

HS-806943

DOT#886

MVMA SIDE IMPACT TESTING

MDB-TO-CAR SIDE IMPACT TEST OF
A 26° CRABBED MOVING DEFORMABLE BARRIER
TO A 1985 FORD LTD
AT 33.6 MPH

PREPARED BY:
TRANSPORTATION RESEARCH CENTER OF OHIO
ST. RT. 33 LOGAN COUNTY
EAST LIBERTY, OHIO 43319

TEST REPORT
TEST NO.: 851018
TEST DATE: OCTOBER 18, 1985
TEST CONDITIONS: MODIFIED STRUCTURE, DUMMY
SEATED AGAINST HARD BOARD DOOR PANEL

PREPARED FOR:
MGA RESEARCH CORPORATION
12790 MAIN ROAD
AKRON, NEW YORK 14001-0071

Prepared By: B. L. Wade

B. L. Wade

Project Engineer

Transportation Research Center of Ohio

Approved By: J. F. Shultis

J. F. Shultis

Manager, Impact Laboratory

Transportation Research Center of Ohio

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

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

Approximate Conversions From Metric Measures

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

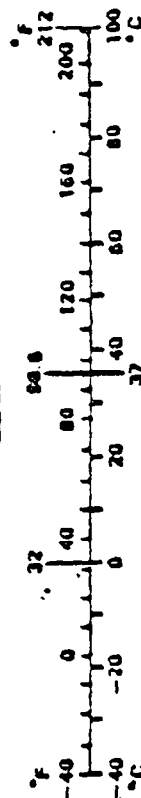


TABLE OF CONTENTS

	<u>Page</u>
1.0 PURPOSE AND INTRODUCTION	1-1
2.0 TEST PARAMETER DATA	2-1
3.0 CRASH TEST DATA	3-1
APPENDIX A DATA PLOT PRESENTATION	A-1
APPENDIX B DUMMY CERTIFICATION	B-1

SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to evaluate occupant responses in a vehicle with a modified A-post and B-post structure and a hardboard door panel in a 90° side impact crash test.

INTRODUCTION

A stationary 1985 Ford LTD 4-door sedan was impacted on the right side by a Moving Deformable Barrier (MDB) on October 18, 1985. The test was to simulate an intersection collision with the striking vehicle travelling at 30 mph and the struck vehicle travelling at 15 mph. The orientation angle of the striking vehicle was 90° clockwise 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 Ford LTD at 33.5 mph with the MDB's wheels crabbed counterclockwise to 26°. The actual test speed was 33.6 mph and the actual leading edge of contact was 37.2 inches forward of the midpoint of the Ford LTD's wheelbase.

The vehicle contained structural modifications in the A-post and B-post areas. The front passenger inner door panel was replaced with a hardboard panel. A side impact dummy (SID) was seated in the right front passenger seat with its shoulder just touching the hardboard door panel. Section 2 contains test parameter data. Section 3 contains crash test data. Appendix A contains Data Plots. Appendix B contains Dummy Certification Data.

SECTION 2.0
TEST PARAMETER DATA

This section includes the following information:

1. General Test Vehicle Information
2. Dummy Temperature Control and Positioning Data
3. High Speed Camera Information
4. Transducer Information

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Ford Motor Company

MAKE/MODEL: Ford LTD

VIN: 1FABP39A3FG215184

BODY STYLE: 4-Door sedan

MODEL YEAR: 1985

NHTSA NO.: DNA

COLOR: Blue

ENGINE DATA: TYPE: Inline CYLINDERS: 4 DISPLACEMENT 2300 cc

TRANSMISSION DATA: Automatic

DATE VEHICLE RECEIVED: 10/7/85

ODOMETER READING: 384

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	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	No
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: Ford Motor Company

DATE OF MANUFACTURE: 4/85

GVWR: 4225 LBS.,

GAWR: FRONT 2103 LBS., REAR 2255 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 32 psi; REAR 32 psi

TIRES ON VEHICLE (MFGR. & LINE, SIZE): General P195/75R-14

BIAS PLY, BELTED, OR RADIAL: Radial

PLY RATING: 3

IS SPARE TIRE "SPACE SAVER"? Yes

IS SPARE TIRE STANDARD EQUIPMENT? Yes

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

RIGHT FRONT	800	LBS.	RIGHT REAR	691	LBS.
LEFT FRONT	802	LBS.	LEFT REAR	683	LBS.
TOTAL FRONT WEIGHT	1602		LBS. (53.8 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1374		LBS. (46.2 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	2976		LBS.		

