

DOT 572

SIDE IMPACT TEST PROCEDURE
DEVELOPMENT

MDB-TO-CAR SIDE IMPACT TEST OF
A 19° CRABBED MOVING DEFORMABLE BARRIER
TO A 1981 VOLKSWAGEN RABBIT
AT 46.4 MPH

PREPARED BY:
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FINAL REPORT
JUNE 1983

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16. Abstract This test report documents a Side Impact Test Procedure Development Crash Test. 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, crabbed to 19°, at 46.4 mph. Occupant responses of two side impact dummies were measured. One dummy was located in the driver's designated seating position and one was placed in the left rear designated seating position. The test date was May 5, 1983 and the ambient temperature was 56°F.			
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

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

Approximate Conversions From Metric Measures

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



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SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to evaluate the Moving Deformable Barrier (MDB) as a tool for laboratory testing of vehicles in side impact collision modes. 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 May 5, 1983. The test was to simulate an intersection collision with the striking vehicle travelling at 35 mph and the struck vehicle travelling at 17.5 mph. The orientation angle of the striking vehicle was 60° 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 46.3 mph with the MDB's wheels crabbed clockwise to 19°. The actual test speed was 46.4 mph and the actual impact point was 36 inches forward of the midpoint of the Volkswagen Rabbit's wheelbase.

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

SECTION 2.0

GENERAL TEST AND VEHICLE PARAMETER DATA

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

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagen of America

MAKE/MODEL: Volkswagen Rabbit

VIN: 1VWAB0175BV121572

BODY STYLE: 2-door Hatchback

MODEL YEAR: 1981

NHTSA NO.: R & D

COLOR: Blue

ENGINE DATA: TYPE: Transverse CYLINDERS: 4 DISPLACEMENT 105 CID

TRANSMISSION DATA: Manual

DATE VEHICLE RECEIVED: 3-21-83

ODOMETER READING: 19.2

DEALER'S NAME AND ADDRESS: VW North
6500 N. High Street
Worthington, Oh. 43085

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	No	AIR CONDITIONING	No
RADIO	No	ANTI-SKID BRAKE	No
CLOCK	No	REAR WINDOW DEFROSTER	No
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: New

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

VEHICLE MANUFACTURED BY: Volkswagen of America

DATE OF MANUFACTURE: March 1981

GVWR: 2822 LBS.,

GAWR: FRONT 1609 LBS., REAR 1278 LBS.

VEHICLE TIRE DATA

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

TIRES ON VEHICLE (MFGR. & LINE, SIZE): 155/80 D13

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 MAXIMUM FLUIDS):

RIGHT FRONT	605	LBS.	RIGHT REAR	346	LBS.
-------------	-----	------	------------	-----	------

LEFT FRONT	619	LBS.	LEFT REAR	331	LBS.
------------	-----	------	-----------	-----	------

TOTAL FRONT WEIGHT 1224 LBS. (64.4 % OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 677 LBS. (35.6 % OF TOTAL VEHICLE WEIGHT)

TOTAL DELIVERED WEIGHT 1901 LBS.

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE: RF 25 11/16 ;LF 25 13/16 ;RR 26 1/16 ;LR 25 15/16

PRE-TEST ATTITUDE: RF 25 3/8 ;LF 25 13/16 ;RR 22 13/16 ;LR 22 15/16

POST-TEST ATTITUDE: RF 25 3/8 ;LF 26 1/4 ;RR 23 1/8 ;LR 22 5/8

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 206 LBS. CARGO:

RIGHT FRONT	665	LBS.	RIGHT REAR	525	LBS.
-------------	-----	------	------------	-----	------

LEFT FRONT	700	LBS.	LEFT REAR	545	LBS.
------------	-----	------	-----------	-----	------

TOTAL FRONT WEIGHT 1365 LBS. (56.1 % OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 1070 LBS. (43.9 % OF TOTAL VEHICLE WEIGHT)

TOTAL TEST WEIGHT 2435 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*: 10.5 GALLONS (FURNISHED BY CTM)
TEST VOLUME: 5 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 35 psi; REAR 35 psi

RECOMMENDED TIRE SIZE: 155/80 D13 LOAD RANGE X B, C,

VEHICLE CAPACITY: TYPES OF SEATS: Front - Bucket
Rear - Bench

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT

CARGO LOAD 185 LBS. 2 REAR
4 TOTAL

TOTAL 785 LBS.

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

TEST CONDITIONS

TEST NUMBER: 830505

DATE OF TEST: 5/5/83

TIME OF TEST: 3:30 PM

WIND VELOCITY: 3-6 mph N.W.

HUMIDITY: NA

AMBIENT TEMPERATURE AT IMPACT AREA: 56

°F

TEMPERATURE IN OCCUPANT COMPARTMENT: 71

°F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2435	2414
MDB TEST WEIGHT (LBS.)	3005	3000
MDB VELOCITY (MPH)	46.4*	46.3
IMPACT POINT (INCHES)**	36	37

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 Volkswagen's wheelbase.

GENERAL TEST AND VEHICLE PARAMETER DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER # SID-06*	PASSENGER # SID-U02
Head	<u>Window Sill</u>	<u>Window Sill, Side Header</u>
Chest	<u>Left Front Door</u>	<u>Left Quarter Panel</u>
Abdomen	<u>Left Front Door</u>	<u>Left Quarter Panel</u>
Left Knee	<u>Left Front Door</u>	<u>Left Quarter Panel</u>
Right Knee	<u>Left Knee</u>	<u>Left Knee</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>Door Separated</u>	<u>Easy</u>
Rear	<u>DNA</u>	<u>DNA</u>

SEAT MOVEMENT:

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

GLAZING DAMAGE:

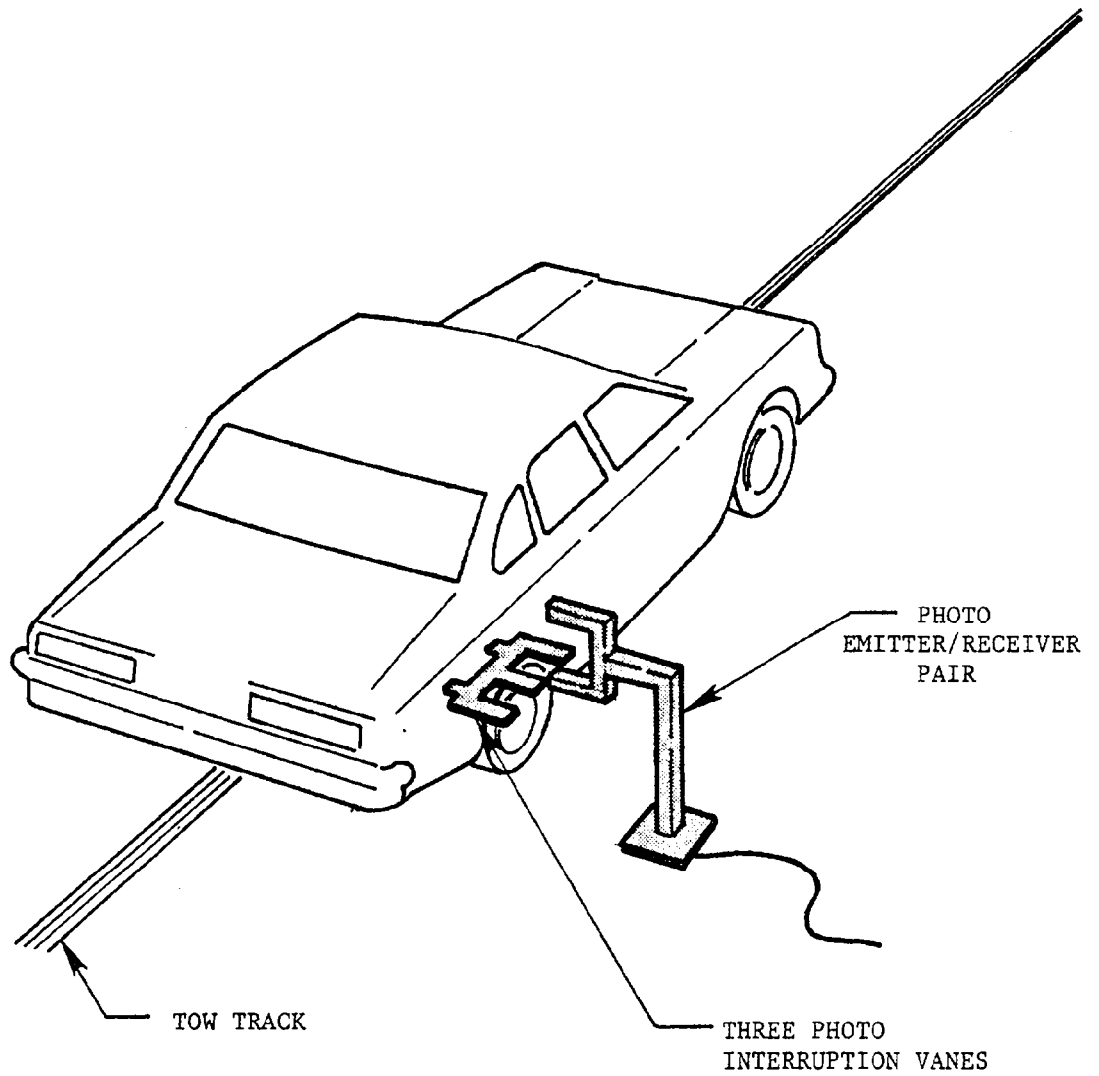
Windshield separated intact from vehicle; no
backlight damage, left side windows shattered.

OTHER NOTABLE IMPACT EFFECTS:

Door liner separated from A-pillar. Roof buckled
at B-pillar. Door sill deformed upward and split.
 A-pillar split.

* Dummy left lower leg severed at knee joint; dummy ejected from vehicle through driver's door.

IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane is located two inches before impact.
The vanes have one foot spacing.

VEHICLE TEST WEIGHT CALCULATION

Test Weight = Unloaded Delivered Weight +
 Number of Dummies X 164 lbs. +
 Cargo Weight
 = 1901 + 2 X 164 + 185 lbs.
 = 2414 lbs.

To achieve test weight, it was necessary to remove the exhaust system and include only 5 gallons of Stoddard Solvent in the fuel tank. The weight of the test vehicle was measured by placing each wheel on a Loadmeter Corporation Hiway Loadometer.

TEST ANOMALIES

- 1) An anomalous negative pulse occurred in the data channel labelled T12YGA which is the redundant Lower Spine accelerometer in the lateral orientation on the driver dummy. It was determined that this pulse was due to cable separation. The pulse began at approximately 83 msec and was of a 10 msec duration. Because of this pulse, no delta velocity was calculated. Because of the similarity of this channel to the primary Lower Spine accelerometer (T12YG1), the maximum negative value was chosen from the electronic data as the maximum of the first negative peak.
- 2) During the crash event, the accelerometer block located at the midrear of the left front door was sheared off of its mounting plate. This accelerometer was labelled LFDYG2 and located at position #8 as shown on VEHICLE ACCELEROMETER LOCATIONS.
- 3) Because of a timing error, all high speed cameras started late. No camera was up to speed at time of impact and the three cameras onboard the Volkswagen Rabbit missed time of impact completely.

SECTION 3.1

DATA REQUIRED BY R&D AND OMI, RULEMAKING

The following pages are included in this section:

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

DUMMY TEMPERATURE CONTROL AND POSITIONING

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

HEAD	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.
LOWER TORSO	Midsagittal plane is vertical and centered on bucket seat.
UPPER LEGS (thighs or femurs)	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.
LOWER LEGS	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.
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.

REAR PASSENGER DSP

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

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

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

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

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

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

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

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: X FIXED
 ADJUSTABLE

TECHNICIANS:

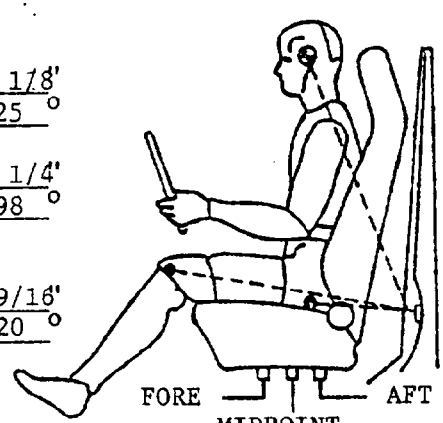
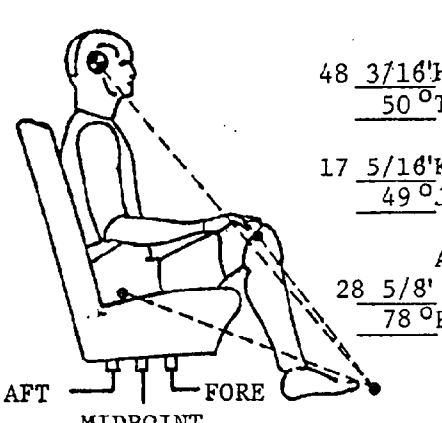
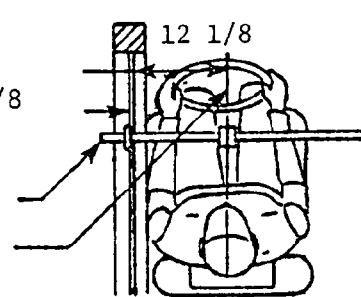
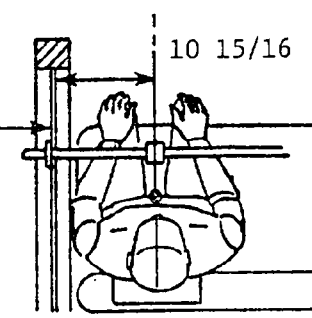
1. J. Kokoruda

2. N. Echeverria

3.

POSITIONING DATE: May 5, 1983

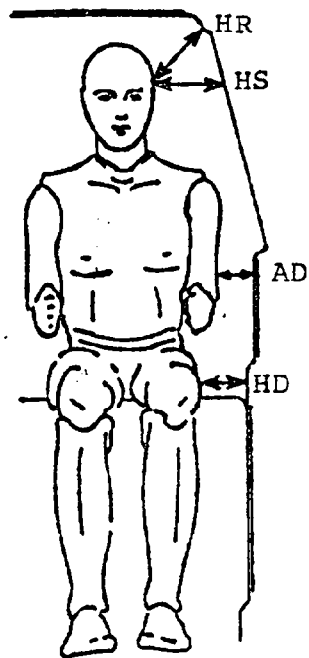
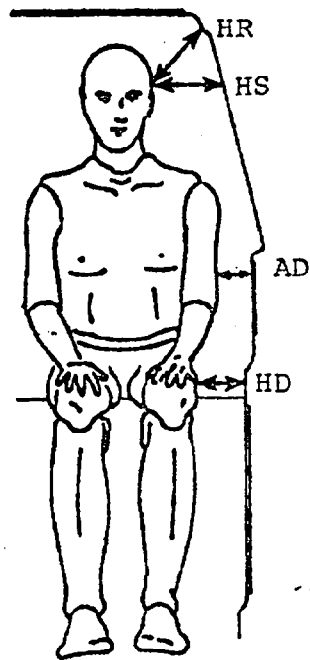
AMBIENT TEMP.: 71° F. TIME: 8:00 AM

DRIVER DUMMY # 06  HEAD <u>19 1/8"</u> TARGET* <u>25°</u> KNEE <u>32 1/4"</u> JOINT <u>98°</u> APPROX. "H" <u>19 9/16"</u> POINT <u>120°</u> FORE MIDPOINT AFT	REAR PASSENGER DUMMY # U02  48 <u>3/16"</u> HEAD <u>50°</u> TARGET** 17 <u>5/16"</u> KNEE <u>49°</u> JOINT APPROX. 28 <u>5/8"</u> "H" <u>78°</u> POINT AFT MIDPOINT FORE
DOOR GLASS HEIGHT*** <u>44 1/8</u> 12 <u>1/8</u> LATERAL BAR ADJUSTABLE POINTER  DRIVER DUMMY # 06	DOOR GLASS HEIGHT — DNA — <u>10 15/16</u>  PASSENGER DUMMY # U02

*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.



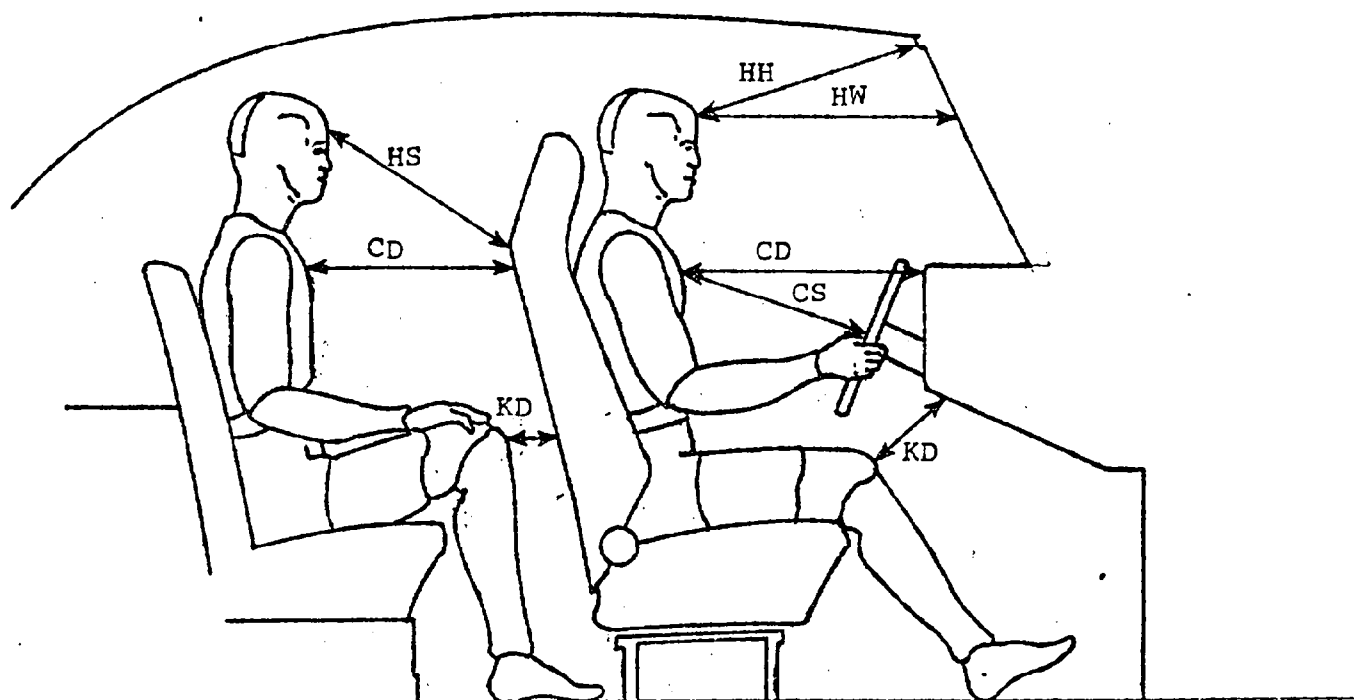
06

*U02

	DRIVER	PASSENGER
HR	6 13/16	5 15/16
HS	8 3/8	7 9/16
AD	4	4 1/16
HD	6 1/16	6

NOTE: ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



06

U02

	DRIVER	PASSENGER
HH	15 1/8	DNA
HW	21 3/4	DNA
HS	DNA	23 5/16
CD	20 1/4	17 1/2
CS	13 1/4	DNA
KDL	4 1/4	3 3/8
KDR	3 5/8	3 3/4

NOTE: ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the dummy's torso contacted the driver's door and the head contacted the driver's window and the driver's window sill. The dummy rebounded and struck the passenger's door with the buttocks passing through the passenger's window. The dummy rebounded from the passenger's door and pitched headfirst through the driver's door which had separated from its hinges during the crash event. The dummy came to rest on its left side on the concrete crash pad. The left lower leg was severed at the knee before ejection.

PASSENGER

During impact, the dummy's torso contacted the inner surface of the left rear quarter panel and the head contacted the left rear window and the side header. The dummy's torso maintained contact with the rear quarter panel and came to rest in an upright position leaning on the quarter panel.

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	10.5	X	X	19.5	19.4	19.4	19.5	19.6	19.6	19.6	19.8	19.8	19.8	20.0	X	X
H-Point	17.6	X	X	17.5	17.4	17.4	17.4	17.4	17.4	17.4	17.5	17.7	17.8	17.9	17.	X
Mid Door	23.6	15.7	17.3	17.2	17.3	17.3	17.3	17.3	17.3	17.3	17.2	17.3	17.4	17.6	17.9	16.3
Window Sill	34.5	19.1	18.9	18.7	18.6	18.6	18.6	18.6	18.6	18.5	18.6	18.8	18.8	19.0	19.1	19.3
Window Top	52.8	X	X	X	X	X	26.0	25.6	25.8	25.8	25.8	25.9	26.1	26.2	26.9	X

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

Axle Height	10.5	X	X	23.1	30.4	34.0	34.0	35.3	35.0	34.3	34.0	33.3	31.3	28.3	24.8	X
H-Point †	17.6	X	X	24.8	X	X	X	X	X	X	X	X	33.6	32.9	29.4	X
Mid Door †	23.6	20.2	22.0	21.9	X	X	X	X	X	X	X	X	36.5	32.9	30.1	26.8
Window Sill †	34.5	20.3	20.3	20.4	X	X	X	X	X	X	X	X	35.8	32.4	28.0	25.6
Window Top	52.8	X	X	X	X	X	27.4	27.1	27.3	27.6	27.9	28.3	27.8	27.6	27.6	X

STATIC CRUSH (IN)

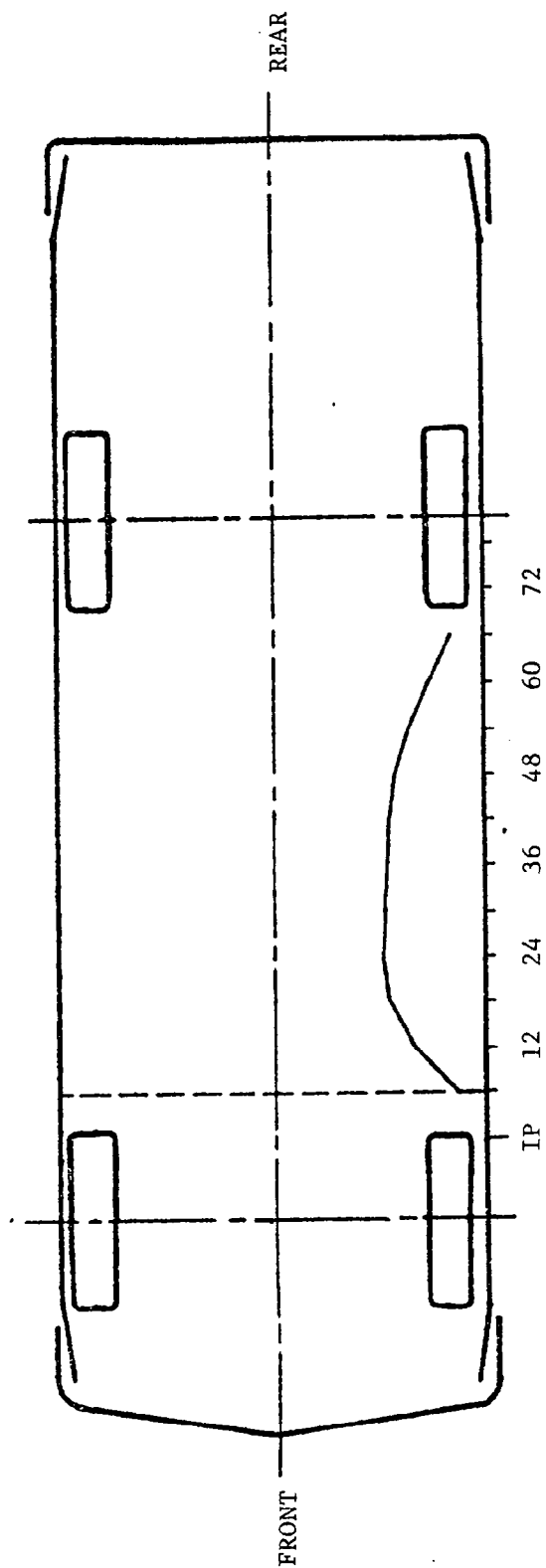
Axle Height	10.5	X	X	3.6	11.0	14.6	15.8	15.4	14.7	14.4	13.5	11.5	8.5	4.8	X	X
H-Point	17.6	X	X	7.3	X	X	X	X	X	X	X	15.9	15.1	11.5	X	X
Mid Door	23.6	4.5	4.7	4.7	X	X	X	X	X	X	X	19.2	15.5	12.5	8.9	X
Window Sill	34.5	1.2	1.4	1.7	X	X	X	X	X	X	X	17.0	13.6	9.0	6.5	3.7
Window Top	52.8	X	X	X	X	X	1.4	1.5	1.5	1.8	2.1	2.4	1.7	1.4	0.7	X

* 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.

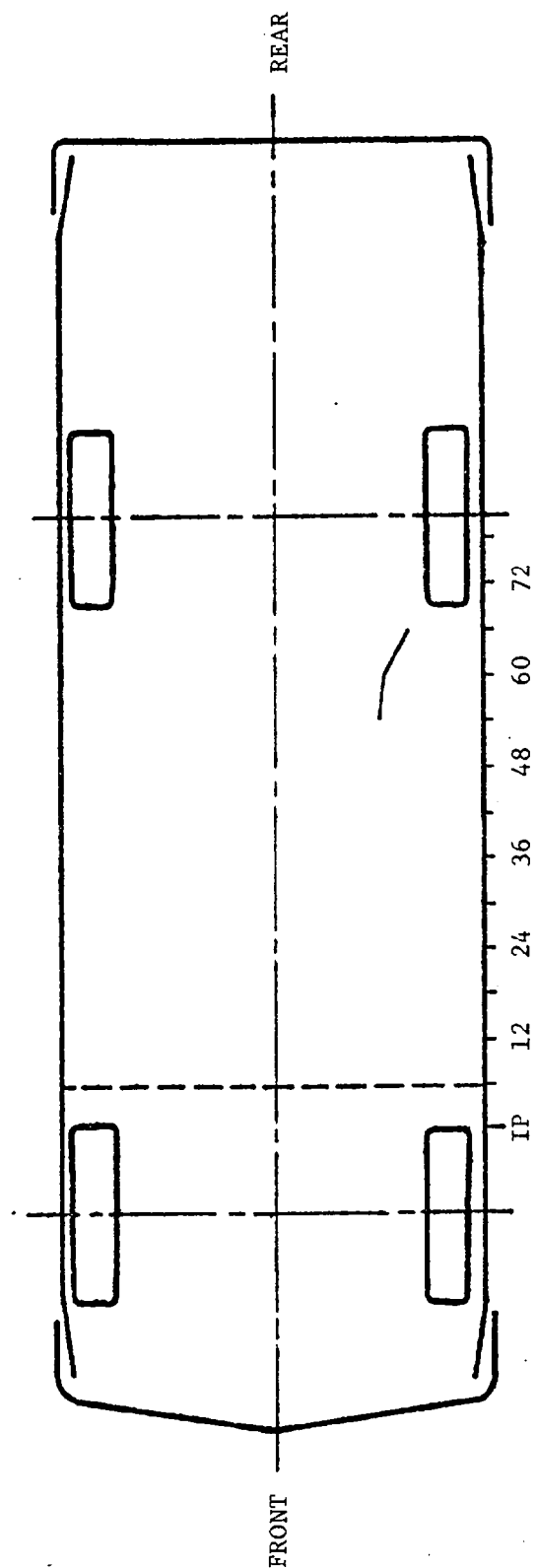
† Twenty-one data points unavailable due to separation of driver's door during crash test.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



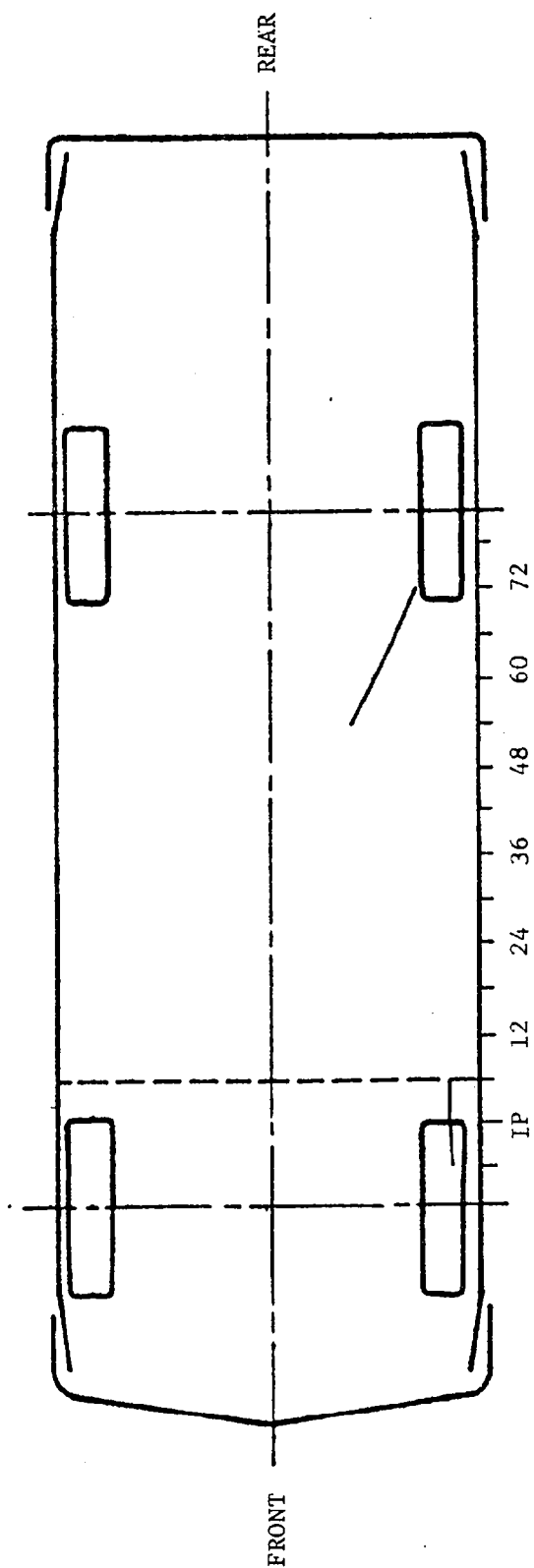
Profile level equals axle height
IP equals project impact point

VEHICLE EXTERIOR STATIC CRUSH PROFILE



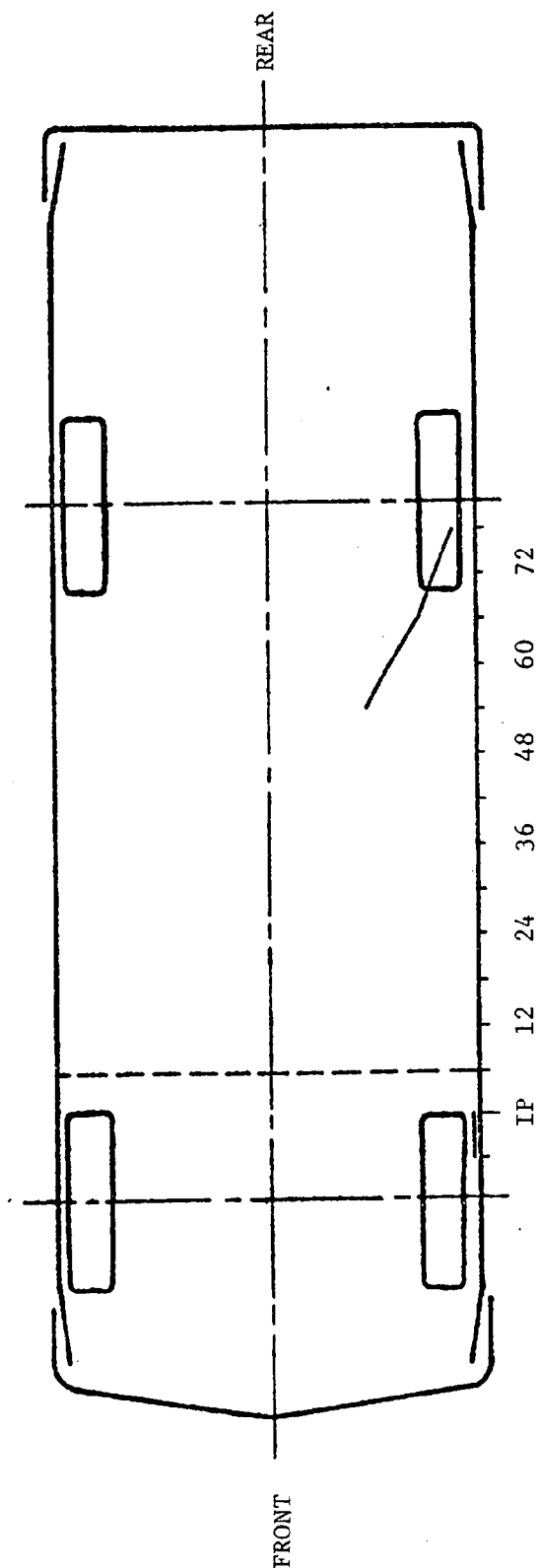
Profile level equals H-Point height
 IP equals projected impact point

VEHICLE EXTERIOR STATIC CRUSH PROFILE



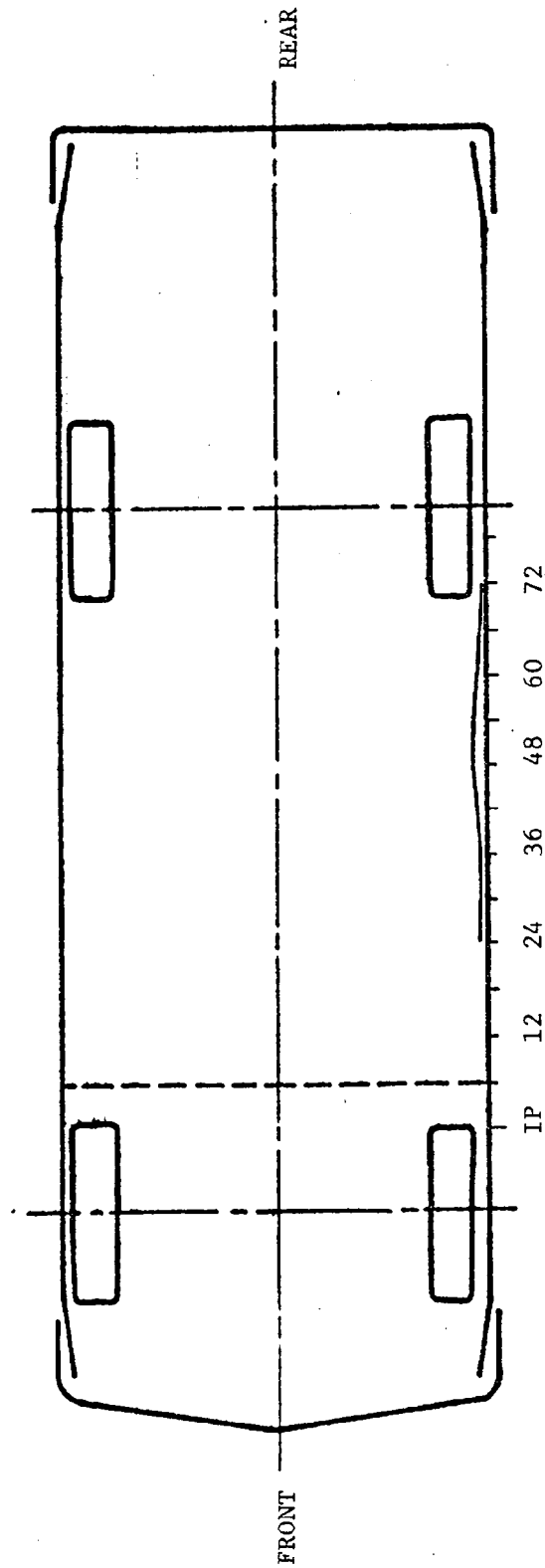
Profile level equals mid door height
IP equals projected impact point

VEHICLE EXTERIOR STATIC CRUSH PROFILE



Profile level equals window sill height
 IP equals project impact point

VEHICLE EXTERIOR STATIC CRUSH PROFILE



Profile level equals window top height
IP equals projected impact point

SIDE IMPACT DUMMY DATA SUMMARY

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE		NEGATIVE		POSITIVE		NEGATIVE	
	DIRECTION*		DIRECTION**		DIRECTION*		DIRECTION**	
	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
HEAD ACCELERATION								
LONGITUDINAL	46.43	167.00	186.10	89.88	40.36	90.25	67.55	80.00
LATERAL	67.68	89.50	27.14	44.63	81.80	72.63	32.20	91.75
VERTICAL	24.60	38.13	129.90	73.63	94.25	85.00	82.88	71.13
RESULTANT		205.26 @ 89.88				124.96 @ 72.50		
HIC	3322.43	from 55.00 to 96.25			1810.21	from 69.25 to 92.38		
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	66.89	163.13	49.84	48.13	13.69	129.38	53.37	75.63
LATERAL (P)***	213.70	48.13	42.11	41.88	138.35	75.00	31.38	91.25
LATERAL (R)***	219.92	48.13	38.85	41.88	141.63	75.00	31.01	91.25
VERTICAL	23.82	35.63	19.90	90.63	30.62	62.50	29.20	88.13
RESULTANT (P)		219.93 @ 48.13				150.17 @ 75.00		
RESULTANT (R)		225.97 @ 48.13				153.45 @ 75.62		
DELTA V (MPH)		27.5 @ 130.00 (P)				25.1 @ 160.00 (P)		
		33.1 @ 130.00 (R)				27.2 @ 160.00 (R)		
LOWER SPINE								
LONGITUDINAL	80.30	55.63	48.96	43.75	58.16	88.13	50.09	71.88
LATERAL (P)	150.85	46.88	53.37	61.25	114.87	75.63	47.86	90.00
LATERAL (R)	152.96	46.88	51.33	61.88 ^Y	117.21	75.63	47.91	89.38
VERTICAL	47.94	46.25	10.48	169.38	46.16	69.38	15.73	95.63
RESULTANT (P)		159.22 @ 46.25				117.33 @ 75.00		
RESULTANT (R)		160.99 @ 46.25 ^Y				119.30 @ 72.50		
DELTA V (MPH)		34.82 @ 130.00 (P)				31.4 @ 100.00 (P)		
						31.2 @ 100.00 (R)		
LEFT UPPER RIB								
LATERAL (P)	189.46	42.50	15.91	178.75	148.41	70.00	14.13	131.25
LATERAL (R)	182.11	43.13	13.41	178.75	150.48	70.00	14.84	110.63
DELTA V (MPH)		40.2 @ 125.0 (P)				42.8 @ 190.00 (P)		
		39.8 @ 125.0 (R)				43.1 @ 190.00 (R)		
LEFT LOWER RIB								
LATERAL (P)	247.15	41.25	51.33	67.50	183.18	68.75	45.25	87.50
LATERAL (R)	235.45	41.25	50.84	66.88	193.43	68.75	41.34	87.50
DELTA V (MPH)		36.8 @ 130.00 (P)				41.0 @ 190.00 (P)		
		34.8 @ 130.00 (R)				43.0 @ 190.00 (R)		
PELVIS ACCELERATION								
LONGITUDINAL	40.89	124.25	63.13	41.75	19.11	107.00	101.28	62.75
LATERAL	225.18	34.75	27.84	73.75	197.91	60.38	71.70	47.63
VERTICAL	73.26	33.88	13.24	46.63	80.12	69.13	12.35	71.13
RESULTANT		232.27 @ 34.63				219.19 @ 60.50		
DELTA V (MPH)		44.5 @ 160.00				31.4 @ 160.00		

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†	0.03	183.88	1.91	103.63	0.23	126.75	1.49	95.63

* LONGITUDINAL: FORWARD
 LATERAL: RIGHTWARD
 VERTICAL: UPWARD

**LONGITUDINAL: REARWARD
 LATERAL: LEFTWARD
 VERTICAL: DOWNWARD

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

Y See Data Anomalies

† Compression: Negative

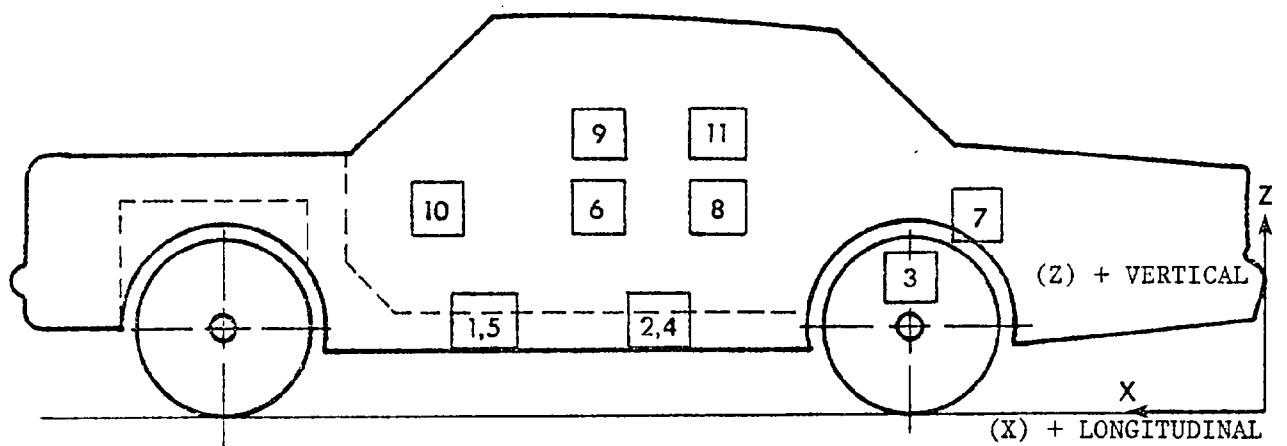
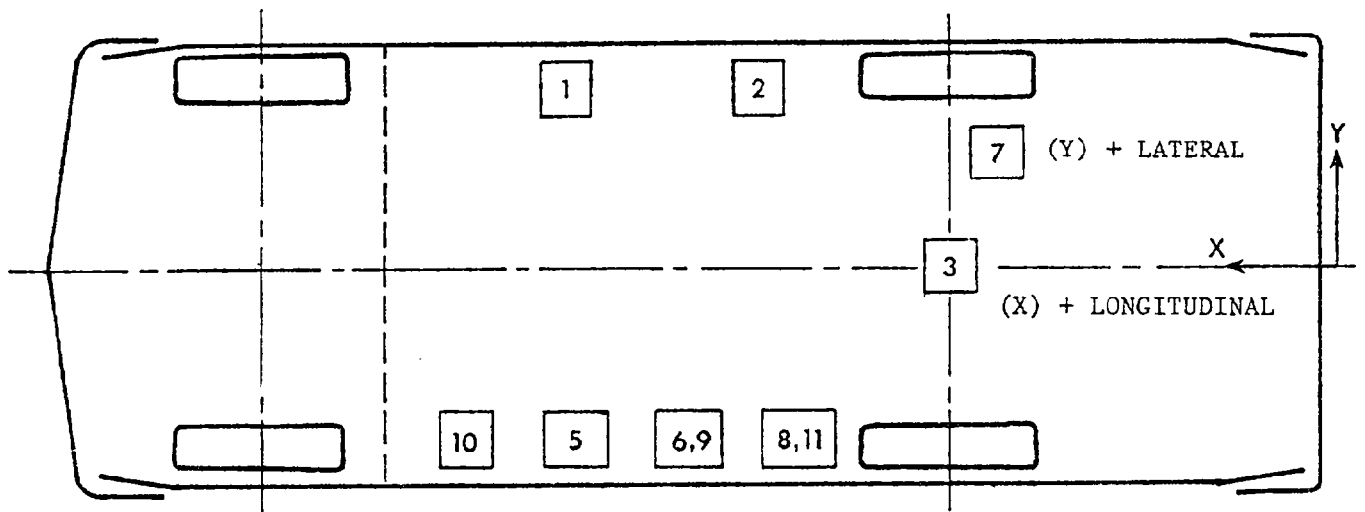
VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	RIGHT SILL AT FRONT SEAT (LONGITUDINAL)	83.3	23.8	11.0				
	(LATERAL)	$\Delta V = -8.4 \text{ mph @ } 120.00 \text{ msec}$			2.14	152.75	9.20	57.00
	(VERTICAL)	$\Delta V = 13.8 \text{ mph @ } 120.00 \text{ msec}$			17.78	73.38	11.07	49.63
	(RESULTANT)				14.28	49.00	7.93	41.88
						18.83 @ 73.13		
2	RIGHT SILL AT REAR SEAT (LONGITUDINAL)	61.3	24.6	9.8				
	(LATERAL)	$\Delta V = -6.5 \text{ mph @ } 120.00 \text{ msec}$			2.76	152.50	9.11	56.38
	(VERTICAL)	$\Delta V = 19.2 \text{ mph @ } 120.00 \text{ msec}$			27.47	72.63	5.44	133.13
	(RESULTANT)				8.16	50.50	6.04	61.75
						27.66 @ 72.50		
3	REAR DECK OVER AXLE (LONGITUDINAL)	32.0	0.0	6.8				
	(LATERAL)	$\Delta V = -8.9 \text{ mph @ } 120.00 \text{ msec}$			7.22	92.00	21.79	77.25
	(VERTICAL)	$\Delta V = 27.3 \text{ mph @ } 120.00 \text{ msec}$			35.82	70.75	5.59	130.38
	(RESULTANT)				9.06	93.50	14.96	72.13
						40.21 @ 72.25		
4	LEFT SILL AT REAR SEAT (LATERAL)	61.0	-24.6	8.8				
		$\Delta V = 12.0 \text{ mph @ } 120.00 \text{ msec}$			81.98	57.50	71.25	66.13
5	LEFT SILL AT FRONT SEAT (LATERAL)	83.6	-24.6	8.8				
		$\Delta V = 2.3 \text{ mph @ } 130.00 \text{ msec}$			54.19	48.63	61.29	60.88
6	LEFT FRONT DOOR CENTERLINE (LATERAL)	81.3	-27.0	23.2				
		$\Delta V = 3.5 \text{ mph @ } 160.00 \text{ msec}$			141.59	25.50	85.78	31.50
7	RIGHT REAR COMPARTMENT (LONGITUDINAL)	31.0	15.4	13.6				
					3.49	151.00	11.78	56.13
8	MIDREAR OF LEFT FRONT DOOR (LATERAL)	60.0	-26.3	23.0				
		$\Delta V = 36.5 \text{ mph @ } 160.00 \text{ msec}$			245.83	67.25	158.70	52.63
9	UPPER LEFT FRONT DOOR CENTERLINE (LATERAL)	81.9	-26.0	32.2				
		$\Delta V = 13.3 \text{ mph @ } 130.00 \text{ msec}$			126.26	32.88	109.45	40.00
10	MIDFRONT OF LEFT FRONT DOOR (LATERAL)	99.6	-26.3	23.3				
		$\Delta V = -10.3 \text{ mph @ } 145.00 \text{ msec}$			116.69	8.13	93.13	12.63
11	UPPER REAR OF LEFT FRONT DOOR (LATERAL)	70.5	-26.0	32.1				
		$\Delta V = 6.6 \text{ mph @ } 150.00 \text{ msec}$			144.29	30.75	66.02	45.88

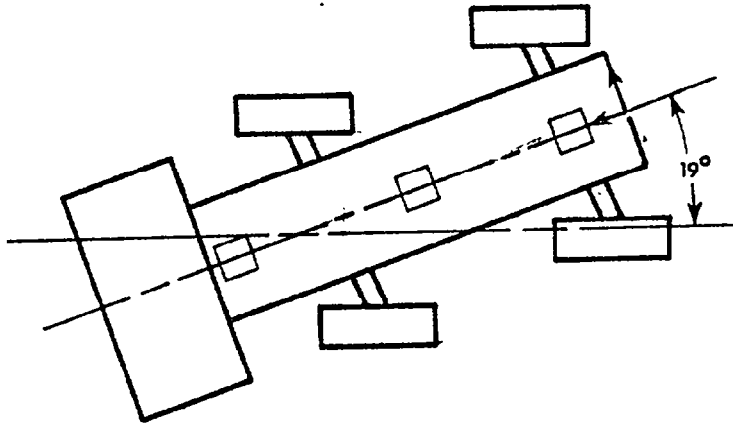
* Reference: X - Rear Bumper (+ Forward), Y - Vehicle Centerline (+ To Right),
Z - Ground Level (+ Up)

All measurements of accelerometer locations in inches.

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	75.5	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -18.8 \text{ mph @ 160 msec}$			0.70	155.25	14.33	66.00
	(LATERAL)	$\Delta V = -3.3 \text{ mph @ 160 msec}$			2.04	131.75	6.45	79.63
	(VERTICAL)				10.65	46.38	12.47	113.88
	(RESULTANT)					16.84 @ 68.63		
2	FRONT FRAME MEMBER	130.3	0.0	11.3				
	(LONGITUDINAL)	$\Delta V = -19.5 \text{ mph @ 150 msec}$			2.20	113.88	13.76	66.13
3	REAR FRAME MEMBER	23.3	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -17.2 \text{ mph @ 130 msec}$			1.35	221.88	13.79	63.88

* 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	Photosonics 1B	8	912	Vehicle dynamics
2	Overhead	Photosonics 1B	25	950	Close-up of impact point
3	Onboard MDB	Stalex	25	1000	Close-up of impact point
4	Onboard MDB	Photosonics 1B	13	502	Driver kinematics
5	Ground level - drivers side	Hycam	25	1050	Overall view
6	Ground level - passengers side	Hycam	16	1125	Overall view
7	Onboard vehicle	Photosonics 1B	8	1125	Driver kinematics - front view
8	Onboard vehicle	Photosonics 1B	8	1125	Driver kinematics
9	Onboard vehicle	Photosonics 1B	8	1060	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	-57"	23'
2	0	-57"	23'
5	33'8"	66'	45"
6	-23'3"	-15'7"	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	MFGR.	DATE OF LAST CALIBRATION	SENSITIVITY	DESIRED FULL SCALE (ENGR. UNITS)
BCGXG	Accel.	4-202-0001	18845	Bell Howell	3-11-83	0.2360 MV/G	50 G
BCGYG	Accel	4-202-0001	18858	Bell Howell	3-11-83	0.2385 MV/G	50 G
BCGZG	Accel.	4-202-0001	18857	Bell Howell	3-15-83	0.2385 MV/G	50 G
BFCXG	Accel.	4-202-0001	18240	Bell Howell	3-11-83	0.2385 MV/G	50 G
BRCXG	Accel.	4-202-0001	19022	Bell Howell	3-16-83	0.2210 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

