

EVALUATION OF NHTSA MODIFIED
VOLKSWAGEN RABBITS

DOT 623

MDB-TO-CAR SIDE IMPACT TEST OF
A 26⁰ CRABBED MOVING DEFORMABLE BARRIER
TO A 1976 VOLKSWAGEN RABBIT
AT 29.1 MPH

PREPARED BY:
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FINAL REPORT
DECEMBER 1983

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
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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	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	metric ton	t
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 (10 000 m ²)	2.5	acres	
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	metric ton (1000 kg)	1.1	short tons	
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

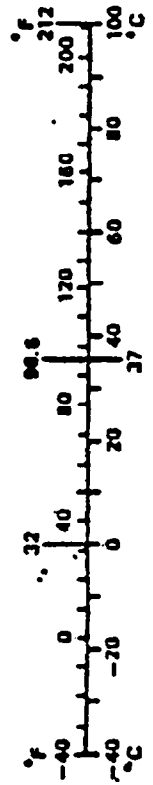


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SECTION 1.0

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 1976 Volkswagen Rabbit 2-door hatchback was impacted on the left side by a Moving Deformable Barrier (MDB) on November 2, 1983. The test was to simulate an intersection collision with the striking vehicle traveling at 26 mph and the struck vehicle traveling at 13 mph. The orientation angle of the striking vehicle was 90° counterclockwise with respect to the longitudinal axis of the struck vehicle. The leading edge of contact was to be 37 inches forward of the 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 29.1 mph with the MDB's wheels crabbed clockwise to 26°. The actual test speed was 29.1 mph and the actual leading edge was 38. inches forward of the midpoint of the Volkswagen Rabbit's wheelbase.

The vehicle was structurally modified to the level designated "Heavy Weight". The driver door and left rear occupant wall were unpadded.

Section 2 contains General Test and Vehicle Parameter Data. Section 3 contains data required by R & D. Appendix A contains pre-test and post-test vehicle and dummy photographs. Appendix B contains Data Plots. Appendix C contains one calibration test of Side Impact Dummy SID 06.

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: Volkswagenwerk AG

MAKE/MODEL: Volkswagen Rabbit

VIN: 1763D31279

BODY STYLE: 2-Door Hatchback

MODEL YEAR: 1976

NHTSA NO.: R & D

COLOR: Red

ENGINE DATA: TYPE: Transverse

CYLINDERS: 4

DISPLACEMENT 97 CID

TRANSMISSION DATA: 4 Speed Manual

DATE VEHICLE RECEIVED: 8/19/83

ODOMETER READING: 65500

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING No
POWER BRAKES No
POWER SEATS No
POWER WINDOWS No
TINTED GLASS No
RADIO Yes
CLOCK Yes
OTHER

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

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? No, Heavy Weight Modification.
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: Volkswagenwerk AG

DATE OF MANUFACTURE: 3/76

GVWR: 2777 LBS.,

GAWR: FRONT 1609 LBS., REAR 1278 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 28 psi; REAR 28 psi

TIRES ON VEHICLE (MFG. & LINE, SIZE): Left Rear - Uniroyal 155 R 13
Others - Michelin XZX 155 R 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 630 LBS. RIGHT REAR 330 LBS.

LEFT FRONT 610 LBS. LEFT REAR 380 LBS.

TOTAL FRONT WEIGHT 1240 LBS. (63.6 % OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 710 LBS. (36.4 % OF TOTAL VEHICLE WEIGHT)

TOTAL DELIVERED WEIGHT 1950 LBS.

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE: RF 25 ;LF 24 7/16 ;RR 25 1/16 ;LR 24 13/16

PRE-TEST ATTITUDE: RF 24 1/8 ;LF 24 3/16 ;RR 22 5/16 ;LR 22 3/8

POST-TEST ATTITUDE: RF 23 1/8 ;LF 25 5/16 ;RR 22 1/4 ;LR 22 9/16

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 162 LBS. CARGO:

RIGHT FRONT 680 LBS. RIGHT REAR 570 LBS.

LEFT FRONT 670 LBS. LEFT REAR 540 LBS.

TOTAL FRONT WEIGHT 1350 LBS. (54.9 % OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 1110 LBS. (45.1 % OF TOTAL VEHICLE WEIGHT)

TOTAL TEST WEIGHT 2460 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): 10.0 GALLONS

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: No

FUEL INJECTION: No

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

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 SR 13

LOAD RANGE X B, C,

VEHICLE CAPACITY:

TYPES OF SEATS:

Front - Bucket
Rear - Bench

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT

2 REAR

CARGO LOAD 142 LBS.

4 TOTAL

TOTAL 642 LBS.

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

TEST CONDITIONS

TEST NUMBER: 831102

DATE OF TEST: November 2, 1983

TIME OF TEST: 12:05

WIND VELOCITY: 3-6 mph 198° S - SW

HUMIDITY: NA

AMBIENT TEMPERATURE AT IMPACT AREA: 64° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 70° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2460	2440
MDB TEST WEIGHT (LBS.)	2990	3000
MDB VELOCITY (MPH)*	29.1	29.1
IMPACT POINT (INCHES)**	38.	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 # 06	PASSENGER # U02
Head	<u>Side window, side header</u>	<u>Side window, side header</u>
Chest	<u>Left door panel</u>	<u>Left rear compartment wall</u>
Abdomen	<u>Left door panel</u>	<u>Left rear compartment wall</u>
Left Knee	<u>Left door panel</u>	<u>Left rear 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>No</u>
Rear	<u>No</u>	<u>No</u>

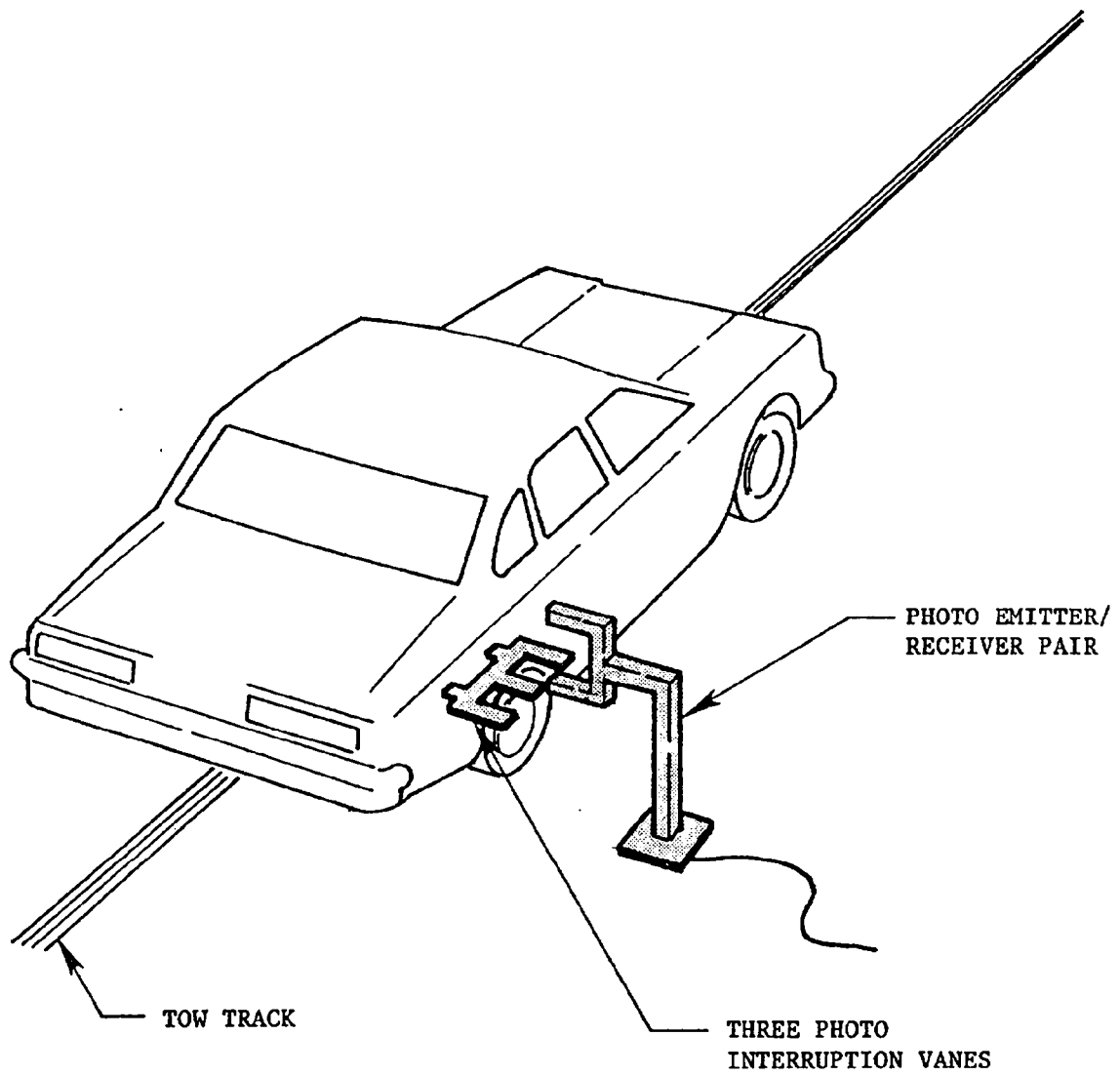
GLAZING DAMAGE:

Windshield cracked and separated from mounts on
both sides, driver's side window shattered, left
rear passenger's side window separated intact,
no backlight damage.

OTHER NOTABLE IMPACT EFFECTS:

Left side of driver's seat separated from
moorings.

IMPACT VELOCITY MEASUREMENT SYSTEM



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

VEHICLE TEST WEIGHT CALCULATION

$$\begin{aligned}\text{Test Weight} &= \text{Unloaded Delivered Weight} + \\ &\quad \text{Number of Dummies} \times 174 \text{ lbs.} + \\ &\quad \text{Cargo Weight} \\ &= 1950 + 2 \times 174 + 142 \text{ lbs.} \\ &= 2440 \text{ lbs.}\end{aligned}$$

To achieve test weight, the battery, exhaust system and alternator were removed and 3 gallons of Stoddard Solvent were added in the fuel tank. The weight of the test vehicle was measured by placing each wheel on a Loadmeter Corporation Hiway Loadometer.

TEST ANOMALIES

1. High speed camera #5, located offboard on the driver's side failed to run. The camera was removed from service for repairs.

2. Cable separation occurred in data channel LFDYG4 - Vehicle Left Front Door (Position 10) Acceleration Y Axis. No peak levels 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

SIDE IMPACT DUMMY*

DRIVER DSP

REAR PASSENGER DSP

HEAD	Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.	Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.
UPPER TORSO	Placed against seat back. Midsagittal plane is vertical and centered on bucket seat.	Placed against seat back. Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.
LOWER TORSO	Midsagittal plane is vertical and centered on bucket seat.	Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.
UPPER LEGS (thighs or femurs)	Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.	Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.
KNEES	Knees set 14.5" apart between pivot bolt head outer surfaces. Outer surface of right knee pivot bolt is 8.6" from midsagittal plane of dummy. Outer surface of left knee pivot bolt is 5.9" from midsagittal plane of dummy.	Located so that planes defined by femur and tibia centerlines are as close as possible to vertical.
LOWER LEGS	Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.	Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.
RIGHT FOOT	Placed on undepressed accelerator pedal -- rearmost point of heel on floorplan in plane of pedal.	Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.
LEFT FOOT **	Placed on toeboard -- rearmost point of heel on floorpan as close as possible to intersection of toeboard and floorpan. Centerline falls in vertical longitudinal plane.	Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.

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

** Due to structural modifications, the left foot was turned inward.

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. M. Garrison

2. J. Kokoruda

3. N. Echeverria

POSITIONING DATE: 11/2/83

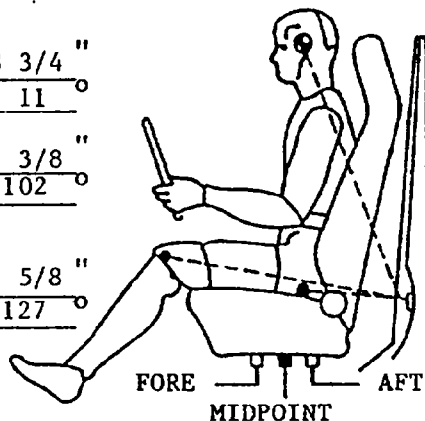
AMBIENT TEMP.: 70° F. TIME: 7:30

DRIVER DUMMY # 06

HEAD 18 3/4"
 TARGET* 11°

KNEE 31 3/8"
 JOINT 102°

APPROX.
 "H" 17 5/8"
 POINT 127°

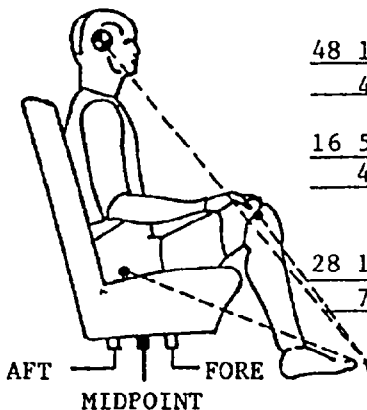


REAR PASSENGER DUMMY # U02

48 1/16" HEAD
49° TARGET**

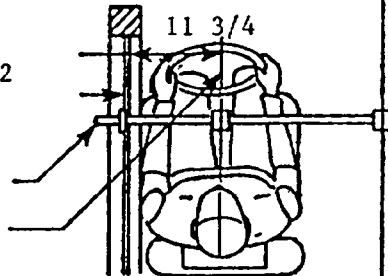
16 5/16" KNEE
46° JOINT

APPROX.
28 1/2" "H"
76° POINT +



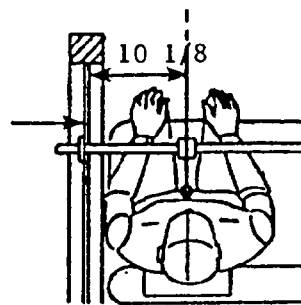
DOOR
 GLASS
 HEIGHT*** 9 1/2

LATERAL BAR
 ADJUSTABLE
 POINTER



DRIVER
 DUMMY # 06

DOOR
 GLASS
 HEIGHT DNA



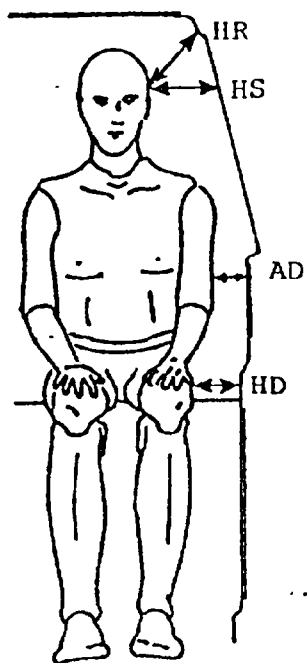
PASSENGER
 DUMMY # U02

*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.

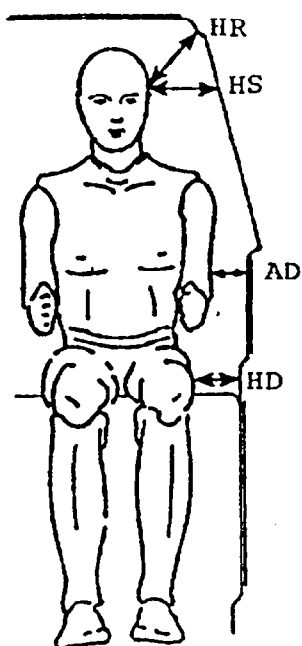
+ Due to structural modification interference, the "H" point location is estimated.



06

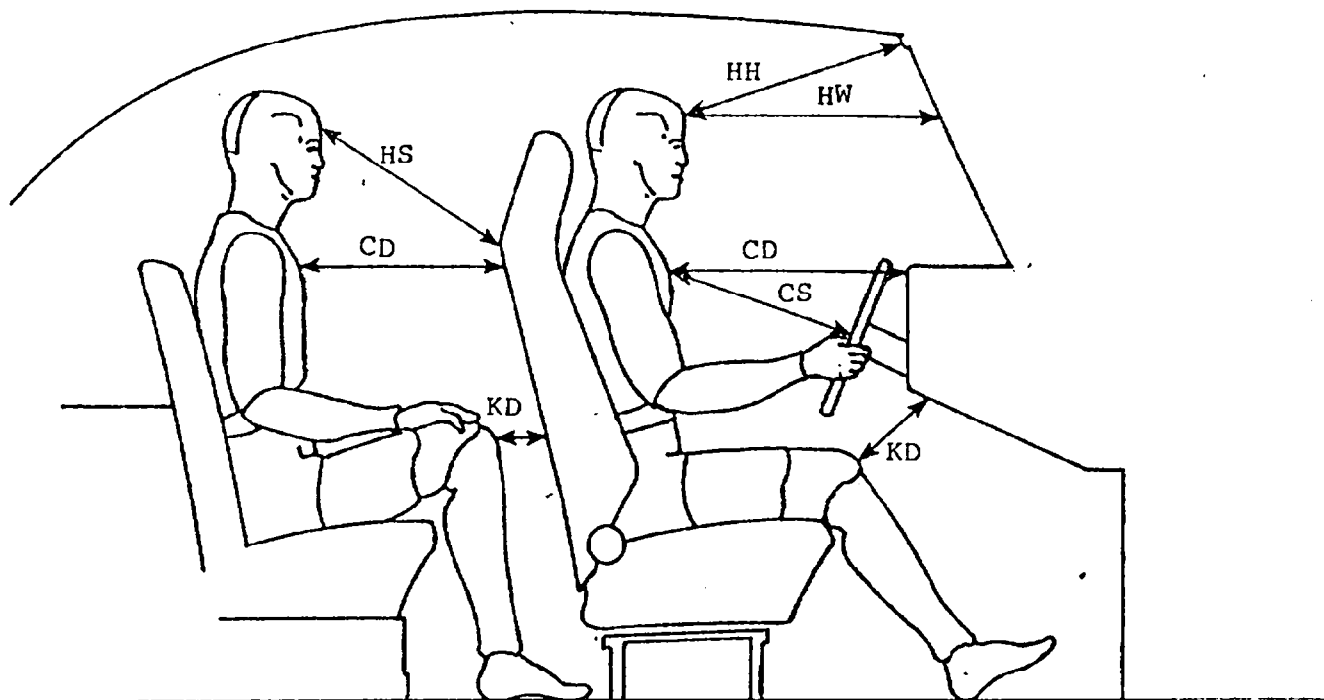
U02

	DRIVER	PASSENGER
HR	6 1/16	5 7/16
HS	8 5/16	7
AD	3 1/4	2 1/4
HD	5 1/4	4 7/16



NOTE: ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



06 U02

	DRIVER	PASSENGER
HH	16 7/8	DNA
HW	22 3/4	DNA
HS	DNA	21 3/16
CD	23 1/2	16 7/8
CS	15 1/8	DNA
KDL	5	2
KDR	5 1/8	2 5/8

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 side window and header. The dummy rebounded laterally in an upright position until it's torso struck the front passenger's door. The dummy came to rest sitting upright in the front passenger's seat.

PASSENGER

During impact, the dummy's torso contacted the left rear passenger side wall and the head contacted the side window and side header. The dummy rebounded across the rear seat with it's feet trapped beneath the driver's seat. The head struck the right rear passenger side wall beneath the window sill and the dummy came to rest laying across the rear seat.

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

LOCATION	HEIGHT (in)	6	0	6	12	18	24	30	36	42	48	54	60	66	72	78
PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Axle Height	10.8	X	X	19.9	19.9	19.9	20.0	20.0	20.1	20.1	20.2	20.3	20.6	20.6	X	X
H-Point	18.0	X	X	17.9	17.8	17.7	17.7	17.7	17.8	17.9	18.0	18.1	18.2	18.3	X	X
Mid Door	25.0	16.3	17.6	17.5	17.5	17.5	17.4	17.4	17.4	17.5	17.6	17.7	17.8	17.9	18.1	X
Window Sill	34.0	X	19.4	19.2	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.2	19.2	19.3	19.4	19.6
Window Top	53.5	X	X	X	X	X	26.8	26.4	26.2	26.2	26.3	26.4	26.4	26.6	27.0	27.5

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

Axle Height	10.8	X	X	23.1	23.4	23.1	22.9	22.7	22.6	22.4	22.3	22.0	21.7	21.3	X	X
H-Point	18.0	X	X	26.0	25.8	26.0	26.0	25.9	25.9	25.6	25.6	25.6	25.4	25.1	X	X
Mid Door	25.0	22.3	24.2	24.3	24.1	24.4	24.6	24.8	25.1	25.4	25.8	25.8	26.3	26.1	23.4	X
Window Sill	34.0	X	22.1	23.2	24.1	24.2	24.3	24.4	24.6	24.9	25.3	26.5	25.6	25.3	23.0	21.5
Window Top	53.5	X	X	X	X	X	27.9	27.5	27.3	27.4	27.5	27.6	27.6	27.6	27.9	28.4

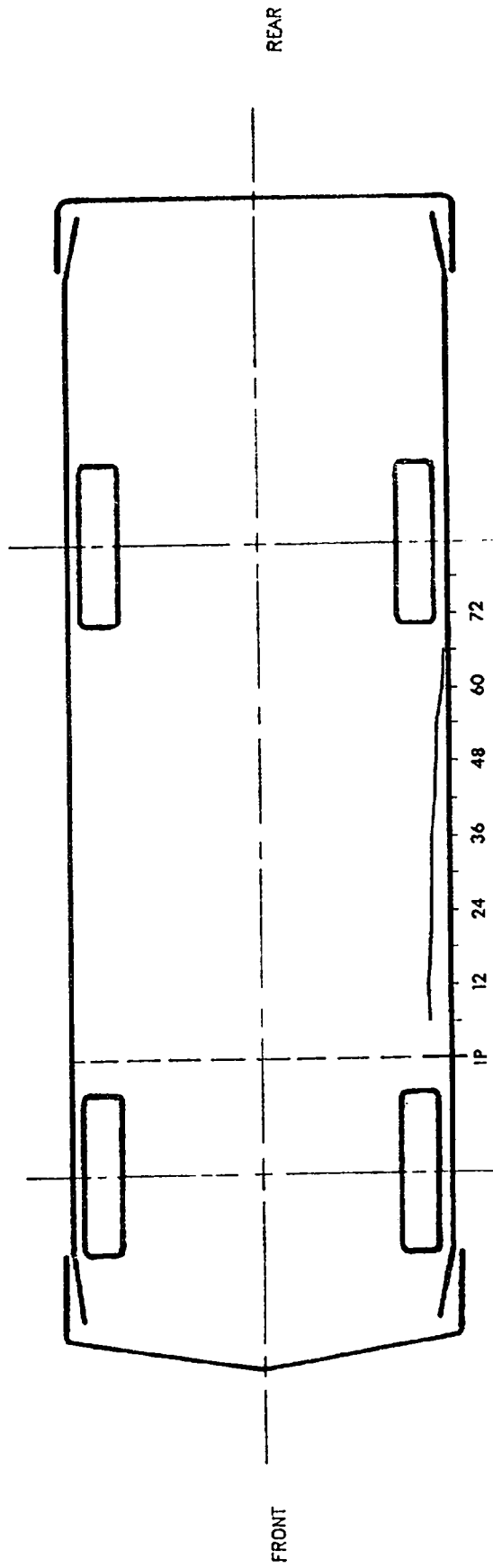
STATIC CRUSH (IN)

Axle Height	10.8	X	X	3.2	3.5	3.2	2.9	2.7	2.5	2.3	2.1	1.7	1.1	0.7	X	X
H-Point	18.0	X	X	8.1	8.0	8.3	8.3	8.2	8.1	7.7	7.6	7.5	7.2	6.8	X	X
Mid Door	25.0	6.0	6.6	6.8	6.6	6.9	7.2	7.4	7.7	7.9	8.2	8.1	8.5	8.2	5.3	X
Window Sill	34.0	X	2.7	4.0	5.0	5.1	5.2	5.3	5.5	5.8	6.2	7.3	6.4	6.0	3.6	1.9
Window Top	53.5	X	X	X	X	X	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.0	0.9	0.9

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

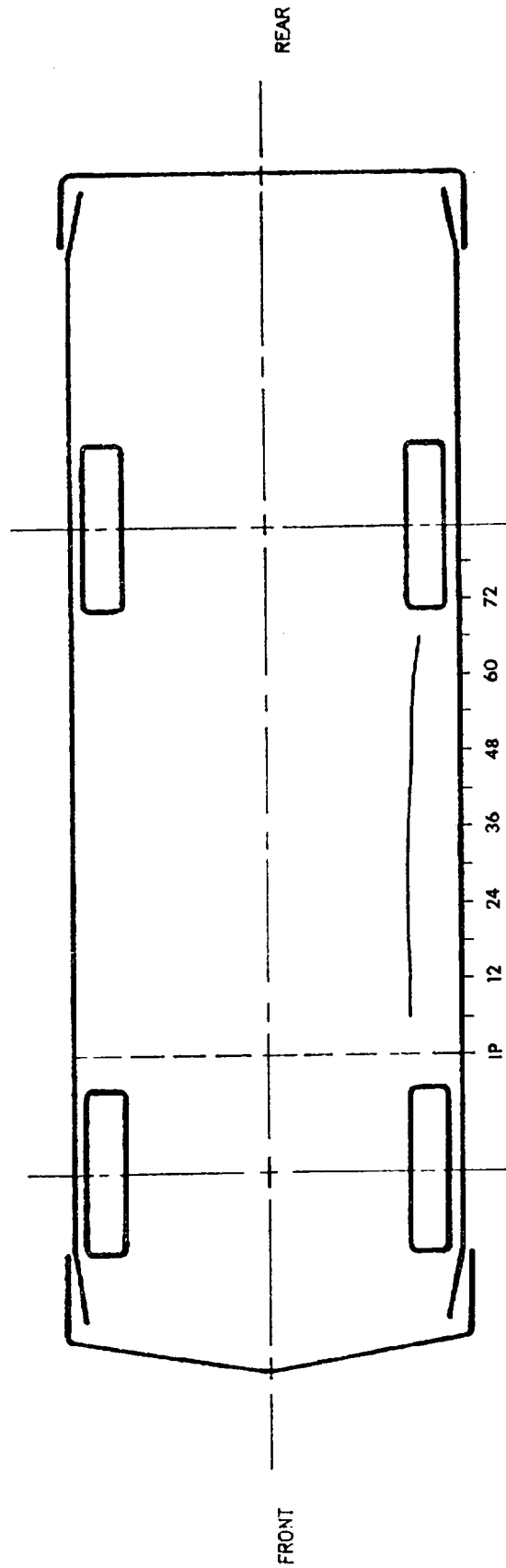
** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



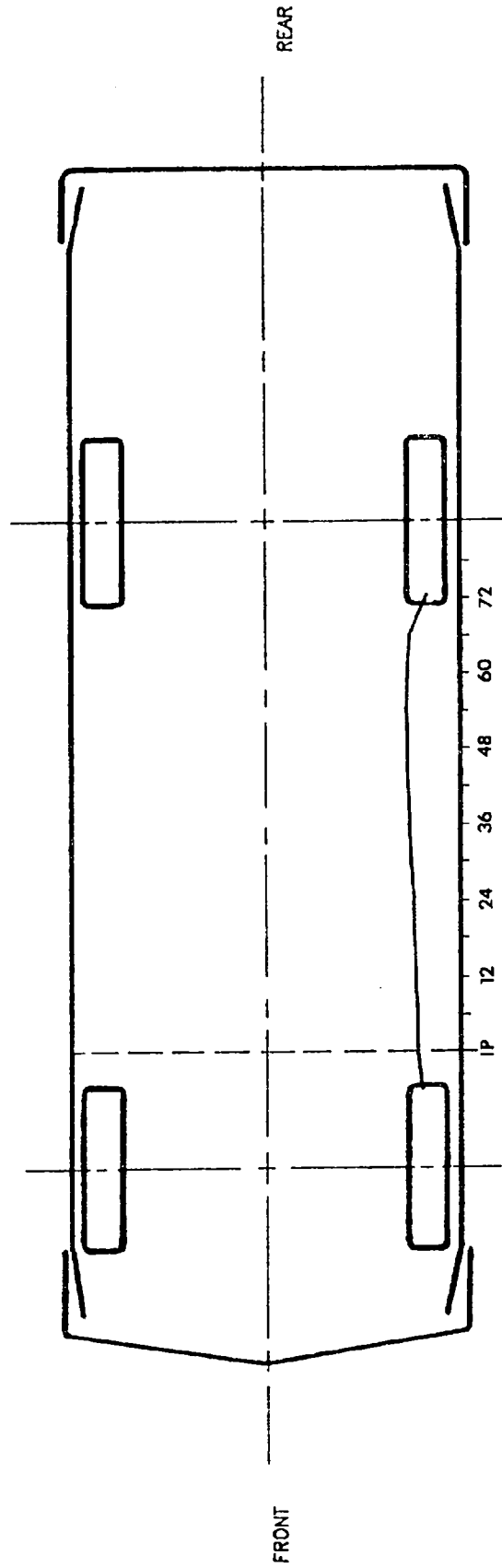
PROFILE LEVEL EQUALS AXLE HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



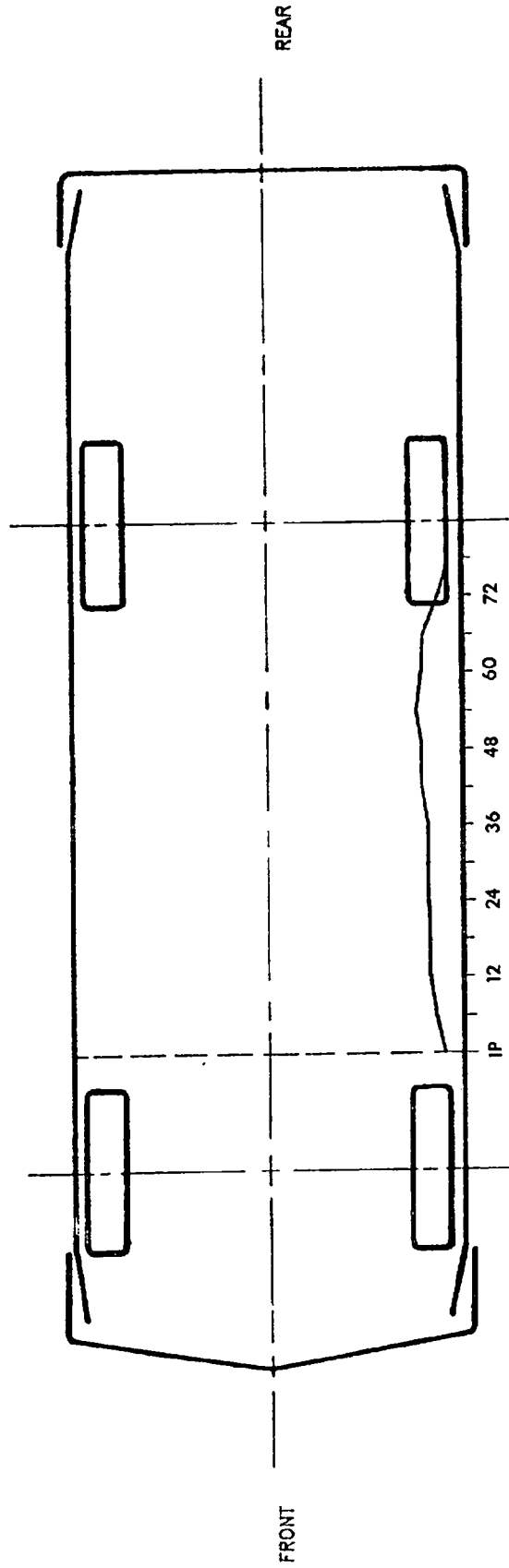
PROFILE LEVEL EQUALS H-POINT HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



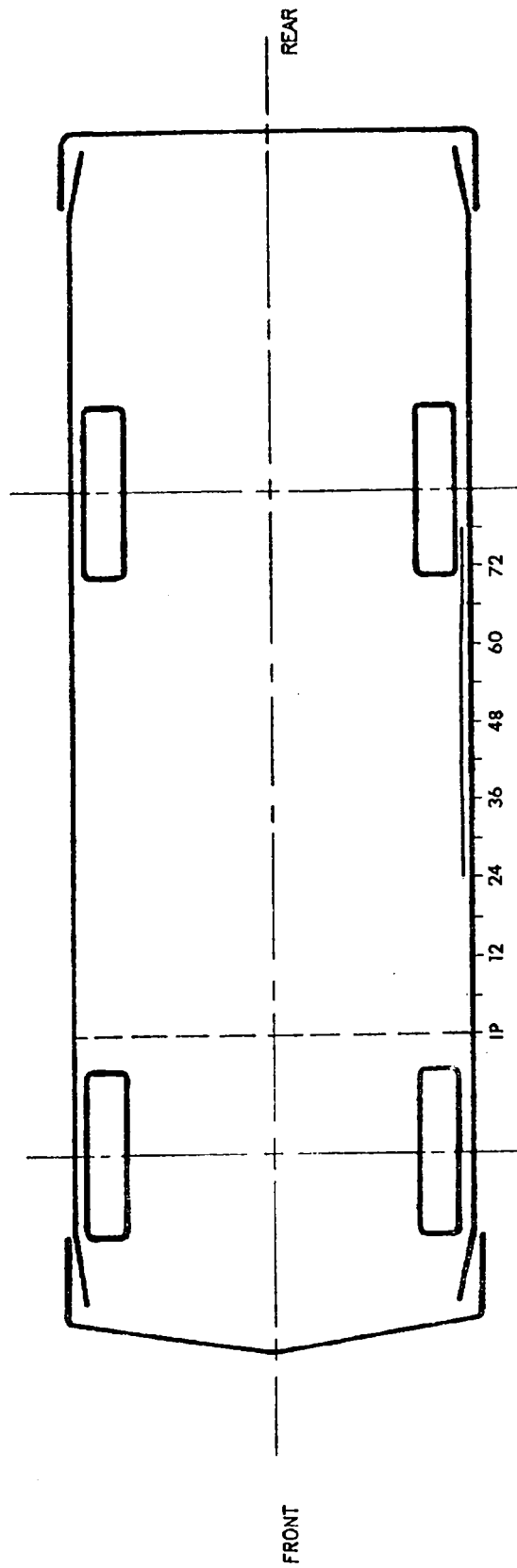
PROFILE LEVEL EQUALS MID-DOOR HEIGHT
IP EQUALS PROJECTED IMPACT POINT

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		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	4.38	274.00	15.97	80.50	6.20	232.38	26.93	68.50
LATERAL	44.40	50.50	14.07	38.13	97.37	47.25	18.42	76.75
VERTICAL	35.89	56.00	26.50	73.38	41.73	58.63	22.78	44.88
RESULTANT		44.79 à 50.50				98.49 à 47.25		
HIC	114.24	from 36.13 to 82.00			431.96	from 44.75 to 69.50		
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	13.33	53.12	32.12	41.25	2.55	207.50	13.60	47.50
LATERAL (P)***	59.61	44.38	26.69	70.63	56.99	48.75	4.28	141.88
LATERAL (R)***	60.37	44.38	26.13	70.63	57.56	48.75	4.81	67.50
VERTICAL	5.95	64.38	4.66	48.75	3.33	24.38	6.43	60.00
RESULTANT (P)		61.86 à 43.75				58.45 à 48.75		
RESULTANT (R)		62.69 à 43.75				59.01 à 48.75		
DELTA V (MPH)****		19.6 à 66.25 (P)				23.8 à 138.13 (P)		
		20.1 à 66.25 (R)				23.5 à 134.37 (R)		
LOWER SPINE								
LONGITUDINAL	23.90	56.87	19.92	70.00	17.88	61.25	16.81	41.87
LATERAL (P)	74.83	35.63	15.12	71.25	57.77	43.75	15.15	66.25
LATERAL (R)	74.71	36.25	15.15	71.25	59.18	43.75	15.12	66.25
VERTICAL	16.77	41.25	3.24	86.88	14.75	45.00	2.95	103.75
RESULTANT (P)		76.47 à 35.63				61.18 à 43.75		
RESULTANT (R)		76.25 à 36.25				62.52 à 43.75		
DELTA V (MPH)		23.2 à 57.50 (P)				23.6 à 58.75 (P)		
		23.7 à 57.50 (R)				24.6 à 60.00 (R)		
LEFT UPPER RIB								
LATERAL (P)	73.31	41.87	17.21	53.75	45.91	50.00	6.40	134.37
LATERAL (R)	72.65	41.87	14.42	54.38	47.73	50.00	6.95	135.00
DELTA V (MPH)		19.1 à 80.00 (P)				24.4 à 154.38 (P)		
		19.1 à 80.00 (R)				25.2 à 153.75 (R)		
LEFT LOWER RIB								
LATERAL (P)	67.97	41.25	12.85	67.50	63.89	41.87	18.99	70.63
LATERAL (R)	70.11	40.63	11.04	67.50	59.94	41.87	21.43	70.63
DELTA V (MPH)		19.4 à 85.63 (P)				27.1 à 173.75 (P)		
		20.1 à 86.25 (R)				22.3 à 158.13 (R)		
PELVIS ACCELERATION								
LONGITUDINAL	8.22	42.38	28.41	30.75	10.94	25.00	44.96	36.25
LATERAL	152.56	31.50	5.13	42.13	142.40	34.13	34.92	22.88
VERTICAL	20.87	36.50	8.25	31.00	24.24	43.25	6.64	45.13
RESULTANT		154.71 à 31.50				144.96 à 34.13		
DELTA V (MPH)		22.1 à 71.13				22.6 à 57.75		

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE		NEGATIVE		POSITIVE		NEGATIVE	
	DIRECTION*		DIRECTION**		DIRECTION*		DIRECTION**	
	MAX	TIME	MAX	TIME	MAX	TIME	MAX	TIME
	(in)	(msec)	(in)	(msec)	(in)	(msec)	(in)	(msec)
RIB DEFLECTION †	0.03	233.63	1.59	115.13	0.06	22.00	1.79	66.00

* 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

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

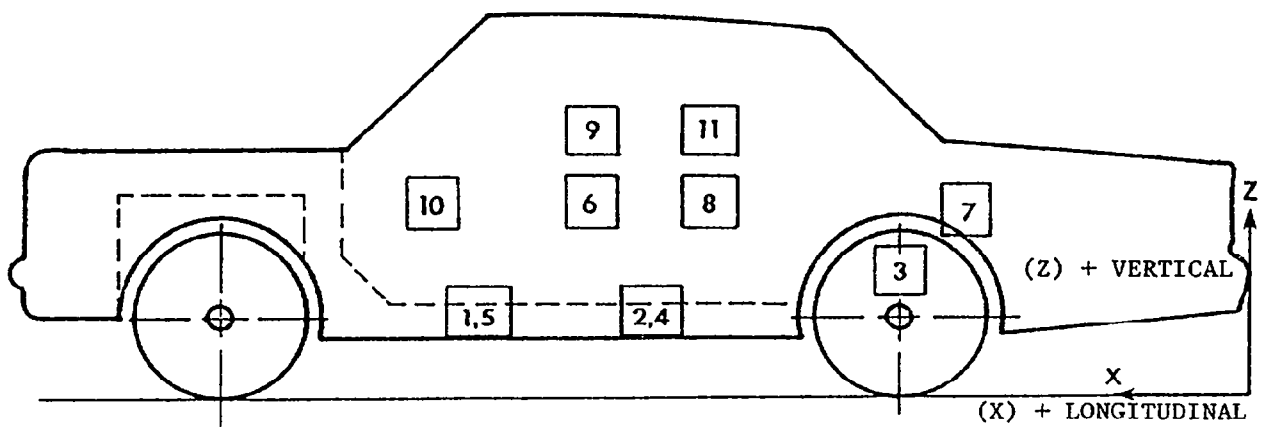
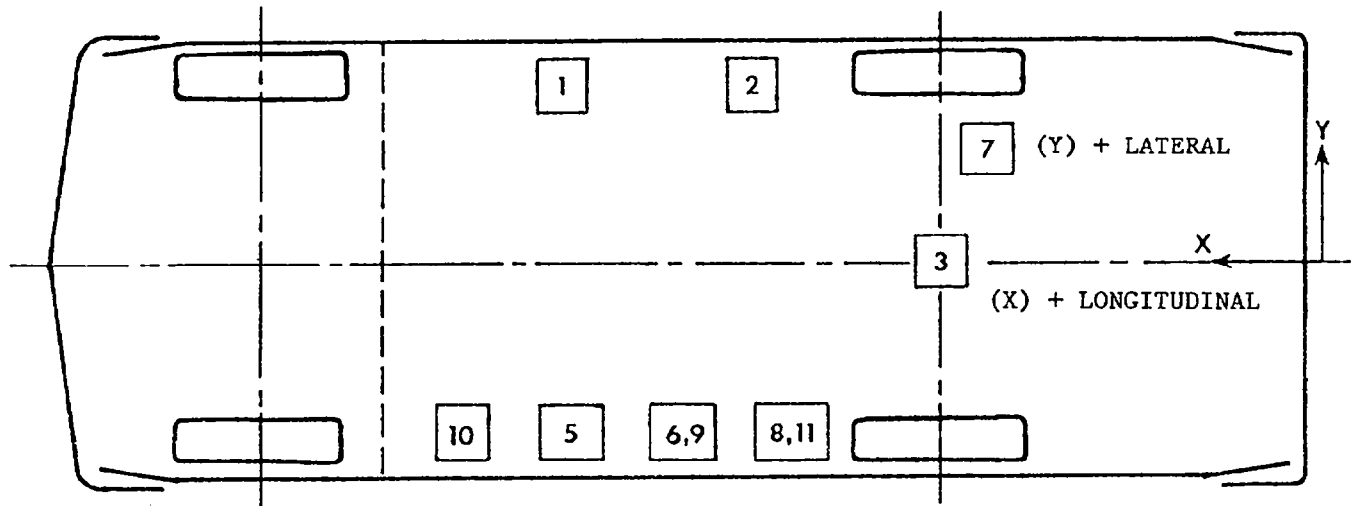
NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	RIGHT SILL AT FRONT SEAT (LONGITUDINAL)	61.8	25.3	9.9				
	(LATERAL)	$\Delta V = -1.7 \text{ mph } \hat{a} \text{ } 80.00 \text{ msec}$			3.64	44.63	6.78	13.88
	(VERTICAL)	$\Delta V = 15.0 \text{ mph } \hat{a} \text{ } 80.00 \text{ msec}$			28.57	10.63	3.18	118.25
	(RESULTANT)				6.81	63.88	6.30	79.13
					29.10 $\hat{a}$ 10.63			
2	RIGHT SILL AT REAR SEAT (LONGITUDINAL)	83.9	23.8	8.9				
	(LATERAL)	$\Delta V = -0.7 \text{ mph } \hat{a} \text{ } 80.00 \text{ msec}$			5.06	44.63	5.49	35.25
	(VERTICAL)	$\Delta V = 16.7 \text{ mph } \hat{a} \text{ } 80.00 \text{ msec}$			35.09	10.63	2.26	119.25
	(RESULTANT)				8.79	20.88	7.75	36.50
					35.12 $\hat{a}$ 10.63			
3	REAR DECK OVER AXLE (LONGITUDINAL)	31.3	0.0	7.3				
	(LATERAL)	$\Delta V = -1.8 \text{ mph } \hat{a} \text{ } 80.00 \text{ msec}$			3.70	16.50	14.31	23.50
	(VERTICAL)	$\Delta V = 19.3 \text{ mph } \hat{a} \text{ } 80.00 \text{ msec}$			27.31	25.50	3.32	93.75
	(RESULTANT)				7.06	17.25	11.80	24.25
					31.95 $\hat{a}$ 24.63			
4	LEFT SILL AT REAR SEAT (LATERAL)	61.5	-23.5	8.0				
		$\Delta V = 13.4 \text{ mph } \hat{a} \text{ } 68.13 \text{ msec}$			20.65	42.13	3.35	78.75
5	LEFT SILL AT FRONT SEAT (LATERAL)	83.9	-23.3	9.3				
		$\Delta V = 6.7 \text{ mph } \hat{a} \text{ } 15.50 \text{ msec}$			37.92	11.63	15.23	25.50
6	LEFT FRONT DOOR CENTERLINE (LATERAL)	80.4	-26.3	23.0				
		$\Delta V = 23.0 \text{ mph } \hat{a} \text{ } 24.13 \text{ msec}$			168.20	13.88	102.13	32.00
7	RIGHT REAR COMPARTMENT (LONGITUDINAL)	30.8	16.1	13.6				
					5.76	44.38	5.79	25.88
8	MIDREAR OF LEFT FRONT DOOR (LATERAL)	61.0	-26.4	23.4				
		$\Delta V = 11.4 \text{ mph } \hat{a} \text{ } 12.88 \text{ msec}$			77.85	7.63	76.30	23.25
9	UPPER LEFT FRONT DOOR CENTERLINE (LATERAL)	81.4	-26.1	32.0				
		$\Delta V = 27.8 \text{ mph } \hat{a} \text{ } 26.13 \text{ msec}$			108.76	22.63	119.51	39.50
10	MIDFRONT OF LEFT FRONT DOOR (LATERAL)	100.1	-26.5	21.8				
					---	--- Y	---	---Y
11	UPPER REAR OF LEFT FRONT DOOR (LATERAL)	70.5	-26.5	32.0				
		$\Delta V = 21.9 \text{ mph } \hat{a} \text{ } 30.13 \text{ msec}$			150.12	31.25	169.07	36.88

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

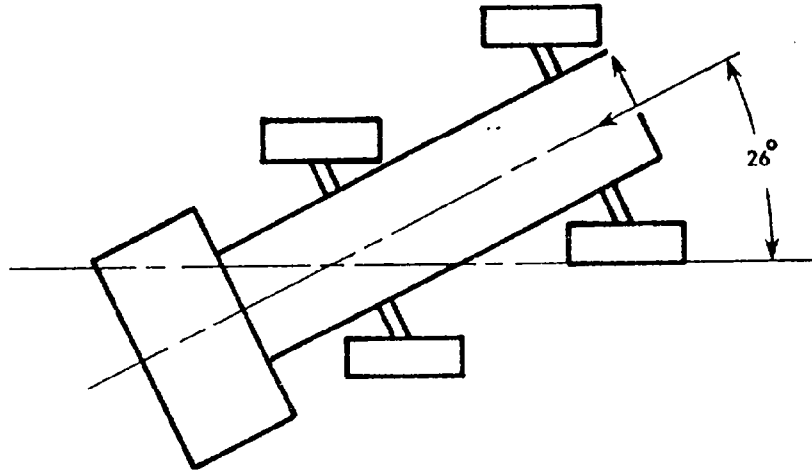
All measurements of accelerometer locations in inches.

Y See TEST ANOMALIES

VEHICLE ACCELEROMETER LOCATIONS



MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY



NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	CENTER OF GRAVITY	74.5	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -13.6 \text{ mph } \dot{a} 80.00 \text{ msec}$			1.10	88.38	14.91	38.88
	(LATERAL)	$\Delta V = -3.1 \text{ mph } \dot{a} 80.00 \text{ msec}$			1.07	63.63	6.57	28.25
	(VERTICAL)				13.16	50.50	17.67	38.75
	(RESULTANT)					23.26 $\dot{a}$ 38.63		
2	FRONT FRAME MEMBER	130.3	0.0	11.3				
	(LONGITUDINAL)	$\Delta V = -14.5 \text{ mph } \dot{a} 80.00 \text{ msec}$			0.48	85.50	15.14	37.63
3	REAR FRAME MEMBER	23.3	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -13.1 \text{ mph } \dot{a} 80.00 \text{ msec}$			0.92	147.25	14.26	38.00

* 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	787	Vehicle Dynamics
2	Overhead	Photosonics 1B	25	755	Close-up of impact point
3	Onboard MDB	Photosonics 1B	25	507	Close-up of impact point
4	Onboard MDB	Stalex	13	500	Driver kinematics
5	Ground level - right	Hycam	25	----*	Overall view
6	Ground level - left	Photosonics 1B	16	797	Overall view
7	Onboard vehicle	Photosonics 1B	8	805	Driver kinematics - front view
8	Onboard vehicle	Photosonics 1B	8	812	Driver kinematics
9	Onboard vehicle	Photosonics 1B	8	802	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.

*See TEST ANOMALIES

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	MFR.	DATE OF LAST CALIBRATION	SENSITIVITY	DESIRED FULL SCALE (ENGR. UNITS)
BOGXG	Accel	4-202-0001	18845	Bell Howell	8/9/83	.236 MV/G	50 G
BOGYG	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

