV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -8.98e 20.00, 5.57 e 60.50

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)

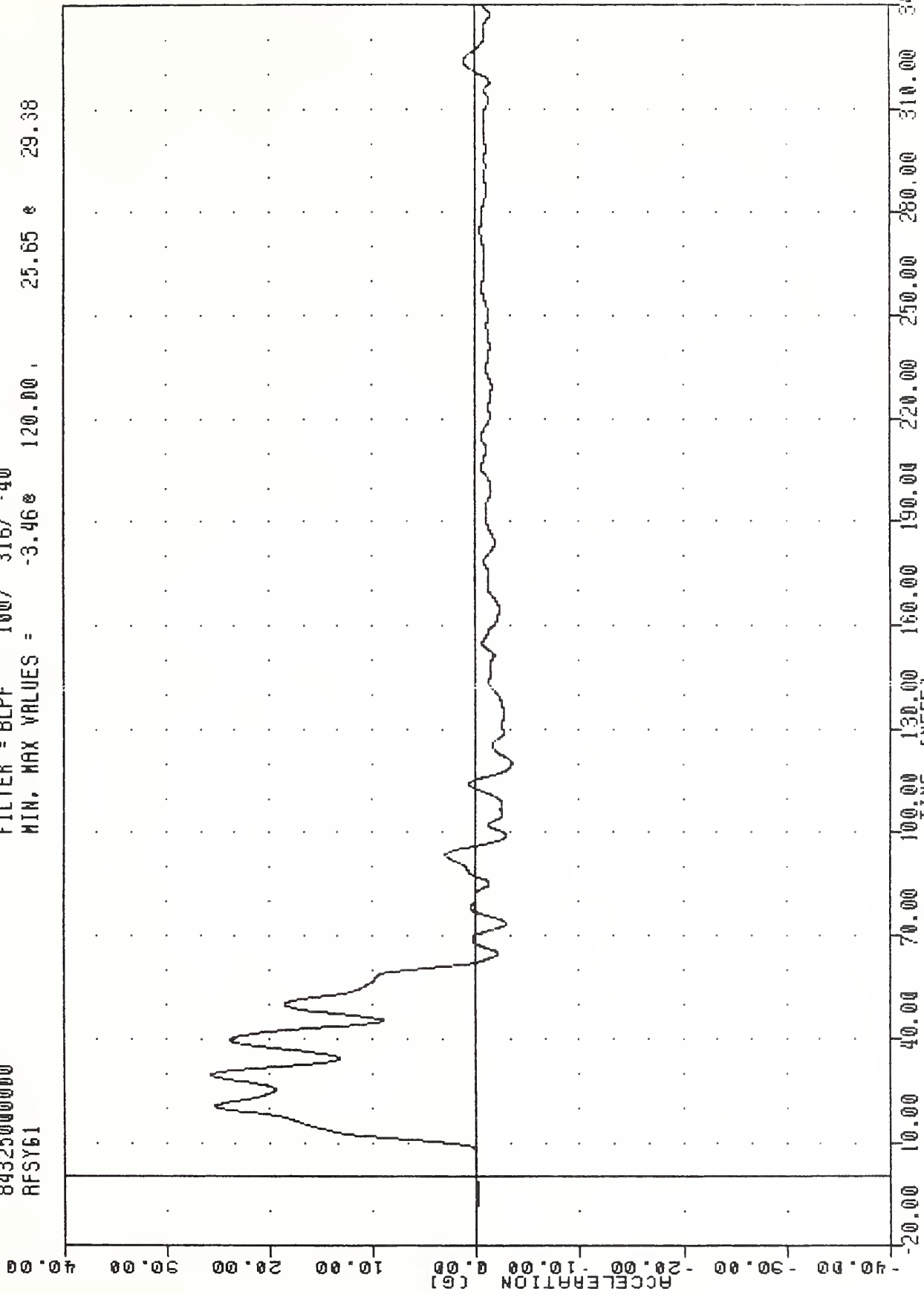
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL ACCELERATION X AXIS

THC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
RFSY61

PLU1 DATE 27-NOV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -3.46e 120.00, 25.65e 29.38



B-71

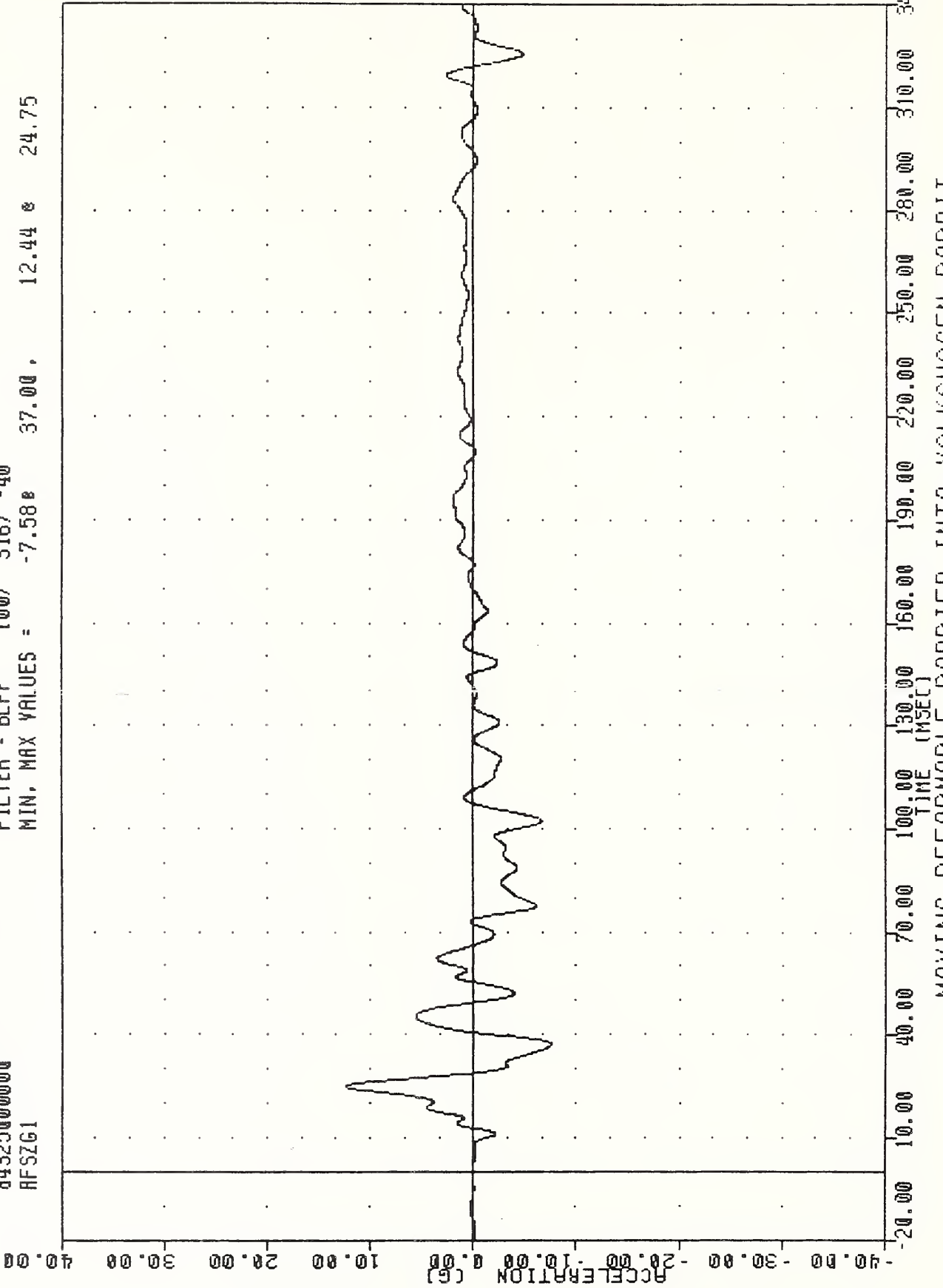
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL ACCELERATION Y AXIS

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
RFSZG1

PLOT DATE 27-NDV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -7.58e 37.00, 12.44 e 24.75



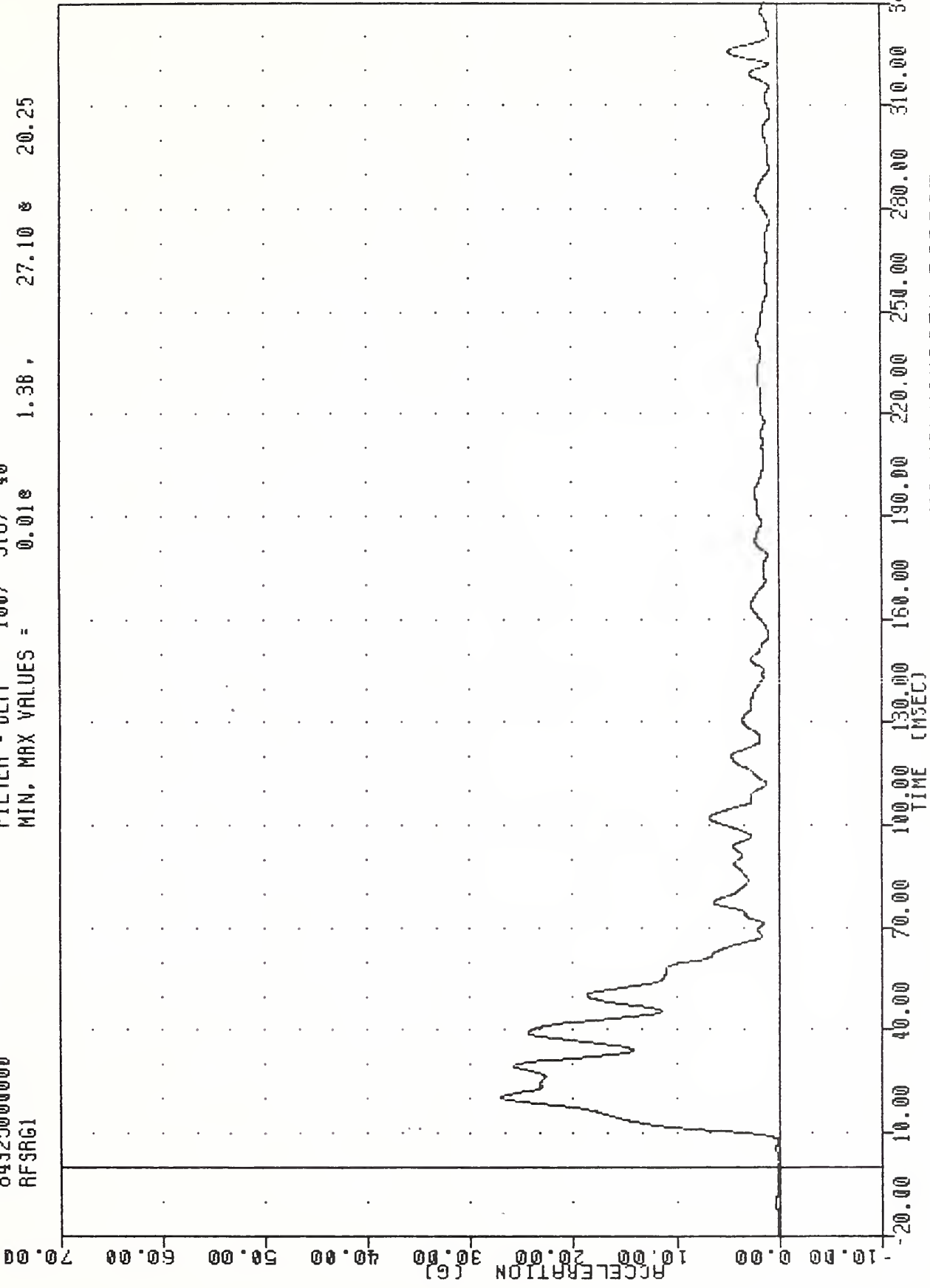
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL ACCELERATION Z AXIS

INC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
RFSRG1

PLUI DATE 27-NOV-84 16:31:49

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = 0.01e 1.36, 27.10 e 20.25



B-73

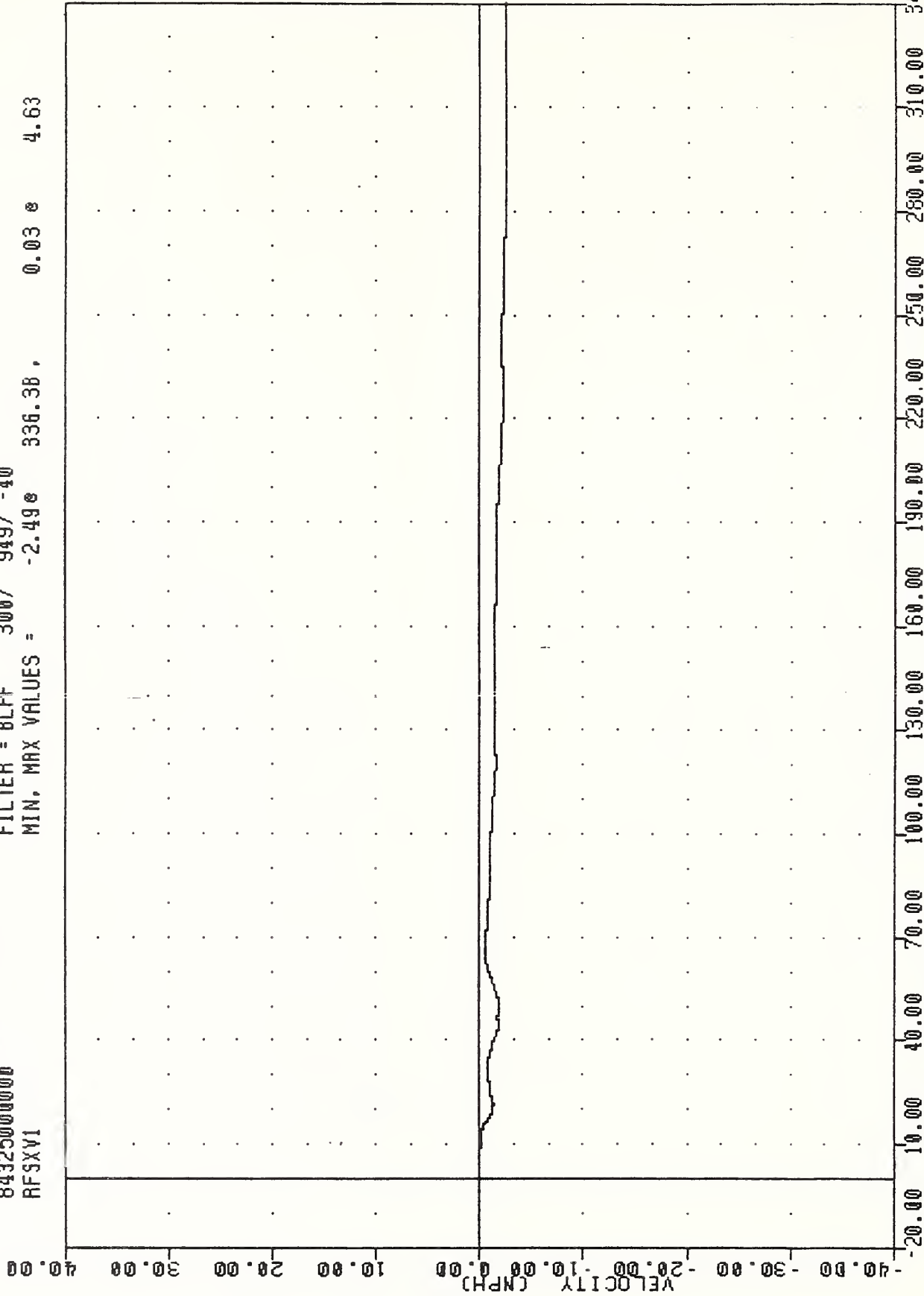
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL RESULTANT

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
RFSXV1

PLOT DATE 27-NOV-84 16:32:40

FILTER = BLFF 300/ 949/ -40

MIN. MAX VALUES = -2.49 336.38 , 0.03 4.63



B-74

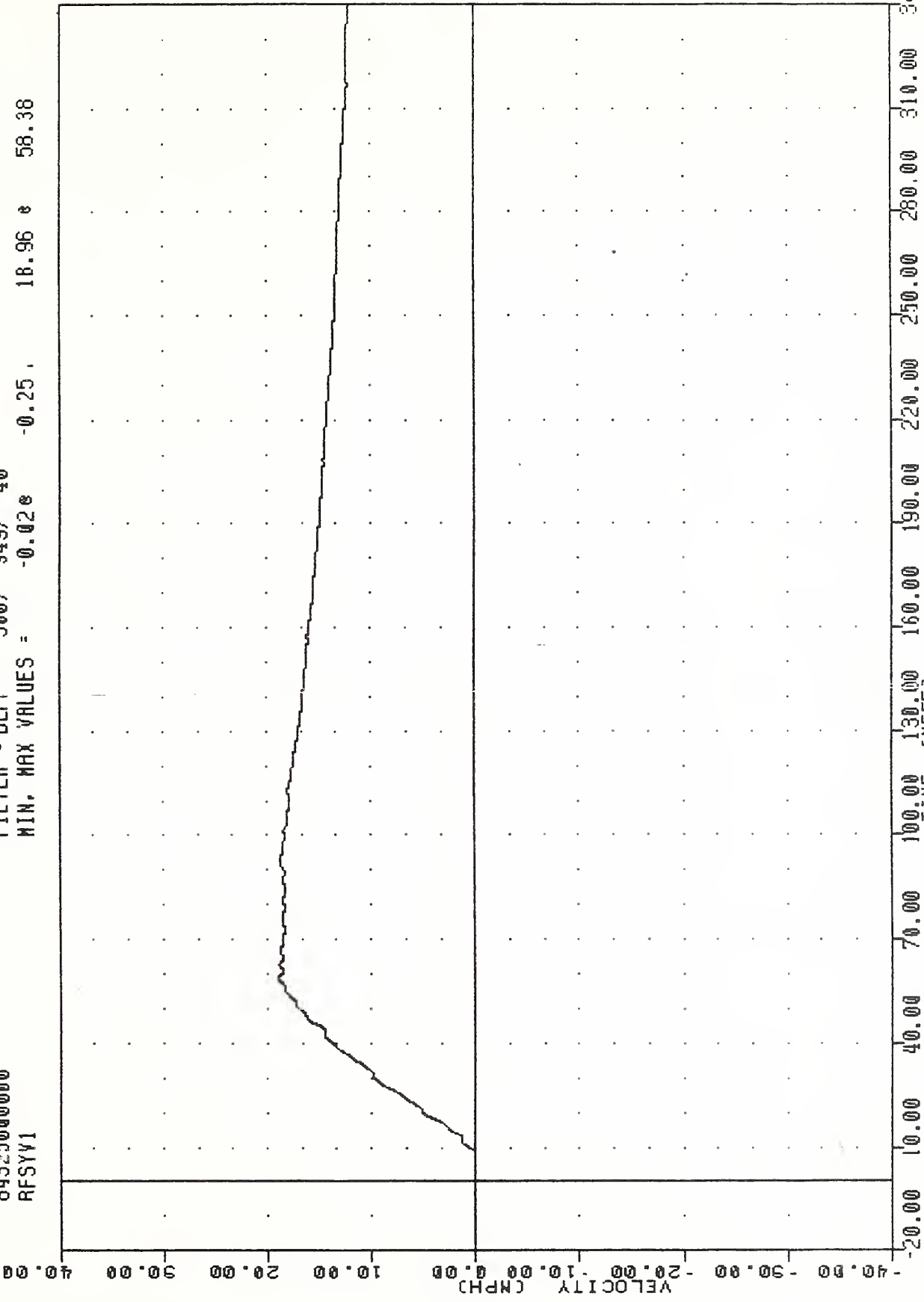
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RFSXG1