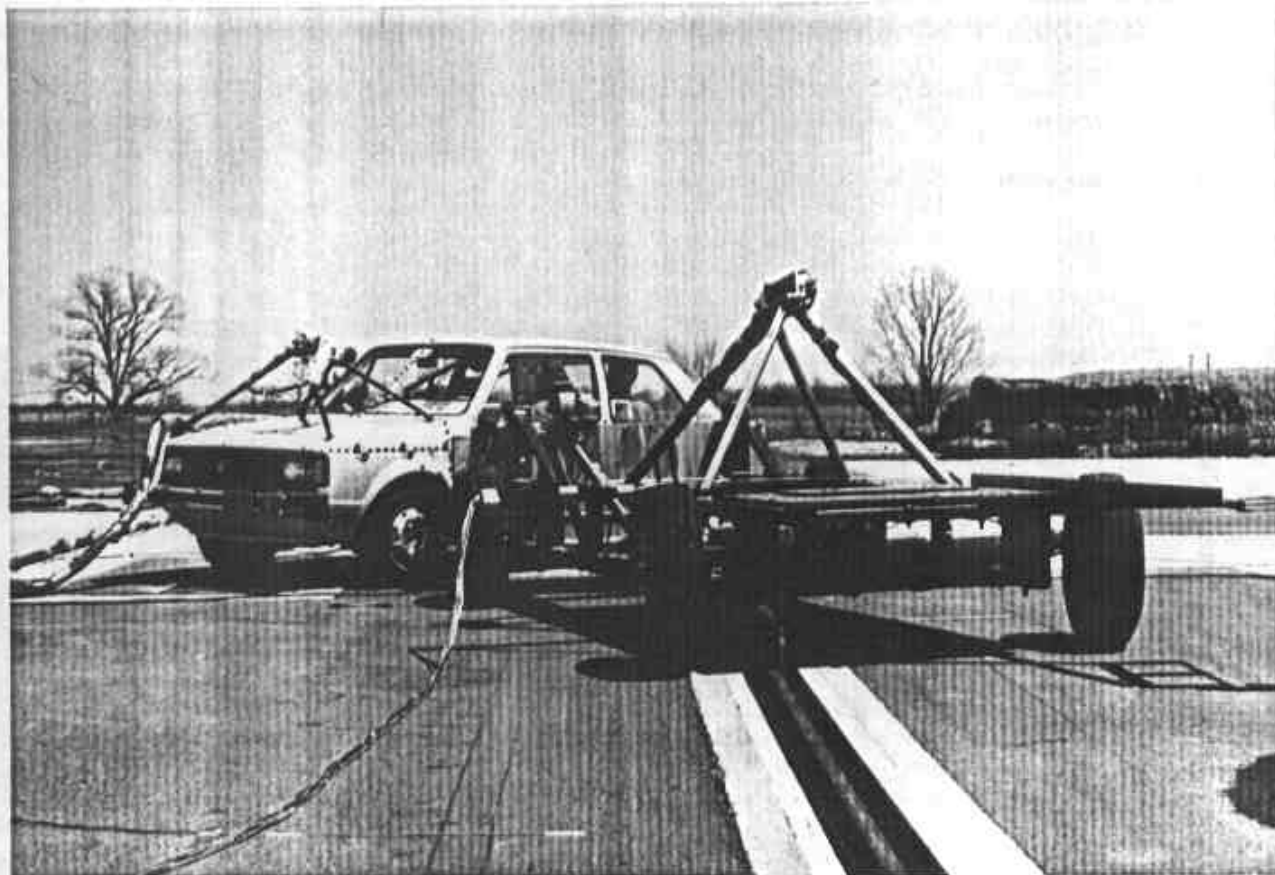


Figure A-2. PRE-TEST OVERALL - VIEW 2



Figure A-3. PRE-TEST CLOSEUP - VIEW 1

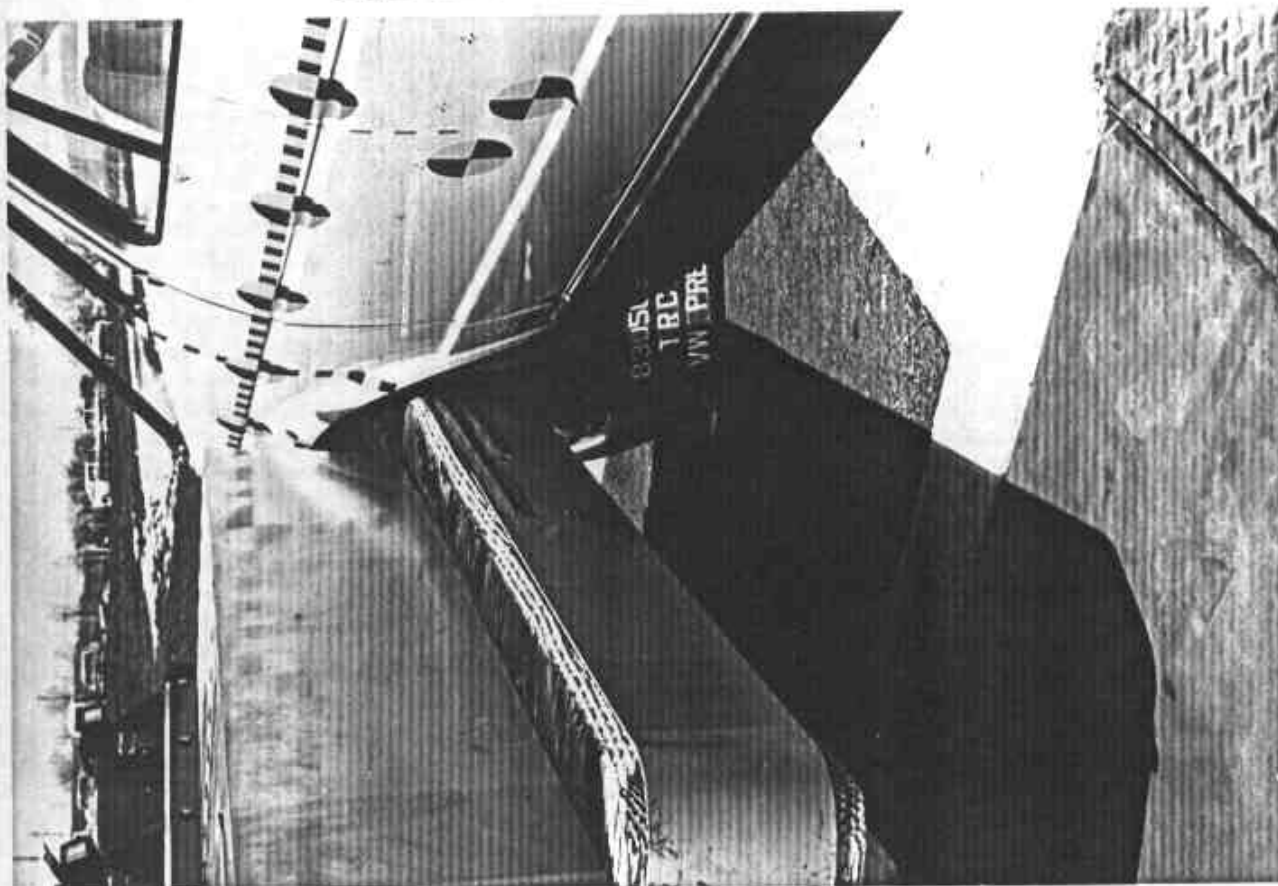


Figure A-4. PRE-TEST CLOSEUP - VIEW 2



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

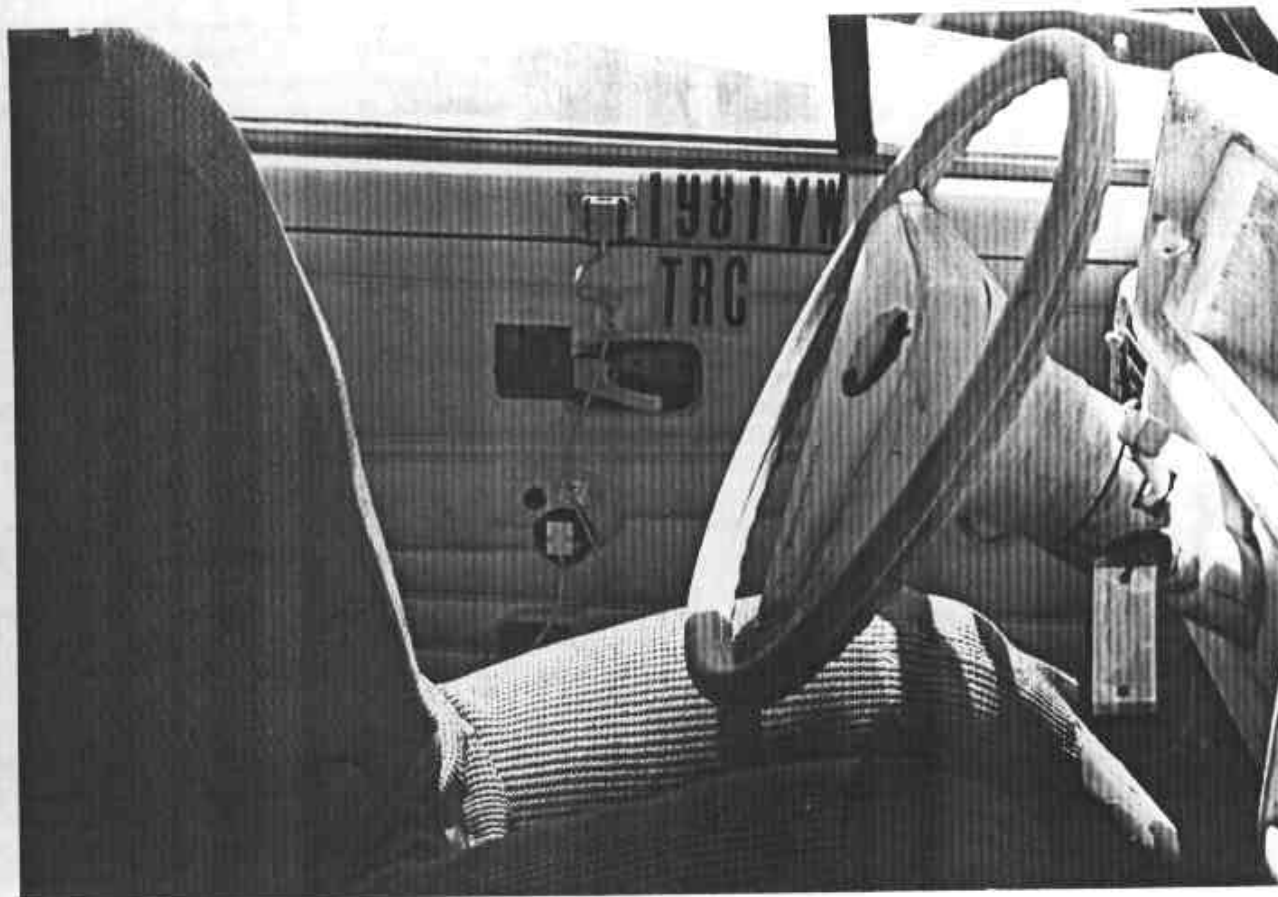


Figure A-6. PRE-TEST DRIVER DUMMY - VIEW 2



Figure A-7. PRE-TEST PASSENGER DUMMY - VIEW 1

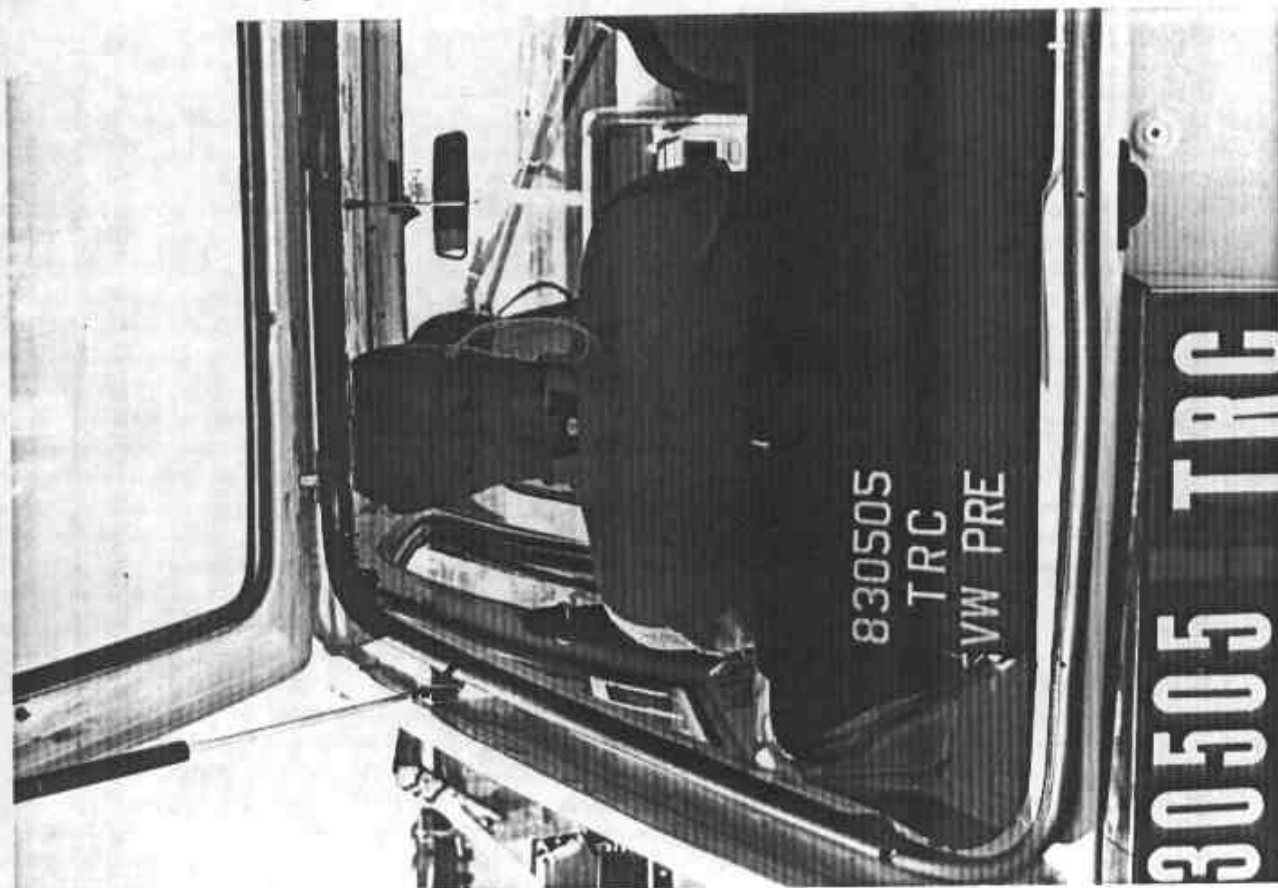


Figure A-8. PRE-TEST PASSENGER DUMMY - VIEW 2



Figure A-9. CRASH EVENT PHOTOGRAPH

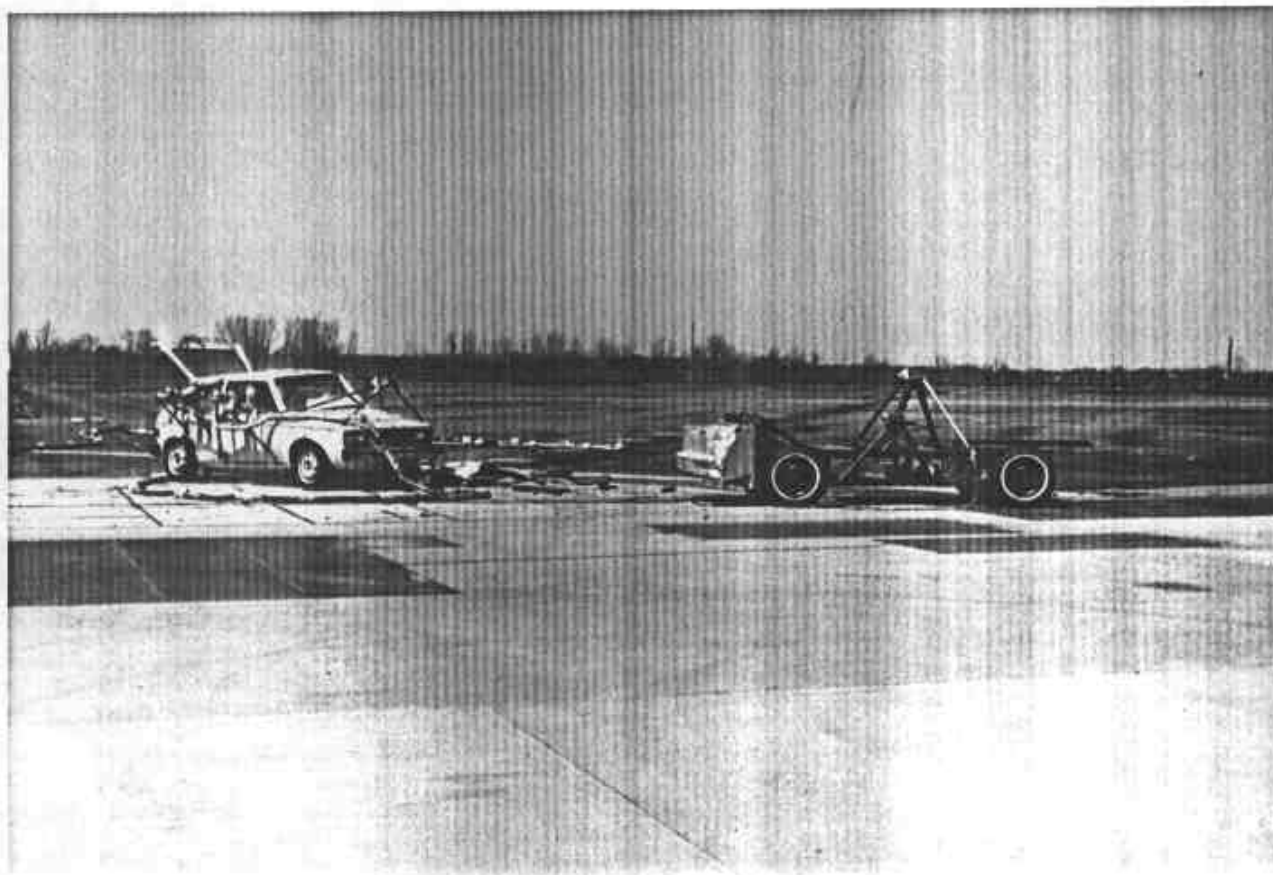


Figure A-10. POST-TEST OVERALL - VIEW 1

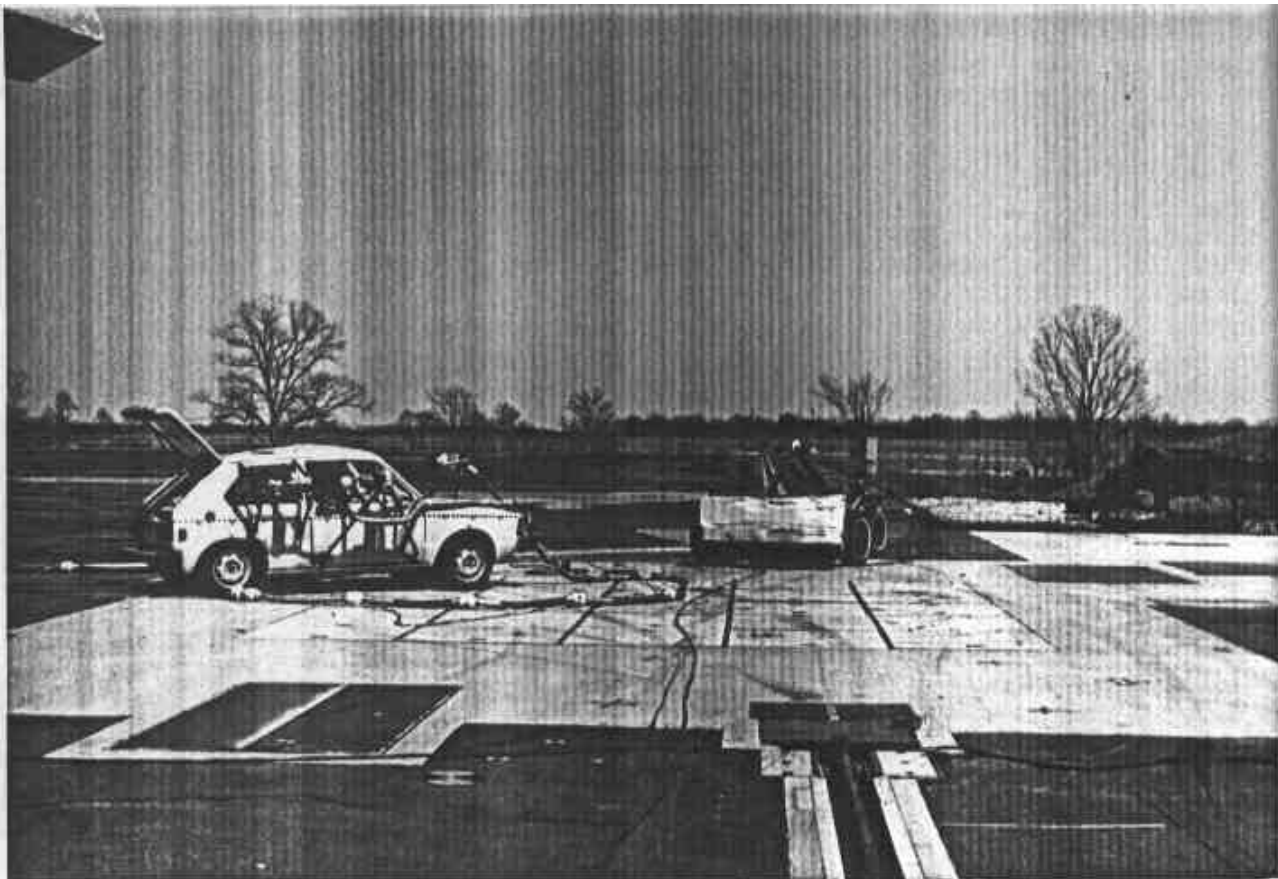


Figure A-11. POST-TEST OVERALL - VIEW 2

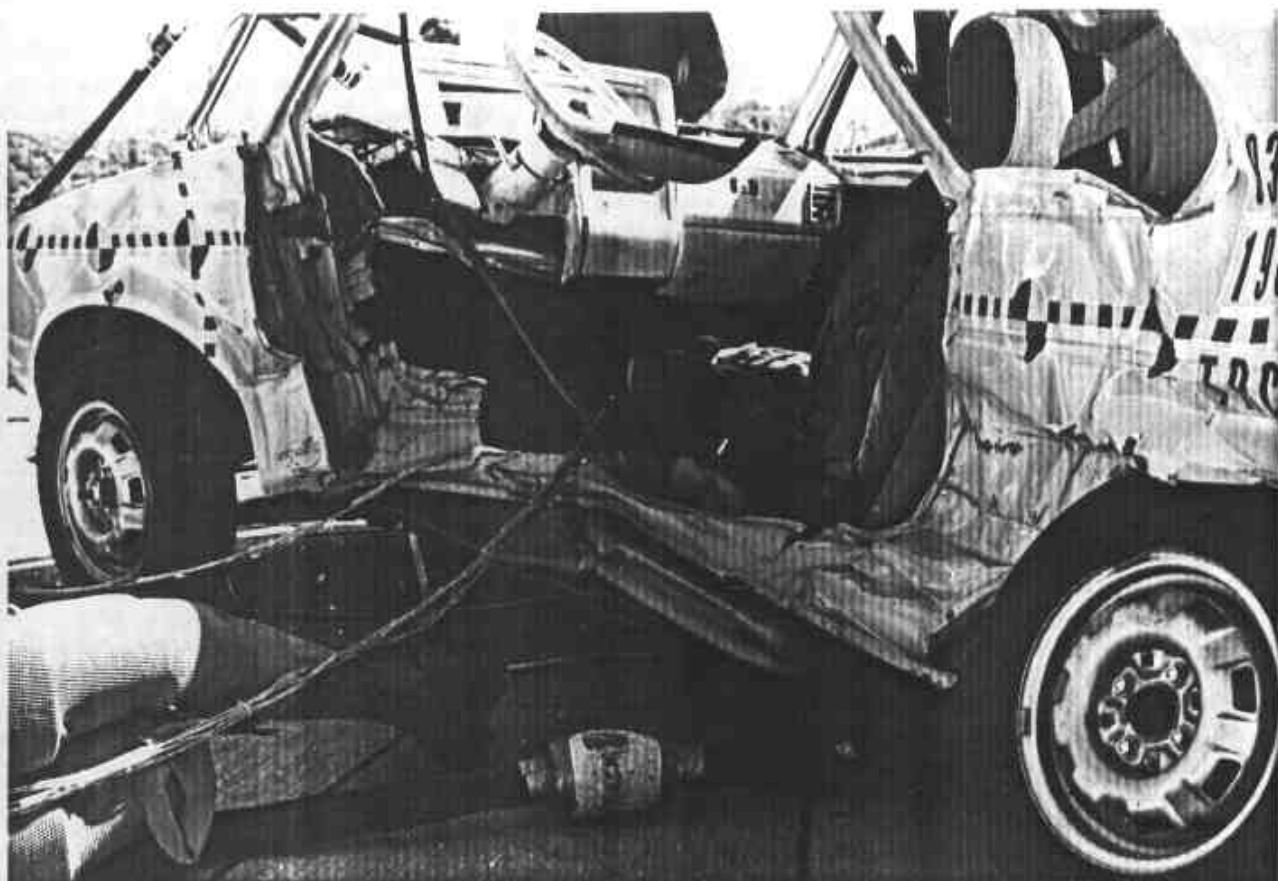


Figure A-12. POST-TEST CLOSEUP - VIEW 1



Figure A-13. POST-TEST CLOSEUP - VIEW 2

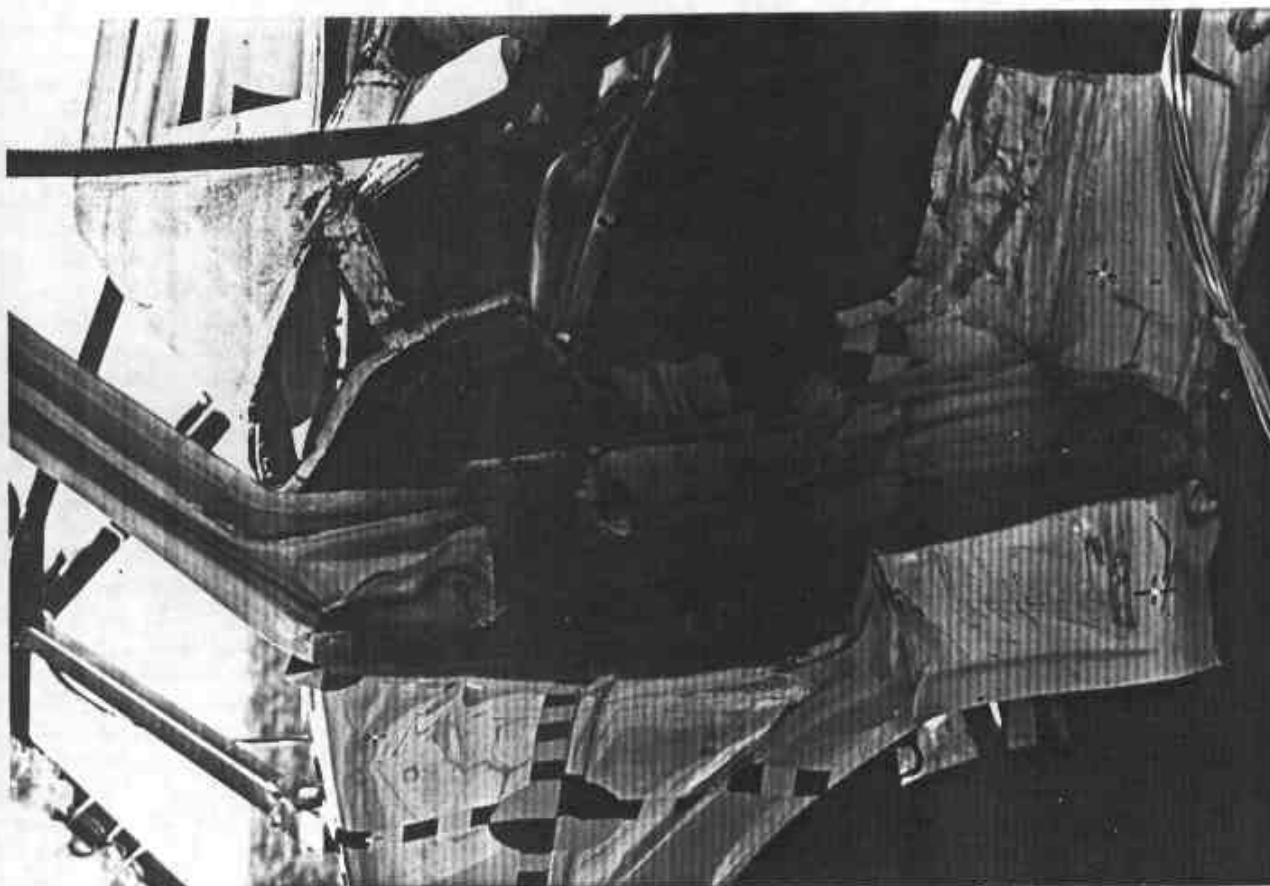


Figure A-14. POST-TEST - A PILLAR DAMAGE



Figure A-15. POST-TEST - SILL DAMAGE



Figure A-16. POST-TEST - IMPACT POINT



Figure A-17. POST-TEST DRIVER'S SEAT

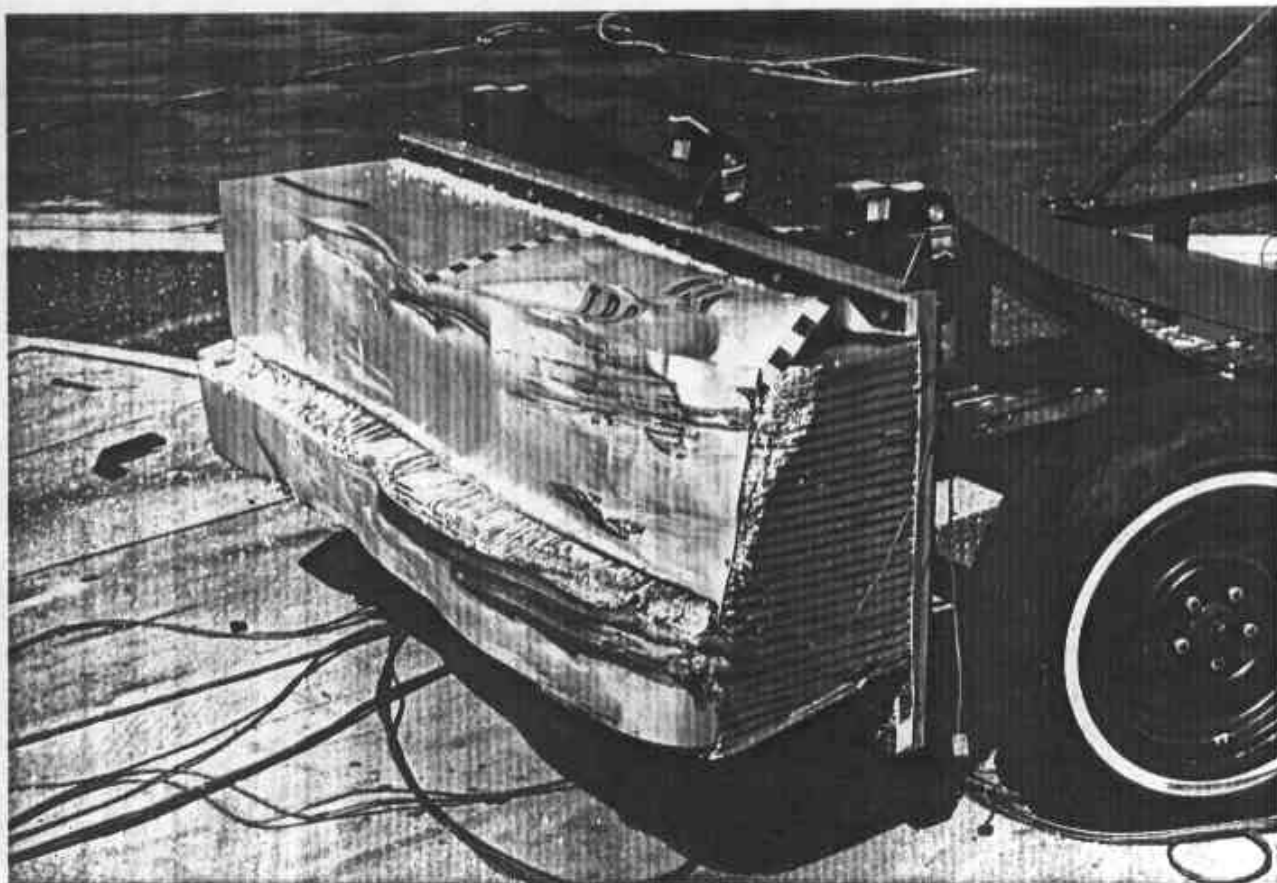


Figure 18. POST-TEST - MOVING DEFORMABLE BARRIER - VIEW 1

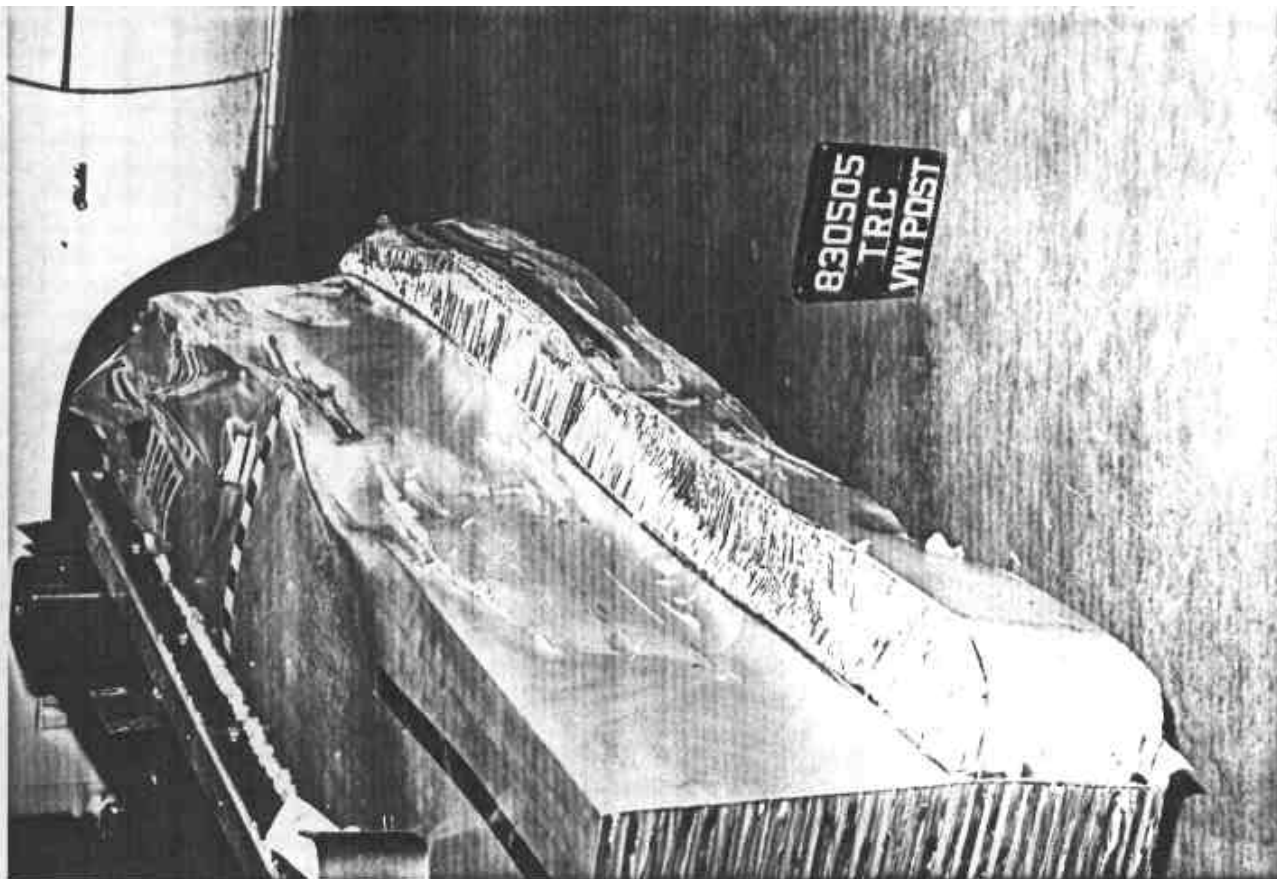


Figure A-19. POST-TEST - MOVING DEFORMABLE BARRIER - VIEW 2

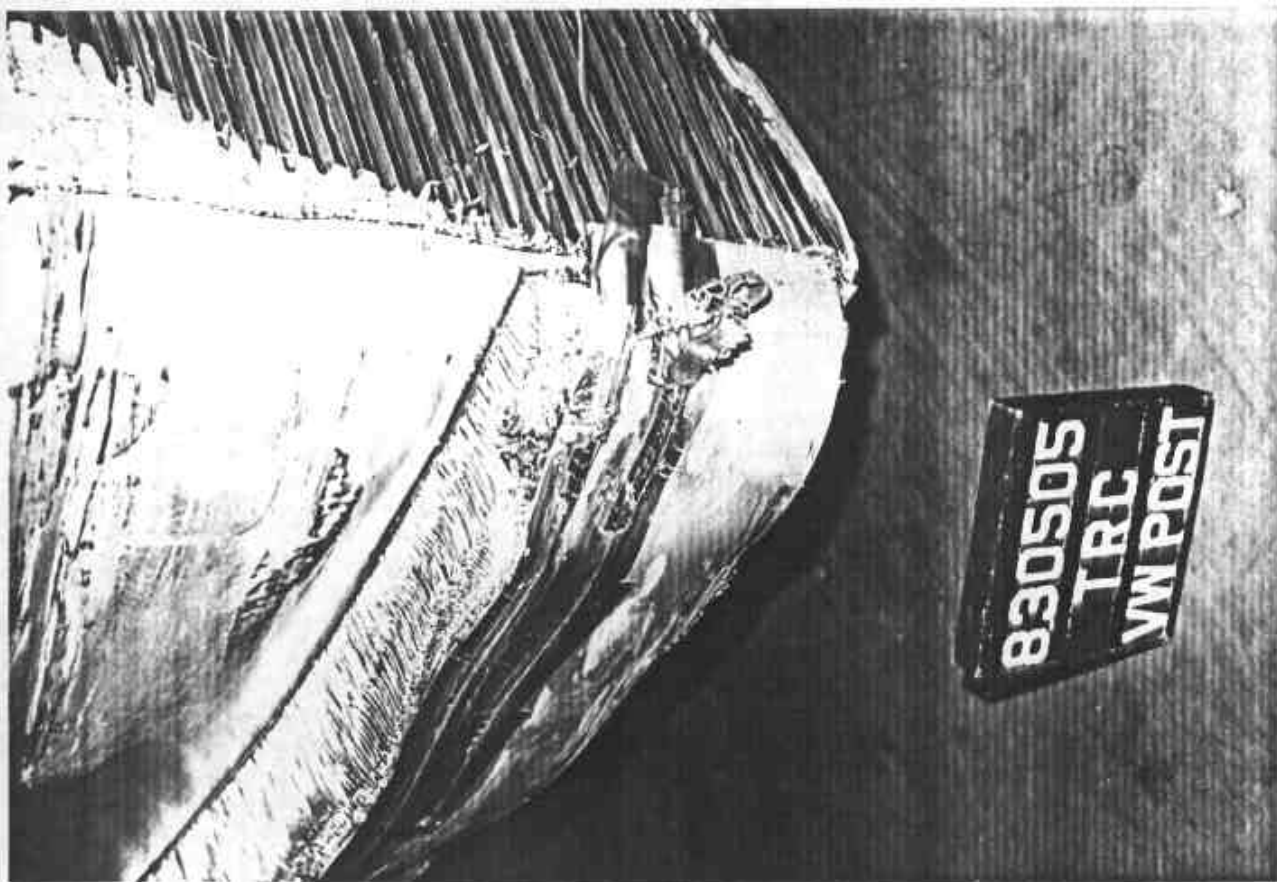


Figure A-20. POST-TEST - MOVING DEFORMABLE BARRIER - VIEW 3



Figure A-21. POST-TEST - DRIVER DUMMY - VIEW 1



Figure A-22. POST-TEST - DRIVER DUMMY - VIEW 2

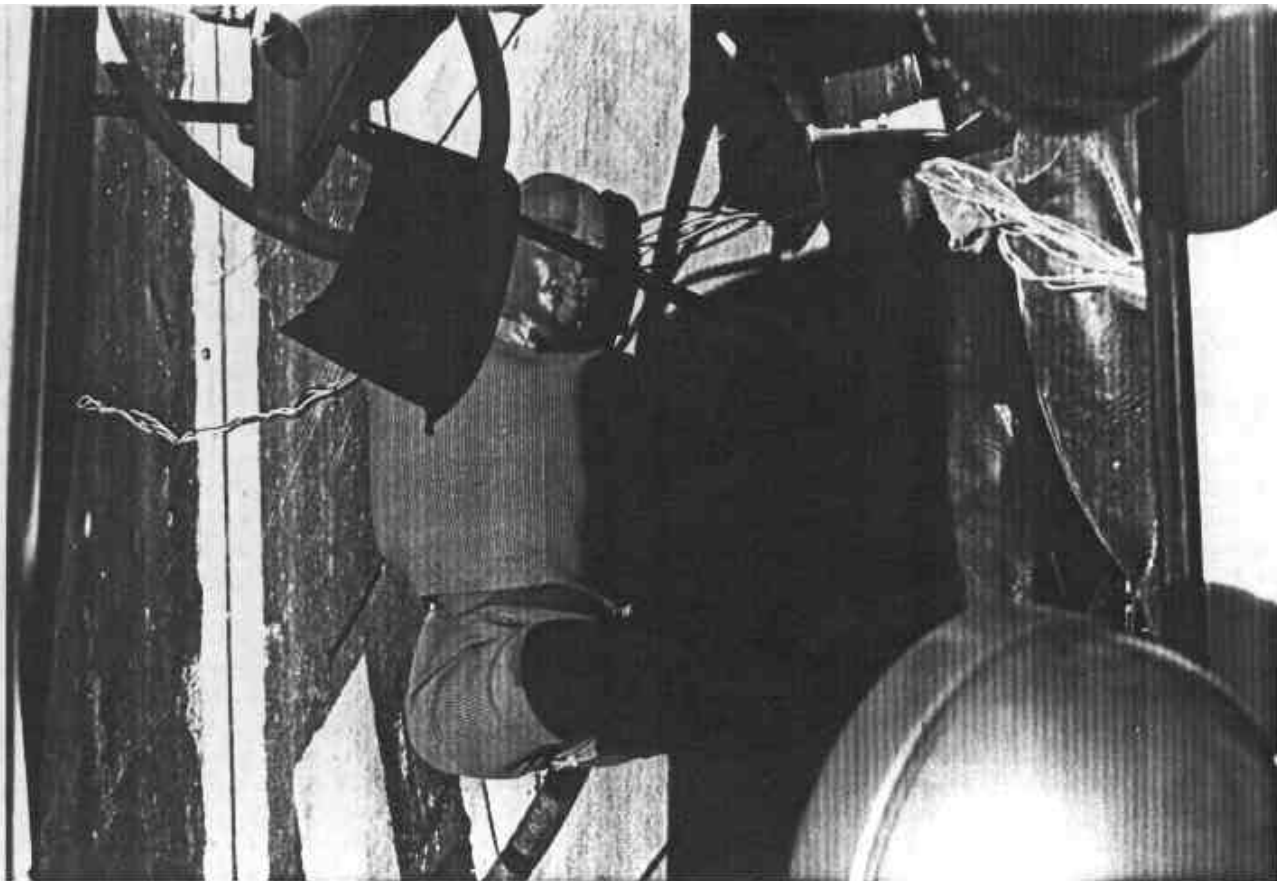


Figure A-23. POST-TEST - DRIVER DUMMY - VIEW 3

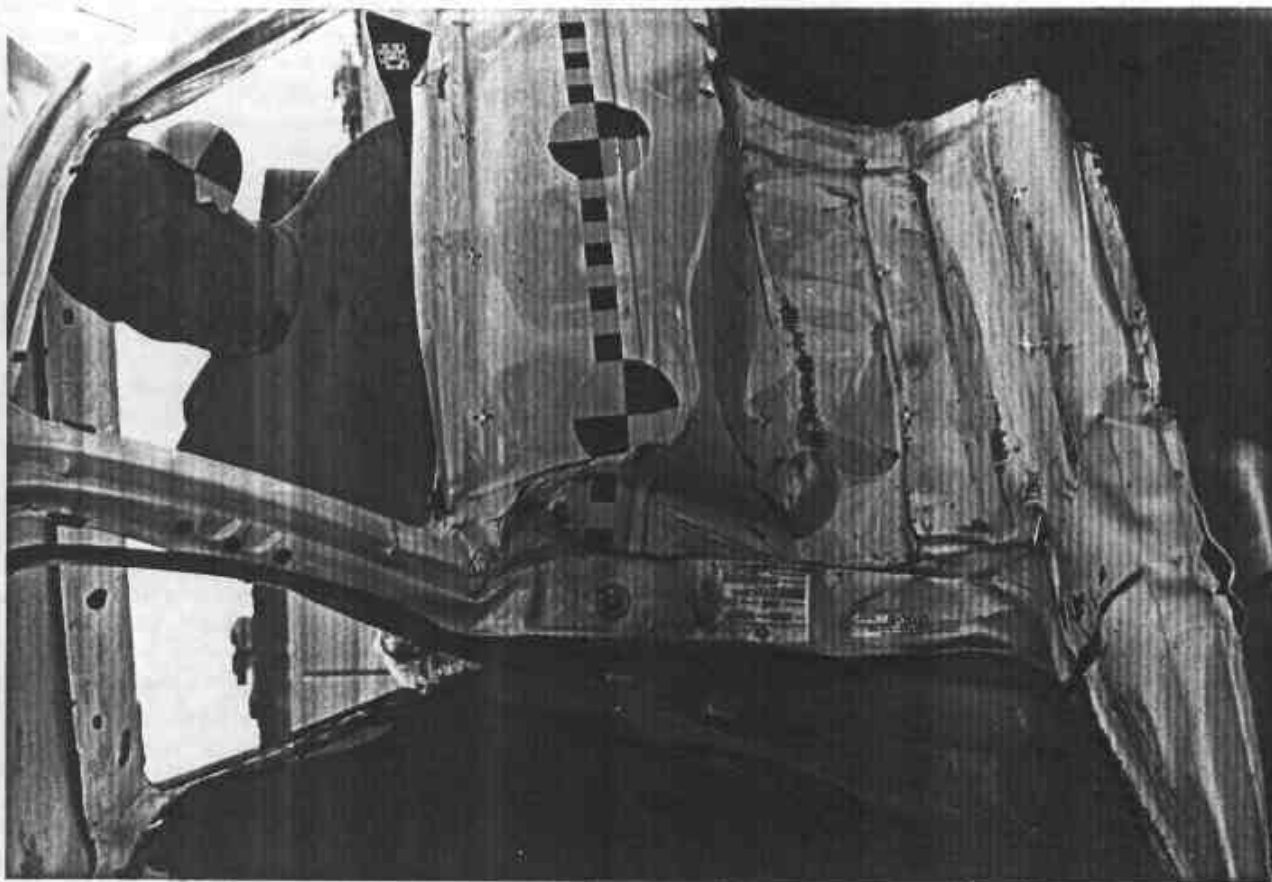


Figure A-24. POST-TEST - PASSENGER DUMMY - VIEW 1

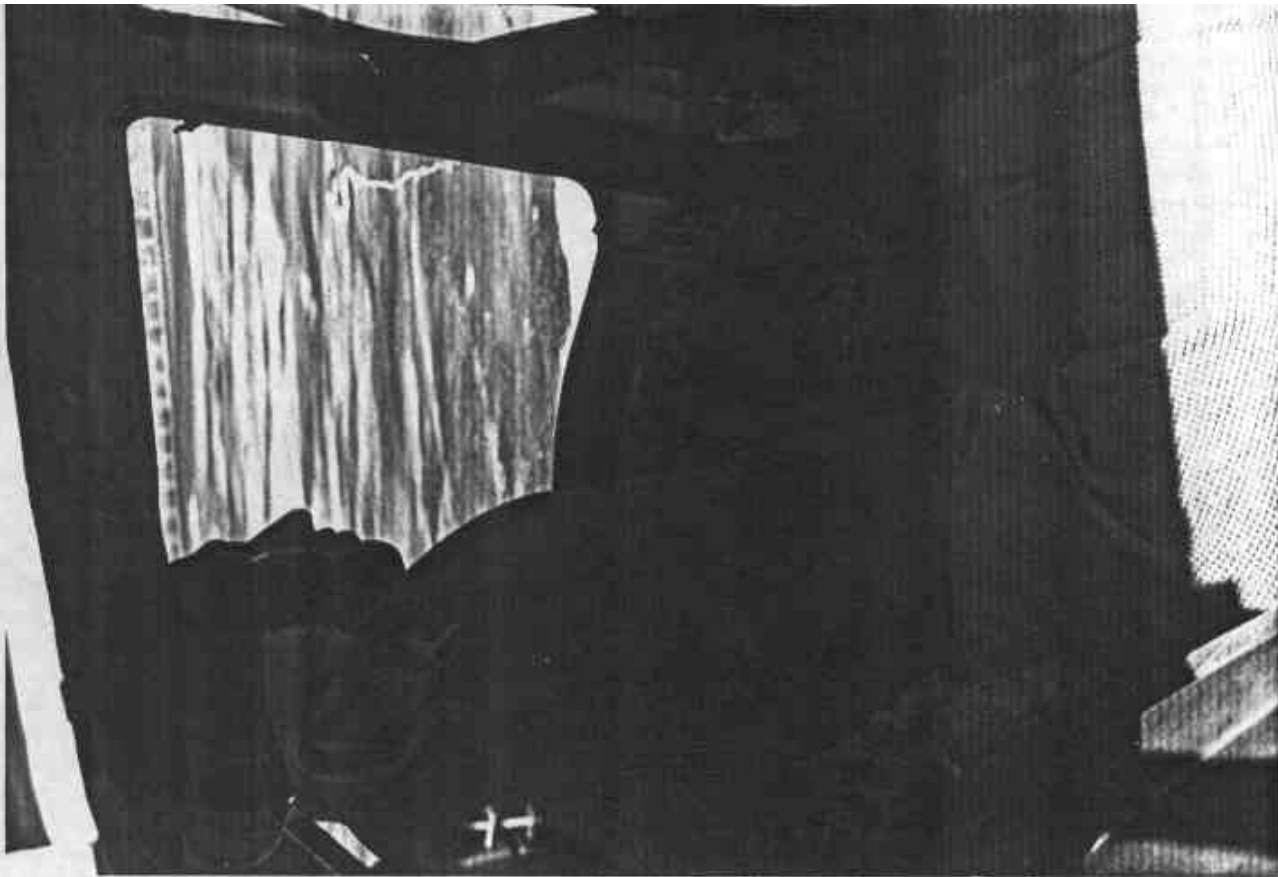


Figure A-25. POST-TEST - PASSENGER DUMMY - VIEW 2

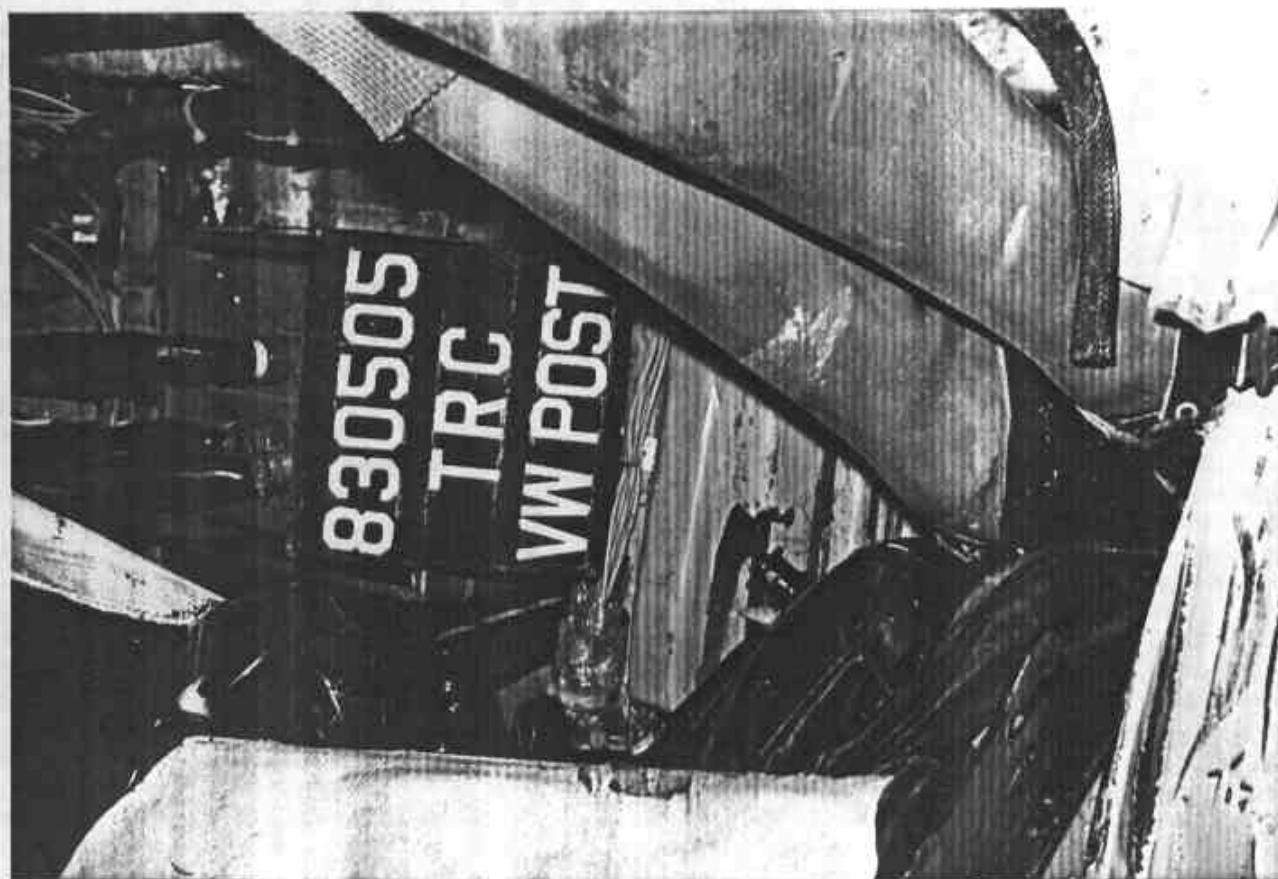


Figure A-26. POST-TEST - PASSENGER DUMMY - VIEW 3

APPENDIX B

DATA PLOT PRESENTATION

Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data were filtered according to SAE J2111, except that dummy thorax data were filtered using the HSRI filter.

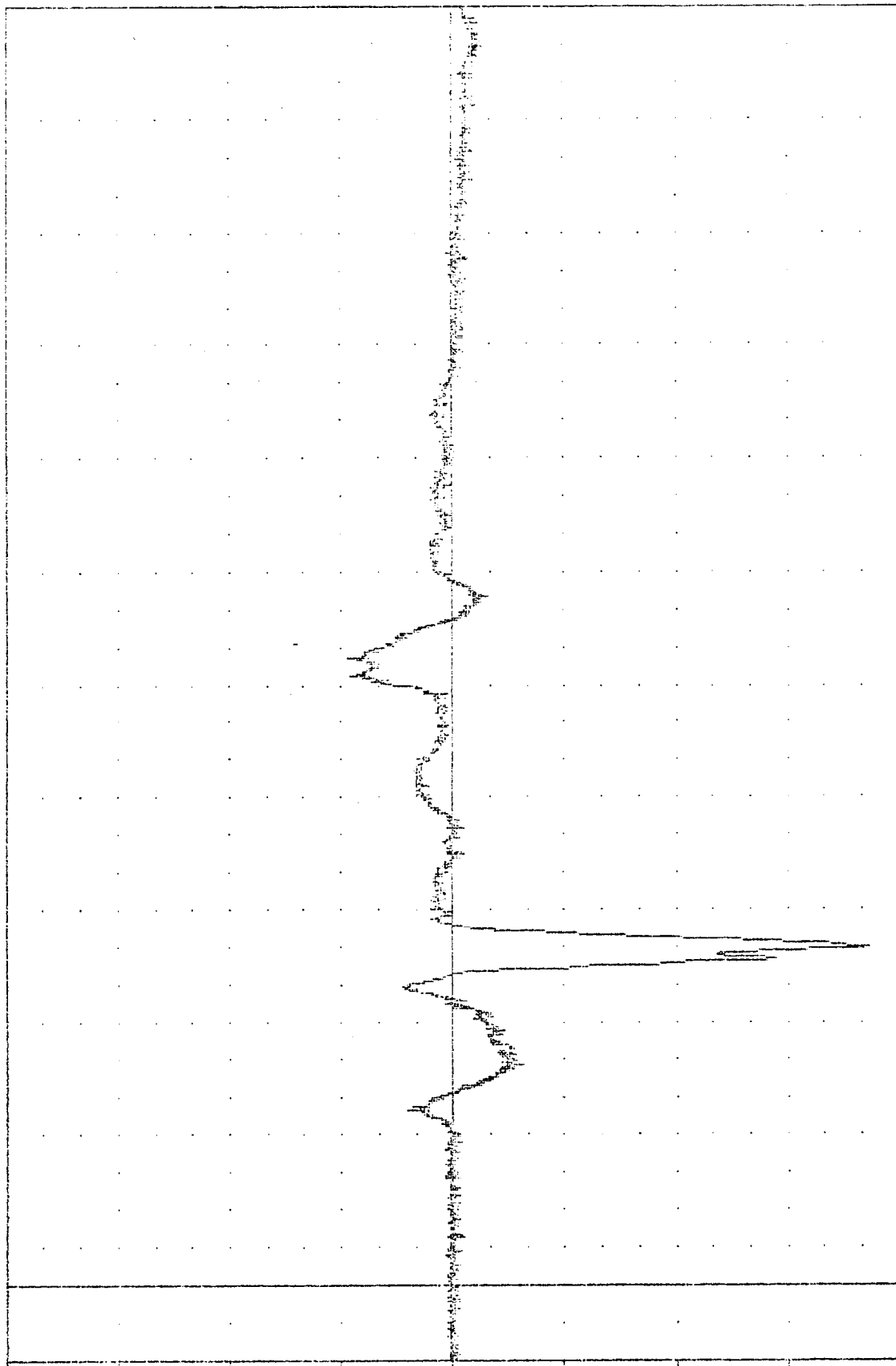
TRC , 030505
 NOB ASSESSMENT-SIDE IMPACT
 03125
 HEDXG1

PLOT DATE 13-MAY-83 10:26:30

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -106.10e 89.88, 46.42 e 167.00

ACCELERATION G



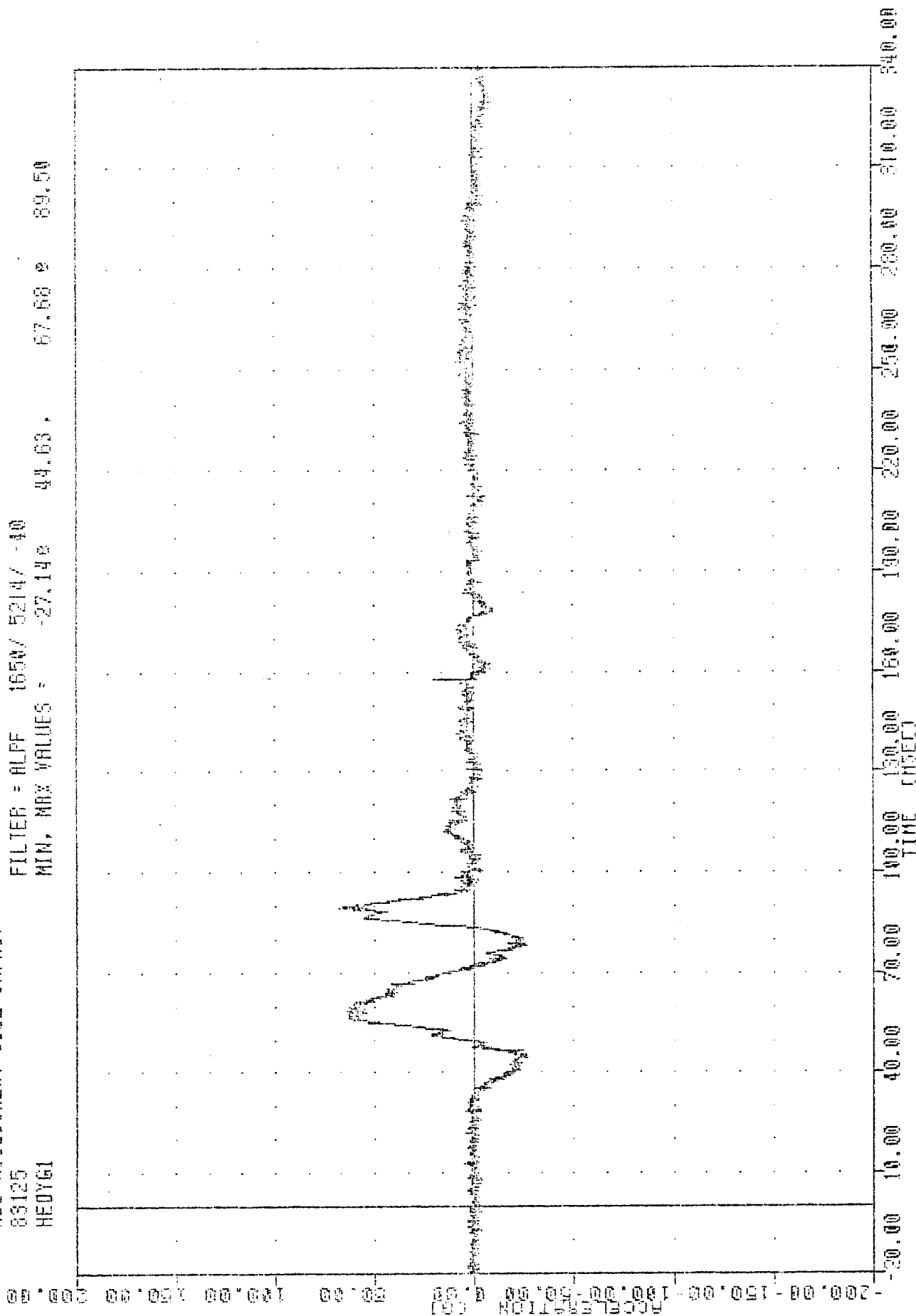
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER HEAD ACCELERATION X AXIS

TBC
 830505
 NDO ASSESSMENT-SIDE IMPACT
 83125
 HEDYG1

PLOT DATE 13-MAY-83 19:26:39

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -27.140 44.63, 67.68 89.50

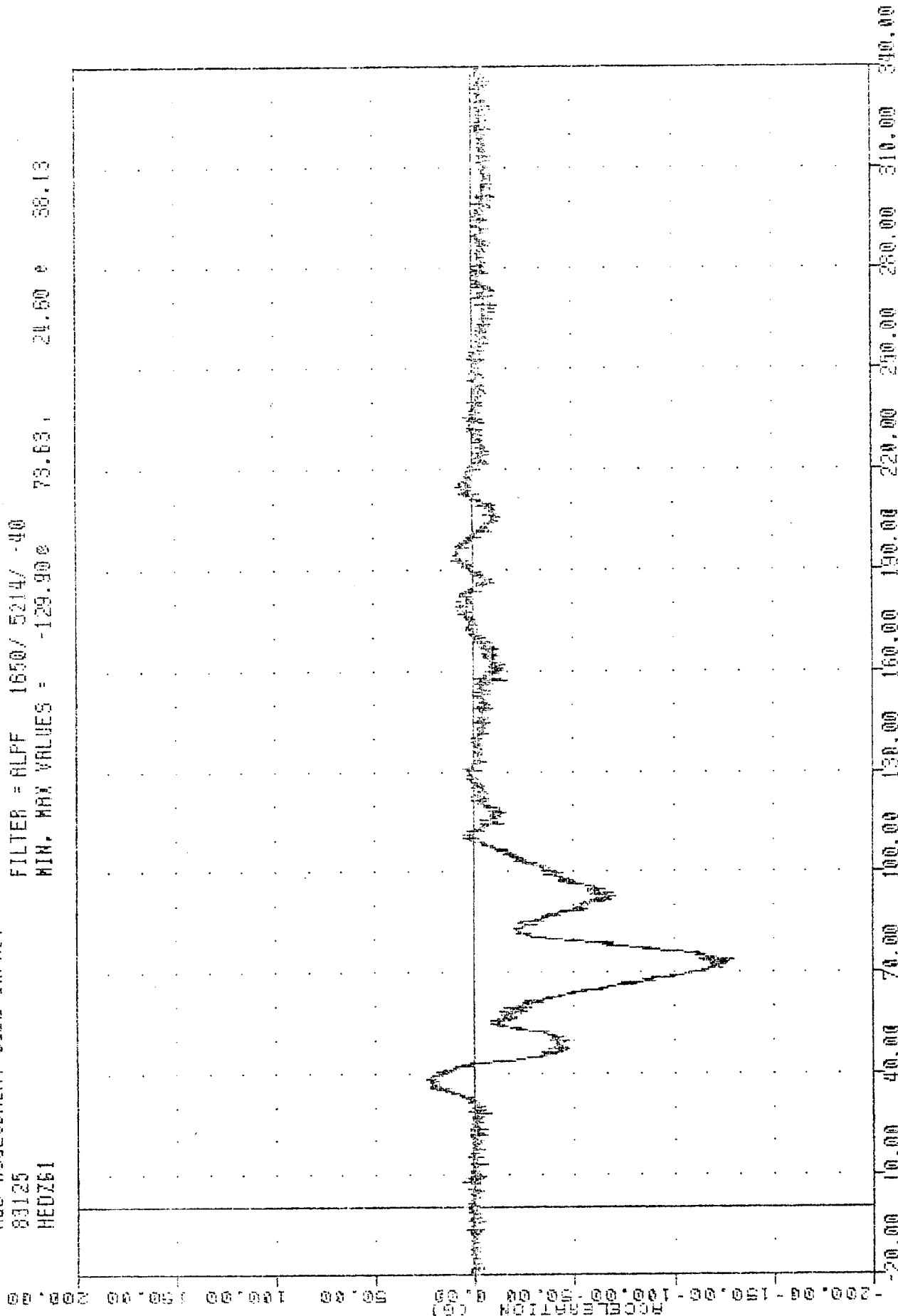


TAC
 MOB ASSESSMENT-SIDE IMPACT
 83125
 HEDZ61

FLUT DATE 13-MAY-83 10:26:38

FILTER = ALFF 1650/ 5214/ -40

MIN. MAX VALUES = -129.900 73.63, 24.60 0 58.13



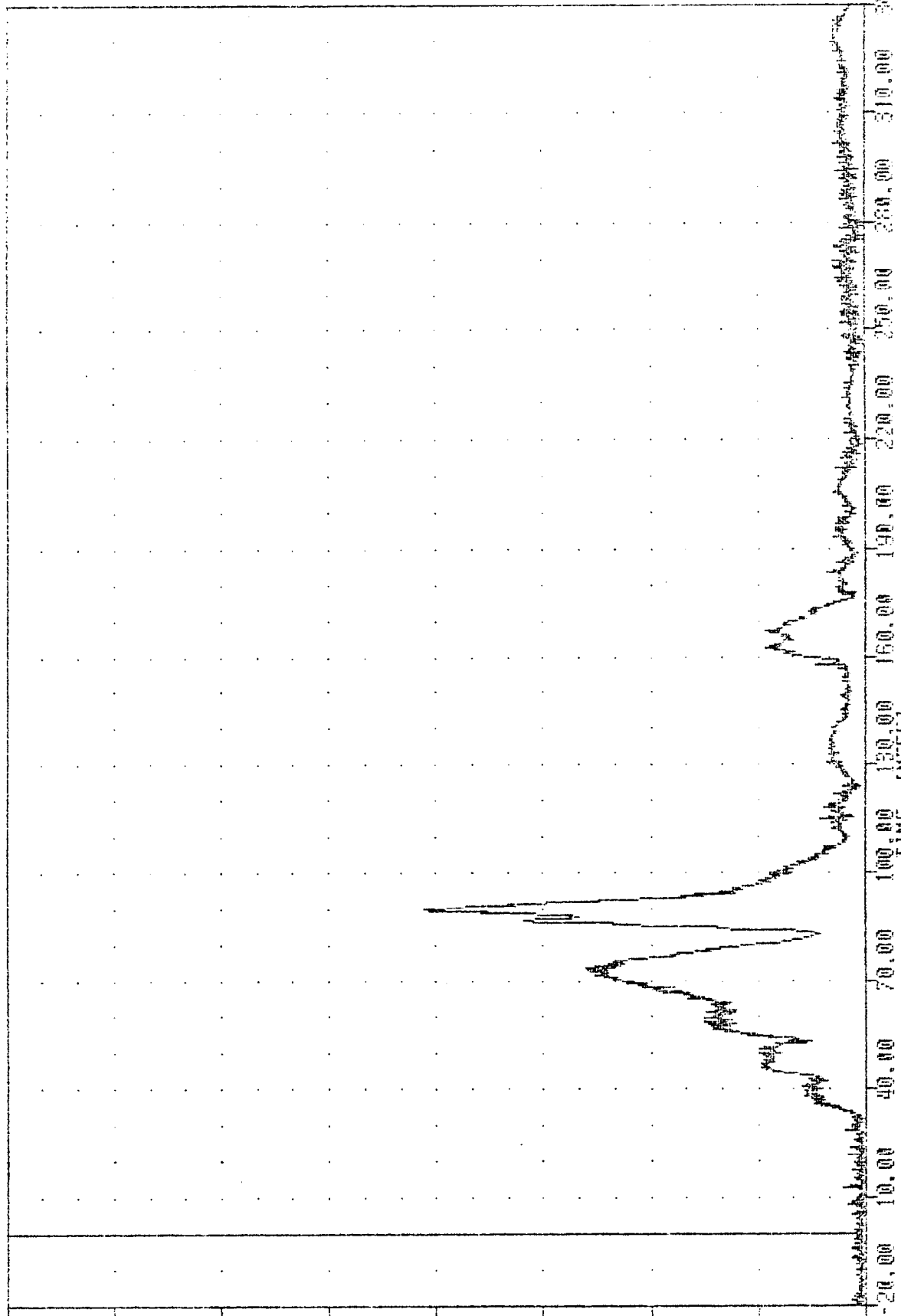
TRC , 830505
 HDO ASSESSMENT-SIDE IMPACT
 83125
 HEDR61

PLOT DATE 13-MAY-80 13:45:32

FILTER = ALPF 1650/ 5214/ -00

MIN. MAX VALUES = 0.15e -18.25, 205.26 e 89.80

ACCELERATION (g)



TIME (msec)

MOVING DEFORMABLE BARRIED INTO VOLKSWAGEN RABBIT
 DRIVER HEAD RESULTANT

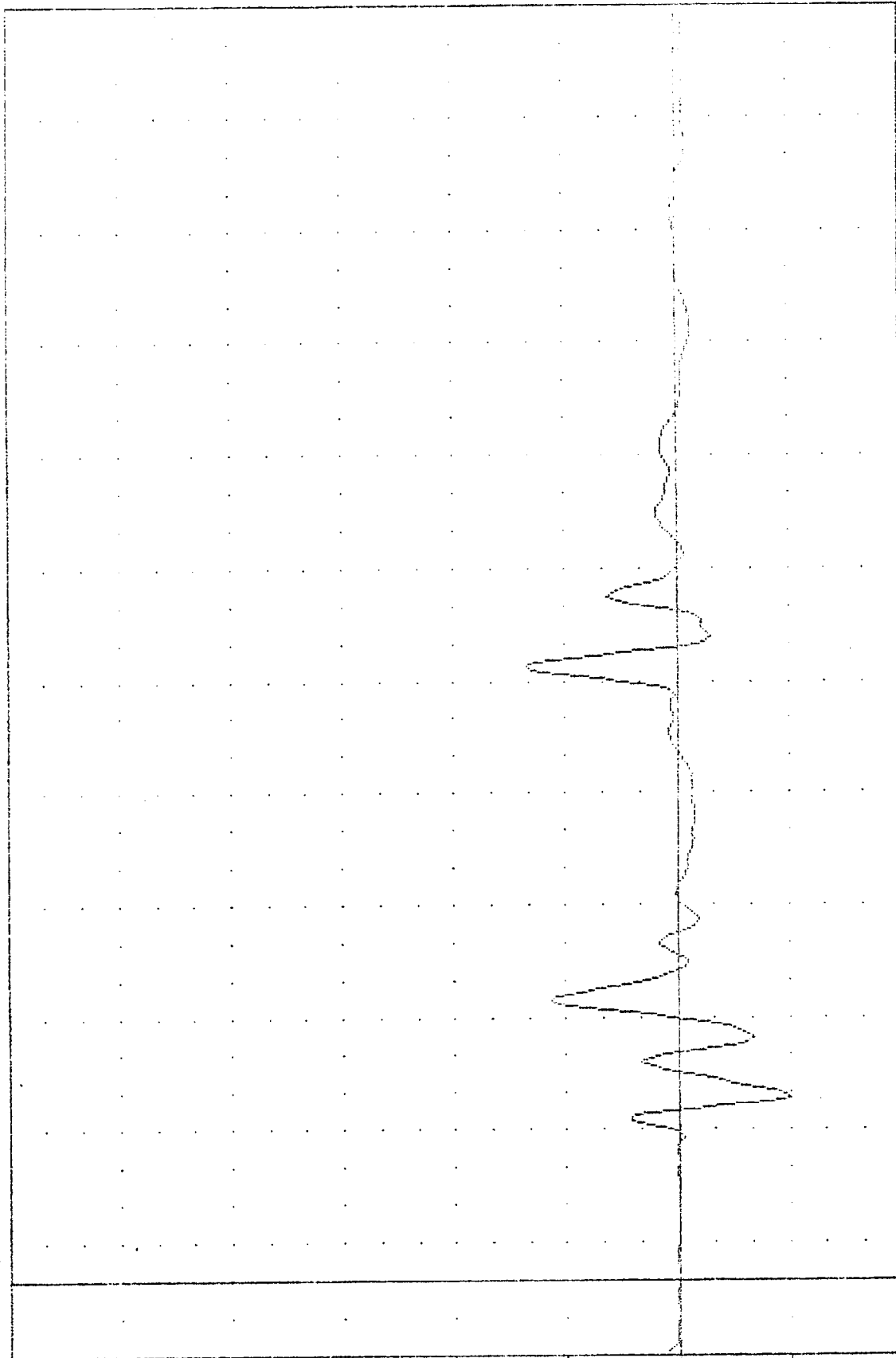
TRC 830505
 NDB ASSESSMENT-SIDE IMPACT
 93125
 101X61

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = -49.84g 48.13g

66.89g 163.13

ACCELERATION



TIME (MSEC)

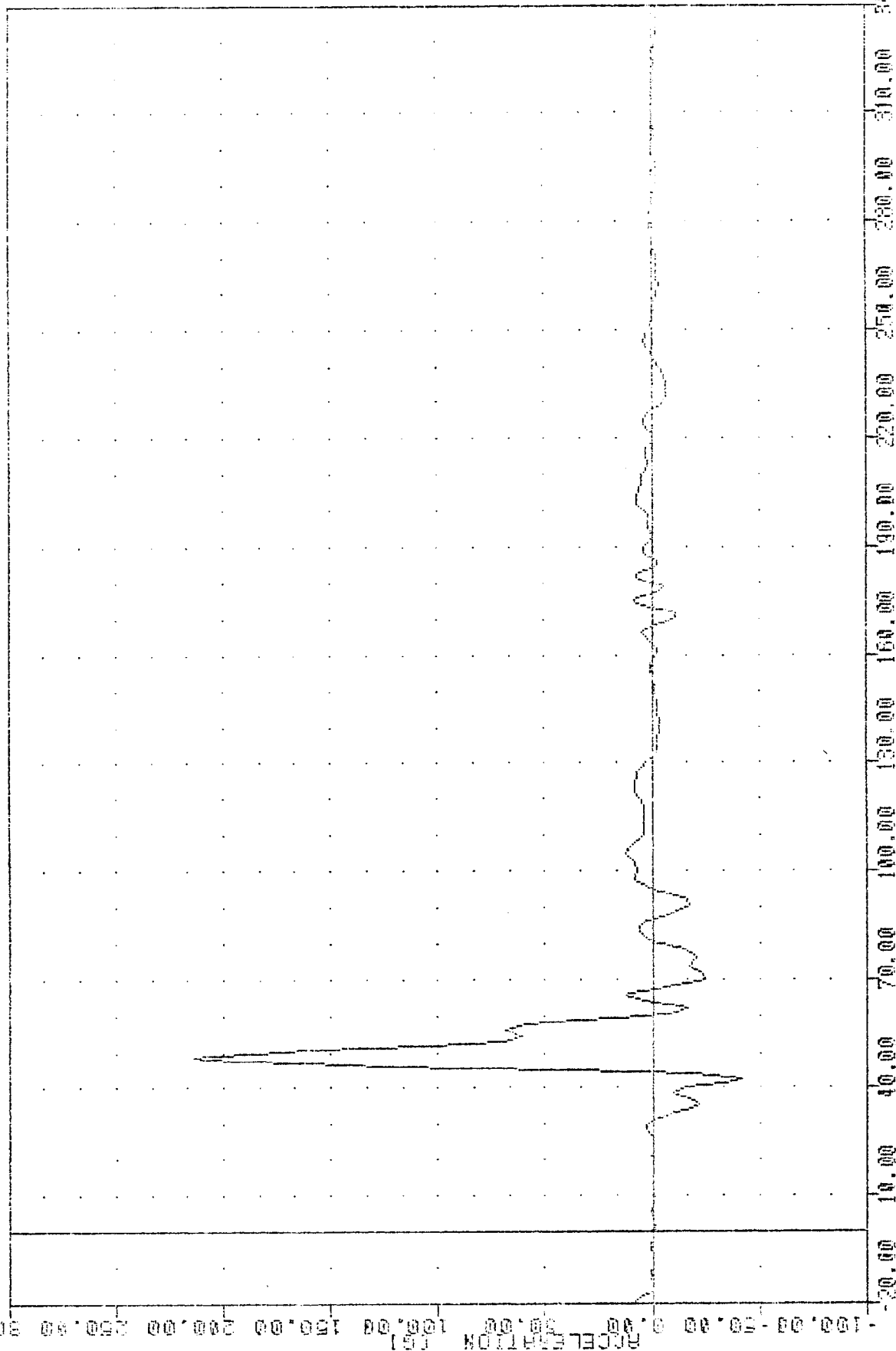
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN PASSAT
 DRIVER UPPER SPINE ACCELERATION X AXIS

TBC 830505
 MOB ASSESSMENT-SIDE IMPACT
 83125
 T01Y61

PLOT DATE 18-MAY-83 12:06:24

FILTER = HSRI 136/ 169/ -50
 MIN, MAX VALUES = -42.112 41.87, 213.70 48.13

ACCELERATION
 TIME (MSEC)



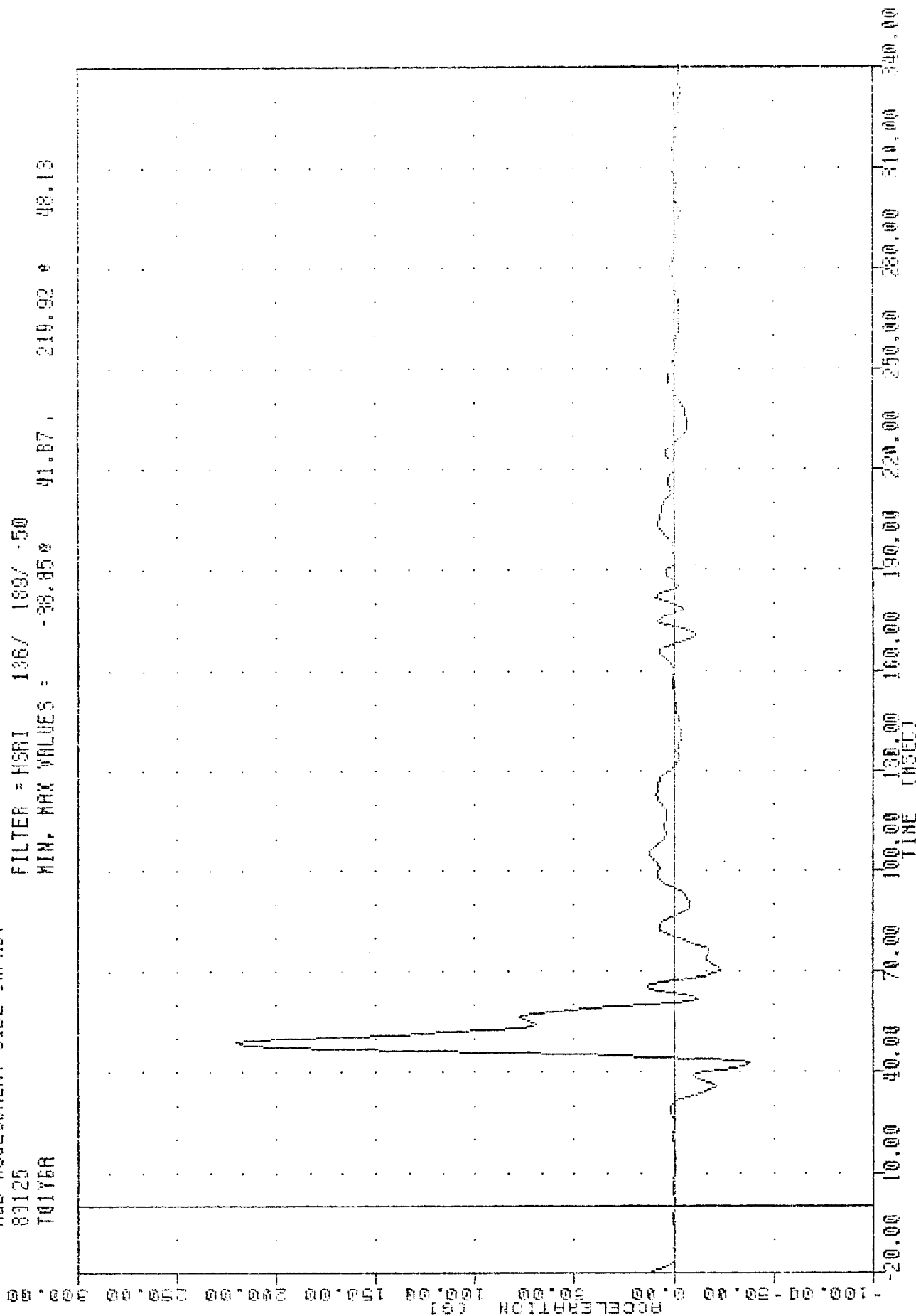
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE ACCELERATION (X AXIS)

TAC 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 T01Y6R

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -38.85° 41.87, 219.92° 48.13



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

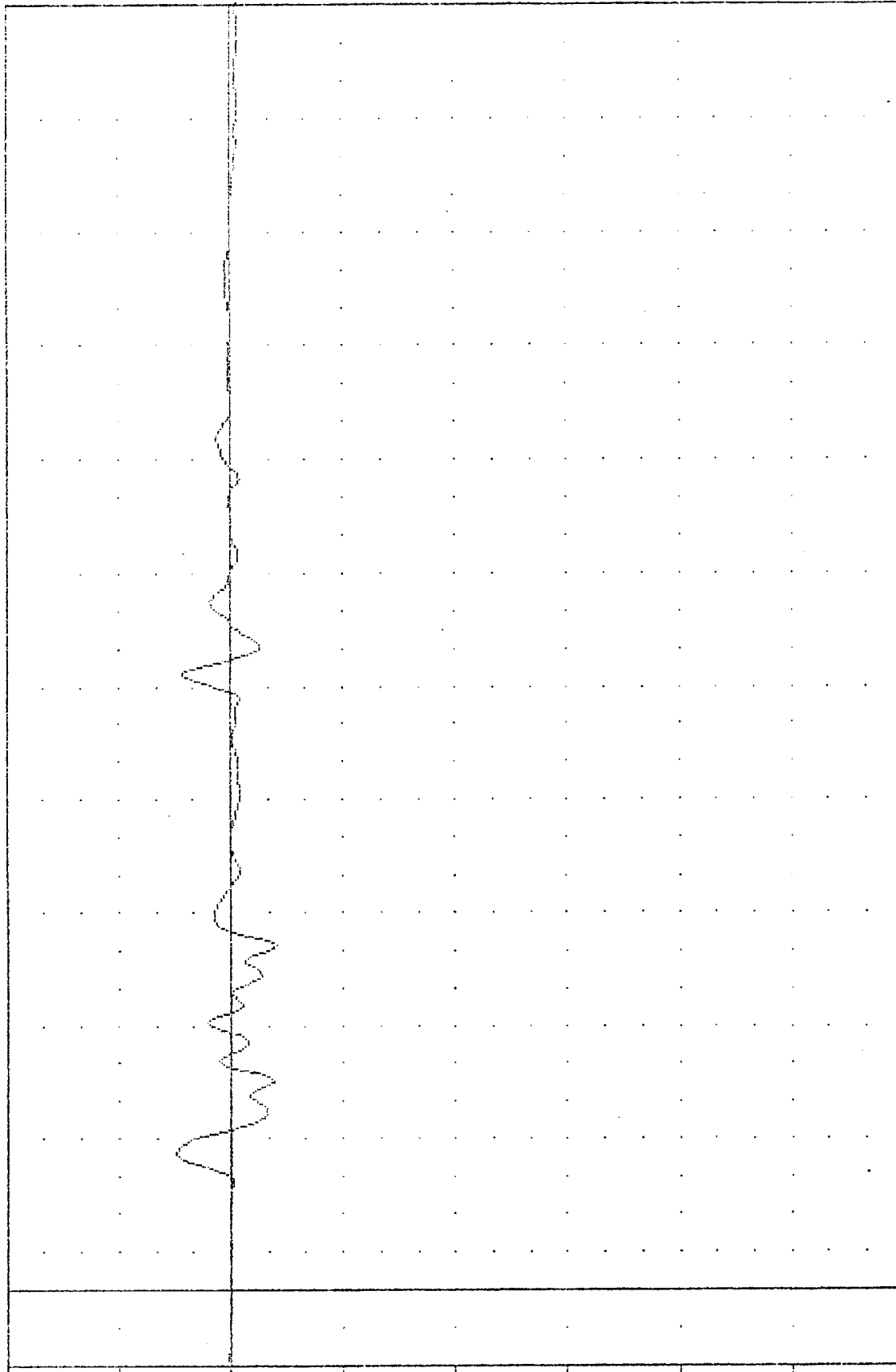
TRC 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 T01ZG1

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSR 136/ 189/ -50

MIN. MAX VALUES : -19.90 90.62, 23.82 35.63

ACCELERATION (G)

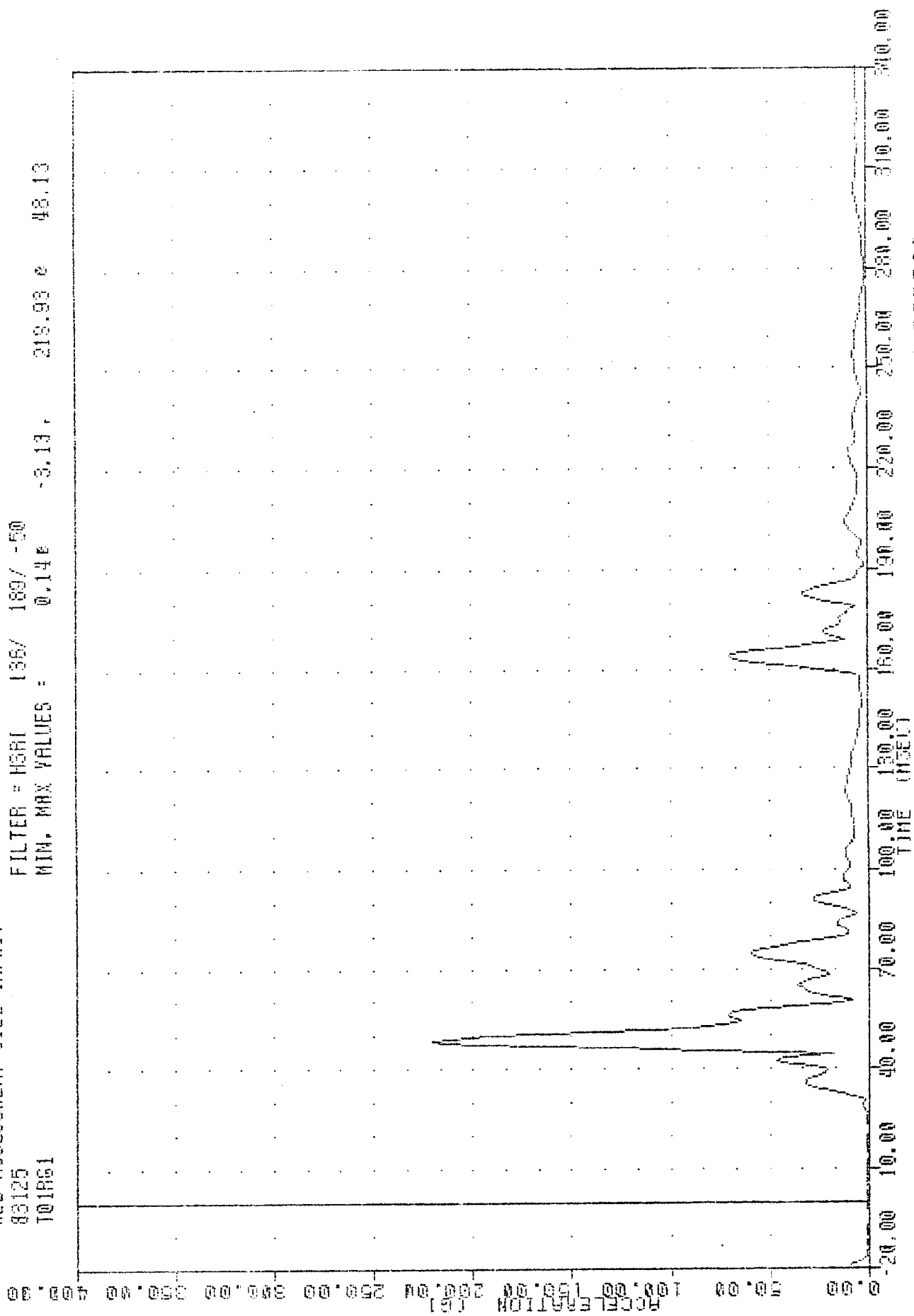


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE ACCELERATION Z AXIS

TRC , 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 T01R61

PLOT DATE 13-MAY-83 13:57:56

FILTER = HGR1 136/ 189/ -50
 MIN. MAX VALUES = 0.142 -3.13, 213.93 e 48.13

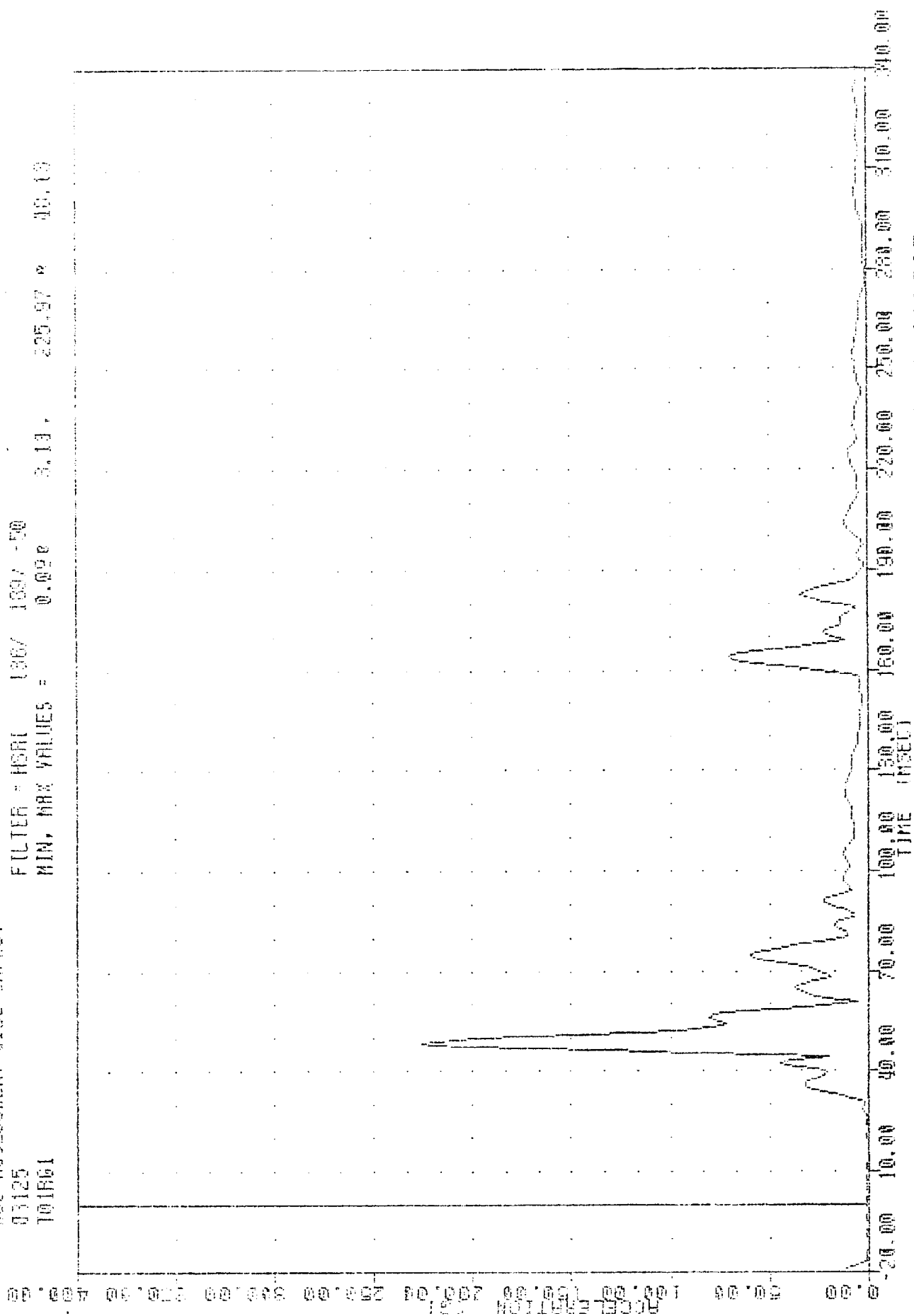


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN PASS11
 DRIVER UPPER SPINE RECHT TRN1

160 8305005
 NO. ASSESSMENT-SIDE IMPACT
 03125
 101R61

PLOT DATE 29 MAY 66 11:00:35

FILTER = HSR 136/ 100/ -50
 MIN. MAX VALUES = 0.000 3.13 225.97 40.10



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN PASSAT
 DRIVEN UPPER SPINE RESULTANT USING T01Y6A

TRC , 830505
NDB ASSESSMENT-SIDE IMPACT

PLOT DATE 16-MAY-83 10:44:31

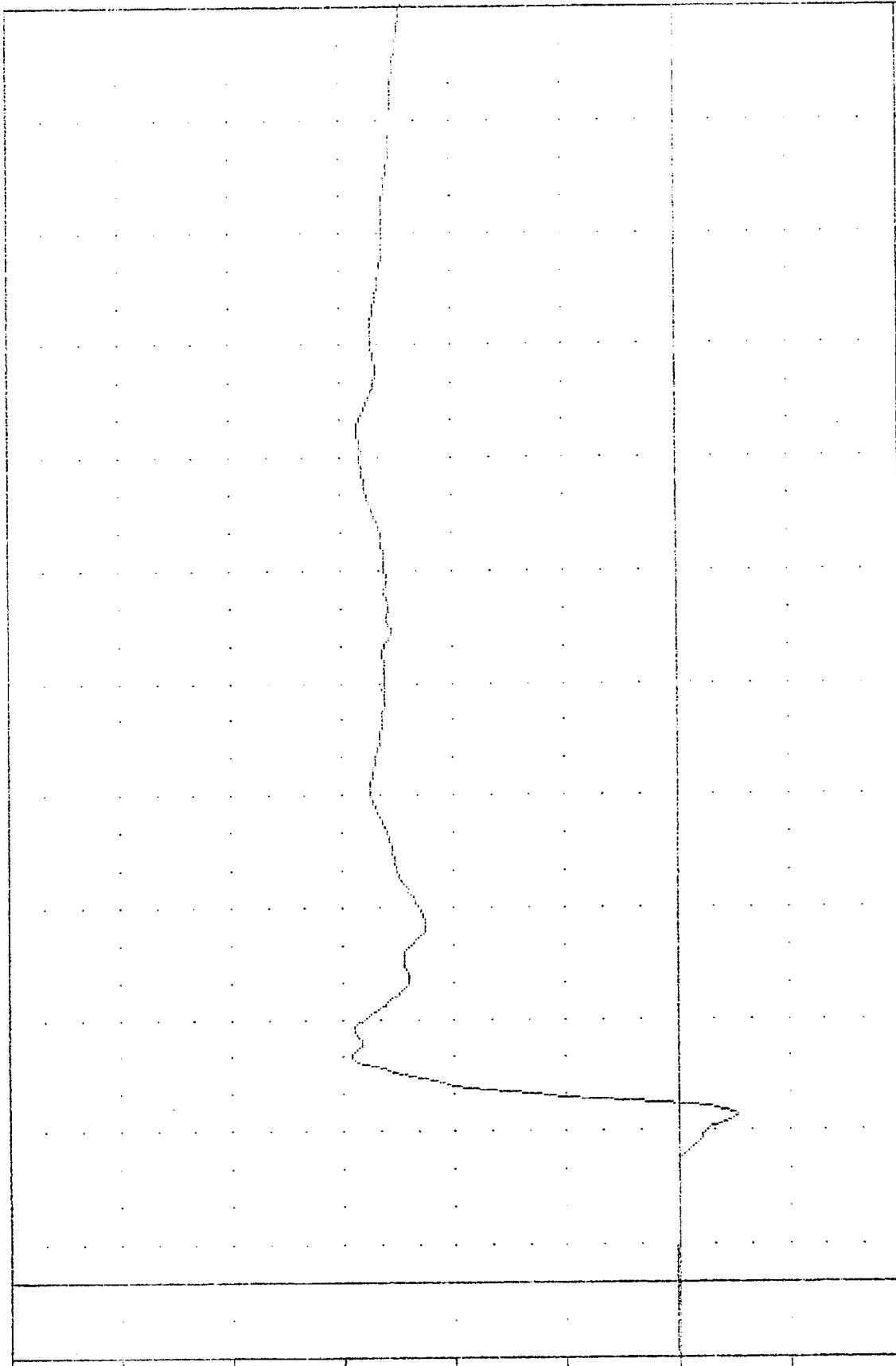
03125

FILTER = HSRI 136/ 183/ -50

T01YV1

MIN. MAX VALUES = -5.41 43.75 , 29.14 59.38

VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN ROCKET

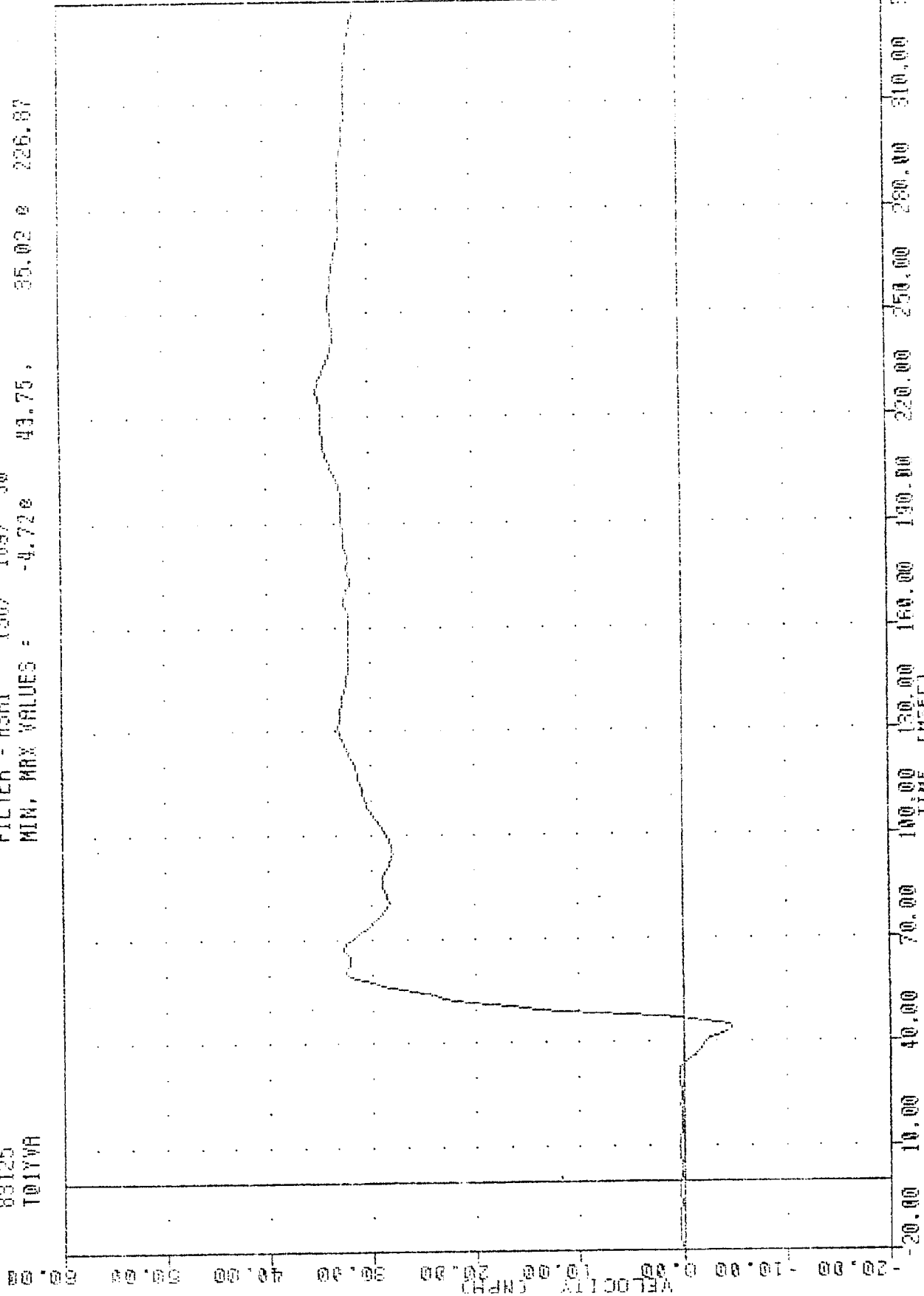
DELTA V USING T01YV1

TRC , 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 T01Y9A

PLOT DATE 16-MAY-88 10:44:31

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -4.72e 43.75, 35.02 e 226.87

