

SIDE IMPACT AGGRESSIVENESS
ATTRIBUTES

DOT# 749

CAR-TO-POLE SIDE IMPACT TEST OF A 45° CRABBED
MOVING 1981 VOLKSWAGEN RABBIT
INTO A FIXED RIGID POLE
AT 20.1 MPH

PREPARED BY:
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FINAL REPORT
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16. Abstract This test report documents a pole crash test conducted under NHTSA Contract DTNH22-82-A-08401, Task Order SRL 92 entitled, "Side Impact Aggressiveness Attributes". Testing was conducted on a 1981 diesel Volkswagen Rabbit 2-door hatchback at the TRCO Crash Test Facility, East Liberty, Ohio. The test vehicle was towed into a fixed, rigid pole, crabbed at a 45 degree angle with a velocity of 20.1 mph. The impact point was 26.5 inches forward of the vehicle wheelbase centerline. Vehicle accelerations were measured, along with occupant responses of two side impact dummies. One dummy was located in the driver's designated seating position and one was located in the left rear passenger position. The test date was July 6, 1984 and the ambient temperature was 74° F.			
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons	0.9	metric ton	t
	(2000 lb)			

VOLUME				
tsp	teaspoons	5	milliliters	ml.
Tbsp	tablespoons	15	milliliters	ml.
in ³	cubic inches	16	milliliters	ml.
fl oz	fluid ounces	30	milliliters	ml.
c	cups	0.24	liters	L
pt	pints	0.47	liters	L
qt	quarts	0.95	liters	L
gal	gallons	3.8	liters	L
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
°F	degrees Fahrenheit	5/9 (after subtracting 32)	degrees Celsius	°C

Approximate Conversions from Metric Measures

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



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SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The purpose of this crash test was to assess occupant safety when a vehicle travelling at 20 mph strikes a fixed, rigid pole at a 45° angle. The vehicle was tested using conditions not currently contained in a Federal Motor Vehicle Safety Standard.

INTRODUCTION

A 1981 diesel Volkswagen Rabbit 2-door hatchback was towed into a fixed, rigid pole on July 6, 1984, with the driver's side of the car leading at a 45° angle. The intended test speed and impact point were 20 mph and 29 inches forward of the wheelbase centerline respectively. Actual impact velocity was 20.1 mph and the actual impact point was 26.5 inches forward of the wheelbase centerline. This test was conducted to assess occupant safety under the previously stated impact conditions. No structural modifications were made to this vehicle.

The General Test and Vehicle Parameter Data is contained in Section 2. Section 3 contains all data required by R & D. Pre-test and post-test vehicle and dummy photographs are found in Appendix A. Appendix B contains all Data Plots.

SECTION 2.0
GENERAL TEST AND VEHICLE PARAMETER DATA

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

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagen of America, Inc.

MAKE/MODEL: Volkswagen Rabbit

VIN: 1VWCG9172BV218470

BODY STYLE: 2-Door Hatchback

MODEL YEAR: 1981

NHTSA NO.: R & D

COLOR: Beige

ENGINE DATA: TYPE: Transverse

CYLINDERS: 4

DISPLACEMENT 97 CID

TRANSMISSION DATA: 5 Speed Manual

DATE VEHICLE RECEIVED: 6/26/84

ODOMETER READING: 44007

DEALER'S NAME AND ADDRESS: Volkswagen North
Worthington, Ohio

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	No	ANTI-SKID BRAKE	No
CLOCK	Yes	REAR WINDOW DEFROSTER	Yes
OTHER	Rear Window Wiper		

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? Yes
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? No
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: Good

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

VEHICLE MANUFACTURED BY: Volkswagen of America, Inc.

DATE OF MANUFACTURE: 8/81

GVWR: 2822 LBS.,

GAWR: FRONT 1609 LBS., REAR 1278 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 35 psi; REAR 35 psi

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

BIAS PLY, BELTED, OR RADIAL: Radial

PLY RATING: 4

IS SPARE TIRE "SPACE SAVER"? No

IS SPARE TIRE STANDARD EQUIPMENT? Yes

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

RIGHT FRONT	660	LBS.	RIGHT REAR	360	LBS.
LEFT FRONT	670	LBS.	LEFT REAR	370	LBS.
TOTAL FRONT WEIGHT	1330		LBS. (64.6 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	730		LBS. (35.4 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	2060	LBS.			

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 24 1/4	;LF 24	;RR 23 7/8	;LR 23 15/16
PRE-TEST ATTITUDE:	RF 23 7/8	;LF 23 3/4	;RR 20 1/4	;LR 20 1/2
POST-TEST ATTITUDE:	RF 23 1/2	;LF 25 3/4	;RR 20	;LR 22

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 187 LBS. CARGO:

RIGHT FRONT	650	LBS.	RIGHT REAR	625	LBS.
LEFT FRONT	730	LBS.	LEFT REAR	590	LBS.
TOTAL FRONT WEIGHT	1380		LBS. (53.2 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1215		LBS. (46.8 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	2595	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: 1.0 GALLONS

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

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: No

FUEL INJECTION: Yes

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

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 35 psi; REAR 35 psi

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

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

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT

2 REAR

CARGO LOAD 185 LBS. 4 TOTAL

TOTAL 785 LBS.

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

TEST CONDITIONS

TEST NUMBER: 840706

DATE OF TEST: July 6, 1984

TIME OF TEST: 16:35

WIND VELOCITY: 15-20 mph 252° WSW

HUMIDITY: 54 %

AMBIENT TEMPERATURE AT IMPACT AREA: 74° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 78° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2595	2593
VEHICLE VELOCITY (MPH)*	20.1	20.0
IMPACT POINT (INCHES)**	26.5	29

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 Glass, Pole Barrier; Passenger Seat Headrest</u>	<u>Left Rear Window Frame & Glass; C-Pillar</u>
Chest	<u>Driver Inner Door Panel</u>	<u>Left Rear Quarter Panel</u>
Abdomen	<u>Driver Inner Door Panel</u>	<u>Left Rear Quarter Panel</u>
Left Knee	<u>Driver Inner 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>DNA*</u>	<u>Easy</u>
Rear	<u>DNA</u>	<u>DNA</u>

SEAT MOVEMENT:

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

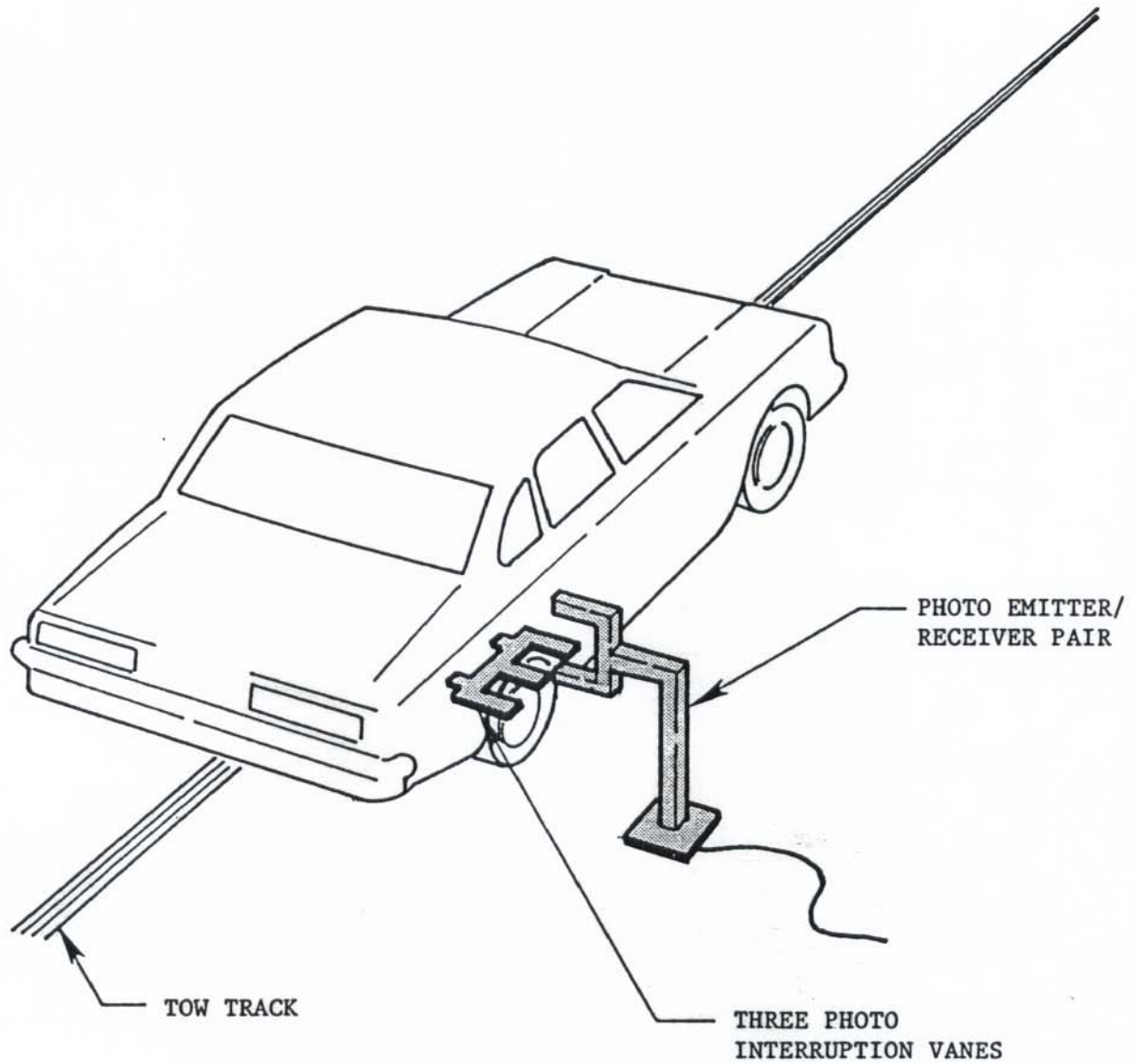
GLAZING DAMAGE: Window in driver's door shattered; windshield cracked
(left side most severe); left rear window popped out
intact; backlight & right side windows undamaged.

OTHER NOTABLE IMPACT EFFECTS:

Driver dummy right leg severed above knee; right side
rocker panel sheet metal seam split open.

*The driver's door 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

$$\begin{aligned}\text{Test Weight} &= \text{Unloaded Delivered Weight} + \\ &\quad \text{Number of Dummies} \times 174 \text{ lbs.} + \\ &\quad \text{Cargo Weight} \\ &= 2060 + 2 \times 174 + 185 \text{ lbs.} \\ &= 2593 \text{ lbs.}\end{aligned}$$

To achieve test weight, 1.0 gallon 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

The "X" axis accelerometer, HEDXG1, mounted in the head of the dummy seated in the driver's position severed during impact. In addition, the first negative peak of this response exceeded the accelerometer full-scale value. Therefore, the resultant calculation is also invalid.

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

DUMMY TEMPERATURE CONTROL AND POSITIONING

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

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

DUMMY PLACEMENT AND POSITIONING

SIDE IMPACT DUMMY

DRIVER DSP

REAR PASSENGER DSP

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

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

DUMMY IN-VEHICLE POSITION RECORDING SHEET

VEHICLE NHTSA NO. R & D

MFR./MAKE/MODEL: Volkswagen Rabbit

FRONT SEAT TYPE: BENCH
X BUCKET
 SPLIT BENCH

ADJUSTER TYPE: X MANUAL
 POWER

BUCKET SEAT BACK TYPE: FIXED
X ADJUSTABLE

TECHNICIANS:

1. J. Kokoruda

2. N. Echeverria

3. M. Garrison

POSITIONING DATE: 7/6/84

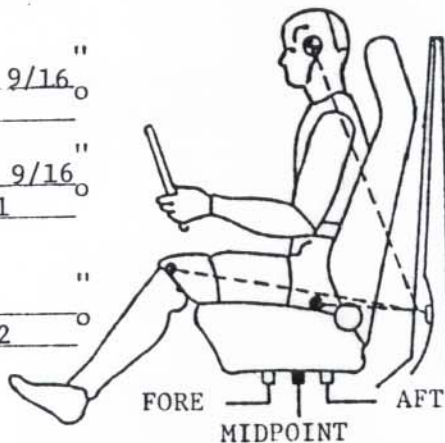
AMBIENT TEMP.: 67°F. TIME: 12:00

DRIVER DUMMY # 06

HEAD 19 9/16"
 TARGET* 39

KNEE 31 9/16"
 JOINT 101

APPROX.
 "H" 19"
 POINT 122

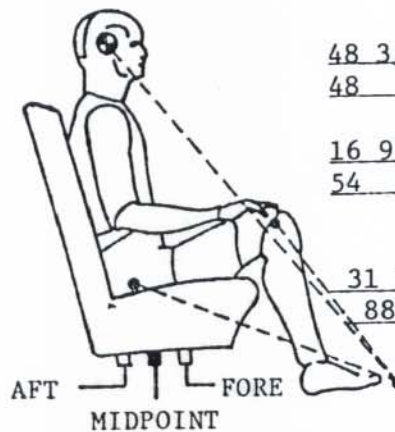


REAR PASSENGER DUMMY # U02

48 3/16" HEAD
48 ° TARGET**

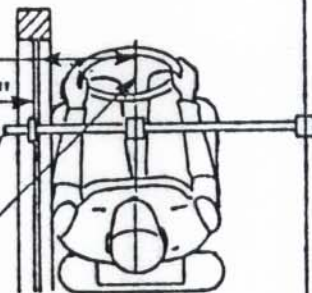
16 9/16" KNEE
54 ° JOINT

APPROX.
31 1/8" "H"
88 ° POINT



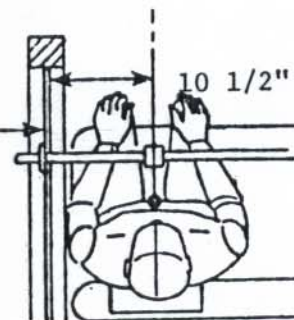
DOOR
 GLASS
 HEIGHT*** 11 3/8"
10 1/4"

LATERAL BAR
 ADJUSTABLE
 POINTER



DRIVER
 DUMMY #
 06

DOOR
 GLASS
 HEIGHT DNA

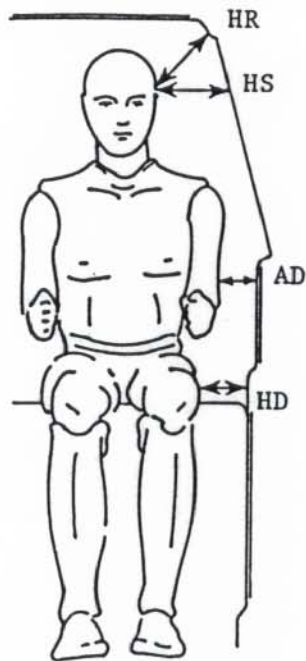
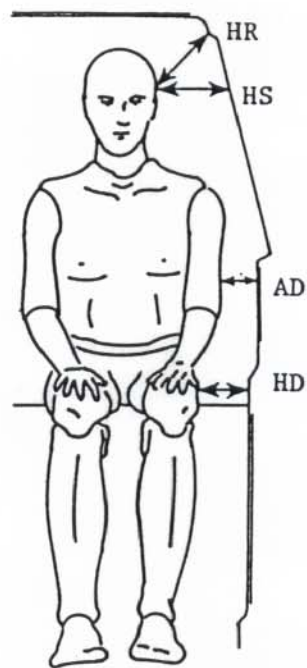


PASSENGER
 DUMMY #
 U02

*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.

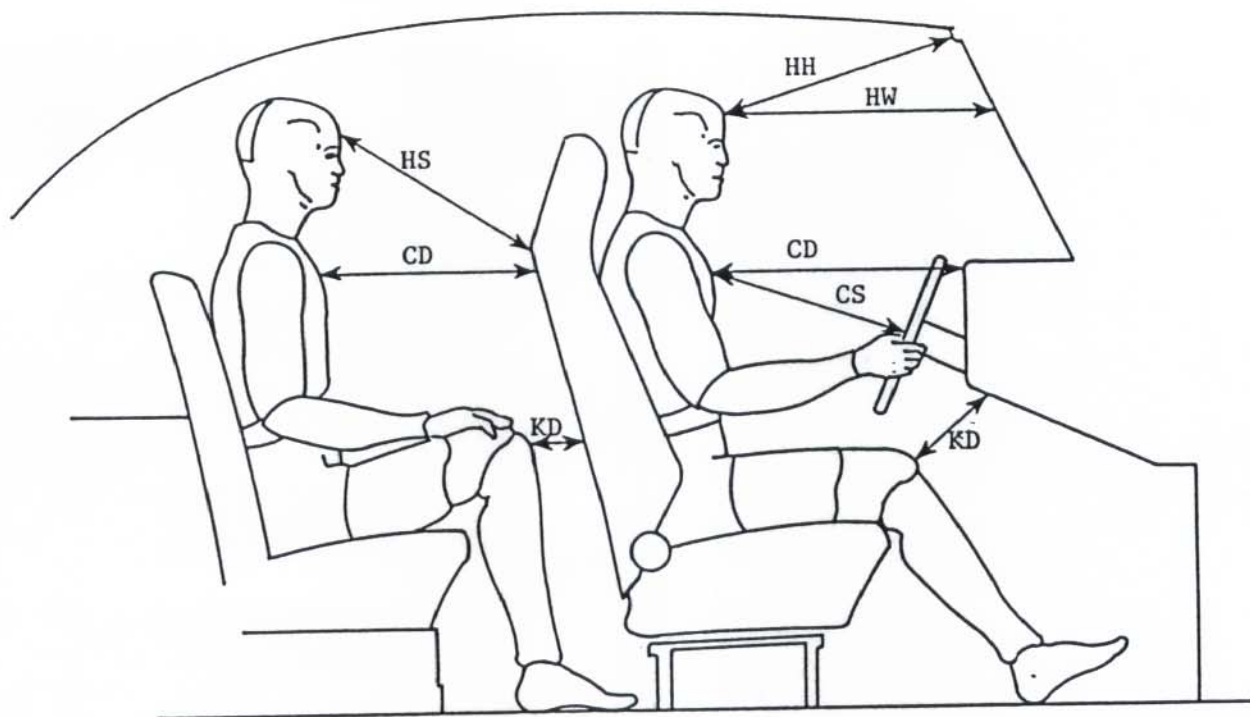
***Door glass height is equal on the right and left side of vehicle at dummy nose level.



	DRIVER 06	PASSENGER U02
HR	6 1/2	5 1/2
HS	7 7/8	7 1/8
AD	3 11/16	3 11/16
HD	6 3/8	5 1/16

ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



DRIVER

PASSENGER

06

U02

HH	14 3/16	DNA
HW	21 5/8	DNA
HS	DNA	20 15/16
CD	20 3/8	17 13/16
CS	13 1/8	DNA
KDL	4 7/8	3 5/8
KDR	5 3/4	3 3/16

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the driver's head went through the driver side window, striking the pole. As the dummy rebounded, the body rotated toward the driver's side door and the buttocks lifted. The dummy travelled across the front occupant compartment in this position. In the final resting position, the dummy was seated in the front passenger's seat facing toward the left with the legs extended leftward.

PASSENGER

During impact, as the dummy slid towards the left rear quarter panel, the driver's seat back fell backwards and rotated right, trapping the passenger's lower legs between the B-Pillar and the front seat. The dummy's left shoulder contacted the side window, the head hitting the C-Pillar and scraping along the top window frame. On the rebound, the dummy rotated towards the right and fell across the rear occupant area. In the final resting position the dummy was stretched across the rear seat with the legs trapped behind the driver's seat back and the shoulders facing forward.

VEHICLE EXTERIOR PROFILES AND STATIC CRUSH

ZERO DISTANCE AT PROJECTED IMPACT POINT*

LOCATION	HEIGHT (in)	12	6	0	6	12	18	24	30	36	42	48	54	60	66	72
PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Axle Height	12.2	X	X	18.9	18.8	18.8	18.6	18.8	18.8	18.9	19.1	19.2	19.3	19.5	X	X
H-Point	21.8	X	16.9	16.8	16.8	16.7	16.6	16.6	16.7	16.8	16.9	17.0	17.1	17.4	15.9	X
Mid Door	25.3	15.8	16.6	16.5	16.5	16.4	16.3	16.3	16.4	16.5	16.6	16.6	16.8	17.0	17.2	15.1
Window Sill	35.9	18.6	18.4	18.1	18.0	17.9	17.8	17.9	18.0	18.0	18.1	18.2	18.4	18.5	18.6	18.8
Window Top	55.3	X	X	X	X	X	26.6	26.2	26.1	26.0	25.9	25.9	26.1	26.3	26.5	26.9

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

Axle Height	12.2	X	X	26.6	32.1	35.3	37.6	39.0	39.4	36.3	30.8	27.3	25.6	24.6	X	X
H-Point	21.8	X	24.9	24.7	31.6	35.9	38.3	39.3	38.7	34.8	29.3	27.0	24.9	23.6	20.9	X
Mid Door	25.3	22.8	24.3	24.4	31.3	35.8	38.5	39.5	38.6	34.6	29.4	27.1	25.3	23.8	22.6	20.4
Window Sill	35.9	25.1	25.4	25.8	31.0	35.4	38.2	40.1	38.8	35.3	31.3	29.6	27.4	25.1	23.6	23.5
Window Top	55.3	X	X	X	X	X	37.3	40.0	40.1	39.1	37.4	36.5	34.8	33.8	32.9	32.3

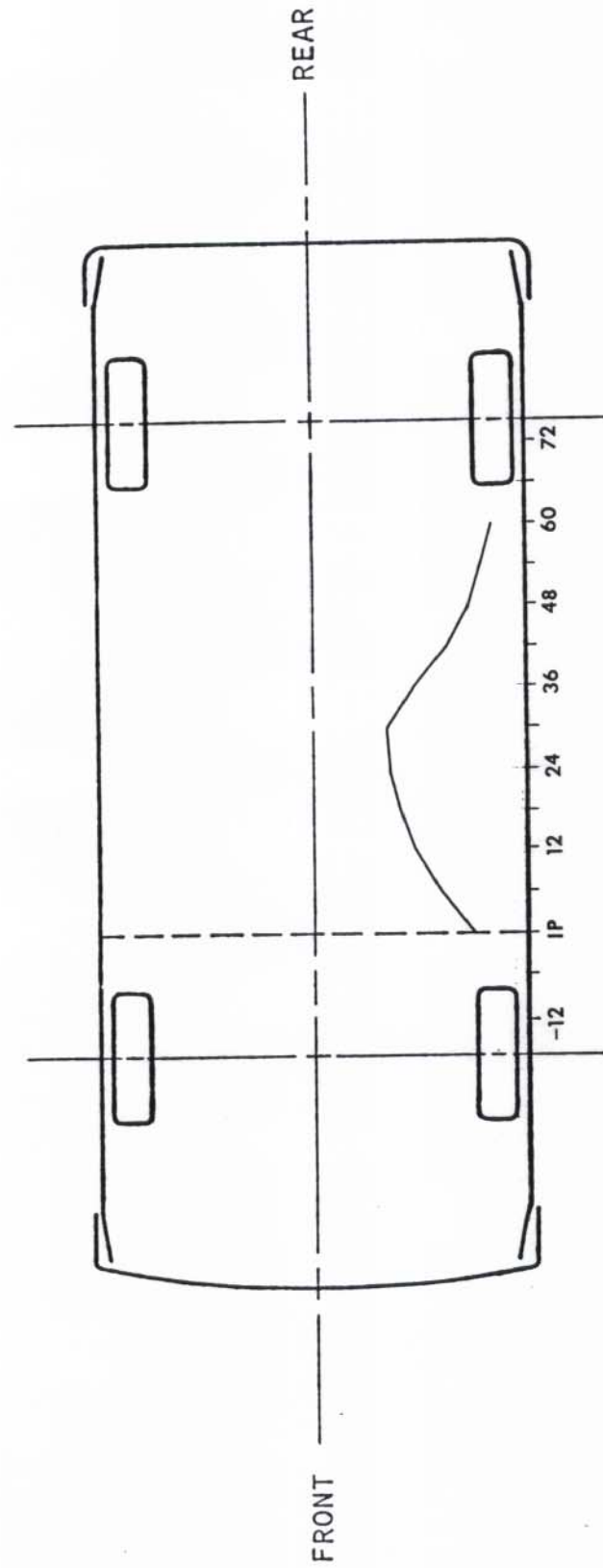
STATIC CRUSH (IN)

Axle Height	12.2	X	X	7.7	13.3	16.5	19.0	20.2	20.6	17.4	11.7	8.1	6.3	5.1	X	X
H-Point	21.8	X	8.0	7.9	14.8	19.2	21.7	22.7	22.0	18.0	12.4	10.0	7.8	6.2	5.0	X
Mid Door	25.3	7.0	7.7	7.9	14.8	19.4	22.2	23.2	22.2	18.1	12.8	10.5	8.5	6.8	5.4	5.3
Window Sill	35.9	6.5	7.0	7.7	13.0	17.5	20.4	22.2	20.8	17.3	13.2	11.4	9.0	6.6	5.0	4.7
Window Top	55.3	X	X	X	X	X	10.7	13.8	14.0	13.1	11.5	10.6	8.7	7.5	6.4	5.4

* Projected impact point is 29 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

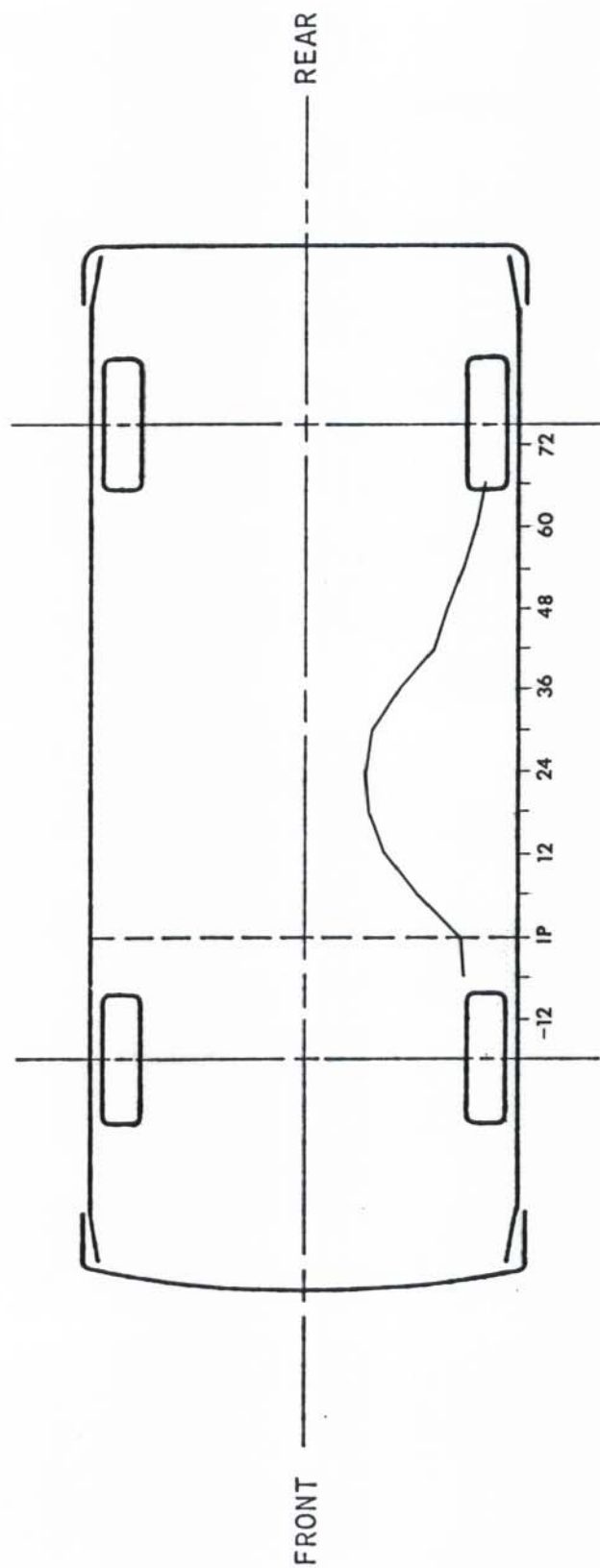


PROFILE LEVEL EQUALS AXLE HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Width of Car = 63.5"
Length of Car = 154.75"

Maximum Crush = 20.6"
Length of Crush = 60.0"

VEHICLE EXTERIOR STATIC CRUSH PROFILE

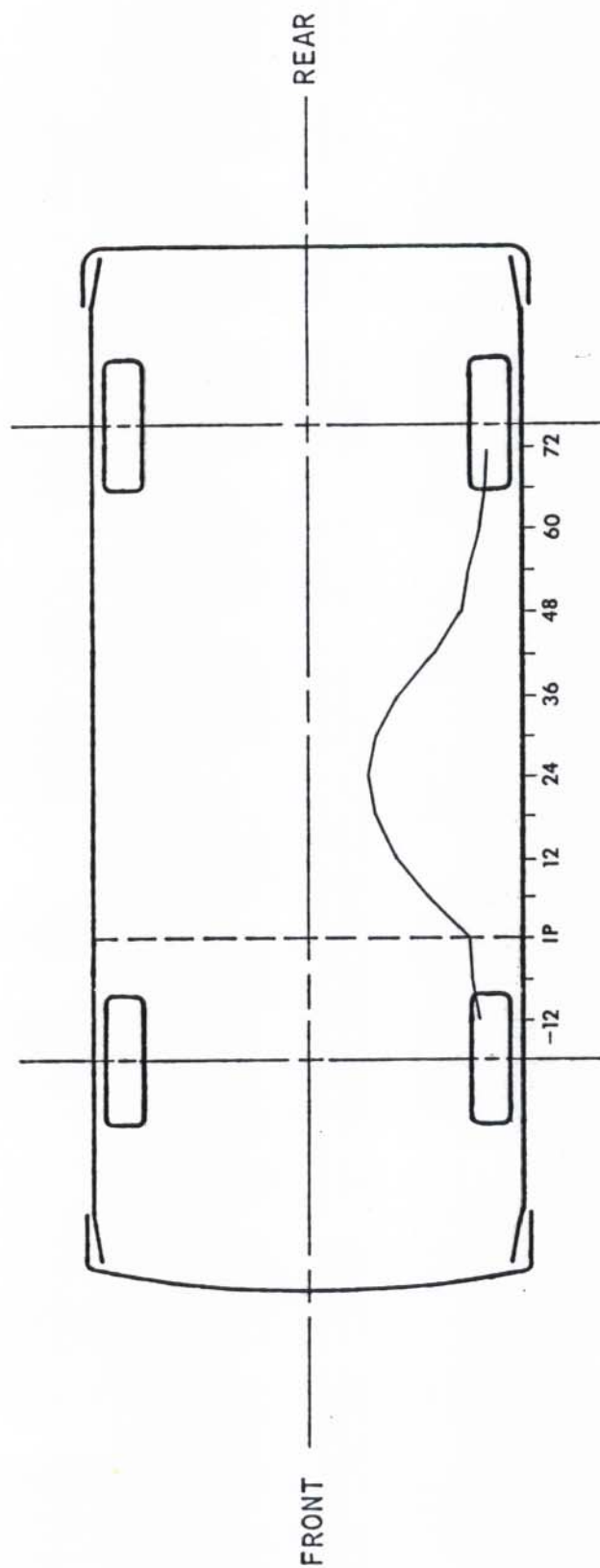


PROFILE LEVEL EQUALS H-POINT
IP EQUALS PROJECTED IMPACT POINT

Width of Car = 63.5"
Length of Car = 154.75"

Maximum Crush = 22.7"
Length of Crush = 72.0"

VEHICLE EXTERIOR STATIC CRUSH PROFILE

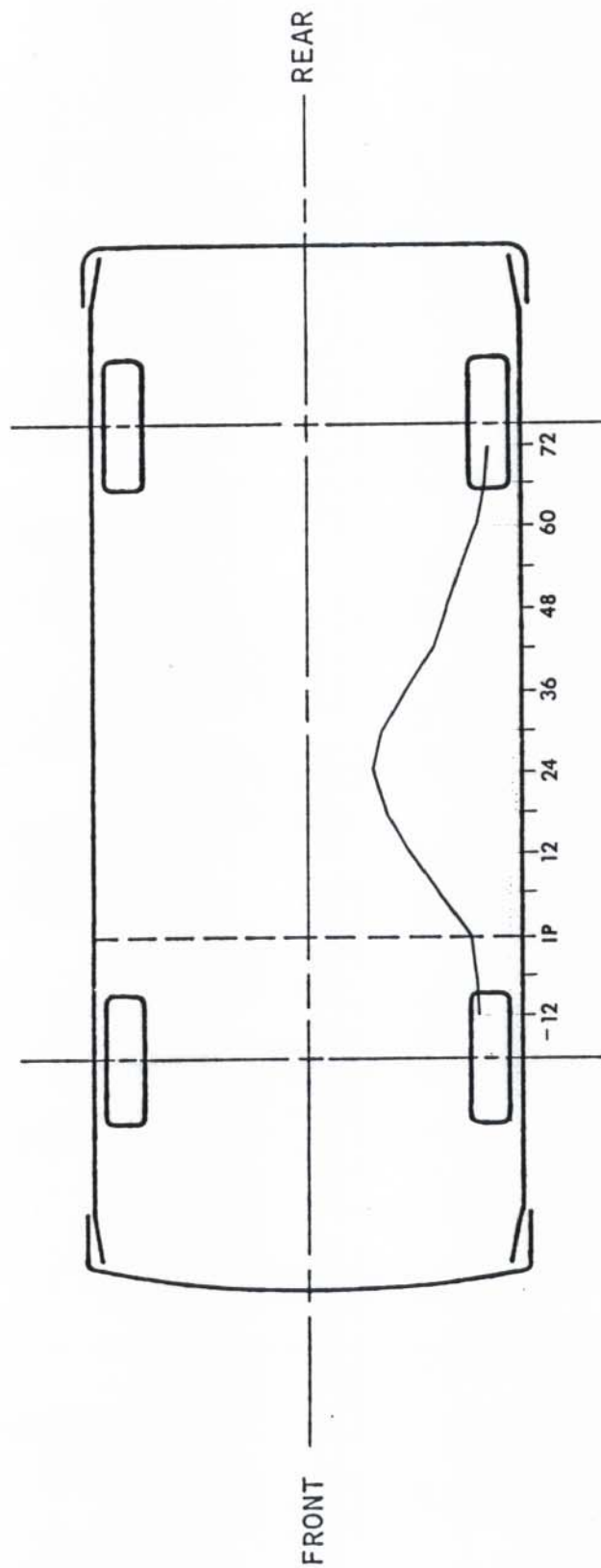


PROFILE LEVEL EQUALS MID-DOOR HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Width of Car = 63.5"
Length of Car = 154.75"

Maximum Crush = 23.2"
Length of Crush = 84.0"

VEHICLE EXTERIOR STATIC CRUSH PROFILE

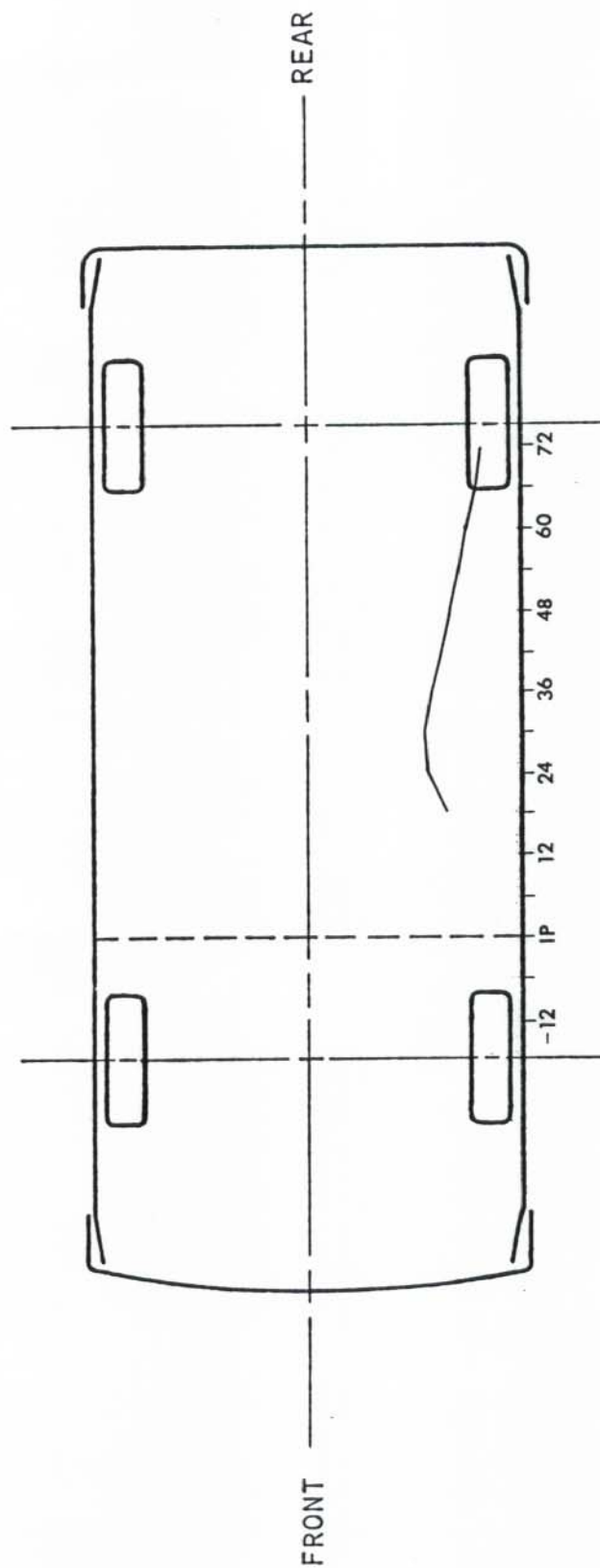


PROFILE LEVEL EQUALS WINDOW SILL HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Width of Car = 63.5"
Length of Car = 154.75"

Maximum Crush = 22.2"
Length of Crush = 84.0"

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Width of Car = 63.5"
Length of Car = 154.75"
Maximum Crush = 14.0"
Length of Crush = 54.0"

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	90.63	108.00 Y	---	---Yβ	8.86	103.00	24.19	119.13
LATERAL	269.06	110.00	37.74	108.00	86.52	91.38	11.23	102.63
VERTICAL	124.43	81.75	50.41	85.38	14.92	120.25	30.09	90.50
RESULTANT		365.28 @	81.13 Yβ			91.24 @	91.38	
HIC	More Than 2945.42	from 80.25 to 81.88 β			239.36	from 89.75 to 93.38		
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	13.03	121.25	82.43	86.25	2.25	86.25	14.97	130.00
LATERAL (P)***	59.50	80.00	10.80	118.13	31.57	111.88	3.88	137.50
LATERAL (R)***	61.05	80.00	11.25	118.13	31.14	111.88	3.62	137.50
VERTICAL	9.26	120.63	30.17	86.88	9.61	111.25	8.03	148.75
RESULTANT (P)		90.01 @	86.25			33.69 @	111.88	
RESULTANT (R)		89.96 @	86.25			33.29 @	111.88	
DELTA V (MPH)****		20.5 @	105.63 (P)			14.8 @	134.37 (P)	
		20.9 @	105.00 (R)			15.0 @	134.37 (R)	
LOWER SPINE								
LONGITUDINAL	14.38	82.50	28.34	93.75	2.76	61.87	23.74	112.50
LATERAL (P)	65.17	73.13	19.70	85.00	23.76	111.25	1.04	138.13
LATERAL (R)	64.62	73.13	18.46	85.00	24.20	111.25	0.08	138.13
VERTICAL	15.12	75.00	14.72	87.50	9.52	111.88	5.08	153.13
RESULTANT (P)		71.21 @	73.13			34.51 @	111.88	
RESULTANT (R)		70.70 @	73.13			34.15 @	111.88	
DELTA V (MPH)		25.8 @	98.12 (P)			14.8 @	144.38 (P)	
		25.7 @	98.12 (R)			16.1 @	144.38 (R)	
LEFT UPPER RIB								
LATERAL (P)	59.87	71.88	15.94	107.50	34.89	104.38	9.56	113.13
LATERAL (R)	59.93	71.88	14.46	108.13	33.77	104.38	8.50	112.50
DELTA V (MPH)		26.4 @	104.38 (P)			15.6 @	143.75 (P)	
		27.3 @	105.00 (R)			17.3 @	143.75 (R)	
LEFT LOWER RIB								
LATERAL (P)	54.22	70.00	11.31	89.38	29.15	106.87	4.29	111.88
LATERAL (R)	54.38	70.00	8.18	89.38	31.10	106.87	4.63	112.50
DELTA V (MPH)		26.4 @	105.00 (P)			15.4 @	143.13 (P)	
		26.1 @	105.62 (R)			14.2 @	143.13 (R)	
PELVIS ACCELERATION								
LONGITUDINAL	3.61	51.75	42.79	66.13	7.58	83.88	36.10	81.38
LATERAL	123.31	67.75	6.21	44.88	20.90	84.50	13.79	81.13
VERTICAL	25.13	69.25	9.25	67.25	5.88	84.38	4.24	86.50
RESULTANT		127.03 @	67.75			38.40 @	81.38	
DELTA V (MPH)		26.2 @	102.00			15.9 @	160.75	

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE		NEGATIVE		POSITIVE		NEGATIVE	
	DIRECTION*		DIRECTION**		DIRECTION*		DIRECTION**	
	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)
RIB DEFLECTION †	1.94	128.38	---	--- ε	1.00	132.63	---	--- ε

* 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: Positive

Y See TEST ANOMALIES

β Response exceeded accelerometer full-scale value.

ε There are no negative values in the time interval of interest.

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

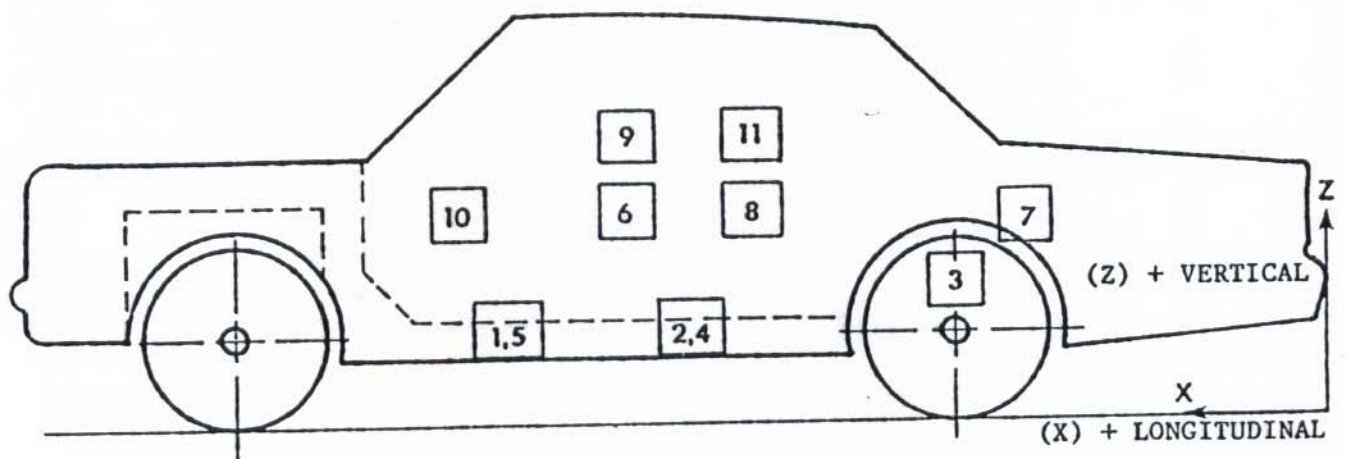
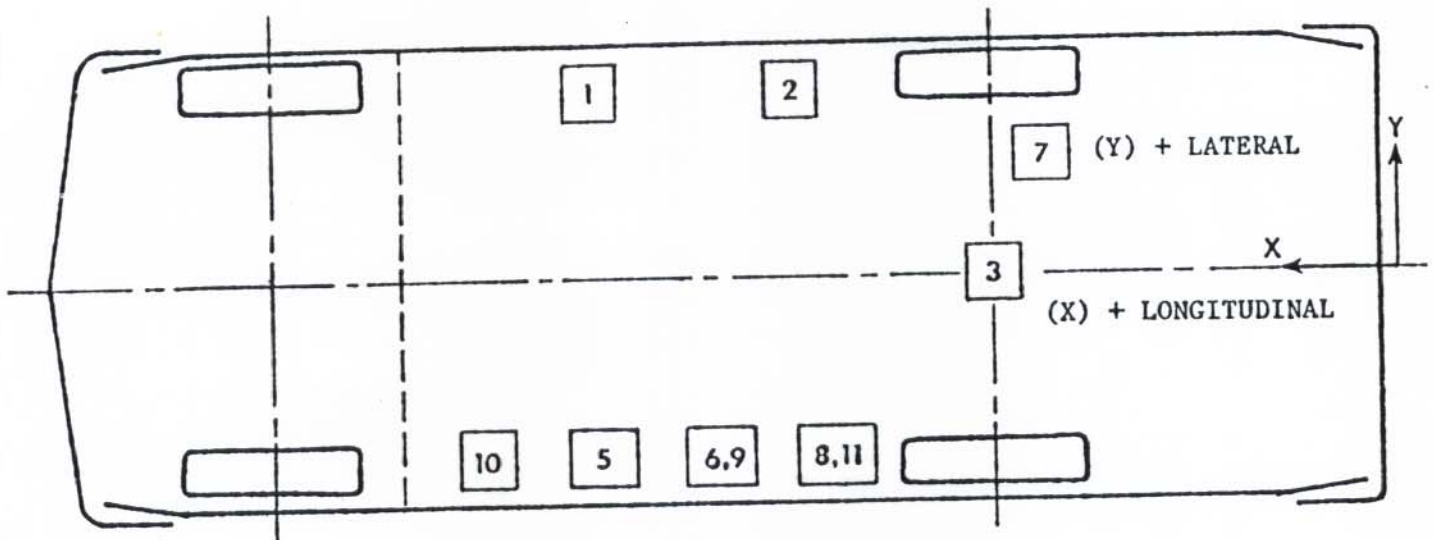
NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	RIGHT SILL AT FRONT SEAT (LONGITUDINAL)	83.4	23.3	10.2	$\Delta V = -11.9 \text{ mph @ } 229.38 \text{ msec}$	0.73	56.63	6.12
	(LATERAL)				$\Delta V = 12.8 \text{ mph @ } 229.38 \text{ msec}$	11.11	88.63	3.57
	(VERTICAL)					9.08	60.13	8.11
	(RESULTANT)						12.75 @ 45.00	46.25
2	RIGHT SILL AT REAR SEAT (LONGITUDINAL)	61.4	23.7	8.5	$\Delta V = -11.1 \text{ mph @ } 229.38 \text{ msec}$	1.20	56.63	5.35
	(LATERAL)				$\Delta V = 15.9 \text{ mph @ } 229.38 \text{ msec}$	10.13	89.50	0.64
	(VERTICAL)					3.50	97.63	4.26
	(RESULTANT)						10.92 @ 90.00	46.38
3	REAR DECK OVER AXLE (LONGITUDINAL)	32.0	0.0	6.3	$\Delta V = -13.7 \text{ mph @ } 229.38 \text{ msec}$	1.73	30.63	8.80
	(LATERAL)				$\Delta V = 18.8 \text{ mph @ } 229.38 \text{ msec}$	8.74	92.50	0.95
	(VERTICAL)					3.95	222.88	4.61
	(RESULTANT)						11.66 @ 75.50	113.88
4	LEFT SILL AT REAR SEAT (LATERAL)	61.0	-23.6	8.5	$\Delta V = 20.9 \text{ mph @ } 210.50 \text{ msec}$	14.53	110.75	3.61
								102.25
5	LEFT SILL AT FRONT SEAT (LATERAL)	83.4	-23.5	10.2		24.12	39.38	20.36
		----	-----	o				70.13
6	LEFT FRONT DOOR CENTERLINE (LATERAL)	81.3	-26.2	23.4	$\Delta V = 19.6 \text{ mph @ } 70.00 \text{ msec}$	106.74	15.88	21.52
								38.00
7	RIGHT REAR COMPARTMENT (LONGITUDINAL)	31.0	15.4	13.5		1.45	56.63	6.36
								74.38
8	MIDREAR OF LEFT FRONT DOOR (LATERAL)	61.3	-26.2	23.5	$\Delta V = 17.8 \text{ mph @ } 126.63 \text{ msec}$	61.70	14.38	40.26
								101.00
9	UPPER LEFT FRONT DOOR CENTERLINE (LATERAL)	82.2	-26.1	32.3	$\Delta V = 16.2 \text{ mph @ } 68.25 \text{ msec}$	73.27	17.38	36.13
								41.38
10	MIDFRONT OF LEFT FRONT DOOR (LATERAL)	99.9	-26.0	22.3		55.19	7.00	38.83
		----	-----	o				23.38
11	UPPER REAR OF LEFT REAR DOOR (LATERAL)	71.3	-26.1	32.3		68.07	16.38	106.83
		----	-----	o				102.38

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

All measurements of accelerometer locations in inches.

oDelta V appears unrealistic after initial velocity change.

VEHICLE ACCELEROMETER LOCATIONS



FIXED POLE LOAD CELL LOCATIONS AND DATA SUMMARY

CELL NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (lb)	TIME (msec)	MAX (lb)	TIME (msec)
1		17.75	-3.25	72.5	486.35	165.50	8898.97	50.63
2		17.75	3.25	72.5	4941.99	51.88	4914.12	98.50
3		17.75	-3.25	4.0	---	--- ξ	12200.28	75.38
4		17.75	3.25	4.0	1980.05	29.63	10718.80	96.63
TOTAL FORCE					---	--- ξ	23790.10	71.63

*Reference Facing Pole Front
X - Pole Base (+ forward)
Y - Pole Centerline (+ right)
Z - Ground Level (+ up)

All location measurements are in inches.

Compression - Negative

ξ There are no positive values in the time interval of interest.

HIGH SPEED CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead	Photosonic 1B	25	547	Impact point
2	Overhead	Photosonic 1B	13	550	Vehicle dynamics
3	Left Side	Photosonic 1B	13	492	Vehicle dynamics
4	Barrier Base	Photosonic 1B	25	508	Impact point
5	Onboard - Front	Photosonic 1B	8	782	Driver kinematics
6	Onboard - Driver Side	Photosonic 1B	8	807	Driver kinematics
7	Onboard - Back Seat	Photosonic 1B	8	790	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	-3' 1/2"	2"	17'3"
2	13'11"	10'3"	13'3"
3	-3'5"	-24'4"	52'1/2"
4	12'9"	5'3/4"	32'1/2"

Origin of Coordinate System is Point of Impact

- +X = Forward of Impact Side of Pole with Respect to Striking Vehicle's Velocity Vector
- +Y = Rightward from Centerline of Pole
- +Z = Upward with Respect to Striking Vehicle's Velocity Vector