THC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
RFSYV1

PLUI DATE 27-NOV-84 16:32:40

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.02e -0.25 , 18.96 e 58.38



B-75

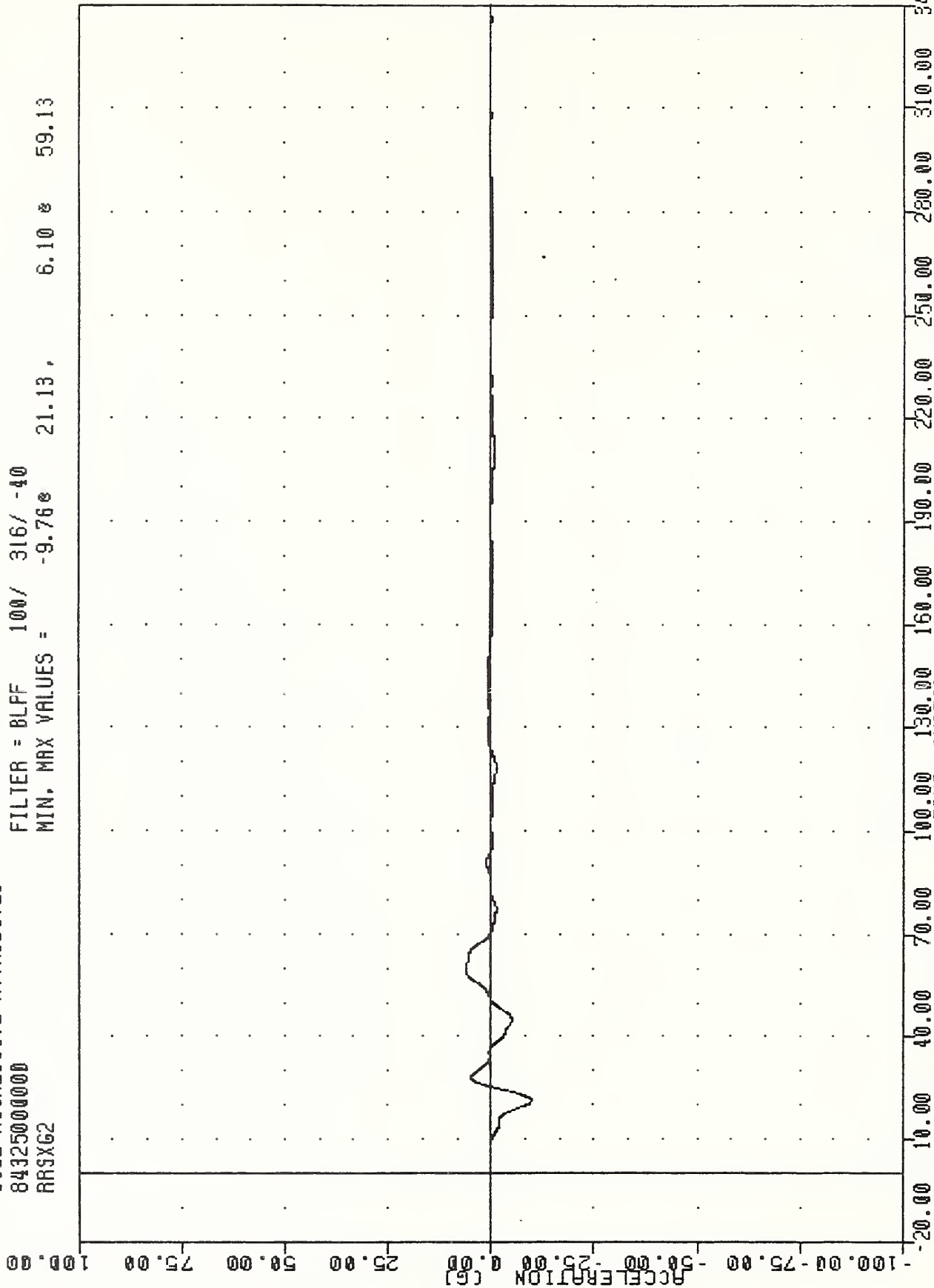
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA Y USING RFSYGI

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
8432500000
RRSX62

PLOT DATE 27-NOV-84 16:29:52

FILTER = BLFF 100/ 316/ -40

MIN. MAX VALUES = -9.76e 21.13 , 6.10 e 59.13



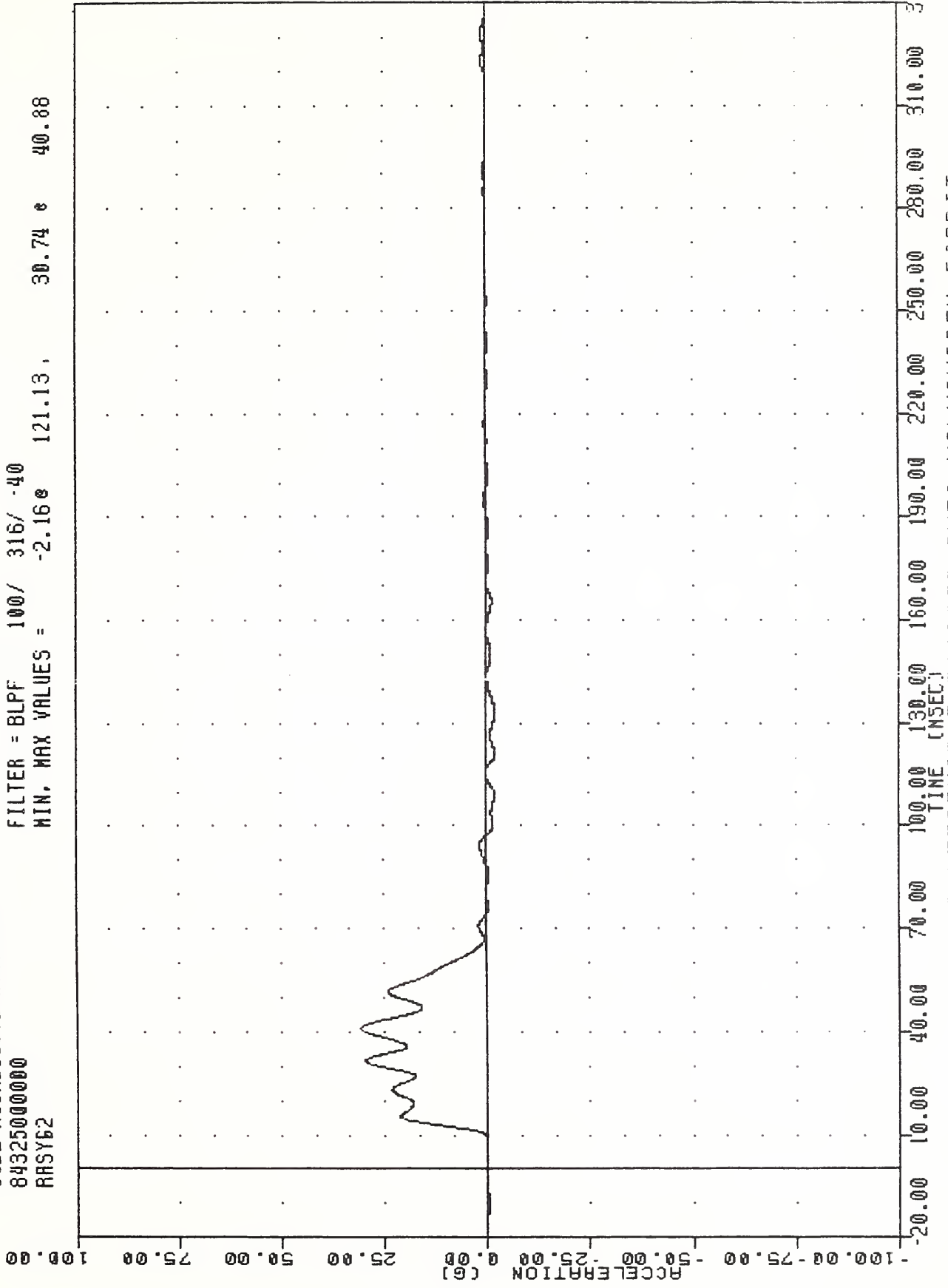
B-76

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION X AXIS

TAC : , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
RRSY62

PLUT DATE 27-NOV-84 16:29:52

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -2.16e 121.13, 30.74 e 40.88



B-77

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION Y AXIS

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
ARSZG2

PLOT DATE 27-NOV-84 16:29:52

FILTER = BLFF 100/ 316/ -40
MIN, MAX VALUES = -7.88 40.13, 13.18 27.00

100.00

75.00

50.00

25.00

0.00

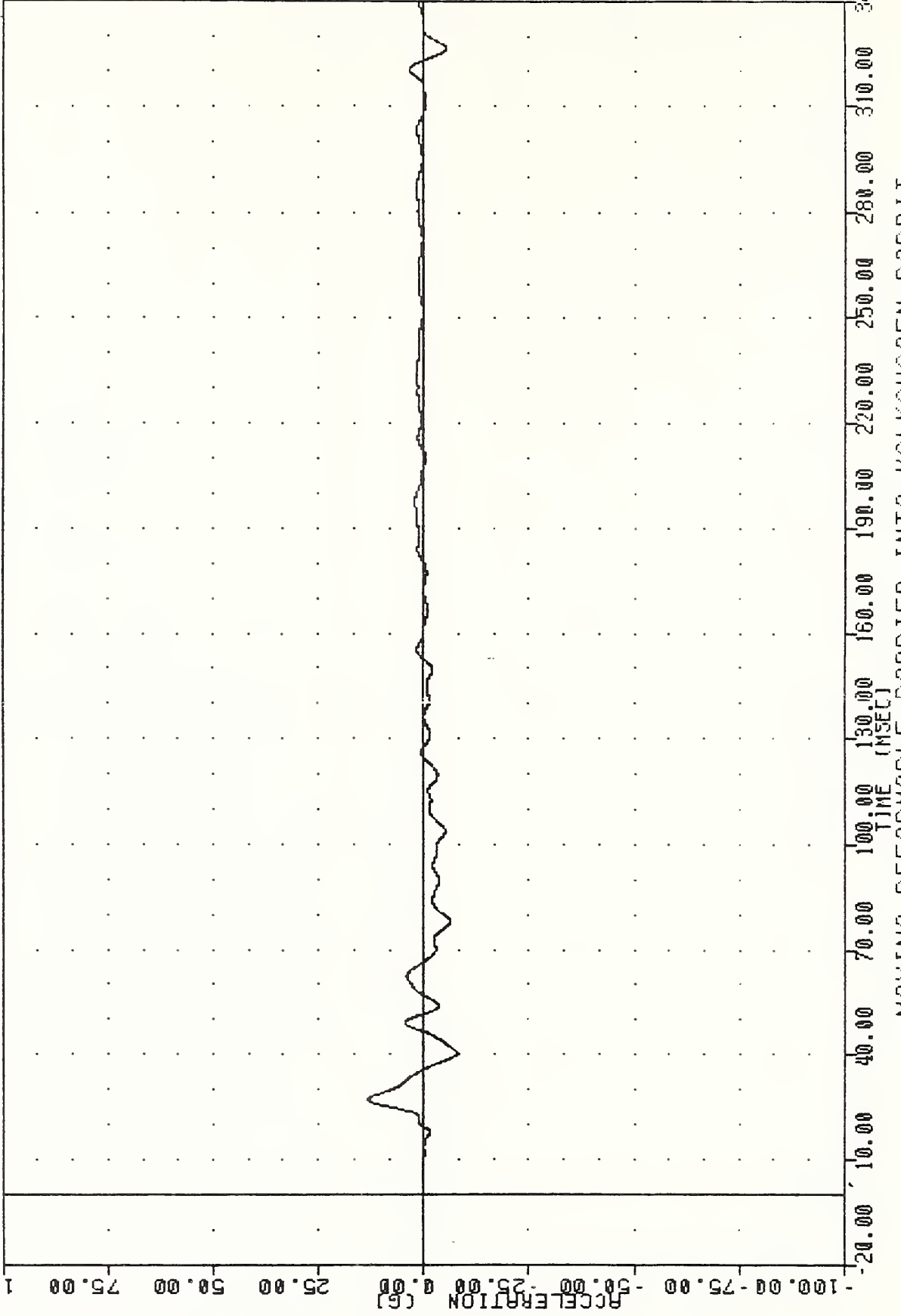
-25.00

-50.00

-75.00

-100.00

B-78

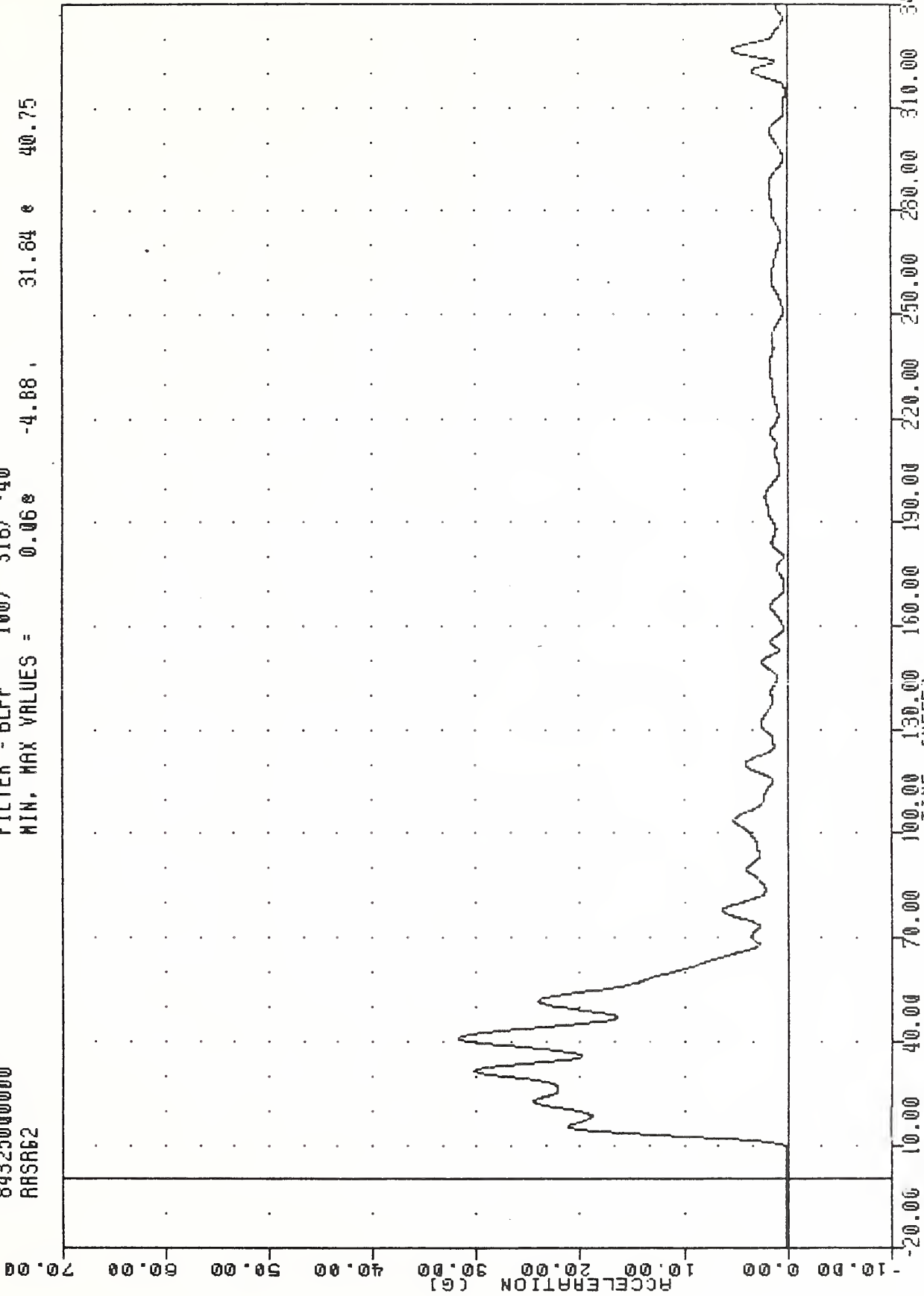


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION Z AXIS

TAC , 84J120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
RRSR62

PLOT DATE 27-NOV-84 16:31:49

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = 0.06e -4.88 , 31.84 e 40.75



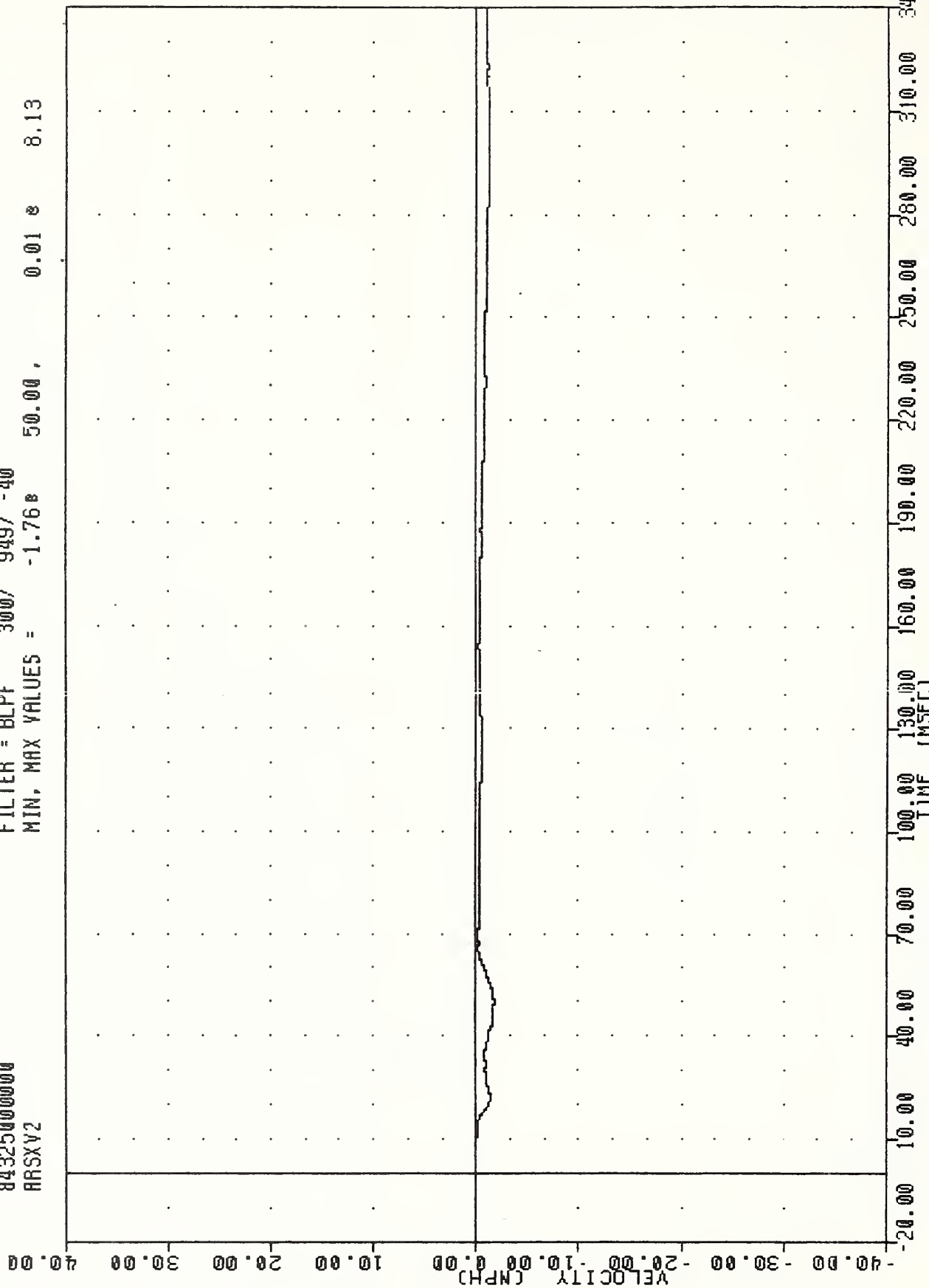
B-79

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL RESULTANT

TRC , 841120
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 ARSXV2

PLOT DATE 27-NOV-84 16:32:40

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -1.76e 50.00, 0.01e 8.13



B-80

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING ARSXG2

TIME , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
RRSYV2

PLU1 DR1E 27-NOV-84 16:32:40

FILTER = BLPF 300 / 949 / -40

MIN. MAX VALUES = -0.03 @ -8.00 , 23.05 @ 94.75

40.00

30.00

20.00

10.00

0.00

-10.00

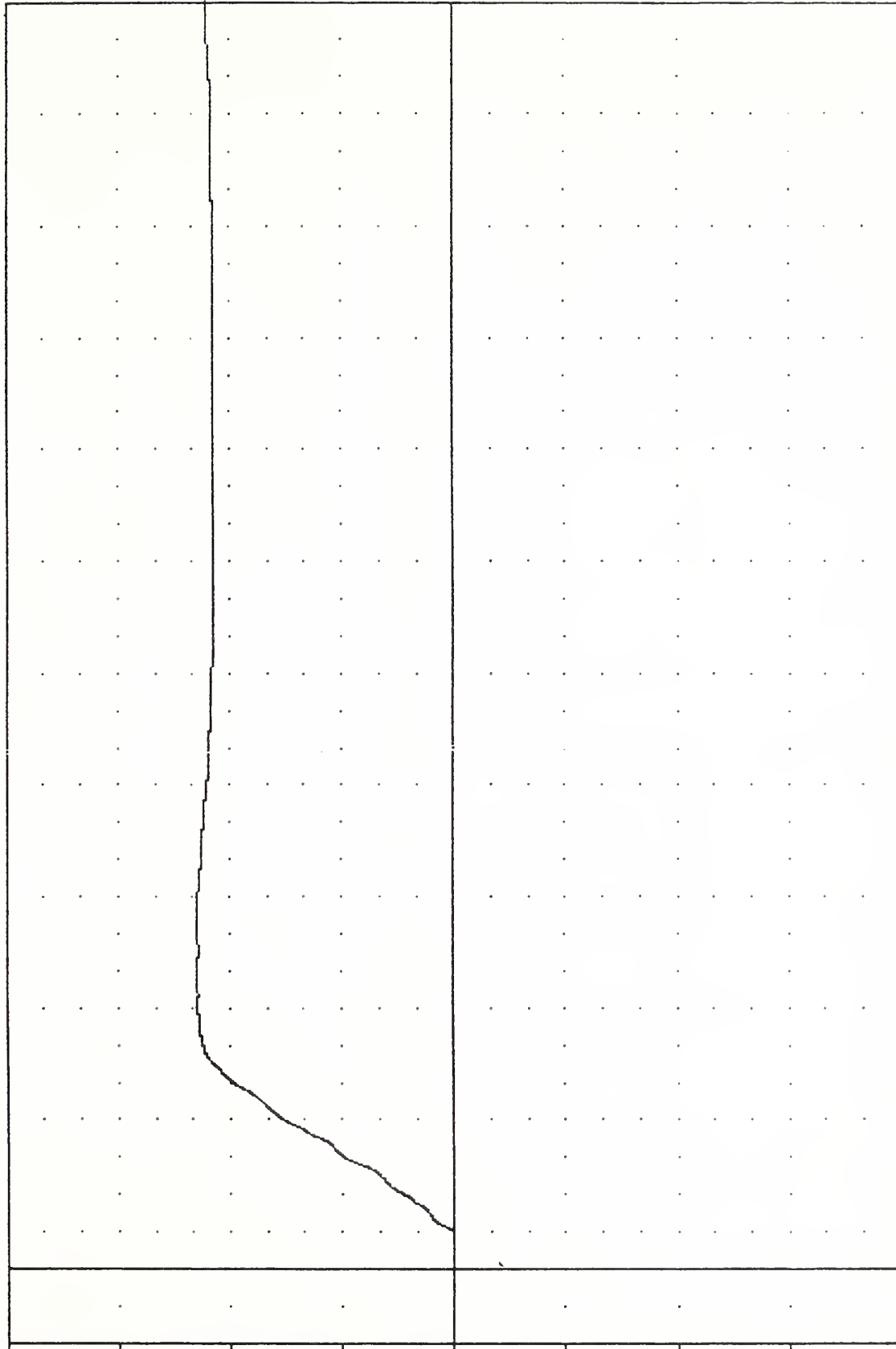
-20.00

-30.00

-40.00

B-81

VELOCITY (MPH)



