

DOT 4742

EVALUATION OF NHTSA MODIFIED
VOLKSWAGEN RABBITS

MDB-TO-CAR SIDE IMPACT TEST OF
A 19⁰ CRABBED MOVING DEFORMABLE BARRIER
TO A 1977 VOLKSWAGEN RABBIT
AT 45.8 MPH

PREPARED BY:
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FINAL REPORT
JUNE 1984

PREPARED FOR:
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16. Abstract This test report documents the repeat of a crash test conducted under NHTSA Contract DTNH22-82-A-08401, Task Order SRL 26 entitled "Side Impact Evaluation", the purpose of which was to evaluate the NHTSA's Modified Volkswagen Rabbits. Testing was conducted on a 1977 Volkswagen Rabbit 2-door hatchback with structural modification designated as Optimized at the TRCO Crash Test Facility, East Liberty, Ohio. The test vehicle was impacted on the left side by a moving deformable barrier, crabbed to 19 ⁰ , at 45.8 mph. Occupant responses of two side impact dummies were measured. One dummy was located in the driver's designated seating position and one was located in the left rear seating position. The test date was May 29, 1984 and the ambient temperature was 50 F.			
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METRIC CONVERSION FACTORS

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

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



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SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to repeat a crash test conducted under NHTSA Contract DTNH22-82-A-08401, Task Order SRL 26 entitled "Side Impact Evaluation". The purpose of the tests conducted under SRL 26 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 1977 Volkswagen Rabbit 2-door hatchback was impacted on the left side by a Moving Deformable Barrier (MDB) on May 29, 1984. 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 60° counterclockwise with respect to the longitudinal axis of the struck vehicle. The impact point was to be 37 inches forward of the vehicle center of gravity which is defined by accident investigation to be the midpoint of the wheelbase.

To simulate this collision, the MDB was to be towed into the stationary Volkswagen Rabbit at 46.3 mph with the MDB's wheels crabbed clockwise to 19°. The actual test speed was 45.8 mph and the actual impact point was 37.5 inches forward of the midpoint of the Volkswagen Rabbit's wheelbase.

The vehicle was structurally modified to the level designated "Optimized". 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 describe the General Test and Vehicle Parameter Data.

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagenwerk AG

MAKE/MODEL: Volkswagen Rabbit

VIN: 1773092939

BODY STYLE: 2-Door Hatchback

MODEL YEAR: 1977

NHTSA NO.: R & D

COLOR: Red

ENGINE DATA: TYPE: Transverse CYLINDERS: 4 DISPLACEMENT 97 CID

TRANSMISSION DATA: 4 Speed Manual

DATE VEHICLE RECEIVED: 5/9/84

ODOMETER READING: 65615

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

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

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? No, structurally optimized 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: Fair

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

VEHICLE MANUFACTURED BY: Volkswagenwerk AG

DATE OF MANUFACTURE: 9/76

GVWR: 2777 LBS.,

GAWR: FRONT 1609 LBS., REAR 1278 LBS.

VEHICLE TIRE DATA

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

TIRES ON VEHICLE (MFGR. & LINE, SIZE): Michelin ZX Radial 155 SR 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	580	LBS.	RIGHT REAR	330	LBS.
LEFT FRONT	570	LBS.	LEFT REAR	370	LBS.
TOTAL FRONT WEIGHT	1150		LBS. (62.2 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	700		LBS. (37.8 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	1850		LBS.		

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 24 7/8	;LF 24 1/4	;RR 24 1/4	;LR 23 7/8
PRE-TEST ATTITUDE:	RF 24	;LF 23 3/8	;RR 21 7/8	;LR 21 5/16
POST-TEST ATTITUDE:	RF 23 5/16	;LF 22 3/4	;RR 21 1/8	;LR 21 13/16

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 272 LBS. CARGO:

RIGHT FRONT	670	LBS.	RIGHT REAR	540	LBS.
LEFT FRONT	670	LBS.	LEFT REAR	590	LBS.
TOTAL FRONT WEIGHT	1340		LBS. (54.3 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1130		LBS. (45.7 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	2470		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*: 9.9 GALLONS

TEST VOLUME: 5.0 GALLONS

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 10.0 GALLONS

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: Yes

FUEL INJECTION: Yes

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

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 262 LBS.

4 TOTAL

TOTAL 862 LBS.

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

TEST CONDITIONS

TEST NUMBER: 840529

DATE OF TEST: May 29, 1984

TIME OF TEST: 16:30

WIND VELOCITY: 8-16 mph 279° NNW

HUMIDITY: 59%

AMBIENT TEMPERATURE AT IMPACT AREA: 50° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 76° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2470	2460
MDB TEST WEIGHT (LBS.)	2990	3000
MDB VELOCITY (MPH)*	45.8	46.3
IMPACT POINT (INCHES)**	37.5	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 vehicle's wheelbase.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER 06	PASSENGER U02
Head	<u>Side Window, Window Sill</u>	<u>Side Header, Side Window</u>
Chest	<u>Padding</u>	<u>Padding</u>
Abdomen	<u>Padding</u>	<u>Padding</u>
Left Knee	<u>Padding</u>	<u>Left Rear Quarter Panel</u>
Right Knee	<u>Left Knee</u>	<u>Left Knee</u>

DOOR OPENING:

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

SEAT MOVEMENT:

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

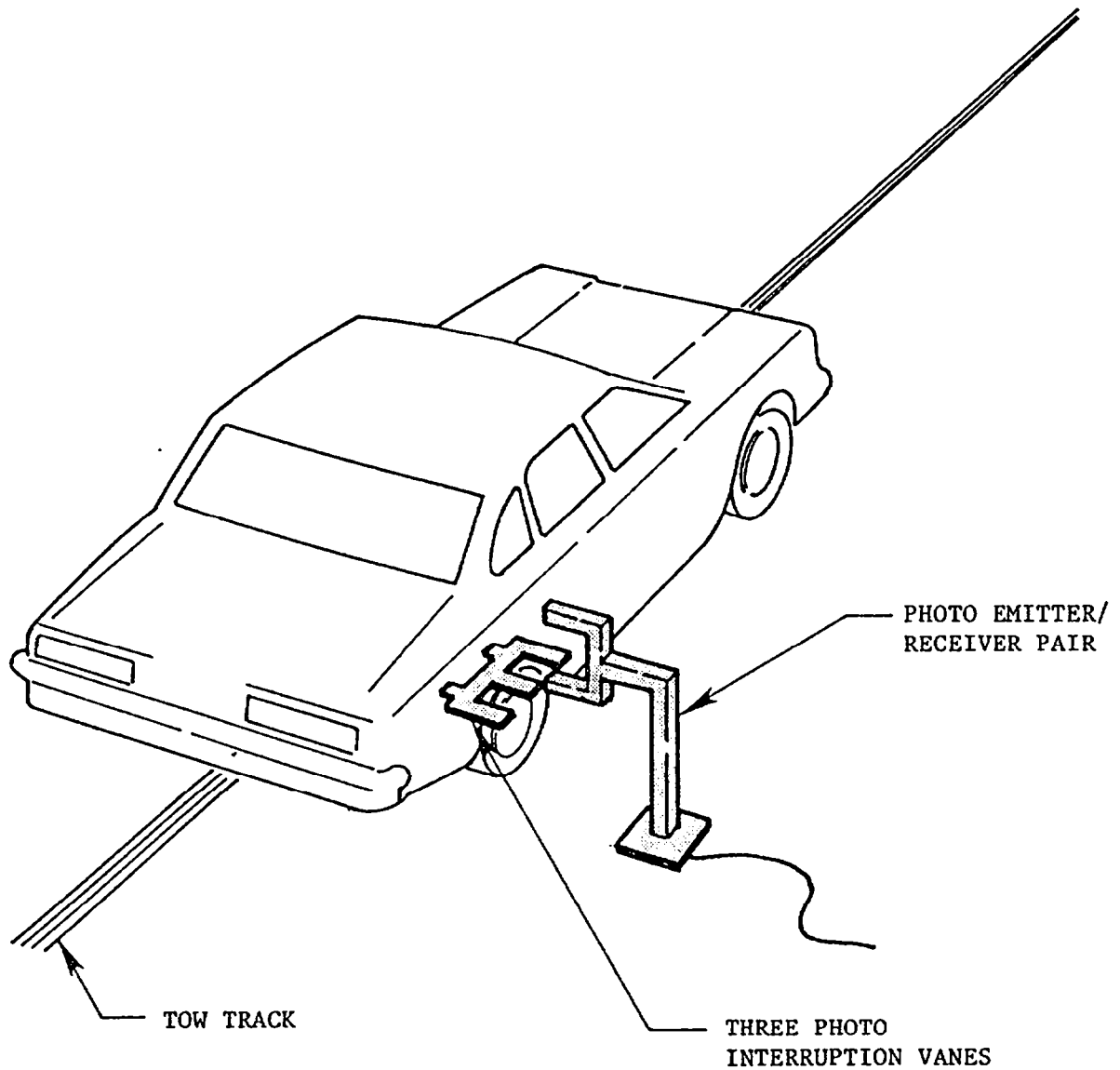
GLAZING DAMAGE: Windshield cracked and separated from mounting; all
driver's side windows shattered; no backlight
damage.

OTHER NOTABLE IMPACT EFFECTS:

Driver door separated from hinges.

* The driver's door was to remain closed for subsequent door opening effort studies.

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
 = 1850 + 2 X 174 + 262 lbs.
 = 2460 lbs.

To achieve test weight, 5 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) Wire separation occurred in data channel LRTYD3 - Passenger Left Rib to Spine Displacement. No peak levels are reported

2) Cable separation occurred in data channel LFDYG5 - Vehicle Left Front Door (Position 11) Acceleration Y Axis. No peak levels or delta velocity are reported.

SECTION 3.0
DATA REQUIRED BY R & D

The following pages are included in this section:

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

DUMMY TEMPERATURE CONTROL AND POSITIONING

The vehicle was kept inside the temperature controlled crash test building until approximately 2 hours prior to the test. Temperature inside the vehicle and ambient temperature at the crash area were recorded. Dummy temperature while outside the crash test building was maintained portably until approximately 1 minute prior to the test.

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

DUMMY PLACEMENT AND POSITIONING

SIDE IMPACT DUMMY*

DRIVER DSP

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

REAR PASSENGER DSP

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

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

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

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

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

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

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

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

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

DUMMY IN-VEHICLE POSITION RECORDING SHEET

VEHICLE NHTSA NO. R & D

MFR./MAKE/MODEL: Volkswagen Rabbit

FRONT SEAT TYPE: BENCH
X BUCKET
 SPLIT BENCH

ADJUSTER TYPE: X MANUAL
 POWER

BUCKET SEAT BACK TYPE: FIXED
X ADJUSTABLE

TECHNICIANS:

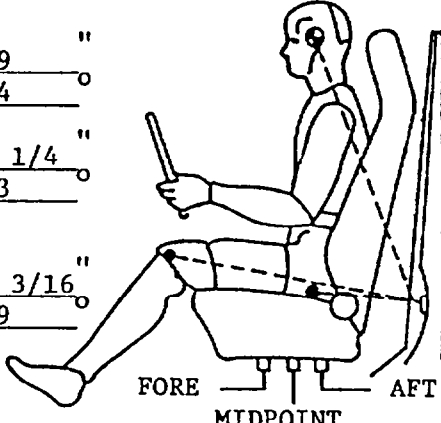
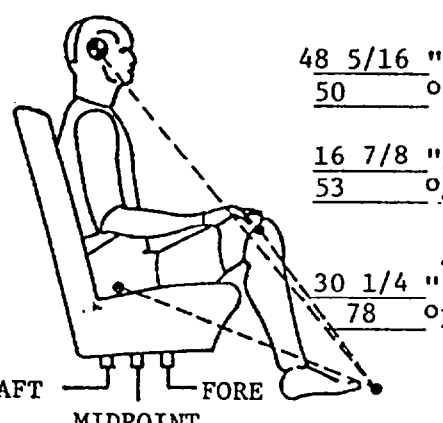
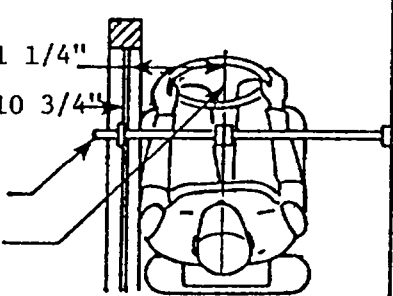
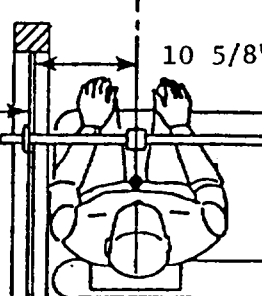
1. J. Kokoruda

2. N. Echeverria

3. M. Garrison

POSITIONING DATE: 5/29/84

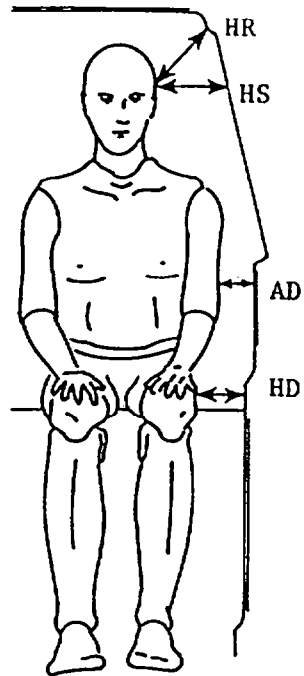
AMBIENT TEMP.: 68° F. TIME: 9:30

DRIVER DUMMY # 06 HEAD <u>19</u>" TARGET* <u>34</u>" KNEE <u>33 1/4</u>" JOINT <u>103</u>" APPROX. "H" <u>19 3/16</u>" POINT <u>119</u>" 	REAR PASSENGER DUMMY # U02 <u>48 5/16</u>" HEAD <u>50</u>" TARGET** <u>16 7/8</u>" KNEE <u>53</u>" JOINT APPROX. "H" <u>30 1/4</u>" POINT <u>78</u>" 
DOOR GLASS HEIGHT*** <u>11 1/4</u>" <u>10 3/4</u>" LATERAL BAR ADJUSTABLE POINTER  DRIVER DUMMY # 06	DOOR GLASS HEIGHT <u>10 5/8</u>" 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.

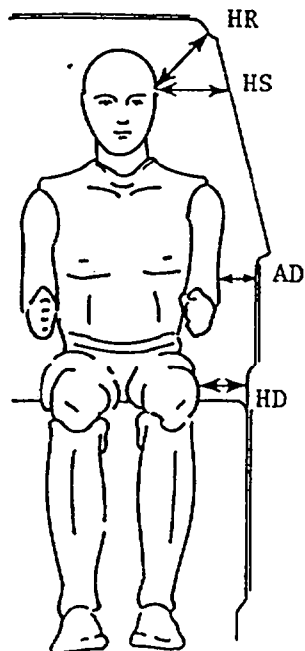
***Door glass height is equal on the right and left side of vehicle at dummy nose level.



DRIVER
06

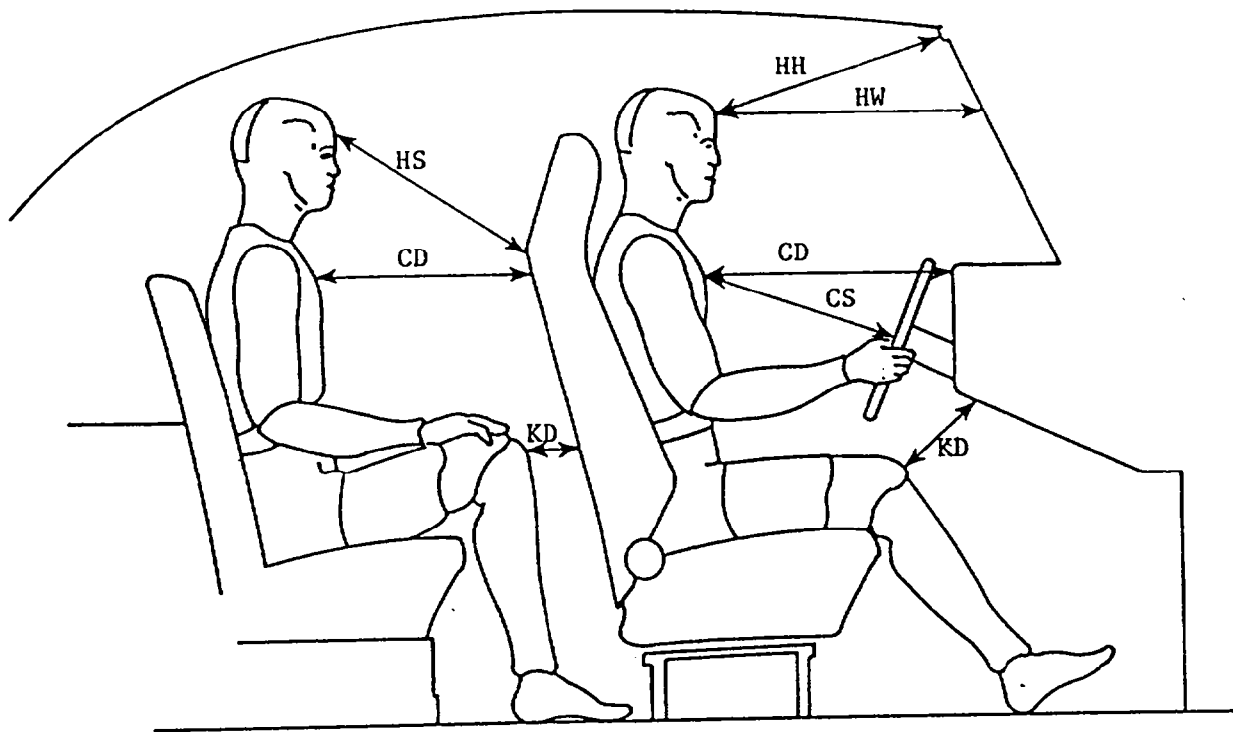
PASSENGER
U02

HR	6 3/8	5 1/2
HS	8	8 3/8
AD	1/2	1/2
HD	2 1/2	3 1/2



ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



DRIVER
O6

PASSENGER
U02

HH	14 1/8	DNA
HW	21 3/8	DNA
HS	DNA	25 15/16
CD	20 1/4	18 3/4
CS	13 1/8	DNA
KDL	8 3/8	3 7/8
KDR	8 3/8	3 3/8

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 contacted the driver's window and window sill. The dummy rebounded from the driver's door across the front occupant compartment and its buttocks struck the front passenger's window sill. The dummy came to rest sitting in the right front passenger seat with it's upper torso wedged between the two front seats.

PASSENGER

During impact, the dummy's torso contacted the padded left rear occupant side wall and the head contacted the side header and side window. The dummy rebounded from the padded side wall and remained upright throughout the event. The dummy came to rest seated upright and facing forward.

VEHICLE EXTERIOR PROFILES AND STATIC CRUSH

ZERO DISTANCE AT PROJECTED IMPACT POINT*

LOCATION	HEIGHT (in)	6	0	6	12	18	24	30	36	42	48	54	60	66	72	78
		PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)														
Axle Height	10.5	X	X	19.9	19.8	19.8	19.8	19.8	19.8	19.9	19.9	20.1	20.1	20.3	X	X
H-Point	20.0	X		16.9	17.9	17.8	17.8	17.8	17.8	17.8	17.9	17.9	18.1	18.1	17.9	X
Mid Door	23.5			16.3	17.8	17.6	17.5	17.5	17.4	17.5	17.5	17.7	17.8	17.9	18.1	X
Window Sill	33.5			19.7	19.4	19.2	19.1	19.0	19.1	19.1	19.2	19.1	19.1	19.3	19.4	19.6
Window Top	52.5	X	X	X	X	X	26.6	26.3	26.1	26.1	26.1	26.2	23.3	26.5	26.9	27.4

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

Axle Height	10.5	X	X	22.8	27.2	27.8	27.9	27.0	25.9	25.0	24.3	23.3	21.9	20.9	X	X
H-Point	20.0	X		24.7	26.4	35.6	36.8	37.1	36.3	34.8	33.1	31.2	28.7	27.0	24.4	22.1
Mid Door	23.5			22.1	24.2	24.1	34.7	36.3	36.5	35.5	33.9	31.8	30.1	28.4	25.8	23.4
Window Sill	33.5			20.8	20.9	21.3	33.4	37.3	38.4	37.3	34.6	32.5	30.2	28.8	25.4	22.8
Window Top	52.5	X	X	X	X	X	27.5	27.1	27.0	27.0	27.1	27.1	27.1	27.1	27.1	27.4

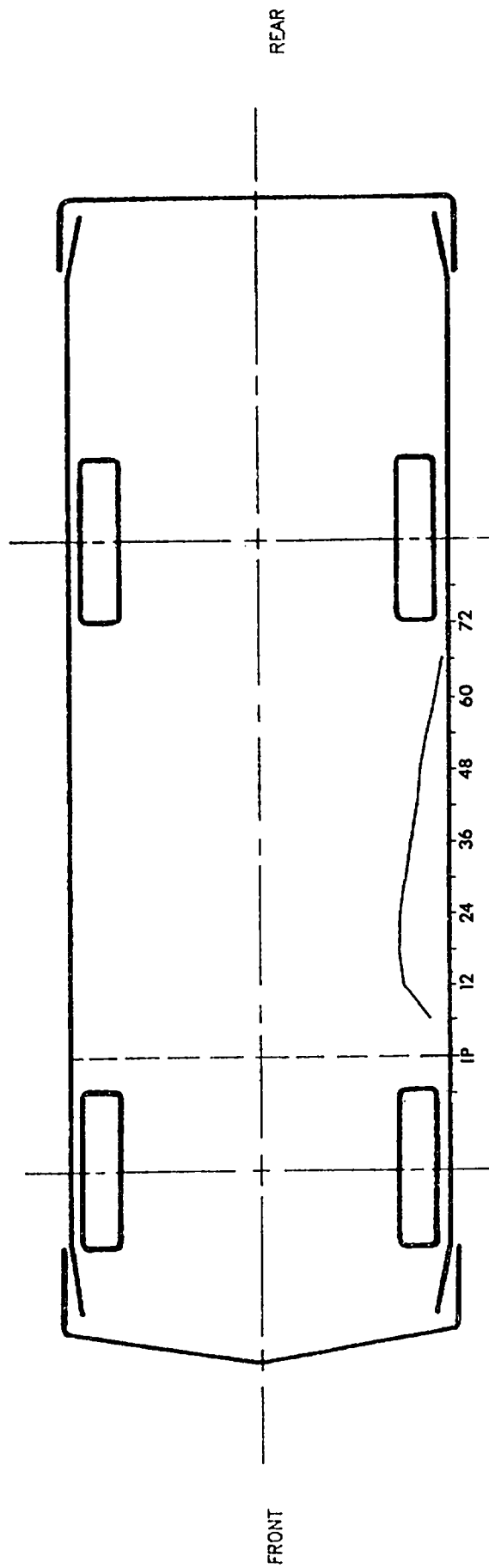
STATIC CRUSH (IN)

Axle Height	10.5	X	X	2.9	7.4	8.0	8.1	7.2	6.1	5.1	4.4	3.2	1.8	0.6	X	X
H-Point	20.0	X		7.8	8.5	17.8	19.0	19.3	18.5	17.0	15.3	13.3	10.8	8.9	6.3	4.2
Mid Door	23.5			5.8	6.4	6.5	17.1	18.8	19.0	16.5	14.3	12.6	10.7	8.0	5.5	1.9
Window Sill	33.5			1.1	1.5	2.1	14.3	18.3	19.4	18.3	15.5	13.4	11.0	9.7	6.3	3.5
Window Top	52.5	X	X	X	X	X	0.9	0.8	0.9	0.9	0.9	1.0	0.9	3.8	0.6	0.5

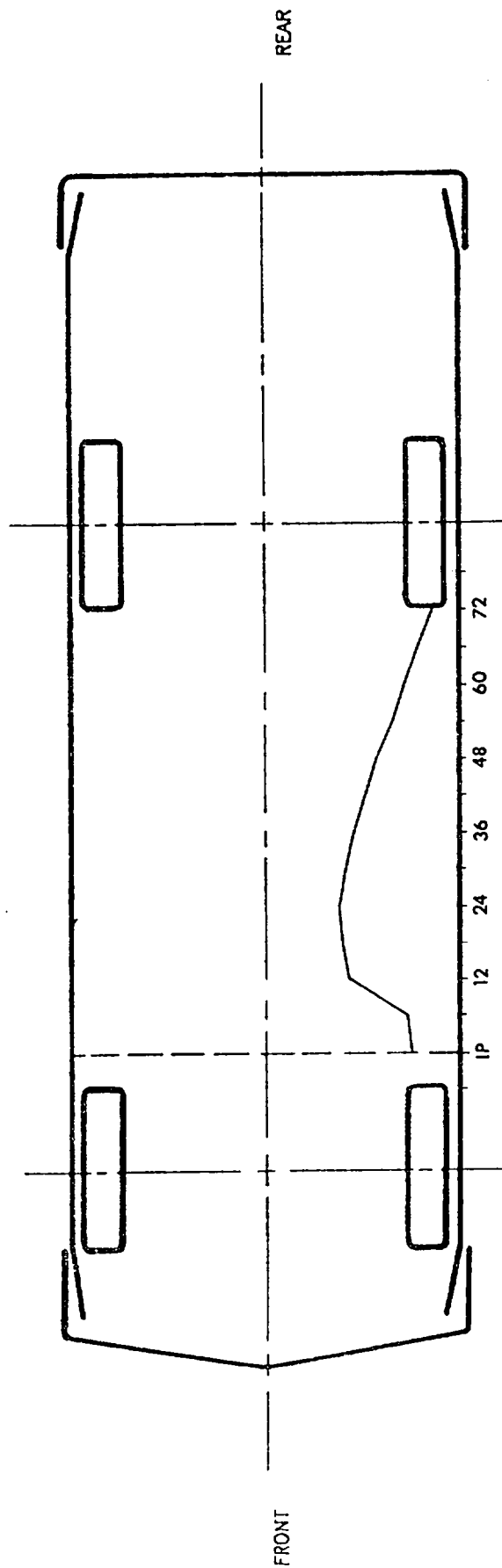
* Projected impact point is 37 inches forward of driver's side wheelbase midpoint. Column readings are front to rear from left to right.

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

VEHICLE EXTERIOR STATIC CRUSH PROFILE

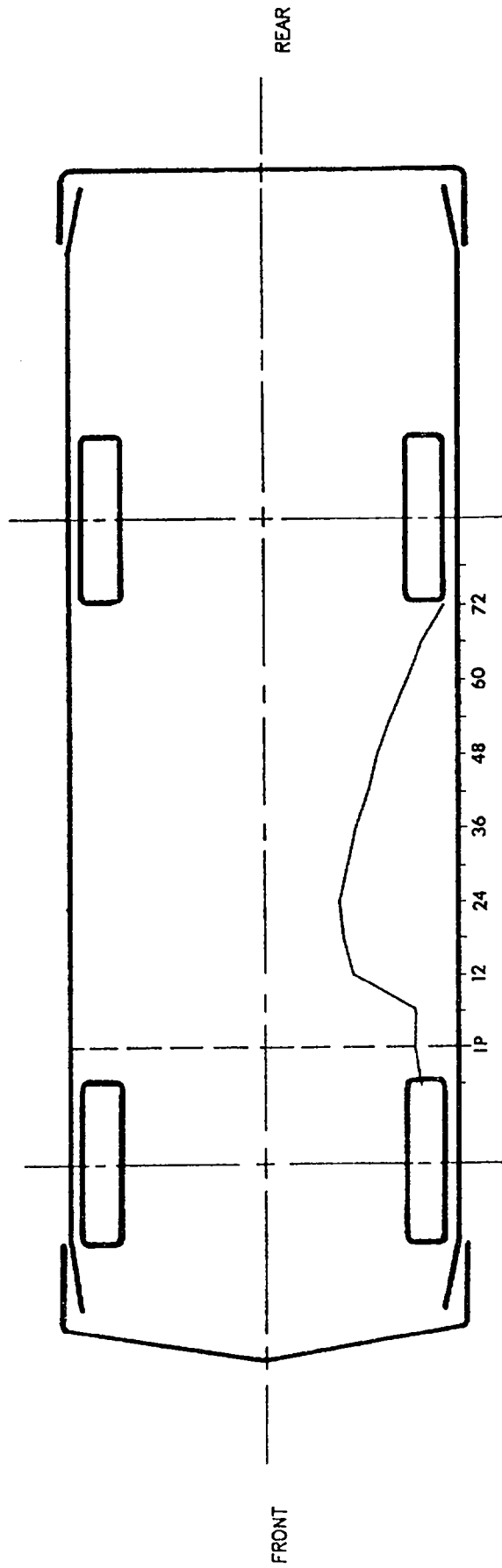


VEHICLE EXTERIOR STATIC CRUSH PROFILE



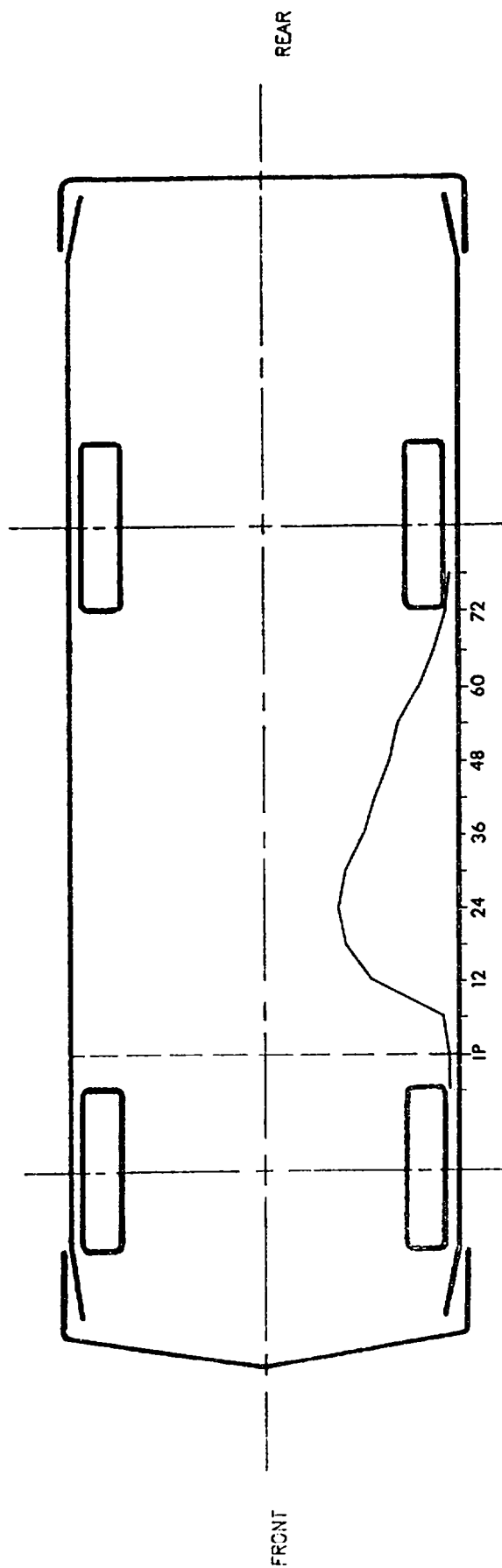
PROFILE LEVEL EQUALS H-POINT HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



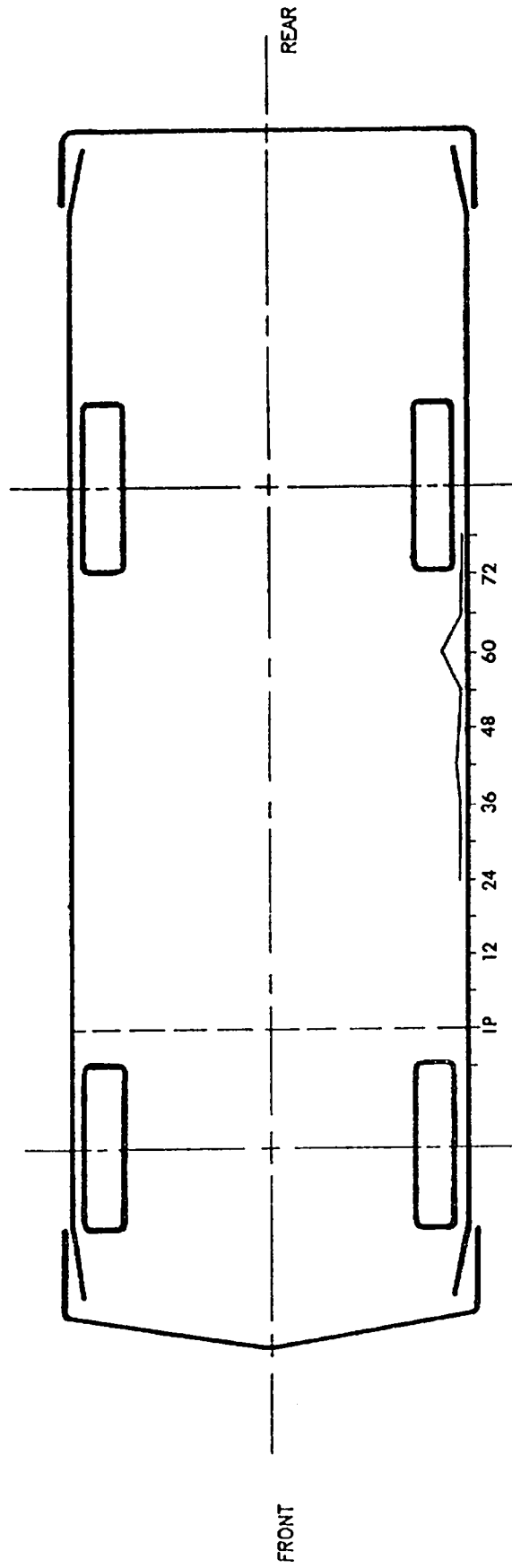
PROFILE LEVEL EQUALS MID-DOOR HEIGHT
IP EQUALS PROJECTED IMPACT POINT

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	TIME	MAX	TIME	MAX	TIME	MAX	TIME
	(g)	(msec)	(g)	(msec)	(g)	(msec)	(g)	(msec)
HEAD ACCELERATION								
LONGITUDINAL	80.71	225.75	163.96	81.50	21.69	89.38	40.43	102.38
LATERAL	83.08	81.50	23.79	72.88	57.58	64.13	35.26	88.13
VERTICAL	12.23	207.00	113.08	70.38	102.48	88.88	46.06	76.25
RESULTANT		188.16 @	83.50			108.60 @	88.88	
HIC	3763.40	from 56.00 to 87.25			667.00	from 59.75 to 107.38		
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	37.42	213.75	50.28	53.12	13.56	107.50	51.95	87.50
LATERAL (P)***	166.83	52.50	42.74	68.13	49.69	79.38	10.48	108.13
LATERAL (R)***	169.99	52.50	41.19	68.13	51.93	79.38	9.41	108.13
VERTICAL	11.98	61.25	36.19	52.50	11.81	65.63	17.20	88.13
RESULTANT (P)		177.89 @	52.50			69.82 @	79.38	
RESULTANT (R)		180.86 @	52.50			71.43 @	79.38	
DELTA V (MPH)****		36.4 @	61.88 (P)			20.1 @	98.12 (P)	
		38.0 @	64.38 (R)			21.6 @	98.12 (R)	
LOWER SPINE								
LONGITUDINAL	56.92	57.50	47.14	48.13	9.26	113.75	48.26	71.25
LATERAL (P)	160.21	49.37	33.63	62.50	63.46	73.13	19.00	95.00
LATERAL (R)	161.77	49.37	31.44	67.50	65.16	73.13	16.47	95.00
VERTICAL	20.36	48.13	8.23	200.63	12.69	76.25	7.38	95.63
RESULTANT (P)		166.35 @	49.37			79.56 @	72.50	
RESULTANT (R)		167.85 @	49.37			80.89 @	72.50	
DELTA V (MPH)		47.4 @	60.00 (P)			27.6 @	90.00 (P)	
		48.1 @	60.00 (R)			29.4 @	90.62 (R)	
LEFT UPPER RIB								
LATERAL (P)	100.92	46.88	12.29	80.63	68.56	80.00	8.08	115.00
LATERAL (R)	116.13	51.25	12.17	71.25	67.30	80.00	6.72	115.00
DELTA V (MPH)		37.6 @	69.38 (P)			27.2 @	108.75 (P)	
		38.5 @	69.38 (R)			28.0 @	106.25 (R)	
LEFT LOWER RIB								
LATERAL (P)	133.97	45.00	55.08	66.25	77.00	74.37	8.21	116.88
LATERAL (R)	125.06	45.00	57.41	65.63	73.51	74.37	8.56	116.88
DELTA V (MPH)		40.3 @	63.38 (P)			28.7 @	111.88 (P)	
		41.7 @	63.75 (R)			28.1 @	112.50 (R)	
PELVIS ACCELERATION								
LONGITUDINAL	56.35	89.75	304.10	58.50 o	10.09	121.88	79.73	67.38
LATERAL	122.30	47.88	368.84	58.25 o	141.46	62.13	24.98	54.13
VERTICAL	64.41	59.63	207.20	57.63 o	31.10	75.00	20.88	62.50
RESULTANT		494.16 @	58.13 o			158.15 @	62.13	
DELTA V (MPH)		---	@ --- o			27.7 @	112.63	

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	<u>DRIVER DUMMY</u>				<u>PASSENGER DUMMY</u>			
	<u>POSITIVE</u> <u>DIRECTION*</u>		<u>NEGATIVE</u> <u>DIRECTION**</u>		<u>POSITIVE</u> <u>DIRECTION*</u>		<u>NEGATIVE</u> <u>DIRECTION**</u>	
	<u>MAX</u> <u>(in)</u>	<u>TIME</u> <u>(msec)</u>	<u>MAX</u> <u>(in)</u>	<u>TIME</u> <u>(msec)</u>	<u>MAX</u> <u>(in)</u>	<u>TIME</u> <u>(msec)</u>	<u>MAX</u> <u>(in)</u>	<u>TIME</u> <u>(msec)</u>
RIB DEFLECTION †	0.13	179.38	1.93	60.25	---	--- Y	---	--- Y

* 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

Y See TEST ANOMALIES

- o 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

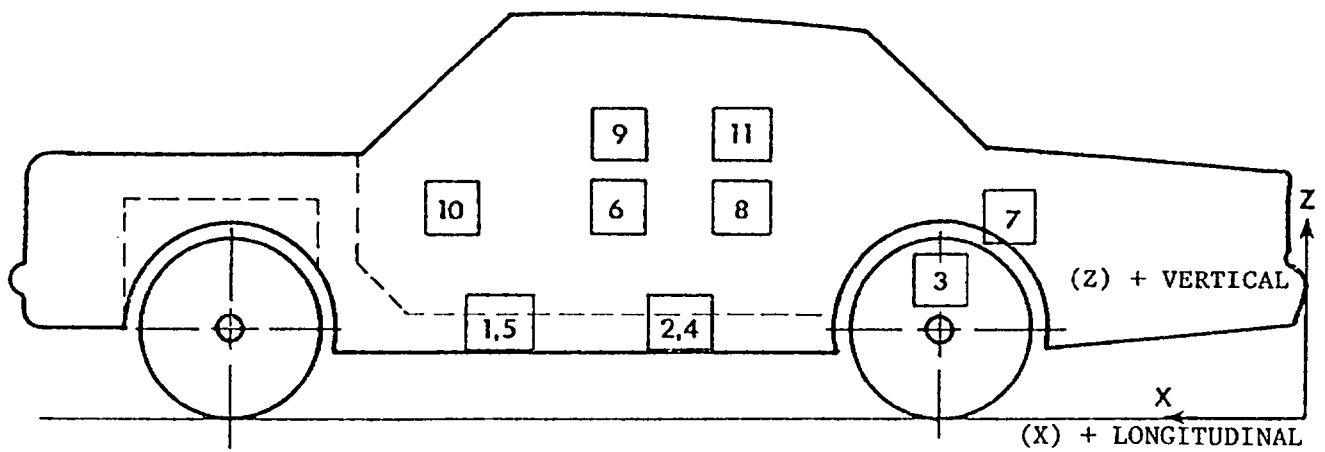
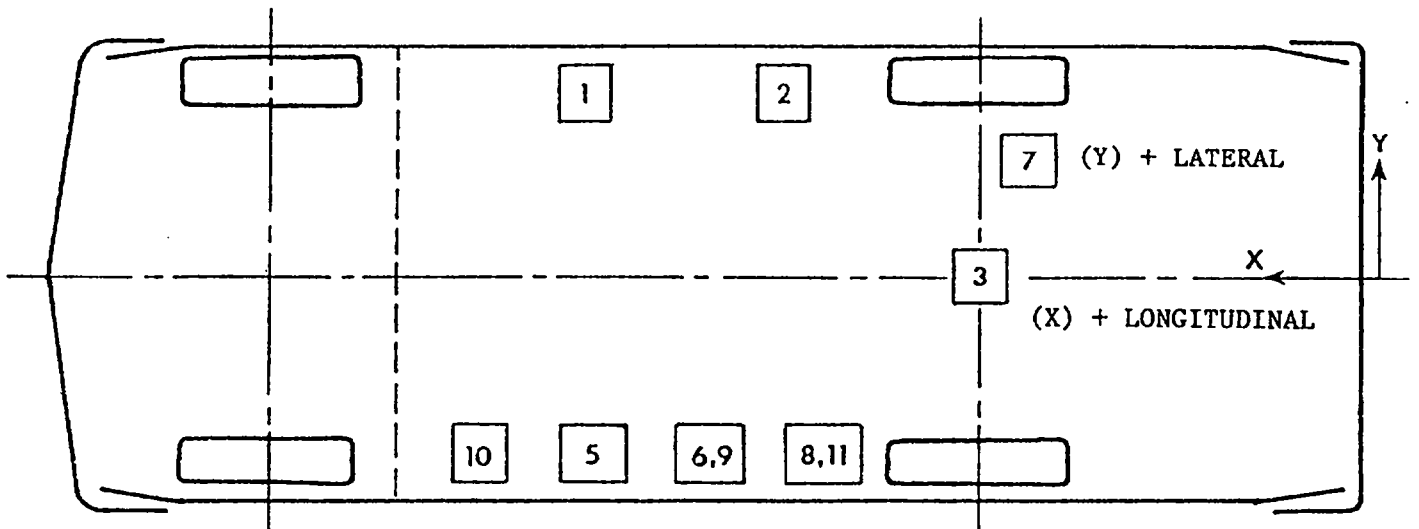
NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	RIGHT SILL AT FRONT SEAT (LONGITUDINAL) (LATERAL) (VERTICAL) (RESULTANT)	83.5 $\Delta V = -8.8$ mph @ 120.00 msec $\Delta V = 14.9$ mph @ 120.00 msec	23.5	9.8	1.93 14.87 11.53	126.63 76.00 57.63 16.24 @ 75.88	8.28 4.28 9.68	16.25 121.75 50.75
2	RIGHT SILL AT REAR SEAT (LONGITUDINAL) (LATERAL) (VERTICAL) (RESULTANT)	61.6 $\Delta V = -8.1$ mph @ 120.00 msec $\Delta V = 19.9$ mph @ 120.00 msec	23.6	8.9	2.18 21.66 8.44	127.13 46.88 58.38 21.84 @ 46.75	8.56 4.41 7.25	16.25 122.63 50.63
3	REAR DECK OVER AXLE (LONGITUDINAL) (LATERAL) (VERTICAL) (RESULTANT)	32.0 $\Delta V = -9.2$ mph @ 120.00 msec $\Delta V = 27.1$ mph @ 120.00 msec	0.0	6.9	4.20 26.54 7.26	27.63 70.75 49.13 29.72 @ 70.75	13.46 2.77 8.65	58.00 126.50 72.13
4	LEFT SILL AT REAR SEAT (LATERAL)	61.2 $\Delta V = 19.1$ mph @ 114.00 msec	-23.5	9.0	26.72	51.88	3.30	130.13
5	LEFT SILL AT FRONT SEAT (LATERAL)	83.5 $\Delta V = 4.7$ mph @ 23.00 msec	-23.5	10.4	26.05	11.50	31.33	48.75
6	LEFT FRONT DOOR CENTERLINE (LATERAL)	80.5 $\Delta V = 24.3$ mph @ 33.50 msec	-26.0	23.4	116.78	25.38	65.31	38.25
7	RIGHT REAR COMPARTMENT (LONGITUDINAL)	31.0 $\Delta V = 3.85$	-15.4	13.9	34.63	9.21	70.38	
8	MIDREAR OF LEFT FRONT DOOR (LATERAL)	60.4 $\Delta V = 28.0$ mph @ 23.00	-26.2	23.4	110.98	10.88	101.24	29.13
9	UPPER LEFT FRONT DOOR CENTERLINE (LATERAL)	81.5 $\Delta V = 34.0$ mph @ 34.13 msec	-26.1	32.3	200.25	30.63	222.04	40.13
10	MIDFRONT OF LEFT FRONT DOOR (LATERAL)	99.9 $\Delta V = 30.4$ mph @ 48.50 msec	-26.2	21.8	183.09	48.13	87.37	54.75
11	UPPER REAR OF LEFT REAR DOOR (LATERAL)	70.5 ---	25.9 ---	32.6 --- Y	---	---	---	---

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

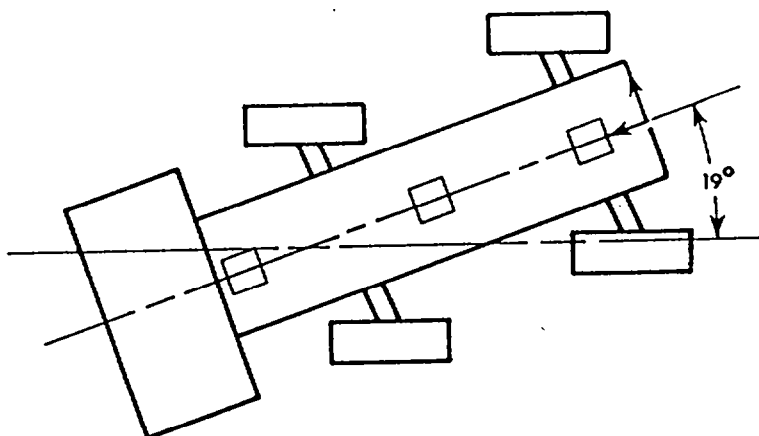
All measurements of accelerometer locations in inches.

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)	$\Delta V = -19.5 \text{ mph @ } 120.00 \text{ msec}$			1.01	184.88	14.95	46.88
	(LATERAL)	$\Delta V = -3.1 \text{ mph @ } 120.00 \text{ msec}$			1.84	45.88	5.50	82.50
	(VERTICAL)				19.58	108.88	12.59	100.88
	(RESULTANT)				20.64 @ 81.50			
2	FRONT FRAME MEMBER	130.3	0.0	11.3				
	(LONGITUDINAL)	$\Delta V = -17.4 \text{ mph @ } 120.00 \text{ msec}$			0.99	219.88	15.18	46.38
3	REAR FRAME MEMBER	23.3	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -18.4 \text{ mph @ } 120.00 \text{ msec}$			1.51	125.13	14.86	46.50

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

All measurements of accelerometer locations in inches.

HIGH SPEED CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead	Photosonic 1B	8	828	Vehicle Dynamics
2	Overhead	Photosonic 1B	25	790	Close-up of impact point
3	Onboard MDB	Photosonic 1B	25	490	Close-up of impact point
4	Onboard MDB	Stalex	13	503	Driver kinematics
5	Ground level - right	Photosonic 1B	25	758	Overall view
6	Ground level - left	Photosonic 1B	17	838	Overall view
7	Onboard vehicle	Photosonic 1B	8	815	Driver kinematics - front view
8	Onboard vehicle	Photosonic 1B	8	798	Driver kinematics
9	Onboard vehicle	Photosonic 1B	8	795	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	26'4"	60'	45"
6	-19'7"	-11'3"	45"

Origin of Coordinate System is Point of Impact

+X = Forward with Respect to Striking Vehicle's Velocity Vector

+Y = Rightward with Respect to Striking Vehicle's Velocity Vector

+Z = Upward with Respect to Striking Vehicle's Velocity Vector

NON-GOVERNMENT FURNISHED TRANSDUCER INFORMATION

PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NUMBER	SERIAL NUMBER	MFGR.	DATE OF LAST CALIBRATION	SENSITIVITY	DESIRED FULL SCALE (ENGR. UNITS)
BCGXG	Accel	4-202-0001	18845	Bell Howell	5/2/84	0.237 MV/G	50 G
BCGYG	Accel	4-202-0001	18858	Bell Howell	5/2/84	0.236 MV/G	50 G
BOG2G	Accel	4-202-0001	18857	Bell Howell	5/2/84	0.239 MV/G	50 G
BFCXG	Accel	4-202-0001	18240	Bell Howell	5/2/84	0.239 MV/G	50 G
BRCXG	Accel	4-202-0001	19022	Bell Howell	5/2/84	0.220 MV/G	50 G