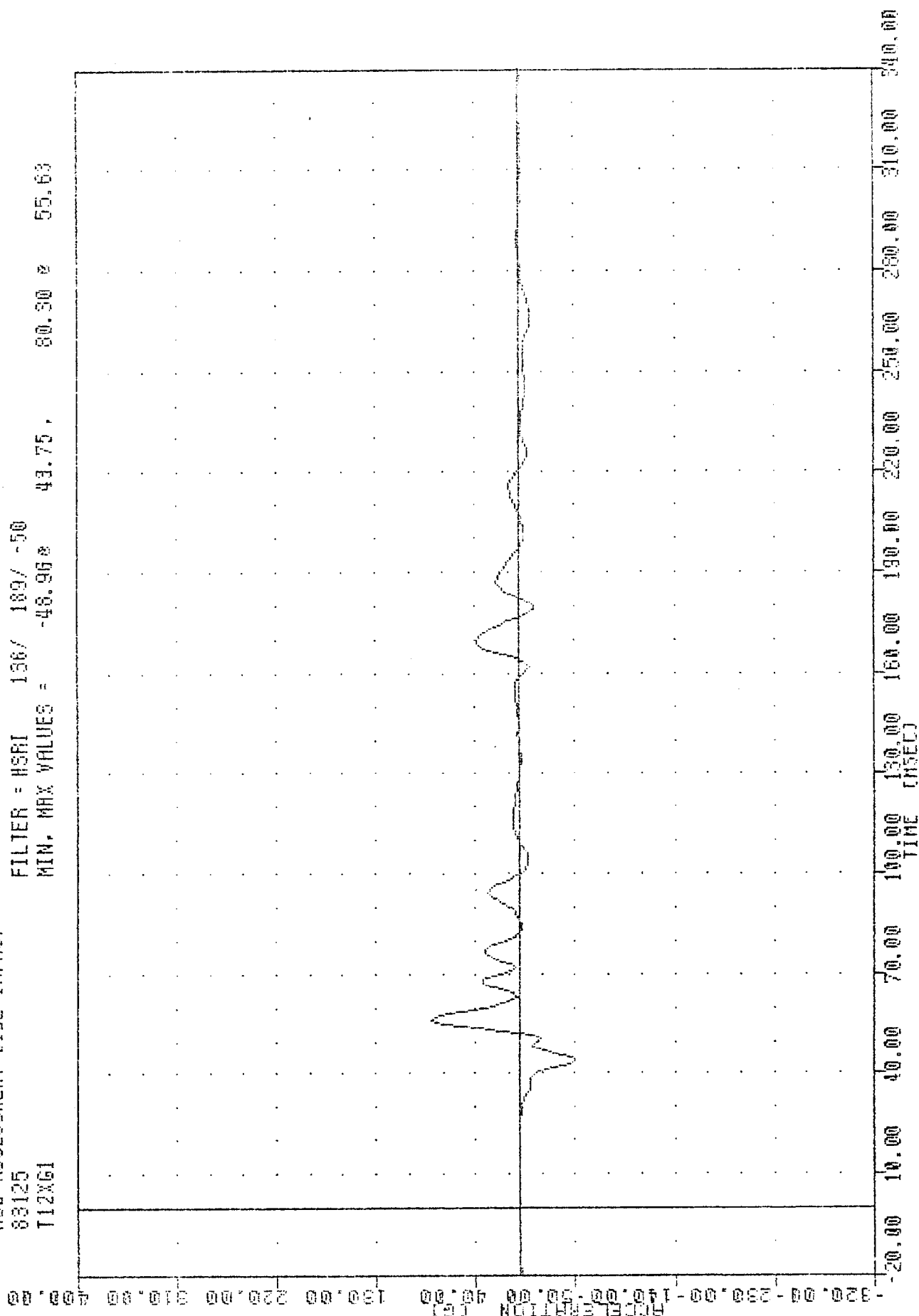


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN CABRIO
 DET IN V USING T01Y9A

TRC 830505
 MOB ASSESSMENT-SIDE IMPACT
 83125
 T12X61

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -48.96 43.75 80.30 55.63

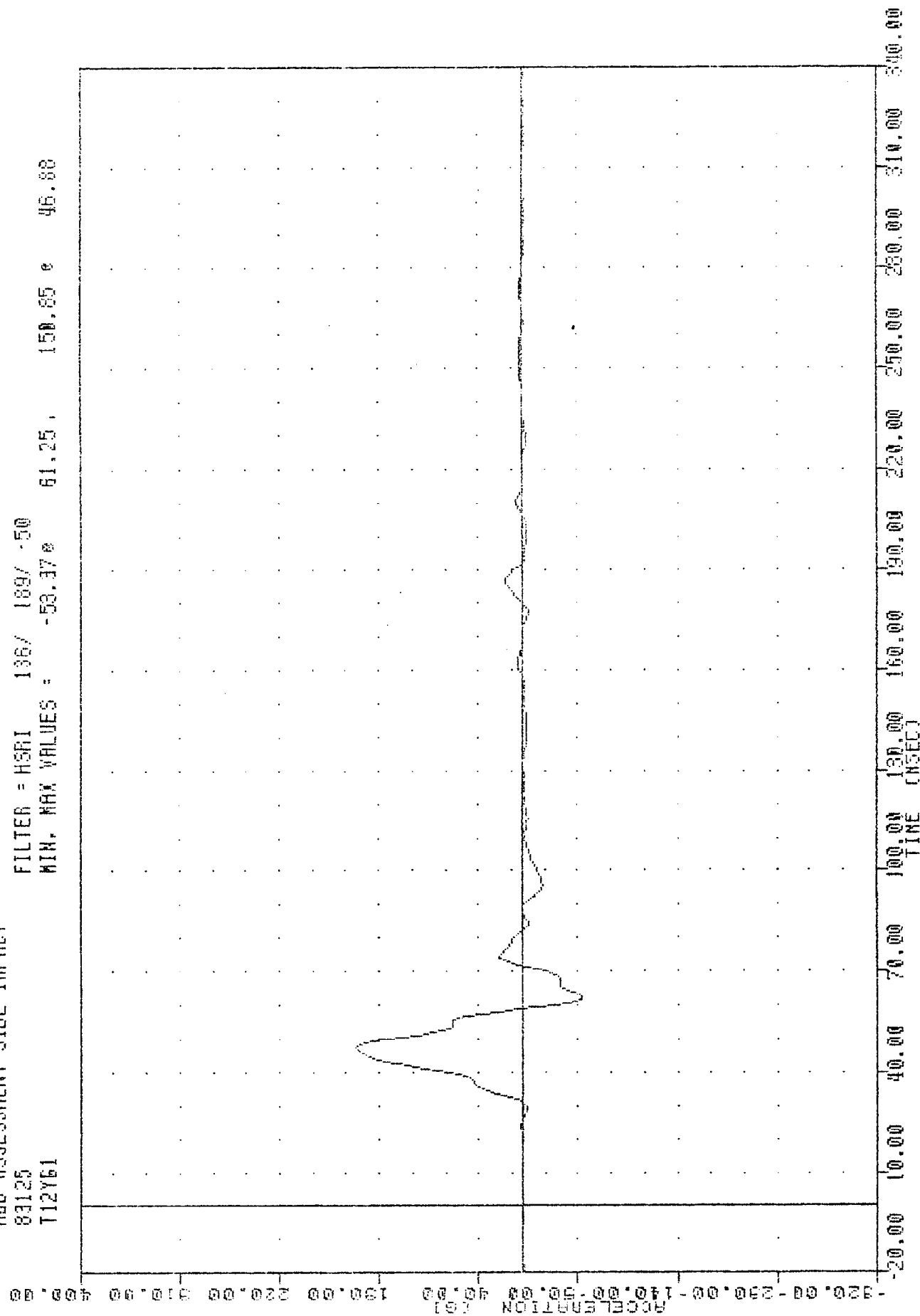


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE ACCELERATION X AXIS

TAC 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 T12Y61

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -53.37° 61.25 , 150.85 ° 46.88



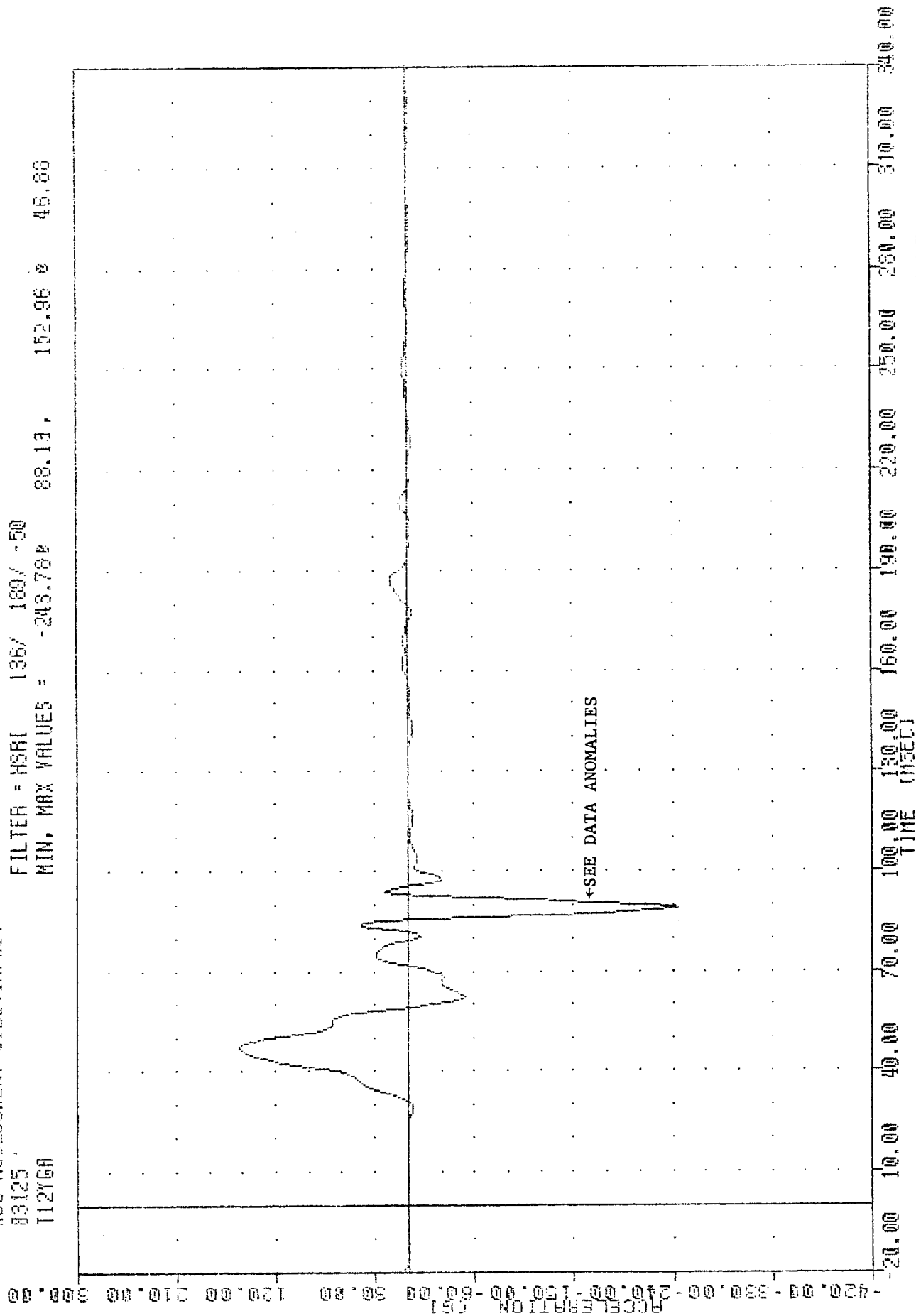
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE ACCELERATION Y AXIS

TRC 830505
 MOB ASSESSMENT-SIDE IMPACT
 83125
 T12YGA

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSR1 136/ 189/ -50

MIN, MAX VALUES = -243.70% 88.13, 152.96% 45.88



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

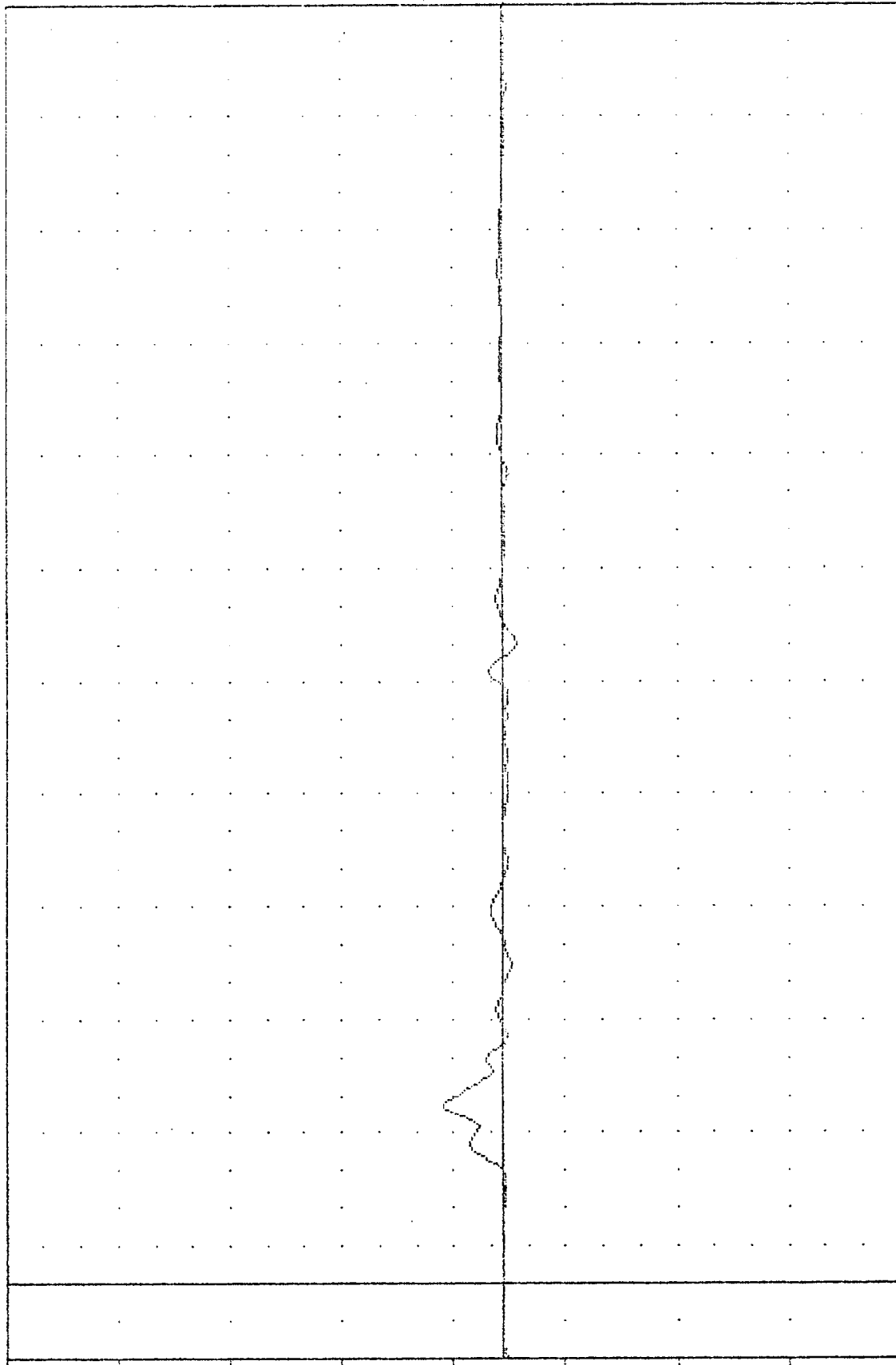
TRC , 830505
 MDB ASSESSMENT-SIDE IMPACT
 83125
 T127G1

PLOT DATE 13-MAY-83 12:46:24

FILTER = H3R1 136/ 189/ -50

MIN. MAX VALUES = -10.480 169.38, 47.94 46.25

ACCELERATION (G)



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

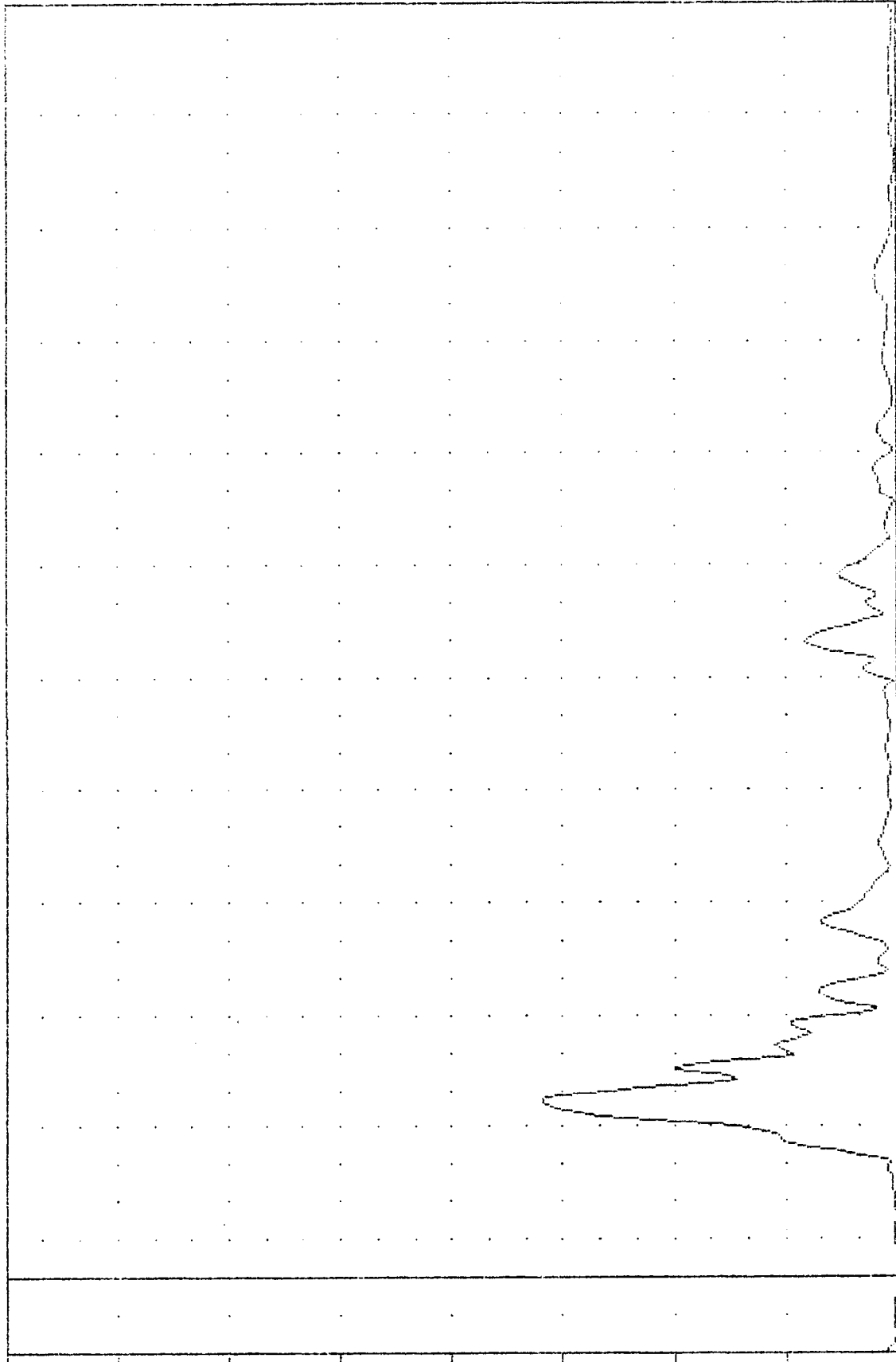
TRC , 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 T12R61

PLOT DATE 13-MAY-83 13:57:56

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.13e 15.00, 159.22 e 46.25

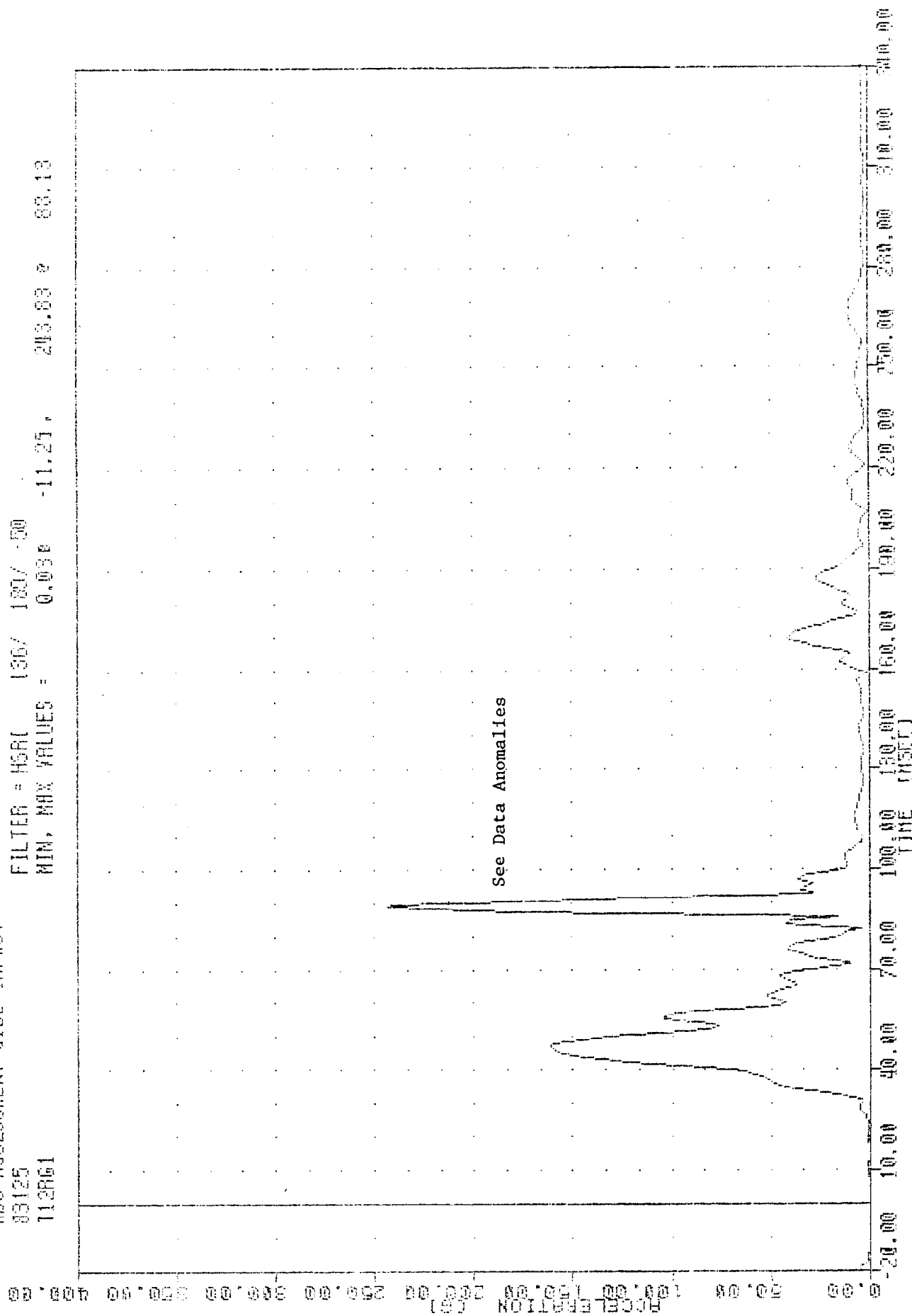
ACCELERATION (G)



TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE RESULTANT

TRC 830505 PLOT DATE 24-MAY-83 13:10:56
 NDB ASSESSMENT-SIDE IMPACT
 83125 FILTER = HGR1 100/ 100/ -50
 112RG1 MIN, MAX VALUES = 0.03e -11.25, 243.88 e 88.13



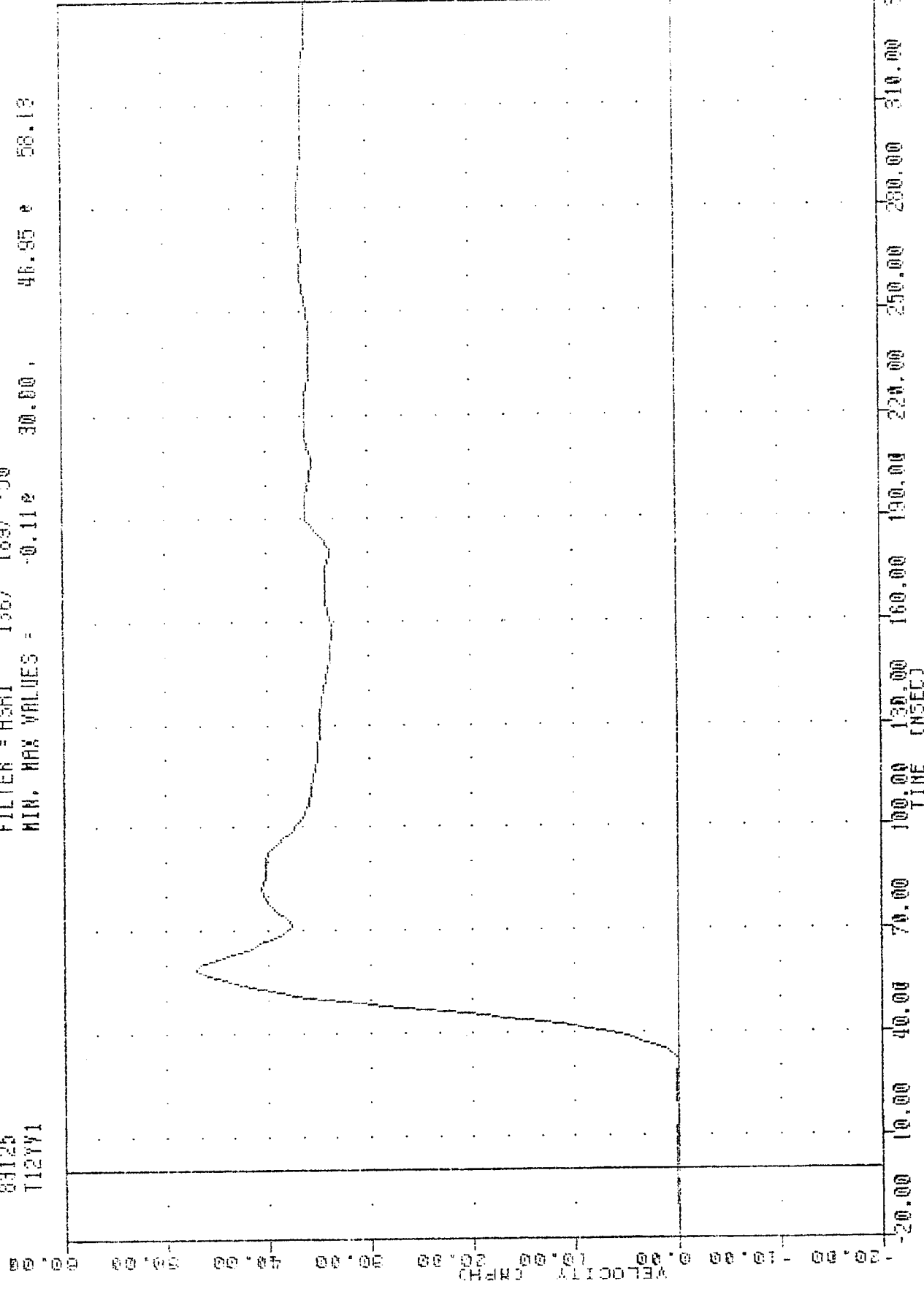
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN CARROT
 DRIVER LOWER SPINE RESULTANT USING 1127GH

TAC 830505
 MOB ASSESSMENT-SIDE IMPACT
 83125
 T12VV1

PLOT DATE 16-MAY-83 10:44:31

FILTER = HSR1 136/ 139/ -50

MIN. MAX VALUES = -0.11e 30.00, 46.95 e 58.13



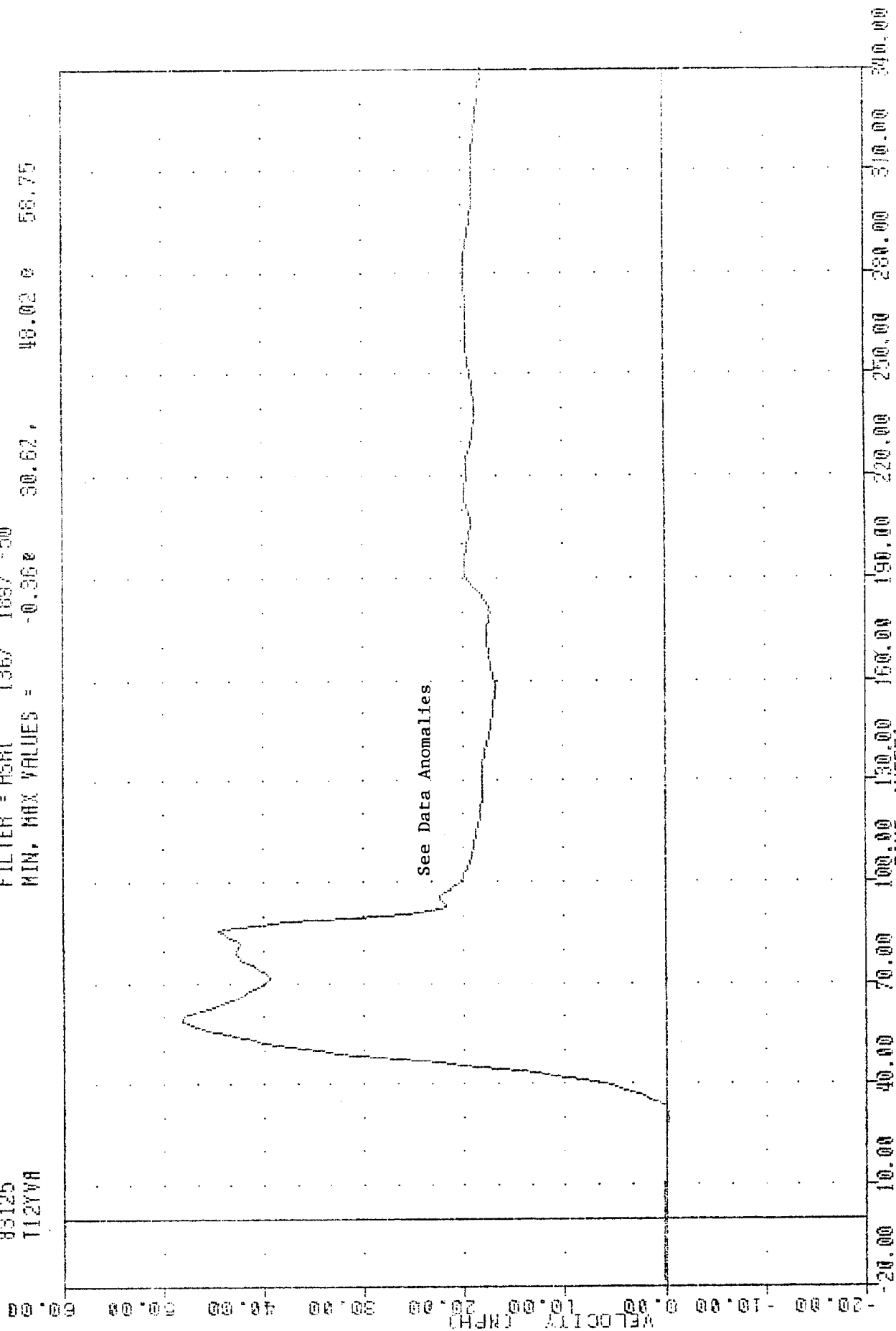
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING PLYVI

TRC , 830505
 MDB ASSESSMENT-SIDE IMPACT
 83125
 T12YVA

PLOT DATE 16-MAY-83 10:44:31

FILTER = HSR 136/ 189/ -50

MIN, MAX VALUES = -0.36e 30.62, 48.02 e 58.75



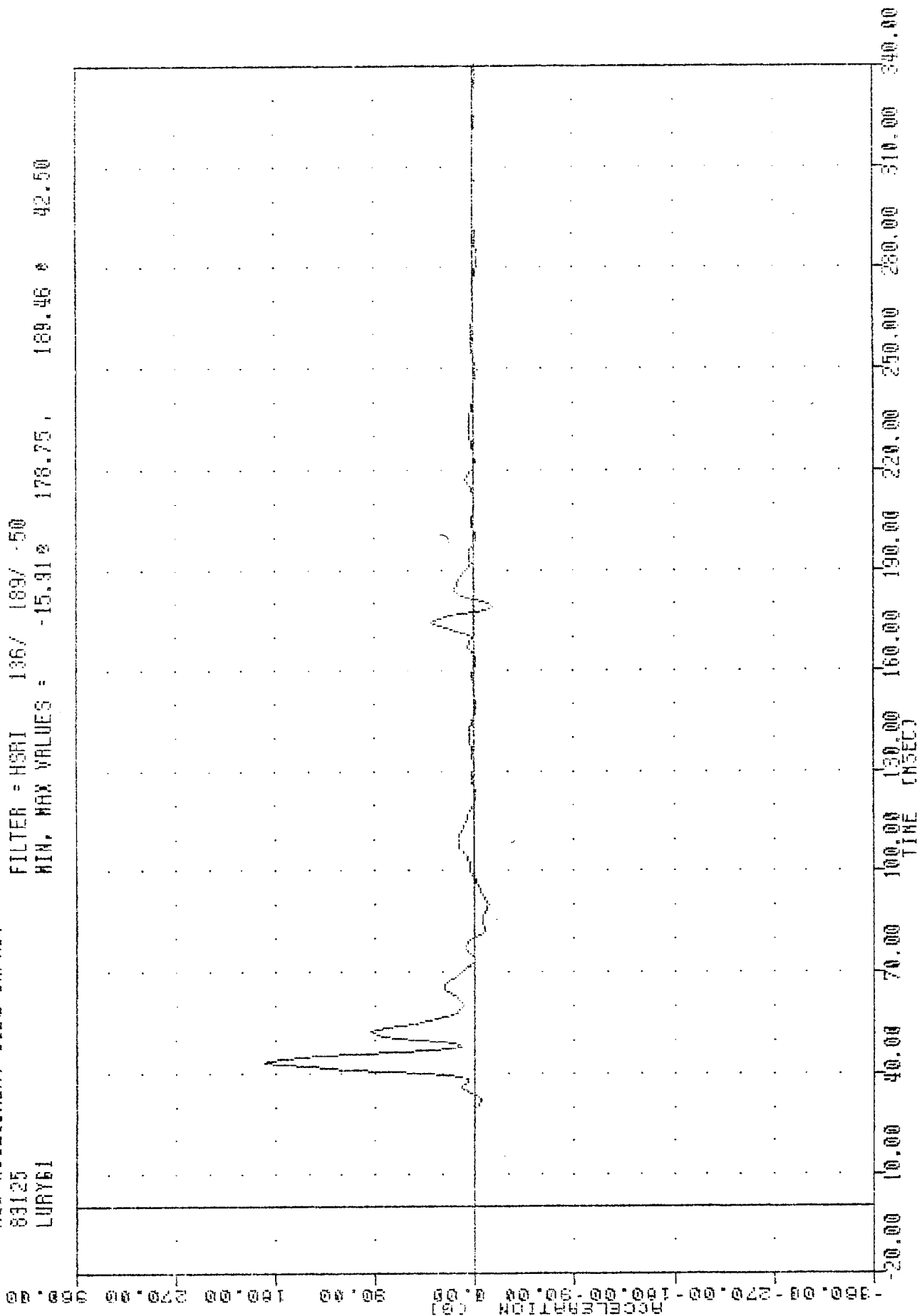
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YVA

TAC
 83125
 LURY61
 NDB ASSESSMENT-SIDE IMPACT

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSRI 136/ 189/ .50

MIN. MAX VALUES = -15.912 178.75 189.46 42.50

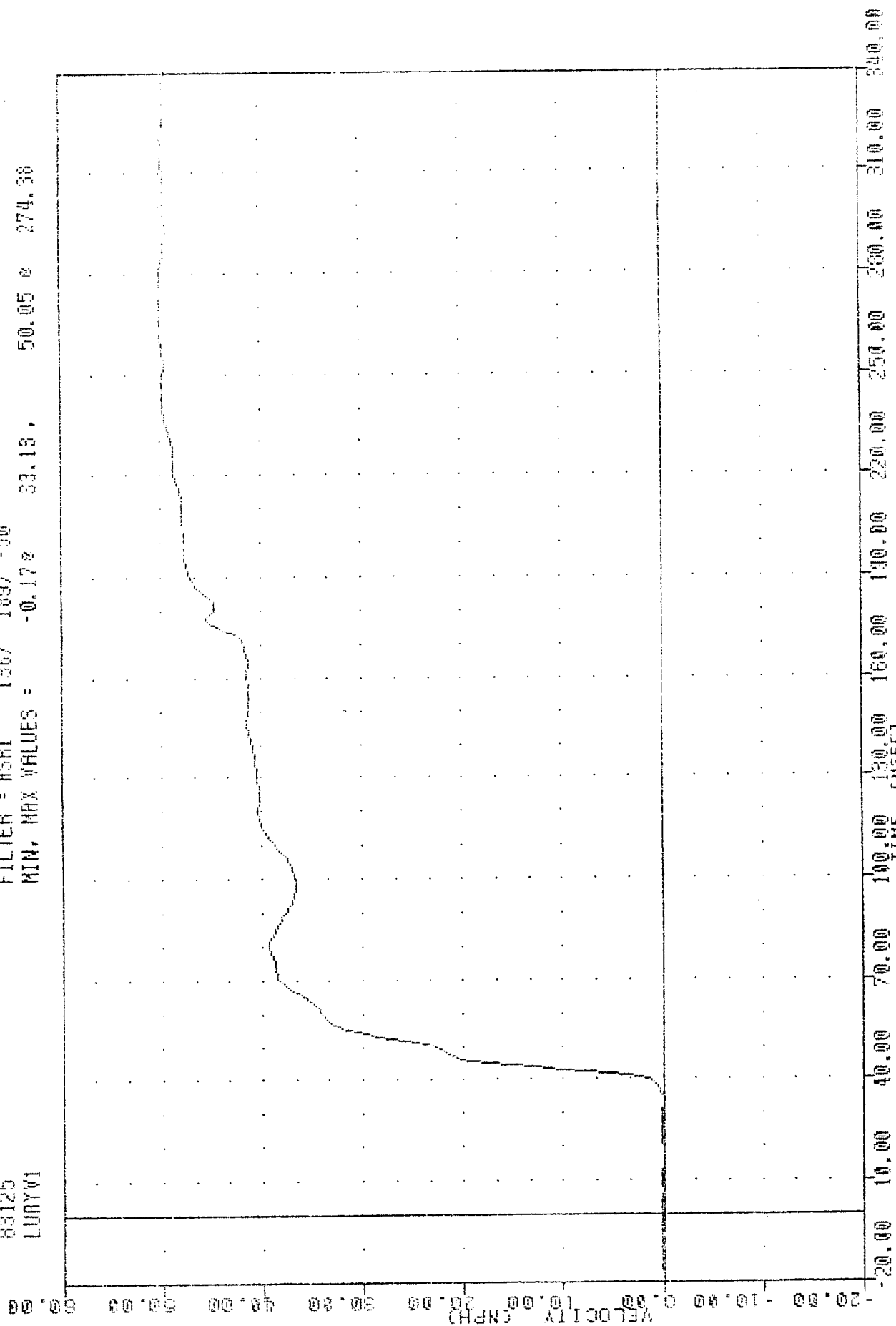


TRC , 830505
 MDB ASSESSMENT-SIDE IMPACT
 83125
 LURAYV1

PLOT DATE 18-MAY-83 10:44:31

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.17% 33.13, 50.05 & 274.38

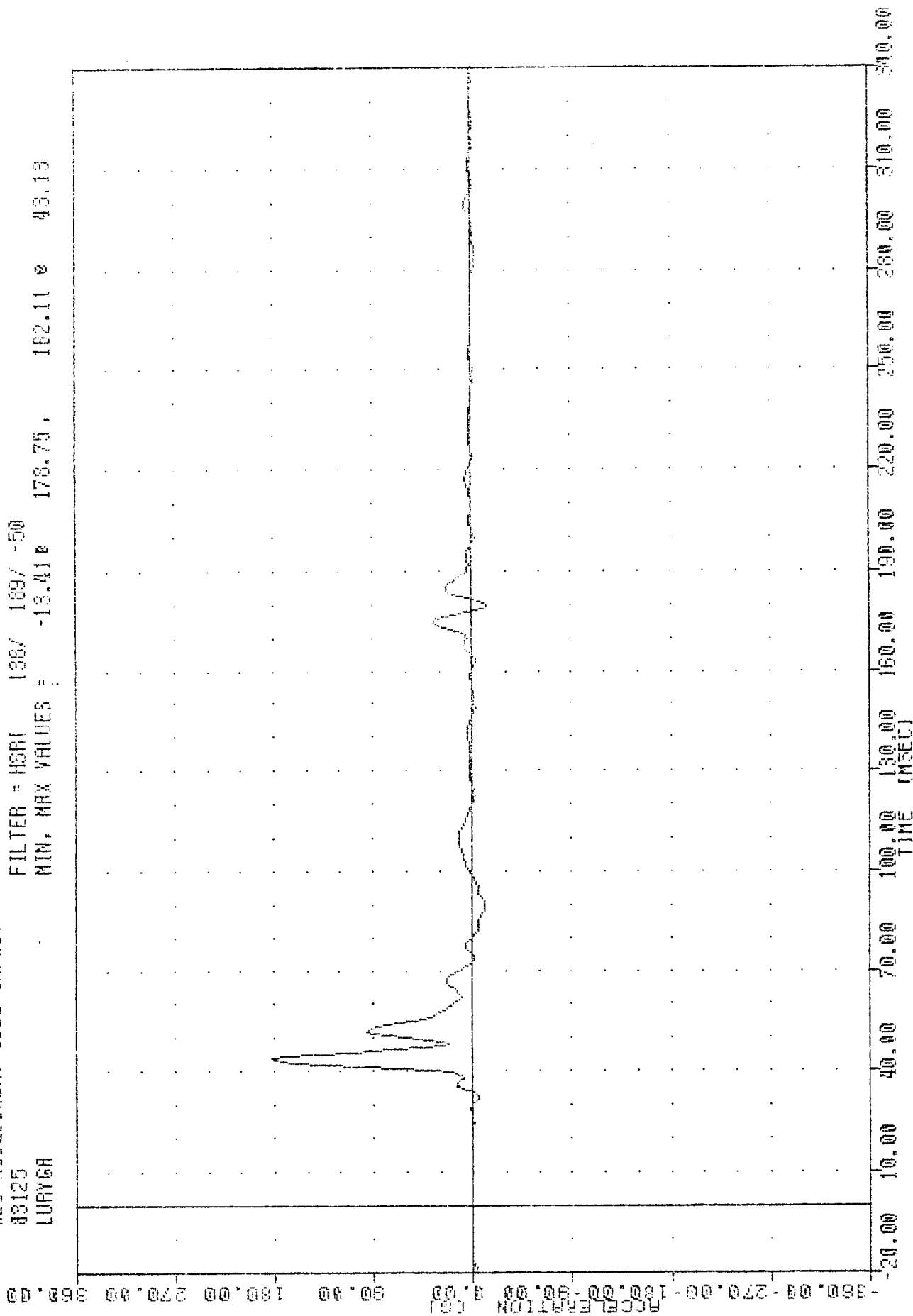


TRC
 NDB ASSESSMENT-SIDE IMPACT
 83125
 LURYGR

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -13.410 173.75, 182.11 0 43.13



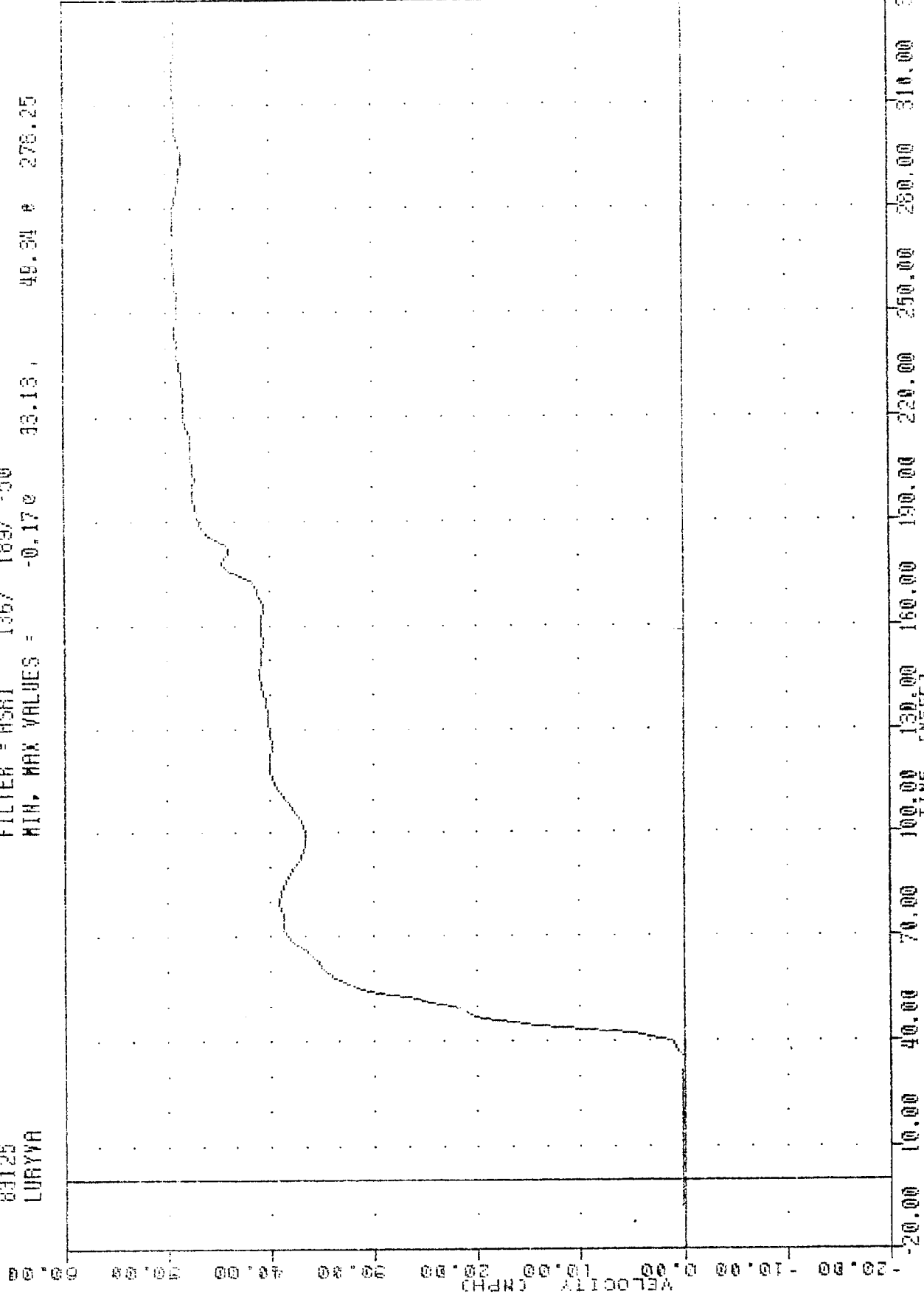
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LEFT UPPER RIB ACCELERATION -2 Y AXIS

TAC 830505
 MDB ASSESSMENT-SIDE IMPACT
 83125
 LURYVA

PLOT DATE 16-MAY-83 10:44:31

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.170 33.13 48.34 276.25



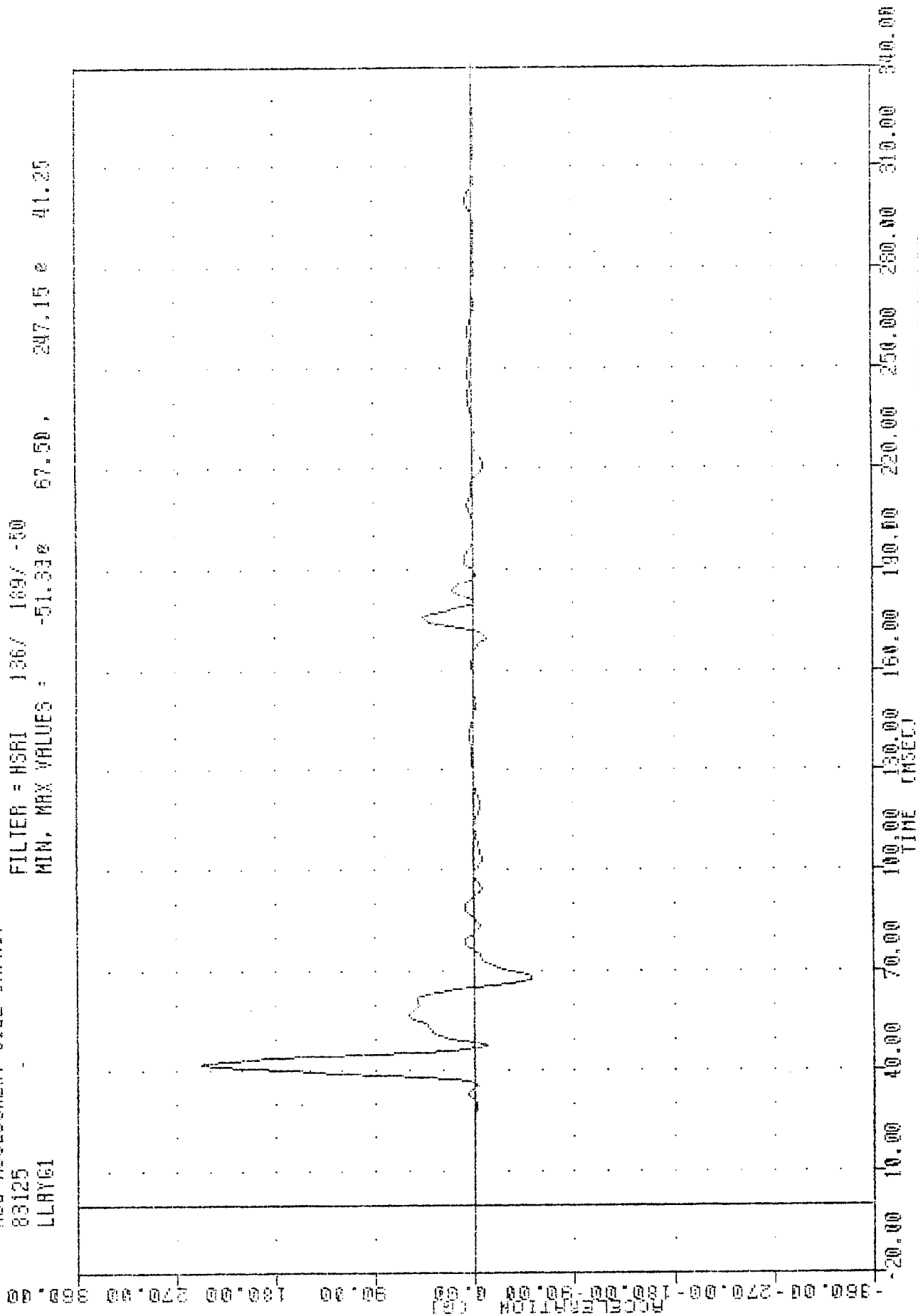
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN HARBET
 DELTA V USING LURYVA

TRC , 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 LRAY61

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES : -51.33% 67.50 , 247.15 e 41.25



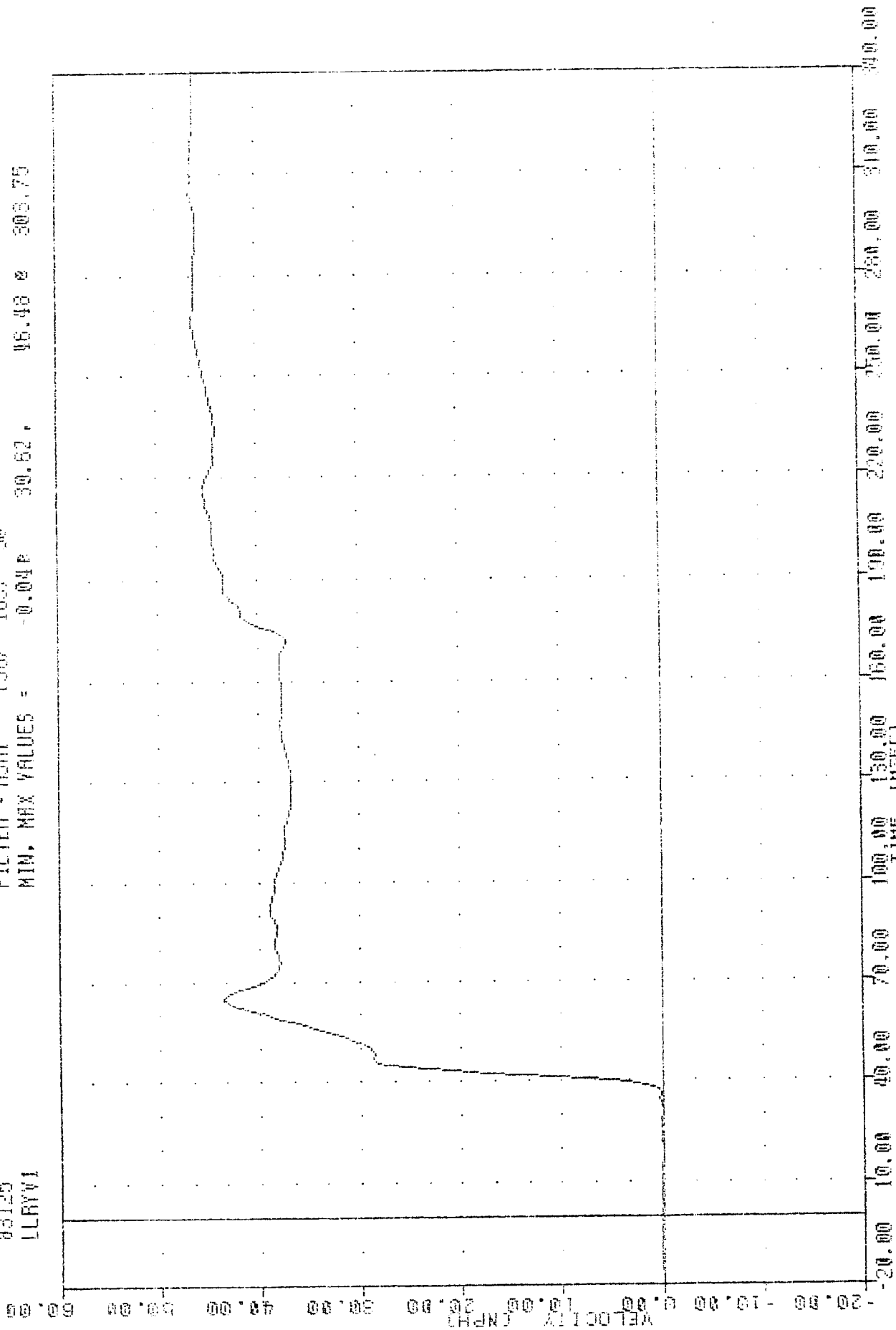
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LEFT LOWER RBX ACCELERATION Y AXIS

TRC 830505
 NOB ASSESSMENT-SIDE IMPACT
 83125
 LLRYV1

PLOT DATE 24-MAY-83 10:21:45

FILTER = HSRI 136/ 169/ -50

MIN, MAX VALUES = -0.048 30.82, 46.48 @ 303.75

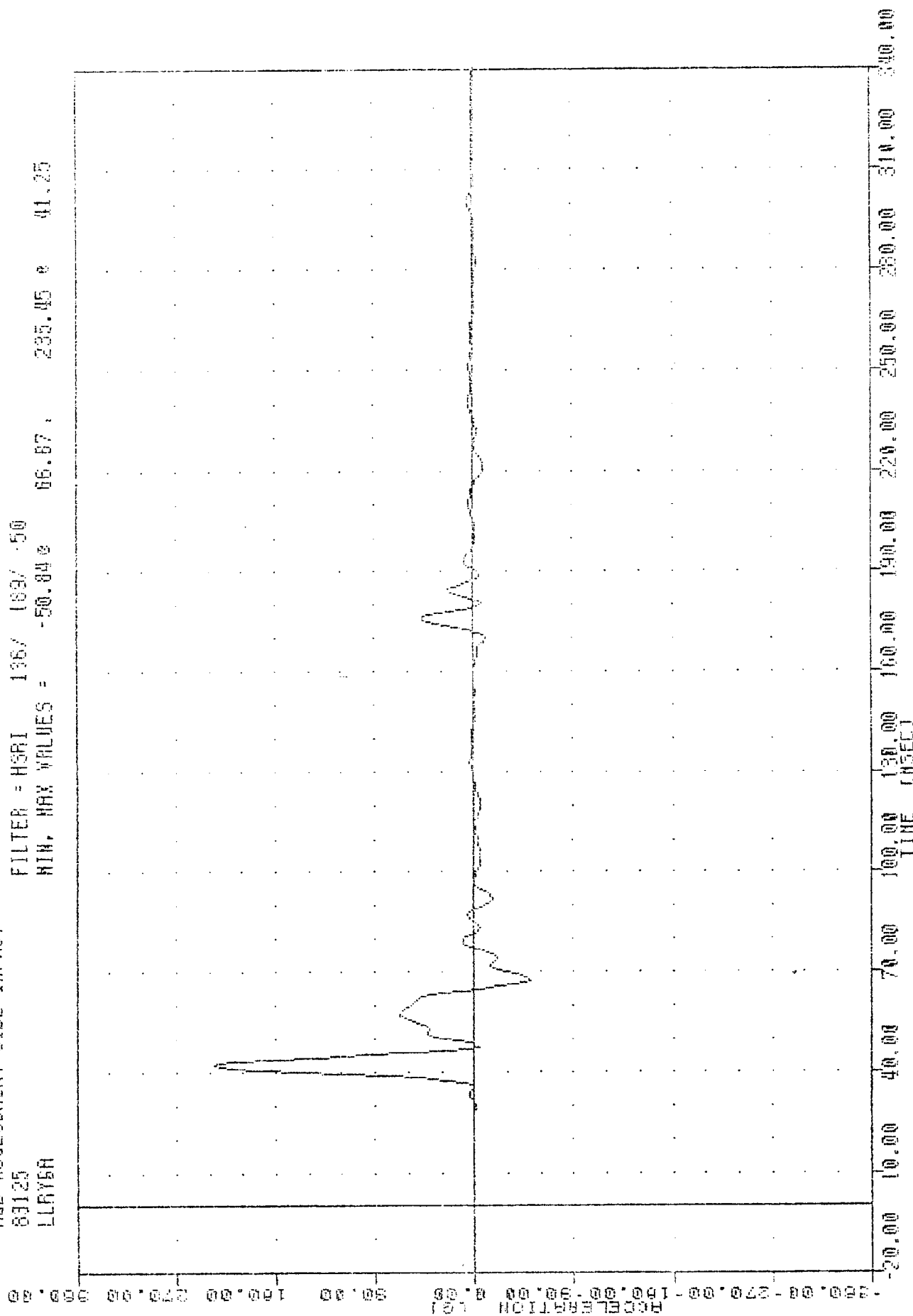


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LIRIGI

TBC
 MUB ASSESSMENT-SIDE IMPACT
 83125
 LLAYER

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSRI 1367 1897 50
 MIN, MAX VALUES = -50.84 0 66.87, 235.45 0 41.25

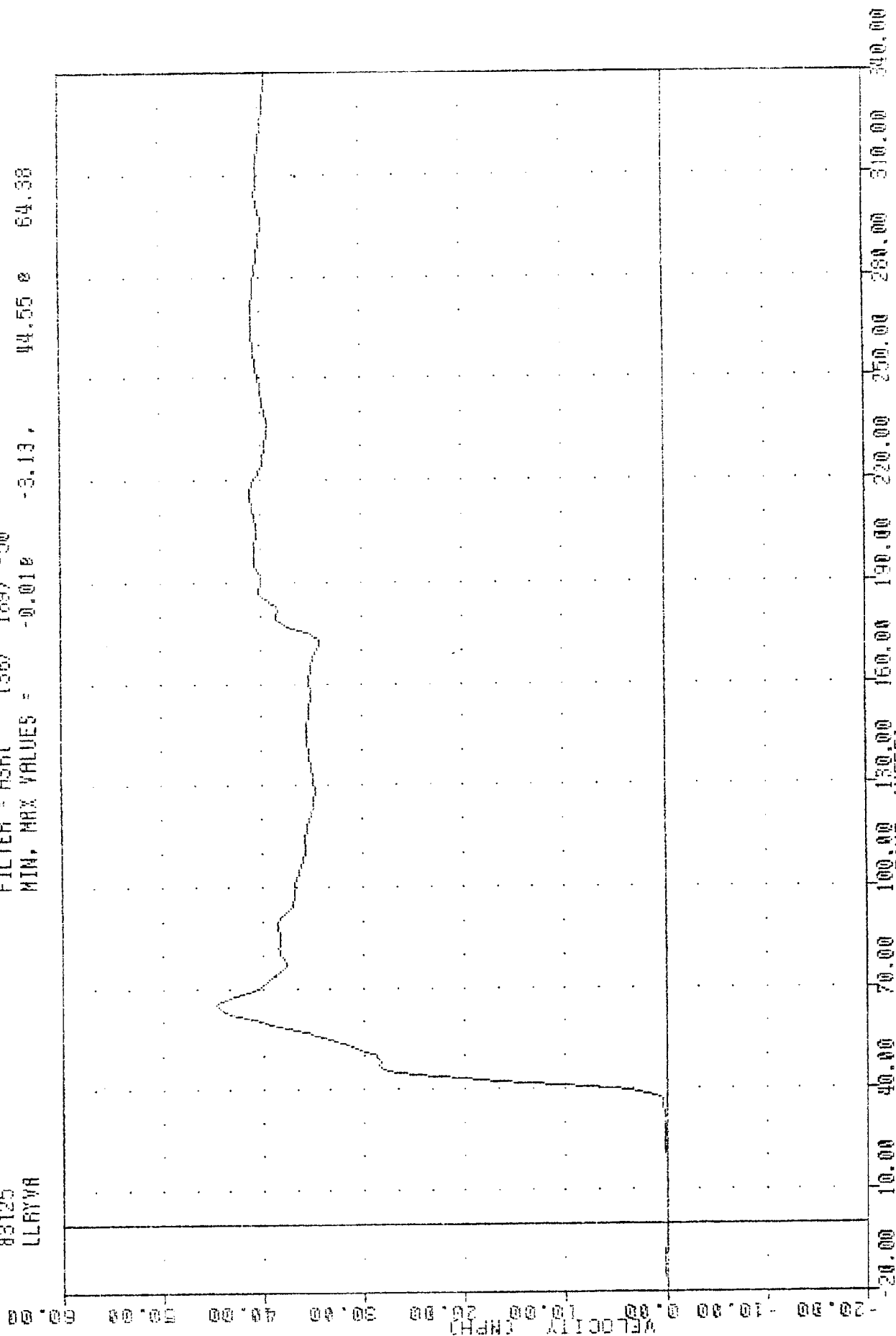


TRC 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 LLRYVA

PLOT DATE 16-MAY-83 18:44:31

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.010 -3.13, 44.55 0 64.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LLRYVA

TRC , 830503

NOB ASSESSMENT-SIDE IMPACT

83125

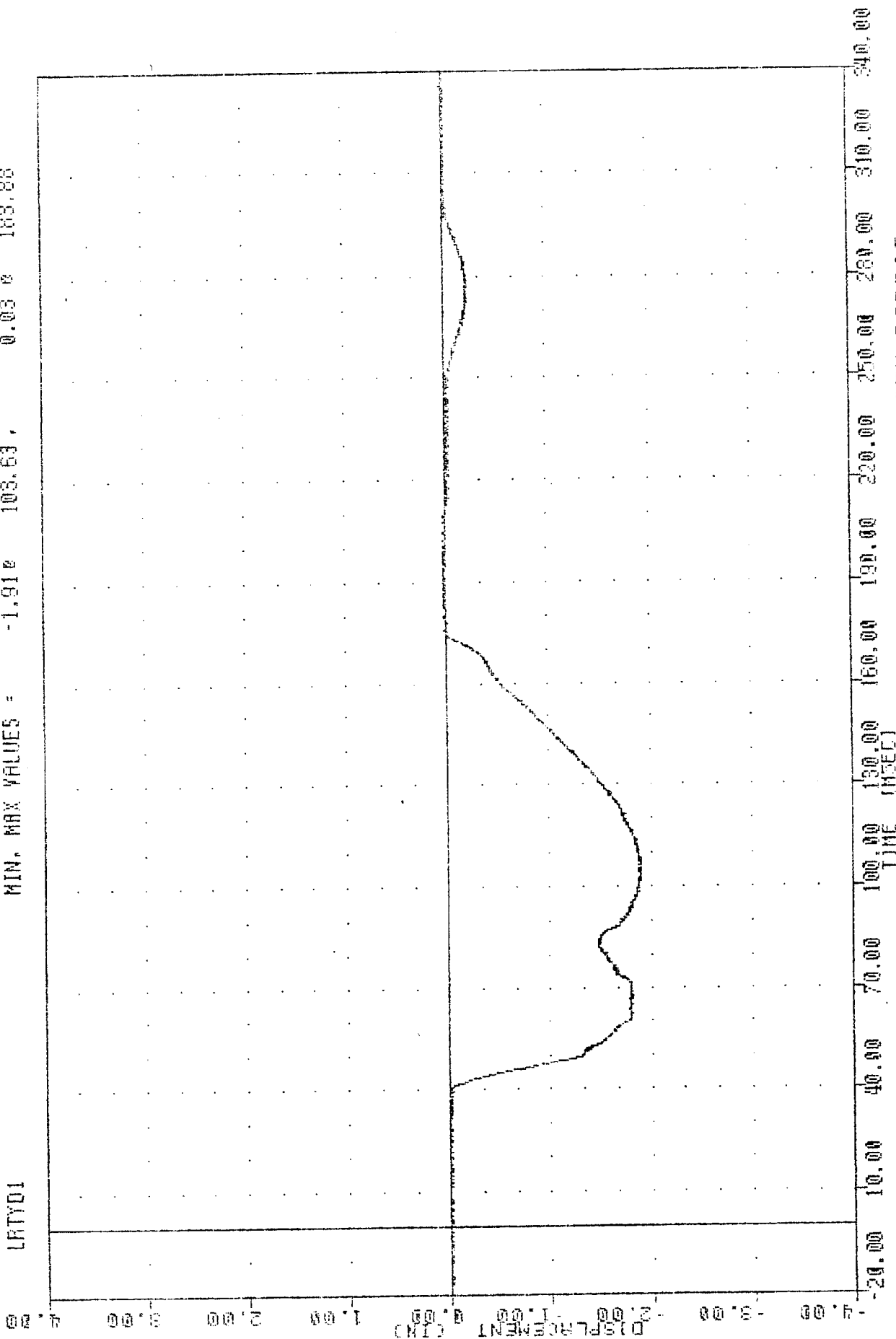
LRTY01

16-MAY-83

15:07:42

FILTER = ALFF 1650/ 5214/ -40

MIN. MAX VALUES = -1.910 103.63, 0.03 0 183.88



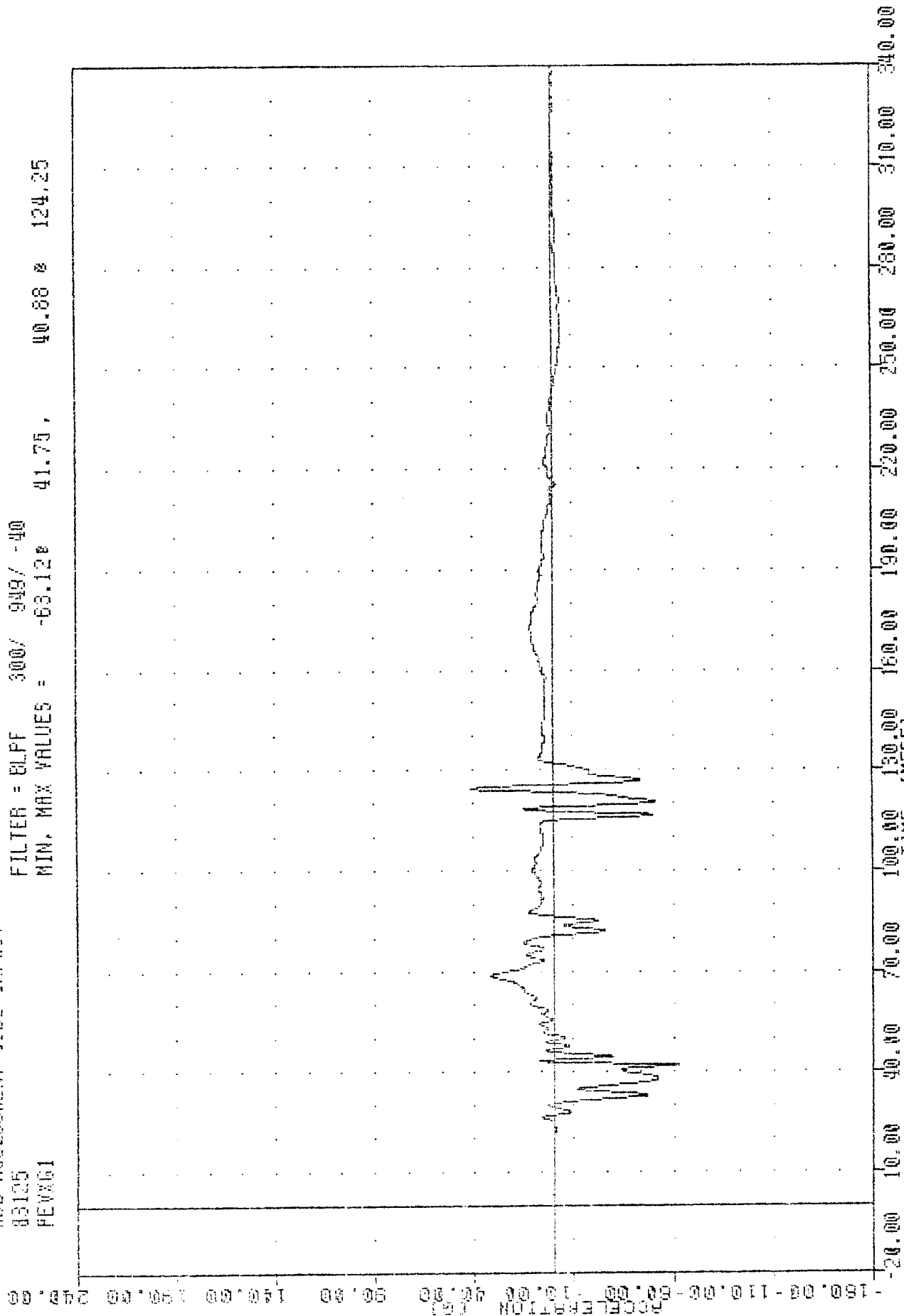
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT RIB TO SPINE DISPLACEMENT INCHES

TRC 830505
 HOB ASSESSMENT-SIDE IMPACT
 83125
 PEVXG1

PLOT DATE 13-MAY-83 10:28:38

FILTER = 8LPP 300/ 949/ -40

MIN. MAX VALUES = -63.12 41.75, 40.88 124.25



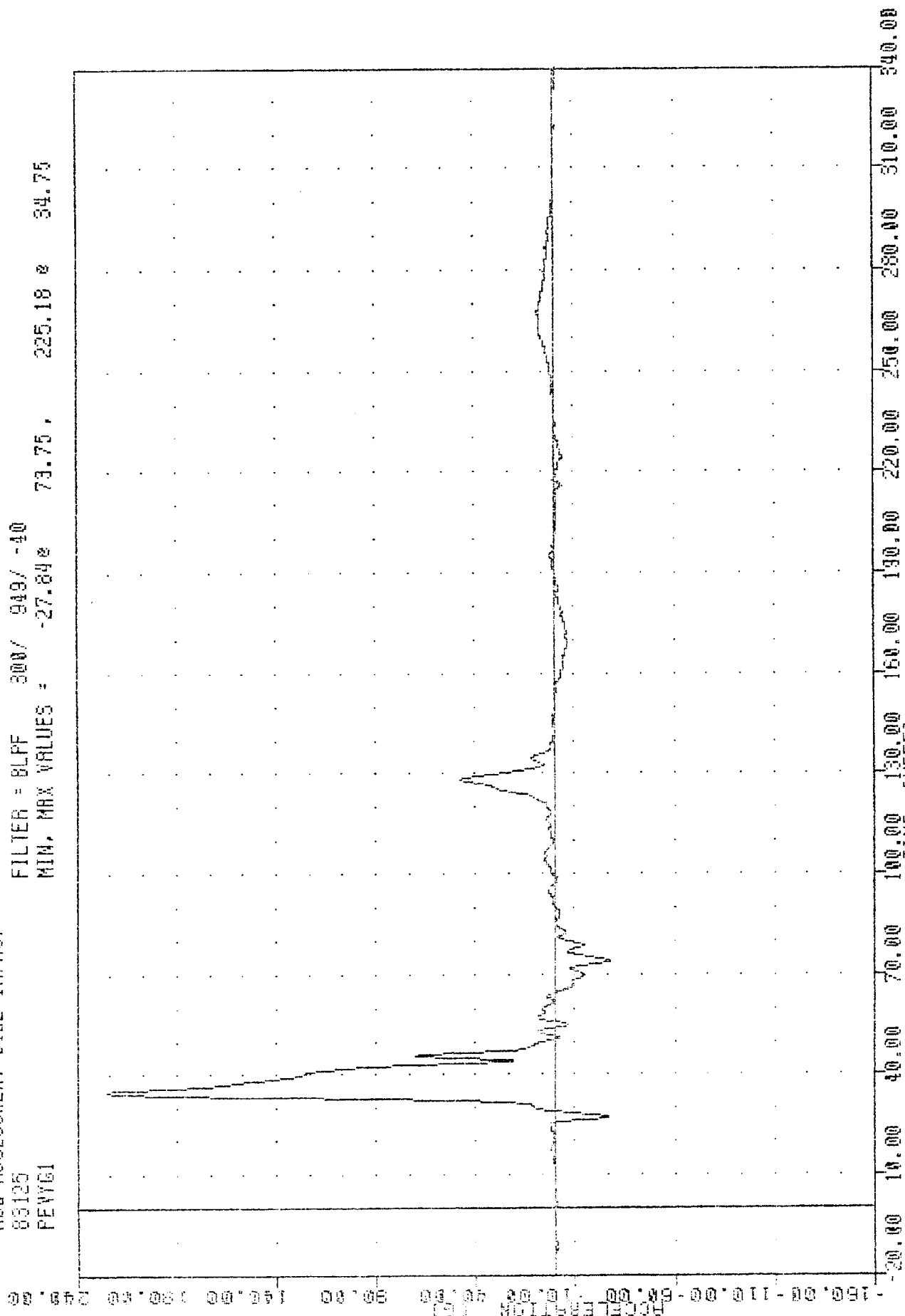
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS ACCELERATION X AXIS