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 26	;LF 26	;RR 23 7/8	;LR 24 3/8
PRE-TEST ATTITUDE:	RF 25 3/8	;LF 26	;RR 22 7/16	;LR 23 1/2
POST-TEST ATTITUDE:	RF 26 9/16	;LF 24 7/8	;RR 22 3/8	;LR 22 5/8

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 90 LBS. CARGO:

RIGHT FRONT	859	LBS.	RIGHT REAR	821	LBS.
LEFT FRONT	779	LBS.	LEFT REAR	781	LBS.
TOTAL FRONT WEIGHT	1638		LBS. (50.6% OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1602		LBS. (49.4 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	3240		LBS.		

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 0 LBS.

TEST FLUID DATA

TEST FLUID TYPE: PURPLE STODDARD SOLVENT 2; SPEC. GRAVITY: 0.764
KINEMATIC VISCOSITY: 0.99 CENTISTOKES
"USEABLE" CAPACITY*: NA GALLONS ACTUAL
TEST VOLUME: 14.9 GALLONS
FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 16.0 GALLONS

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: No

FUEL INJECTION: No

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

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 32 psi; REAR 32 psi

RECOMMENDED TIRE SIZE: P195/75R-14 LOAD RANGE X B, C,

VEHICLE CAPACITY: TYPES OF SEATS: Bench

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

CARGO LOAD 100 LBS.

TOTAL 1000 LBS.

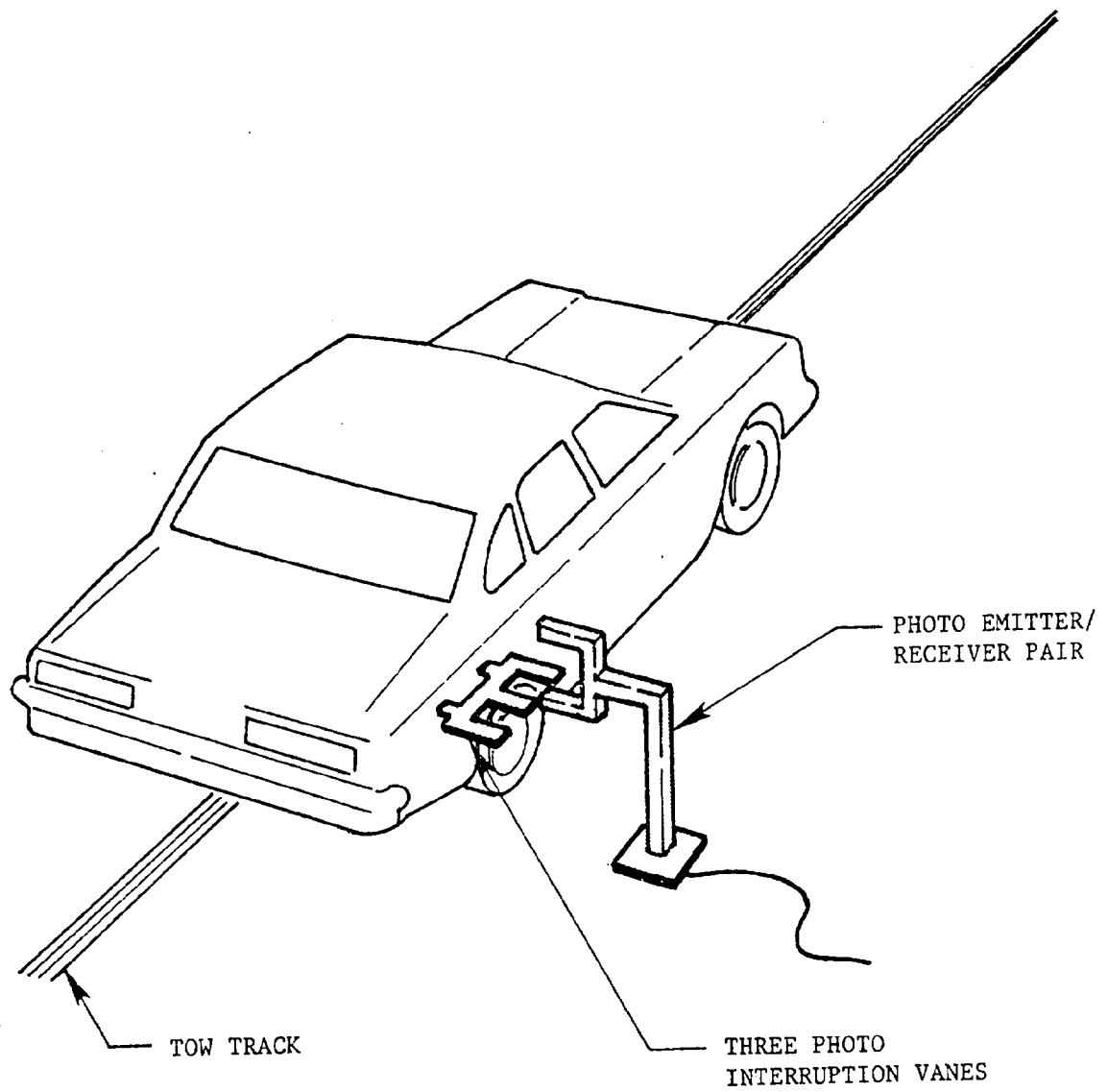
*WITH ENTIRE FUEL SYSTEM FILLED WITH FUEL TANK THROUGH CARBURETOR BOWL.