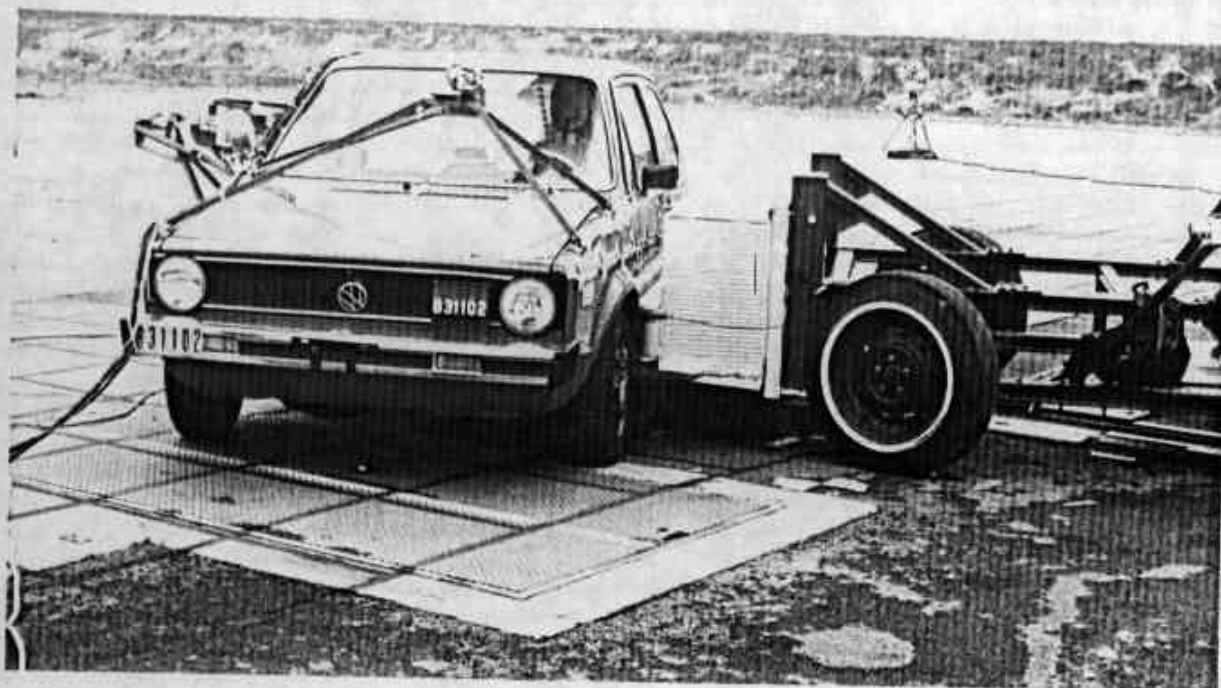


Figure A-1. PRE-TEST OVERALL - VIEW 1



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

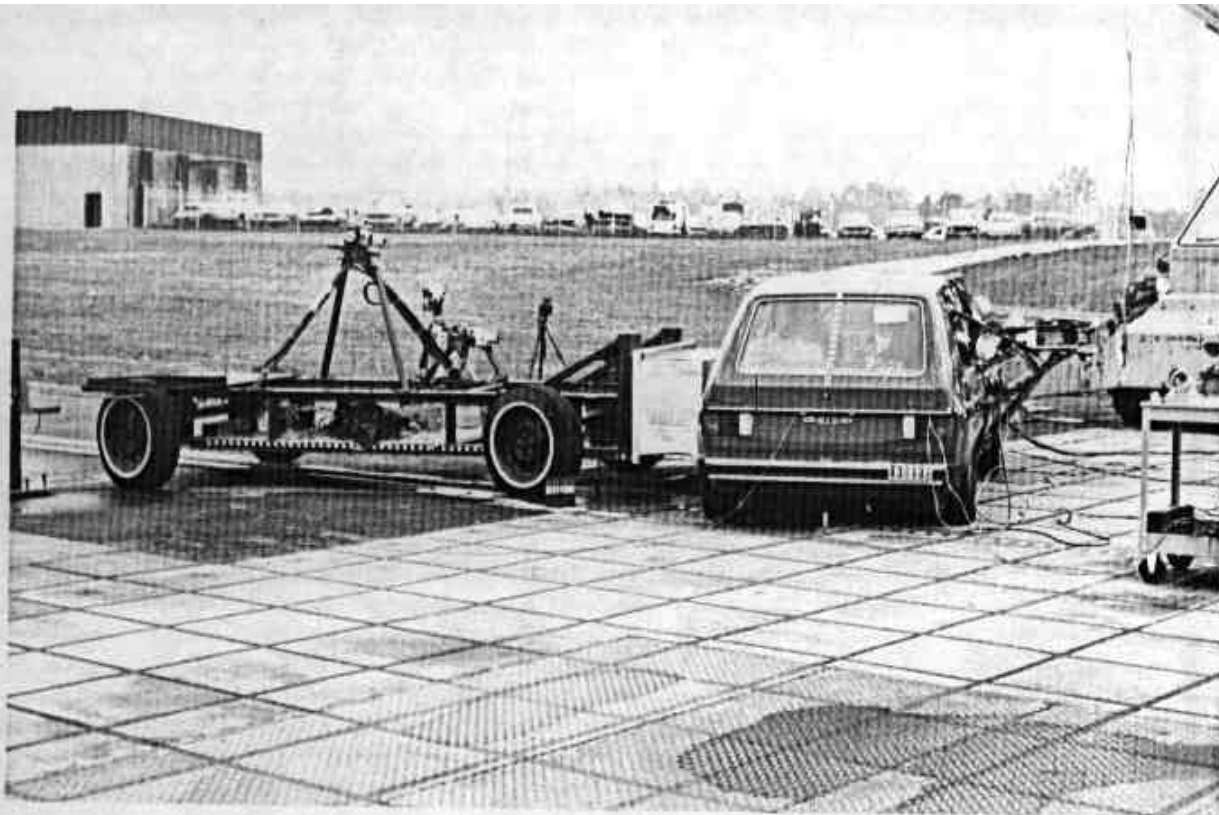


Figure A-3. PRE-TEST OVERALL - VIEW 3

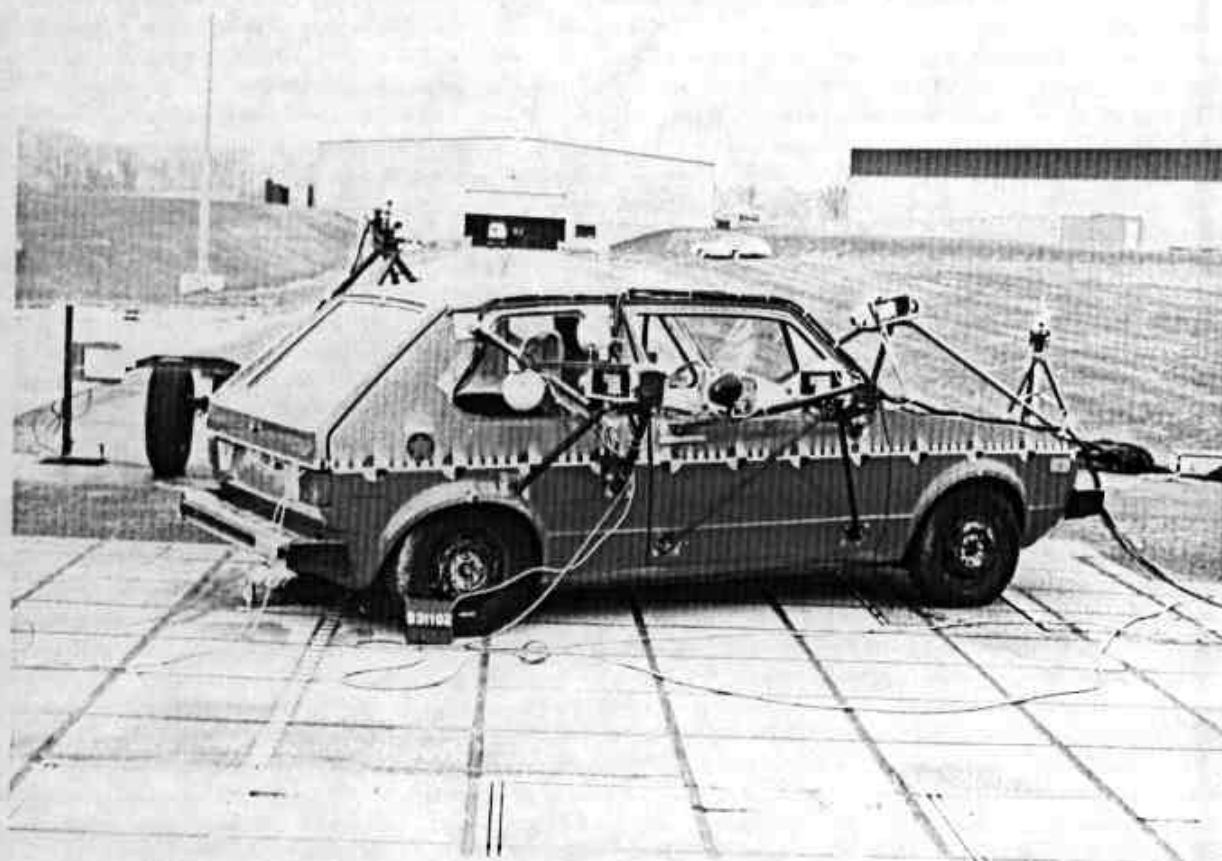


Figure A-4. PRE-TEST OVERALL - VIEW 4

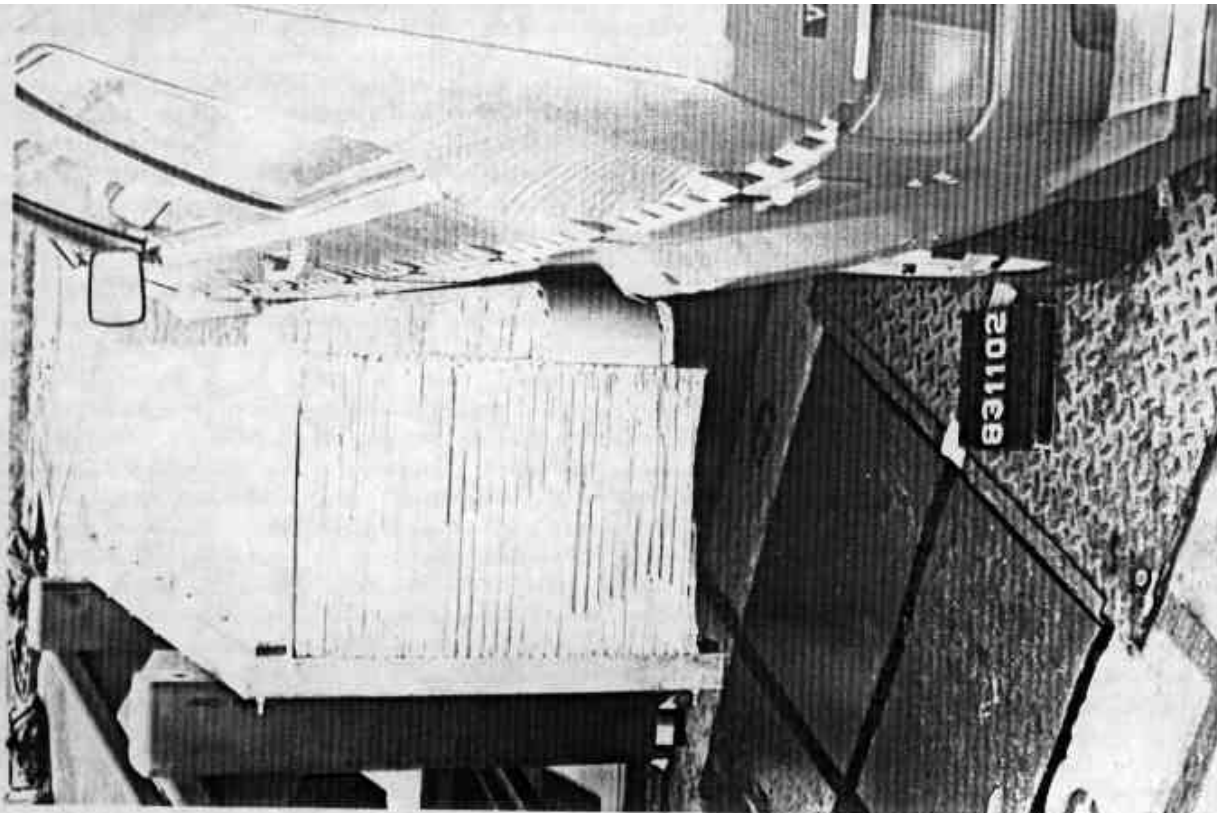


Figure A-5. PRE-TEST CLOSEUP - VIEW 1



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

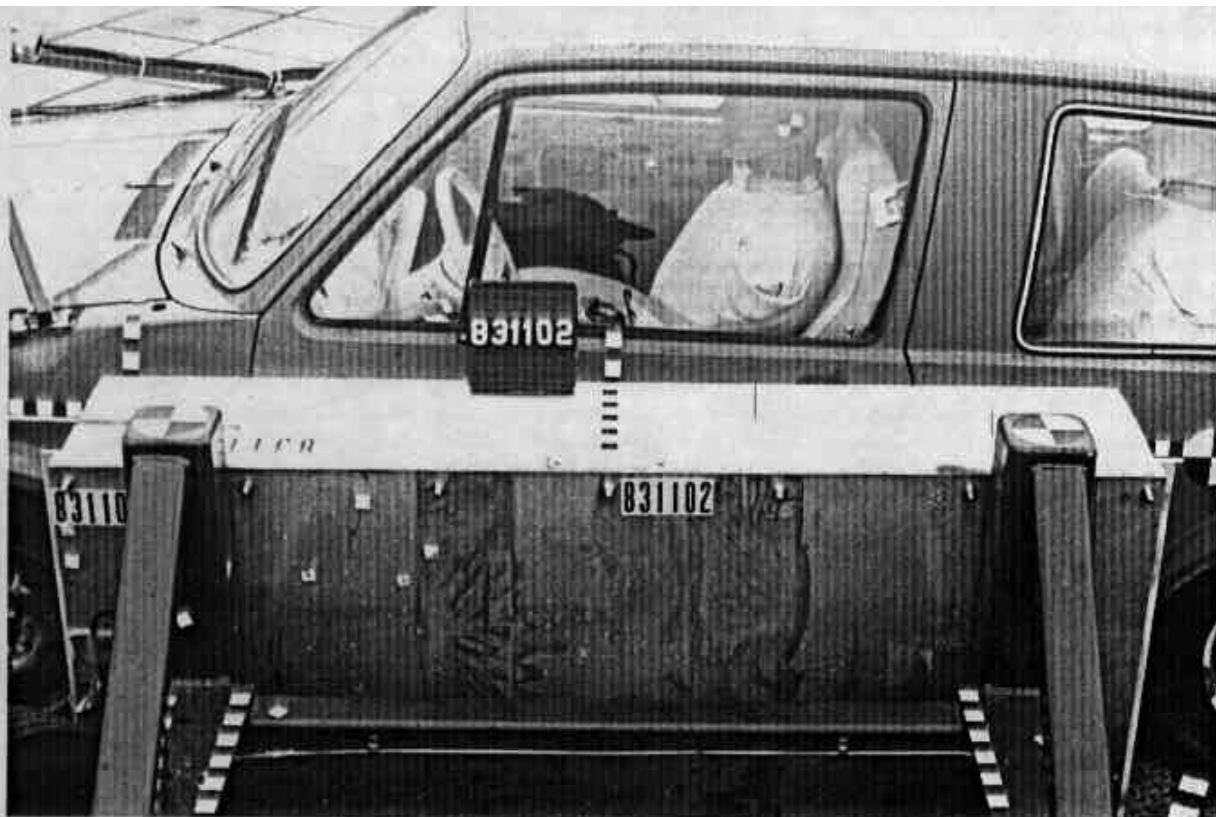


Figure A-7. PRE-TEST CLOSEUP - VIEW 3

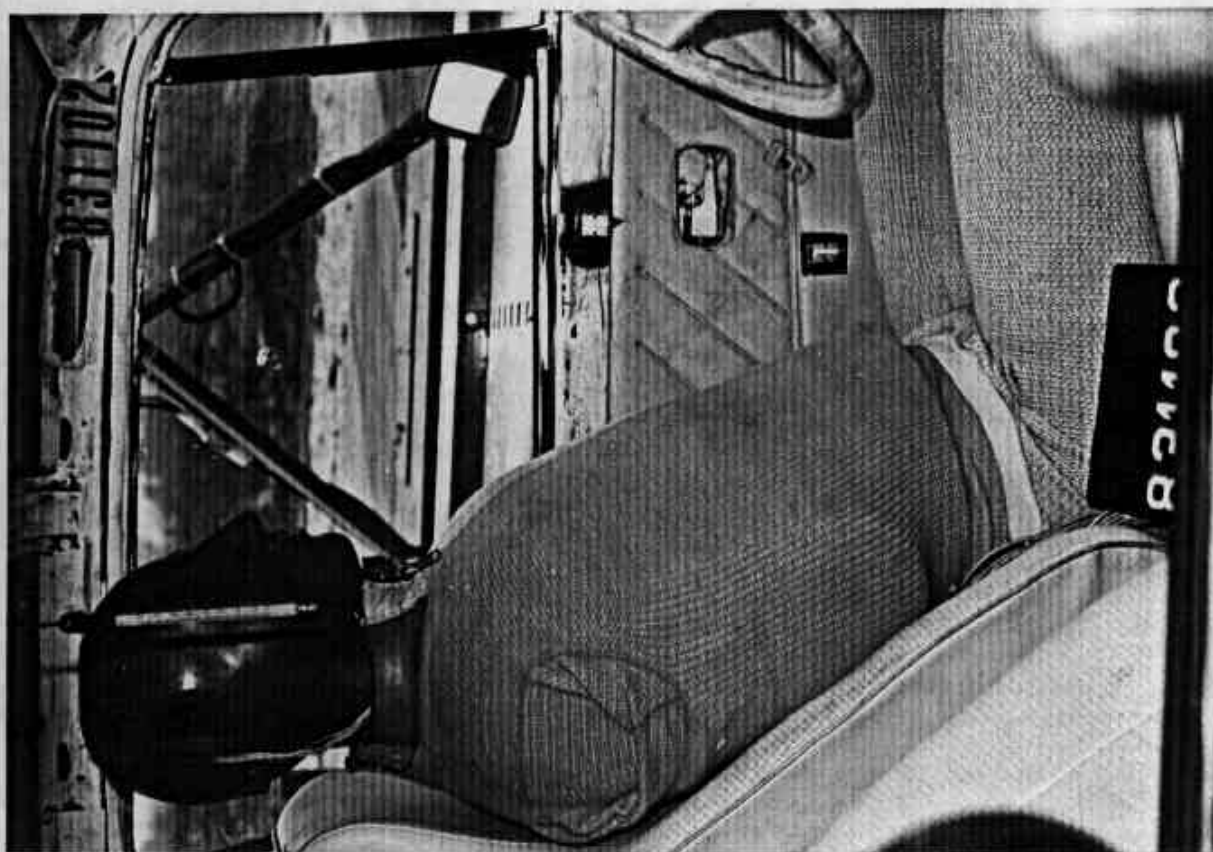


Figure A-8. PRE-TEST DRIVER DUMMY - VIEW 1



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

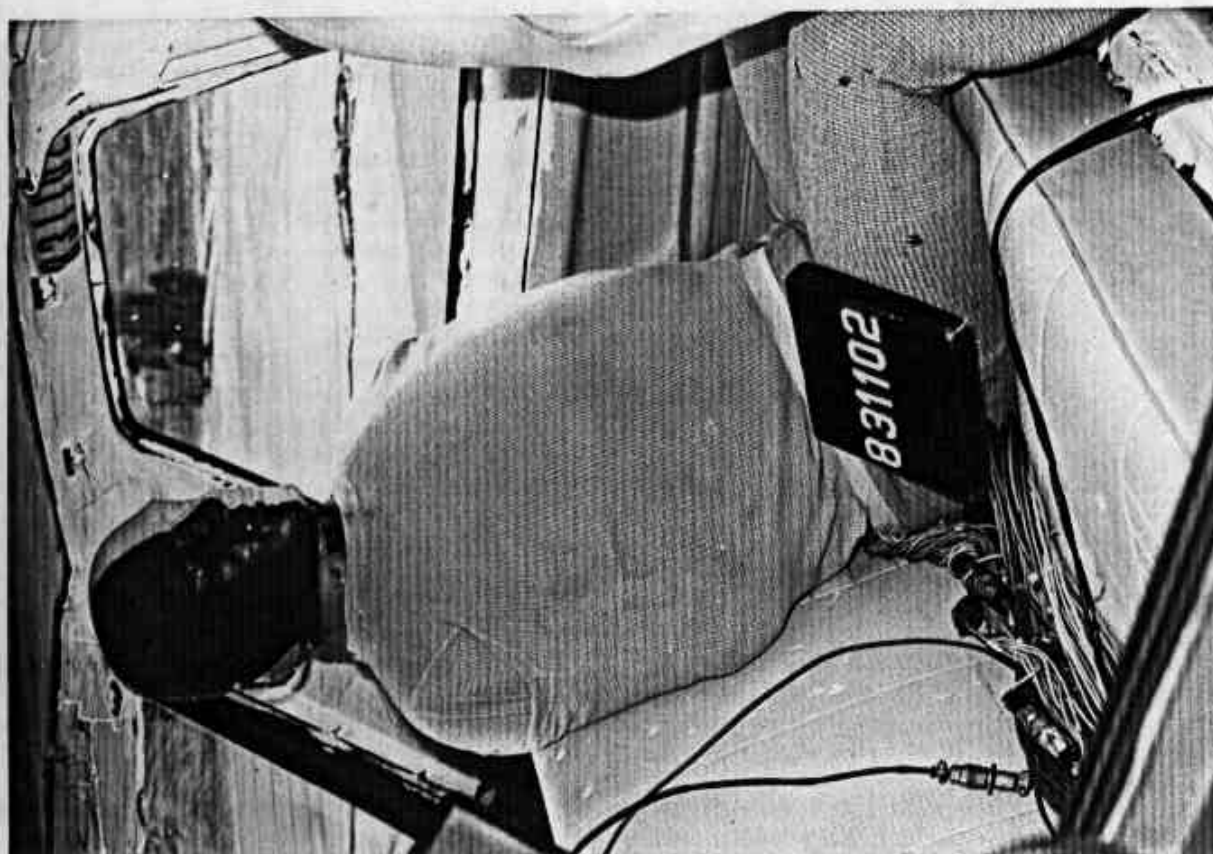


Figure A-10. PRE-TEST PASSENGER DUMMY - VIEW 1

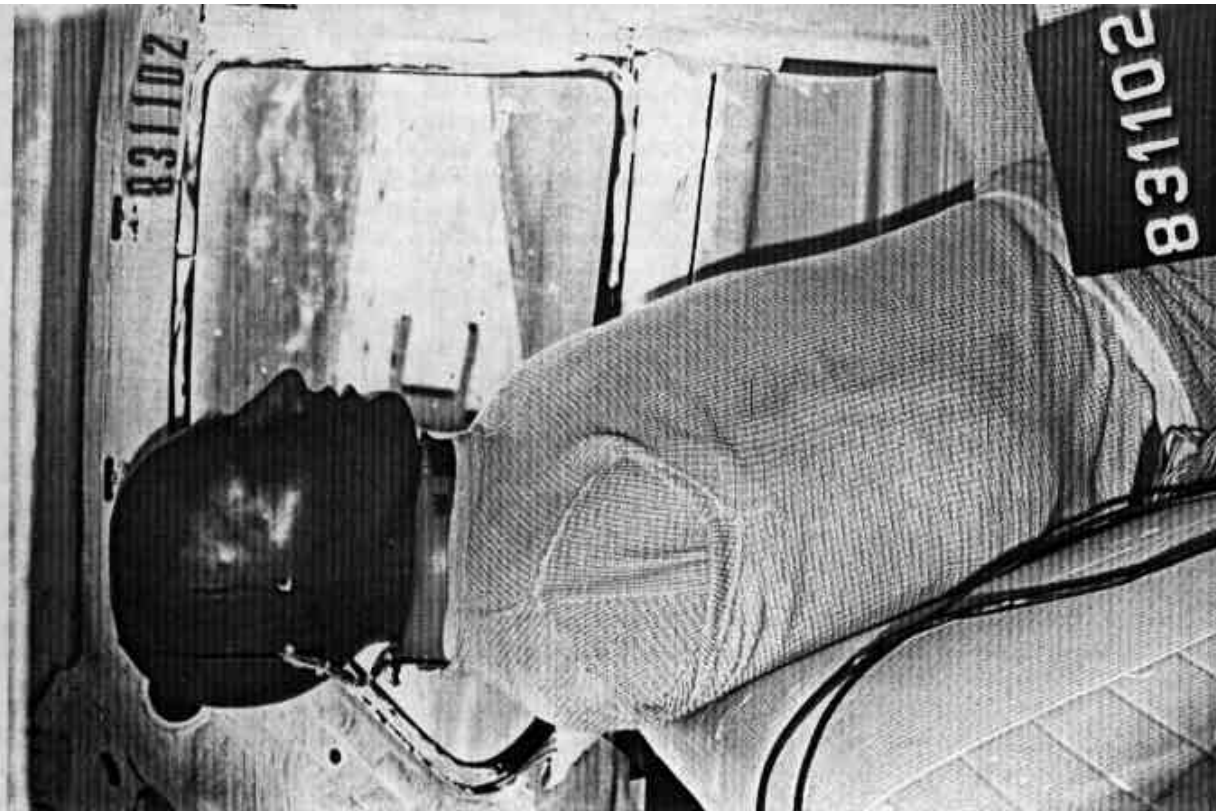


Figure A-11. PRE-TEST PASSENGER DUMMY - VIEW 2



Figure A-12. CRASH EVENT PHOTOGRAPH



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



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

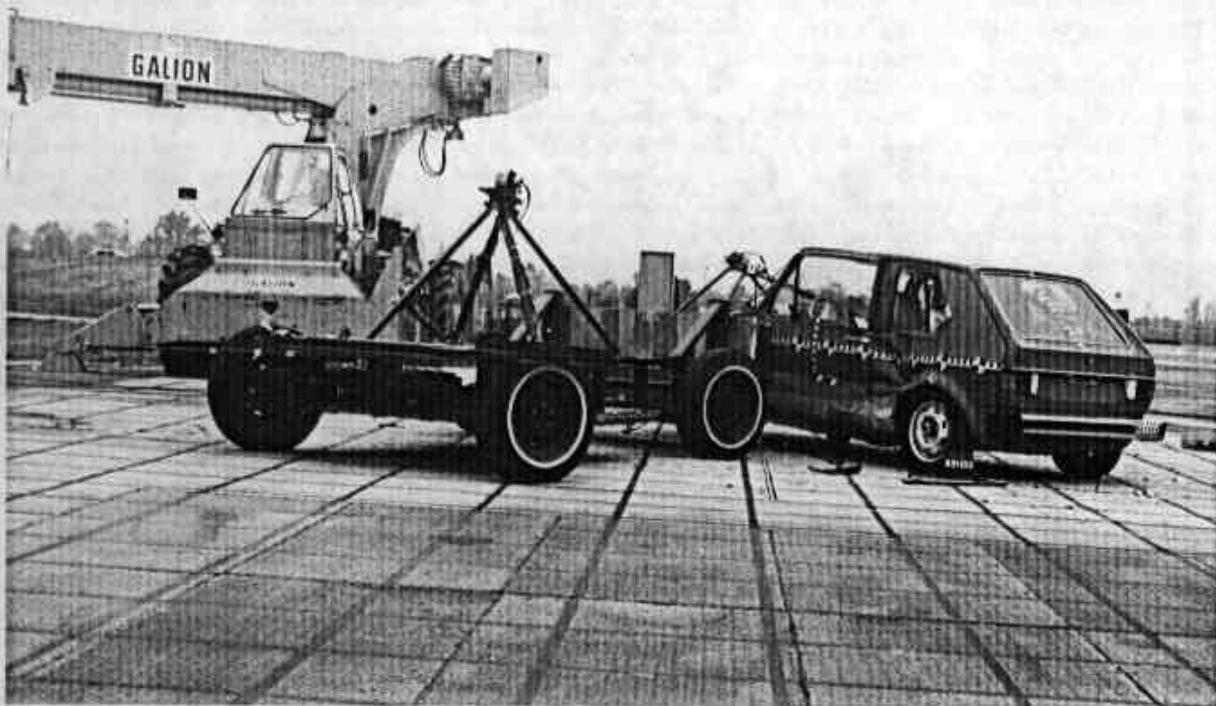


Figure A-15. POST-TEST OVERALL - VIEW 3

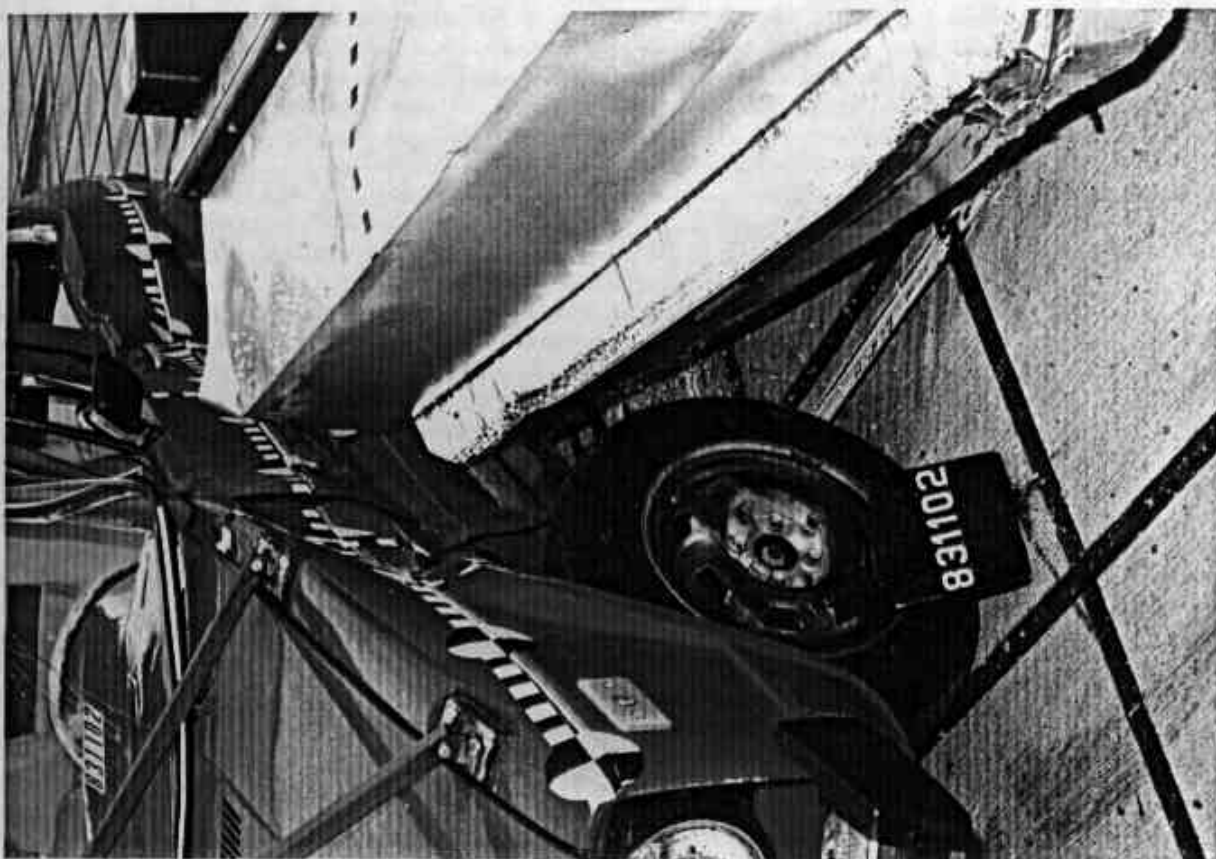


Figure A-16. POST-TEST CLOSEUP - VIEW 1

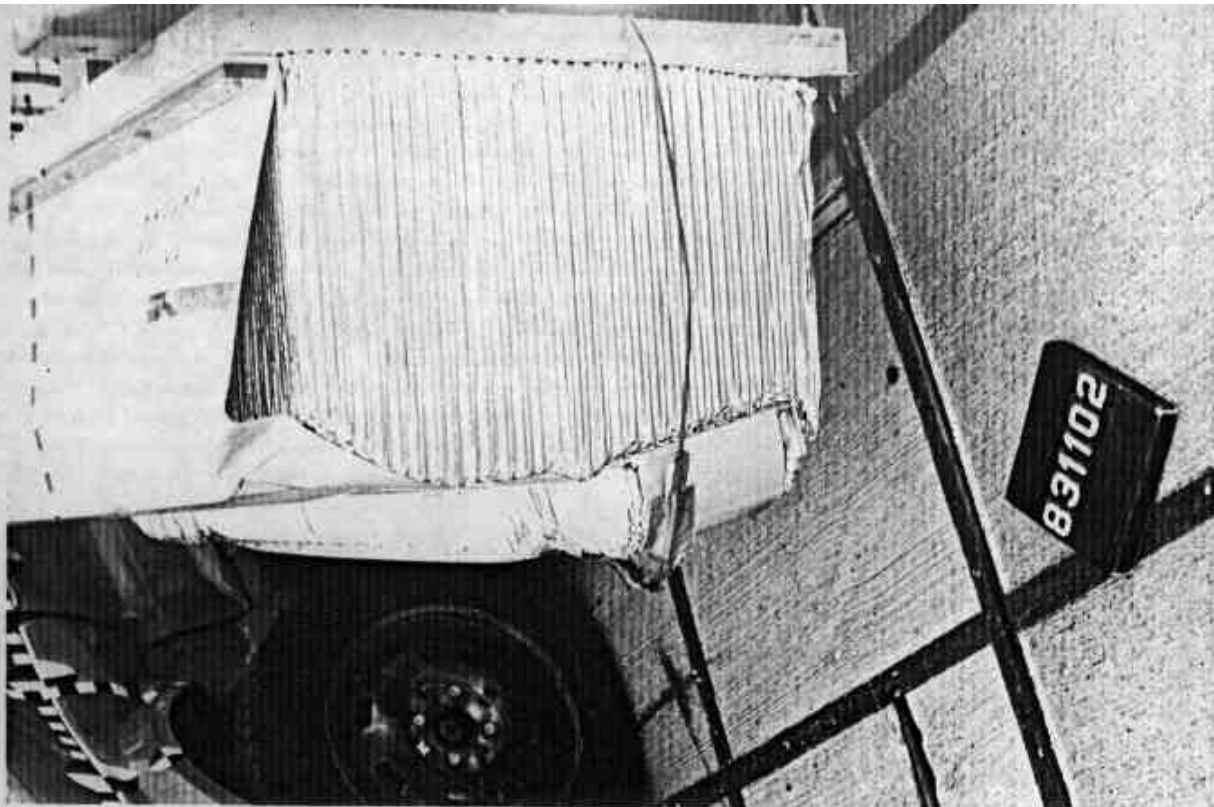


Figure A-17. POST-TEST CLOSEUP - VIEW 2



Figure A-18. POST-TEST DRIVER DUMMY - VIEW 1

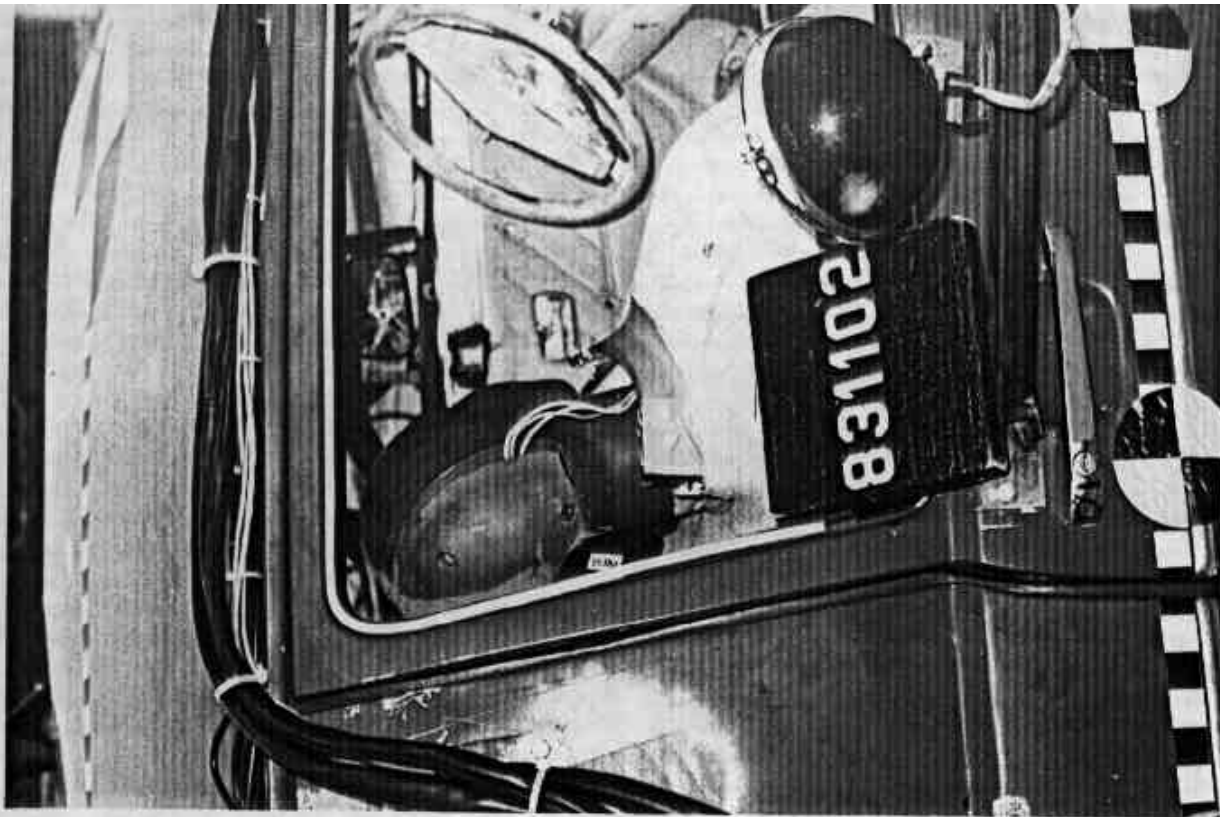


Figure A-19. POST-TEST DRIVER DUMMY - VIEW 2

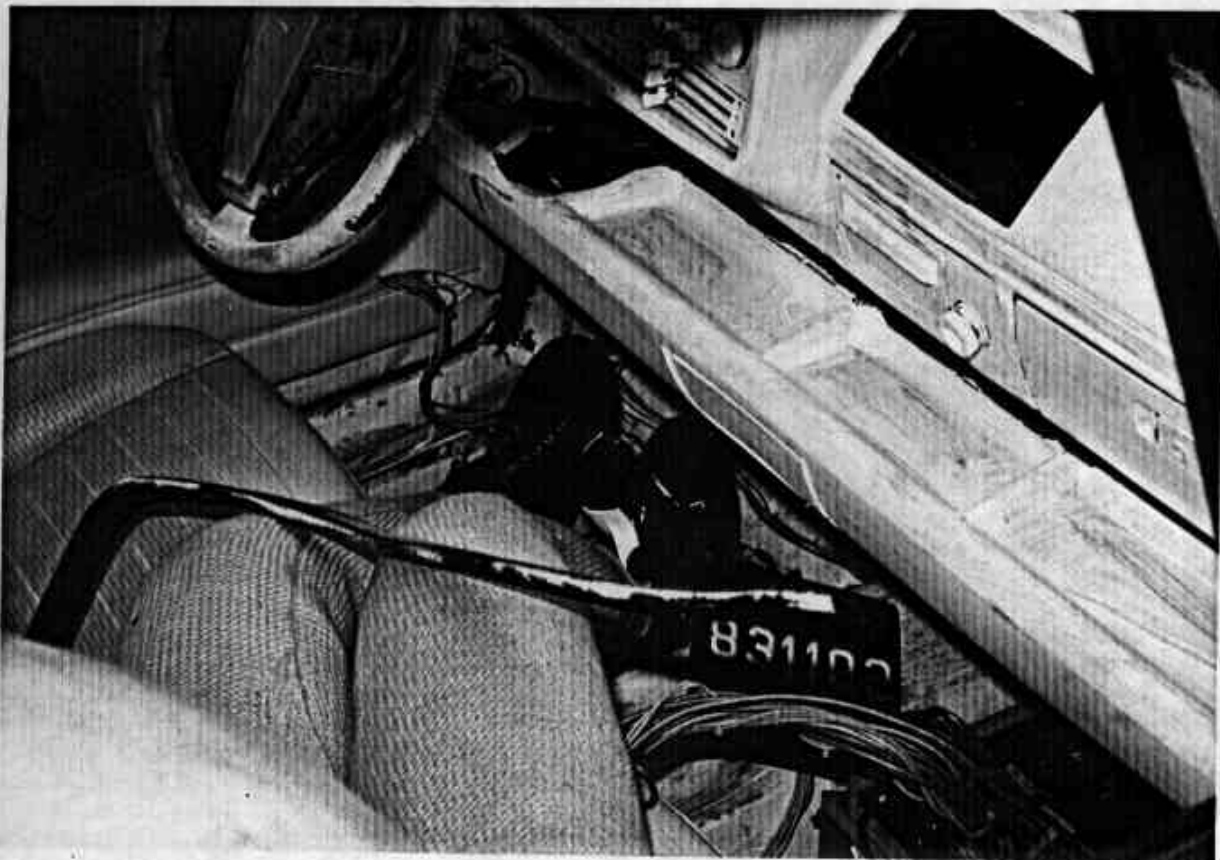


Figure A-20. POST-TEST DRIVER DUMMY - VIEW 3



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

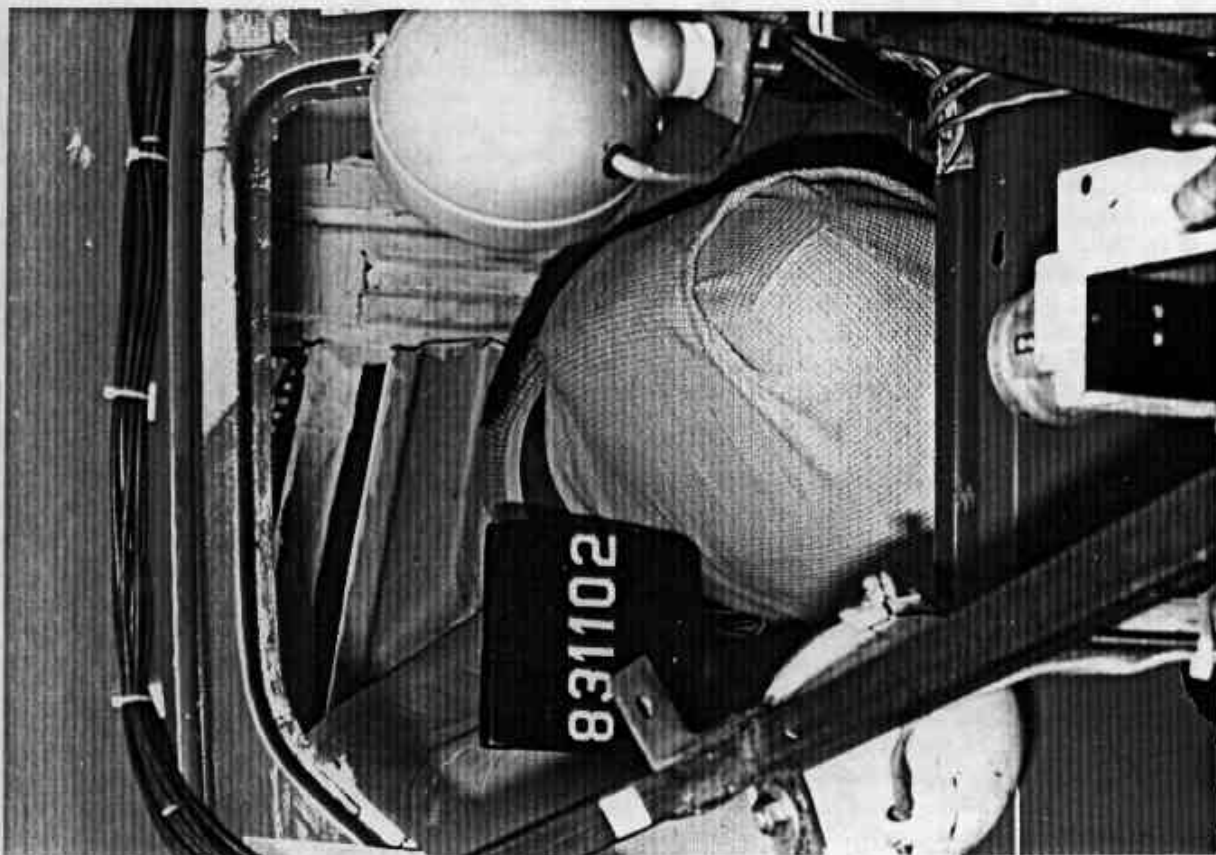


Figure A-22. POST-TEST PASSENGER DUMMY - VIEW 2

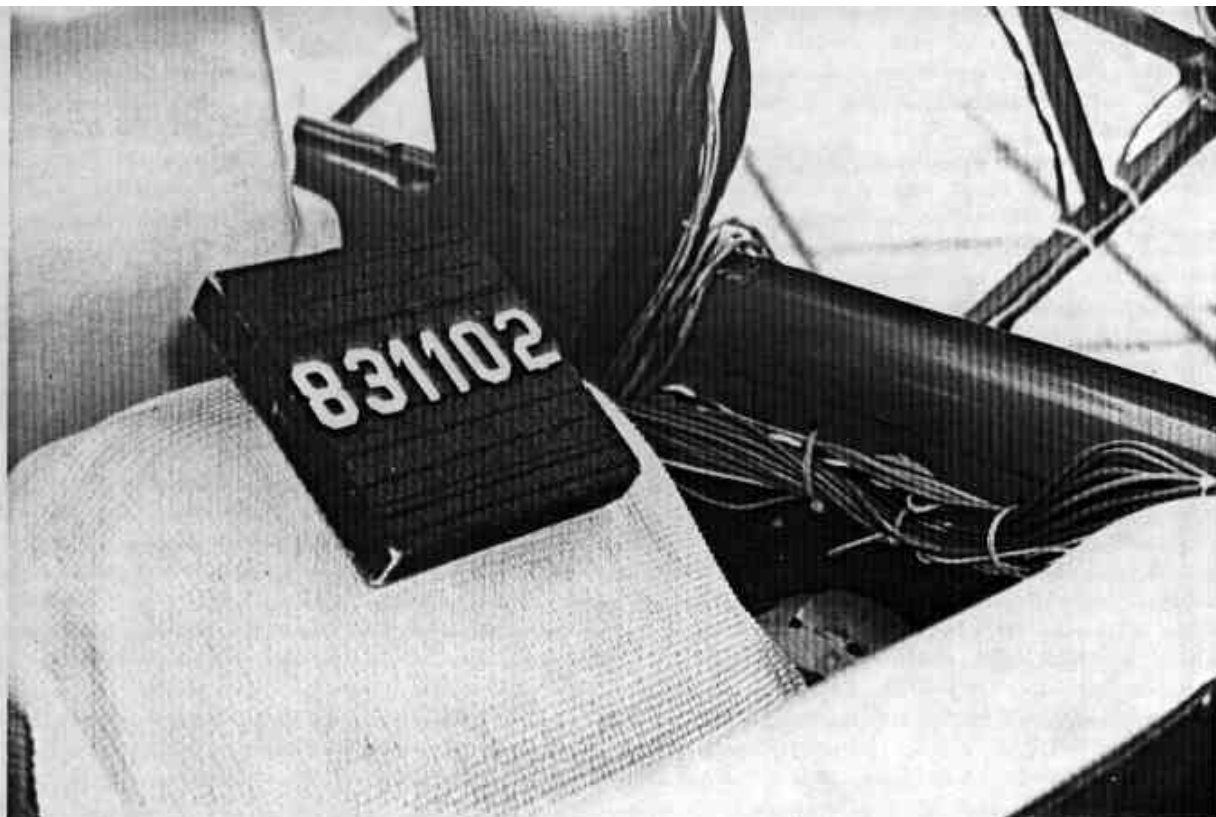


Figure A-23. POST-TEST PASSENGER DUMMY - VIEW 3

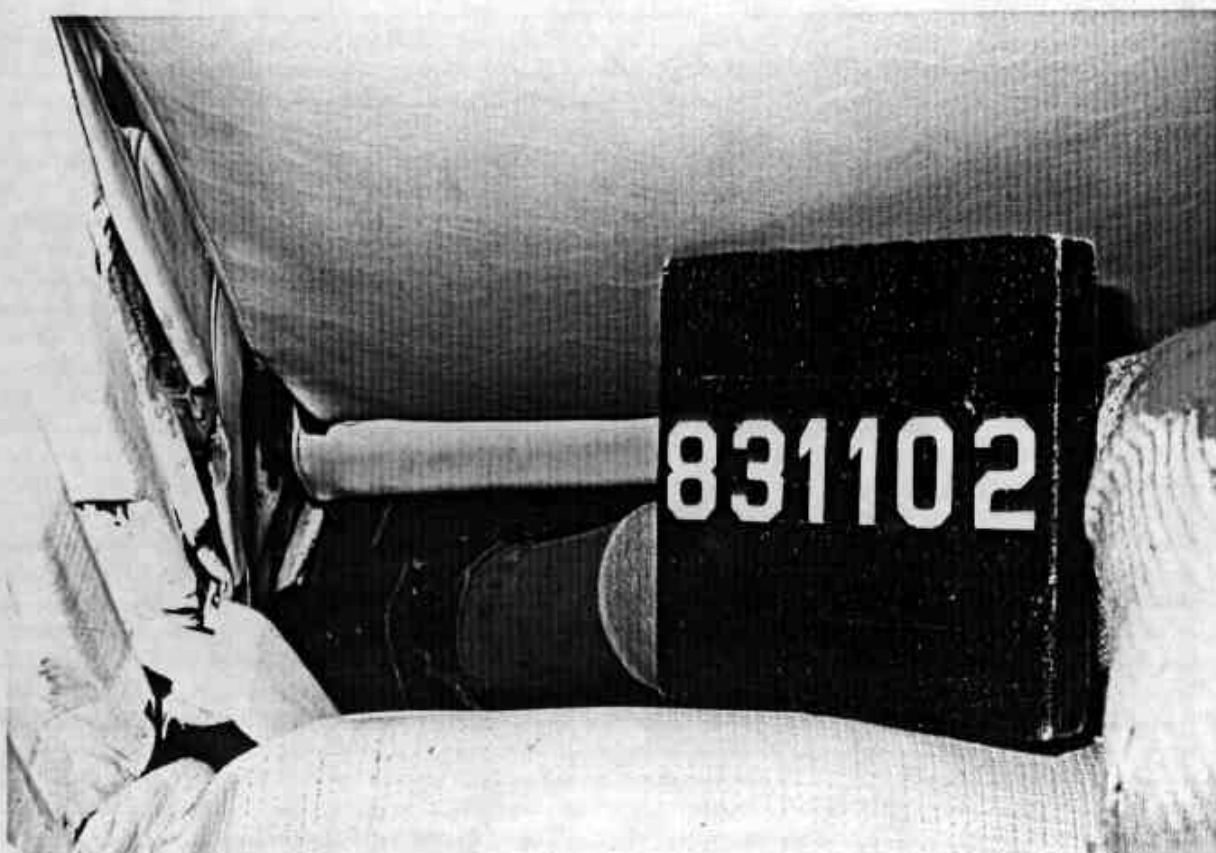


Figure A-24. POST-TEST PASSENGER DUMMY - VIEW 4



Figure A-25. POST-TEST VEHICLE DAMAGE - VIEW 1

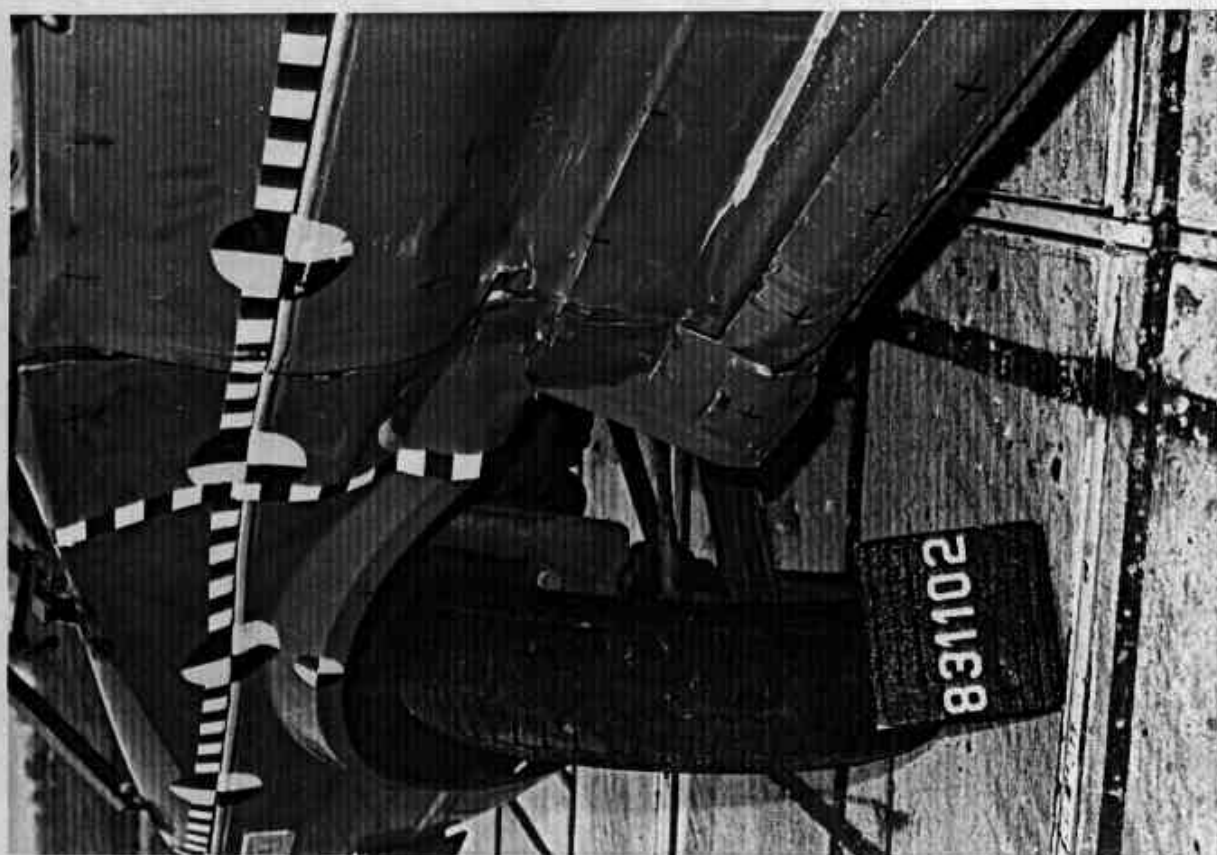


Figure A-26. POST-TEST VEHICLE DAMAGE - VIEW 2

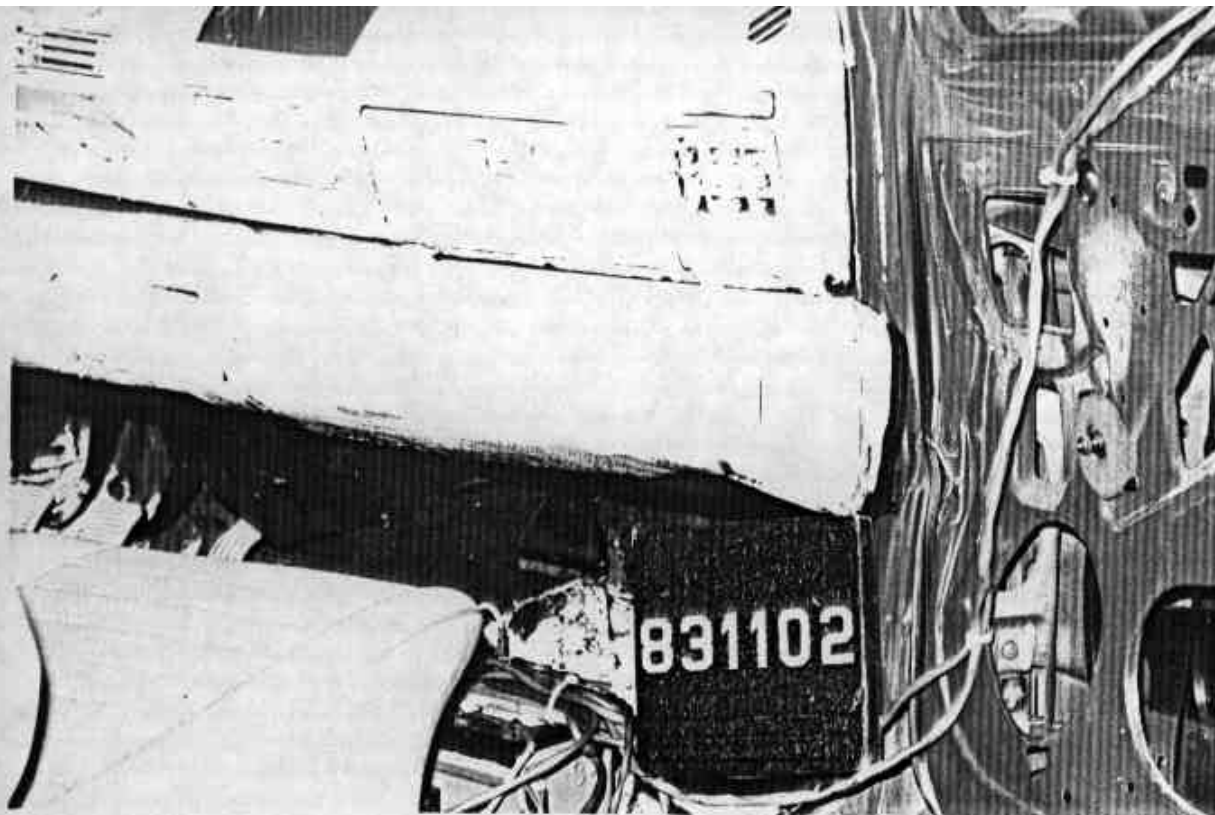


Figure A-27. POST-TEST VEHICLE DAMAGE - VIEW 3



Figure A-28. POST-TEST VEHICLE DAMAGE - VIEW 4

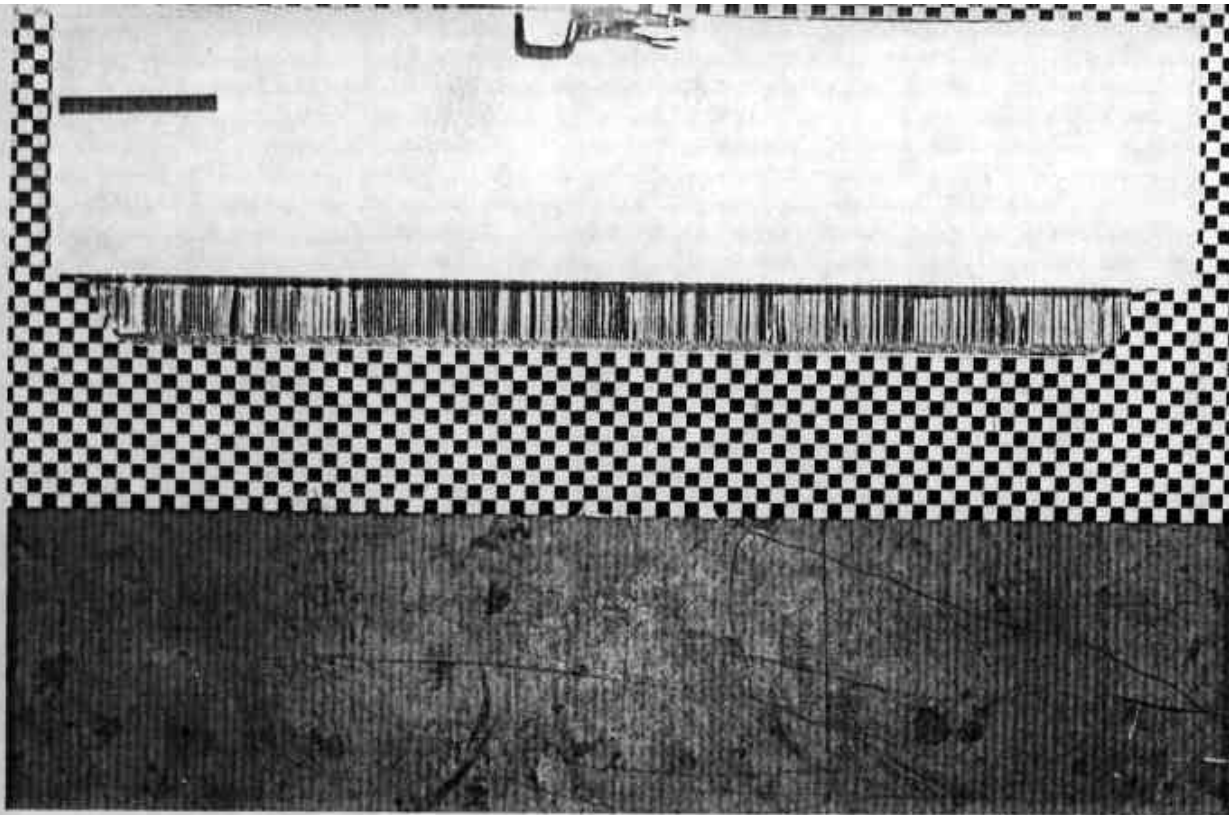


Figure A-29. PRE-TEST MDB FACE - VIEW 1

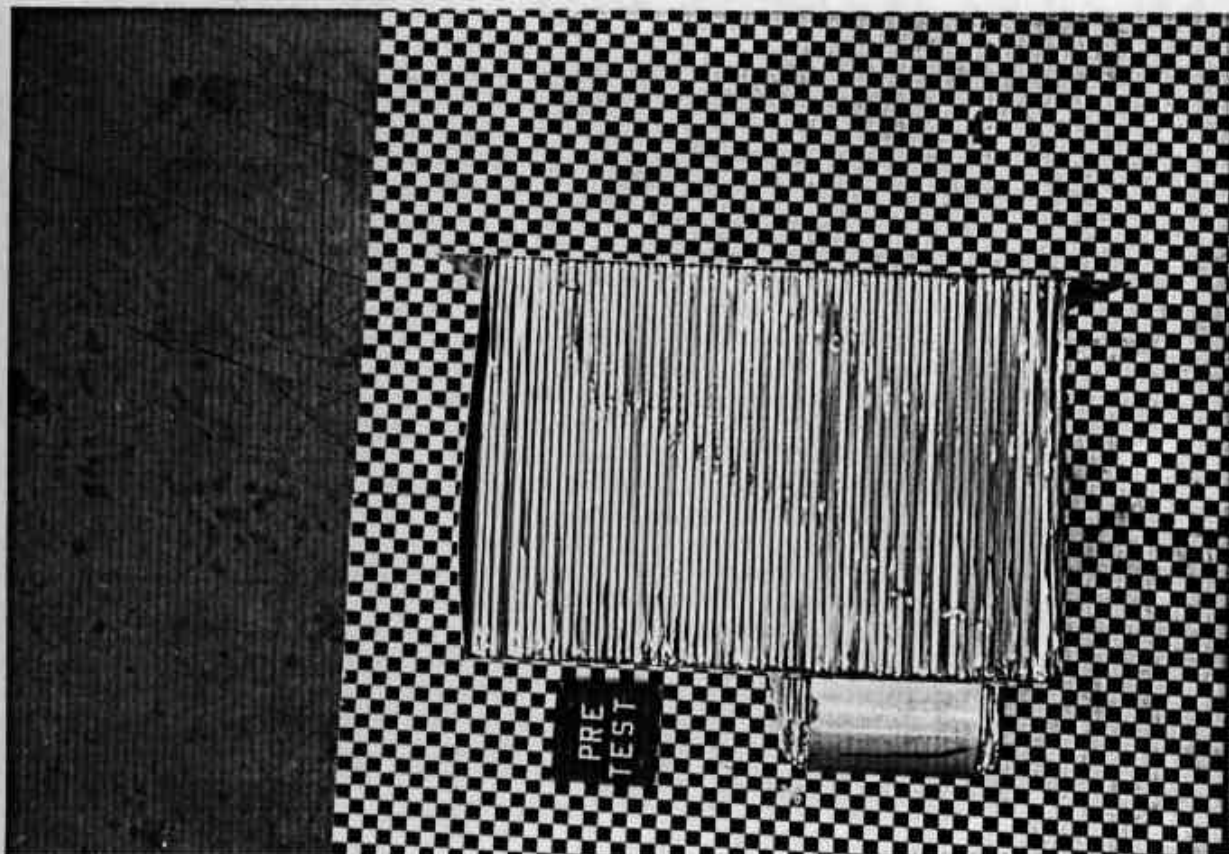


Figure A-30. PRE-TEST MDB FACE - VIEW 2

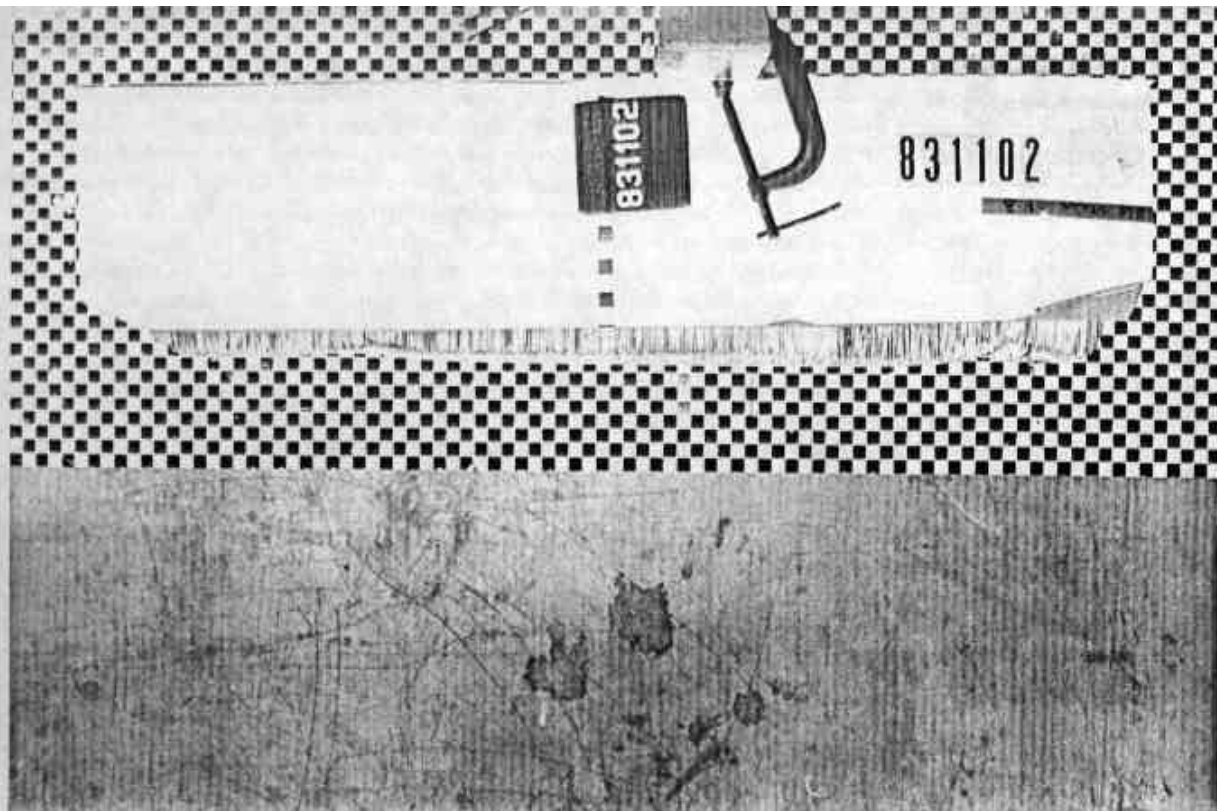


Figure A-31. POST-TEST MDB FACE - VIEW 1

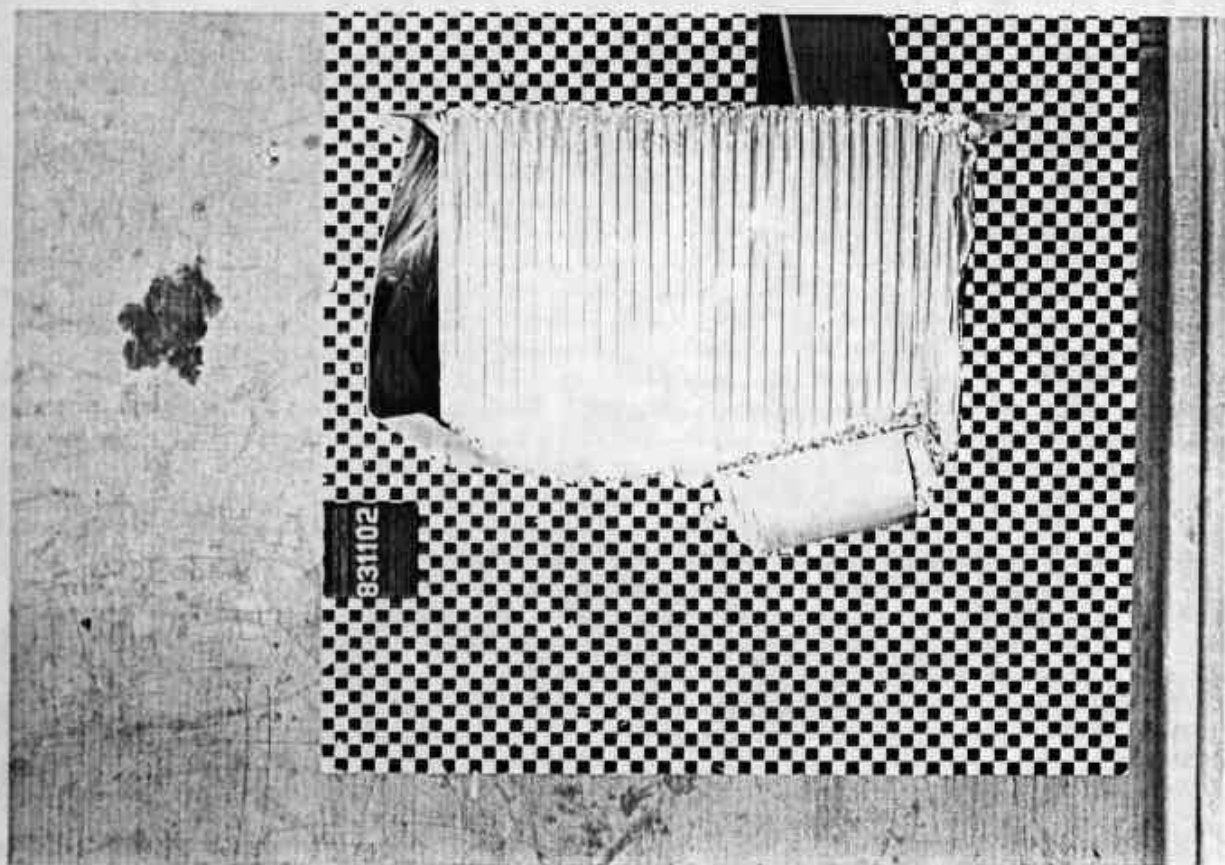
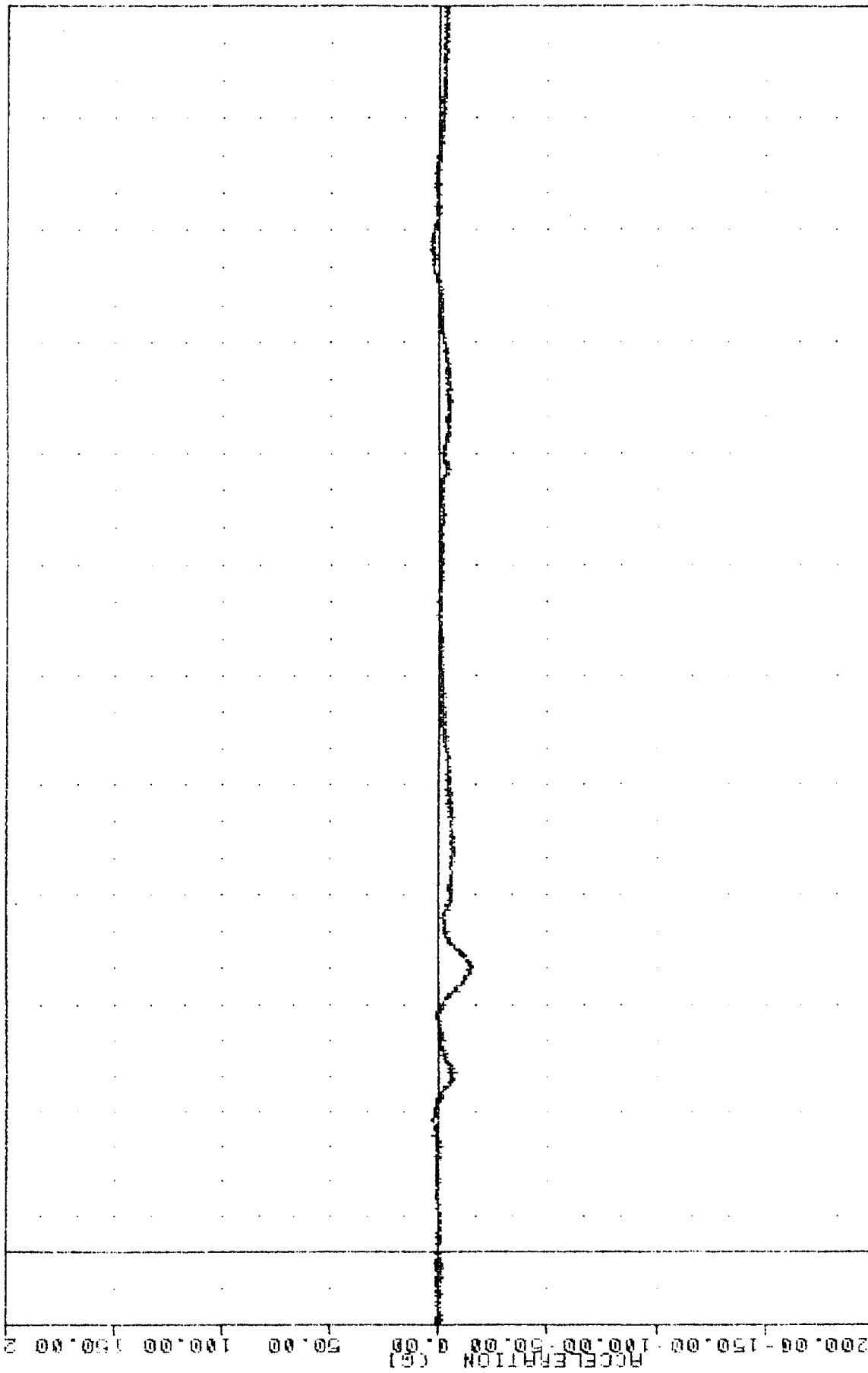


Figure A-32. POST-TEST MDB FACE - VIEW 2

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
 EVALUATION OF MOD VN FLEET
 83305000000
 HEDXG1
 FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -15.978 80.50 , 4.38 @ 274.00
 PLOT DATE 7-MAY-83 08:19:38

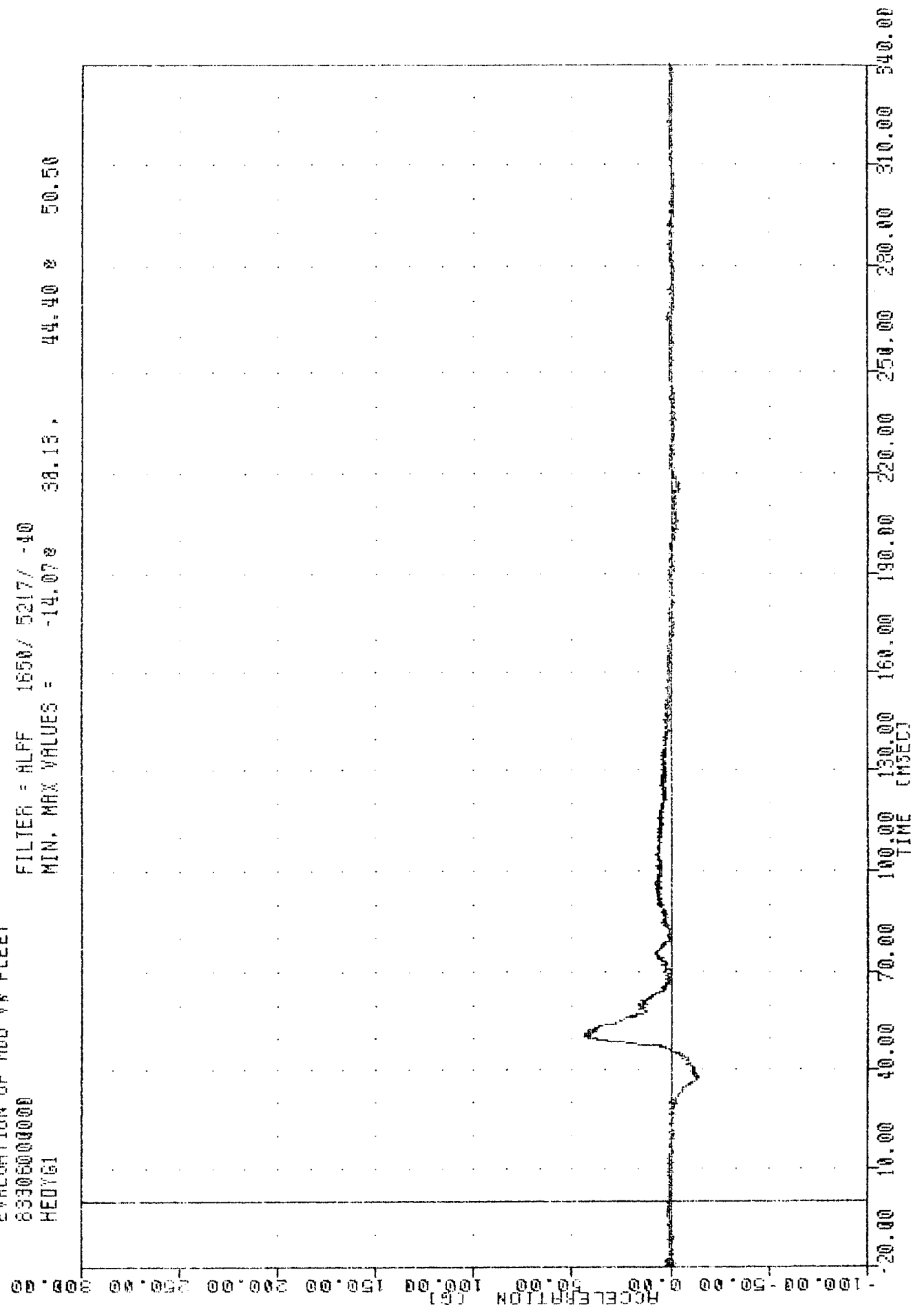


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER HEAD ACCELERATION X AXIS

TRC 631102 PLOT DATE 7 NOV 85 09:18:35

EVALUATION OF MDD VW FLEET
63306000000
HEDY61

FILTER = ALPF 1650/ 5217/ -40
MIN. MAX VALUES = -14.07e 38.13, 44.40 e 50.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION Y AXIS

TRC

831102

PLOT DATE

7-NOV-83

09:19:38

EVALUATION OF MOD VN FLEET

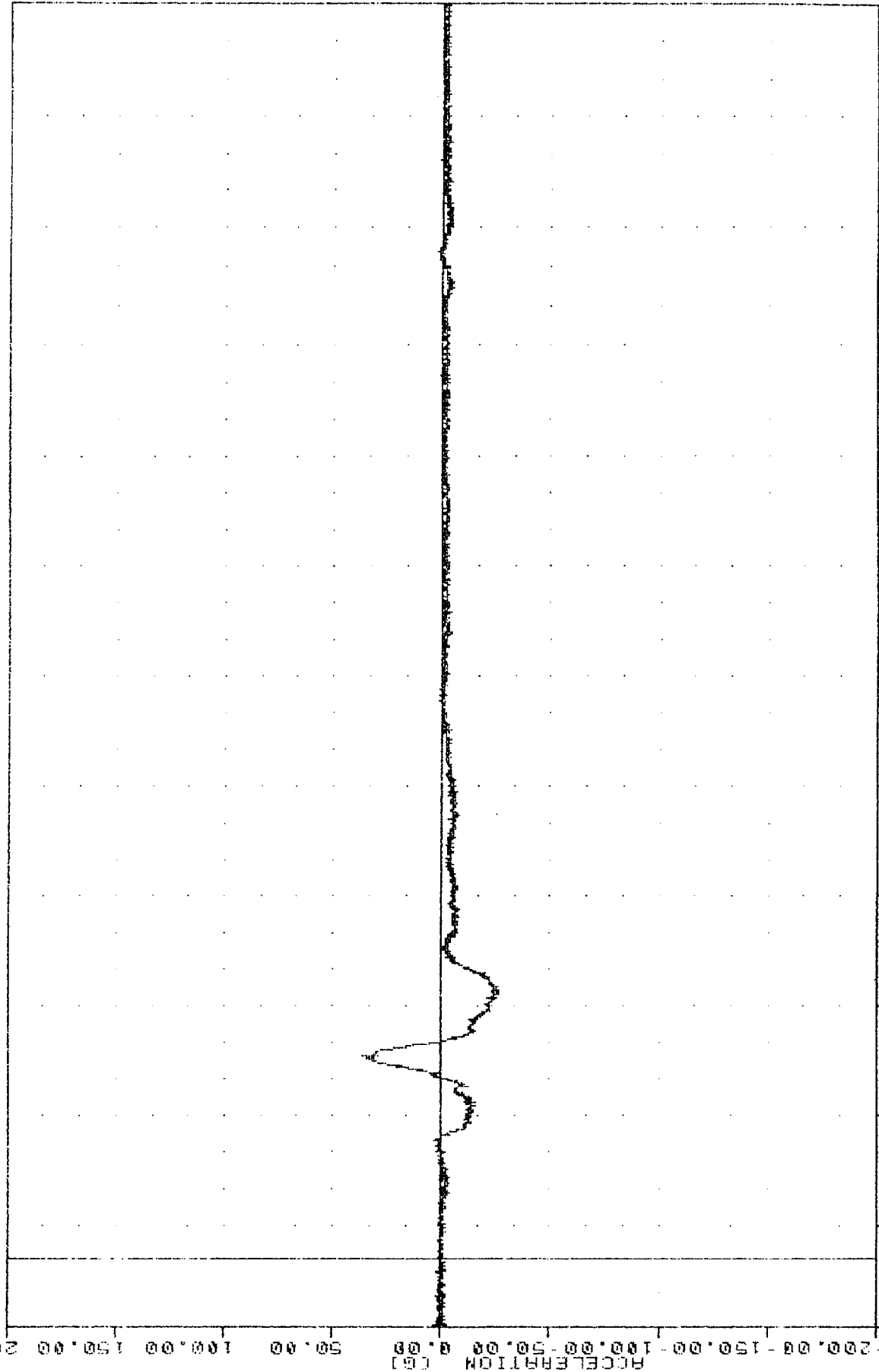
833080000000

HEAD161

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -26.50 73.38 35.89 56.80

200.00



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

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

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION Z AXIS

TBL 031102 7-NOV-83 09:19:38

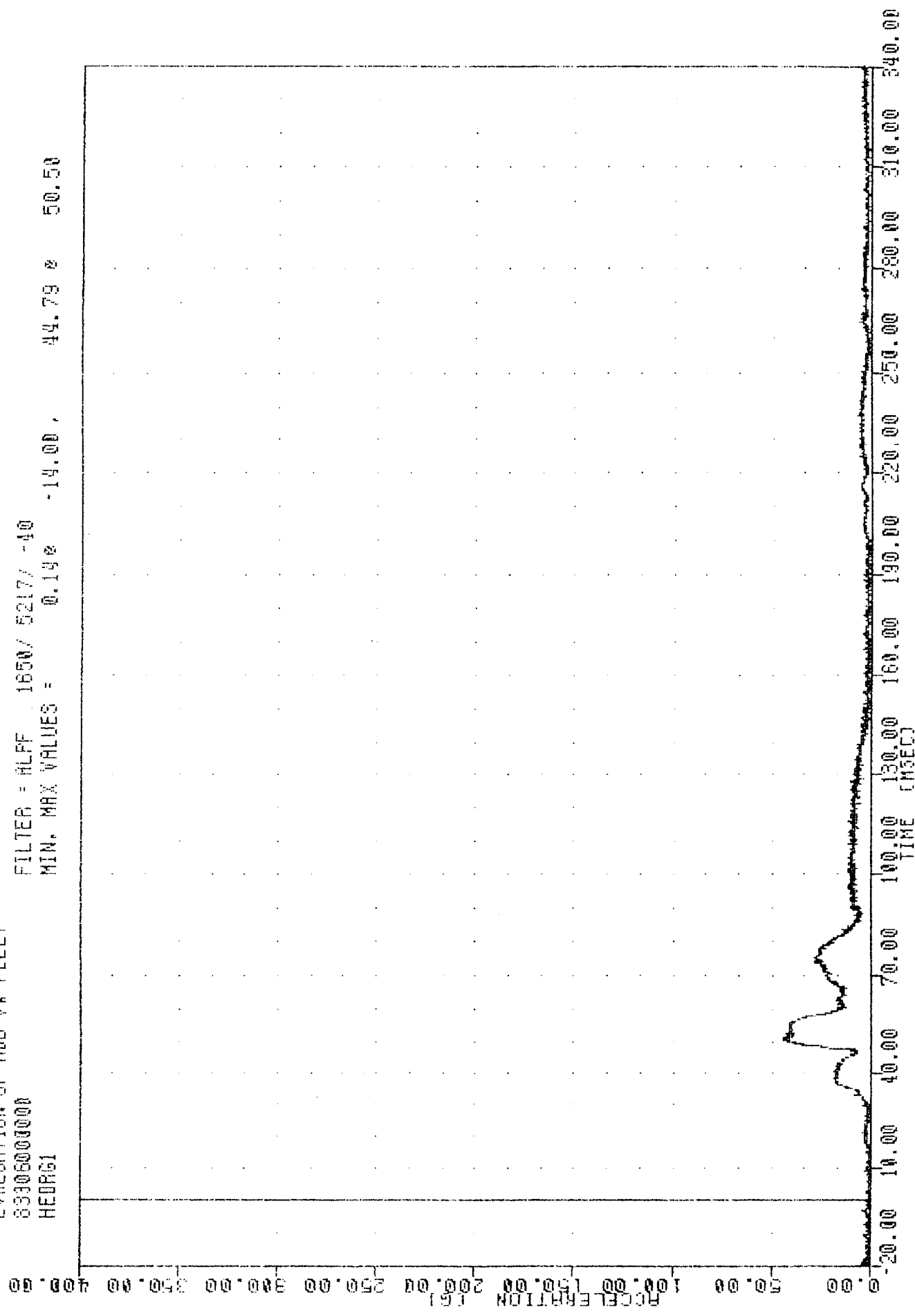
EVALUATION OF MOD VN FLEET

83305000000

HEOR61

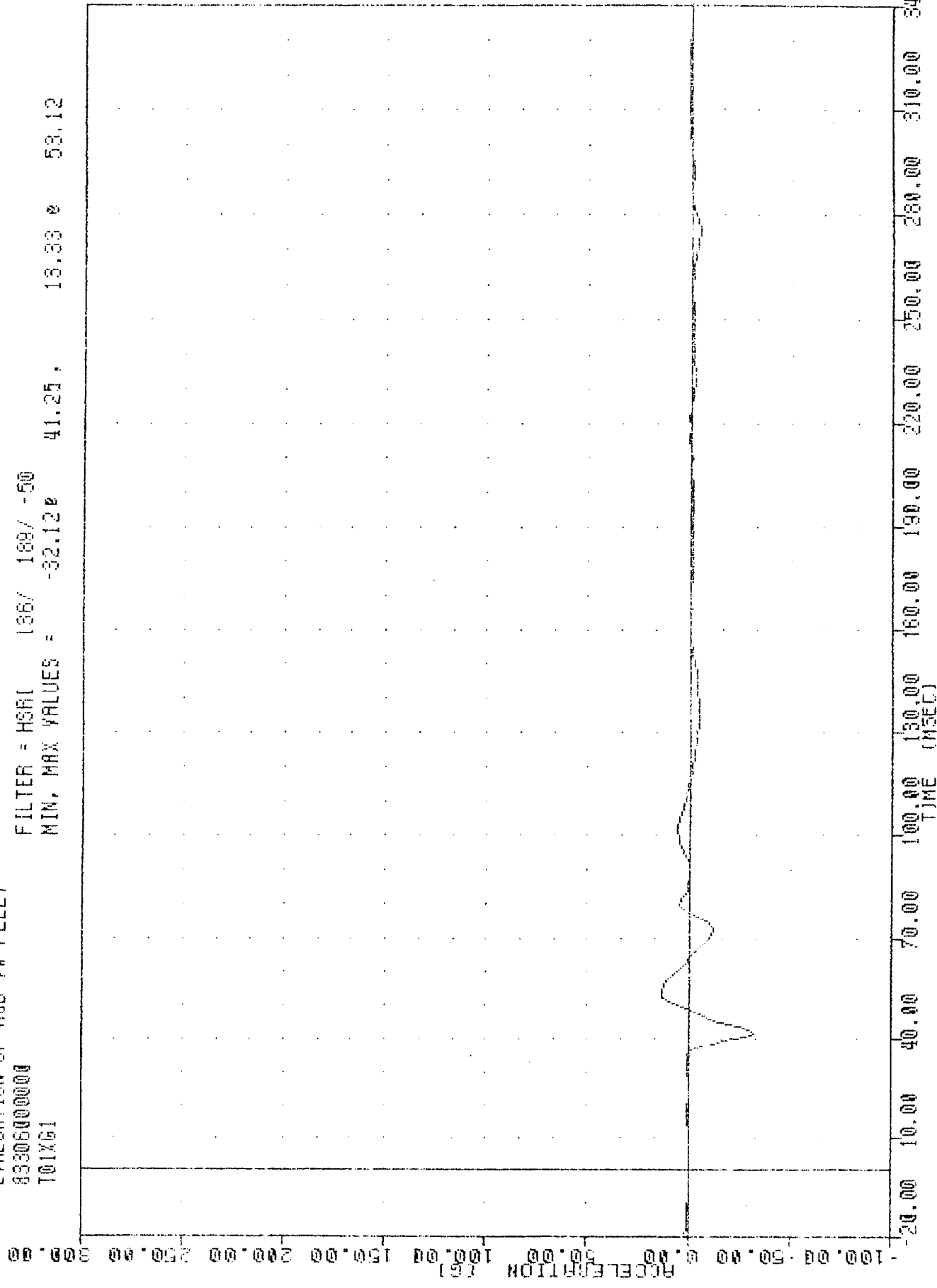
FILTER = ALFF 1650/ 5217/ -40

MIN. MAX VALUES = 0.140 -14.00 44.79 50.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD RESULTANT

TAC 831102
 EVALUATION OF MOD VW FLEET
 83306000000
 T01XG1
 PLUT DATE 7-NOV-83 15:16:14
 FILTER = HSRI 136/ 139/ -50
 MIN, MAX VALUES = -32.12e 41.25, 13.33 e 53.12