TRC , 030505
 NDB ASSESSMENT-SIDE IMPACT
 03125
 PEVYG1

PLOT DATE 13-MAY-83 10:26:38

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -27.84e 73.75, 225.18 e 34.75

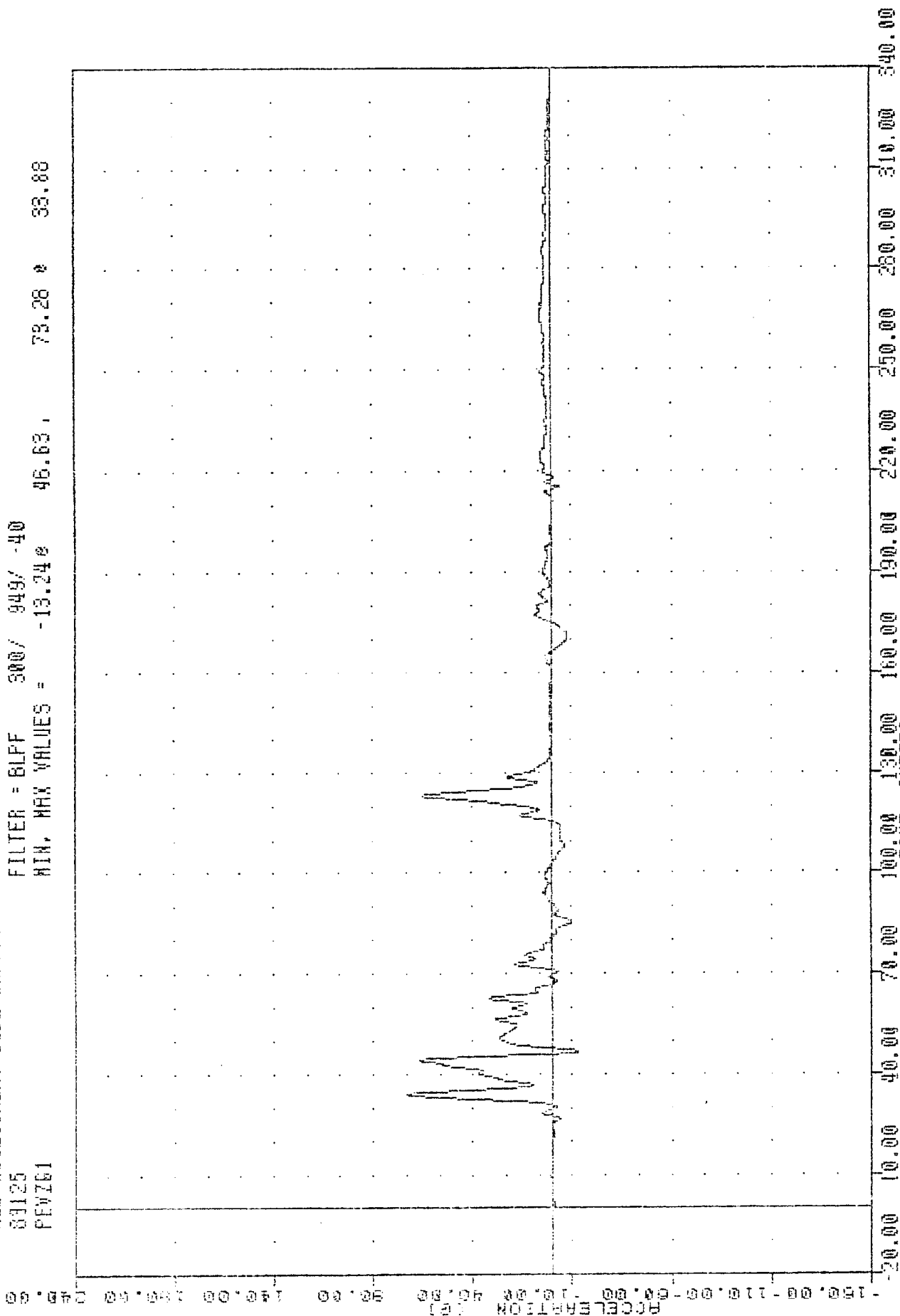


TRC , 630505
 MOD ASSESSMENT-SIDE IMPACT
 63125
 PEVZ61

PLOT DATE 13-MAY-83 10:26:38

FILTER = 8LFF 300/ 949/ -40

MIN. MAX VALUES = -13.24e 46.63 , 73.28 e 33.88



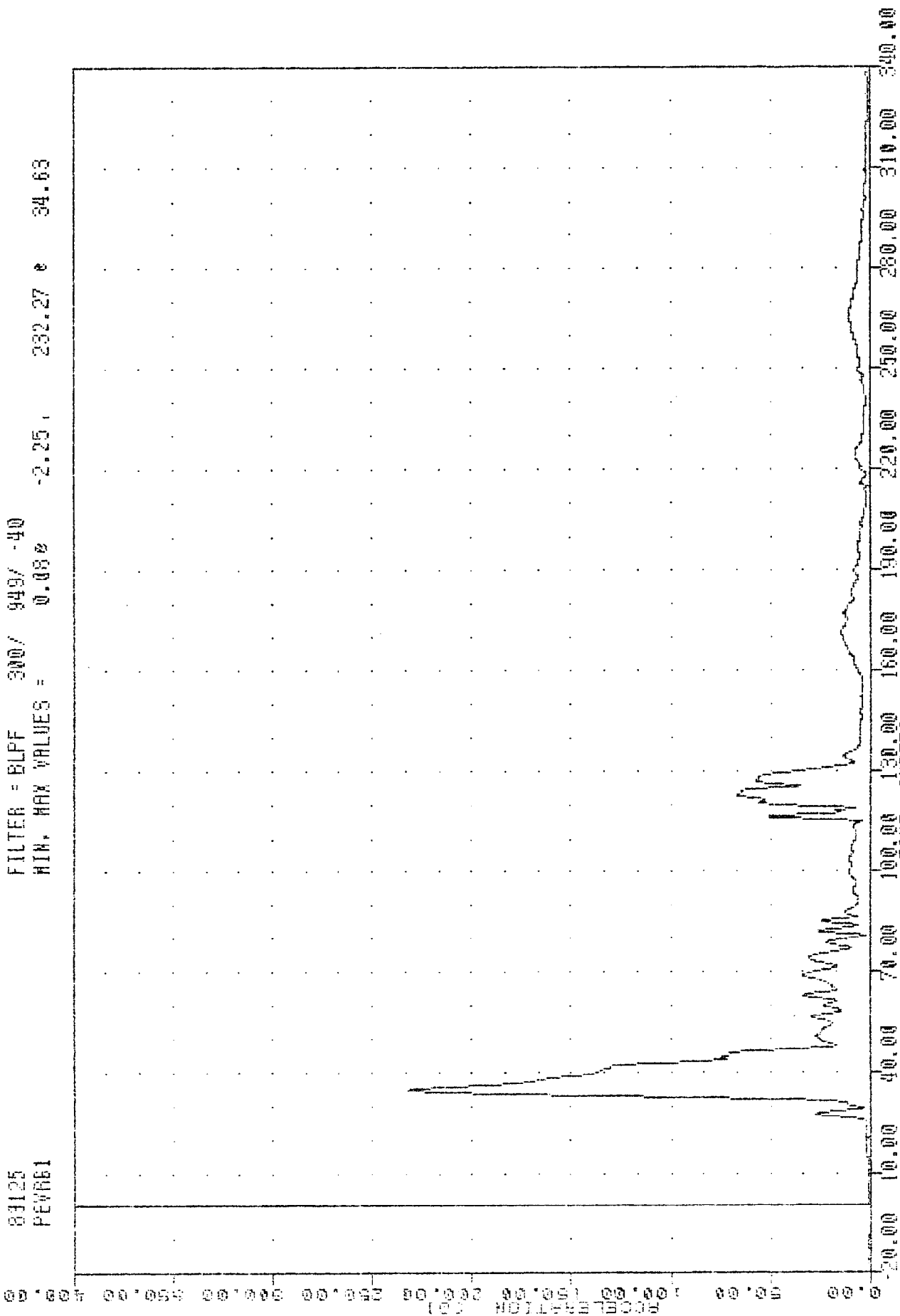
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS ACCELERATION Z AXIS

TDC , 838505
MOV ASSESSMENT-SIDE IMPACT
83125
PEVR61

PLOT DATE 13-MAY-83 13:45:32

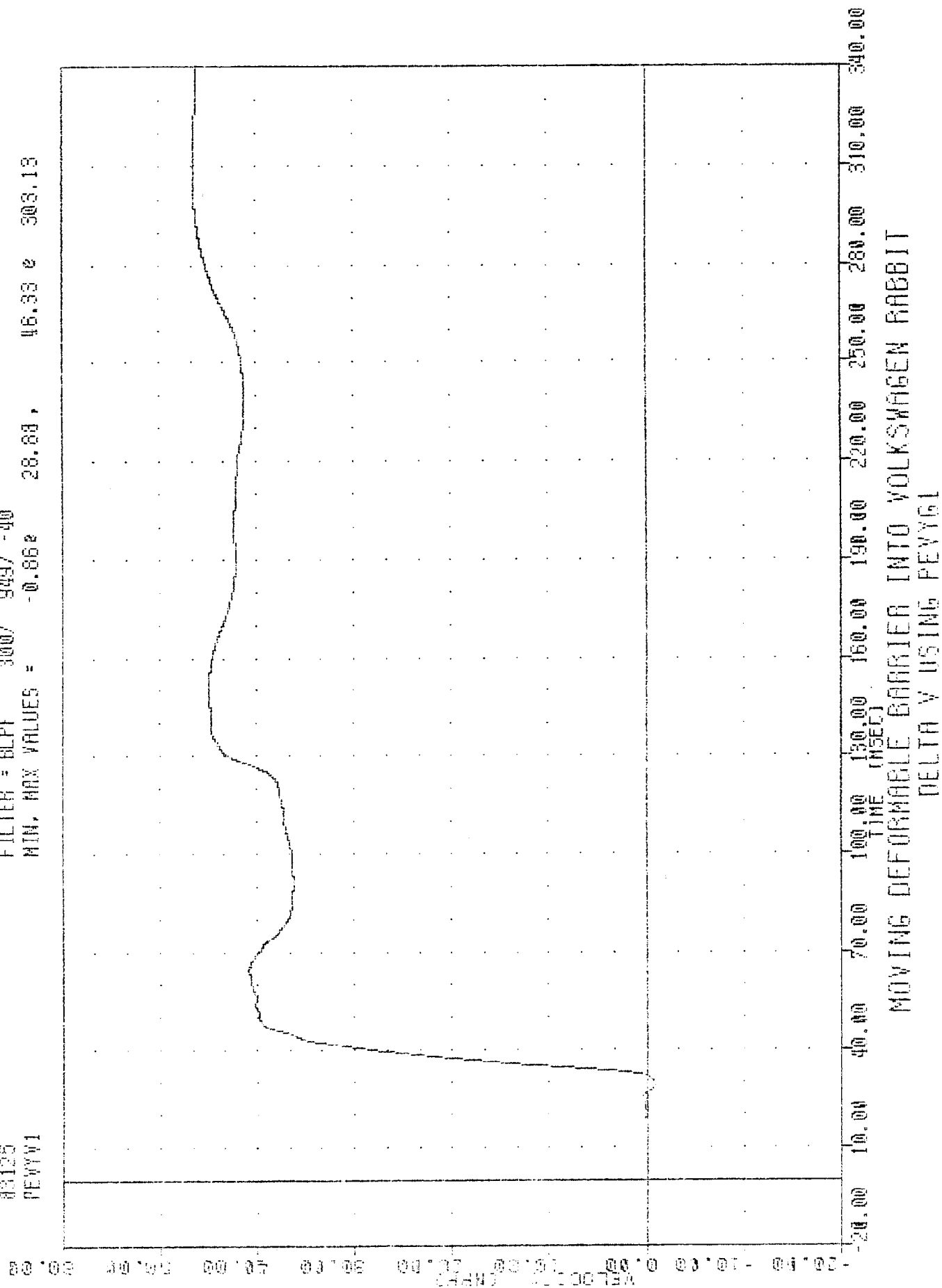
FILTER = BLPF 300/ -40

MIN. MAX VALUES = 0.000 -2.25, 232.27 e 34.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS RESULTANT

160 830505 PLOT DATE 16-MAY-83 10:45:28
 RDB ASSESSMENT-SIDE IMPACT
 83125 FILTER = BLPF 300/ 949/ -40
 PEVYV1 MIN, MAX VALUES = -0.862 28.88, 48.33 e 303.13

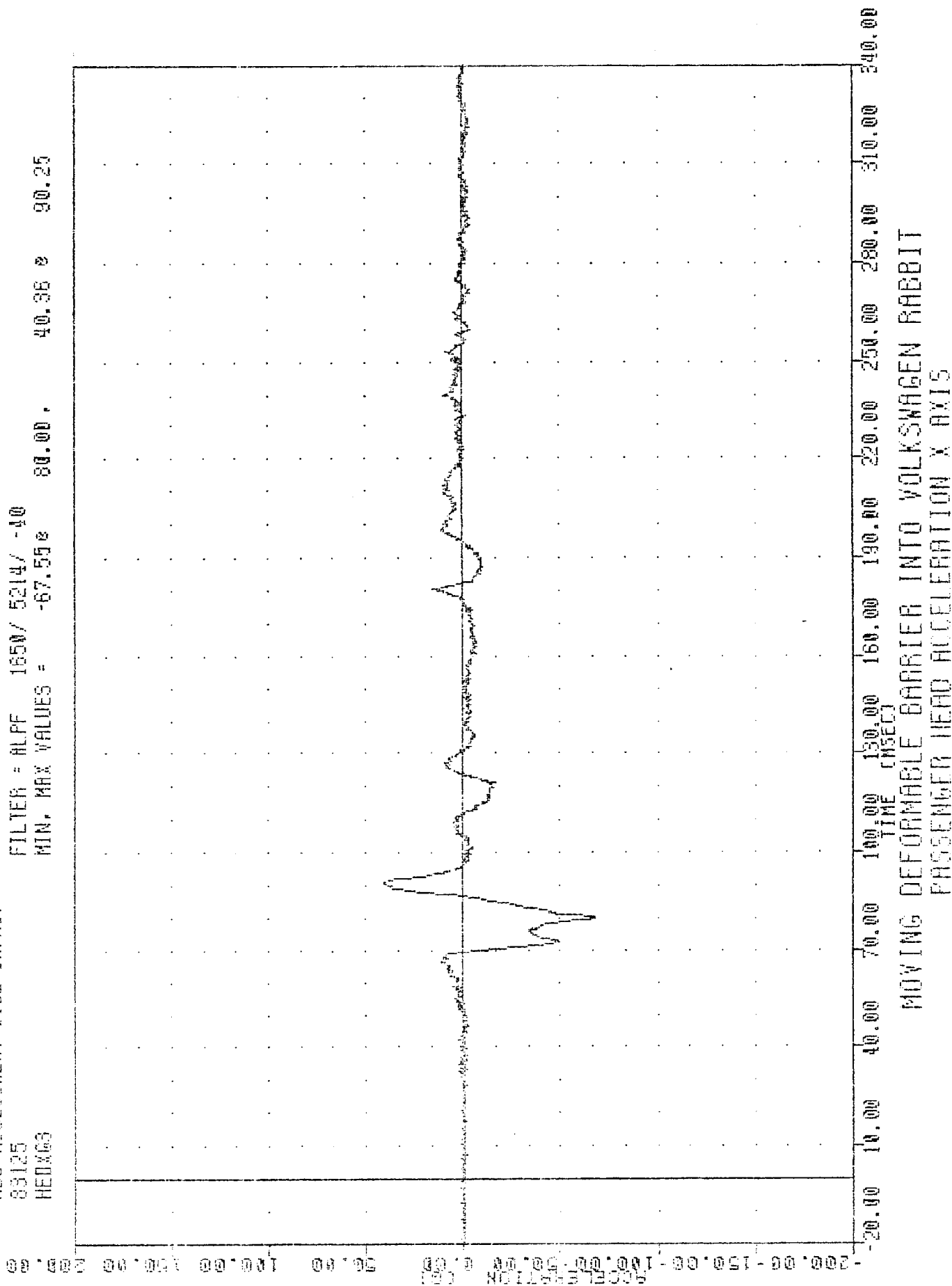


THC , 830505
 MDB ASSESSMENT-SIDE IMPACT
 83125
 HEDX63

PLOT DATE 13-MAY-83 10:26:36

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = -67.55% 80.00, 40.36 % 90.25



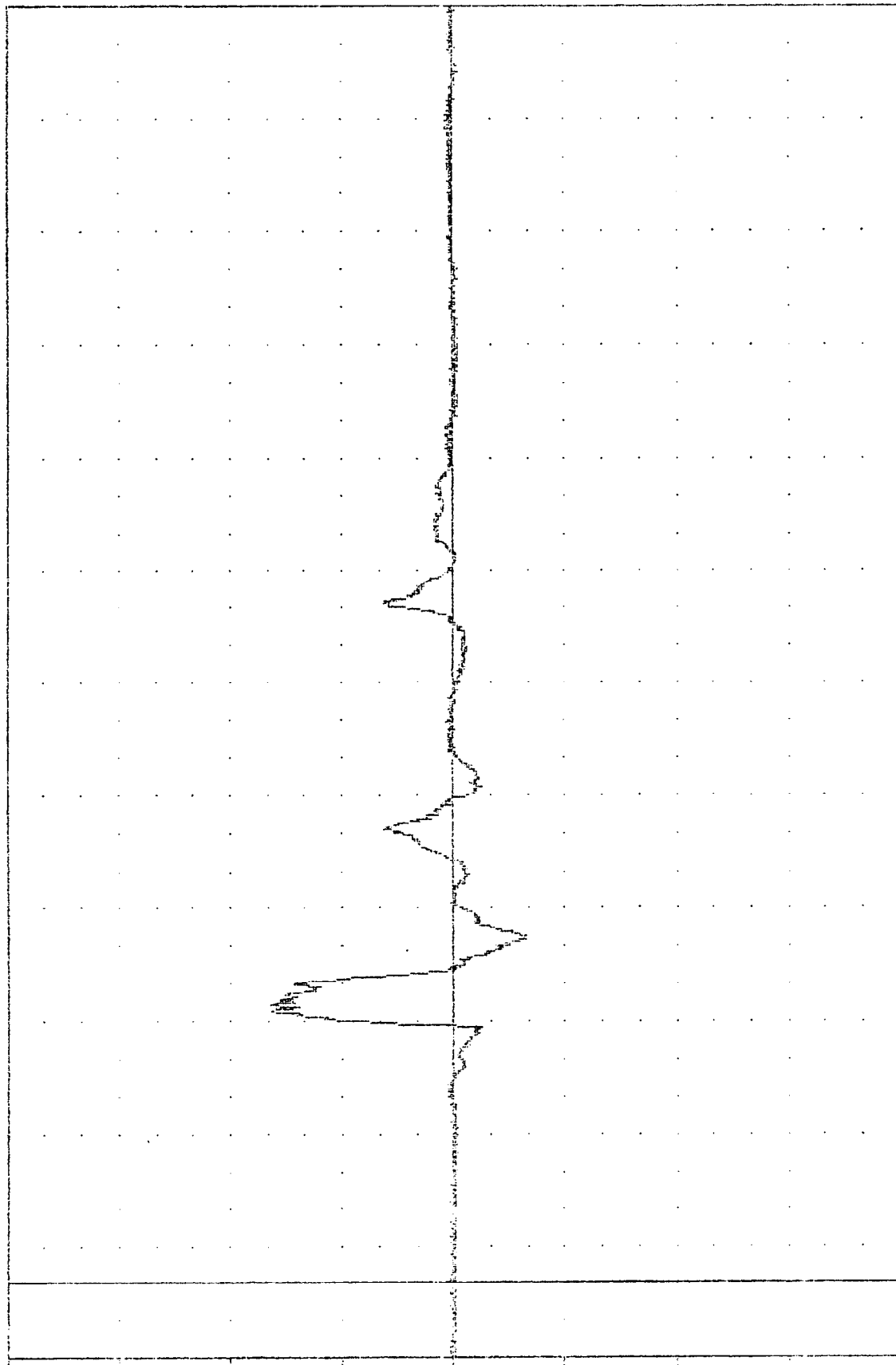
TAC 830505
 NOD ASSESSMENT-SIDE IMPACT
 83125
 HEDY63

PLOT DATE 13-MAY-83 10:26:38

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = -32.20e 91.75, 81.60 e 72.63

ACCELERATION 100
 200.00 150.00 100.00 50.00 0.00 -50.00 -100.00 -150.00 -200.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER HEAD ACCELERATION Y AXIS

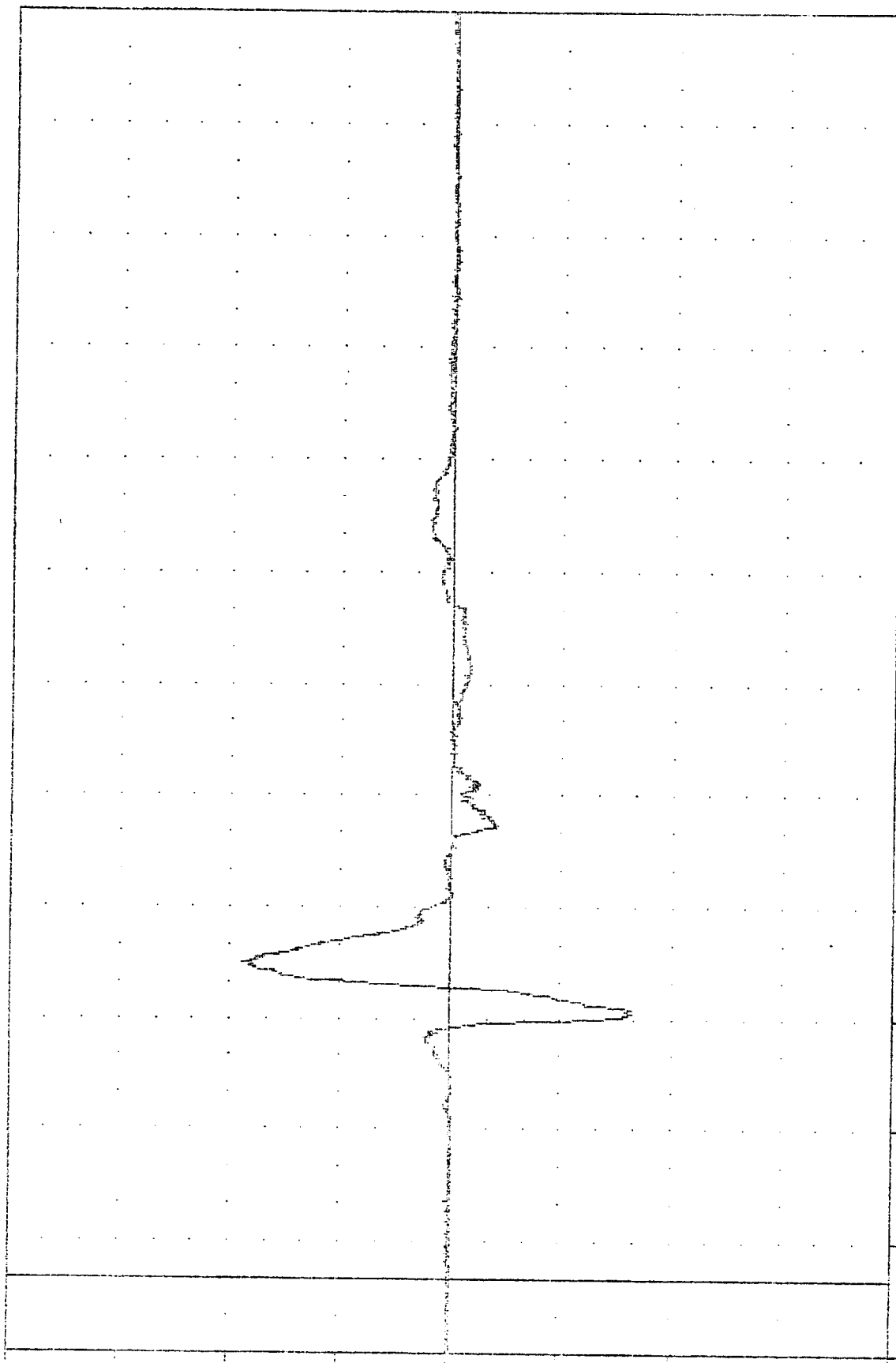
IRC
 NDB ASSESSMENT-SIDE IMPACT
 83125
 HEDZ63

PLOT DATE 13-MAY-83 10:26:38

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -82.88e 71.13, 94.25 e 85.00

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



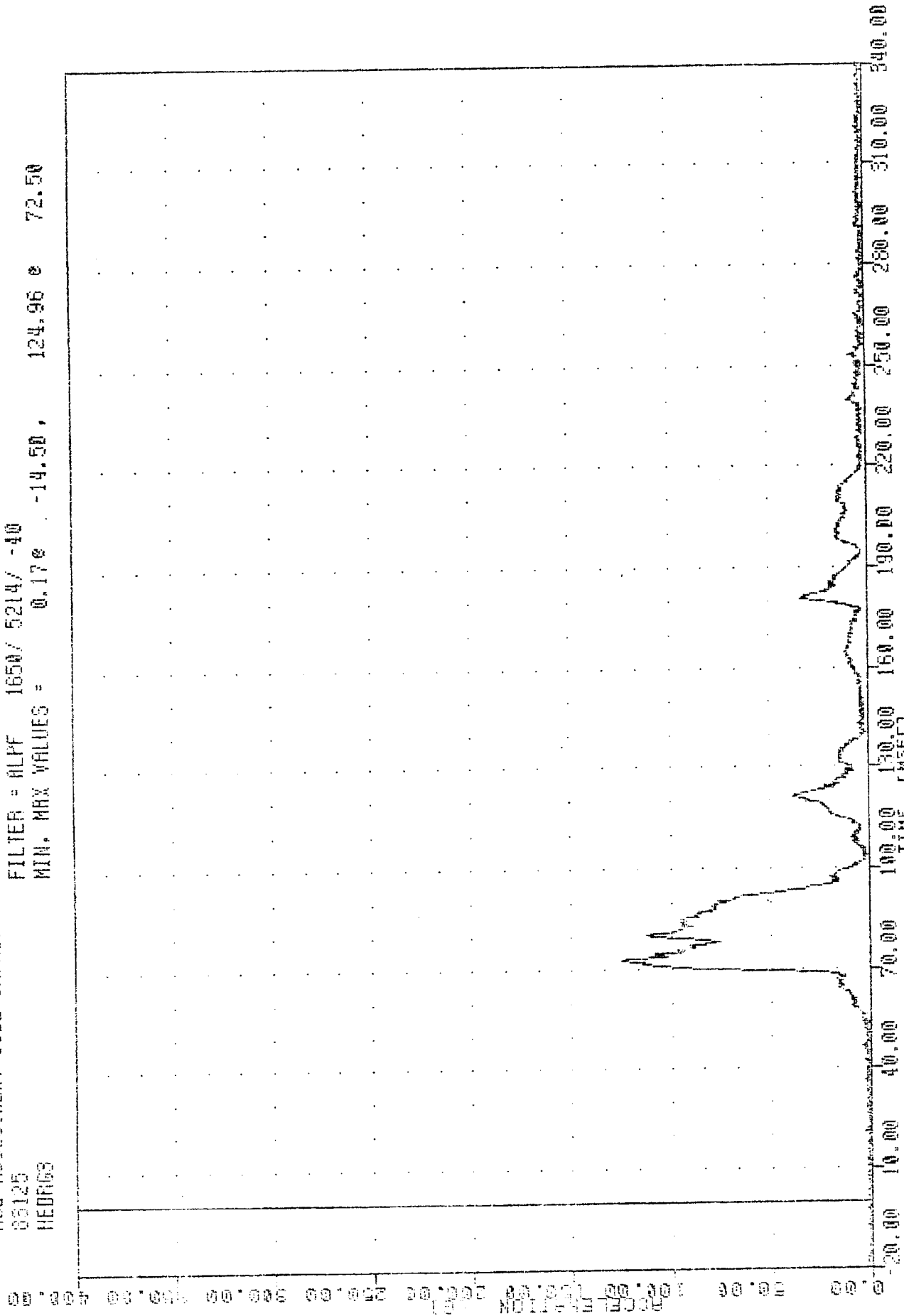
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER HEAD ACCELERATION Z AXIS

TRC 830505
 HCU ASSESSMENT-SIDE IMPACT
 83125
 HEDR63

PLOT DATE 13-MAY-83 13:45:32

FILTER = ALPF 165N/ 5214/ -40

MIN. MAX VALUES = 0.178 -14.50, 124.96 72.50



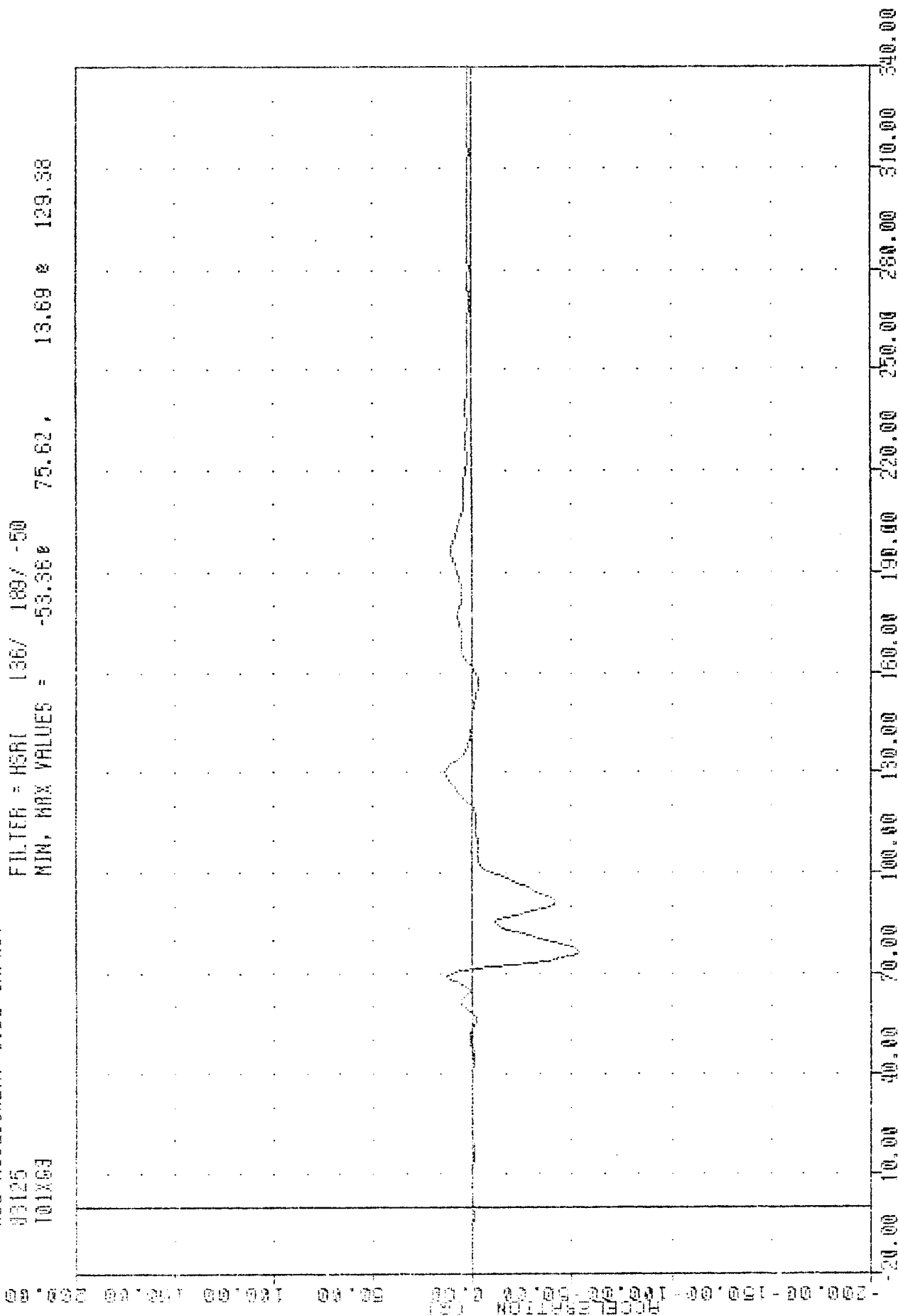
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER HEAD RESULTANT

TBC , 800505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 101X63

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSR1 136/ 189/ -50

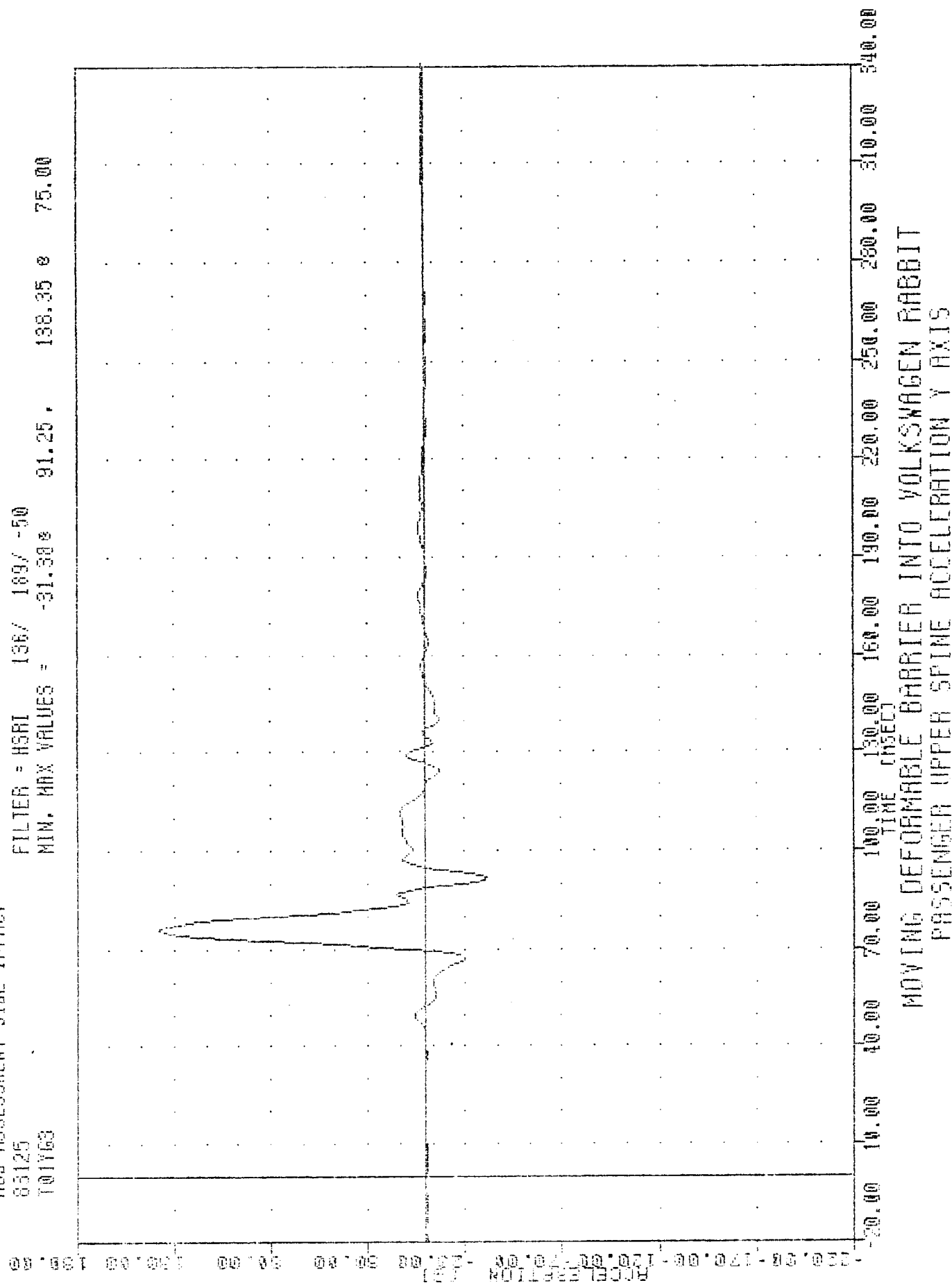
MIN, MAX VALUES = -53.36 75.62, 13.69 129.38



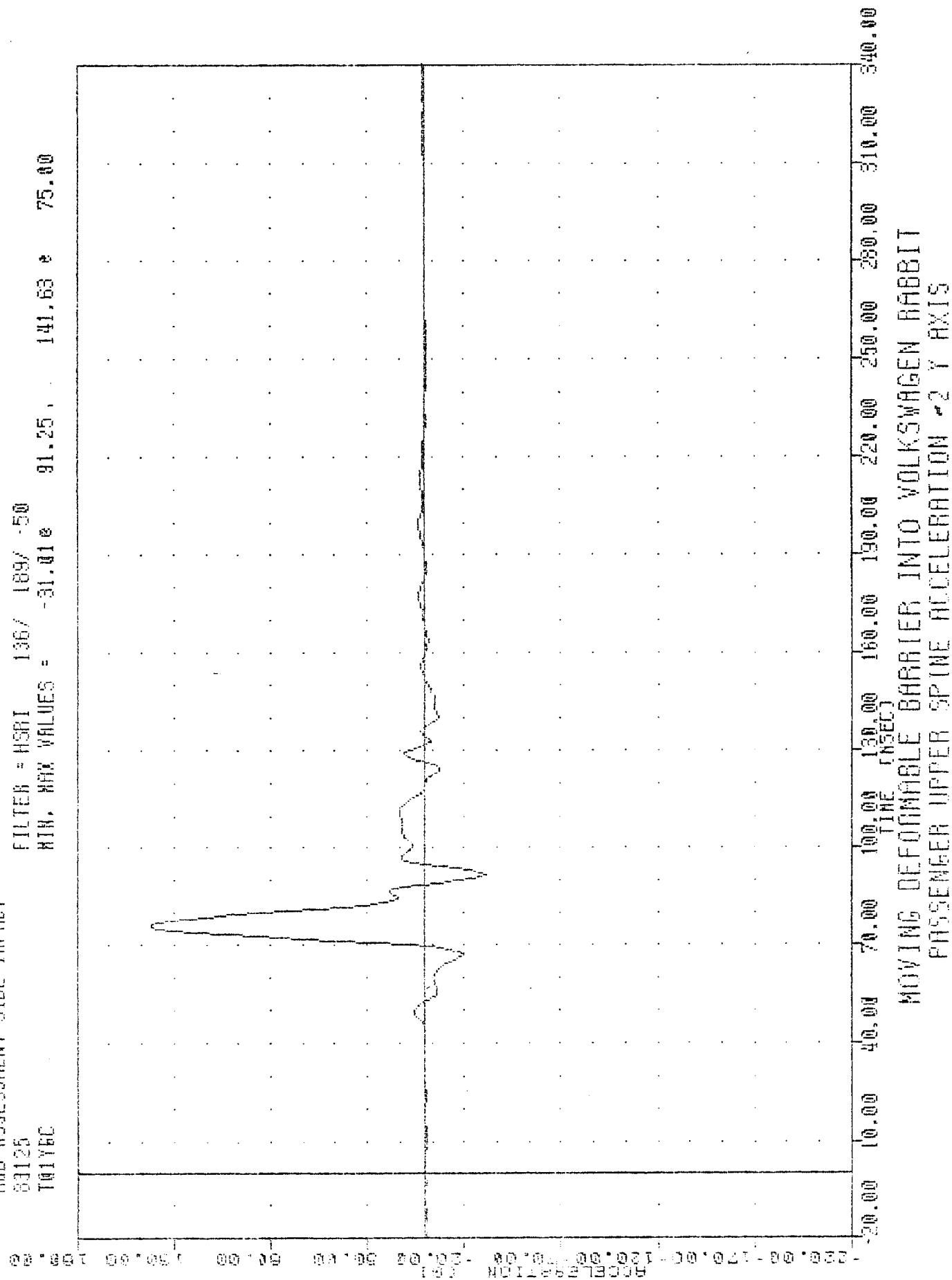
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE ACCELERATION X AXIS

TAC 030505
 ROB ASSESSMENT-SIDE IMPACT
 03125
 T01Y63

PLOT DATE 13-MAY-03 12:46:24
 FILTER = HSRI 1367 1897 -50
 MIN. MAX VALUES = -31.38% 91.25% 138.35% 75.00



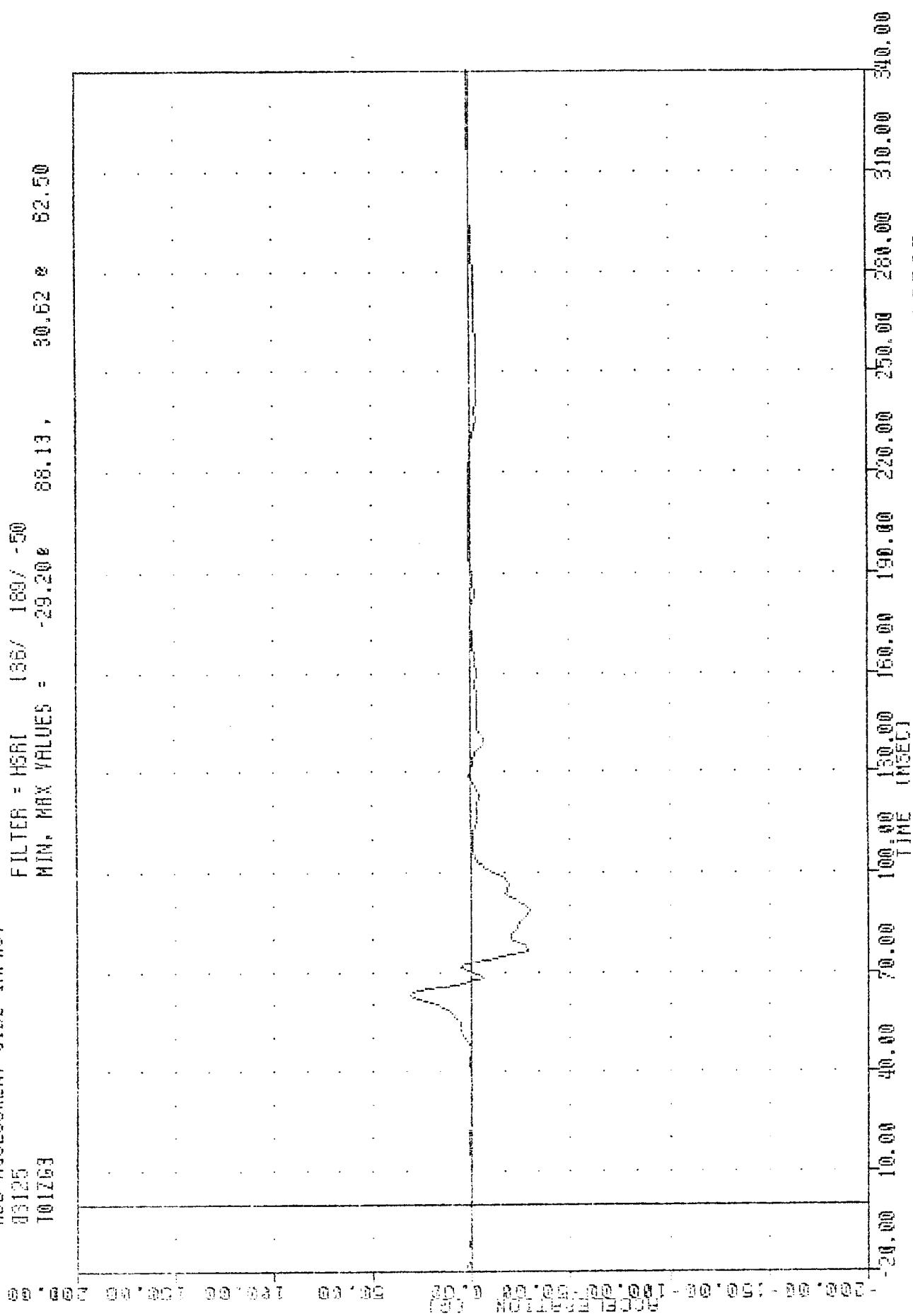
TAC 000505
 HND ASSESSMENT-SIDE IMPACT
 83125
 T01YEC
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -31.01e 91.25, 141.63 e 75.00



IRC 030505
 HOB ASSESSMENT-SIDE IMPACT
 03125
 101763

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSRI 136/ 180/ -50
 MIN. MAX VALUES = -29.20e 88.13, 30.62 e 82.50



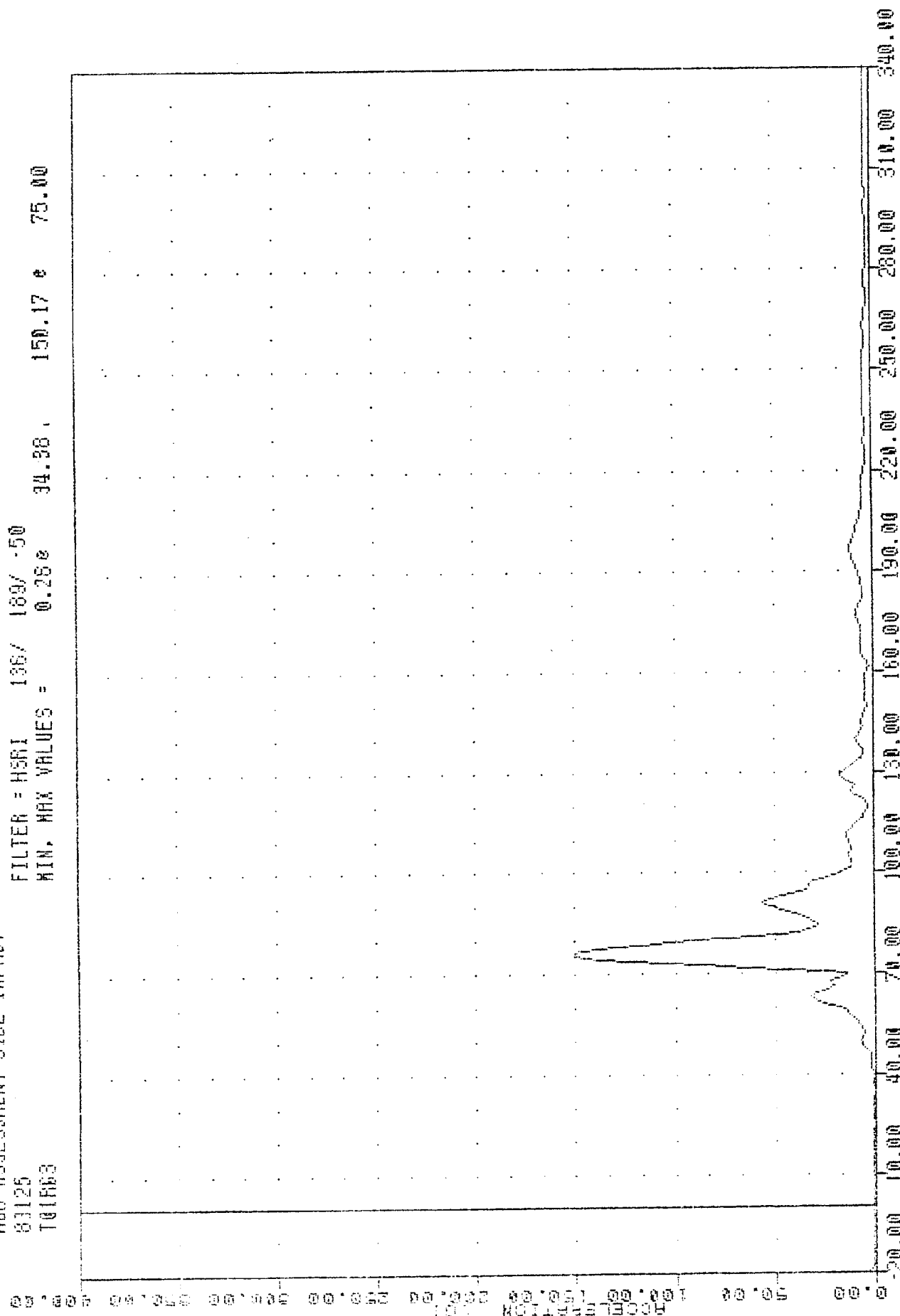
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE ACCELERATION Z AXIS

TAC , 830505
 HOB ASSESSMENT-SIDE IMPACT
 83125
 T01R63

PLUT DATE 13-MAY-83 13:57:56

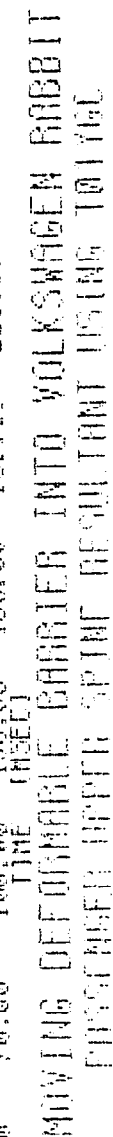
FILTER = HSR1 136/ 189/ -50

MIN. MAX VALUES = 0.28e 34.38 , 150.17 e 75.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE RESULTANT

MIN. MAX. VALUES	0.25	99.75	153.45	75.62
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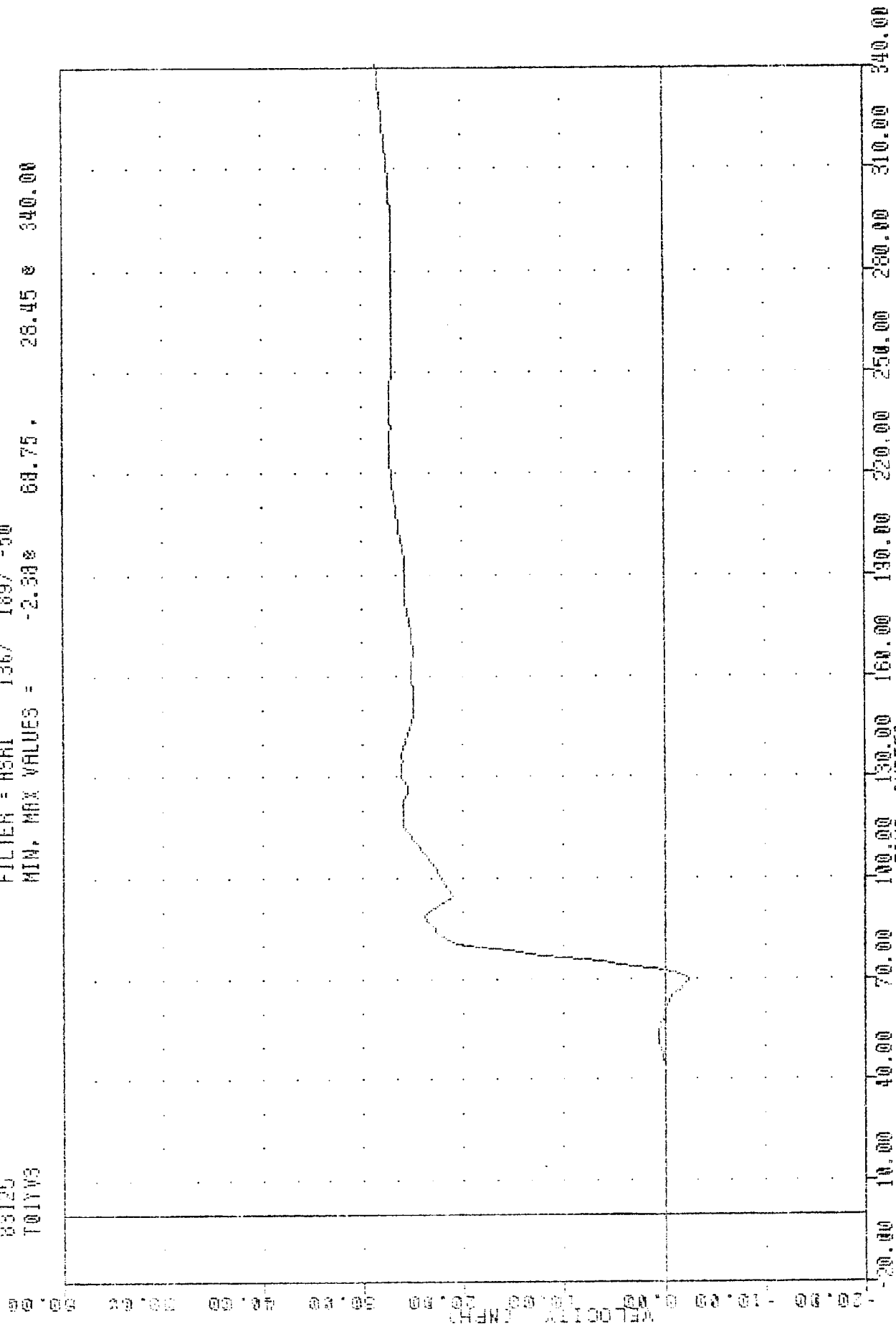


TRC * 830505
 MDB ASSESSMENT-SIDE IMPACT
 83125
 T01YV3

PLOT DATE 18-MAY-83 10:44:31

FILTER = HSAI 136/ 189/ -50

MIN. MAX VALUES = -2.38 68.75 28.45 340.00



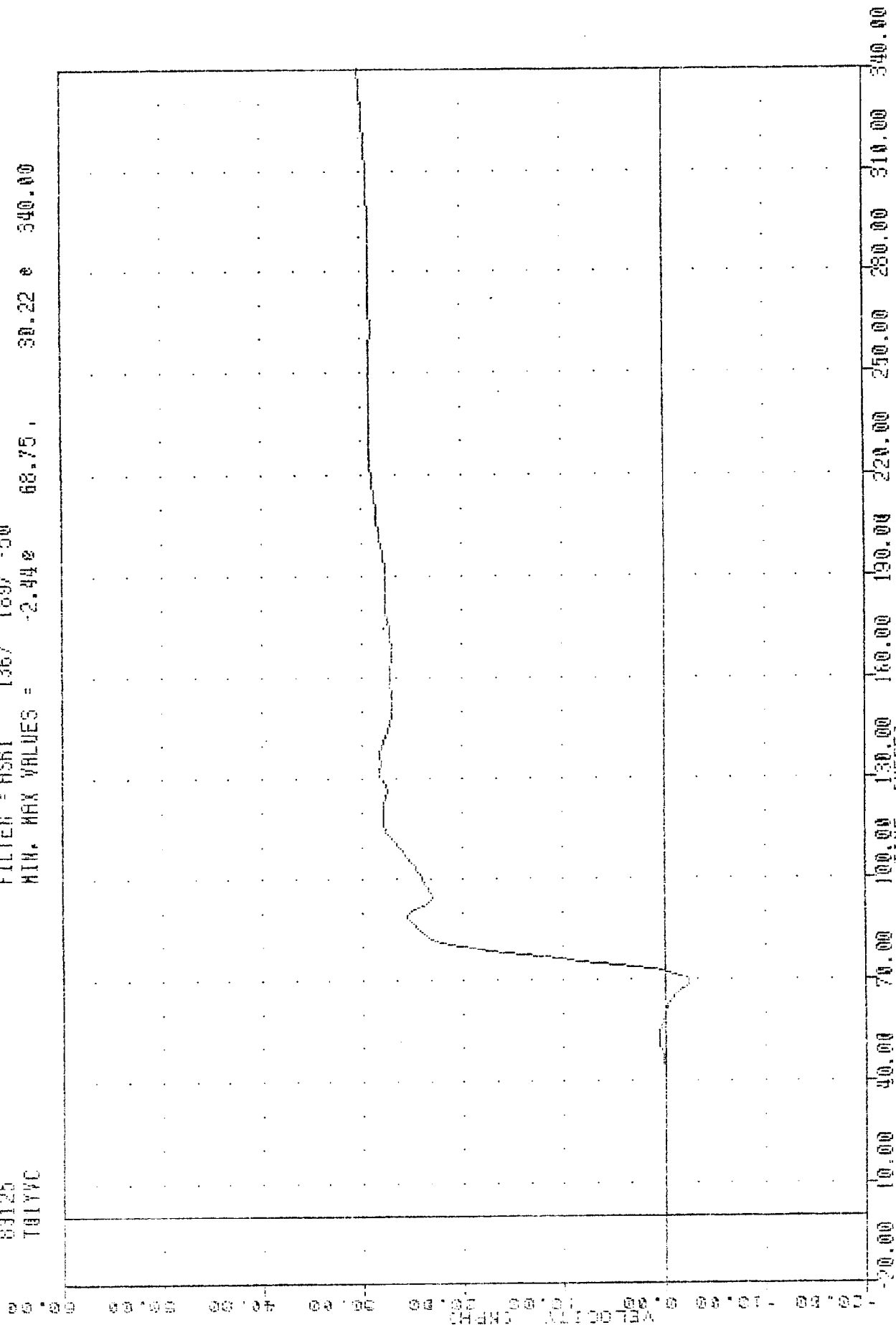
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T01YV3

TAC , 630505
 NDB ASSESSMENT-SIDE IMPACT
 63125
 T01YVC

PLOT DATE 16-MAY-83 10:44:31

FILTER = NSRI 136/ 189/ -50

MIN. MAX VALUES = -2.440 68.75 , 30.22 0 340.00



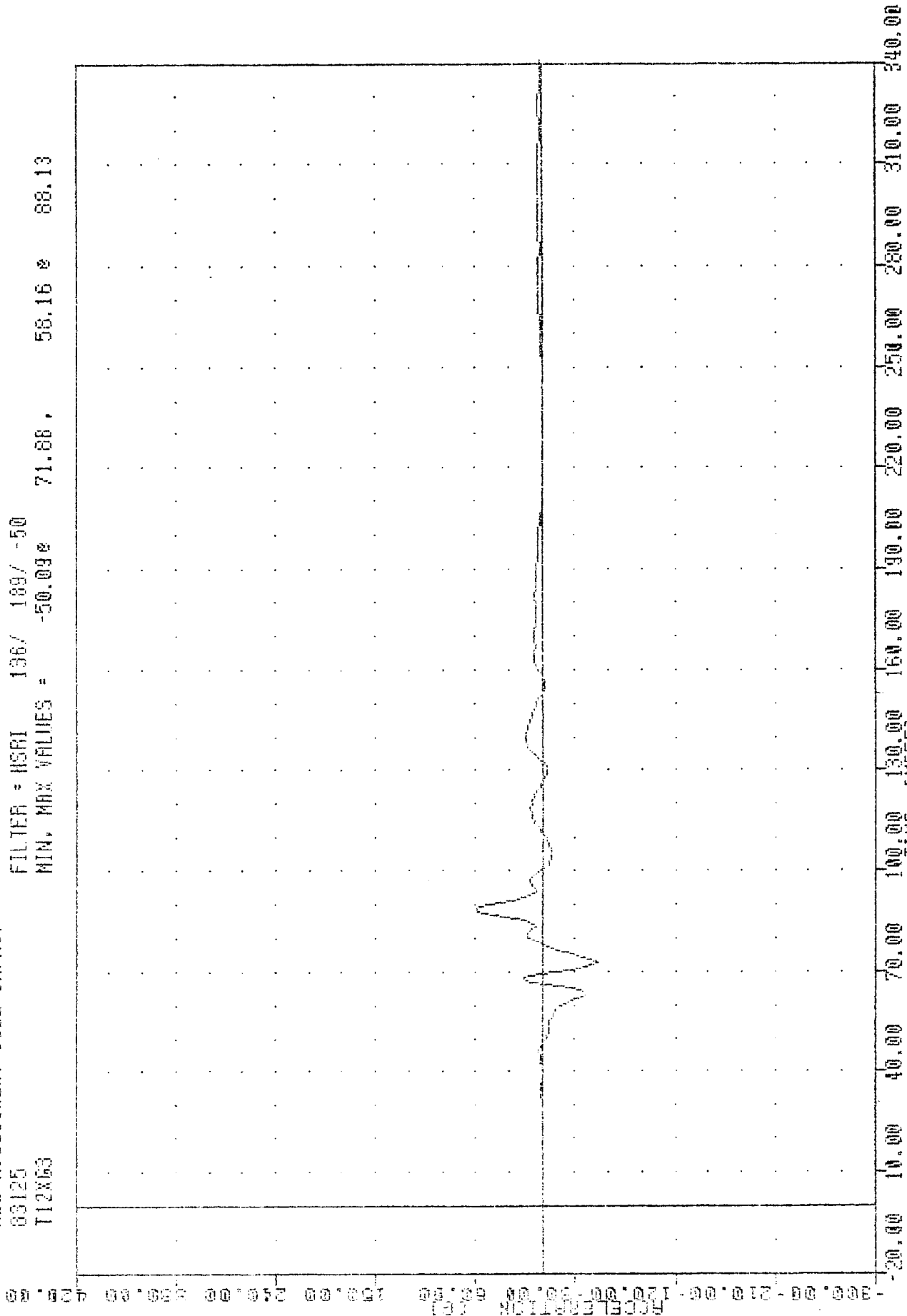
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T01YVC

TBC
HDB ASSESSMENT-SIDE IMPACT
83125
T12X63

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSRI 136/ 189/ -50

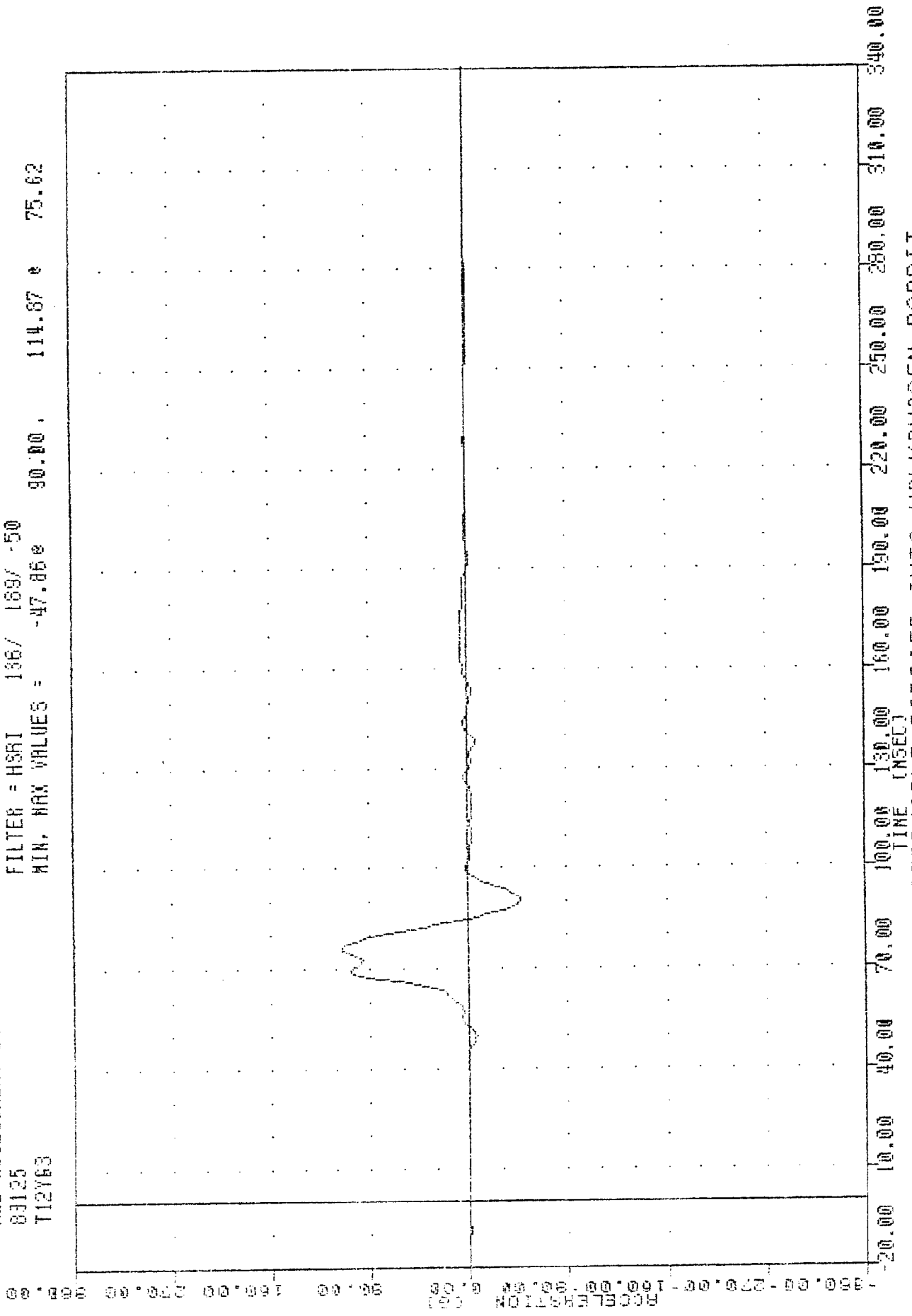
MIN, MAX VALUES = -50.090 71.88, 58.16 88.13



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

TAC , 830505
 MOD ASSESSMENT-SIDE IMPACT
 83125
 T12Y63

PLOT DATE 13-MAY-83 12:46:24
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -47.85e 90.00, 114.87 e 75.62



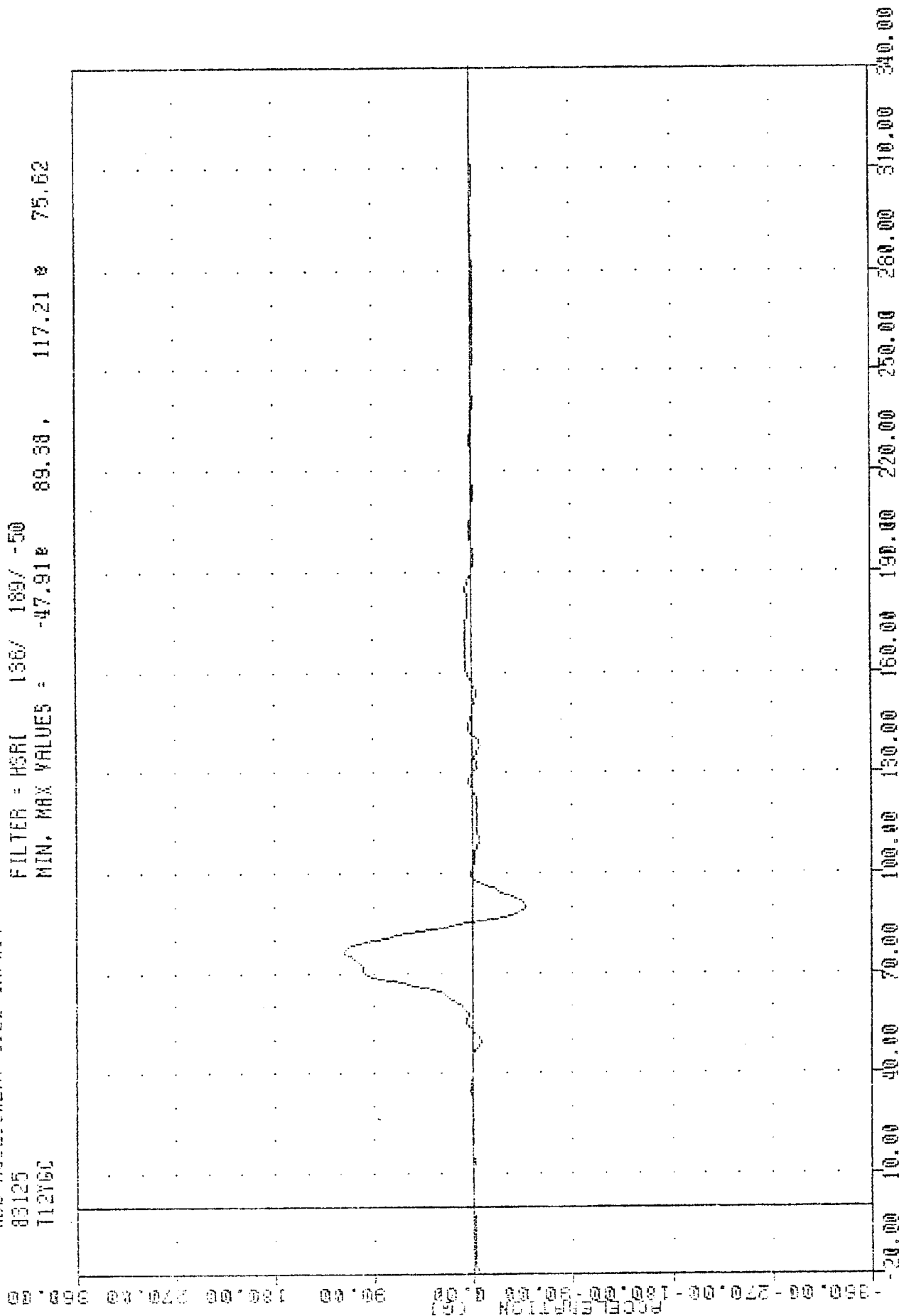
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE ACCELERATION Y AXIS

TRC 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 112Y6C

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSR 136/ 189/ -50

MIN. MAX VALUES = -47.91e 89.38, 117.21 e 75.62

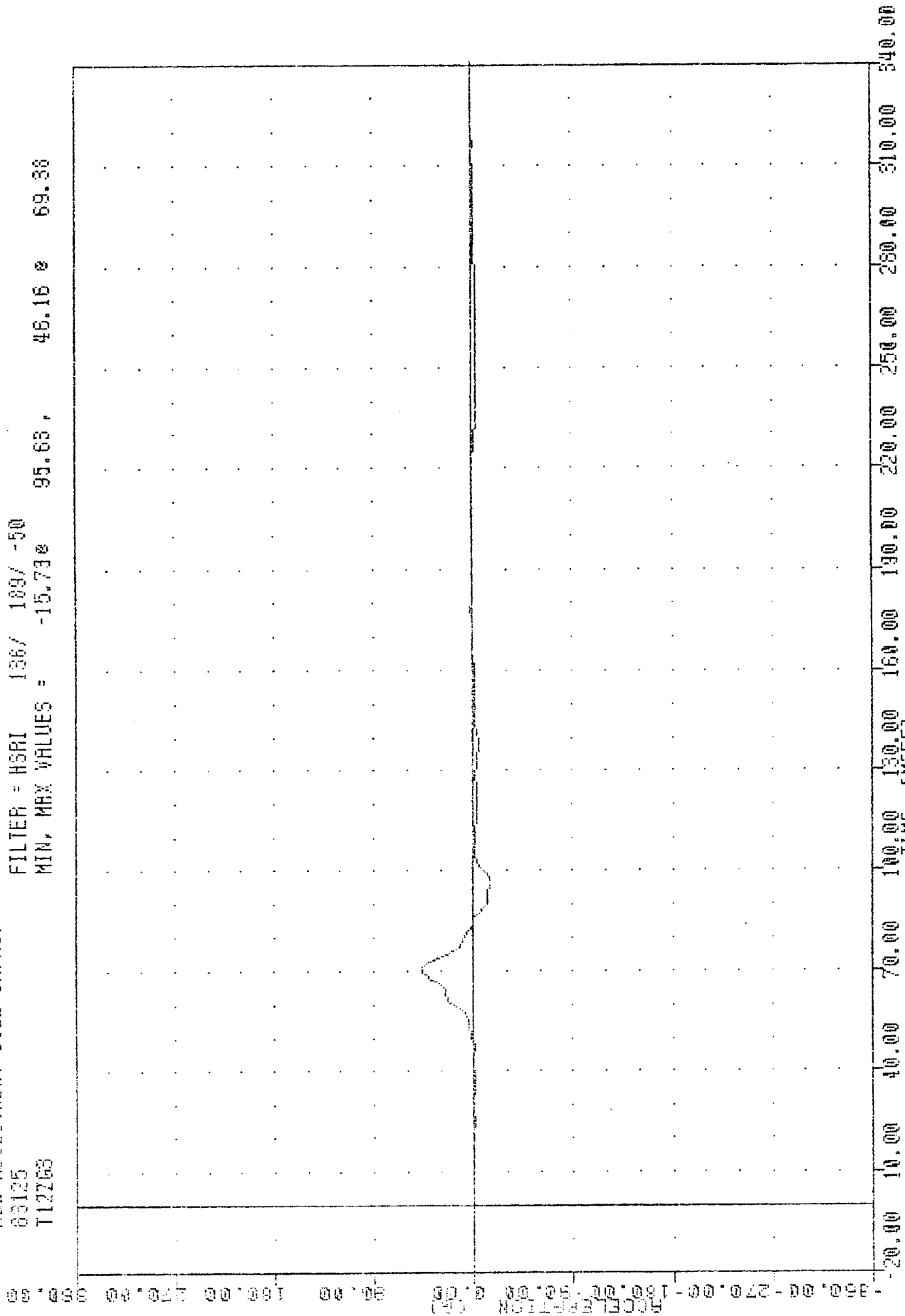


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE ACCELERATION -2 Y AXIS

TBC , 030505
 HDB ASSESSMENT-SIDE IMPACT
 03125
 T12763

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSRI 136/ 109/ -50
 MIN, MAX VALUES = -15.730 95.63 , 46.16 0 69.30



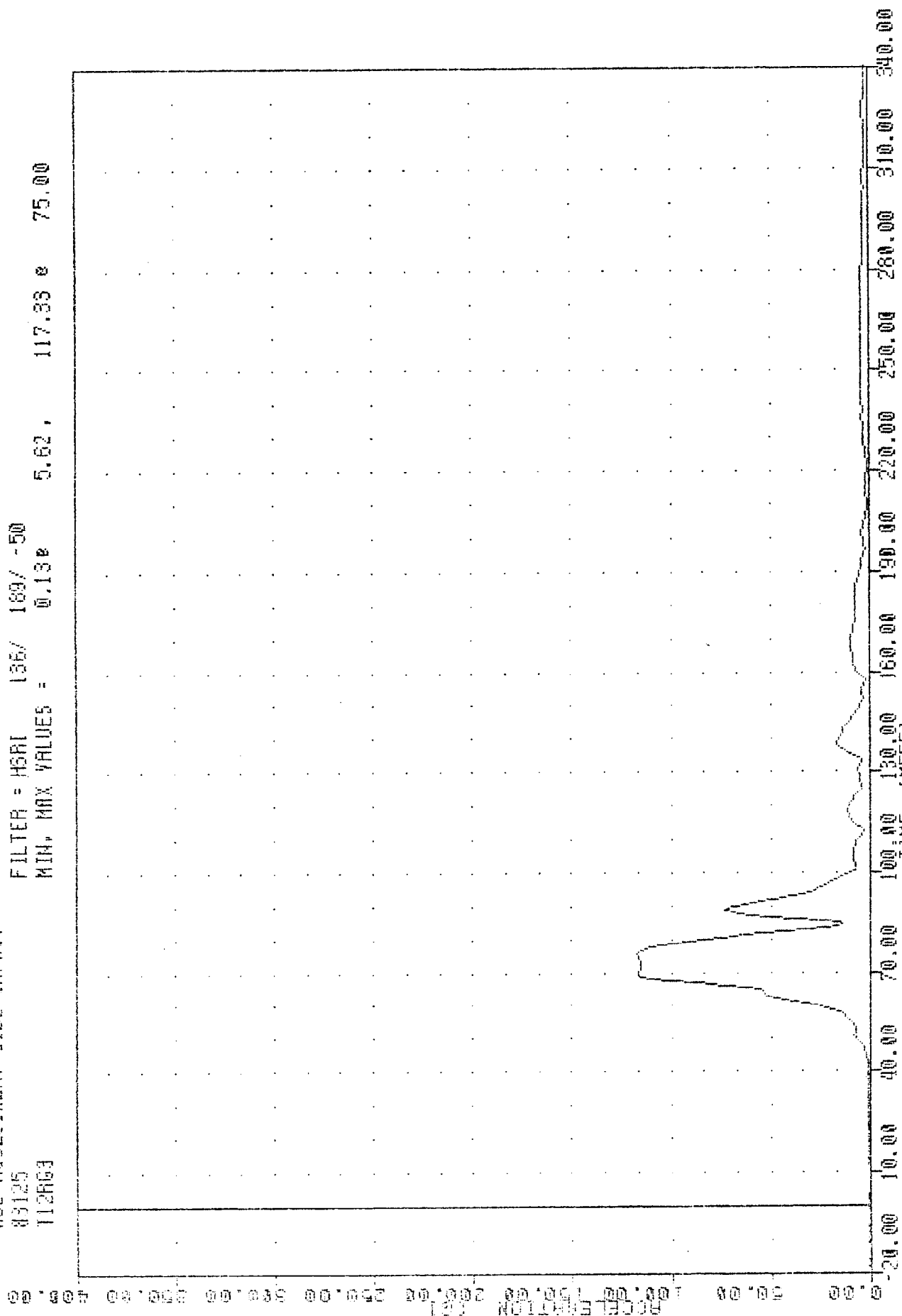
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE ACCELERATION Z AXIS