APPENDIX A
PHOTOGRAPHS

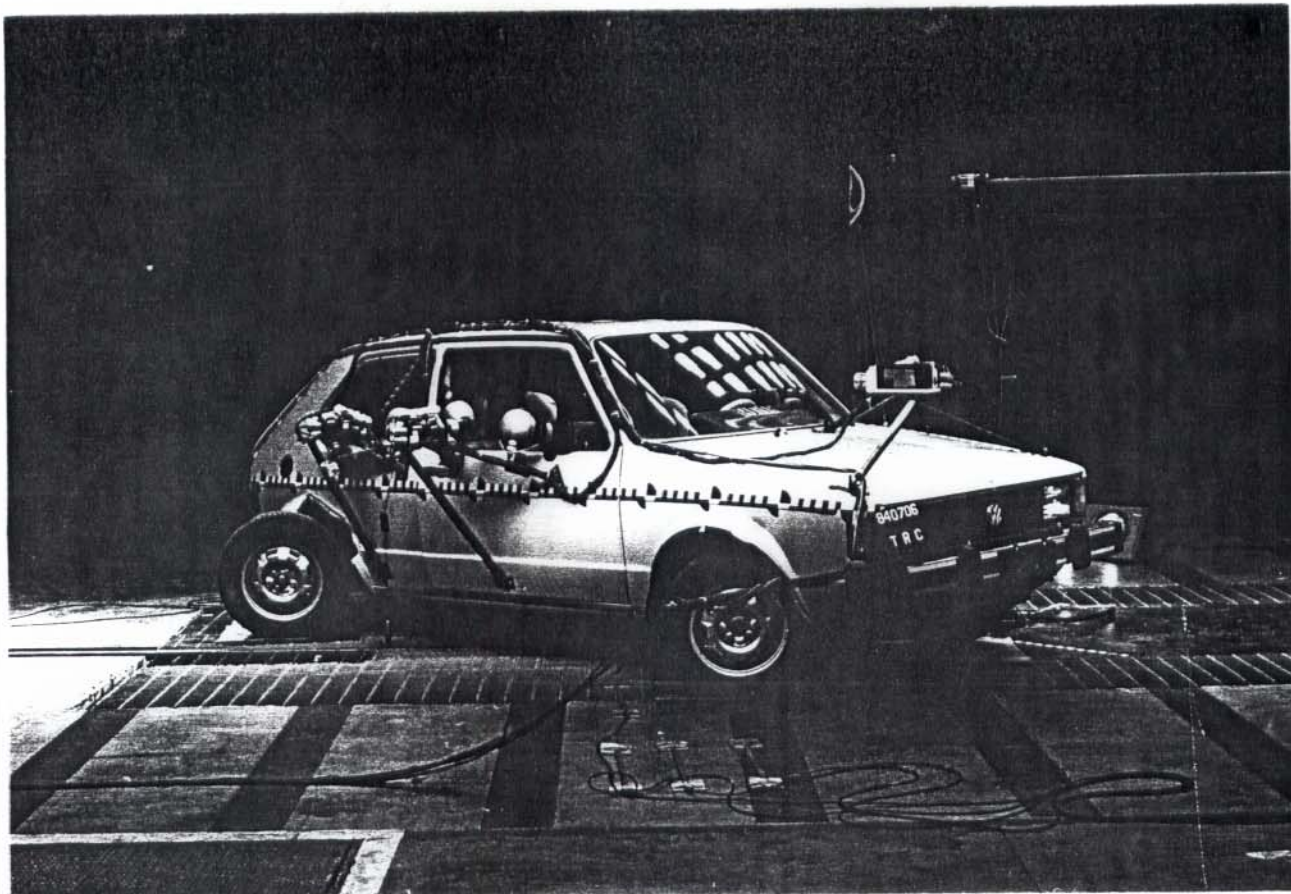


Figure A-1. PRE-TEST OVERALL - VIEW 1



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



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

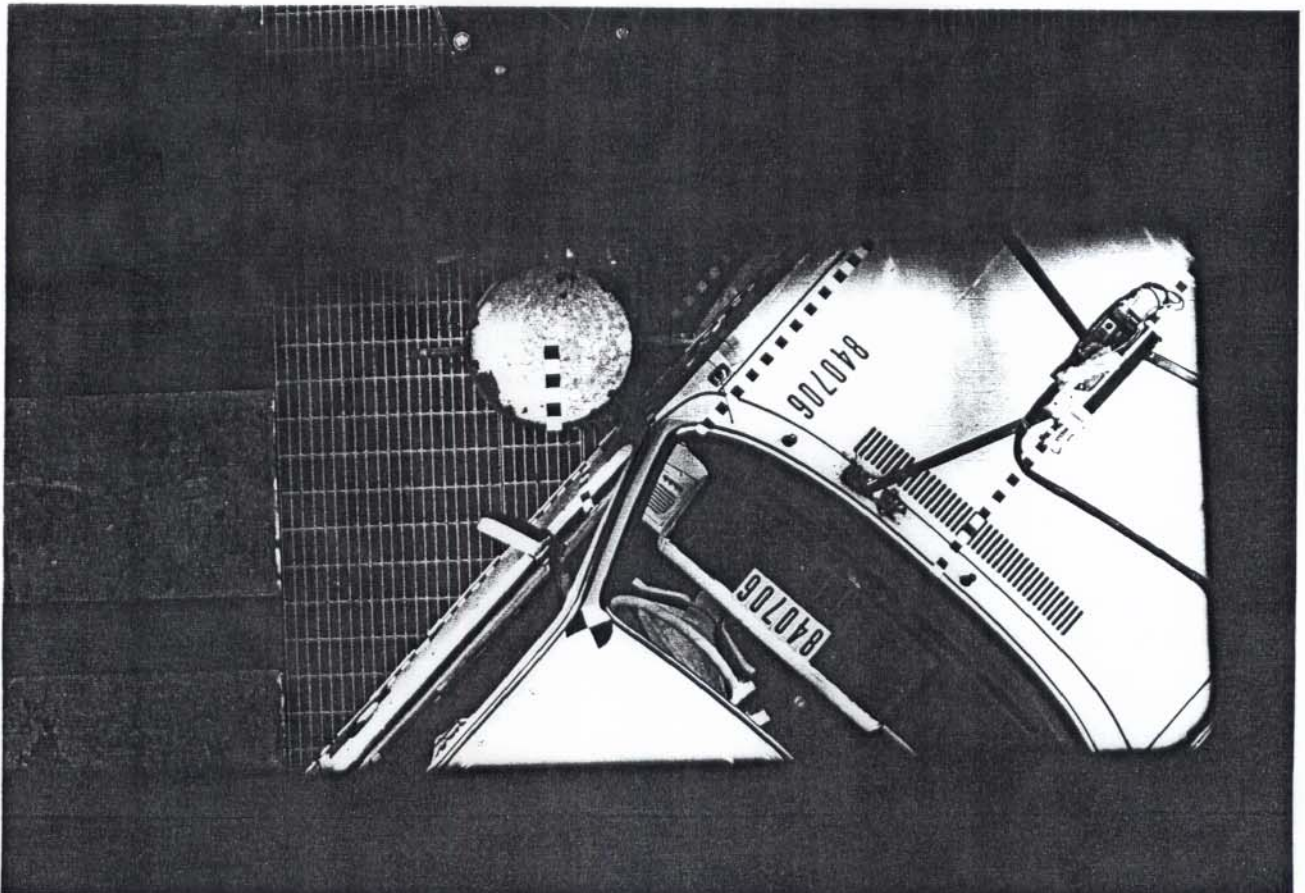


Figure A-4. PRE-TEST OVERALL - VIEW 4
A-3

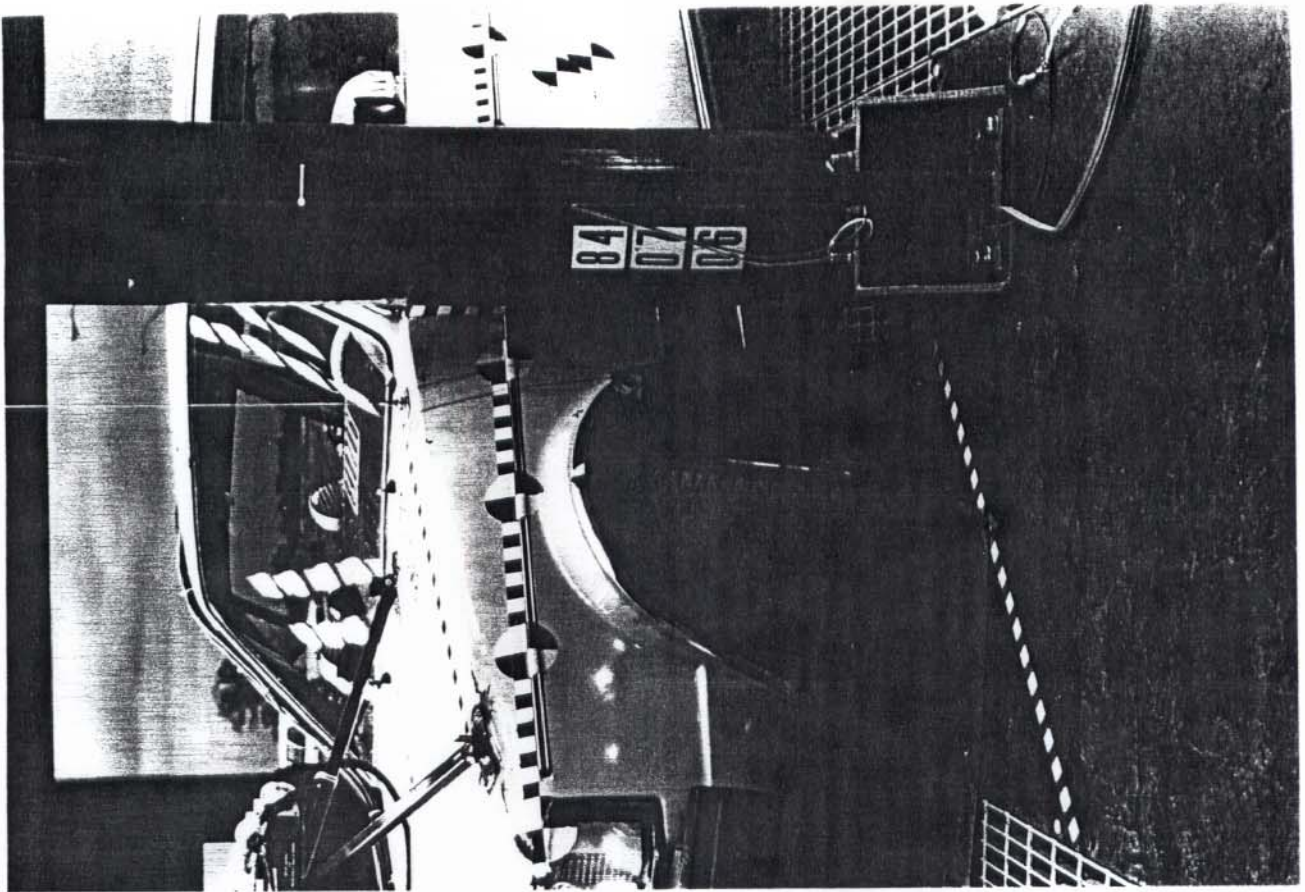


Figure A-5. PRE-TEST CLOSEUP

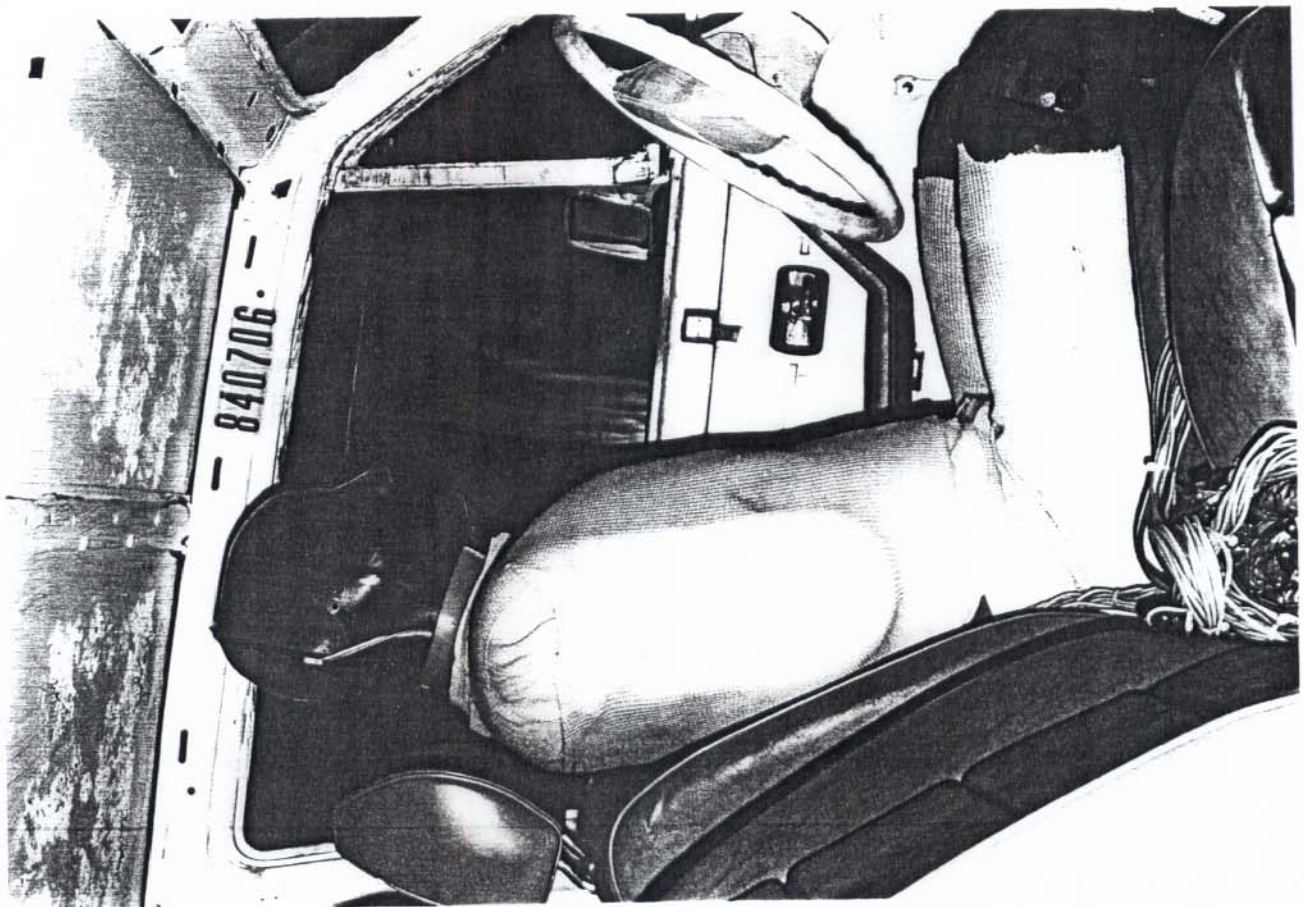


Figure A-6. PRE-TEST DRIVER DUMMY - VIEW 1



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

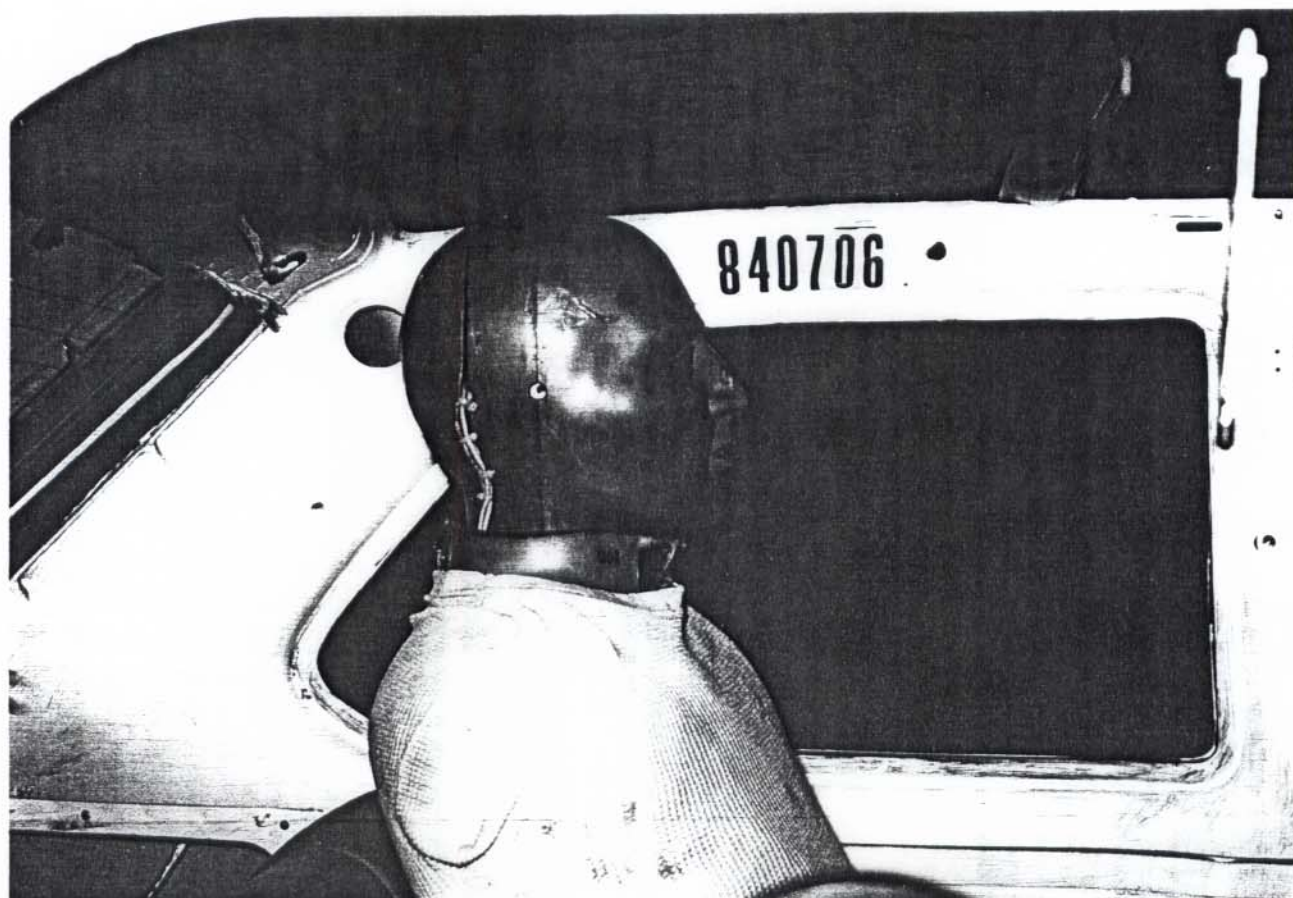


Figure A-8. PRE-TEST PASSENGER DUMMY - VIEW 1
A-5

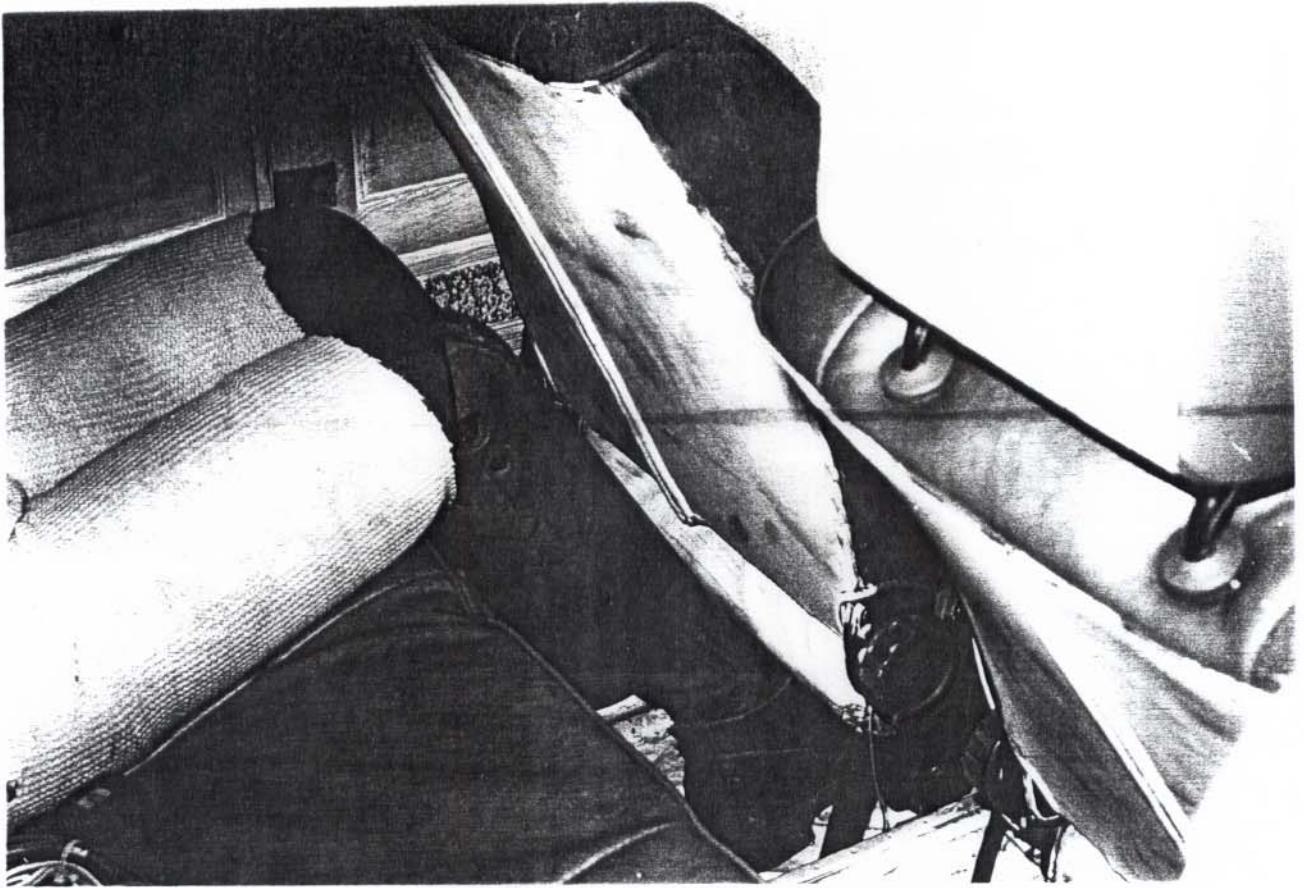


Figure A-9. PRE-TEST PASSENGER DUMMY - VIEW 2

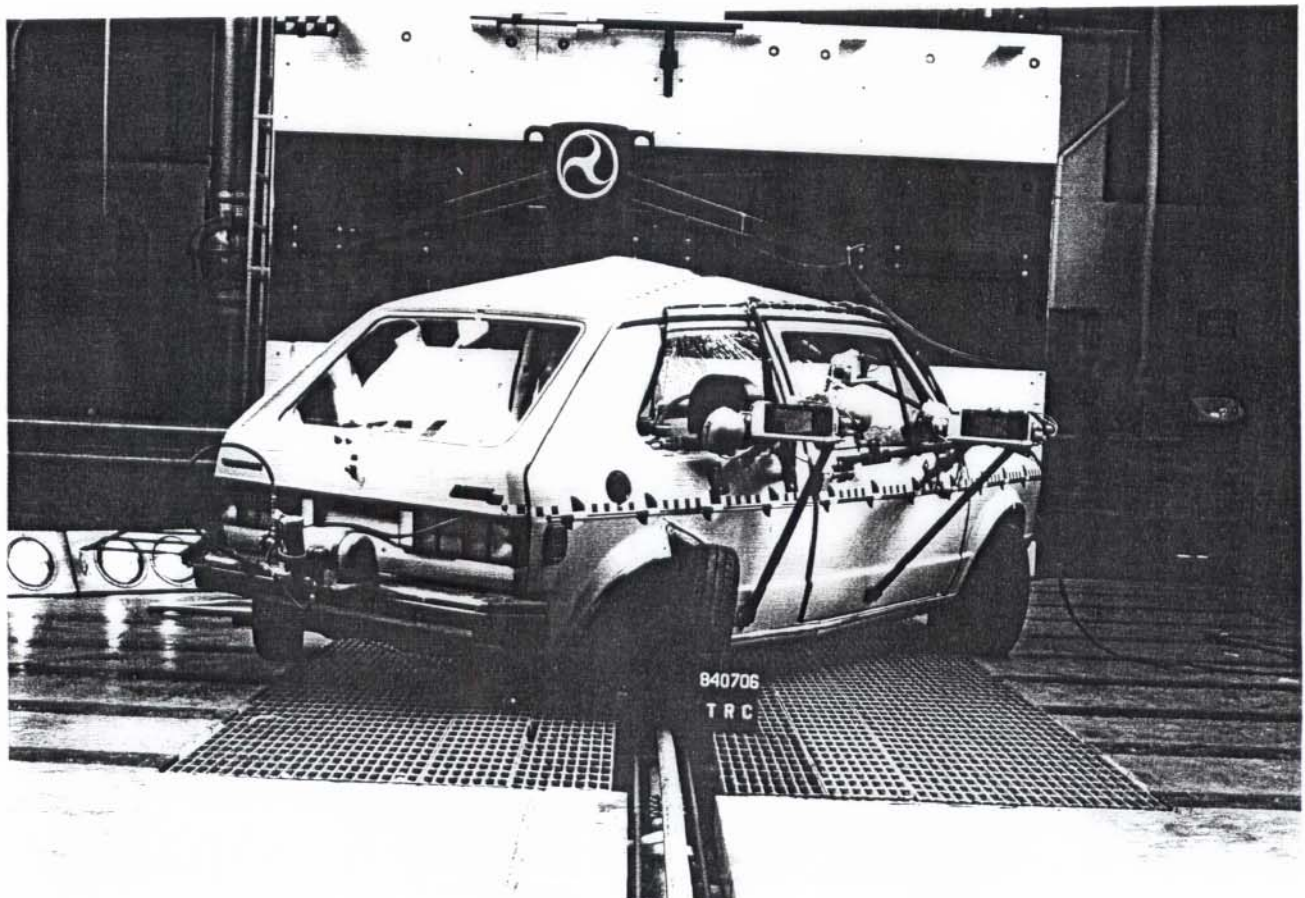


Figure A-10. POST-TEST OVERALL - VIEW 1
A-6



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

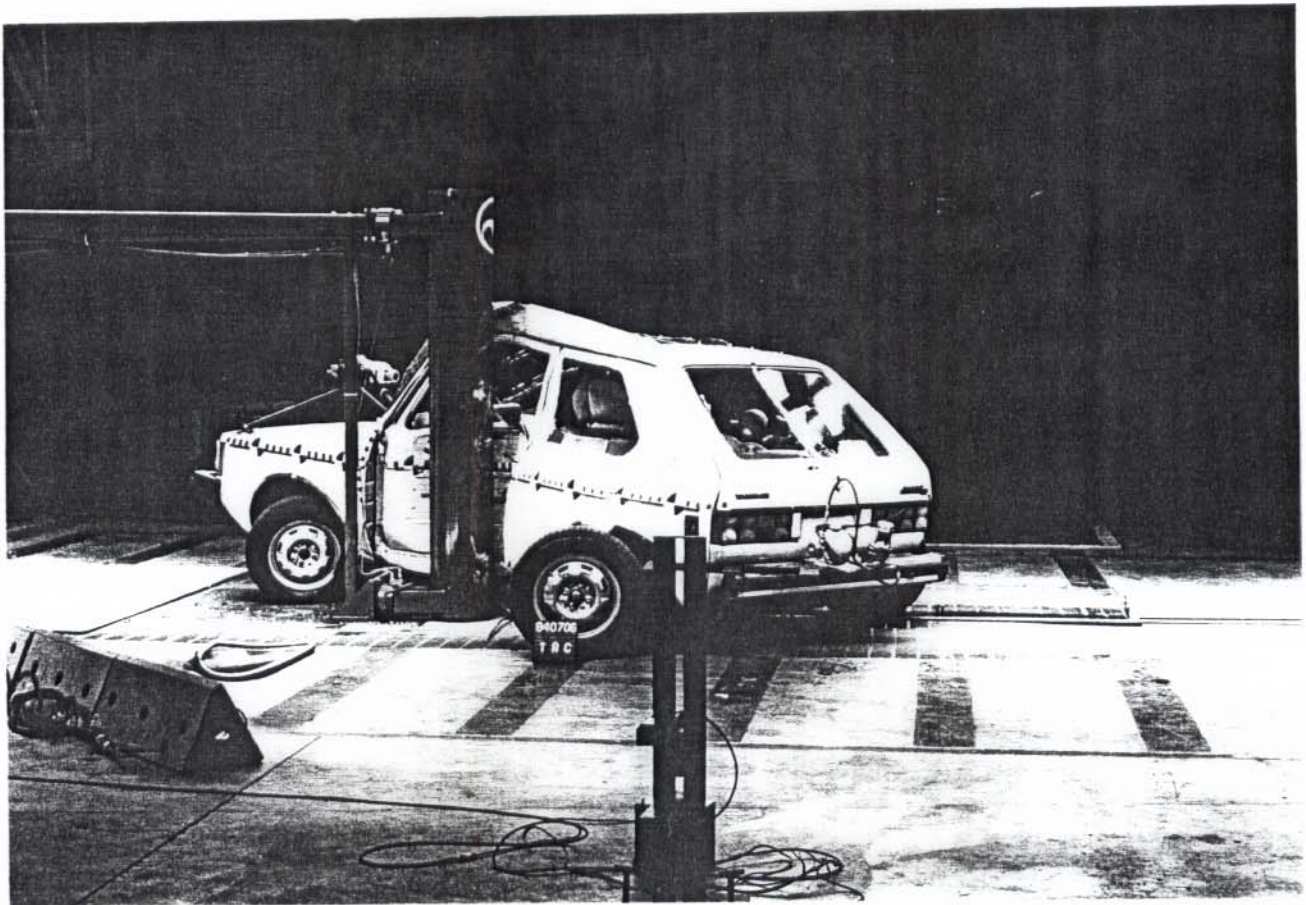


Figure A-12. POST-TEST OVERALL - VIEW 3
A-7

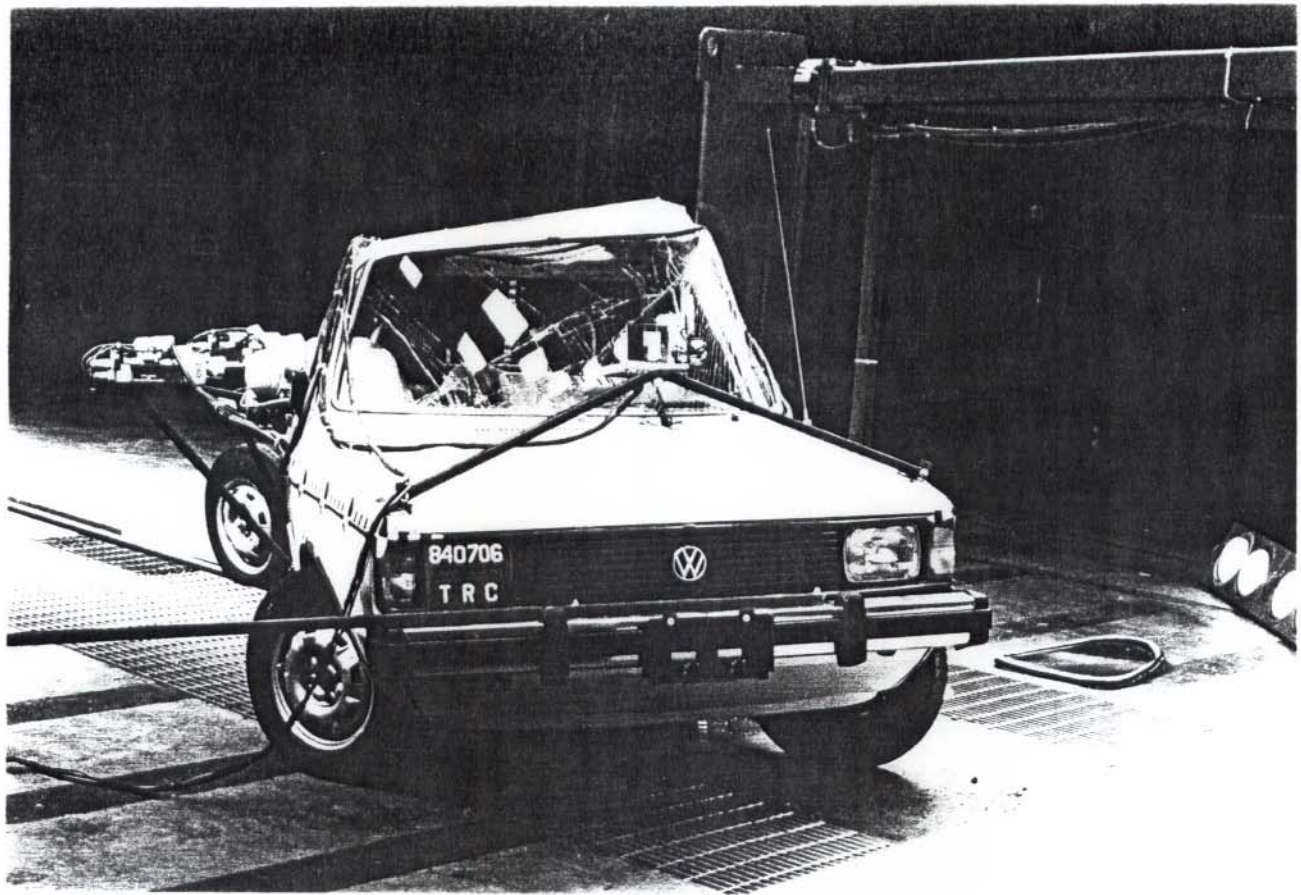


Figure A-13. POST-TEST OVERALL - VIEW 4

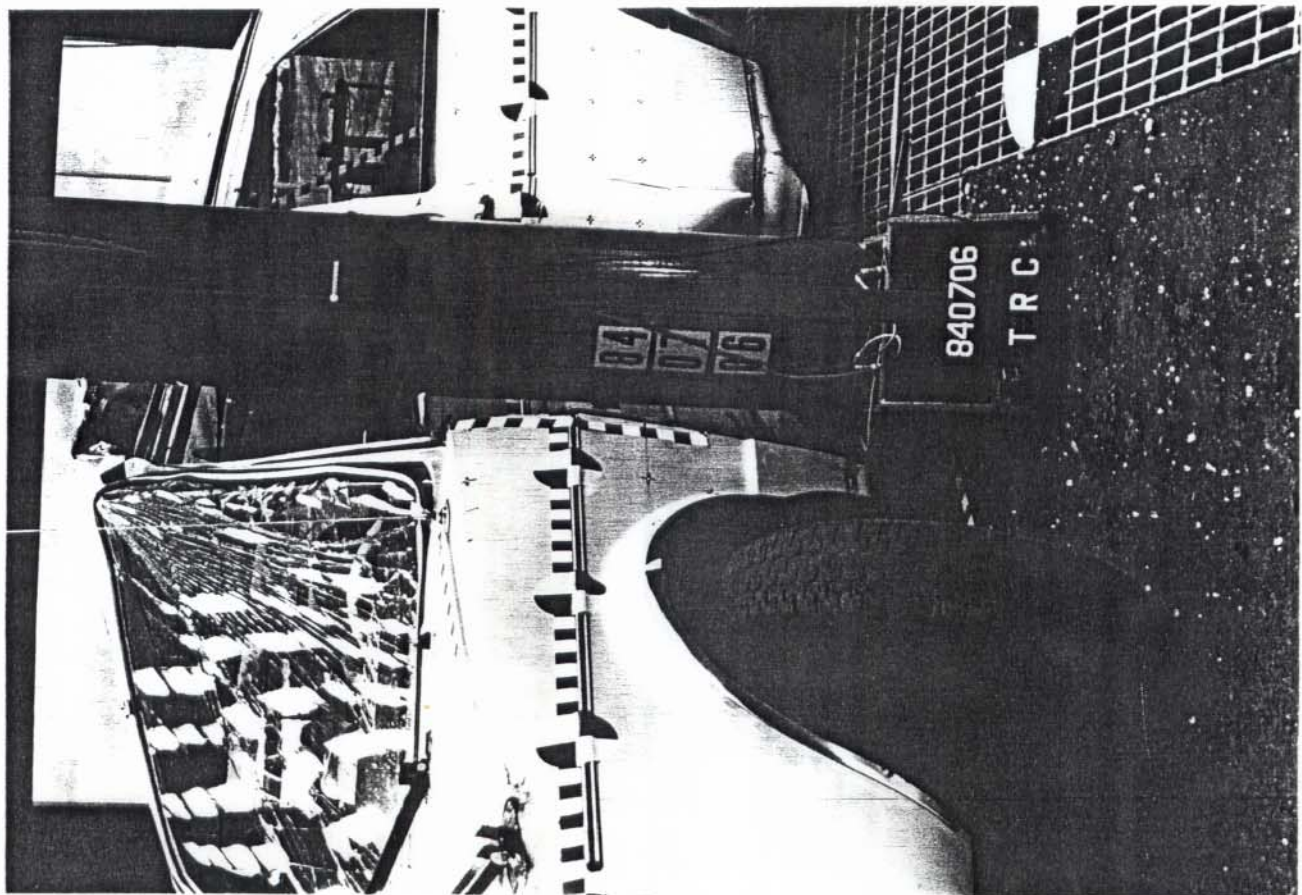


Figure A-14. POST-TEST CLOSEUP
A-8



Figure A-15. POST-TEST DRIVER DUMMY



Figure A-16. POST-TEST DRIVER DUMMY DAMAGE -- VIEW 1
A-9



Figure A-17. POST-TEST DRIVER DUMMY DAMAGE - VIEW 2

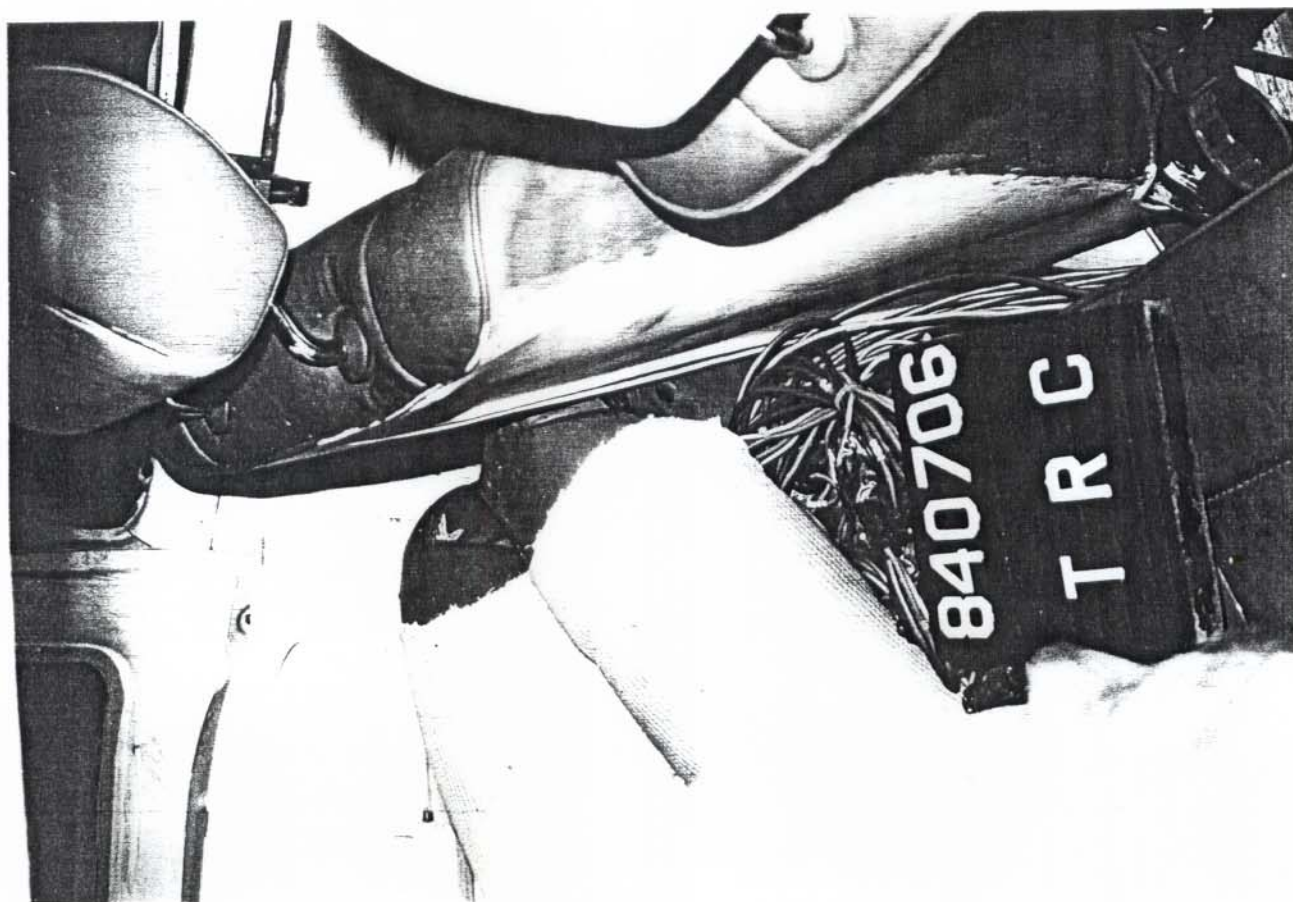


Figure A-18. POST-TEST PASSENGER DUMMY
A-10

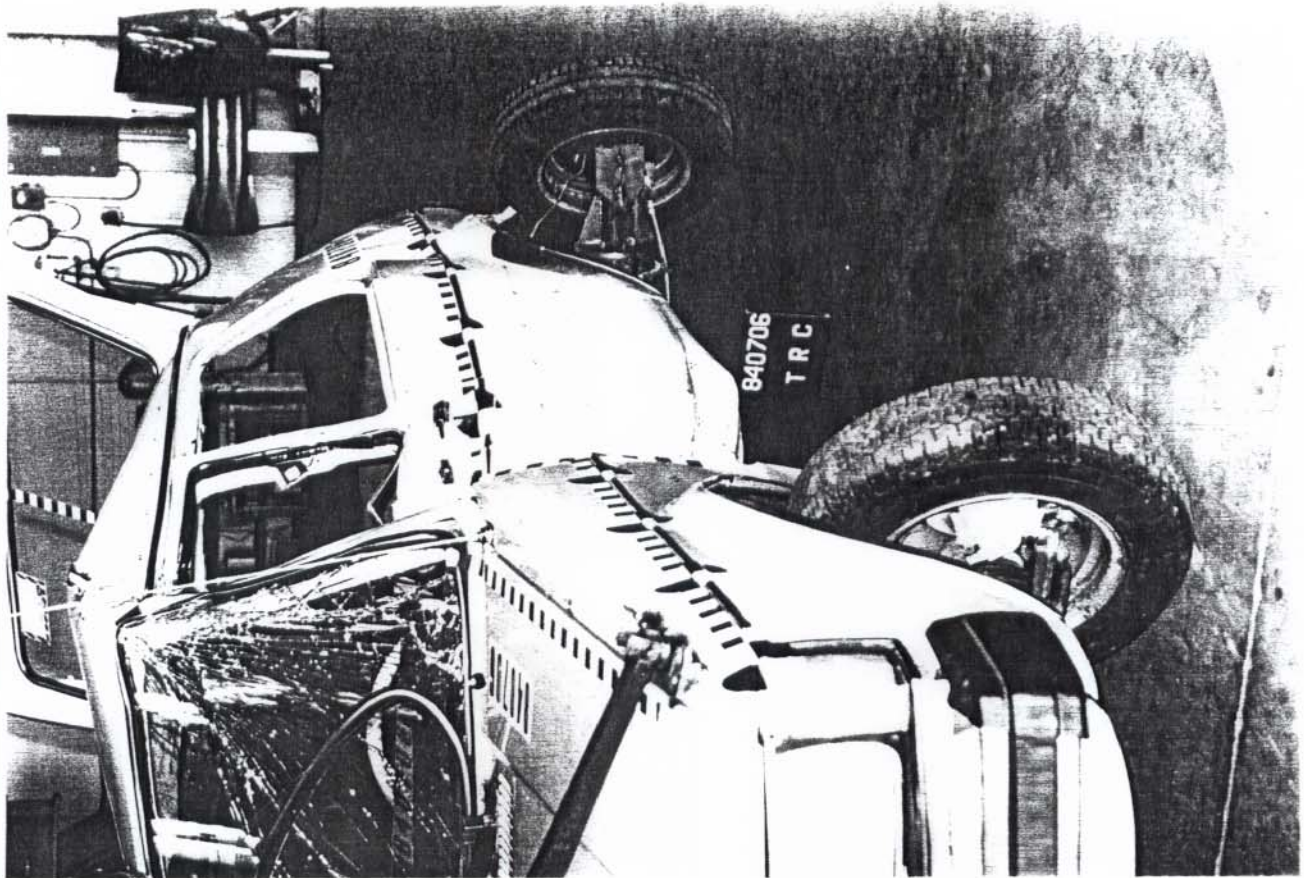


Figure A-19. POST-TEST VEHICLE DAMAGE - VIEW 1

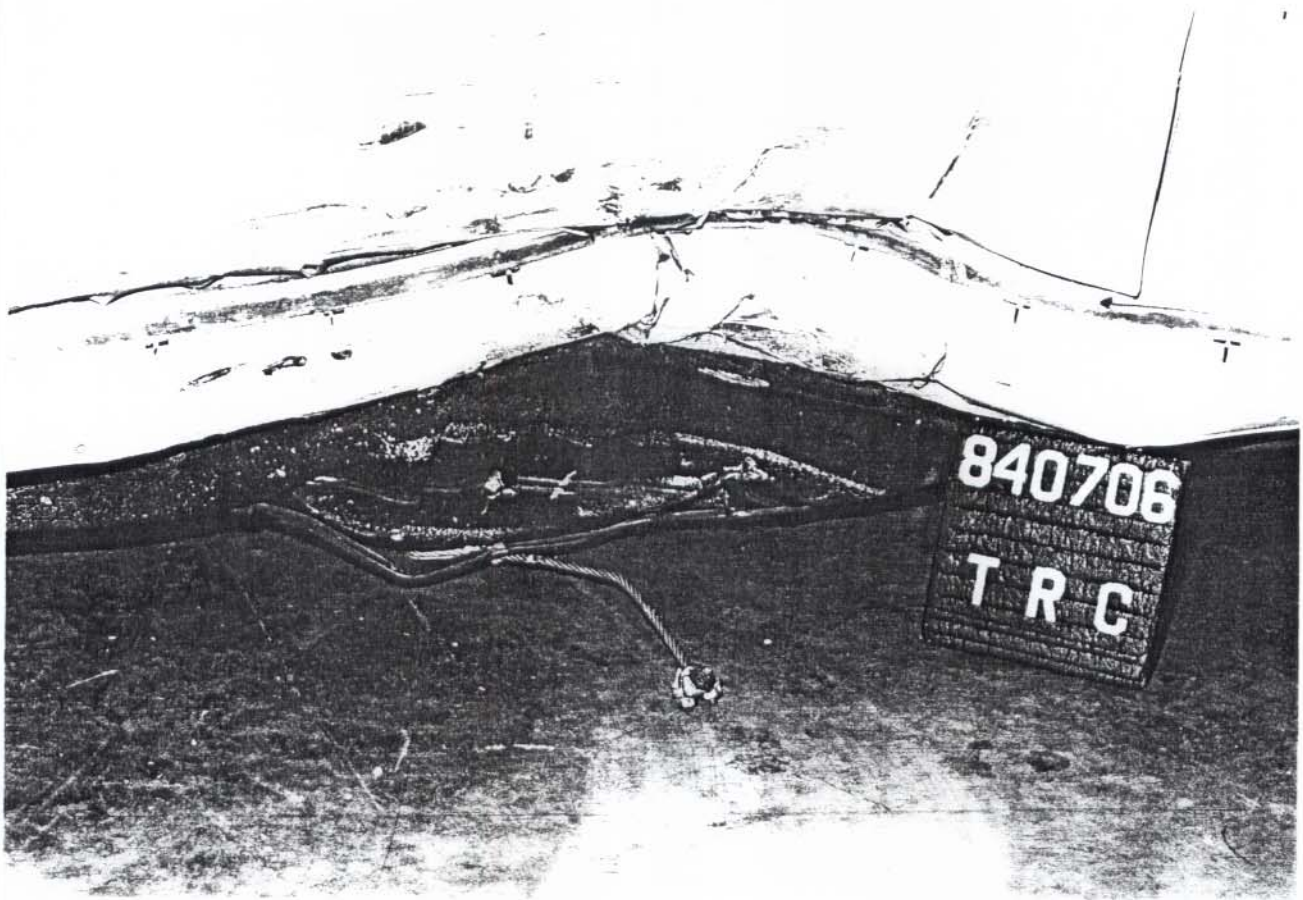


Figure A-20. POST-TEST VEHICLE DAMAGE - VIEW 2

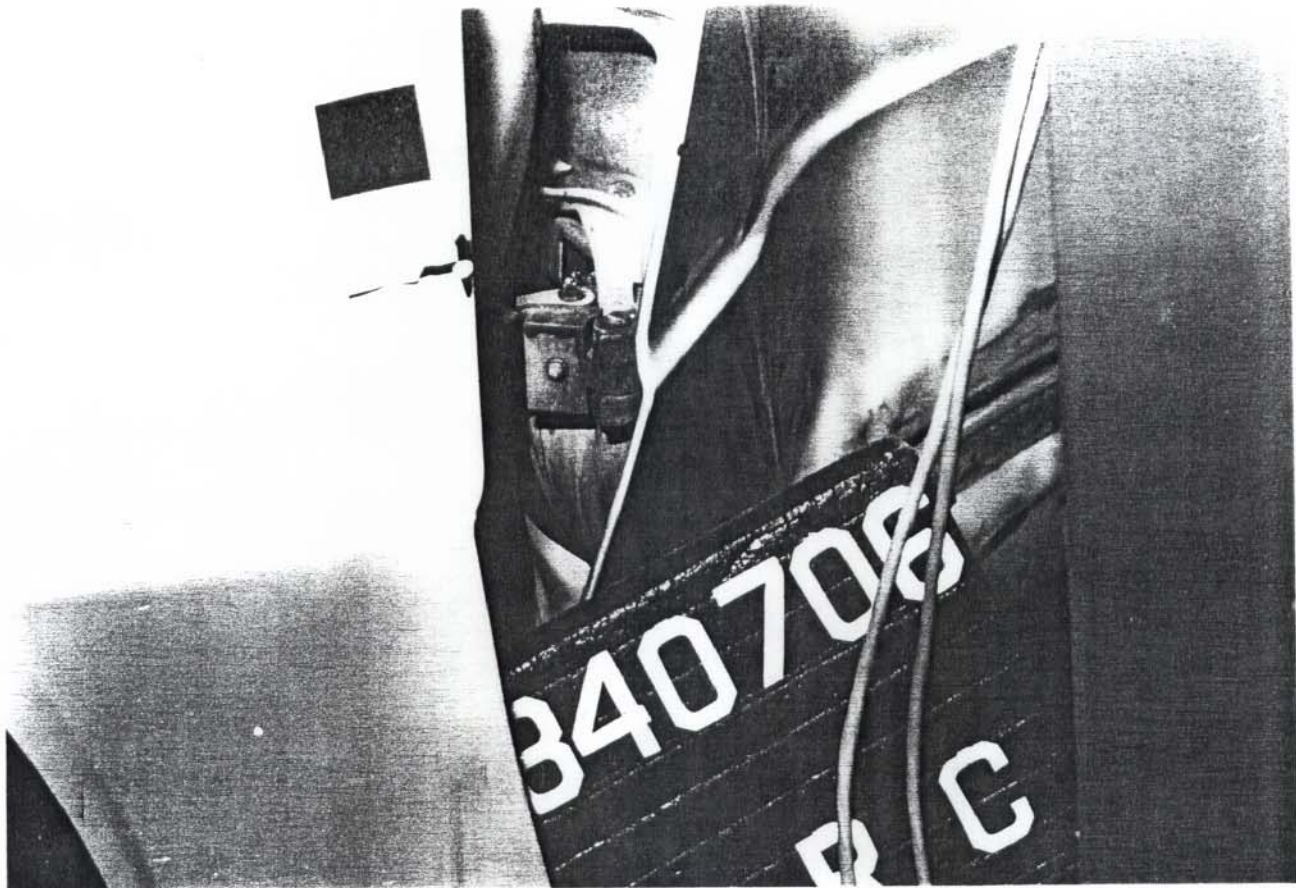


Figure A-21. POST-TEST VEHICLE DAMAGE - VIEW 3

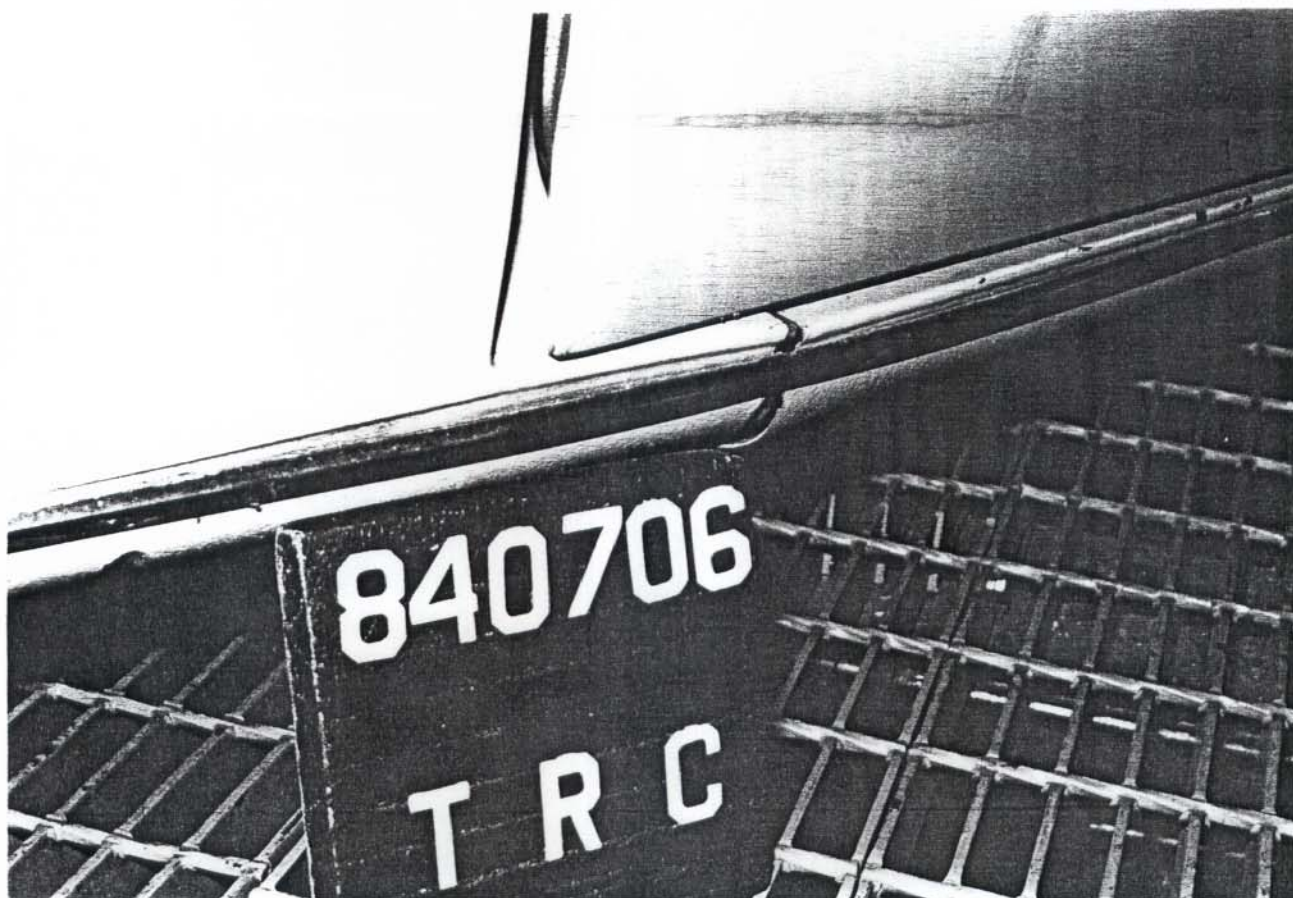


Figure A-22. POST-TEST VEHICLE DAMAGE - VIEW 4
A-12

APPENDIX B
DATA PLOT PRESENTATION

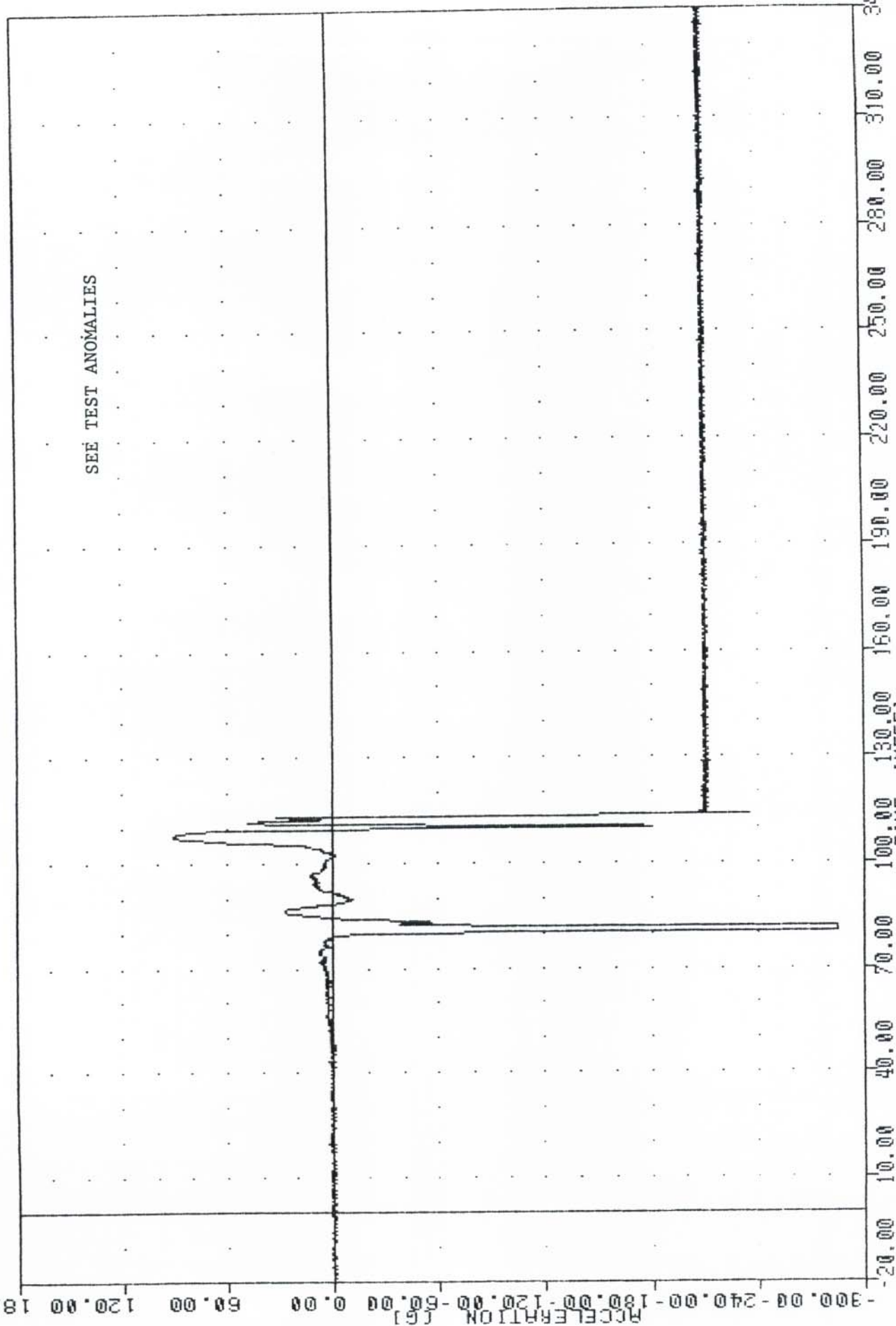
Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data were filtered according to SAE J211, except that dummy thorax data were filtered using the HSRI filter.

PLU, DATE 17-nov-84 13:39:54

THC, 040706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
HEDXG1

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -285.36 80.50, 90.63 108.00



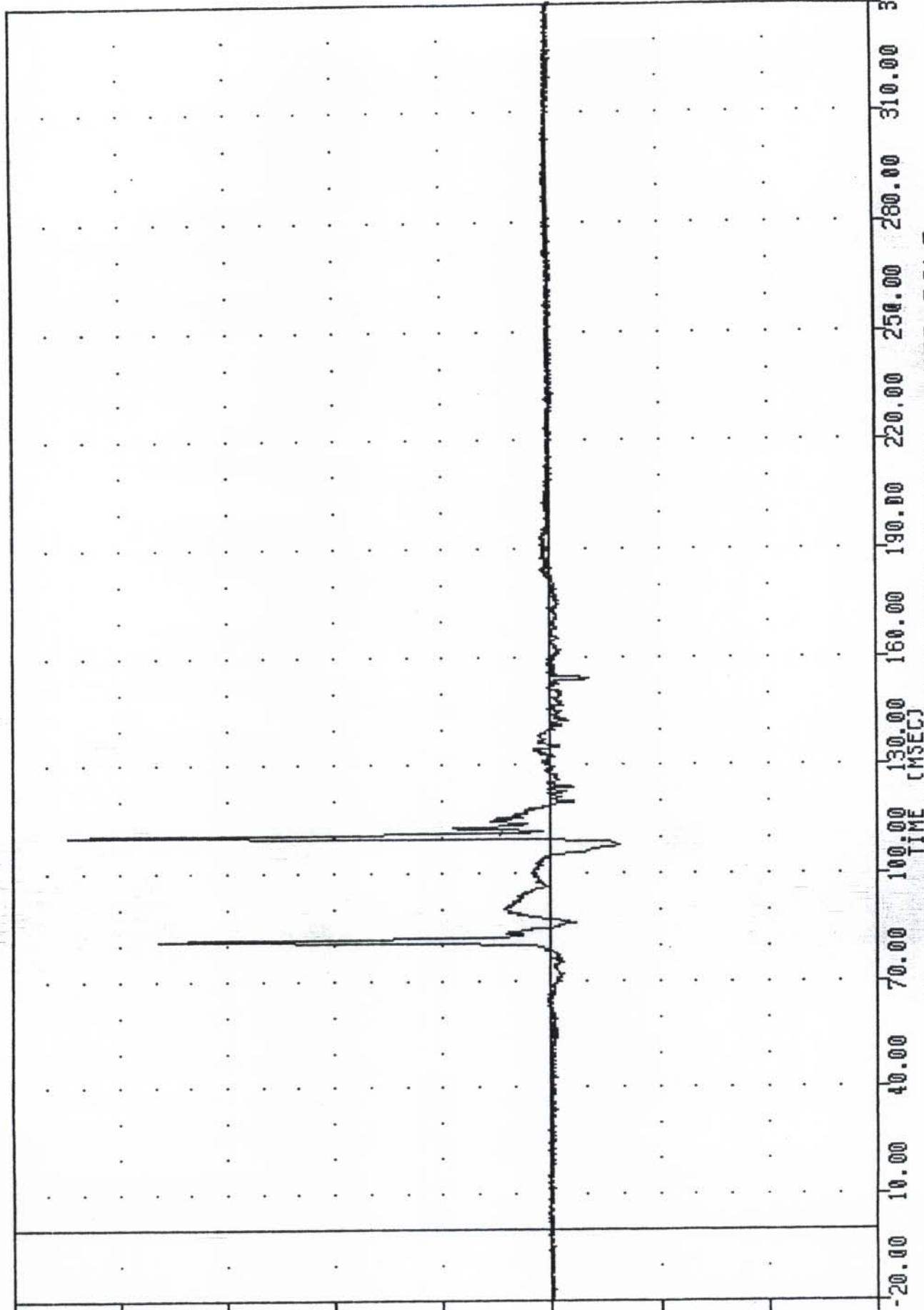
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER HEAD ACCELERATION X AXIS

TRC 0706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
HEDYG1

PLC DATE 15 1109-84 05.02:32

FILTER = ALPF 1650/ 5217/ -40
MIN. MAX VALUES = -37.74e 108.00, 269.06 e 110.00

ACCELERATION (G)



B-3

45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER HEAD ACCELERATION Y AXIS

TRC 0706
SIDE AGGRESSIVE ATTRIBUTES
8418800000
HEDZ61

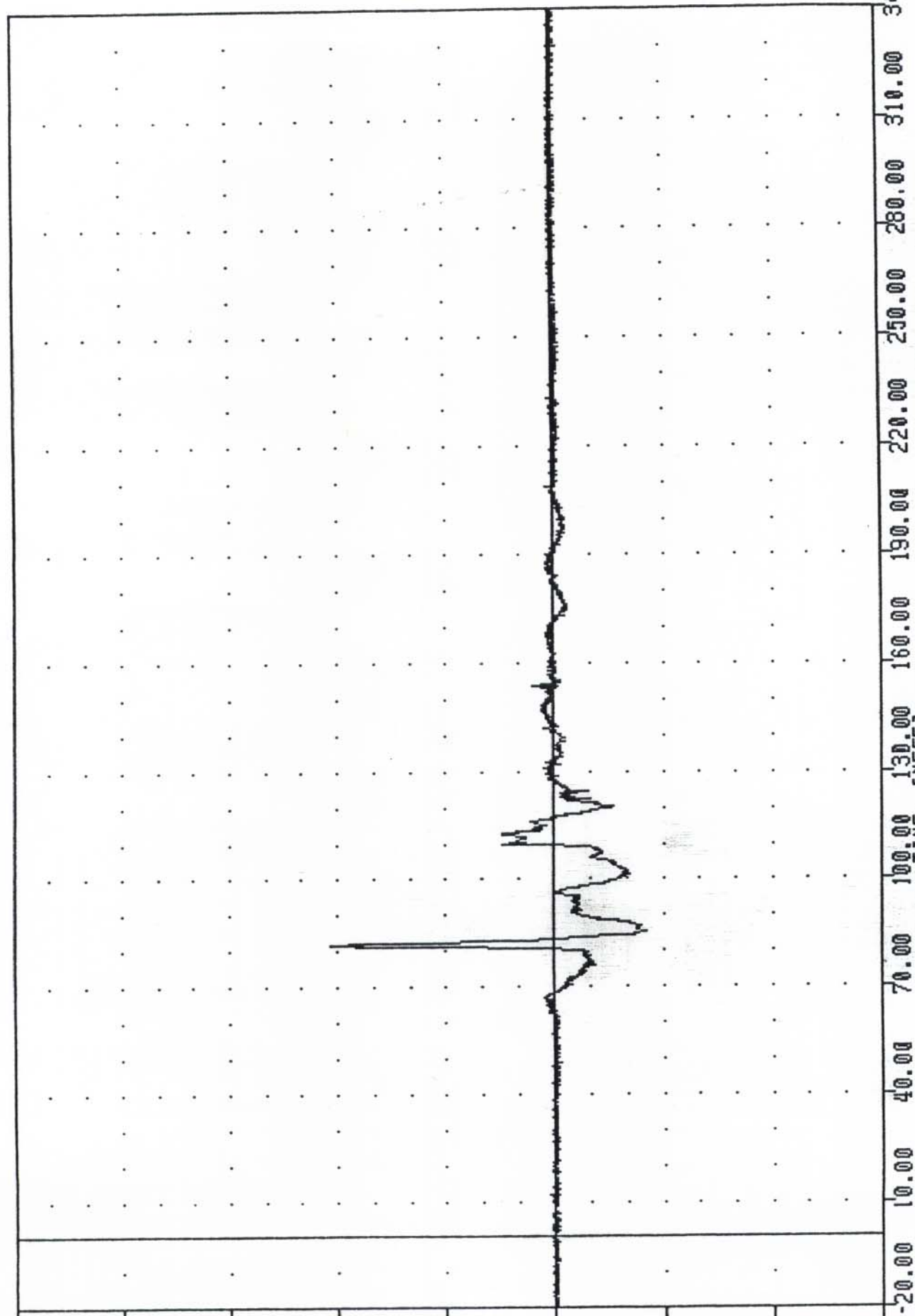
PLC DATE 15 NOV 84 05:21:32

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -50.41e 85.38 , 124.43 e 81.75

ACCELERATION (G)

B-4



45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER HEAD ACCELERATION Z AXIS

TRAIL J70C 15 106-82 05.02:32

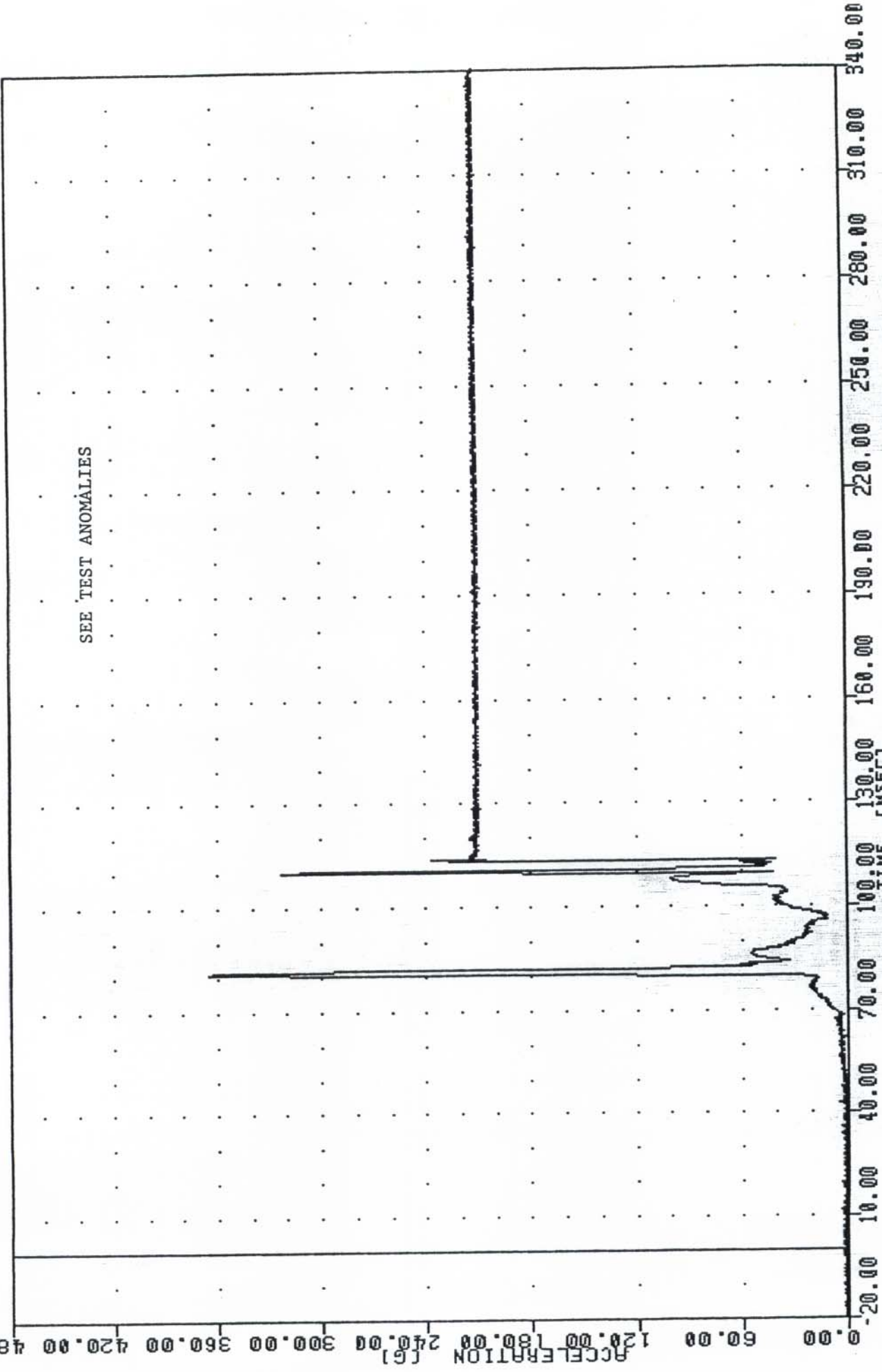
SIDE AGGRESSIVE ATTRIBUTES

84188000000

HEADG1

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = 0.05e 32.00, 365.28 e 81.13



45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER HEAD RESULTANT

TIME 040700 PLU DATE 15-MUG-84 09:09:26

SIDE AGGRESSIVE ATTRIBUTES

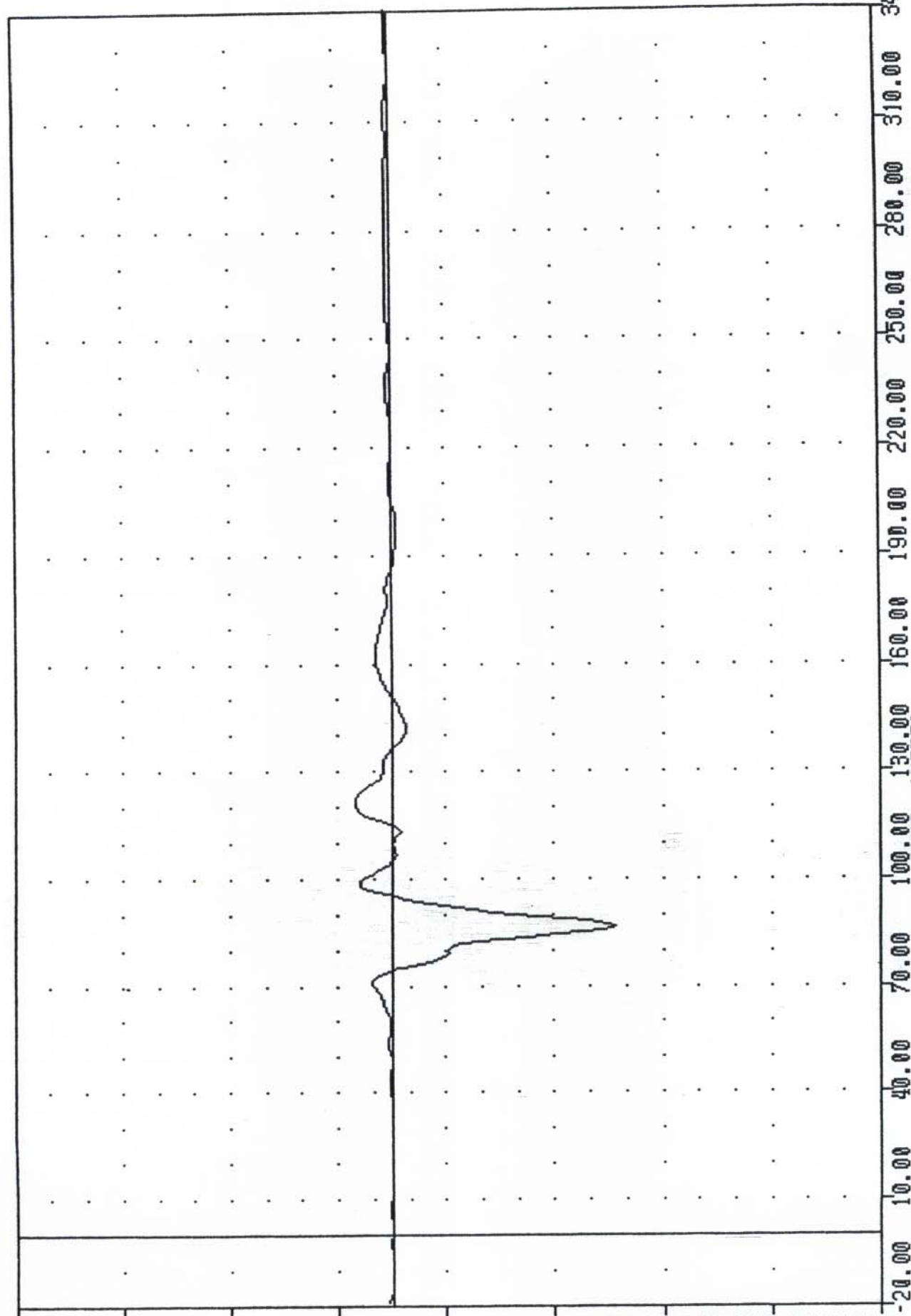
84188000000

T01XG1

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -82.43 86.25, 13.03 121.25

ACCELERATION (G)



B-6

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER UPPER SPINE ACCELERATION X AXIS