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

10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 340.00

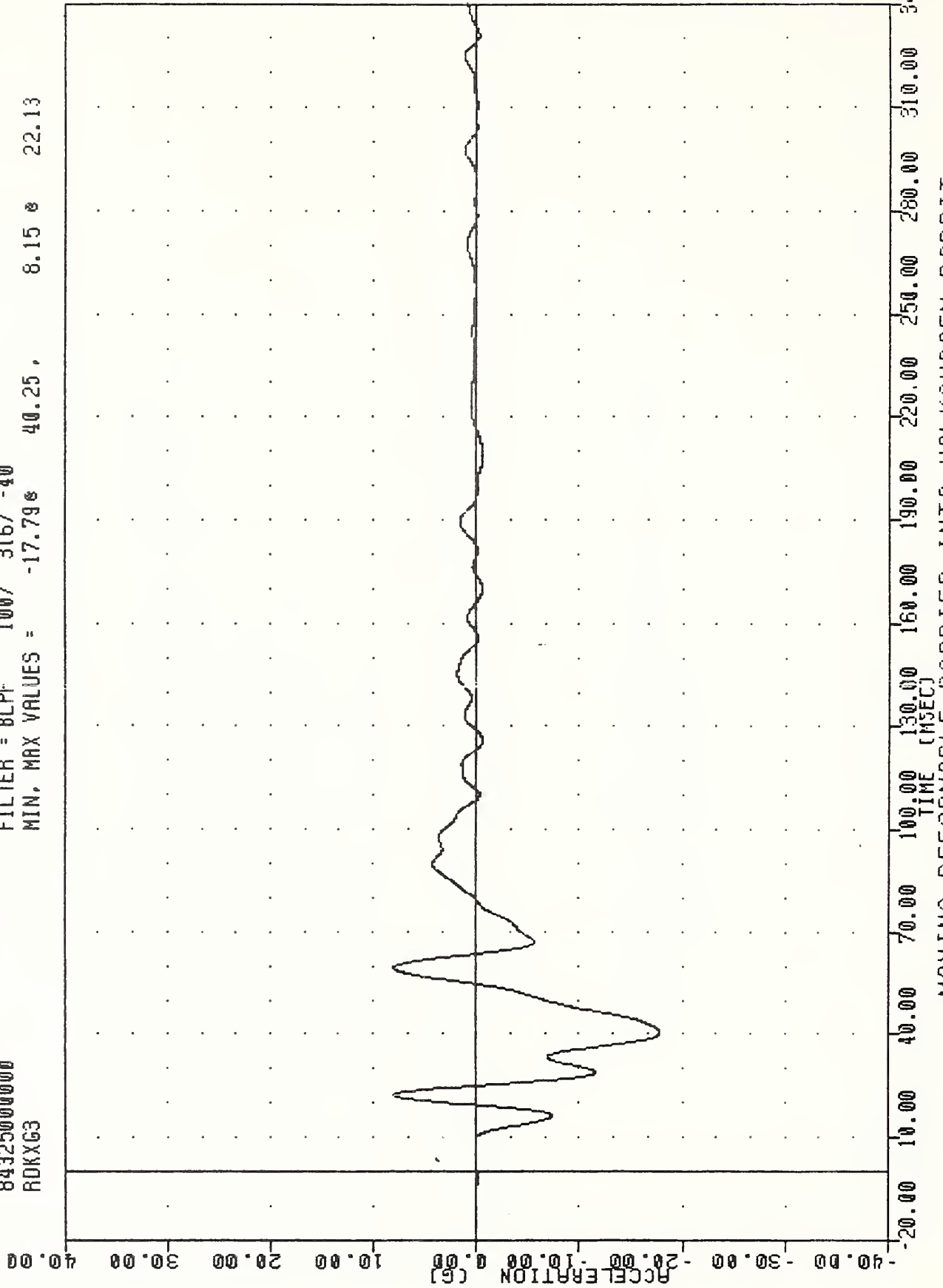
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RRSYG2

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
RDKXG3

PLOT DATE 27-NOV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -17.79e 40.25, 8.15 e 22.13

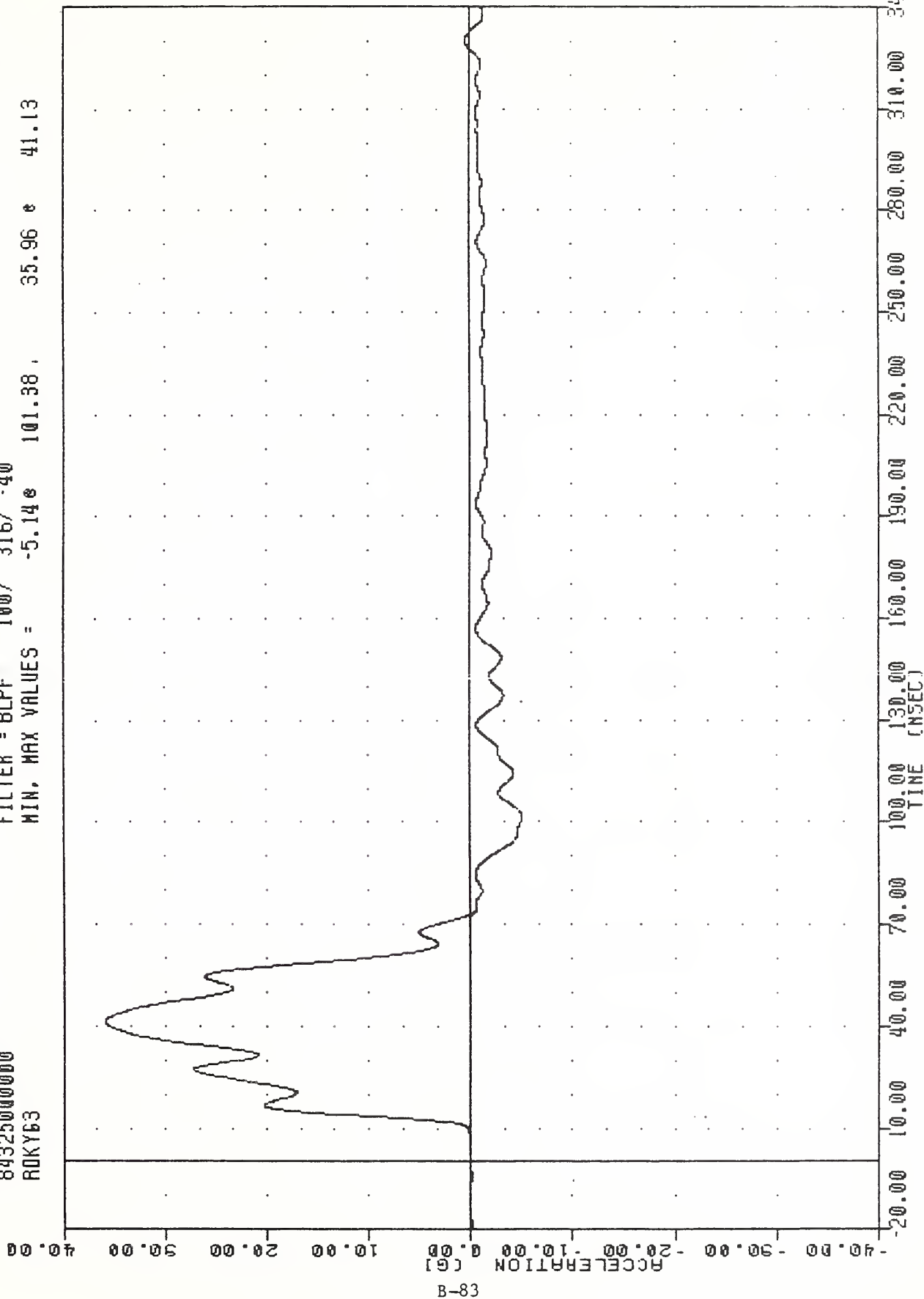


B-82

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION X AXIS

THL 841120
SIDE AGGRESSIVE ATTRIBUTES
8432500000
R0KY63

PLUI DATE 27-NOV-84 16:29:52
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -5.14e 101.38, 35.96 e 41.13



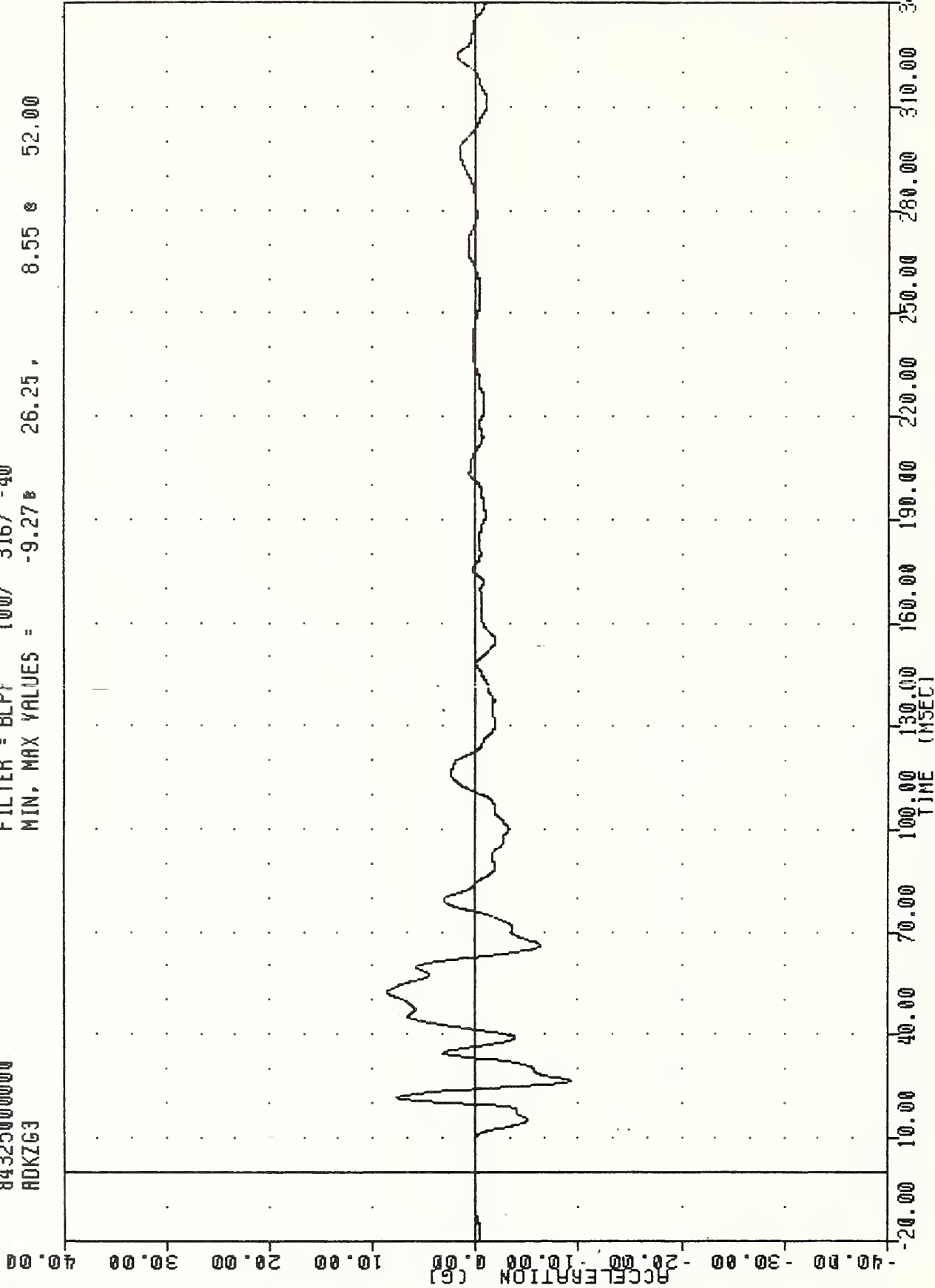
B-83

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION Y AXIS

IHL
SIDE AGGRESSIVE ATTRIBUTES
84325000000
ADKZG3

PLUI DATE 27-NDV-84 16:29:52

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -9.27* 26.25, 8.55 * 52.00

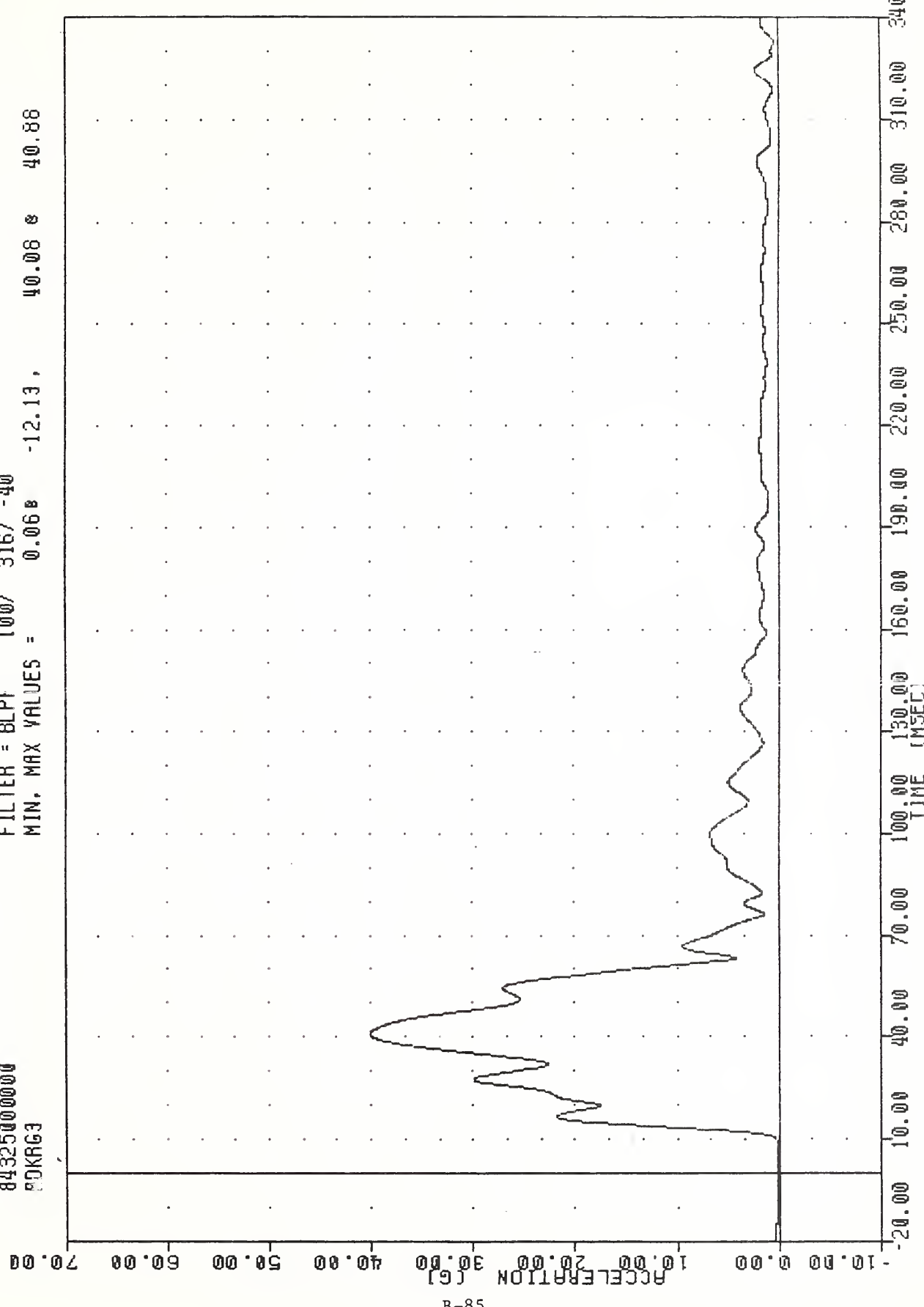


B-84

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION Z AXIS

INL , 84112W
SIDE AGGRESSIVE ATTRIBUTES
84325000000
8DKRG3

FLUI DATE 27-NOV-84 16:31:49
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = 0.068 -12.13, 40.08 8 40.88



B-85

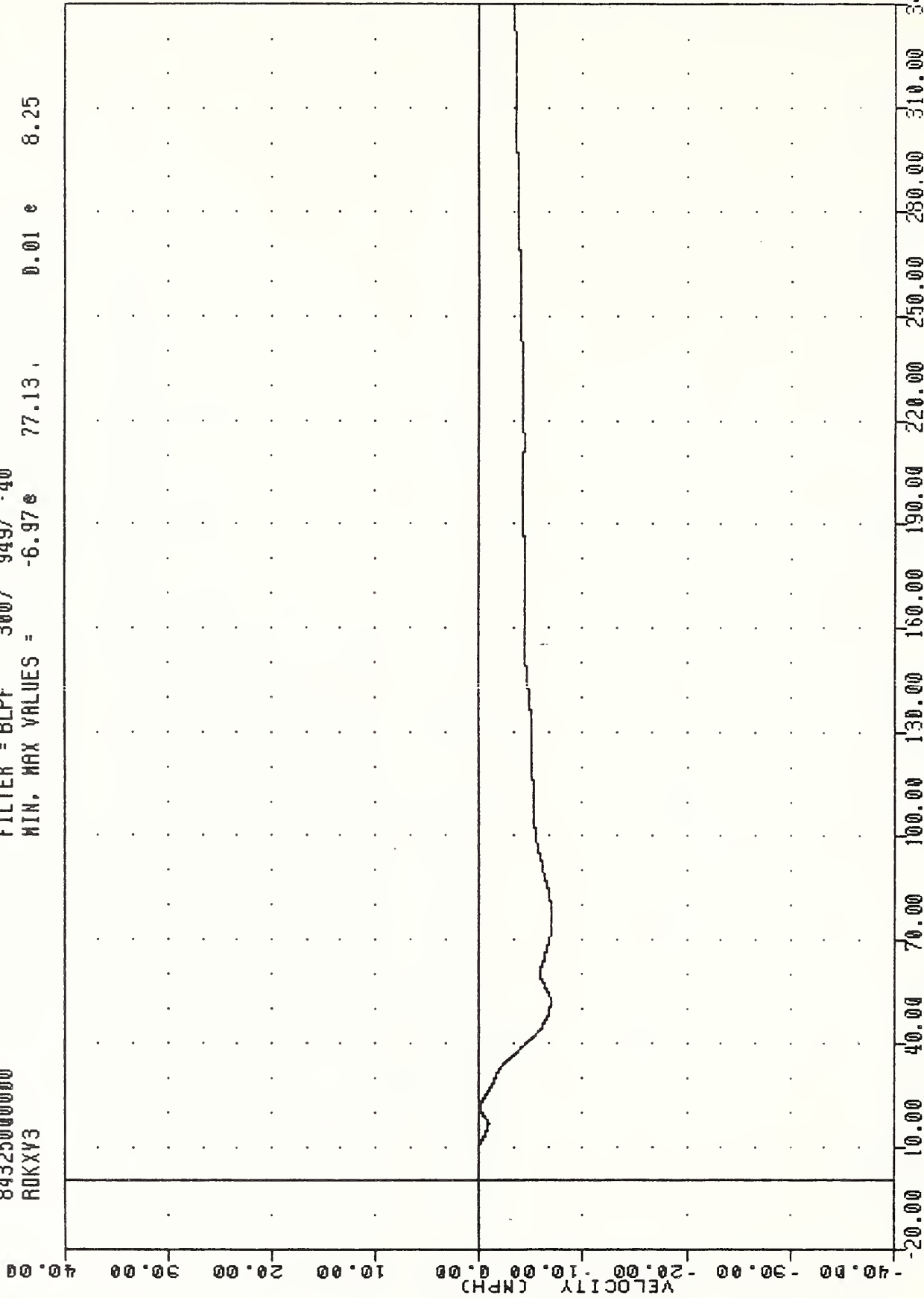
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK RESULTANT