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

APPENDIX A
PHOTOGRAPHS

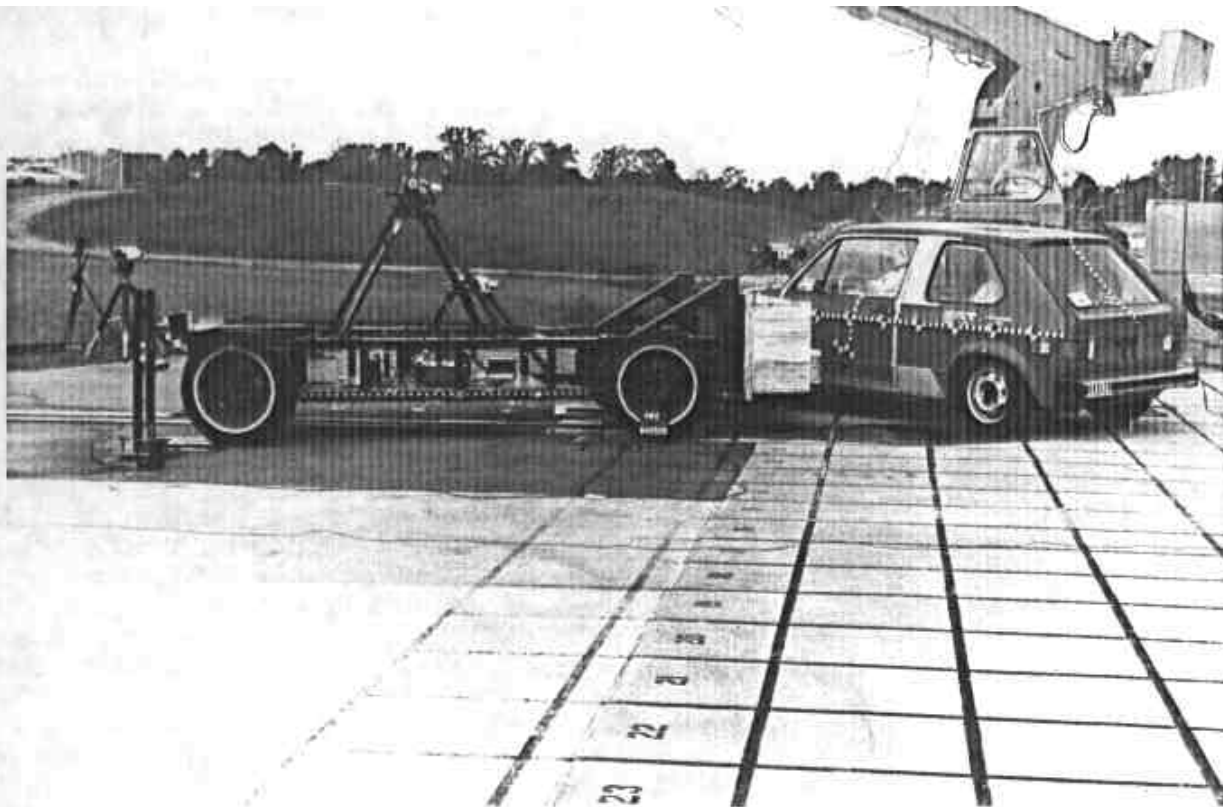


Figure A-1. PRE-TEST OVERALL - VIEW 1

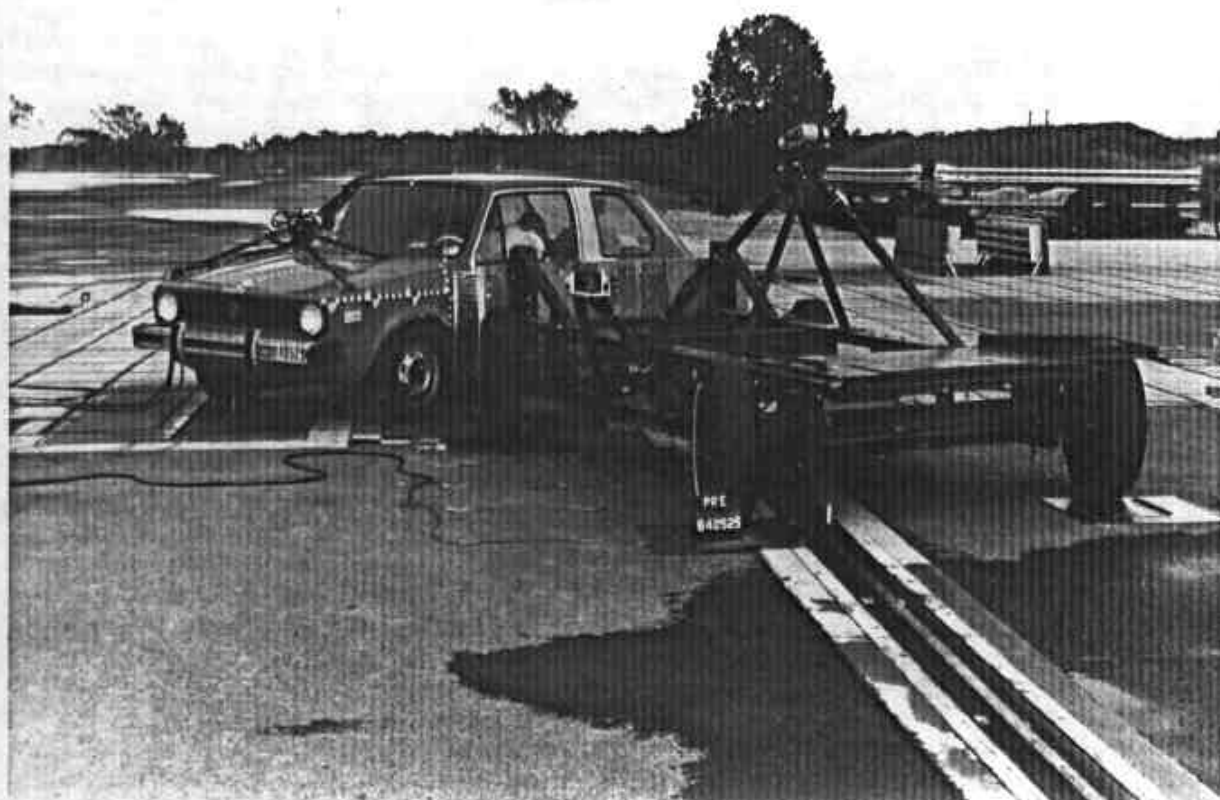


Figure A-2. PRE-TEST OVERALL - VIEW 2



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

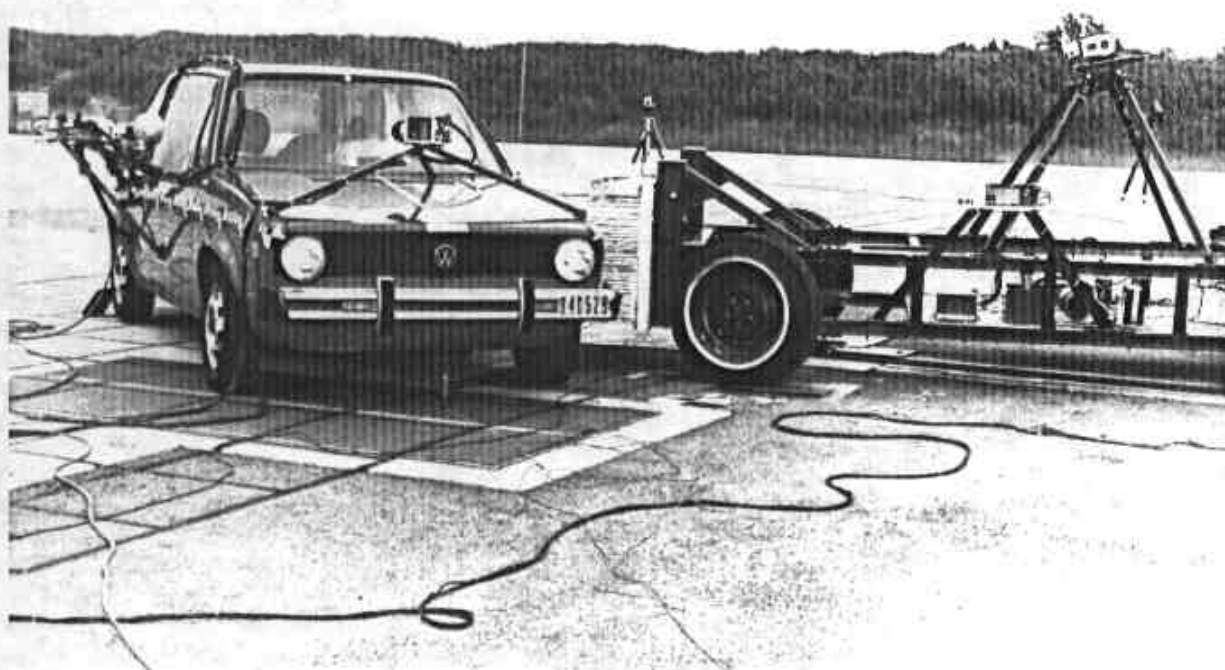


Figure A-4. PRE-TEST OVERALL - VIEW 4

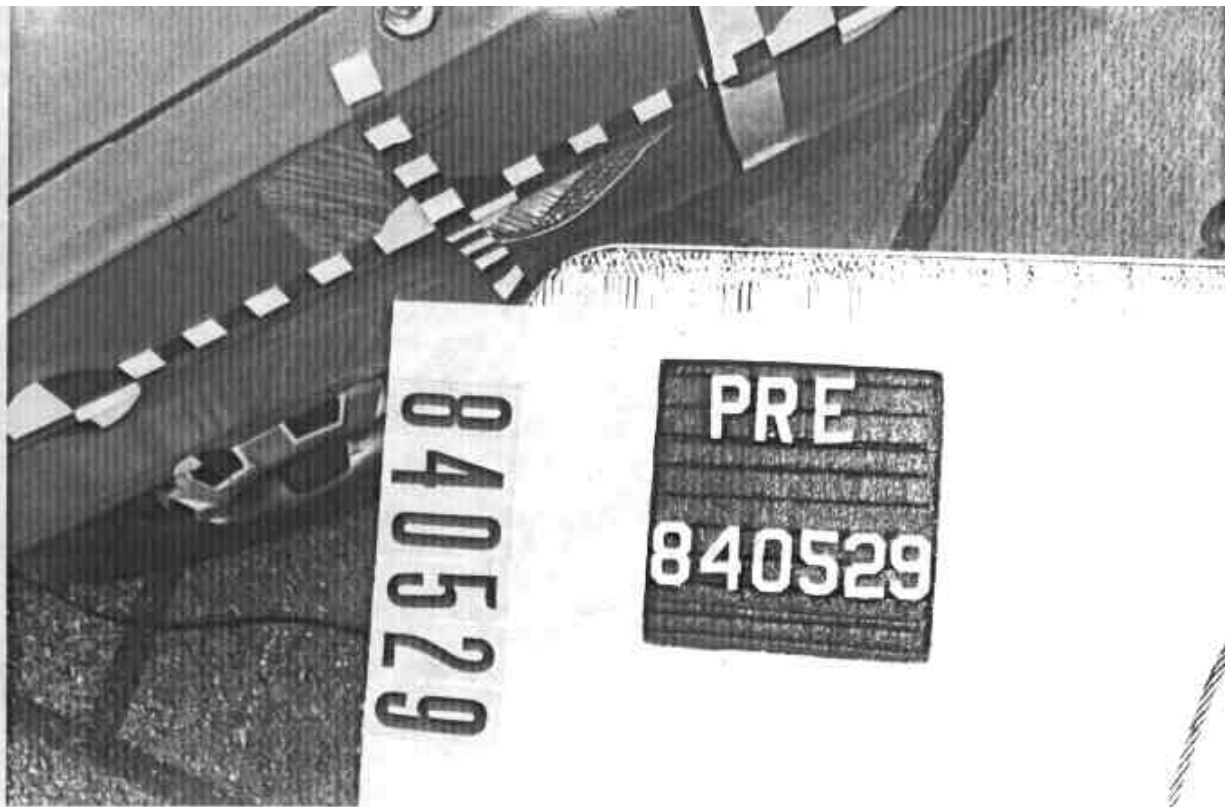


Figure A-5. PRE-TEST CLOSEUP

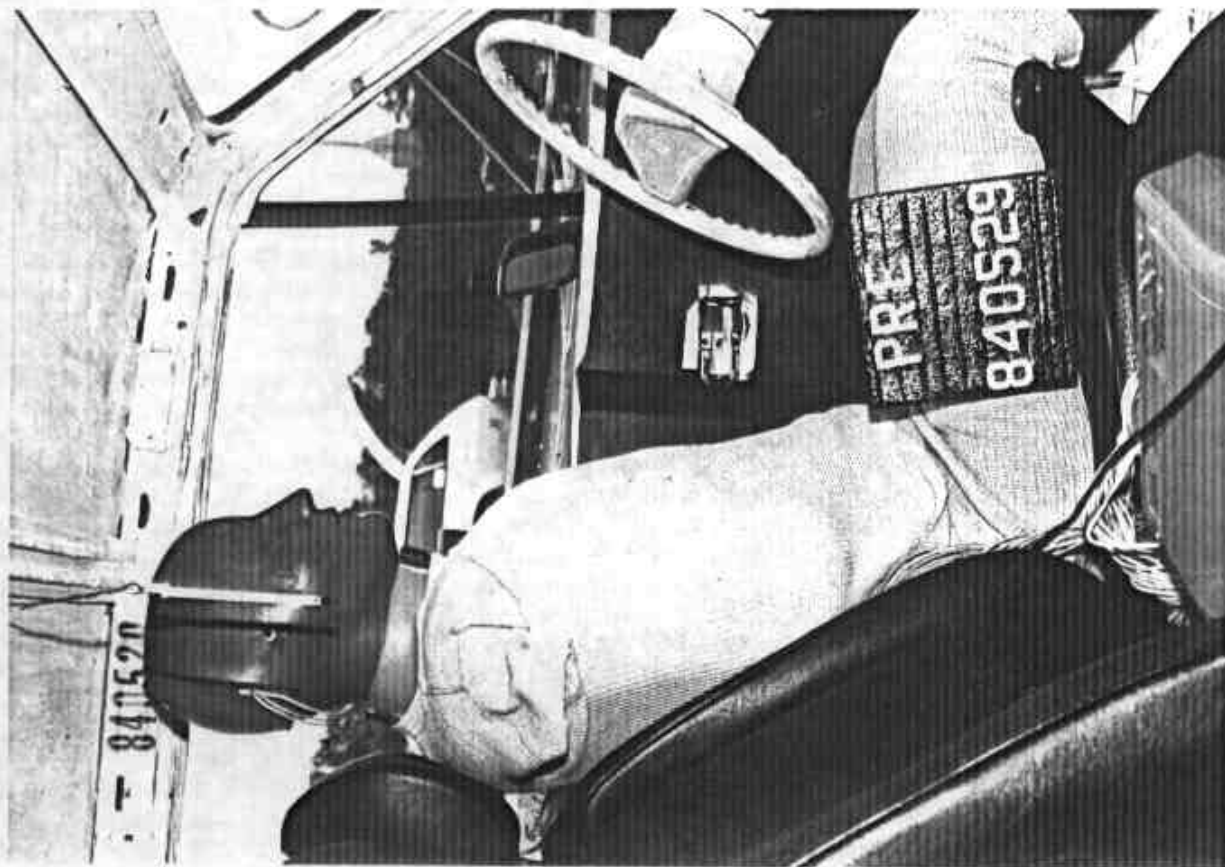


Figure A-6. PRE-TEST DRIVER DUMMY - VIEW 1



Figure A-7. PRE-TEST DRIVER DUMMY - VIEW 2



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

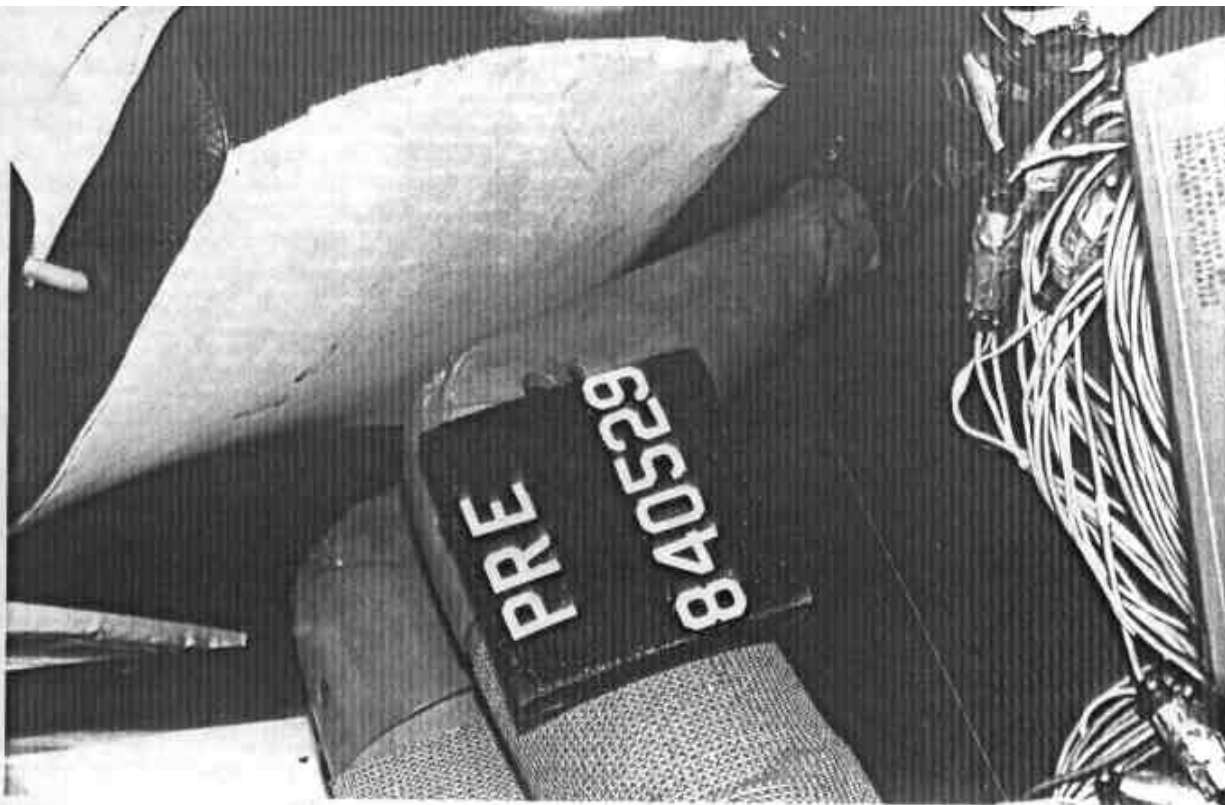


Figure A-9. PRE-TEST PASSENGER DUMMY - VIEW 2



Figure A-10. CRASH EVENT PHOTOGRAPH



Figure A-11. POST-TEST OVERALL - VIEW 1



Figure A-12. POST-TEST OVERALL - VIEW 2



Figure A-13. POST-TEST OVERALL - VIEW 3

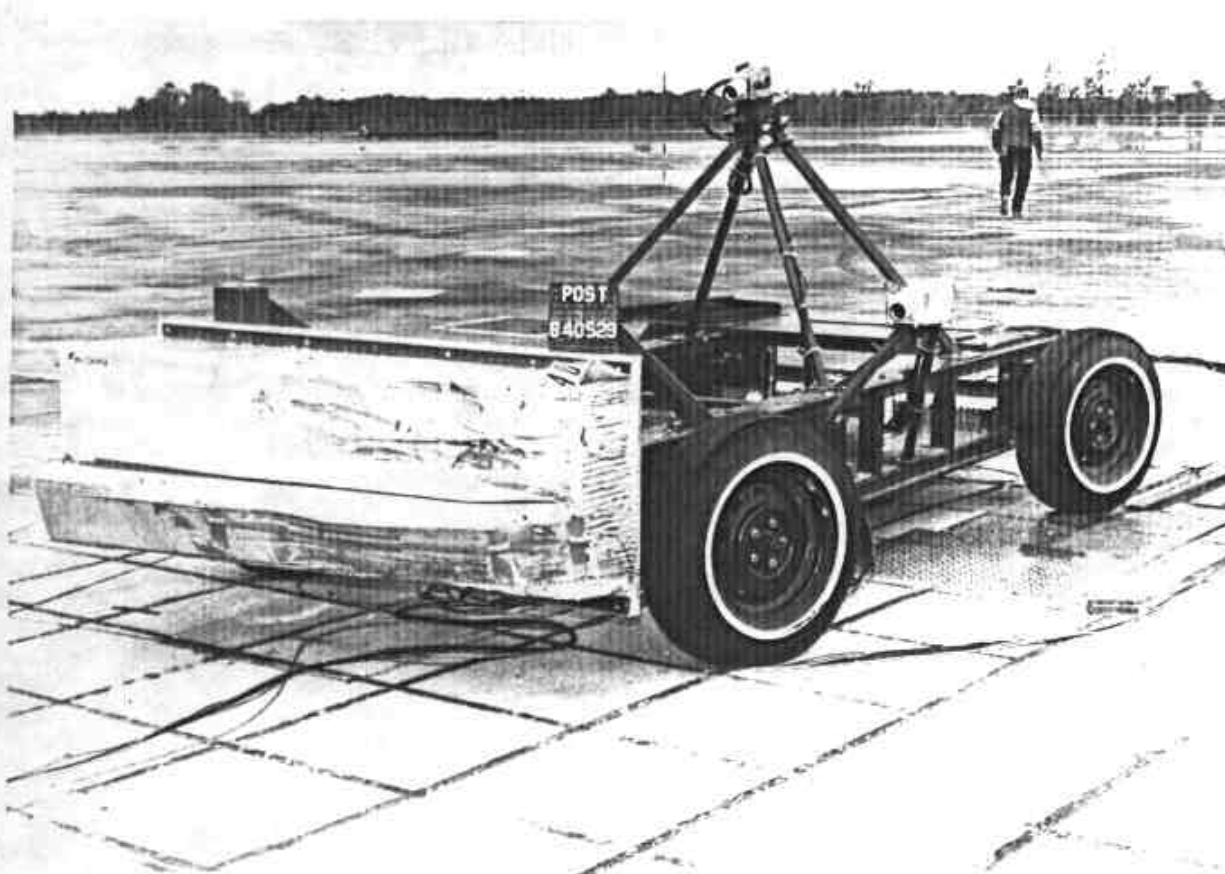


Figure A-14. POST-TEST OVERALL - VIEW 4



Figure A-15. POST-TEST DRIVER DUMMY - VIEW 1



Figure A-16. POST-TEST DRIVER DUMMY - VIEW 2

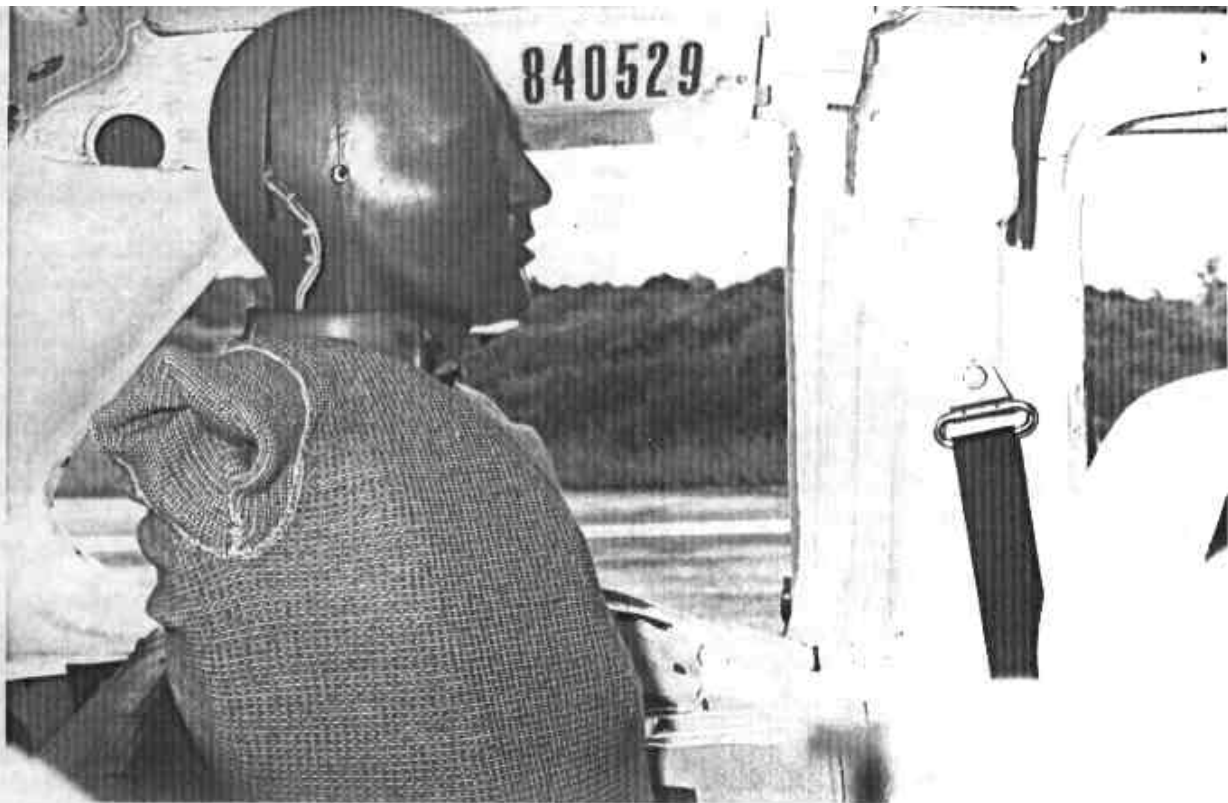


Figure A-17. POST-TEST PASSENGER DUMMY - VIEW 1



Figure A-18. POST-TEST PASSENGER DUMMY - VIEW 2

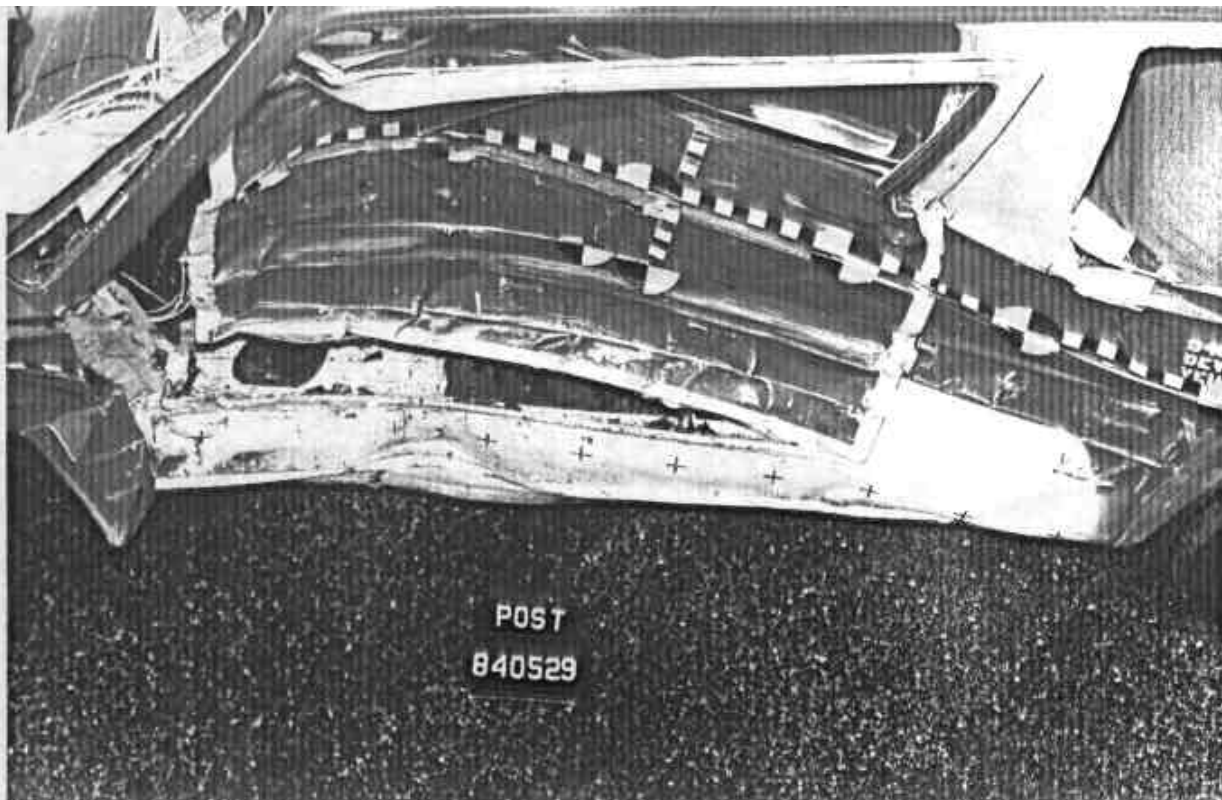


Figure A-19. POST-TEST VEHICLE DAMAGE

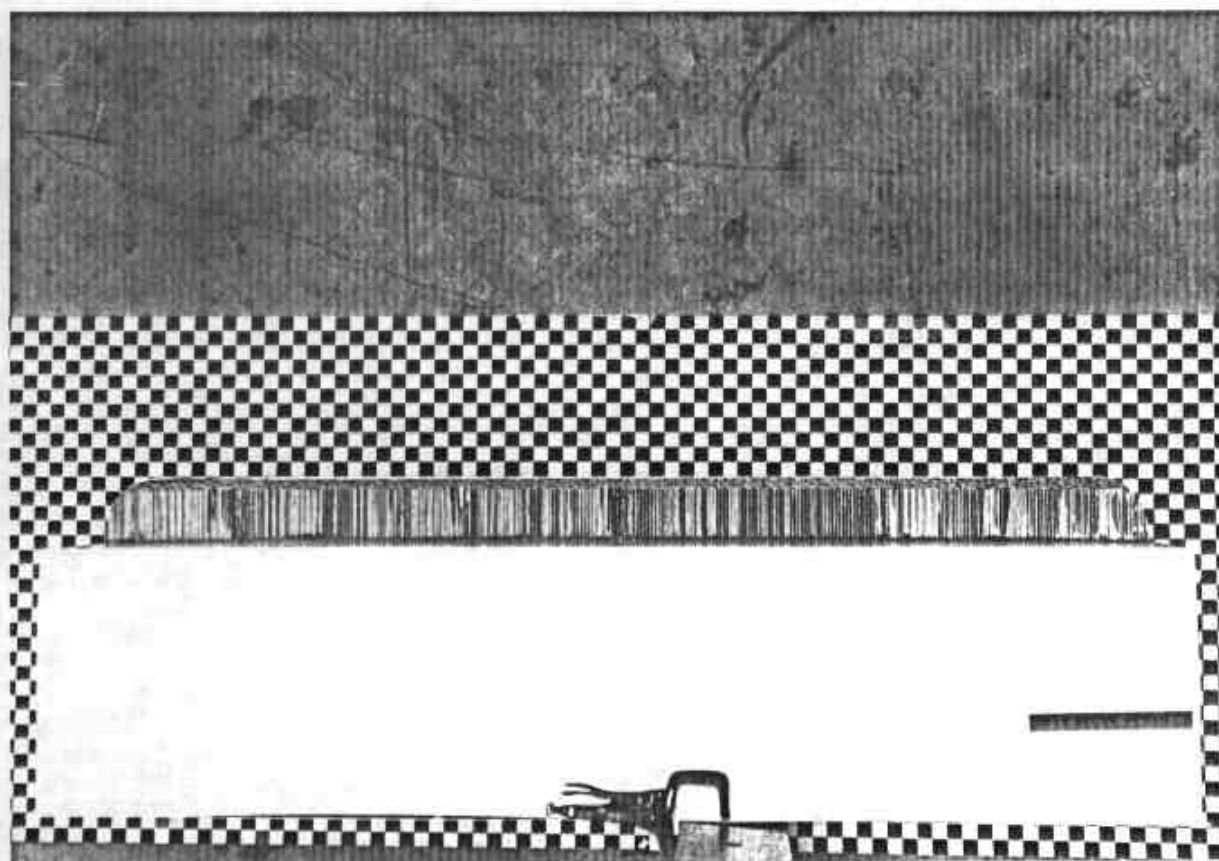


Figure A-20. PRE-TEST MDB FACE - VIEW 1

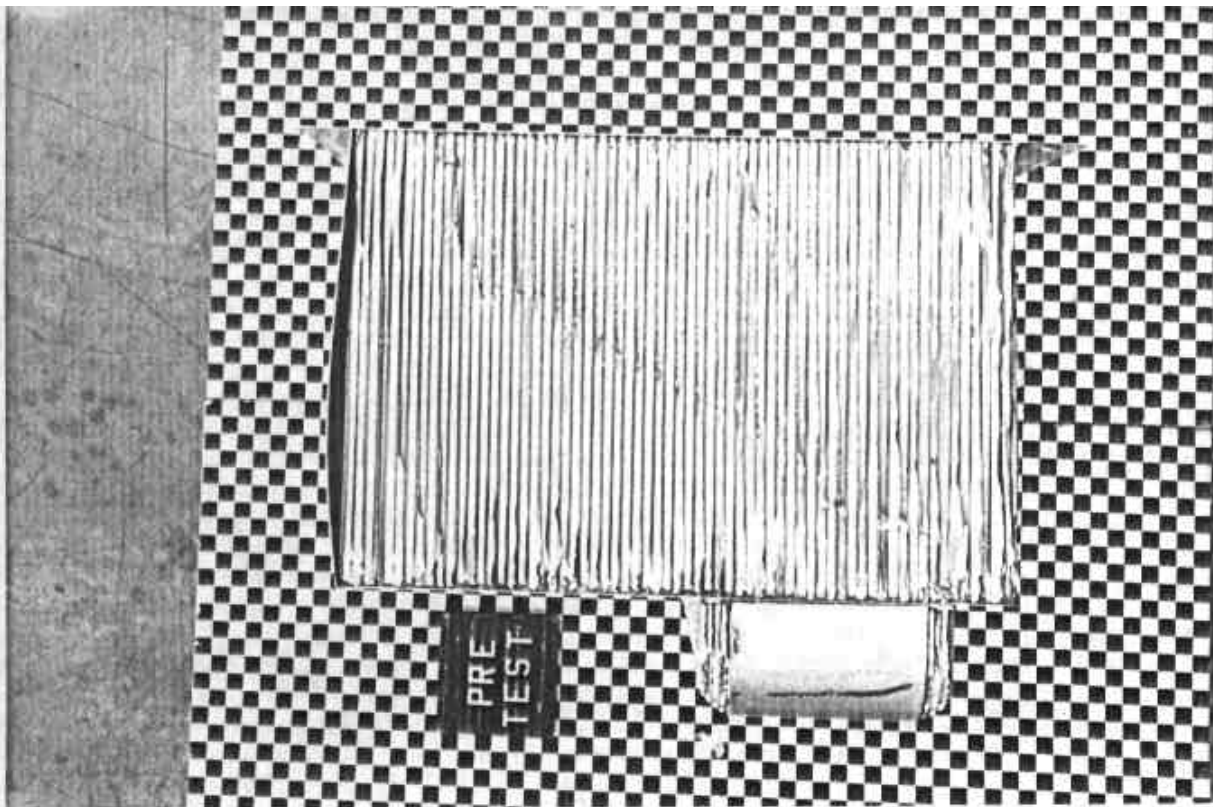


Figure A-21. PRE-TEST MDB FACE - VIEW 2

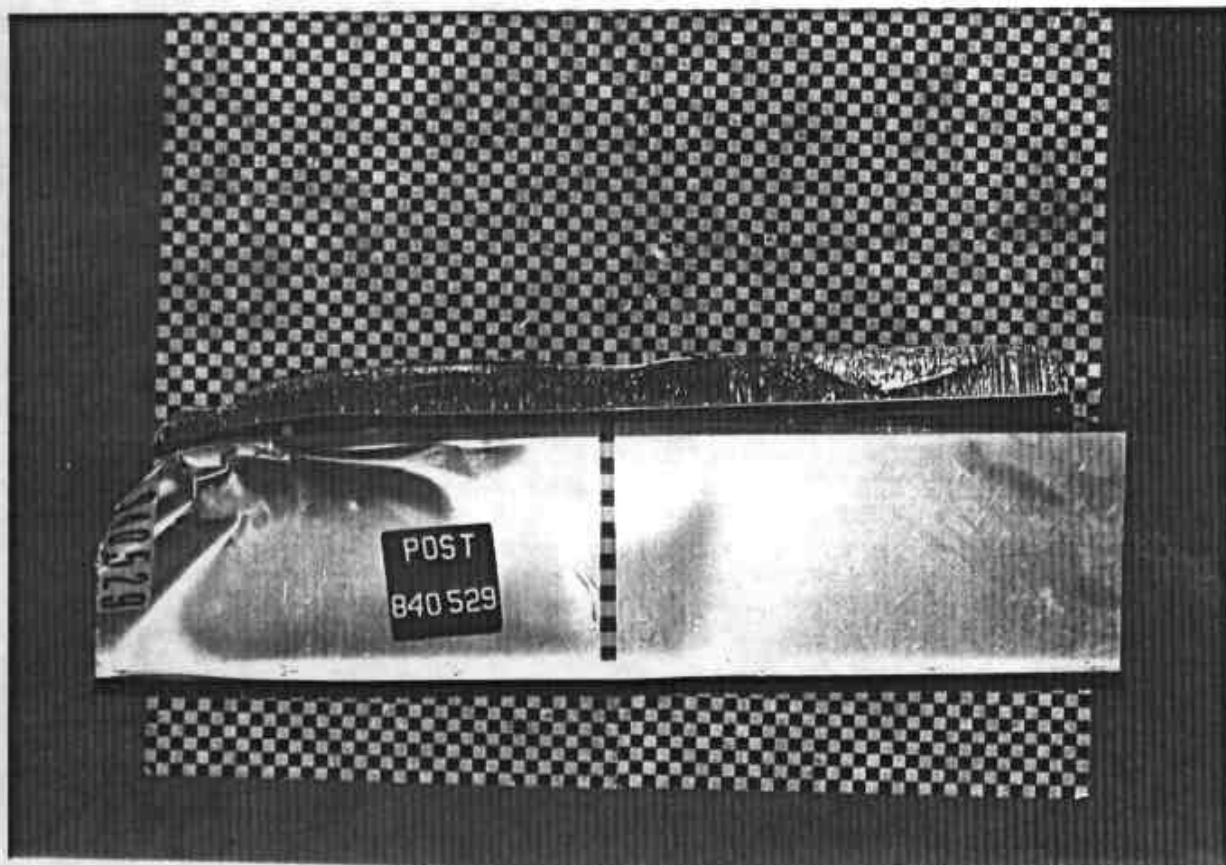


Figure A-22. POST-TEST MDB FACE - VIEW 1

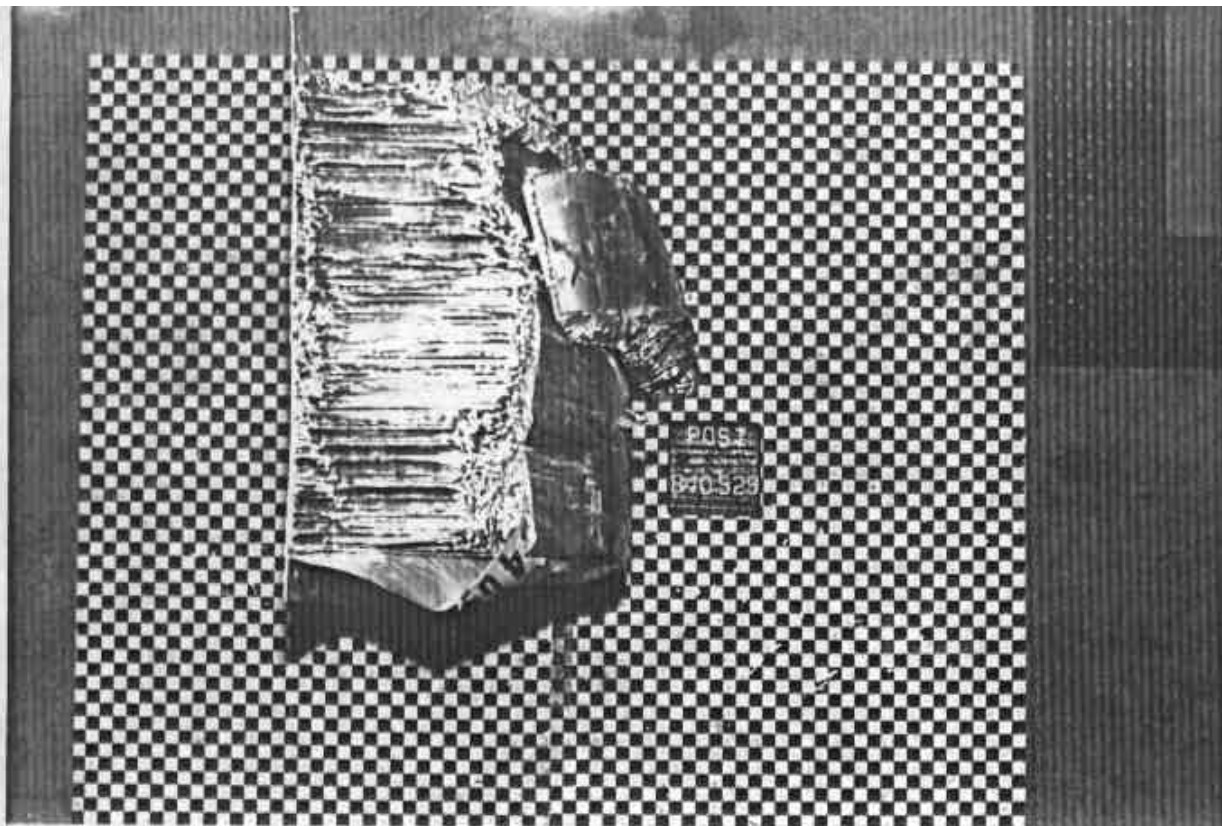


Figure A-23. POST-TEST MDB FACE - VIEW 2

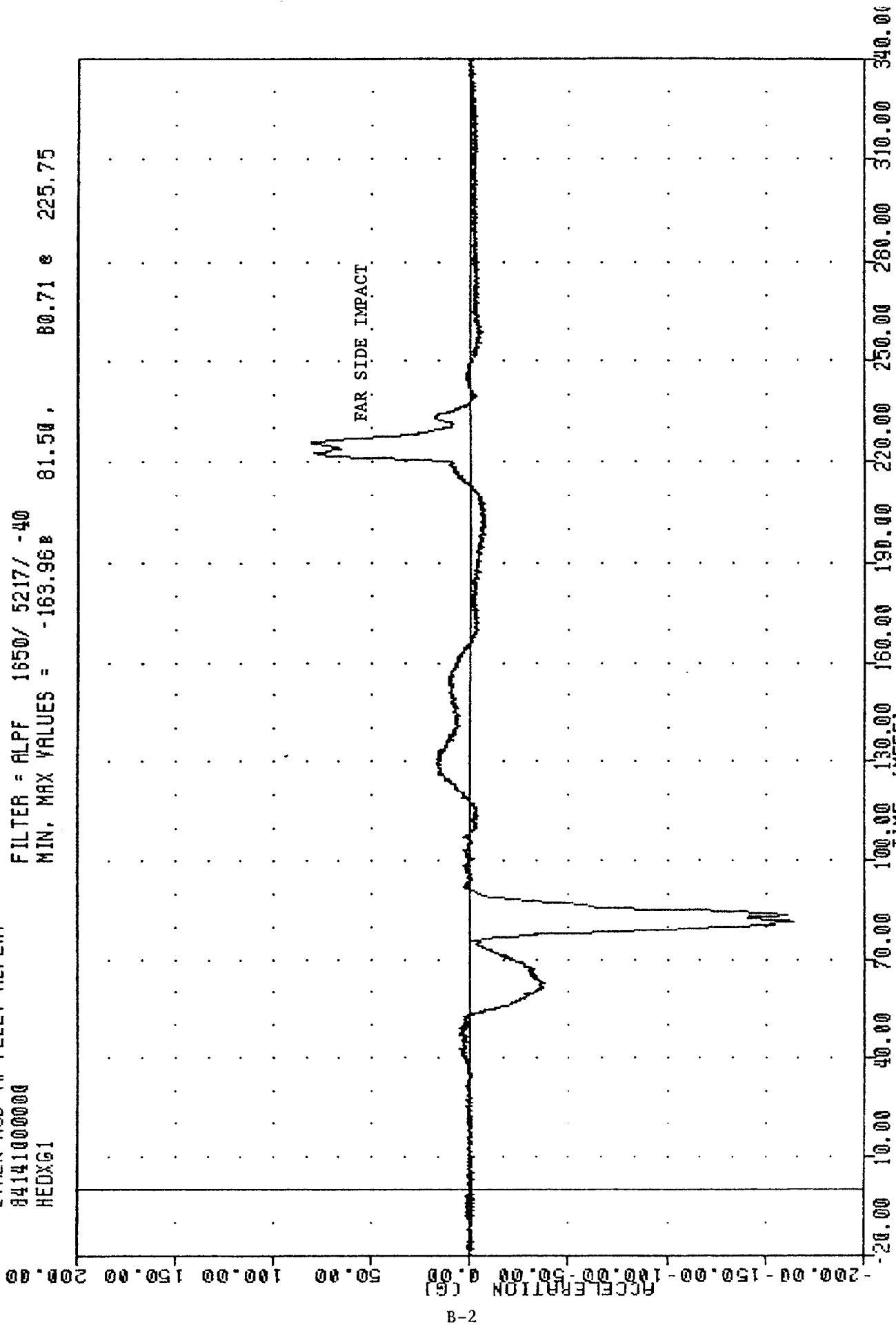
APPENDIX B
DATA PLOT PRESENTATION

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
 EVALN MOD VW FLEET REPEAT
 84141000000
 HEDXG1

PLOT DATE 5 JUN 84 14:01:03

FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -163.96 81.50, 80.71 & 225.75

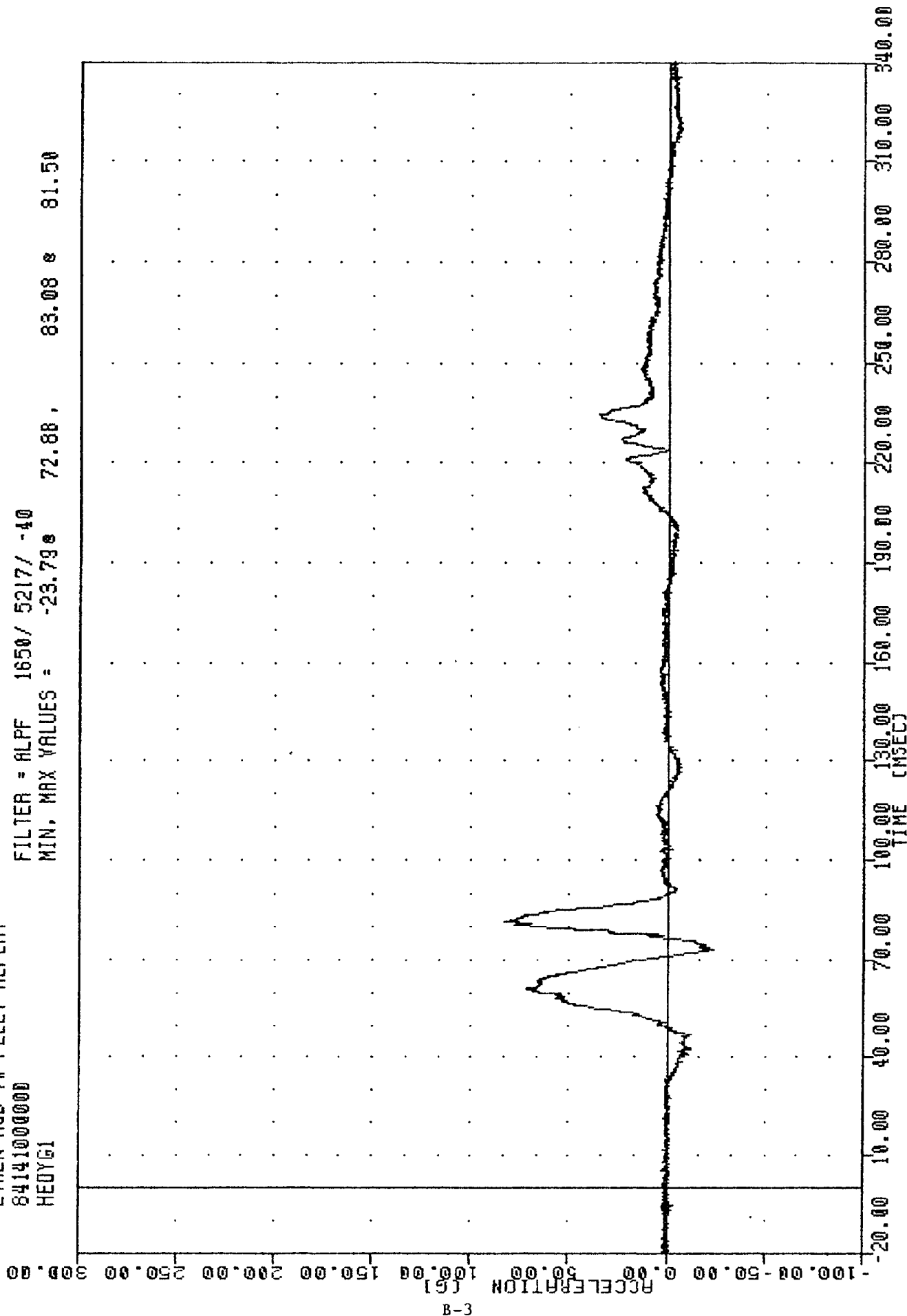


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER HEAD ACCELERATION X AXIS

TRC 040529
EVALN MOD YN FLEET REPEAT
84141000000
HEDYGI

PLOT DATE 5 JUN 84 14:01:03

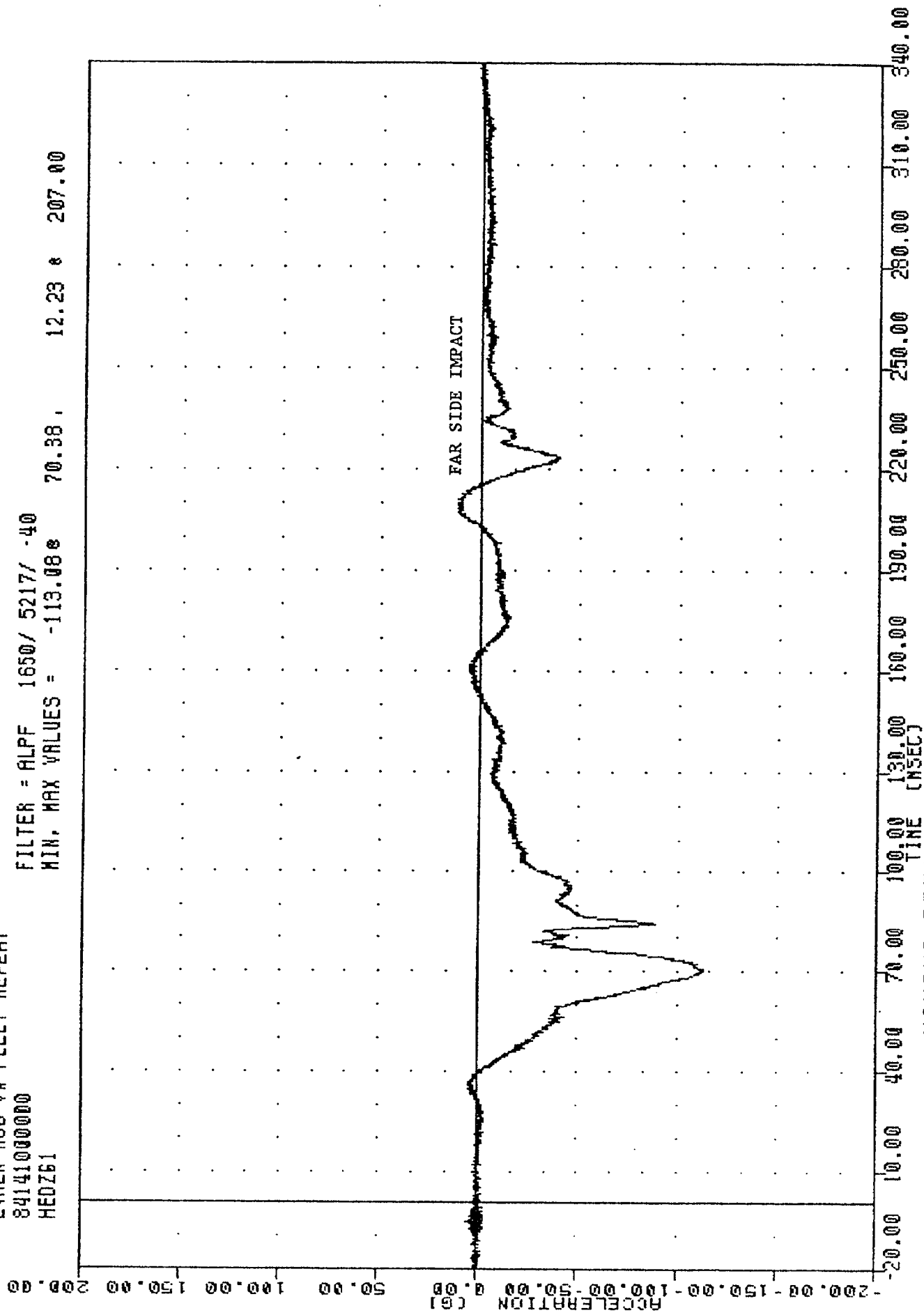
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -23.79 72.88, 83.08 81.50



TRC 84141000000
 EVALN MOD VH FLEET REPEAT
 HEDZ61

DATE 5-JUN-84 14:01:03

FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -113.08 70.38, 12.23 & 207.00

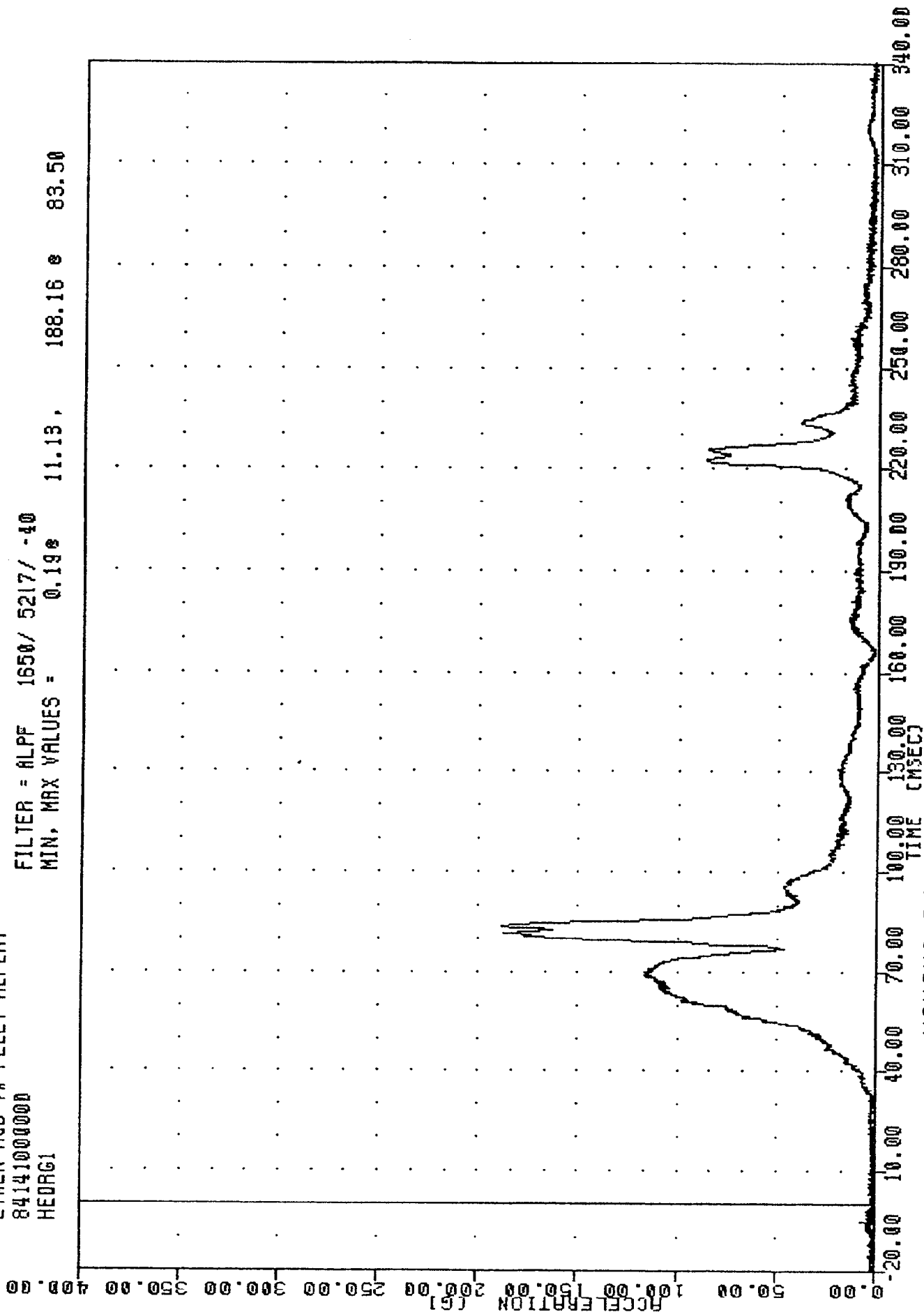


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER HEAD ACCELERATION Z AXIS

TRC 529
EVALN MOD YW FLEET REPEAT
84141000000
HEORC1

PLOT DATE 5 JAN 81 14:01:03

FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = 0.193 11.13, 188.16 83.50

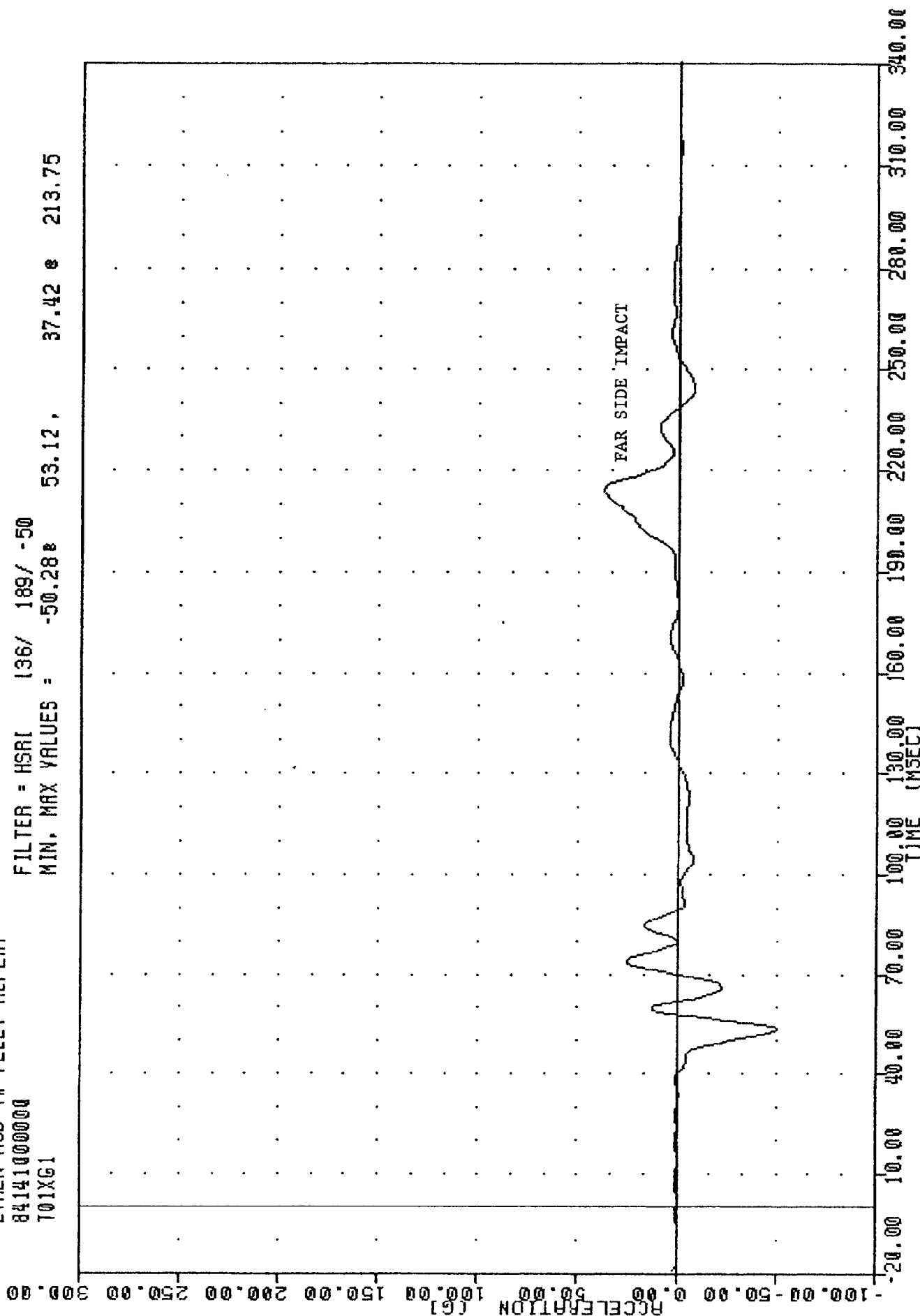


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD RESULTANT

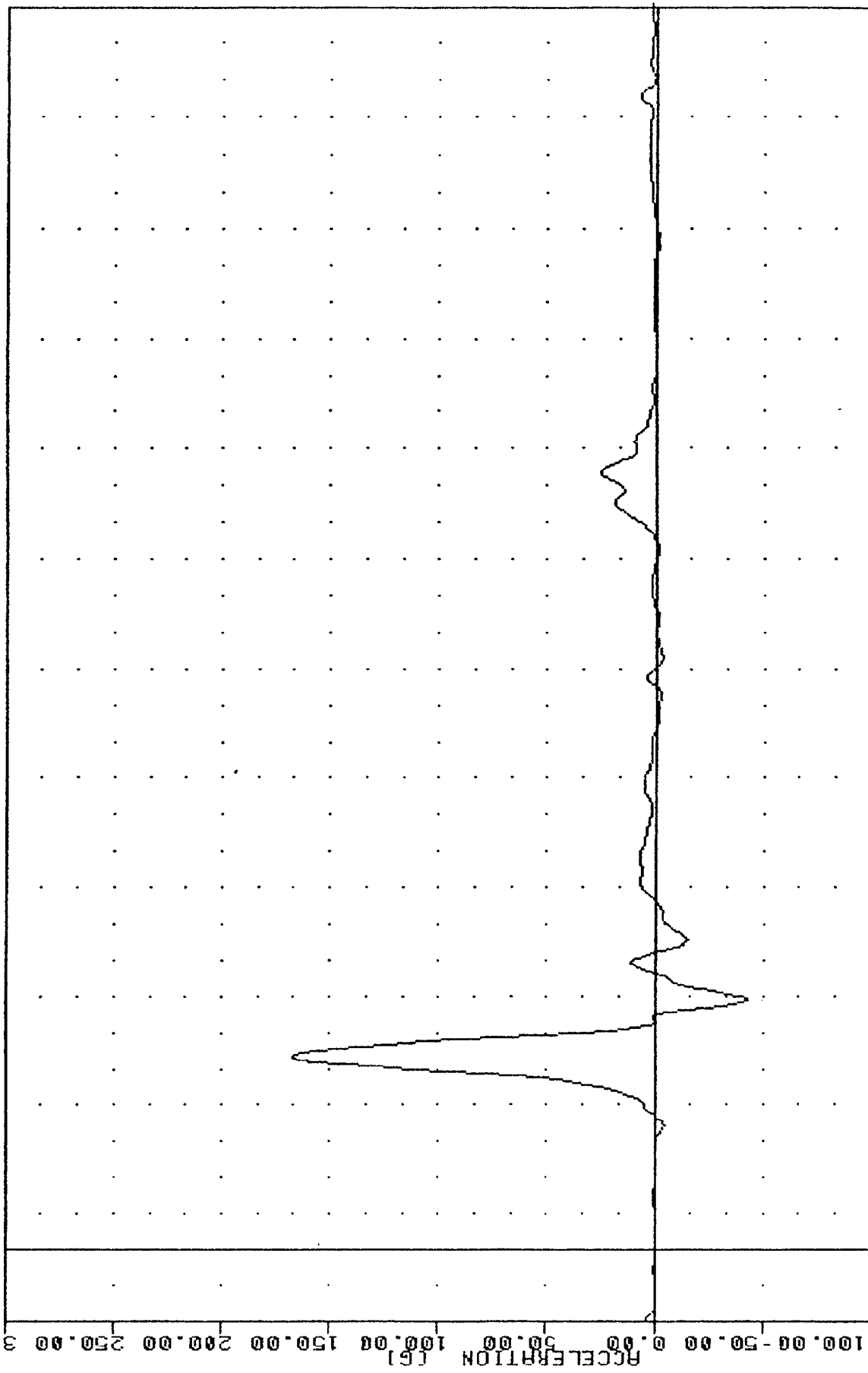
TRC 040529
 EVALN MOD YH FLEET REPEAT
 84141000000
 701XG1

PLOT DATE 5 JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -50.28 53.12, 37.42 213.75



TRC 040529 5-JUN-84 14:03:51
 EVALN MOD YW FLEET REPERT
 84141000000
 T01YG1
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -42.74e 68.13, 166.83 e 52.50



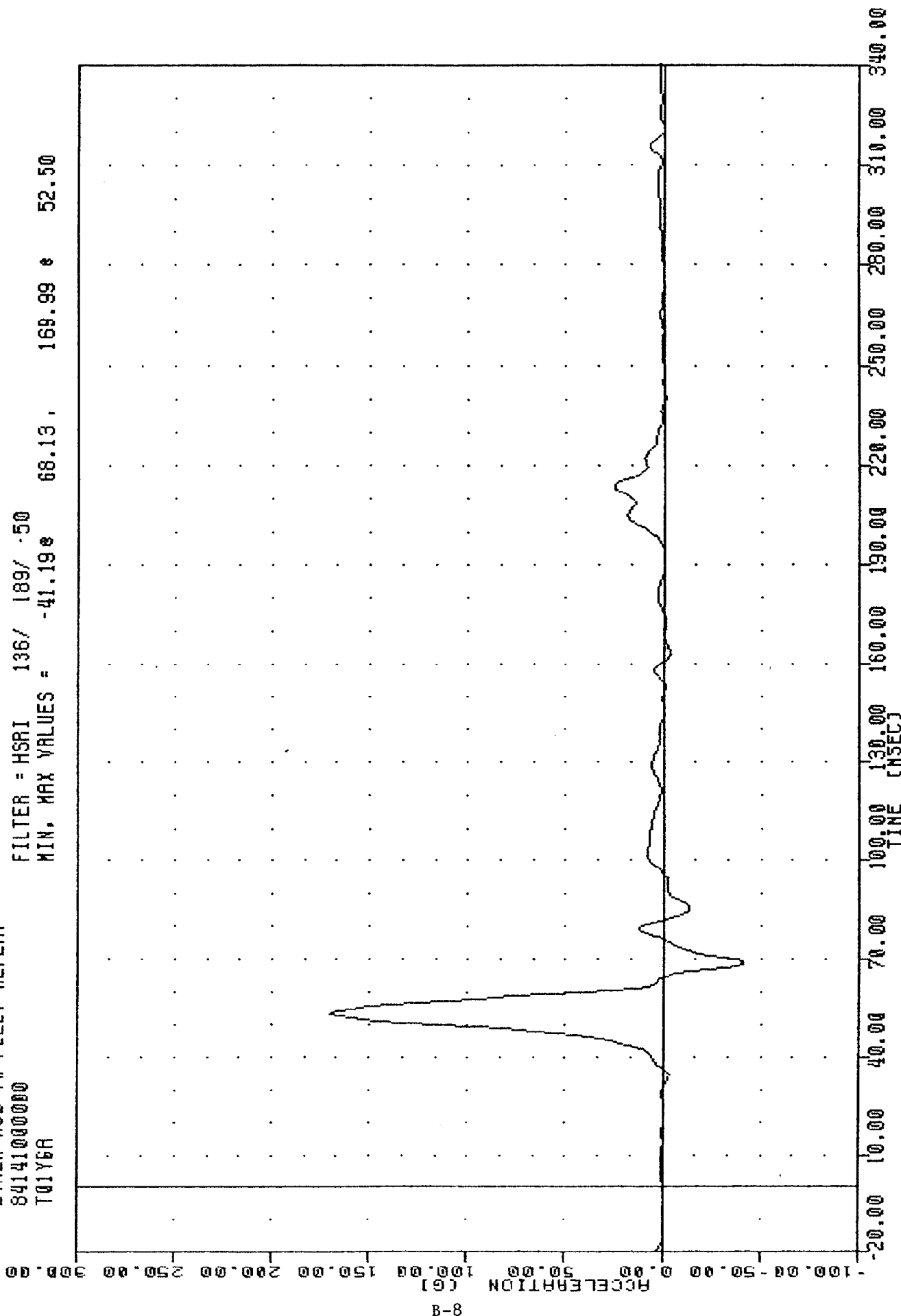
-100.00 -50.00 0.00 50.00 100.00 150.00 200.00 250.00 300.00 340.00
 ACCELERATION (G)
 TIME (msec)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE ACCELERATION Y AXIS

TRC 84141000000
 EVALN MOD VW FLEET REPEAT
 TQ1Y6R

DATE 14.03.51

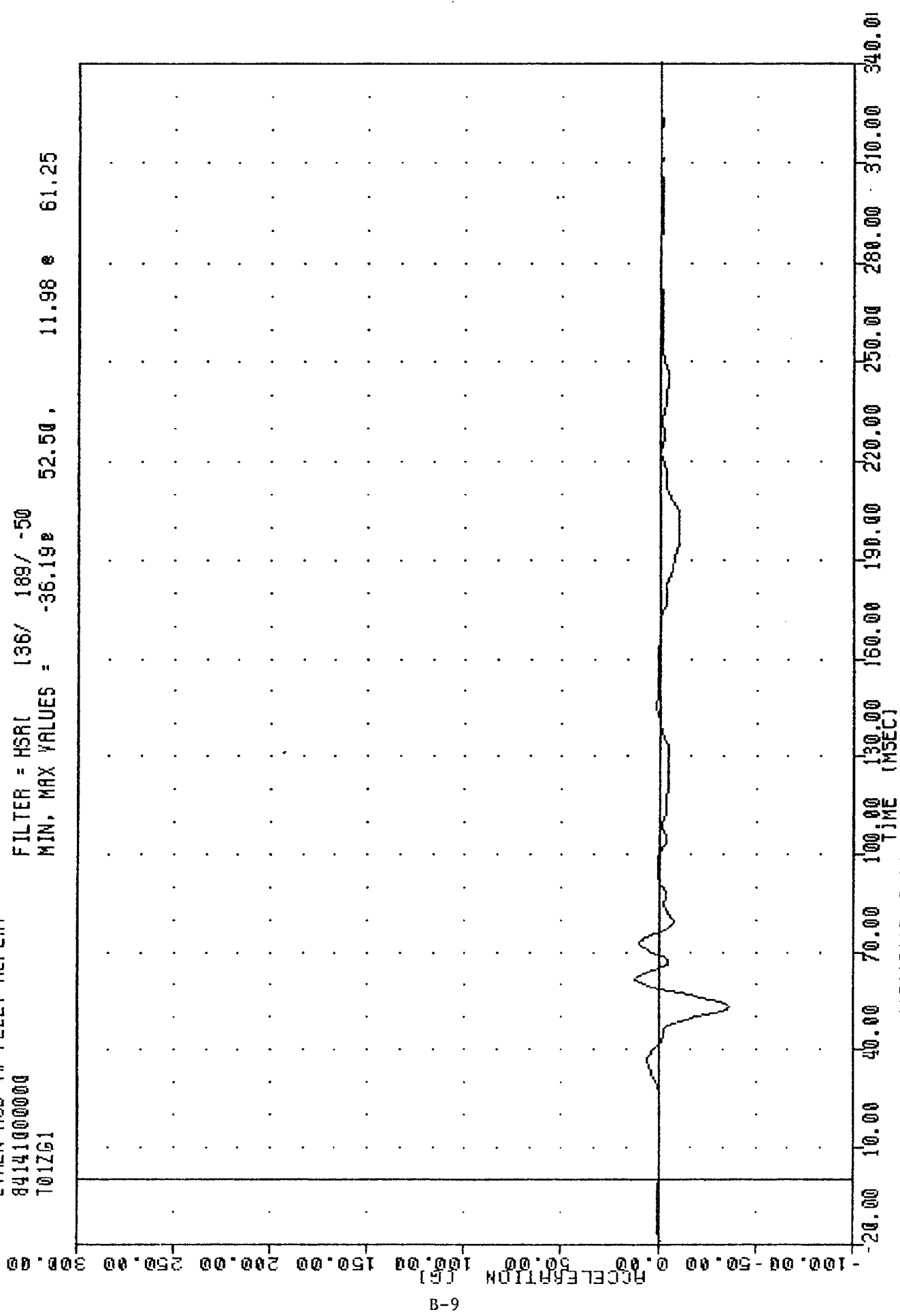
5 00N-84

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -41.19 68.13 169.99 52.50



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

TRC 040529 5-JUN-84 14:03:51
 EVALN MOD VW FLEET REPEAT
 84141000000
 101ZG1
 FILTER = HSRL 136/ 189/ -50
 MIN, MAX VALUES = -36.19e 52.50, 11.98 e 61.25

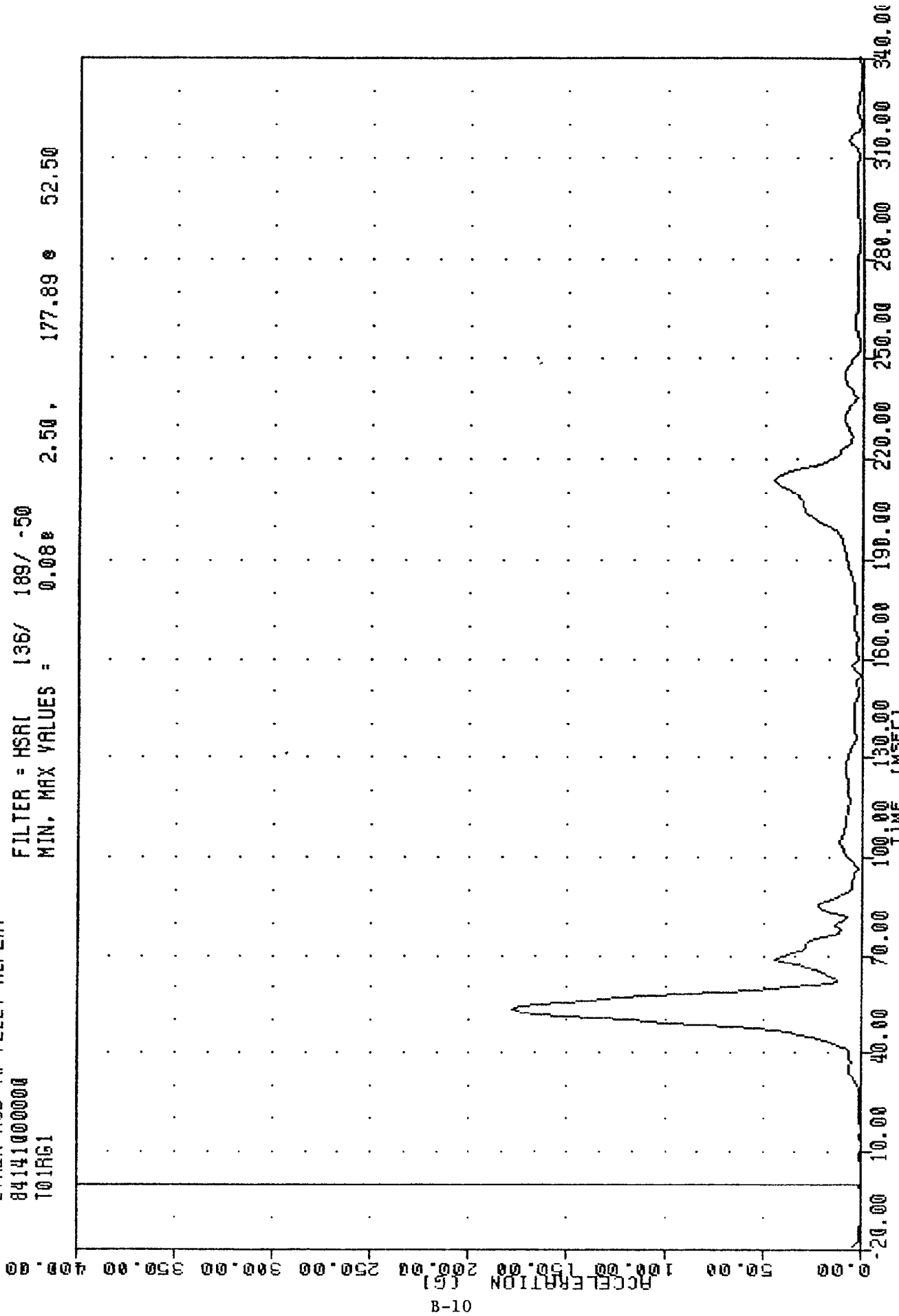


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE ACCELERATION Z AXIS

TRC
 EVALN MOD VV FLEET REPERT
 84141000000
 T01RG1

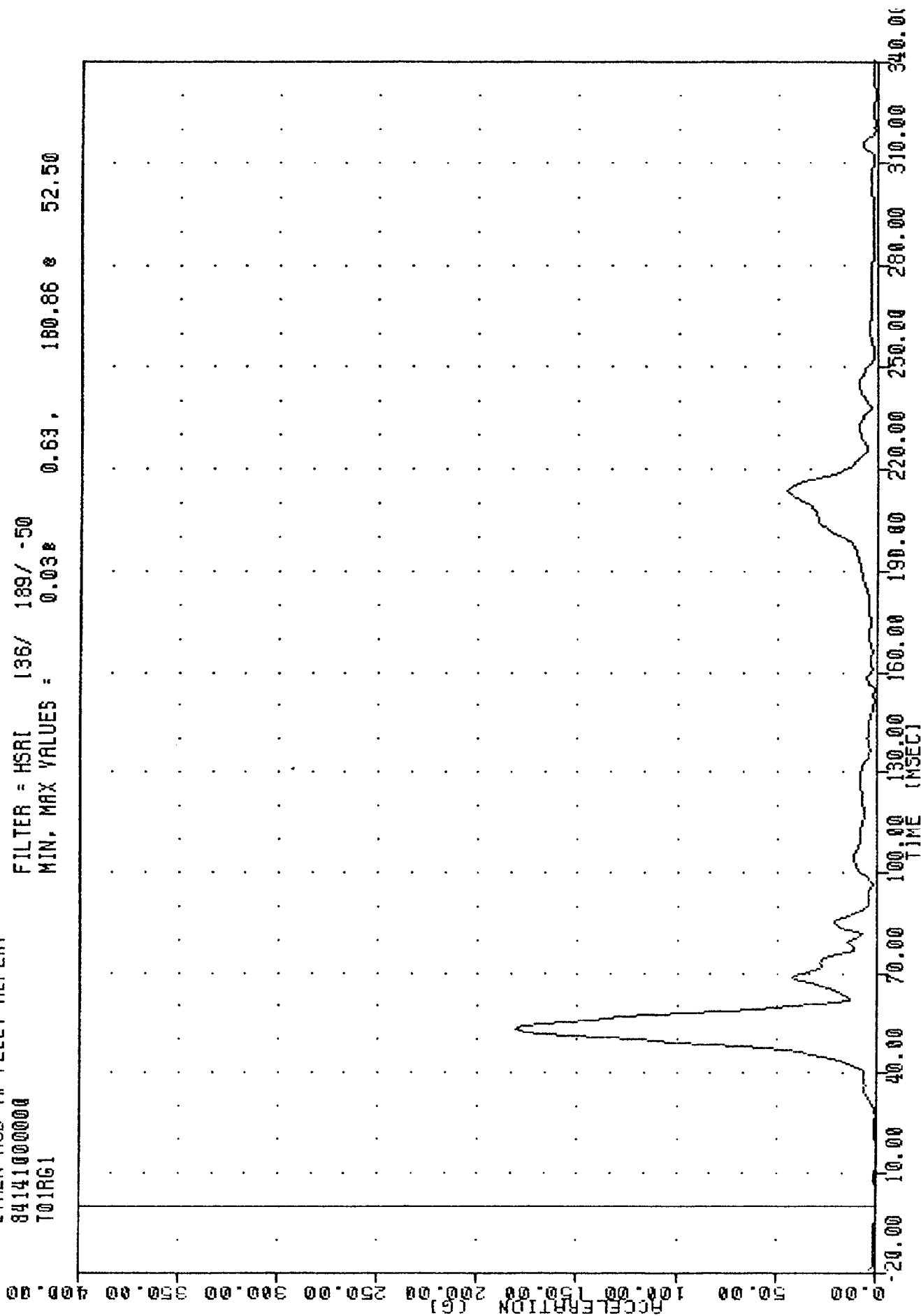
PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.088 2.50 177.89 52.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE RESULTANT

TRC , 040529 , PLOT DATE 5 JUN-84 14:03:09
 EVALN MOD VW FLEET REPERT
 84141000000
 T01RG1
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.038 0.63, 180.86 & 52.50

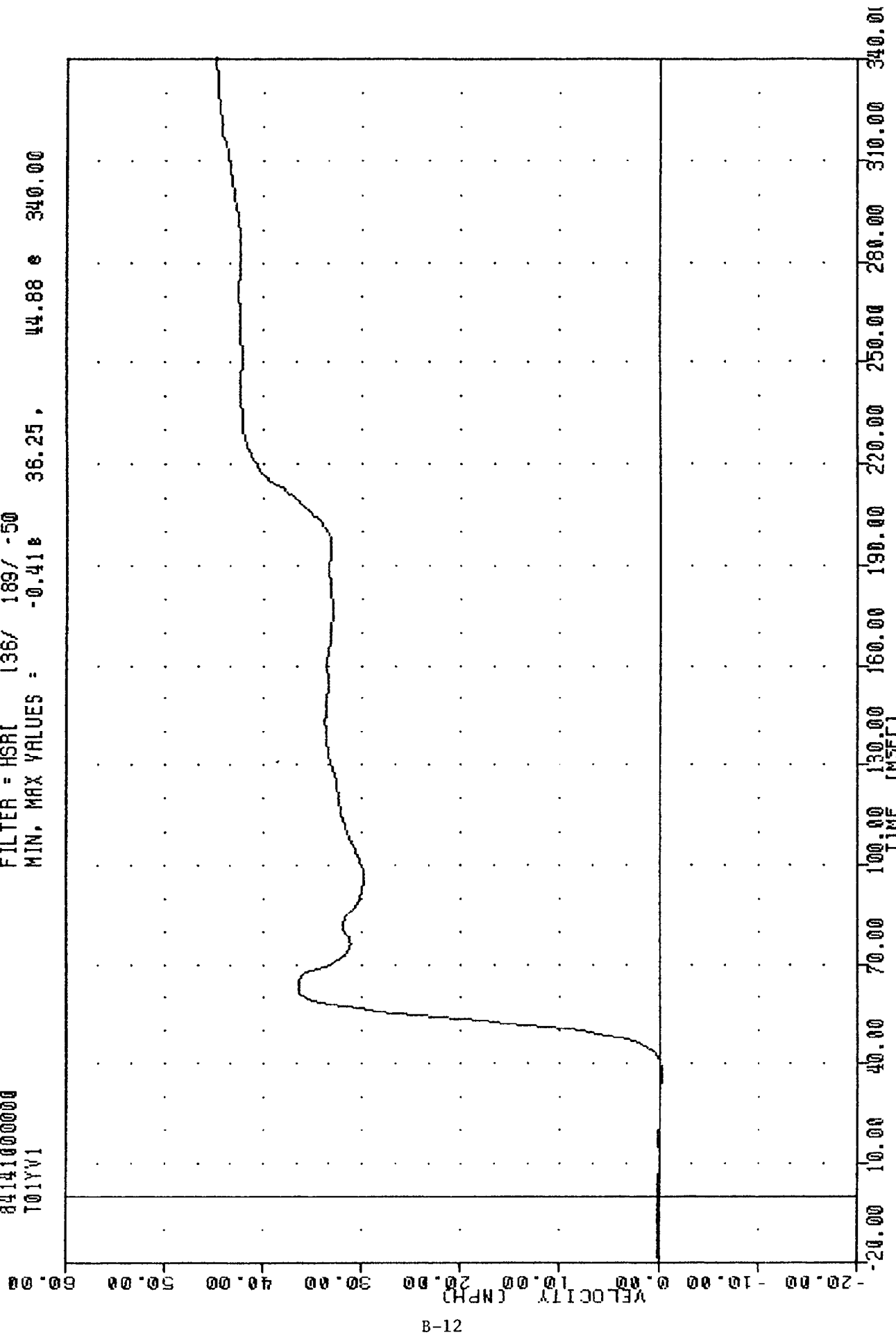


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE RESULTANT USING T01YGA

TRC , 540529
 EVALN MOD VW FLEET REPEAT
 84141000000
 T01YV1

PLOT DATE 5 JUN-84 14:03:35

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.418 36.25, 44.88 340.00

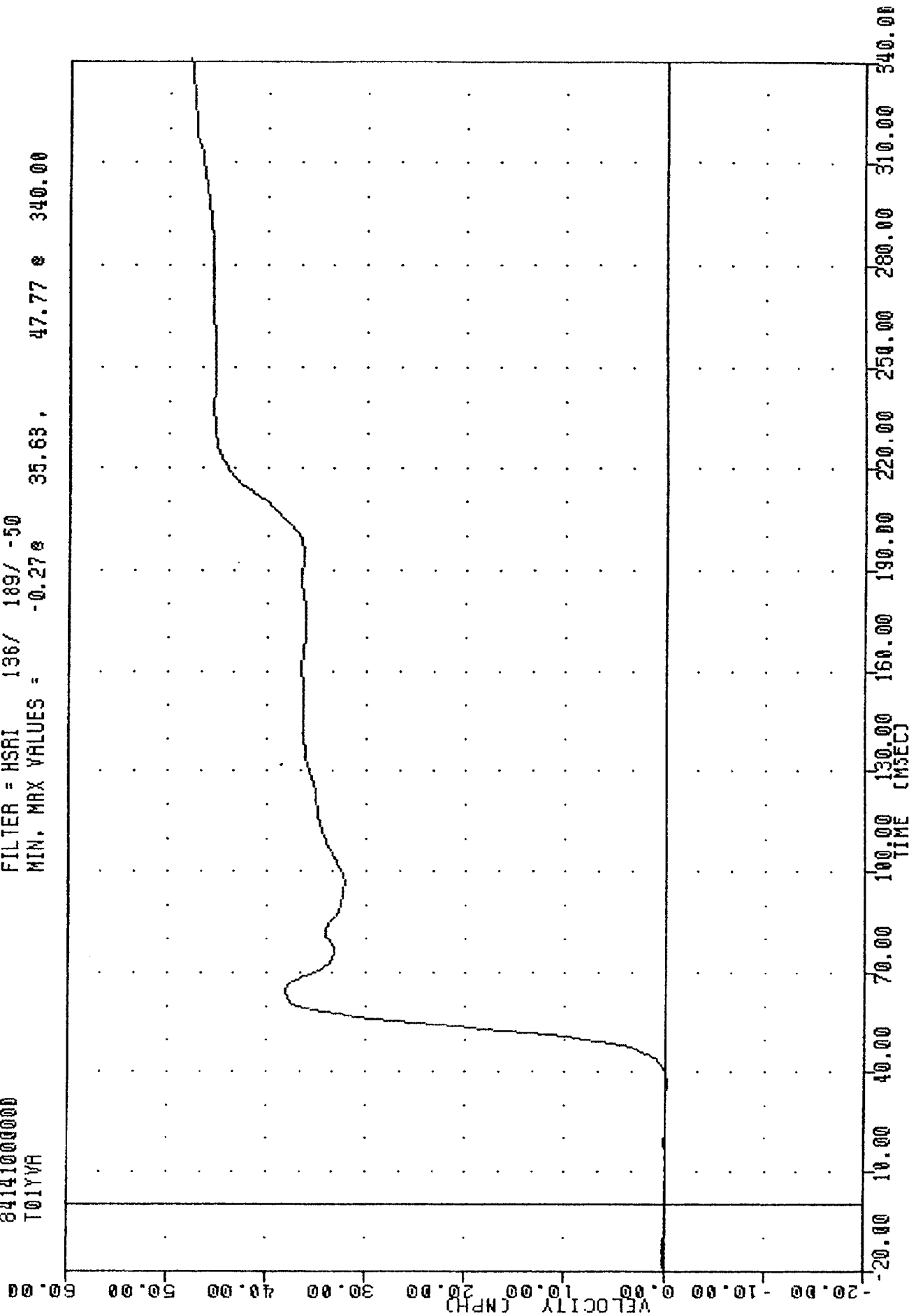


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T01YGI

TRC 000529
 EVALN MOD YN FLEET REPEAT
 84141000000
 T01YVR

PLOT DATE 5 JUN-84 14:00:35

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.278 35.63, 47.77 e 340.00

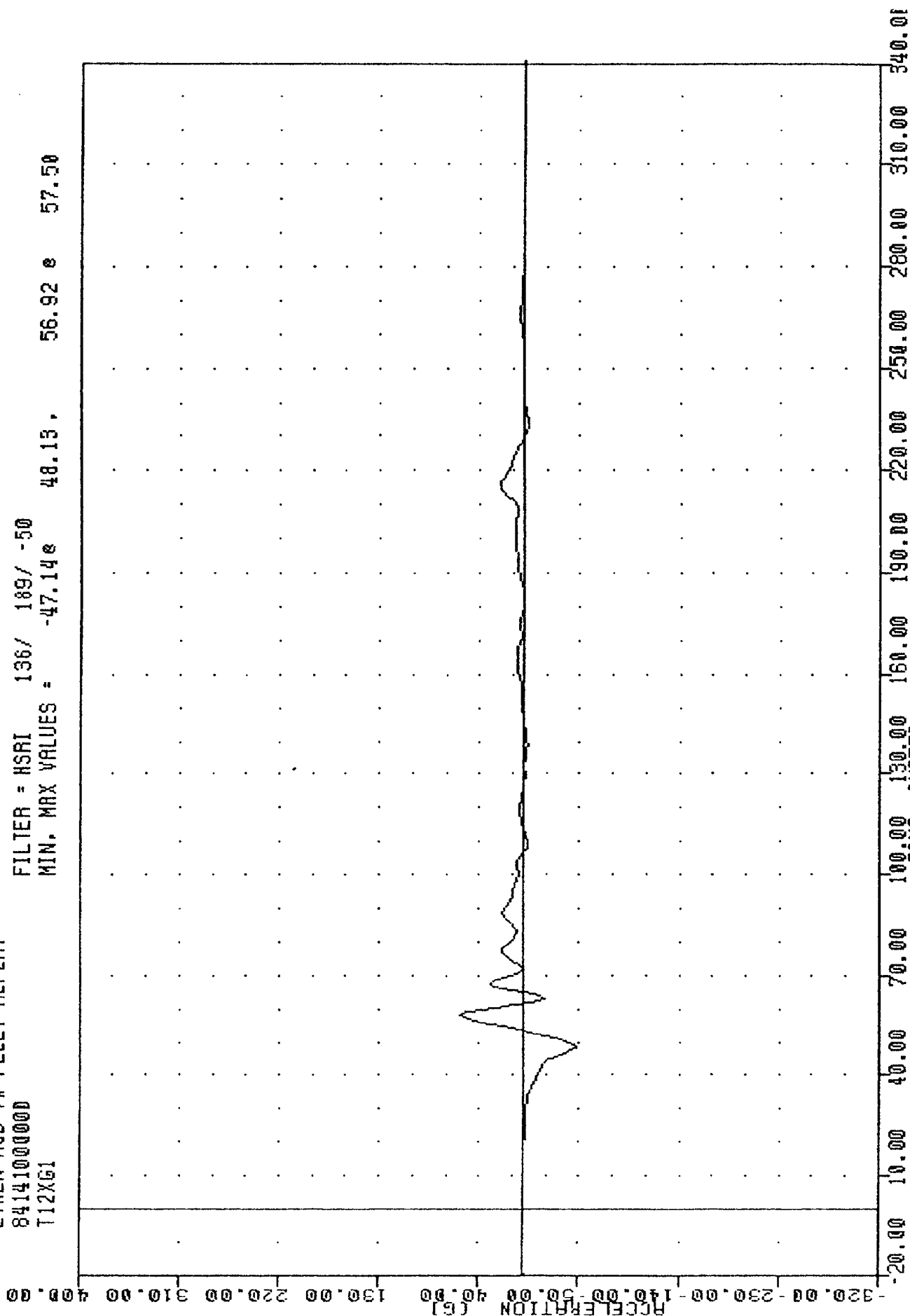


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T01YGA

TRC 040529
 EVALN MOD YW FLEET REPEAT
 84141000000
 T12XG1

PLOT DATE 5 JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -47.14e 48.13, 56.92 e 57.50

