

DOT # 704

SIDE PROTECTION IN 2-DOOR
AND 4-DOOR PRODUCTION VEHICLES

MDB-TO-CAR SIDE IMPACT TEST OF
A 26° CRABBED MOVING DEFORMABLE BARRIER
TO A 1982 NISSAN SENTRA
AT 33.5 MPH

PREPARED BY:
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EAST LIBERTY, OHIO 43319



FINAL REPORT
APRIL 1984

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16. Abstract This test report documents one of a series of thirteen crash tests to evaluate side impact protection in various vehicle models. Testing was conducted on a 1982 Nissan Sentra 2-door Sedan at the TRCO Crash Test Facility, East Liberty, Ohio. The test vehicle was impacted on the left side by a moving deformable barrier, crabbled to 26°, at 33.5 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 March 2, 1984 and the ambient temperature was 30°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	pinta	pt
L	liters	1.06	quarts	qt
L	liters	0.26	gallons	gal
m ³	cubic meters	35	cubic feet	ft ³
m ³	cubic meters	1.3	cubic yards	yd ³
TEMPERATURE (exact)				
°C	degrees Celsius	9/5 (then add 32)	degrees Fahrenheit	°F

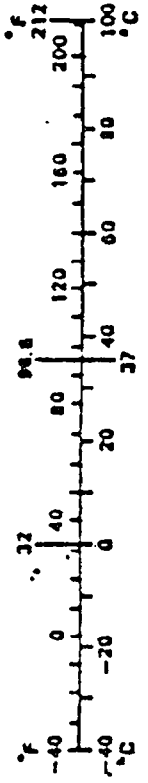


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SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to evaluate side impact protection in one of a fleet of 2-door and 4-door vehicles. The vehicle was tested using conditions not currently contained in a Federal Motor Vehicle Safety Standard.

INTRODUCTION

A stationary 1982 Nissan Sentra 2-door sedan was impacted on the left side by a Moving Deformable Barrier (MDB) on March 2, 1984. The test was to simulate an intersection collision with the striking vehicle traveling at 30 mph and the struck vehicle traveling at 15 mph. The orientation angle of the striking vehicle was 90° counterclockwise with respect to the longitudinal axis of the struck vehicle. The leading edge of contact was to be 37 inches forward of the vehicle center of gravity which is defined by accident investigation to be the midpoint of the wheelbase.

To simulate this collision, the MDB was to be towed into the stationary Nissan Sentra at 33.5 mph with the MDB's wheels crabbed clockwise to 26°. The actual test speed was 33.5 mph and the actual leading edge of contact was 37. inches forward of the midpoint of the Nissan Sentra's wheelbase.

The vehicle was a baseline model with no structural modification. The driver door and left rear occupant wall were unpadded.

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

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: Nissan Motor Company, Ltd.

MAKE/MODEL: Nissan Sentra

VIN: JN1HB12S6CU012333

BODY STYLE: 2-Door Sedan

MODEL YEAR: 1982

NHTSA NO.: R & D

COLOR: White

ENGINE DATA: TYPE: Transverse CYLINDERS: 4 DISPLACEMENT: 90.8 CID

TRANSMISSION DATA: 5 Speed Manual

DATE VEHICLE RECEIVED: 2/21/84

ODOMETER READING: 2017

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	No	ANTI-SKID BRAKE	No
CLOCK	No	REAR WINDOW DEFROSTER	Yes
OTHER			

REMARKS:

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

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

VEHICLE MANUFACTURED BY: Nissan Motor Company, Ltd.

DATE OF MANUFACTURE: 3/82

GVWR: 2875 LBS.,

GAWR: FRONT 1420 LBS., REAR 1465 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 24 psi; REAR 24 psi

TIRES ON VEHICLE (MFGR. & LINE, SIZE): Toyo "E-31" 155-13/6.15-13

BIAS PLY, BELTED, OR RADIAL: Bias Ply

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	580	LBS.	RIGHT REAR	380	LBS.
LEFT FRONT	590	LBS.	LEFT REAR	370	LBS.
TOTAL FRONT WEIGHT	1170		LBS.	(60.9 % OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	750		LBS.	(39.1 % OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	1920		LBS.		

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 25 11/16	;LF 25 3/4	;RR 24 11/16	;LR 25
PRE-TEST ATTITUDE:	RF 25 3/4	;LF 25 1/2	;RR 22 7/8	;LR 22 3/4
POST-TEST ATTITUDE:	RF 24 5/8	;LF 23 3/4	;RR 20 5/8	;LR 21 3/4

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 0 LBS. CARGO:

RIGHT FRONT	605	LBS.	RIGHT REAR	545	LBS.
LEFT FRONT	635	LBS.	LEFT REAR	555	LBS.
TOTAL FRONT WEIGHT	1240		LBS.	(53.0 % OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1100		LBS.	(47.0 % OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2340		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*: 13.2 GALLONS

TEST VOLUME: 4.0 GALLONS

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

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: No FUEL INJECTION: No

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

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 24 psi; REAR 24 psi

RECOMMENDED TIRE SIZE: 155-13/6.15-13 LOAD RANGE X B, C,

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

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT
3 REAR
5 TOTAL

CARGO LOAD 75 LBS.

TOTAL 825 LBS.

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

TEST CONDITIONS

TEST NUMBER: 840302

DATE OF TEST: March 2, 1984

TIME OF TEST: 1305

WIND VELOCITY: 0-2 mph 198° SSW

HUMIDITY: NA

AMBIENT TEMPERATURE AT IMPACT AREA: 30° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 70° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2340	2343
MDB TEST WEIGHT (LBS.)	2990	3000
MDB VELOCITY (MPH)*	33.5	33.5
IMPACT POINT (INCHES)**	37.	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 test vehicles wheelbase.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER 06	PASSENGER U02
Head	<u>Side Window, Sill</u>	<u>C-Pillar</u>
Chest	<u>Driver's Door Panel</u>	<u>Left Rear Side Wall</u>
Abdomen	<u>Driver's Door Panel</u>	<u>Left Rear Side Wall</u>
Left Knee	<u>Driver's Door Panel</u>	<u>Left Rear Side Wall</u>
Right Knee	<u>Left Knee</u>	<u>Left Knee</u>

DOOR OPENING:

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

SEAT MOVEMENT:

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

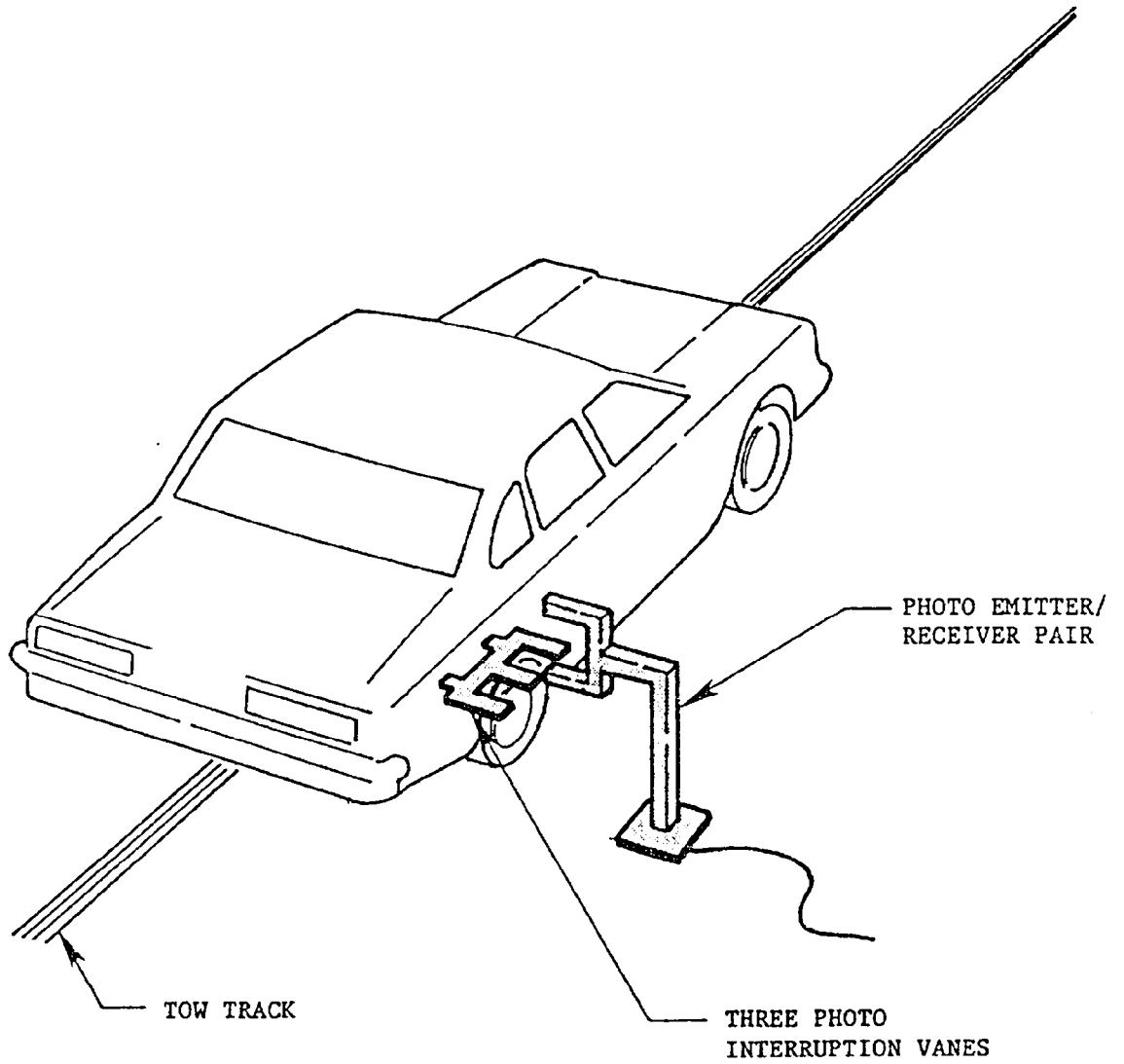
GLAZING DAMAGE:

Left side of windshield cracked; all left side
windows shattered; no backlight damage.

OTHER NOTABLE IMPACT EFFECTS:

Steering column displaced upward and to right.
Left side of windshield separated from mounting.

IMPACT VELOCITY MEASUREMENT SYSTEM



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

VEHICLE TEST WEIGHT CALCULATION

$$\begin{aligned} \text{Test Weight} &= \text{Unloaded Delivered Weight} + \\ &\quad \text{Number of Dummies X 174 lbs.} + \\ &\quad \text{Cargo Weight} \\ &= 1920 + 2 \times 174 + 75 \text{ lbs.} \\ &= 2343 \text{ lbs.} \end{aligned}$$

To achieve test weight, the exhaust system and manifold, air filter, alternator, radiator, distributor, and carburetor were removed and 4 gallons of Stoddard Solvent were added in the fuel tank. The weight of the test vehicle was measured by placing each wheel on a Loadmeter Corporation Hiway Loadometer.

SECTION 3.0
DATA REQUIRED BY R&D

The following pages are included in this section:

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

DUMMY TEMPERATURE CONTROL AND POSITIONING

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

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

DUMMY PLACEMENT AND POSITIONING

SIDE IMPACT DUMMY*

DRIVER DSP

REAR PASSENGER DSP

HEAD	Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.	Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.
UPPER TORSO	Placed against seat back. Midsagittal plane is vertical and centered behind steering column.	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 behind steering column.	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 floorpan 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: Nissan Sentra

FRONT SEAT TYPE: BENCH
 X BUCKET
 SPLIT BENCH

ADJUSTER TYPE: X MANUAL
 POWER

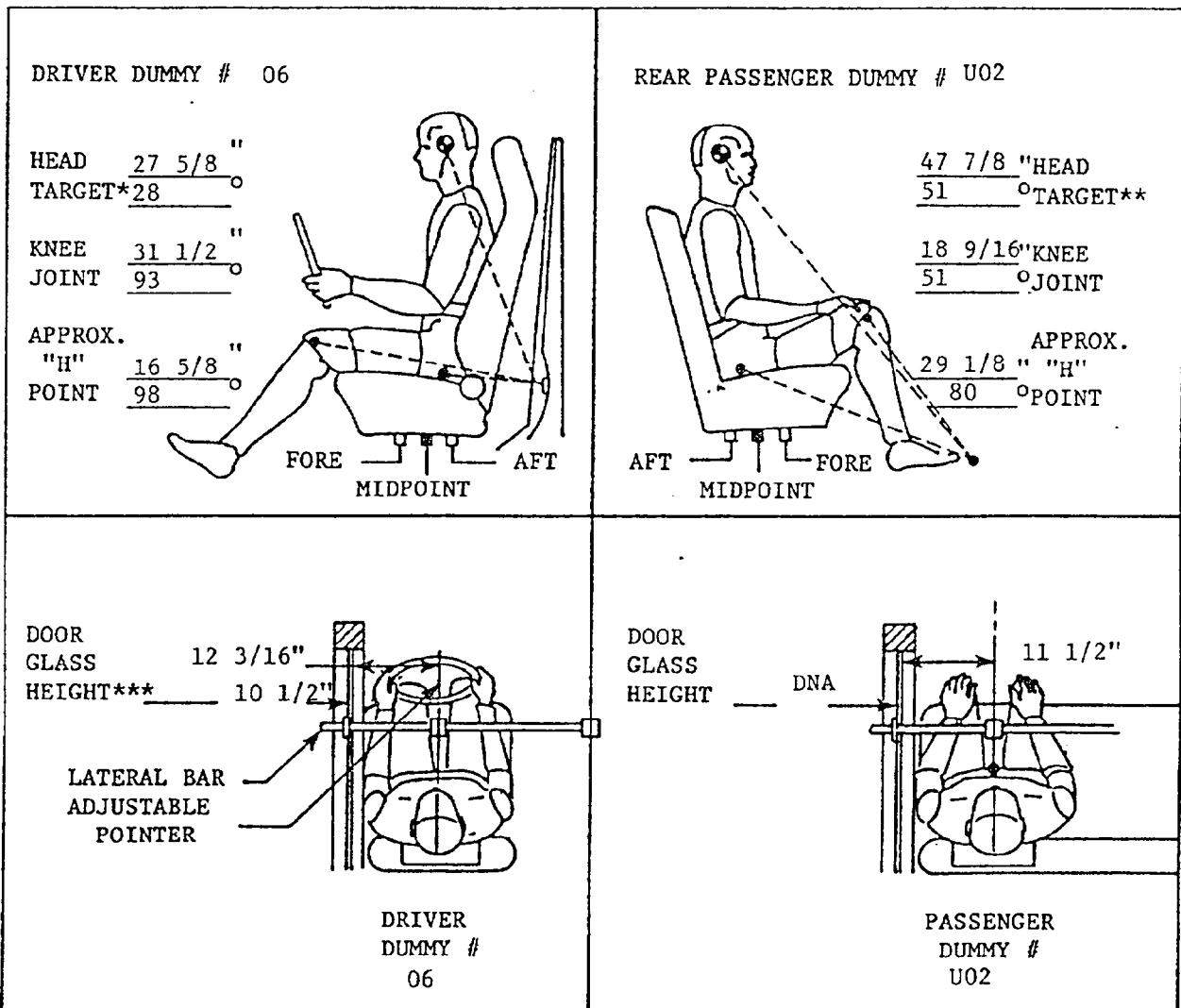
BUCKET SEAT BACK TYPE: FIXED
 X ADJUSTABLE

TECHNICIANS:

1. J. Kokoruda
2. N. Echeverria
3. B. Fishbaugh

POSITIONING DATE: 3/22/84

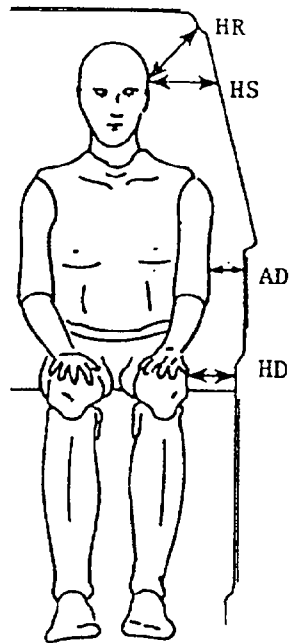
AMBIENT TEMP.: 69° F. TIME: 7:30



*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.

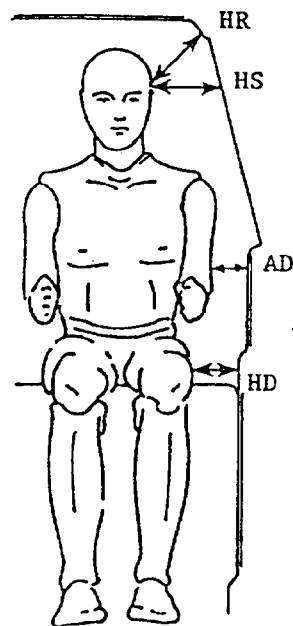
***Door glass height is equal on the right and left side of vehicle at dummy nose level.



DRIVER
06

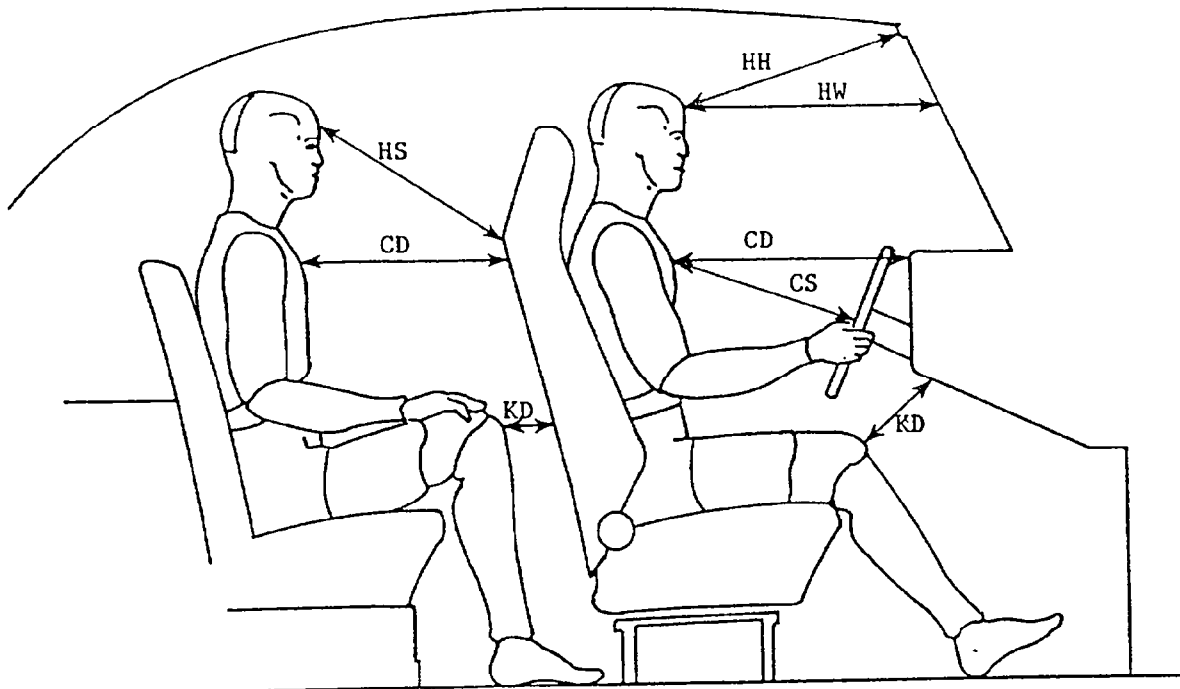
PASSENGER
U02

HR	5 1/8	6 13/16
HS	7 1/4	6 7/16
AD	3 7/8	3 3/4
HD	6 3/16	6 5/16



ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



DRIVER
06

PASSENGER
U02

HH	8	DNA
HW	18	DNA
HS	DNA	24 9/16
CD	19	20 7/8
CS	11 1/8	DNA
KDL	5 5/8	4 13/16
KDR	6 1/2	5 3/8

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the dummy's torso contacted the driver's door and the head contacted the driver's side window and window sill. The dummy rebounded rearward across the vehicle. The head and shoulders struck the roof and the buttocks struck the front passenger's door. The dummy came to rest upright in the front passenger's seat with it's head and upper torso wedged between the seat back and the passenger's side B-pillar.

PASSENGER

During impact, the dummy's torso contacted the left rear side wall and the head contacted the driver's side C-Pillar. The dummy rebounded from the side wall and fell over onto it's right side. The dummy came to rest lying on it's right side across the rear seat.

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

LOCATION	HEIGHT (in)	6	0	6	12	18	24	30	36	42	48	54	60	66	72	78
		PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)														
Axle Height	11.0	X	X	18.4	18.2	18.1	18.1	18.0	18.1	18.1	18.1	18.2	18.3	18.3	X	X
H-Point	20.0	X	X	16.6	16.4	16.4	16.3	16.3	16.3	16.3	16.3	16.4	16.4	16.5	16.4	X
Mid Door	22.5	X	16.4	16.5	16.4	16.3	16.2	16.2	16.2	16.2	16.3	16.3	16.3	16.4	16.4	16.1
Window Sill	33.5	19.3	19.1	18.8	18.6	18.5	18.5	18.4	18.4	18.5	18.5	18.5	18.6	18.7	18.8	18.8
Window Top	52.0	X	X	X	X	X	X	27.7	27.3	27.2	27.3	27.3	27.3	27.2	27.4	27.3

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

Axle Height	11.0	X	X	34.3	34.4	34.0	33.8	33.1	32.6	32.3	31.5	31.0	28.8	25.6	X	X
H-Point	20.0	X	X	32.2	33.6	33.7	33.7	34.1	34.3	34.4	34.4	34.6	33.6	31.5	26.9	X
Mid Door	22.5	X	28.4	31.1	31.4	31.6	31.8	32.1	32.3	32.5	32.9	32.7	33.1	31.9	27.2	24.5
Window Sill	33.5	22.4	23.5	25.6	29.1	30.7	31.5	31.4	31.5	31.9	32.1	32.4	32.5	31.4	27.3	24.3
Window Top	52.0	X	X	X	X	X	X	32.2	31.7	31.7	31.7	31.5	30.9	30.5	30.3	30.8

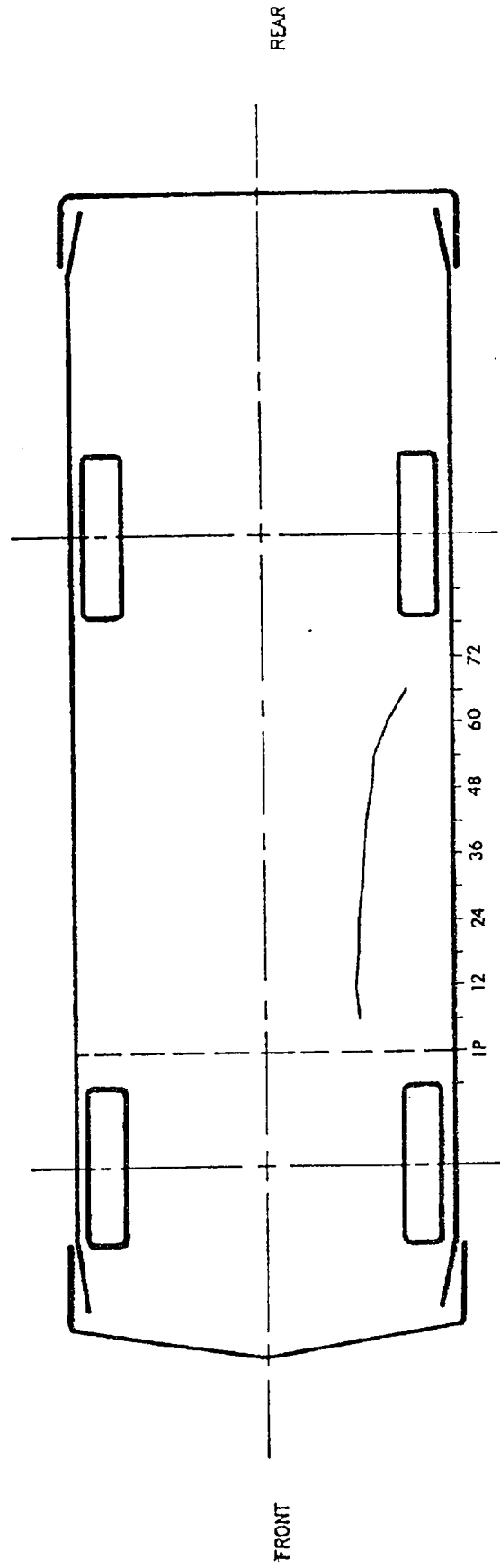
STATIC CRUSH (IN)

Axle Height	11.0	X	15.9	16.2	15.9	15.7	15.1	14.5	14.2	13.4	12.8	10.5	7.3	X	X	
H-Point	20.0	X	15.6	17.2	17.3	17.4	17.8	18.0	18.1	18.1	18.2	17.2	15.0	10.5	X	
Mid Door	22.5	X	12.0	14.6	15.0	15.3	15.6	15.9	16.1	16.3	16.6	16.4	16.8	15.5	10.8	8.4
Window Sill	33.5	3.1	4.4	6.8	10.5	12.2	13.0	13.1	13.4	13.6	13.9	13.9	12.7	8.5	5.5	
Window Top	52.0	X	X	X	X	X	4.5	4.4	4.5	4.4	4.2	3.6	3.3	3.1	3.5	

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

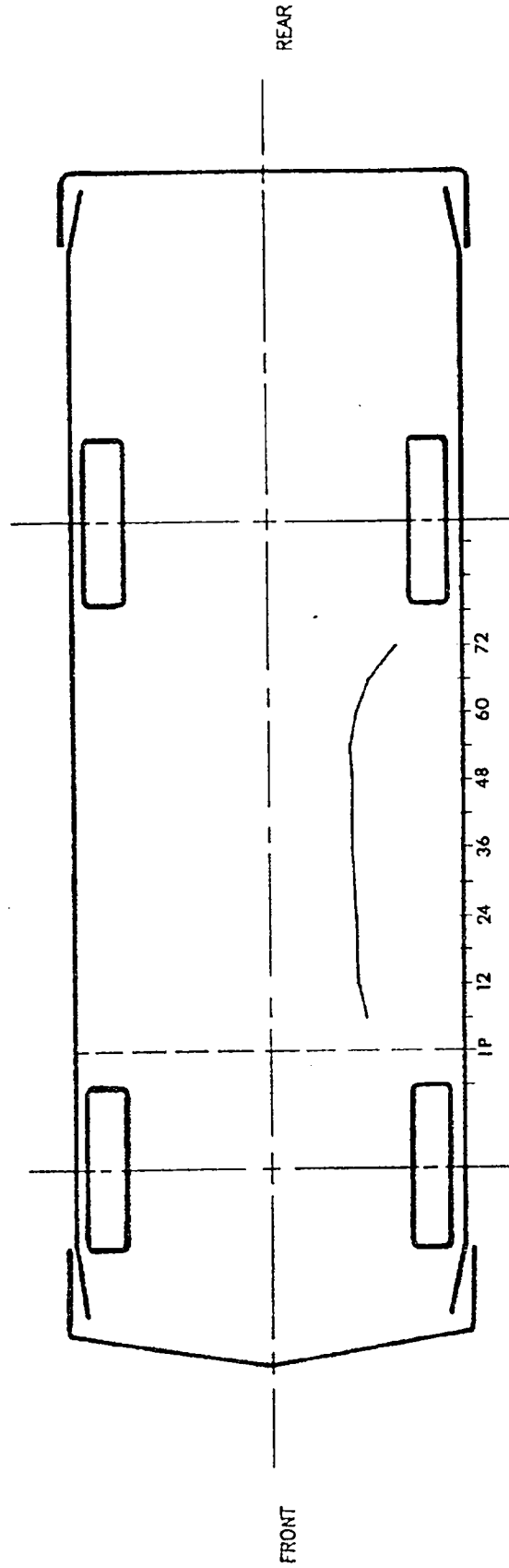
** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



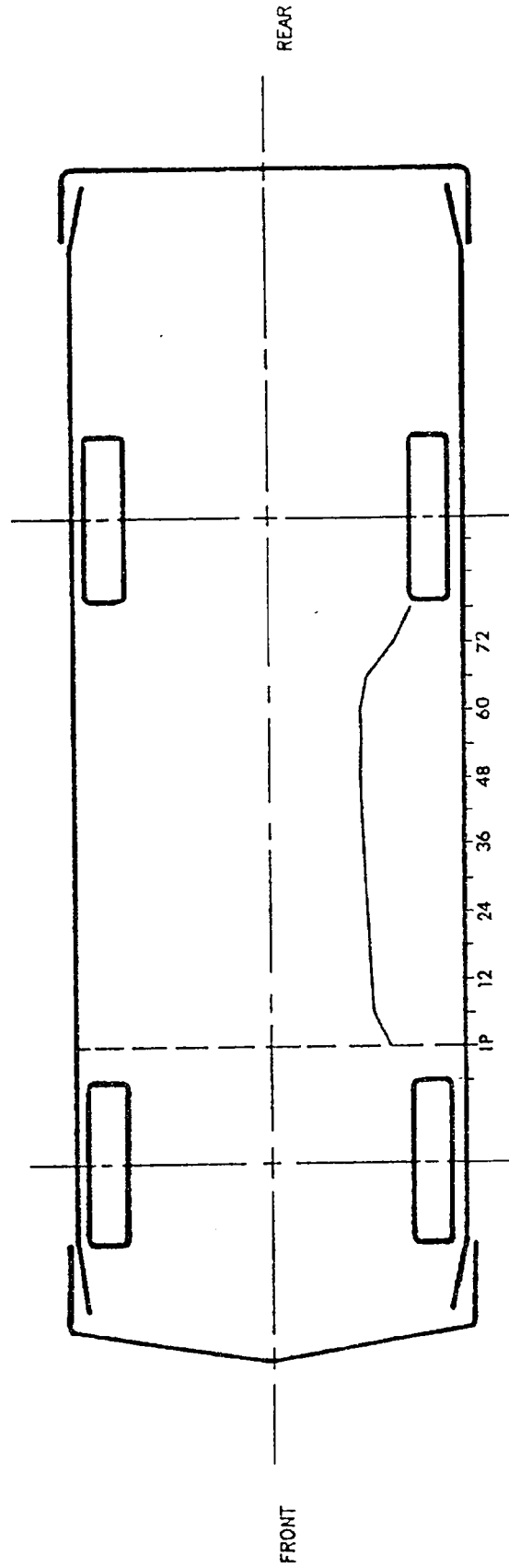
PROFILE LEVEL EQUALS AXLE HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



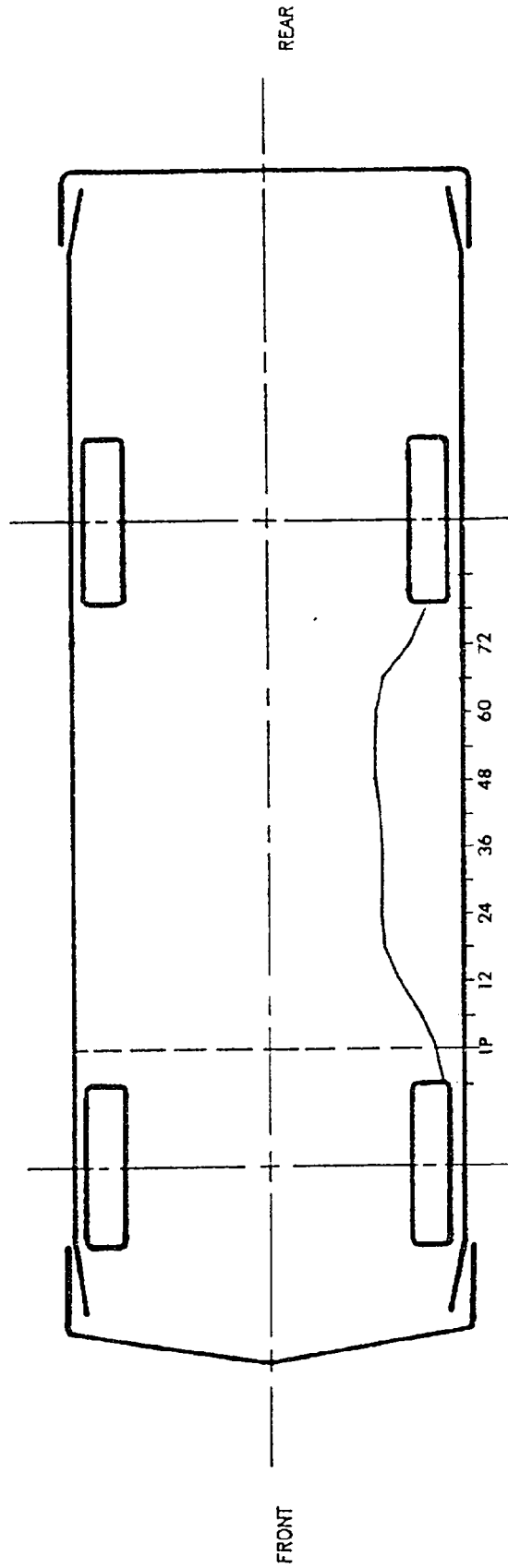
PROFILE LEVEL EQUALS H-POINT HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



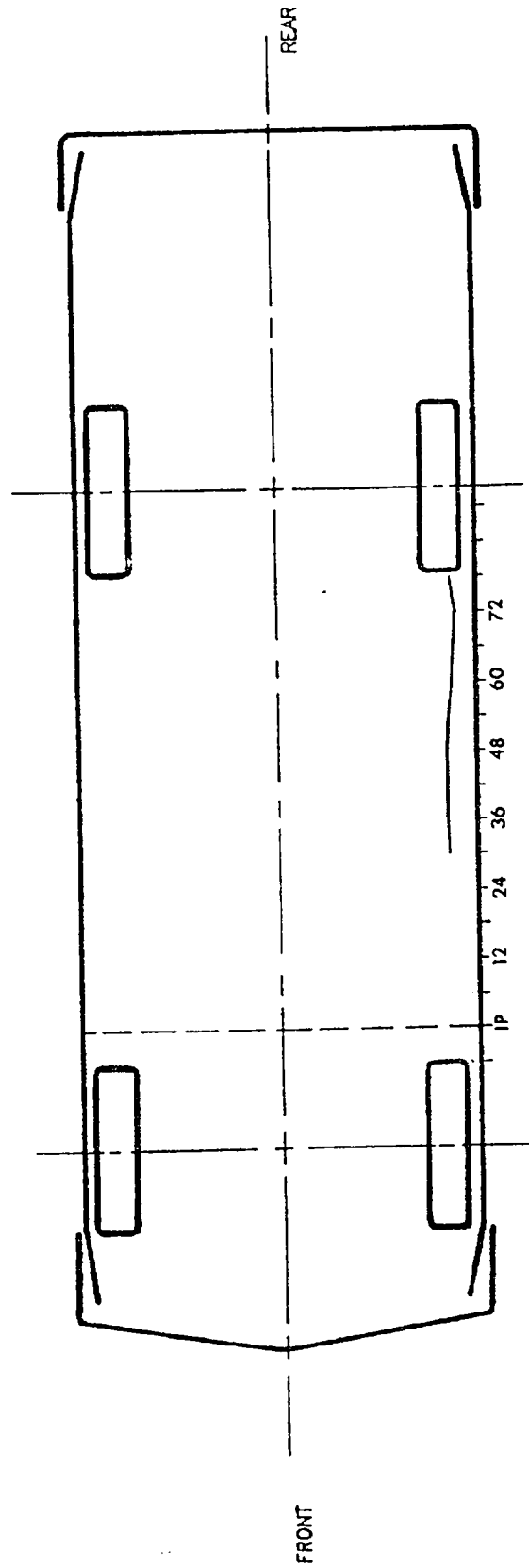
PROFILE LEVEL EQUALS MID-DOOR HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW SILL HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT
IP EQUALS PROJECTED IMPACT POINT

SIDE IMPACT DUMMY DATA SUMMARY

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE		NEGATIVE		POSITIVE		NEGATIVE	
	DIRECTION*		DIRECTION**		DIRECTION*		DIRECTION**	
	MAX	TIME	MAX	TIME	MAX	TIME	MAX	TIME
	(g)	(msec)	(g)	(msec)	(g)	(msec)	(g)	(msec)
HEAD ACCELERATION								
LONGITUDINAL	12.44	61.25	28.88	99.00	10.67	45.25	23.76	55.13
LATERAL	42.63	47.75	20.71	37.00	80.00	50.50	13.26	41.13
VERTICAL	26.85	46.13	71.14	67.50	50.78	59.00	37.56	48.38
RESULTANT		71.19 @	67.50			83.86 @	55.88	
HIC	595.31	from 34.13	to 102.00		580.24	from 47.88	to 63.38	
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	29.37	51.25	35.70	36.88	5.73	75.62	22.37	66.25
LATERAL (P)***	109.08	38.75	49.55	64.38	75.71	50.63	11.78	38.13
LATERAL (R)***	111.51	38.75	49.43	64.38	77.70	50.00	11.71	38.13
VERTICAL	14.28	58.75	19.95	33.75	8.08	33.75	13.11	49.37
RESULTANT (P)		112.37 @	38.13			79.21 @	50.00	
RESULTANT (R)		114.77 @	38.13			77.25 @	50.00	
DELTA V (MPH)****		27.8 @	60.62 (P)			23.4 @	90.00 (P)	
		28.8 @	60.62 (R)			23.8 @	91.25 (R)	
LOWER SPINE								
LONGITUDINAL	44.76	49.37	42.47	35.63	12.38	60.00	30.04	41.87
LATERAL (P)	149.30	34.38	27.54	63.75	72.40	41.87	20.31	63.75
LATERAL (R)	151.06	34.38	29.79	63.75	73.80	41.87	20.20	64.38
VERTICAL	30.22	37.50	6.64	81.25	9.95	45.00	5.37	80.00
RESULTANT (P)		153.86 @	34.38			78.71 @	41.87	
RESULTANT (R)		155.57 @	34.38			79.99 @	41.87	
DELTA V (MPH)		33.4 @	50.63 (P)			26.6 @	60.00 (P)	
		33.7 @	50.63 (R)			27.5 @	60.00 (R)	
LEFT UPPER RIB								
LATERAL (P)	122.18	33.13	23.85	76.88	57.91	36.25	5.41	150.00
LATERAL (R)	120.86	32.50	25.59	76.25	54.73	35.63	3.93	153.13
DELTA V (MPH)		27.3 @	73.13 (P)			25.7 @	104.38 (P)	
		27.2 @	73.13 (R)			25.5 @	103.75 (R)	
LEFT LOWER RIB								
LATERAL (P)	149.35	33.13	23.24	70.00	64.53	45.00	21.15	69.38
LATERAL (R)	149.16	32.50	16.39	69.38	59.39	40.63	20.11	68.75
DELTA V (MPH)		27.4 @	66.85 (P)			27.5 @	66.25 (P)	
		27.9 @	65.63 (R)			26.0 @	66.25 (R)	
PELVIS ACCELERATION								
LONGITUDINAL	16.95	42.63	32.00	41.13	12.44	69.00	44.09	33.25
LATERAL	219.99	28.50	52.95	41.88	146.78	37.63	49.47	24.63
VERTICAL	38.68	35.25	15.09	37.75	31.79	43.75	7.07	45.63
RESULTANT		220.41 @	28.50			151.89 @	37.63	
DELTA V (MPH)		31.5 @	39.25			27.1 @	52.75	

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	<u>DRIVER DUMMY</u>				<u>PASSENGER DUMMY</u>			
	<u>POSITIVE DIRECTION*</u>		<u>NEGATIVE DIRECTION**</u>		<u>POSITIVE DIRECTION*</u>		<u>NEGATIVE DIRECTION**</u>	
	<u>MAX (in)</u>	<u>TIME (msec)</u>	<u>MAX (in)</u>	<u>TIME (msec)</u>	<u>MAX (in)</u>	<u>TIME (msec)</u>	<u>MAX (in)</u>	<u>TIME (msec)</u>
RIB DEFLECTION †	0.08	164.25	1.81	88.38	0.02	25.63	1.89	69.88

* LONGITUDINAL: FORWARD
 LATERAL: RIGHTWARD
 VERTICAL: UPWARD

**LONGITUDINAL: REARWARD
 LATERAL: LEFTWARD
 VERTICAL: DOWNWARD

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

**** For dummy channels, Delta V is the velocity change at the approximate time of separation from the contact area.

† Compression: Negative

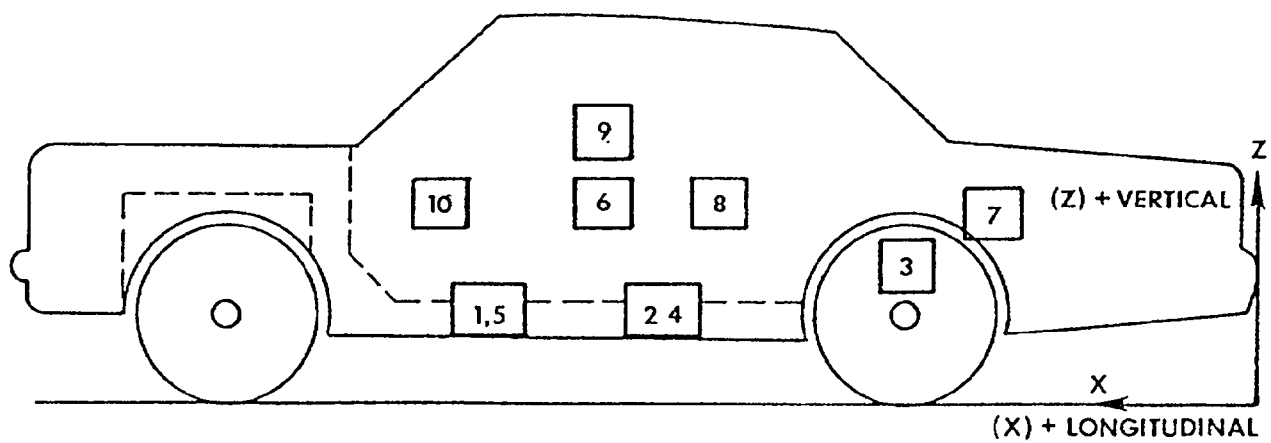
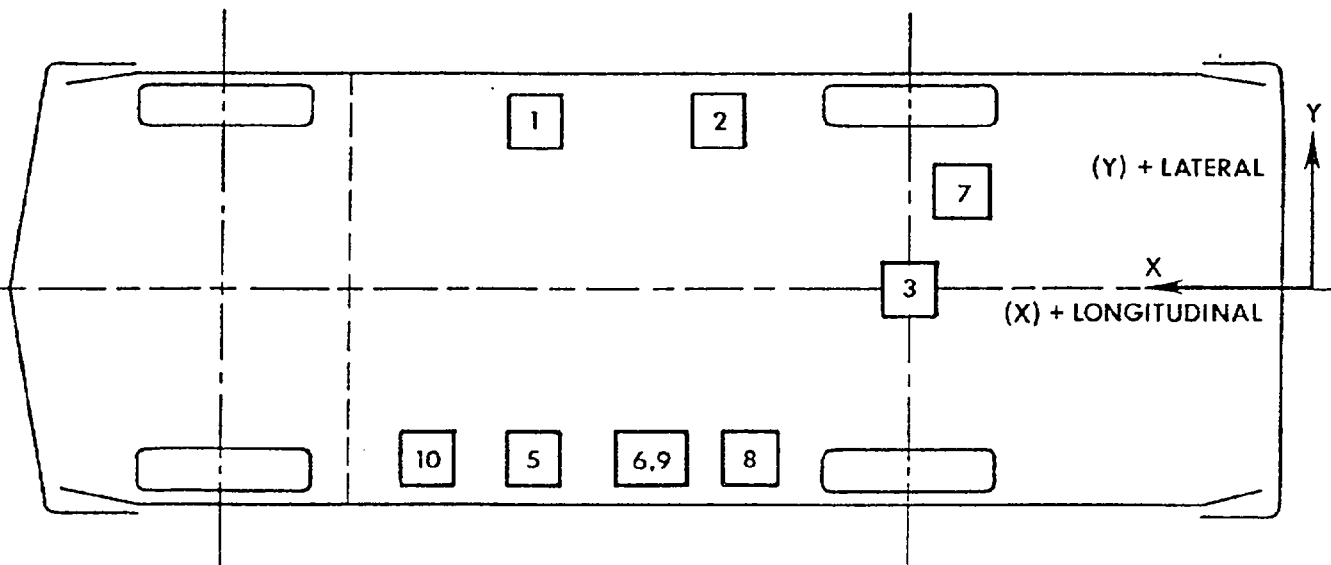
VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION		
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	
1	RIGHT SILL AT FRONT SEAT	96.8	25.9	10.3					
	(LONGITUDINAL)				$\Delta V = -2.3 \text{ mph @ } 110.00 \text{ msec}$	5.82	63.63	7.17	27.00
	(LATERAL)				$\Delta V = 14.8 \text{ mph @ } 110.00 \text{ msec}$	17.40	12.25	10.21	63.00
	(VERTICAL)					14.53	62.13	6.27	30.88
	(RESULTANT)						18.14 @ 12.63		
2	RIGHT SILL AT REAR SEAT	66.8	25.8	9.1					
	(LONGITUDINAL)				$\Delta V = -0.3 \text{ mph @ } 110.00 \text{ msec}$	7.53	25.38	7.63	33.75
	(LATERAL)				$\Delta V = 20.6 \text{ mph @ } 110.00 \text{ msec}$	19.34	12.50	1.62	134.00
	(VERTICAL)					3.43	65.63	6.94	26.88
	(RESULTANT)						21.27 @ 26.50		
3	REAR DECK OVER AXLE	39.5	0.0	18.9					
	(LONGITUDINAL)				$\Delta V = -3.5 \text{ mph @ } 110.00 \text{ msec}$	2.53	30.63	11.09	25.63
	(LATERAL)				$\Delta V = 22.2 \text{ mph @ } 110.00 \text{ msec}$	18.61	25.63	2.63	121.00
	(VERTICAL)					21.89	33.25	24.56	29.25
	(RESULTANT)						28.01 @ 33.25		
4	LEFT SILL AT REAR SEAT	67.0	-26.0	9.2					
	(LATERAL)				$\Delta V = 10.7 \text{ mph @ } 76.88 \text{ msec}$	40.48	26.13	28.04	32.50
5	LEFT SILL AT FRONT SEAT	96.9	-26.0	10.3					
	(LATERAL)				$\Delta V = 12.0 \text{ mph @ } 46.88 \text{ msec}$	89.68	23.25	51.80	16.50
6	LEFT FRONT DOOR CENTERLINE	92.3	-26.6	20.3					
	(LATERAL)				$\Delta V = 24.9 \text{ mph @ } 19.13 \text{ msec}$	206.82	12.63	103.32	27.75
7	RIGHT REAR COMPARTMENT	26.6	-20.3	18.5					
	(LONGITUDINAL)					2.88	56.63	6.42	25.63
8	MIDREAR OF LEFT FRONT DOOR	84.1	-26.6	24.4					
	(LATERAL)				$\Delta V = 23.9 \text{ mph @ } 16.13 \text{ msec}$	133.23	34.00	151.18	28.75
9	UPPER LEFT FRONT DOOR CENTERLINE	92.3	-26.4	29.5					
	(LATERAL)				$\Delta V = 4.8 \text{ mph @ } 8.13 \text{ msec}$	38.40	37.13	161.35	31.88
10	MIDFRONT OF LEFT FRONT DOOR	100.8	-26.6	23.8					
	(LATERAL)				$\Delta V = 23.9 \text{ mph @ } 22.13 \text{ msec}$	168.95	11.50	100.95	29.13

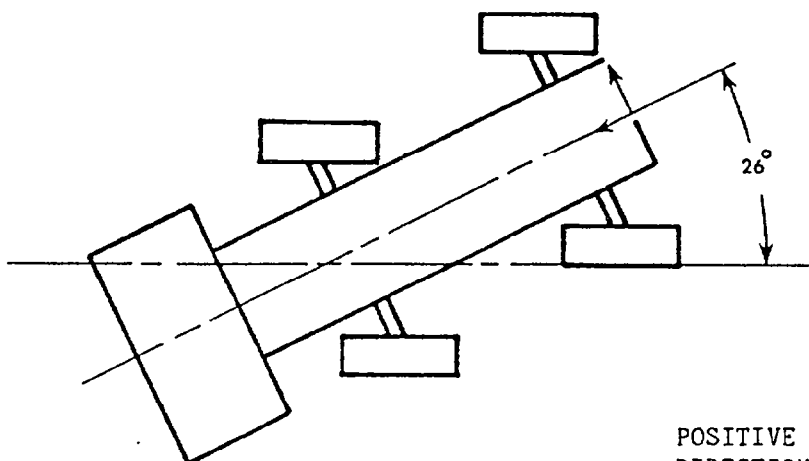
* Reference: X - Rear Bumper (+ Forward), Y - Vehicle Centerline (+ To Right), Z - Ground Level (+ Up)

All measurements of accelerometer locations in inches.

VEHICLE ACCELEROMETER LOCATIONS



MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY



NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	CENTER OF GRAVITY	74.5	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -15.3 \text{ mph @ } 110.00 \text{ msec}$			0.86	126.63	12.18	44.75
	(LATERAL)	$\Delta V = -4.1 \text{ mph @ } 110.00 \text{ msec}$			1.47	59.88	6.33	32.63
	(VERTICAL)				14.71	56.88	15.51	66.13
	(RESULTANT)					17.33 @	66.13	
2	FRONT FRAME MEMBER	130.3	0.0	11.3				
	(LONGITUDINAL)	$\Delta V = -14.4 \text{ mph @ } 110.00 \text{ msec}$			0.87	144.00	12.33	36.75
3	REAR FRAME MEMBER	23.3	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -14.1 \text{ mph @ } 110.00 \text{ msec}$			1.18	113.63	11.81	34.13

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

All measurements of accelerometer locations in inches.

HIGH SPEED CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead	Photosonics 1B	8	790	Vehicle Dynamics
2	Overhead	Photosonics 1B	25	832	Close-up of impact point
3	Onboard MDB	Photosonics 1B	25	500	Close-up of impact point
4	Onboard MDB	Stalex	13	502	Driver kinematics
5	Ground level - right	Photosonics 1B	25	775	Overall view
6	Ground level - left	Photosonics 1B	17	795	Overall view
7	Onboard vehicle	Photosonics 1B	8	802	Driver kinematics - front view
8	Onboard vehicle	Photosonics 1B	8	805	Driver kinematics
9	Onboard Vehicle	Photosonics 1B	8	792	Passenger kinematics

NOTE: CAMERAS ARE NUMBERED ACCORDING TO SPLICING SEQUENCE OF FILM.
 (24 fps) REAL TIME MOVIE FILM COVERAGE OF PRE-CRASH, POST-CRASH
 AND CRASH EVENT SPLICED AT START AND END OF FILM.

LOCATIONS OF OFFBOARD HIGH SPEED CAMERAS

CAMERA NO.	X	Y	Z
1	0	0	25'
2	0	0	25'
5	24'10"	58'8"	45"
6	-20'11"	-13'3"	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	MFR.	DATE OF LAST CALIBRATION	SENSITIVITY	DESIRED FULL SCALE (ENGR. UNITS)
BCGXG	Accel	4-202-0001	18845	Bell Howell	12/7/83	.237 MV/G	50 G
BCYGG	Accel	4-202-0001	18858	Bell Howell	12/7/83	.240 MV/G	50 G
BCGZG	Accel	4-202-0001	18857	Bell Howell	12/7/83	.240 MV/G	50 G
BFCXG	Accel	4-202-0001	18240	Bell Howell	12/7/83	.240 MV/G	50 G
BRCXG	Accel	4-202-0001	19022	Bell Howell	12/7/83	.222 MV/G	50 G