TR, 030708

PLC, JATE 15 NOV 84 05:33:28

SIDE AGGRESSIVE ATTRIBUTES

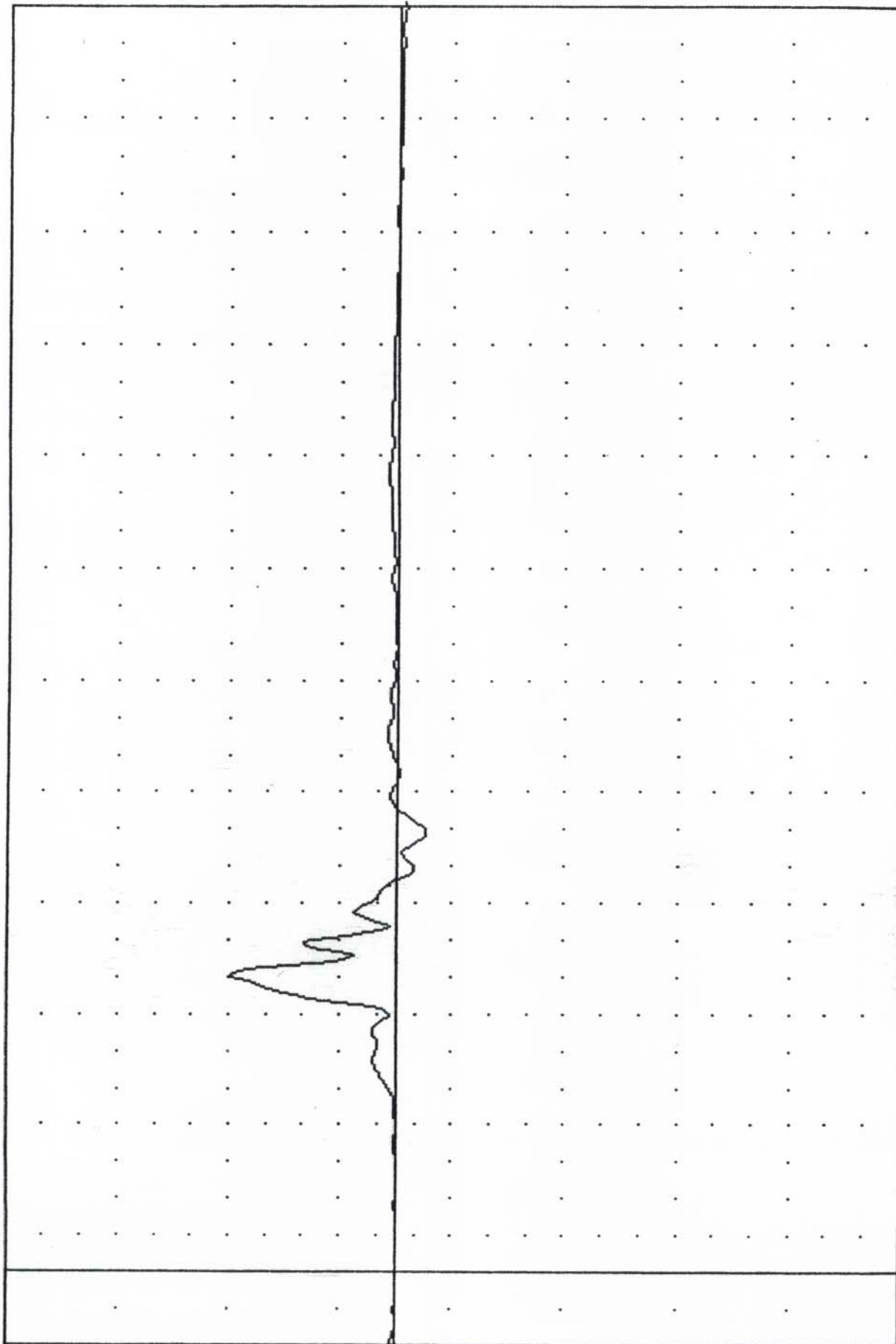
84188000000

T01Y61

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -10.80 118.13, 59.50 80.00

ACCELERATION (G)



B-7

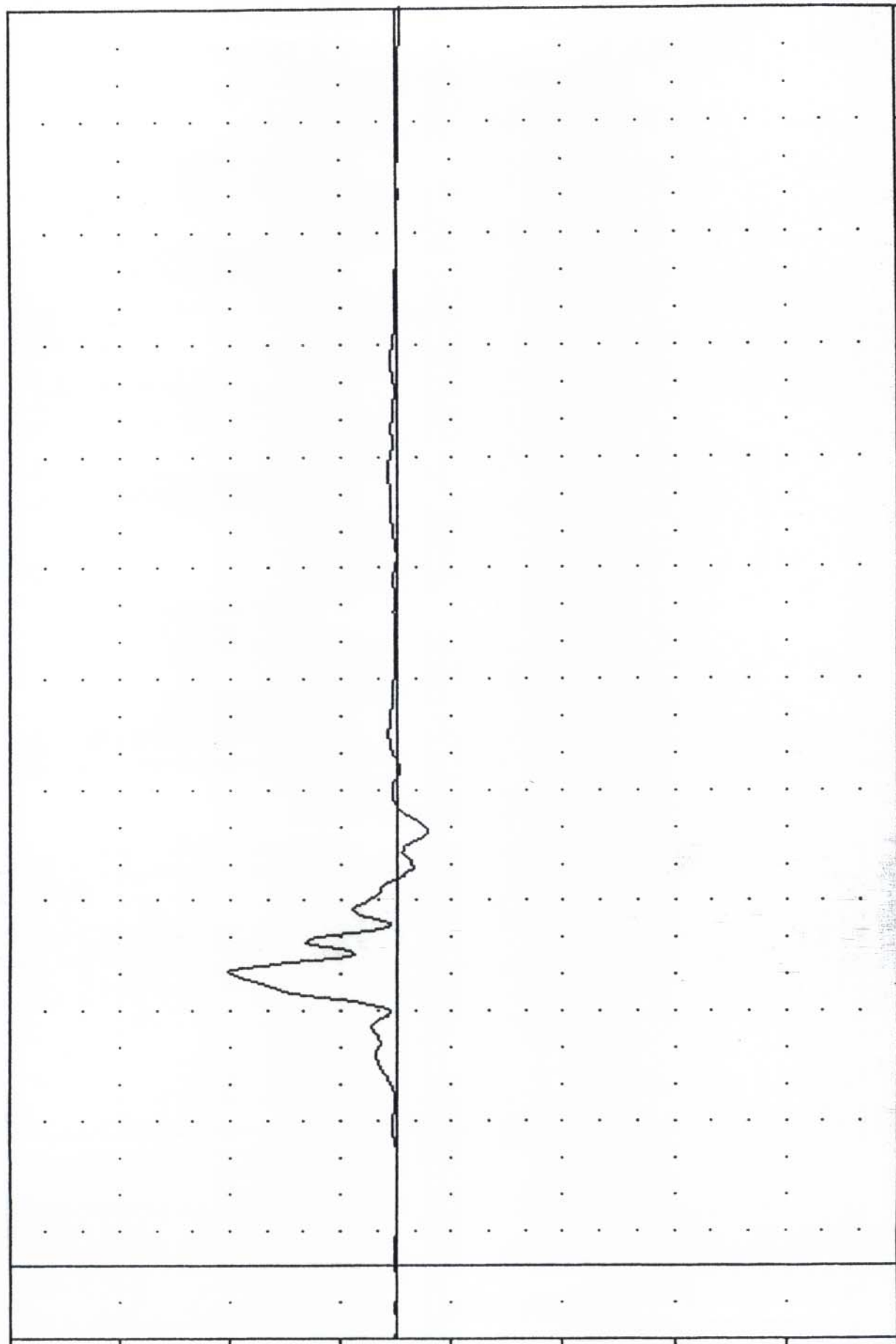
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER UPPER SPINE ACCELERATION Y AXIS

TRC 040706
 SIDE AGGRESSIVE ATTRIBUTES
 84188000000
 T01Y6A

PLD, DATE 15 NOV 84 09:39:28

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -11.25 118.13, 61.05 80.00

ACCELERATION (G)



B-8

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER UPPER SPINE ACCELERATION -2 Y AXIS

TIME 04:07:00 PLU, DATE 15-JUG-84 09:09:20

SIDE AGGRESSIVE ATTRIBUTES

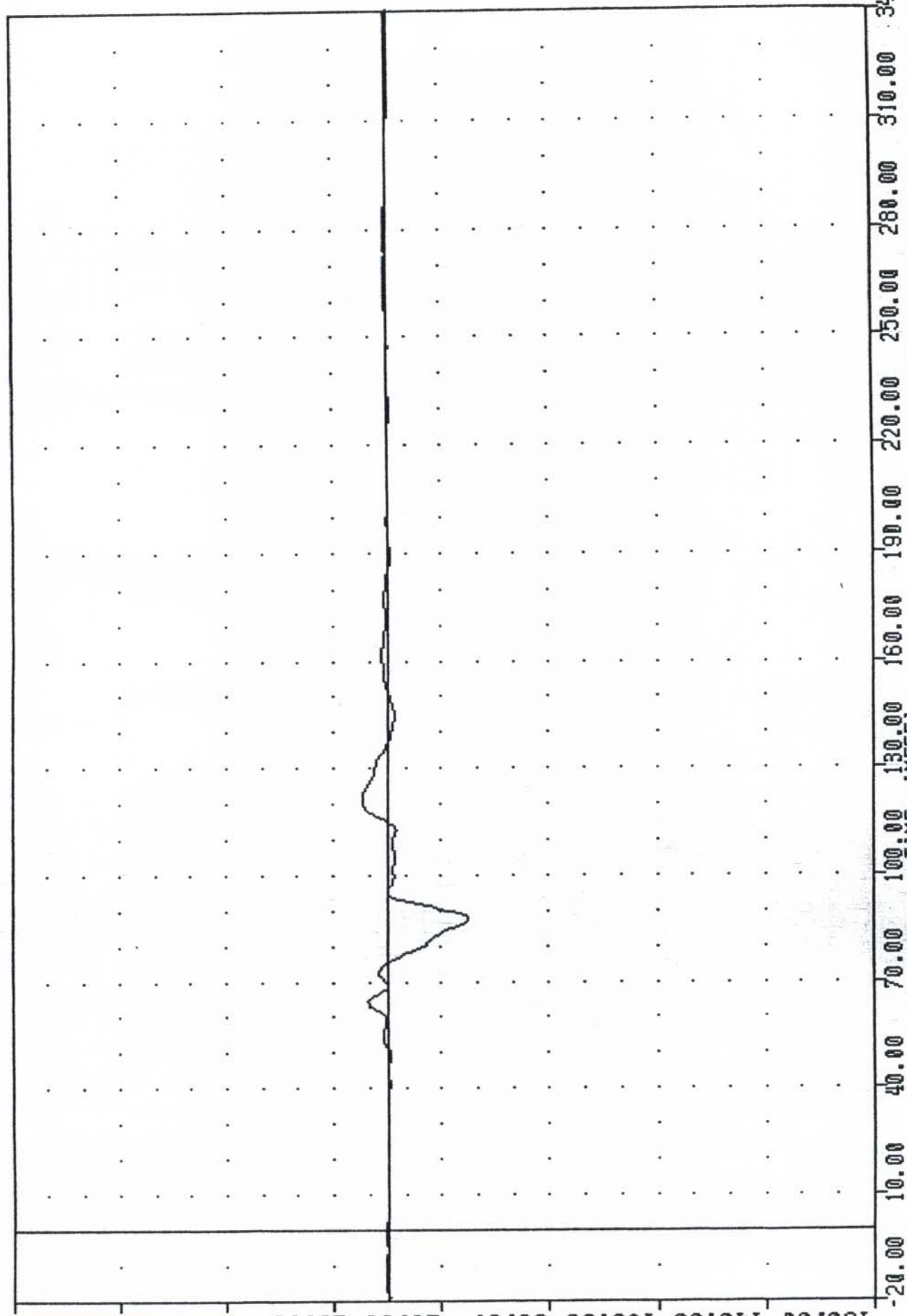
84188000000

7017G1

FILTER = HSR1 136/ 189/ -50

MIN, MAX VALUES = -30.17 86.88, 9.26 120.63

ACCELERATION [G]



B-9

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER UPPER SPINE ACCELERATION Z AXIS

PLG, DATE 15-MUG-84 09:59:26

TRC SIDE AGGRESSIVE ATTRIBUTES

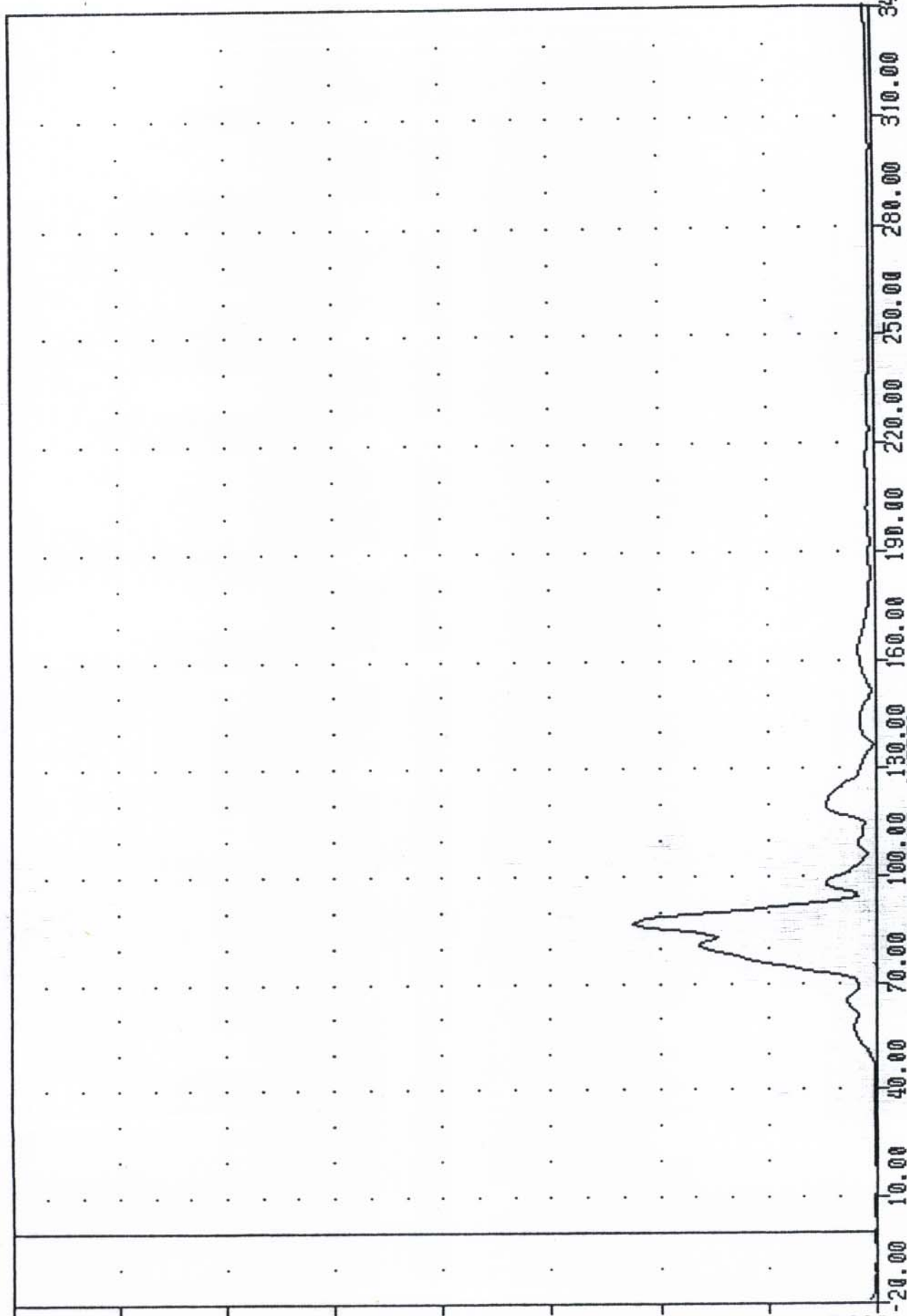
84188000000

T01RG1

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.07 14.37, 90.01 86.25

ACCELERATION (G)



B-10

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER UPPER SPINE RESULTANT

PLU, DATE 15-JUG-84 1w.w0:3/

TIC, 040700
SIDE AGGRESSIVE ATTRIBUTES

84188000000

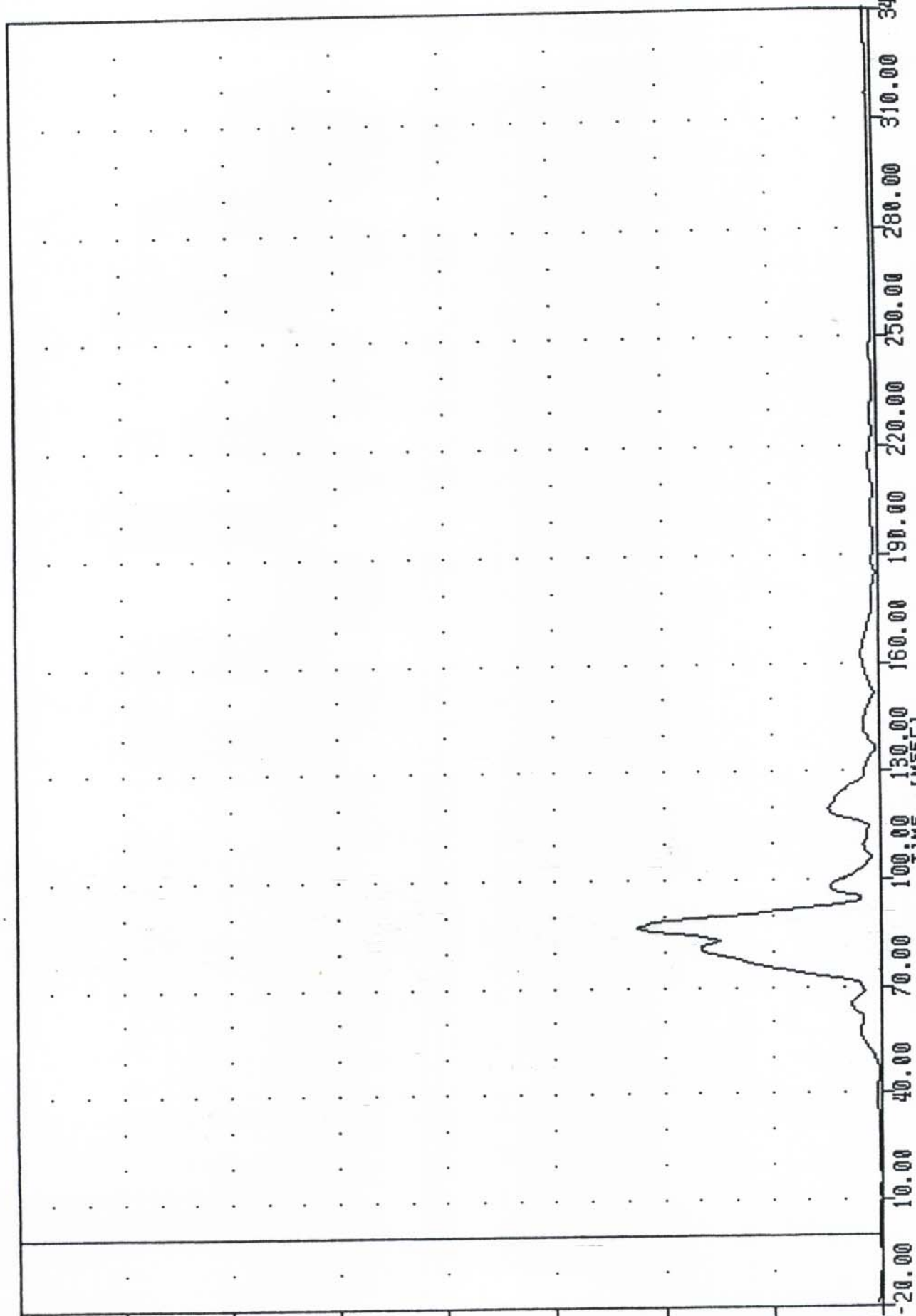
T01RGA

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.20B

-7.50, 89.96 e 86.25

ACCELERATION (G)



B-11

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER UPPER SPINE RESULTANT USING T01YGA

PLC, DATE 15 AUG 84 10:33:40

TIME 03700
SIDE AGGRESSIVE ATTRIBUTES

84188000000

T01YV1

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -14.22 30.62, 8.52 287.50

20.00

15.00

10.00

5.00

0.00

-5.00

-10.00

-15.00

-20.00

B-12

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

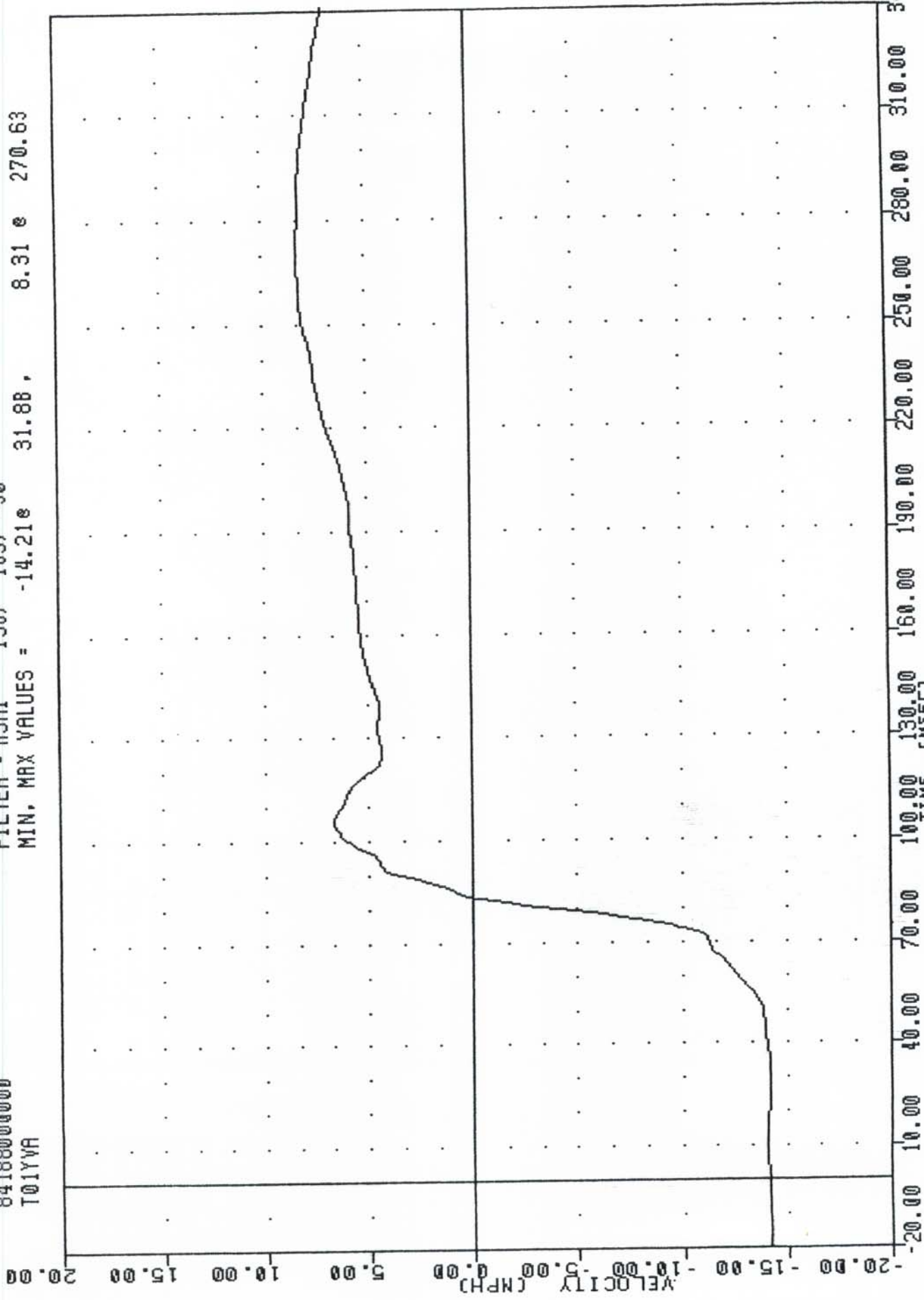
TIME (MSEC)

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE

DELTA V USING T01YV1

TALE, J700
SIDE AGGRESSIVE ATTRIBUTES
8418800000
T01YVA

PLG, JATL 15 10G-8 10.03:40
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -14.21e 31.88, 8.31 e 270.63



B-13

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING T01YGA

PLC, DRTL 15 106-8- 00.09:20

TIME 0700
SIDE AGGRESSIVE ATTRIBUTES

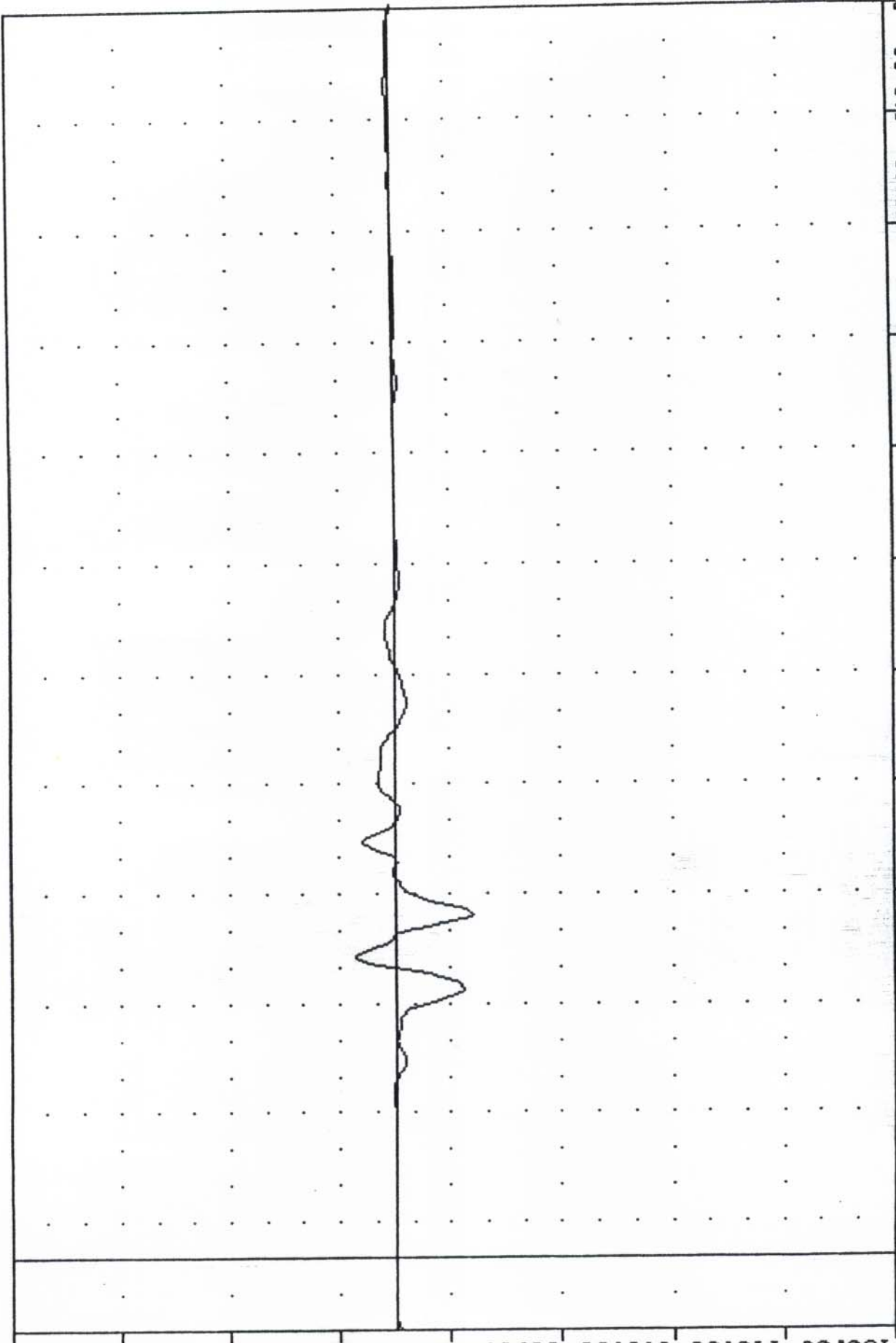
84188000000

T12XG1

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -28.34 93.75, 14.38 82.50

ACCELERATION (G)



B-14

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER LOWER SPINE ACCELERATION X AXIS

TRC 706

SIDE AGGRESSIVE ATTRIBUTES

84188000000

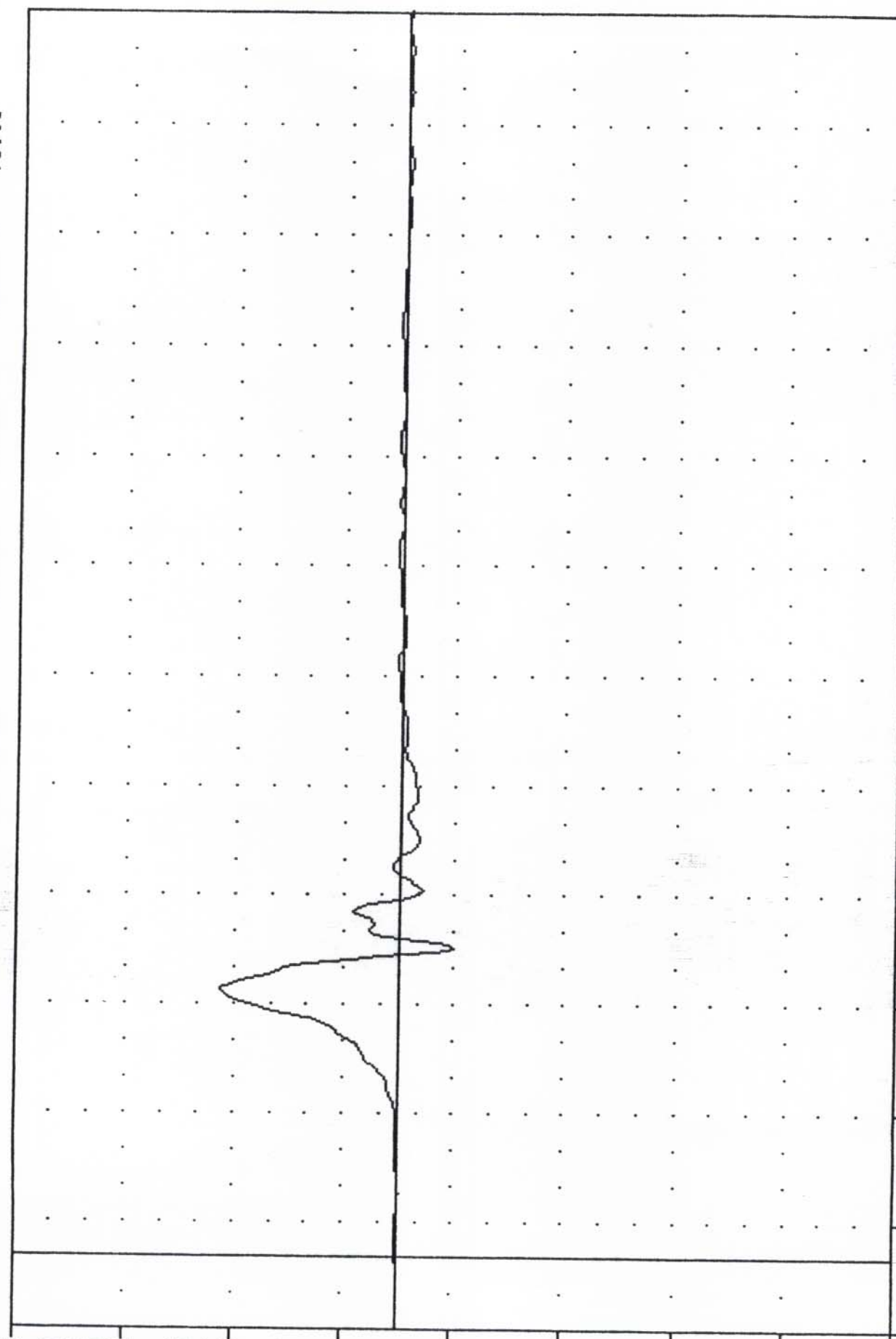
T12Y61

PLC RATE 15 153-84 09:00:28

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -19.70e 85.00, 65.17 e 73.13

ACCELERATION (G)



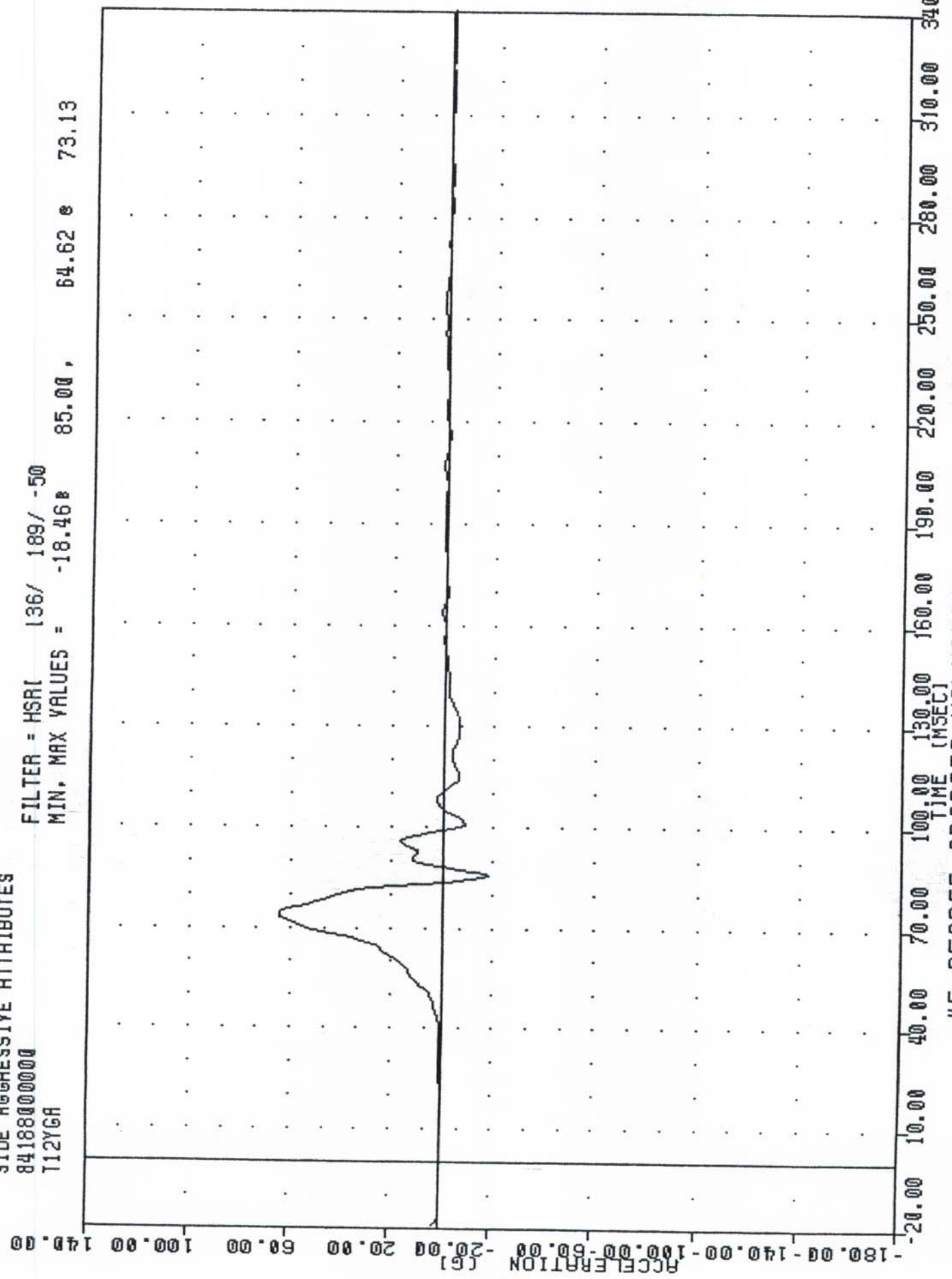
B-15

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE

DRIVER LOWER SPINE ACCELERATION Y AXIS

TITLE 040700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
T12YGR

PLU, DATE 15-MUG-84 09:59:28
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -18.46 85.00, 54.62 73.13



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER LOWER SPINE ACCELERATION -2 Y AXIS

TITLE: 040700

SIDE AGGRESSIVE ATTRIBUTES

84188000000

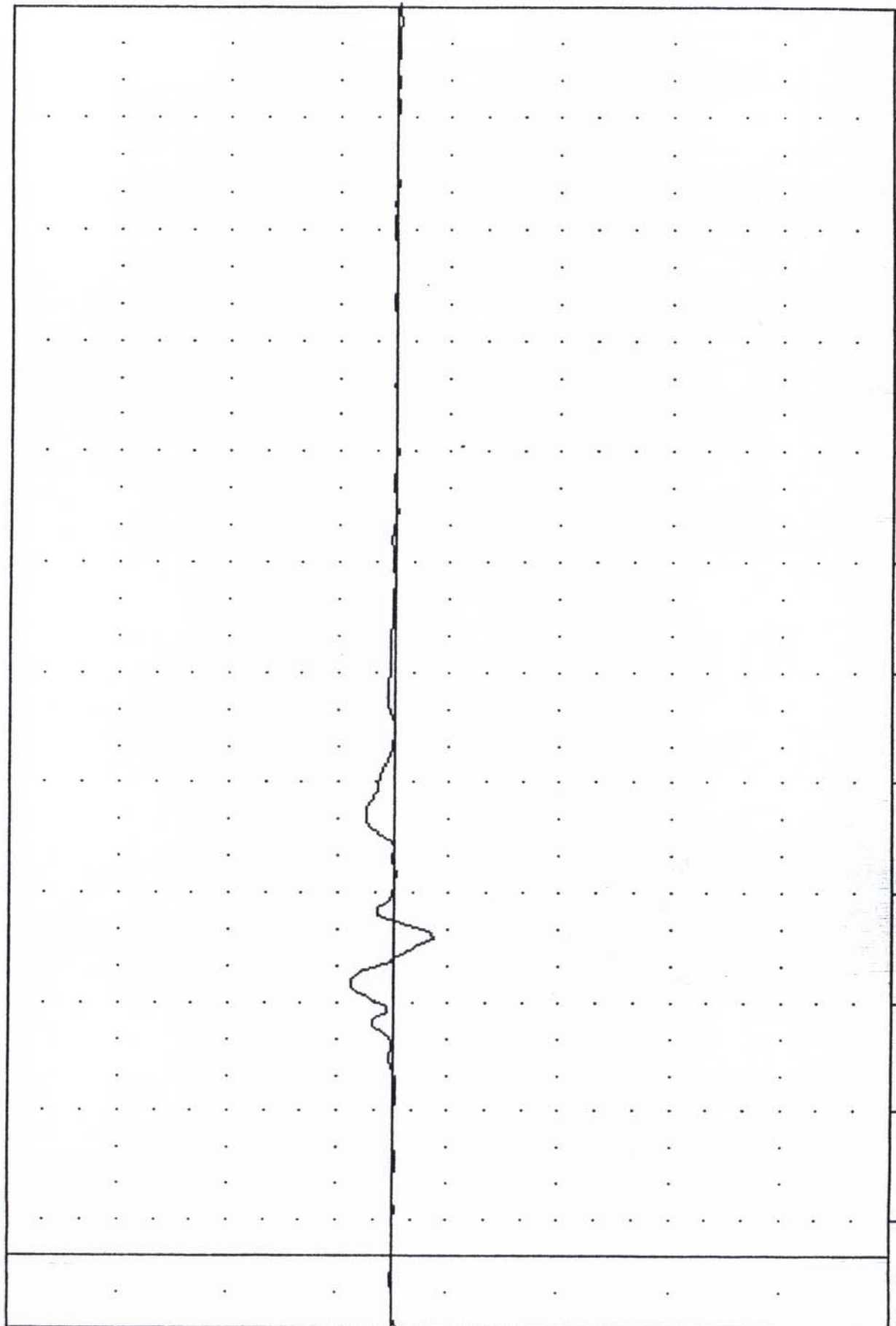
T12ZG1

PLU: DATE 15-JUG-84 09:39:28

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -14.72 87.50 15.12 75.00

ACCELERATION (G)



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

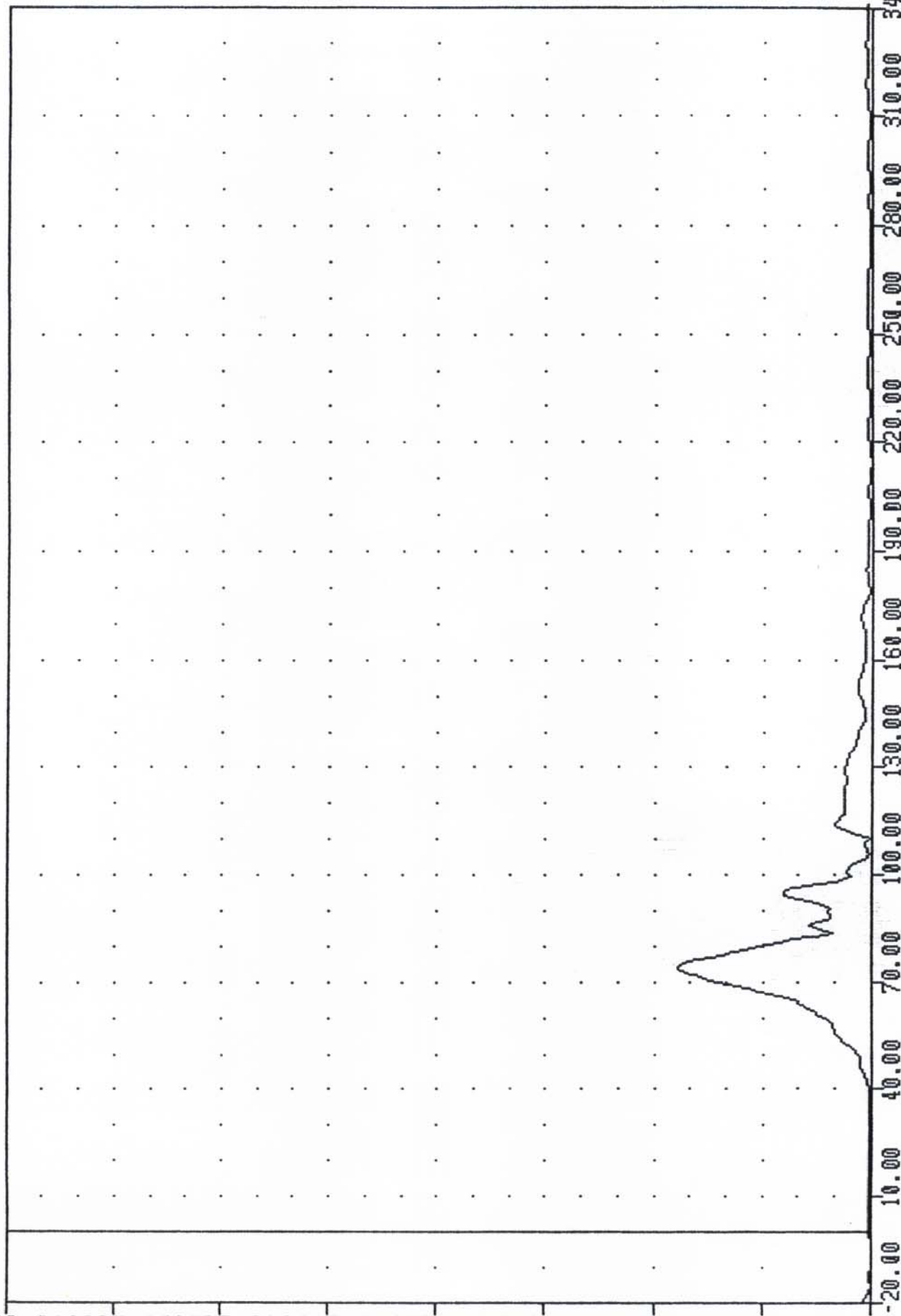
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER LOWER SPINE ACCELERATION Z AXIS

PLU, JATL 15-nug-84 09:39:26

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = 0.06e -4.38, 71.21 e 73.13

TIME 043700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
T12RG1

ACCELERATION (G)



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER LOWER SPINE RESULTANT

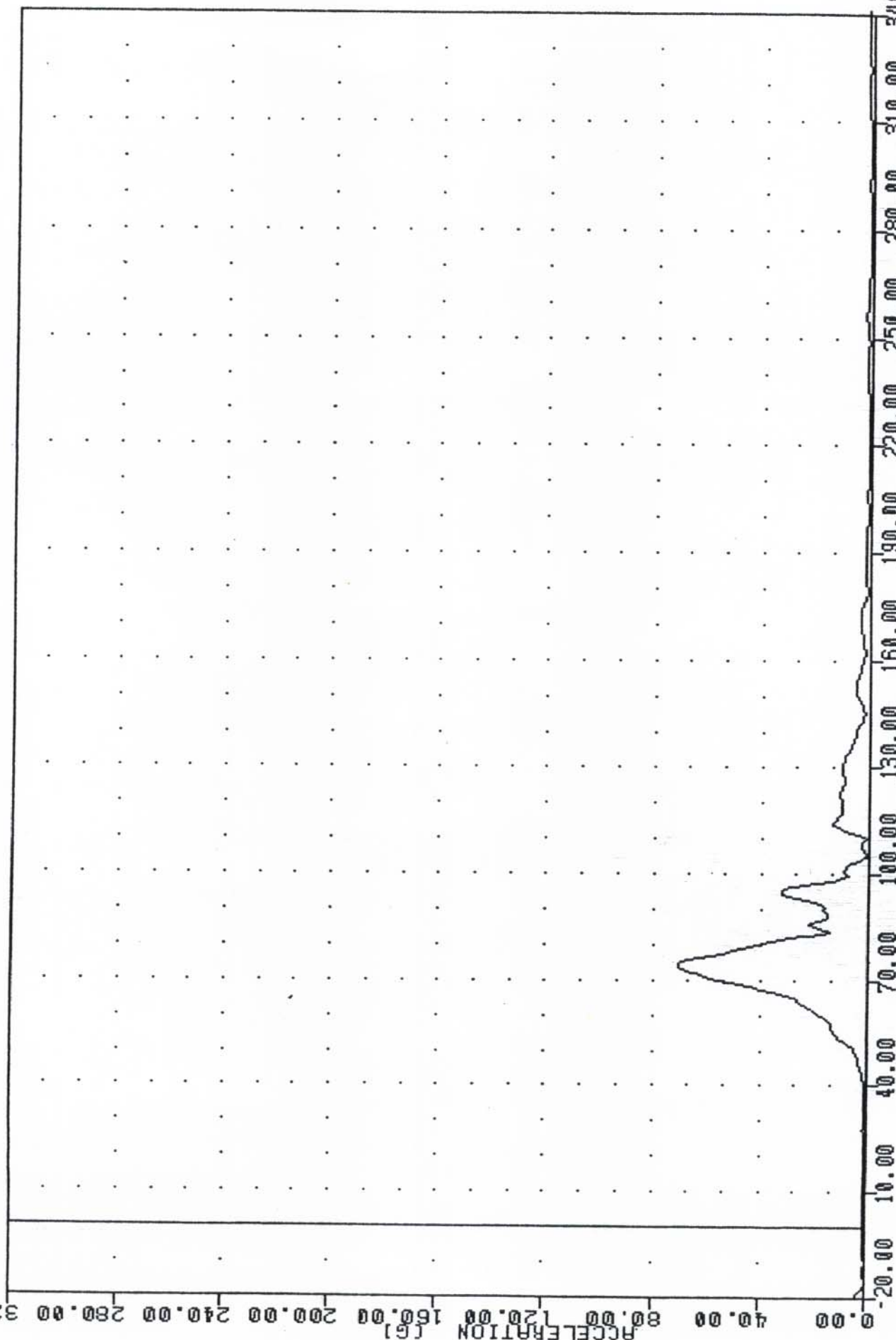
T112
SIDE AGGRESSIVE ATTRIBUTES
84188000000
T12RGA

PLU1 DATE 15-MUG-84 10:00:37

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.25e -16.25, 70.70 e 73.13

ACCELERATION (G)



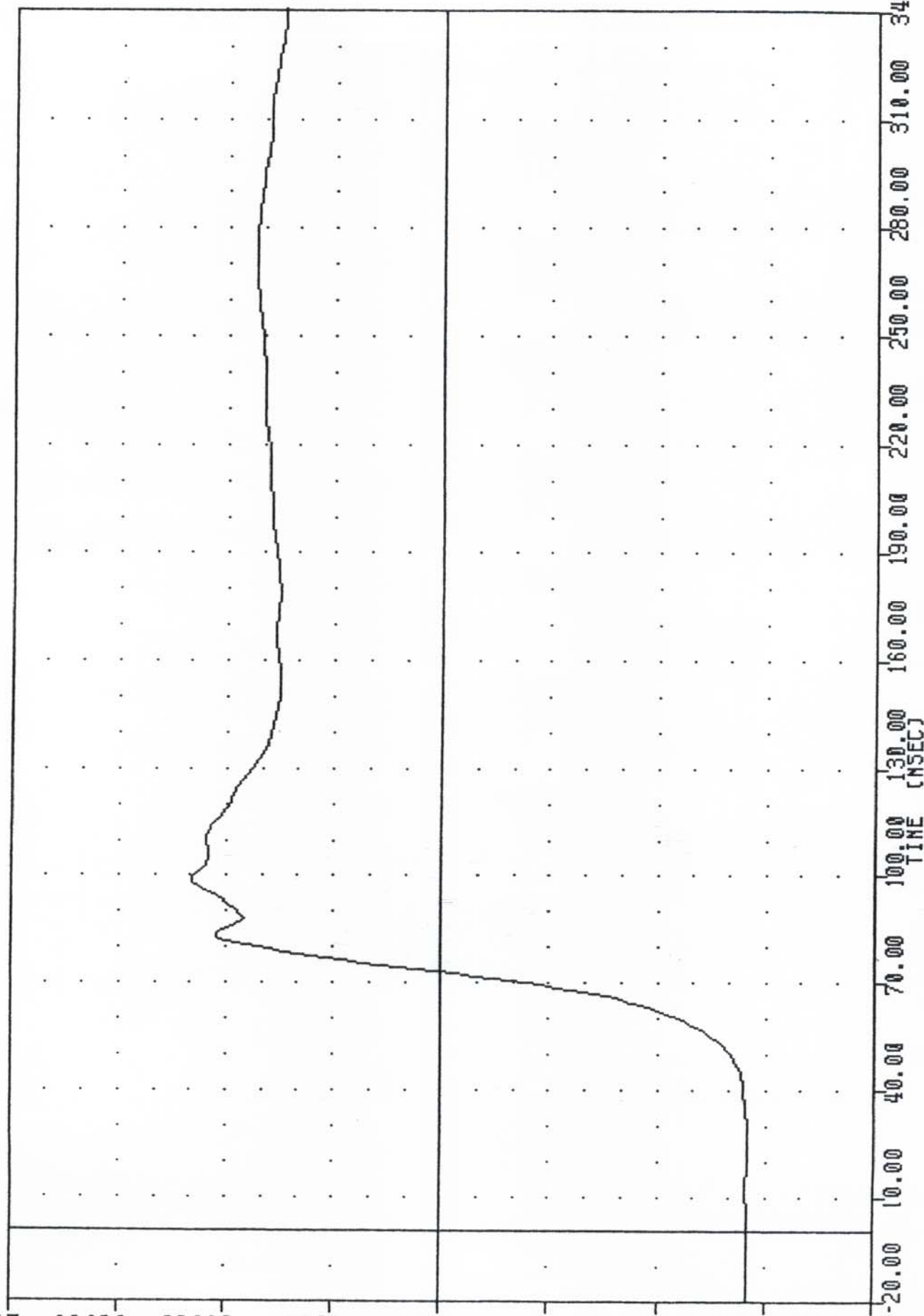
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER LOWER SPINE RESULTANT USING T12YGA

TR. 706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
T12YV1

PLD. DATE 15 NOV 84 10.00:48

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -14.23e -4.38, 11.59 e 98.12

B-20
VELOCITY (MPH)
20.00
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING T12YV1

TIC 040700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
T12YVA

PLU1 DATE 15-nuG-84 1w:u3:48

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -14.348 21.88, 11.37 98.12

20.00

15.00

10.00

5.00

0.00

-5.00

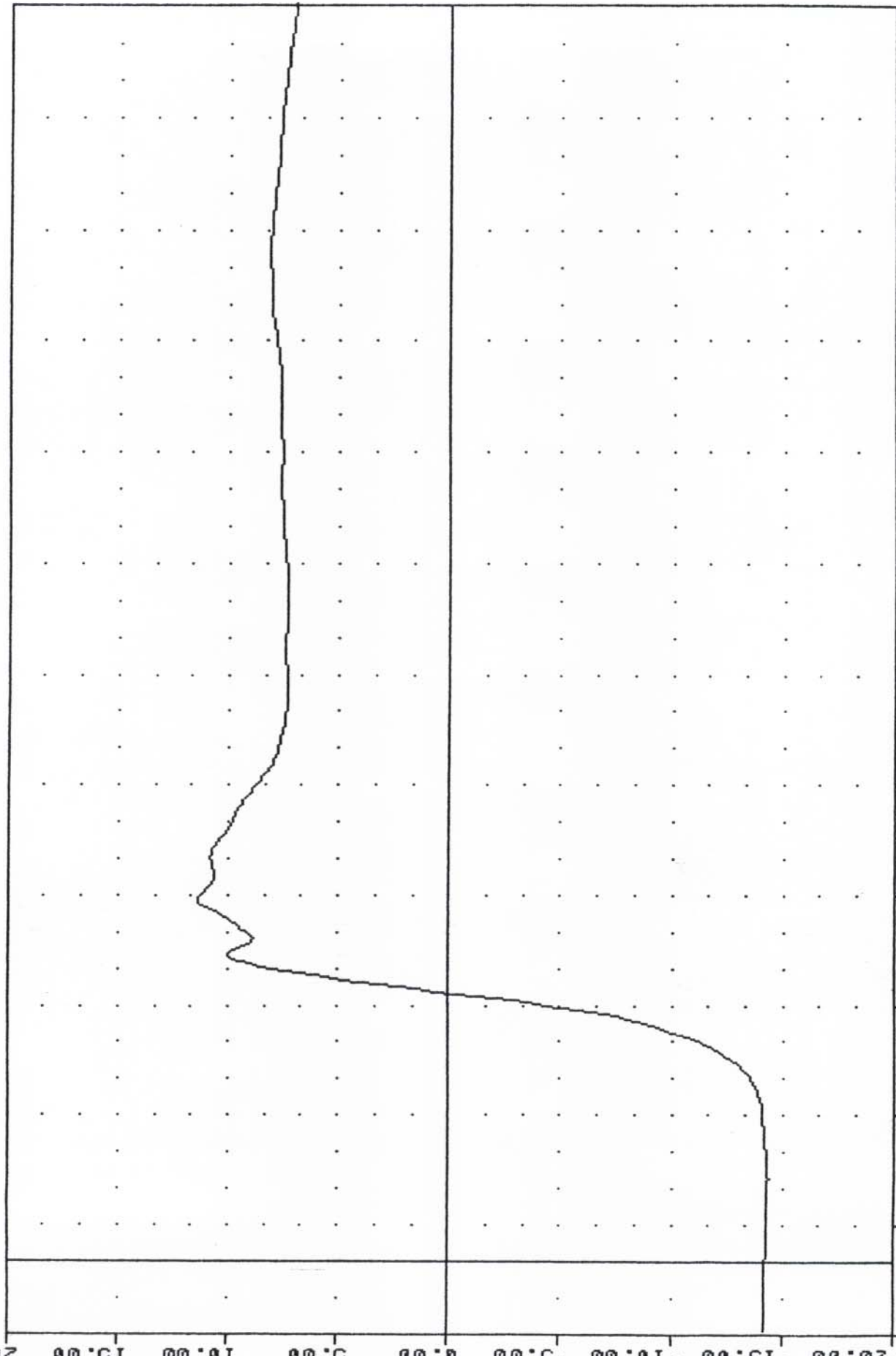
-10.00

-15.00

-20.00

B-21

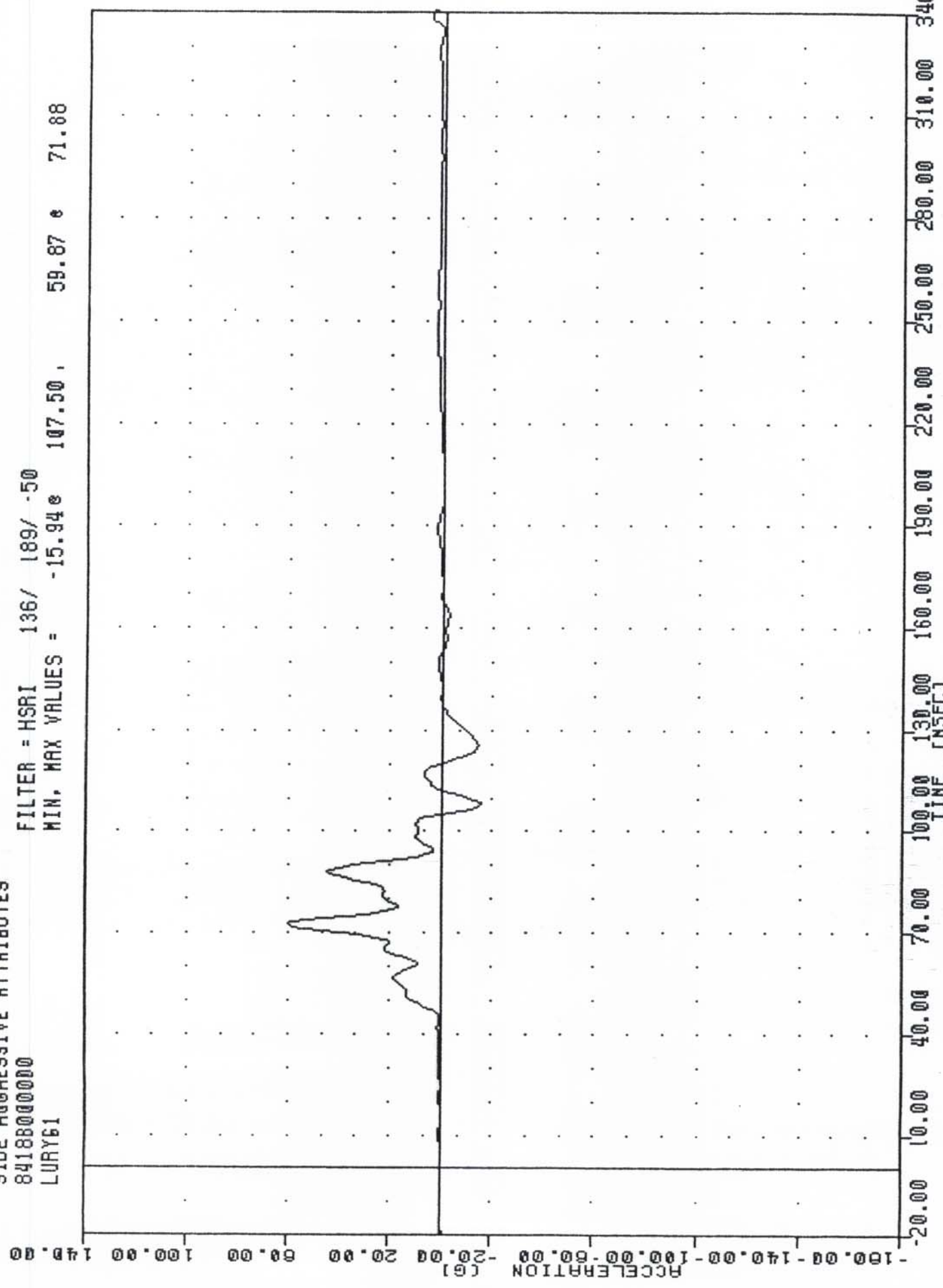
VELOCITY (MPH)



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING T12YGA

TRC 0708
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LURY61

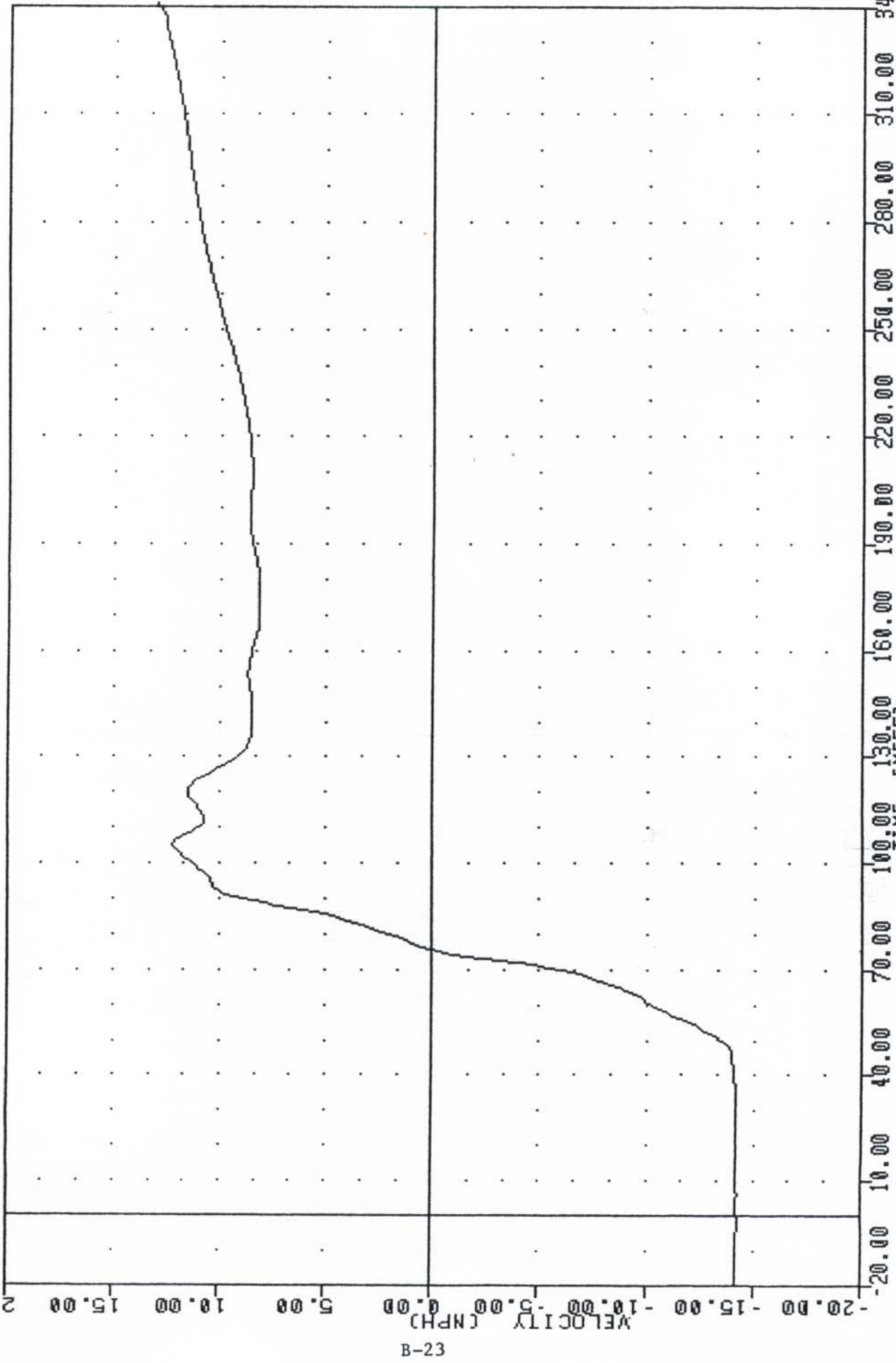
PLG, DATE 15 MAR 84 05:33:28
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -15.94e 107.50, 59.87 e 71.88



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER LEFT UPPER RIB ACCELERATION Y AXIS

TIME 04:37:00
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LURYV1

PLC: JATL 15 106-84 10.03:46
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -14.24e -3.13, 13.03 e 340.00



