

EVALUATION OF NHTSA MODIFIED
VOLKSWAGEN RABBITS

DOT 604

220135

MDB-TO-CAR SIDE IMPACT TEST OF
A 26⁰ CRABBED MOVING DEFORMABLE BARRIER
TO A 1982 VOLKSWAGEN RABBIT
AT 39.1 MPH

PREPARED BY:
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FINAL REPORT
OCTOBER 1983

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16. Abstract This test report documents one of a series of twelve crash tests to evaluate the NHTSA's Modified Volkswagen Rabbits. Testing was conducted on a baseline 1982 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, crabbled to 26°, at 39.1 mph. Occupant responses of two side impact dummies were measured. One dummy was located in the driver's designated seating position and one was located in the left rear seating position. The test date was September 30, 1983 and the ambient temperature was 67°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	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 add 32)	degrees Fahrenheit	°F

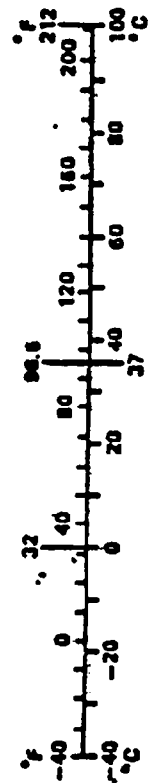


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SECTION 1.0

PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to evaluate the NHTSA fleet of modified Volkswagen Rabbits with and without padding. The vehicle was tested using conditions not currently contained in a Federal Motor Vehicle Safety Standard.

INTRODUCTION

A stationary 1982 Volkswagen Rabbit 2-door hatchback was impacted on the left side by a Moving Deformable Barrier (MDB) on September 30, 1983. 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 90⁰ counterclockwise with respect to the longitudinal axis of the struck vehicle. The leading edge of contact 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 26⁰. The actual test speed was 39.1 mph and the actual leading edge was 36 inches forward of the midpoint of the Volkswagen Rabbit's wheelbase.

The vehicle was a baseline model with no structural modification. The driver door and left rear occupant wall contained three inches of padding.

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 and photographs describe the General Test and Vehicle Parameter Data.

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagen of America

MAKE/MODEL: Volkswagen Rabbit

VIN: 1VWBB0178CV110877

BODY STYLE: 2-Door Hatchback

MODEL YEAR: 1982

NHTSA NO.: R & D

COLOR: Burgundy

ENGINE DATA: TYPE: Transverse

CYLINDERS: 4

DISPLACEMENT 105 CID

TRANSMISSION DATA: 4 Speed Manual

DATE VEHICLE RECEIVED: 9/9/83

ODOMETER READING: 14762

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	Yes
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

DATE OF MANUFACTURE: 7/82

GVWR: 2822 LBS.,

CAWR: FRONT 1609 LBS., REAR 1278 LBS.

VEHICLE TIRE DATA

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

TIRES ON VEHICLE (MFG. & LINE, SIZE): Michelin 155/R80/13

BIAS PLY, BELTED, OR RADIAL: Radial

PLY RATING: 3

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 640 LBS. RIGHT REAR 330 LBS.

LEFT FRONT 670 LBS. LEFT REAR 340 LBS.

TOTAL FRONT WEIGHT 1310 LBS. (66.2 % OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 670 LBS. (33.8 % OF TOTAL VEHICLE WEIGHT)

TOTAL DELIVERED WEIGHT 1980 LBS.

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE: RF 25 1/2 ;LF 25 3/8 ;RR 25 5/16 ;LR 25 1/8

PRE-TEST ATTITUDE: RF 24 3/4 ;LF 24 3/4 ;RR 22 11/16 ;LR 22 11/16

POST-TEST ATTITUDE: RF 23 1/4 ;LF 23 9/16 ;RR 23 5/16 ;LR 22 7/8

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 157 LBS. CARGO:

RIGHT FRONT 685 LBS. RIGHT REAR 560 LBS.

LEFT FRONT 685 LBS. LEFT REAR 555 LBS.

TOTAL FRONT WEIGHT 1370 LBS. (55.1 % OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 1115 LBS. (44.9 % OF TOTAL VEHICLE WEIGHT)

TOTAL TEST WEIGHT 2485 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: 3.0 GALLONS

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 15.0 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 27 psi

RECOMMENDED TIRE SIZE: 155 R80 13 LOAD RANGE X B, C,

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

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT

CARGO LOAD 135 LBS. 2 REAR

TOTAL 735 LBS. 4 TOTAL

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

TEST CONDITIONS

TEST NUMBER: 830930

DATE OF TEST: September 30, 1983

TIME OF TEST: 10:25

WIND VELOCITY: 0-2 mph 288° NW

HUMIDITY: NA

AMBIENT TEMPERATURE AT IMPACT AREA: 67° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 72° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2485	2463
MDB TEST WEIGHT (LBS.)	2990	3000
MDB VELOCITY (MPH)*	39.1	39.1
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 #	PASSENGER #
Head	<u>Side window and sill</u>	<u>Side header padding & window</u>
Chest	<u>Padding</u>	<u>Padding</u>
Abdomen	<u>Padding</u>	<u>Padding</u>
Left Knee	<u>Padding</u>	<u>Left quarter panel</u>
Right Knee	<u>Left knee</u>	<u>Left knee</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>Tools required</u>	<u>Easy</u>
Rear	<u>DNA</u>	<u>DNA</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>No</u>	<u>Left Front shifted 3"</u>
Rear	<u>No</u>	<u>No</u>

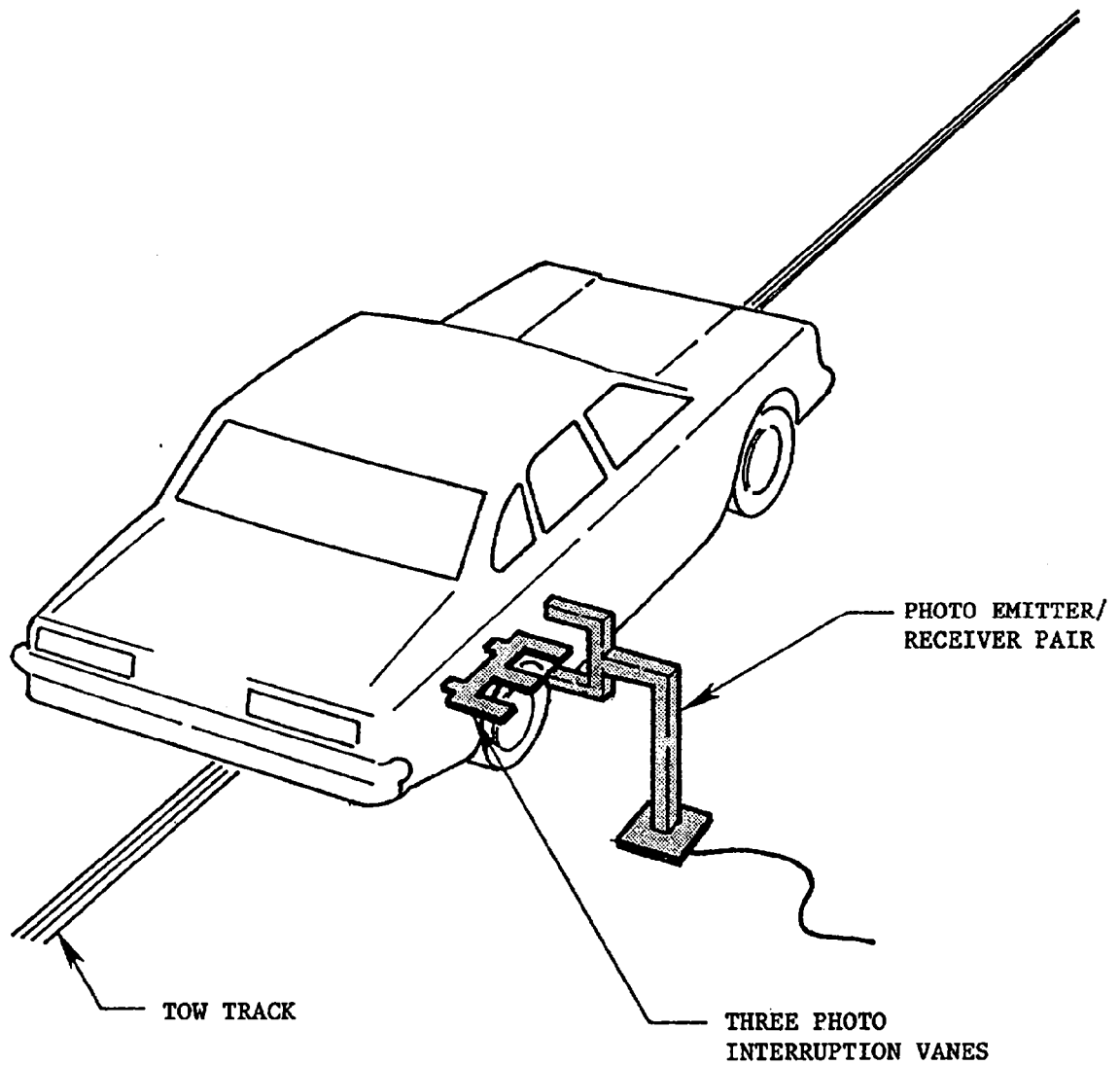
GLAZING DAMAGE:

Left edge of windshield cracked, both driver's
side window and left rear passenger window
shattered

OTHER NOTABLE IMPACT EFFECTS:

Approximately 8 inches of sill torn loose at
front seat area, A-pillar split from sill.

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 174 lbs. +
Cargo Weight
= 1980 + 2 X 174 + 135 lbs.
= 2463 lbs.

To achieve test weight, the exhaust system and starter motor were removed and 3 gallons of Stoddard Solvent was added 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) Cable separation occurred in data channel T01XG1 (Driver Upper Spine Acceleration X Axis) at approximately 320 msec. Because the separation occurred late in the crash, the test results are unaffected by it.

2) Cable separation occurred in data channel LFDYG2 {Left Front Door (Position 8) Acceleration Y Axis} within the first 10 msec. No peak values or Delta Velocities are reported.

SECTION 3.0
DATA REQUIRED BY R&D

The following pages are included in this section:

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

DUMMY TEMPERATURE CONTROL AND POSITIONING

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

<u>SIDE IMPACT DUMMY*</u>	<u>DRIVER DSP</u>	<u>REAR PASSENGER DSP</u>
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. J. Kokoruda

2. M. Garrison

3. D. LeVally

POSITIONING DATE: 9/30/83

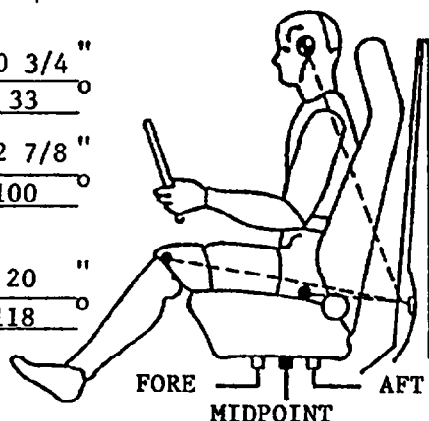
AMBIENT TEMP.: 69° F. TIME: 5:30

DRIVER DUMMY # 06

HEAD 20 3/4"
 TARGET* 33

KNEE 32 7/8"
 JOINT 100

APPROX. 20"
 "H" 118

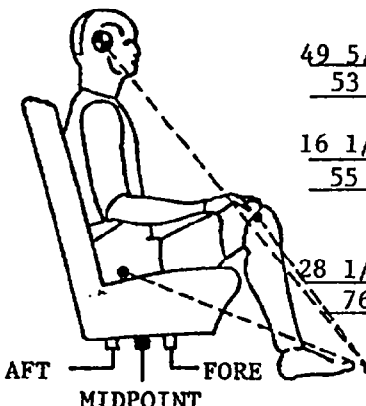


REAR PASSENGER DUMMY # U02

49 5/16" HEAD
53 ° TARGET**

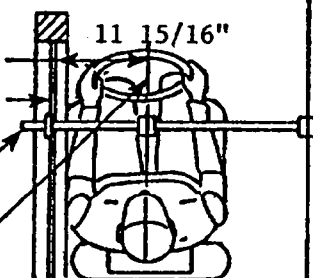
16 1/2" KNEE
55 ° JOINT

APPROX. 28 1/2" "H"
76 ° POINT



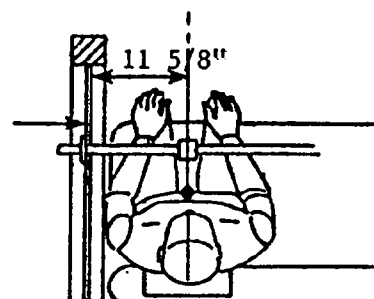
DOOR GLASS HEIGHT*** 9 1/2"

LATERAL BAR
 ADJUSTABLE
 POINTER



DRIVER
 DUMMY # 06

DOOR GLASS HEIGHT DNA

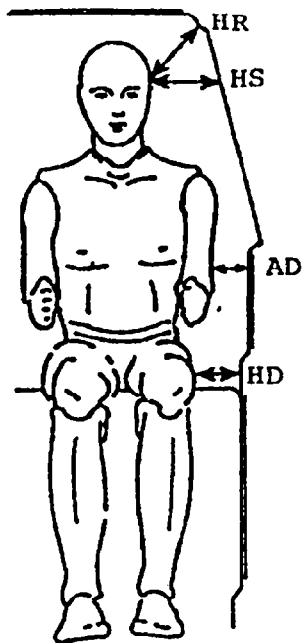
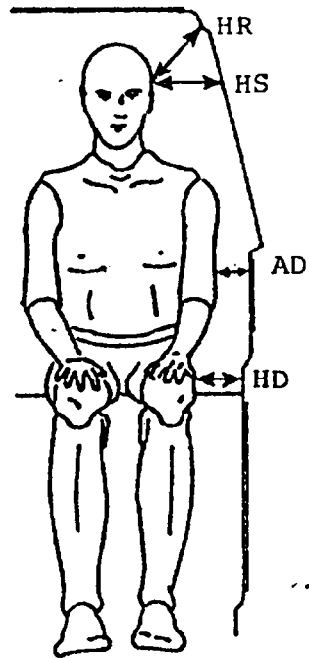


PASSENGER
 DUMMY # U02

*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.

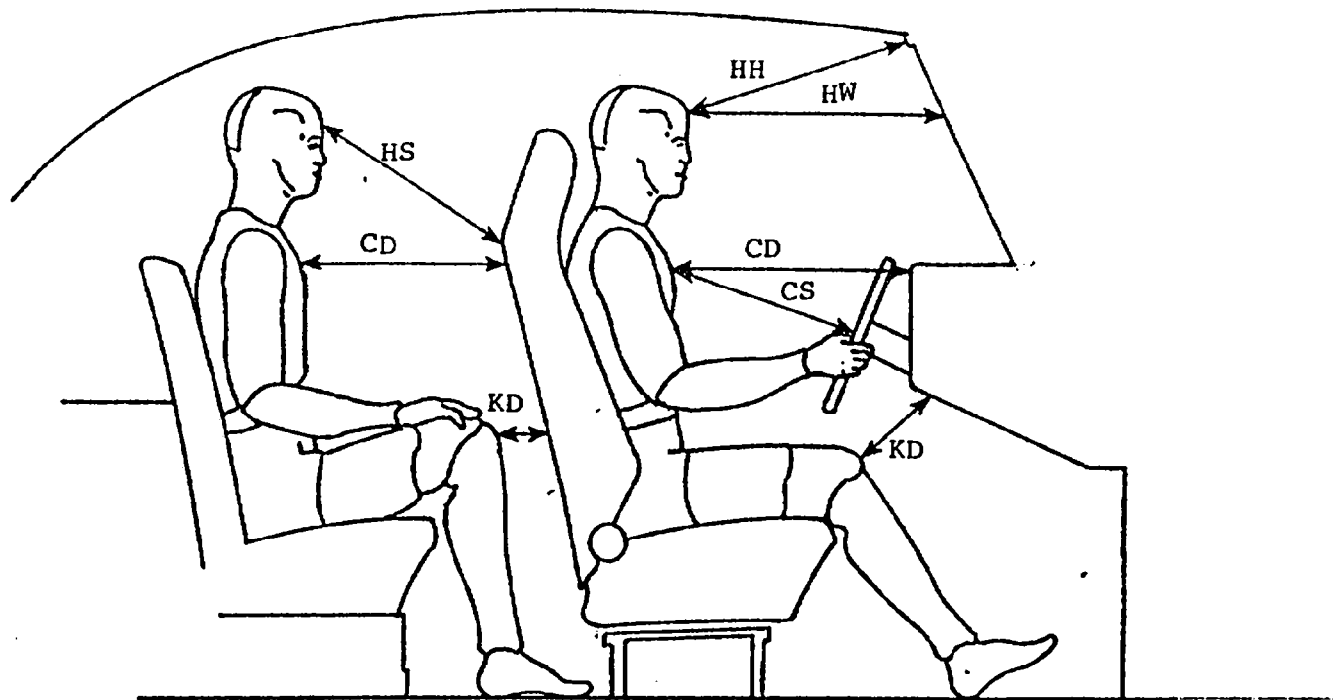
***Door glass height is equal on the right and left side of vehicle at dummy nose level.



	06	'002
	DRIVER	PASSENGER
HR	5 7/8	4 11/16
HS	7 5/8	7 7/8
AD	0	1/2
HD	2 3/8	1 3/4

NOTE: ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



06

U02

	DRIVER	PASSENGER
HH	12 1/4	DNA
HW	19 1/2	DNA
HS	DNA	24
CD	20 1/8	17 13/16
CS	11 3/8	DNA
KDL	3 5/8	4 1/4
KDR	3 13/16	4 1/4

NOTE: ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the dummy's torso contacted the padded driver's door and the head passed through the already shattered driver's window and then struck the window sill. The dummy rebounded across the front seats. It's buttocks struck and passed through the front passenger's window sill and it's head and back struck the roof. The dummy came to rest sitting on the front passenger's window sill with it's head wedged between the front bucket seat's head restraints.

PASSENGER

During impact, the dummy's torso contacted the padded left rear occupant side wall and the head contacted the side window and side header padding. The dummy remained upright throughout the entire crash event with it's feet trapped in the left rear passenger foot well.

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	8.6	X	X	20.6	20.5	20.4	20.4	20.5	20.4	20.5	20.5	20.6	20.8	21.1	X	X
H-Point	16.4	X	X	18.1	18.1	18.1	18.1	18.0	18.0	18.0	18.1	18.3	18.3	18.3	X	X
Mid Door	23.9	16.5	18.0	17.9	17.8	17.8	17.7	17.7	17.7	17.8	17.8	17.8	17.9	17.9	18.1	16.6
Window Sill	33.0	X	19.8	19.5	19.3	19.3	19.3	19.3	19.2	19.3	19.3	19.3	19.4	19.5	19.6	19.8
Window Top	51.5	X	X	X	X	X	28.0	26.8	26.5	26.4	26.4	26.4	26.6	26.8	27.1	28.1

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

Axle Height	8.6	X	X	30.9	32.3	31.6	31.3	31.4	31.4	31.6	31.3	30.5	27.6	24.9	X	X
H-Point	16.4	X	X	32.5	34.9	35.5	35.4	35.4	35.3	35.1	35.1	35.1	33.2	30.9	X	X
Mid Door	23.9	24.6	26.5	30.1	32.1	32.2	32.4	32.6	32.8	32.8	32.9	34.1	32.9	31.8	28.3	23.4
Window Sill	33.0	X	23.3	24.9	30.6	30.9	31.4	31.9	32.1	32.4	32.6	33.1	33.0	31.4	27.2	23.4
Window Top	51.5	X	X	X	X	X	31.0	29.8	29.2	29.1	28.9	28.9	28.6	28.5	28.6	29.2

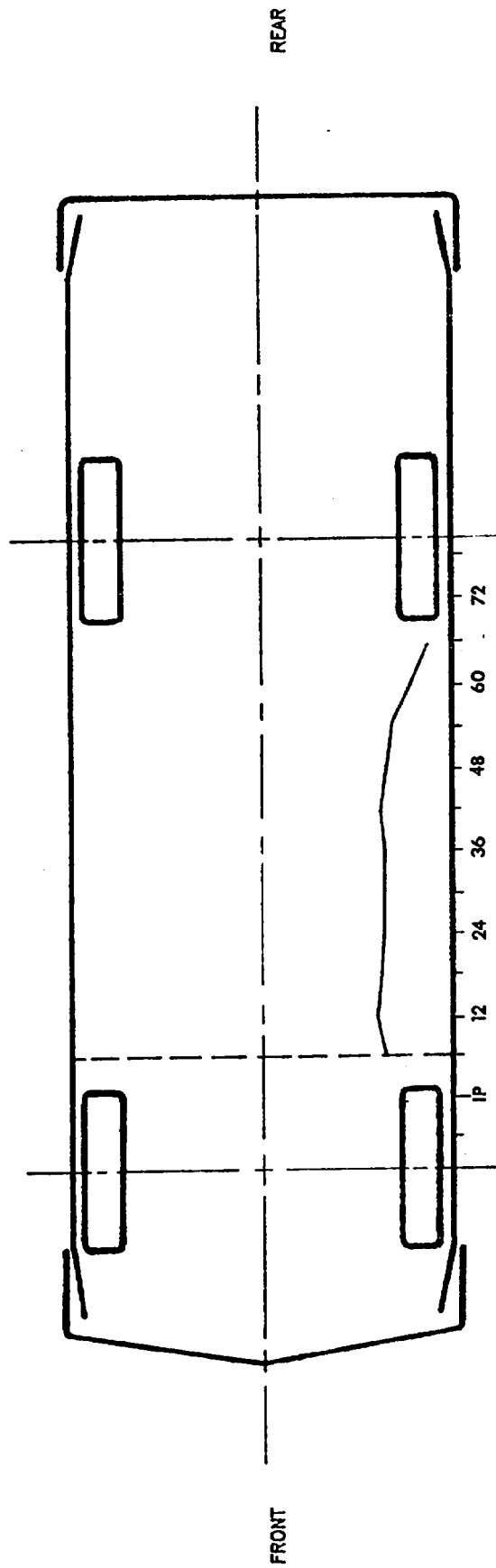
STATIC CRUSH (IN)

Axle Height	8.6	X	X	10.3	11.8	11.2	10.9	10.9	11.0	11.1	10.8	9.9	6.8	3.8	X	X
H-Point	16.4	X	X	14.4	16.8	17.4	17.3	17.4	17.3	17.1	17.0	16.8	14.9	12.6	X	X
Mid Door	23.9	8.1	8.5	12.2	14.3	14.4	14.7	14.9	15.1	15.0	15.1	16.3	15.0	13.9	10.2	6.8
Window Sill	33.0	X	3.5	5.4	11.3	11.6	12.1	12.6	12.9	13.1	13.3	13.8	13.6	11.9	7.6	3.6
Window Top	51.5	X	X	X	X	X	3.0	3.0	2.7	2.7	2.5	2.5	2.0	1.7	1.5	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.

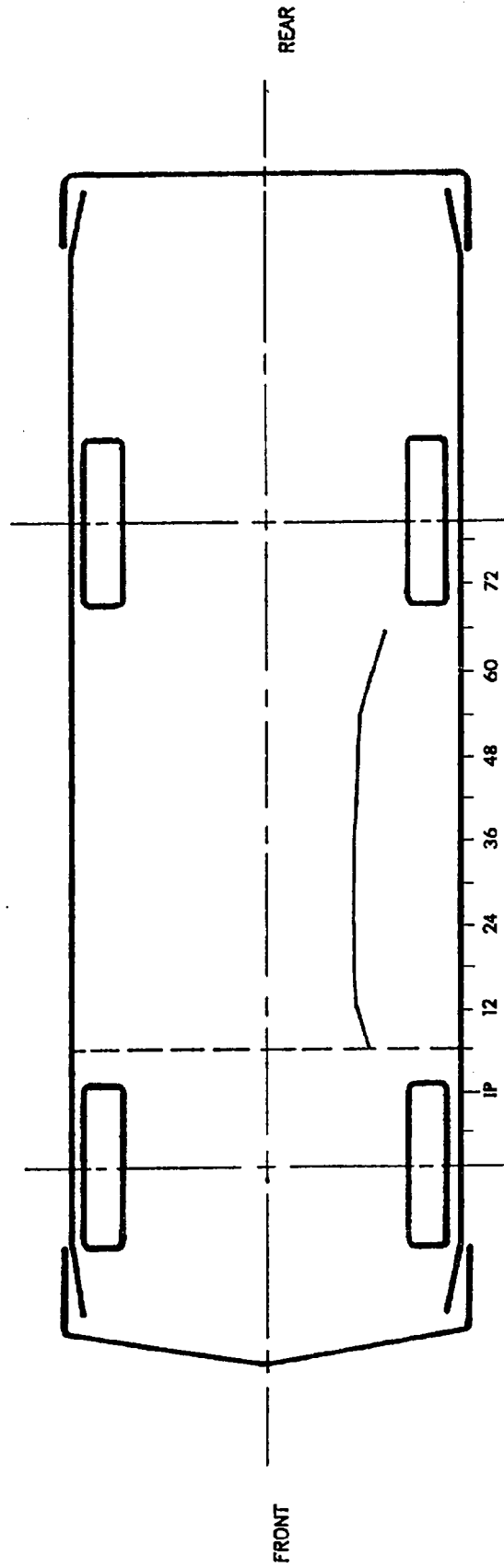
** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



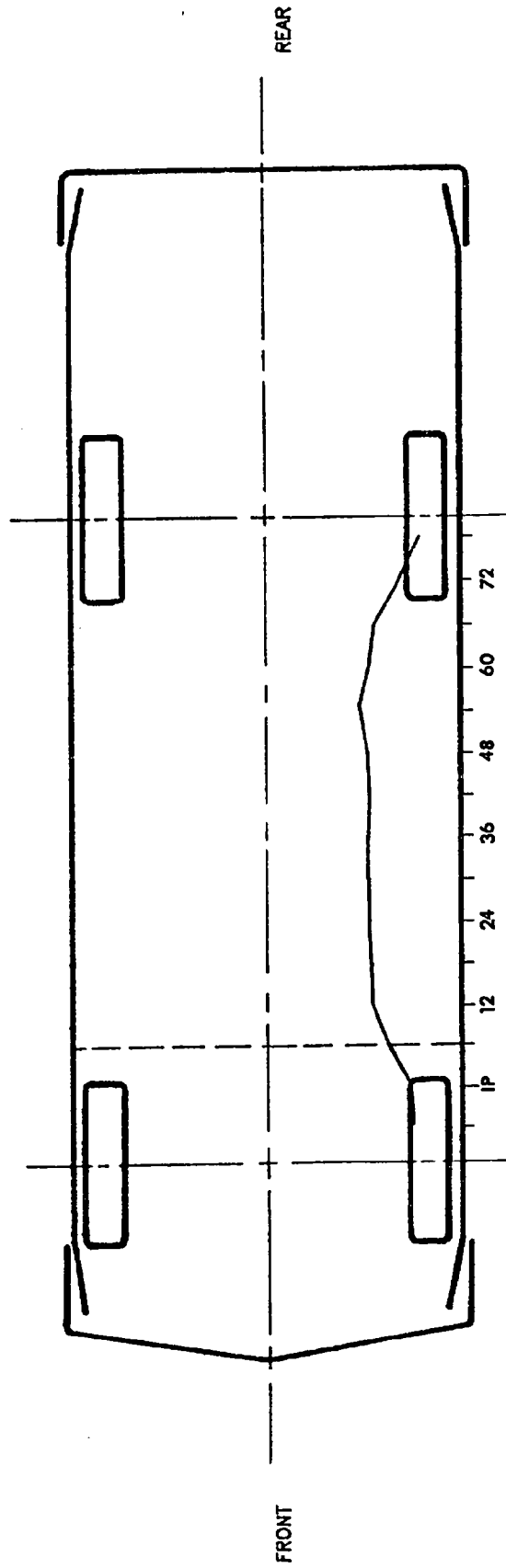
PROFILE LEVEL EQUALS AXLE HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



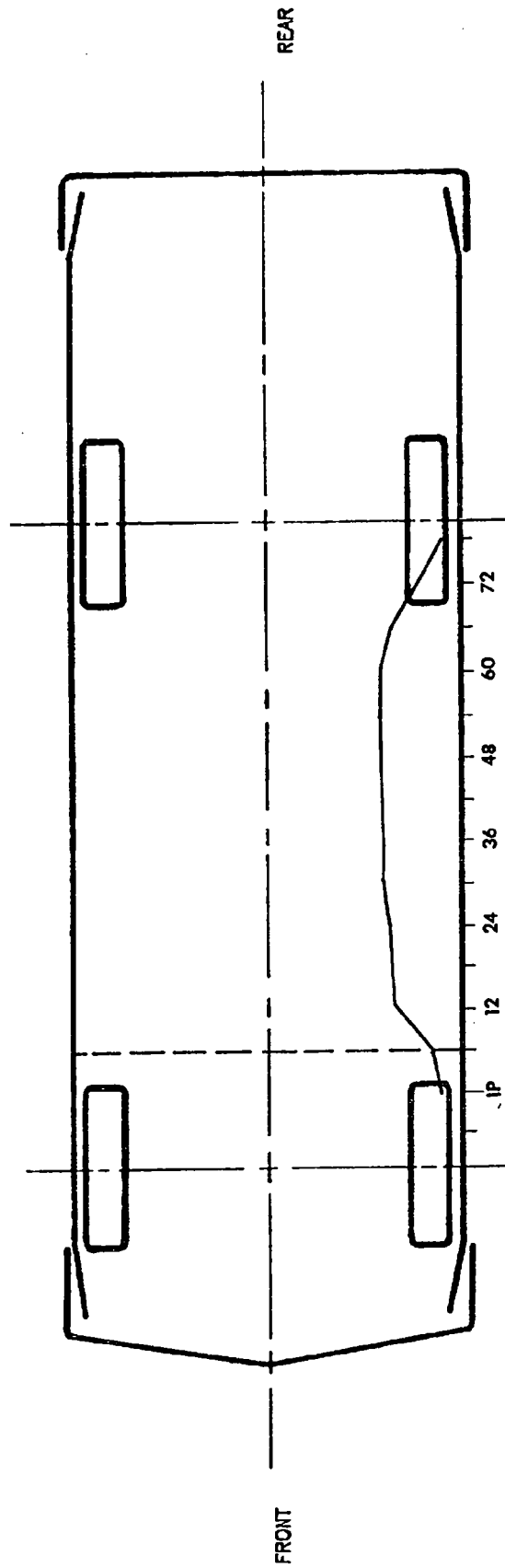
PROFILE LEVEL EQUALS H-POINT HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



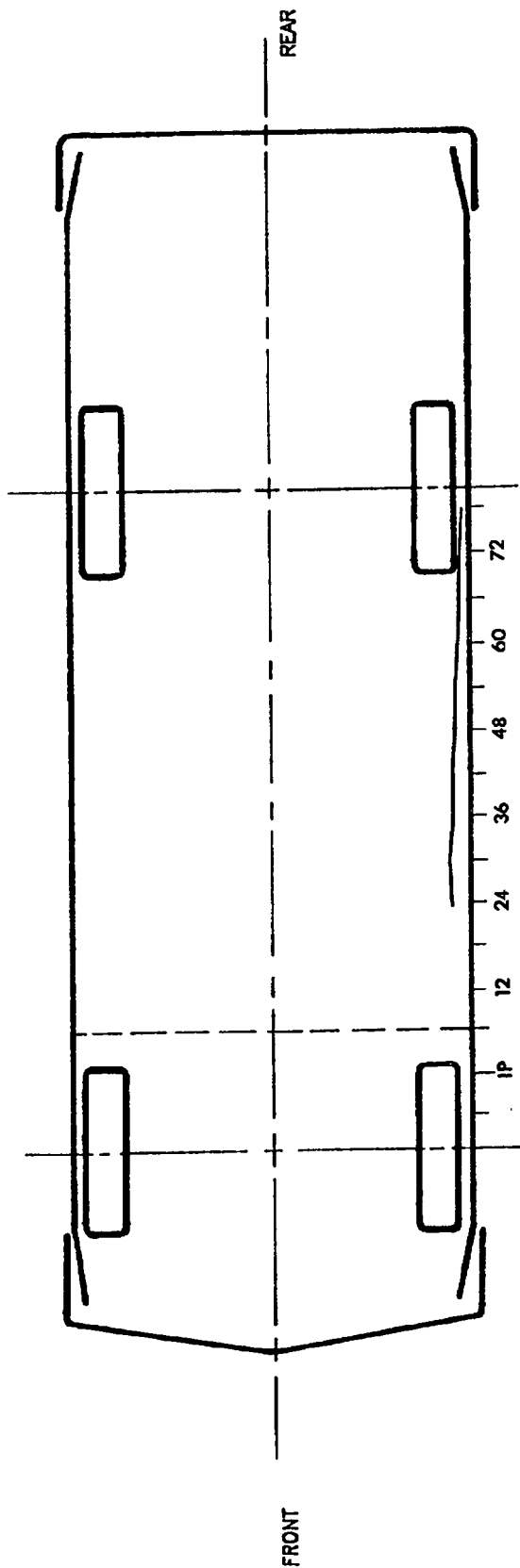
PROFILE LEVEL EQUALS MID-DOOR HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW SILL HEIGHT
 IP EQUALS PROJECTED 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 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	28.99	164.00	89.51	75.38	22.98	129.88	28.25	52.50
LATERAL	73.93	75.25	21.56	163.63	117.49	48.38	12.62	134.38
VERTICAL	8.62	163.13	68.93	54.00	31.89	56.13	26.76	38.00
RESULTANT		123.63 à 75.38				120.79 à 48.38		
HIC	944.33	from 35.63 to 80.00			1012.15	from 44.88 to 55.00		
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	25.22	46.88	27.73	54.38Y	6.38	145.00	21.86	56.25
LATERAL (P)***	114.32	33.13	63.10	52.50	56.59	41.25	6.05	136.88
LATERAL (R)***	116.11	32.50	62.63	52.50	58.53	41.25	6.24	138.13
VERTICAL	17.10	50.00	13.56	68.75	12.50	25.63	16.50	56.25
RESULTANT (P)		115.14 à 33.13Y				60.12 à 41.25		
RESULTANT (R)		116.85 à 33.13Y				61.95 à 41.25		
DELTA V (MPH)****		35.2 à 48.75 (P)				25.9 à 128.13 (P)		
		36.4 à 48.75 (R)				26.2 à 127.50 (R)		
LOWER SPINE								
LONGITUDINAL	43.25	40.63	32.91	52.50	12.18	42.50	32.88	30.00
LATERAL (P)	135.51	24.38	40.41	51.88	85.41	30.00	28.39	57.50
LATERAL (R)	135.45	24.38	50.83	51.88	86.38	30.62	27.45	57.50
VERTICAL	27.40	30.62	7.76	68.75	19.52	36.88	5.32	97.50
RESULTANT (P)		135.73 à 24.38				92.00 à 30.00		
RESULTANT (R)		135.67 à 24.38				92.82 à 30.62		
DELTA V (MPH)		40.7 à 41.25 (P)				33.1 à 51.25 (P)		
		41.7 à 41.87 (R)				33.9 à 51.25 (R)		
LEFT UPPER RIB								
LATERAL (P)	100.67	28.75	12.92	65.63	56.02	25.63	5.58	146.25
LATERAL (R)	103.59	20.00	14.30	61.25	57.80	25.63	5.17	82.50
DELTA V (MPH)		31.9 à 58.75 (P)				29.8 à 135.00 (P)		
		32.3 à 58.75 (R)				31.2 à 137.50 (R)		
LEFT LOWER RIB								
LATERAL (P)	110.04	19.38	78.65	56.87	68.51	33.75	14.19	56.87
LATERAL (R)	118.67	19.38	75.91	56.87	65.82	24.38	12.95	56.25
DELTA V (MPH)		34.3 à 54.38 (P)				30.9 à 53.75 (P)		
		34.6 à 54.38 (R)				29.7 à 53.75 (R)		
PELVIS ACCELERATION								
LONGITUDINAL	12.57	59.50	280.43	85.13°	9.03	94.25	75.18	27.13
LATERAL	191.61	23.50	30.61	41.75°	182.21	28.50	8.47	72.75
VERTICAL	36.55	26.88	114.57	74.38°	39.62	31.00	7.89	94.63
RESULTANT		282.64 à 85.38°				186.34 à 28.50		
DELTA V (MPH)		37.2 à 55.88°				30.9 à 57.13		

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE		NEGATIVE		POSITIVE		NEGATIVE	
	<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 †	0.04	210.00	1.80	50.88	0.04	6.50	1.56	54.38

* LONGITUDINAL: FORWARD
 LATERAL: RIGHTWARD
 VERTICAL: UPWARD

**LONGITUDINAL: REARWARD
 LATERAL: LEFTWARD
 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: Negative

‡ See TEST ANOMALIES

° 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.

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

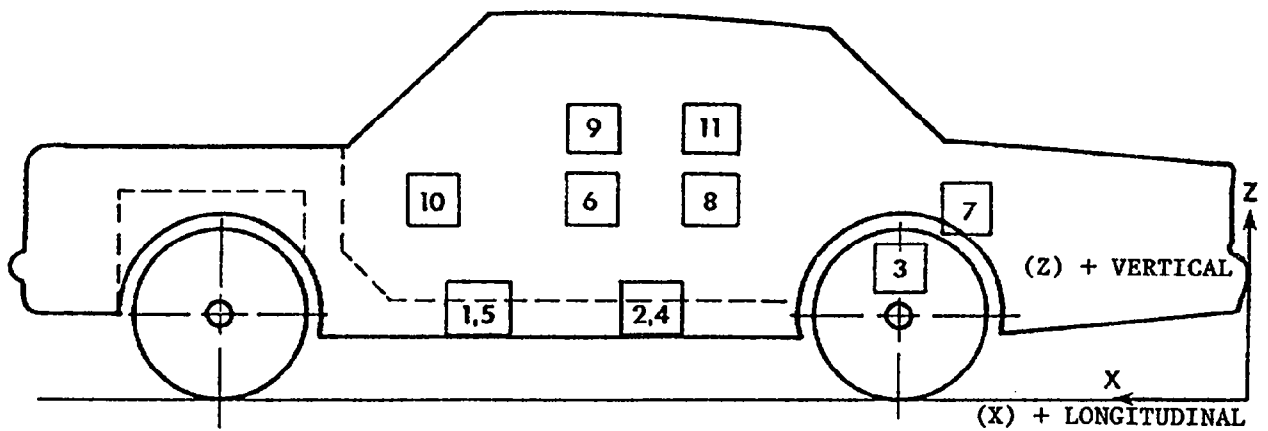
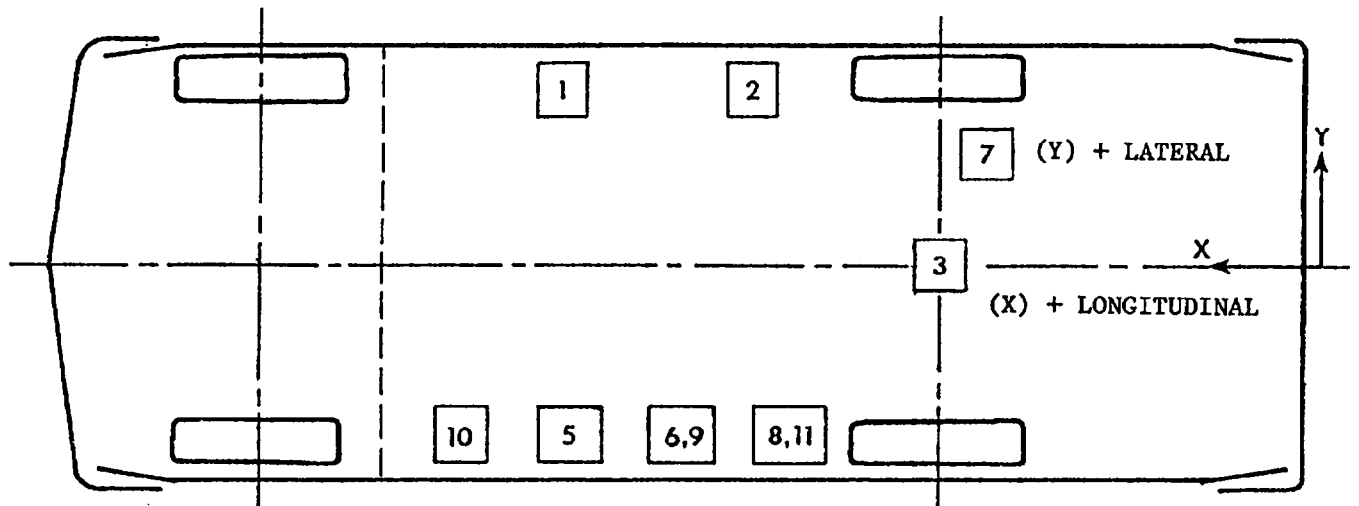
NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	RIGHT SILL AT FRONT SEAT (LONGITUDINAL)	83.3	23.4	10.5				
	(LATERAL)	$\Delta V = -1.7 \text{ mph } \Delta 100.00 \text{ msec}$			4.87	63.88	8.18	20.13
	(VERTICAL)	$\Delta V = 18.1 \text{ mph } \Delta 100.00 \text{ msec}$			21.10	34.50	2.66	151.63
	(RESULTANT)				8.45	64.25	14.67	33.13
						24.76 Δ 33.63		
2	RIGHT SILL AT REAR SEAT (LONGITUDINAL)	61.3	23.6	9.0				
	(LATERAL)	$\Delta V = -0.1 \text{ mph } \Delta 100.00 \text{ msec}$			4.81	64.00	7.62	19.88
	(VERTICAL)	$\Delta V = 21.1 \text{ mph } \Delta 100.00 \text{ msec}$			24.08	35.25	3.03	152.13
	(RESULTANT)				6.58	53.50	10.07	34.00
						25.85 Δ 35.00		
3	REAR DECK OVER AXLE (LONGITUDINAL)	32.0	0.0	7.1				
	(LATERAL)	$\Delta V = -3.1 \text{ mph } \Delta 100.00 \text{ msec}$			6.17	35.00	15.53	19.50
	(VERTICAL)	$\Delta V = 25.8 \text{ mph } \Delta 100.00 \text{ msec}$			23.78	21.13	2.55	147.63
	(RESULTANT)				8.95	35.75	11.08	20.13
						29.51 Δ 20.25		
4	LEFT SILL AT REAR SEAT (LATERAL)	61.0	-23.6	9.0				
		$\Delta V = 18.6 \text{ mph } \Delta 39.25 \text{ msec}$			45.05	24.63	33.42	47.00
5	LEFT SILL AT FRONT SEAT (LATERAL)	83.6	-23.3	10.5				
		$\Delta V = 8.8 \text{ mph } \Delta 10.00 \text{ msec}$			54.40	10.13	58.49	16.00
6	LEFT FRONT DOOR CENTERLINE (LATERAL)	80.8	-25.4	23.3				
		$\Delta V = 17.5 \text{ mph } \Delta 15.13 \text{ msec}$			124.12	11.88	94.60	22.25
7	RIGHT REAR COMPARTMENT (LONGITUDINAL)	31.0	15.4	13.9				
					4.23	33.00	10.04	19.00
8	MIDREAR OF LEFT FRONT DOOR (LATERAL)	60.4	-25.0	23.8	---	---	---	---
						Y		Y
9	UPPER LEFT FRONT DOOR CENTERLINE (LATERAL)	81.8	-25.4	32.6				
		$\Delta V = 21.6 \text{ mph } \Delta 16.13 \text{ msec}$			231.31	17.13	161.61	24.63
10	MIDFRONT OF LEFT FRONT DOOR (LATERAL)	98.9	-25.8	22.8				
		$\Delta V = 23.6 \text{ mph } \Delta 17.00 \text{ msec}$			136.48	7.25	64.97	23.63
11	UPPER REAR OF LEFT FRONT DOOR (LATERAL)	70.8	-25.5	32.6				
		$\Delta V = 17.6 \text{ mph } \Delta 18.25 \text{ msec}$			116.24	19.25	129.92	24.00

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

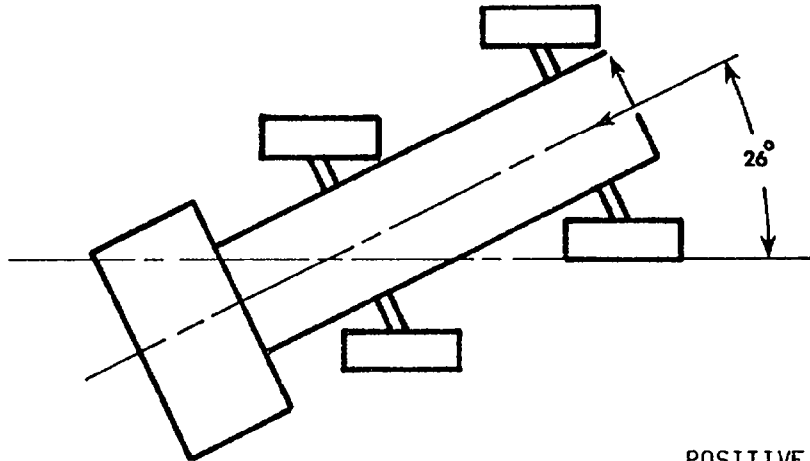
All measurements of accelerometer locations in inches.

YSee 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)	$\Delta V = -18.5 \text{ mph } \hat{a} \text{ } 100.00 \text{ msec}$			0.99	159.63	17.94	38.00
	(LATERAL)	$\Delta V = -5.0 \text{ mph } \hat{a} \text{ } 100.00 \text{ msec}$			1.12	73.25	9.03	39.88
	(VERTICAL)				17.49	68.00	13.40	60.13
	(RESULTANT)					20.89	38.00	
2	FRONT FRAME MEMBER	130.3	0.0	11.3				
	(LONGITUDINAL)	$\Delta V = -17.1 \text{ mph } \hat{a} \text{ } 100.00 \text{ msec}$			0.64	247.88	17.07	37.38
3	REAR FRAME MEMBER	23.3	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -17.0 \text{ mph } \hat{a} \text{ } 100.00 \text{ msec}$			1.37	152.00	16.63	36.88

* 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	792.5	Vehicle Dynamics
2	Overhead	Photosonics 1B	25	732.5	Close-up of Impact Point
3	Onboard MDB	Stalex	25	500	Close-up of Impact Point
4	Onboard MDB	Photosonics 1B	13	1002	Driver Kinematics
5	Ground Level - Right	Hycam	25	845	Overall View
6	Ground Level - Left	Photosonics 1B	17	810	Overall View
7	Onboard Vehicle	Photosonics 1B	8	812	Driver Kinematics - Front View
8	Onboard Vehicle	Photosonics 1B	8	800	Driver Kinematics
9	Onboard Vehicle	Photosonics 1B	8	800	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"	-13'	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	MFG.	DATE OF LAST CALIBRATION	SENSITIVITY	DESIRED FULL SCALE (ENGR. UNITS)
BCGXG	Accel	4-202-0001	18845	Bell Howell	8/9/83	.236 MV/G	50 G
BCGYG	Accel	4-202-0001	18858	Bell Howell	8/9/83	.2385 MV/G	50 G
BOGZG	Accel	4-202-0001	18857	Bell Howell	8/9/83	.2385 MV/G	50 G
BFCXG	Accel	4-202-0001	18240	Bell Howell	8/9/83	.2385 MV/G	50 G
BRCXG	Accel	4-202-0001	19022	Bell Howell	8/9/83	.221 MV/G	50 G