THC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
RDKXY3

PLUI DATE 2/NOV-84 16:32:40

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -6.97e 77.13, 0.01 e 8.25

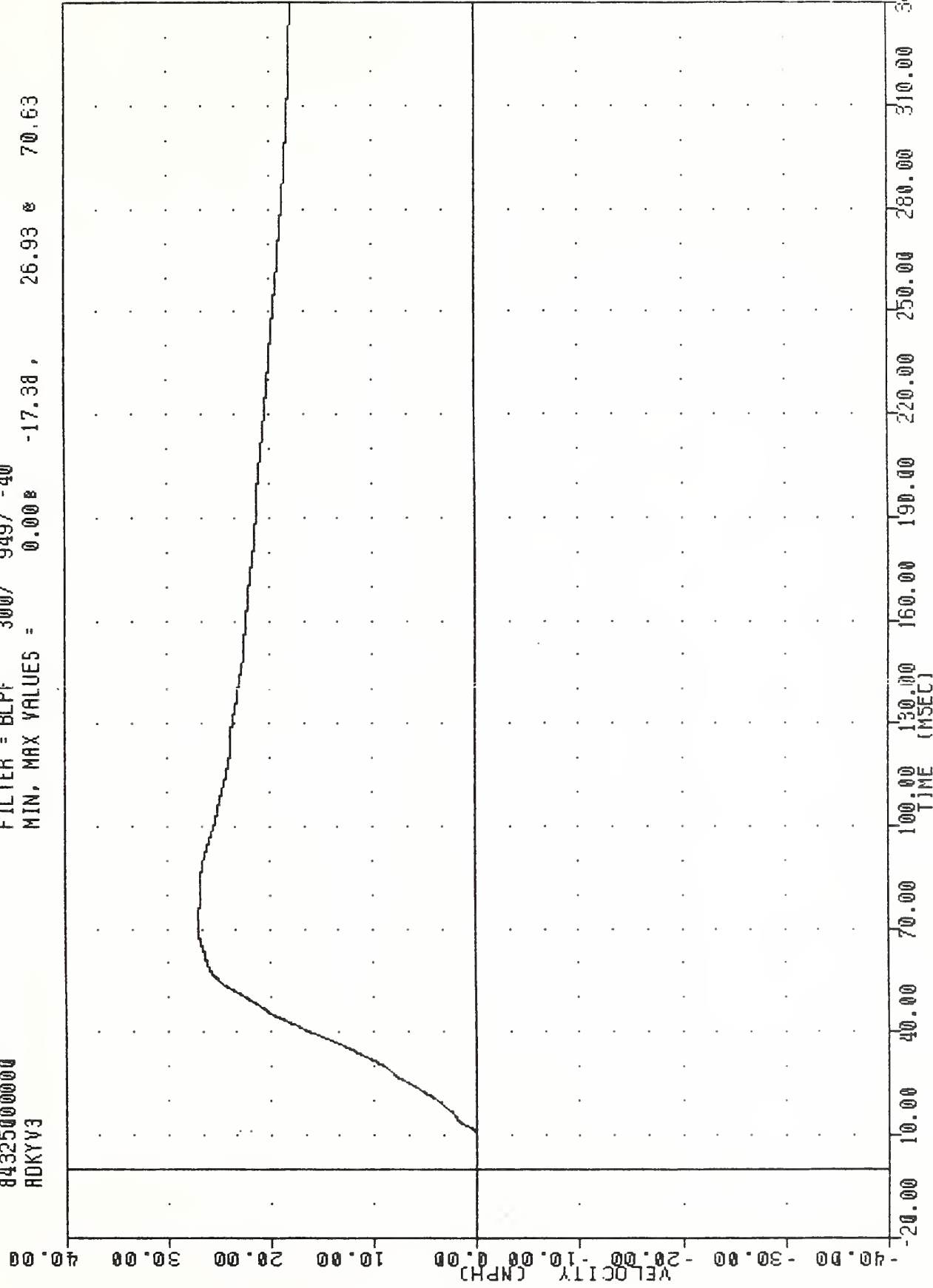


B-86

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RDKXG3

IKL , 04112W
SIDE AGGRESSIVE ATTRIBUTES
8432500000
ADKYV3

FLUI DRIC 27-NOV-84 16:32:40
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.008 -17.38 , 26.93 e 70.63



B-87

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING ADKYG3

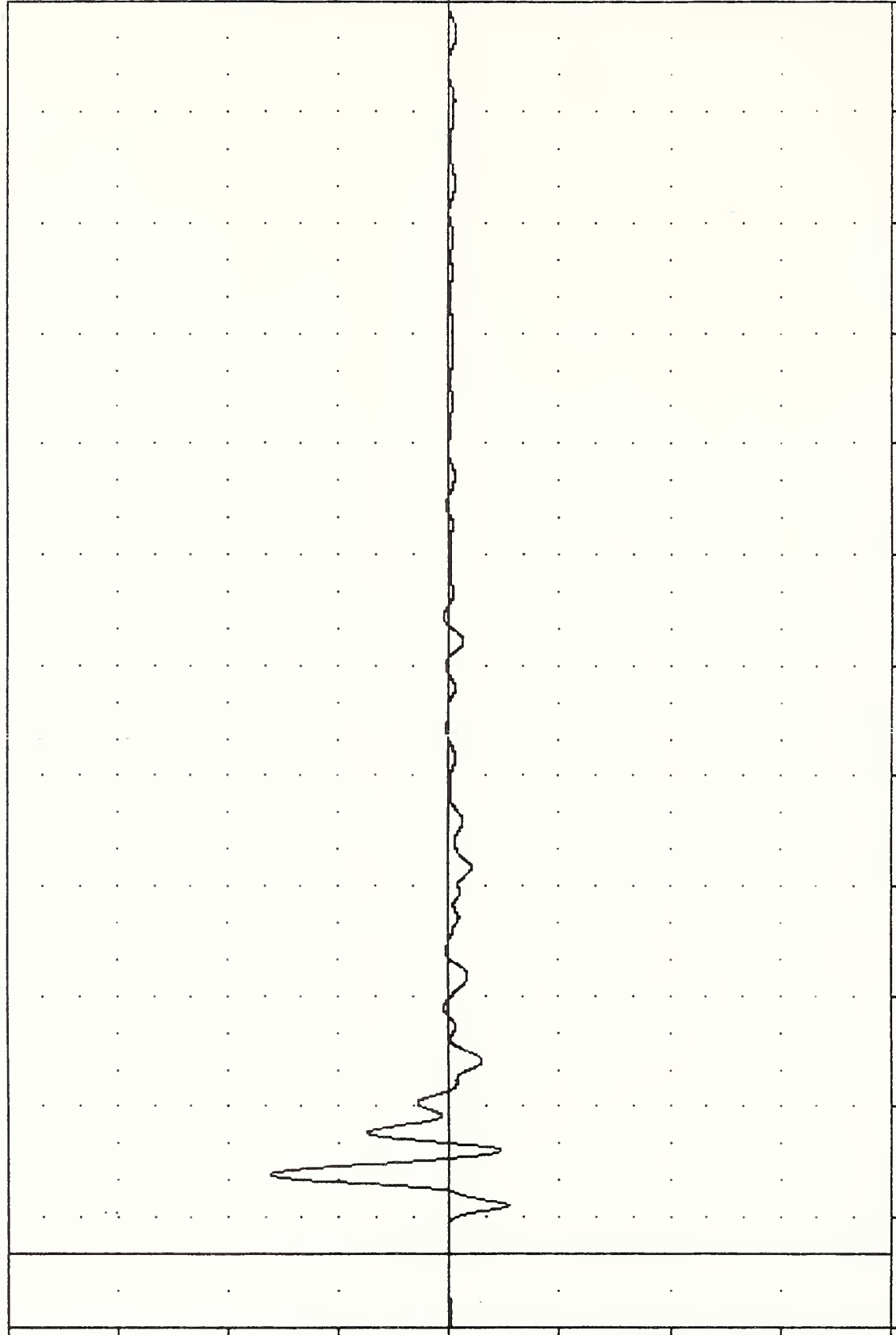
TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LASY64

PLUT DATE 27-NOV-84 16:29:52

FILTER = 8LPF 100/ 316/ -40

MIN, MAX VALUES = -27.15e 13.00, 81.13 e 21.38

ACCELERATION (G)



B-88

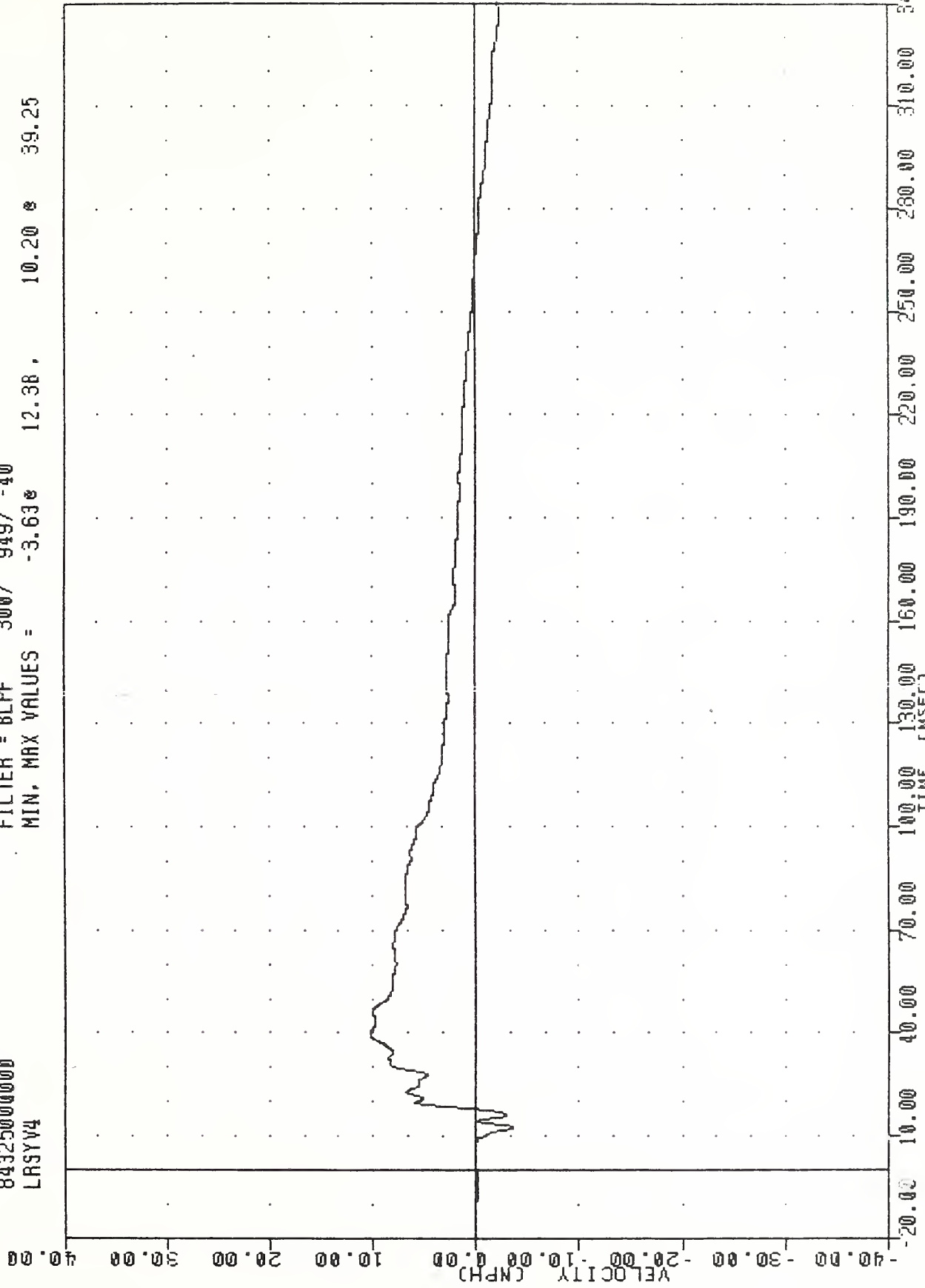
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT REAR SILL ACCELERATION Y AXIS

INC 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LRSYV4

PLUI DRIT 27-NOV-84 16:32:40

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -3.63e 12.38, 10.20 * 39.25



B-89

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LRSY64

THU 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LFSY65

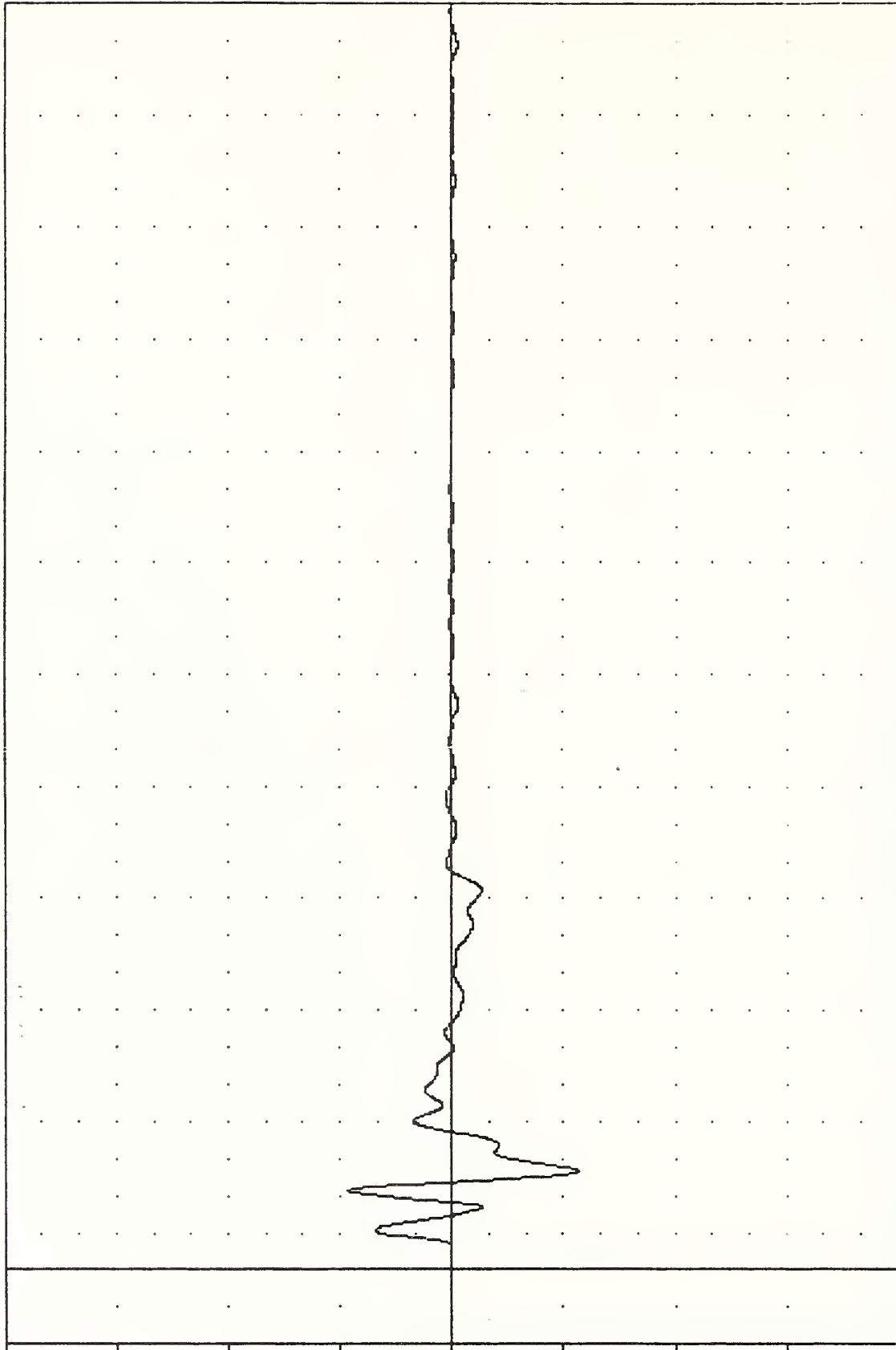
PLUI DATE 2/-NOV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -56.51 26.63 46.40 21.25

ACCELERATION (G)

B-90



TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS

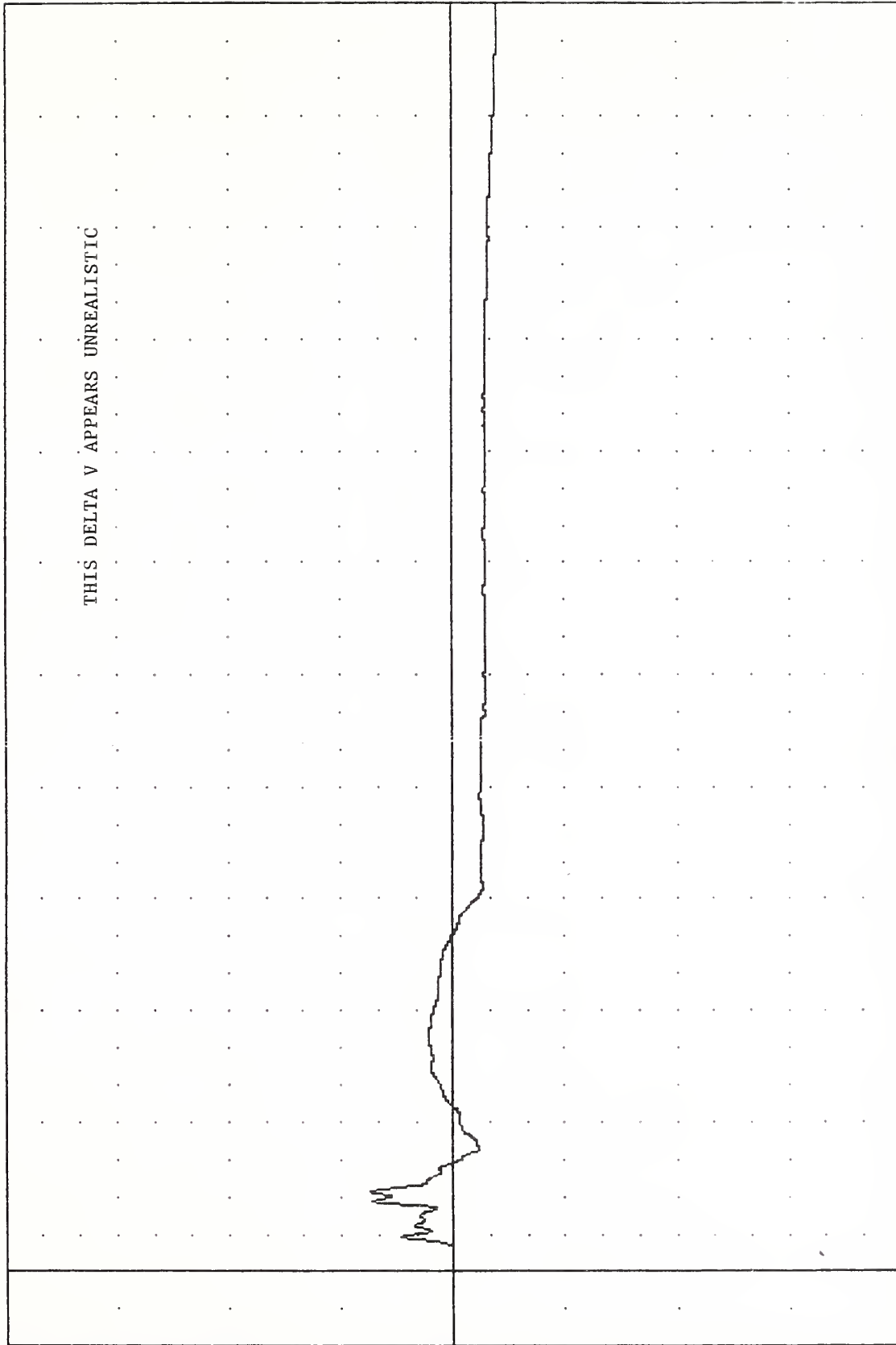
THC 841120
SIDE AGGRESSIVE ATTRIBUTES
8452500000
LFSY5

PLU1 DATE 27-NOV-84 16:32:40

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -4.04e 392.75 , 7.38 e 21.13