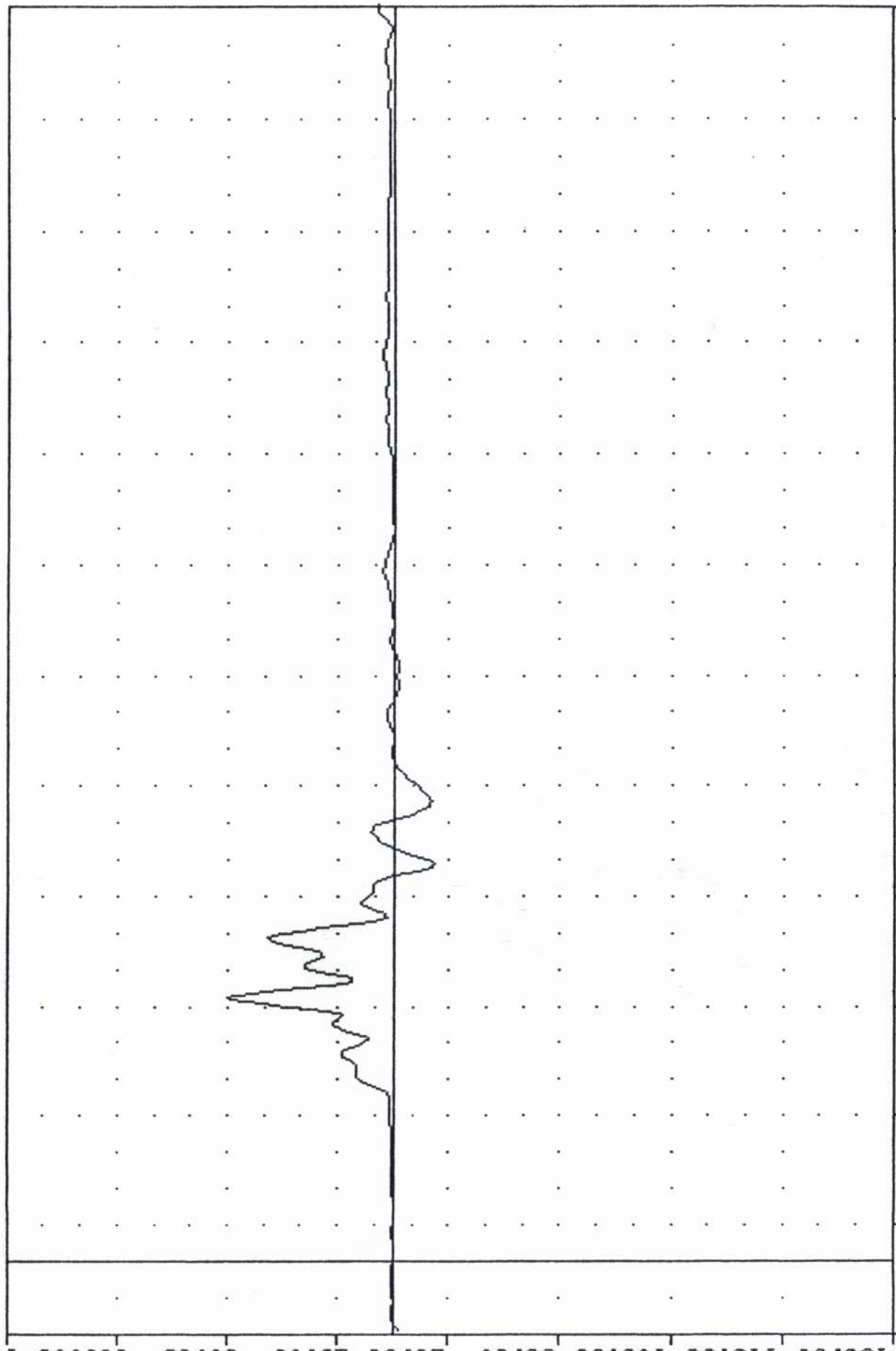
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LURYG1

THC 040700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LURYGA

PLU, DATL 15 1106-84 05.09:26

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -14.46 108.13, 59.93 71.88

ACCELERATION [G]



B-24

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER LEFT UPPER RIB ACCELERATION -2 Y AXIS

TRC 706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LURYVA

PLD, JATE 15 NOV-84 10:00:48

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -14.26e -17.50, 17.10 e 340.00

20.00

15.00

10.00

5.00

0.00

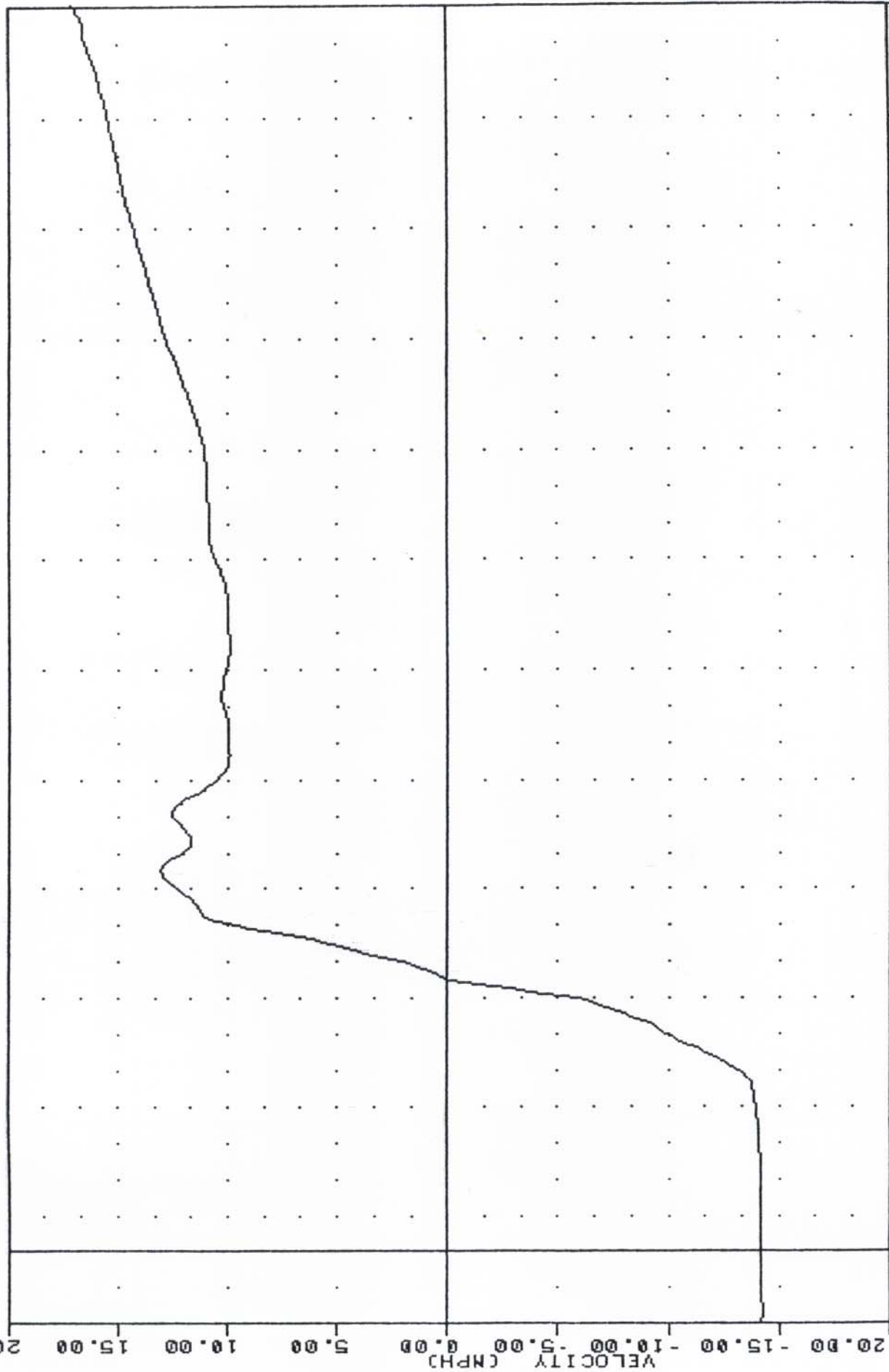
-5.00

-10.00

-15.00

-20.00

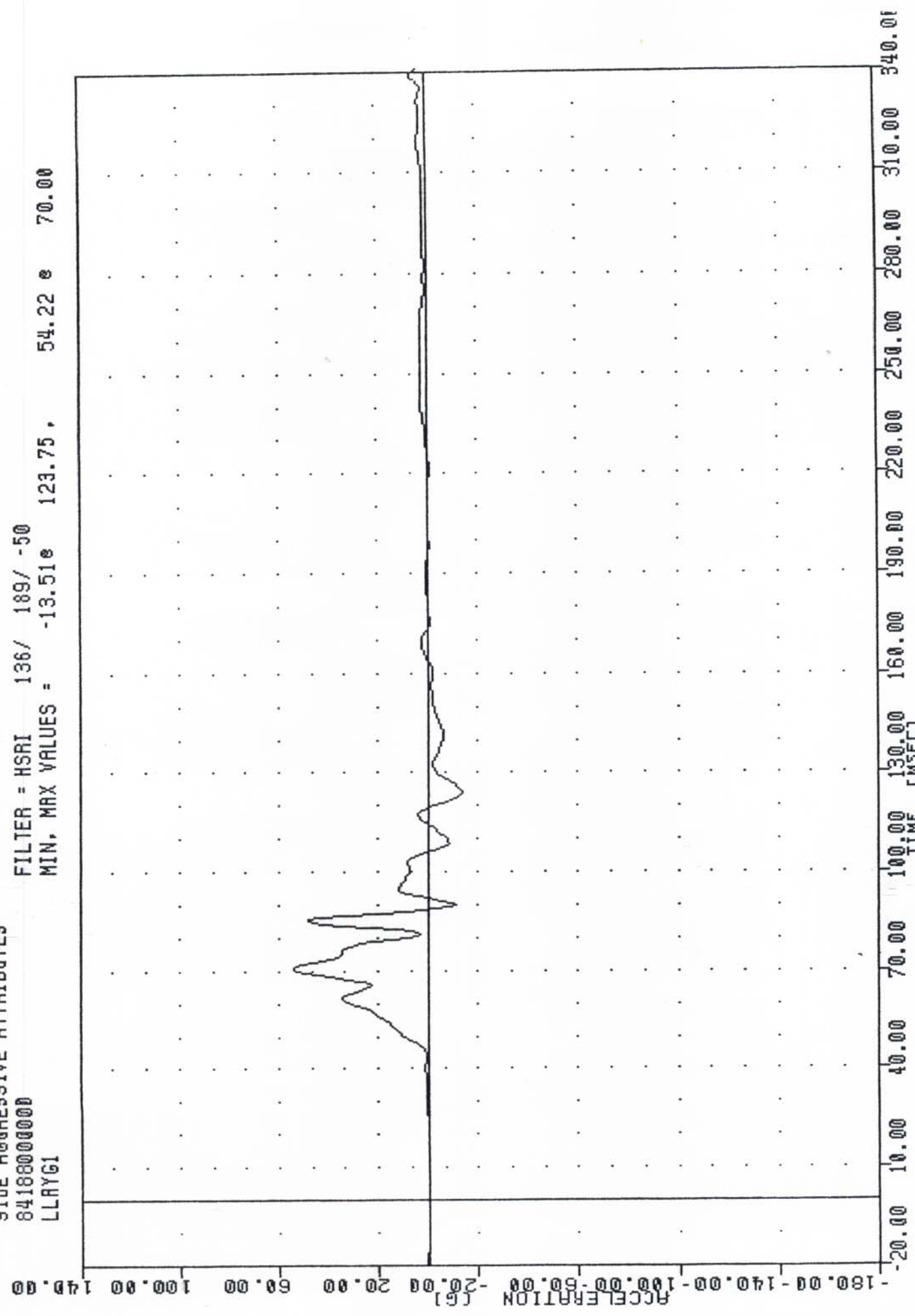
B-25



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LURYGA

TIME 03:20
 SIDE AGGRESSIVE ATTRIBUTES
 84188000000
 LLRYG1

PLU, DATL 15 11G-8+ 03:29:20
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -13.51e 123.75, 54.22 e 70.00



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER LEFT LOWER RIB ACCELERATION Y AXIS

PLC, JATL 15 106-8 10.03:40

SIDE AGGRESSIVE ATTRIBUTES

84188000000

LLRYV1

FILTER = HSR1 136/ 189/ -50

MIN, MAX VALUES = -14.23 3.75, 12.14 105.00

20.00

15.00

10.00

5.00

0.00

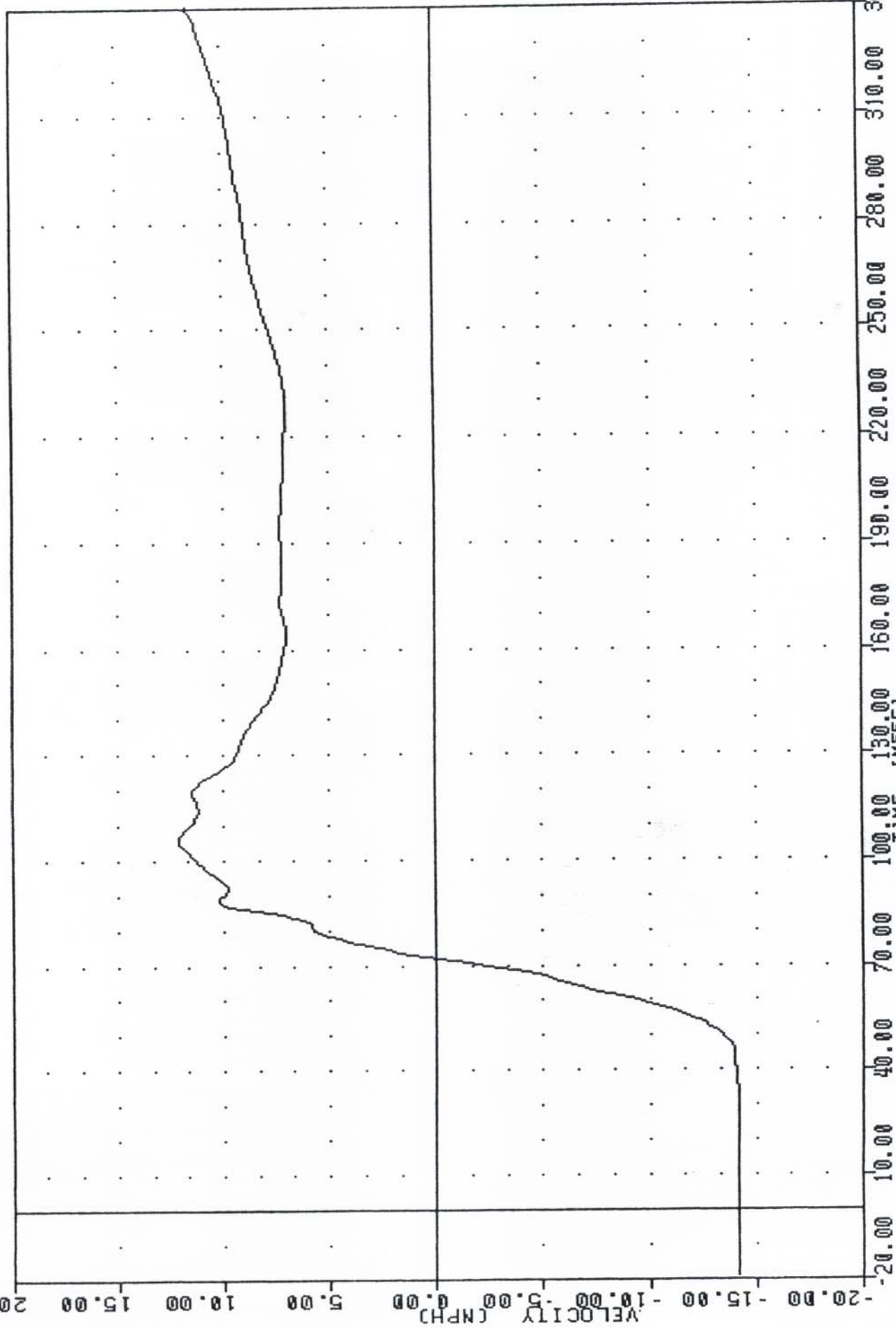
-5.00

-10.00

-15.00

-20.00

B-27



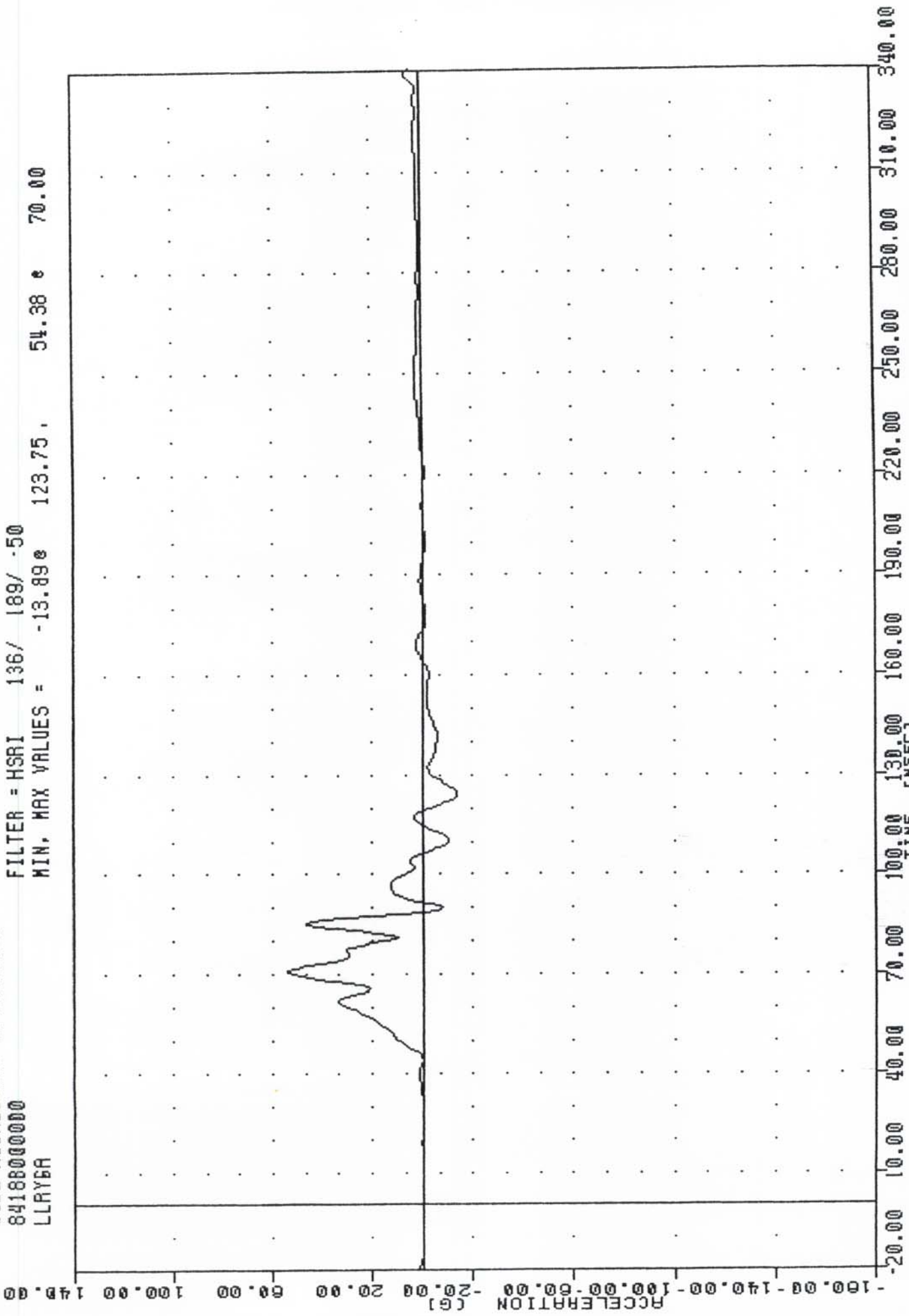
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE

DELTA V USING LLRYG1

TR_ 000708
 SIDE AGGRESSIVE ATTRIBUTES
 84188000000
 LLYR6A

PLG. JATE 15 106-84 05.03:26

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -13.89 123.75, 54.38 70.00



B-28

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER LEFT LOWER RIB ACCELERATION -2 Y AXIS.

PLG, DATL 15 10G-84 10.03:40

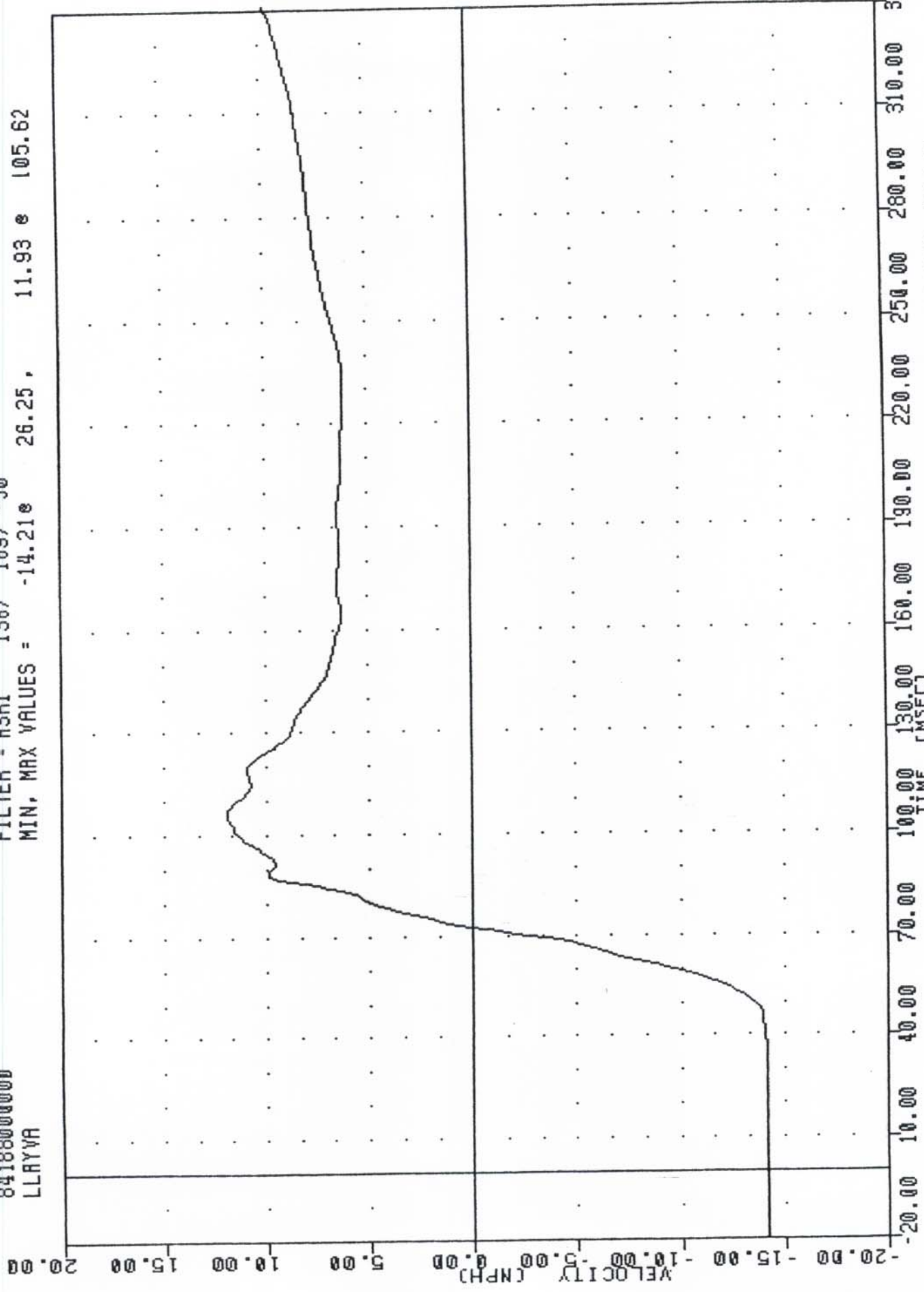
SIDE AGGRESSIVE ATTRIBUTES

8418800000

LLAYVA

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -14.21e 26.25, 11.93 e 105.62

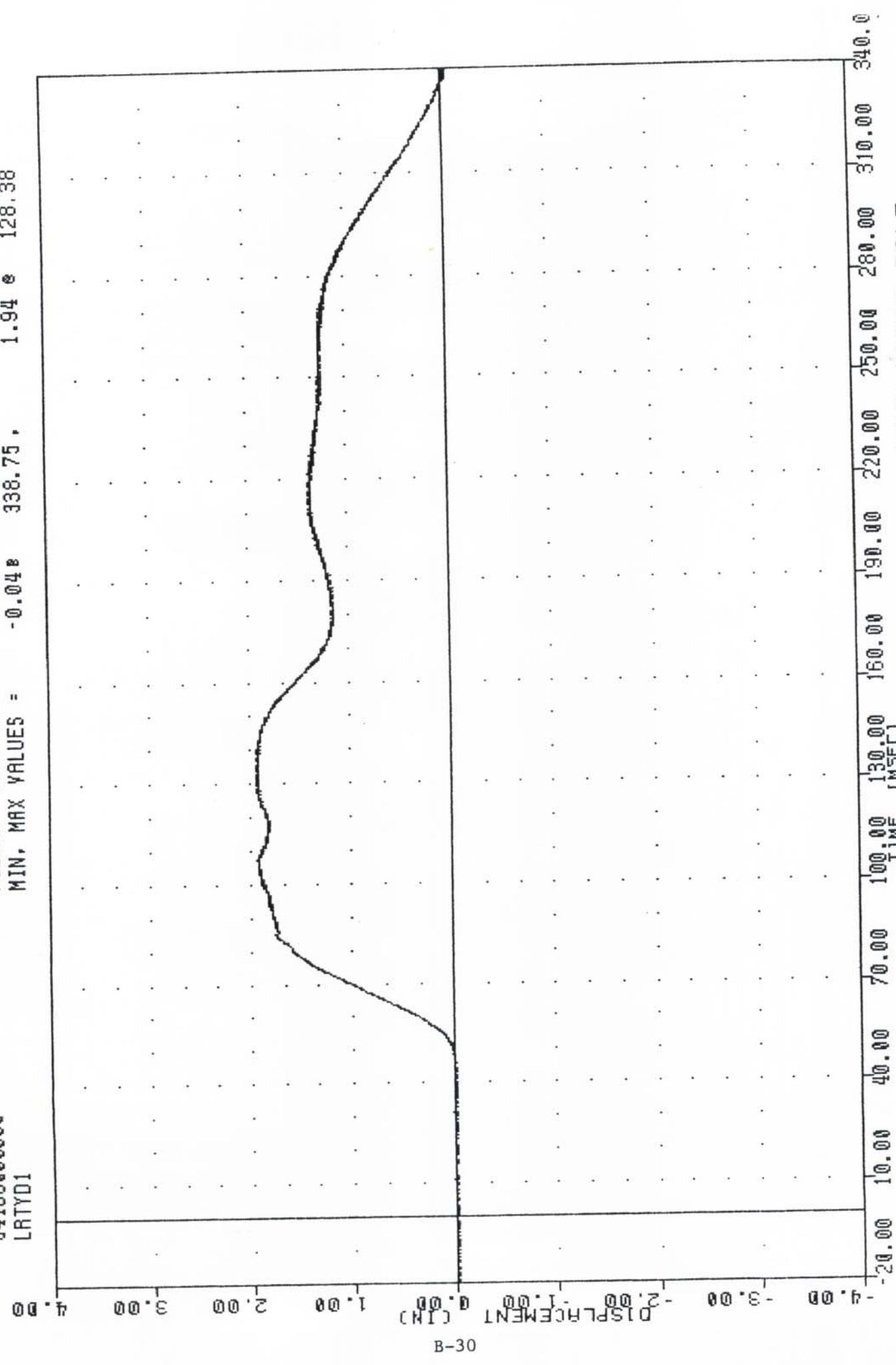


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE

DELTA V USING LLAYVA

THC 040700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LRTYD1

PLU, DATE 16-mjG-84 12.31:45
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -0.048 338.75, 1.94 @ 128.38



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER LEFT RIB TO SPINE DISPLACEMENT INCHES

PLC DATE 10-10-84 00:02:32

TIME 00:07:00
SIDE AGGRESSIVE ATTRIBUTES

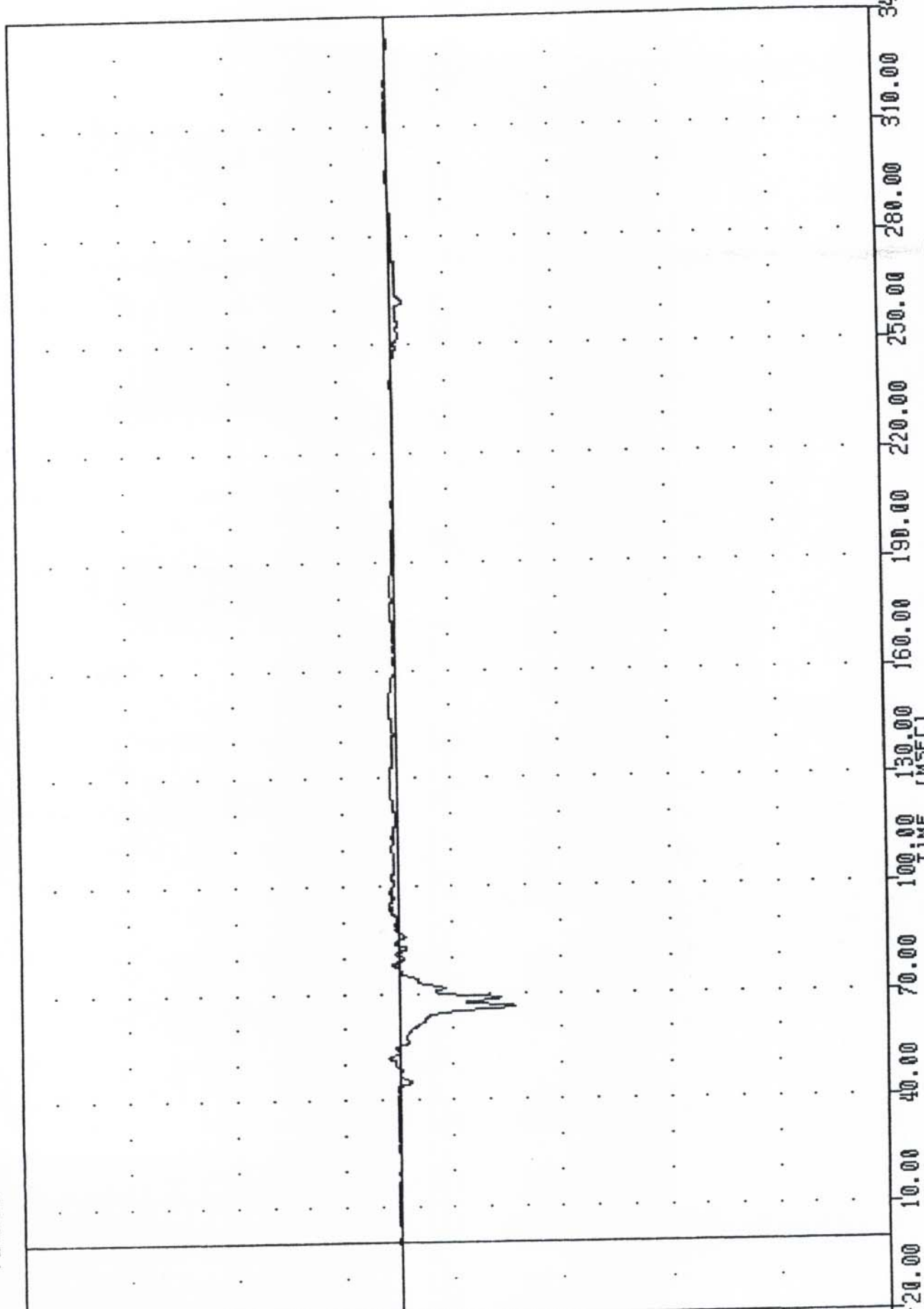
84188000000

PEVXG1

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -42.79 66.13, 3.61 51.75

ACCELERATION (G)



45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER PELVIS ACCELERATION X AXIS

THL 840706 PLU1 DATE 15-MUG-84 09:02:32

SIDE AGGRESSIVE ATTRIBUTES

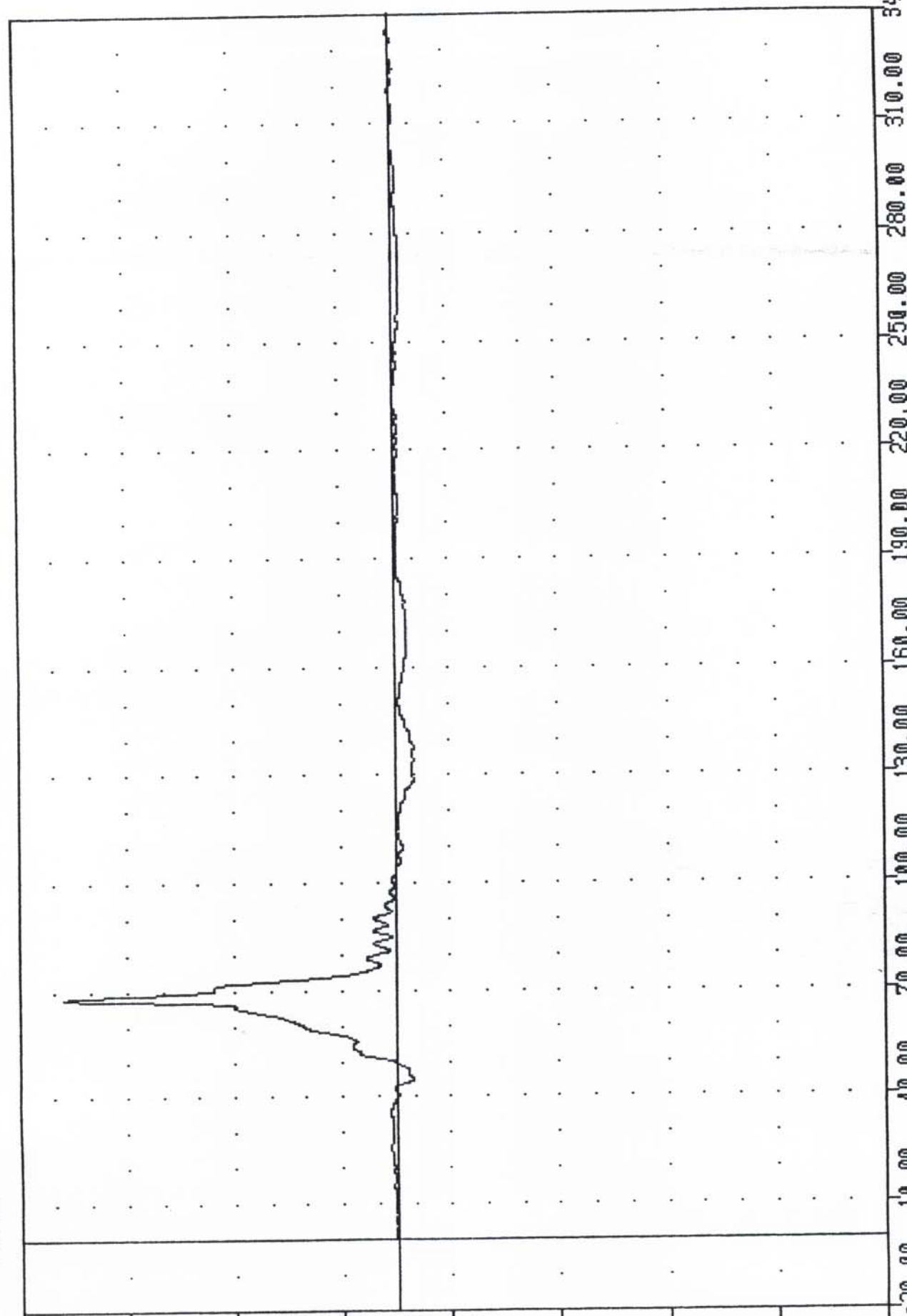
84188000000

PEVYG1

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -6.85e 137.75, 123.31 e 67.75

ACCELERATION (G)

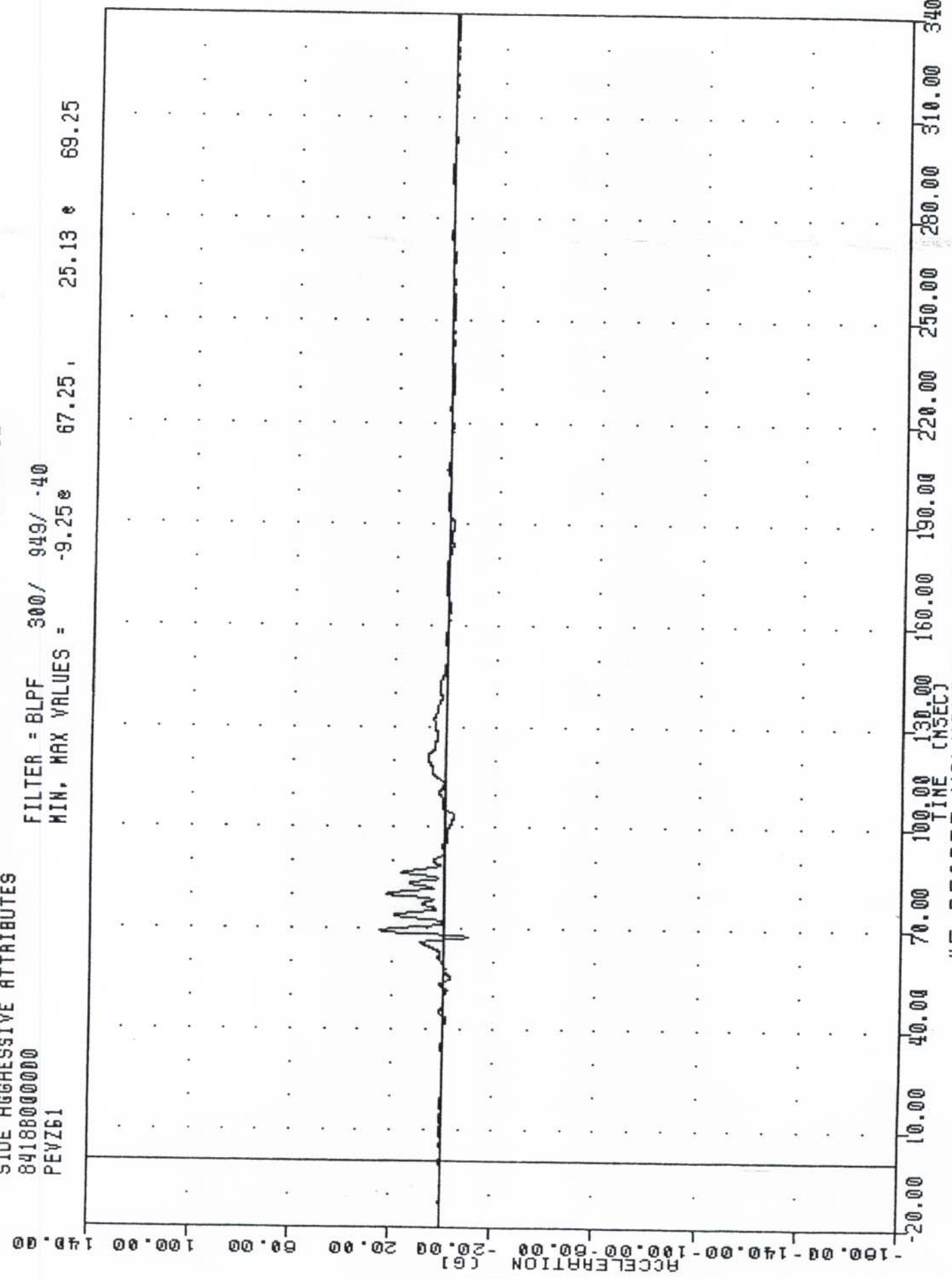


45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER PELVIS ACCELERATION Y AXIS

TRC , 040706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
PEVZ61

PL01 DATE 15-nov-84 09:52:32

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -9.25e 67.25, 25.13 e 69.25



B-33

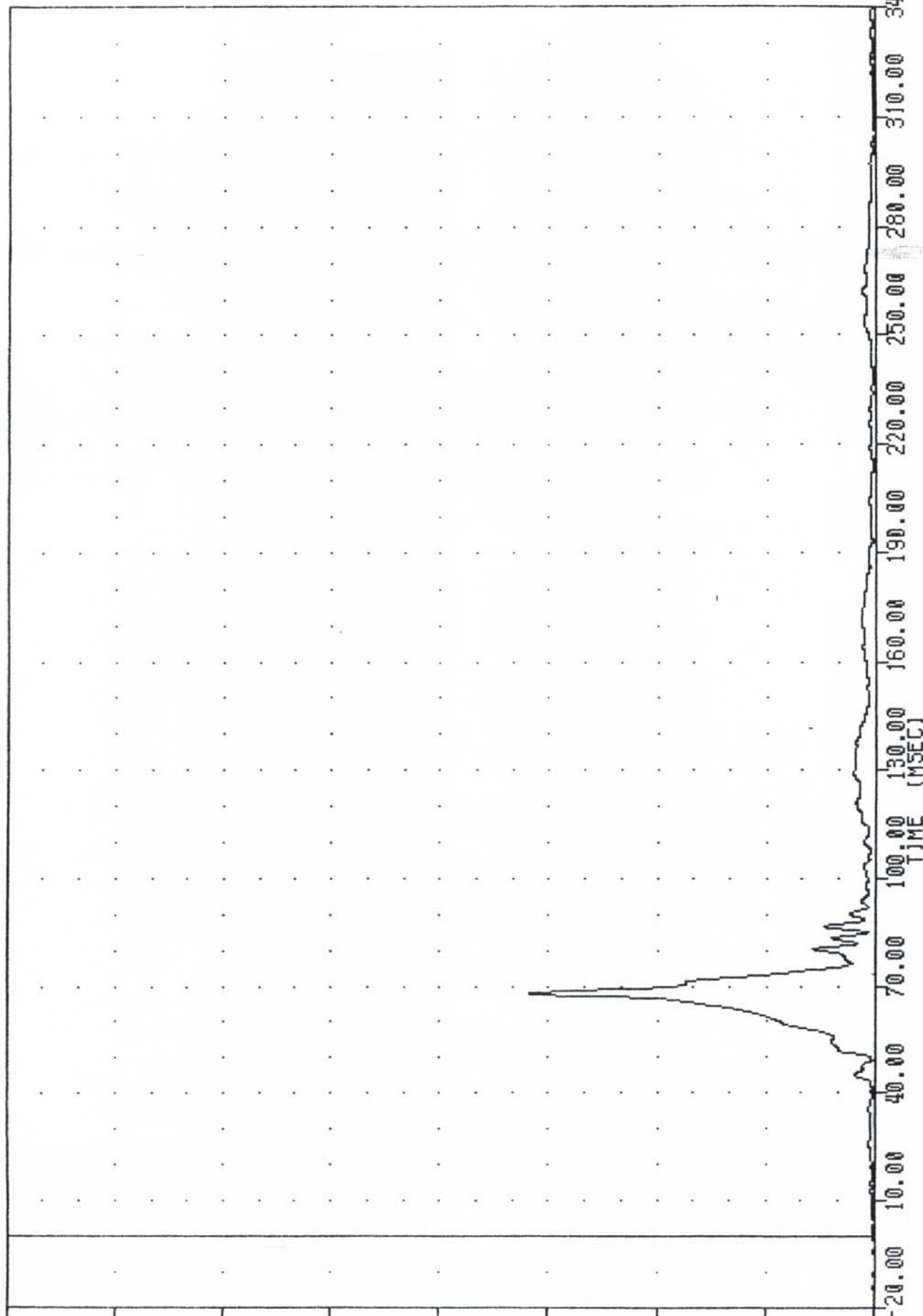
45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER PELVIS ACCELERATION Z AXIS

THC 040700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
PEVRG1

PLU1 DATE 16 NOV-84 05:22:42

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.058 -13.13 127.03 67.75

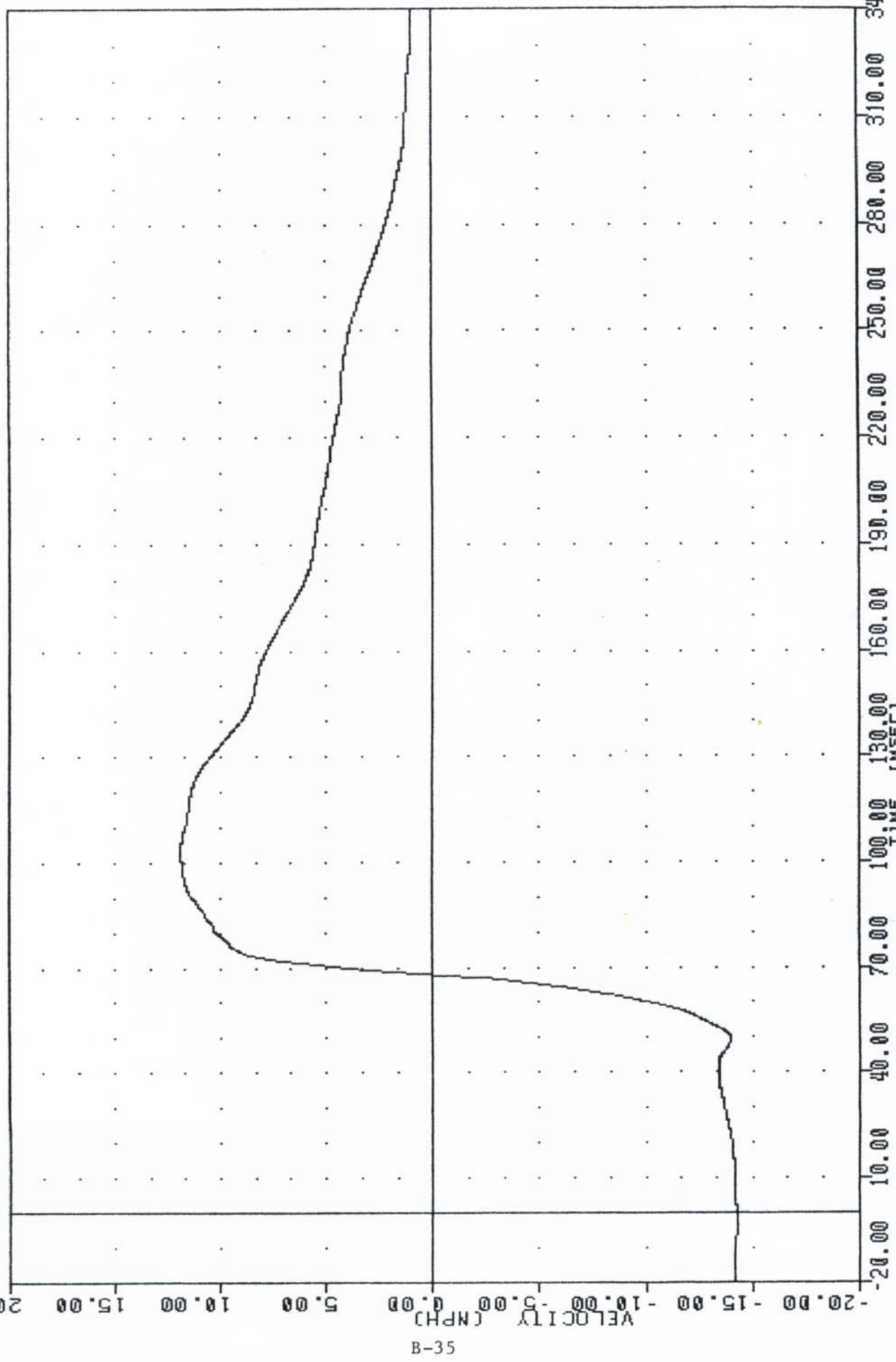
ACCELERATION (G)



45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER PELVIS RESULTANT

THC 04J700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
PEVYV1

PLG, DATE 15 NOV-84 10.04:50
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -14.258 -1.38, 11.90 102.00



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING PEVY61

TRC 040706 15-MUG-84 09:52:32

SIDE AGGRESSIVE ATTRIBUTES

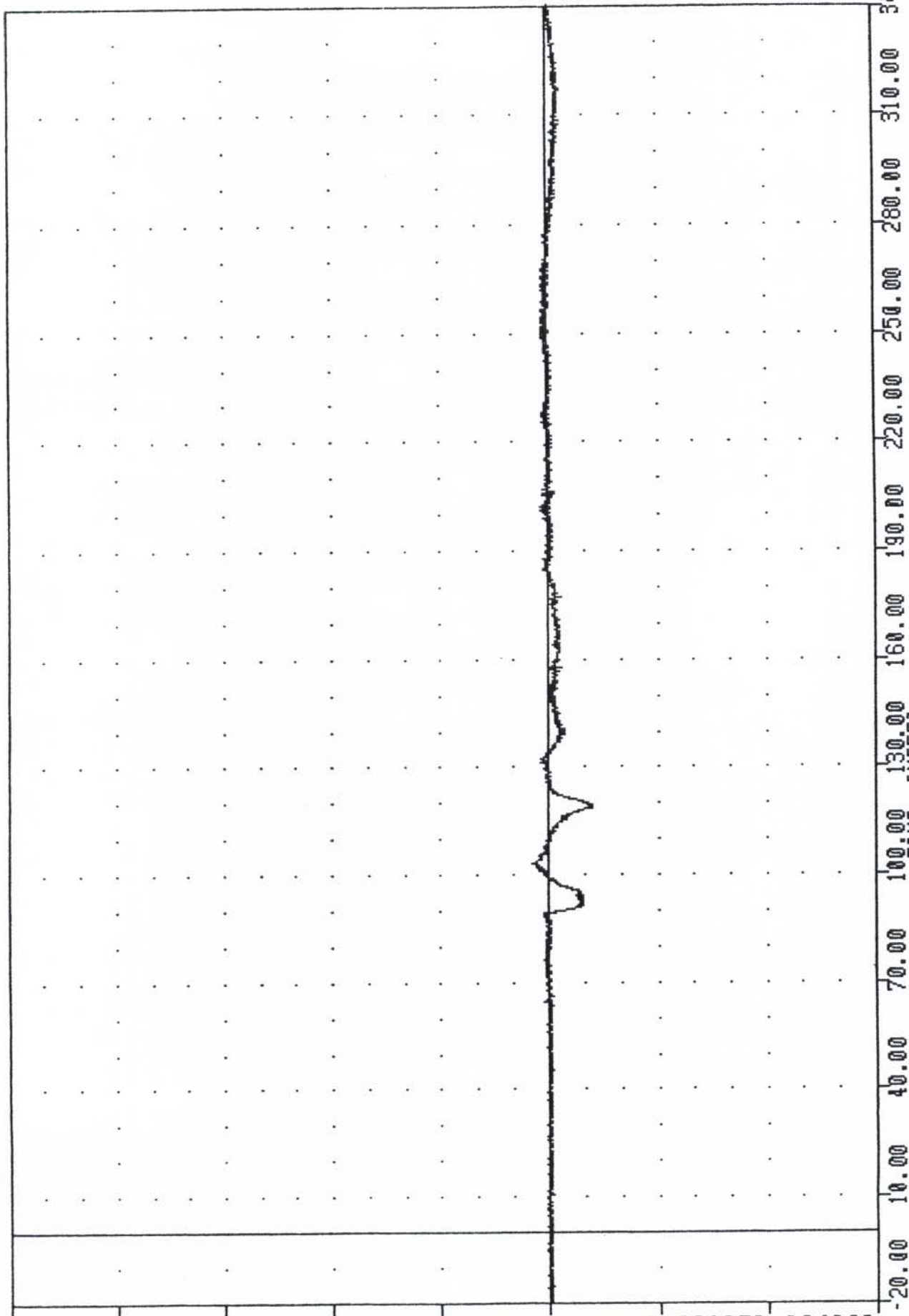
84188000000

HEADX63

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -24.198 119.13 , 8.86 8 103.00

ACCELERATION (G)



B-36

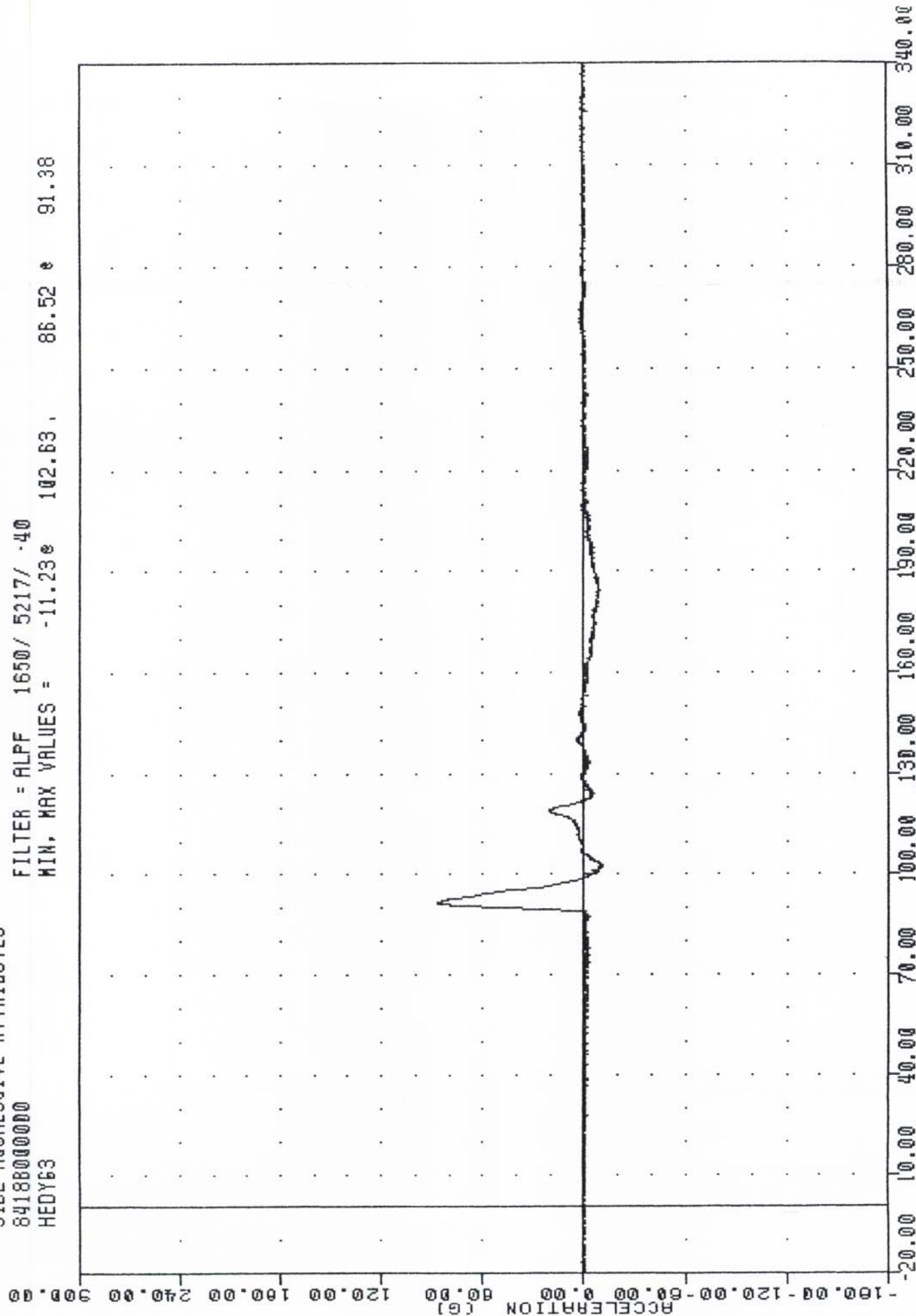
45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER HEAD ACCELERATION X AXIS

TRC 0706
SIDE AGGRESSIVE ATTRIBUTES
8418800000
HEDY63

PLU, DATE 15 1108-84 05.02:32

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -11.238 102.63, 86.52 91.38



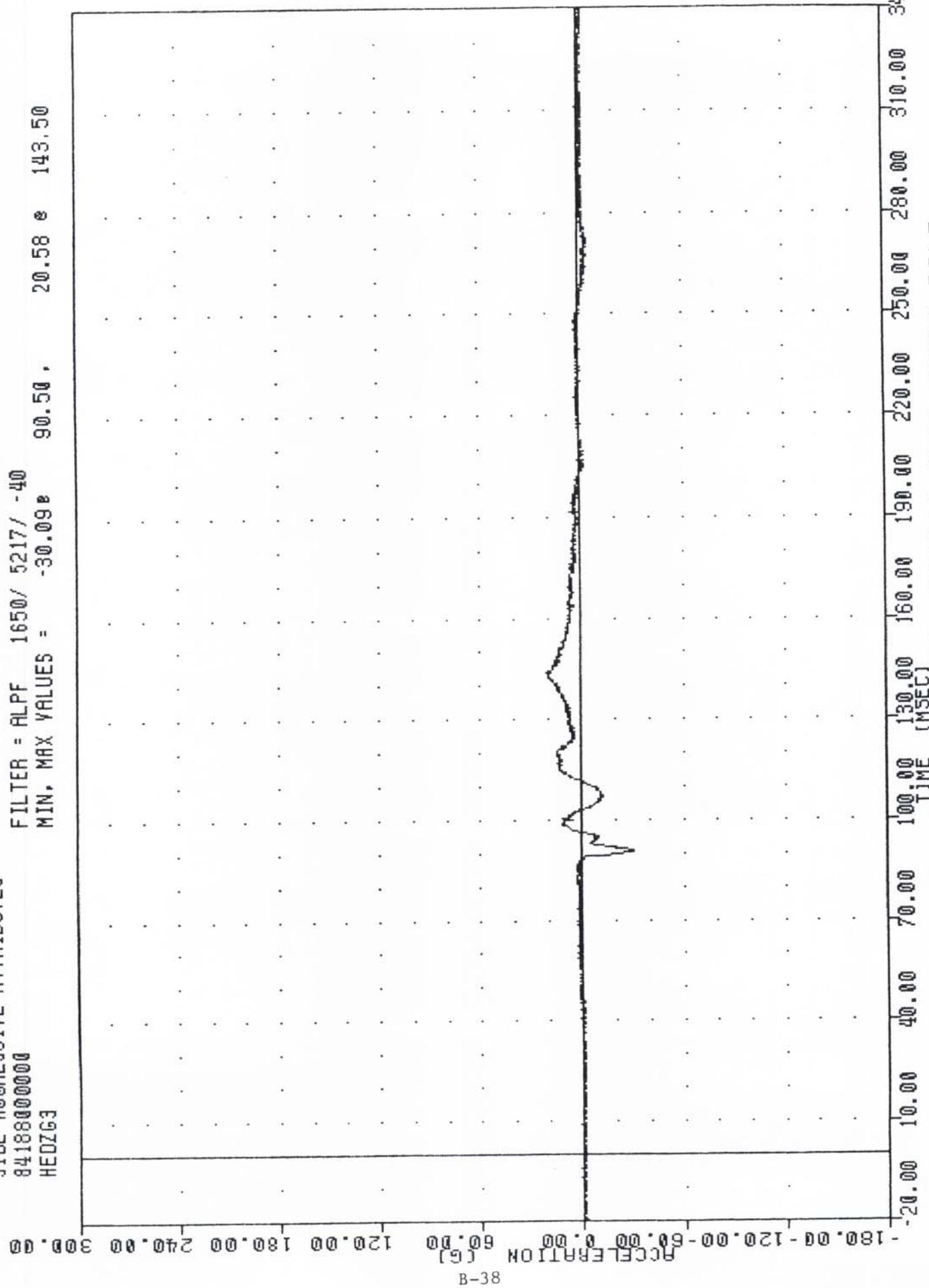
B-37

45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER HEAD ACCELERATION Y AXIS

TRC 040706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
HEADZG3

PLU, DATE 15 NOV 84 05:2:32

FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -30.090 90.50, 20.58 143.50



B-38

45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER HEAD ACCELERATION Z AXIS

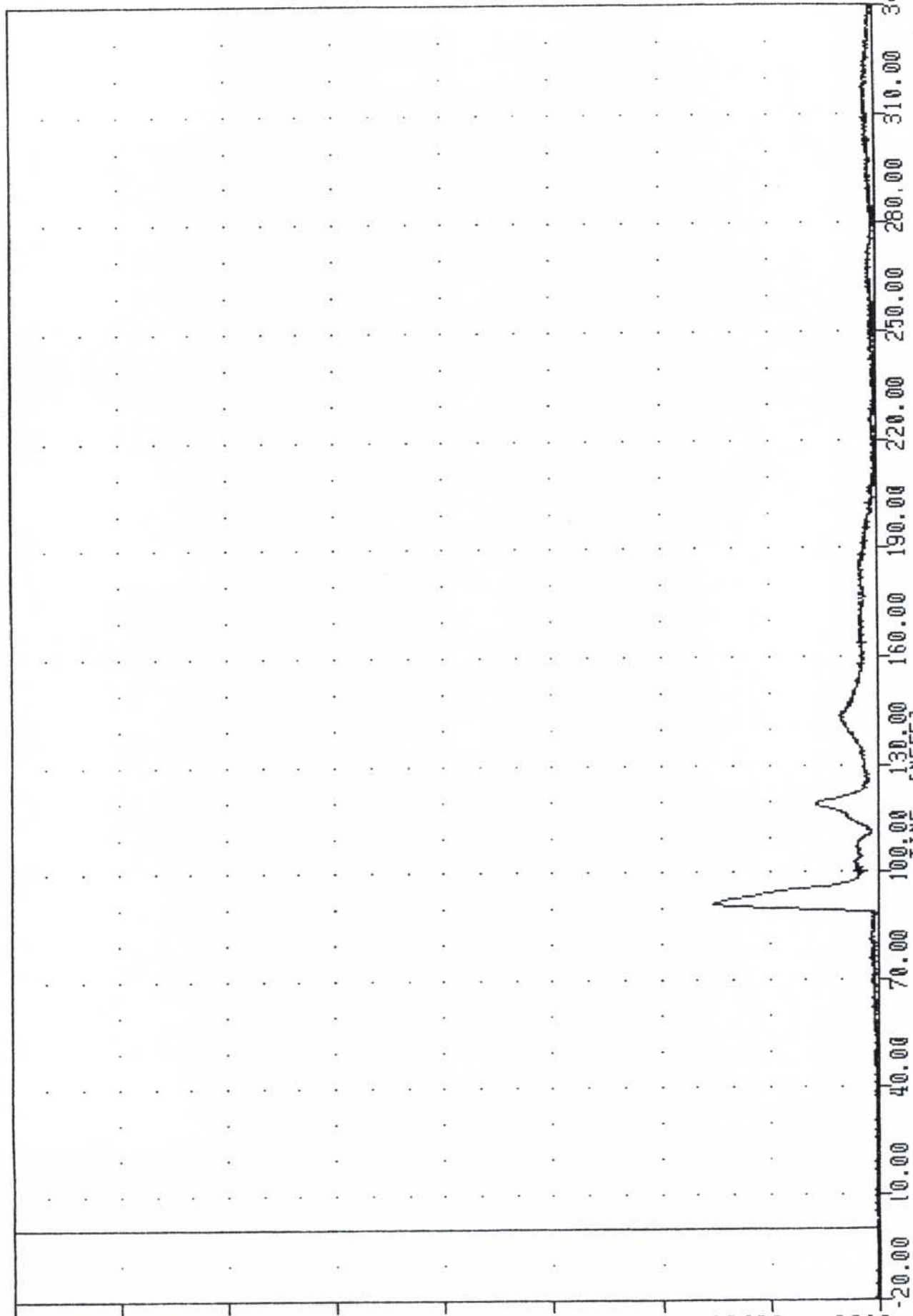
TRC 040706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
HEDR63

PLG, DATE 15 NOV-84 05:21:32

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = 0.09e 255.63, 91.24 e 91.38

ACCELERATION [G]



45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER HEAD RESULTANT

TRC 000700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
T01XG3

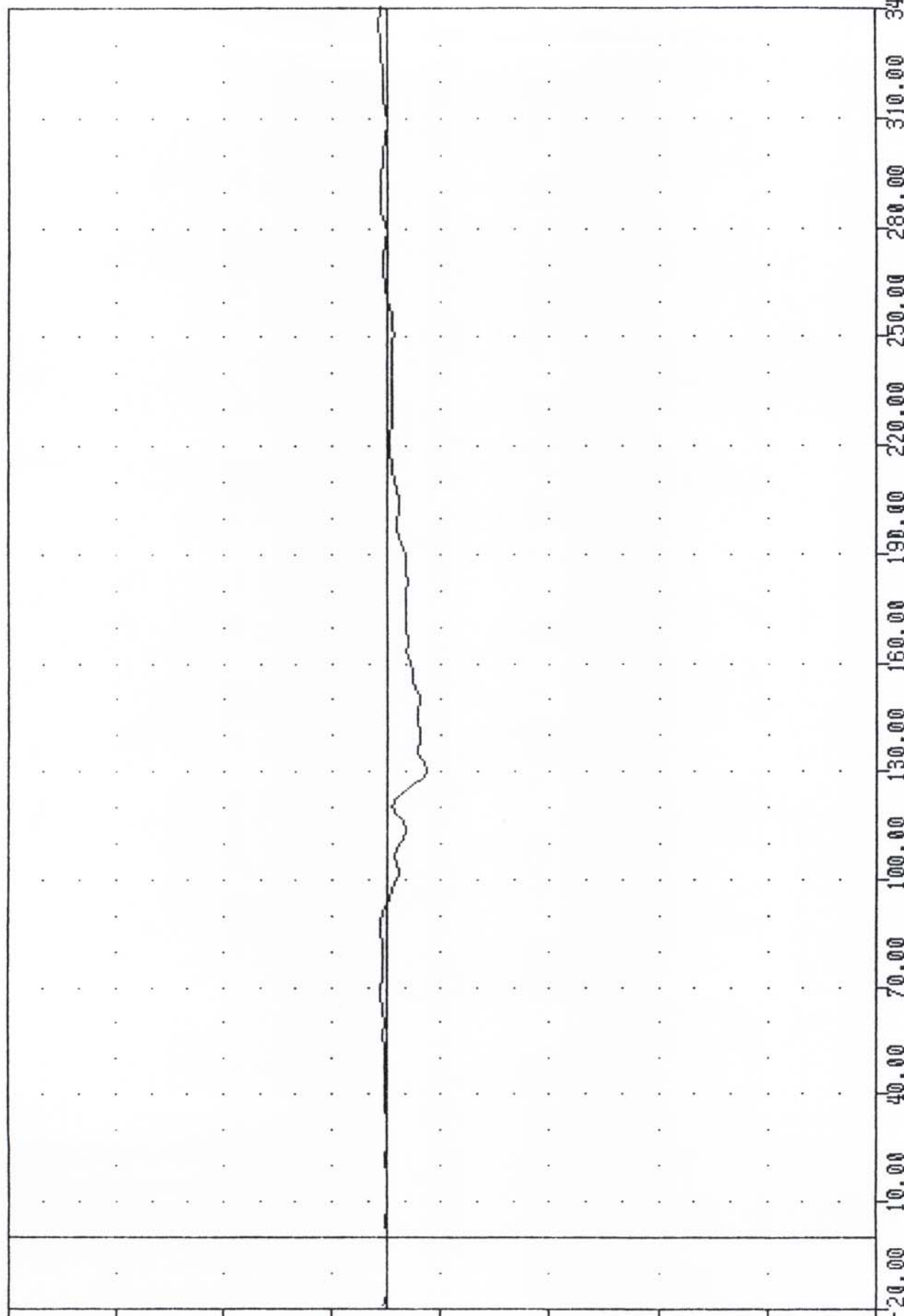
PLC, DATL 15 00G-8, 00.03:20

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -14.97e 130.00, 3.25 e 335.00