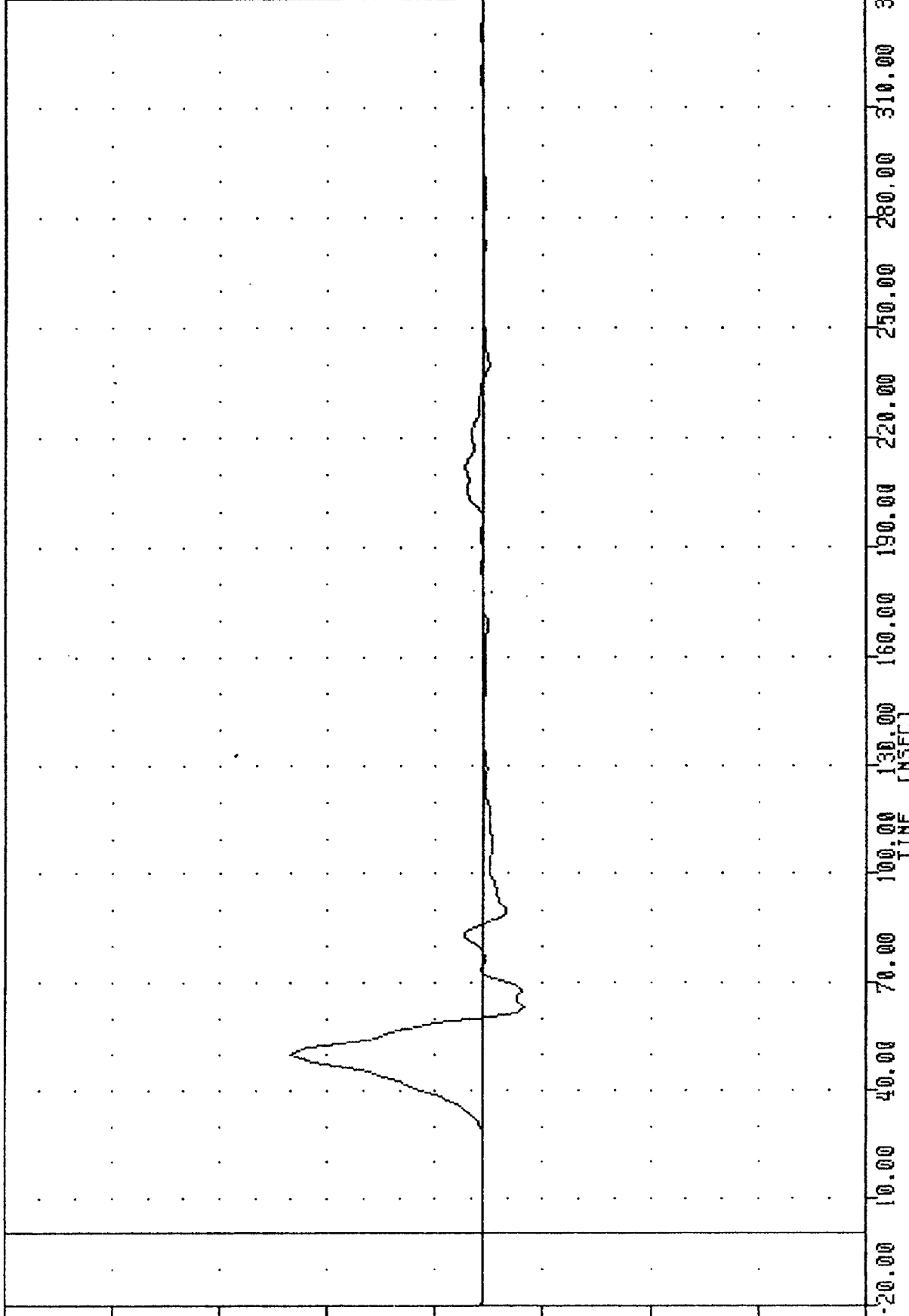


TRC 84141000000
 EVALN MOD VM FLEET REPEAT
 T12Y61

PLOT DATE 5 JUN 84 14:03:51

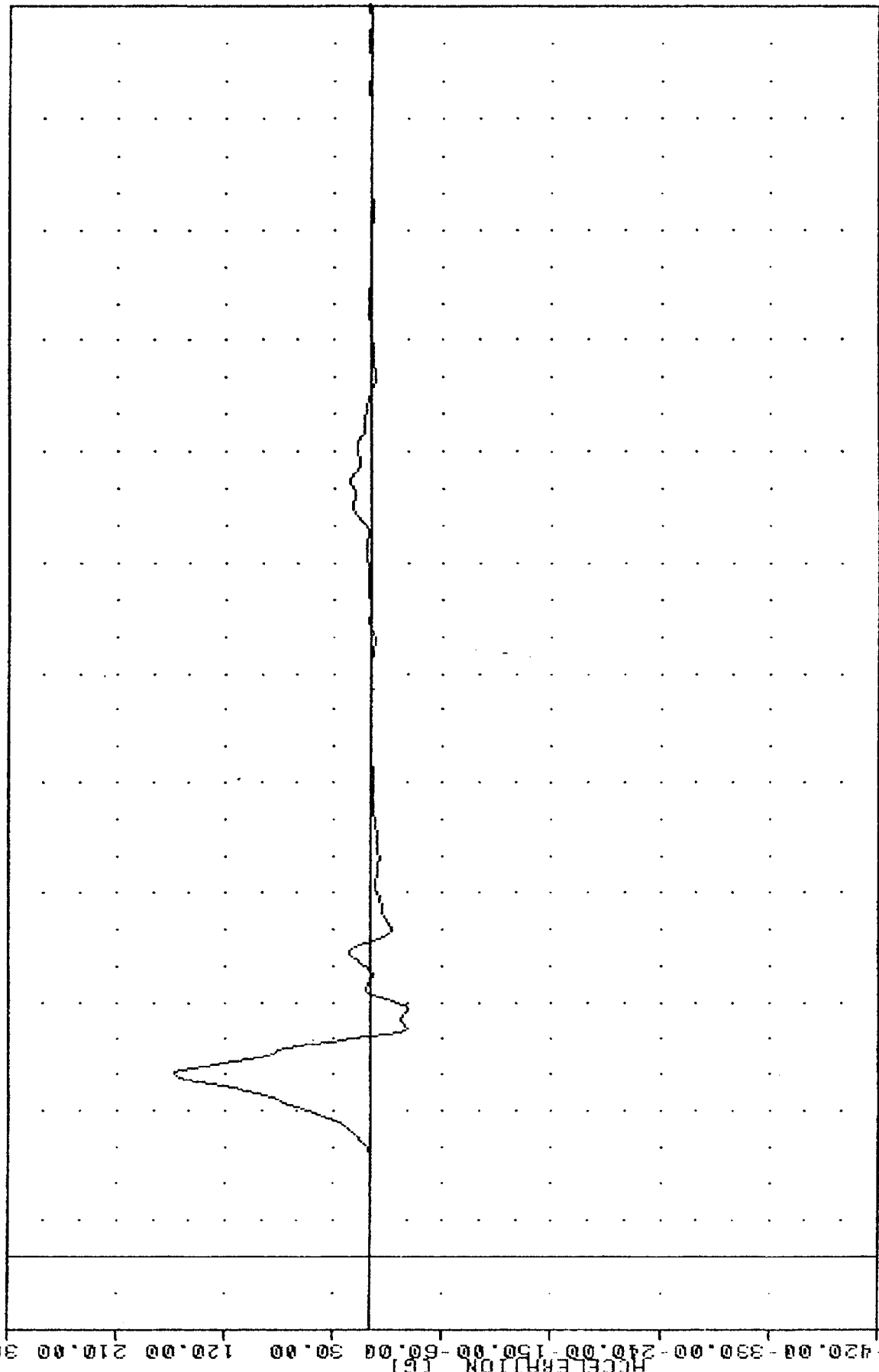
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -33.63 62.50 160.21 49.37

B-15
 ACCELERATION (G)
 -320.00 -290.00 -140.00 -50.00 0 50.00 100.00 190.00 220.00 250.00 310.00 340.00



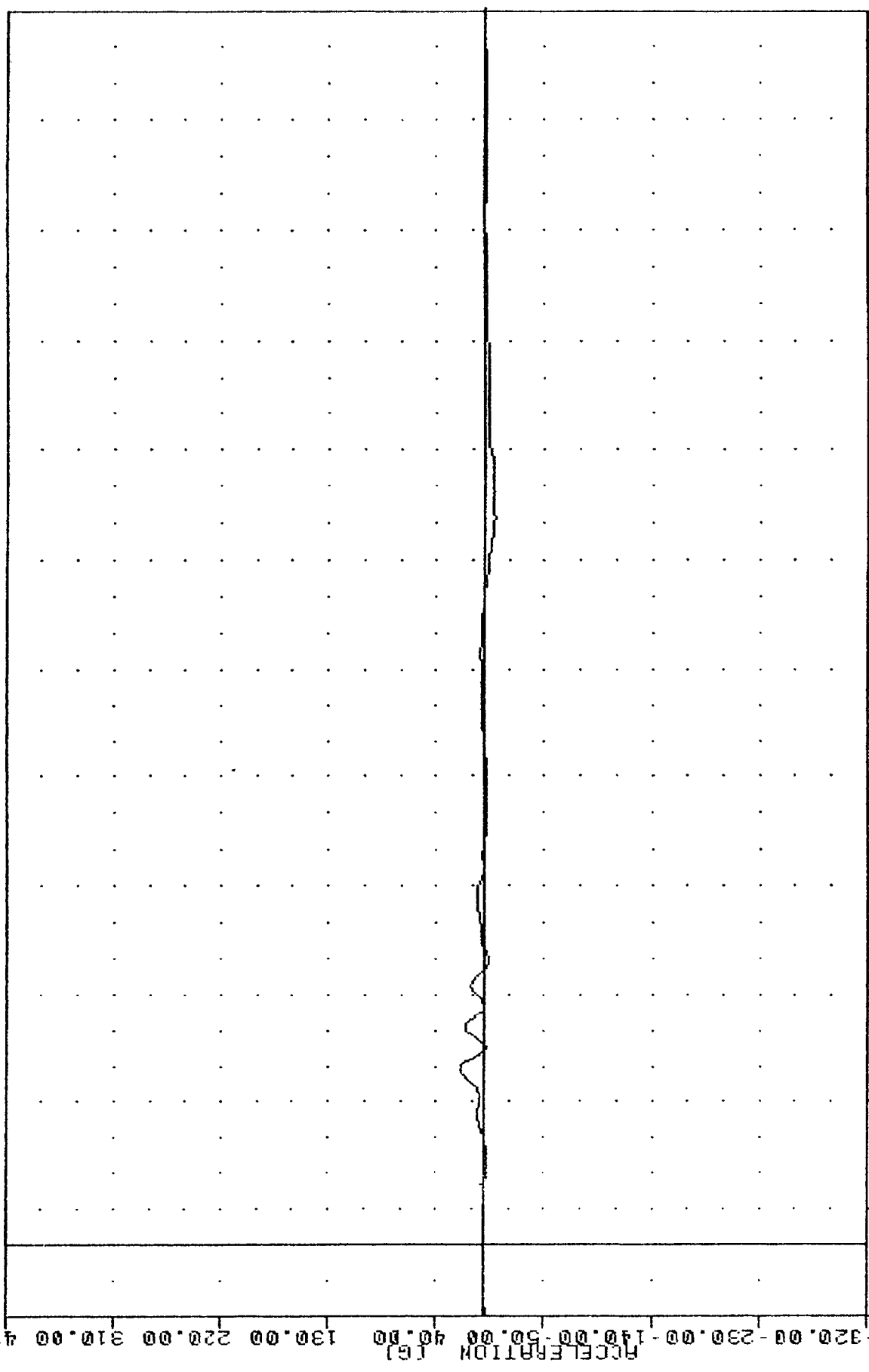
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE ACCELERATION Y AXIS

TRC 840529 PLOT DATE 5-JUN-84 14:03:51
 EVALN MOD VW FLEET REPEAT
 84141000000
 T12YGR
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -31.44 67.50, 181.77 49.37



-420.00 -390.00 -360.00 -330.00 -300.00 -270.00 -240.00 -210.00 -180.00 -150.00 -120.00 -90.00 -60.00 -30.00 0 30.00 60.00 90.00 120.00 150.00 180.00 210.00 240.00 270.00 300.00 330.00 360.00
 TIME (MSEC)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE ACCELERATION -2 Y AXIS

TRC 840529, 040529 5-JUN-84 14:03:51
 EVALN MOD VW FLEET REPERT
 84141000000
 T12ZG1
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -8.23e 200.63, 20.36 e 48.13



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

TRC

840529

5-JUN-84

14:03:51

EVALN MOD VW FLEET REPEAT

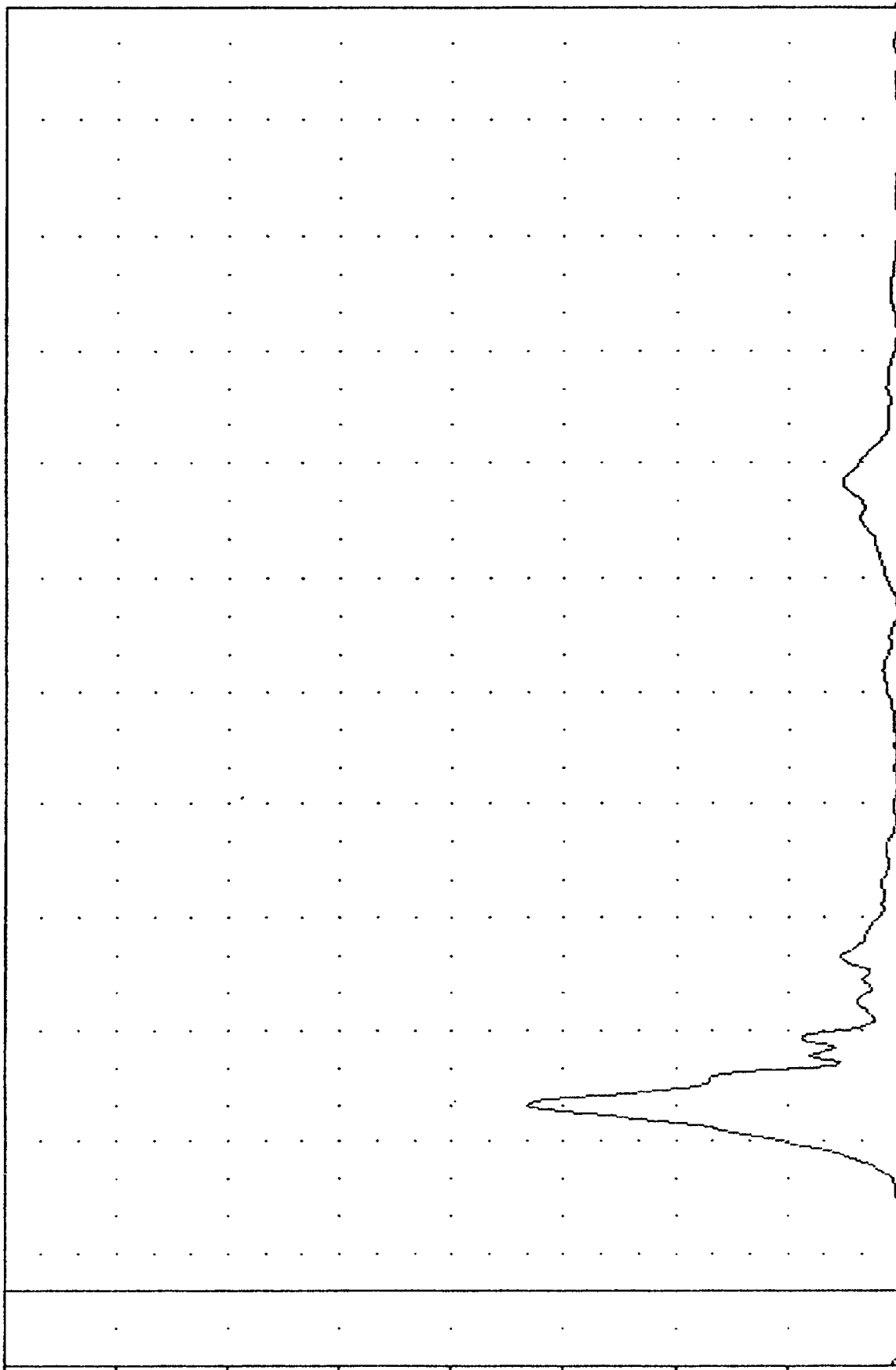
84141000000

T12RG1

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.108 -16.25, 166.35 8 49.37

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

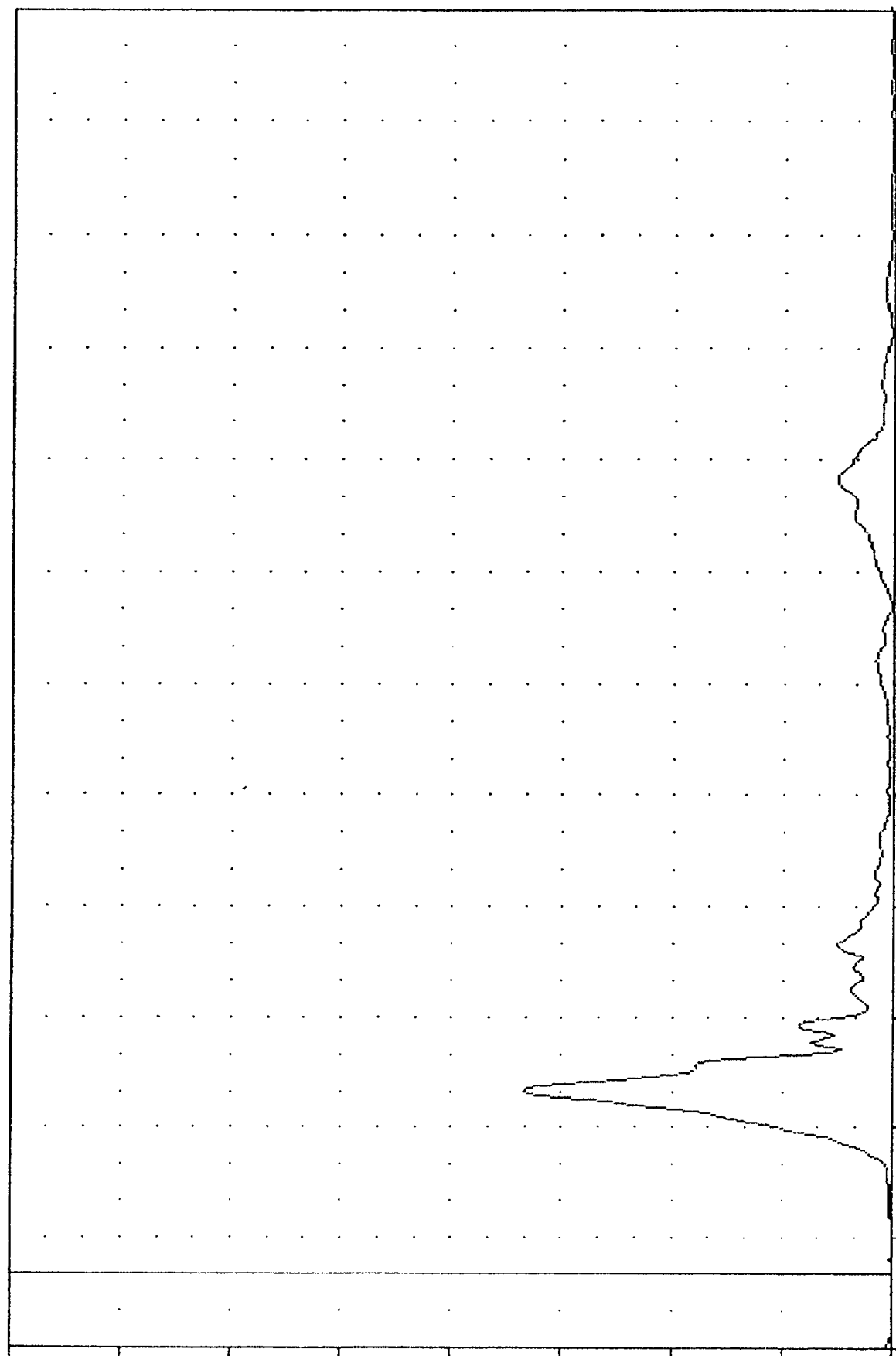
DRIVER LOWER SPINE RESULTANT

TRUCK , 5528
 EVALN MOD YW FLEET REPEAT
 84141000000
 T12R61

PLC, DATE 5 JUN 84 14:05:05

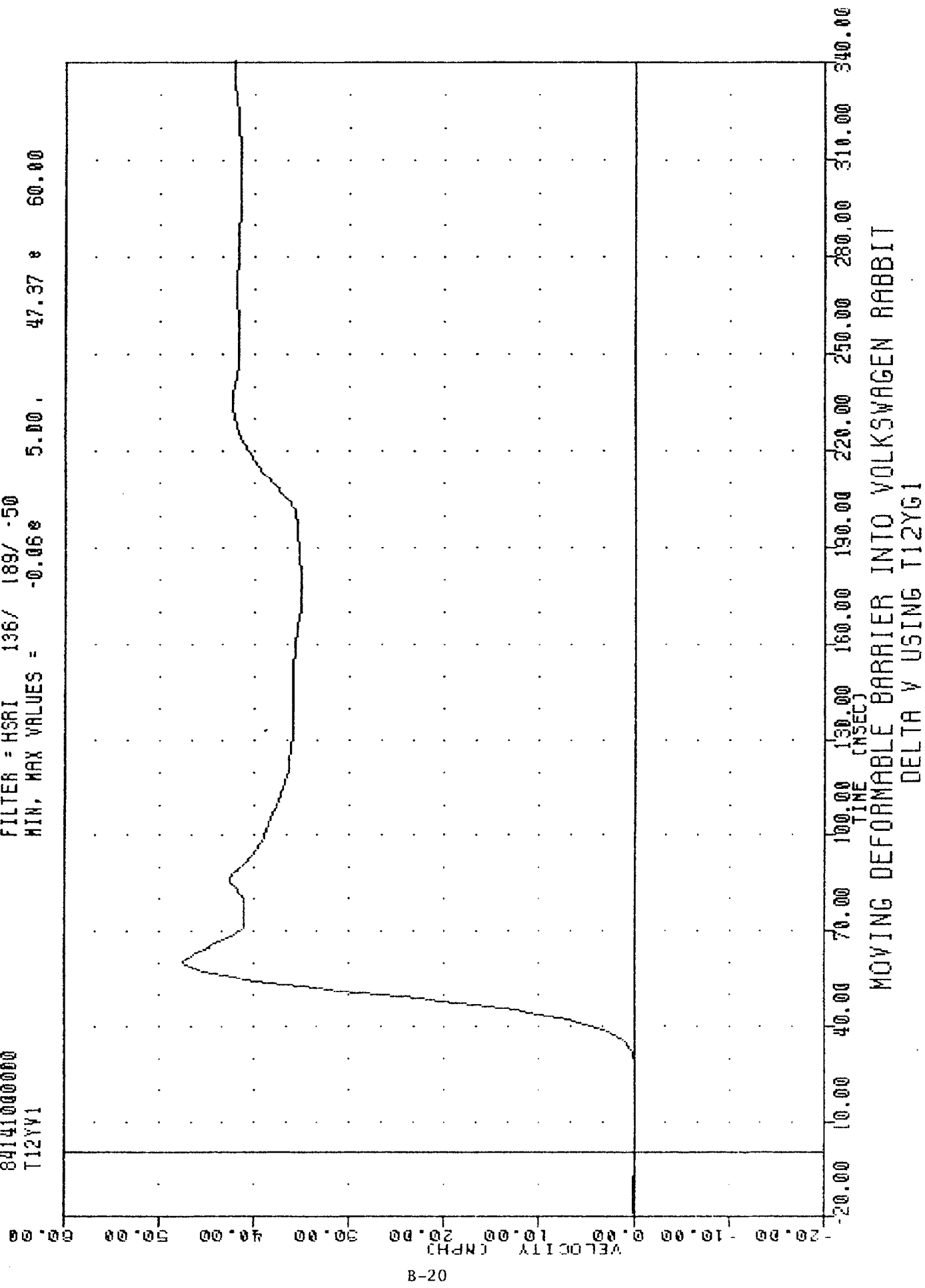
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.05e -16.87 , 167.85 e 49.37

ACCELERATION (G)
 400.00
 350.00
 300.00
 250.00
 200.00
 150.00
 100.00
 50.00
 0.00

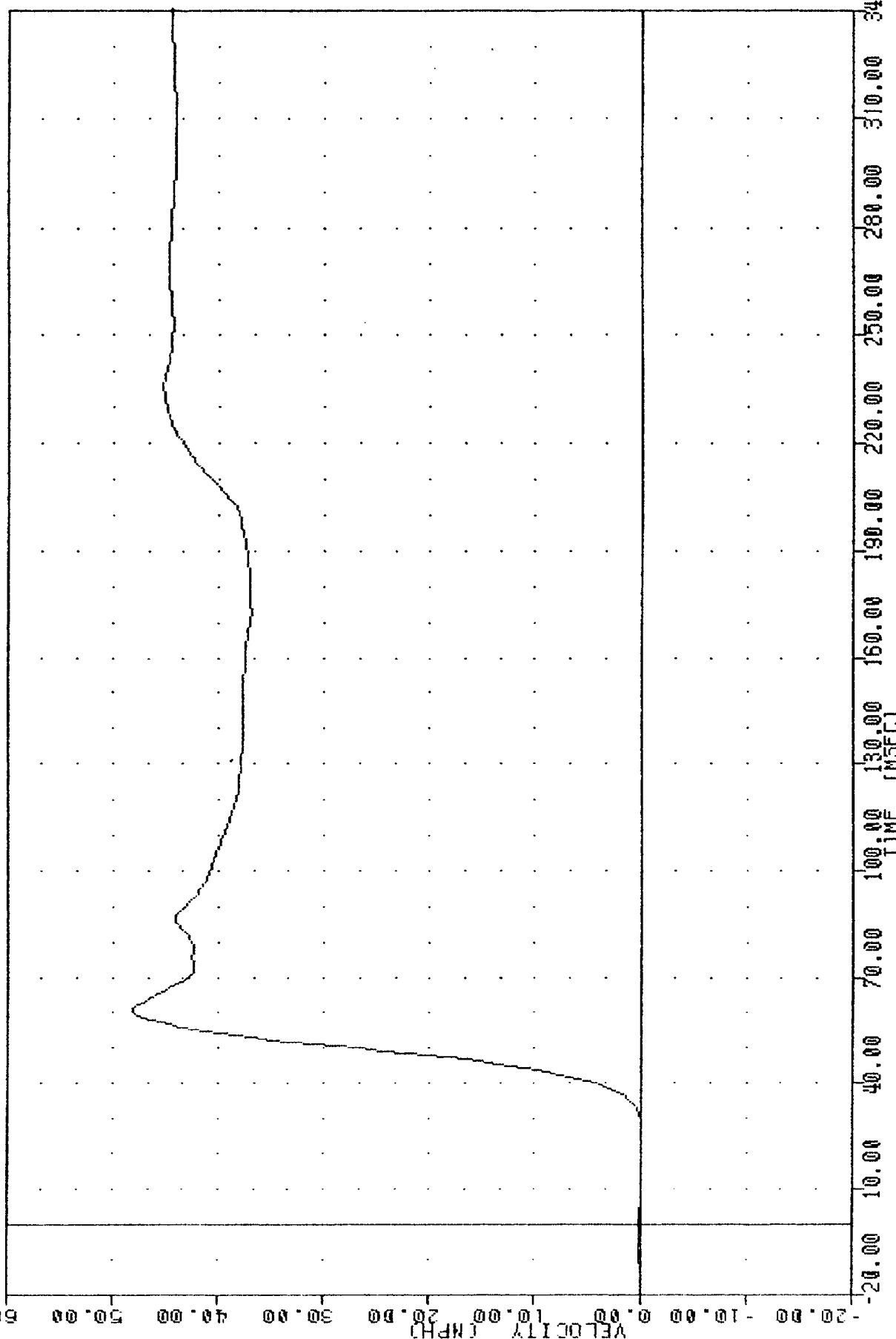


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE RESULTANT USING T12YGA

TRC
 EVALN NOD VV FLEET REPEAT
 84141000000
 T12YV1
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.06 5.00 47.37 60.00
 PLOT DATE 5-JUN-84 14:05:35



TRC 84141000000
 EVALN MOD VW FLEET REPERT
 84141000000
 T12YVA
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.038 26.87, 48.11 e 60.00
 PLOT DATE 5-JUN-84 14:05:35



B-21

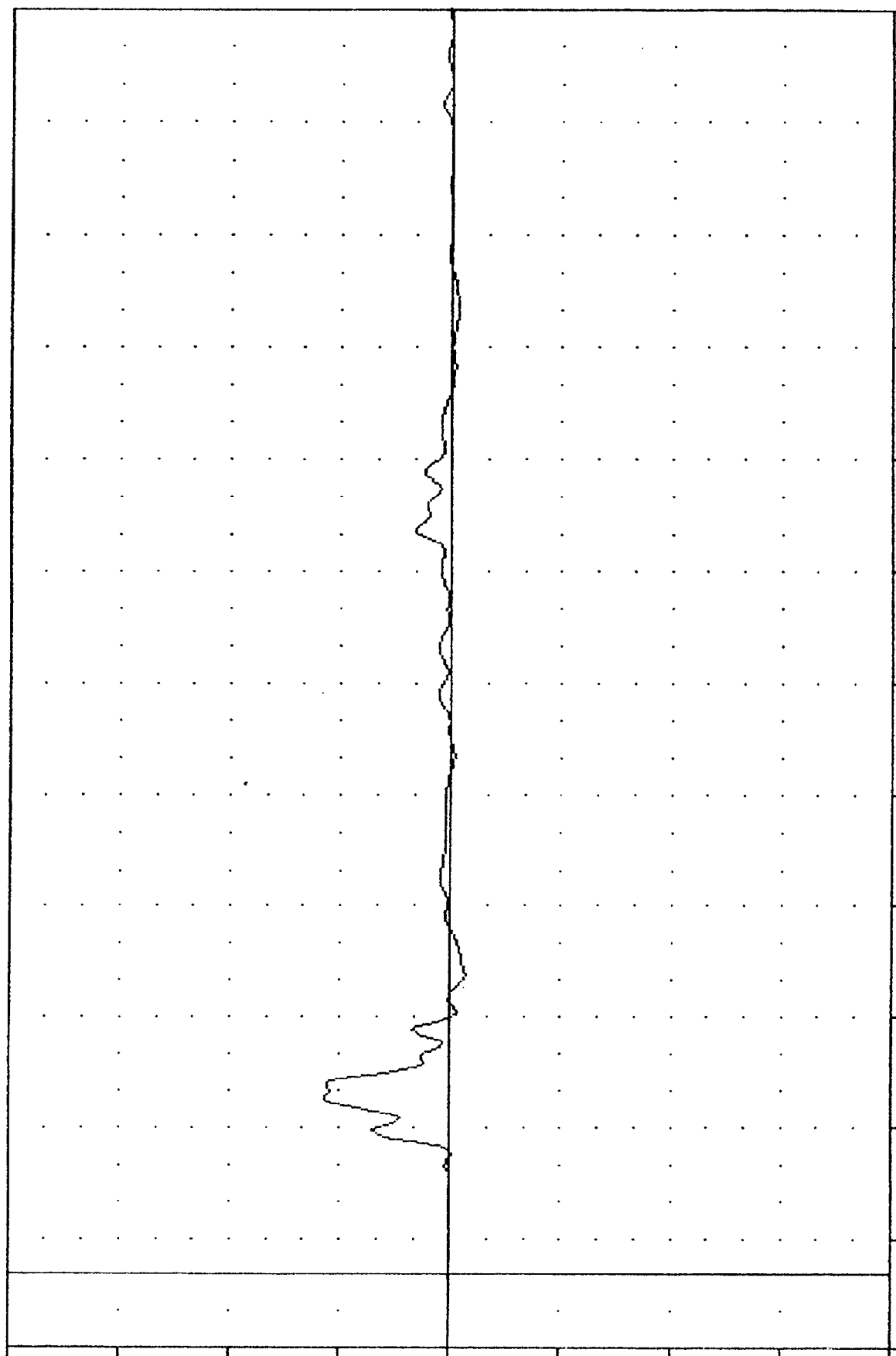
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YGA

TAC 84141000000
 EVALM MOD YH FLEET REPEAT
 LURY61

PLOT DATE 5 JUN 84 14:03:51

FILTER = HSRI 136/ 189/ .50
 MIN. MAX VALUES = -12.29e 80.63, 100.92 e 46.88

ACCELERATION (G)
 -360.00 -270.00 -180.00 -90.00 0.00 90.00 180.00 270.00 360.00

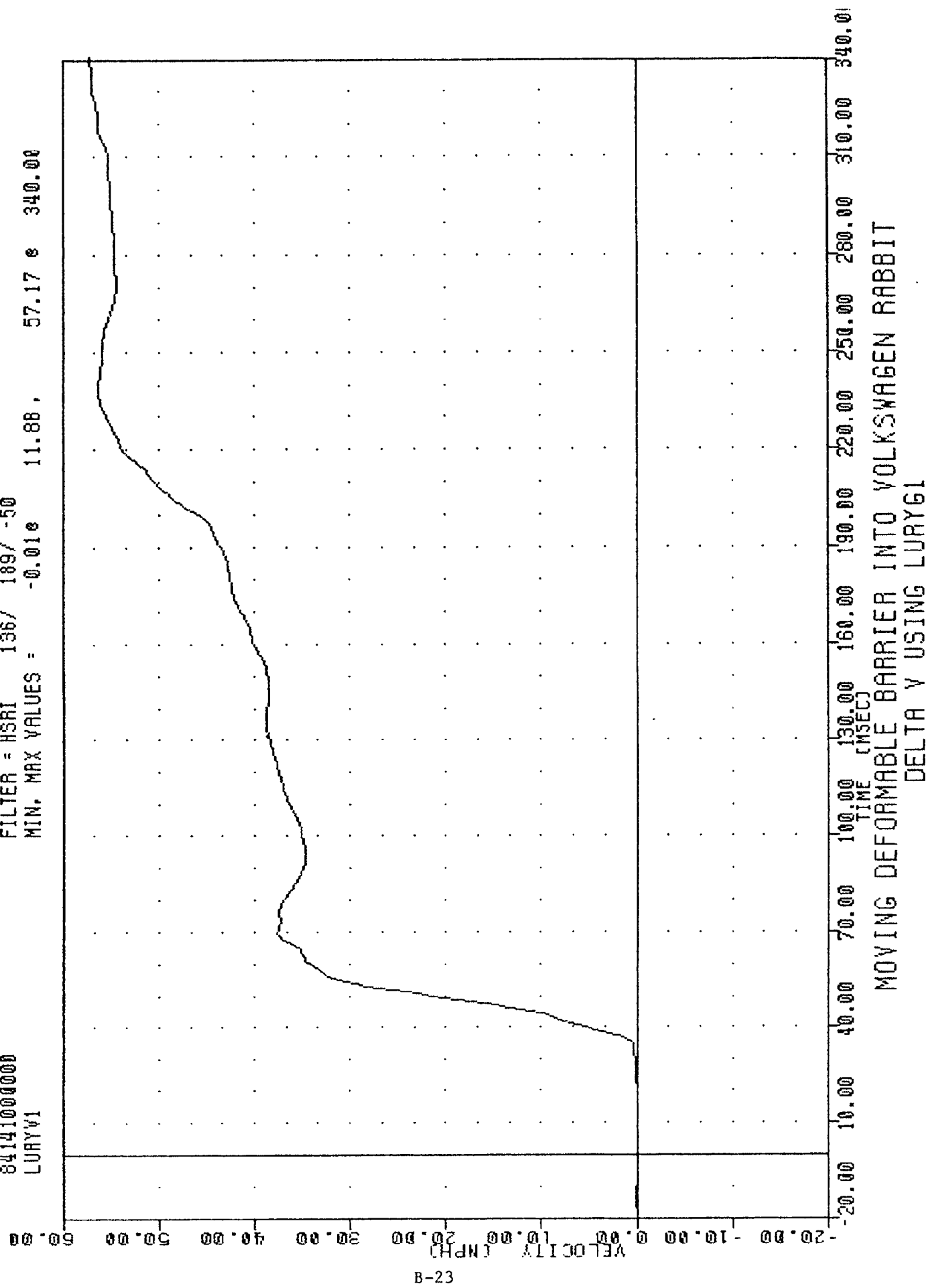


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LEFT UPPER RIB ACCELERATION Y AXIS

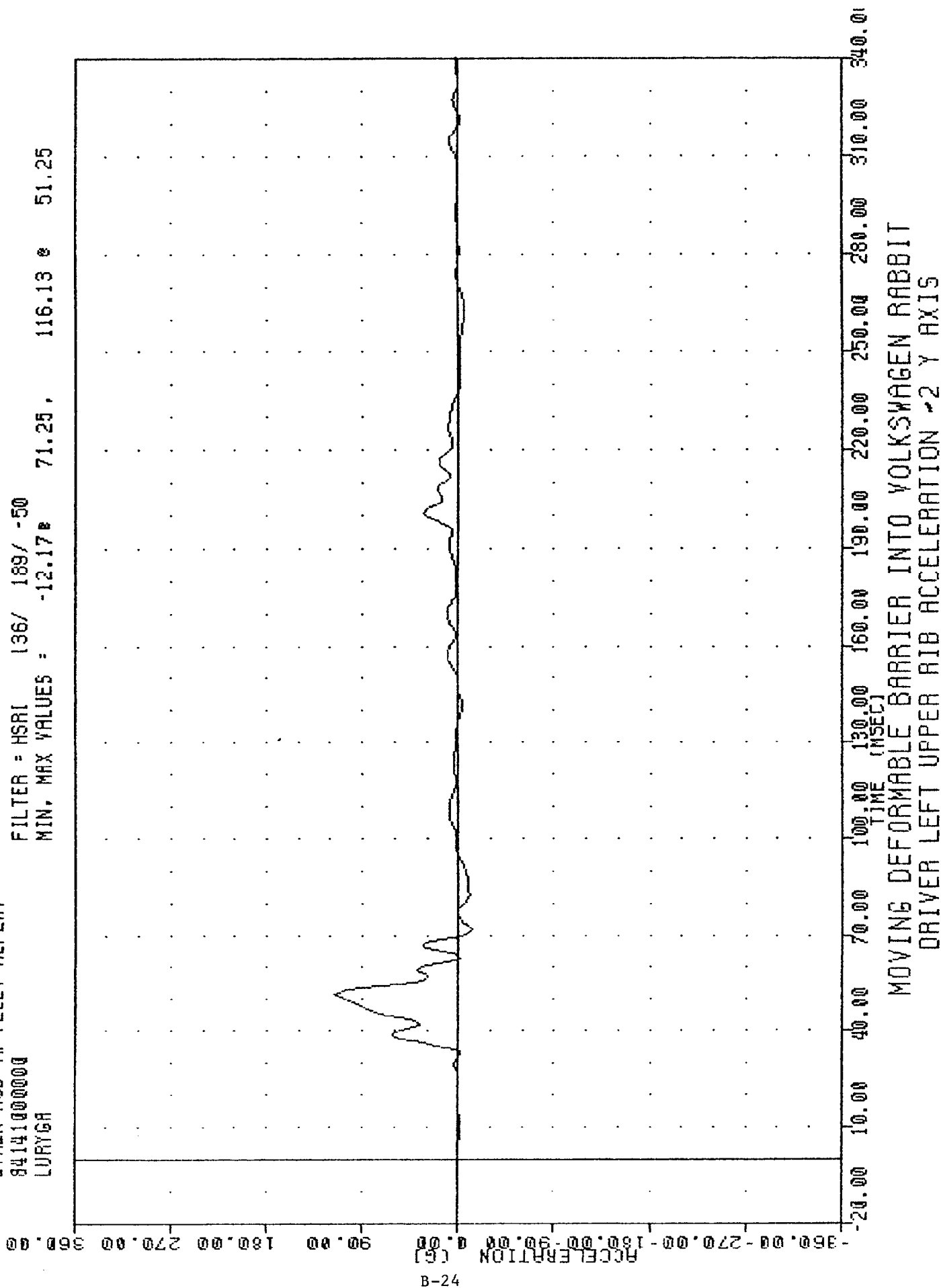
TRC 040529
 EVALN MOD VW FLEET REPEAT
 84141000000
 LURYV1

PLOT DATE 5 JUN-84 14:03:35

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.01e 11.88, 57.17 e 340.00



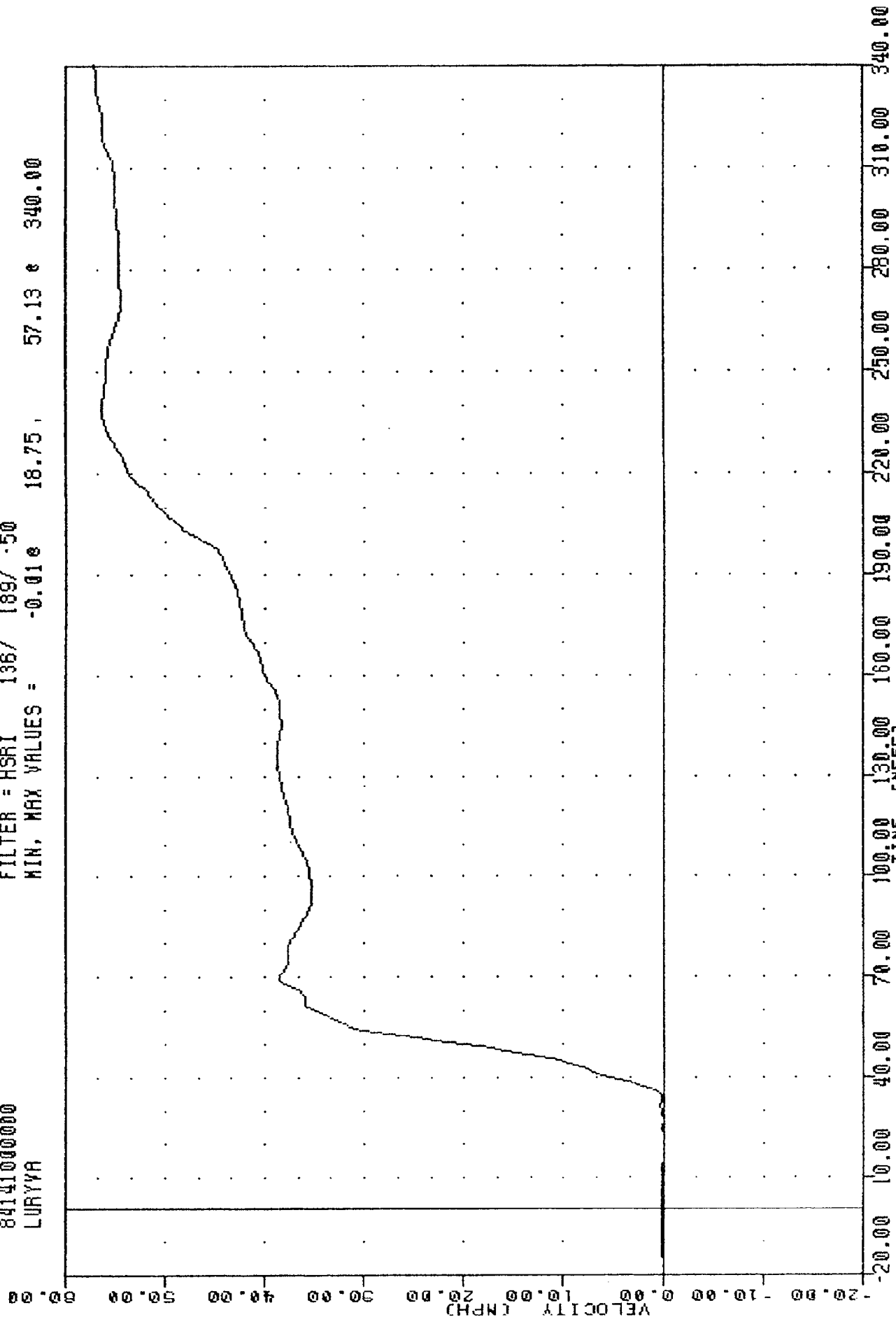
TRC
 EVALN MOD VW FLEET REPERT
 84141000000
 LURYGA
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -12.17 71.25, 116.13 51.25
 PLOT DATE 5-JUN-84 14:03:51



TRC 040529
 EVALN MOD VM FLEET REPEAT
 84141000000
 LURYVA

PLOT DATE 5 JUN 84 14:00:35

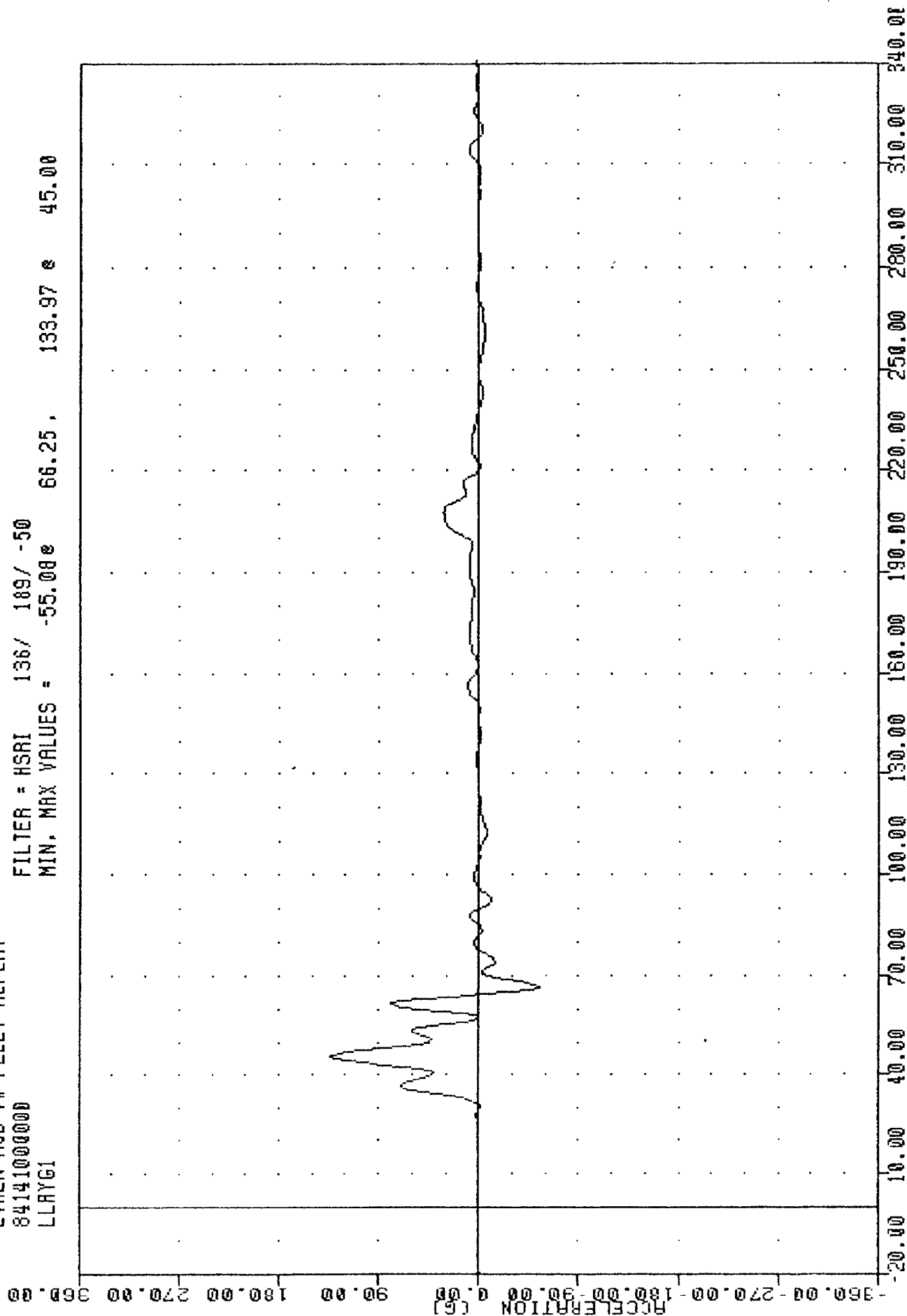
FILTER = HSRI 136/ 189/ .50
 MIN, MAX VALUES = -0.01e 18.75, 57.13 e 340.00



TRC
 EVALN MOD YW FLEET REPEAT
 84141000000
 LLAGY61

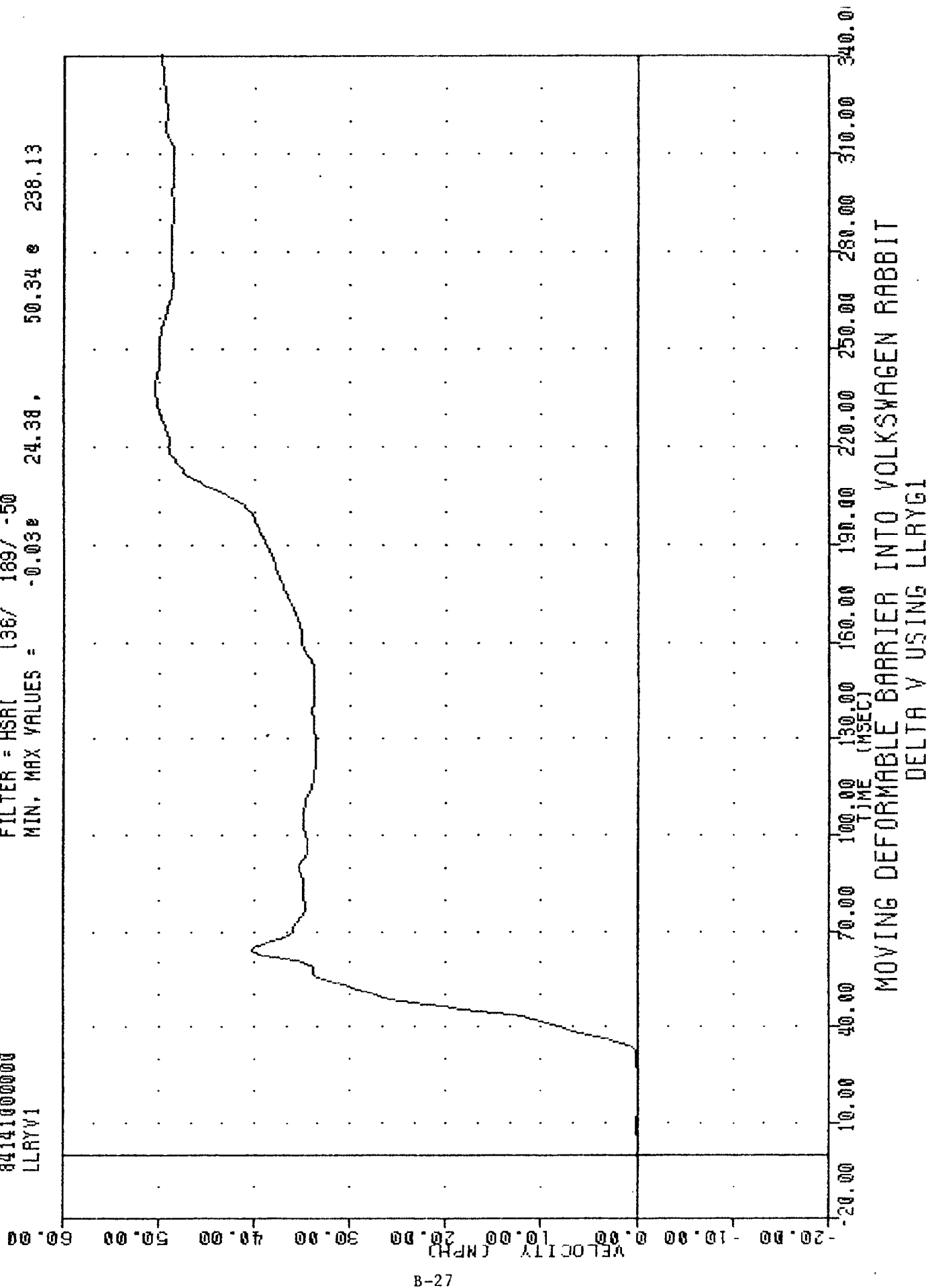
PLOT DATE 5 JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -55.08e 66.25, 133.97 e 45.00



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

TRC 84141000000
 EVALN MOD VW FLEET REPERT
 84141000000
 LLYV1
 FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = -0.03e 24.38, 50.34 e 238.13
 PLOT DATE 5-JUN-84 14:05:35



TRC 844329 5 JUN 84 14:03:51

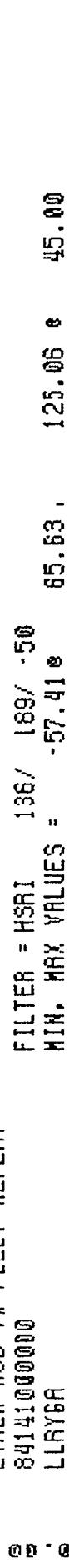
EVALN MOD VM FLEET REPEAT

84141000000

LLRY6A

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -57.41 e 85.63 , 125.06 e 45.00

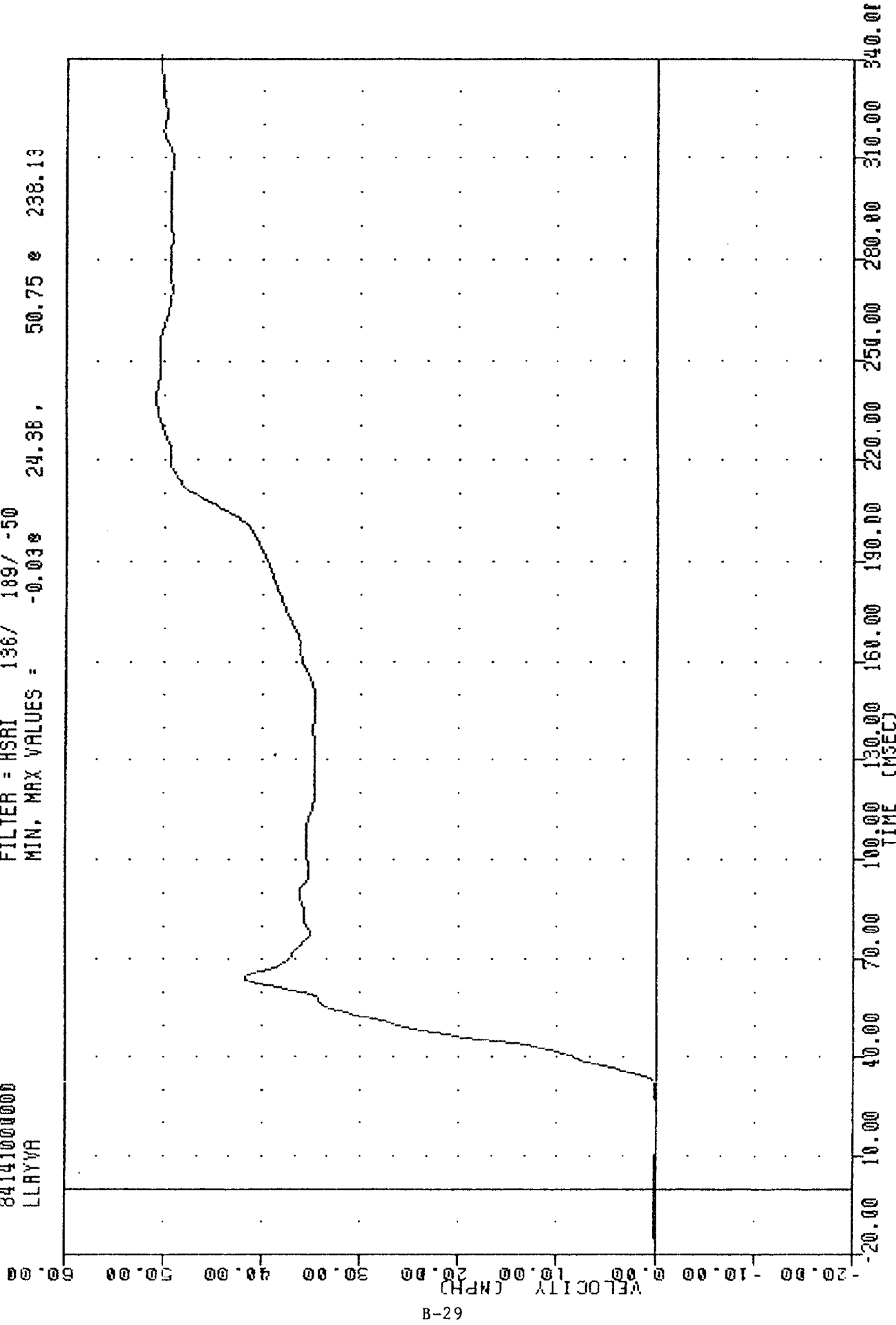


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT LOWER RIB ACCELERATION -2 Y AXIS

TRC , 040529
 EVALN MOD VW FLEET REPERT
 84141000000
 LLYYVA

PLOT DATE 5-JUN-84 14:03:35

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.038 24.38 , 50.75 e 238.13



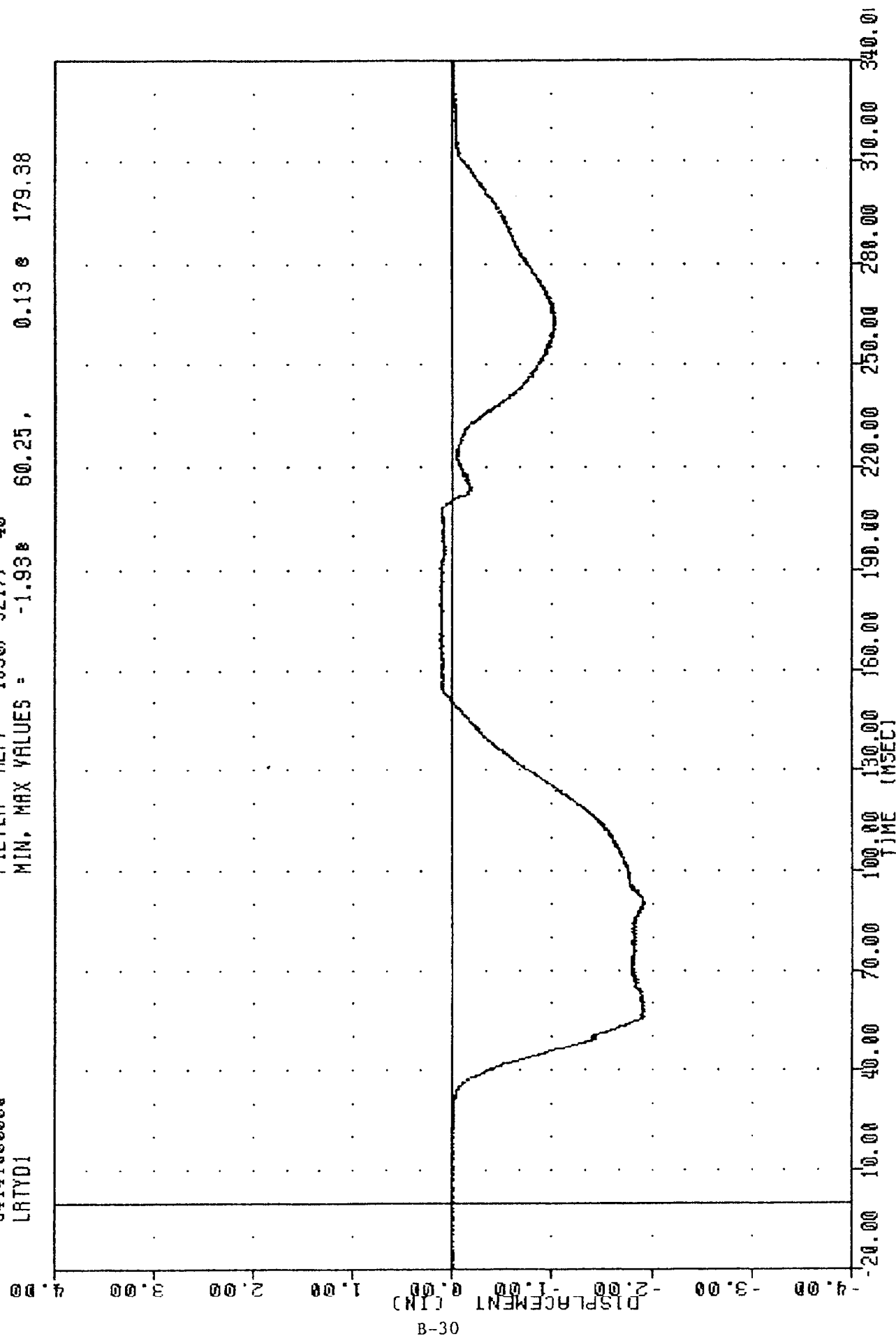
B-29

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LLYYGA

TRC
 EVALN MOD VW FLEET REPERT
 84141000000
 LRTYD1

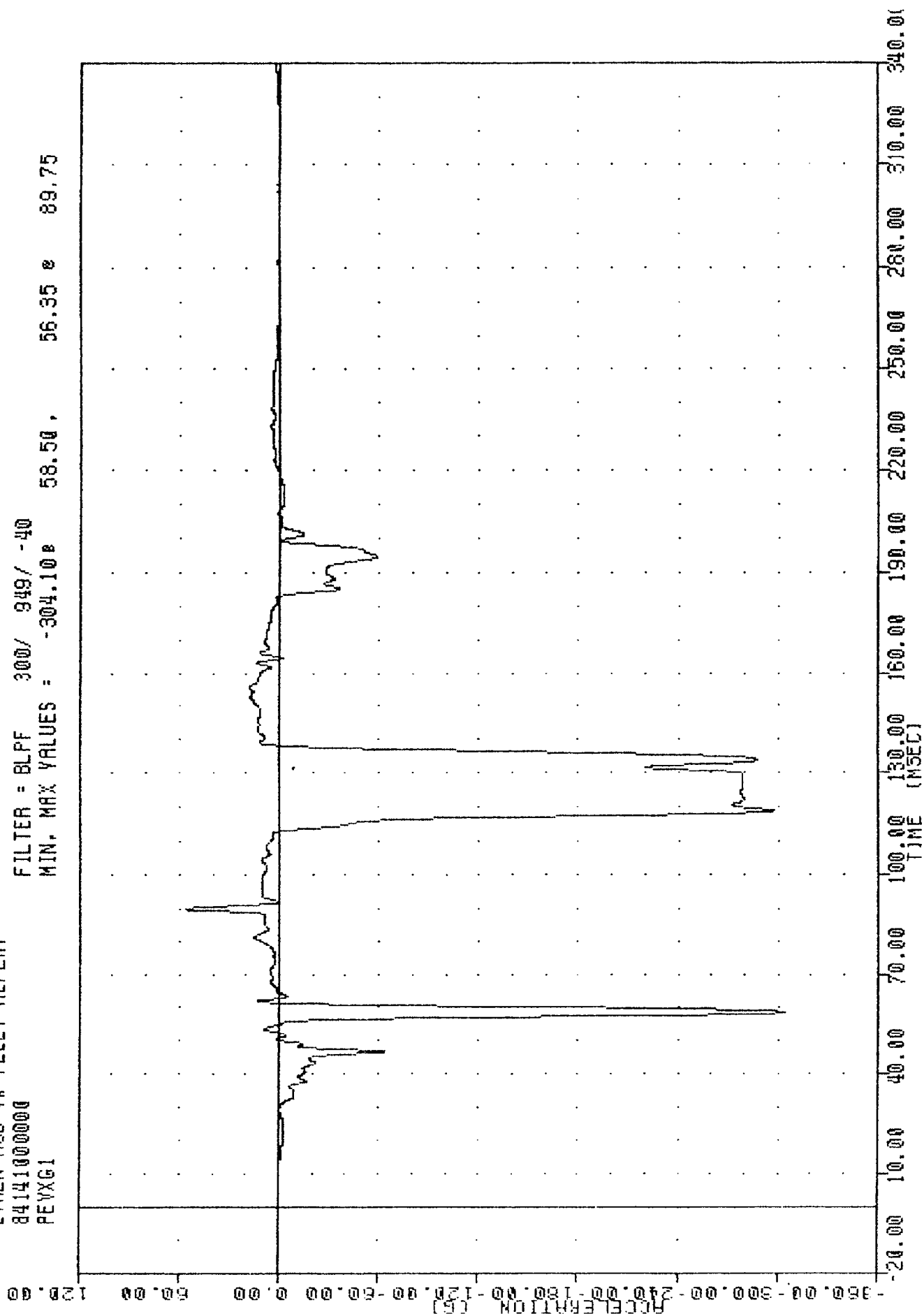
PLOT DATE 5 JUN-84 14:01:03

FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = -1.93 60.25, 0.13 179.38



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

TRC 840529 6-JUN-84 13:48:55
 EVALN MOD VW FLEET REPERT
 84141000000
 PEYXG1
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -304.10 58.50, 56.35 89.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS ACCELERATION X AXIS

TRC 840529

EVALN MOD VW FLEET REPERT

84141000000

PEVYG1

PLOT DATE

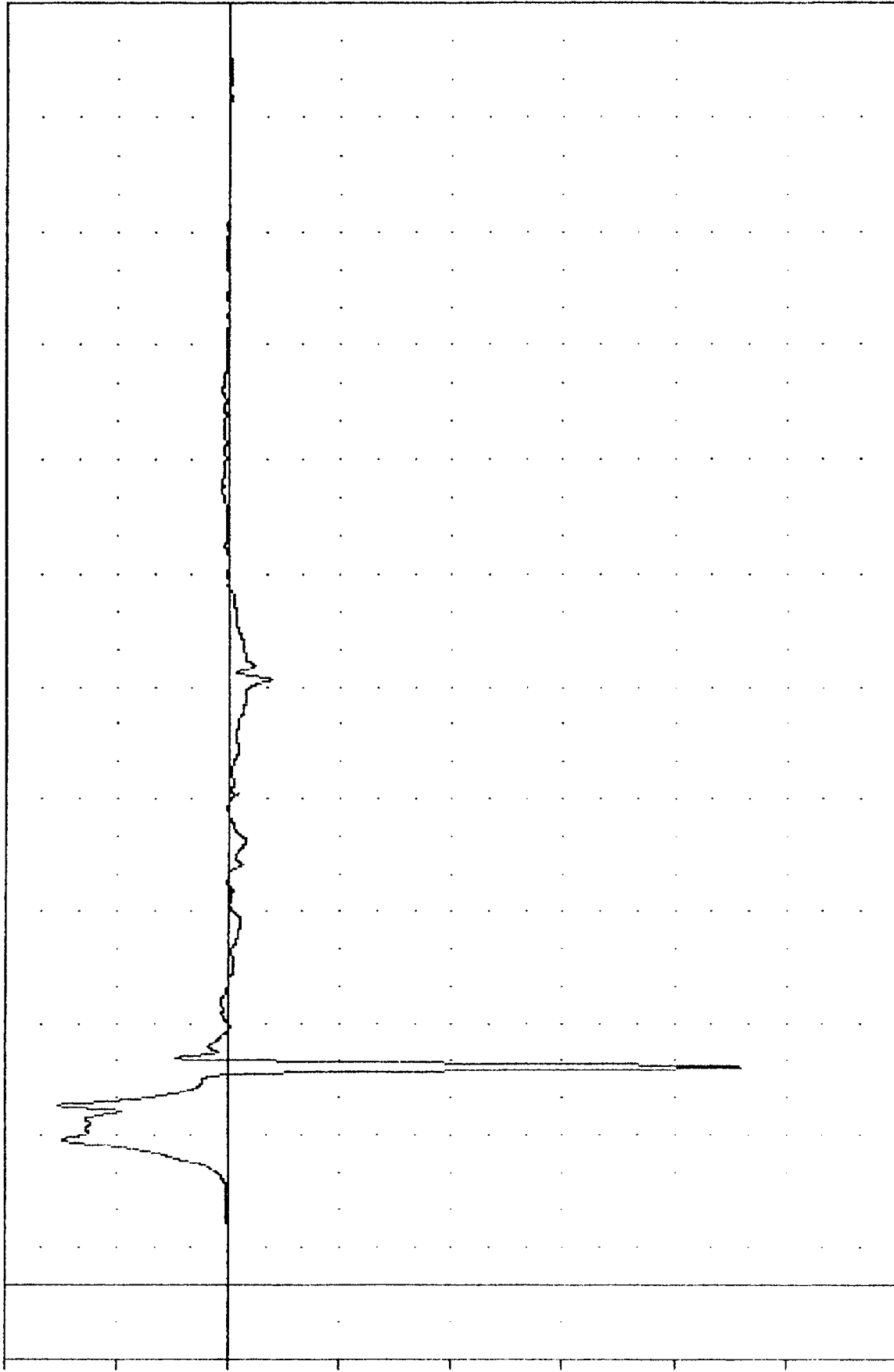
6-JUN-84

09:00:16

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -368.84 58.25, 122.30 47.88

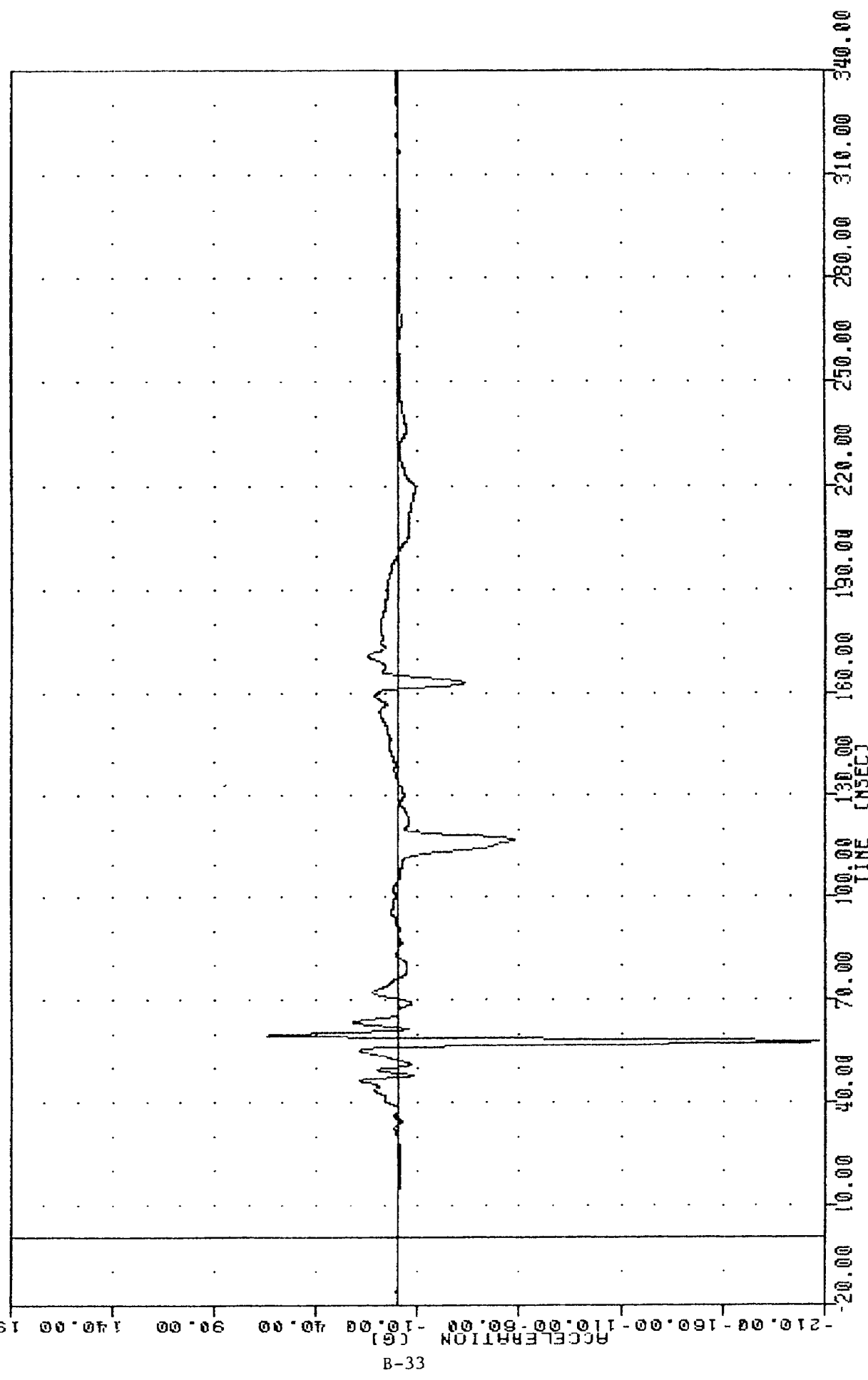
ACCELERATION [G]



-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 PELVIS ACCELERATION Y AXIS

TRC 841410000000
 EVALN MOD VV FLEET REPEAT
 841410000000
 PEVZ61
 PLOT DATE 5-JUN-84 14:01:03
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -207.20e 57.63, 61.41 e 59.63