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



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

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFSY65

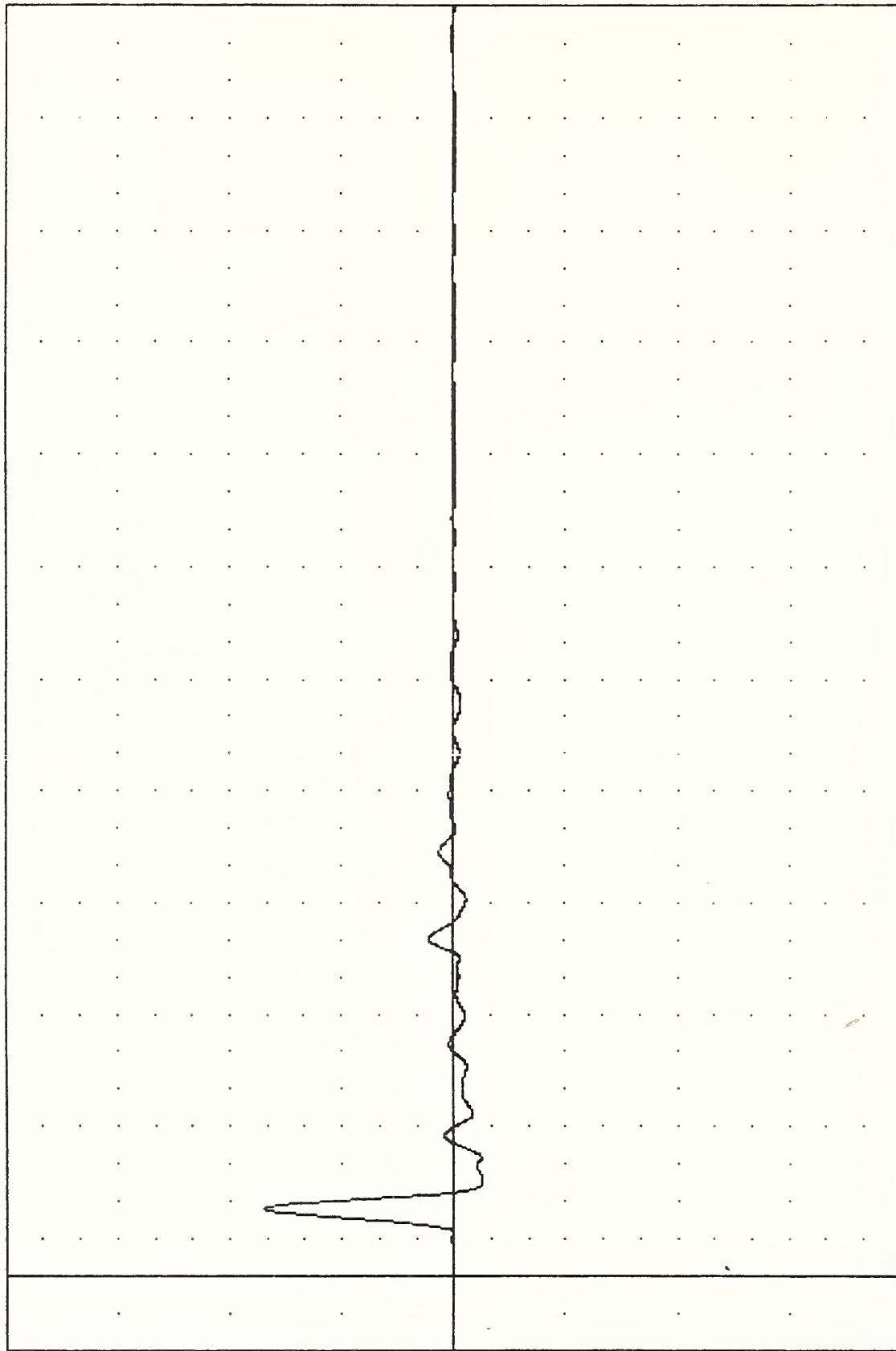
TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LFDY61

PLUI DATE 27-NDV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -38.80 24.88 254.28 17.88

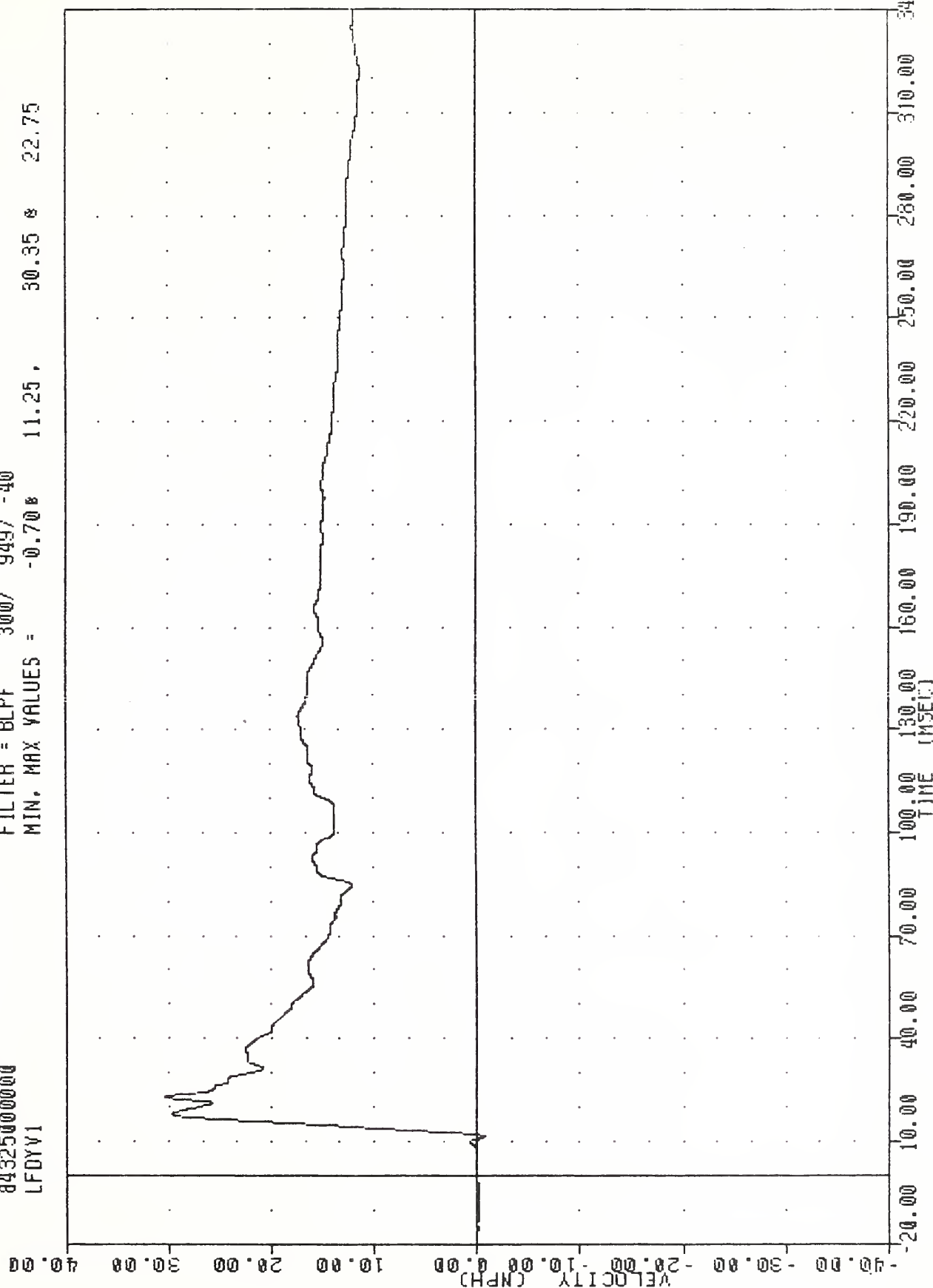
ACCELERATION (G) (X10²)



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

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 6) ACCELERATION Y AXIS

IHC , 841120
 SIDE AGGRESSIVE ATTRIBUTES
 84325000000
 LFDYV1
 PLU1 DATE 27-NOV-84 16:32:40
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.70 11.25, 30.35 22.75



B-93

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LFDY61

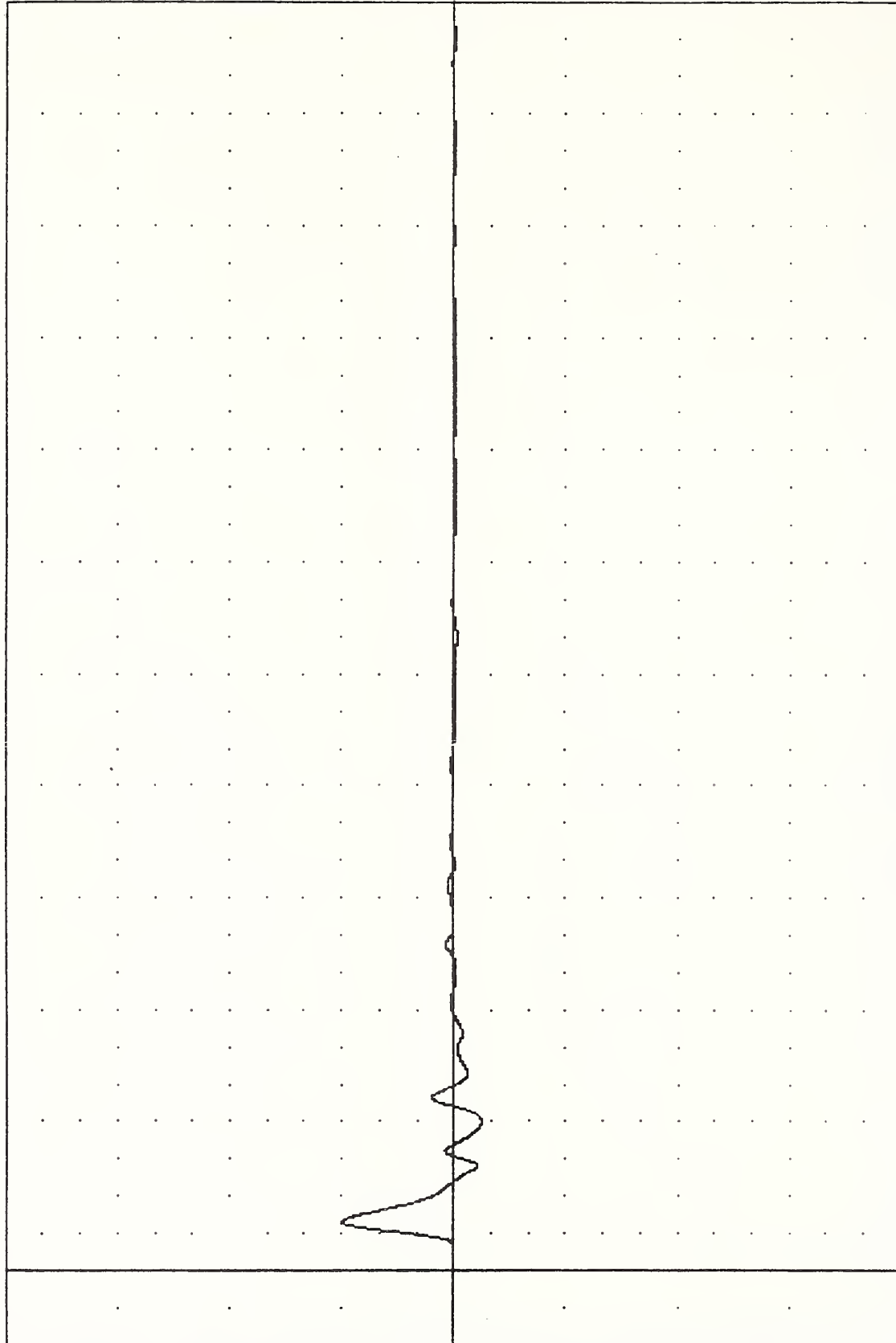
TAC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LFDY62

PLOT DATE 27-NOV-84 16:29:52

FILTER = 8LPF 100/ 316/ -40

MIN. MAX VALUES = -37.20e 39.75 , 149.47 e 13.00

ACCELERATION (G) (X10²)



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

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 8) ACCELERATION Y AXIS

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LFDYV2

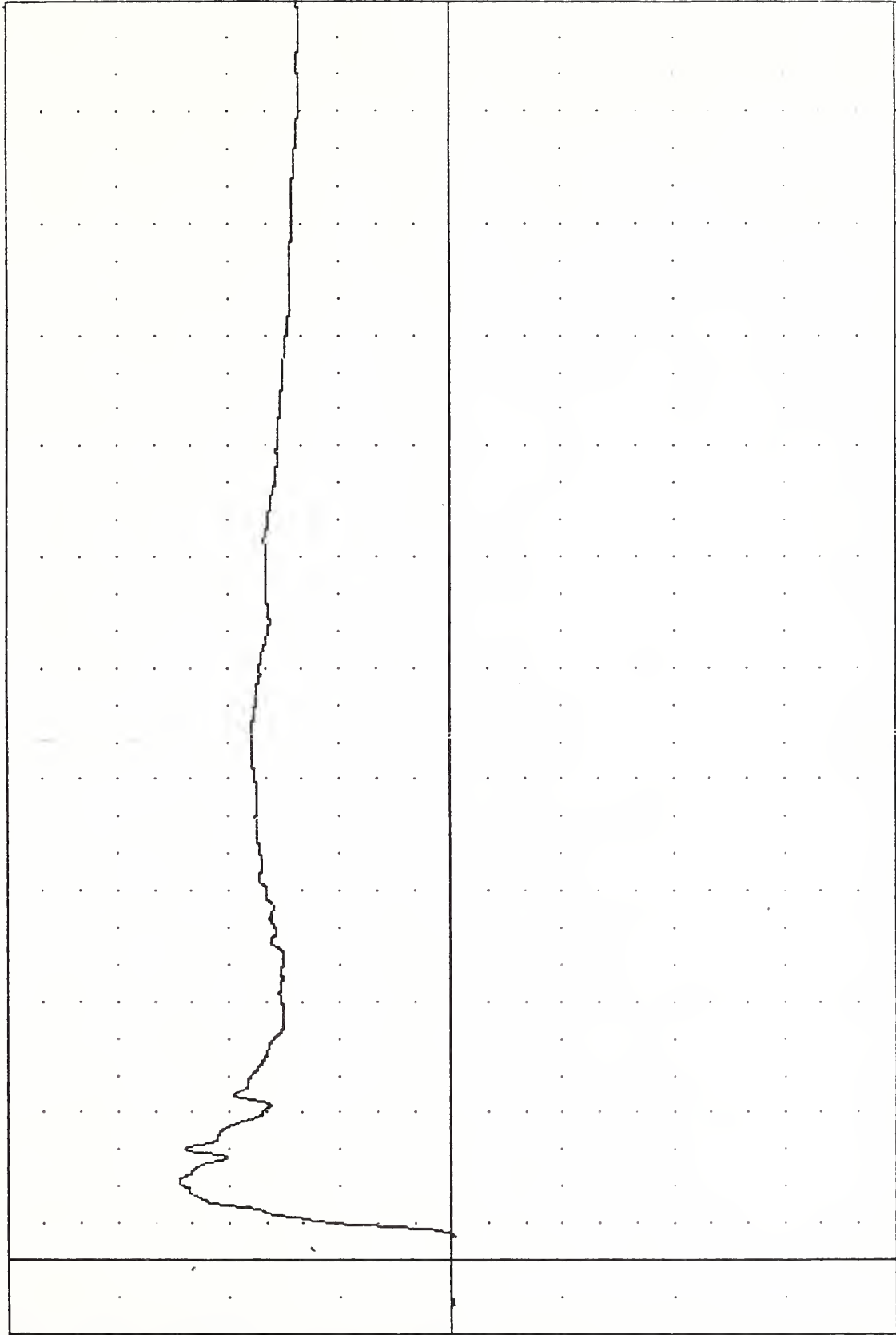
PLOT DATE 27-NOV-84 16:32:40

FILTER = 8LPF 300/ 949/ -40

MIN, MAX VALUES = -0.27e 6.50, 24.53 e 21.13

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

B-5



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

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDY62

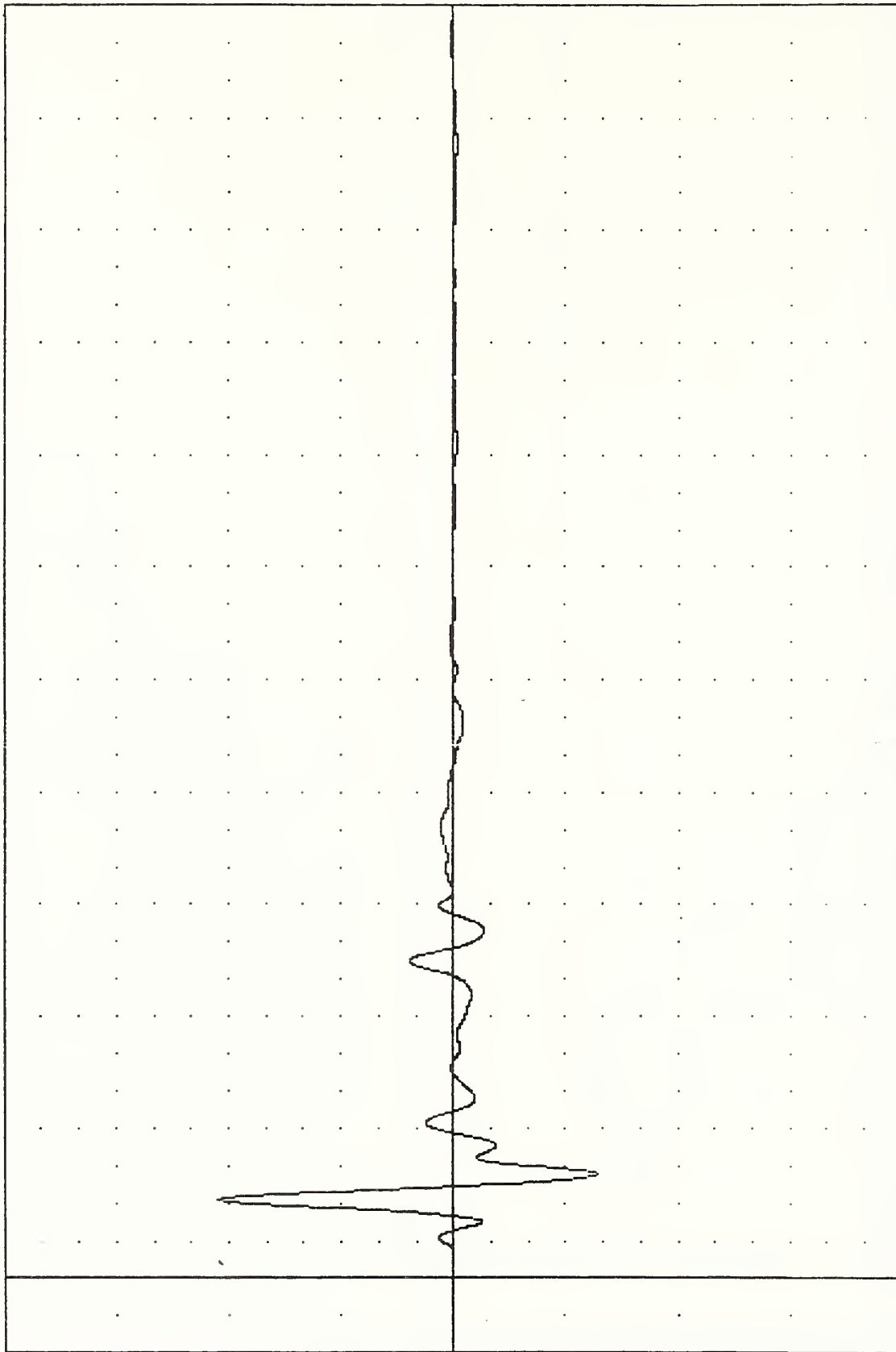
TAC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LFDY63

PLOT DATE 27-NOV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -193.51e 27.63, 314.77 e 20.75

ACCELERATION (G) (X10²)



TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 9) ACCELERATION Y AXIS

TRC . 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LFDYV3

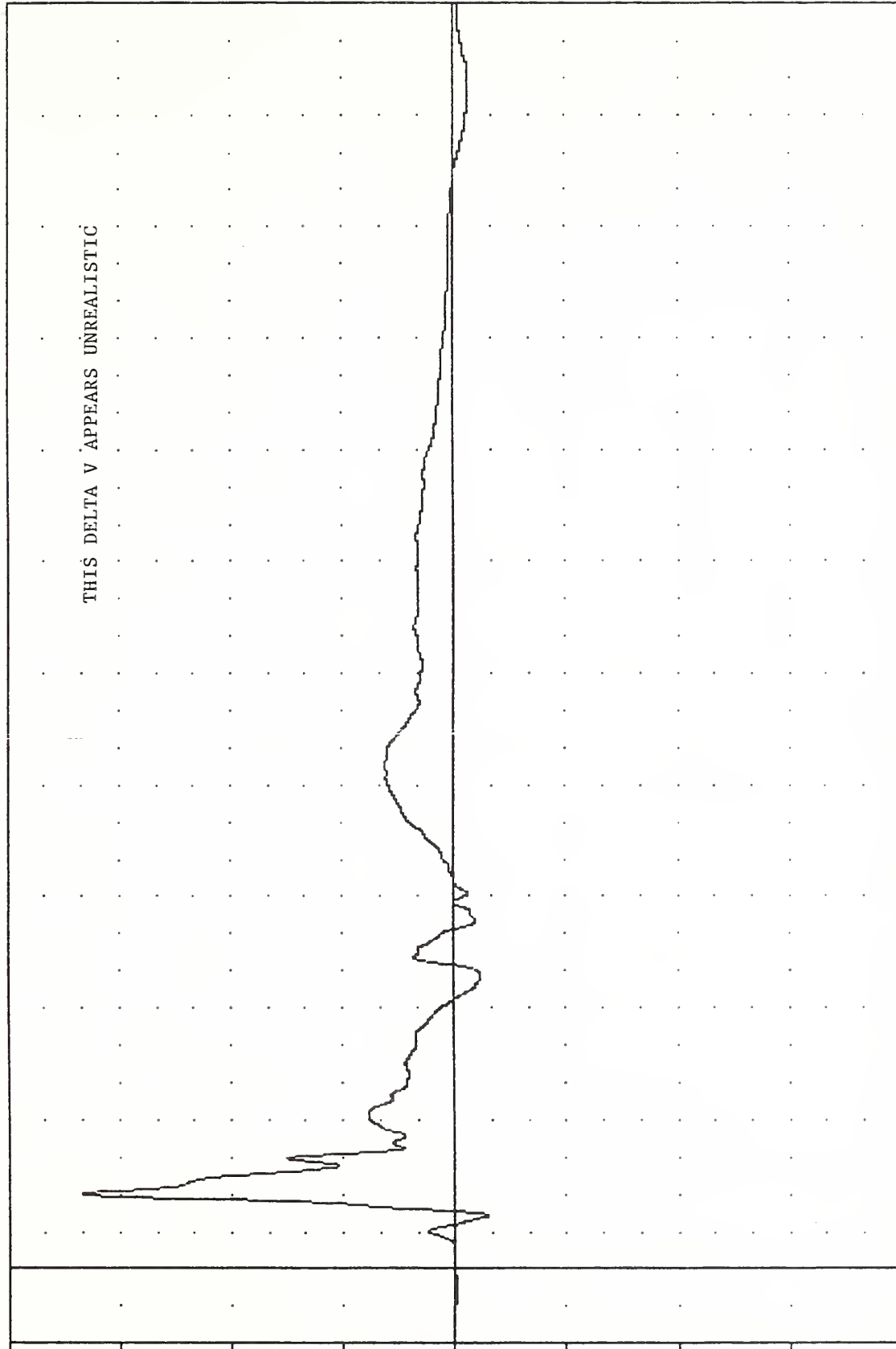
PLOT DATE 27-NOV-84 16:32:40

FILTER = 8LPF 300/ 949/ -40

MIN, MAX VALUES = -2.89 14.25 33.40 19.86

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

B-97



-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

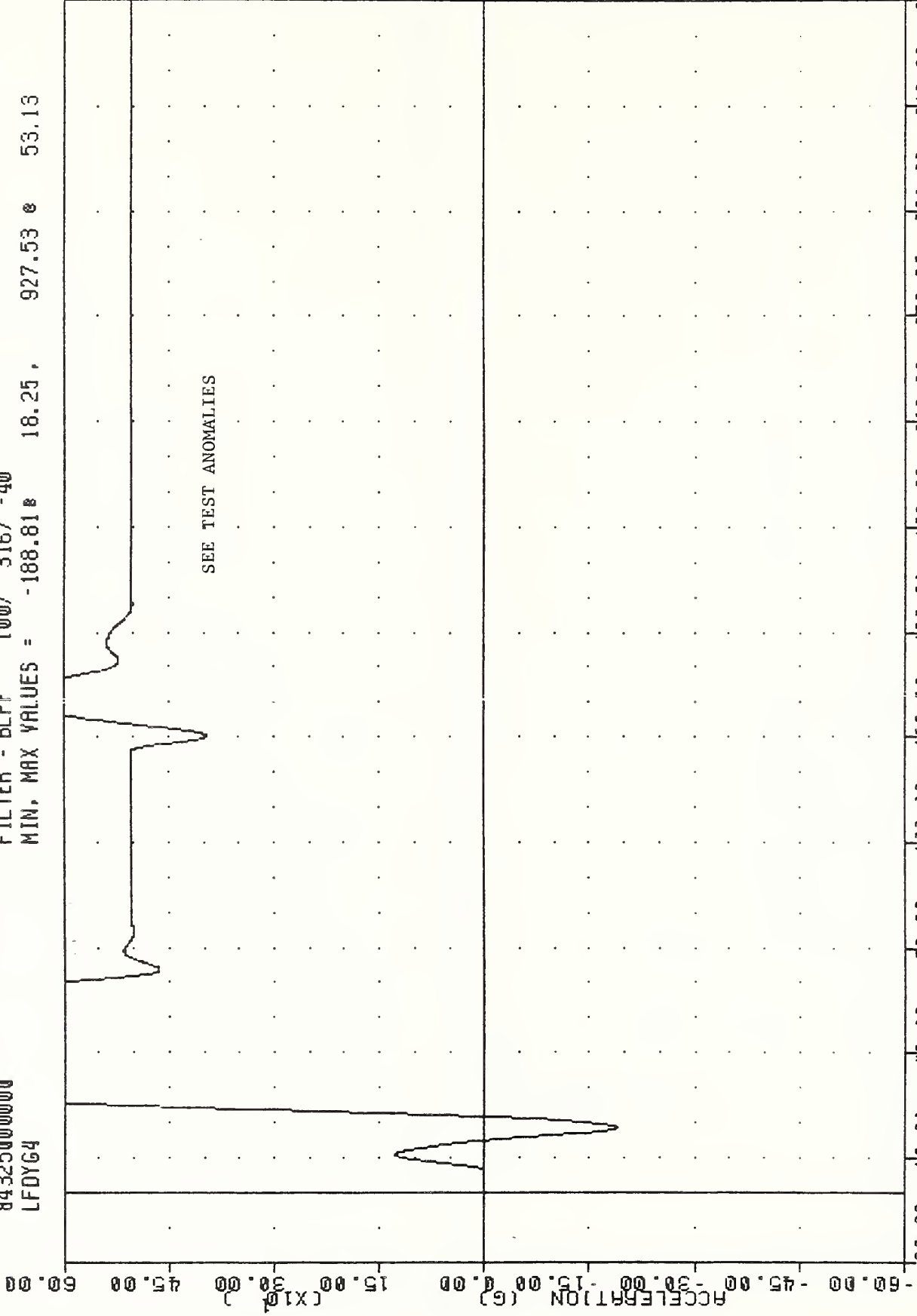
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDY63

IHC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LFDY64

PLUI DATE 27-NDV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -188.81 18.25 , 927.53 53.13

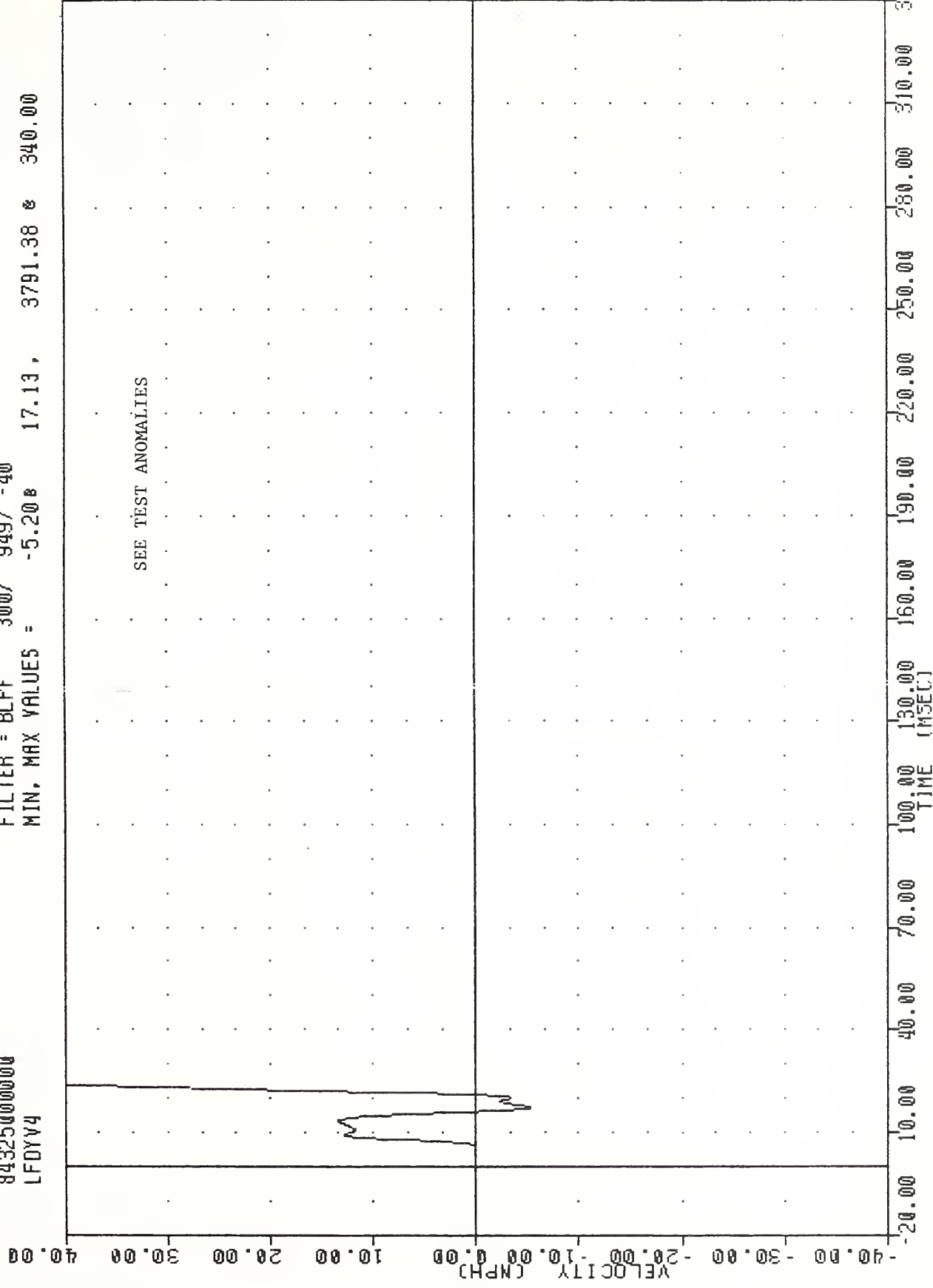


B-98

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 10) ACCELERATION Y AXIS

IHC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LFDYV4

PLUI DATE 27-NDV-84 16:32:40
FILTER = BLFF 300/ 949/ -40
MIN, MAX VALUES = -5.208 17.13, 3791.38 @ 340.00



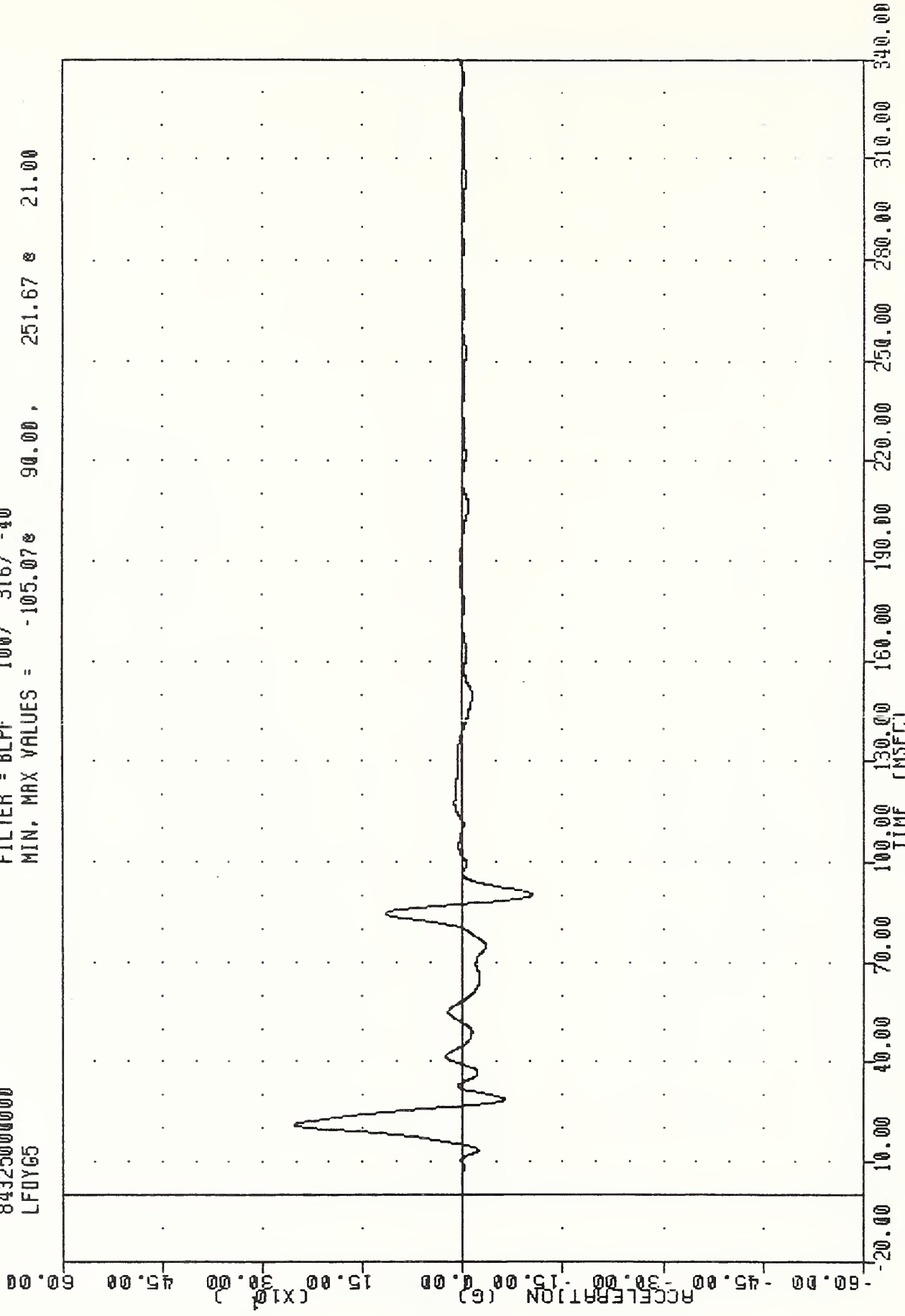
66-B

40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
-40.00
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYV4

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LFDY65

PL01 DATE 27-NOV-84 16:29:52

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -105.07s 90.00, 251.67 s 21.00

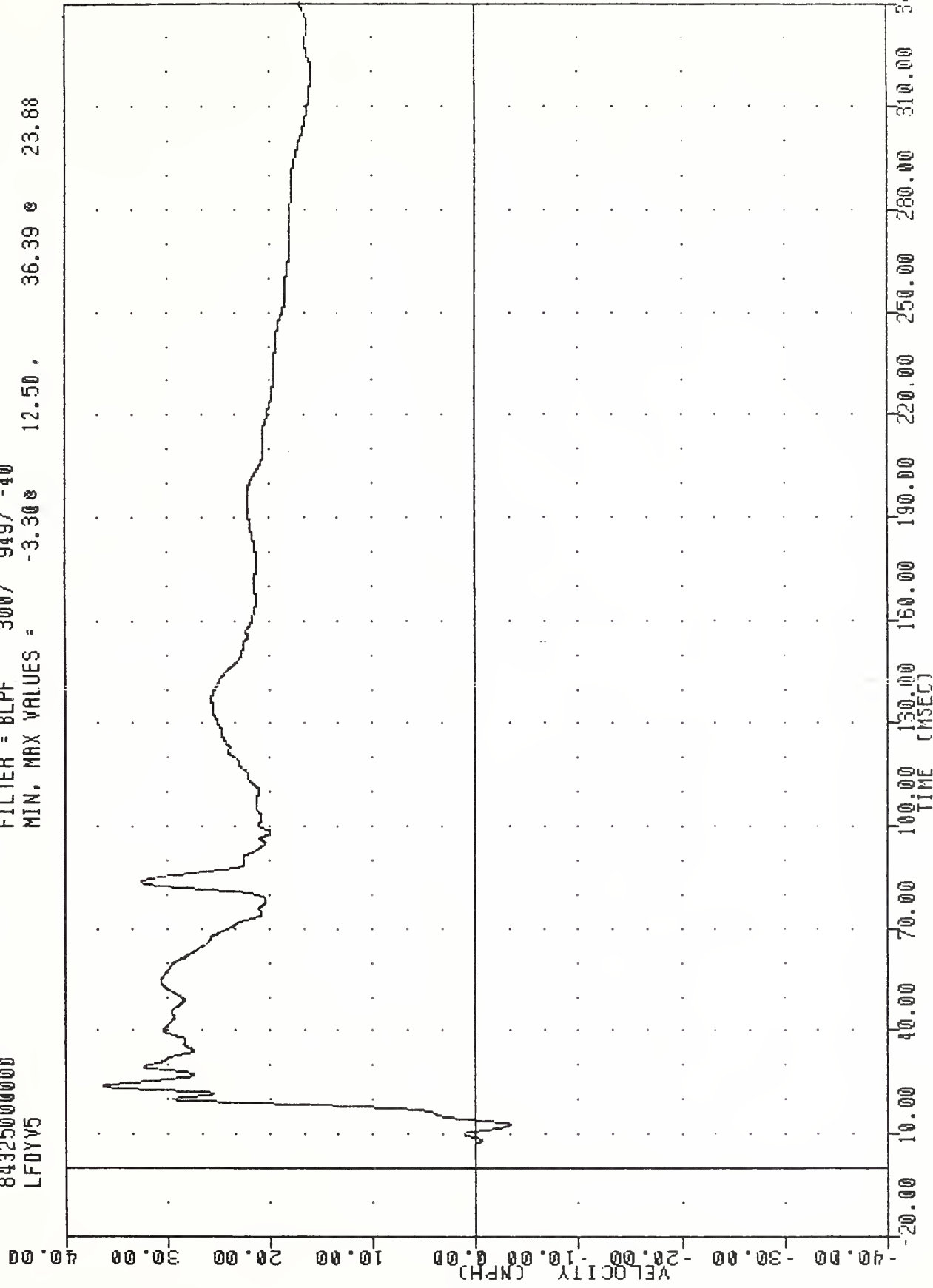


B-100

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 11) ACCELERATION Y AXIS

IML 041120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
LFDYV5

PLU1 DRIC 27-NOV-04 10:32:40
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -3.30 12.50, 36.39 23.88



B-101

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDY65

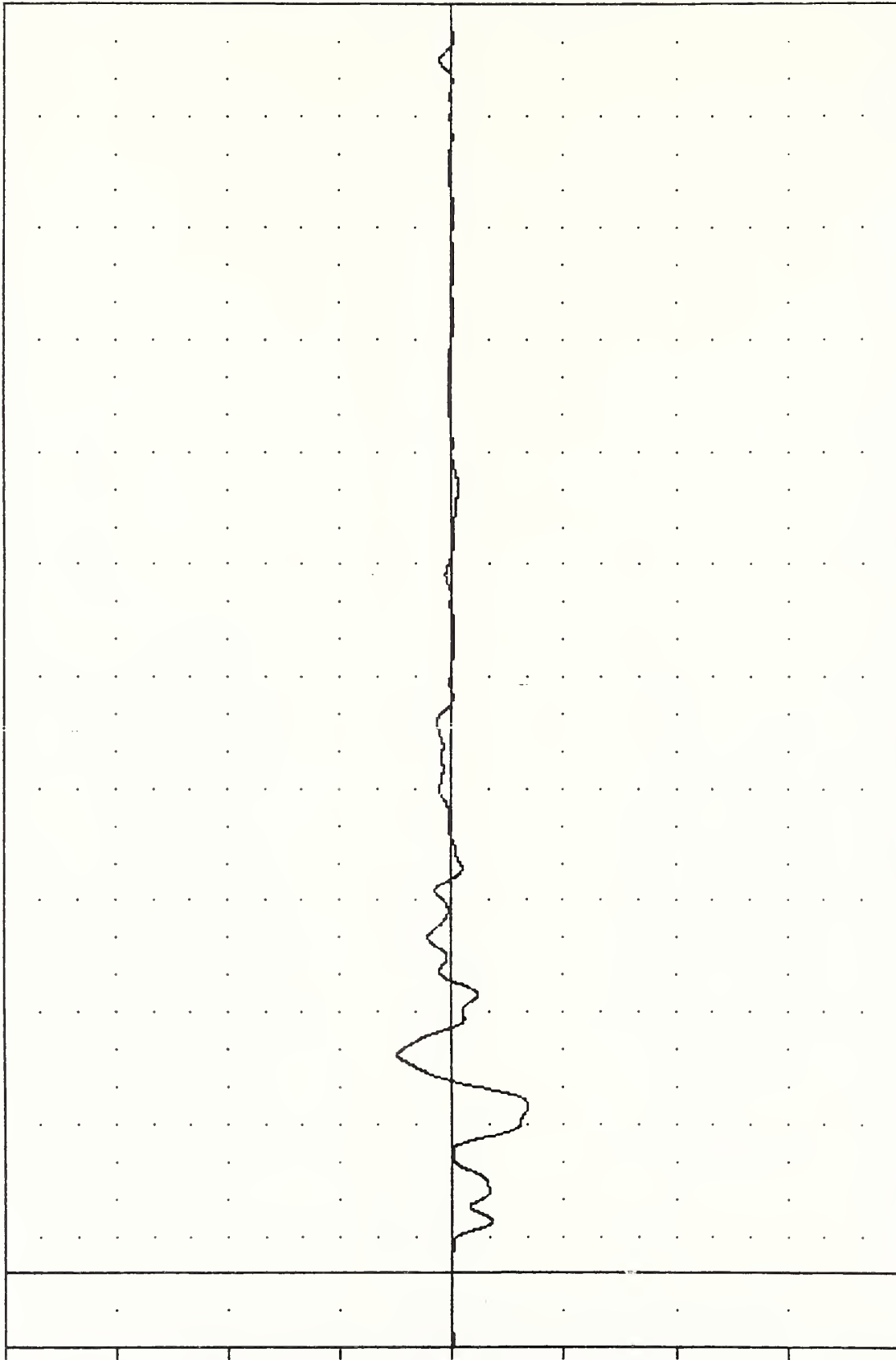
TAC .841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
TFRX67