ACCELERATION (G)

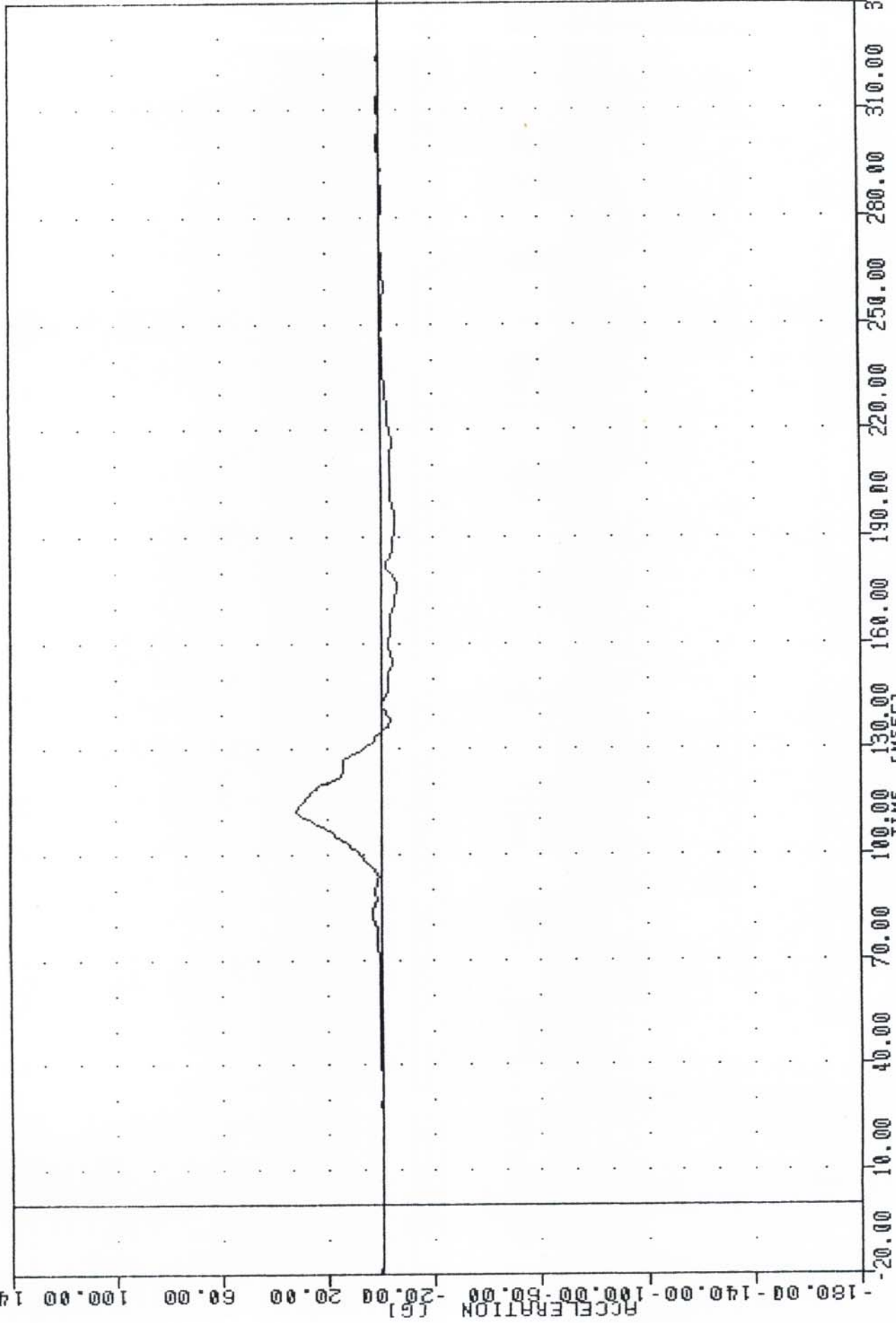
B-40



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER UPPER SPINE ACCELERATION X AXIS

T11C 040700
 SIDE AGGRESSIVE ATTRIBUTES
 84188000000
 T01YG3

PLU, JATL 15 11G-84 00.09:20
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -6.18e 175.63, 31.57 e 111.88

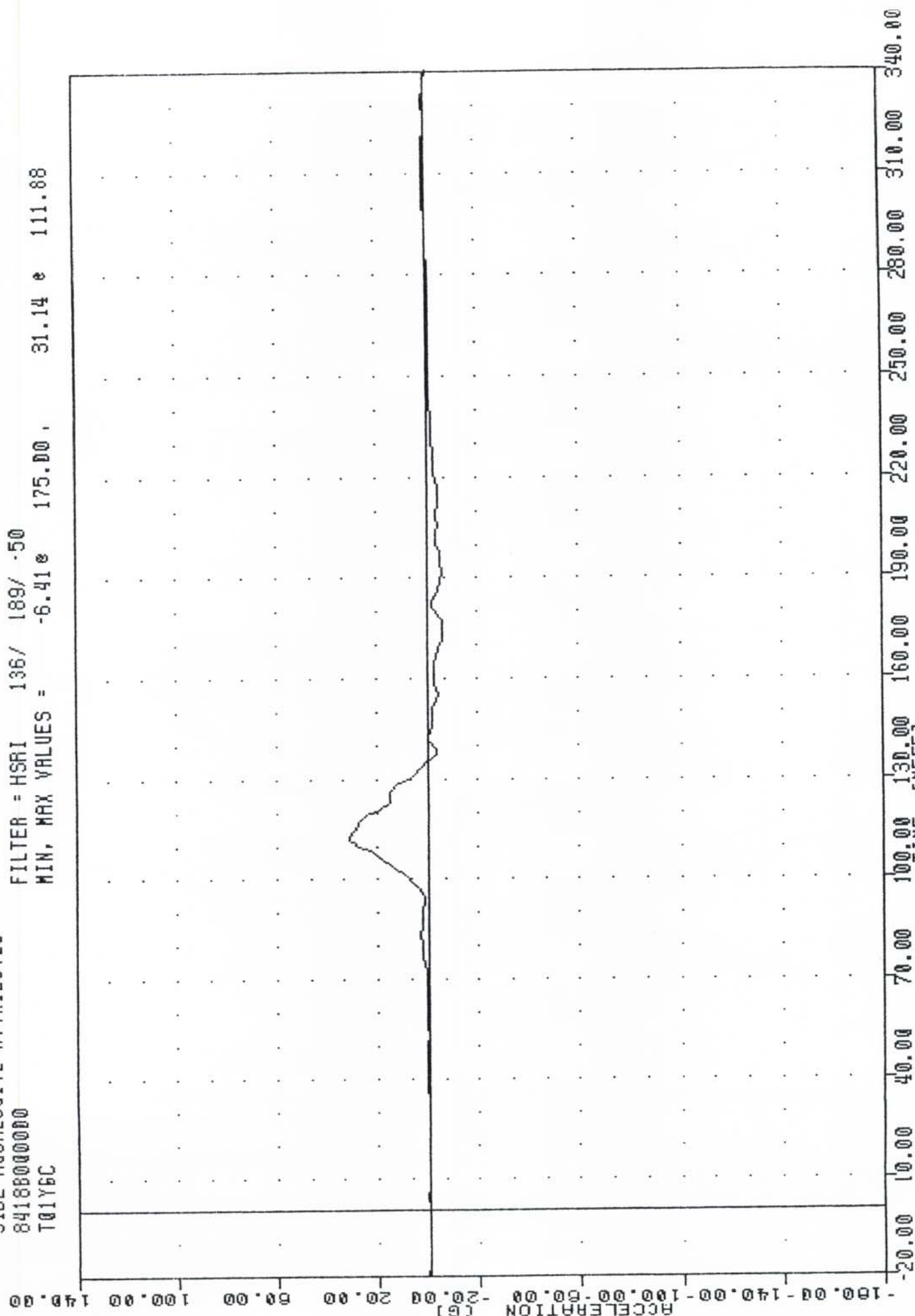


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER UPPER SPINE ACCELERATION Y AXIS

TAL 040706
 SIDE AGGRESSIVE ATTRIBUTES
 84188000000
 T01Y6C

PLD, DATE 15 NOV 84 09:53:28

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -6.41e 175.00, 31.14 e 111.88



B-42

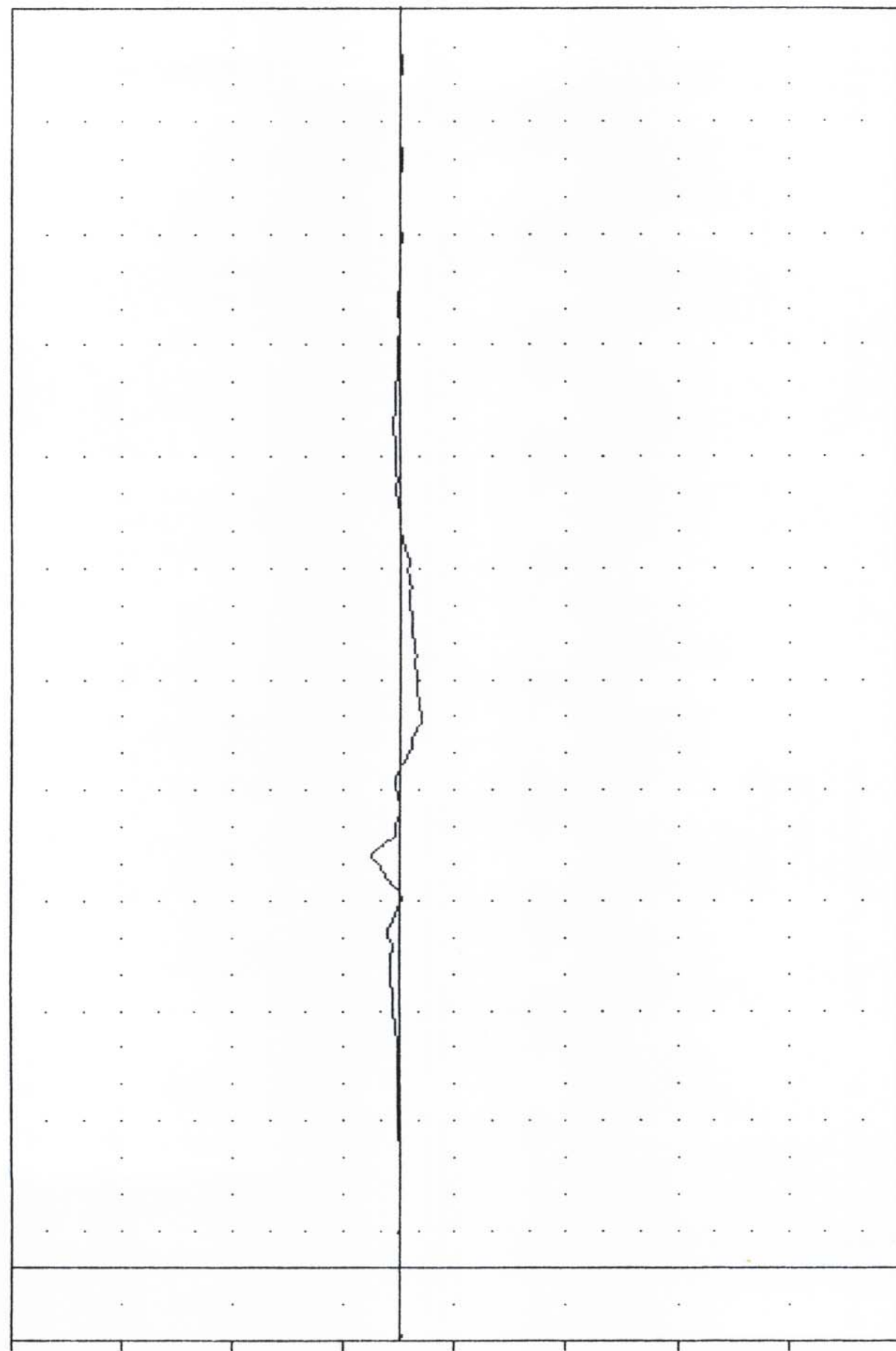
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER UPPER SPINE ACCELERATION -2 Y AXIS

PLU1 DATE 15-MUG-84 09:20

TML 840706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
T01ZG3

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -8.038 148.75, 9.61 111.25

B-43
ACCELERATION (G)
-180.00 -140.00 -100.00 -60.00 -20.00 00 20.00 60.00 100.00 140.00



-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)

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER UPPER SPINE ACCELERATION Z AXIS

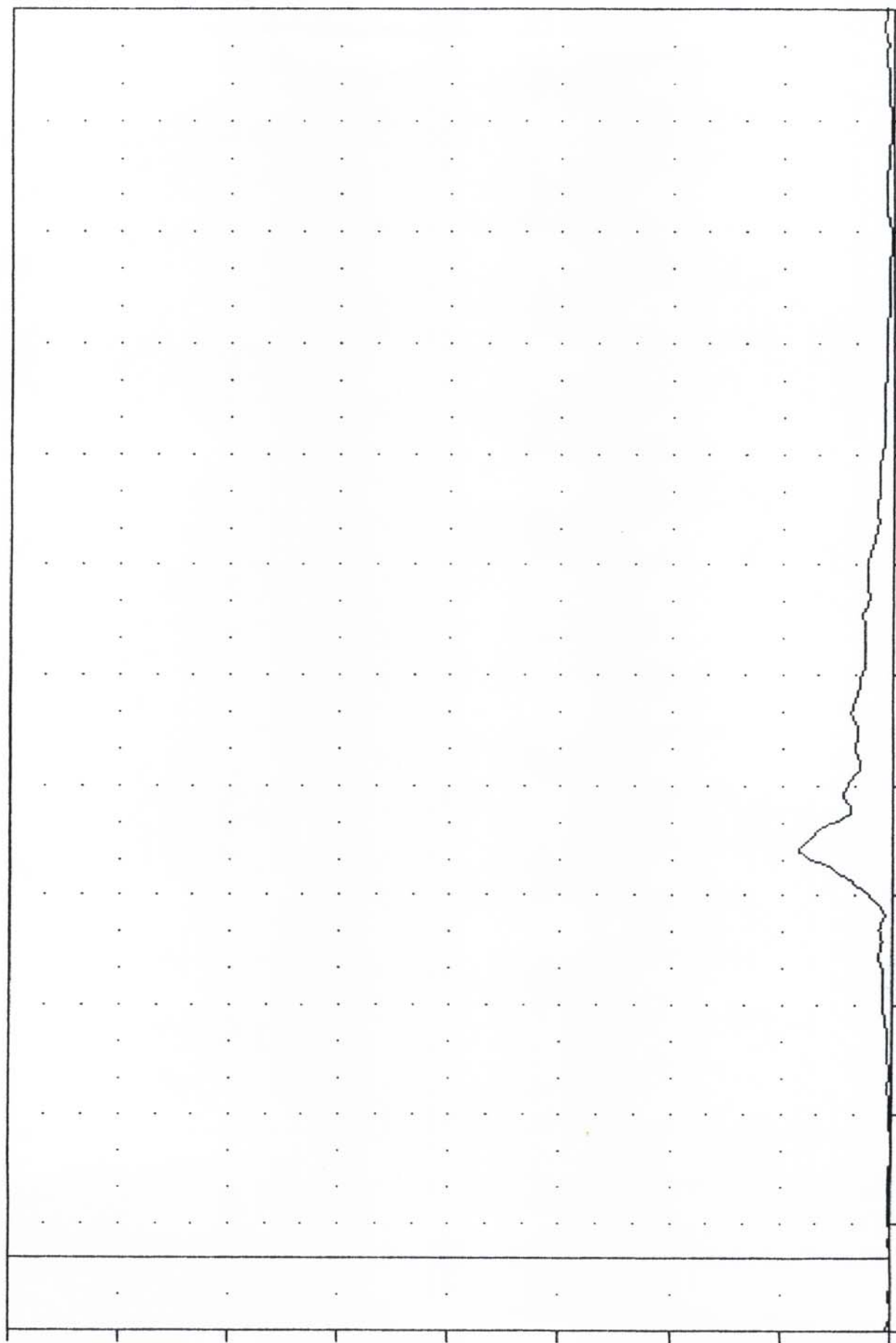
TRC 040706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
T01R63

PLG DATE 15 NOV 84 05:33:26

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.06e 32.50, 33.69 e 111.88

ACCELERATION (G)

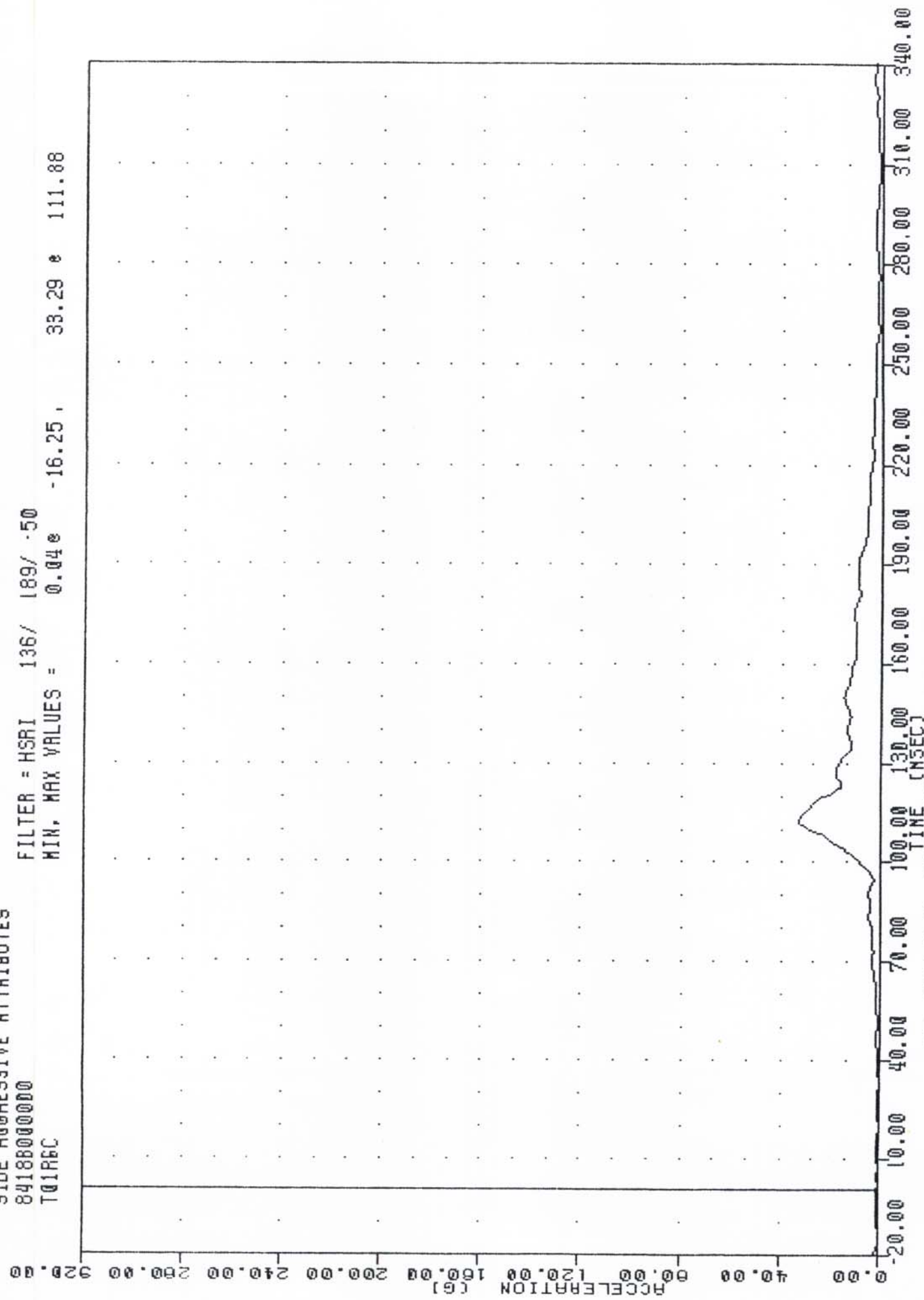


0.00 20.00 40.00 60.00 80.00 100.00 120.00 140.00 160.00 180.00 200.00 220.00 240.00 260.00 280.00 300.00 320.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER UPPER SPINE RESULTANT

TR. 708
SIDE AGGRESSIVE ATTRIBUTES
84188000000
T01REC

PLC. RATE 15 100-80 100J:37
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = 0.04e -16.25, 33.29 e 111.88



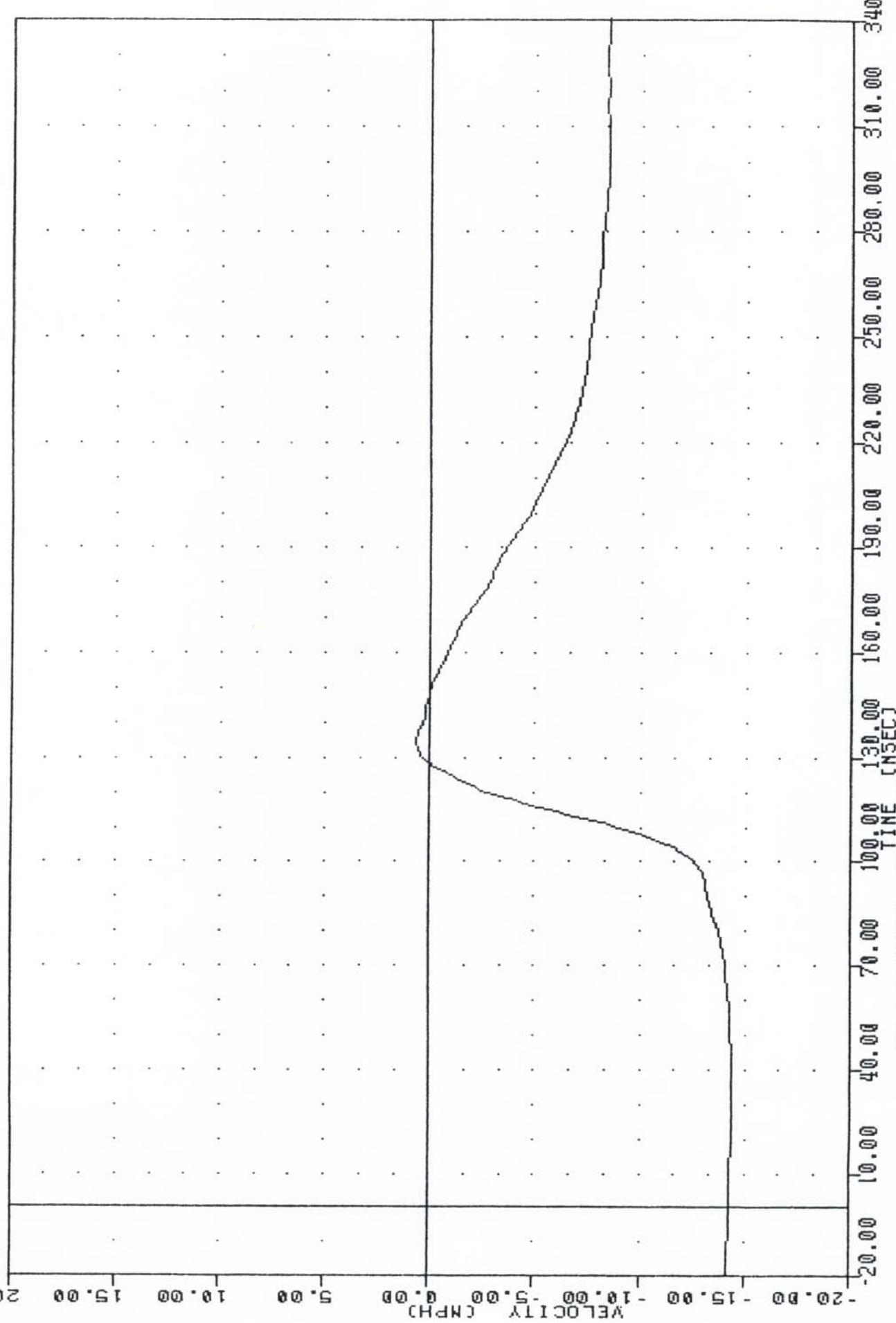
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER UPPER SPINE RESULTANT USING T01YGC.

TRC 0706
 SIDE AGGRESSIVE ATTRIBUTES
 8418800000
 T01YV3

PLD, RATE 15 100-84 10.00:48
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -14.42e 25.63, 0.64 e 134.37

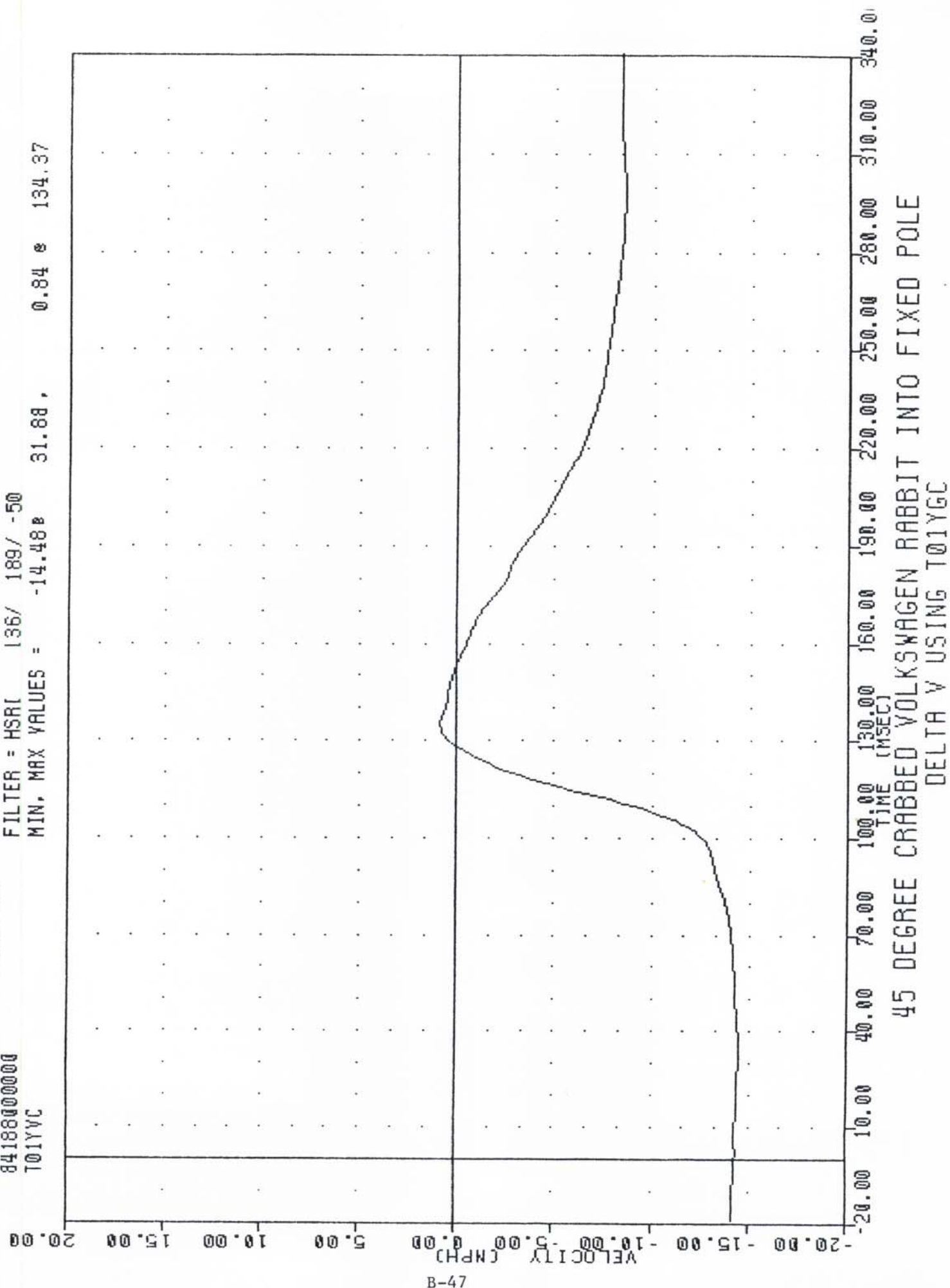
20.00
 15.00
 10.00
 5.00
 0.00
 -5.00
 -10.00
 -15.00
 -20.00

B-46



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING T01YG3

MIN. MAX VALUES =	-14.488	31.88	0.84 s	134.37
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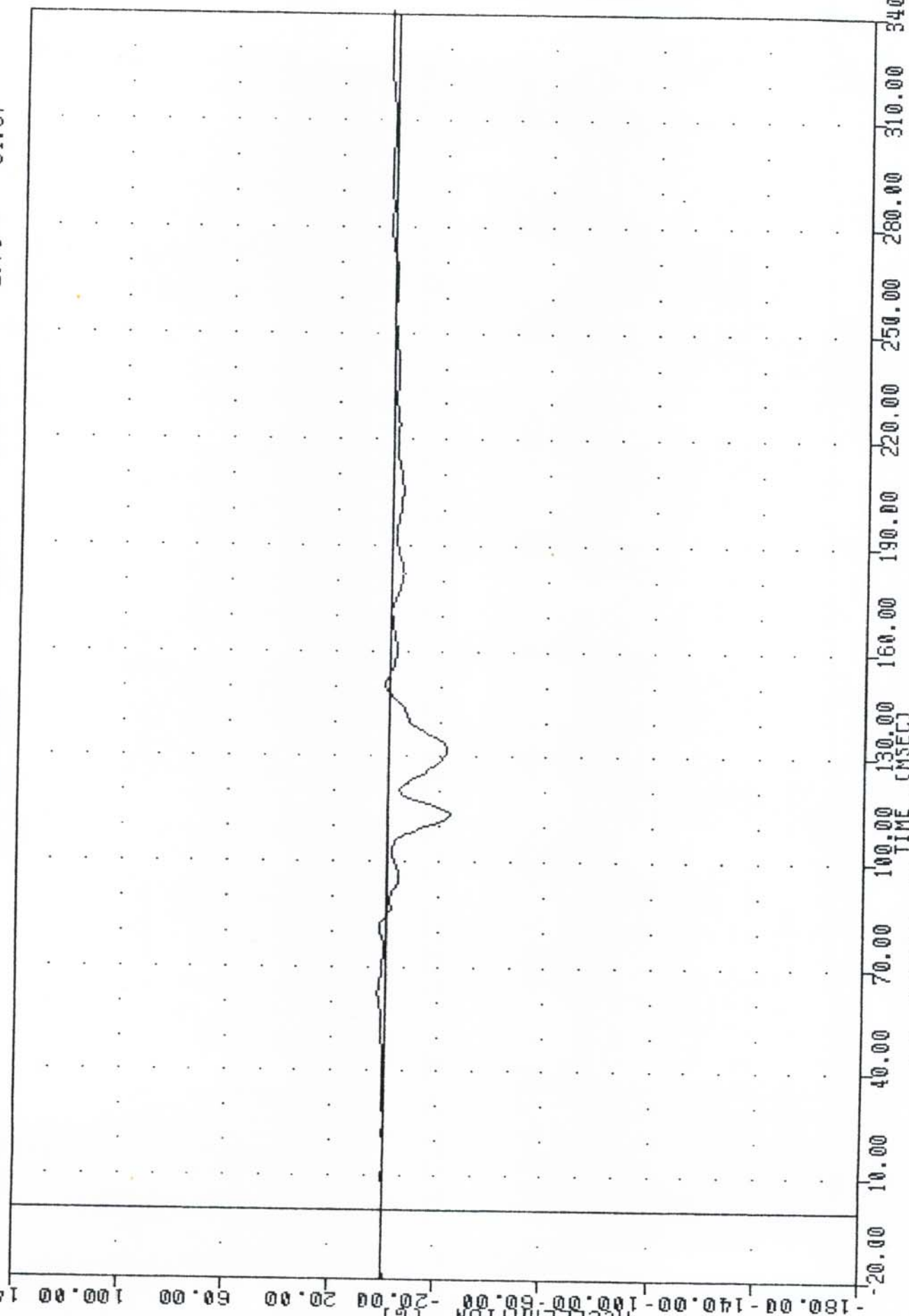


TRAIL, 020700
SIDE AGGRESSIVE ATTRIBUTES
841880000000
T12XG3

PLC, JATE 15 06-82 05:3:20

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -23.74e 112.50, 2.76 e 61.87

ACCELERATION (G)



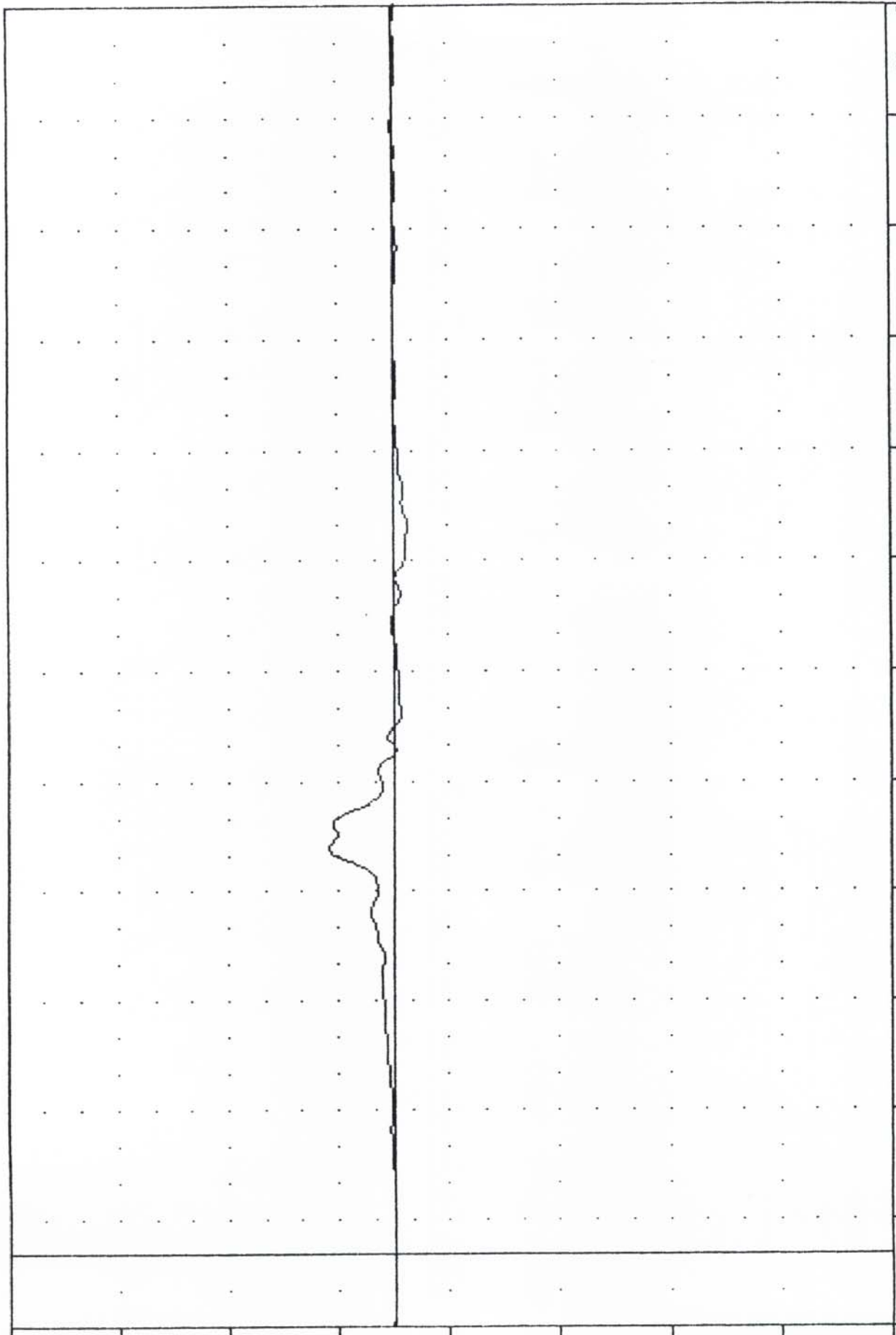
B-48

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER LOWER SPINE ACCELERATION X AXIS

TRC 708
SIDE AGGRESSIVE ATTRIBUTES
84188000000
T12Y63

PLD. DATE 15 MAR 84 09:00:28
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -5.36e 198.75, 23.76 e 111.25

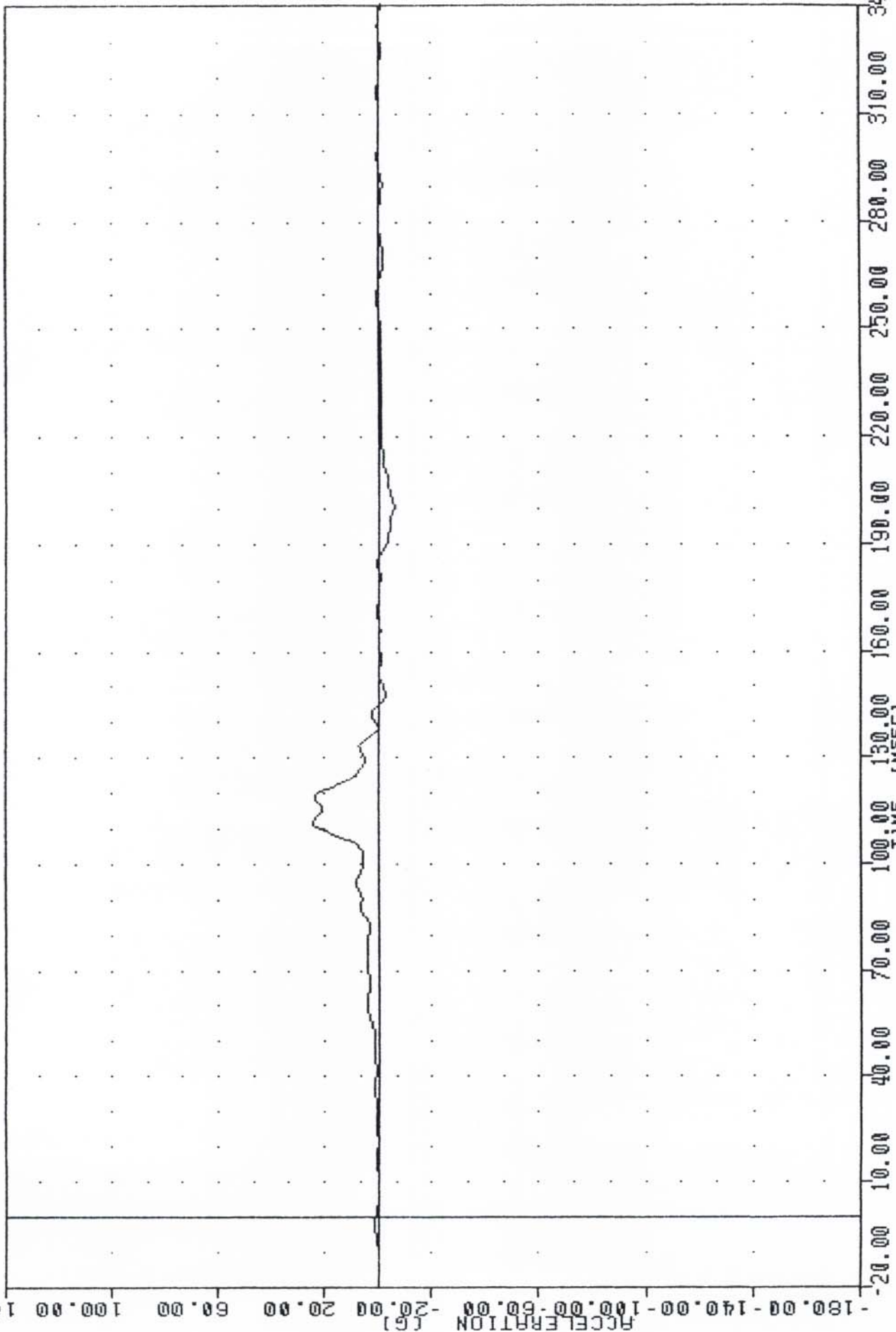
ACCELERATION (G)



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER LOWER SPINE ACCELERATION Y AXIS

T112YGC
 SIDE AGGRESSIVE ATTRIBUTES
 84188000000
 712YGC

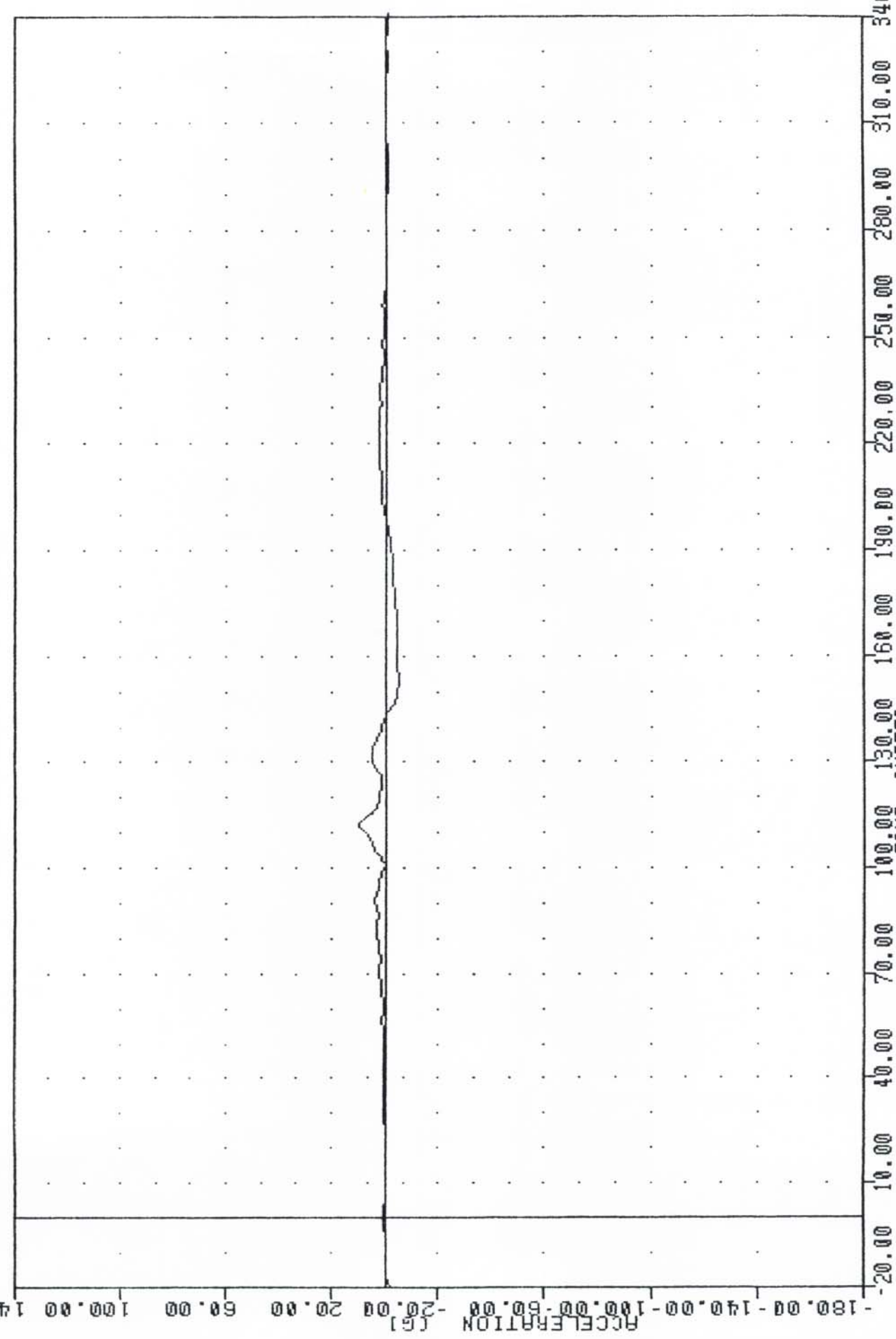
PLC, JATL 15 116-8z 03.09:20
 FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = -5.99e 200.00, 24.20 e 111.25



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER LOWER SPINE ACCELERATION #2 Y AXIS

TRAIL, J700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
T12ZG3

PLC, JRTL 15 106-8 05.3:20
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -5.08e 153.13, 9.52 e 111.88



B-51

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER LOWER SPINE ACCELERATION Z AXIS

TAL 0706
 SIDE AGGRESSIVE ATTRIBUTES
 84186000000
 T12YVC

PLD, DATE 15 NOV 84 10.00:48

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -14.258 -9.37, 1.86 e 144.38

20.00

15.00

10.00

5.00

0.00

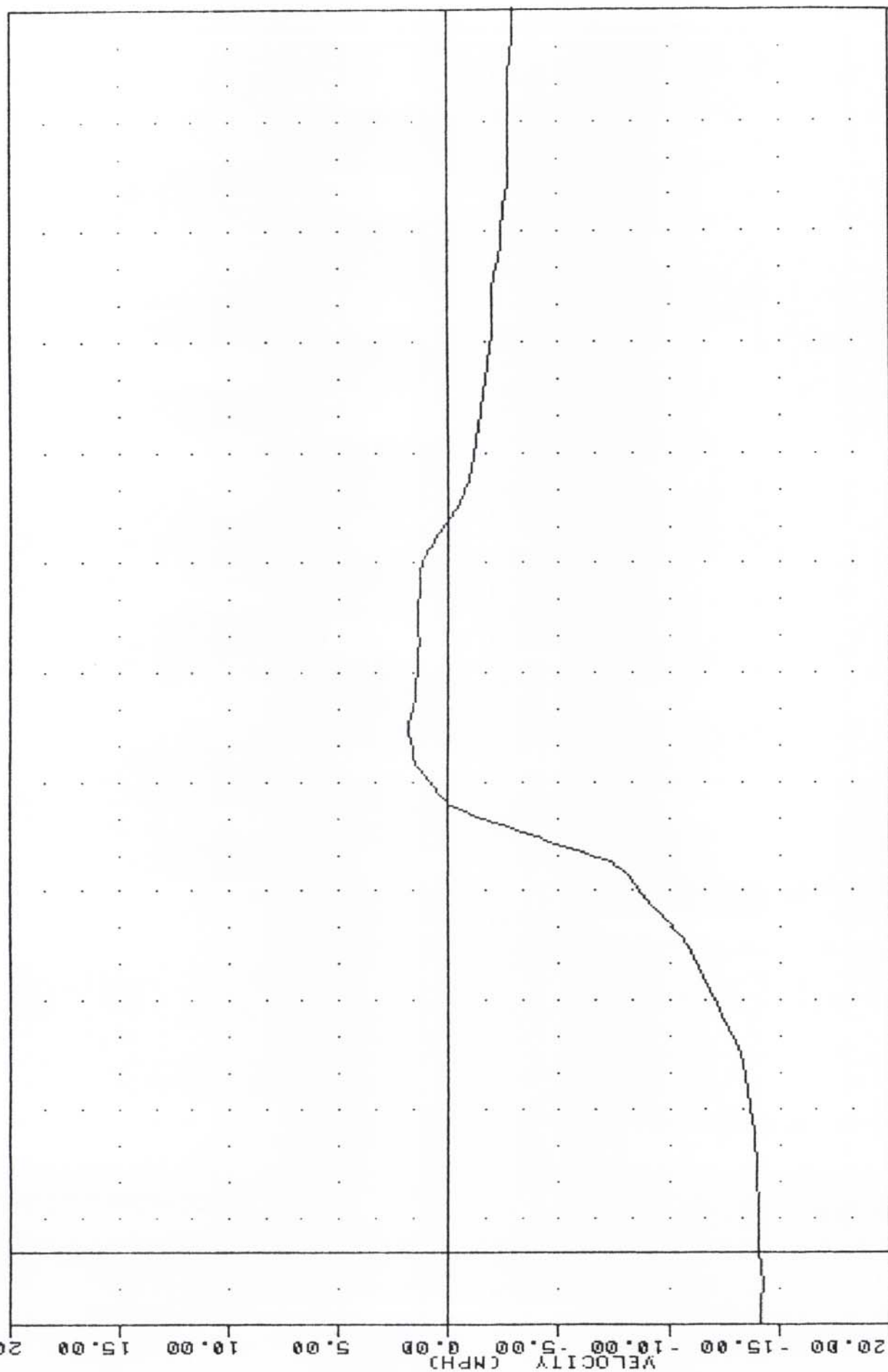
-5.00

-10.00

-15.00

-20.00

B-55



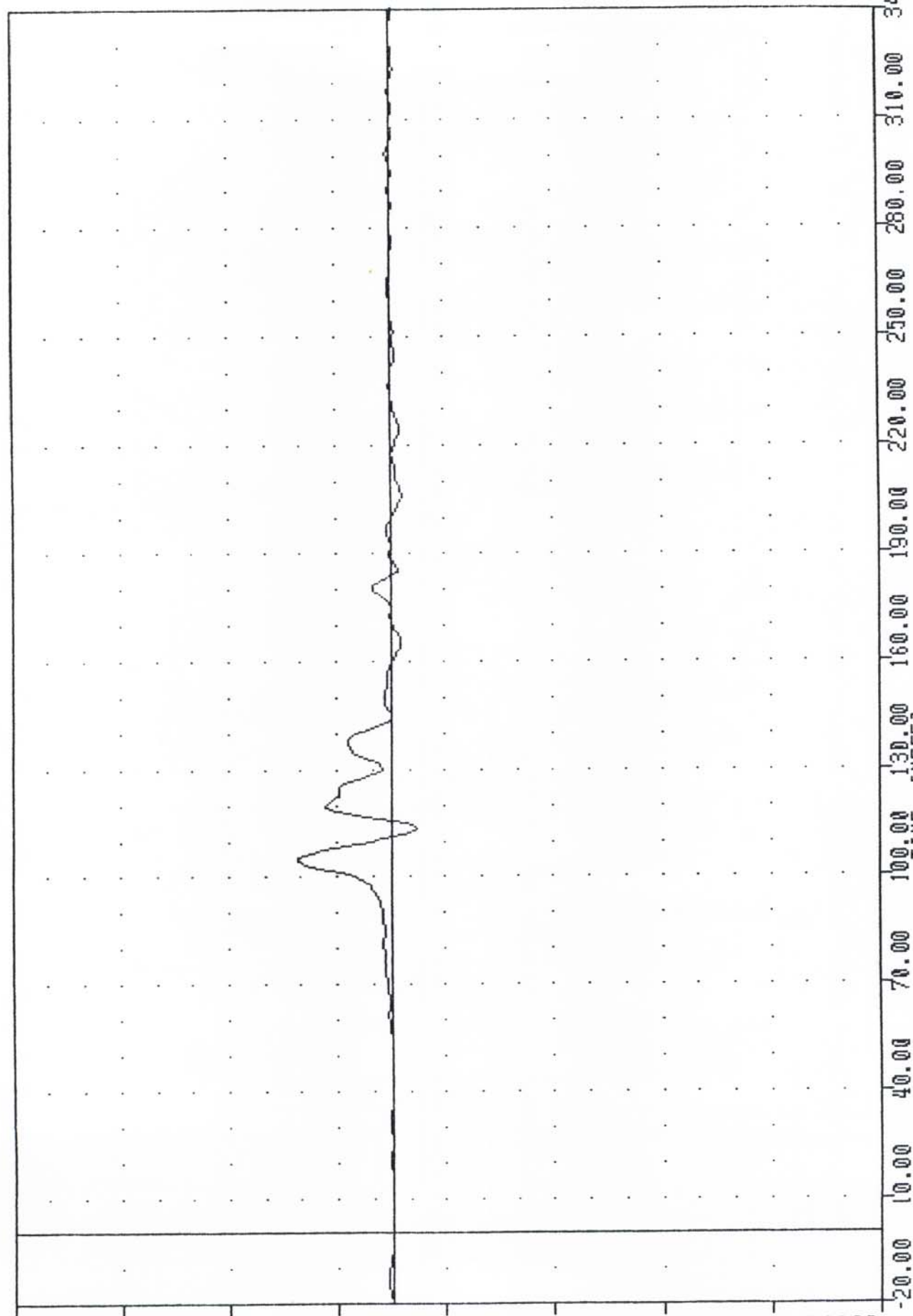
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING T12YVC

-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 040708
 SIDE AGGRESSIVE ATTRIBUTES
 84188000000
 LURY63

PLD, DATE 15 NOV 84 05:33:28
 FILTER = HSRI 136/ 189/ .50
 MIN, MAX VALUES = -9.56e 113.13, 34.89 e 104.38

ACCELERATION (G)
 -160.00 -140.00 -120.00 -100.00 -80.00 -60.00 -40.00 -20.00 0 20.00 40.00 60.00 80.00 100.00 120.00 140.00



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER LEFT UPPER RIB ACCELERATION Y AXIS

TRC J706
SIDE AGGRESSIVE ATTRIBUTES
8418800000
LURYV3

PLC DATE 15 06-81 10:3:40

FILTER = HSR1 136/ 189/ -50

MIN. MAX VALUES = -14.21 53.75, 1.92 183.12

20.00

15.00

10.00

5.00

0.00

-5.00

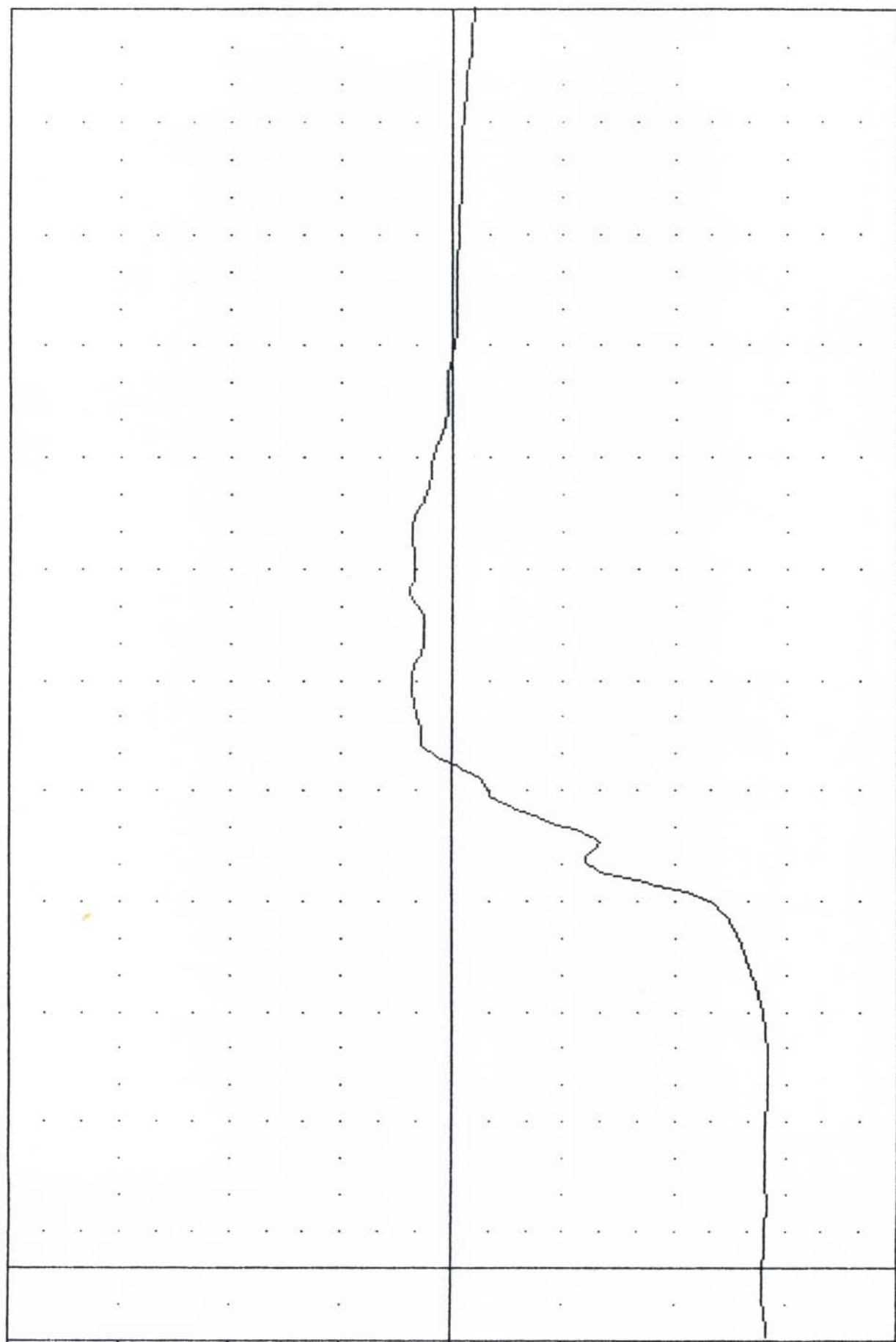
-10.00

-15.00

-20.00

B-57

VELOCITY (MPH)



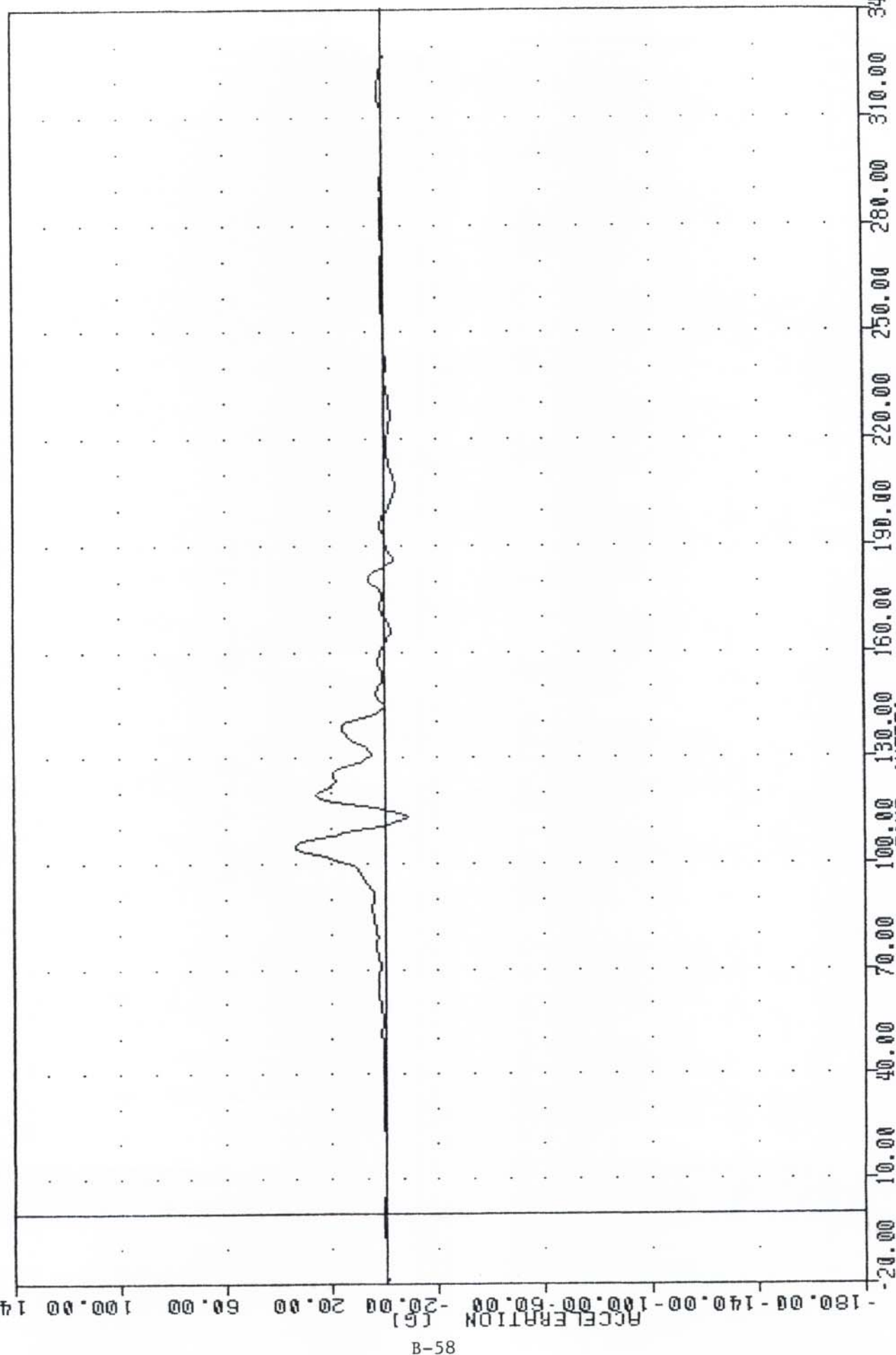
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LURYG3

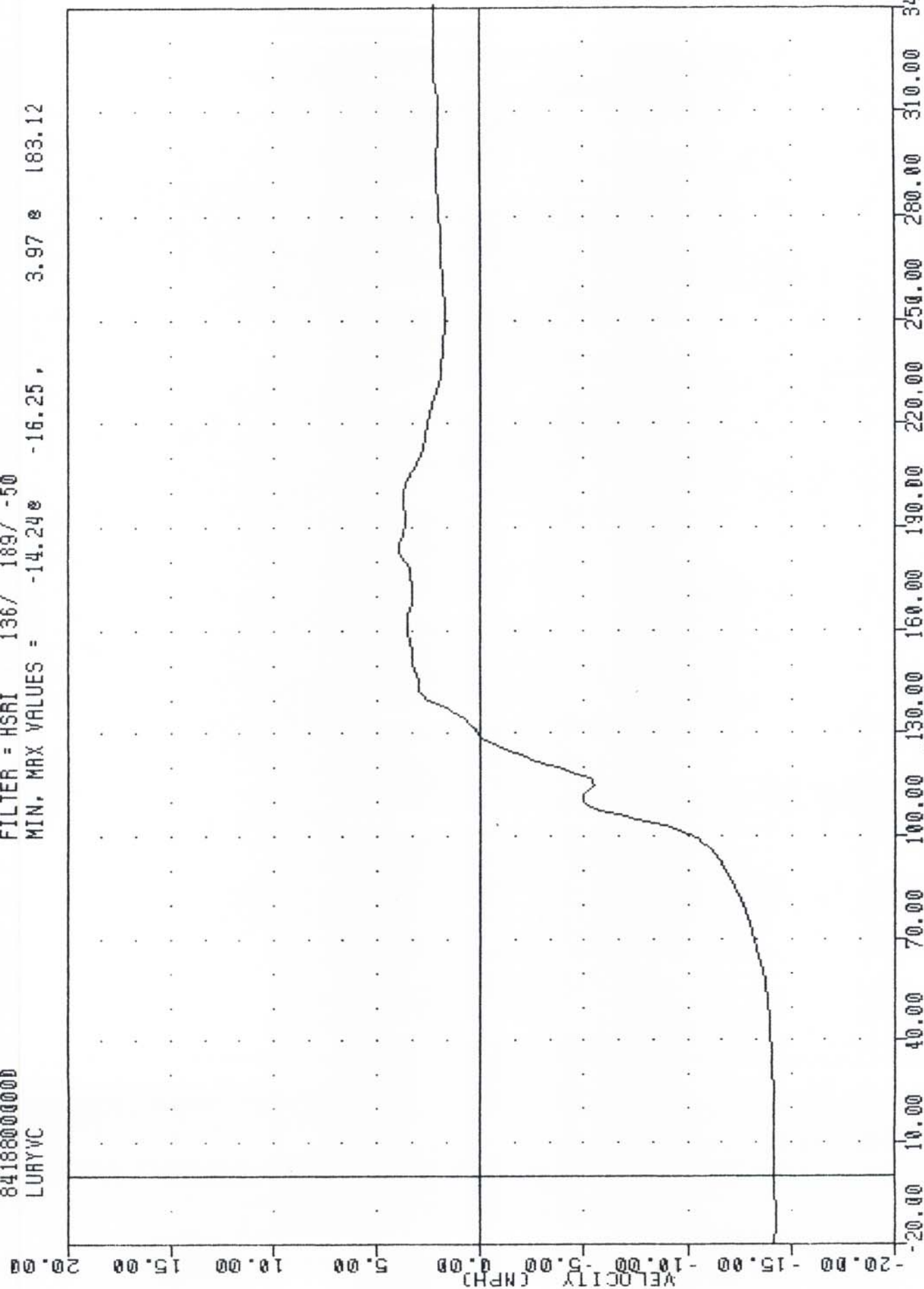
TIME 0700
SIDE AGGRESSIVE ATTRIBUTES
8418800000
LURYGC