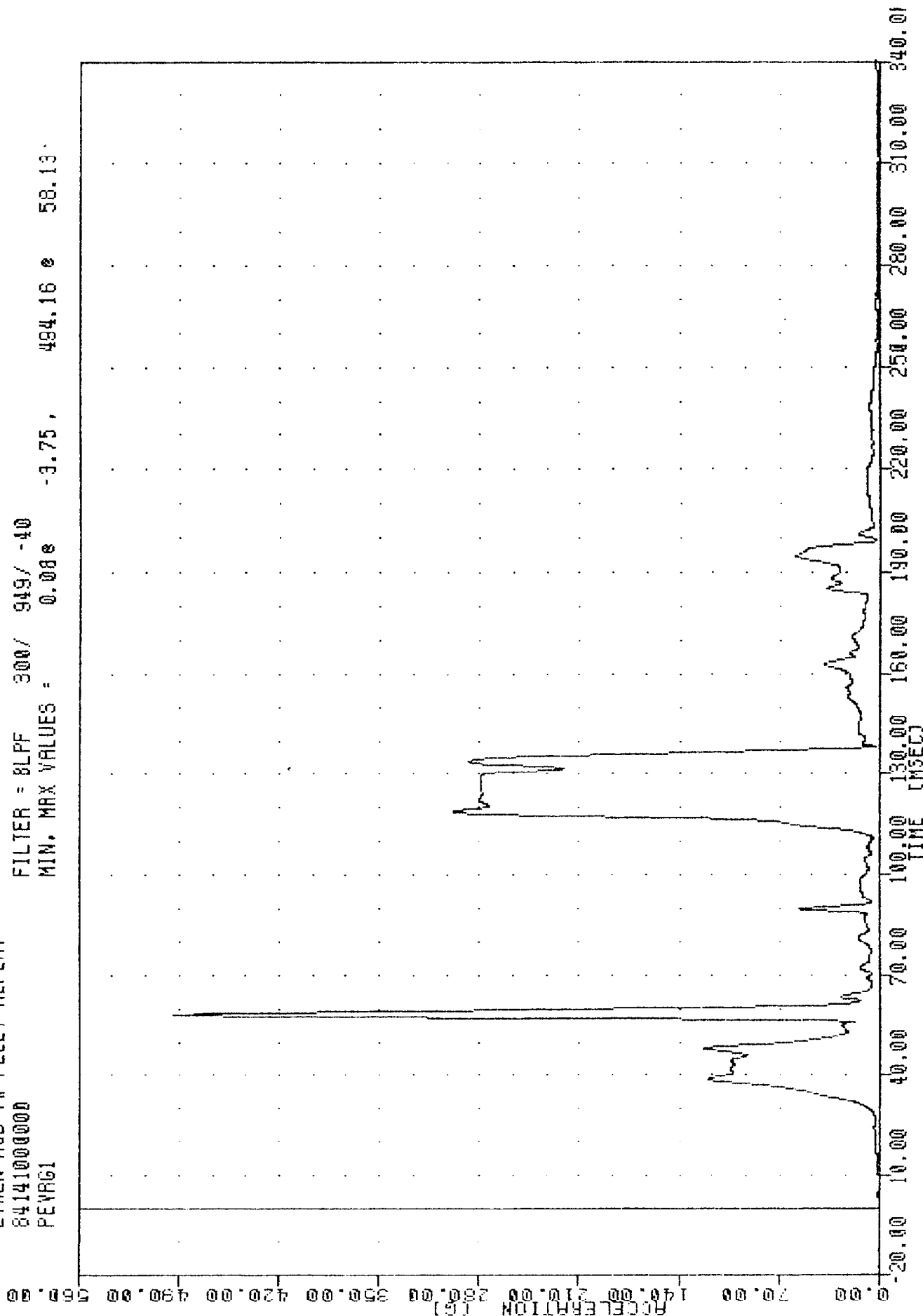


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS ACCELERATION Z AXIS

TRC
EVALN MOD VW FLEET REPEAT
84141000000
PEVRG1

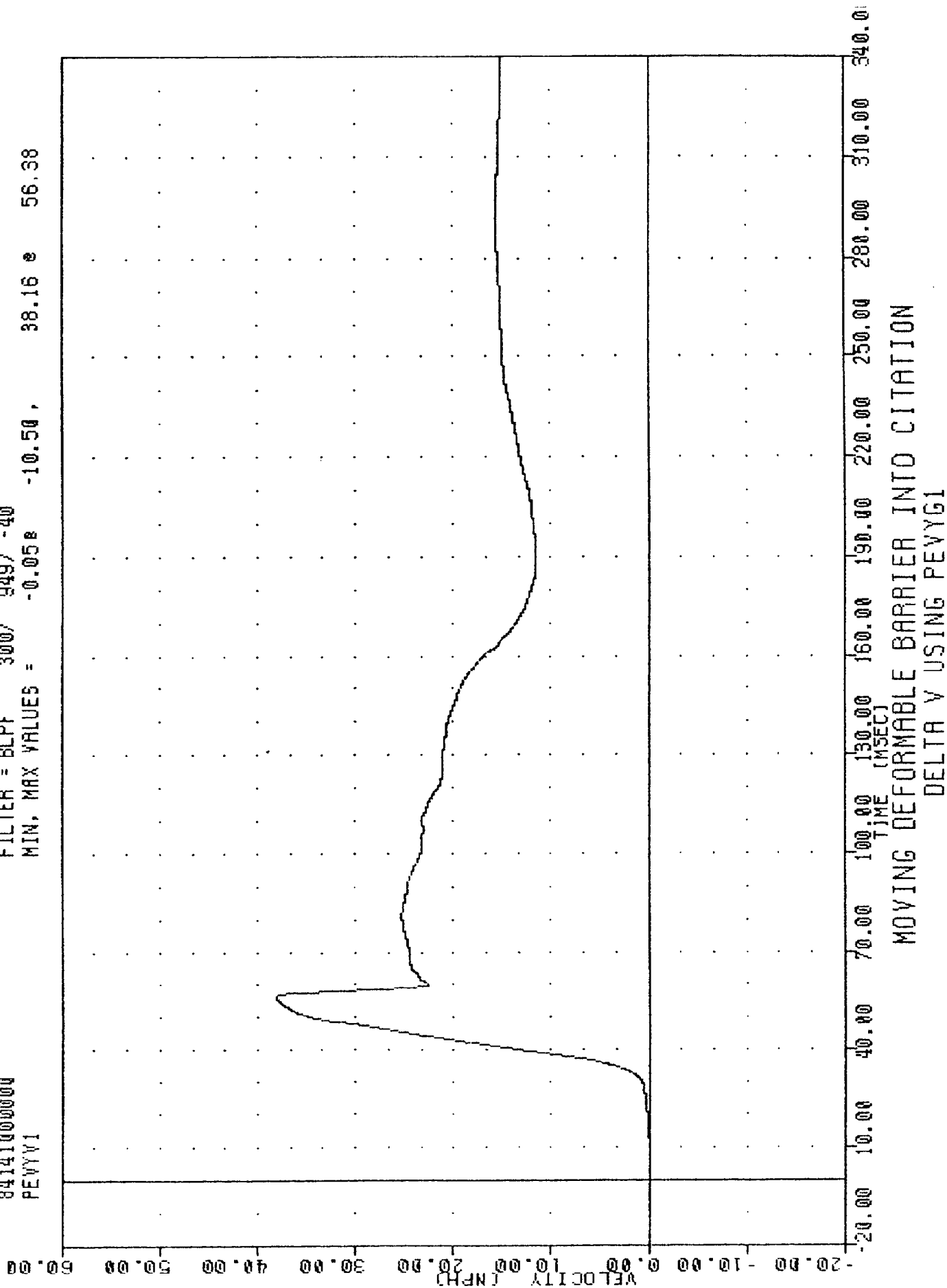
PLOT DATE 6-JUN-84 09:00:16

FILTER = 8LFF 300/ 949/ -40
MIN. MAX VALUES = 0.08e -3.75, 484.16 e 58.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS RESULTANT

TRC 040529 14:06:19
 EVALN MOD VW FLEET REPERT 5-JUN-84
 84141000000 FILTER = BLPF 300/ 949/ -40
 PEVYV1 MIN, MAX VALUES = -0.058 -10.50, 38.16 56.38



TRC

840529

5-JUN-84

14:01:03

EVALN MOD YW FLEET REPEAT

84141000000

HEADXG3

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -40.438 102.38, 21.69 e 89.38

200.00

150.00

100.00

50.00

0.00

-50.00

-100.00

-150.00

-200.00

ACCELERATION (G)

TIME (MSEC)

20.00

40.00

60.00

80.00

100.00

120.00

140.00

160.00

180.00

200.00

220.00

240.00

260.00

280.00

300.00

320.00

340.00

360.00

380.00

400.00

420.00

440.00

460.00

480.00

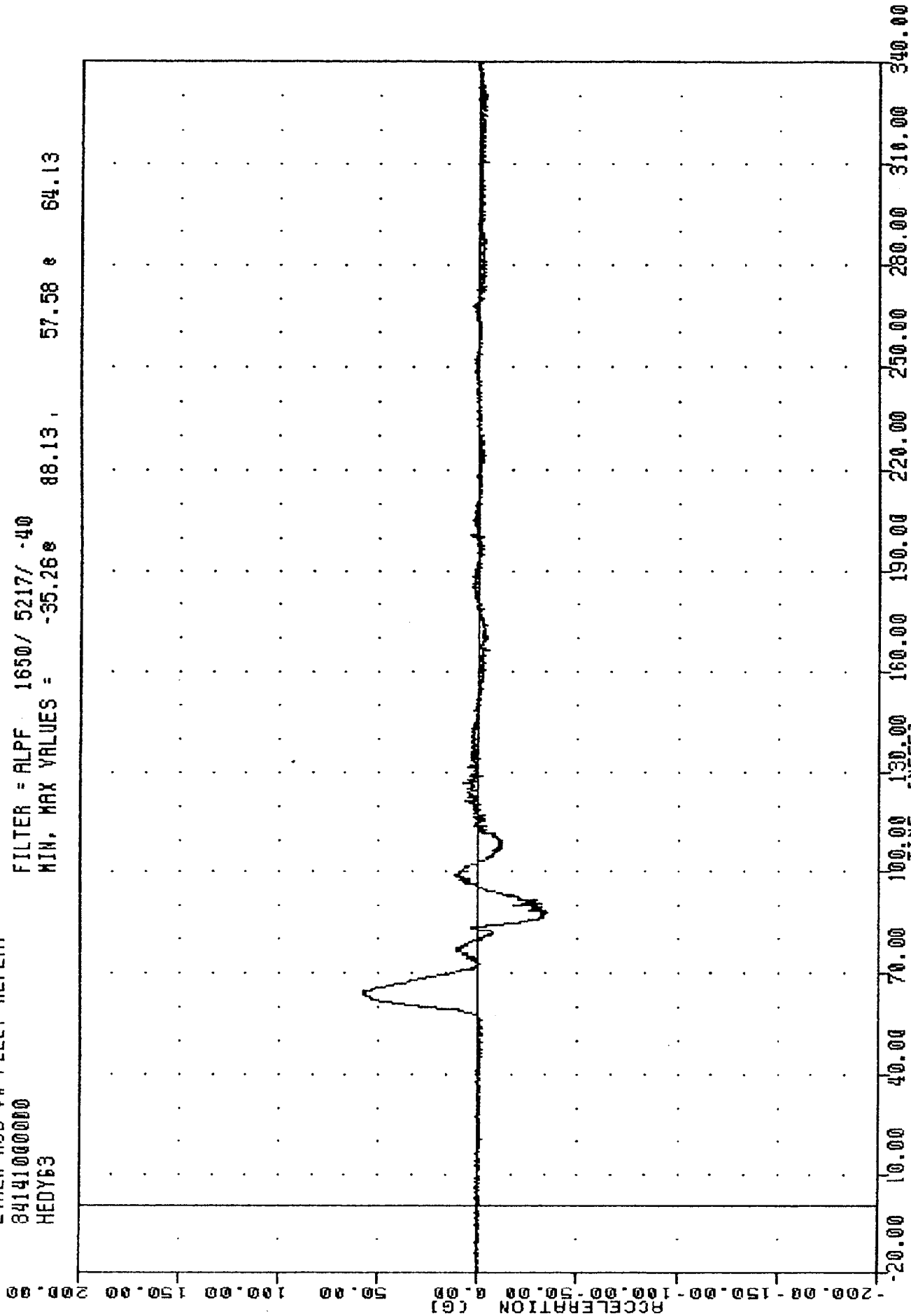
500.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION X AXIS

TRC
 EVALN NOD VV FLEET REPEAT
 84141000000
 HEDY63

PLOT DATE 5 JUN 84 14:01:03

FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -35.26 88.13 57.58 64.13

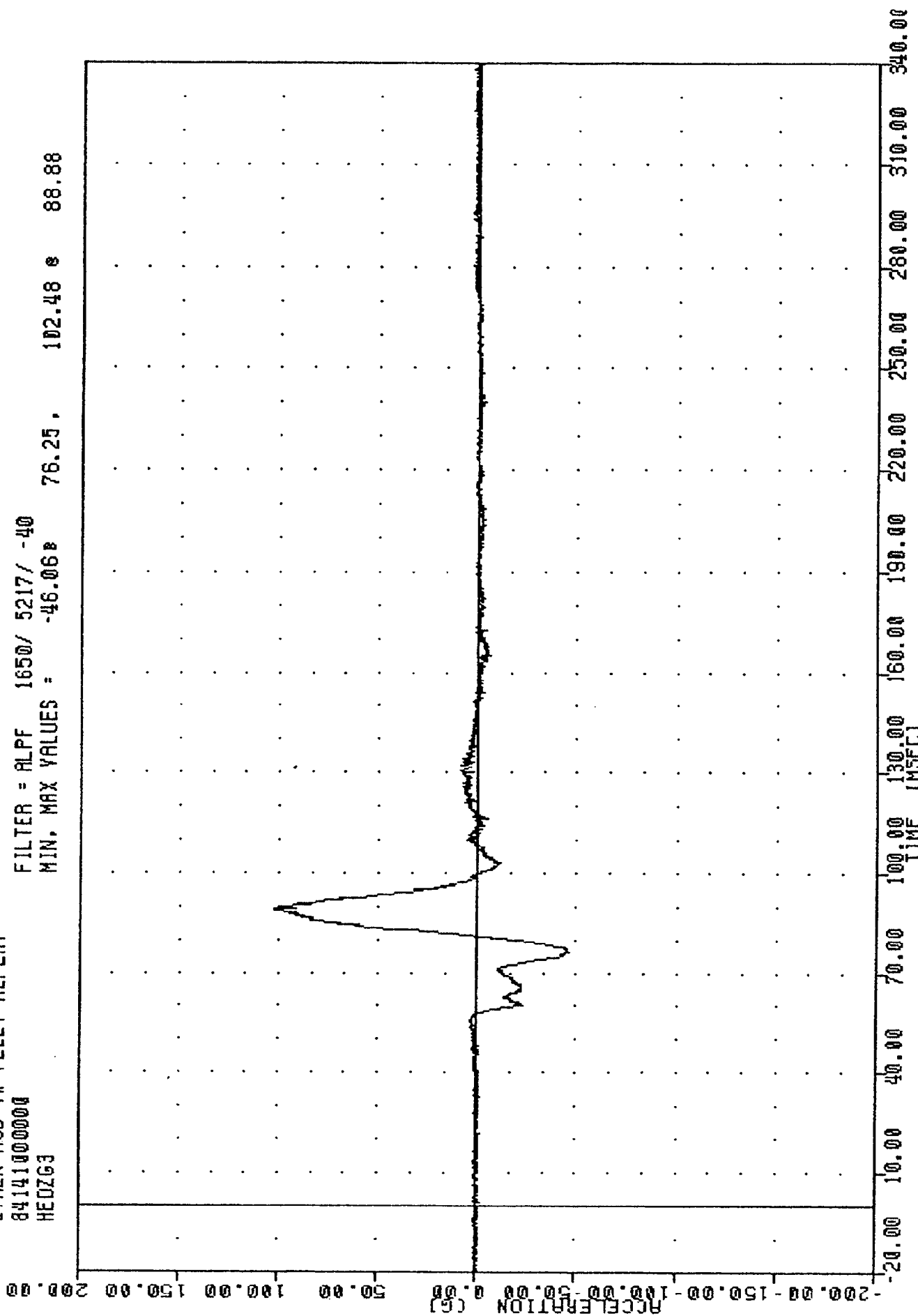


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER HEAD ACCELERATION Y AXIS

TRC , 040529
 EVALN MOD VN FLEET REPERT
 84141000000
 HEDZG3

PLOT DATE 5 JUN 84 14:01:03

FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = -46.068 76.25, 102.48 88.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER HEAD ACCELERATION Z AXIS

TRC 040529 5 JUN 84 14:01:03

EVALN MOD VV FLEET REPEAT

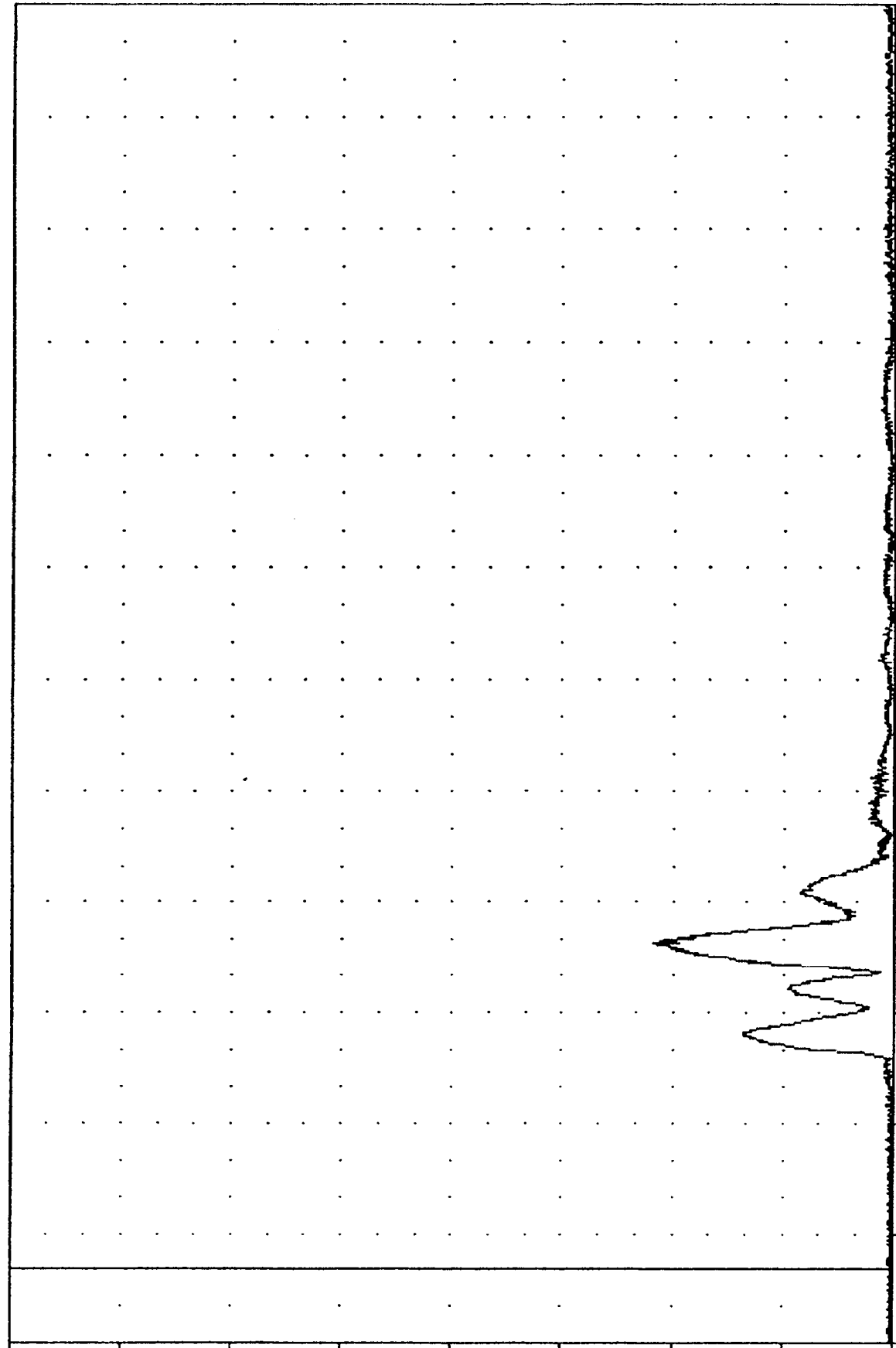
84141000000

HEDR63

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = 0.18e 10.13 , 108.60 e 88.88

ACCELERATION [G]



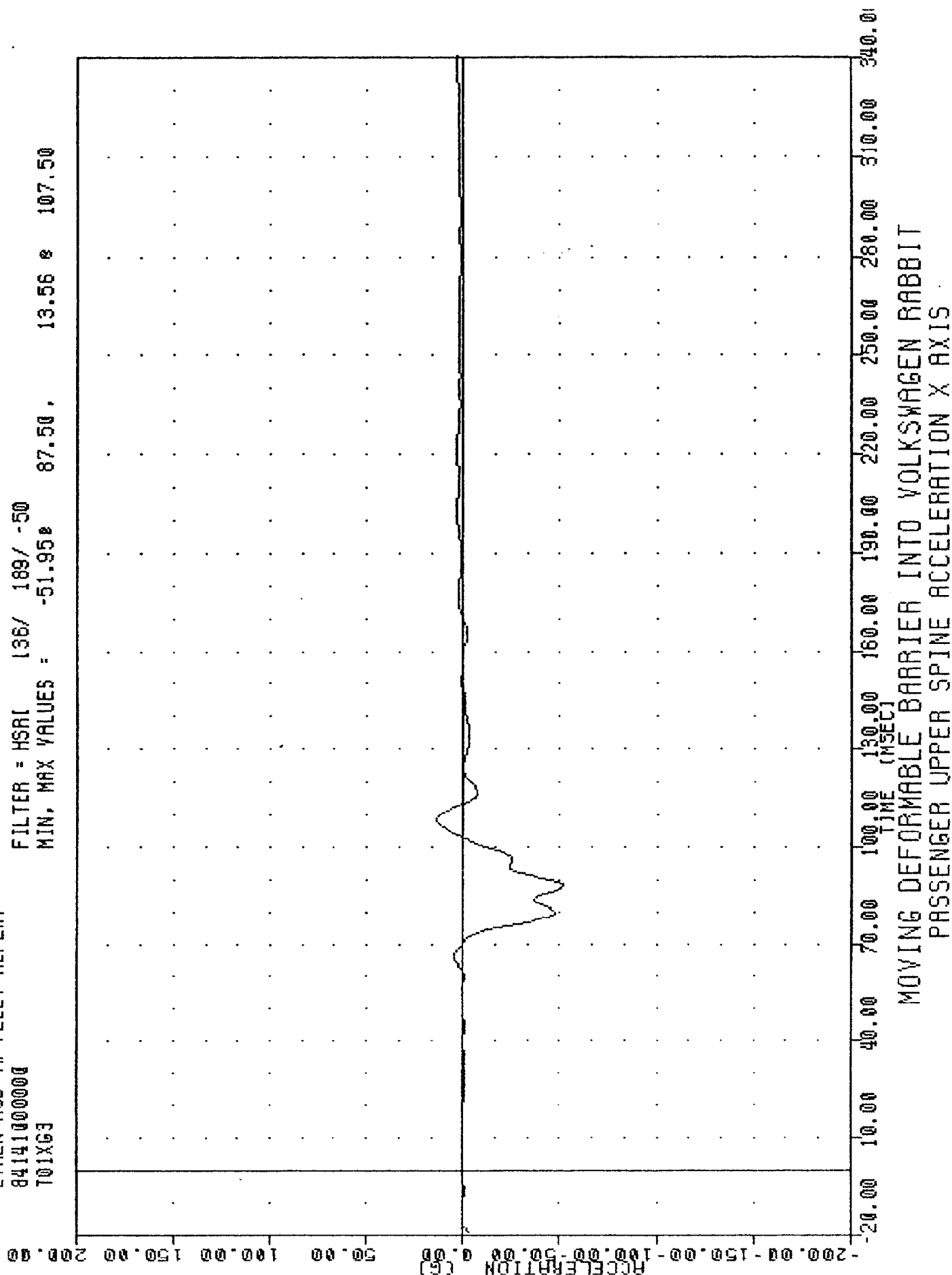
0.00 50.00 100.00 150.00 200.00 250.00 300.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD RESULTANT

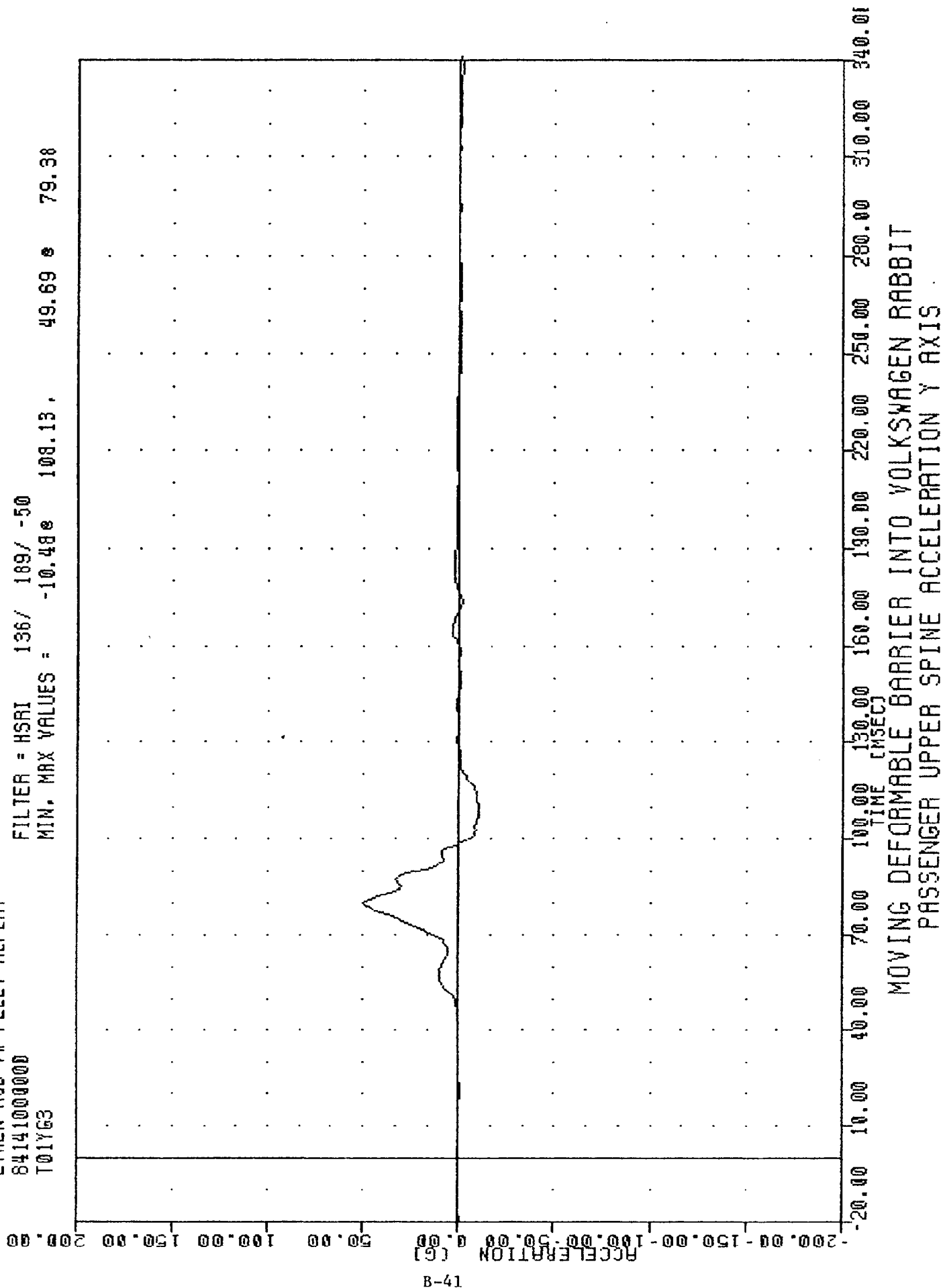
TRC
 EVALN MOD VW FLEET REPERT
 84141000000
 701XG3

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -51.958 87.50, 13.56 & 107.50



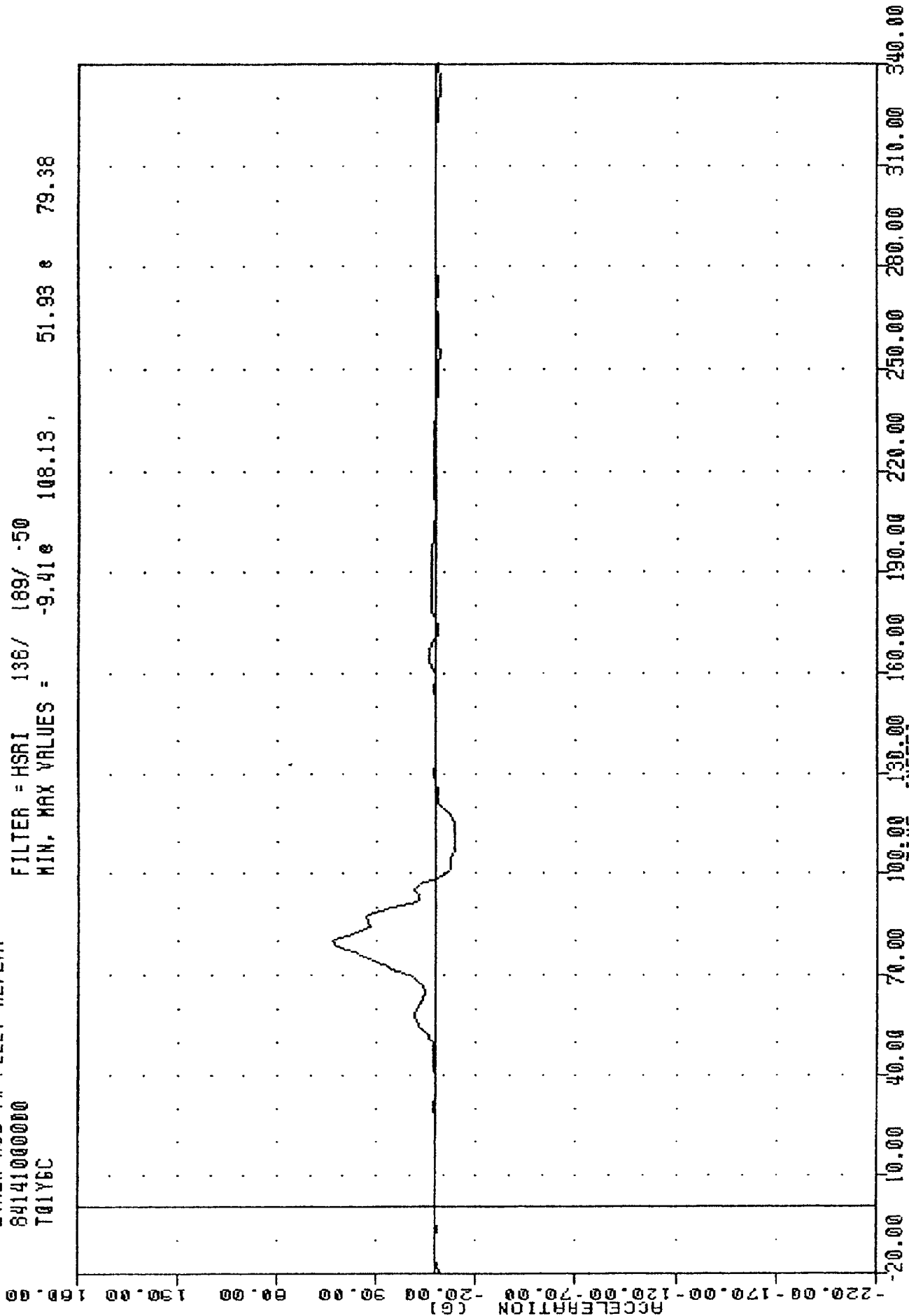
TRC 040529, PLOT DATE 5 JUN 84 14:03:51
 EVALN MOD YW FLEET REPEAT
 84141000000
 T01Y63
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -10.48e 108.13, 49.69 e 79.38



TRC 040329
 EVALN MOD VM FLEET REPEAT
 84141000000
 T01Y6C

PLOT DATE 5 JUN 84 14:03:51

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -9.41e 108.13, 51.93 e 79.38

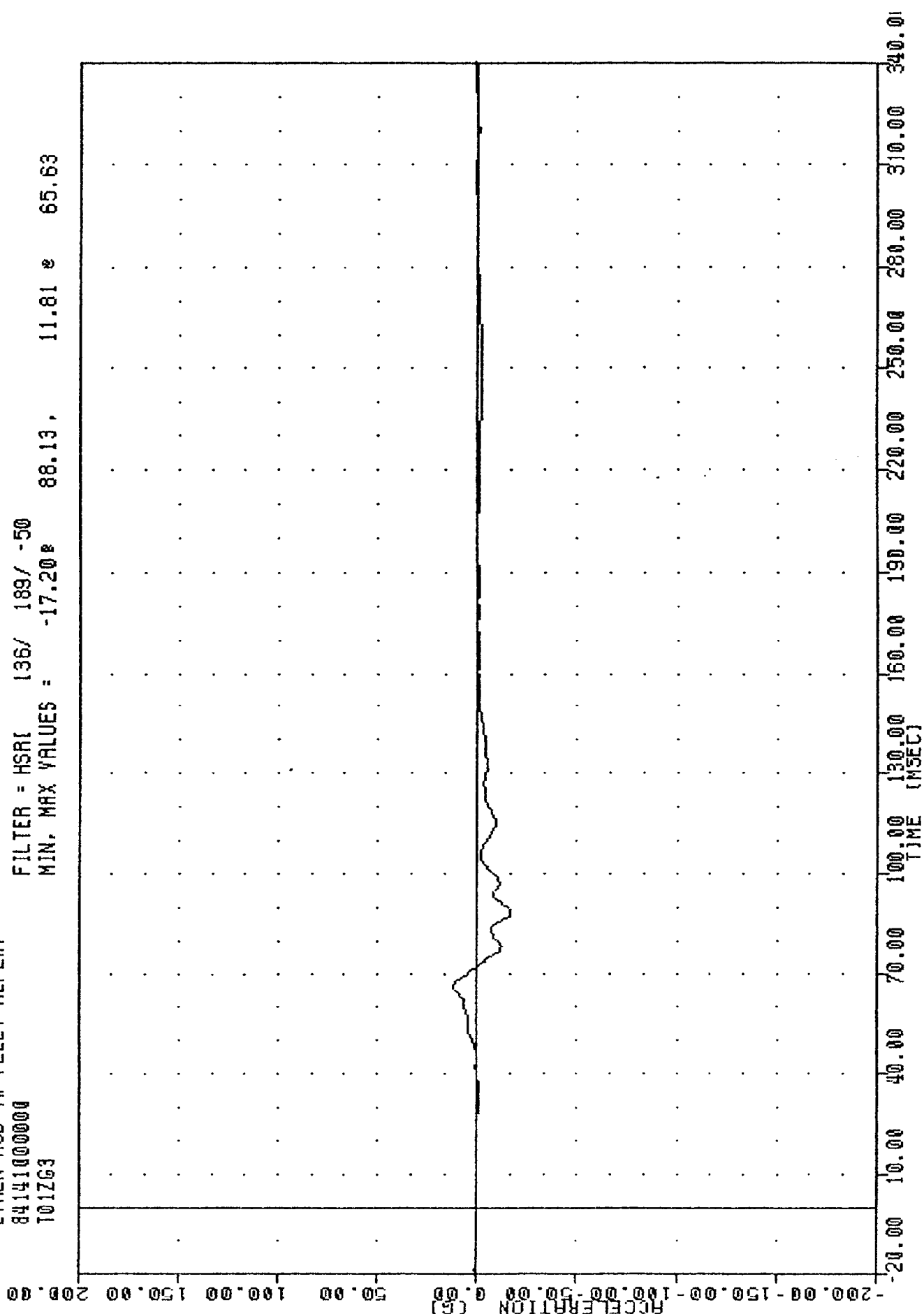


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE ACCELERATION #2 Y AXIS

TRC 84141000000
 EVALN MOD VW FLEET REPERT
 T01ZG3

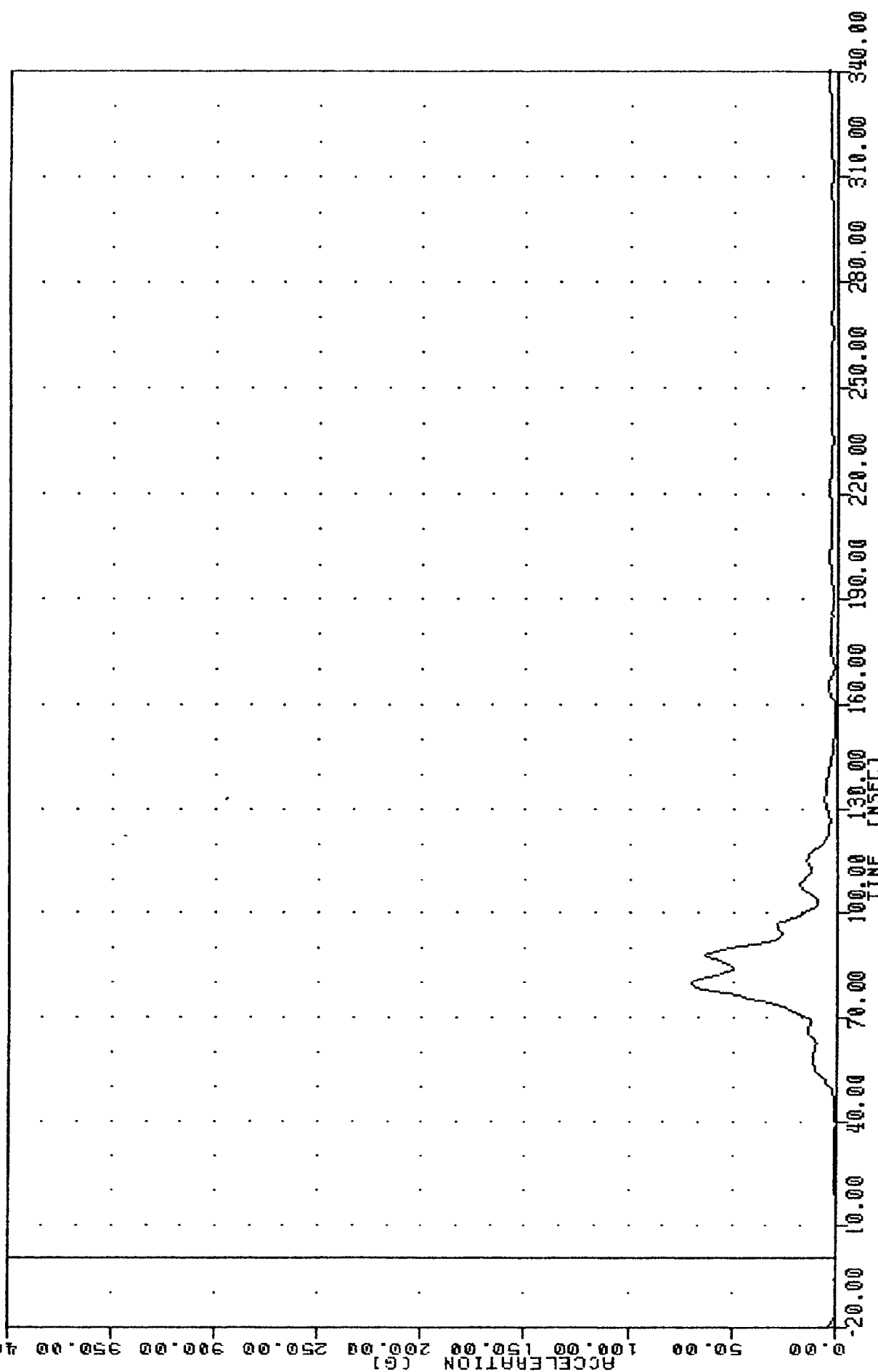
PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -17.20 88.13, 11.81 65.63



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

TRC 840529 5-JUN-84 14:03:51
 EVALN MOD VN FLEET REPEAT
 84141000000
 T01P63
 FILTER = HSRI 136/ 189/ .50
 MIN, MAX VALUES = 0.048 -14.37, 69.82 & 79.38

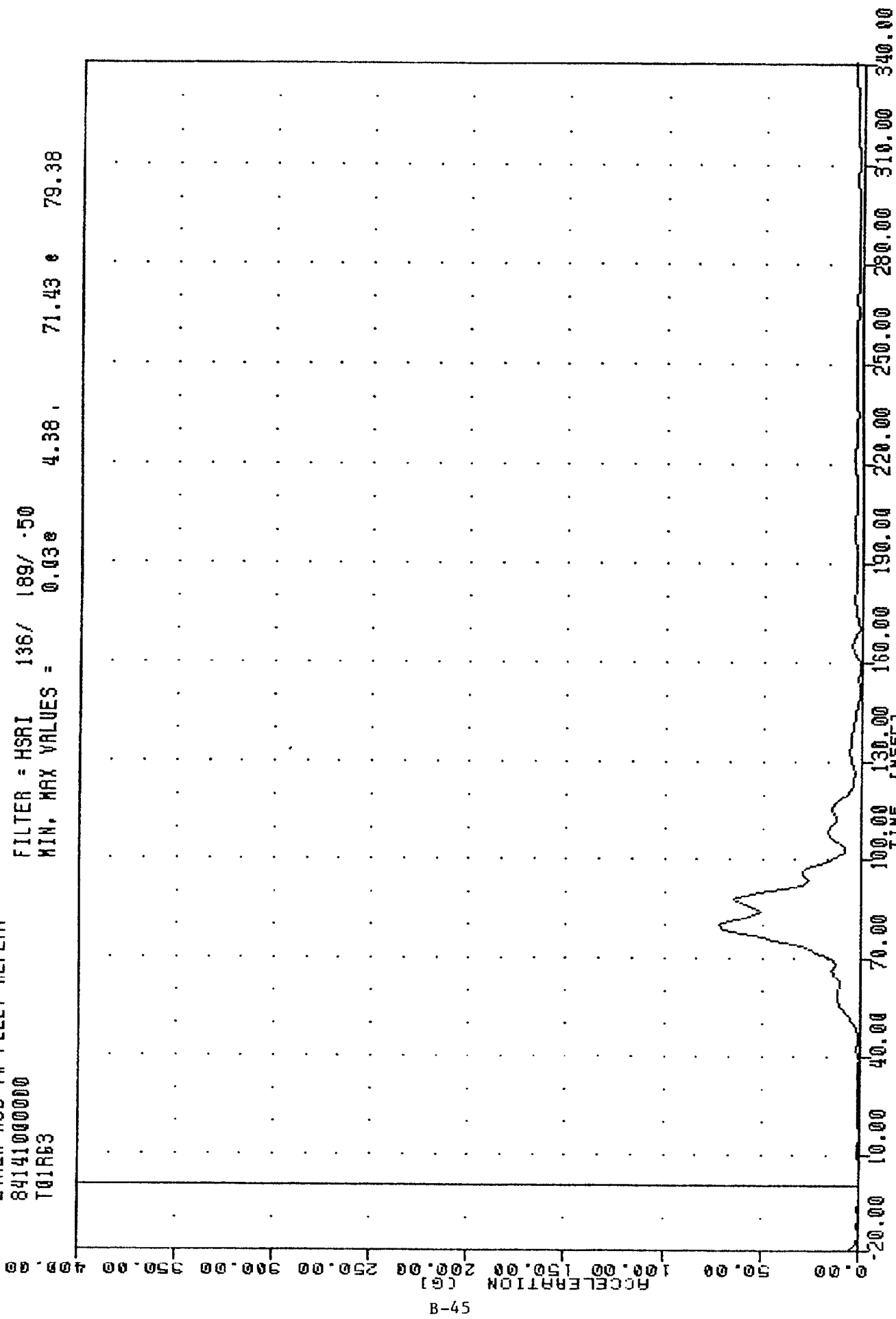


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE RESULTANT

TRC 84141000000
 EVALN MOD VV FLEET REPEAT
 T01R63

PLOT DATE 5 JUN 84 14:03:09

FILTER = HSRI 136/ 189/ .50
 MIN. MAX VALUES = 0.038 4.38 71.43 79.38

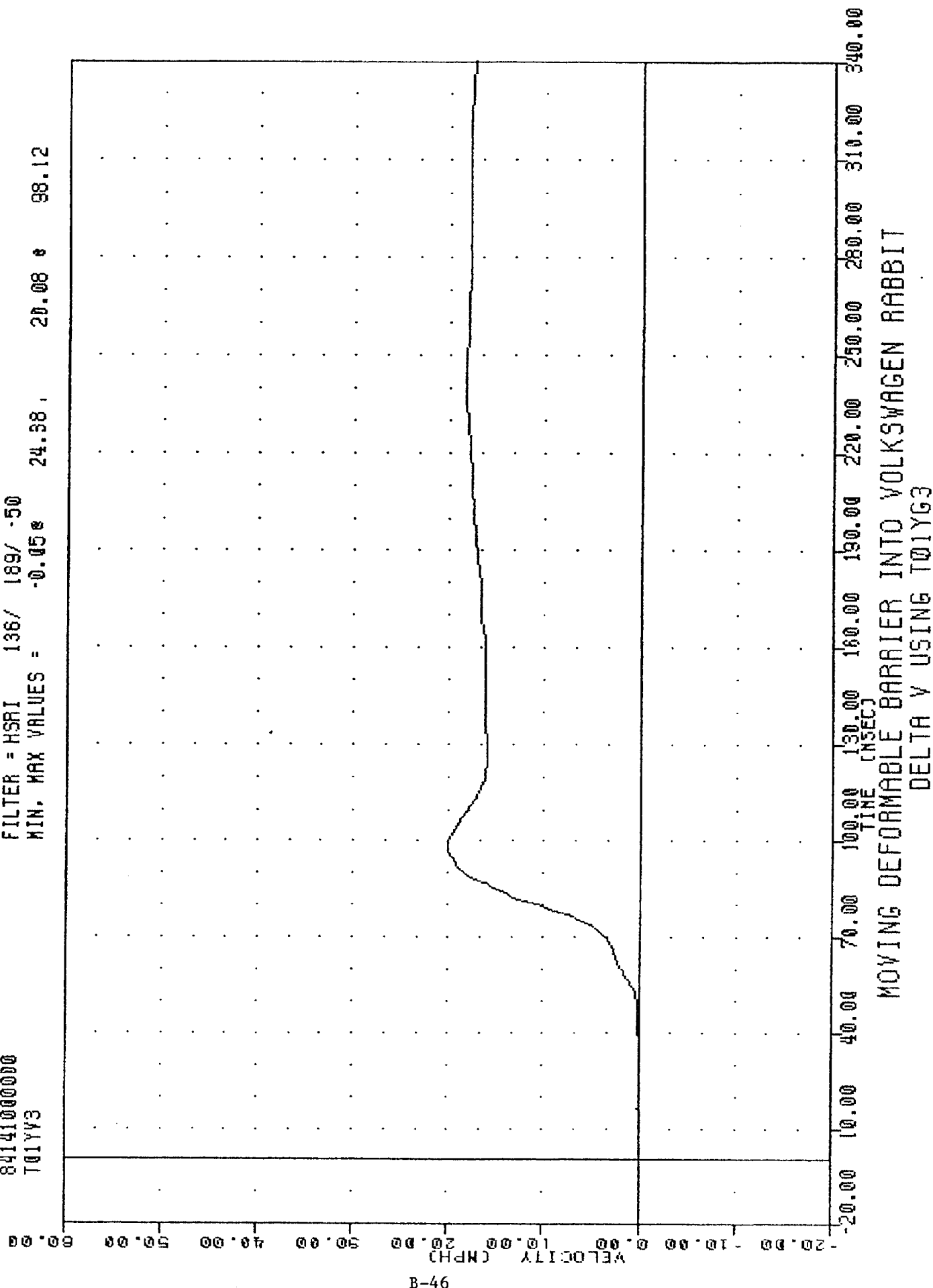


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE RESULTANT USING T01YGC

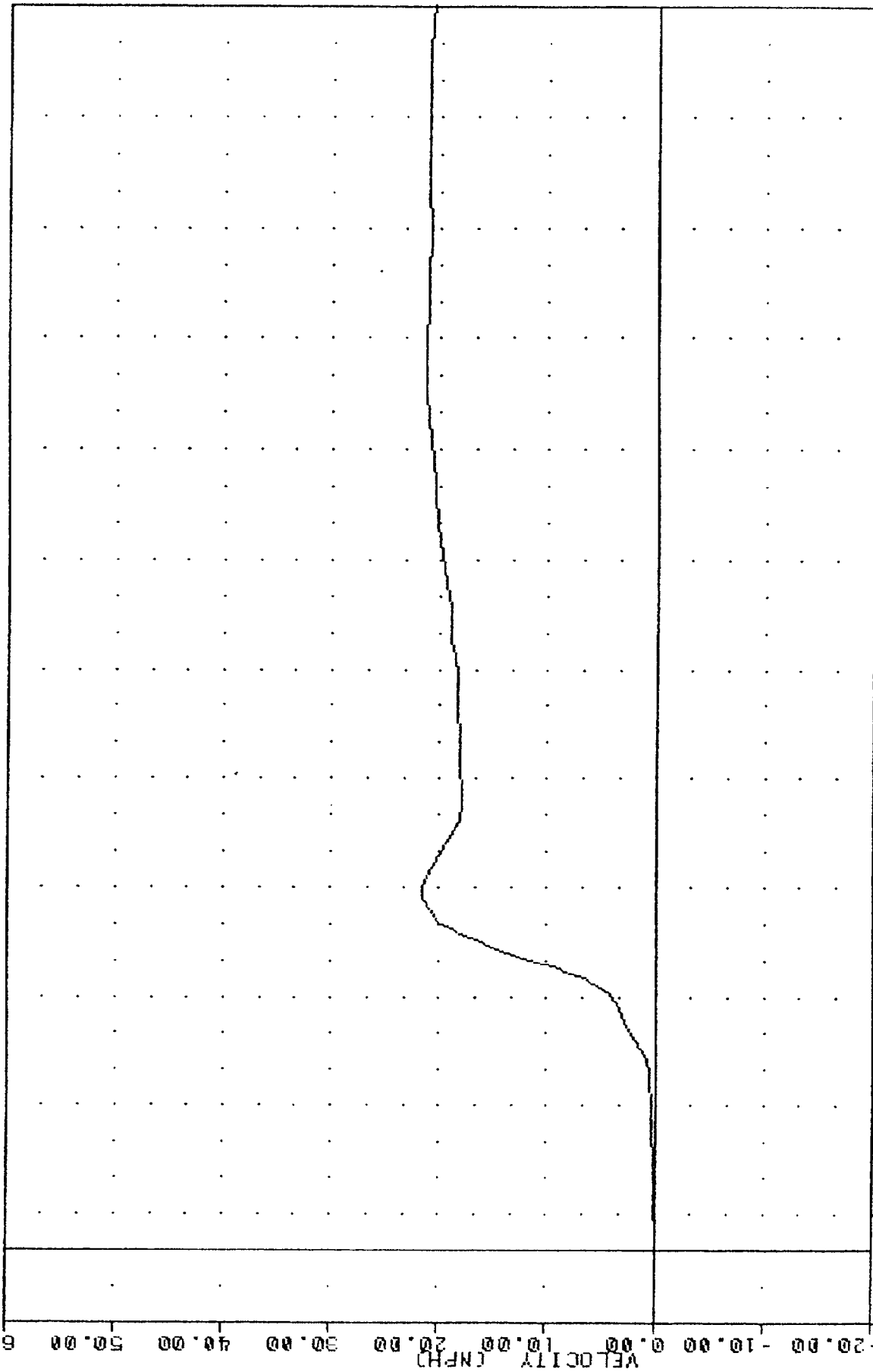
TRC 040529
 EVALN MOD VV FLEET REPEAT
 84141000000
 T01YV3

PLOT DATE 5 JUN 84 14:03:35

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.050 24.38 20.08 98.12



TRC 840529 5-JUN-84 14:05:35
 EVALN MOD VW FLEET REPERT
 84141000000
 T01YVC
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.068 -16.87, 21.62 98.12

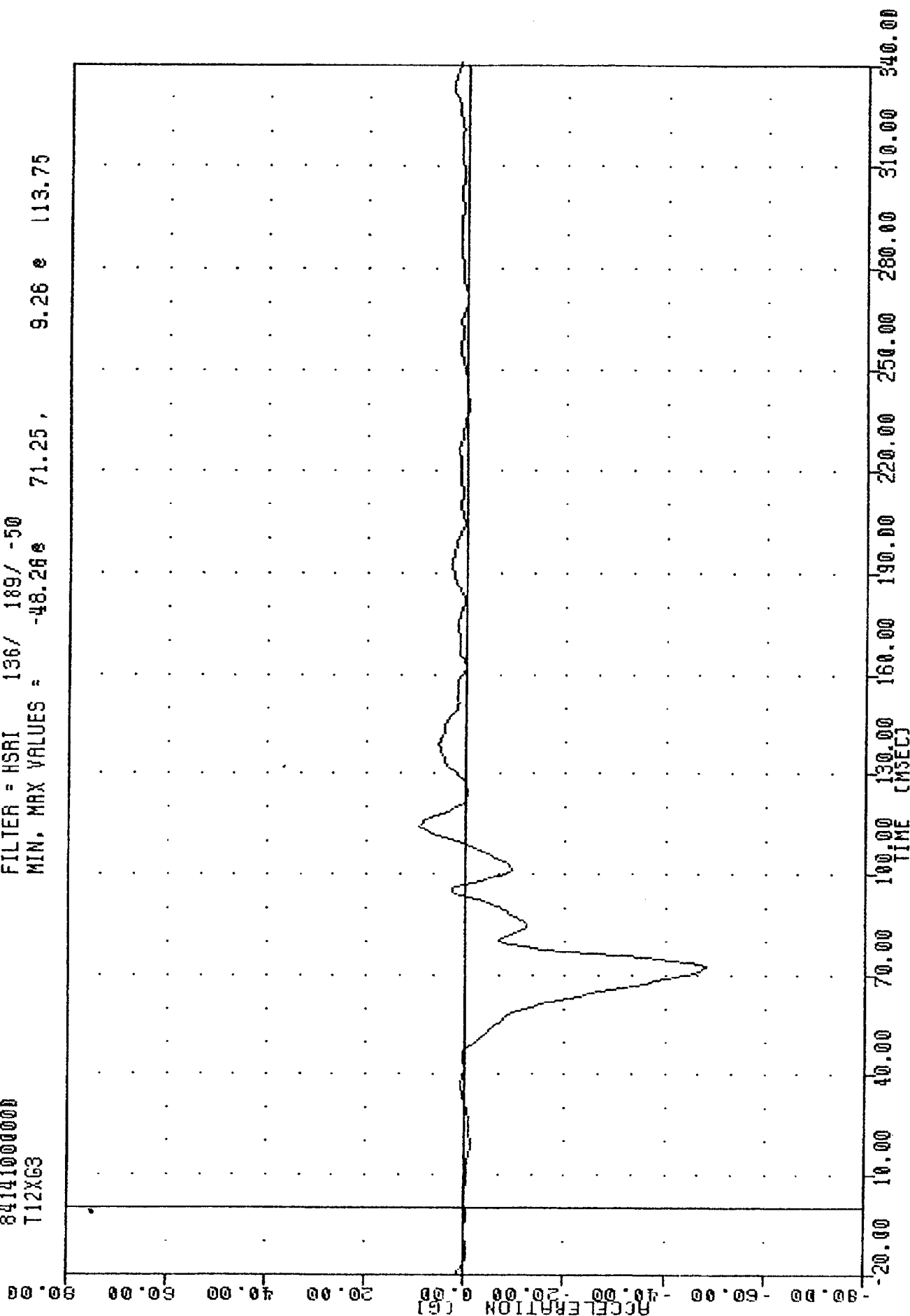


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T01YGC

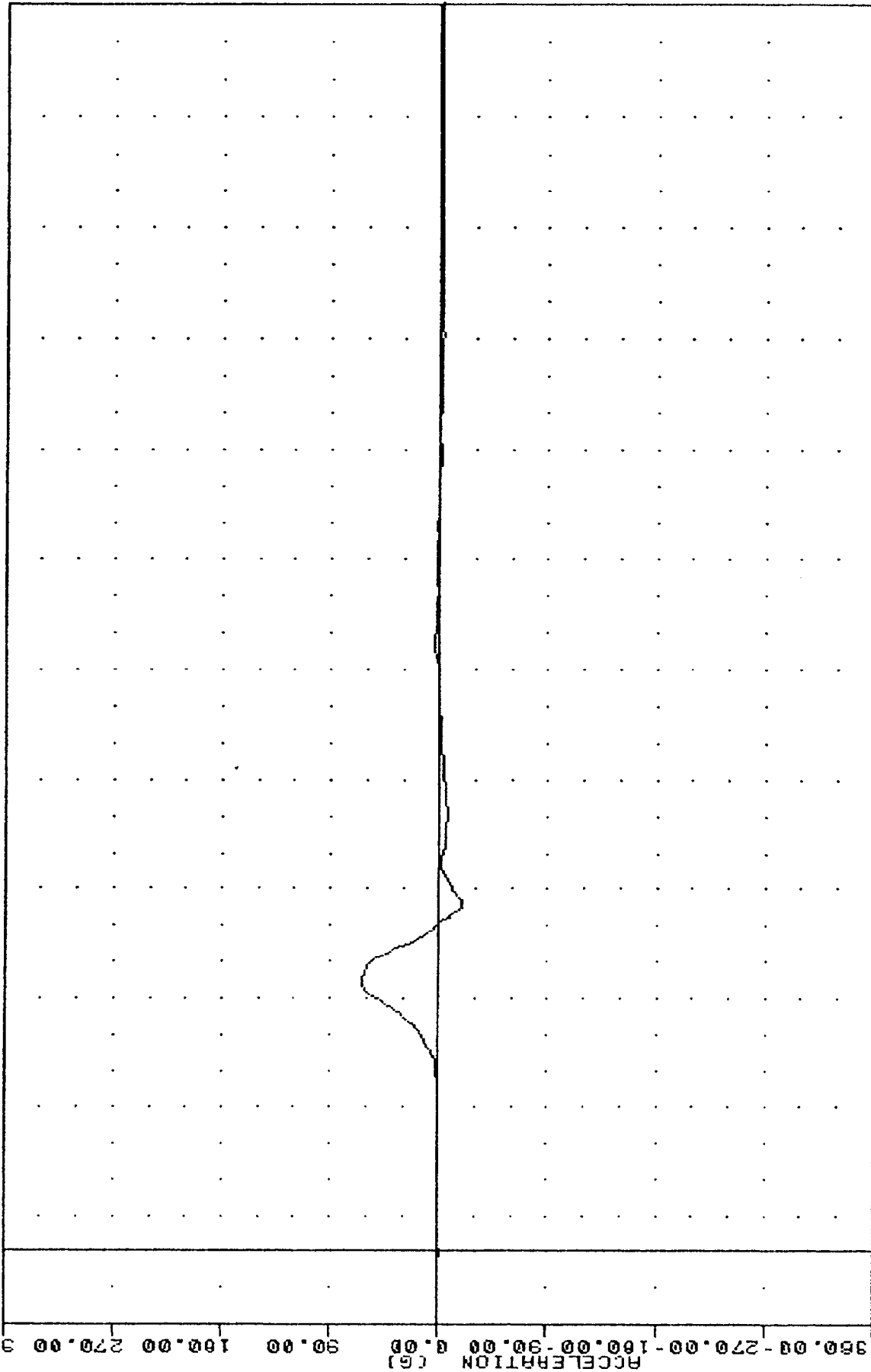
TRC 529
EVALN MOD YV FLEET REPEAT
84141000000
T12XG3

PLOT DATE 5 JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -48.26 71.25, 9.26 e 113.75

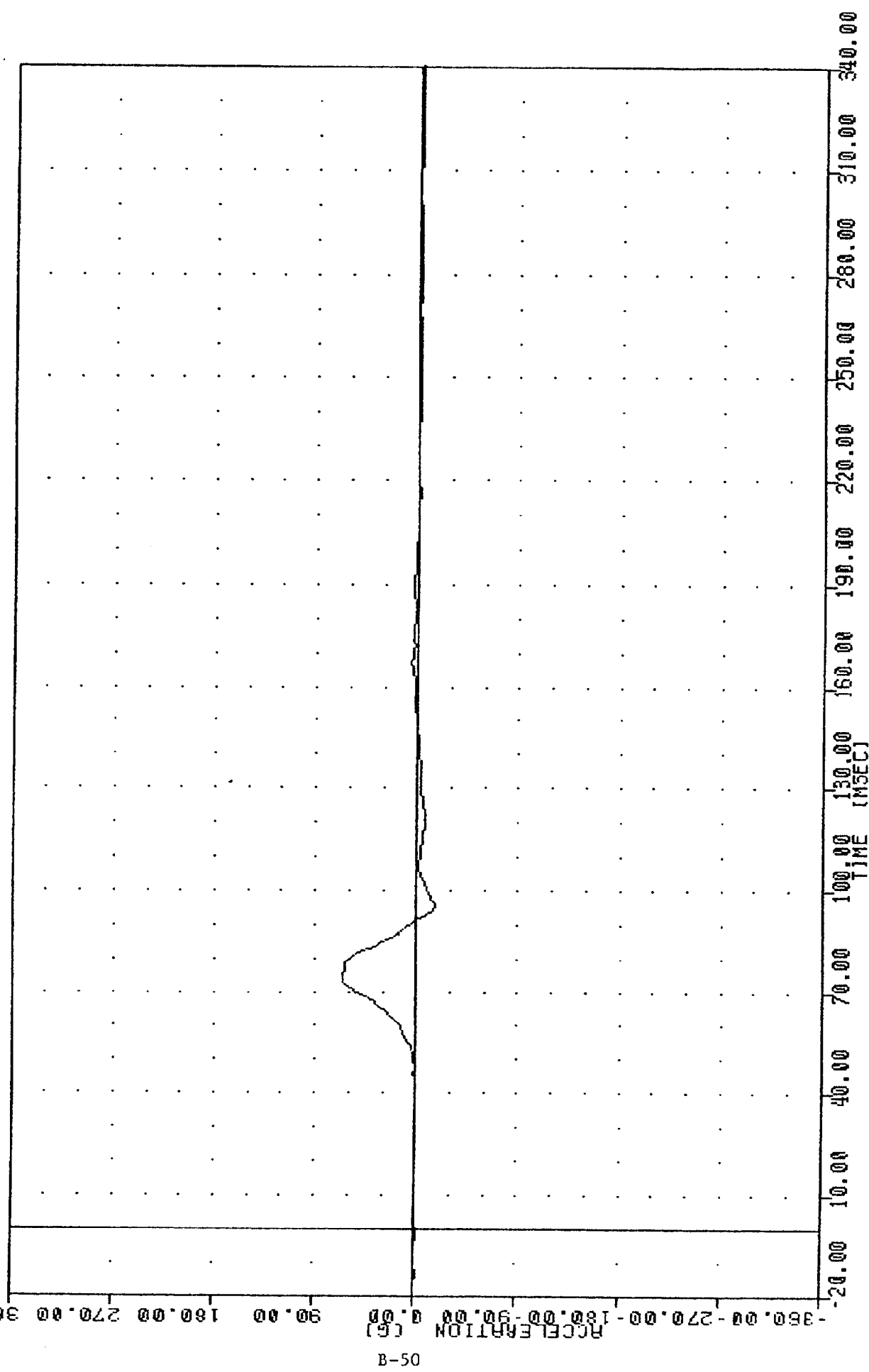


TRC 84141000000
 EVALN MOD VW FLEET REPEAT
 T12Y63
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -19.00e 95.00, 63.46 e 73.13
 PLOT DATE 5 JUN 84 14:03:51



-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
 PASSENGER LOWER SPINE ACCELERATION Y AXIS

TRC 529, 5 JUN 84 14:03:51
 EVALN MOD VW FLEET REPT
 8414100000
 T12YGC
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -16.47 95.00, 65.16 73.13

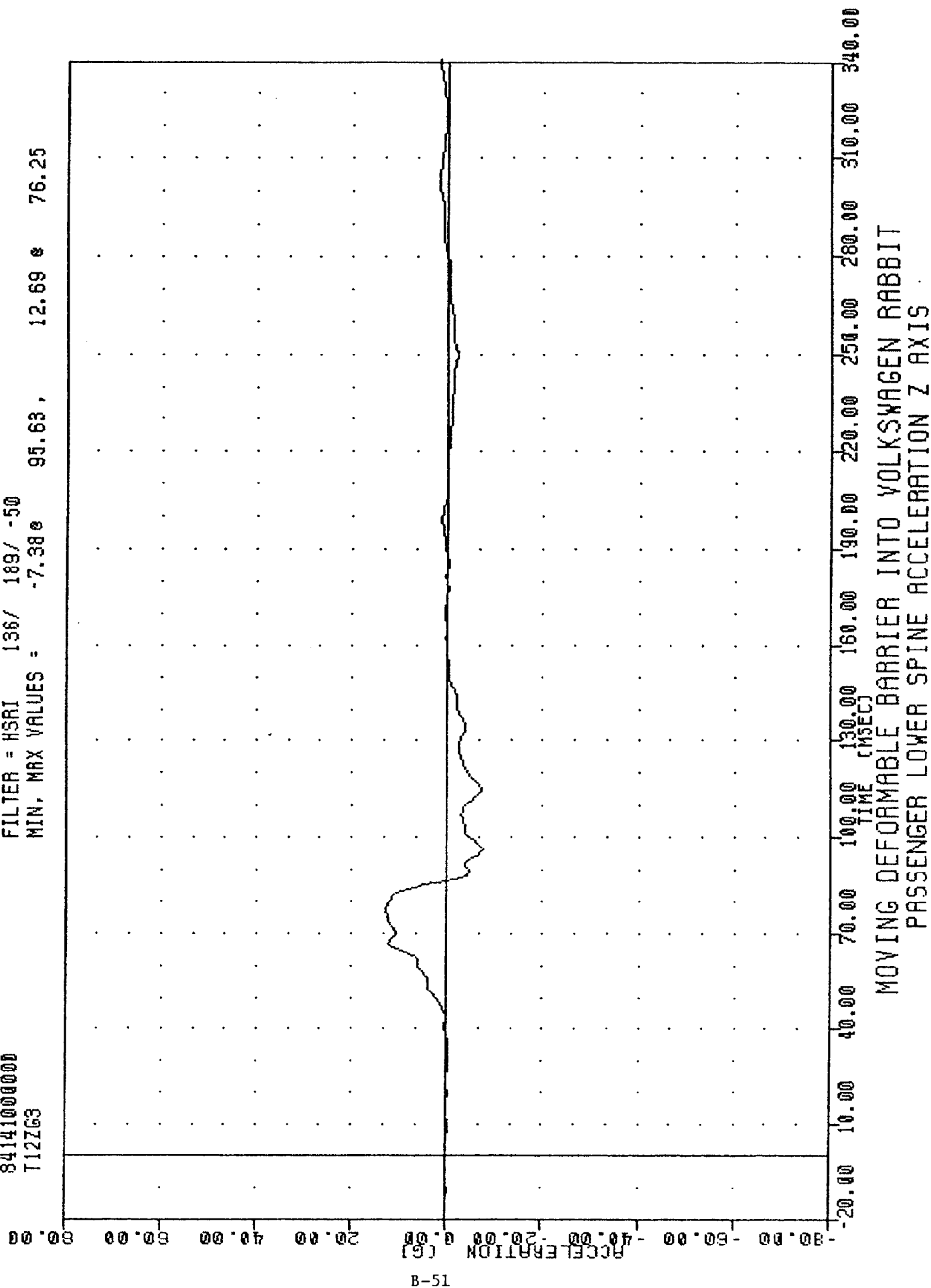


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE ACCELERATION -2 Y AXIS

TRC 040529
 EVALN MOD YW FLEET REPEAT
 84141000000
 T12Z63

PLOT DATE 5 JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -7.380 95.63, 12.69 & 76.25

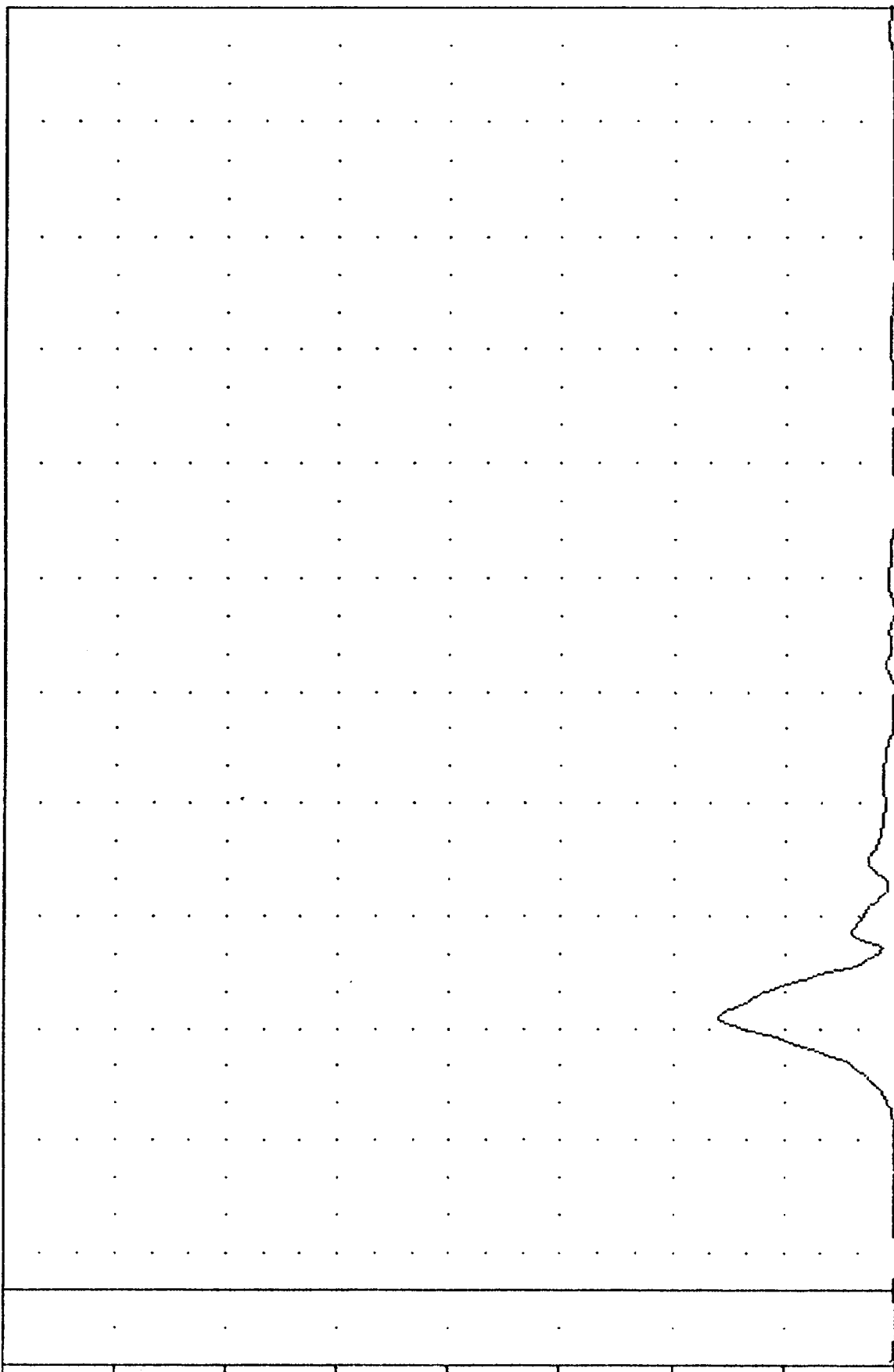


TRC 040529
 EVALN MOD VV FLEET REPERT
 84141000000
 T12RG3

PLOT DATE 5 JUN -84 14:03:51

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.048 -5.62, 79.56 72.50

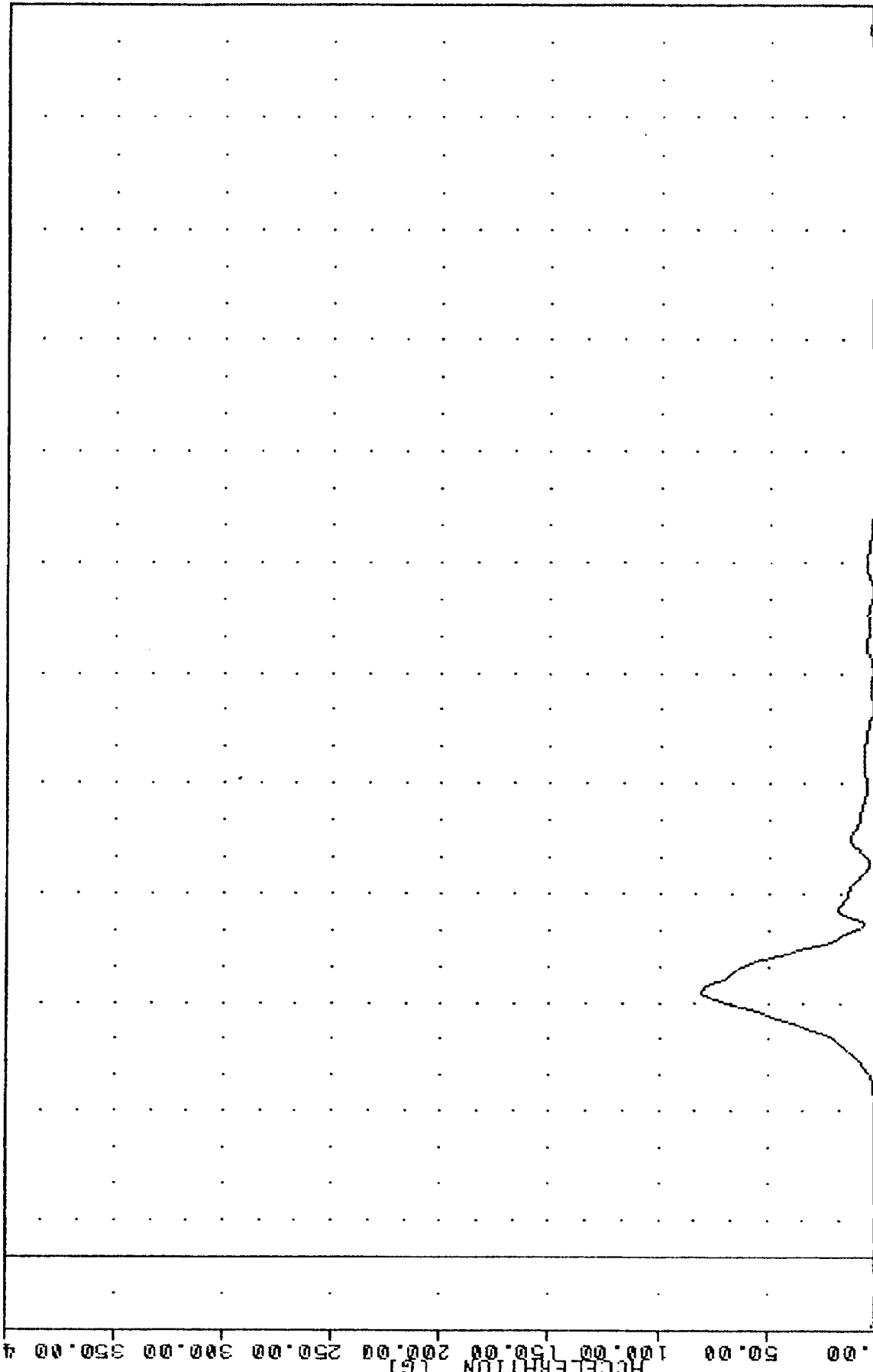
ACCELERATION (G)