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

APPENDIX A
PHOTOGRAPHS

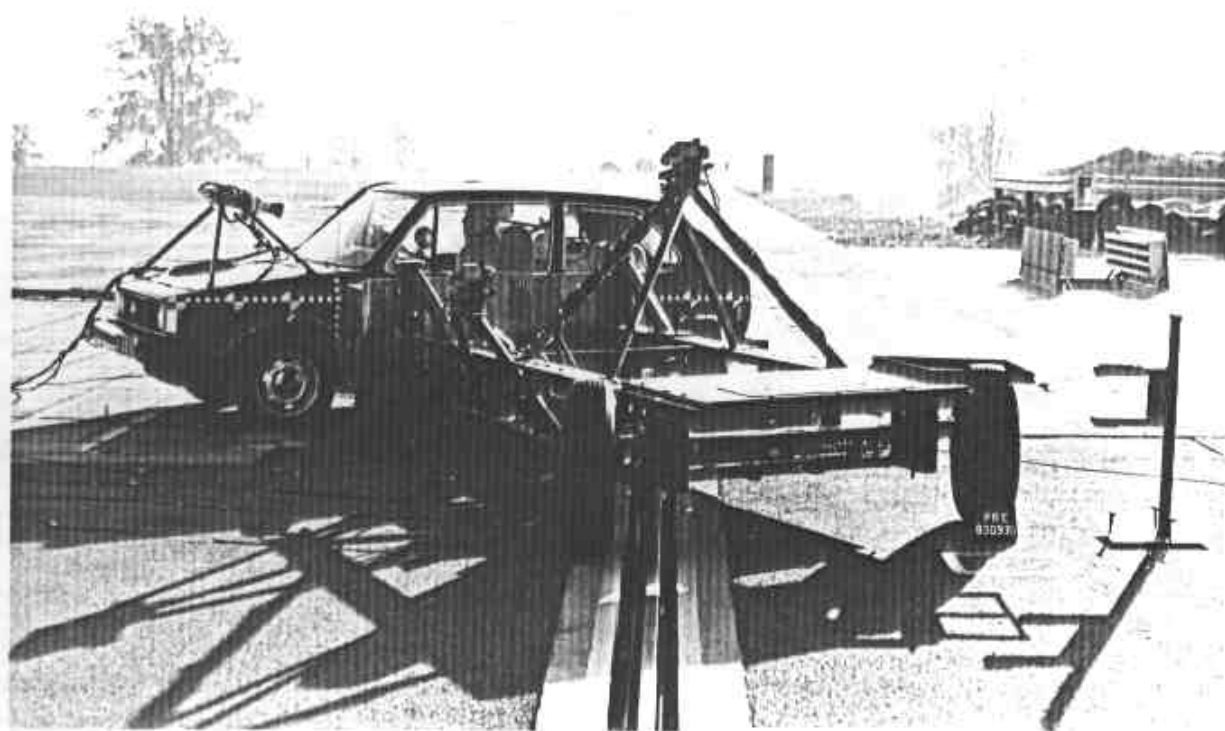


Figure A-1. PRE-TEST OVERALL - VIEW 1



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

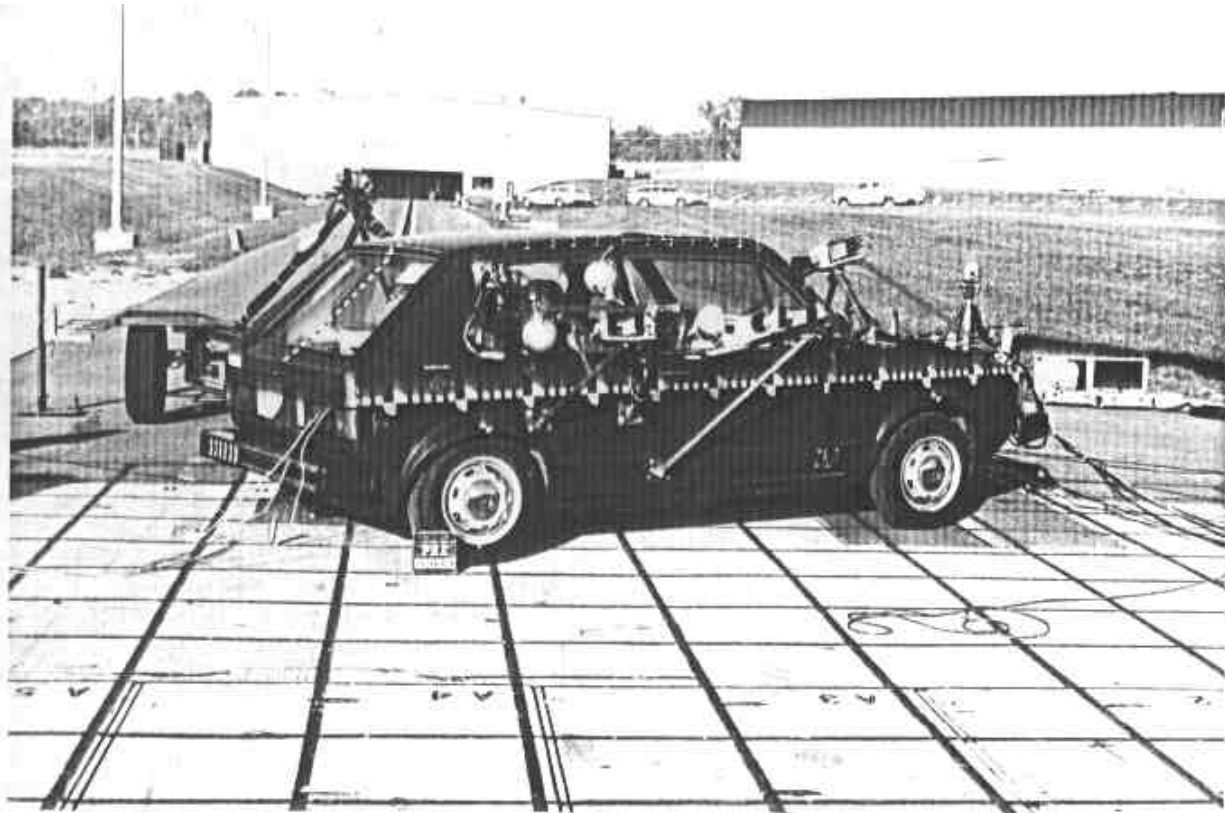


Figure A-3. PRE-TEST OVERALL - VIEW 3

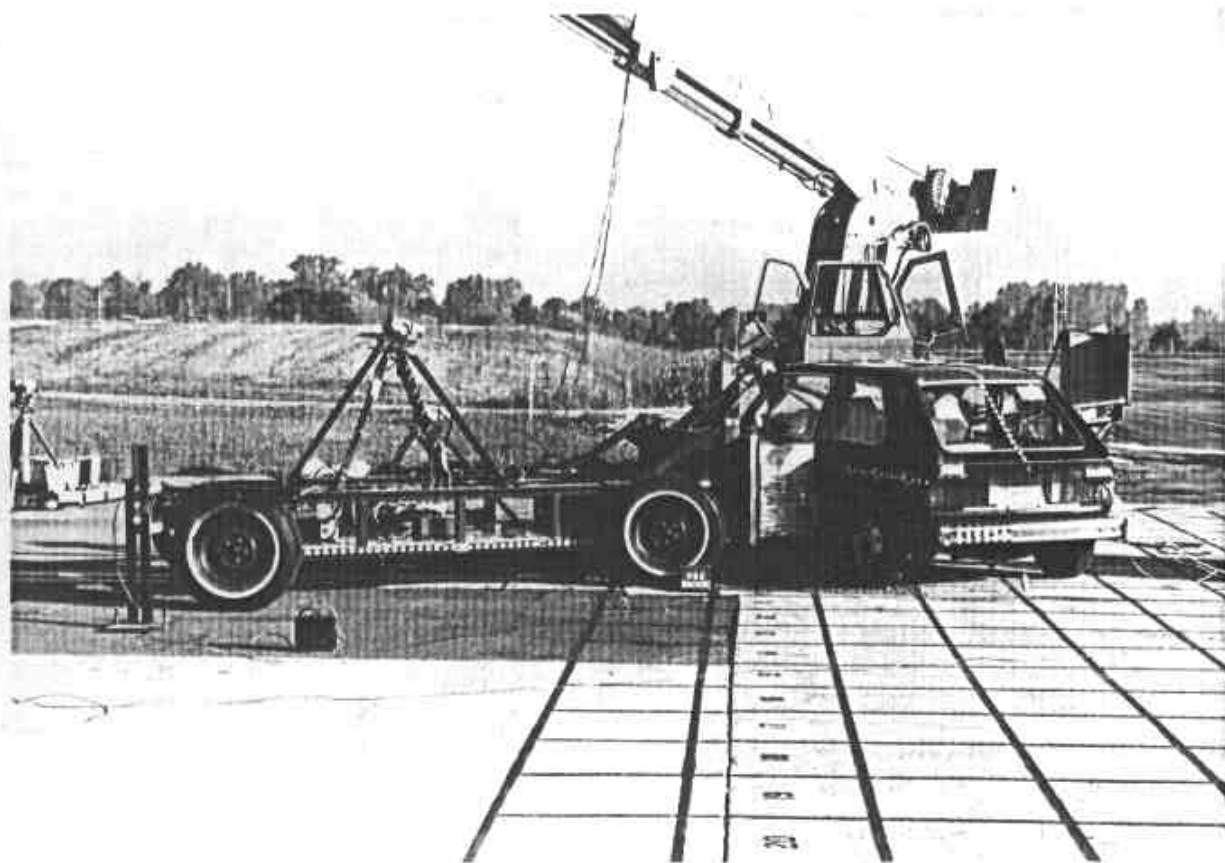


Figure A-4. PRE-TEST OVERALL - VIEW 4

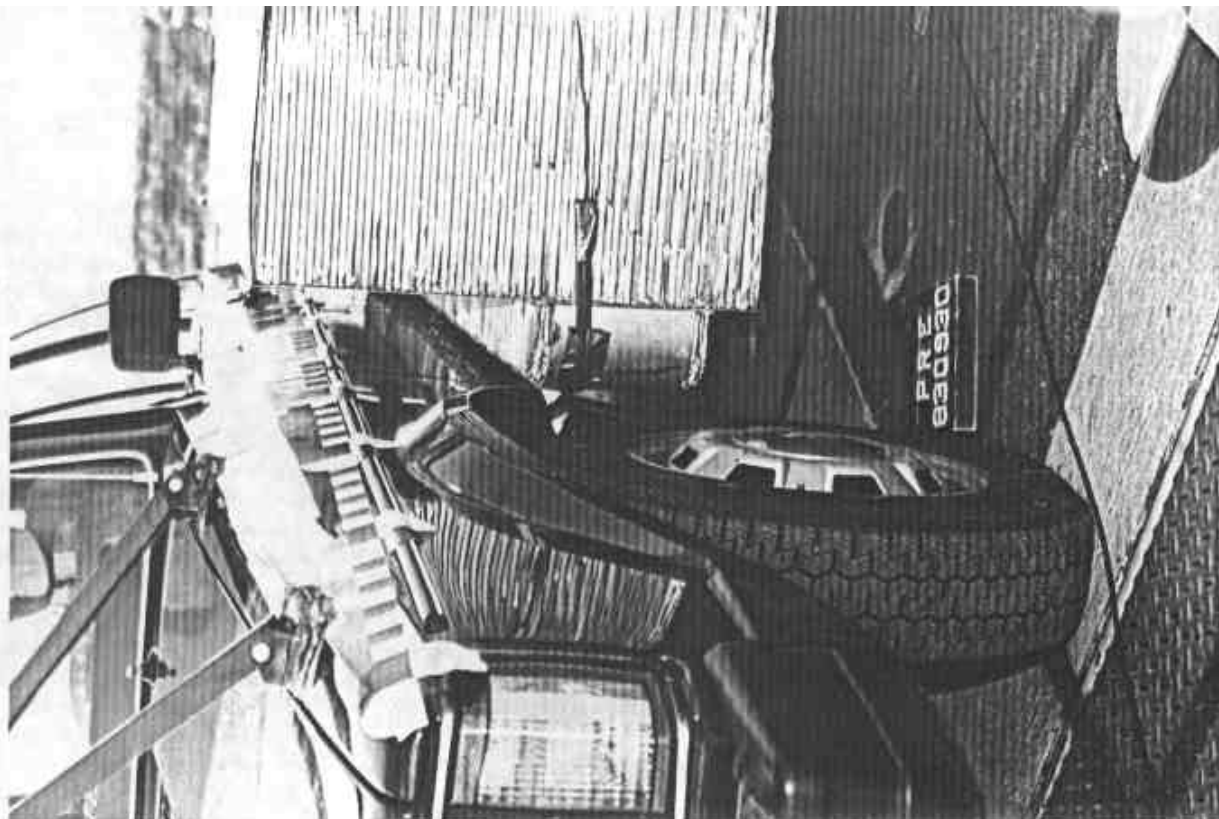


Figure A-5. PRE-TEST CLOSEUP - VIEW 1

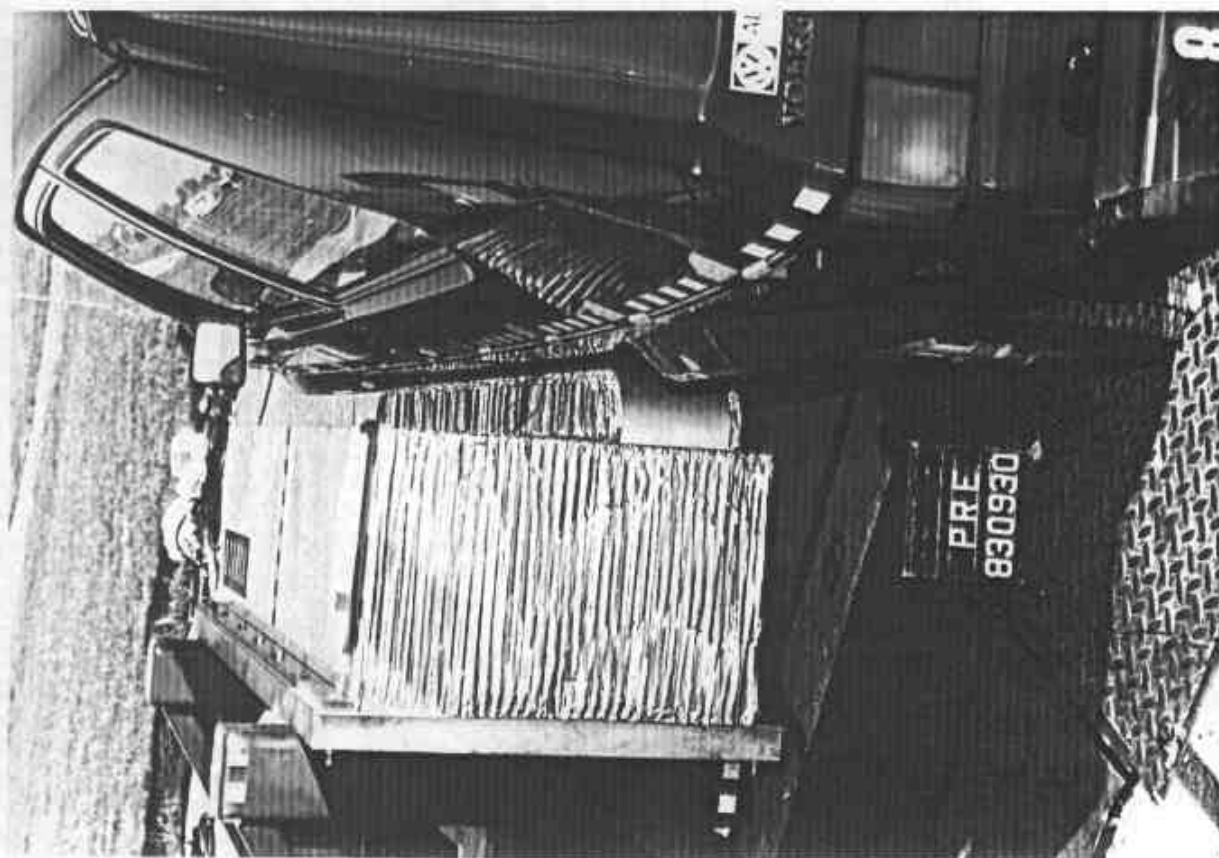


Figure A-6. PRE-TEST CLOSEUP - VIEW 2



Figure A-7. PRE-TEST CLOSEUP - VIEW 3

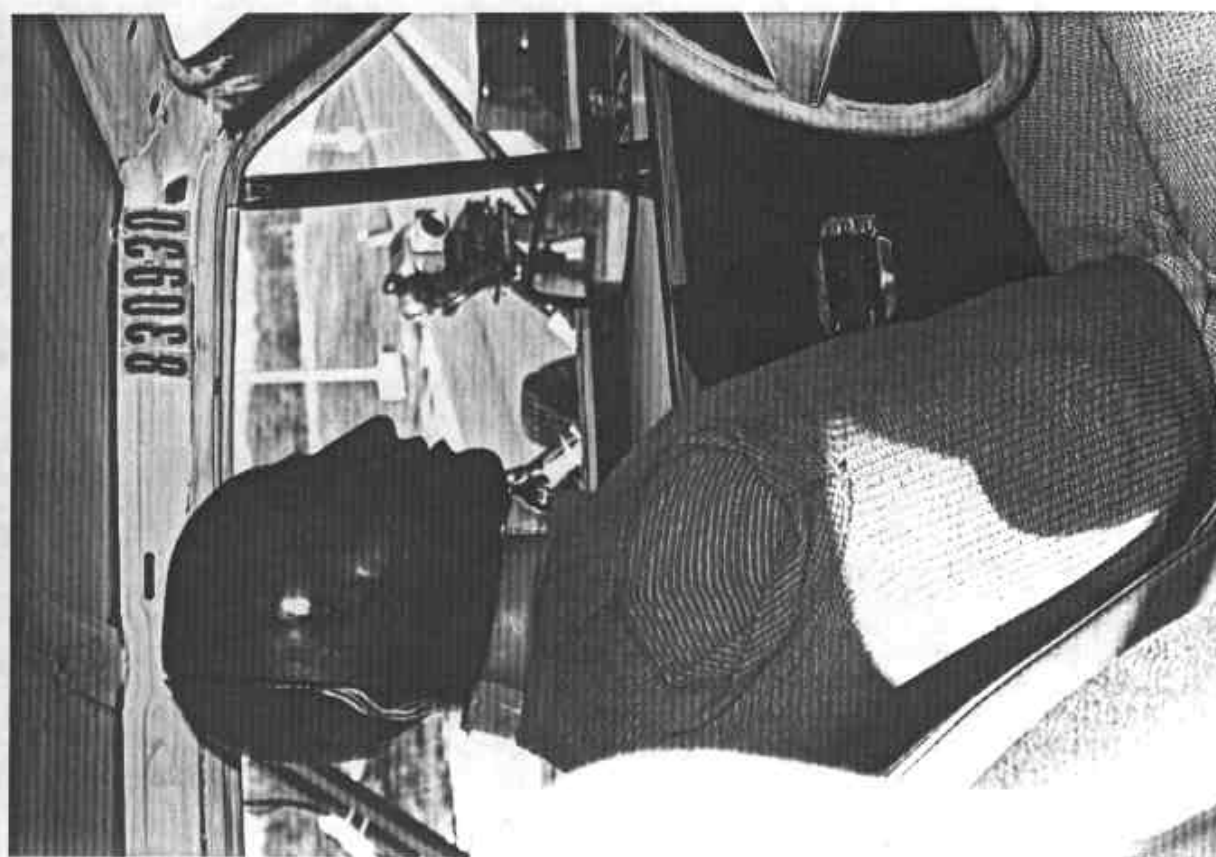


Figure A-8. PRE-TEST DRIVER DUMMY - VIEW 1



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



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

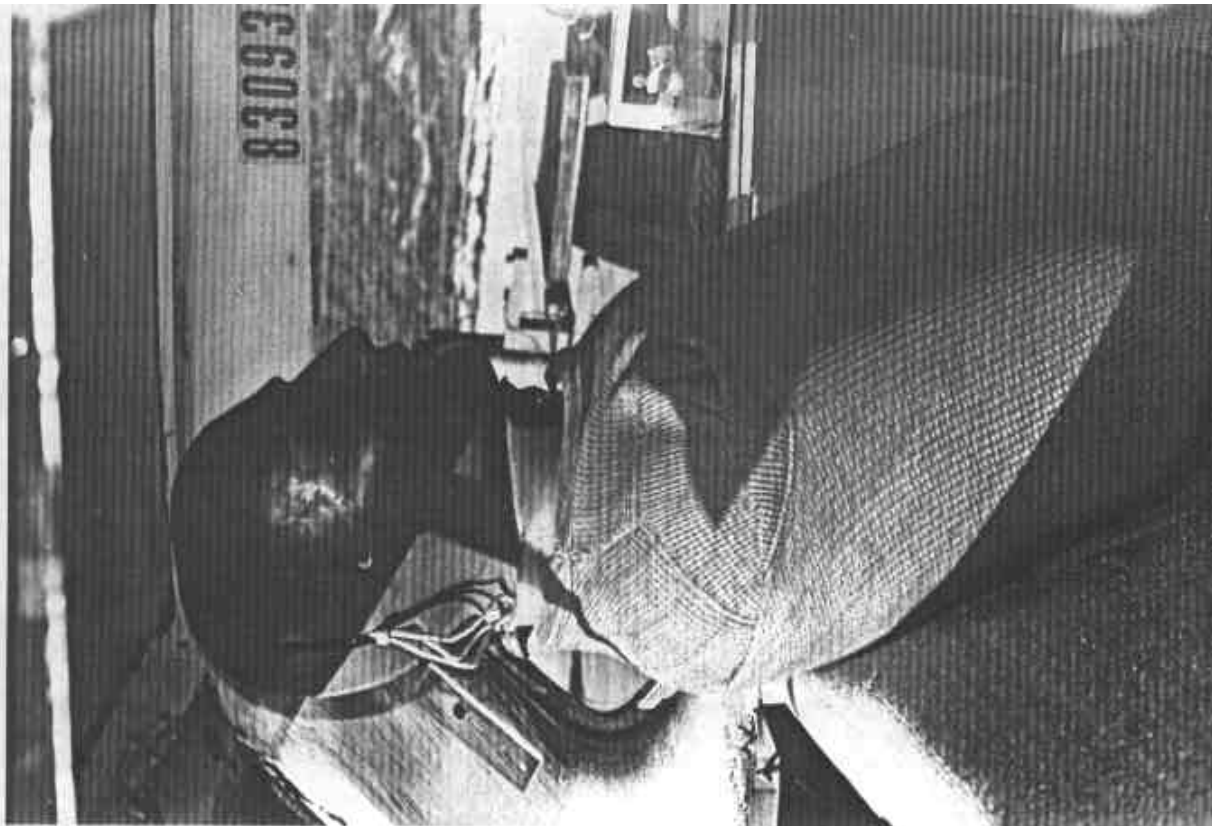


Figure A-11. PRE-TEST PASSENGER DUMMY - VIEW 2

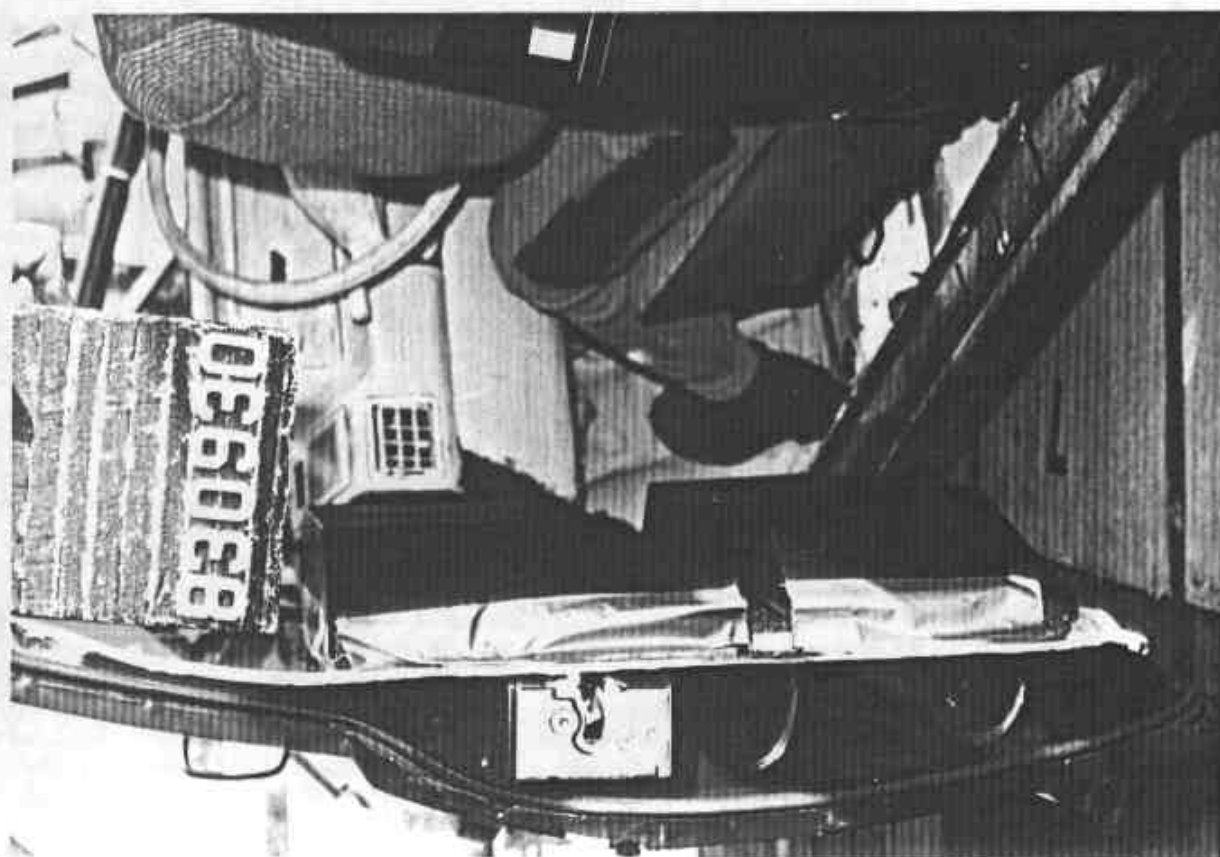


Figure A-12. PRE-TEST DRIVER'S PADDING - VIEW 1

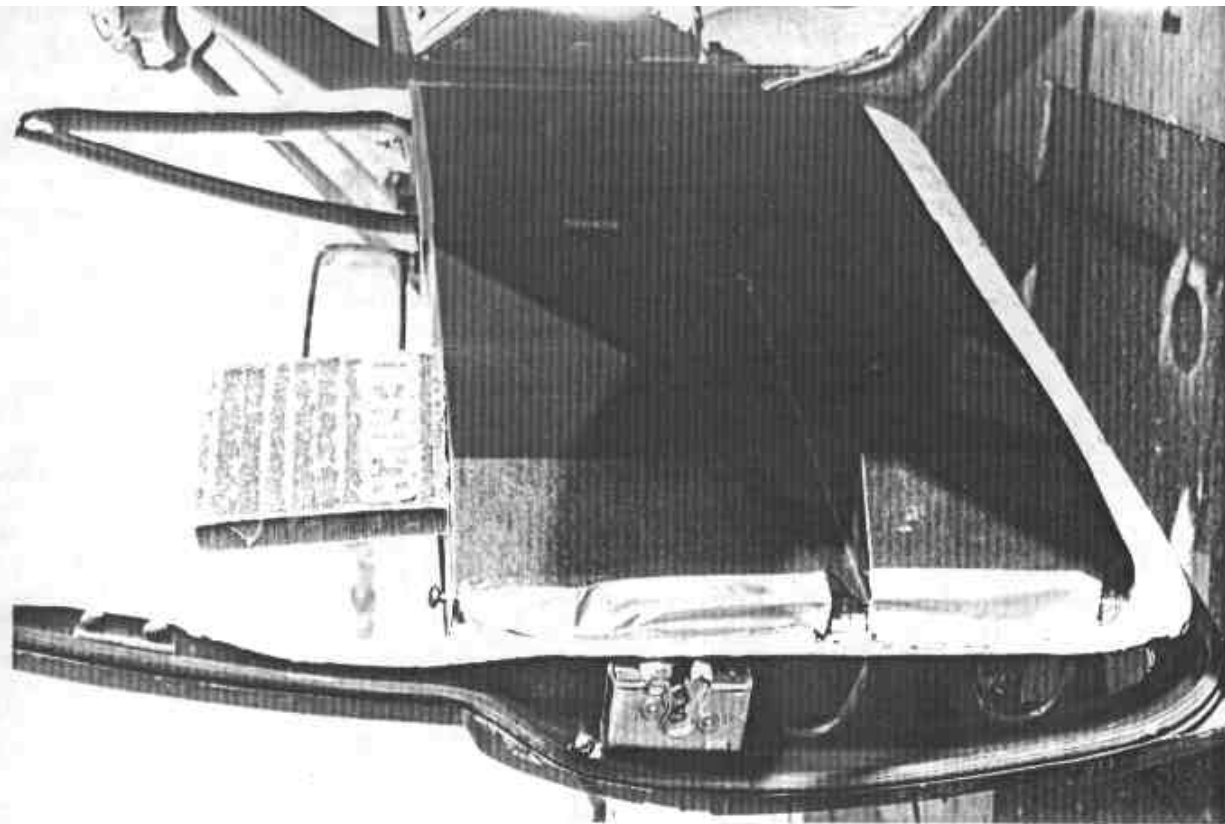


Figure A-13. PRE-TEST DRIVER'S PADDING - VIEW 2



Figure A-14. CRASH EVENT PHOTOGRAPH

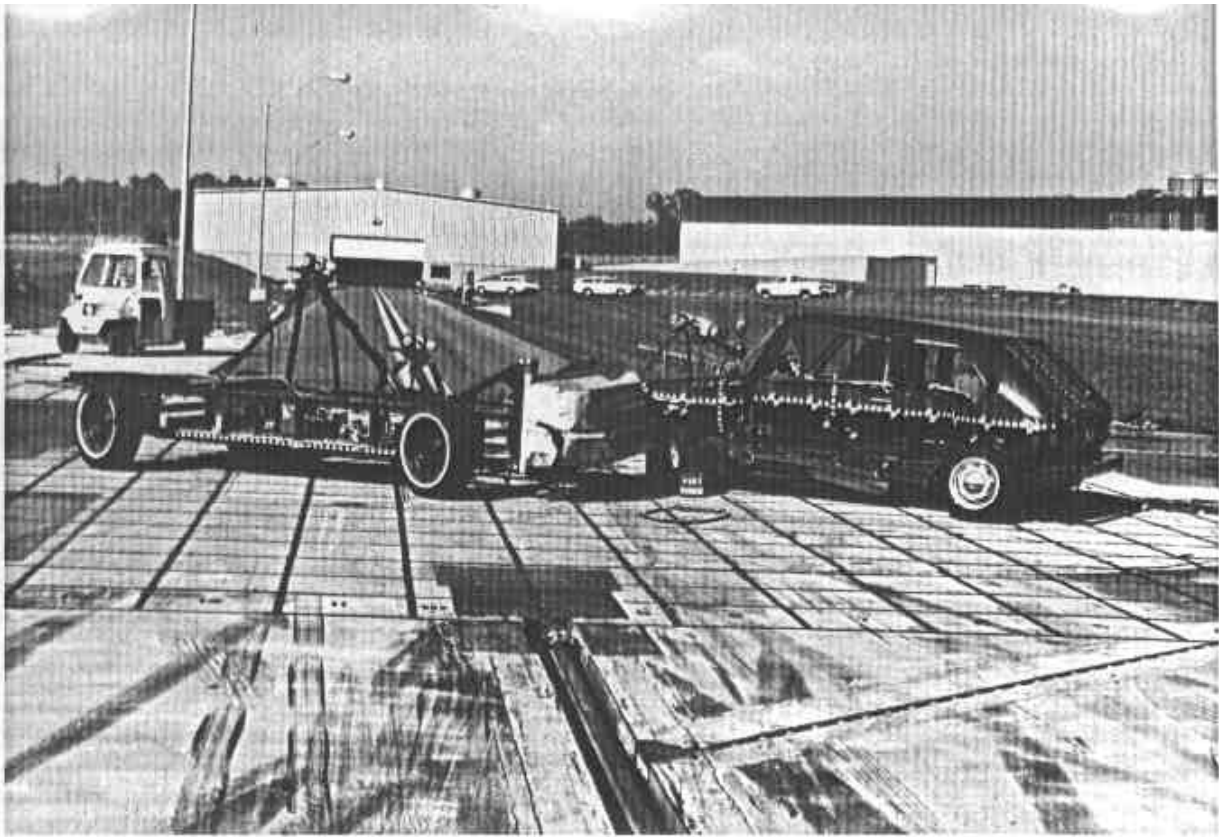


Figure A-15. POST-TEST OVERALL - VIEW 1

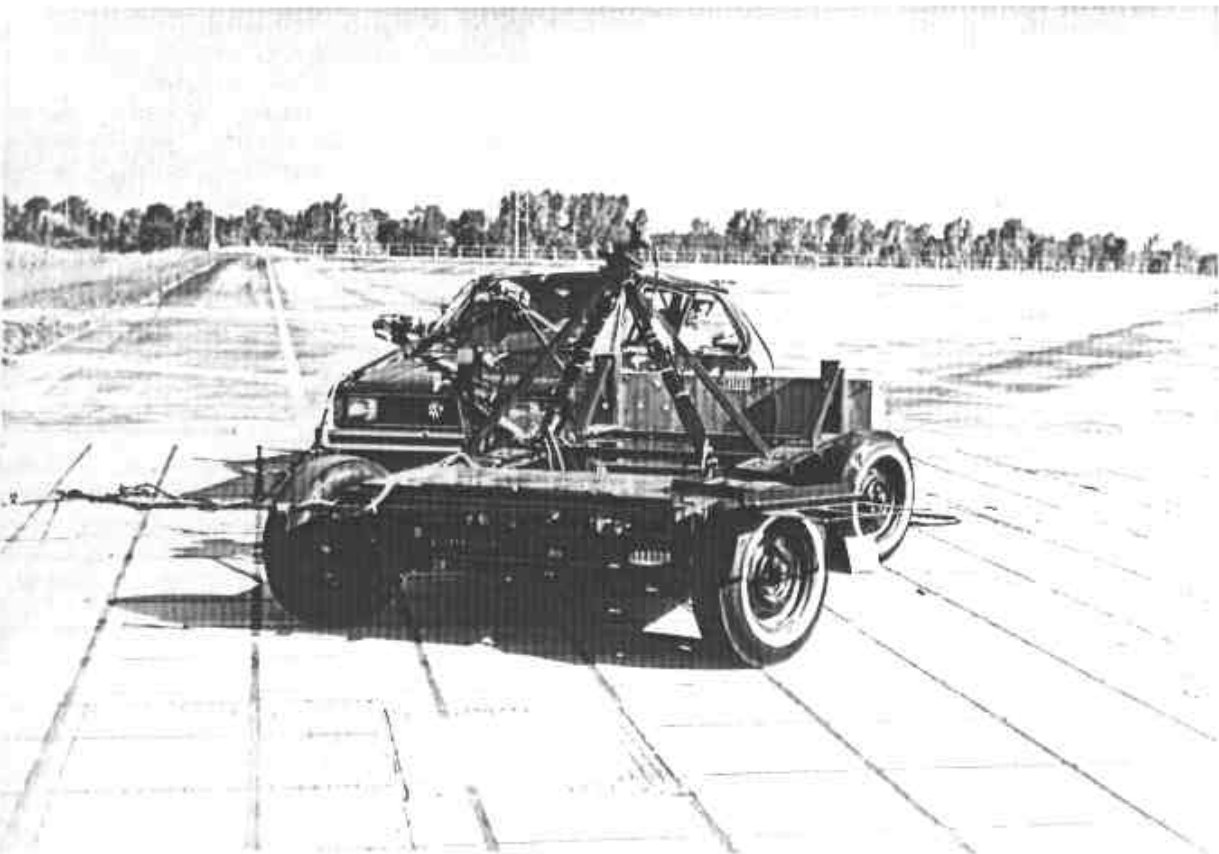


Figure A-16. POST-TEST OVERALL - VIEW 2



Figure A-17. POST-TEST OVERALL - VIEW 3

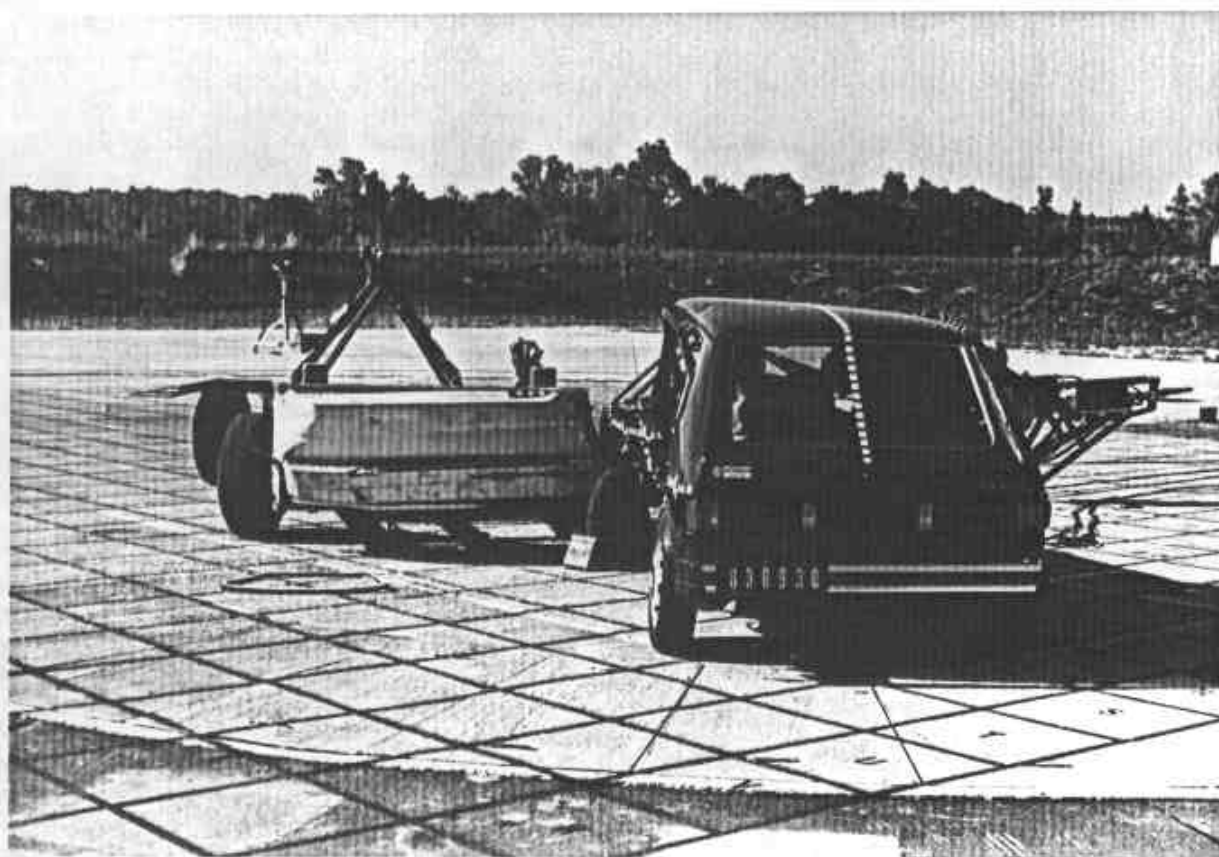


Figure A-18. POST-TEST OVERALL - VIEW 4

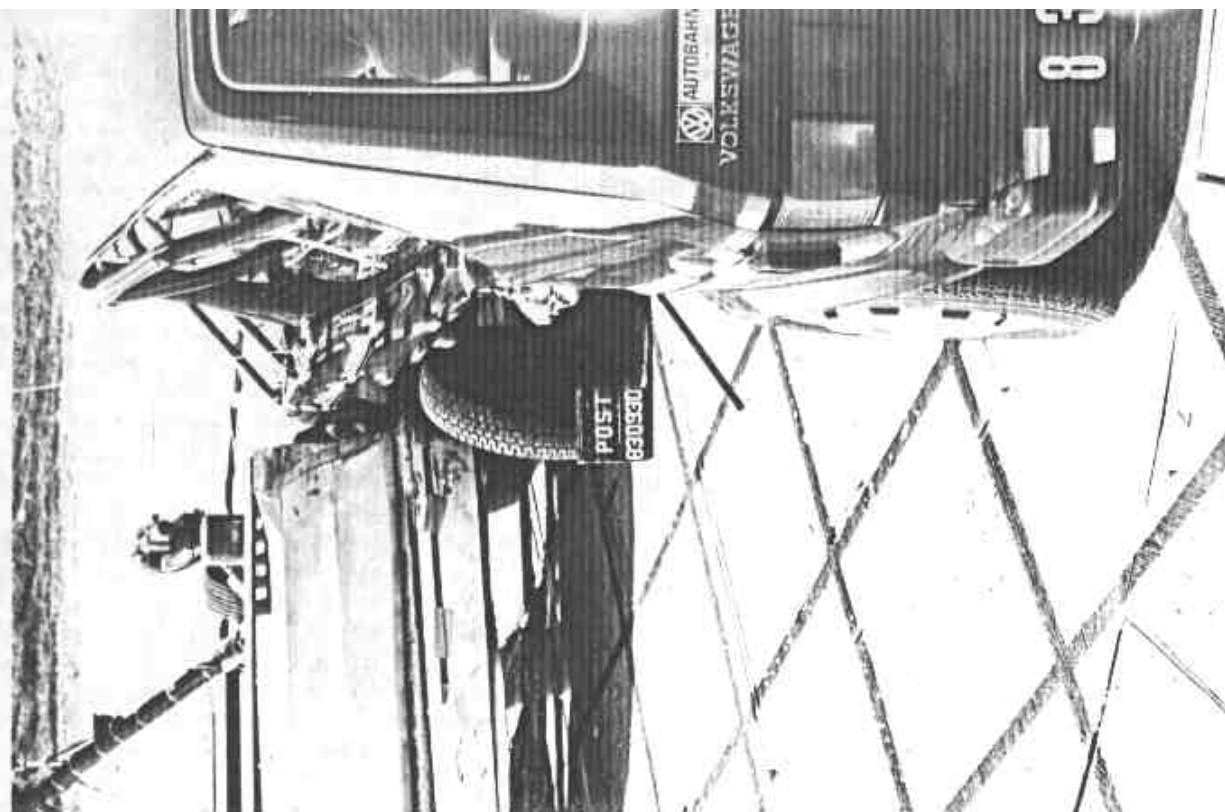


Figure A-19. POST-TEST CLOSEUP - VIEW 1



Figure A-20. POST-TEST DRIVER DUMMY - VIEW 1

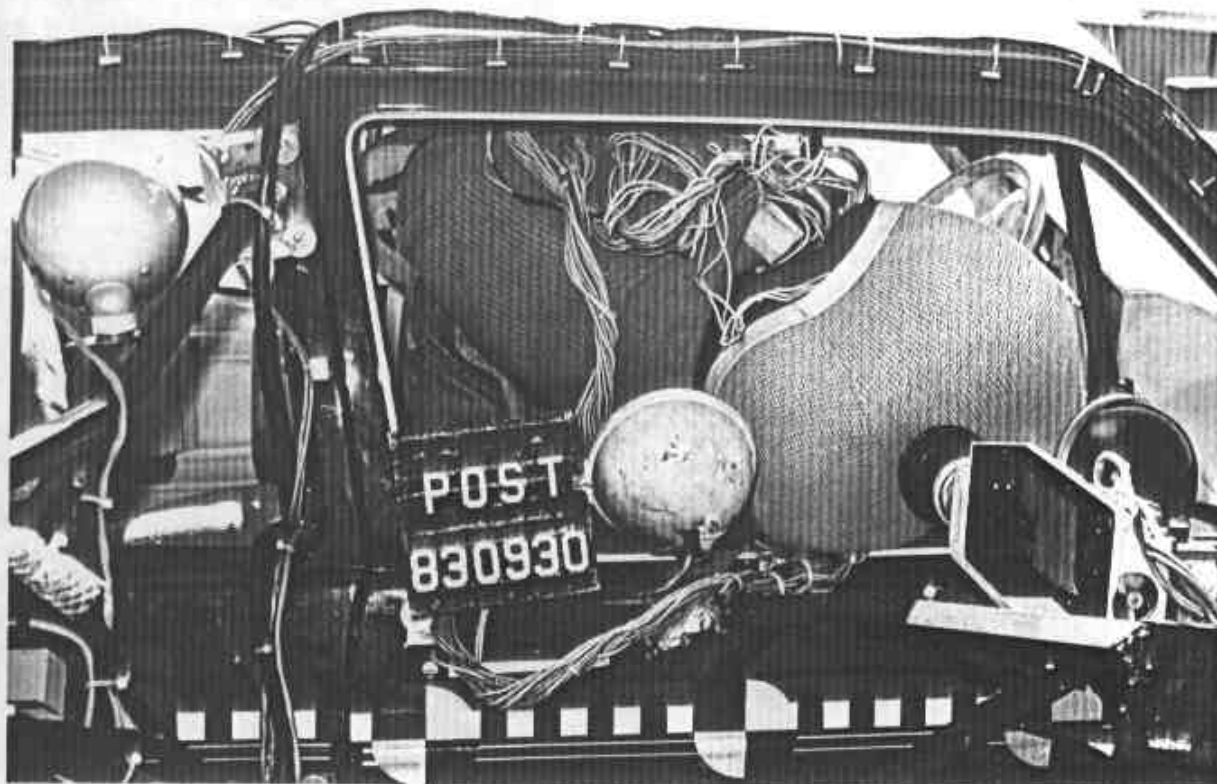


Figure A-21. POST-TEST DRIVER DUMMY - VIEW 2



Figure A-22. POST-TEST PASSENGER DUMMY - VIEW 1



Figure A-23. POST-TEST PASSENGER DUMMY - VIEW 2



Figure A-24. POST-TEST PASSENGER DUMMY - VIEW 3

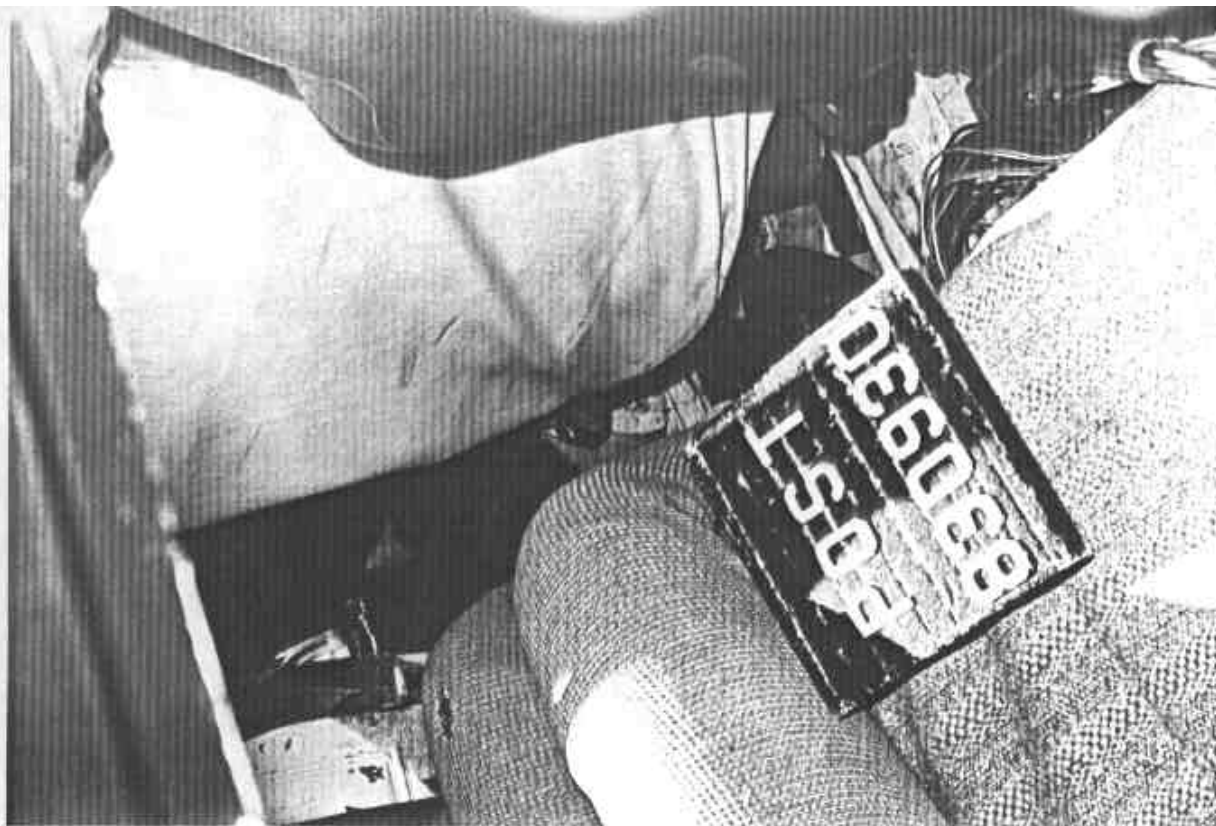


Figure A-25. POST-TEST PASSENGER DUMMY - VIEW 4

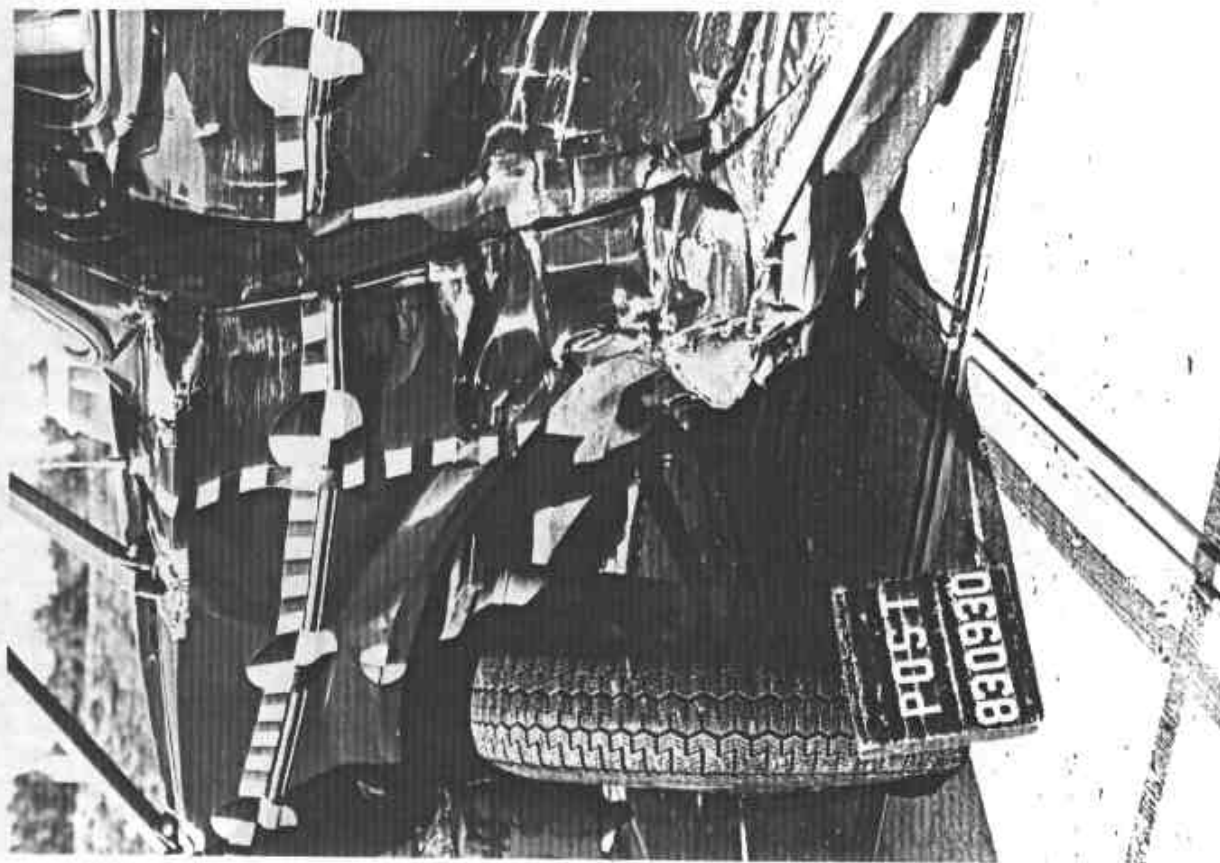


Figure A-26. POST-TEST VEHICLE DAMAGE - VIEW 1

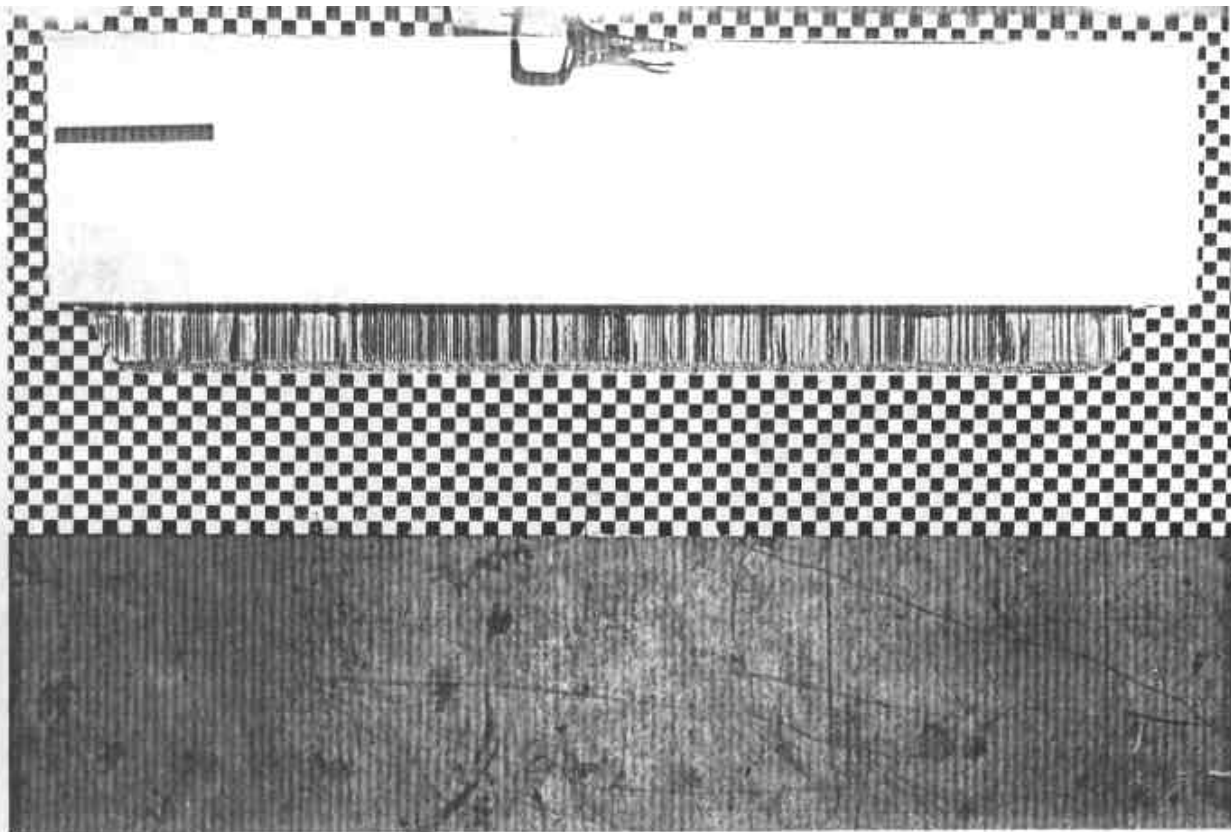


Figure A-27. PRE-TEST MDB FACE - VIEW 1

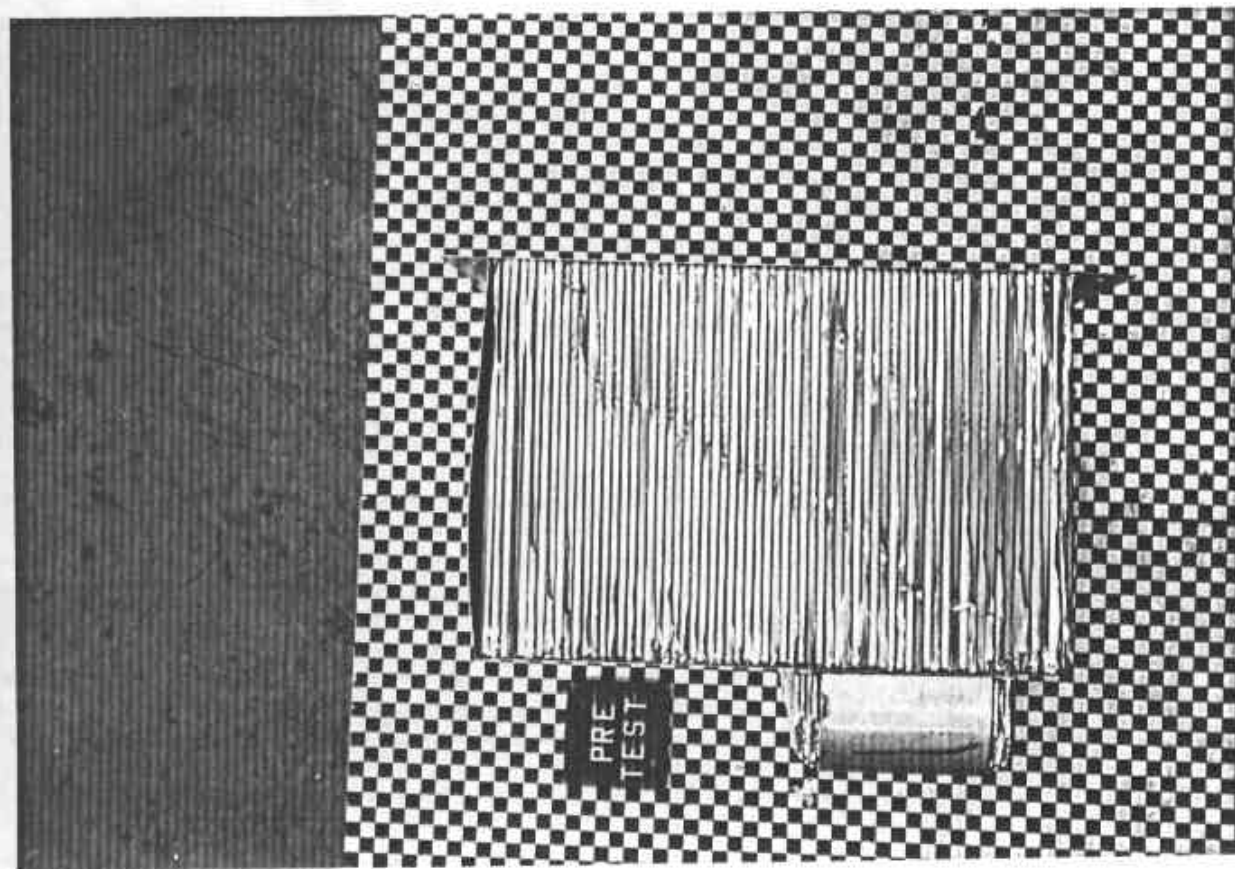


Figure A-28. PRE-TEST MDB FACE - VIEW 2

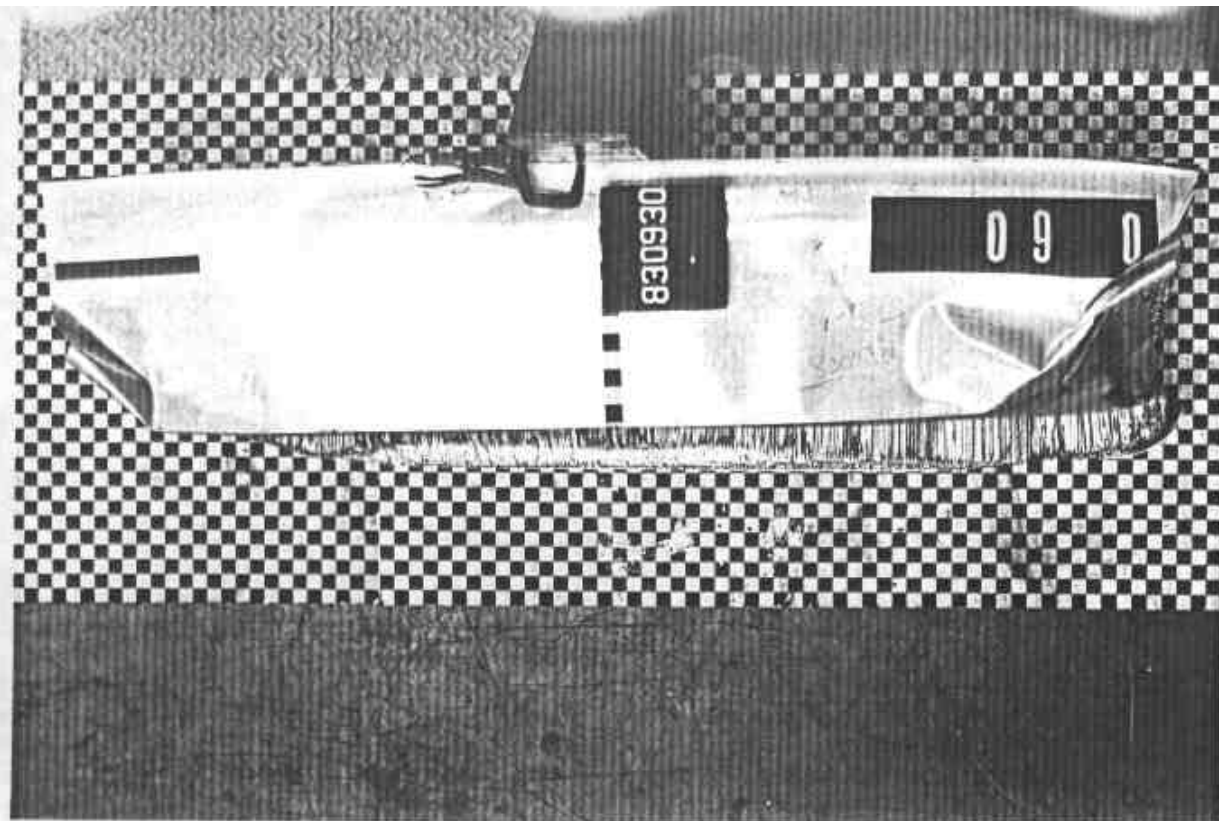


Figure A-29. POST-TEST MDB FACE - VIEW 1

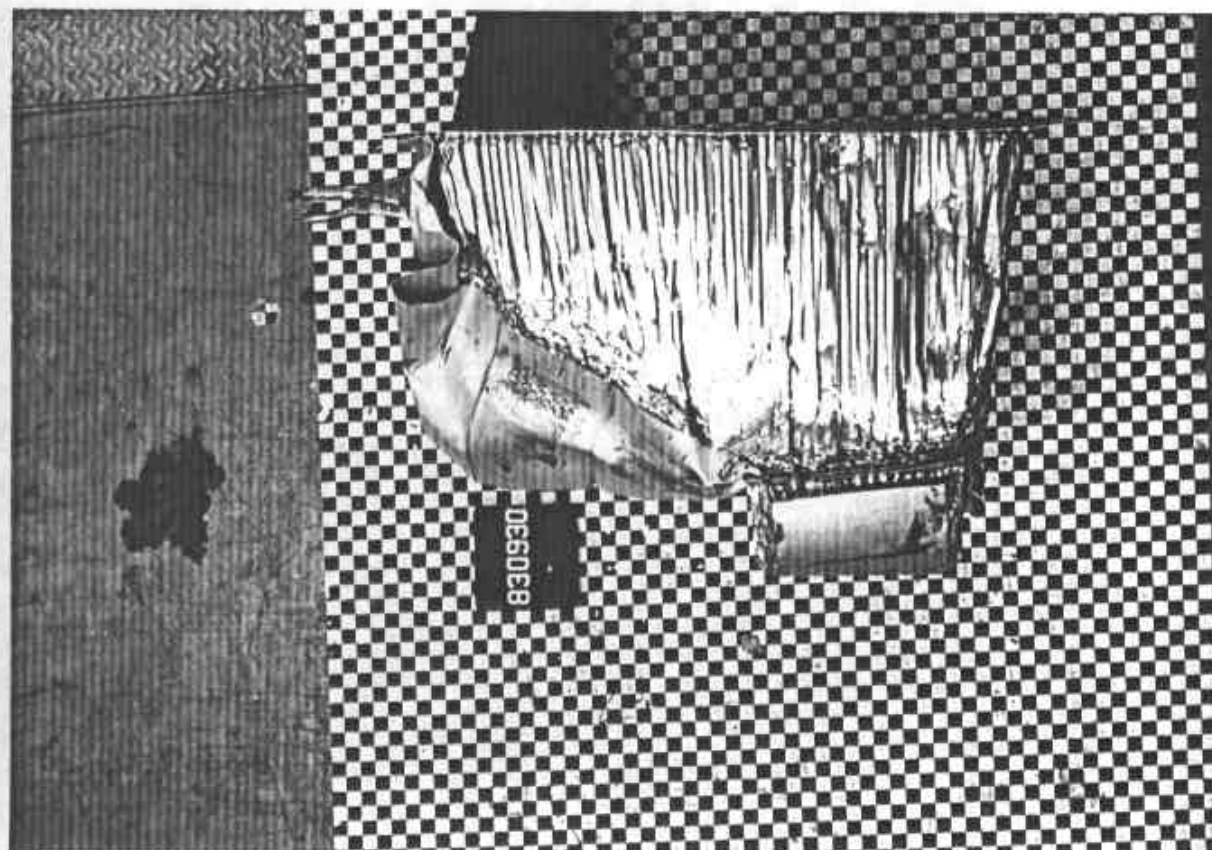


Figure A-30. POST-TEST MDB FACE - VIEW 2

APPENDIX B
DATA PLOT PRESENTATION

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

TRC 830930 PLOT DATE 4-OCT-83 10:45:38

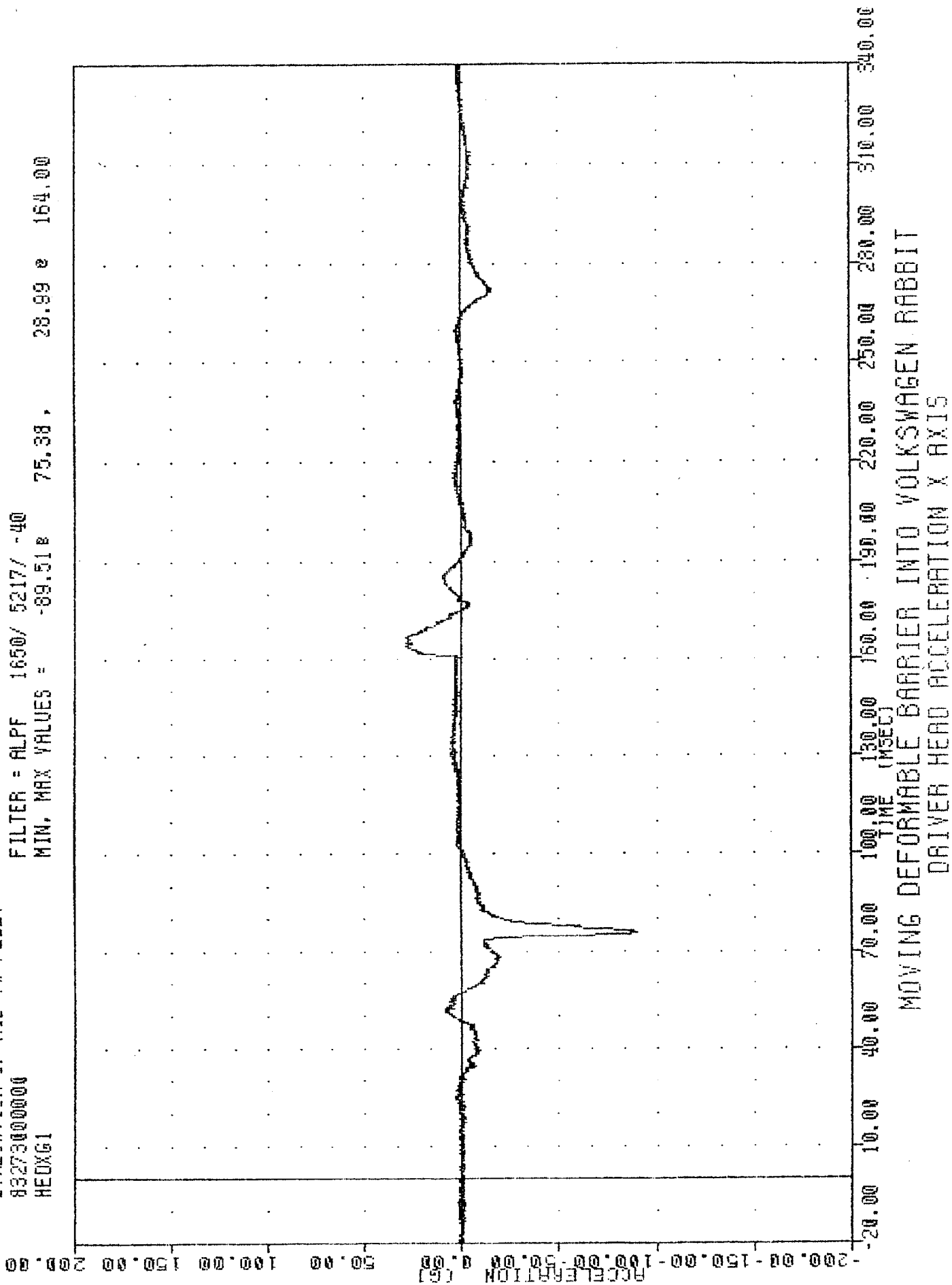
EVALUATION OF MOD YW FLEET

83273000000

HEADG1

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -89.51g 75.38, 28.99 e 164.00



TRC 830830 PLOT DATE 4-OCT-88 10:45:38

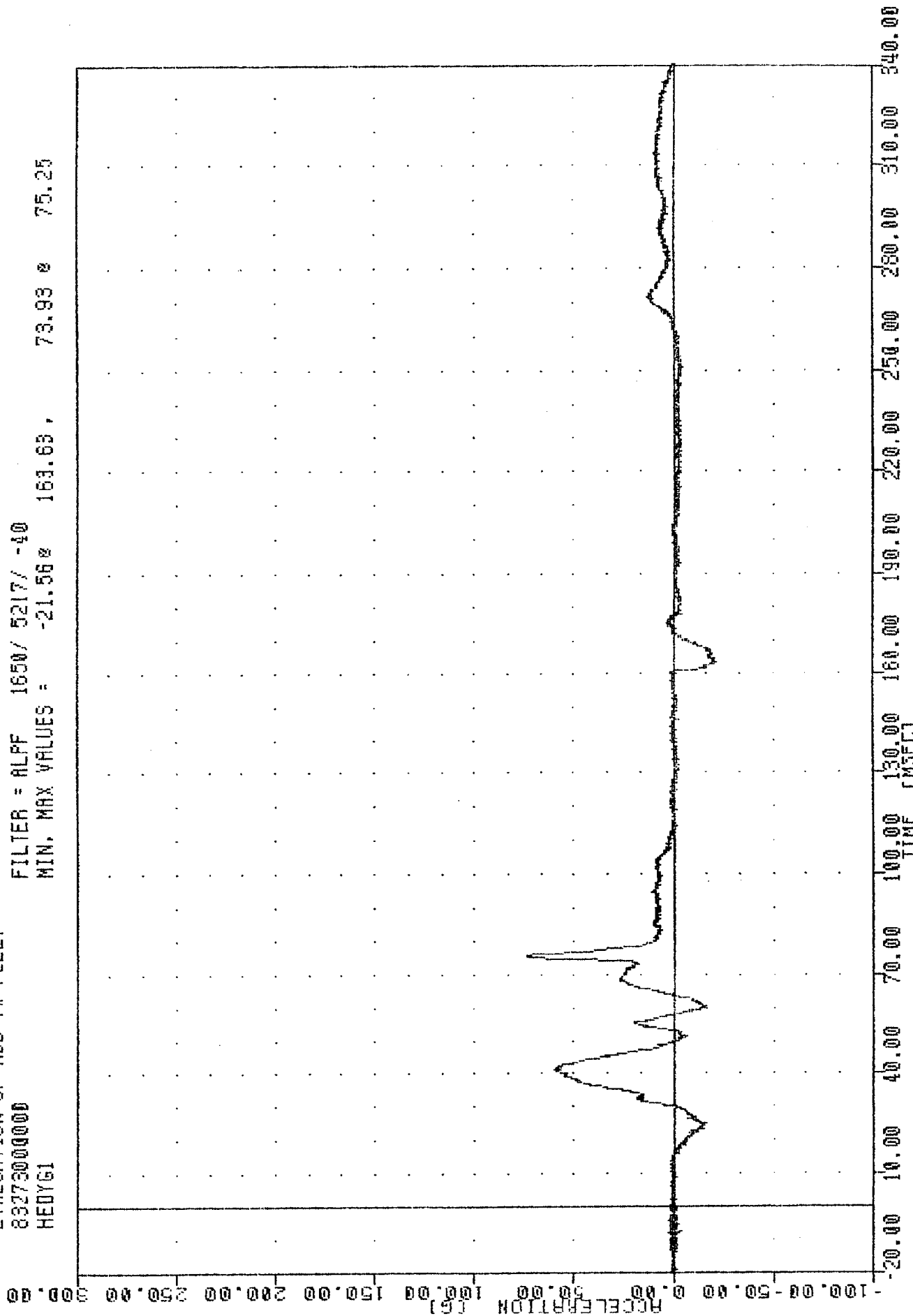
EVALUATION OF MDD VW FLEET

832730000000

HEDYG1

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -21.56% 163.63, 73.93 @ 75.25



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION Y AXIS

TAC

83W830

PLOT DATE

4-OCT-83

10:45:36

EVALUATION OF MOD VW FLEET

83273000000

FILTER = ALPF 1650/ 5217/ -40

HEDZ61

MIN, MAX VALUES = -68.932 54.00 ,

8.62 e 163.13

200.00

150.00

100.00

50.00

0.00

-50.00

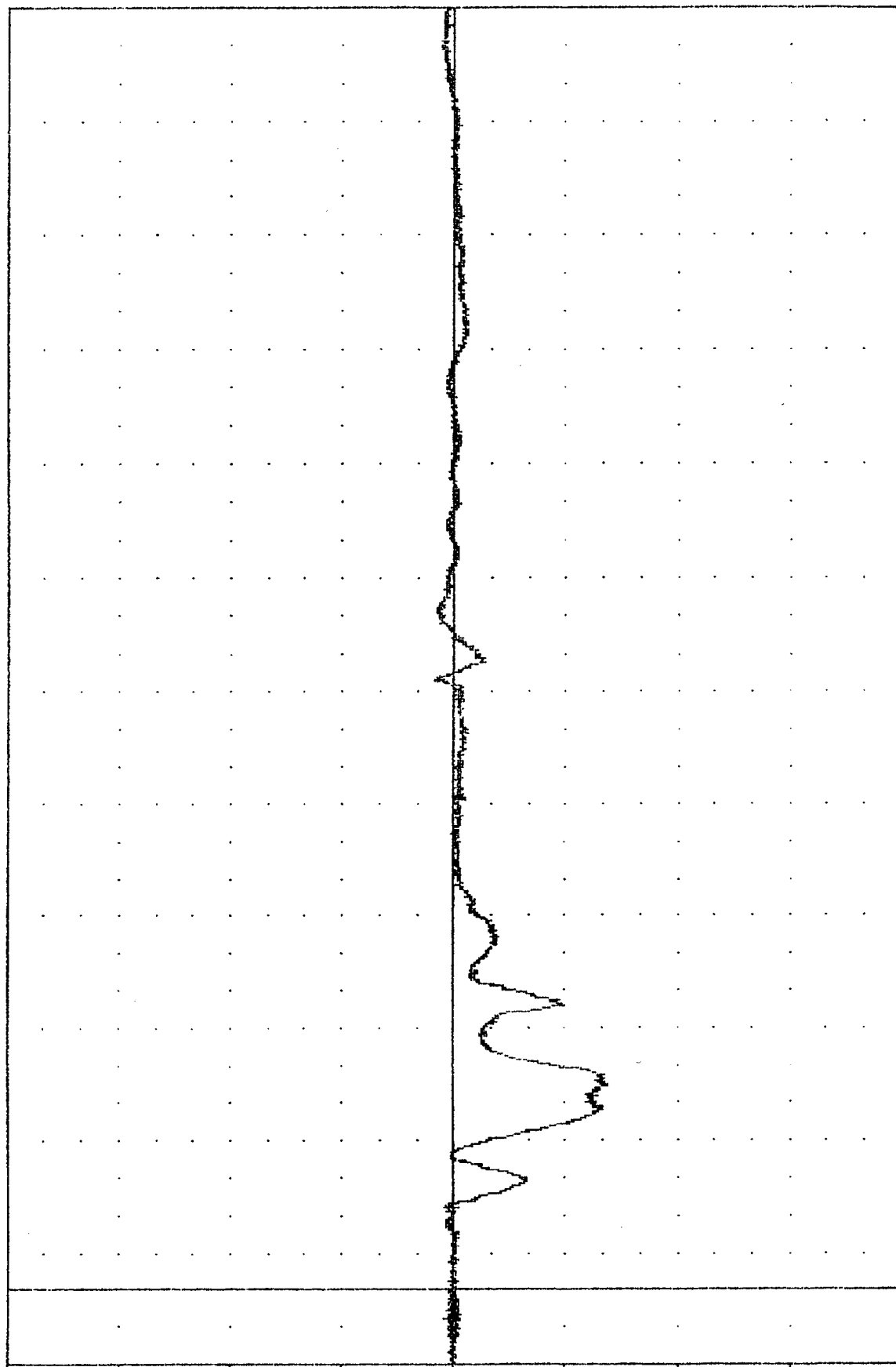
-100.00

-150.00

-200.00

ACCELERATION (G)

B-4

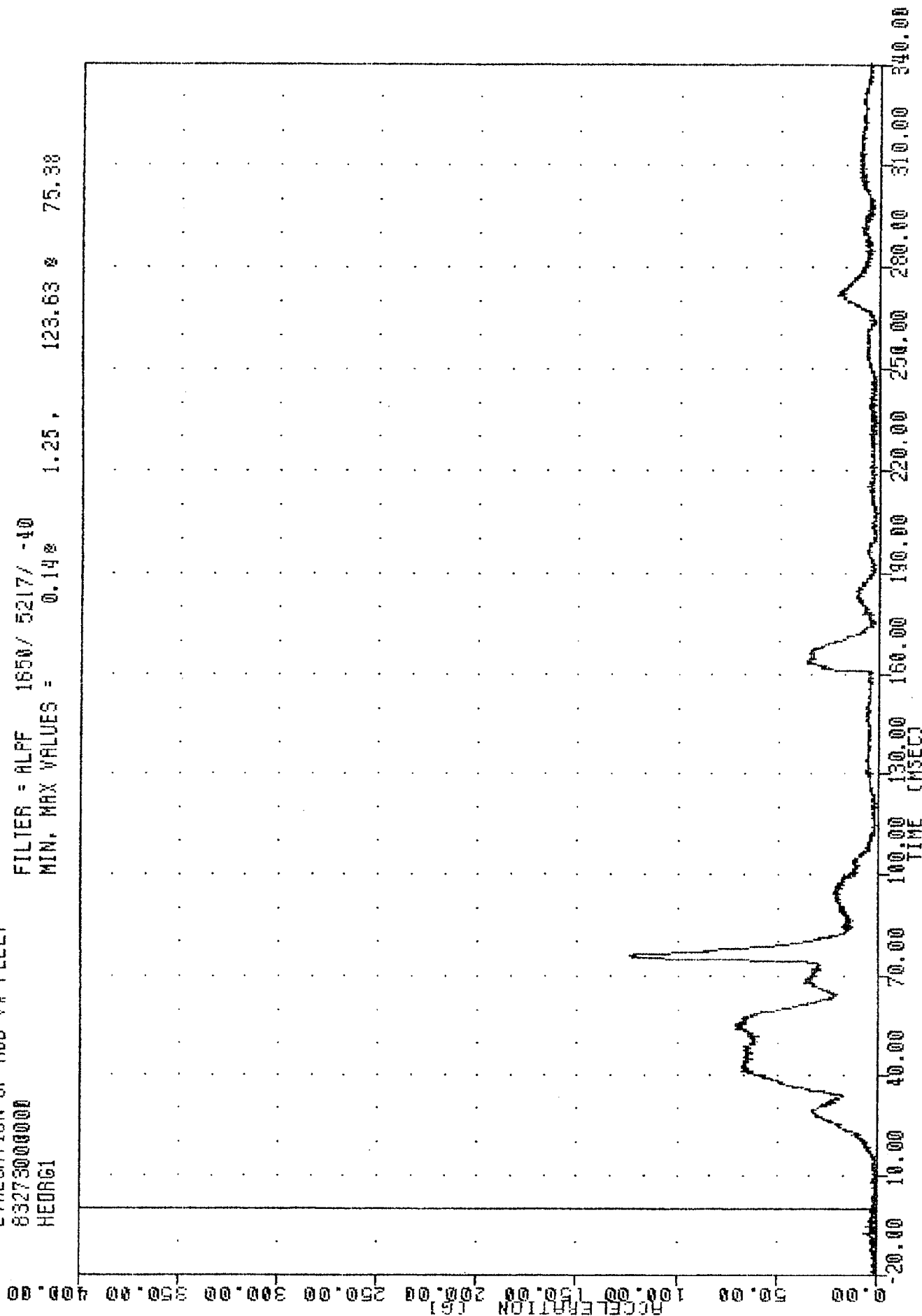


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (msec)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION Z AXIS

TRC
 EVALUATION OF MOD VW FLEET
 83273000000
 HEAD61
 PLOT DATE 4 OCT 83 10:43:36
 FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = 0.148 1.25, 123.63 75.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER HEAD RESULTANT

TRC 830830 4-OCT-83 10:47:45

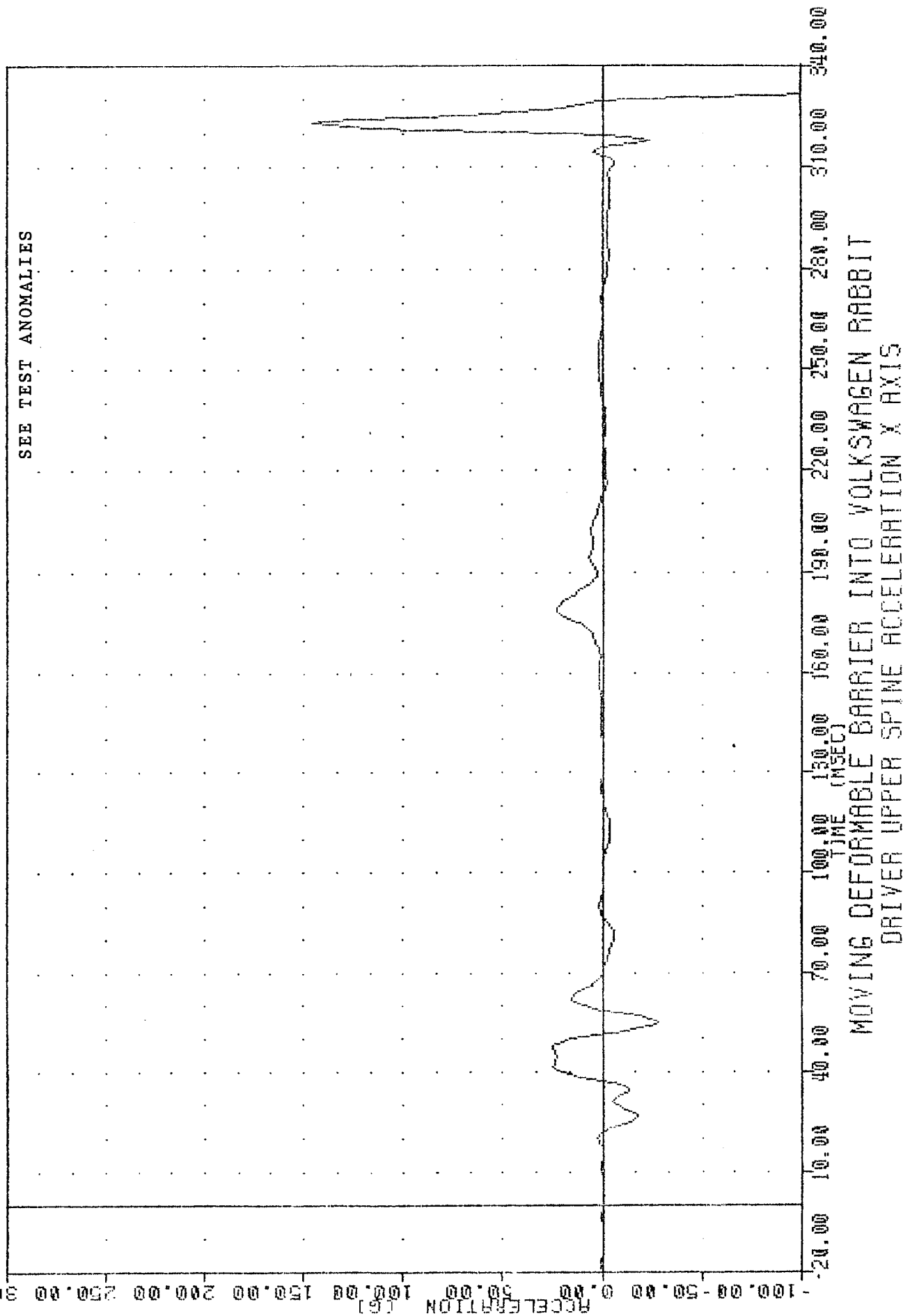
EVALUATION OF MOD VV FLEET

83273000000

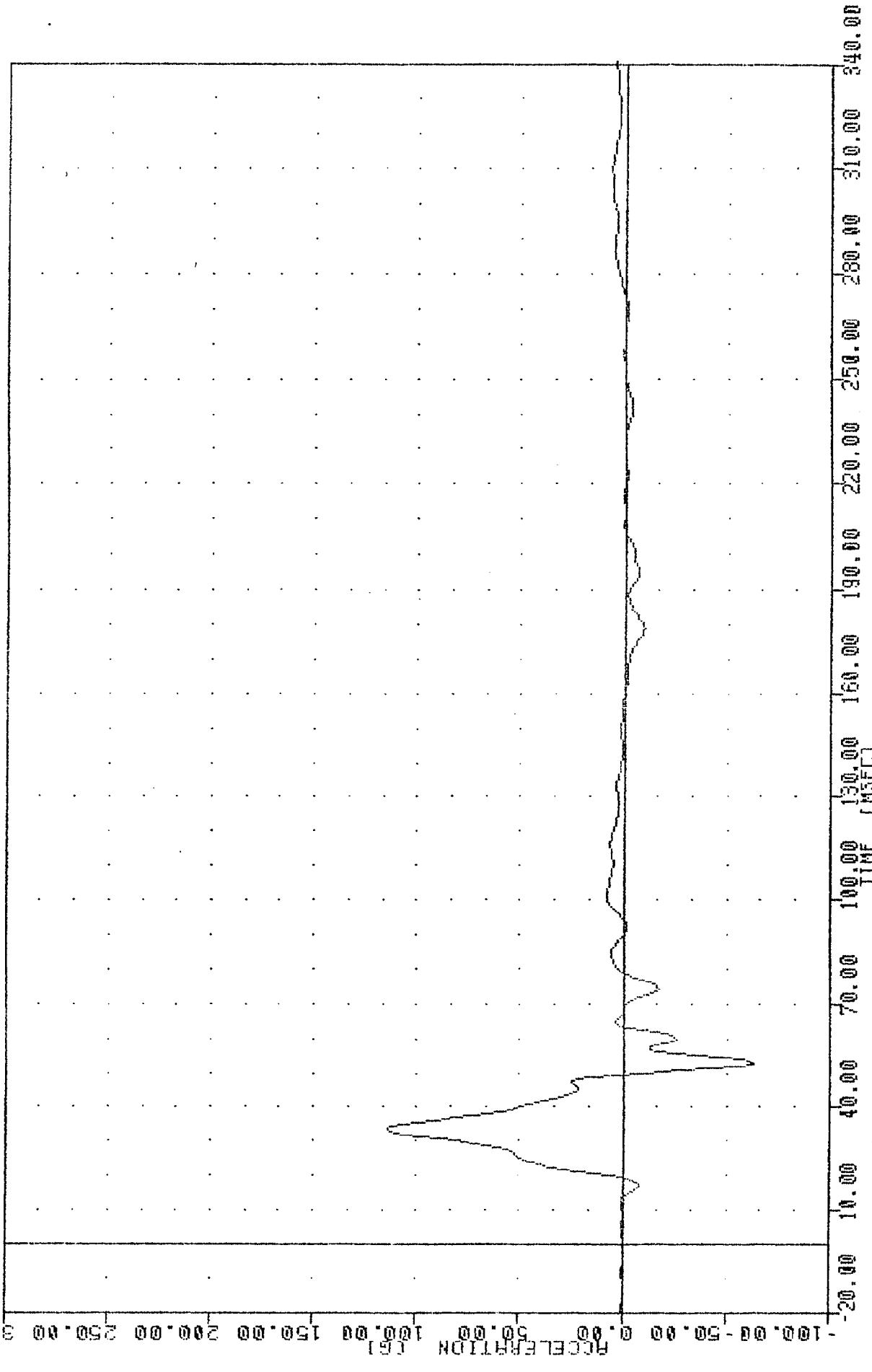
T01XG1

FILTER = HSRL 136/ 189/ -50

MIN. MAX VALUES = -276.46 340.00, 145.71 322.50



TRC 830830 4-OCT-83 10:47:45
 EVALUATION OF MOD VW FLEET
 832730000000
 T01YG1
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -63.10 52.50 114.32 33.13