PLC, JATL 15...6-8 0...9:20
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -8.50 112.50, 33.77 104.38



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER LEFT UPPER RIB ACCELERATION -2 Y AXIS

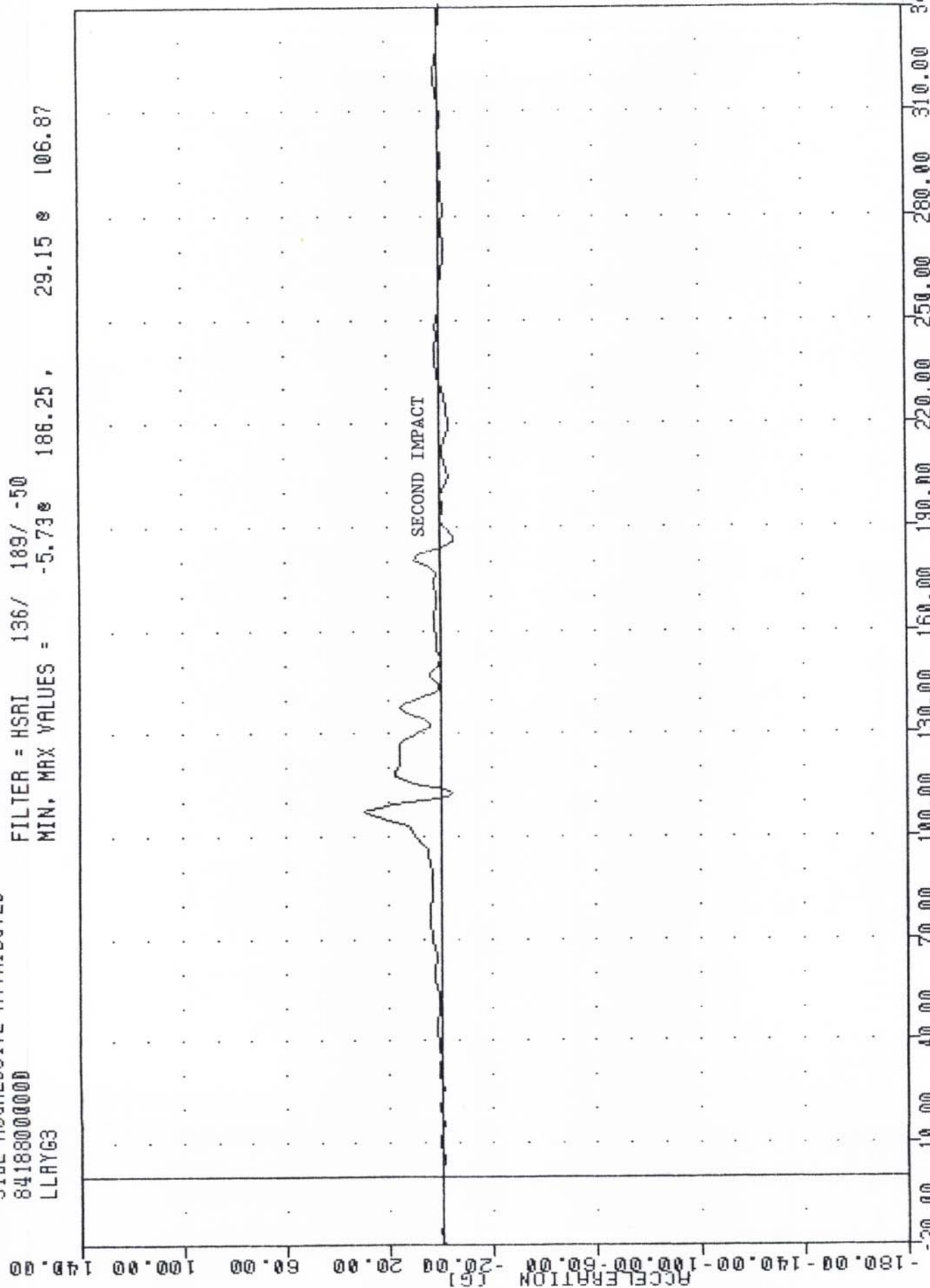
TF [] [] 700 [] PL [] RT [] 15 6-8 [] 1 [] 3:40
 SIDE AGGRESSIVE ATTRIBUTES
 84188000000
 LURYVC
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -14.248 -16.25, 3.97 183.12



B-59

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING LURY6C

TIME 00:00:00 DATE 11-06-80 00:03:20
 SIDE AGGRESSIVE ATTRIBUTES
 84188000000
 LLAG3
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -5.73 186.25, 29.15 106.87



B-60

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER LEFT LOWER RIB ACCELERATION Y AXIS

TR 0706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LLRYV3

PLC. DATE 15 FEB 84 16:03:46

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -14.45e 28.13, 3.08 e 183.12

20.00

15.00

10.00

5.00

0.00

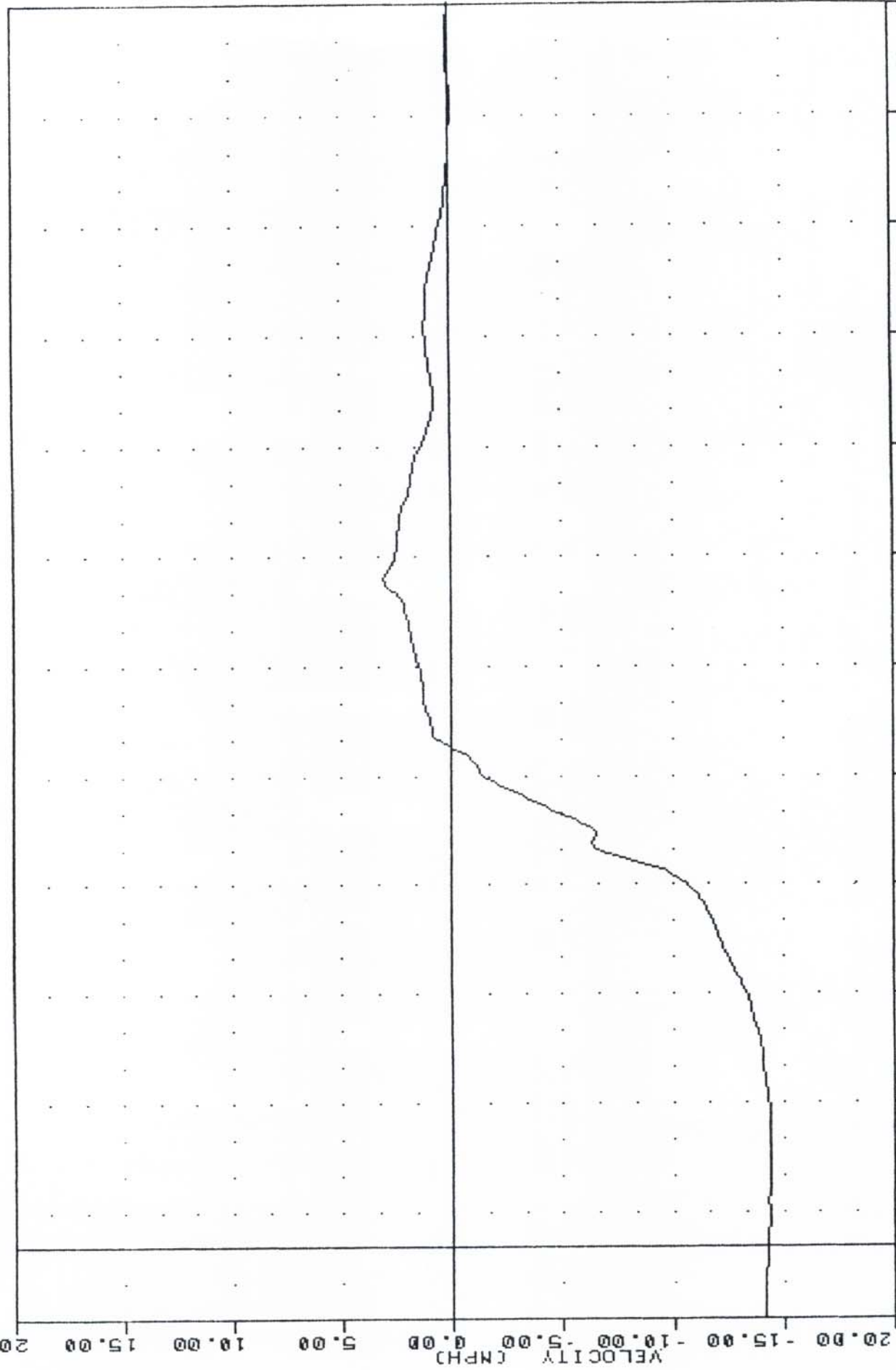
-5.00

-10.00

-15.00

-20.00

B-61



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LLRYG3

-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

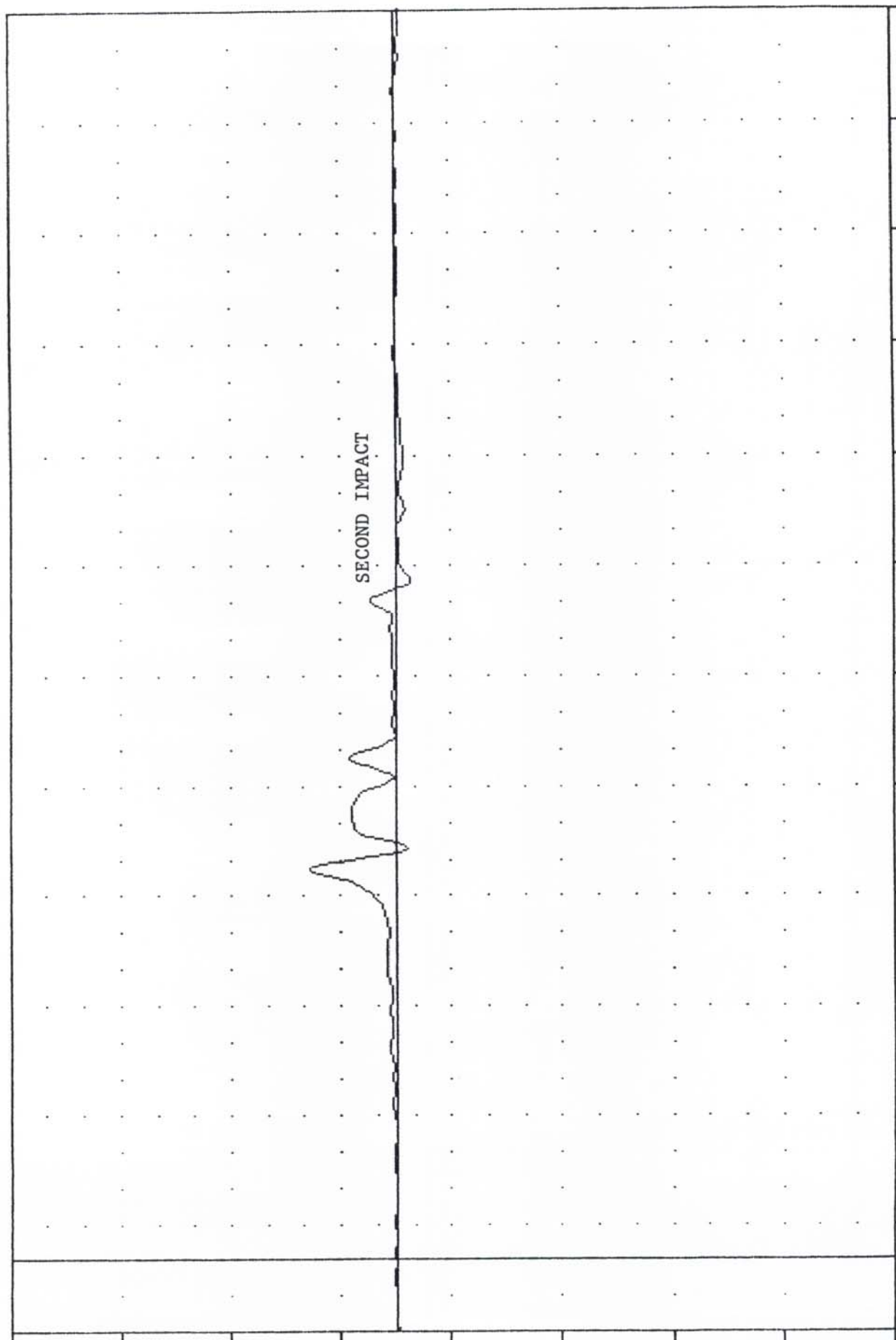
TRC 0708
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LLRY6C

PLG. DATE 15 NOV 84 05:33:28

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -5.52e 185.63, 31.10 e 106.87

ACCELERATION (G)



B-62

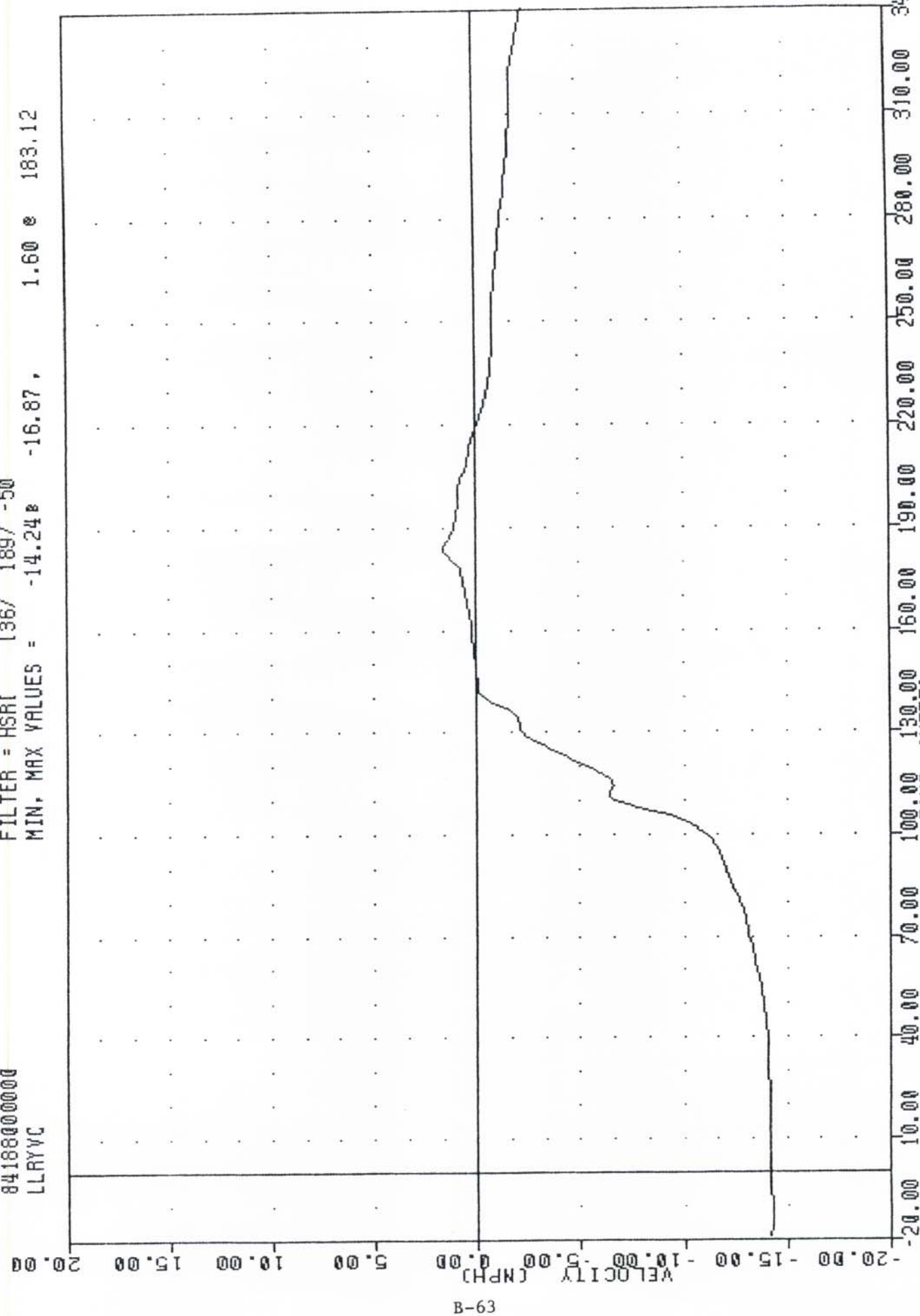
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER LEFT LOWER RIB ACCELERATION #2 Y AXIS

PLC, DATL 15 JUN 87 10:03:40

84188000000
LLRYVC

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -14.248 -16.87, 1.60 183.12



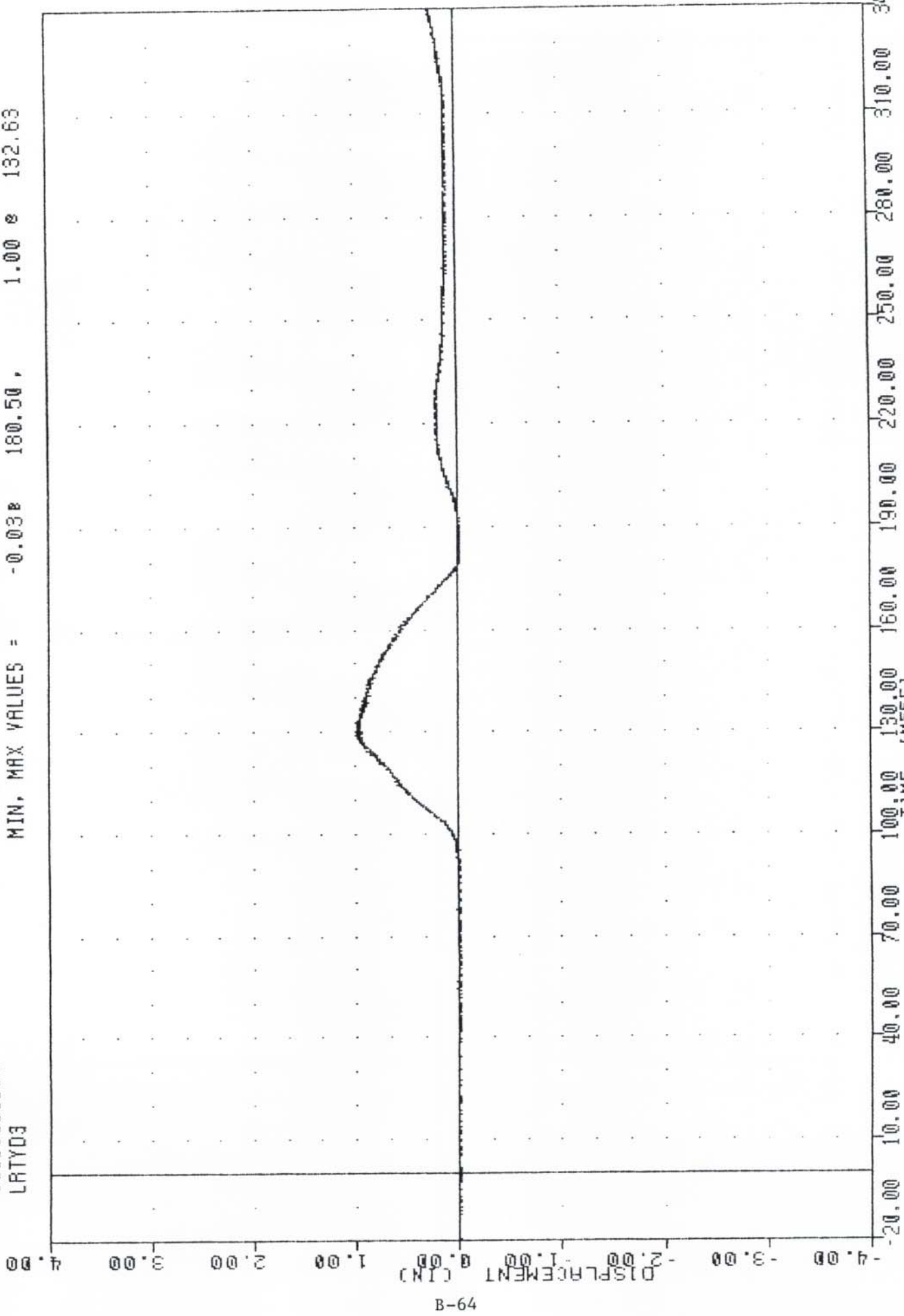
B-63

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LLRYGC

T... 070C
 SIDE AGGRESSIVE ATTRIBUTES
 8418800000
 LRTYD3

PLU. DATE 1C JJG-62 12.14.31

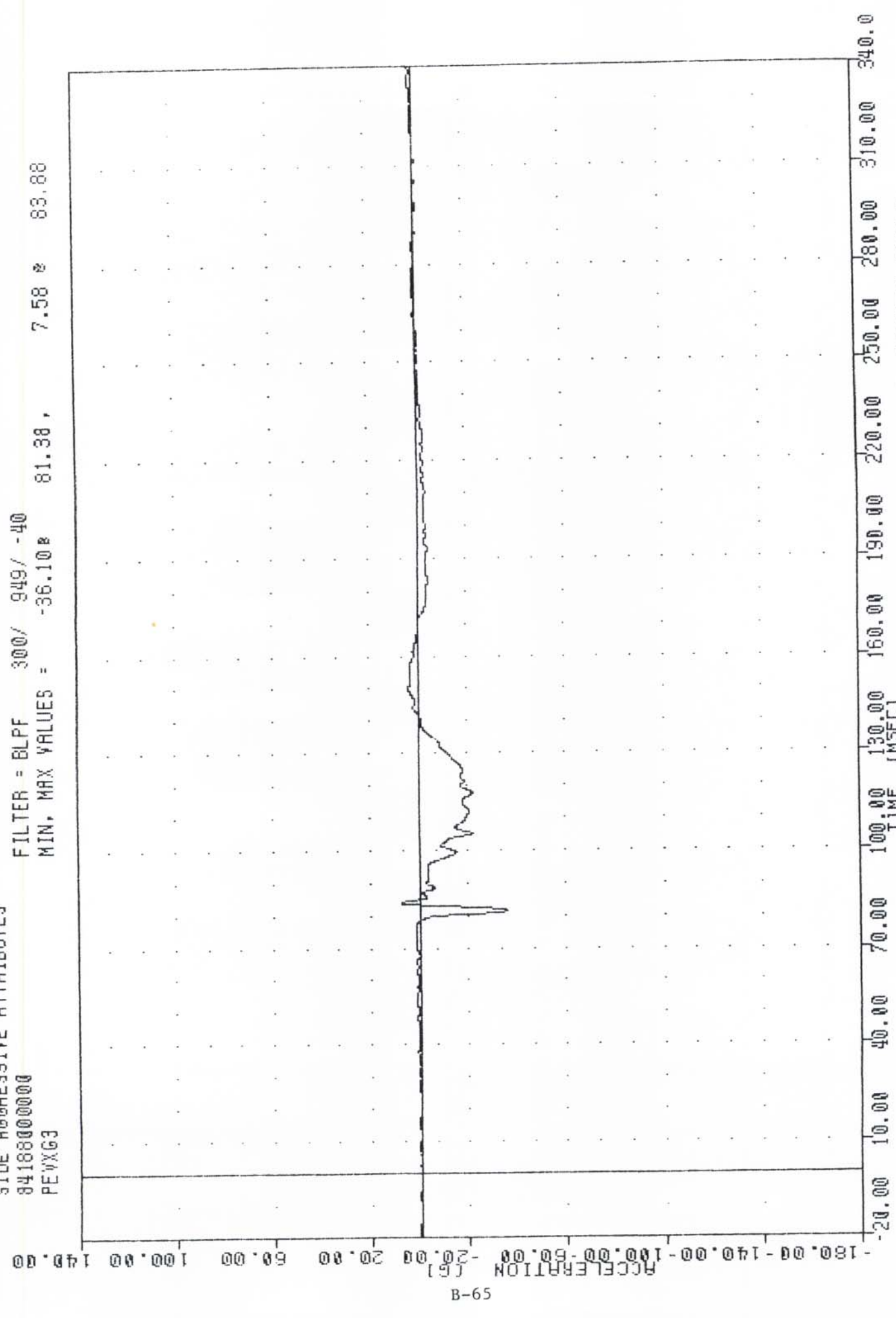
FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = -0.038 180.50, 1.00 132.63



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER LEFT RIB TO SPINE DISPLACEMENT INCHES

TIME 0700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
PEVXG3

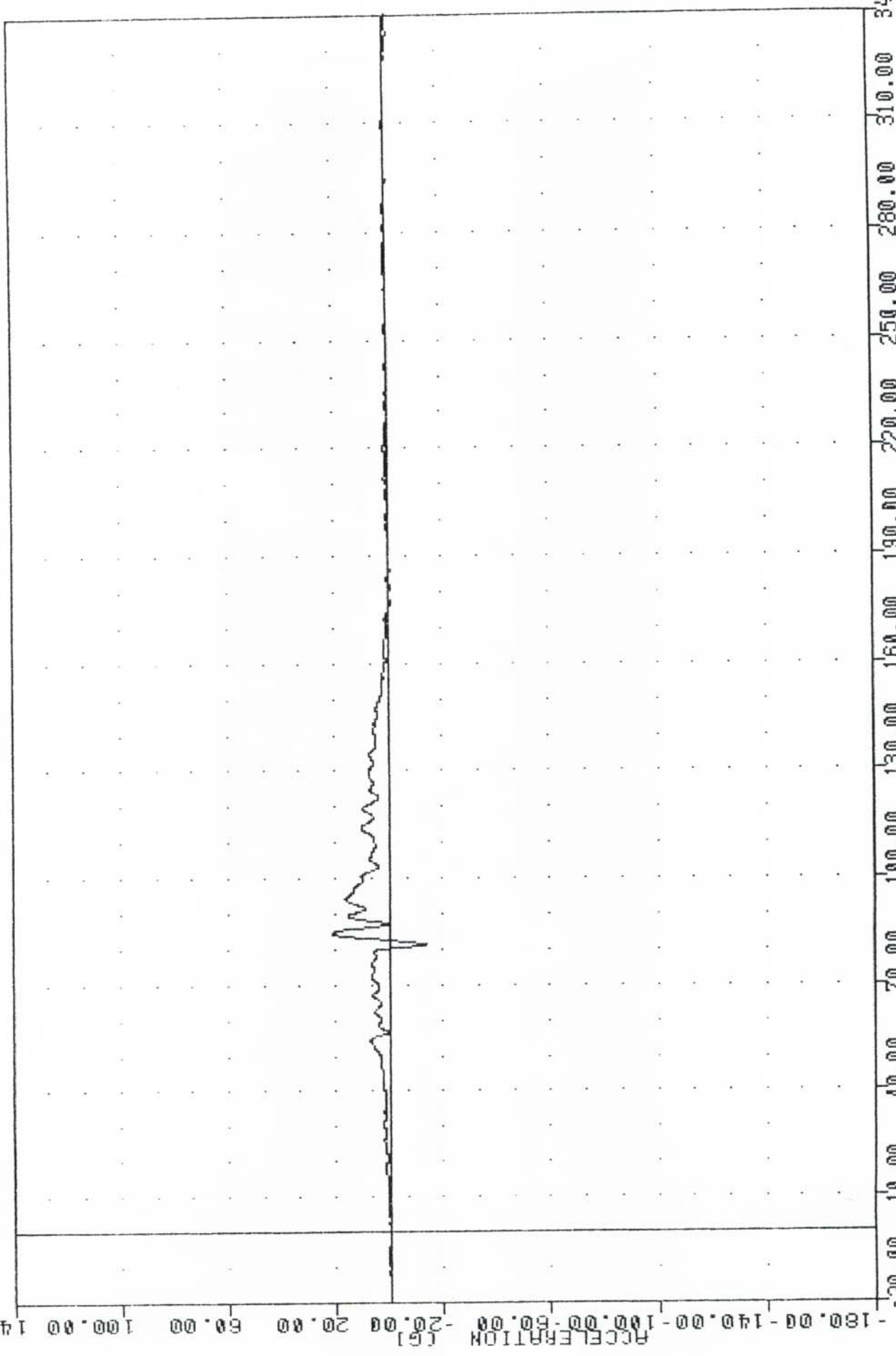
PLC. DATE 10 AUG-82 00:22:52
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -36.10 81.38, 7.58 83.88



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER PELVIS ACCELERATION X AXIS

TI 070
SIDE AGGRESSIVE ATTRIBUTES
8418800000
PEVYG3

PLC DAT 10 06-8 00 2:50
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -13.79e 81.13, 20.90 e 84.50

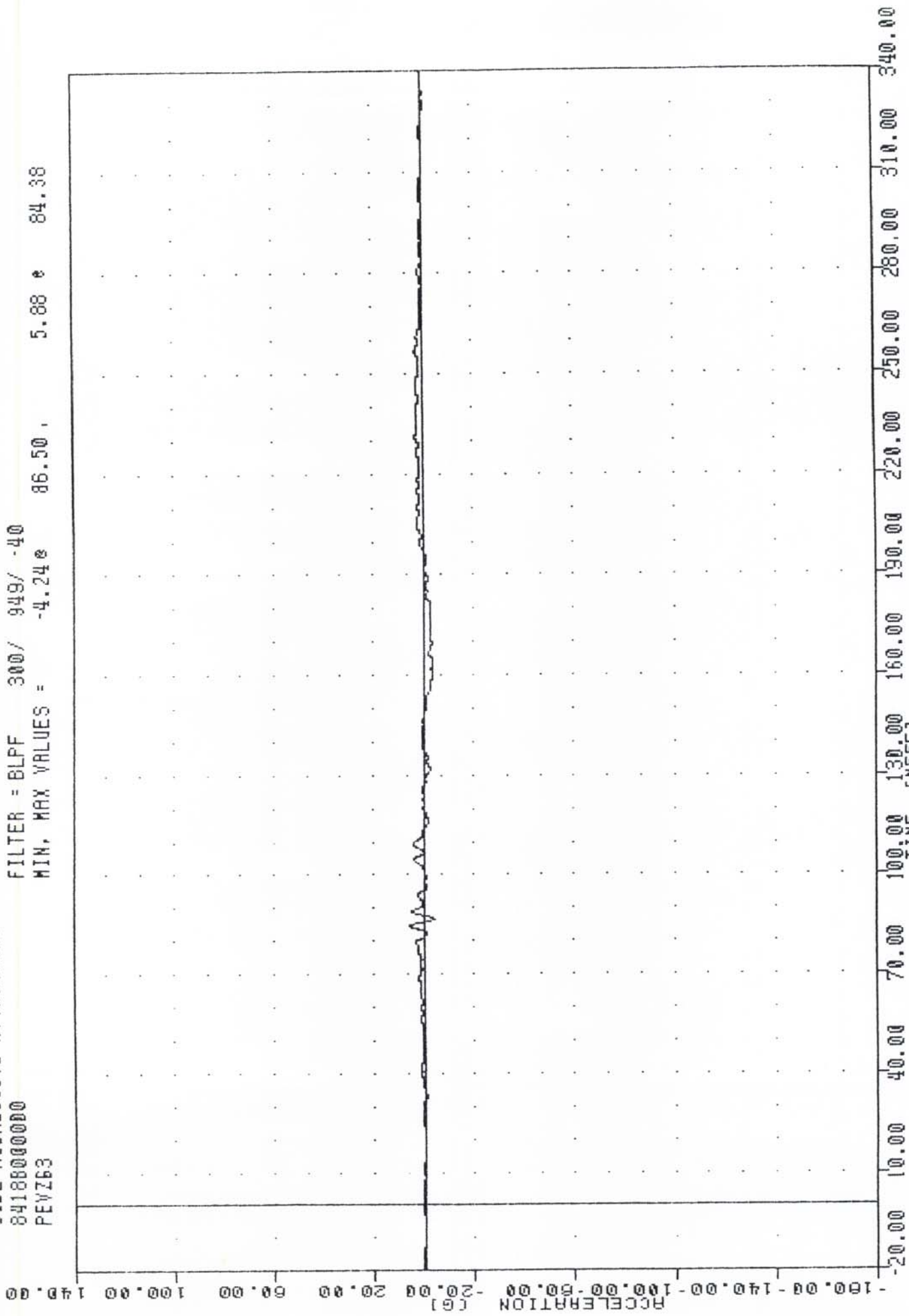


B-66

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER PELVIS ACCELERATION Y AXIS

TRC 0708
 SIDE AGGRESSIVE ATTRIBUTES
 84188000000
 PEVZ63

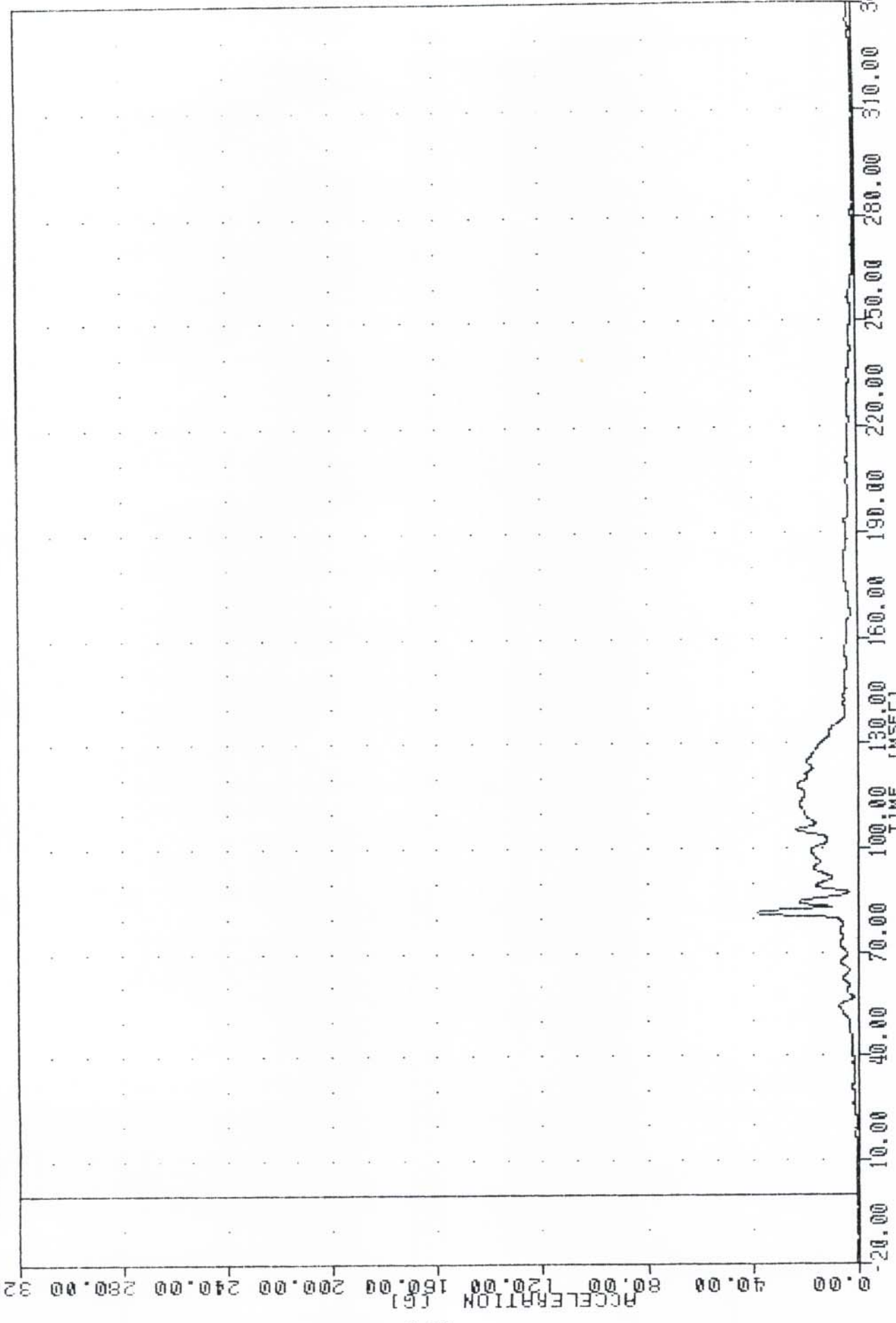
PLG DATE 16 1106-84 05:22:54
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -4.24 86.50 5.88 84.38



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER PELVIS ACCELERATION Z AXIS

TIME 0700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
PEVRG3

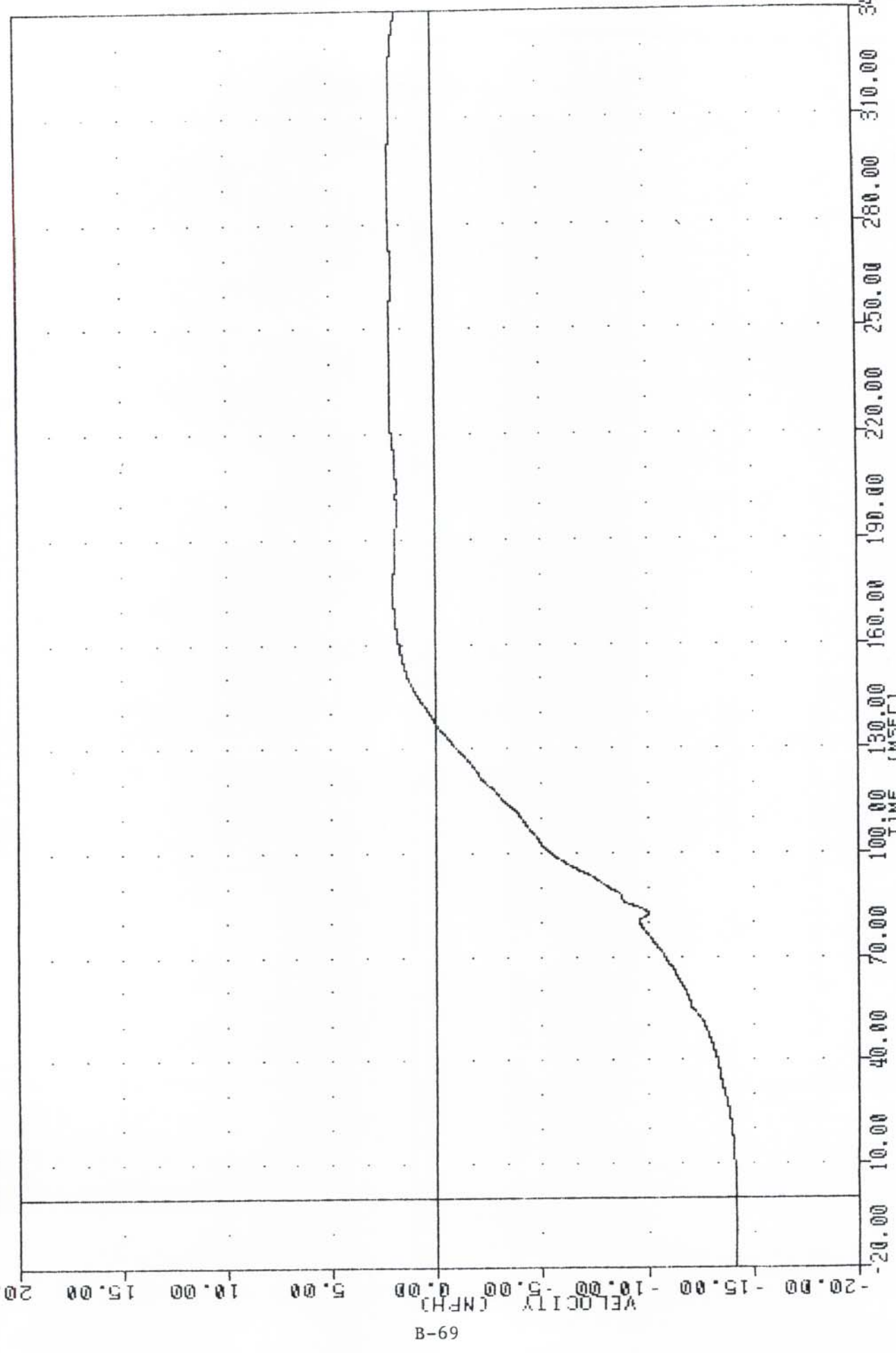
PLU, DATE 10 1106-07 05:24:14
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.07e -4.00, 38.40 e 81.38



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER PELVIS RESULTANT

TITLE: 0700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
PEVYV3

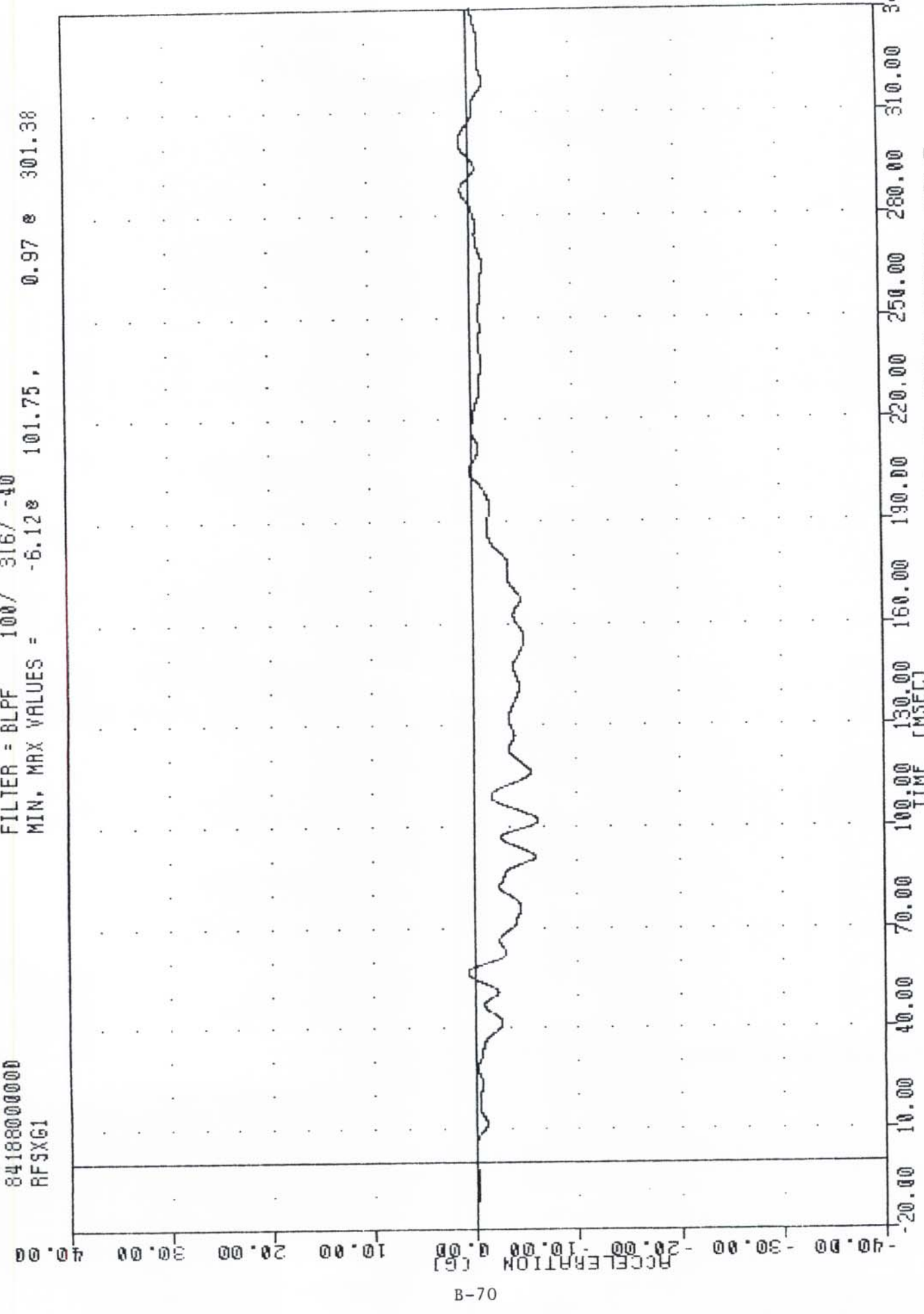
PLU, DATE 16 AUG-82 05:24:30
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -14.20e -12.88, 2.18 e 233.00



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING PEVYV3

T... 0700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
RFSXG1

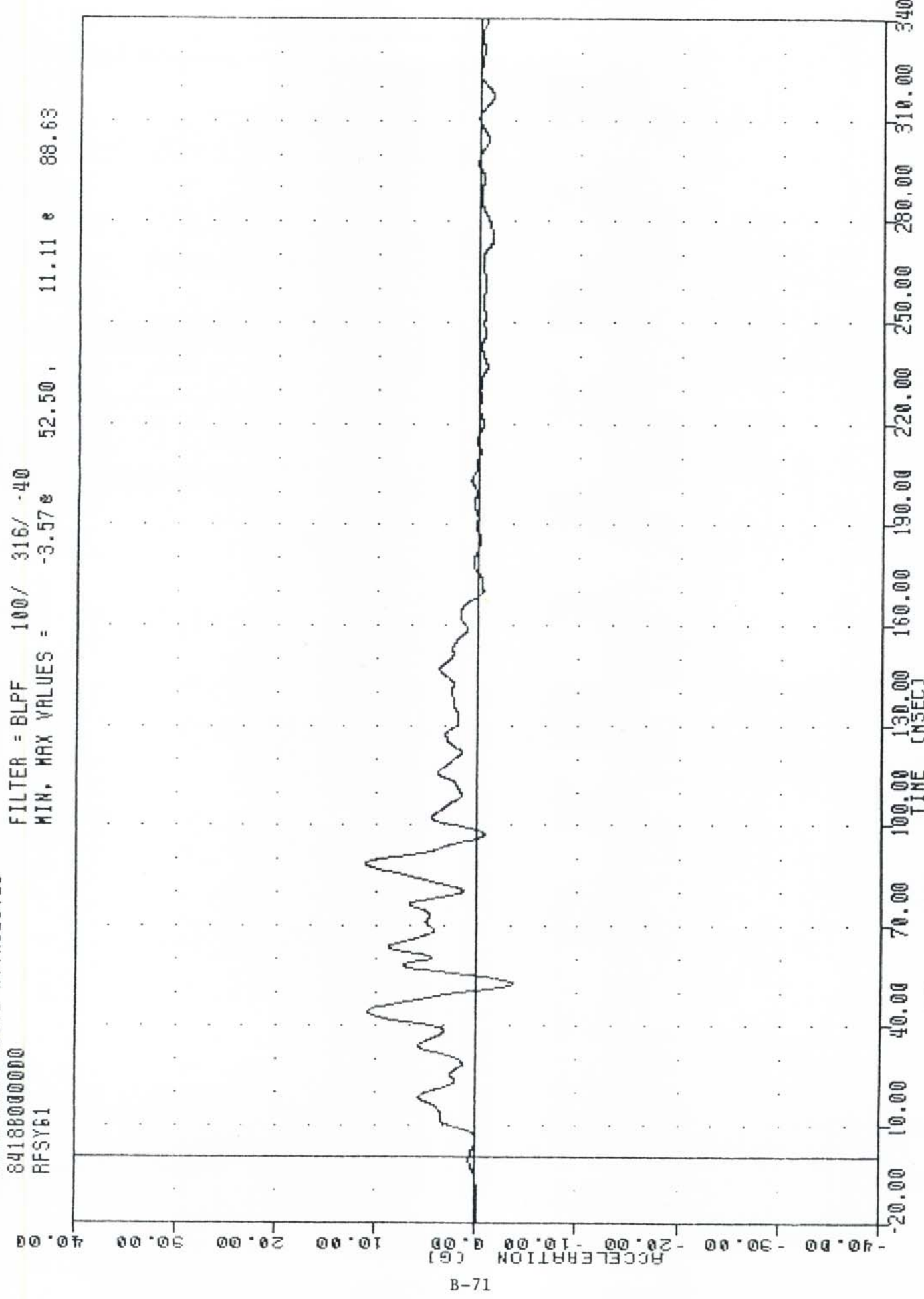
PLC, JRTL 1L 06-8 00.2:5
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -6.128 101.75, 0.97 301.38



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE RIGHT FRONT SILL ACCELERATION X AXIS

TR 708
SIDE AGGRESSIVE ATTRIBUTES
84188000000
RFSY61

PLC RATE 18 3-8 00:54
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -3.57e 52.50, 11.11 e 88.63

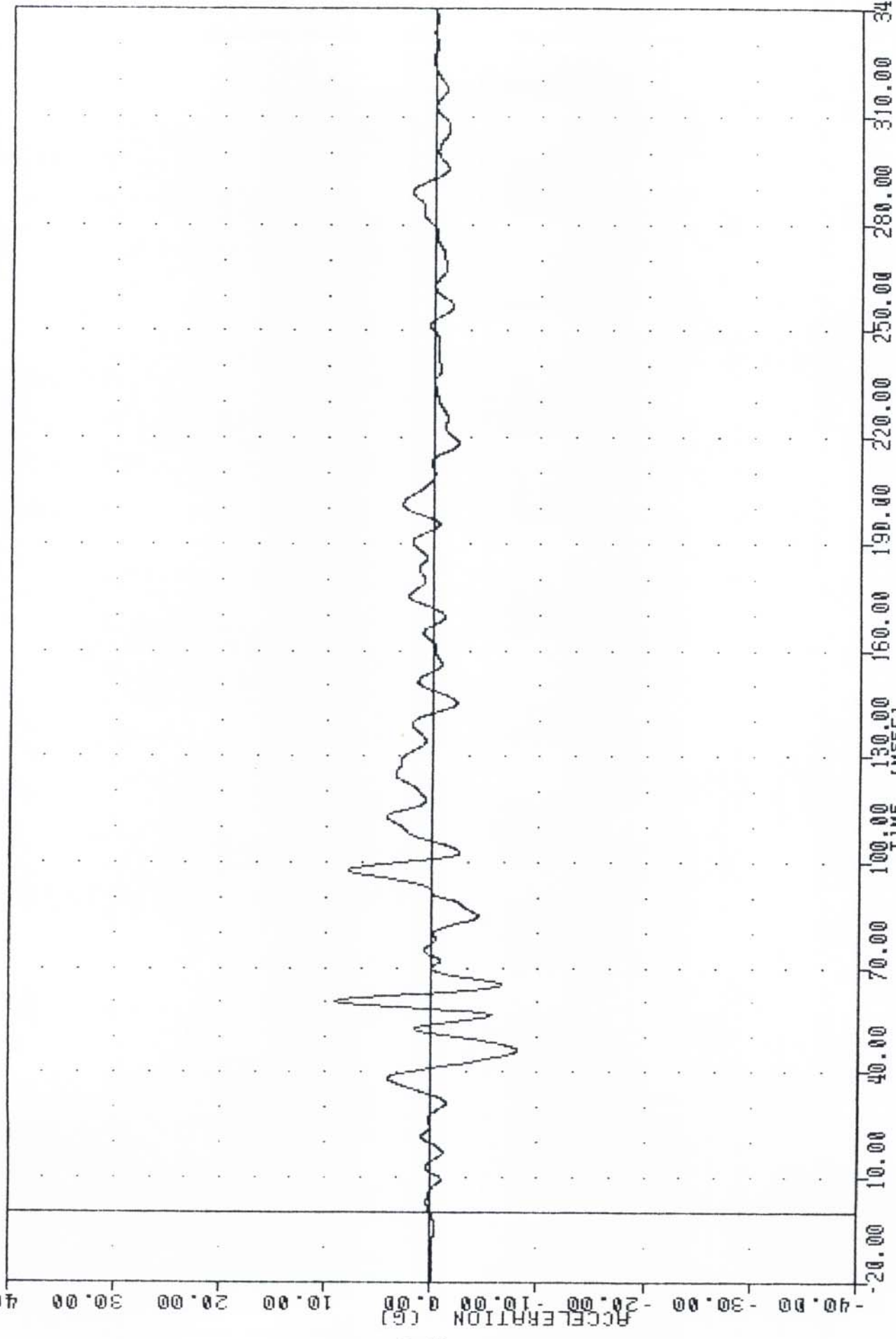


B-71

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE RIGHT FRONT SILL ACCELERATION Y AXIS

1... 070
SIDE AGGRESSIVE ATTRIBUTES
84188000000
RFSZG1

PLC. DATE 1C JG-6z 03.2:5z
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -8.11e 46.25, 9.08 e 60.13



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE RIGHT FRONT SILL ACCELERATION Z AXIS

PL DATE 18 6-8 04:11

TF 7070 SIDE AGGRESSIVE ATTRIBUTES

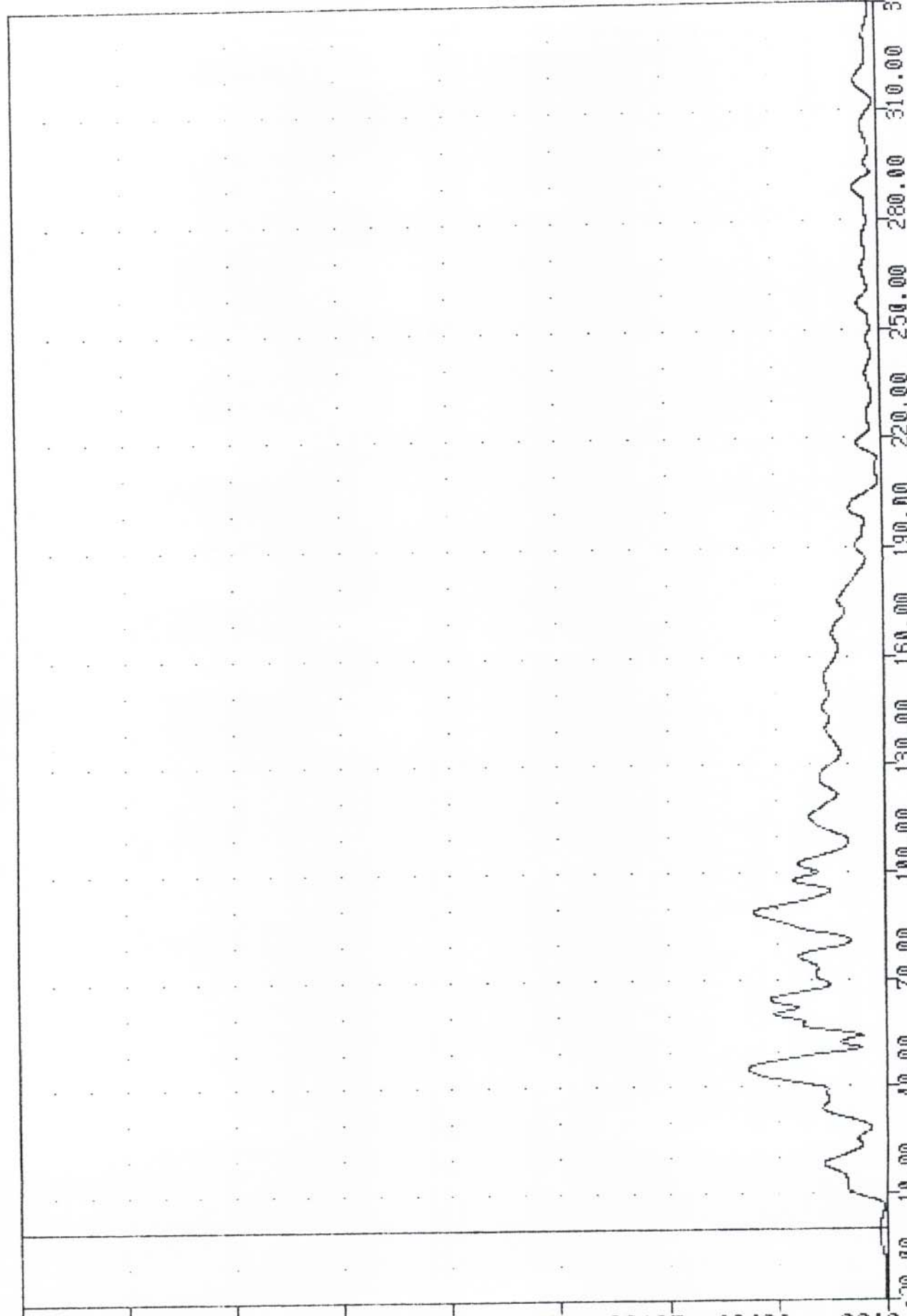
84188000000

RF5RG1

FILTER = 8LPF 100/ 316/ -40

MIN. MAX VALUES = 0.148 6.38 12.75 e 45.00

ACCELERATION (G)

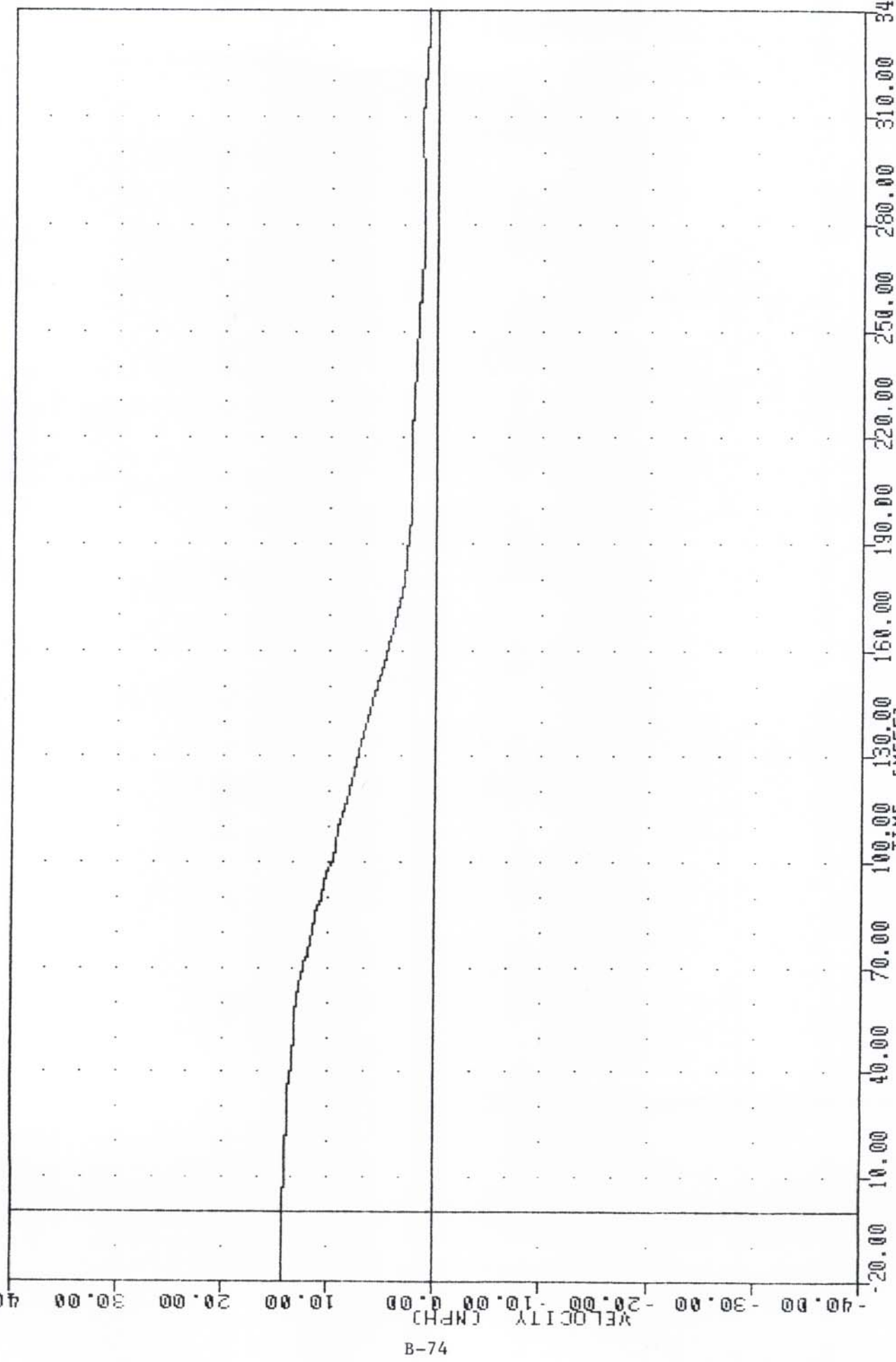


B-73

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE RIGHT FRONT SILL RESULTANT

TIN 02700
SIDE AGGRESSIVE ATTRIBUTES
8418800000
RFSXV1

PLG, DATE 16 JUN 84 03.24:30
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.90 339.36, 14.20 17.75



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING RFSXG1

TR 708
SIDE AGGRESSIVE ATTRIBUTES

84188000000

RFSYV1

PLC RATE 16 06-8 00:1:31

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -14.230 -10.00, -1.32 213.25

40.00

30.00

20.00

10.00

0.00

-10.00

-20.00

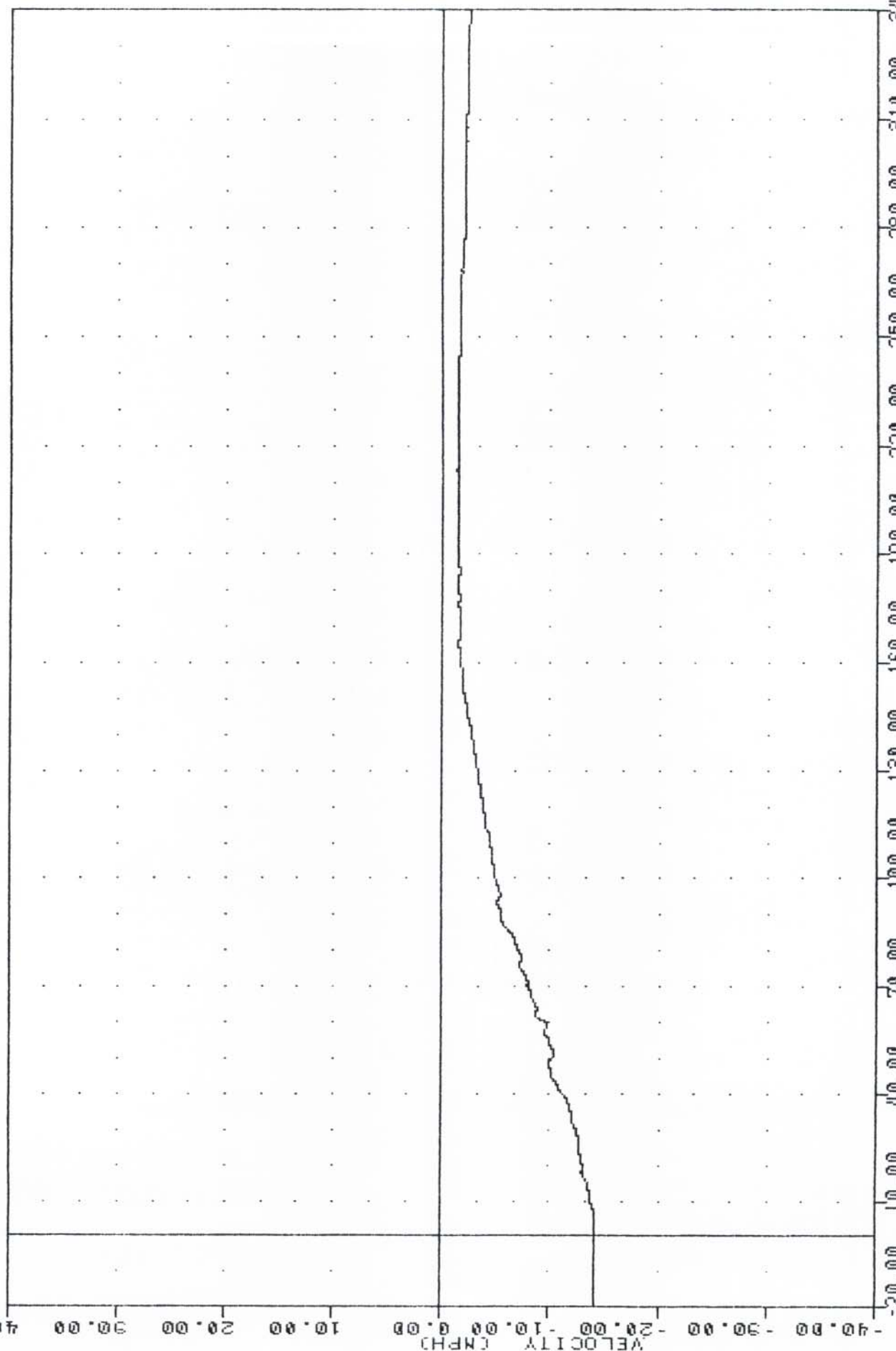
-30.00

-40.00

-50.00

-60.00

B-75

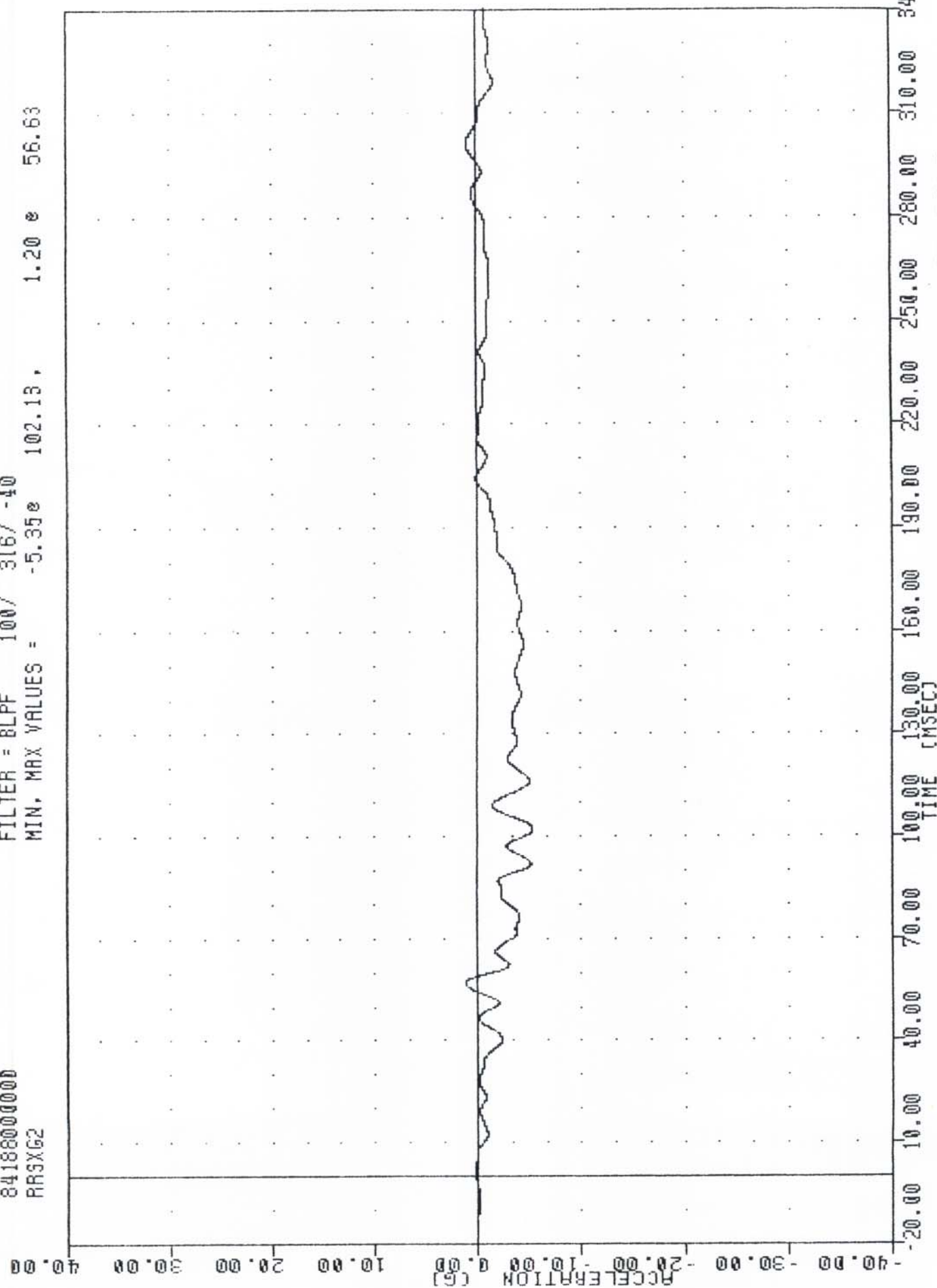


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING RFSYG1

TRC 000000000000
SIDE AGGRESSIVE ATTRIBUTES
84188000000
RR3XG2

PLC, JRTL 1E 00G-8z 00.2:5z

FILTER = 8LPF 100/ 316/ -40
MIN, MAX VALUES = -5.35e 102.13, 1.20 e 56.63

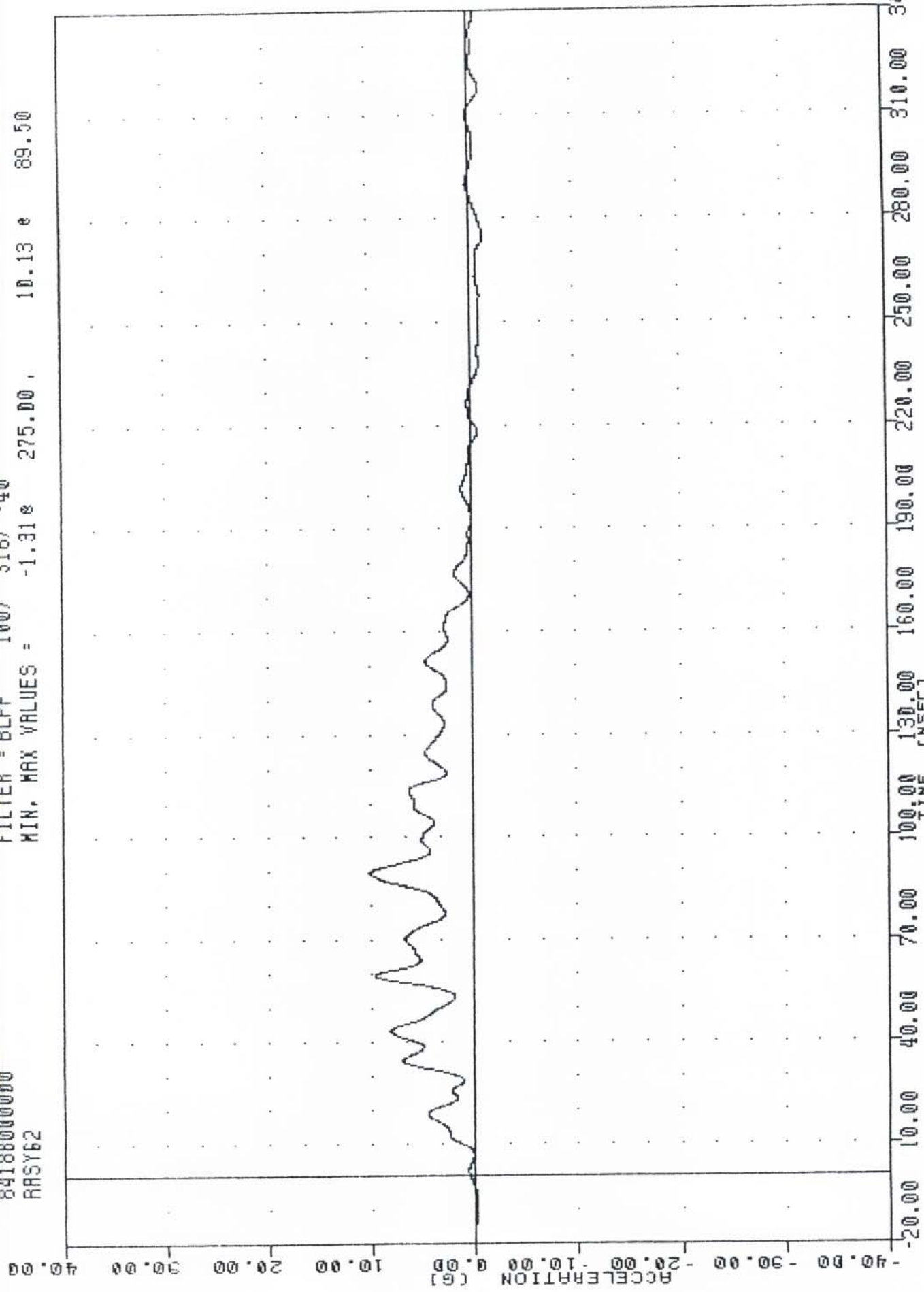


B-76

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE RIGHT REAR SILL ACCELERATION X AXIS.