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

APPENDIX A
PHOTOGRAPHS



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



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

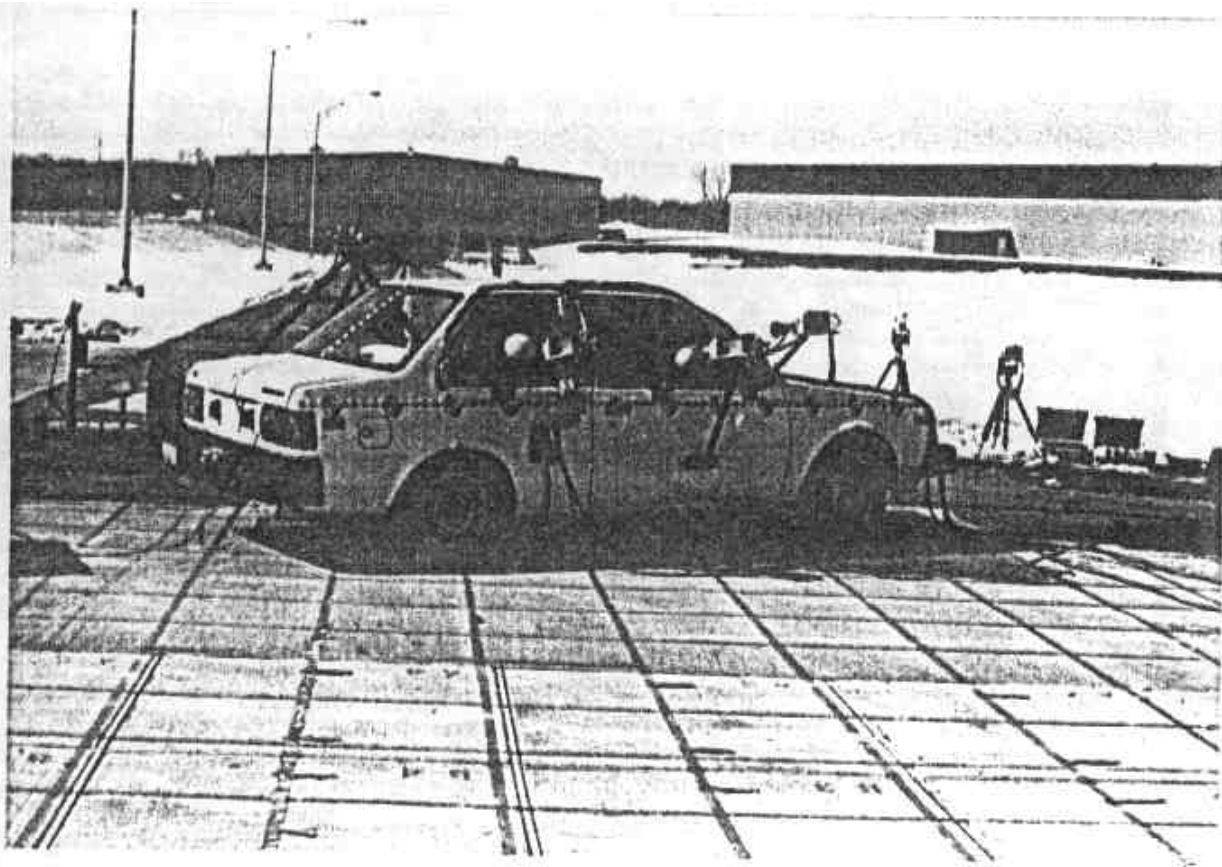


Figure A-3. PRE-TEST OVERALL - VIEW 3

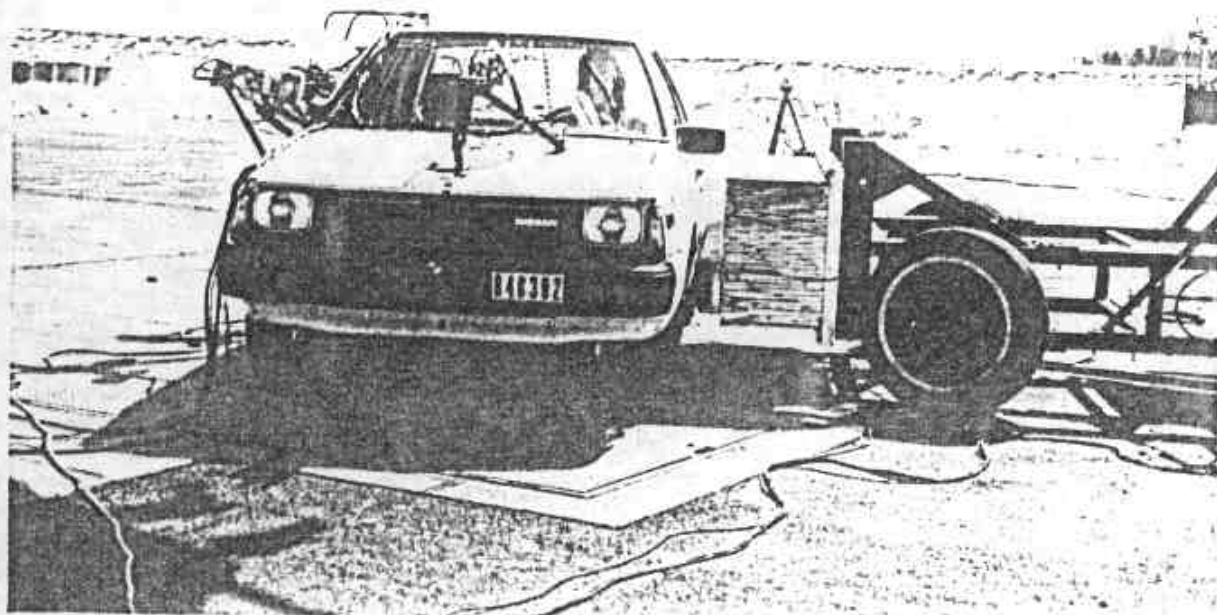


Figure A-4. PRE-TEST OVERALL - VIEW 4

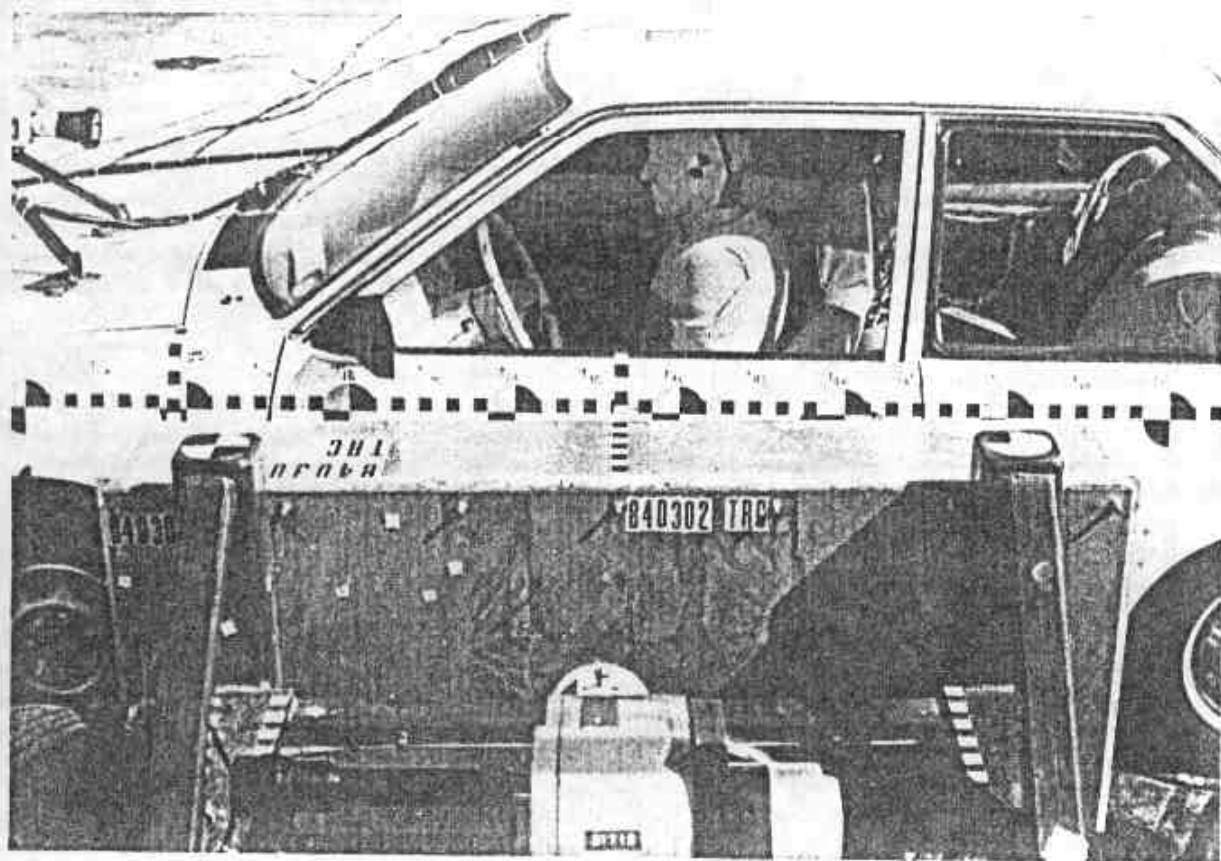


Figure A-5. PRE-TEST CLOSEUP - VIEW 1

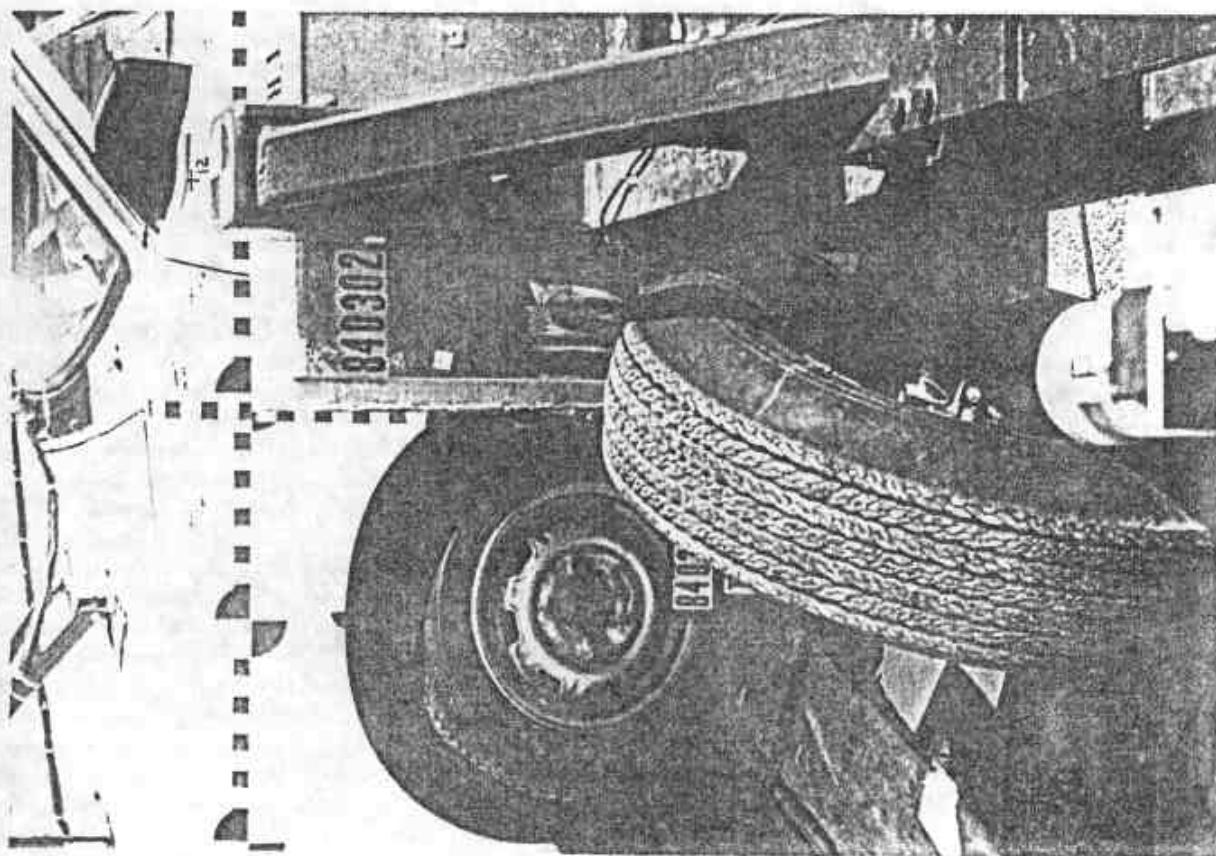


Figure A-6. PRE-TEST CLOSEUP - VIEW 2

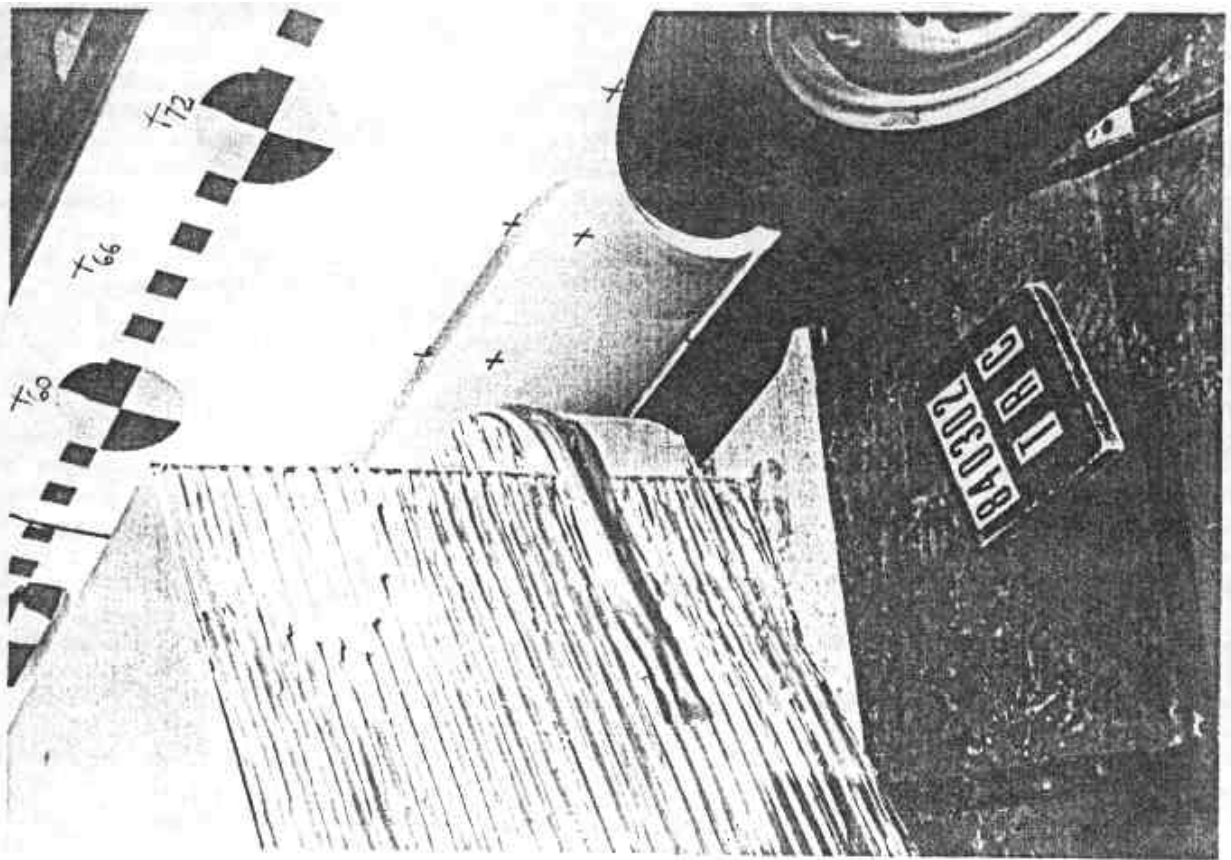


Figure A-7. PRE-TEST CLOSEUP - VIEW 3



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



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

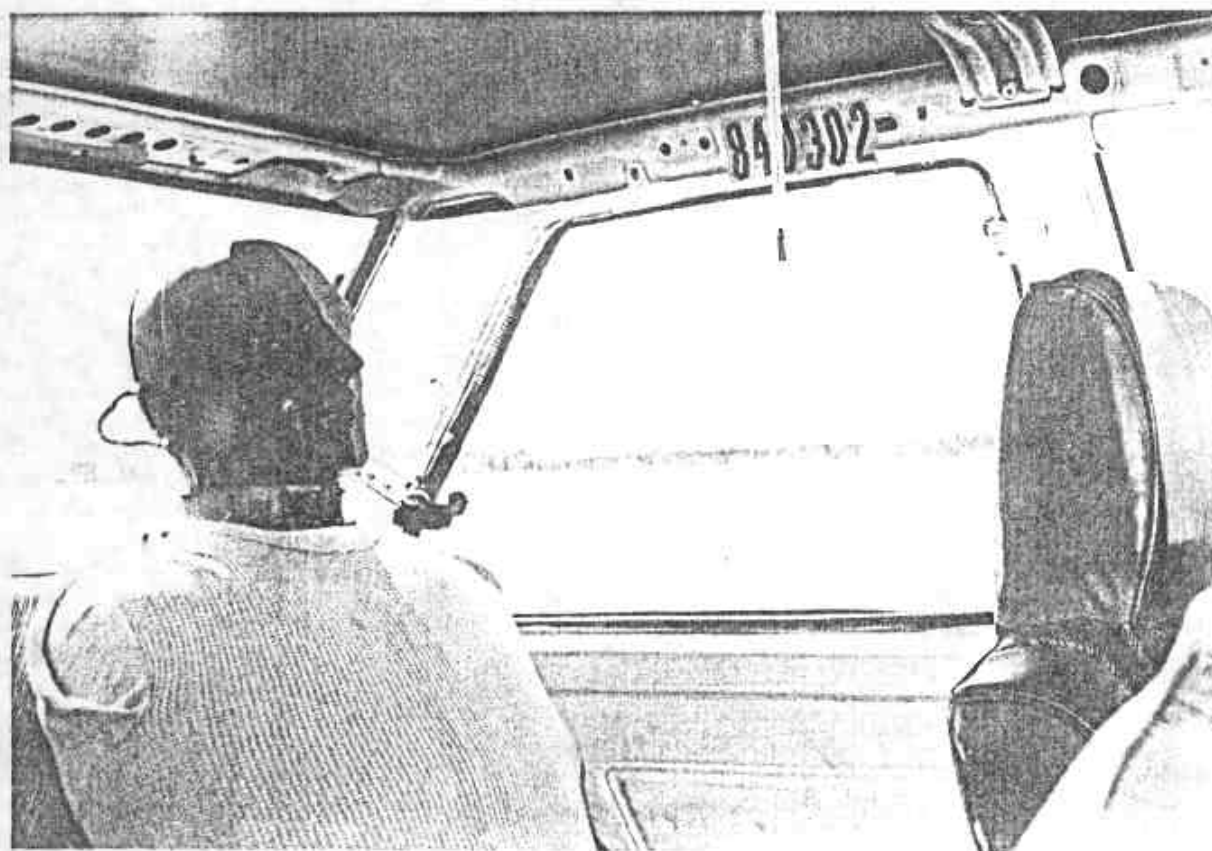


Figure A-10. PRE-TEST PASSENGER DUMMY - VIEW 1

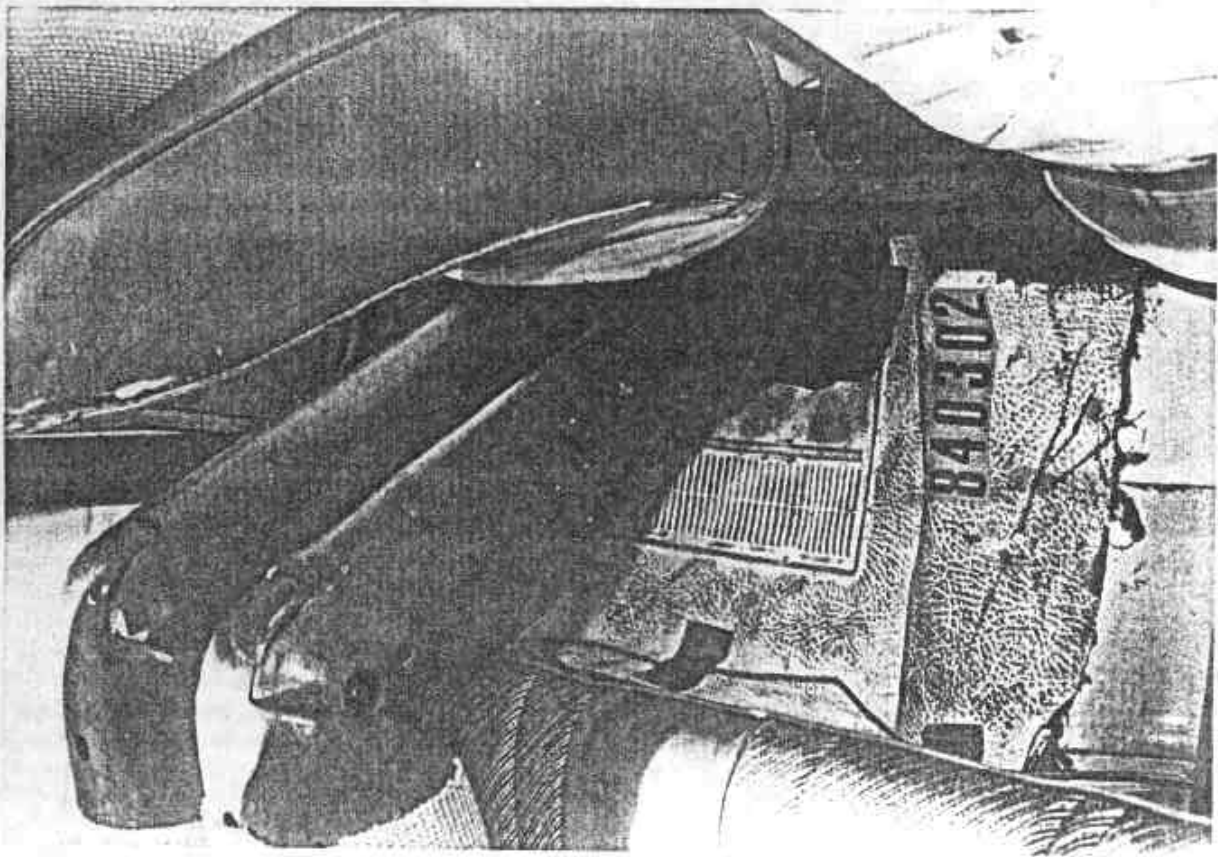


Figure A-11. PRE-TEST PASSENGER DUMMY - VIEW 2



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

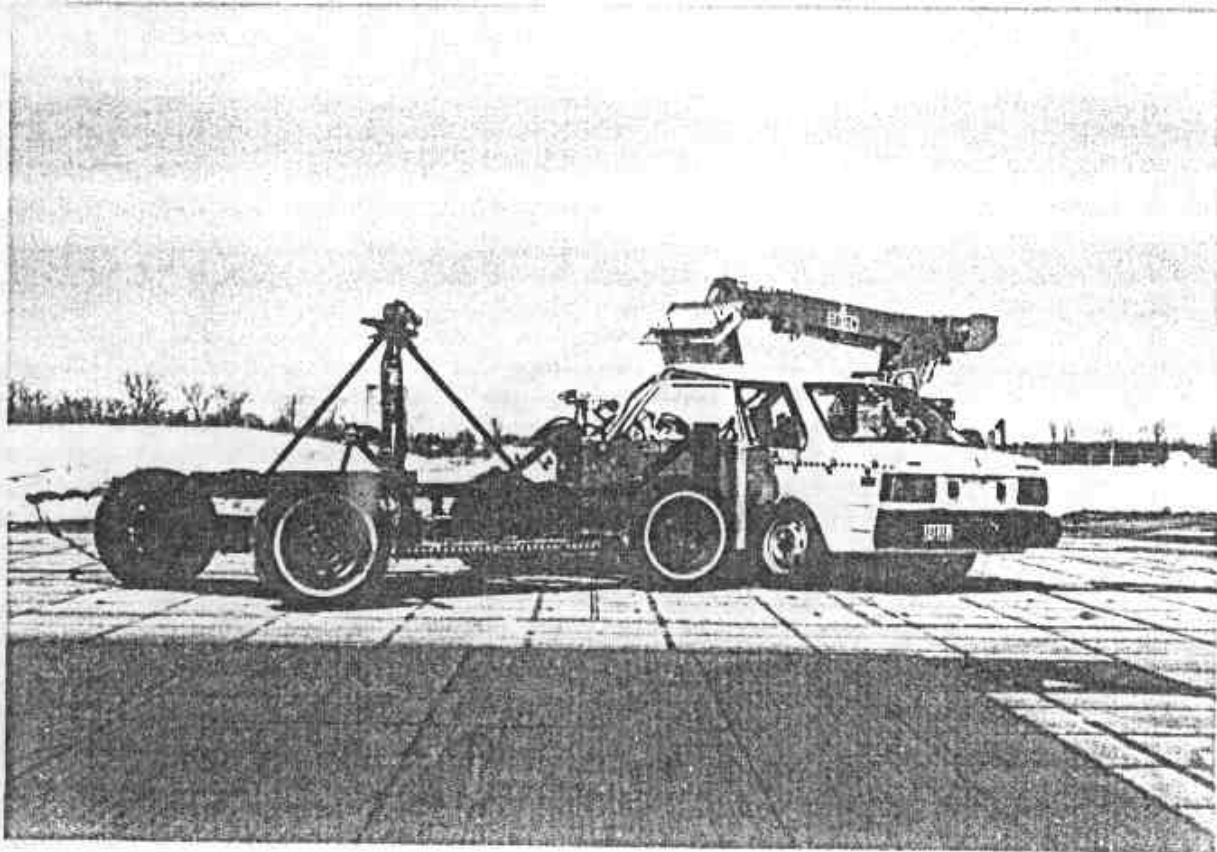


Figure A-13. POST-TEST OVERALL - VIEW 2



Figure A-14. POST-TEST OVERALL - VIEW 3
A-R

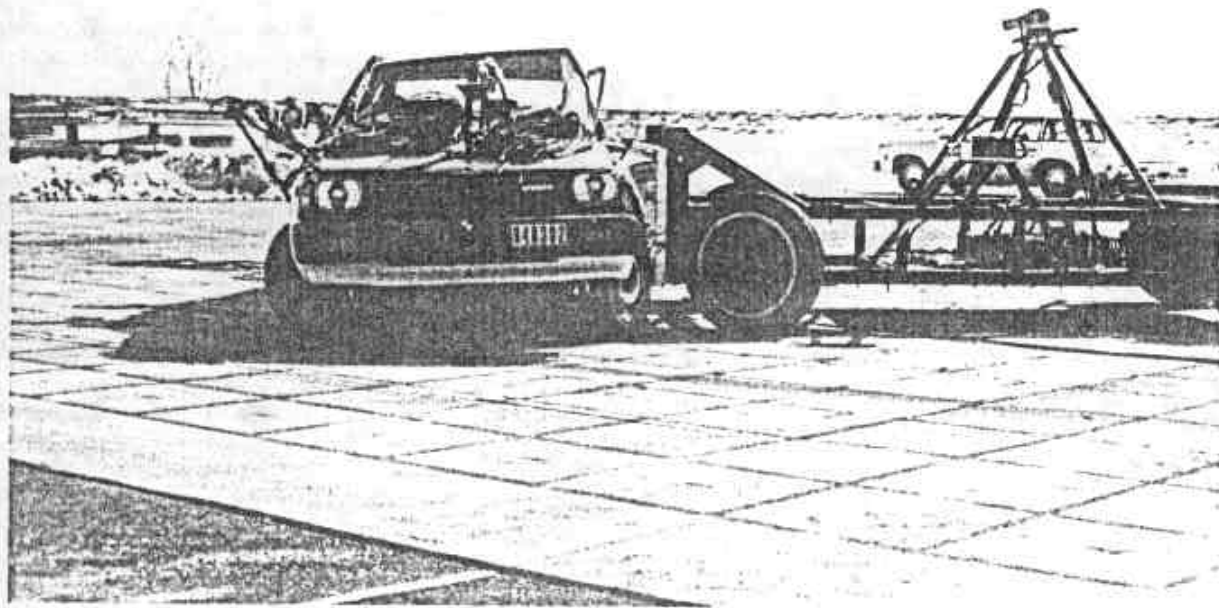


Figure A-15. POST-TEST OVERALL - VIEW 4



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

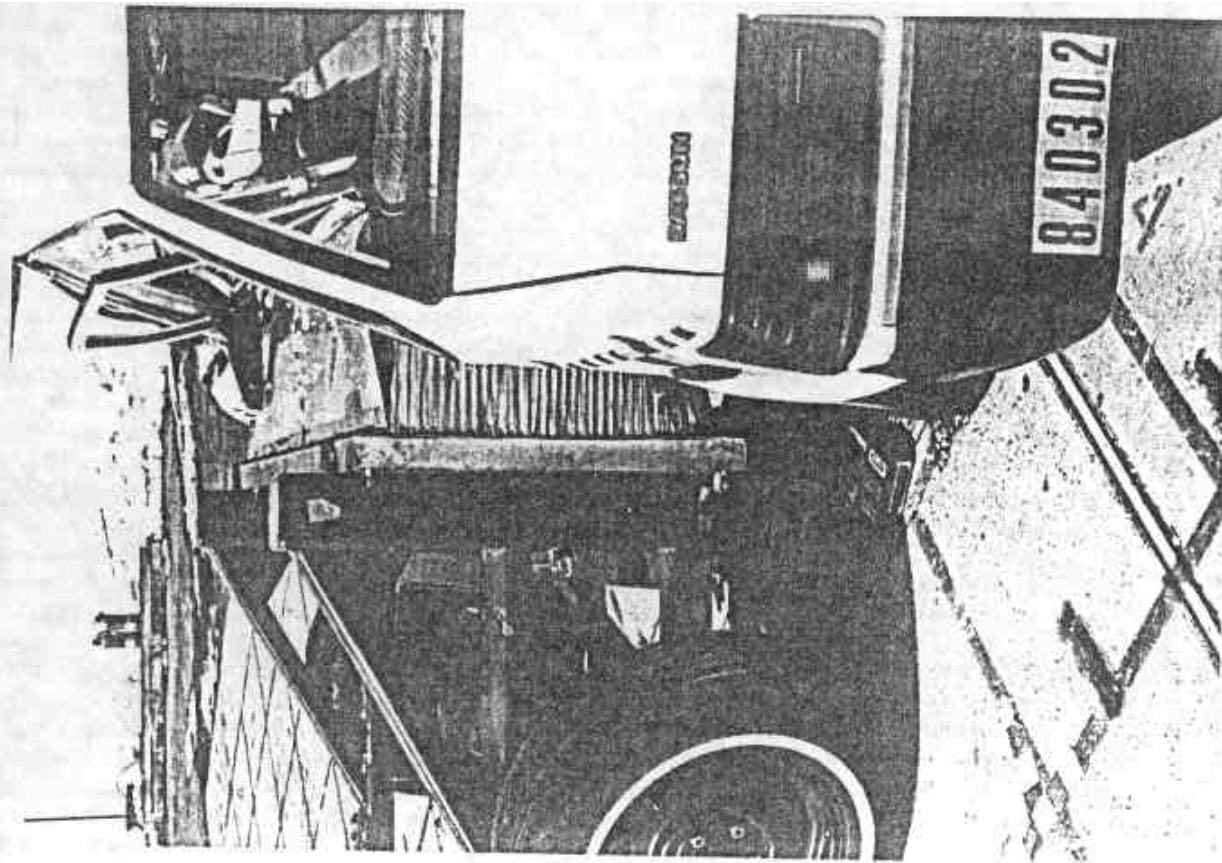


Figure A-17. POST-TEST CLOSEUP - VIEW 2

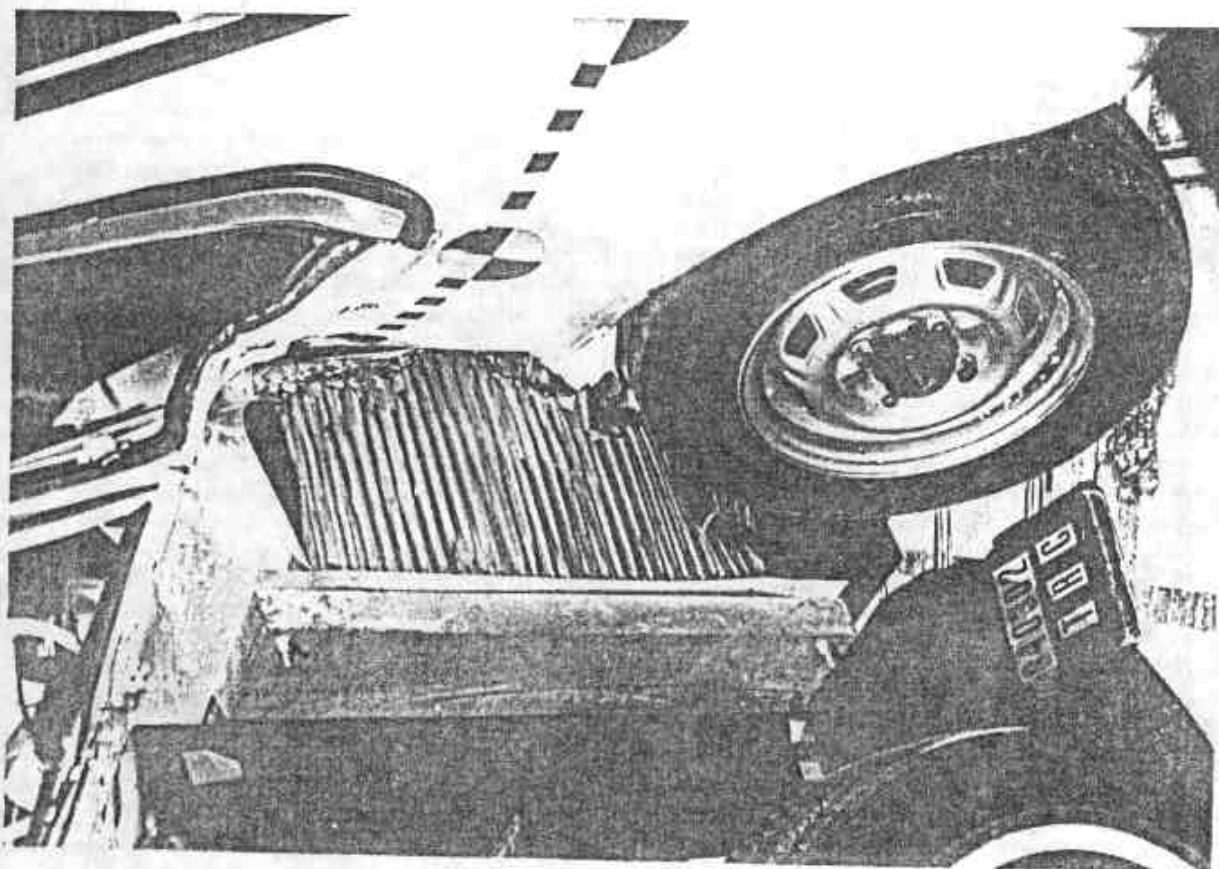


Figure A-18. POST-TEST CLOSEUP - VIEW 3
A-10

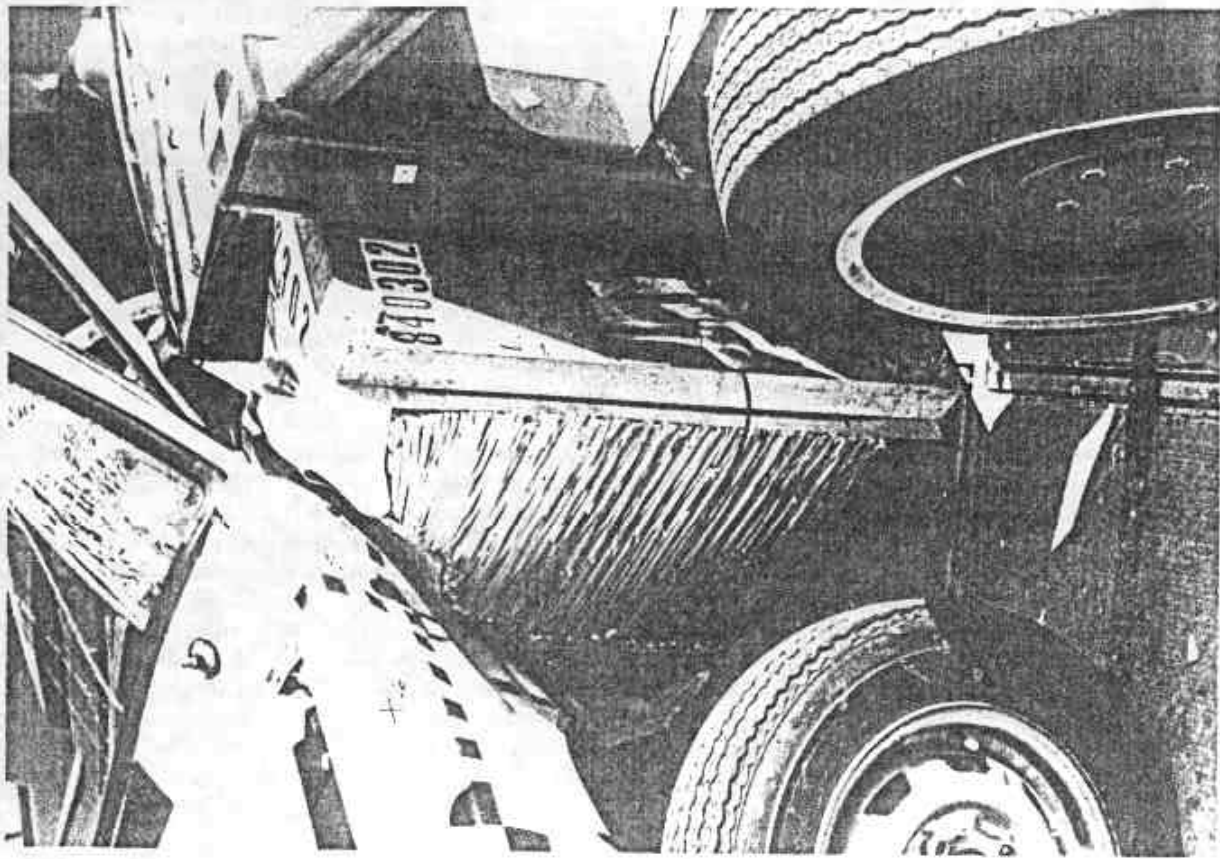


Figure A-19. POST-TEST CLOSEUP - VIEW #

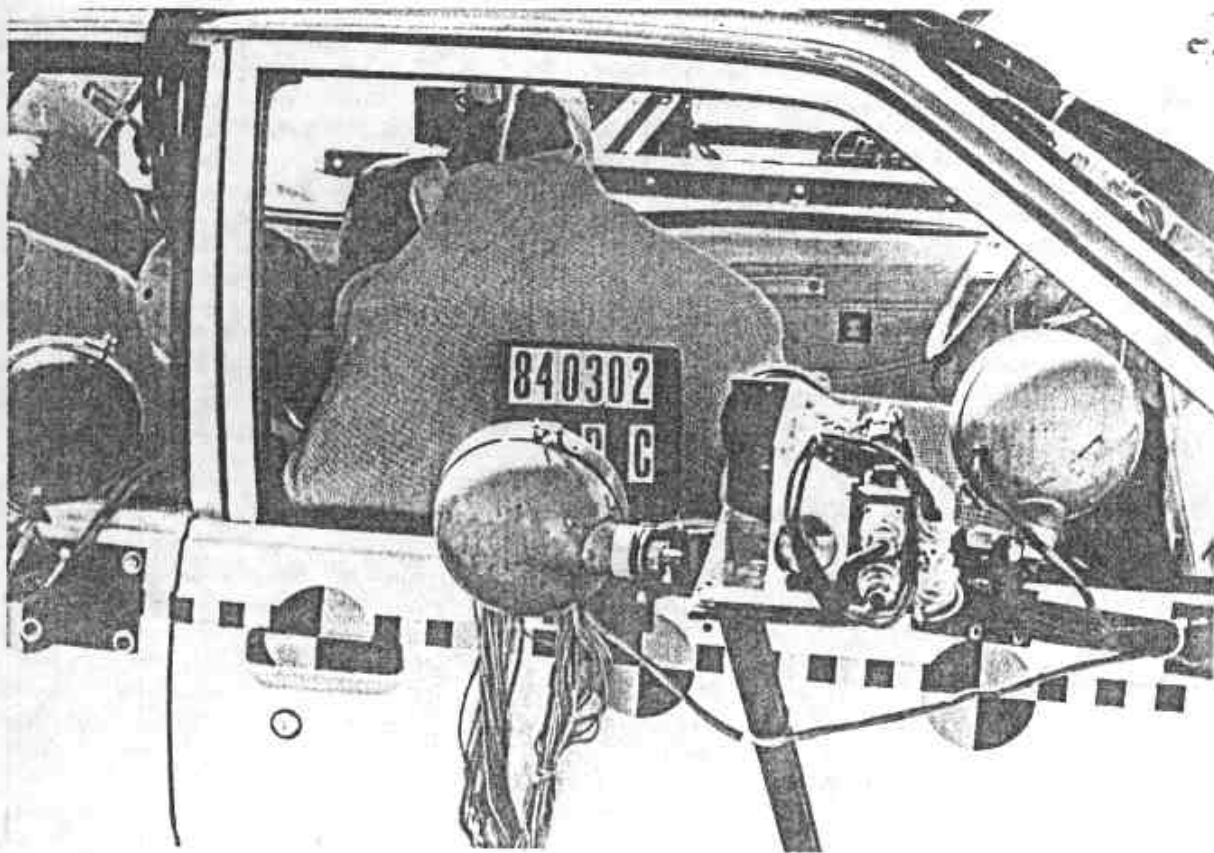


Figure A-20. POST-TEST DRIVER DUMMY - VIEW 1



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

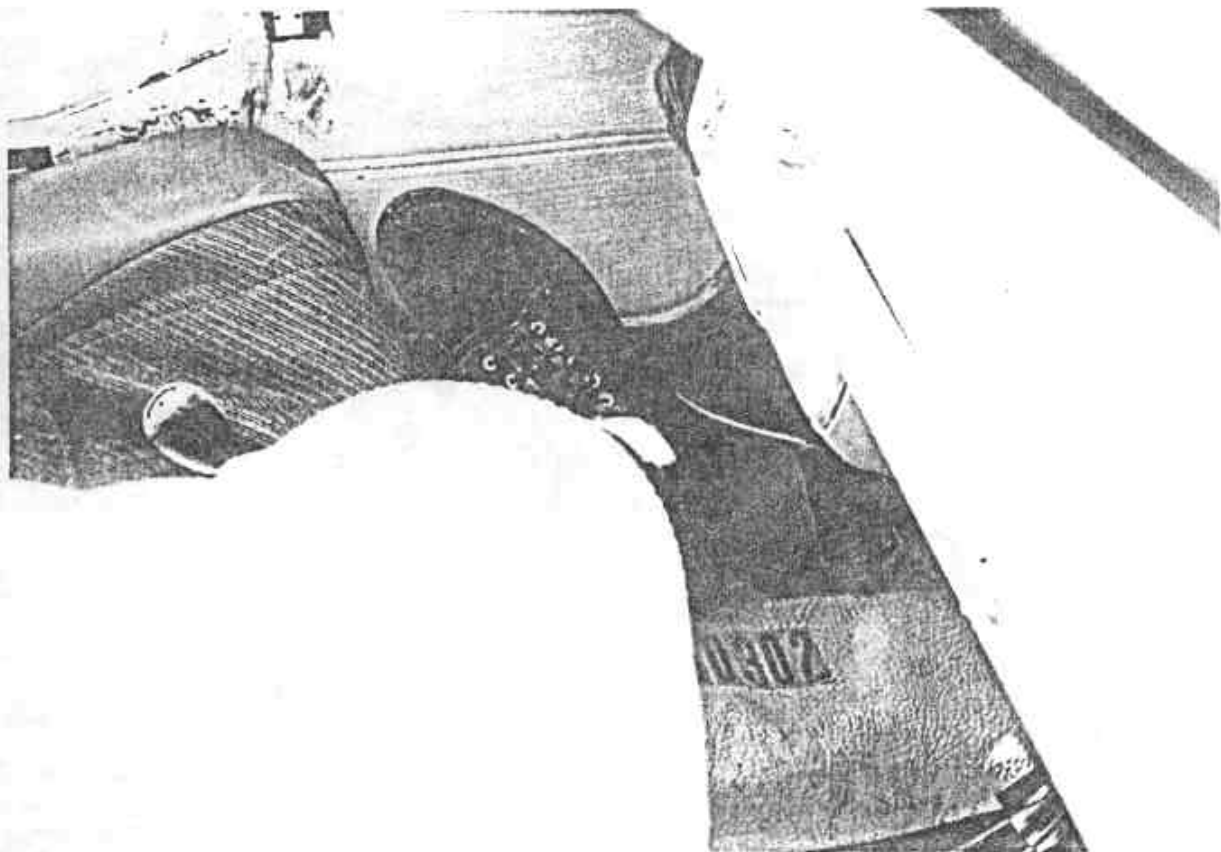


Figure A-22. POST-TEST DRIVER DUMMY - VIEW 3

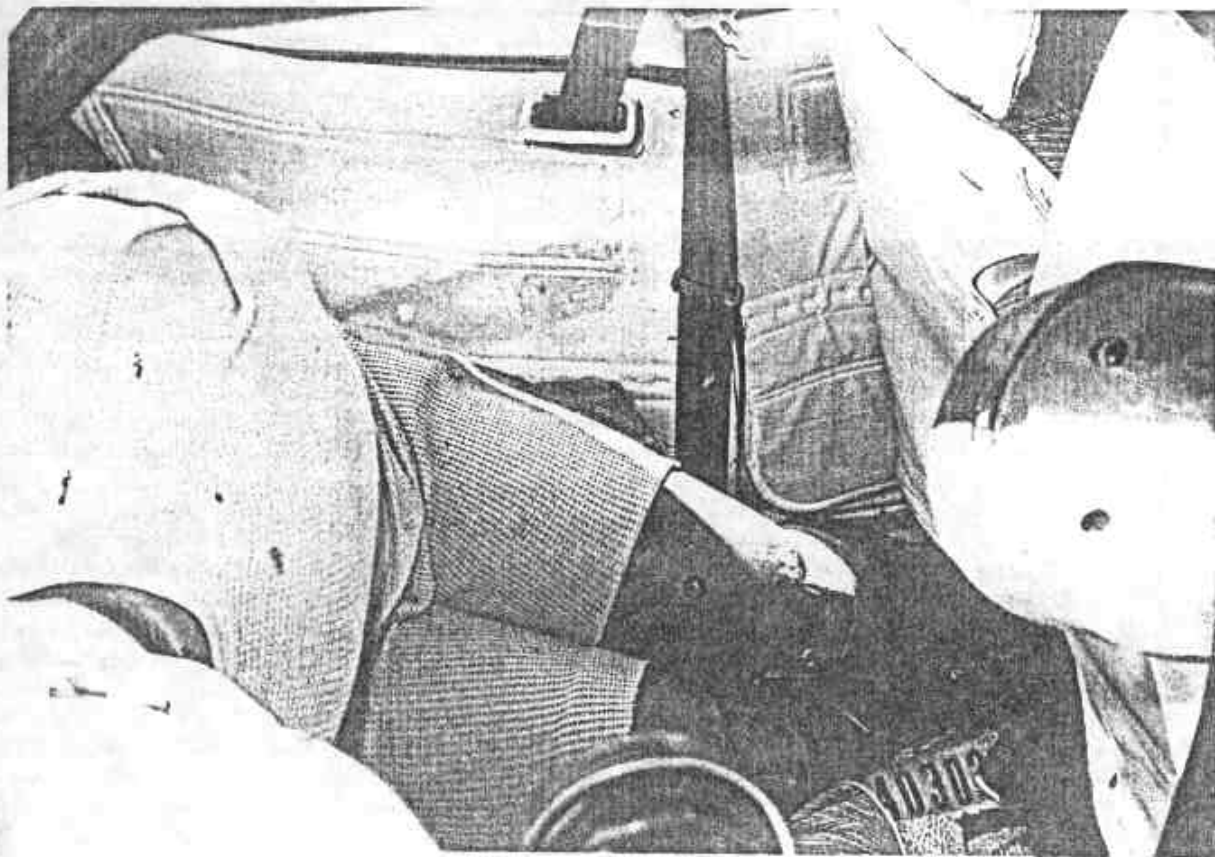


Figure A-23. POST-TEST PASSENGER DUMMY - VIEW 1

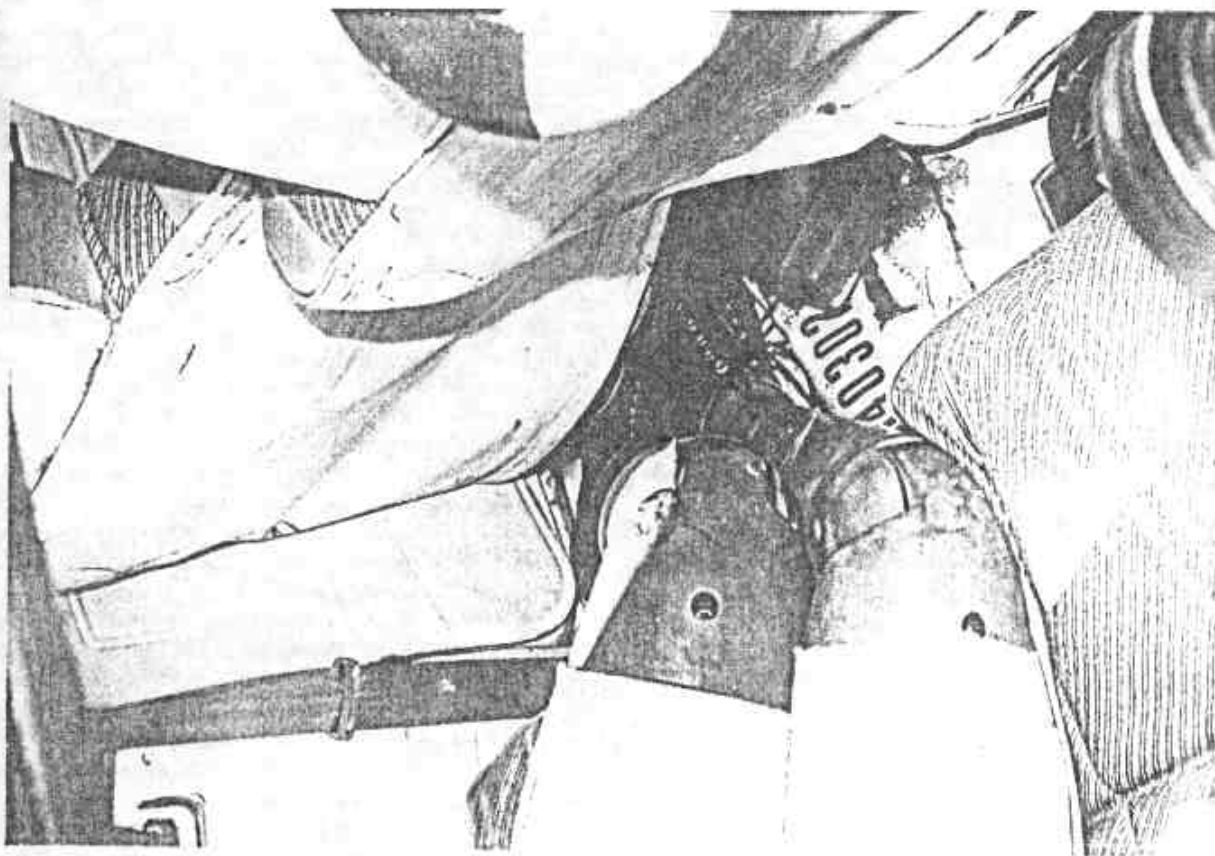


Figure A-24. POST-TEST PASSENGER DUMMY - VIEW 2

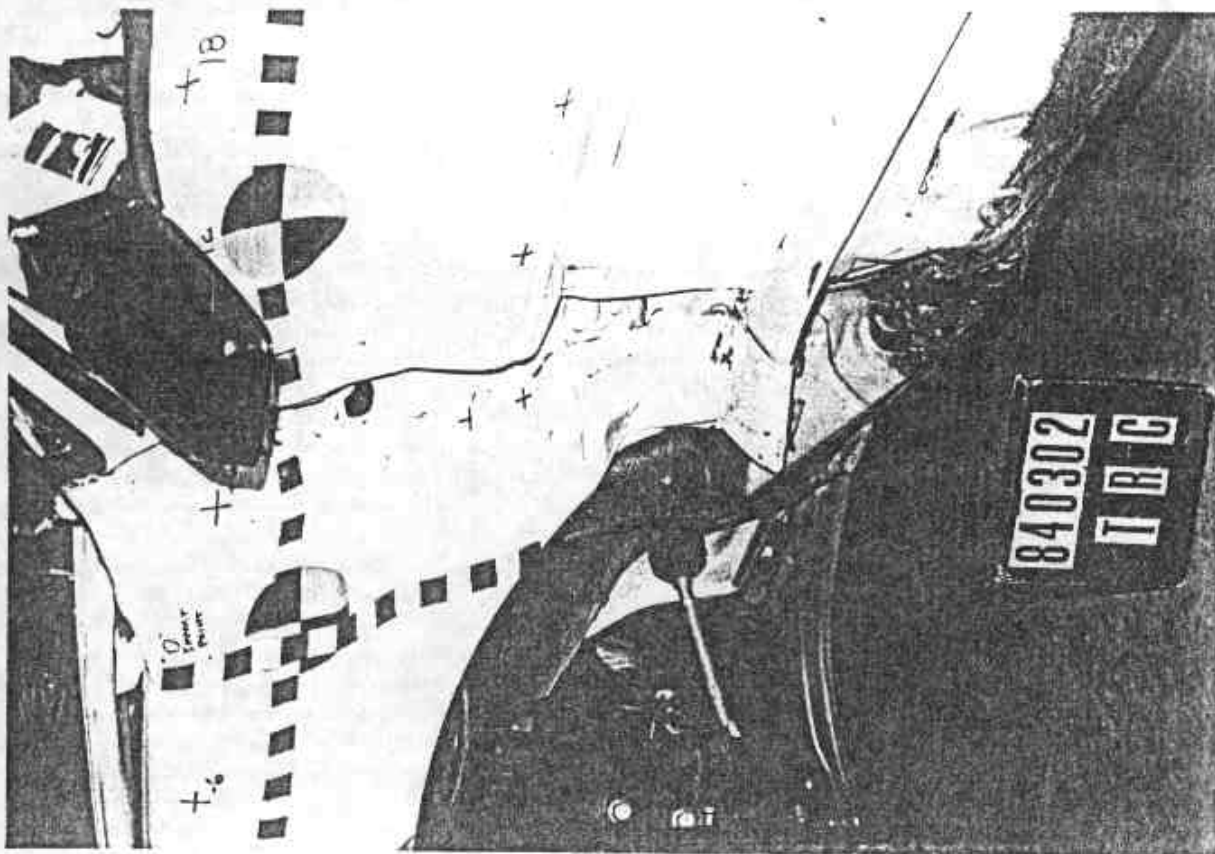


Figure A-25. VEHICLE DAMAGE - VIEW 1

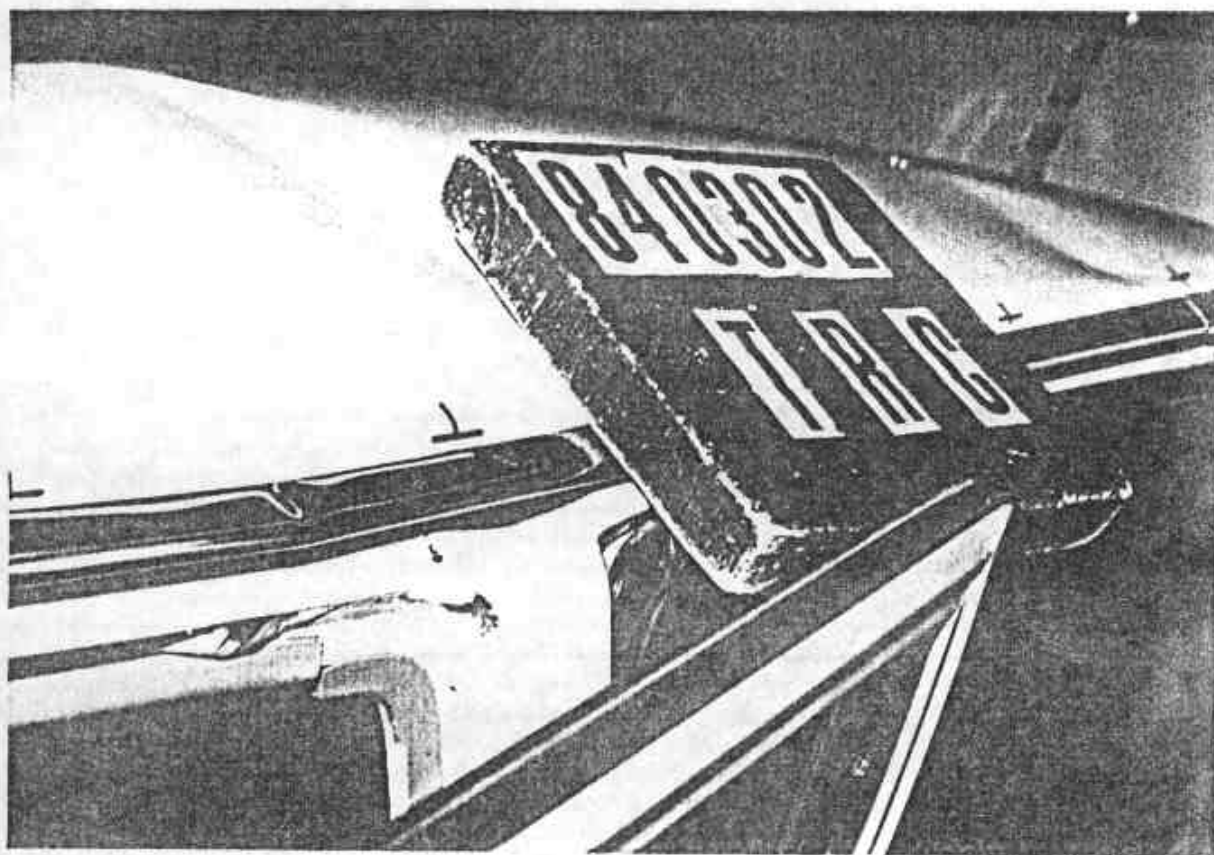


Figure A-26. VEHICLE DAMAGE - VIEW 2

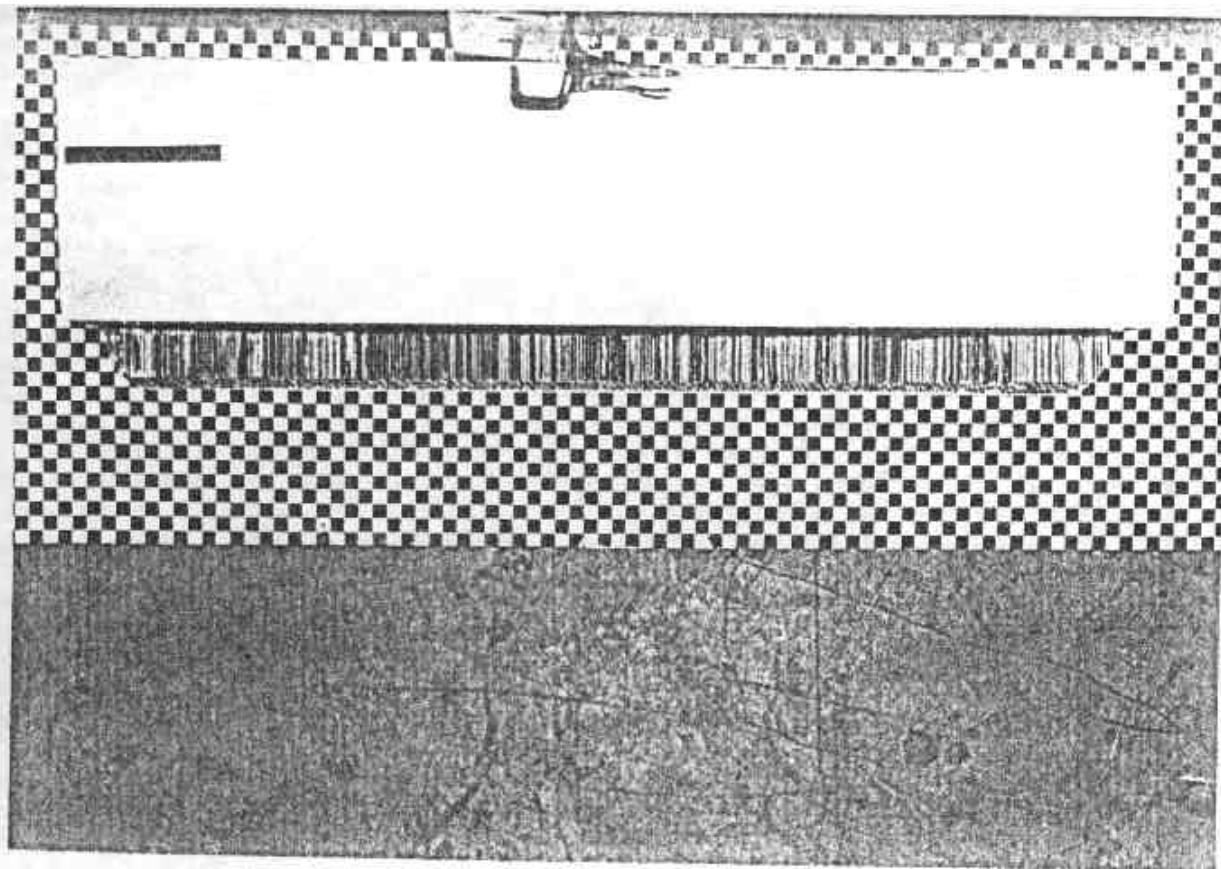


Figure A-27. PRE-TEST MDB FACE - VIEW 1

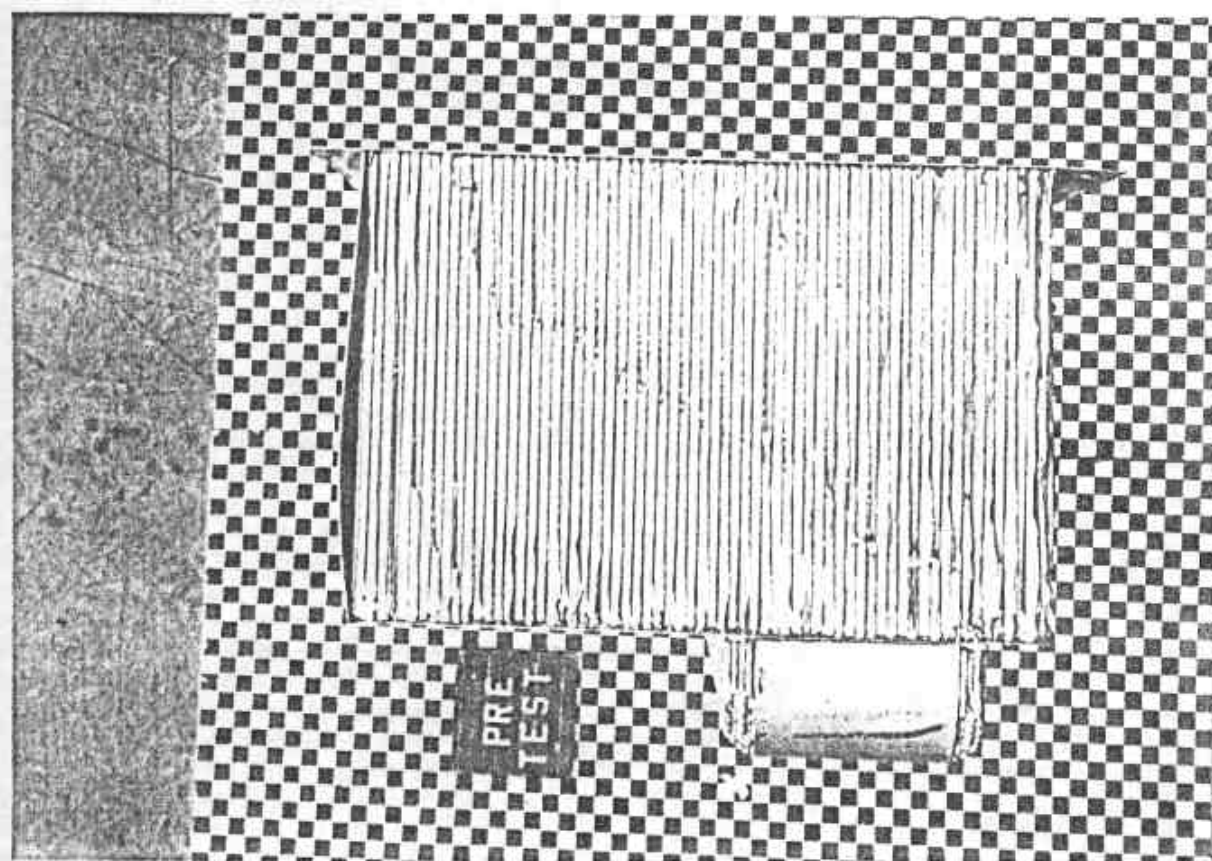


Figure A-28. PRE-TEST MDB FACE - VIEW 2

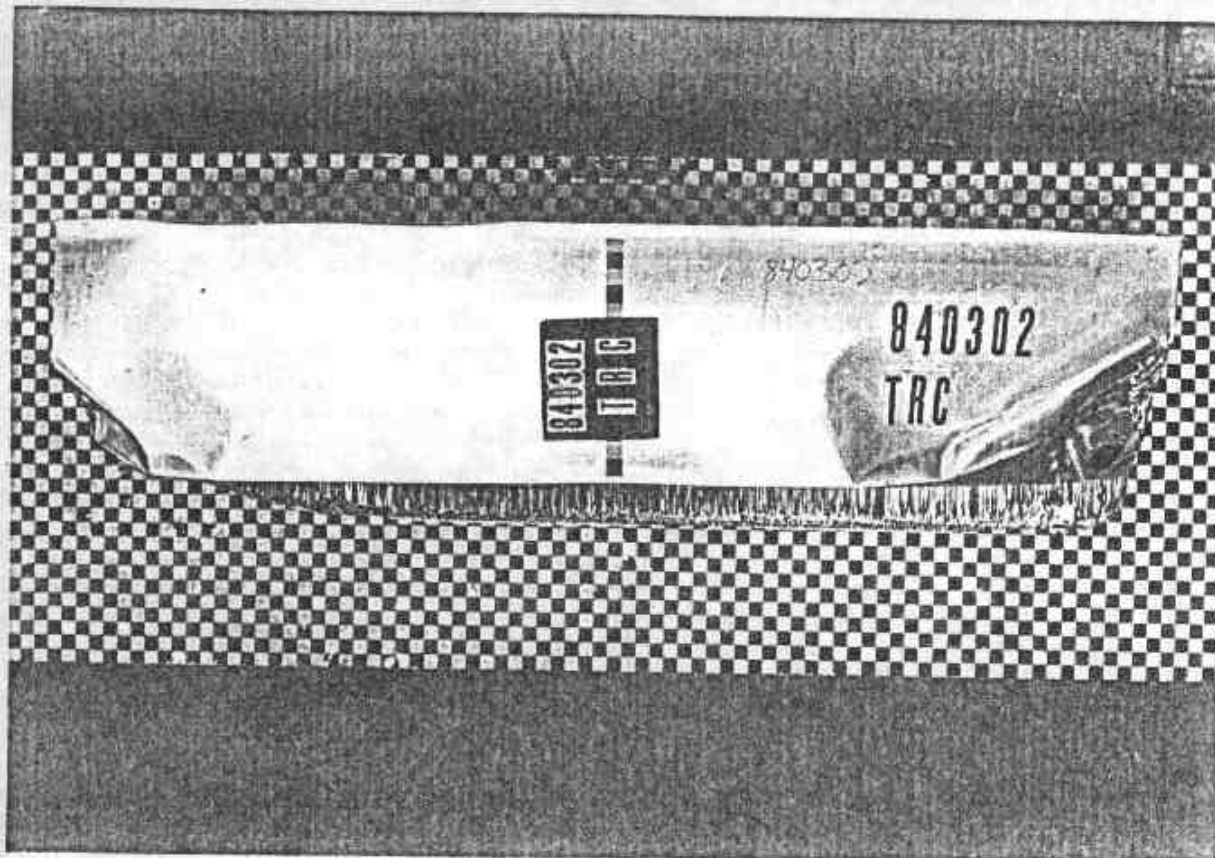


Figure A-29. POST-TEST MDB FACE - VIEW 1

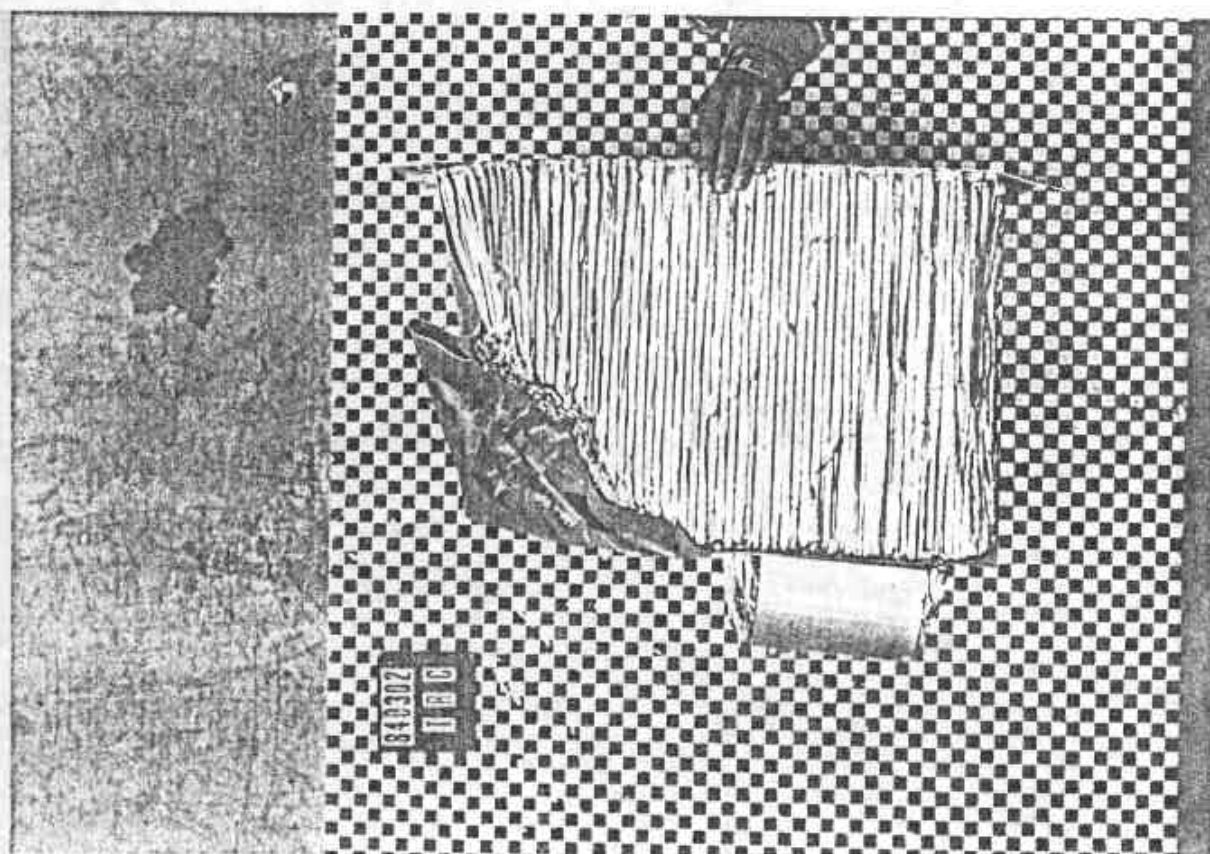


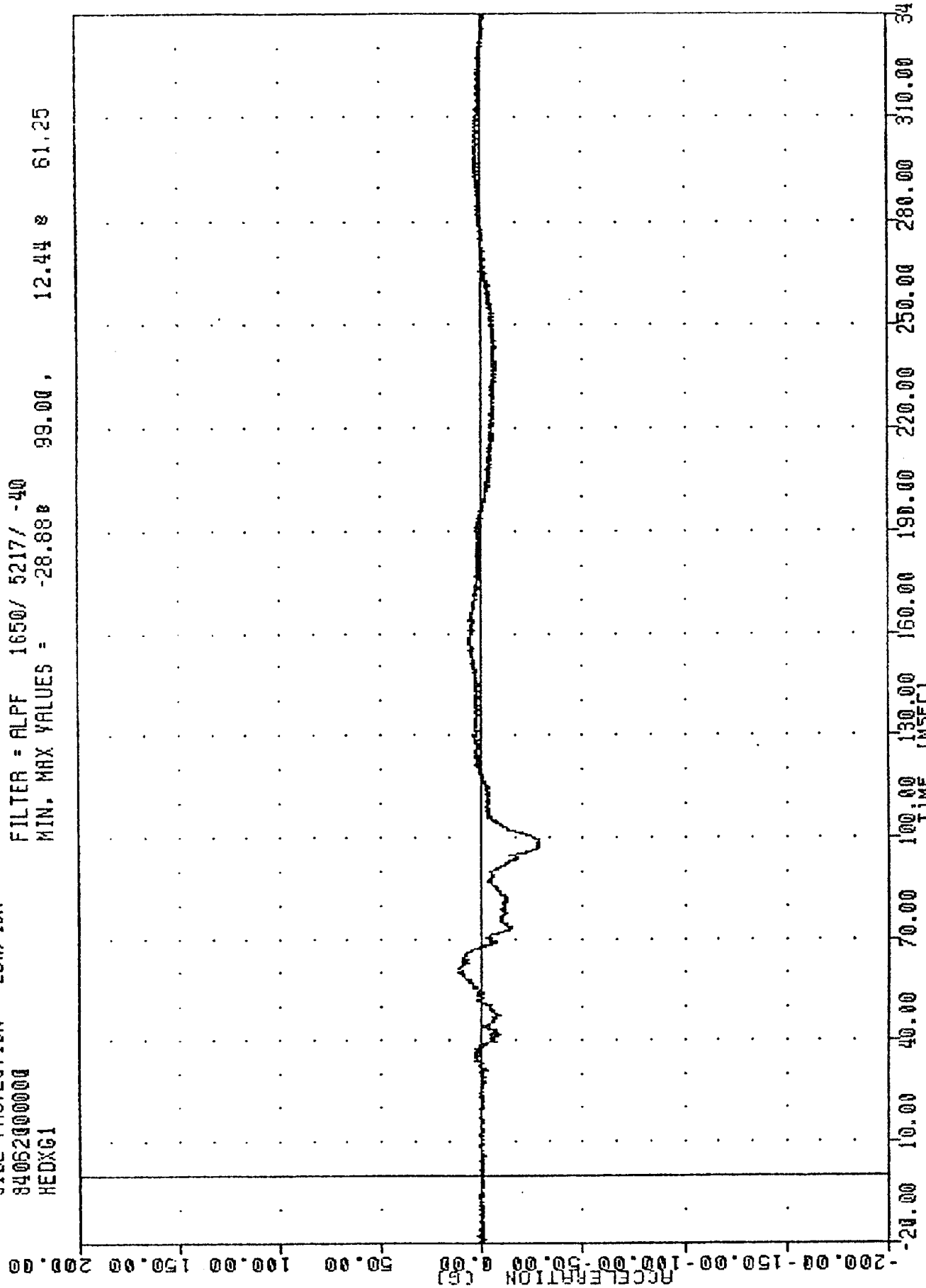
Figure A-30. POST-TEST MDB FACE - VIEW 2

APPENDIX B
DATA PLOT PRESENTATION

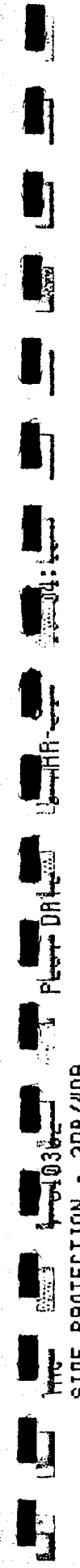
Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data were filtered according to SAE J211, except that dummy thorax data were filtered using the HSRI filter.

YMC 84062000000 HEDXG1
SIDE PROTECTION - 2DR/4DR
10302
PLOT DATE 10:01:40

FILTER = ALPF 1650/ 5217/ -40
MIN. MAX VALUES = -28.888 99.00, 12.44 8 61.25

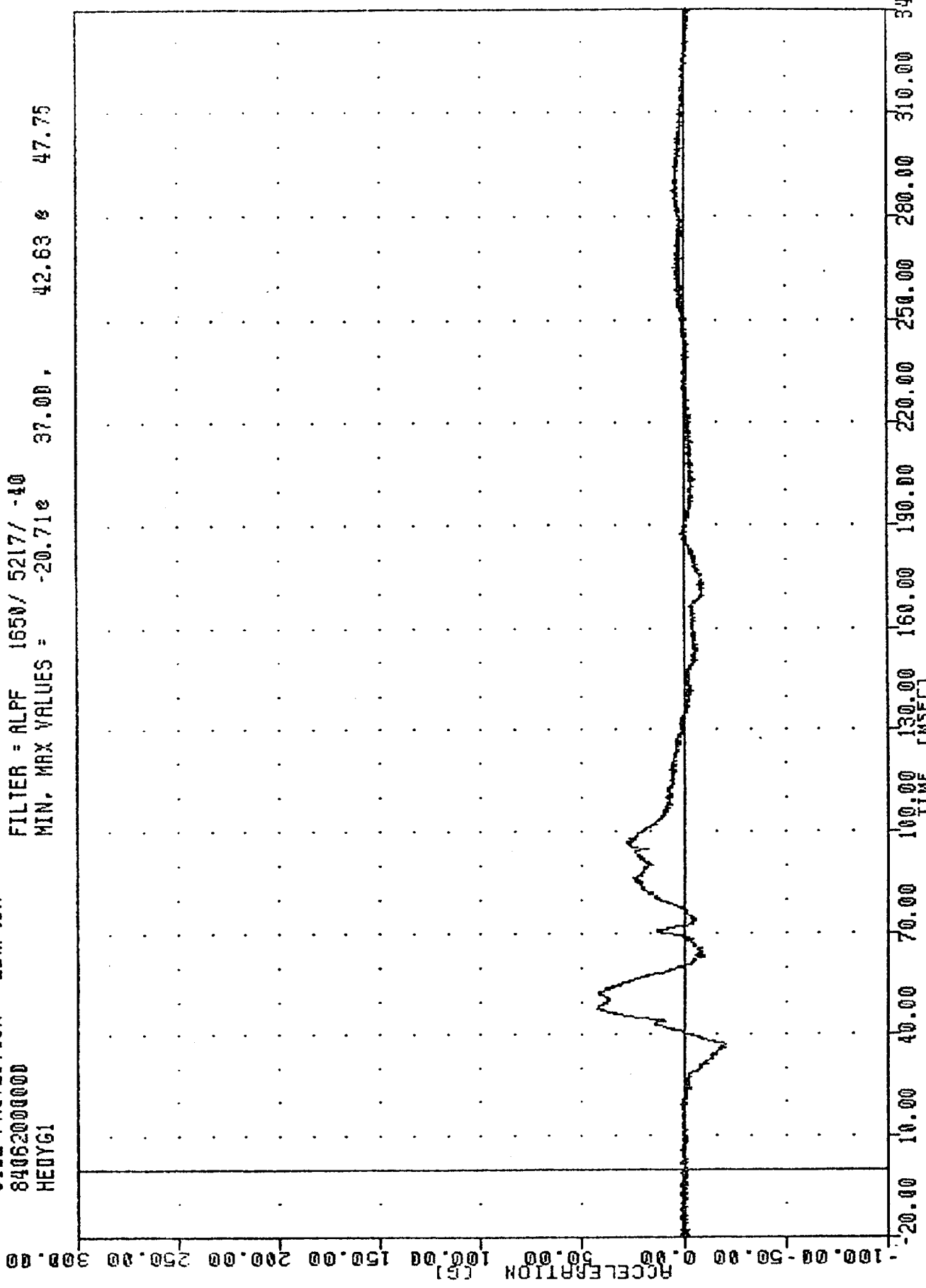


MOVING DEFORMABLE BARRIER INTO SENTRA
NATIVE HFN ACCCELERATION X AXIS



SIDE PROTECTION - 2DR/4DR
 84062000000
 HEDYG1

FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = -20.71e 42.63 e 47.75



MOVING DEFORMABLE BARRIER INTO SENTRA
 DRIVER HEAD ACCELERATION Y AXIS

THE DATE 5-11-84 13:24:40

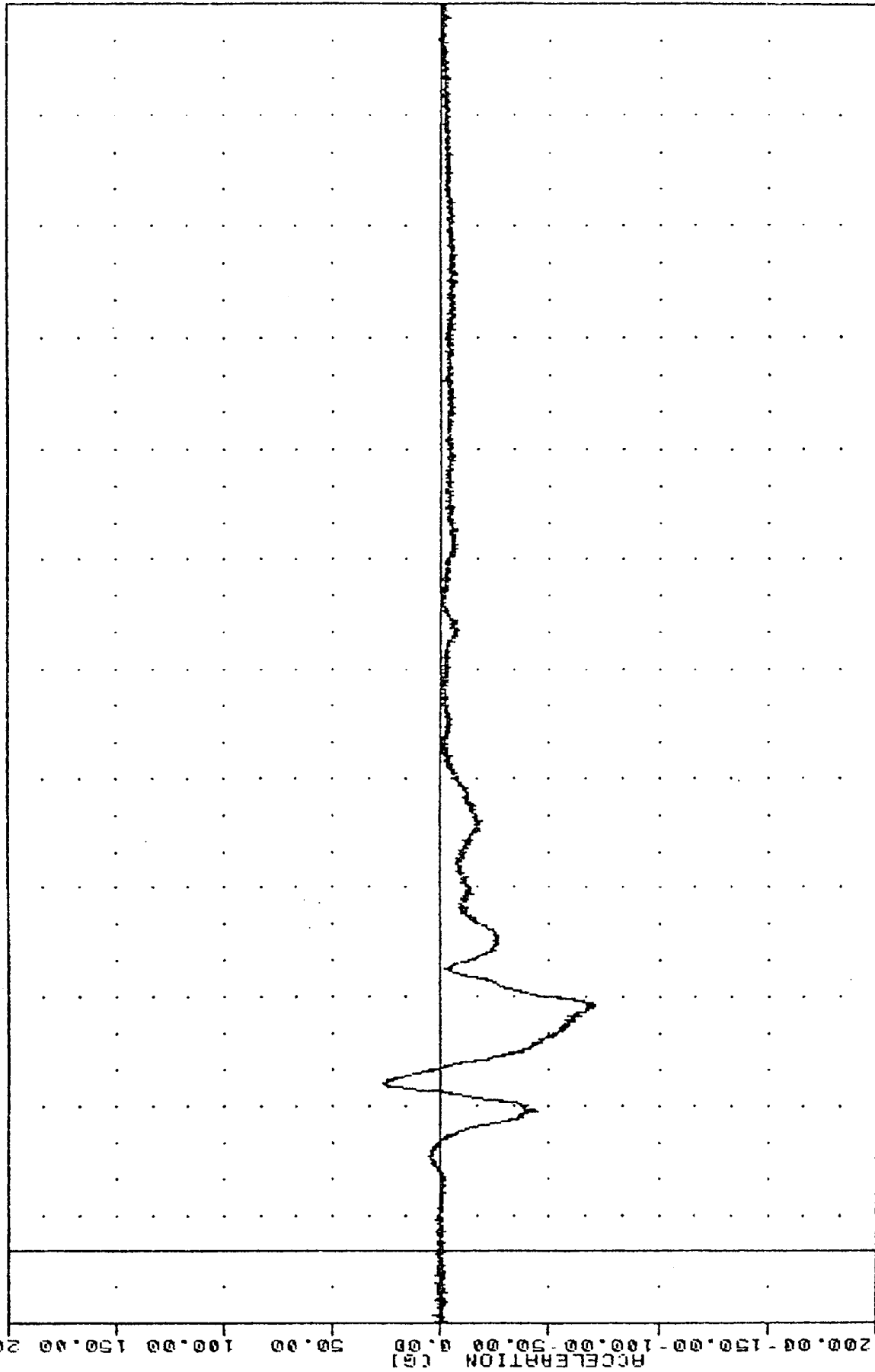
SIDE PROTECTION - 20R/4DR

84062000000

HEADZ61

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -71.14 67.50 , 26.85 46.13



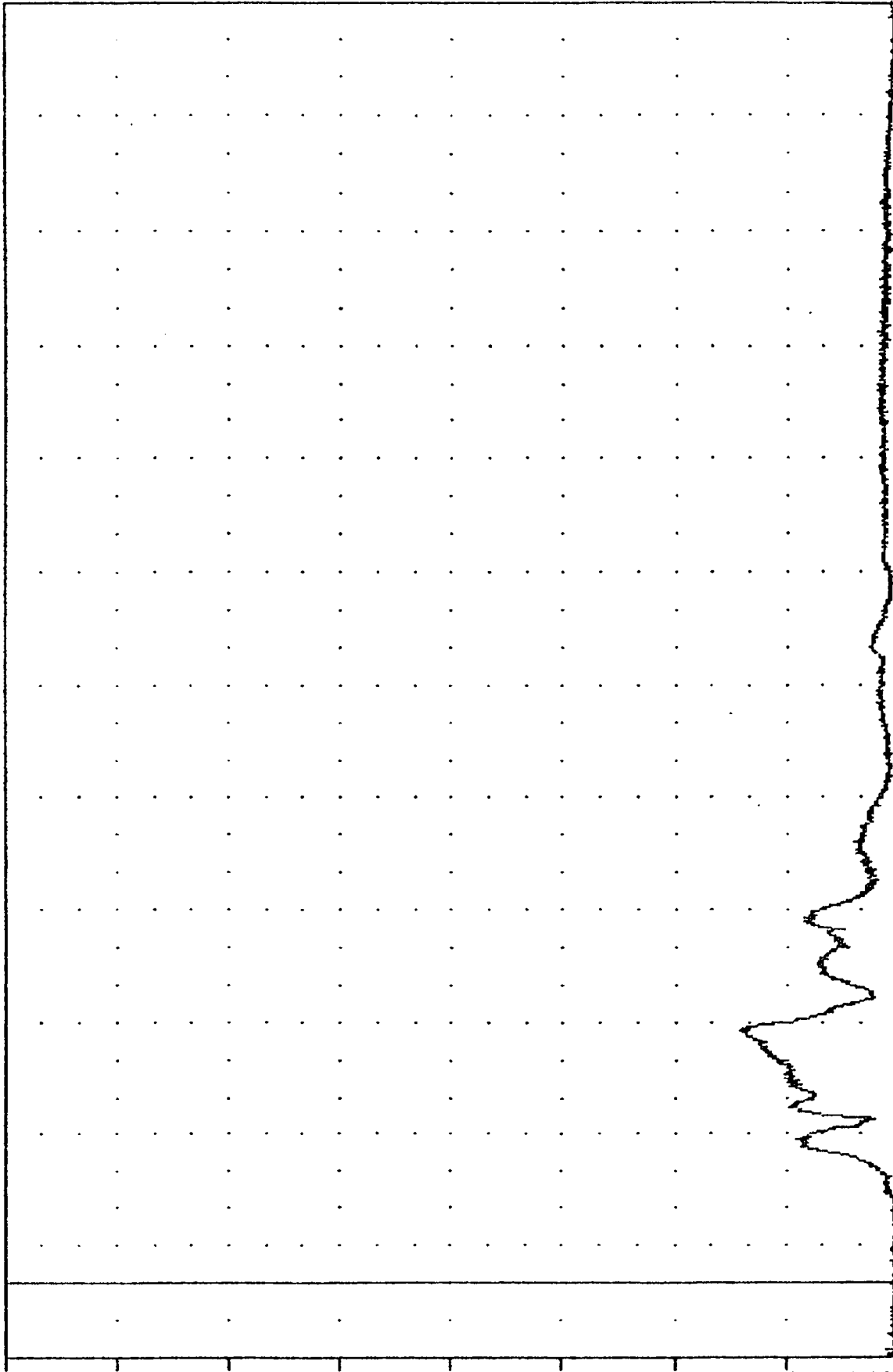
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
ACCELERATION (G)
TIME (CNSEC)

MOVING DEFORMABLE BARRIER INTO SENTRA
DRIVER HEAD ACCELERATION 7 AXIS



ACCELERATION (G)

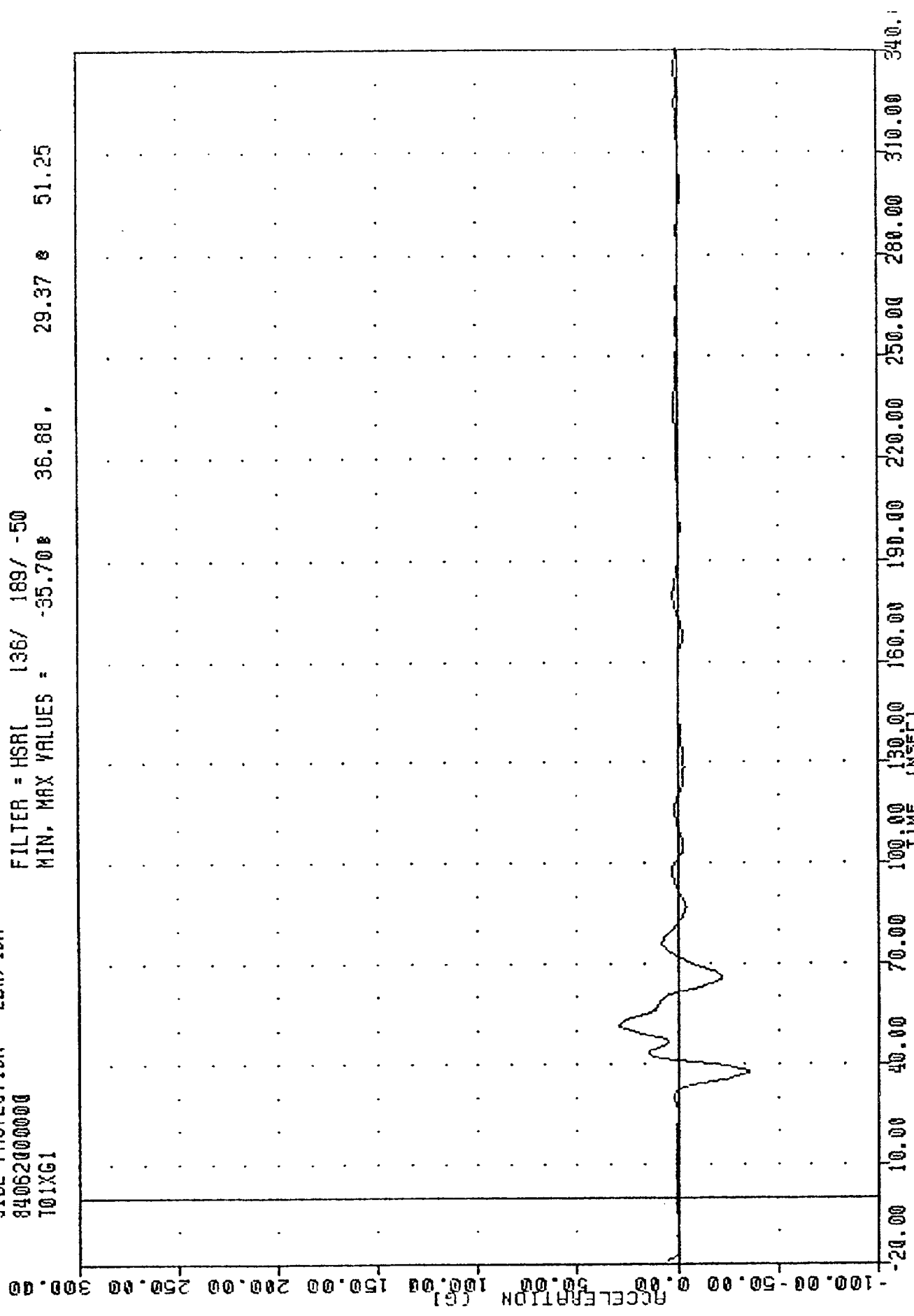
13:04:40
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = 0.16e 9.25, 71.19 e 67.50



-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 SENTRA
DRIVER HEAD RESULTANT

84062000000
 101XG1
 SIDE PROTECTION - 20R/40R
 84062000000
 101XG1
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -35.70 36.68, 29.37 51.25
 TYPICAL DATE 10/05/22