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

TRC 001102 PLOT DATE 7 NOV 89 16:16:14

EVALUATION OF MOO VN FLEET

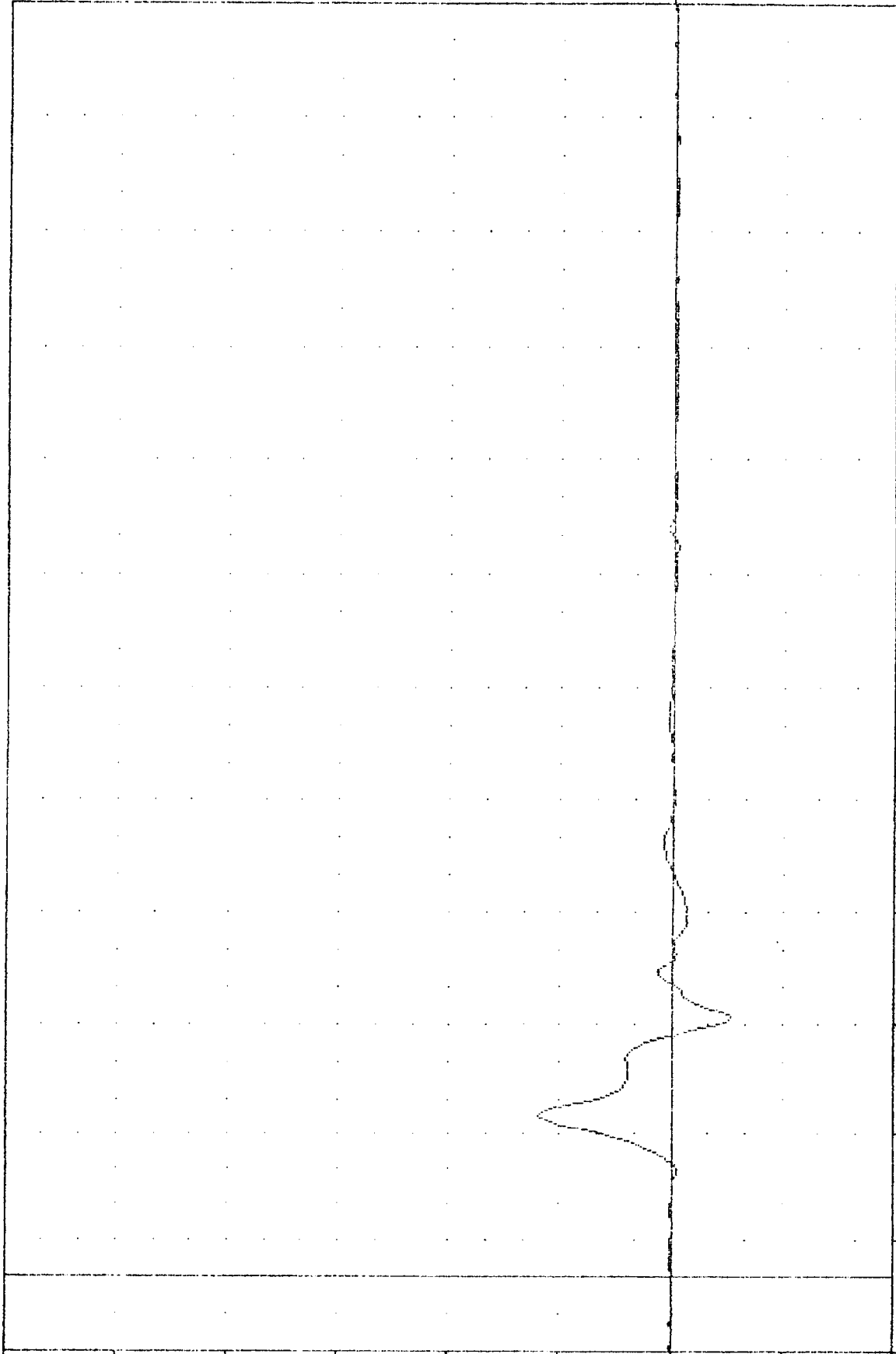
83305000000

T01Y61

FILTER = HSRI 136/ 189/ -50

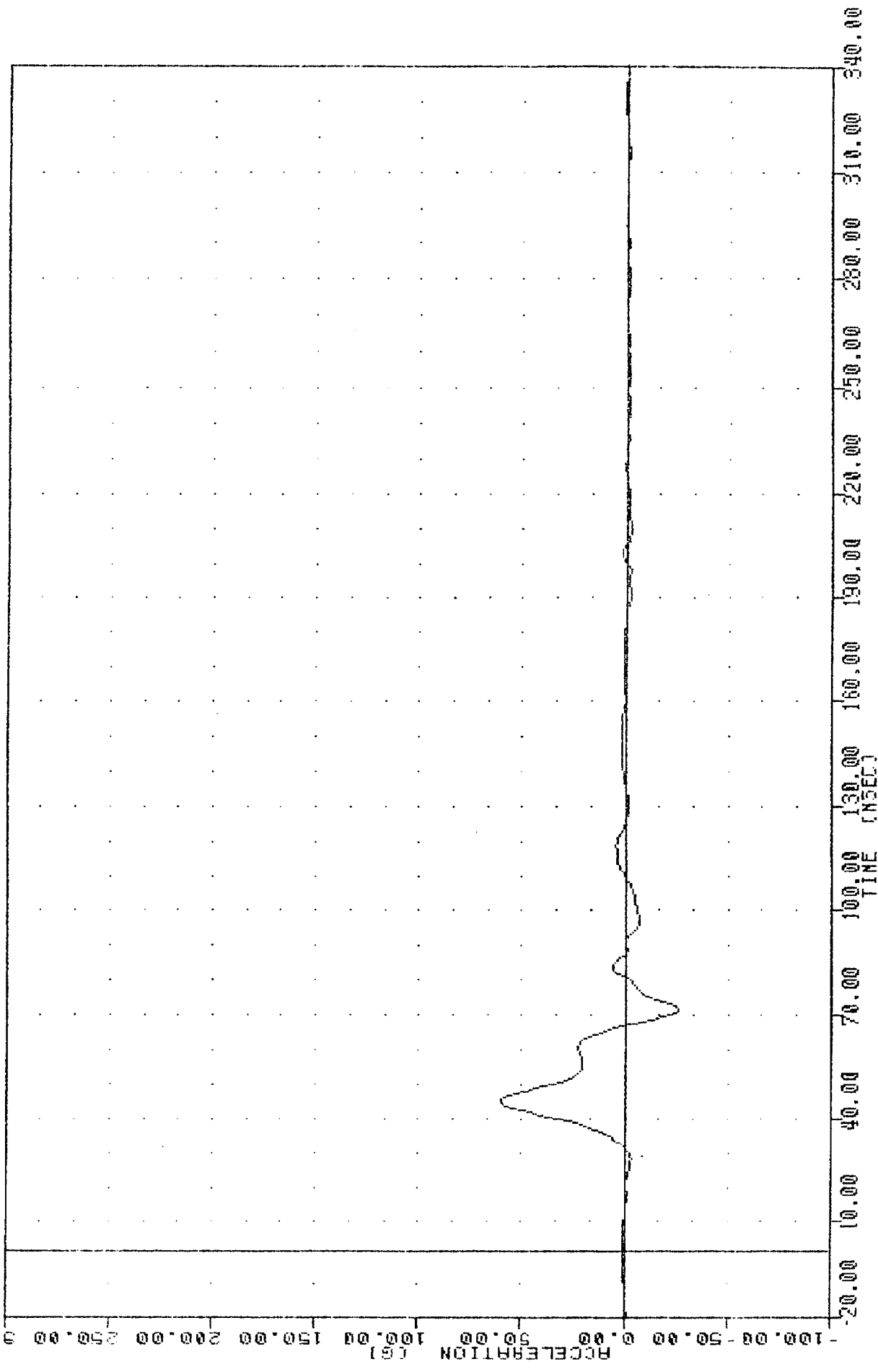
MIN. MAX VALUES = -26.69% 70.63, 59.61 @ 44.38

ACCELERATION (G)



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

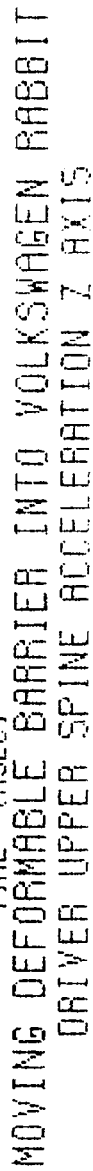
TRC 831102 7-NOV-83 16:16:14
 EVALUATION OF MOD VW FLEET
 83306000000
 T01Y6R
 FILTER = HSRI 136/ 189/ .50
 MIN. MAX VALUES = -26.13e 70.63, 60.37 e 44.38



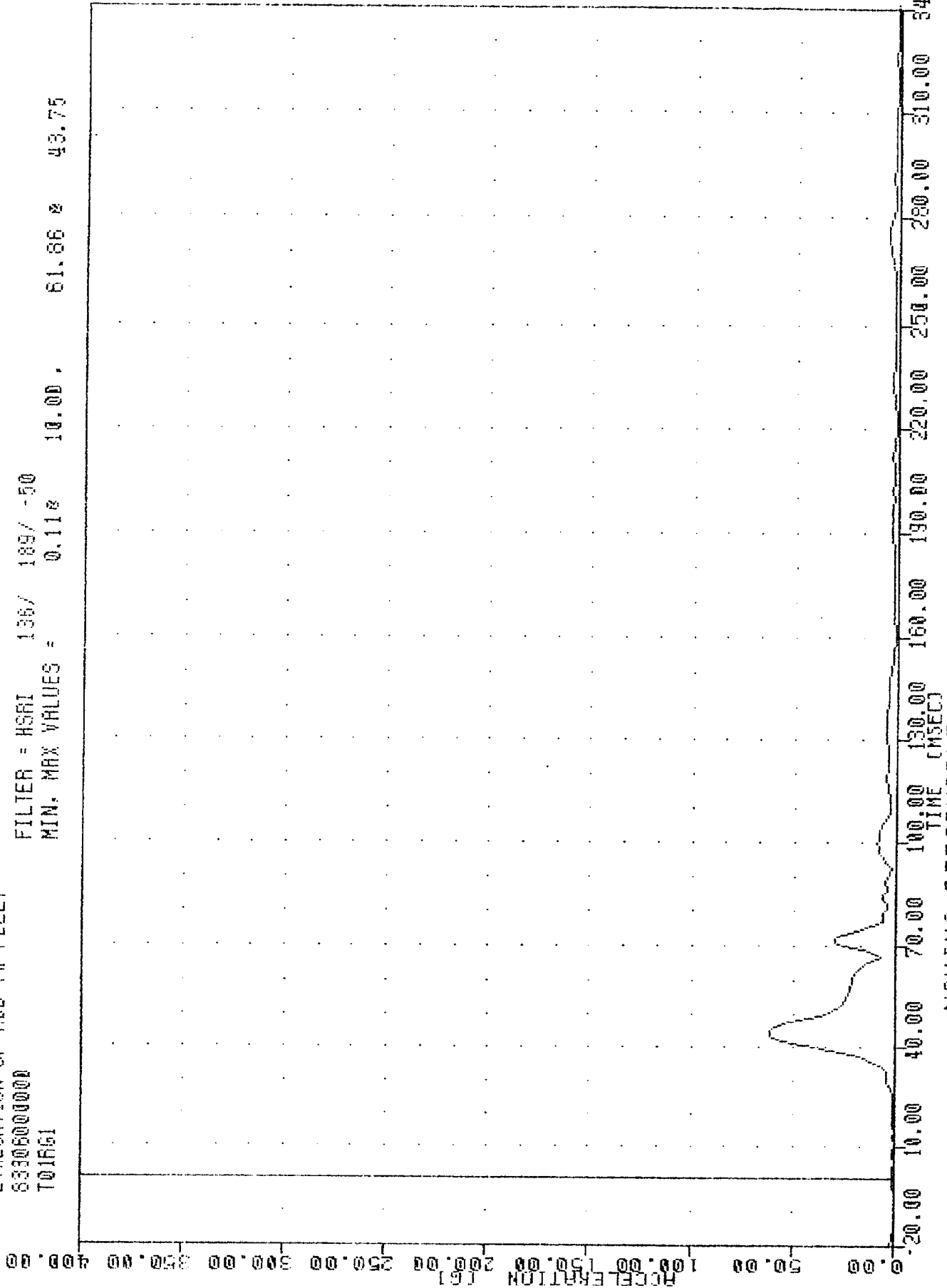
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE ACCELERATION -2 Y AXIS

1

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TRC [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
 EVALUATION OF MOD VW FLEET
 8330500000
 T01661
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.11g 10.00, 61.86 g 43.75
 PLOT DATE 7 NOV-83 16:16:14



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE RESULTANT

TRC

831102

PLOT DATE

7-NOV-83

09:26:57

EVALUATION OF MOD VW FLEET

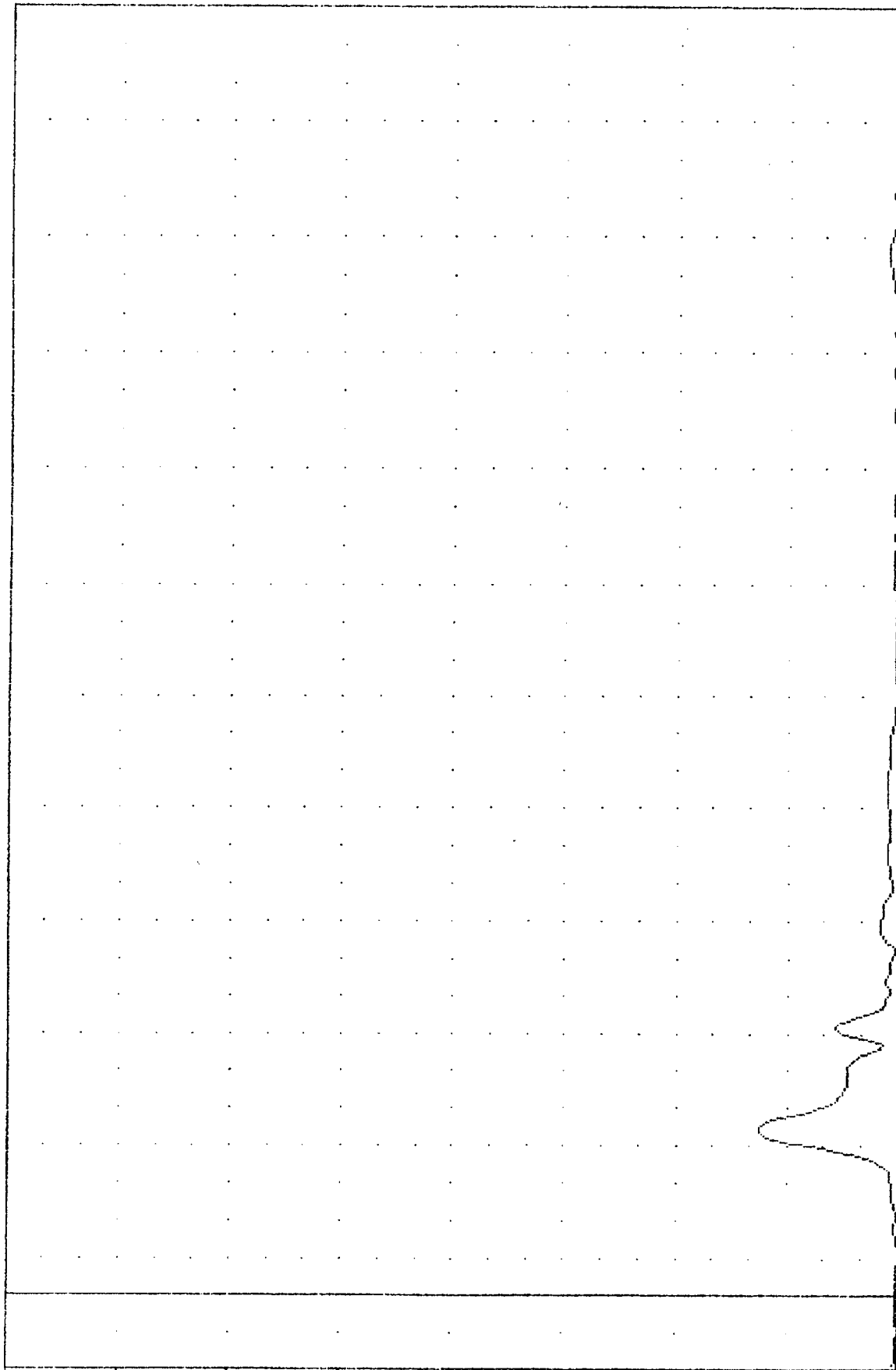
FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.07 11.25, 62.69 43.75

83306000000

T01RG1

ACCELERATION (G)



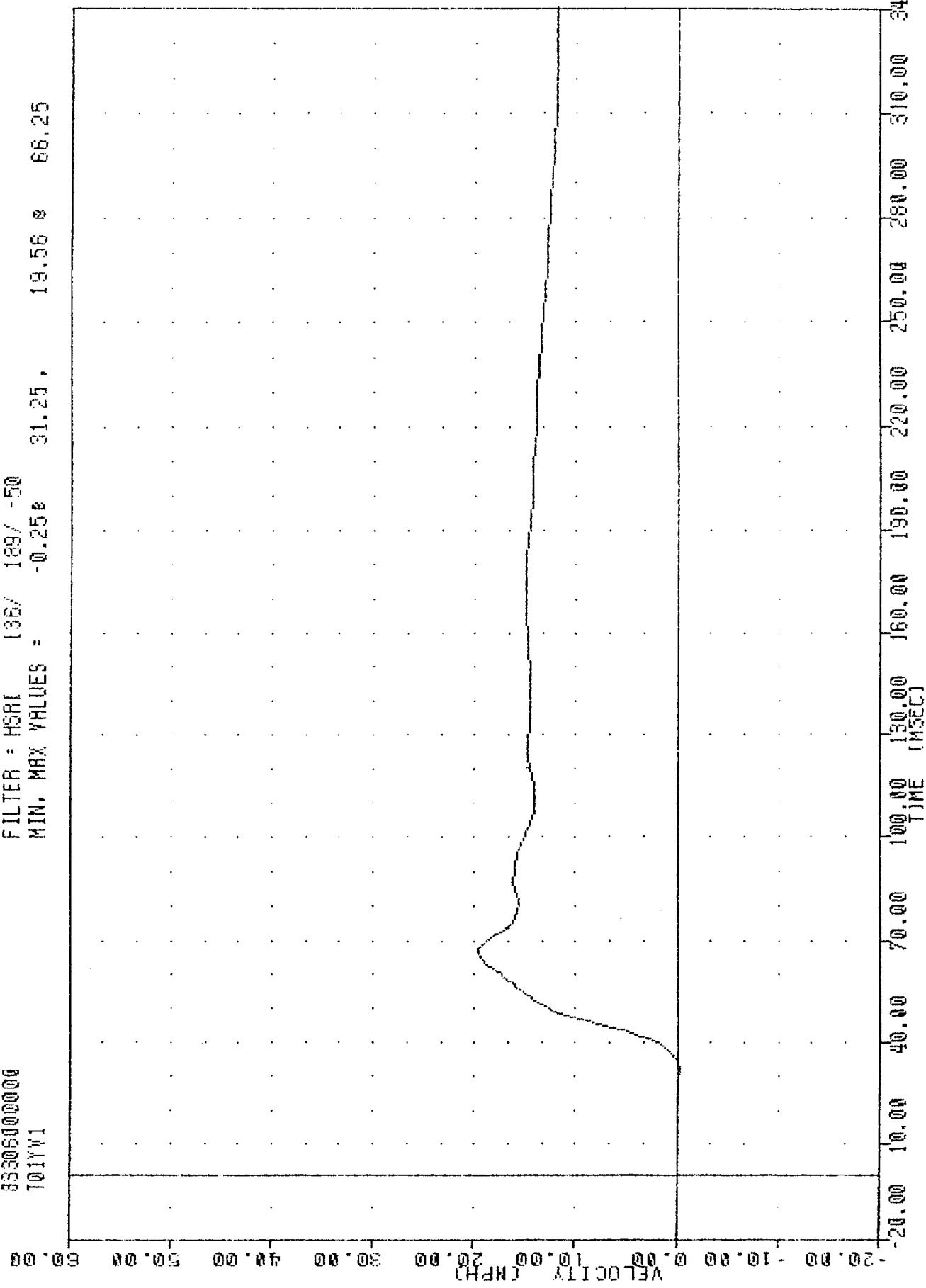
0.00 50.00 100.00 150.00 200.00 250.00 300.00 350.00 400.00

TIME (MSEC)

-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 UPPER SPINE RESULTANT USING T01YGA

TRC 831102 PLOT DATE 7-NOV-83 14:26:25
 EVALUATION OF MOD YW FLEET
 833050000000
 T01YV1
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.25e 31.25 19.56 e 66.25

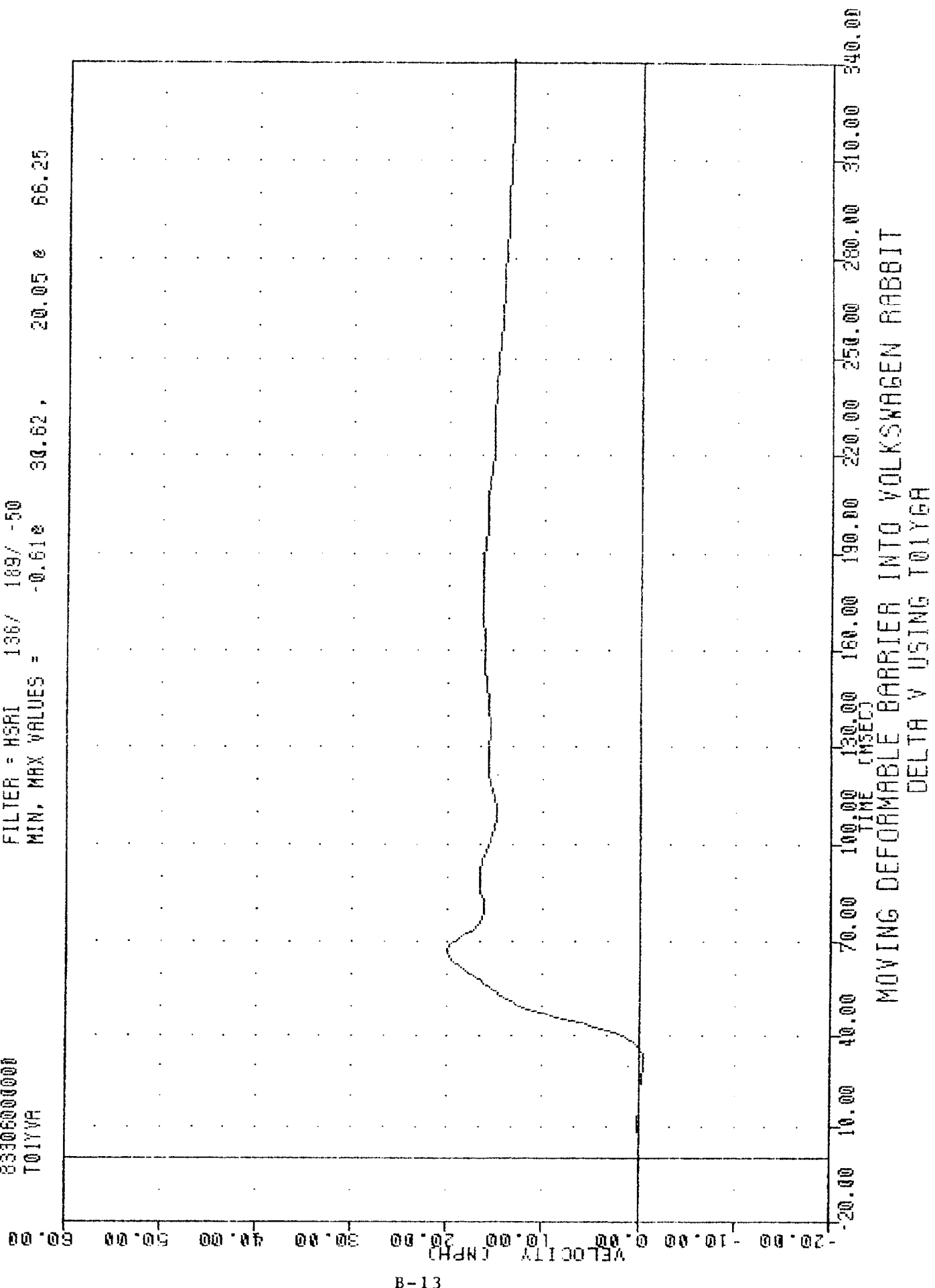


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T01Y61

TRC 831102
 EVALUATION OF MDD VW FLEET
 83306000000
 T01YVR

PLOT DATE 7-NOV-83 14:26:25

FILTER = HSRI 136/ 109/ -50
 MIN, MAX VALUES = -0.618 30.62, 20.05 & 66.25



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T01YGA

TRC

831102

PLOT DATE

7-NOV-83

16:16:14

EVALUATION OF MOD VW FLEET

83306000000

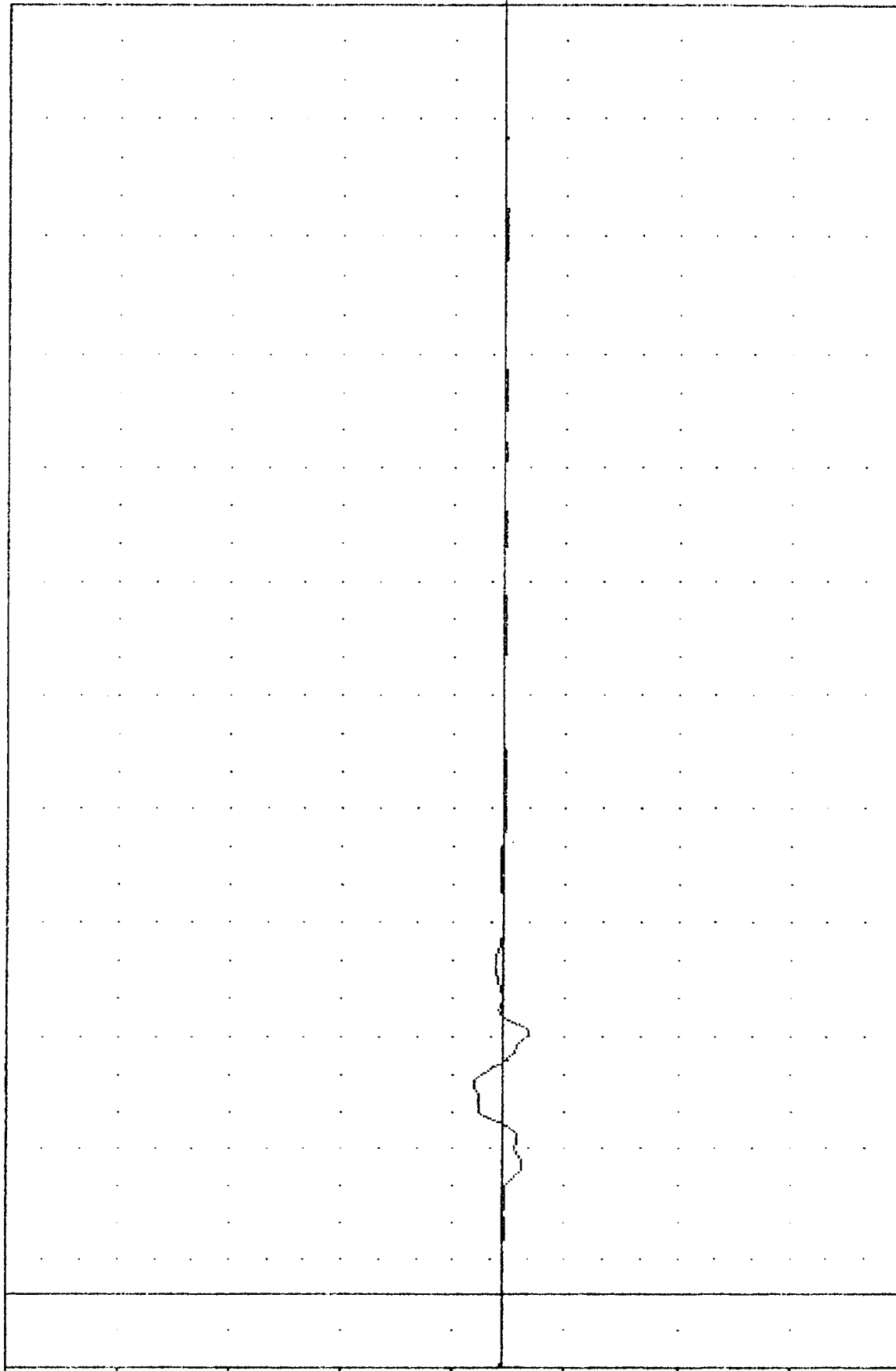
T12XG1

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -19.92 70.00

23.90 56.87

ACCELERATION (G)



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

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

TRC 831102 PLOT DATE 7-NOV-83 16:18:14

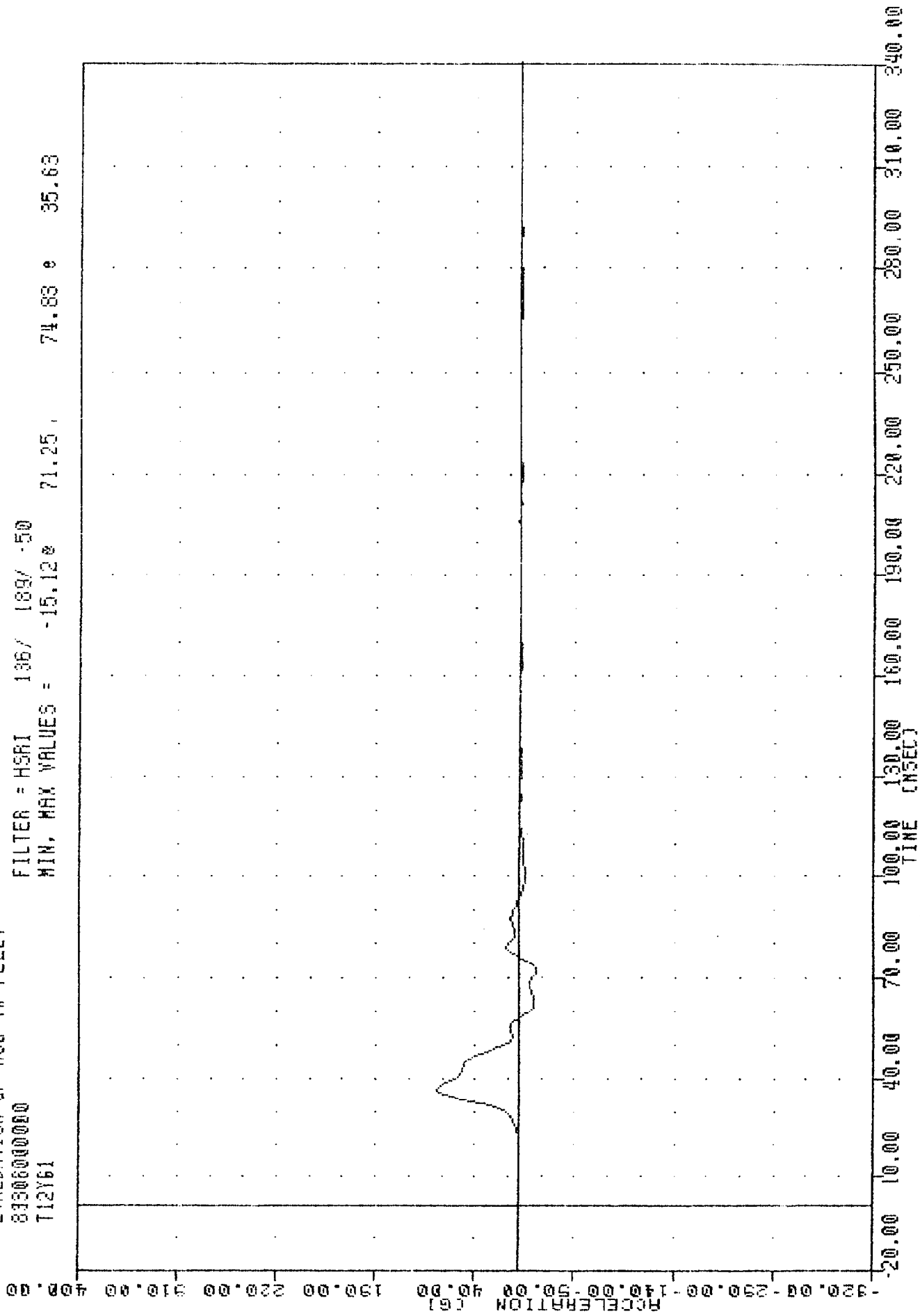
EVALUATION OF MOD VN FLEET

83306000000

T12Y61

FILTER = HSRI 136/ 139/ -50

MIN, MAX VALUES = -15.12 71.25 74.83 35.63



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

TRC 831102 PLOT DATE 7-NOV-83 16:16:14

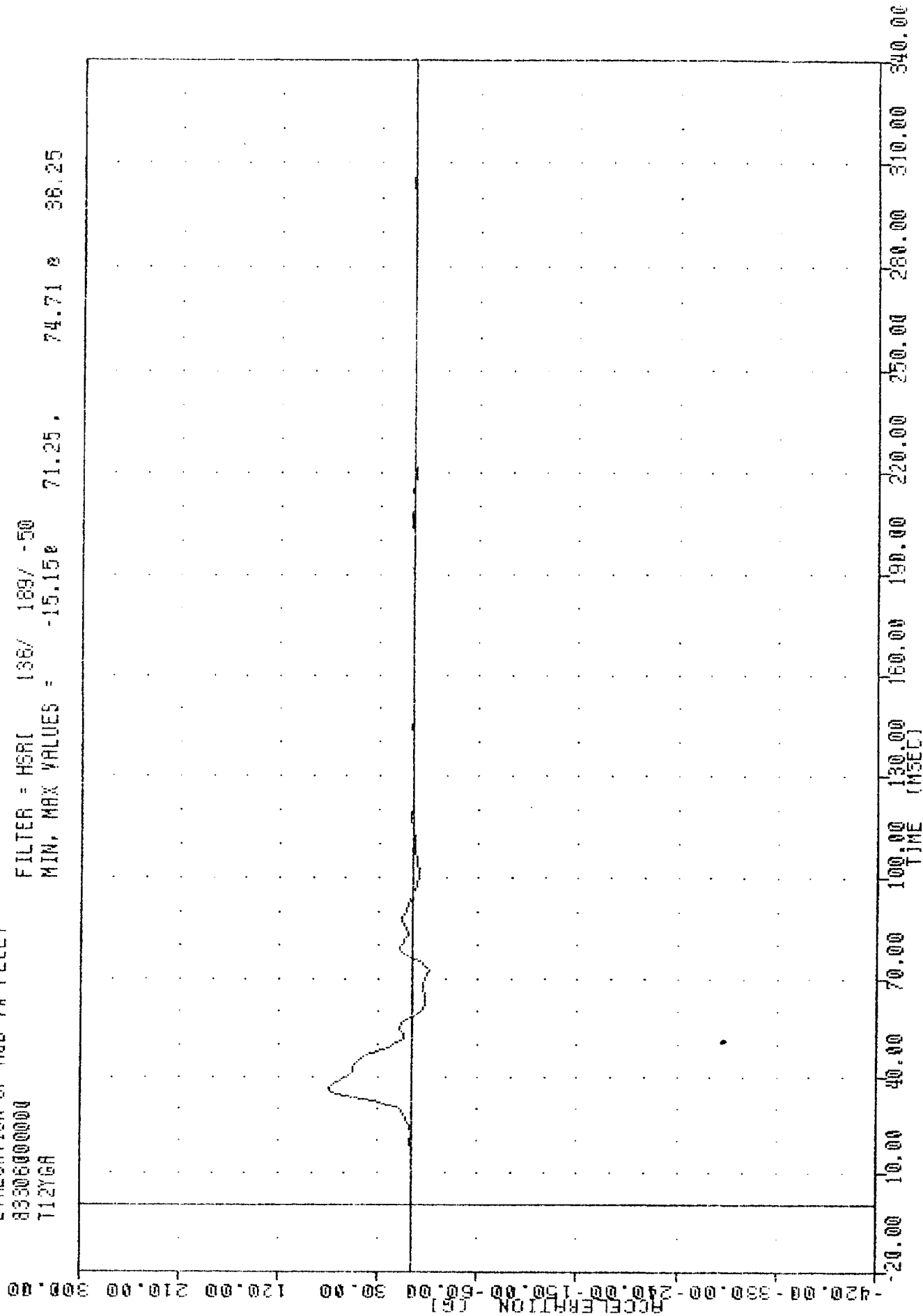
EVALUATION OF MOD VN FLEET

83306000000

T12Y6A

FILTER = HSR1 136/ 189/ -50

MIN, MAX VALUES = -15.15e 71.25, 74.71 e 36.25



TRC

831102

PLOT DATE

7-MAY-83

16:15:14

EVALUATION OF MDD V/N FLEET

833060000000

T12761

FILTER = HSRI

136/

189/ -50

MIN, MAX VALUES =

-3.24%

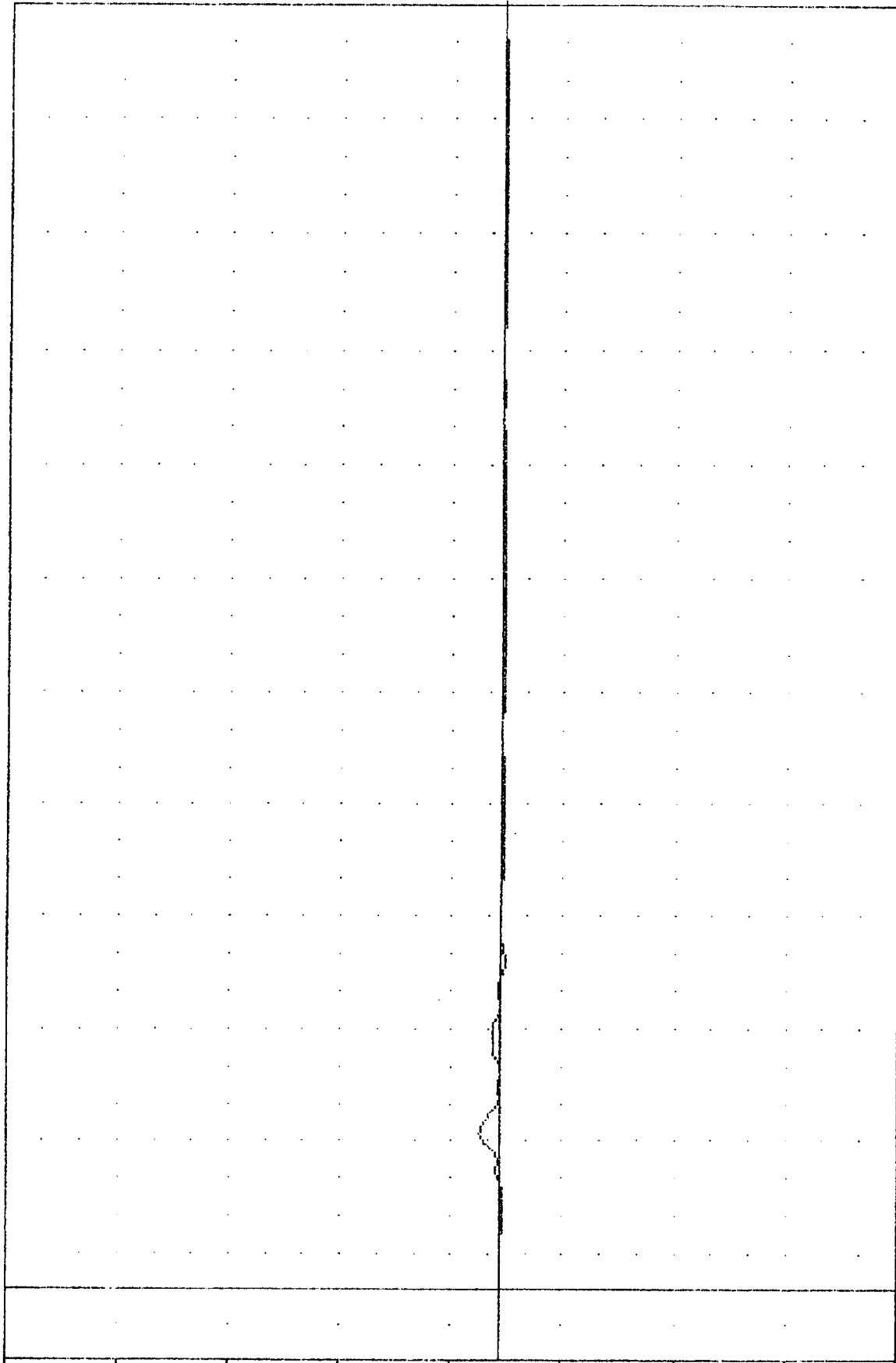
86.88,

16.77%

41.25

ACCELERATION (G)

-320.00 -280.00 -240.00 -200.00 -160.00 -120.00 -80.00 -40.00 0.00 40.00 80.00 120.00 160.00 200.00 240.00 280.00 320.00



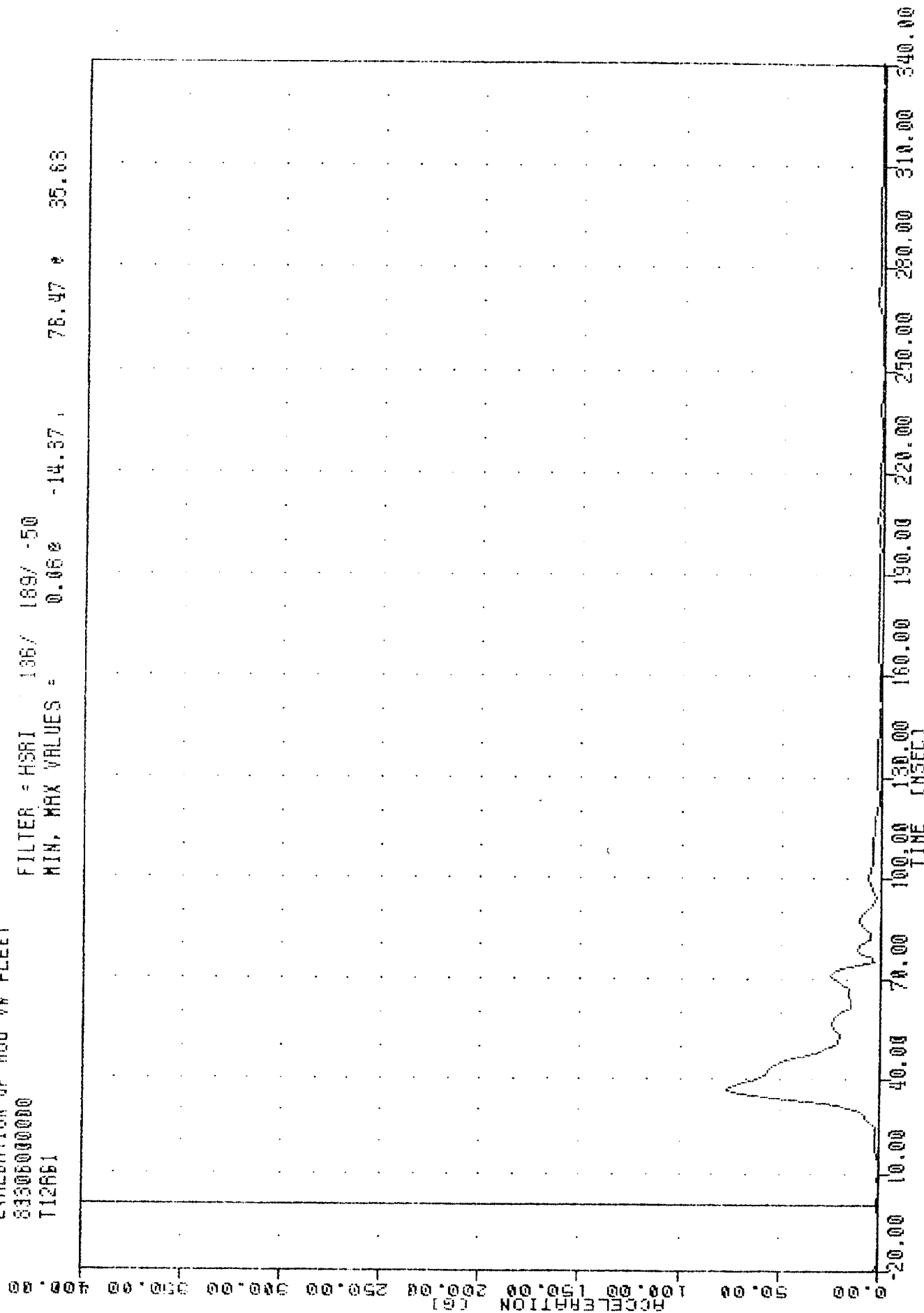
0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

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

TRC
EVALUATION OF MOD VW FLEET
83306000000
T12661

DATE 7 NOV 83 16.15.14

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = 0.068 -14.37, 78.47 35.83



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE RESULTANT

TRC 831102 PLOT DATE 7-NOV-83 09:26:57

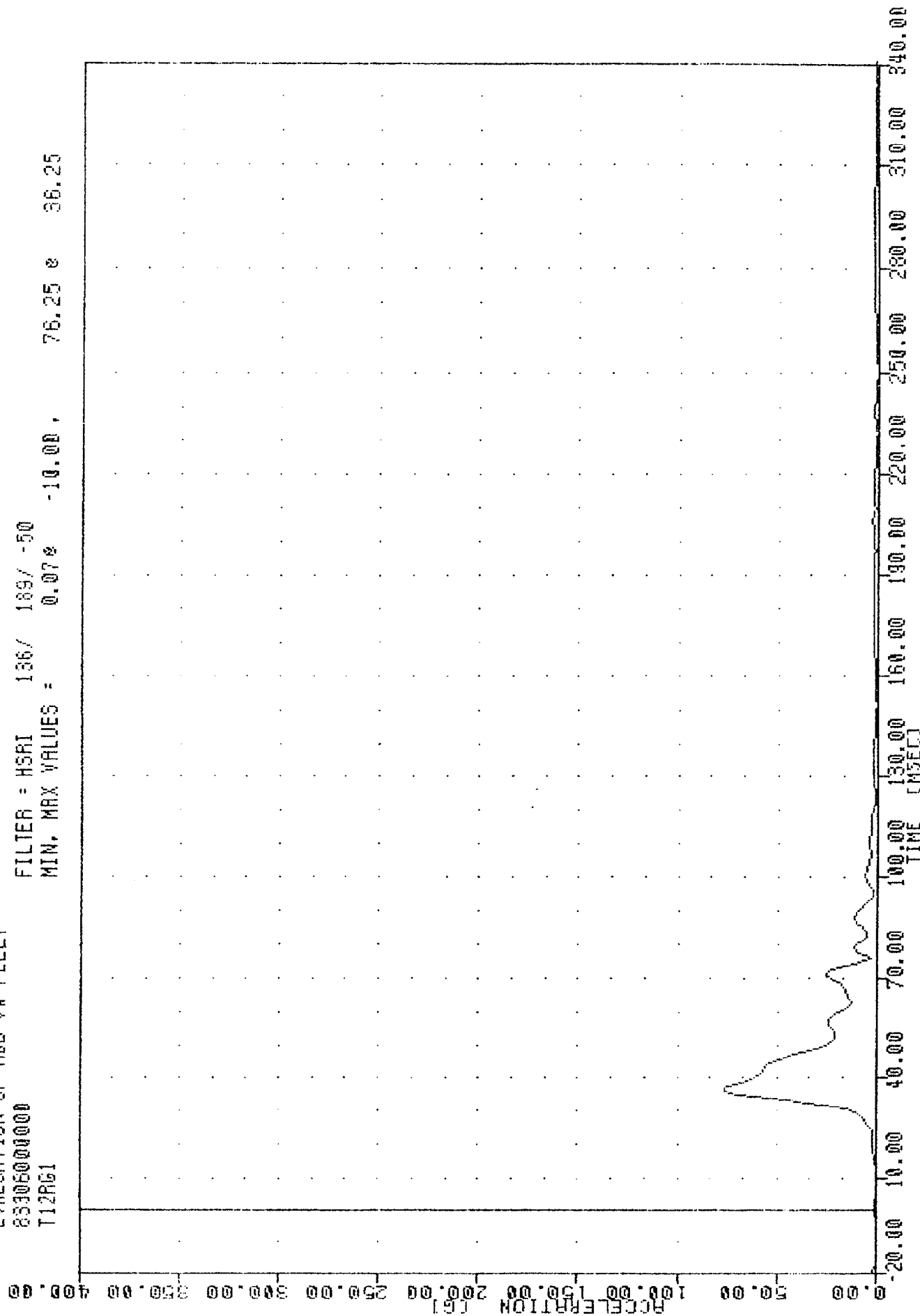
EVALUATION OF MOD VW FLEET

833050000000

T12RG1

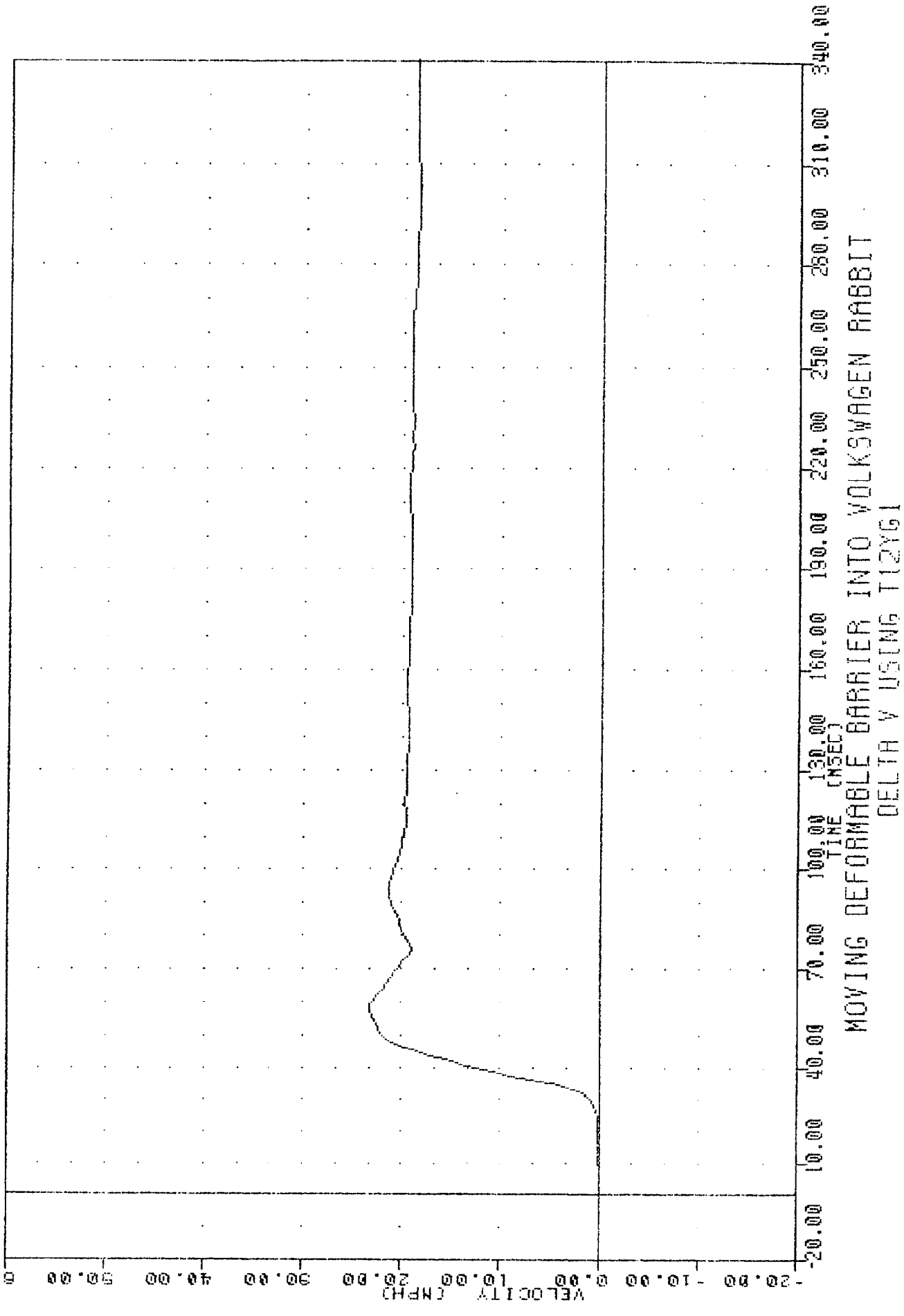
FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.07% -10.00, 76.25 & 36.25



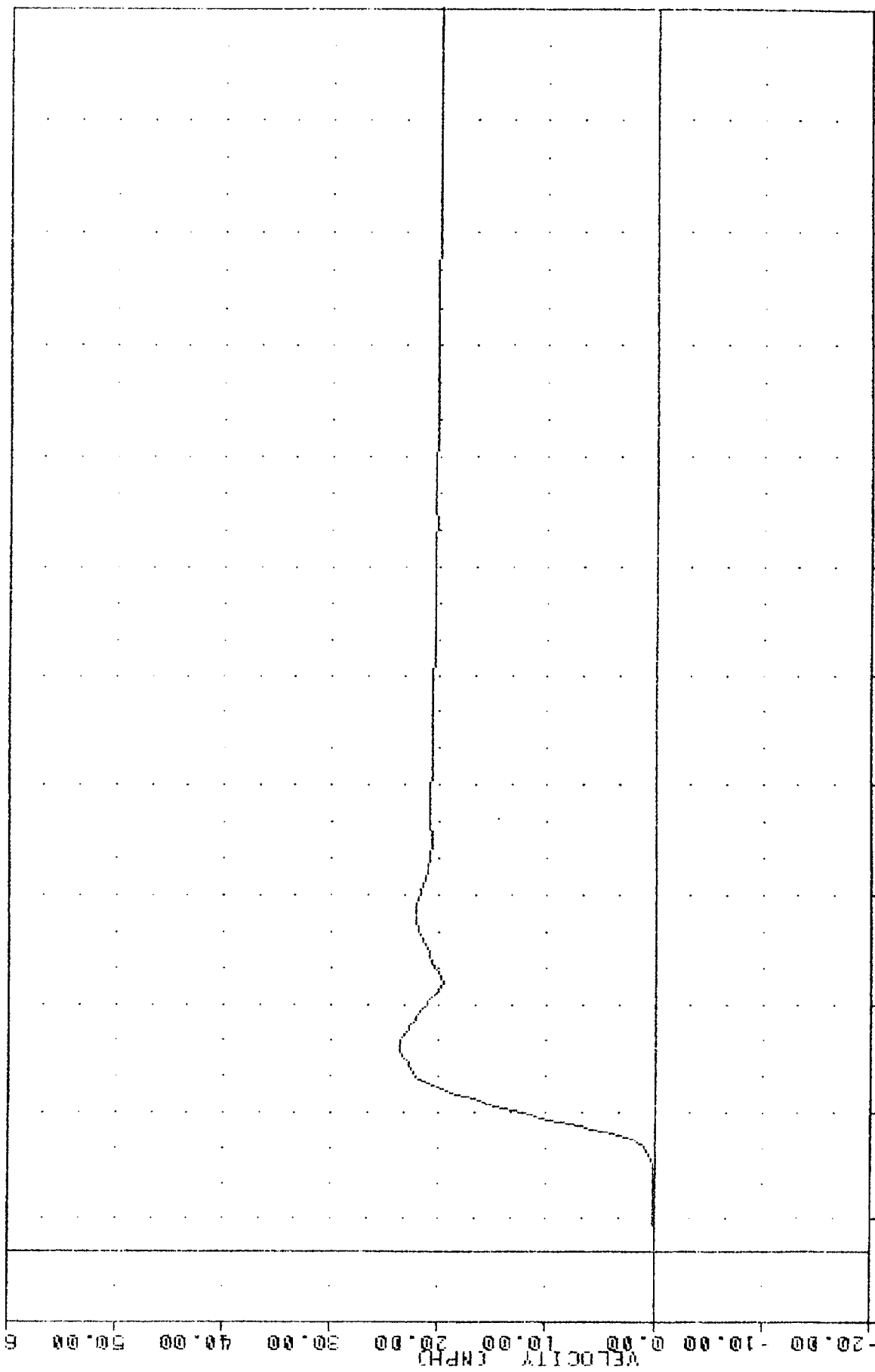
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE RESULTANT USING T12YGA

TRC [REDACTED], 83J102 [REDACTED] PLOT DATE 7 NOV-83 14:26.25
 EVALUATION OF MOD VN FLEET
 83306000000
 T12YW1
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.01% 3.75 28.28 57.50



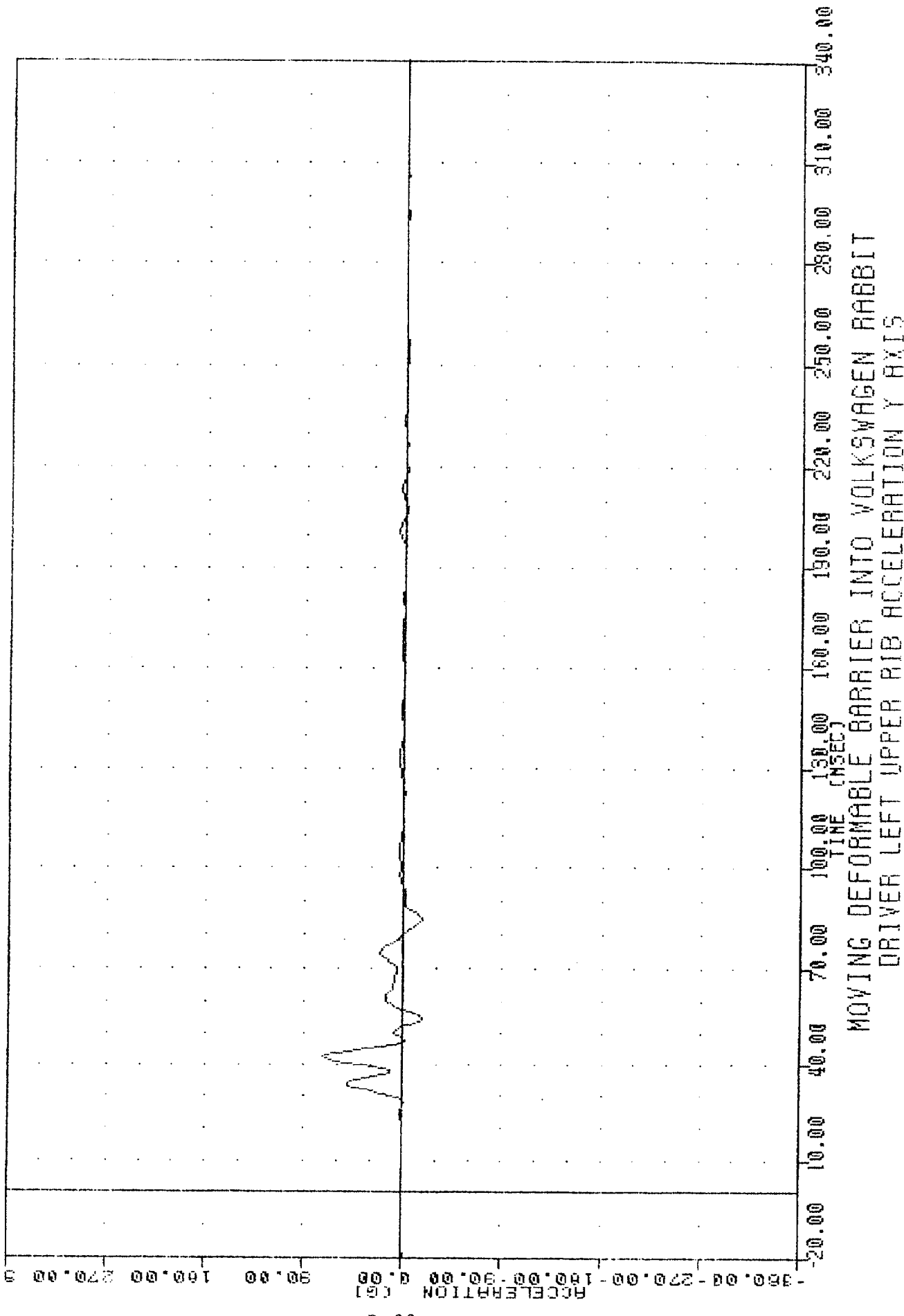
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YGI

TRC 831102 7-NOV-83 14:28:25
 EVALUATION OF MOD VV FLEET
 83005000000
 T12YGA
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.028 -17.50 , 23.71 8 57.50



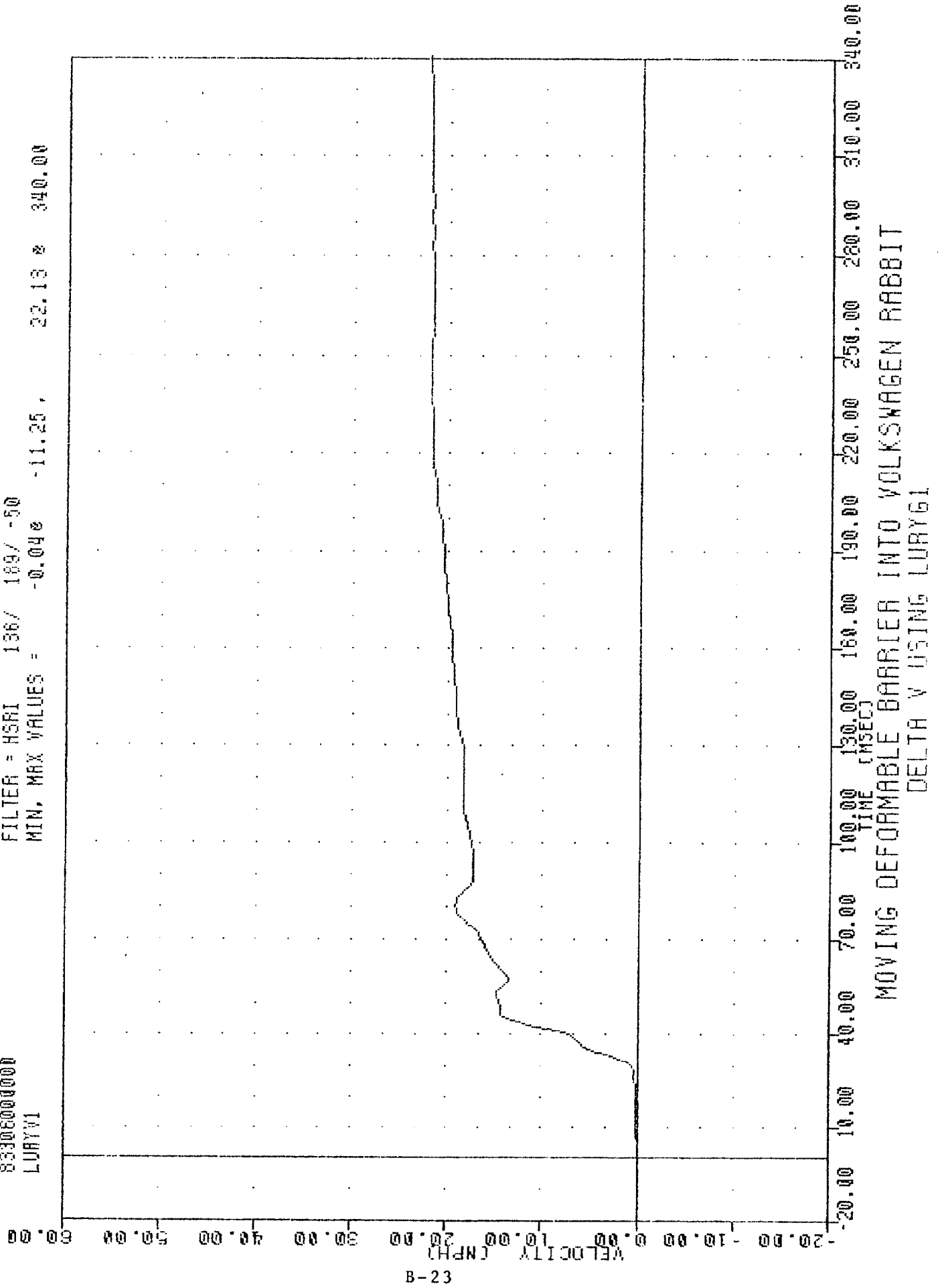
-20.00 10.00 20.00 30.00 40.00 50.00 60.00
 VELOCITY (MPH)
 0.00 10.00 20.00 30.00 40.00 50.00 60.00
 TIME (MSEC)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YGA

TAC 831102 7-NOV-83 16:16:14
 EVALUATION OF HOO VN FLEET
 83306000000
 LURY61
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -17.218 53.75, 73.31 41.87



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

THE [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
 EVALUATION OF MDD VW FLEET
 83308000000
 LURYV1
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.040 -11.25, 22.13 & 340.00
 PLOT DATE 7 NOV-83 14:26:25



TRC

031102

PLOT DATE

7 NOV 83

16:16:14

EVALUATION OF MOD VW FLEET

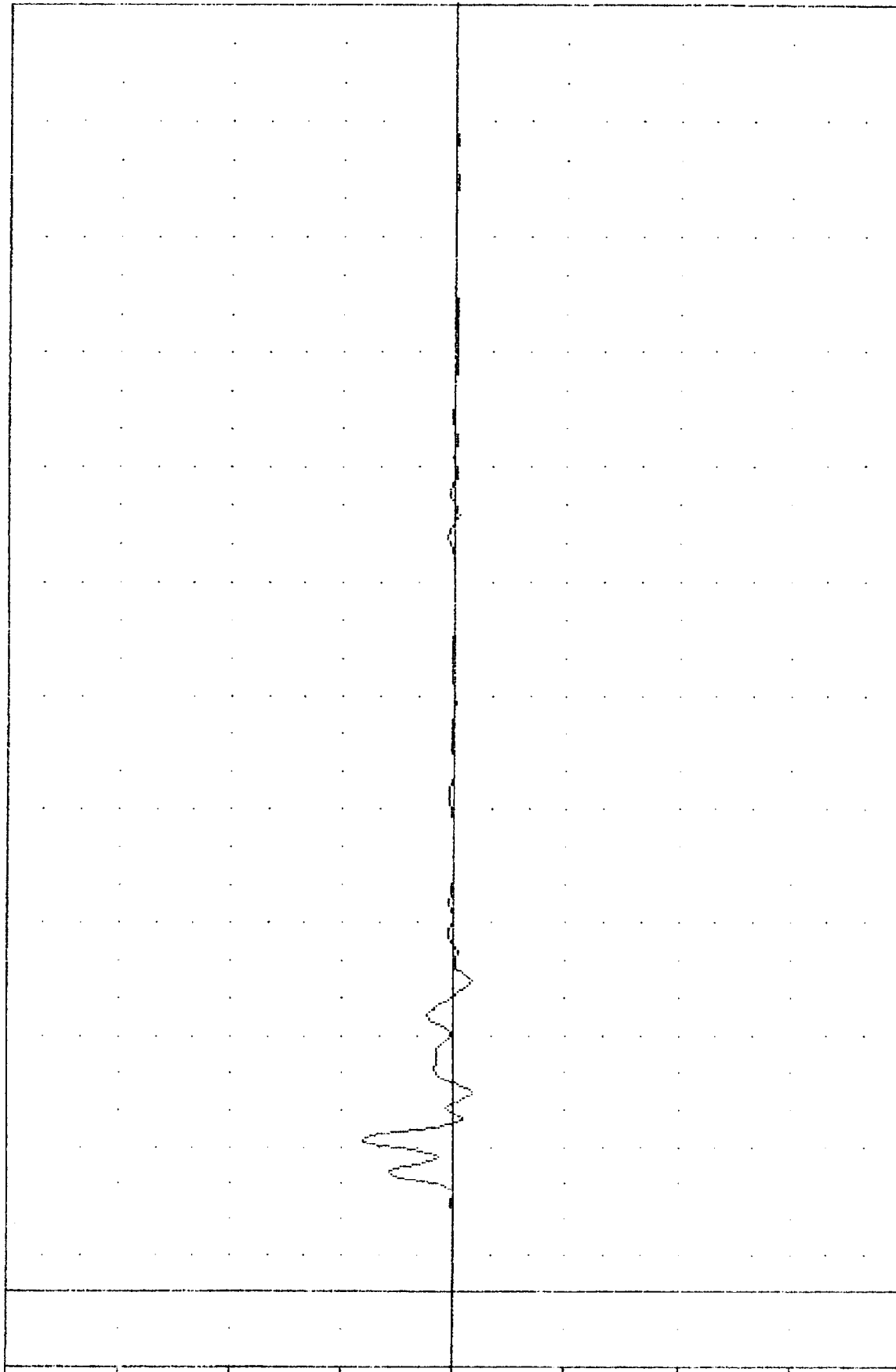
83306000000

LURYCH

FILTER = HSRI 135/ 189/ -50

MIN. MAX VALUES = -14.42 54.38 72.65 41.87

ACCELERATION (G)

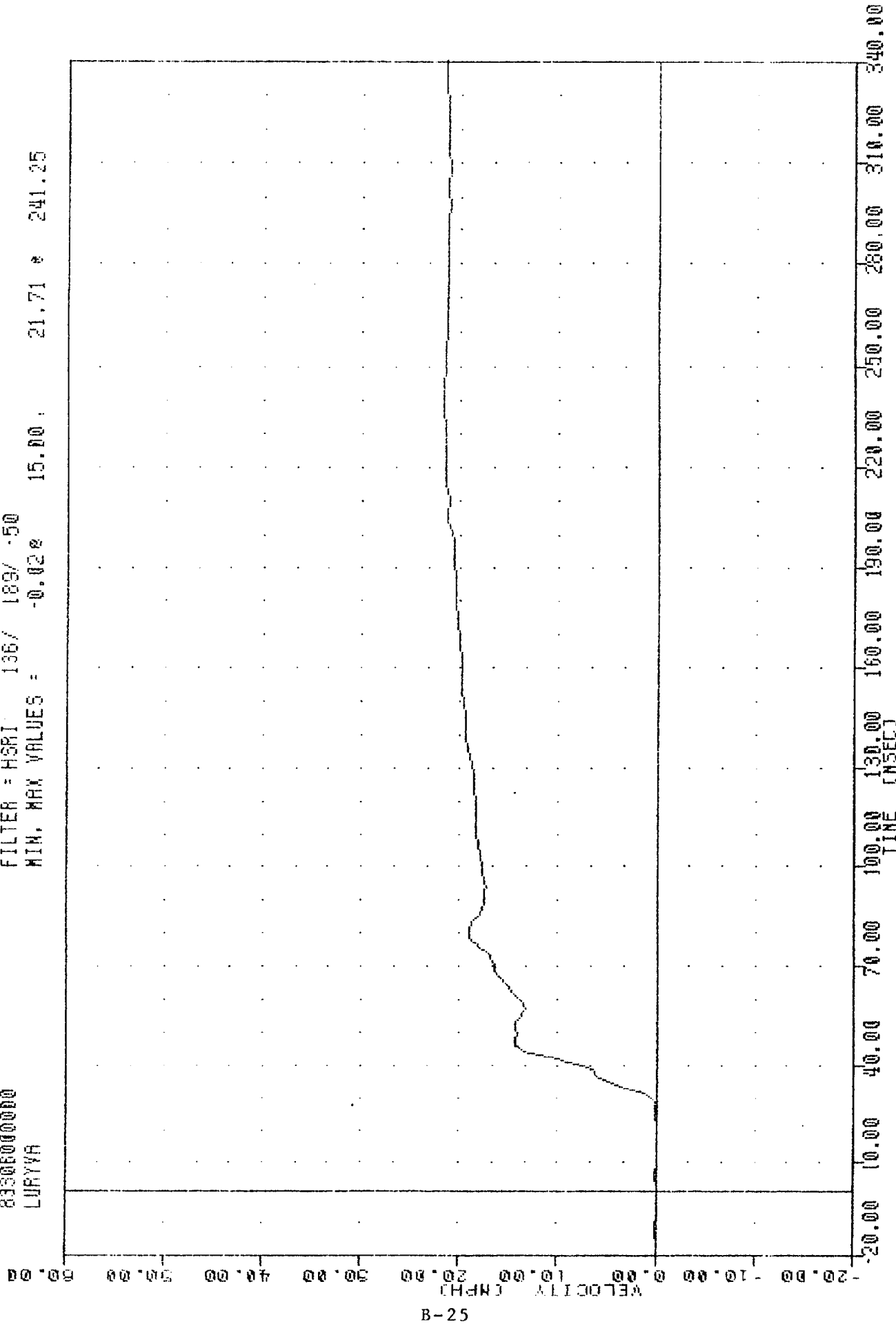


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT UPPER RIB ACCELERATION -Z Y AXIS