PLU1 DATE 27-NOV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -6.79e 44.63, 4.88 e 58.38

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

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE TRUNK FLOOR RIGHT ACCELERATION X AXIS

IHC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
BCGXG

PLUI DATE 27-NOV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -21.10 42.88 , 1.72 107.63

40.00

30.00

20.00

10.00

0.00

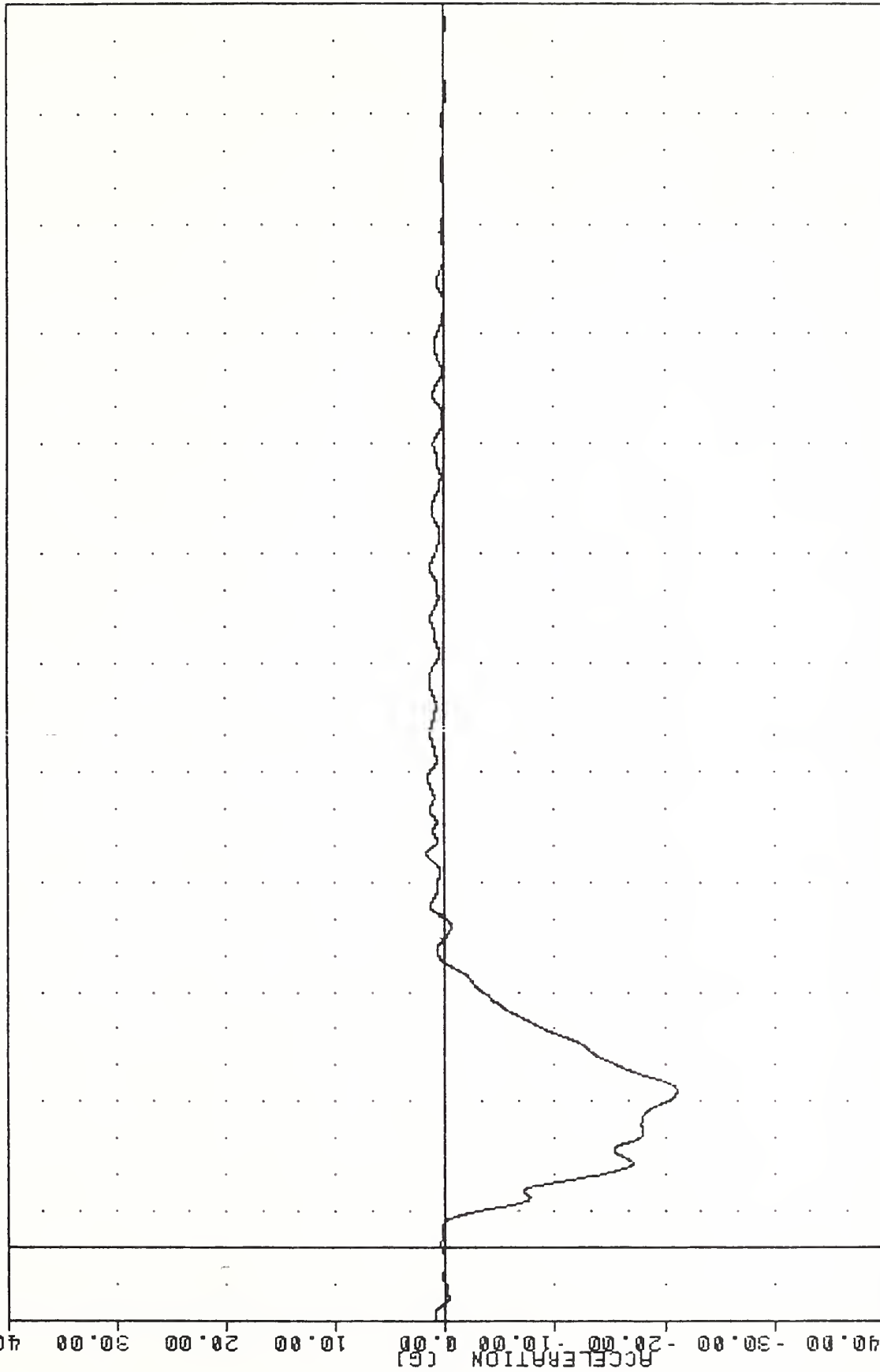
-10.00

-20.00

-30.00

-40.00

B-103



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

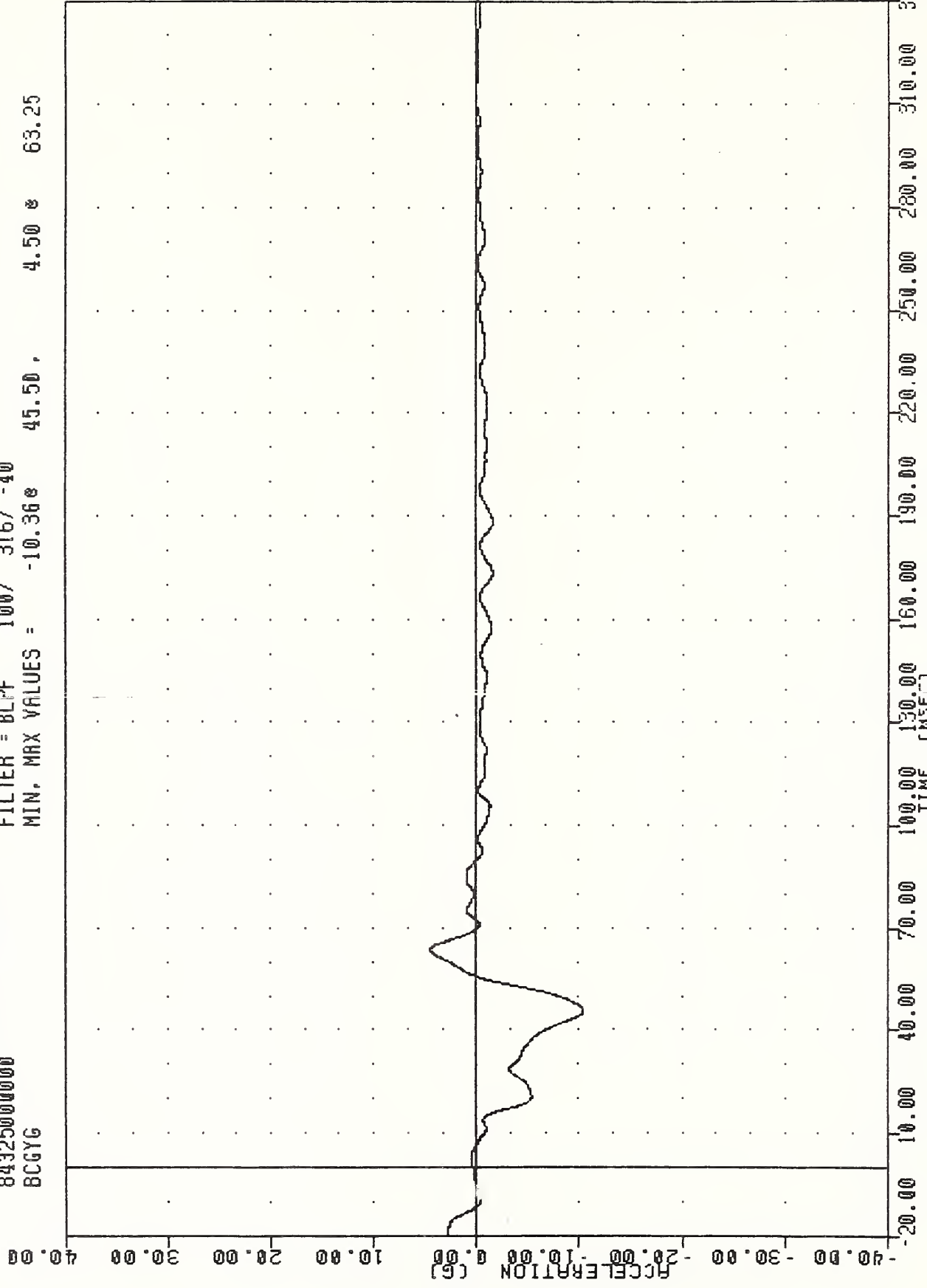
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER CENTER OF GRAVITY X AXIS

TRC
SIDE AGGRESSIVE ATTRIBUTES
84325000000
BCGYG

PLUI DRIT 27-NOV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -10.36 45.50, 4.50 63.25



B-104

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER CENTER OF GRAVITY Y AXIS

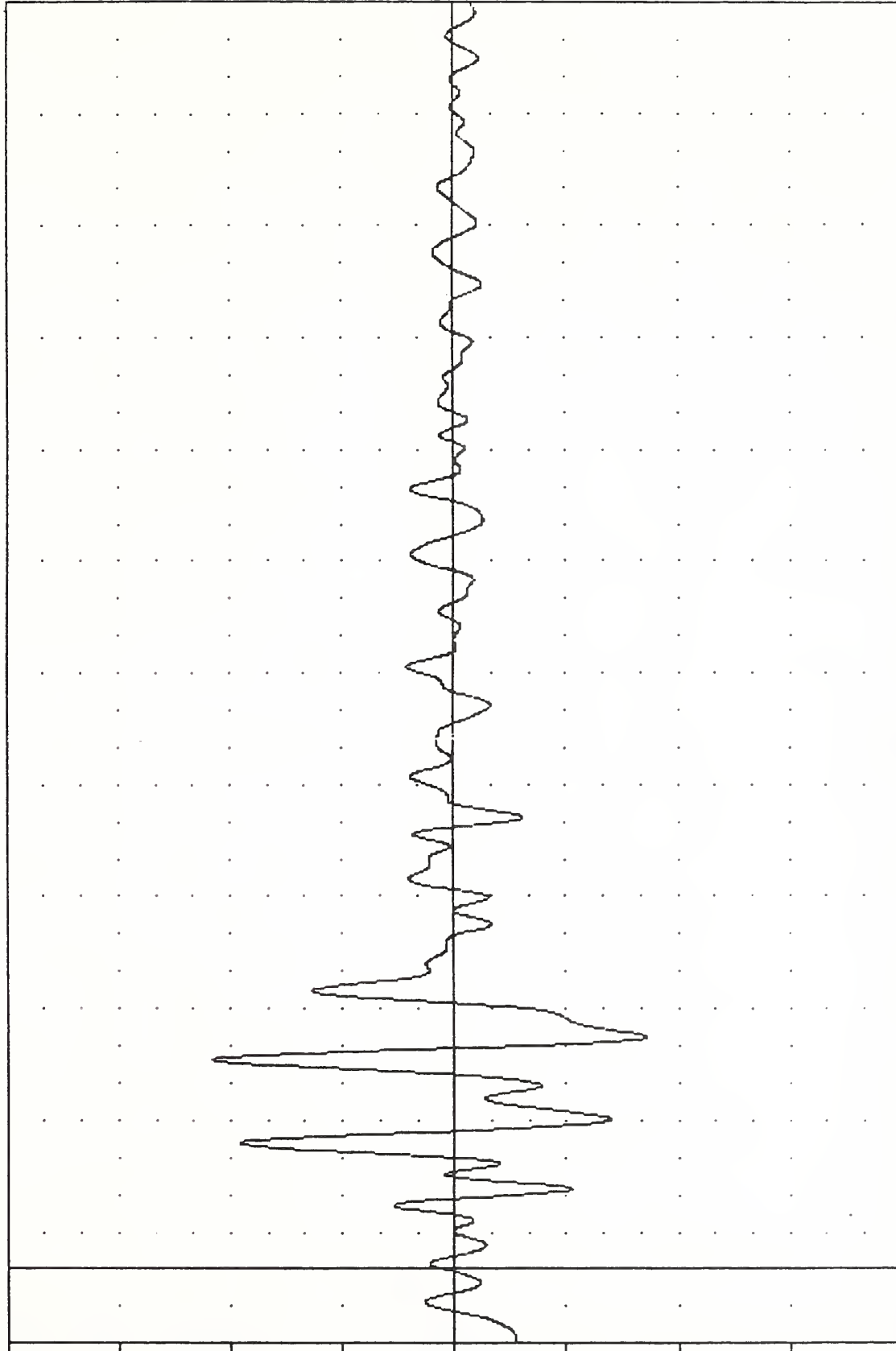
TAC
SIDE AGGRESSIVE ATTRIBUTES
84325000000
BCGZ6

PLOT DATE 27-NOV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -17.12e 62.25, 21.69 e 56.13

ACCELERATION (G)

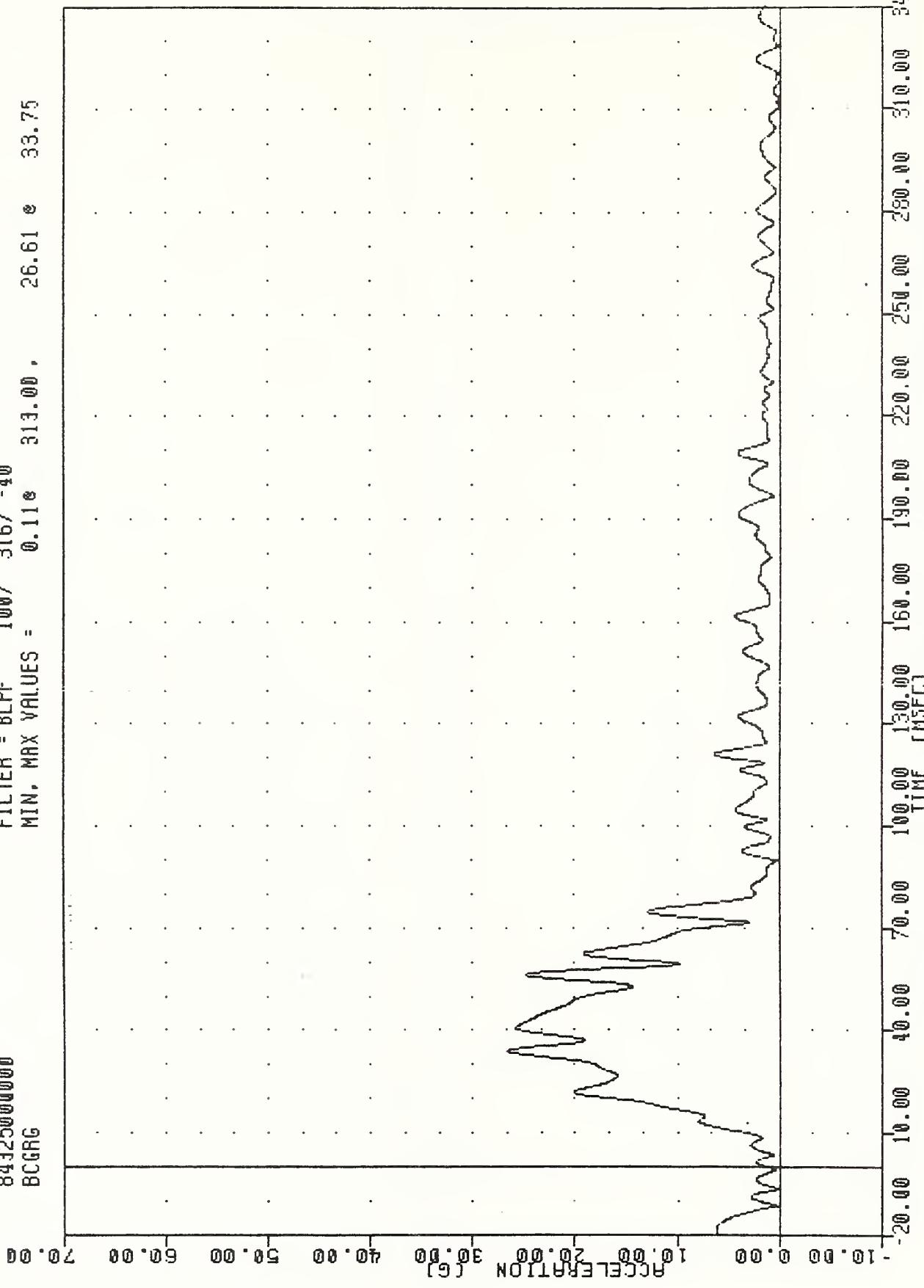


TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER CENTER OF GRAVITY Z AXIS

TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
8432500000
BCGCG

PLUI DATE 27-NOV-84 16:31:49
FILTER = 8LPF 100/ 316/ -40
MIN, MAX VALUES = 0.11e 313.00, 26.61 e 33.75

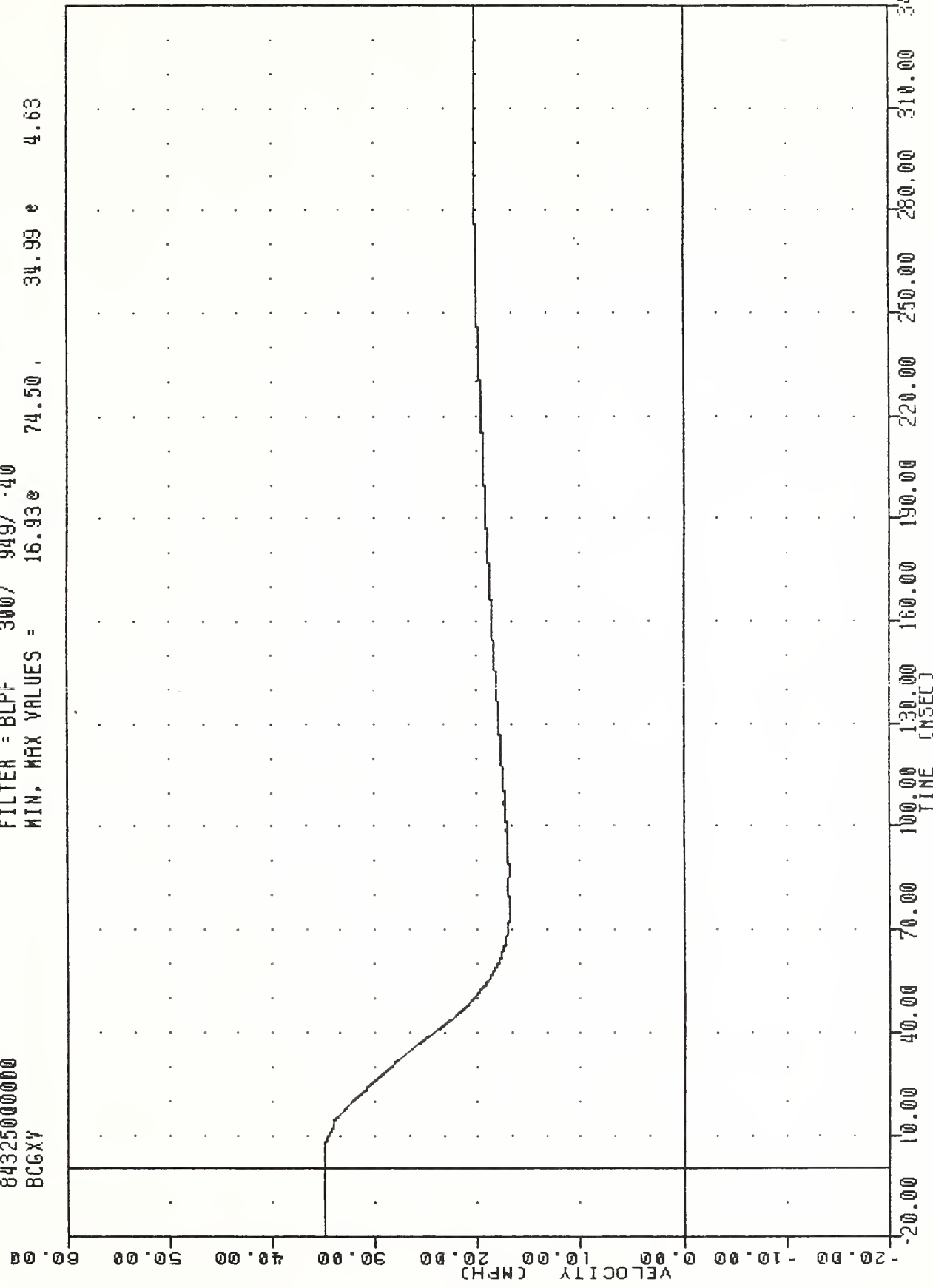


B-106

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER CG RESULTANT

TAC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
BCGXV

PLOT DATE 27-NOV-84 16:32:40
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 16.93e 74.50 , 34.99 e 4.63