MOVING DEFORMABLE BARRIER INTO SENTRA
 NATYR UPPER SPINE ACCELERATION X AXIS

TRC

840620000000

840300Z

04 MAR 84

16:05:22

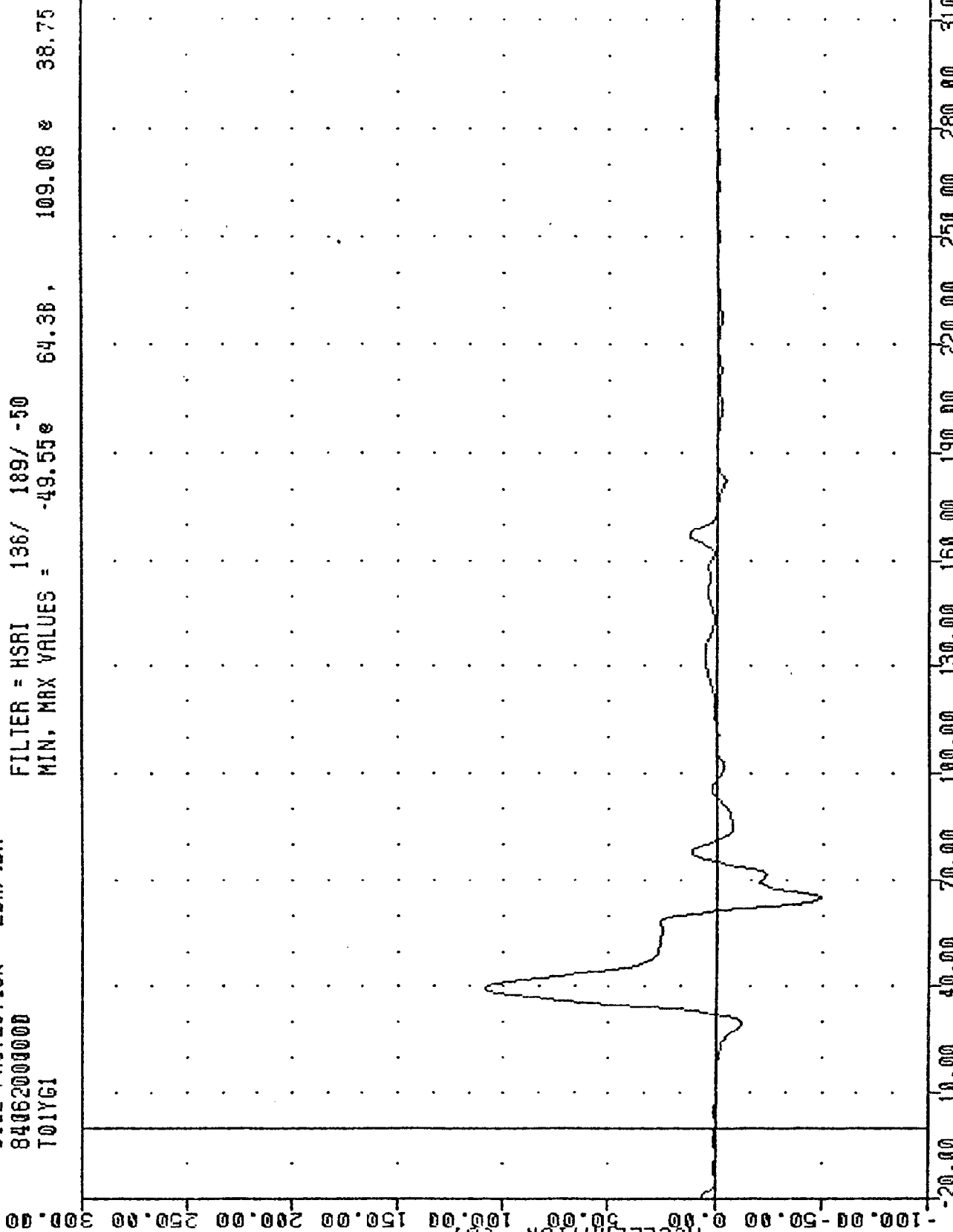
109.08

64.38

189 / -50

38.75

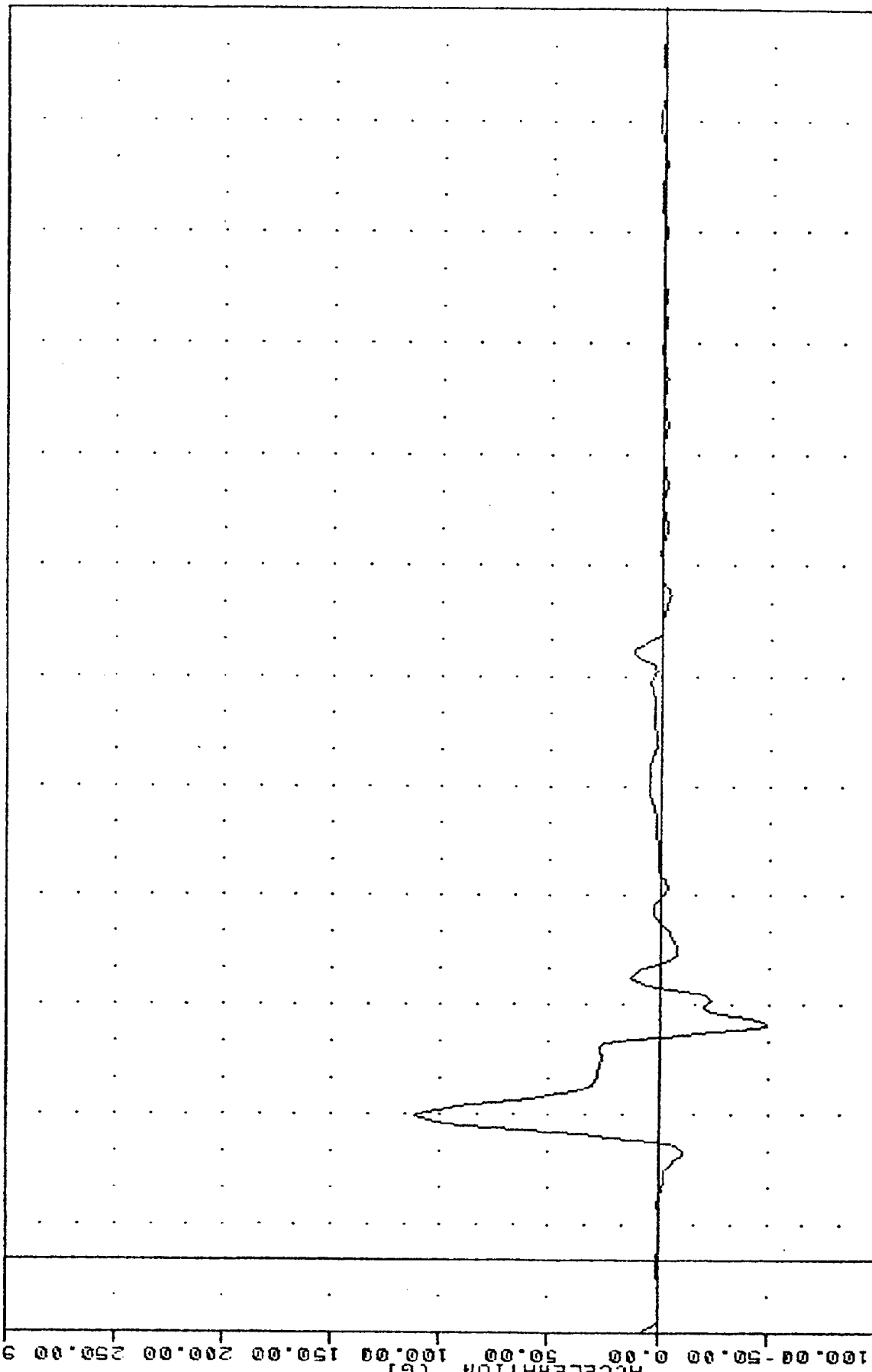
SIDE PROTECTION - 2DR/4DR
 840620000000
 T01Y61
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -49.55 64.38



MOVING DEFORMABLE BARRIER INTO SENTRA
 NATWR UPPER SPTRF ACCELERATION Y AXIS

SIDE PROTECTION - 2DR/4DR
 84062000000
 TQ1YSA
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -49.438 64.38 , 111.51 & 38.75
 PLAT-DATA
 15:05:22

ACCELERATION [G]
 -100.00 -50.00 0.00 50.00 100.00
 150.00 200.00 250.00 300.00 340.00
 TIME (MSEC)
 -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

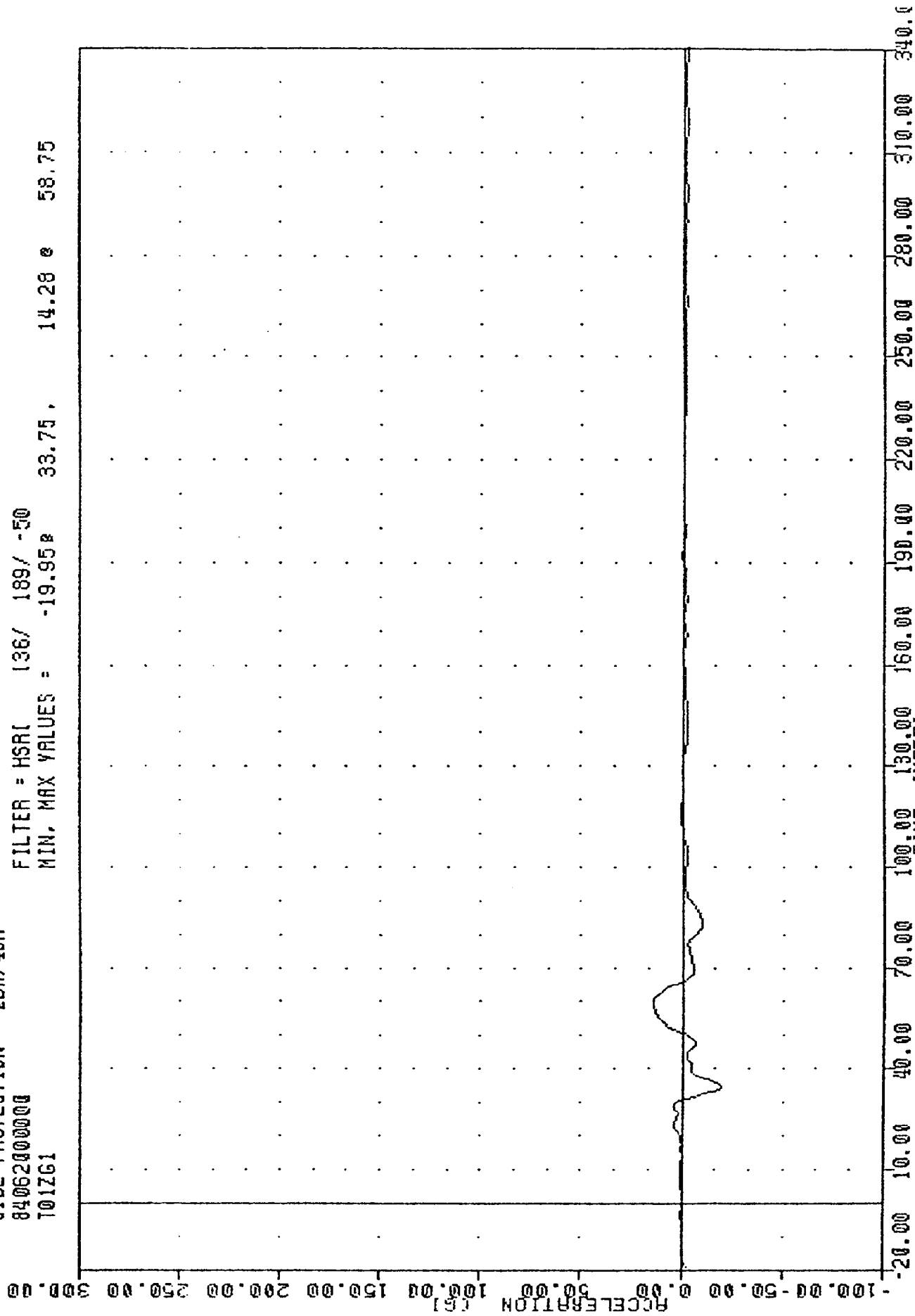


MOVING DEFORMABLE BARRIER INTO SENTRA
 DRIVER UPPER SPINE ACCELERATION - Y AXIS



SIDE PROTECTION - 2DR/4DR
 84062000000
 T01ZG1

FILTER = HSRC 136/ 189/ -50
 MIN, MAX VALUES = -19.95 33.75 , 14.28 e 58.75

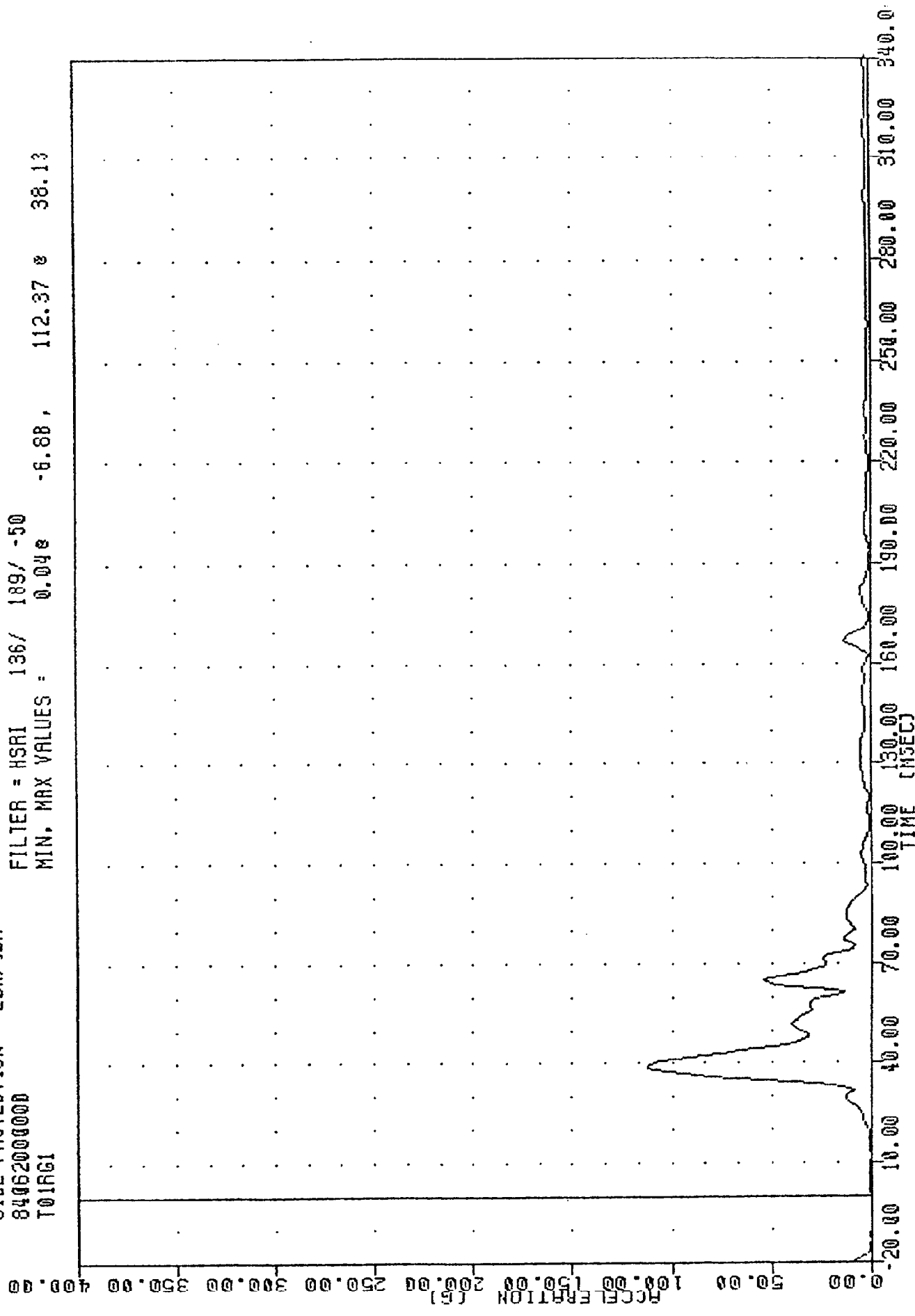


MOVING DEFORMABLE BARRIER INTO SENTRA
 DRIVER UPPER SPINE ACCELERATION Z AXIS

TTC 0001 090302
SIDE PROTECTION - 2DR/4DR
84062000000
T01RG1

PLATE DATA 10-28-16

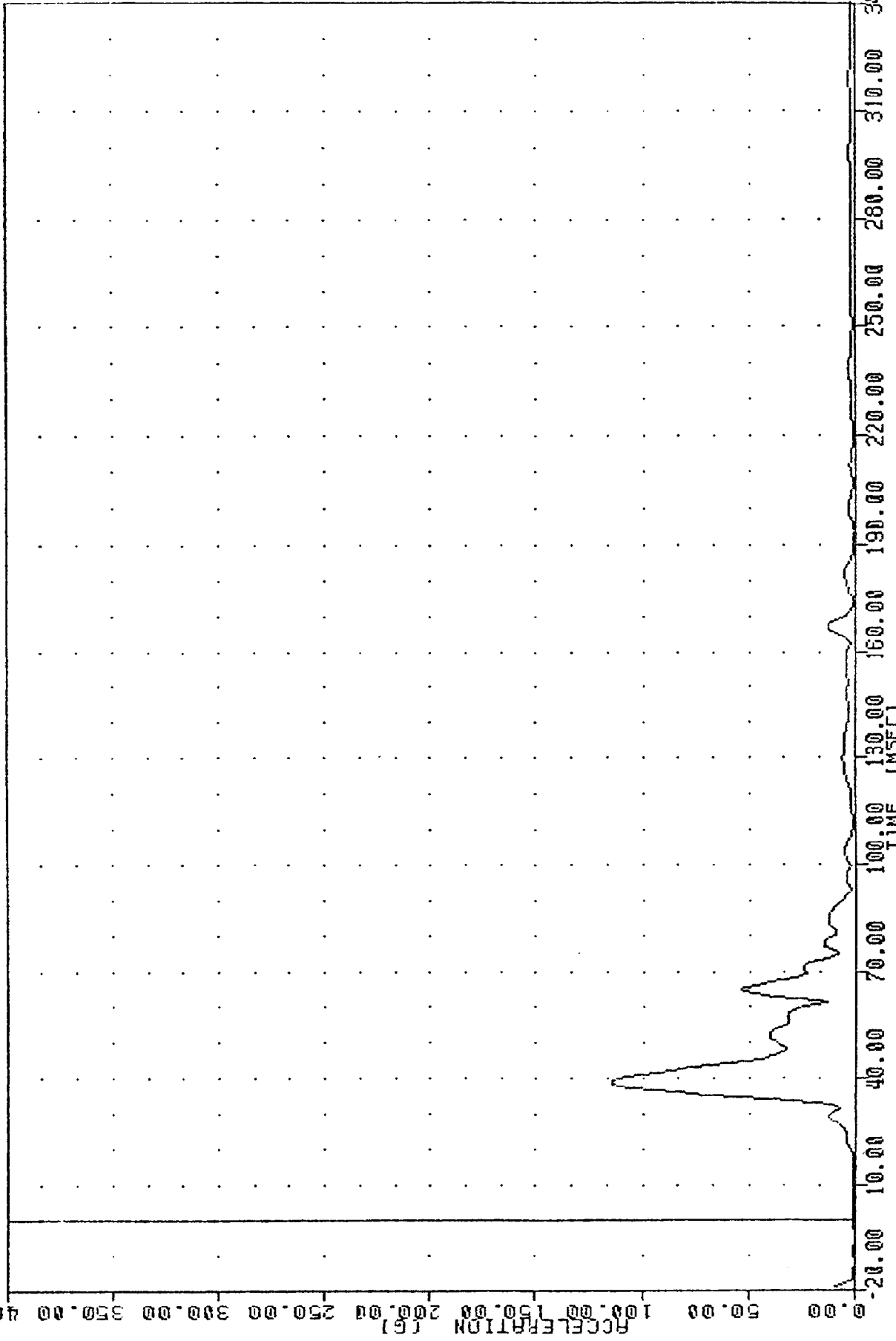
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.04e -6.88, 112.37 e 38.13



MOVING DEFORMABLE BARRIER INTO SENTRA
DRIVER UPPER SPINE RESULTANT

PLT DATE 6 MAR 64 10:31:17

FILTER = HSR1 136/ 189/ -50
MIN. MAX VALUES = 0.118 -6.25, 114.77 e 38.13



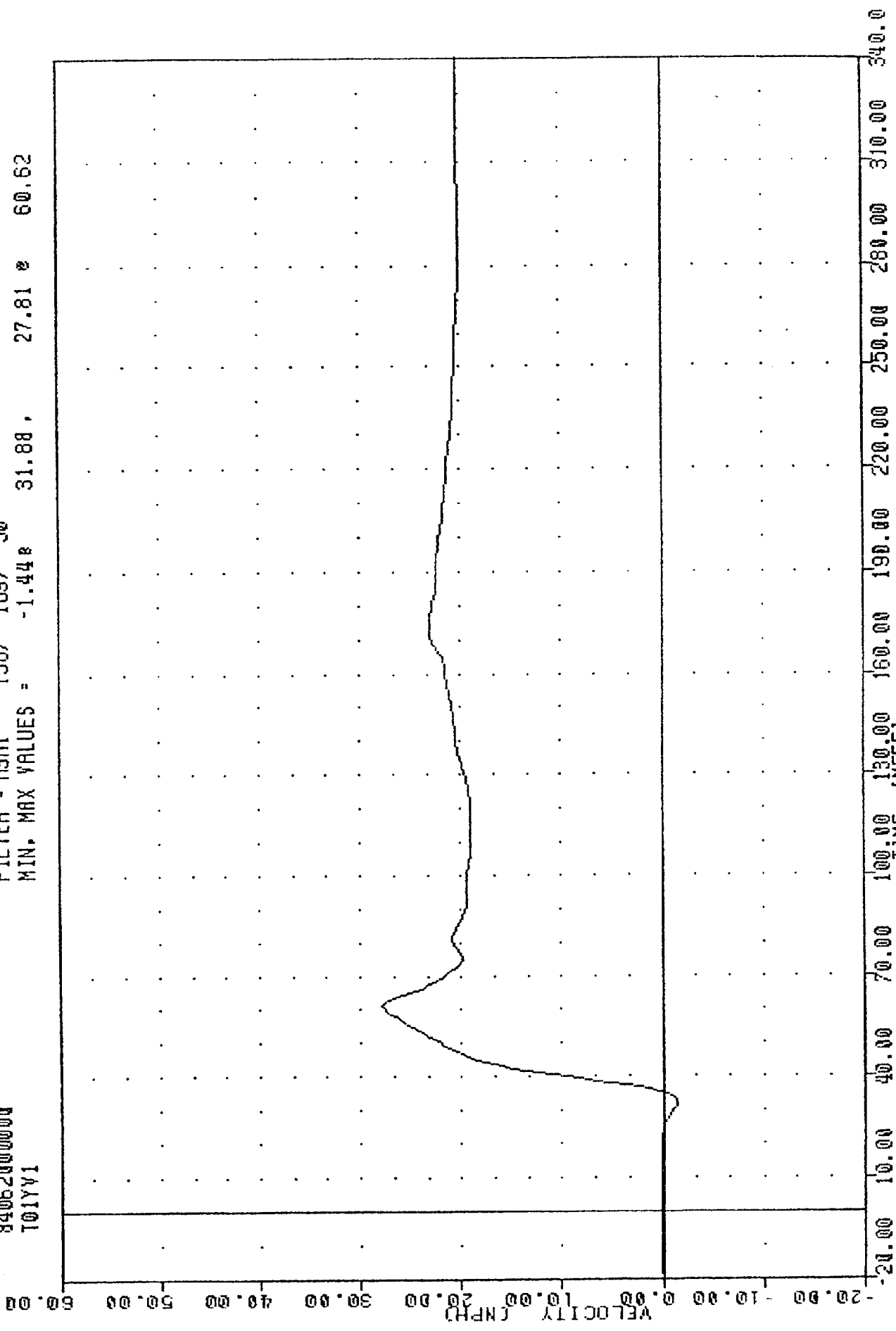
MOVING DEFORMABLE BARRIER INTO SENTRA
DRIVER UPPER SPINE RESULTANT USING T01YGA

THC

84062000000
T01YV1
SIDE PROTECTION - 2DR/4DR

PLT DATE 1988:25

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -1.44 31.88, 27.81 60.62



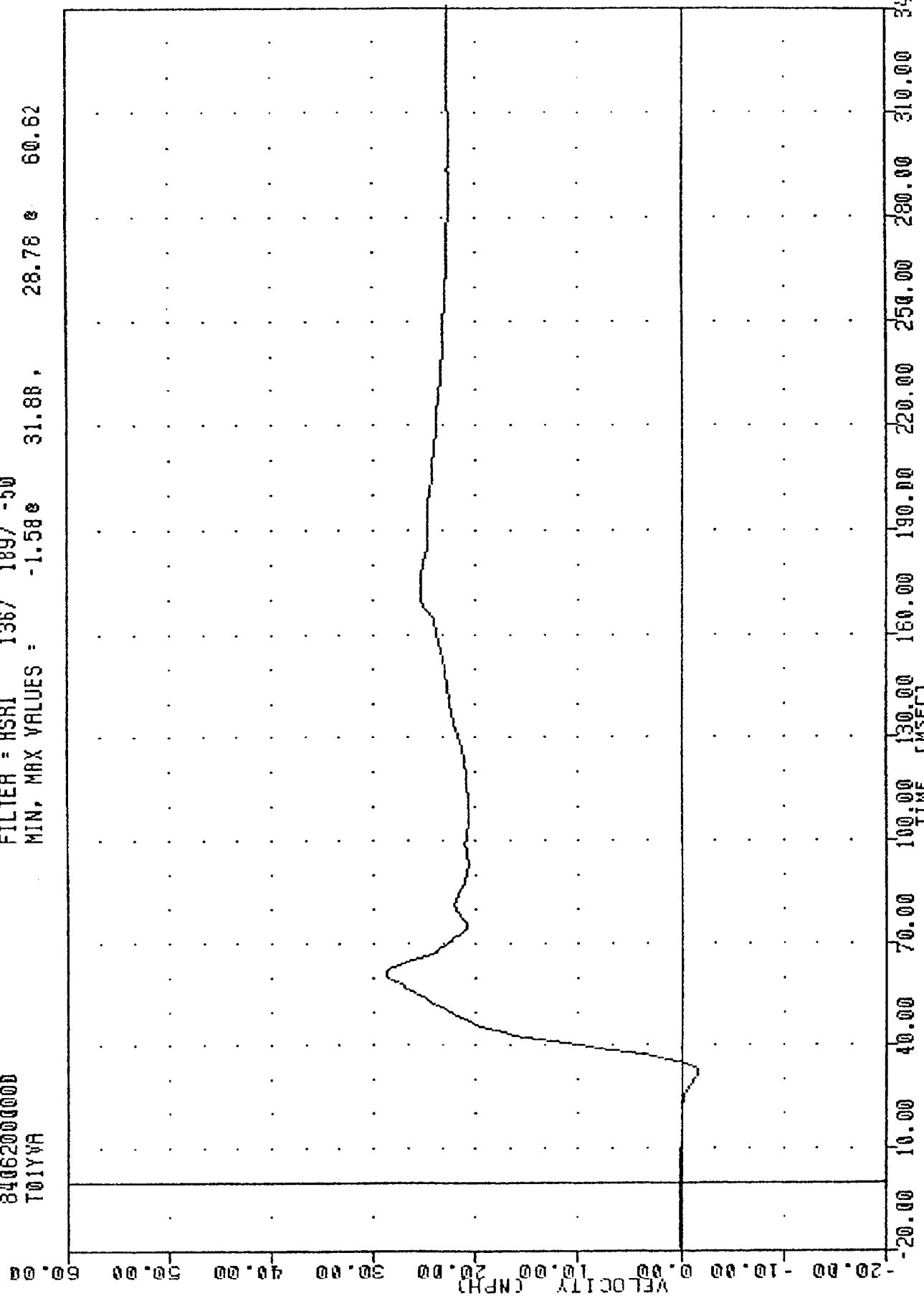
B-12

MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V USING T01Y61

TRC
 840302
 SIDE PROTECTION - 2DR/4DR
 8406200000
 TOIYVA

PLOT DATE 6-MAR-84 13:58:23

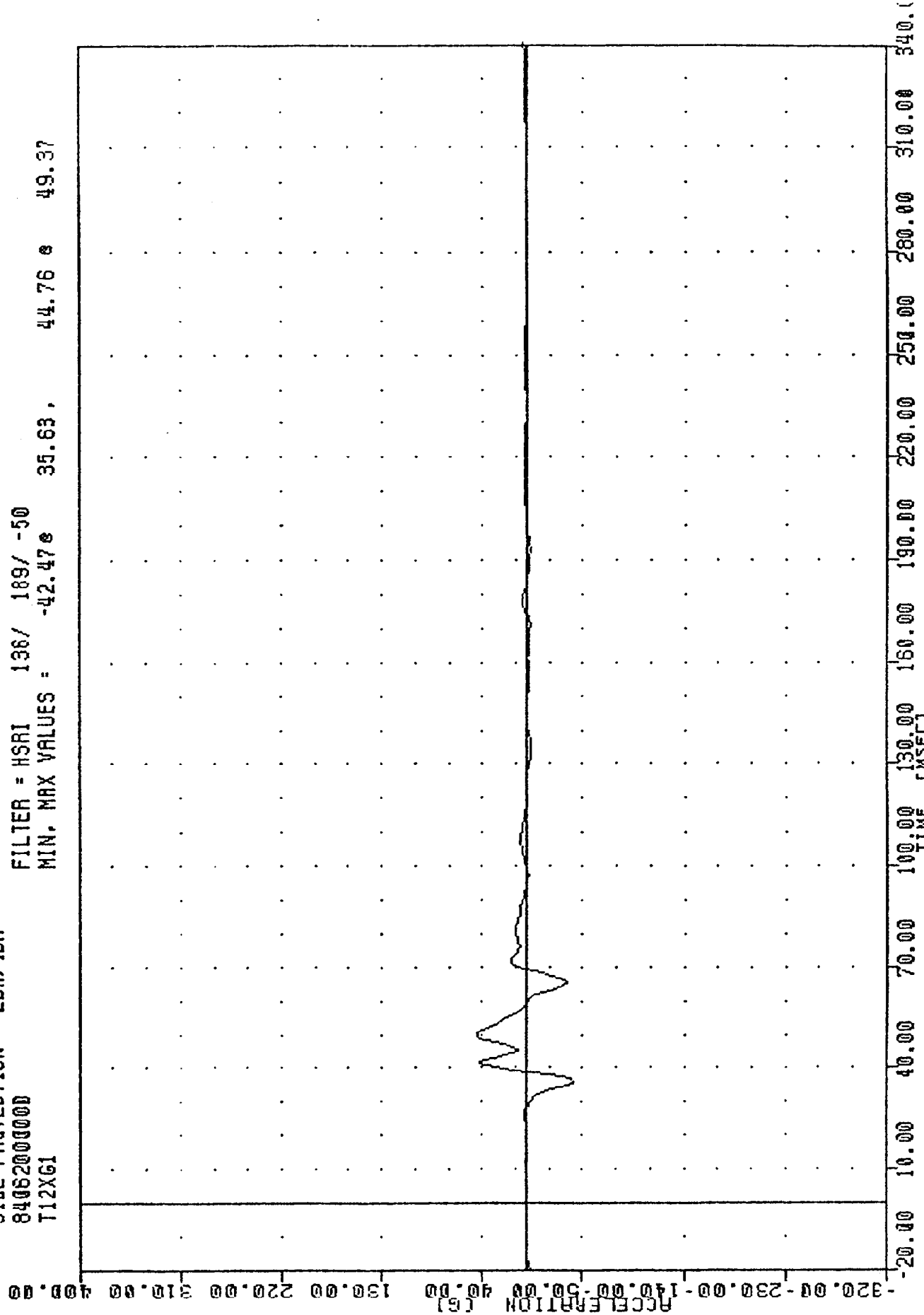
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -1.58e 31.88, 28.78 e 60.62



B-13

MOVING DEFORMABLE BARRIER INTO SENTRA
 DELTA V IICINC TOIYCA

840302
 SIDE PROTECTION - 2DR/4DR
 84062000000
 T12XG1
 PLOT DATE 10-05-72
 136/ 189/ -50
 MIN. MAX VALUES = -42.47e 44.76e 49.37

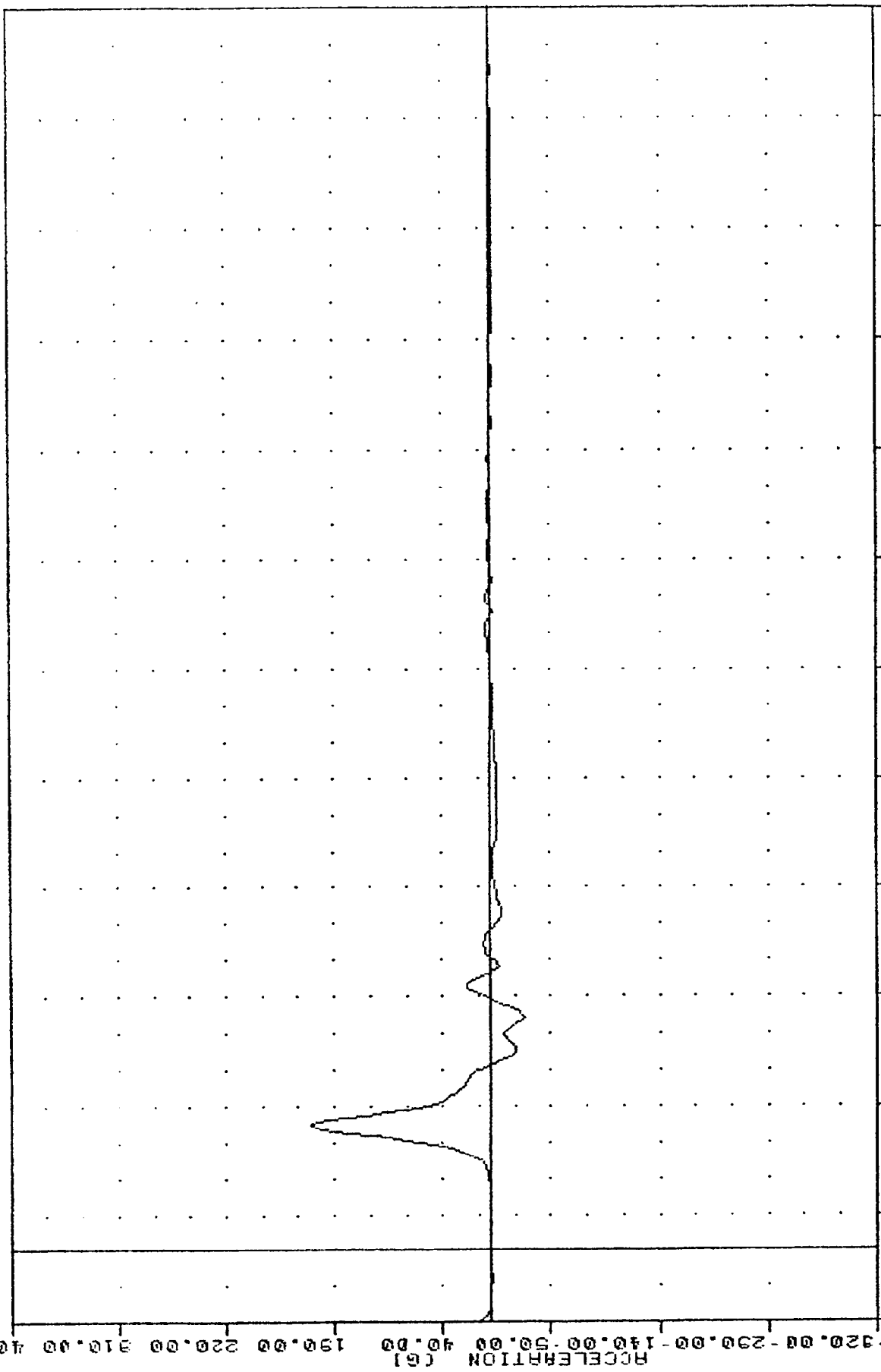


MOVING DEFORMABLE BARRIER INTO SENTRA
 NATVR LOWER SPINE ACCELERATION X AXIS

PLUG-DATA

FILTER = HSRI 136 / 189 / .50
MIN. MAX VALUES = -27.54 e 63.75 , 149.30 e 34.38

SIDE PROTECTION - 20R/4DR
84062000000
T12YB1



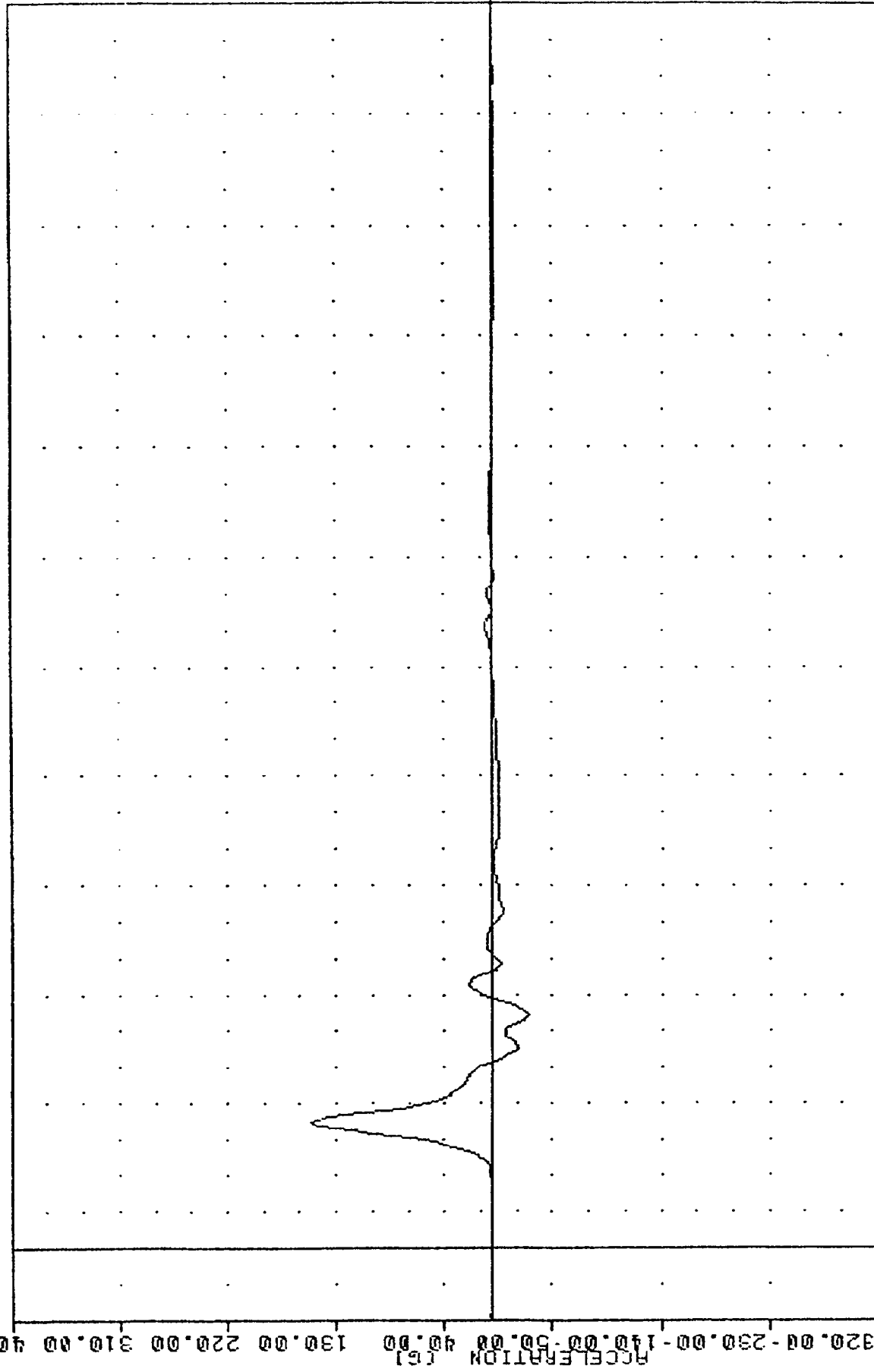
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO SENTRA
DRIVER LOWER SPINE ACCELERATION Y AXIS

11/05/92
 136/189/50
 63.75, 151.06 e 34.38
 136/189/50
 63.75, 151.06 e 34.38

SIDE PROTECTION - 2DR/4DR
 84062000000
 T12YGR

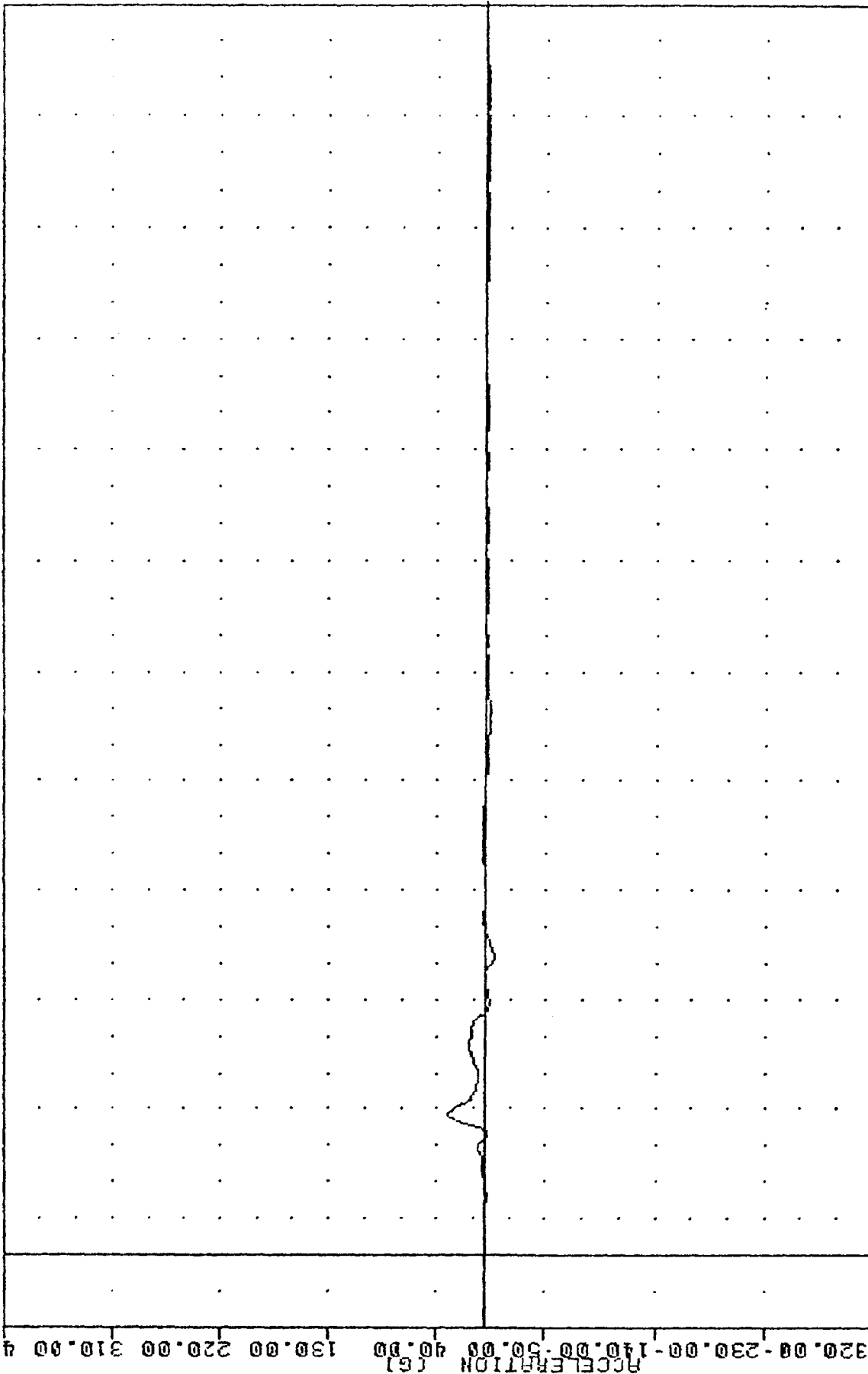
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -29.79e 63.75, 151.06 e 34.38



-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 SENTRA
 DRIVER LOWER SPINE ACCELERATION #2 Y AXIS

84062000000
T12ZG1

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -6.64g 30.22 g 37.50



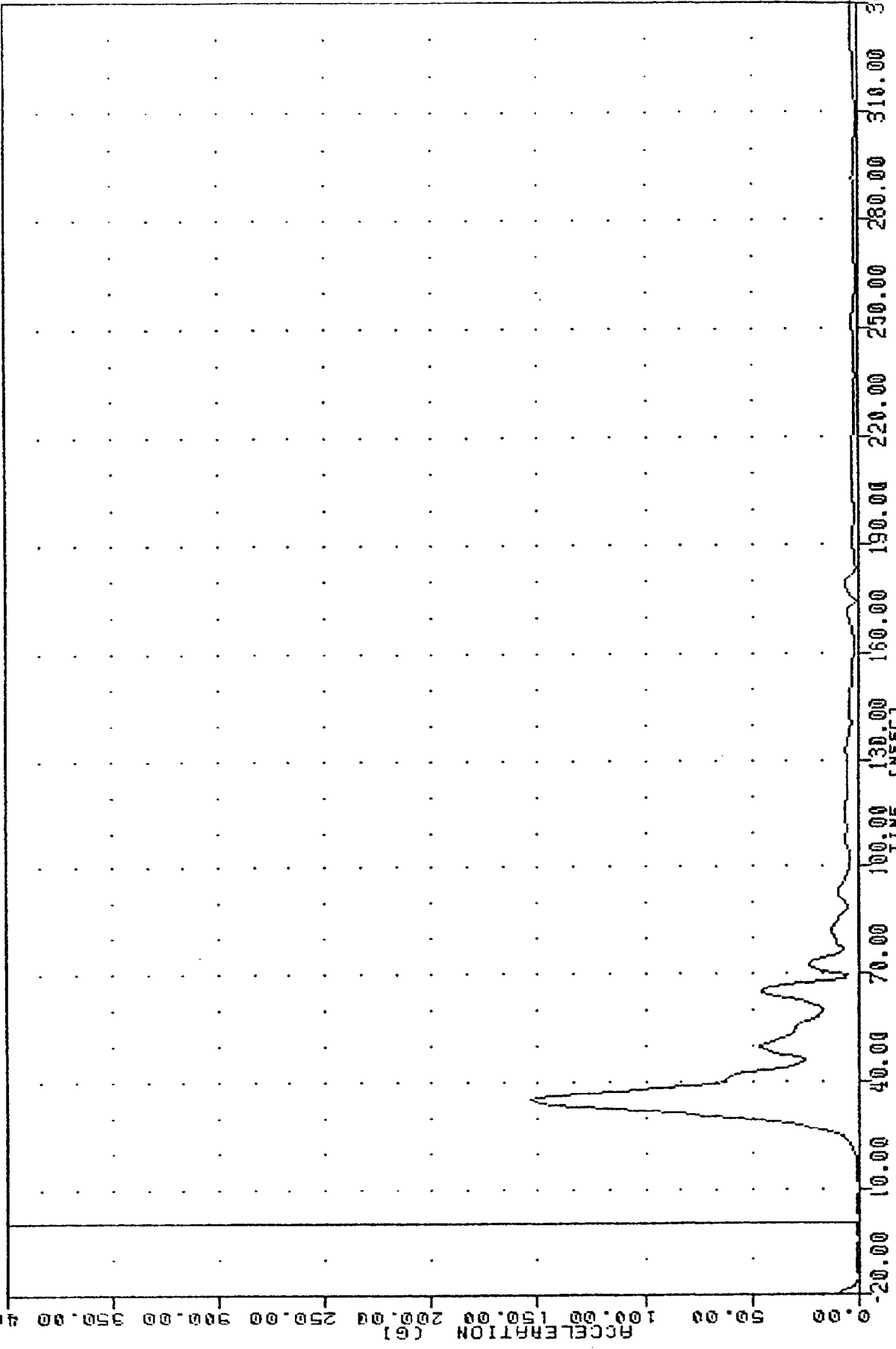
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO SENTRA
DRIVER LOWER SPINE ACCELERATION Z AXIS

TRC 840302 6-11-84 13:42:16

SIDE PROTECTION - 20R/4DR
84062000000
T12R61

FILTER = HSRI 136/ 189/ .50
MIN. MAX VALUES = 0.19g -5.00 153.86 g 34.38

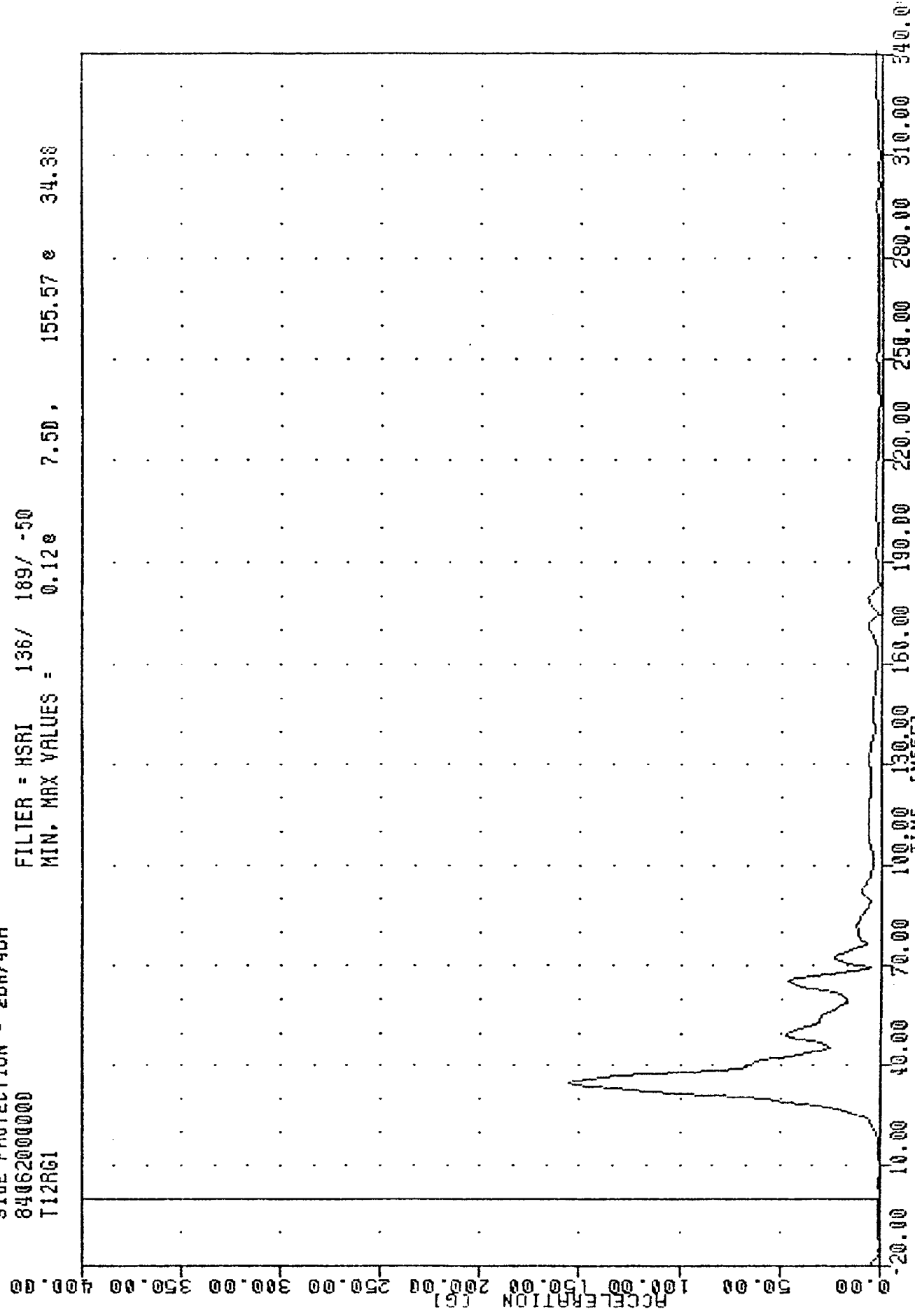


MOVING DEFORMABLE BARRIER INTO SENTRA
DRIVER IN WFR SPINE RESISTANT

THC
84062000000
T12R61
SIDE PROTECTION - 2DR/4DR
84062000000
T12R61

PLUT DATE 13.04.17

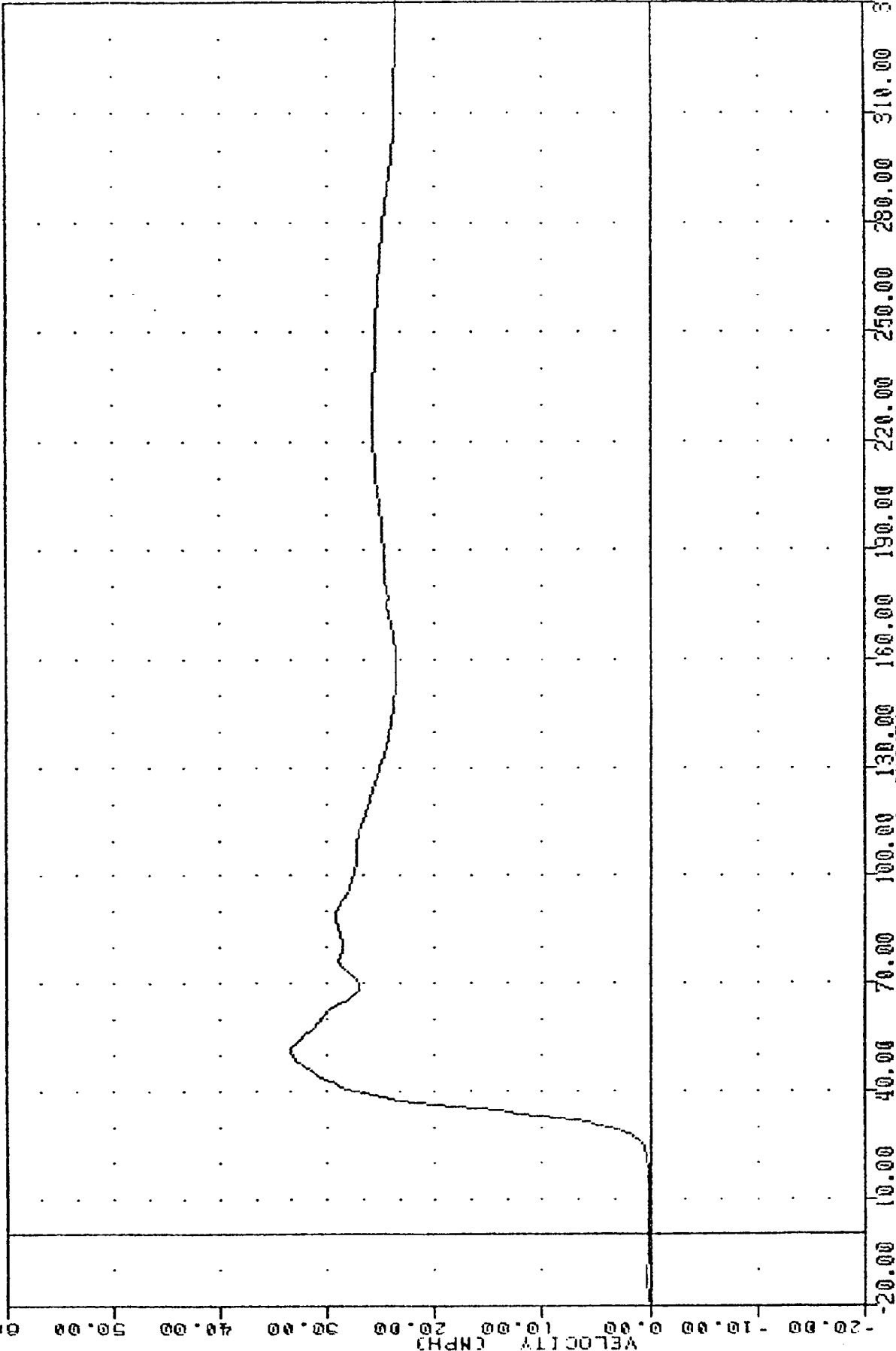
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.12e 7.50, 155.57 e 34.38



MOVING DEFORMABLE BARRIER INTO SENTRA
DRIVER LOWER SPINE RESISTANT USING T12YCA

THC 040302 8 APR 84 15:38:23

FILTER = HSRI 136/ 189/ .50
MIN. MAX VALUES = 0.00e -20.00, 33.38 e 50.63

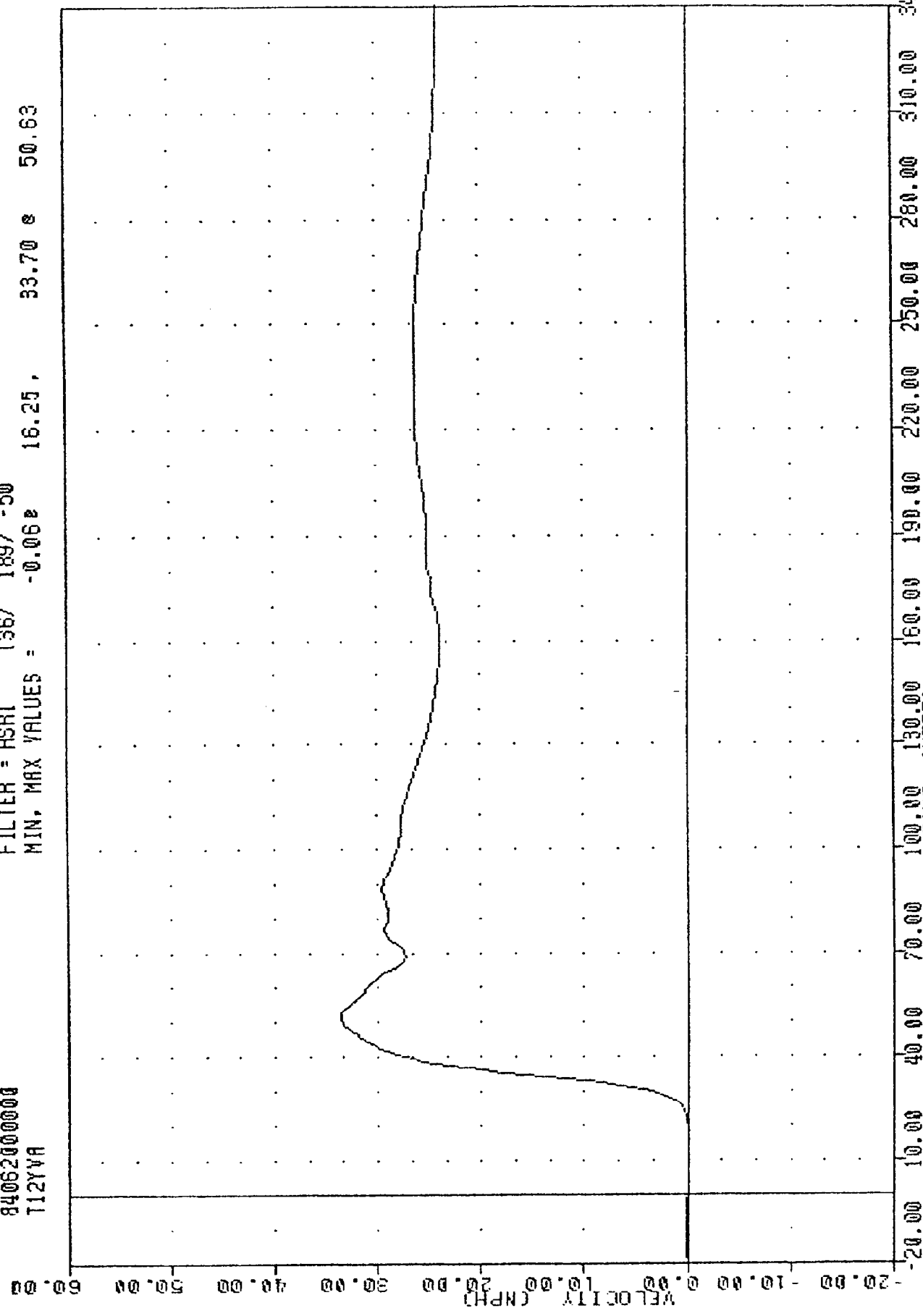


MOVING DEFORMABLE BARRIER INTO SENTRA
NETA W IISING T12YGI

Plot DATE 04/03/02 13:38:23

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -0.062 16.25 , 33.70 e 50.63

Inc 84062000000
SIDE PROTECTION - 2DR/4DR
T12YVA

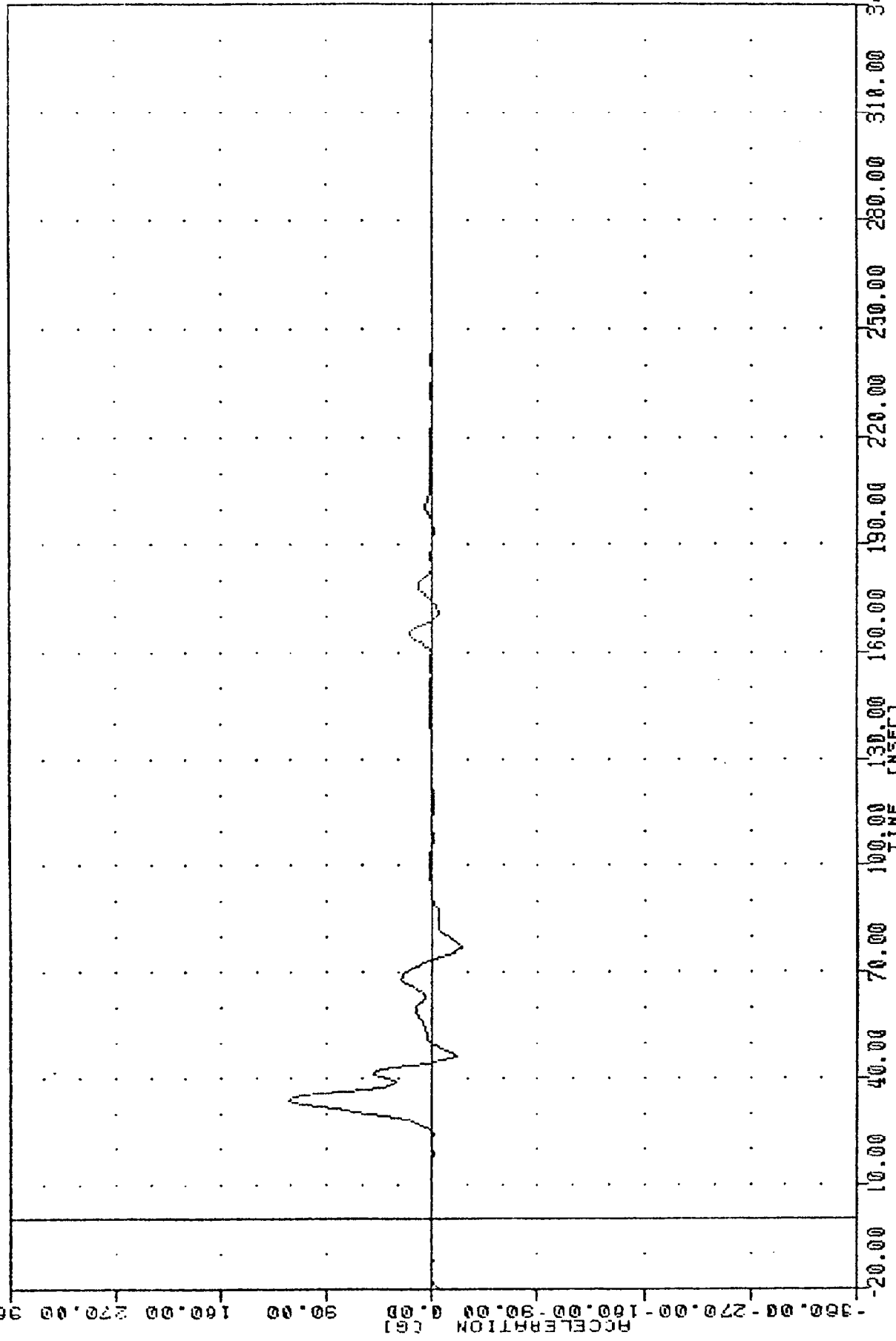


MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V USING T12YGA

DATE: 04/03/02 TIME: 10:05:22

SIDE PROTECTION - 20R/40R
84062000000
LURY61

FILTER = HSRI 136/ 189/ .50
MIN. MAX VALUES = -23.85 76.88 122.18 33.13



B-22

MOVING DEFORMABLE BARRIER INTO SENTRA
DATAFR 1 FFT UPPER RTR ACCELERATION Y AXIS

TMC 64030Z 6 MAR 64 13:58:23

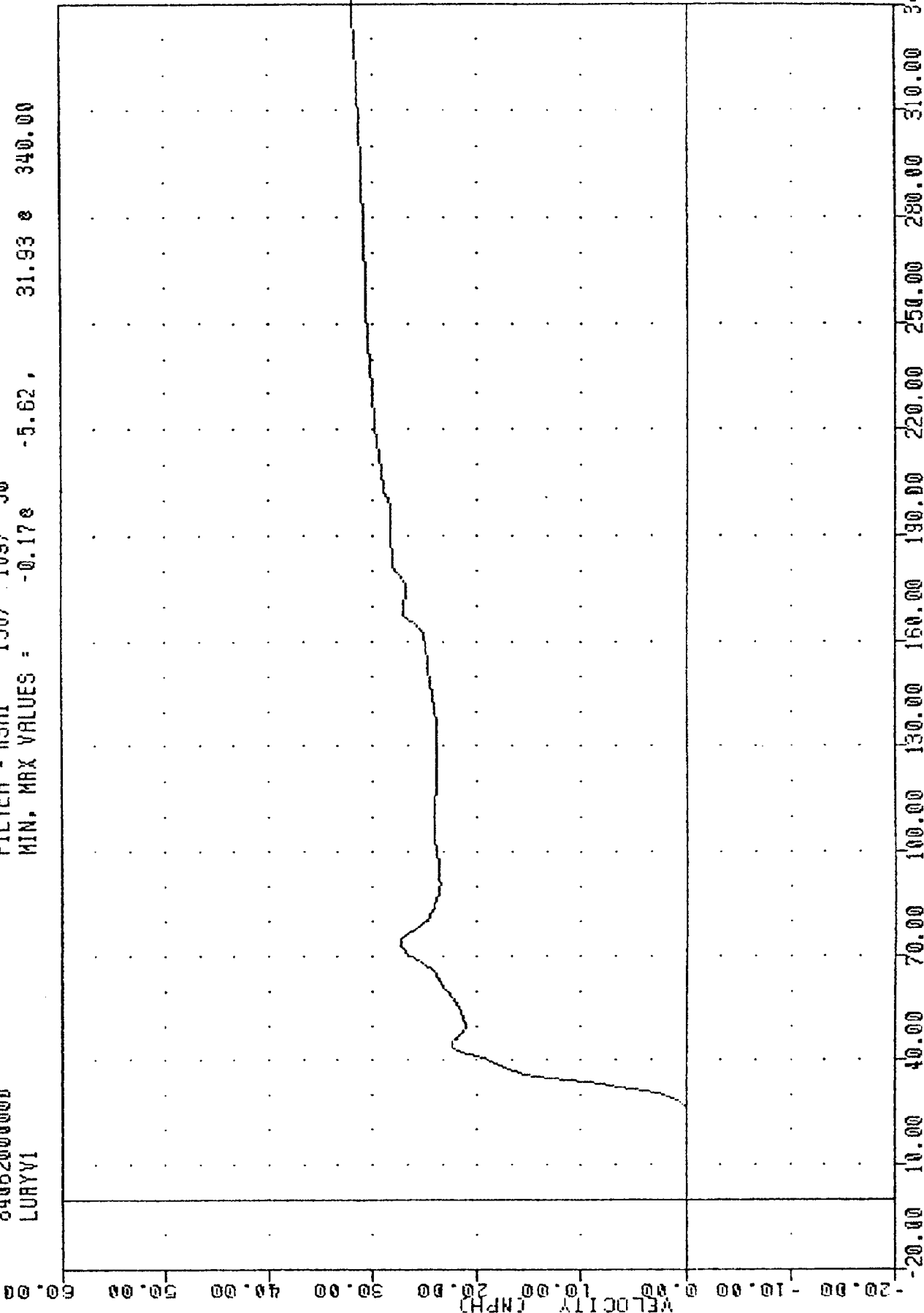
SIDE PROTECTION - 2DR/4DR

64062000000

LURYV1

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.17e -5.62, 31.93 e 340.00



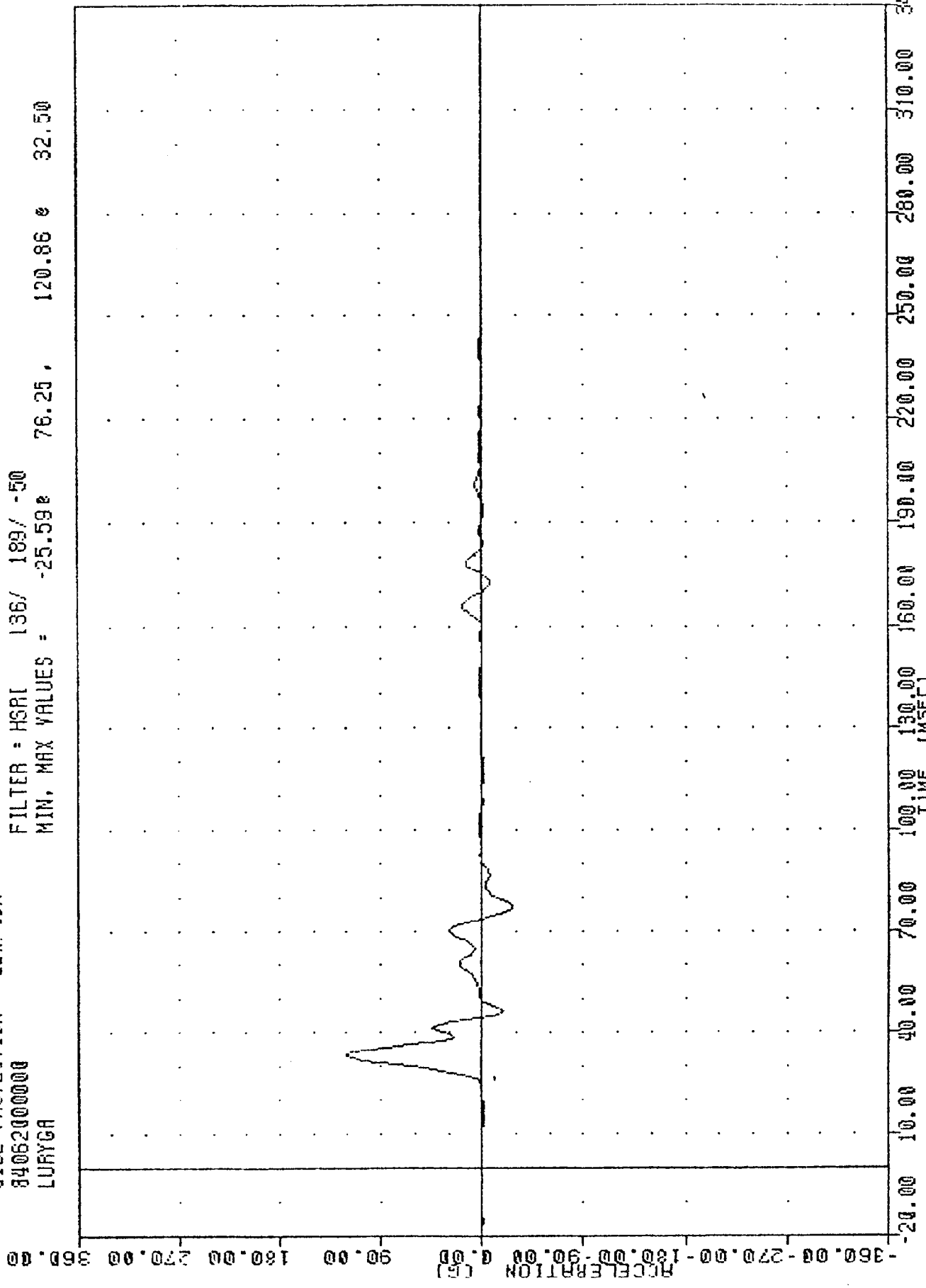
MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V USING LURYGI



7-040502 13:05:22

TTC
SIDE PROTECTION - 20R/40R
84052000000
LURYGA

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -25.59e 76.25, 120.86 e 32.50

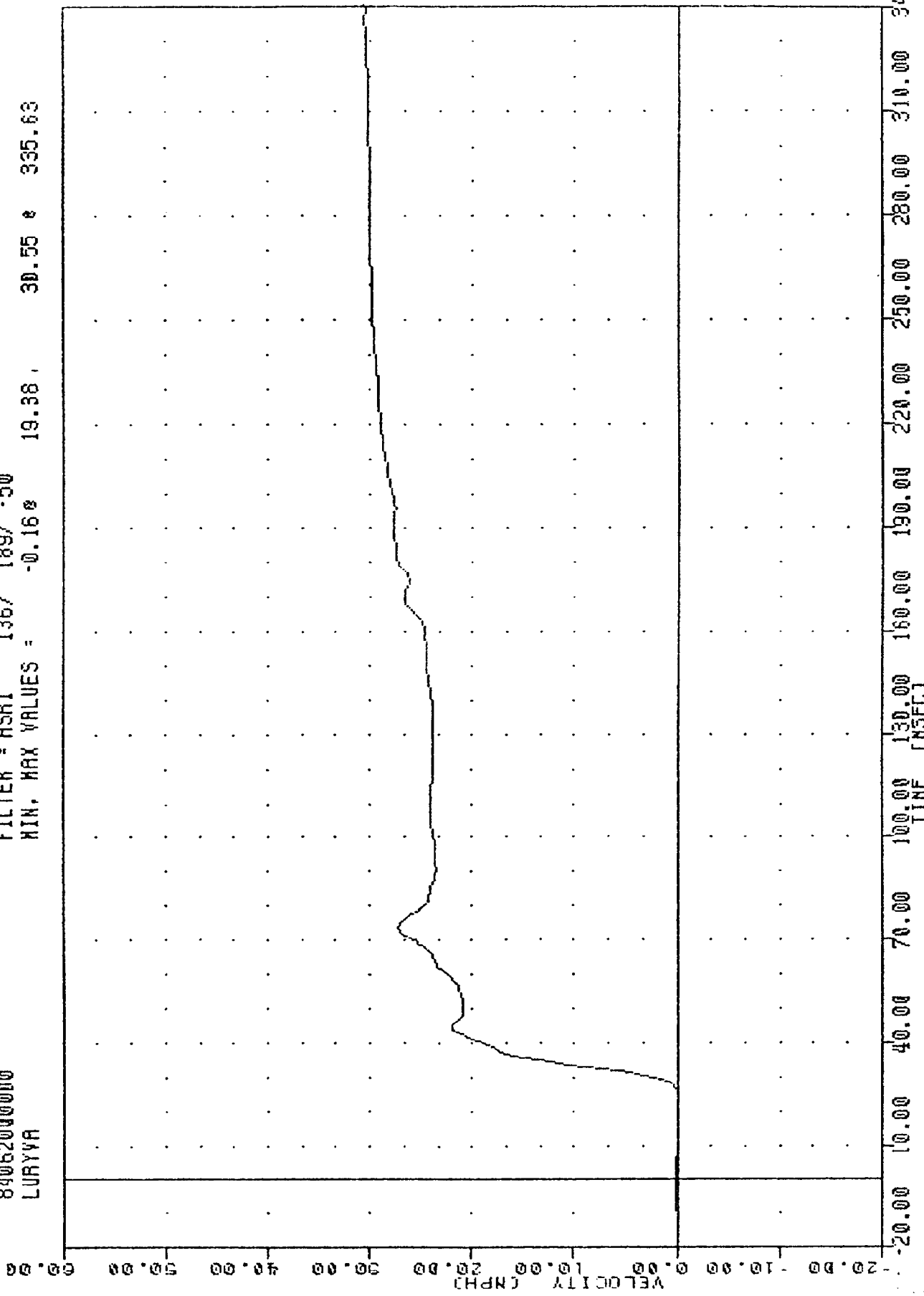


MOVING DEFORMABLE BARRIER INTO SENTRA
DRIVER LEFT UPPER RTR ACCELERATION -2 Y AXIS

TMC 84062000000
 SIDE PROTECTION - 2DR/4DR
 84062000000
 LURYVA

PLOT DATE 6 APR 89 15:58:25

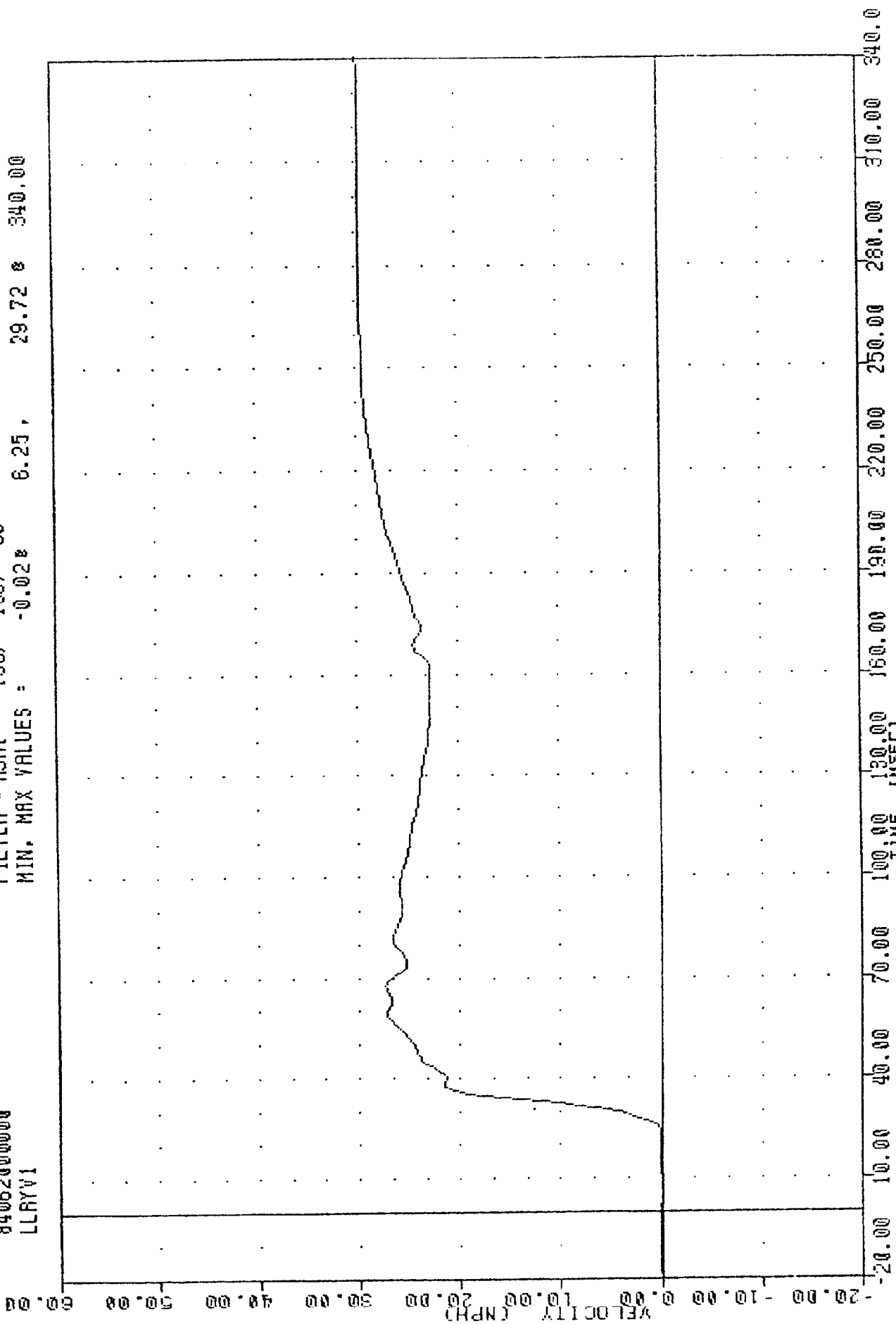
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.16 30.55 335.63