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

TAC

830930

4-OCT-83

10:47:45

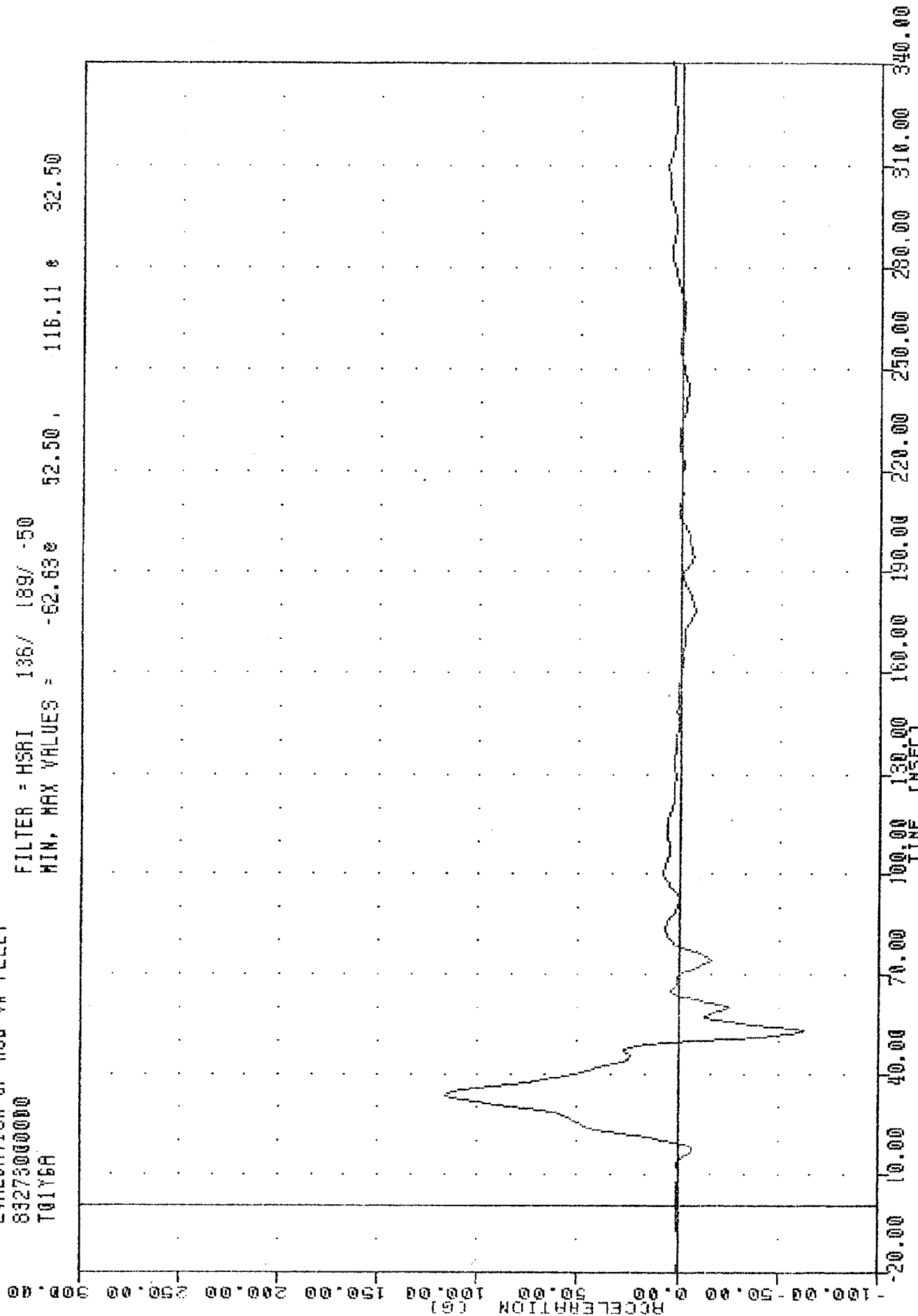
830930

EVALUATION OF MOD VN FLEET

8327300000

TQ1Y5A

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -62.63e 52.50 116.11 e 32.50



TRC

830930

EVALUATION OF MOD YW FLEET

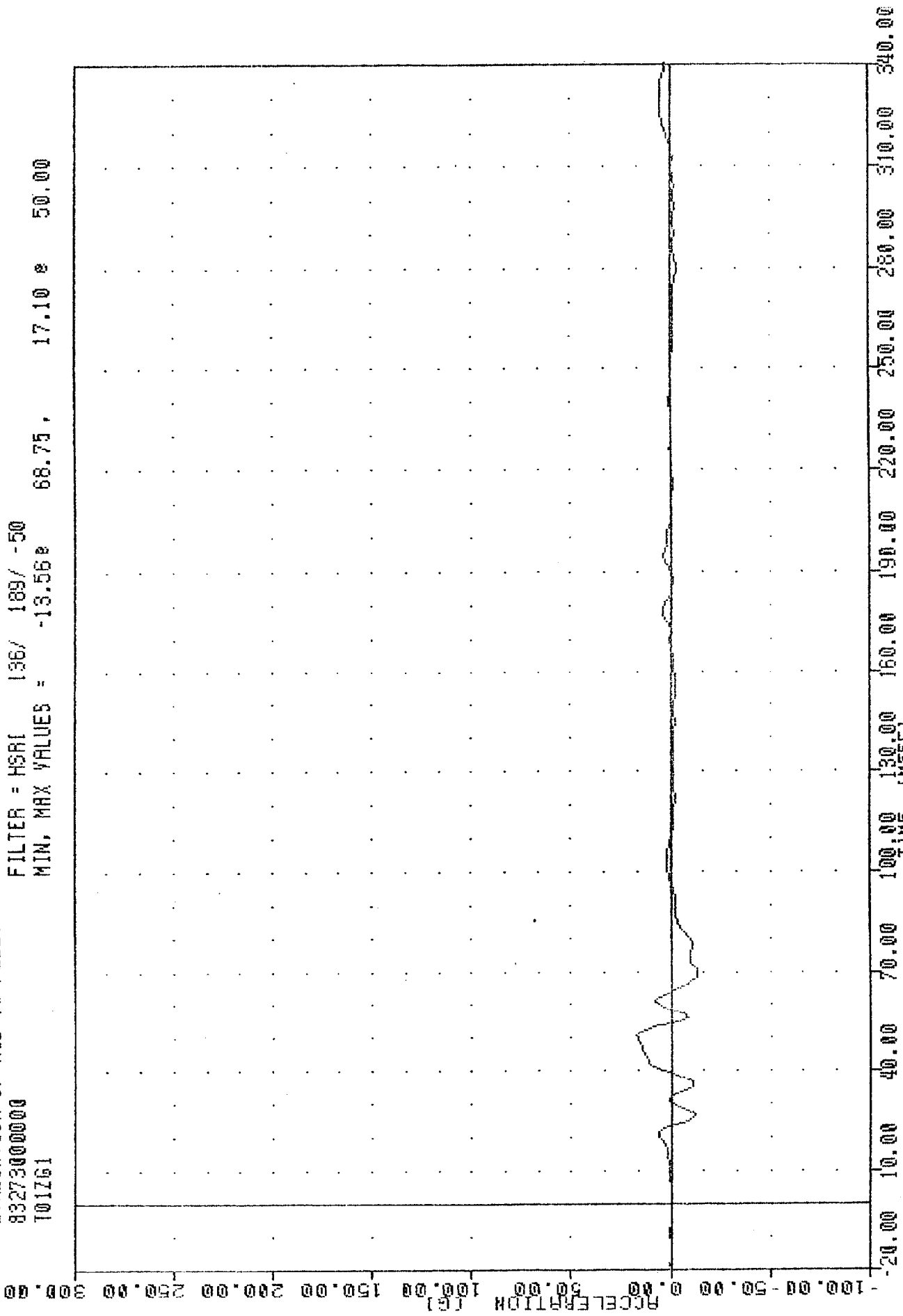
832730000000

101761

4-OCT-83

10:47:45

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -13.56e 68.75, 17.10 e 50.00



TRC 830930 4-OCT-83 10:47:45

EVALUATION OF MOD YW FLEET

83273000000

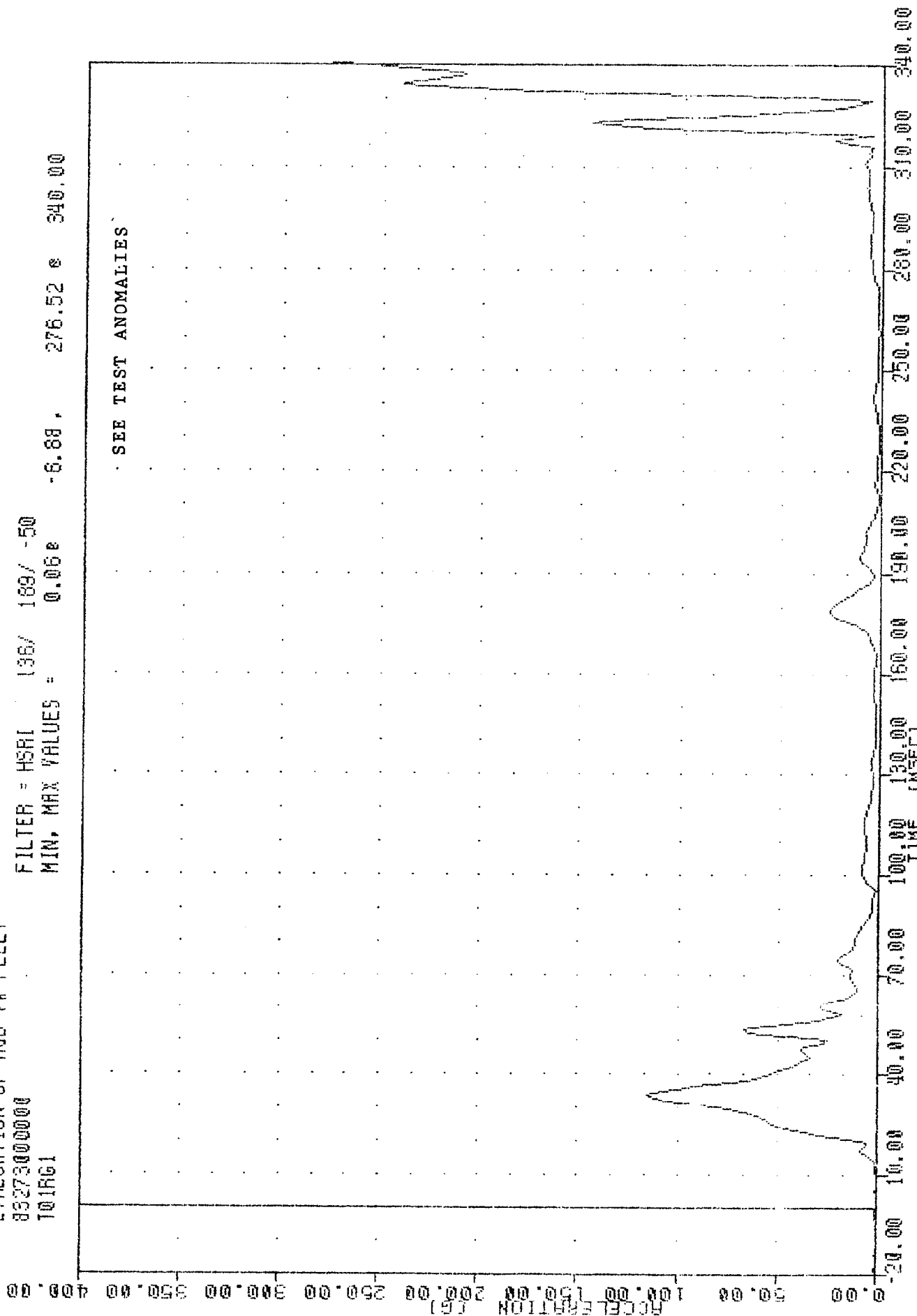
101RG1

FILTER = HSRI 136/ 189/ -50

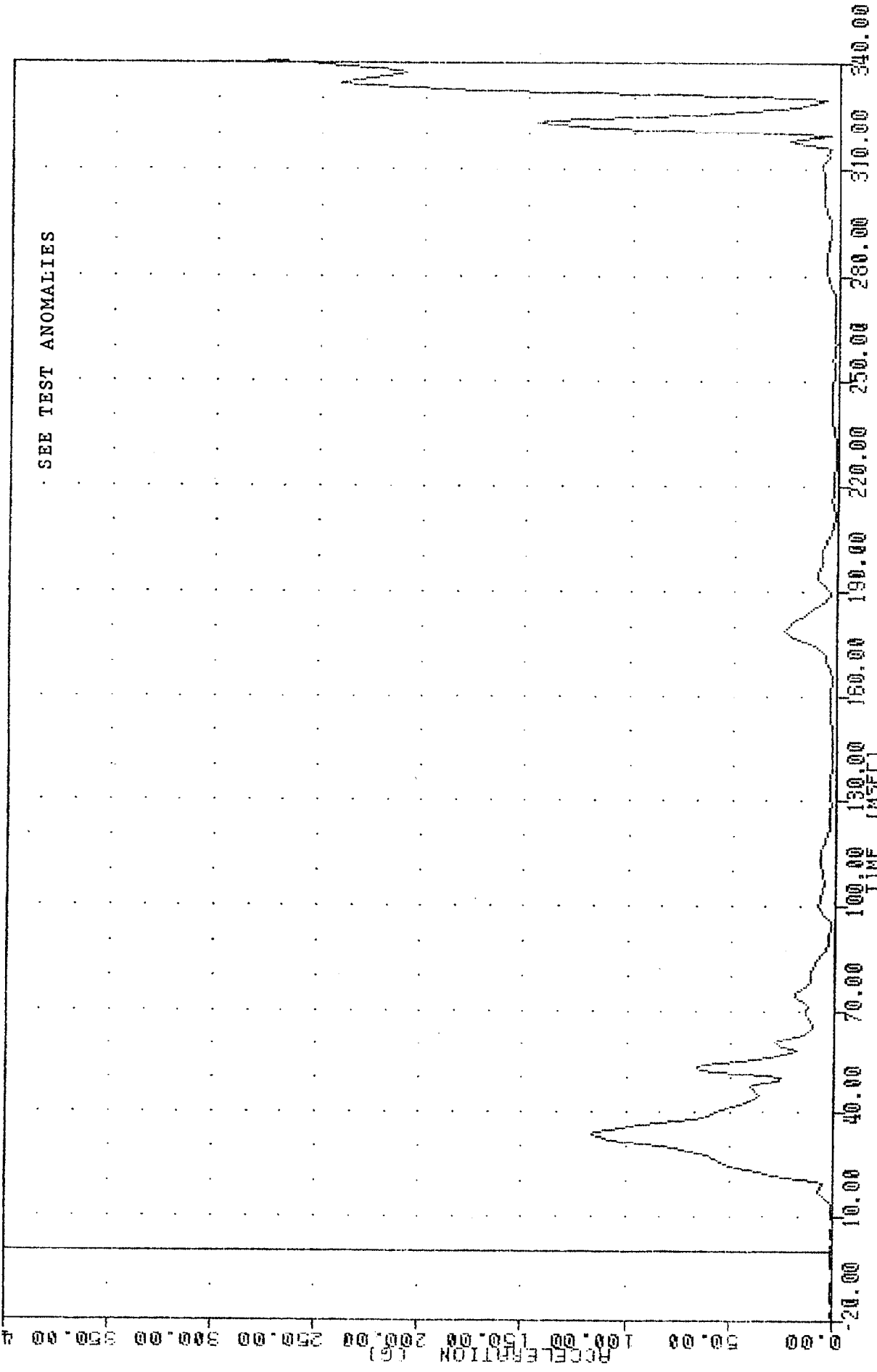
MIN, MAX VALUES = 0.06e

-6.88, 276.52 e 340.00

SEE TEST ANOMALIES



TRC
 EVALUATION OF MOD YW FLEET
 832730000000
 T01RG1
 PLOT DATE 4-OCT-83 10:48:47
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.14e -7.50, 278.52 e 340.00



SEE TEST ANOMALIES

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE RESULTANT USING TQ1YGA

TRC

830930

PLOT DATE

4-ULY-83

13:39:37

EVALUATION OF MOD VN FLEET

83273000000

FILTER = HSRI 136/ 189/ -50

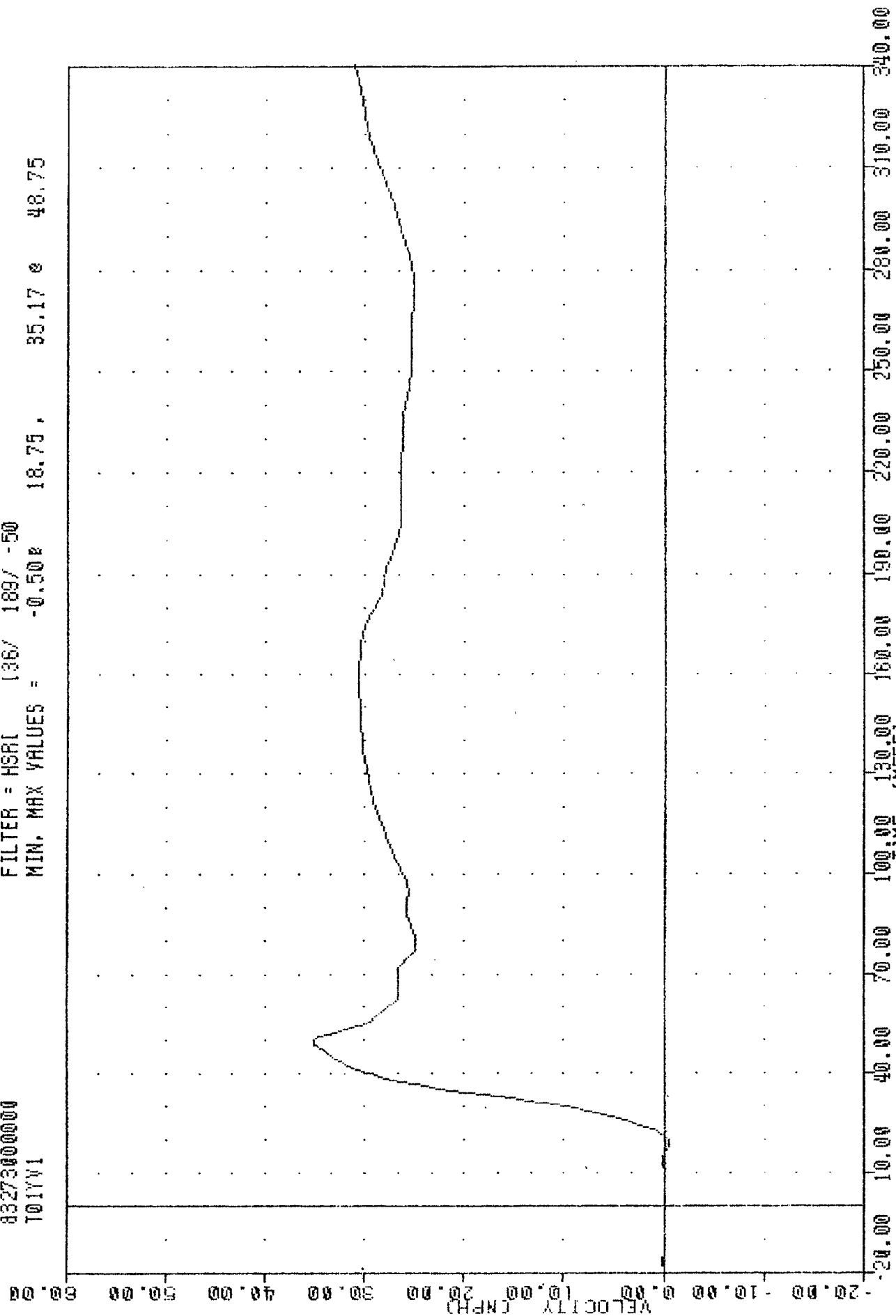
T01YV1

MIN. MAX VALUES = -0.50%

18.75,

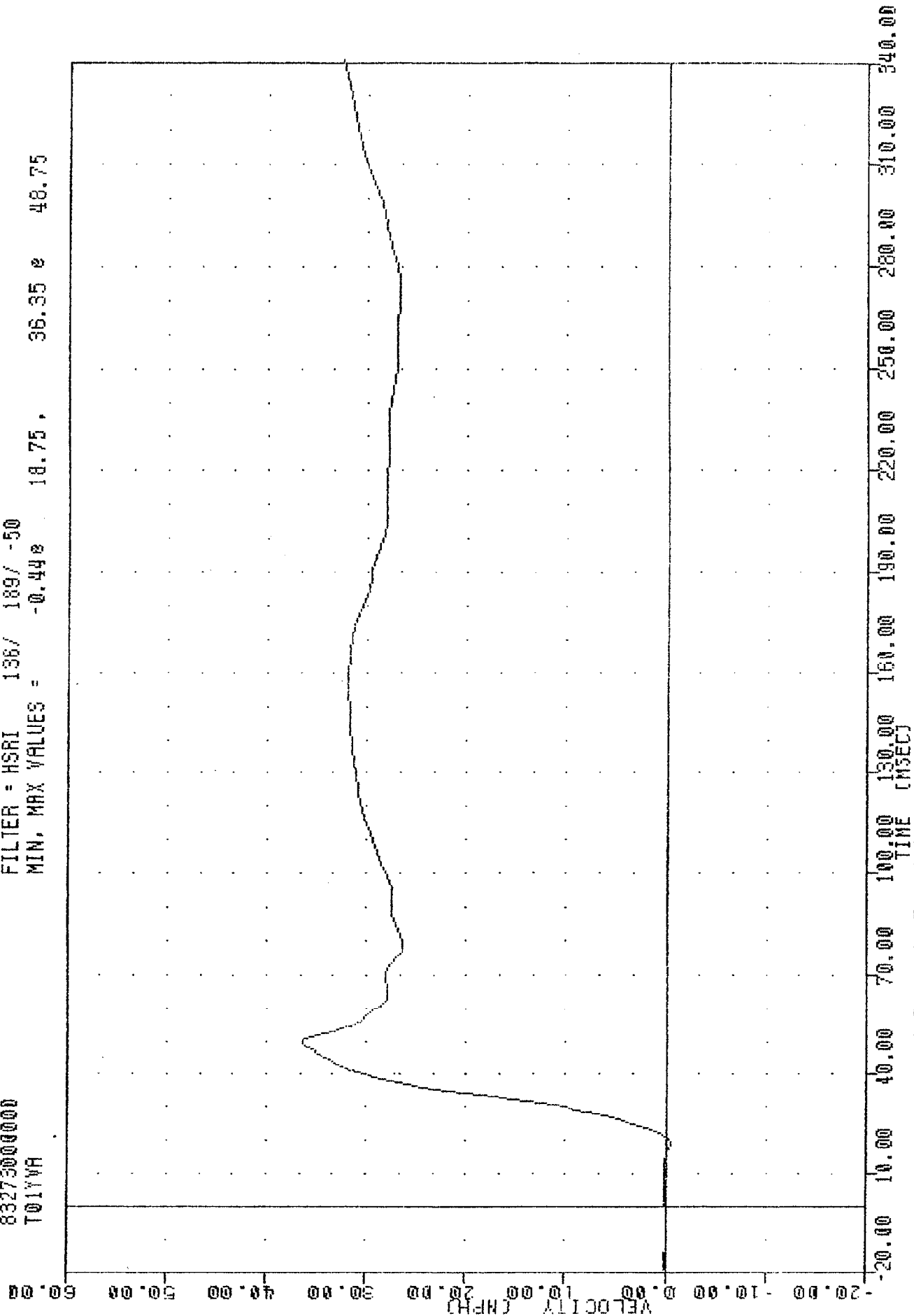
35.17%

48.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T01YGI

TRC 830930 PLOT DATE 4-OCT-83 13:39:37
 EVALUATION OF MDD VW FLEET
 83273000000
 T01YVA
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.448 18.75 36.35 e 48.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T01YGA

TRC

830930

EVALUATION OF MOD VW FLEET

832730000000

T12XG1

PLOT DATE

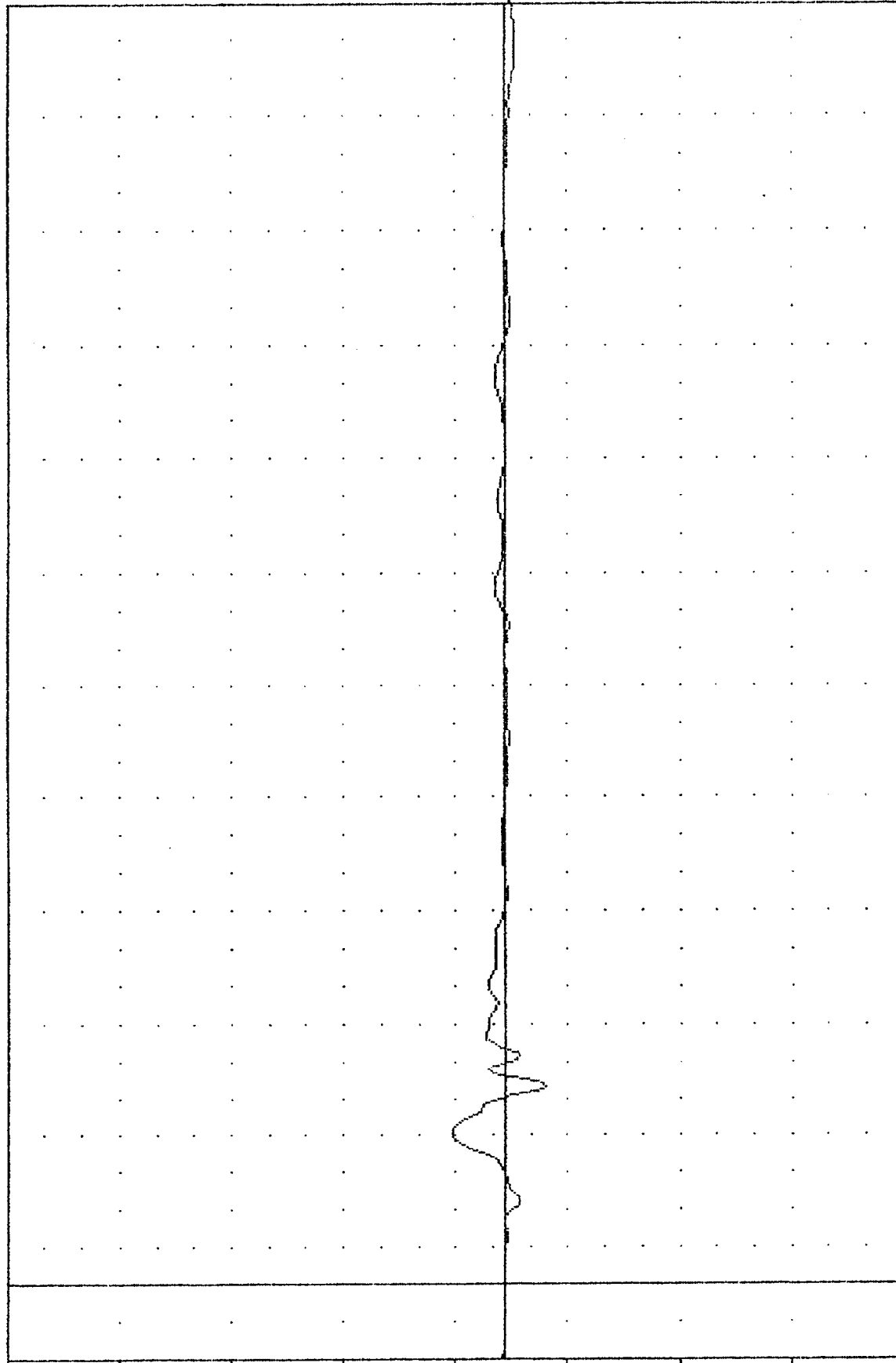
4-OCT-83

10:47:45

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -32.91% 52.50% 43.25% 40.63

ACCELERATION (G)



-20.00 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 LOWER SPINE ACCELERATION X AXIS

TAC 830930 4-DEC-83 10:47:45

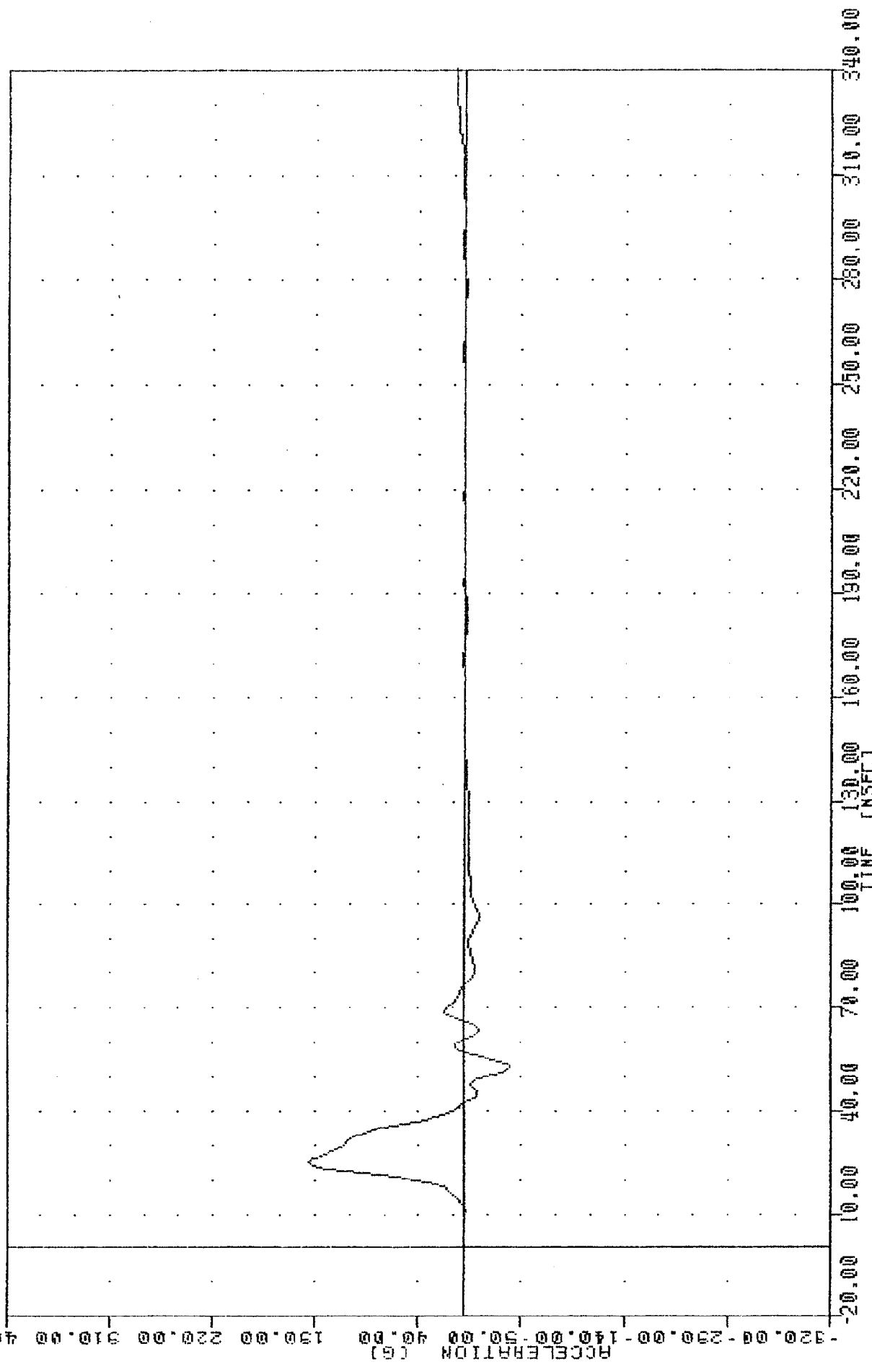
EVALUATION OF MOD VN FLEET

83273000000

T12Y61

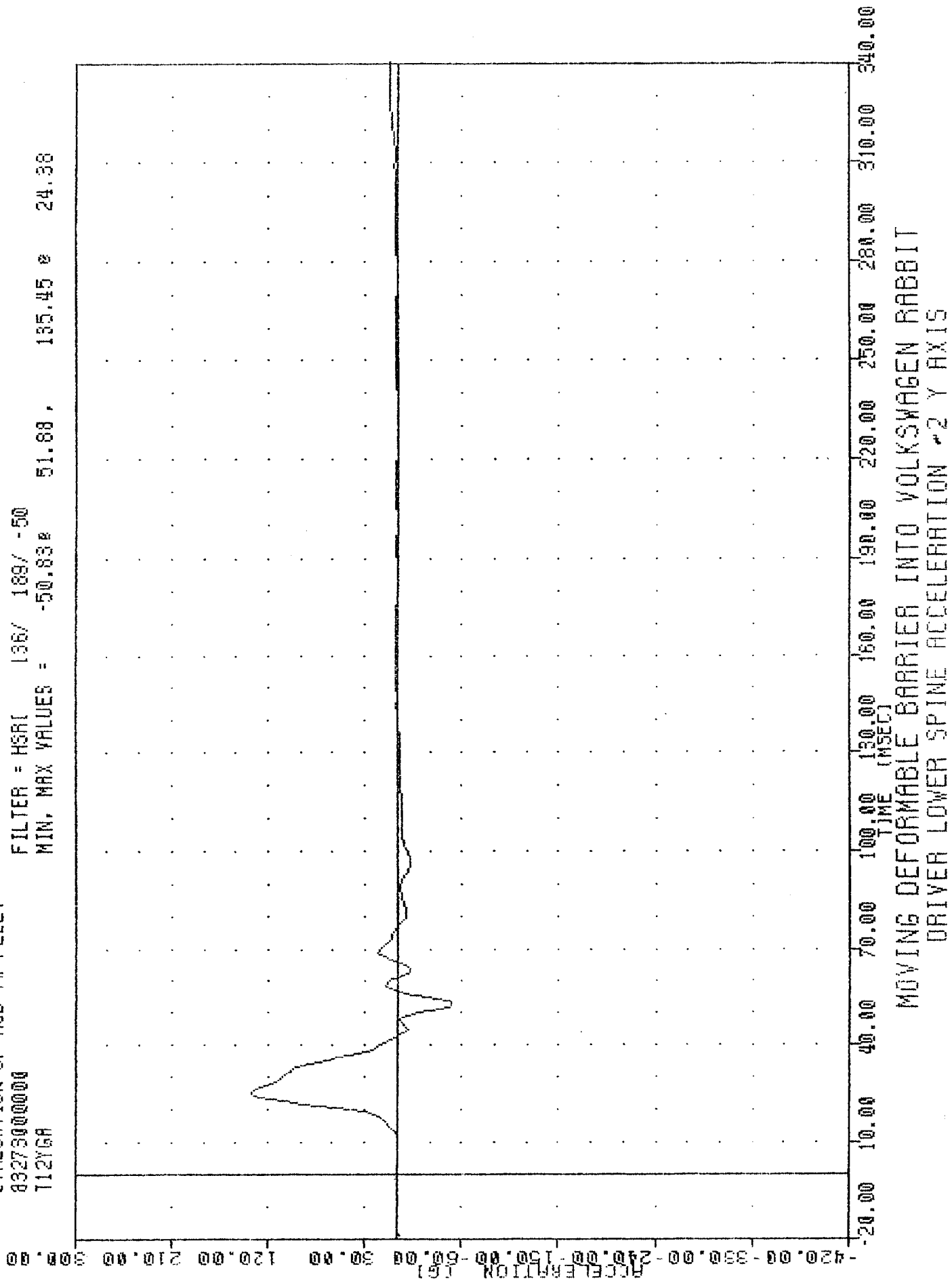
FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -40.41e 51.88, 135.51 e 24.38



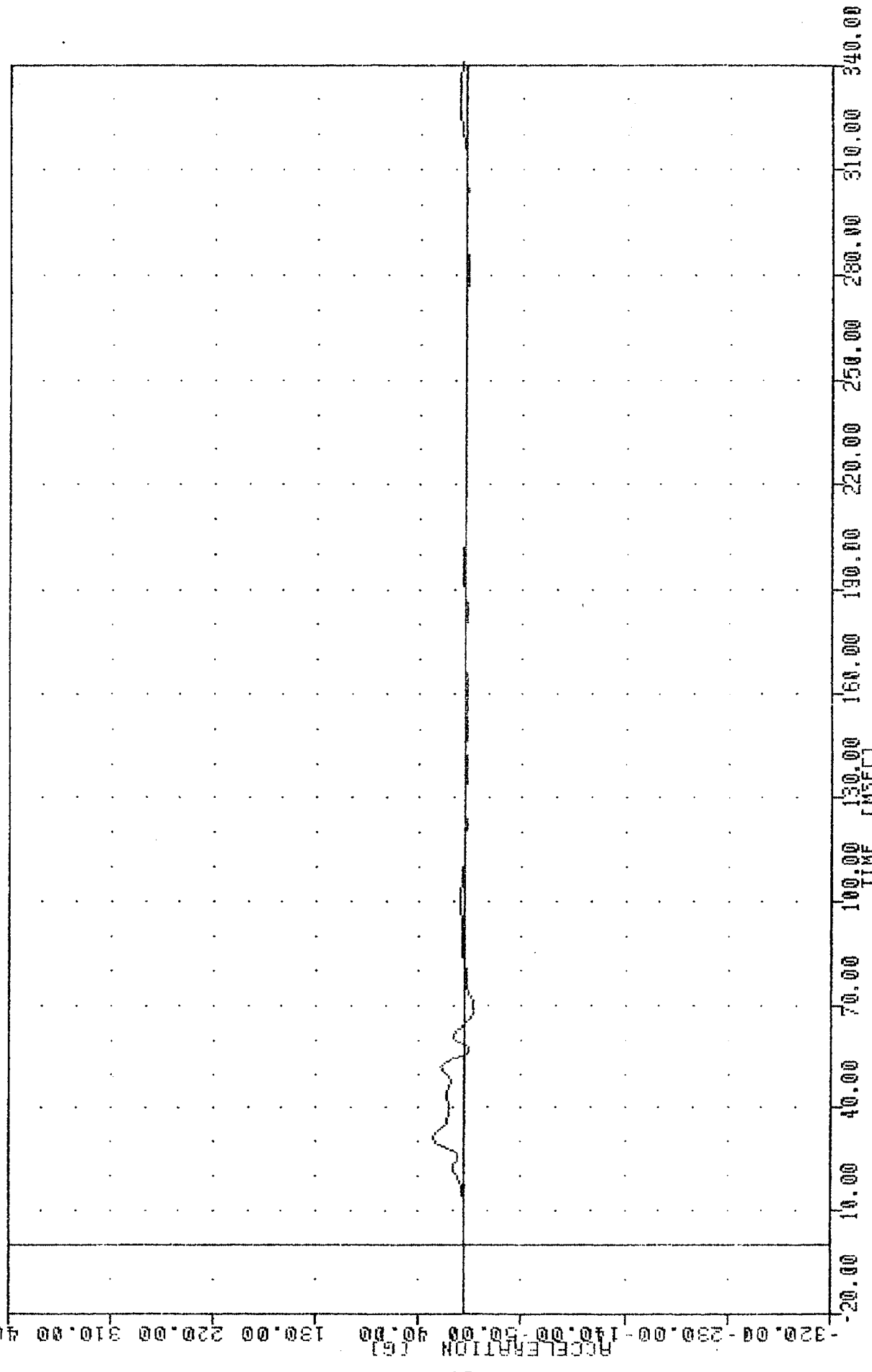
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION Y AXIS

TRC 830930 PLOT DATE 4 OCT 83 10:47:45
 EVALUATION OF MOD YW FLEET
 832730000000
 712YGA
 FILTER = HSR 136/ 189/ -50
 MIN. MAX VALUES = -50.83 51.88, 135.45 24.38



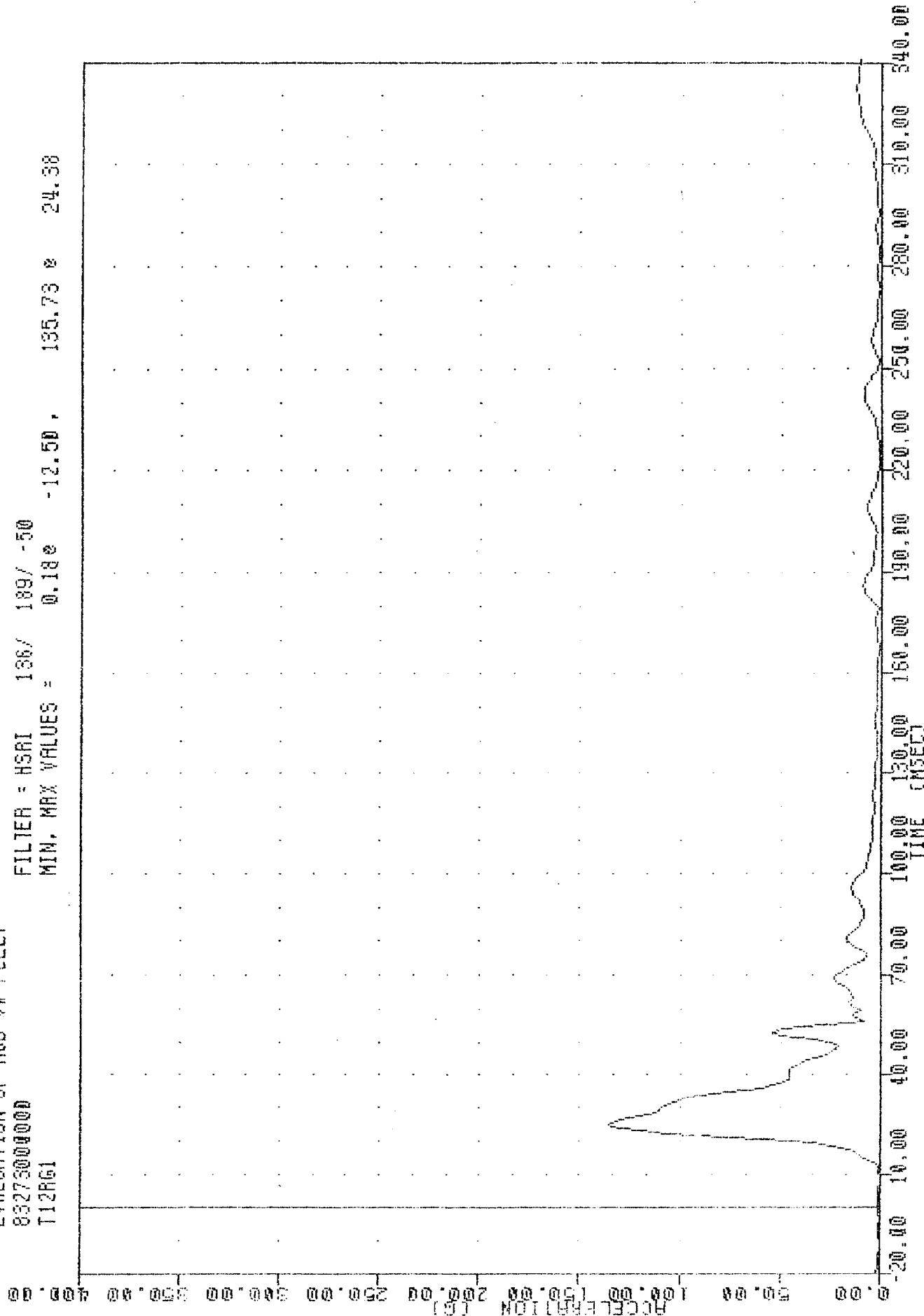
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE ACCELERATION -2 Y AXIS

TRC 880830 PLOT DATE 4-OCT-83 10:47:45
 EVALUATION OF MOD V/W FLEET
 832730000000
 T12761
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -7.76e 68.75, 27.40 e 30.62



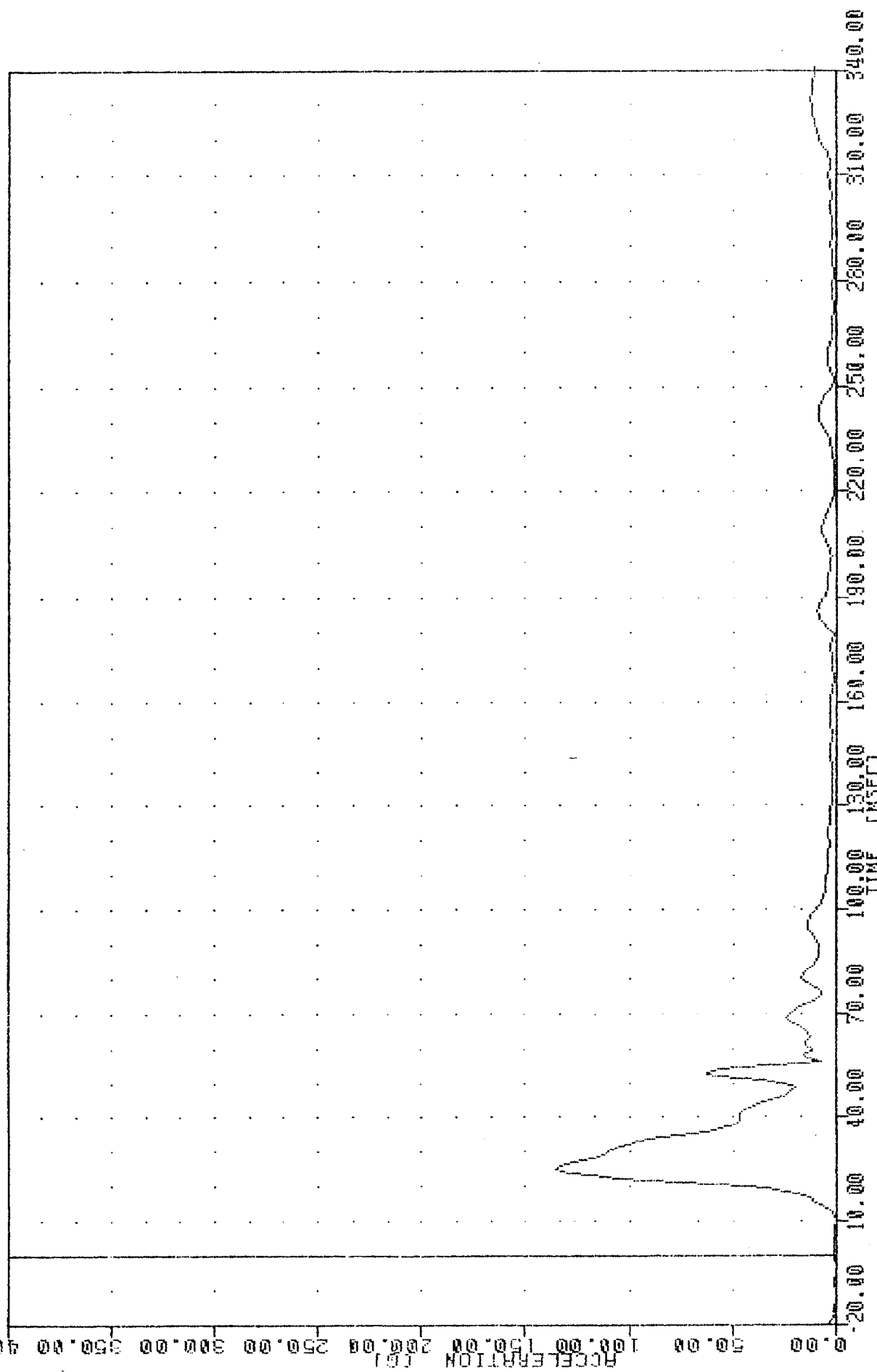
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE ACCELERATION Z AXIS

TRC 830930 PLOT DATE 4-OCT-85 10:47:45
 EVALUATION OF MOD VW FLEET
 8327300000
 T12RG1
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.180 -12.50, 135.73 24.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE RESULTANT

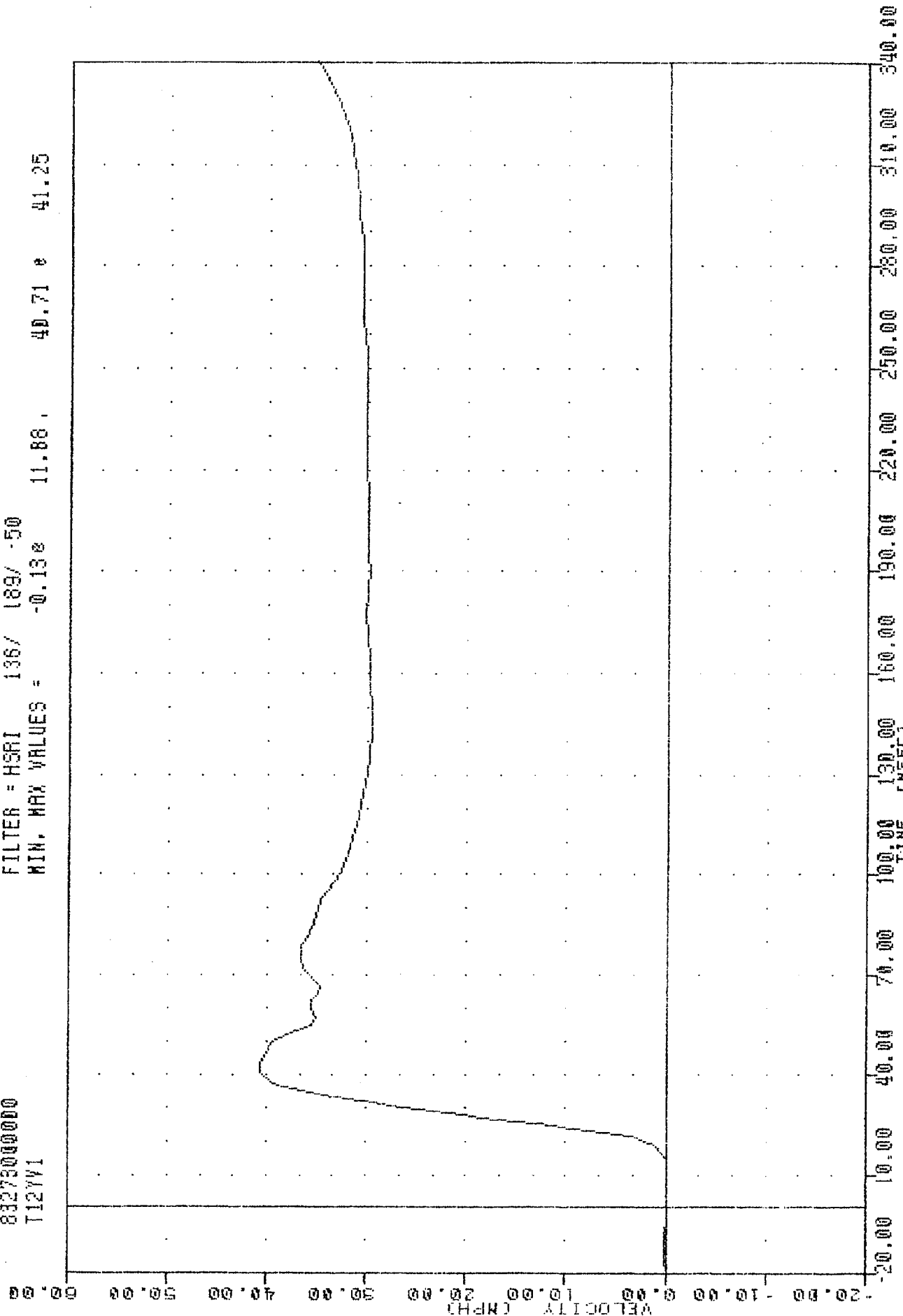
TRC
 EVALUATION OF MDD VW FLEET
 832730000000
 T12RG1
 PLOT DATE 4-DLT-83 10:48:47
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.17e -13.13, 135.67 e 24.30



TAC 830930
 EVALUATION OF MOD VN FLEET
 83273000000
 T12YV1

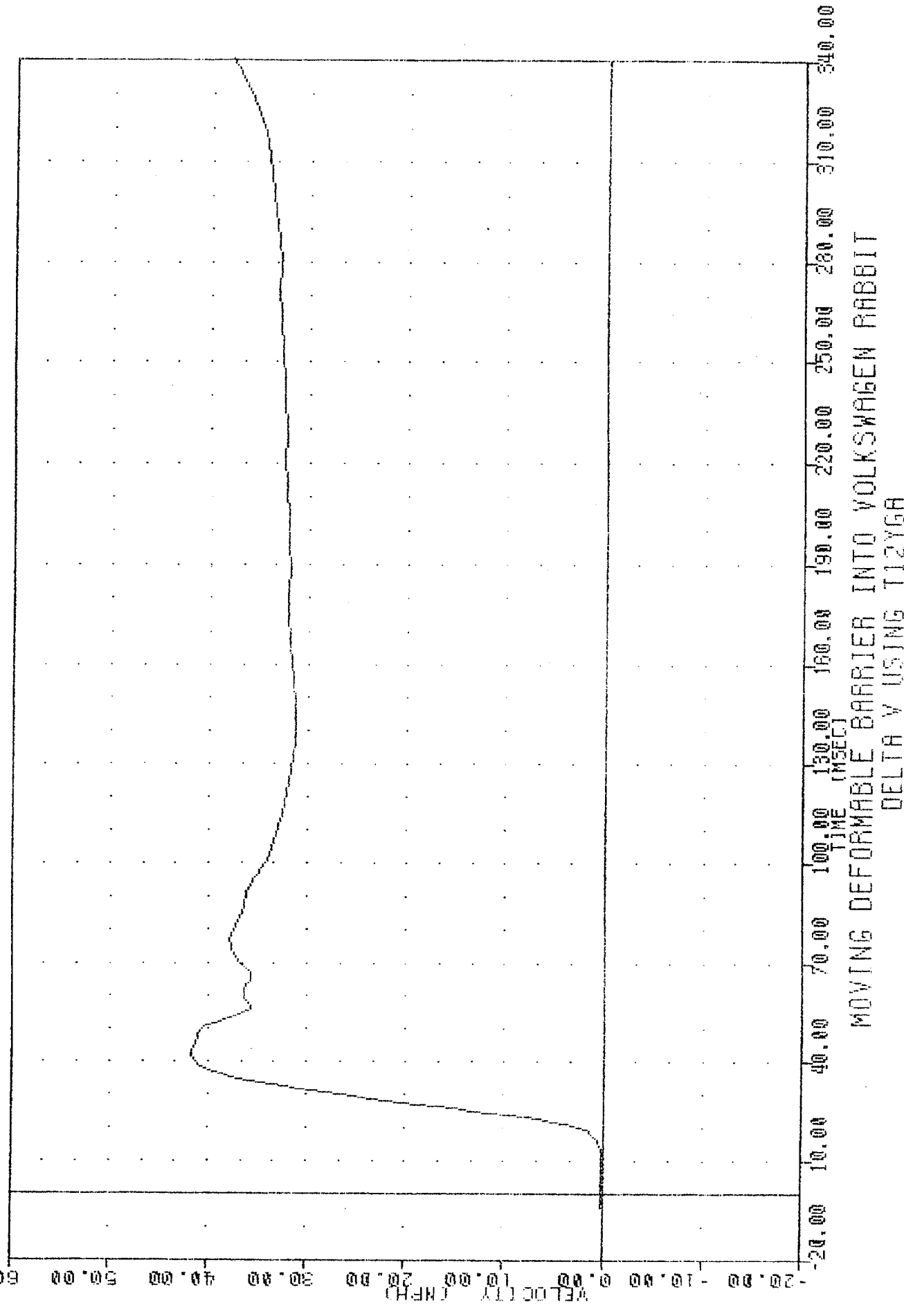
PLOT DATE 4-OCT-83 13:39:37

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.13e 40.71 e 41.25

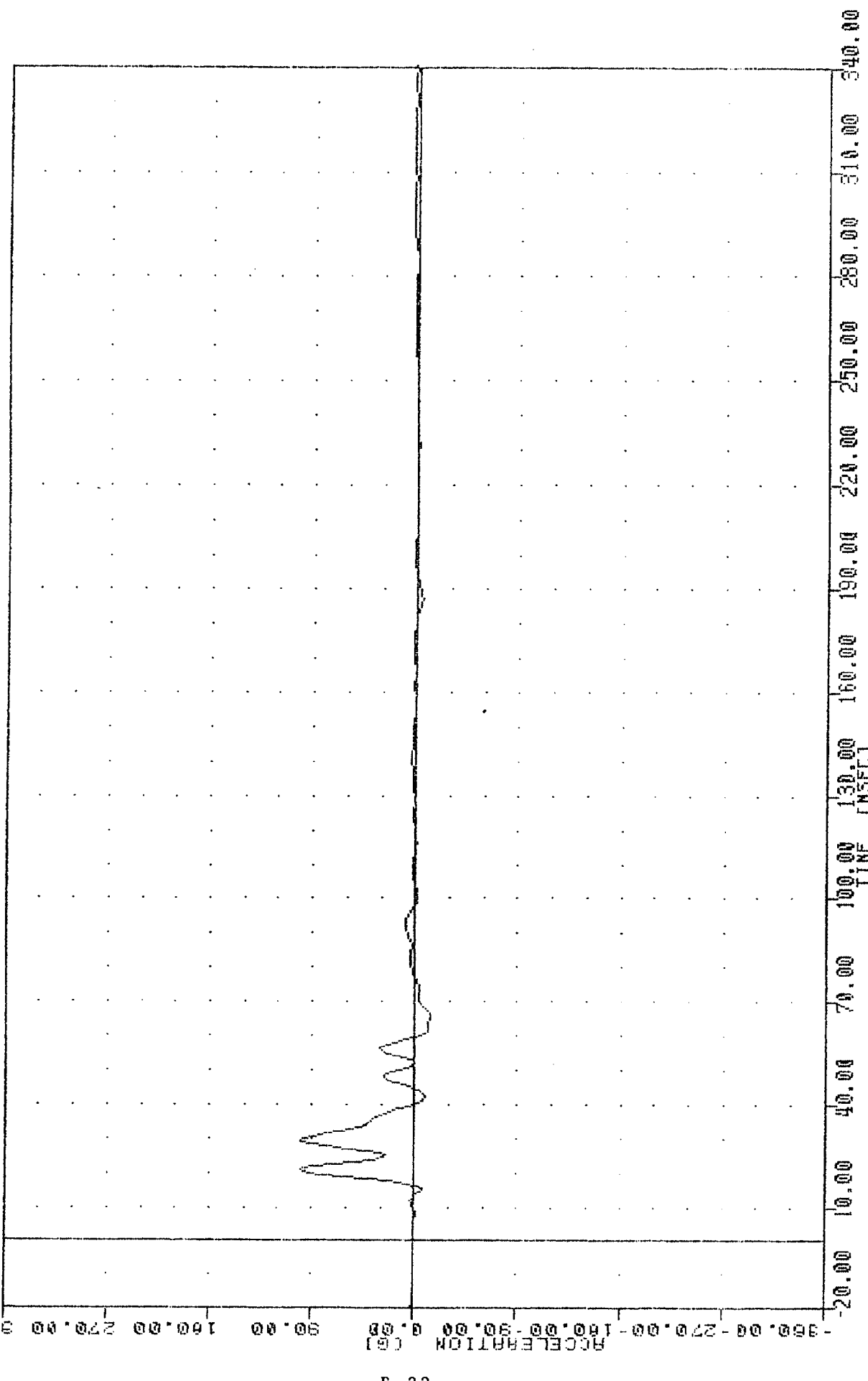


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12Y61

TRC 030330, 030330, 030330, 030330, 030330, 030330, 030330, 030330, 030330, 030330
 EVALUATION OF MOD VN FLEET
 832730000000
 T12YVA
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.05% -17.50, 41.72% 41.87
 PLOT DATE 4 OCT 83 13:33:37

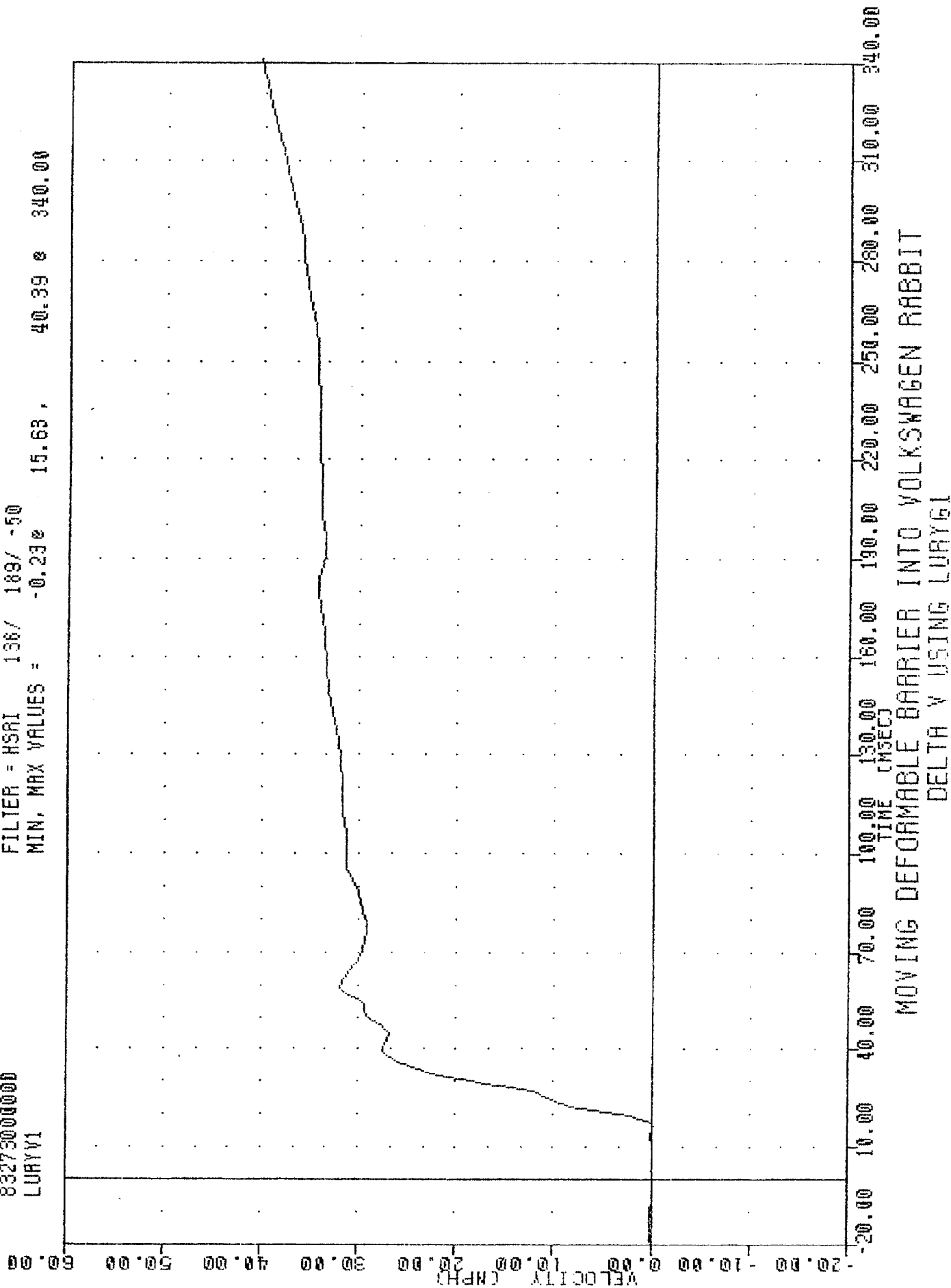


TRC 630930 4-OCT-83 10:47:45
 EVALUATION OF HOD VW FLEET
 83273000000
 LURY61
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -12.92e 65.63, 100.67 e 28.75

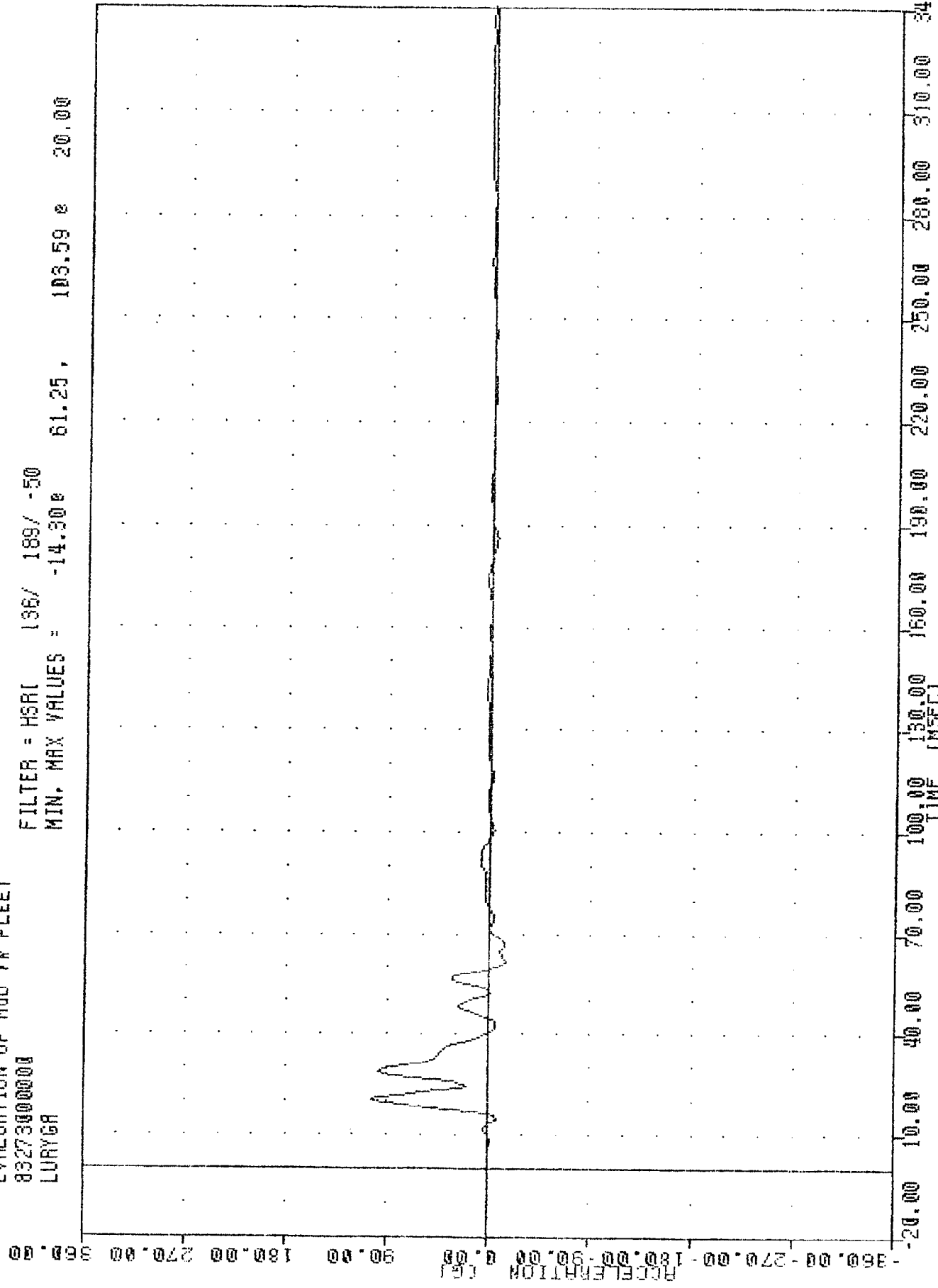


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LEFT UPPER RIB ACCELERATION Y AXIS