TRC 040708
SIDE AGGRESSIVE ATTRIBUTES
84188000000
RRSY62

PLD, WATE 16 1106-84 05.22:54
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -1.31e 275.00, 10.13 e 89.50

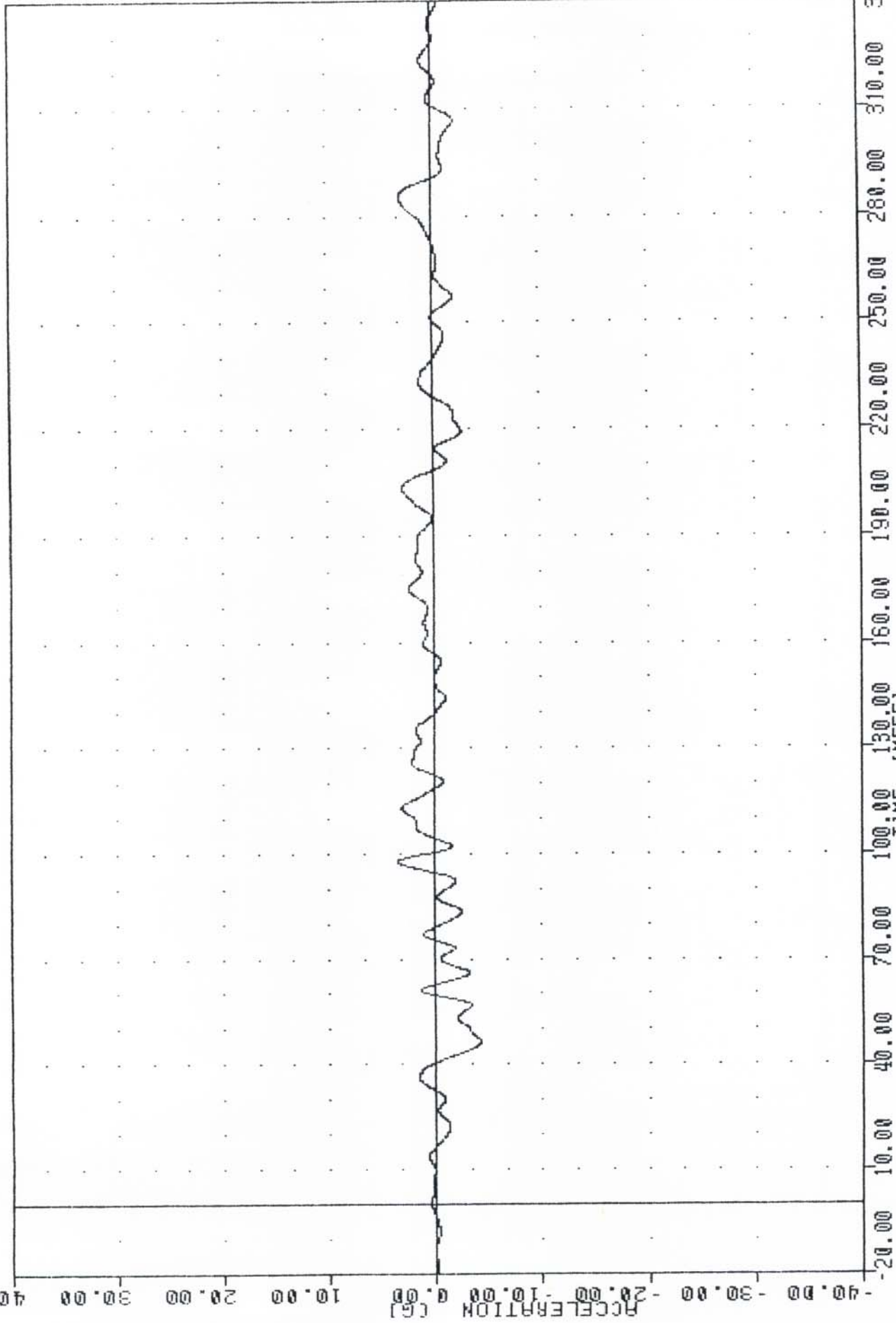


B-77

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE RIGHT REAR SILL ACCELERATION Y AXIS.

TIME 0700
 SIDE AGGRESSIVE ATTRIBUTES
 84188000000
 RRSZG2

PLU, DATE 10 11 65-02 03.22:54
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -4.26e 46.38, 3.50 e 97.63



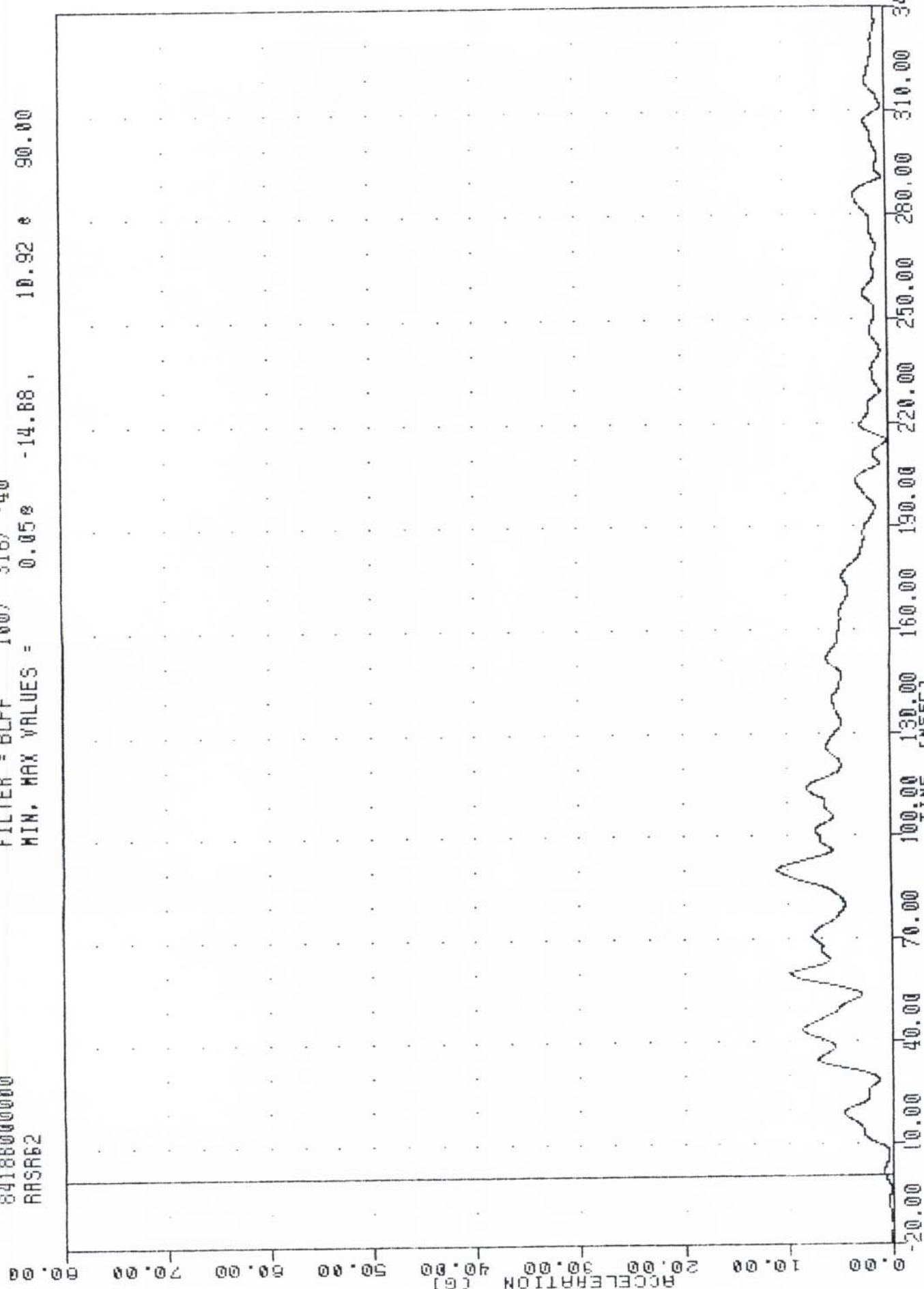
B-78

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 VEHICLE RIGHT REAR SILL ACCELERATION Z AXIS.

TRC 040706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
RRSR62

PLD, DATE 16 NOV-84 05:24:14

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = 0.058 -14.88, 10.92 90.00

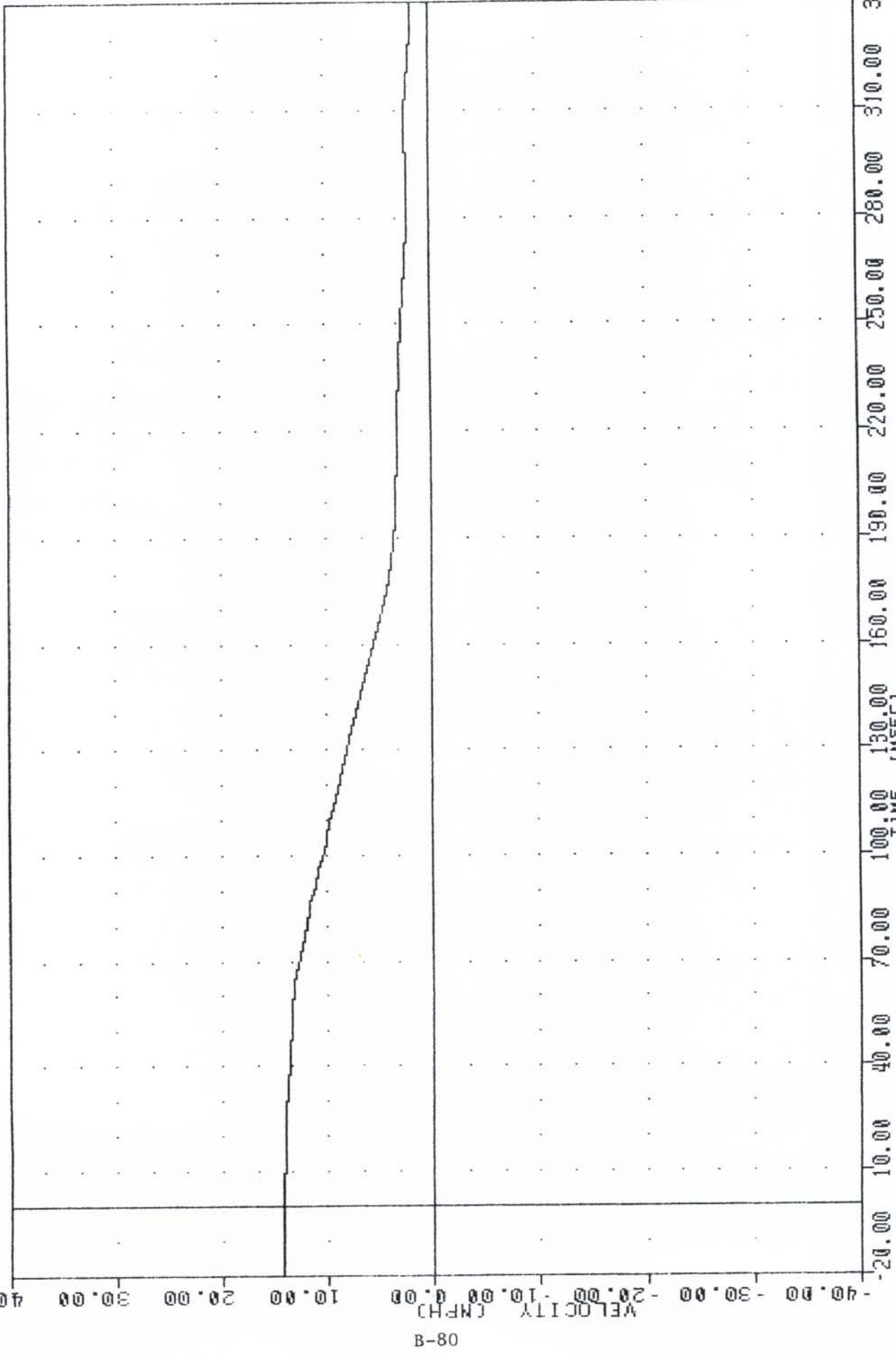


B-79

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE RIGHT REAR SILL RESULTANT

TIME 0700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
RRSXV2

PLC, DATA 16 116-8+ 00.24:30
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 1.658 340.00, 14.22 5.88

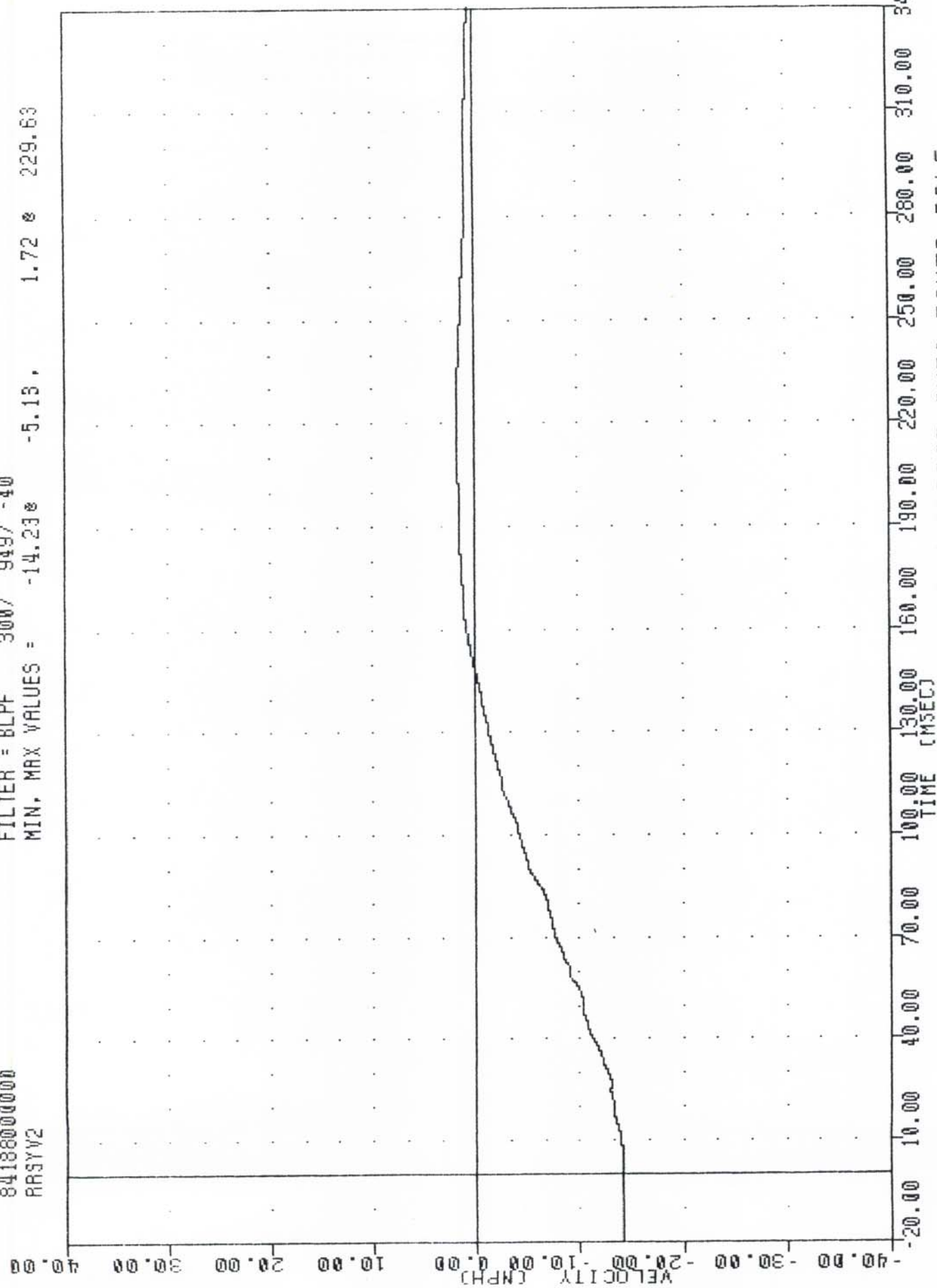


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING RRSXG2

TIME 04:30
SIDE AGGRESSIVE ATTRIBUTES
8418800000
RRSYV2

PLU, JRTL 16 106-64 03.24:30

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -14.23 1.72 229.63

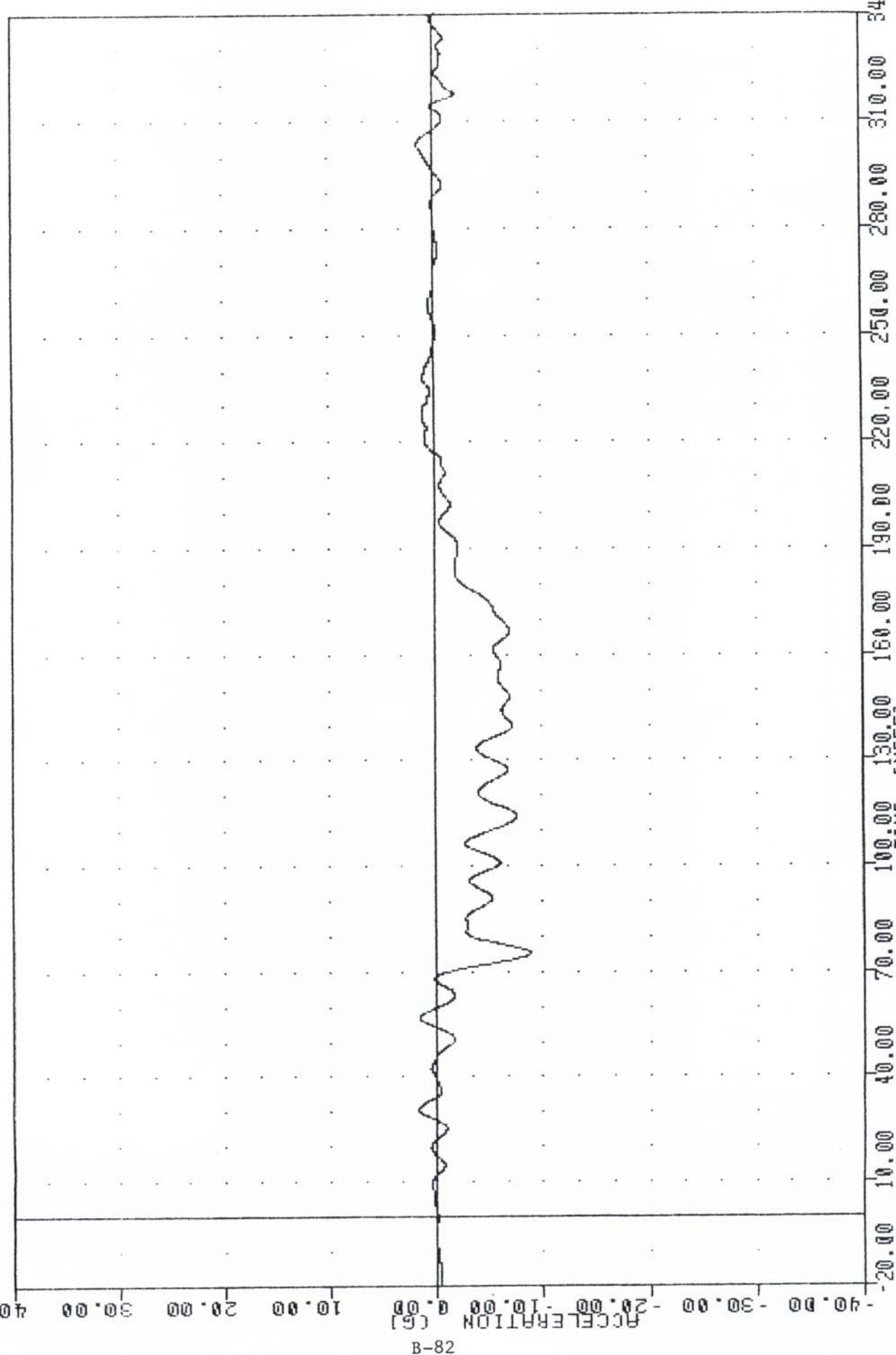


B-81

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING RRSYG2

TL 0700
SIDE AGGRESSIVE ATTRIBUTES
8418800000
RDKXG3

PLC DRTL 1E 06-8. 00-2:52
FILTER = 8LPF 100/ 316/ -40
MIN, MAX VALUES = -8.80e 75.13, 1.73 s 30.63

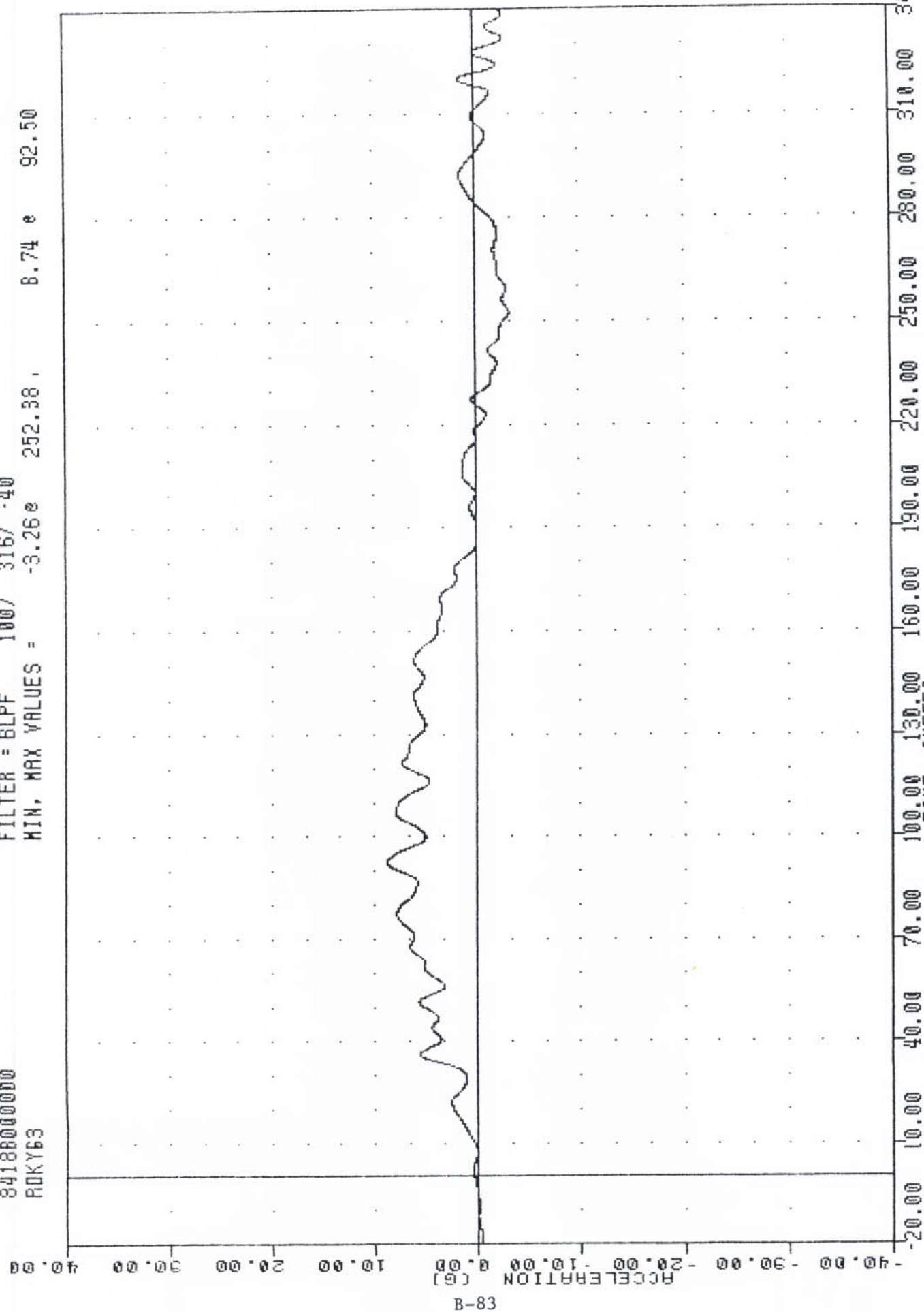


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE REAR DECK ACCELERATION X AXIS

TRF 1700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
RDKY63

PLT DATE 18 6-8 0 2:50

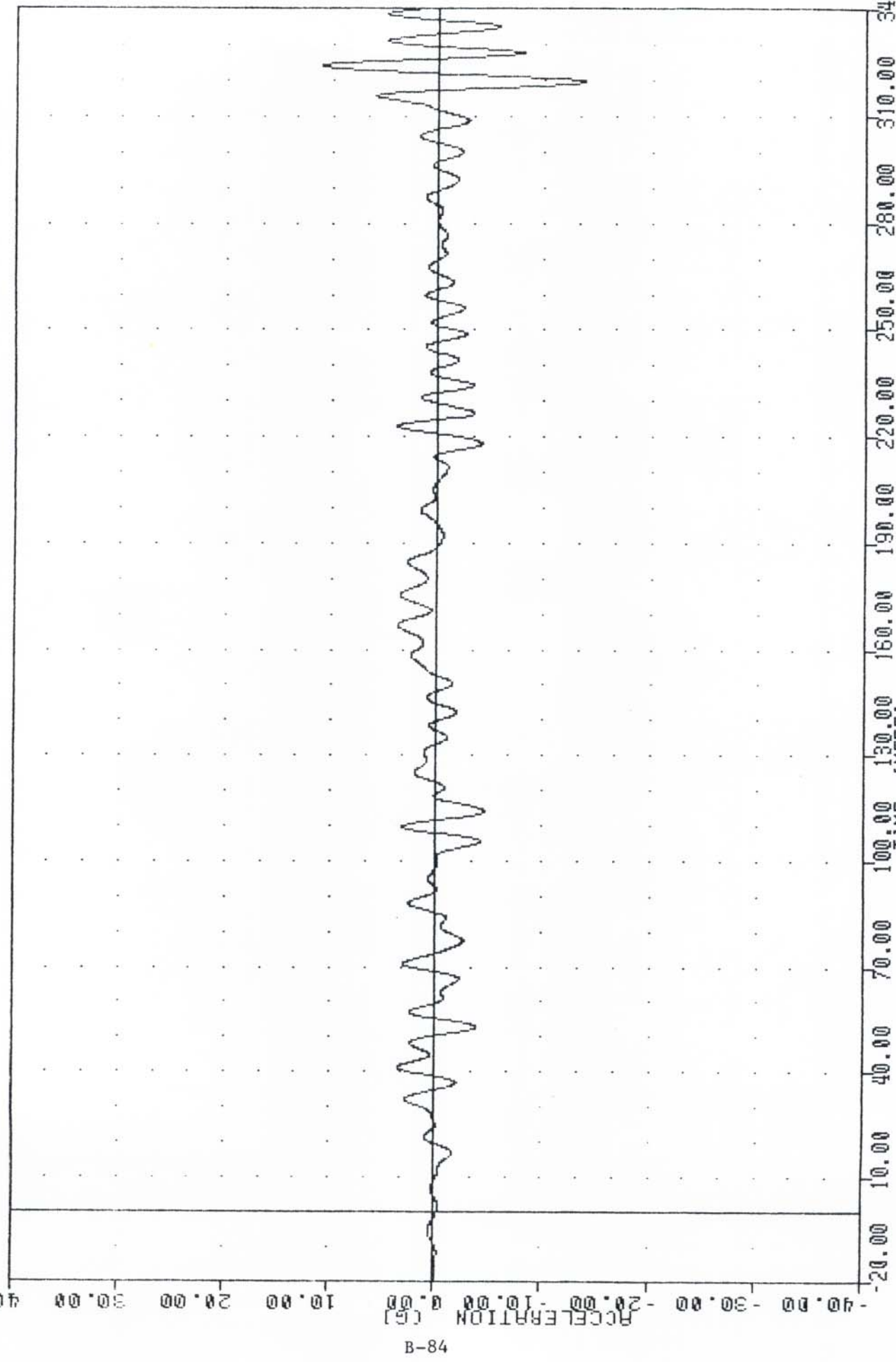
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -3.26e 252.38, 8.74 e 92.50



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE REAR DECK ACCELERATION Y AXIS

TIME 040700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
ADKZG3

PLU, DATL 10 1106-04 03.22:54
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -13.828 319.63, 11.13 323.88

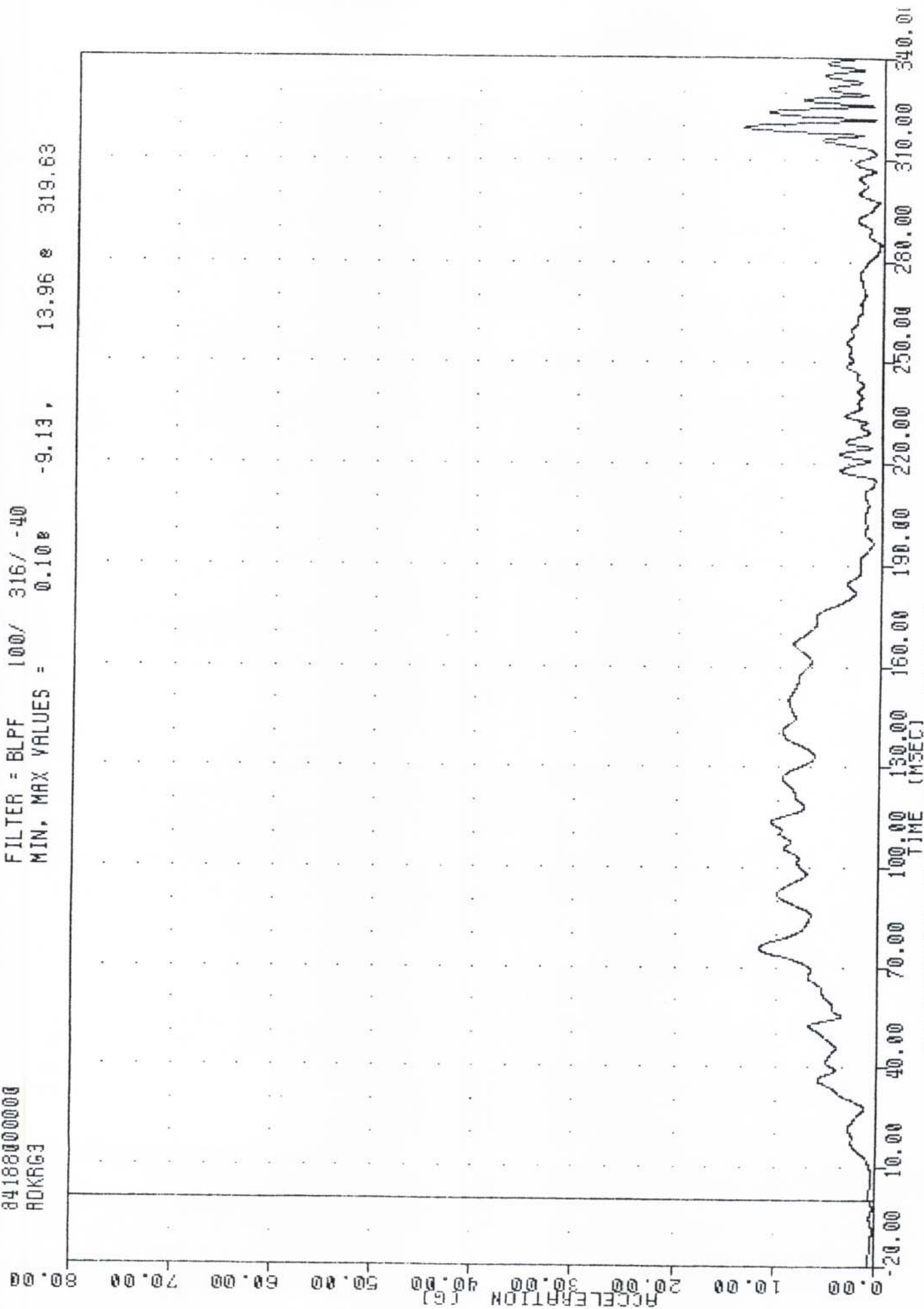


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE REAR DECK ACCELERATION Z AXIS

TL- 0.070L
SIDE AGGRESSIVE ATTRIBUTES
84188000000
ADKRG3

PLC. DATL 1L JG-L. 0.4:1.

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = 0.100 -9.13, 13.96 e 319.63

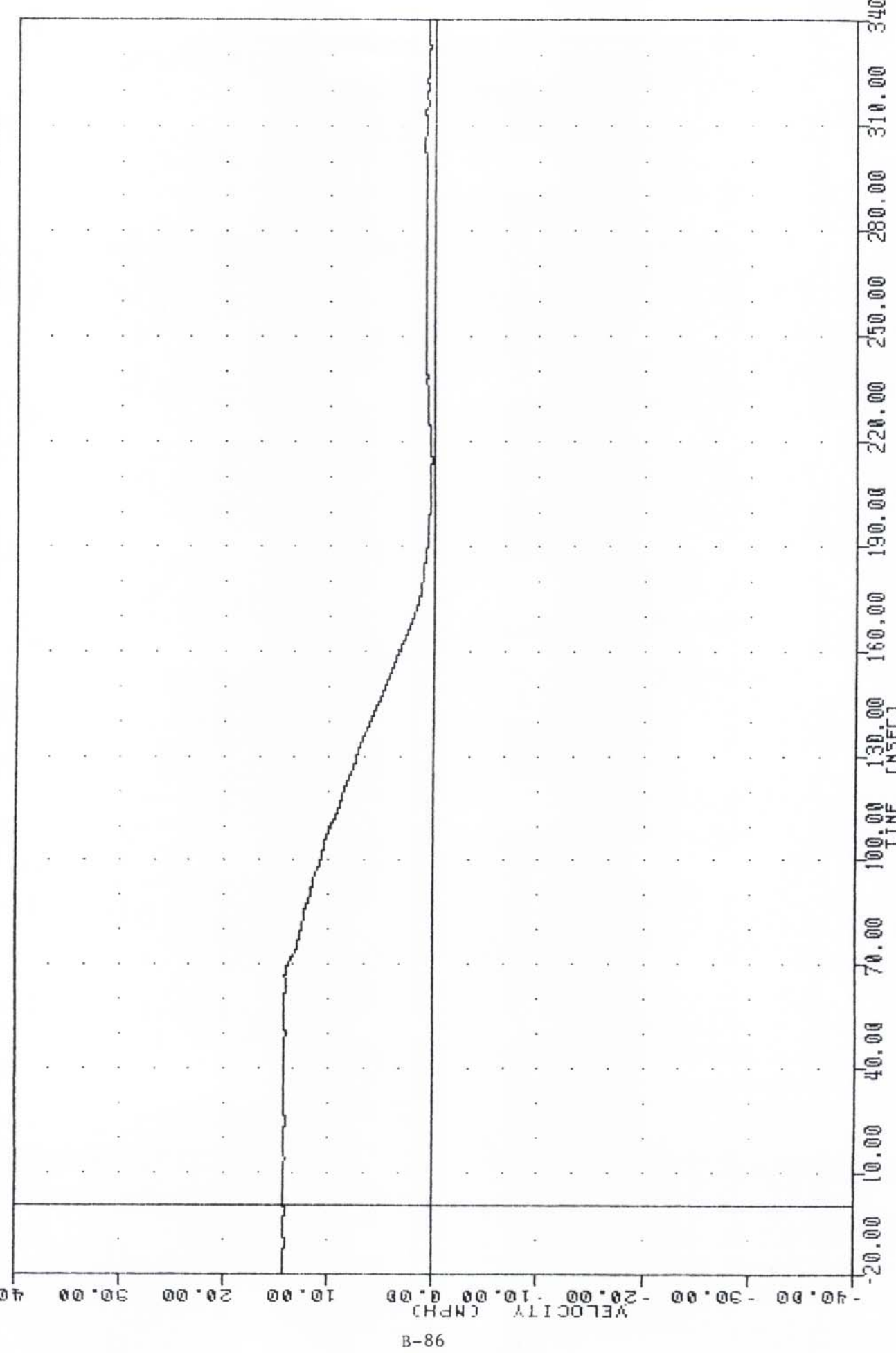


B-85

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE REAR DECK RESULTANT

TRC 0706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
RDKXV3

PLG, DATE 16 NOV 84 05.24:35
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.318 214.75, 14.35 e 41.38



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING RDKXG3

Time 00:07:00

PLC, DATE 10 JUN 82 00:24:30

SIDE AGGRESSIVE ATTRIBUTES

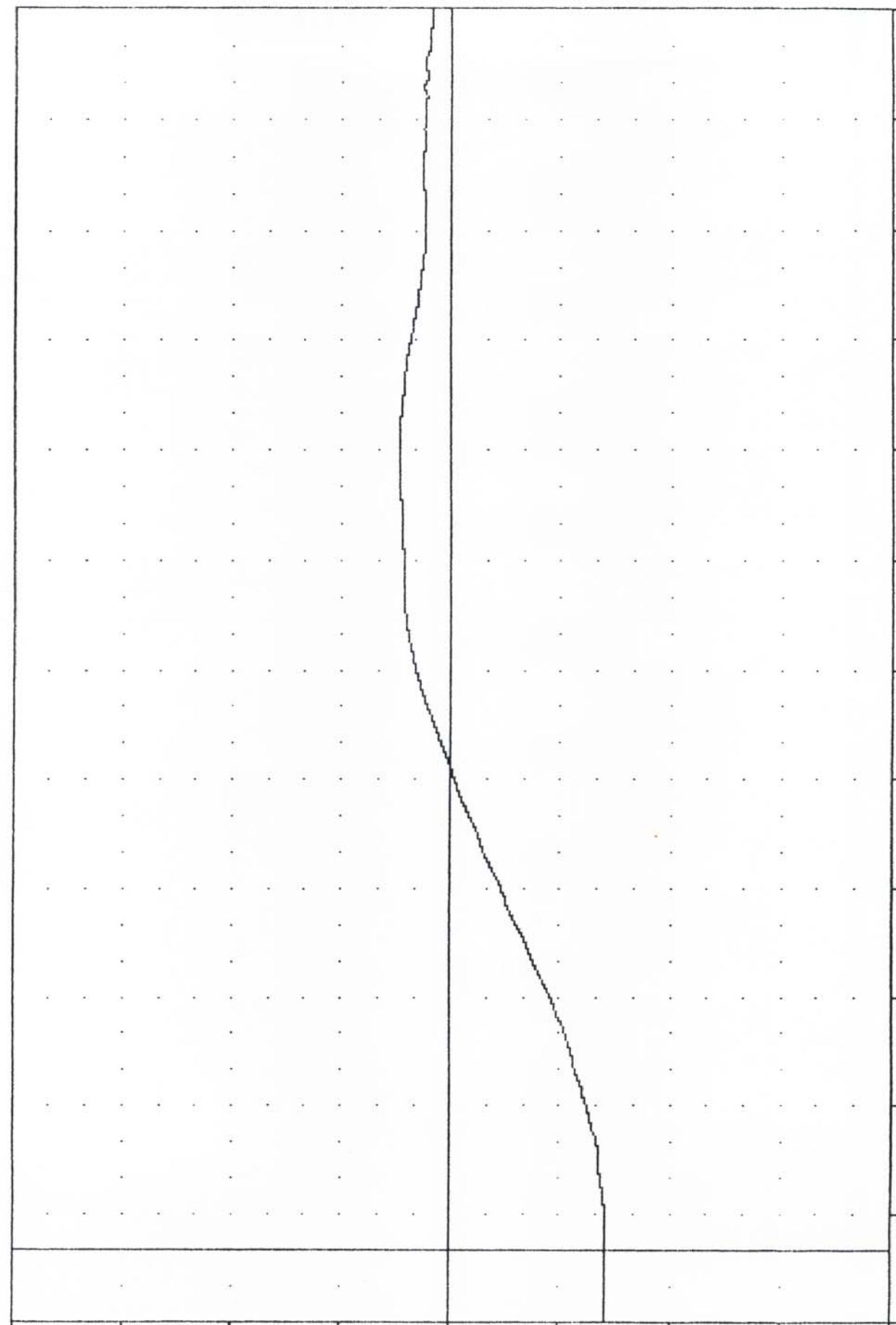
84188000000

ADKYV3

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -14.238 -9.75, 4.77 e 215.63

VELOCITY (MPH)



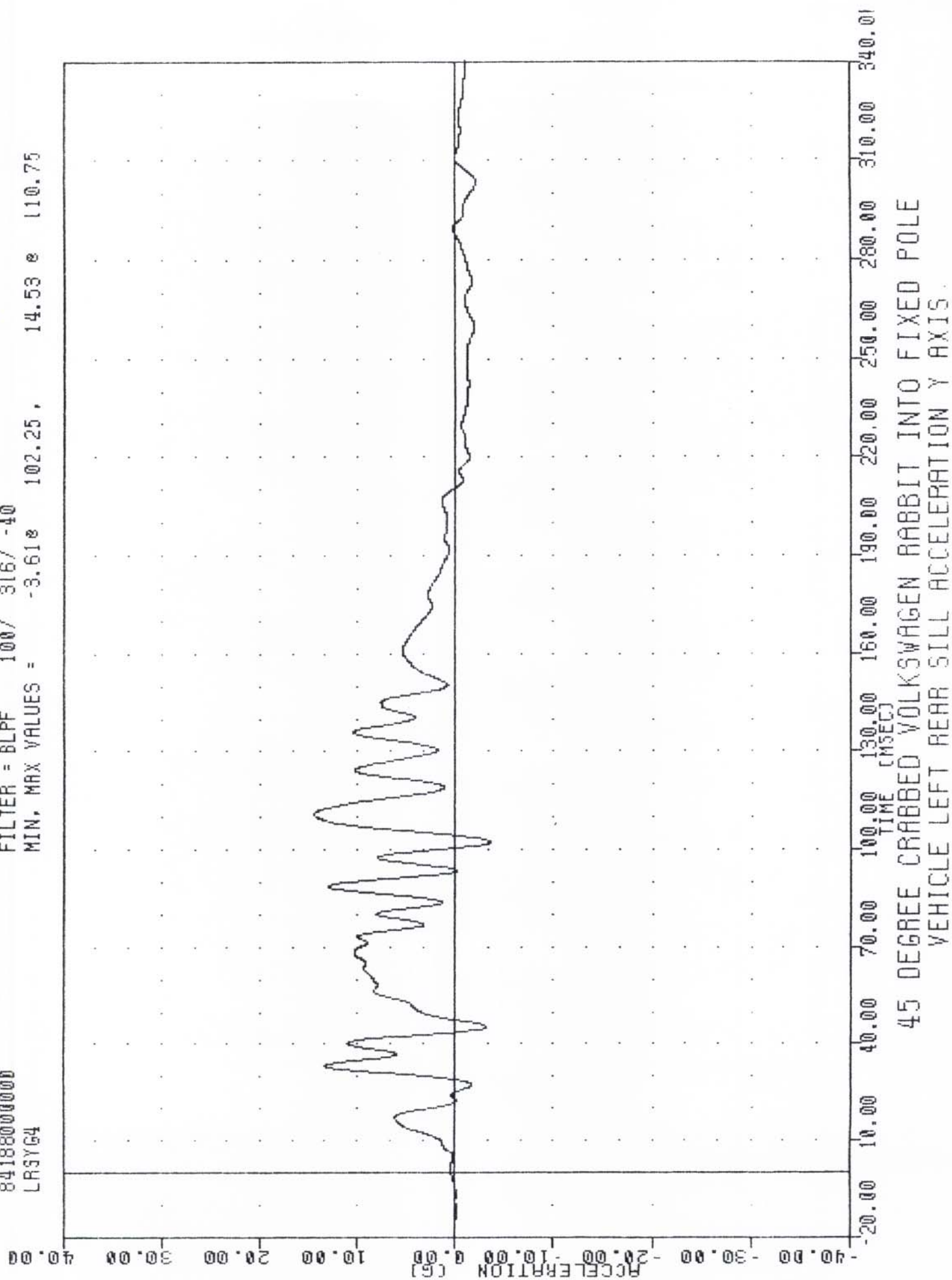
TIME (MSEC)

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING ADKYG3

TFC 04700
 SIDE AGGRESSIVE ATTRIBUTES
 8418800000
 LRSYG4

PLG JATL 1E 10G-8 05.2:5

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -3.61e 102.25, 14.53 e 110.75

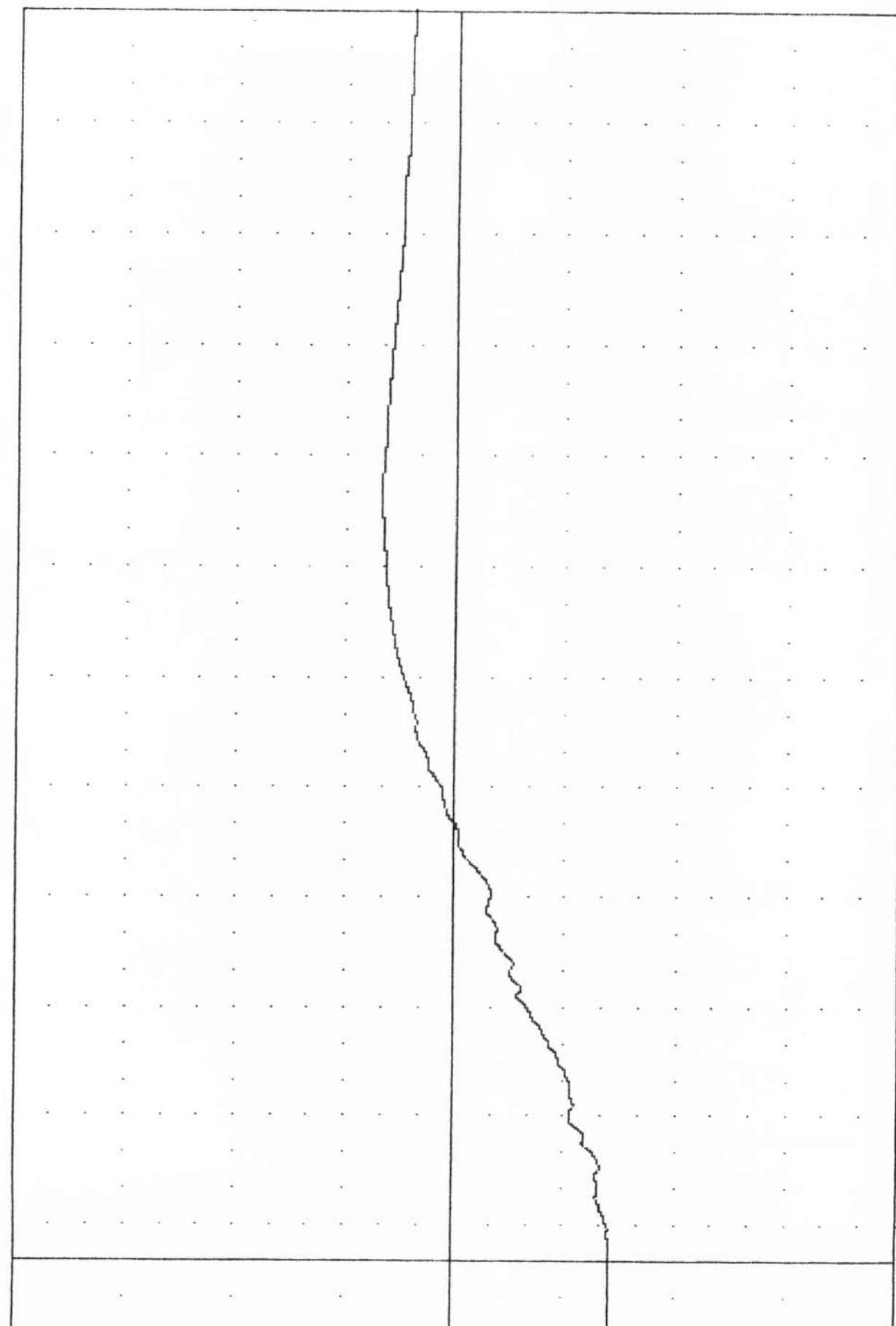


TIME 0700
SIDE AGGRESSIVE ATTRIBUTES
8418000000
LRSYV4

PLC, JATL 1E, 1G-8, 00.4:30

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -14.22e -7.50, 6.82 e 207.38

B-89
VELOCITY (MPH)
-40.00
-30.00
-20.00
-10.00
0.00
10.00
20.00
30.00
40.00



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

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LRSY64

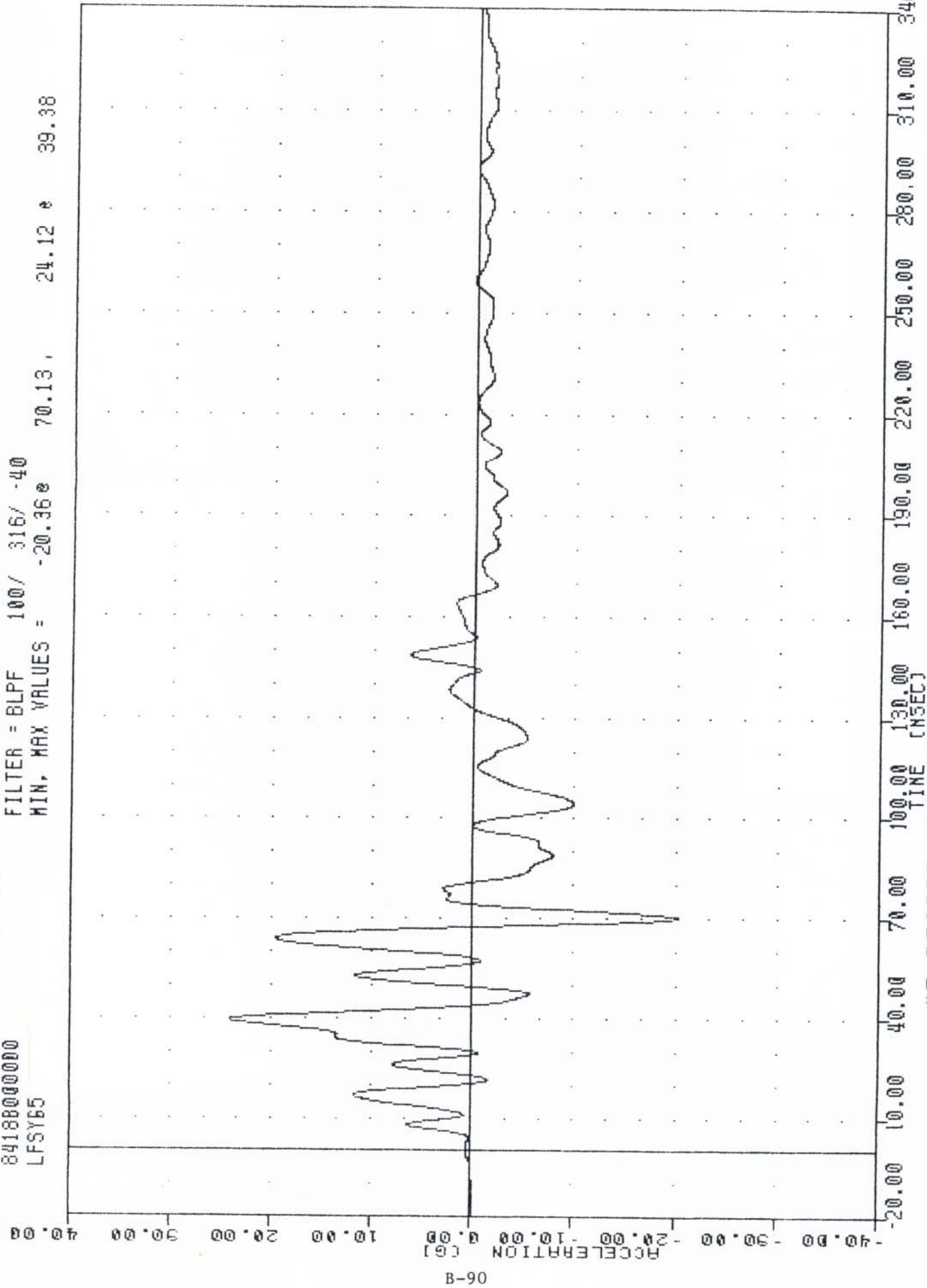
PLC RATE 16 3-8 00 54

TR 708
SIDE AGGRESSIVE ATTRIBUTES

84188000000
LFSY65

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -20.36 70.13, 24.12 39.38



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS.