TRC 831102
EVALUATION OF MOD VN FLEET
83306000000
LURYVA

PLOT DATE 7-NOV-83 14:26:25

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -0.028 15.00 21.71 241.25



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LURYGA

TRC 831102

PLOT DATE

7-NOV-88

16:16:14

EVALUATION OF MOD VN FLEET

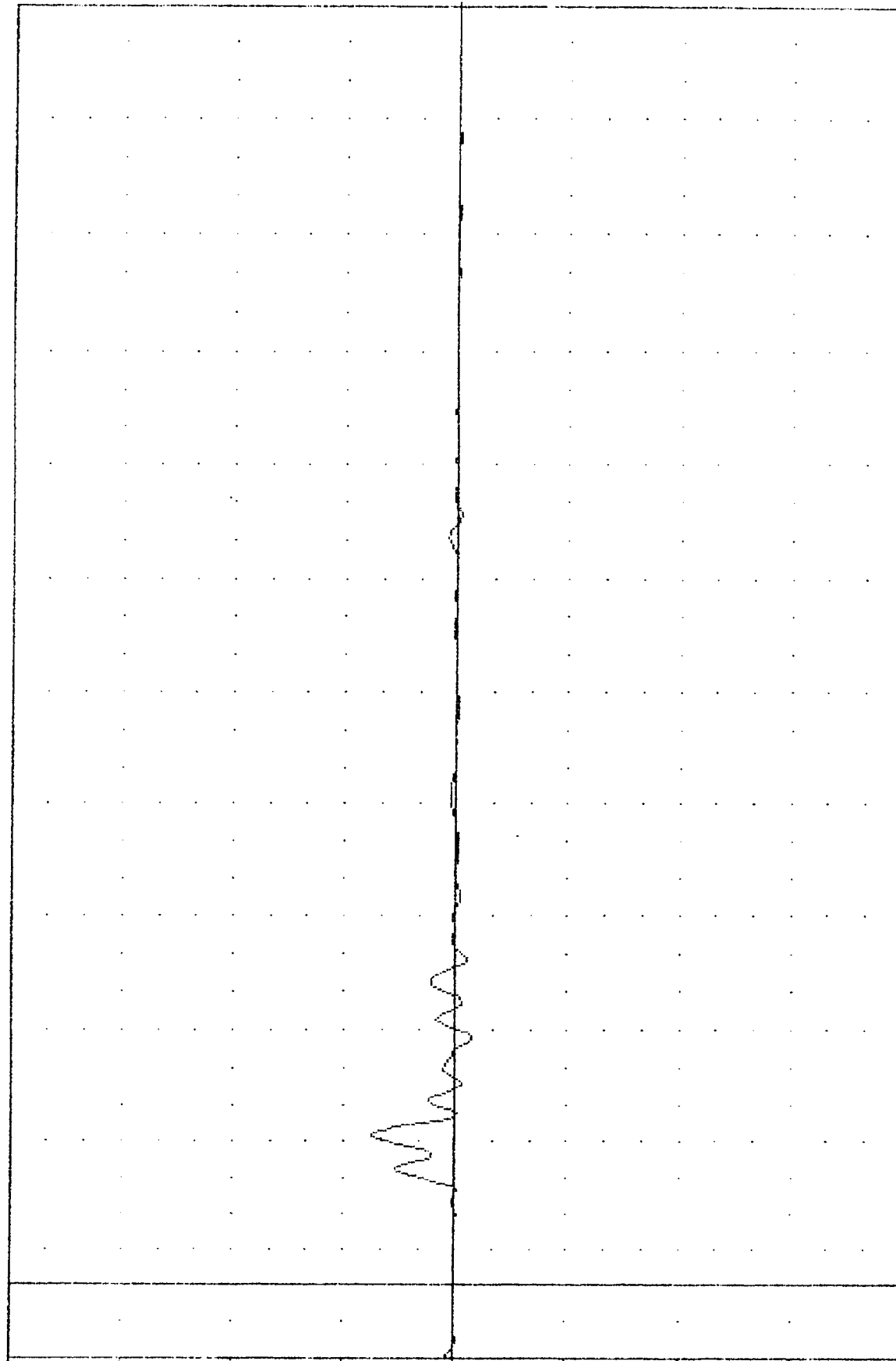
833060000000

LLAYG1

FILTER = HSRI 136/ 189/ -50

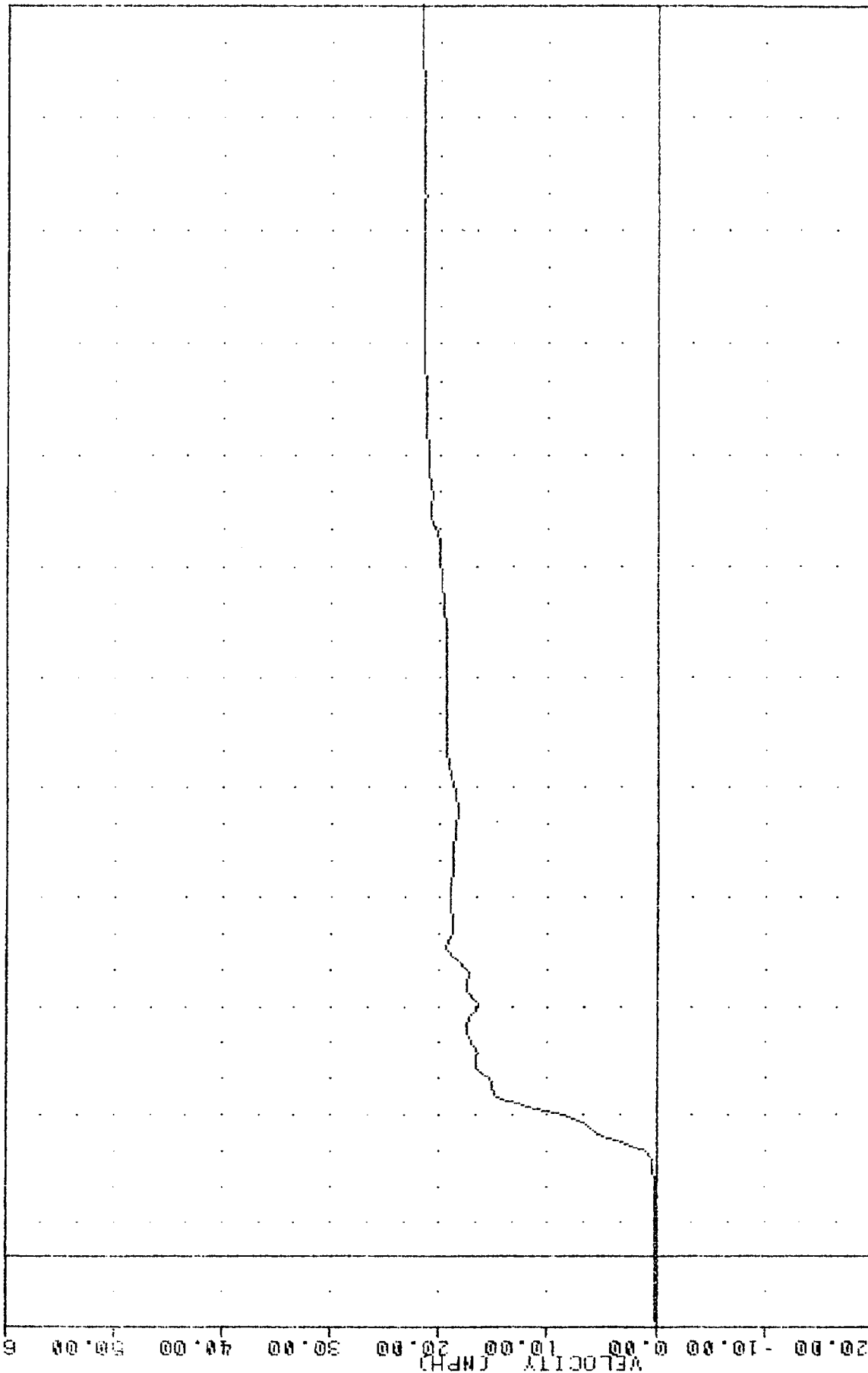
MIN. MAX VALUES = -12.85 67.50 67.97 41.25

ACCELERATION (G)



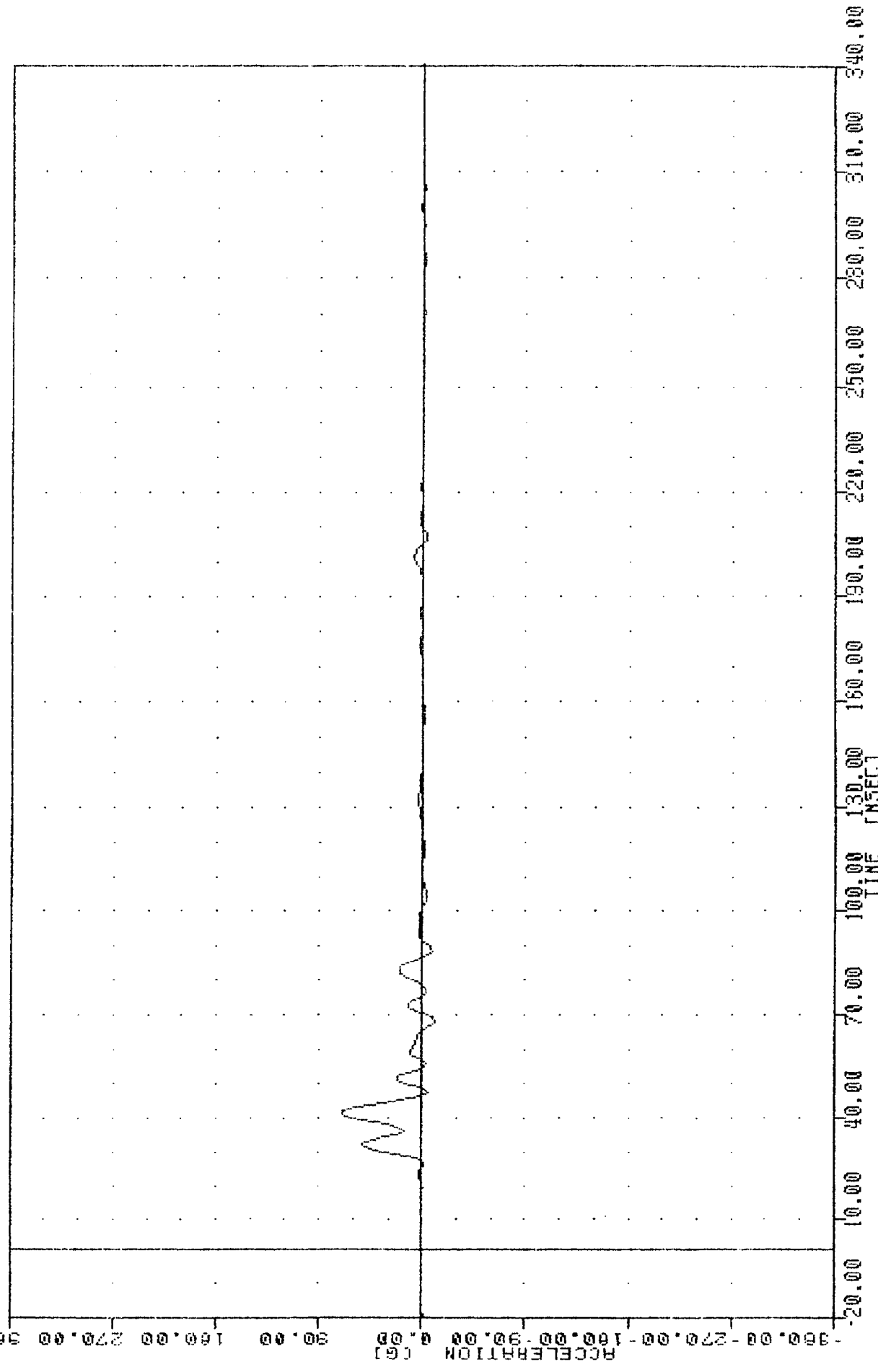
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT LOWER RIB ACCELERATION Y AXIS

TRC 831102
 EVALUATION OF M00 YW FLEET
 83305000000
 LLRYV1
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.000 -20.00 , 21.86 & 340.00
 PLOT DATE 7-NOV-83 14:26:25



-20.00 -10.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00
 VELOCITY (MPH)
 -20.00 10.00 20.00 30.00 40.00 50.00 60.00
 TIME (msec)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LLRYG1

TRC 831102
 EVALUATION OF MOD VW FLEET
 83306000000
 LAYER
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -11.042 67.50, 70.11 & 40.63
 PLOT DATE 7-MAY-83 16:16:14



TAC 831102 PLOT DATE 7-NOV-83 14:26:25

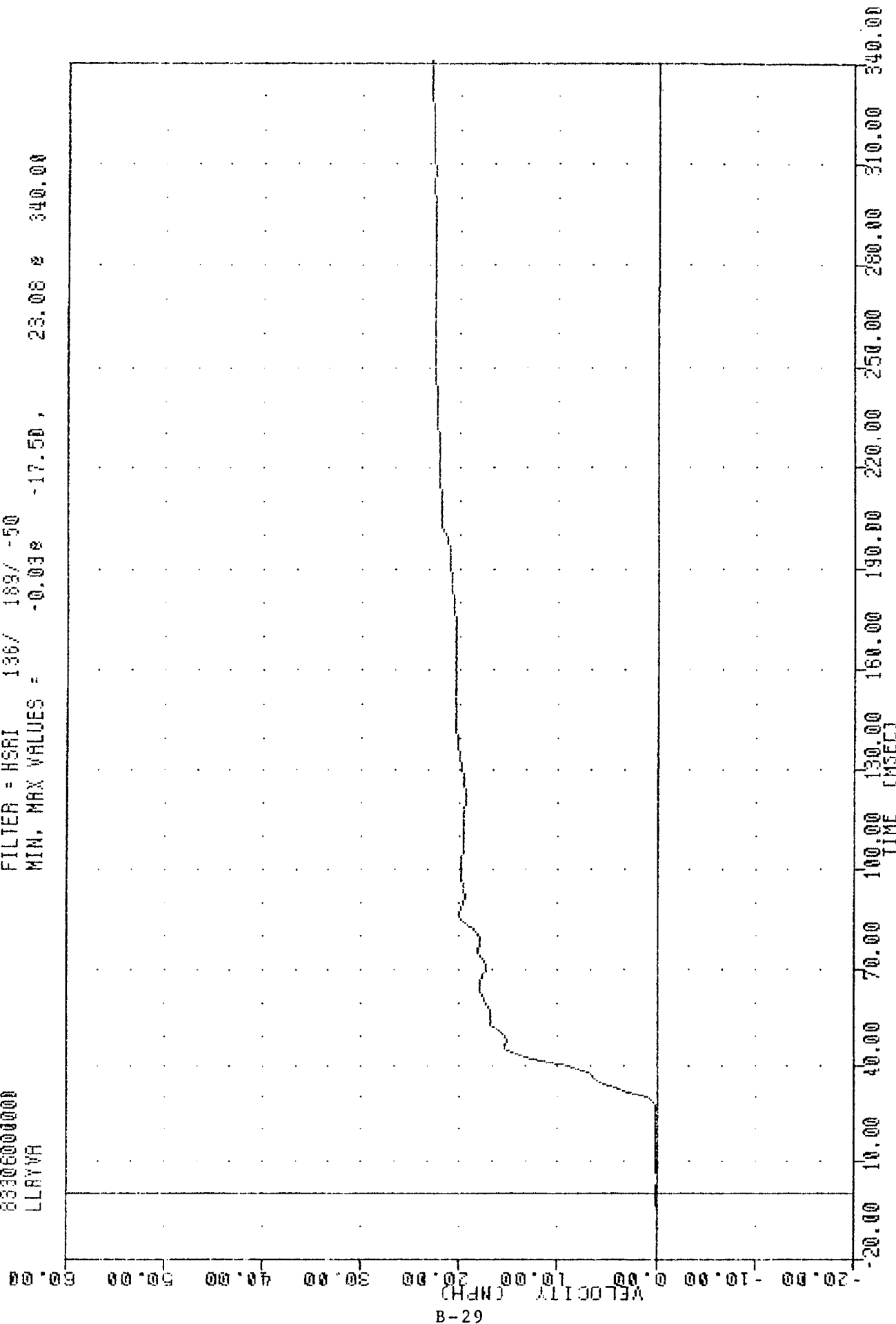
EVALUATION OF MDD VW FLEET

83306000000

LLAYVA

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.038 -17.50, 23.08 340.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLAYVA

TRC 831102 PLOT DATE 7-NOV-83 09:19:38

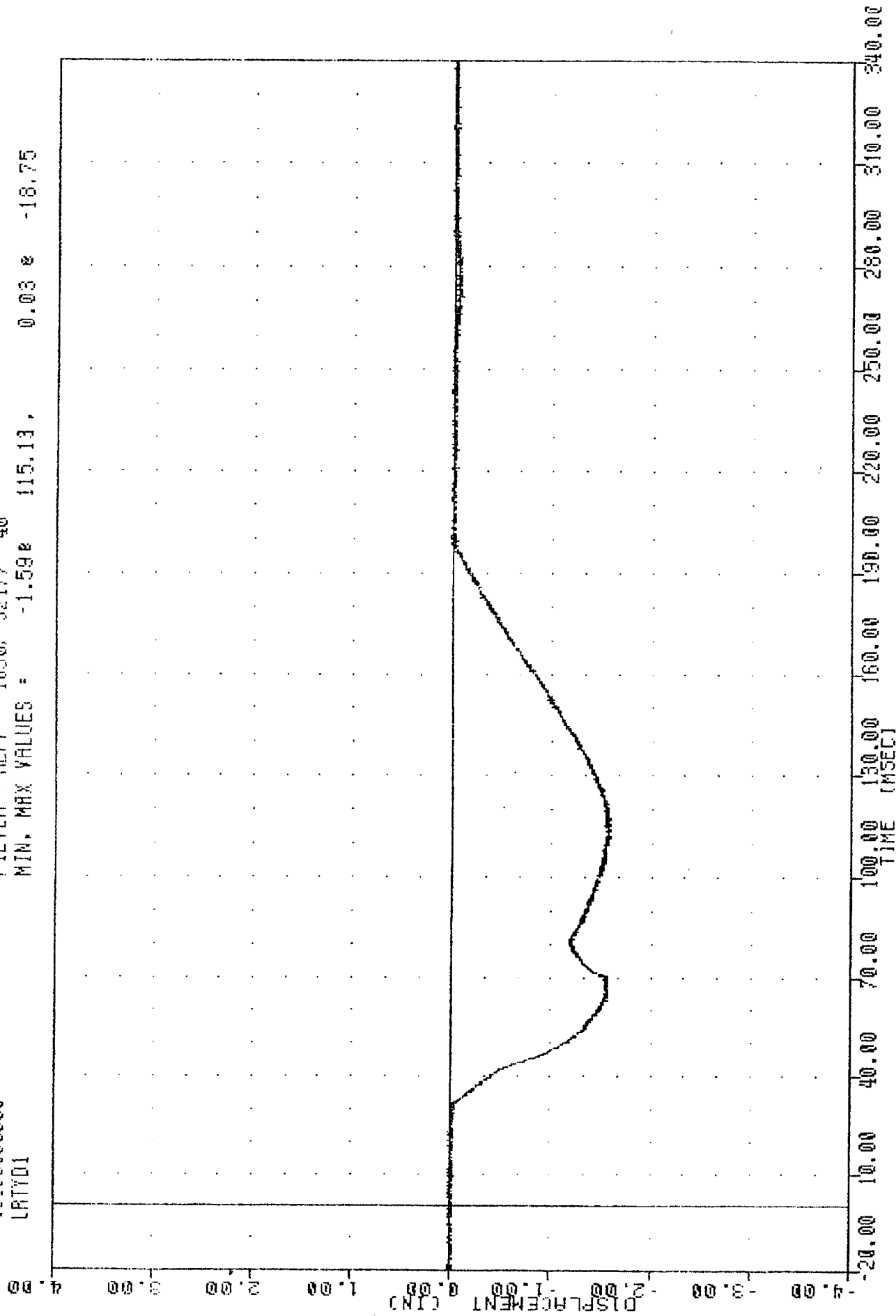
EVALUATION OF MOD YW FLEET

83306000000

LRTYD1

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -1.59e 115.13, 0.03 e -18.75



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

TRC

EVALUATION OF MOD YW FLEET

83306000000

PEVXG1

PLOT DATE

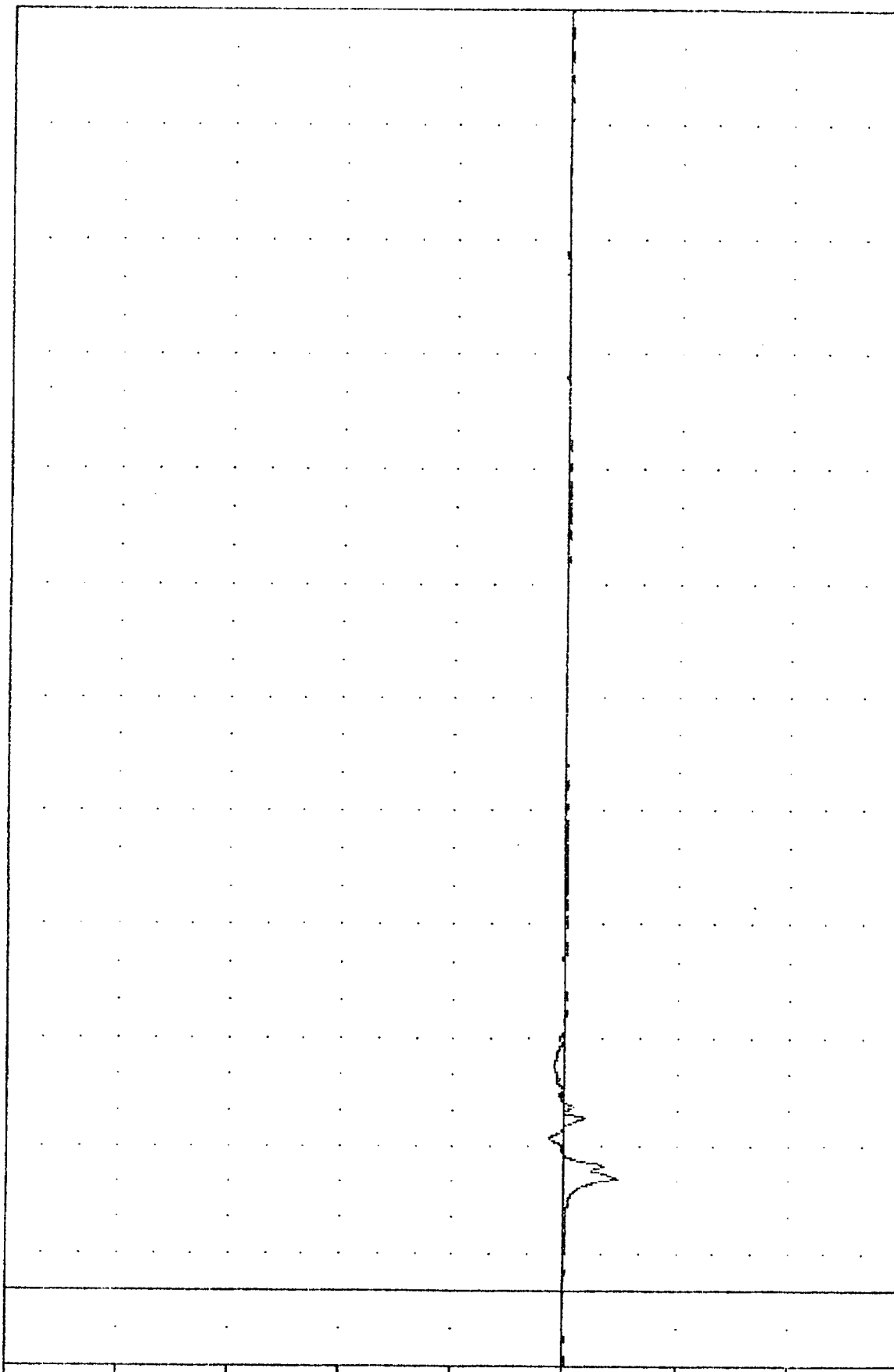
7-NOV-83

09:19:38

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -26.41e 30.75, 8.22 e 42.38

ACCELERATION [G]

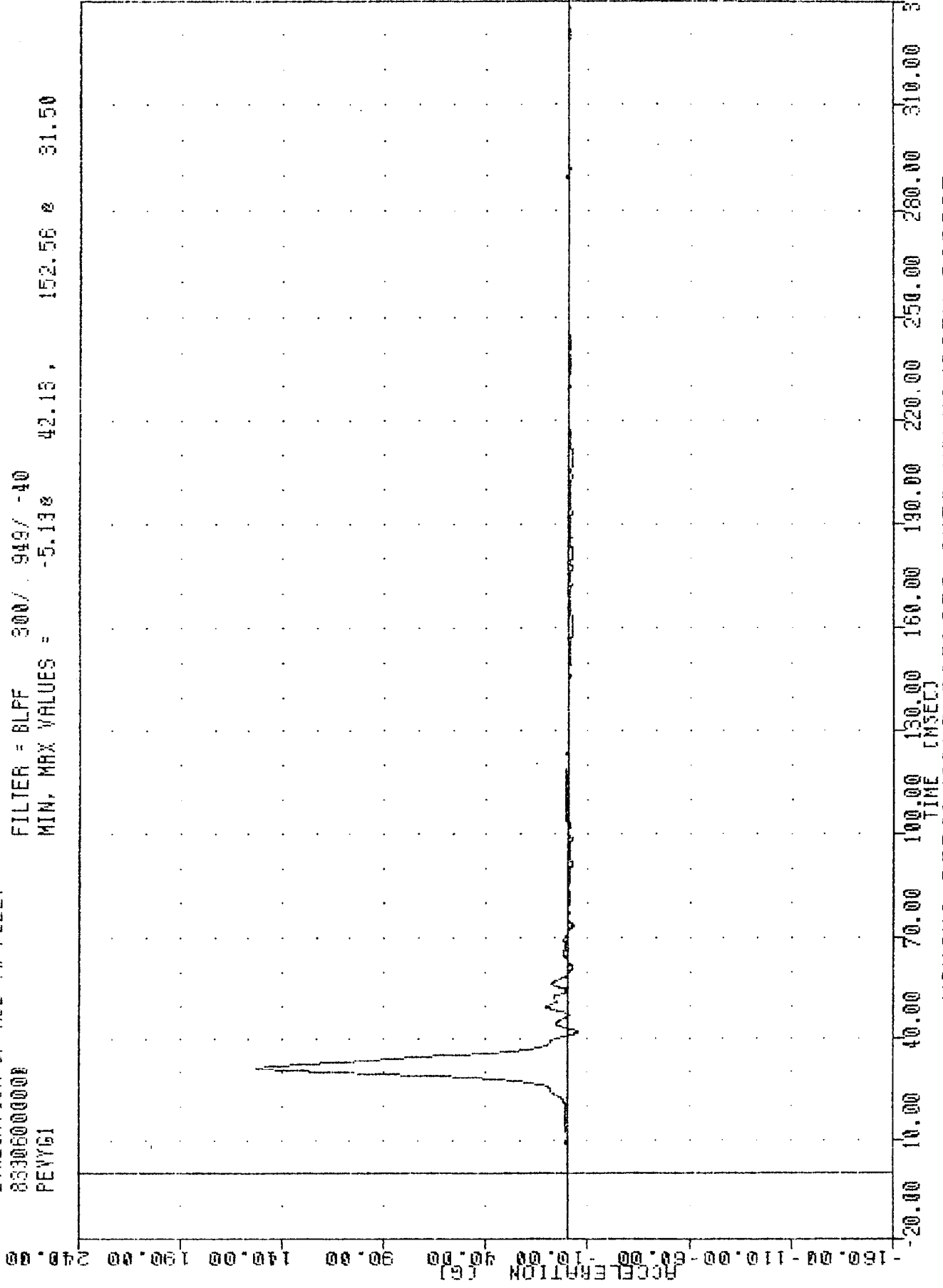


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS ACCELERATION X AXIS

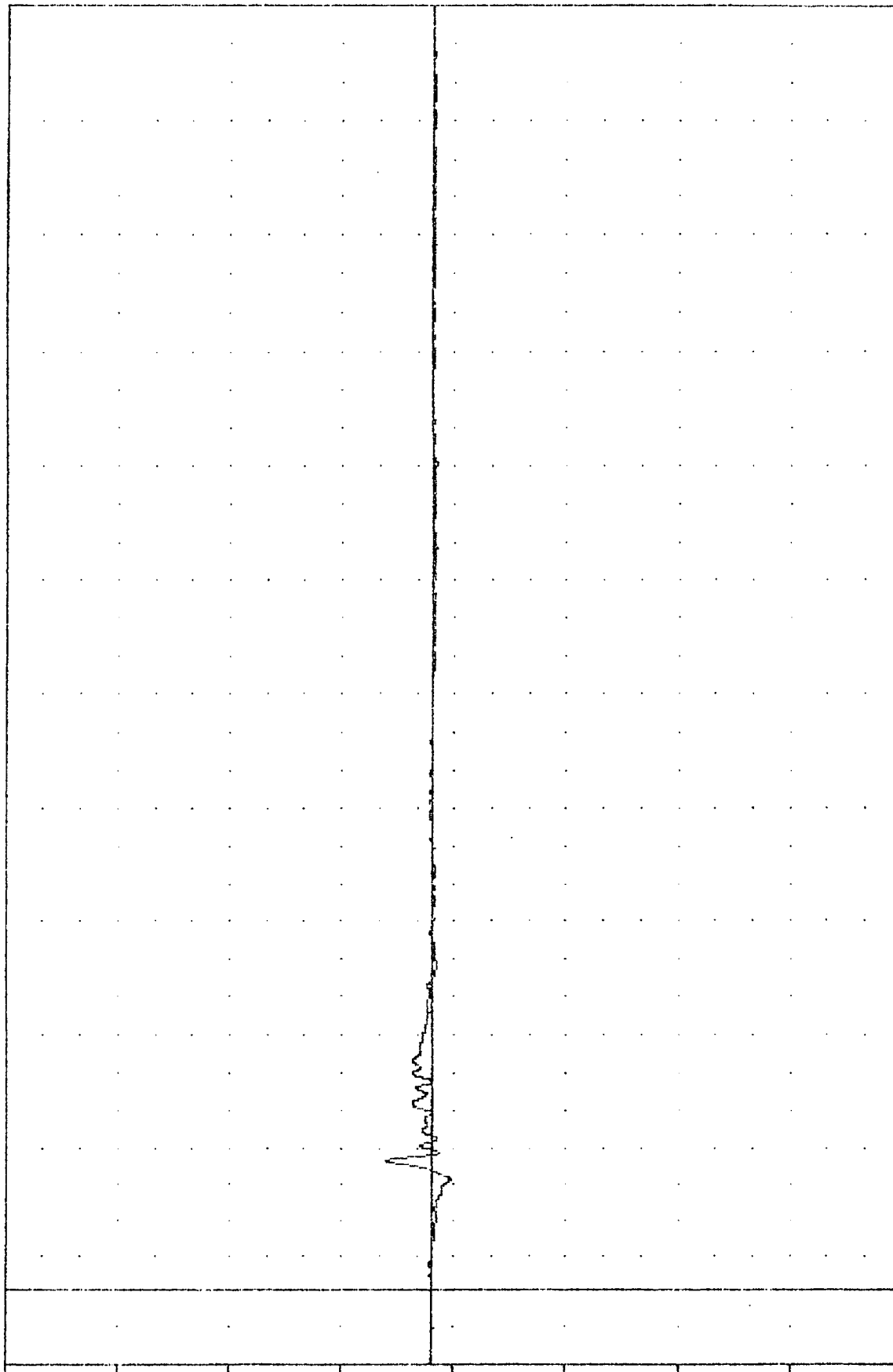
TRC 831102 PLOT DATE 7-NOV-83 09:19:38
 EVALUATION OF MDD VW FLEET
 833060000000
 PEVY61
 FILTER = BLPF 300 / 949 / -40
 MIN, MAX VALUES = -5.13 42.13 152.56 31.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS ACCELERATION Y AXIS

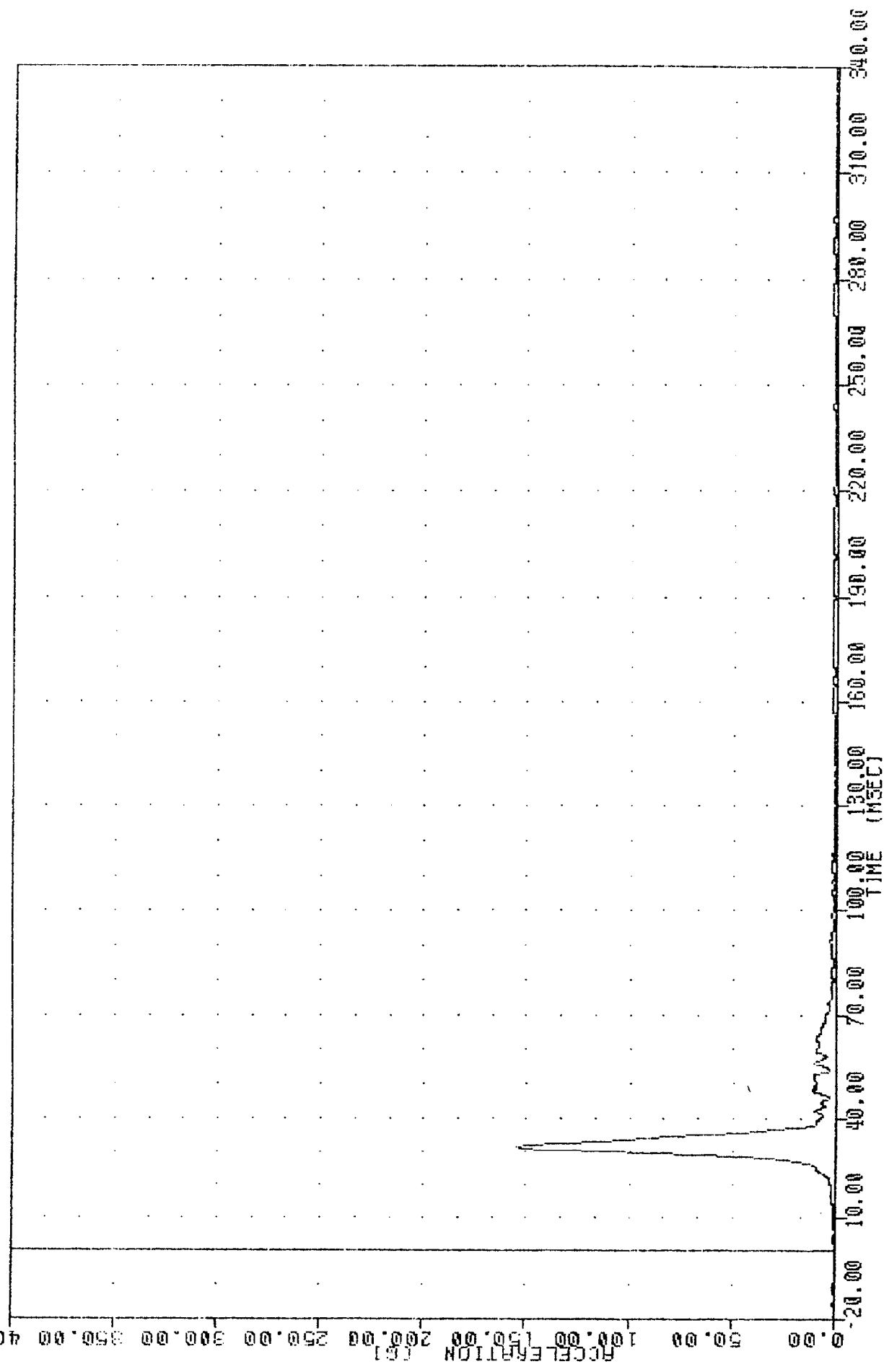
TRC [REDACTED], 831102 [REDACTED] PLOT DATE 7-MAY-83 09:19:38
 EVALUATION OF MOD VW FLEET
 83306000000
 PEVZ61
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -8.25e 31.00, 20.87 e 36.50

B-33
 ACCELERATION (G)
 -210.00 -180.00 -150.00 -120.00 -90.00 -60.00 -30.00 0.00 30.00 60.00 90.00 120.00 150.00 180.00 210.00



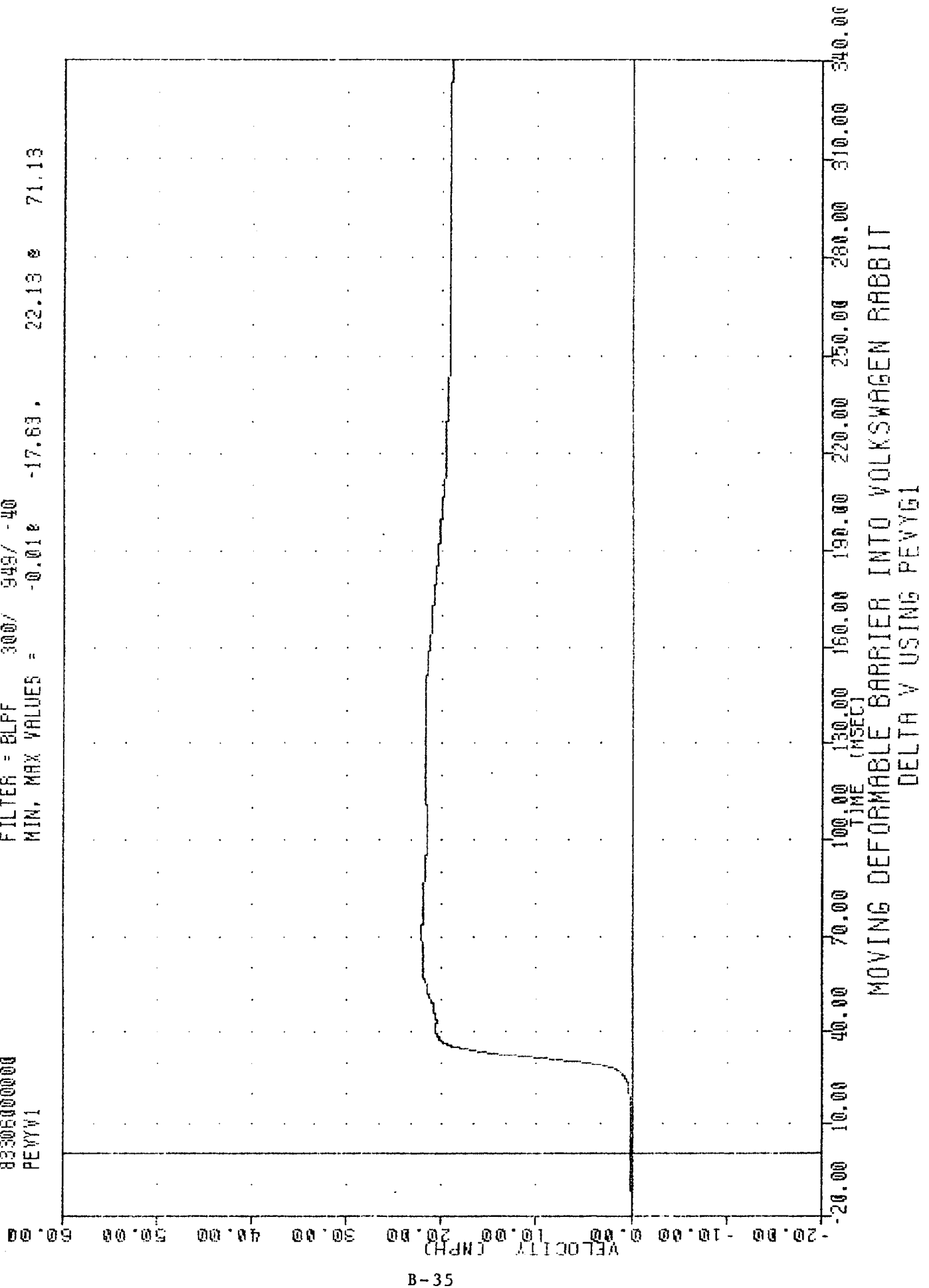
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (msec)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS ACCELERATION Z AXIS

TRC 831102
 EVALUATION OF MOD YW FLEET
 83305000000
 PEVRG1
 PLOT DATE 7-MOV-83 09:19:38
 FILTER = BLFF 300/ 949/ -40
 MIN. MAX VALUES = 0.00e -14.63, 154.71 e 31.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS RESULTANT

TRC 831102 PLOT DATE 7-NOV-83 14:27:39
 EVALUATION OF MOD YW FLEET
 83305000000
 PEVYV1
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.018 -17.63. 22.13 71.13



TRC 833102 PLOT DATE 7-MAY-85 09:19:38

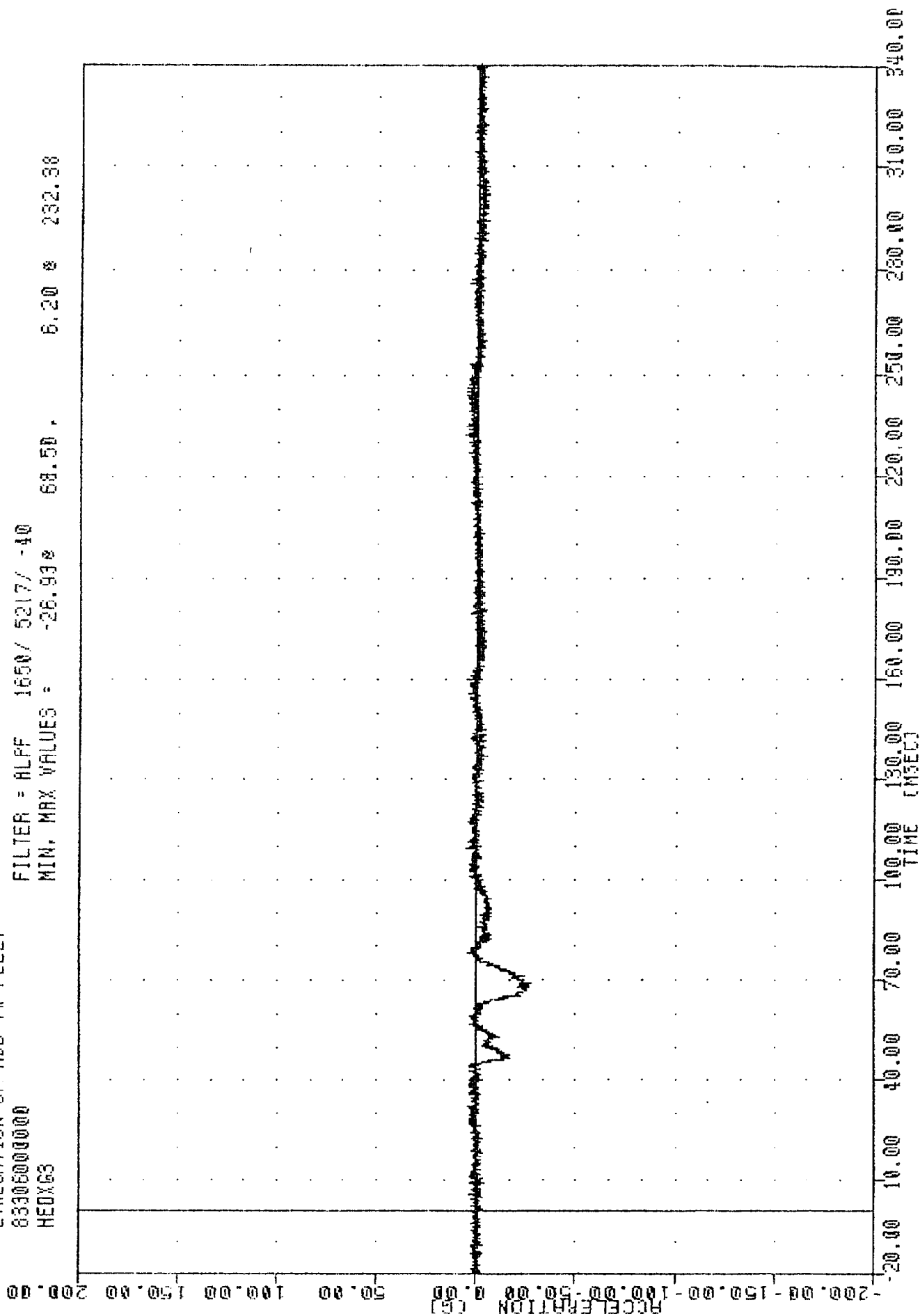
EVALUATION OF MOD VW FLEET

833060000000

HE0X63

FILTER = ALFF 1650/ 5217/ -40

MIN. MAX VALUES = -26.93% 68.50% 6.20% 232.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION X AXIS

TAC 831102

EVALUATION OF MOD VN FLEET

83305000000

HEDY63

PLOT DATE

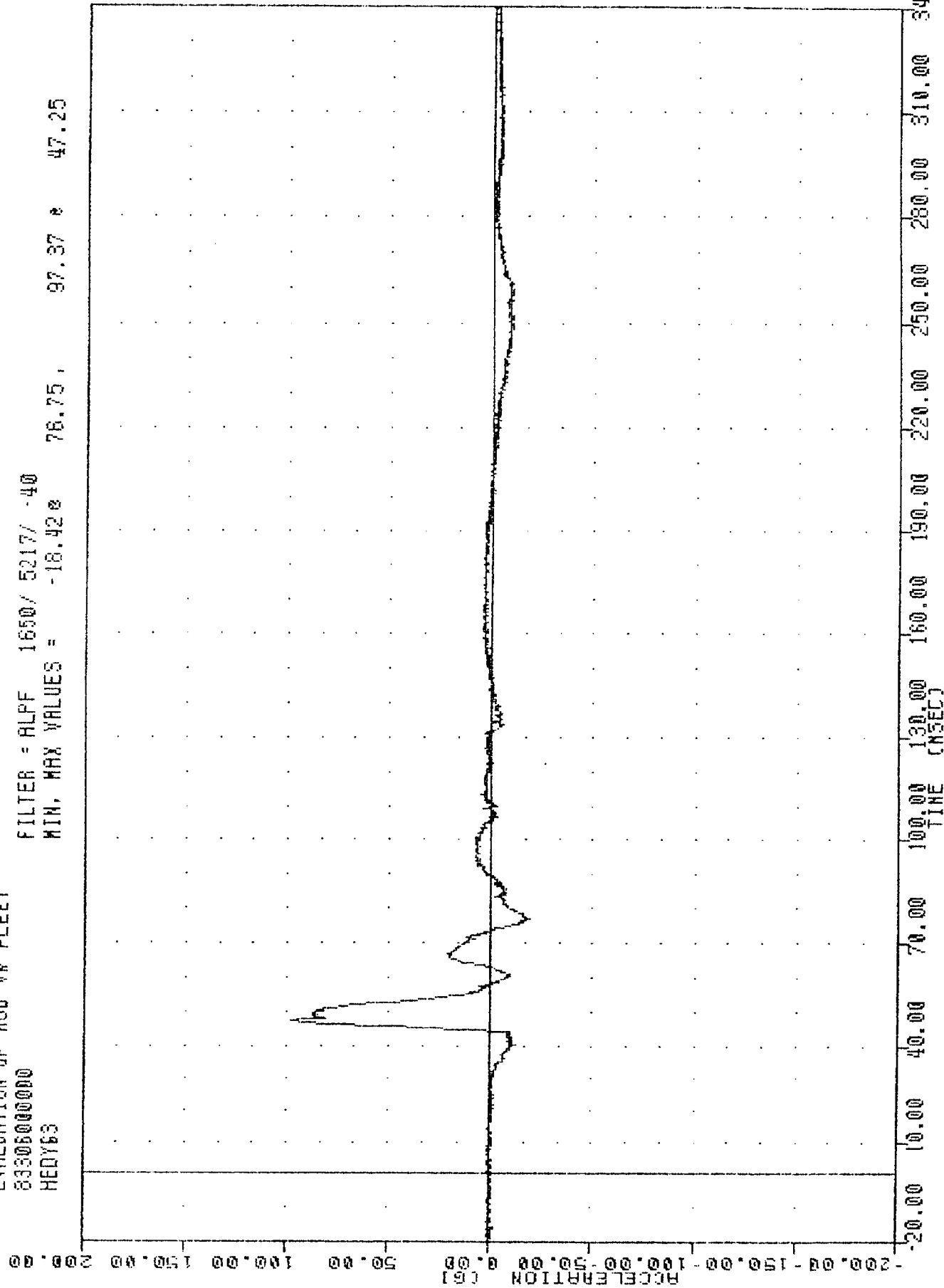
7-NOV-83

09:19:38

FILTER = RLPF 1650/ 5217/ -40

MIN. MAX VALUES = -18.42 76.75 ,

97.37 47.25



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION Y AXIS

TAC

, 831102

PLOT DATE

7-NOV-83

09:19:38

EVALUATION OF MOD YN FLEET

83306000000

HEADZ63

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -22.78e

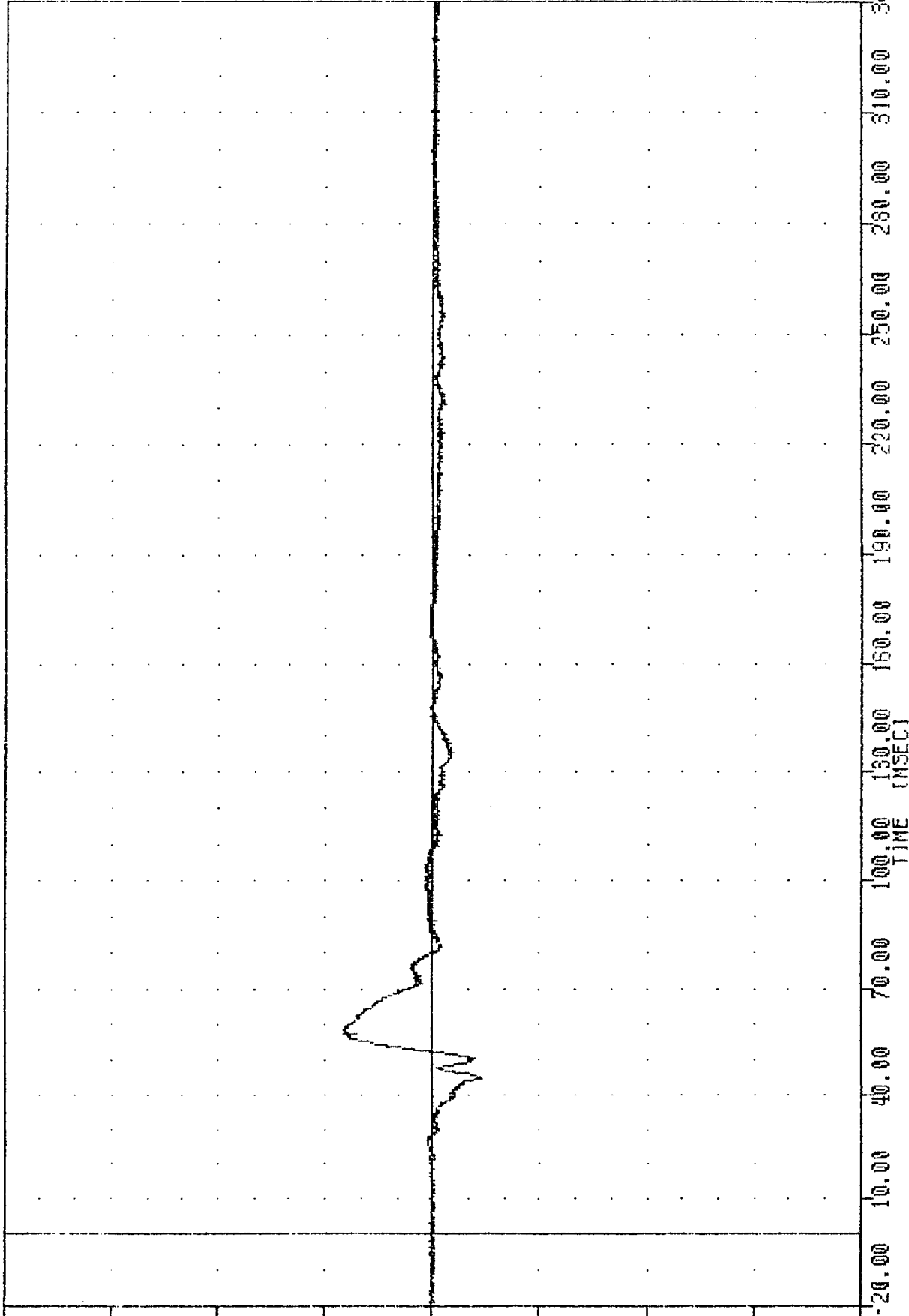
44.88,

41.73 e

58.63

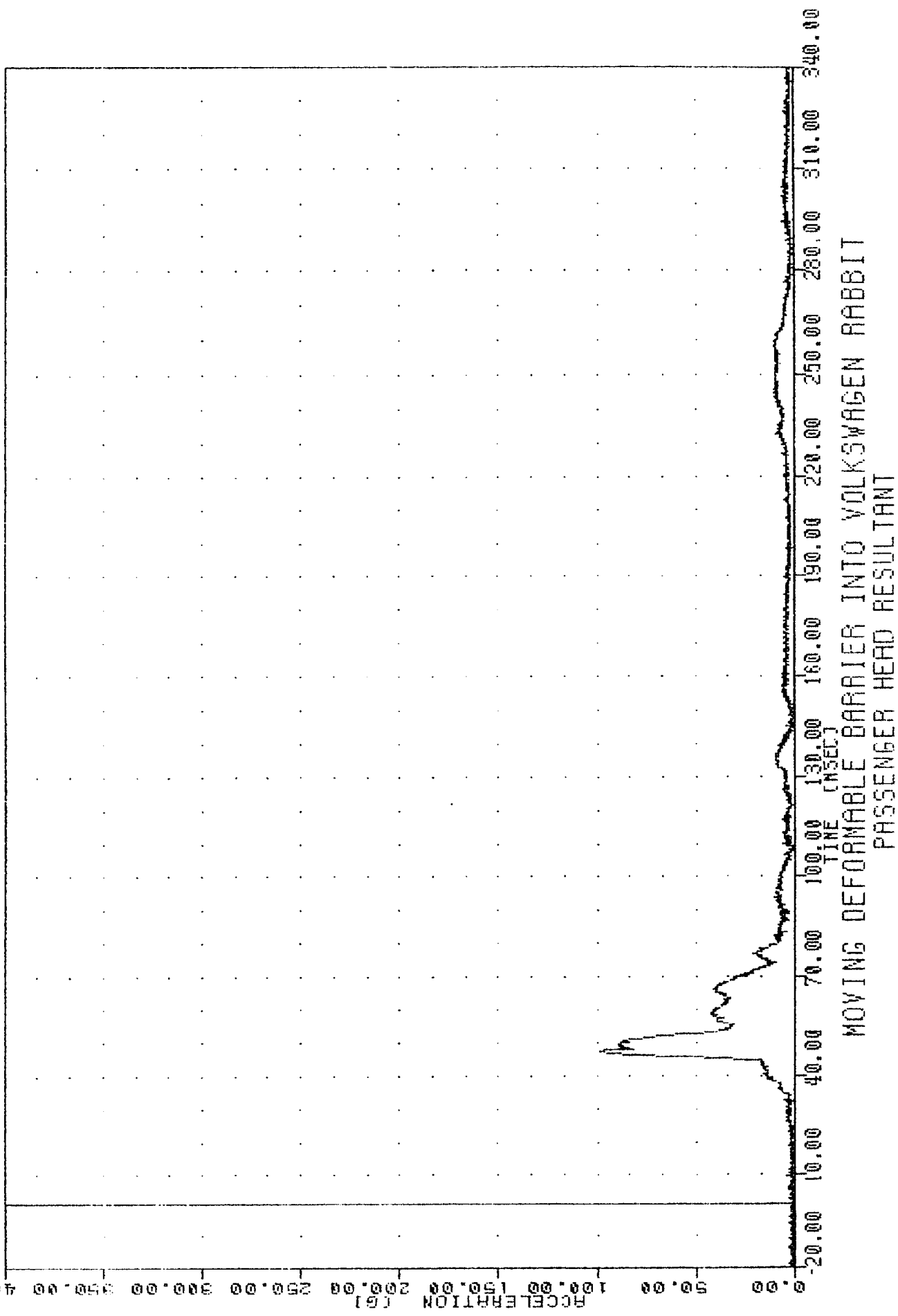
ACCELERATION, G

B-38

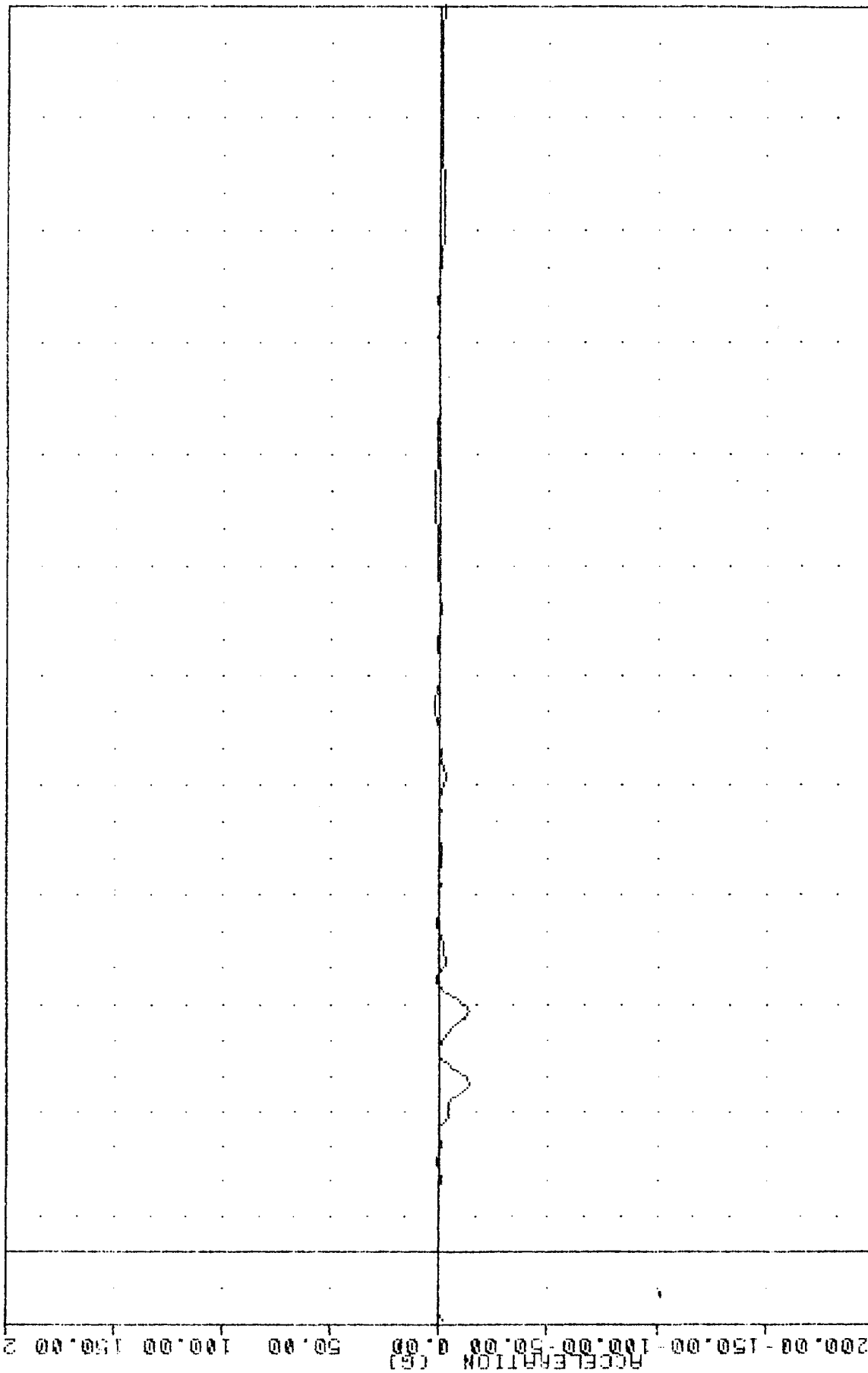


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION Z AXIS

FAC [REDACTED], 831102 [REDACTED] PLOT DATE 7-MAY-83 09:19:38
 EVALUATION OF MOD VN FLEET
 83306000000
 HEAD63
 FILTER = ALPF 1650/ 5217/ 40
 MIN. MAX VALUES = 0.10e -9.25, 98.49 e 47.25

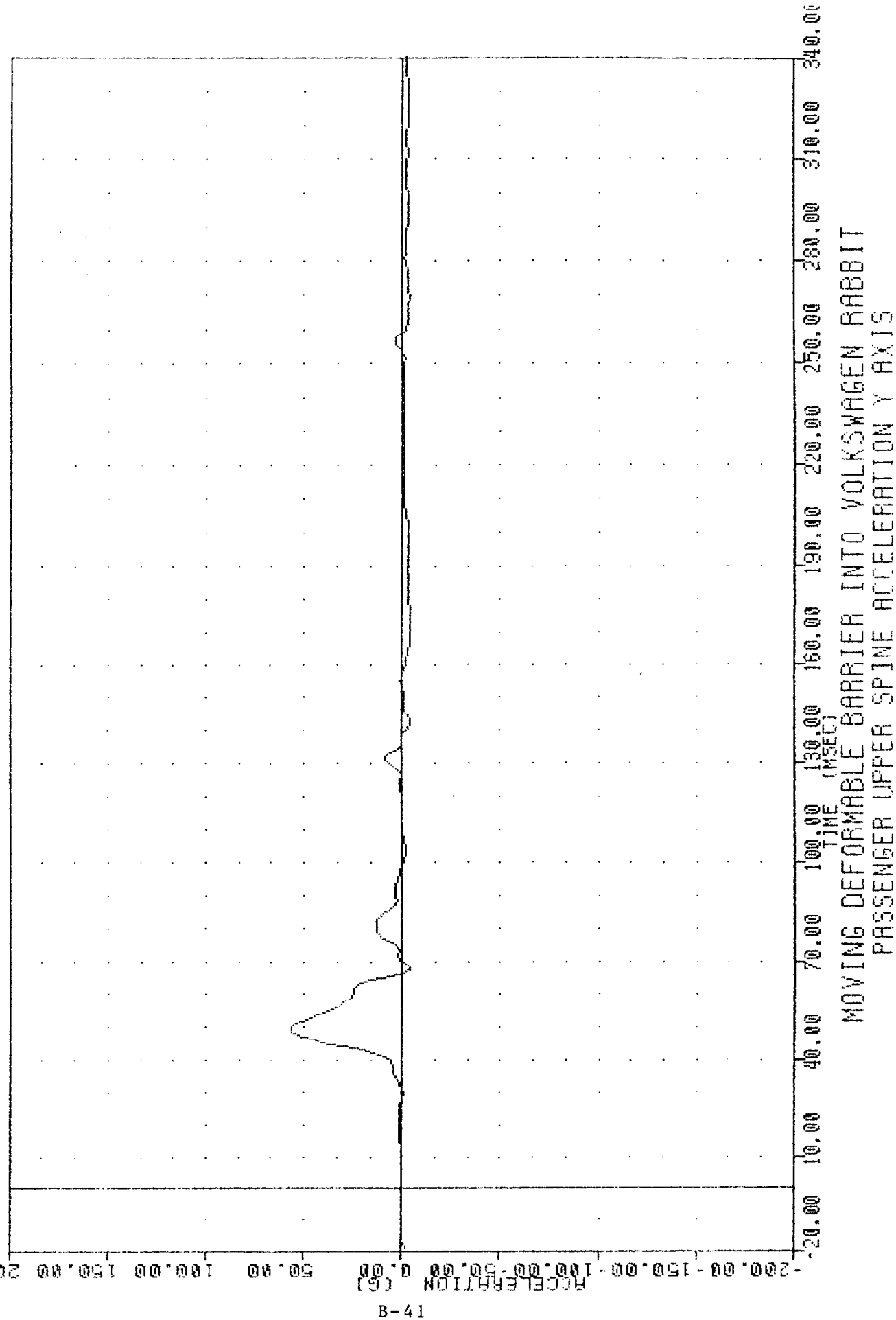


TRC , 831102
 EVALUATION OF MOD YW FLEET
 83306000000
 101XG3
 FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = -13.60e 47.50 , 2.55 e 207.50
 PLOT DATE 7-MAY-83 15:16:14



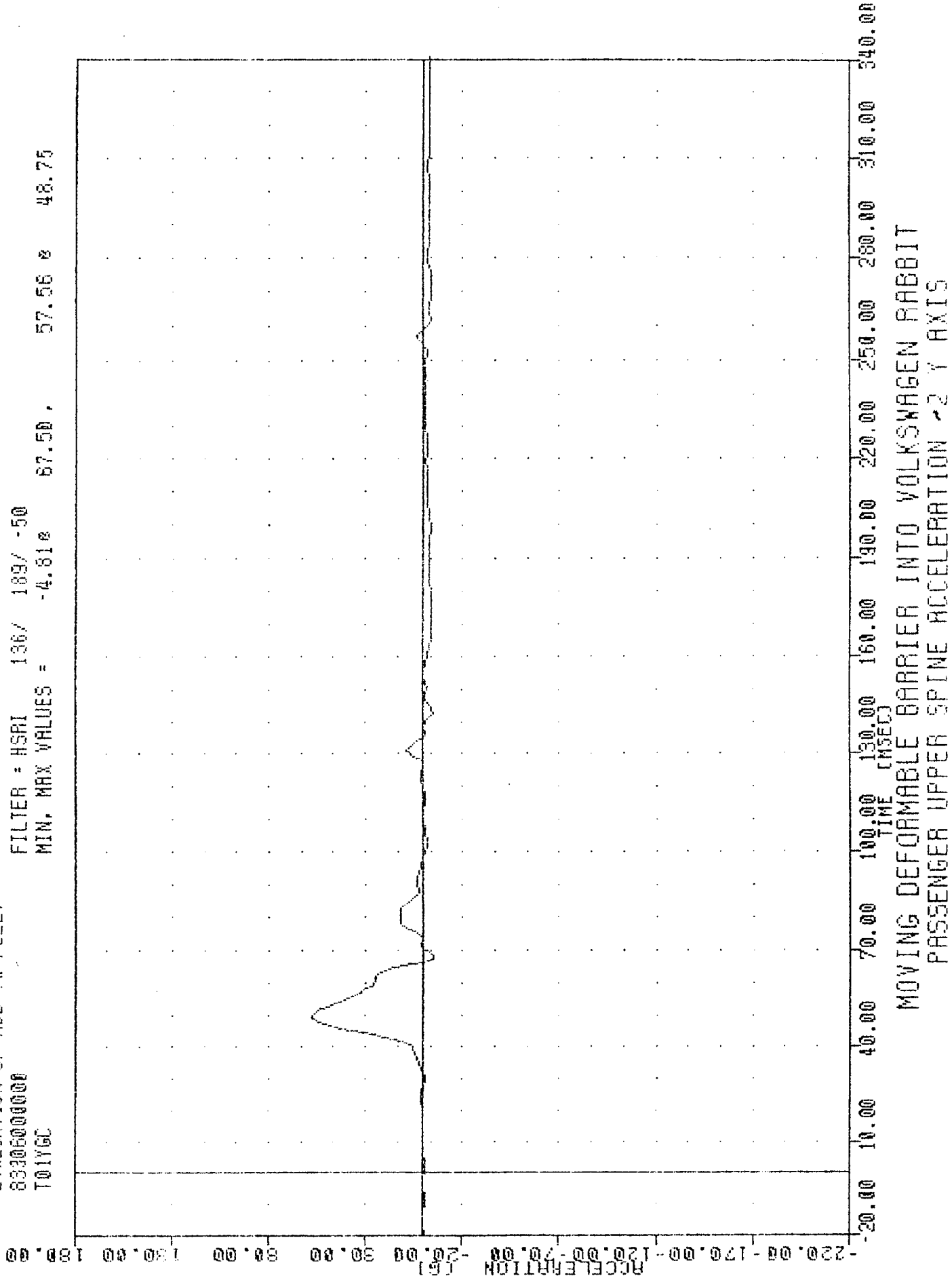
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (msec)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE ACCELERATION X AXIS

TRC [REDACTED], 831102 [REDACTED] PLOT DATE [REDACTED] 7-RUN-83 [REDACTED] 09:26:35
 EVALUATION OF MOD YW FLEET
 83306000000
 101Y63
 FILTER = HSR1 136/ 189/ -50
 MIN, MAX VALUES = -4.28e 141.88, 56.99 e 48.75



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

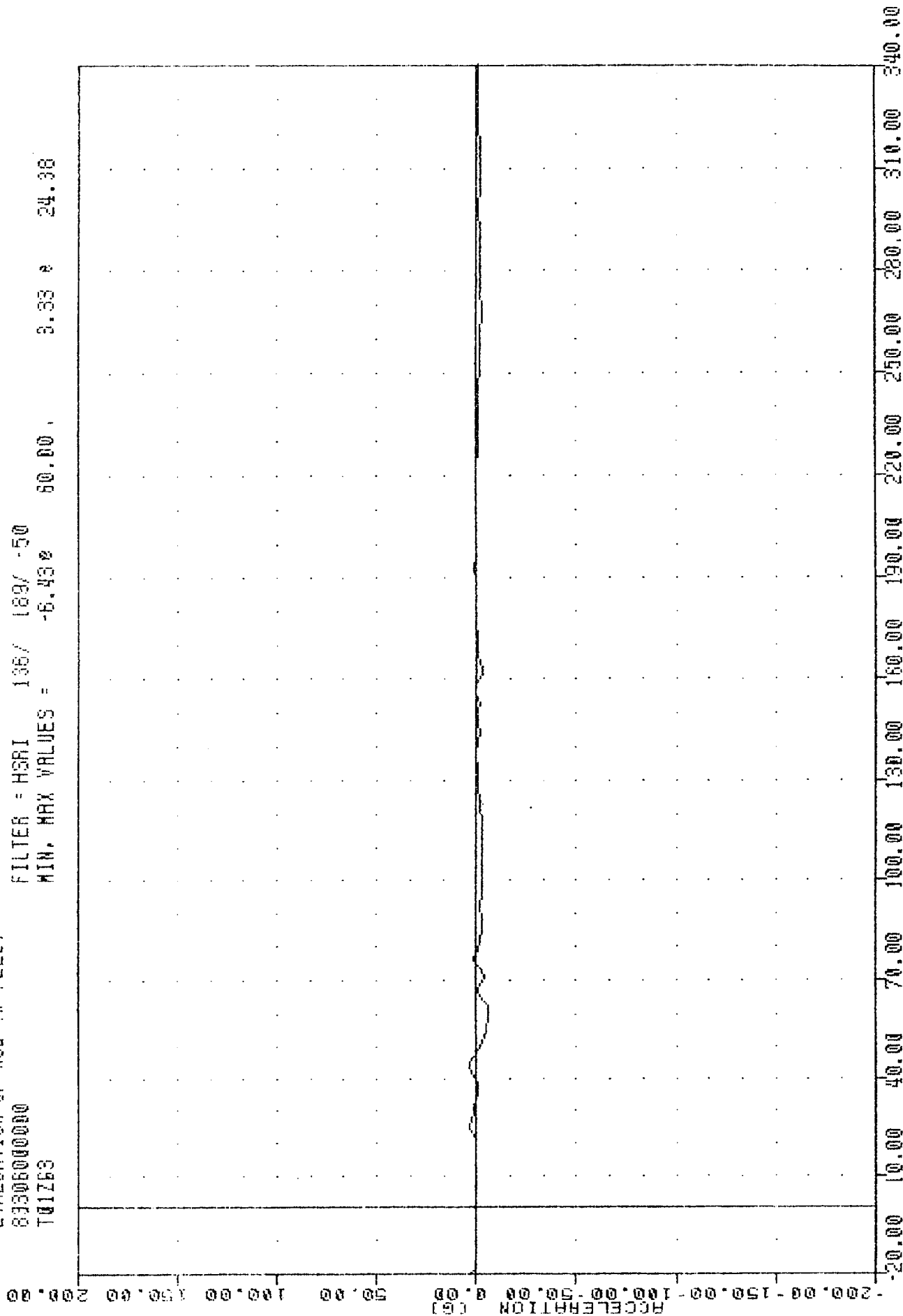
TRC 831102 PLOT DATE 7-NOV-83 16:16:14
 EVALUATION OF MDO VW FLEET
 83306000000
 T01Y6C
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -4.81% 67.50, 57.56 % 48.75