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

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE RESULTANT

TRAIL, 000529, PLOT DATE 5-06N-84 14:03:09
 EVALN MOD VW FLEET REPERT
 84141000000
 T12RG3
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.188 12.50, 80.89 72.50

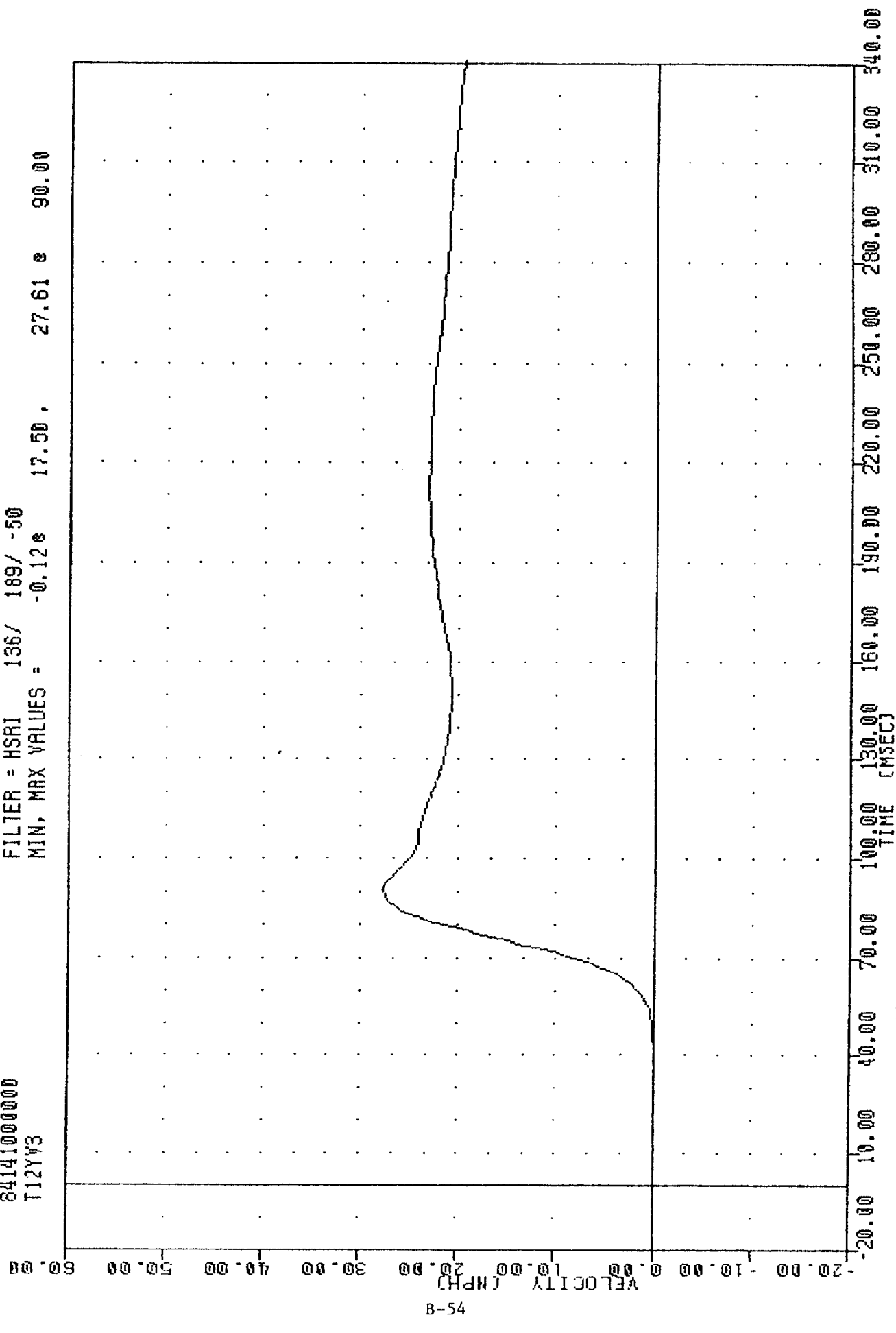


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE RESULTANT USING T12YGC

TR 000000, 000029
 EVALN MOD VV FLEET REPEAT
 84141000000
 T12YV3

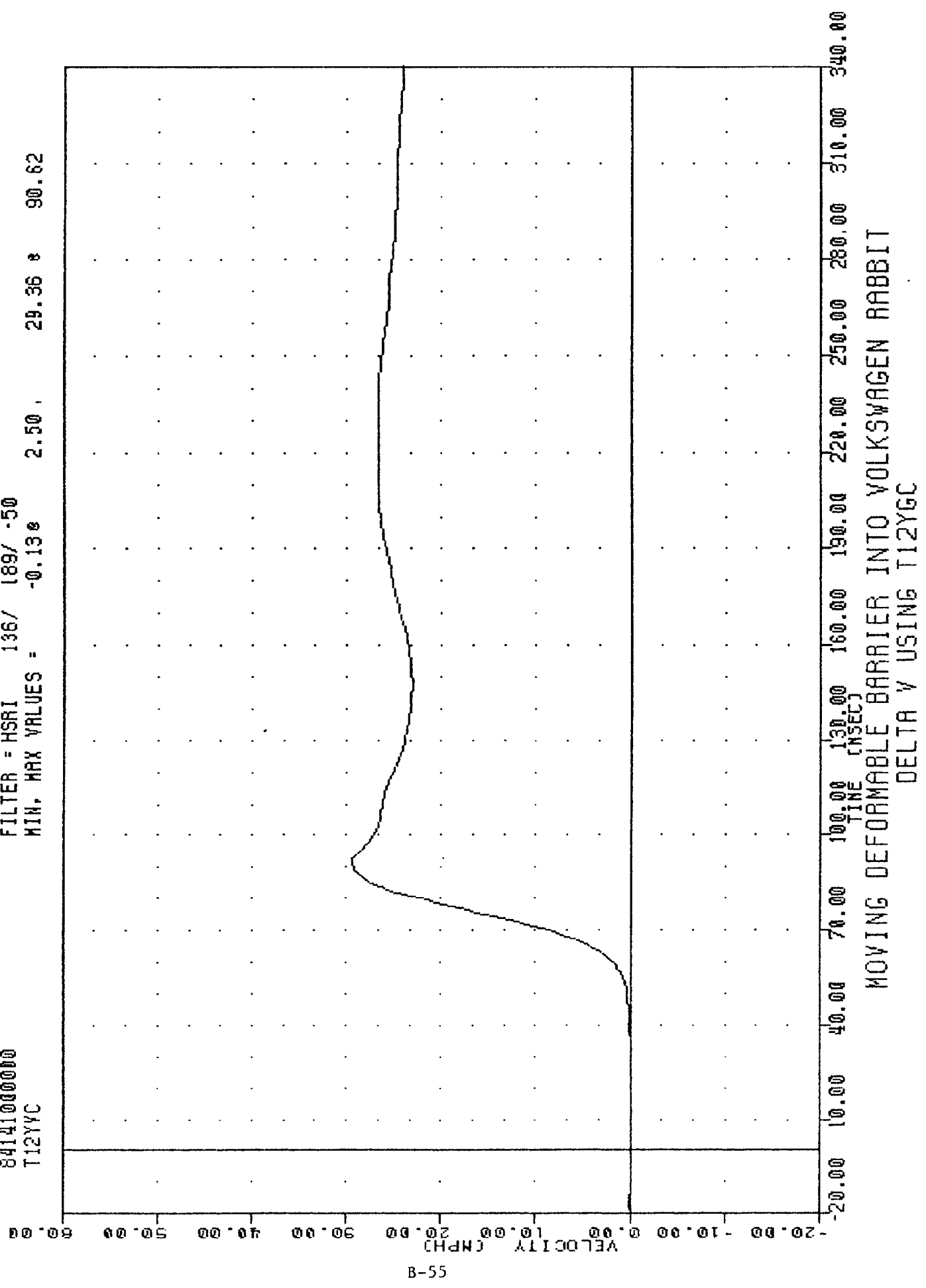
PLOT DATE 5 JAN 84 14:03:35

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.128 17.50, 27.61 @ 90.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12Y63

TRC 040329 5 JUN 84 14:03:35
 EVALN MOD VM FLEET REPEAT
 84141000000
 T12YYC
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.13 2.50 29.36 90.62

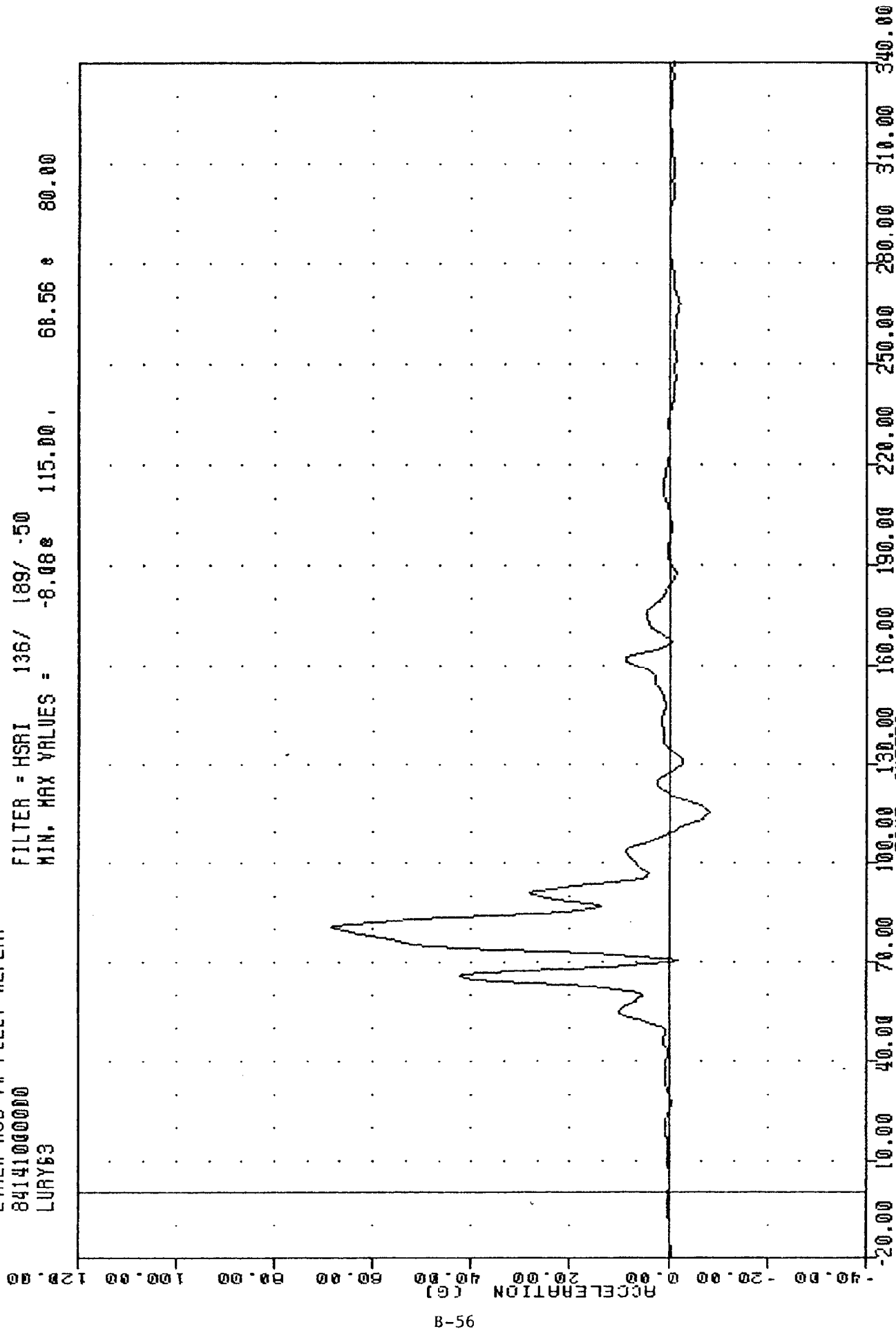


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YGC

TRC 84141000000
 EVALN MOD V# FLEET REPEAT
 LURY63

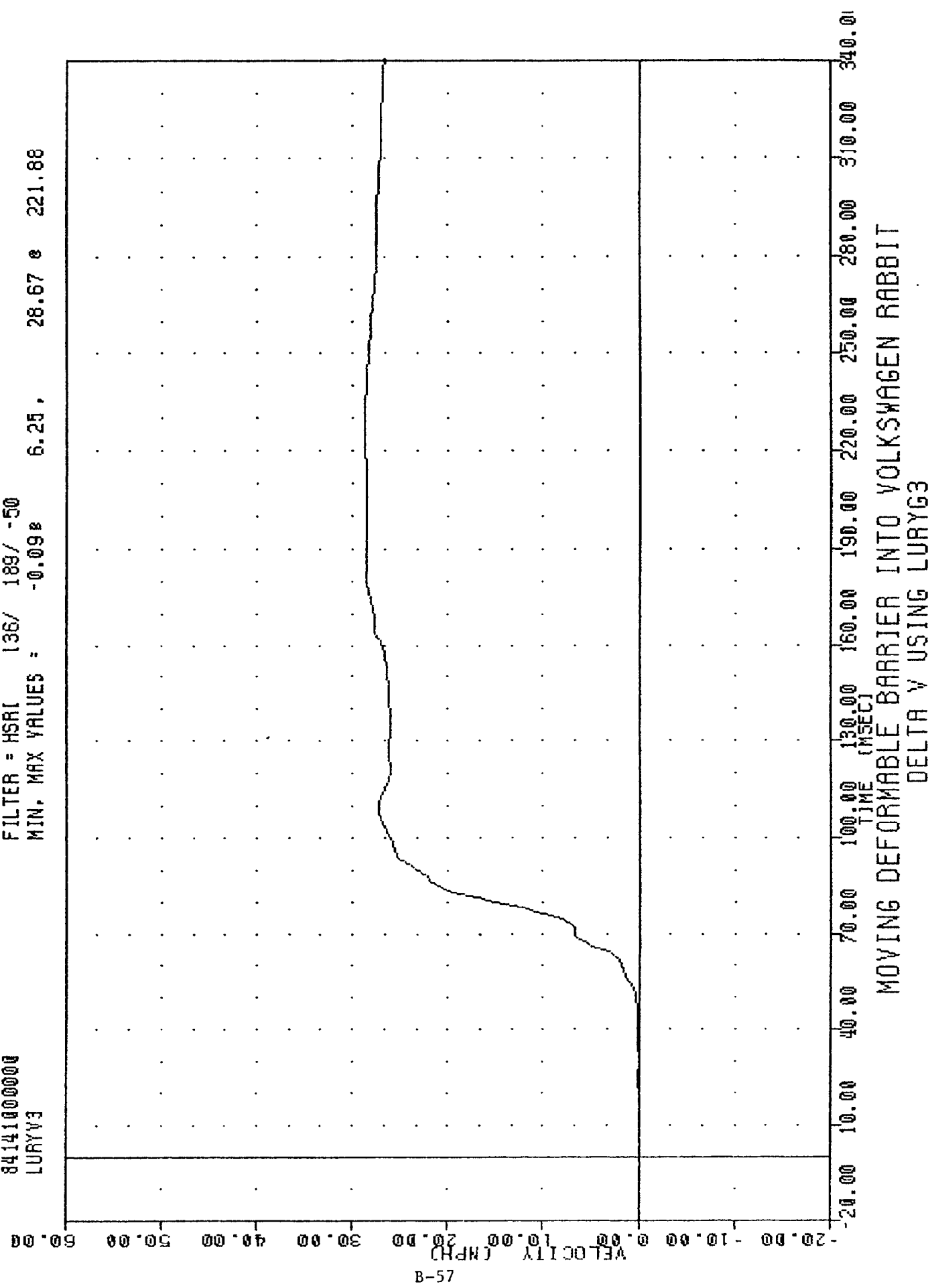
PLOT DATE 5 JUN 84 14:03:51

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -8.08 115.00 68.56 80.00



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

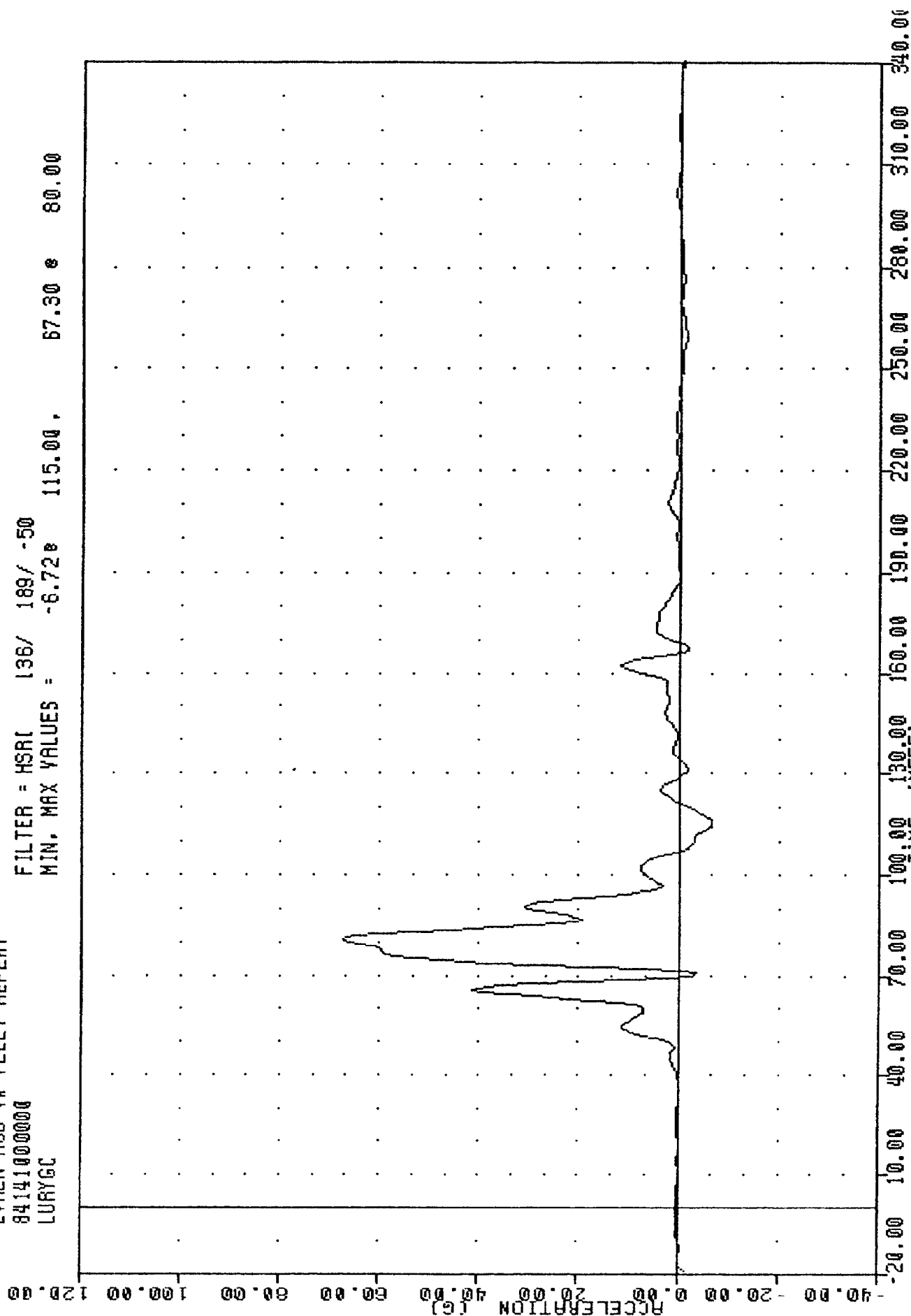
TRC [REDACTED], 040529 [REDACTED] PLOT DATE [REDACTED] 5-JUN-84 [REDACTED] 14:03:35 [REDACTED]
 EVALN MOD VW FLEET REPERT
 84141000000
 LURYV3
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.098 6.25, 28.67 & 221.88



TRC 040529
 EVALN MOD VW FLEET REPEAT
 84141000000
 LURYGC

PLOT DATE 5 JUN-84 14:03:51

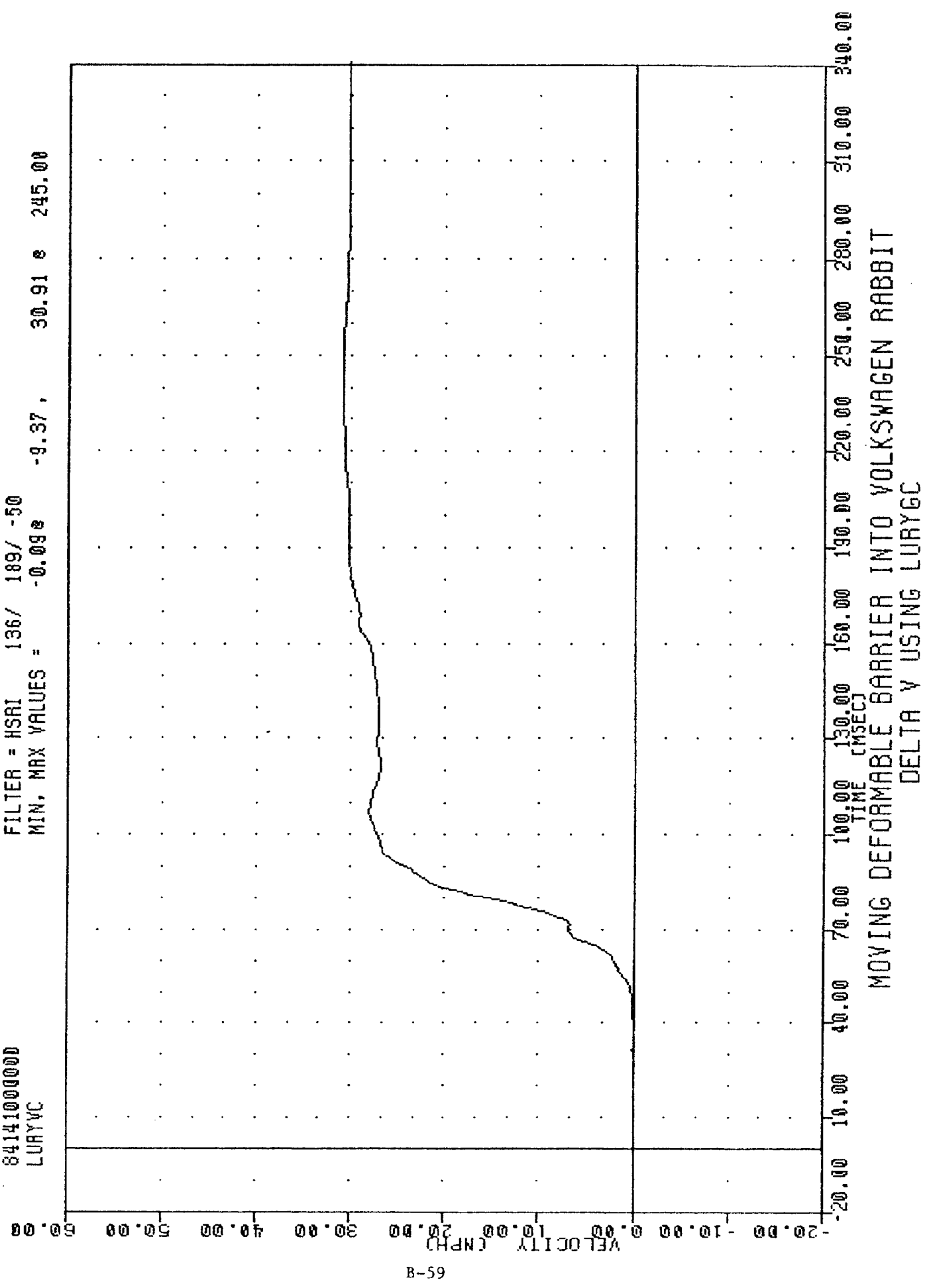
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -6.728 115.00, 67.30 e 80.00



TRC 000529
 EVALN MOD YN FLEET REPEAT
 84141000000
 LURYVC

PLOT DATE 5 JUN 84 14:03:35

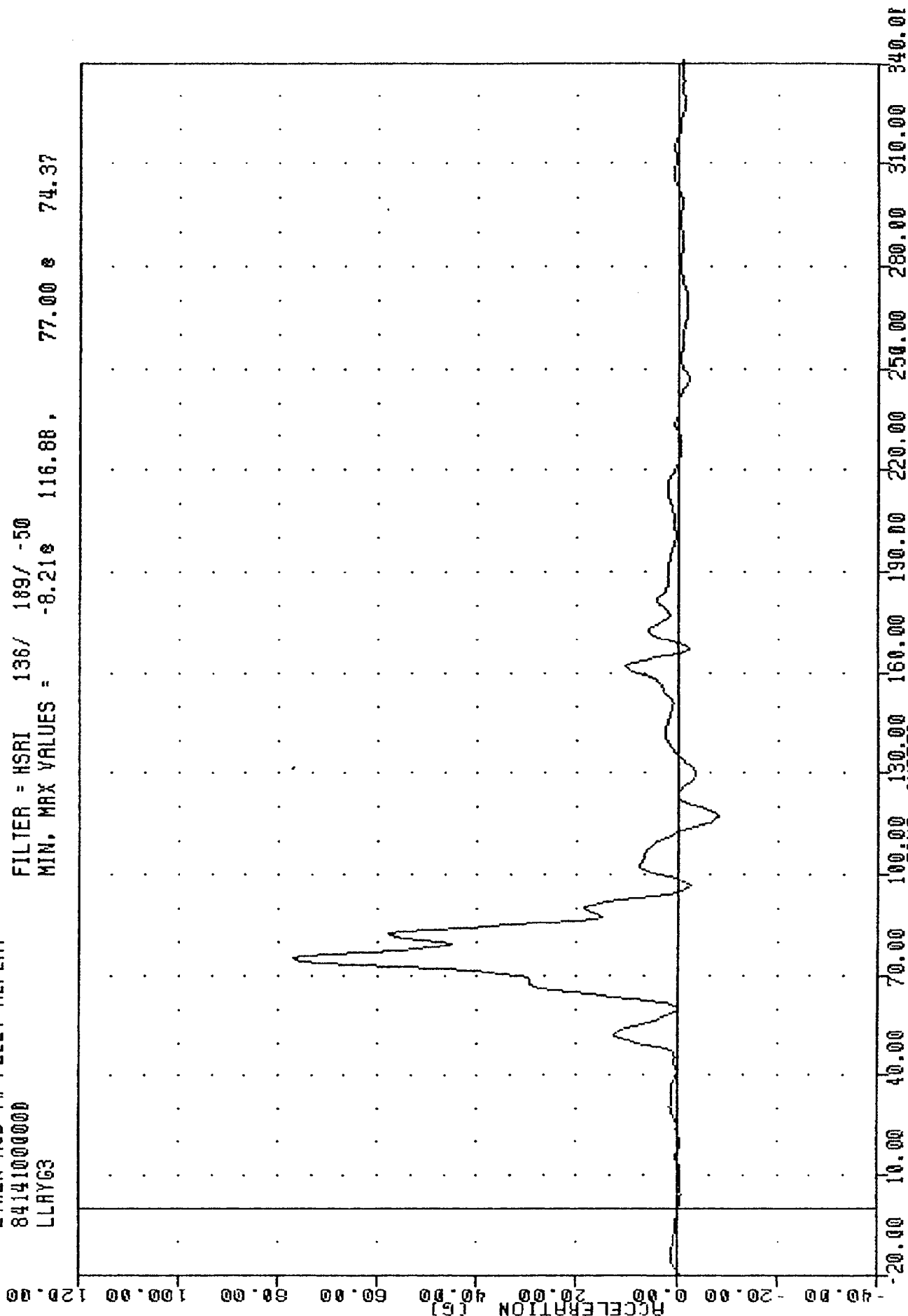
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.098 -9.37, 30.91 & 245.00



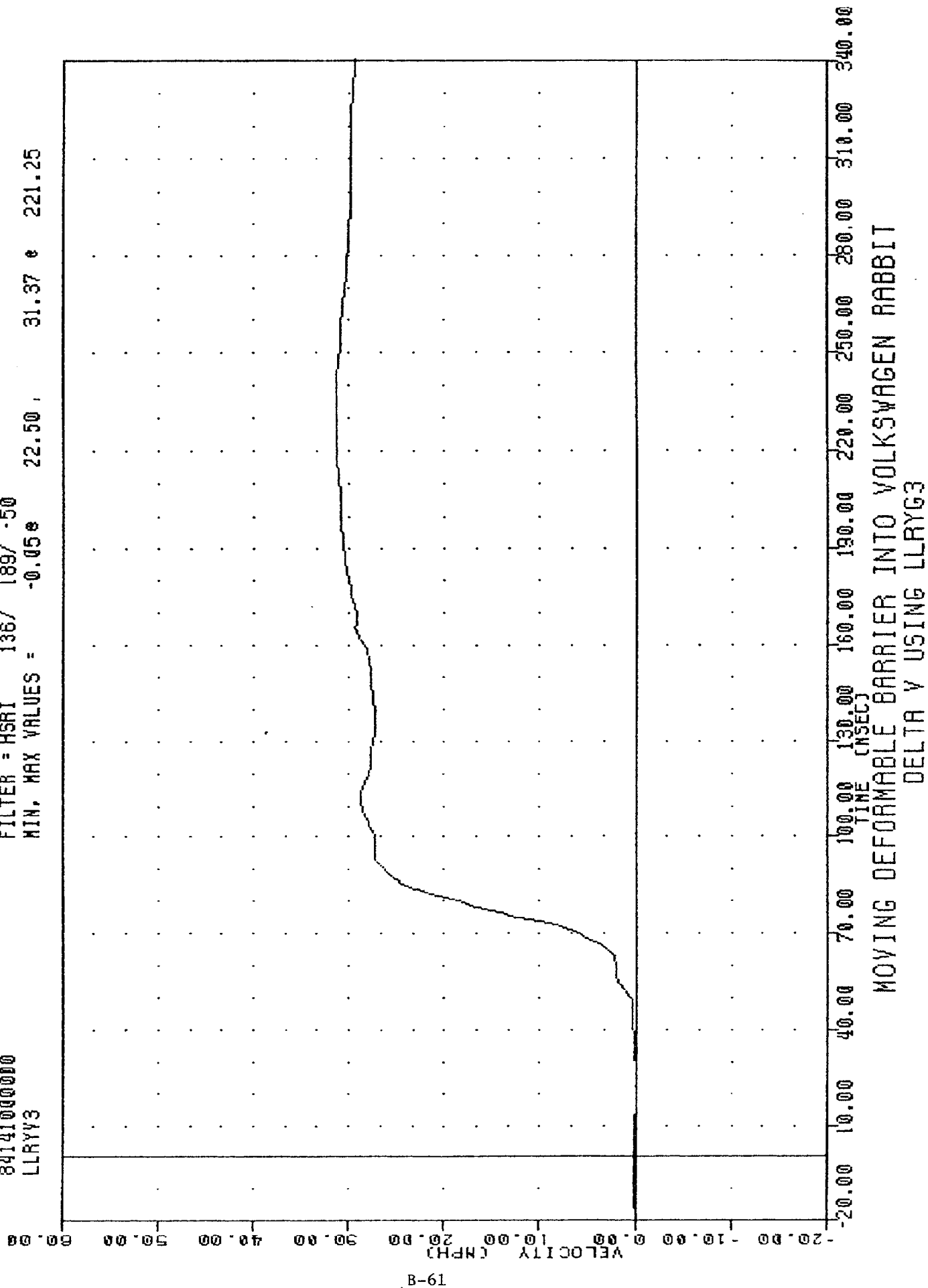
TRC 529
EVALN MOD YV FLEET REPEAT
84141000000
LLRYG3

PLOT DATE 5-26-84 14:03:51

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -8.218 116.88 77.00 74.37



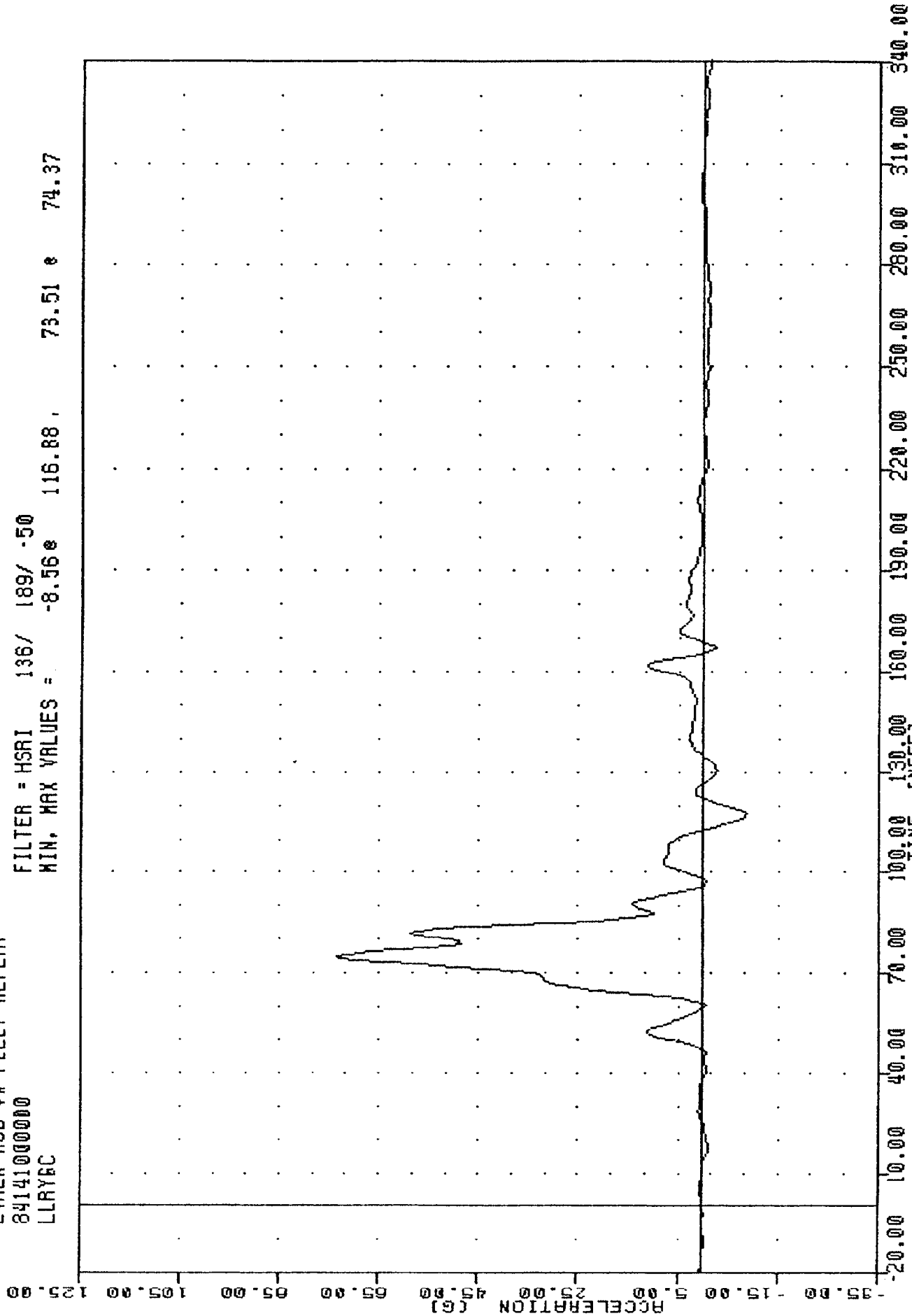
TRC [REDACTED] 540329 [REDACTED] 5-JUN-84 14:05:35
 EVALN NOD V# FLEET REPEAT
 84141000000
 LLRYV3
 FILTER = HSRI 136/ 189/ .50
 MIN. MAX VALUES = -0.05e 22.50 , 31.37 e 221.25



TRC 84141000000
 EVALN MOD V# FLEET REPEAT
 LLYRC

DATE 5 JUN 84 14:03:51

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -8.56 116.88 73.51 74.37

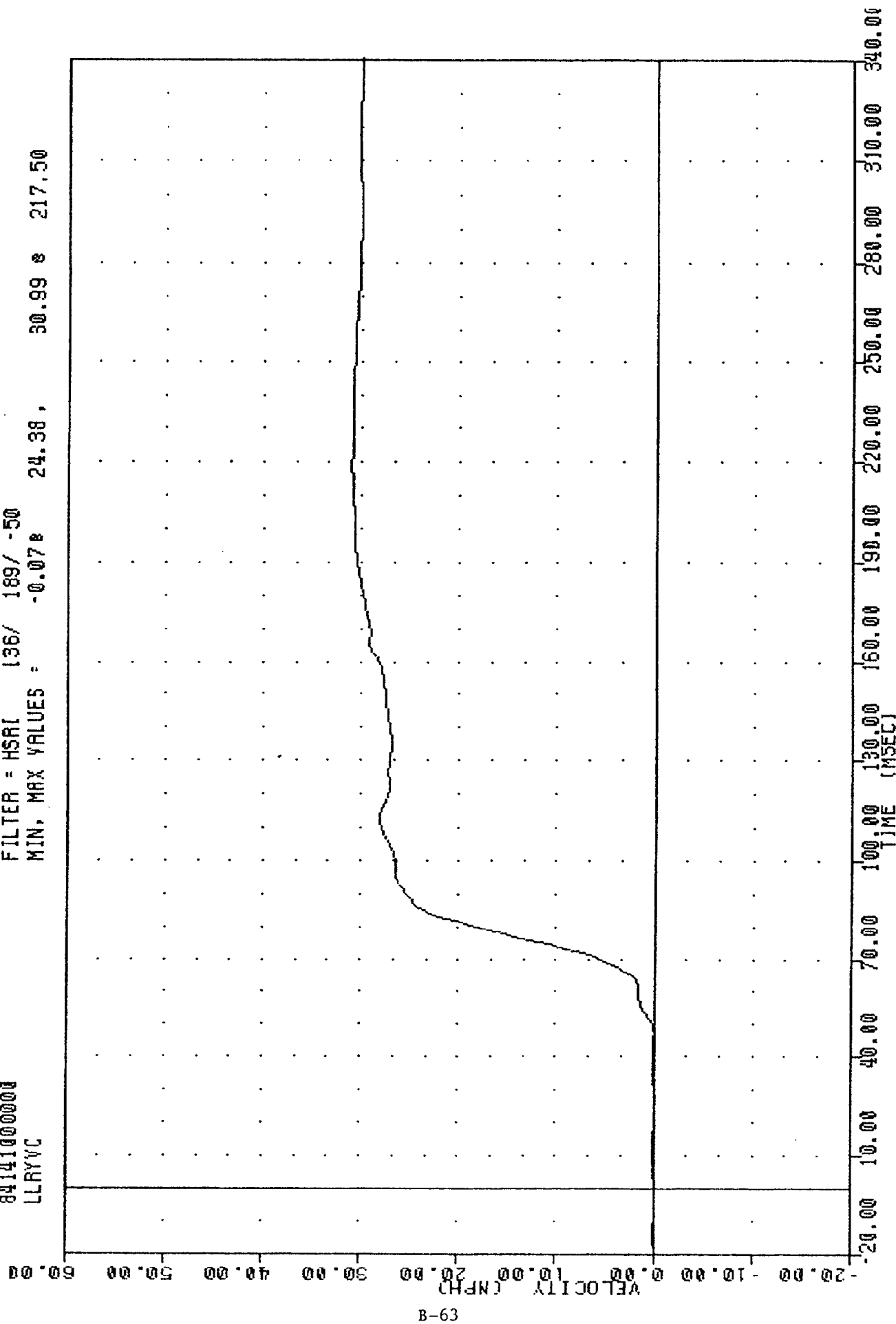


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LEFT LOWER RIB ACCELERATION #2 Y AXIS

TRAILER, 529
 EVALN MOD VW FLEET REPEAT
 84141000000
 LLRYVC

PLUG DATE 5-24-84 14:35

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.078 24.38, 30.99 & 217.50

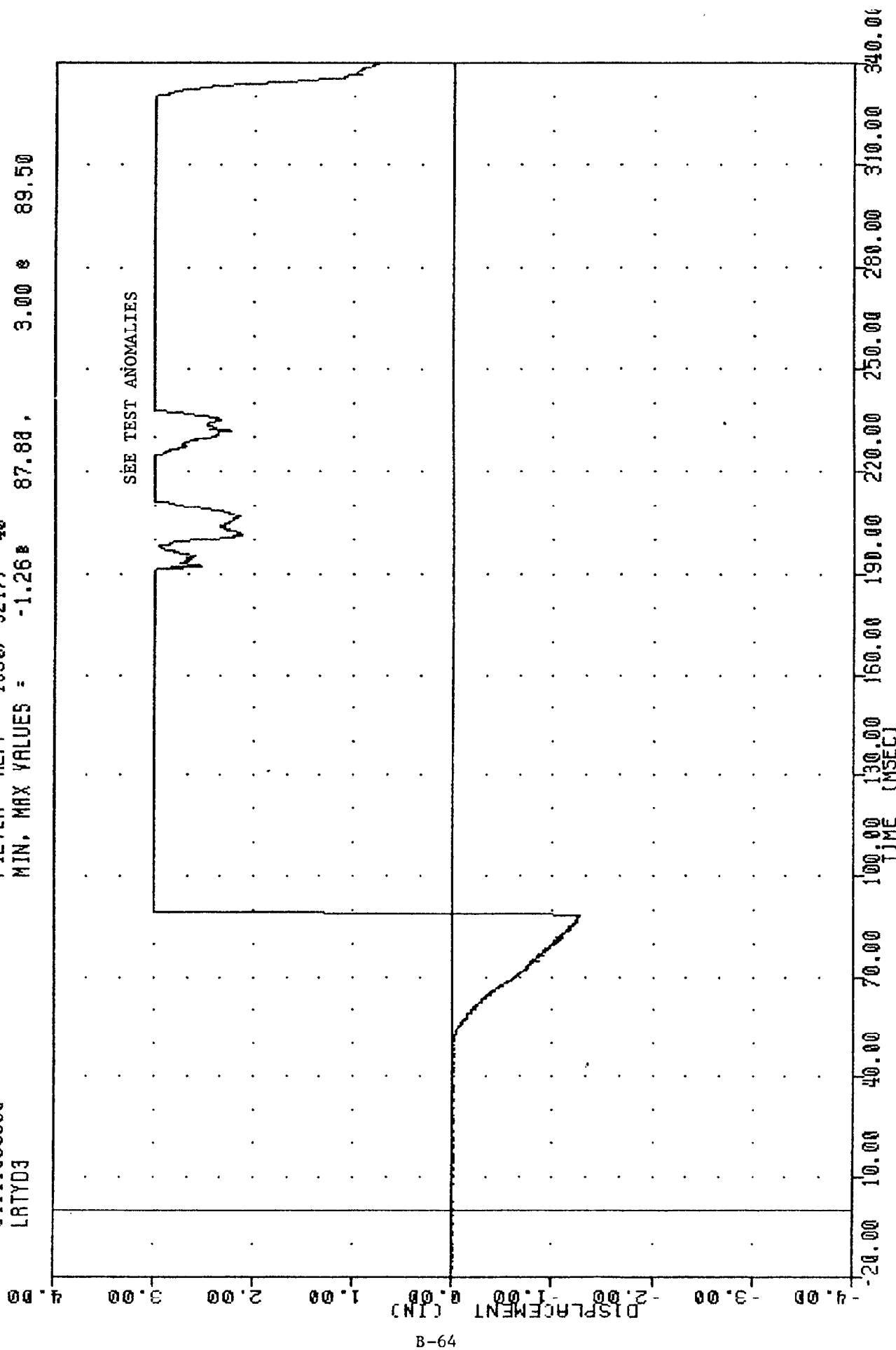


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LLRYGC

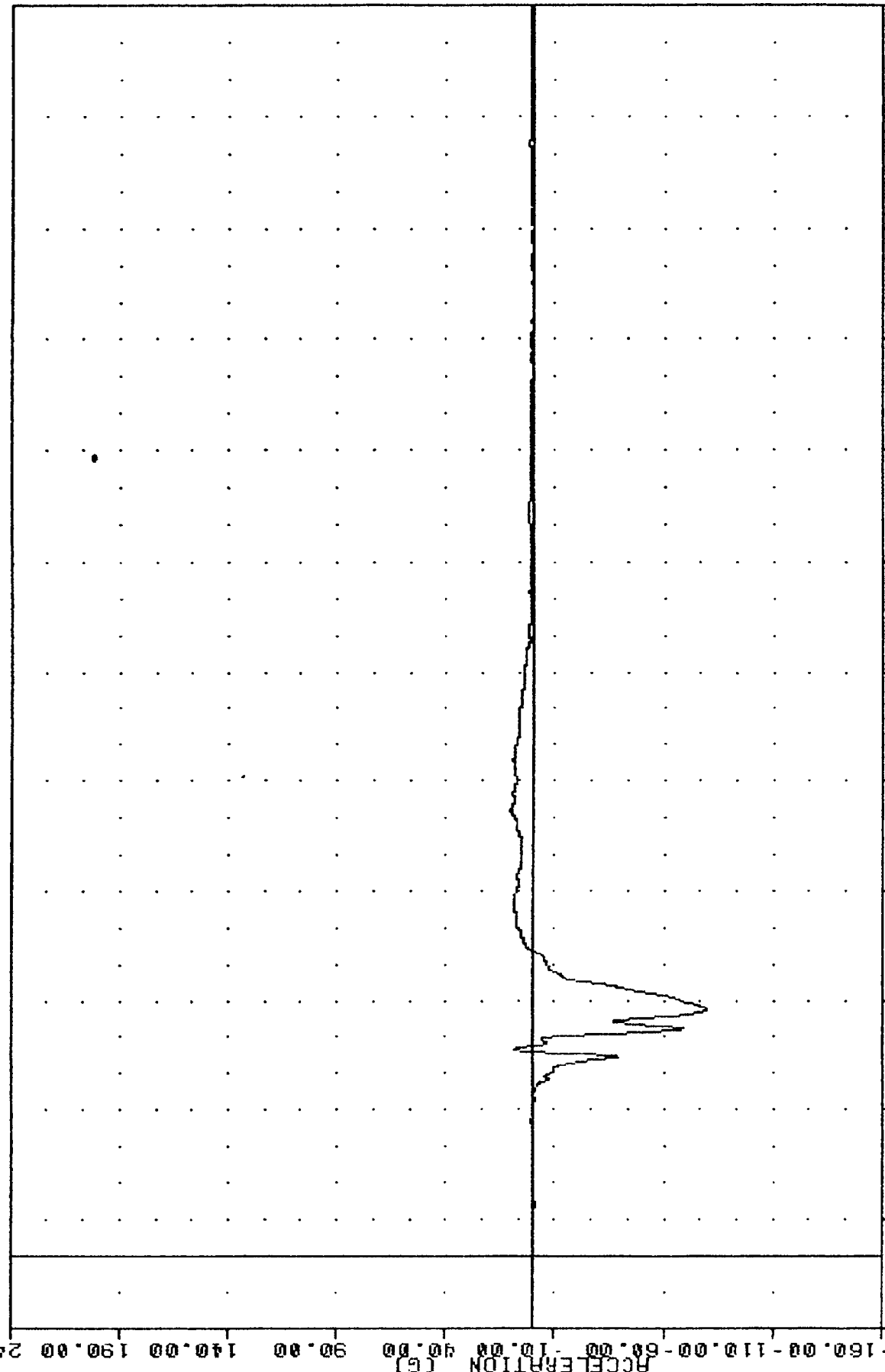
TRC 528
 EVALN MOD VW FLEET REPERT
 84141000000
 LRTYD3

PLOT DATE 5 JUN-84 14:01:58

FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = -1.26 87.88 3.00 89.50

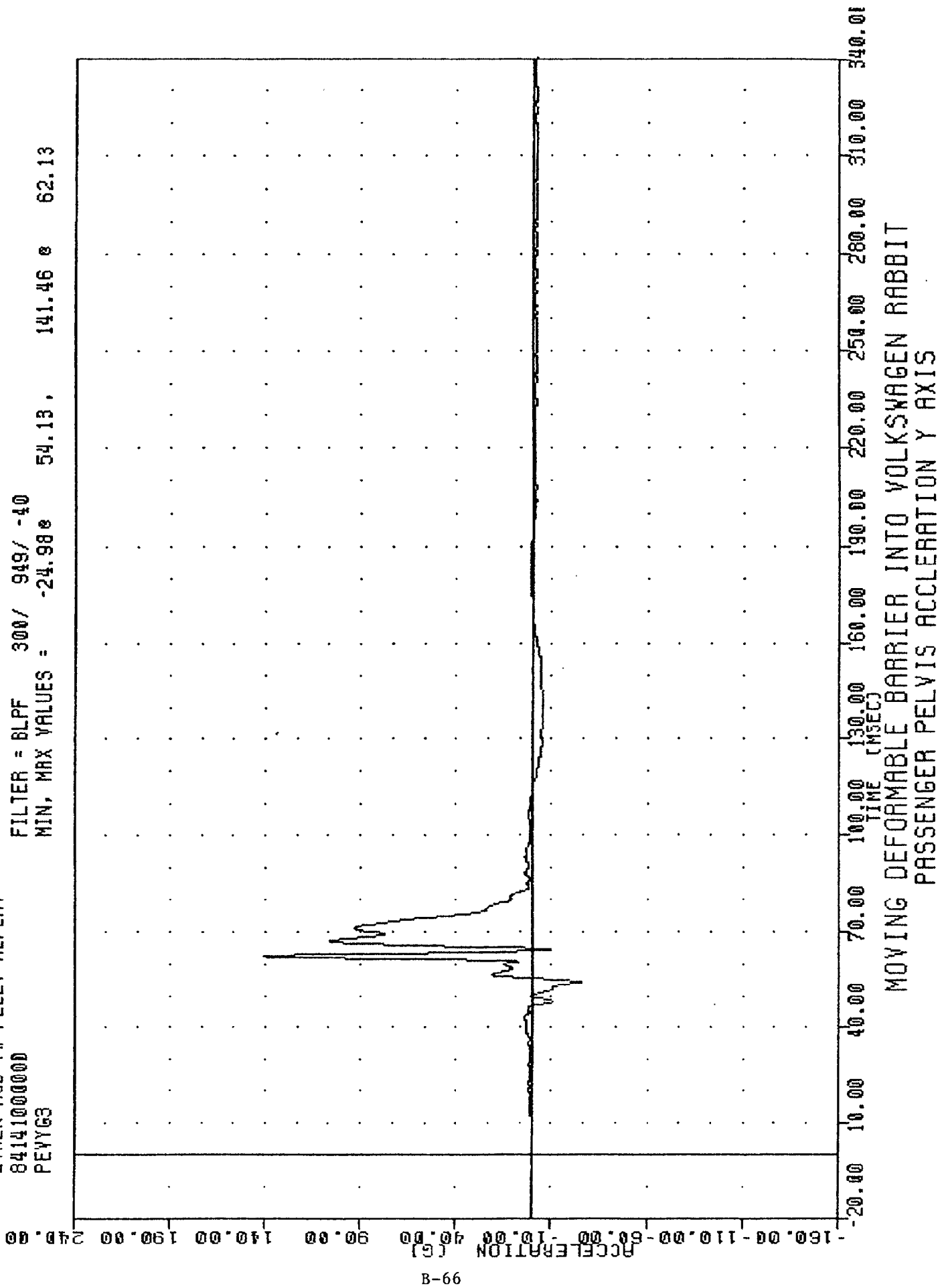


TRC 529, 5 JUN-84 14:01:58
 EVALN MOD VW FLEET REPERT
 84141000000
 PEYXG3
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -79.73e 67.38, 10.09 e 121.88



-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
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER PELVIS ACCELERATION X AXIS

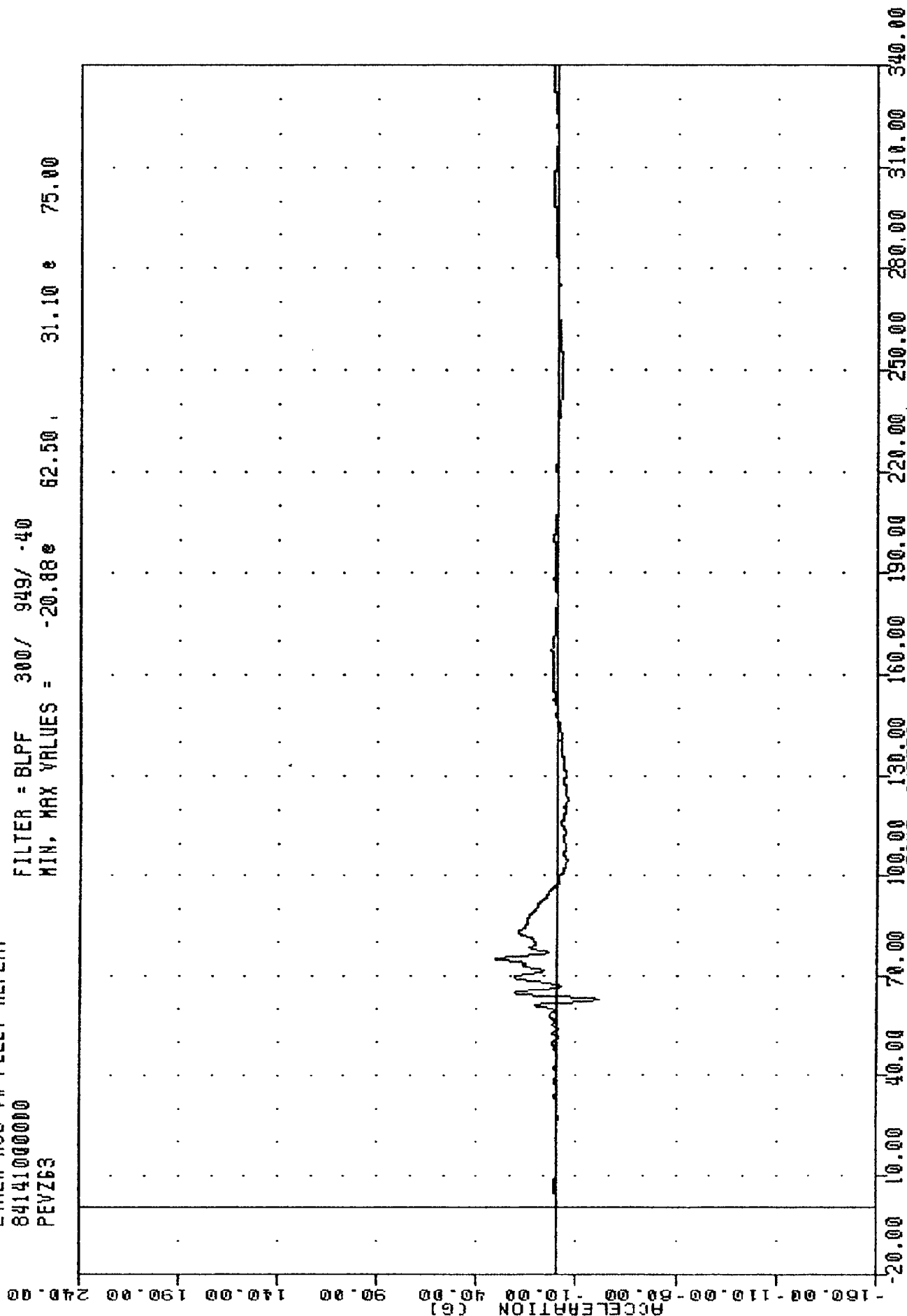
TRC 040329 , 040329 PLOT DATE 5 JUN 84 14:01:58
 EVALN MOD YW FLEET REPEAT
 84141000000
 PEY63
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -24.98 54.13, 141.46 62.13



TRC
 EVALN MOD V# FLEET REPEAT
 84141000000
 PEVZ63

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -20.88e 62.50 , 31.10 e 75.00

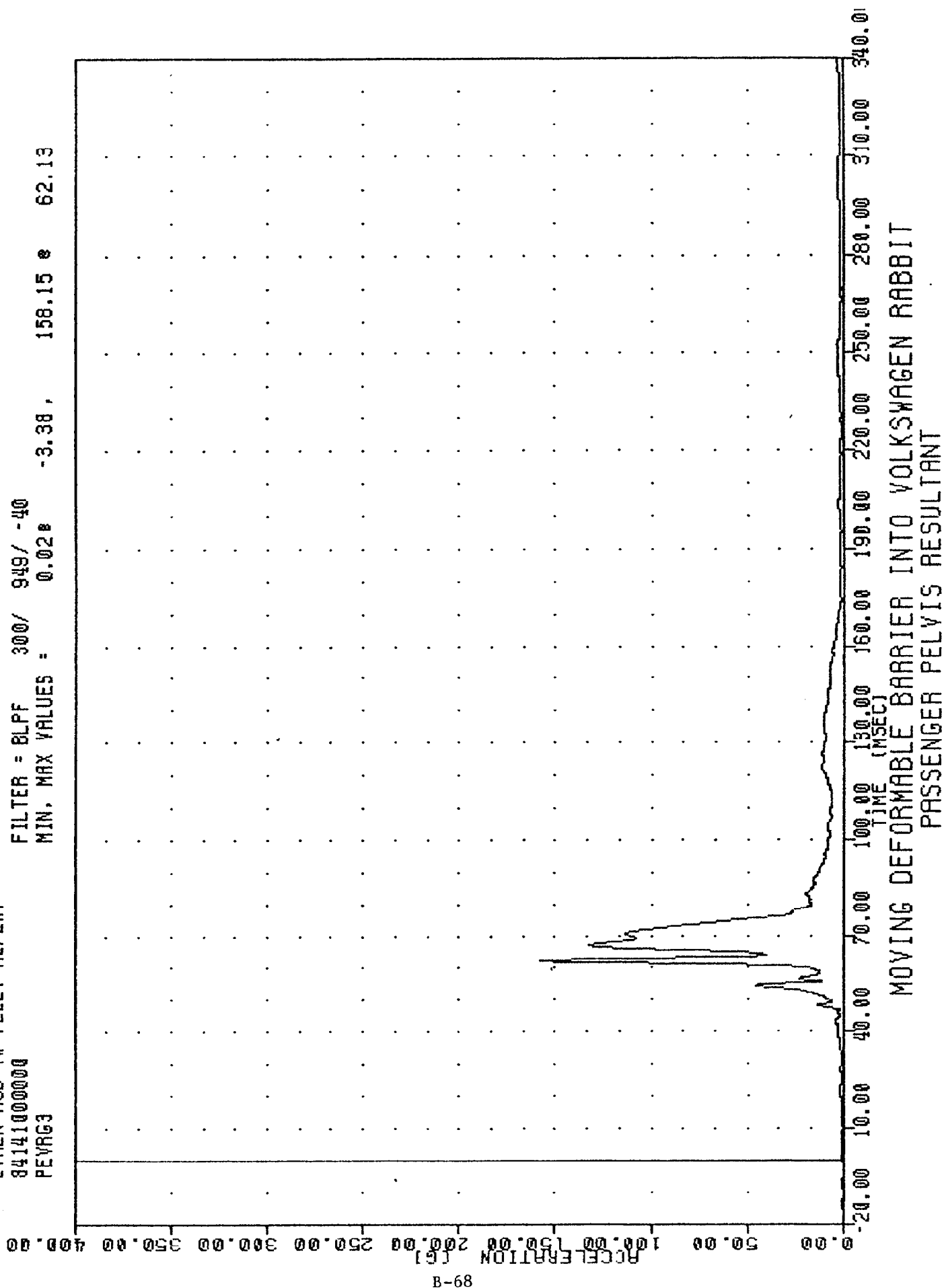


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER PELVIS ACCELERATION Z AXIS

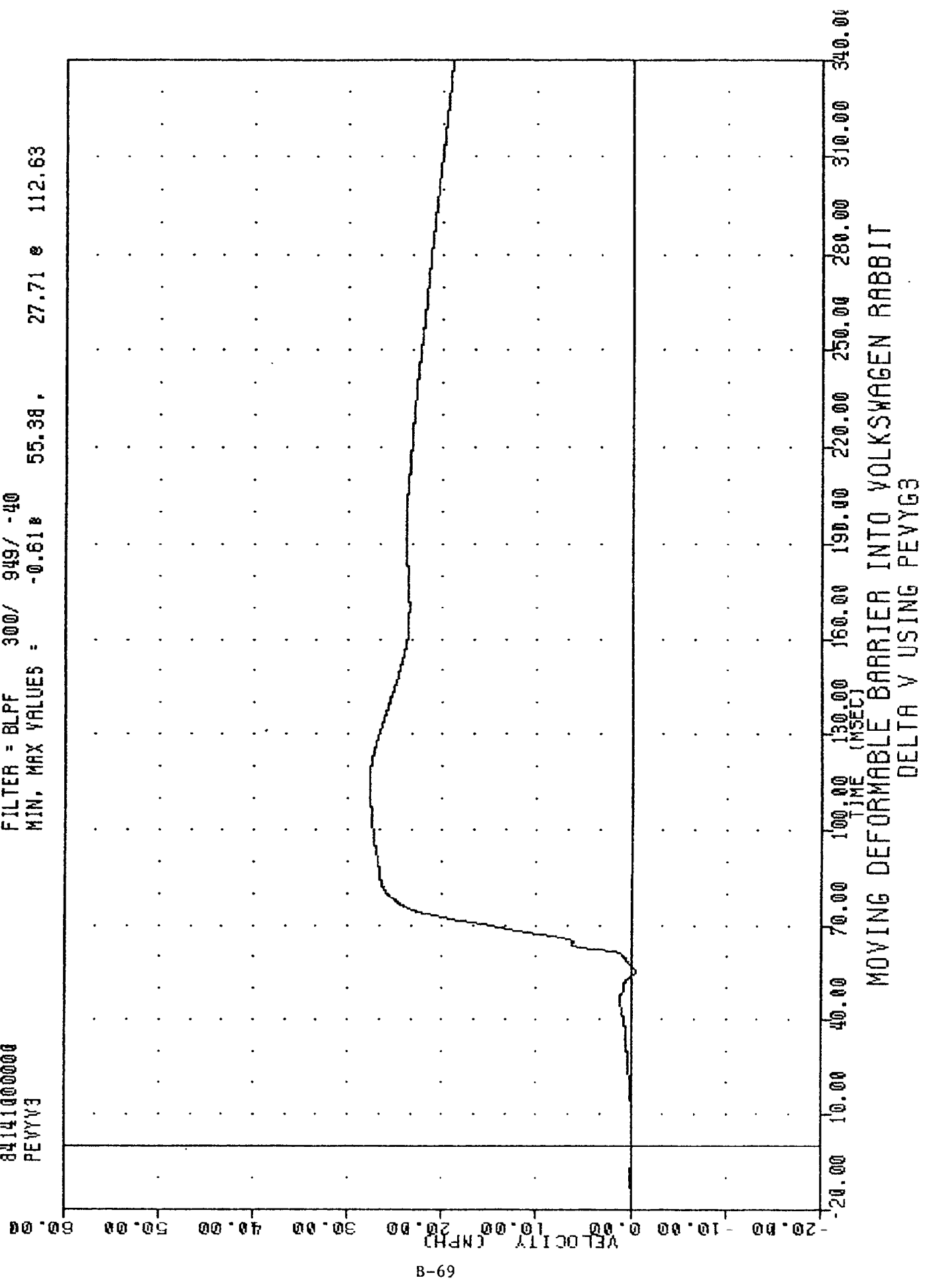
TRC
EVALN MOD VW FLEET REPERT
84141000000
PEVRG3

PLOT DATE 5-JUN-84 14:03:22

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.028 -3.38, 158.15 62.13



TRC 040529 , 040529 PLOT DATE 5 JUN-84 14:06:39
 EVALN MOD VW FLEET REPERT
 84141000000
 PEVYV3
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.618 55.38 , 27.71 e 112.63

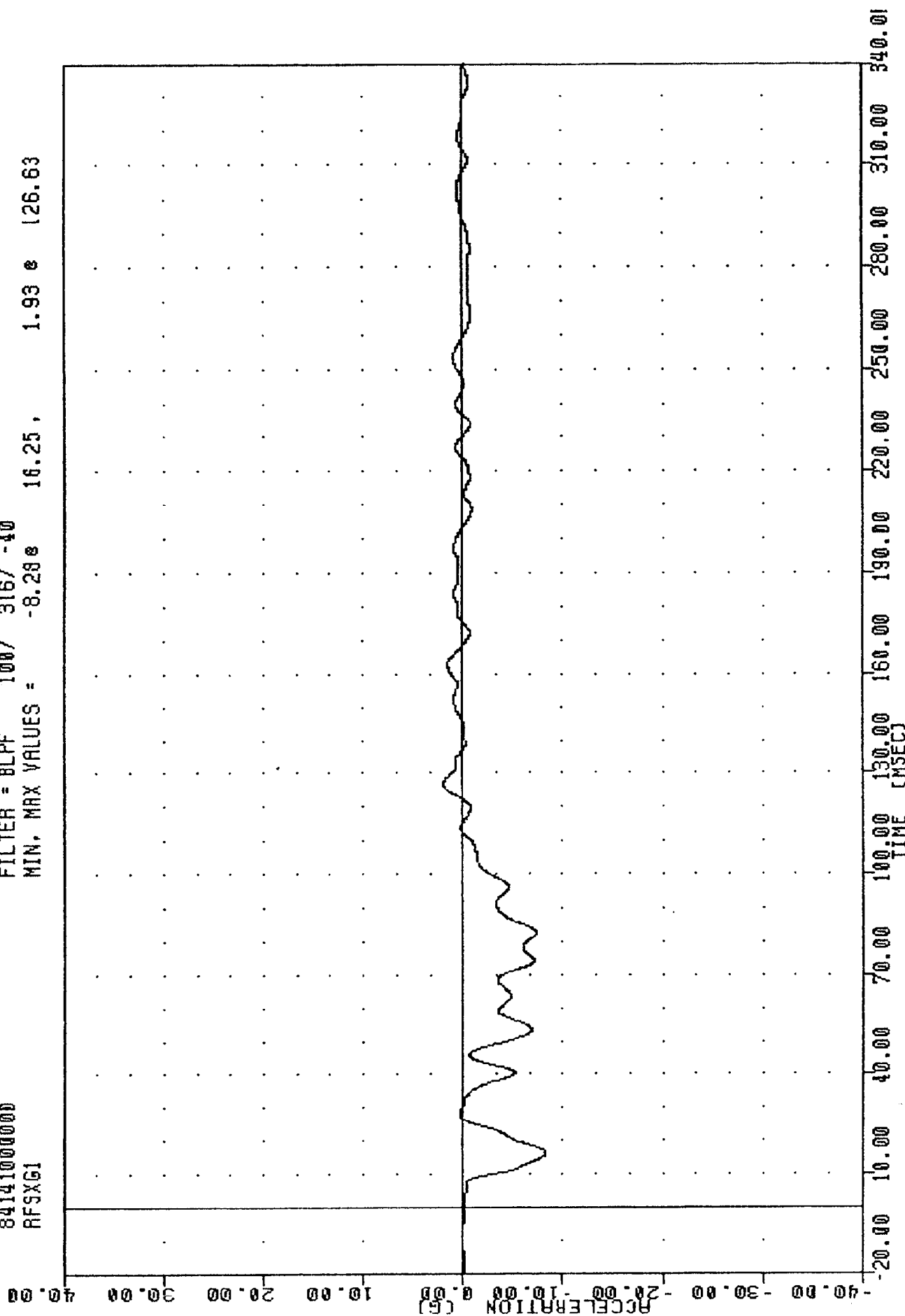


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING PEVYG3

TRC 040529
 EVALN MOD VV FLEET REPEAT
 84141000000
 RFSXG1

PLOT DATE 5 JUN 84 14:01:58

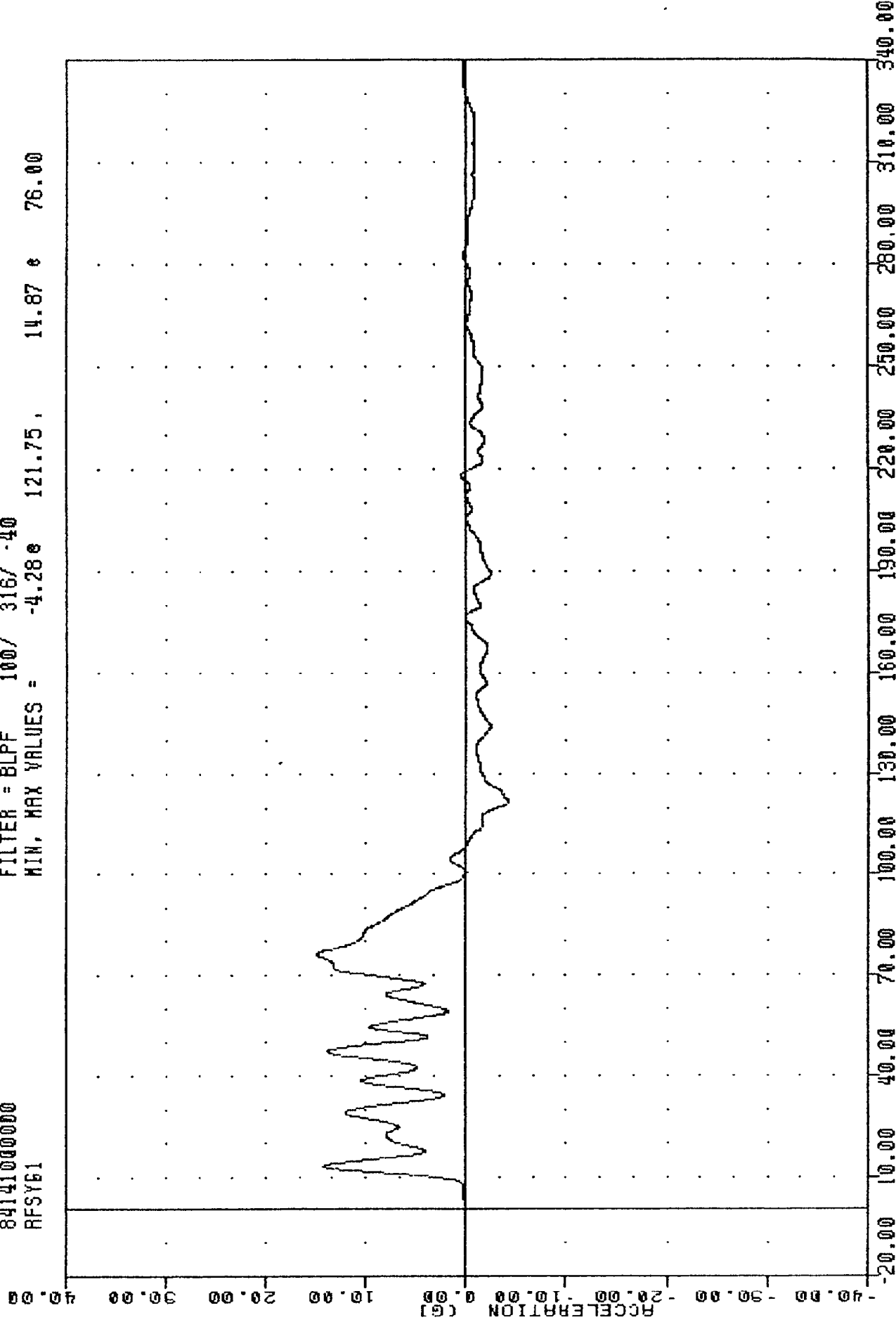
FILTER = 8LPF 100/ 316/ -40
 MIN, MAX VALUES = -8.28 16.25 1.93 126.63