TRC 830505
 HOB ASSESSMENT-SIDE IMPACT
 83125
 112863

PLOT DATE 13-MAY-83 13:57:58

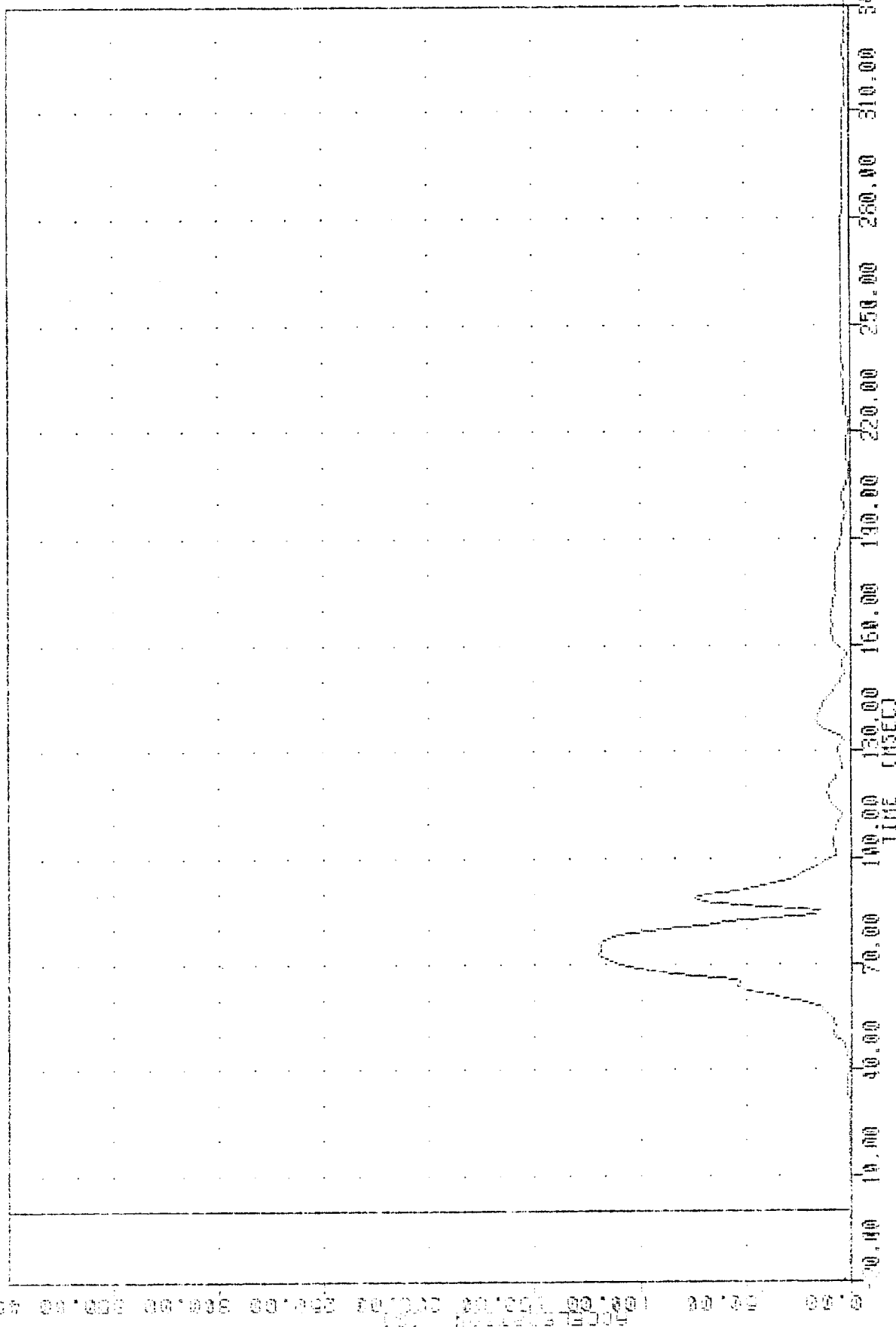
FILTER = HSB1 135/ 189/ -50

MIN, MAX VALUES = 0.13e 5.62, 117.33 e 75.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE RESULTANT

5.92	119.80	89	22.58
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MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE RESULTANT USING I12Y6C

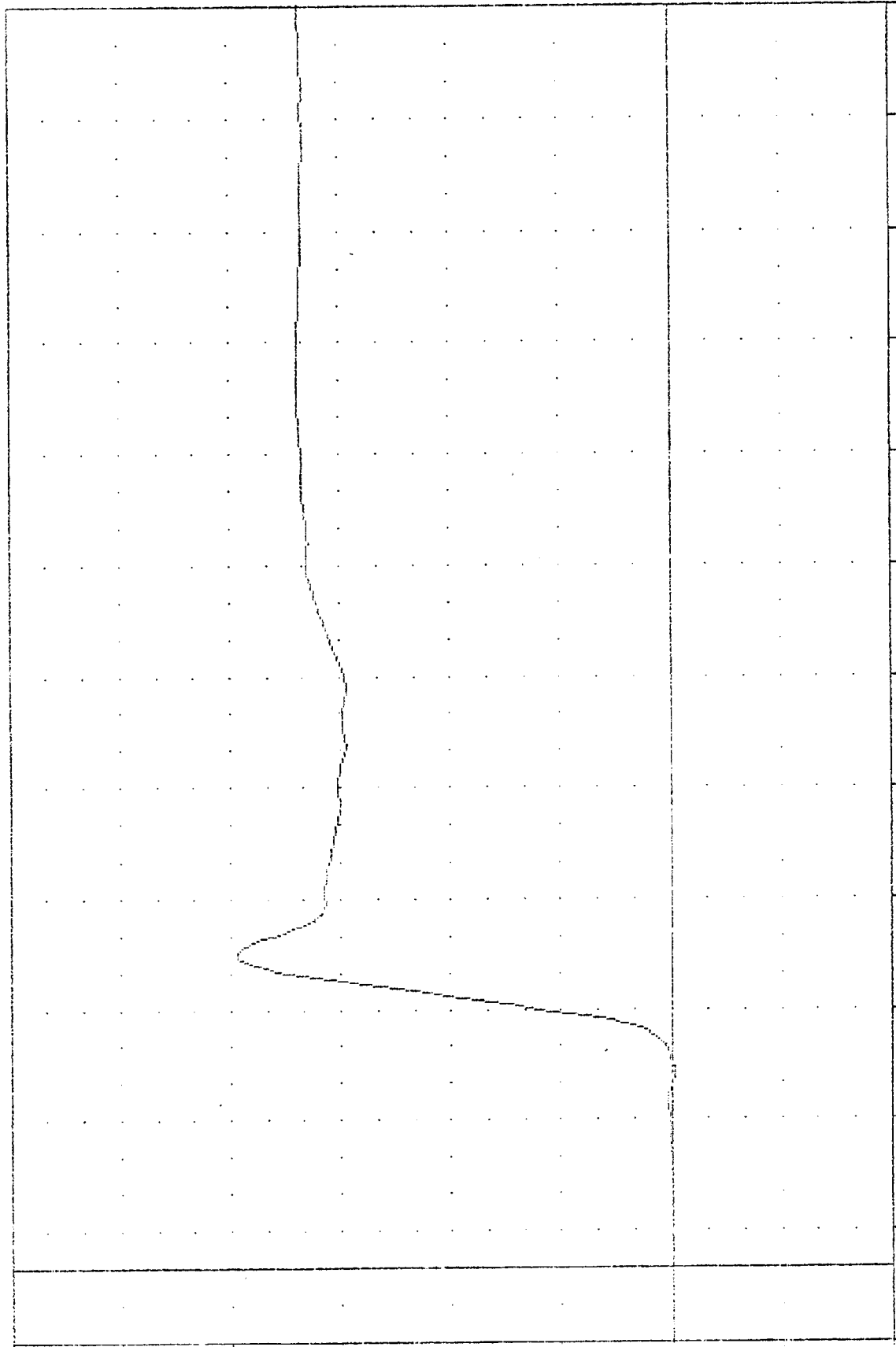
IRC 030505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 T12YV3

PLOT DATE 18-MAY-83 10:44:31

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.31% 51.88, 99.42 & 84.38

VELLOCITY (INCH)



Time (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

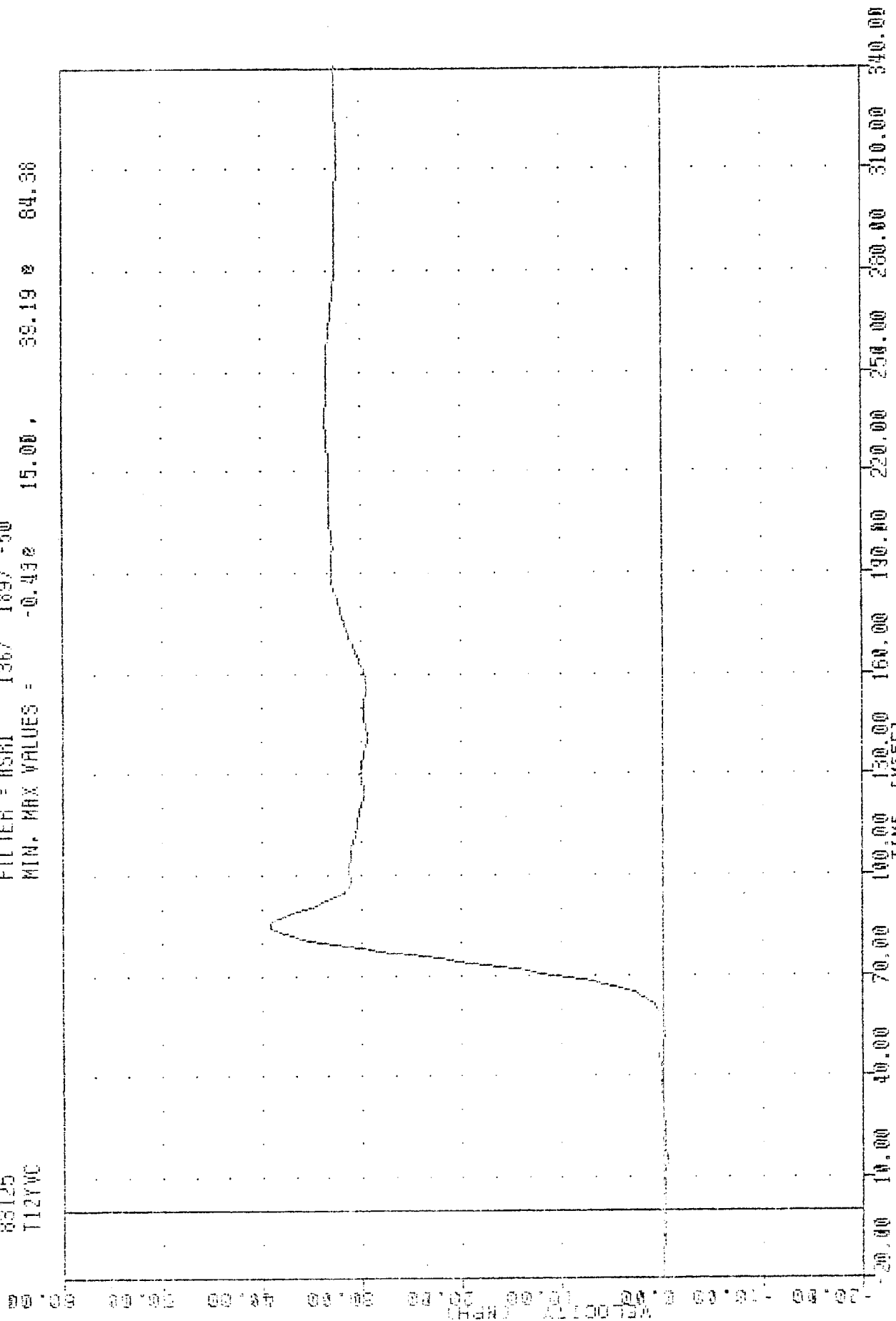
DELTA V USING T12Y63

TSC , 850505
 MUB ASSESSMENT-SIDE IMPACT
 85125
 T12Y6C

PLOT DATE 16-MAY-83 10:44:31

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.432 15.00, 39.19 84.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

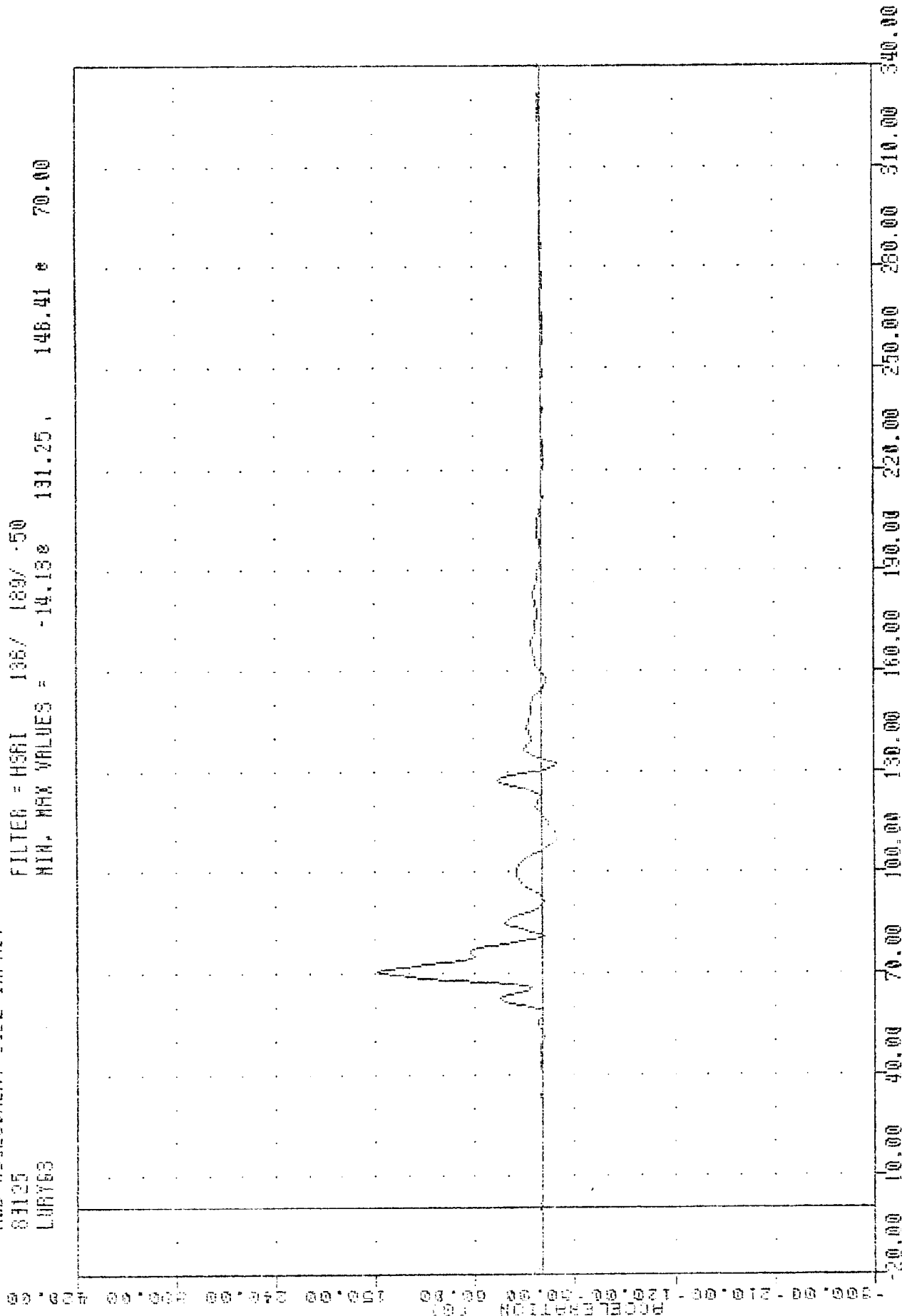
DELTA V USING T12Y6C

TAC : 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 LURV63

PLAT DATE 13-MAY-83 12:46:24

FILTER = HSB1 135/ 129/ -50

MIN. MAX VALUES = -14.130 131.25, 146.41 70.00



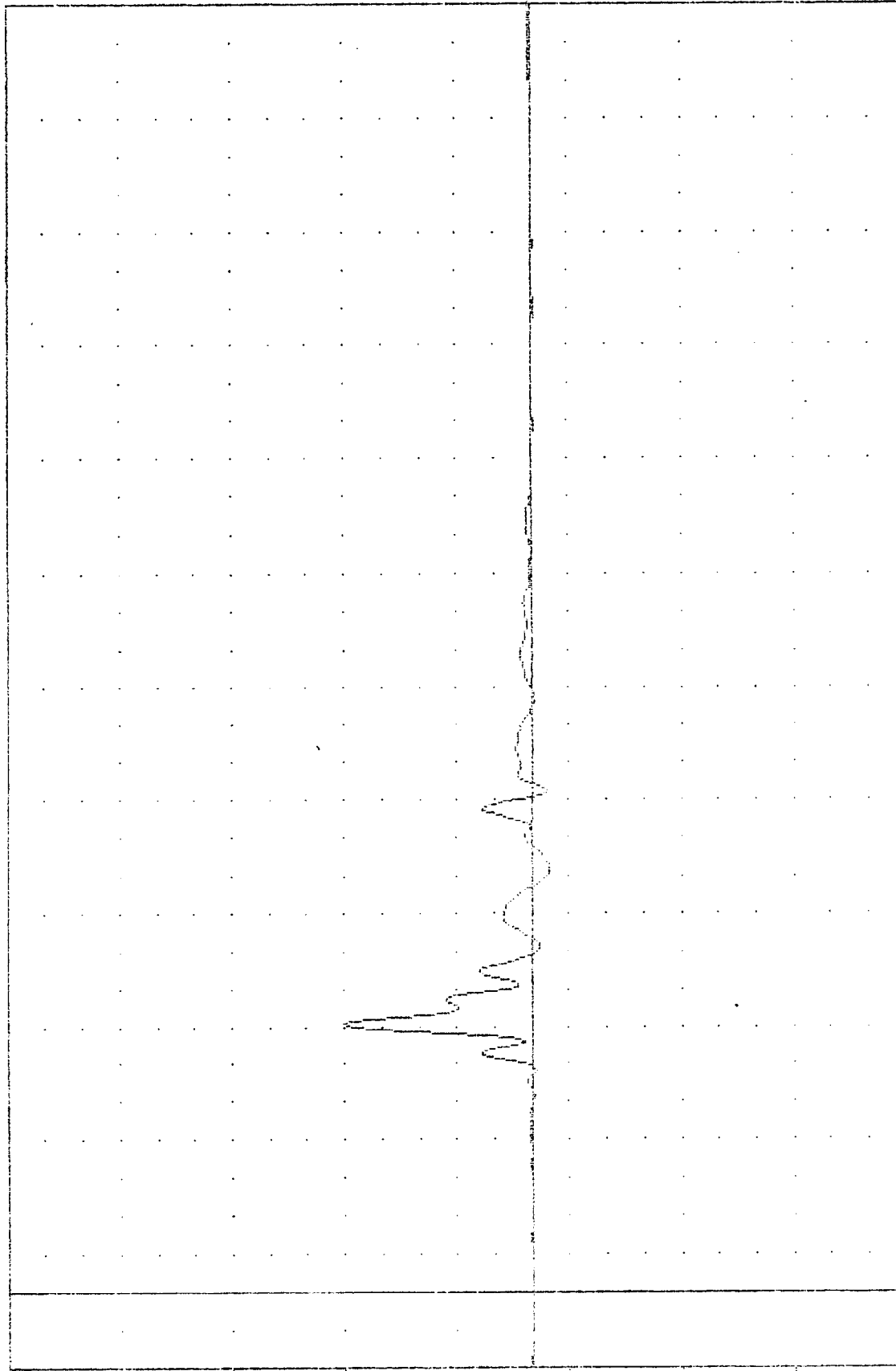
18C , 830505
 H00 ASSESSMENT-SIDE IMPACT
 83125
 LURY6C

PLOT DATE 13-MAY-83 12:46:24

FILTER = HSR1 136/ 189/ -50

MIN. MAX VALUES = -14.84e 110.63, 150.48 e 70.00

ACCEL. POSITION (G)
 -300.00 -210.00 -120.00 -30.00 60.00 150.00 240.00 330.00 420.00



-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 LEFT UPPER RIB ACCELERATION -2 Y AXIS

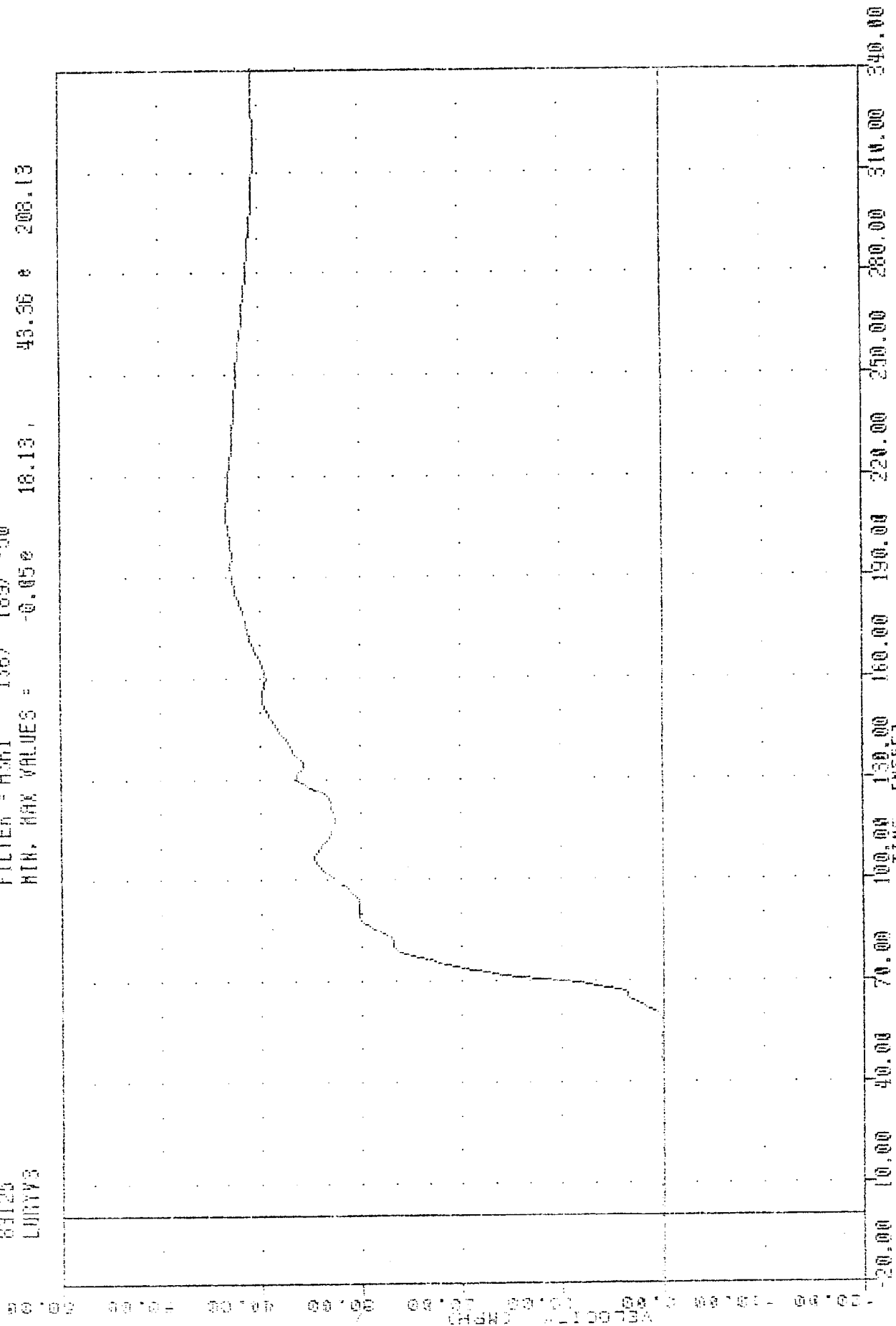
TAC
 83125
 LURVY3
 8345003
 MOV ROSESSENT-SIDE IMPACT

PLOT DATE 16-MAY-83 10:44:31

FILTER = HSB1 136/ 189/ -50

MIN. MAX VALUES = -0.050 18.13

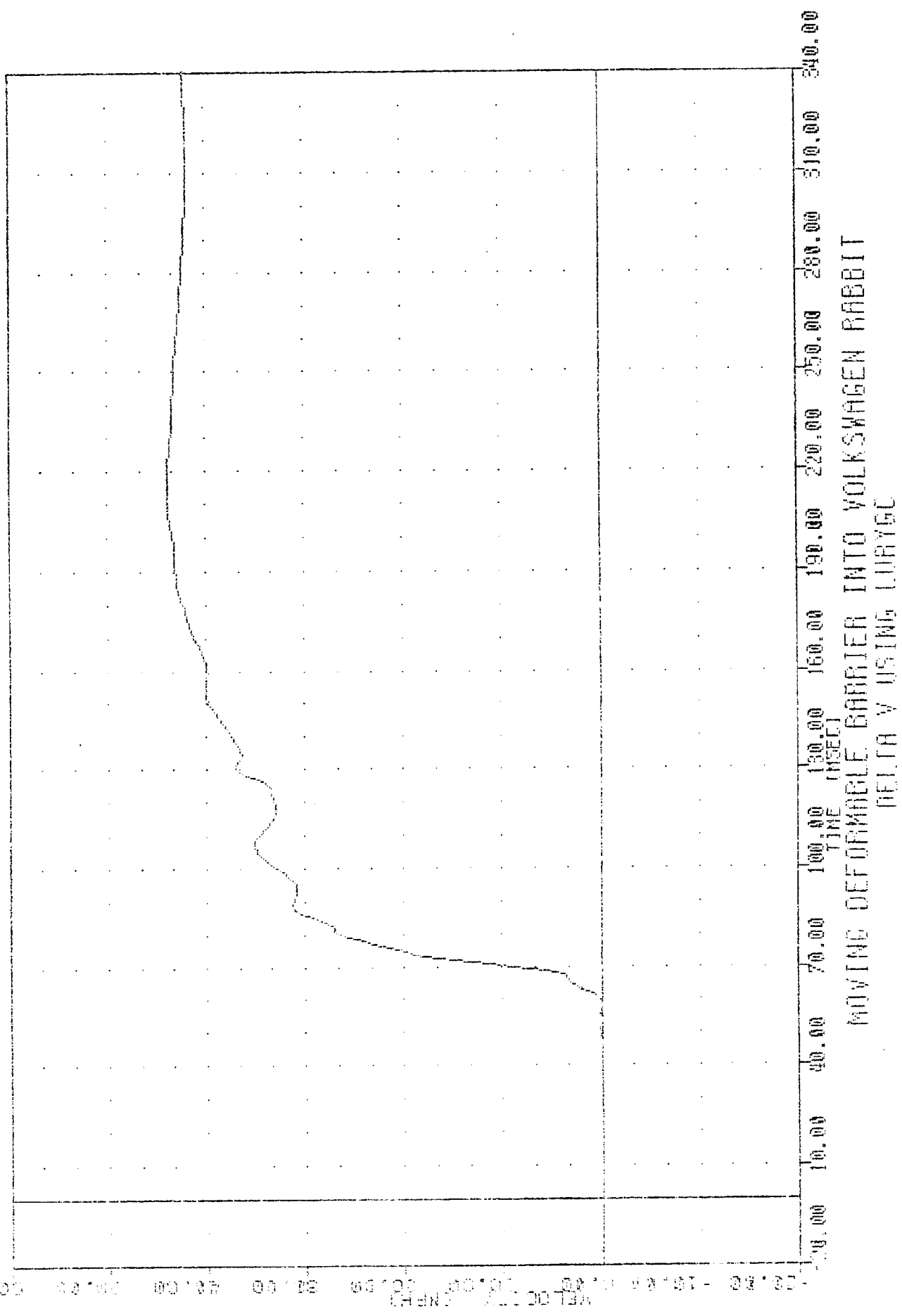
43.36 * 208.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING LURVY3

ID: 010505
 PLOT DATE: 16-MAY-83 10:44:31
 MIN, MAX VALUES = -0.130 11.25, 43.88 & 209.38
 FILTER = HERR 1367 1897 -50
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LURVGC



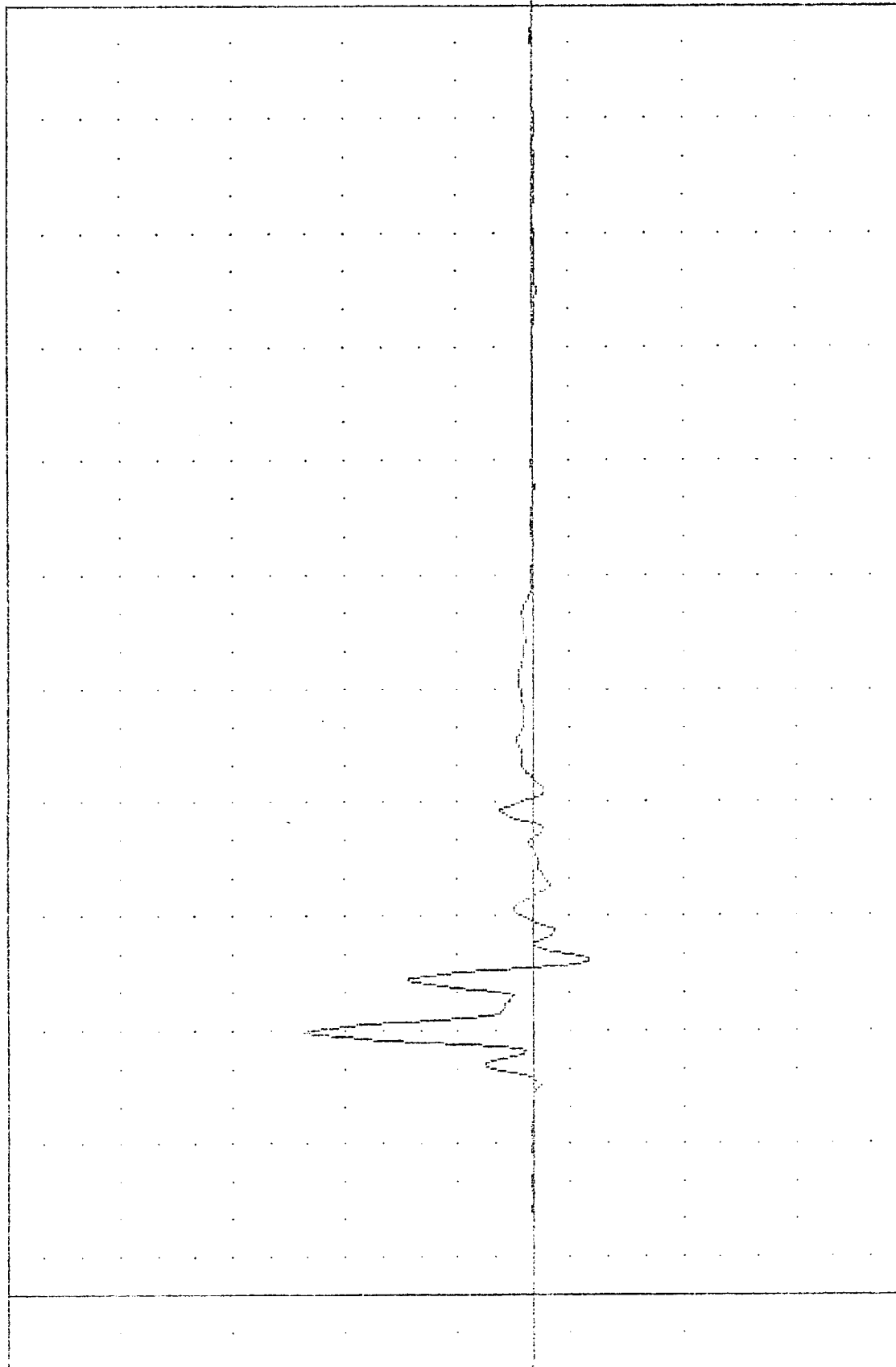
830505 13-MAY-83 12:46:24

MOD ASSESSMENT-SIDE IMPACT

FILTER = HSR 136/ 189/ -50

MIN. MAX VALUES = -45.250 87.50 183.18 0 66.75

ACCELERATION (G)



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

180 PLOT DATE 13-MAY-68 12:46:24

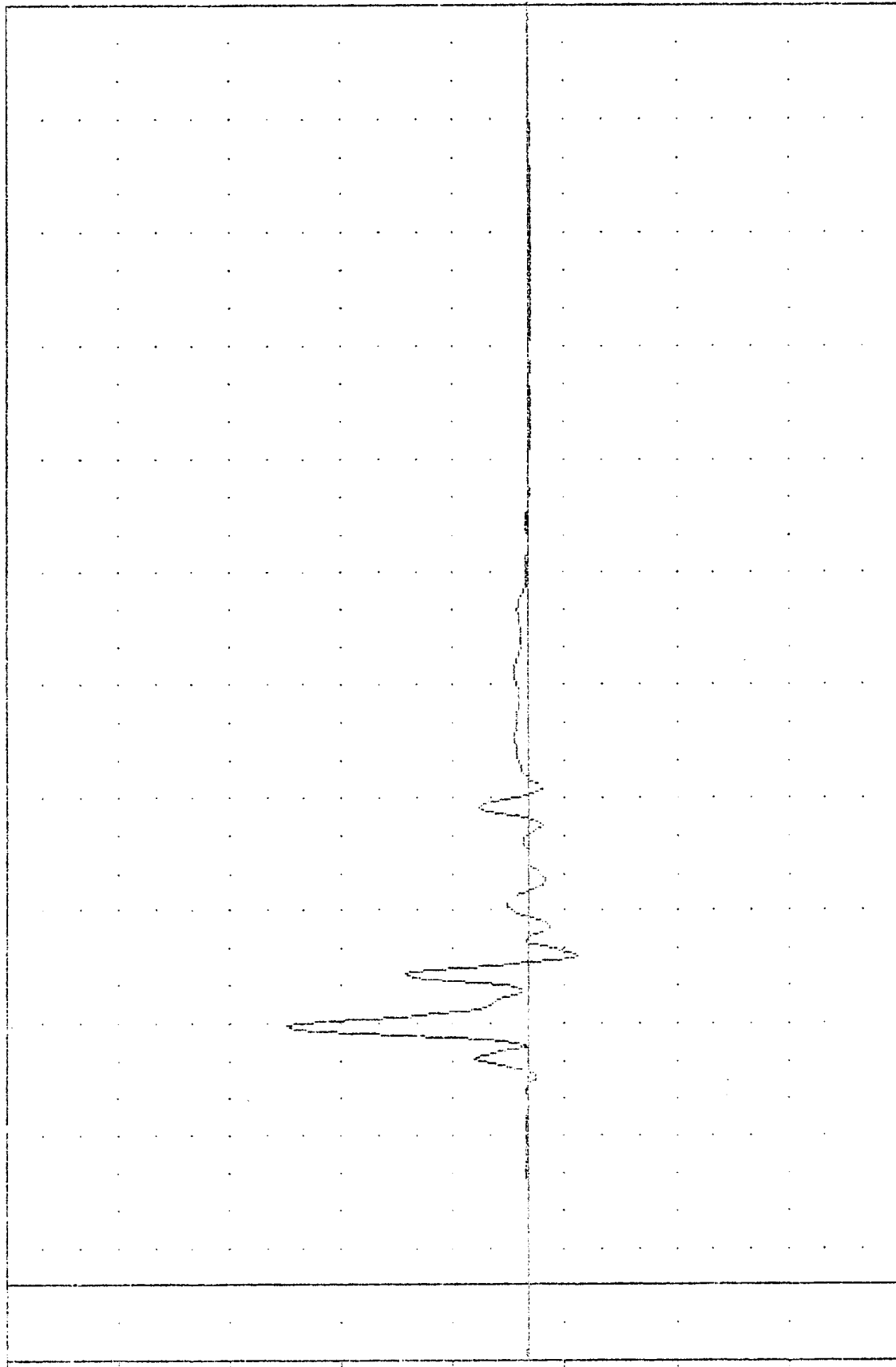
MOB ASSESSMENT-SIDE IMPACT

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -41.34 87.50 193.43 68.75

83125
LRYEC

ACCELERATION (G)



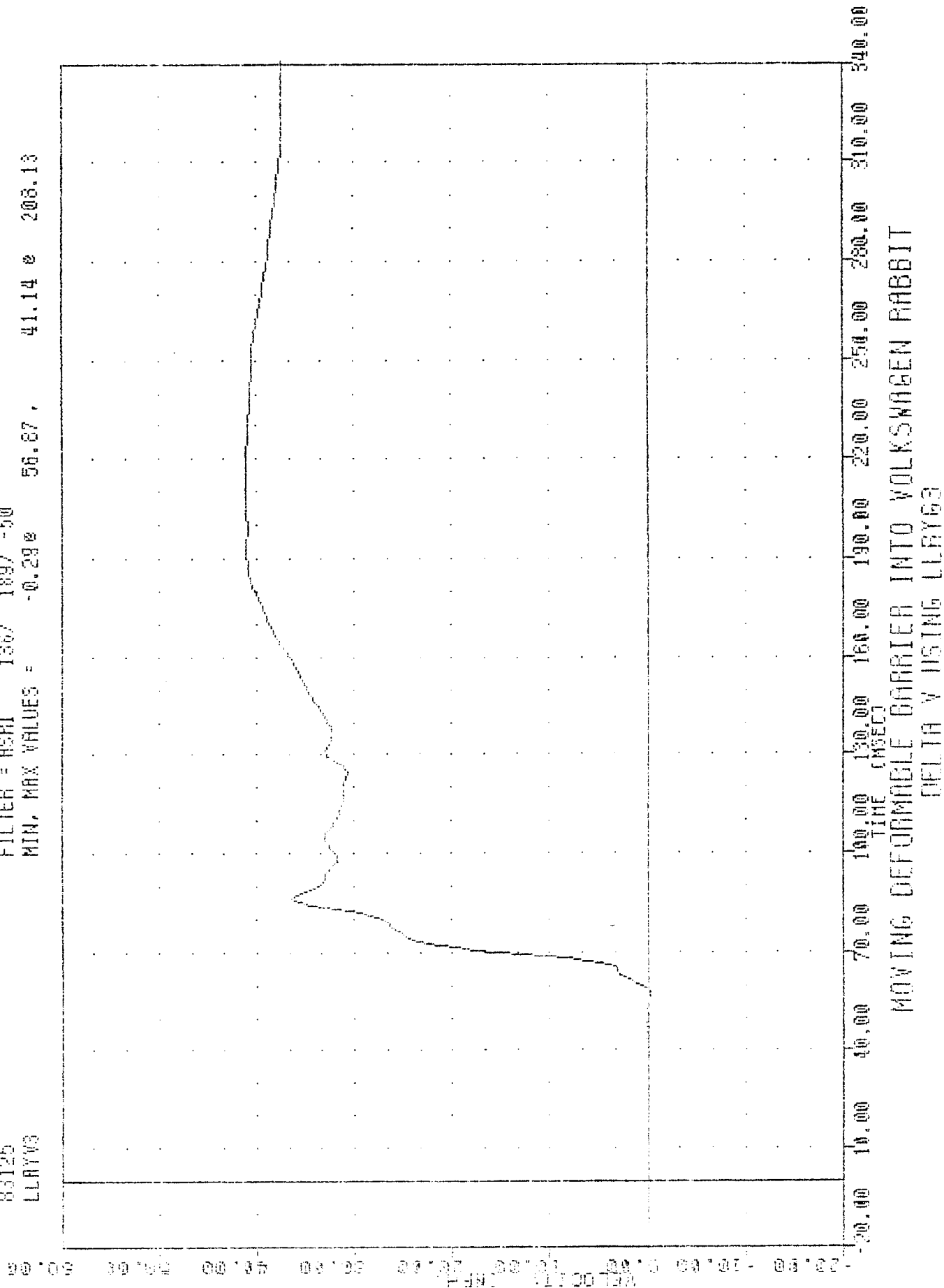
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT LOWER AID ACCELERATION Y AXIS

TAC , 830505
 MOD ASSESSMENT-SIDE IMPACT
 83125
 LLYV3

PLOT DATE 18-MAY-83 10:44:31

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.290 56.87, 41.14 @ 208.13

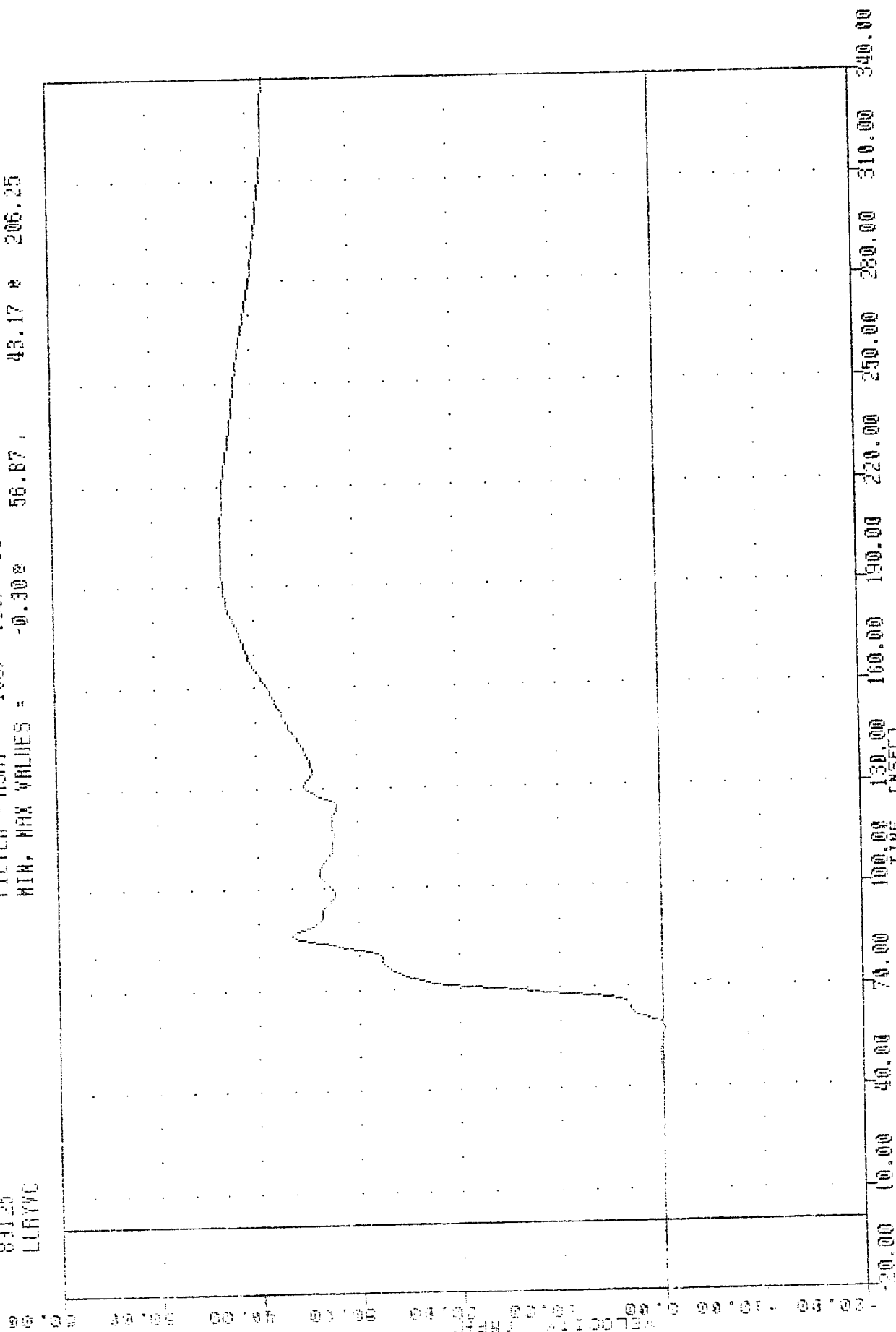


TDC , 830505
 HOB REASSESSMENT-SIDE IMPACT
 83125
 LCRYGC

PLOT DATE 16-MAY-83 10:44:31

FILTER = HSB1 136/ 123/ -50

MIN, MAX VALUES = -0.302 55.87 , 43.17 206.25



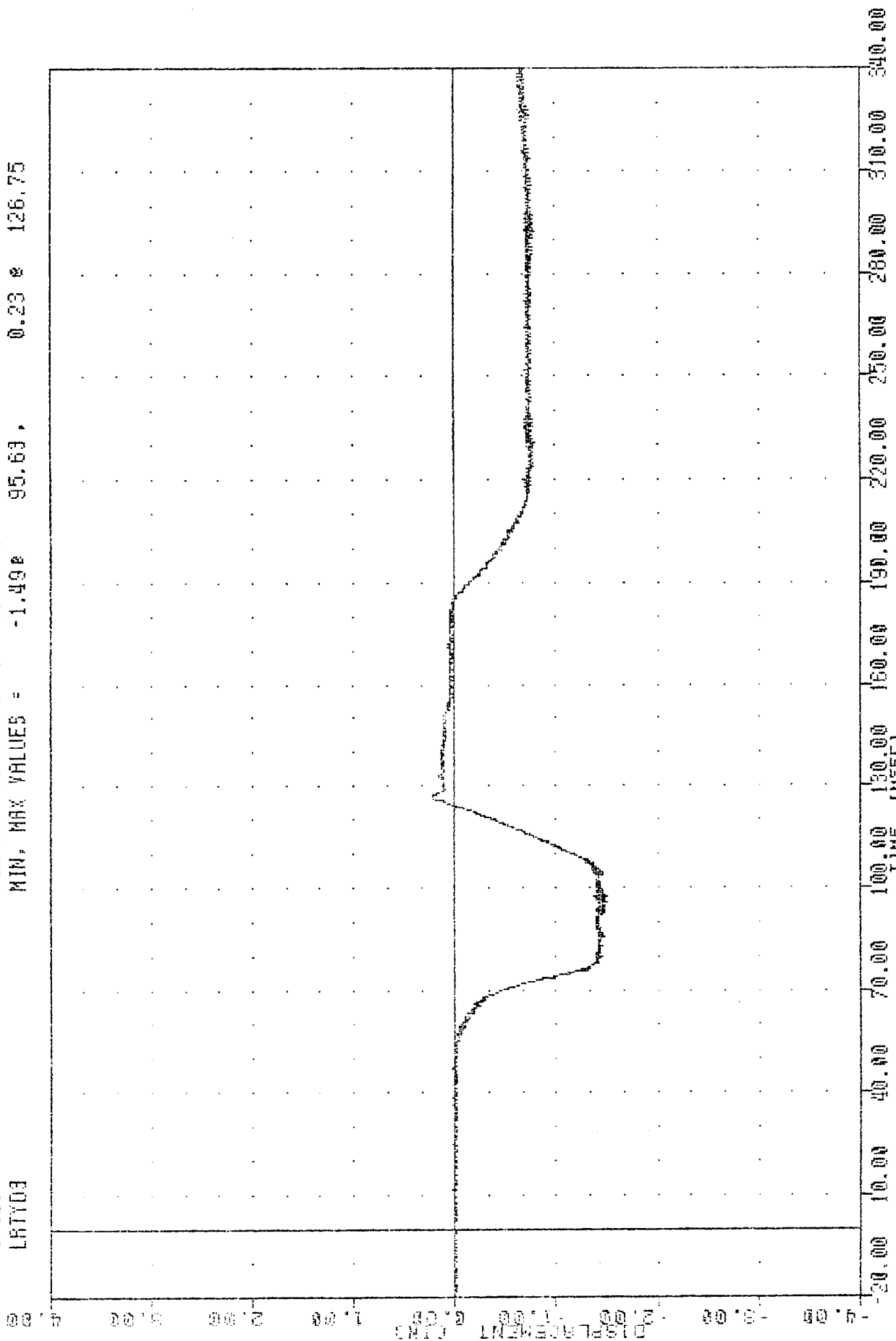
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LCRYGC

TRC 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 L8TY03

PLOT DATE 16-MAY-83 15:00:08

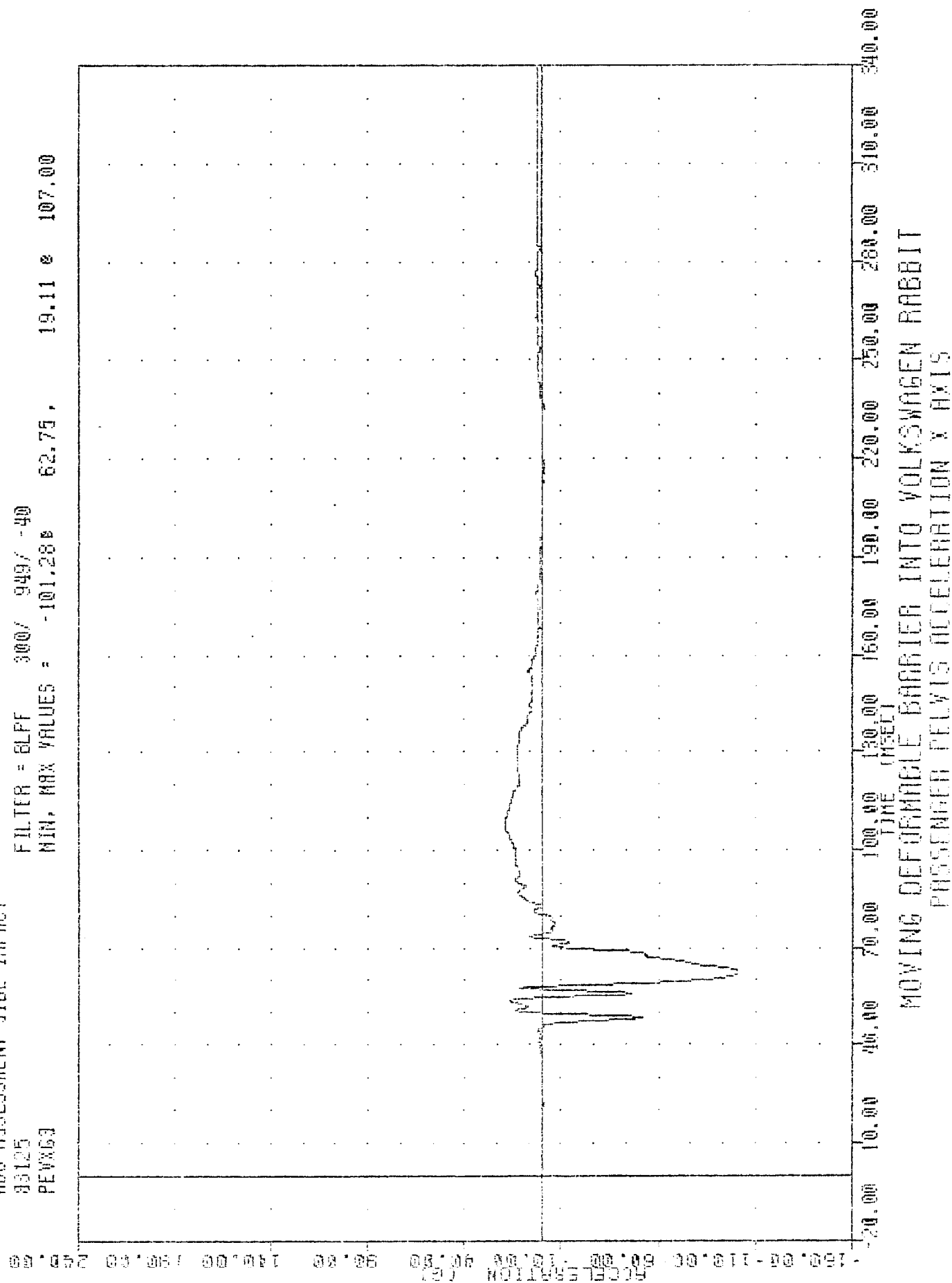
FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -1.498 95.63, 0.23 126.75



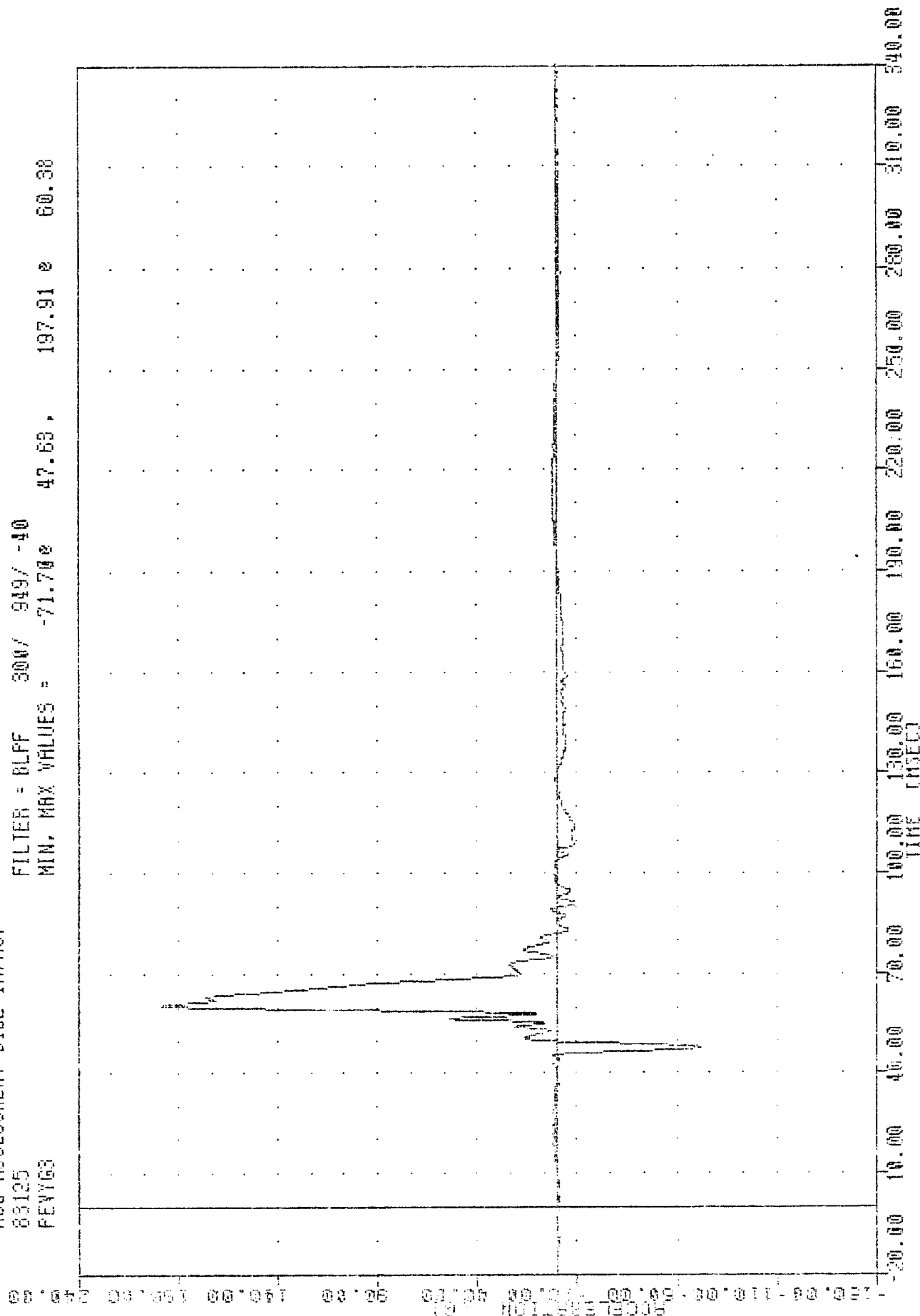
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LEFT RIB TO SPINE DISPLACEMENT INCHES

TRC 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 PEVX63
 PLOT DATE 13-MAY-83 10:27:41
 FILTER = 6LFF 300/ 949/ -40
 MIN, MAX VALUES = -101.28 62.75, 19.11 & 107.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER PELVIS ACCELERATION X AXIS

TRC , 330595
 MOB ASSESSMENT-SIDE IMPACT
 83125
 PEVY63
 FLOT DATE 13-MAY-83 10:27:41
 FILTER = BLFF 300/ 949/ -10
 MIN, MAX VALUES = -71.700 47.63, 197.91 0 60.38



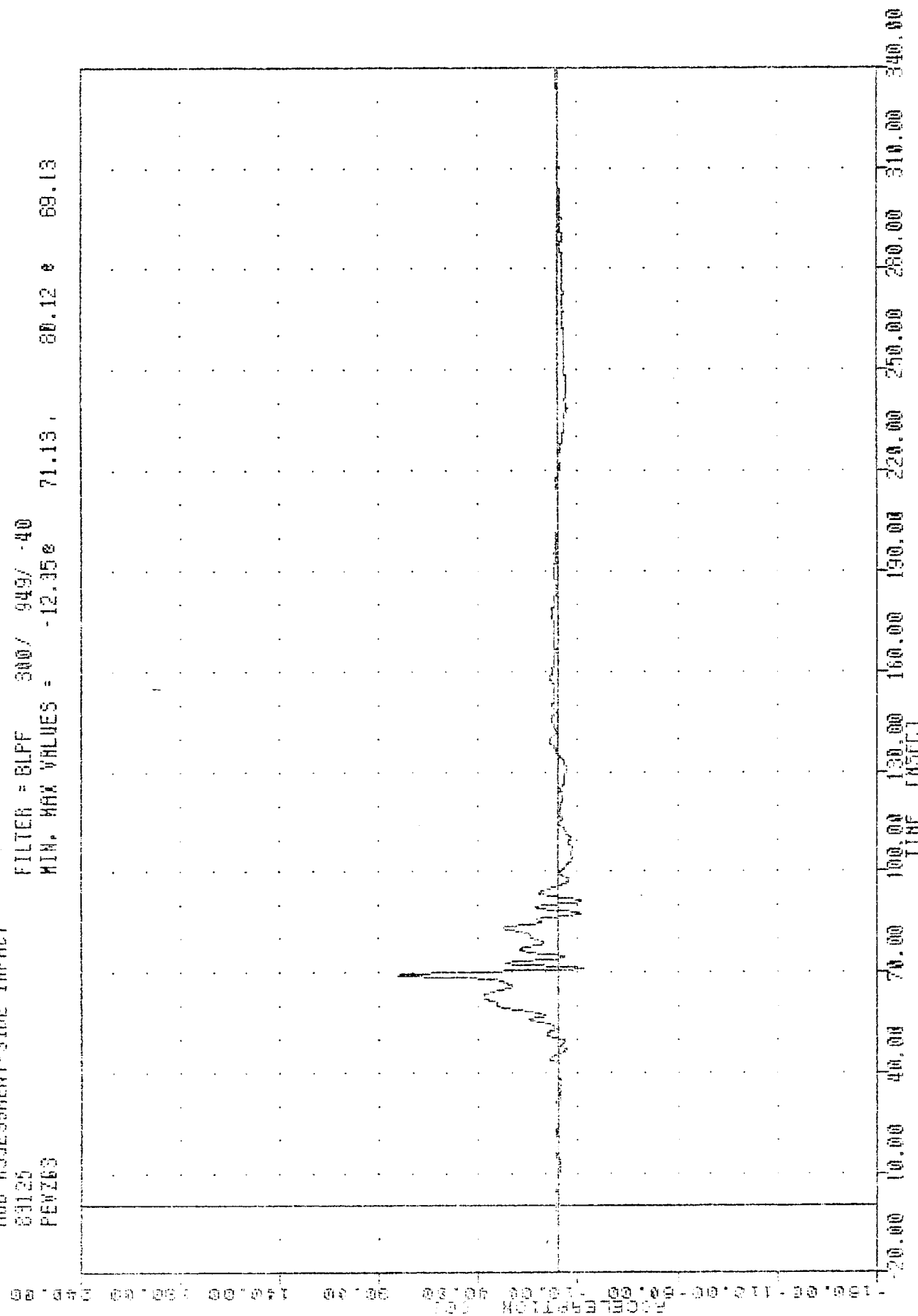
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER PELVIS ACCELERATION Y AXIS

TAC , 830505
 MOB ASSESSMENT-SIDE IMPACT
 09125
 PEVZ63

PLOT DATE 13-MAY-83 10:27:41

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -12.350 71.13 80.12 69.13



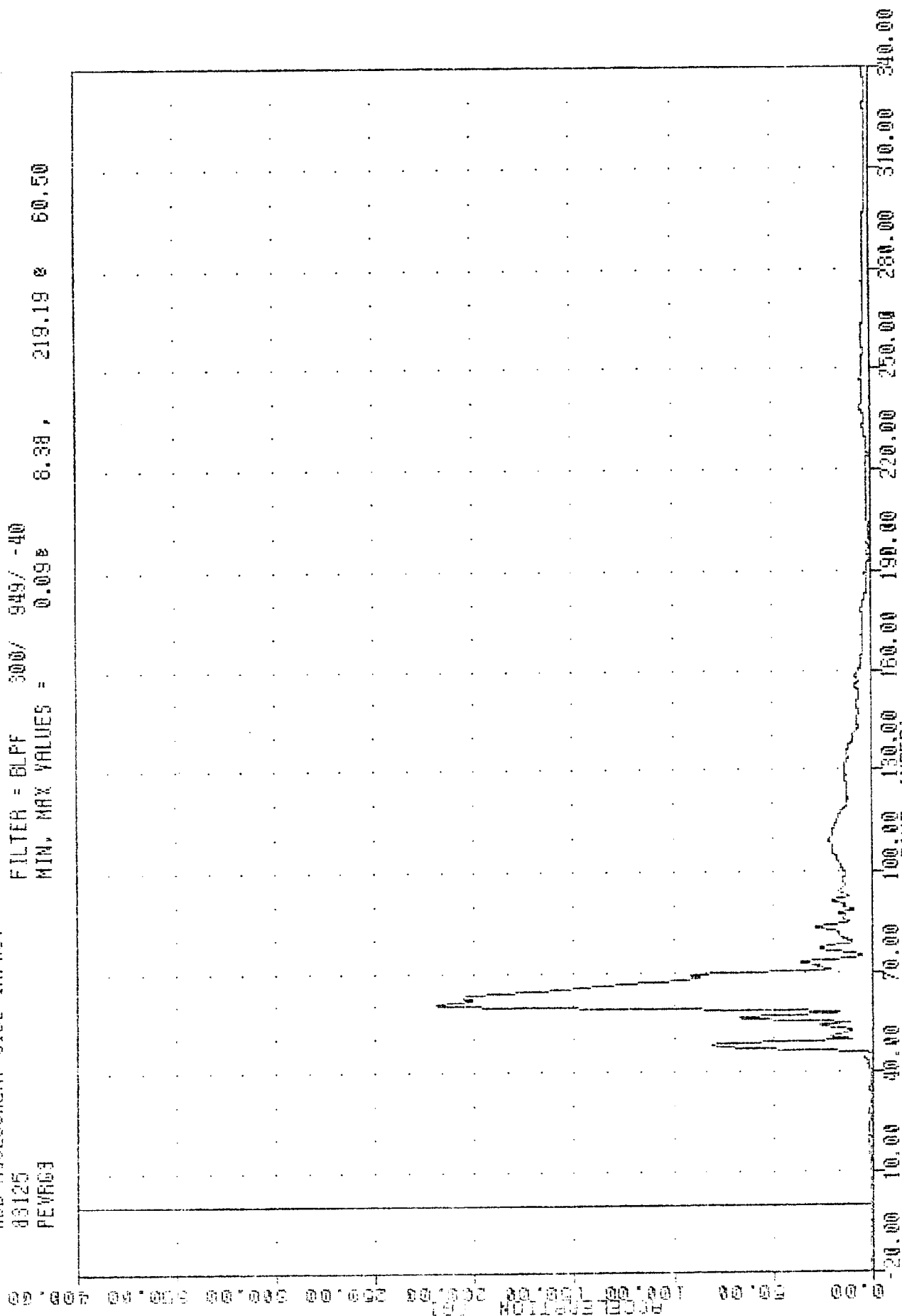
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER PELVIS ACCELERATION Z AXIS

TRC , 830505
NO9 ASSESSMENT-SIDE IMPACT
83125
PEVR03

PLOT DATE 13-MAY-83 13:46:22

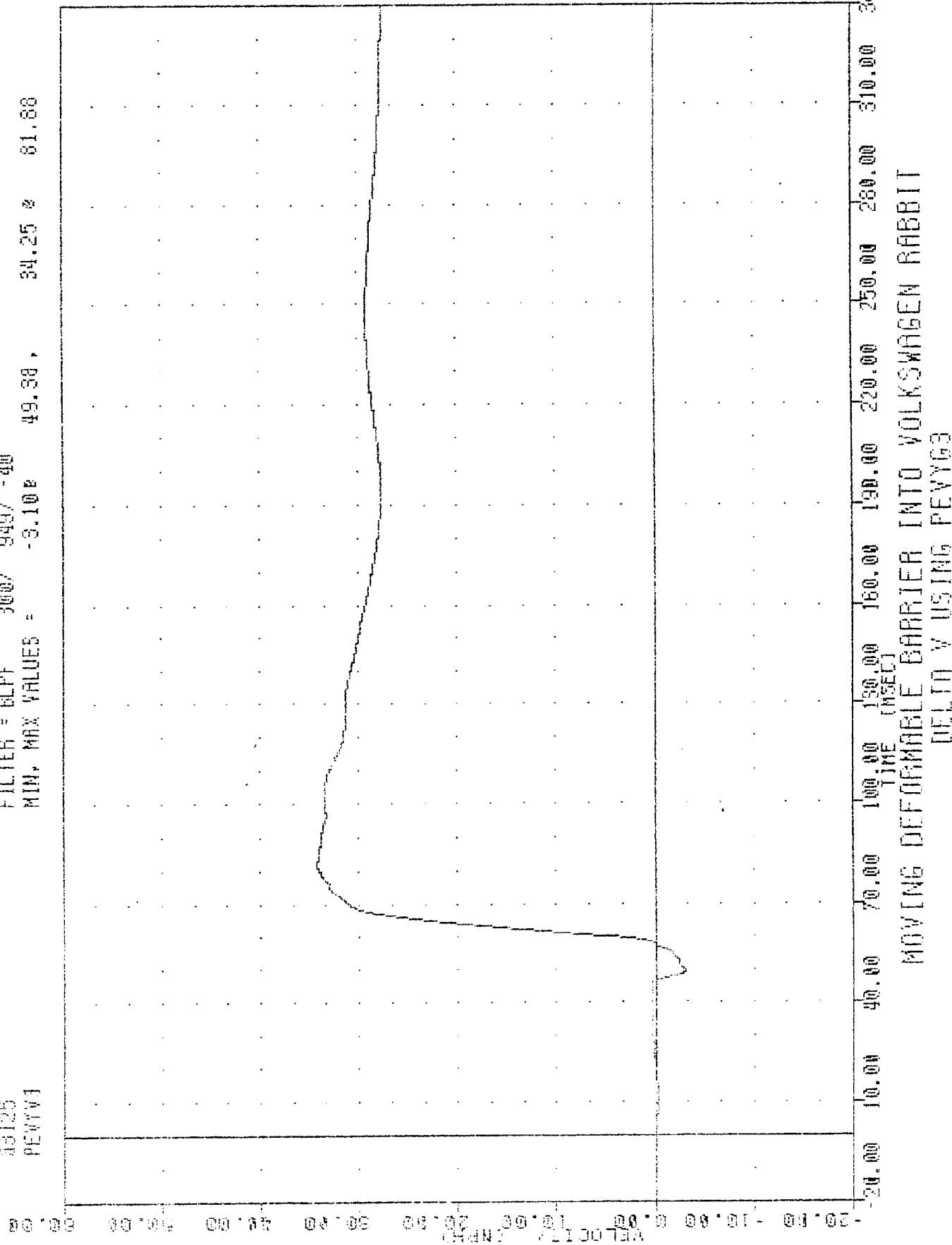
FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = 0.098 8.38 , 219.19 8 60.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PLIVIS RESULTANT

TRC 030500
 H00 ASSESSMENT-SIDE IMPACT
 03125
 PEVTV1
 PLOT DATE 16-MAY-83 13:44:58
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -3.10E 49.38 , 34.25 * 81.88

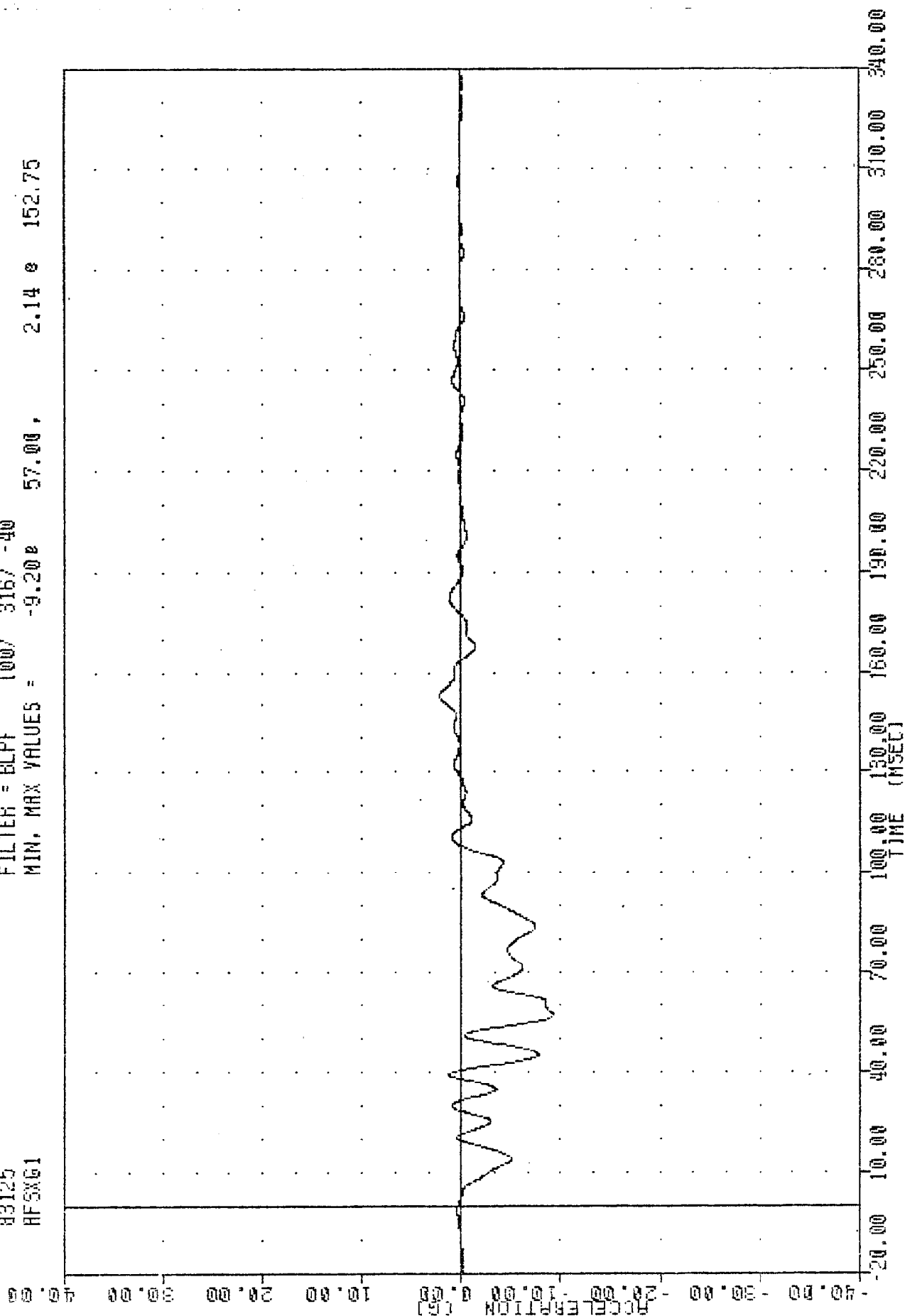


TRC 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 HFSXG1

PLOT DATE 15-JUN-83 13:34:09

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -9.20e 57.00, 2.14 e 152.75

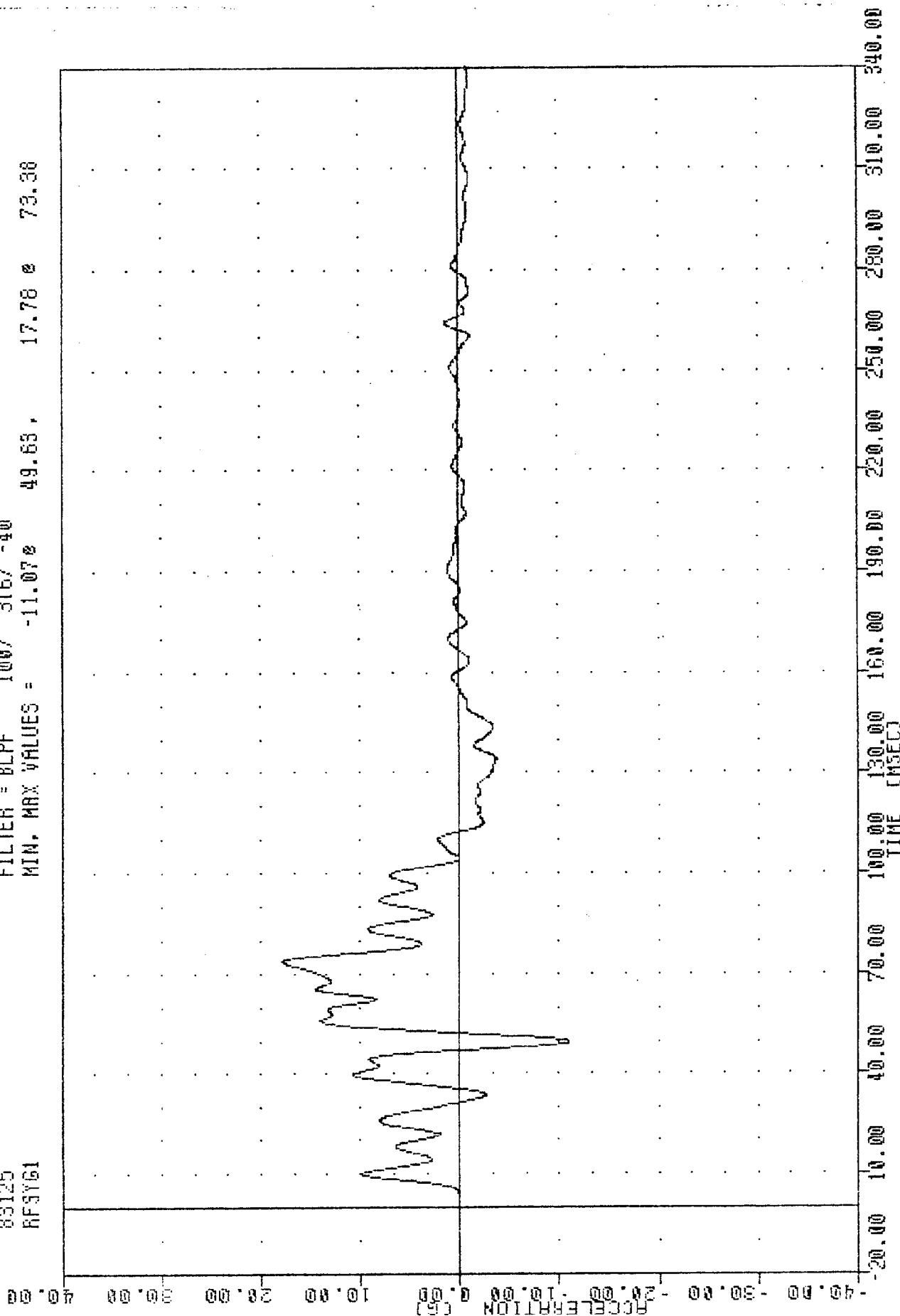


TRC , 830505
MDB ASSESSMENT-SIDE IMPACT
83125
RF3Y61

PLOT DATE 15-JUN-83 13:34:09

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -11.07e 49.63, 17.78 e 73.38