TAC 83T102
 EVALUATION OF MOD VN FLEET
 83306000000
 T01Z63

PLOT DATE 7-MAY-83 16:15.14

FILTER = HSRI 135/ 189/ -50
 MIN. MAX VALUES = -6.432 50.00 3.33 24.38



TRC 831102 PLOT DATE 7-MAY-83 18:16:14

EVALUATION OF MOD VN FLEET

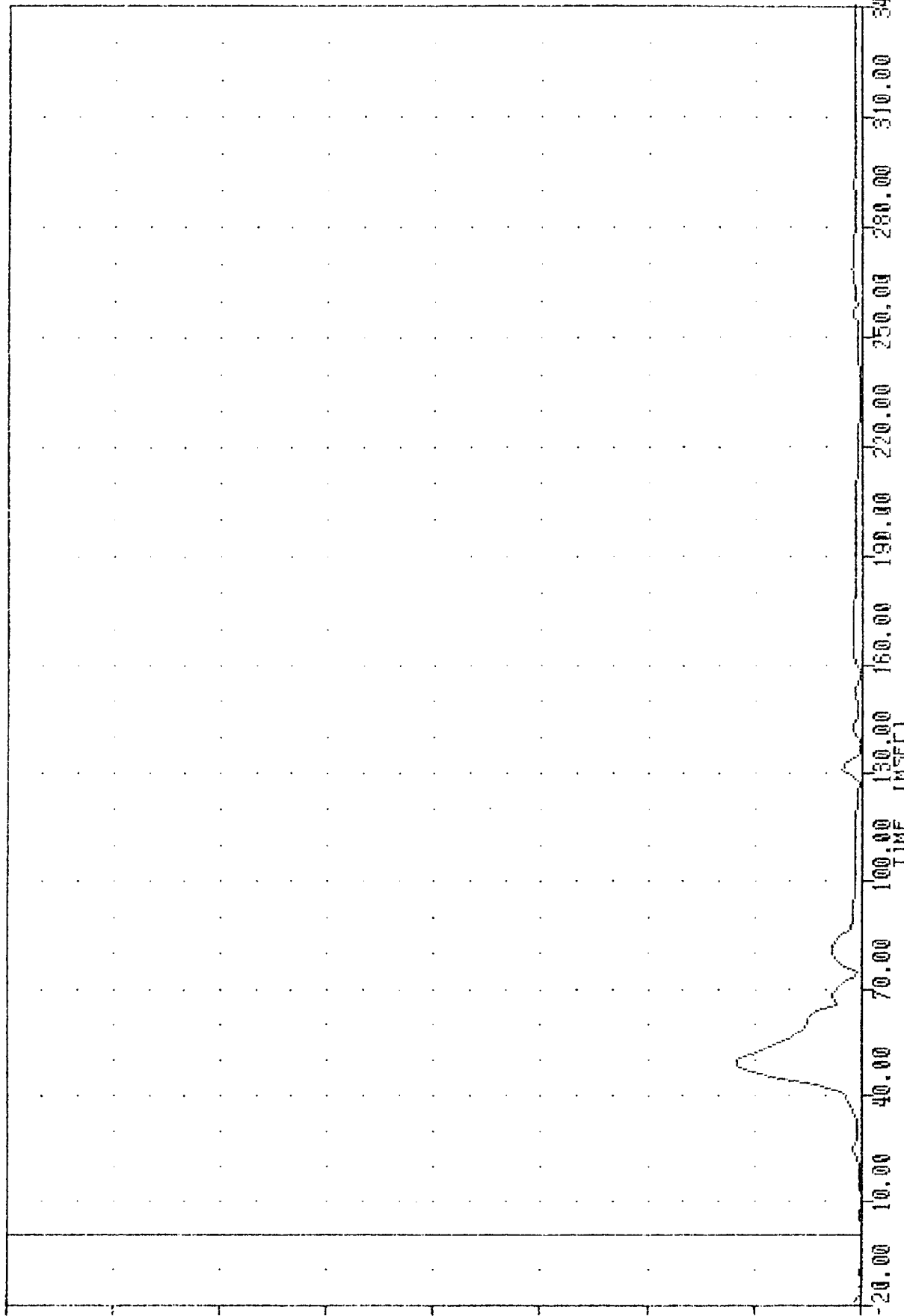
83308000000

TOIFG3

FILTER = HSRL 136/ 189/ -50

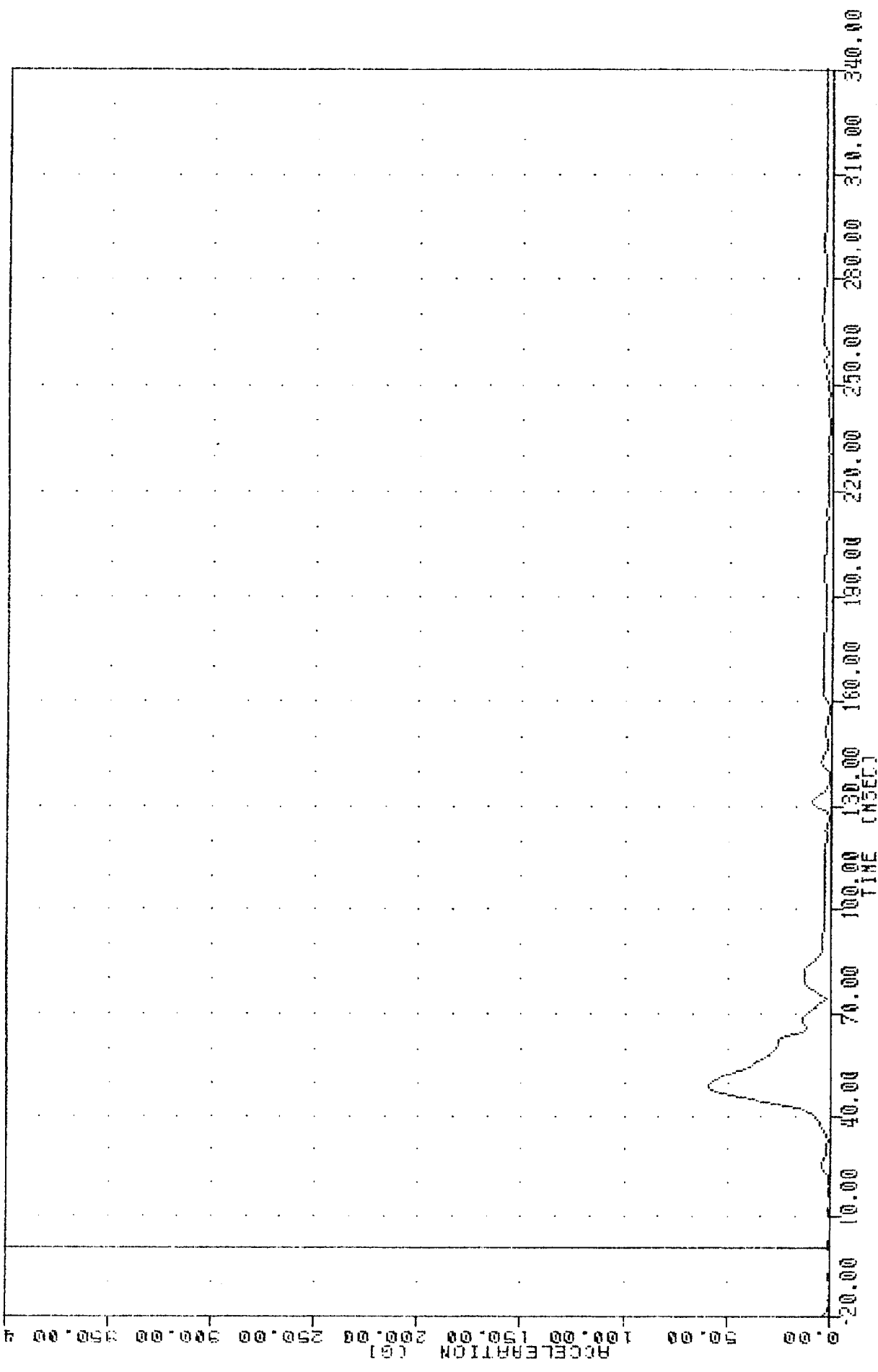
MIN. MAX VALUES = 0.172 -17.50 58.45 48.75

ACCELERATION 161



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE RESULTANT

TRC 631102 7 NOV 68 09:26:57
 EVALUATION OF H00 VM FLEET
 83305000000
 T01R83
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.17% -17.50 , 59.01 e 48.75



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

TAL

, 831102

PLOT DATE

7-NOV-83

14:25:25

EVALUATION OF MOO VN FLEET

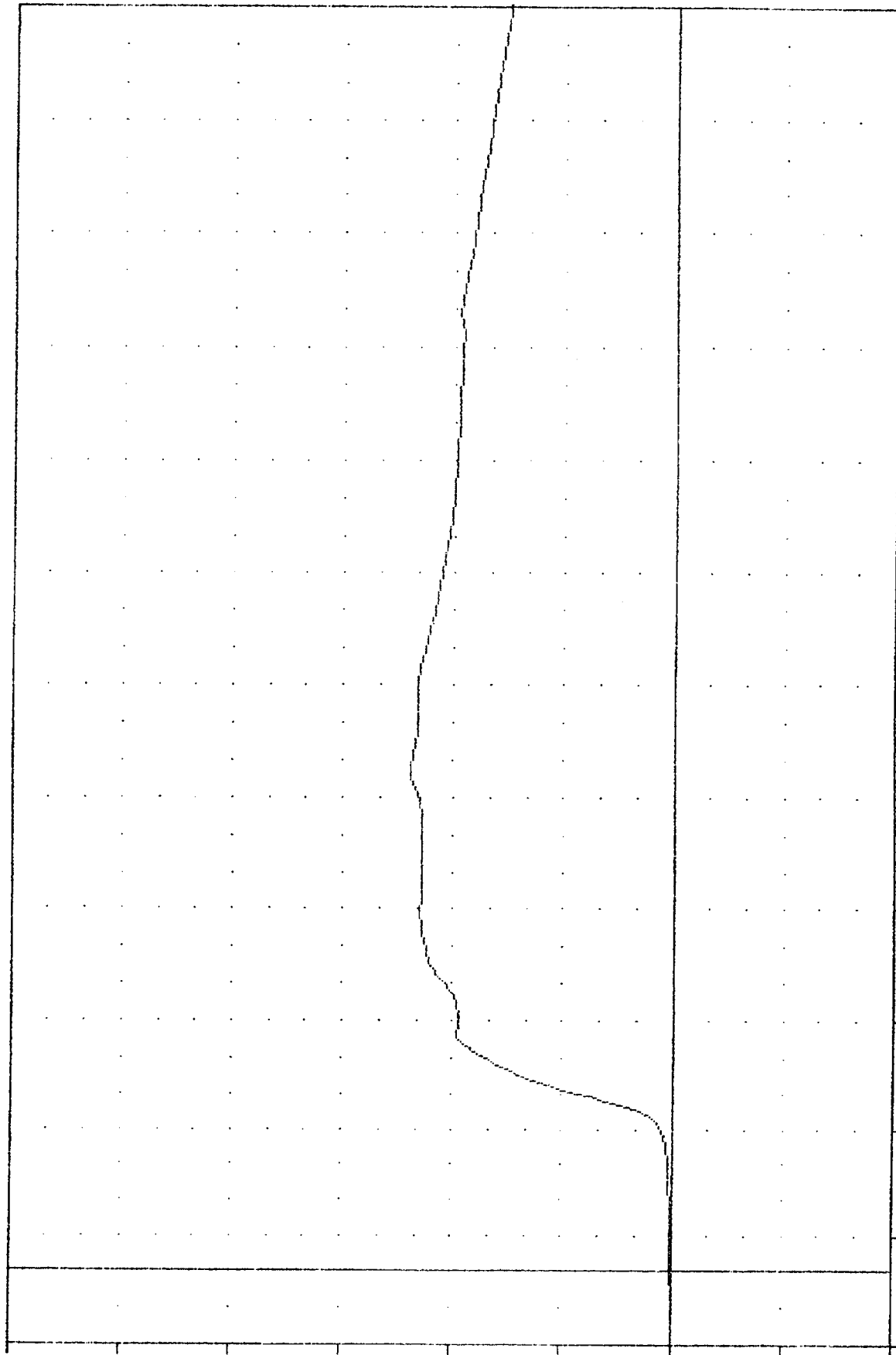
83306000000

T01YV3

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.050 -16.67, 23.73 * 138.13

VELOCITY (MPH)

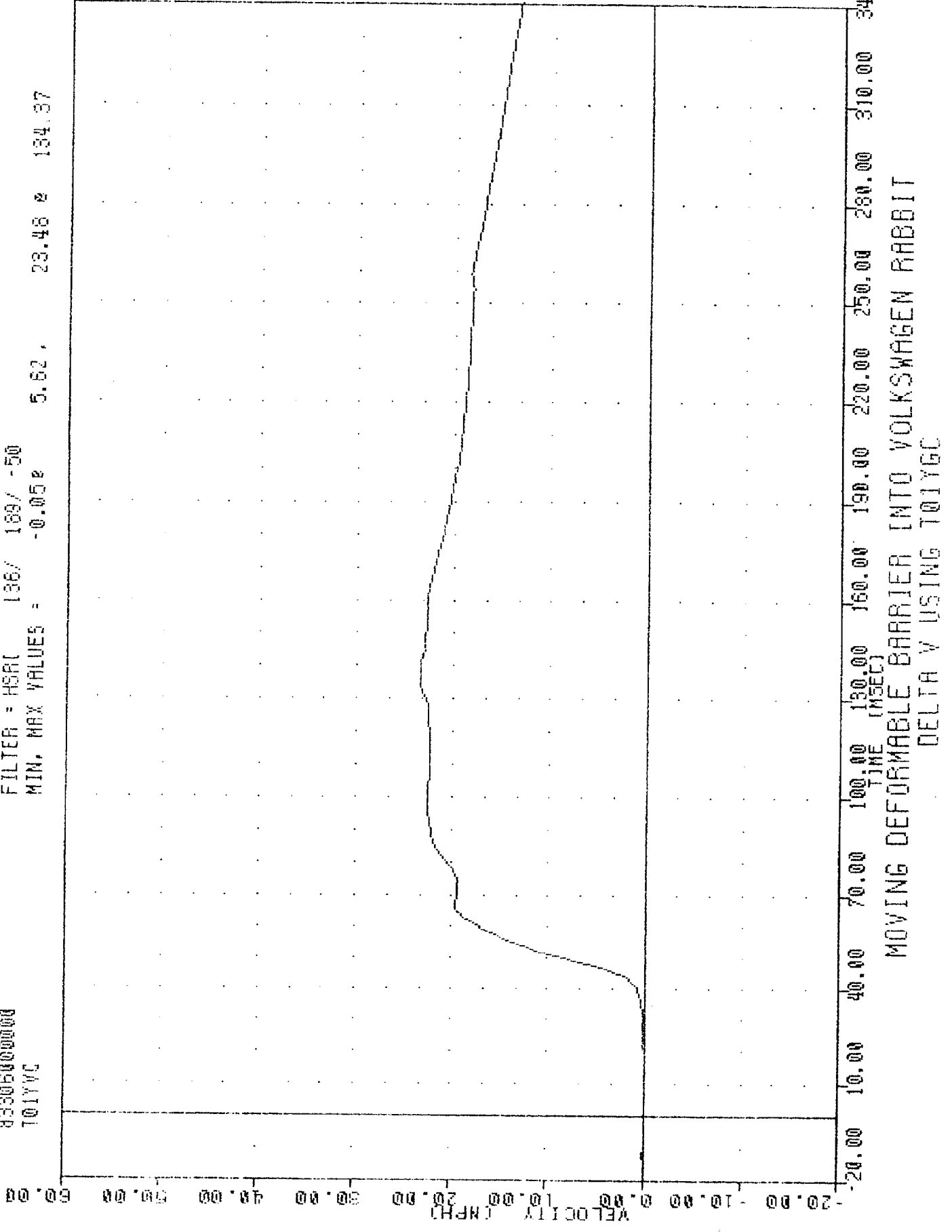


-20.00 10.00 20.00 30.00 40.00 50.00 60.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING T01YV3

TRC [REDACTED], 001102 [REDACTED] PLOT DATE [REDACTED] 7 NOV 85 [REDACTED] 14:20:25
 EVALUATION OF MOD VW FLEET
 83306000000
 T01YVC
 FILTER = HSRC 136/ 136/ -50
 MIN. MAX VALUES = -0.05e 5.62, 23.46 e 134.37



TRC 00102

PLT DATE 7 NOV 85 16:18:14

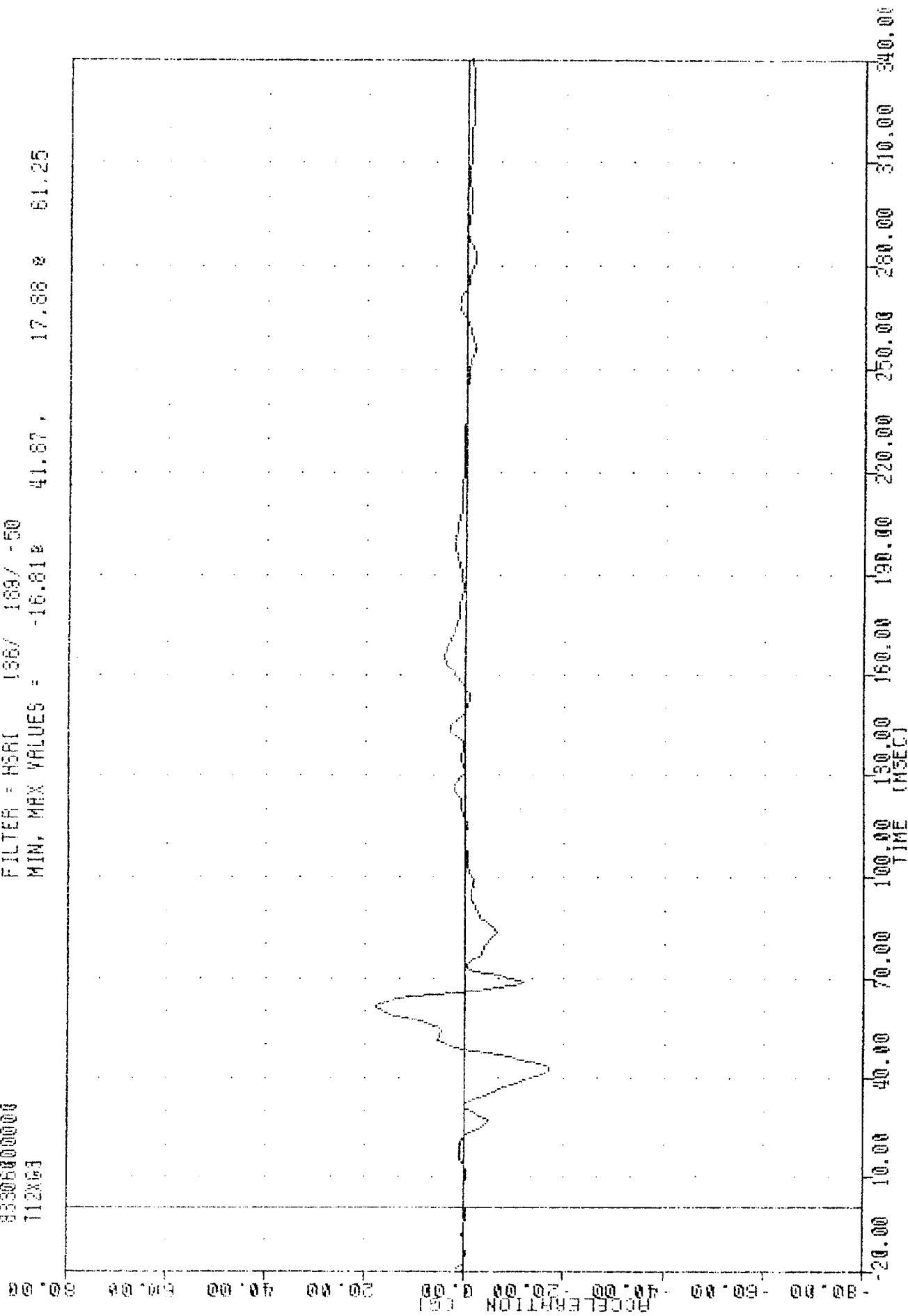
EVALUATION OF MOD YW FLEET

83306800000

112063

FILTER = HSR 136/ 139/ -50

MIN, MAX VALUES = -16.81g 41.87, 17.88 g 61.25

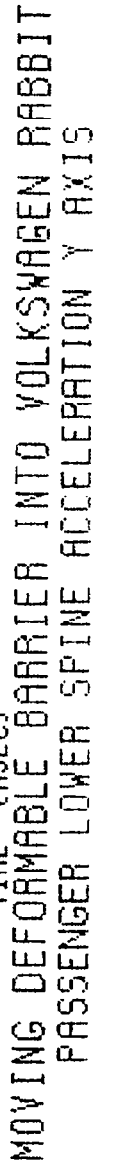


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE ACCELERATION X AXIS

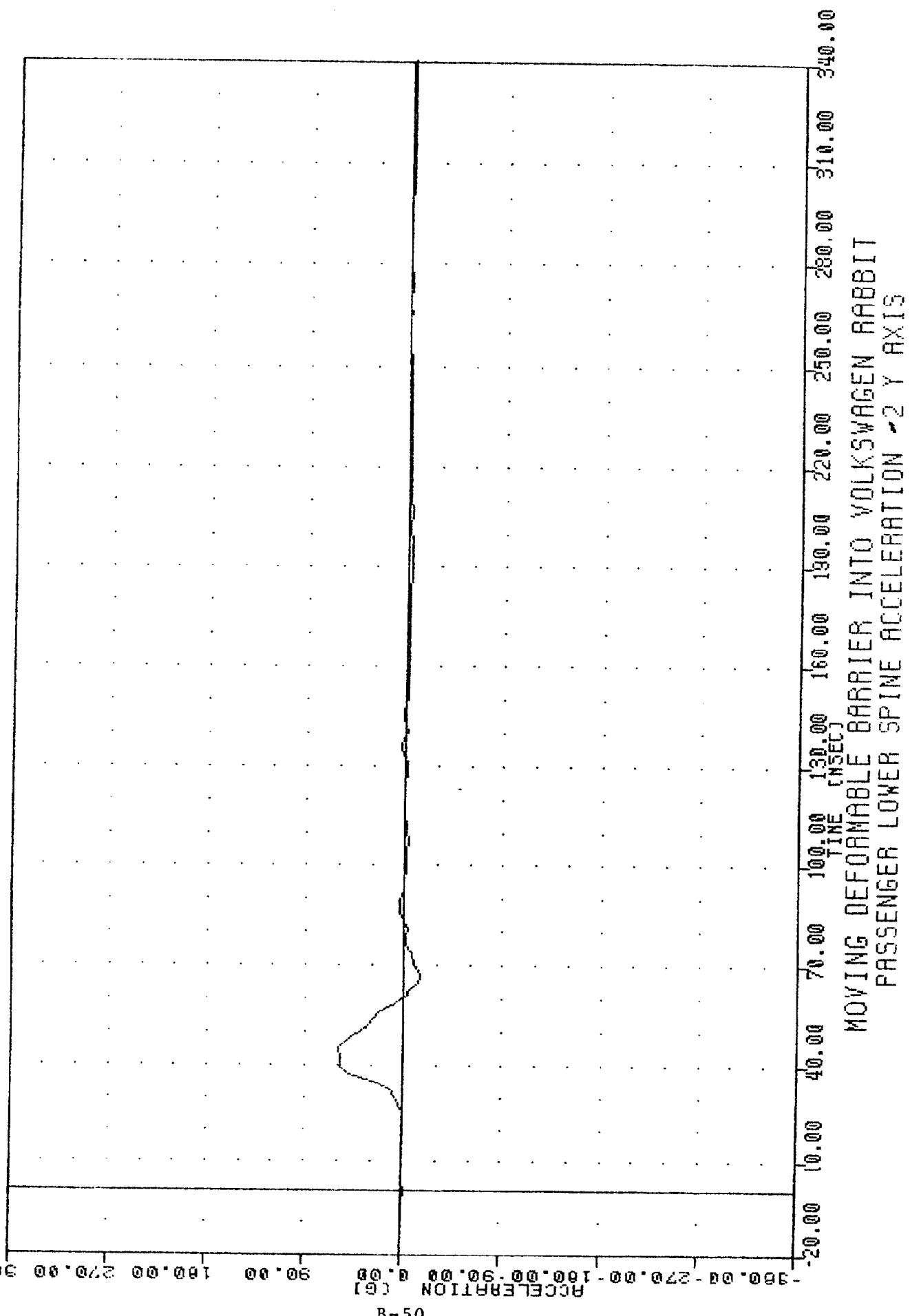
16:11

100

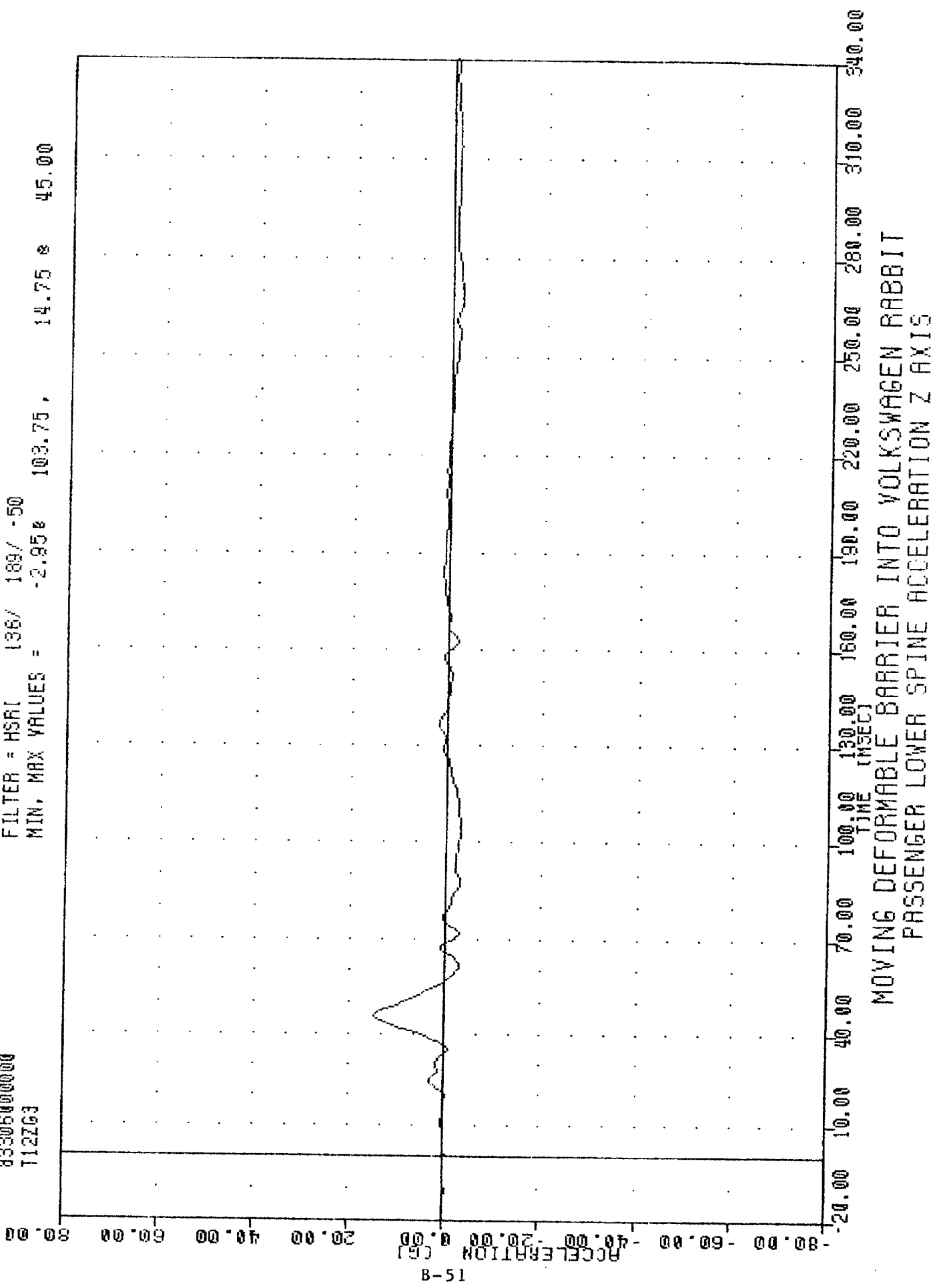
52.67



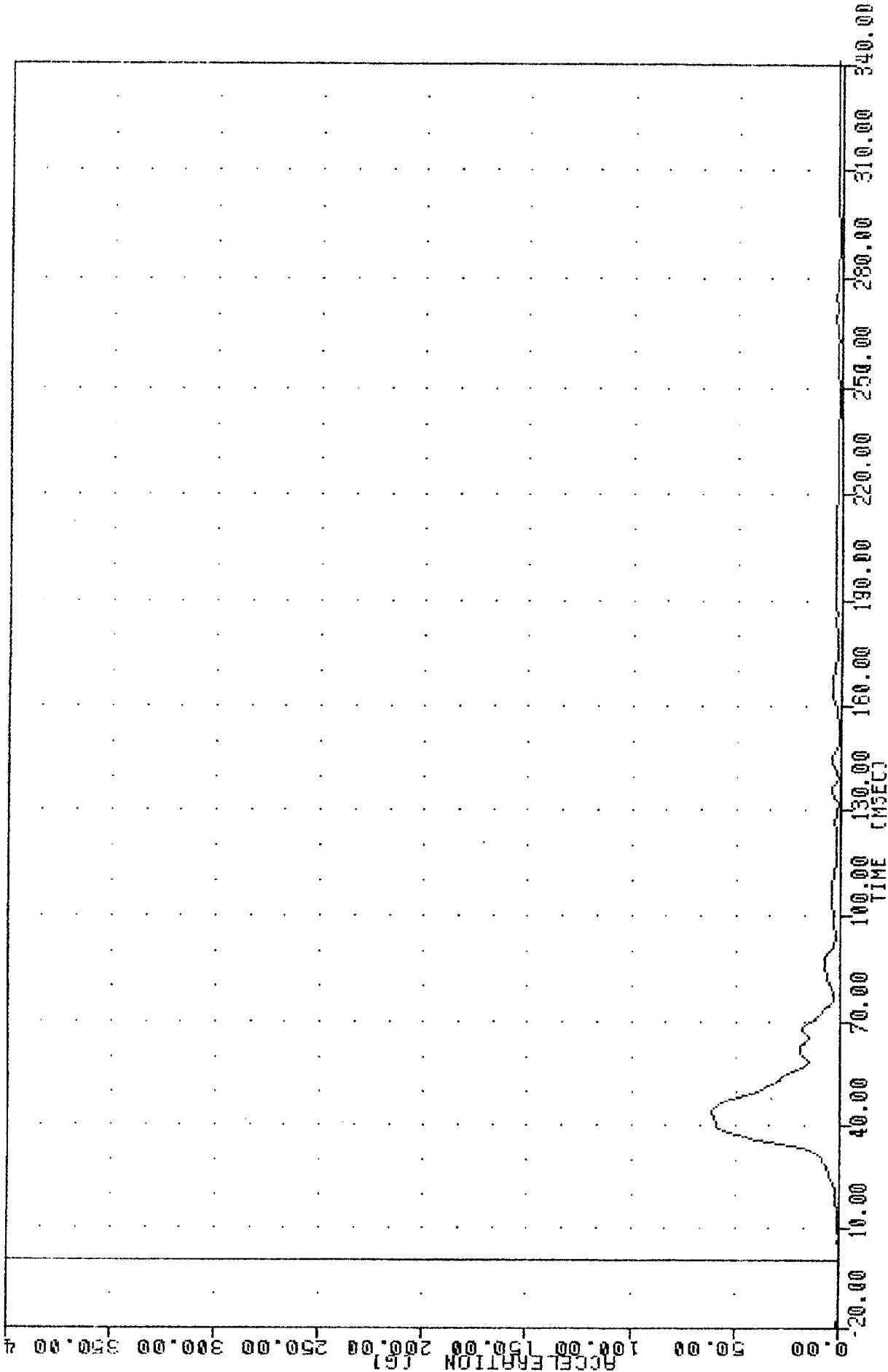
TRC [REDACTED], 631102 [REDACTED] PLOT DATE [REDACTED] 7-NOV-83 [REDACTED] 16:16:14
 EVALUATION OF MOD VW FLEET
 83306000000
 T12Y6C
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -15.12g 66.25, 59.18 g 43.75



TRC [REDACTED], 031102 [REDACTED] PLOT DATE [REDACTED] 7 NOV 83 16:16:14
 EVALUATION OF MOD VW FLEET
 83306000000
 712ZG3
 FILTER = HSR1 136/ 189/ -50
 MIN, MAX VALUES = -2.95e 103.75, 14.75 s 45.00



TRC [REDACTED], 031102 [REDACTED] PLOT DATE [REDACTED] 7 MAY 83 [REDACTED] 16:18:14
 EVALUATION OF MOD VW FLEET
 83306000000
 T12R63
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.13e -17.50, 61.18 e 43.75



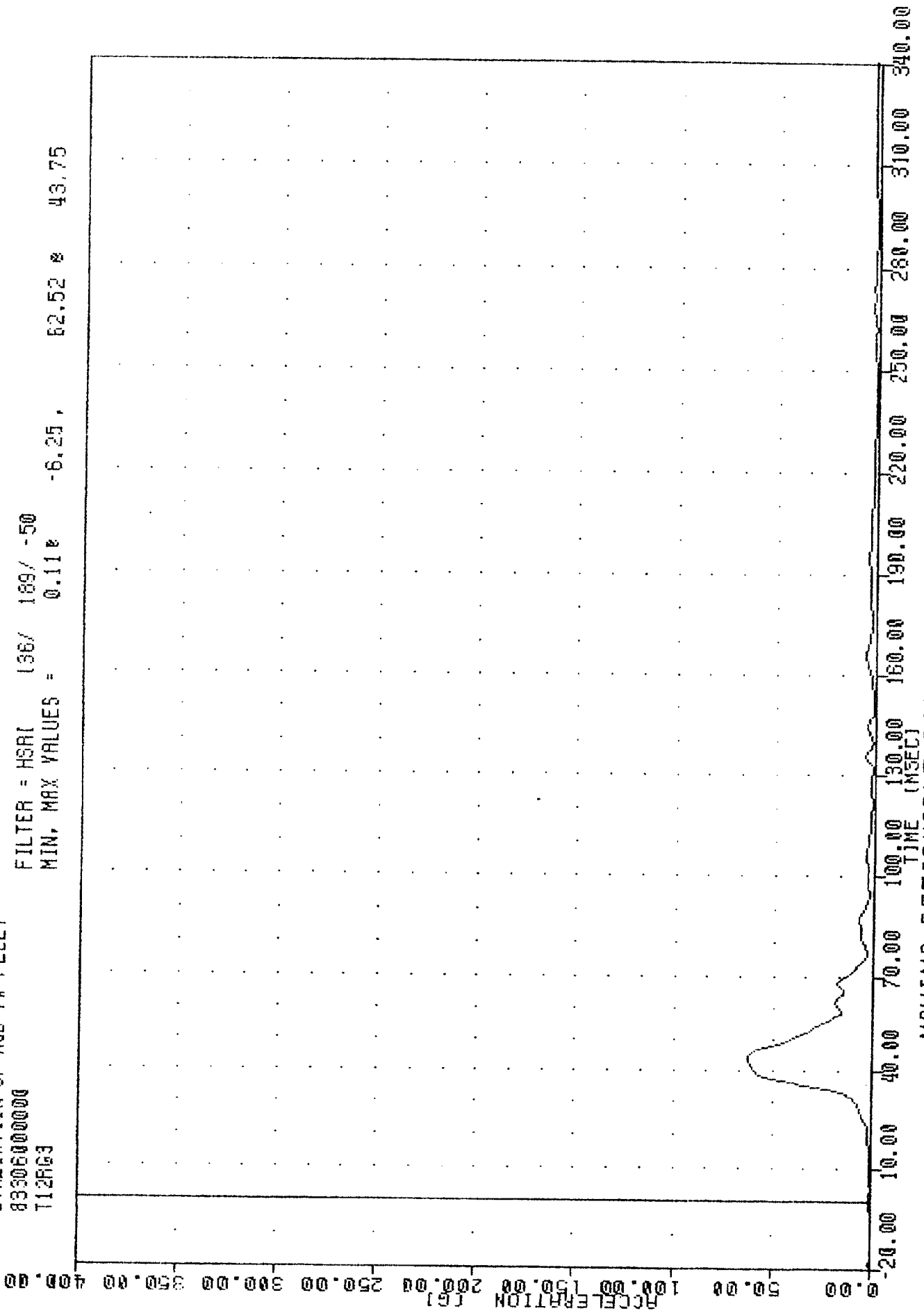
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE RESULTANT

TRC
EVALUATION OF MOD VW FLEET
83306000000
T12RQ3

PLC DATE 7 NOV 83 08:20:57

FILTER = HSR1 136/ 189/ -50

MIN, MAX VALUES = 0.11e -6.25, 62.52 s 43.75



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

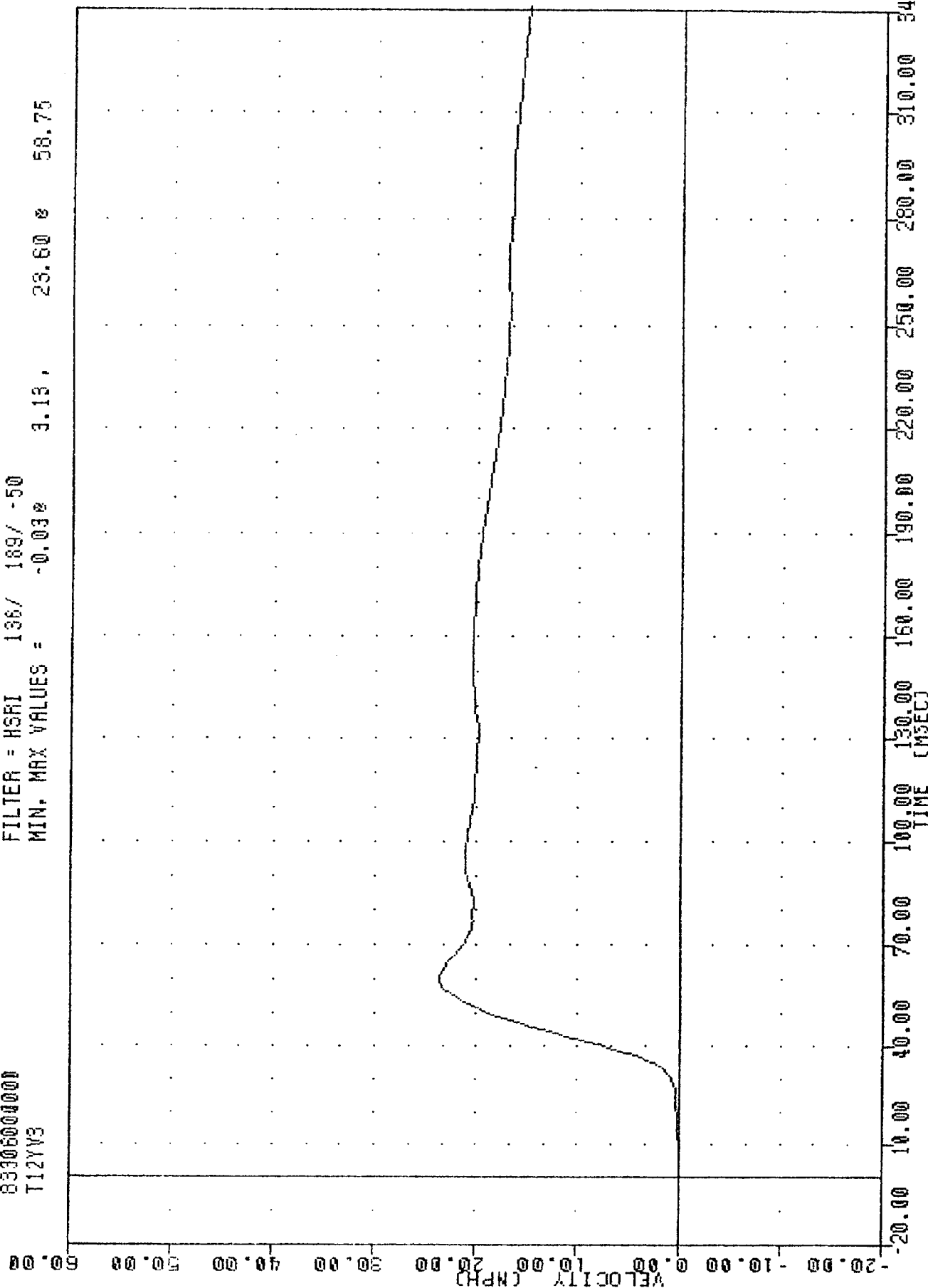
PLOT DATE [REDACTED] 7 MAY - 83 14:26:29

RECEIVED

611211

FILTER = HSP1 199/ 189/ -50

MIN. MAX VALUES =	-0.032	3.13	23.60	58.75
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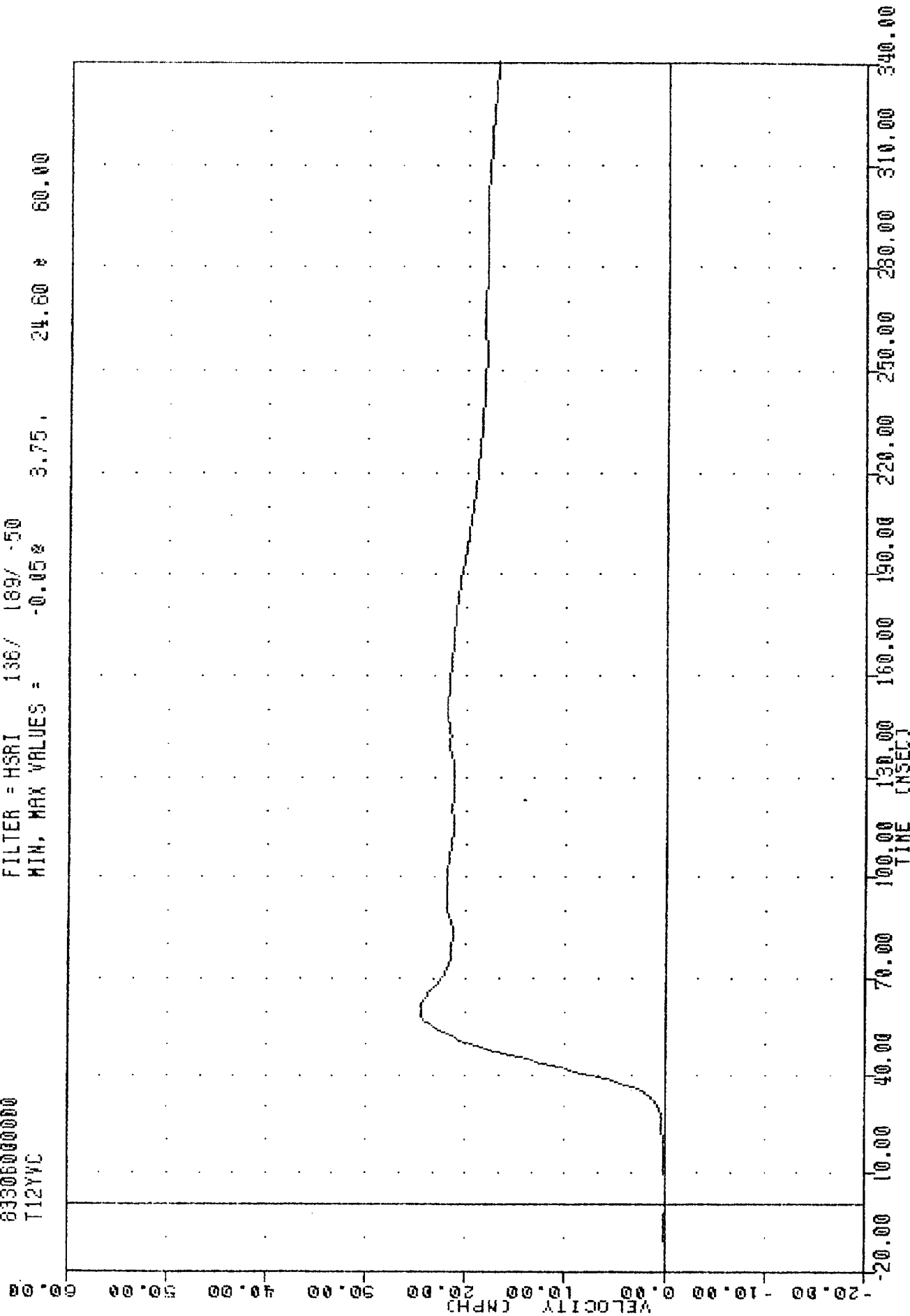
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12Y63

TRC
EVALUATION OF KOD VV FLEET
833060000000
T12YVC

PLOT DATE 7 NOV 83 14.26.25

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.05% 3.75, 24.60 e 60.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12YGC

TRC

831102

PLOT DATE

7-NOV-83

09:28:35

EVALUATION OF MOD VW FLEET

83306000000

FILTER = HSRI 136/ 189/ -50

LURY63

MIN, MAX VALUES =

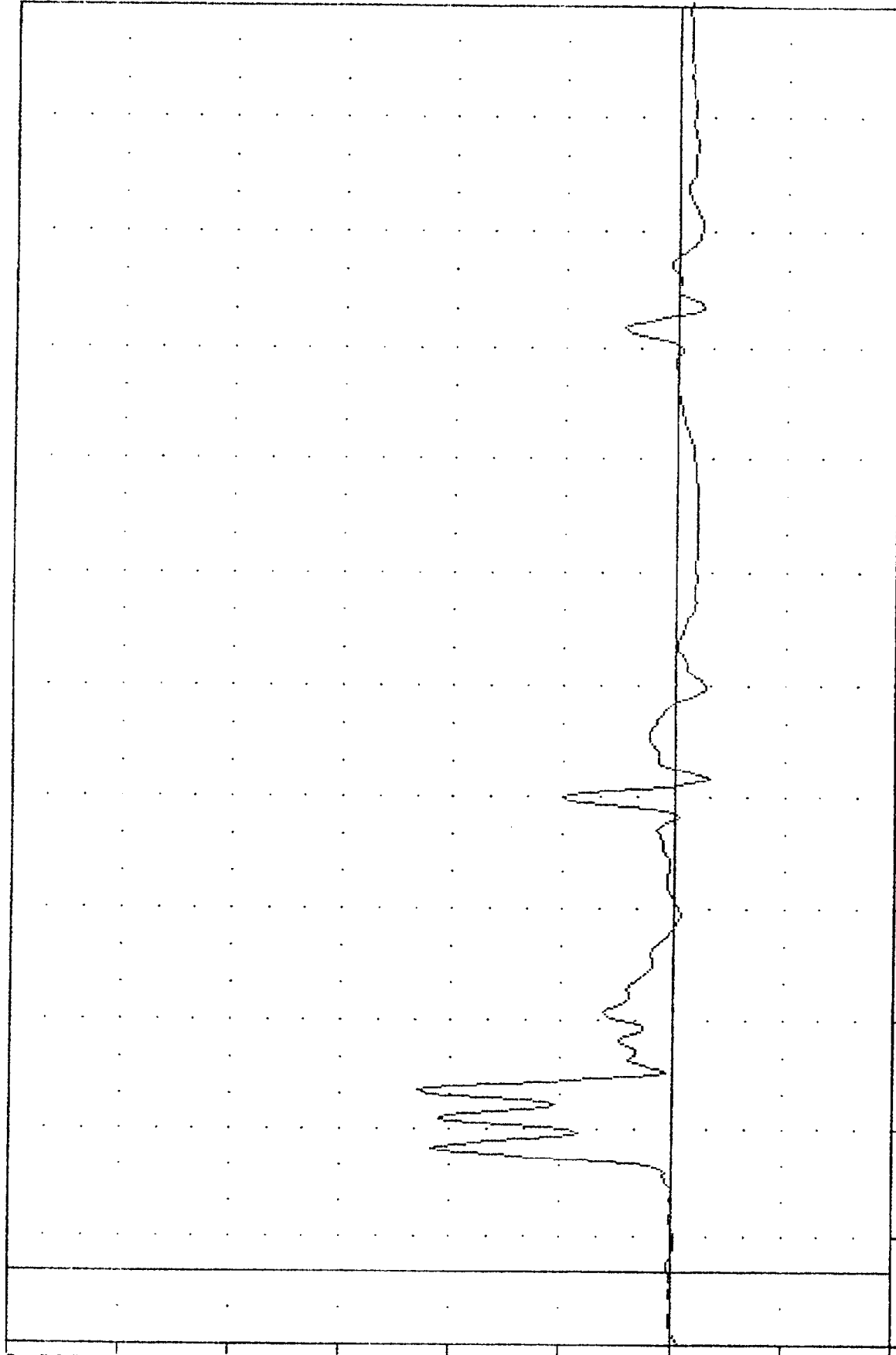
-6.40%

134.37,

45.91%

50.00

ACCELERATION (G)



TIME (MSEC)

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

TAC 831102 PLOT DATE 7-NOV-83 14:26:25

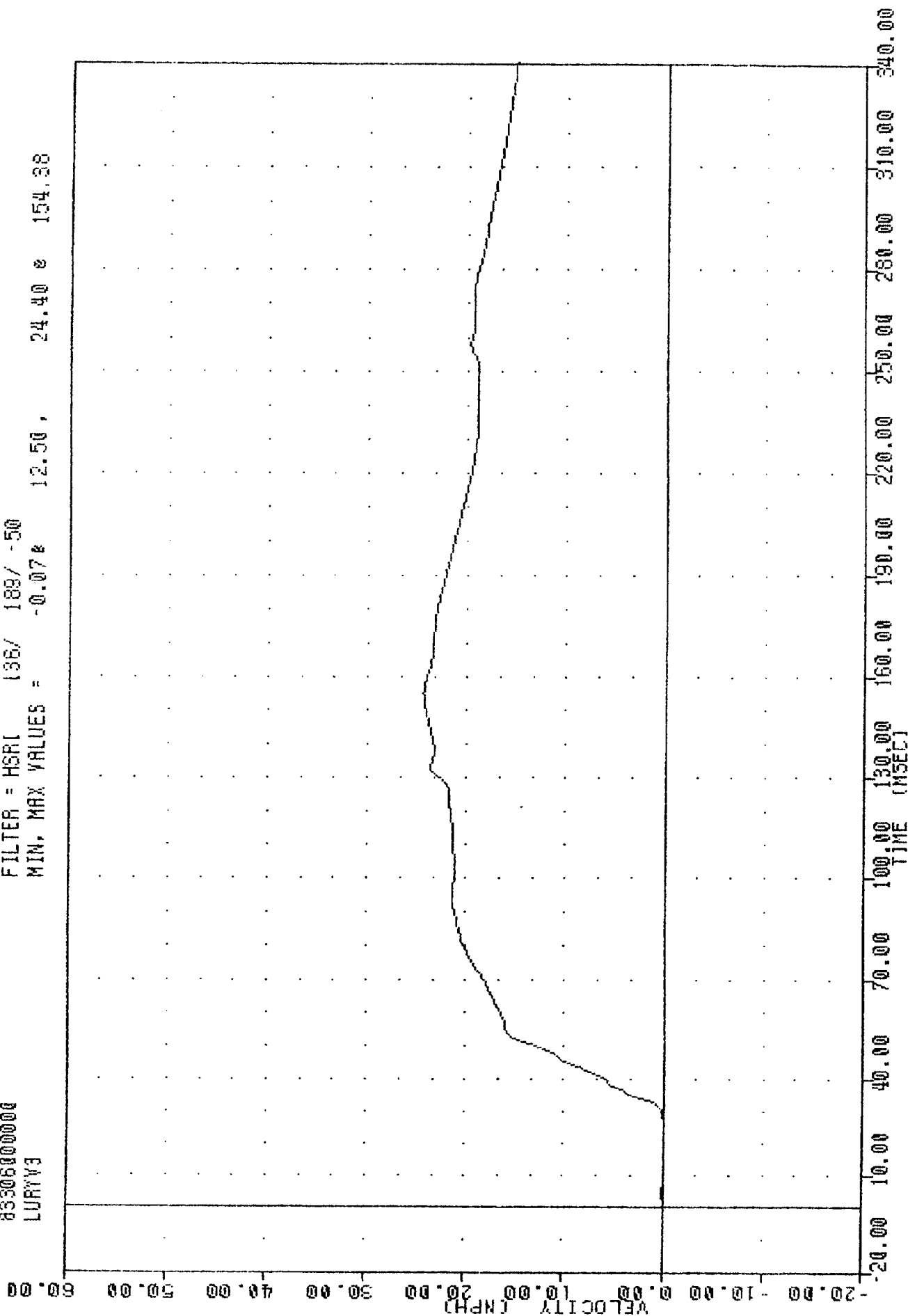
EVALUATION OF MOD VN FLEET

83306000000

LURYV3

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.07 12.50, 24.40 154.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LURYG3

TAC

833102

833102

7-NOV-83

09:26:35

EVALUATION OF H00 VW FLEET

83306000000

LURY6C

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -6.95% 135.00 , 47.73 % 50.00

120.00

100.00

80.00

60.00

40.00

20.00

0.00

-20.00

-40.00

-60.00

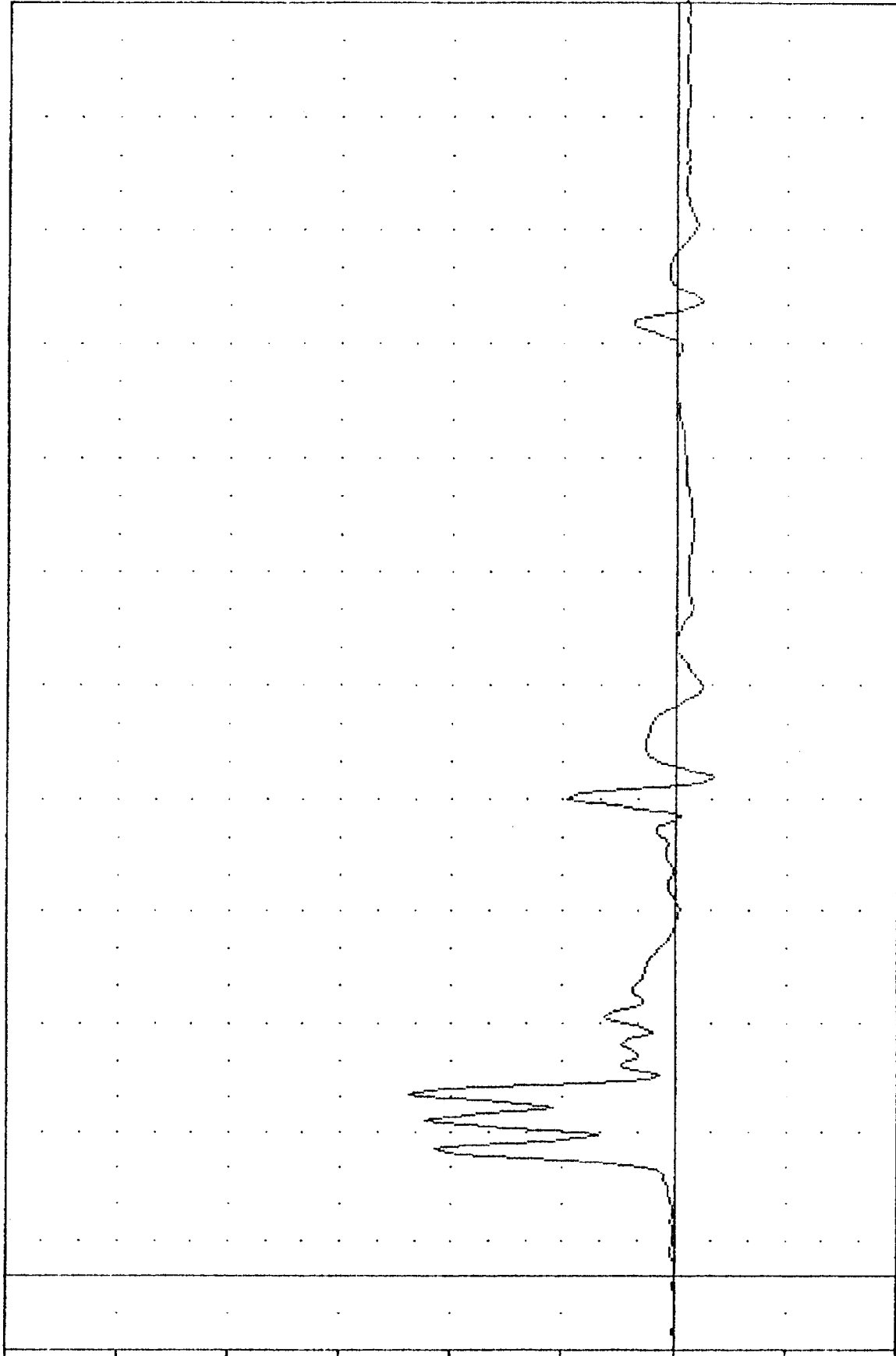
-80.00

-100.00

-120.00

B-58

ACCELERATION (G)



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

TRC 831102 PLOT DATE 7-MAY-83 09:26:35

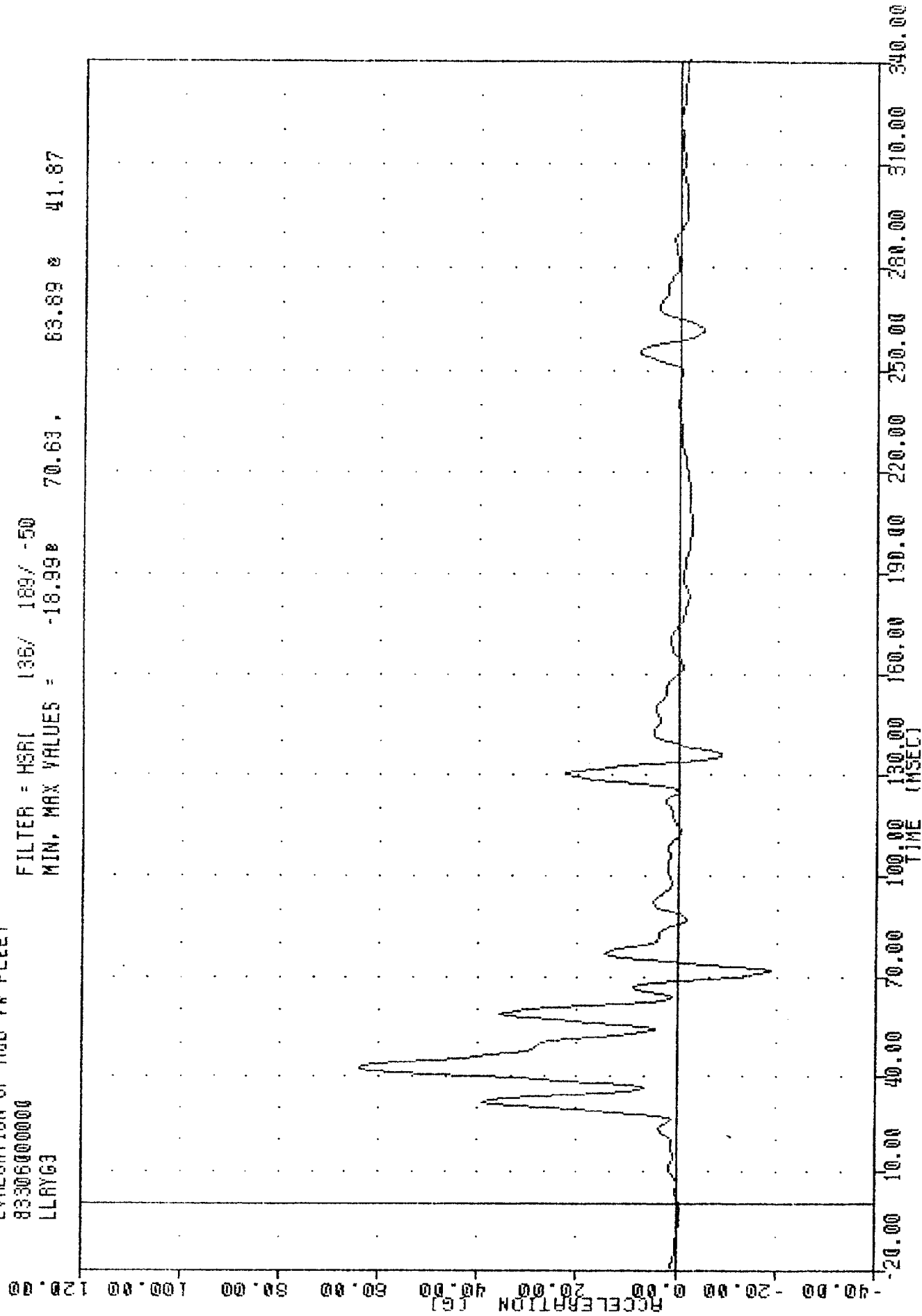
EVALUATION OF MOD VN FLEET

83306000000

LLAY63

FILTER = H3R1 136/ 189/ -50

MIN, MAX VALUES = -18.99 70.63, 83.89 41.87



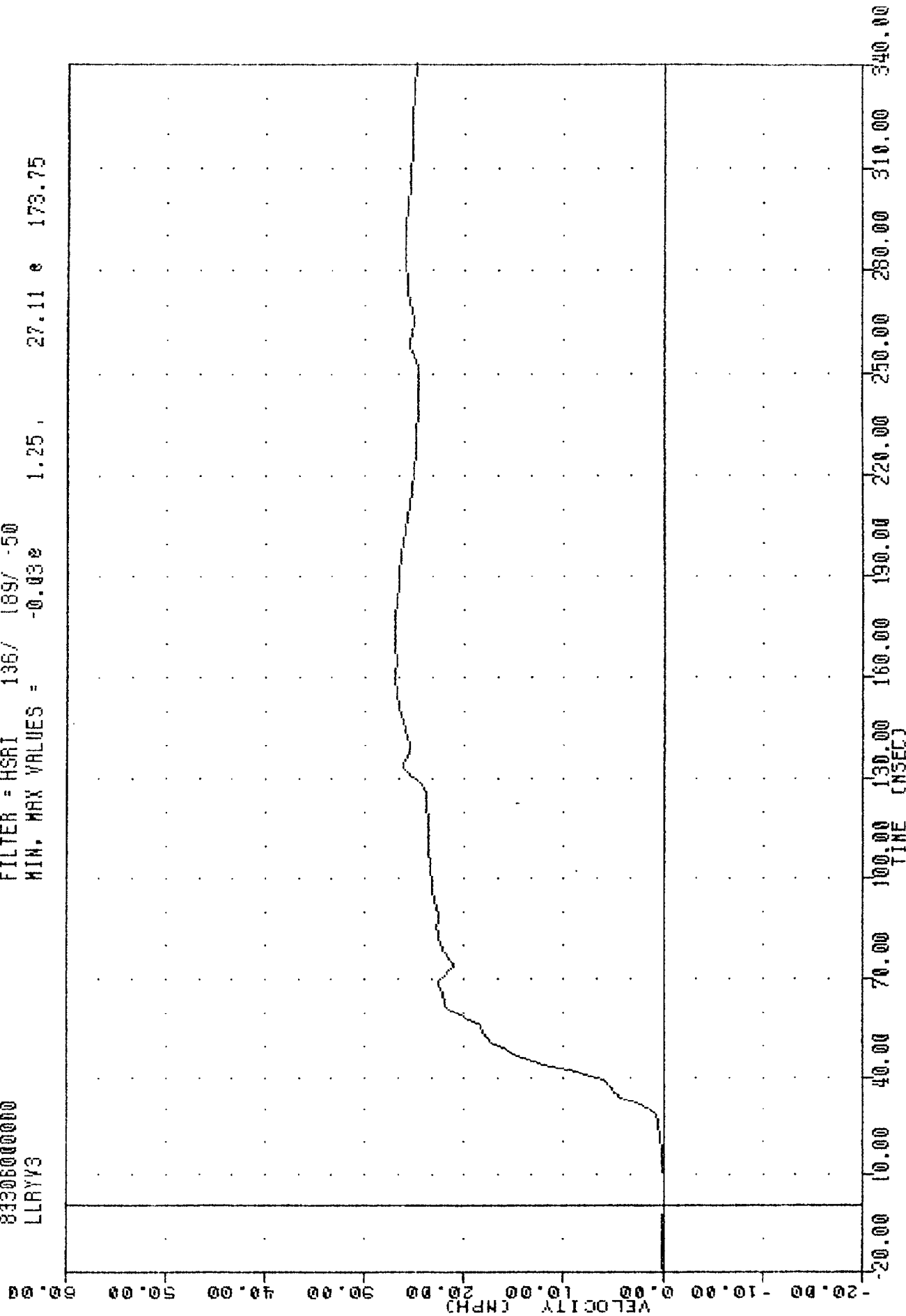
B-60

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

TRC 831102
 EVALUATION OF MOD VN FLEET
 83306000000
 LLRYV3

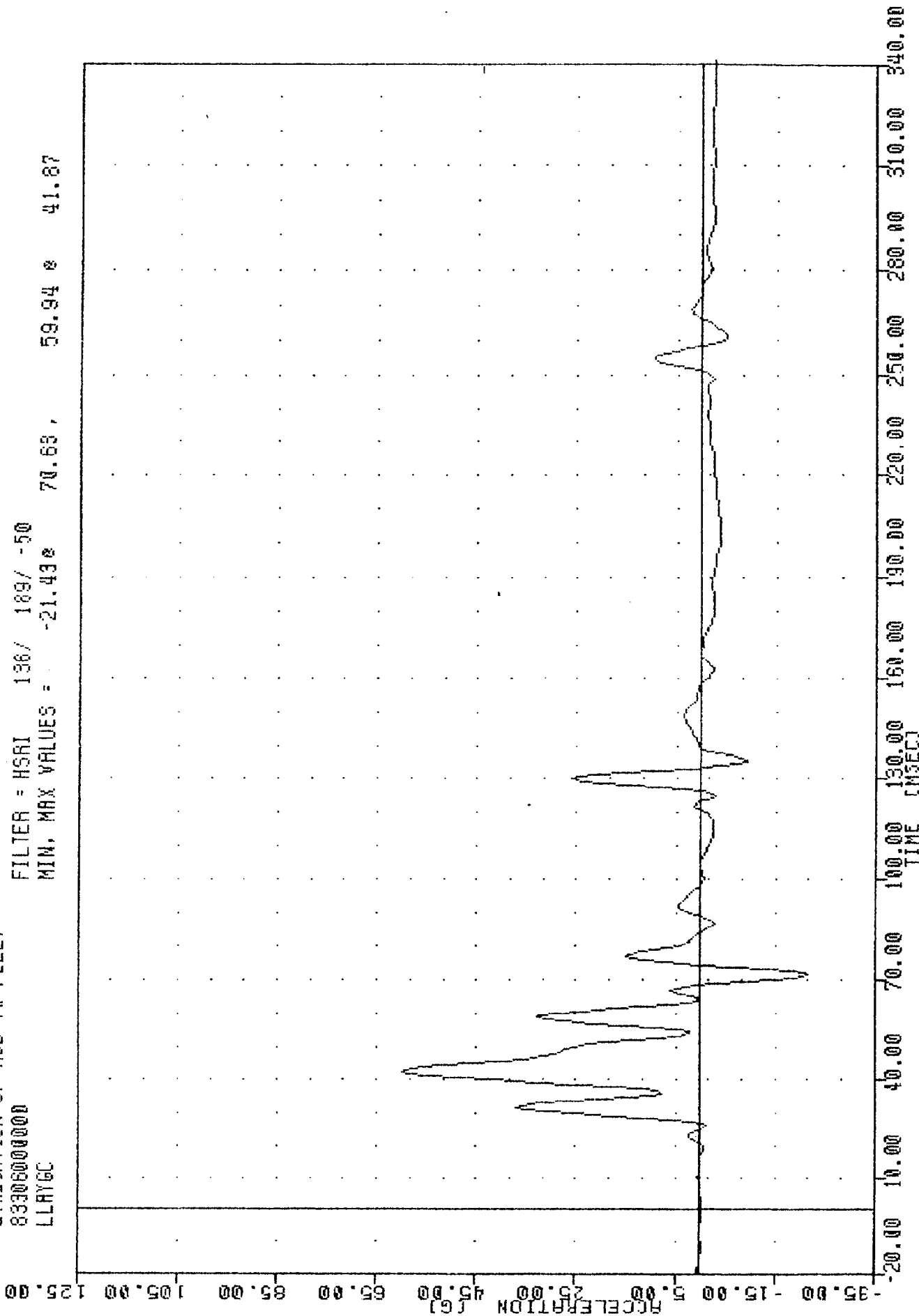
PLOT DATE 7-NOV-83 14:26:25

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.03e 1.25 , 27.11 e 173.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LLRYG3

TRC 831102, 831102 PLOT DATE 7-NOV-83 09:25:35
 EVALUATION OF MOD VW FLEET
 83306000000
 LLYG6
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -21.430 70.63, 59.94 0 41.87



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

TRC 831102 PLOT DATE 7-NOV-85 14:28:25

EVALUATION OF MOD VW FLEET

83306000000

LLRYVC

FILTER = HSRL 136/ 189/ -50

MIN, MAX VALUES = -0.028

4.38, 22.27 s 158.13

60.00

50.00

40.00

30.00

20.00

B-63

VELOCITY (MPH)