TRC 84141000000
 EVALN MOD YH FLEET REPEAT
 RFSY61

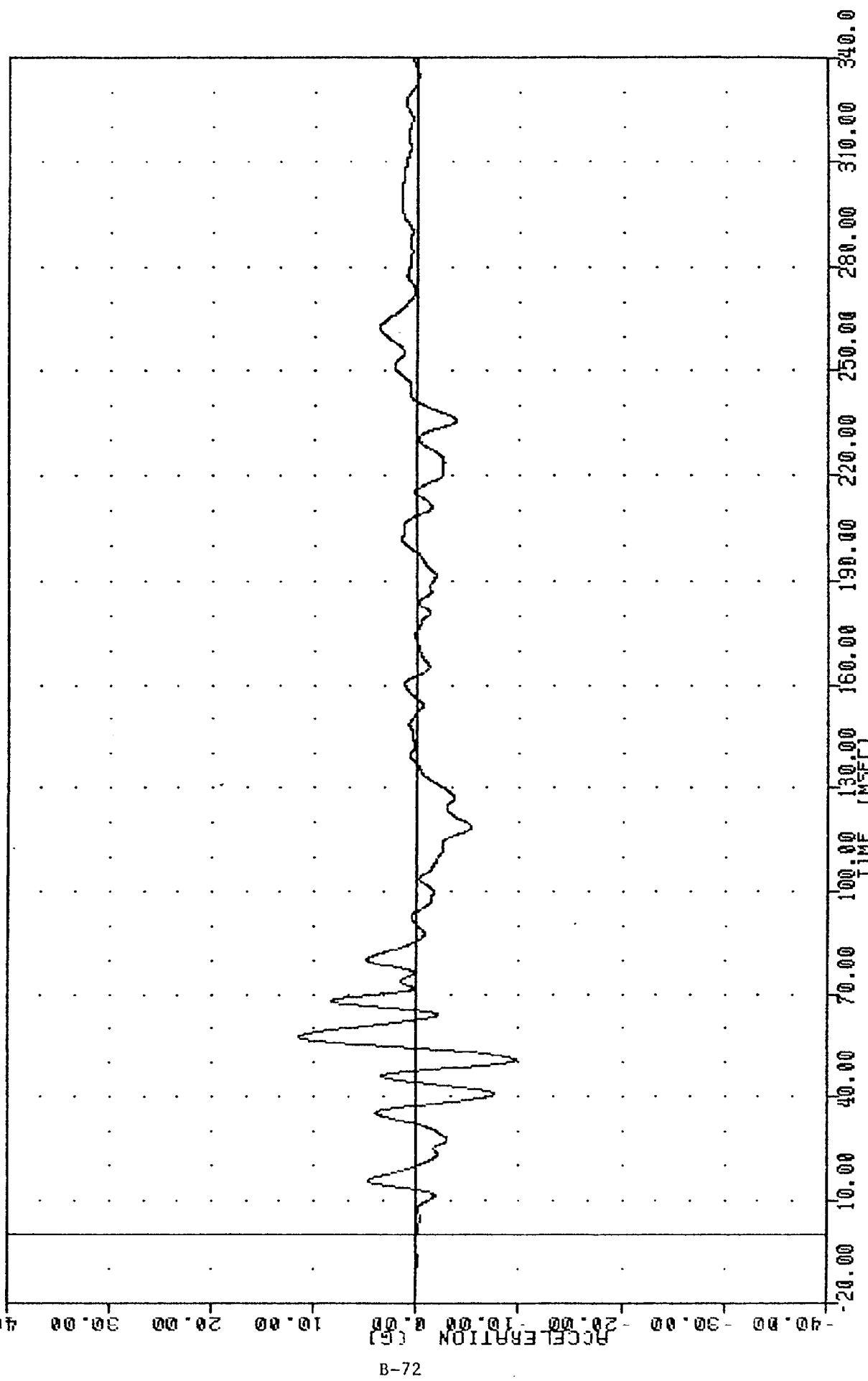
DATE 5-20-84 14:01:58

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -4.28e 121.75, 14.87 e 76.00



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

TRC 840529 5-JUN-84 14:01:58
 EVALN MOD VW FLEET REPEAT
 84141000000
 RFSZG1
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -9.68 50.75, 11.53 57.63

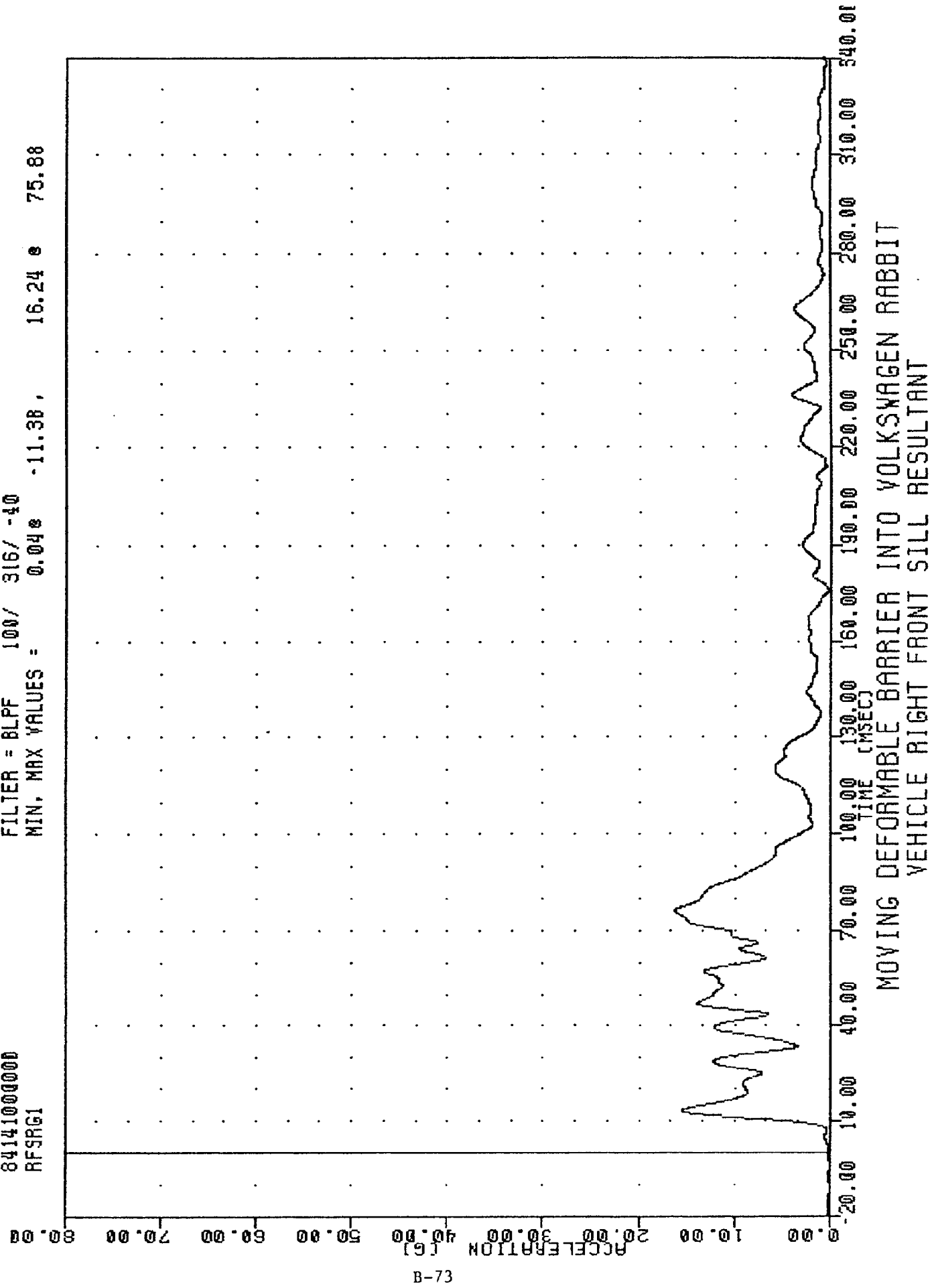


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE RIGHT FRONT SILL ACCELERATION Z AXIS

TRC 040529
EVALN MOD YW FLEET REPEAT
84141000000
RFSRG1

PLOT DATE 5 JUN 84 14:03:22

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = 0.048 -11.38, 16.24 e 75.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL RESULTANT

TRC 529
 EVALN MOD VV FLEET REPEAT
 84141000000
 RFSXV1

PLOT DATE 5 JUN-84 14:06:39

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -8.650 119.13, 0.00 0 -20.00

100.00

80.00

60.00

40.00

20.00

0.00

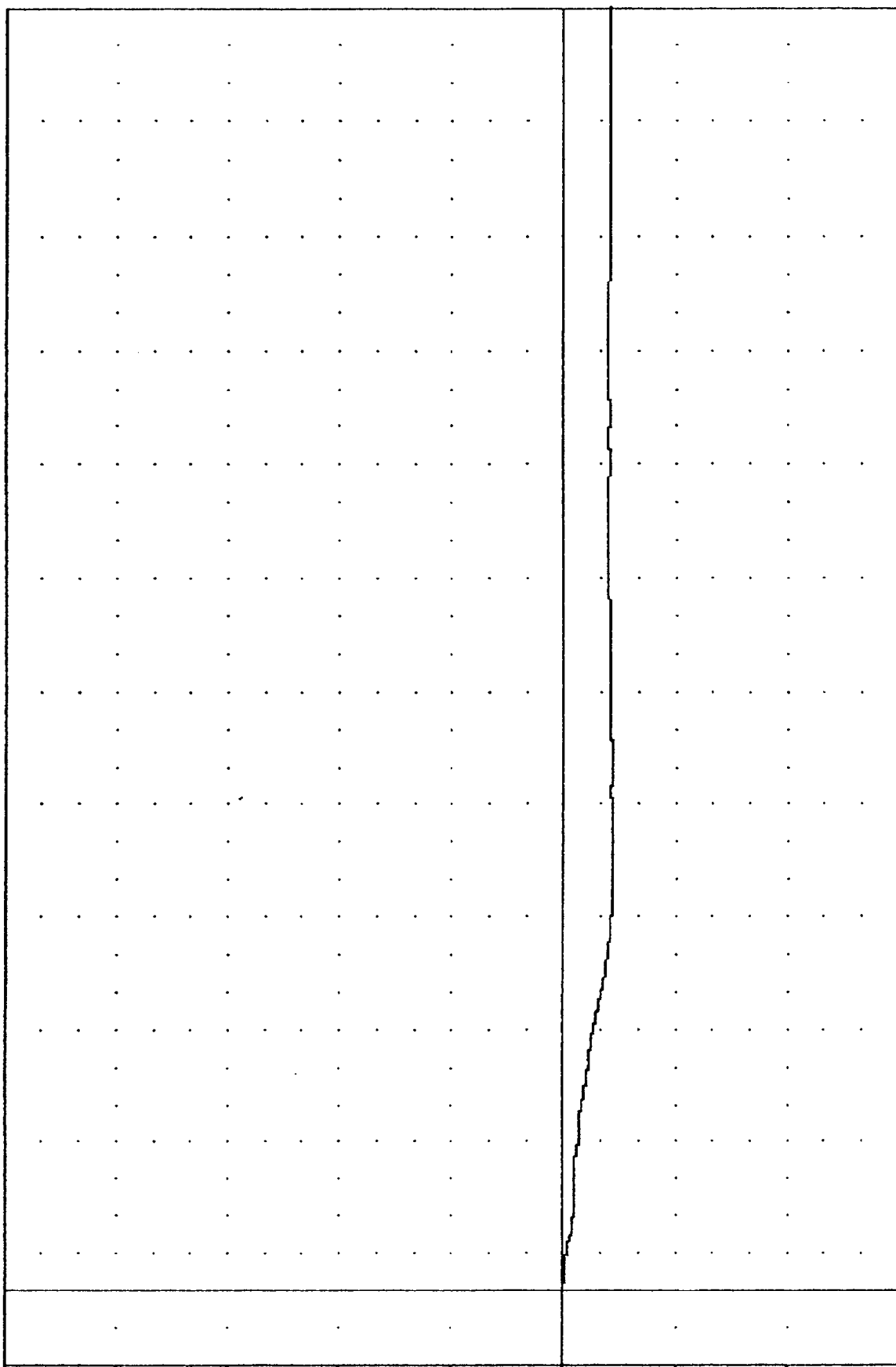
-20.00

-40.00

-60.00

B-74

VELOCITY (MPH)



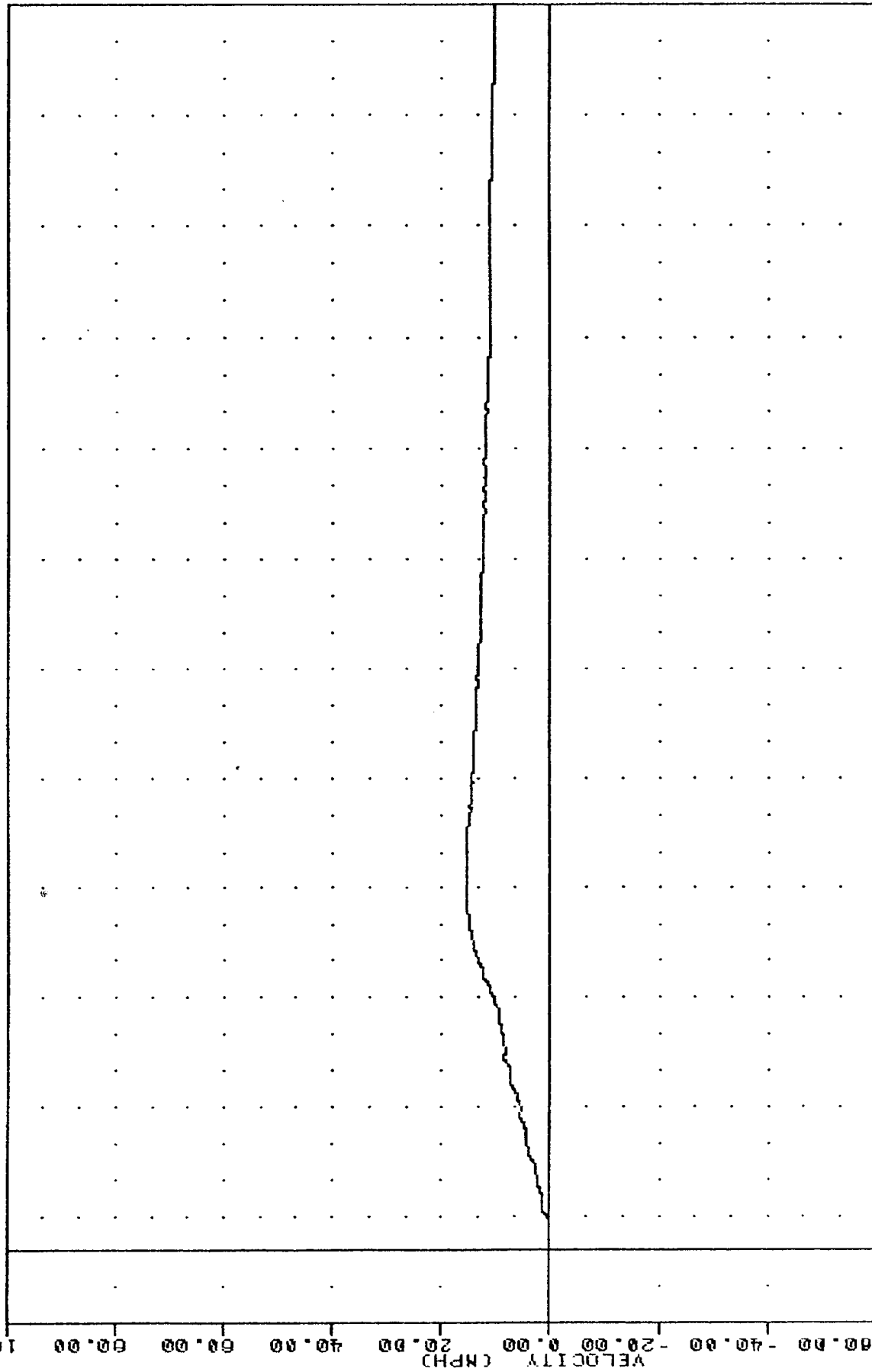
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING RFSXG1

TAC [REDACTED], 840329 [REDACTED] 5-JUN-84 [REDACTED] 14:05:39 [REDACTED]

EVALM MOD VW FLEET REPEAT
84141000000
RFSYV1

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.01e -5.75, 15.51 e 108.63

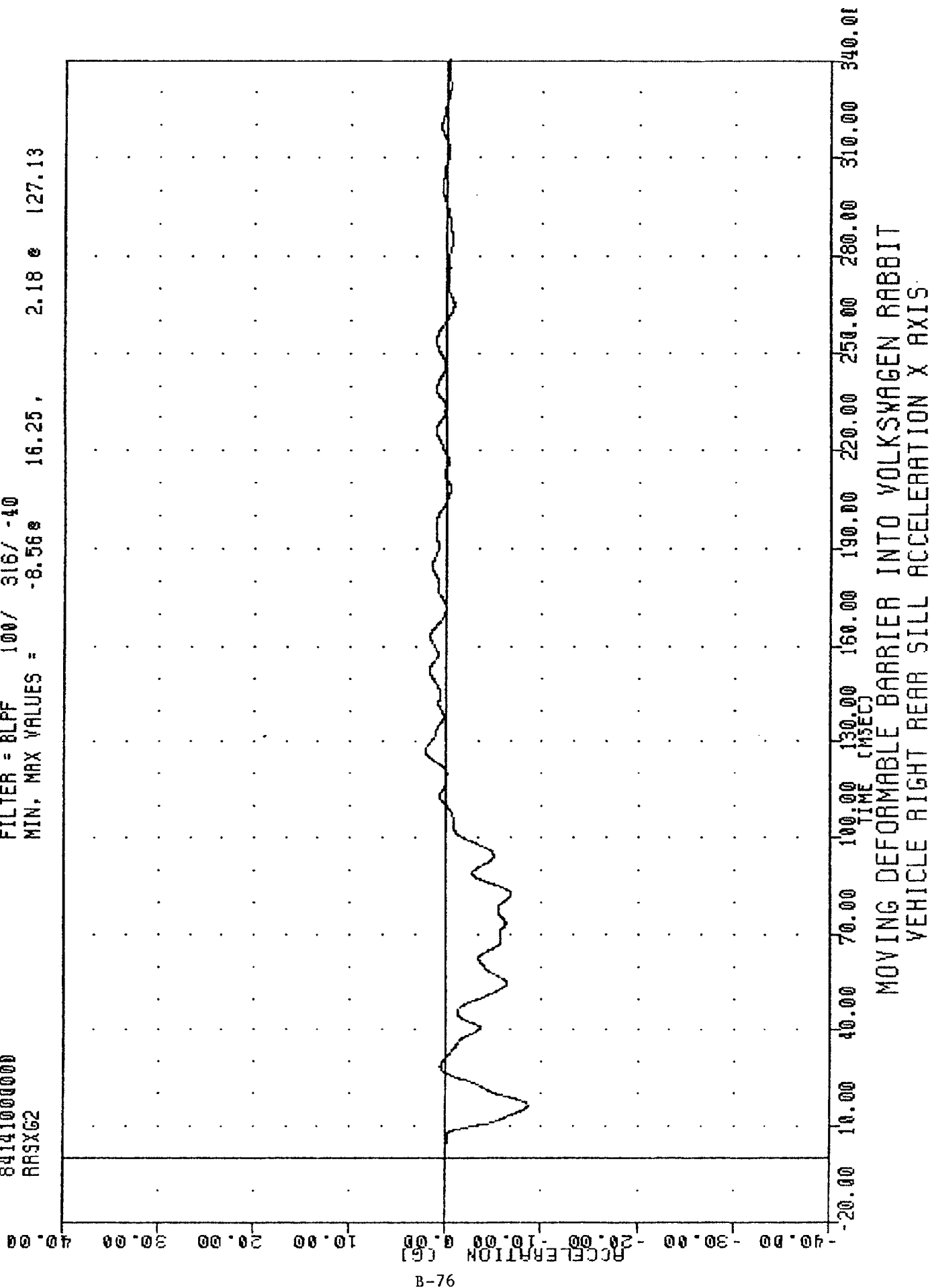


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RFSYG1

TRC 040529
EVALN MOD YV FLEET REPEAT
84141000000
RPSXG2

PLOT DATE 5 JUN-84 14:01:58

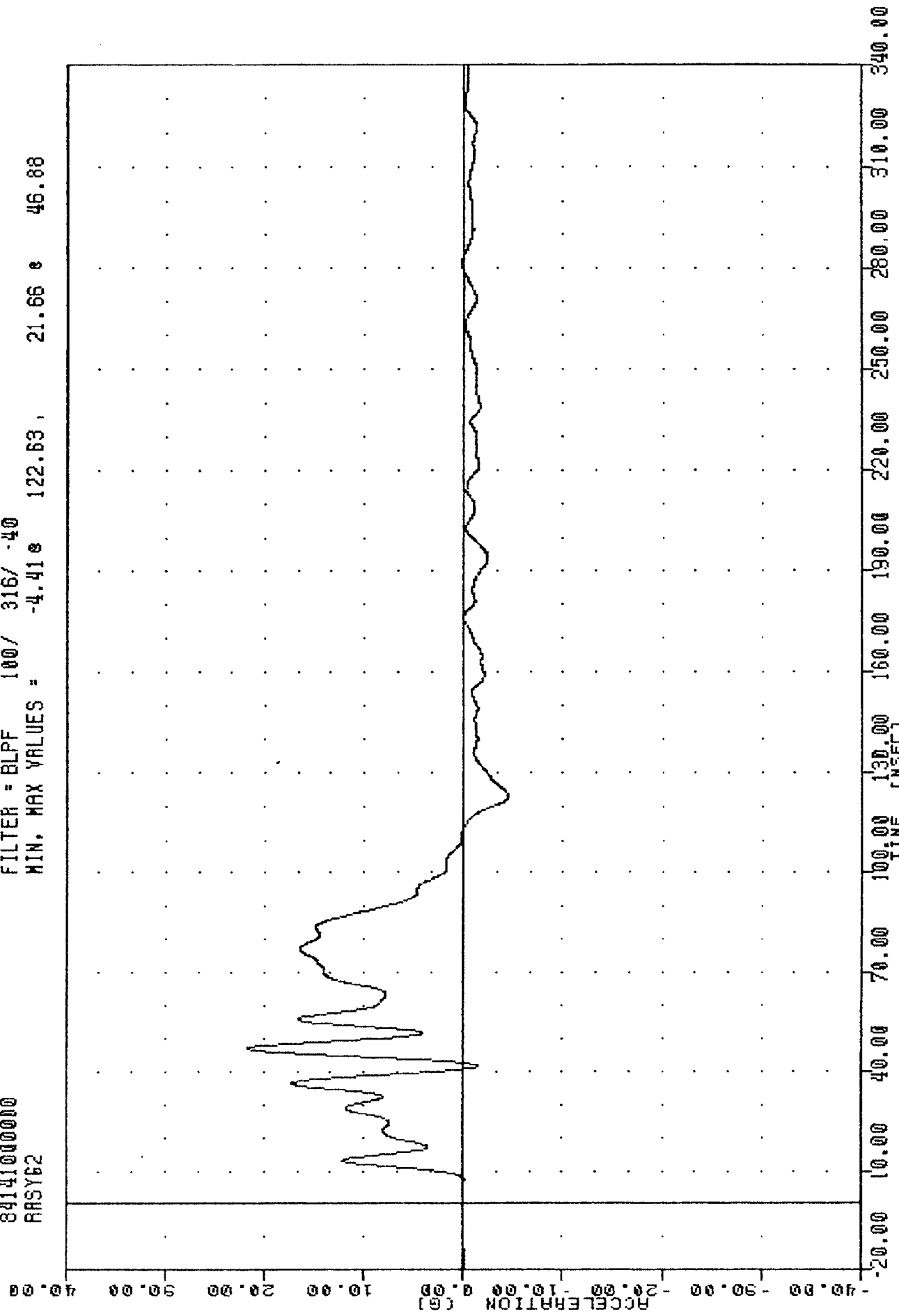
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -8.56g 16.25, 2.18 g 127.13



TRC 0000000000
 EVALN MOD VH FLEET REPEAT
 84141000000
 RRSY62

DATE 5 JUN 84 14:01:58

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -4.41e 122.63, 21.66 e 46.88



TRC

540529

PLOT DATE

5 JUN 84

14:01:58

EVALN MCD VW FLEET REPERT

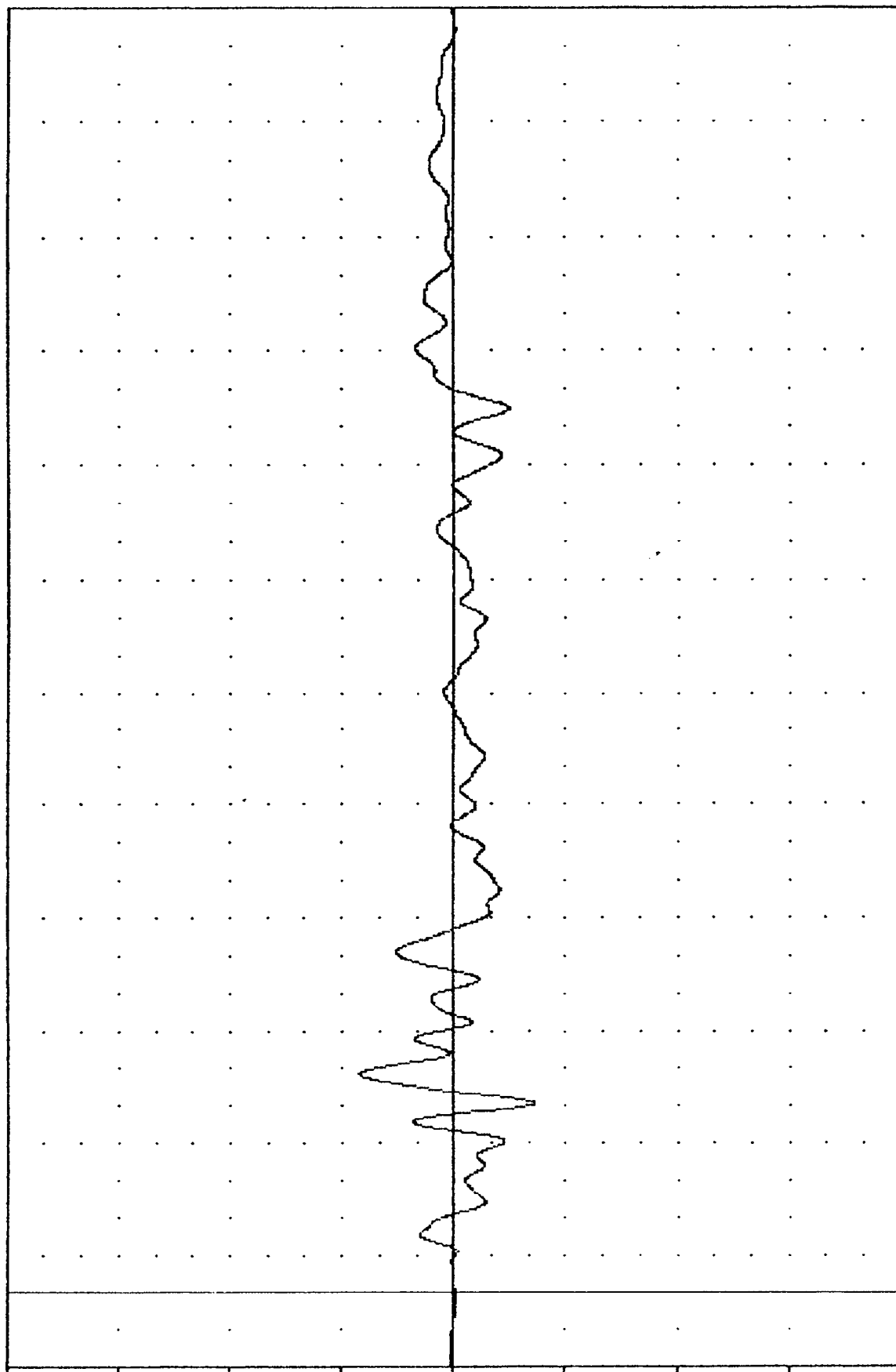
84141000000

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -7.25 50.63, 8.44 58.38

RRSZG2

ACCELERATION (G)



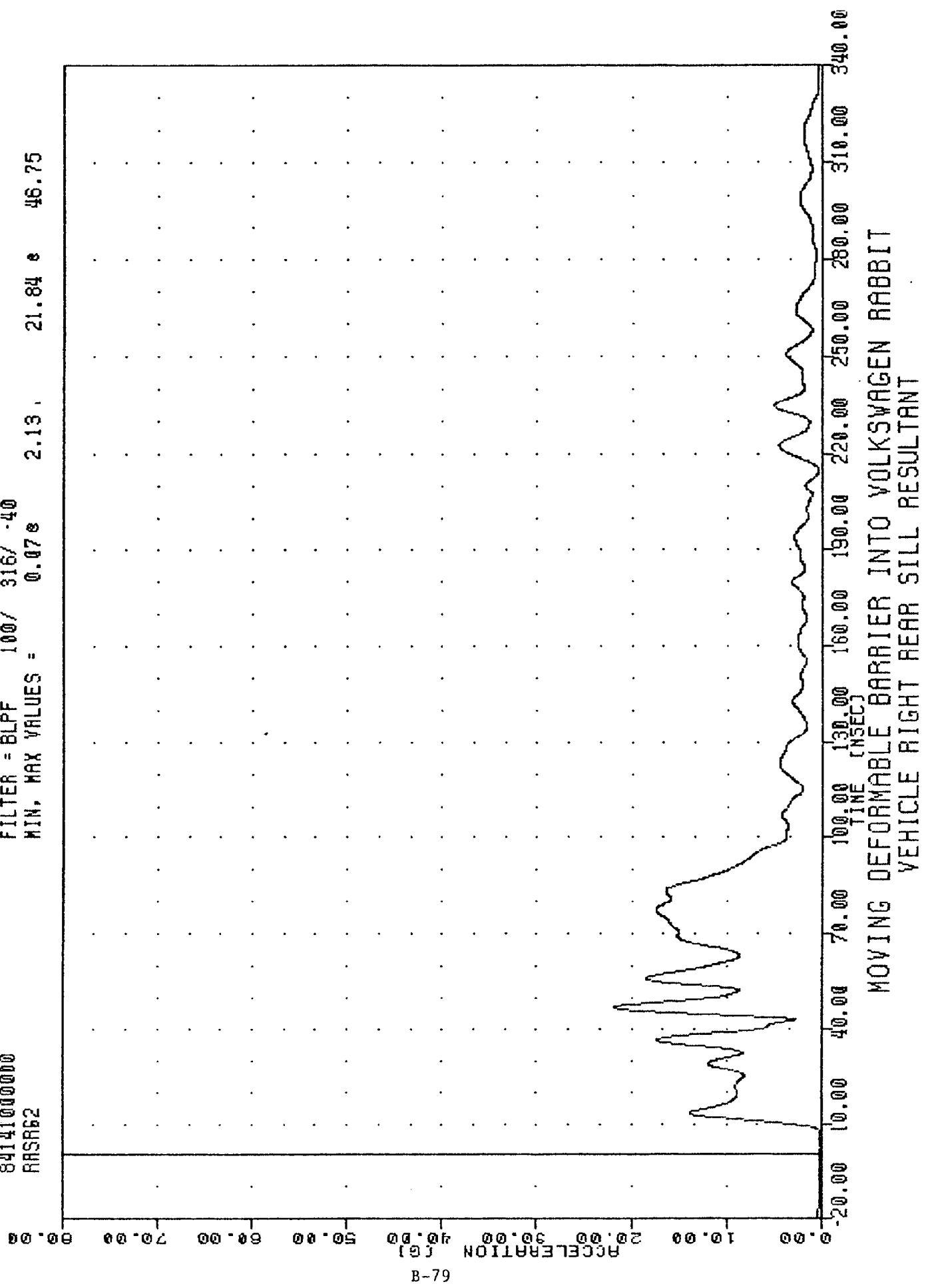
B-78

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

TRC 529
 EVALN MOD V# FLEET REPEAT
 84141000000
 RRSR62

PLOT DATE 5 JUN 84 14:03:22

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = 0.078 21.84 46.75



08-8

VELOCITY (NPH)

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

-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

TRC , 840529
EVALN MOD VV FLEET REPERT
84141000000
RRSXV2

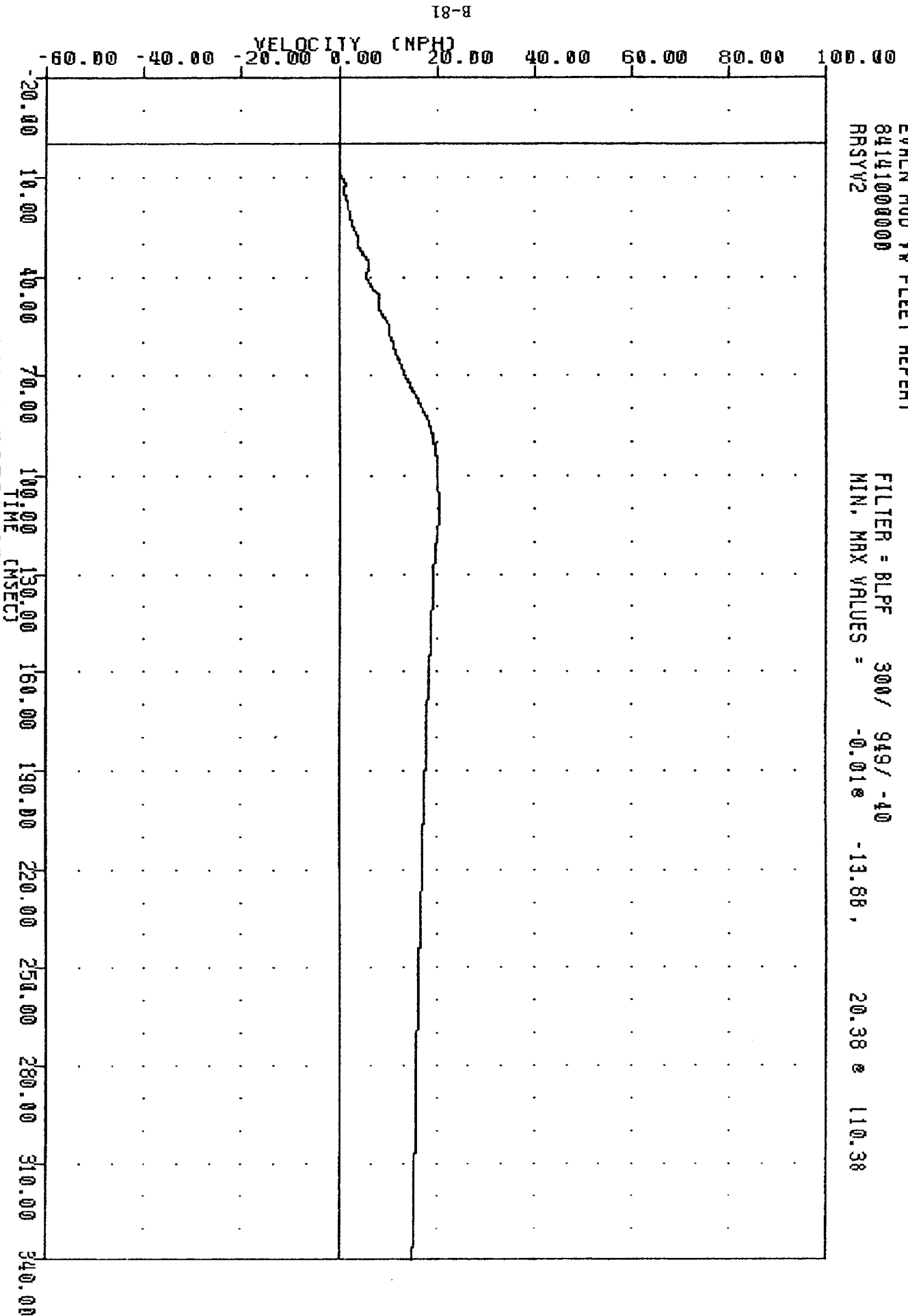
PLOT DATE 5-JUN-84 14:06:39
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -8.13e 108.00 , 0.01 e 1.75

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

TFC , 840529
EVALN MOD YV FLEET REPERT
8414100000
RRSYV2

PLOT DATE 5-JUN-84 14:06:39
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.018 -13.88 , 20.38 @ 110.38



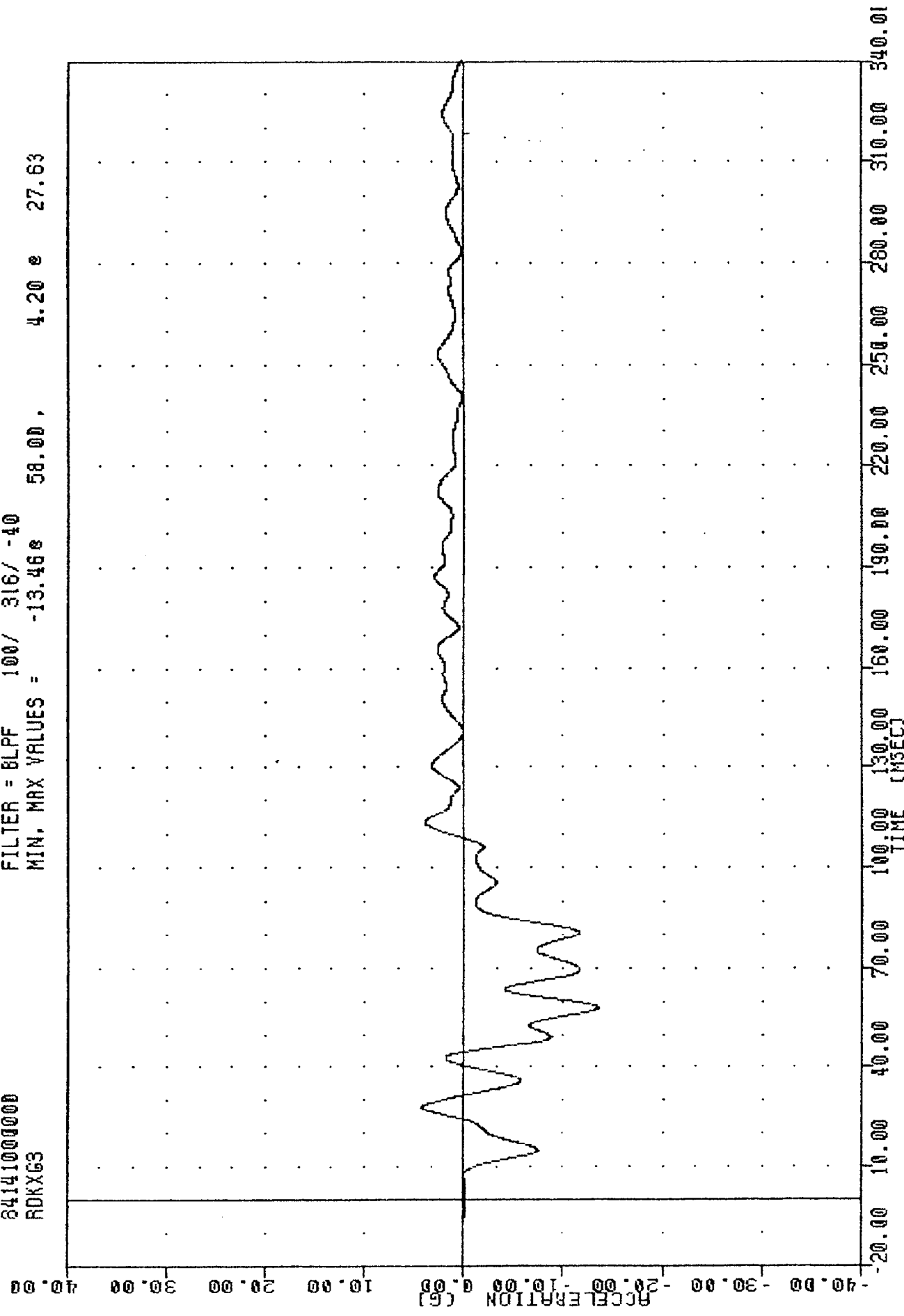
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA VHSING RFGG2

TRC 090329
EVALN MOD YW FLEET REPERT
84141000000
RDXG63

PLOT DATE 5 JUN 84 14:01:58

FILTER = 8LPF 100/ 316/ -40
MIN, MAX VALUES = -13.46g 58.00, 4.20g 27.63



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

TRC 840329 5-JUN-84 14:01:58

EVALN MOD VN FLEET REPEAT

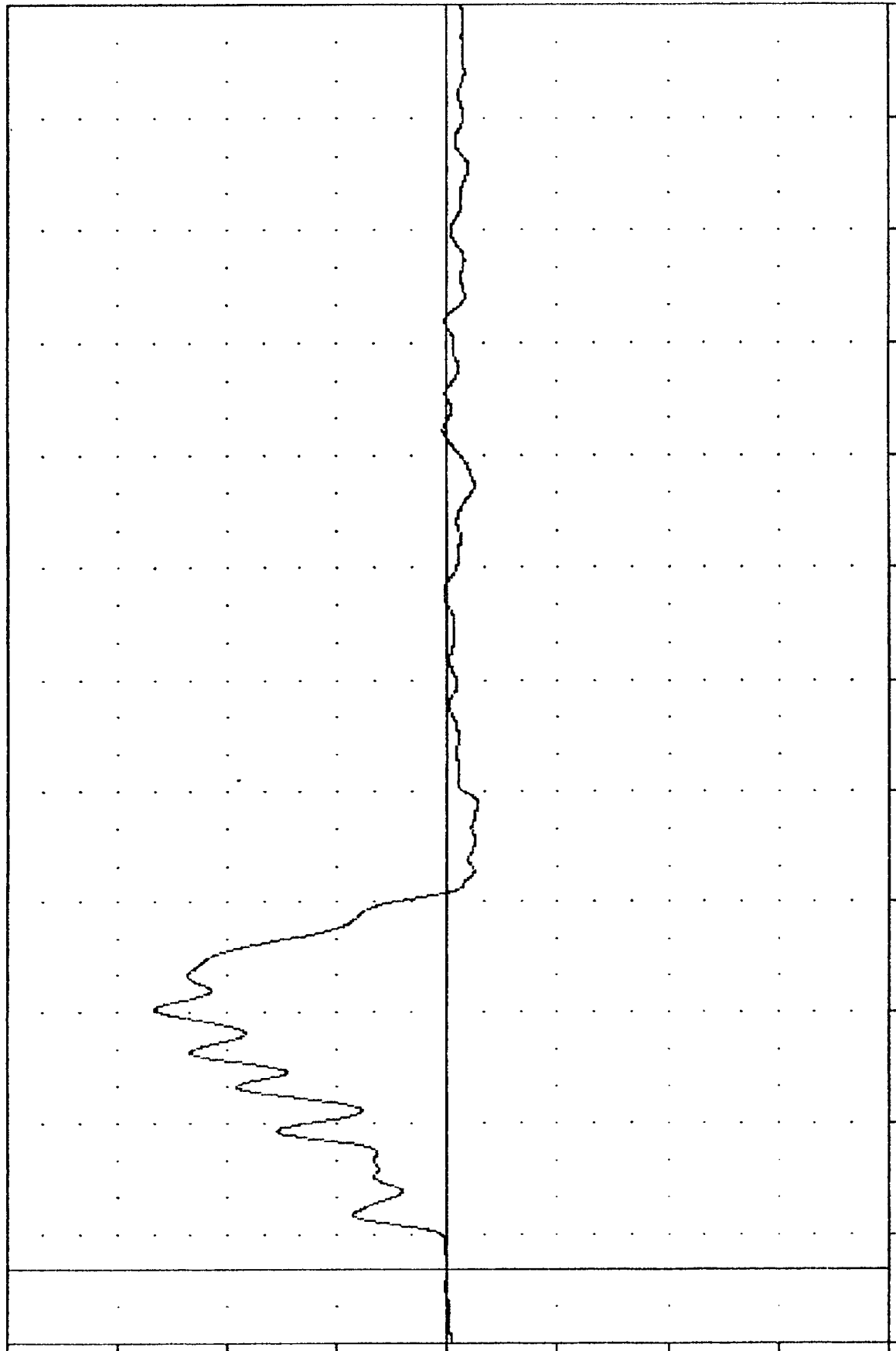
84141000000

ROKY63

FILTER = 6LPF 100/ 316/ -40

MIN, MAX VALUES = -2.77 126.50 26.54 70.75

ACCELERATION [G]



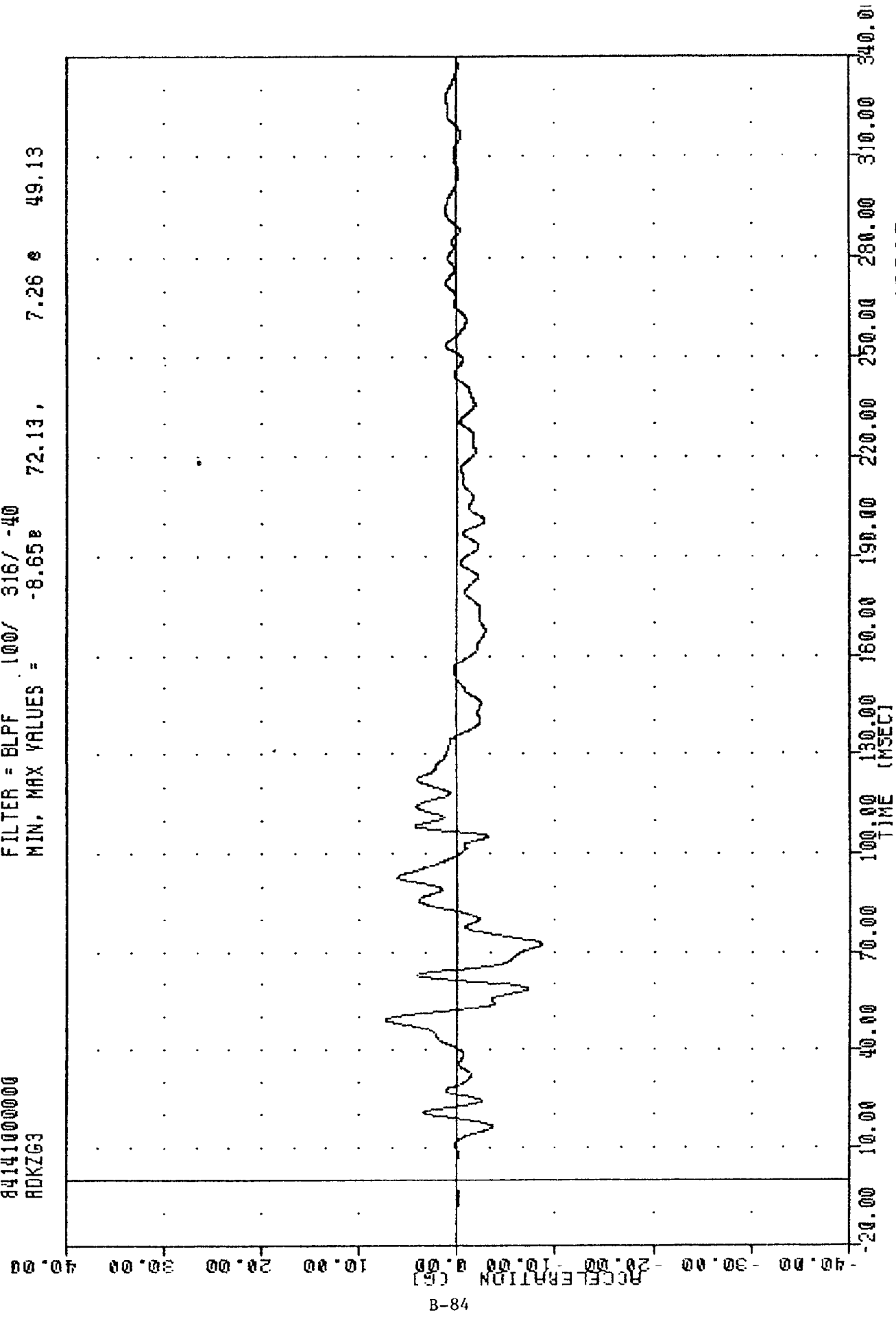
B-83

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

TRC 840529
 EVALN MOD VW FLEET REPERT
 84141000000
 RDKZG3

PLOT DATE 5 JUN 84 14:01:58

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -8.65e 72.13, 7.26 e 49.13

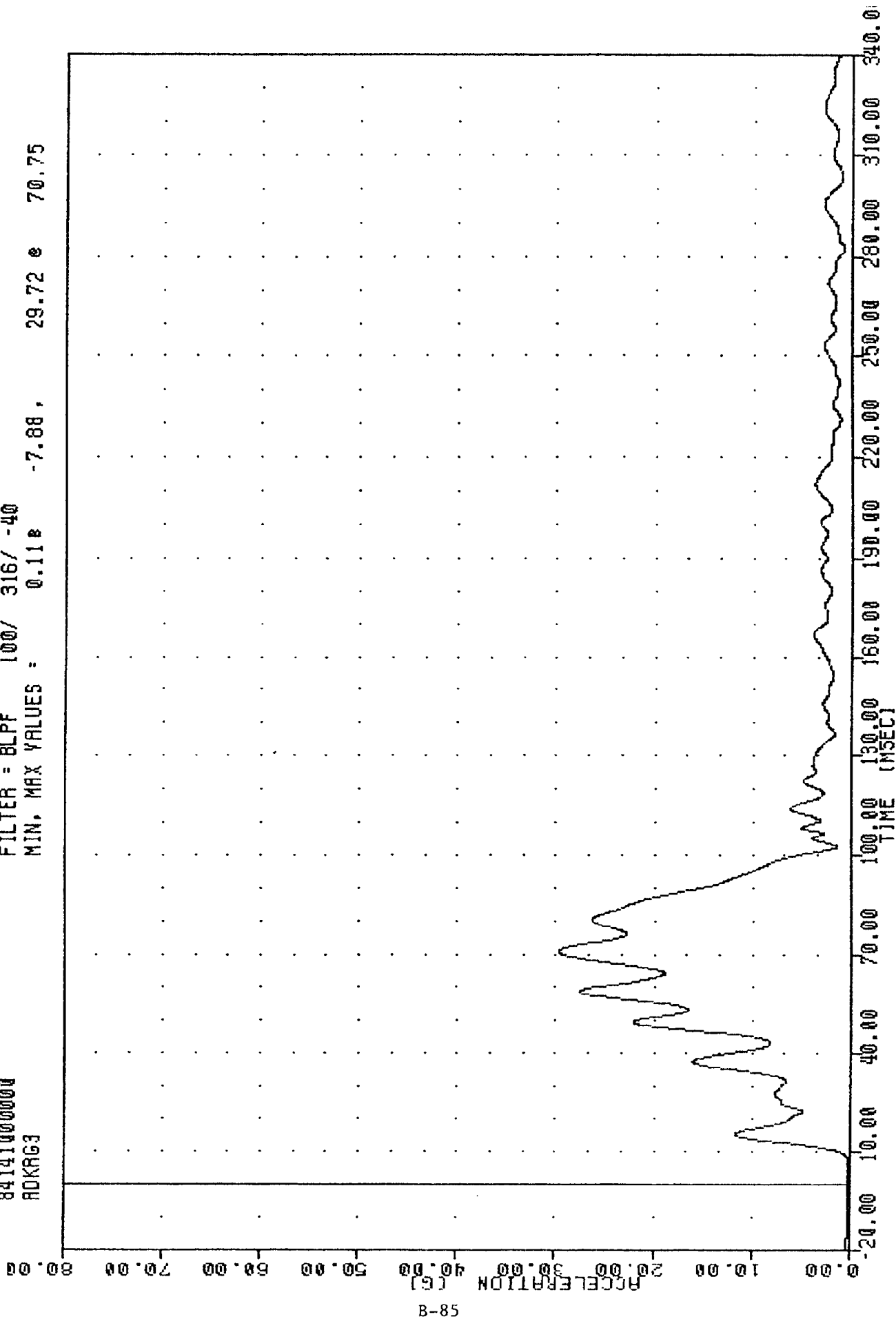


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE REAR DECK ACCELERATION Z AXIS

TRC 040529
 EVALN MOD YW FLEET REPEAT
 84141000000
 ADKRG3

PLOT DATE 5 JUN-84 14:03:22

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = 0.118 -7.88, 29.72 70.75

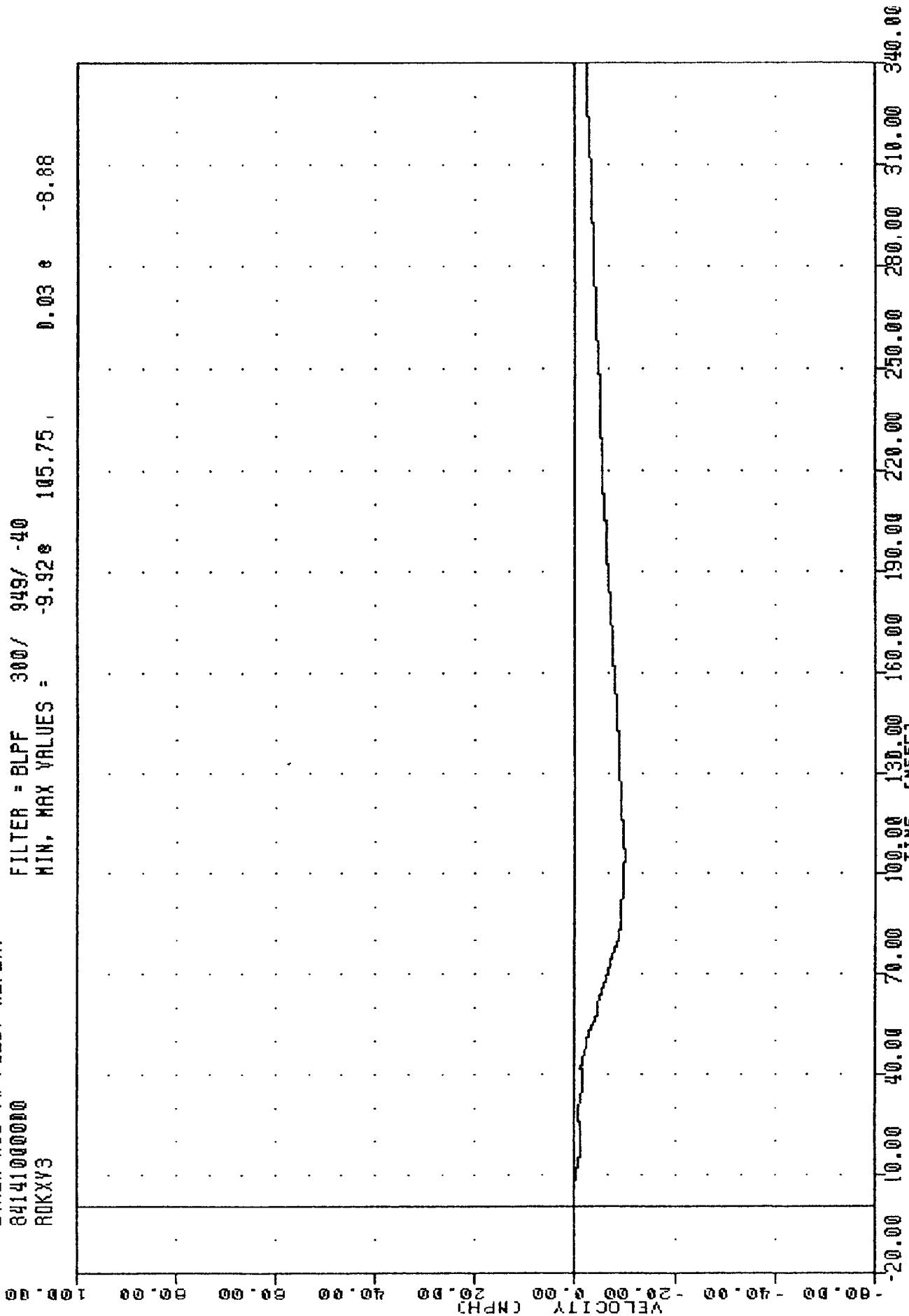


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE REAR DECK RESULTANT

TRC 840329
 EVALN MOD VH FLEET REPERT
 84141000000
 ROKXY3

PLOT DATE 5 JUN 84 14:00:39

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -9.92 105.75 0.03 -8.88



TRC , 040529
 EVALN MOD VW FLEET REPERT
 84141000000
 RDKYV3

PLOT DATE 5 JUN-84 14:00:39

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.048 -10.63, 28.04 8 99.13

100.00

80.00

60.00

40.00

20.00

0.00

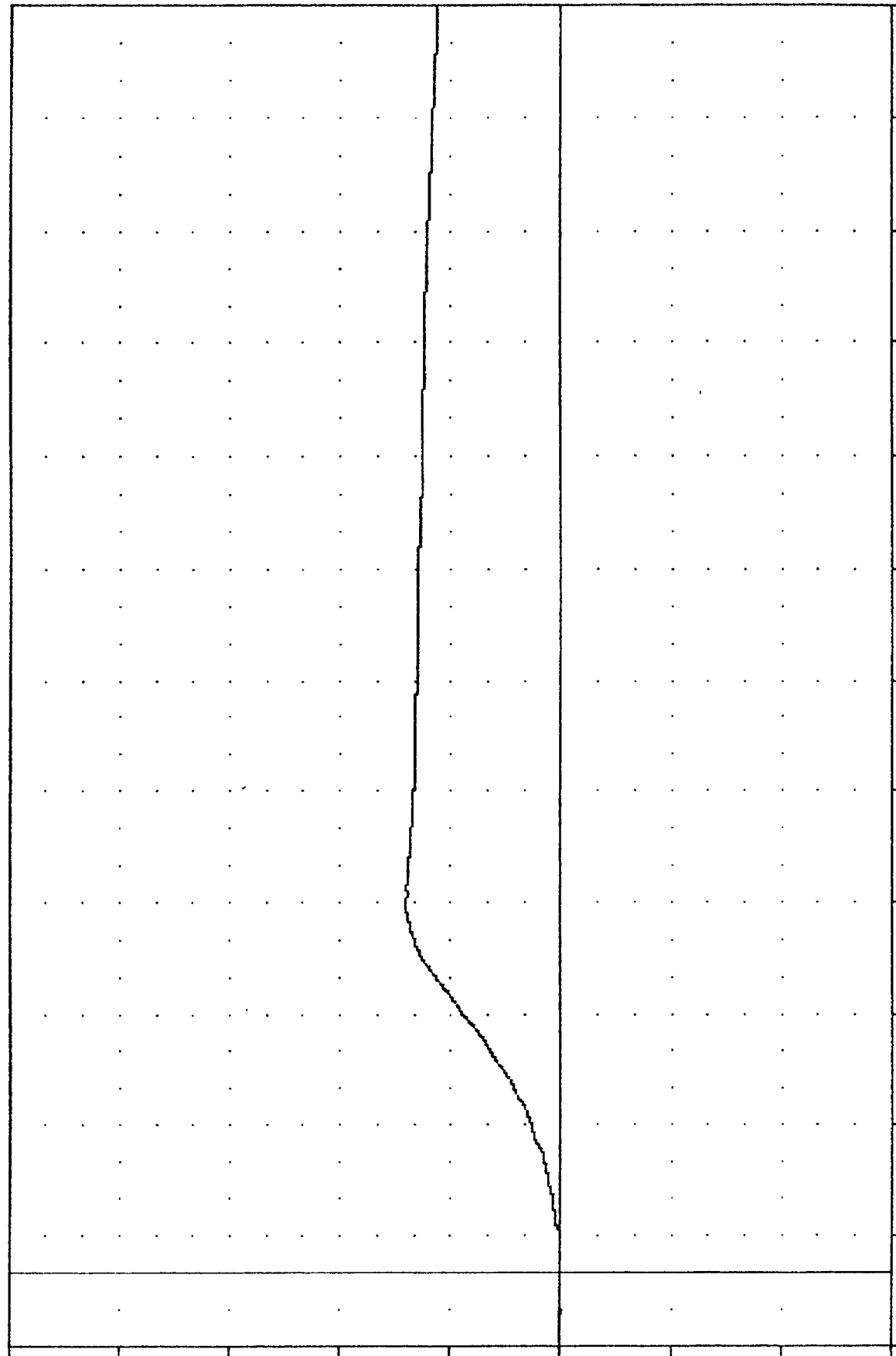
-20.00

-40.00

-60.00

-80.00

B-87



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING RDKYG3

TRC 840529
EVALN MOD YW FLEET REPEAT
84141000000
LRSYG4

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -3.308 130.13, 26.72 e 51.88

120.00

90.00

60.00

30.00

0.00

-30.00

-60.00

-90.00

-120.00

-120.00

-90.00

-60.00

-30.00

0.00

30.00

60.00

90.00

120.00

150.00

180.00

210.00

240.00

270.00

300.00

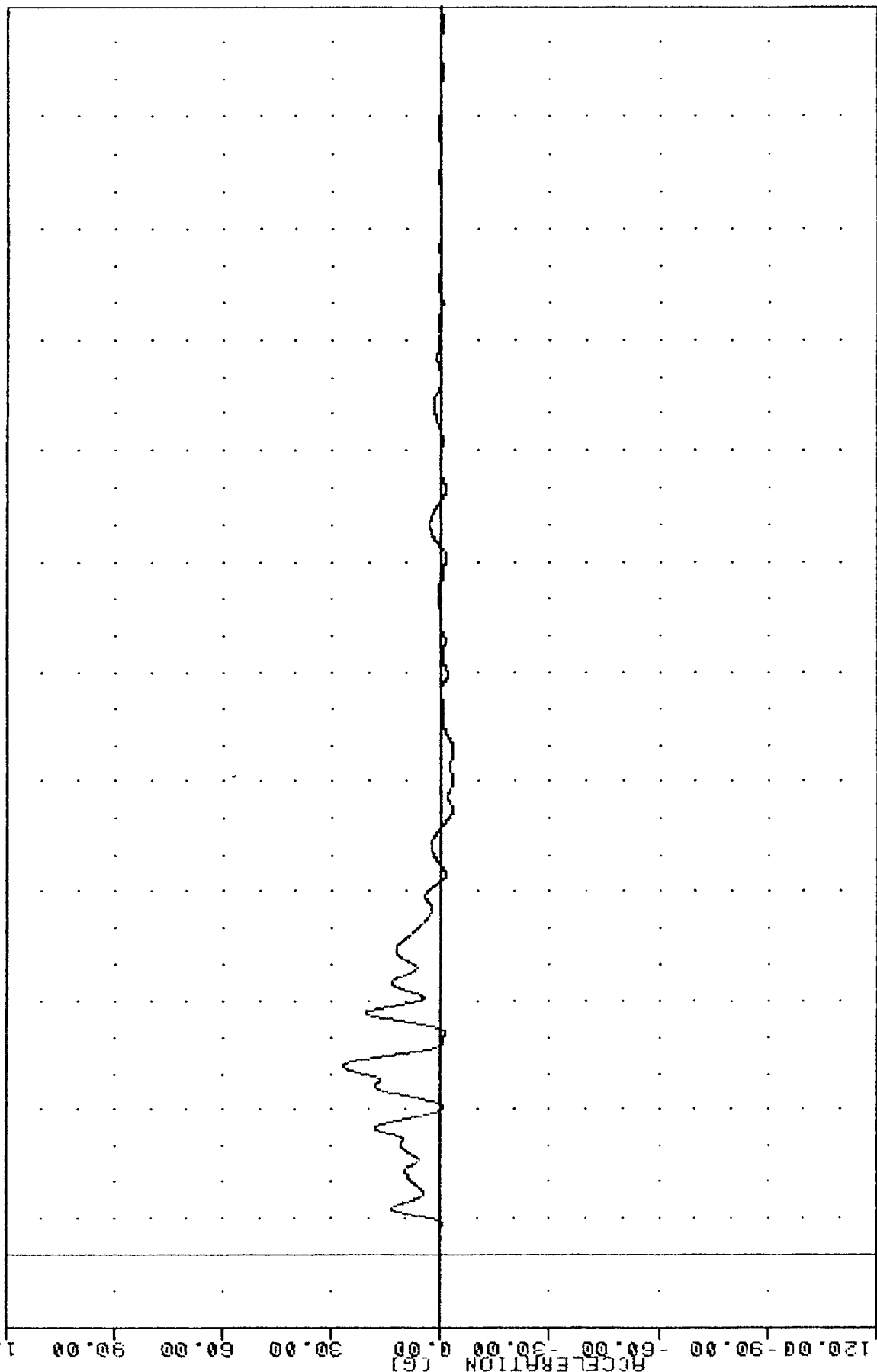
330.00

360.00

390.00

420.00

B-88



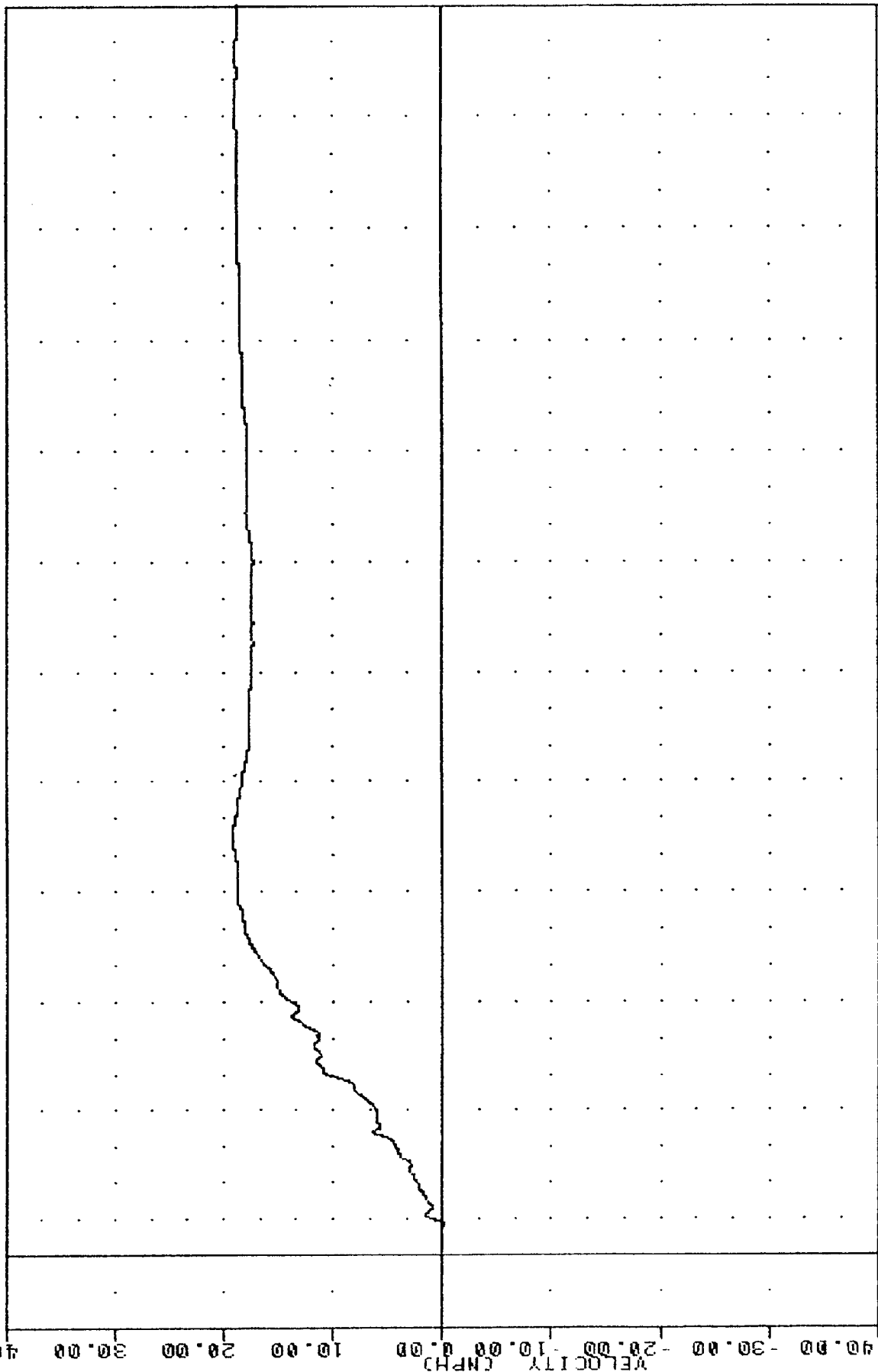
TRC 840529
 EVALN MOD YW FLEET REPEAT
 84141000000
 LRSYV4

PLOT DATE 5 JUN 84 14:06:39

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.148 8.50, 19.11 & 114.00

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

B-89



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LRSYG4

TAC 840529 5-JUN-84 14:01:58

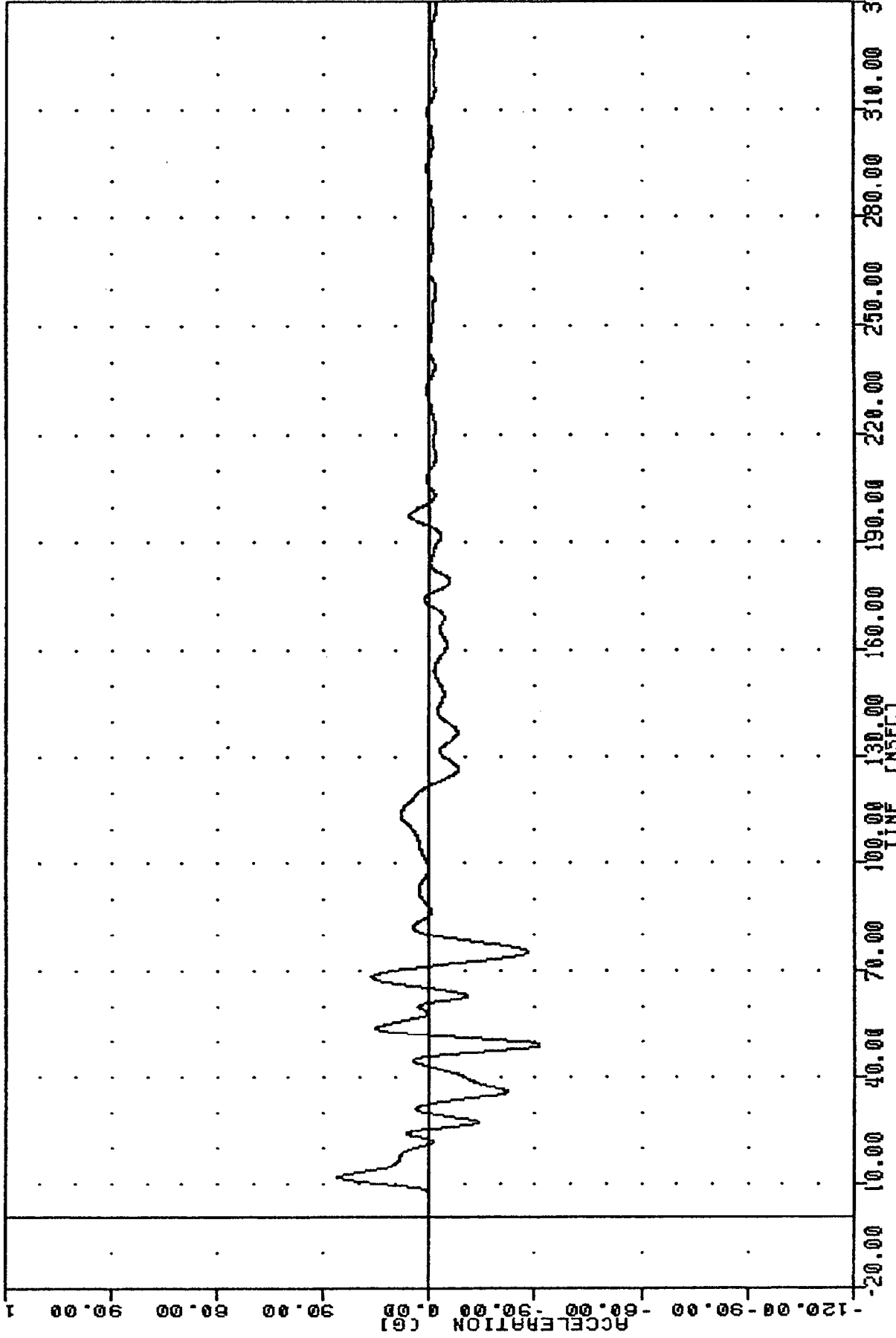
EVALN MOD VY FLEET REPEAT

84141000000

LFSY65

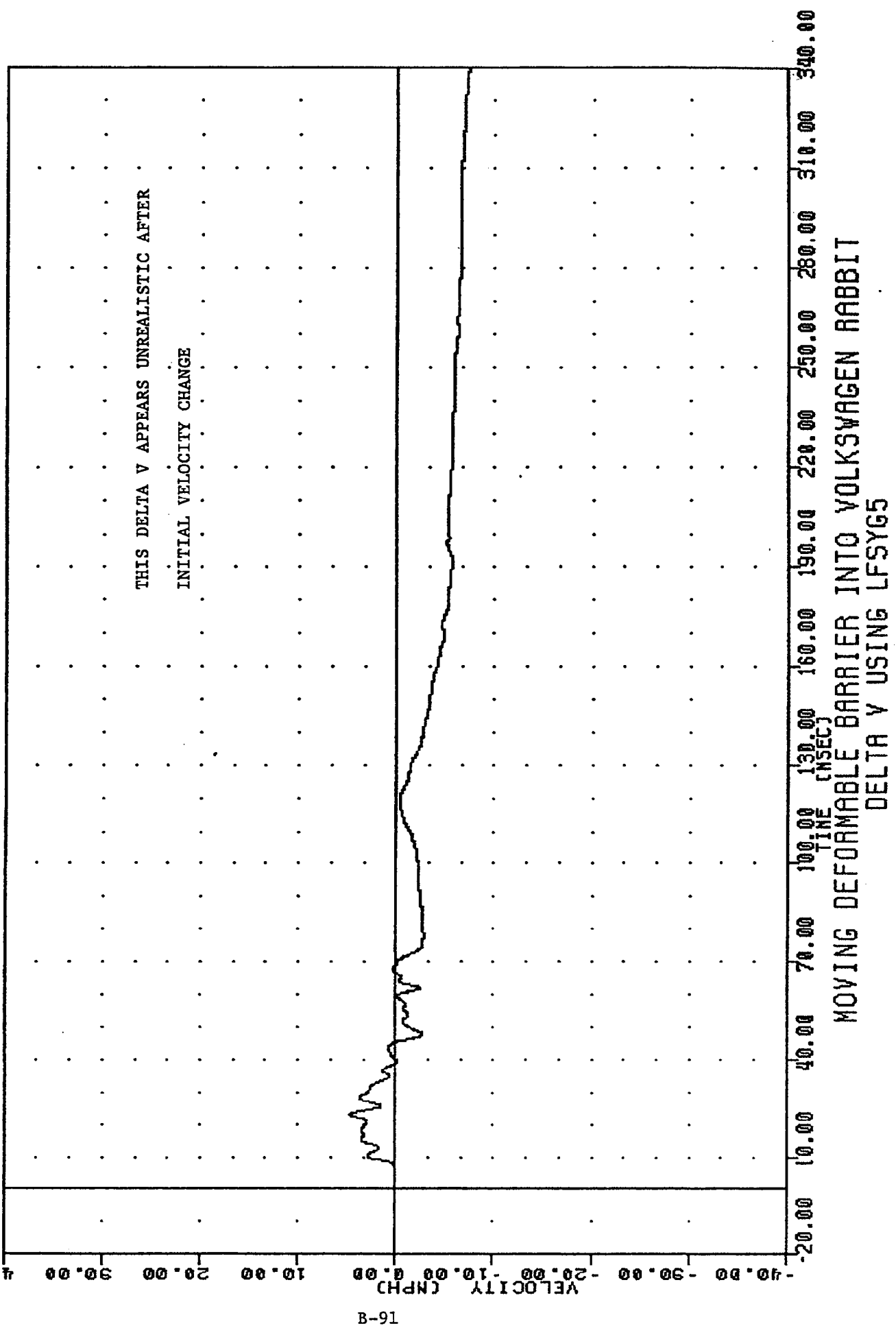
FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -31.33e 48.75 , 26.05 e 11.50