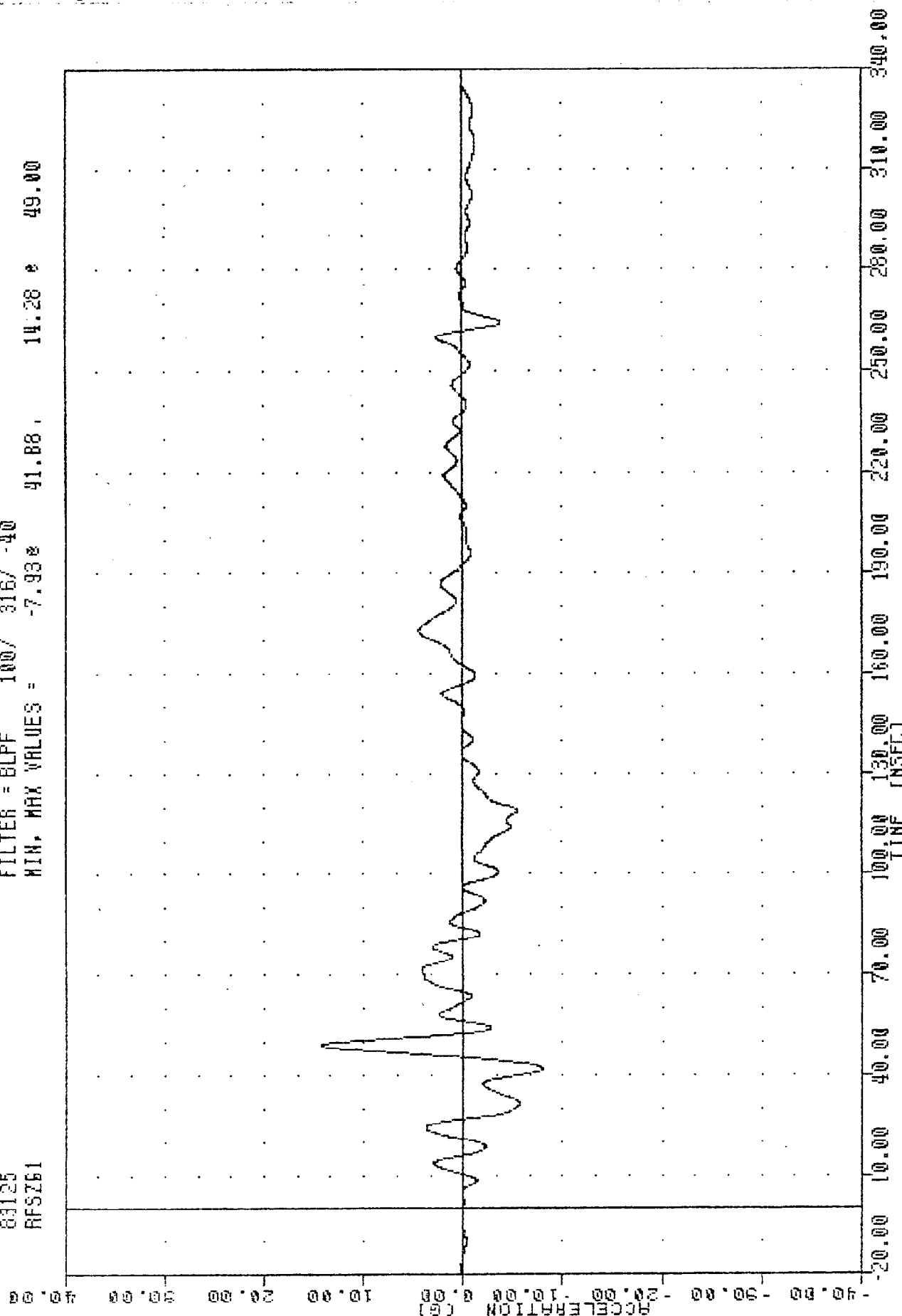


TAC 830505
 MOB ASSESSMENT-SIDE IMPACT
 83125
 RFSZ61

PLOT DATE 15-JUN-83 13:34:09

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -7.938 41.88, 14.28 49.00

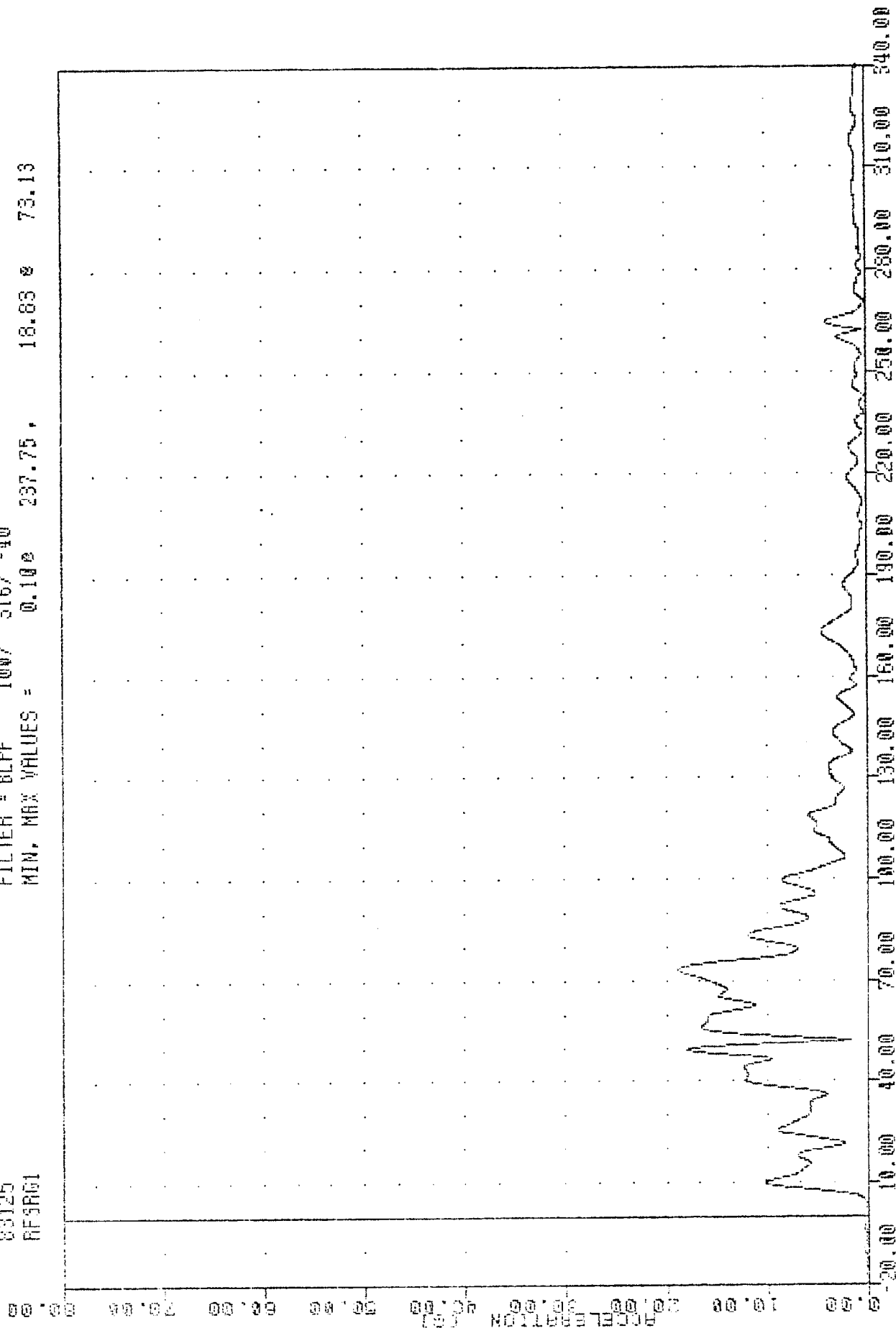


TRC 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 RF3RG1

PLOT DATE 13-MAY-83 13:46:22

FILTER = 8LFF 100/ 316/ -40

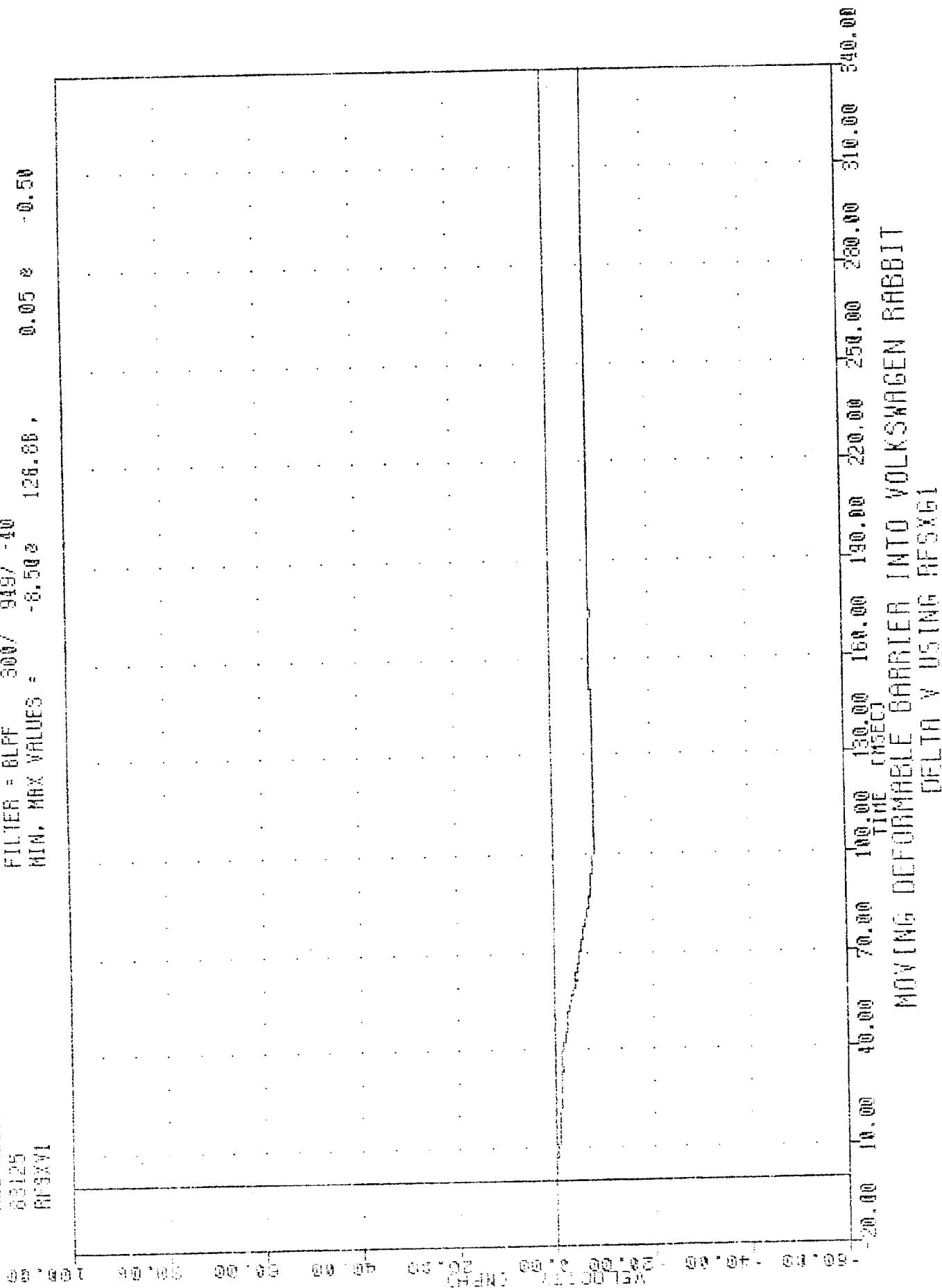
MIN. MAX VALUES = 0.100 237.75, 18.83 73.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE RIGHT FRONT SILL RESULTANT

16C
 830505
 MOB ASSESSMENT-SIDE IMPACT
 03125
 RFSXV1

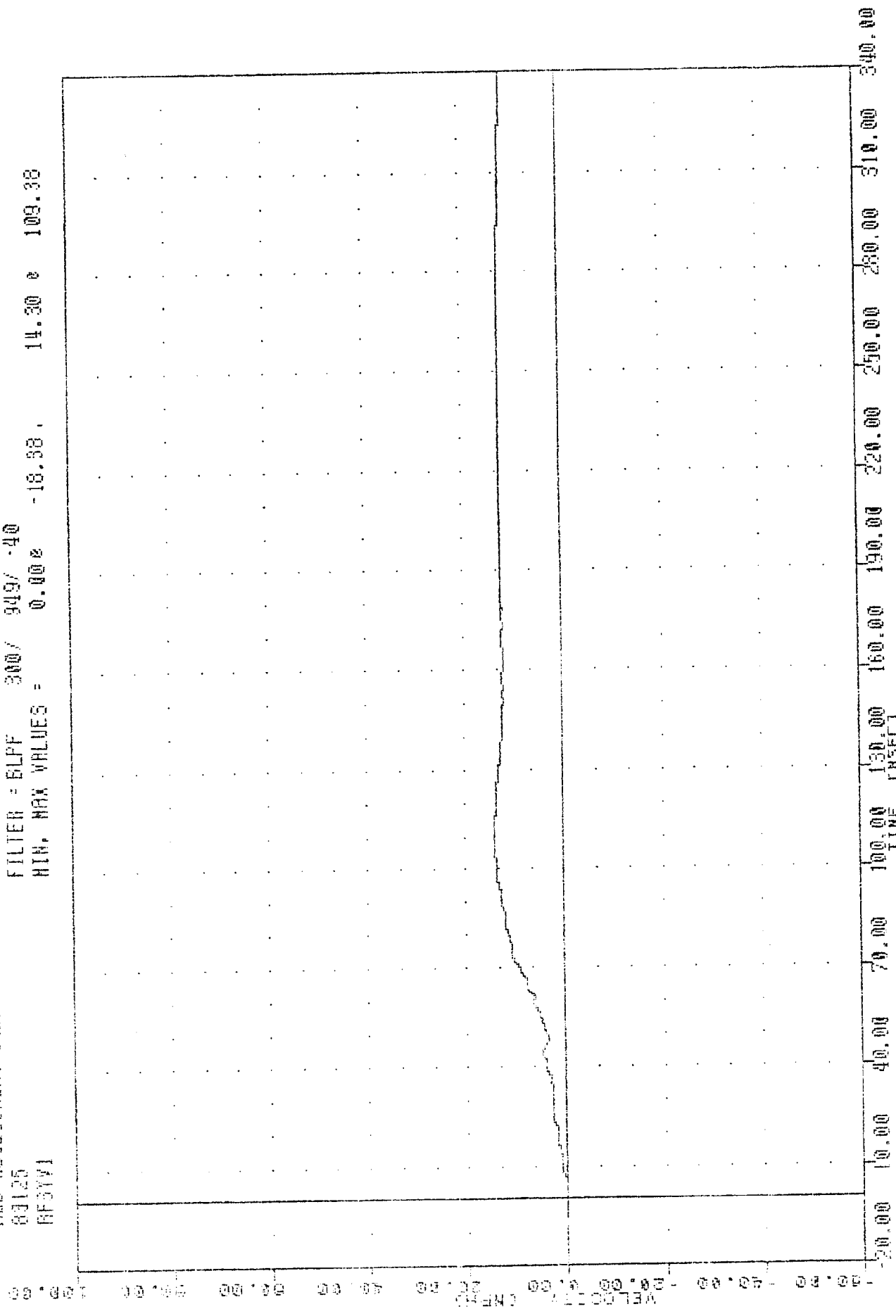
PLOT DATE 16-MAY-83 13:44:58
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -8.50 128.88 0.05 0.50



THE 830505
 MDG DISSEMENT-SIDE IMPACT
 83125
 RFSYV1

PLOT DATE 16-MAY-83 13:44:58

FILTER = 6LPP 300/ 949/ -40
 MIN. MAX VALUES = 0.00e -18.88. 14.30 e 109.38



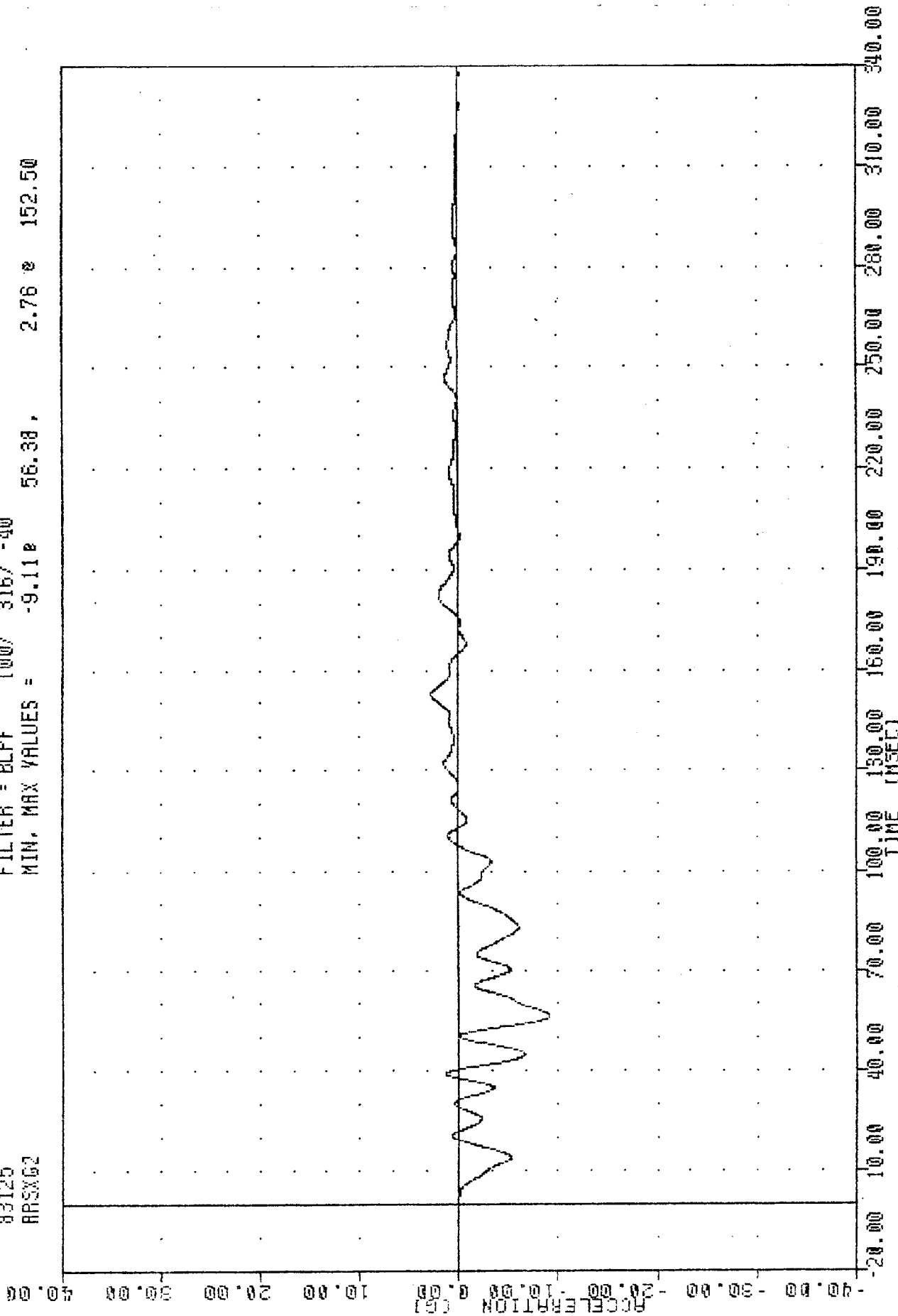
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING RFSYGI

TRC , 630505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 ARSXG2

PLOT DATE 15-JUN-83 13:34:09

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -9.11e 56.38 , 2.76 e 152.50



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

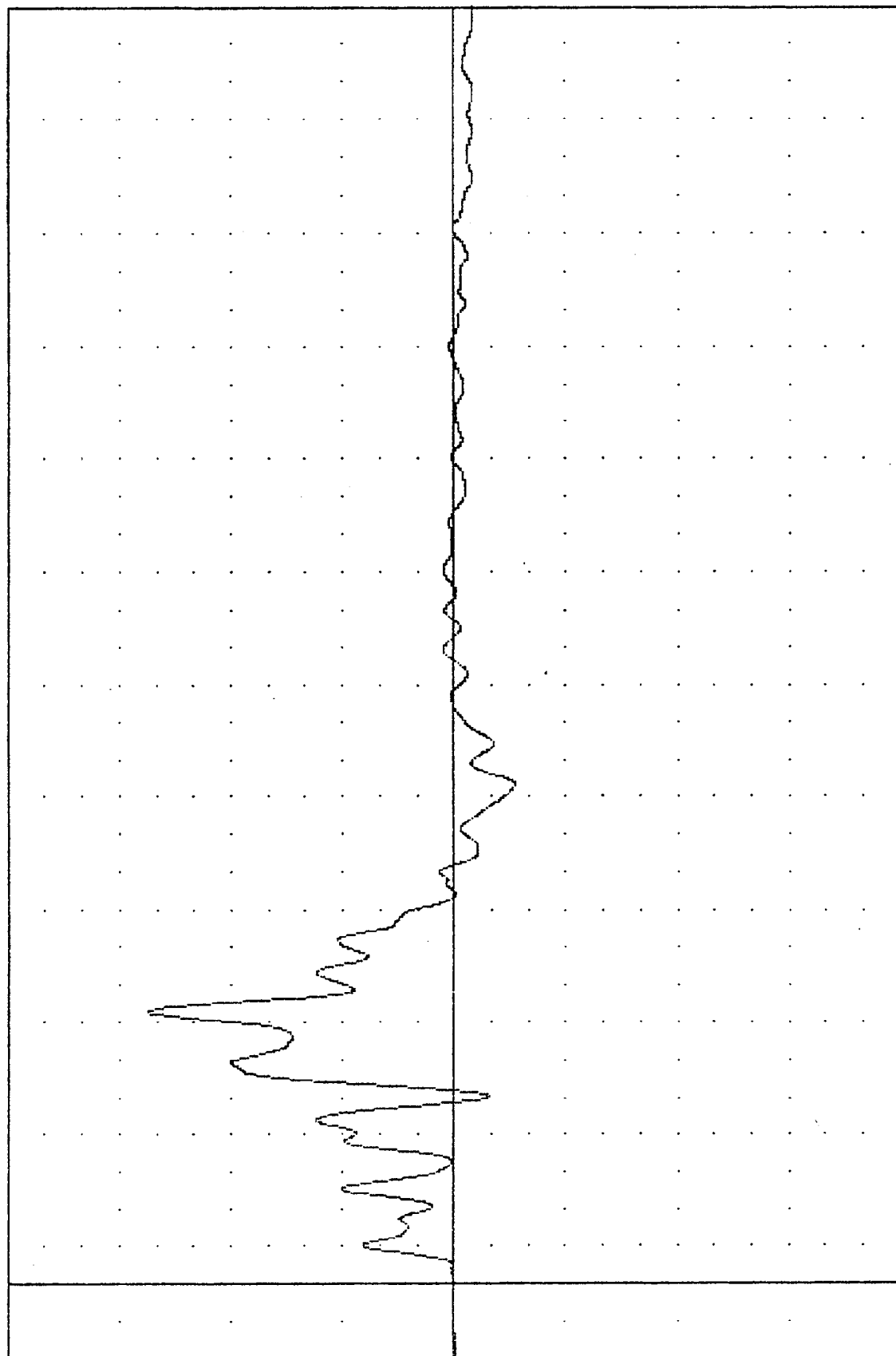
TRC , 830505
NDB ASSESSMENT-SIDE IMPACT
83125
RR3Y62

PLOT DATE 15-JUN-83 13:34:09

FILTER = 6LFF 100/ 316/ -40

MIN. MAX VALUES = -5.44e 133.13, 27.47 e 72.63

ACCELERATION (G)



TIME (MSEC)

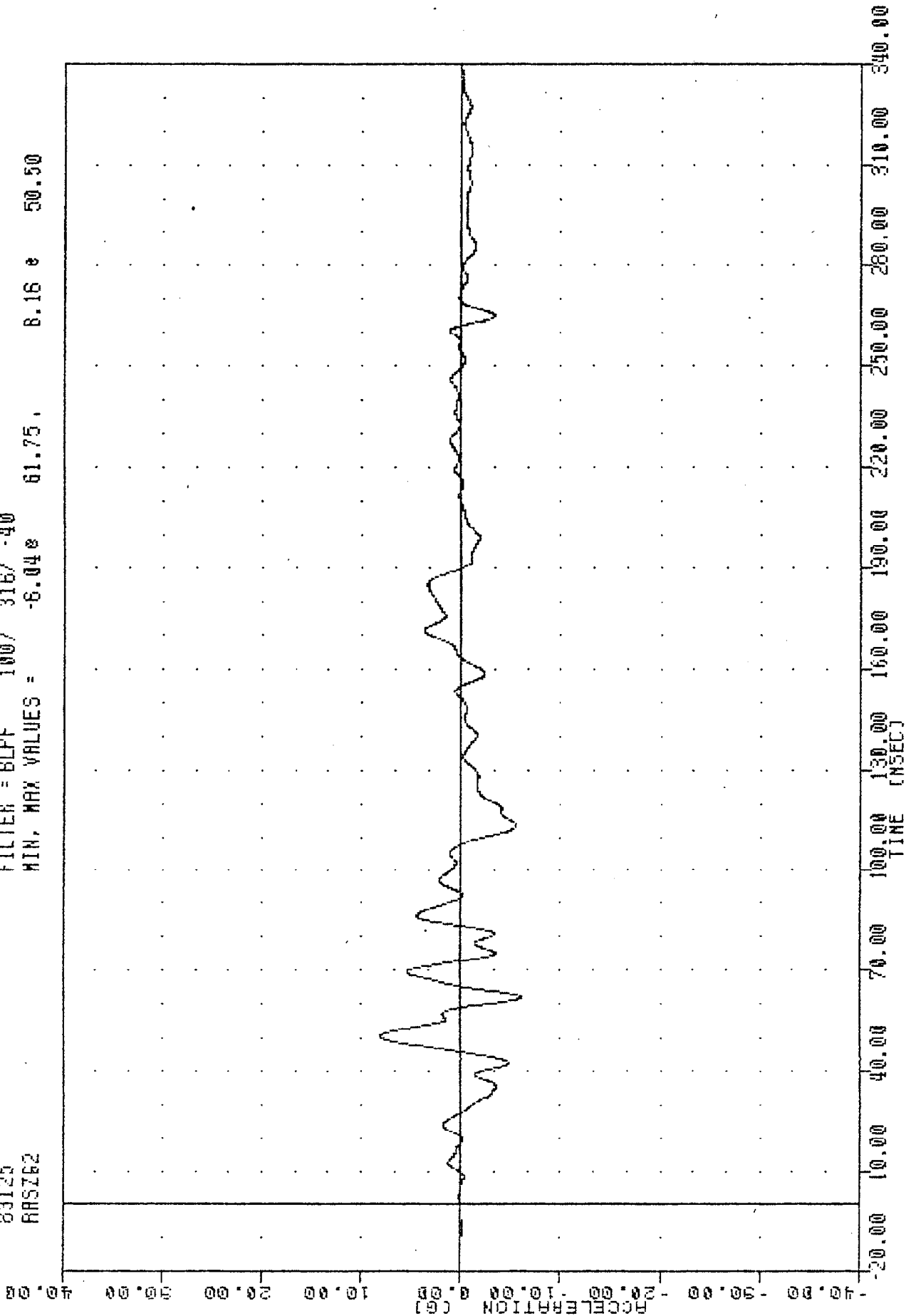
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION Y AXIS

TAC 830505
MDB ASSESSMENT-SIDE IMPACT
83125
RRSZ62

PLOT DATE 15-JUN-83 13:34:09

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -6.04e 61.75, 8.16 e 50.50



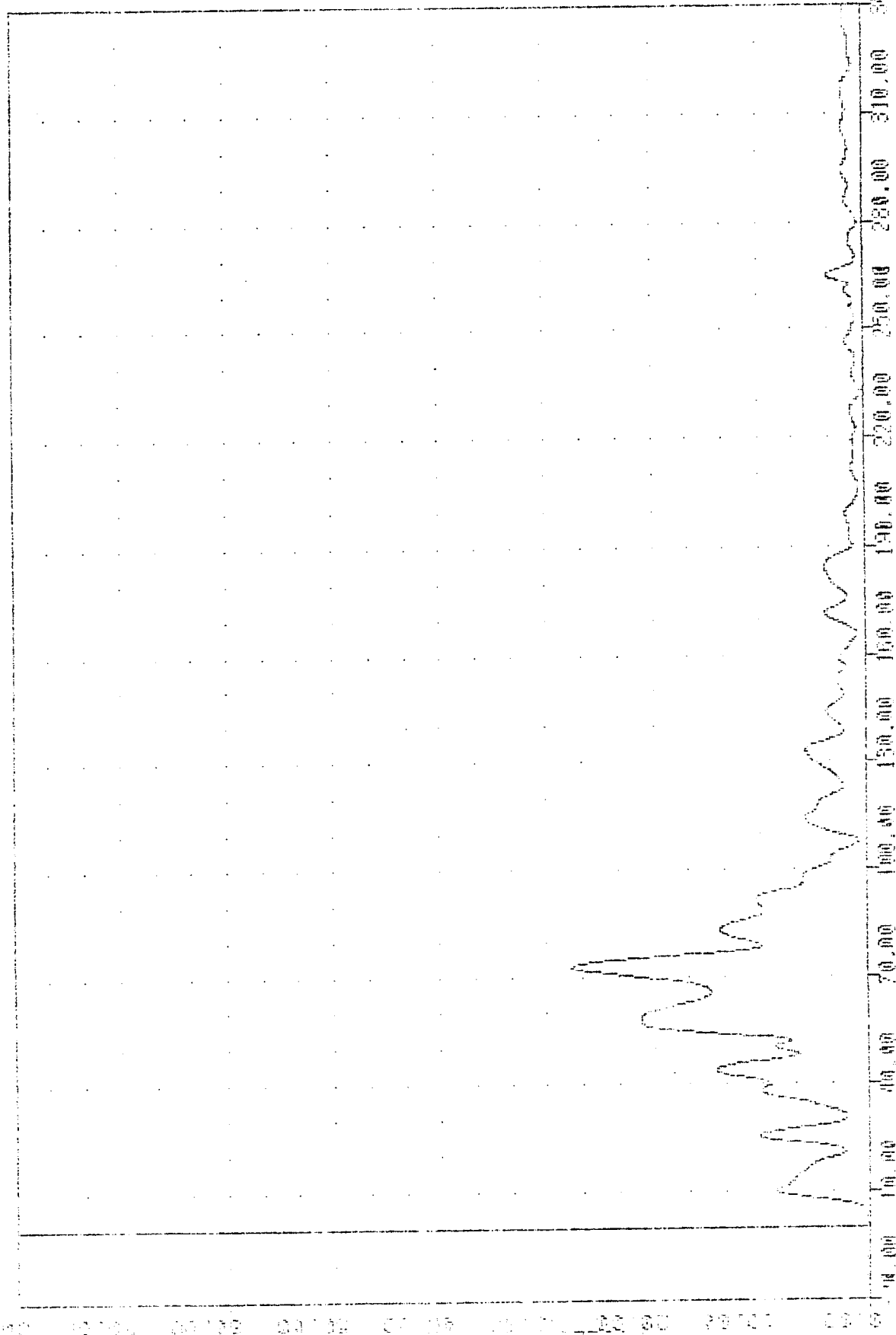
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION Z AXIS

100 8/15/95 1-JUN-95 11:00:00

800 857000000-FILE 100901

00005 FILTER = RLFF 100/ 316/ -90

000002 MIN. MAX VALUES = 0.012 -10.50 27.66 72.50

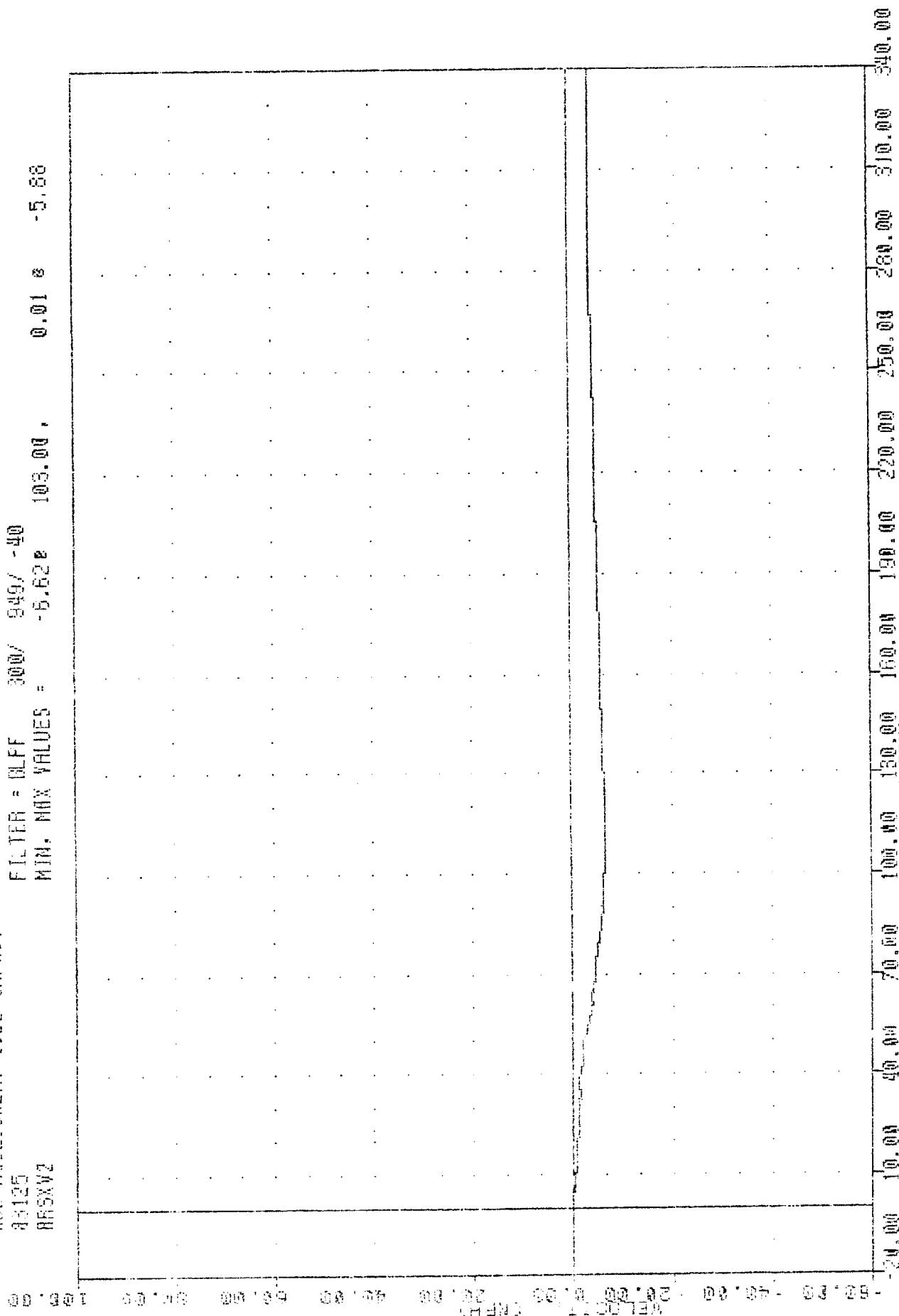


MOVING AVERAGE FILTER INTO VOLKSWAGEN RABBIT
VIBRATE HEAD HORN SILENT RESULT

INC 630505
 NON ASSESSMENT-SIDE IMPACT
 83125
 RRSXV2

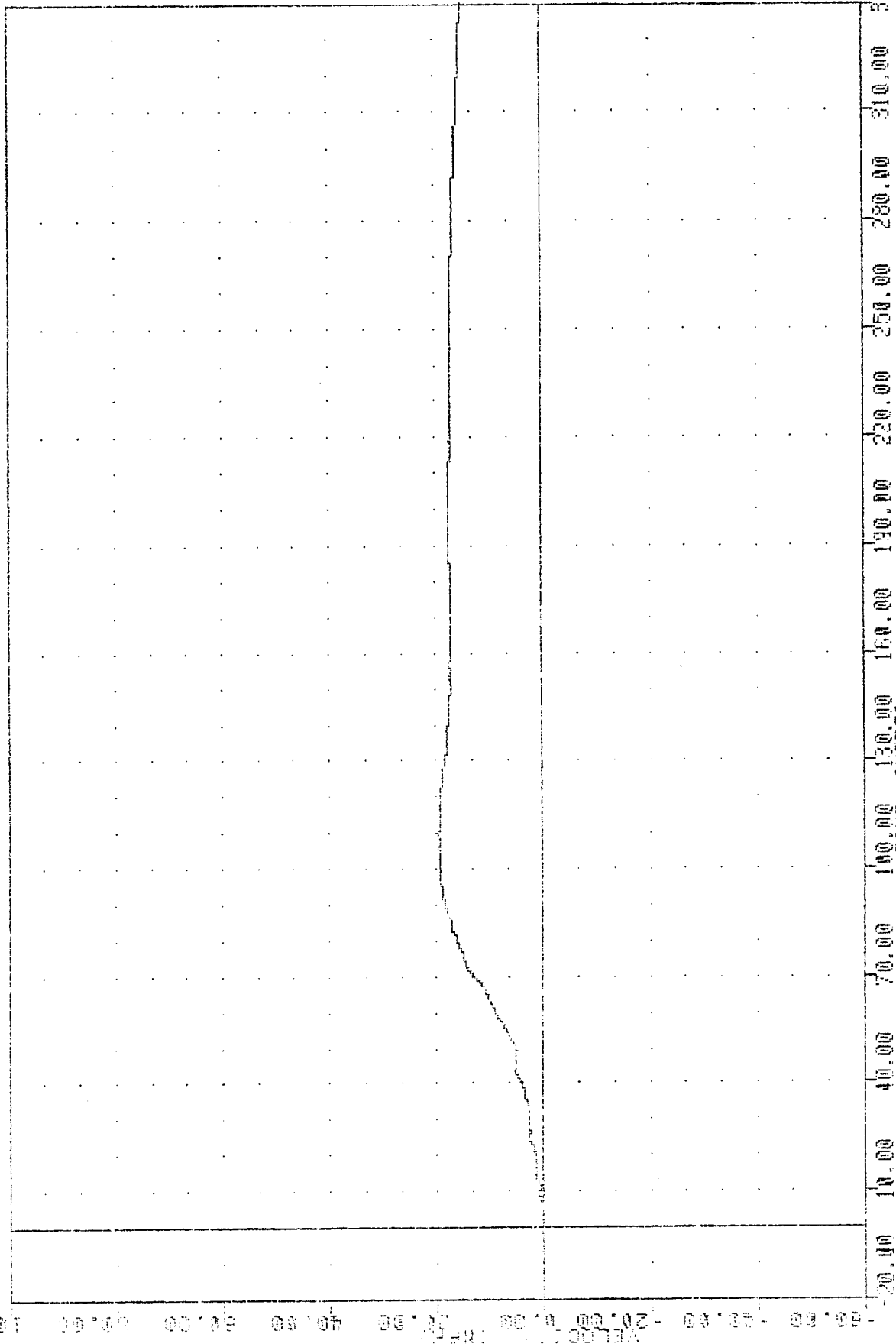
PLOT DATE 16-MAY-83 13:44:58

FILTER = BLFF 300/ 849/ -40
 MIN. MAX VALUES = -5.628 0.018 -5.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING RRSXG2

TBC , 830505
 HOB ASSESSMENT-SIDE IMPACT
 85125
 RRSYV2
 PLOT DATE 16-MAY-83 13:44:58
 FILTER = BLPF 300/ 949/ -10
 MIN, MAX VALUES = -0.032 4.50, 19.64 @ 109.50



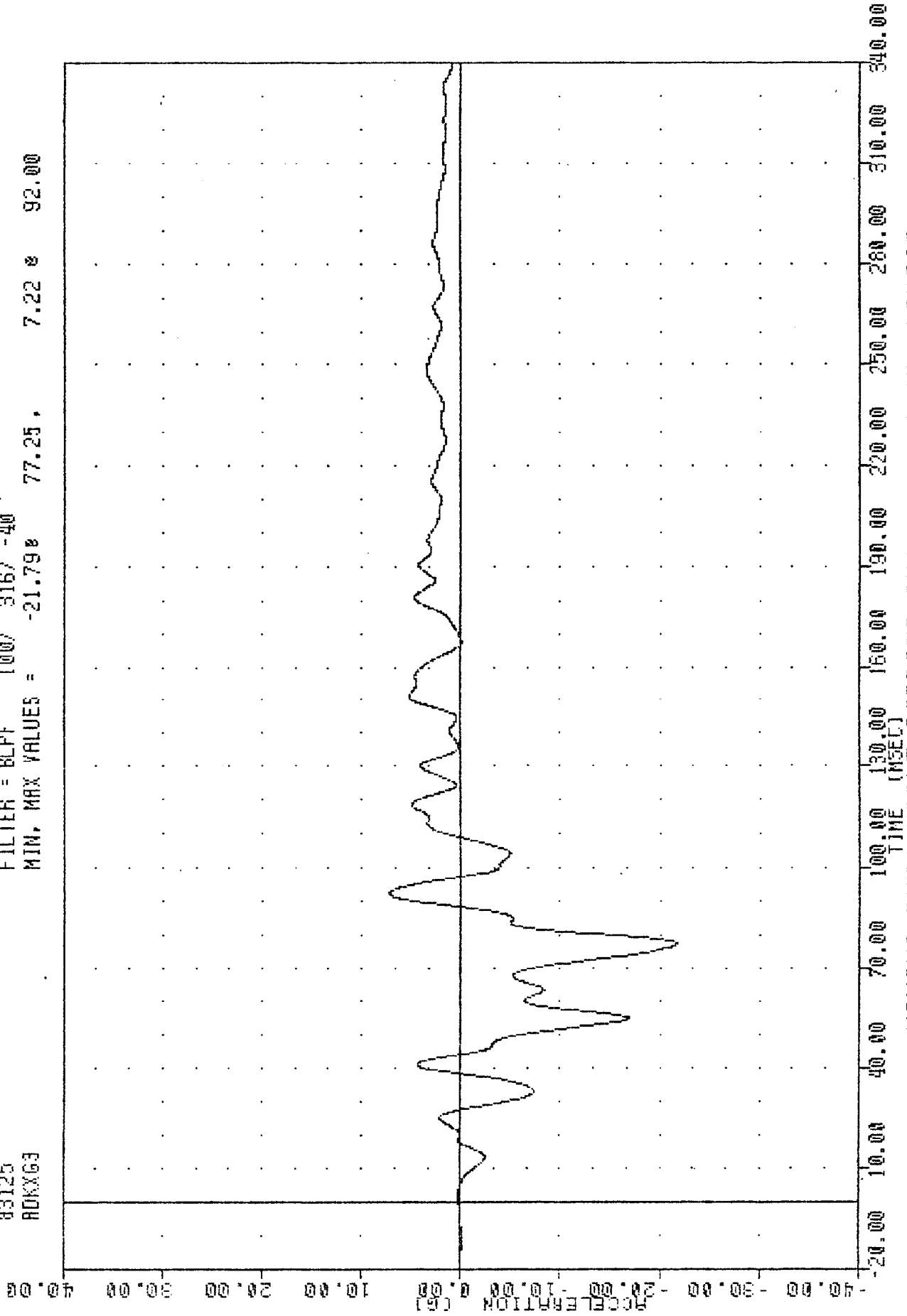
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 INFL TO V USING RRSYV2

TRC , 830505
NDB ASSESSMENT-SIDE IMPACT
83125
ADKXG3

PLOT DATE 15-JUN-83 13:34:09

FILTER = BLPF 100/ 316/ -40

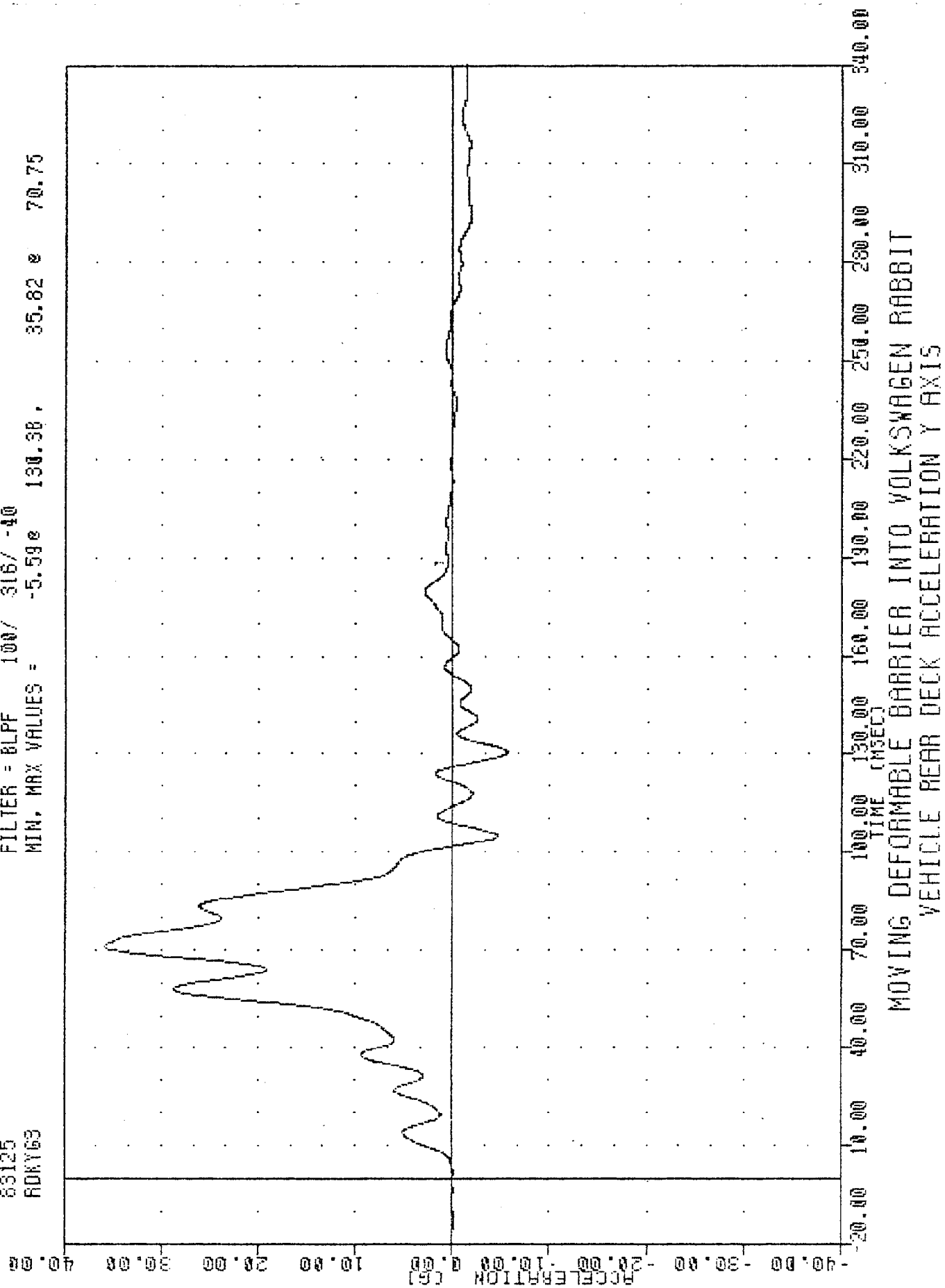
MIN, MAX VALUES = -21.798 77.25, 7.22 92.00



TAC , 830505
MOB ASSESSMENT-SIDE IMPACT
83125
RDY63

PLOT DATE 15-JUN-83 13:34:09

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -5.59e 130.38, 35.82 e 70.75



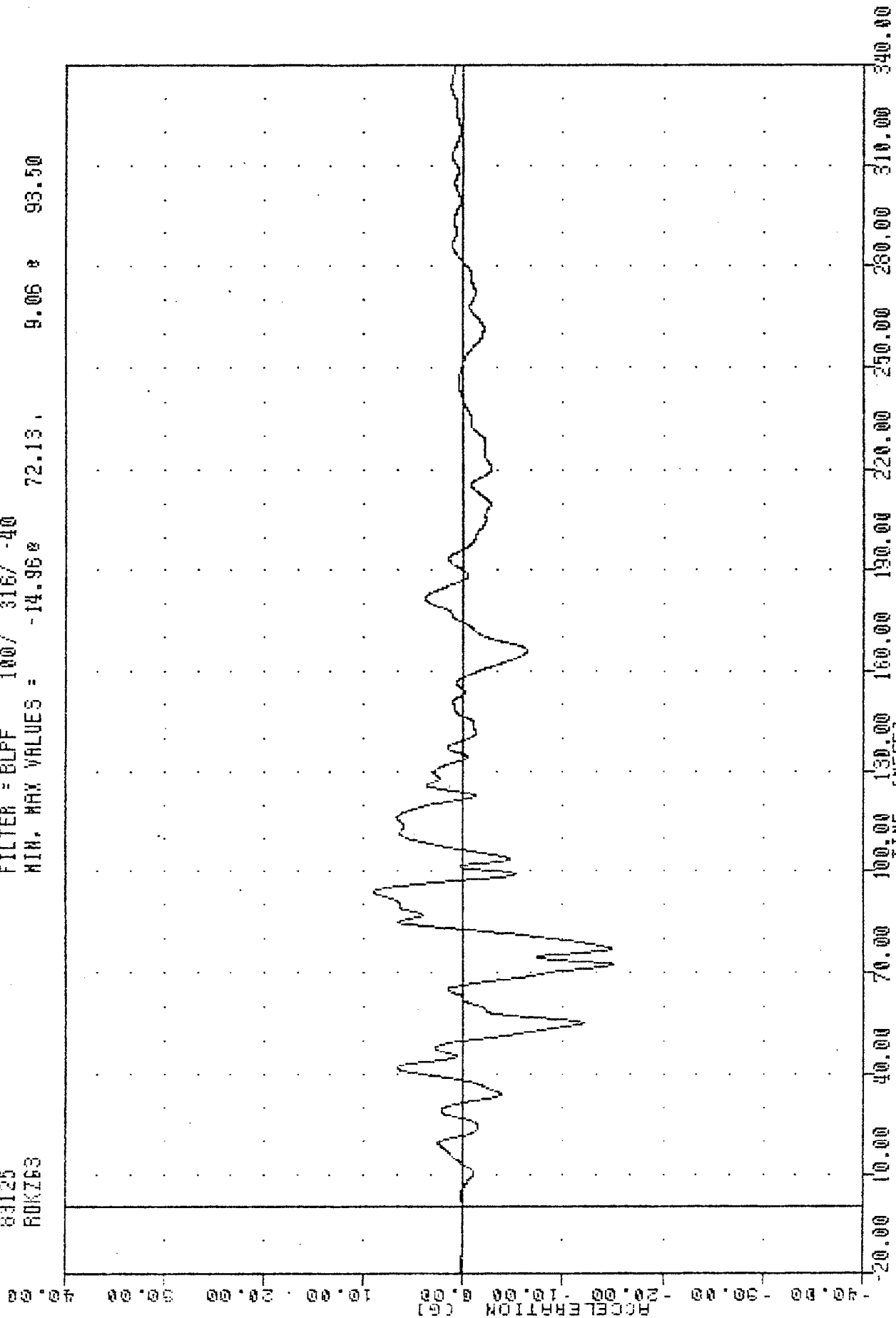
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION Y AXIS

TAC , 830505
 MDB ASSESSMENT-SIDE IMPACT
 83125
 ROKZ63

PLOT DATE 15-JUN-83 13:34:09

FILTER = BLPF 100/ 315/ -40

MIN. MAX VALUES = -14.96 9.06 93.50

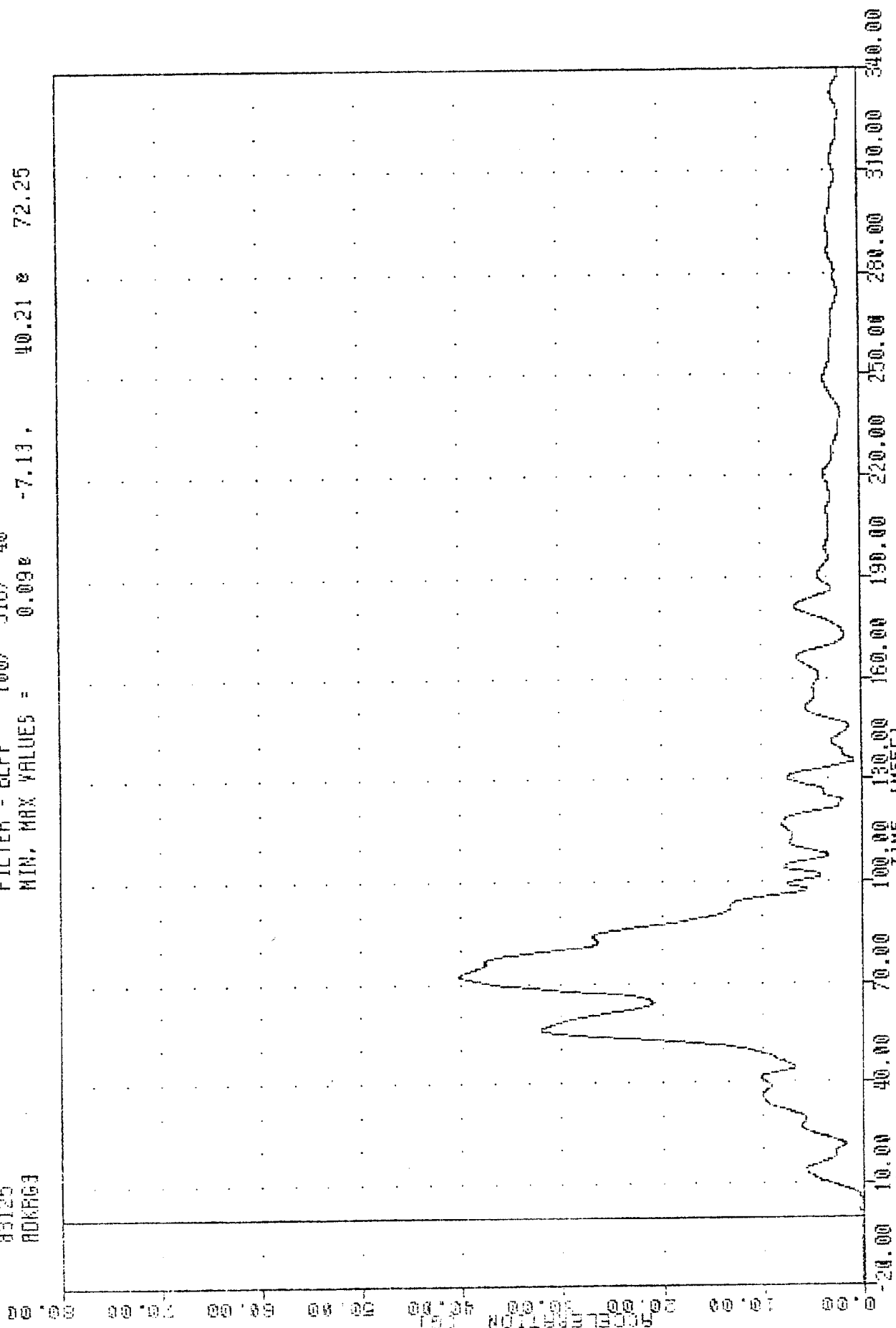


TRC 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 ADKRG3

PLOT DATE 13-MAY-83 13:46:22

FILTER = BLPF 100/ 3167 -40

MIN, MAX VALUES = 0.09e -7.13, 40.21 e 72.25



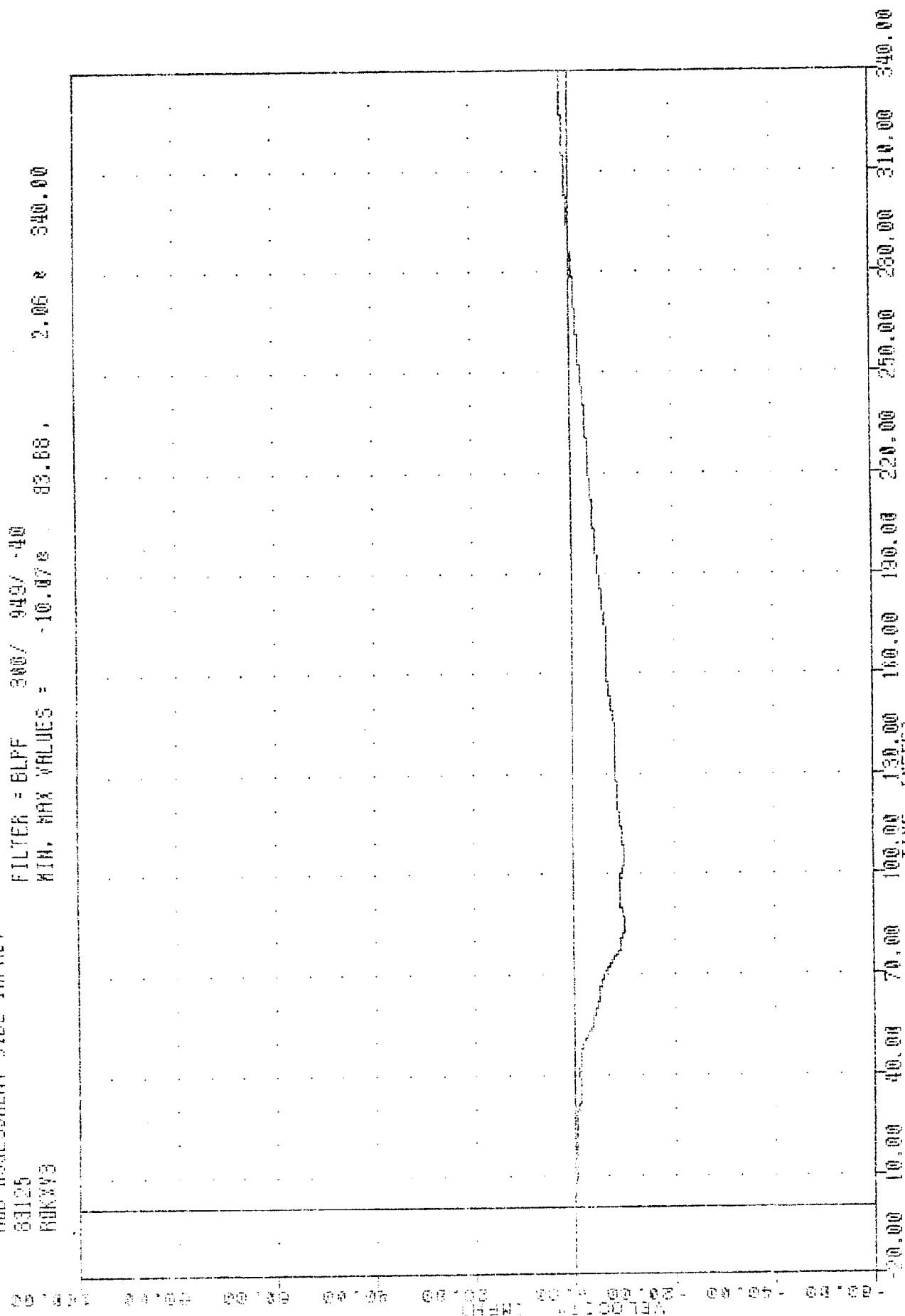
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE REAR DECK RESULTANT

TAC , 838505
 HUB W/ASSESSMENT-SIDE IMPACT
 83125
 ROKXV3

PLOT DATE 16-MAY-83 13:44:58

FILTER = 8LFF 300/ 949/ -40

MIN. MAX VALUES = -10.078 83.68, 2.06 340.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING ROKX63

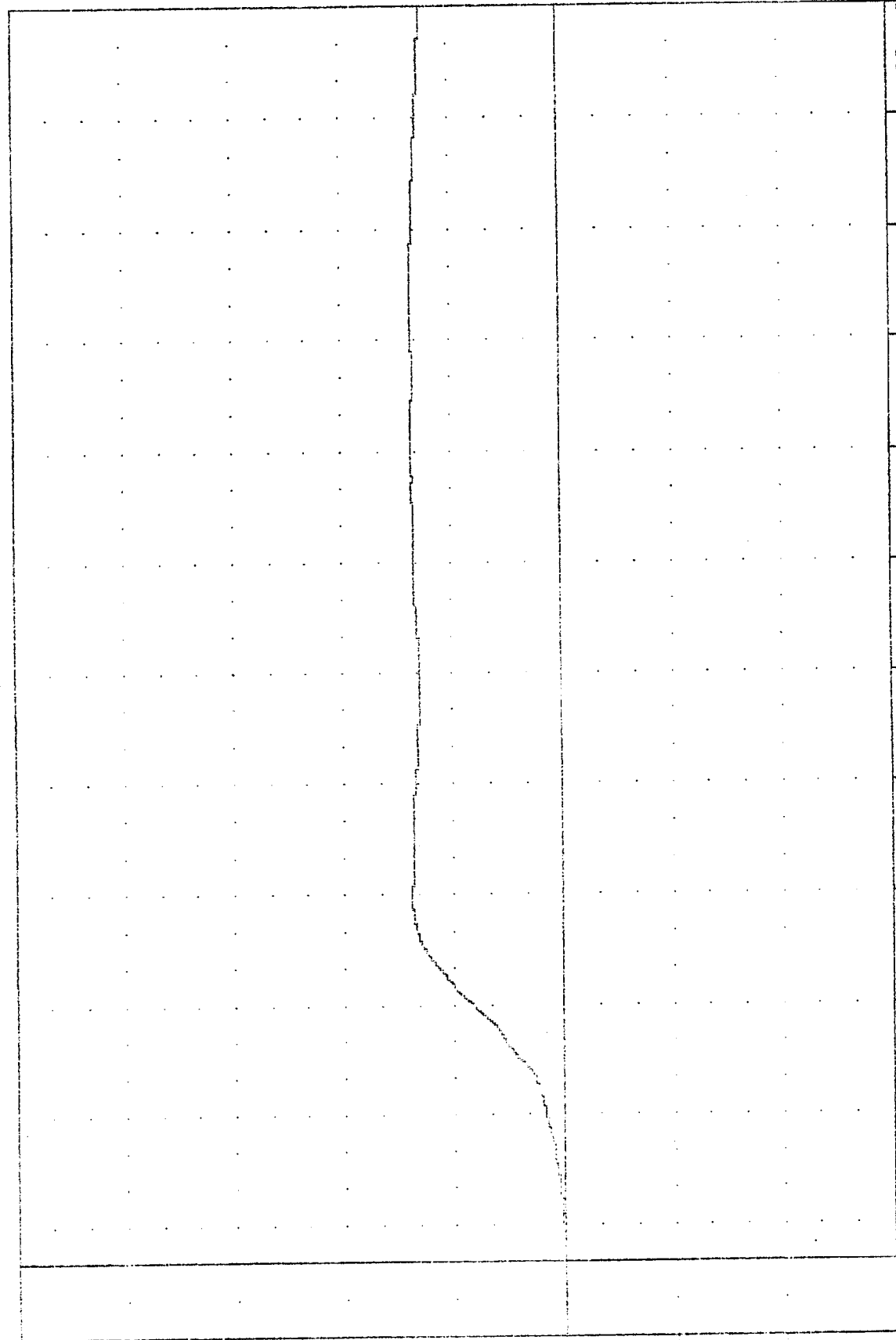
TRC 030505
 NDB ASSESSMENT-SIDE IMPACT
 03125
 ROKYV3

PLOT DATE 16-MAY-83 13:44:58

FILTER = BLFF 300/ 949/ -40

MIN, MAX VALUES = -0.032 1.25, 27.76 0 98.25

VELOCITY (MPH)
 100.00
 90.00
 80.00
 70.00
 60.00
 50.00
 40.00
 30.00
 20.00
 10.00
 0.00



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
 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00
 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00
 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00
 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00
 40.00 50.00 60.00 70.00 80.00 90.00 100.00
 50.00 60.00 70.00 80.00 90.00 100.00
 60.00 70.00 80.00 90.00 100.00
 70.00 80.00 90.00 100.00
 80.00 90.00 100.00
 90.00 100.00
 100.00

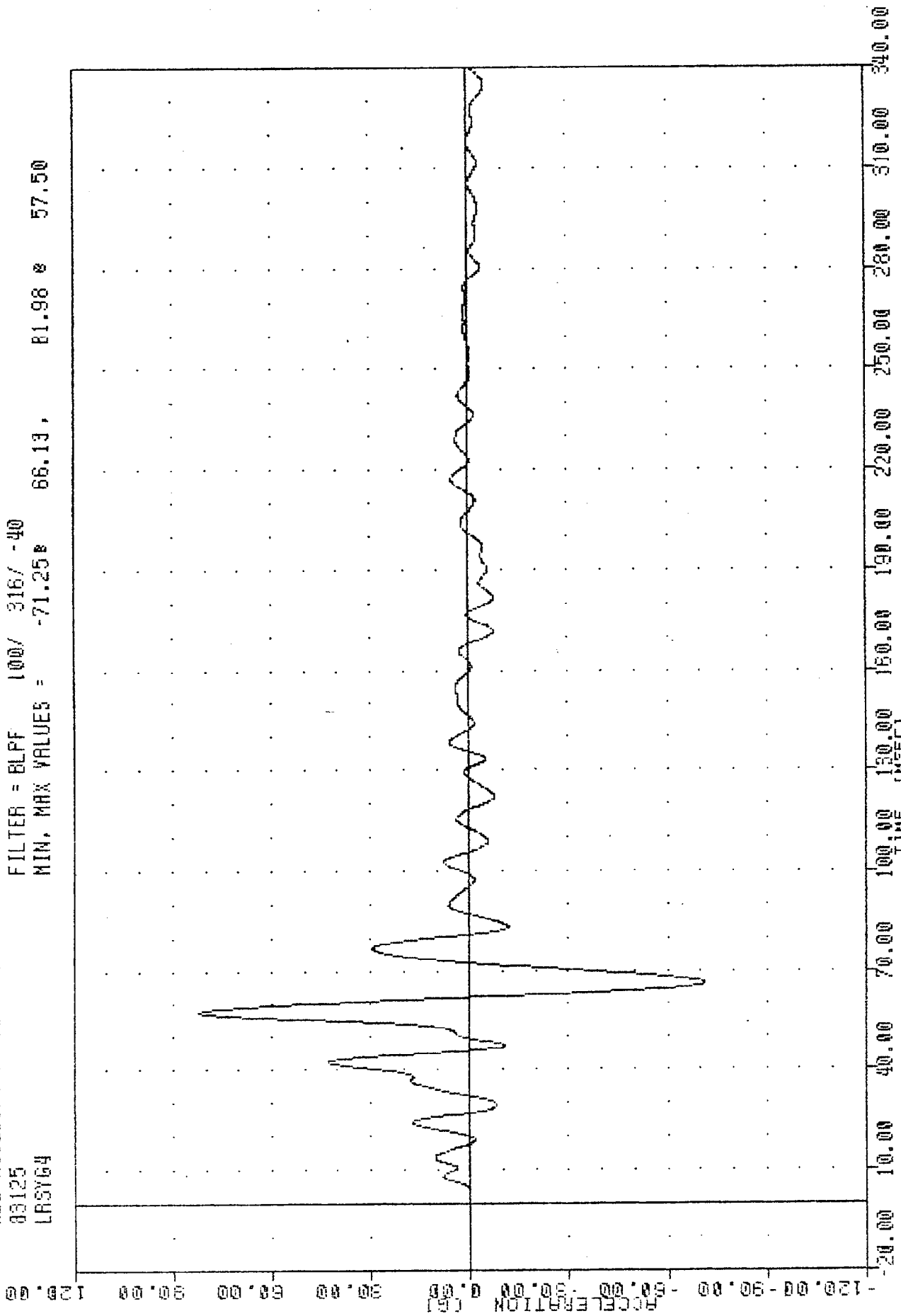
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING ROKYV3

TRC , 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 LRSY64

PLOT DATE 15-JUN-83 13:34:09

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -71.25 66.13, 81.98 57.50



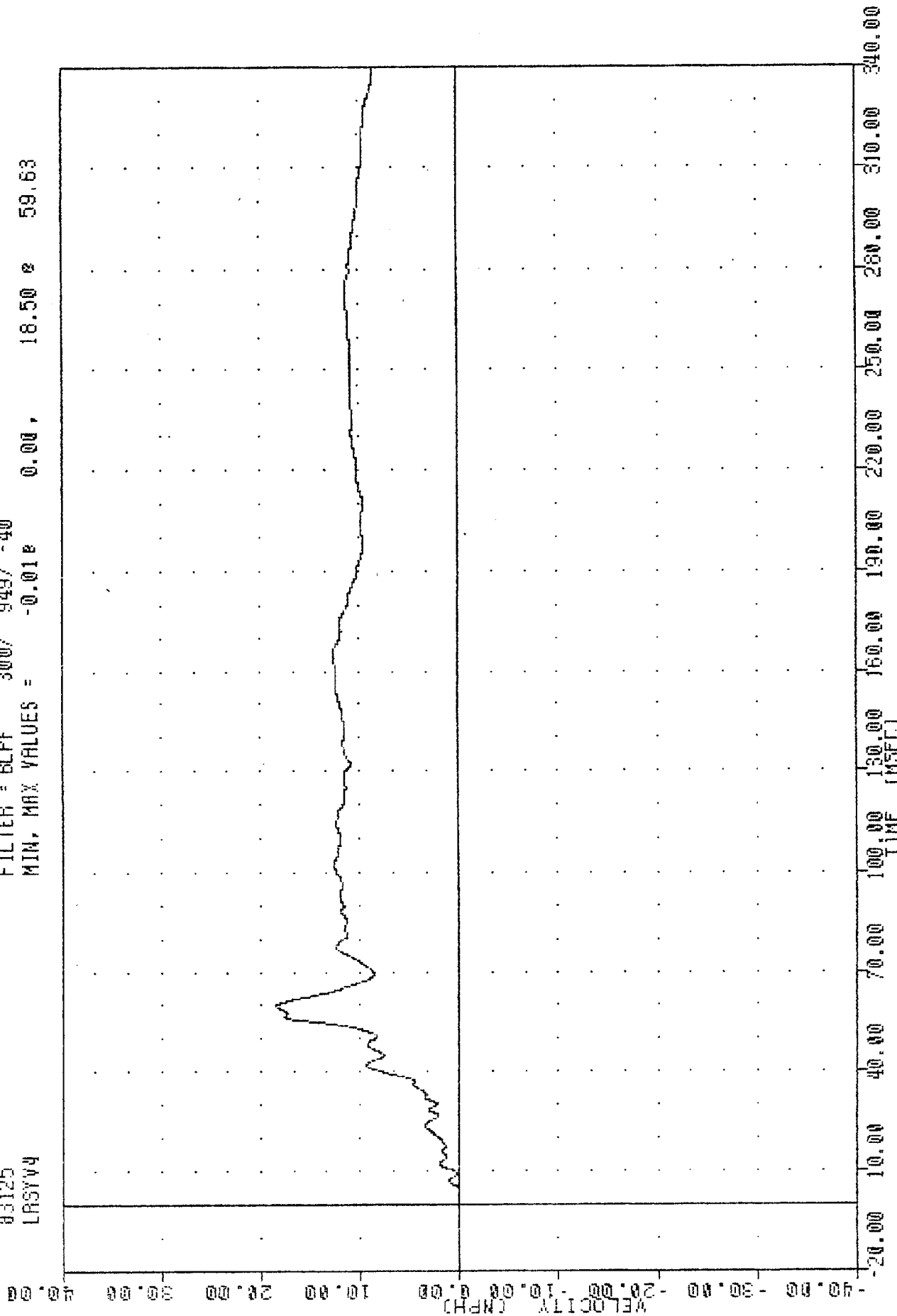
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE LEFT REAR SILL ACCELERATION Y AXIS

TRC , 830505
NO8 ASSESSMENT-SIDE IMPACT
83125
LRSYV4

PLOT DATE 15-JUN-83 13:36:46

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -0.01e 0.00, 18.50 e 59.63



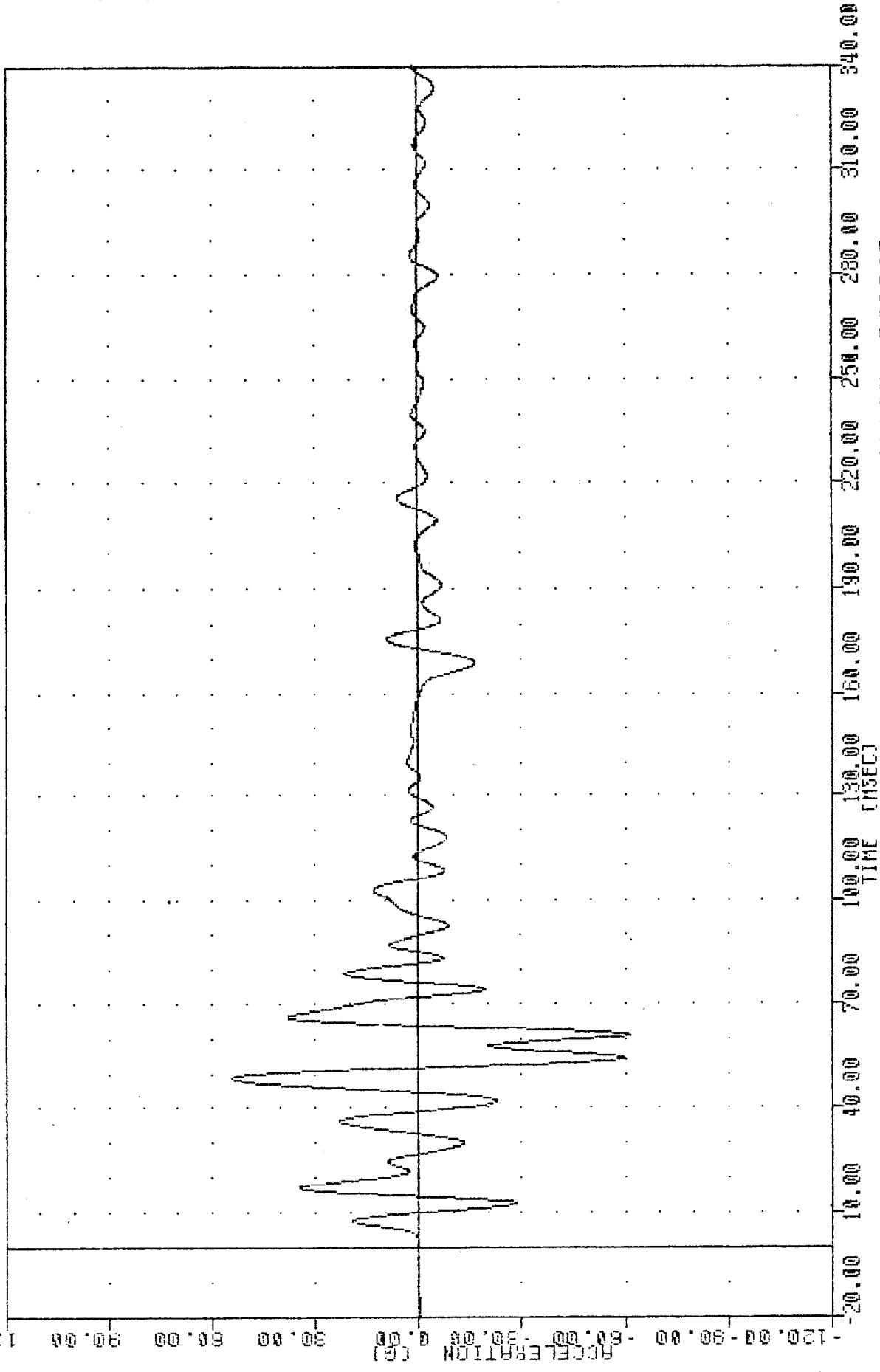
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LRSY64