0.00

-10.00

-20.00

-20.00

-10.00

0.00

10.00

20.00

30.00

40.00

50.00

60.00

70.00

80.00

90.00

100.00

110.00

120.00

130.00

140.00

150.00

160.00

170.00

180.00

190.00

200.00

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220.00

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760.00

770.00

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1010.00

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2880.00

2890.00

2900.00

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2930.00

2940.00

2950.00

TRC 831102 PLOT DATE 7-MAY-63 09:20:28

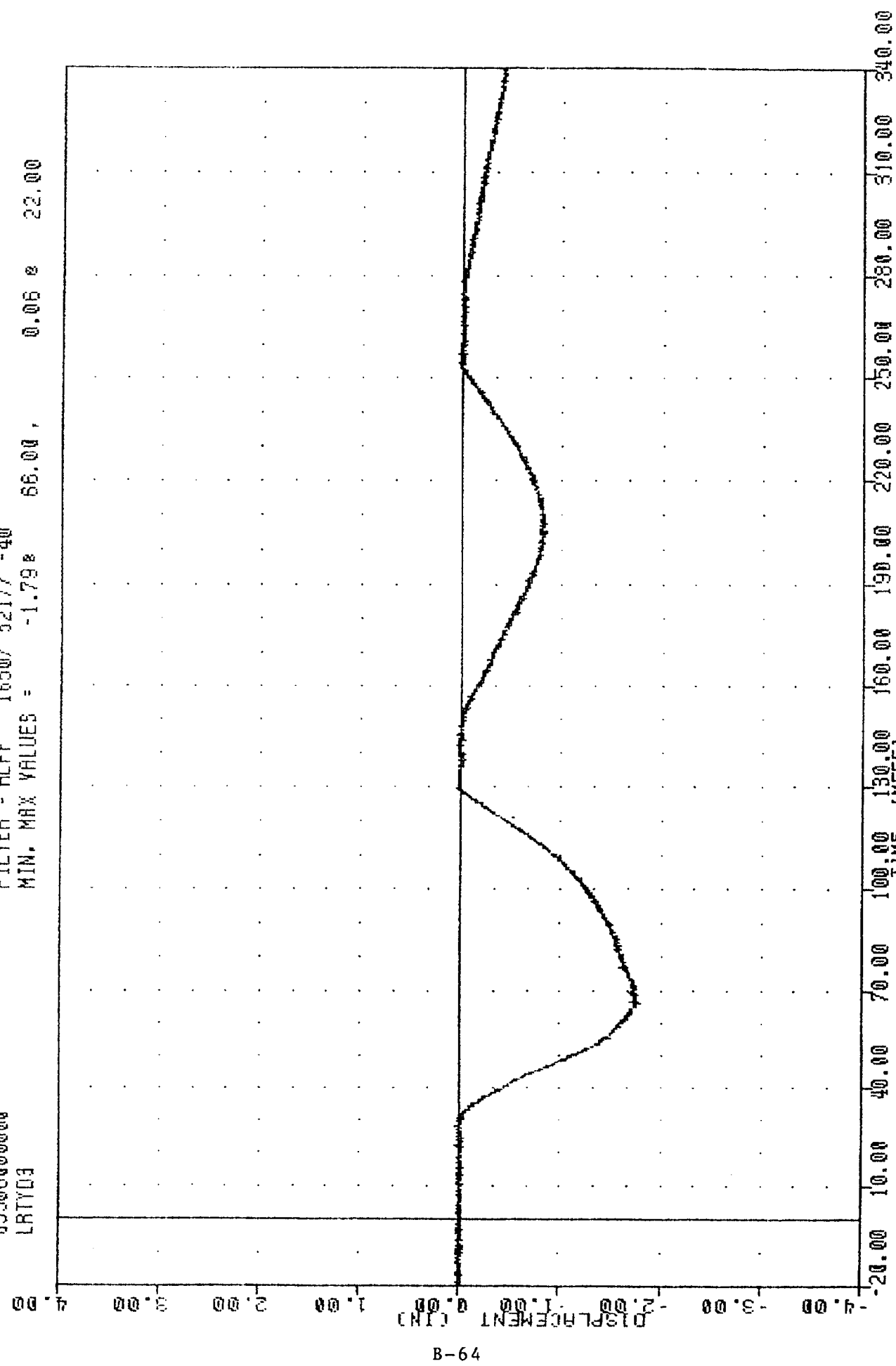
EVALUATION OF MOD YW FLEET

83306000000

LRTYD3

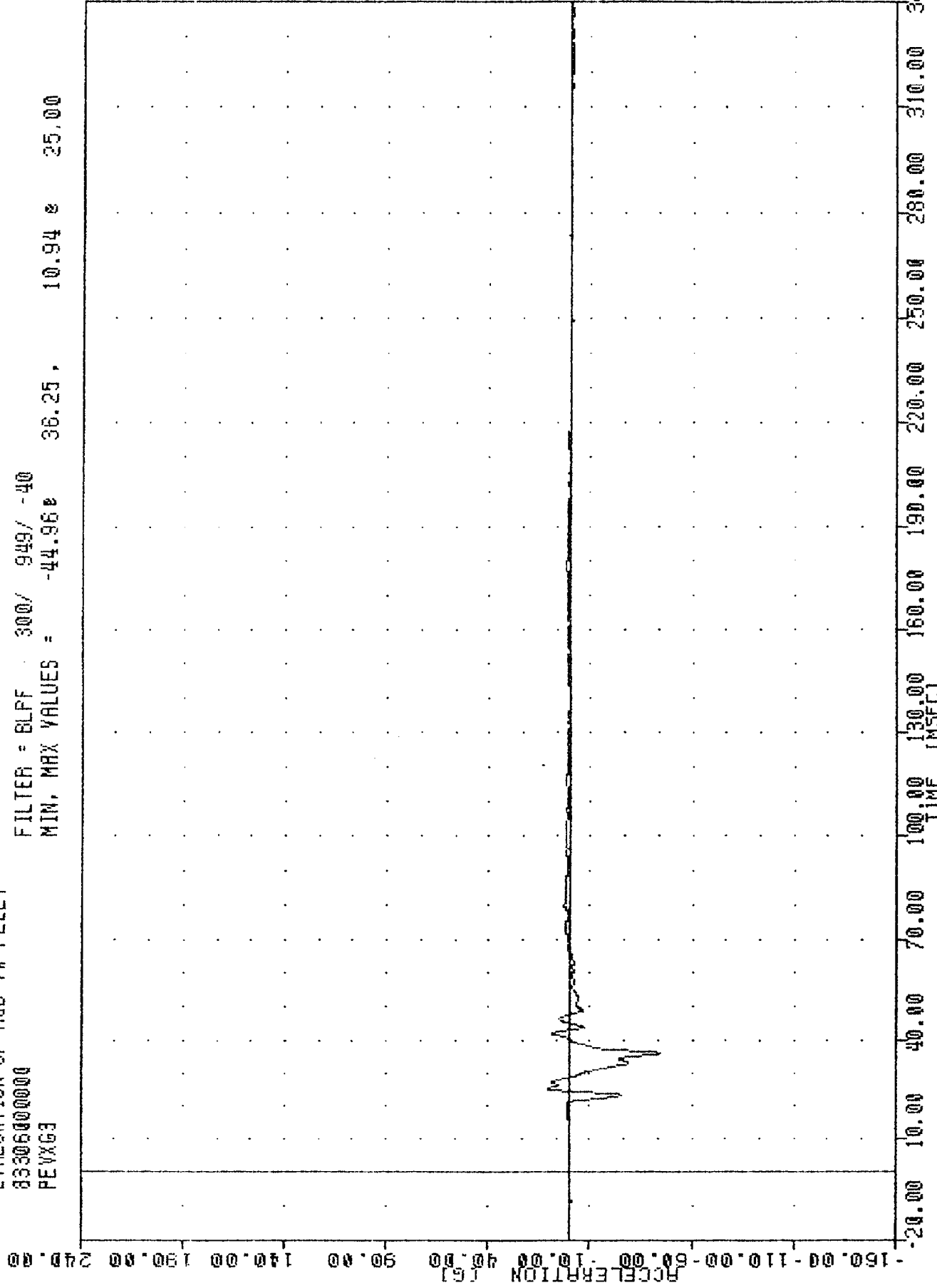
FILTER = ALFF 1650/ 5217/ -40

MIN. MAX VALUES = -1.79 66.00 0.06 22.00



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

TRC 831102, 831102 PLOT DATE 7 NOV 83 09:20:28
 EVALUATION OF MOD YW FLEET
 8330600000
 PEVXG3
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -44.96 36.25 10.94 25.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER PELVIS ACCELERATION X AXIS

TRC 831102

EVALUATION OF MOD VN FLEET

83306000000

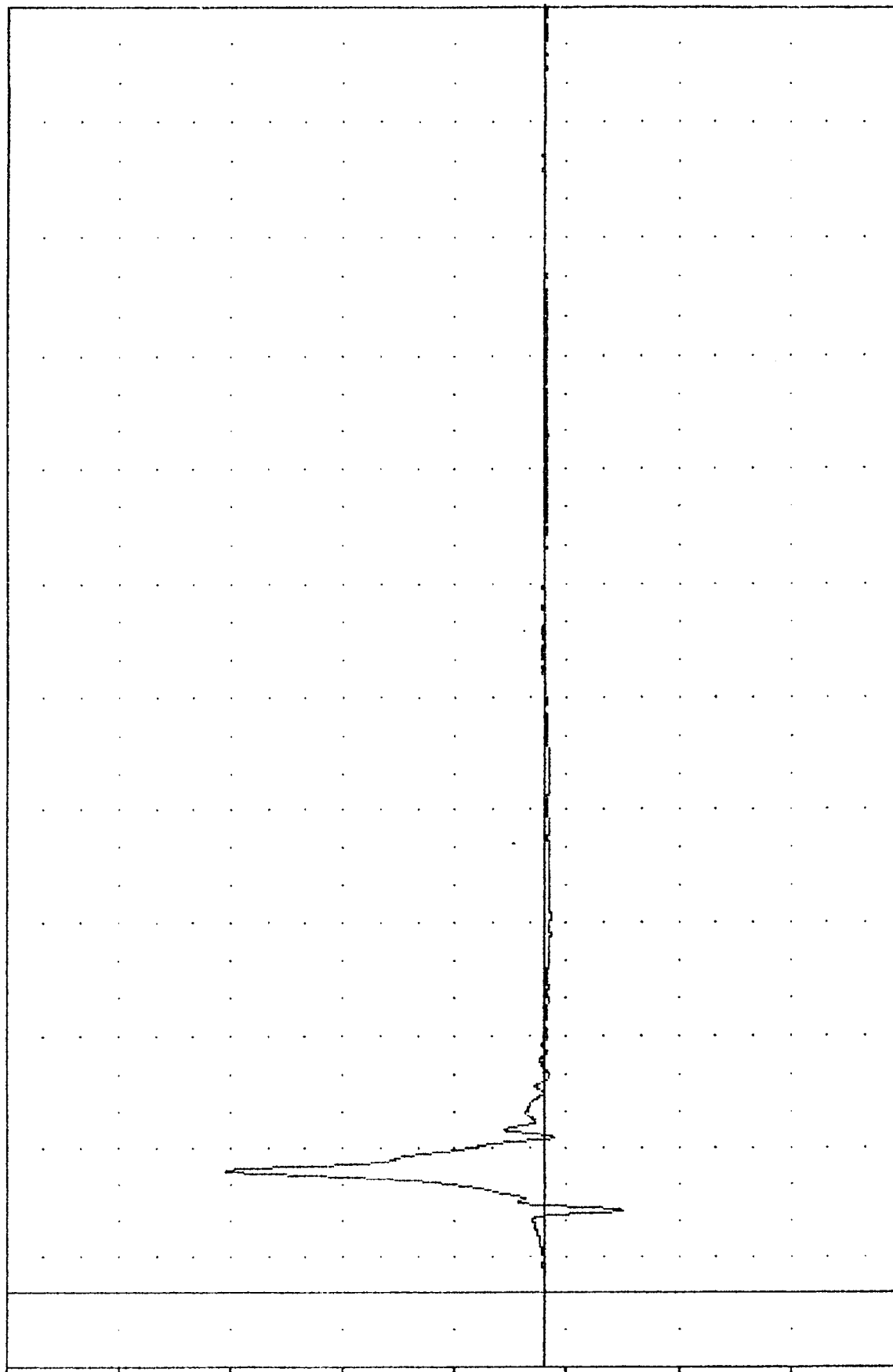
PEVY63

7-NOV-83 09:20:28

FILTER = 6LFF 300/ 949/ -40

MIN. MAX VALUES = -34.928 22.86, 142.40 34.13

ACCELERATION (G)

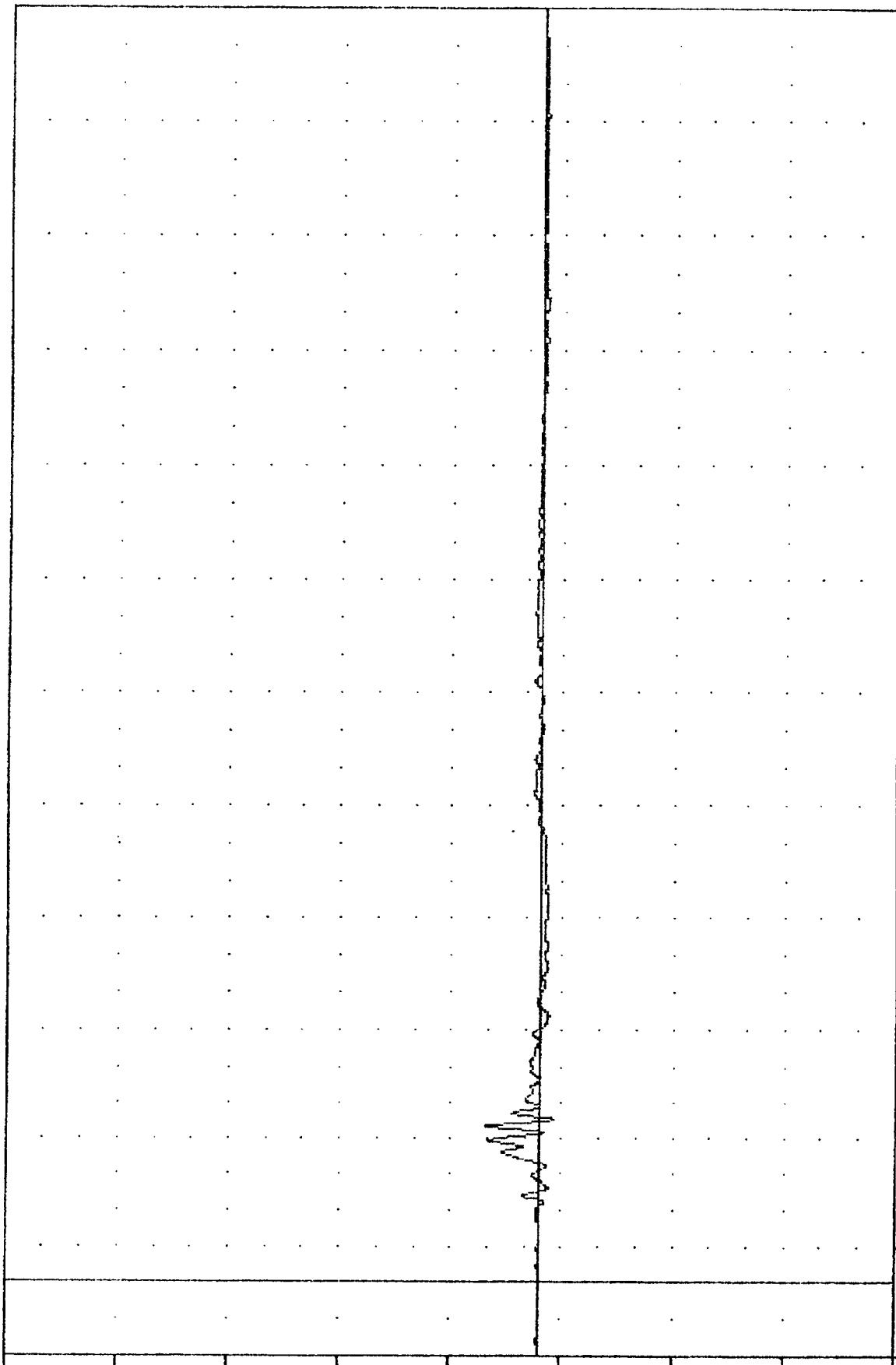


TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS ACCELERATION Y AXIS

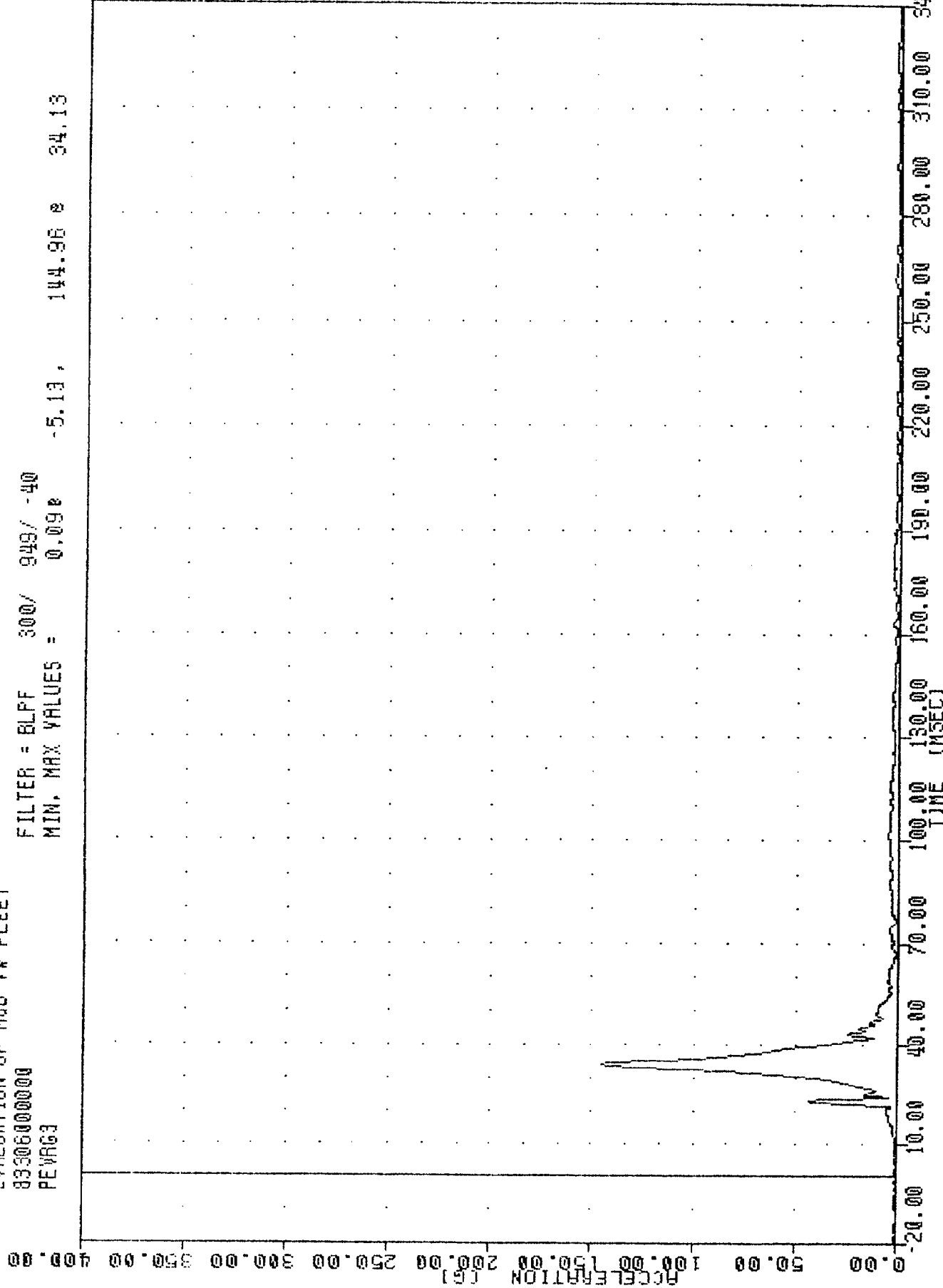
TRC [REDACTED], 831102 [REDACTED] PLOT DATE [REDACTED] 7-MAY-83 [REDACTED] 09:20:28
 EVALUATION OF MOD VN FLEET
 83506000000
 PEVZ63
 FILTER = BLFF 300/ 949/ -40
 MIN, MAX VALUES = -6.64 45.13 24.24 43.25

ACCELERATION (G)



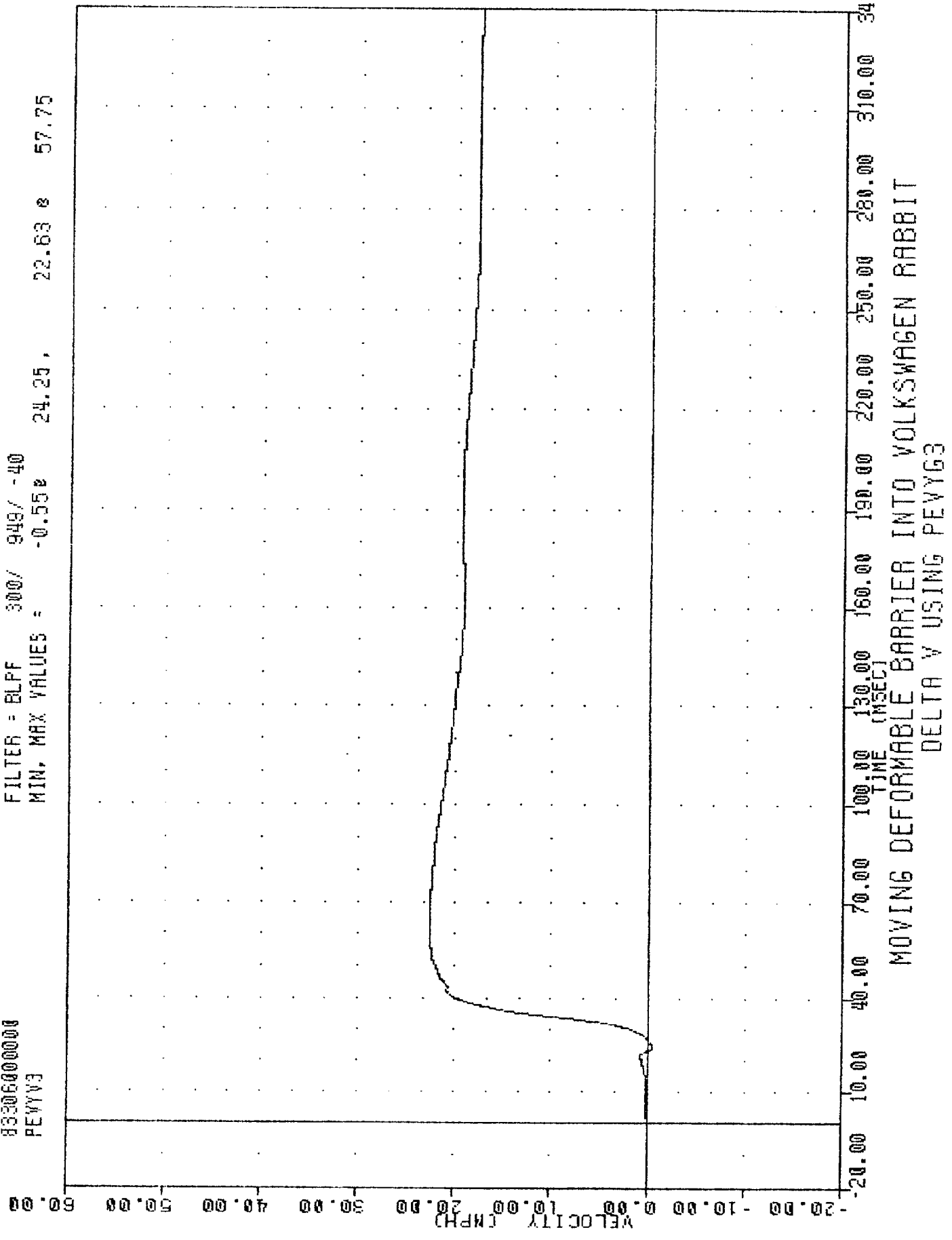
-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER PELVIS ACCELERATION Z AXIS

TRC 831102, 831102 PLOT DATE 7-NOV-83 09:26:08
 EVALUATION OF MOD YW FLEET
 83306000000
 PEVRG3
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 0.098 -5.13, 144.96 34.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER PELVIS RESULTANT

TRC [REDACTED], 031102 [REDACTED] PLOT DATE [REDACTED] 7-NOV-83 [REDACTED] 14:31:52
 EVALUATION OF MOD YW FLEET
 83306000000
 PEYV3
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.55e 24.25, 22.63 e 57.75



TRC 831102 PLOT DATE 7-MOV-83 09:20:28

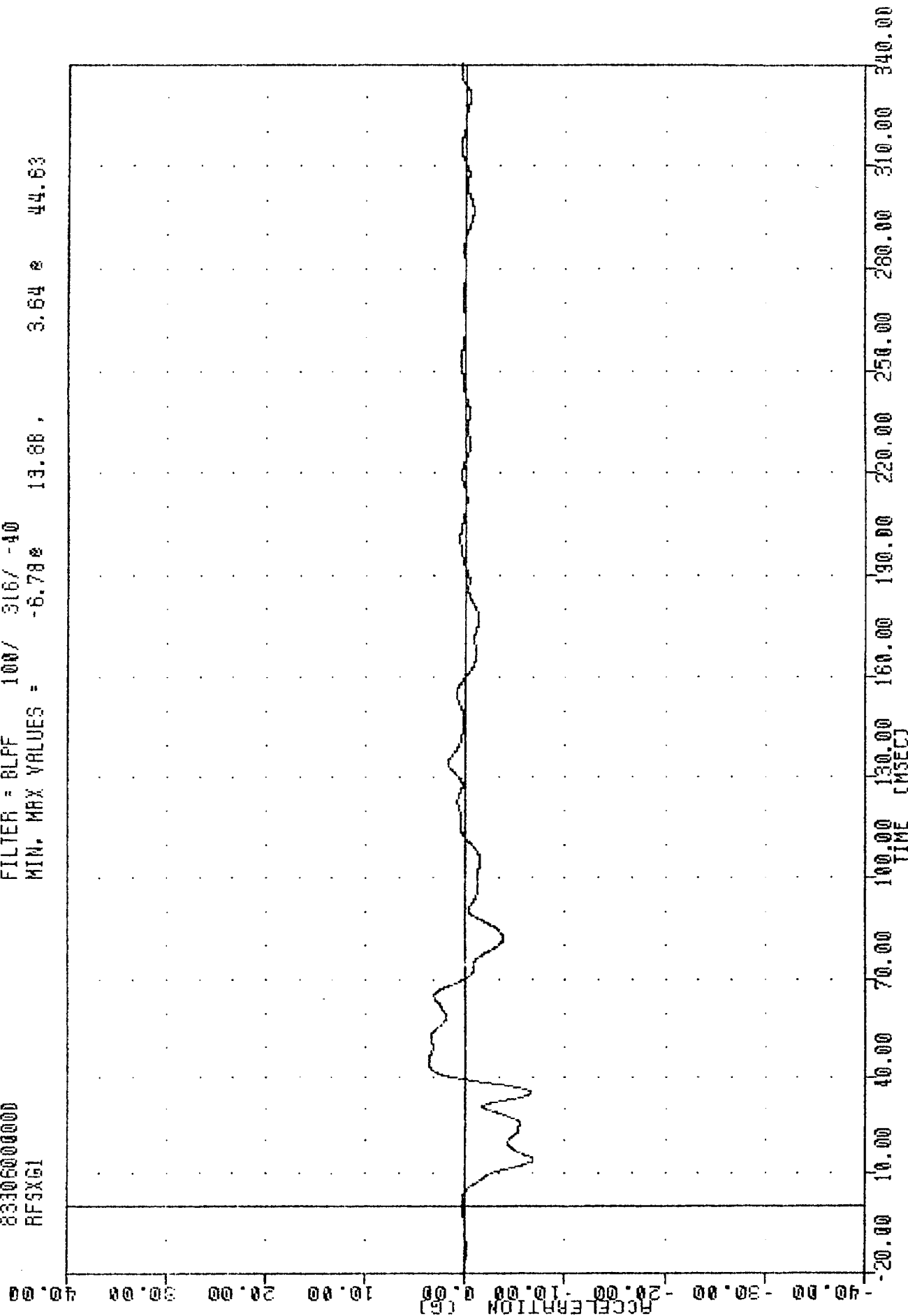
EVALUATION OF MOD VW FLEET

83106000000

RFSXG1

FILTER = BLPF 100/ 316/ -10

MIN. MAX VALUES = -6.78 13.88 3.64 44.63



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

TAC 831102 PLOT DATE 7-MAY-83 09:20:28

EVALUATION OF MOD VN FLEET

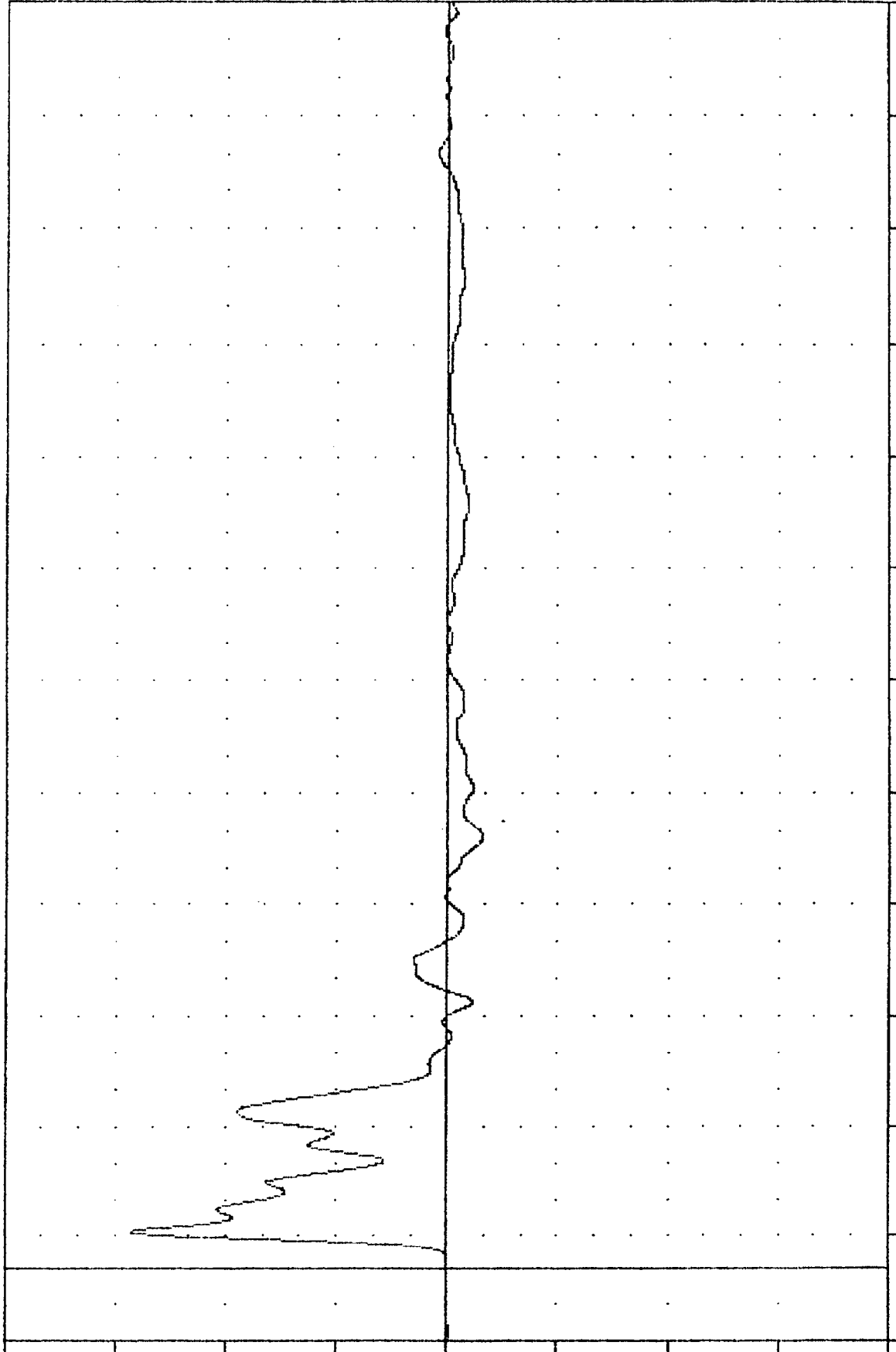
83306000000

AFSY61

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -3.18e 118.25, 28.57 e 10.63

ACCELERATION (G)



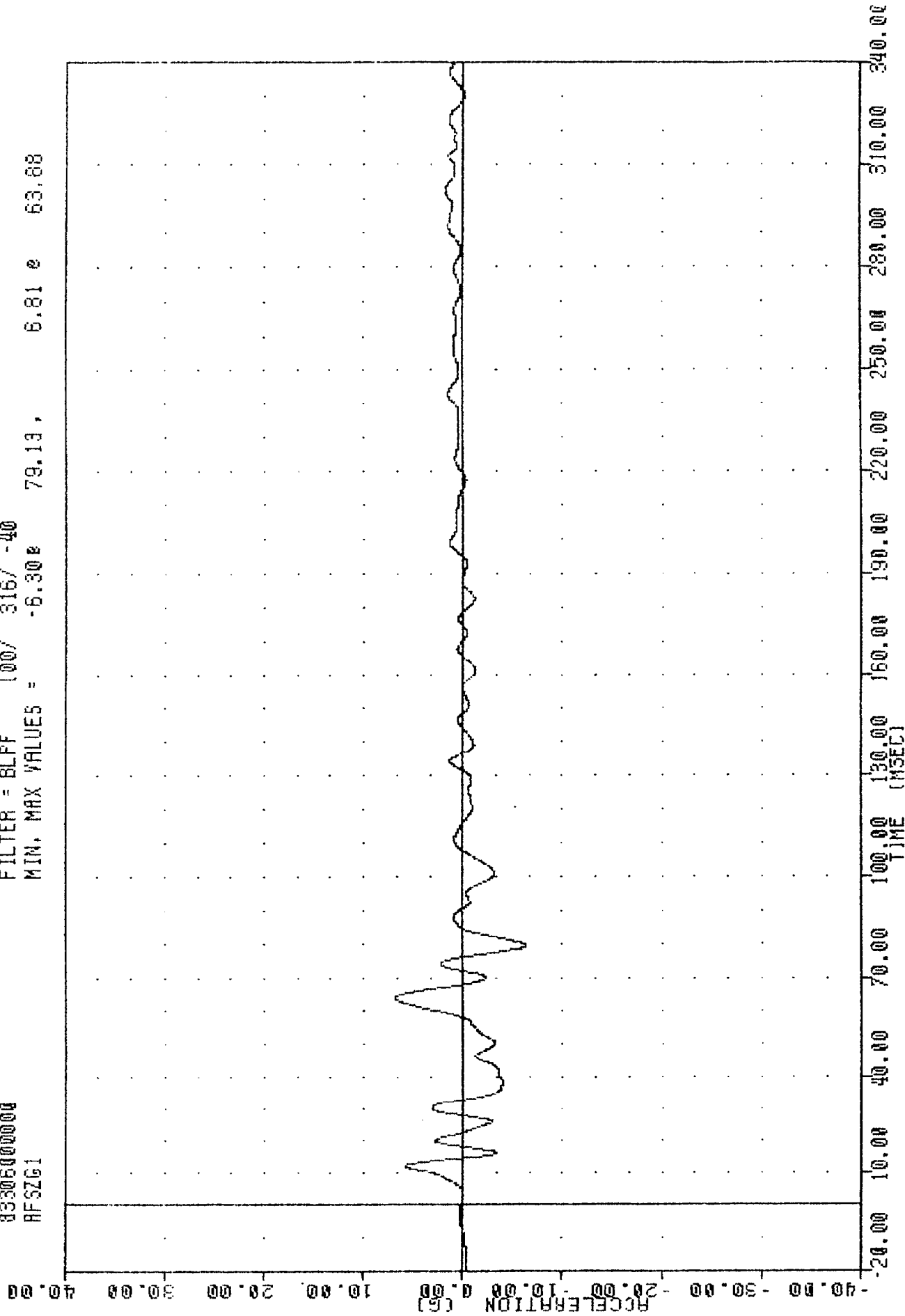
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

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

TRC 83T102
 EVALUATION OF MOD VW FLEET
 83306000000
 RFSZG1

PLOT DATE 7 NOV 83 08:20:28

FILTER = BLFF 100/ 316/ -40
 MIN. MAX VALUES = -6.30E 79.13, 6.81E 63.88



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

TRC

831102

PLOT DATE

7 NOV 83

09:25:08

EVALUATION OF MOD VM FLEET

83305000000

RF3RG1

FILTER = 8LFF 100/ 316/ -40

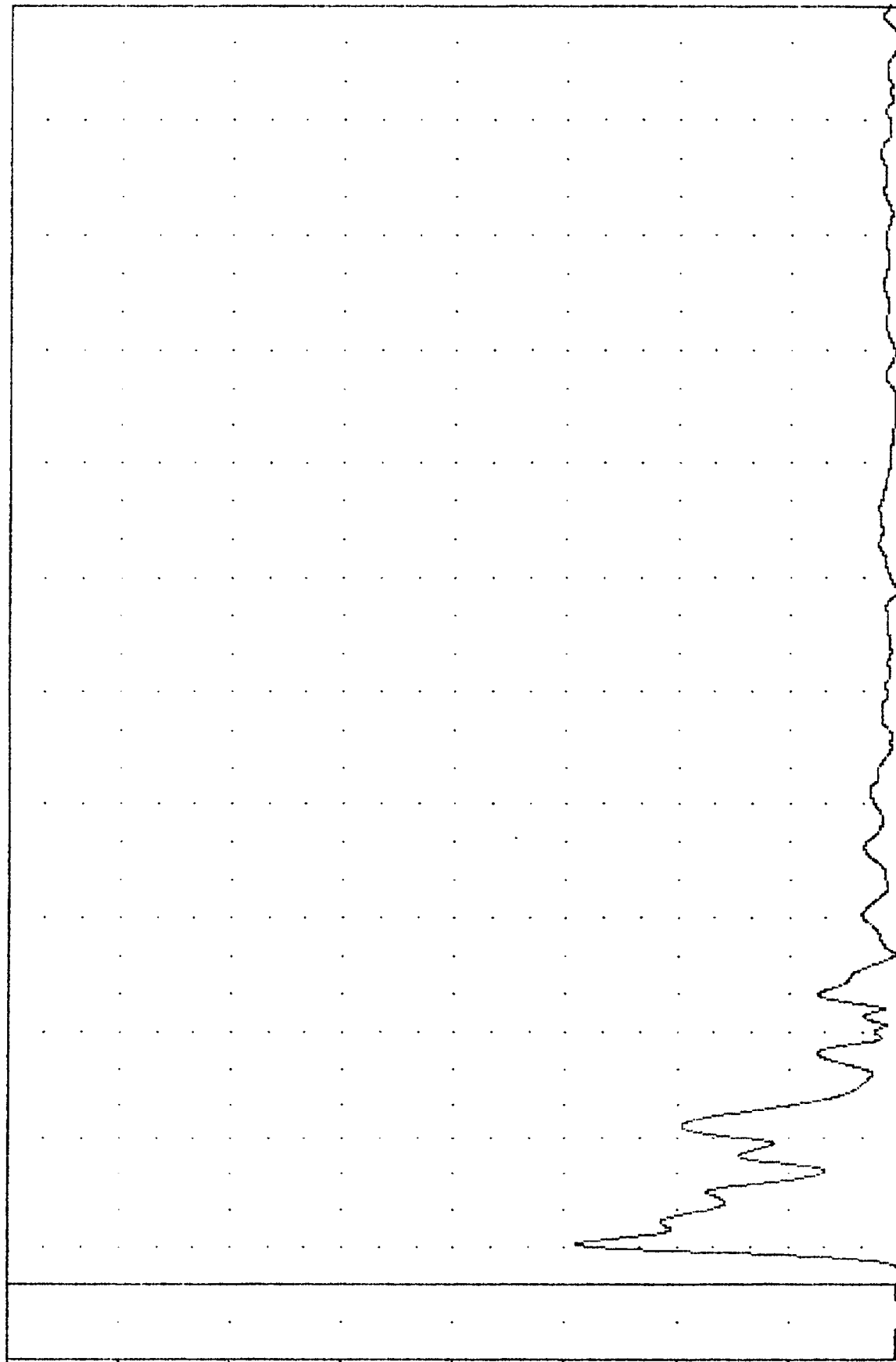
MIN, MAX VALUES = 0.032

-8.13,

29.10 &

10.63

ACCELERATION (G)

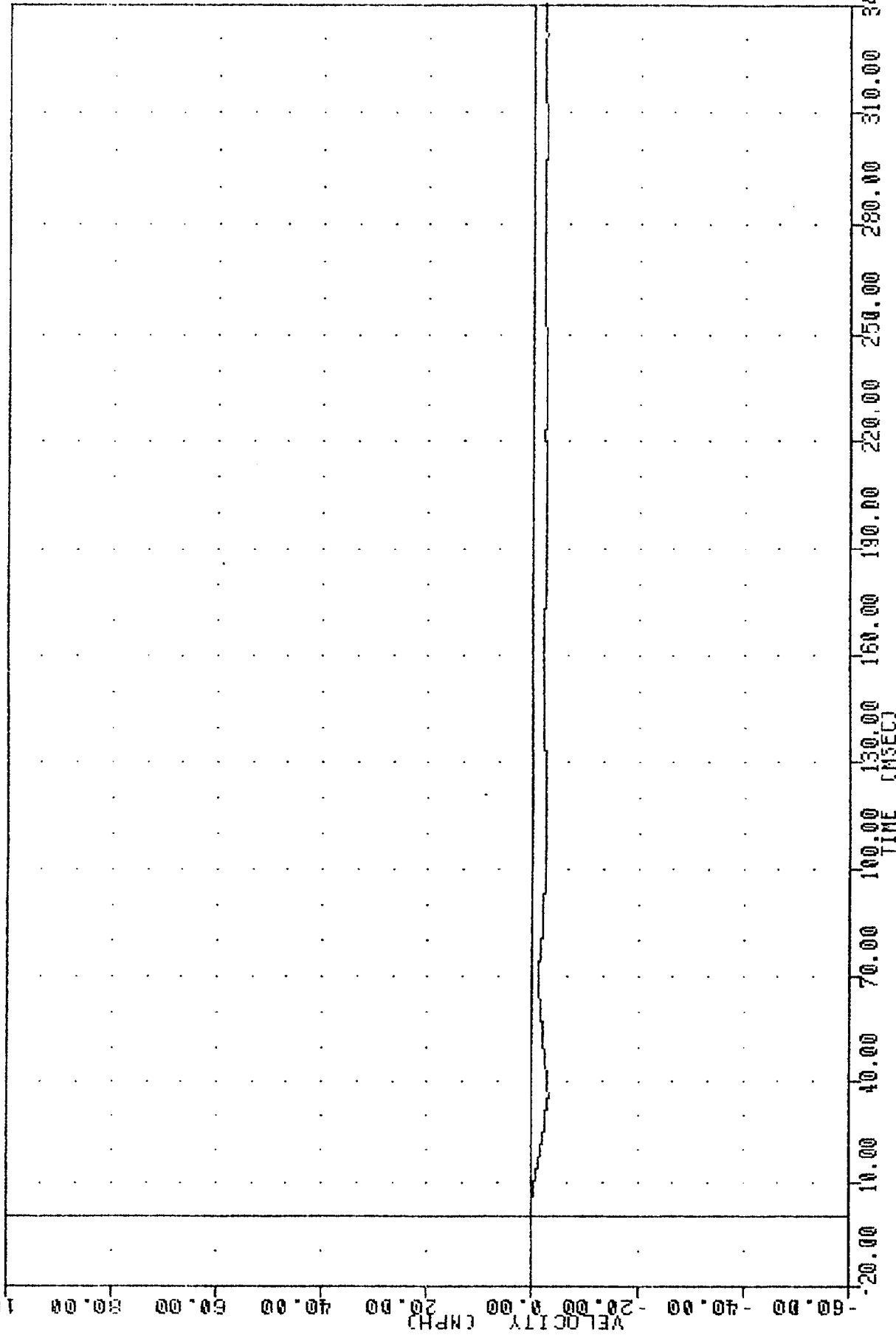


TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL RESULTANT

TRC 031102 7 NOV 83 14:31:52
 EVALUATION OF MOD VW FLEET
 83306001000
 RFSXV1

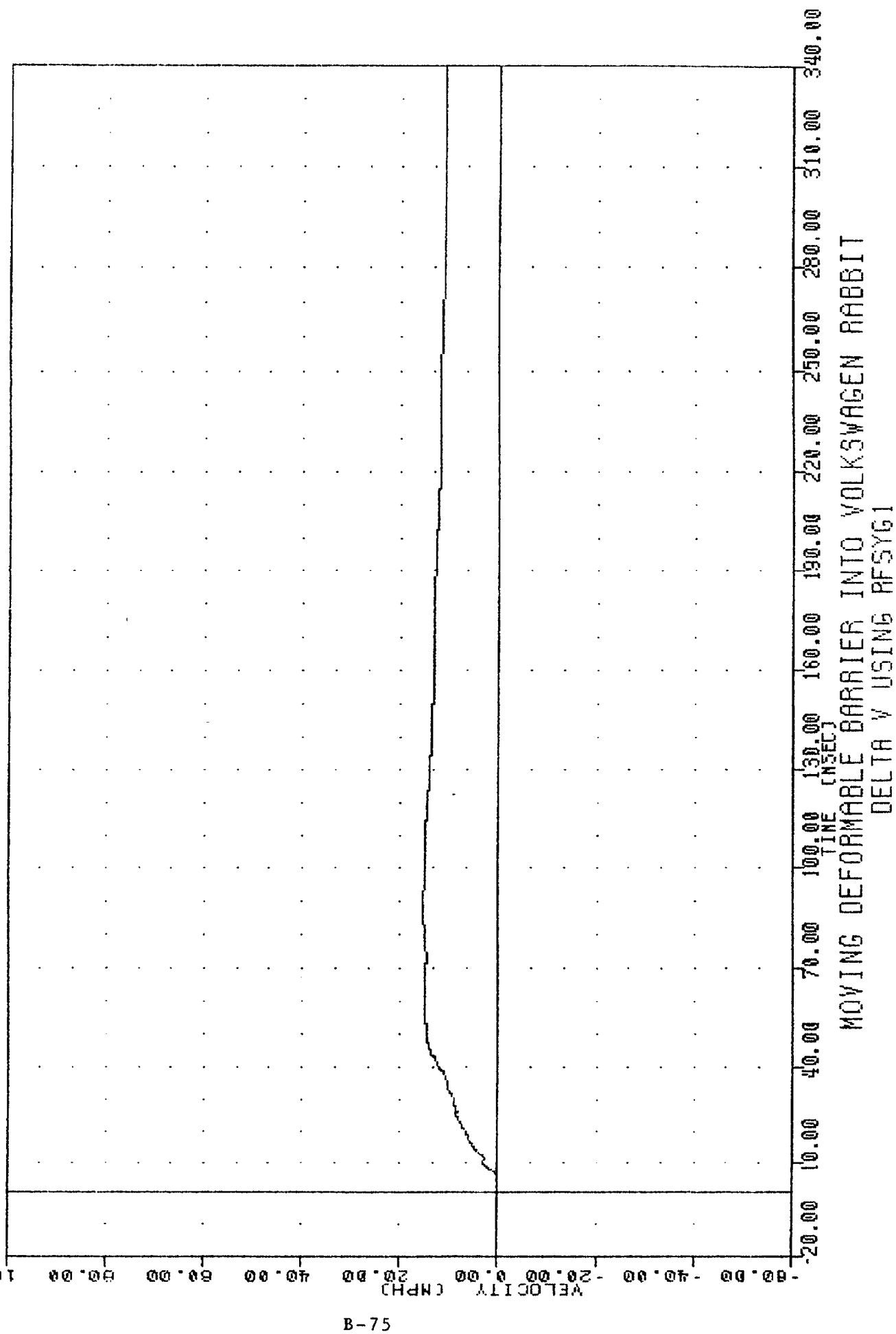
FILTER = BLFF 300/ 949/ -40
 MIN. MAX VALUES = -3.04e 36.13, 0.04 e 2.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING RFSXG1

TAC [REDACTED], 031102 [REDACTED] PLOT DATE [REDACTED] 7 NOV-83 [REDACTED] 14:31:52
 EVALUATION OF MOD VN FLEET
 83306000000
 RFSYV1

FILTER = SLRF 300/ 949/ -40
 MIN, MAX VALUES = -0.01e -17.75 , 15.38 e 89.25



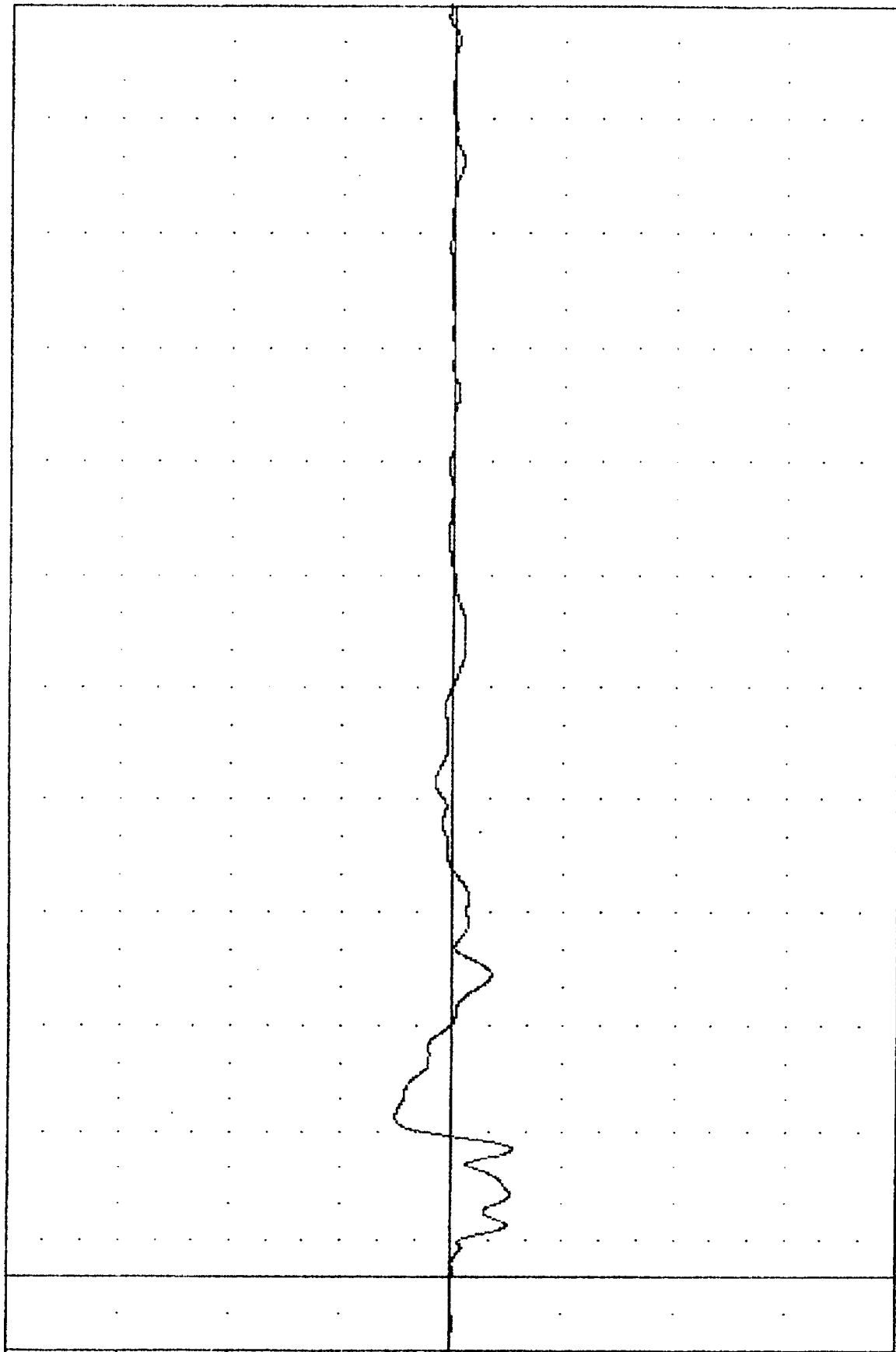
TRC , 831102
 EVALUATION OF MOD VW FLEET
 83305000000
 RRSXG2

PLOT DATE 7-NOV-83 09:20:28

FILTER = 8LPF 100/ 316/ -40

MIN. MAX VALUES = -5.49% 35.25, 5.06 % 44.63

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

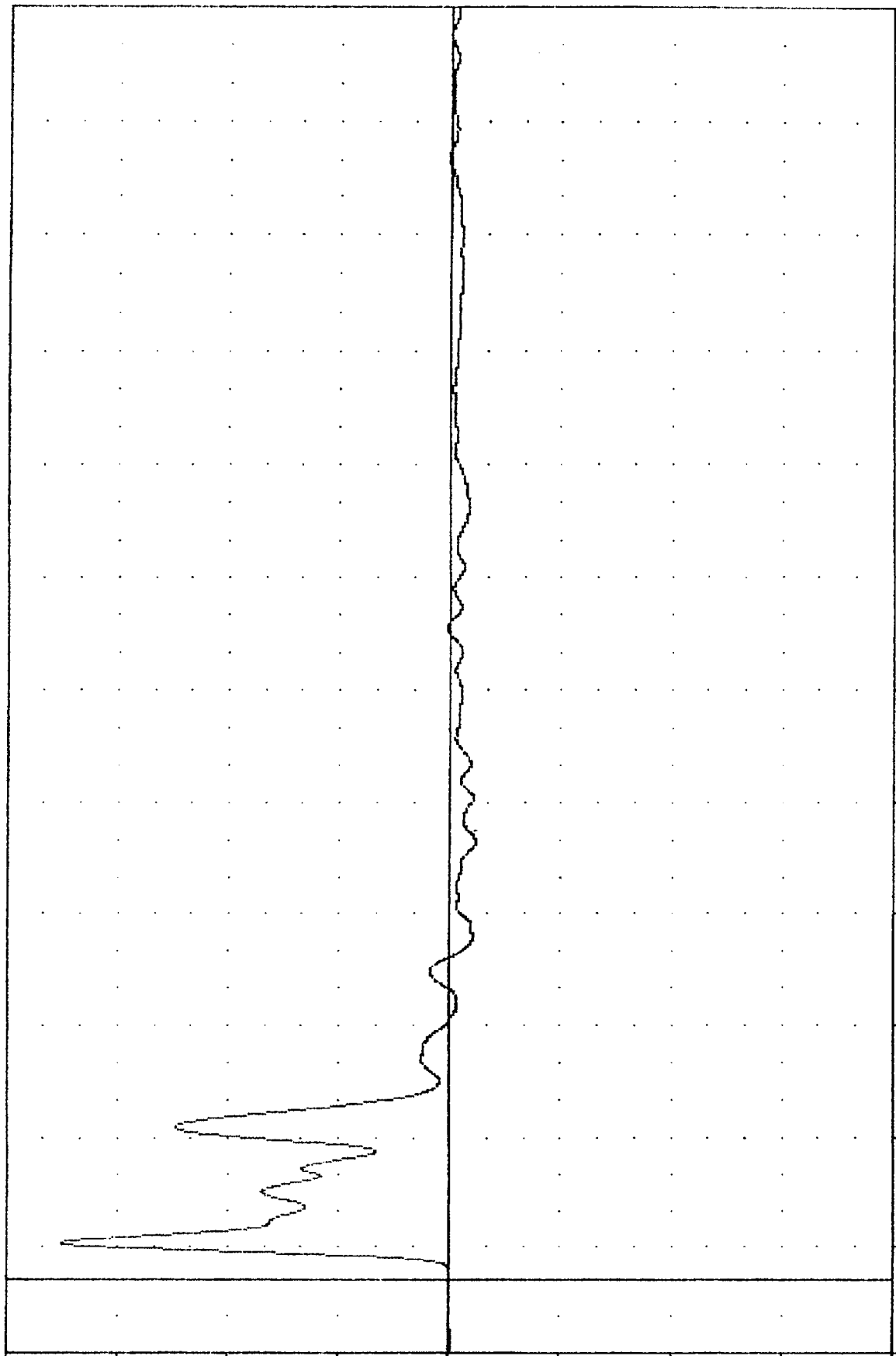
TAC
EVALUATION OF MOD VW FLEET
83306000000
RRSY62

PLOT DATE 7-NOV-83 09:20:28

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -2.268 119.25, 35.09 e 10.63

ACCELERATION (G)

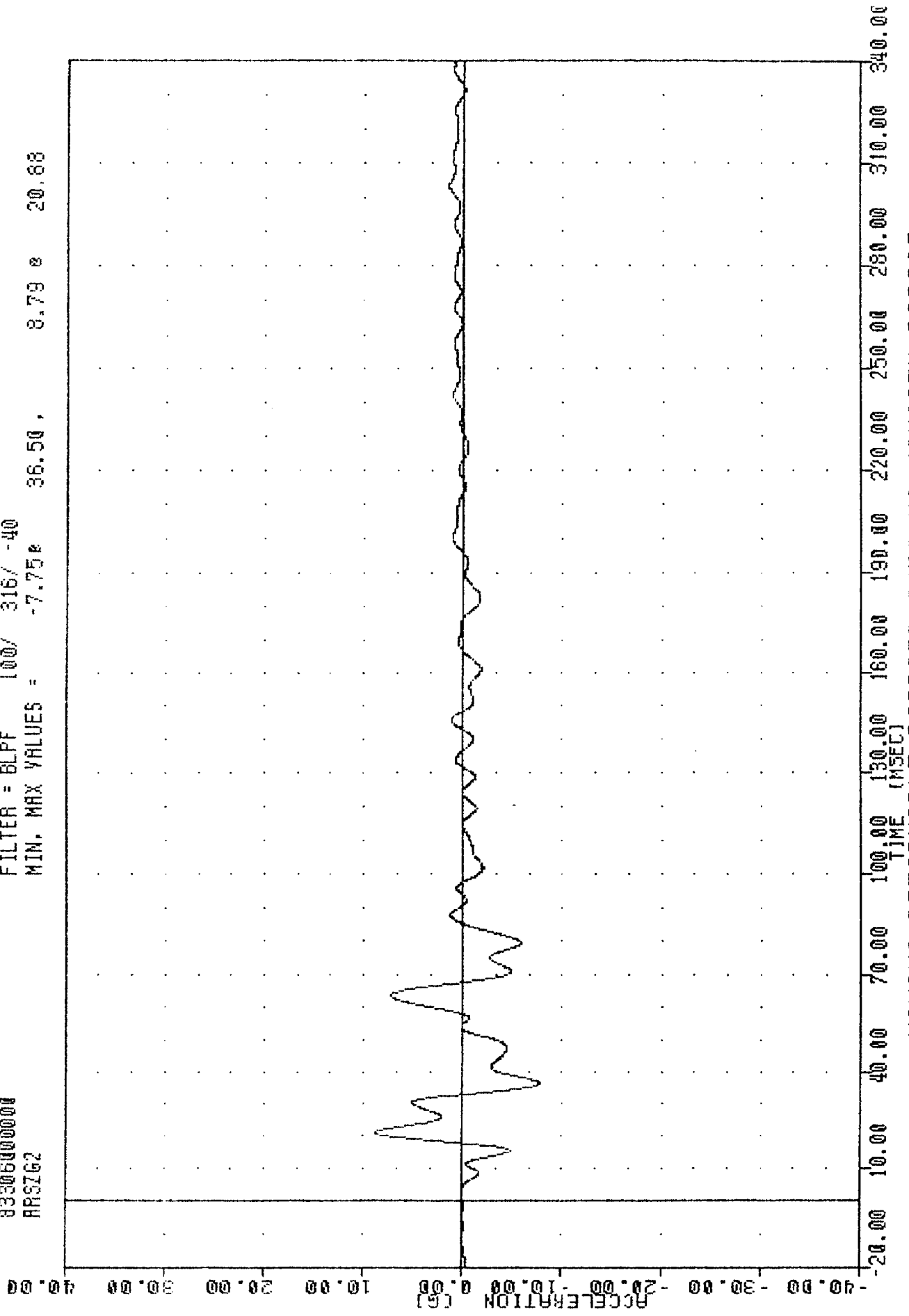


B-77

TIME (msec)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

TRC
 EVALUATION OF MOD VW FLEET
 83306000000
 ARSZG2
 PLOT DATE 7-NOV-68 09:20:28
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -7.75 36.50 8.79 20.68



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

TAC 83J102 PLOT DATE 7-NOV-83 09:26:08

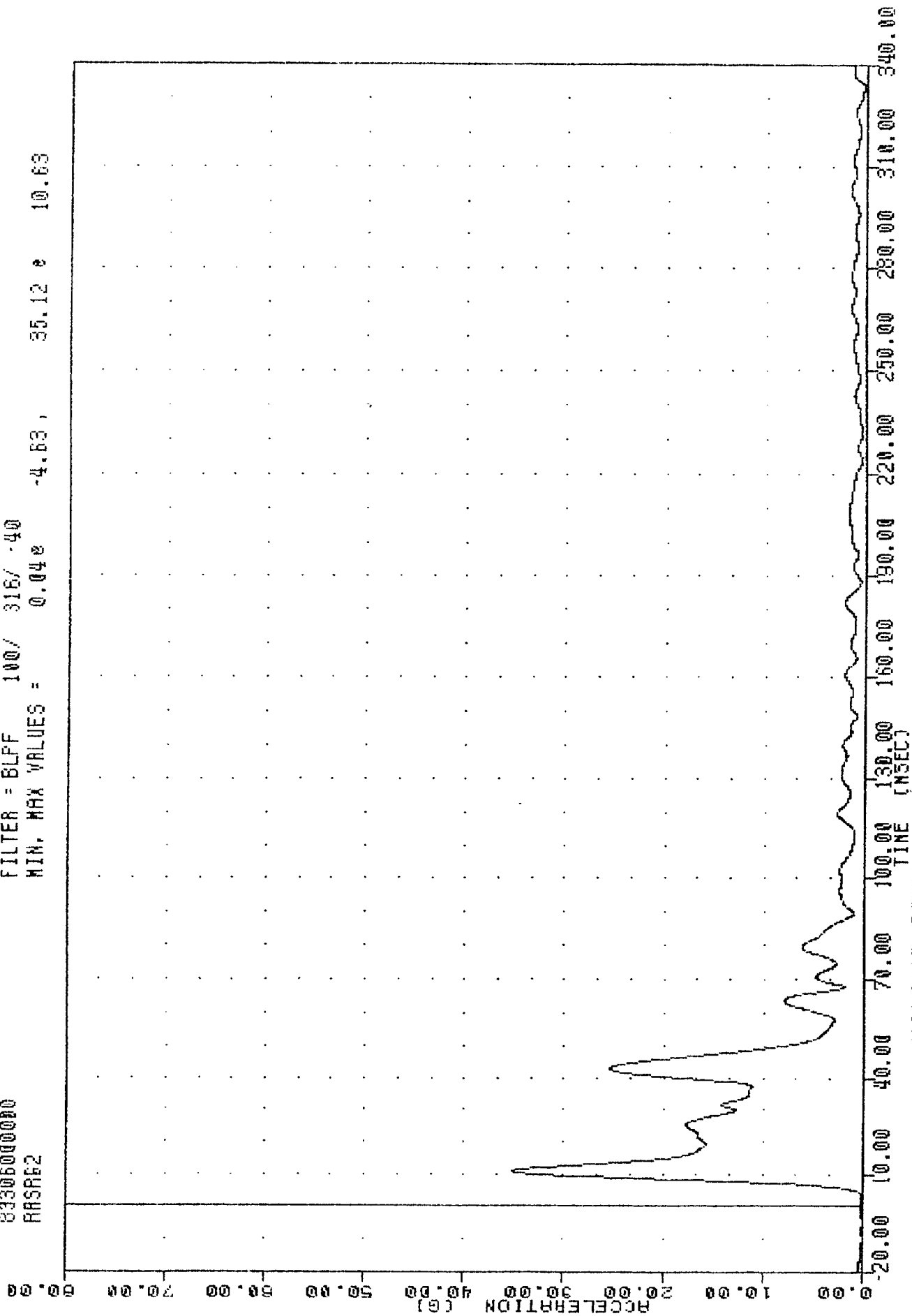
EVALUATION OF MOD VN FLEET

83306000000

RASRE2

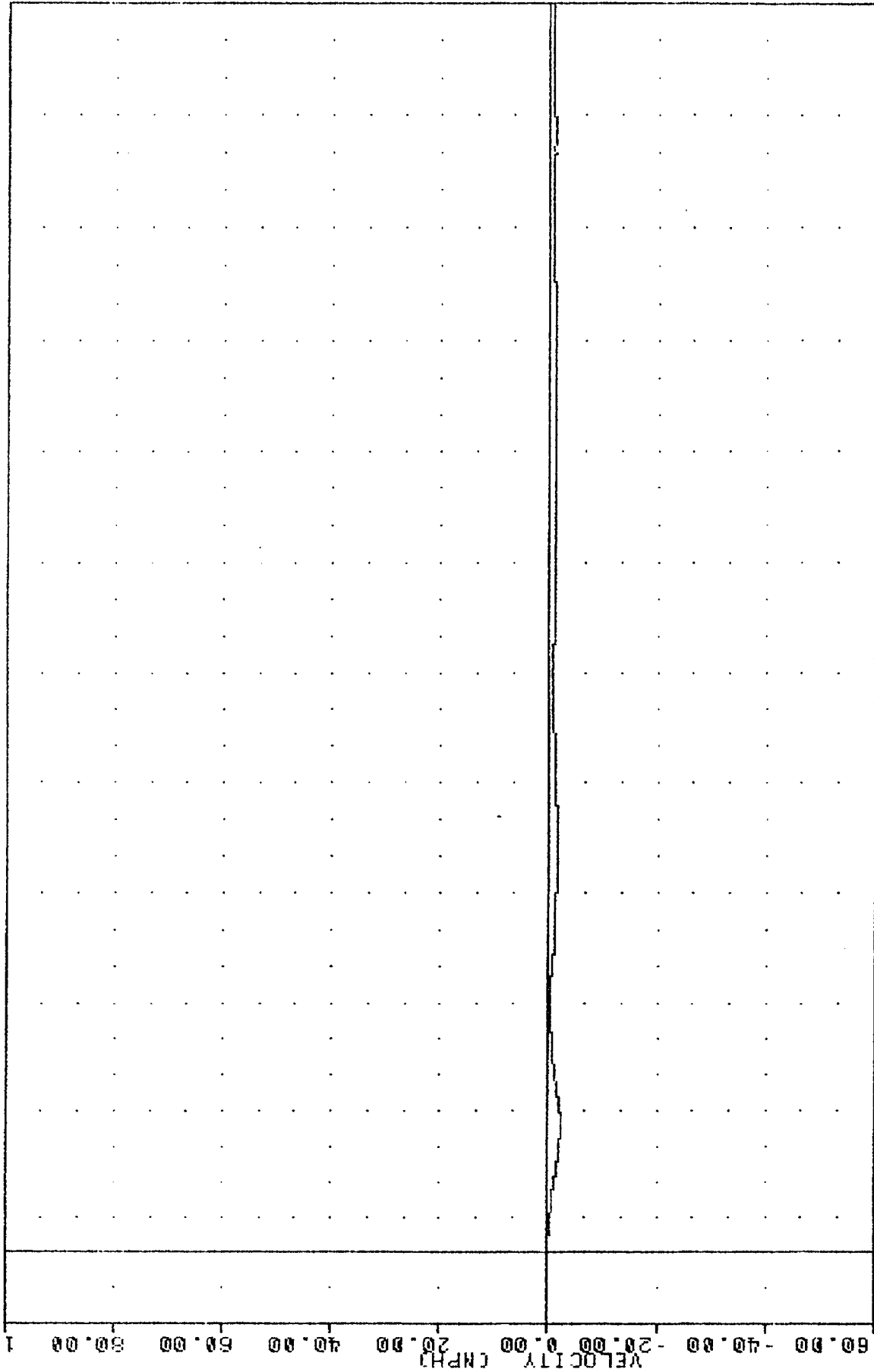
FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = 0.04e -4.63, 35.12 e 10.63



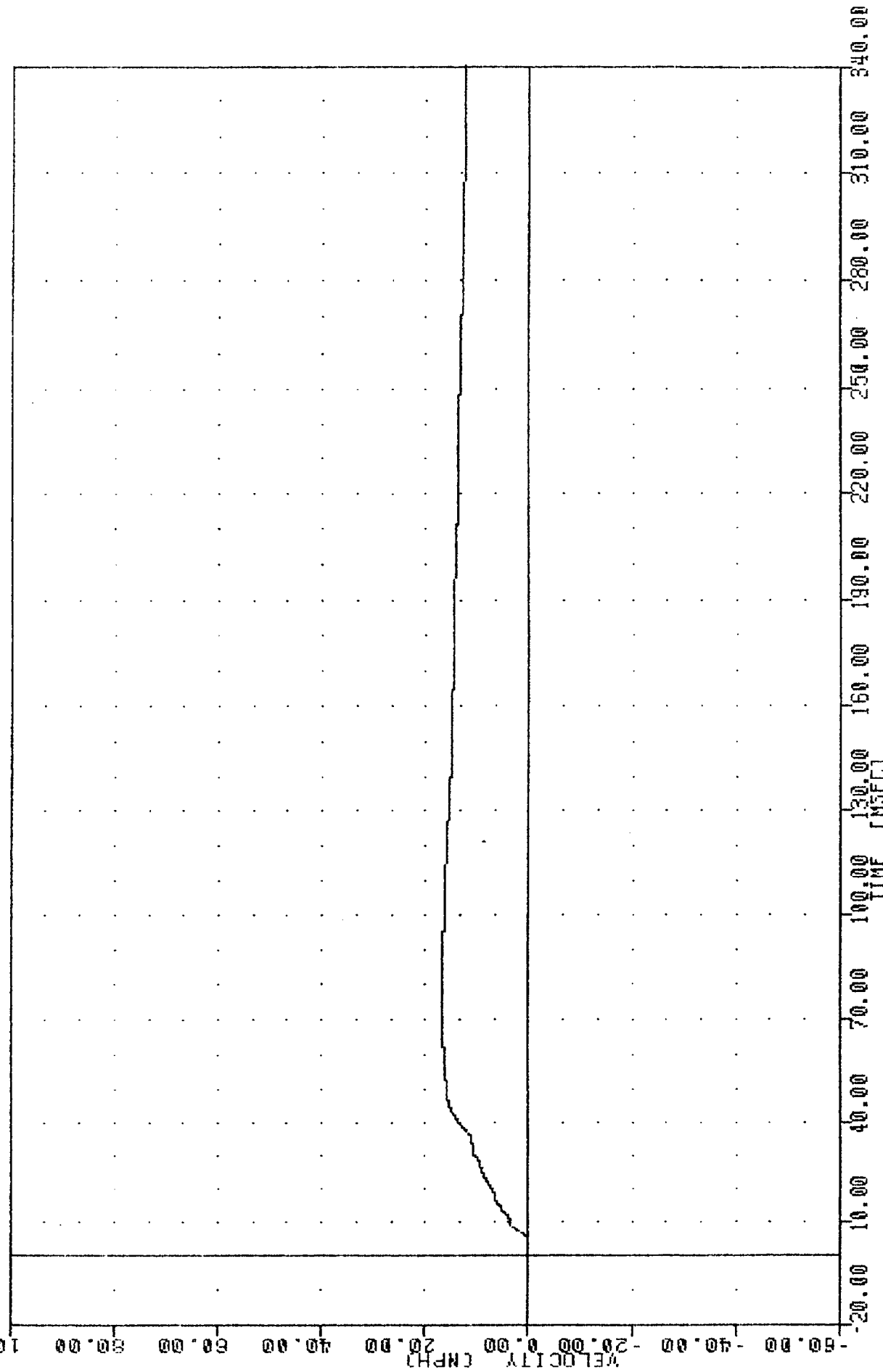
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL RESULTANT

TRC 831102, 831102 PLOT DATE 7-NOV-83 14:31:52
 EVALUATION OF MOD YW FLEET
 833060000000
 RRSXV2
 FILTER = BLFF 300/ 949/ -40
 MIN. MAX VALUES = -2.44 36.00 0.00 -20.00