TRC 830930 PLOT DATE 4 OCT-83 13:39:37
 EVALUATION OF MDD VW FLEET
 83273000000
 LURYV1
 FILTER = HSAI 188/ 183/ -50
 MIN. MAX VALUES = -0.23e 15.63 , 40.39 e 340.00



TRC
 EVALUATION OF MOD VV FLEET
 83273000000
 LURYGA
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -14.30e 61.25, 103.59 e 20.00
 PLOT DATE 4-OCT-83 10:47:45



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

TAC 830930 4-OCT-83 13:39:37

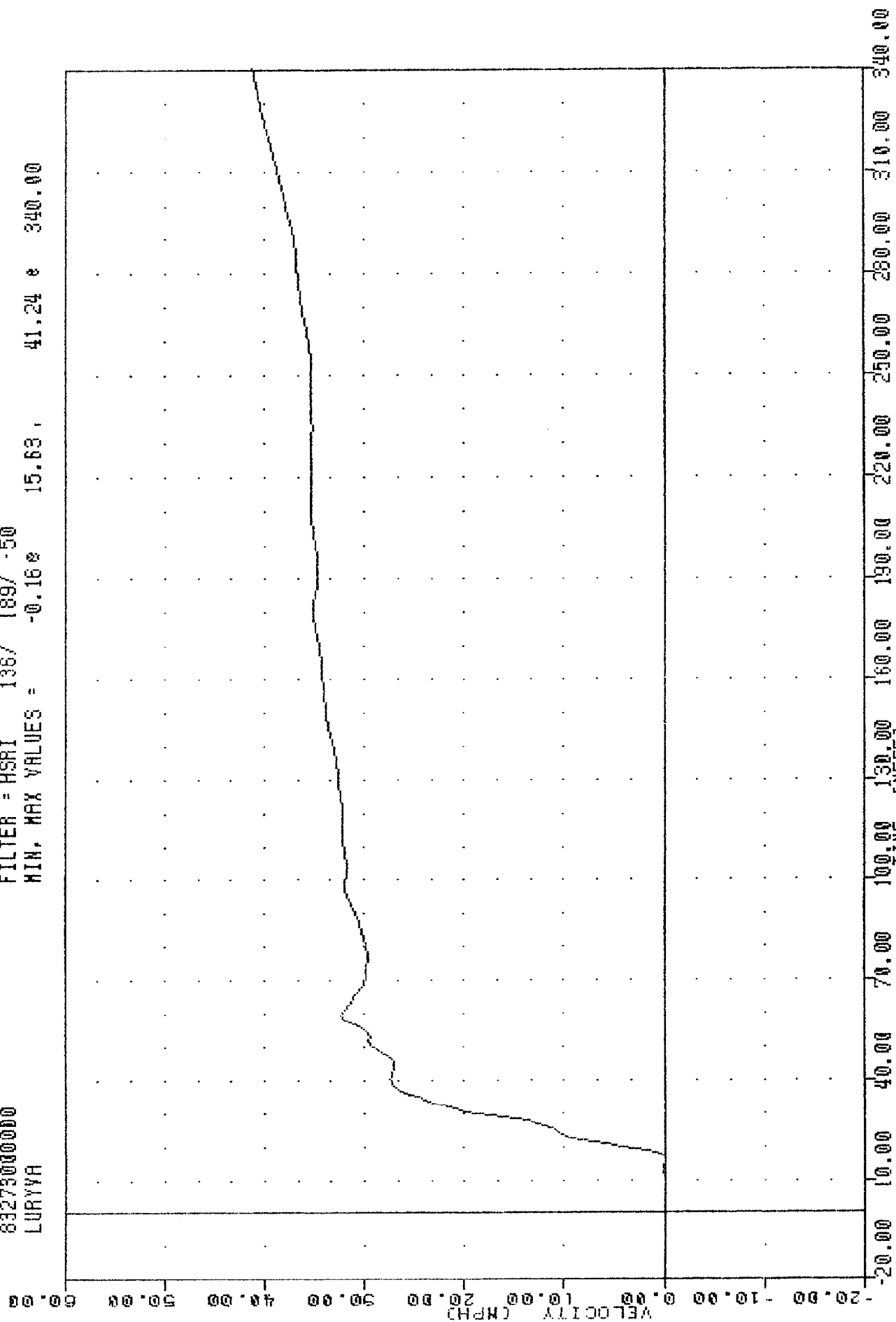
EVALUATION OF MOD VN FLEET

83273000000

LURYVA

FILTER = HSRI 136/ 189/ -50

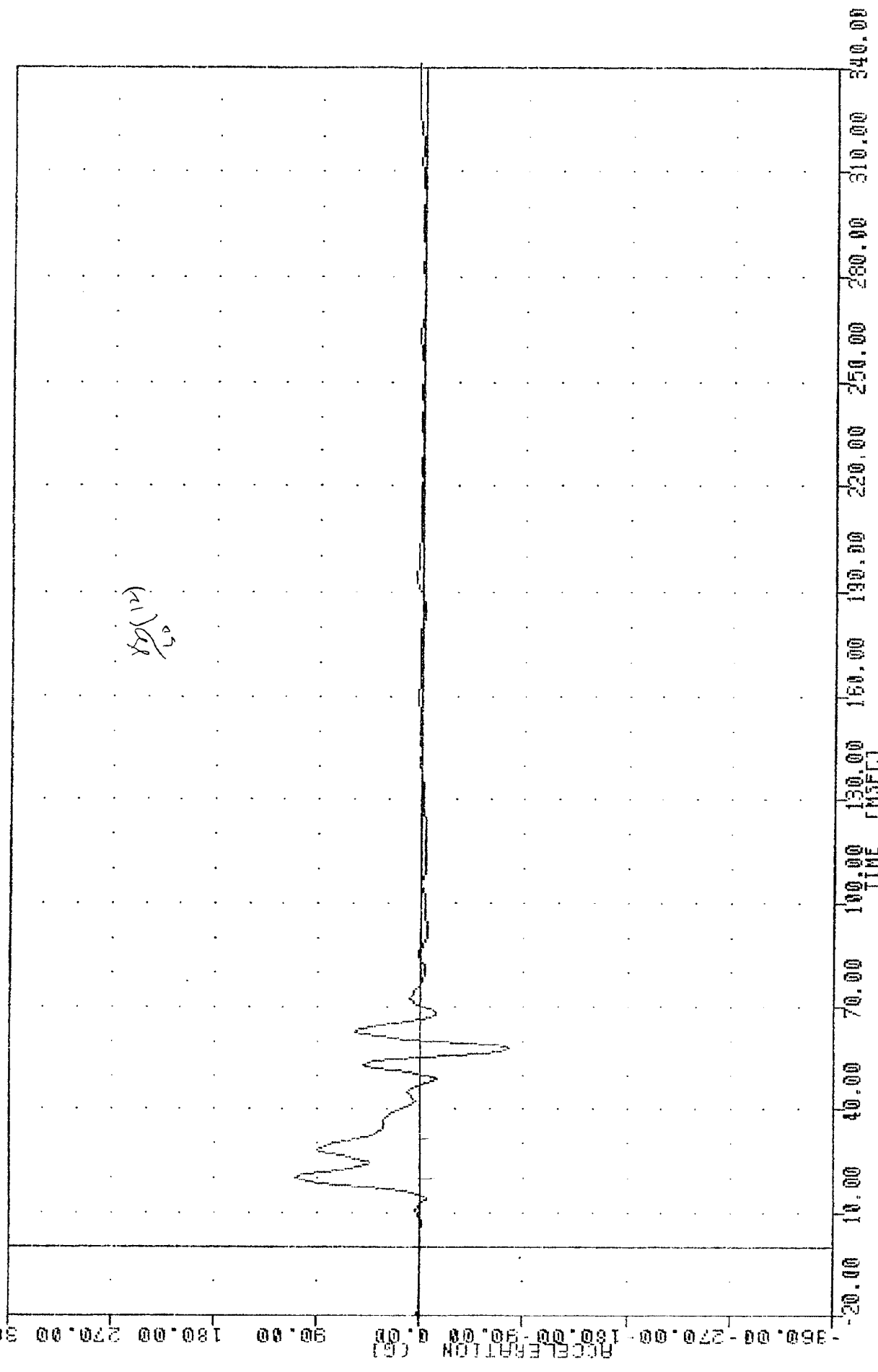
MIN, MAX VALUES = -0.160 15.63, 41.24 e 340.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING LURYGA

TRC
 EVALUATION OF MOD VN FLEET
 83273000000
 LLY61
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -78.65 56.87, 110.04 19.38
 PLOT DATE 4-OCT-83 10:47:45



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

TRC

8300330

PLOT DATE

4 OCT 83

13:39:37

EVALUATION OF MOD VW FLEET

832730000000

LLRYV1

FILTER = HSRL 136/ 189/ -50

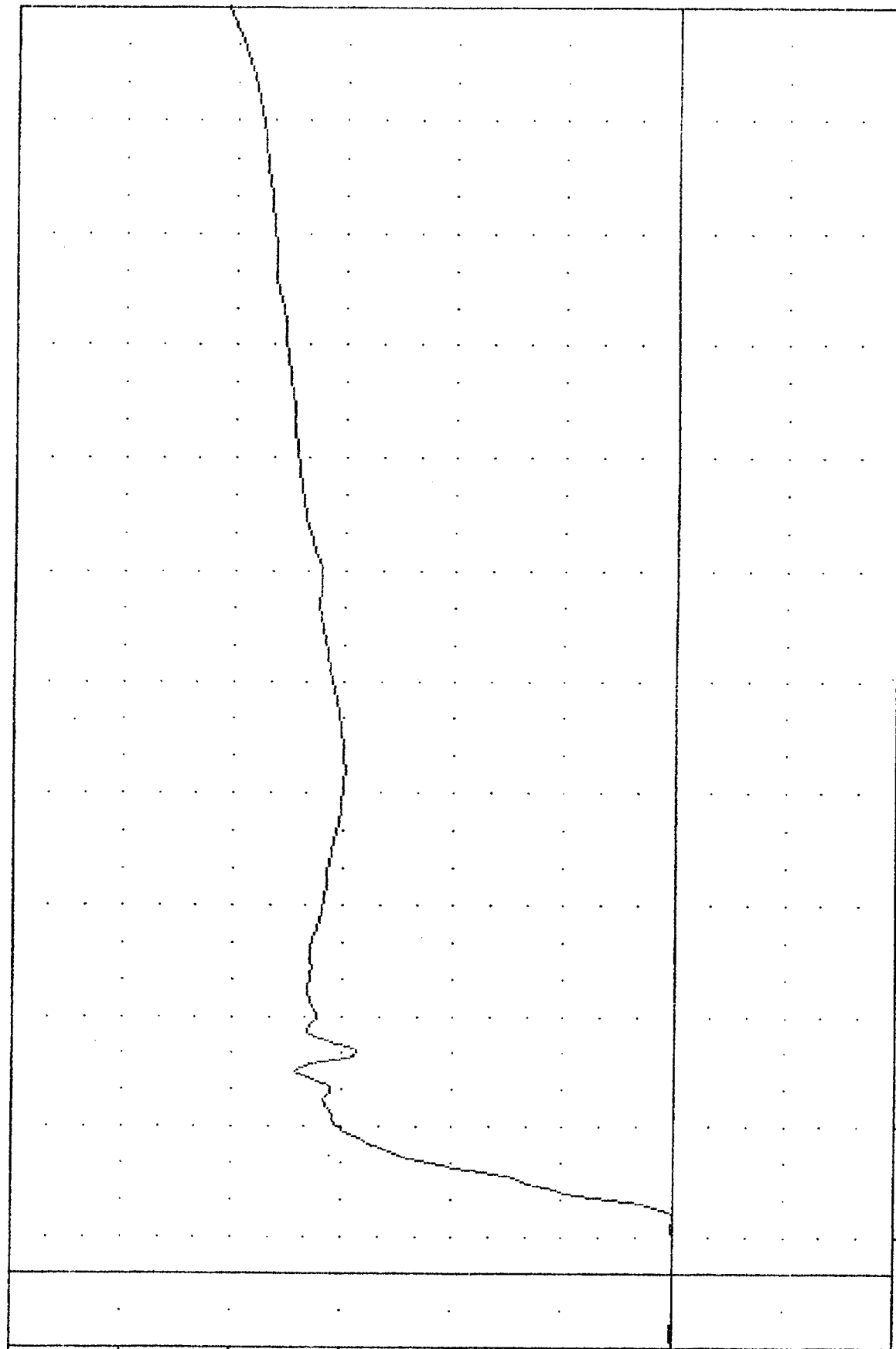
MIN. MAX VALUES = -0.10e

15.00,

40.86 e

340.00

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 LLRYG1

TAC

830530

PLOT DATE

4-OCT-83

10:47:45

EVALUATION OF MOD VW FLEET

832730000000

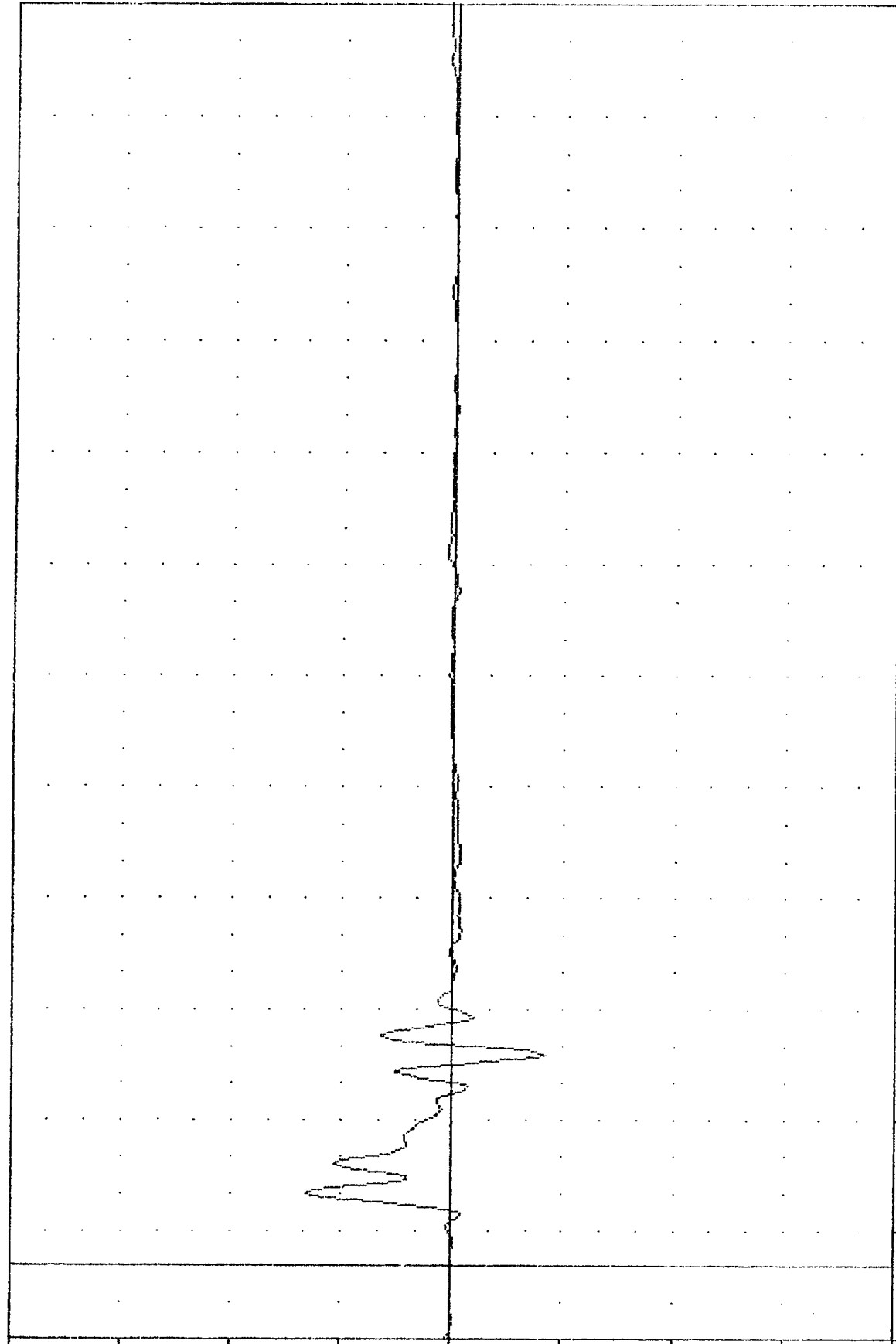
LLRYER

FILTER = HSRI 186/ 189/ -50

MIN. MAX VALUES = -75.91% 56.87

118.67 e 19.38

ACCELERATION (G)



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

TRC

832730000000

PLOT DATE 4-OCT-83 13:39:37

EVALUATION OF MOD VV FLEET

832730000000

LLAYVA

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.23e 15.00, 39.51 e 340.00

60.00

50.00

40.00

30.00

20.00

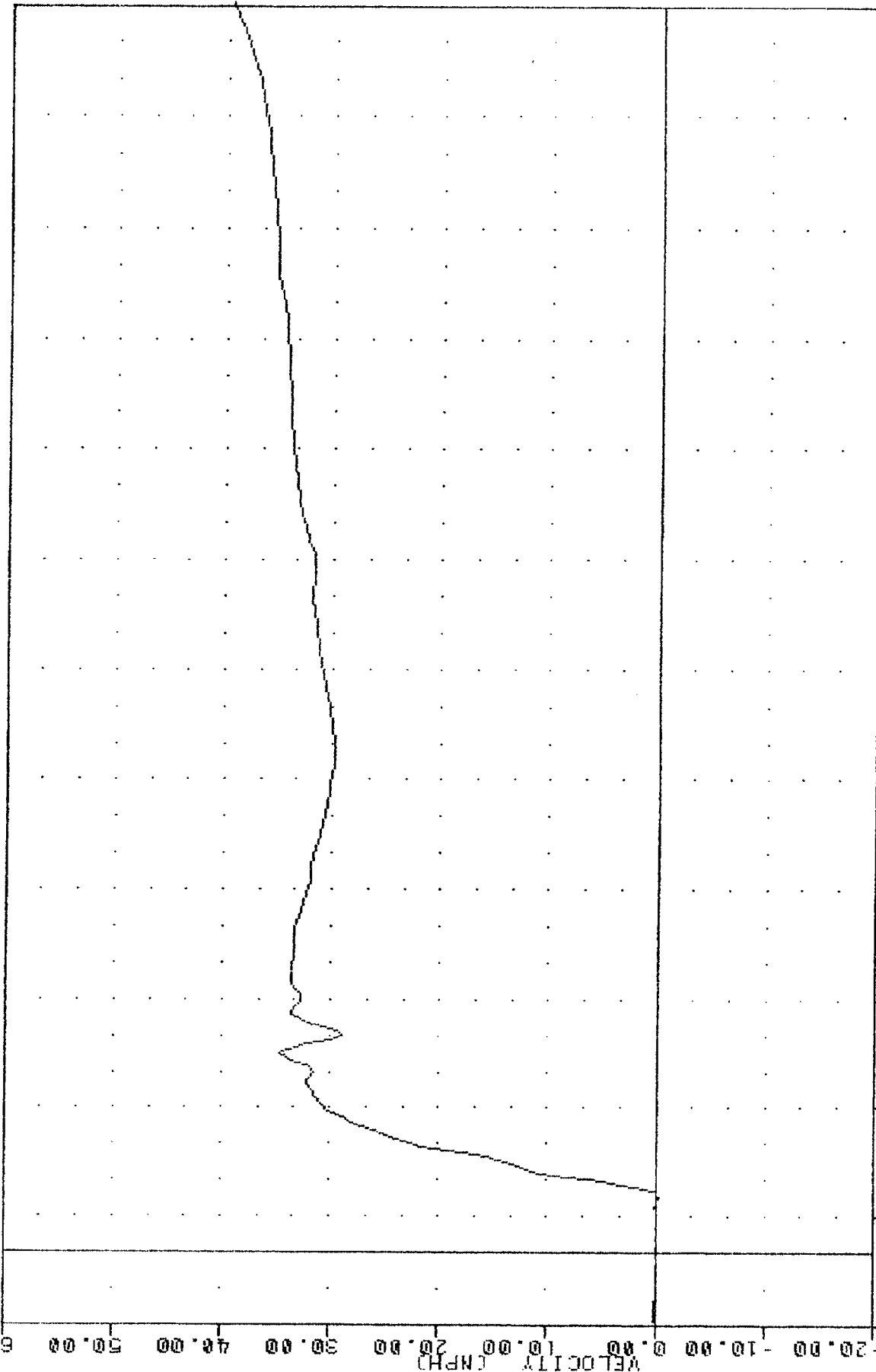
10.00

0.00

-10.00

-20.00

R-20



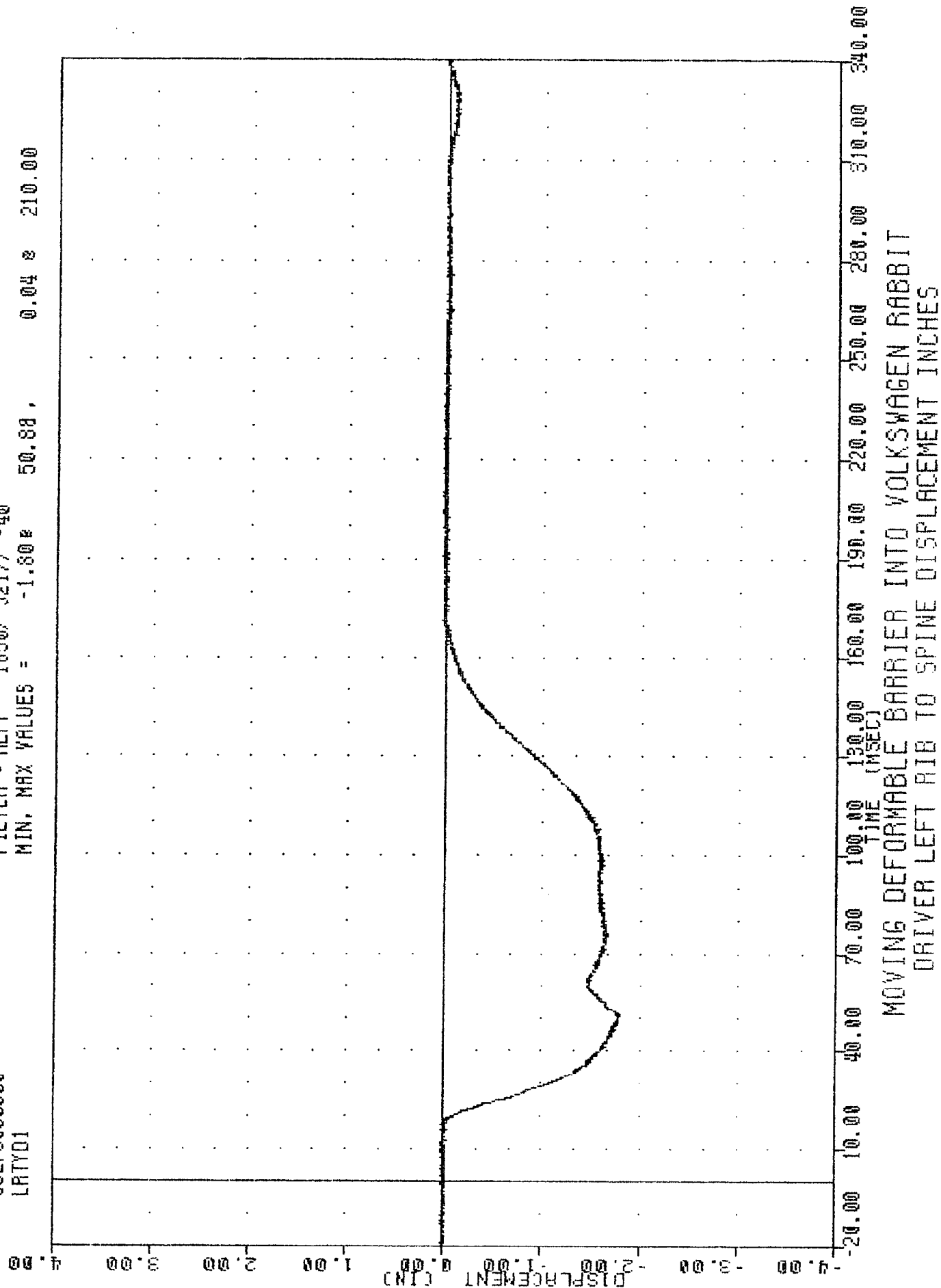
340.00 310.00 280.00 250.00 220.00 190.00 160.00 130.00 100.00 70.00 40.00 10.00 -20.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLAYVA

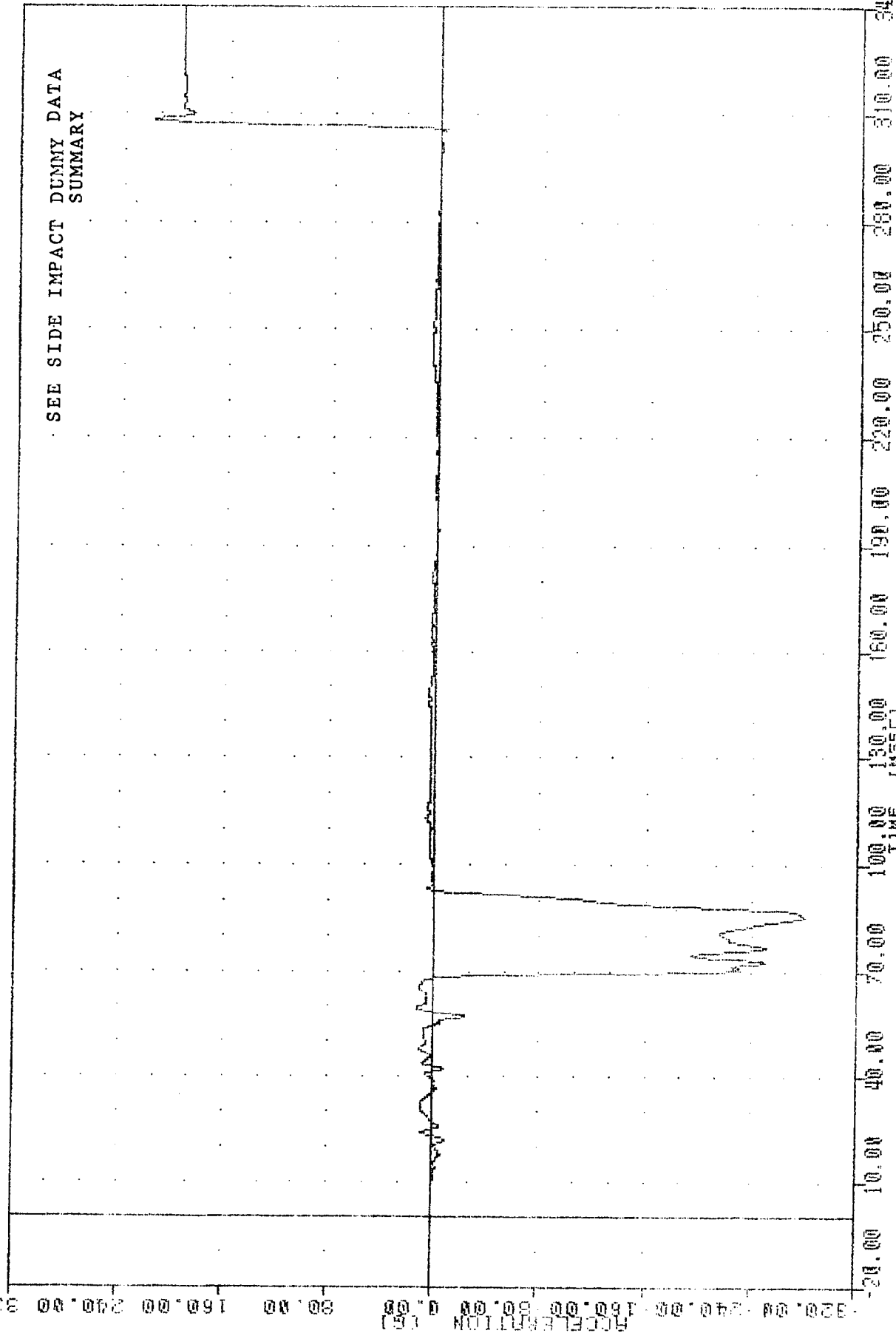
TRC
EVALUATION OF MOD VV FLEET
83273000000
LRDYD1

PLOT DATE 4-OCT-83 10:45:36

FILTER = ALPF 1650/ 5217/ -40
MIN. MAX VALUES = -1.80E 50.88, 0.04 E 210.00

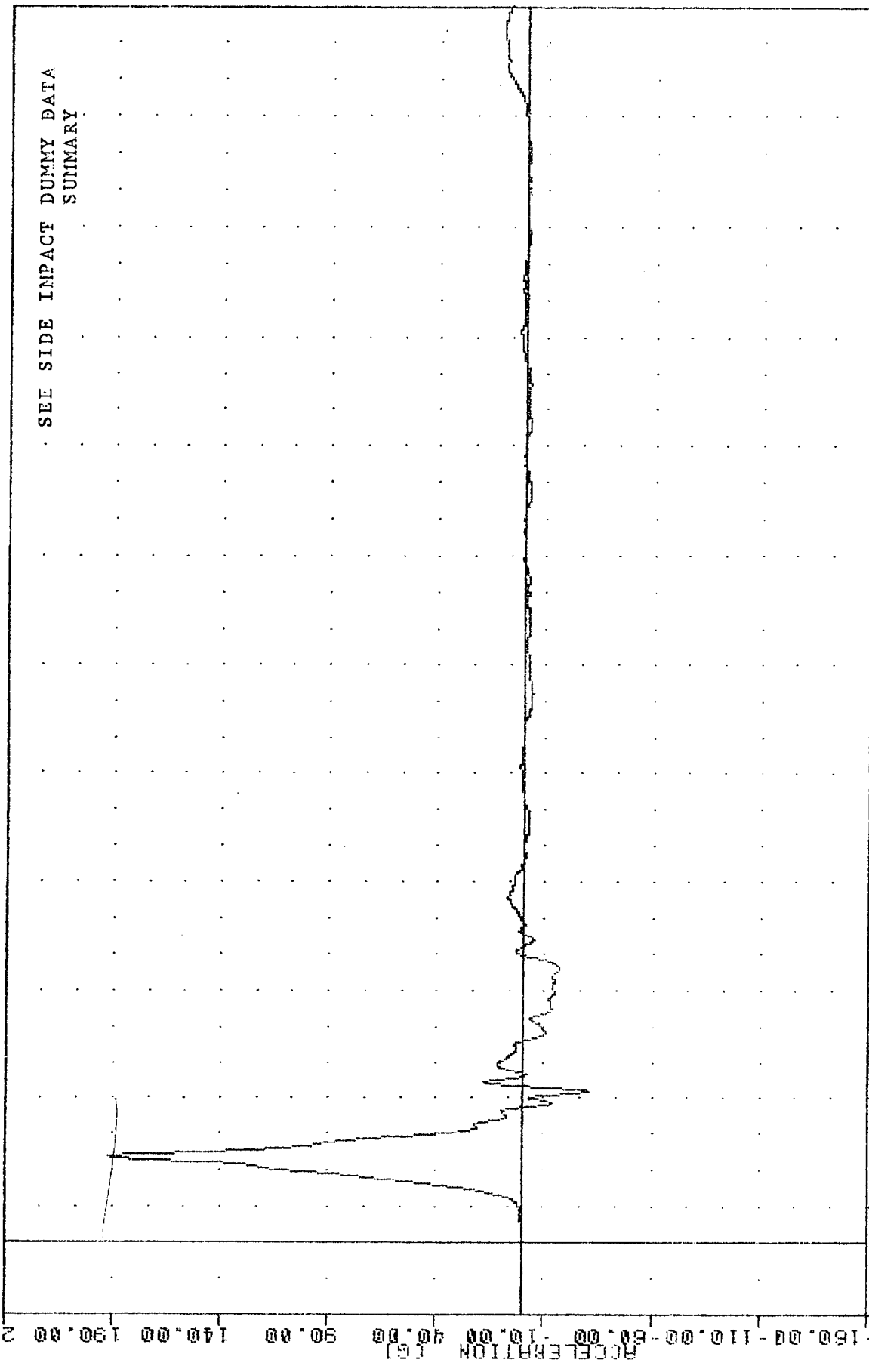


TRC
 EVALUATION OF MOD VW FLEET
 83273000000
 PEVXG1
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -280.43 85.13, 217.69 308.13
 PLOT DATE 12-06-83 18:30:22



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS ACCELERATION X AXIS

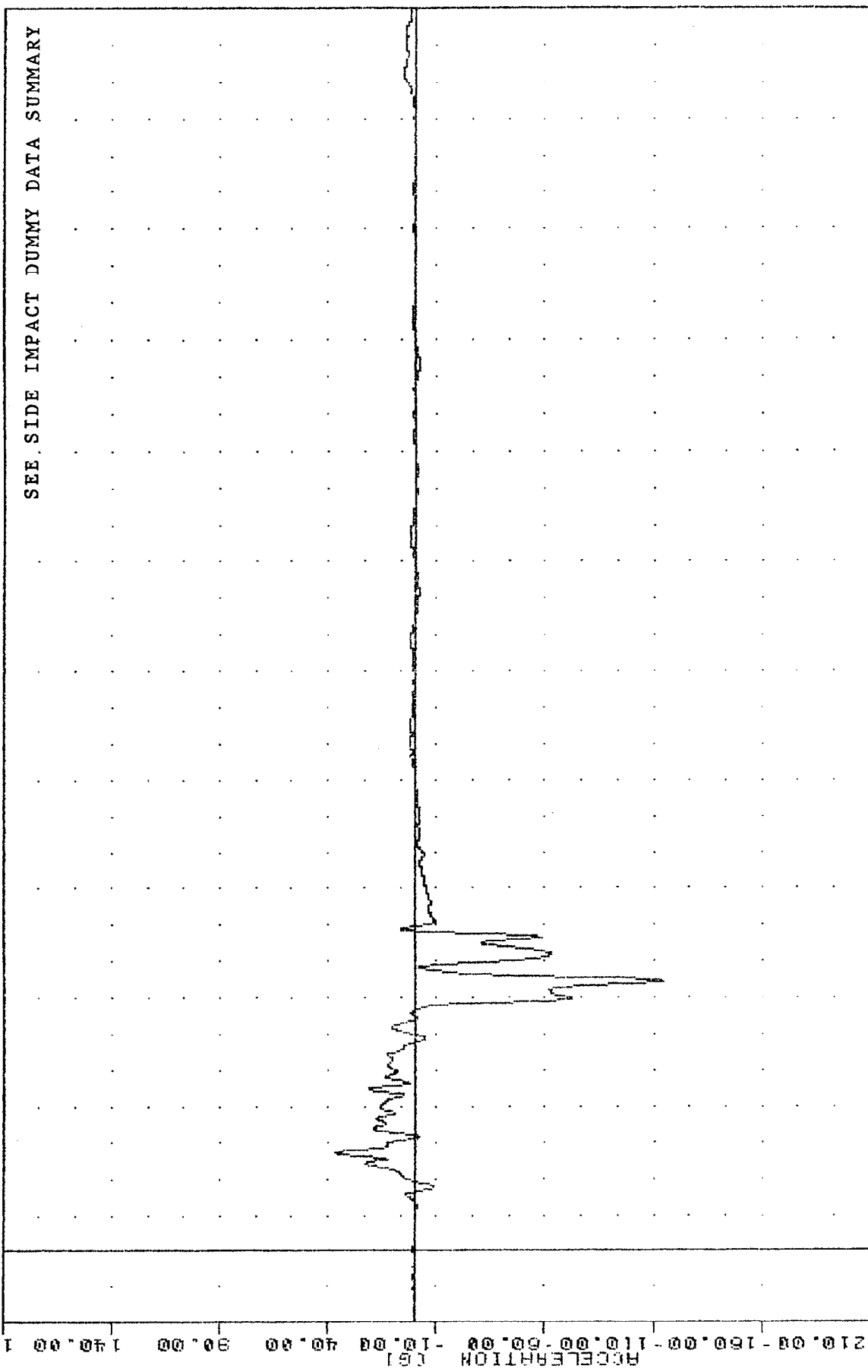
TRC 630930 4-OCT-83 10:45:36
 EVALUATION OF MOD VN FLEET
 83273000000
 PEVYG1
 FILTER = 8LPF 300/ 949/ -40
 MIN. MAX VALUES = -30.61e 41.75. 191.61 e 23.50



-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
 DRIVER PELVIS ACCELERATION Y AXIS

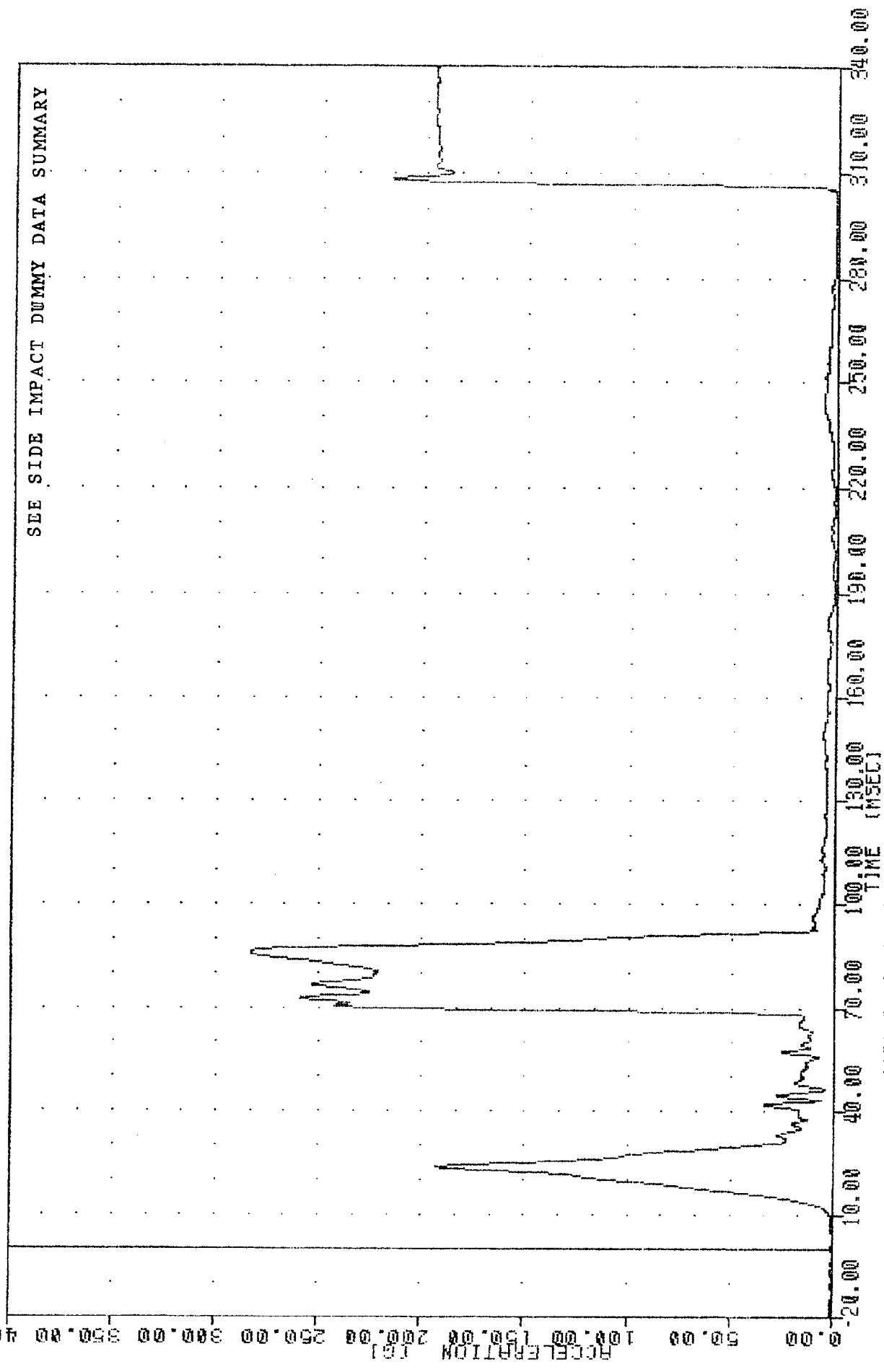
TRC [REDACTED], 830930 [REDACTED] 4-OCT-83 [REDACTED] 10:43:36
 EVALUATION OF MOD VW FLEET
 83273000000
 PEVZ61

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -114.57 74.38 36.55 26.88



-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
 DRIVER PELVIS ACCELERATION Z AXIS

TRC 630830 4-OCT-83 10:45:36
 EVALUATION OF MOD YW FLEET
 83273000000
 PEVRG1
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 0.038 2.88 282.64 8 85.38



SEE SIDE IMPACT DUMMY DATA SUMMARY

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS RESULTANT

TRC

830830

PLOT DATE

4-OCT-83

13:40:20

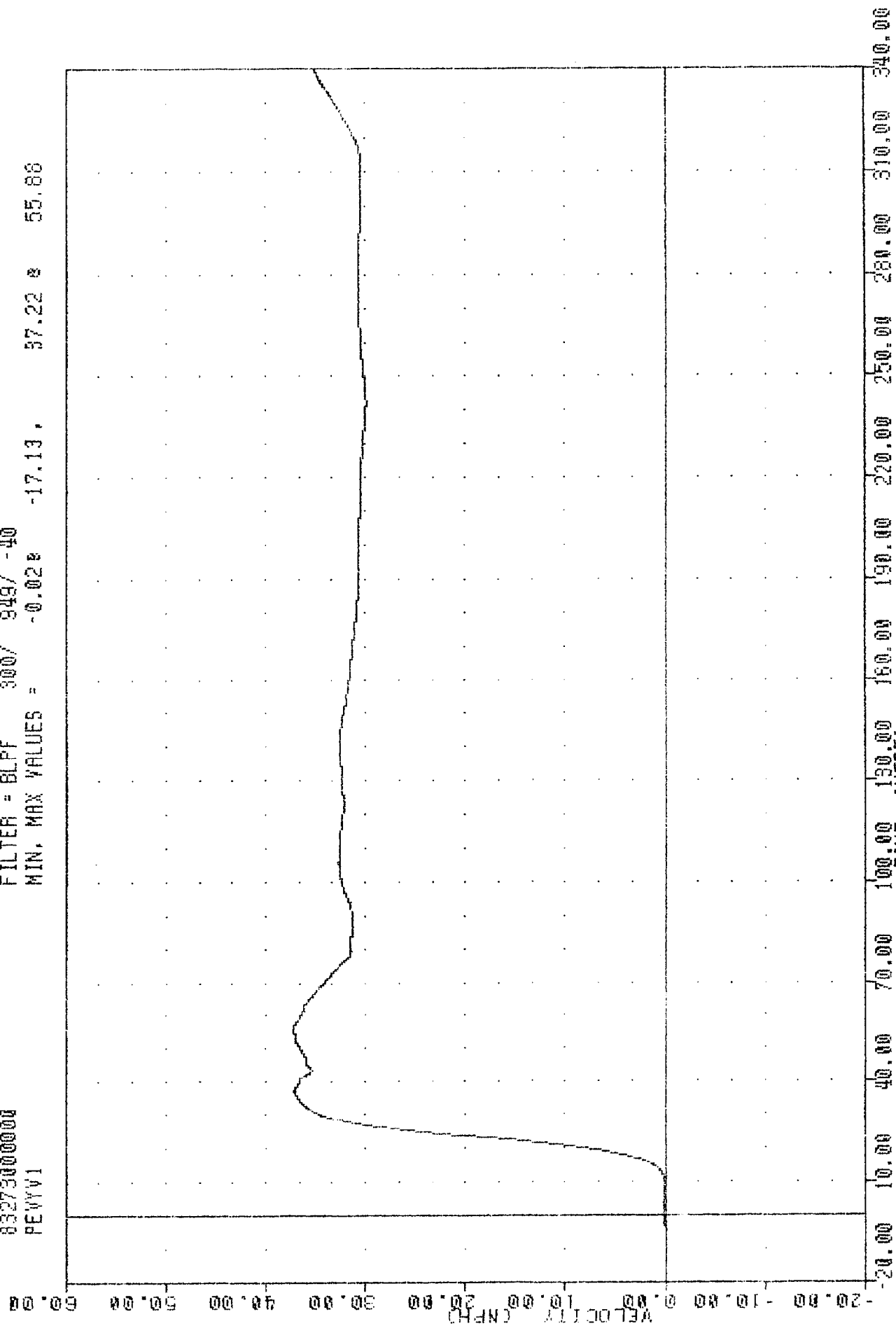
EVALUATION OF MOD VW FLEET

832730000000

PEVYV1

FILTER = BLPF 300/ 949/ -40

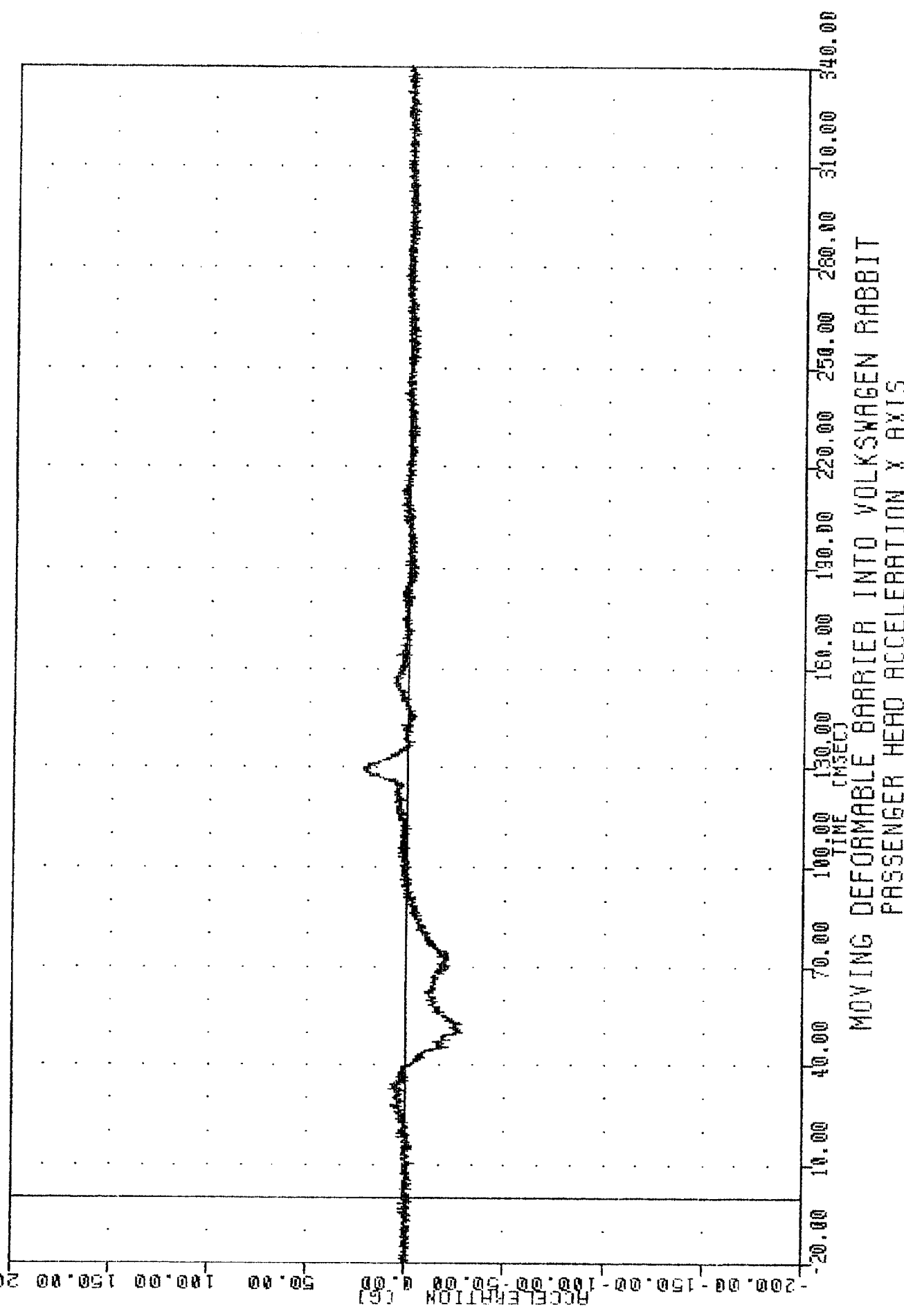
MIN. MAX VALUES = -0.028 -17.13, 37.22 8 55.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

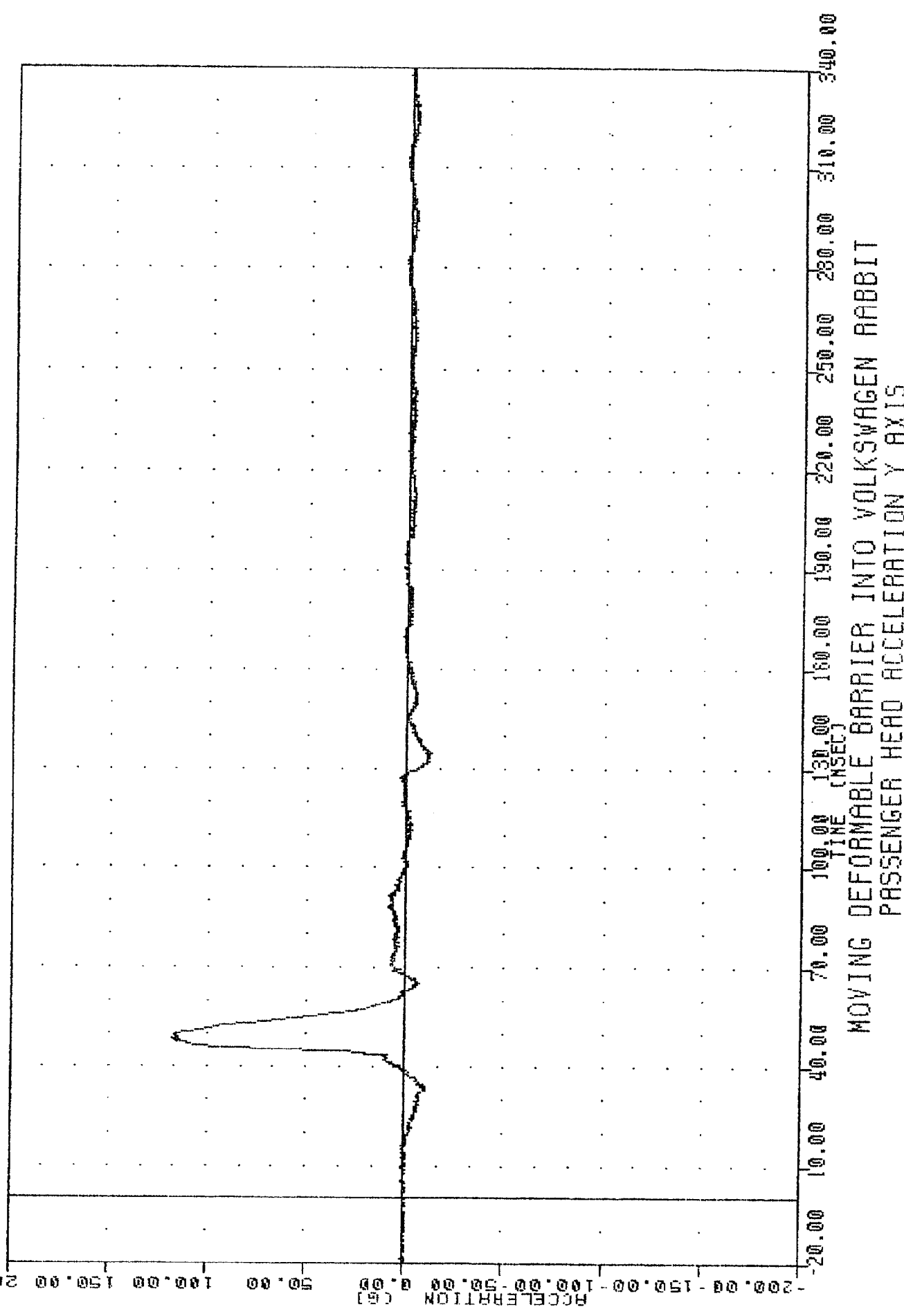
DELTA V USING PEVY61

TRC 830330 4 OCT 83 10:43:36
 EVALUATION OF MDD VW FLEET
 83273000000
 HEDXG3
 FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -28.25 52.50 22.98 129.88



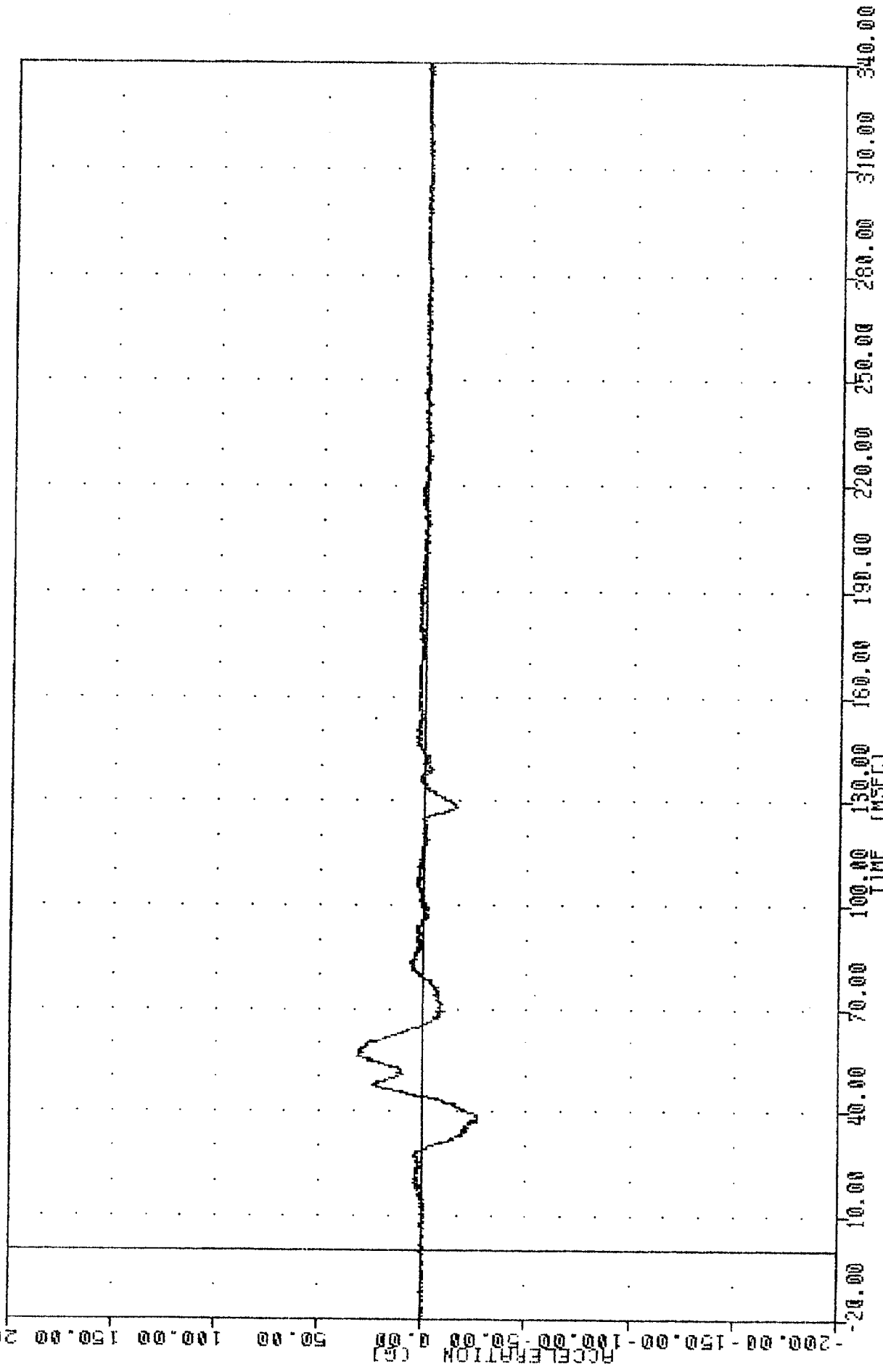
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER HEAD ACCELERATION X AXIS

TRC 800330 4-OCT-83 10.43.36
 EVALUATION OF MOD. VN FLEET
 63273000000
 HEDY63
 FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = -12.62 134.38 117.49 48.38



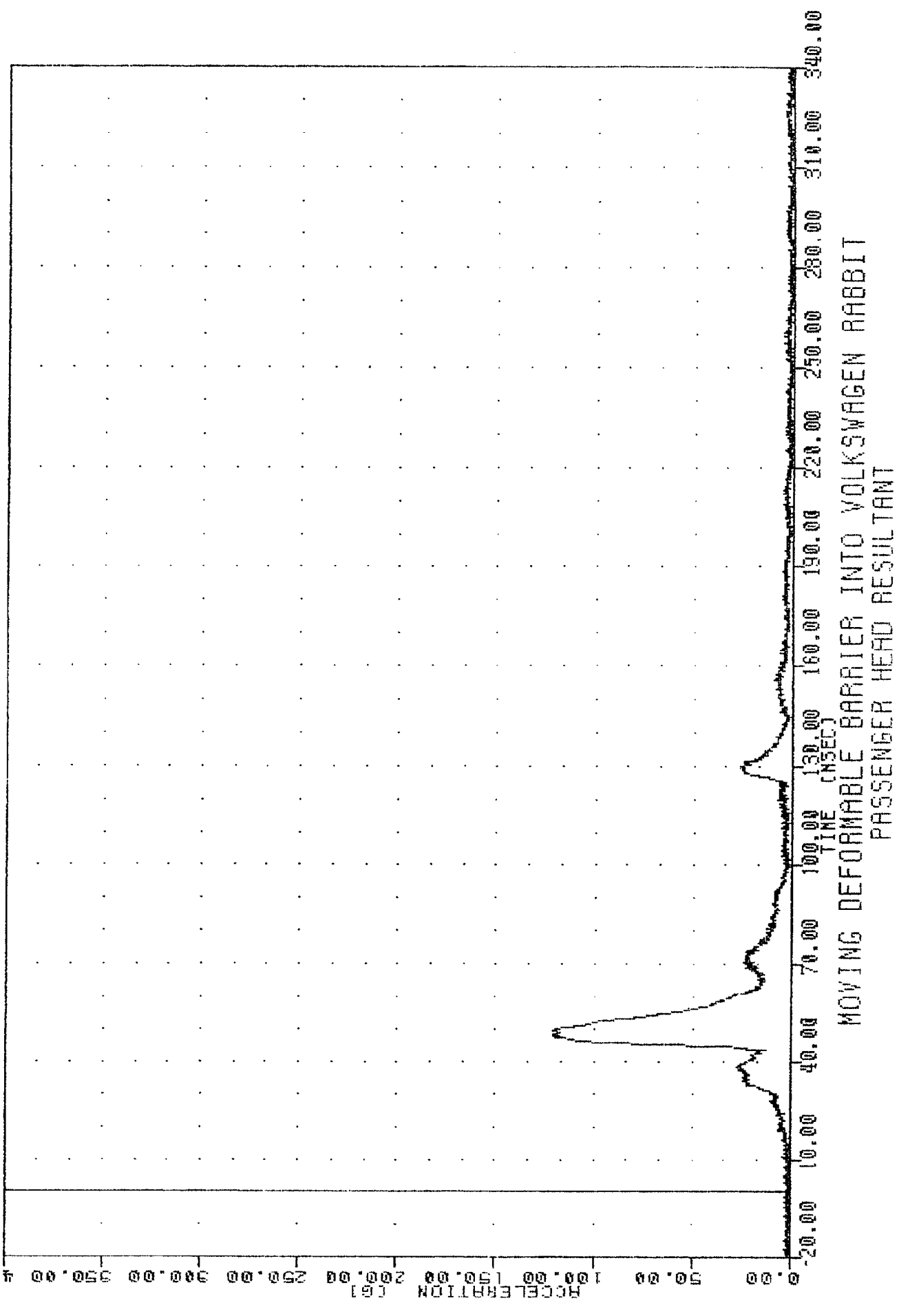
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER HEAD ACCELERATION Y AXIS

TRC
 EVALUATION OF MOD VW FLEET
 83273000000
 HEDZ63
 PLOT DATE 4-OCT-83 10:45:36
 FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -26.76e 38.00. 31.89 e 56.13

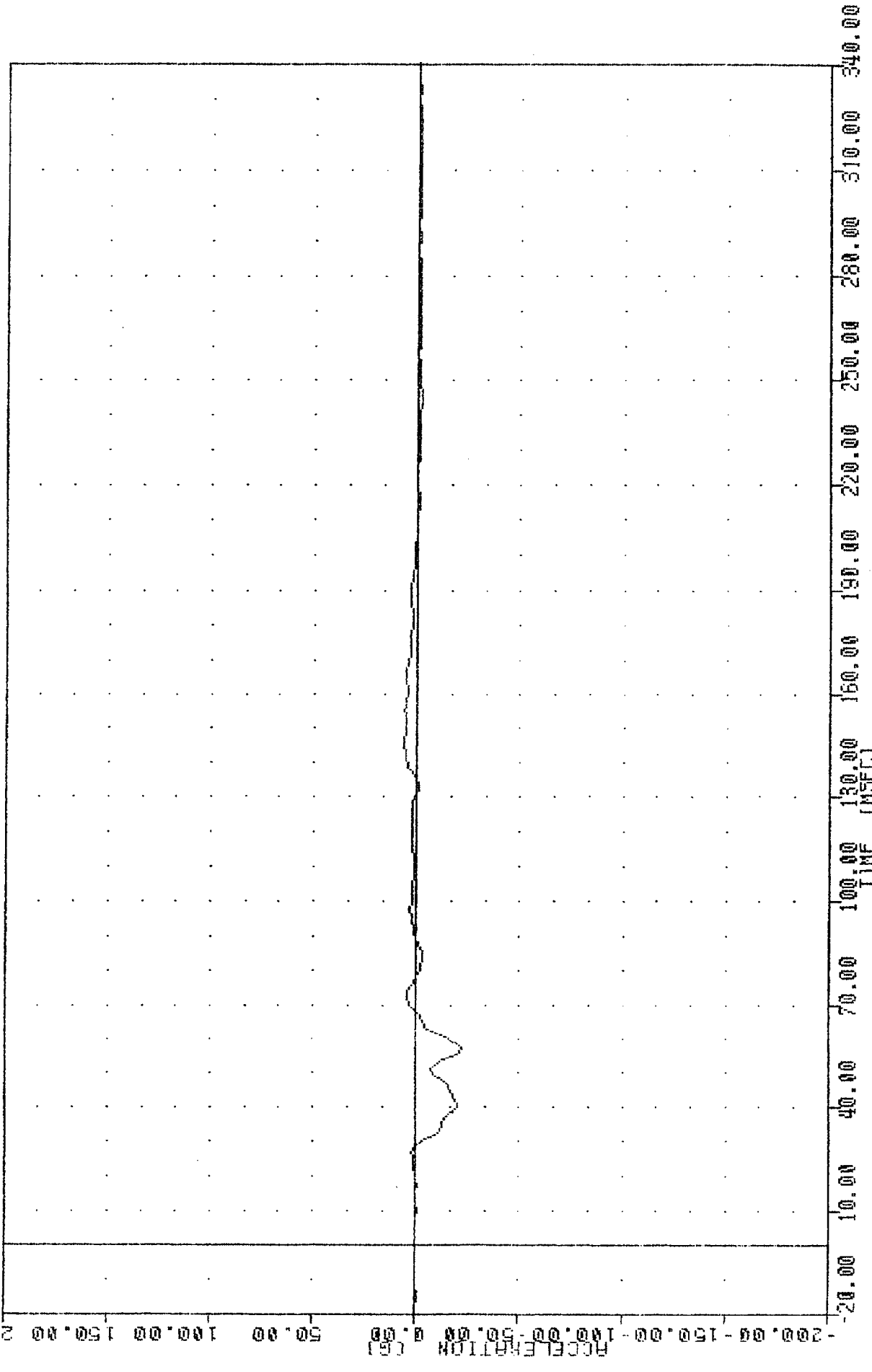


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER HEAD ACCELERATION Z AXIS

TAC 83273000000
 EVALUATION OF MOD VW FLEET
 HEDR63
 FILTER = ALPF 1650 / 5217 / -40
 MIN. MAX VALUES = 0.100 286.50 120.79 * 48.38
 PLOT DATE 4-06-83 10:43:36



TRC 830930
 EVALUATION OF MOD VV FLEET
 832730000000
 T01X63
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -21.86 56.25, 6.38 145.00
 PLOT DATE 4-OCT-83 10:47:45



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

TRC 550330 PLOT DATE 4-OCT-83 10:47:45

EVALUATION OF NDD VW FLEET

832730000000

T01Y63

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -6.052 136.88 ,

56.59 e 41.25

100.00

50.00

0.00

-50.00

-100.00

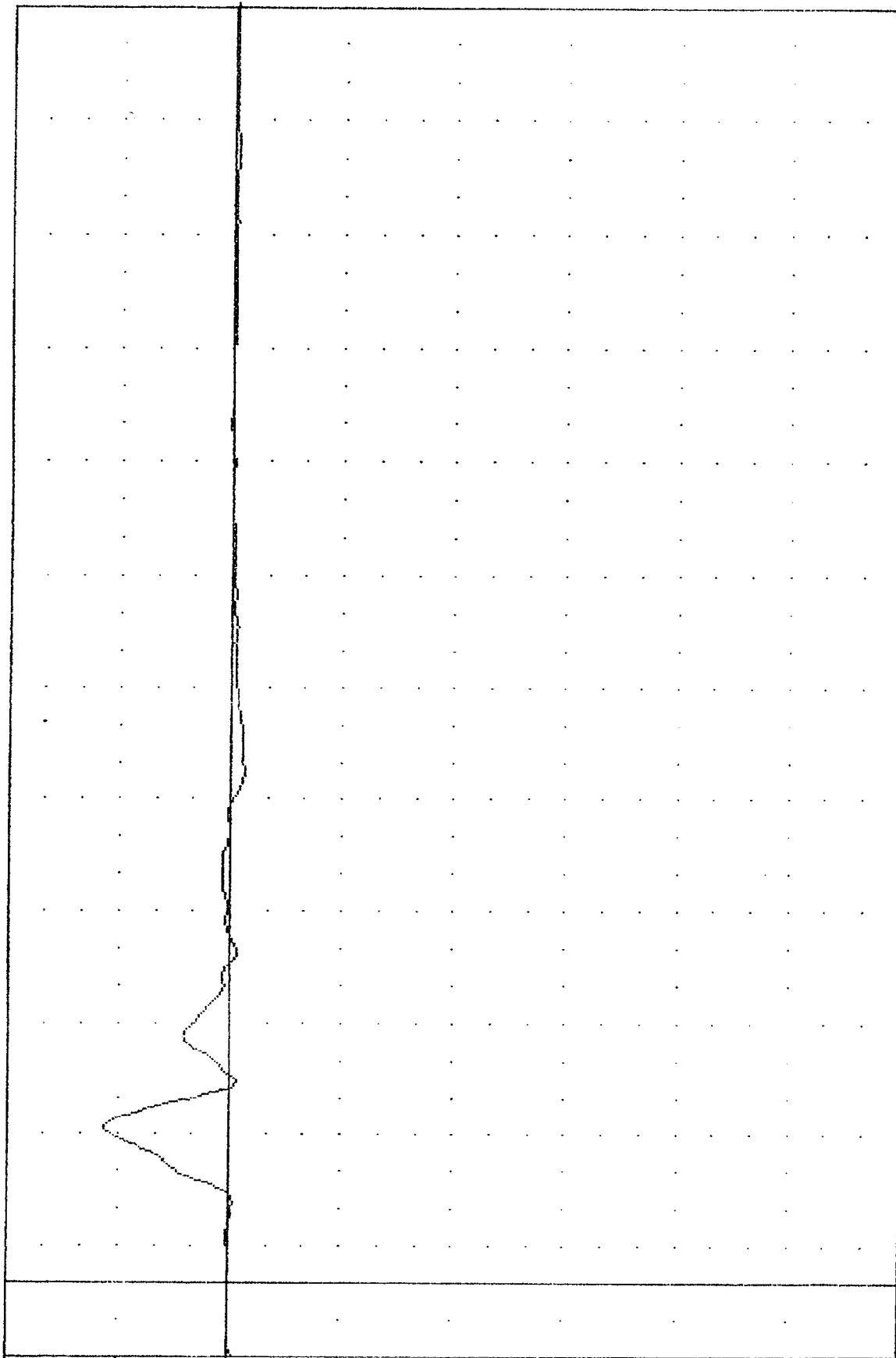
-150.00

-200.00

-250.00

-300.00

ACCELERATION (G)