TRC , 830505
MDB ASSESSMENT-SIDE IMPACT
83125
LF3Y65

PLOT DATE 15-JUN-83 13:34:09

FILTER = 8LPF 100/ 316/ -40

MIN, MAX VALUES = -61.29g 60.88g 54.19 e 48.63



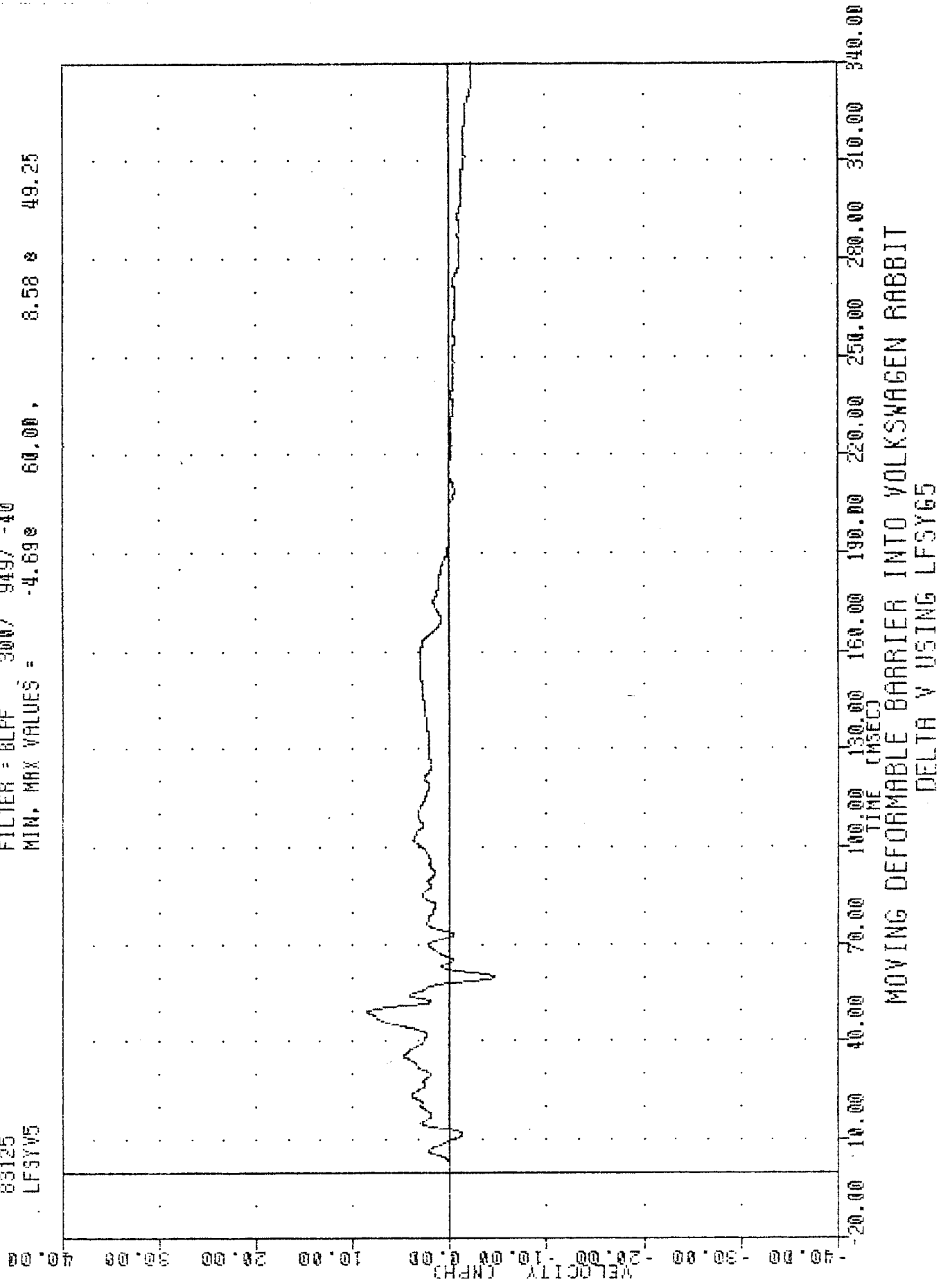
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS

TRC , 830505
 MOB ASSESSMENT-SIDE IMPACT
 83125
 LFSYV5

PLOT DATE 15-JUN-83 13:56:46

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -4.698 60.00, 8.58 49.25



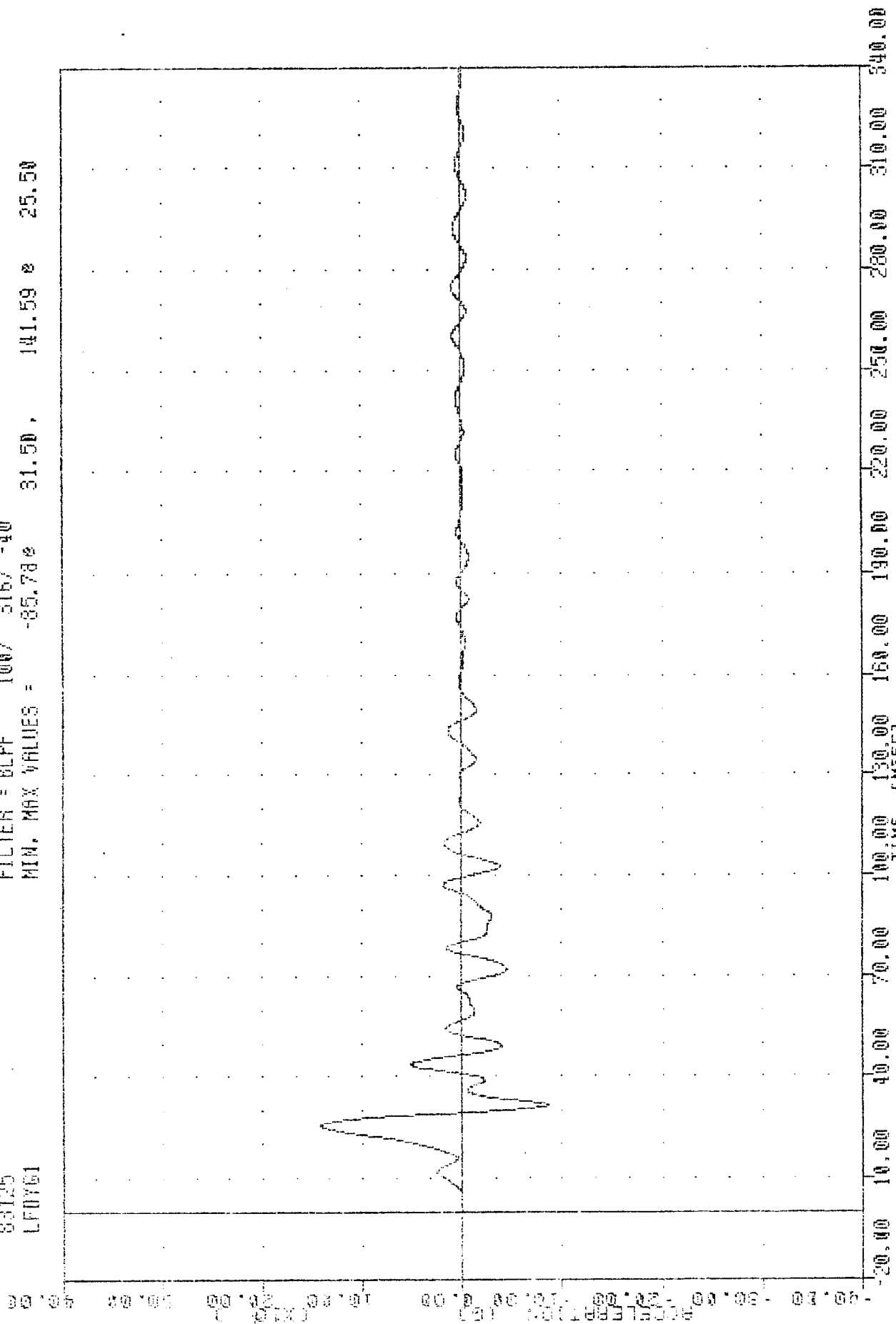
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LFSY65

TAC , 830505
 MDB ASSESSMENT-SIDE IMPACT
 83125
 LF0Y61

PLOT DATE 13-MAY-83 10:27:41

FILTER = 8LFF 100/ 316/ -40

MIN. MAX VALUES = -85.782 31.50, 141.59 25.50



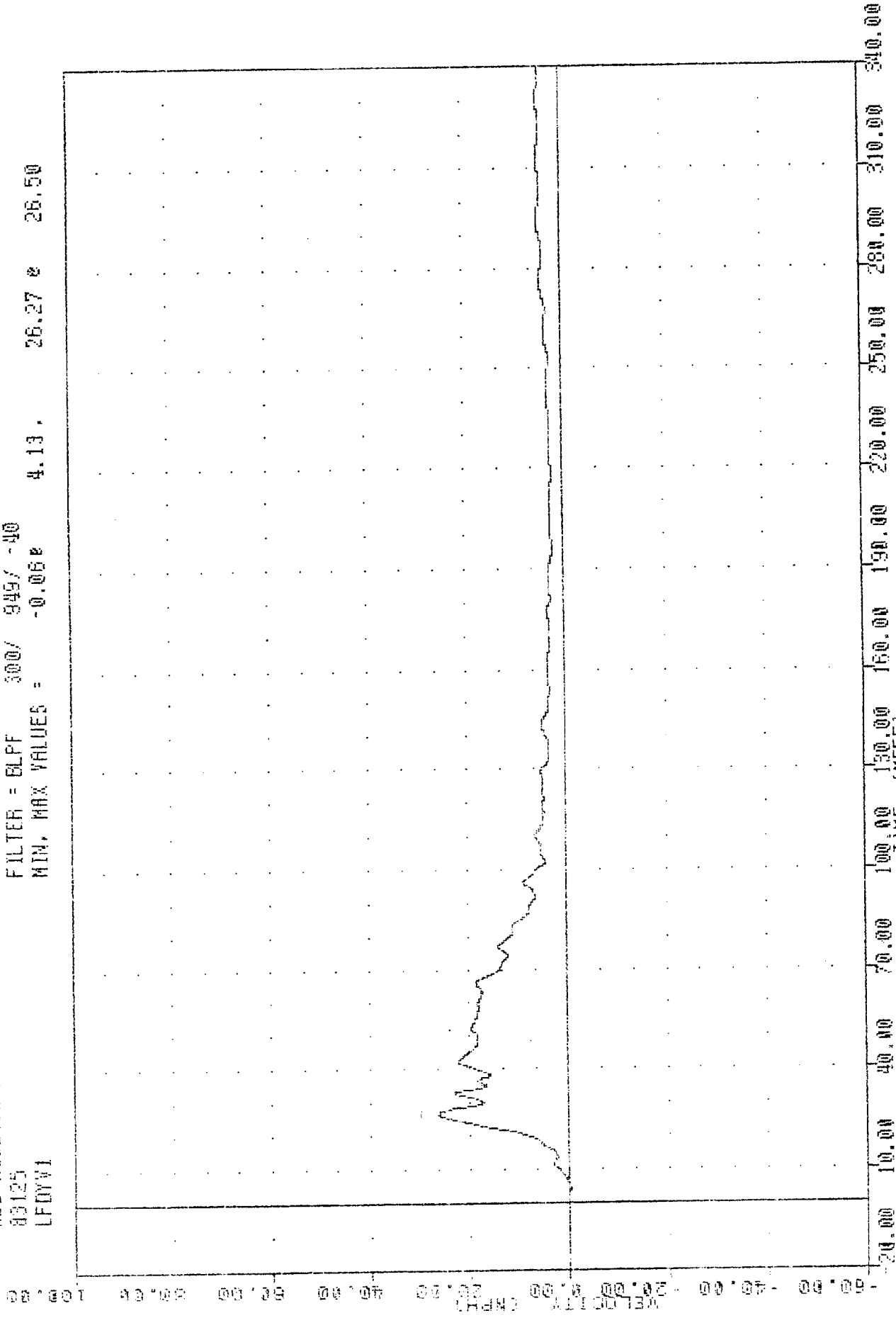
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE LEFT FRONT DOOR (POSITION 6) ACCELERATION Y AXIS

TRC 030505
 NDB ASSESSMENT-SIDE IMPACT
 03125
 LFDYV1

PLOT DATE 16-MAY-83 13:44:58

FILTER = BLPF 300/ 945/ -40

MIN, MAX VALUES = -0.068 4.13 26.27 26.50



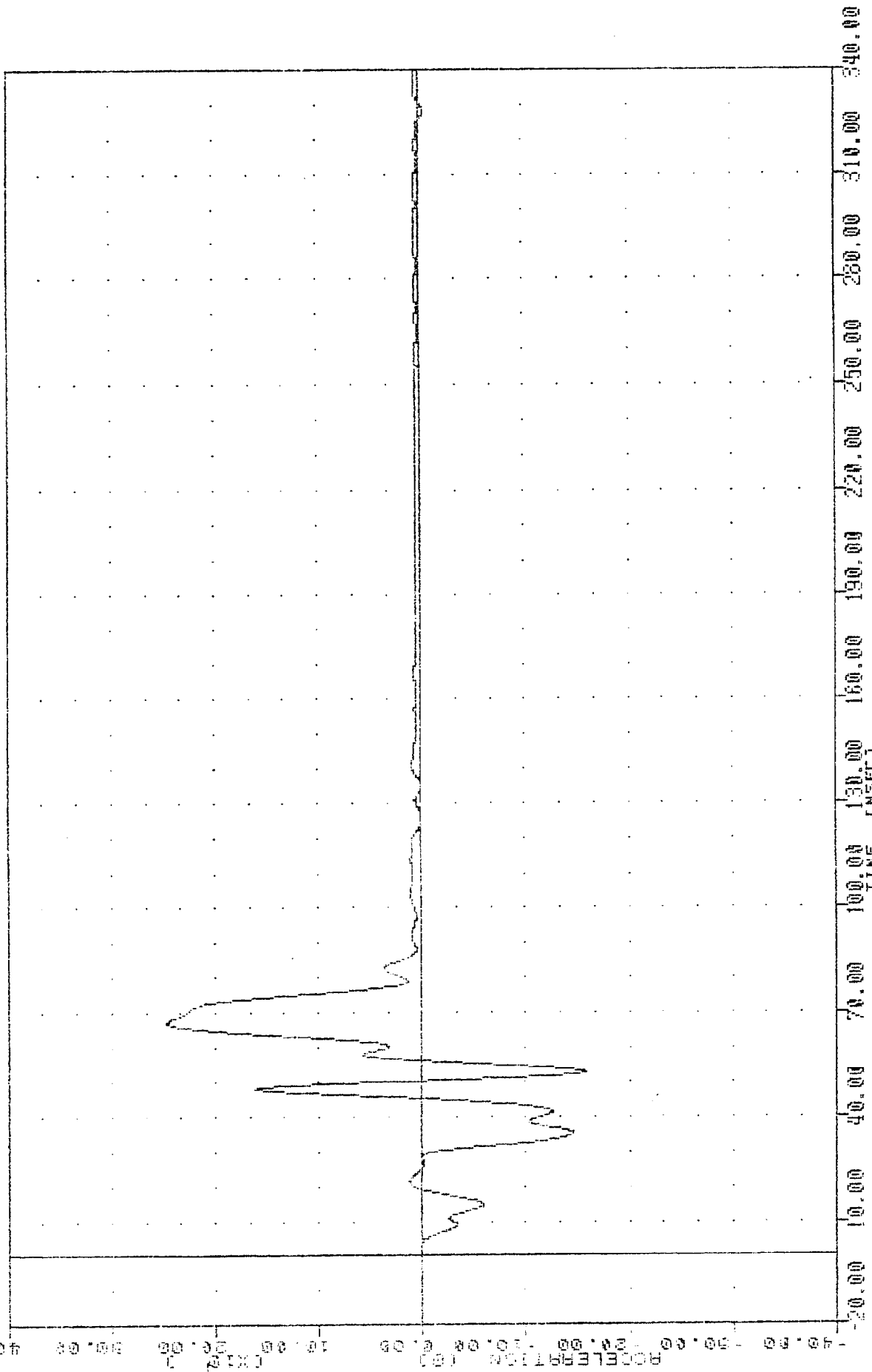
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LFDY61

IRC , 830505
 MUB ASSESSMENT-SIDE IMPACT
 83125
 LFDY62

PLOT DATE 13-MAY-83 10:27:41

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -158.70 52.63 245.83 67.25



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

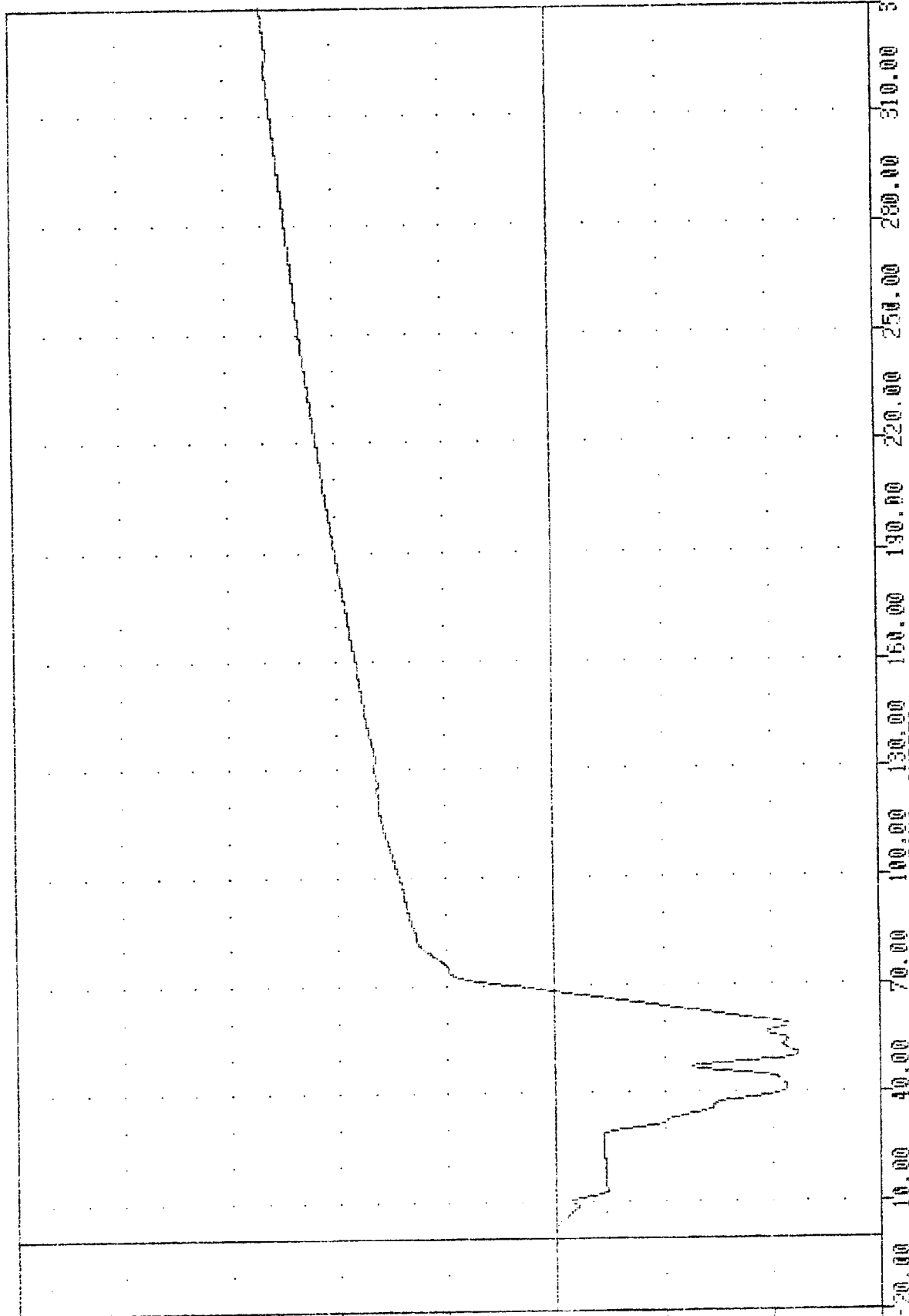
TRC 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 LFOYV2

PLOT DATE 18-MAY-83 13:44:58

FILTER = BLPF 300/ 919/ -40

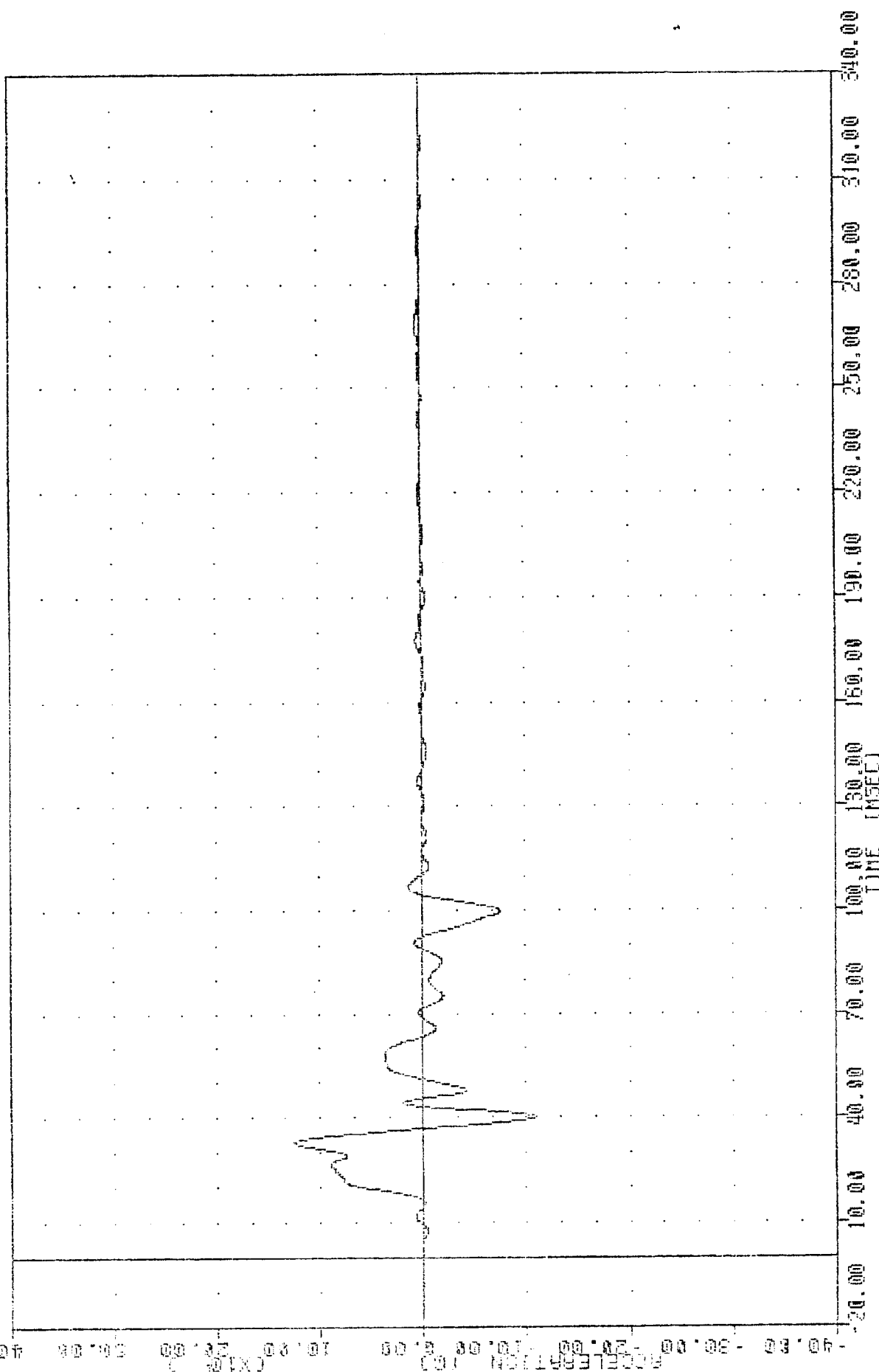
MIN, MAX VALUES = -44.84e 50.50, 53.17 e 340.00

VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LFOY62

TRC 830505
 R09 ASSESSMENT-SIDE IMPACT
 83125
 LFDY03
 PLOT DATE 13-MAY-83 10:27:41
 FILTER = BLFF 100/ 316/ -40
 MIN. MAX VALUES = -109.450 40.00 126.26 32.68

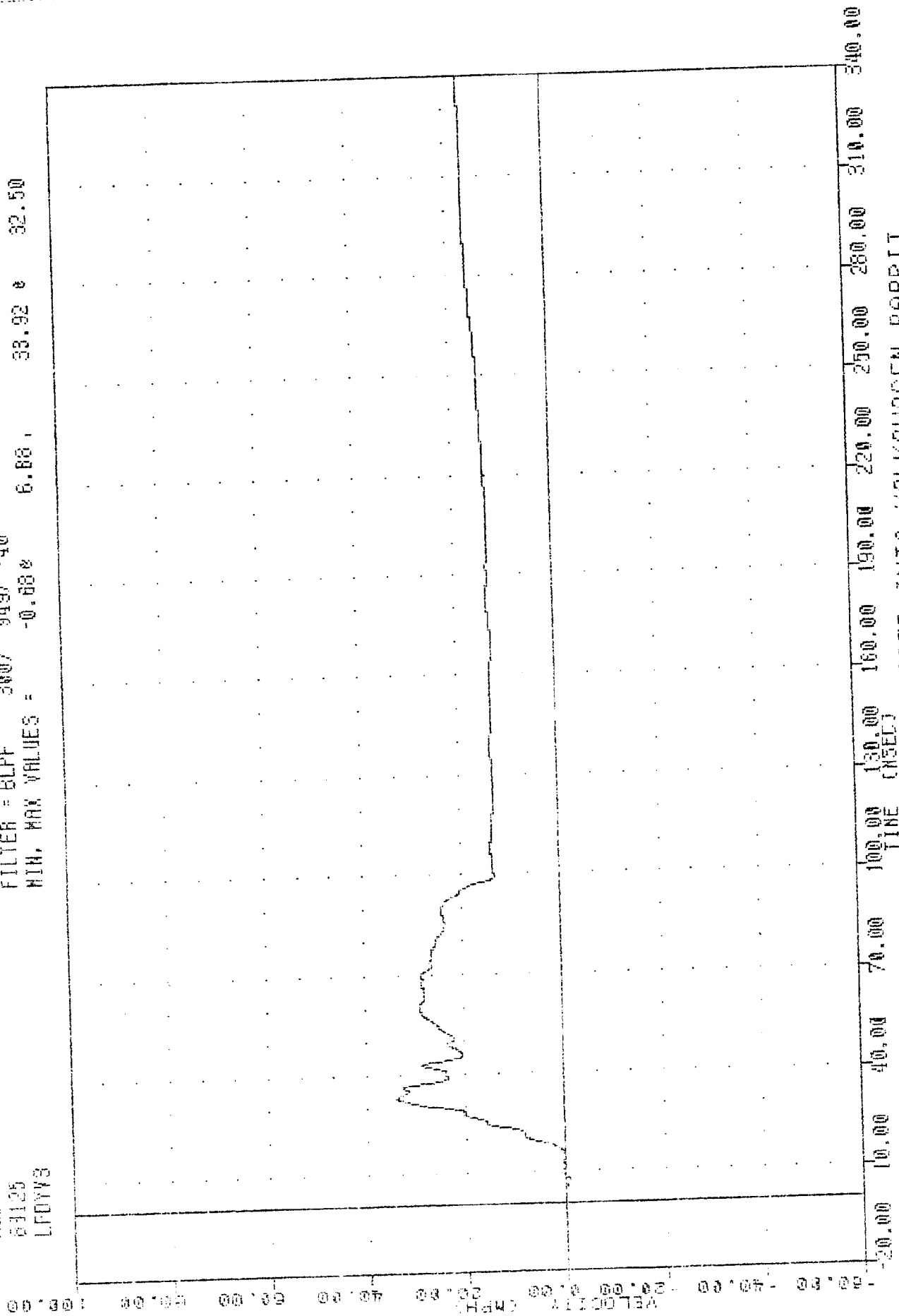


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE LEFT FRONT DOOR (POSITION 9) ACCELERATION Y AXIS

TAC 030505
 MOD ASSESSMENT-SIDE IMPACT
 63125
 LFDYV3

PLOT DATE 16-MAY-83 13:44:58

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.68 6.88 33.92 32.50



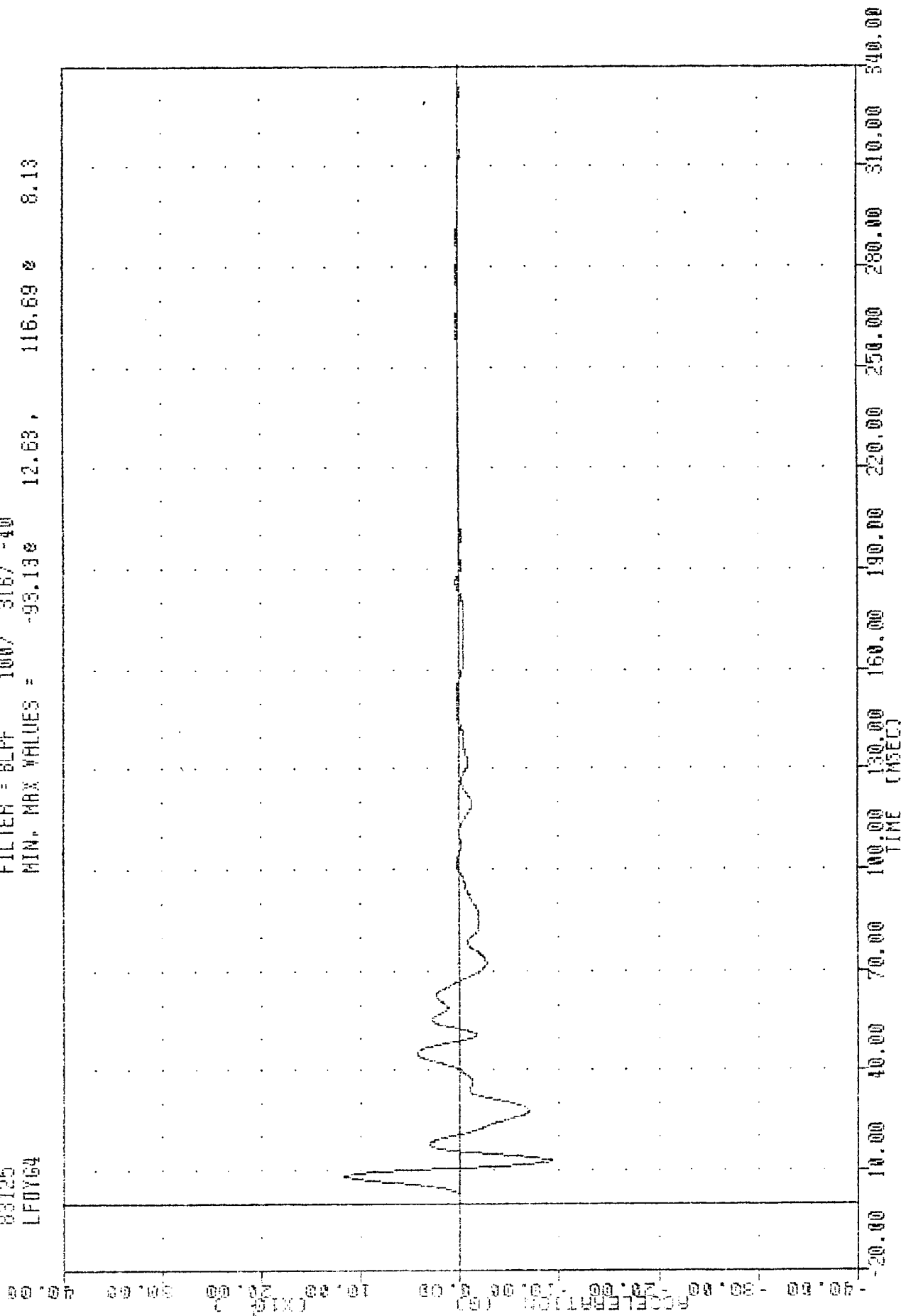
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 NET TO V LISTING LFDYV3

TRC 830505
 MDB ASSESSMENT-SIDE IMPACT
 83125
 LFOY64

PLOT DATE 13-MAY-83 10:27:41

FILTER = 8LFF 100/ 316/ -40

MIN. MAX VALUES = -93.13e 12.53, 116.69 e 8.13



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

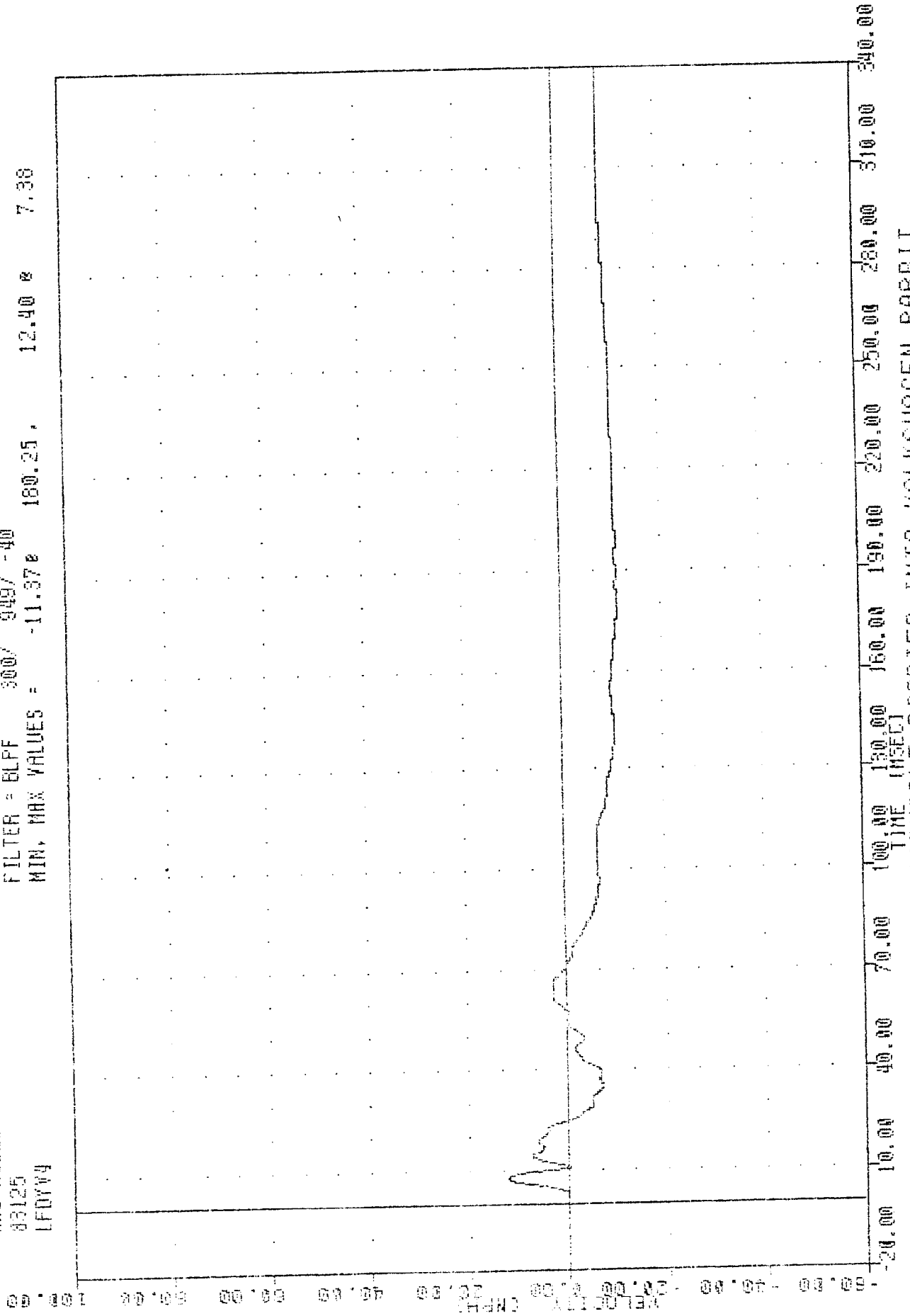
TRC , 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 LFDYV4

PLOT DATE 16-MAY-83 13:44:58

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -11.37% 180.25%

12.40 % 7.38



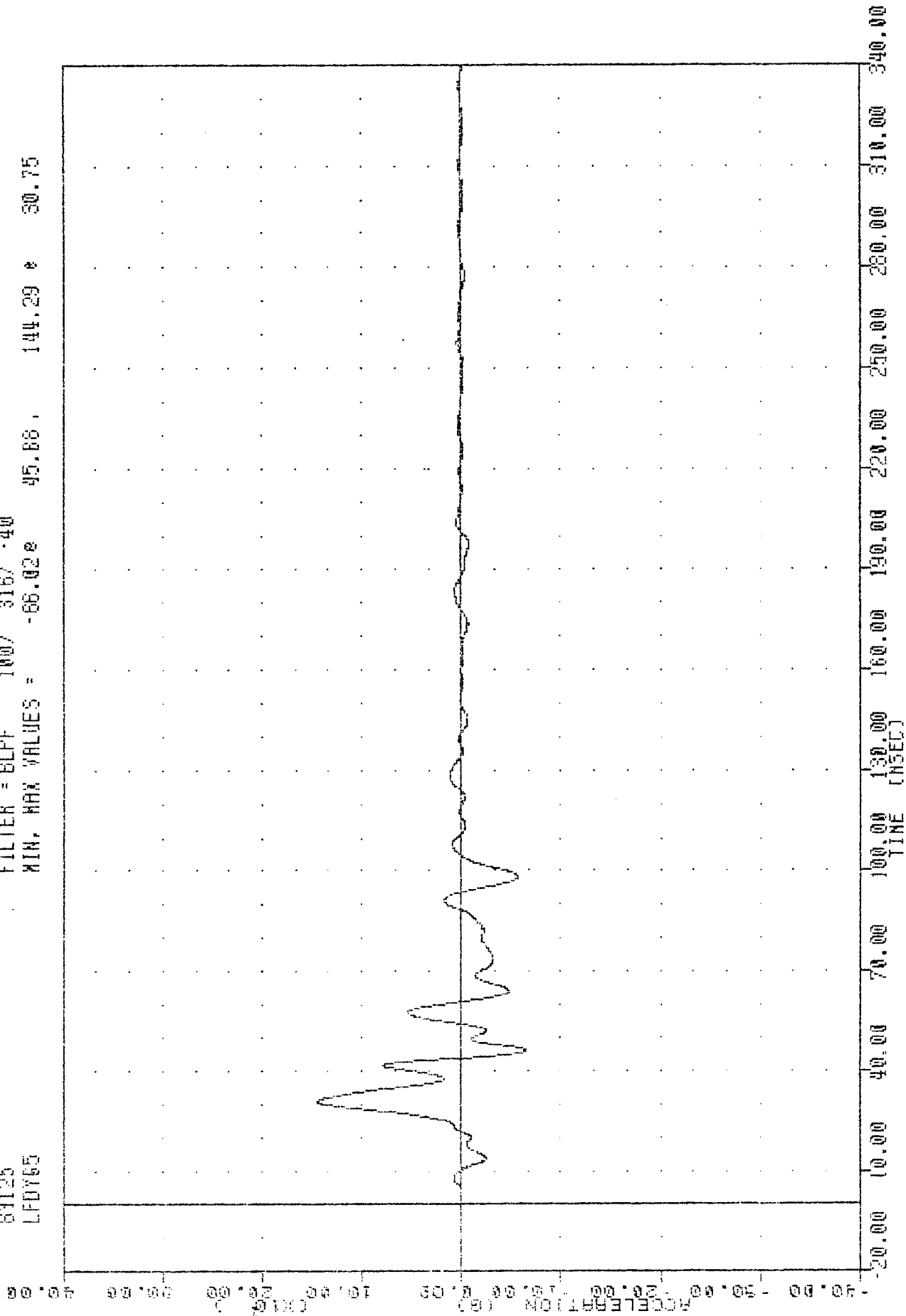
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V HITING LFDYV4

TAC 830505
MOV ASSESSMENT-SIDE IMPACT
89125
LFDY65

PLOT DATE 13-MAY-83 10:27:41

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -86.028 45.88 144.29 30.75



TRC 830505

NOB ASSESSMENT-SIDE IMPACT

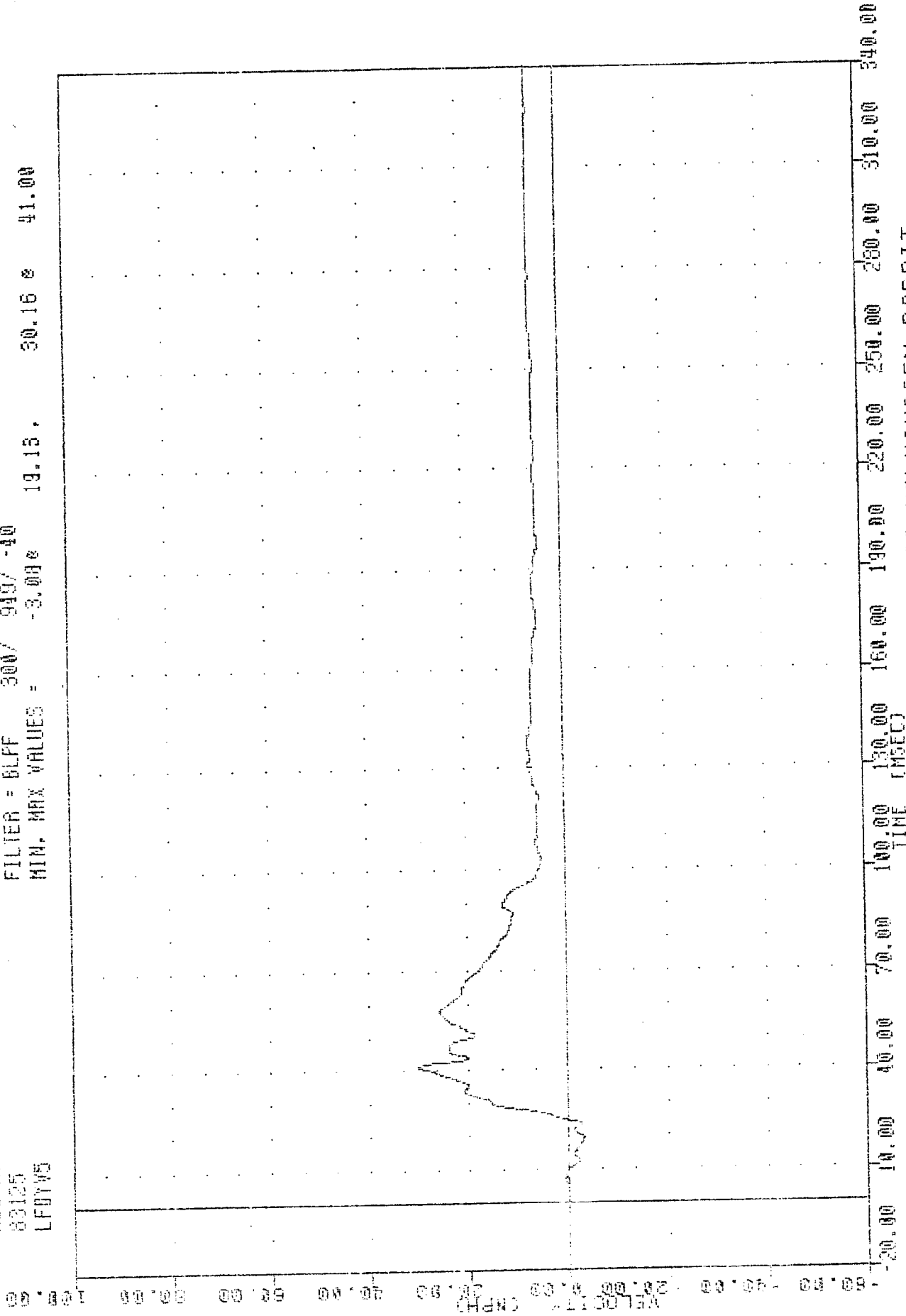
83125

LFDYV5

PLOT DATE 16-MAY-88 13:44:58

FILTER = BLFF 300/ 919/ -40

MIN. MAX VALUES = -3.088 19.13 30.16 41.00



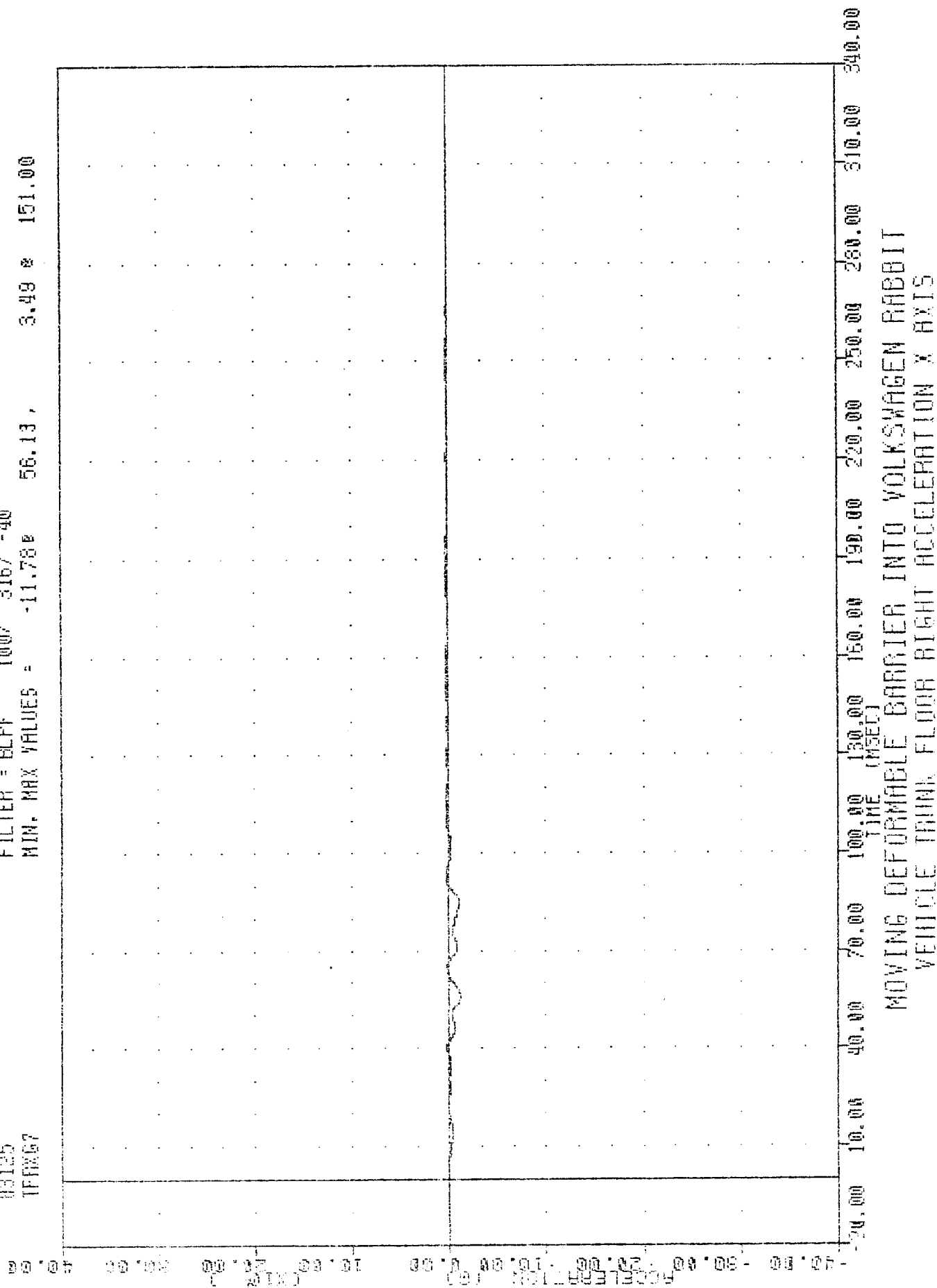
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYV5

TRC , 030505
 HOB ASSESSMENT-SIDE IMPACT
 03125
 TFRX67

PLOT DATE 13-MAY-83 10:27:41

FILTER = BLFF 100/ 316/ -40

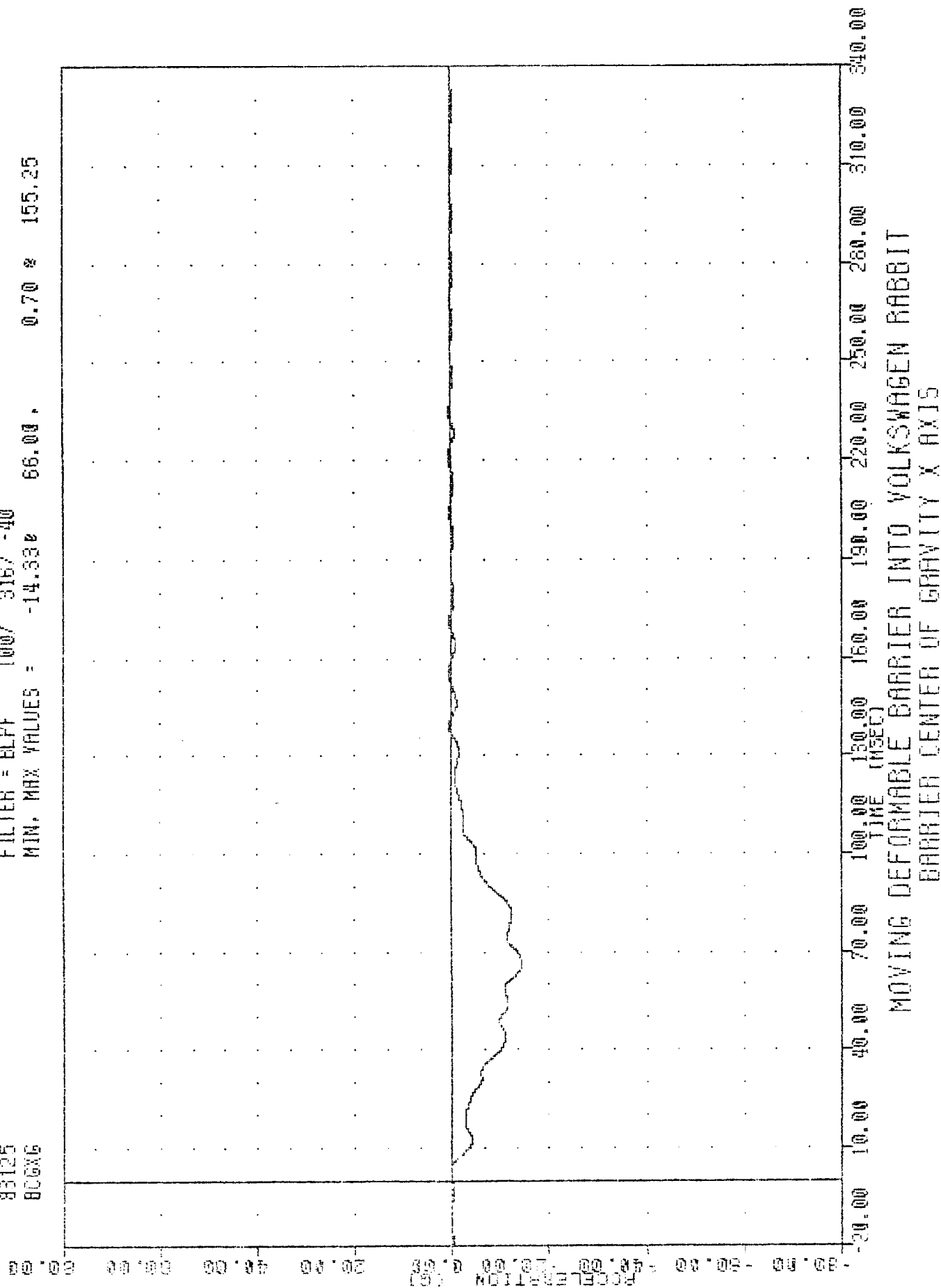
MIN. MAX VALUES = -11.78e 56.13, 3.49 e 151.00



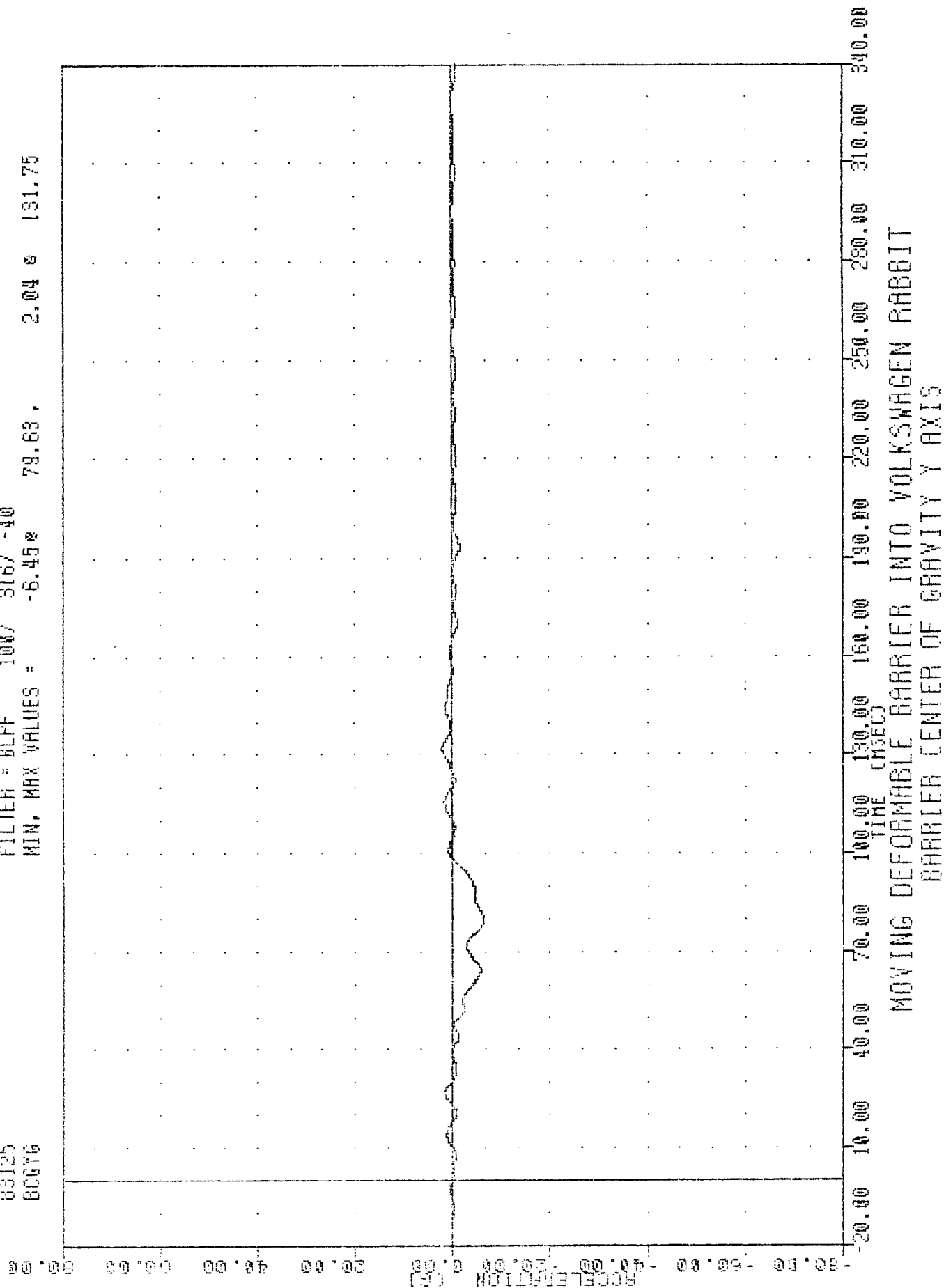
TRC , 830505
 HDR ASSESSMENT-SIDE IMPACT
 83125
 BCGX6

PLOT DATE 13-MAY-83 10:27:41

FILTER = BLFF 100/ 316/ -40
 MIN. MAX VALUES = -14.33% 66.00% 0.70% 155.25



TAC , 030505 PLOT DATE 13-MAY-83 10:27:41
 MDB ASSESSMENT-SIDE IMPACT
 03125 FILTER = BLFF 100/ 316/ -40
 BCCYG MIN. MAX VALUES = -6.450 79.63, 2.04 & 131.75

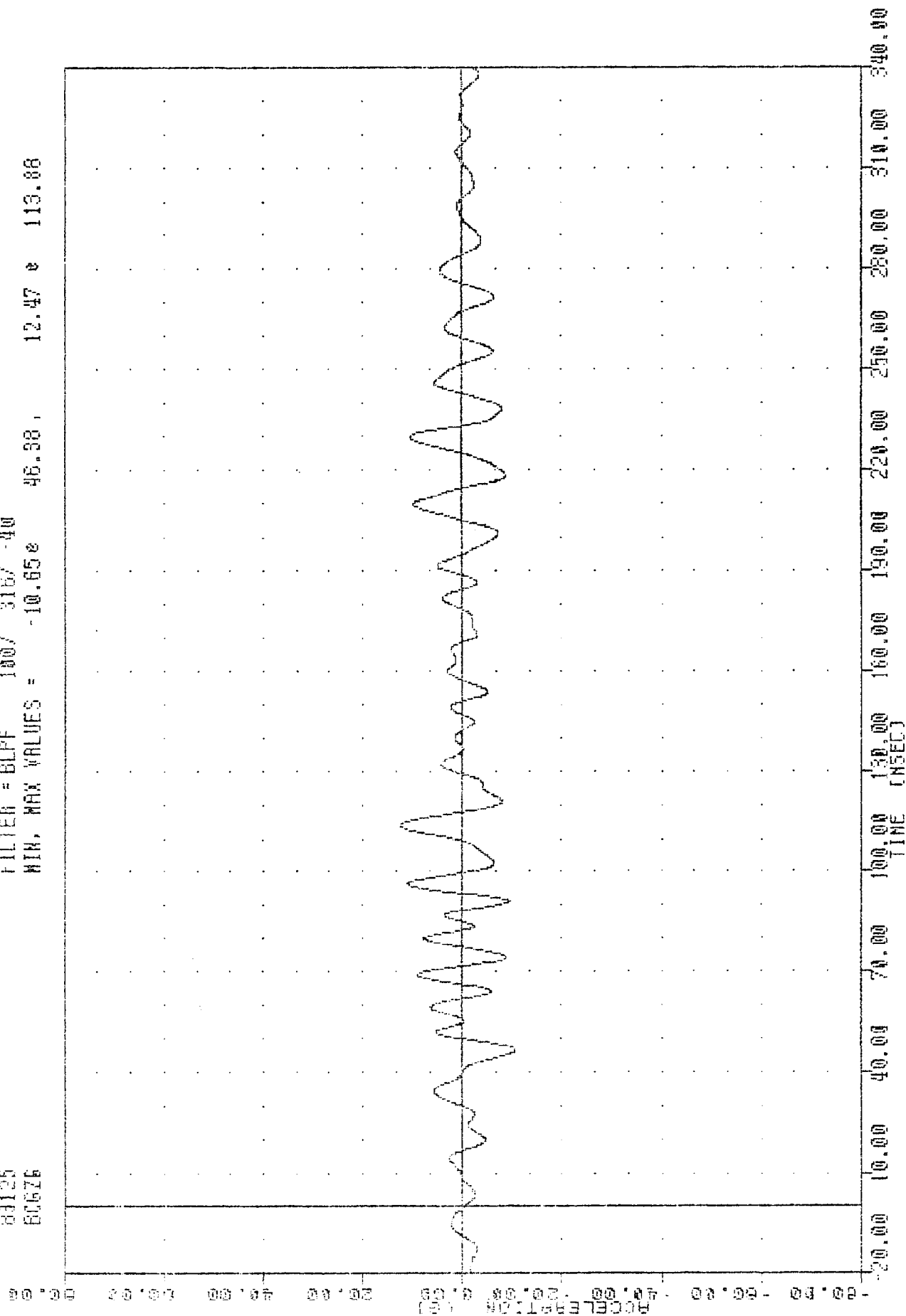


IRC , 830505
 MOB ASSESSMENT-SIDE IMPACT
 83125
 80676

PLOT DATE 13-MAY-83 10:27:41

FILTER = BLPF 100/ 315/ -40

MIN, MAX VALUES = -10.65e 46.38 , 12.47 e 113.88



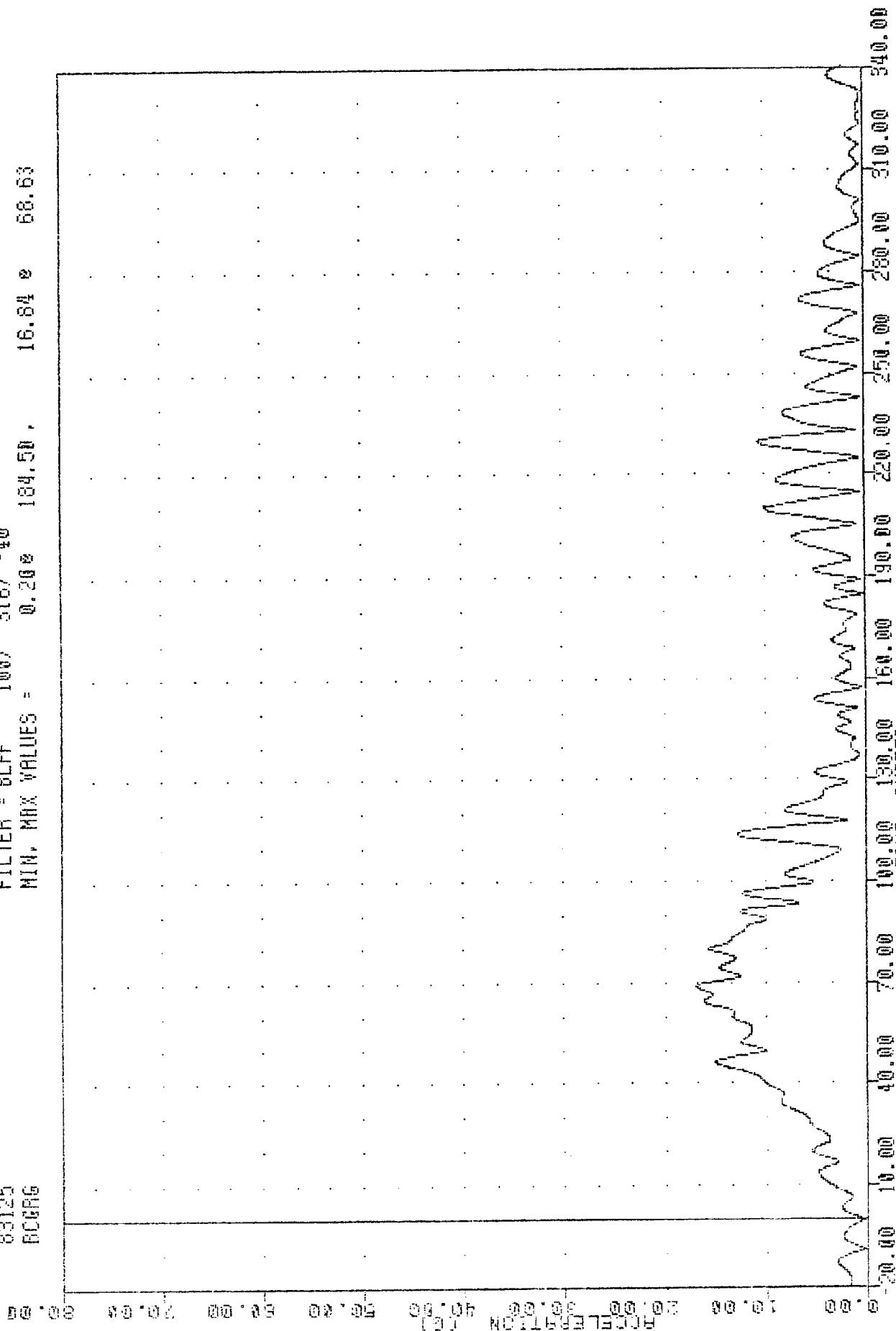
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 BARRIER CENTER OF GRAVITY Z AXIS

TRC , 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 BCGRG

PLOT DATE 13-MAY-83 13:46:22

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = 0.20e 184.50, 16.84 e 68.63



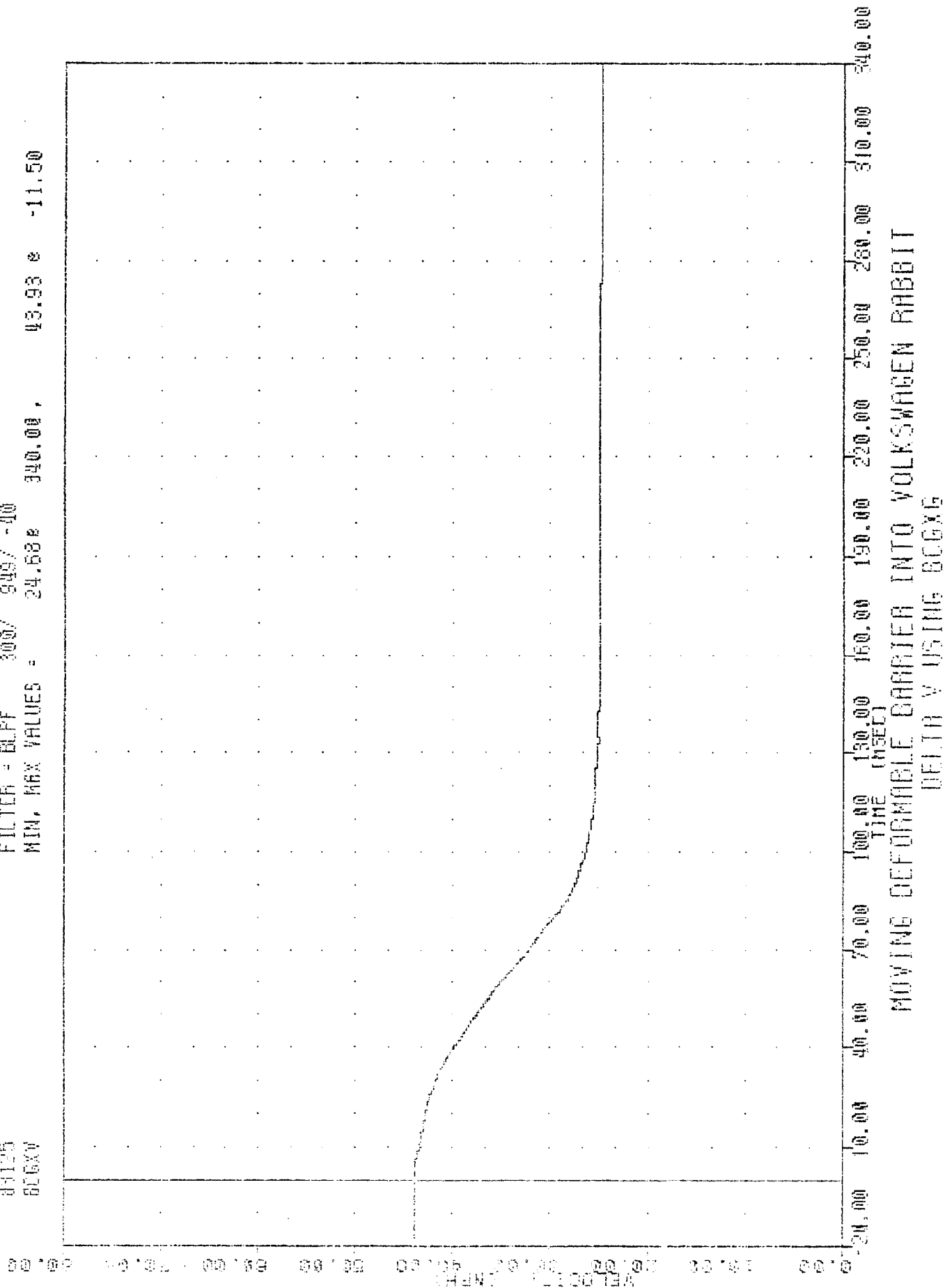
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 BARRIER CG RESULTANT

TAC , 830505
 NDB ASSESSMENT-SIDE IMPACT
 83125
 BCGXV

PLOT DATE 24-MAY-83 11:26:42

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 24.58e 340.00, 43.93 e -11.50

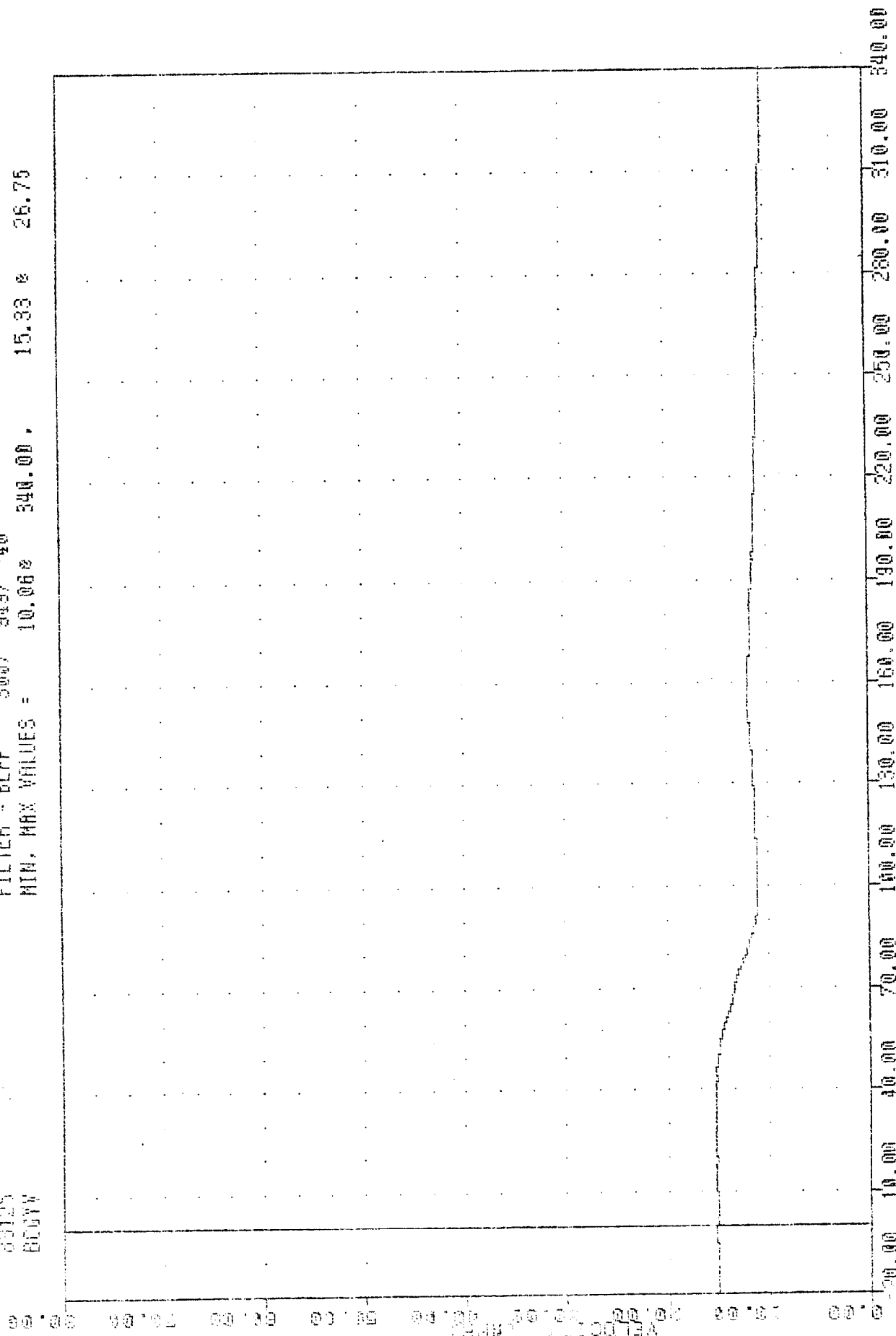


TAC 030505
 HOB ASSESSMENT SIDE IMPACT
 03125
 BC6YV

PLOT ORTE 24-MAY-83 11:26:42

FILTER = BLFF 300/ 949/ -40

MIN. MAX VALUES = 10.00% 340.00. 15.33% 26.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

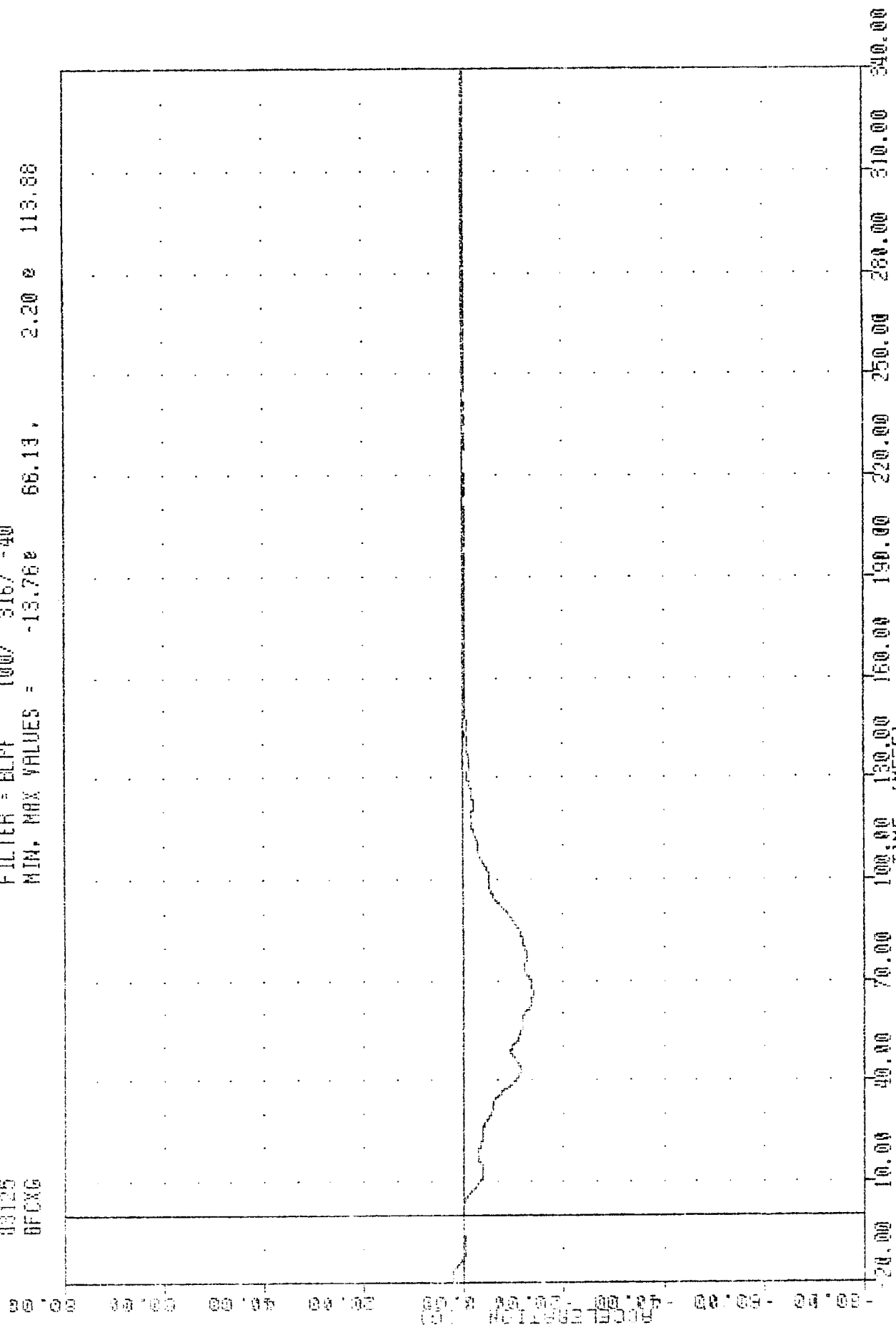
DELTA V USING BC6YV

TRC 030505
 HDB ASSESSMENT-SIDE IMPACT
 03125
 BFCXG

PLOT DATE 13-MAY-80 10:27:41

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -13.76e 66.13, 2.20 e 113.68