MOVING DEFORMABLE BARRIER INTO SENTRA
 DELTA W HSTNG IIRYGA

INC 0302 PLT-DATL 136/189/50
 SIDE PROTECTION - 2DR/4DR
 84062000000
 LLYYV1

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.02 6.25 29.72 340.00

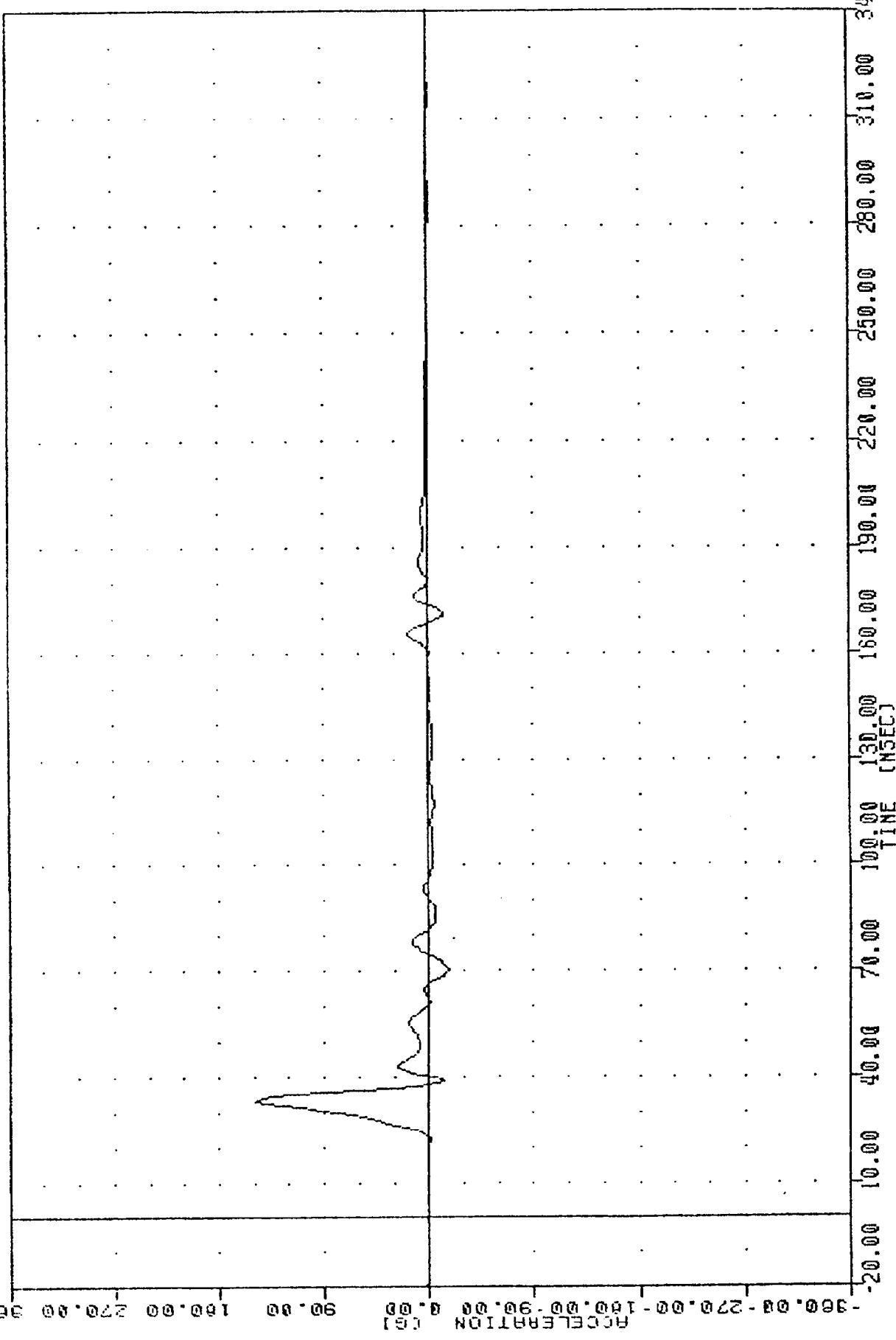


MOVING DEFORMABLE BARRIER INTO SENTRA
 DELTA V USING LLYYGI



TMC
 84062000000
 LLYEA
 SIDE PROTECTION - 20R/40R
 84062000000

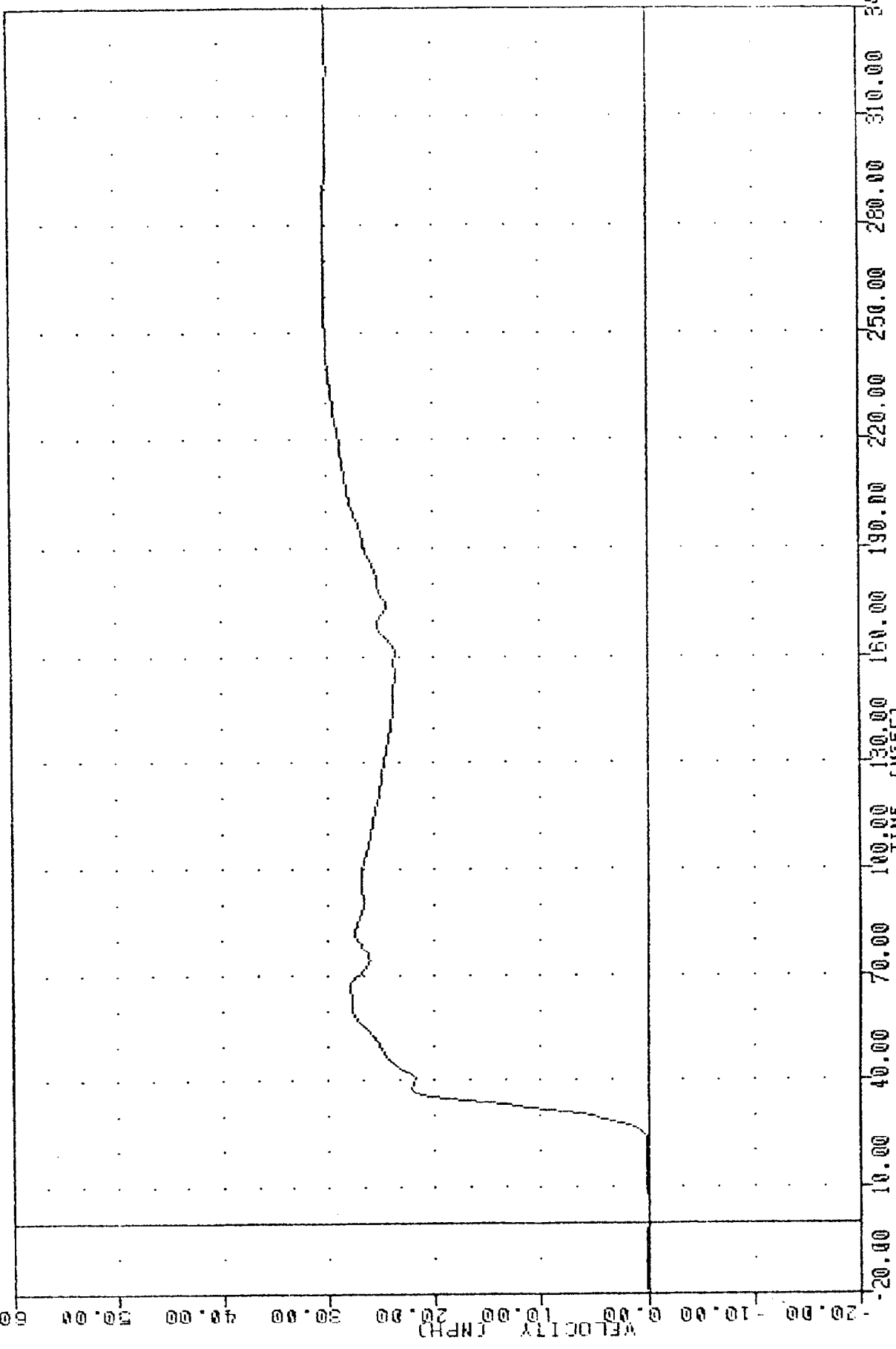
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -16.39e 69.38, 149.16 e 32.50



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

TRC
 840302
 SIDE PROTECTION - 2DR/4DR
 8406200000
 LLYYR
 PLOT DATE 6 APR 84 15:36:25

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.028 3.13, 50.32 @ 278.13

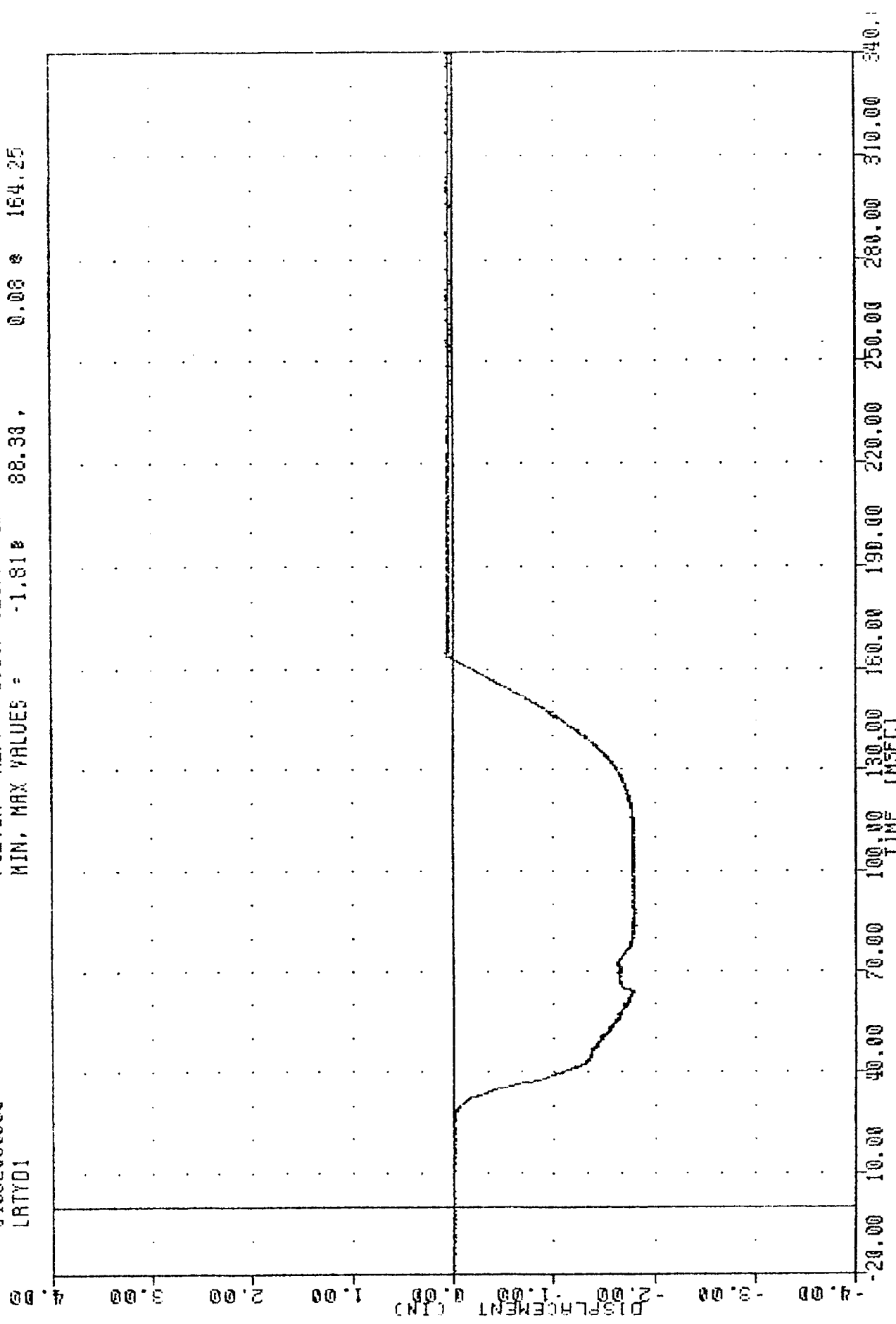


MOVING DEFORMABLE BARRIER INTO SENTRA
 PFI TA V IISTING I IRYGA



SIDE PROTECTION - 2DR/4DR
 84062000000
 LRTYD1

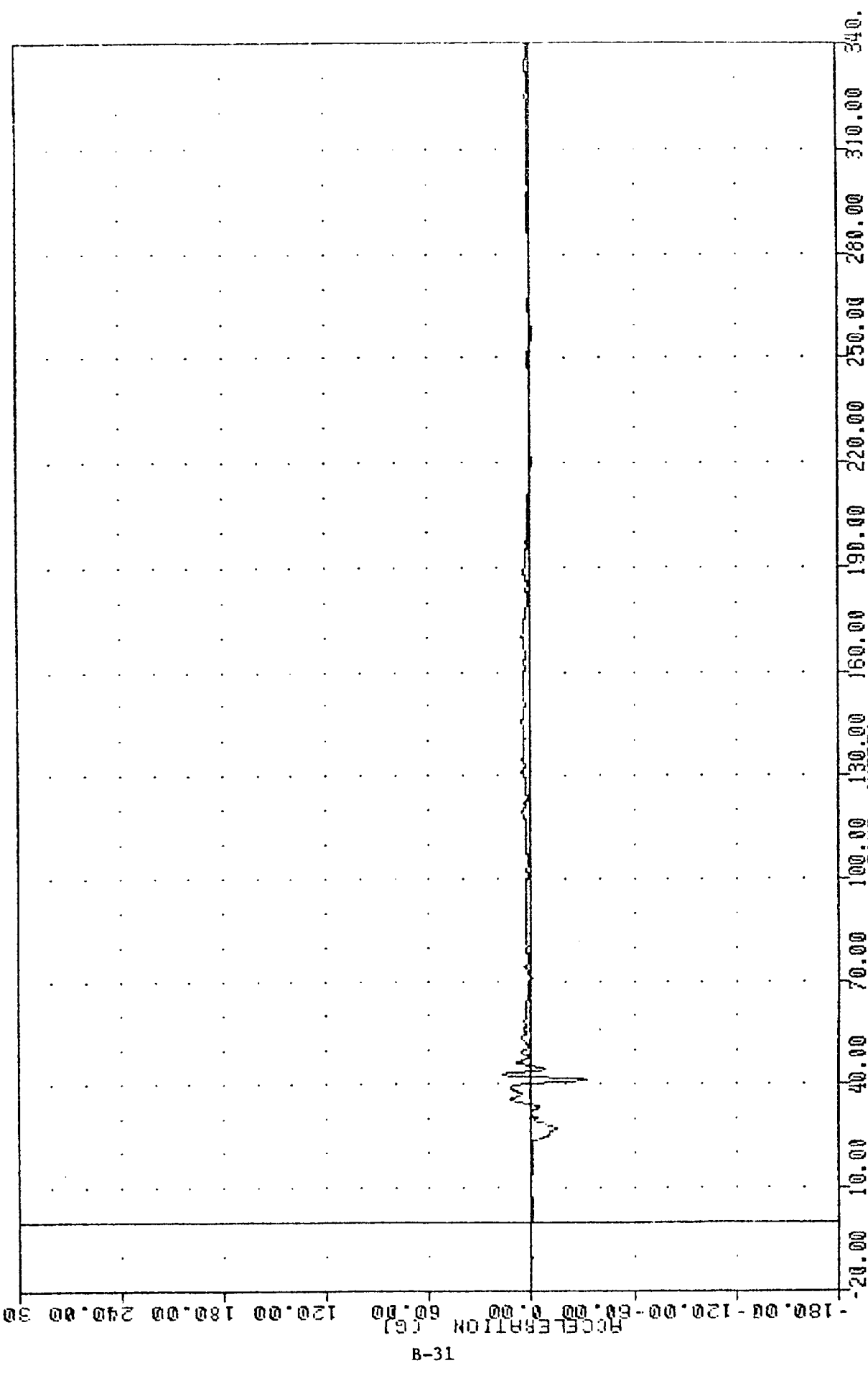
FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = -1.818 88.38, 0.08 e 164.25



MOVING DEFORMABLE BARRIER INTO SENTRA
 DRIVER LEFT RIB TO SPINE DISPLACEMENT INCHES

0362
 SIDE PROTECTION - 2DR/4DR
 84062000000
 PEYXG1
 Plot-DATA
 300/ 949/ -40
 32.00%
 41.13, 16.95 e 42.63

FILTER = BLPF
 MIN, MAX VALUES =

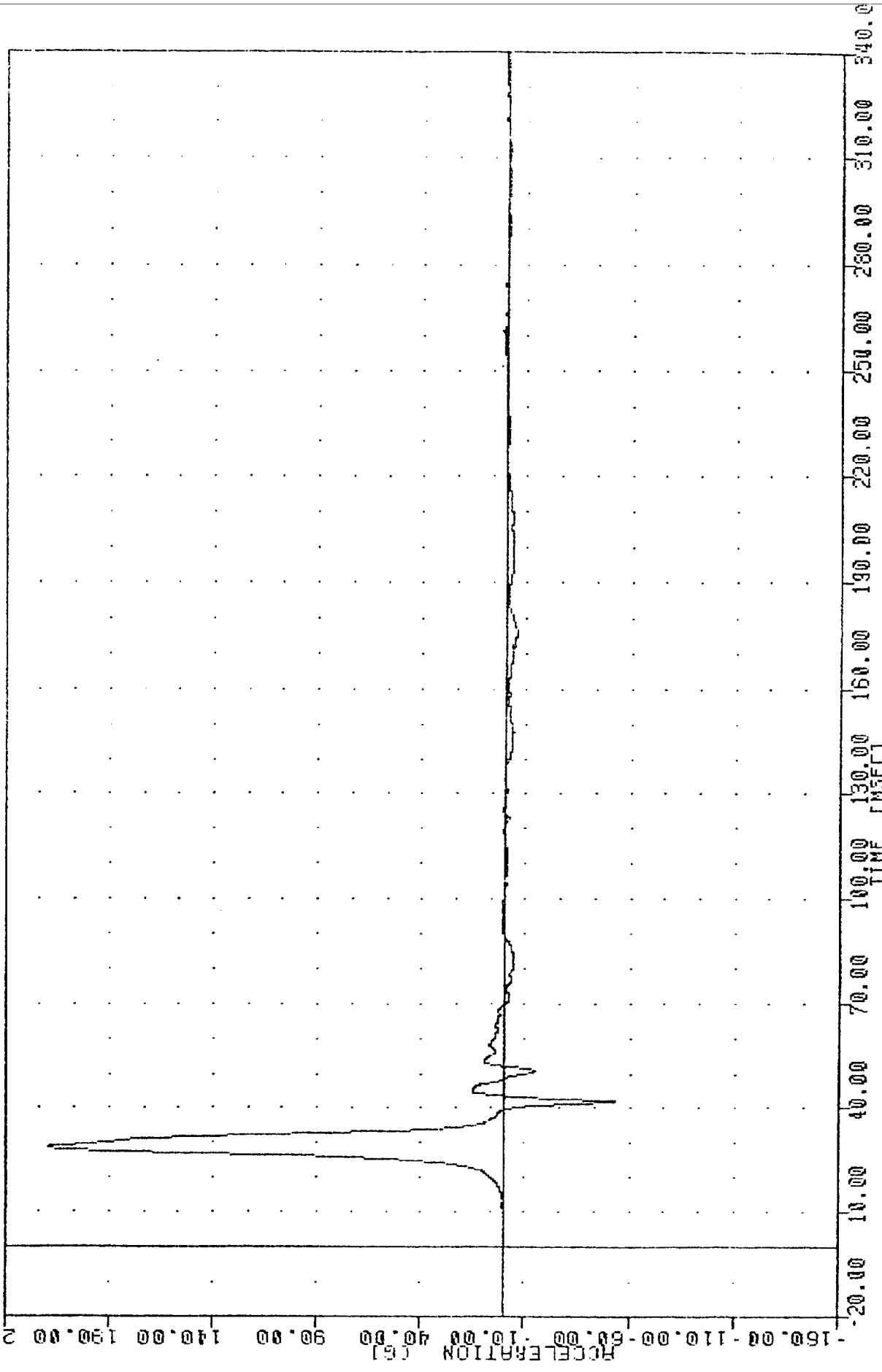


-180.00 -120.00 -60.00 0.00 60.00 120.00 180.00 240.00 300.00
 ACCELERATION (G)
 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00
 TIME (MSEC)
 MOVING DEFORMABLE BARRIER INTO SENTRA
 DRIVER PELVIS ACCELERATION X AXIS

840620000000
SIDE PROTECTION - 2DR/4DR
4-0103
PLATE DRIVER
4:04:30

FILTER = 6LPF 300/ 949/ -10
MIN, MAX VALUES = -52.95e 41.88, 219.99 e 28.50

PEVY61



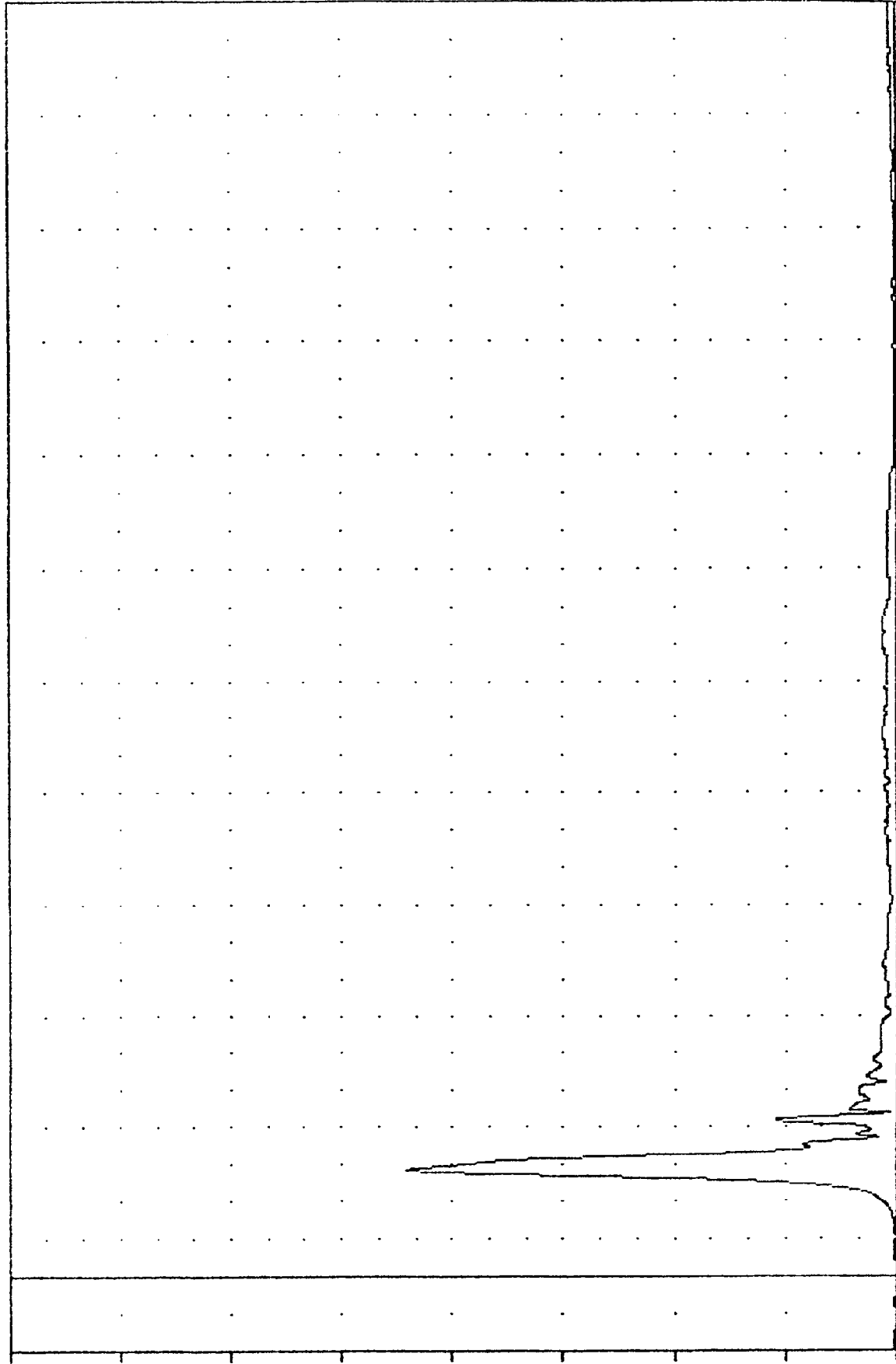
MOVING DEFORMABLE BARRIER INTO SENTRA
DRIVER PELVIS ACCELERATION Y AXIS

ACCELERATION (G)

MIN. MAX VALUES = 0.05g 220.41g

FILTER = BLPF 300/ 949/ -40

10.13 28.50



20.00 10.00 0.00 50.00 100.00 150.00 200.00 250.00 300.00 340.00

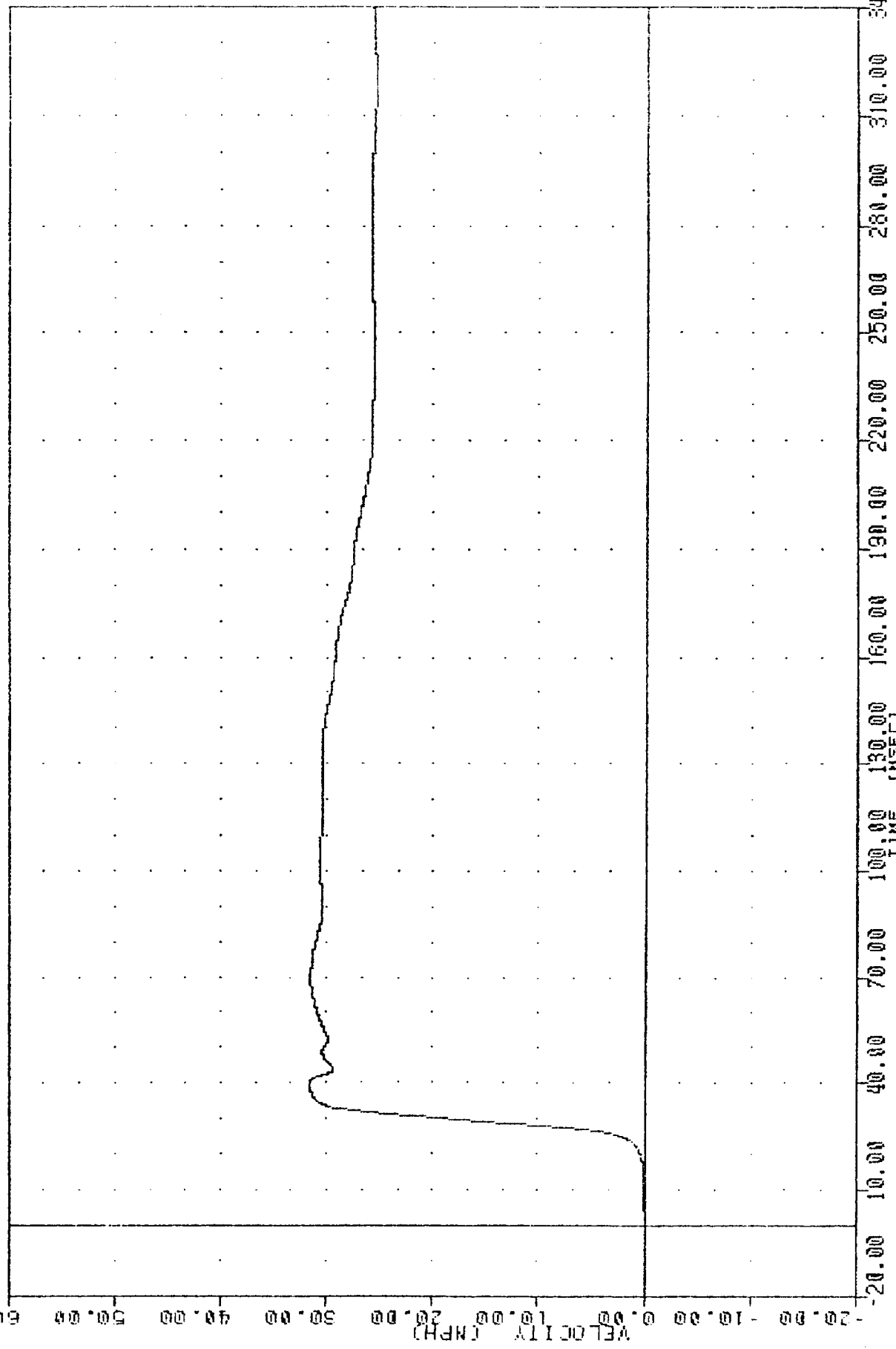
MOVING DEFORMABLE BARRIER INTO SENTRA
DRIVER PREVIOUS RESISTANT

MTG 0000 040302 Plot DATE 1980: 08: 00: 00

SIDE PROTECTION - 2DR/4DR
84062000000
PEVRG1

THE DATE TIME
 840620000000
 SIDE PROTECTION - 2DR/4DR
 840620000000
 PEVYV1
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.018 -2.75, 31.52 8 39.25
 07:20

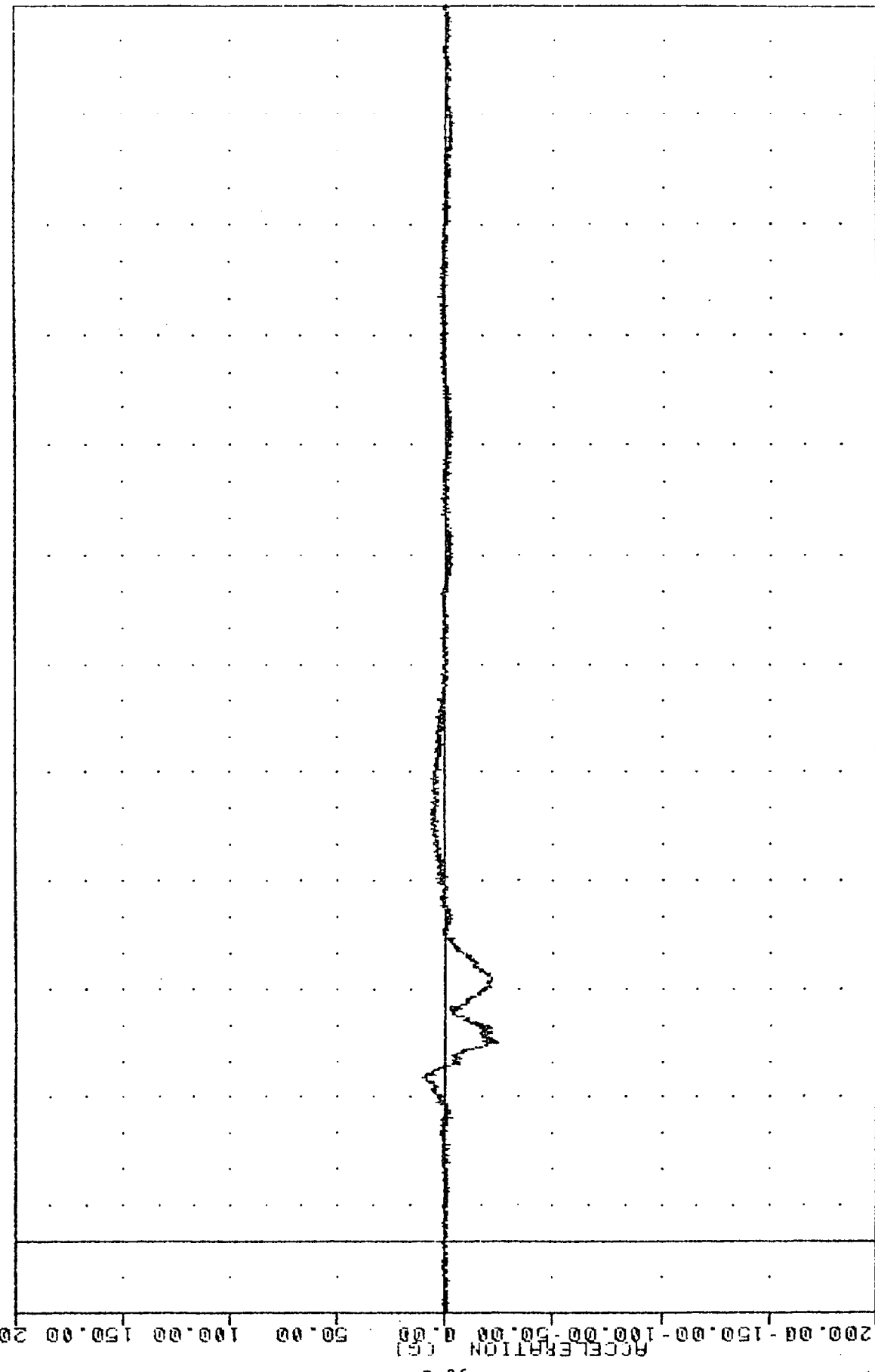
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.018 -2.75, 31.52 8 39.25



MOVING DEFORMABLE BARRIER INTO SENTRA
 NETTA W IISING PFVYGI

840620000000
 HEDX63
 SIDE PROTECTION - 2DR/4DR
 4-040385
 10-04:30
 10.87 e 45.25
 55.13
 -23.76 e
 1650/ 5217/ -40
 FILTER = ALPF

MIN, MAX VALUES =
 FILTER = ALPF

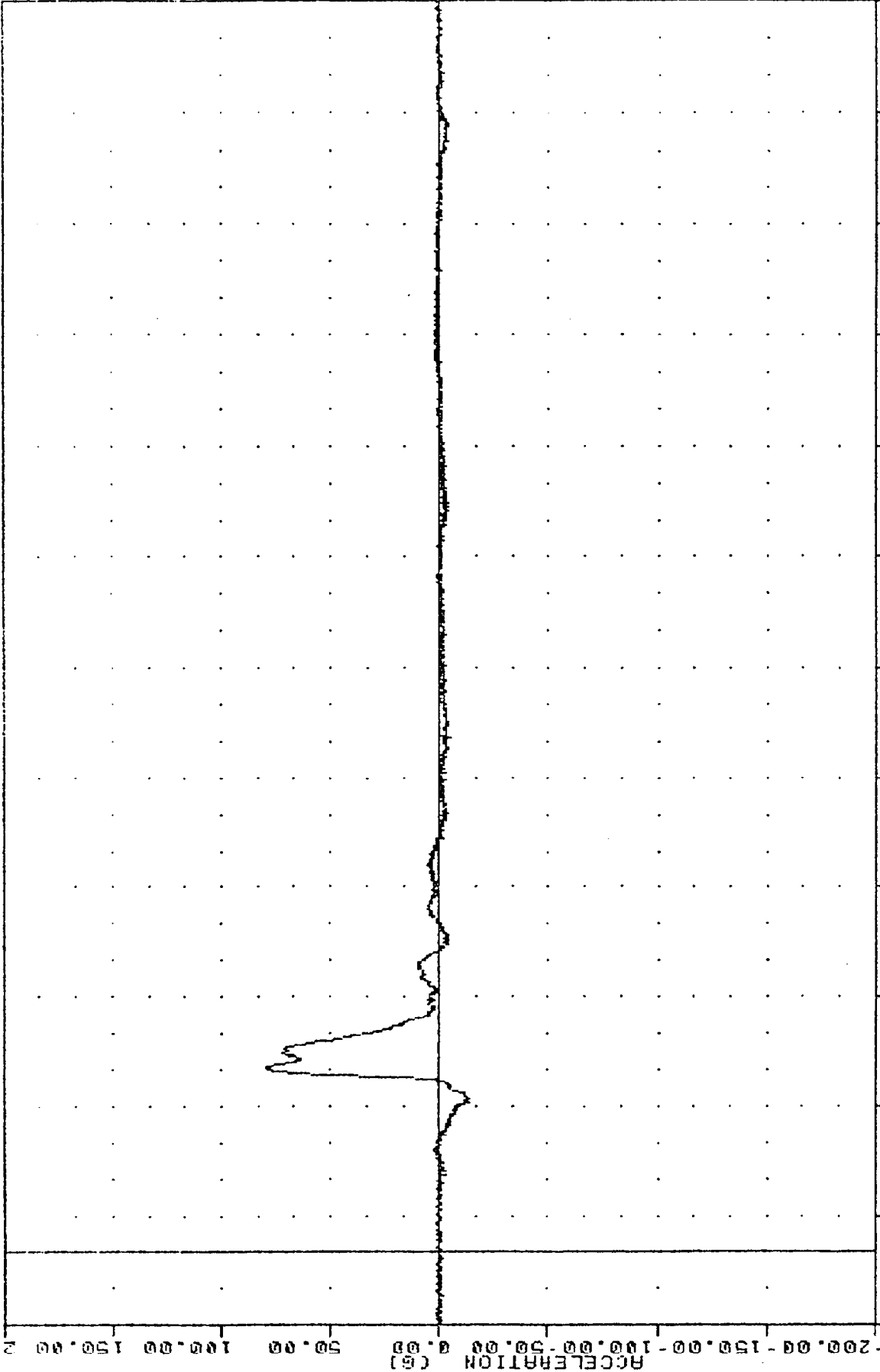


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER HEAD ACCELERATION X AXIS

THE DATE TIME

PLT DATE 10-04-40
FILTER = ALPF 1650/ 5217/ -40
MIN. MAX VALUES = -13.26 80.00 * 50.50

SIDE PROTECTION - 2DR/4DR
84062000000
HEDY63



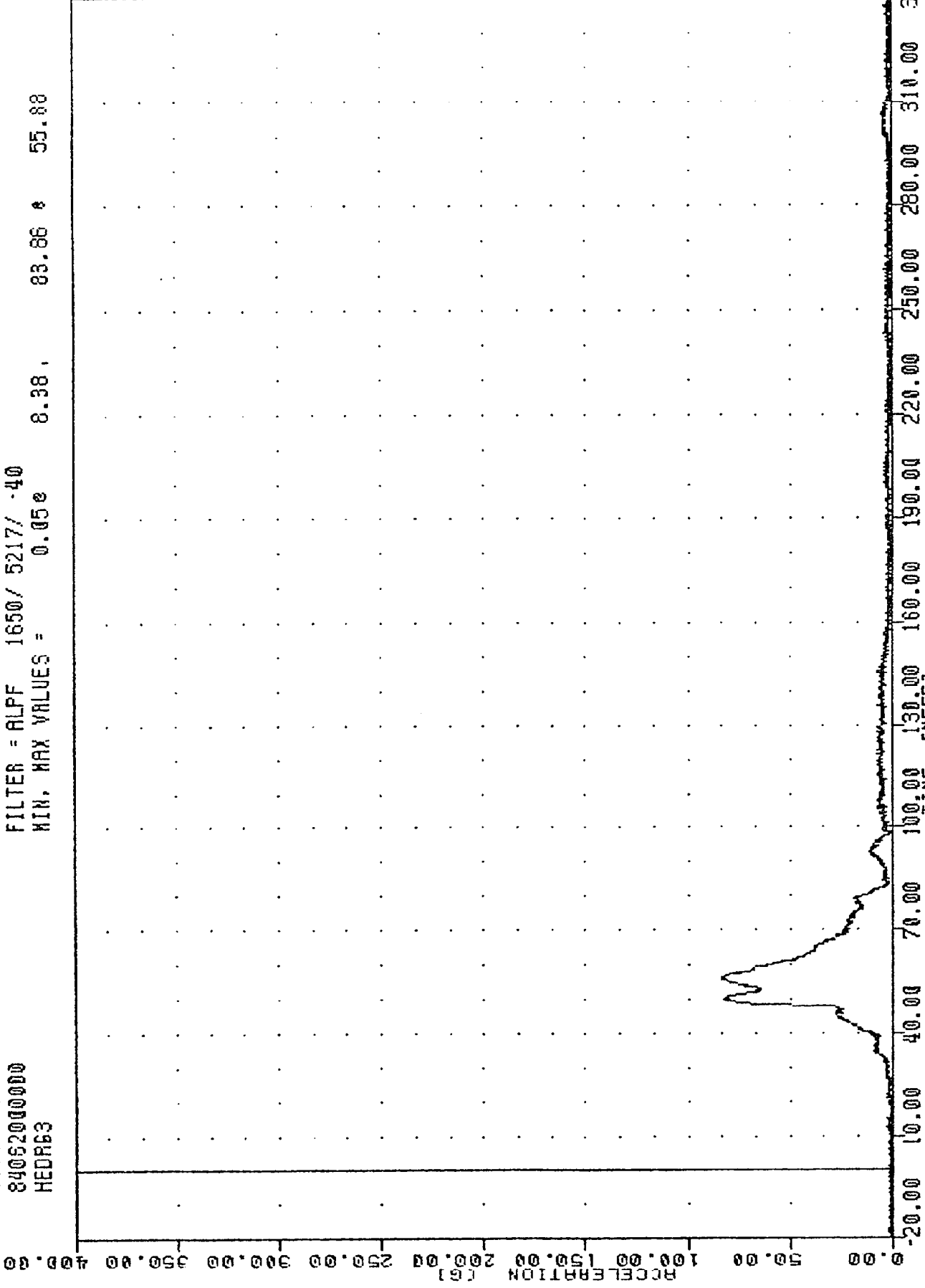
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO SENTRA
PASSENGER HEAD ACCELERATION Y AXIS

THC 840302 5 MAR 89 15:04:40

SIDE PROTECTION - 20R/4DR
84052000000
HEDR63

FILTER = ALPF 1650/ 5217/ .40
MIN. MAX VALUES = 0.05e 8.38 , 83.86 e 55.88

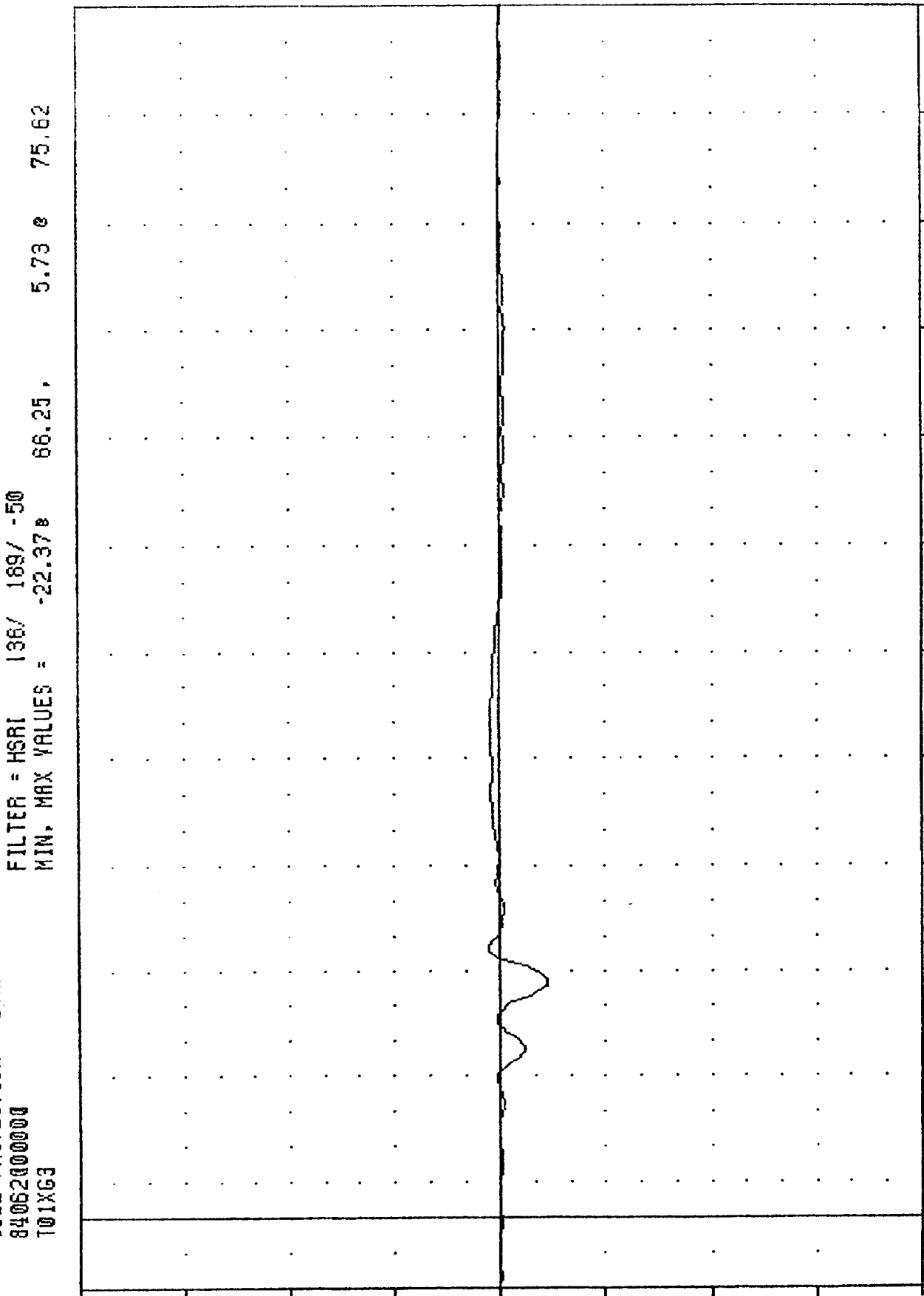


B-39

MOVING DEFORMABLE BARRIER INTO SENTRA
PASSENGER HEAD REFRONT



ACCELERATION (G)



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

MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER UPPER SPINE ACCELERATION X AXIS

INC
 SIDE PROTECTION - 2DR/4DR
 84062000000
 T01XG3

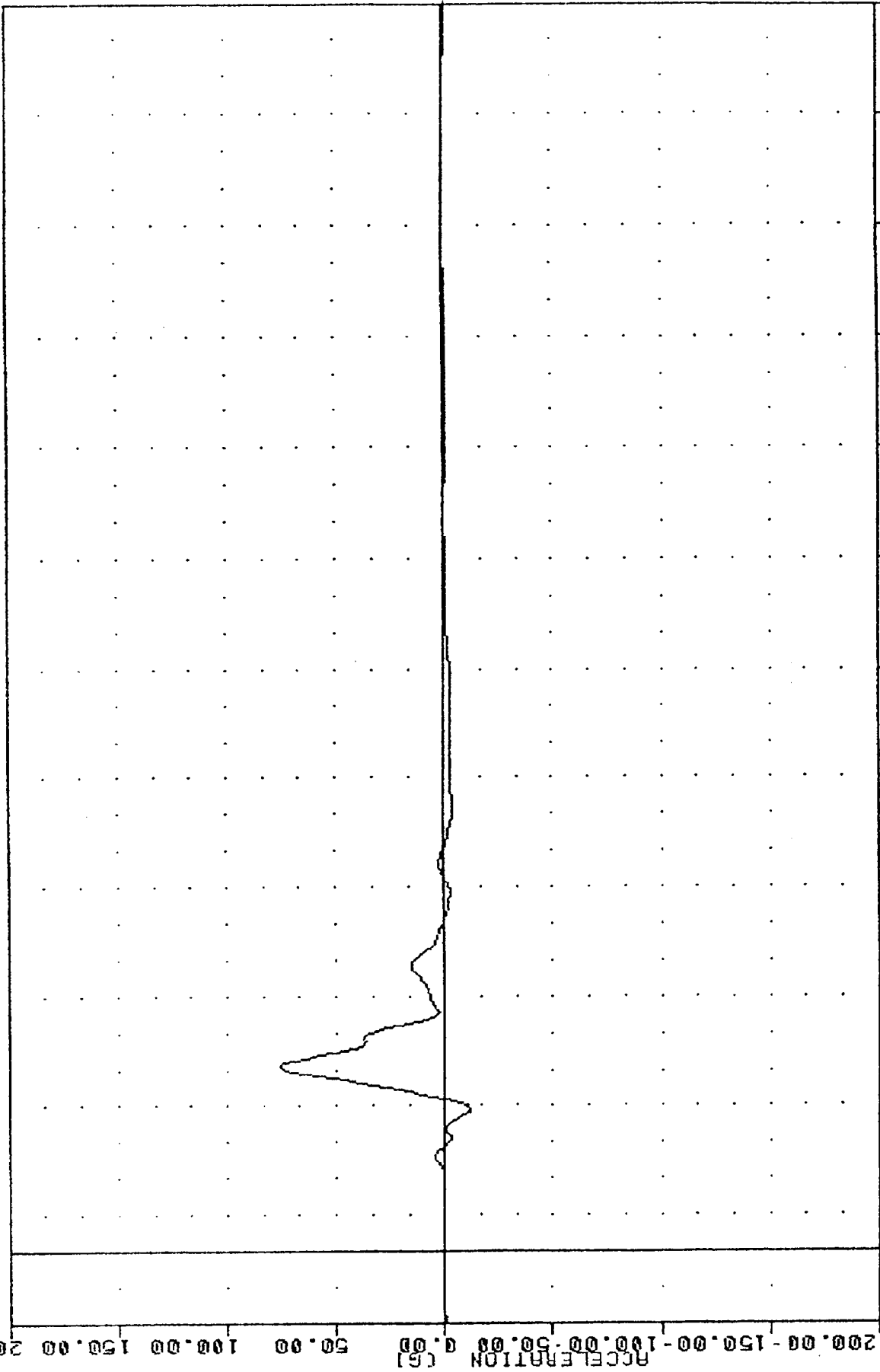
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -22.37 e 66.25 , 5.73 e 75.62

PLOT DATE 19-05-22
 04-AR-04

Plot DRIFT 13:05:52

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -11.78e 38.13, 75.71 e 50.63

8406200000
T01Y63
SIDE PROTECTION - 2DR/4DR

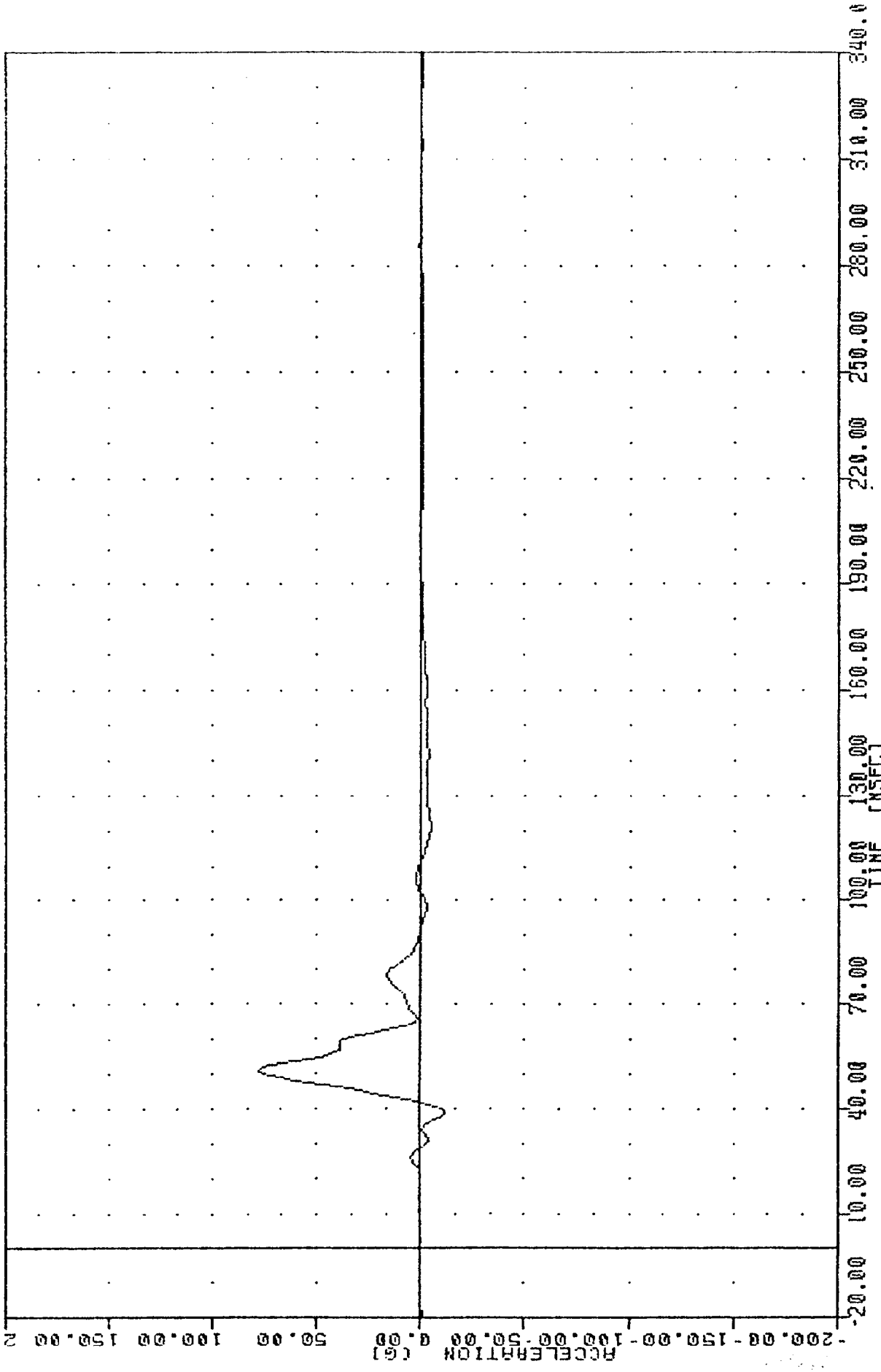


B-41

MOVING DEFORMABLE BARRIER INTO SENTRA
PASSENGER UPPER SPINE ACCELERATION Y AXIS

THE
 SIDE PROTECTION - 2DR/4DR
 84062000000
 T01Y6C
 040302
 PLT DATE 10/18/84 10:05:22

FILTER = HSRI 136/ 189/ .50
 MIN. MAX VALUES = -11.71 38.13, 77.70 50.00

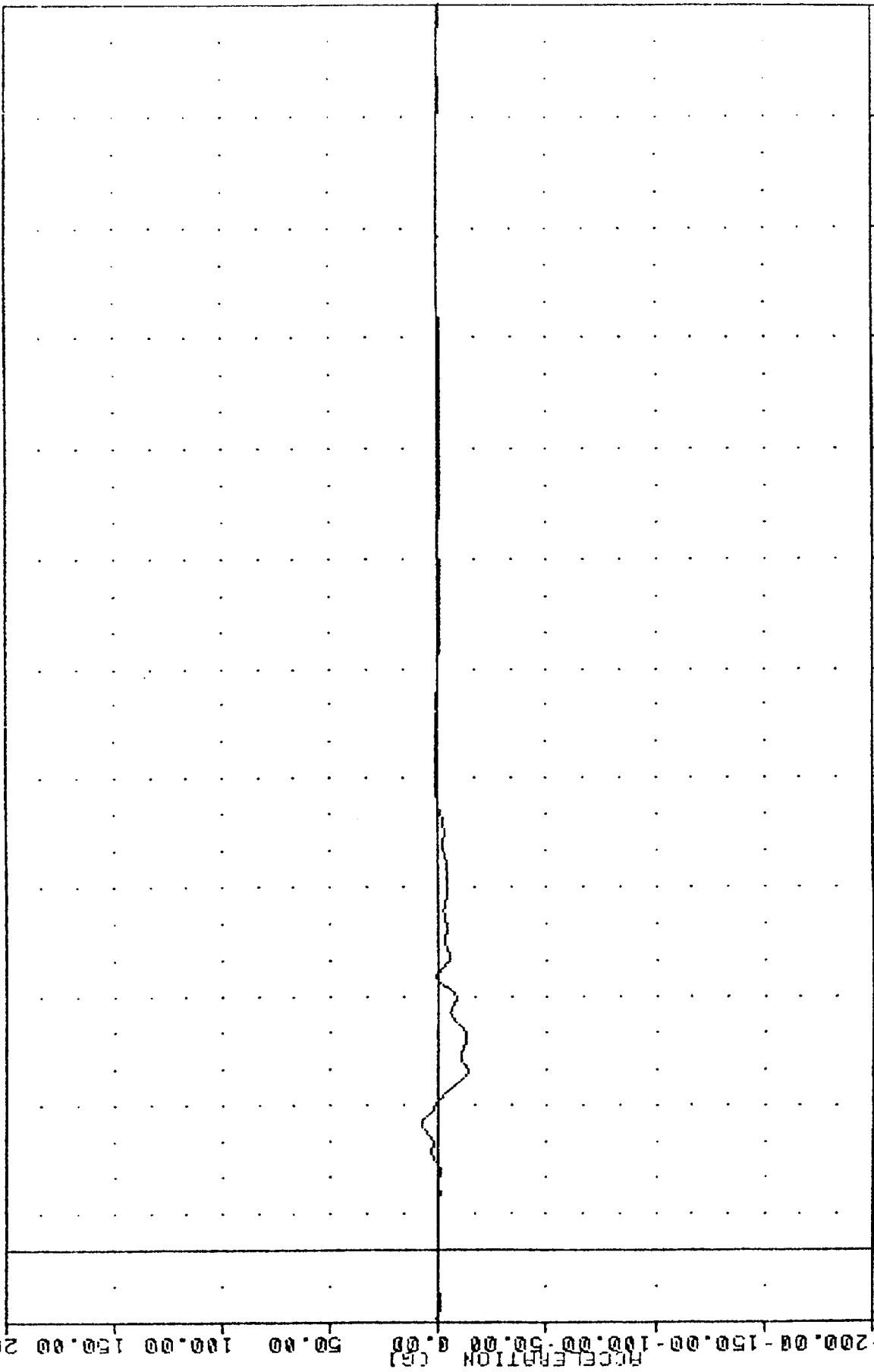


MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER UPPER SPINE ACCELERATION -2 Y AXIS

TRC 840302 84062000000 701ZG3

SIDE PROTECTION - 2DR/4DR
84062000000
701ZG3

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -13.11e 49.37, 8.06 e 33.75

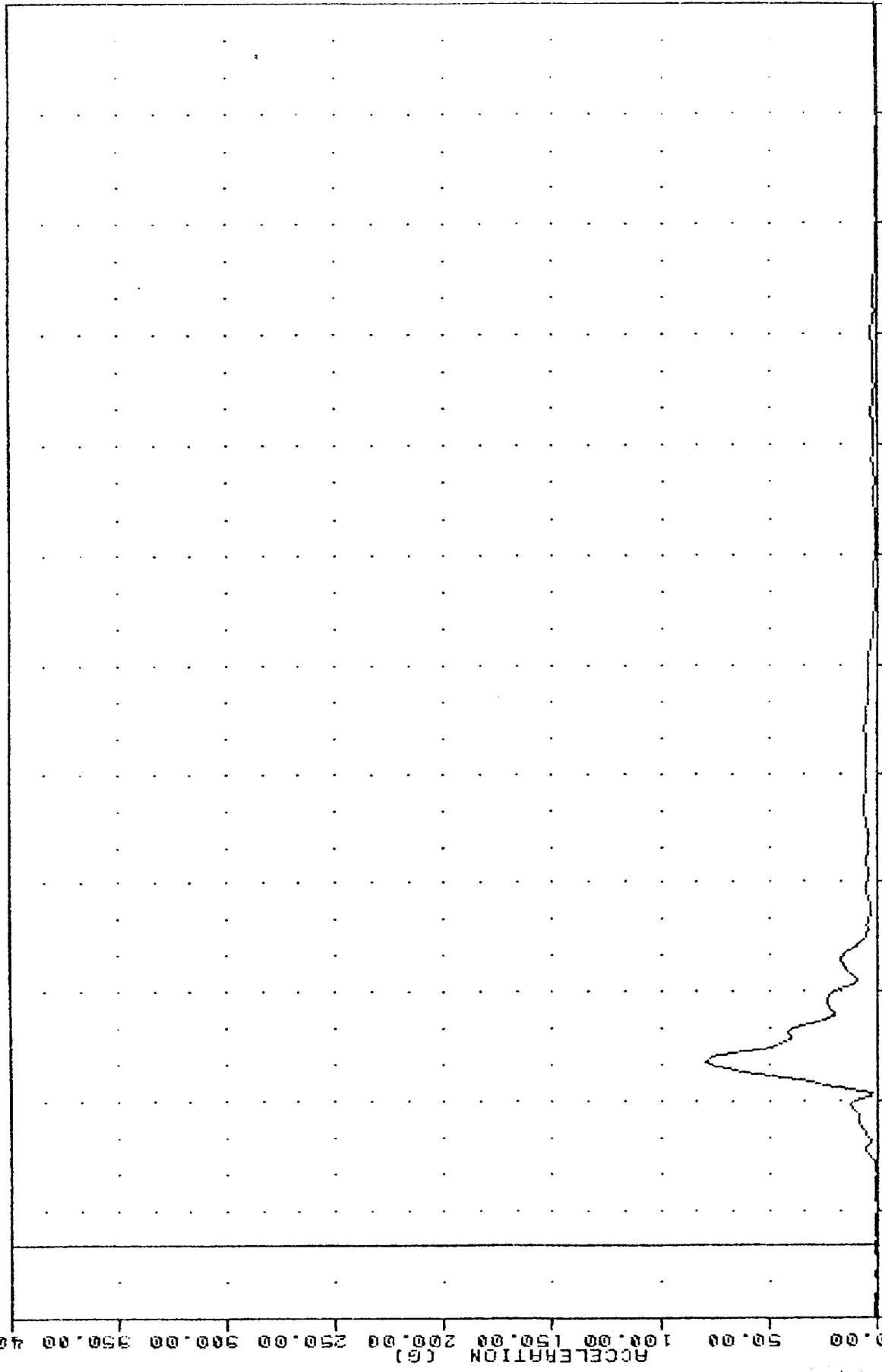


200.00 150.00 100.00 50.00 0.00 -50.00 -100.00 -150.00 -200.00
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO SENTRA
PASSENGER HIPPER 9PTNF ACCIFRATION 7 AXIS

TRC 84062000000
SIDE PROTECTION - 20R/4DR
PLU-DATE 6 mm-8g 136/189/50

FILTER = HSRI 136/ 189/ 50
MIN. MAX VALUES = 0.20e -5.00 . 79.21 e 50.00

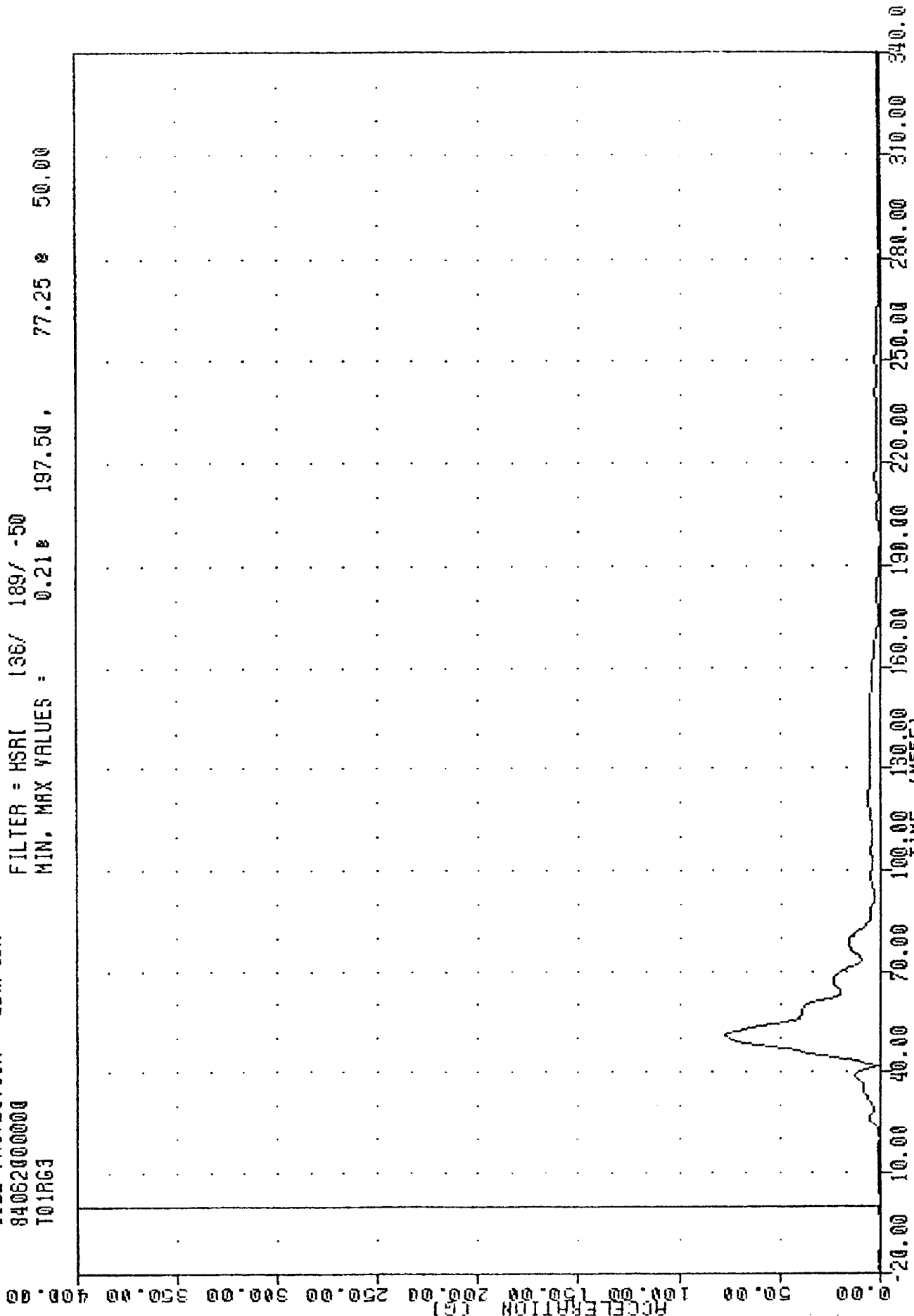


B-44

MOVING DEFORMABLE BARRIER INTO SENTRA
PASSENGER UPPER SPINE RESULTANT USING T01YGC

TRC
 84062000000
 T01RG3
 SIDE PROTECTION - 2DR/4DR
 84062000000
 T01RG3
 1040302
 6 mdr-64
 13:48:16
 PLT-DATE

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.21 197.50, 77.25 50.00



MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER UPPER SPINE RESULTANT

PLUT DATE 6 APR 84 13:58:23

FILTER = HSRI 136/ 189/ .50

MIN, MAX VALUES = -0.85e 41.25, 23.35 e 90.00

SIDE PROTECTION - 2DR/4DR

84062000000

T01Y43

60.00

50.00

40.00

30.00

20.00

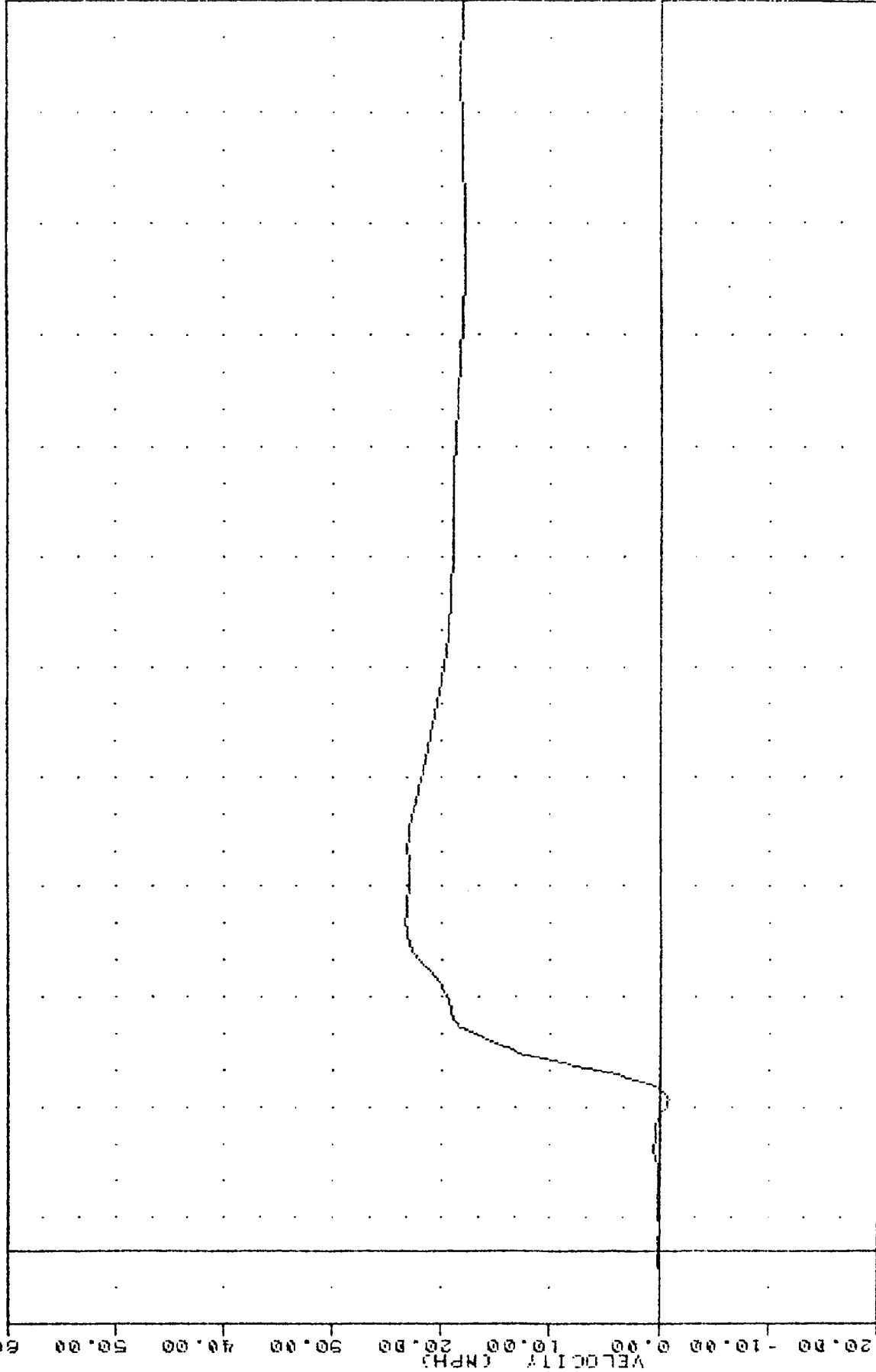
10.00

0.00

-10.00

-20.00

94-B



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

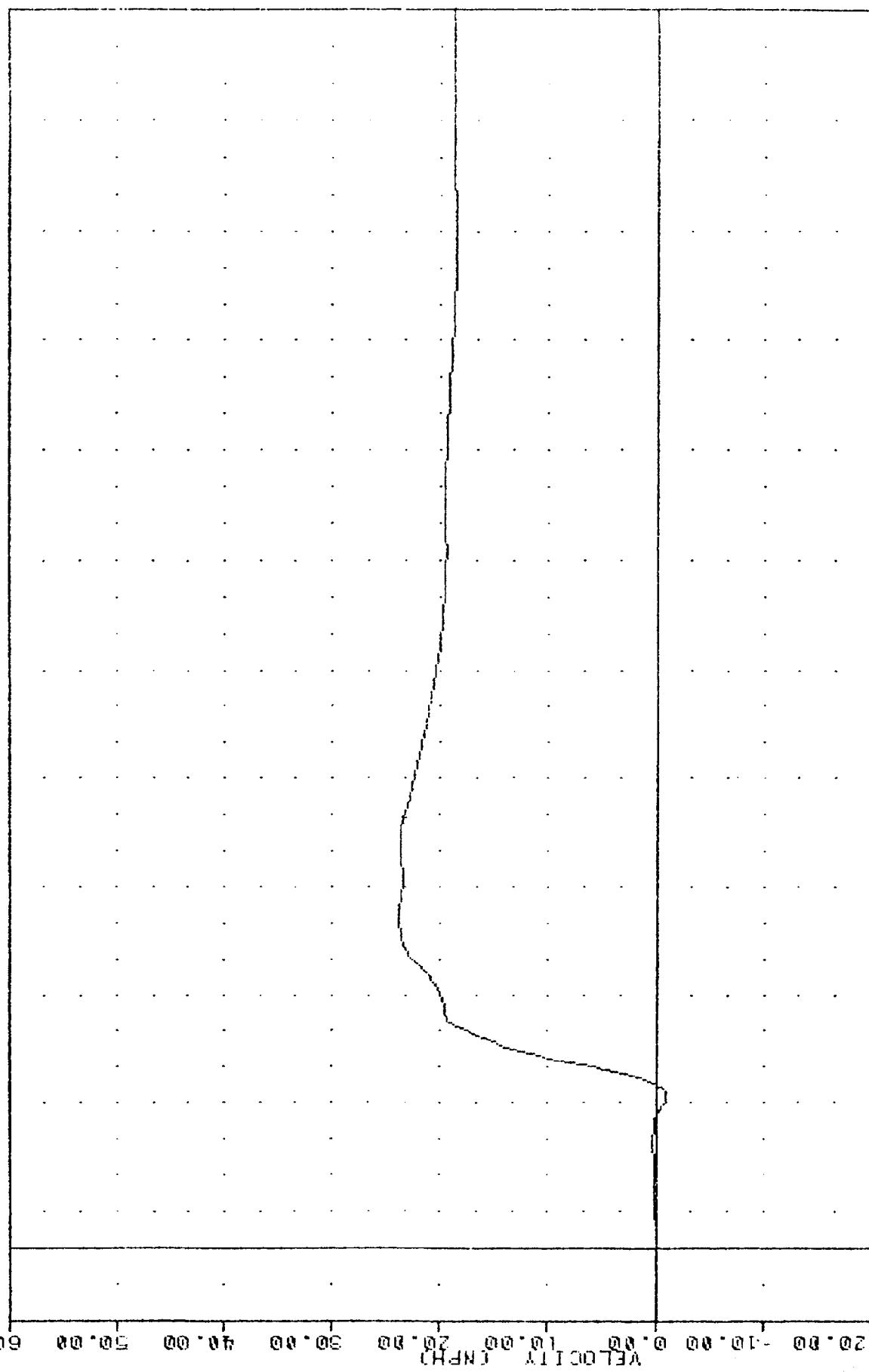
TIME (CNSEC)