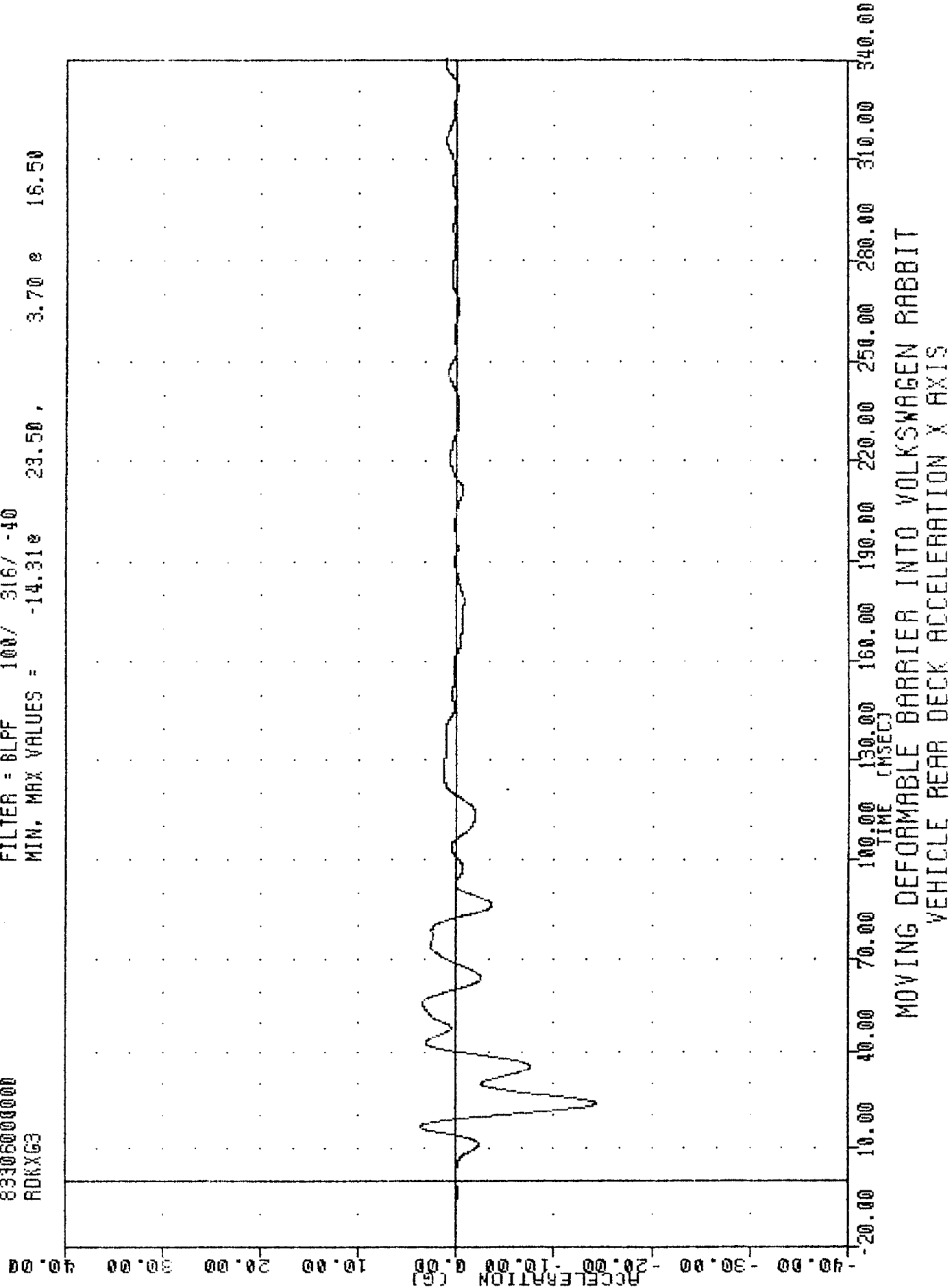
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING RRSXG2

TRC 831102, 831102 PLOT DATE 7 NOV 83 14:31:52
 EVALUATION OF MOD VN FLEET
 83306000000
 RRSYV2
 FILTER = 8LFF 300/ 919/ -40
 MIN, MAX VALUES = -0.018 -9.75, 16.84 & 84.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING RRSY62

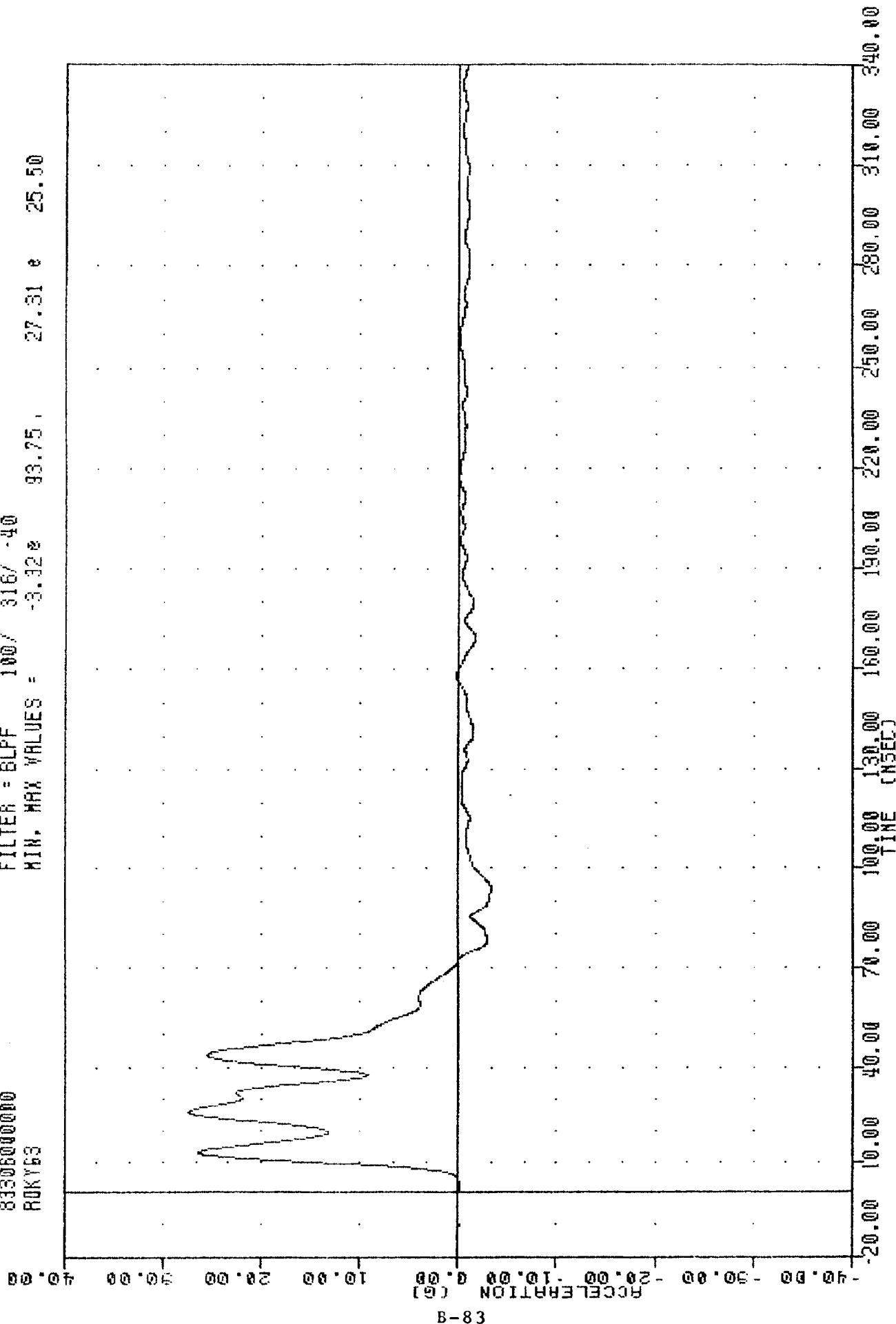
TRC
 EVALUATION OF MOD VN FLEET
 83306000000
 RDKXG3
 PLOT DATE 7-NOV-83 09:20:28
 FILTER = 6LPF 100/ 316/ -40
 MIN. MAX VALUES = -14.318 23.50 , 3.70 16.50



TAC 831102
 EVALUATION OF MOD VN FLEET
 83306000000
 ROKY63

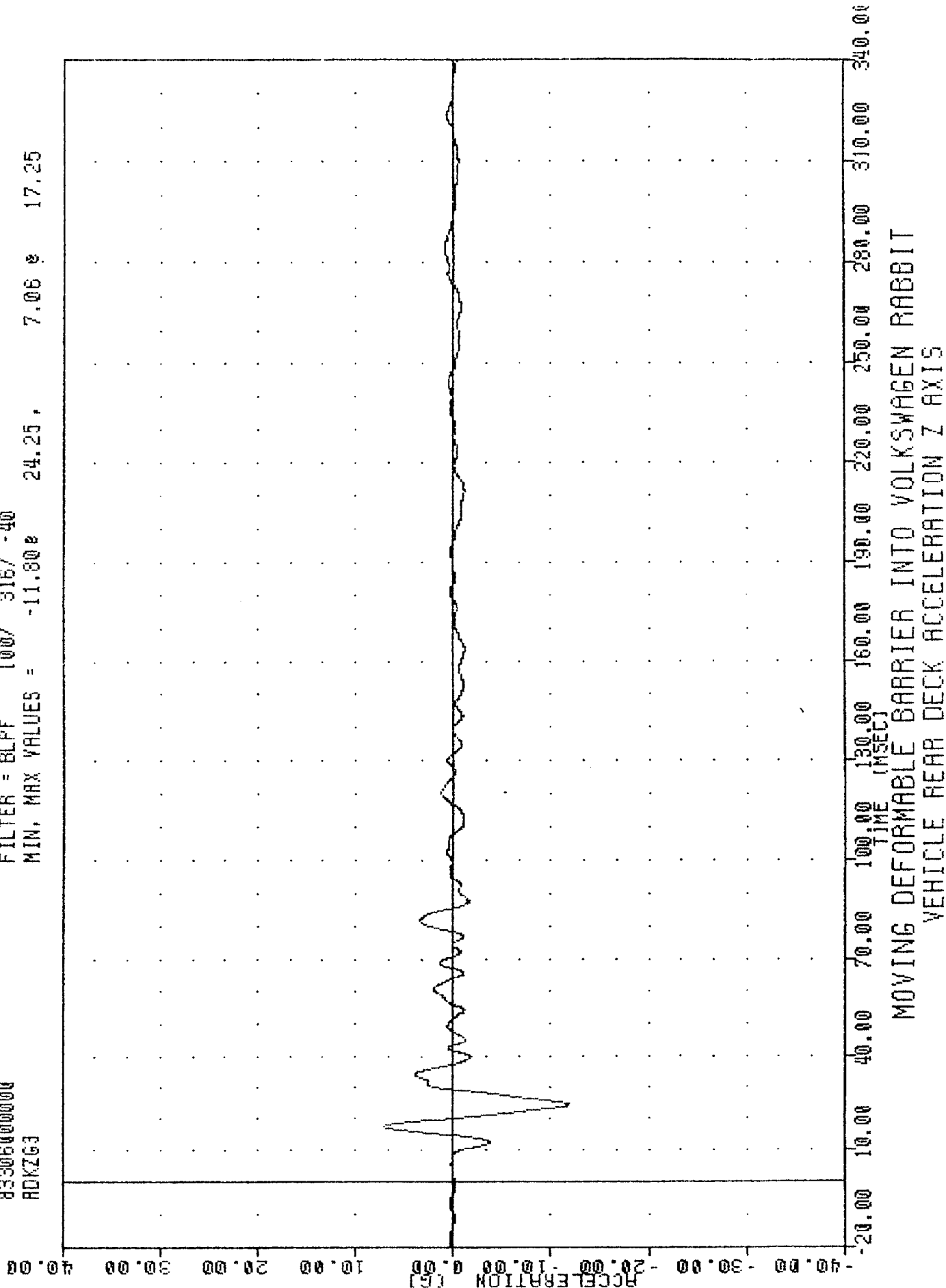
PLOT DATE 7-NOV-83 09:20:20

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -3.328 93.75 27.31 e 25.50



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

TRC 831102, 831102 PLOT DATE 7-MAY-83 09:20:28
 EVALUATION OF MOD YN FLEET
 83306000000
 RDKZG3
 FILTER = BLFF 100/ 315/ -40
 MIN. MAX VALUES = -11.80 24.25, 7.06 17.25



TRC

, 831102

PLOT DATE

7-NOV-83

09:28:08

EVALUATION OF MOD YW FLEET

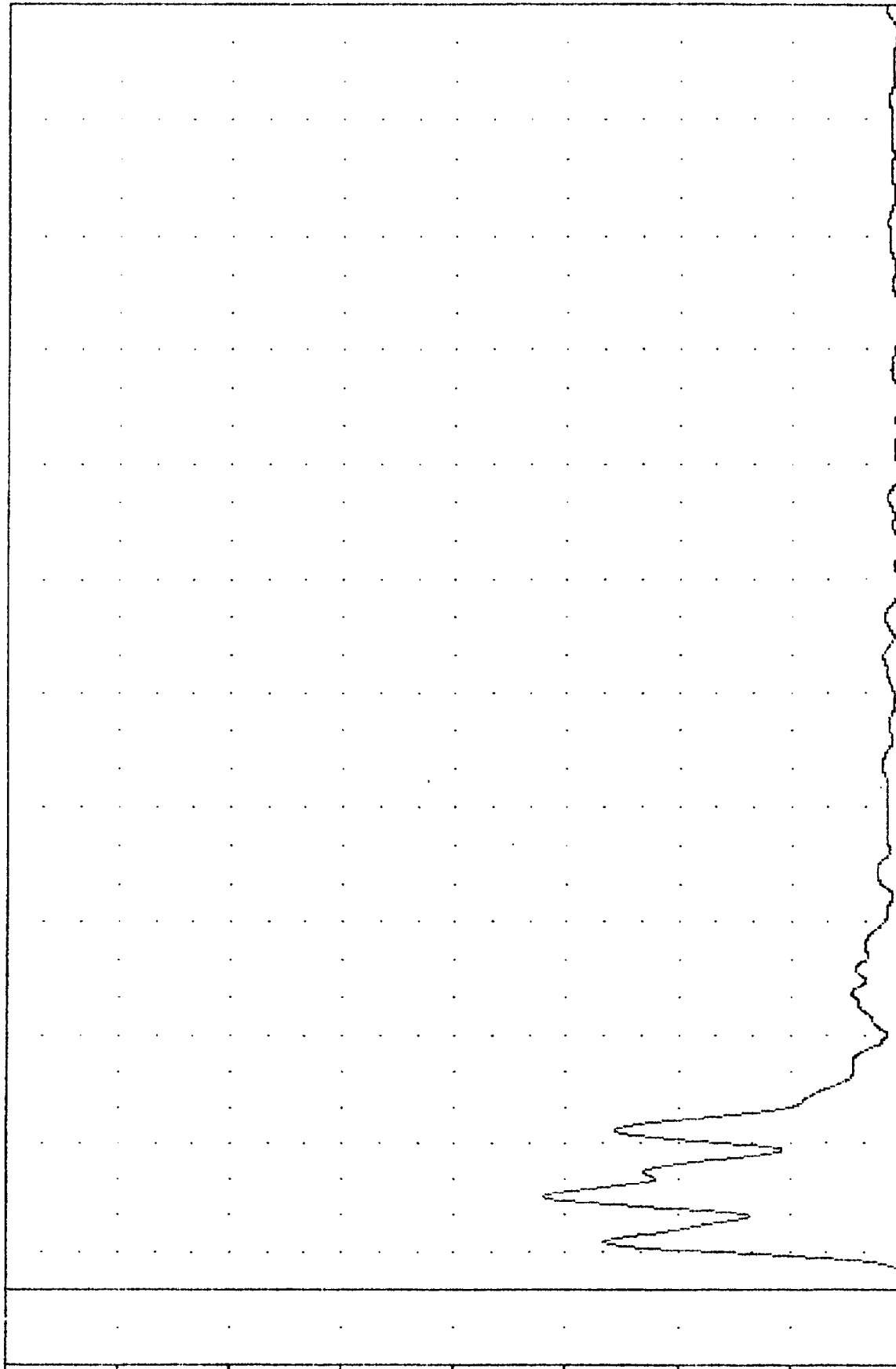
833060000000

ADKRG3

FILTER = 8LPF 100/ 316/ -40

MIN. MAX VALUES = 0.06g -13.50 , 31.95 g 24.63

ACCELERATION (G)



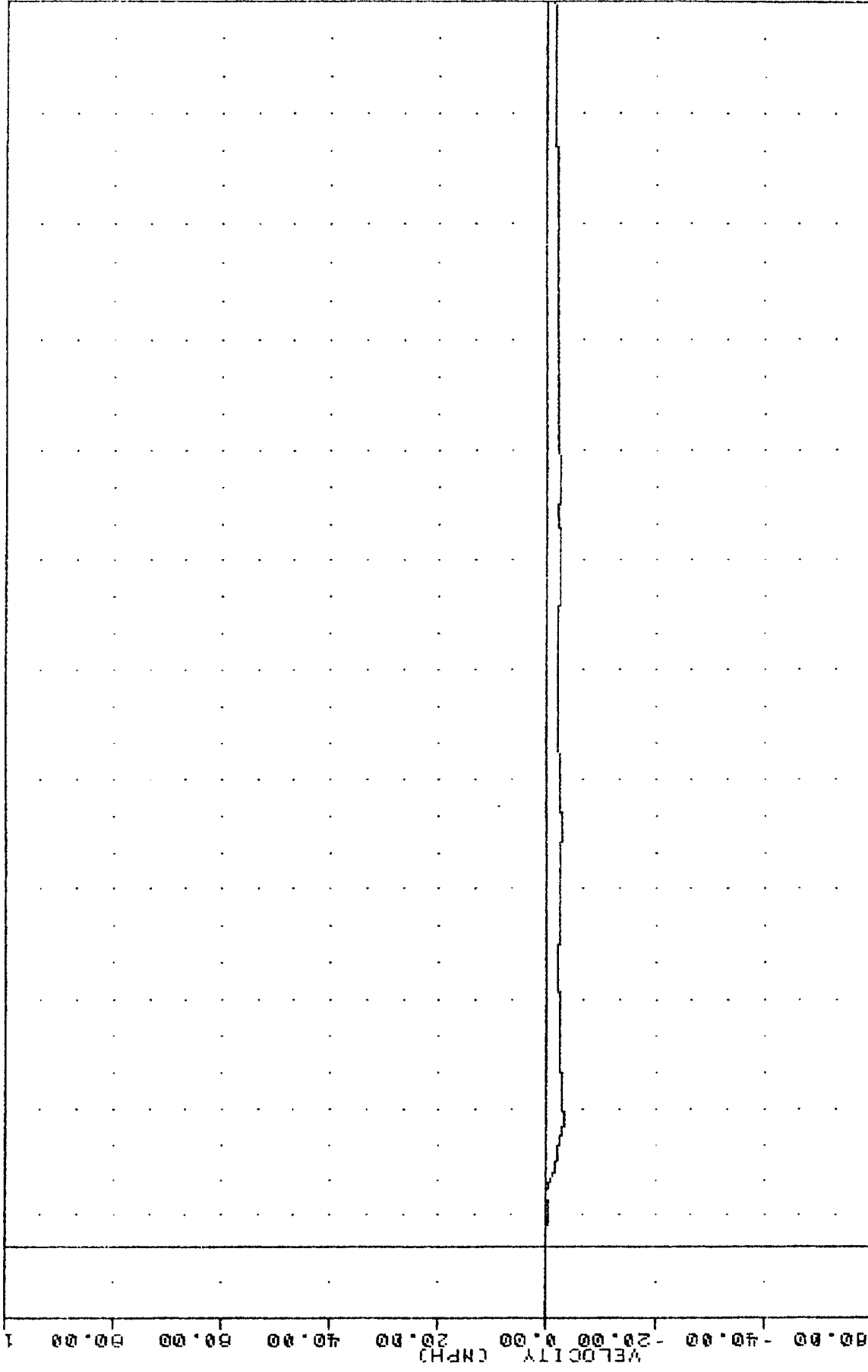
0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK RESULTANT

TRC [REDACTED], 831102 [REDACTED] PLOT DATE [REDACTED] 7-MAY-83 [REDACTED] 14:31:52
 EVALUATION OF MOD VN FLEET
 83306000000
 ROKXV3

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -3.10% 37.25, 0.13% 15.50

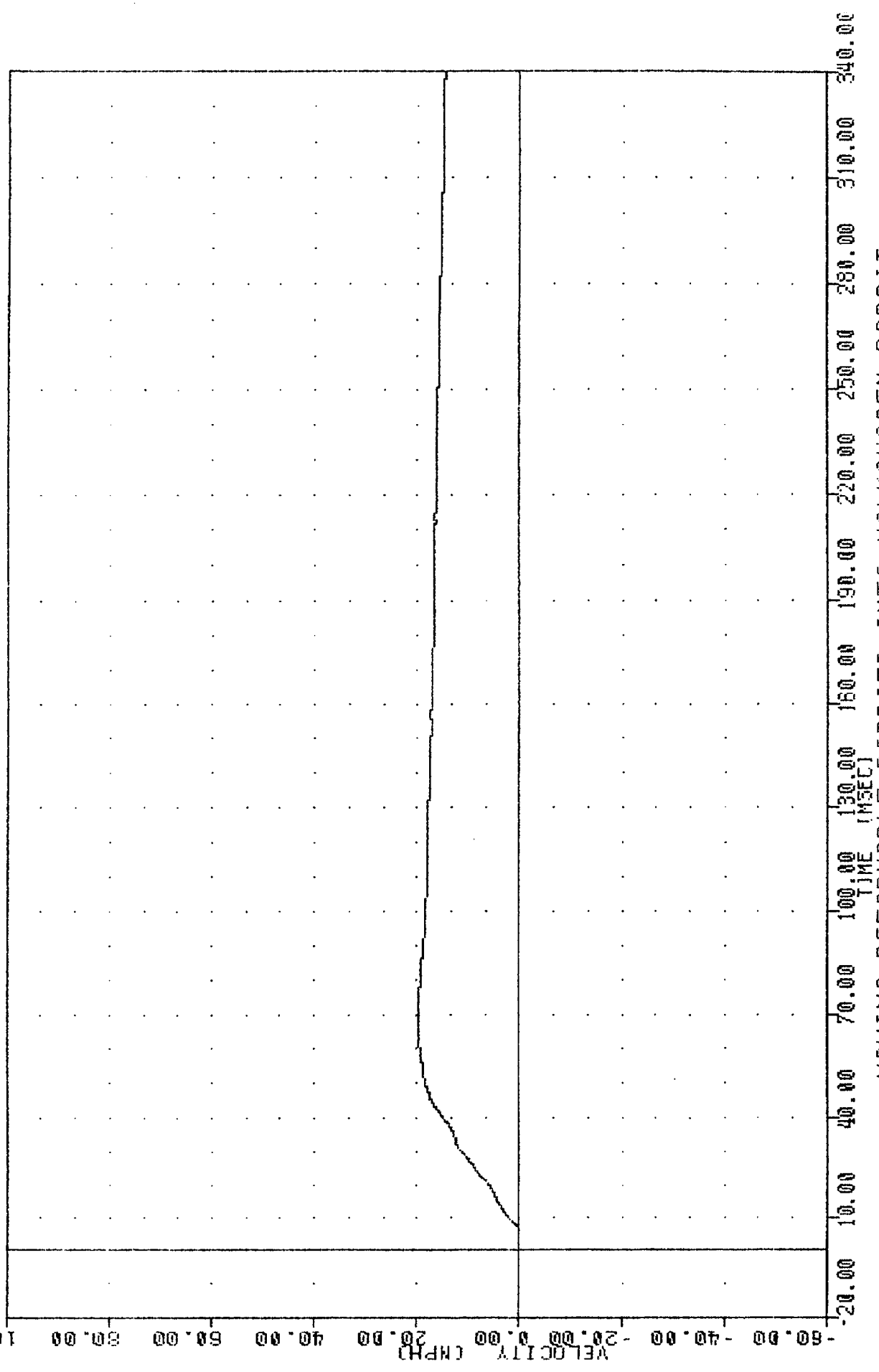


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (CNSEC)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING ROKXG3

TRC 03T102 PLOT DATE 7-MAY-83 14:31:52

EVALUATION OF MOD YW FLEET
83306000000
RDKYV3

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.018 2.63, 19.60 @ 69.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA W USING RDKY63

TRC 831102 PLOT DATE 7-MAY-83 09:20:28

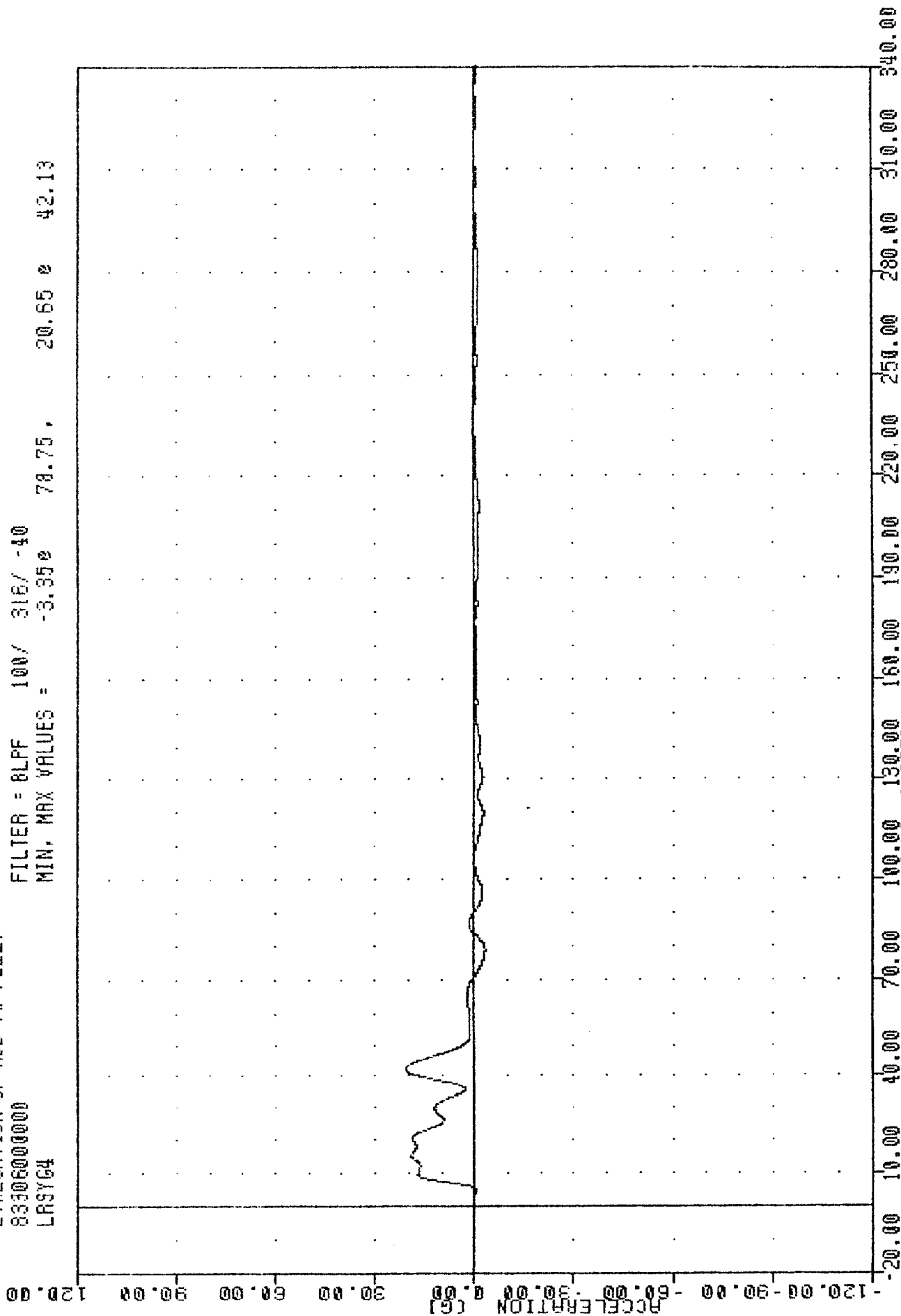
EVALUATION OF MOD VN FLEET

83306000000

LR5Y64

FILTER = 8LFF 100/ 316/ -40

MIN. MAX VALUES = -3.35e 78.75, 20.65 e 42.13



TRC [REDACTED] , 031102 [REDACTED]
[REDACTED] PLOT DATE [REDACTED] 7-MAY-83 [REDACTED] 19:31:52

██████████, 051102

[REDACTED]

[REDACTED] 2

[REDACTED]

[REDACTED]

[REDACTED]
 [REDACTED]
 [REDACTED]

PLOT DATE 7-MAY-83 14:31

PLC DATE 7-NOV-83

☐ ☐ ☐ ☐ ☐



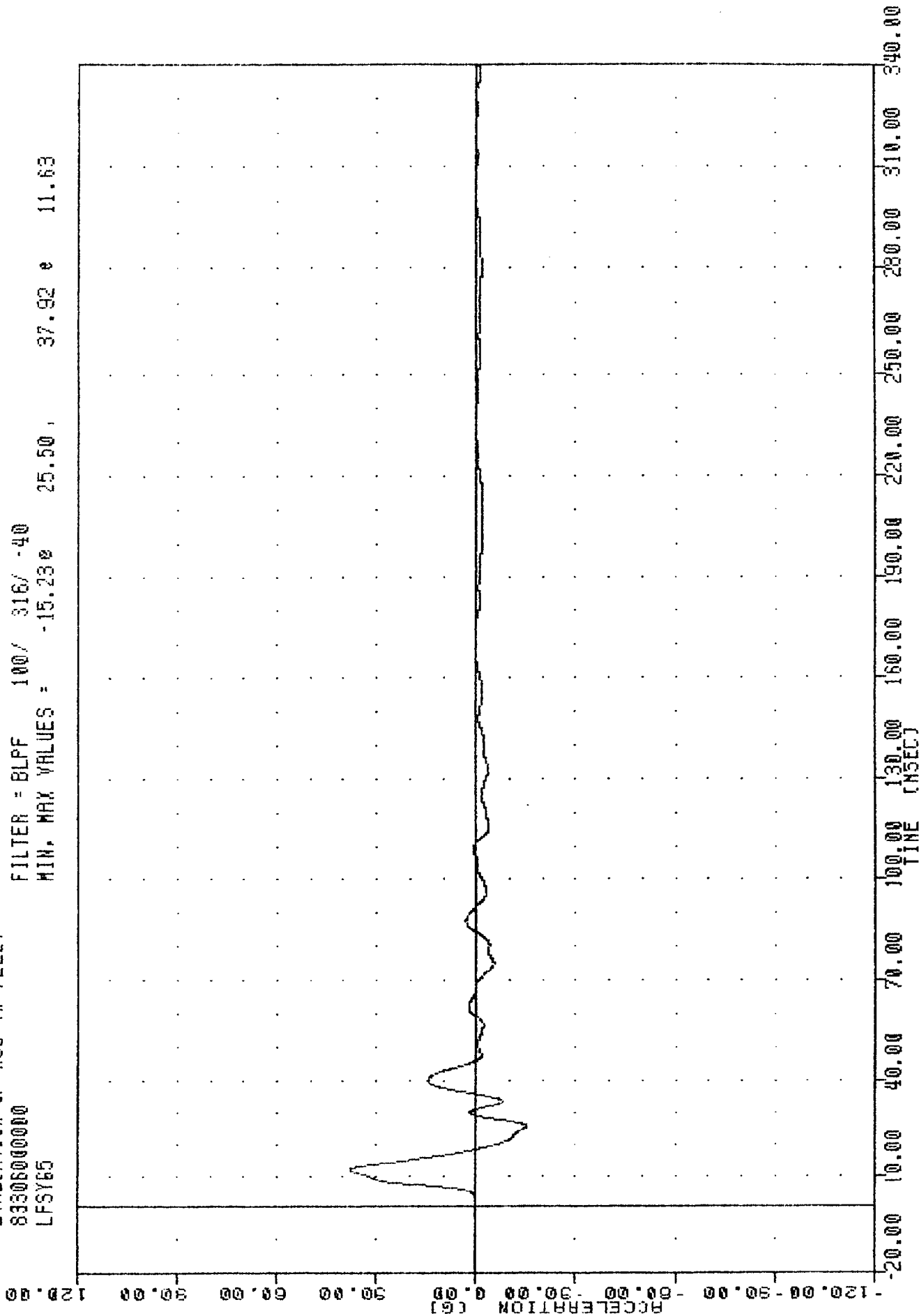
1102 [REDACTED] PLOT DATE [REDACTED] 7-NOV-83 19:31:52 [REDACTED]

DATE 7-MAY-83 19:31:56

TRC 831102
 EVALUATION OF MOD VEHICLE FLEET
 83305000000
 LFSY65

PLOT DATE 7-NOV-83 09:20:28

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -15.230 25.50 37.92 e 11.63

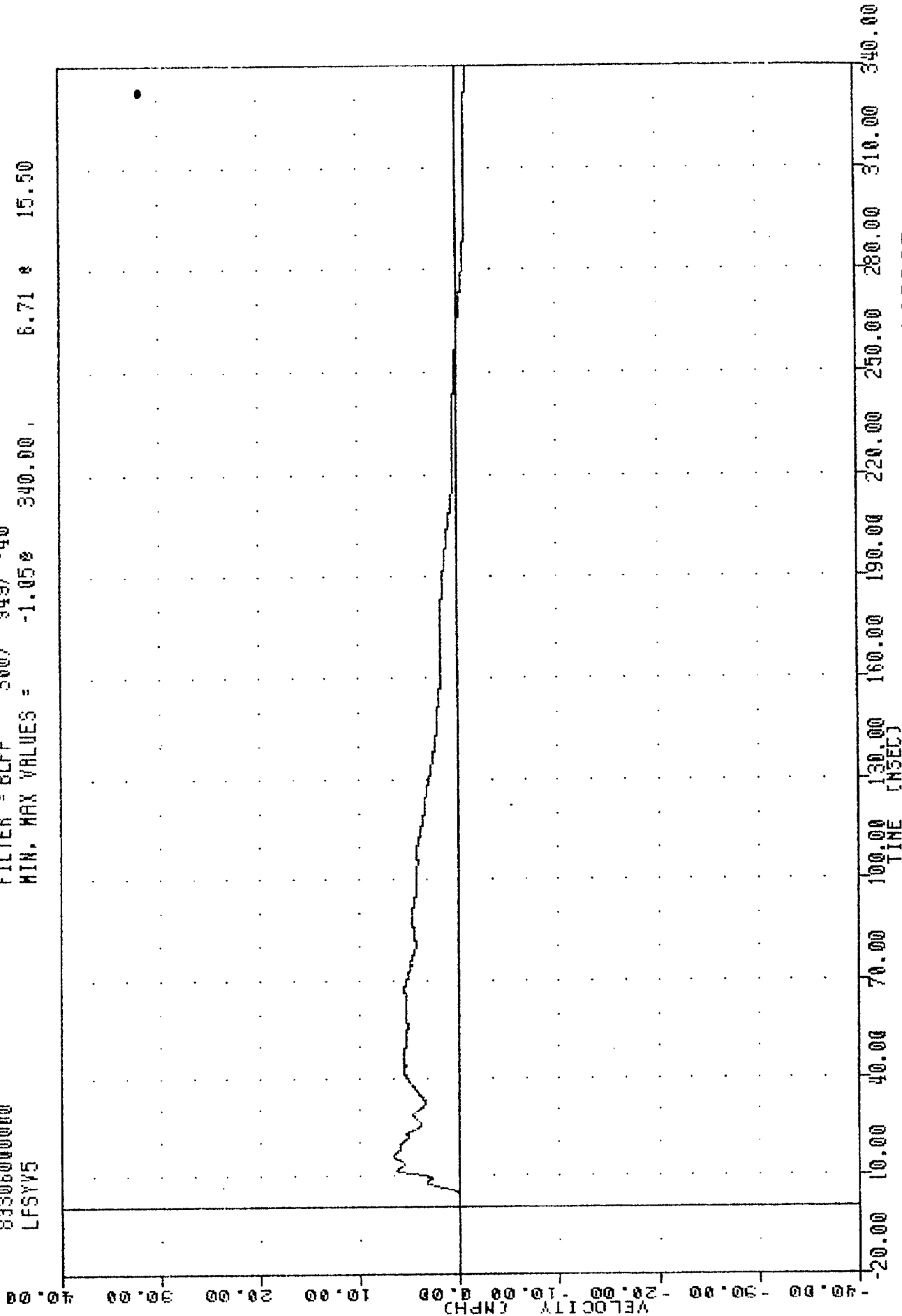


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS

TAC 831102
 EVALUATION OF MOD VW FLEET
 83306000000
 LFSYV5

PLOT DATE 7-NOV-83 14:31:52

FILTER = 8LFF 300/ 949/ -40
 MIN. MAX VALUES = -1.052 340.00 6.71 15.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LFSYG5

TRC 831102 PLOT DATE 7-MOV-83 09:20:28

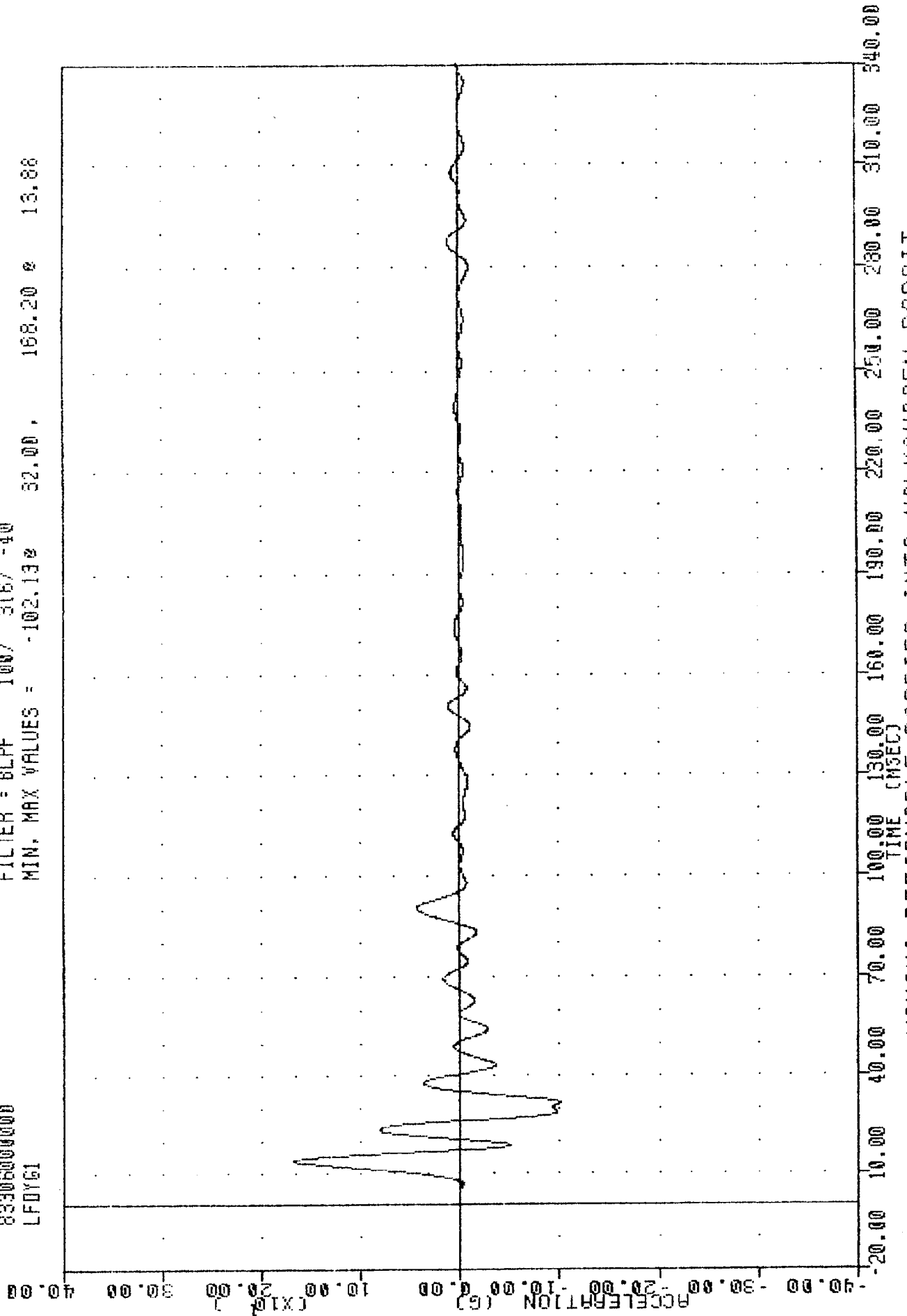
EVALUATION OF MOD YW FLEET

833060000000

LFOY61

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -102.13 32.00, 168.20 13.88



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

TRC 831102 PLOT DATE 7-NOV-83 14:31:52

EVALUATION OF MOD VW FLEET

83306000000

LFDYV1

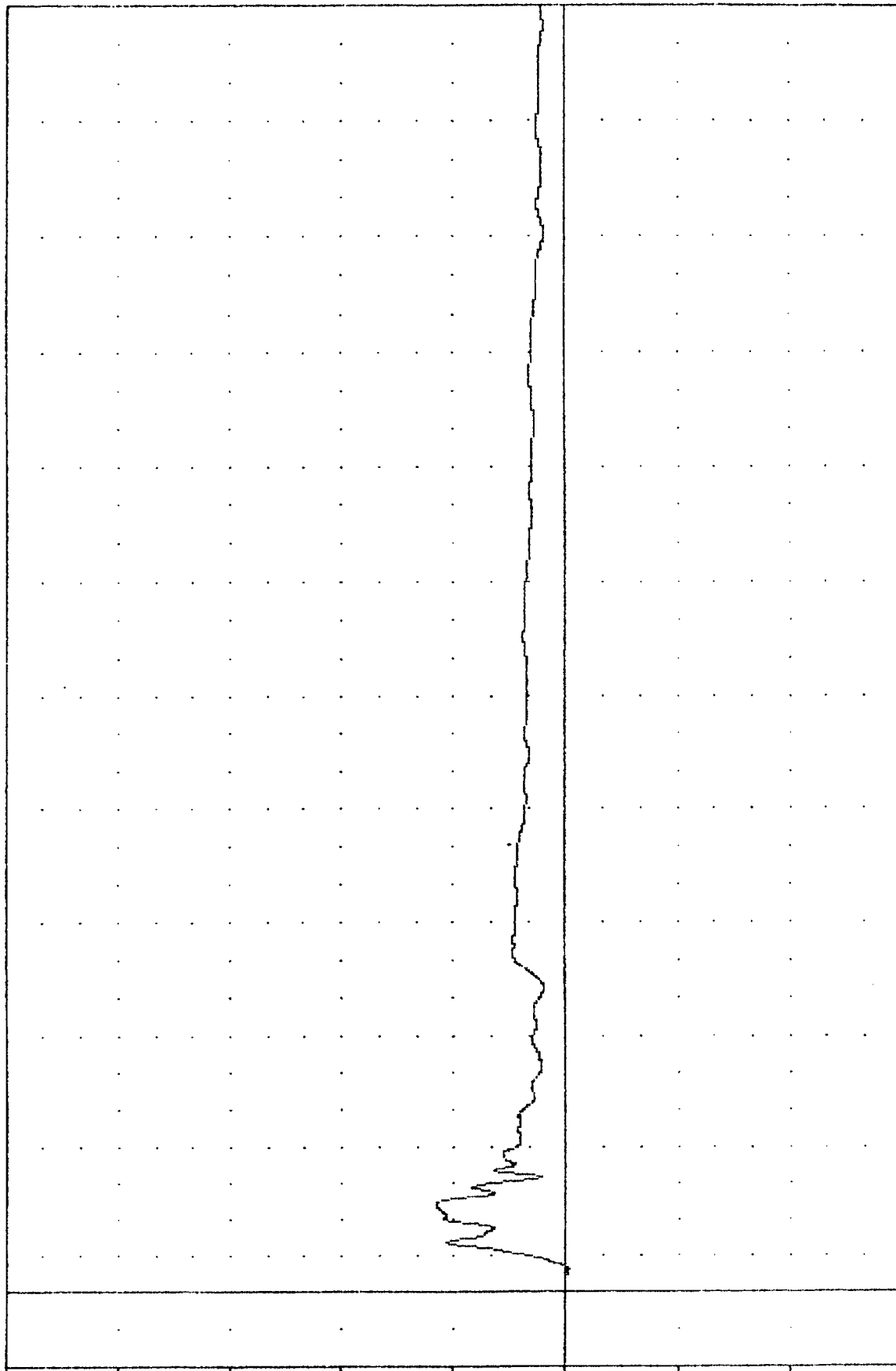
FILTER = BLFF 300/ 949/ -40

MIN. MAX VALUES = -0.482

6.13, 23.02 24.13

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

VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYGI

TAC

831102

PLOT DATE

7-NOV-83

09:20:28

EVALUATION OF MOD YN FLEET

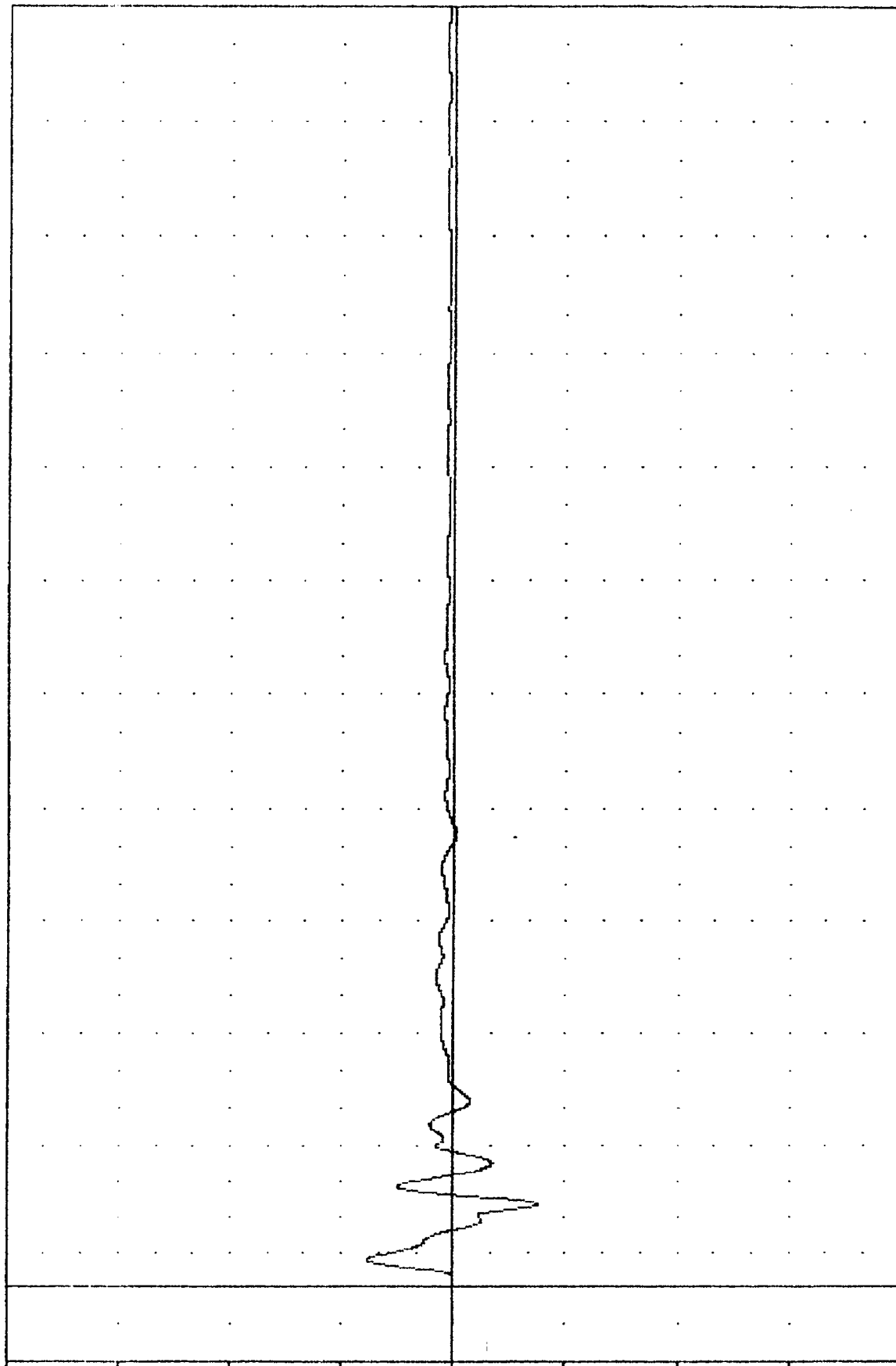
833060000000

LFOY62

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -76.30e 23.25, 77.85 e 7.63

ACCELERATION (G)
(X10²)



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

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

TRC

831102

PLOT DATE

7 NOV 83

14:31:52

EVALUATION OF MOD V/W FLEET

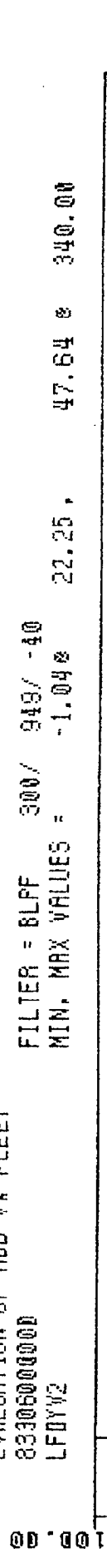
83306000000

LFOYV2

FILTER = 8LFF 300/ 949/ -40

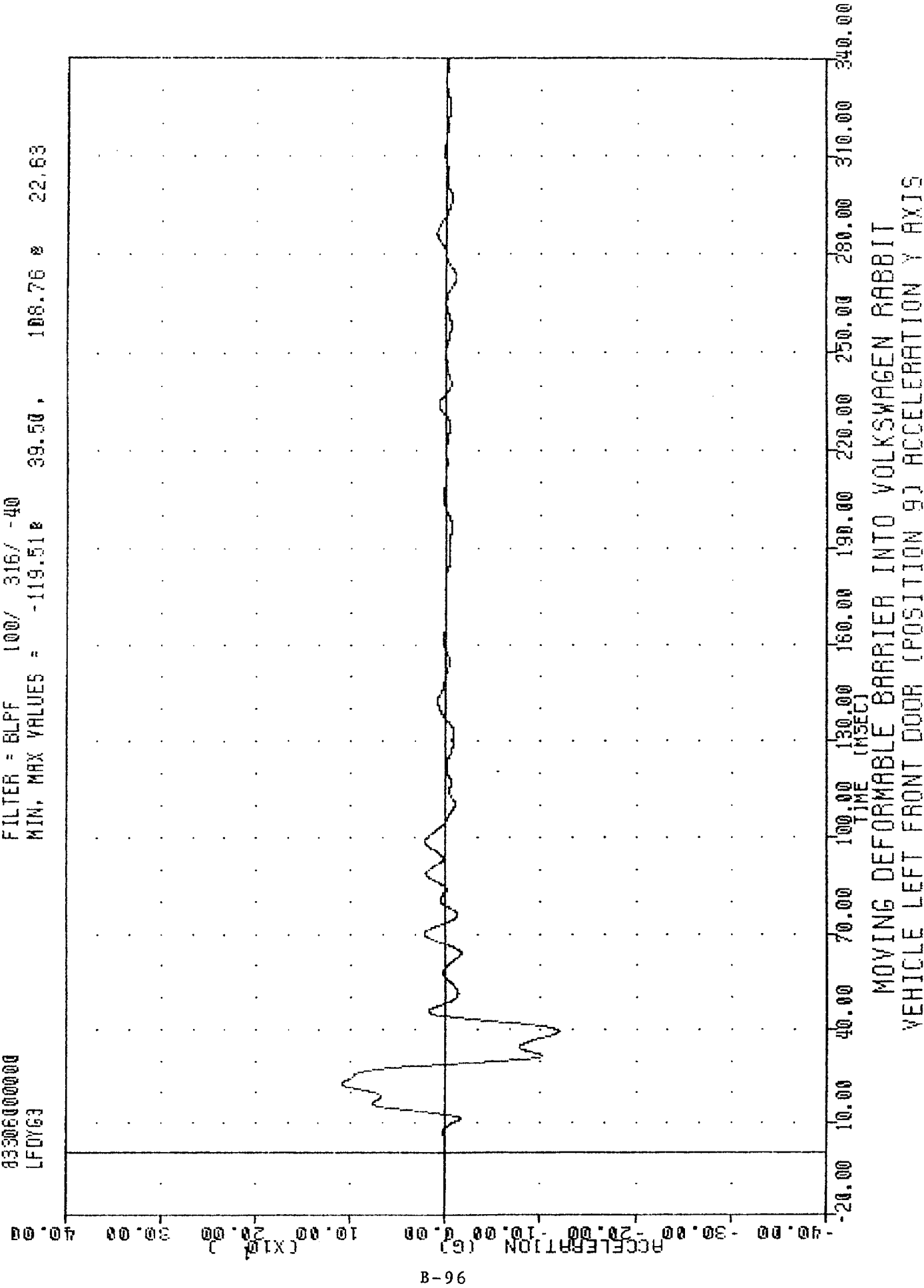
MIN. MAX VALUES = -1.048

22.25, 47.64 & 340.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFOY62

TRC , 831102
 EVALUATION OF MOD YH FLEET
 83306000000
 LFOY63
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -119.518 39.50 , 108.76 22.63
 PLOT DATE 7-NOV-85 09:20:28



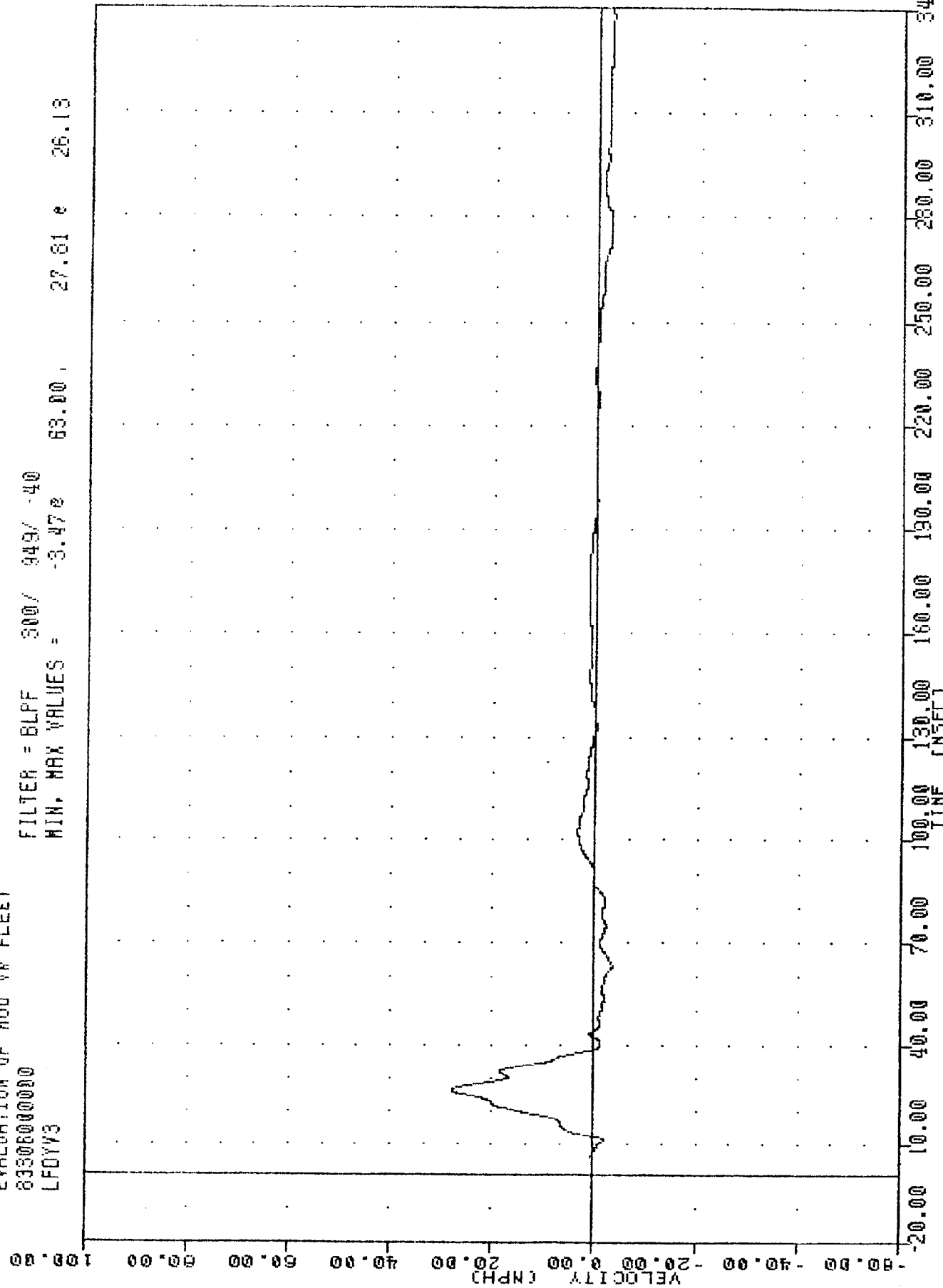
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE LEFT FRONT DOOR (POSITION 9) ACCELERATION Y AXIS

TRC 831102
EVALUATION OF MOD VW FLEET
83306000000
LFDYV3

PLOT DATE 7-MAY-83 14:31:52

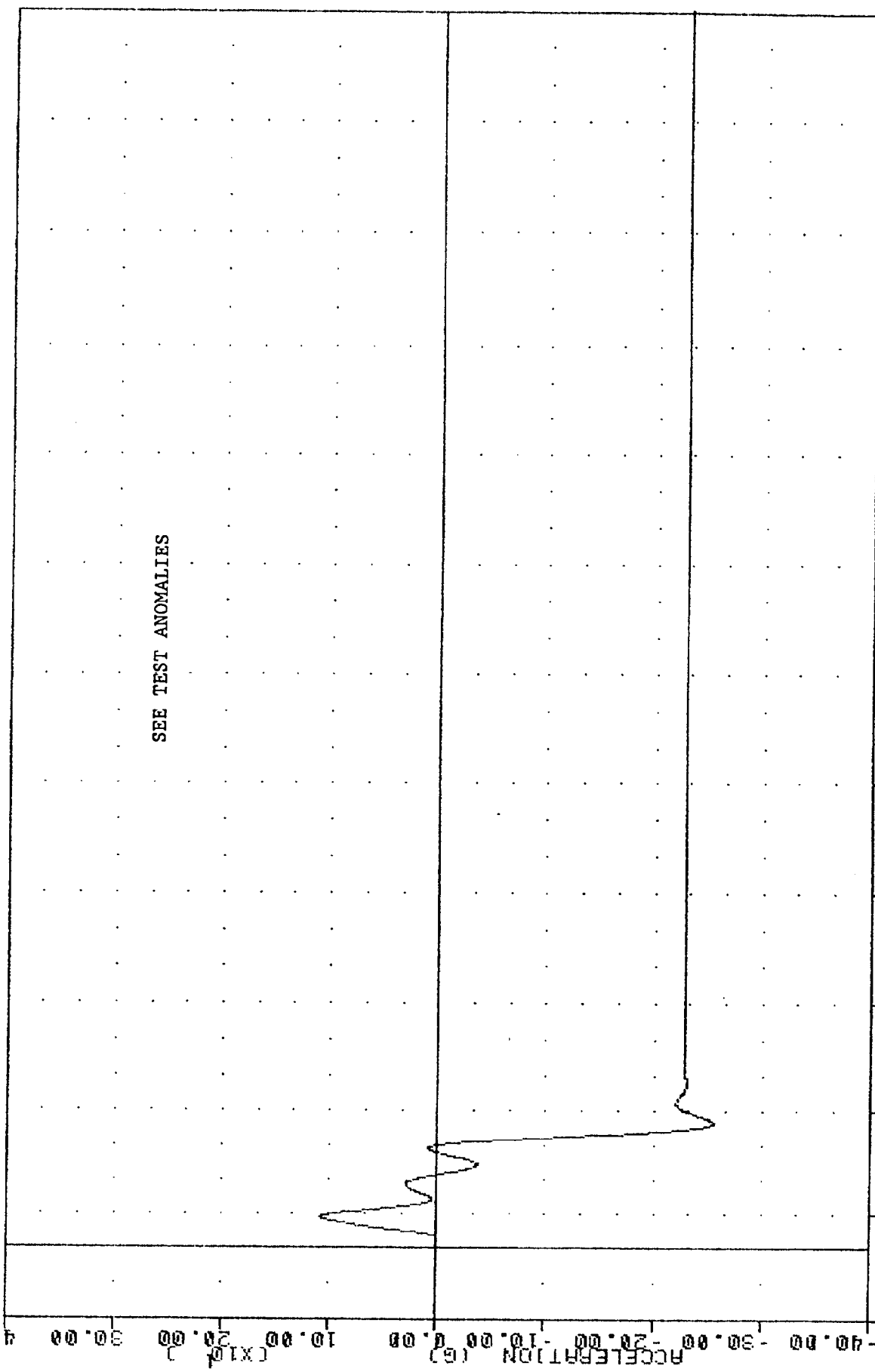
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -3.478 63.00 27.61 26.13

B-97



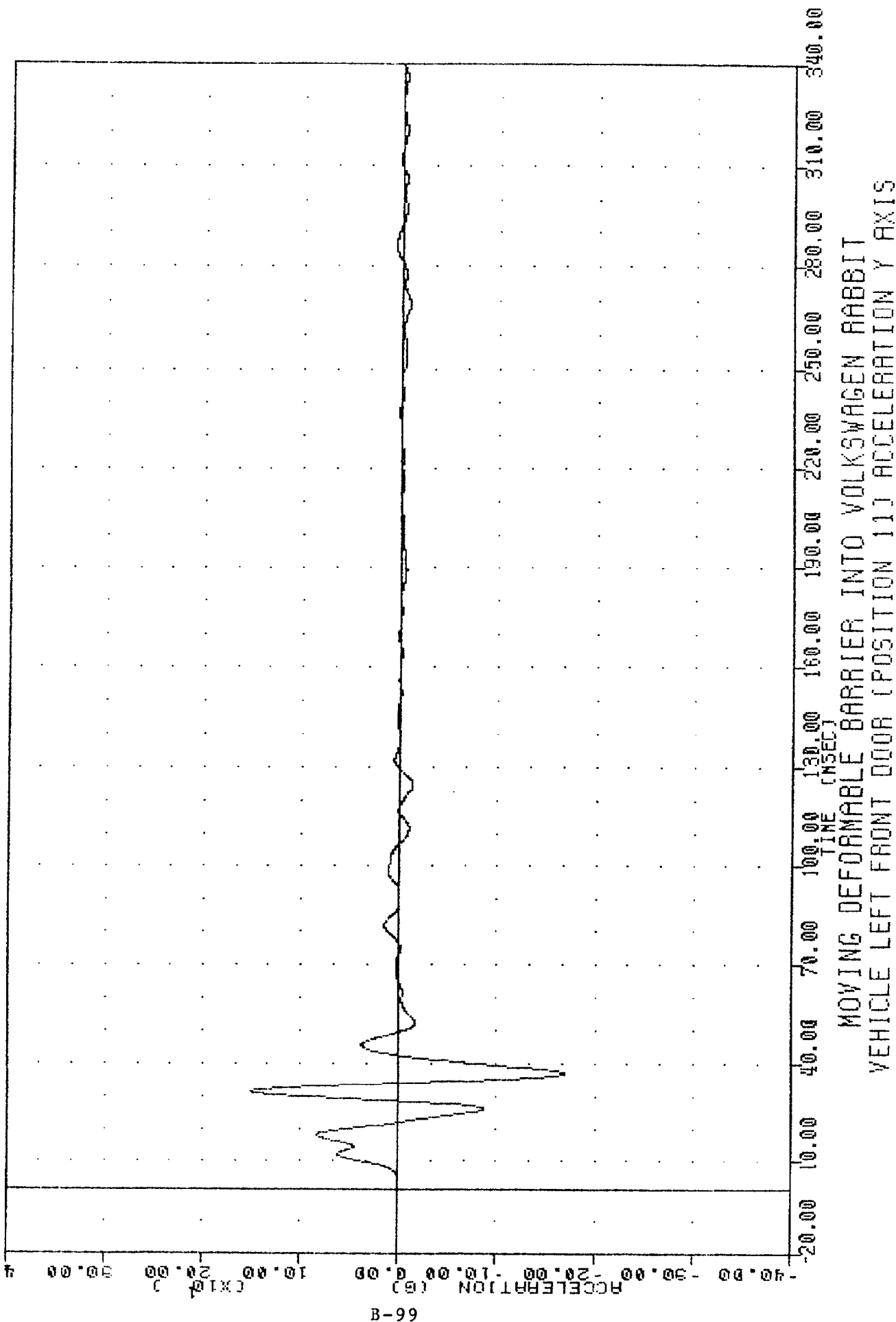
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYV3

TRC 831102
 EVALUATION OF MOD VW FLEET
 83306000000
 LFDY64
 PLOT DATE 7-NOV-83 09:20:28
 FILTER = BLFF 100/ 316/ -40
 MIN. MAX VALUES = -255.652 36.75 , 108.14 8 8.88

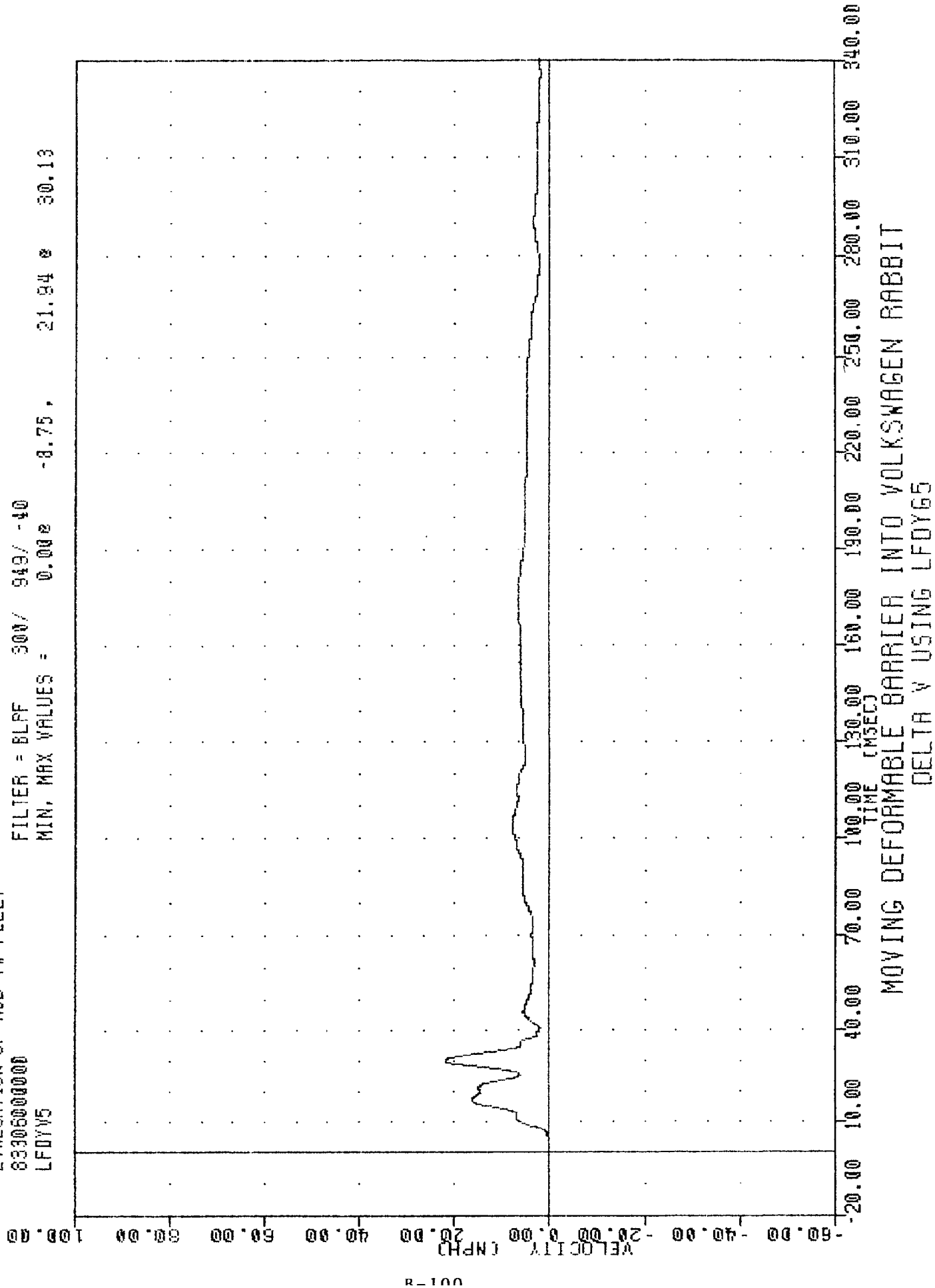


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE LEFT FRONT DOOR (POSITION 10) ACCELERATION Y AXIS

TRC 83J102 7-MAY-83 09:20:28
 EVALUATION OF MOD VN FLEET
 83306000000
 LFDY65
 FILTER = BLPF 100/ 315/ -40
 MIN, MAX VALUES = -169.07e 36.88, 150.12 e 31.25



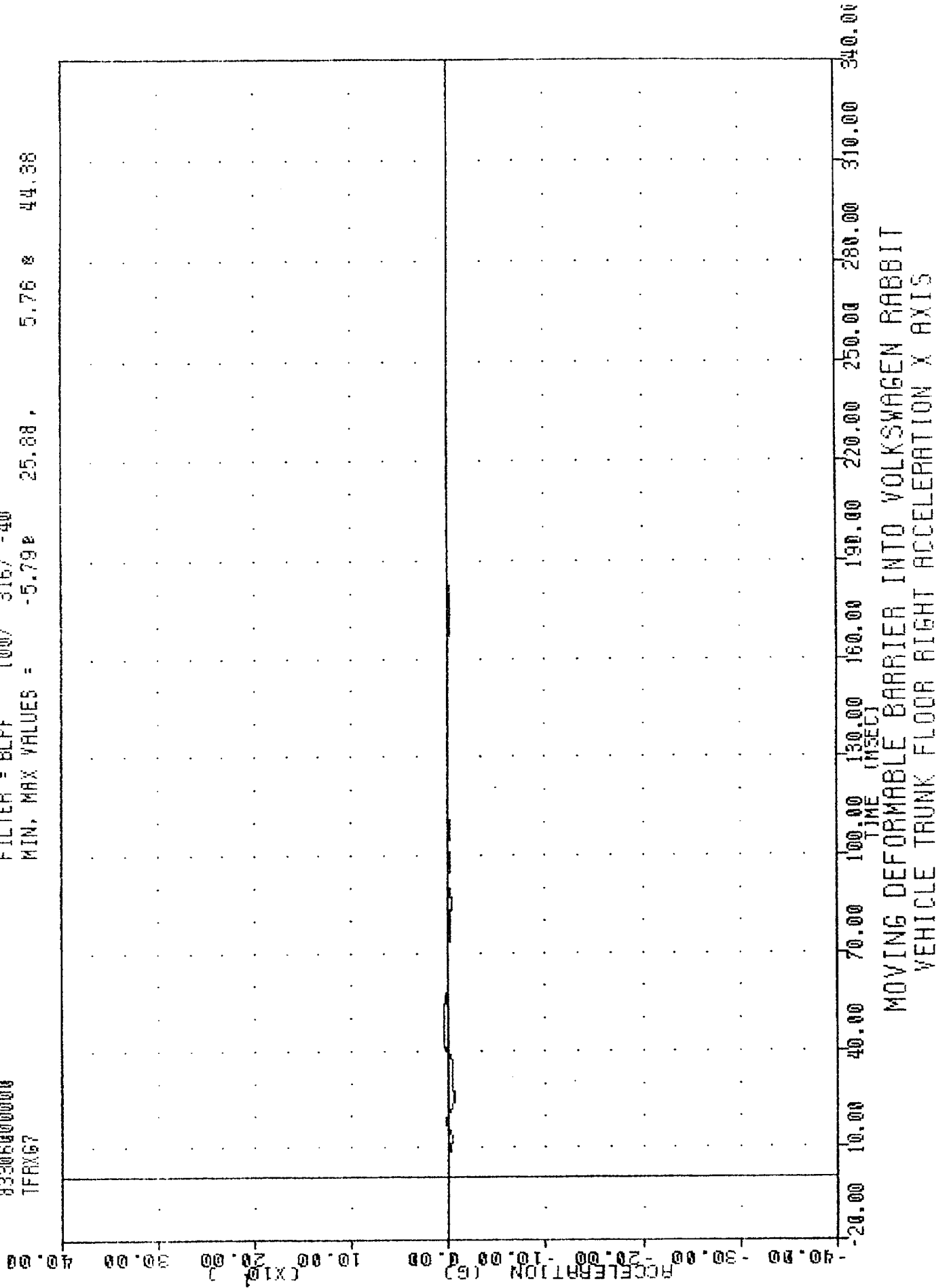
TRC 831102 PLOT DATE 7-NOV-83 14:31:52
 EVALUATION OF MOD VW FLEET
 83306000000
 LFDYV5
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 0.002 -8.75, 21.94 30.13