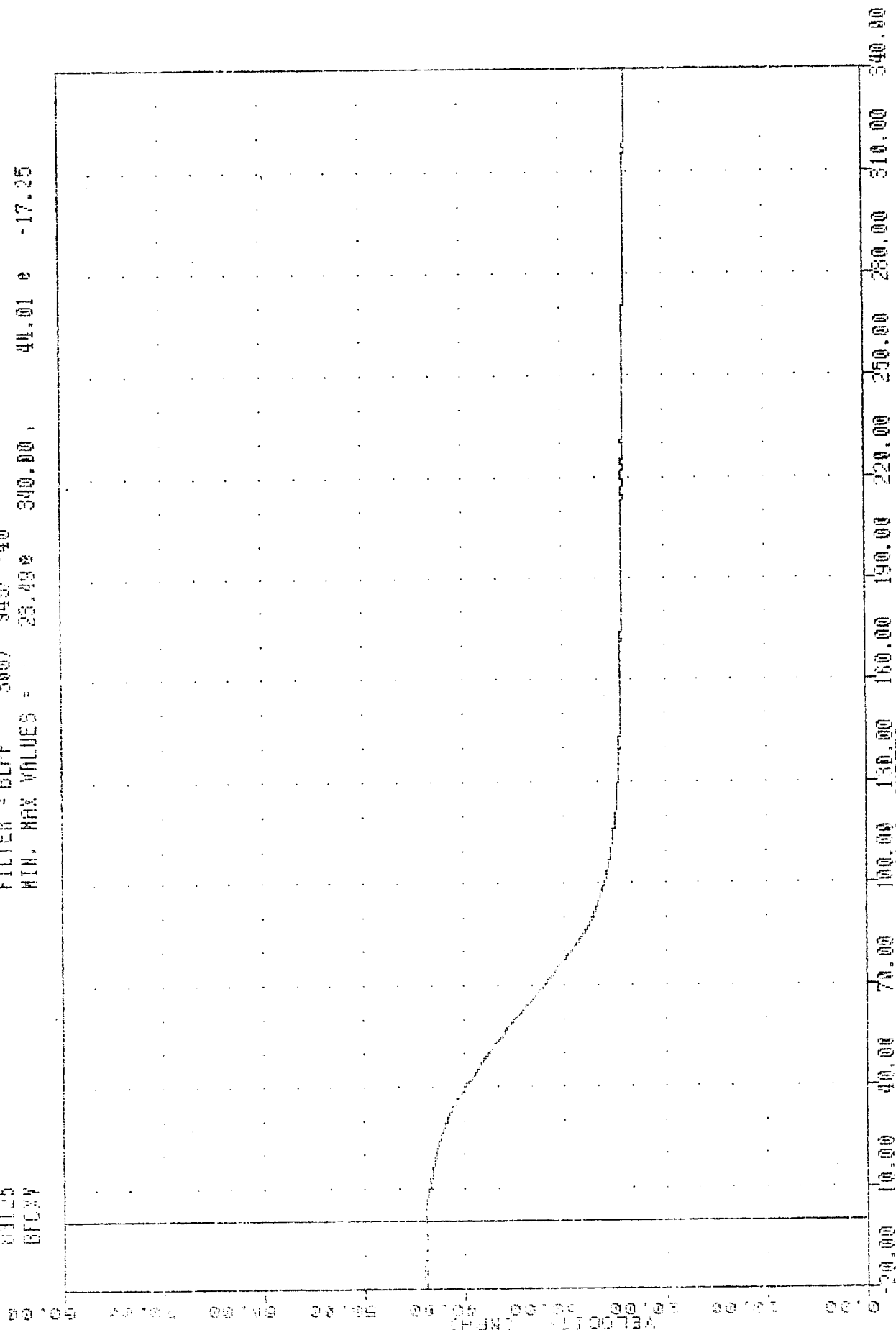
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 BARRIER FRONT CROSSMEMBER ACCELERATION X AXIS

TAC 830505
 HMO ASSESSMENT-SIDE IMPACT
 63125
 BFCVY

PLUT DATE 24-MAY-83 11:26:42

FILTER = BLFF 300/ 940/ -40

MIN, MAX VALUES = 23.49 340.00 41.01 e -17.25



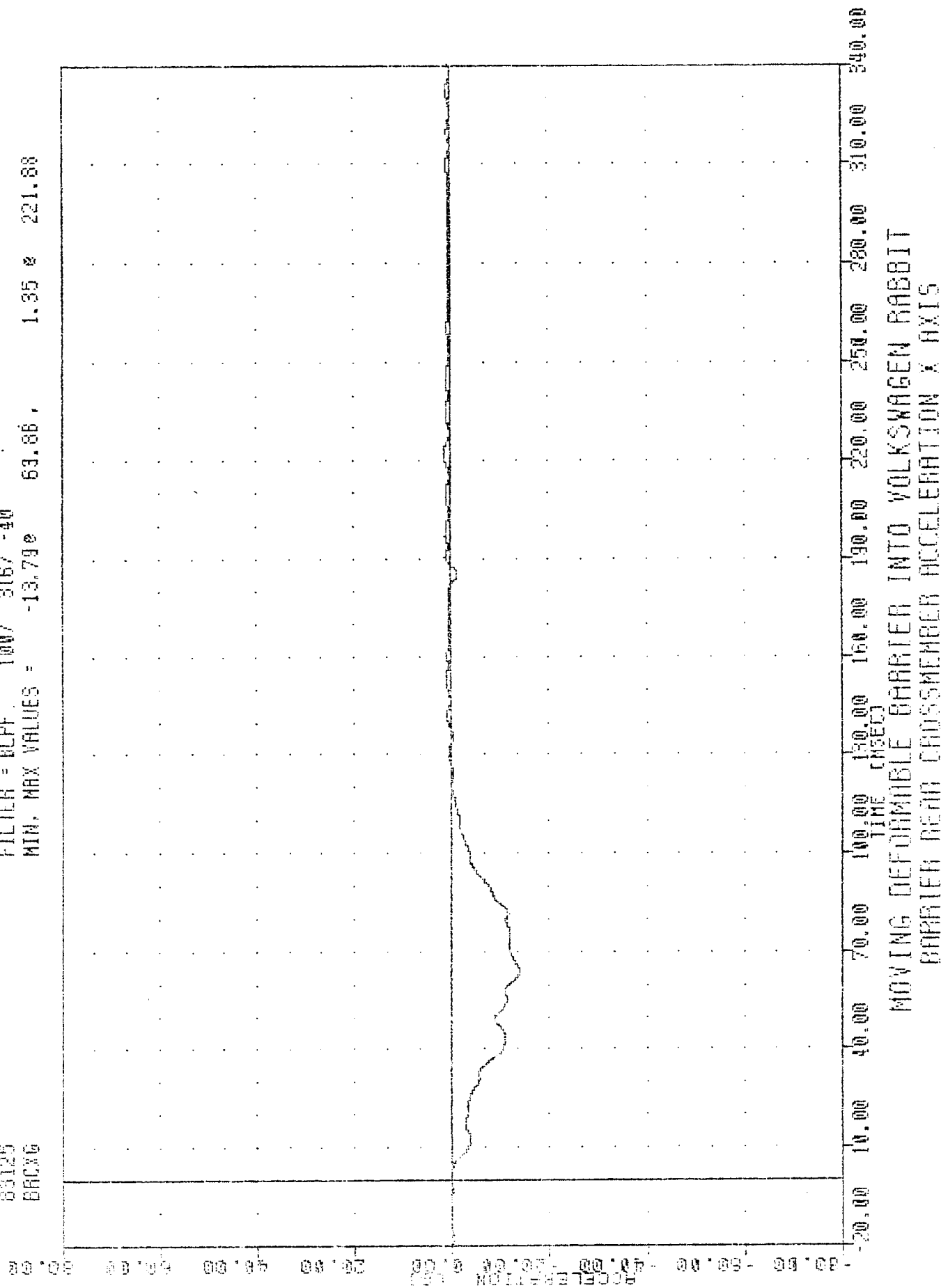
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING BFCVXG

TBC
 MOB ASSESSMENT-SIDE IMPACT
 83125
 BRCYG

PLOT DATE 13-MAY-83 10:27:41

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -13.79e 63.86, 1.35 e 221.88



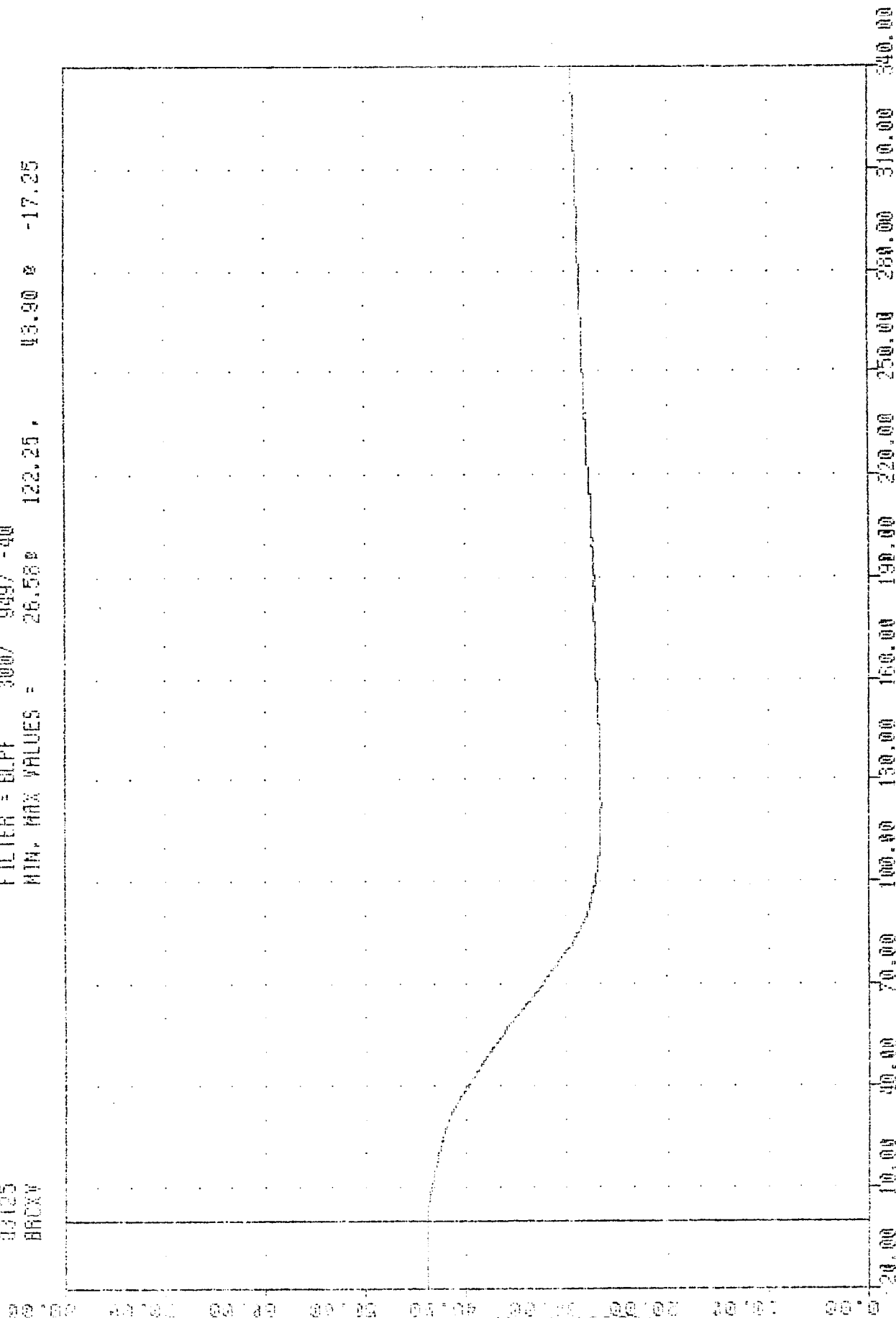
TAC 030505
 HOB ASSESSMENT-SIDE IMPACT
 03125
 BRCKX

PLOT DATE 24-MAY-83 11:26:42

FILTER = BLPF 300/ 9497 -40

MIN. MAX VALUES = 26.56 122.25

43.90 0 -17.25

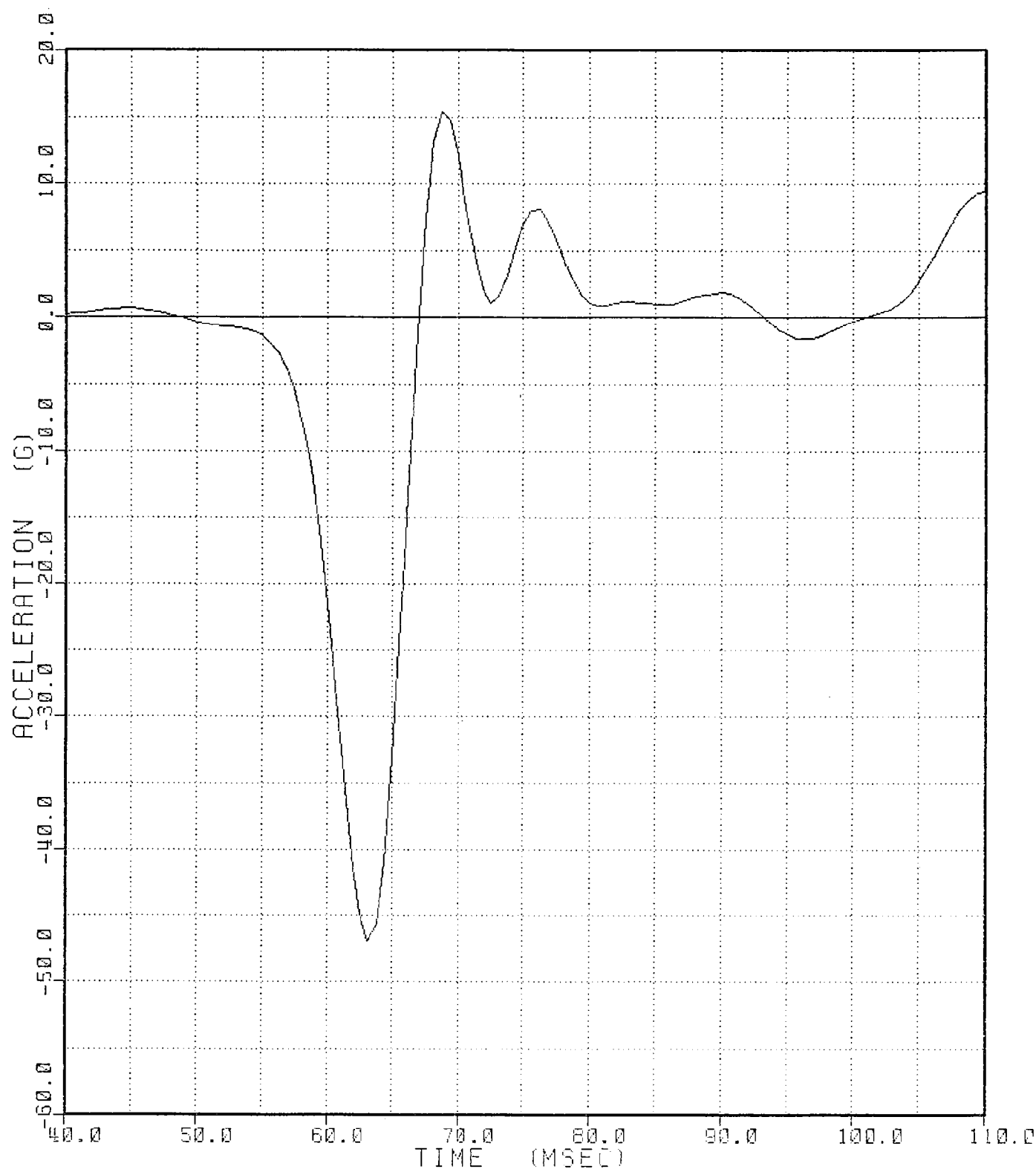


MOVING DEFORMABLE CARRIED INTO VOLKSWAGEN RABBIT

DELTA V USING BRCKG

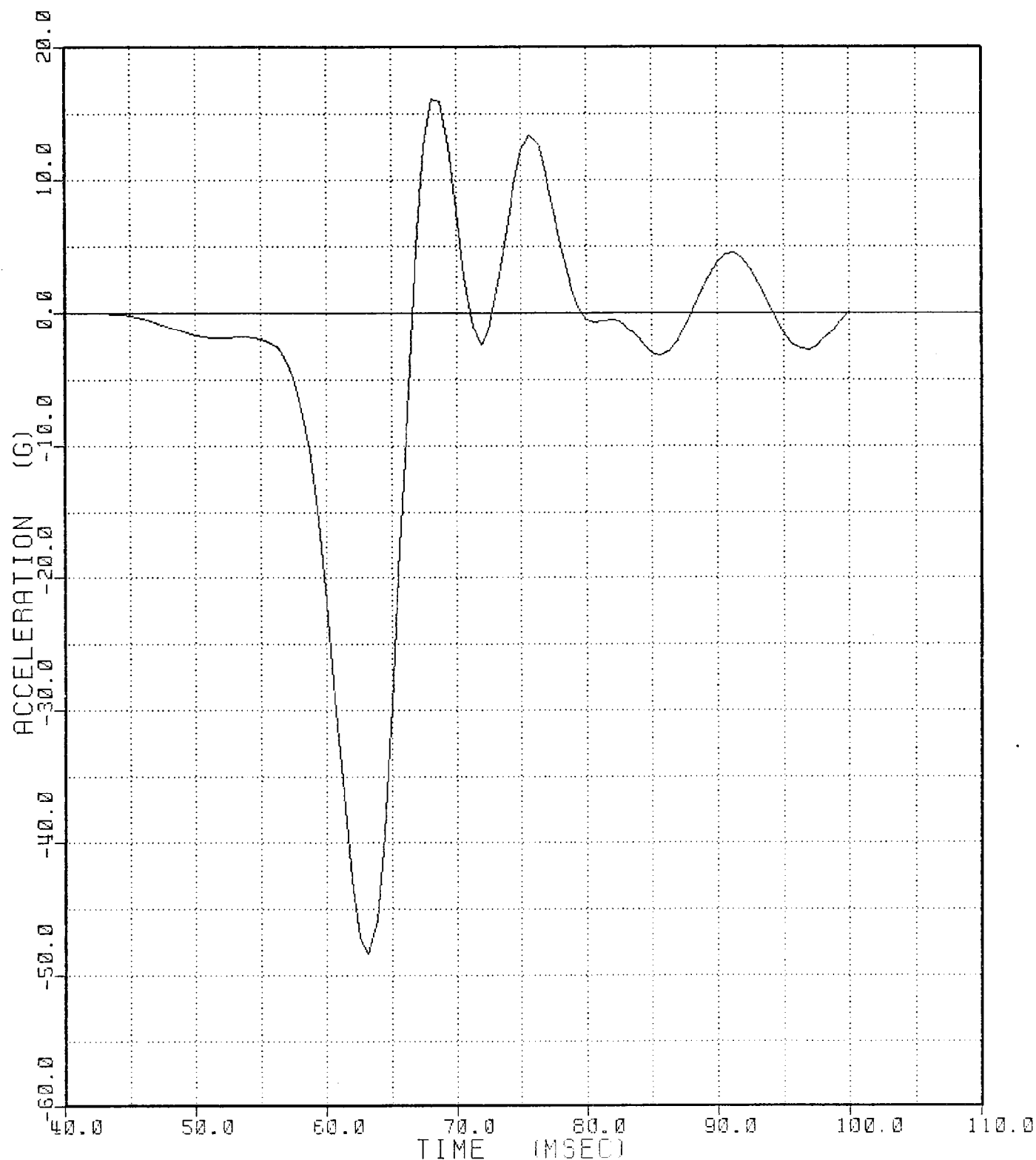
APPENDIX C
DUMMY CERTIFICATION

CAL57F ARL006 CAL057 83105085230 15-APR-83 09:18:22
LURYG1 FILTER = HSR1 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -46.906 63.1250 15.443 68.7500



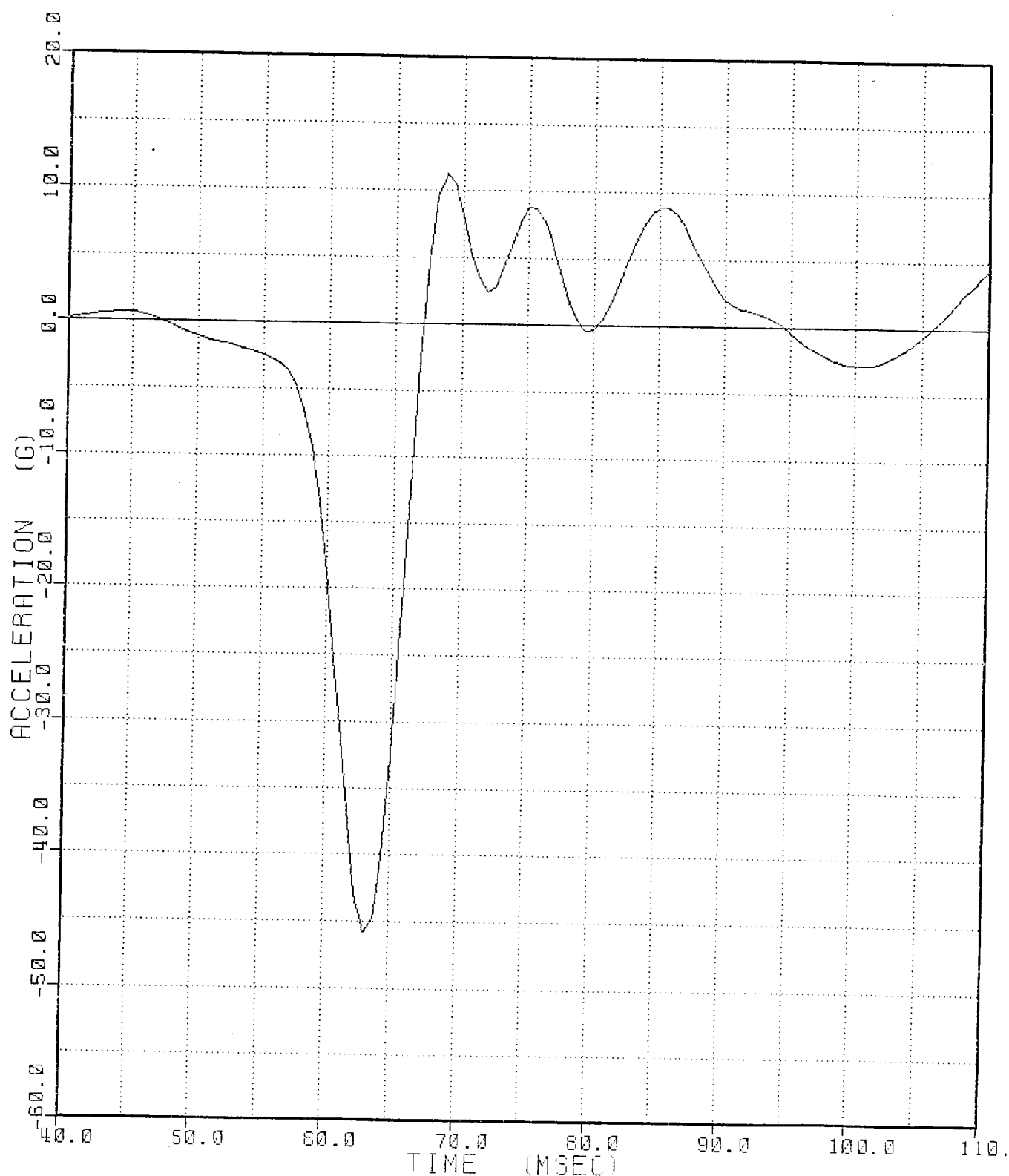
TEST #57 (ARL6) - LEFT UPPER RIB (1)

CAL57F ARL006 DAL057 83105085230 15-APR-83 09:18:22
LURYGA FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -48.409 63.1250 16.133 68.1250



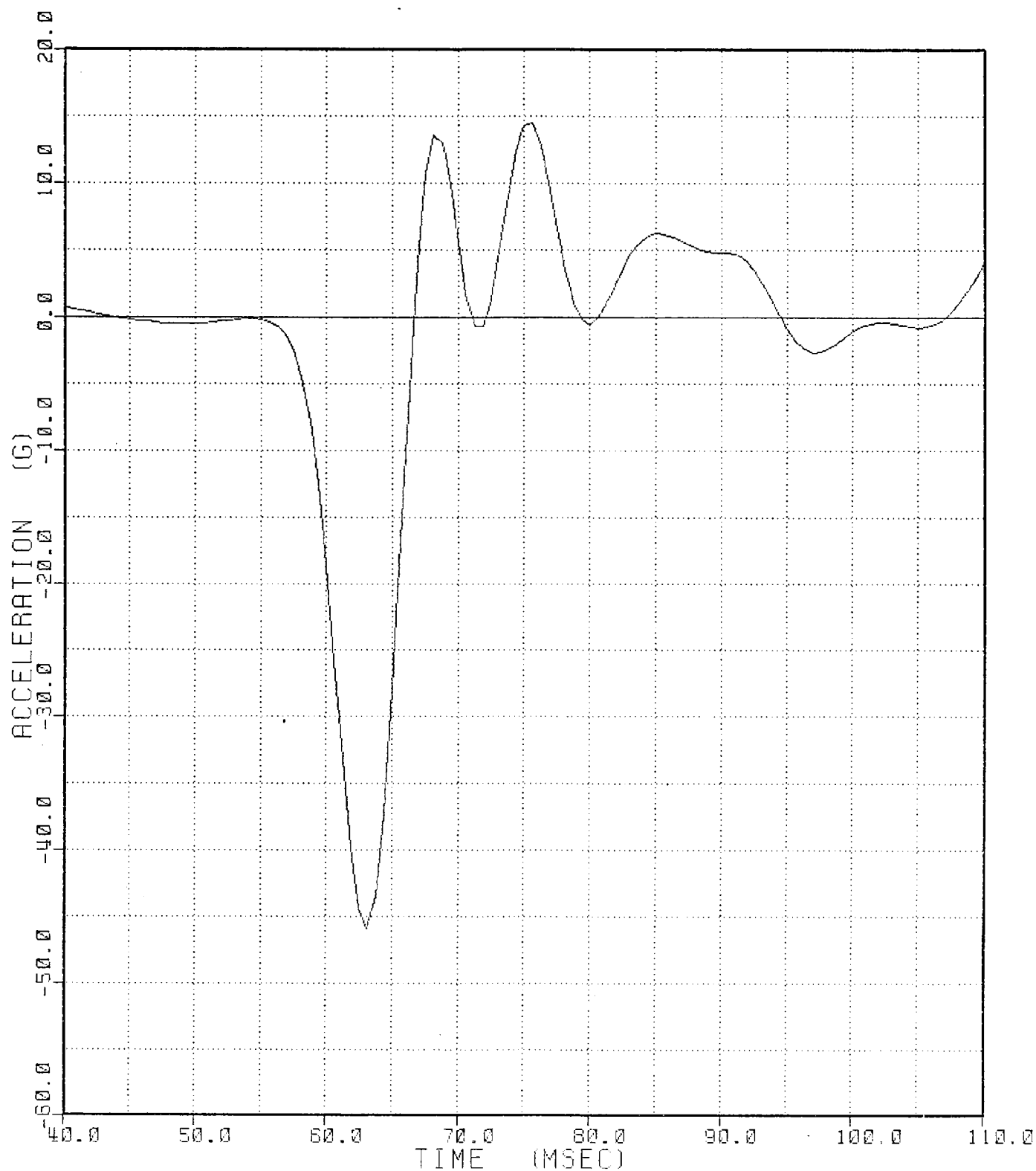
TEST #57 (ARL6) - LEFT UPPER RIB (2)

CAL57F ARL006 CAL057 83105085230 15-APR-83 09:18:22
LLAYG1 FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -45.791 63.1250 11.206 68.7500



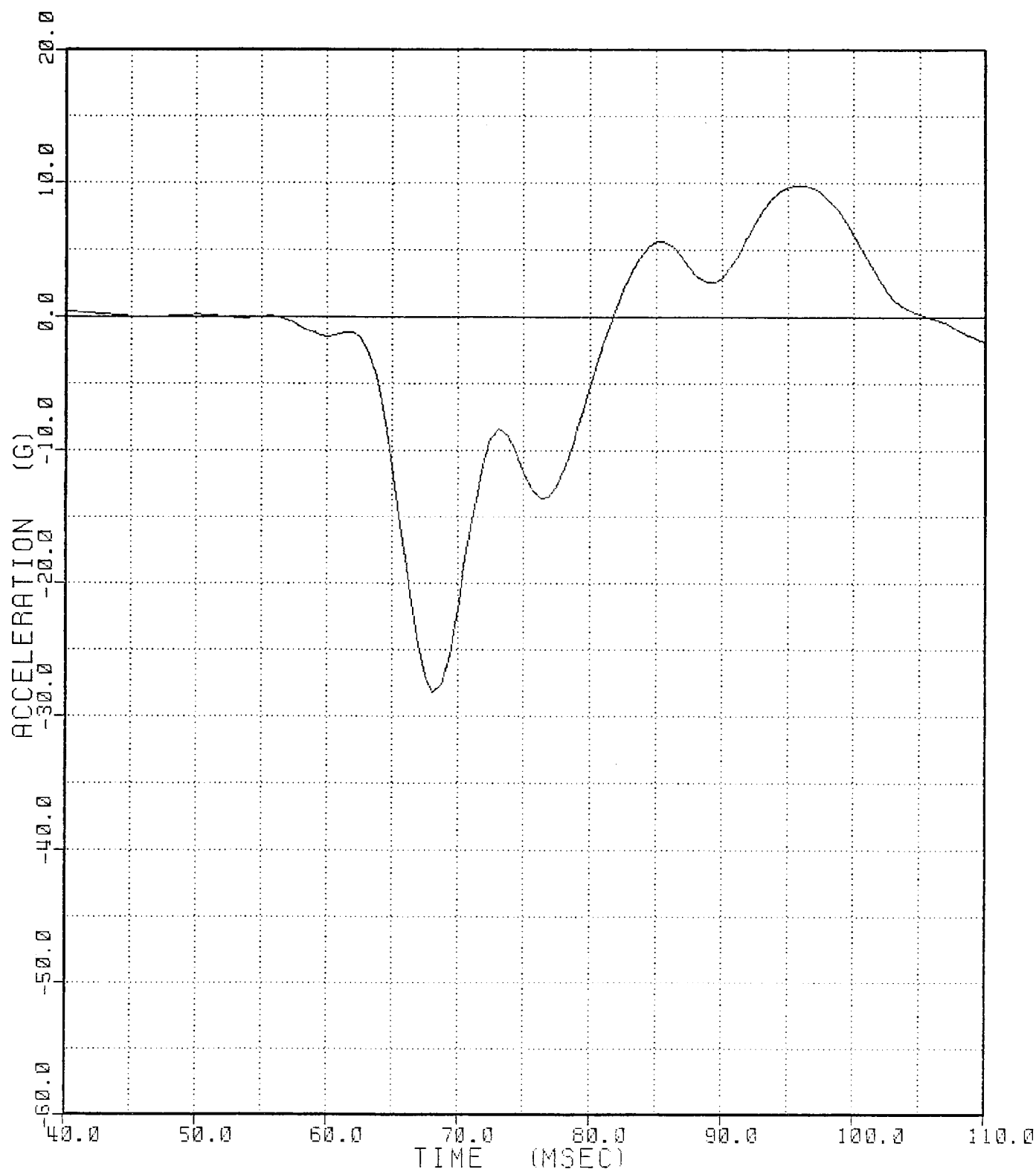
TEST #57 (ARLS) - LEFT LOWER RIB (1)

CAL57F ARL006 CAL057 83105085230 15-APR-83 09:18:22
LLAYGA FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -45.851 * 63.1250 14.452 * 75.6250



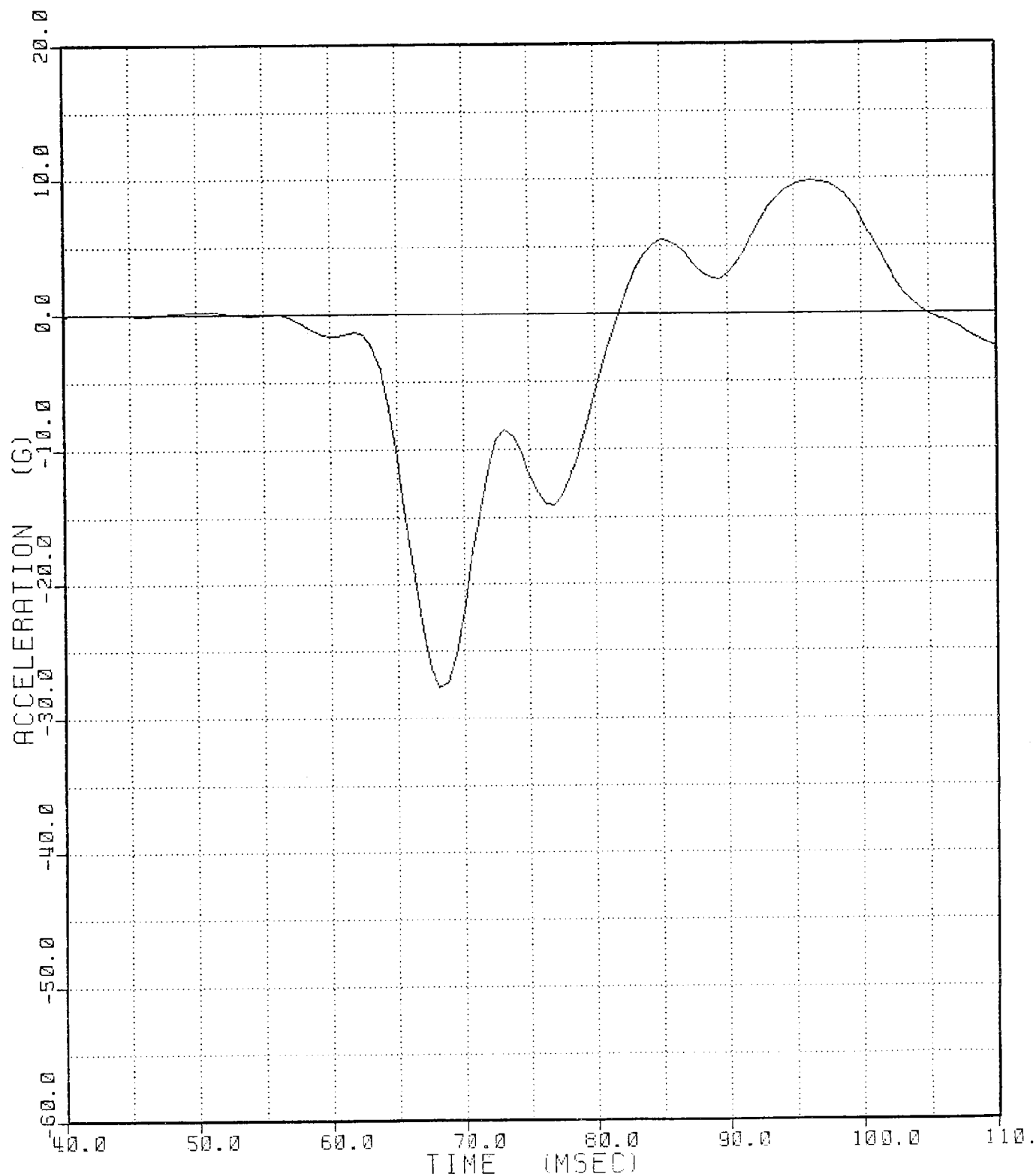
TEST #57 (ARL6) - LEFT LOWER RIB (2)

CAL57F ARL006 CAL057 83105085230 15-APR-83 09:18:22
T01YG1 FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -28.152 68.1250 9.839 95.6250



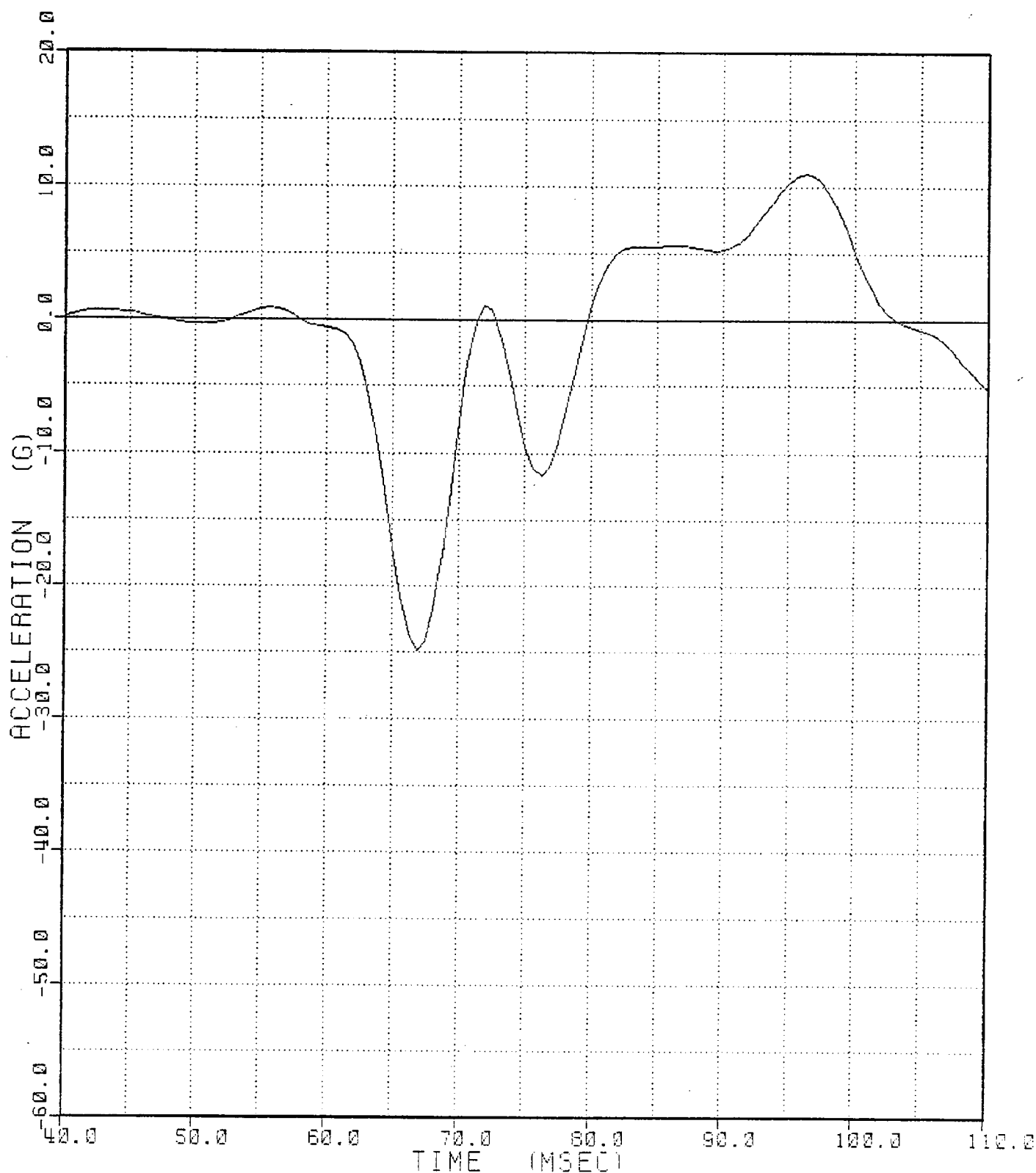
TEST #57 (ARL6) -UPPER SPINE (1)

CAL57F ARL006 CAL057 83105085230 15-APR-83 09:18:22
T0LYGA FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -27.698 68.1250 9.776 96.2500



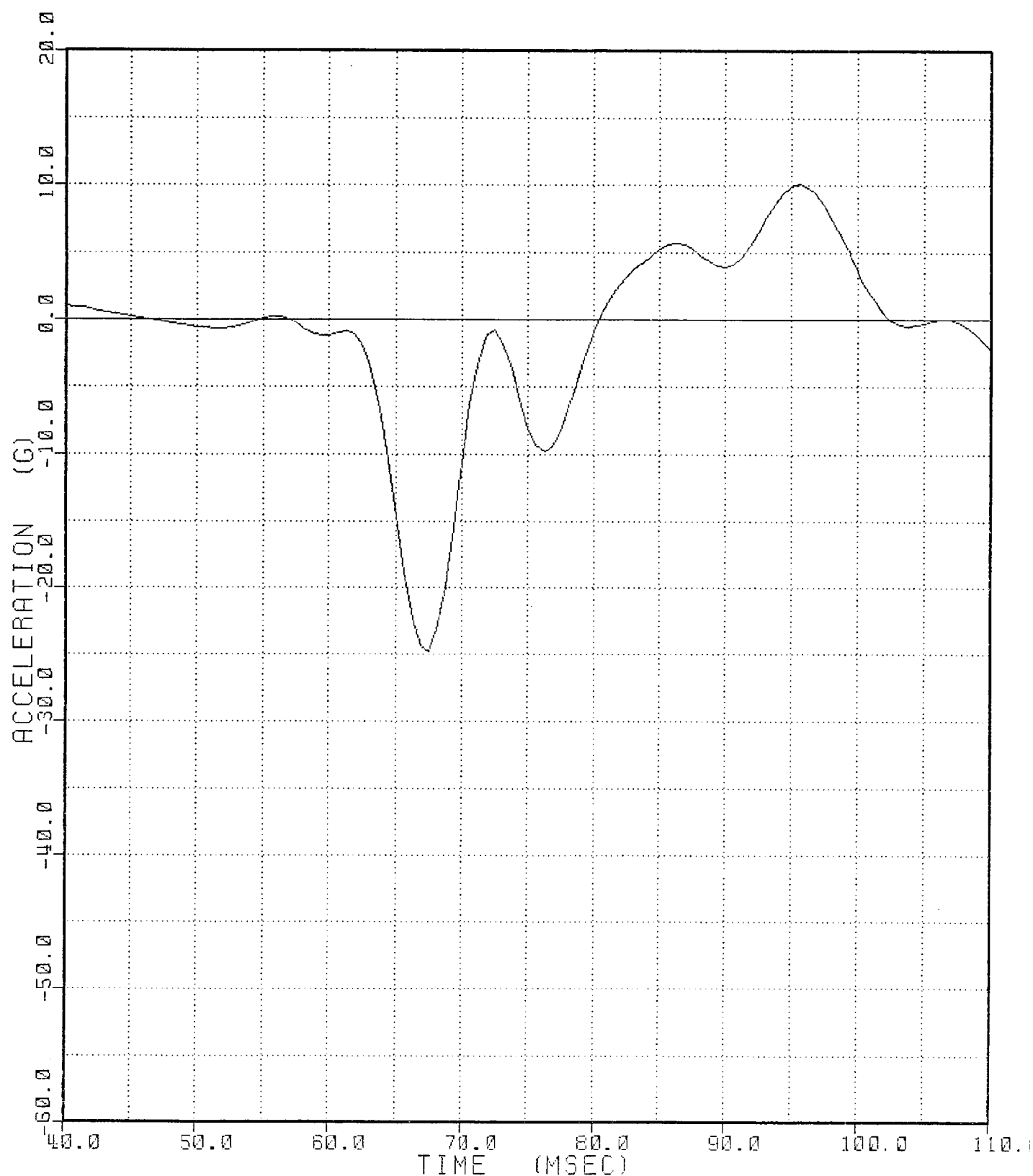
TEST #57 (ARL6) -UPPER SPINE (2)

CAL57F ARL006 CAL057 83105085230 15-APR-83 09:18:22
T12YG1 FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -24.865 * 66.8750 10.983 * 96.2500



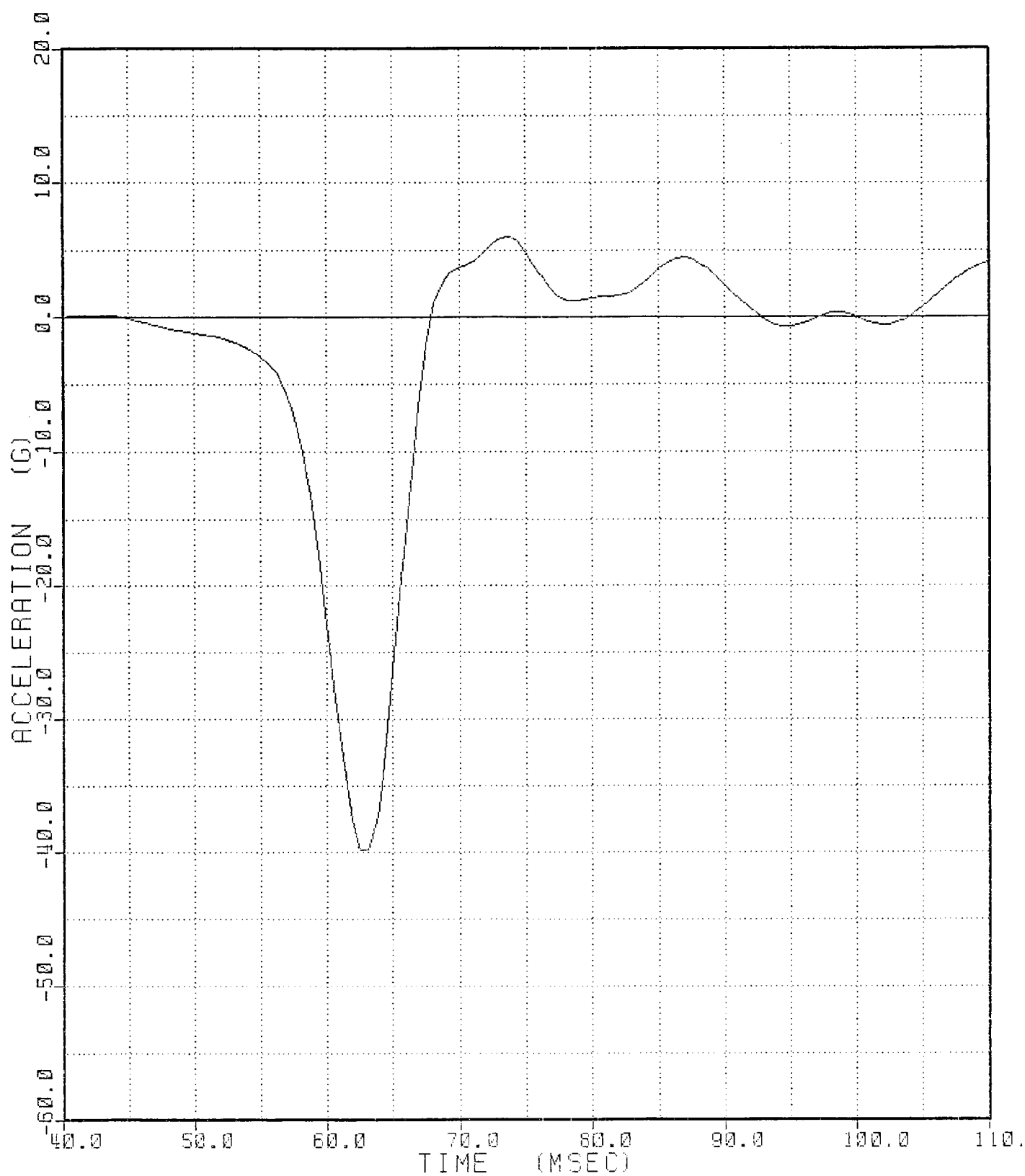
TEST #57 (ARL6) - LOWER SPINE (1)

CAL57F ARL006 CAL057 83105085230 15-APR-83 09:18:22
T12YGA FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -24.771 67.5000 10.059 95.6250



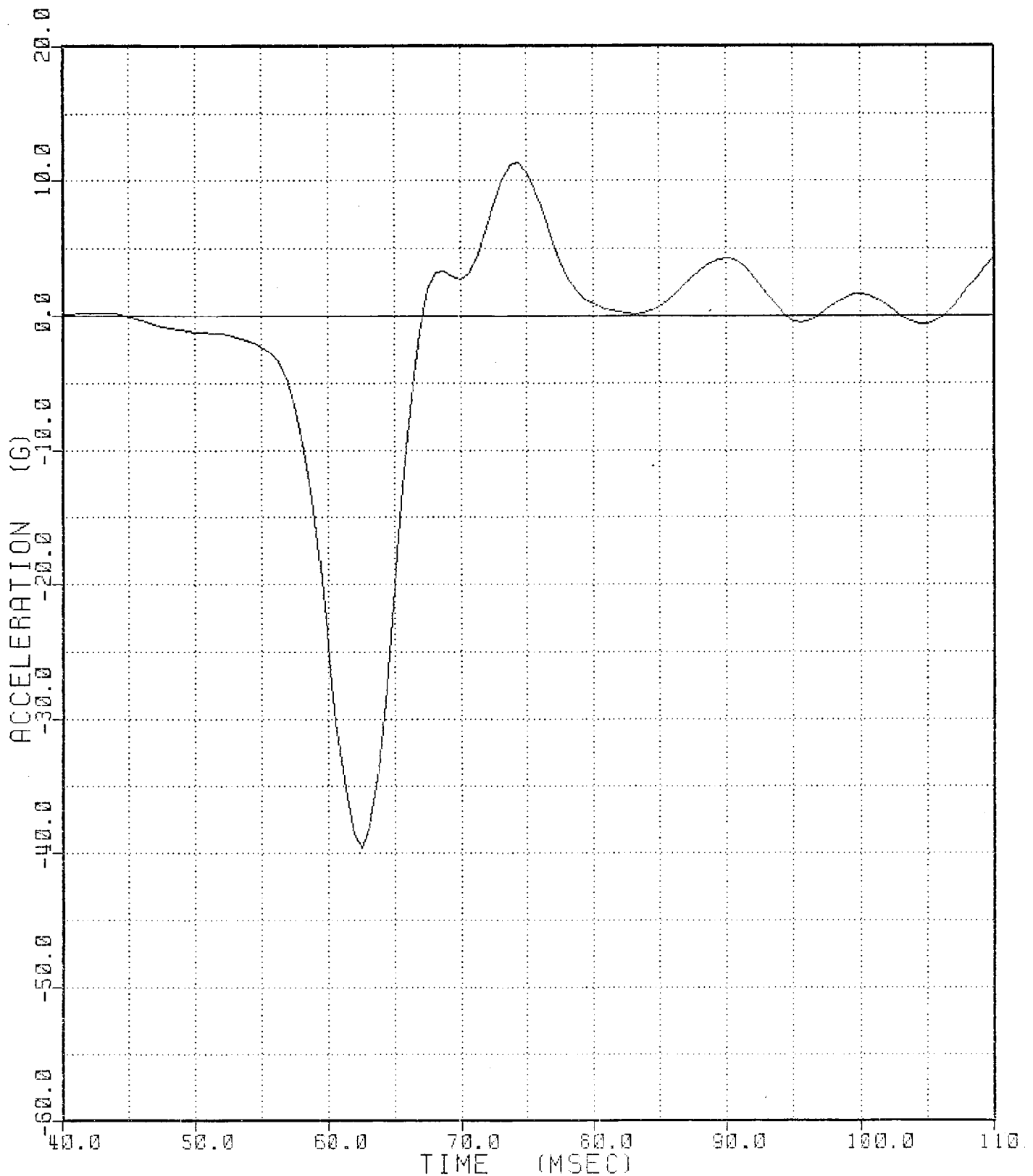
TEST #57 (ARL6) - LOWER SPINE (2)

CAL56F ARLU02 CAL056 83104145339 15-APR-83 07:49:25
LURYG3 FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -39.821 62.5000 6.004 73.7500



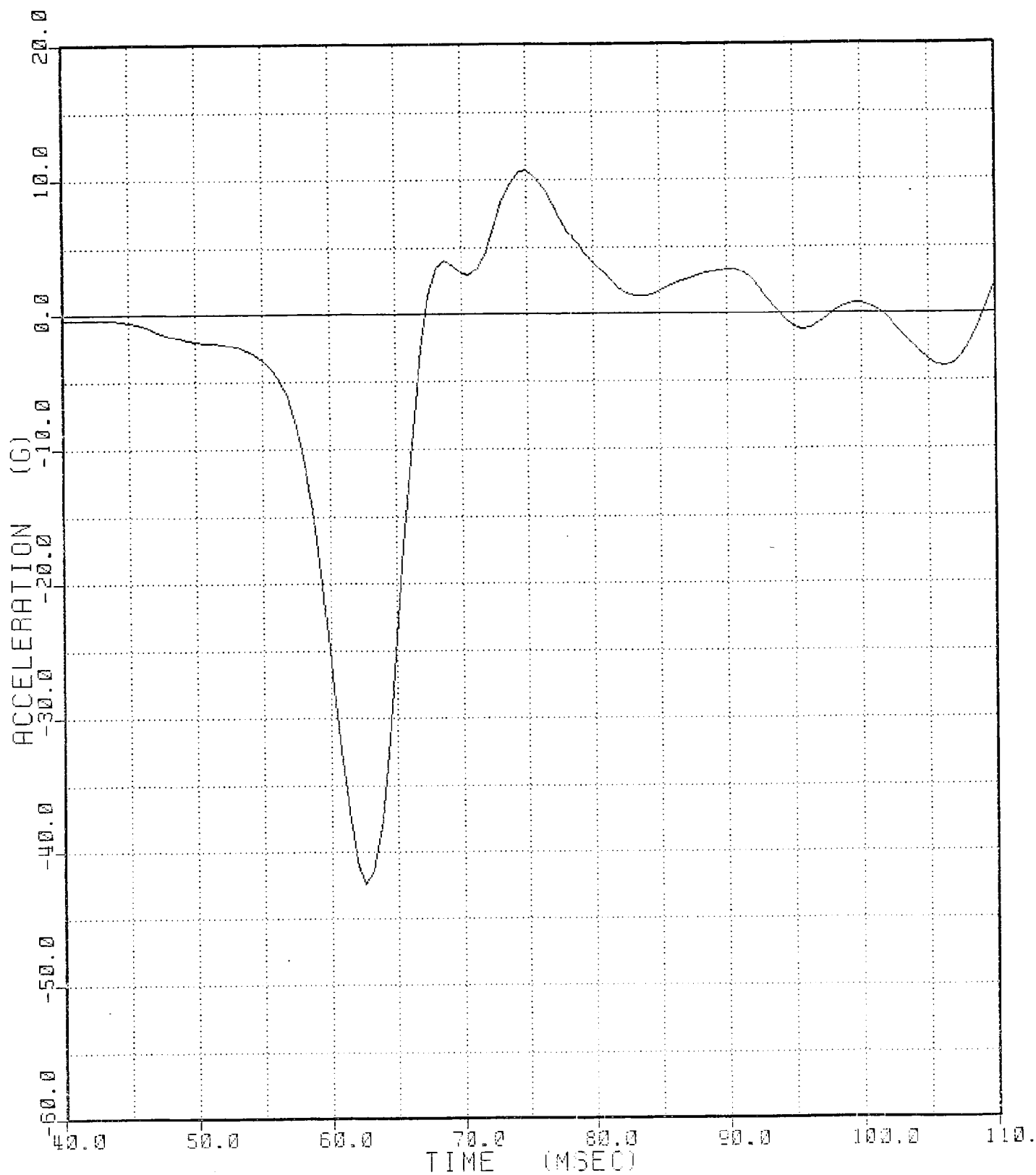
TEST #56 (V03) -LEFT UPPER RIB (1)

CAL56F ARLU02 CAL056 83104145339 15-APR-83 07:49:25
LURYGB FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -39.645 62.5000 11.393 74.3750



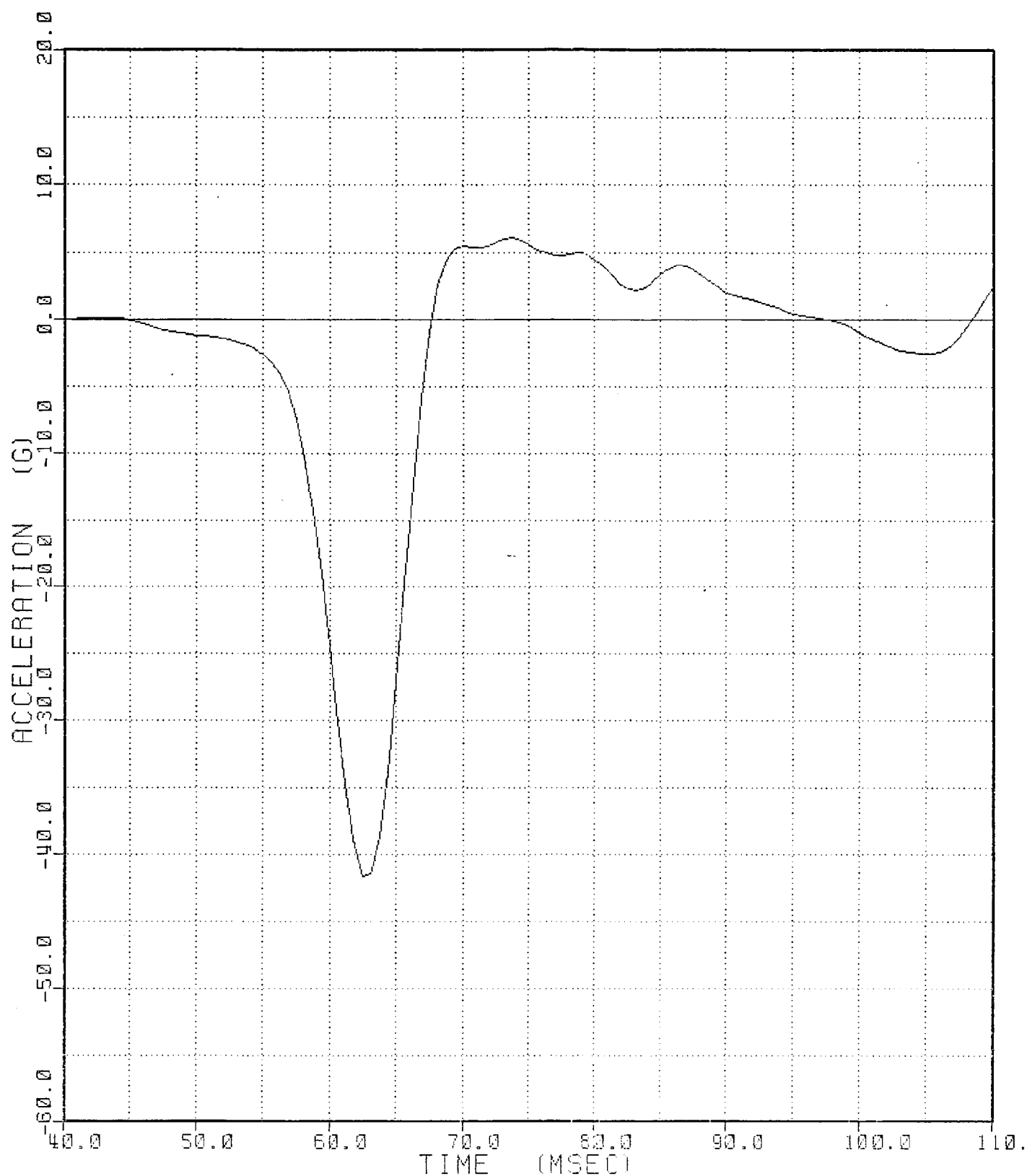
TEST #56 (V03) -LEFT UPPER RIB (2)

CAL56F ARLU02 CAL056 83104145339 15-APR-83 07:48:25
LLRYG3 FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -42.374 62.5000 10.738 75.0000



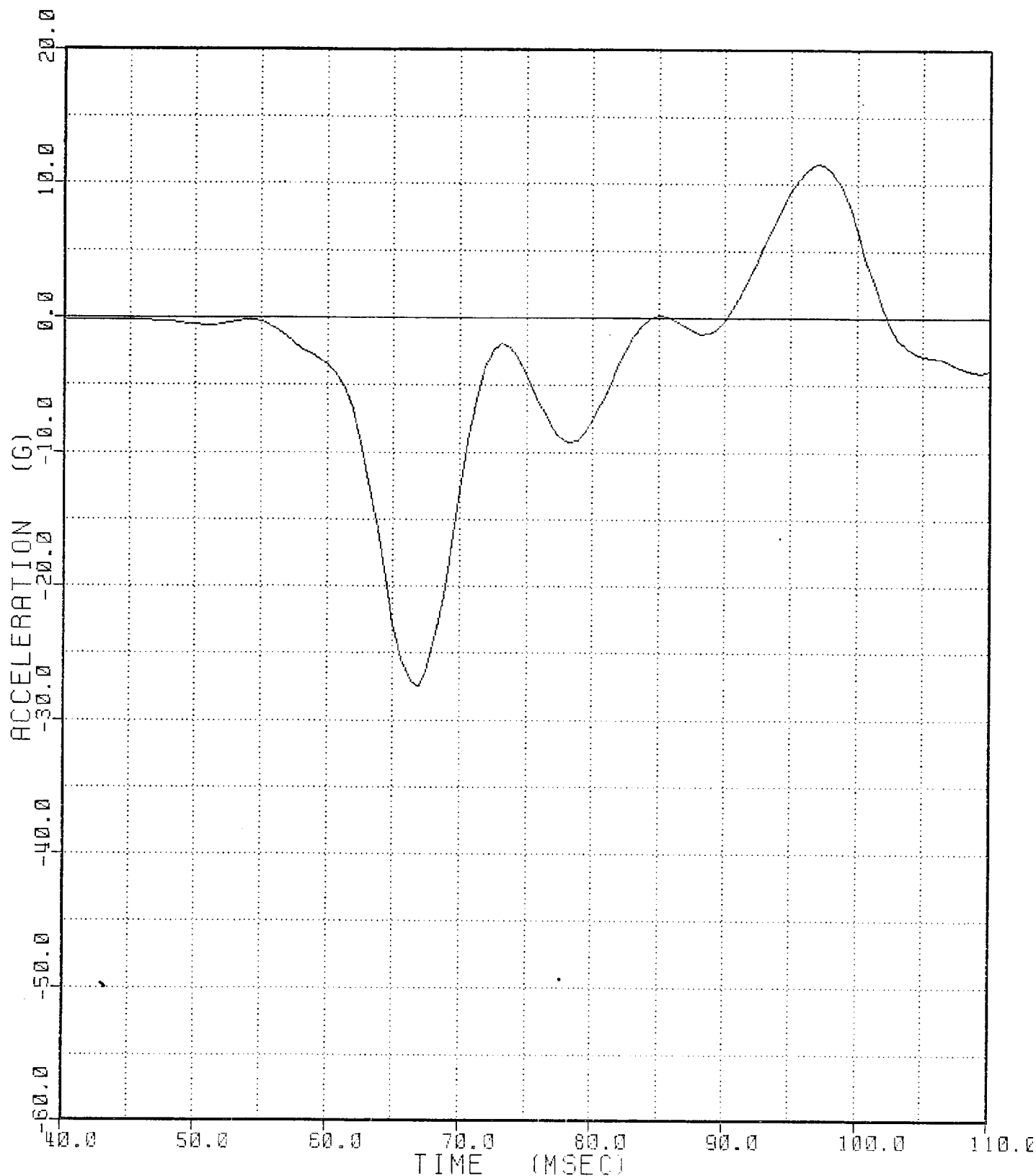
TEST #56 (V03) -LEFT LOWER RIB (1)

CAL56F ARLU02 CAL056 83104145339 15-APR-83 07:49:25
LLRYGB FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -41.589 62.5000 6.063 73.7500



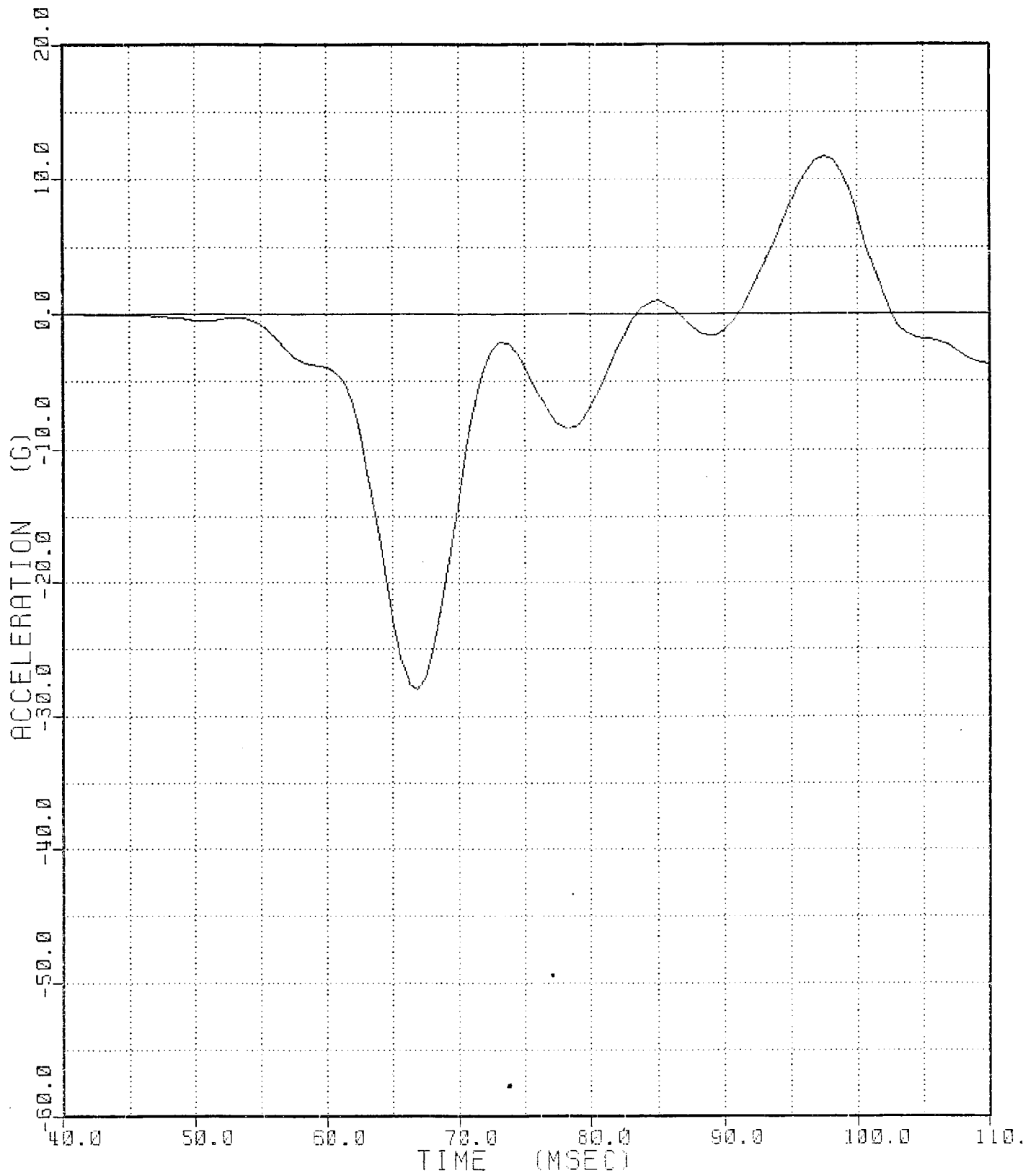
TEST #56 (V03) - LEFT LOWER RIB (2)

CAL56F ARLU02 CAL056 83104145339 15-APR-83 07:49:25
T01Y03 FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -27.462 * 66.8750 11.477 * 96.8750



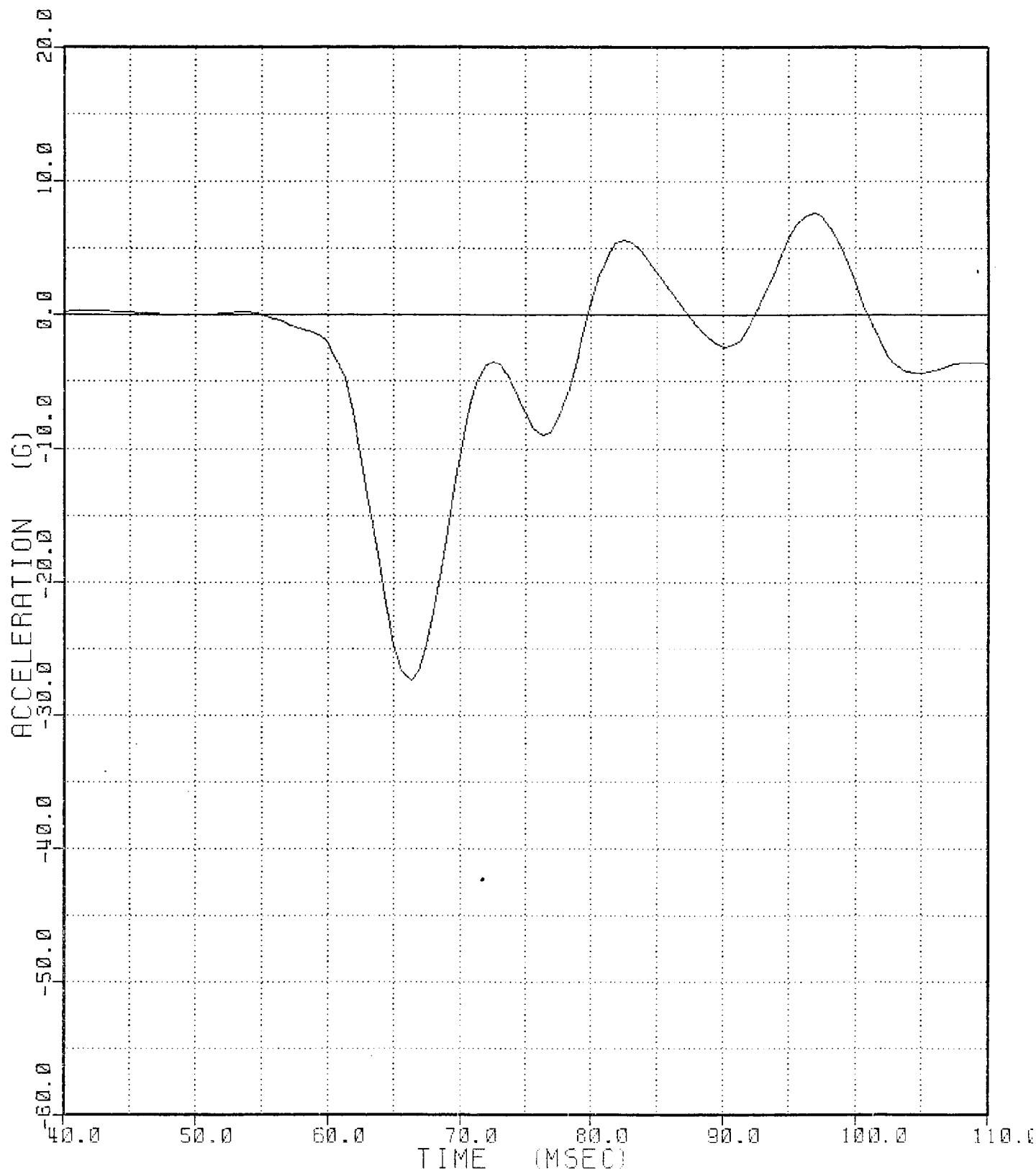
TEST #56 (V03) -UPPER SPINE (1)

CAL56F ARLU02 CAL056 83104145339 15-APR-83 07:49:25
T01YGB FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -28.048 @ 66.8750 11.746 @ 97.5000



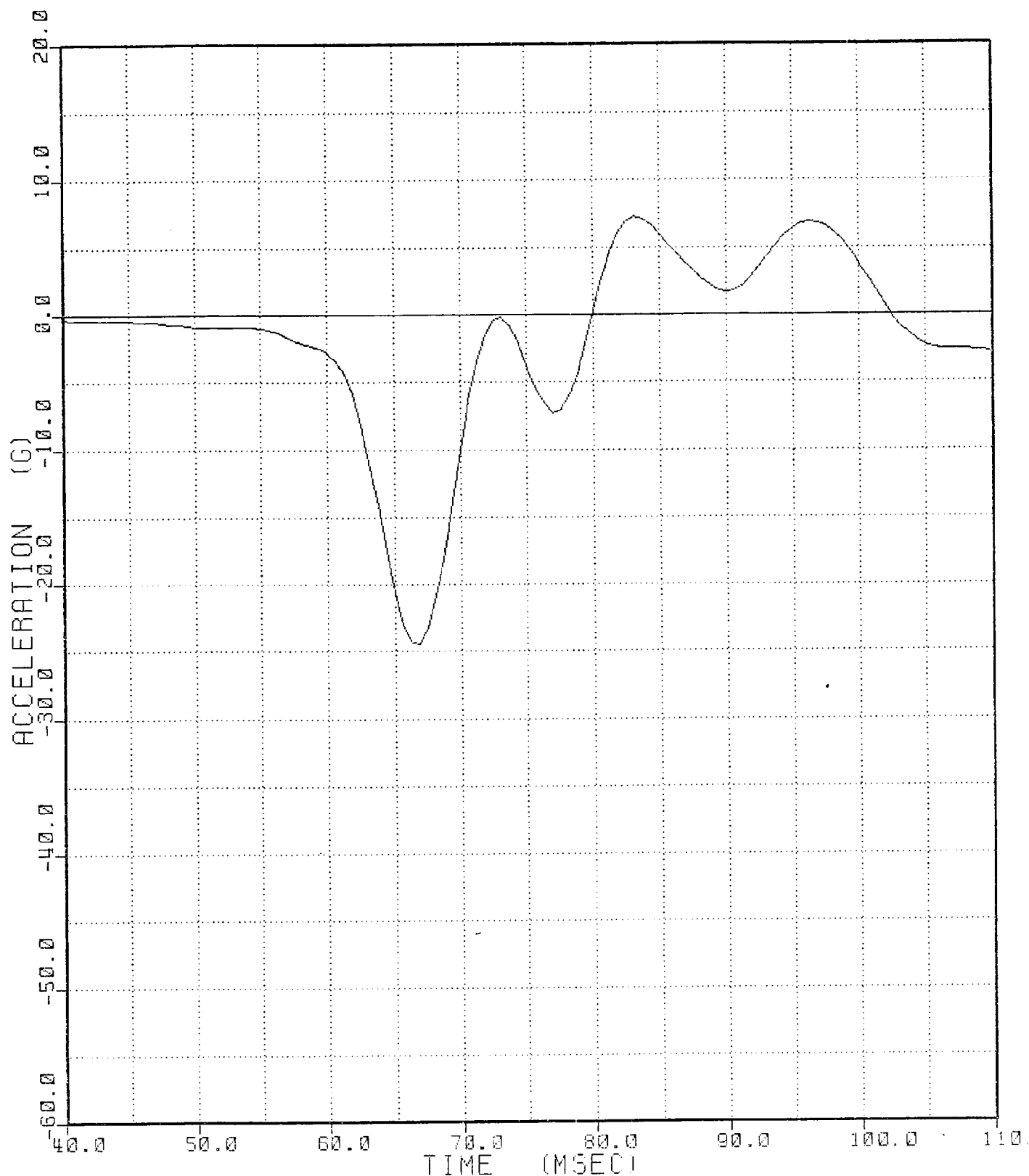
TEST #56 (V03) - UPPER SPINE (2)

CAL56F ARLU02 CAL056 83104145339 15-APR-83 07:49:25
T12Y03 FILTER = HSRI 136/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -27.363 66.2500 7.567 96.8750



TEST #56 (V03) -LOWER SPINE (1)

CAL56F ARLU02 CAL056 83104145339 15-APR-83 07:49:25
T12YGB FILTER = HSRI 196/ 189/ -50 14.0 FT/SEC
MIN, MAX VALUES = -24.469 @ 66.8750 7.292 @ 83.1250



TEST #56 (V03) - LOWER SPINE (2)