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

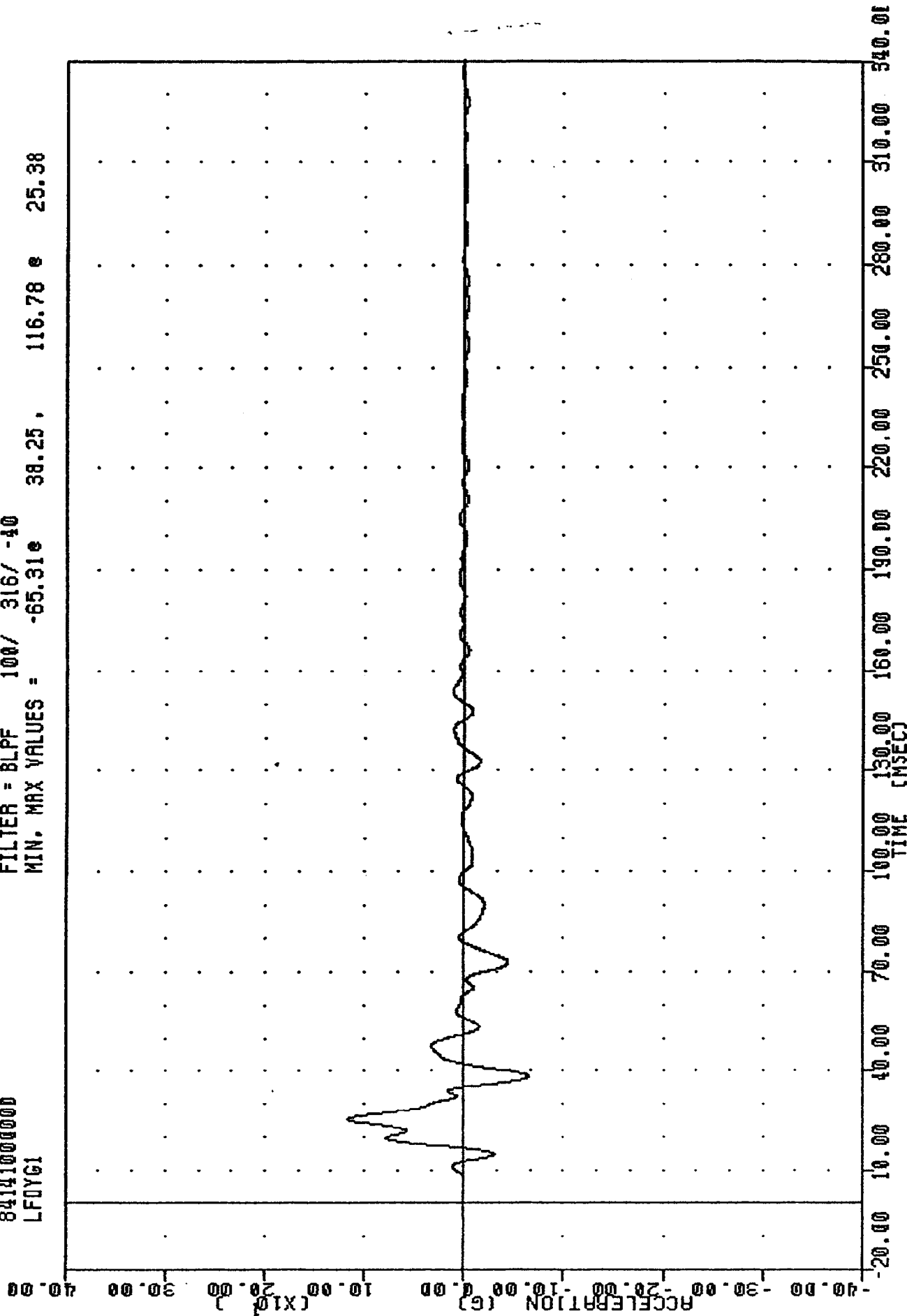
TRC 840529 5-JUN-84 14:06:39
 EVALN NOD VM FLEET REPEAT
 84141000000
 LFSY5
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -7.32e 340.00, 4.71 e 23.00



TRC 84141000000
 EVALN MOD YW FLEET REPEAT
 84141000000
 LFOYG1

PLOT DATE 5 JUN 84 14:01:58

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -65.31e 38.25, 116.78 e 25.38



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

TRC
EVALN MOD VW FLEET REPEAT
84141000000
LFDYV1

PLOT DATE 5-JUN-84 14:06:39

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -3.06 13.63, 24.29 33.50

100.00

80.00

60.00

40.00

20.00

B-93

VELOCITY (MPH)

-20.00

-40.00

-60.00

-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

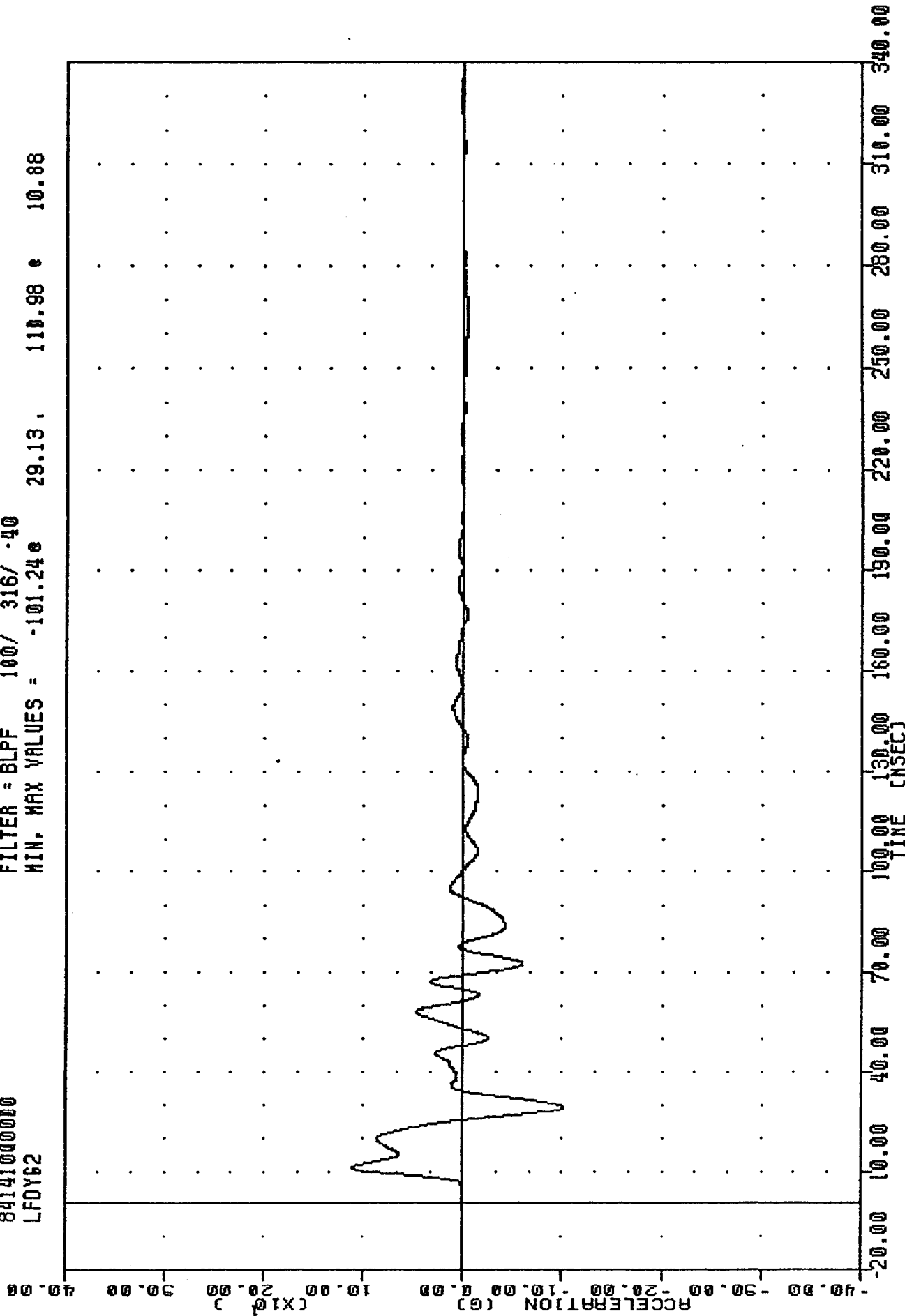
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYGI

TRC 84141000000
EVALN MOD YN FLEET REPEAT
LFOY62

PLOT DATE 5 JUN 84 14:01:58

FILTER = BLPF 100/ 316/ .40
MIN, MAX VALUES = -101.24e 29.13, 110.98 e 10.88



B-94

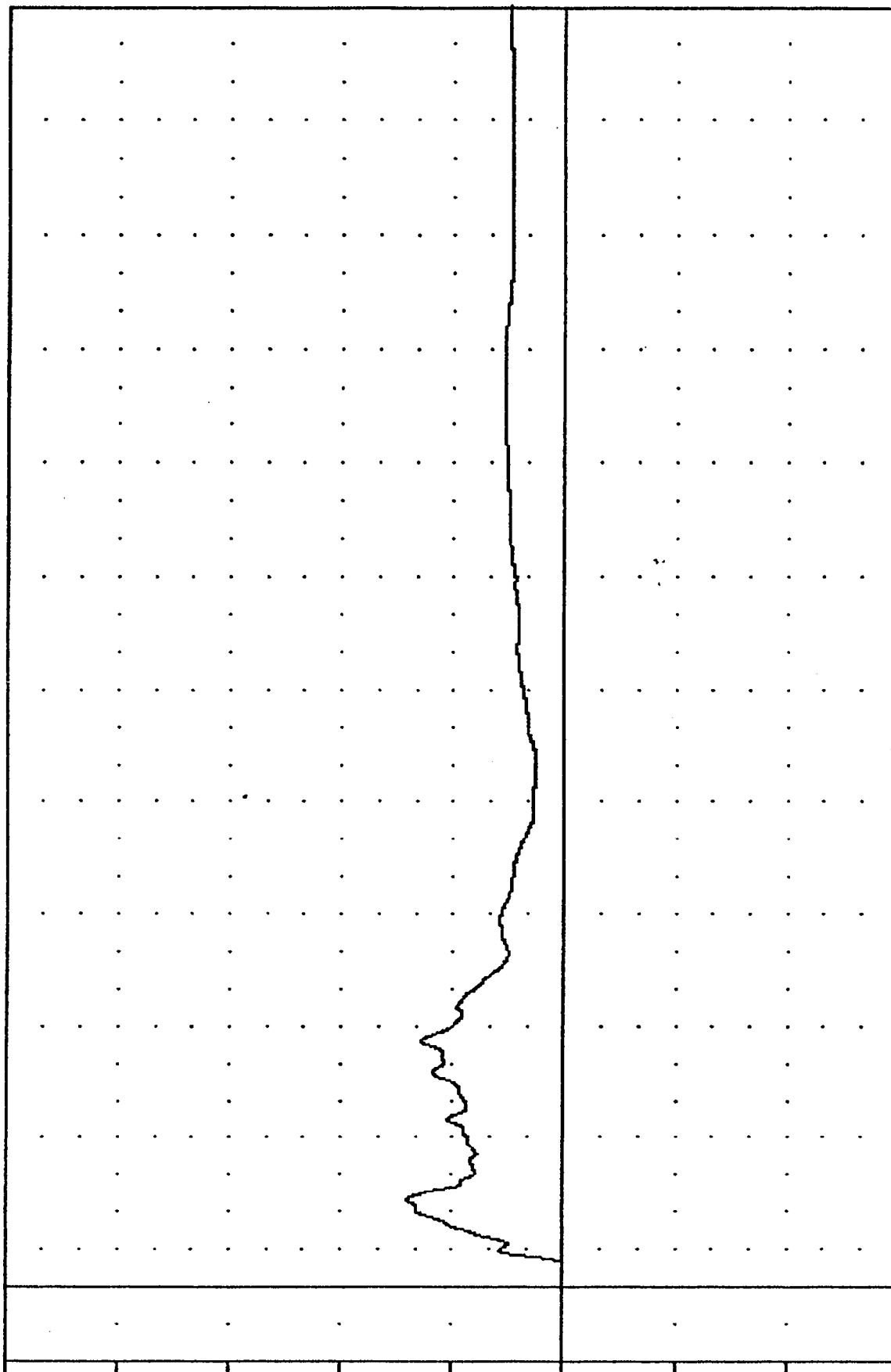
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 8) ACCELERATION Y AXIS

TRC 040529
EVALN MOD YW FLEET REPEAT
84141000000
LFDYV2

PLOT DATE 5 JUN-84 14:00:39

FILTER = 8LPF 300/ 949/ -10
MIN. MAX VALUES = -0.02e -1.75, 28.04 e 23.00

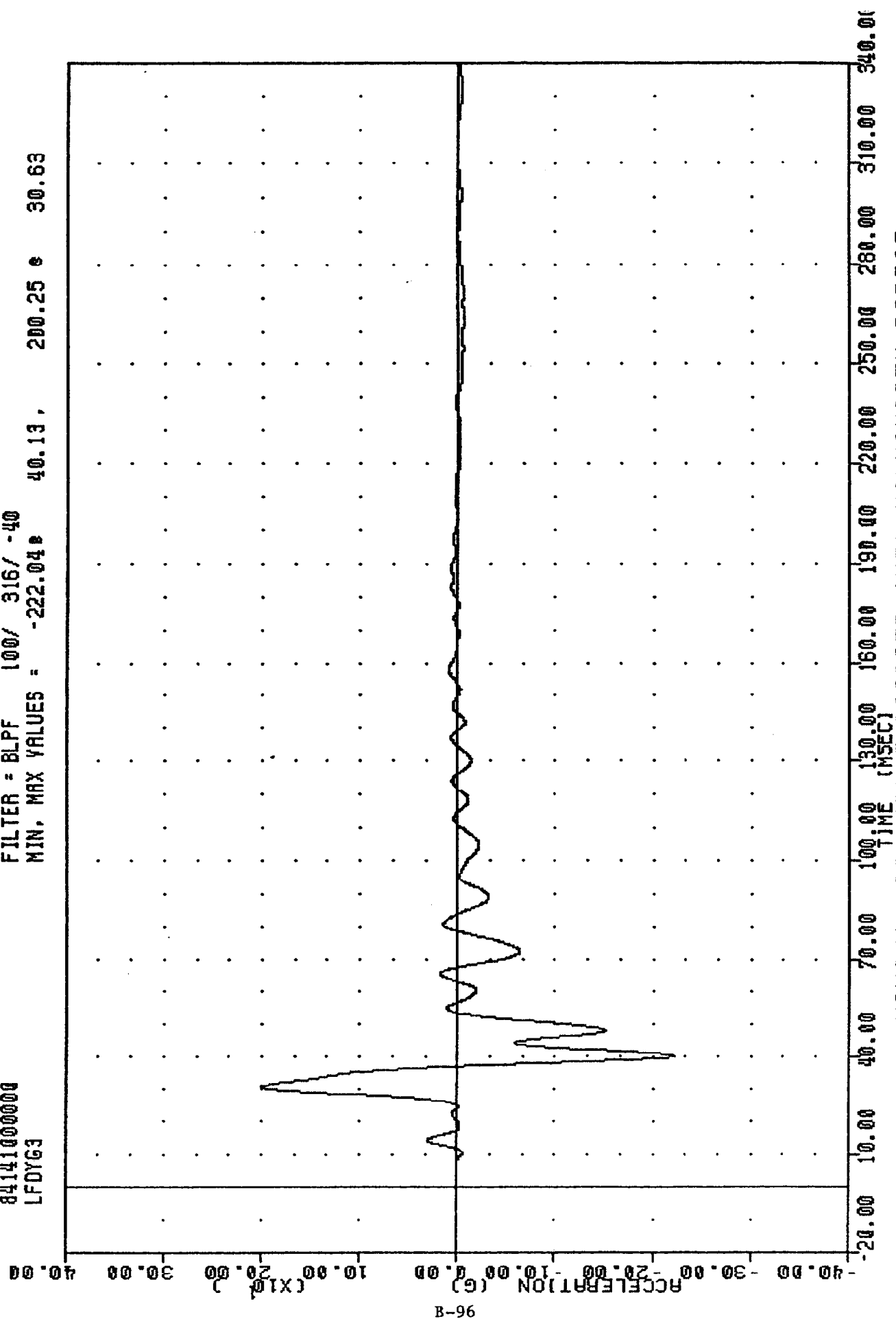
VELOCITY (MPH)



-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

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDY62

TRC 54W528 PLOT DATE 5 JUN 84 14:01:58
 EVALN MOD VW FLEET REPEAT
 84141000000
 LFDY63
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -222.048 40.13, 200.25 30.63



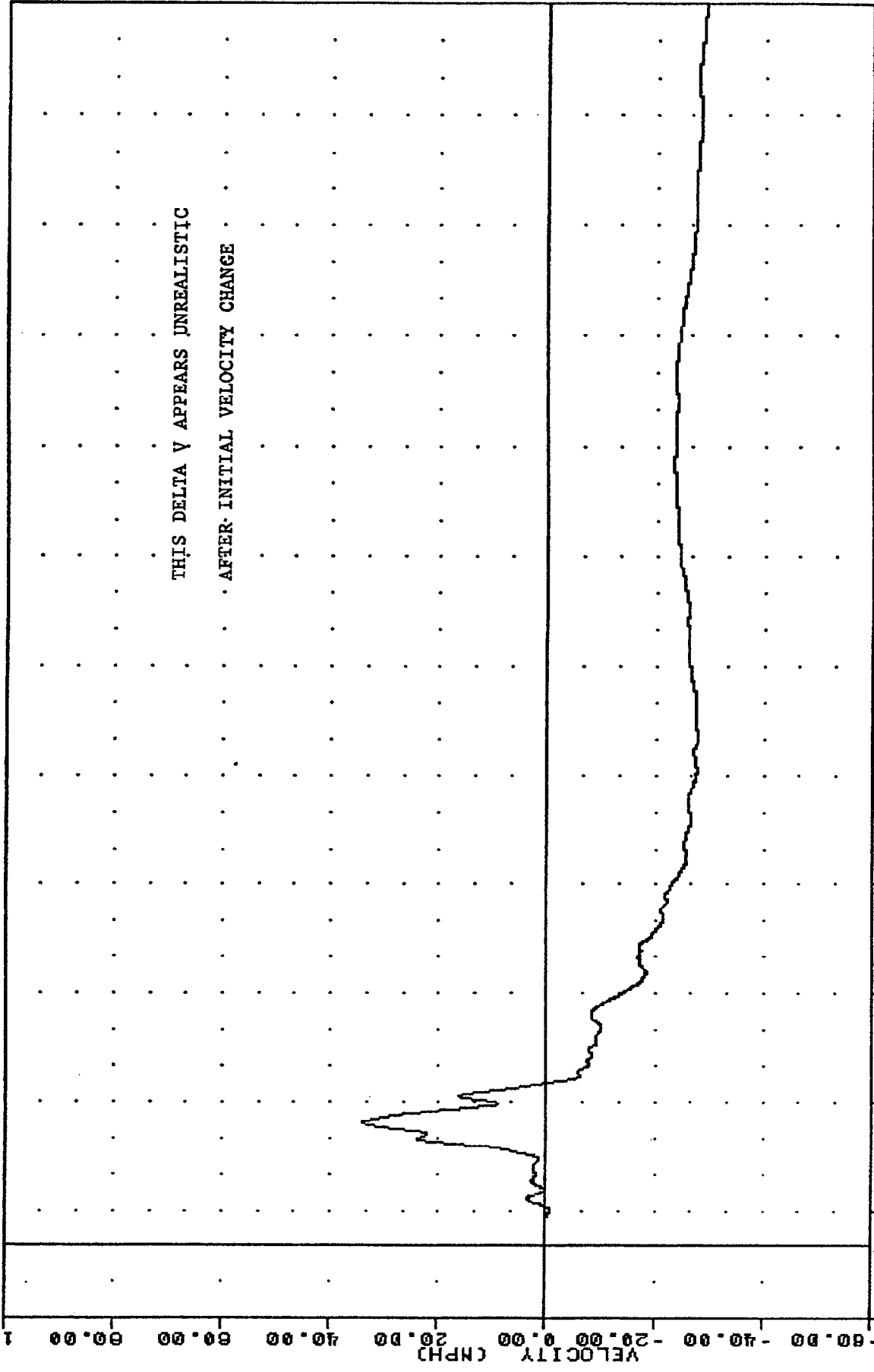
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE LEFT FRONT DOOR (POSITION 9) ACCELERATION Y AXIS

TRC 840529
 EVALN MOD VM FLEET REPEAT
 84141000000
 LFDYV3

PLOT DATE 5-JUN-84 14:06:39

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -29.06 340.00 31.00 34.13

100.00

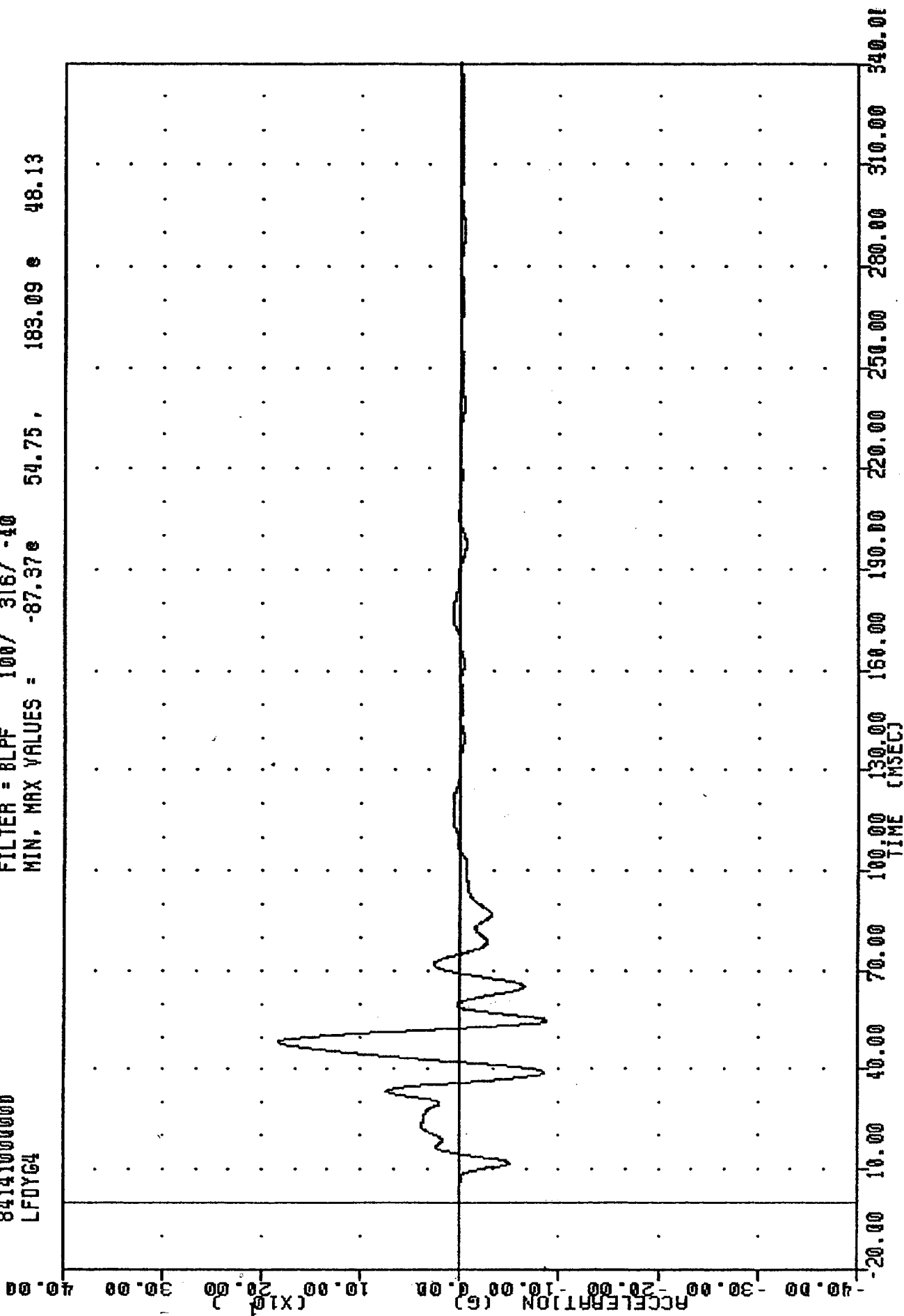


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LFDYV3

TRC
EVALN MOD YW FLEET REPEAT
84141000000
LFDY64

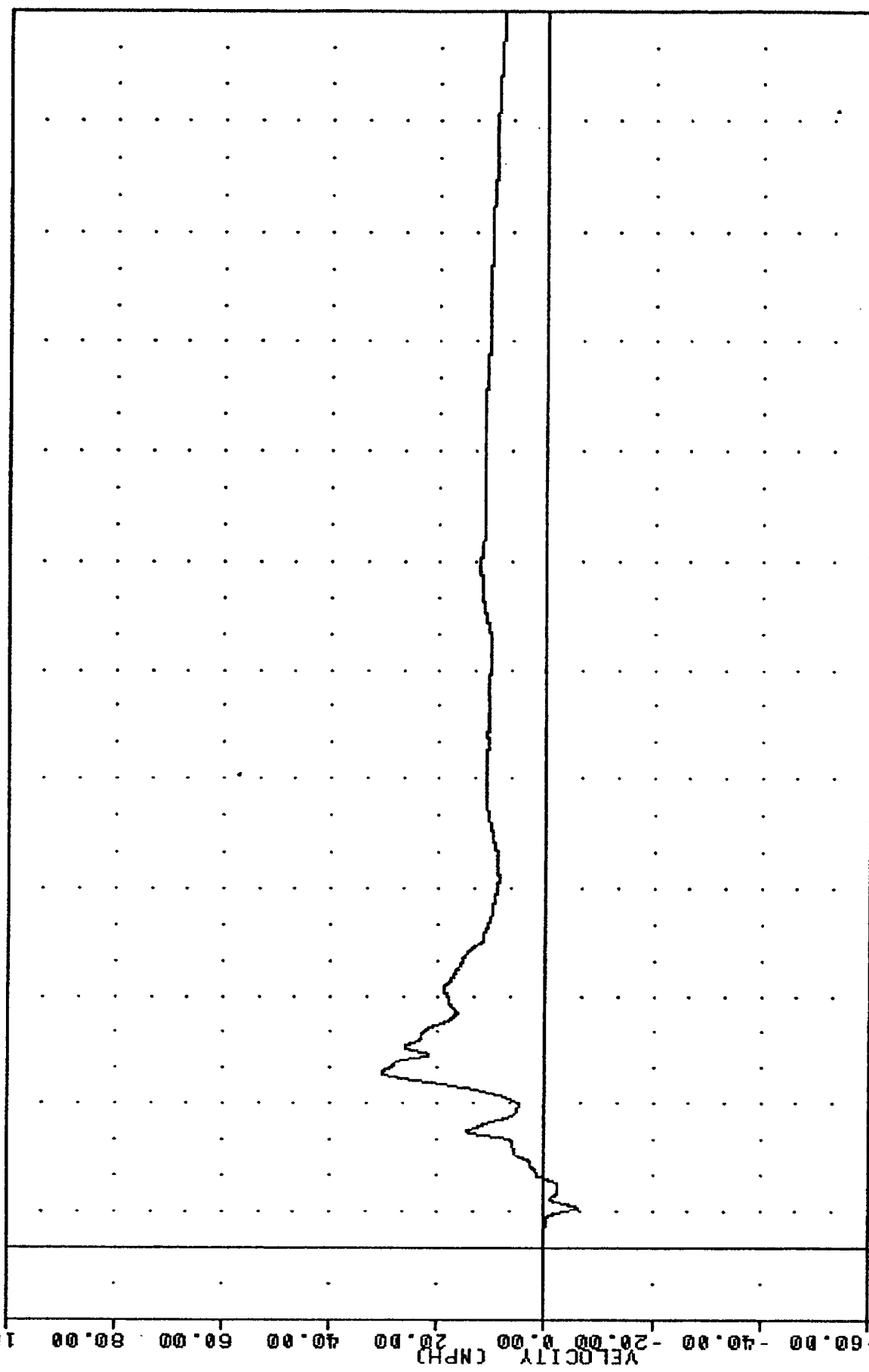
PLOT DATE 5-JUN-84 14:01:58

FILTER = 8LPF 100/ 316/ -40
MIN. MAX VALUES = -87.37e 54.75, 183.09 e 48.13



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

TRC 529
 EVALN MOD VV FLEET REPERT
 84141000000
 LFOYV4
 PLOT DATE 5 JUN 84 14:06:39
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -6.23 10.75, 30.39 48.50

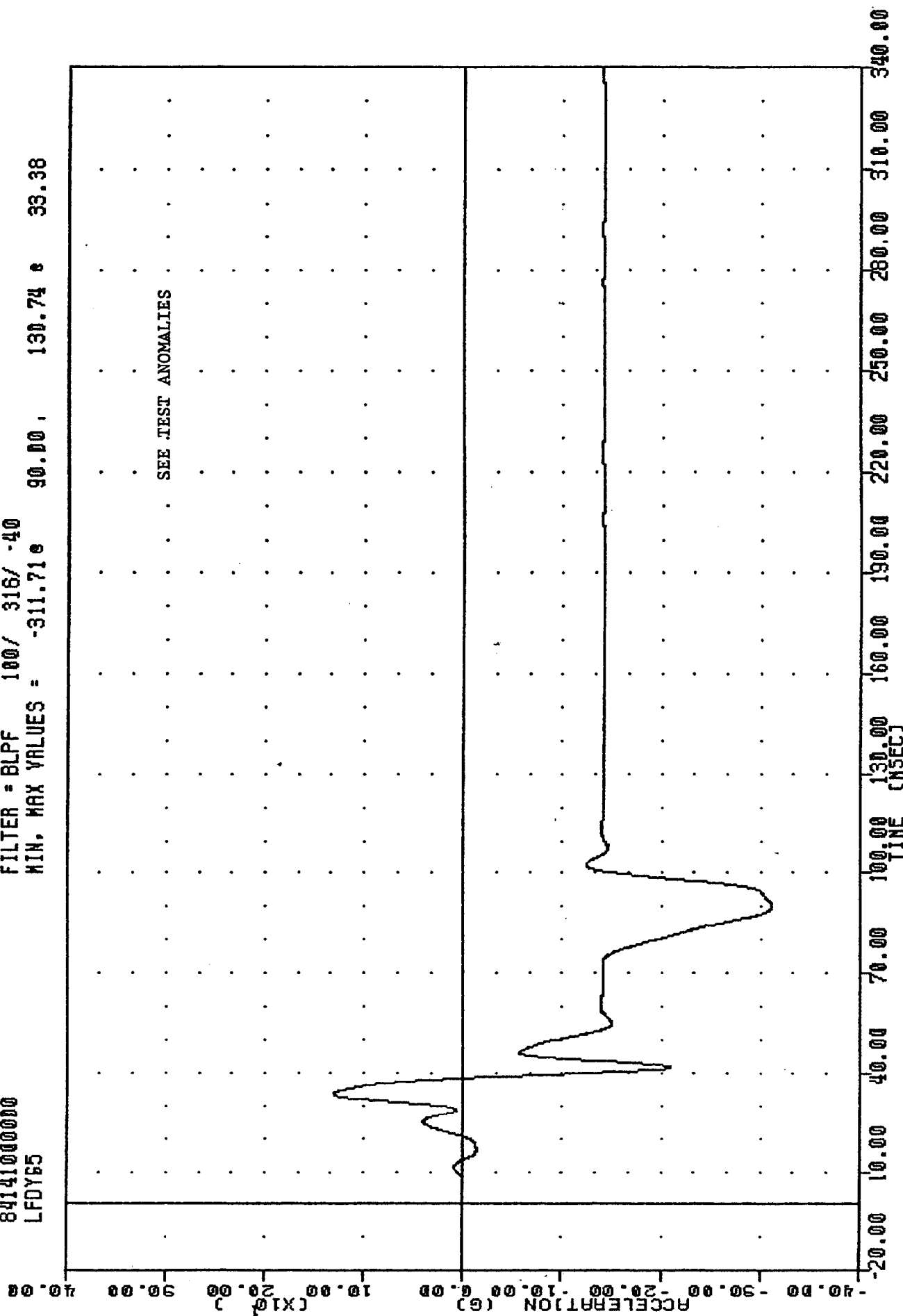


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LFOYV4

TRC 040529
 EVALN MOD YH FLEET REPEAT
 84141000000
 LFDY65

PLOT DATE 5 JUN 84 14:01:58

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -311.71 90.00 130.74 33.38



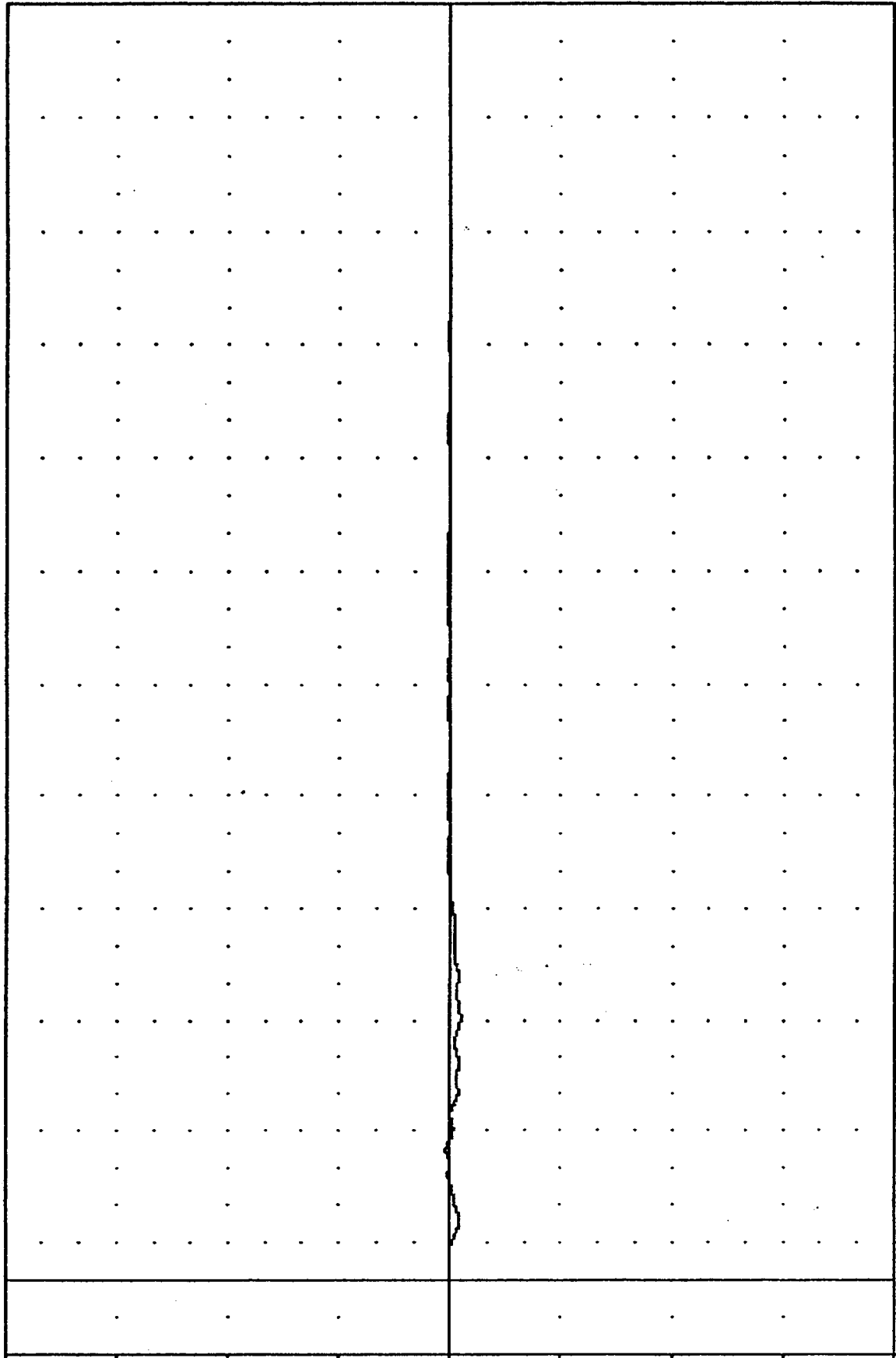
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE LEFT FRONT DOOR (POSITION 11) ACCELERATION Y AXIS

TRC
 EVALN MOD YW FLEET REPERT
 84141000000
 TFRXG7

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -9.218 70.38, 3.85 e 34.63

ACCELERATION (G)
 (x10²)



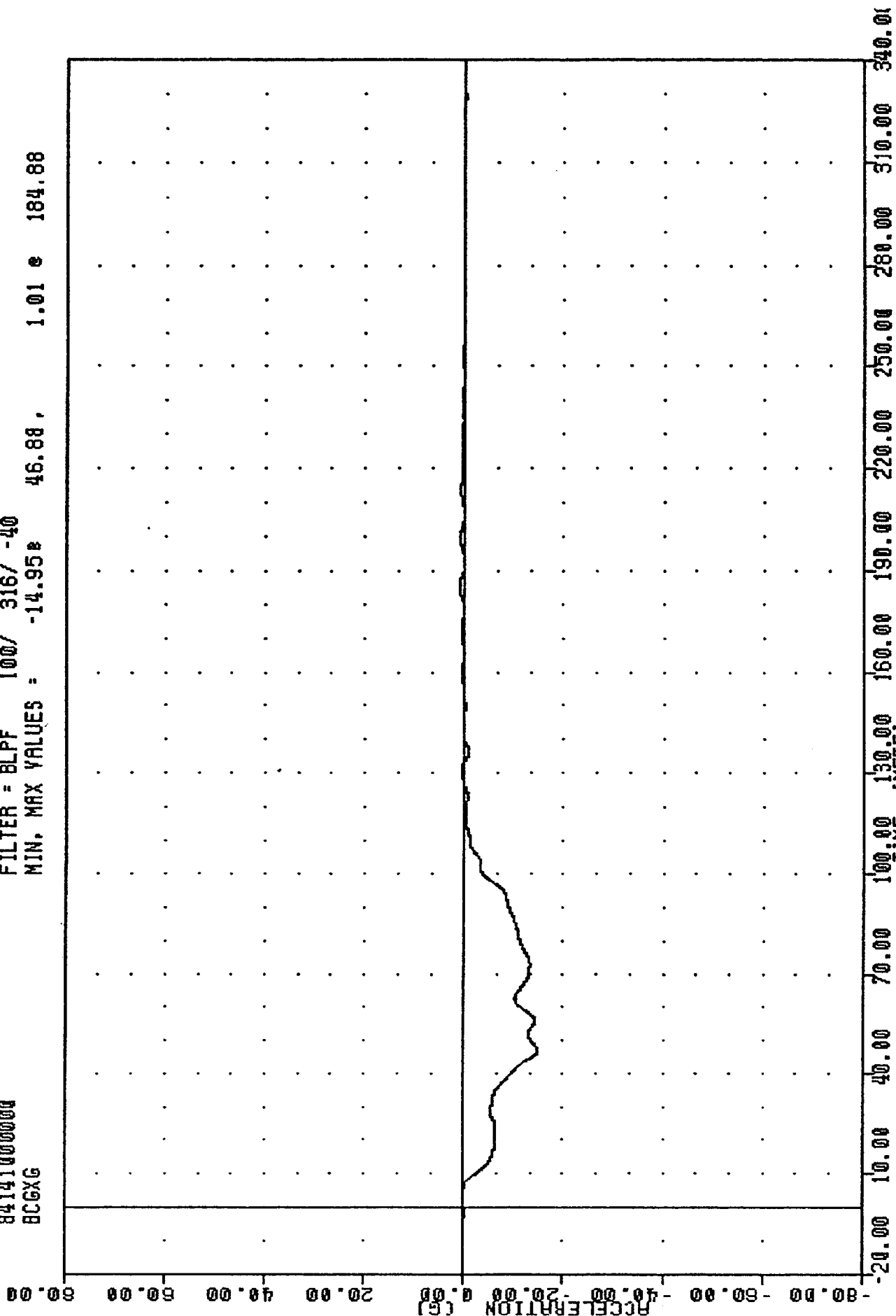
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

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

TRC
 EVALN MOD VW FLEET REPERT
 84141000000
 BCGXG

PLOT DATE 5 JUN 84 14:01:56

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -14.95 46.88, 1.01 e 184.88

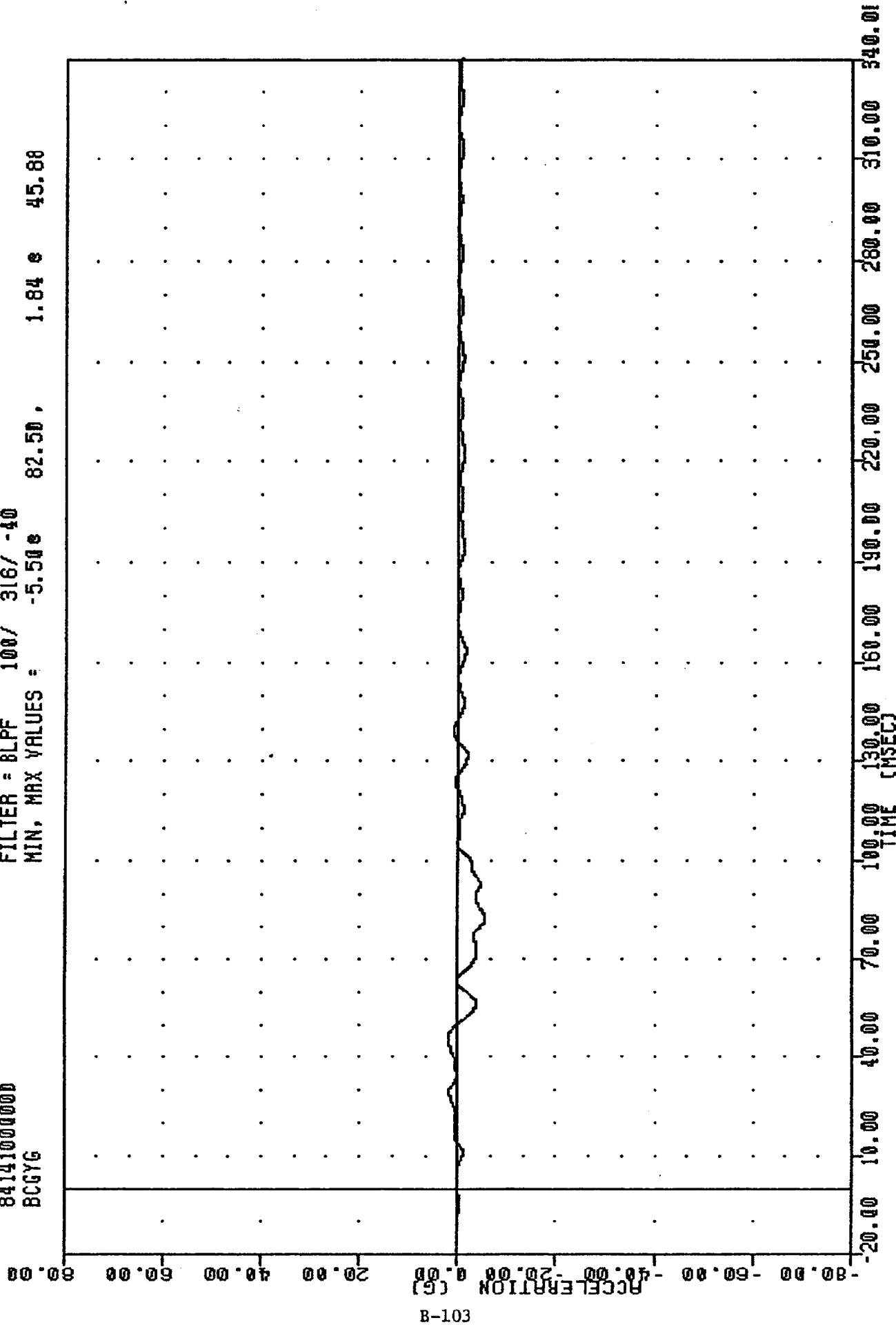


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 BARRIER CENTER OF GRAVITY X AXIS

TRC
EYALN MOD YW FLEET REPEAT
84141000000
BCGYG

PLOT DATE 5-JUN-84 14:01:58

FILTER = 8LPF 100/ 316/ -40
MIN, MAX VALUES = -5.50e 82.50. 1.84 e 45.88

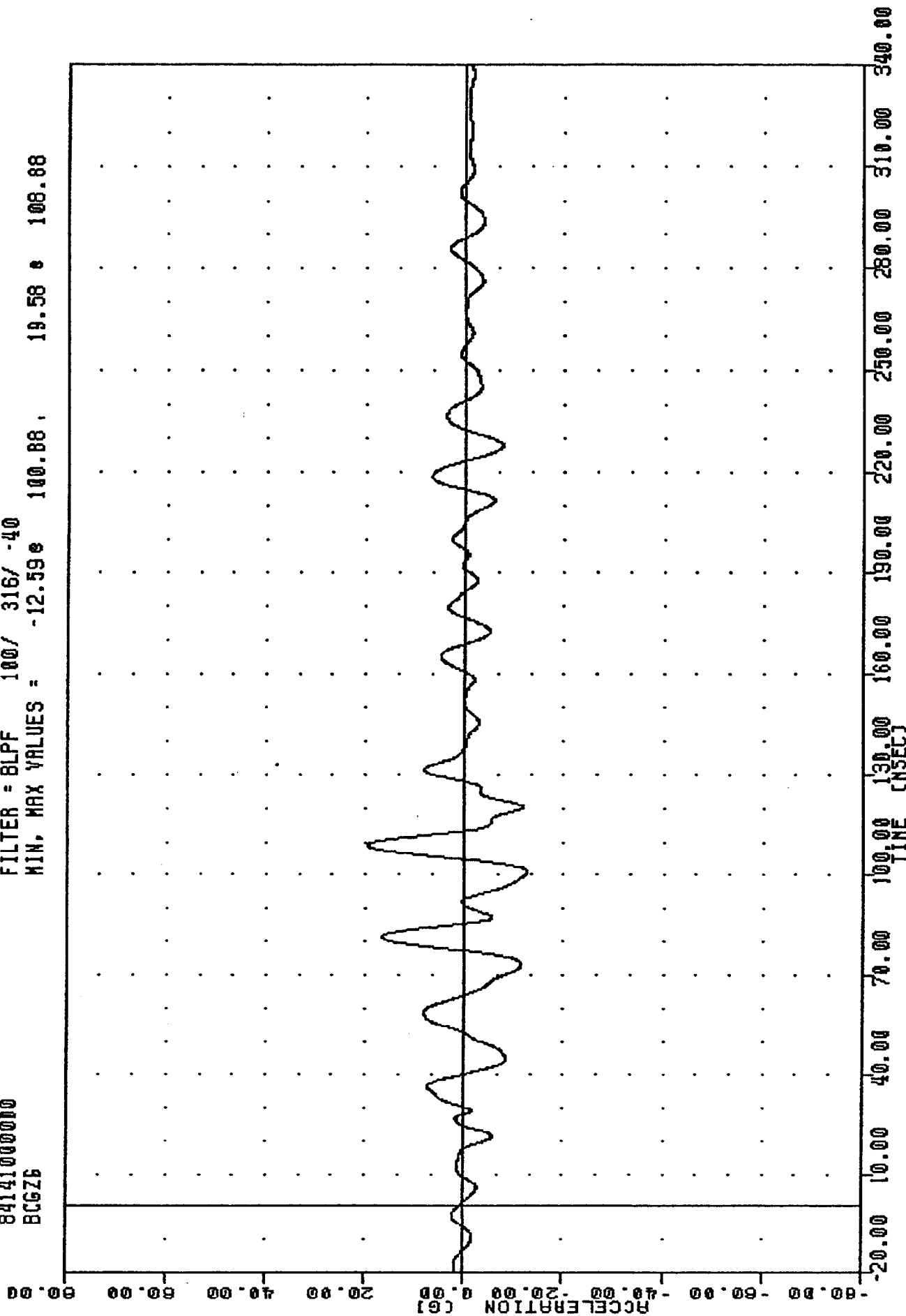


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER CENTER OF GRAVITY Y AXIS

TRC
 EVALN NOD YH FLEET REPEAT
 84141000000
 BCGZB

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -12.59e 100.88, 19.58 e 108.88



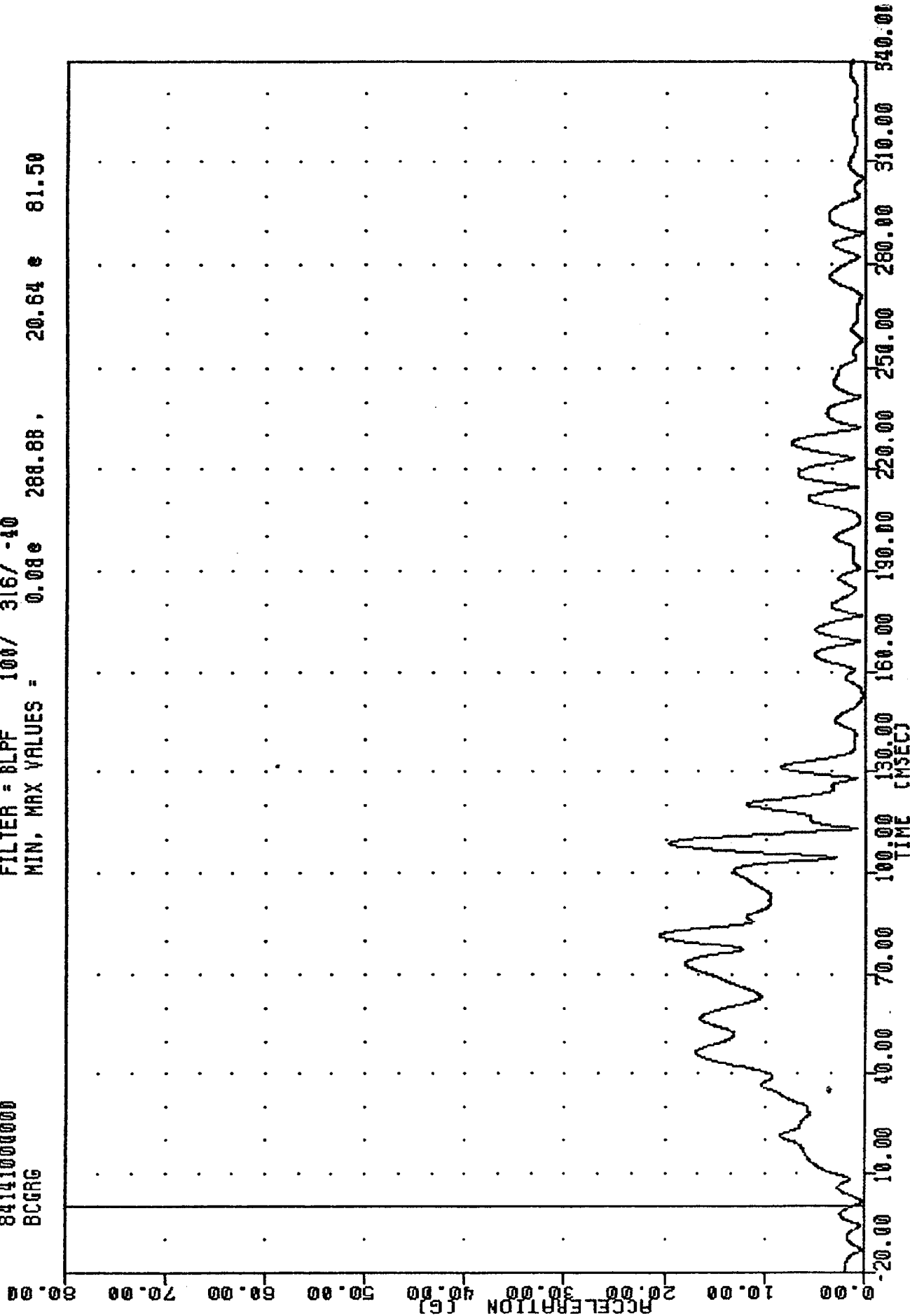
B-104

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

TRC , 040529
 EVALN MOD YV FLEET REPEAT
 84141000000
 BCGRG

PLOT DATE 5 JUN-84 14:03:22

FILTER = 8LPF 100/ 316/ -40
 MIN, MAX VALUES = 0.08e 288.88, 20.64 e 81.50



B-105

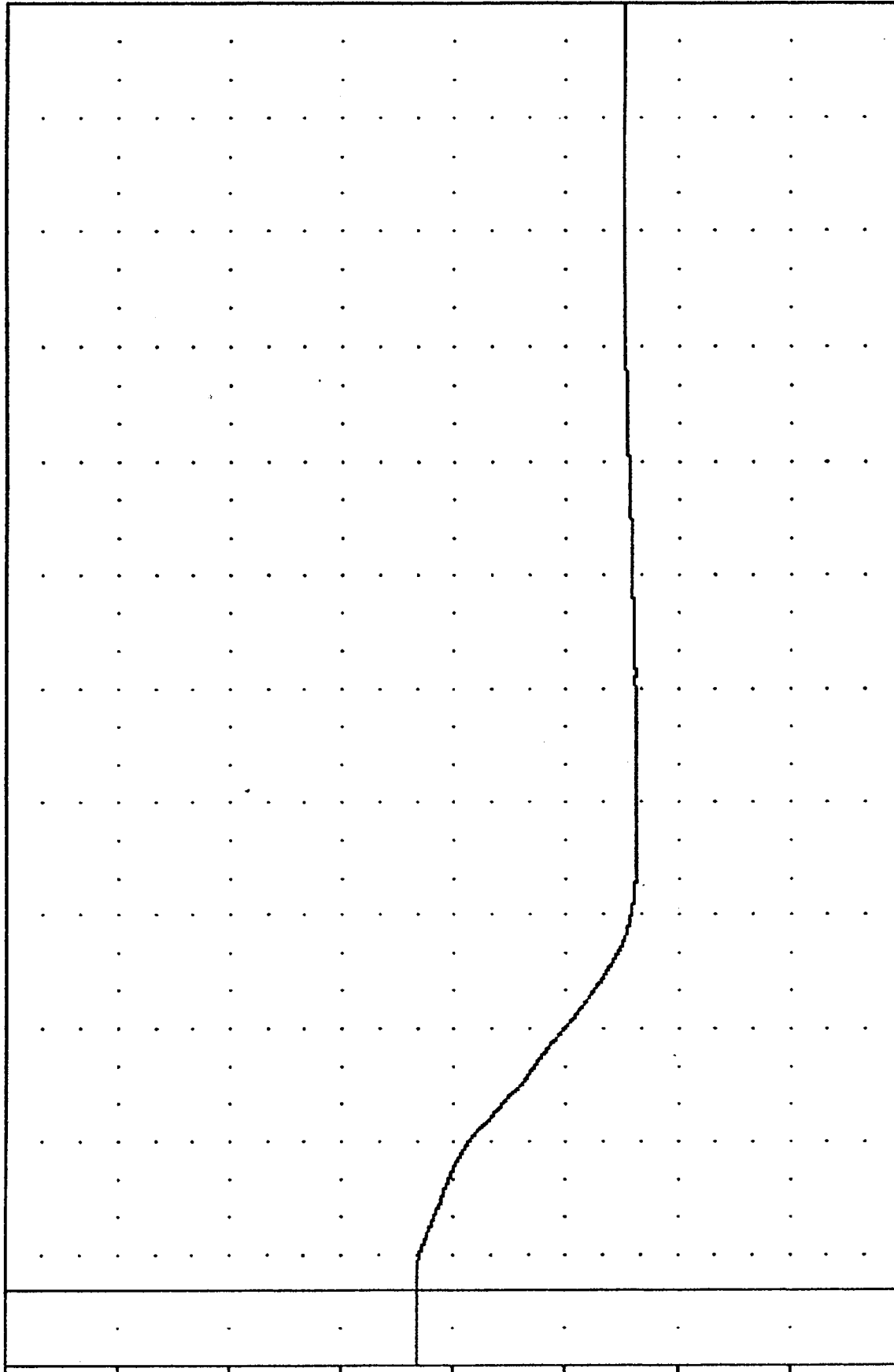
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 BARRIER CG RESULTANT

TRC
EVALN MOD VW FLEET REPEAT
84141000000
BCGXV

DATE 5 JUN 84 14:00:39

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 23.72 122.50 43.34 -8.25

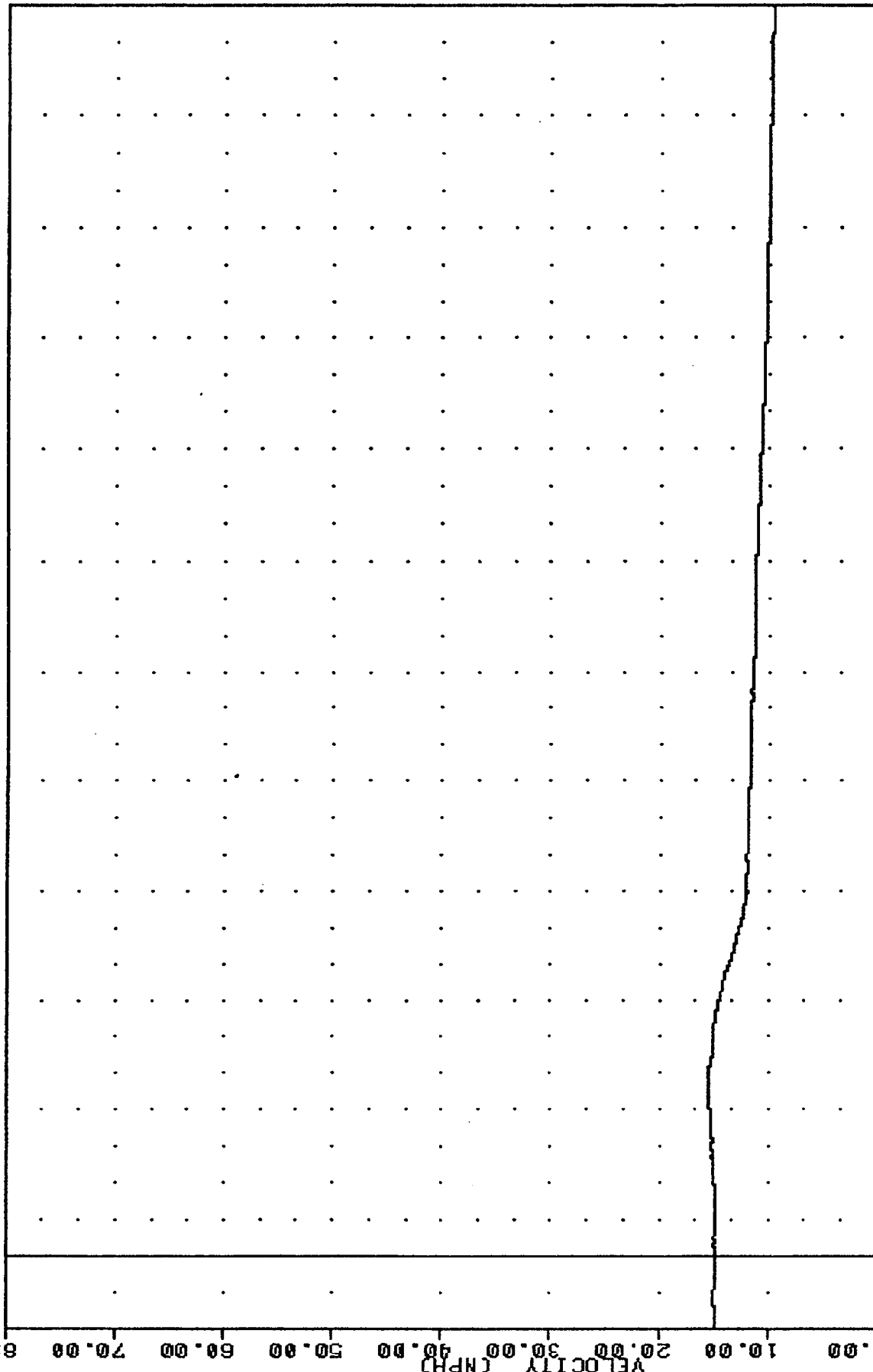
VELOCITY (MPH)



B-106

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BCGXG

TRC 840529 5-JUN-84 14:06:39
 EVALN MOD VW FLEET REPERT
 84141000000
 BCGYV
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 9.53 340.00, 15.55 46.38

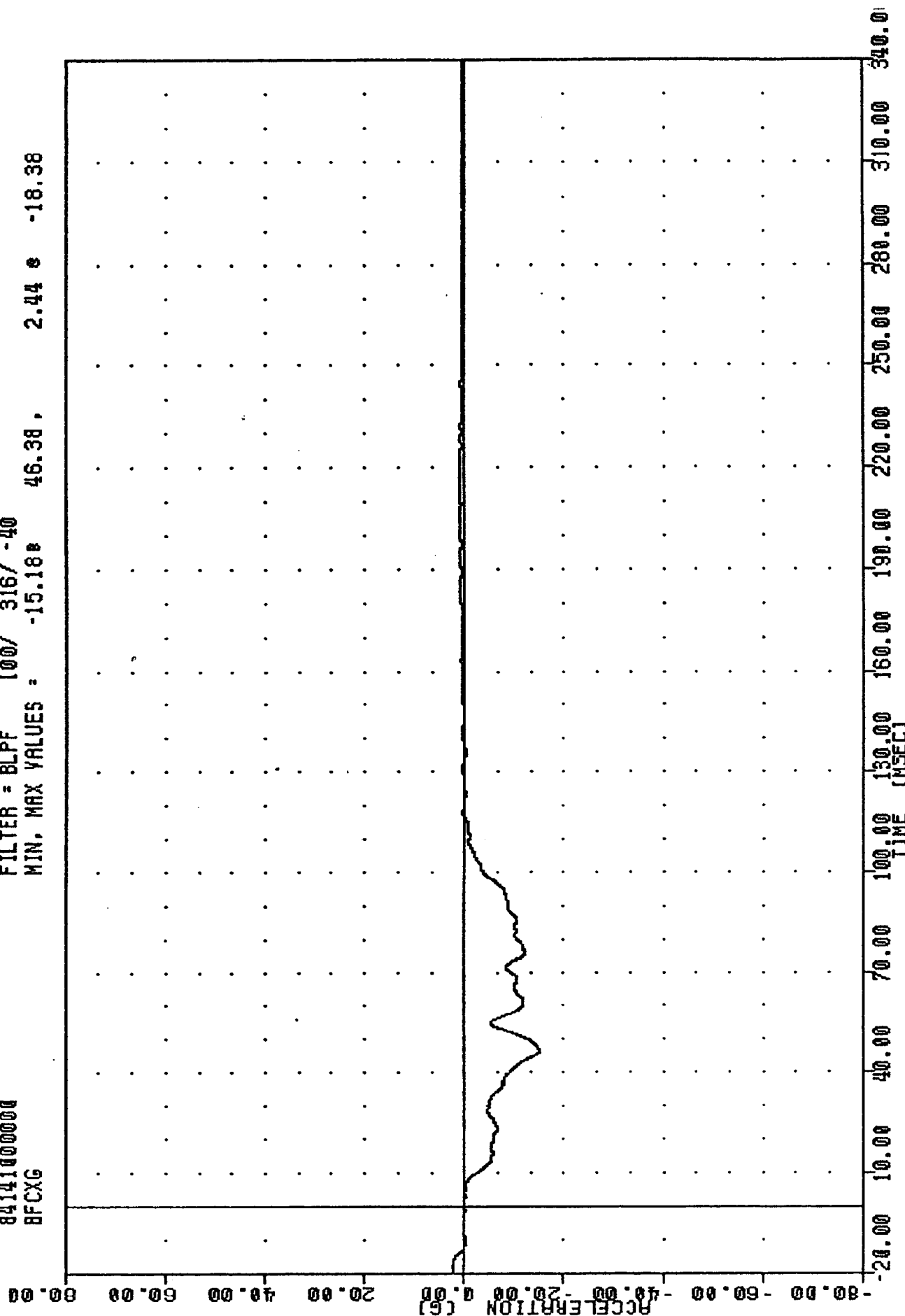


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING BCGYG

TRC
EVALN MOD VW FLEET REPERT
84141000000
BFCXG

PLOT DATE 5 JUN 84 14:01:58

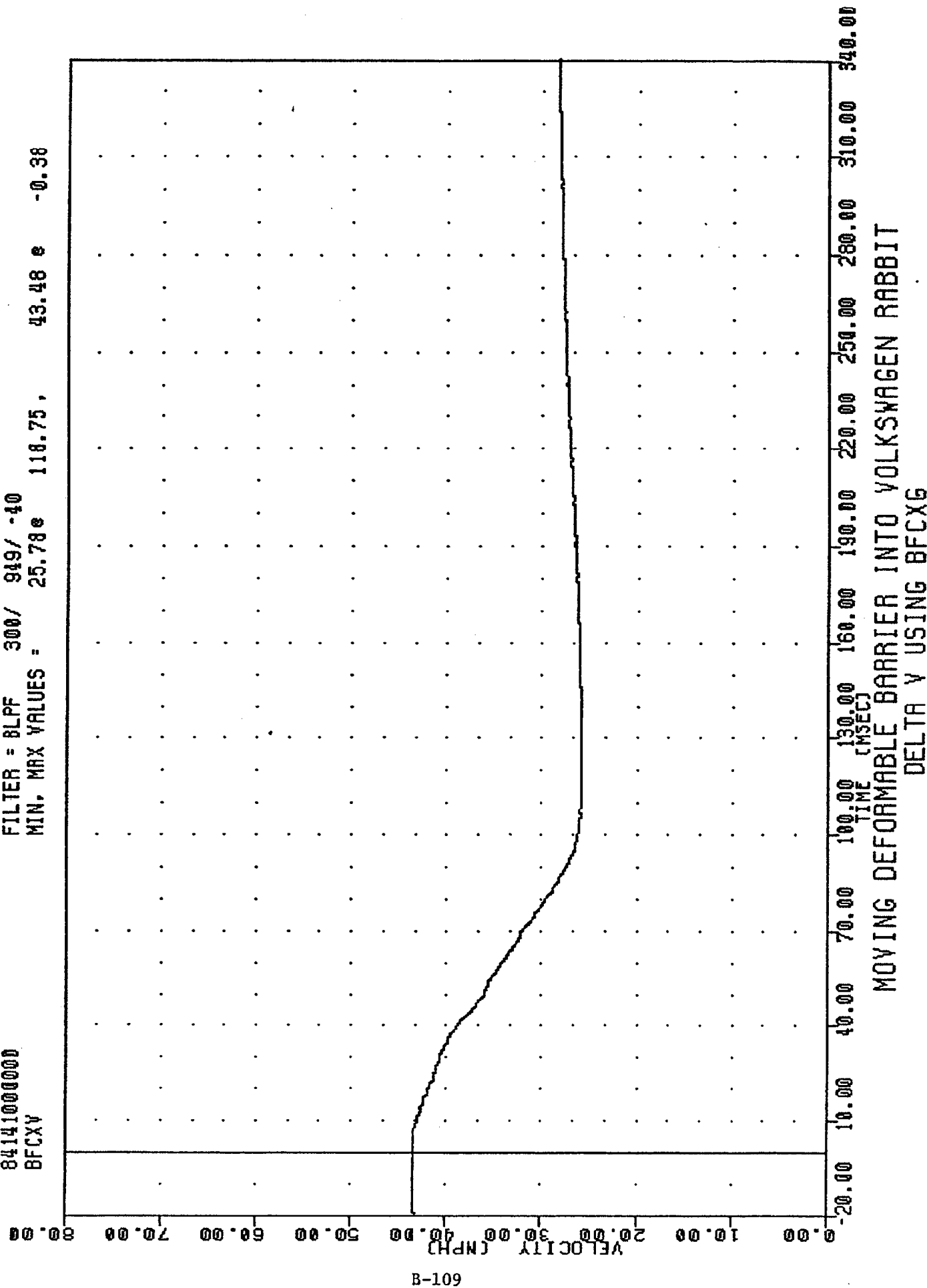
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -15.18 46.38, 2.44 -18.38