TRC
EVALUATION OF MOD VW FLEET
8330600000
TFRX67

PLOT DATE 7-NOV-83 09:20:28

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -5.79 25.88 5.76 44.38

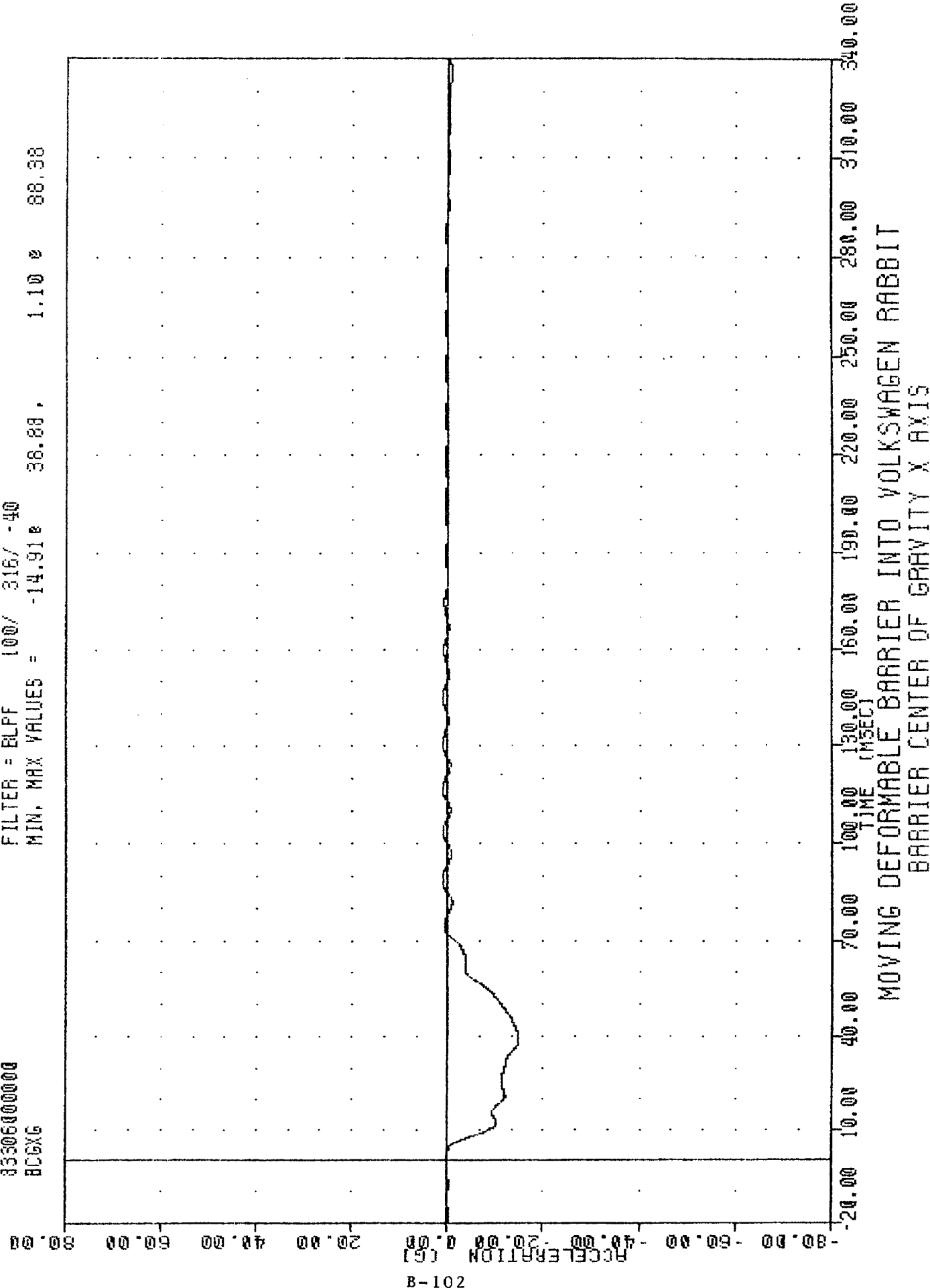


TRC 331102 PLOT DATE 7-AUG-83 09:20:28

EVALUATION OF MOD VW FLEET

333060000000 FILTER = BLPF 100/ 316/ -40

BCGXG MIN. MAX VALUES = -14.91e 36.88, 1.10 e 88.38



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

TRC 001102

7 MAY 80 09:20:28

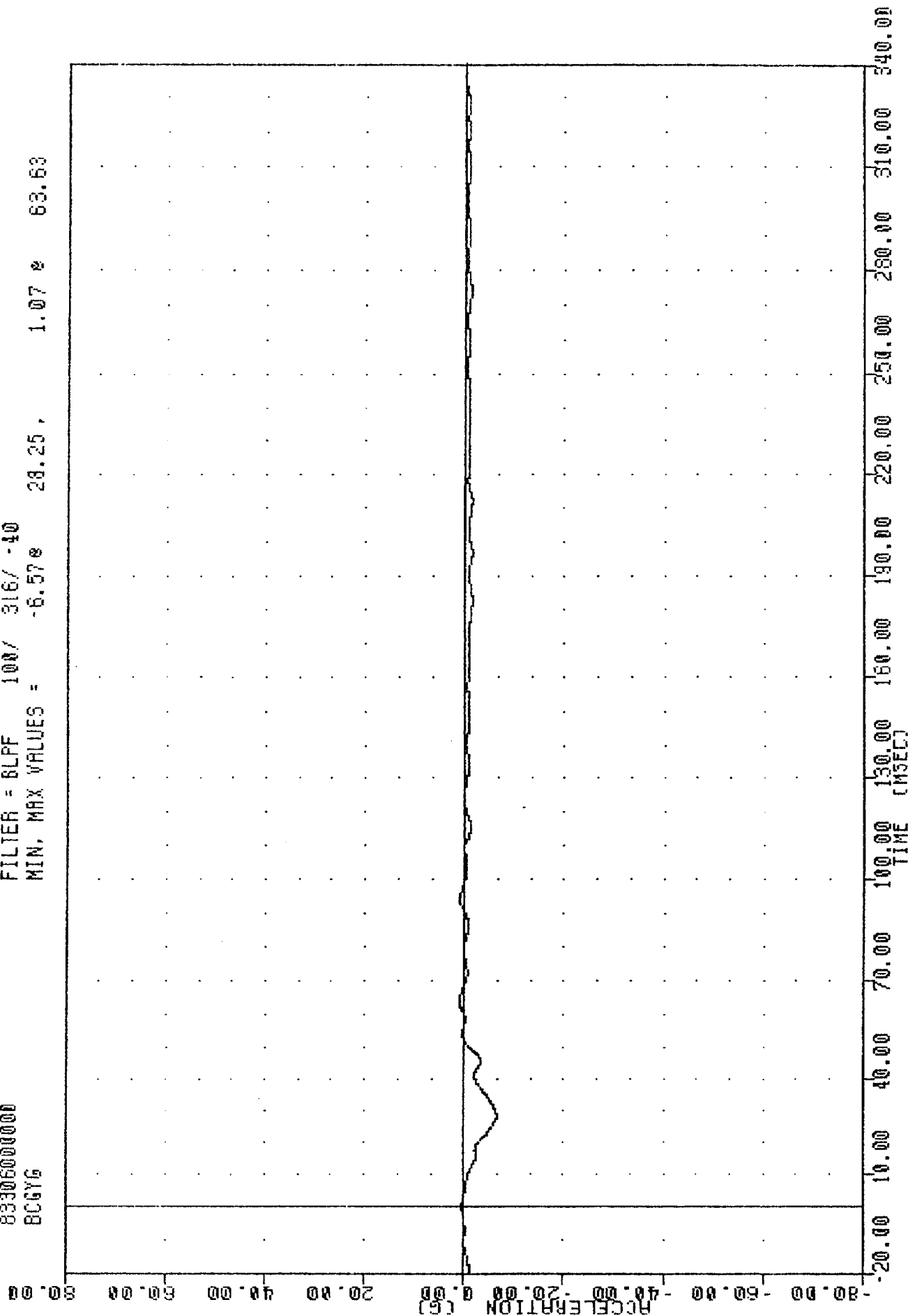
EVALUATION OF MDD YW FLEET

83306000000

BCGYG

FILTER = 8LPP 100/ 316/ -40

MIN. MAX VALUES = -6.57e 28.25, 1.07 e 63.63



TAC

833060000000

EVALUATION OF MOD VN FLEET

PLOT DATE

7-NOV-83

09:20:28

833060000000

BC626

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -17.67 e 38.75 ,

13.16 e 50.50

60.00

60.00

60.00

40.00

20.00

0.00

-20.00

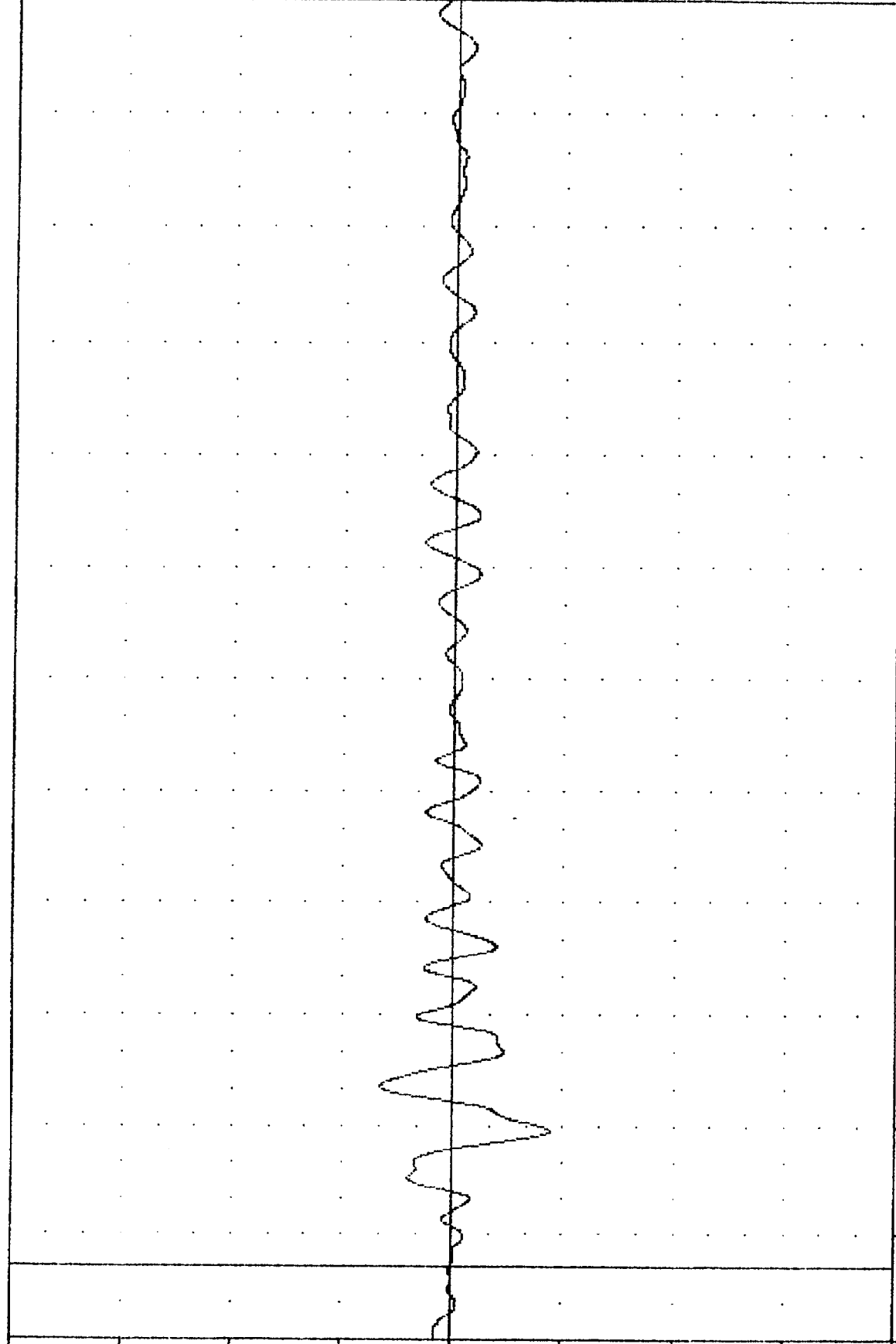
-40.00

-60.00

-80.00

B-104

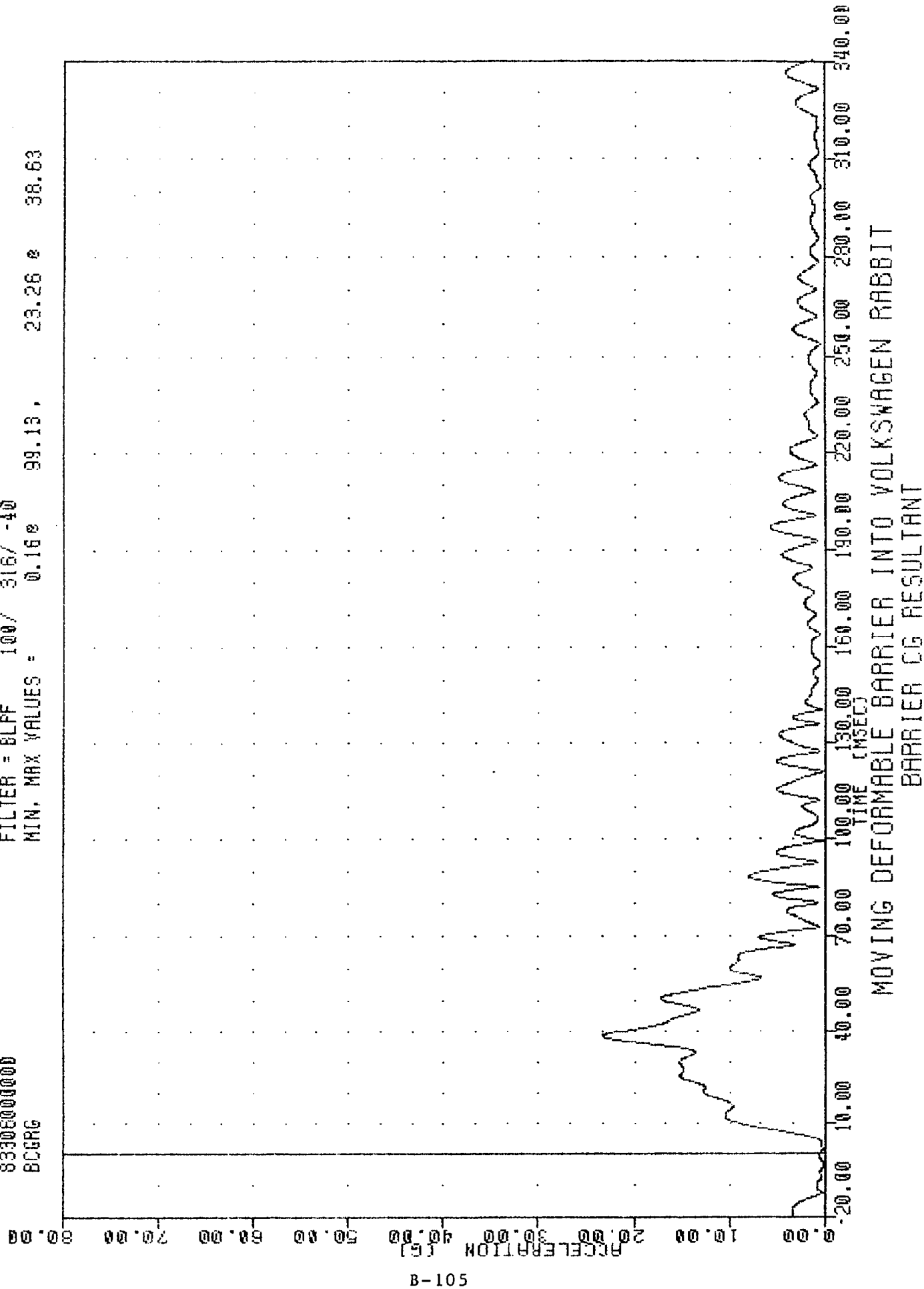
ACCELERATION (G)



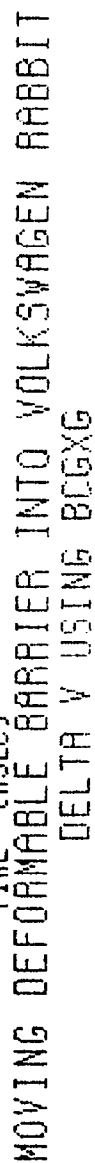
-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

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

TRC [REDACTED], 831102 [REDACTED] PLOT DATE [REDACTED] 7-NOV-83 [REDACTED] 09:26:08
 EVALUATION OF MDD VW FLEET
 83308000000
 BCGRG
 FILTER = BLFF 100/ 316/ -40
 MIN. MAX VALUES = 0.168 99.13, 23.26 38.63



FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 12.578



TRC
EVALUATION OF MOD YW FLEET
83305000000
BCGYV

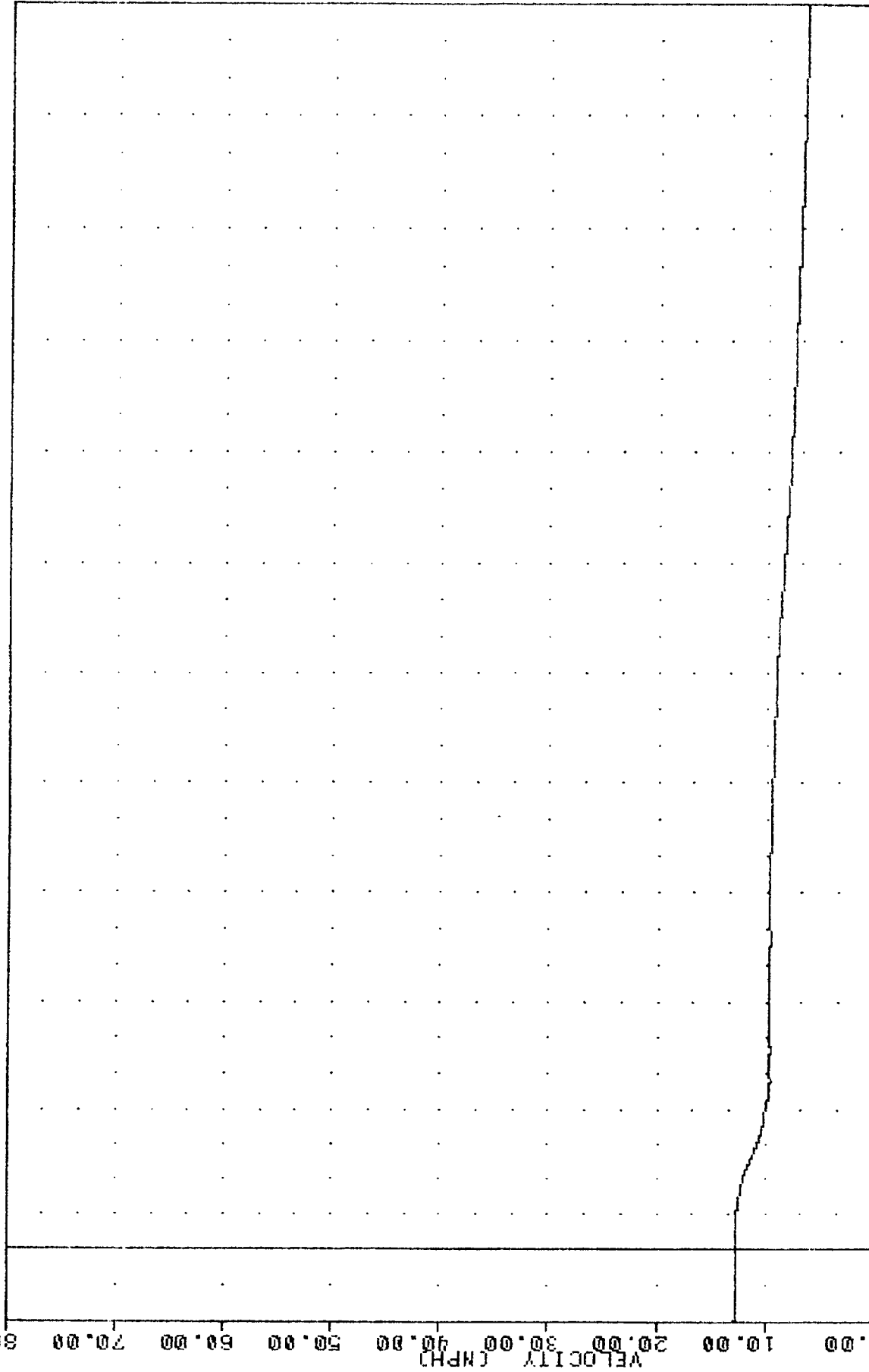
531102
PLOT DATE 7-MAY-83 14:31:52

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 6.328 331.50, 12.80 8 -20.00

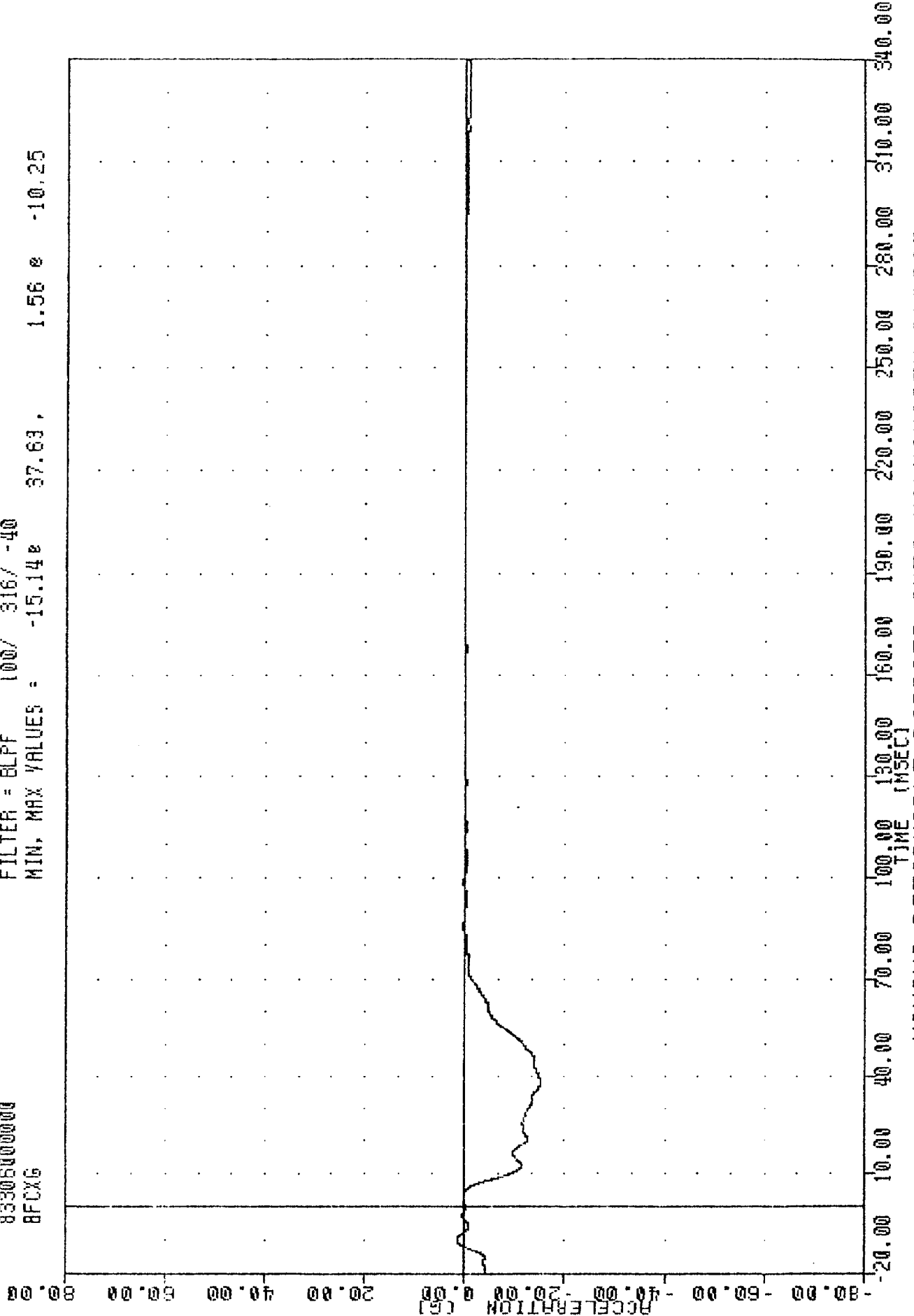
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00

B-107



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BCGYG

TRC 831102
 EVALUATION OF MOD VW FLEET
 83306000000
 BFCX6
 PLOT DATE 7-MAY-83 09:20:28
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -15.14e 37.63, 1.56 e -10.25



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

TRC 831102 7-NOV-83 14:31:52

EVALUATION OF MOD VW FLEET

83306000000

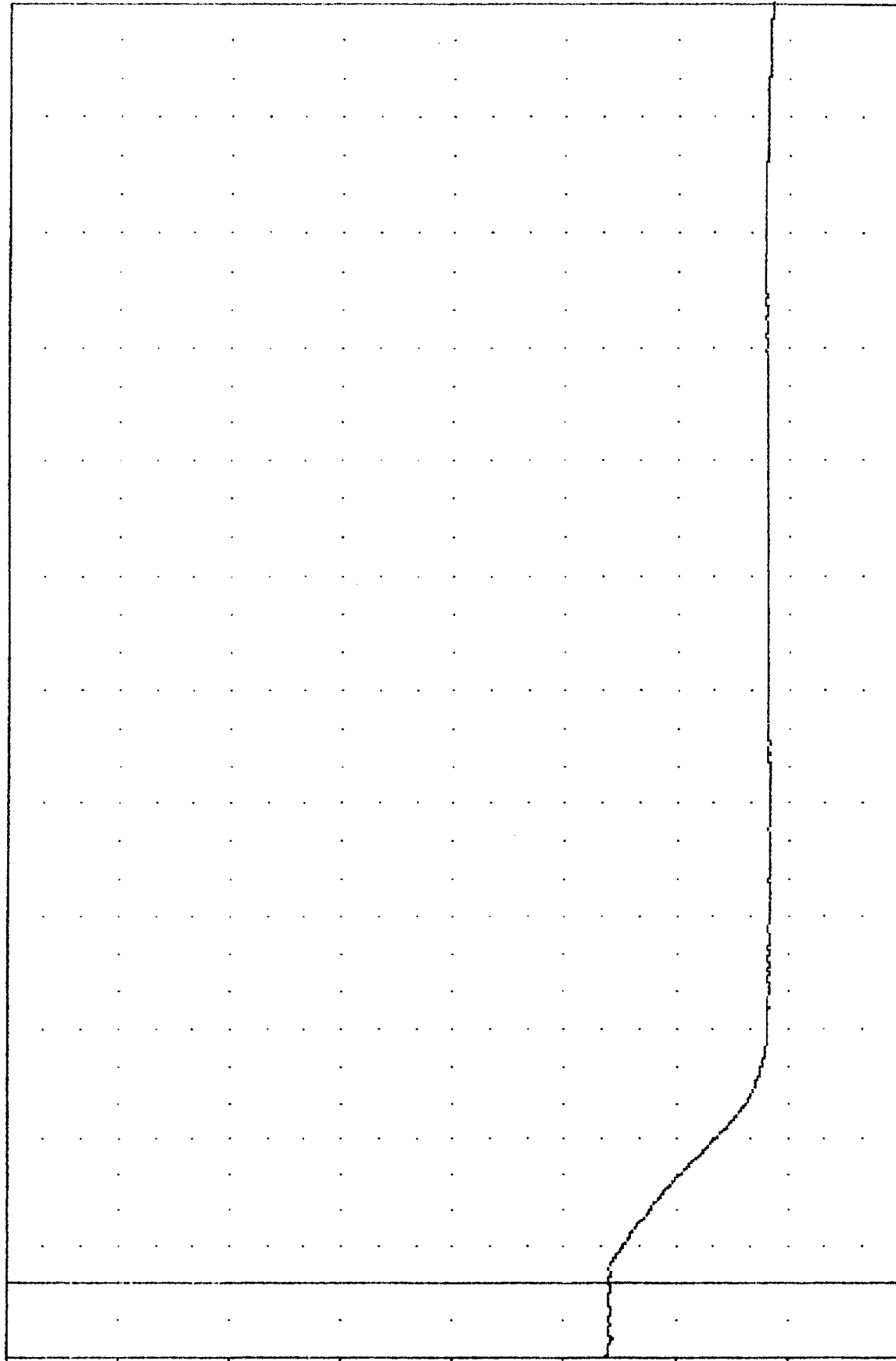
BFCXY

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 11.49e 339.50, 26.20 e -20.00

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 V USING BFCXG

TRC

831102

PLOT DATE

7-NOV-83

09:20:28

EVALUATION OF MOD VW FLEET

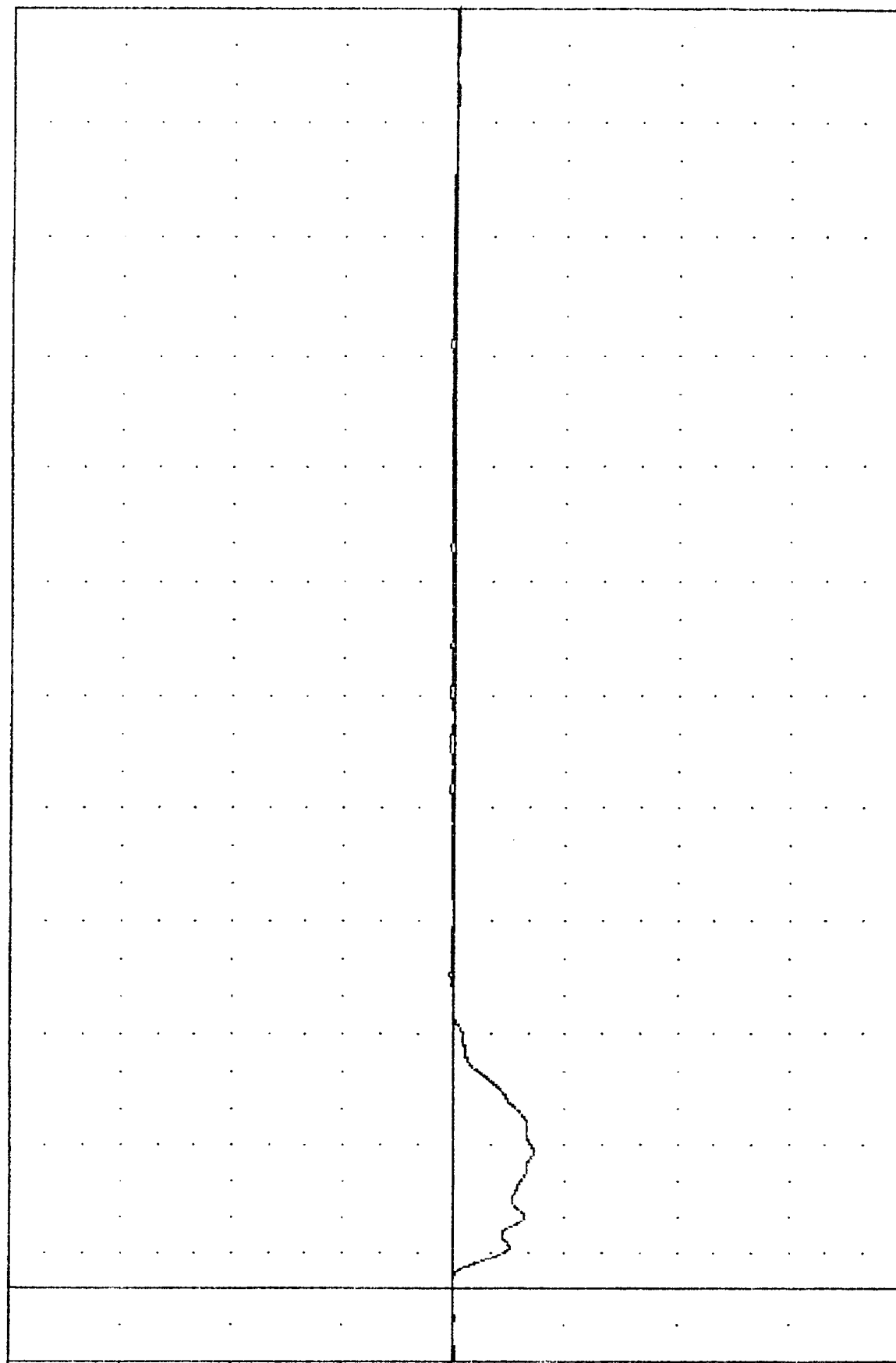
83305000000

BRXG

FILTER = 8LFF 100/ 316/ -40

MIN. MAX VALUES = -14.26g 38.00, 0.92g 147.25

ACCELERATION (G)



B-110

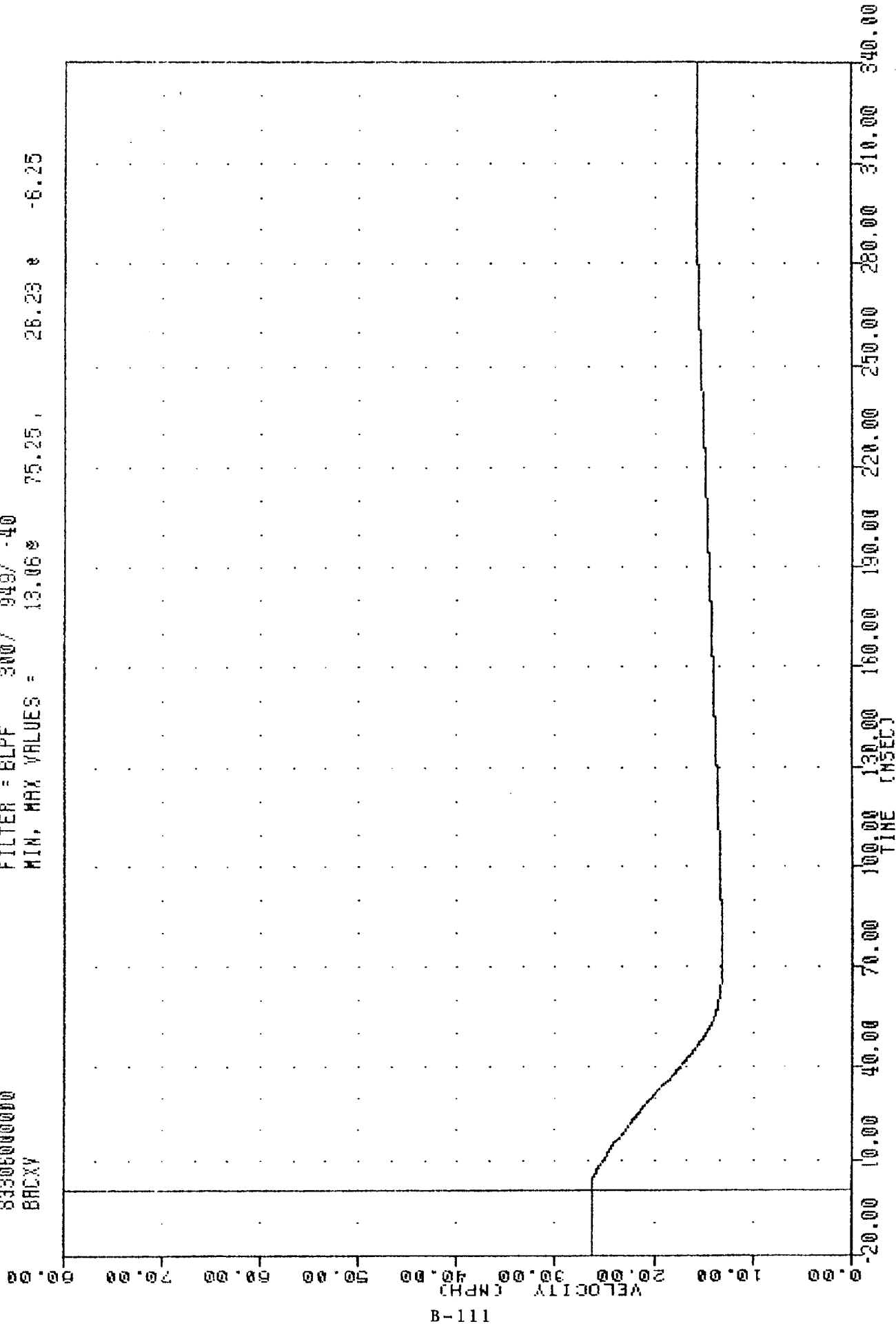
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

BARRIER REAR CROSSMEMBER ACCELERATION X AXIS

TRC 831102
EVALUATION OF MOD VV FLEET
83305000000
BRCXY

PLOT DATE 7-NOV-83 14:31:52

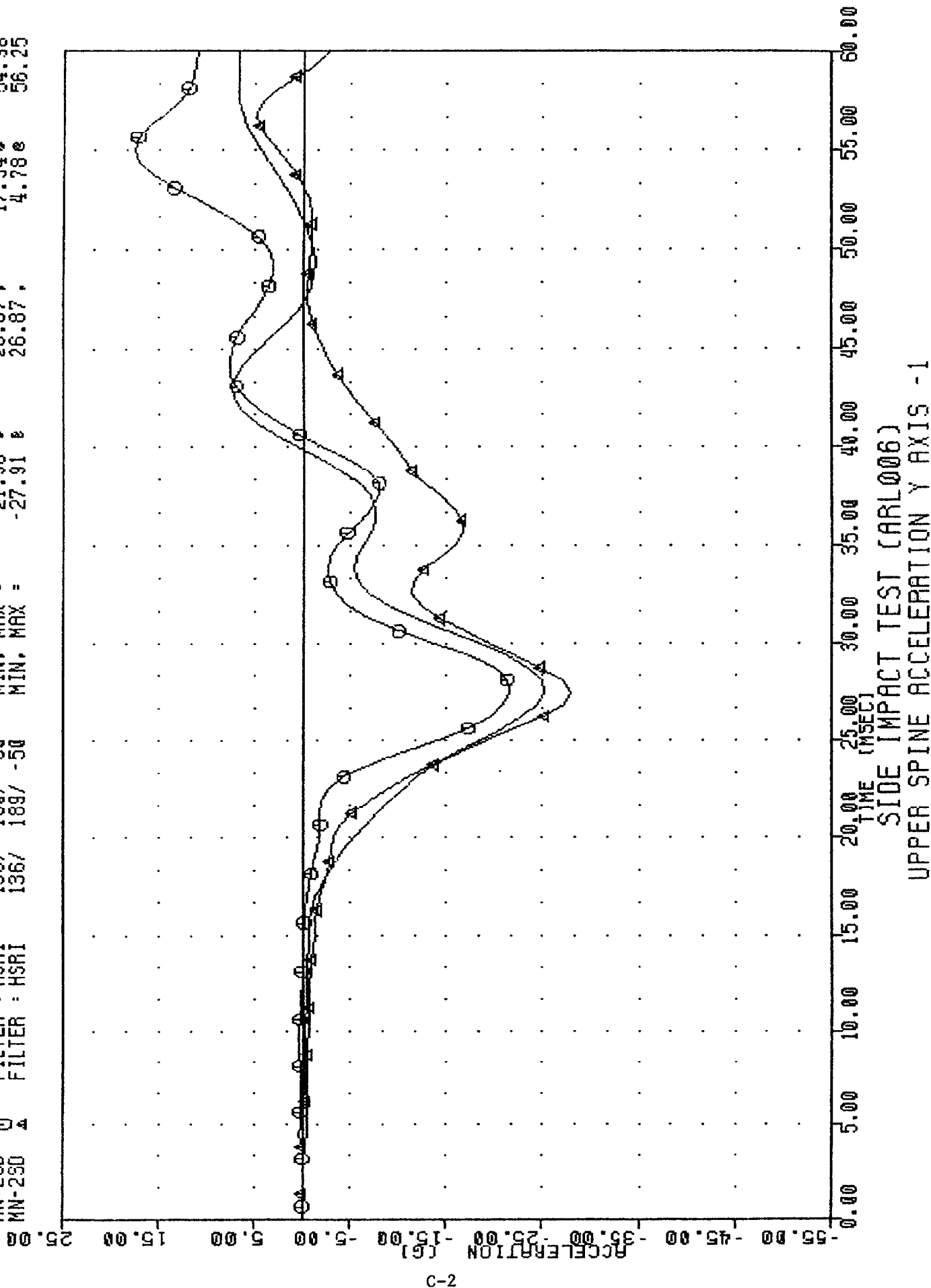
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 13.06 75.25 26.23 -8.25



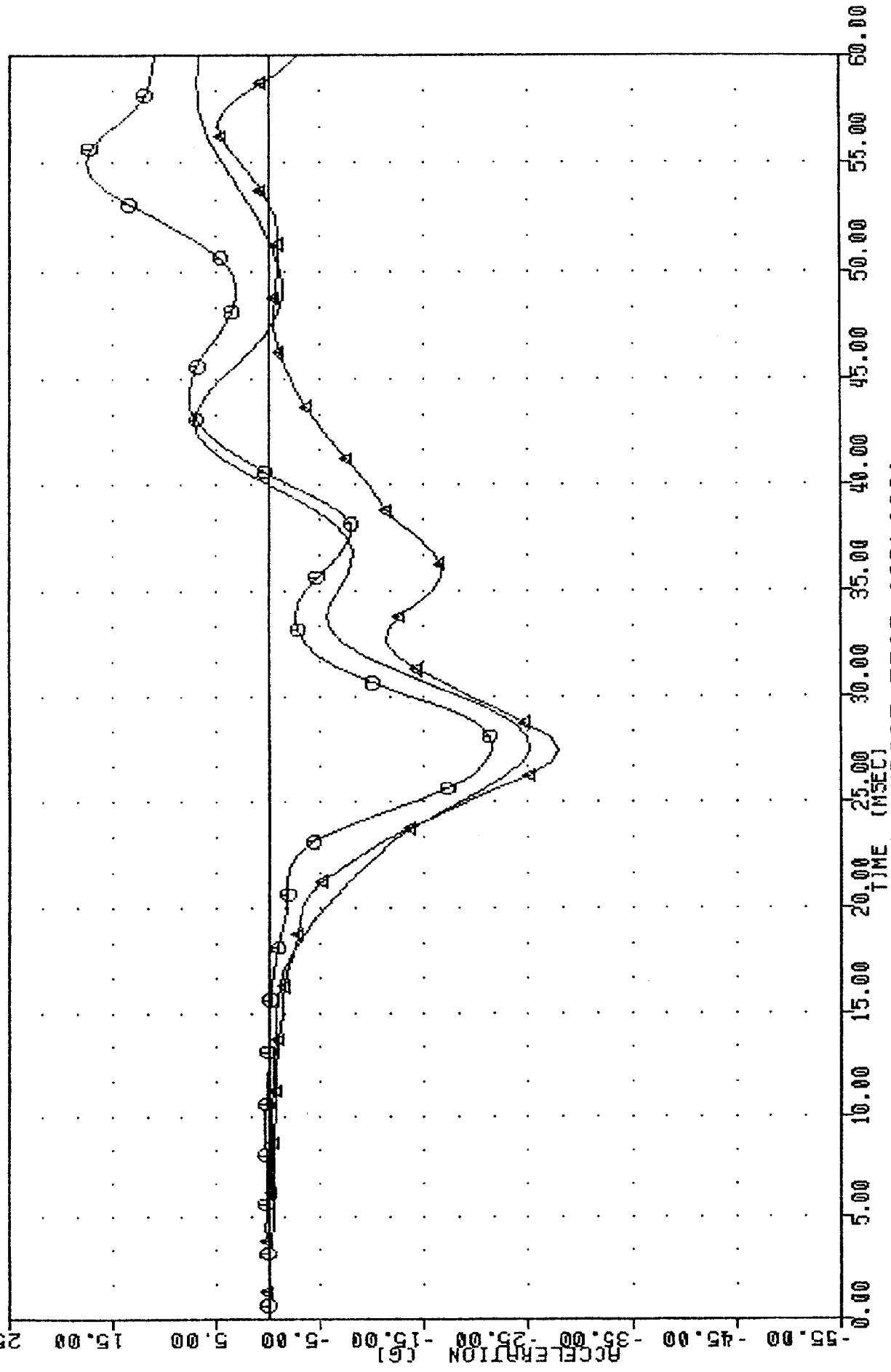
B-111

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BRCXG

APPENDIX C
DUMMY CERTIFICATION

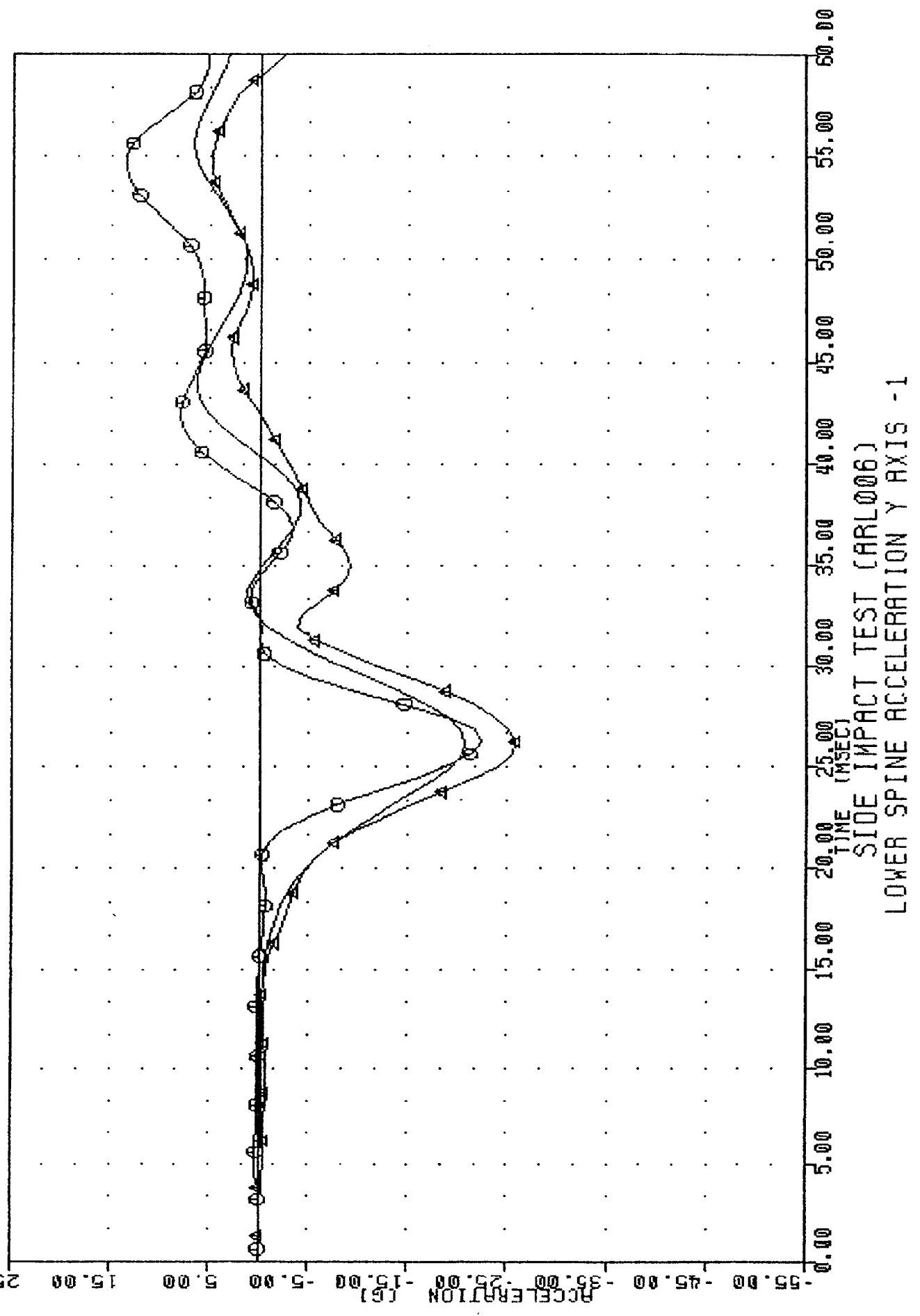
[illegible]

VRTIC SHL26
 TOI YGA
 MN-250
 MN-250
 HRL6CRY1
 FILTER : HSRI
 FILTER : HSRI
 FILTER : HSRI
 SIO
 THURAX 5 BODY 318 CAL 71
 136/ 189/ -50
 136/ 189/ -50
 136/ 189/ -50
 83301
 -25.18
 -21.58
 -27.91
 31-OCT-83
 26.87
 26.87
 26.87
 11:11:23
 7.06
 17.54
 4.78
 42.50
 54.38
 56.25

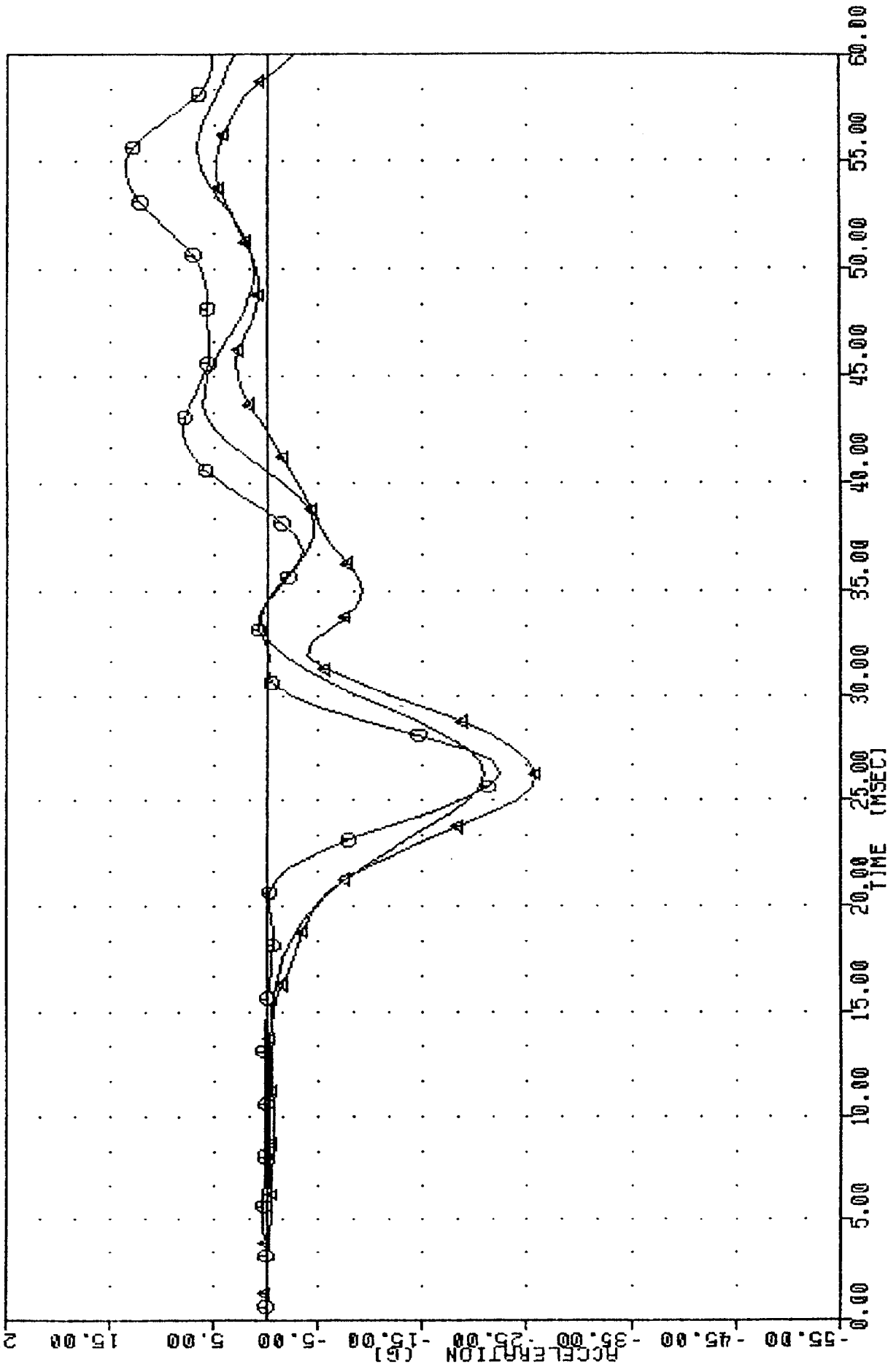


SIDE IMPACT TEST (ARL006)
 UPPER SPINE ACCELERATION Y AXIS -A

VRC SML26
 T12YGI
 MN-2SD
 MN-2SD
 FILTER : HSRI
 FILTER : HSRI
 FILTER : HSRI
 510 THORAX BODY 318 CHL 71
 136/ 189/ -50
 136/ 189/ -50
 136/ 189/ -50
 MIN, MAX =
 MIN, MAX =
 MIN, MAX =
 -20.75
 -22.37
 -25.84
 25.63
 25.63
 25.63
 6.63
 13.64
 4.85
 55.00
 53.75
 53.75
 12:05:52

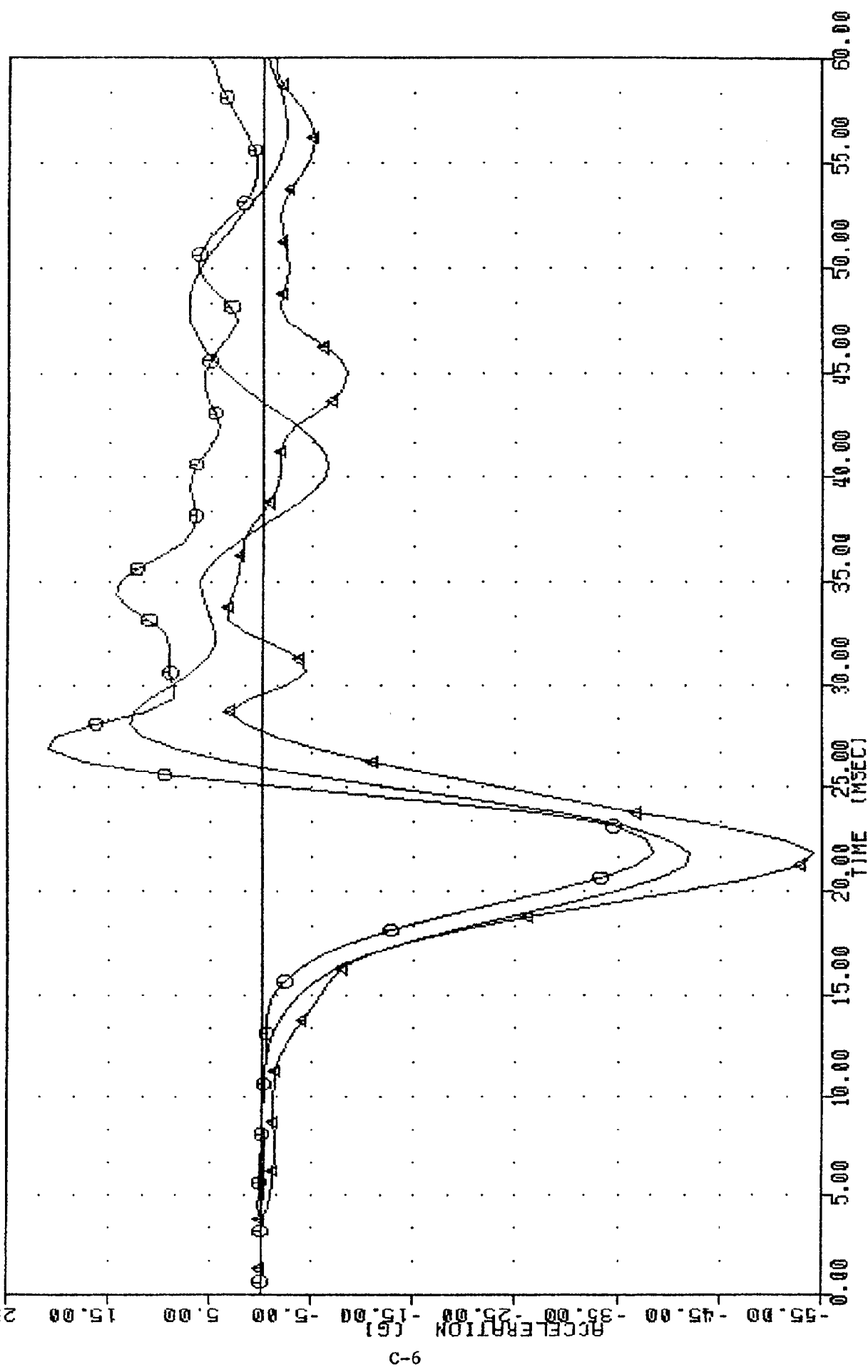


UNIT: SAE28
 T12Y6H
 MN-2SD 0
 MN-2SD 4
 FILTER: HSRI
 FILTER: HSRI
 THOMAX 6 BODY 310
 136/ 189/ -50
 136/ 189/ -50
 136/ 189/ -50
 CRL 71
 MIN, MAX =
 MIN, MAX =
 MIN, MAX =
 83301
 -20.80 s
 -22.37 s
 -25.84 s
 PLOT DATE 31-OCT-83
 25.63
 25.63
 25.63
 11:15:18
 6.61 s
 13.64 s
 4.85 s
 55.00
 53.75
 53.75



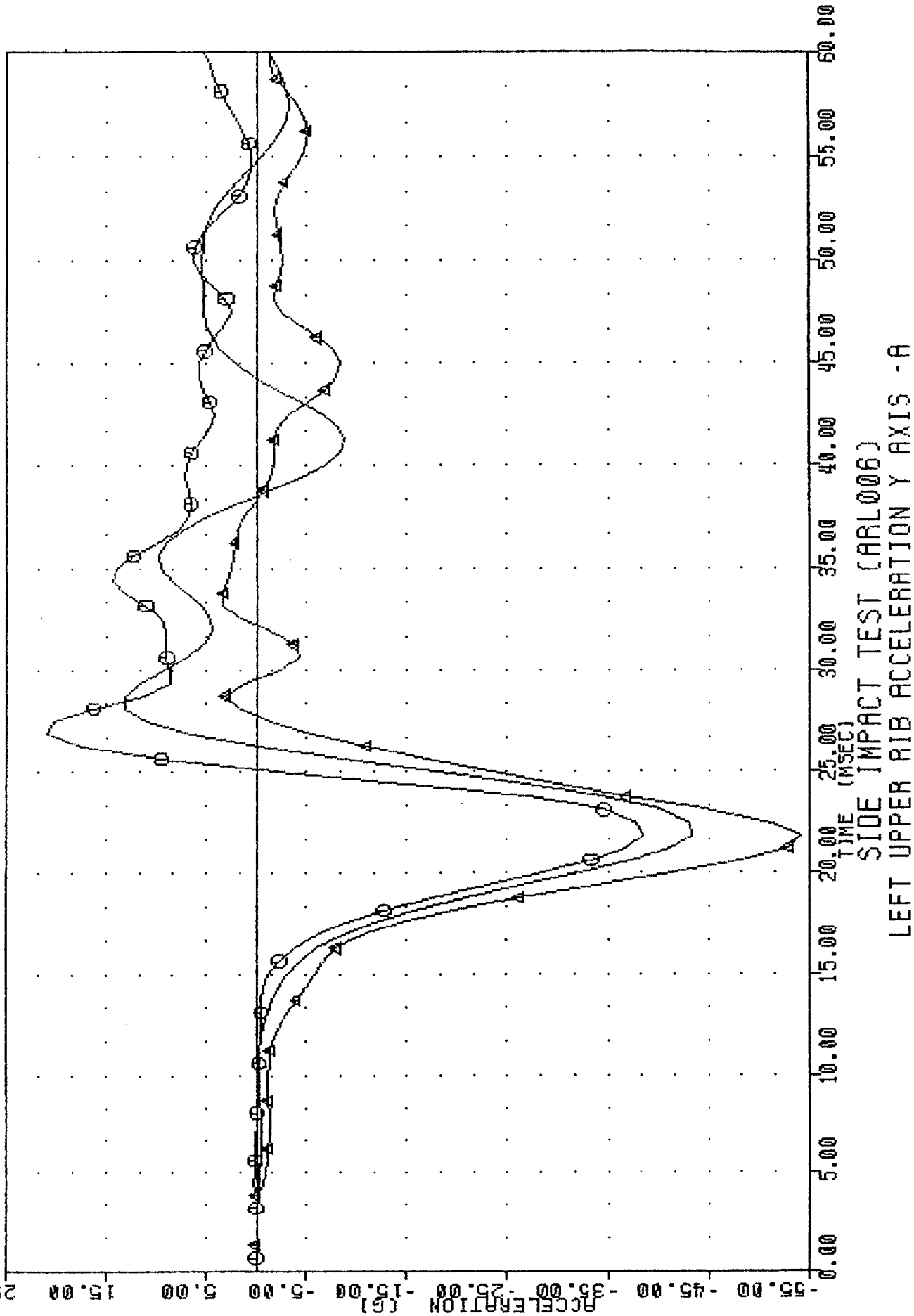
SIDE IMPACT TEST (CARL006)
 LOWER SPINE ACCELERATION Y AXIS -A

WHC 51126 HML6CART 310 THORAX 5 BODY 318 CHL 71 83301 PLOT DATE 31-OCT-83 11:34:09
 LURYGI FILTER : HSRI 136/ 189/ -50 MIN, MAX = -42.10 8 21.25 12.80 8 27.50
 MN-2SD 0 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -38.14 8 21.25 20.92 8 26.25
 MN-2SD 1 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -54.08 8 21.25 3.31 8 33.13

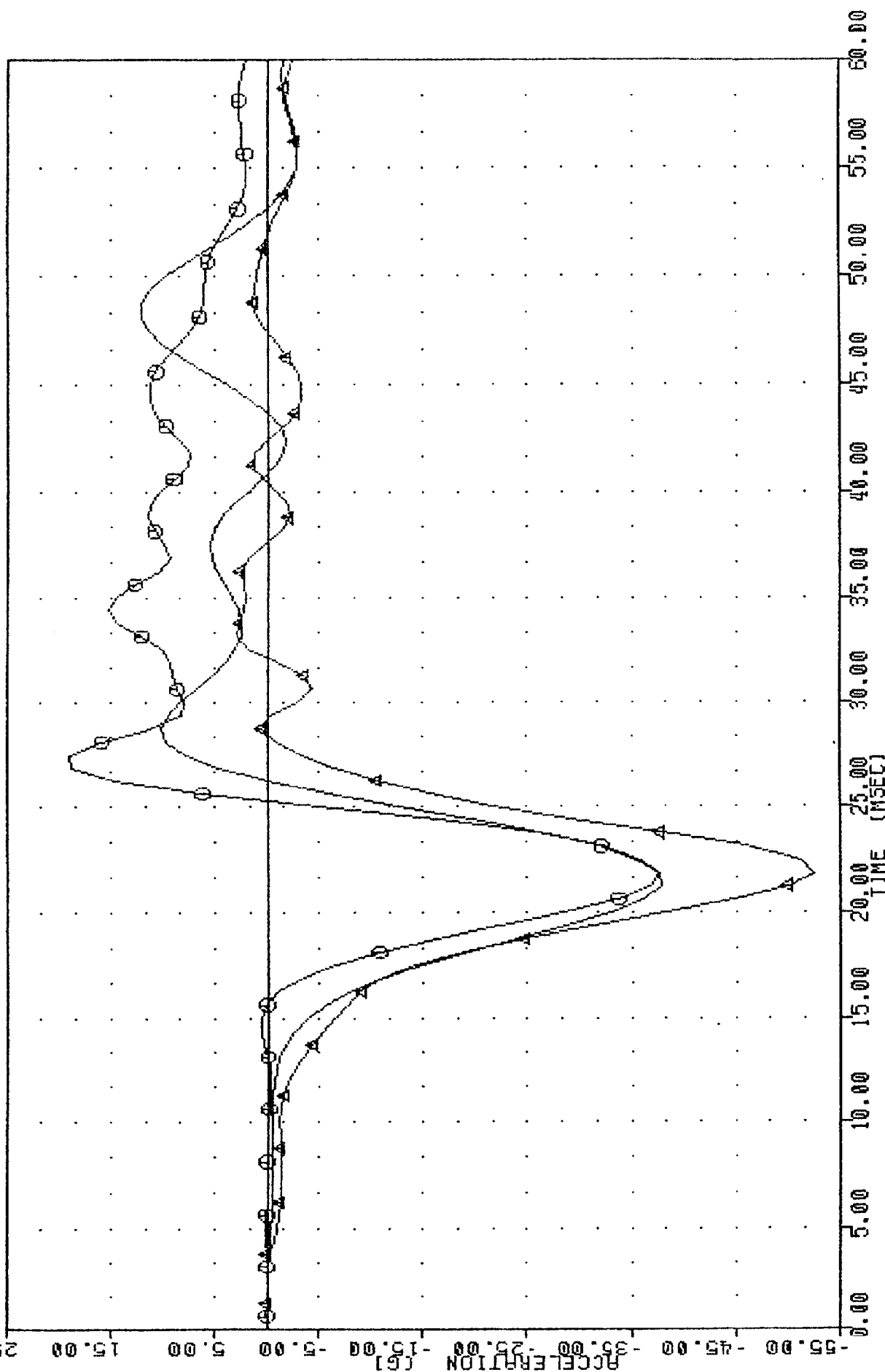


SIDE IMPACT TEST (ARL006)
 LEFT UPPER RIB ACCELERATION Y AXIS -1

VITAL SHL26 , HRLSCA71 310 TADMAX 6 BODY 318 CAL 71 83301 PLOT DATE 31-OCT-83 11:31:59
 LURYGA FILTER = HSRI 136/ 189/ -50 MIN, MAX = -43.41 21.25, 13.14 28.13
 MN-2SD 0 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -38.44 21.25, 20.82 26.25
 MN-2SD A FILTER = HSRI 136/ 189/ -50 MIN, MAX = -54.08 21.25, 3.31 33.13

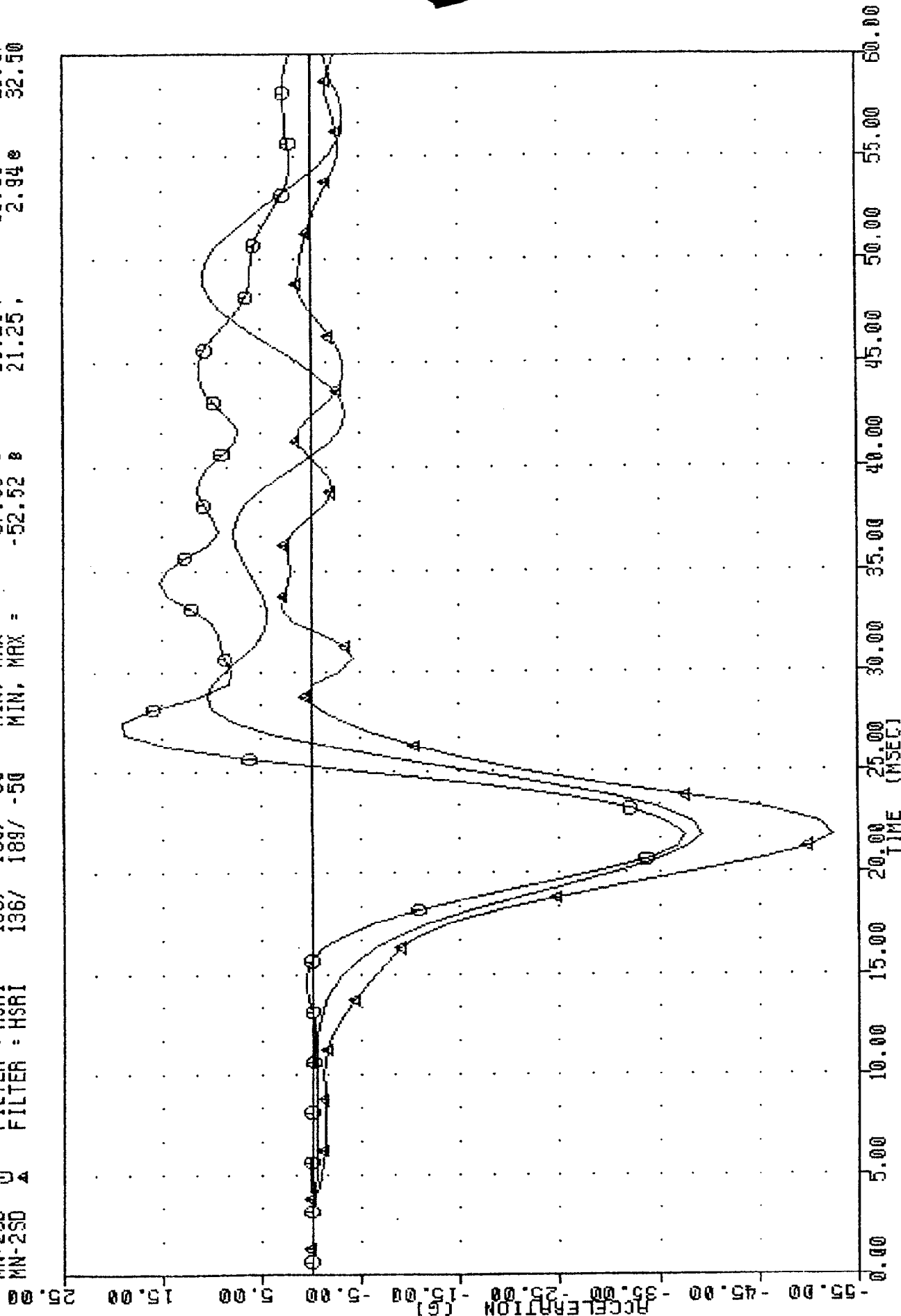


FILE: C:\DATA\1886\1886.DAT
 FILTER: HSRI
 MN-2SD 0
 THOMAS BODY 310
 136/ 189/ -50
 MIN, MAX =
 MIN, MAX =
 MIN, MAX =
 3301
 -37.78
 -37.66
 -52.52
 12:16:25
 47.50
 26.87
 32.50
 12:16:25
 12.08
 19.00
 2.94
 21.25
 21.25
 21.25



SIDE IMPACT TEST (CARL006)
 LEFT LOWER RIB ACCELERATION Y AXIS -1

WRTC SML26
 LRYGA
 MN-2SD
 MN-2SD
 SIO THURAX 6 BODY 318
 136/ 189/ -50
 136/ 189/ -50
 136/ 189/ -50
 HRL6C471
 FILTER : HSRI
 FILTER : HSRI
 FILTER : HSRI
 83301
 MIN. MAX =
 MIN. MAX =
 MIN. MAX =
 -39.23
 -37.66
 -52.52
 21.25
 21.25
 21.25
 31-OCT-83
 10.71
 18.00
 2.94
 11:28:34
 48.75
 26.87
 32.50



SIDE IMPACT TEST (CARL008)
 LEFT LOWER RIB ACCELERATION Y AXIS -A