MOVING DEFORMABLE BARRIER INTO SENTRA

DATA V LISTING T01Y43

TMC
 SIDE PROTECTION - 3DR/4DR
 84062000000
 T01YVC
 Plot DATE
 13738.23

FILTER = HSRI 136/ 169/ -50
 MIN. MAX VALUES = -1.04 23.80 e 91.25



-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)

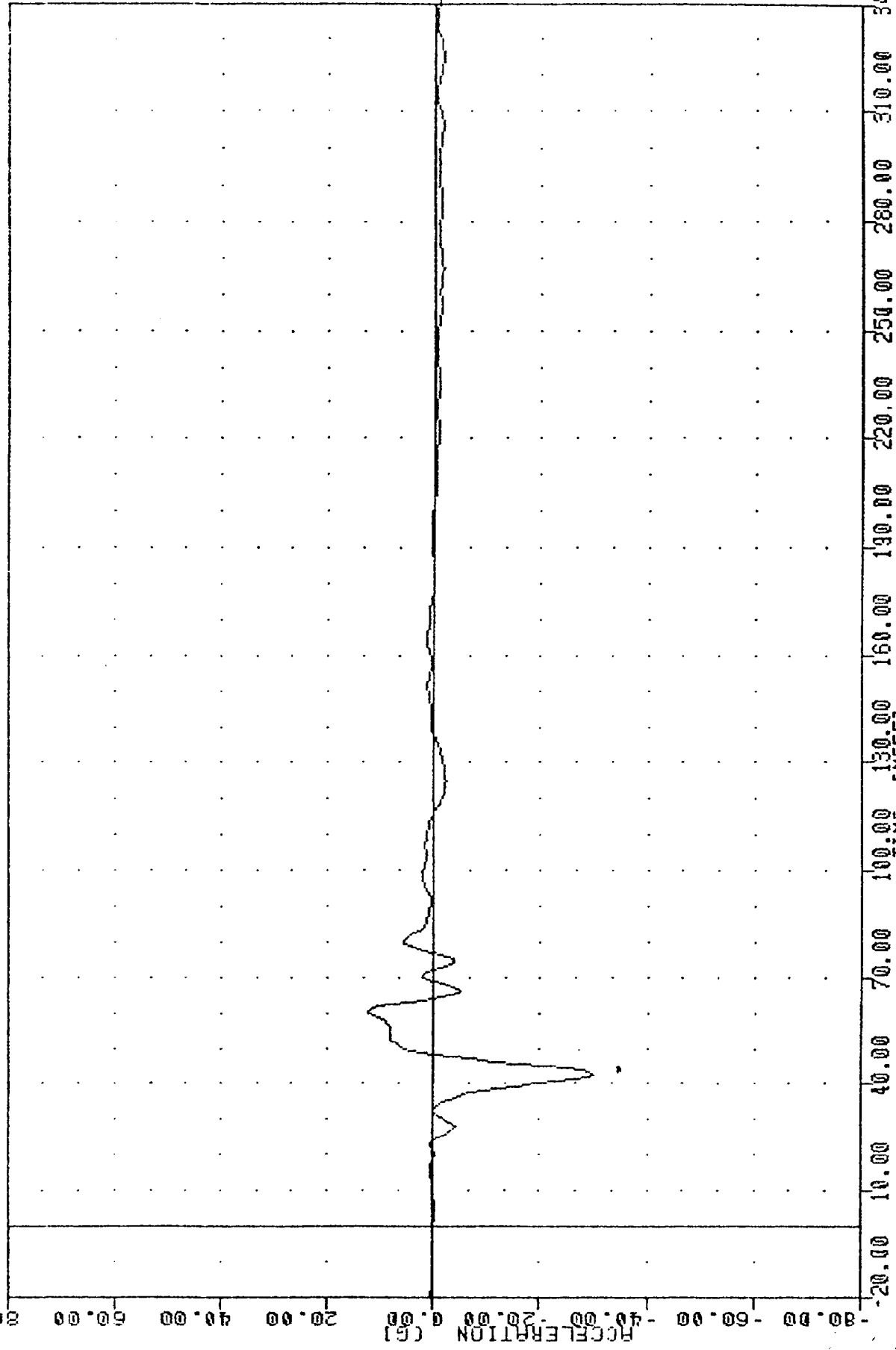
MOVING DEFORMABLE BARRIER INTO SENTRA
 DELTA V USING T01YGC

FILE 0000 041030Z 15 MAR 04 15:05:22

SIDE PROTECTION - 2DR/4DR

8406200000
T12XG3

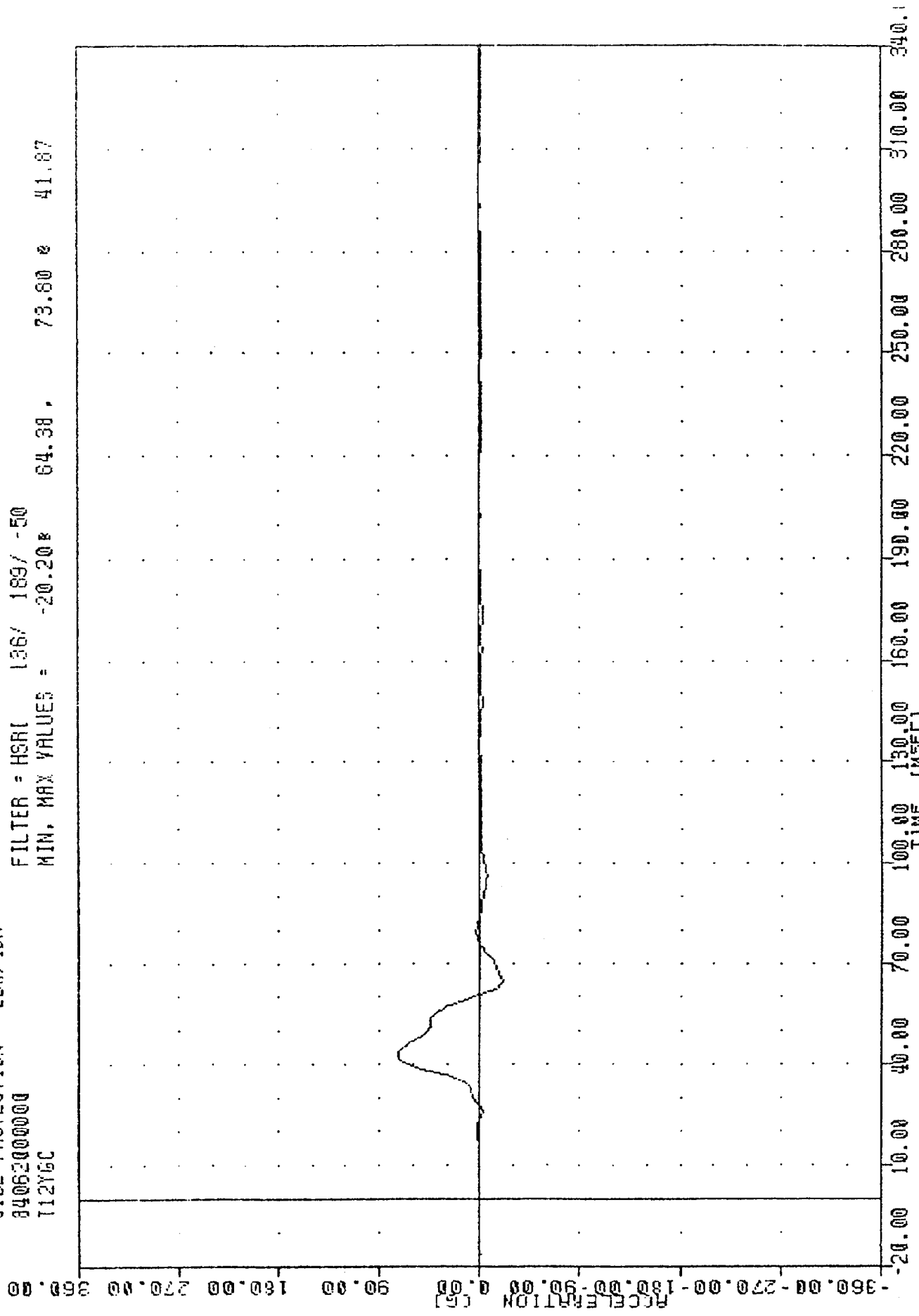
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -30.04e 41.87, 12.38 e 60.00



B-48

MOVING DEFORMABLE BARRIER INTO SENTRA
PASSENGER LOWER SPINE ACCELERATION X AXYS

THU 02:25 03/03/82 10:05:22
 SIDE PROTECTION - 20R/40R
 04062000000
 T12Y6C
 05 MAR 84
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -20.20 73.80 e 41.87

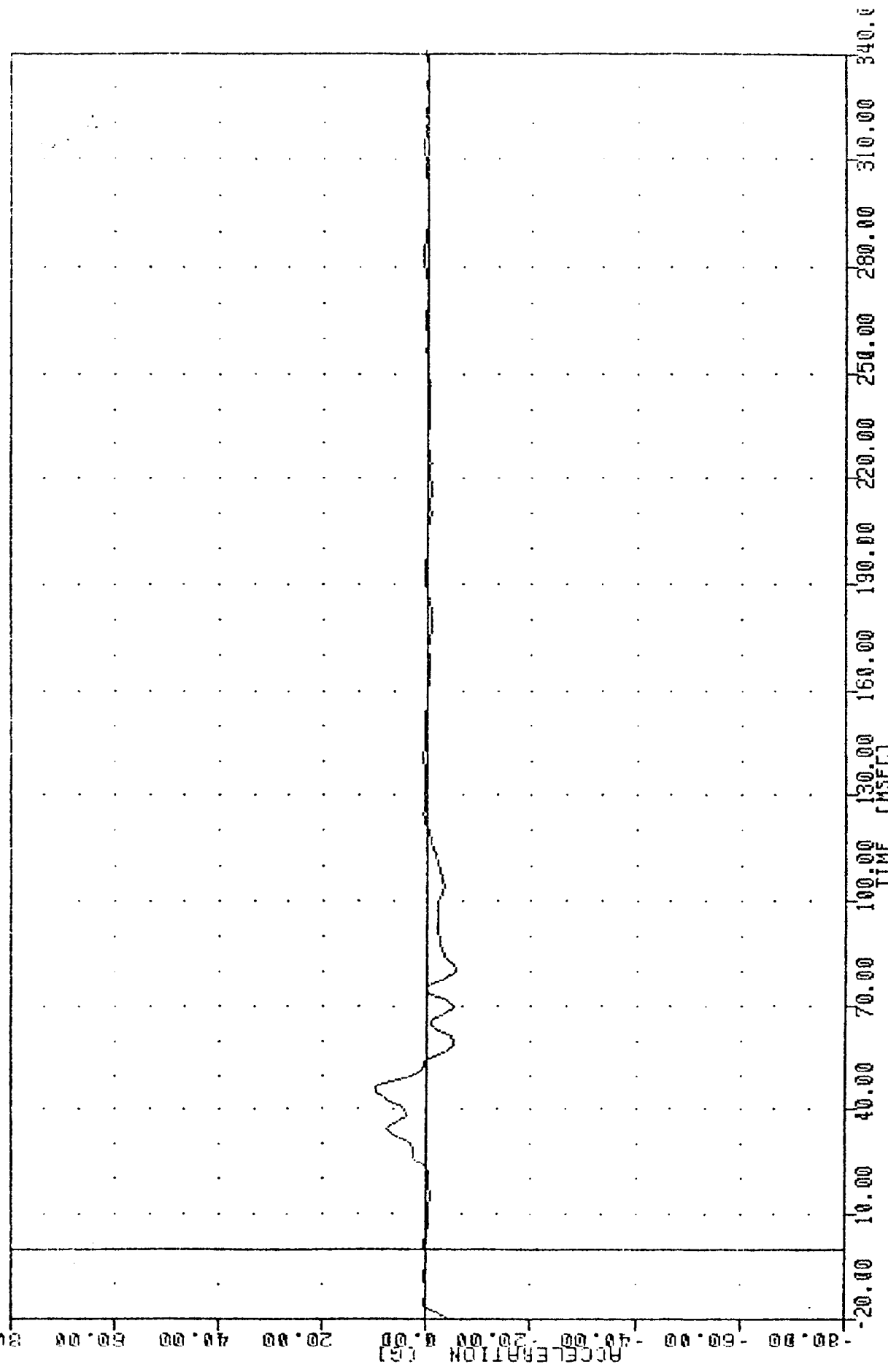


B-50

MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER LOWER SPINE ACCELERATION #2 Y AXIS

040362
 SIDE PROTECTION - 2DR/4DR
 64062000000
 T12163
 Plot DATE 13 APR 1984 13:05:22

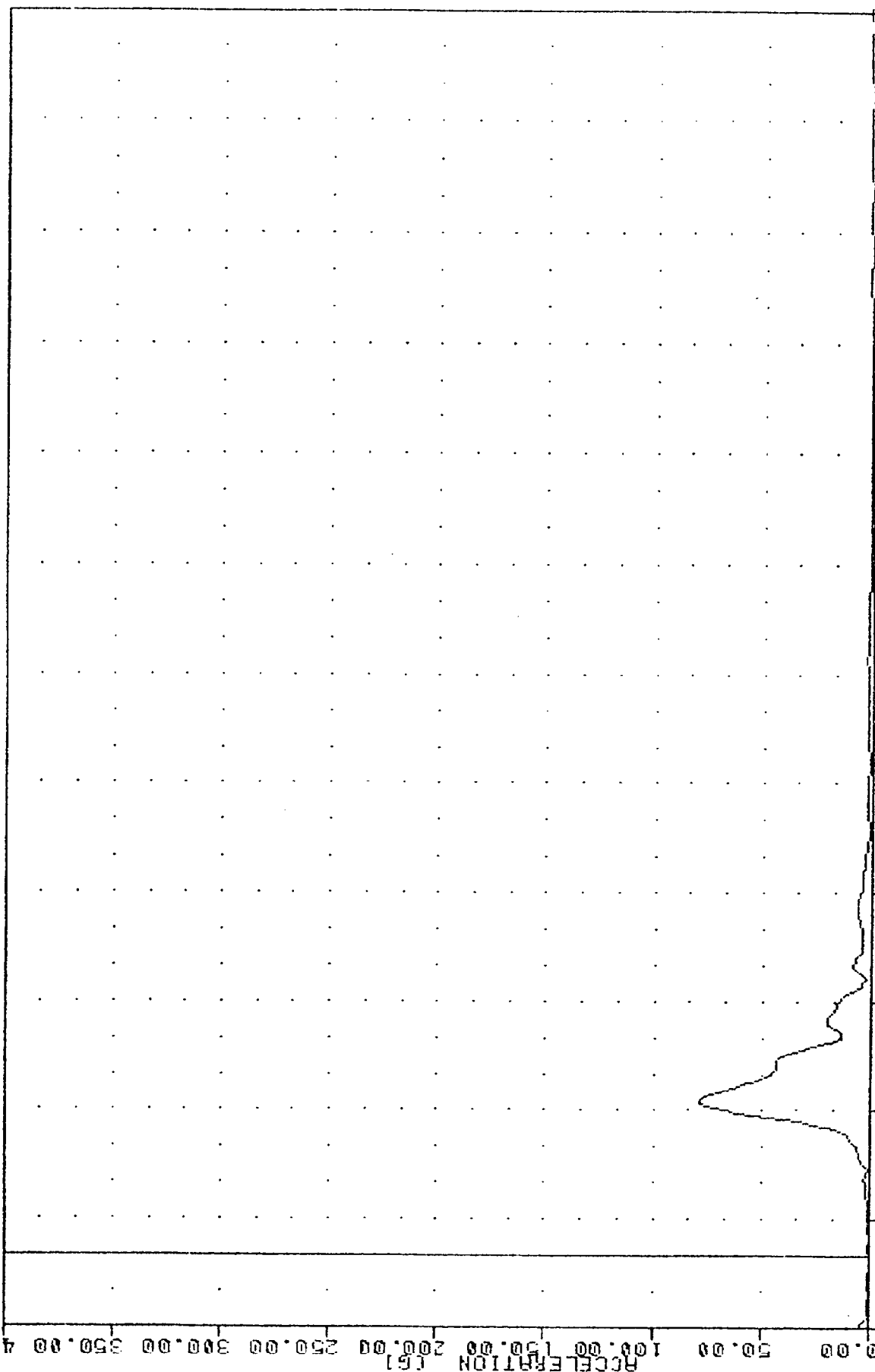
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -5.37e 80.00, 9.95 e 45.00



MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER LOWER SPINE ACCELERATION Z AXIS



FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.18e -11.6B. 78.71 e 41.87

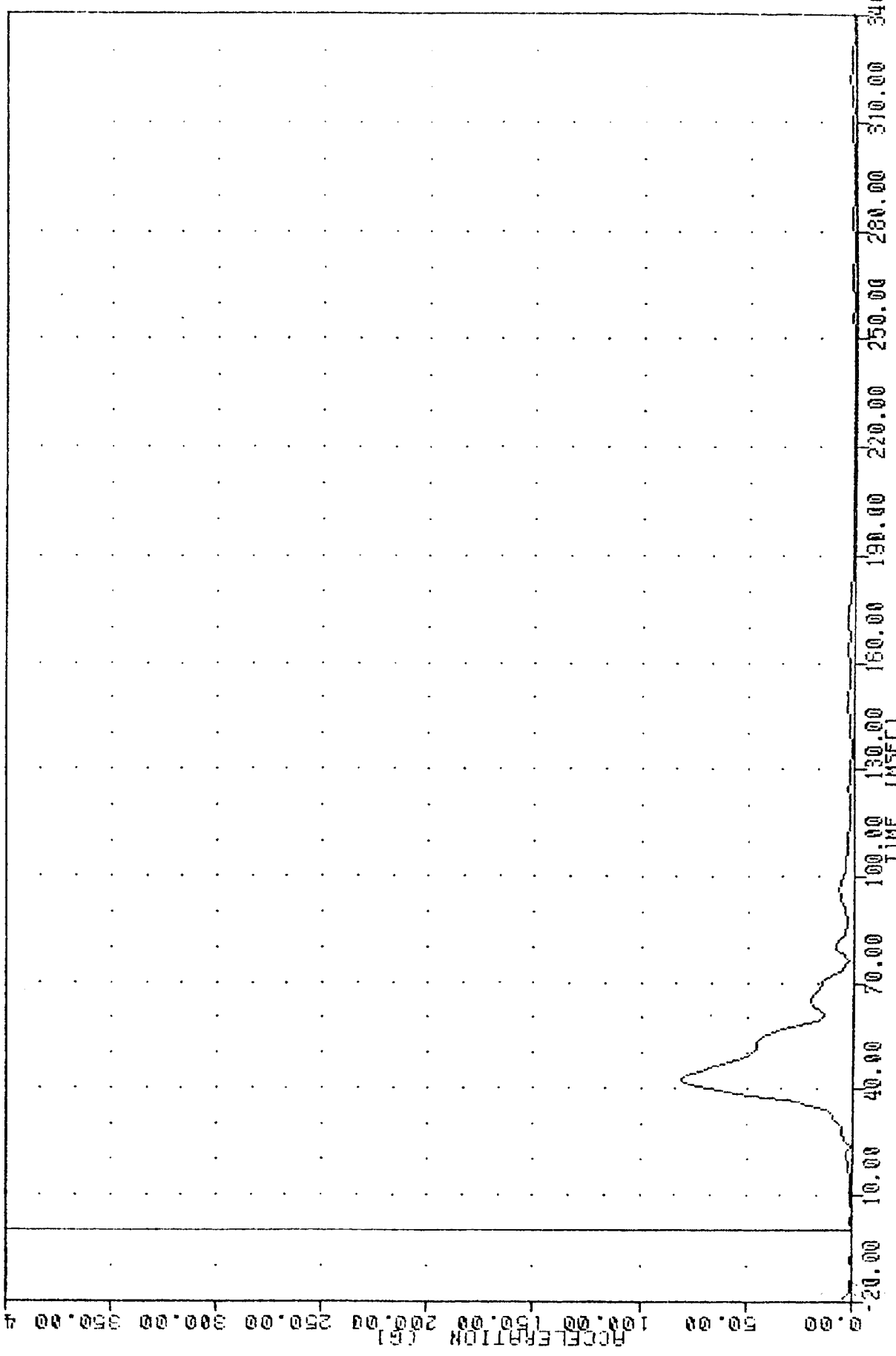


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER LOWER SPINE RESULTANT

TIME 040302 674HR-89 13:51:17

SIDE PROTECTION - 30R/40R
84062000000
T12R63
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = 0.10e -12.50, 79.99 e 41.87



MOVING DEFORMABLE BARRIER INTO SENTRA
PASSENGER LOWER SPINE RESULTANT USING T12Y6C

TRC 840302 6-RRR-84 13:58:23

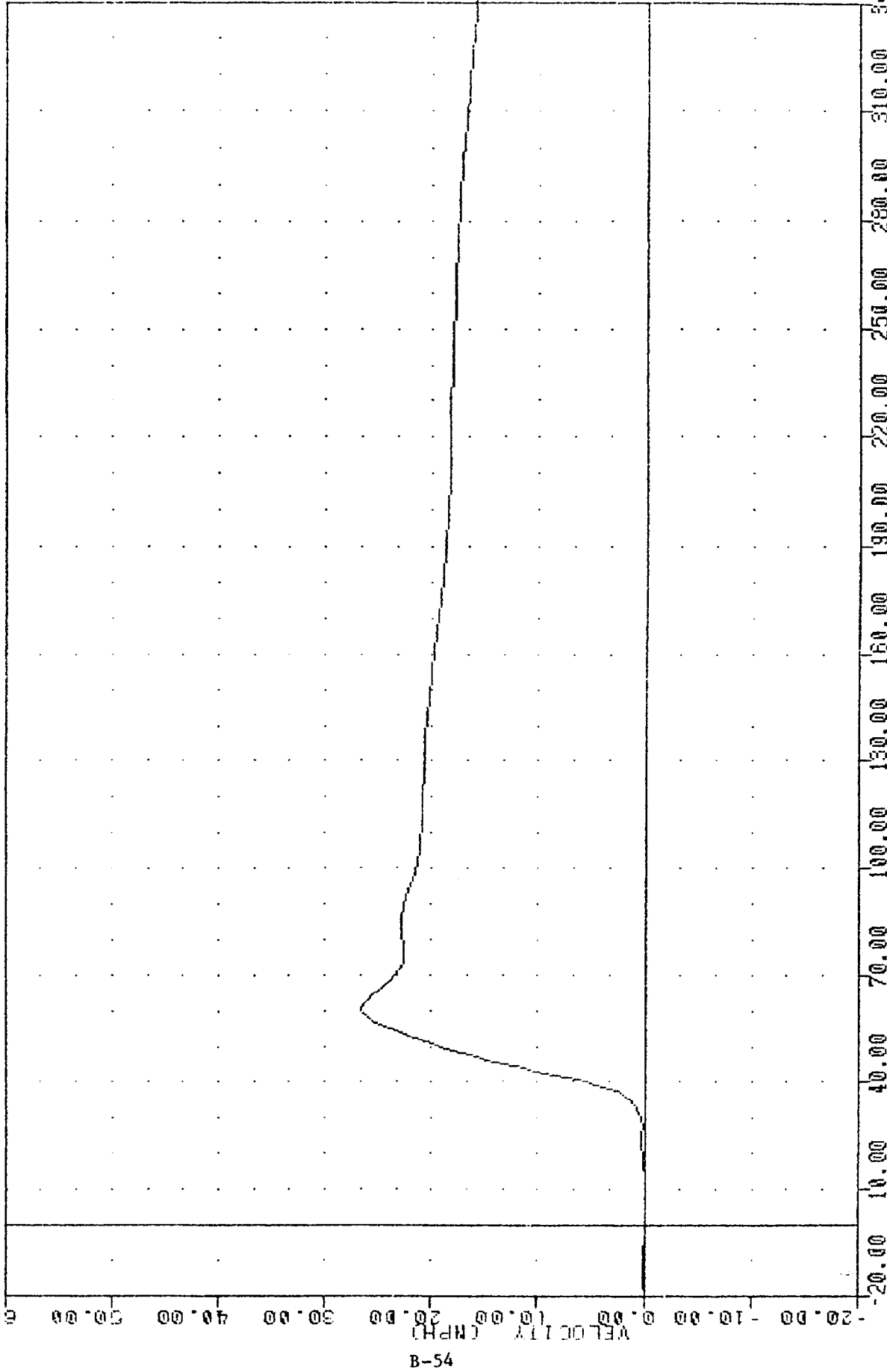
SIDE PROTECTION - 2DR/4DR

8406200000

T12YV3

FILTER = HSRI 136/ 189/ -50

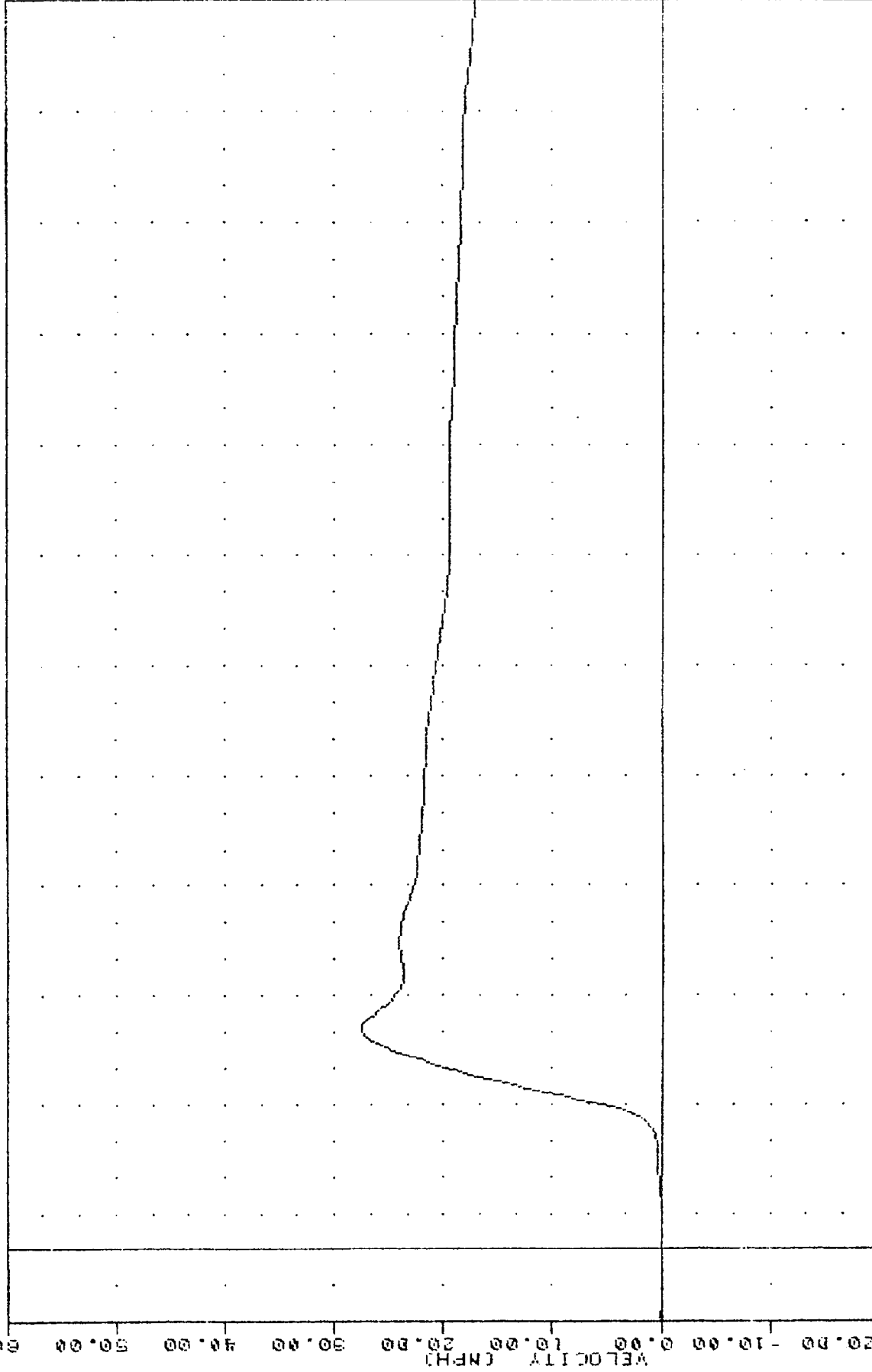
MIN. MAX VALUES = -0.018 12.50 . 26.56 e 60.00



MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V LISTING T12YV3

TRIP
SIDE PROTECTION - 20R/4DR
84062000000
T12YFC
PLUG GATE
65mm-0.15
15:25

FILTER = HSRI 136/ 169/ -50
MIN, MAX VALUES = -0.03e -8.13 , 27.53 e 60.00

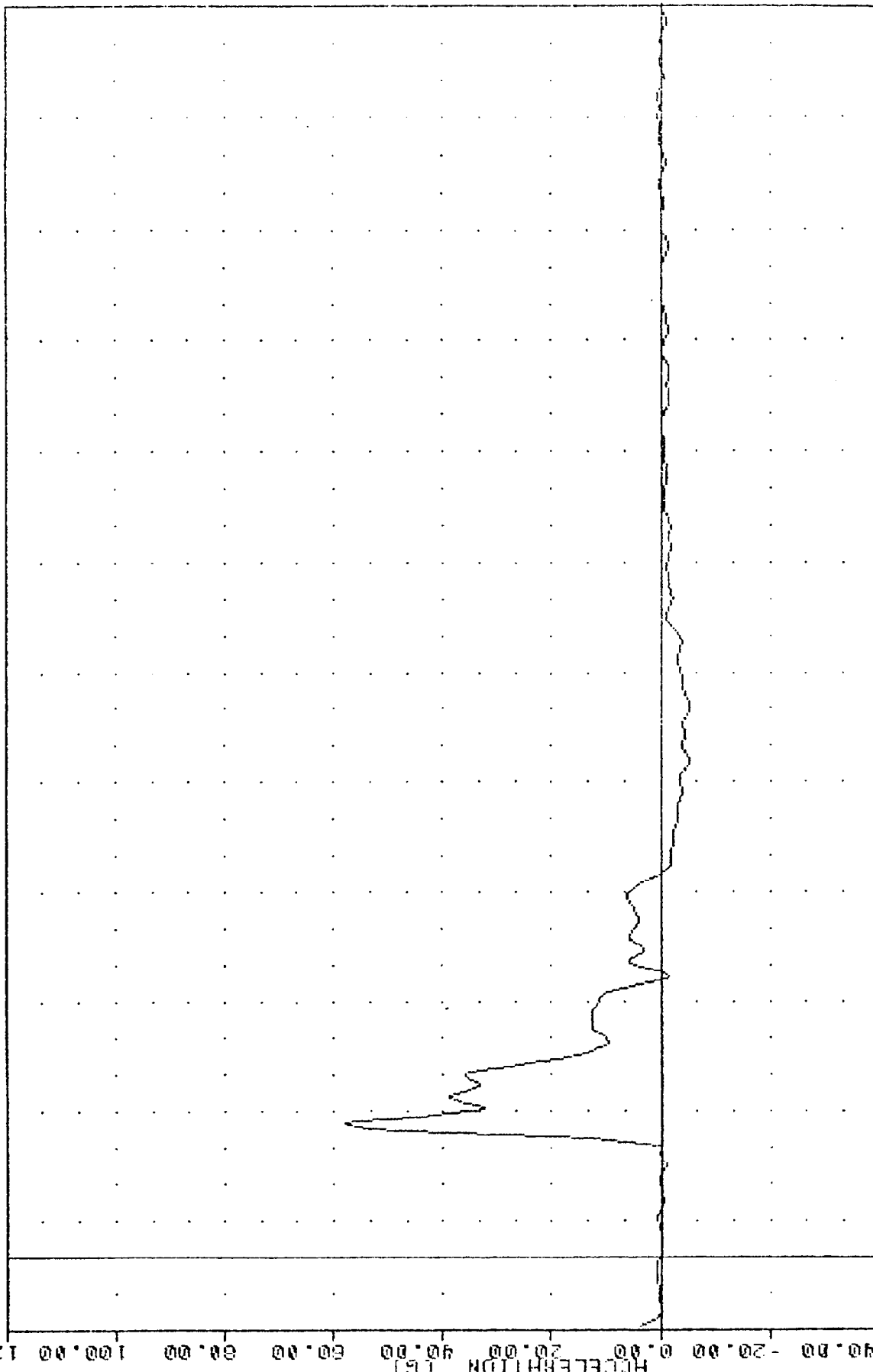


B-55

-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 (INSEC)
MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V USING T12YGC

SIDE PROTECTION - 20R/40R
 84052000000
 LURYG3

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -5.41e 150.00. 57.91 e 36.25

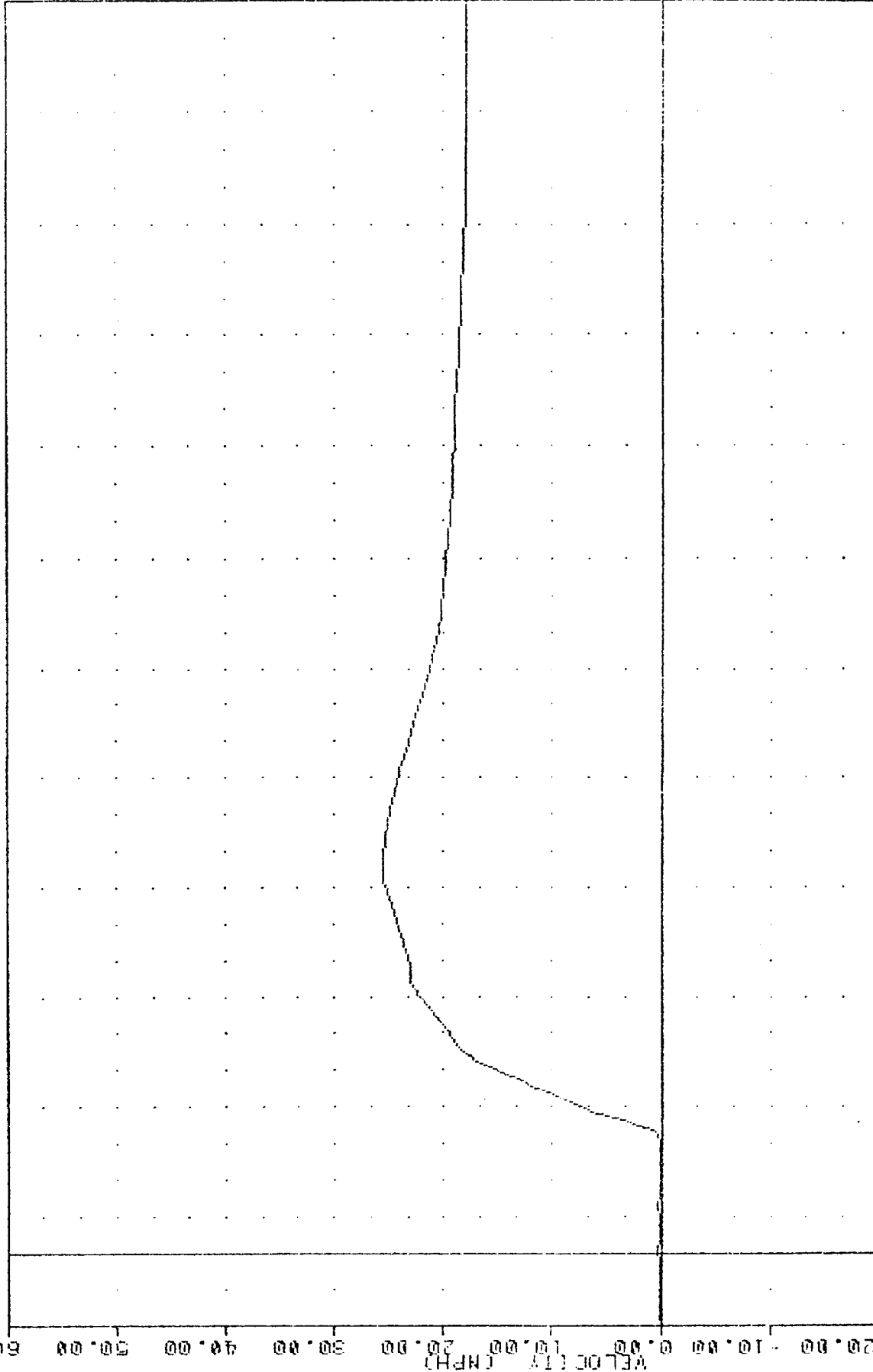


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER LEFT UPPER RIB ACCELERATION Y AXIS

TRC
 84062000000
 LURYV3
 SIDE PROTECTION - 2DR/4DR
 840302
 040302
 PLT DATE
 6-MR-84
 1975:25

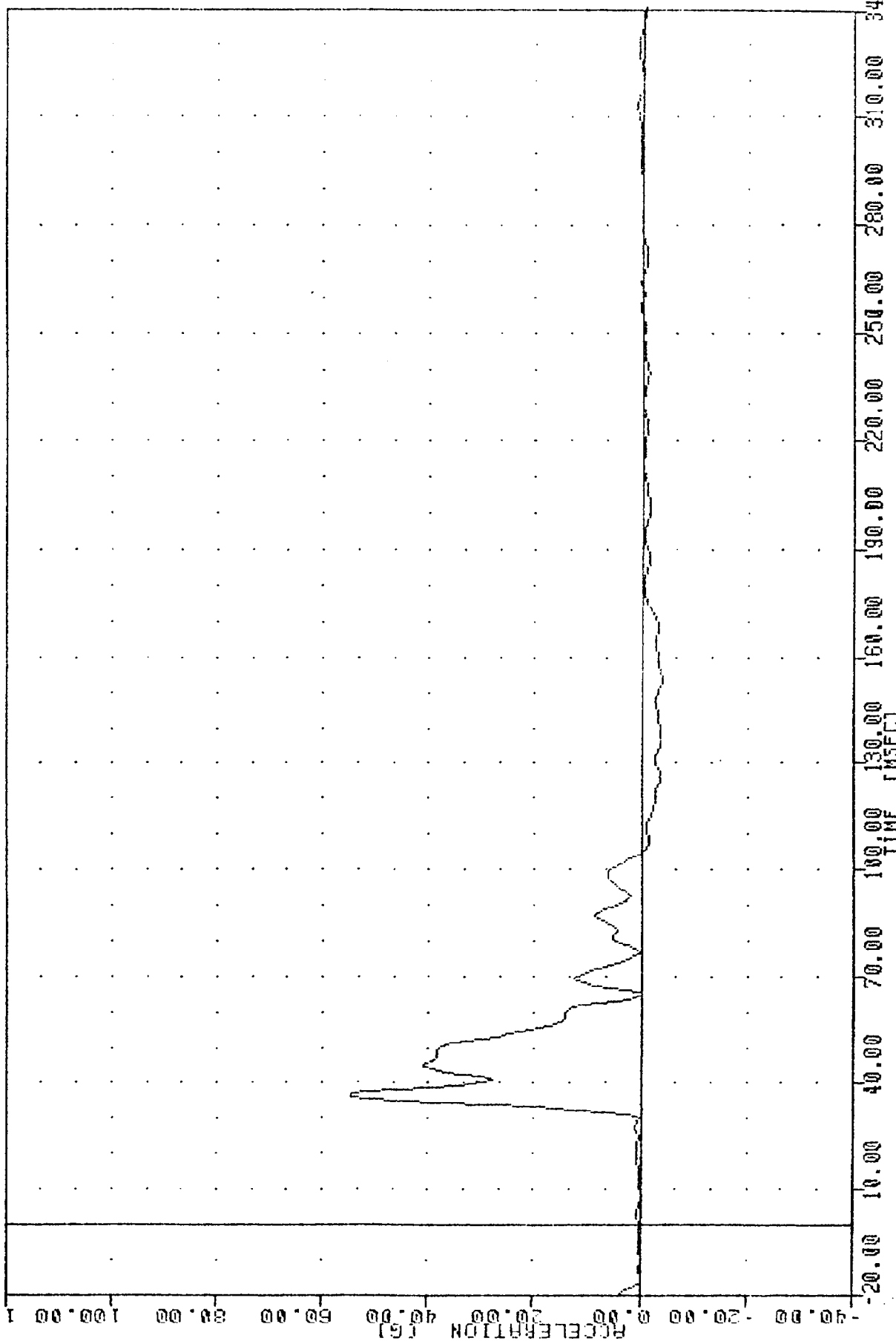
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.00 25.65 104.38
 -20.00 -20.00



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MOVING DEFORMABLE BARRIER INTO SENTRA
 DELTA V USING LURY63

THE
 SIDE PROTECTION - 2DR/4DR
 8406200000
 LURYGC
 840302
 6 MAR 84
 13:48:16

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -3.93e 153.13, 54.73 e 35.63



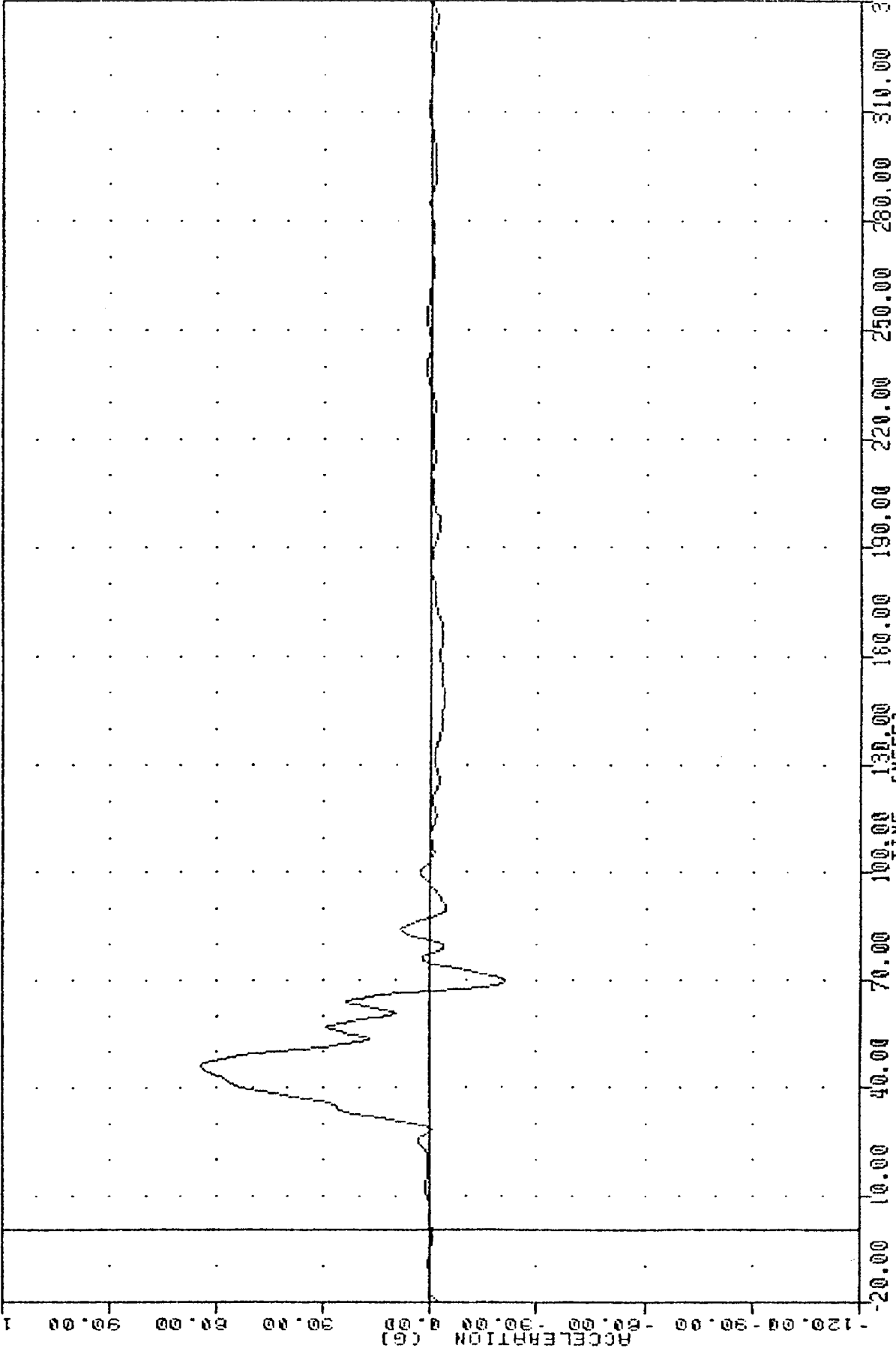
B-58

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

PLUT DATE 6 MAR 84 13:48:16

FILTER = HSRI 136/ 189/ .50
MIN, MAX VALUES = -21.15e 64.53 e 45.00

TAC 84062000000
SIDE PROTECTION - 20R/40R
LLRY63



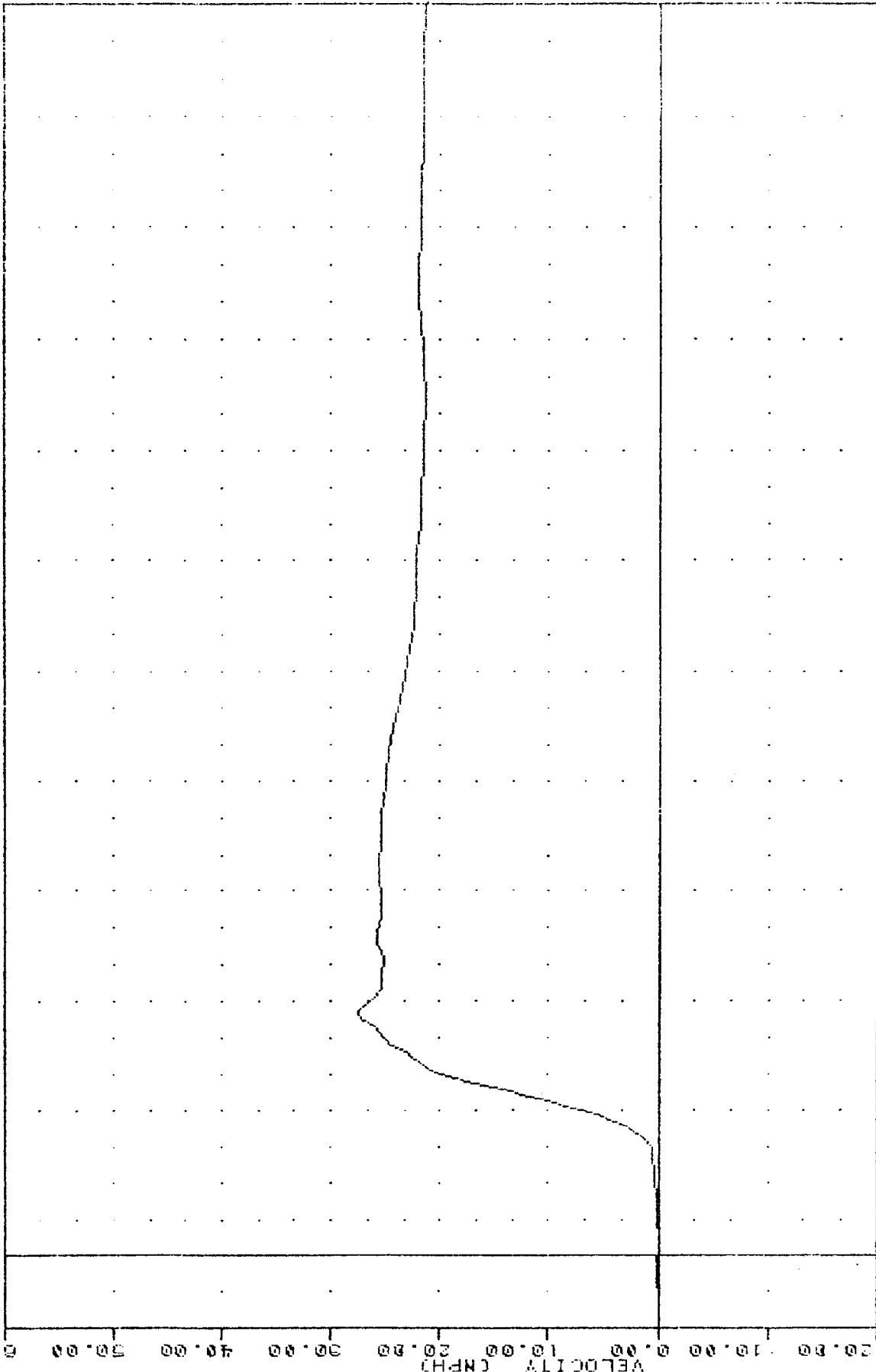
B-60

MOVING DEFORMABLE BARRIER INTO SENTRA
PASSENGER LEFT LOWER AIR ACCELERATION Y AXIS

PLUT DATE 6-MAR-84 13:58:25

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -0.03 27.45 e 86.25

TAC 840302
SIDE PROTECTION - 20R/4DR
84062000000
LLRYW3



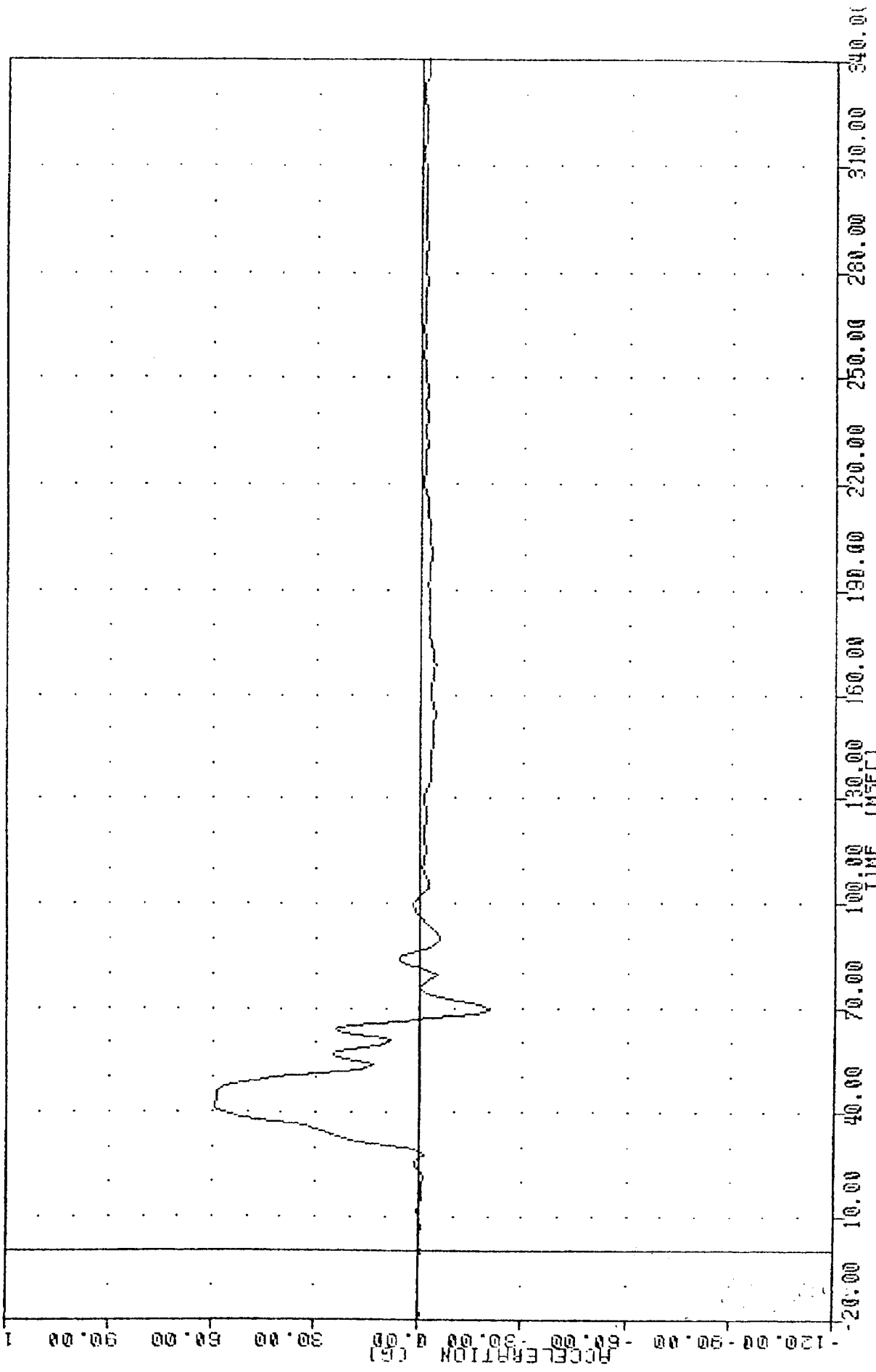
19-B

-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 (CHSEC)

MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V TESTING II RYCA

THE
 84062000000
 SIDE PROTECTION - 20R/40R
 84062000000
 LLYYGC
 6 MAR 84
 13:48:16

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -20.11e 68.75, 59.39 e 40.65

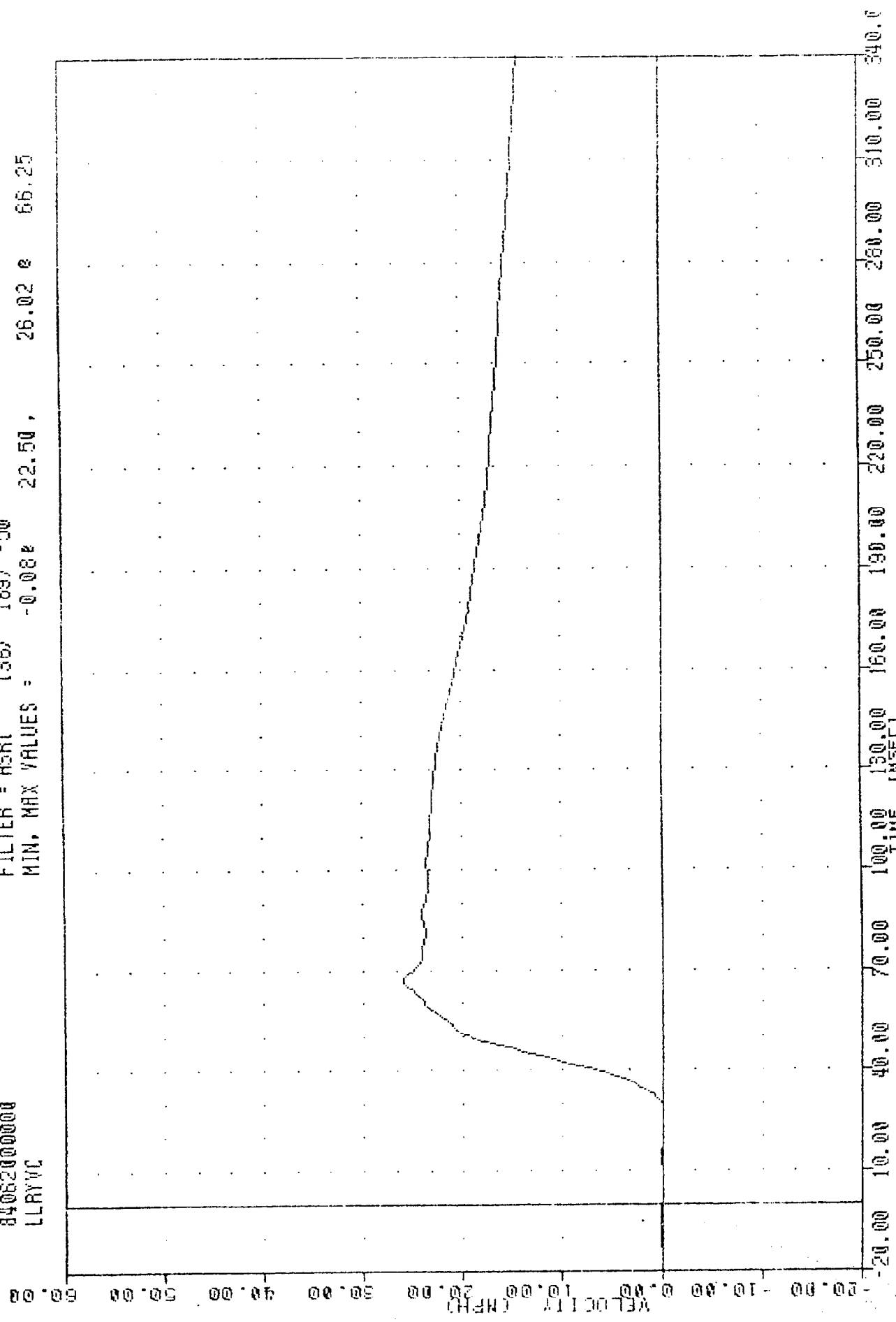


MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER LEFT LOWER RIB ACCIFFRATION -2 Y AXIS

TRC 840502 6 MAR 84 13:38:25

SIDE PROTECTION - 20A/40A
84062000000
LLRYVC

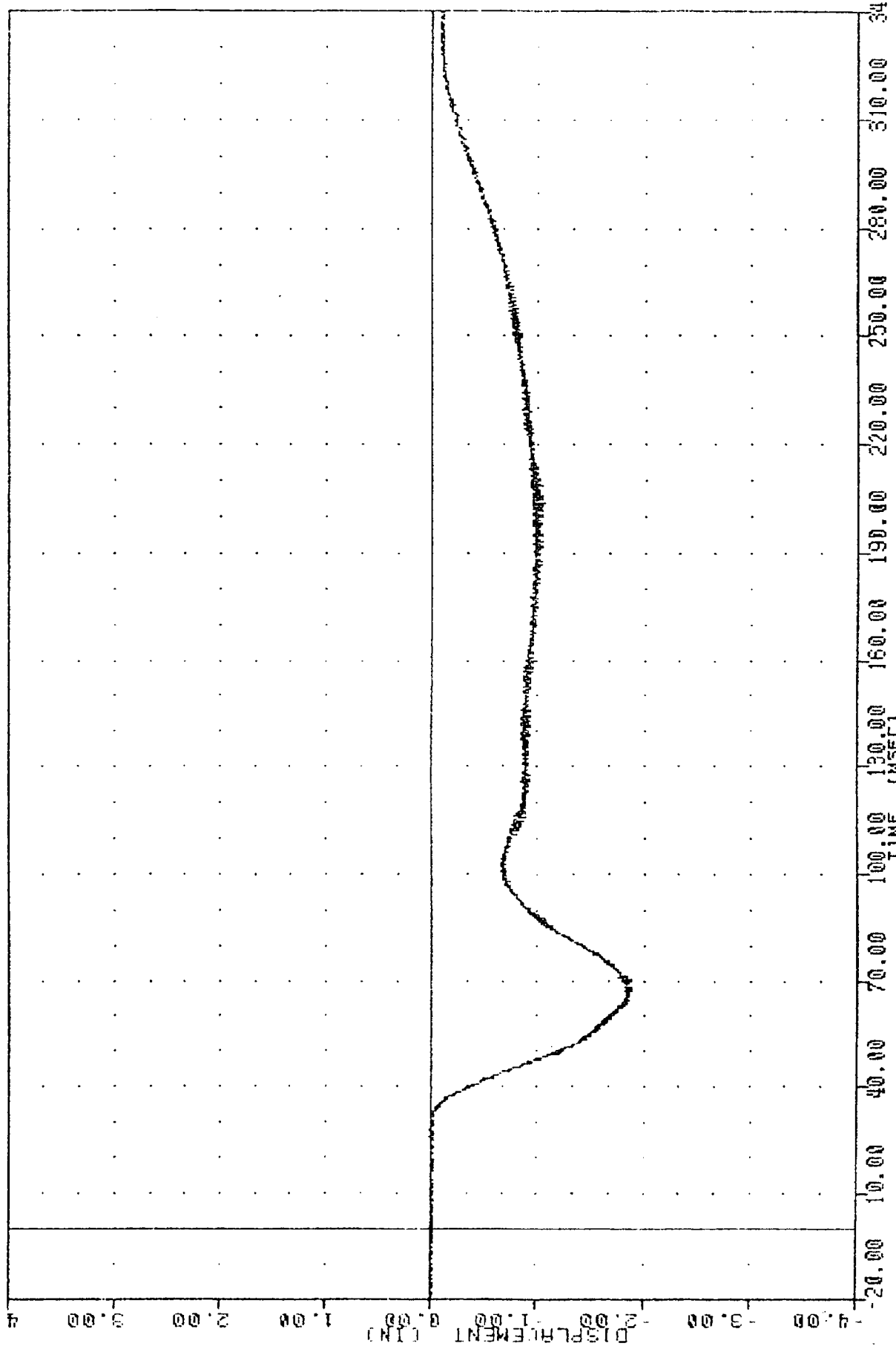
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -0.08% 22.50 , 26.02 e 66.25



MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V USING LLRYVC

THE 840302 14:07:45
 SIDE PROTECTION - 2DR/4DR
 8406200000
 LRTY03

FILTER = ALPF 1850/ 5217/ -40
 MIN. MAX VALUES = -1.89E 69.88, 0.02 E 25.63



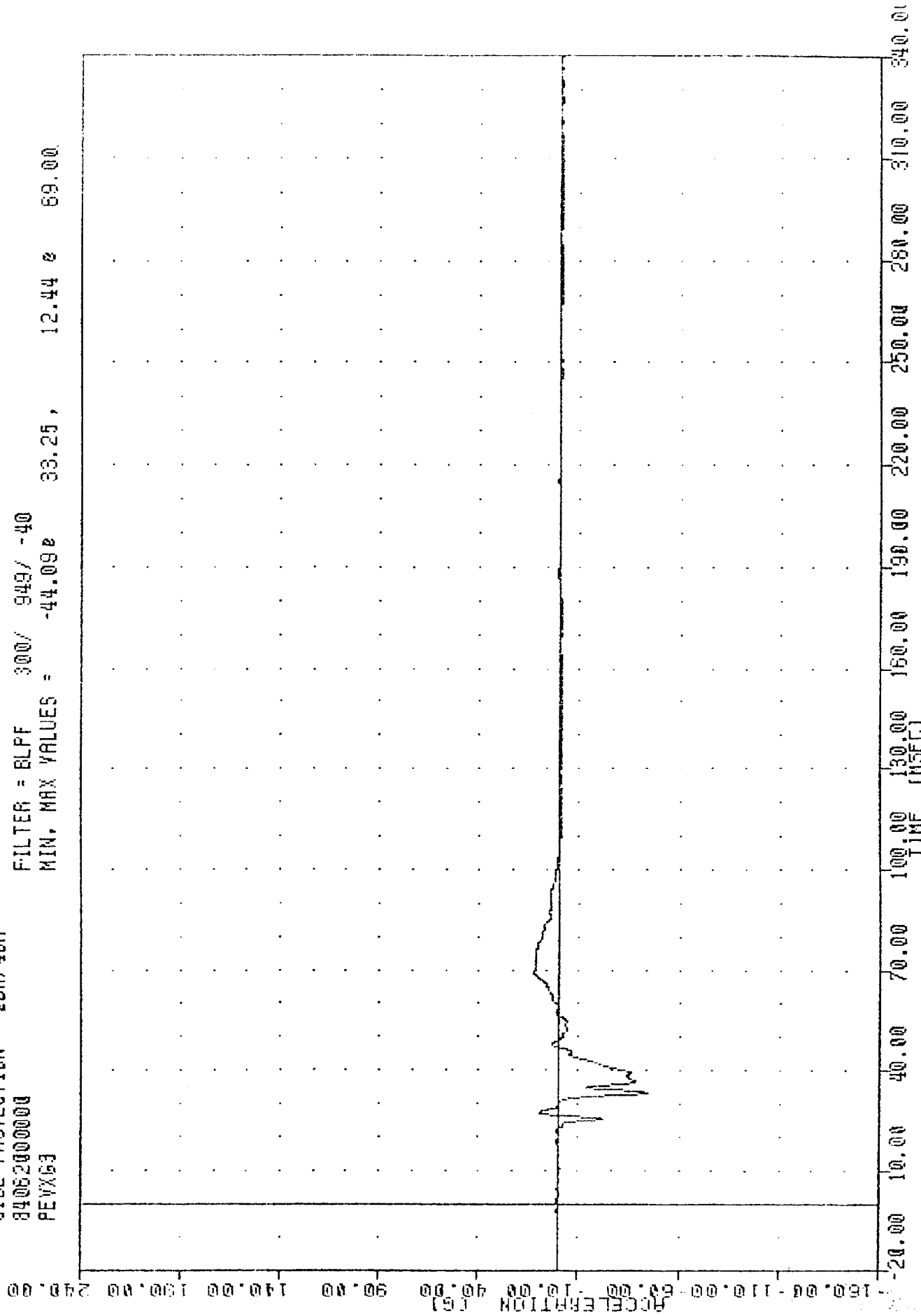
B-64

MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER LEFT-RTR TO SPINE DISPLACEMENT INCHES

TIME 00:00:30
SIDE PROTECTION - 2DR/4DR
84062000000
PEXX53

PLT-DATA 0-mbr-bx 14:07:40

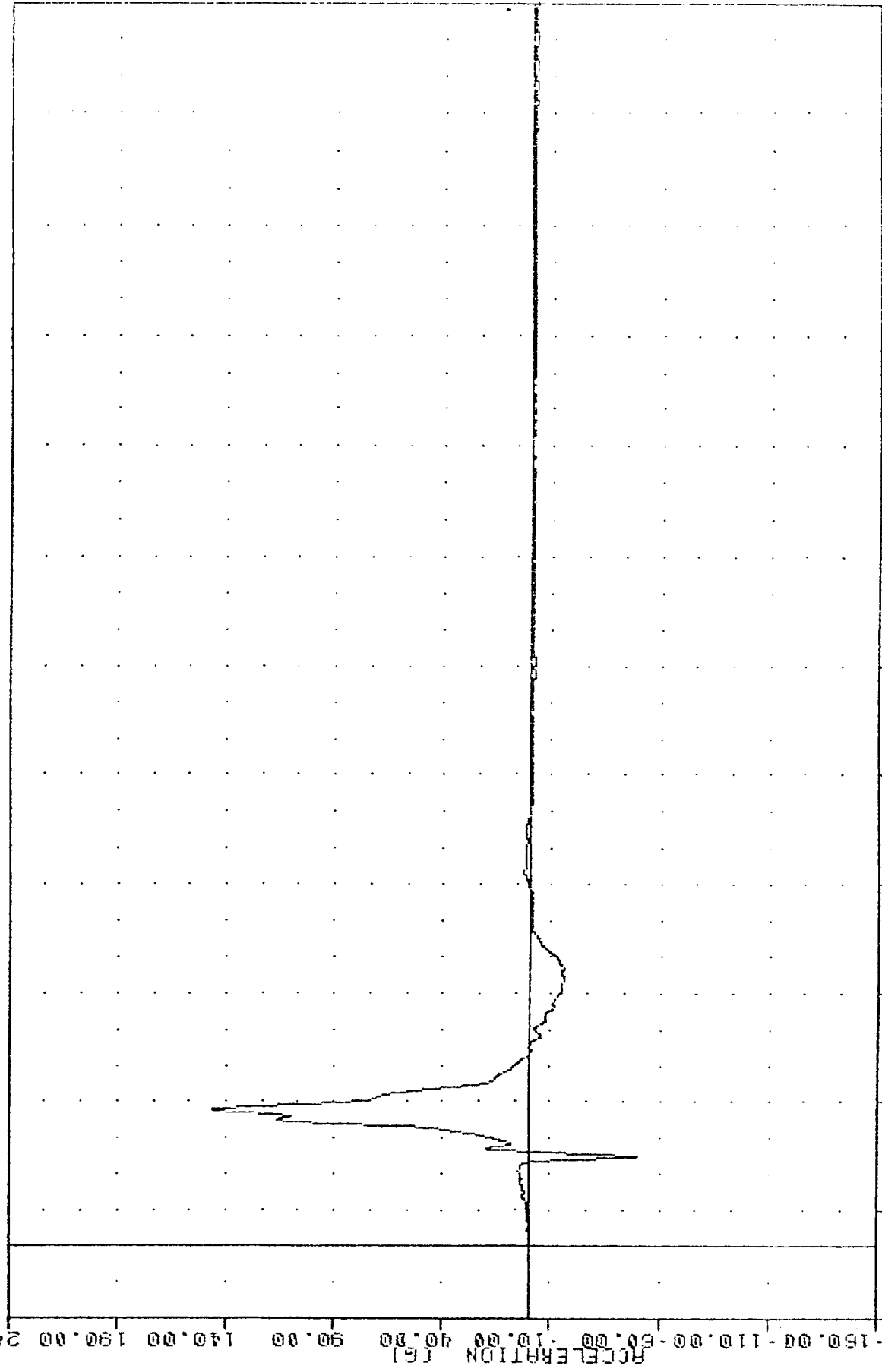
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -44.09g 33.25, 12.44 g 69.00



MOVING DEFORMABLE BARRIER INTO SENTRA
PASSENGER PELVIS ACCELERATION X AXIS

SIDE PROTECTION - 20R/40R
 84062000000
 PEY63

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -49.47e 24.63, 146.78 e 37.53