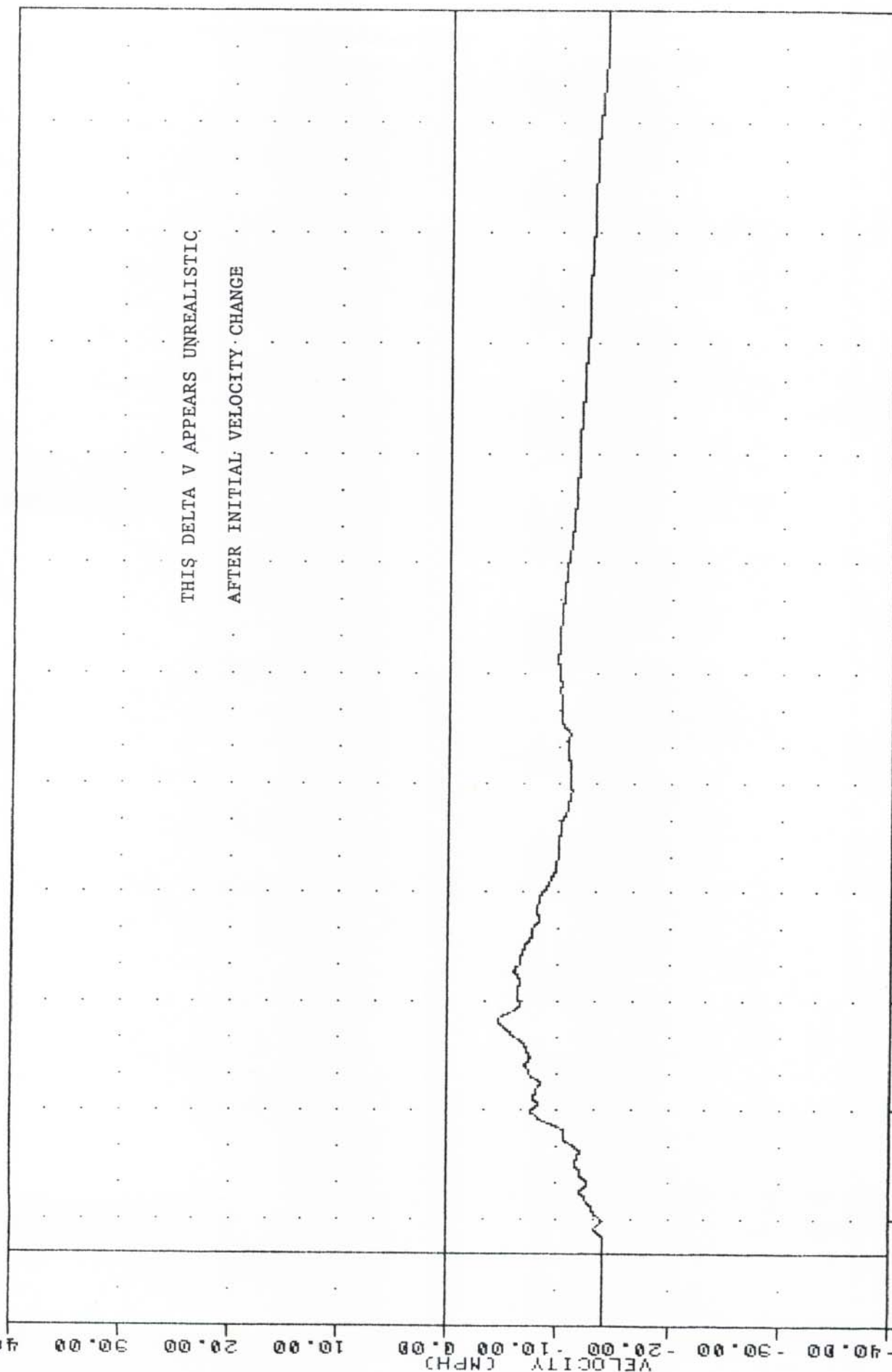
TAL 840706
 SIDE AGGRESSIVE ATTRIBUTES
 8418000000
 LFSYV5

PLU DATE 16-nu6-84 05:24:35

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -14.23 64.63
 -10.13 -4.54

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

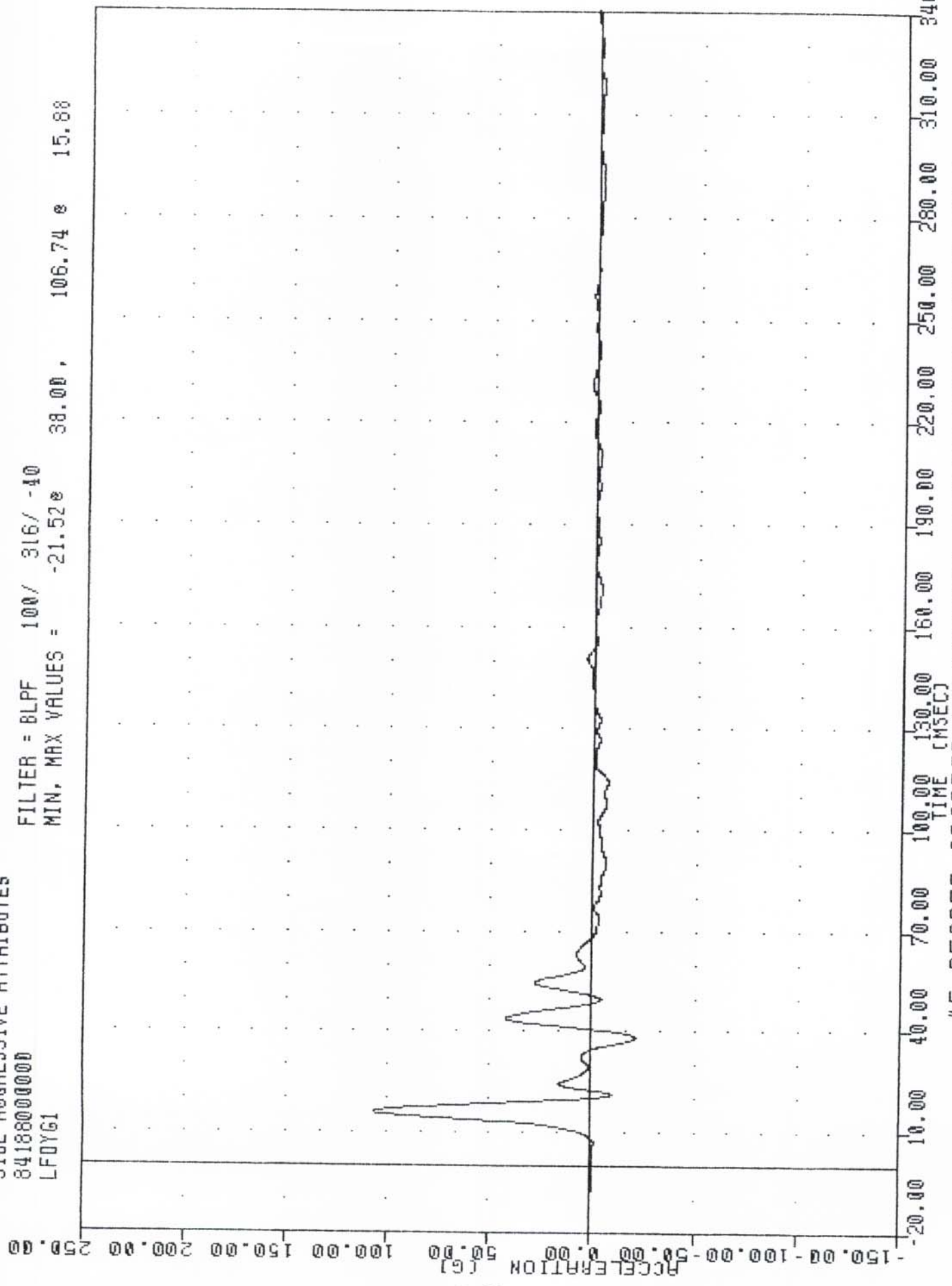
B-91



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING LFSYG5

TITLE: 0700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LF0Y61

PLU, DATL 1L 00G-8- 00.2:5-
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -21.52e 38.00, 106.74 e 15.88



B-92

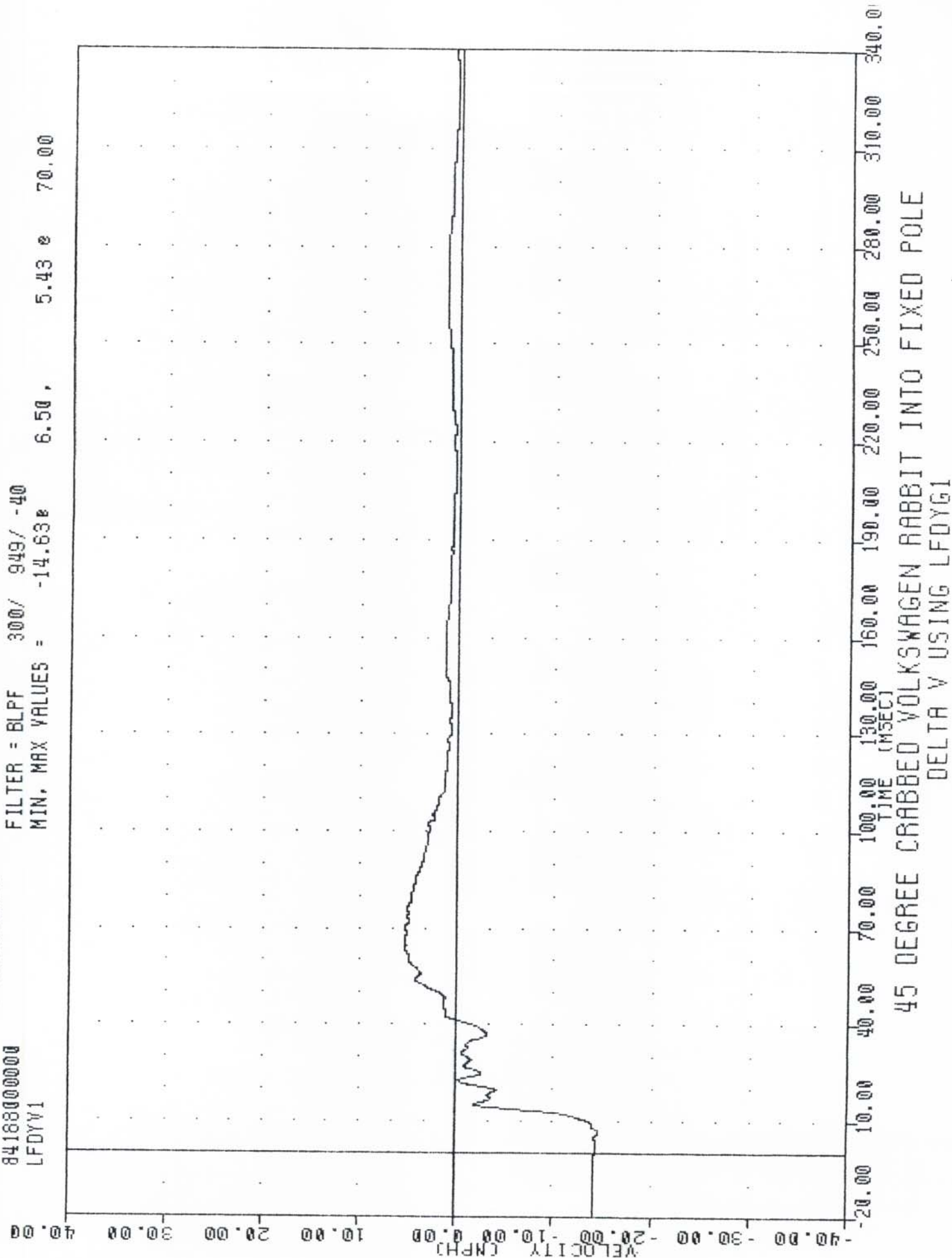
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE LEFT FRONT DOOR (POSITION 6) ACCELERATION Y AXIS

TIME 0700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LFDYV1

PLU. DAT_ 1C JG-L. 00:4:30

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -14.63e 6.50, 5.43 e 70.00

B-93



TR- J700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LFDY62

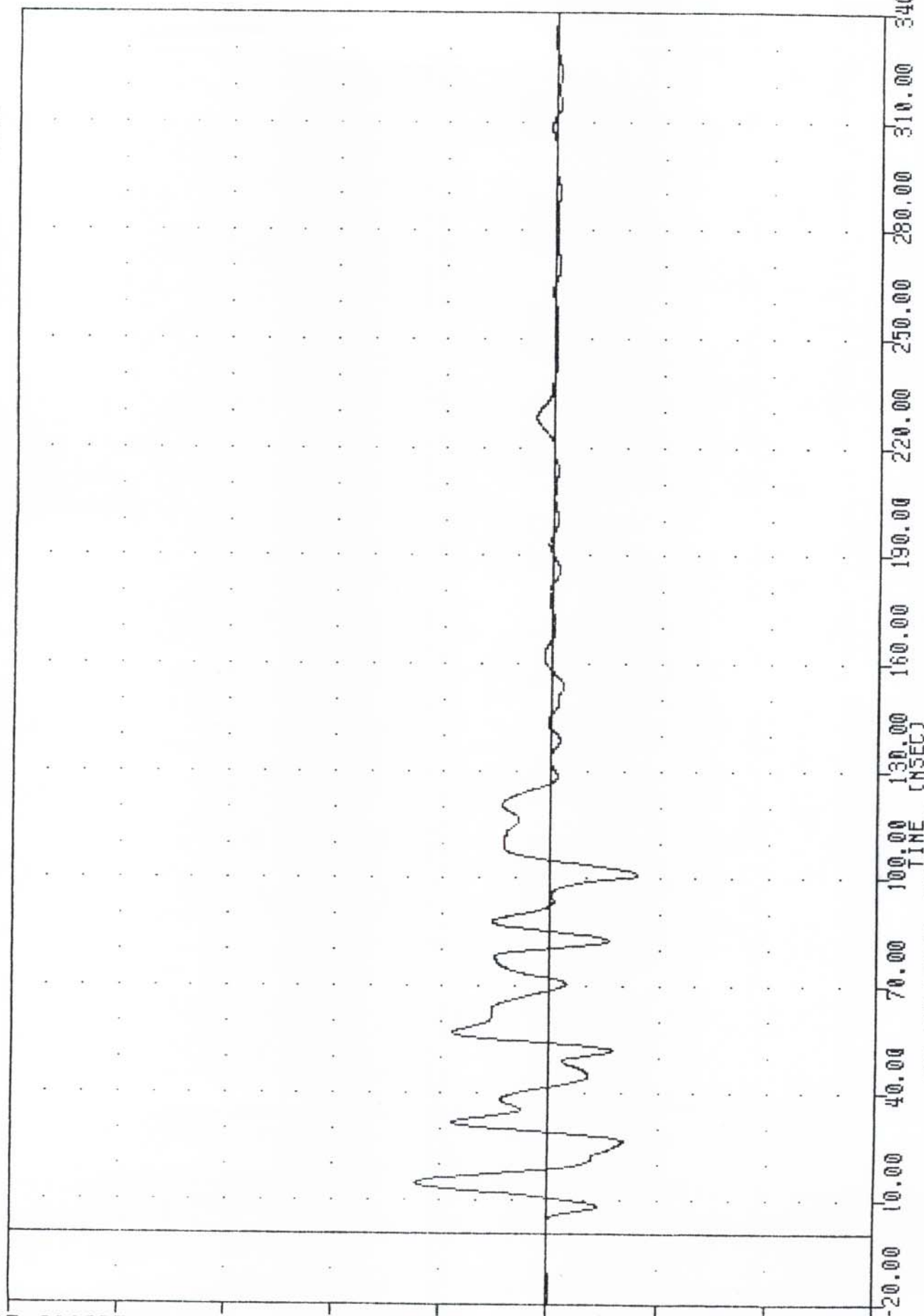
PLC. JATE 16 06-8. 00.2:56

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -40.26e 101.00, 61.70 e 14.38

ACCELERATION (G)

B-94



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE LEFT FRONT DOOR (POSITION 8) ACCELERATION Y AXIS

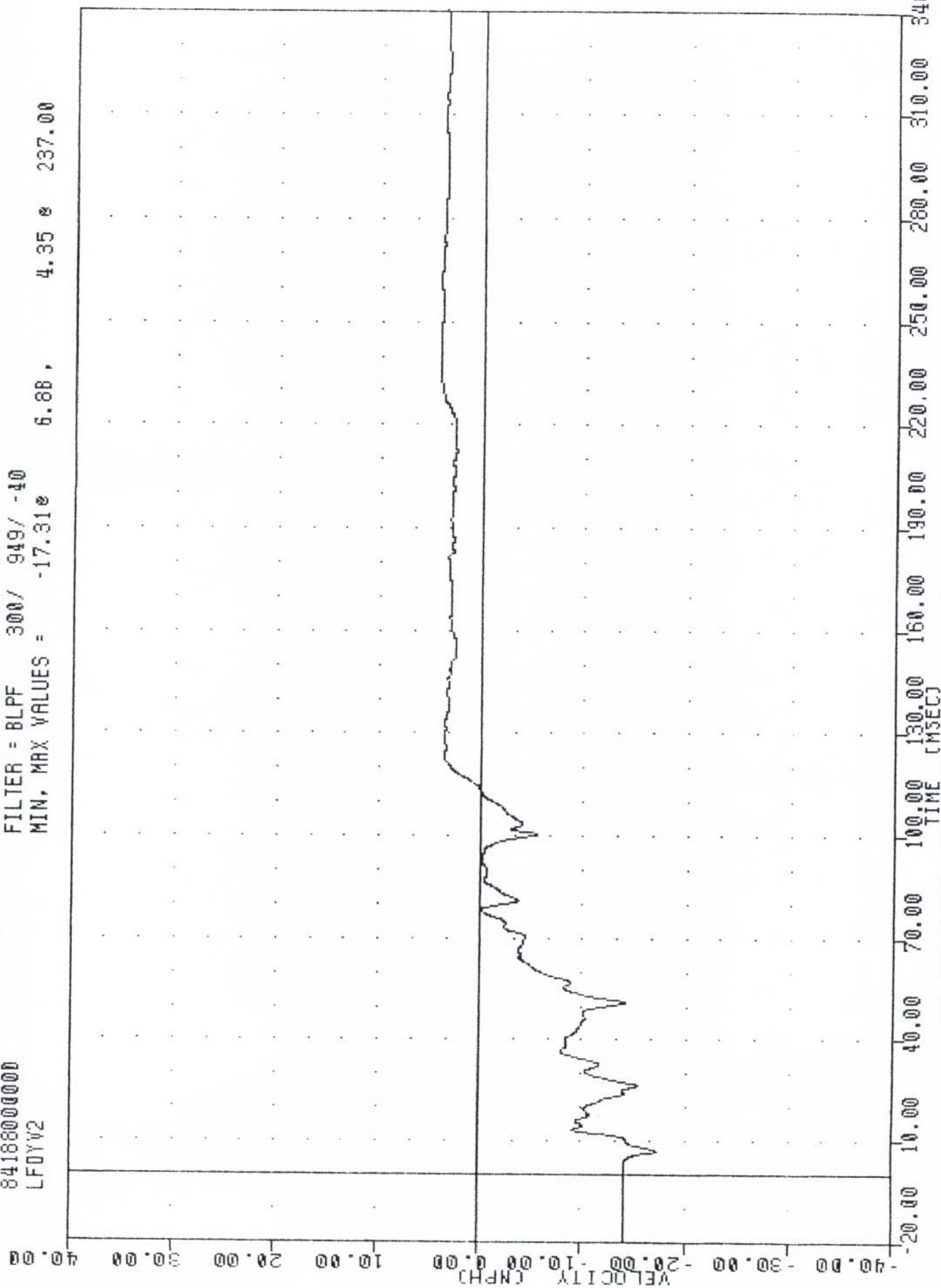
TIME 0700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LFDYV2

PLC, JATL 1E 06-82 00:4:30

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -17.31e 6.88, 4.35 e 237.00

B-95



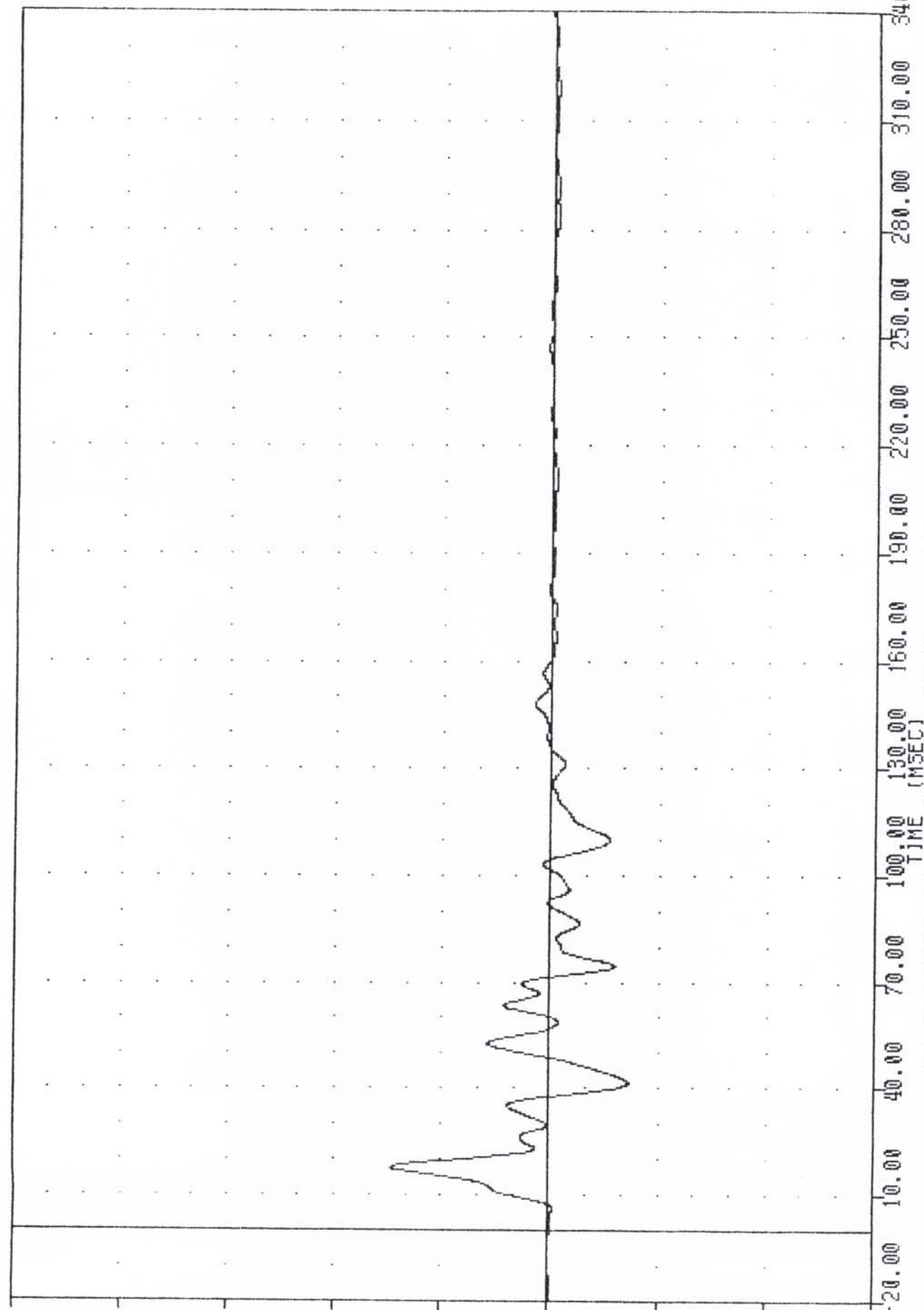
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LFDY62

TIME 0.070
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LFDY63

PLC. DATA 10 JG-8. 00-2:5.

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -36.31 41.38, 73.27 17.38

ACCELERATION [G]

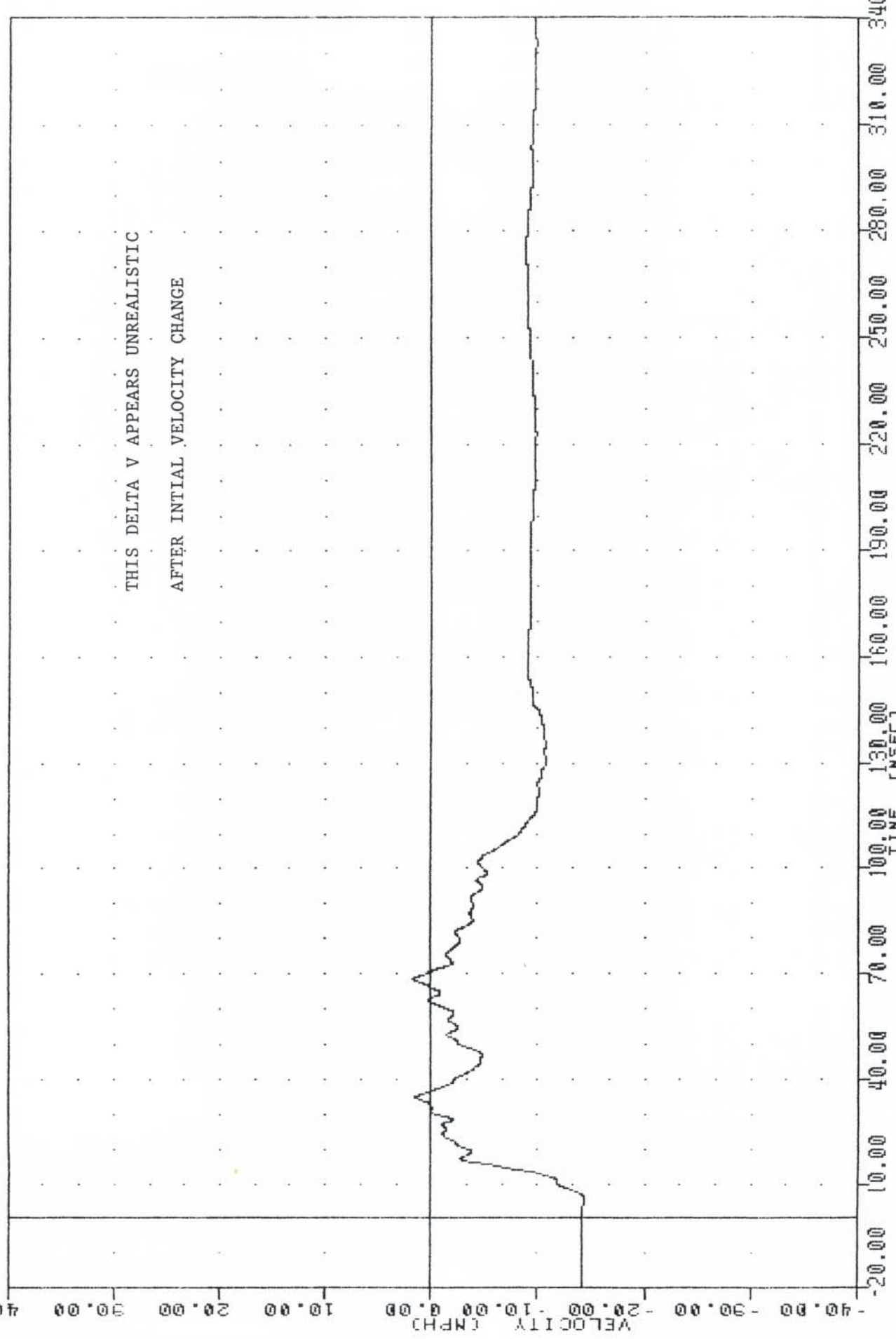


B-96

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE LEFT FRONT DOOR (POSITION 9) ACCELERATION Y AXIS

TRC 040706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LFDYV3

PLD, DATE 16-nov-84 05:24:35
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -14.478 5.25, 1.68 * 68.25



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LFDYV3

TKL 840706
SIDE AGGRESSIVE ATTRIBUTES
8418000000
LF0Y64

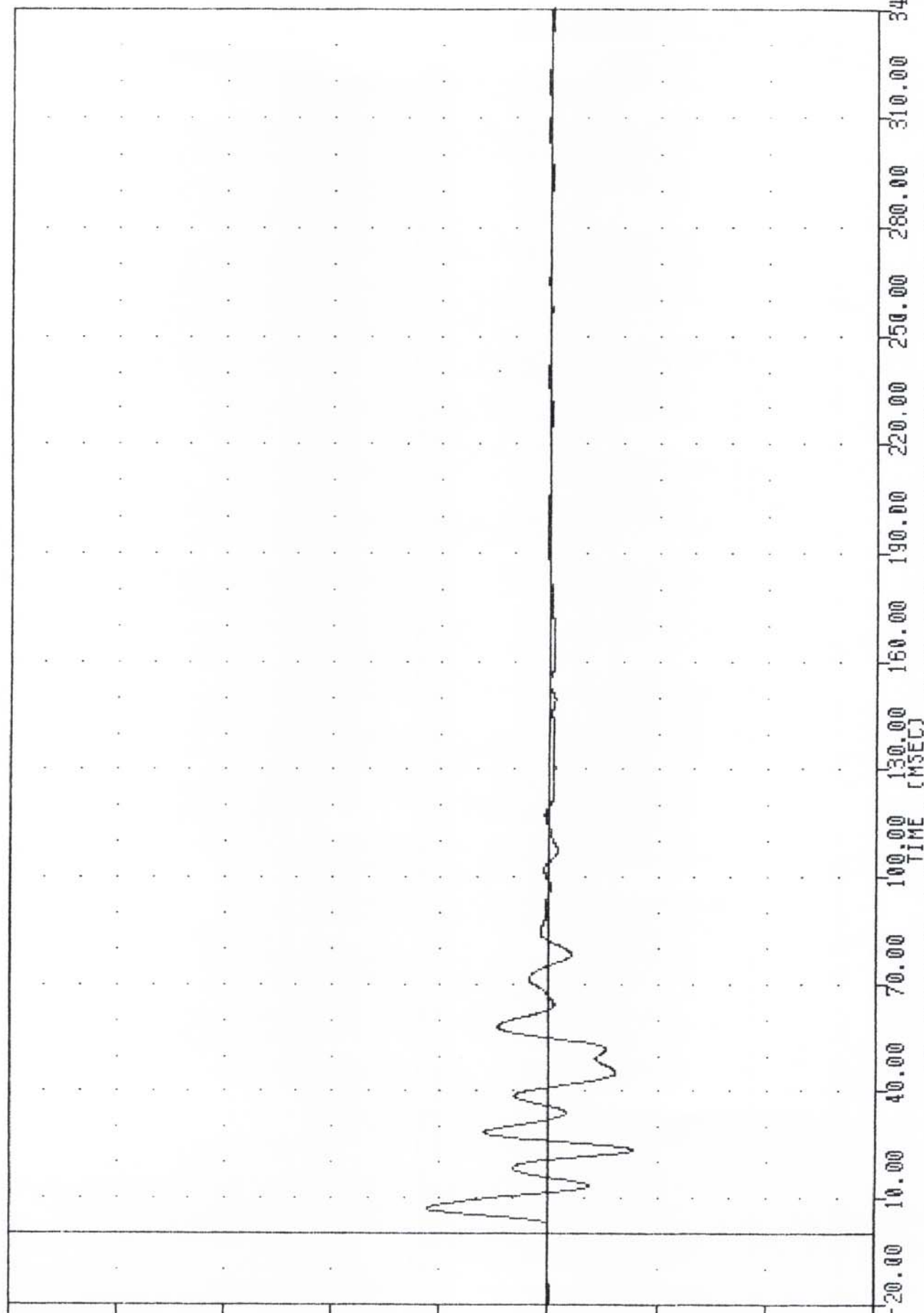
PLU1 DATE 16-MUG-84 09:22:54

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -38.838 23.38 55.91 7.00

ACCELERATION (G)

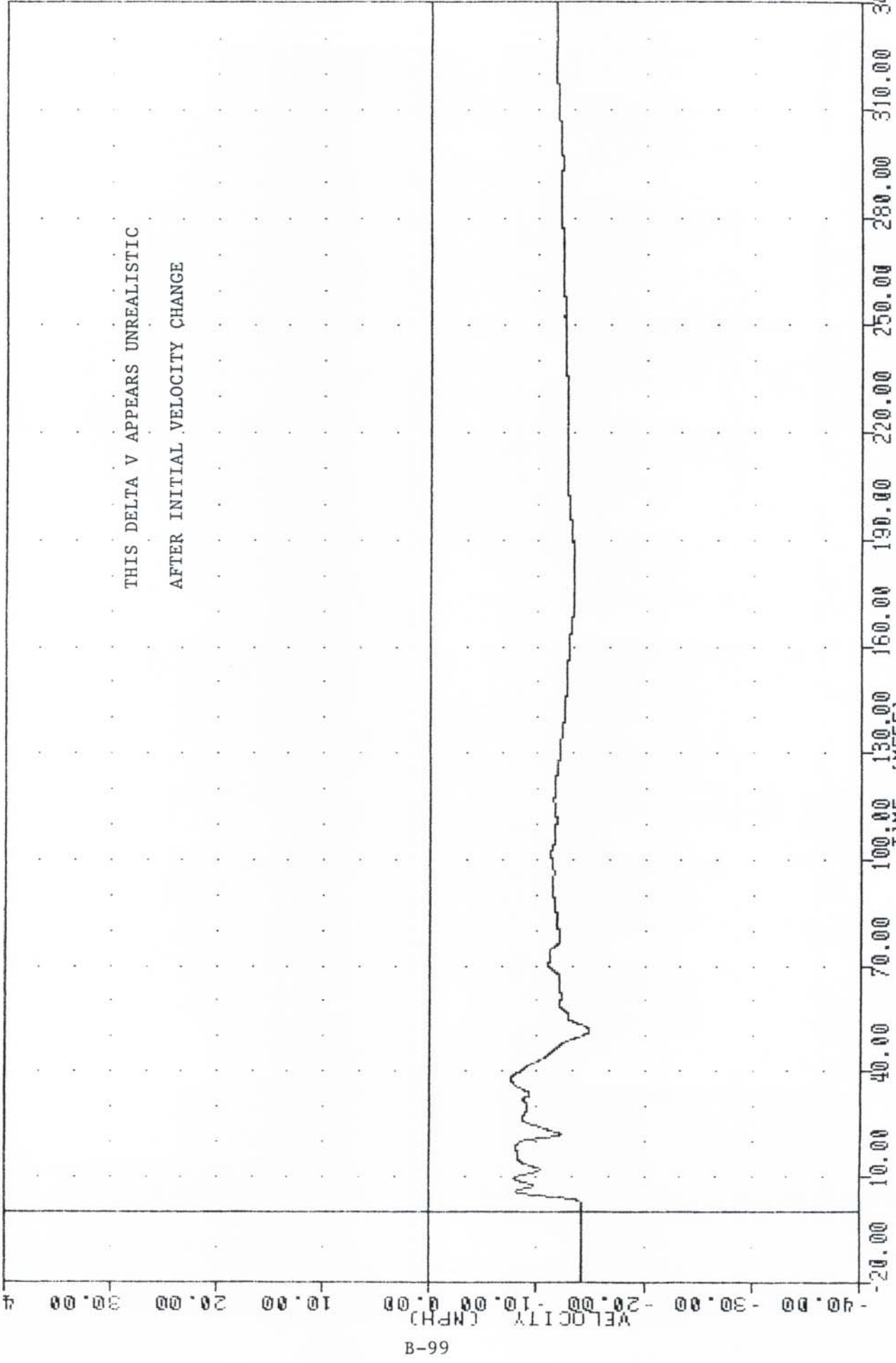
B-98



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE LEFT FRONT DOOR (POSITION 10) ACCELERATION Y AXIS

THE
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LFDYV4

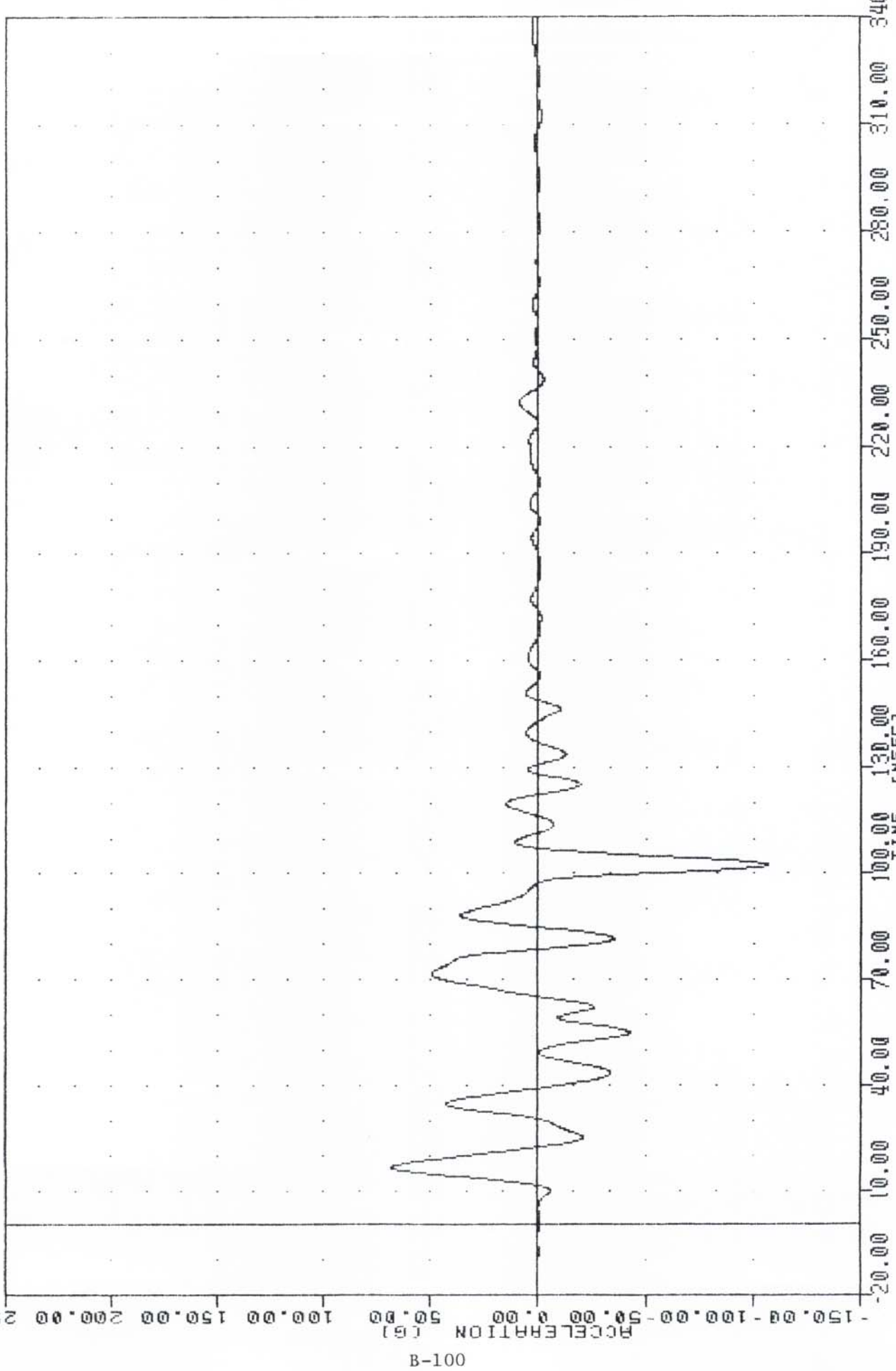
PLU1 DATE 16-mjG-64 03.24:35
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -14.85 51.50 , -7.60 37.75



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LFDYV4

TRC 040708
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LFDY65

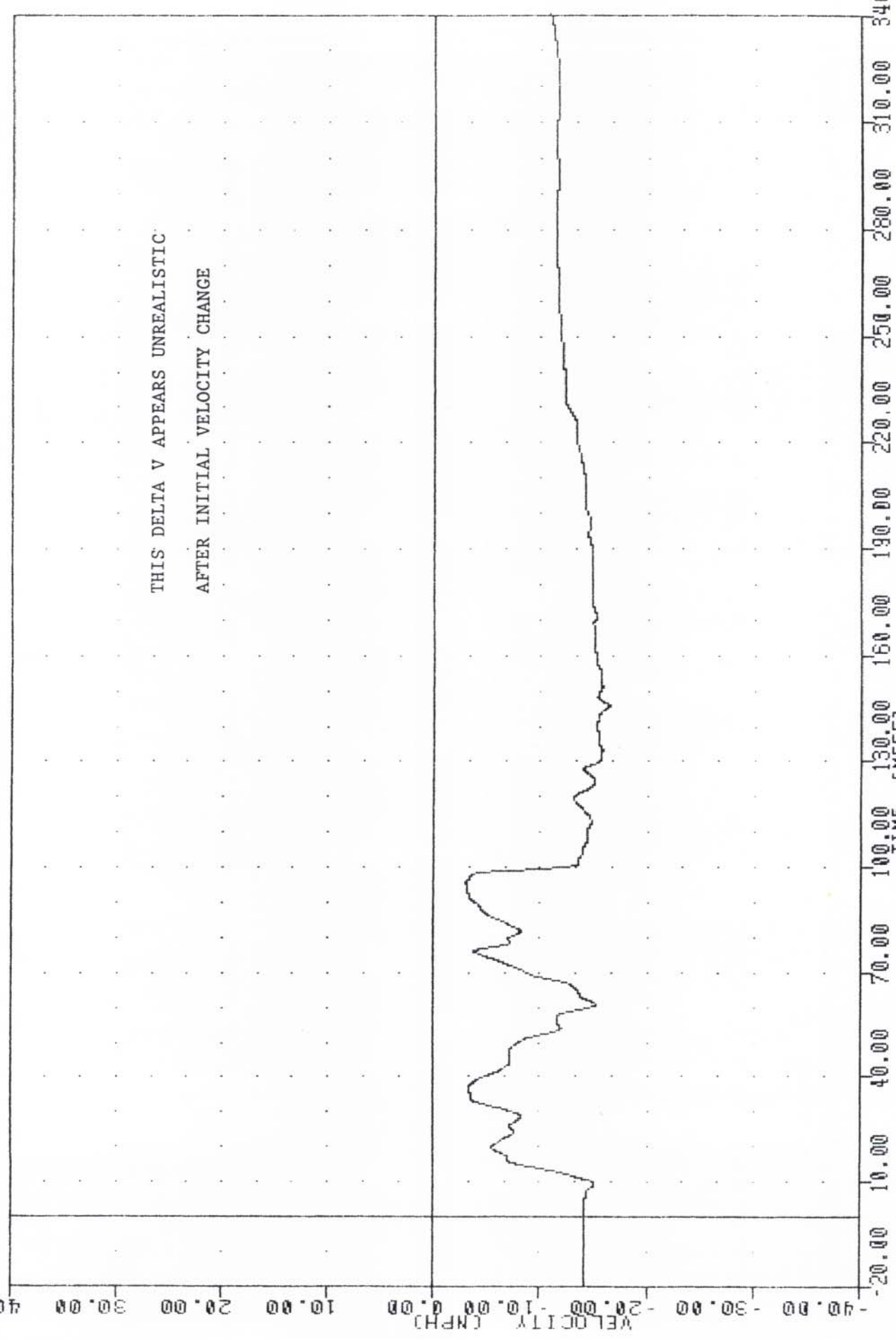
PLG, DATE 16 JUN 84 05.27:54
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -106.83 102.38, 68.07 16.38



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE LEFT FRONT DOOR (POSITION 11) ACCELERATION Y AXIS

TRC 04706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
LF0YV5

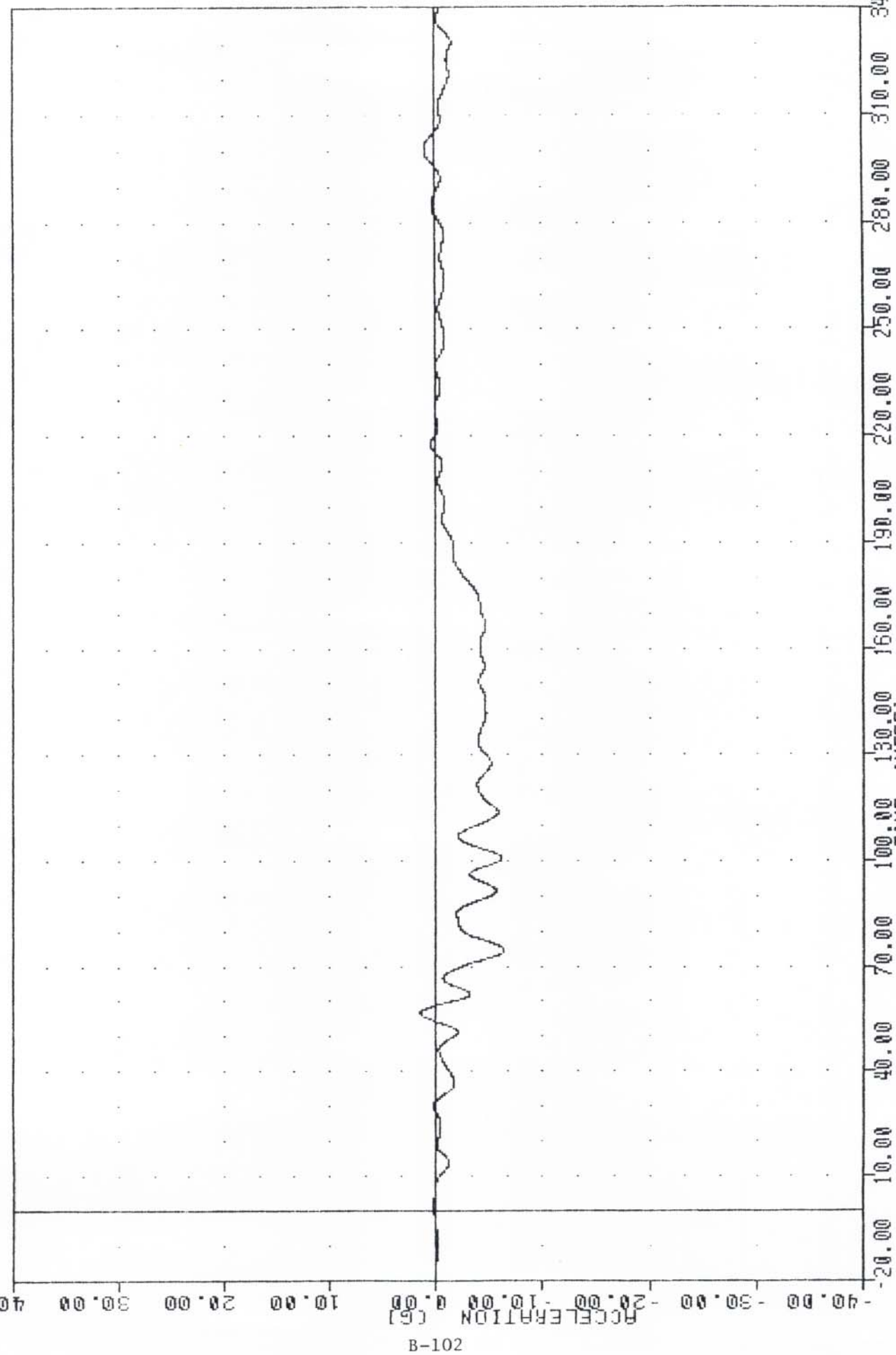
PLG, JATE 16 106-82 05.24:33
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -16.45e 145.63, -2.97 e 95.38



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LF0Y65

THE 040700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
TFRXG7

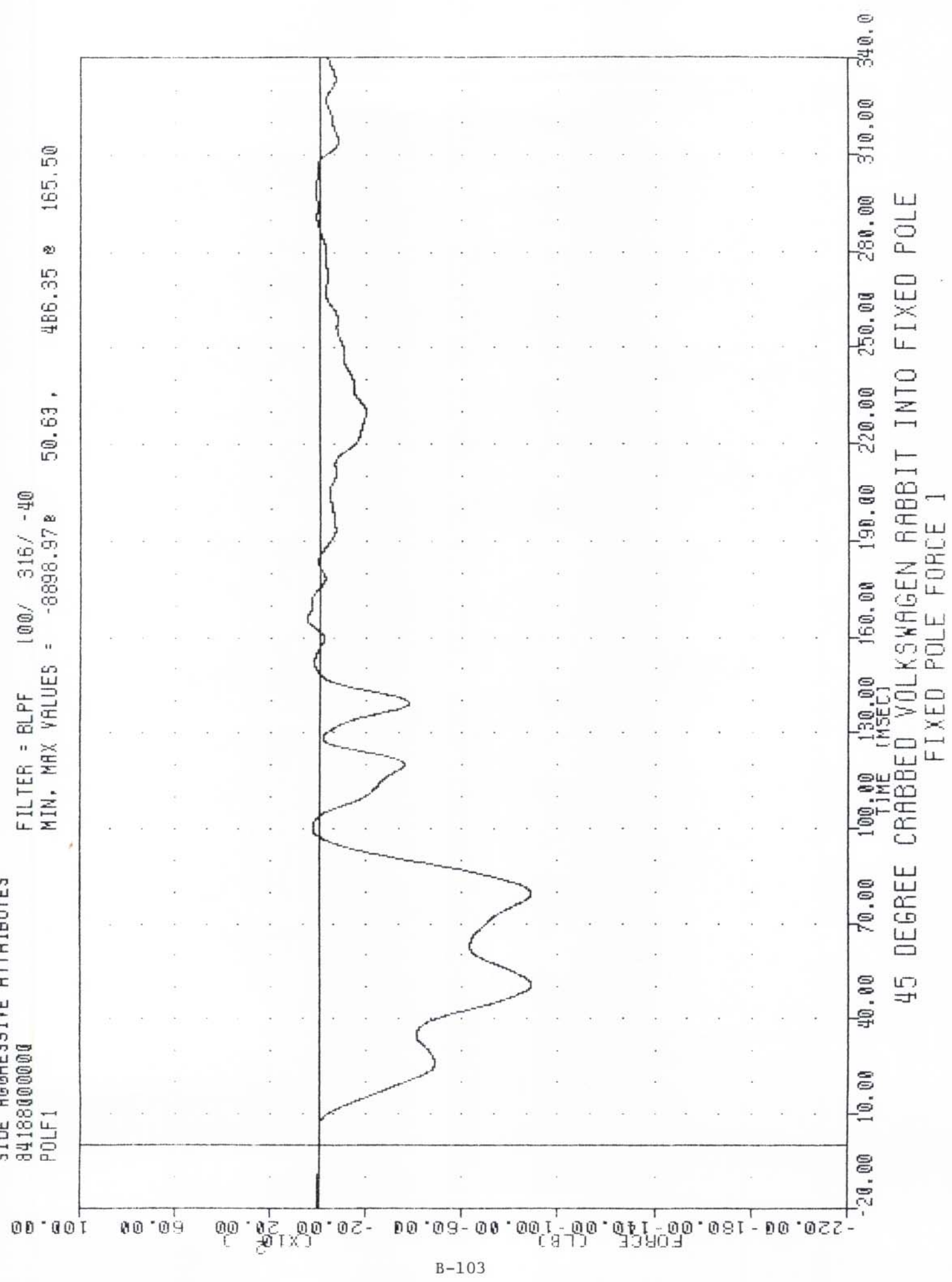
PL01 DATL 16 1106-04 03.22:54
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -6.368 74.38 1.45 56.63



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE TRUNK FLOOR RIGHT ACCELERATION X AXIS

TRC, UW706
SIDE AGGRESSIVE ATTRIBUTES
84188000000
POLF1

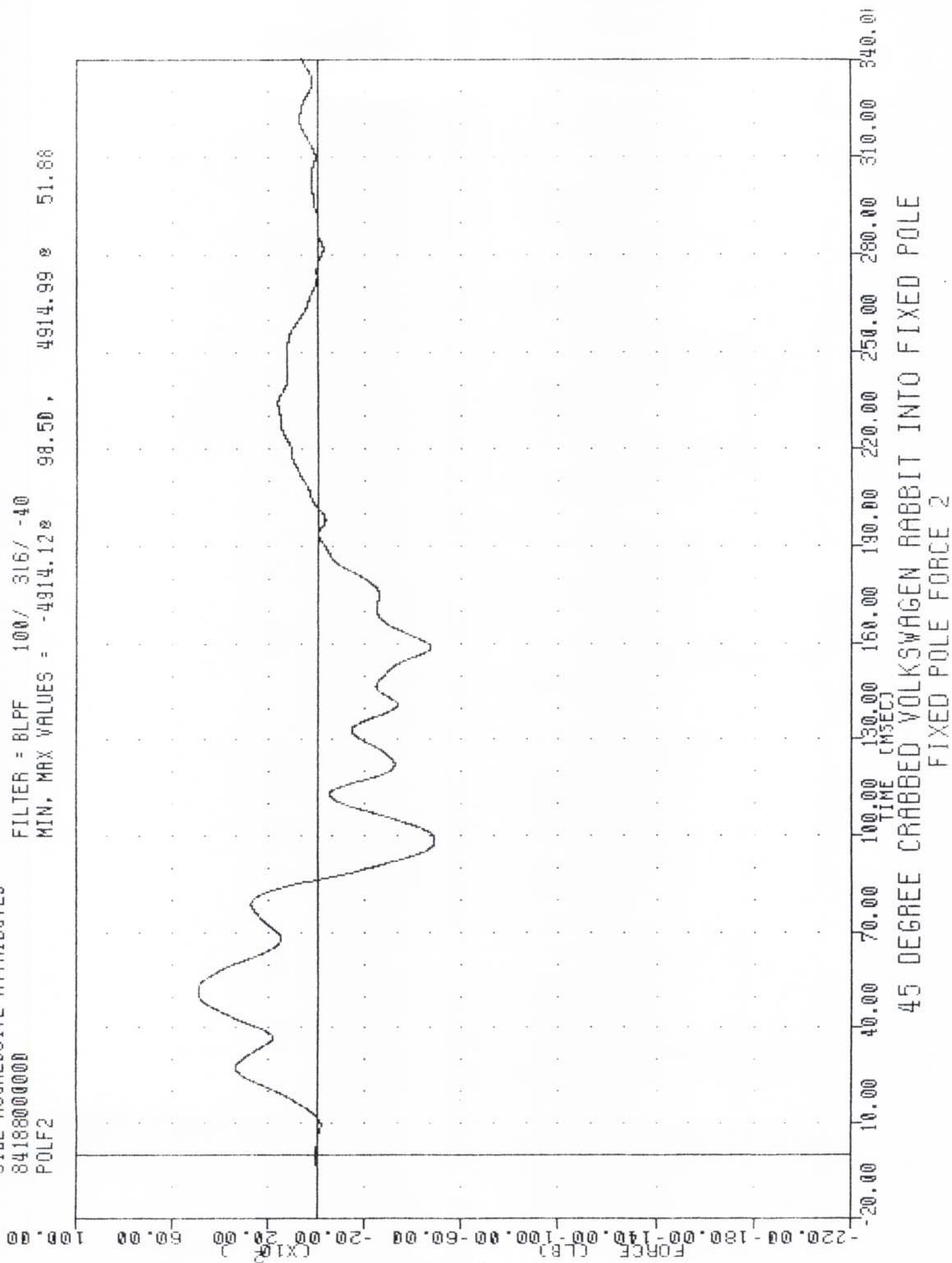
PLU, DATE 16 NOV 84 05.22:54
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -8898.97 50.63, 486.35 165.50



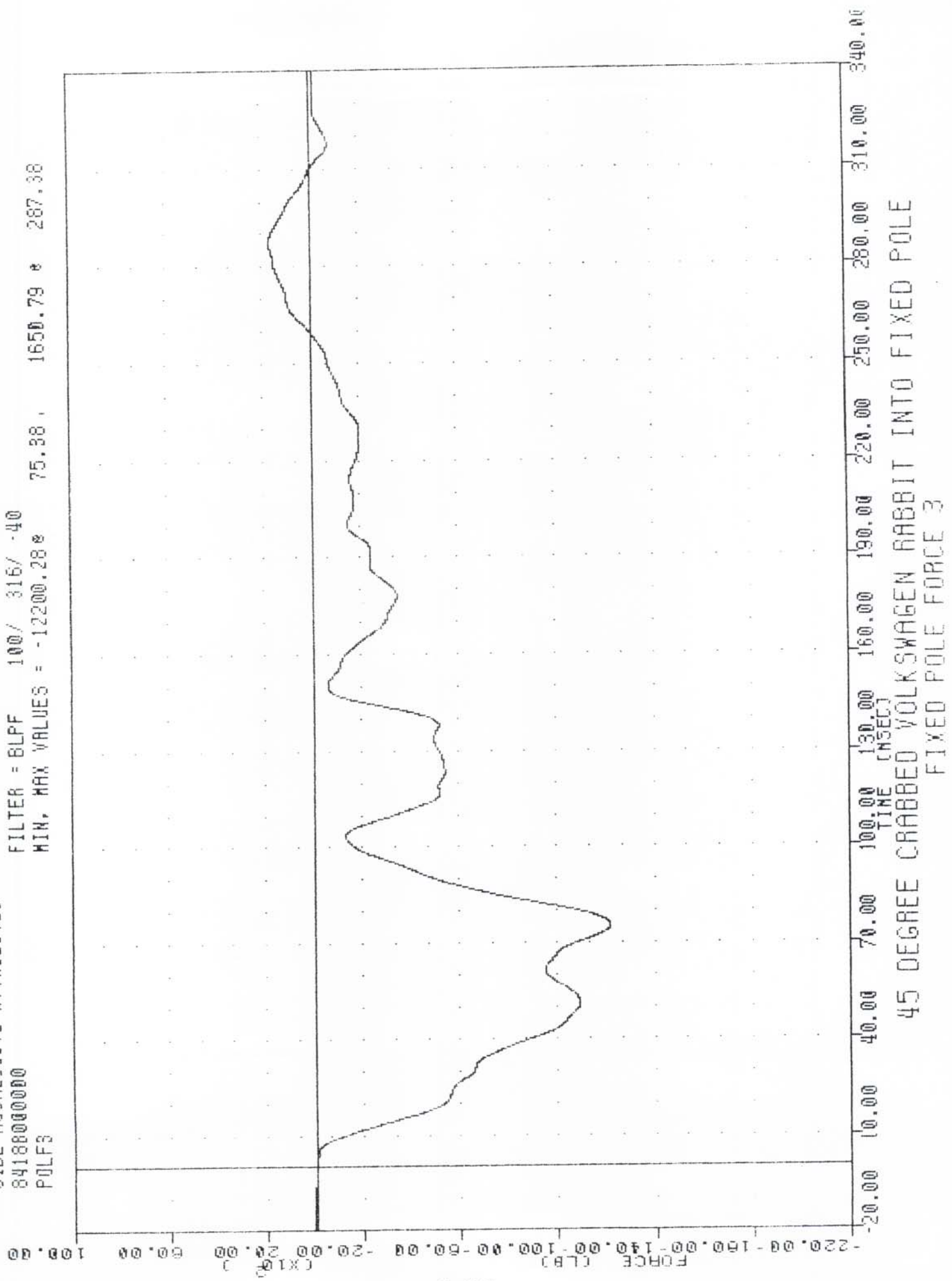
TITLE: 040700
SIDE AGGRESSIVE ATTRIBUTES
84188000000
POLF2

PLU1 DATE 16-nov-84 03:22:54

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -4914.128 98.50, 4914.99 51.88



TRC 040706 PLD, DATE 16 NOV-84 09:22:54
 SIDE AGGRESSIVE ATTRIBUTES
 84188000000
 POLF3
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -12200.28 75.38, 1650.79 * 287.38



PLC DATE 16 JUL 81 00:22:51

71.0 0.0700
SIDE AGGRESSIVE ATTRIBUTES

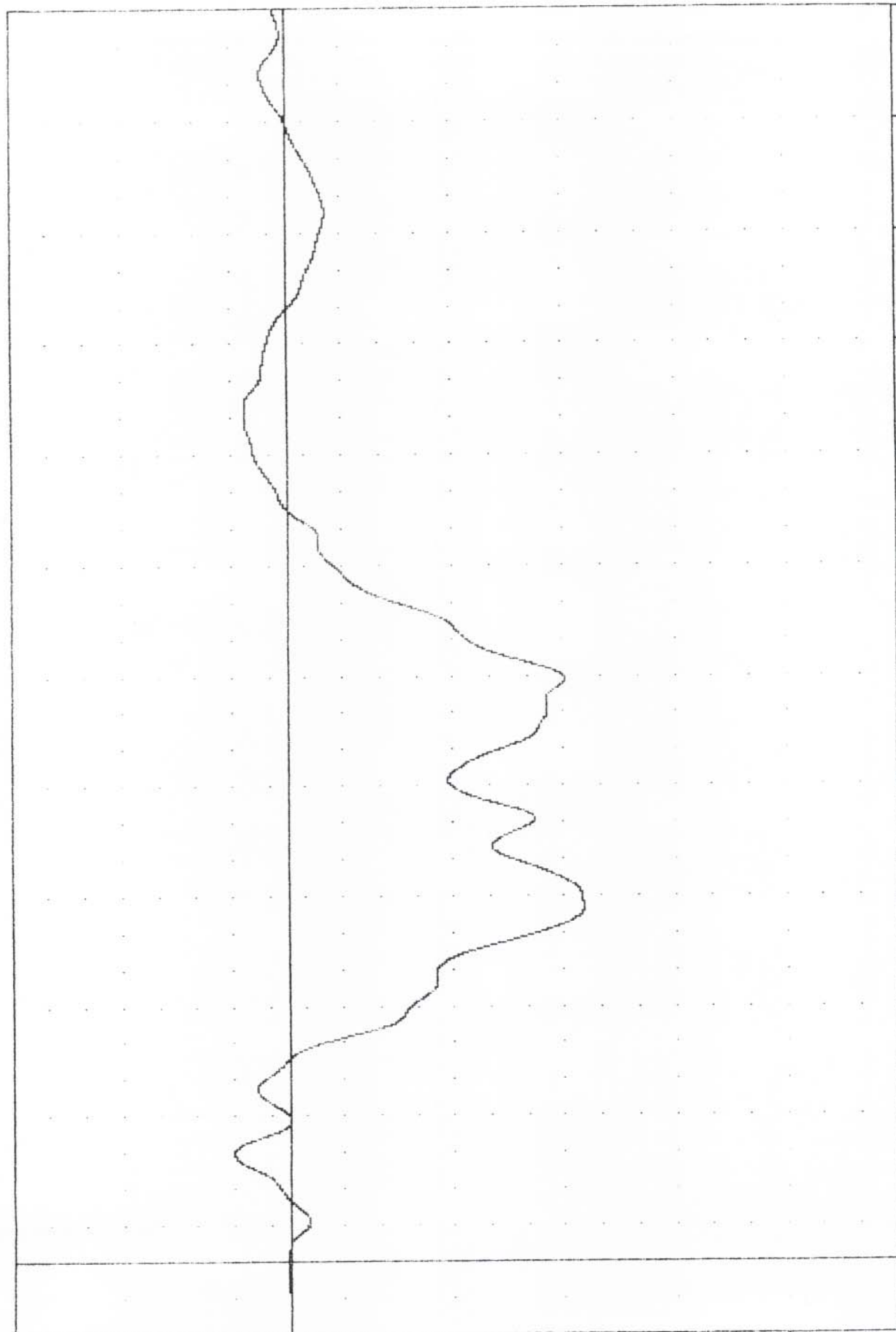
84188000000

POLF4

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -10718.80e 96.63, 1980.05 e 29.63

100.00 80.00 60.00 40.00 20.00 0.00 -20.00 -40.00 -60.00 -80.00 -100.00 -120.00 -140.00 -160.00 -180.00 -200.00 -220.00



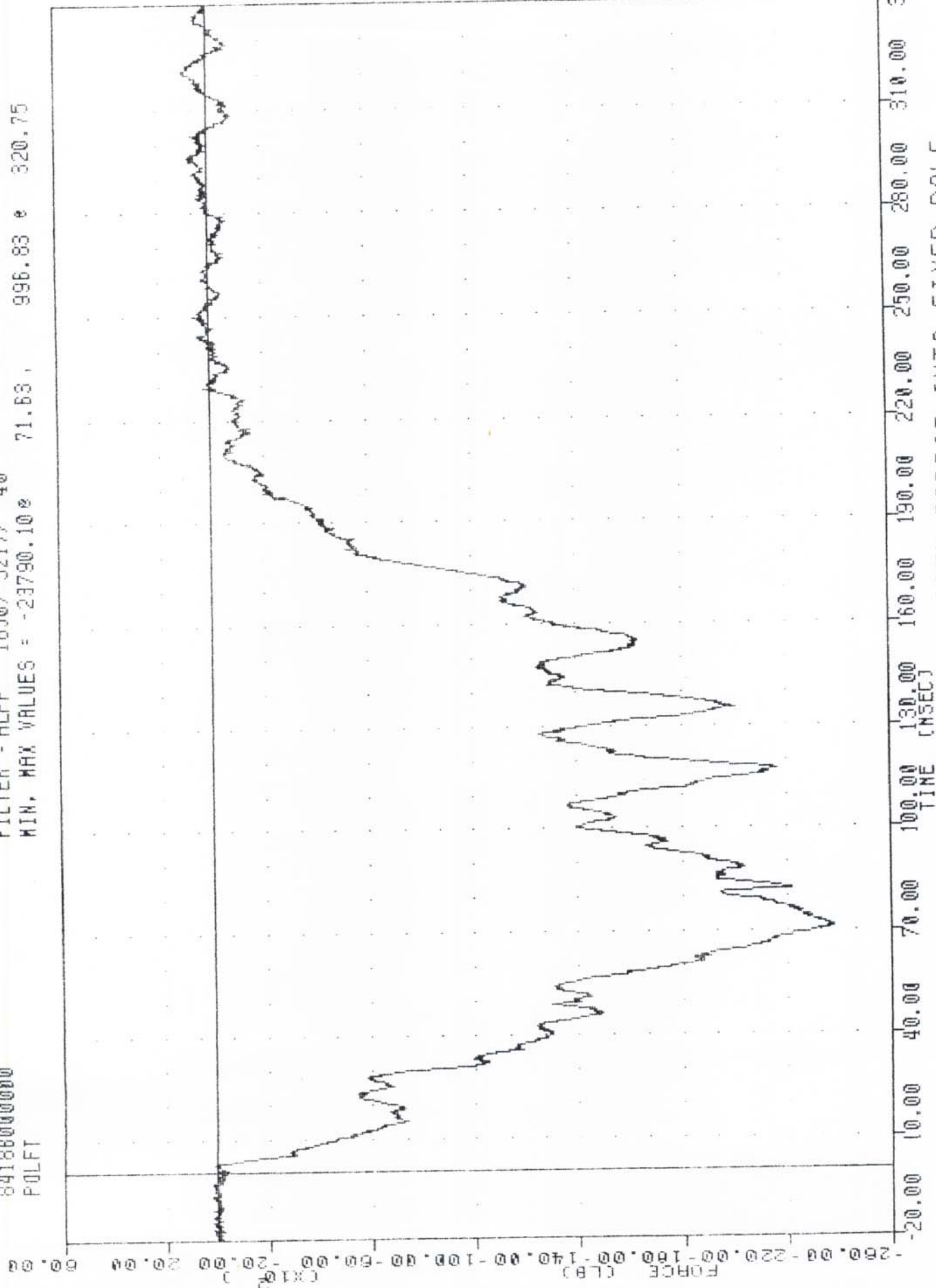
TIME (MSEC) 0.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
FIXED POLE FORCE 4

TRC 0706
SIDE AGGRESSIVE ATTRIBUTES
84186000000
POLFT

PLD, DATE 16/03/80 09:00:33

FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -23790.108 71.63, 996.83 e 320.75



B-107

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
TOTAL OF FOUR POLE FORCES