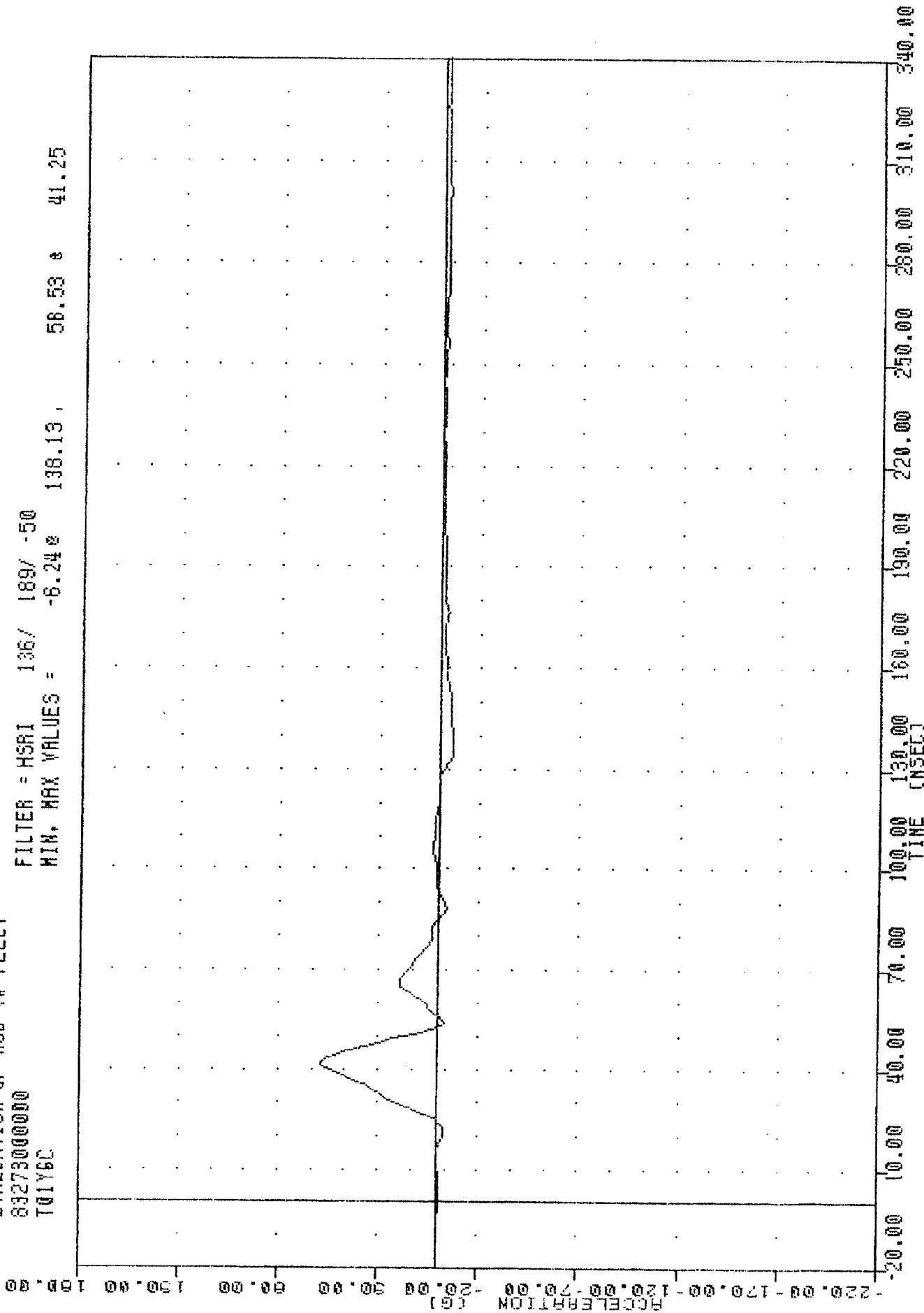


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (msec)

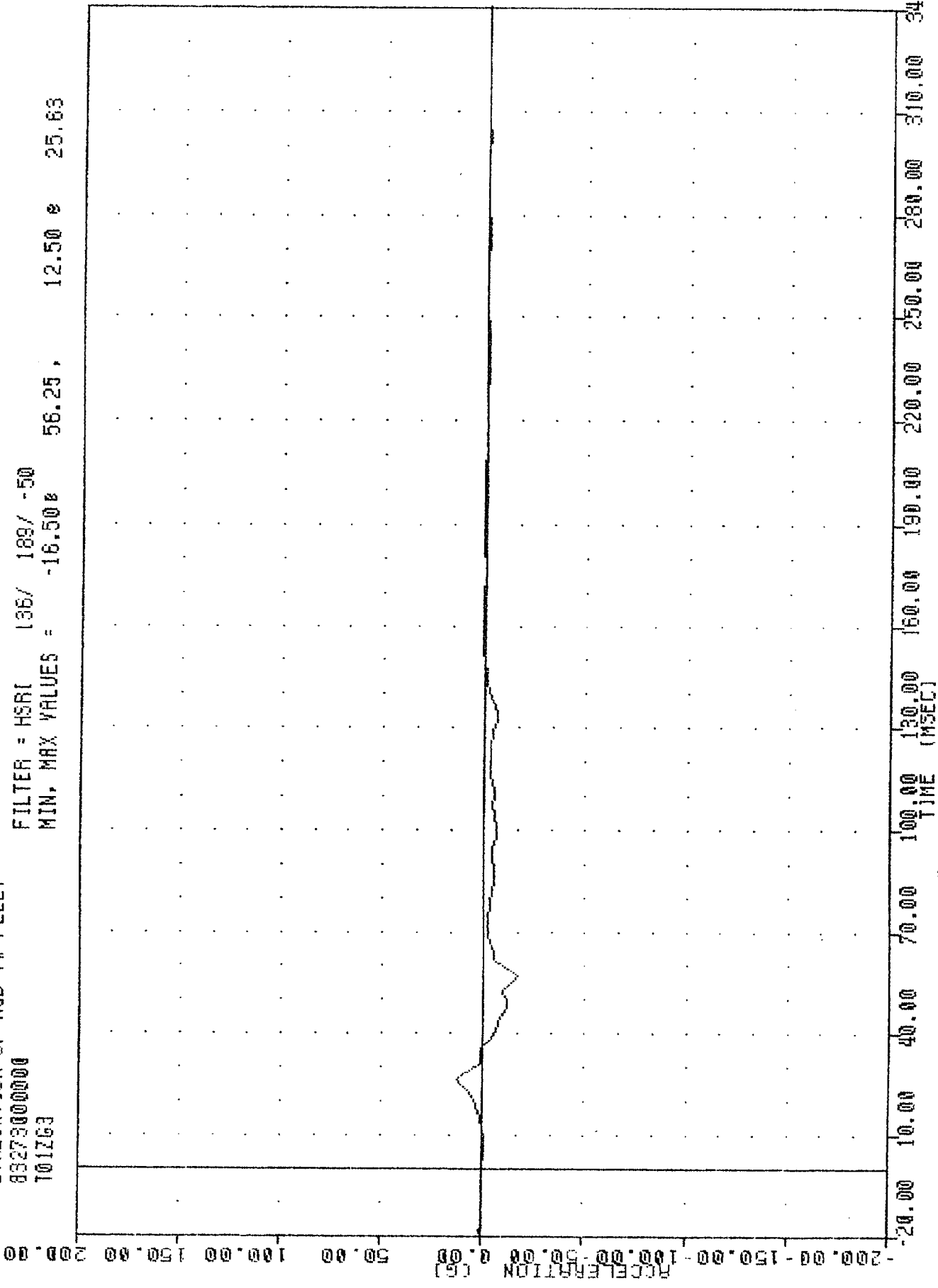
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE ACCELERATION Y AXIS

TAC 830930
 EVALUATION OF MOD VW FLEET
 83273000000
 T01Y6C
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -6.24 138.13 58.53 41.25
 PLOT DATE 4-OCT-83 10:47:45



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

TRC
 EVALUATION OF MOD VW FLEET
 83273000000
 T01263
 PLOT DATE 4-DCT-83 10:47:45
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -16.50g 56.25, 12.50 g 25.63



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

TAC 600330 PLOT DATE 4-OCT-83 10:47:45

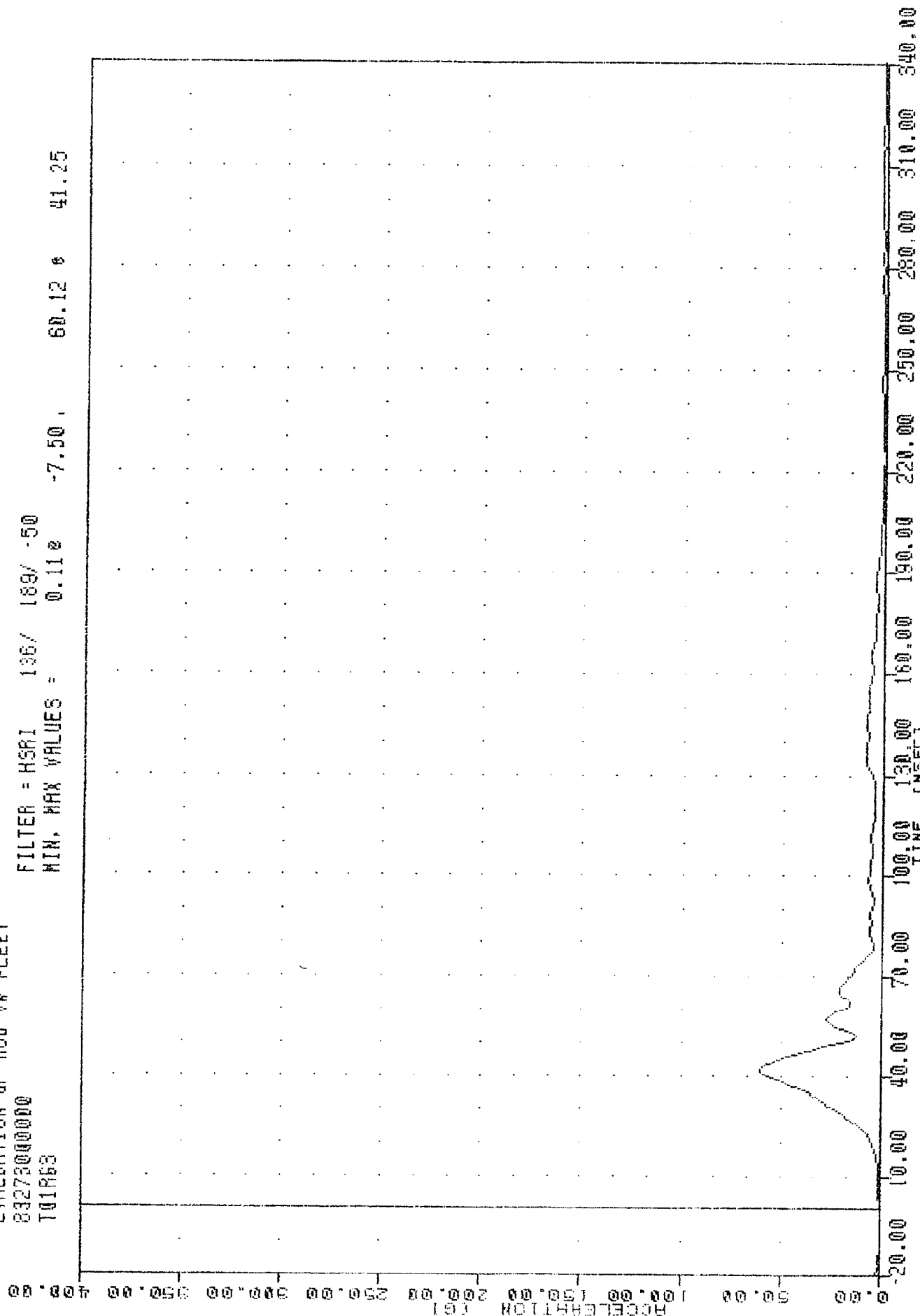
EVALUATION OF MOD VN FLEET

832730000000

T01R63

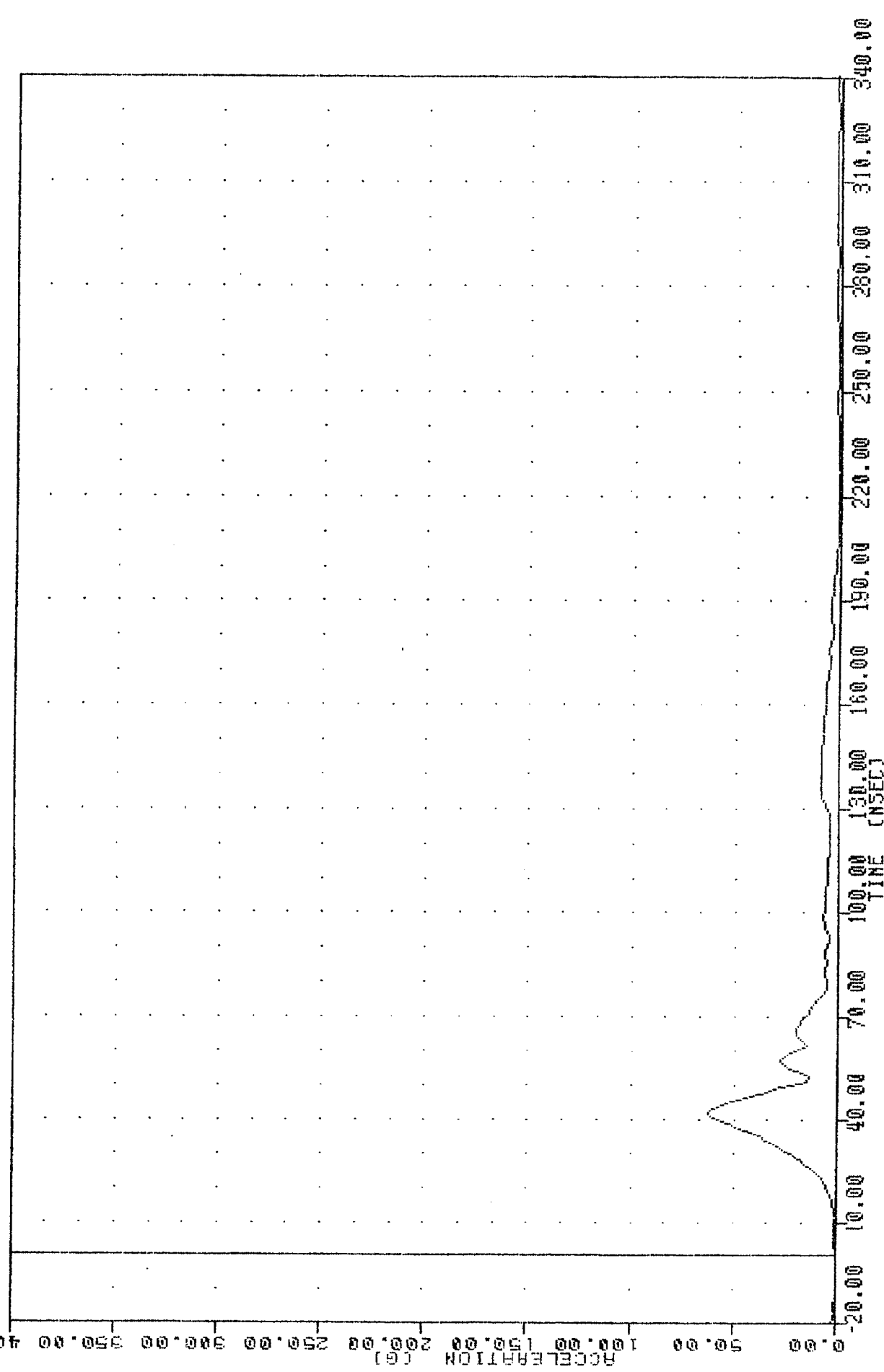
FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.112 -7.50 , 60.12 6 41.25



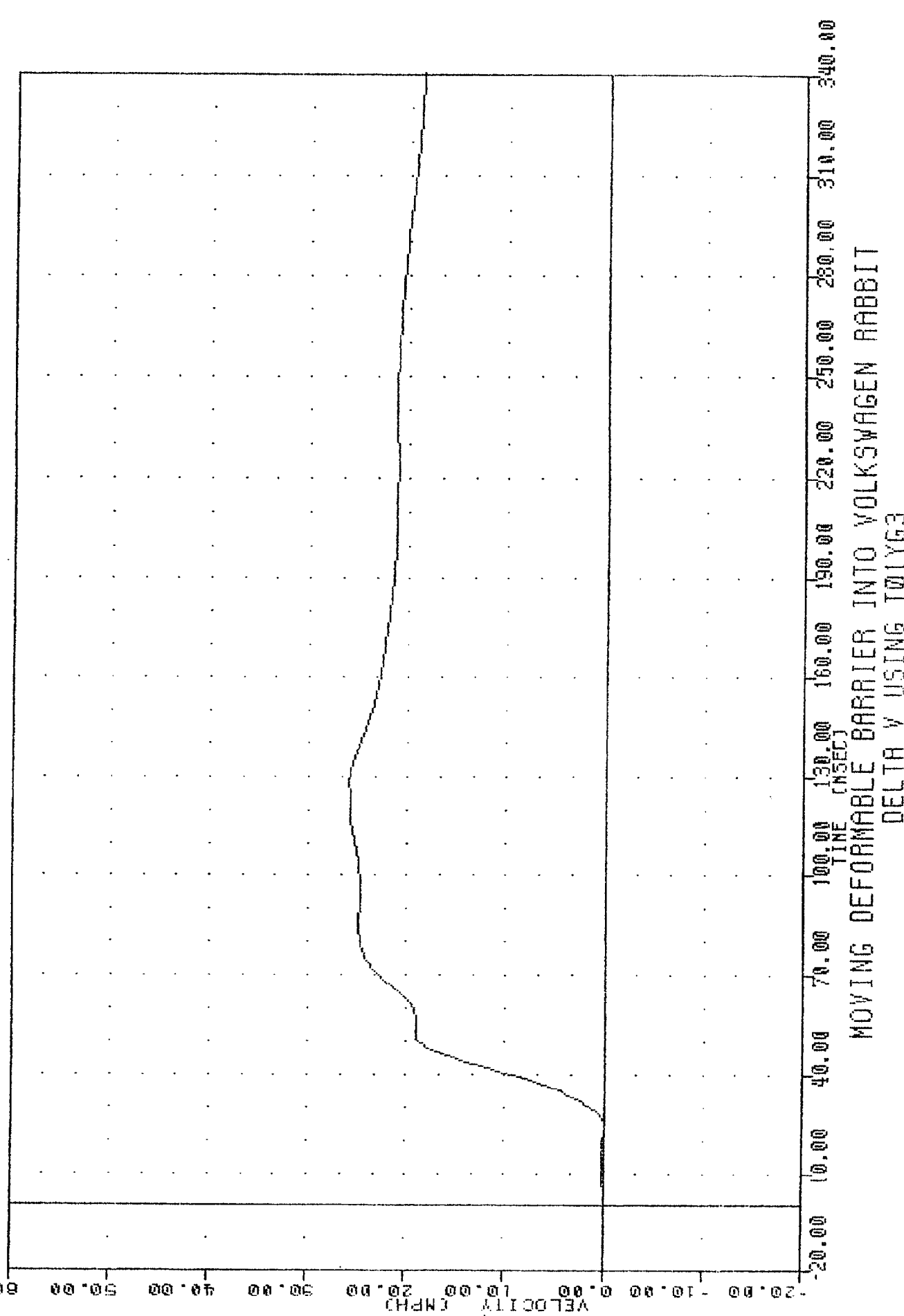
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE RESULTANT

TRC 830330
 EVALUATION OF MOD VN FLEET
 83275000000
 T01R63
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.10s -7.50, 61.95 s 41.25
 PLOT DATE 4 OCT 83 10:48:47



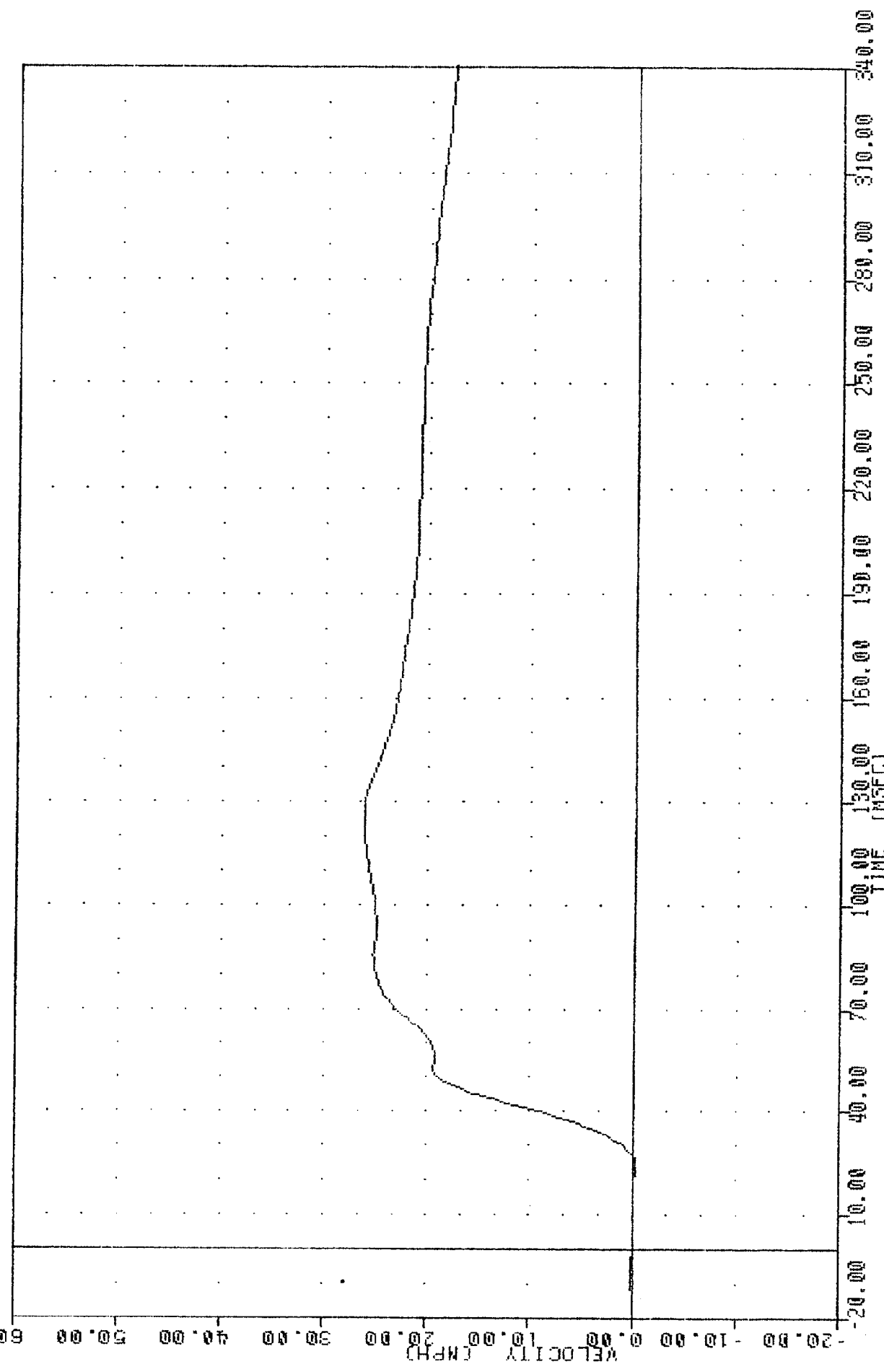
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE RESULTANT USING T01YGC

TRC 850330 4-OCT-83 13:38:37
 EVALUATION OF MOD VN FLEET
 832730000000
 T01YV3



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T01YV3

TRC 832730000000
 EVALUATION OF MOD VW FLEET
 T01YVC
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.38% 23.75, 26.19 e 127.50
 PLOT DATE 4-OCT-83 13:39:37



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T01YGC

TRC 830930 PLOT DATE 4-OCT-83 10:47:45

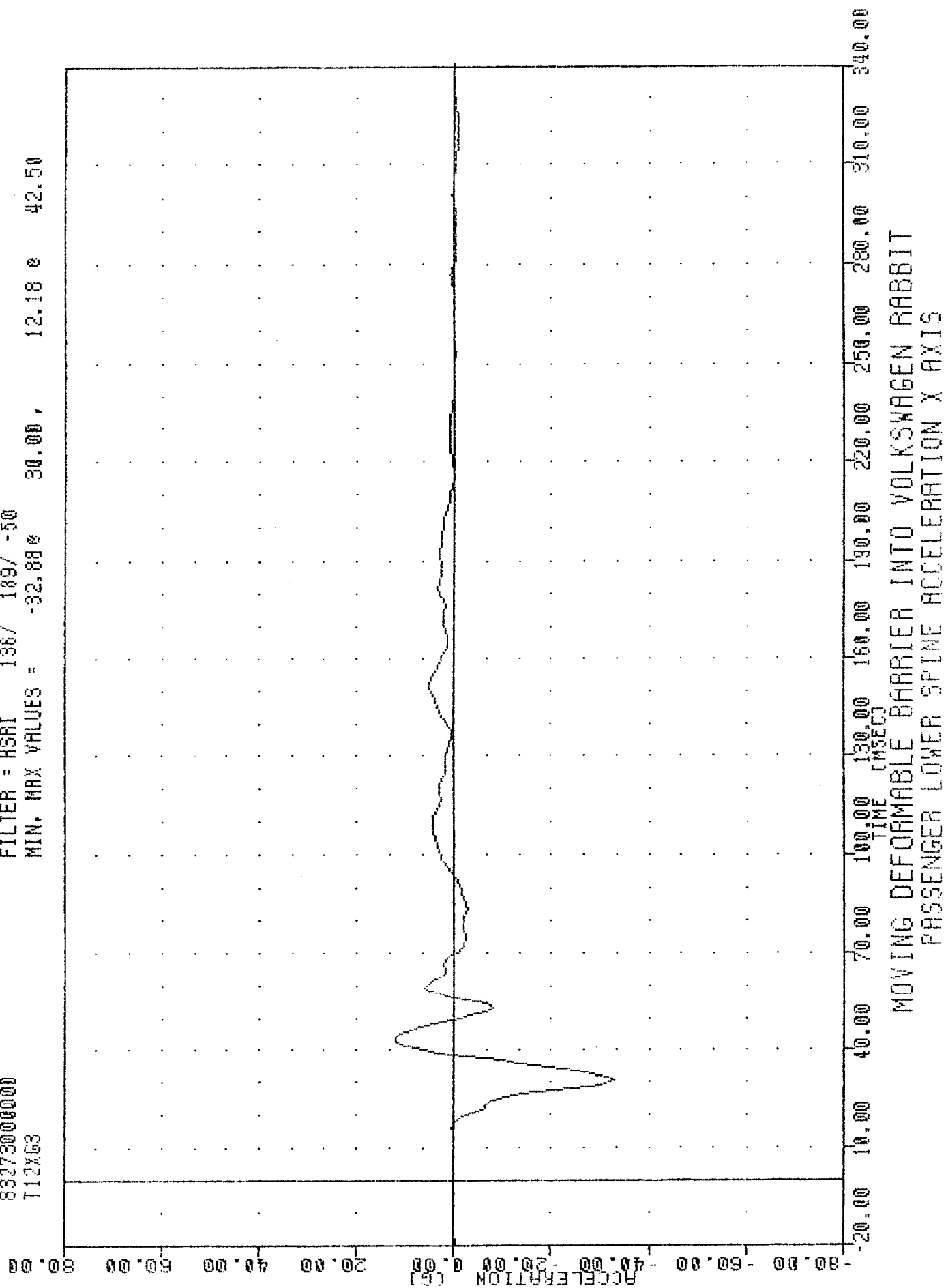
EVALUATION OF MDD VW FLEET

832730000000

T12XG3

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -32.88% 30.00, 12.18 42.50



TAC 830930 4-OCT-83 10:47:45

EVALUATION OF MOD VN FLEET

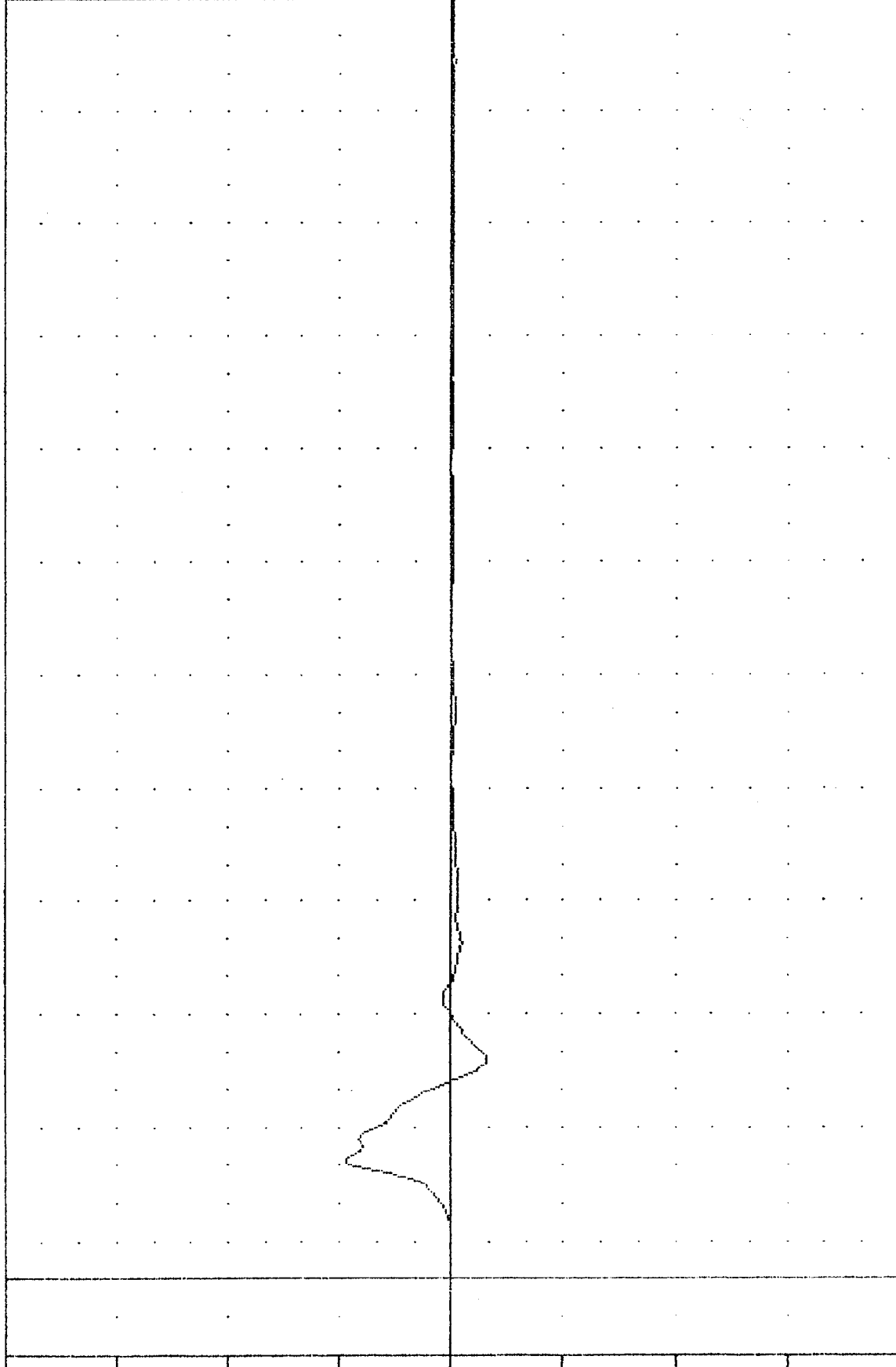
832730000000

T12Y63

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -28.39 57.50 25.41 e 30.00

ACCELERATION (G)



-350.00 -270.00 -190.00 -110.00 -30.00 50.00 130.00 210.00 290.00 350.00

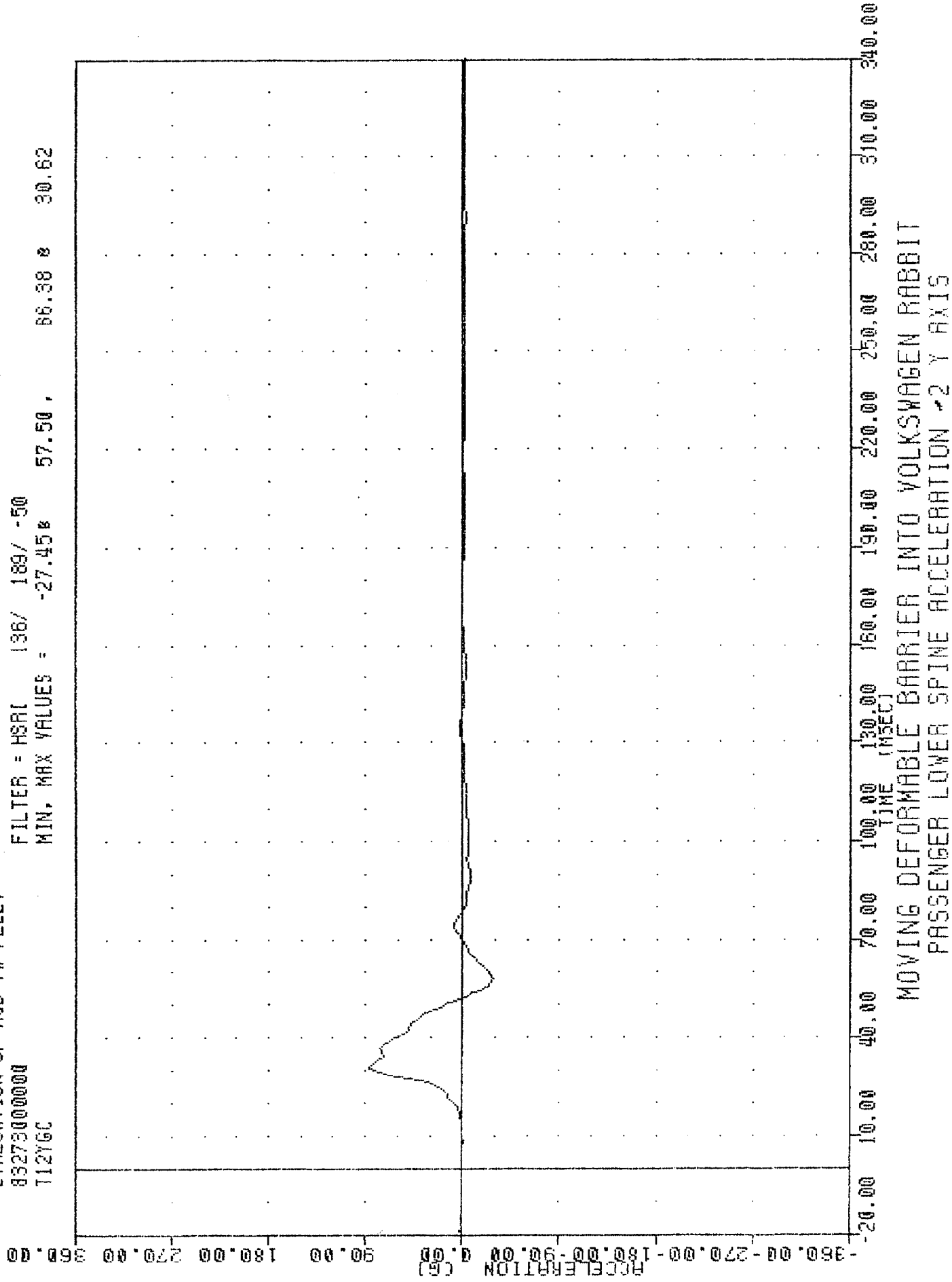
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE ACCELERATION Y AXIS

TRC
EVALUATION OF MOD YW FLEET
83273000000
T12YGC

PLOT DATE 4-OCT-83 10:47:45

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -27.45% 57.50, 86.38 % 30.62



TRC

830930

4-OCT-83

10:47:45

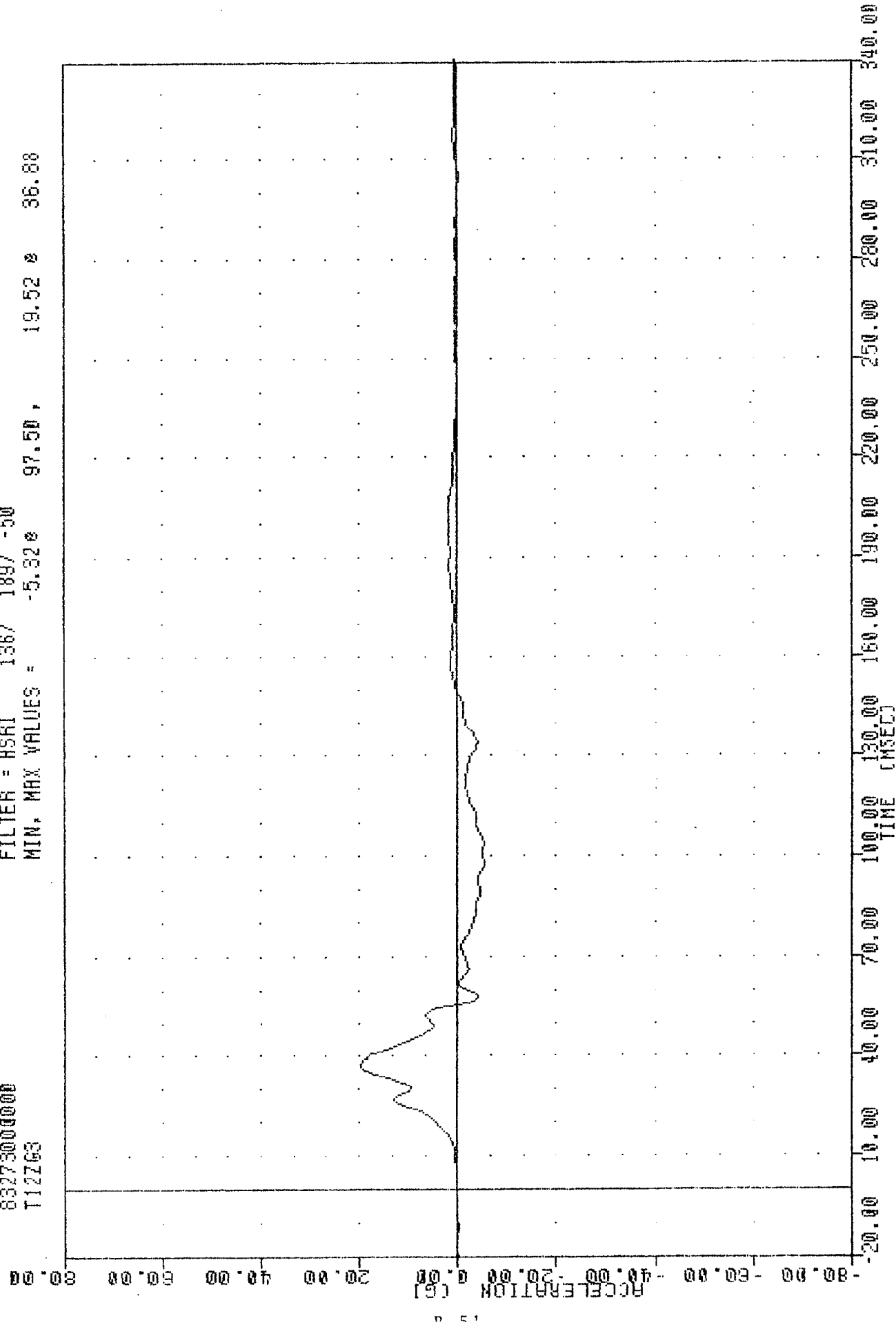
EVALUATION OF MOD VW FLEET

83273000000

FILTER = HSRI 136/ 189/ -50

T12Z63

MIN. MAX VALUES = -5.32 97.50 19.52 36.88



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

TRC
EVALUATION OF MOD VV FLEET
832730000000
T12RG3

PLOT DATE

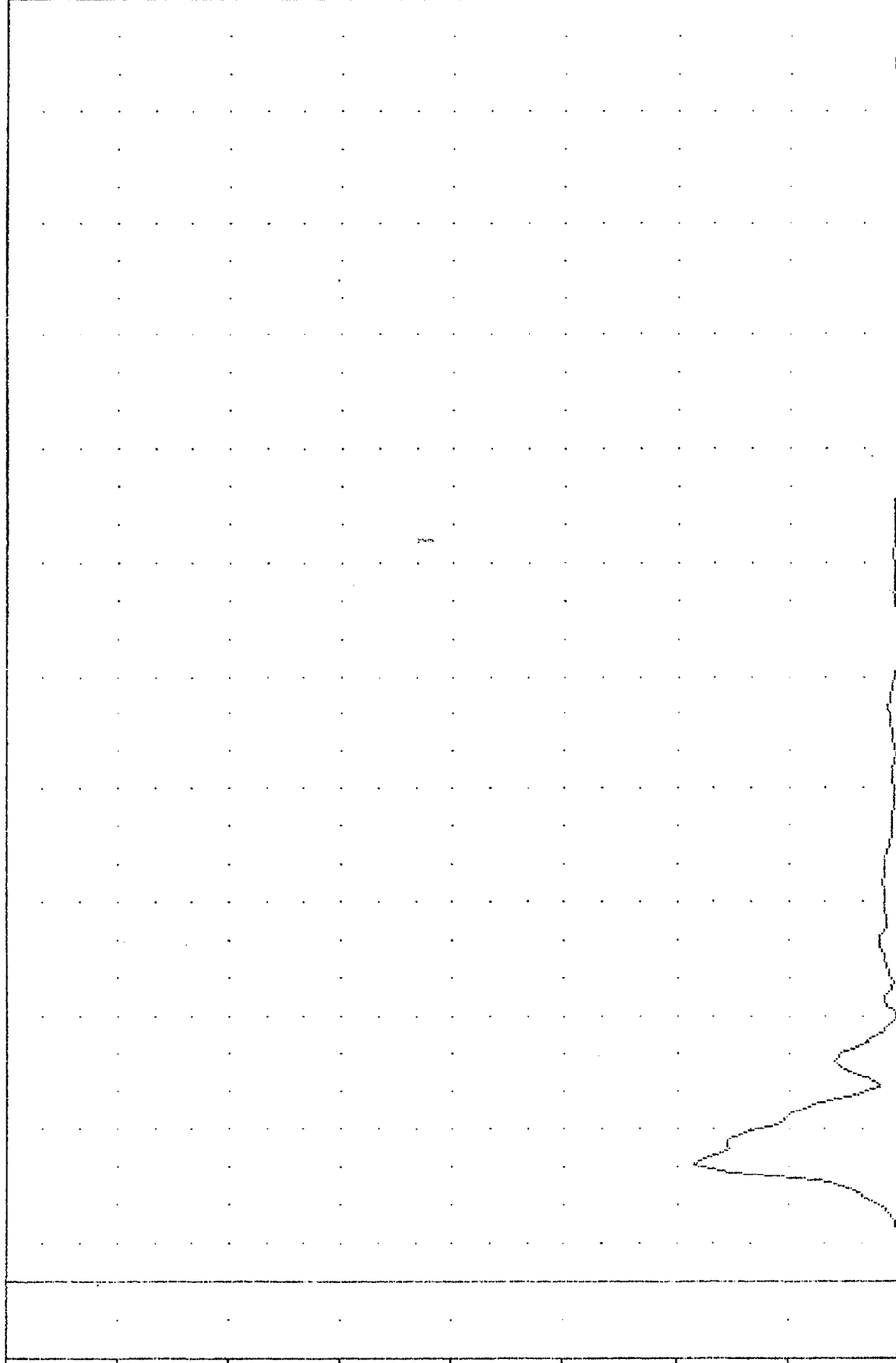
4-ULI-83

10:47:45

FILTER = HSRI 136/ 169/ -50

MIN. MAX VALUES = 0.05e -15.00 , 92.00 e 30.00

ACCELERATION (G)



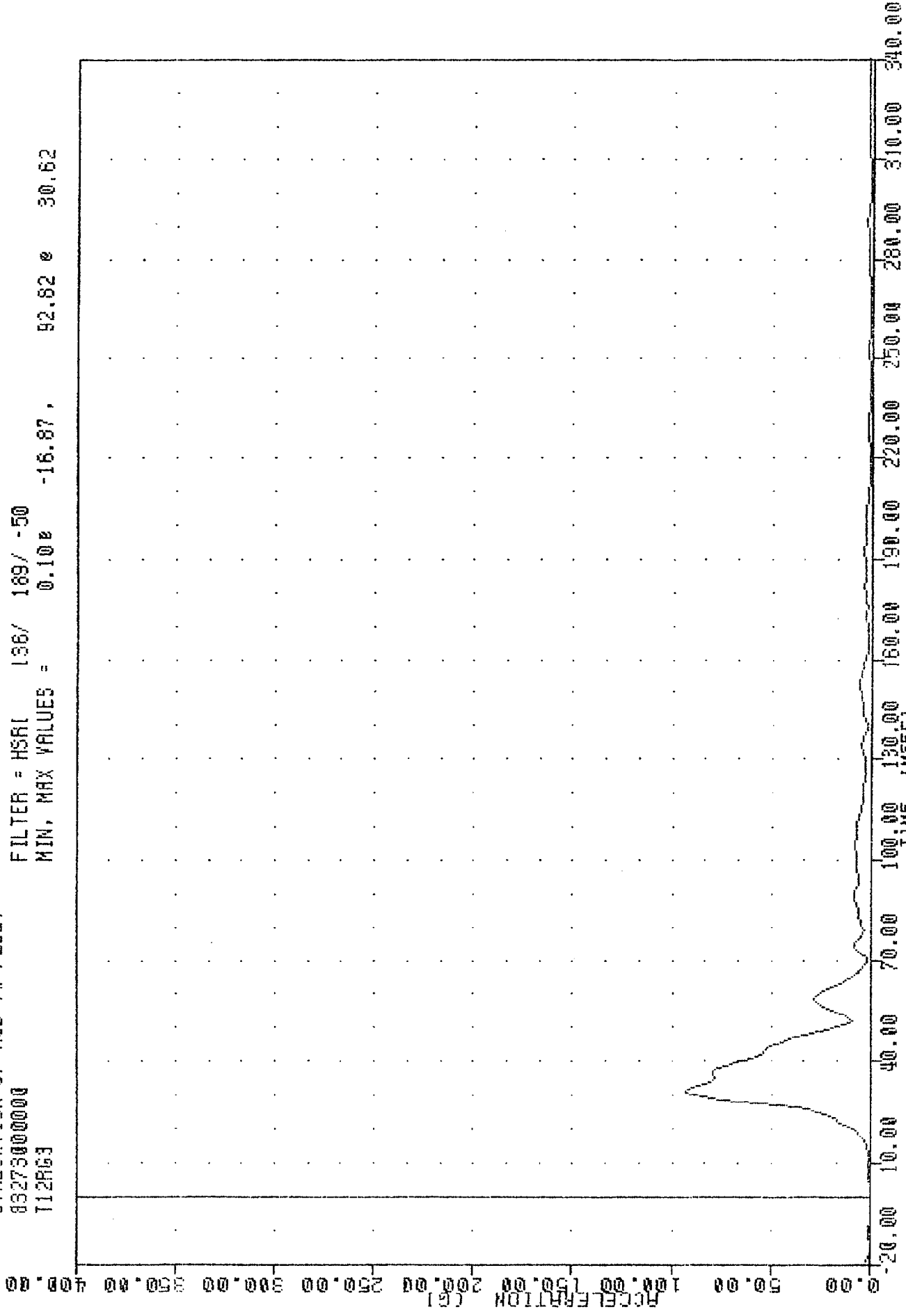
0.00 50.00 100.00 150.00 200.00 250.00 300.00 340.00
-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE RESULTANT

IRC 830930
EVALUATION OF MOD VW FLEET
832730000000
T12RG3

PLOT DATE 4-OCT-83 10:48:47

FILTER = HSRL 136/ 189/ -50
MIN, MAX VALUES = 0.10e -16.87, 92.62 e 30.62



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

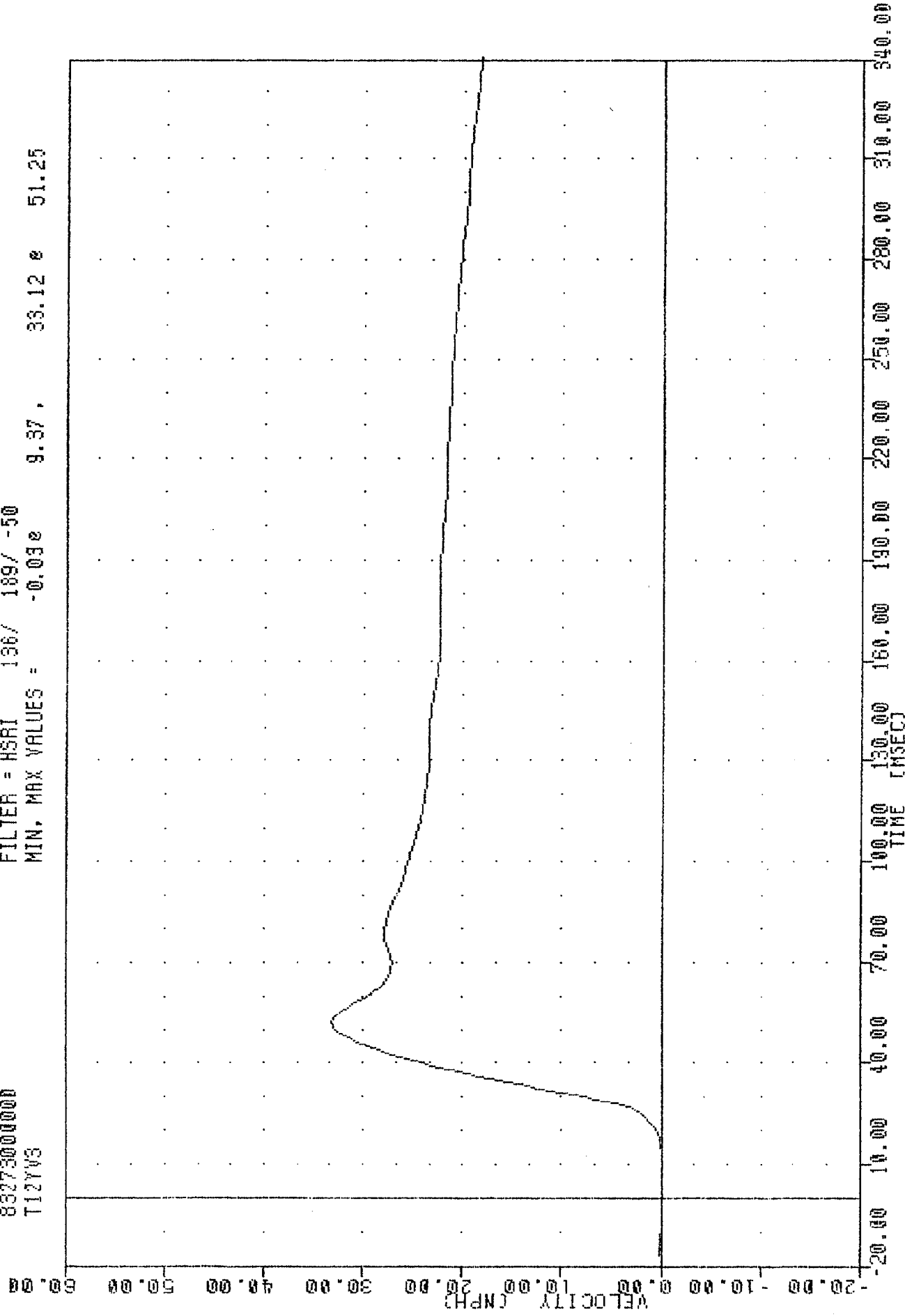
TRC , 830930
EVALUATION OF MOD VW FLEET
832730000000
T12YV3

PLOT DATE 4-OCT-83 13:39:37

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.032

9.37 , 33.12 e 51.25

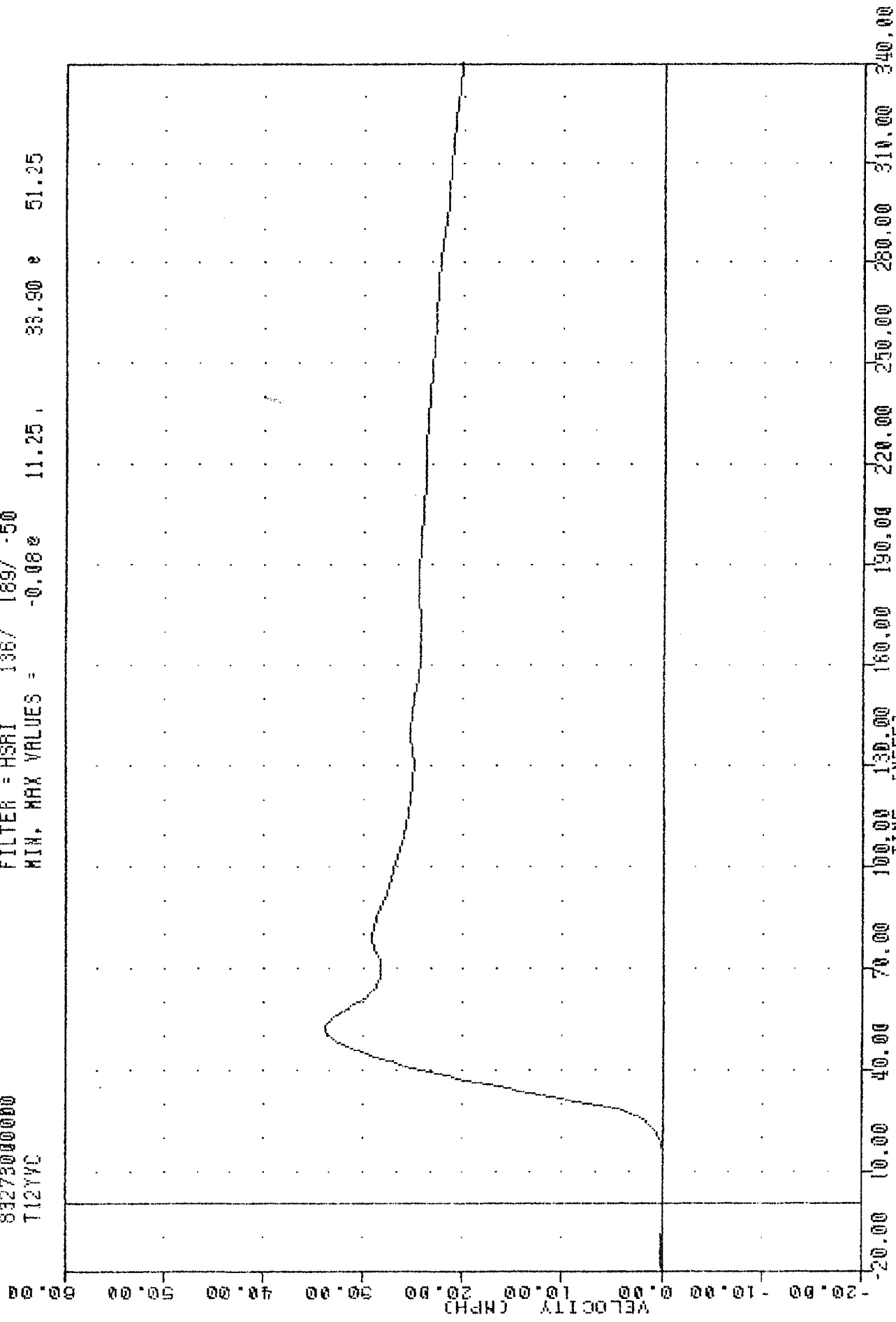


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12Y63

TAC
EVALUATION OF MOD VW FLEET
83273000000
T12YYC

830930
4-OCT-83 13:39:37

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -0.08 11.25 33.90 51.25



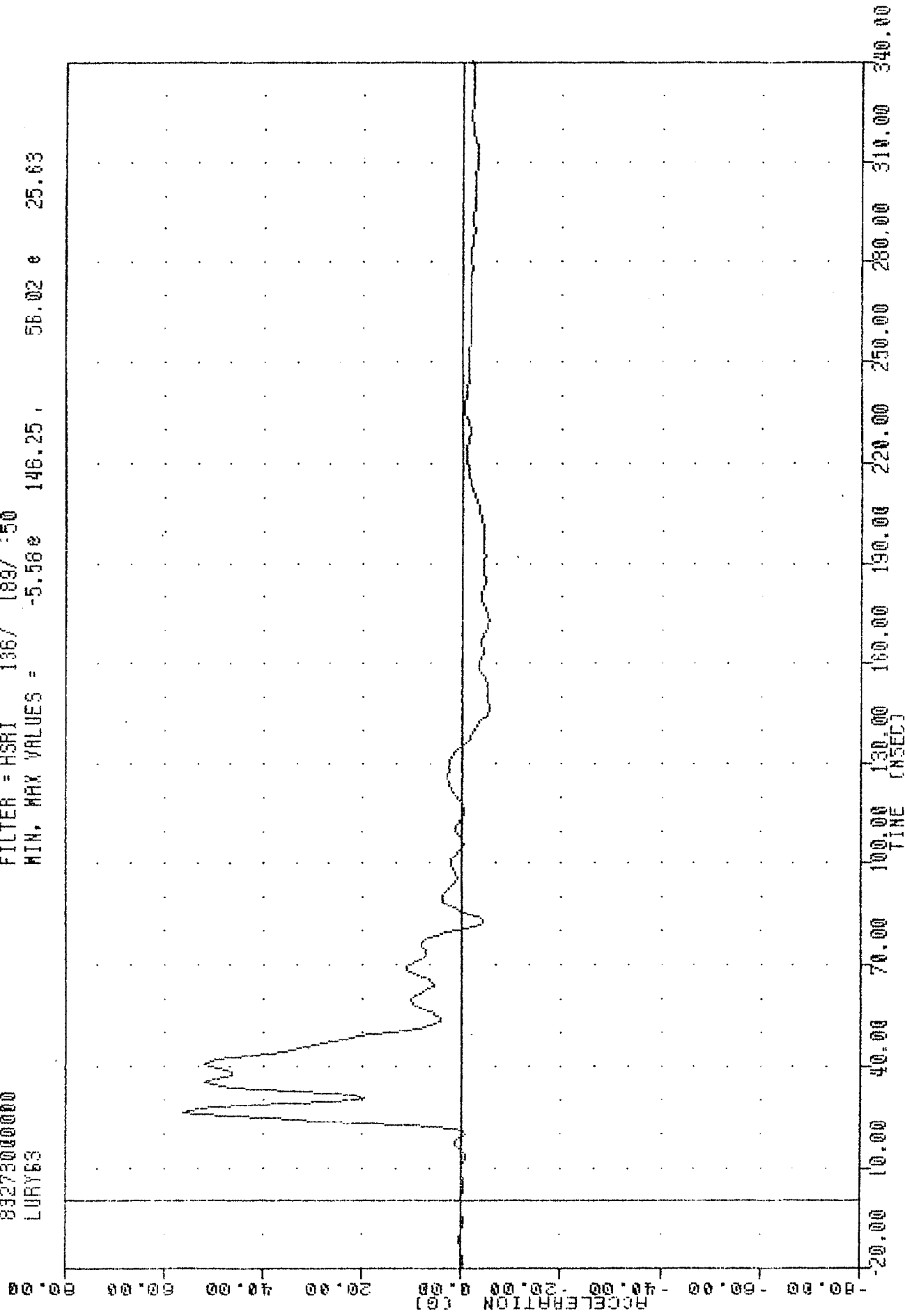
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12YGC

TAC 830930
EVALUATION OF MOD VN FLEET
832730000000
LURY63

PLOT DATE 4-OCT-83 10:47:45

FILTER = HSRI 136/ 189/ 50

MIN. MAX VALUES = -5.58e 146.25 , 56.02 e 25.63



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

TAC

830930

PLOT DATE

4-OCT-83

13:39:37

EVALUATION OF MDD VW FLEET

032730000000

LURYV3

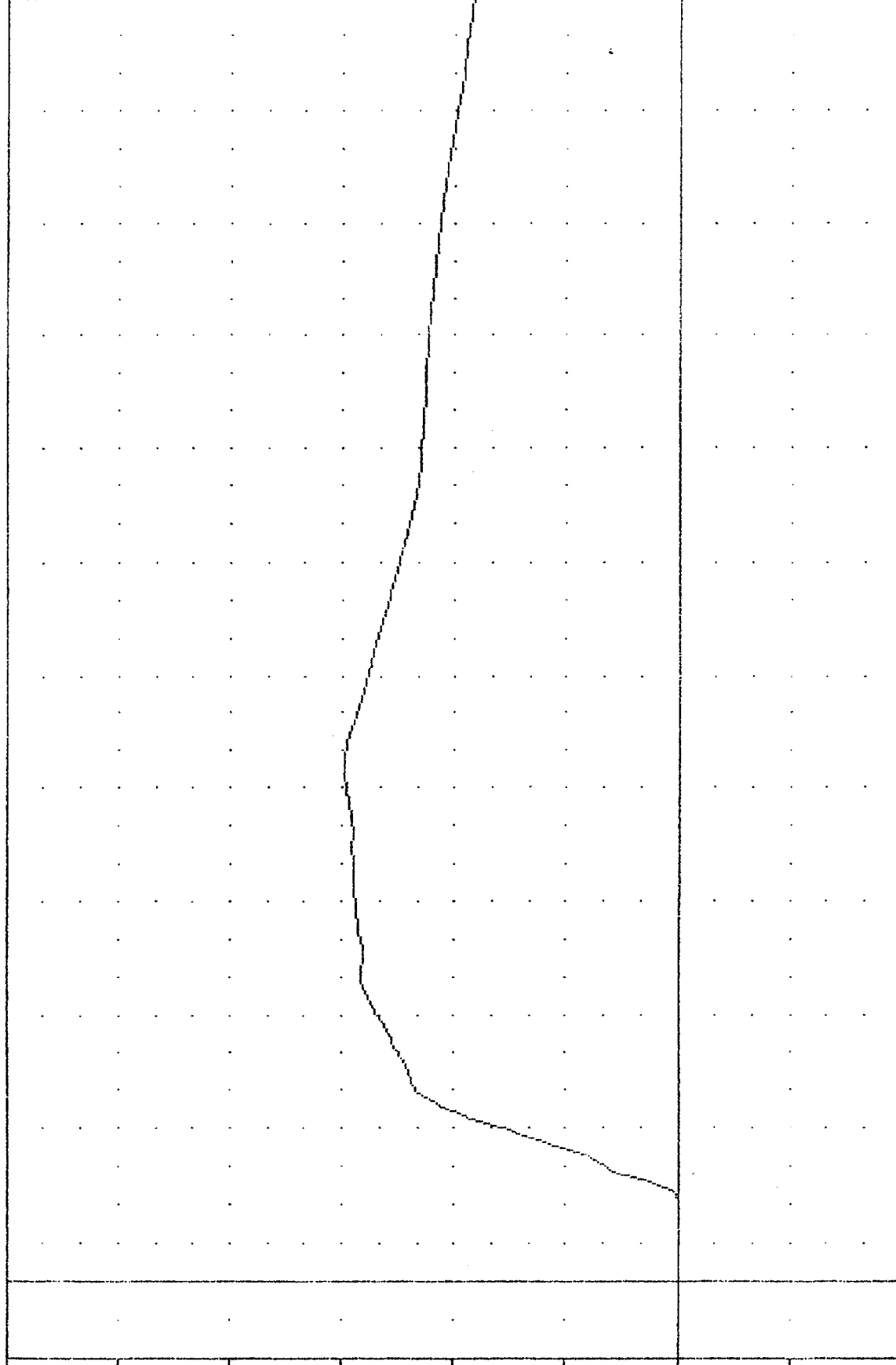
FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.062

14.37,

29.83 2 135.00

VELOCITY (MPH)



20.00 10.00 0.00 -10.00 -20.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