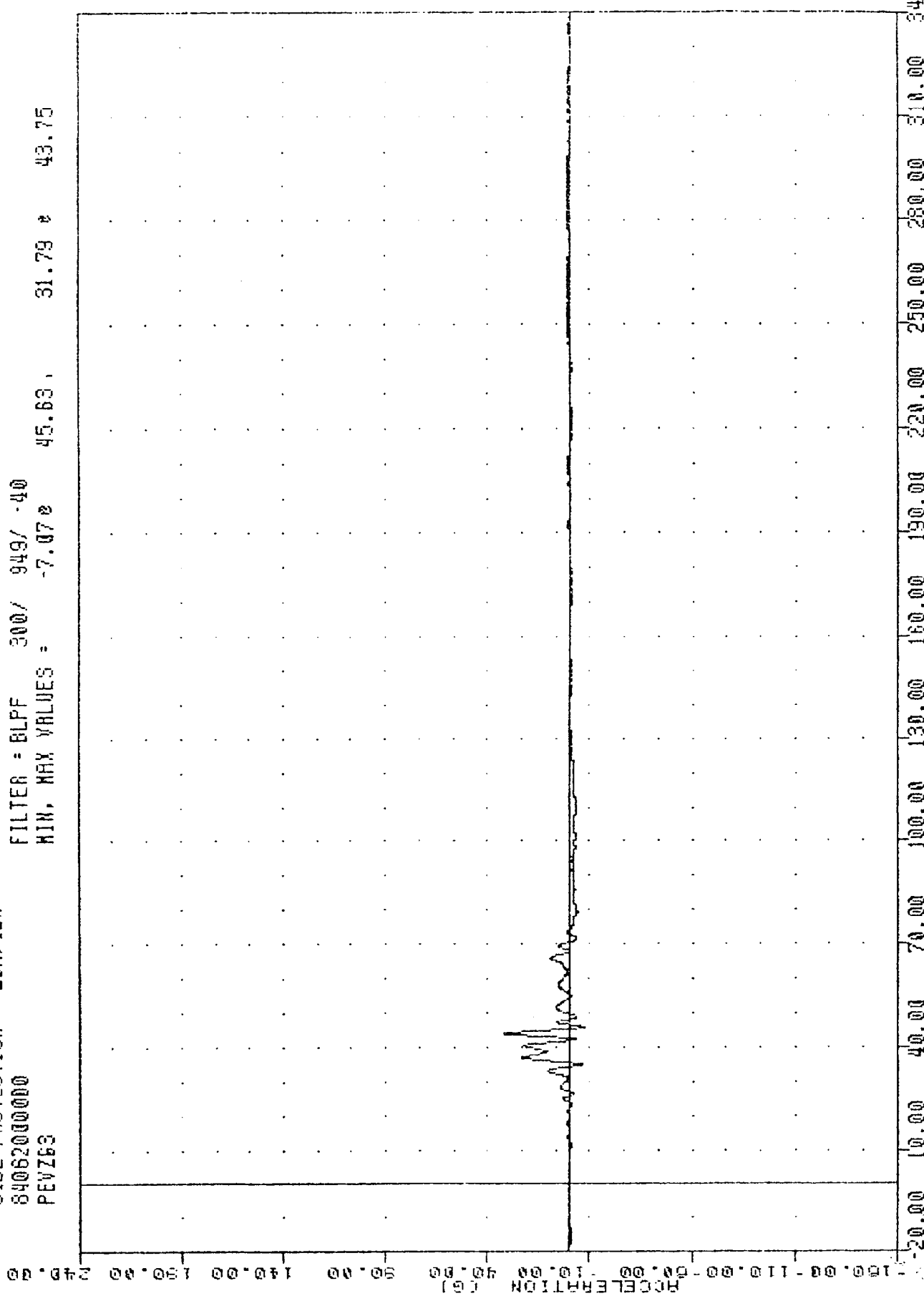


20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00 350.00 360.00 370.00 380.00 390.00 400.00 410.00 420.00 430.00 440.00 450.00 460.00 470.00 480.00 490.00 500.00 510.00 520.00 530.00 540.00

MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER PELVIS ACCELERATION Y AXIS

TIC 0003 040302 PLT-DATE 6 MAR 84 14:07:45
 SIDE PROTECTION - 20R/4DR
 84062000000
 PEVZ63

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -7.07 e 45.63 , 31.79 e 43.75

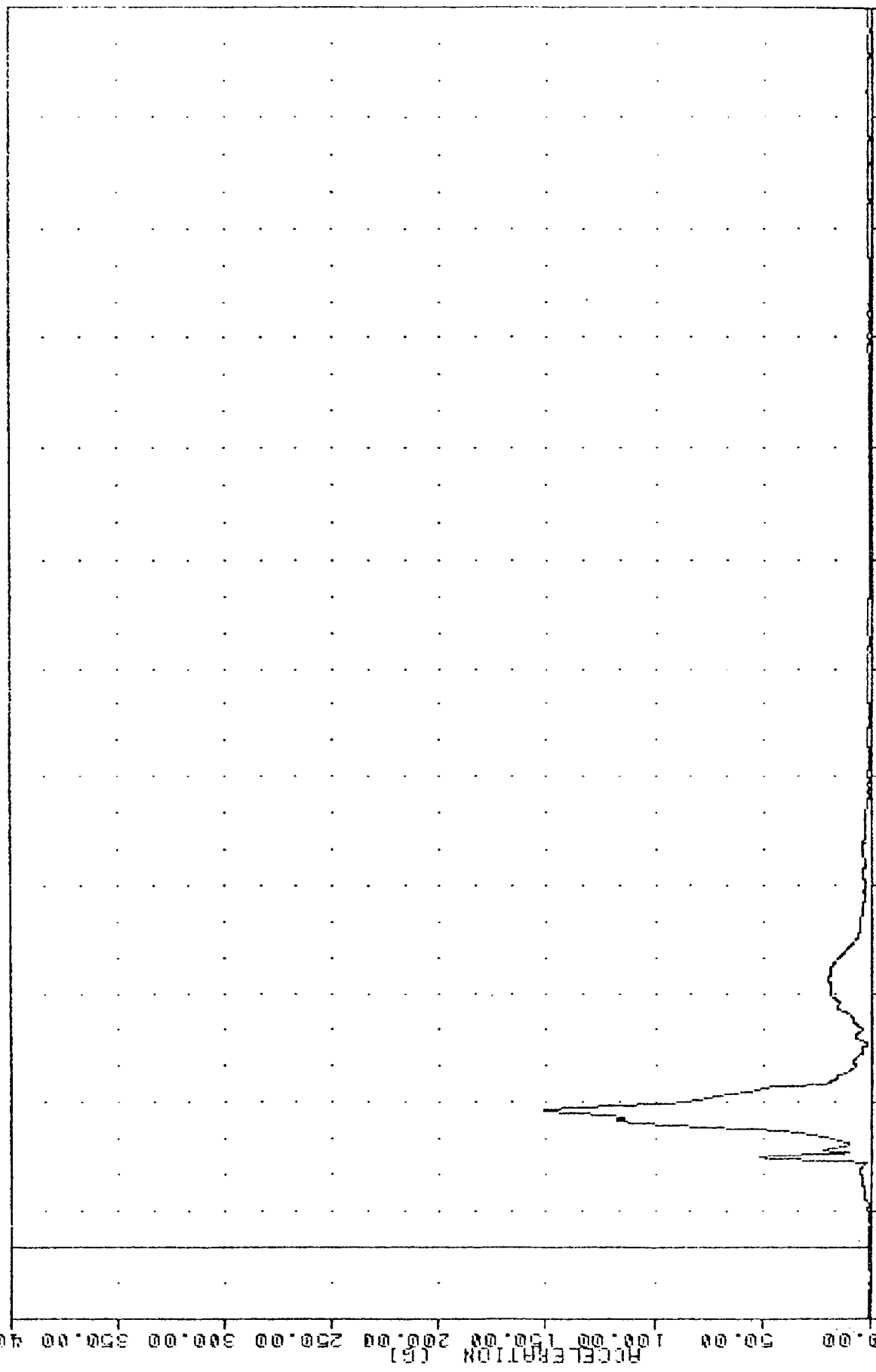


MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER PEVZ63 ACCELERATION 7 AXIS



SIDE PROTECTION - 2DR/4DR
 84052000000
 PEVRG3

FILTER = SLPF 300/ 949/ -40
 MIN. MAX VALUES = 0.07e -7.50, 151.89 e 97.83

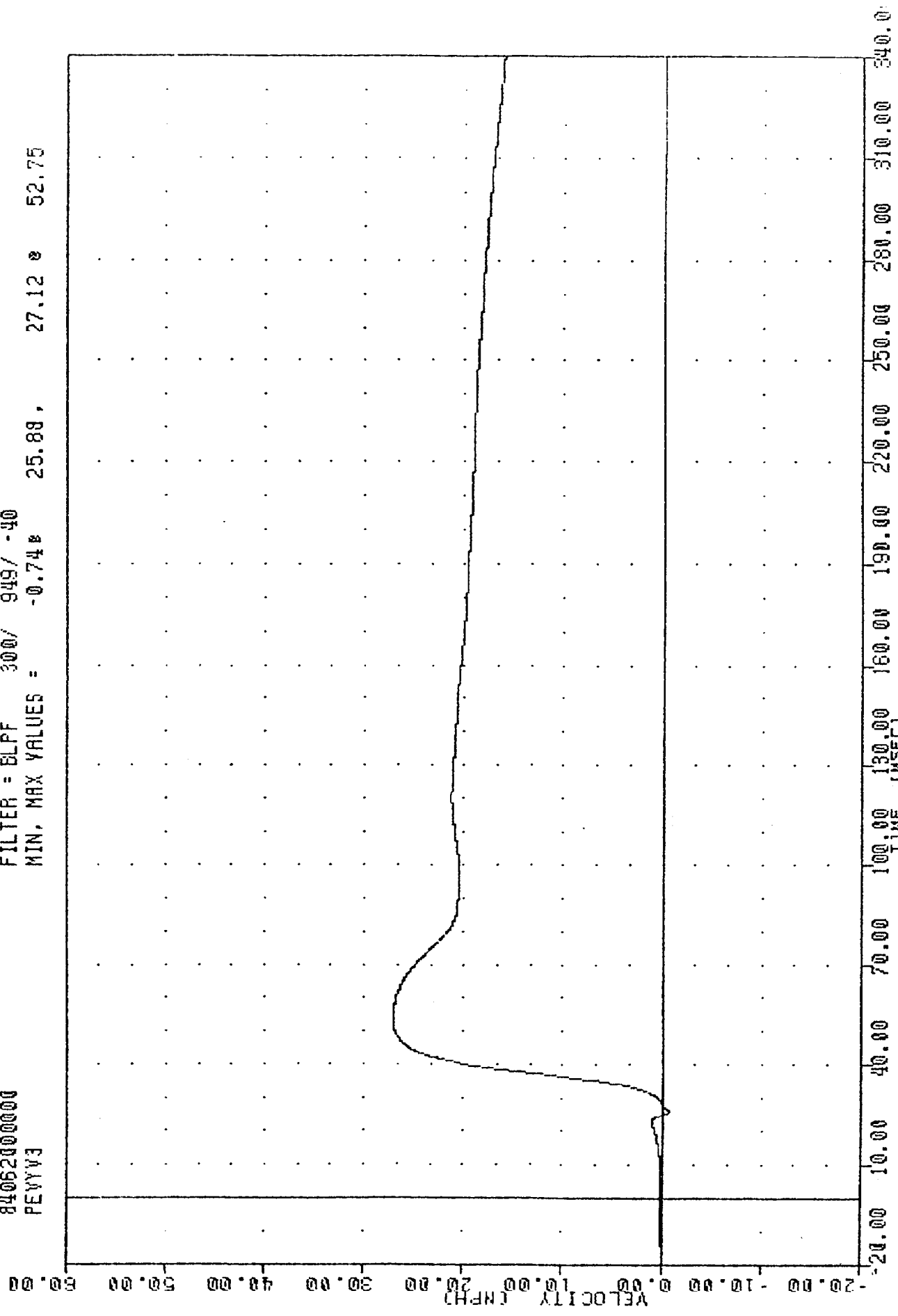


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MOVING DEFORMABLE BARRIER INTO SENTRA
 PASSENGER PELVIS RESULTANT

INC 840520000000
SIDE PROTECTION - 2DR/40R
PEYV3

15:39:02

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.74 25.88, 27.12 52.75

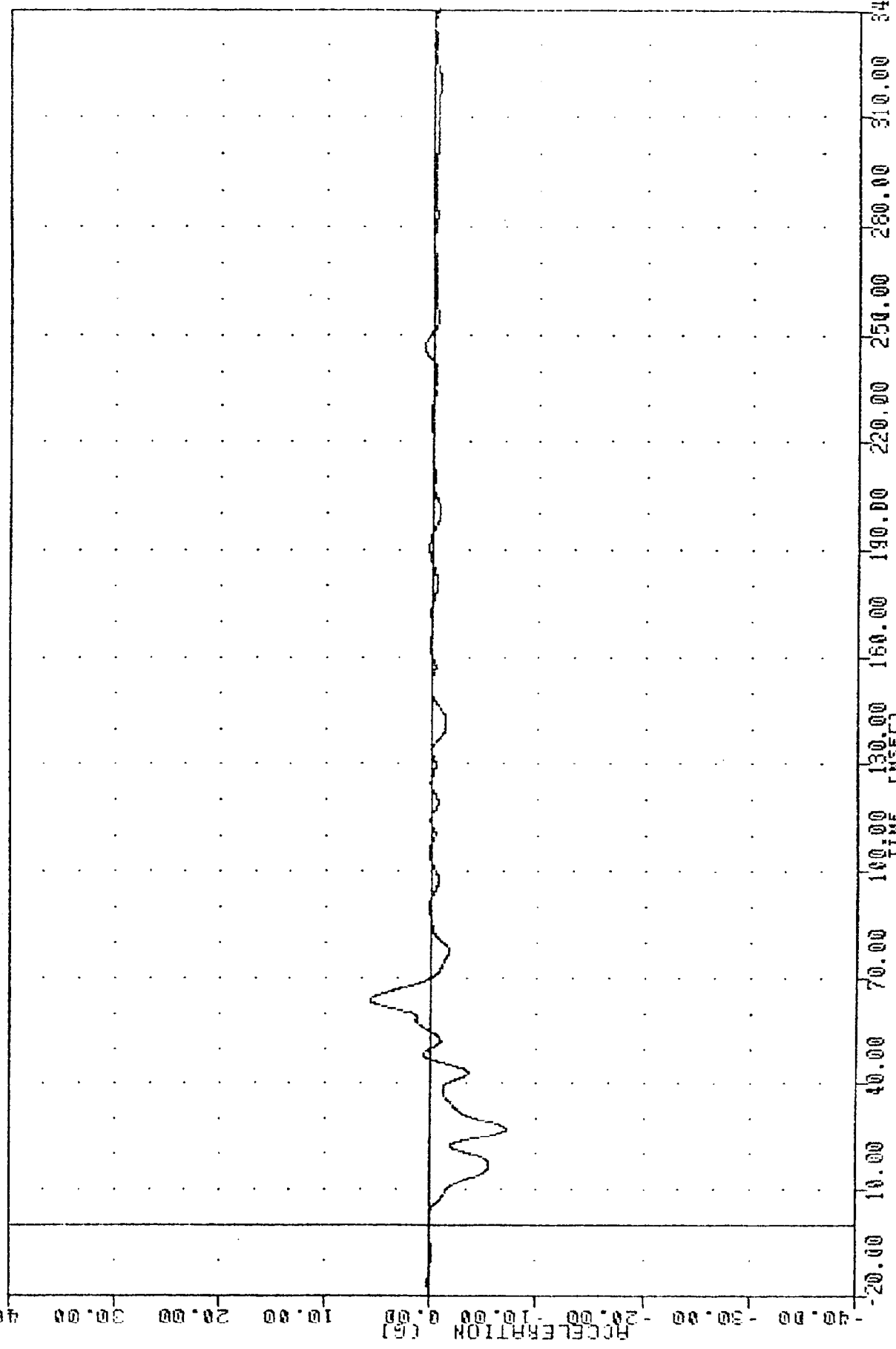


69-B

MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V USING PEYV3

THE DATE 04/03/02 PLOT DATE 07/14/07:43
 SIDE PROTECTION - 20R/40R
 84062000000
 RFSXG1

FILTER = 8LPF 100/ 316/ -40
 MIN. MAX VALUES = -7.17e 27.00, 5.82 e 83.63



B-70

MOVING DEFORMABLE BARRIER INTO SENTRA
 VEHICLE RIGHT FRONT STILL ACCCELERATION Y AVTS

TMC 7040302
84062000000
RFSY61

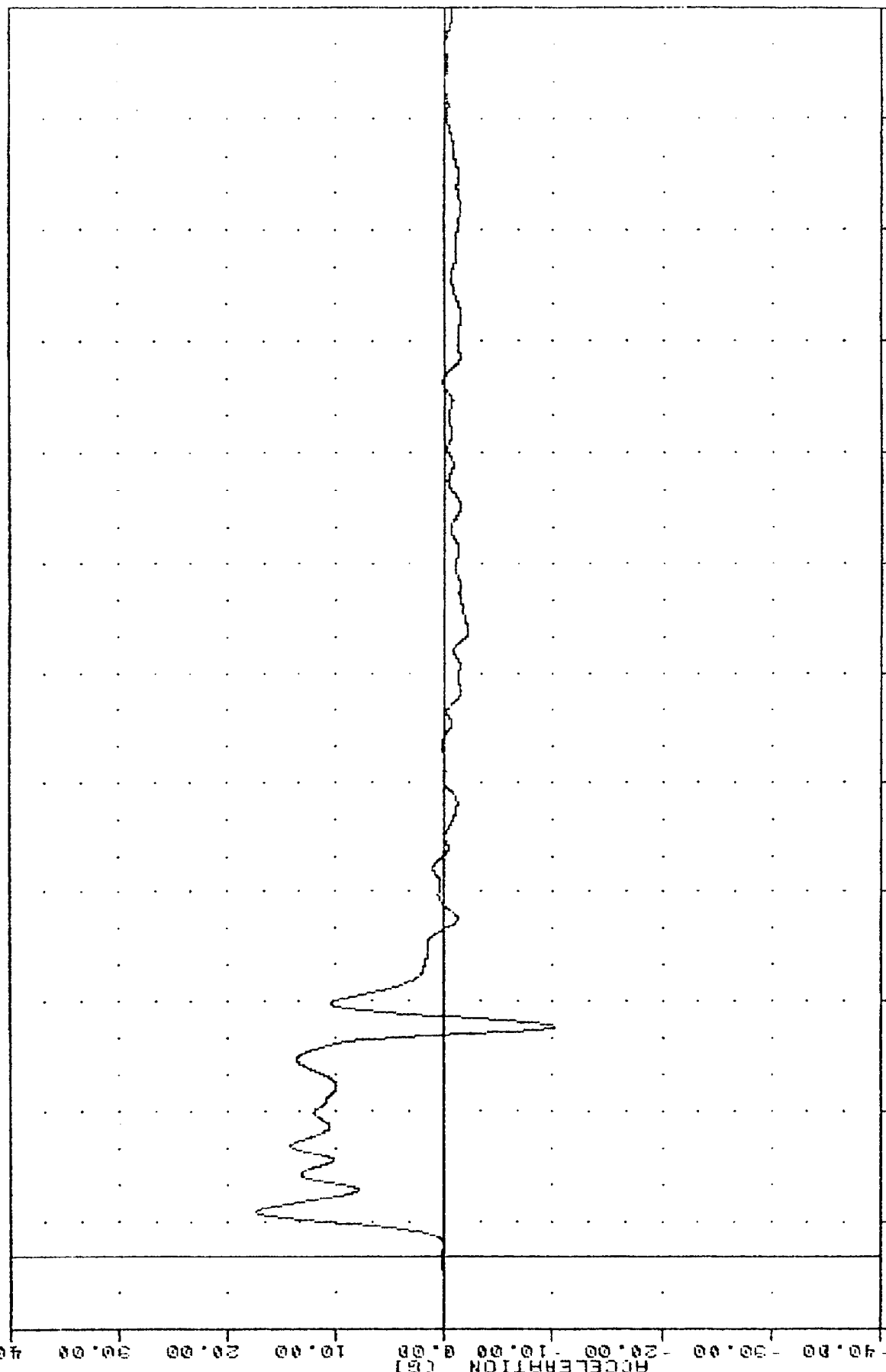
PLUT DATE 6 MAR 84 14:07:43

SIDE PROTECTION - 2DR/4DR

FILTER = BLPF 100/ 318/ -40

MIN. MAX VALUES = -10.21e 63.00

17.40 e 12.25



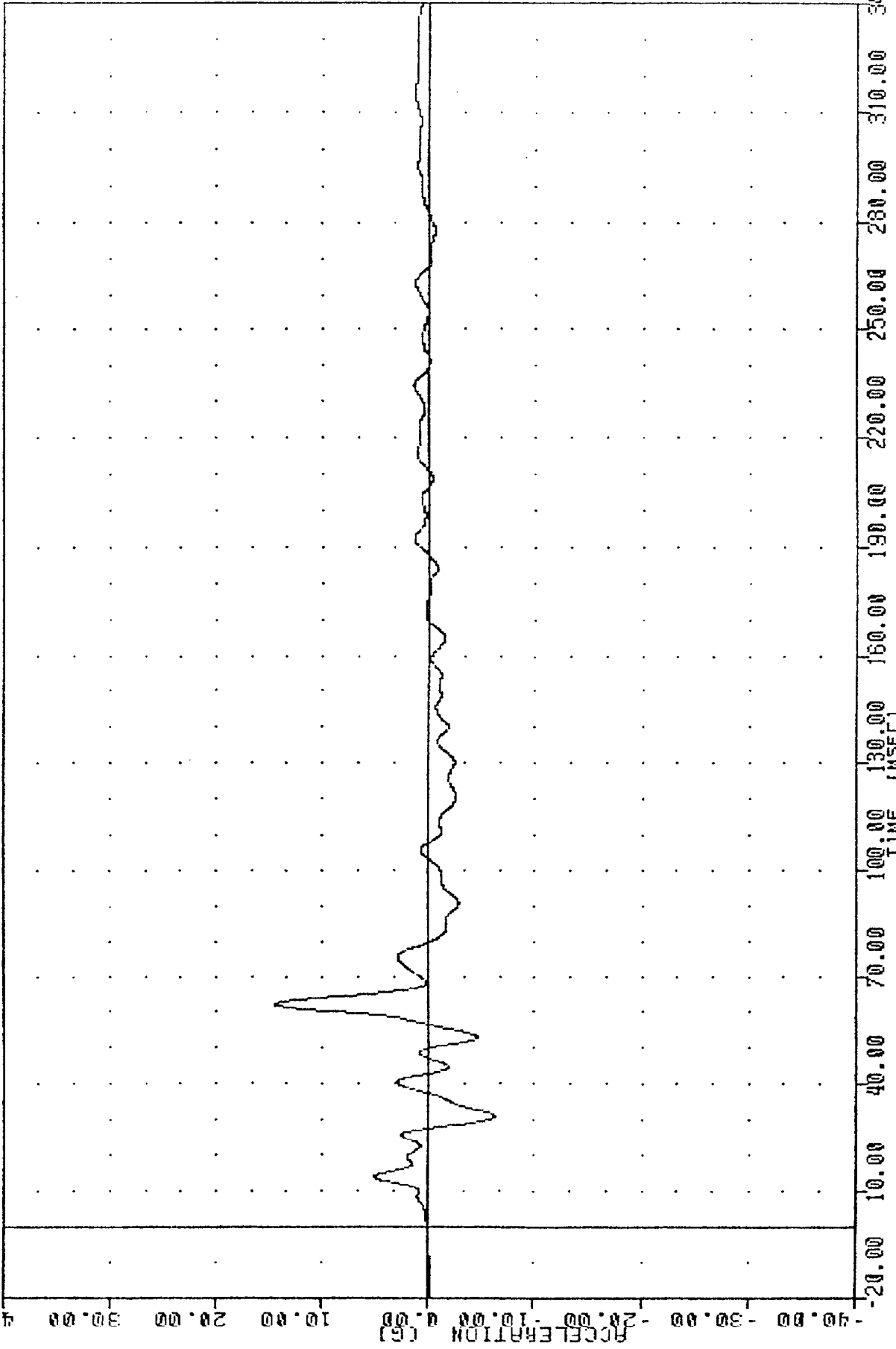
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO SENTRA
VEHICLE RIGHT FRONT SILL ACCELERATION Y AXIS

SIDE PROTECTION - 2DR/4DR
 84052000000
 RFSZG1

FILTER = 6LPF 100/ 316/ -40
 MIN, MAX VALUES = -6.27% 30.88, 14.53 @ 62.13

13:07:34

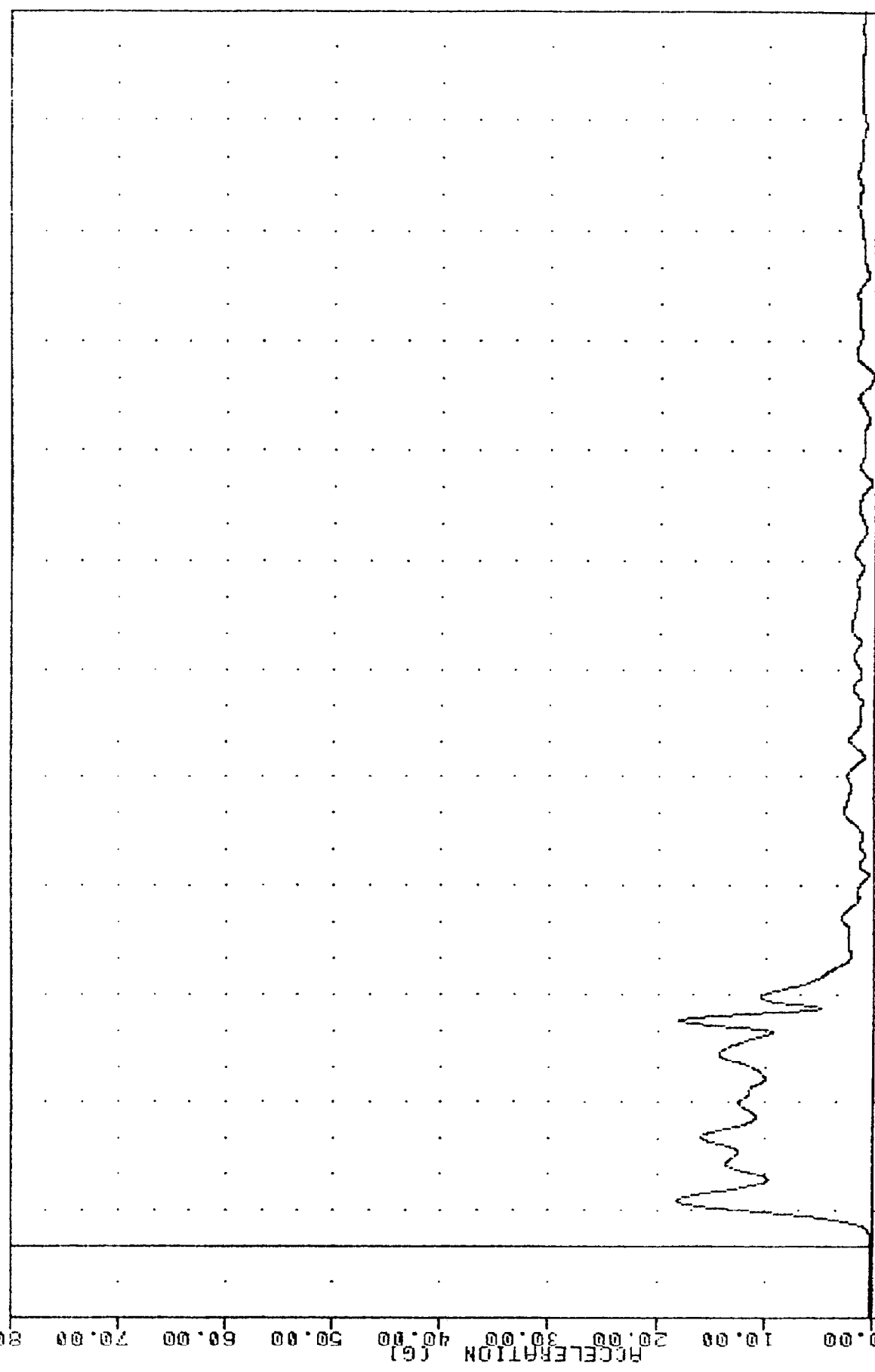


MOVING DEFORMABLE BARRIER INTO SENTRA
 VEHICLE RIGHT FRONT STILL ACCELERATION Z AXIS

DATE: 03/08/90

FILTER = 8LFF 100/ 316/ -40
MIN. MAX VALUES = 0.12g -6.13g 16.14g 12.63g

SIDE PROTECTION - 2DR/4DR
84062000000
RFSRG1



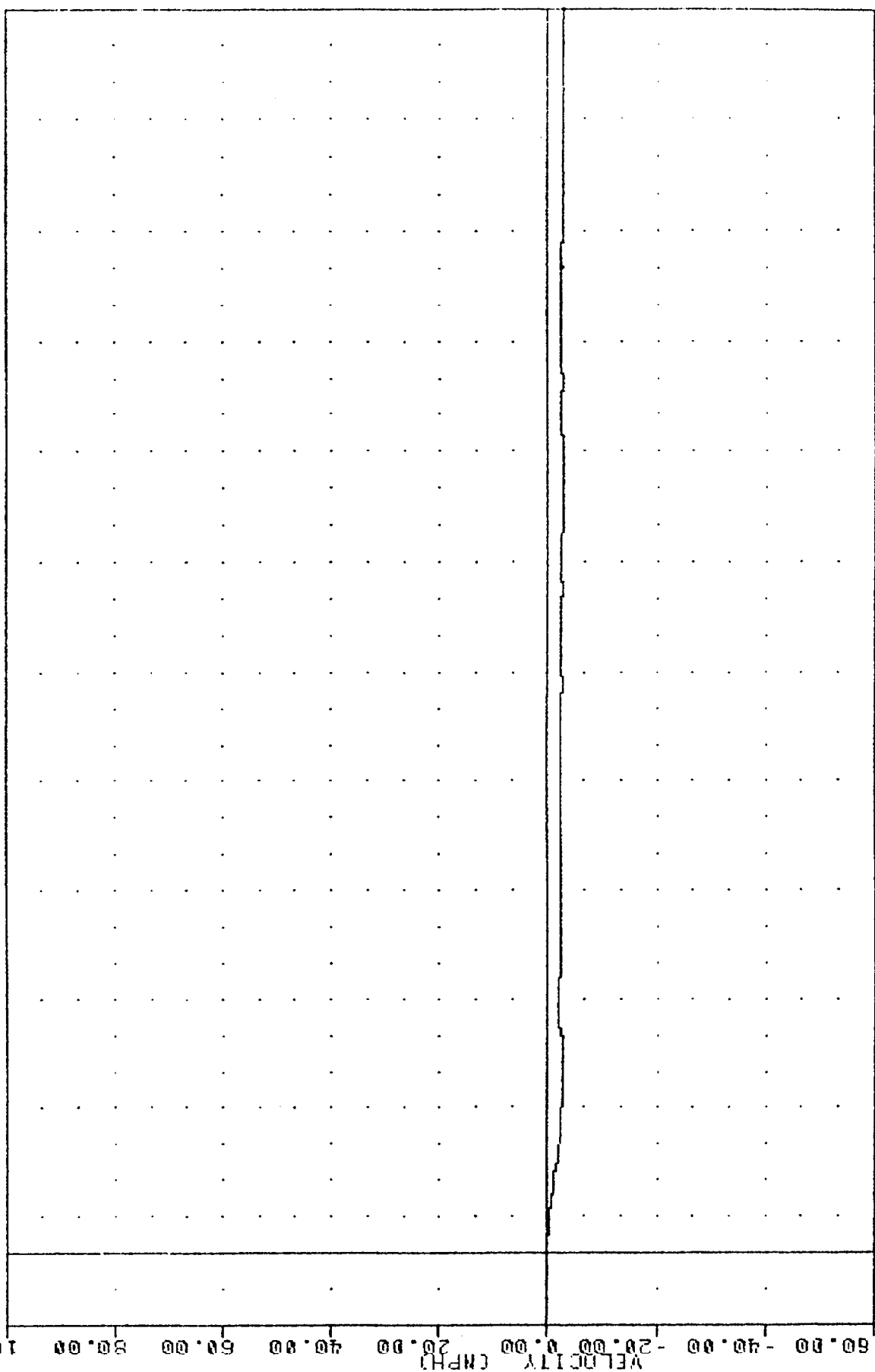
B-73

MOVING DEFORMABLE BARRIER INTO SENTRA
VEHICLE RIGHT FRONT SILL RESULTANT

THC 840302 PLOT DATE 3-MAR-84 15:09:02

SIDE PROTECTION - 2DR/4DR
8406200000
RFSXV1

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -2.95e 340.00, 0.01 e -15.38

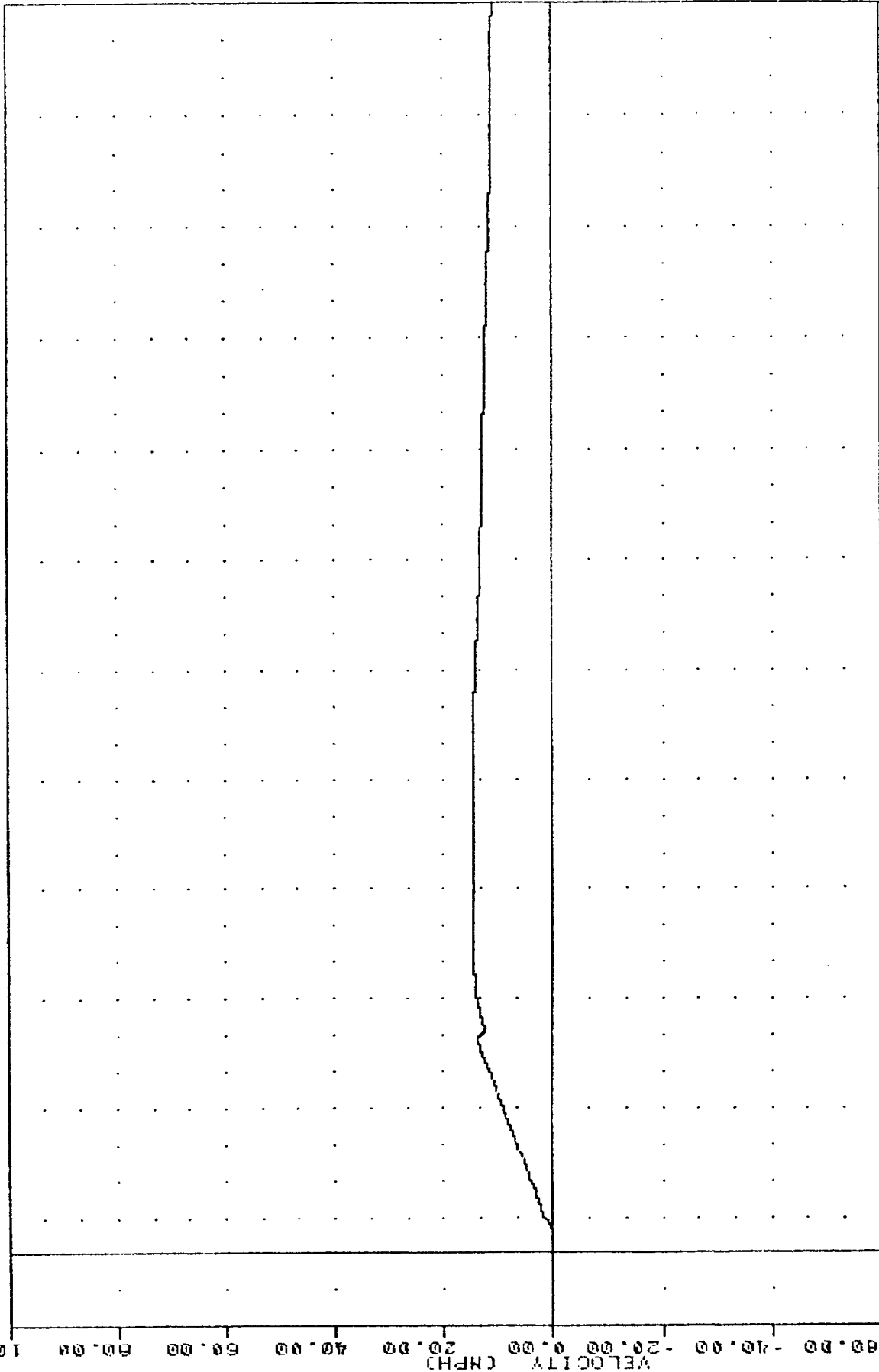


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V USING RFSXG1

TRC 0000, 00000302
 SIDE PROTECTION - 2DR/4DR
 84062000000
 RFSYV1

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 0.00 14.80 106.75

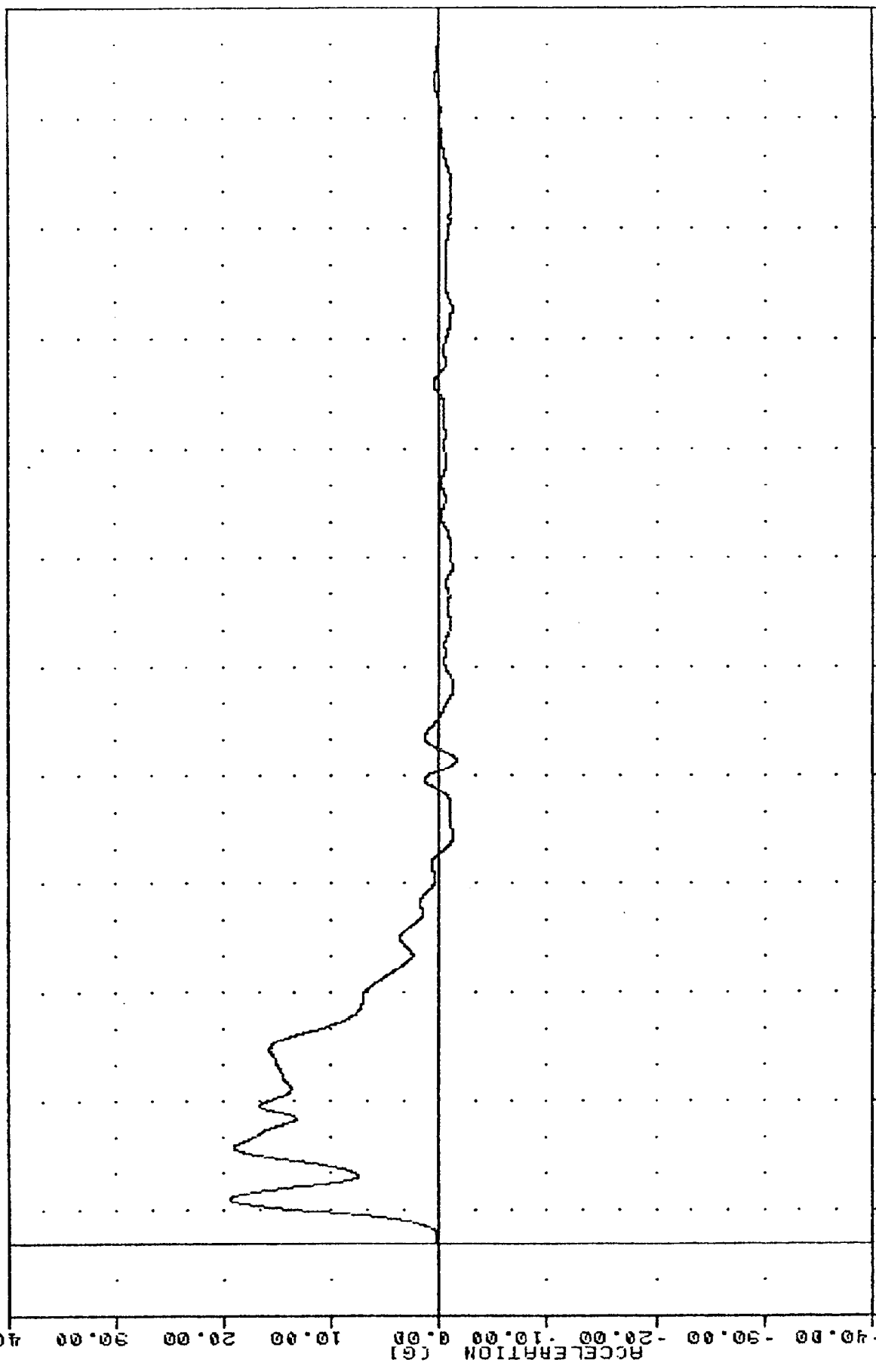


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (NSEC)

MOVING DEFORMABLE BARRIER INTO SENTRA
 DELTA V USING RFSYGI

TRC 1000, 04V302
SIDE PROTECTION - 2DR/4DR
84062000000
RASYE2

PLUG RATE 5 mm/s 15.07:34
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -1.62g 134.00, 19.34 e 12.50



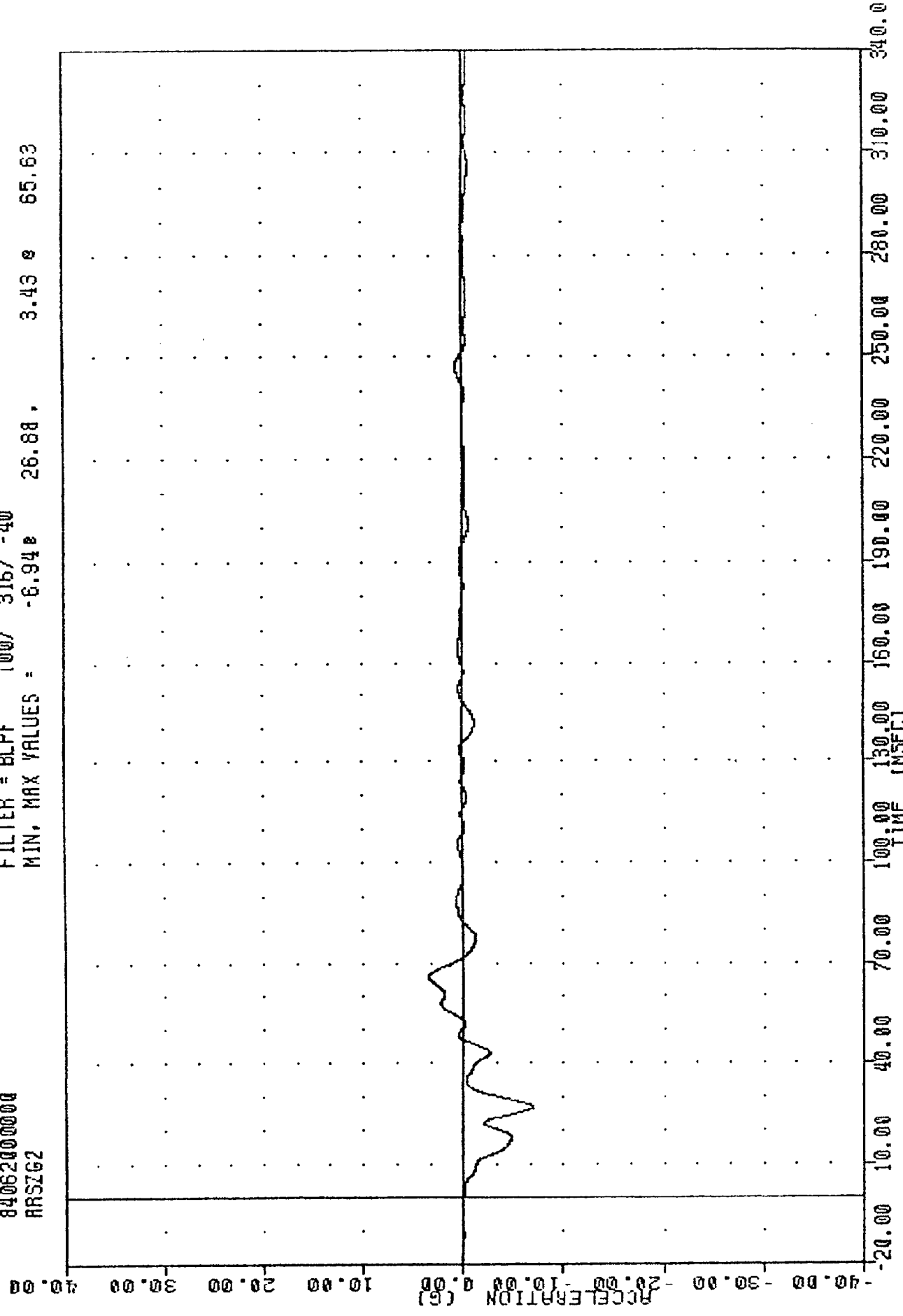
ACCELERATION (G)
-40.00 -30.00 -20.00 -10.00 0.00 10.00 20.00 30.00 40.00
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO SENTRA
VEHICLE RIGHT REAR SILL ACCELERATION Y AXIS

TRC 840302 5MMR-84 10.07:34

SIDE PROTECTION - 2DR/4DR
84062000000
RRSZG2

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -6.94e 26.88, 3.43 e 65.63

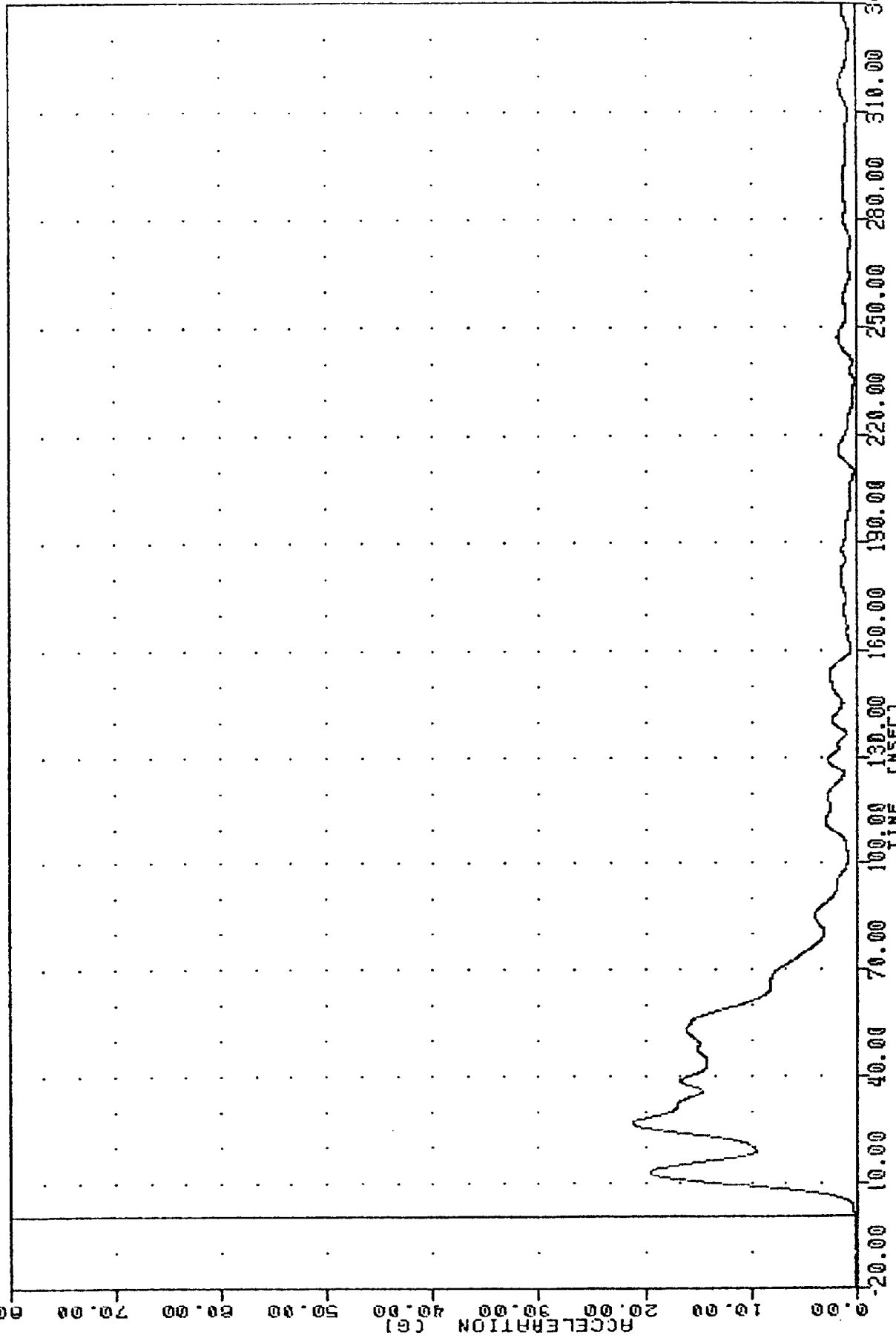


B-78

MOVING DEFORMABLE BARRIER INTO SENTRA
VEHICLE RIGHT REAR SILL ACCELERATION Z AXIS

TAC 840620000000
840302
PLT DATE 5 MAR 84 15:06:35

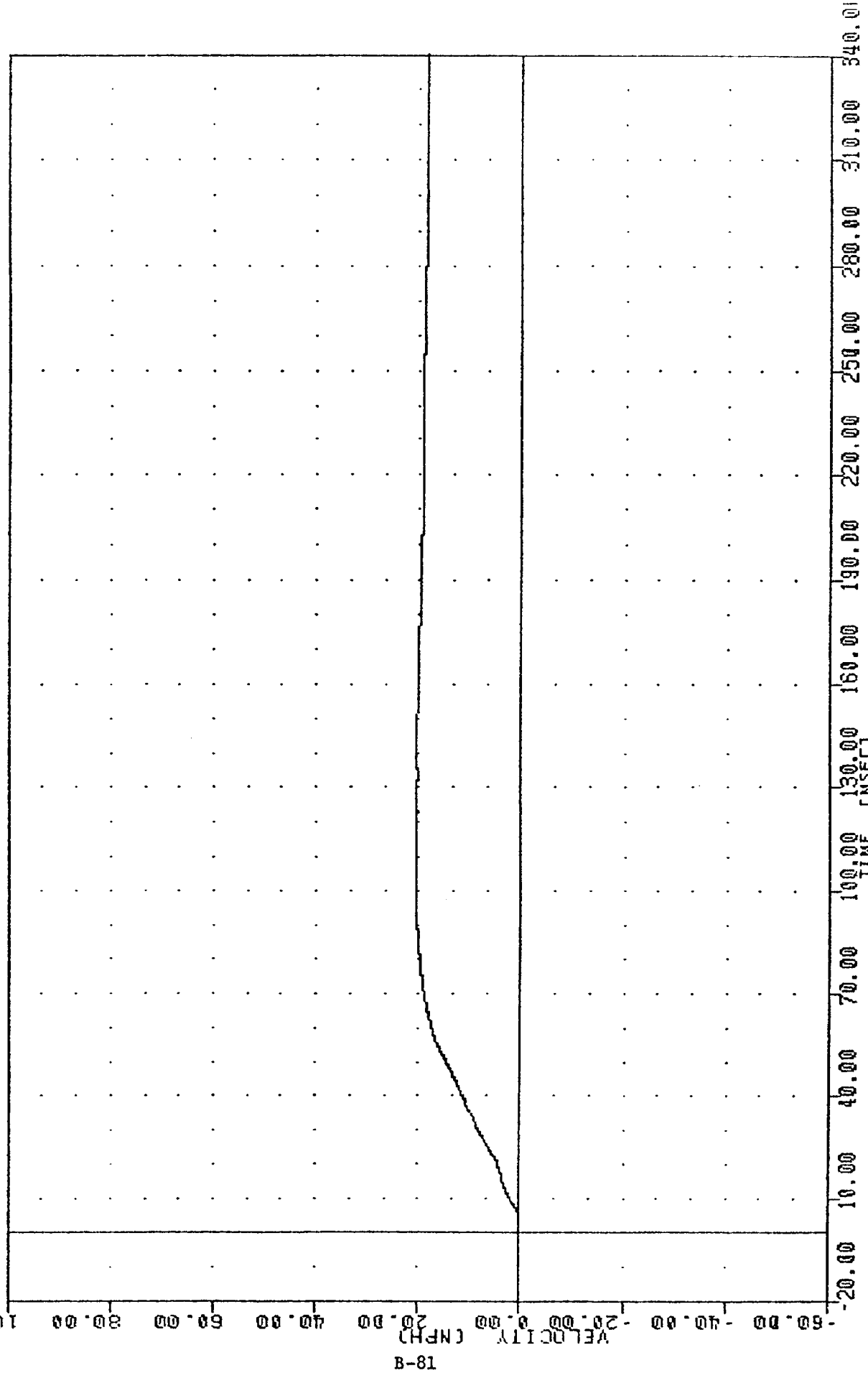
SIDE PROTECTION - 2DR/4DR
840620000000
RRSR62
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = 0.07e -10.25, 21.27 e 26.50



MOVING DEFORMABLE BARRIER INTO SENTRA
VEHICLE RIGHT REAR S111 REFSUITANT

THE SIDE PROTECTION - 2DR/4DR
84062000000
RRSYV2

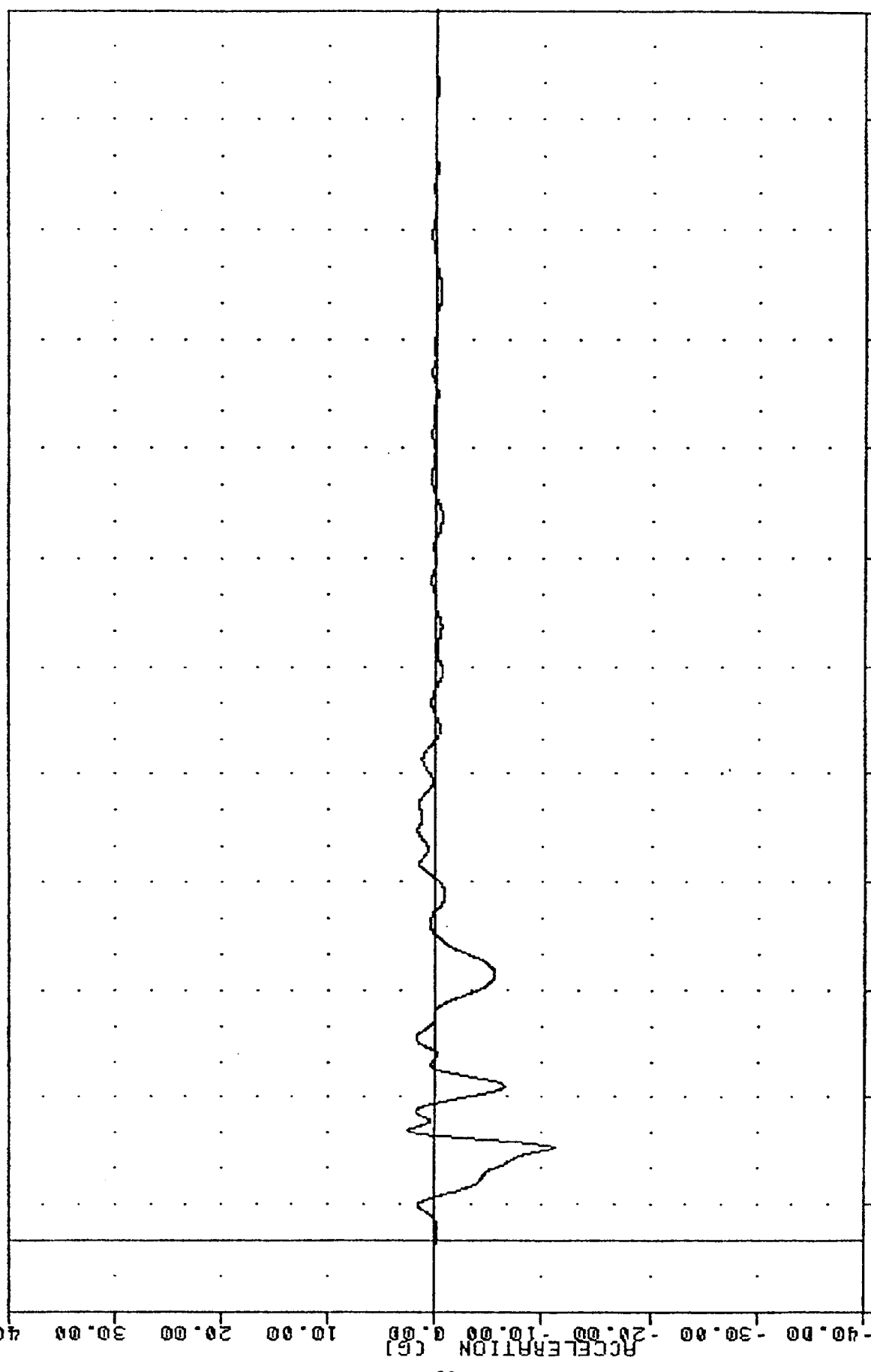
PLOT DATE 10-03-02
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.00s -5.50, 20.67 s 105.75



MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V USING RRSYG2

The
 SIDE PROTECTION - 2DR/4DR
 84062000000
 RDXG3
 PLATE
 3-11-84
 13:07:34

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -11.09e 25.63, 2.53 e 30.63

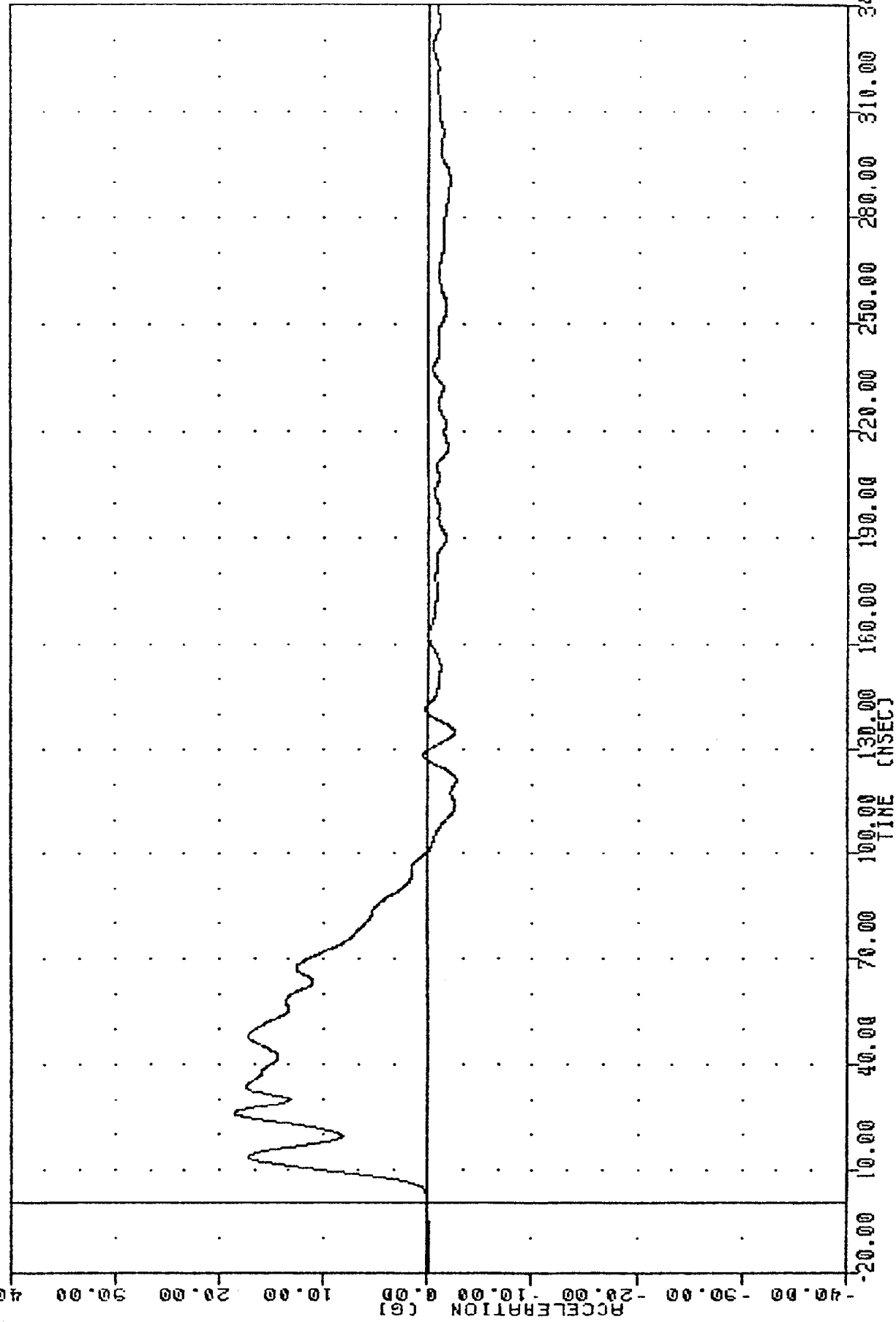


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO SENTRA
 VEHICLE REAR DECK ACCELERATION X AXIS

TRC
 SIDE PROTECTION - 2DR/4DR
 84062000000
 ROKY63
 LPLD-RATE 5 mm-8
 15.07:34

FILTER = BLPF 100/ 316/ .40
 MIN, MAX VALUES = -2.63e 121.00, 18.61 e 25.63



MOVING DEFORMABLE BARRIER INTO SENTRA
 VEHICLE REAR DECK ACCELERATION Y AXIS

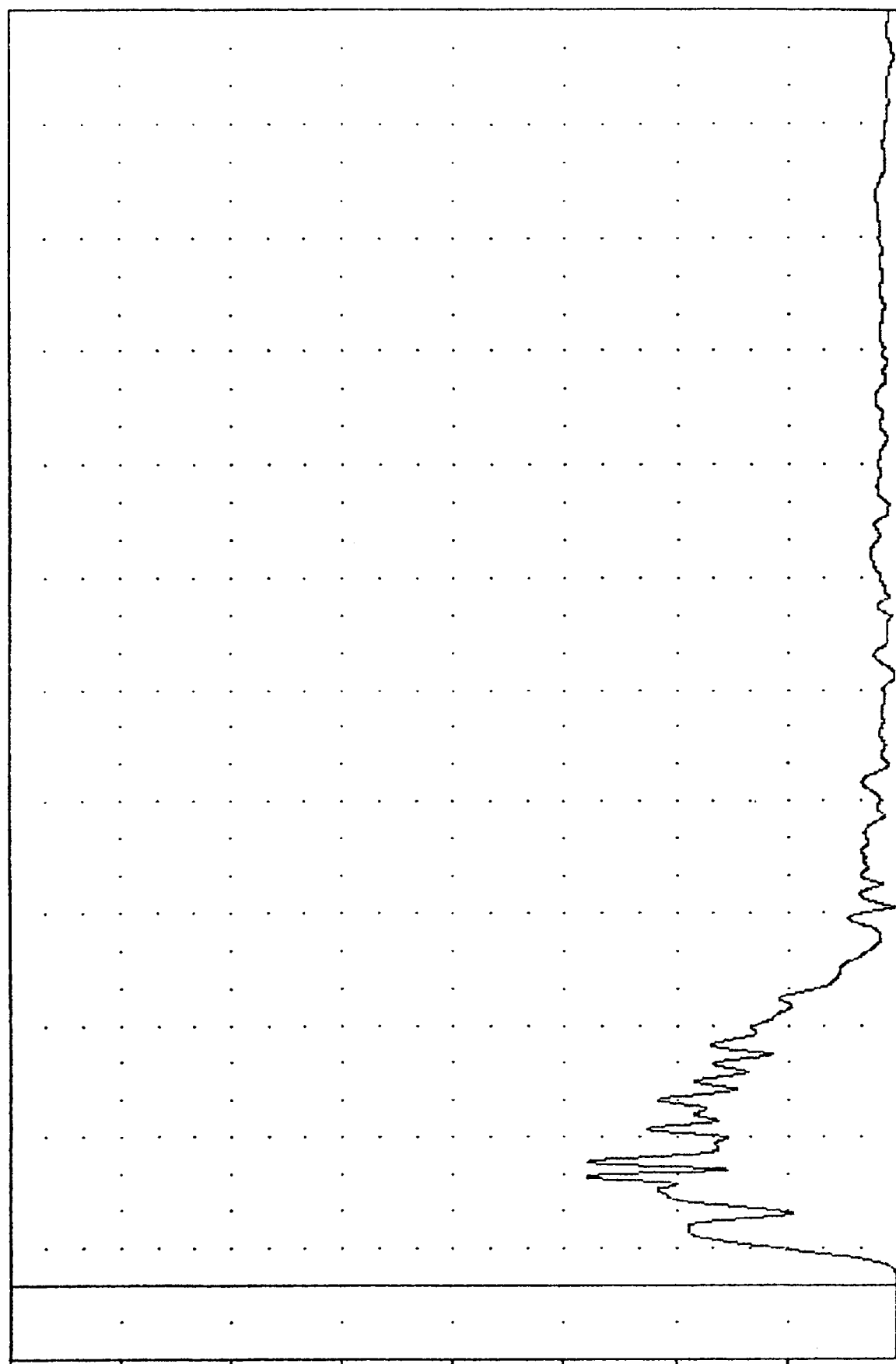


PLT DATE 13:08:30

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = 0.13B -5.00, 28.01 & 33.25

THC
SIDE PROTECTION - 2DR/4DR
8406200000
ADKRG3

ACCELERATION (G)

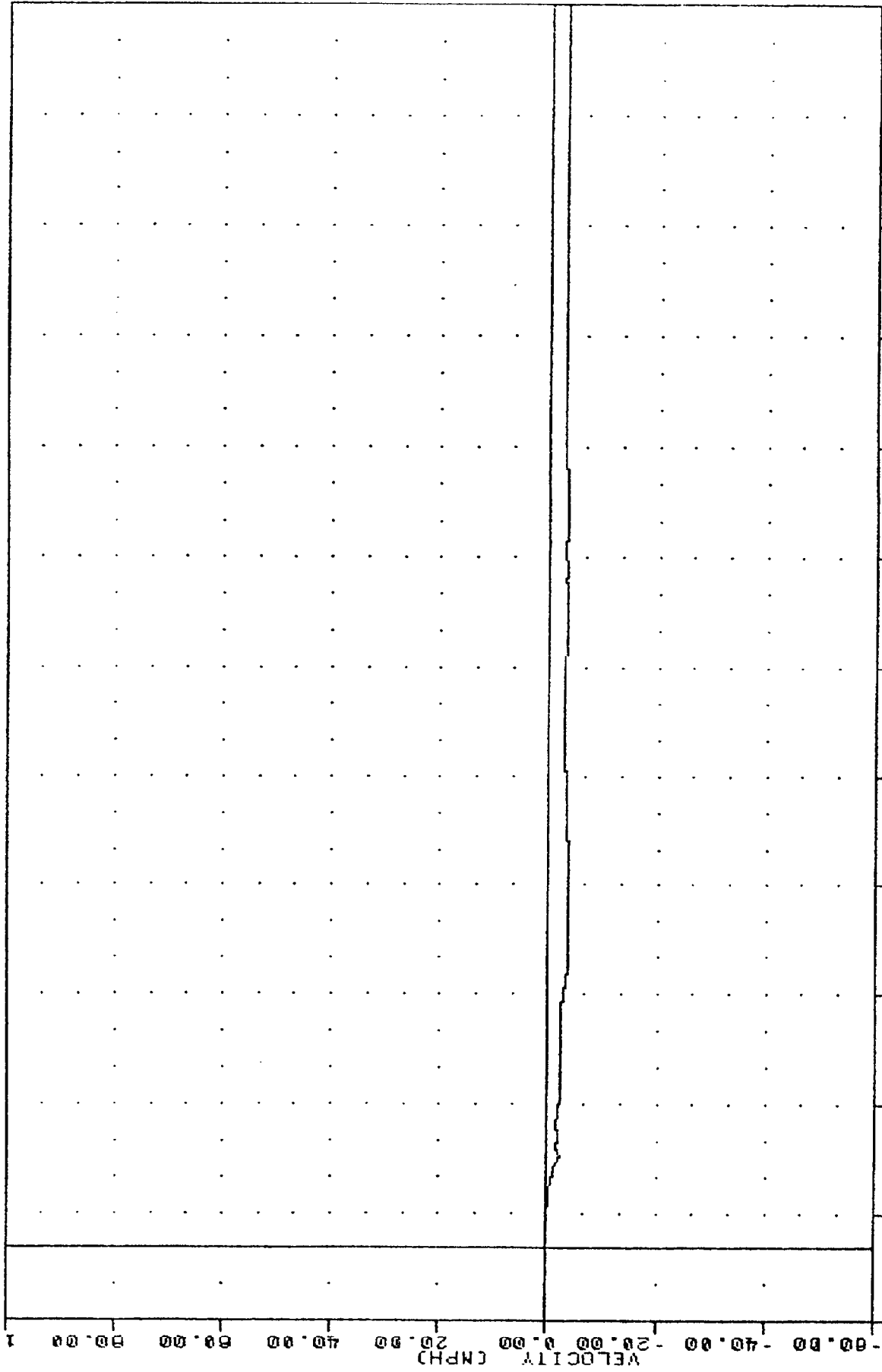


0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MOVING DEFORMABLE BARRIER INTO SENTRA
VEHICLE REAR DECK RESISTANT

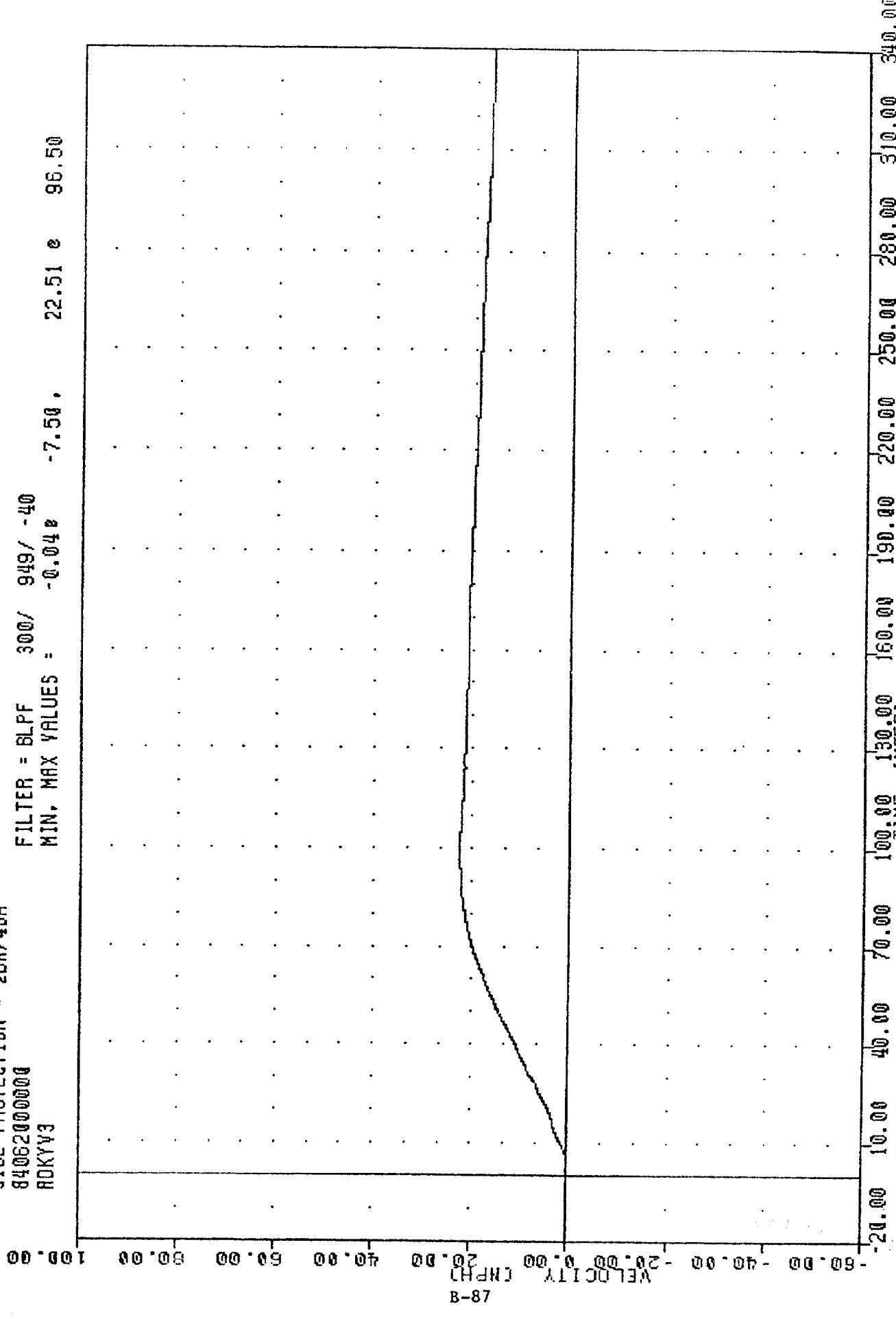
SIDE PROTECTION - 20R/4DR
 84062000000
 RDKXV3
 PLUG RATE 5 min - 8 10:03:02

FILTER = BLPF 300 / 949 / -40
 MIN. MAX VALUES = -3.81e 97.88, 0.19 e 9.25



-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 (NSEC)
 MOVING DEFORMABLE BARRIER INTO SENTRA
 DELTA V USING RDKXG3

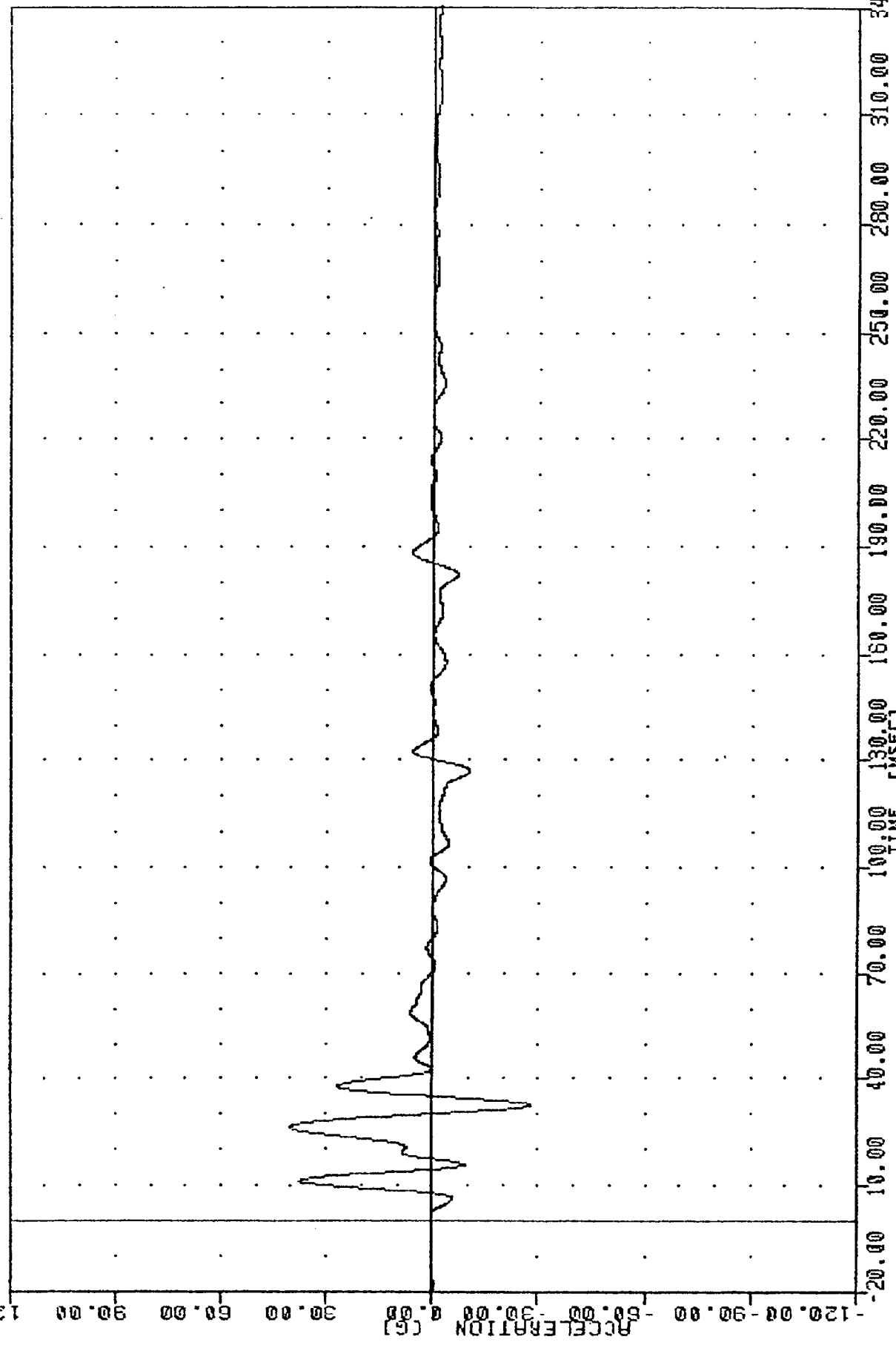
TIME 0300
 SIDE PROTECTION - 2DR/4DR
 84062000000
 RDKYV3
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.048 -7.50, 22.51 e 96.50
 PLOT DATE 13:09:02
 3mlR-b