B-107

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BCGXG

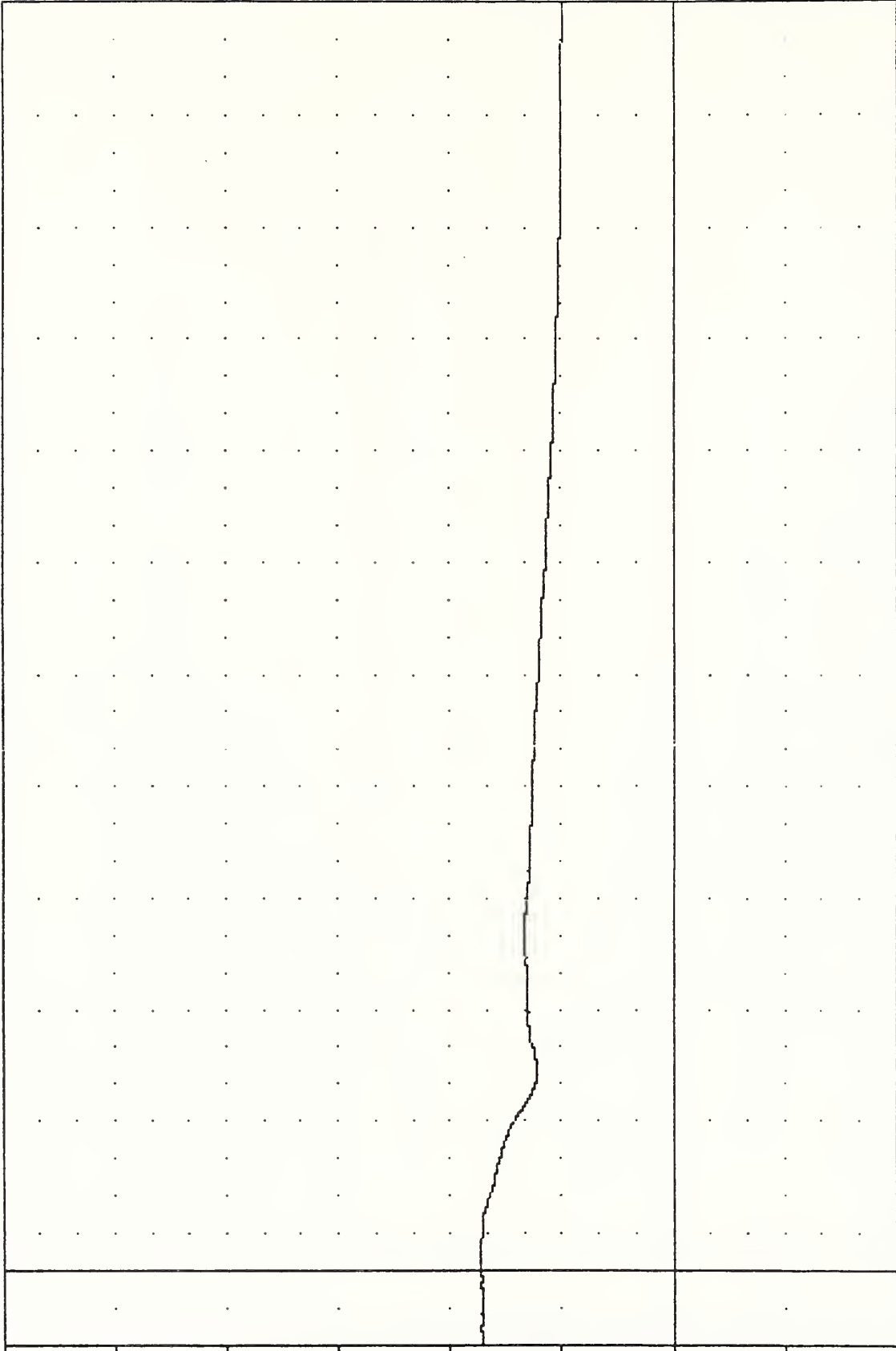
TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
BCGYV

PLOT DATE 27-NOV-84 16:32:40

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 9.91 340.00 , 17.26 3.75

60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00

VELOCITY (MPH)



-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 VOLKSWAGEN RABBIT
DELTA V USING BCGYG

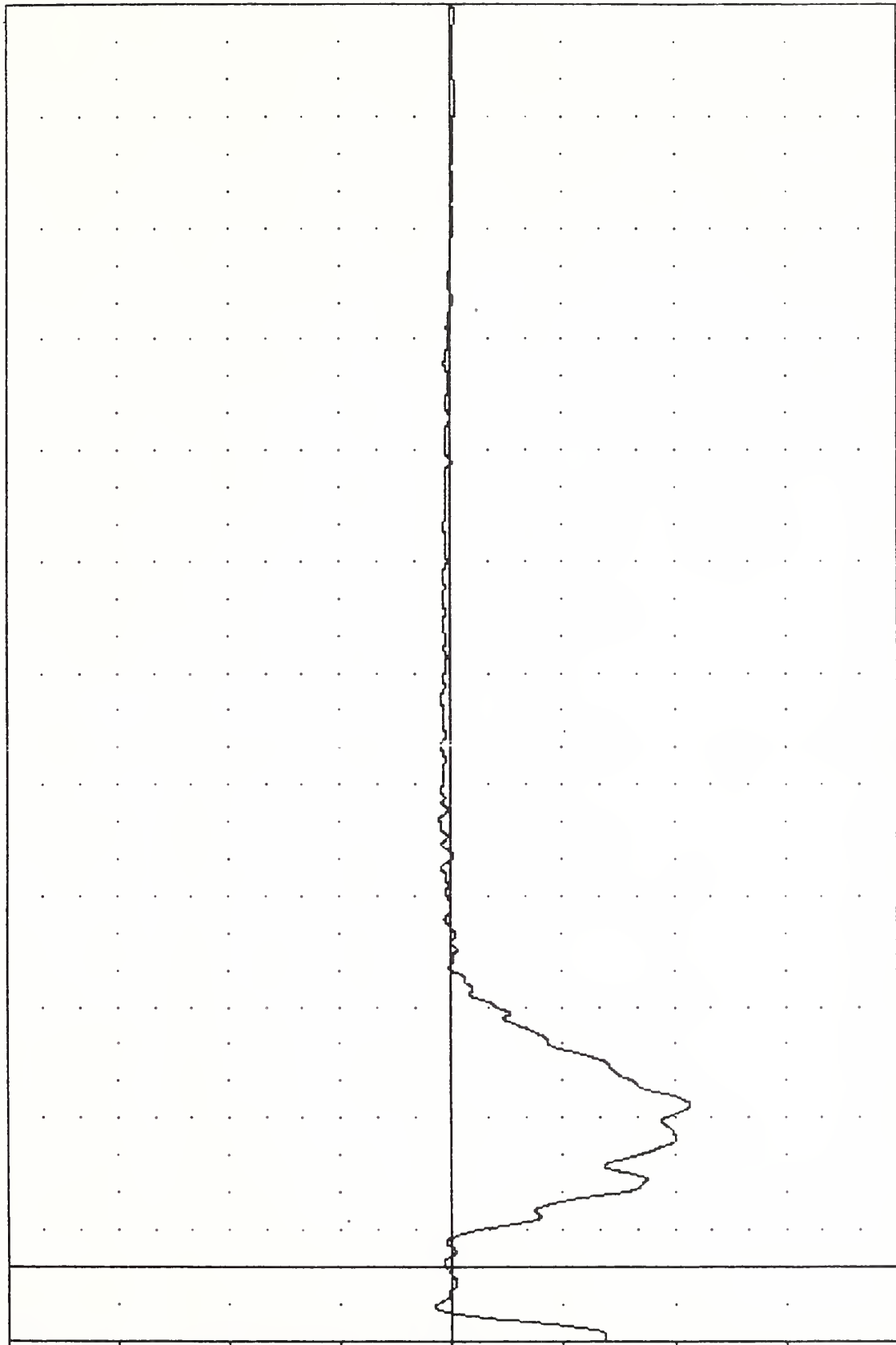
TRC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
BFCXG

PLOT DATE 27-NOV-84 16:29:52

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -21.45g 43.25g 1.56g -10.88

ACCELERATION (G)



B-109

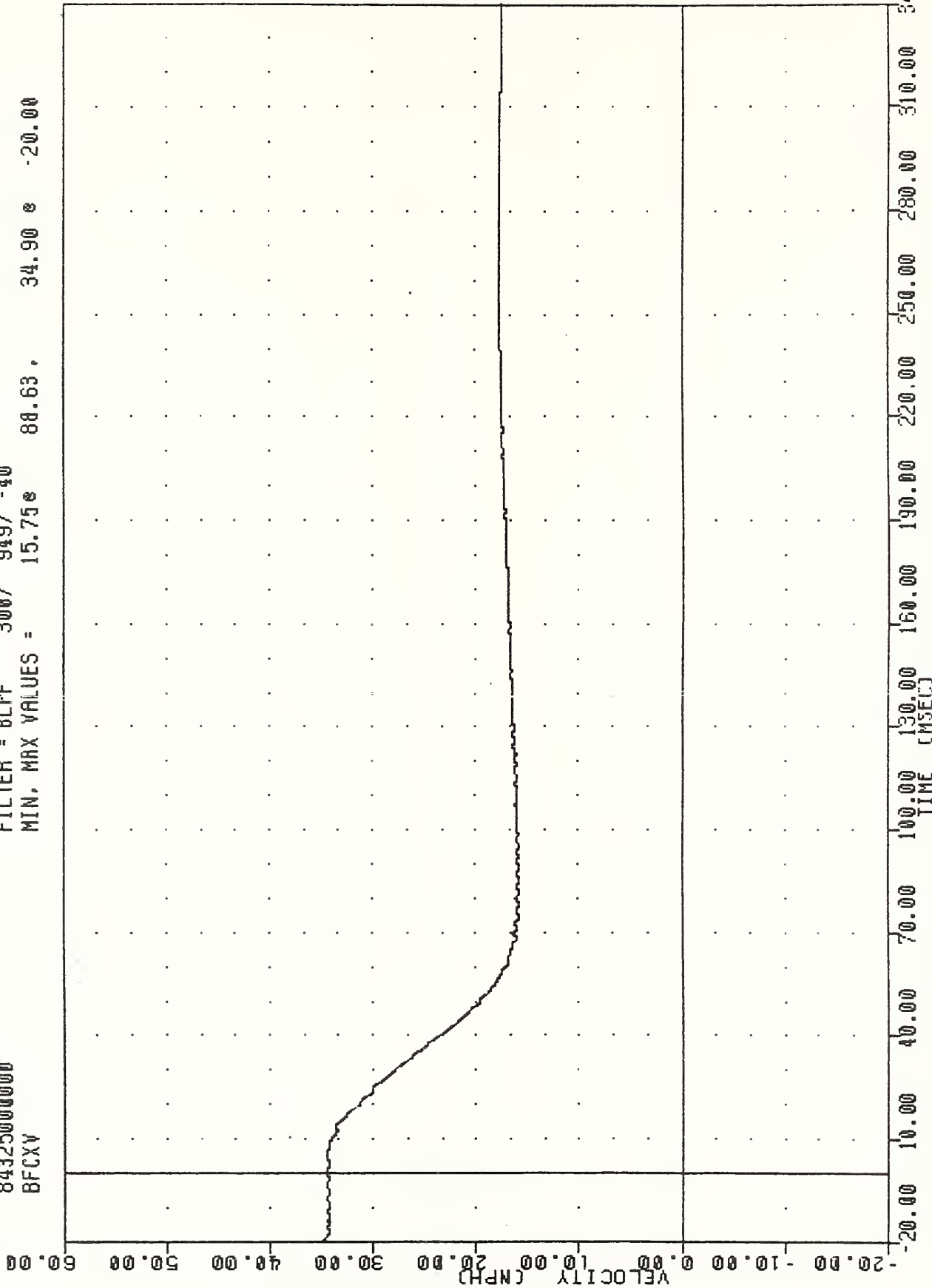
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER FRONT CROSSMEMBER ACCELERATION X AXIS

THC , 841120
SIDE AGGRESSIVE ATTRIBUTES
8432500000
BFCXV

PLUI DATE 27-NOV-84 16:32:40

FILTER = 6LPF 300/ 949/ -40

MIN, MAX VALUES = 15.75e 88.63, 34.90 e -20.00



B-110

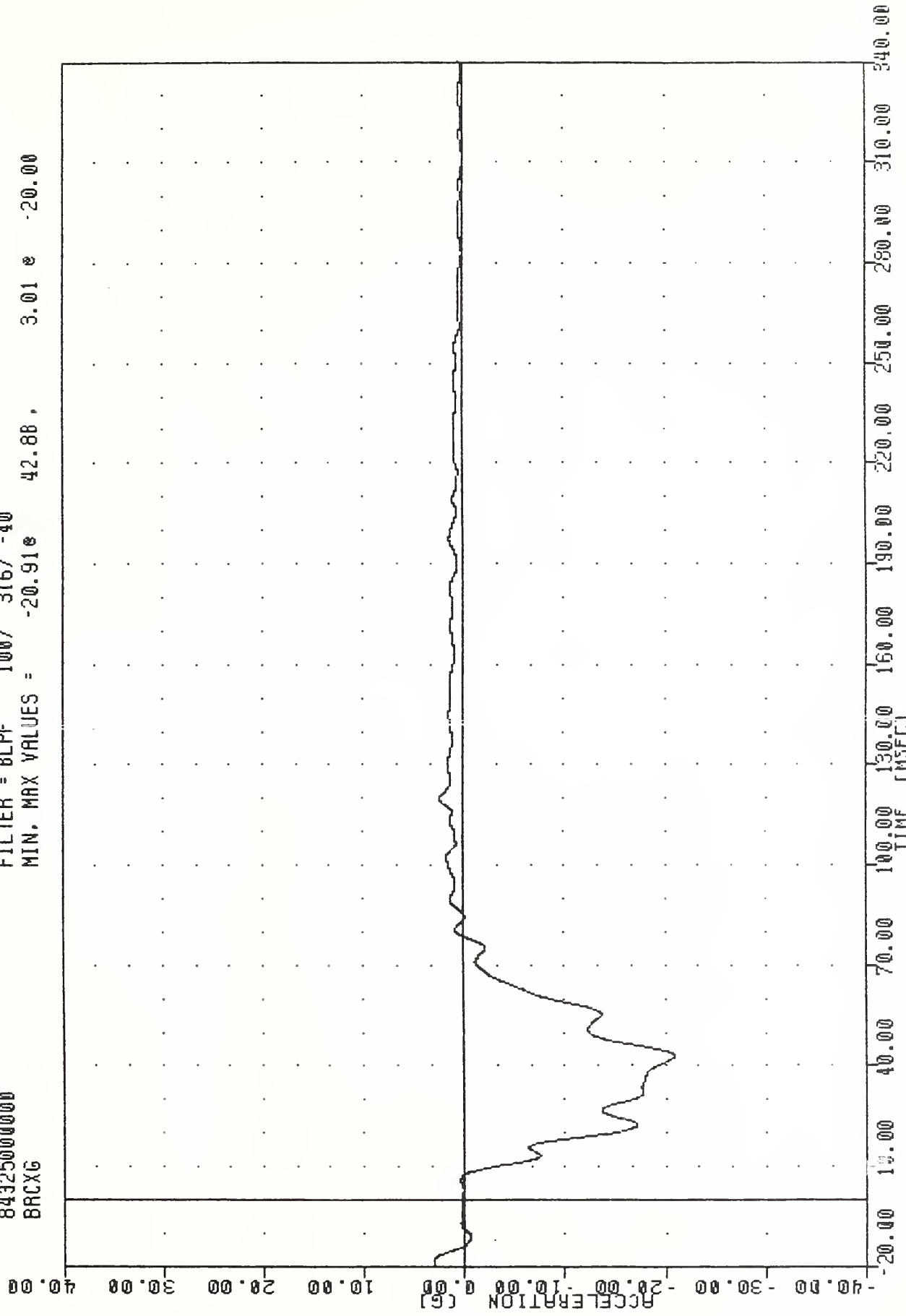
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BFCXG

TRC
SIDE AGGRESSIVE ATTRIBUTES
84325000000
BRCXG

PLOT DATE 27-NOV-84 16:29:52

FILTER = 8LPF 100/ 316/ -40

MIN. MAX VALUES = -20.91e 42.88, 3.01 e -20.00



B-111

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER REAR CROSSMEMBER ACCELERATION X AXIS

TAC , 841120
SIDE AGGRESSIVE ATTRIBUTES
84325000000
BACXY

PLOT DATE 27-NOV-84 16:32:40

FILTER = 6LPF 300/ 949/ -40

MIN. MAX VALUES = 18.19e 75.25. 35.09 e 4.50

60.00

50.00

40.00

30.00

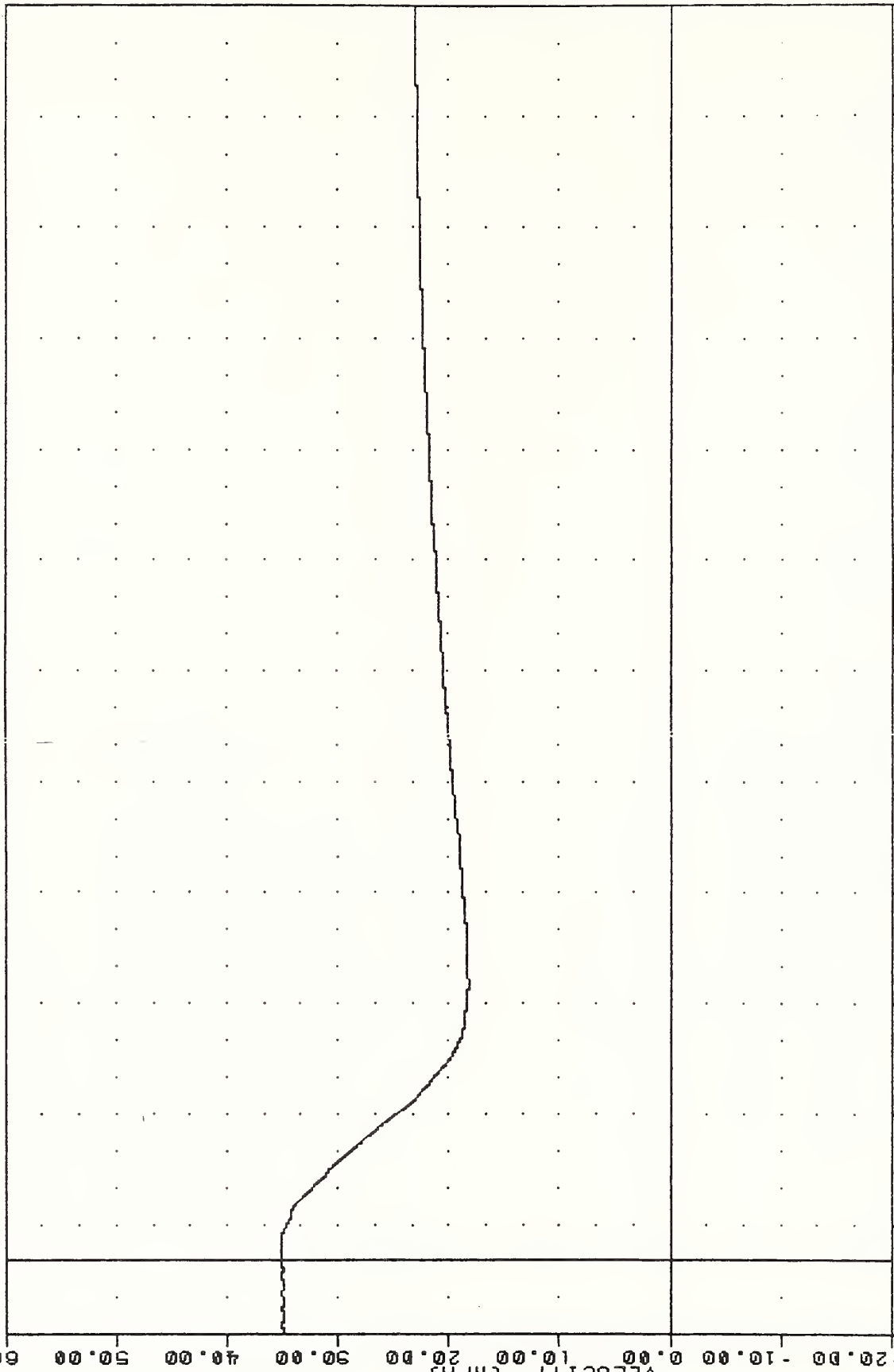
20.00

10.00

0.00

-10.00

-20.00



B-112

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BRCXG

TL 242 .BA1

Bell, L. J.

Side impac
attribute

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