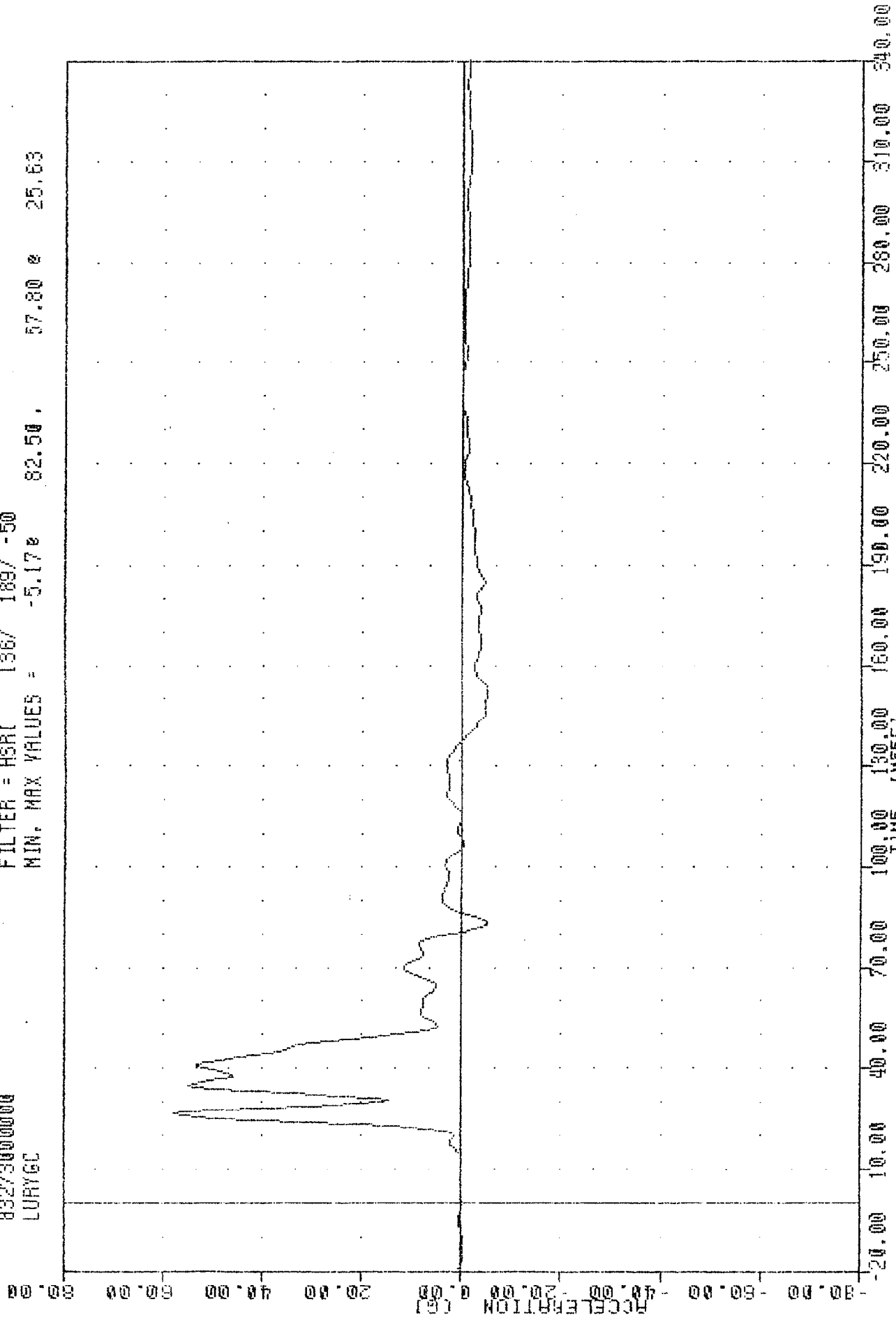
DELTA V USING LURYG3

TRC 830930
EVALUATION OF MOD YW FLEET
83273000000
LURYGC

PLOT DATE 4-OCT-83 10:47:45

FILTER = HSRL 136/ 189/ -50

MIN. MAX VALUES = -5.17e 82.50. 57.80 e 25.63



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

TRC

830930

PLUT DATE

4-UCT-83

13:39:37

EVALUATION OF MDD VW FLEET

832730000000

LURYVC

FILTER = HSRI 136/ 189/ -50

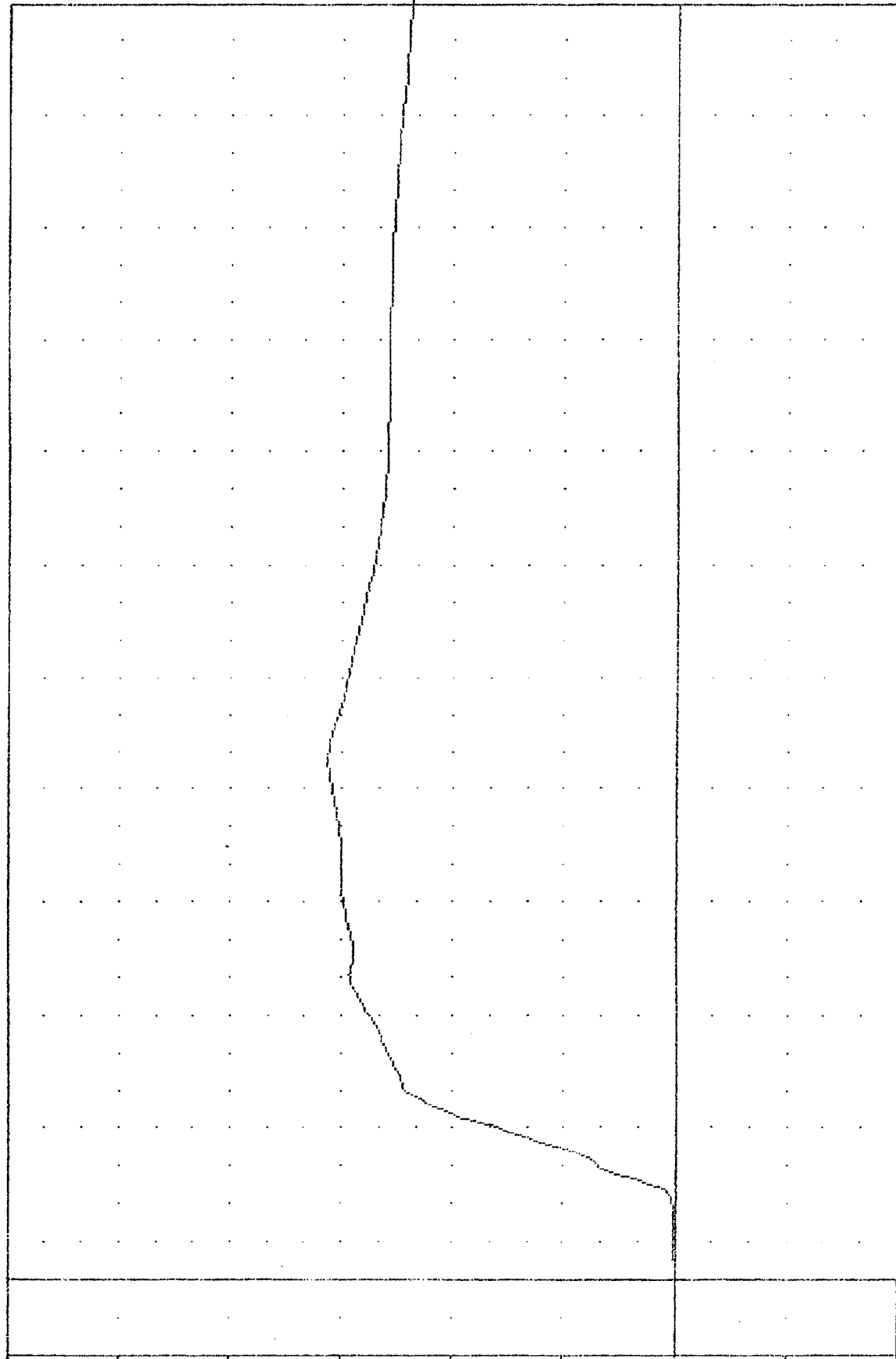
MIN. MAX VALUES = -0.048

-9.37,

31.21 e

137.50

VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING LURY6C

THU 830930 4-OCT-83 10:47:45

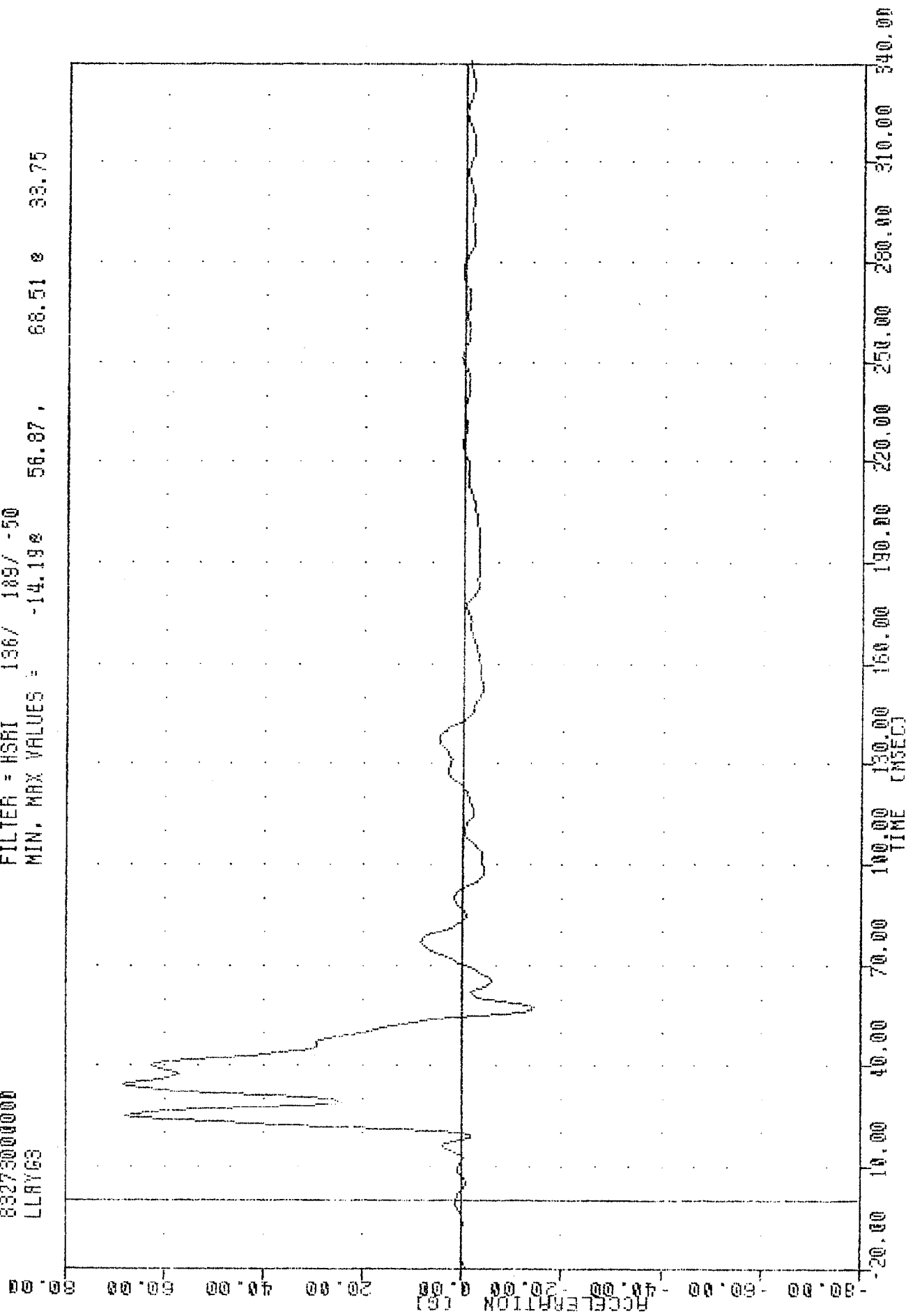
EVALUATION OF MOD VW FLEET

83273000000

LLRY63

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -14.19% 56.87, 68.51 @ 33.75



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

TAC 830930 PLOT DATE 4-OCT-83 13:39:37

EVALUATION OF MOD VW FLEET

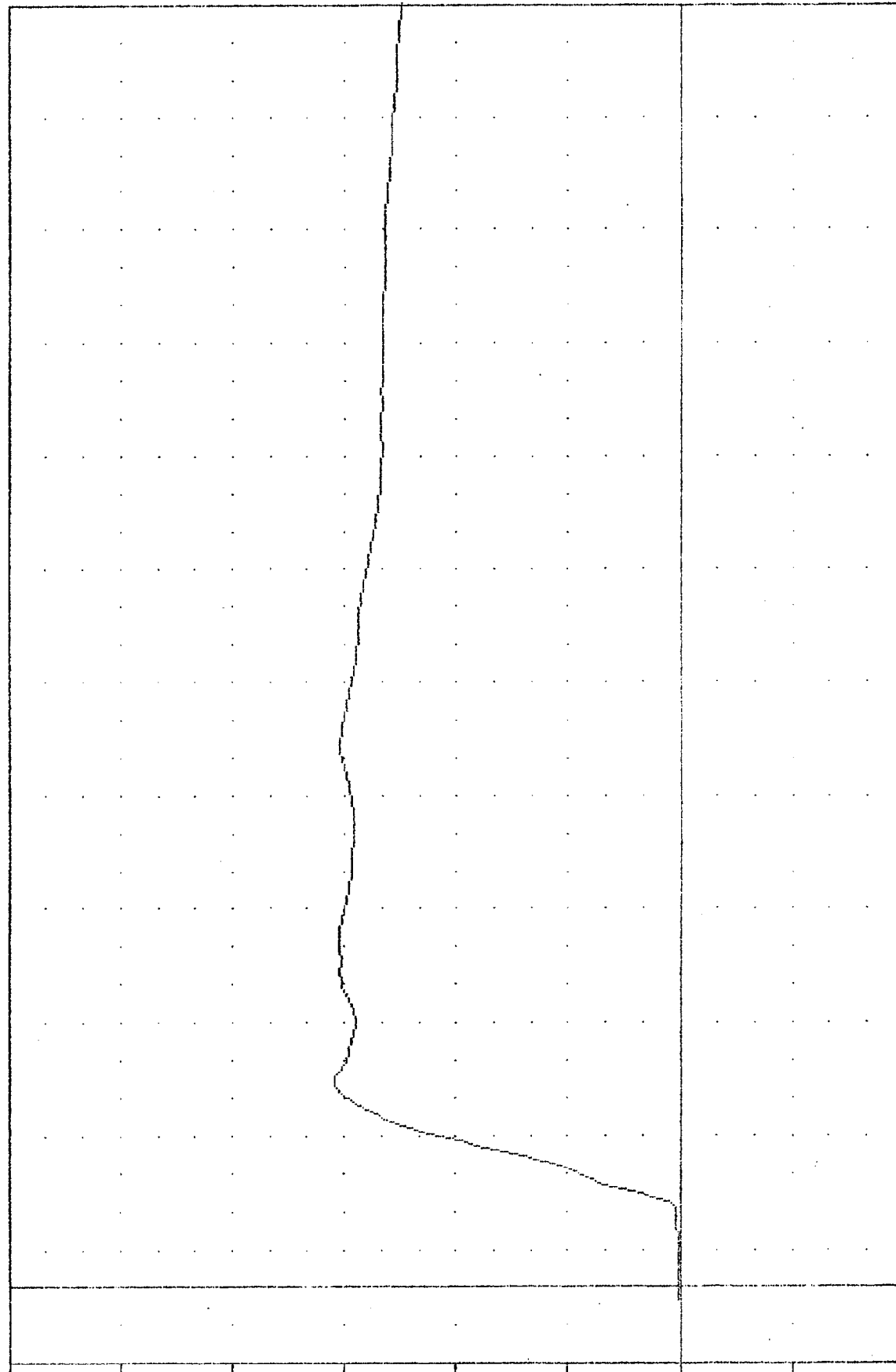
832730000000

LLRYV3

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.01e -18.13, 30.93 e 53.75

VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

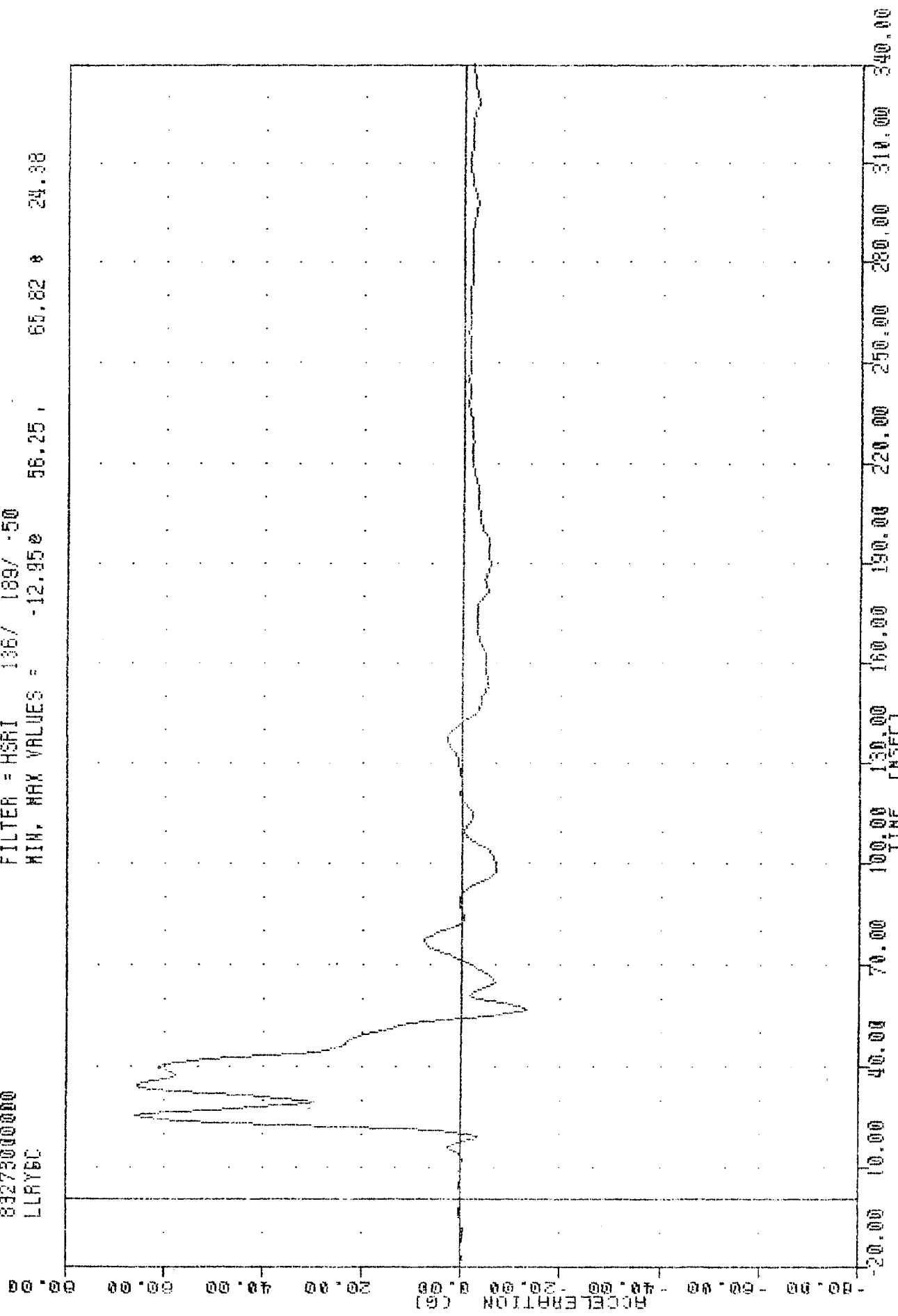
DELTA V USING LLRYG3

TAC
 EVALUATION OF MOD VW FLEET
 83273000000
 LLY5C

PLOT DATE 4-OCT-83 10:47:45

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -12.950 56.25, 65.82 & 24.38



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

TRC 830930 4-OCT-83 13:39:37

EVALUATION OF MOD VW FLEET

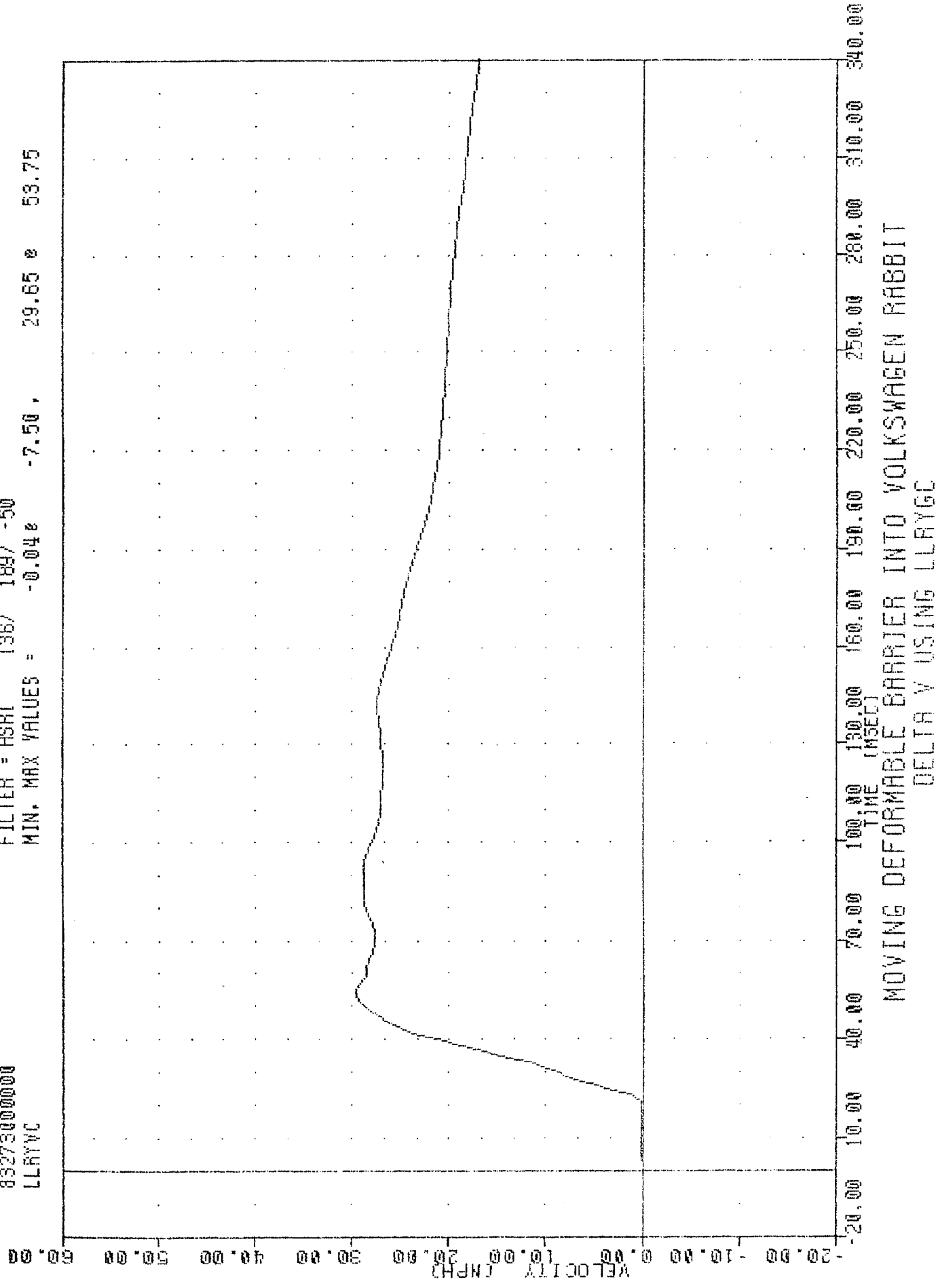
832730000000

LLRYVC

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.04e

-7.50, 29.65 e 53.75

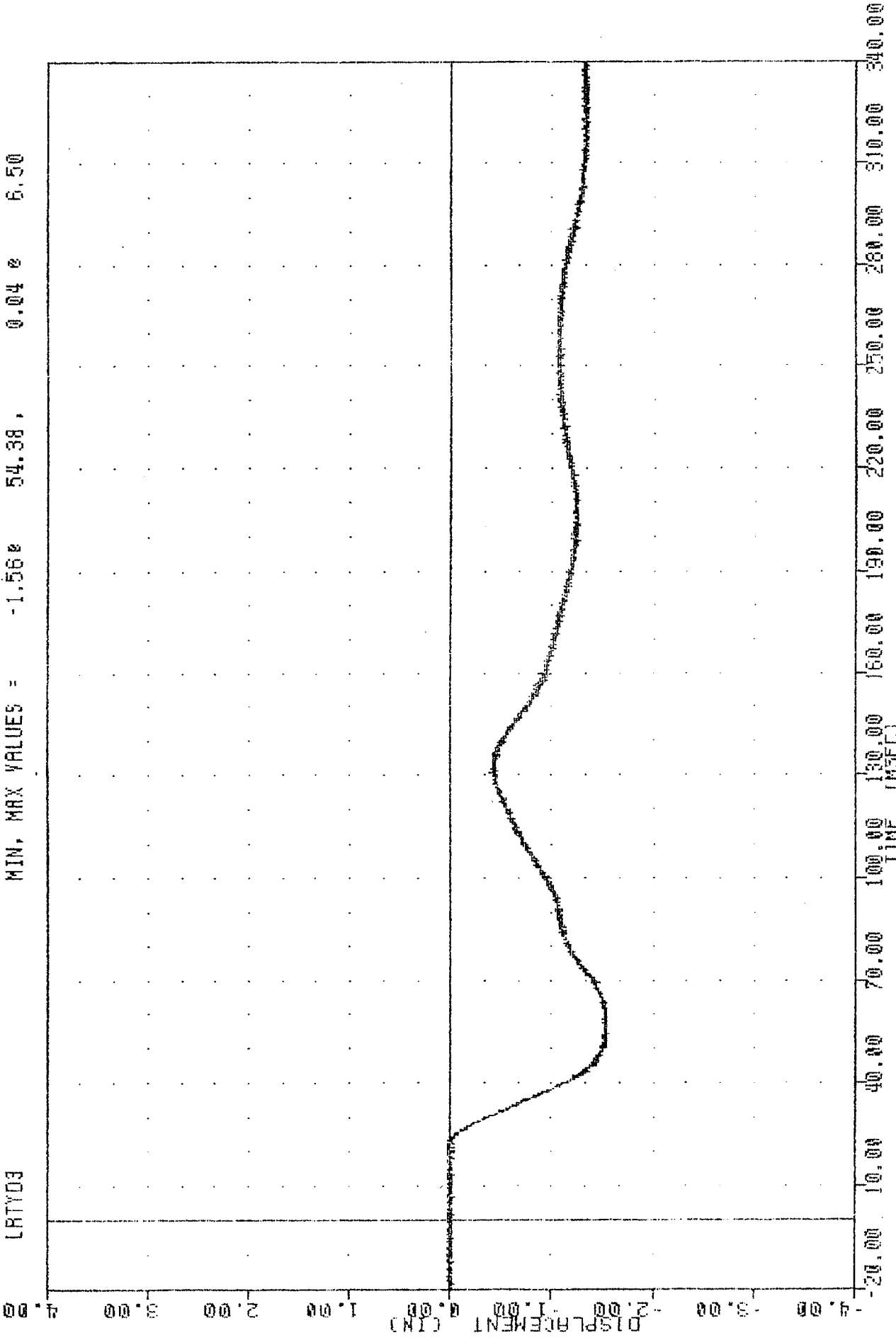


TAC
EVALUATION OF MOD YW FLEET
83273000000
LRTY03

830930 4-OCT-83 10:46:20

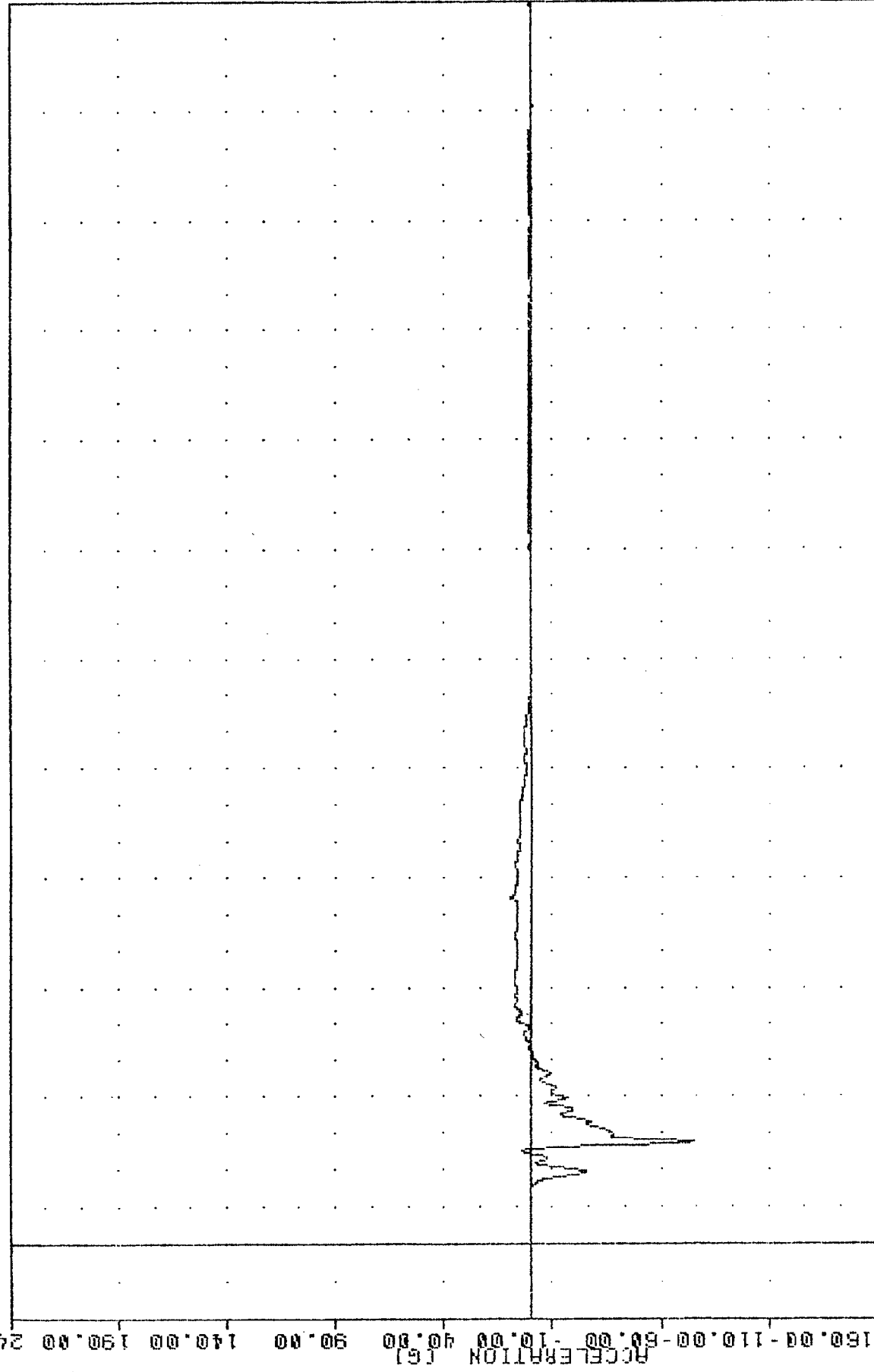
FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -1.56% 54.38, 0.04 @ 6.50



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

TRC
 EVALUATION OF MOD YW FLEET
 83273000000
 PEVXG3
 FILTER = SLPF 300/ 949/ -40
 MIN. MAX VALUES = -75.18 27.13 9.03 94.25
 PLOT DATE 4 OCT 83 12:49:30



-150.00 -110.00 -50.00 -10.00 40.00 90.00 140.00 190.00 240.00
 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 PELVIS ACCELERATION X AXIS

TRC 830930 4-01-83 12:49:35

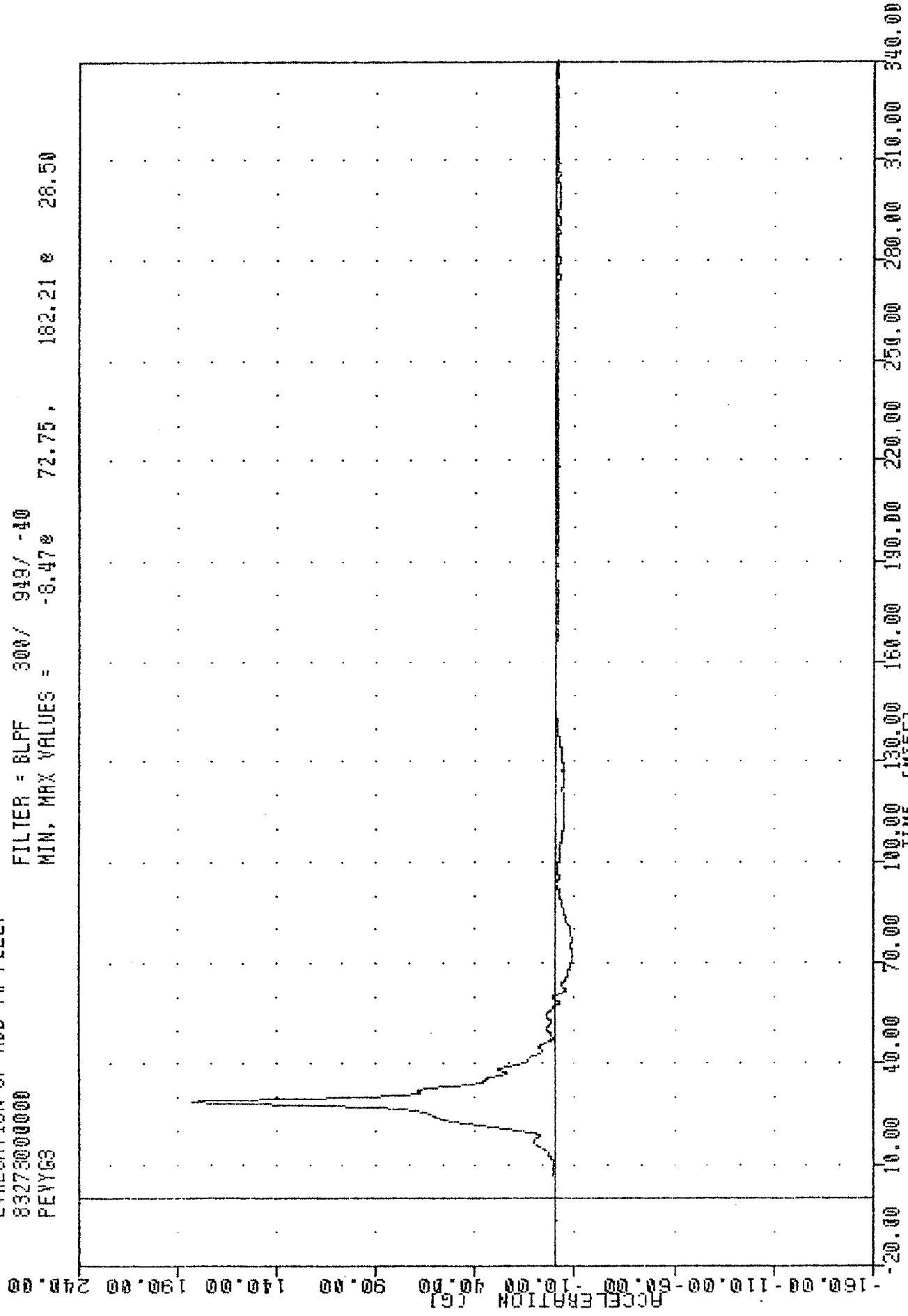
EVALUATION OF MDD VN FLEET

83273000000

PEYGC3

FILTER = 8LFF 300/ 949/ -40

MIN, MAX VALUES = -8.47% 72.75, 182.21 % 28.50

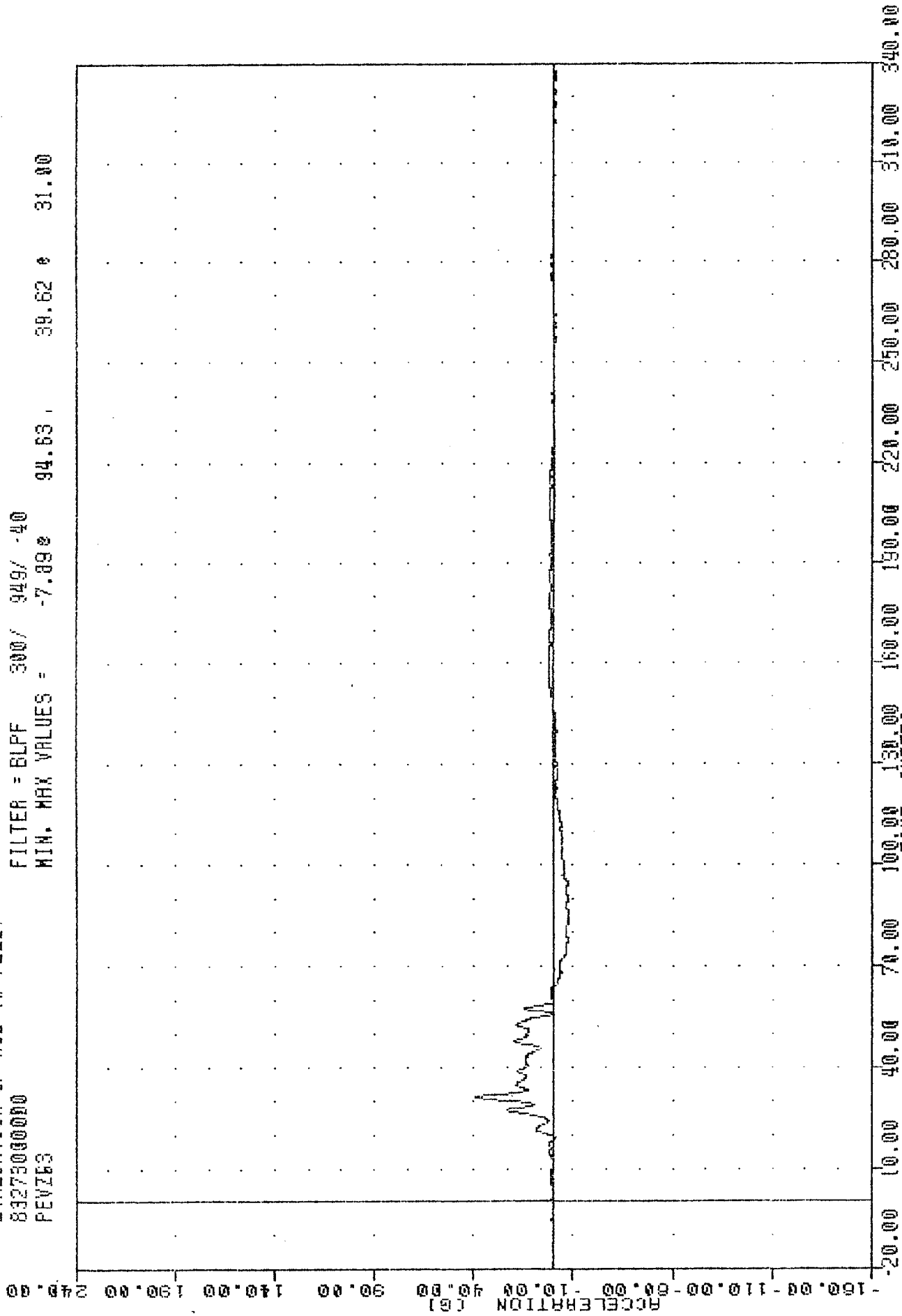


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS ACCELERATION Y AXIS

TAC
EVALUATION OF MOD VN FLEET
832730000000
PEVZE3

PLOT DATE 4-OCT-83 12:49:38

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -7.89e 94.63, 39.62 e 31.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS ACCELERATION Z AXIS

TAC 830930 PLUT DATE 4-OCT-83 10:46:20

EVALUATION OF MOD VN FLEET

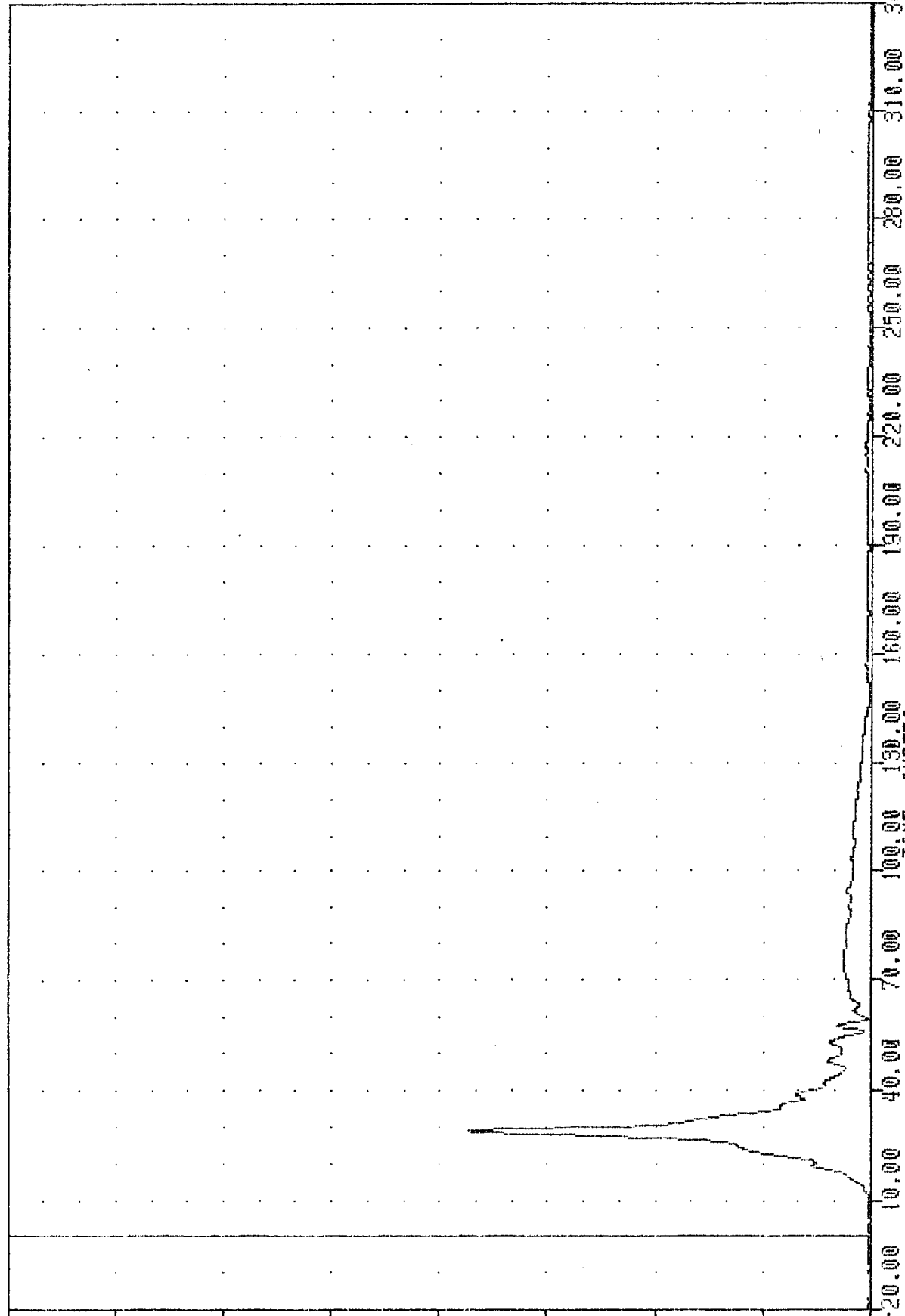
83273000000

FEVR63

FILTER = 8LPF 300/ 949/ -40

MIN. MAX VALUES = 0.062 -17.75 168.34 28.50

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS RESULTANT

TRC 830930 4-OCT-83 13:51:45

EVALUATION OF MOD YW FLEET

83273000000

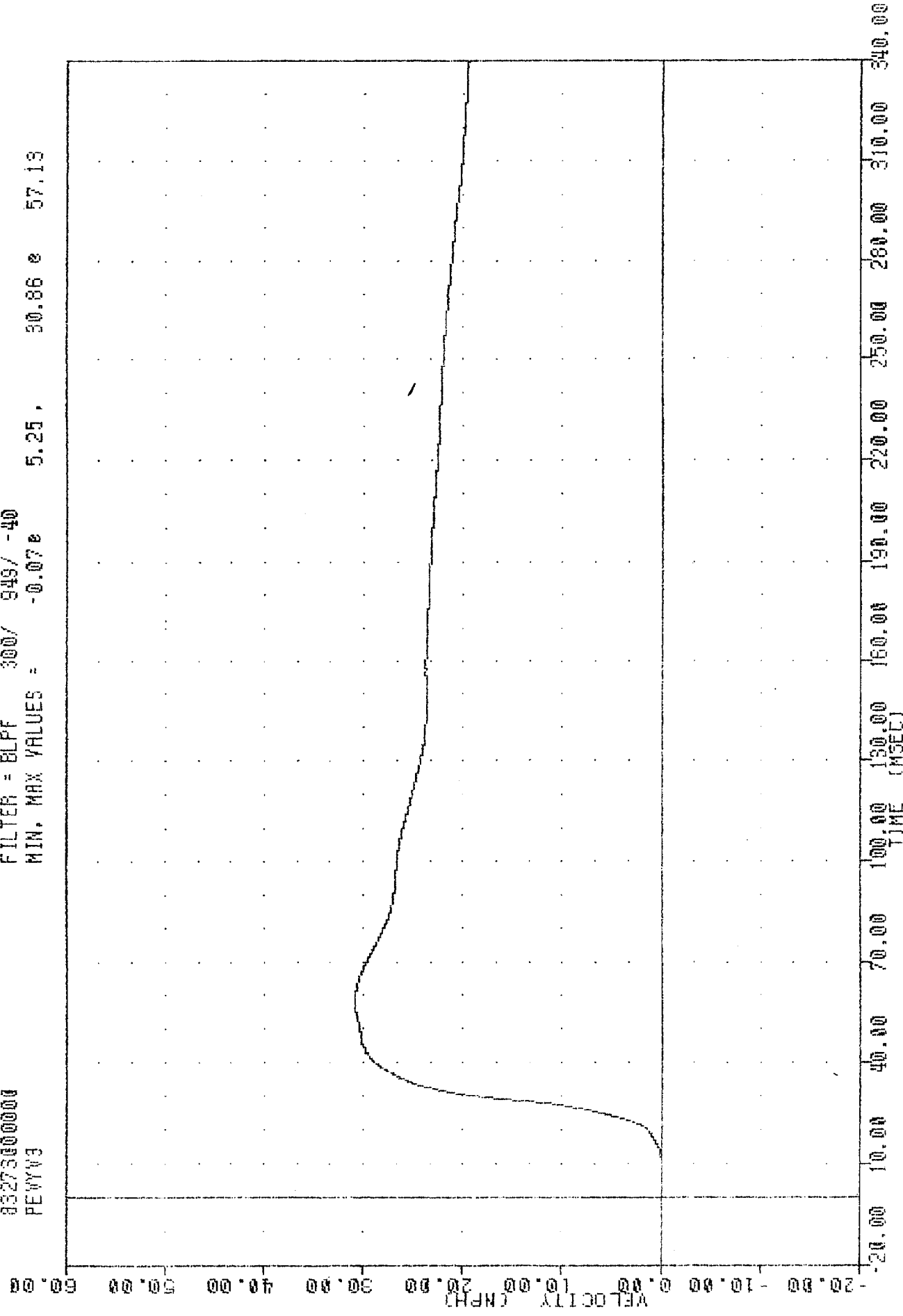
PEVYV3

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.07e

30.86 e

57.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING PEVYV3

TRC 830830 PLOT DATE 4-OCT-83 10:46:20

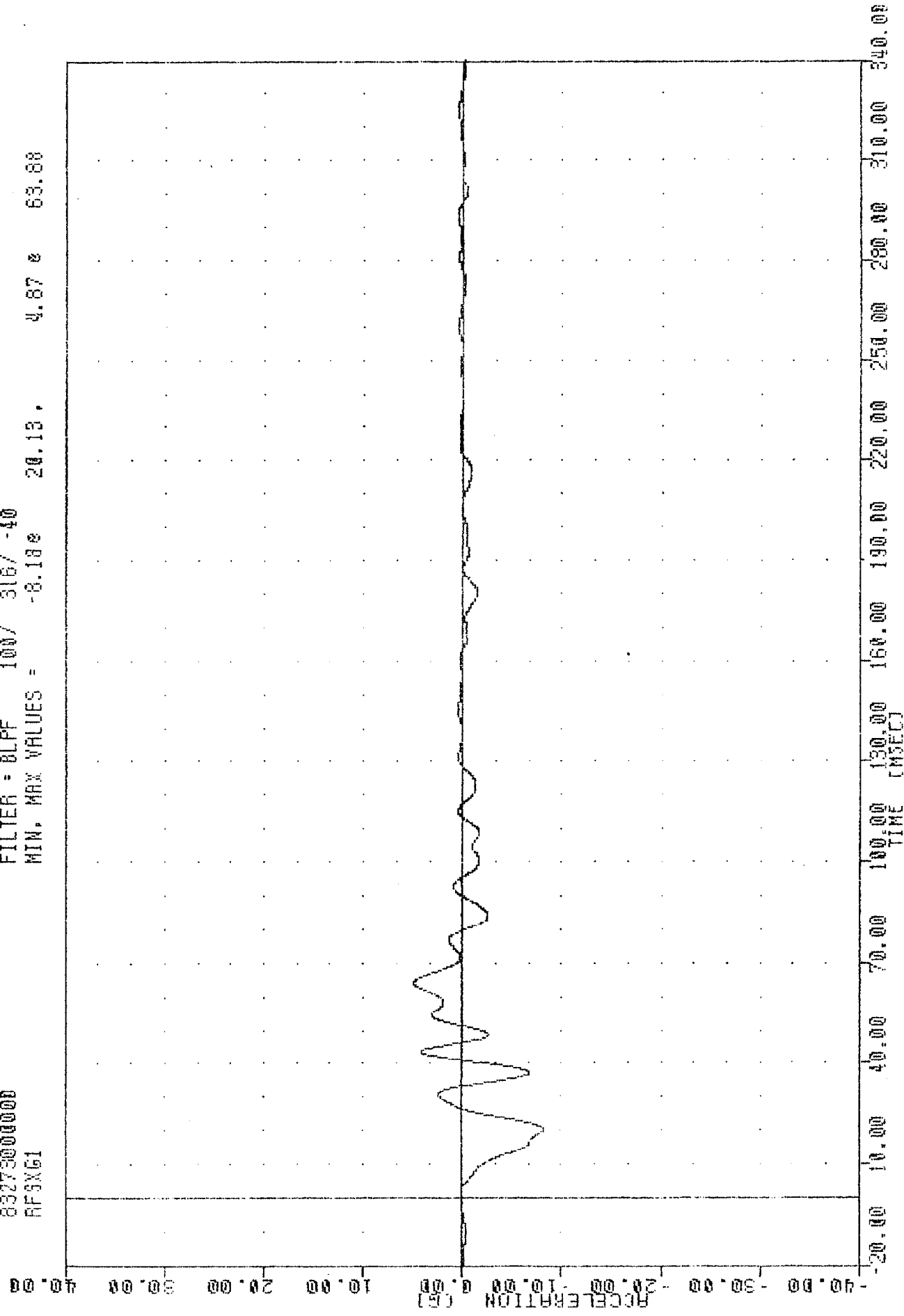
EVALUATION OF MOD VW FLEET

83273000000

RF9XG1

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -8.18e 20.13, 4.87 e 63.88

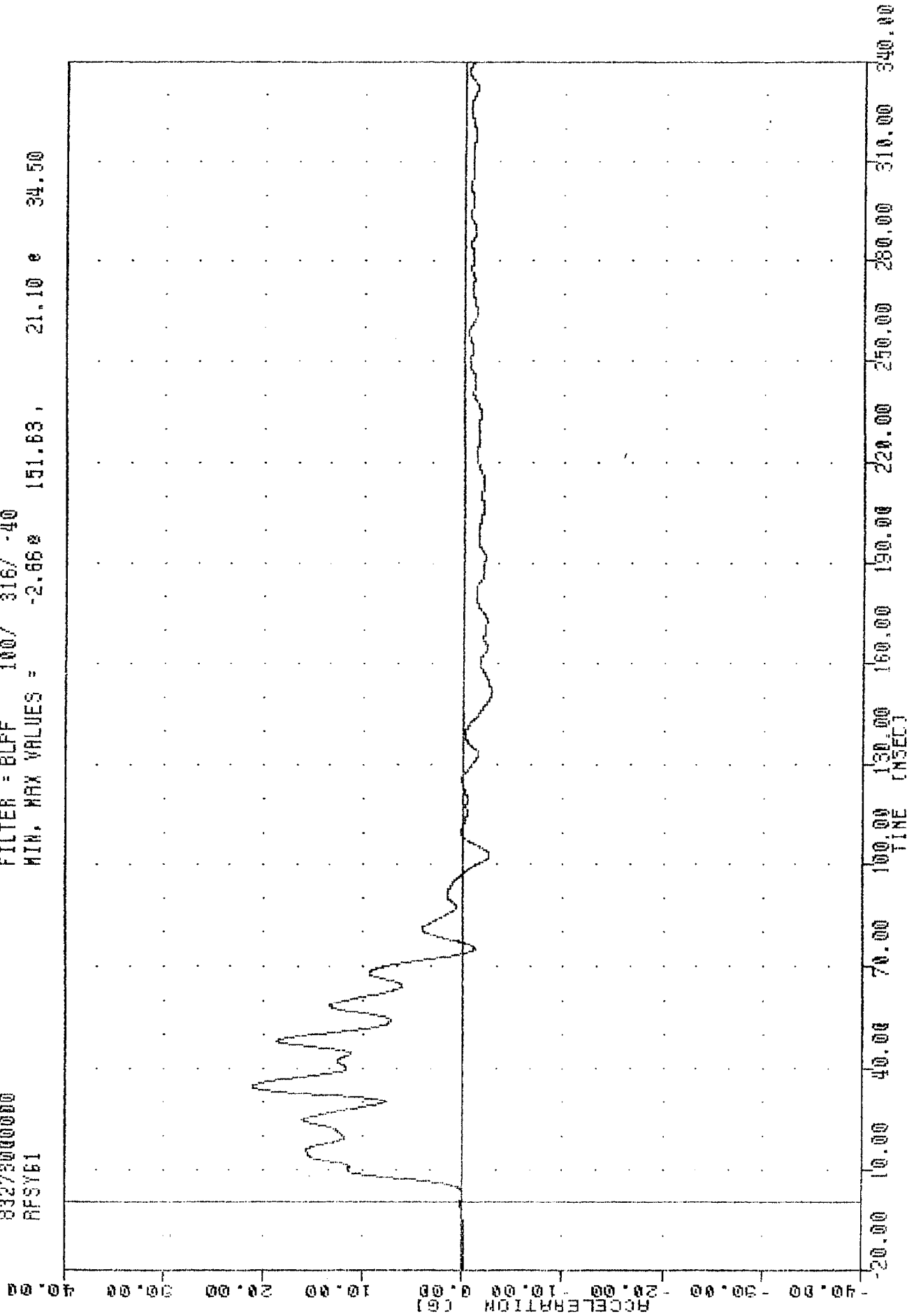


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT STILL ACCELERATION X AXIS

TRC
EVALUATION OF MOD VW FLEET
83273000000
RFSY61

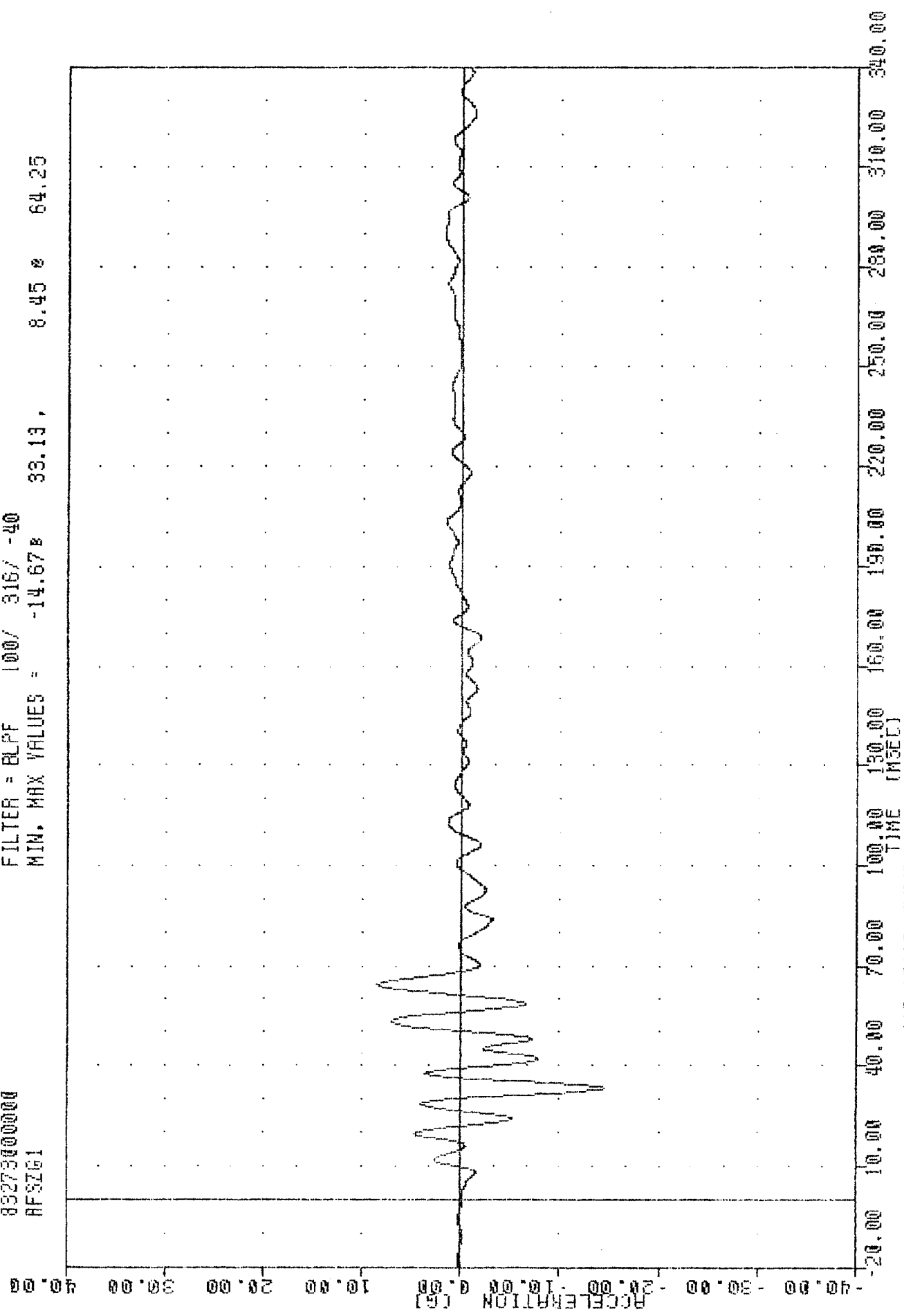
PLUT DATE 4-OCT-83 10:46:20

FILTER = BLFF 100/ 316/ -40
MIN. MAX VALUES = -2.66e 151.63, 21.10 e 34.50



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

TRC 830930 4-OCT-83 10:46:20
 EVALUATION OF MOD VN FLEET
 832730000000
 RFSZG1
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -14.67 33.13, 8.45 64.25



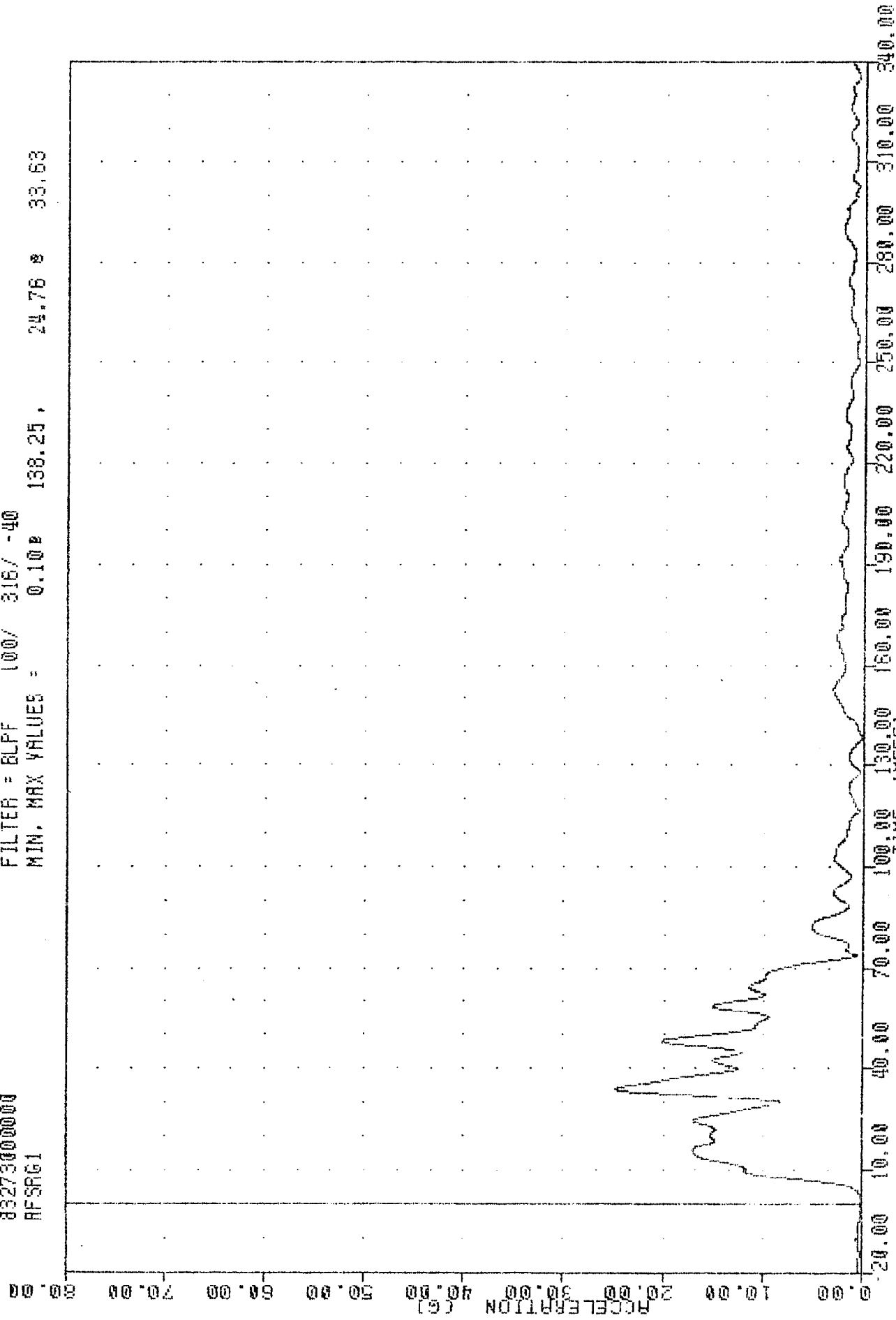
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE RIGHT FRONT SILL ACCELERATION Z AXIS

TRC 830930
EVALUATION OF MOD VW FLEET
832730000000
RFSRG1

PLOT DATE 4-OCT-83 10:46:20

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = 0.100 138.25, 24.76 33.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL RESULTANT

THU

830930

PLOT DATE

4-OCT-83

13:51:45

EVALUATION OF MOD VW FLEET

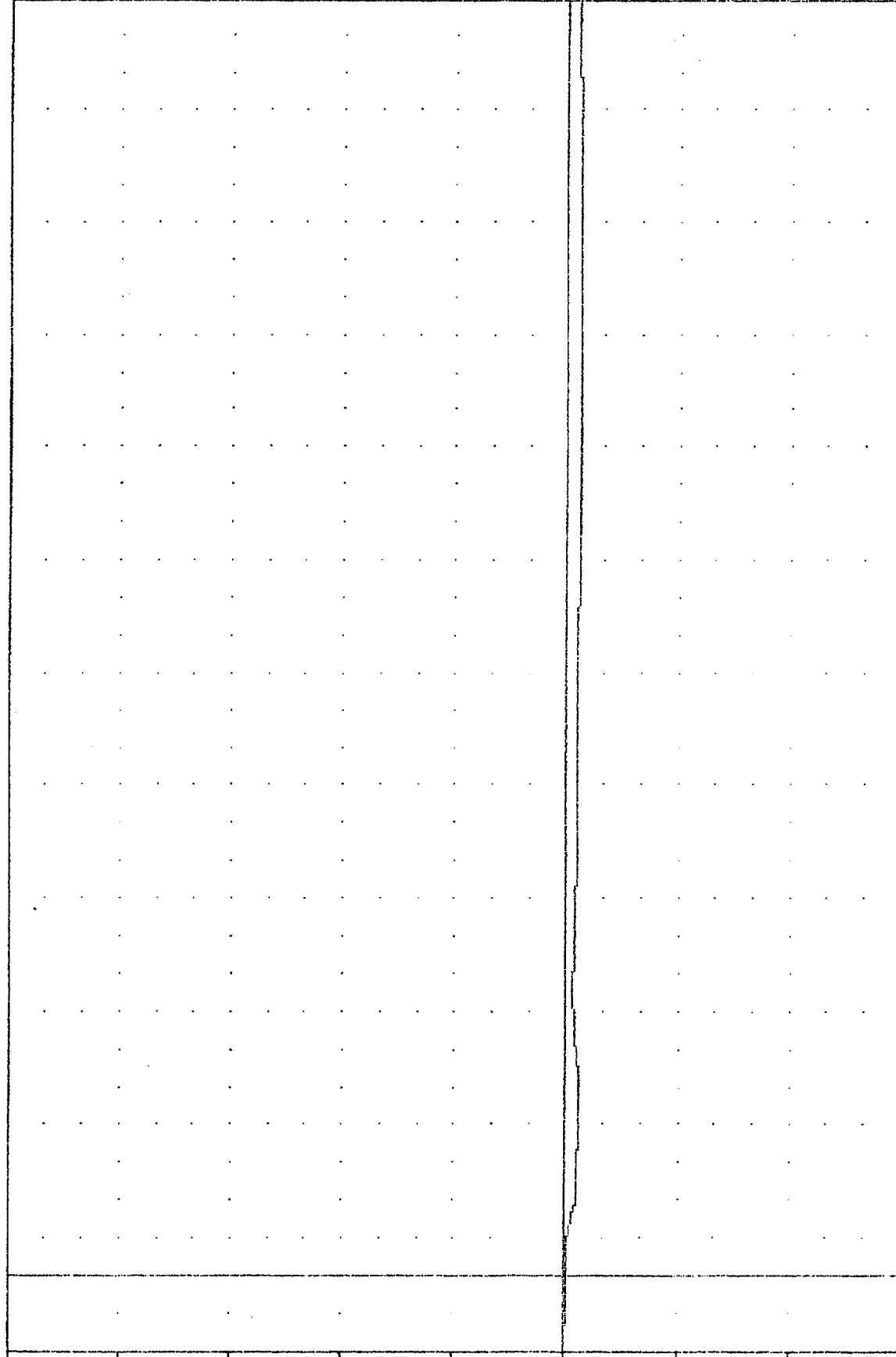
832730000000

RFSXV1

FILTER = BLPF 300/ 849/ -40

MIN. MAX VALUES = -2.59e 37.50, 0.00 e -20.00

VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING RFSXG1

TAC

830930

PLUT DATE

4-OCT-83

13:51:45

EVALUATION OF MOD VV FLEET

83273000000

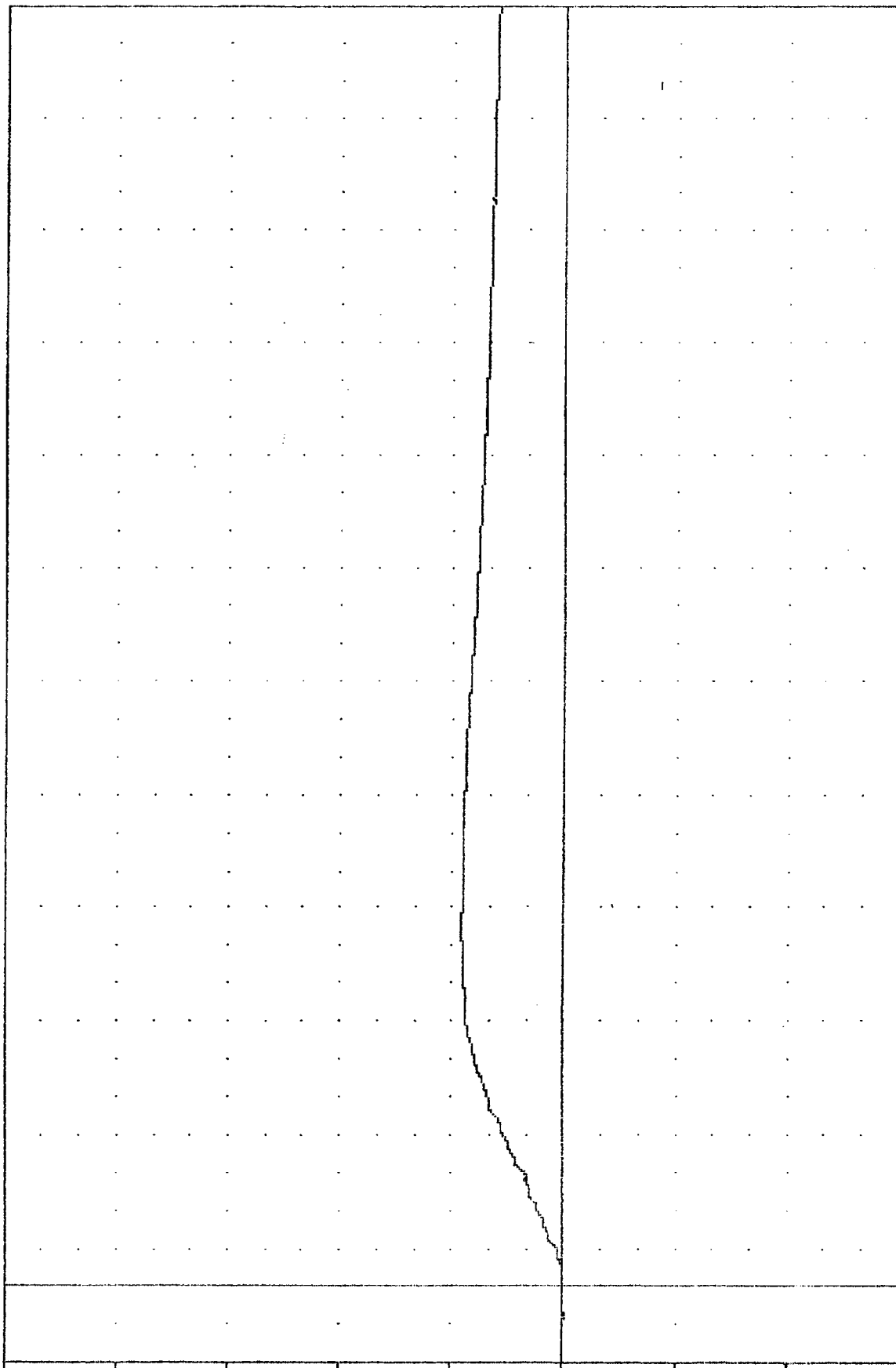
FILTER = BLPF 300/ 949/ -40

RFSYV1

MIN, MAX VALUES = -0.04 s -8.00 .