MOVING DEFORMABLE BARRIER INTO SENTRA
 DELTA V USING RDKYV3

THE 3000 PLT-PORT 5-MR-54 10/17/35

SIDE PROTECTION - 2DR/4DR
8406200000
LRSYG4
FILTER = 8LPF 100/ 316/ -10
MIN, MAX VALUES = -28.04e 32.50, 40.48 s 26.13

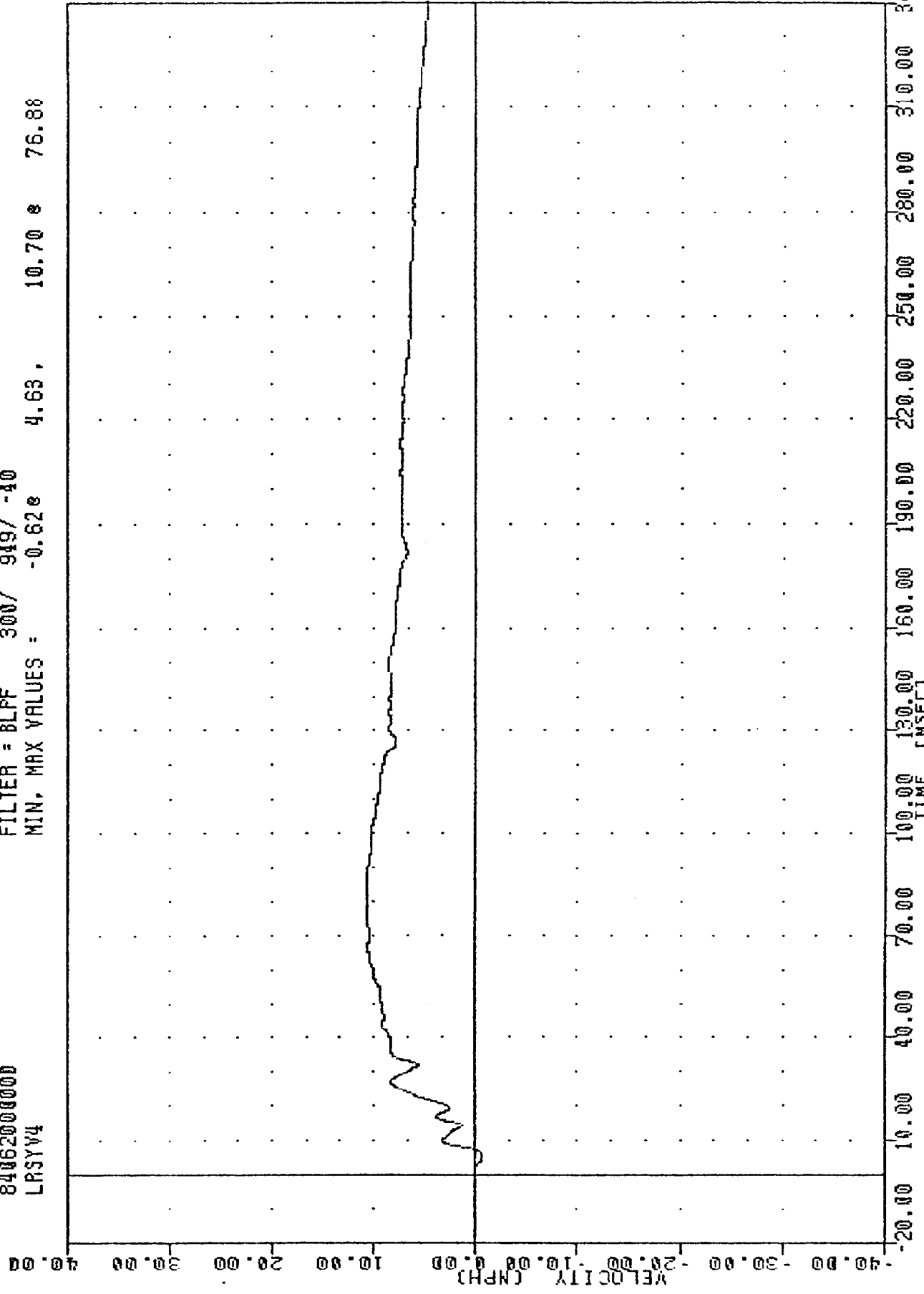


MOVING DEFORMABLE BARRIER INTO SENTRA
VEHICLE LEFT REAR SILL ACCELERATION Y AXIS

THE
SIDE PROTECTION - 2DR/4DR
84062000000
LRSYV4

PLUT-DAT 1.0.03.02

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.62e 4.63, 10.70 e 76.88

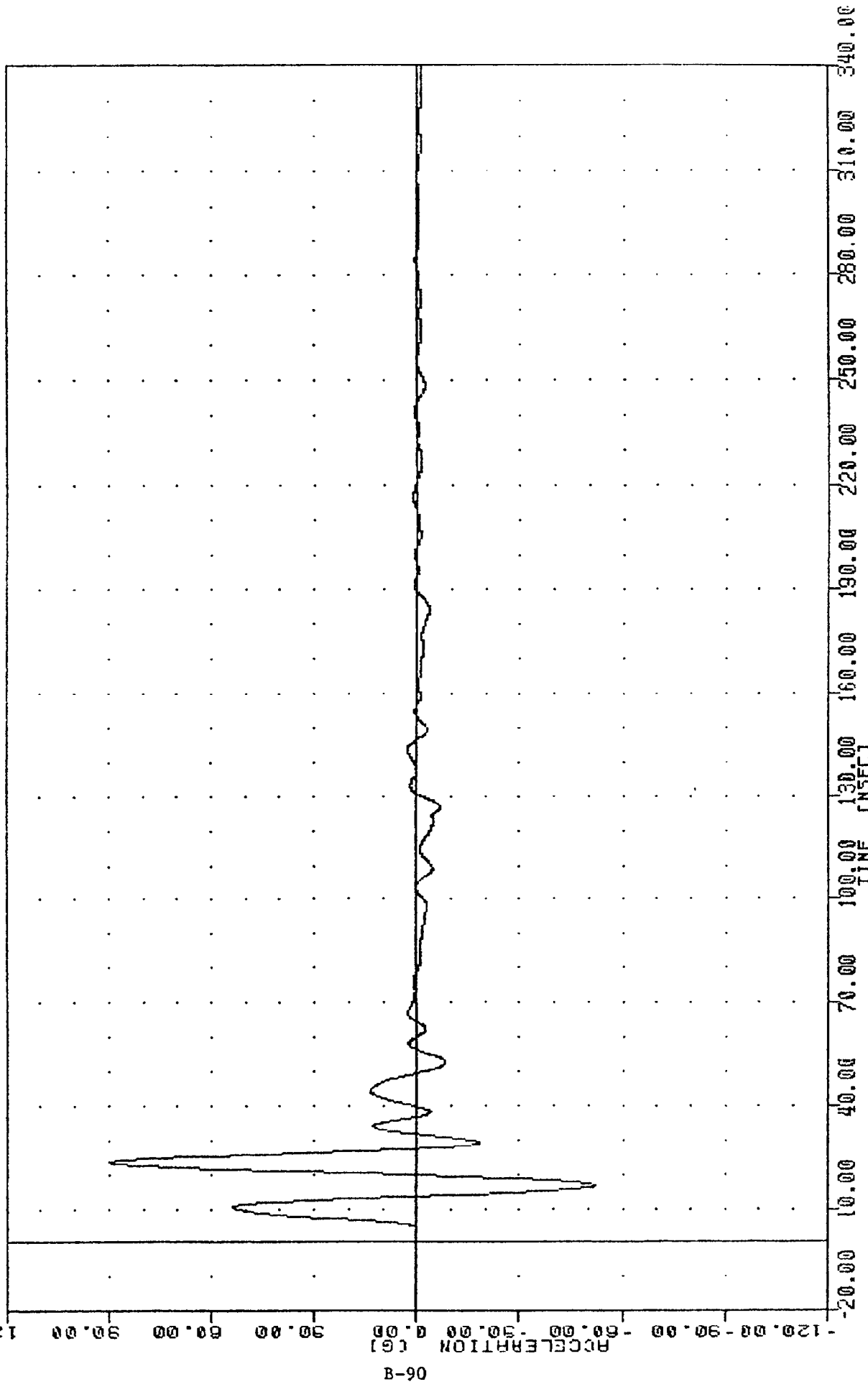


68-B

MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V USING LRSY64

TRC 84062000000
SIDE PROTECTION - 2DR/4DR
84062000000
LFSY65

PLT DATE 5-MAR-84 15:47:34
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -51.80e 16.50, 88.68 e 23.25

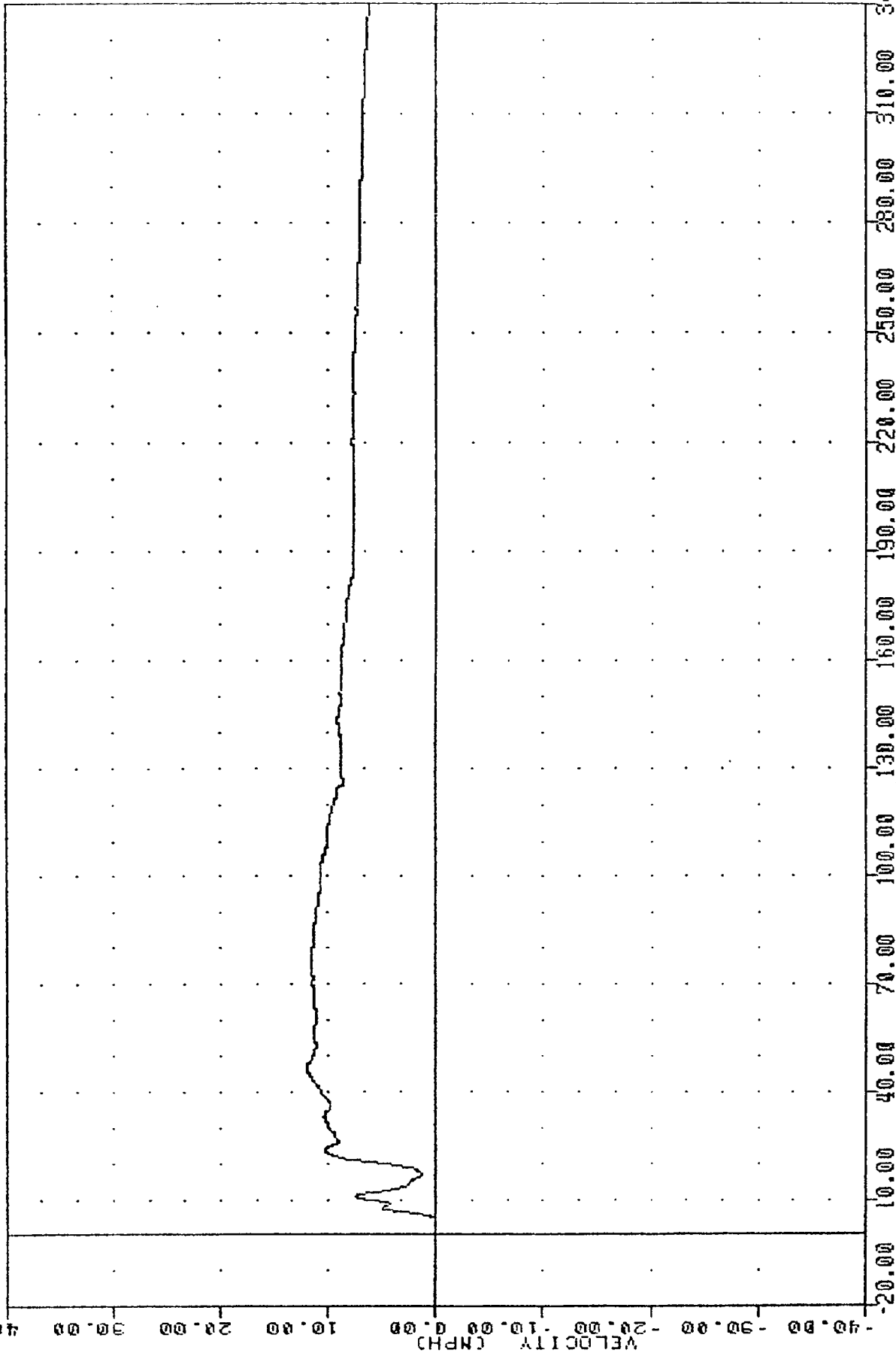


MOVING DEFORMABLE BARRIER INTO SENTRA
VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS

TRC 544302 PLU-DATE 5 MAR 84 15:09:02

SIDE PROTECTION - 20R/4DR
84062000000
LFSYV5

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.00e -18.00 , 12.01 e 46.88



B-91

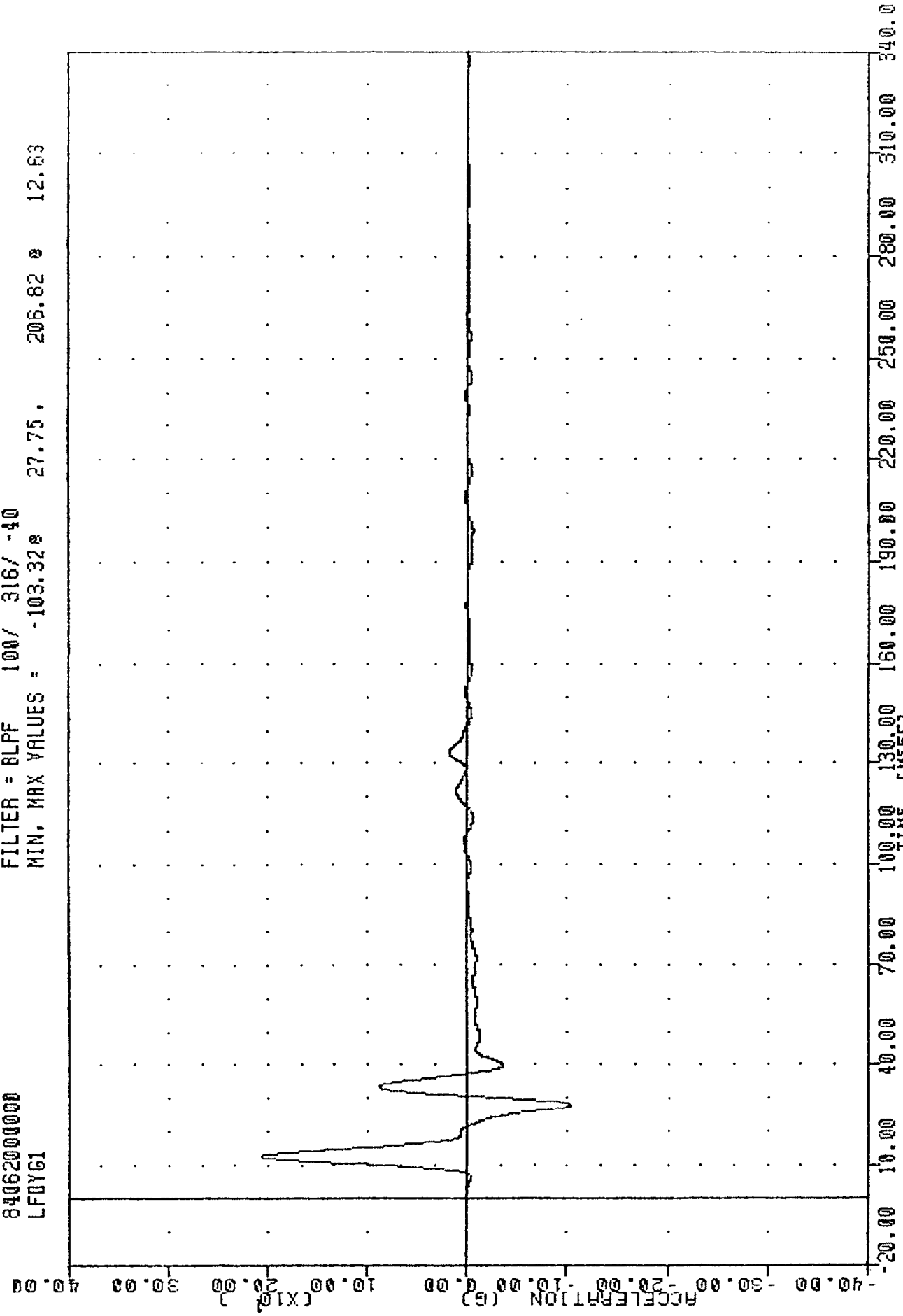
MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V USING LFSYG5



PLT-DAT 10:07:34

840302
SIDE PROTECTION - 2DR/4DR
84062000000
LFDY61

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -103.32 27.75, 206.82 12.63

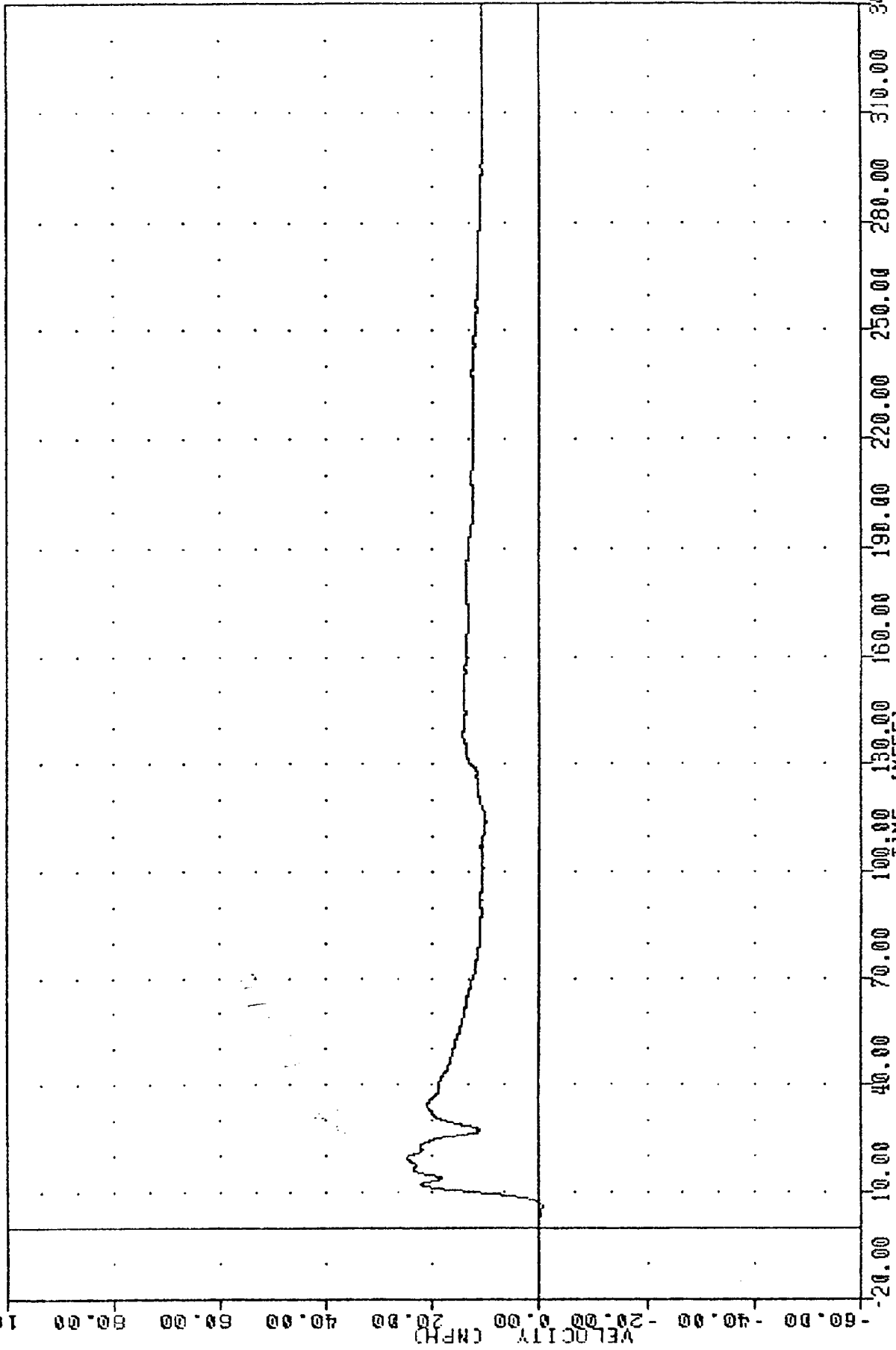


B-92

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

TAC 84030Z
SIDE PROTECTION - 20R/40R
84062000000
LFDYV1

PLT-DAT 13:03:0z
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.84e 5.88, 24.93 e 19.13

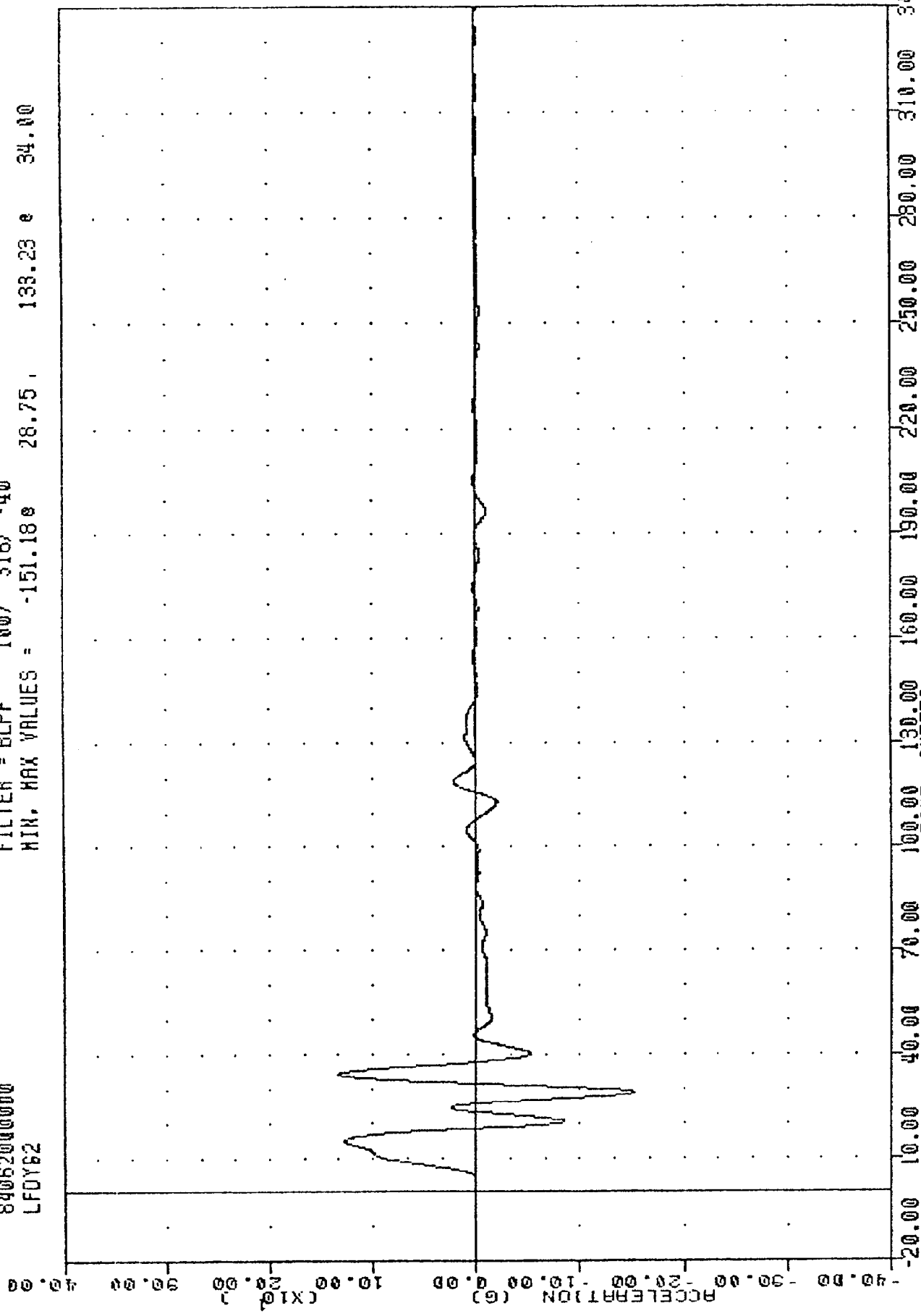


MOVING DEFORMABLE BARRIER INTO SENTRA
NFITA V USING LFDYGI

TRC 840302 5-MAR-84 15:07:34

84062000000
LFDY62
SIDE PROTECTION - 20R/4DR

FILTER = BLPF 100/ 316/ -40
HIK, MAX VALUES = -151.18e 28.75, 138.23 e 34.00

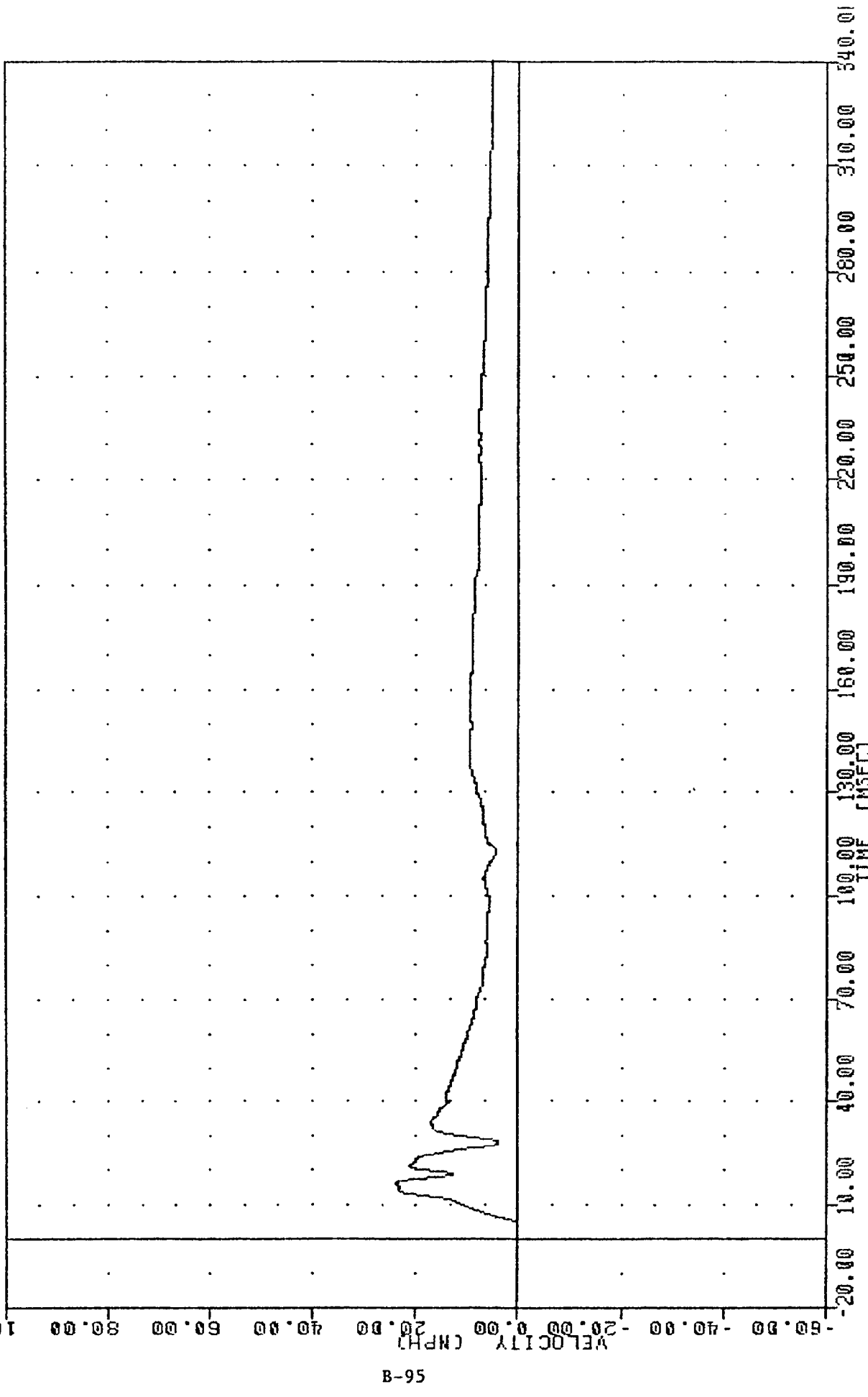


B-46

VEHICLE LEFT FRONT CORNER POSITION AT ACCELERATION Y AXIS
MOVING DEFORMABLE BARRIER INTO SENTRA

TRC
 84062000000
 LFDYV2
 SIDE PROTECTION - 2DR/4DR
 840302
 840302
 PLOT DATE 5 MAR 84 10:09:02

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.03e -3.75, 23.91 e 16.13

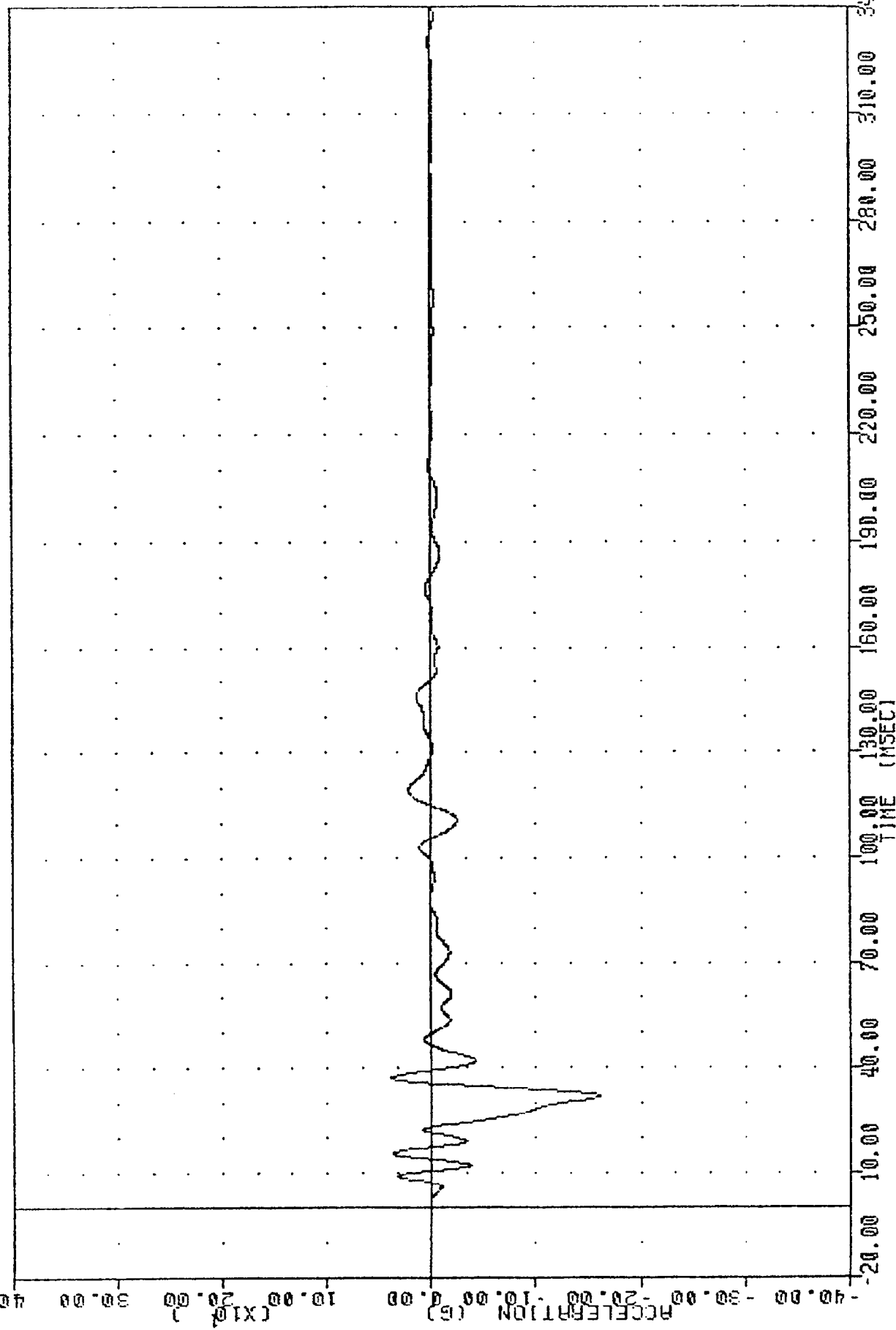


MOVING DEFORMABLE BARRIER INTO SENTRA
 DELTA V USING LFDYV2

TRC 840302 57MR-84 13:07:34

SIDE PROTECTION - 2DR/4DR
 8406200000
 LFDY63

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -161.35e 31.88, 38.40 e 37.13



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

TRC
SIDE PROTECTION - 20R/40R
84062000000
LFDYV3

PLUT DATE 5 MAR 84 15:09:02

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -39.62 340.00 4.76 6.13

100.00

80.00

60.00

40.00

20.00

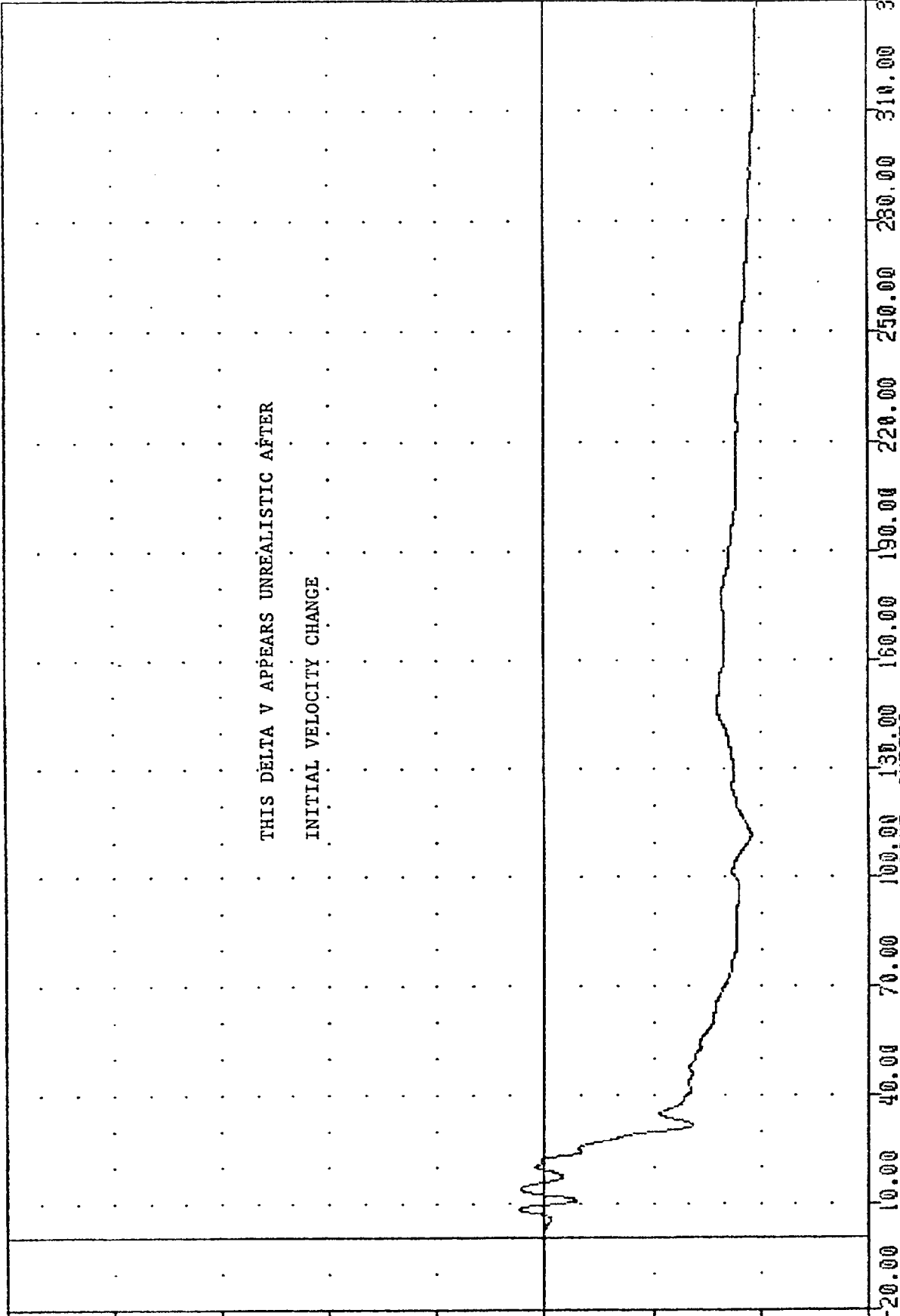
0.00

-20.00

-40.00

-60.00

66-8



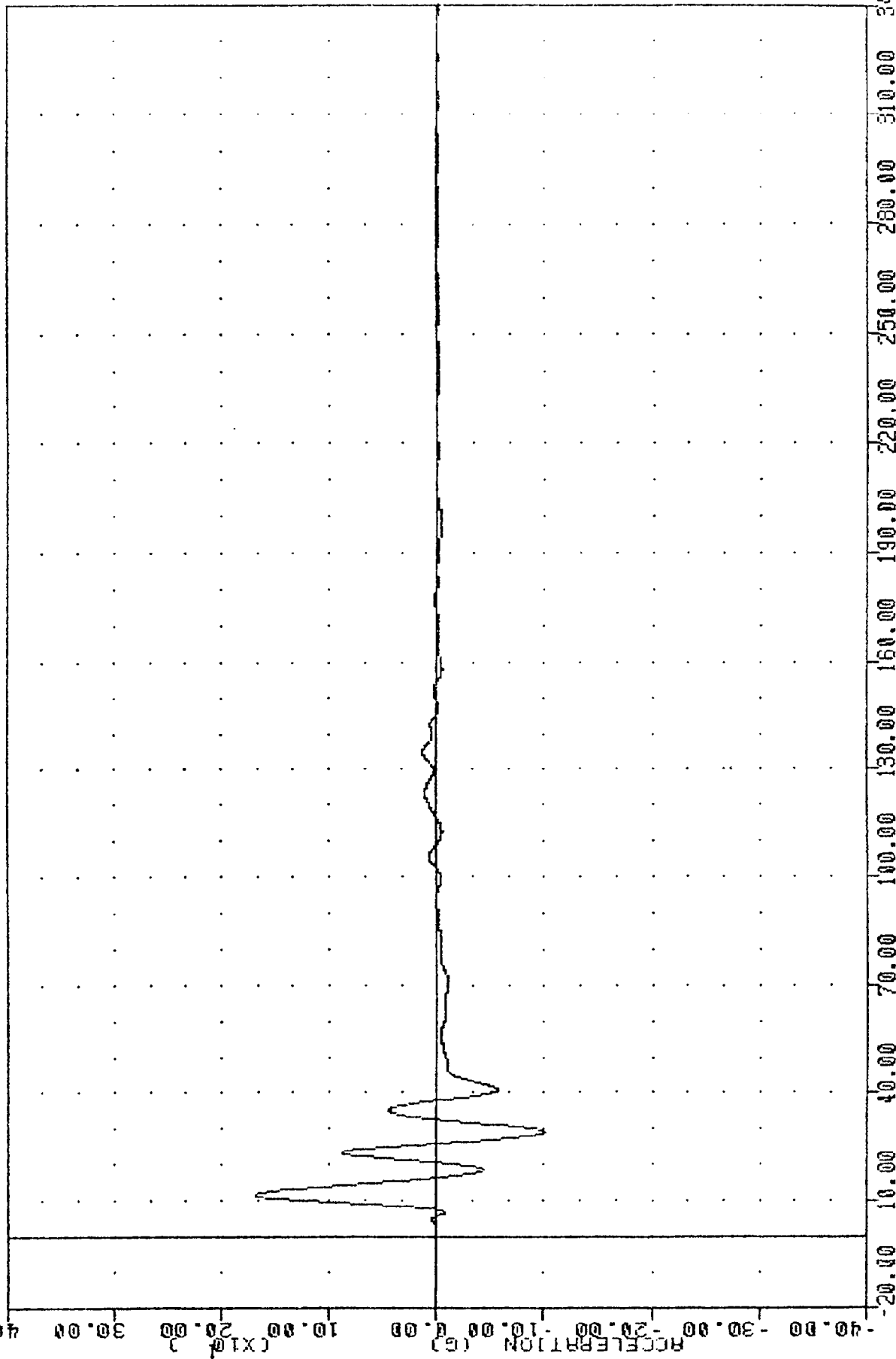
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V LISTING LEFTY63

TRC 840302 5mmH-84 15.0/34

SIDE PROTECTION - 2DR/4DR
 8406200000
 LFOY64

FILTER = 8LPF 100/ 316/ -40
 MIN, MAX VALUES = -100.958 29.13, 168.958 11.50



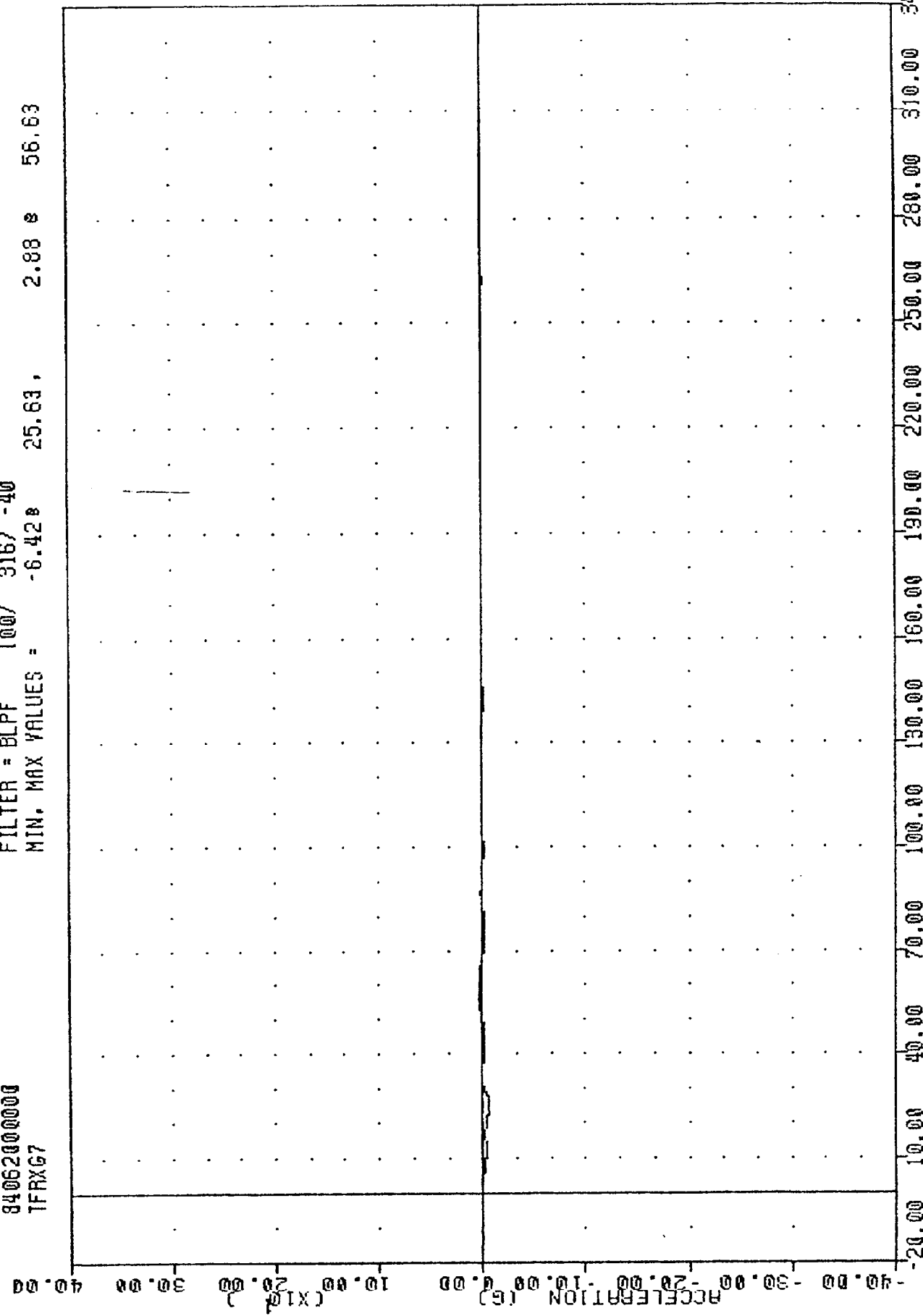
B-98

MOVING DEFORMABLE BARRIER INTO SENTRA
 VEHICLE LEFT FRONT DOOR (POSITION 107) ACCELERATION Y AXIS

TRC 840302
 SIDE PROTECTION - 2DR/4DR
 84062000000
 TFRXG7

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -6.428 25.63, 2.88 56.63

PLOT DATE 5-MAR-84 15:07:34



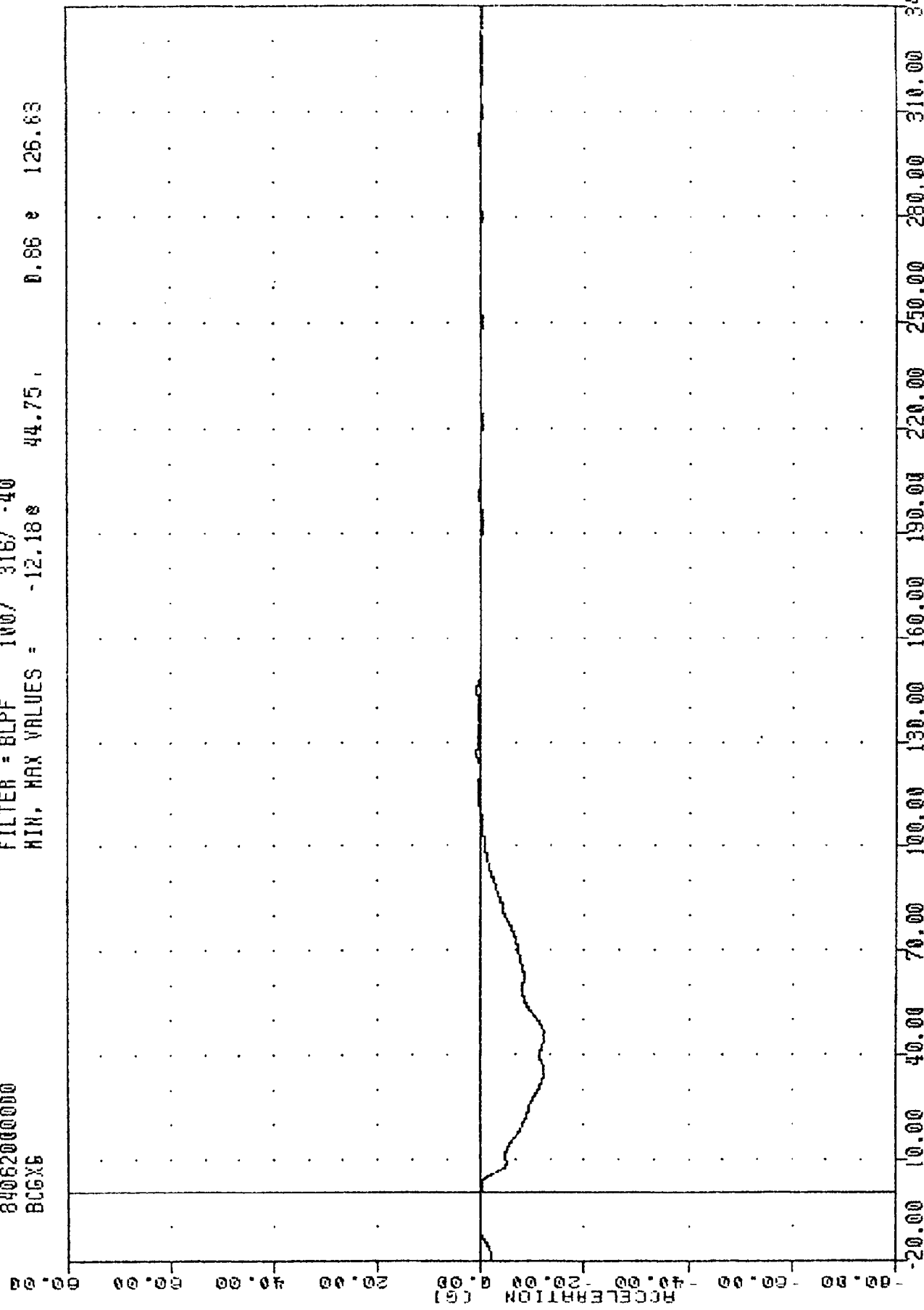
-40.00
-30.00
-20.00
-10.00
0.00
10.00
20.00
30.00
40.00
 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MOVING DEFORMABLE BARRIER INTO SENTRA
 VEHICLE TRUNK FLOOR RIGHT ACCELERATION X AXIS

TRC
 84062000000
 BCGXB
 SIDE PROTECTION - 20R/4DR

5-MAR-84 15:07:34
 PLUT DATE

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -12.188 44.75 0.86 e 126.83



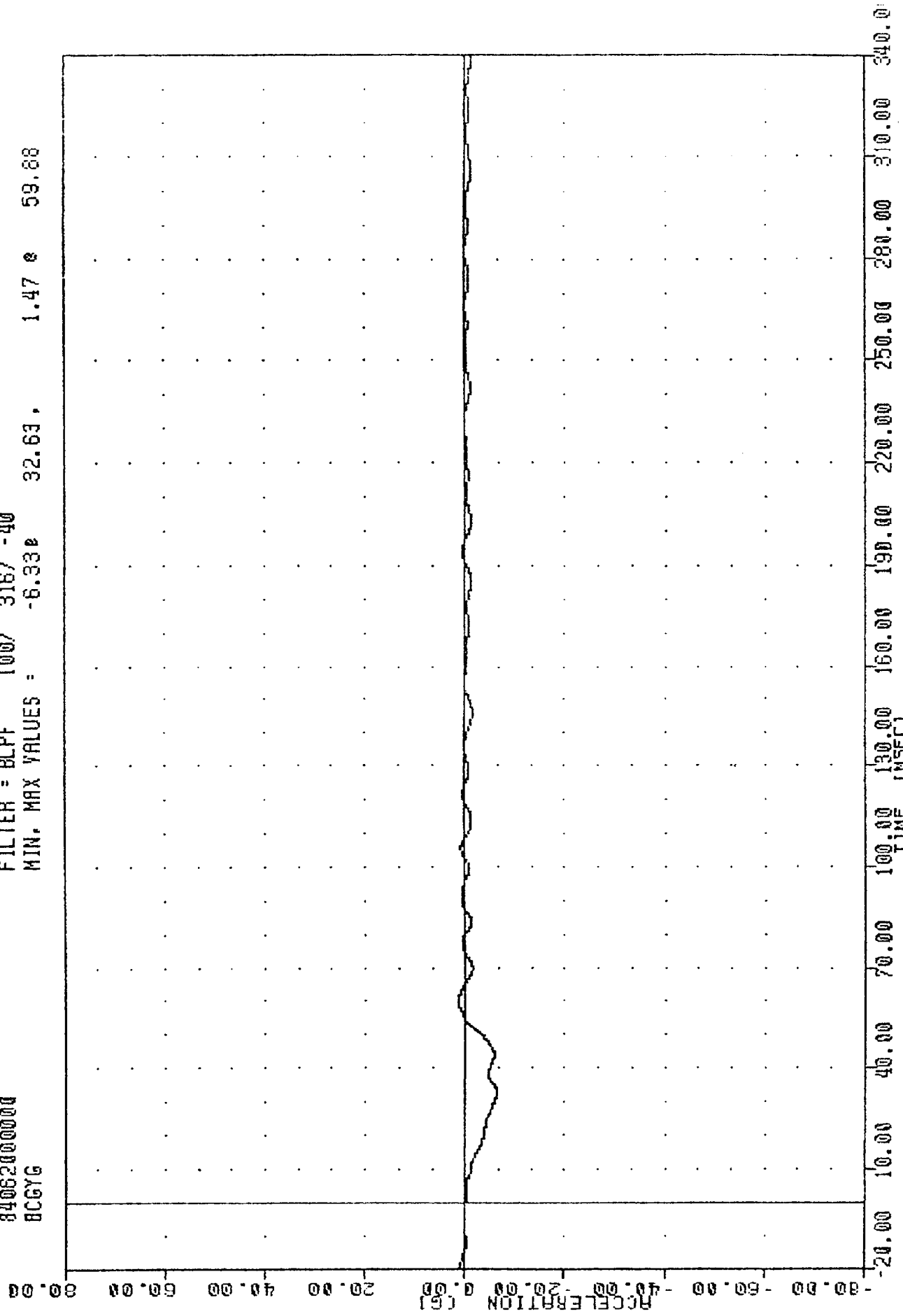
B-101

MOVING DEFORMABLE BARRIER INTO SENTRA
 BARRIER CENTER OF GRAVITY X AXIS

TRC 840302 5 MAR 84 13:07:34

SIDE PROTECTION - 2DR/4DR
84062000000
BCGYG

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -6.33e 32.63, 1.47 e 59.68

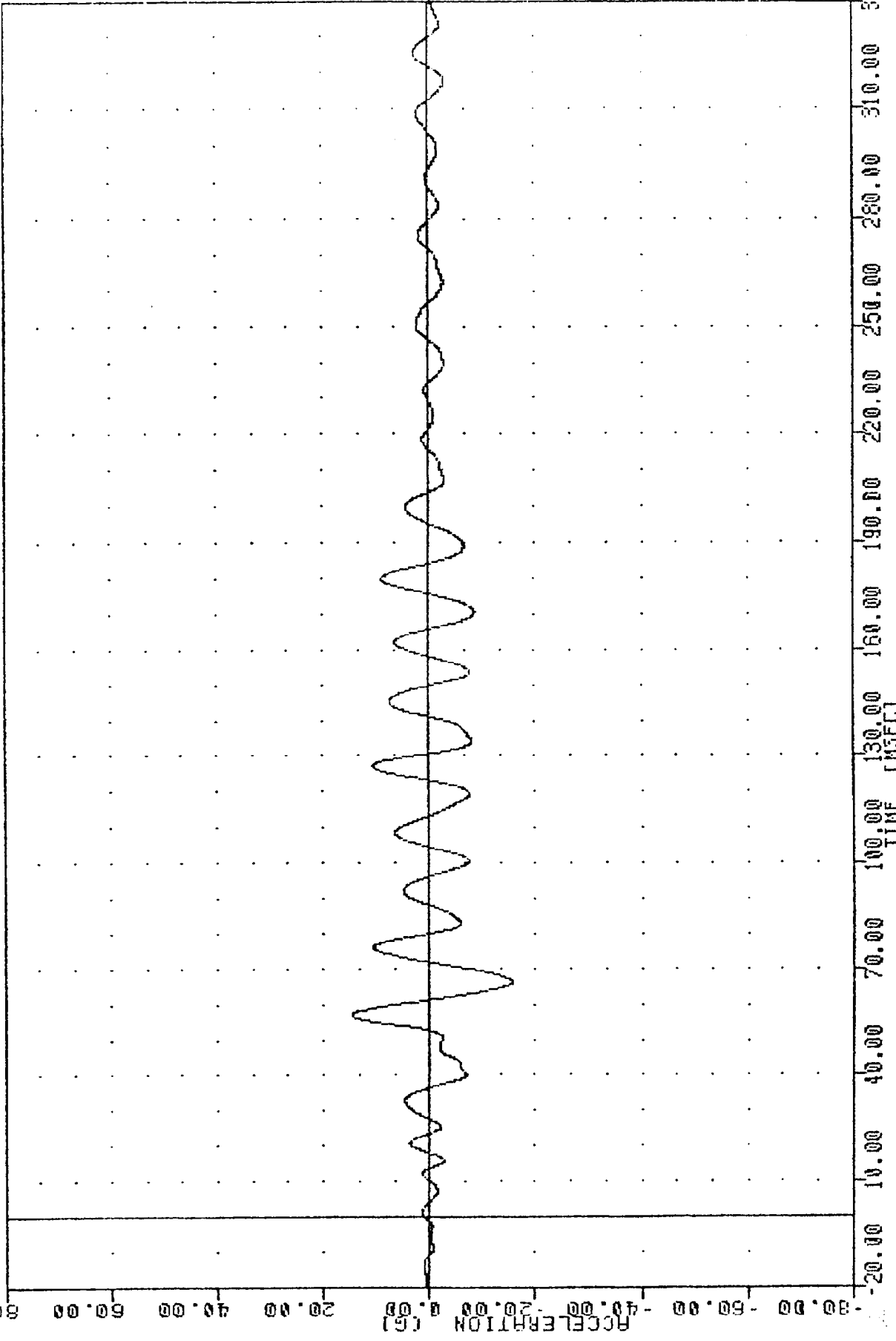


MOVING DEFORMABLE BARRIER INTO SENTRA
BARRIER CENTER OF GRAVITY Y AXIS

TRC 840302 5-MAR-84 15:07:34

SIDE PROTECTION - 2DR/4DR
84062000000
BCGZG

FILTER = 8LPF 100/ 316/ -40
MIN. MAX VALUES = -15.51e 68.13. 14.71 e 56.68



MOVING DEFORMABLE BARRIER INTO SENTRA
BARRIER CENTER OF GRAVITY 7 AXIS

TRC 540302 5-MAR-84 10:08:38

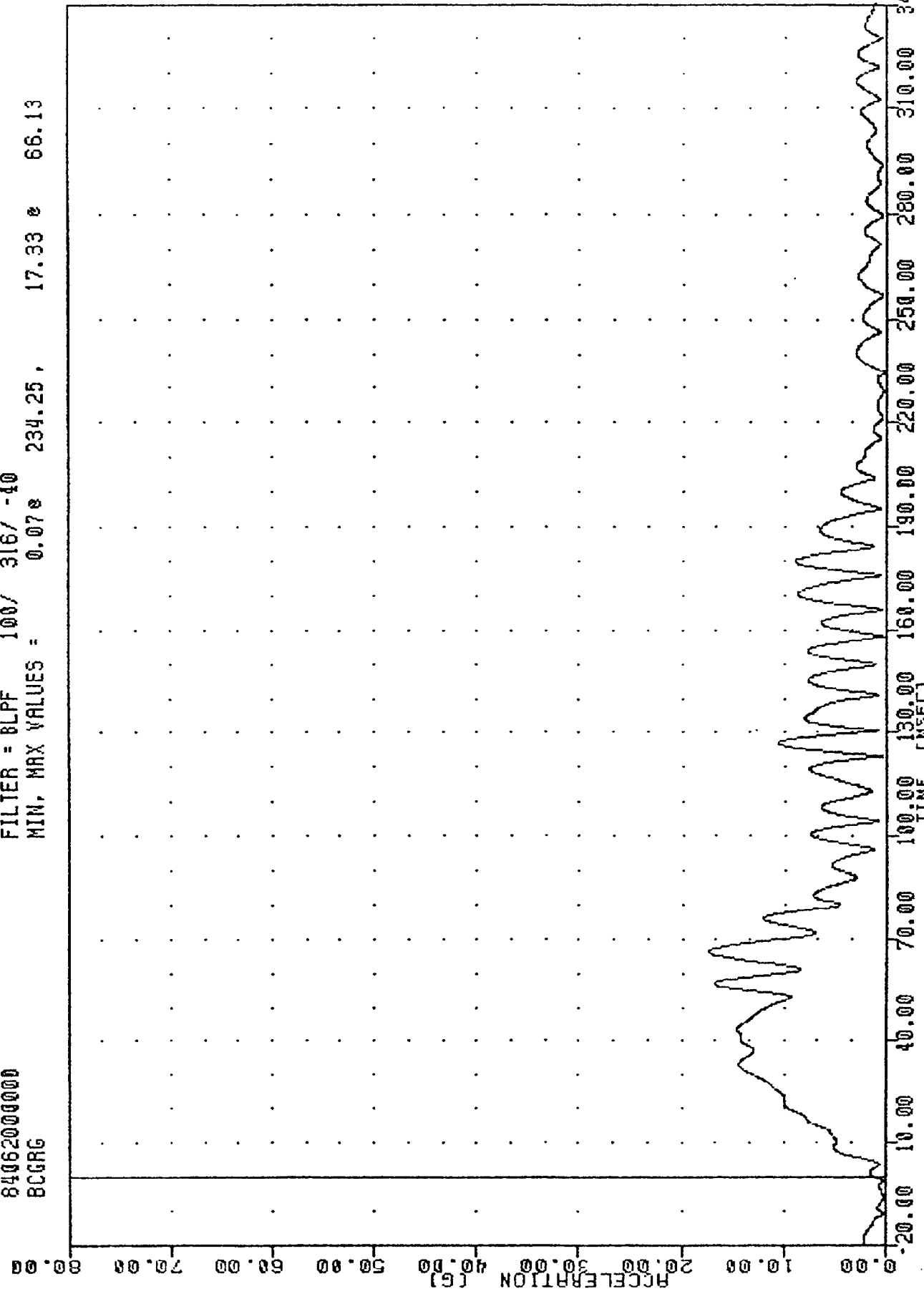
SIDE PROTECTION - 20R/4DR

84062000000

BCGRG

FILTER = 8LPF 100/ 316/ -40

MIN, MAX VALUES = 0.07e 234.25, 17.33 e 66.13



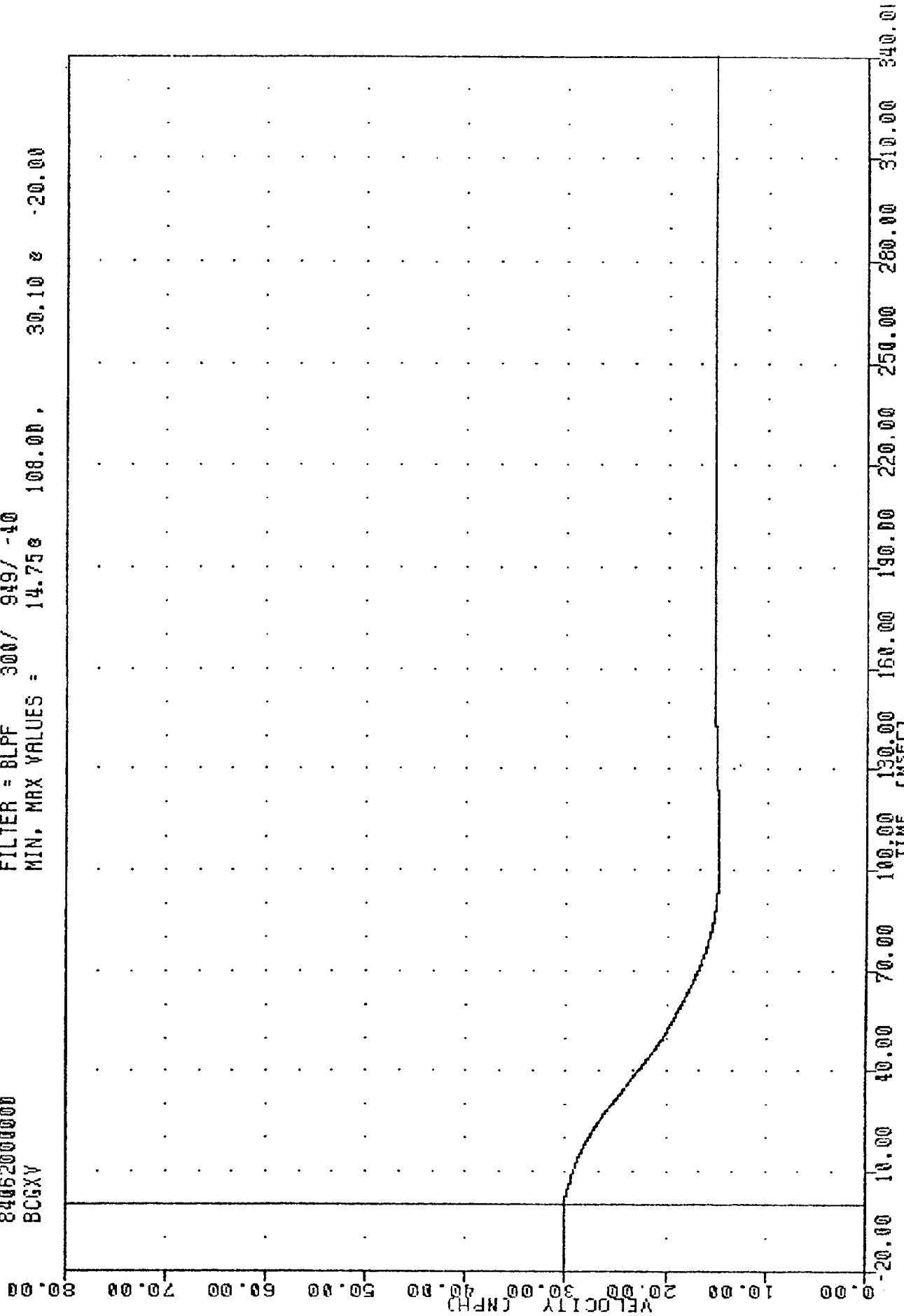
B-104

MOVING DEFORMABLE BARRIER INTO SENTRA
BARRIER CG RESULTANT

THC
050302
SIDE PROTECTION - 2DR/4DR
8406200000
BCGXV

PLUT DATE 6-MAR-64 14:08:38

FILTER = BLPF 300/ 919/ -10
MIN. MAX VALUES = 14.75e 108.00, 30.10 e -20.00



B-105

MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V USING RCGXG

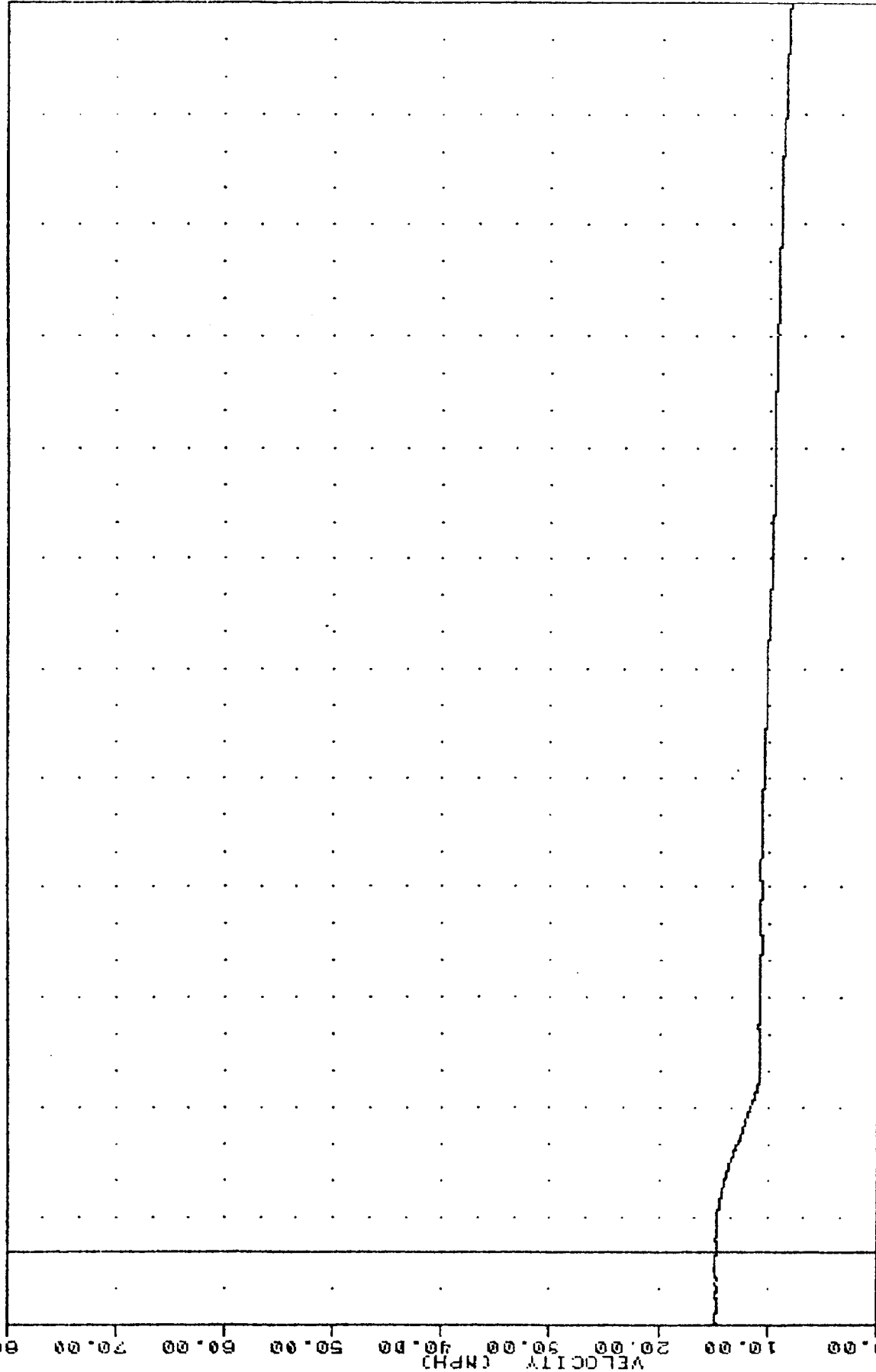
PLT DATE 6 MAR 84 14:08:38

FILTER = BLPF 300 / 949 / .40
MIN, MAX VALUES = 8.10e 340.00 . 14.74 e -5.13

SIDE PROTECTION - 2DR/4DR

84062000000

BCGY



901-B

0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00
-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