TRC
EVALN MOD VW FLEET REPERT
84141000000
BFCXY

PLOT DATE 5-JUN-84 14:06:39

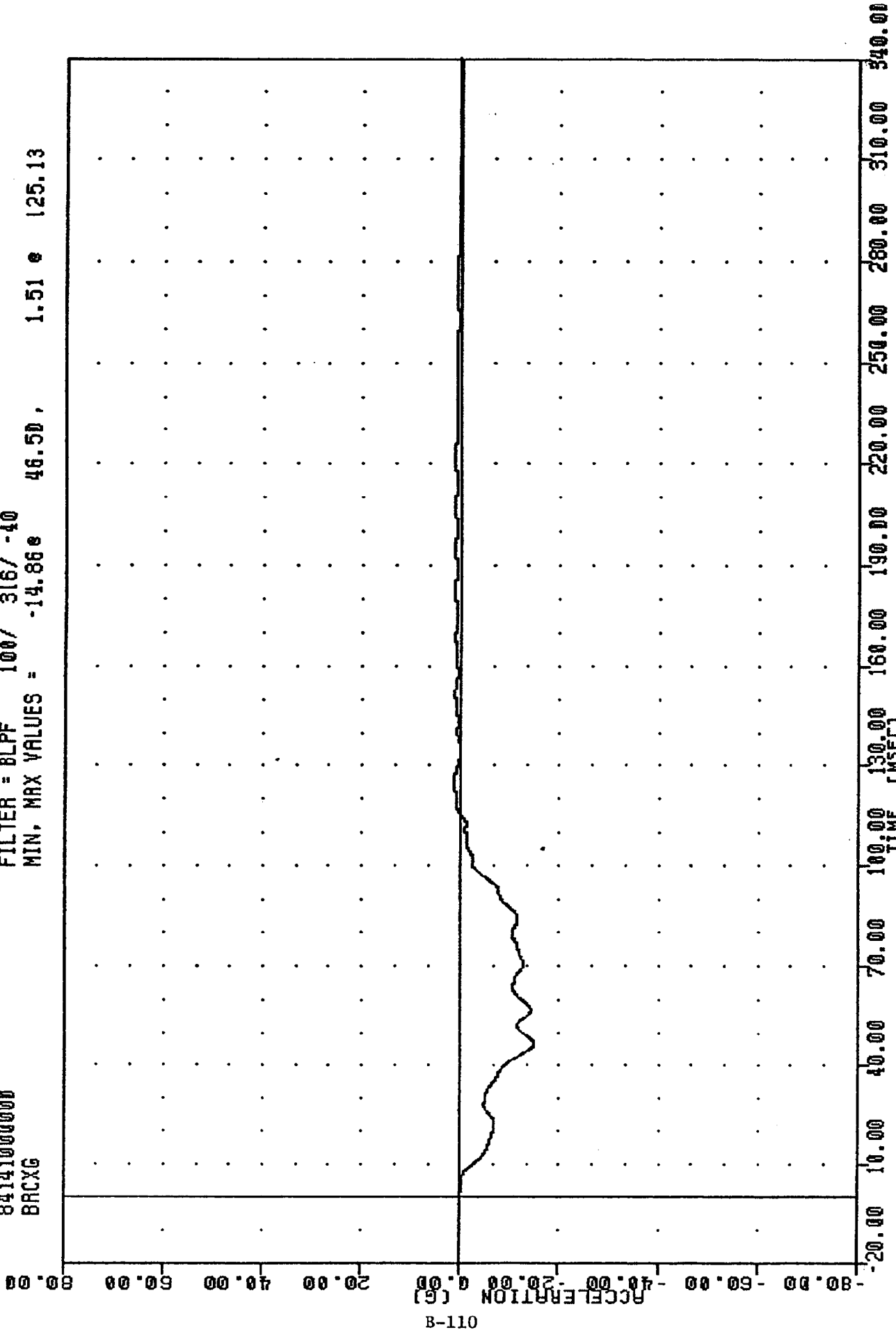
FILTER = 8LPF 300/ 949/ -40
MIN, MAX VALUES = 25.78e 118.75, 43.48 e -0.38



TRC
 EVALN MOD VV FLEET REPEAT
 84141000000
 BRCXG

PLOT DATE 5 JUN-84 14:01:58

FILTER = 8LPF 100/ 316/ -40
 MIN, MAX VALUES = -14.86e 46.50, 1.51 e 125.13

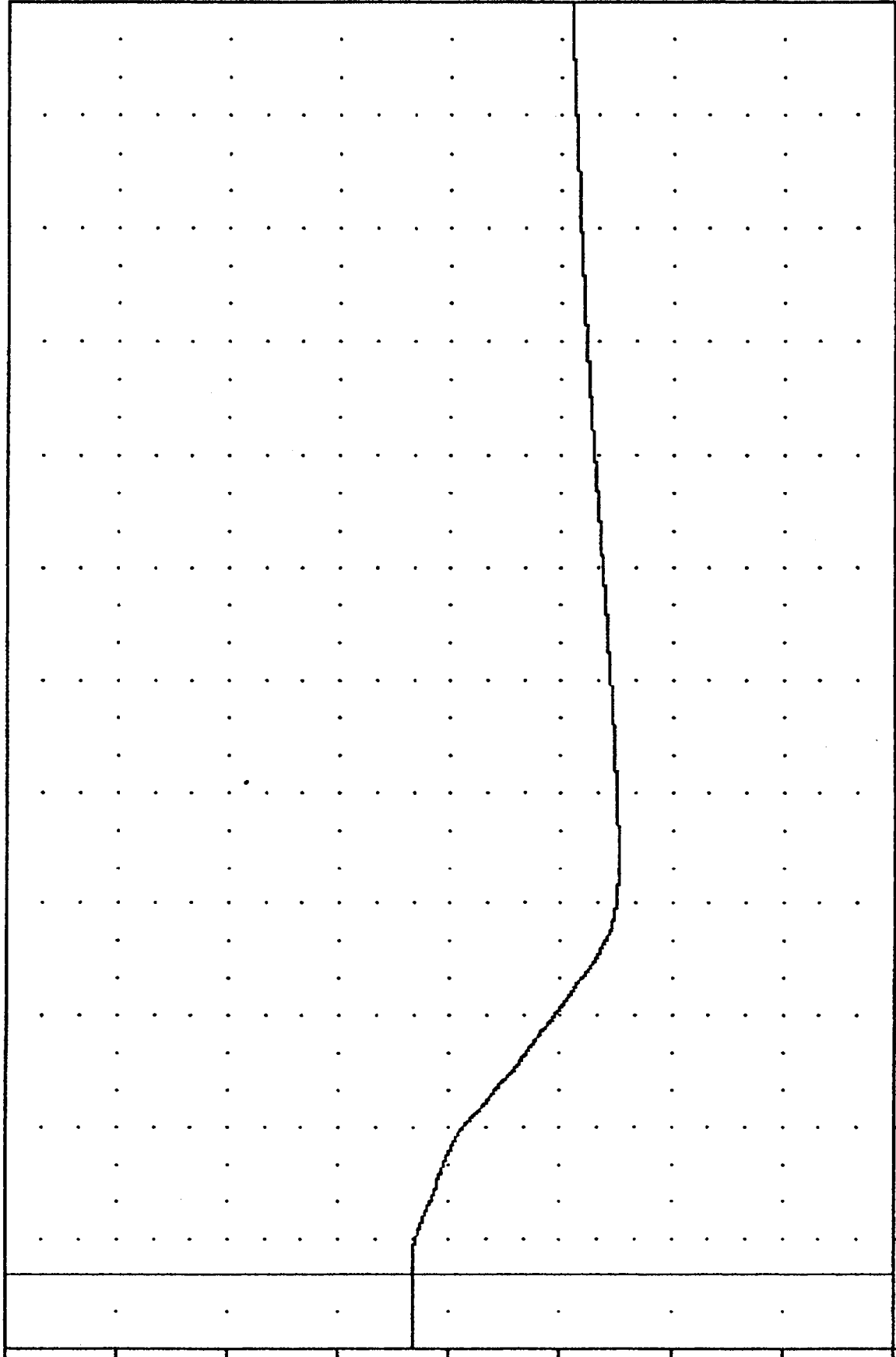


TAG 529
 EVALN MOD VH FLEET REPEAT
 84141000000
 BRXY

PLOT DATE 5 JUN-84 14:00:39

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 24.68e 112.25 , 43.33 e -3.25

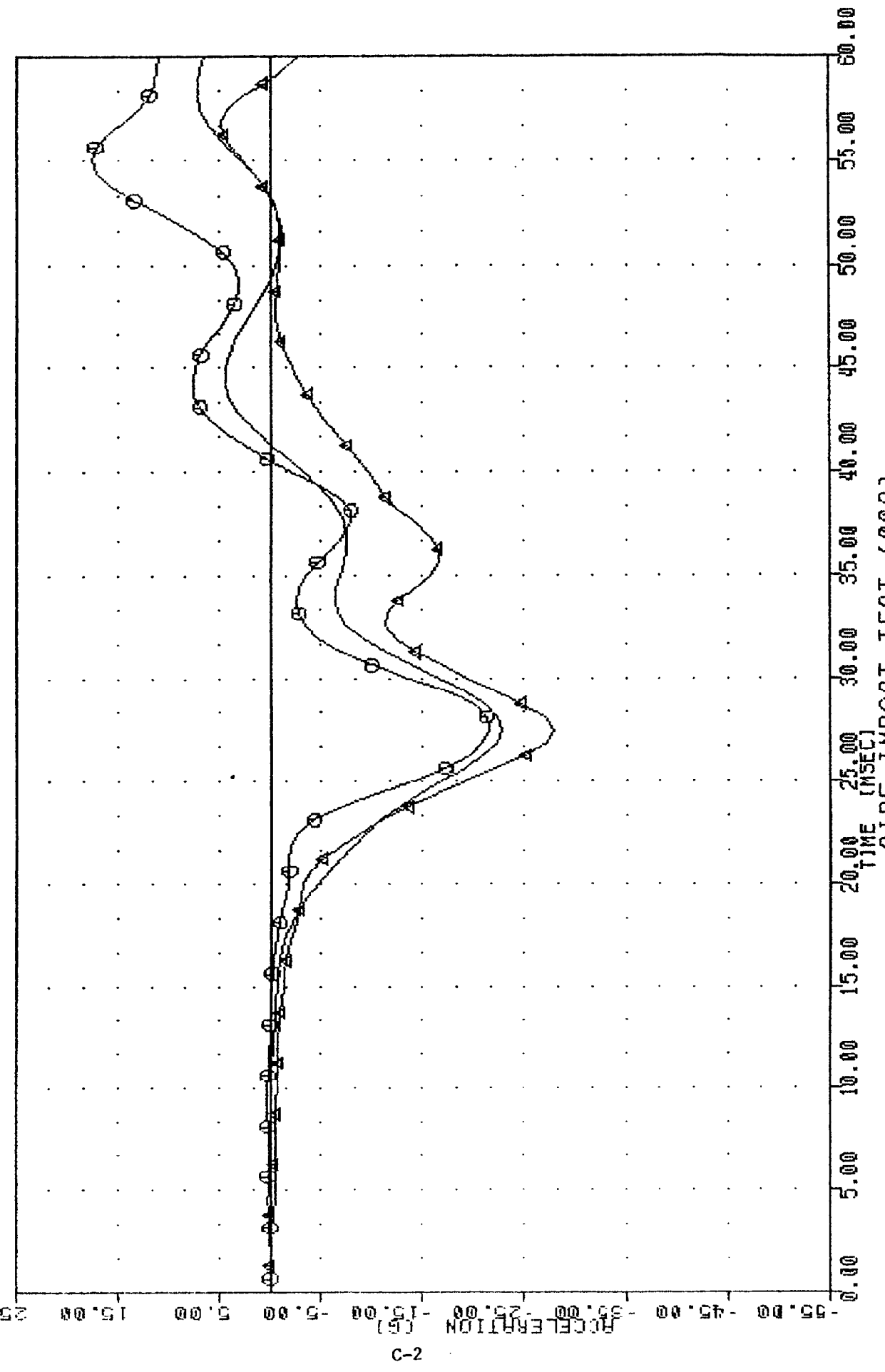
111-B
 VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING BRXY

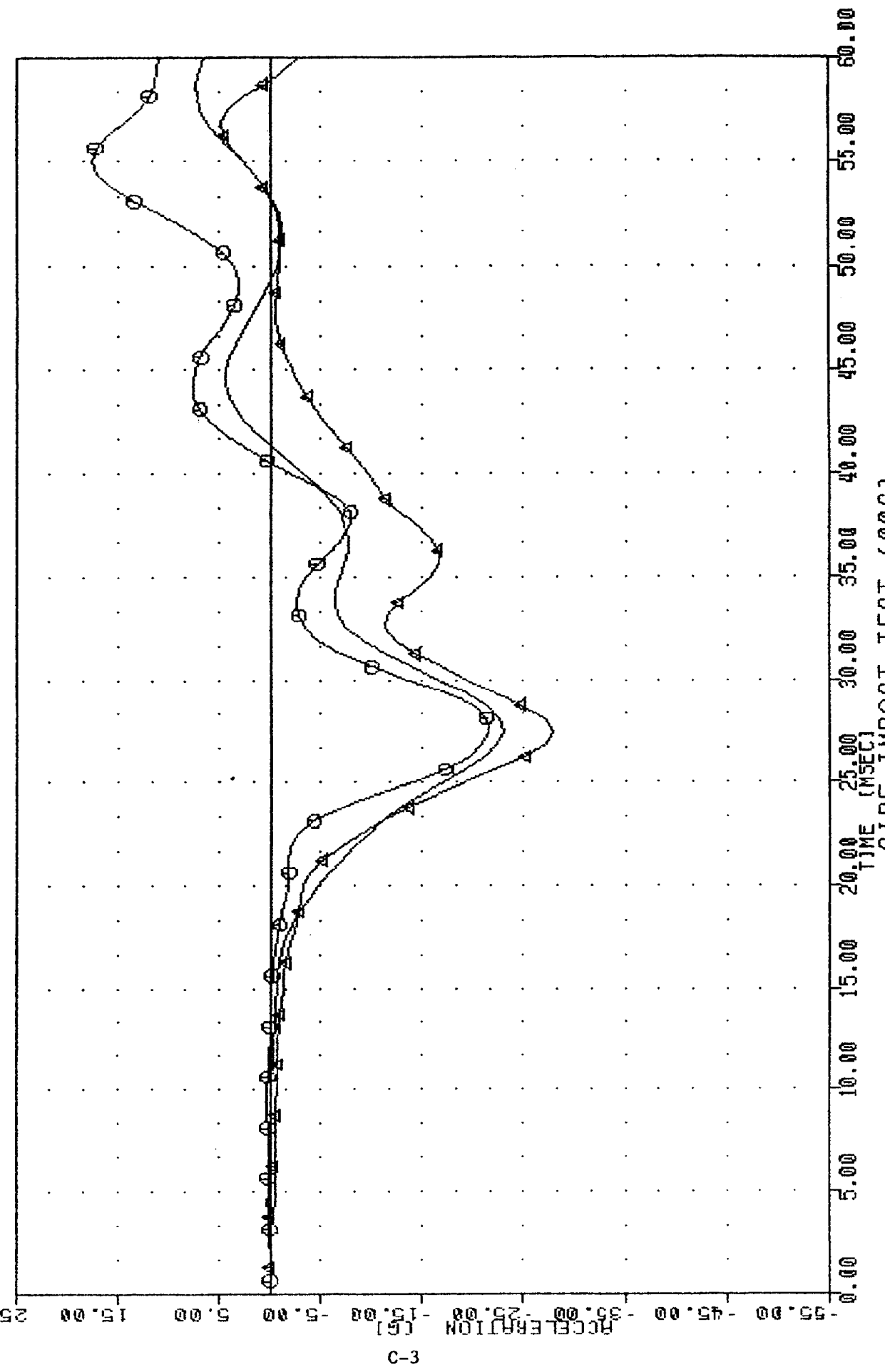
APPENDIX C
DUMMY CERTIFICATION

VMC SMC92 31006103 310 THUMAX 000 BOUT 318 CHL 103 84136 PLOT DATE 21-MAR-84 15:39:20
 T01Y61 FILTER : HSRI 136/ 189/ -50 MIN. MAX = -22.82 8 26.87 58.13
 MN-250 0 FILTER : HSRI 136/ 189/ -50 MIN. MAX = -21.58 8 28.87 54.38
 MN-250 A FILTER : HSRI 136/ 189/ -50 MIN. MAX = -27.91 8 26.87 56.25



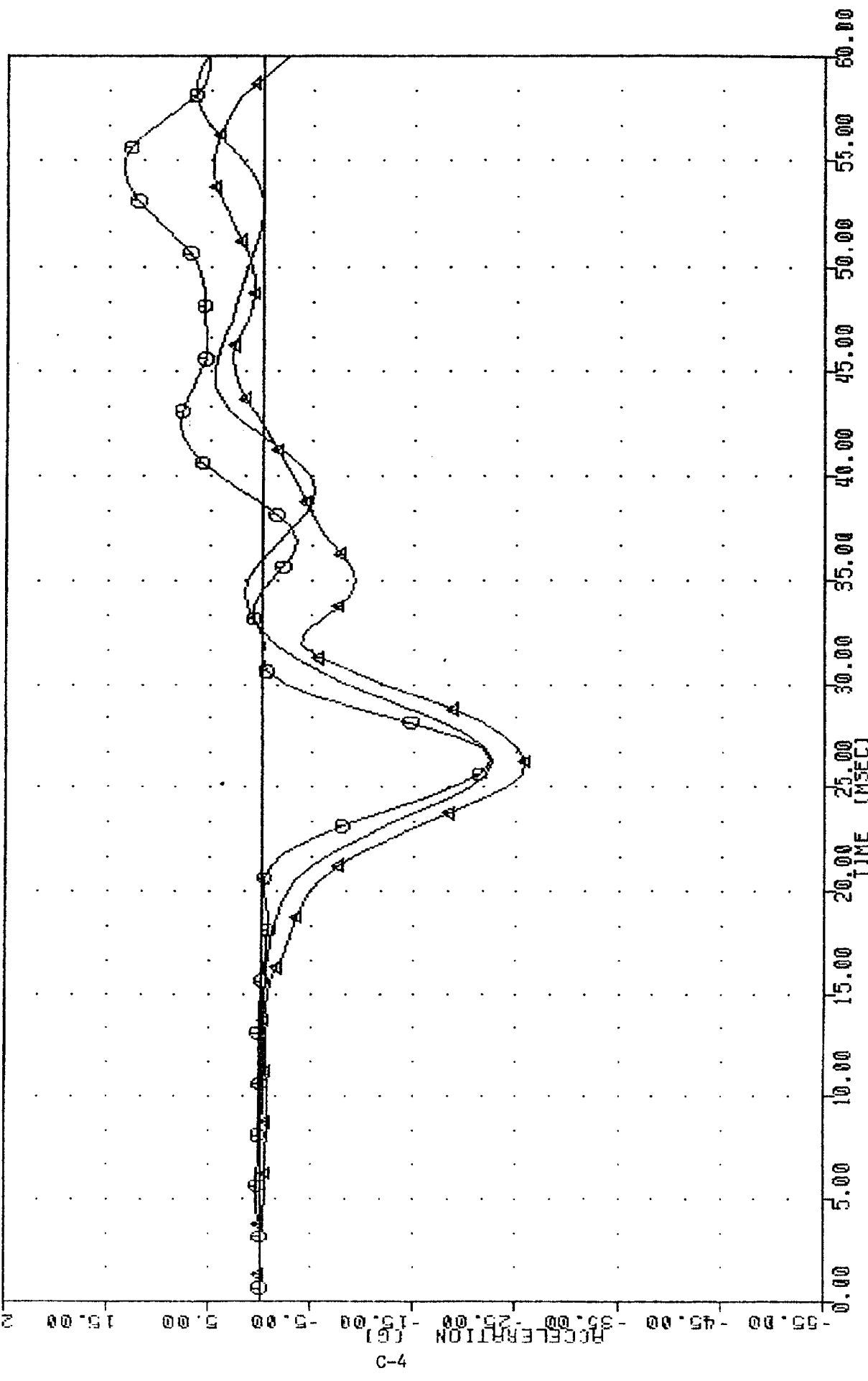
SIDE IMPACT TEST (006)
 UPPER SPINE ACCELERATION Y AXIS - 1

VMC SMC92 31006103 310 THORAX 000 BOUT 318 CHL103 84136 PLOT DATE 21-MAY-84 15:40:38
 TO1 YGR FILTER : HSRI 136/ 189/ -50 MIN, MAX = -23.03 7.23 58.13
 MN-250 0 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -21.58 17.54 54.38
 MN-250 A FILTER : HSRI 136/ 189/ -50 MIN, MAX = -27.91 4.78 56.25



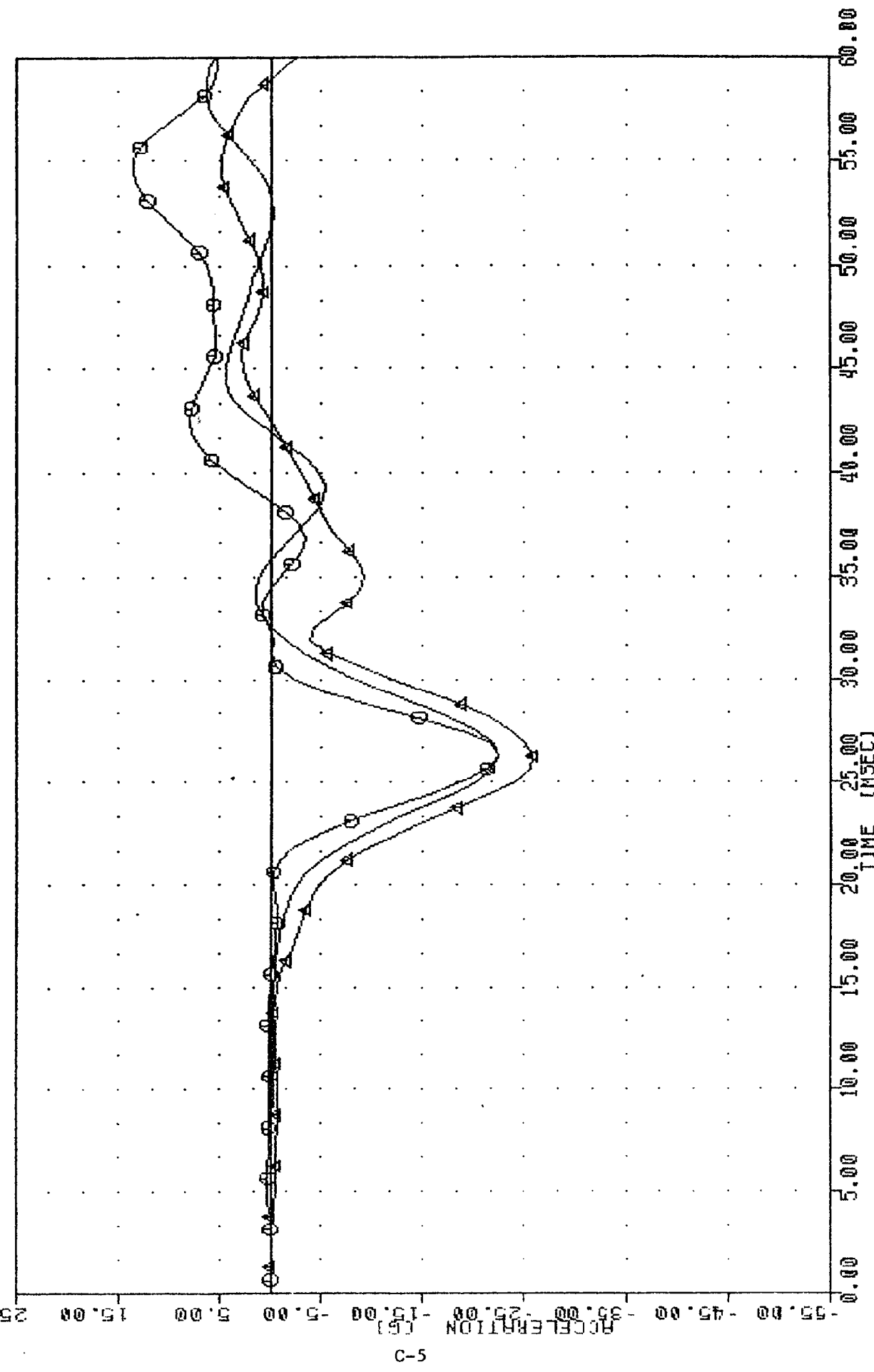
SIDE IMPACT TEST (006)
 UPPER SPINE ACCELERATION Y AXIS - A

VMC SMC92, 310061W3, 310 THORAX 006 BODY 318 CHL103 84138 PLOT DATE 21-MAY-84 15:45:02
 T12YGI FILTER : HSRI 136/ 189/ -50 MIN, MAX = -22.56 6 25.63 58.13
 MN-2SD 0 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -22.37 6 25.63 53.75
 MN-2SD A FILTER : HSRI 136/ 189/ -50 MIN, MAX = -25.84 6 25.63 53.75



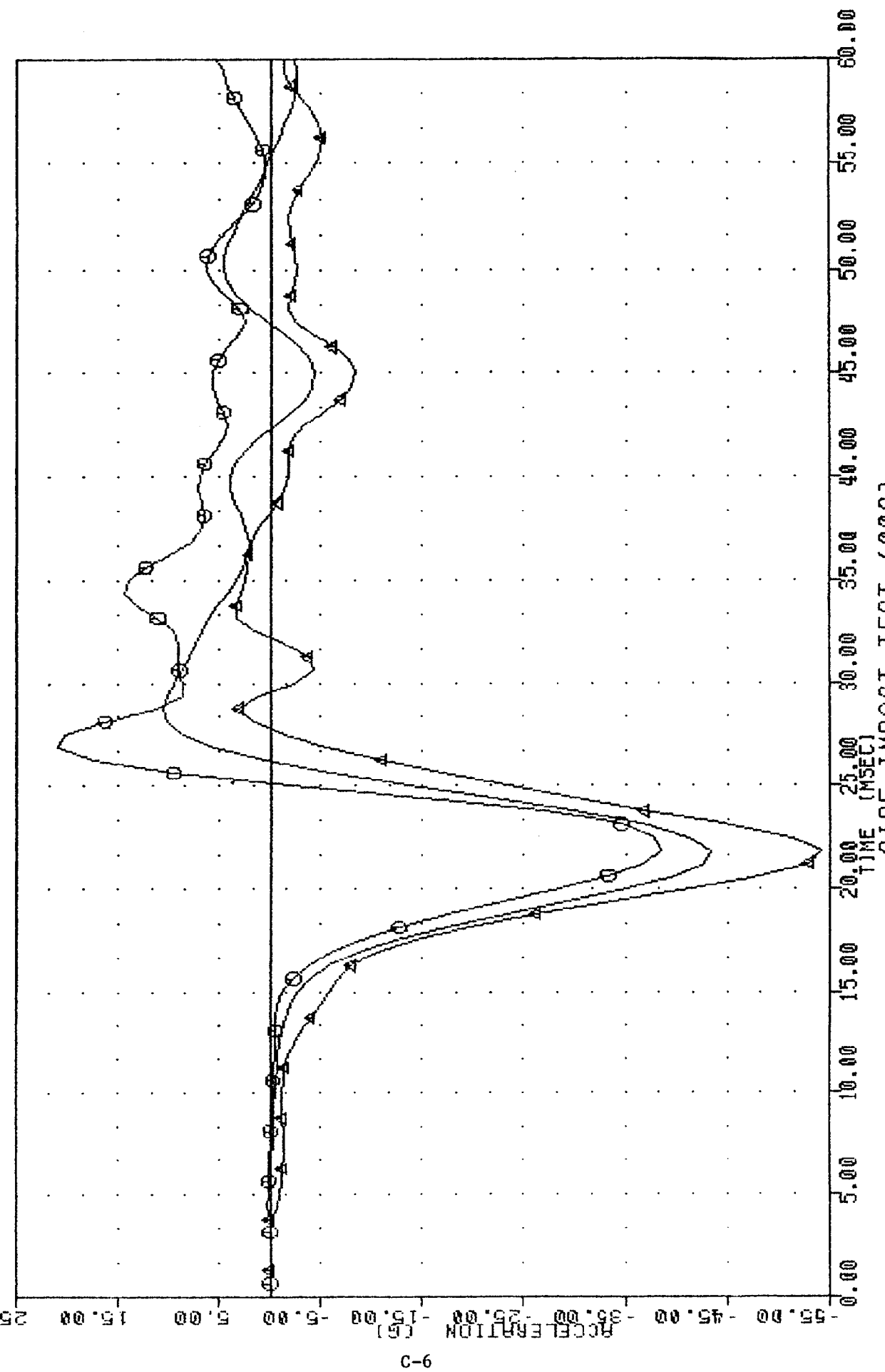
SIDE IMPACT TEST (006)
 LOWER SPINE ACCELERATION Y AXIS - 1

VMC SML92 31006103 310 THUMAX 000 BOUT 318 CHL103 04136 21-MAT-04 15:44:05
 T12YGH FILTER : HSRI 136/ 189/ -50 MIN. MAX = -22.40 25.63 25.63 6.37 57.50
 MN-250 0 FILTER : HSRI 136/ 189/ -50 MIN. MAX = -22.37 25.63 25.63 13.54 53.75
 MN-250 1 FILTER : HSRI 136/ 189/ -50 MIN. MAX = -25.84 25.63 25.63 4.85 53.75



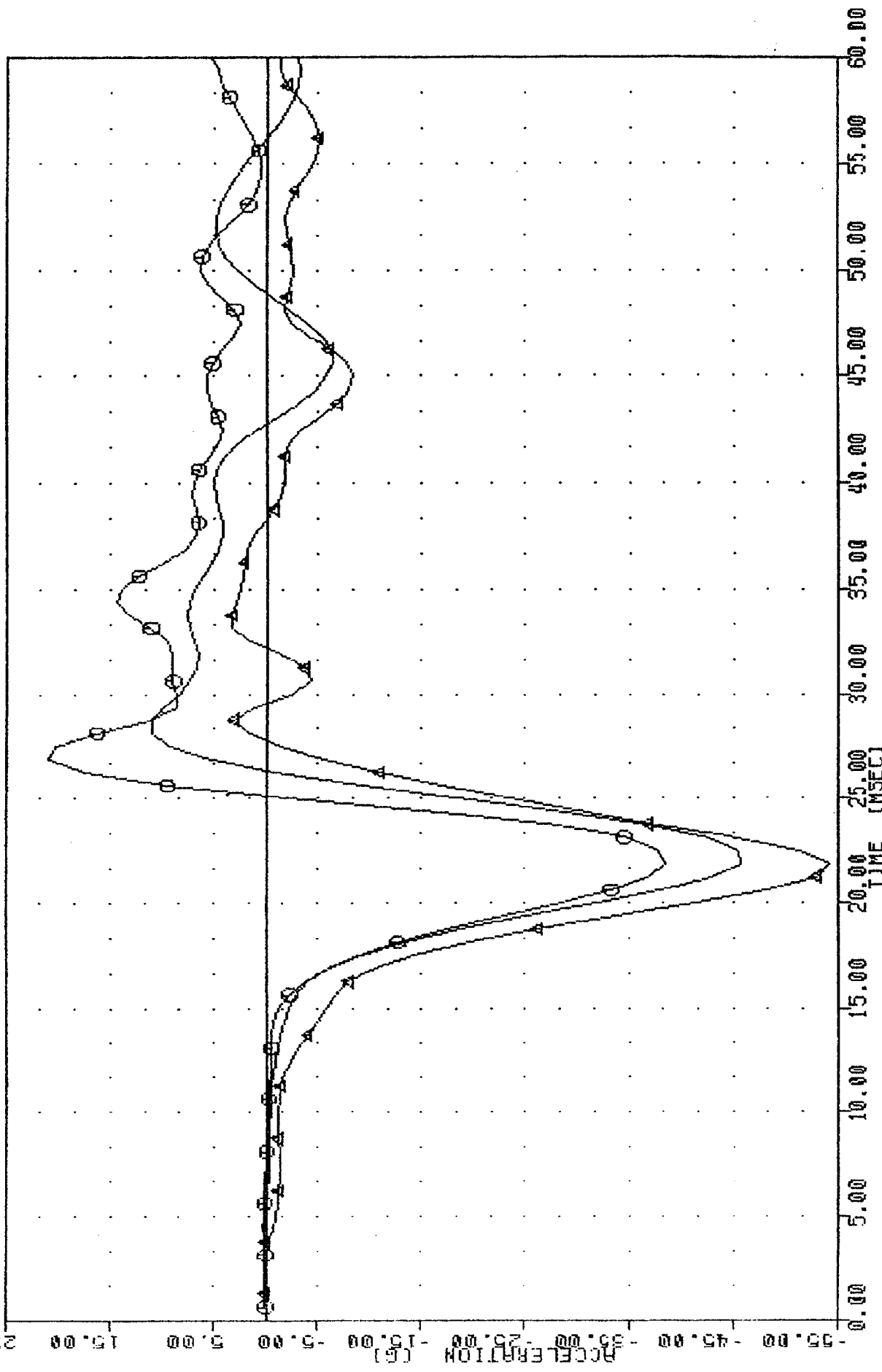
SIDE IMPACT TEST (006)
 LOWER SPINE ACCELERATION Y AXIS - A

WNTC SHEL32 21006103 STD THUMMX DNG BOUT 318 Ch103 04130 PLOT DATE 27-MAR-04 15:41:37
 LURYGI FILTER : HSRI 136/ 189/ -50 MIN. MAX = -43.31 21.25 28.13
 MN-250 0 FILTER : HSRI 136/ 189/ -50 MIN. MAX = -38.44 21.25 28.25
 MN-250 A FILTER : HSRI 136/ 189/ -50 MIN. MAX = -54.08 21.25 33.13



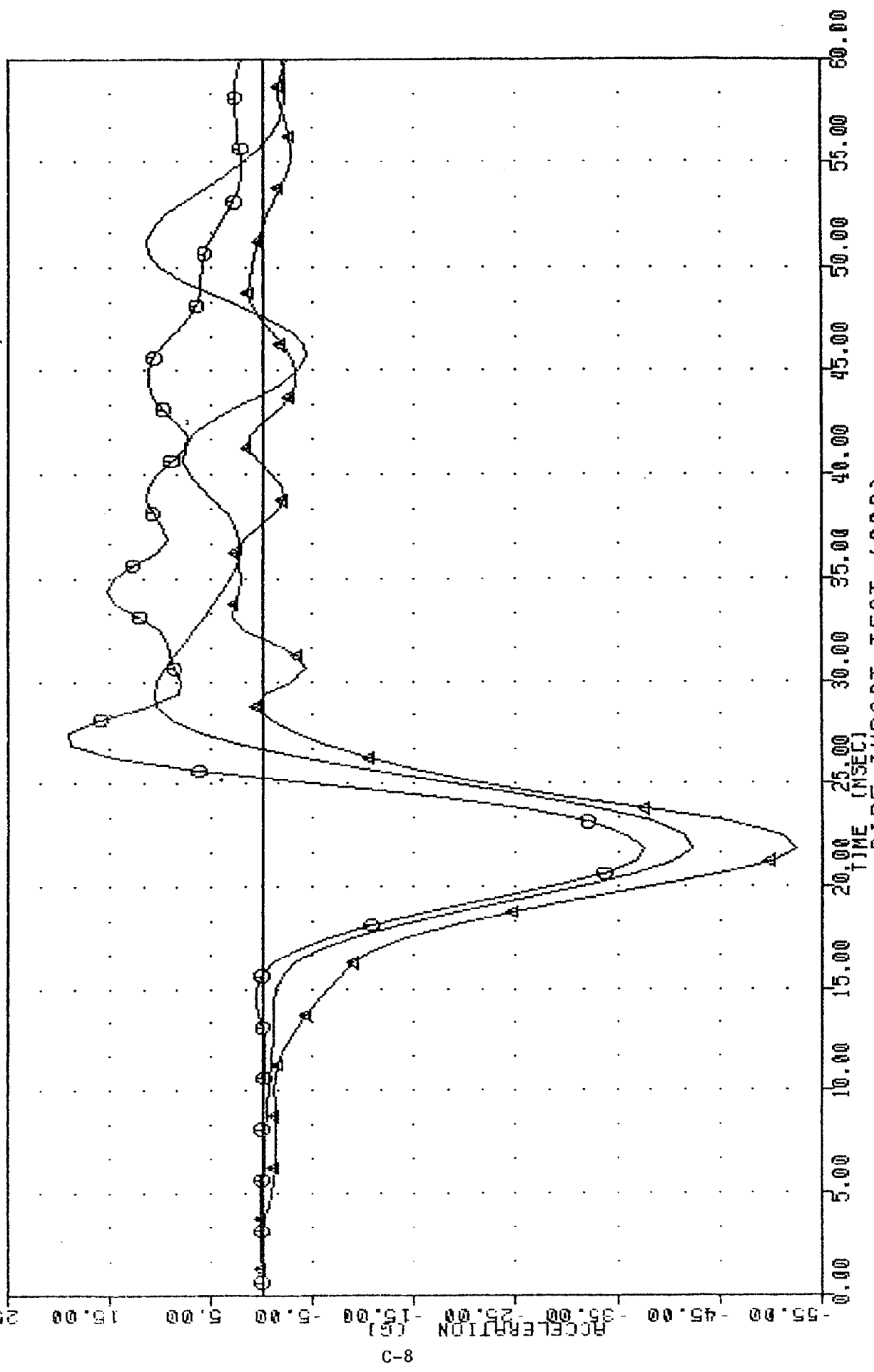
SIDE IMPACT TEST (0006)
 LEFT UPPER RIB ACCELERATION Y AXIS - 1

VMC SHL92, SIV06103, STD THURAX 000 BOUT 318 CHL103 84138 PLOT DATE 21-MAY-84 15:48:07
 LURYGA FILTER: HSRI 136/ 189/ -50 MIN, MAX = -45.61 21.25 10.860 28.13
 MN-250 0 FILTER: HSRI 136/ 189/ -50 MIN, MAX = -38.44 21.25 20.920 26.25
 MN-250 A FILTER: HSRI 136/ 189/ -50 MIN, MAX = -54.08 21.25 3.310 33.13



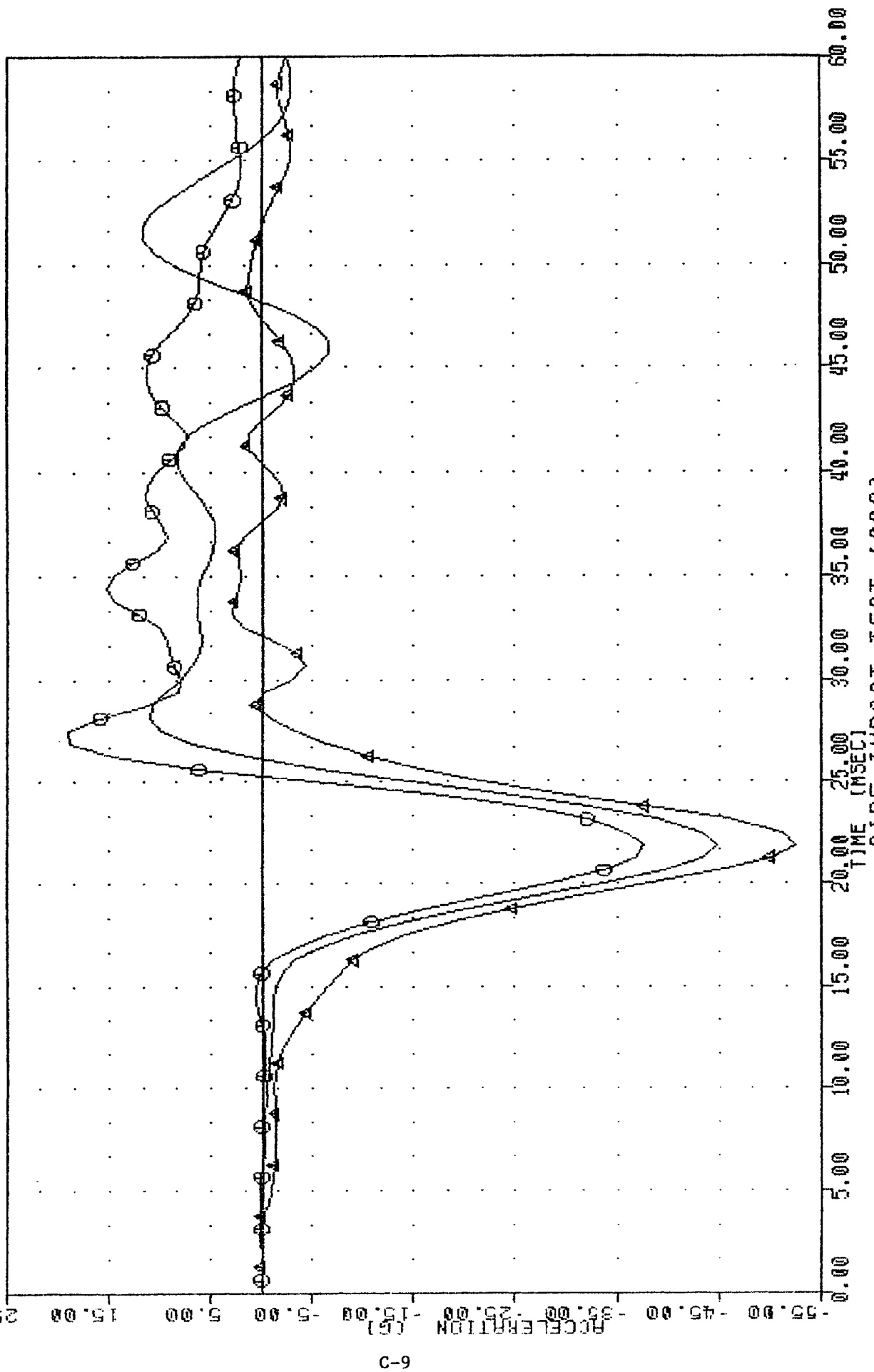
SIDE IMPACT TEST (0006)
 LEFT UPPER RIB ACCELERATION Y AXIS - A

VRLC SRI92
 LRLY61
 MN-250
 MN-250
 STU THURAX 006 BODY 318 CHL103 84138
 FILTER : HSRI 136/ 189/ -50 MIN. MAX =
 FILTER : HSRI 136/ 189/ -50 MIN. MAX =
 FILTER : HSRI 136/ 189/ -50 MIN. MAX =
 PLOT DATE 21-MAY-84 15:45:22
 21.25 11.44 50.63
 21.25 10.00 26.87
 21.25 2.94 32.50



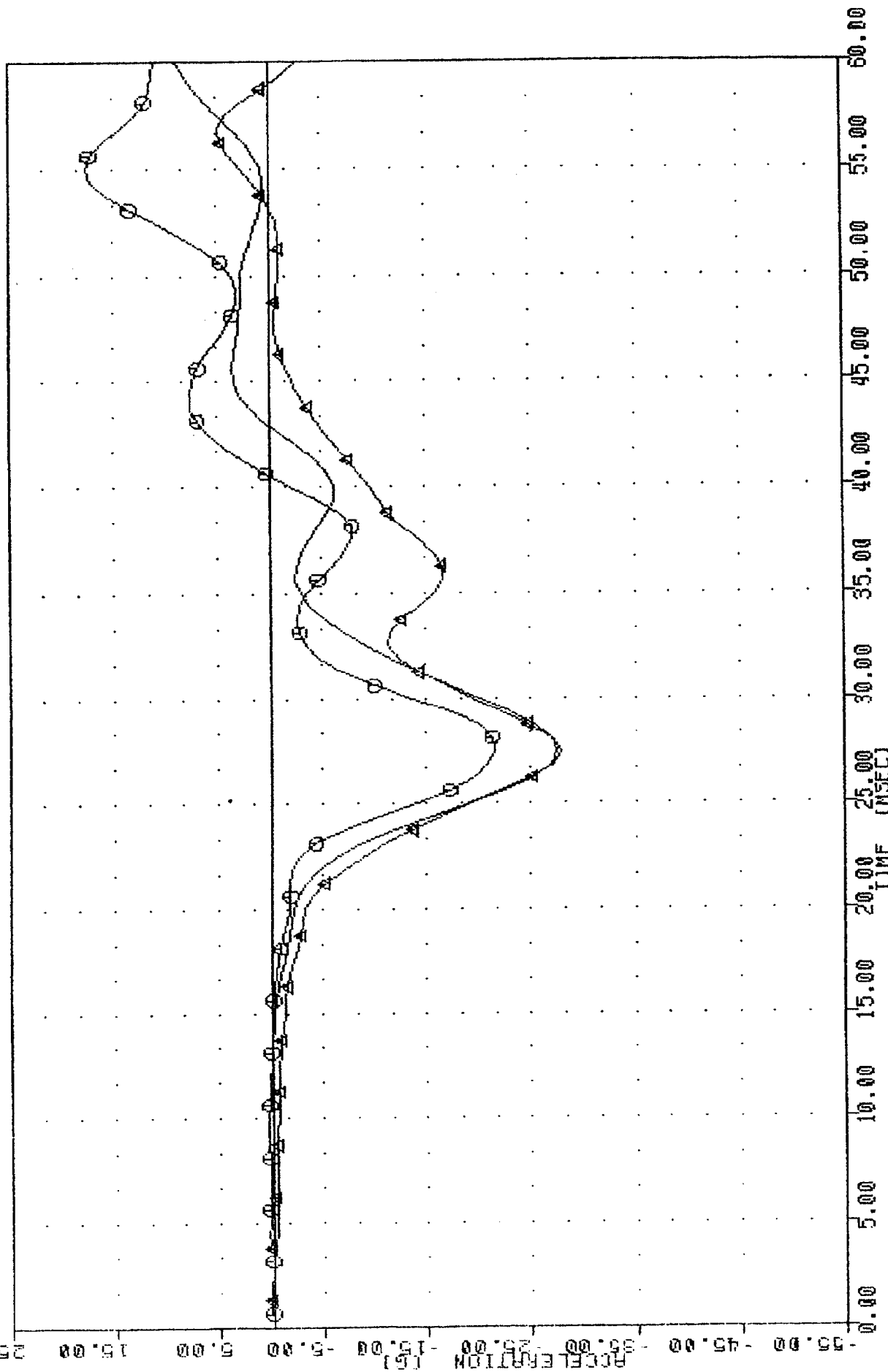
SIDE IMPACT TEST (0006)
 LEFT LOWER RIB ACCELERATION Y AXIS - 1

VRTC SFL92, 51006103, STD THORAX 005 BODY 318 CHL103 84138, PLOT DATE 21-MAY-84 15:47:12
 LLRYGR FILTER: HSRI 136/ 189/ -50 MIN, MAX = -44.83 21.25, 11.54 50.63
 MN-250 FILTER: HSRI 136/ 189/ -50 MIN, MAX = -37.66 21.25, 19.00 26.87
 MN-250 FILTER: HSRI 136/ 189/ -50 MIN, MAX = -52.52 21.25, 2.94 32.50



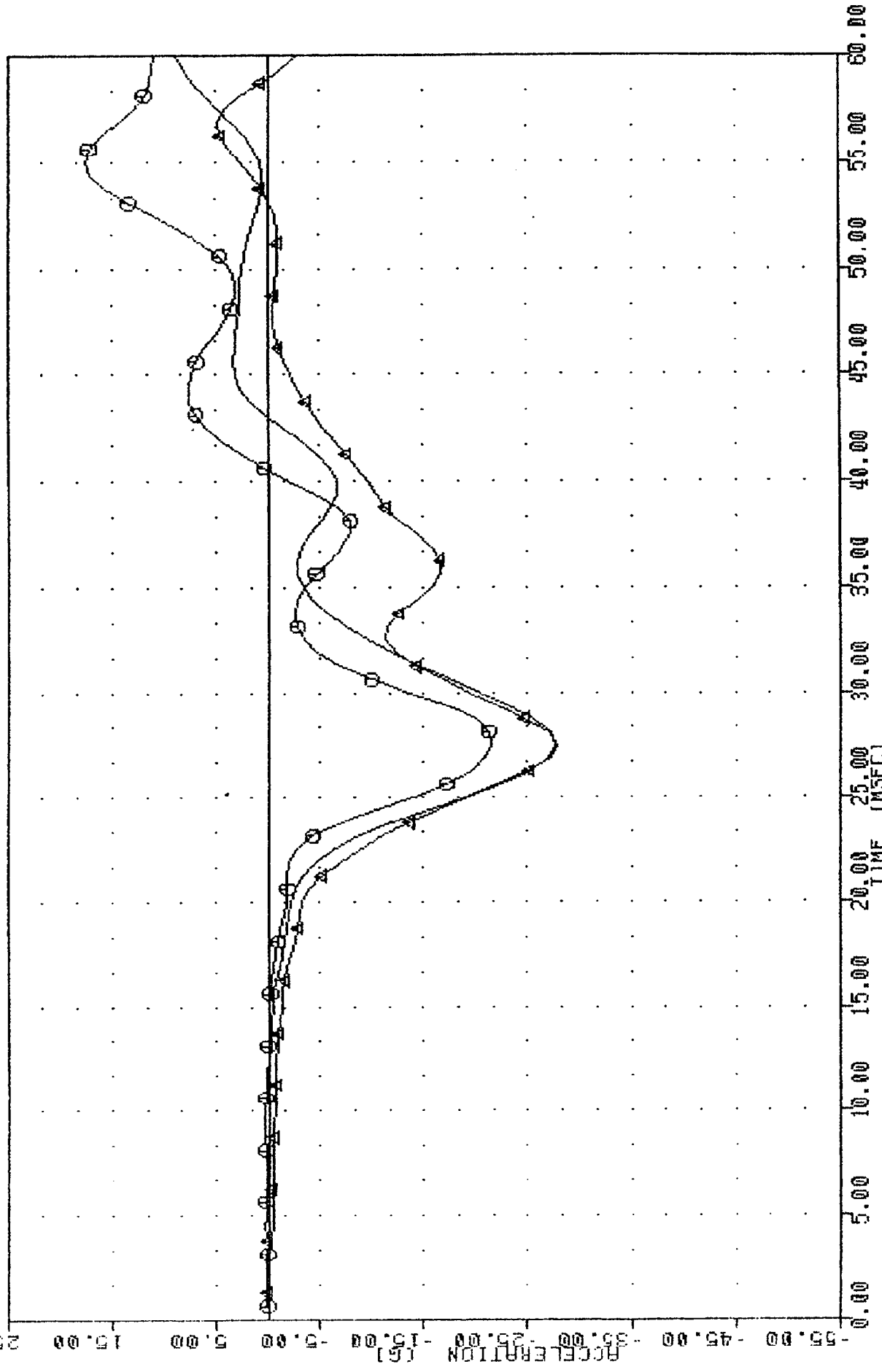
SIDE IMPACT TEST (006)
 LEFT LOWER RIB ACCELERATION Y AXIS - A

WRID SCL92 , SID THURAX U02 BODY 830 CHL102 84137 PLOT DATE 21-MAY-84 15:54:32
 T01Y61 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -27.57 9.24 60.00
 MN-2SD 0 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -21.58 17.54 54.38
 MN-2SD 4 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -27.91 26.87 56.25



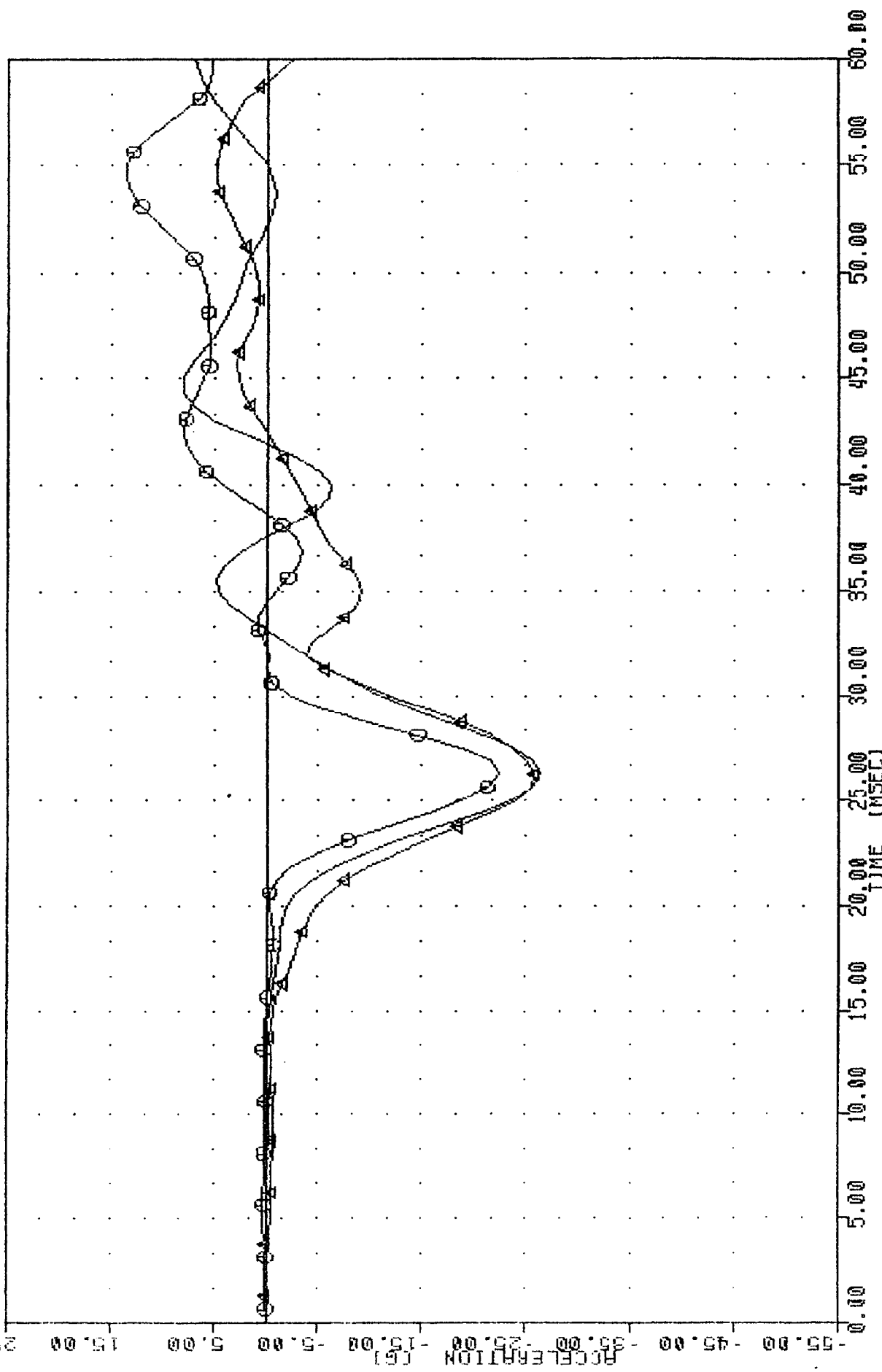
SIDE IMPACT TEST (U02)
 UPPER SPINE ACCELERATION Y AXIS - 1

WRIC SRI92, S1002102, S10 THURAX 002 BODY 830 CHL102 84137 PLOT DATE 21-MAR-84 15:55:46
 TOLYGA FILTER: HSRI 136/ 189/ -50 MIN, MAX = -27.72 8 26.87 9.21e 60.00
 MN-250 0 FILTER: HSRI 136/ 189/ -50 MIN, MAX = -21.58 8 26.87 17.54e 54.38
 MN-250 4 FILTER: HSRI 136/ 189/ -50 MIN, MAX = -27.91 8 26.87 4.78e 56.25



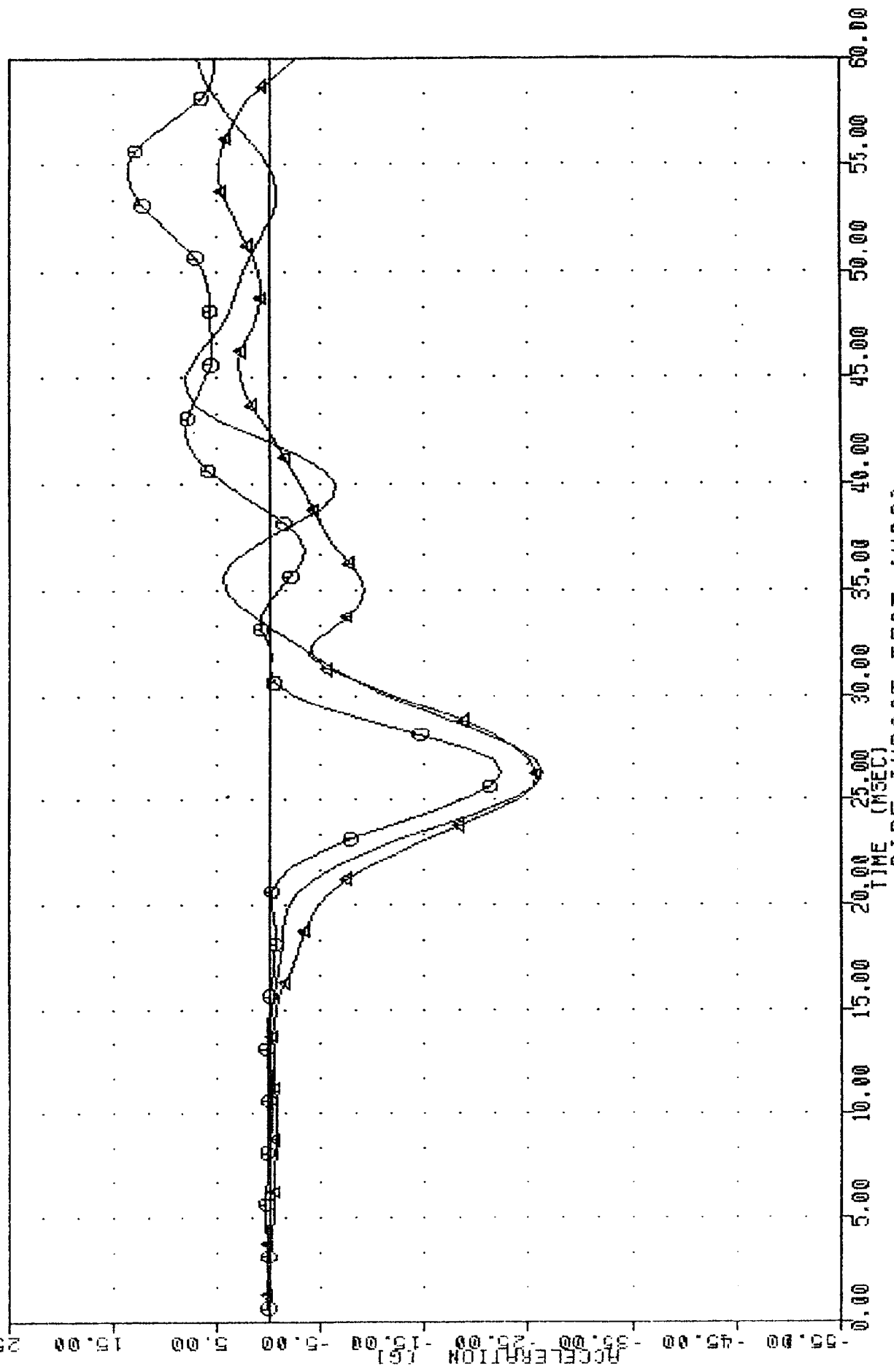
SIDE IMPACT TEST (U02)
 UPPER SPINE ACCELERATION Y AXIS - A

VRTG SML92, 310021WZ, 510 THURAX OV2 BODY 830 CHL102 84137 PLOT DATE 21-MAY-84 15:56:34
 T12Y61 FILTER: HSRI 136/ 189/ -50 MIN. MAX = -26.36 8 7.360 44.38
 MN-250 FILTER: HSRI 136/ 189/ -50 MIN. MAX = -22.37 8 13.540 53.75
 MN-250 FILTER: HSRI 136/ 189/ -50 MIN. MAX = -25.84 8 4.850 53.75



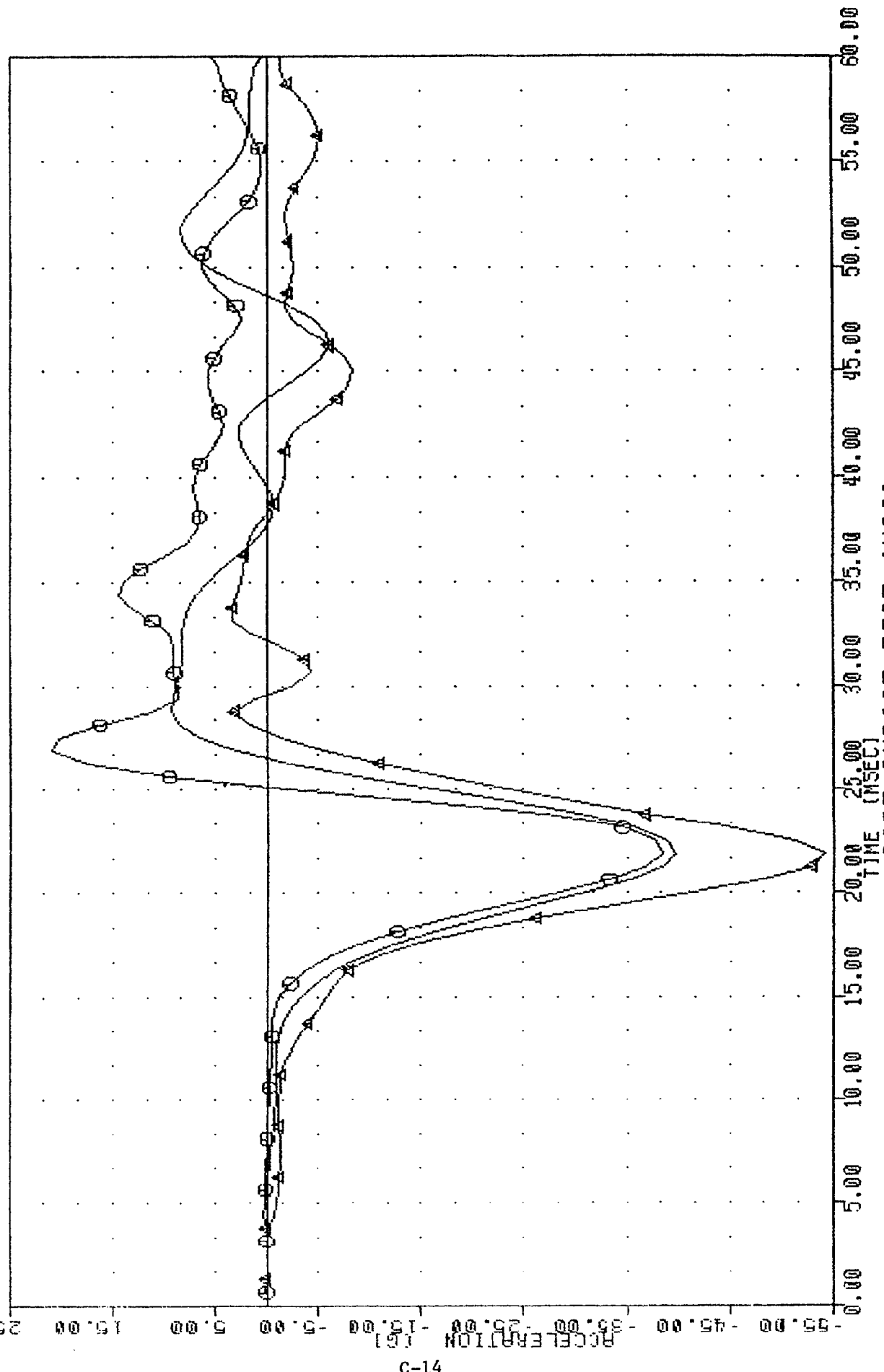
SIDE IMPACT TEST (U02)
 LOWER SPINE ACCELERATION Y AXIS - 1

VRIC SRI92 SID THORAX U02 BODY 830 CAL102 84137 PLOT DATE 21-MAY-84 15:57:24
 T12YGA FILTER : HSRI 136/ 189/ -50 MIN, MAX = -26.34 8 7.88 8 44.38
 MN-250 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -22.37 8 13.54 8 53.75
 MN-250 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -25.84 8 4.85 8 53.75



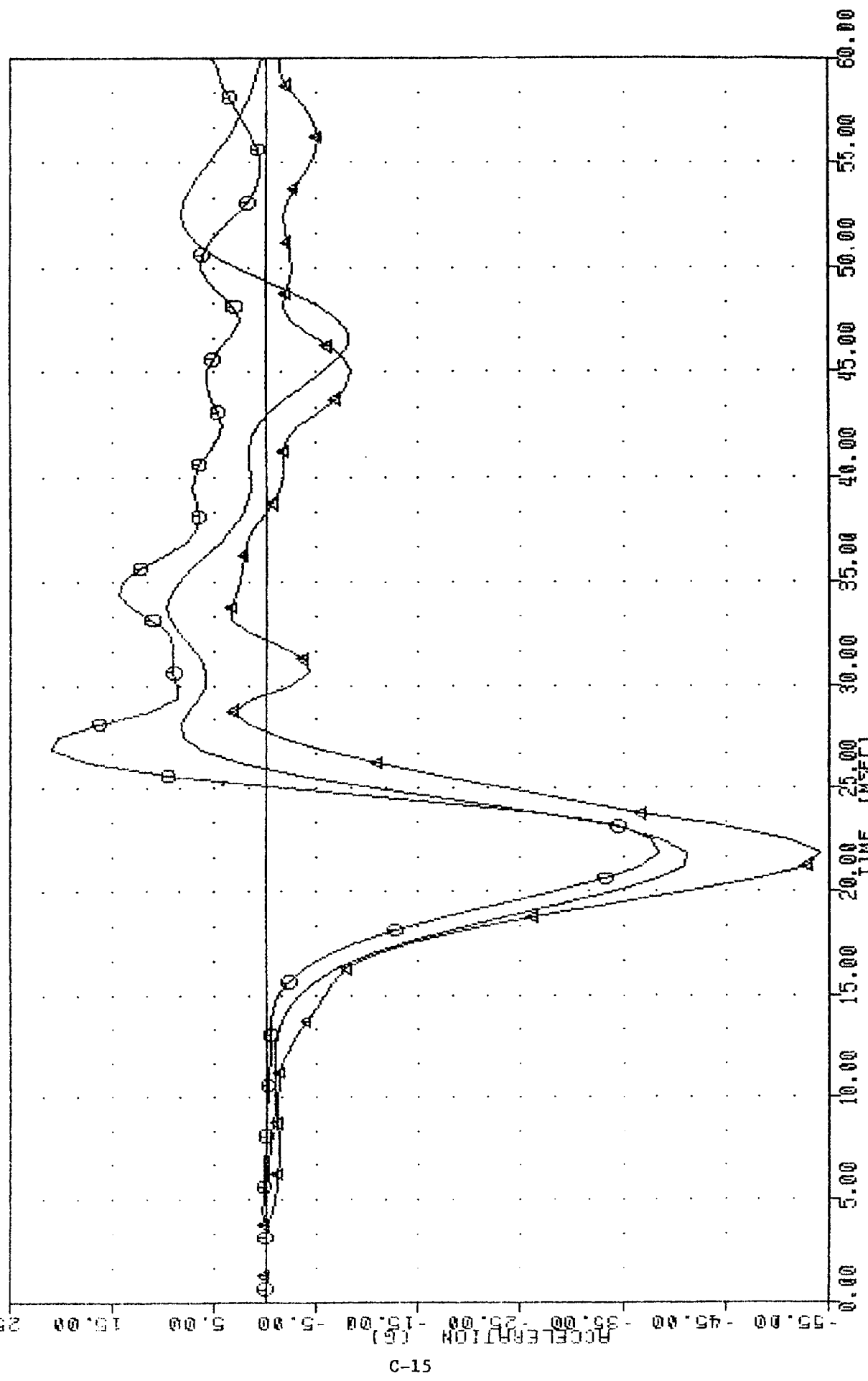
SIDE IMPACT TEST (U02)
 LOWER SPINE ACCELERATION Y AXIS - A

WRIC 9H92 31002102 SID THURAX 002 BODY 830 CHL102 84137 PLOT DATE 21-MAY-84 16:00:47
 LURYGI FILTER : HSRI 136/ 189/ -50 MIN, MAX = -39.84 8 21.25 26.13
 MN-230 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -38.14 8 21.25 26.25
 MN-230 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -54.08 8 21.25 33.13



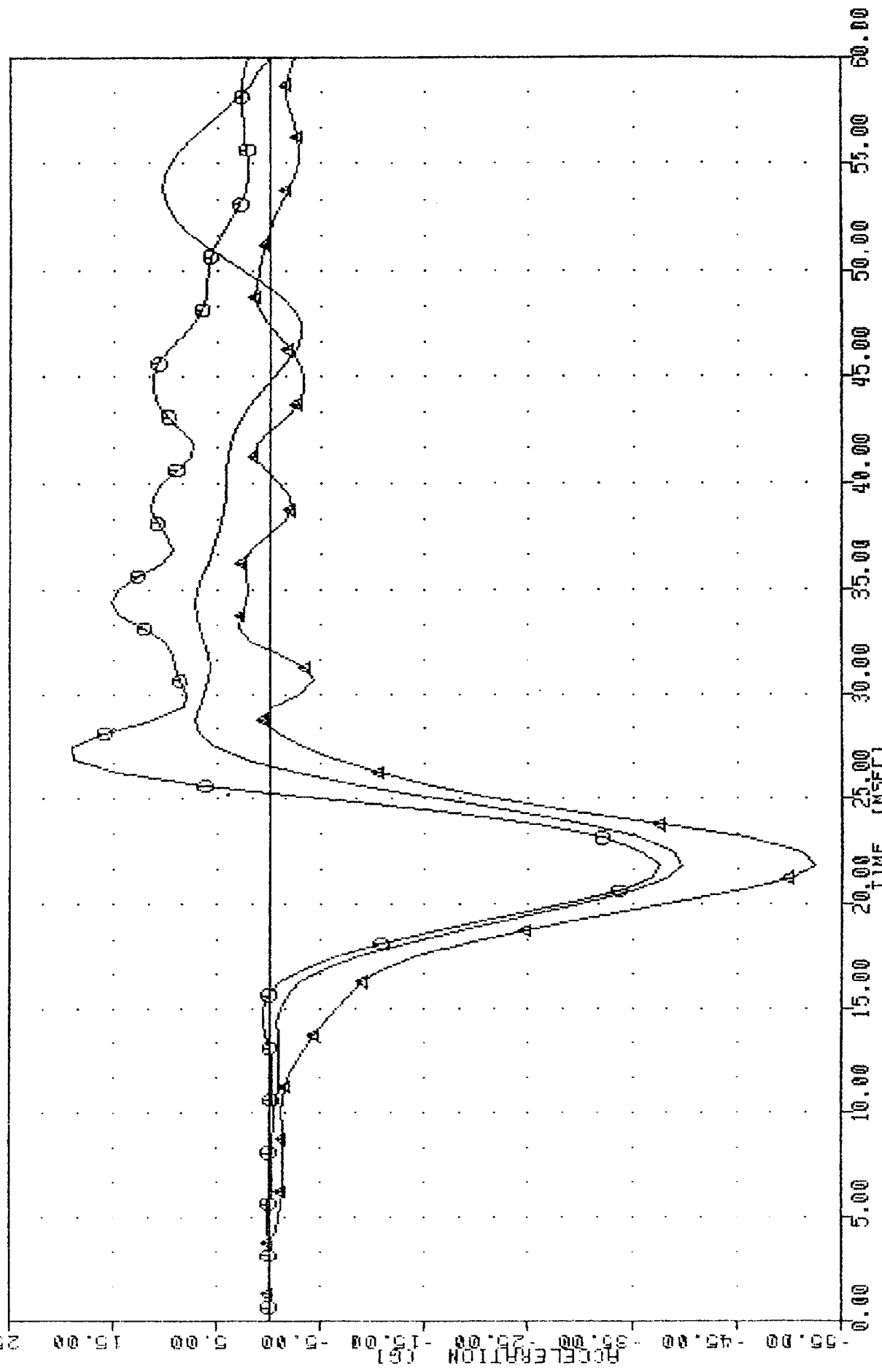
SIDE IMPACT TEST (U02)
 LEFT UPPER RIB ACCELERATION Y AXIS - 1

WRIC SALS2 SID THORAX U02 BODY 830 CAL102 84137 PLOT DATE 21-MAY-84 16:01:34
 LURYGA FILTER = HSRI 136/ 189/ -50 MIN. MAX = -41.20 e 9.57 e 33.13
 MN-250 FILTER = HSRI 136/ 189/ -50 MIN. MAX = -38.44 e 20.82 e 26.25
 MN-250 FILTER = HSRI 136/ 189/ -50 MIN. MAX = -54.08 e 3.31 e 33.13



SIDE IMPACT TEST (U02)
 LEFT UPPER RIB ACCELERATION Y AXIS - A

WRIC SRI92 ST0 THORAX UN2 BODY 830 CHL102 84137 PLOT DATE 21-MAY-84 15:58:26
 LRAYGI FILTER : HSRI 136/ 189/ -50 MIN. MAX = -39.82 10.24 53.12
 MN-2SD FILTER : HSRI 136/ 189/ -50 MIN. MAX = -37.86 19.00 26.87
 MN-2SD FILTER : HSRI 136/ 189/ -50 MIN. MAX = -52.52 2.94 32.50



SIDE IMPACT TEST (U02)
 LEFT LOWER RIB ACCELERATION Y AXIS - 1