18.29 s 94.63

VELOCITY (MPH)



TIME (msec)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING RFSYGI

TRC

830930

PLUT DATE

9-OCT-83

10:46:20

EVALUATION OF MOD VW FLEET

83273000000

FILTER = 8LPP 100/ 316/ -40

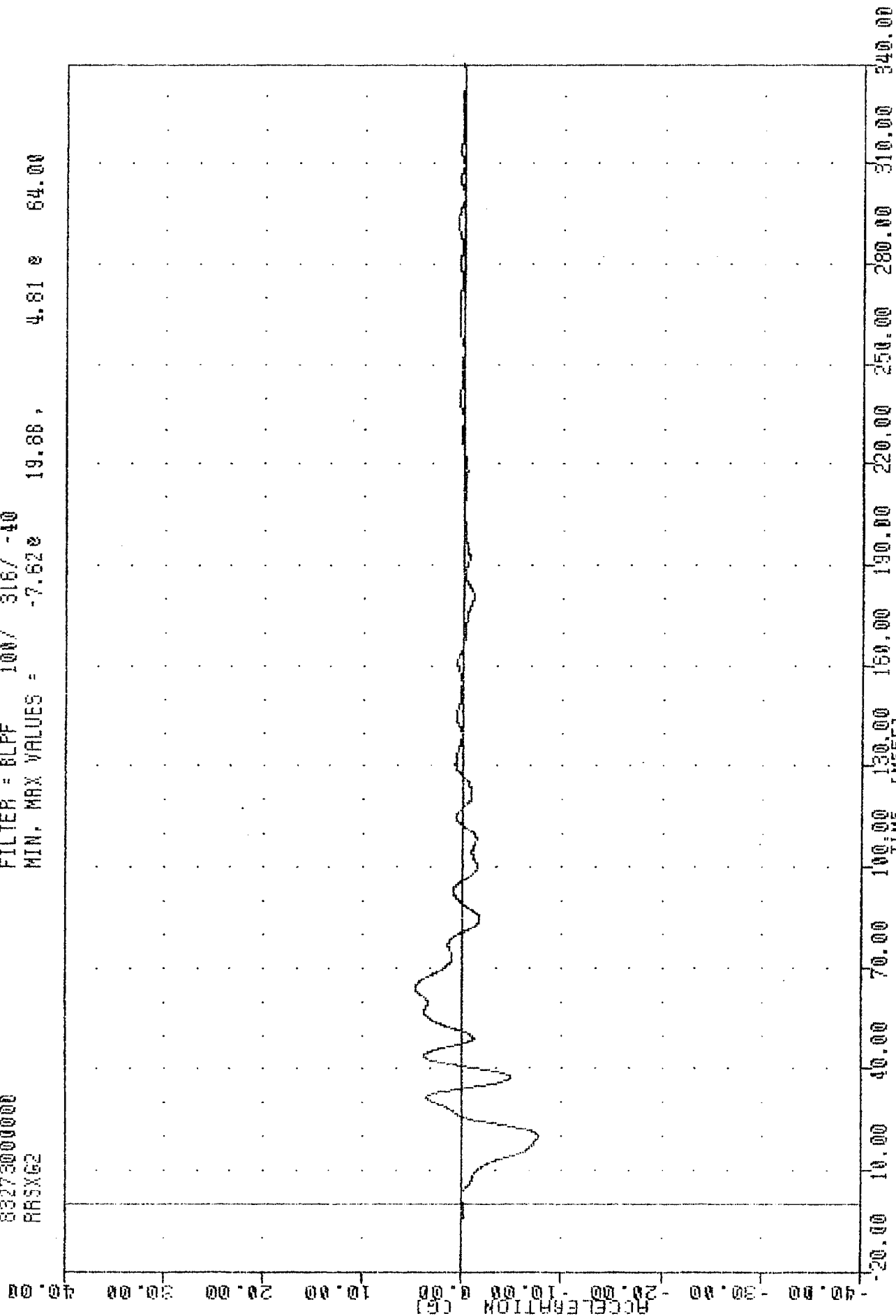
RR5XG2

MIN. MAX VALUES = -7.62e

19.88,

4.81 e

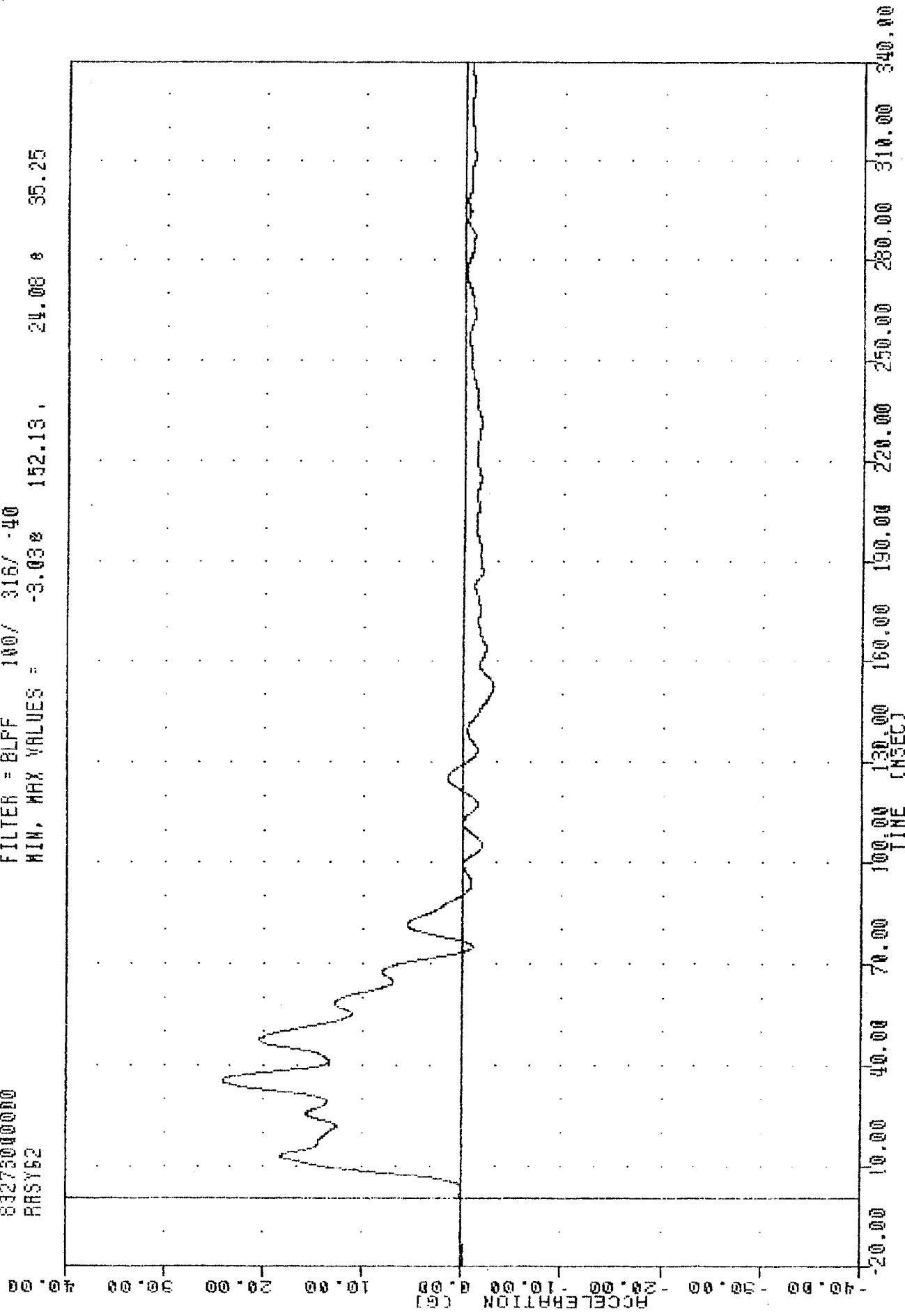
64.00



TAC 830930
EVALUATION OF MOD VV FLEET
83273000000
RRSYB2

PLUT DATE 4-OCT-83 10:46:20

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -3.03e 152.13, 24.08 e 35.25



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

TRC

830930

PLOT DATE

4-OCT-83

10:46:20

EVALUATION OF MDD YV FLEET

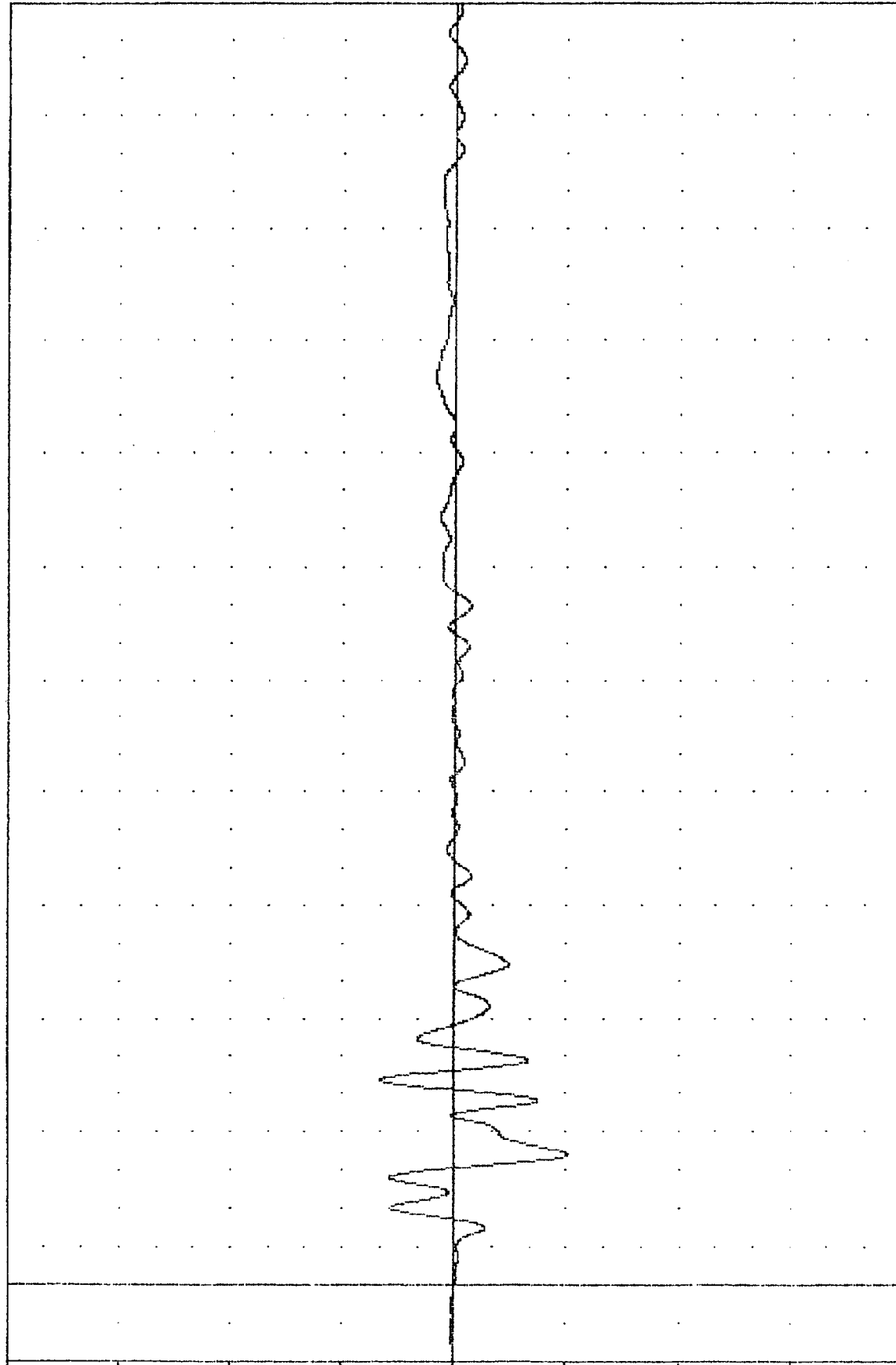
83273000000

RRSZG2

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -10.07g 34.00, 6.58g 53.50

ACCELERATION (G)



R-78

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

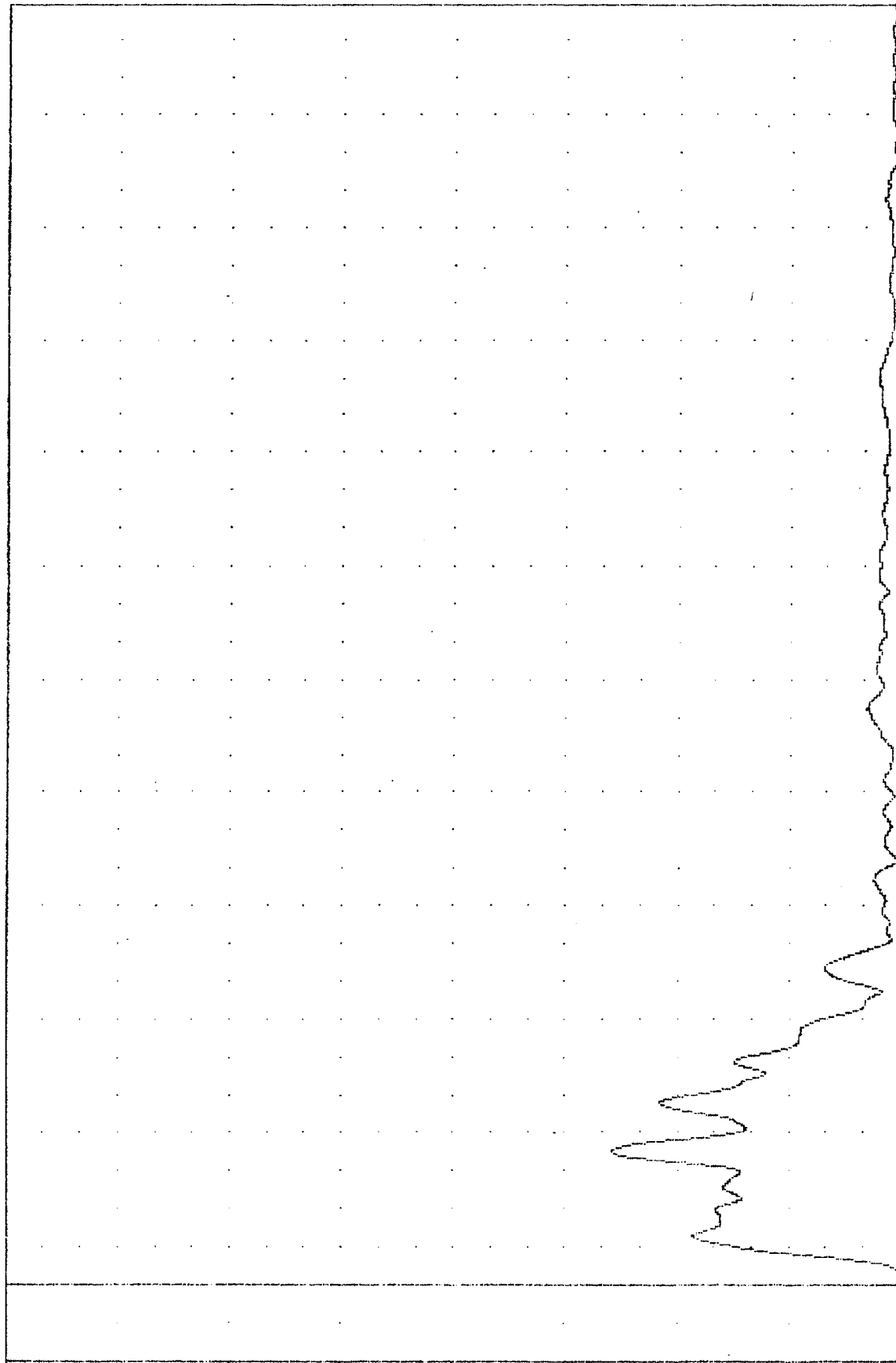
TAC 830930
EVALUATION OF MOD VW FLEET
832730000000
RRSRG2

PLOT DATE 4-OCT-83 10:46:20

FILTER = BLPF 100/ 318/ -40

MIN, MAX VALUES = 0.15e 3.13, 25.85 e 35.00

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL RESULTANT

TRC 830930 4-OCT-83 13:51:45

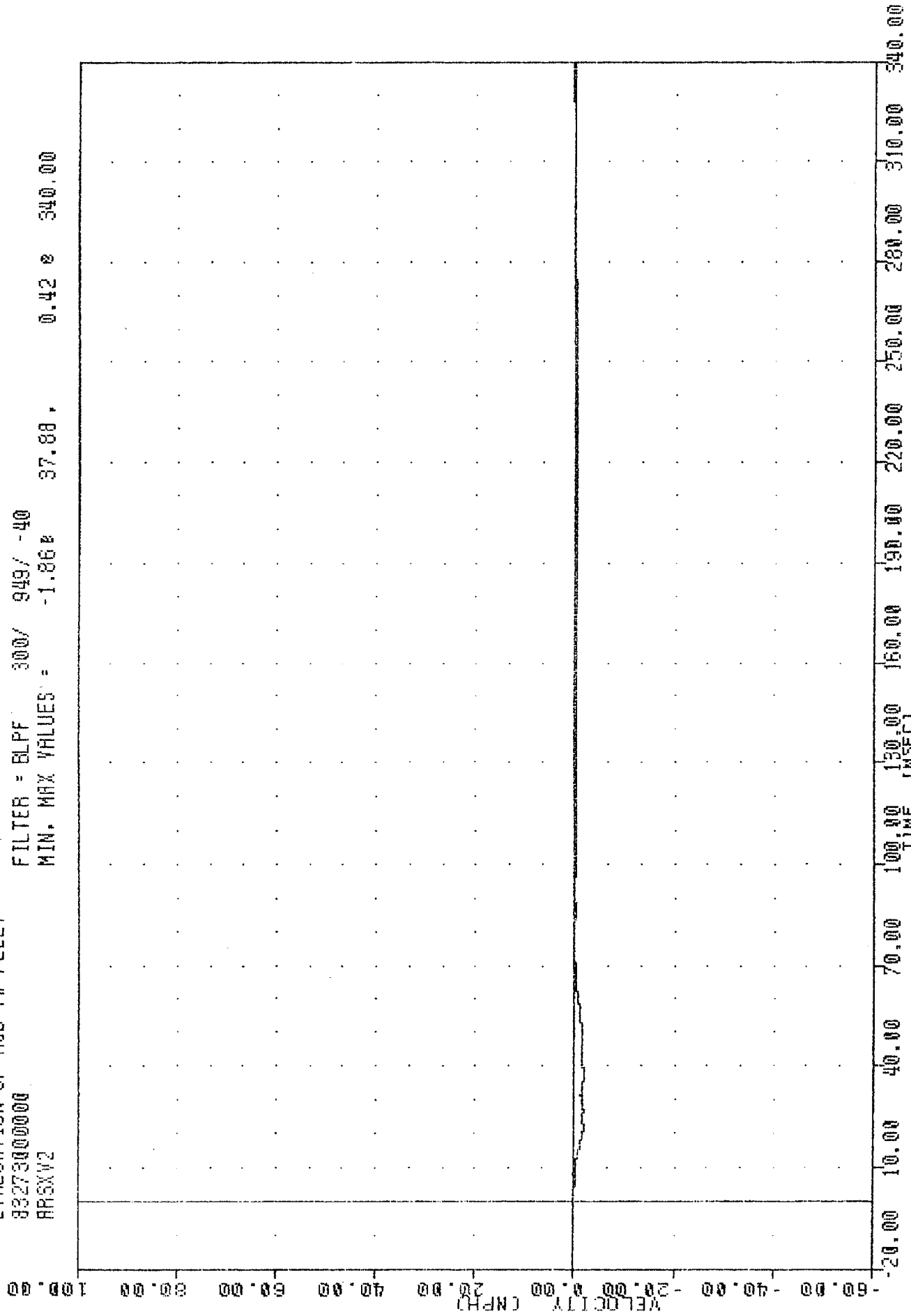
EVALUATION OF MOD YW FLEET

83273000000

RRSXV2

FILTER = BLPF 300/ 949/ -40

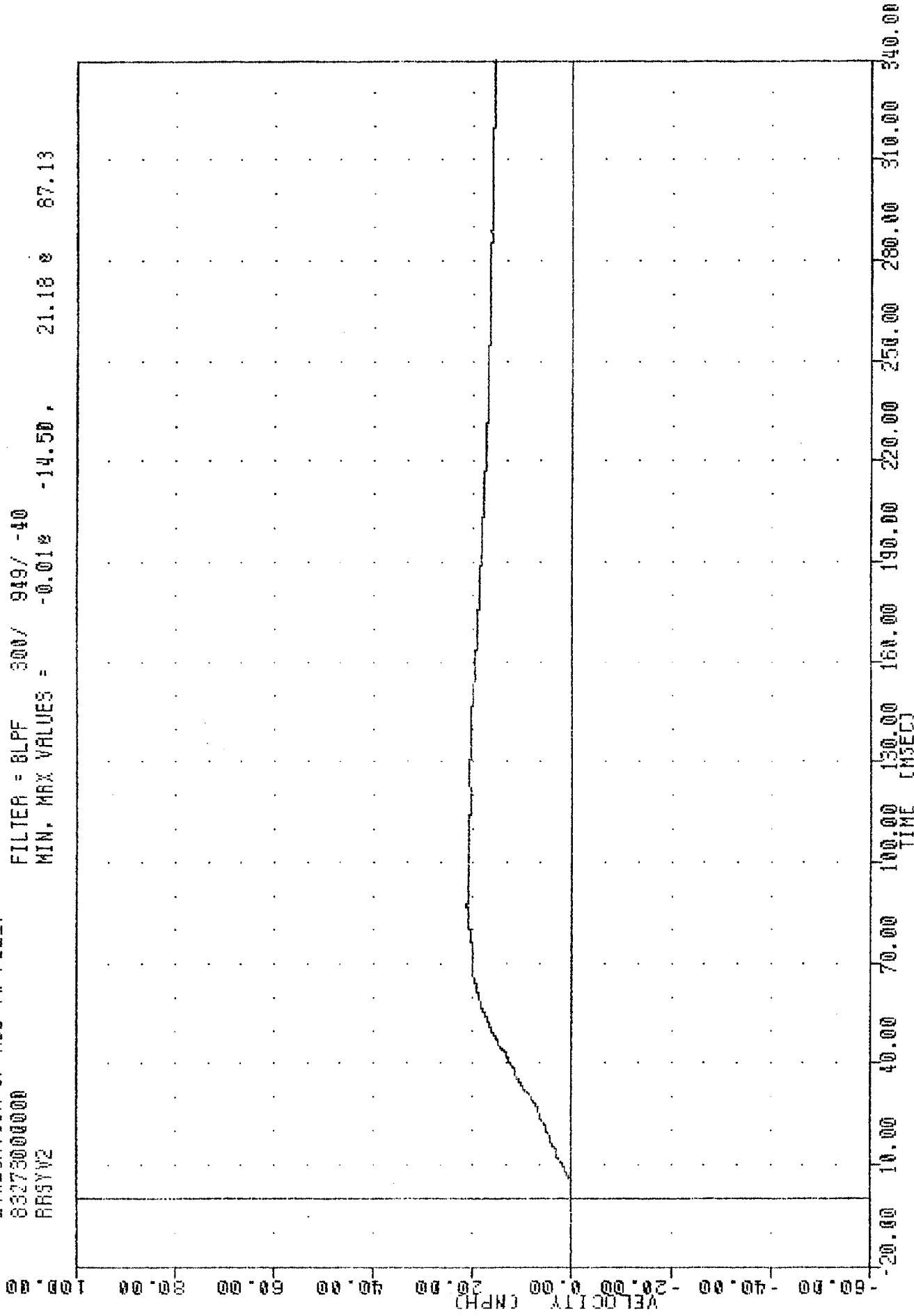
MIN. MAX VALUES = -1.86 e 37.88 , 0.42 e 340.00



TAC
EVALUATION OF MOD VW FLEET
83273000000
RRSYV2

PLOT DATE 4-OCT-83 13:51:45

FILTER = 8LPF 300/ 949/ -40
MIN. MAX VALUES = -0.01% -14.50, 21.18 % 87.13



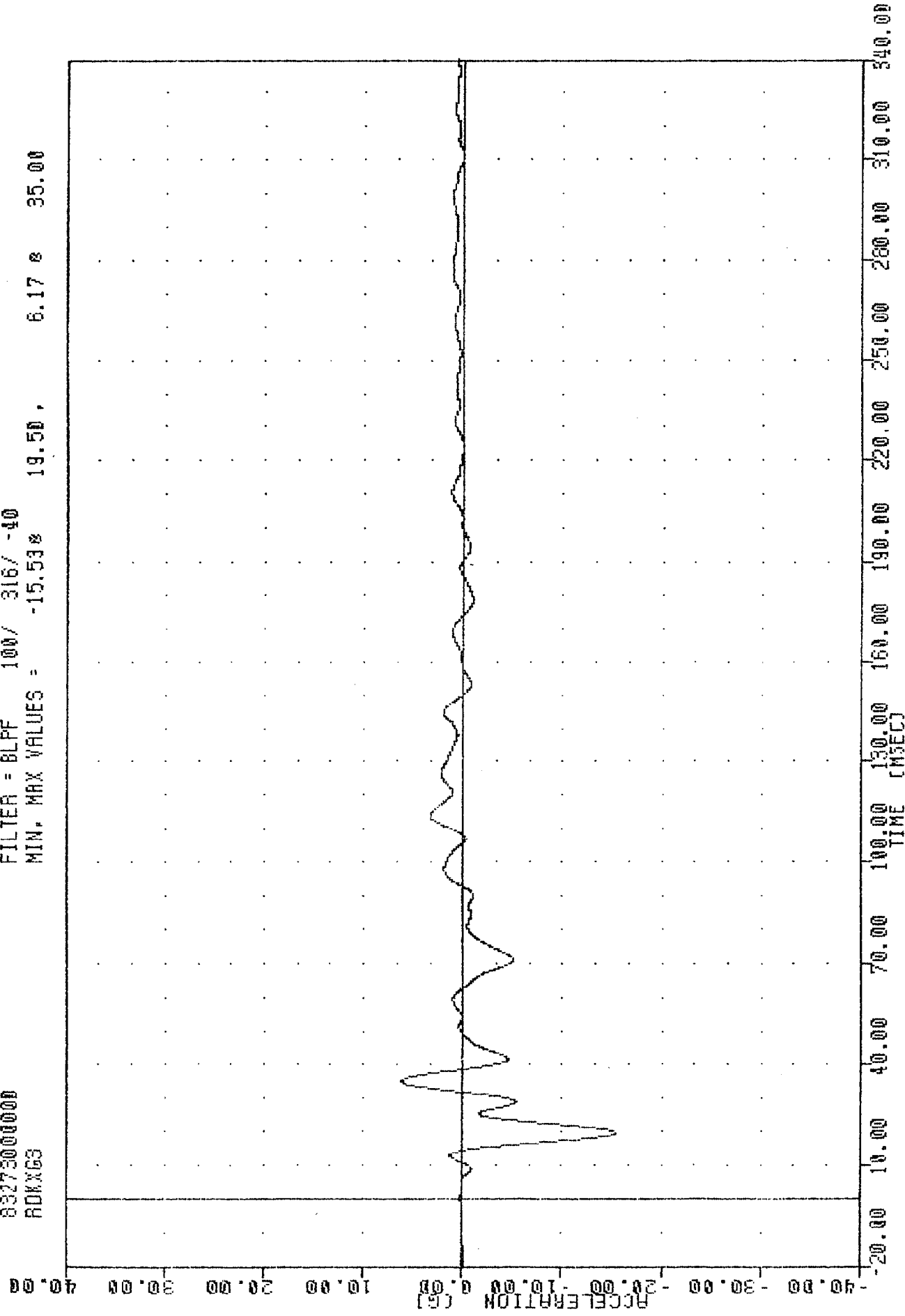
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RRSYG2

TRC
EVALUATION OF NDD V'N FLEET
832730000000
RDXK63

PLOT DATE 4-OCT-83 10:46:20

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -15.53% 19.50, 6.17 % 35.00



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

TAC

830930

PLUT DATE

4-OCT-83

10:46:20

EVALUATION OF MOD VEHICLE FLEET

832730000000

R0KY63

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -2.55 147.63

23.78

21.13

40.00

30.00

20.00

10.00

0.00

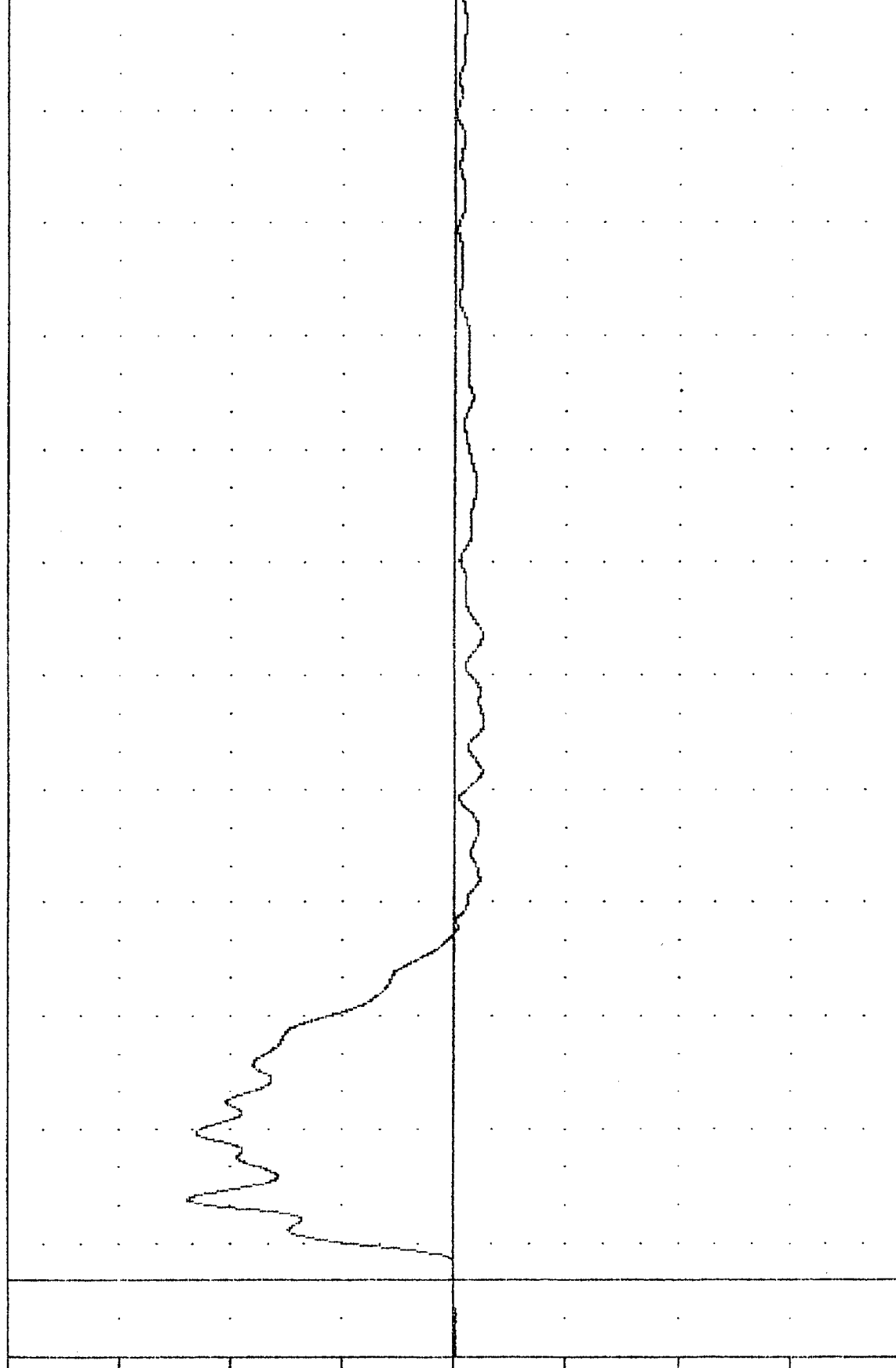
-10.00

-20.00

-30.00

-40.00

ACCELERATION (G)



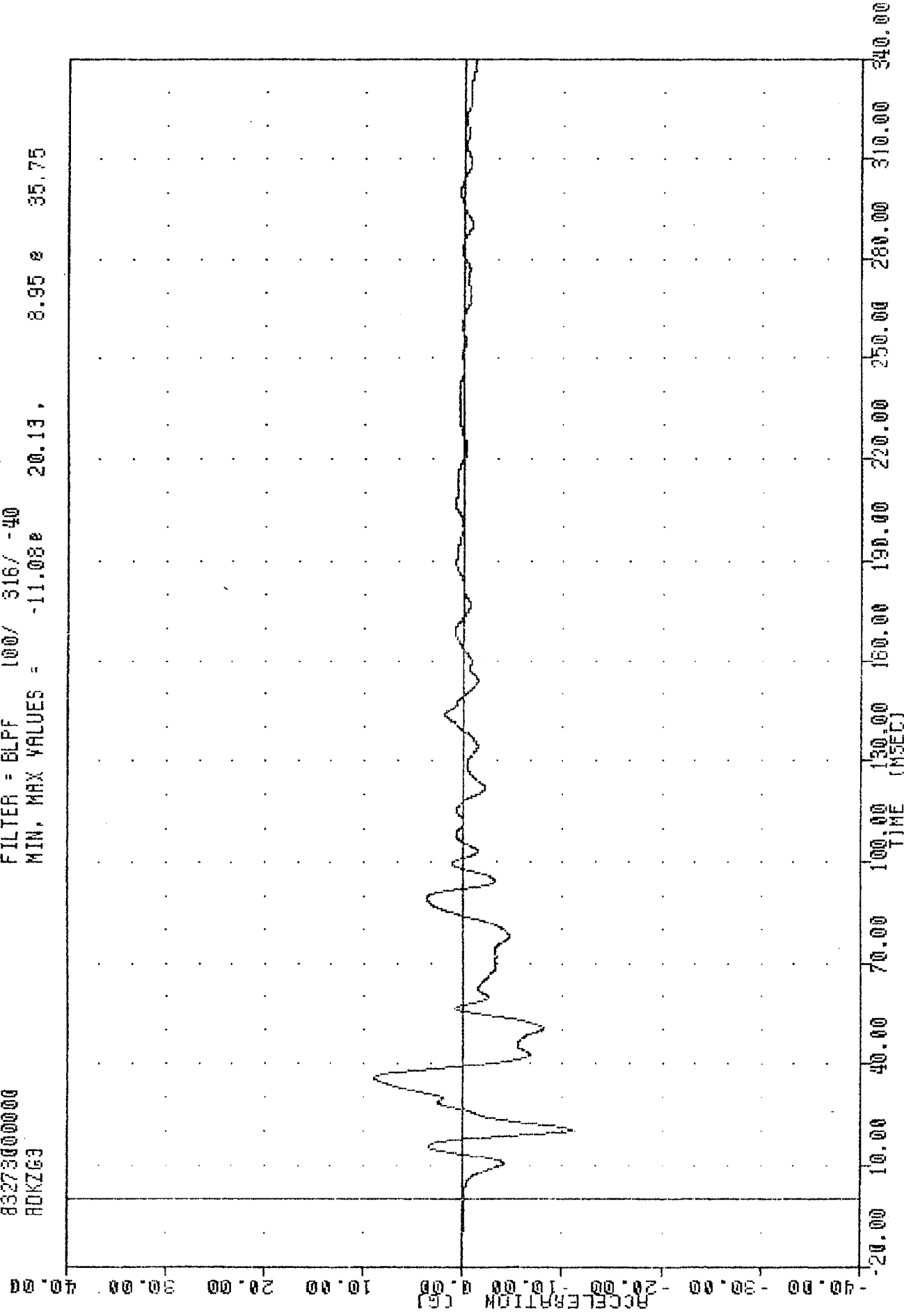
TIME (msec)

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

TRC
EVALUATION OF MOD VV FLEET
83273000000
ADKZG3

PLOT DATE 4-OCT-83 10:46:20

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -11.08e 20.13, 8.95 e 35.75



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

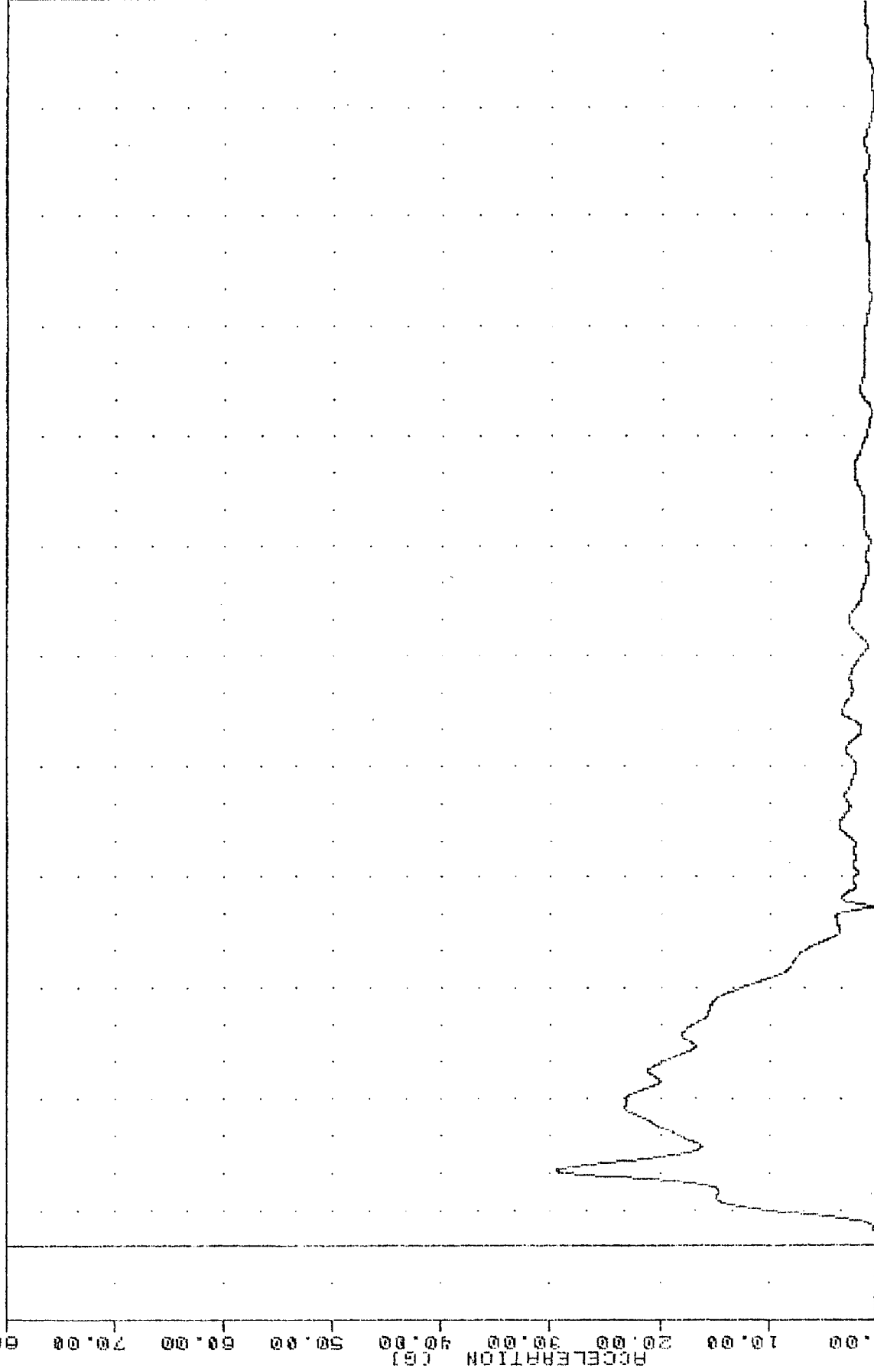
TAC 830930
EVALUATION OF MOD VN FLEET
832730000000
ADKAG3

PLOT DATE 4-OCT-83 10:46:20

FILTER = BLPF 100/ 318/ -40

MIN, MAX VALUES = 0.11g -10.00, 29.51 g 20.25

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK RESULTANT

TAC

830930

PLUT DATE

4-OCT-83

13:51:45

EVALUATION OF MOD VW FLEET

83273000000

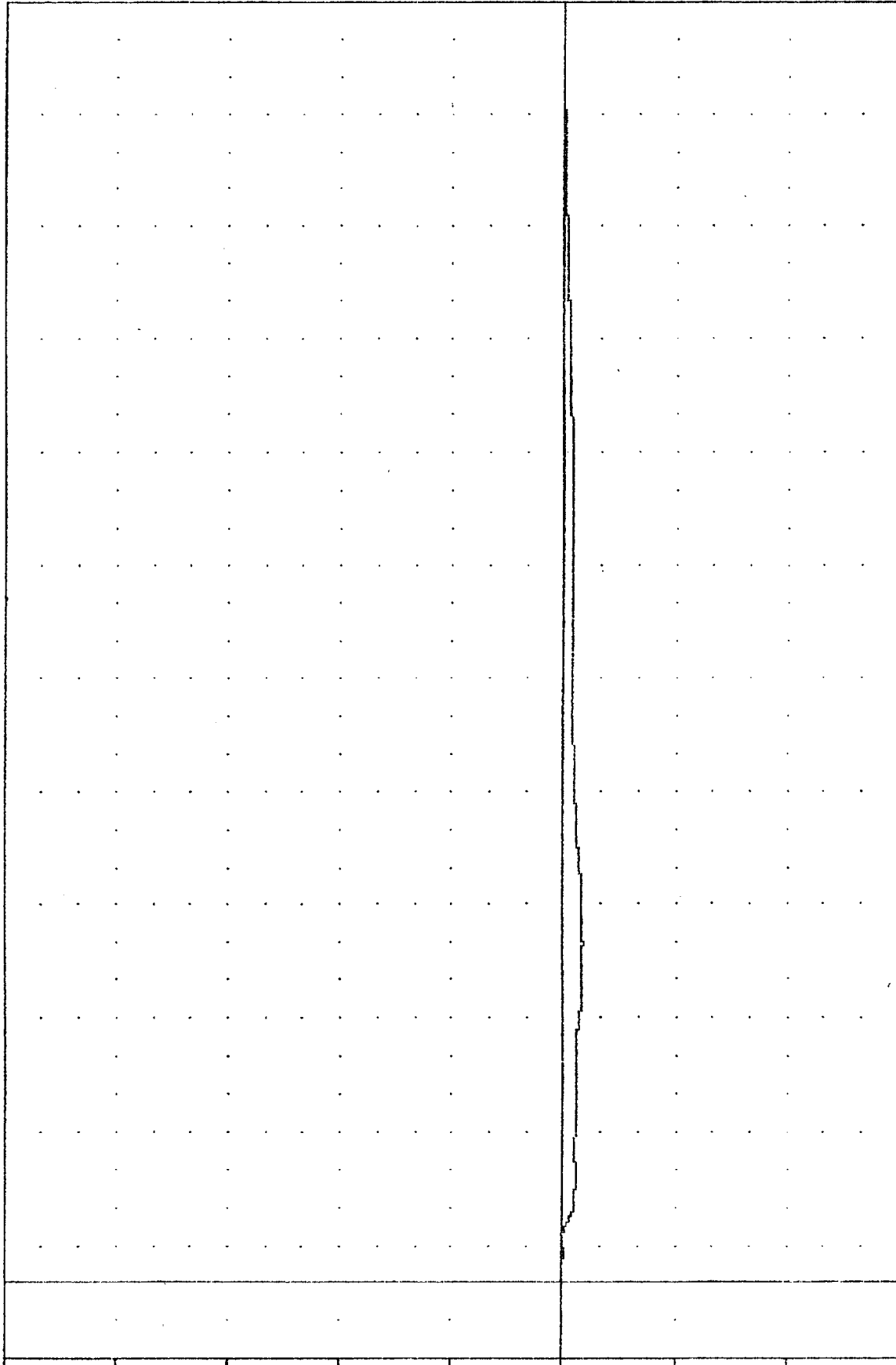
FILTER = BLPF 300/ 949/ -40

ADKXV3

MIN, MAX VALUES = -3.44e 89.50

0.37 e 340.00

VELOCITY (MPH)



-80.00 -60.00 -40.00 -20.00 0.00 20.00 40.00 60.00 80.00 100.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING ADKXG3

TAC

830930

PLOT DATE

4-ULY-83

13:51:45

EVALUATION OF MOD YW FLEET

83273000000

RDKYV3

FILTER = BLPF 300/ 949/ -40

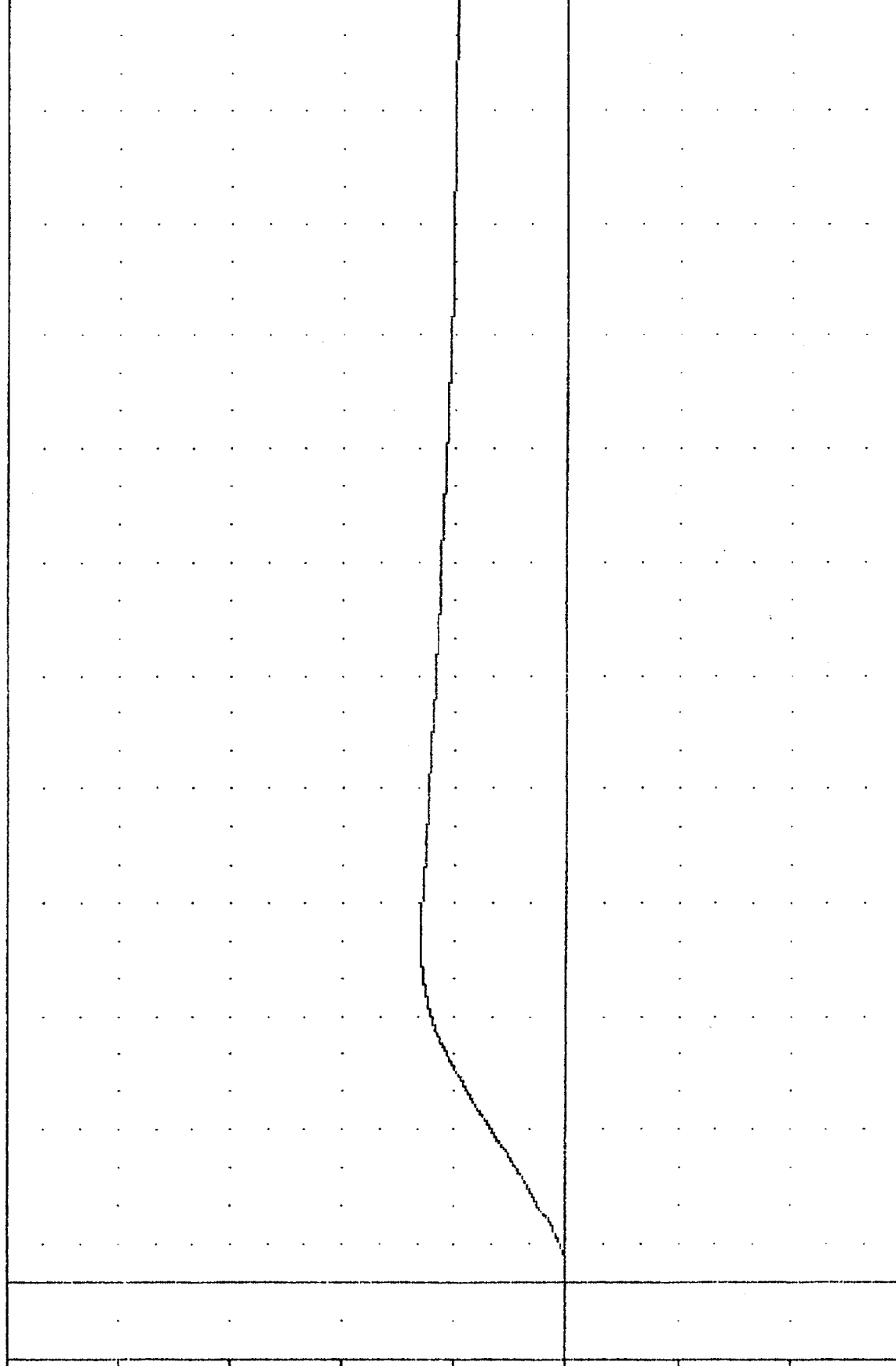
MIN. MAX VALUES = -0.028

-8.25,

26.01 e

89.00

VELOCITY (MPH)



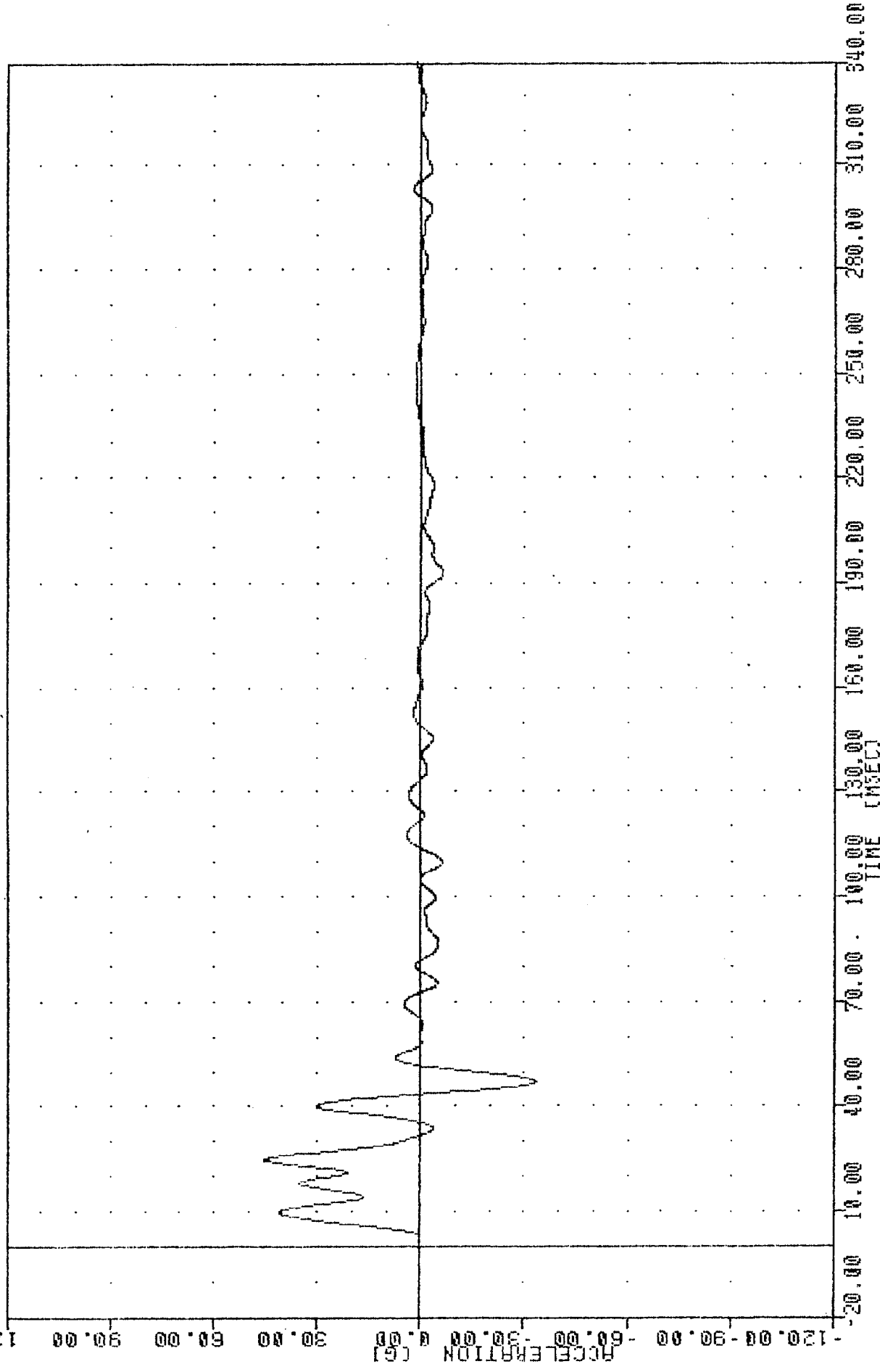
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING RDKYV3

TAC
EVALUATION OF MDD VW FLEET
832730000000
LRSYG4

PLUT DATE 4-OCT-83 10:48:20

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -33.42% 47.00, 45.05 % 24.63



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

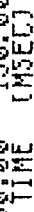
11

CH-105

1

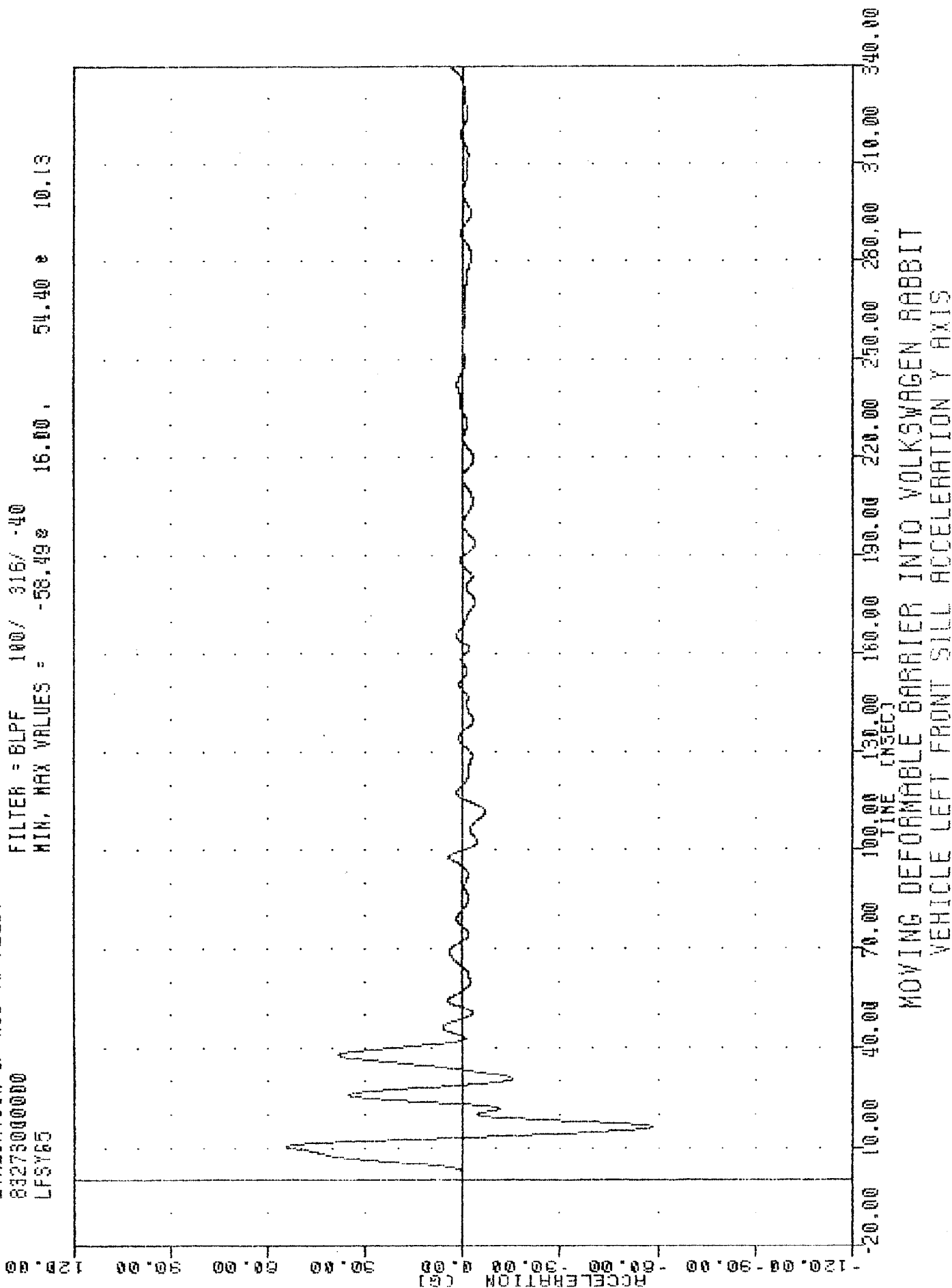
2023

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DELIVERED BY AIR MAIL

TRC 830930 PLOT DATE 4 OCT 85 10:40:20
 EVALUATION OF MOD VM FLEET
 83273000000
 LFSY65
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -58.49 16.00, 54.40 10.13



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

TAC

, 830930

PLUT DATE

4-OCT-83

13:51:45

EVALUATION OF MOD VN FLEET

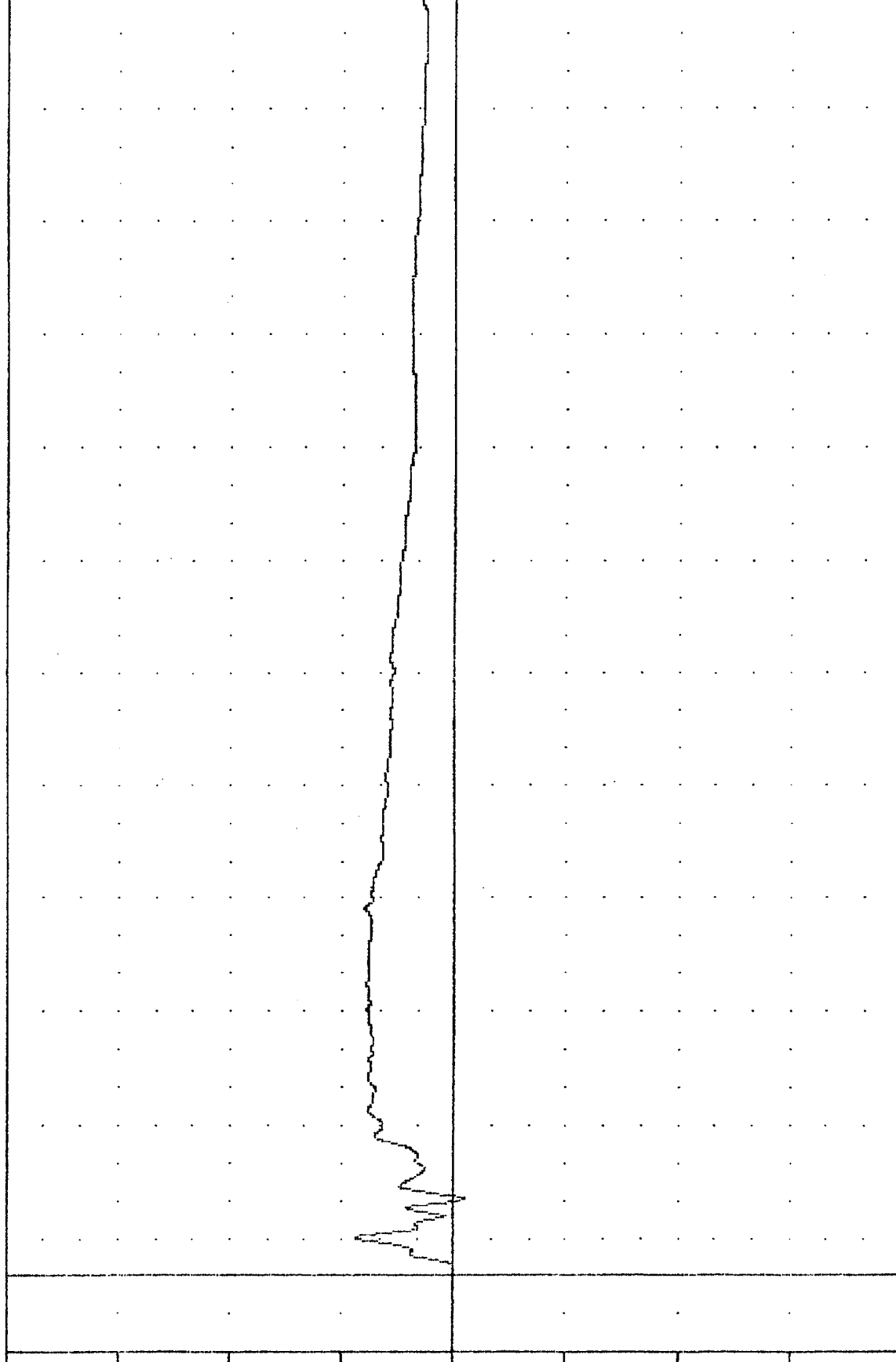
832730000000

LFSYV5

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -1.07e 20.38, 8.79 e 10.00

VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING LFSYG5

TAC 830930 PLUT DATE 4-OCT-83 10:46:20

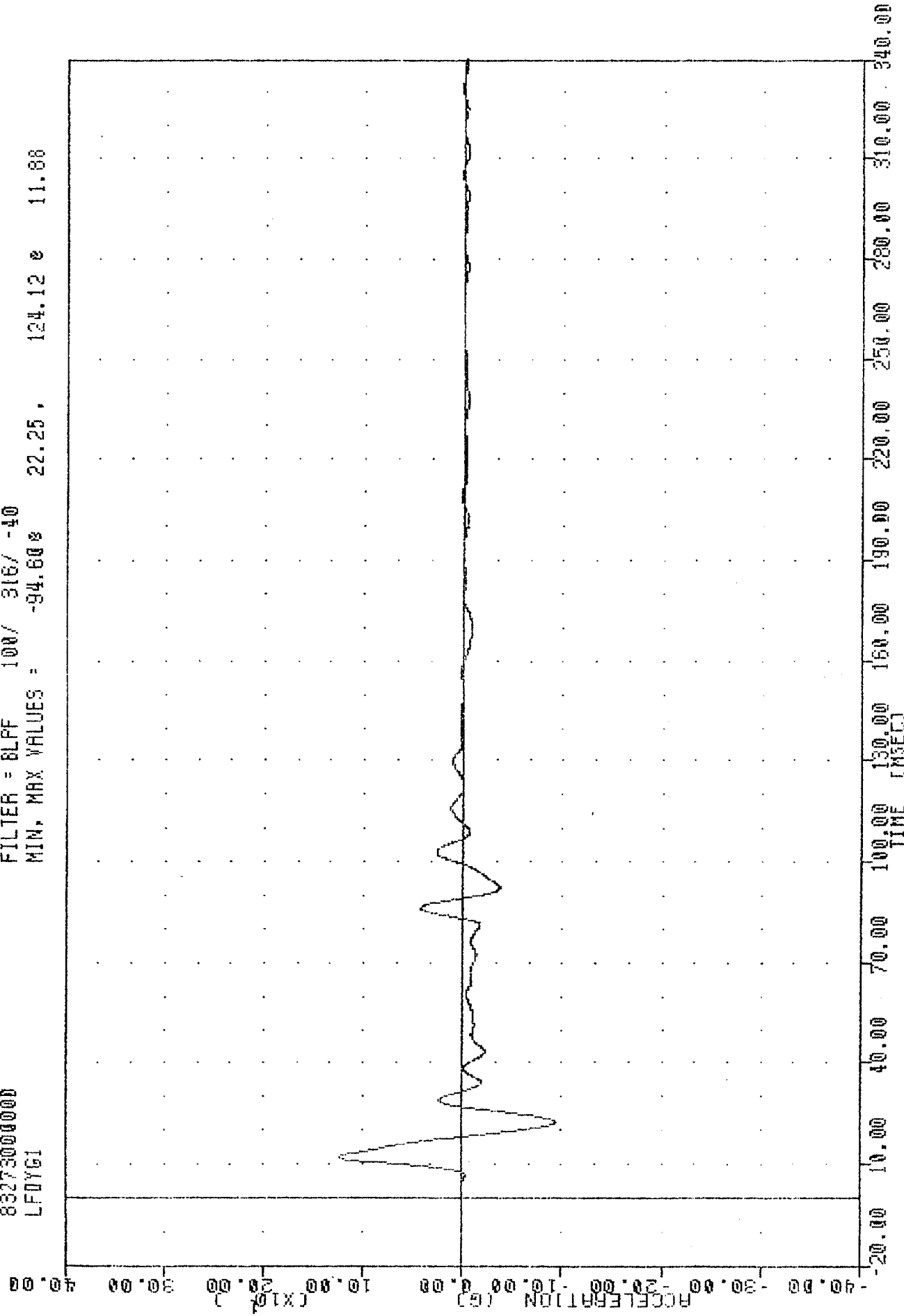
EVALUATION OF MOD VV FLEET

832730000000

LF0Y61

FILTER = 8LFF 100/ 316/ -40

MIN. MAX VALUES = -94.60% 22.25 . 124.12 e 11.88



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

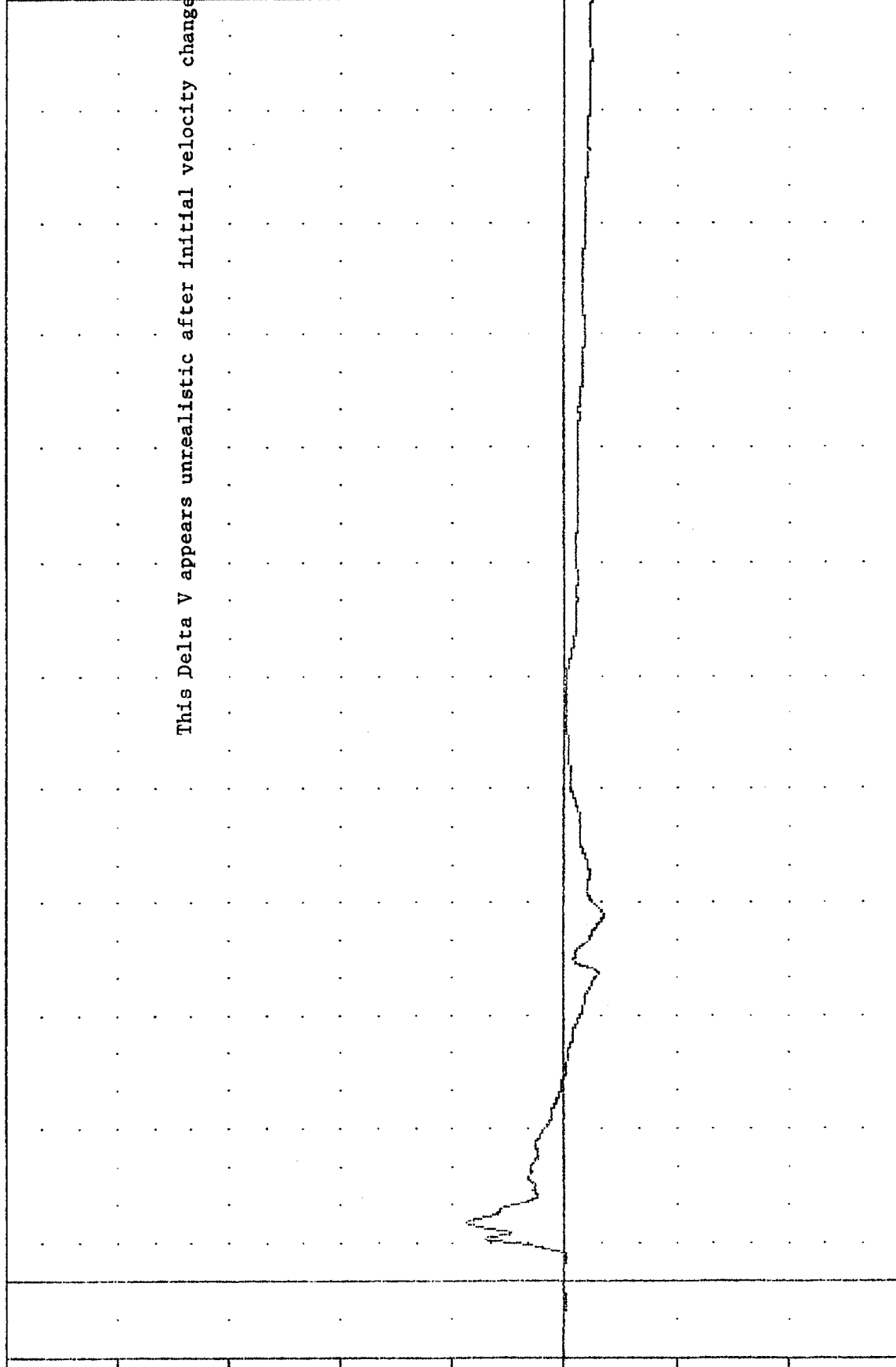
TRC 830930
EVALUATION OF MOD YW FLEET
832730000000
LFDYV1

PLOT DATE 4-OCT-83 13:51:45

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -6.93e 96.25, 17.47 e 15.13

100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
-60.00
-80.00
-100.00

VELOCITY (MPH)