MOVING DEFORMABLE BARRIER INTO SENTRA
NETA V HATING BCGY

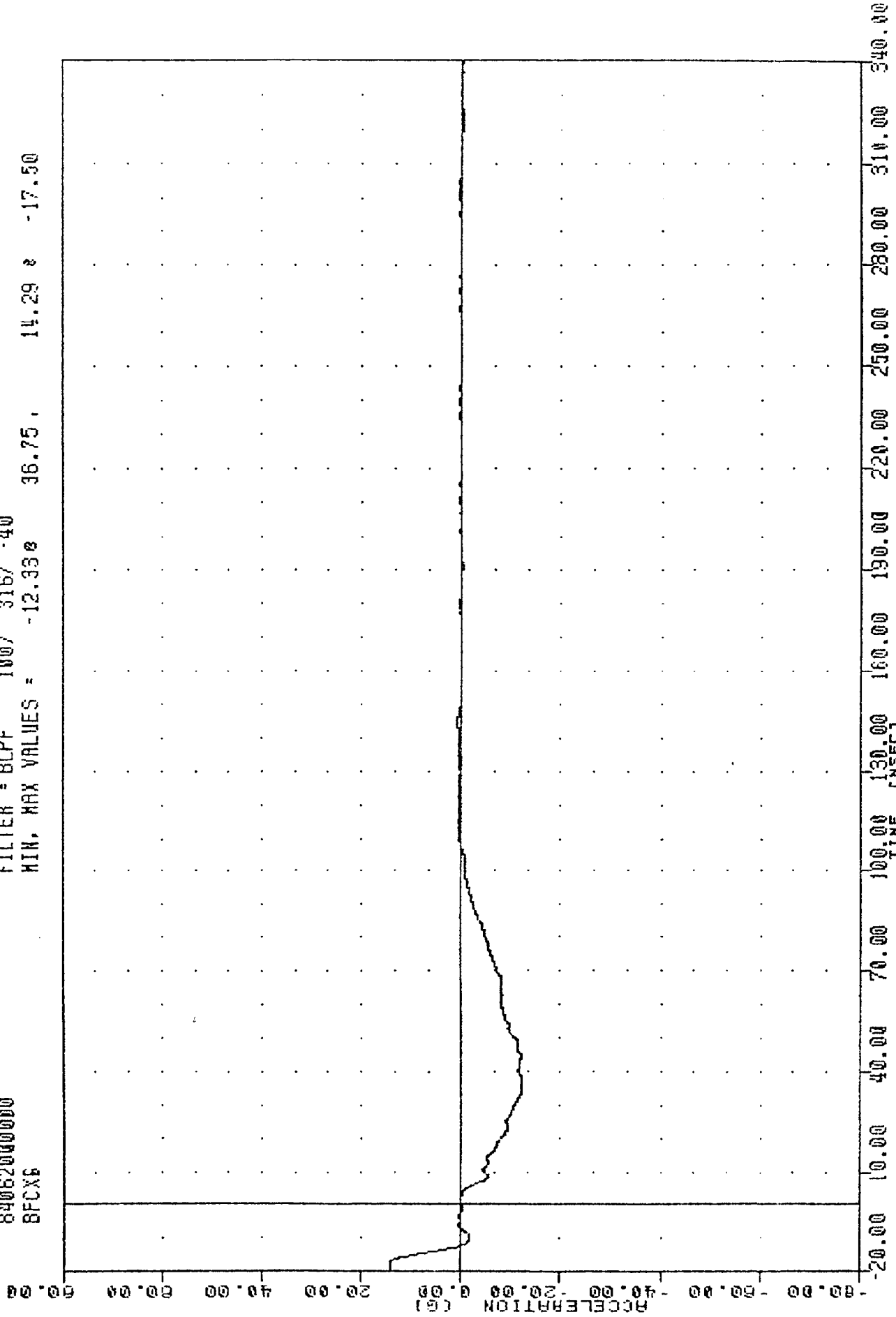
TMC
640302
PLT DATE 5 MAR 84 15:07:34

64062000000
SIDE PROTECTION - 2DR/4DR

BFCX6

FILTER = 8LPF 100/ 316/ .40

MIN, MAX VALUES = -12.330 36.75, 14.29 & -17.50



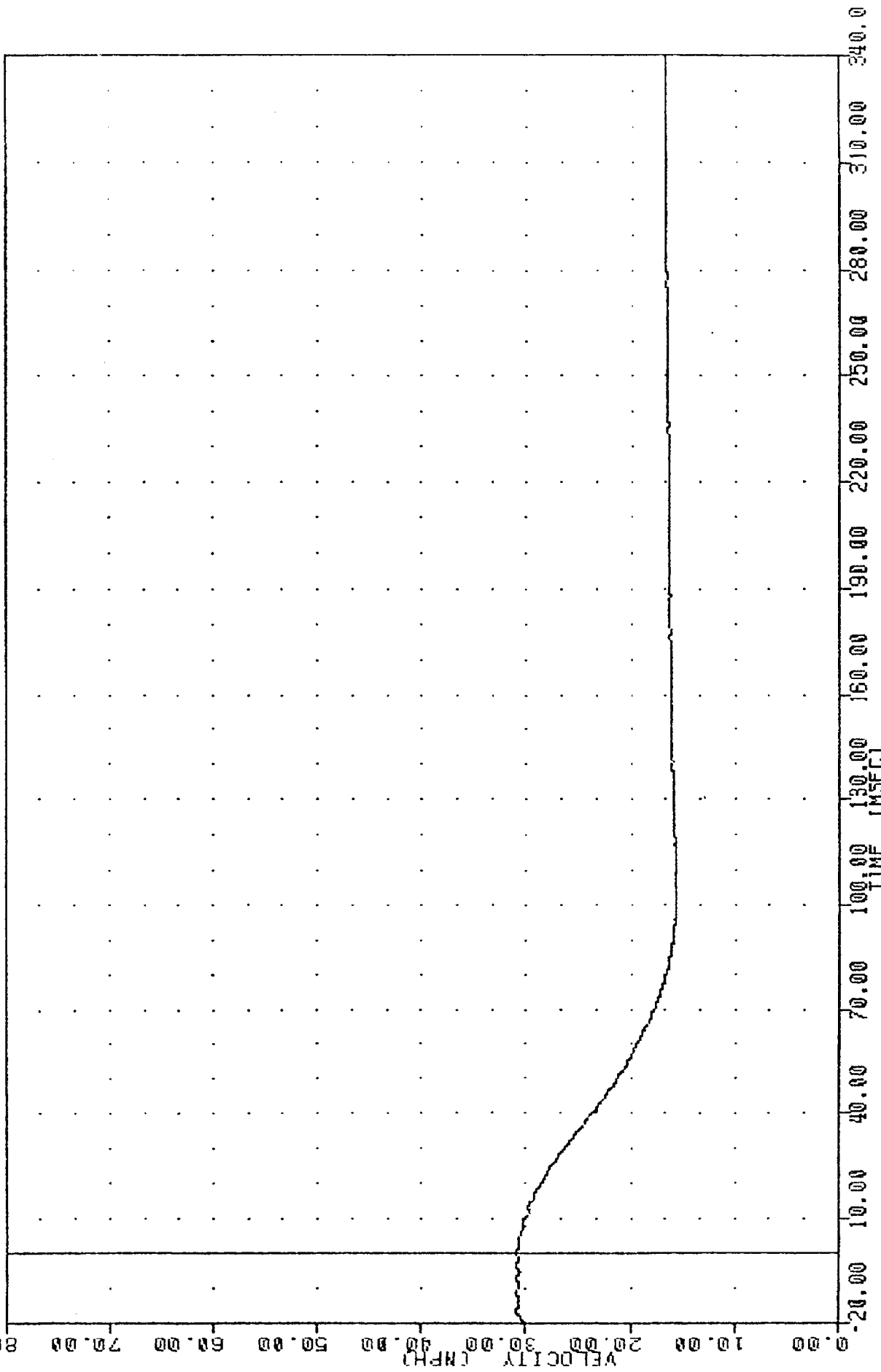
B-107

MOVING DEFORMABLE BARRIER INTO SENTRA
BARRIER FRONT CROSSMEMBER ACCIFRATTON X AXIS

TMC 840302 14:08:36

84062000000
SIDE PROTECTION - 2DR/4DR
BFCXY

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 15.628 104.13, 31.02 8 -16.88

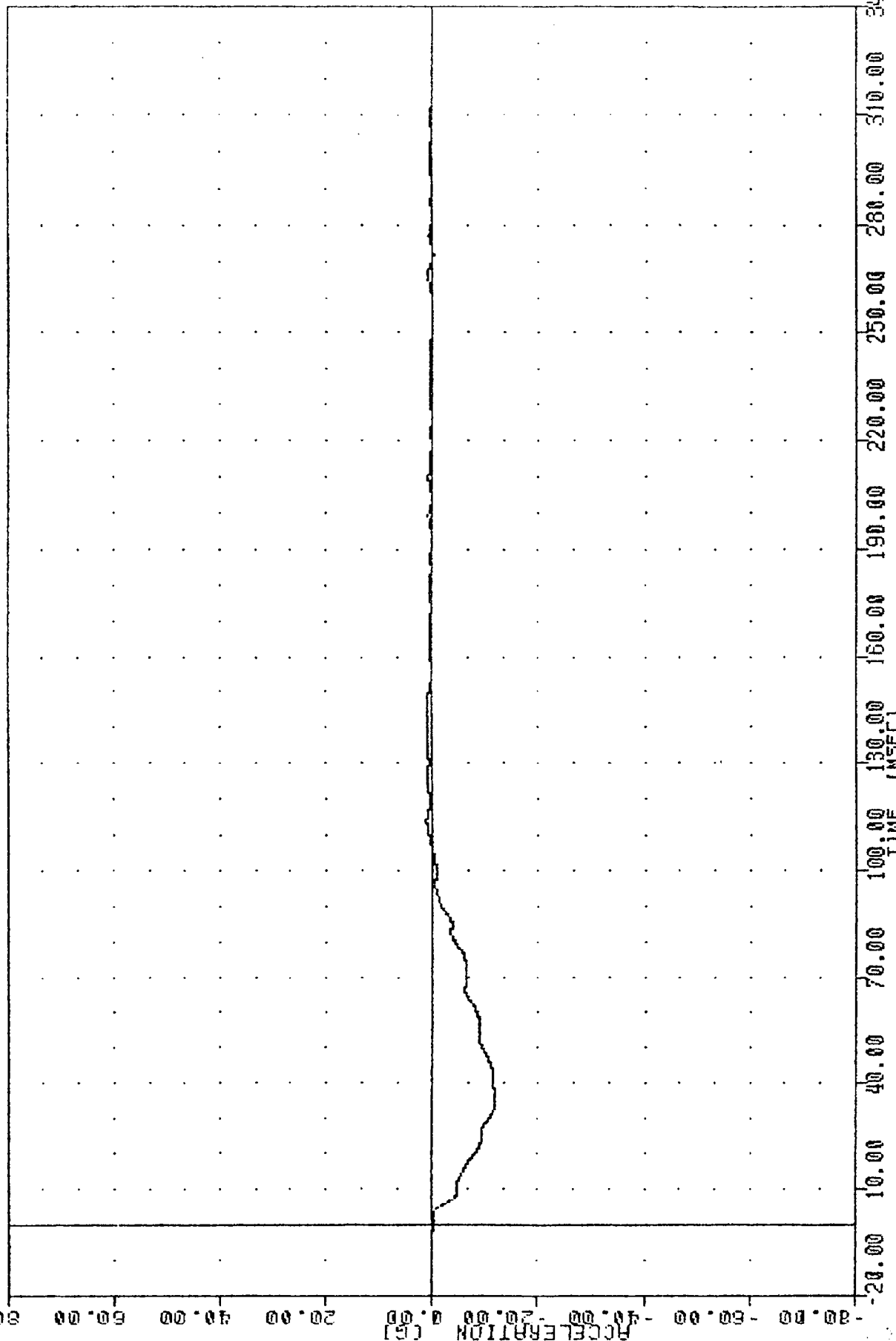


MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V USING BFCXG

TMC 840302 10:07:34

84062000000
SIDE PROTECTION - 2DR/4DR
BRCXG

FILTER = 8LFF 100/ 316/ -40
MIN. MAX VALUES = -11.81 34.13 1.18 113.63



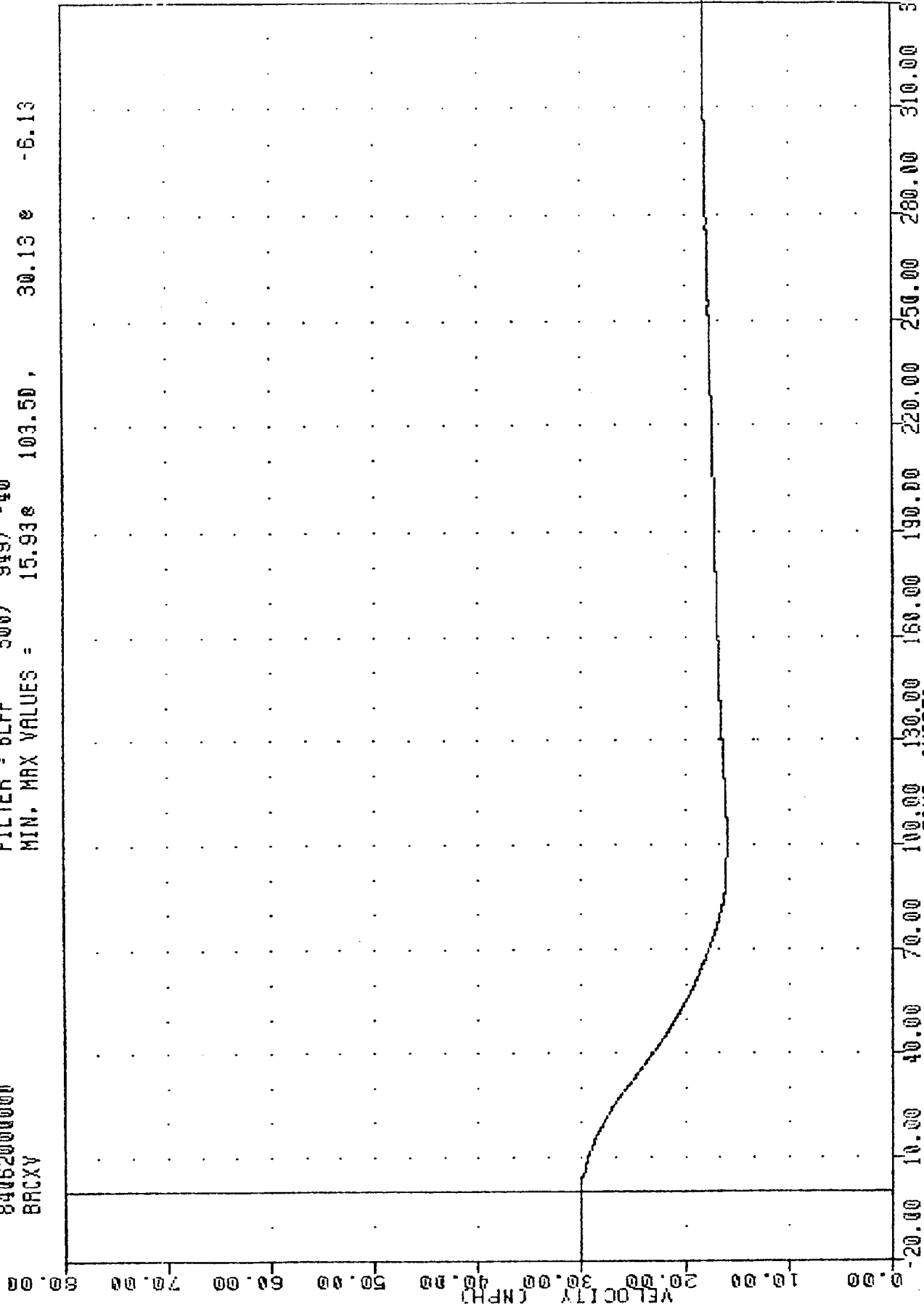
B-109

MOVING DEFORMABLE BARRIER INTO SENTRA
BARRIER REAR CROSSMEMBER ACCELERATION X AXIS

TRC 840302 6-MAR-84 14:08:38

SIDE PROTECTION - 2DR/4DR
84062000000
BRXXV

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 15.93e 103.50, 30.13 e -6.13



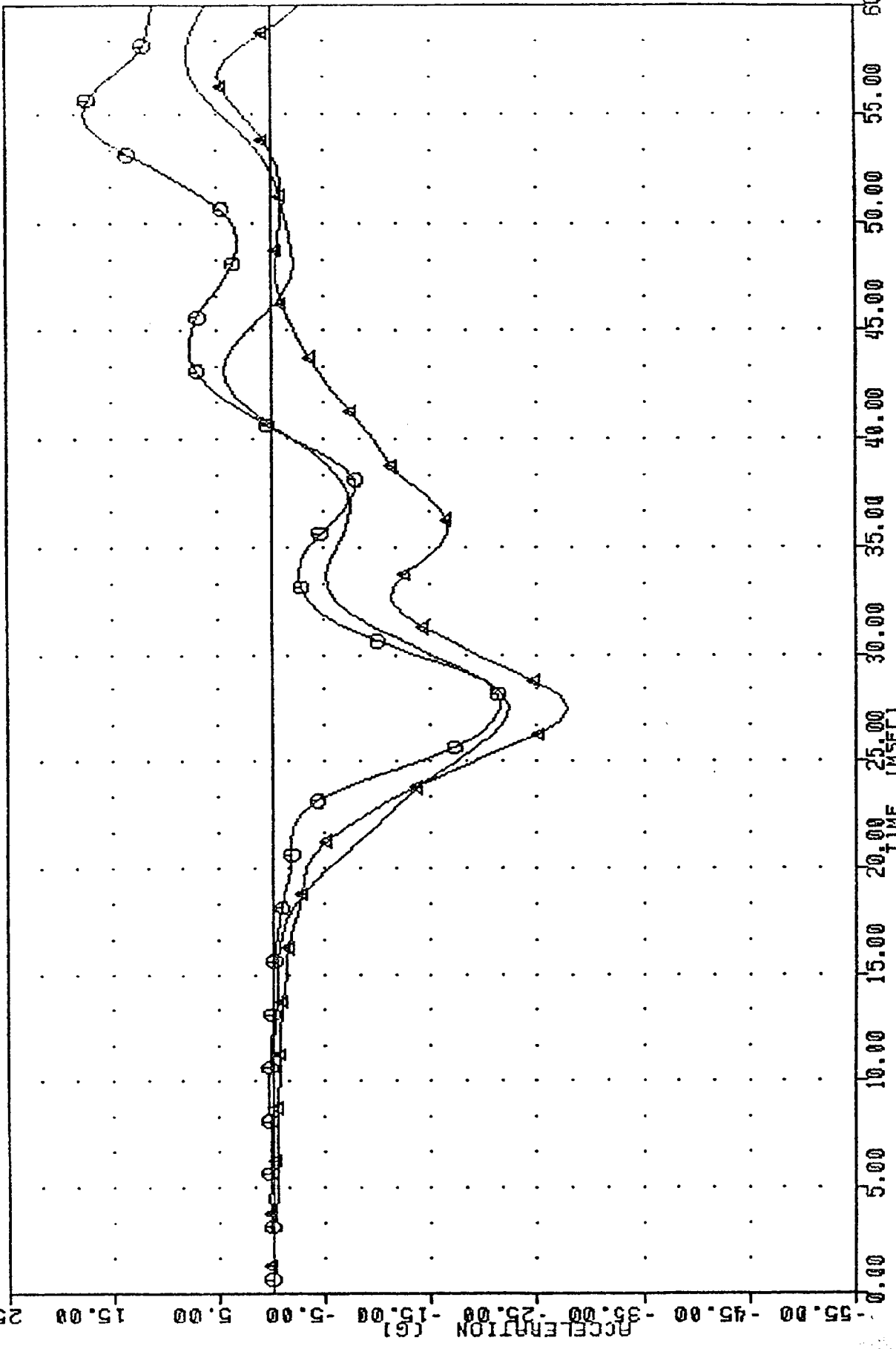
B-110

MOVING DEFORMABLE BARRIER INTO SENTRA
DELTA V LISTING BRXXV

0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00
-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00
100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

APPENDIX C
DUMMY CERTIFICATION

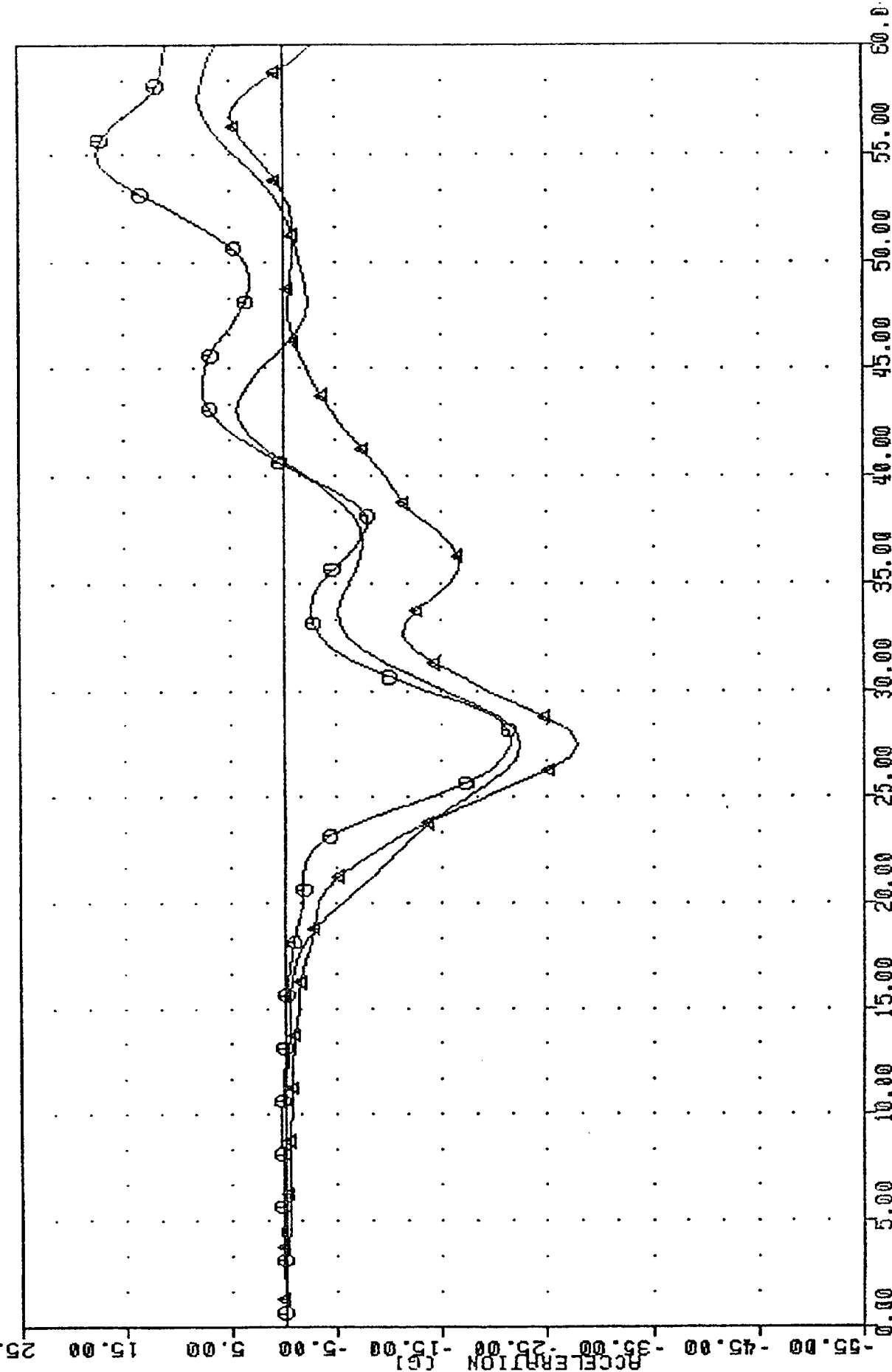
VRIC 5RL91
 TOI Y61
 MN-250
 MN-250
 S100095
 FILTER : HSRI
 FILTER : HSRI
 FILTER : HSRI
 SID 136/ 189/ -50
 HU MAX 136/ 189/ -50
 BODY 318
 MIN, MAX =
 MIN, MAX =
 MIN, MAX =
 CHL 96
 84055
 PLUT DATE 5-MAR-84
 10:29:29
 7.79e
 17.54e
 4.78e
 26.87
 26.87
 26.87
 -22.29
 -21.58
 -27.91
 56.87
 54.38
 56.25



SIDE IMPACT TEST (006)

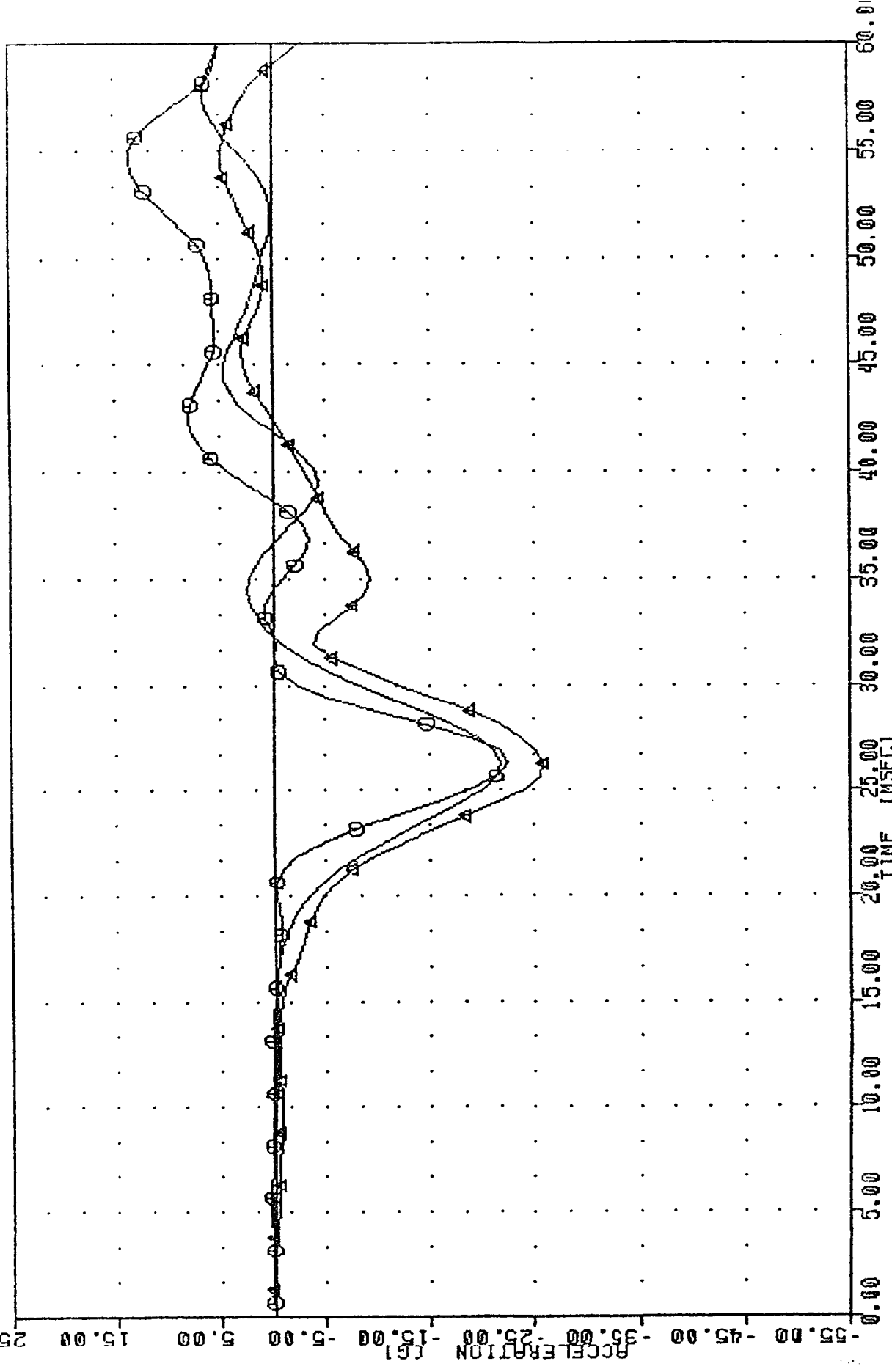
UPPER SPINE ACCELERATION Y AXIS -1

DATE: 5/10/84
 TIME: 10:30:46
 PLOT DATE: 5-MAY-84
 7.85
 56.87
 17.54
 54.38
 4.78
 56.25



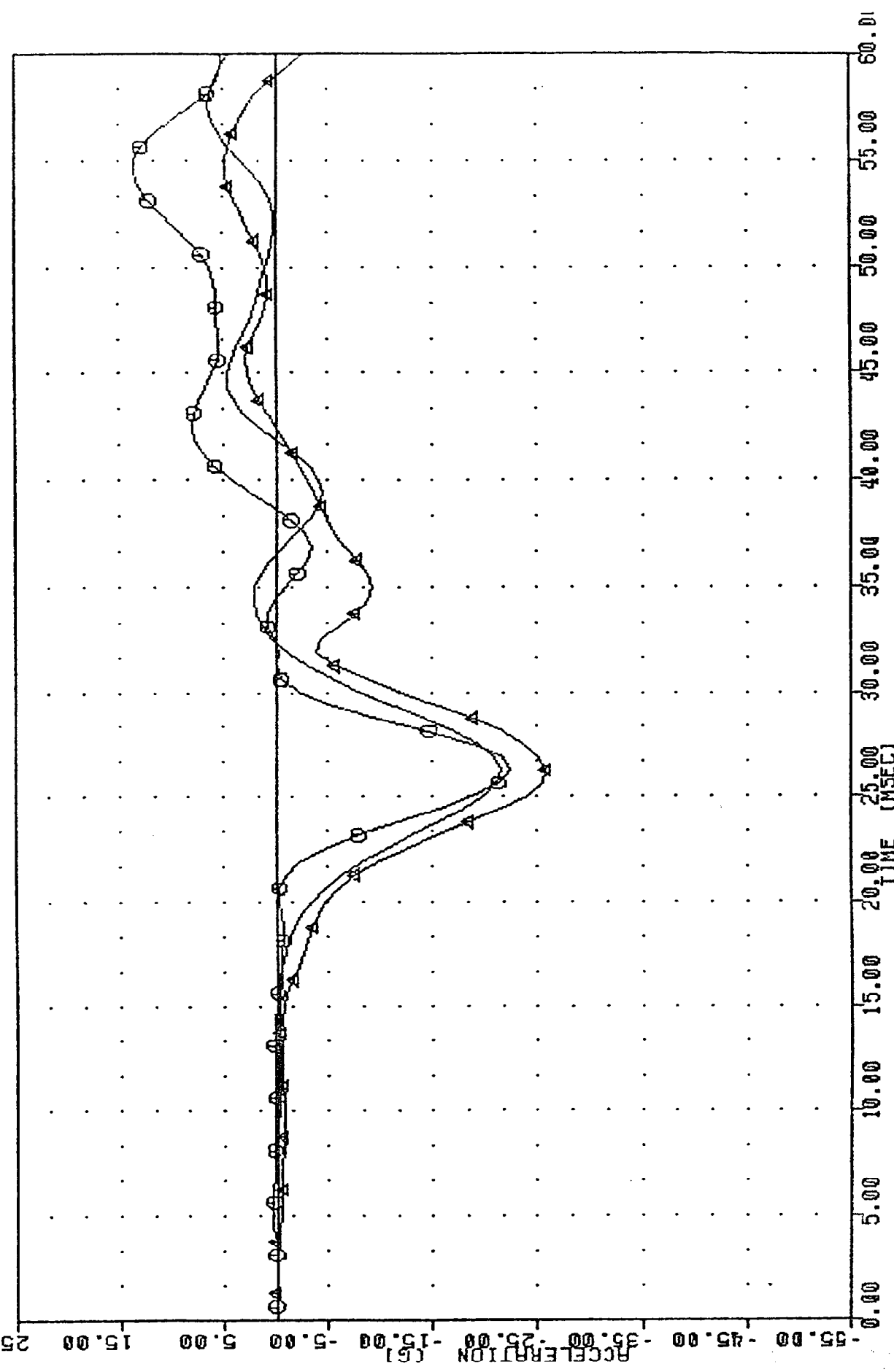
SIDE IMPACT TEST (006)
 IIPFRA SPINE ACCELERATION Y AXIS -A

VRIC 3RL91 , SINO0696 SID THORAX 5 BOOT 318 CHL 96 PLUT DATE 5-MAR-84 10:05:17
 T12Y61 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -21.65 6.48 56.87
 MN-290 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -22.37 13.54 53.75
 MN-230 Q FILTER = HSRI 136/ 189/ -50 MIN, MAX = -25.84 4.85 53.75



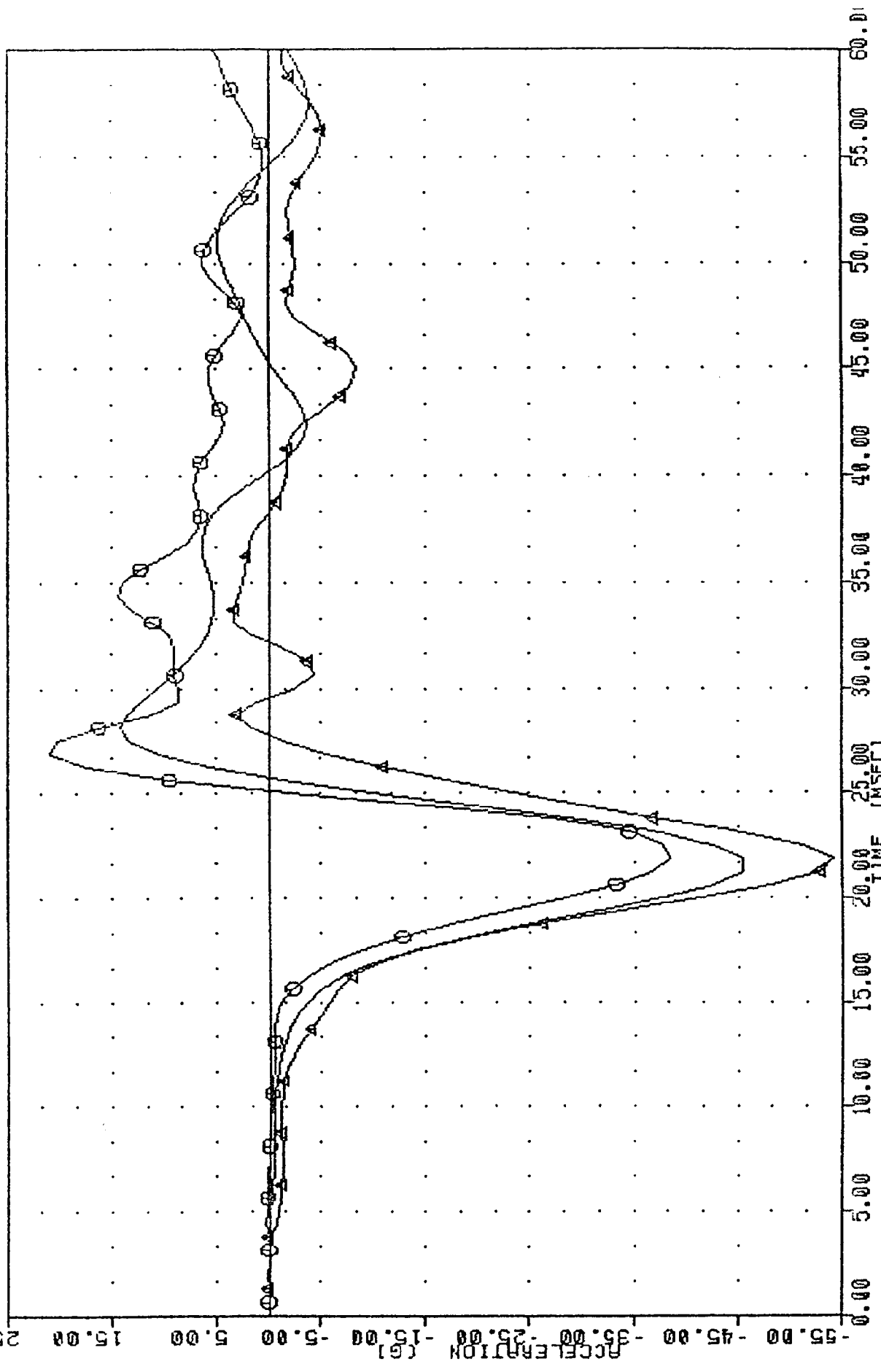
SIDE IMPACT TEST (006)
 LOWER SPINE ACCIFFRATION Y AXYS -1

MIC 010050
 T12YGR FILTER = HSRI
 MN-2SD 0
 MN-2SD A
 SID
 MAX 189/ -50
 MIN 136/ -50
 136/ 189/ -50
 136/ 189/ -50
 84.53
 MIN, MAX =
 MIN, MAX =
 MIN, MAX =
 96
 21.50
 22.37
 25.63
 54.00
 6.42
 13.54
 4.85
 10.07
 56.87
 53.75
 53.75



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

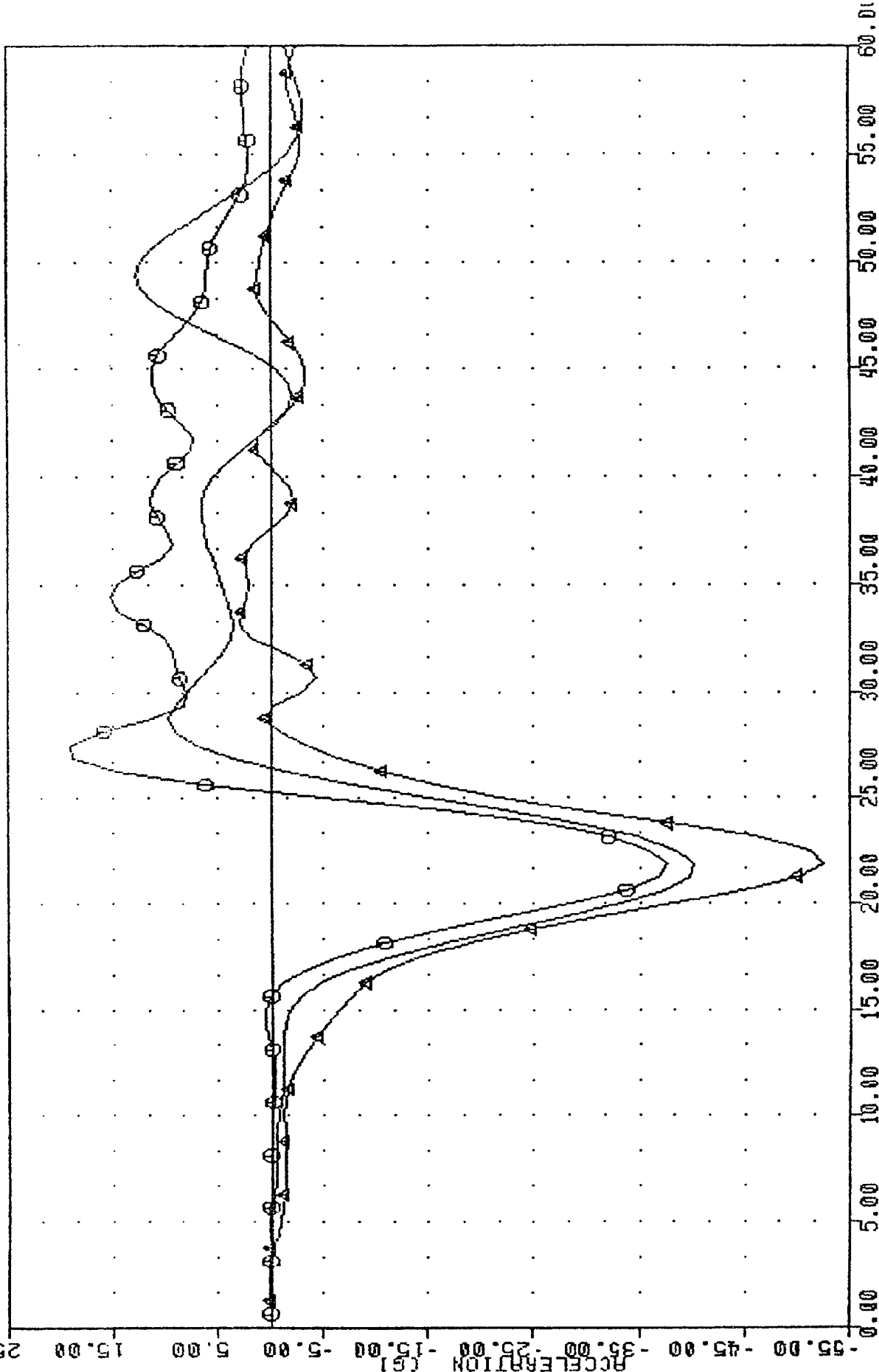
VRIC SRL91
 LURYGA
 MN-250
 MN-250
 SID THORAX 5 BOUT 318
 136/ 189/ -50
 136/ 189/ -50
 136/ 189/ -50
 CHL 96
 MIN, MAX =
 MIN, MAX =
 MIN, MAX =
 84055
 -45.53
 -38.44
 -54.08
 PLUT DATE 5-MAR-84
 21.25
 21.25
 21.25
 10:02:48
 14.04
 20.82
 3.31
 27.50
 26.25
 33.13



SIDE IMPACT TEST (006)

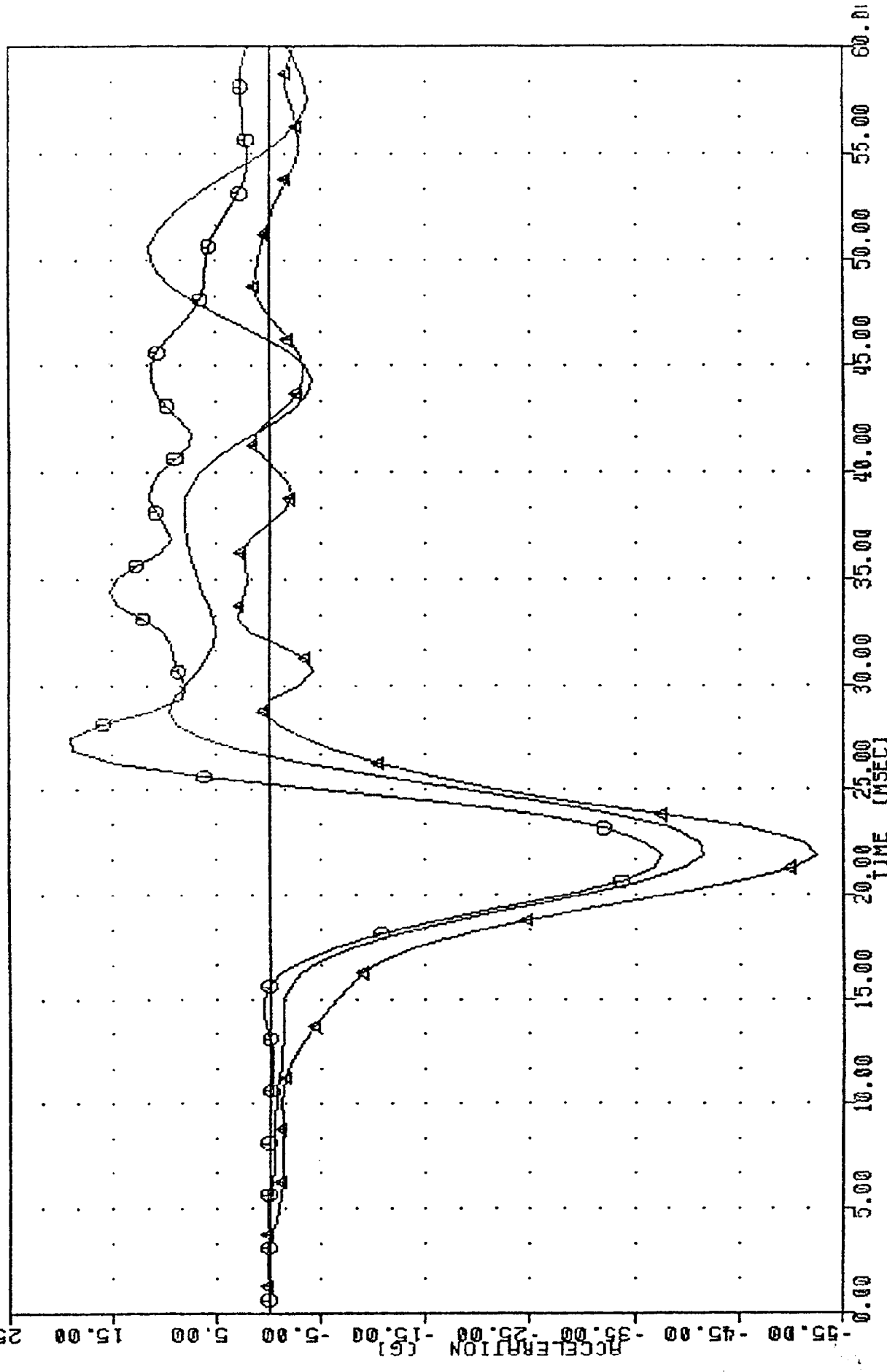
LEFT UPPER RIB ACCELERATION Y AXIS - A

WTC SPTS1 310030
 LLRYGI FILTER : HSRI
 MN-2SD 0
 MN-2SD A
 510 INTRAX 300-318 GHT 96
 136/ 189/ -50 MIN. MAX =
 136/ 189/ -50 MIN. MAX =
 136/ 189/ -50 MIN. MAX =
 8100
 -40.24 8
 -37.66 8
 -52.52 8
 PLUT DATE 5-MAR-84 09:30:03
 12.66 8
 19.00 8
 2.94 8
 48.75
 26.87
 32.50



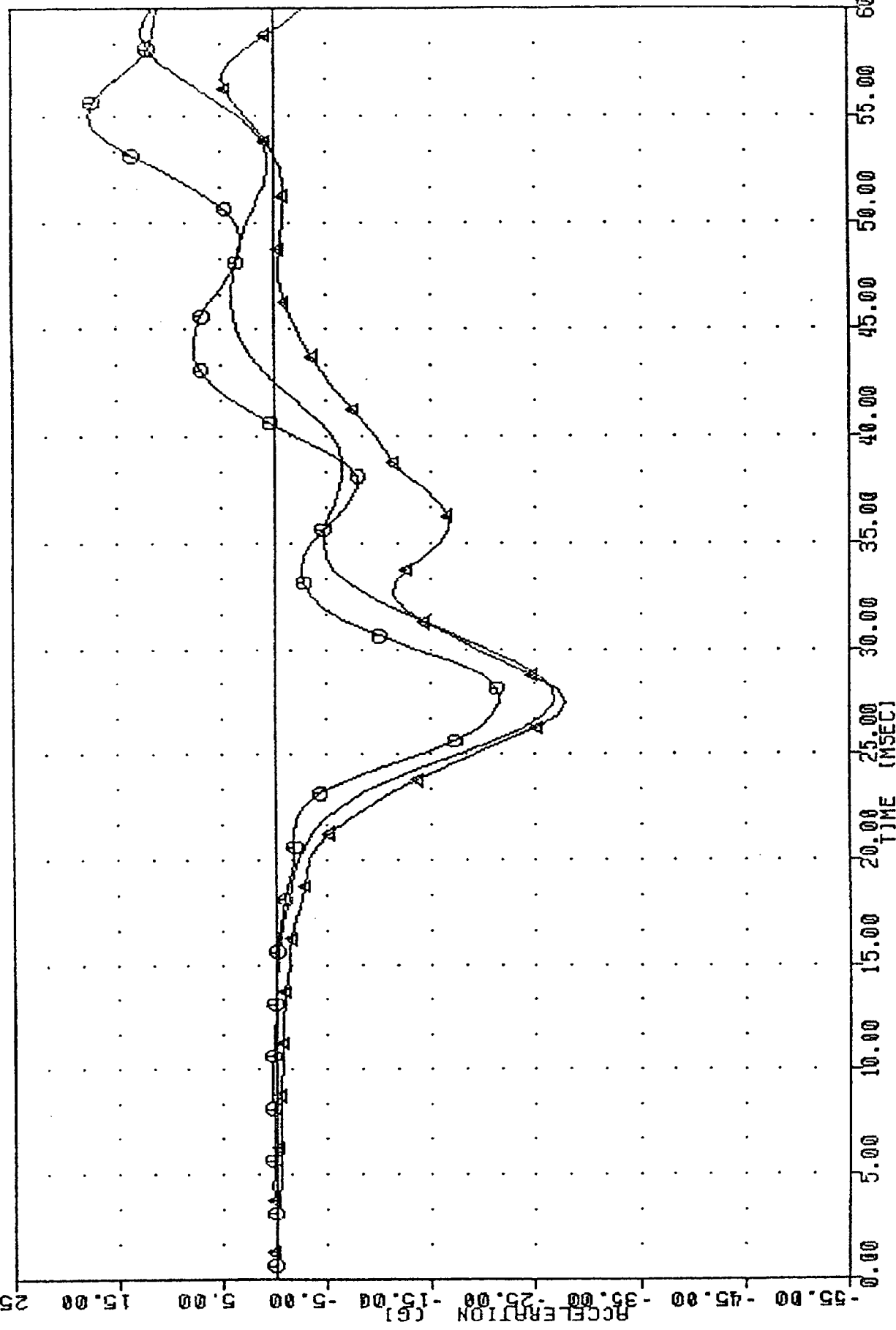
SIDE IMPACT TEST (006)
 LEFT LOWER RIB ACCELERATION Y AXIS -1

TRIC 51891 SID 100596 518 84033 5-MIN 84 10-TW 04
 LLYGR FILTER : HSRI 136/ 189/ -50 MIN, MAX = -41.66 21.25
 MN-2SD 0 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -37.66 21.25
 MN-2SD 4 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -52.52 21.25
 5-MIN 84 10-TW 04
 11.28 50.00
 19.00 26.87
 2.94 32.50



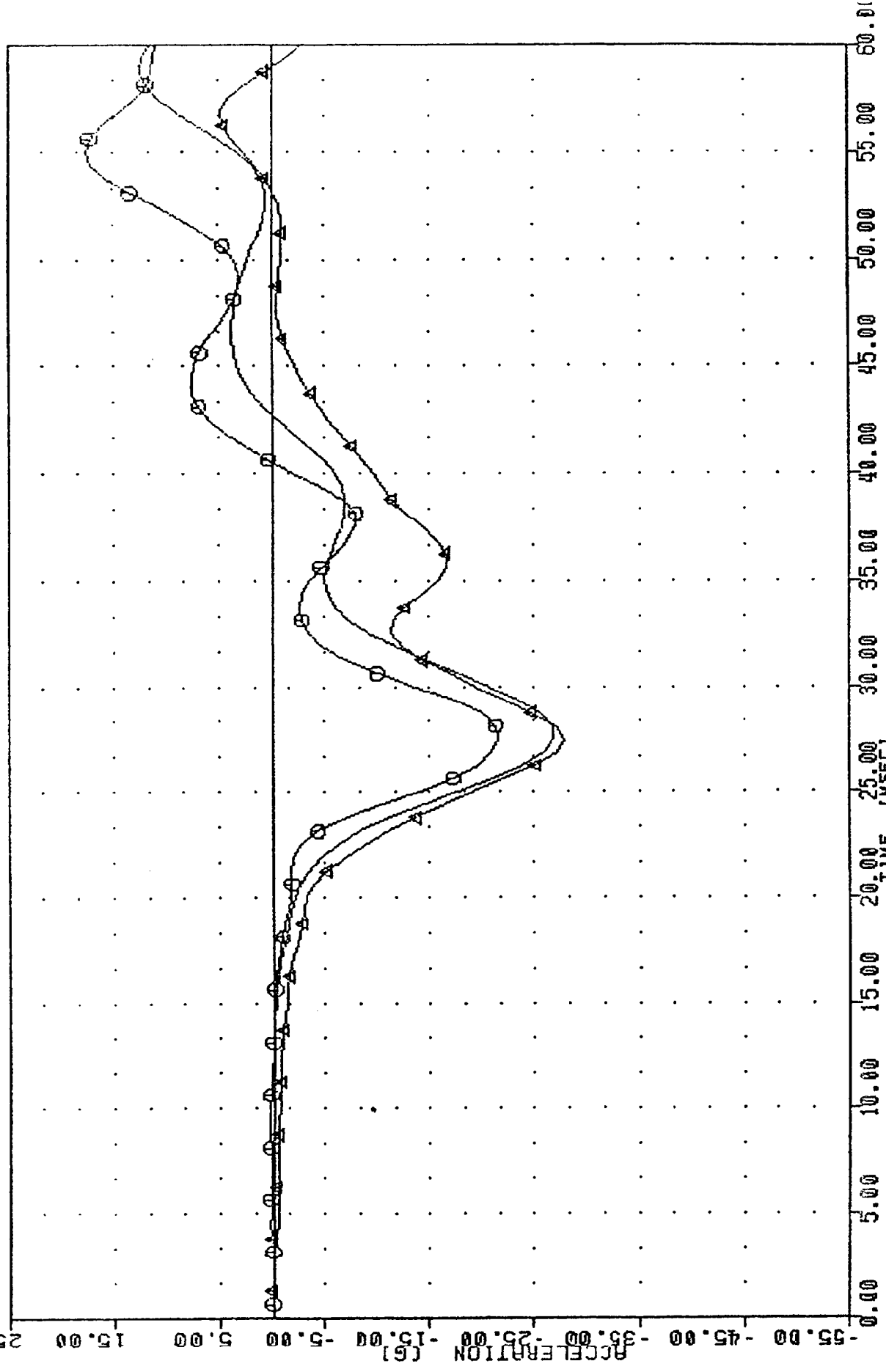
SIDE IMPACT TEST (006)
 1 FET LOWER AIR ACCELERATION Y AXIS - A

TRIC 5M191
 TO1YGI
 MN-2SD
 MN-2SD
 SID
 136/ 189/
 136/ 189/
 136/ 189/
 5
 84
 5
 26.87
 26.87
 26.87
 58.13
 54.38
 56.25



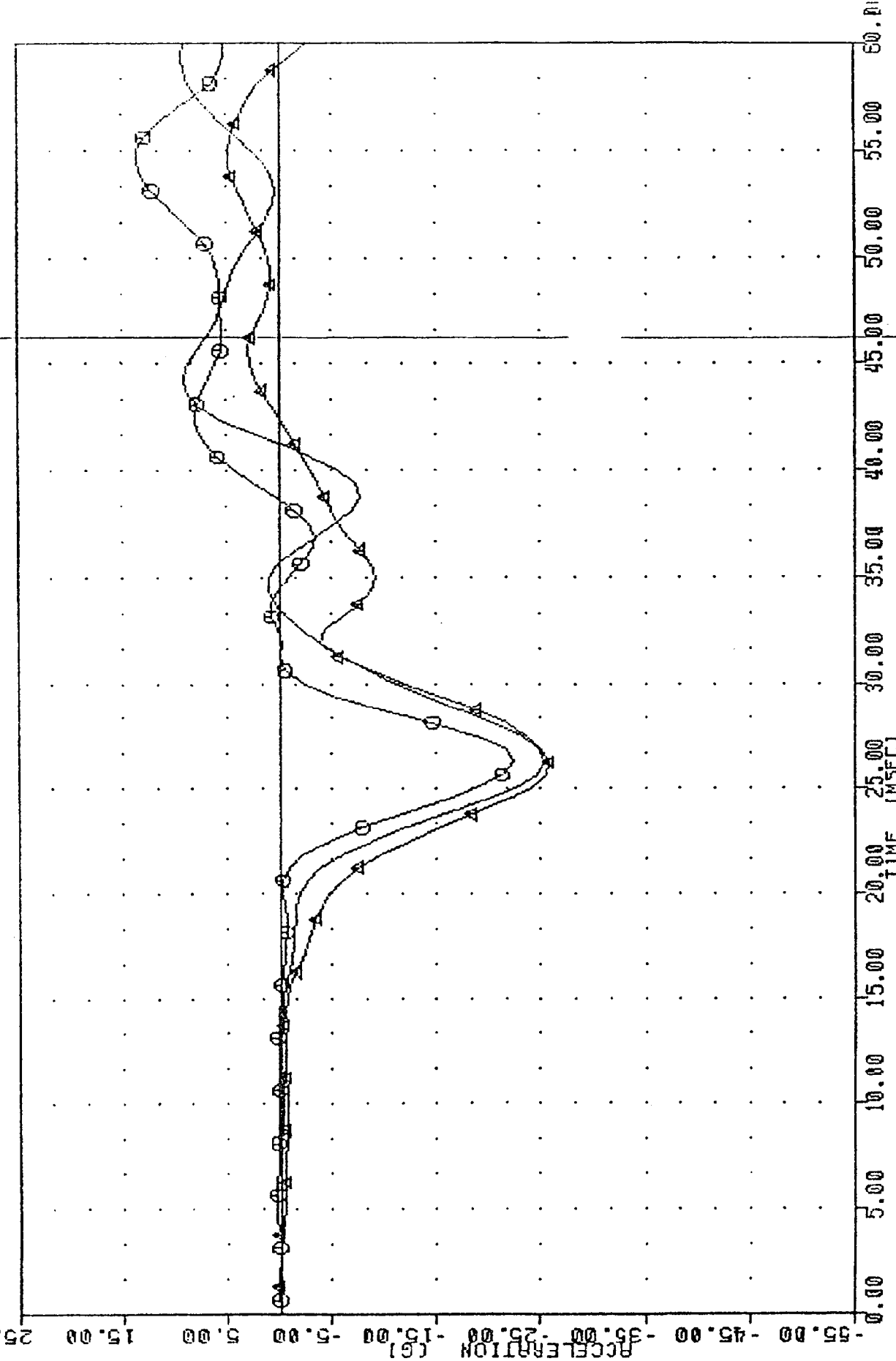
SIDE IMPACT TEST (U02)
 UPPER SPINE ACCELERATION Y AXIS -1

VTRIC SRL91
 TOUYGH
 MN-2SD
 MN-2SD
 SID THORAX U02
 136/ 189/ -50
 136/ 189/ -50
 136/ 189/ -50
 830 CAL 97 84055
 MIN, MAX = -26.89
 MIN, MAX = -21.58
 MIN, MAX = -27.91
 PLOT DATE 5-MAR-84 10:30:10
 12.37
 17.54
 4.78
 58.13
 54.38
 56.25



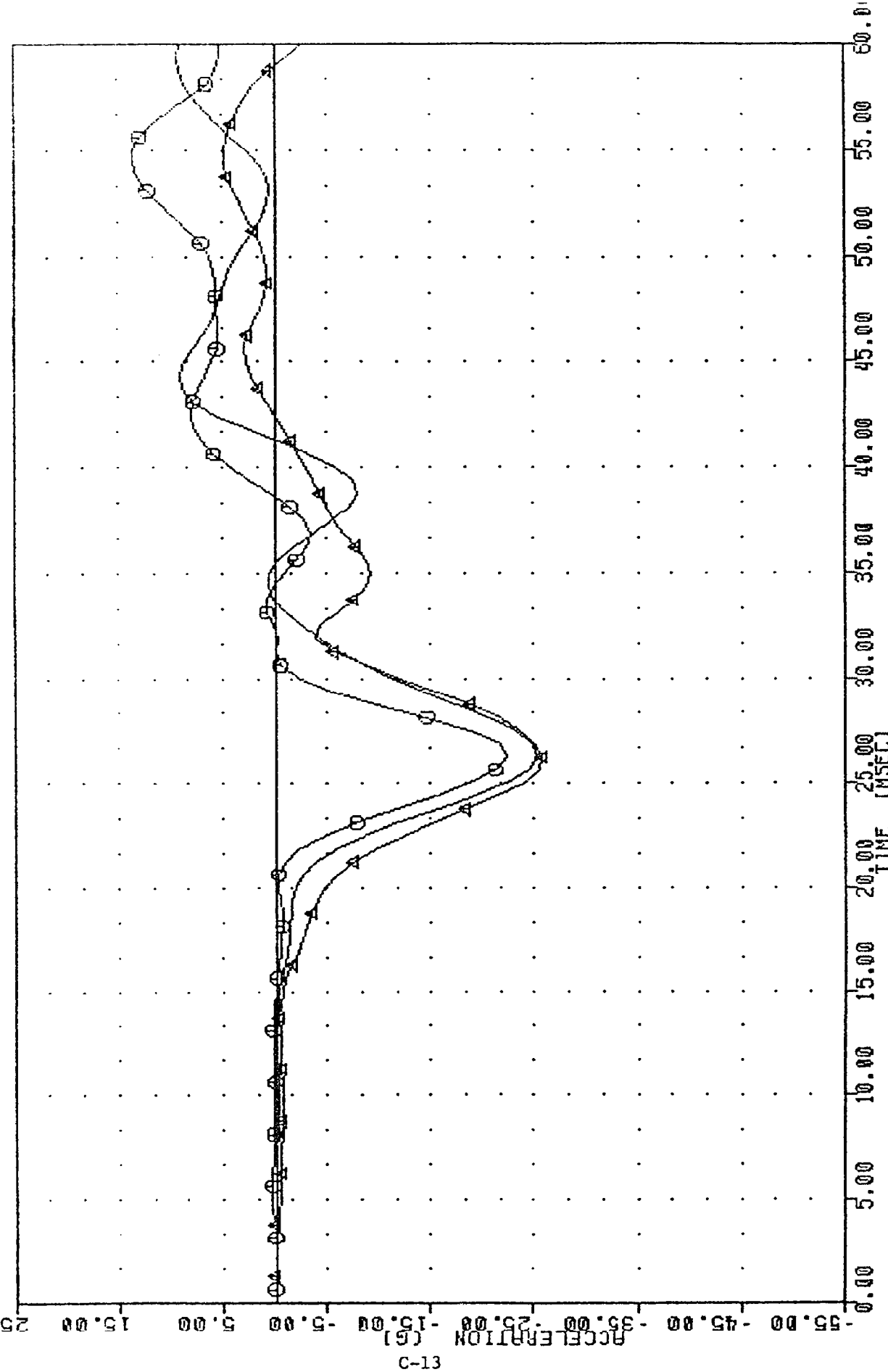
HIDDEN
 SIDE IMPACT TEST (U02)
 COTME ACCEL BOTTOM V AVTC -R

TRC 5R191 5110297 SID 100RAK 002 BUI 830 CAL 37 84000 5 MIN 84 09:06:49
 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -25.44 8 25.63 25.63
 MN-2SD 136/ 189/ -50 MIN, MAX = -22.37 8 25.63 25.63
 MN-2SD 136/ 189/ -50 MIN, MAX = -25.84 8 25.63 25.63



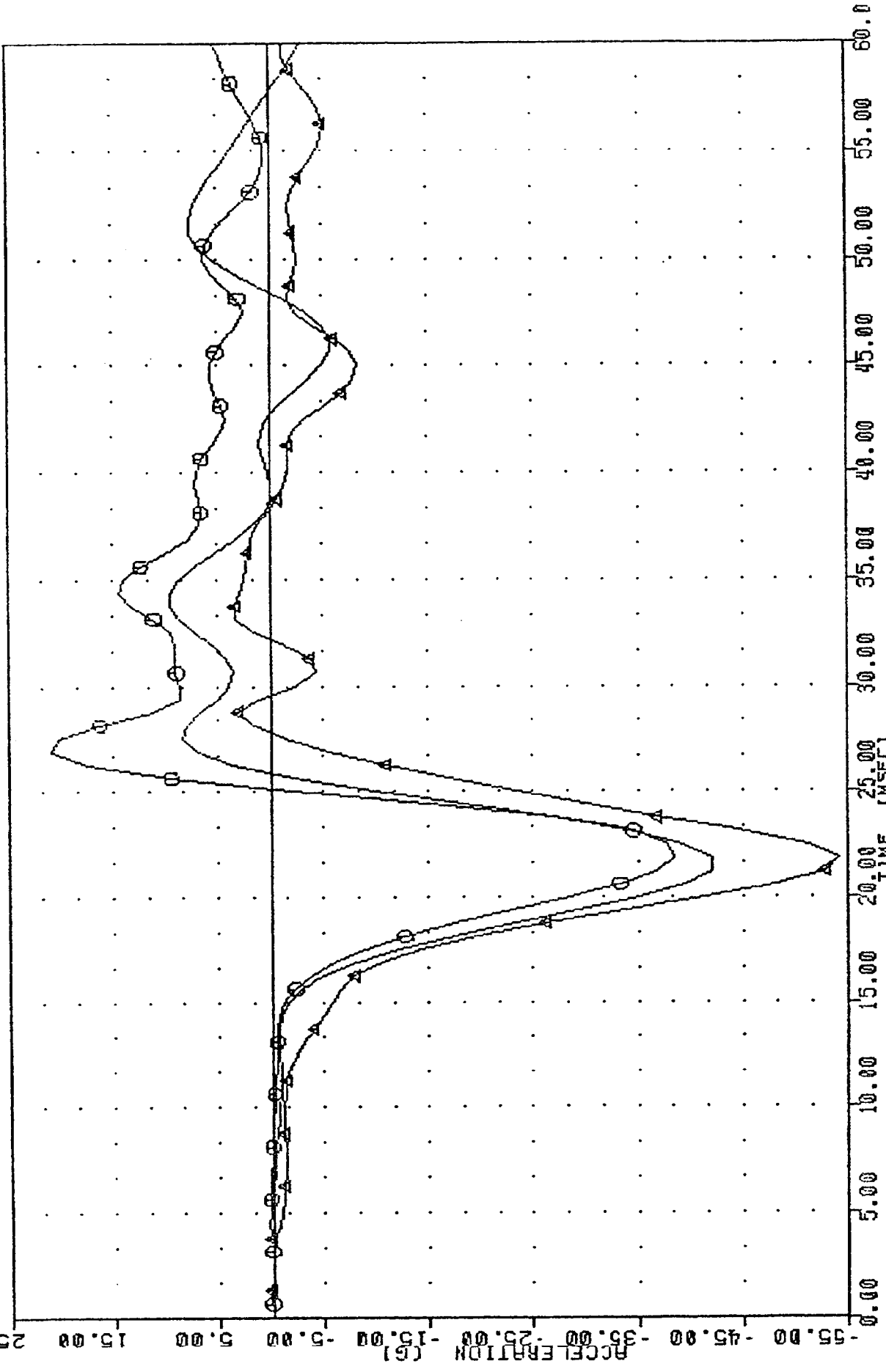
SIDE IMPACT TEST (U02)
 LOWER SPINE ACCELERATION Y AXIS -1

T12YGR
 MN-2SD
 MN-2SD
 S1U0297
 FILTER = HSRI
 FILTER = HSRI
 FILTER = HSRI
 SID
 INURAX U02
 136/ 189/ -50
 136/ 189/ -50
 136/ 189/ -50
 84000
 MIN, MAX =
 MIN, MAX =
 MIN, MAX =
 -25.38
 -22.37
 -25.84
 5-MIN-84
 9.13
 13.54
 4.85
 10:00:53
 58.75
 58.75
 53.75



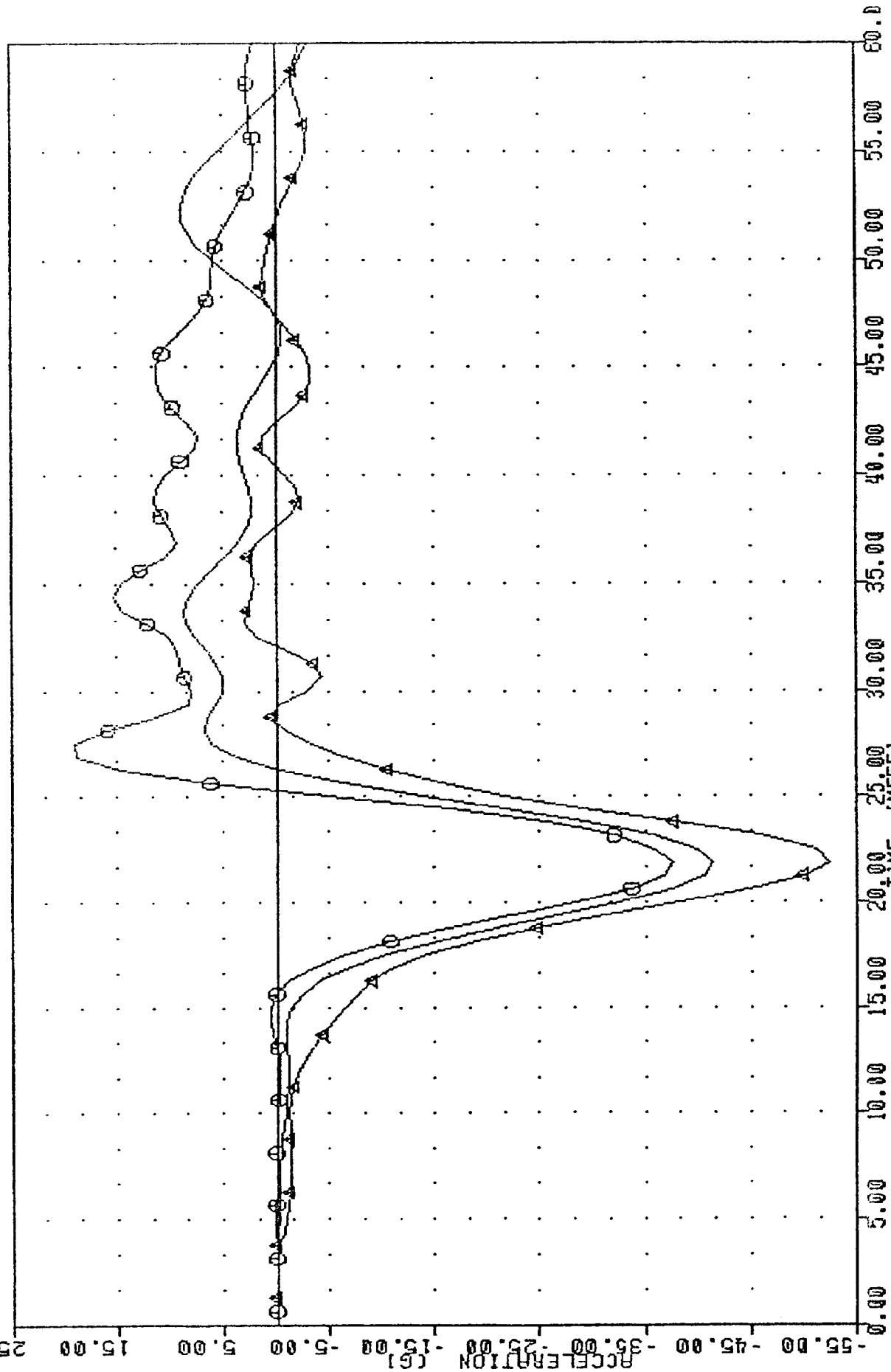
SIDE IMPACT TEST (U02)
 LOWER SPINE ACCELERATION Y AXIS -A

VRTIC SRL91
 LURYGR
 MN-230
 MN-250
 SIU0297
 FILTER : HSRI
 FILTER : HSRI
 FILTER : HSRI
 SID THORAX U02 BODY 230 CHL 97 84055
 136/ 189/ -50
 136/ 189/ -50
 MIN, MAX =
 MIN, MAX =
 MIN, MAX =
 -42.07 g
 -38.44 g
 -54.08 g
 PLOT DATE 5-MAR-84 10:10:49
 9.35g
 20.92g
 3.31g
 33.75
 26.25
 33.13



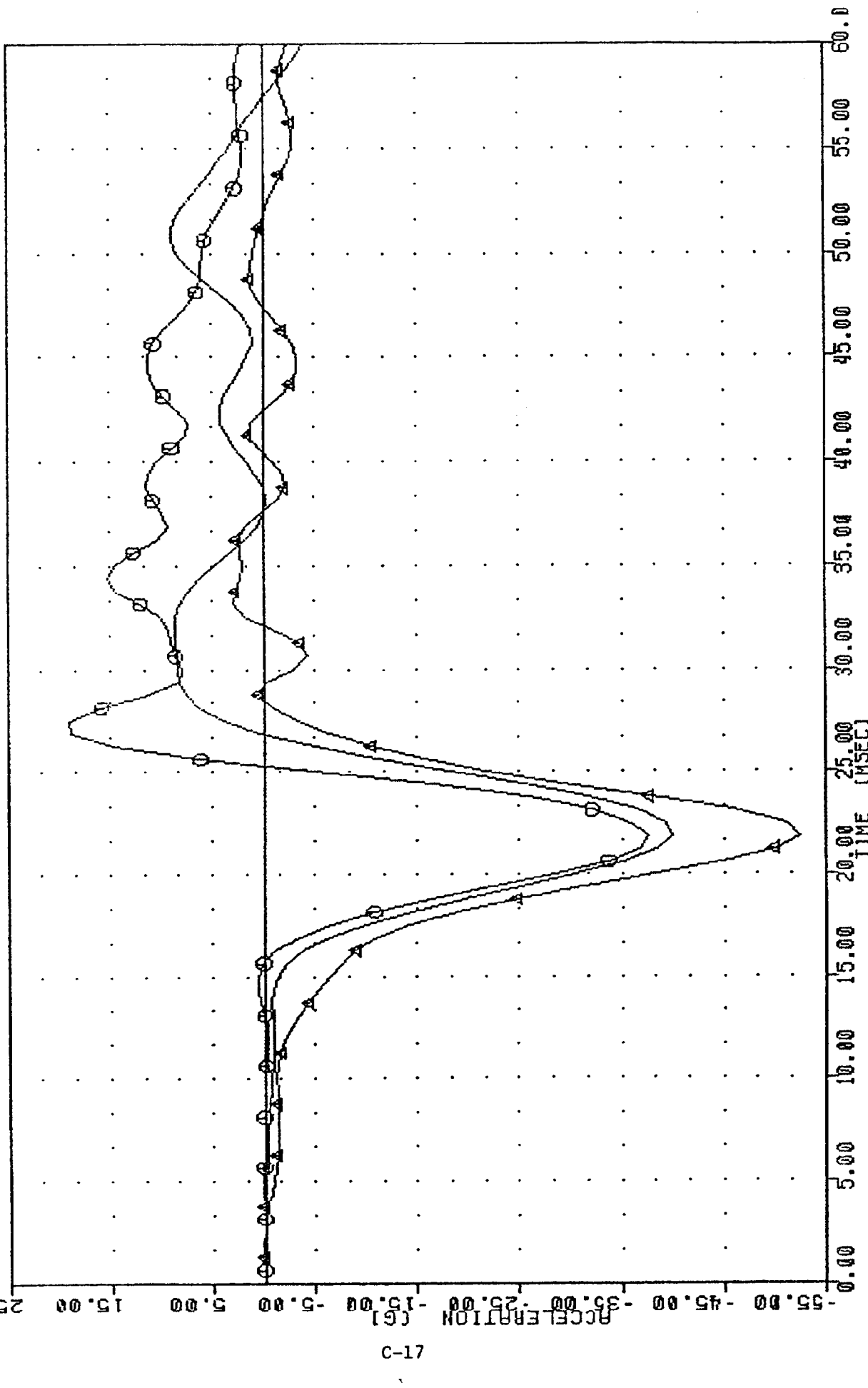
SIDE IMPACT TEST (U02)
 LEFT UPPER RIB ACCIFIRATION Y AXIS -A

VRTC SALS1 LLRYGI MN-2SD MN-2SD
 S10 THORAX U02 BODY 830 CAL 97 84055
 136/ 189/ -50 MIN. MAX = -41.51 g
 136/ 189/ -50 MIN. MAX = -37.66 g
 136/ 189/ -50 MIN. MAX = -52.52 g
 PLOT DATE 5-MAR-84 10:03:59
 21.25 8.87g 51.86
 21.25 19.00g 26.87
 21.25 2.94g 32.50



SIDE IMPACT TEST (U02)
 LEFT LOWER AIR ACCELERATION Y AXYS -1

VATIC SR191, S100297, S10 TRU MAX UN2 600 Y 830 CAL 37, 84050, 5-MAR-84, 10:06:08
 LLAYGA, FILTER: HSRI, 136/ 189/ -50, MIN, MAX = -40.02, 21.25, 8.89, 50.00
 MN-2SD, FILTER: HSRI, 136/ 189/ -50, MIN, MAX = -37.66, 21.25, 19.00, 26.87
 MN-2SD, FILTER: HSRI, 136/ 189/ -50, MIN, MAX = -52.52, 21.25, 2.34, 32.50



SIDE IMPACT TEST (U02)
 1 FT INWFR AIR ACCIFFRATION Y AXIS -A