This Delta V appears unrealistic after initial velocity change

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
DELTA V USING LFDYGI

TRC

830930

PLT DATE

4-OCT-83

10:46:20

EVALUATION OF MOD VN FLEET

832730000000

FILTER = BLPF 100/ 316/ -40

LFDY62

MIN. MAX VALUES = -569.858

36.13

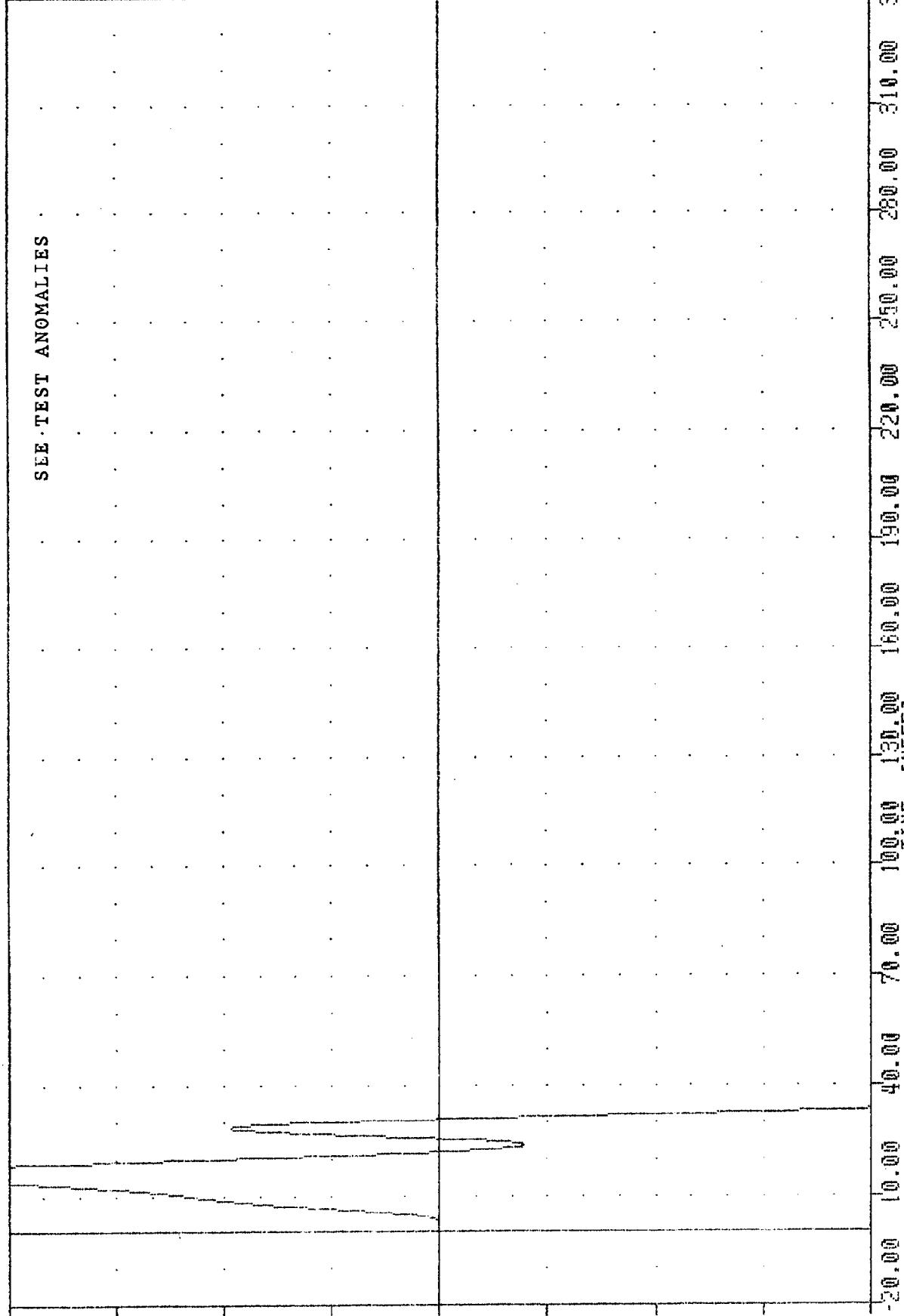
491.78

16.13

40.00

($\times 10^4$)

ACCELERATION (G)



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

TIME (MSEC)

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
VEHICLE LEFT FRONT DOOR (POSITION 8) ACCELERATION Y AXIS

TRC

830930

EVALUATION OF MOD YW FLEET

83273000000

LFDV63

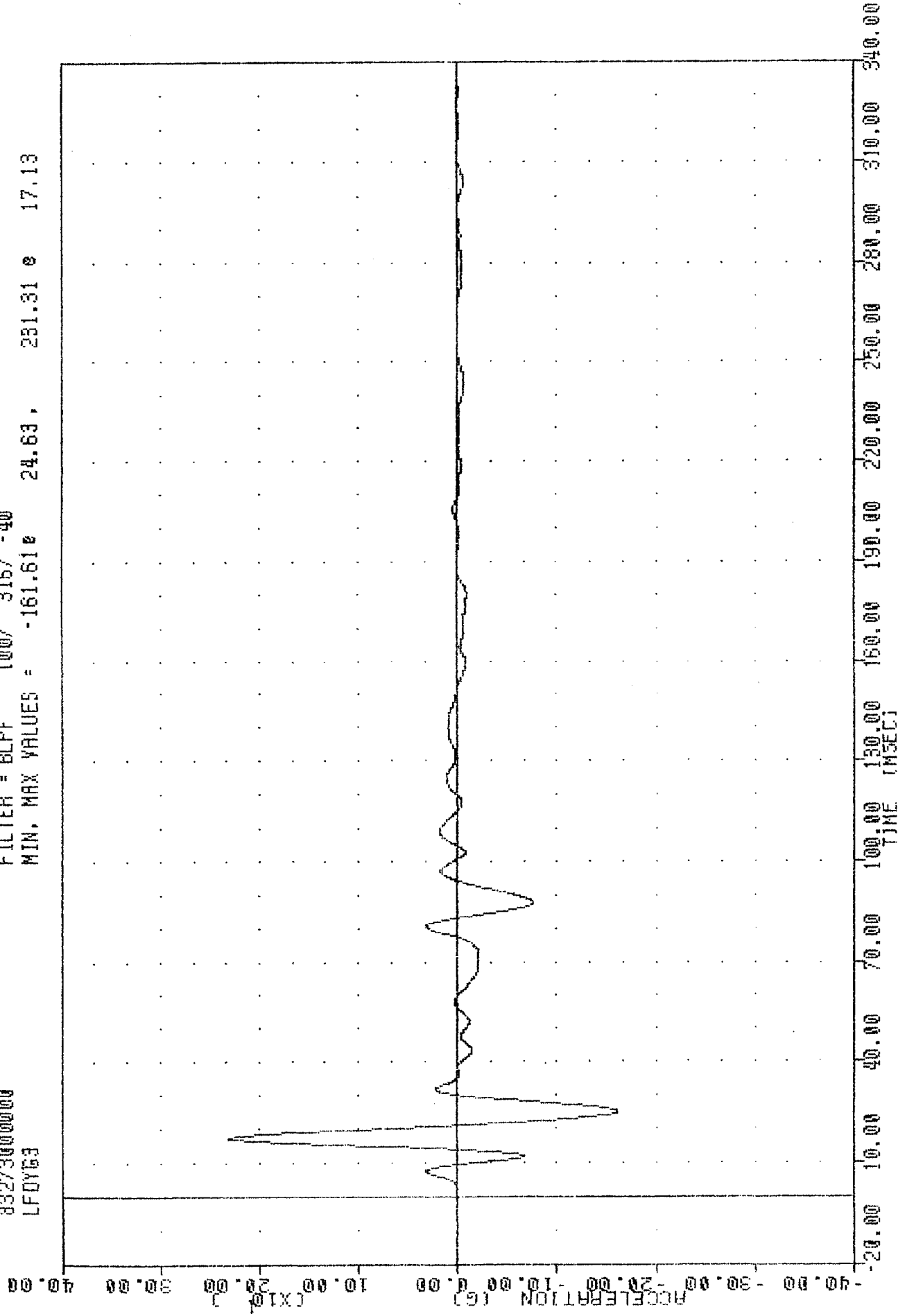
PLUT DATE

4-OCT-83

10:46:20

FILTER = BLPF 100/ 316/ -40

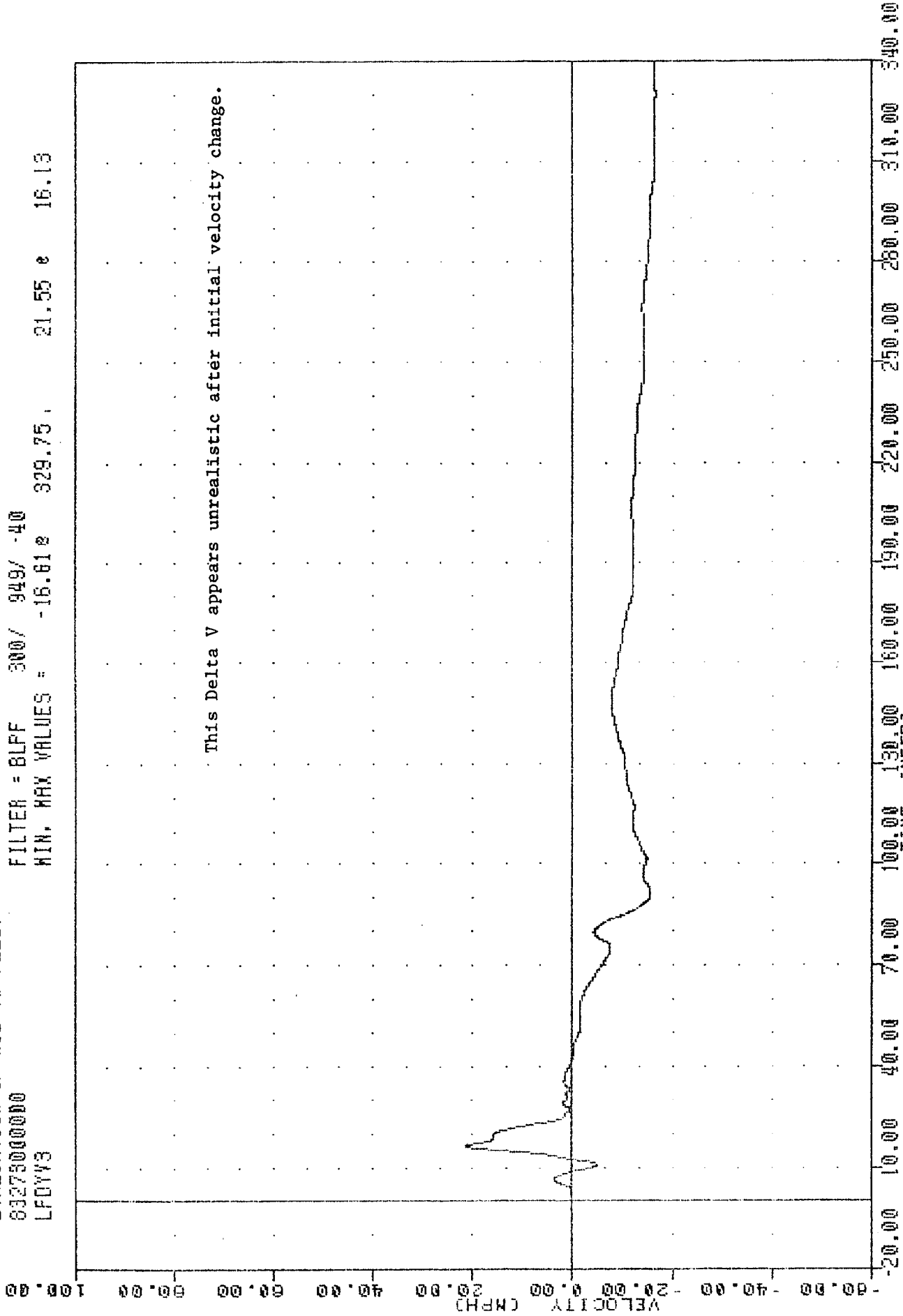
MIN. MAX VALUES = -161.61e 24.63, 231.31 e 17.13



TAC 830930
EVALUATION OF MOD VW FLEET
832750000000
LFDYV3

PLUT DATE 4-OCT-83 13:51:45

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -16.612 329.75 21.55 e 16.13



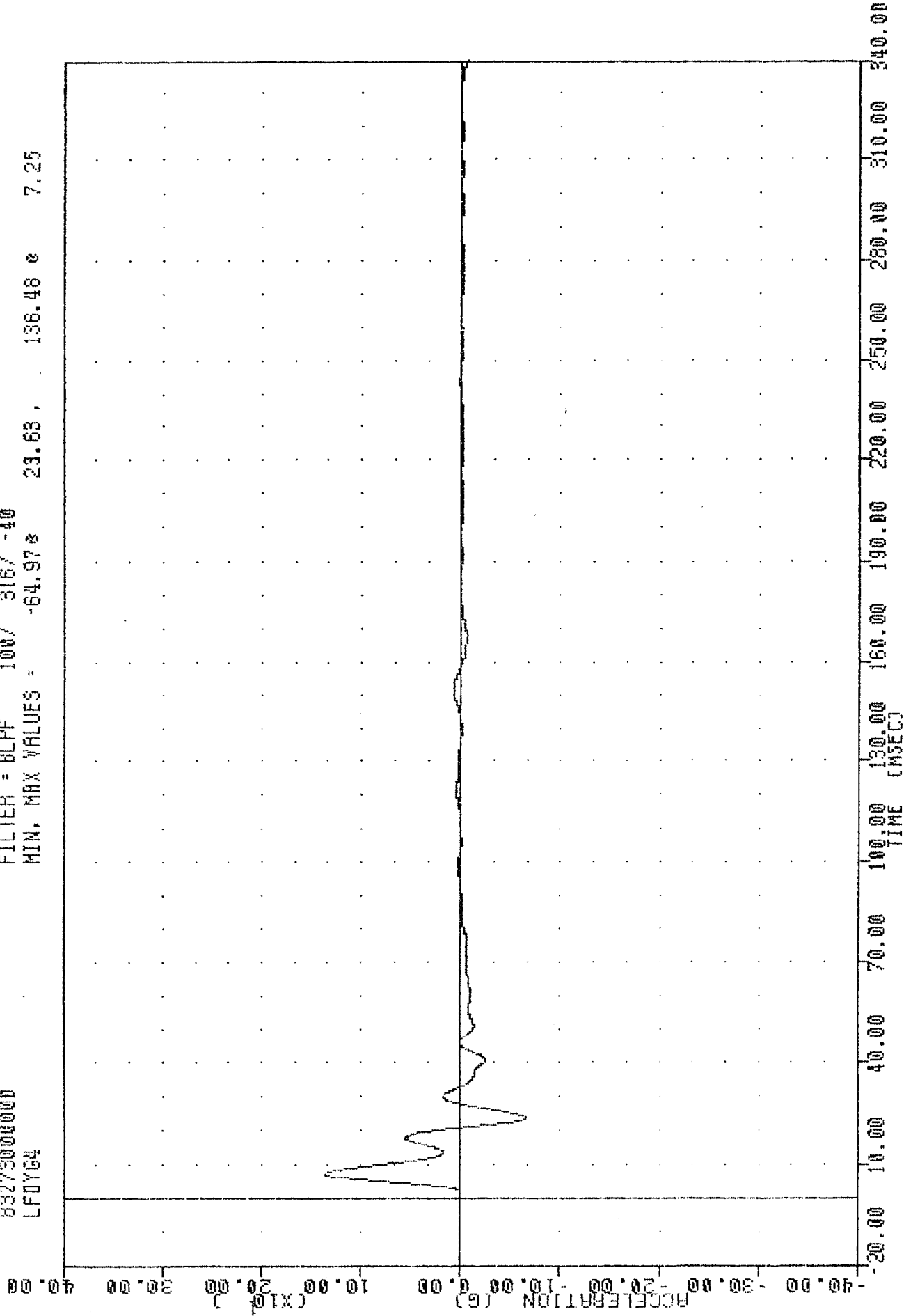
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYV3

TRC
EVALUATION OF MDD VW FLEET
832730000000
LFDYGC

PLOT DATE 4-OCT-83 10:46:20

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -64.97 23.63 136.48 7.25



TRC
EVALUATION OF MOD VV FLEET
83273000000
LFOYV4

PLOT DATE

4-OCT-83

13:51:45

FILTER = BLPF 300/ 949/ -40

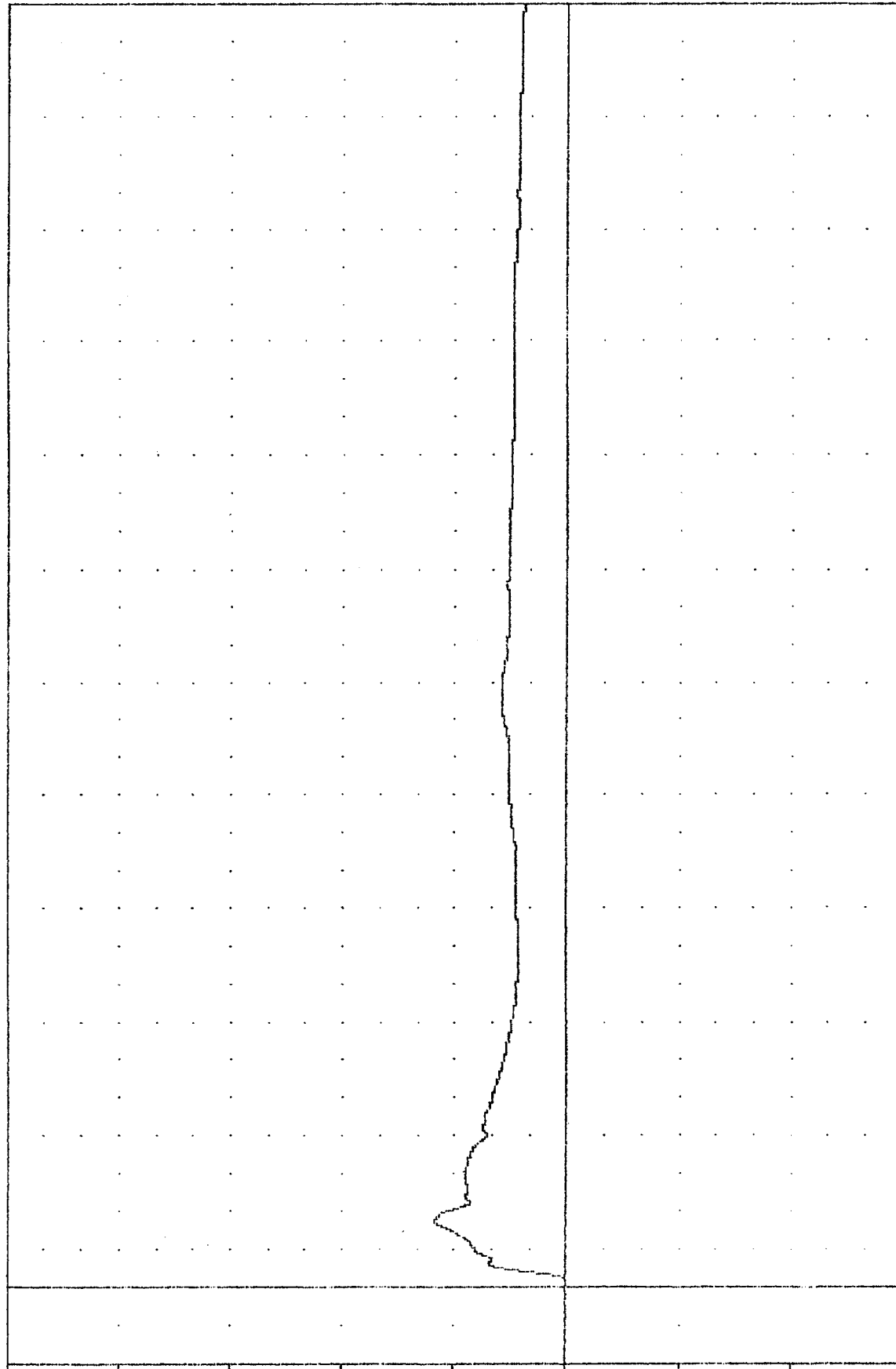
MIN. MAX VALUES = -0.02e

-4.63,

23.60 e

17.00

VELOCITY (MPH)



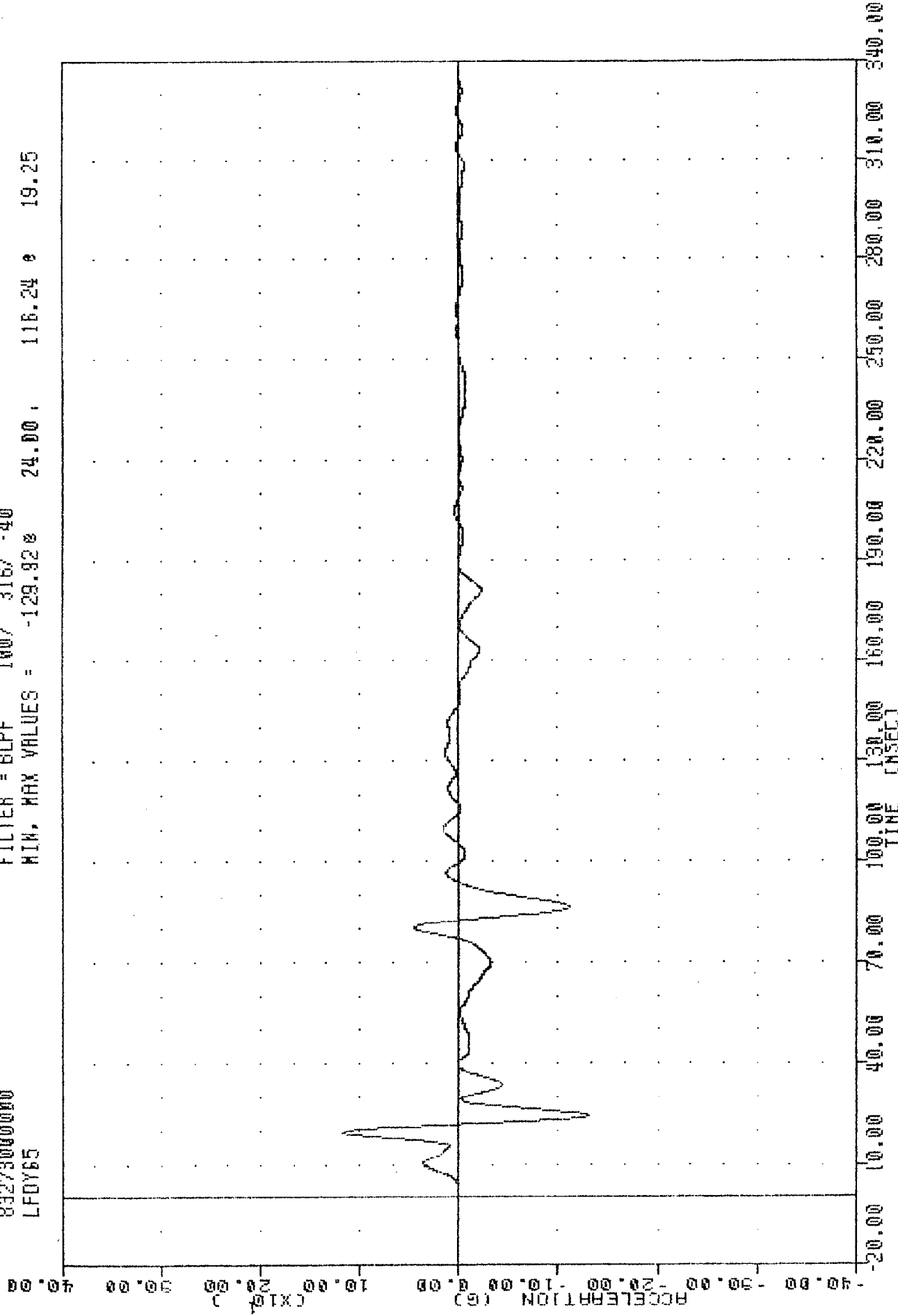
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFOYV4

TAC 830930
EVALUATION OF MOD VV FLEET
832730000000
LFDY65

PLOT DATE 4-OCT-83 10:46:20

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -129.92 24.00 116.24 19.25



TRC

830930

PLUT DATE

4-OCT-83

13:51:45

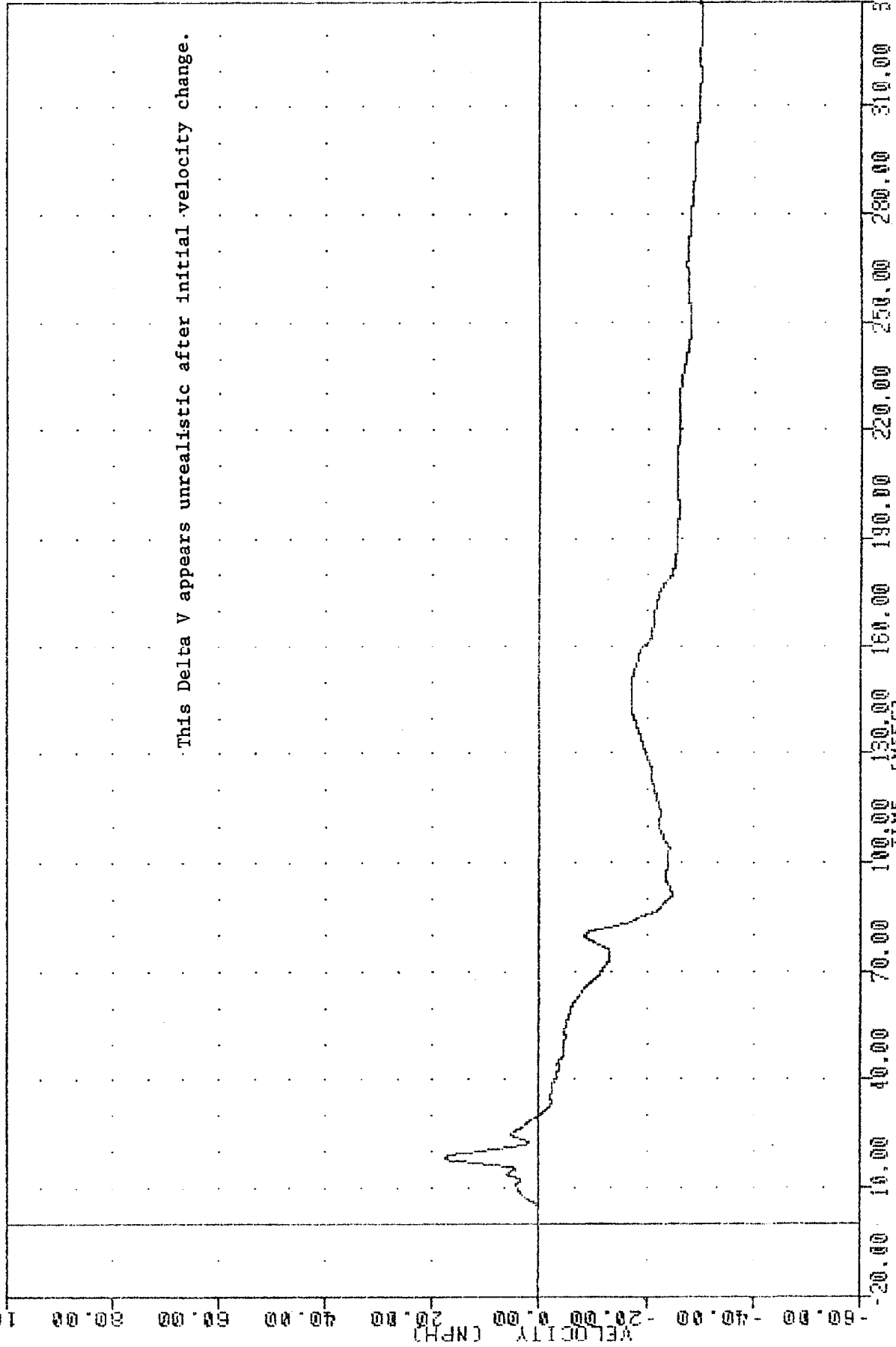
EVALUATION OF MOD VV FLEET

832730000000

LFDYV5

FILTER = 8LFF 300/ 949/ -40

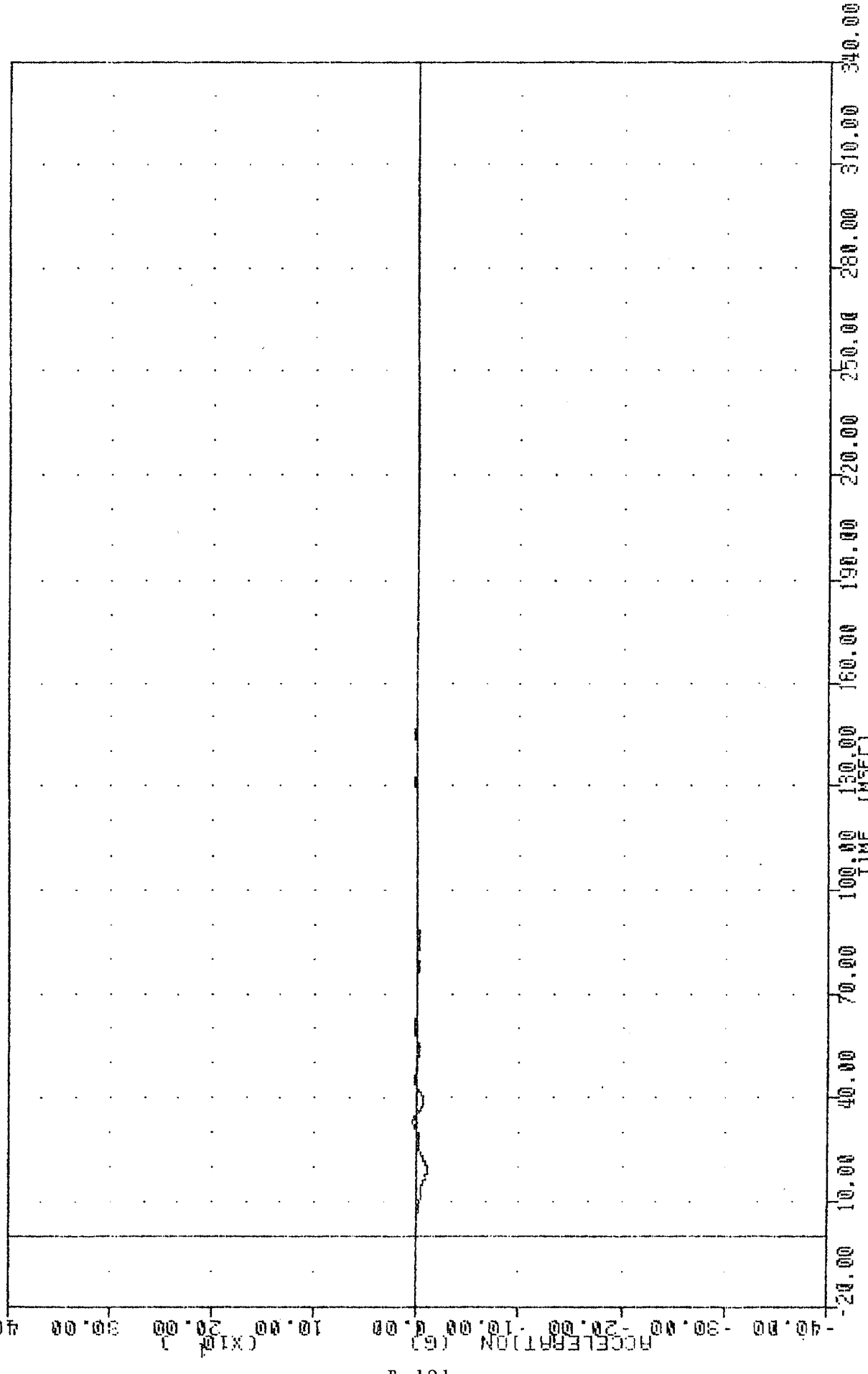
MIN. MAX VALUES = -30.328 331.13 17.60 e 18.25



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING LFDY65

TRC
 EVALUATION OF MOD VV FLEET
 832730000000
 TFRXG7
 PLOT DATE 4-OCT-83 10:46:20
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -10.04e 19.00 4.23e 33.00



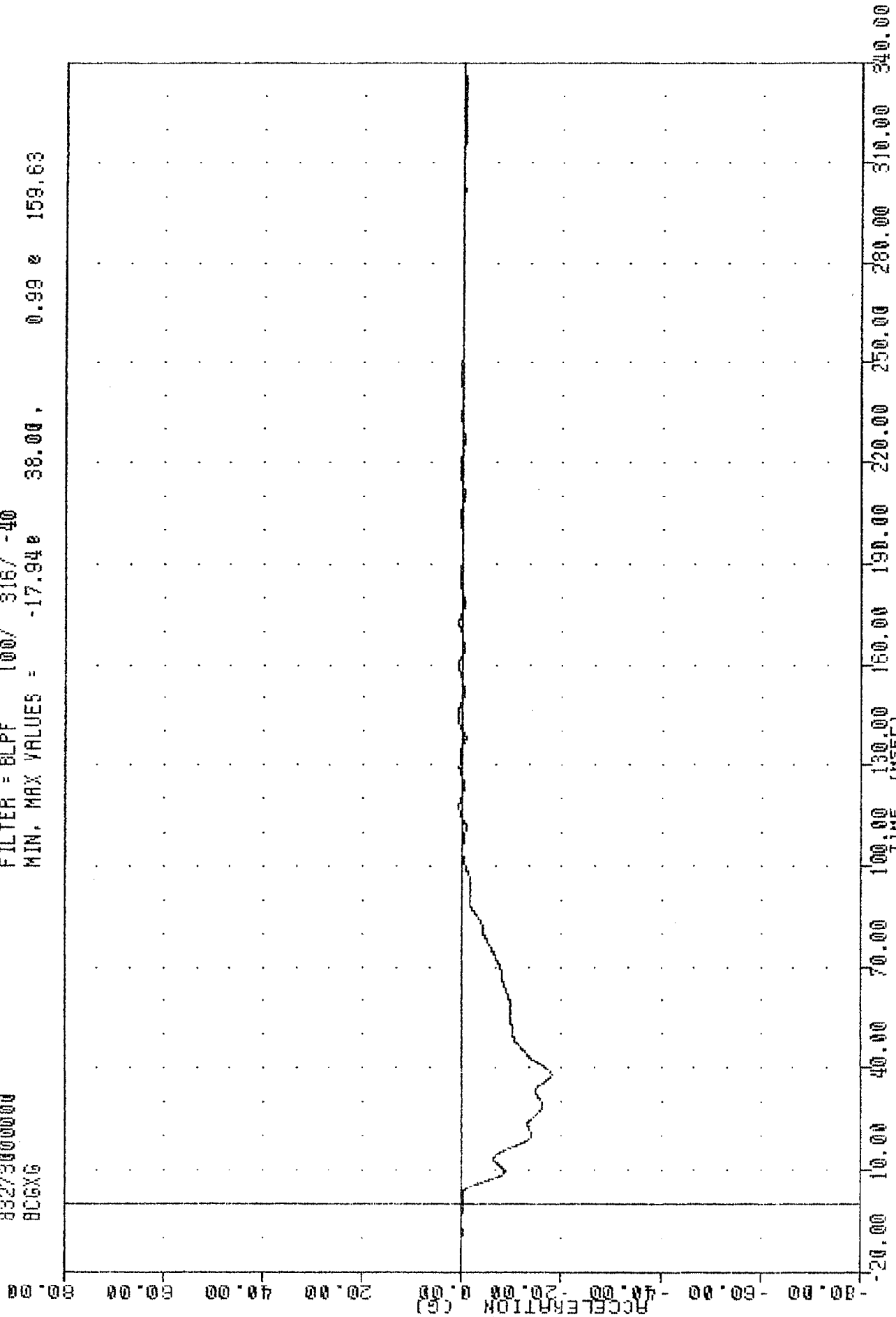
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE TRUNK FLOOR RIGHT ACCELERATION X AXIS

TRC 830930
 EVALUATION OF MOD VW FLEET
 832738000000
 BCGXG

PLOT DATE 4-OCT-83 10:46:20

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -17.94e 38.00, 0.99 e 159.63



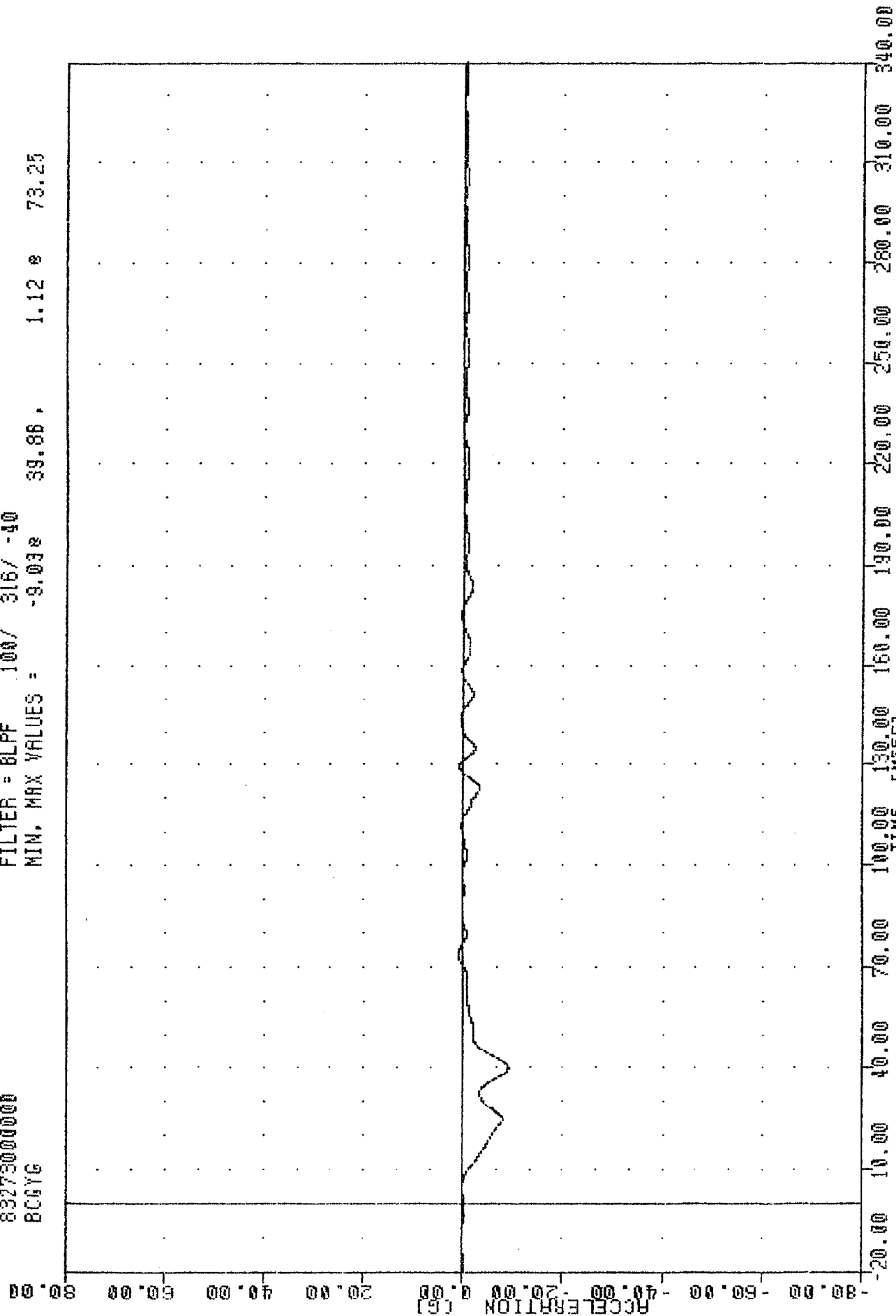
R-102

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

TRC
EVALUATION OF MDD VW FLEET
83273000000
BCGYG

PLOT DATE 4-OCT-83 10:46:20

FILTER = 8LPF 100/ 316/ -40
MIN. MAX VALUES = -9.03g 39.86g 1.12g 73.25



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

TAC

830930

PLUT DATE

4-OCT-83

10:46:20

EVALUATION OF MOD YW FLEET

83273000000

BCGZ6

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -13.402

60.13,

17.49 e

68.00

ACCELERATION (G)

80.00

60.00

40.00

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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
BARRIER CENTER OF GRAVITY Z AXIS

TAC

830930

PLOT DATE

4-OCT-83

10:48:20

EVALUATION OF MOD YW FLEET

832730000000

FILTER = BLPF 100/ 316/ -40

BCGAG

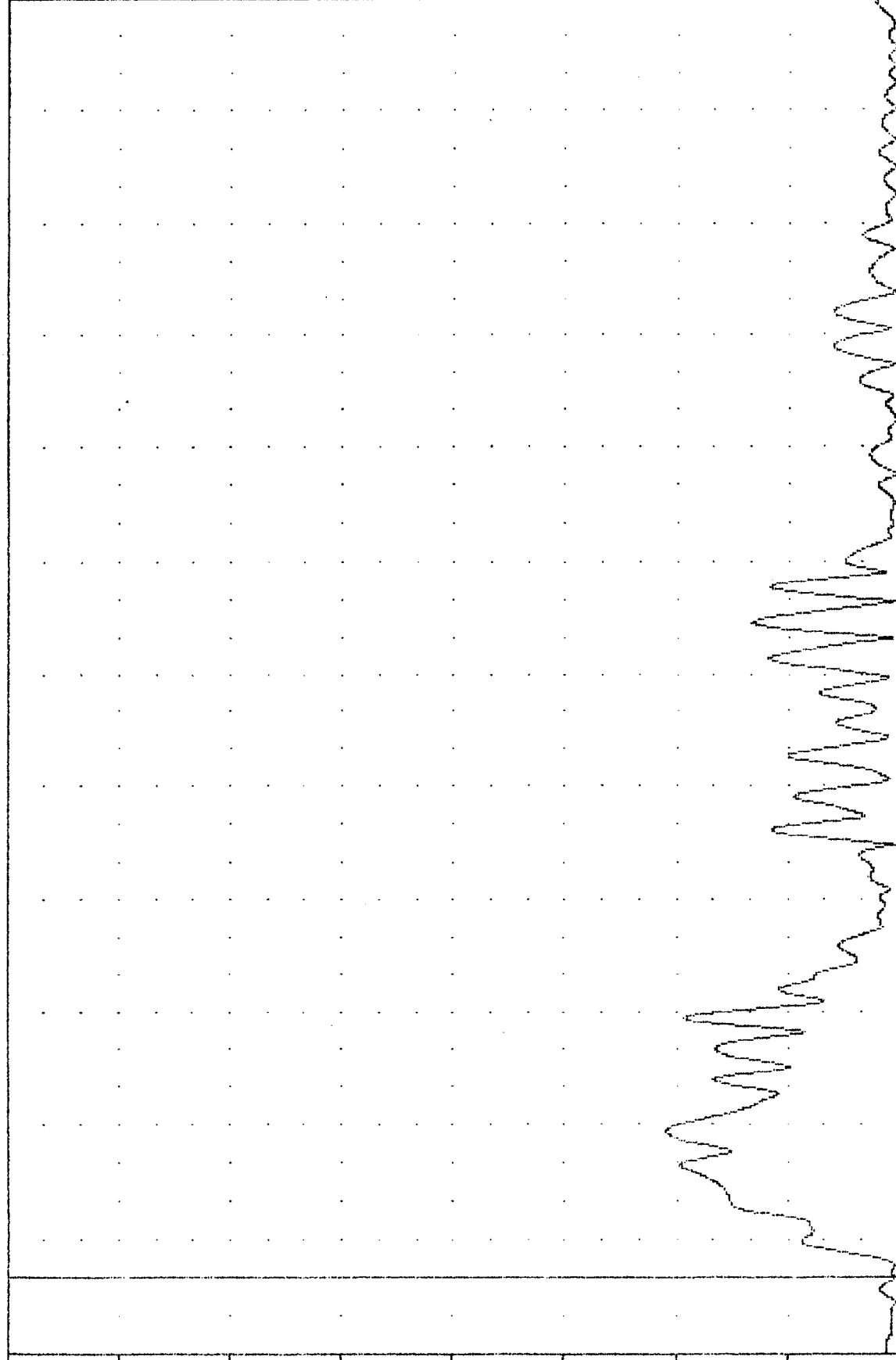
MIN. MAX VALUES = 0.07g

-6.75,

20.89 g

38.00

ACCELERATION (G)



TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

BARRIER CG RESULTANT

TAC

, 830930

EVALUATION OF MOD VN FLEET

832730000000

BCGXV

PLUT DATE

4-OCT-83

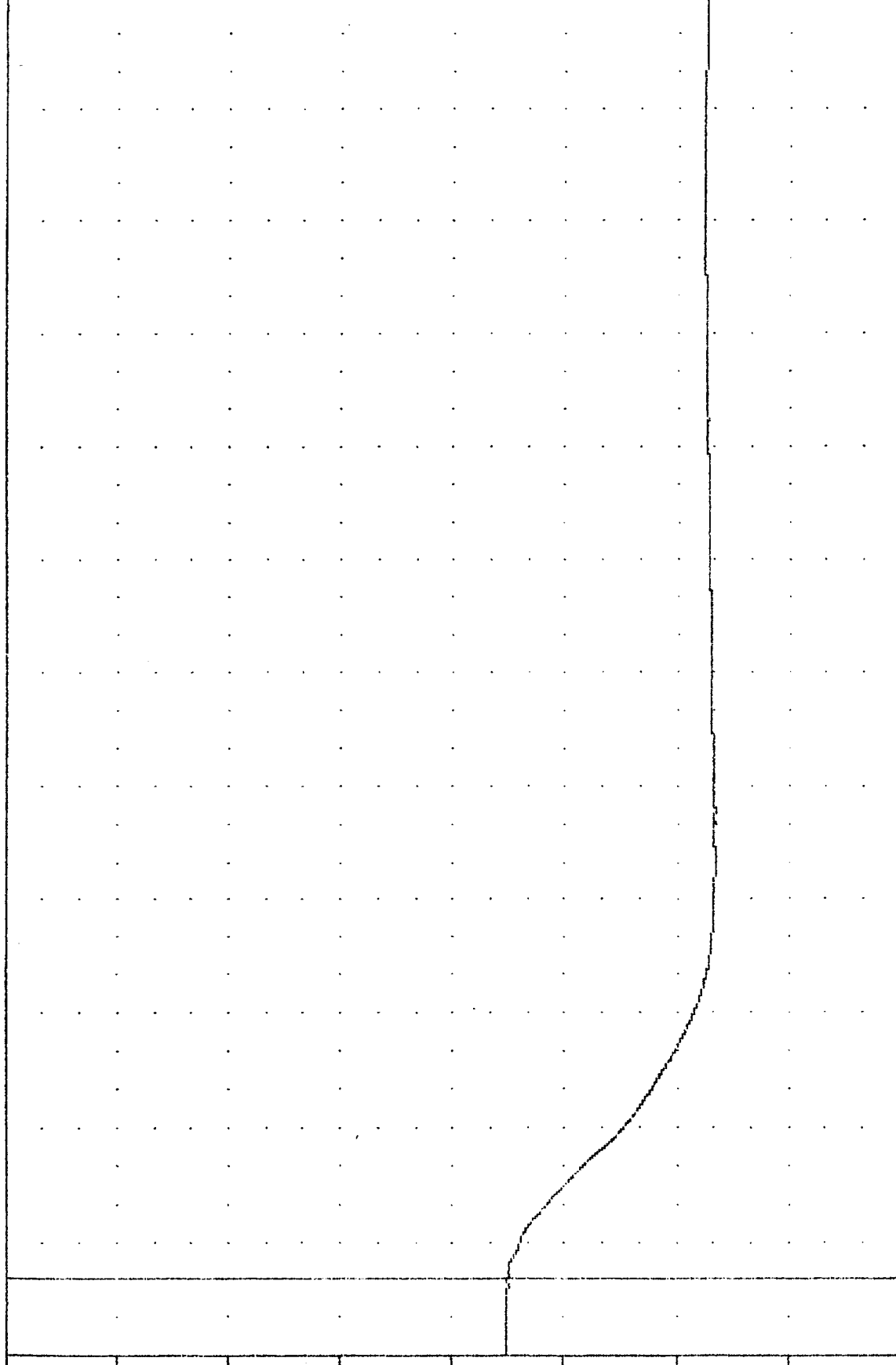
13:51:45

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = 16.540 111.13, 35.12 0 -12.38

80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00

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 W USING BCGXG

TRC

830930

4-OCT-83

13:51:45

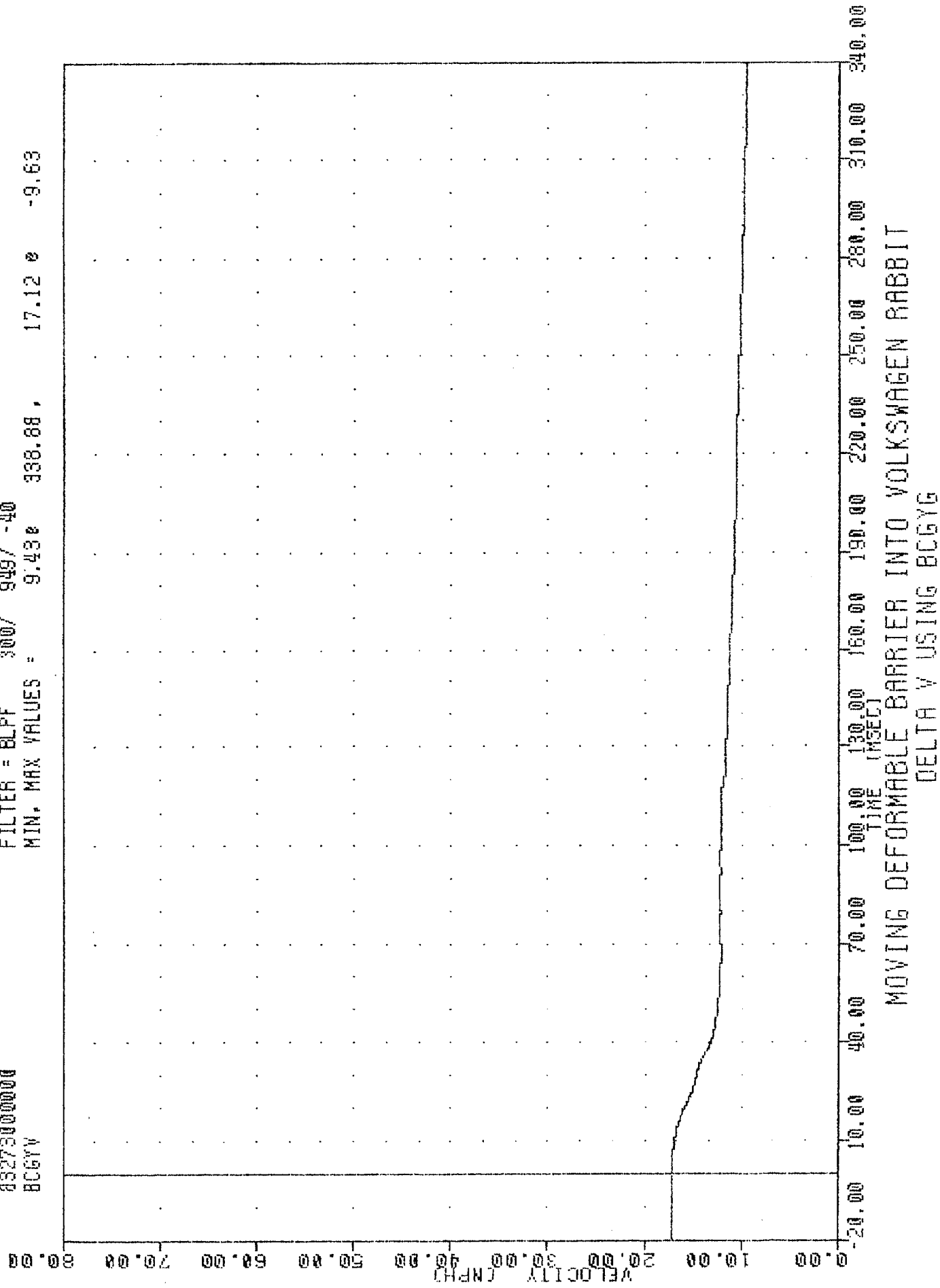
EVALUATION OF MOD V# FLEET

832730000000

FILTER = BLPF 300/ 949/ -40

BCGY

MIN. MAX VALUES = 9.43 338.88, 17.12 -9.63



TRC 830930 4-OCT-83 10:46:20

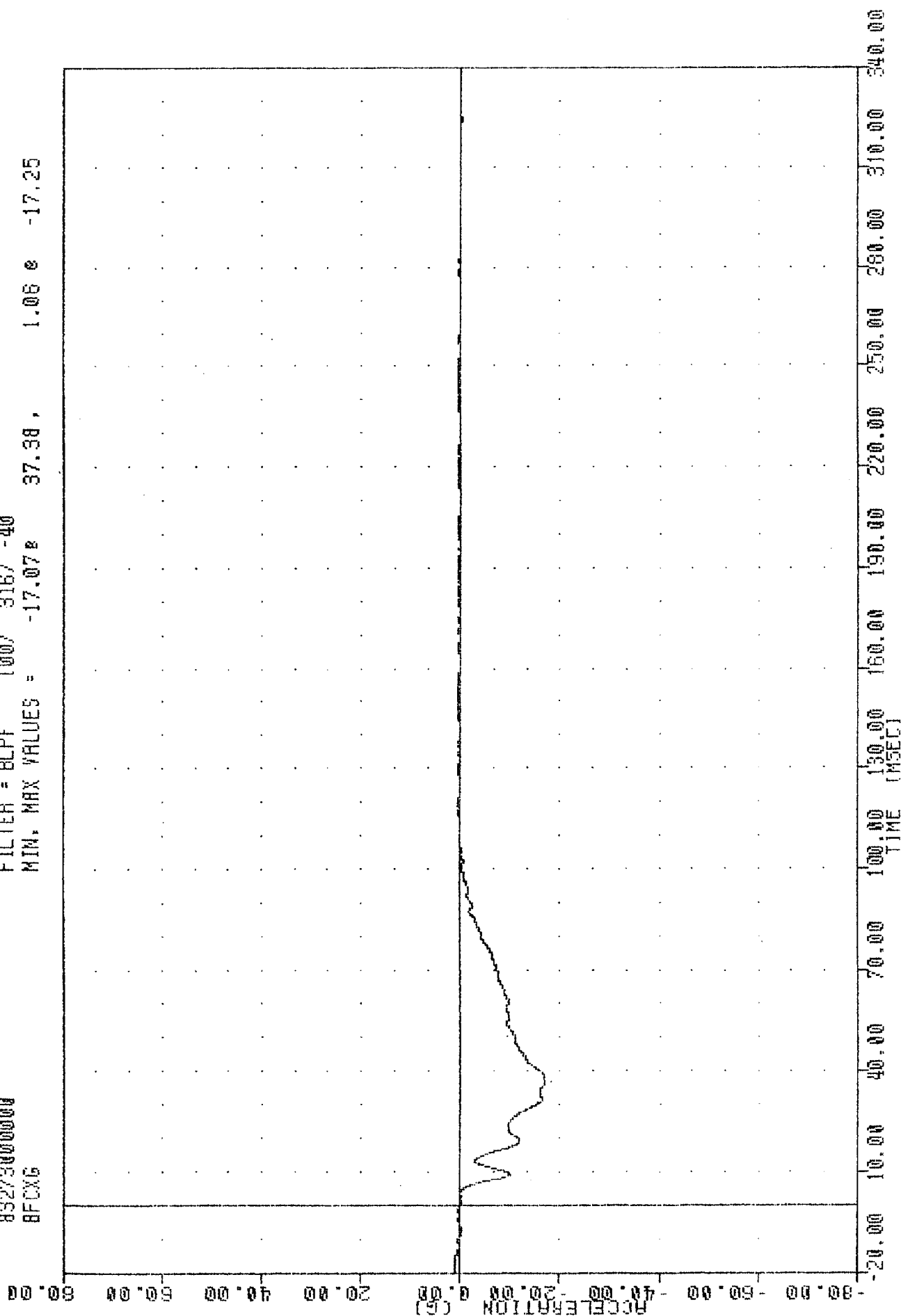
EVALUATION OF MOD YW FLEET

83273000000

BFCXG

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -17.07 37.38 1.06 e -17.25



R-108

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

TRC

830930

PLUT DATE

4-ULT-83

13:51:45

EVALUATION OF MOD VW FLEET

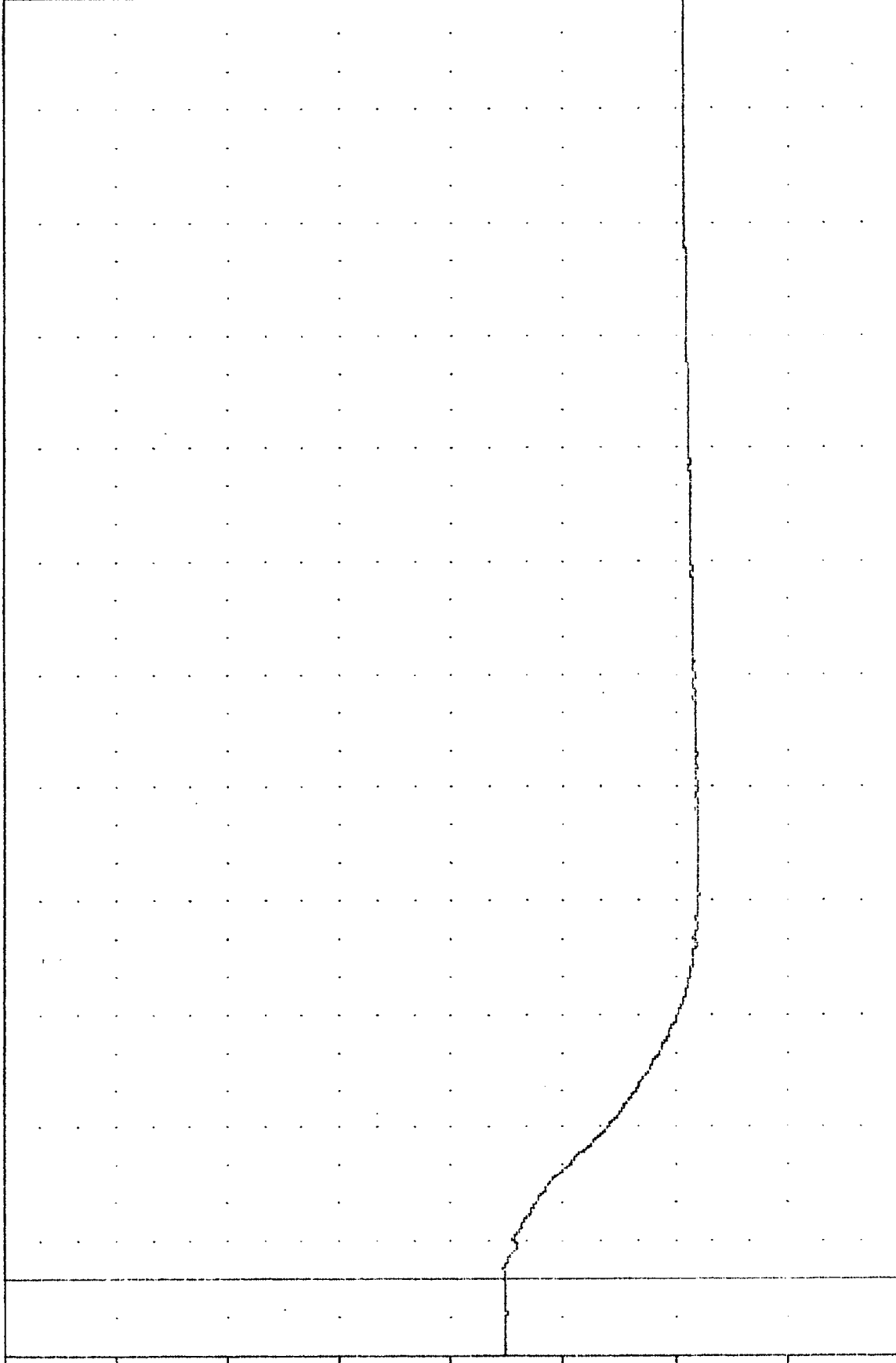
832730000000

FILTER = BLPF 300/ 949/ -40.

BFCXY

MIN, MAX VALUES = 17.87e 101.50, 35.30 e 2.63

VELOCITY (MPH)

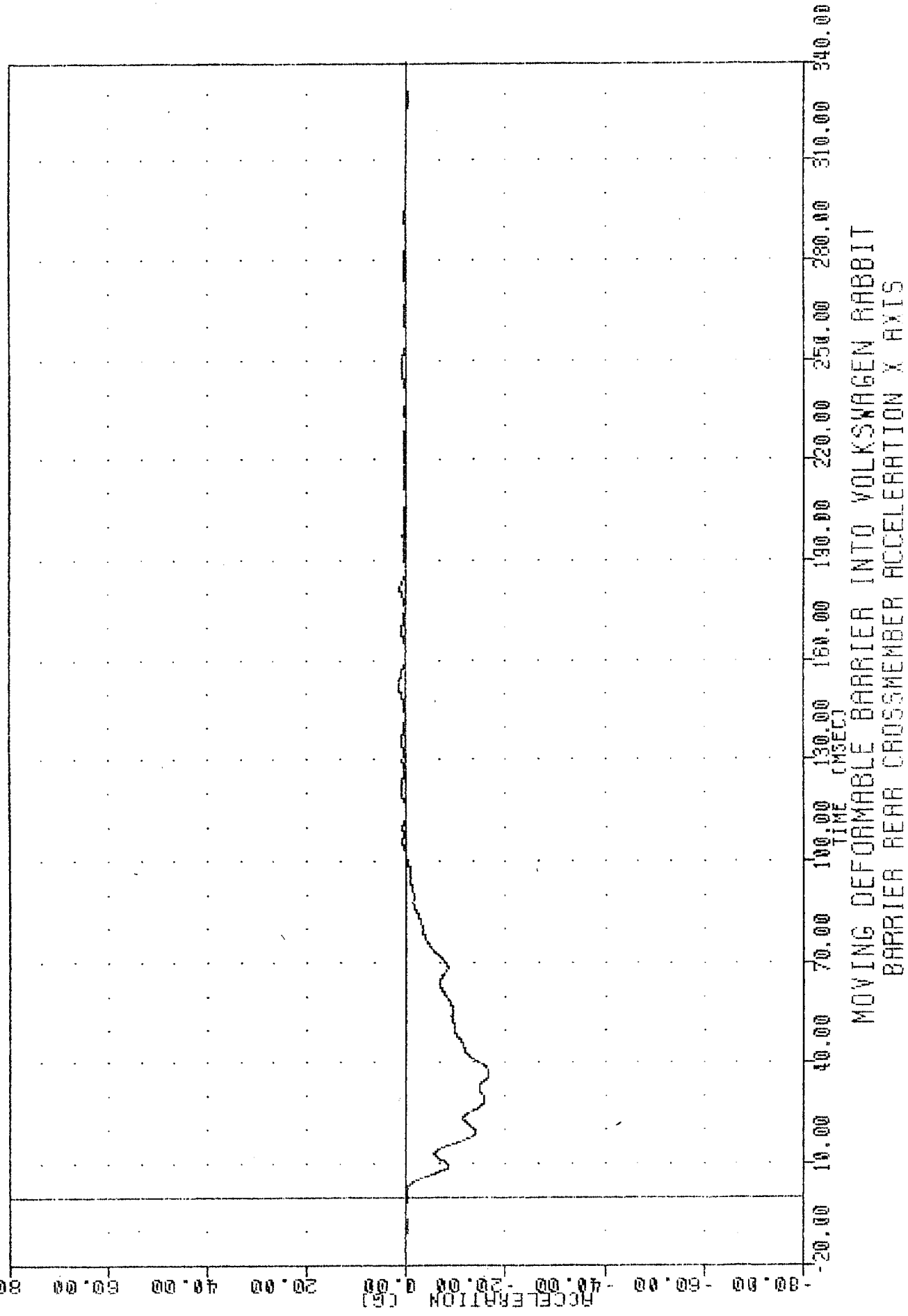


0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING BFCXG

TRC
 EVALUATION OF MOD VW FLEET
 832730000000
 BRCXG
 FILTER = 6LPF 100/ 316/ -40
 MIN. MAX VALUES = -16.63 36.88, 1.37 152.00
 830930
 10.40:20
 OCT-83



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

TAC 830930 4-OCT-83 13:51:45

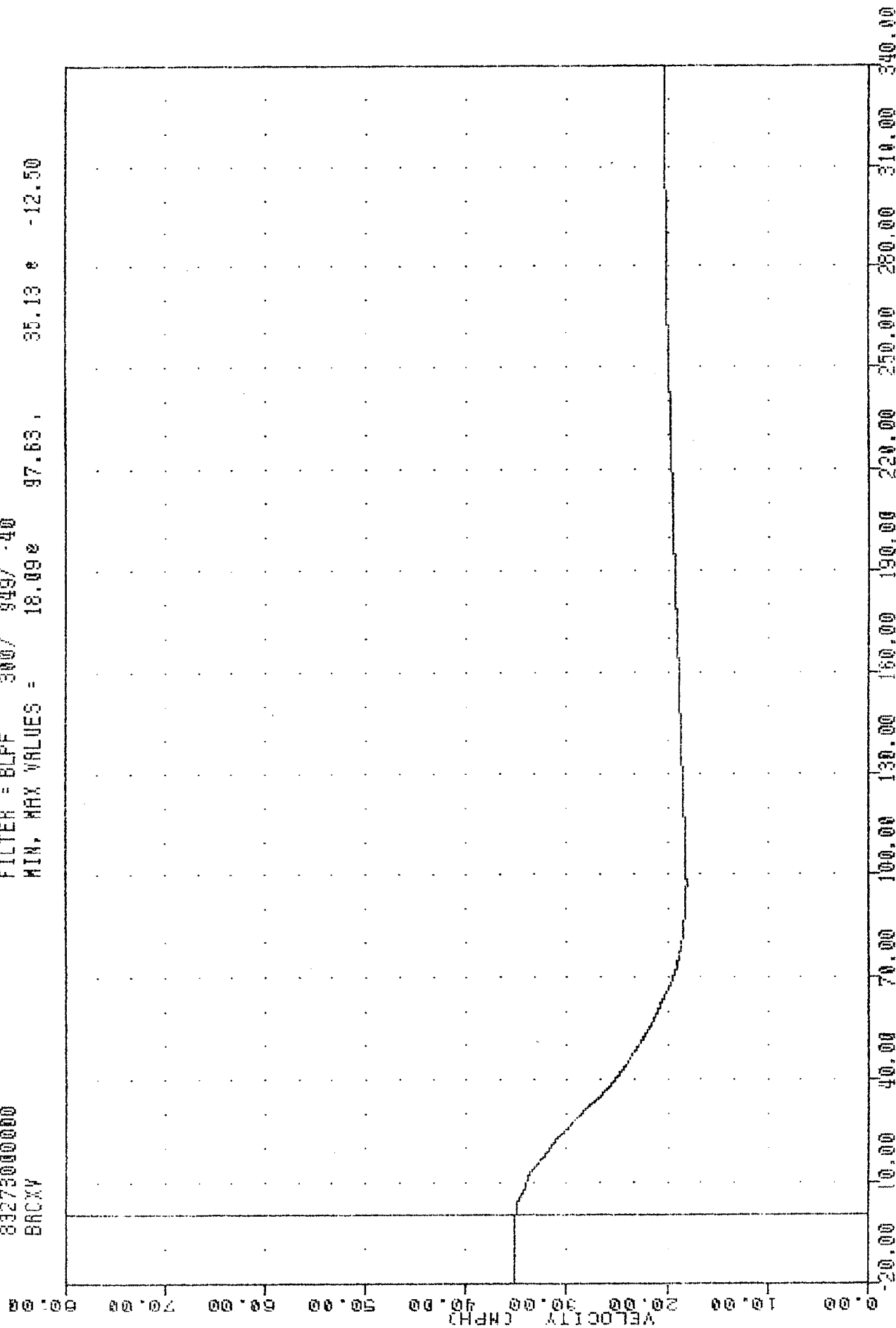
EVALUATION OF MOD VN FLEET

83273000000

BRCXY

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = 18.09 97.63, 35.13 -12.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING BRCXG