VEHICLE TEST WEIGHT CALCULATION

Test Weight = Unloaded Delivered Weight +
 Number of Dummies X 174 lbs. +
 Cargo Weight
 = 2976 + 1 X 174 + 100 lbs.
 = 3250 lbs.

To achieve test weight, the battery and the exhaust system were removed and 14.9 gallons of Stoddard Solvent were added in the fuel tank. The weight of the test vehicle was measured by placing each wheel on a Force Plate manufactured by K.J. Law Engineers, Inc., Detroit, Michigan.

IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane is located two inches before impact.

The vanes have one foot spacing.

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.

SIDE IMPACT DUMMY SEATING PROCEDURE

The following is an outline of the Side Impact Dummy Seating Procedure which is currently being developed.

1. The seat is placed in the midpoint of the fore to aft adjustment.
2. The H-point location of the NHTSA Side Impact Dummy (SID) is located by using the SAE three-dimensional H-point machine (SAE J826 APR80 - 50TH Percentile Male Configuration). The H-point machine is positioned in the right front outboard designated seating position such that the midsagittal plane is vertical and longitudinal. The H-point is located and documented using Sections 4 through 6 of SAE Standard J826 APR80.
3. The H-point machine is removed and the SID is positioned in the right front passenger seat such that its right shoulder is either five inches from or against the hardboard or padded inner door panel. The knees are initially set 11 1/2 inches apart, measured between the outer surfaces of the knee pivot bolt heads, if possible. The H-point is then positioned to within 1/2 inch of the coordinates of the H-point machine H-point location found in Step 2 by applying force in the appropriate direction to the dummy's lower torso. If the dummy's upper torso does not rest against the seatback, position the torso without moving the H-point so the upper torso does rest against the seatback. The dummy's feet are then positioned such that the heels rest on the floorpan and the feet are on the toeboard. If the dummy's feet will not reach the toeboard, the feet are positioned such that the feet are at right angles to the lower legs. If wheelhouse projections interfere with the above positioning of the feet, the heel is placed on the floorpan with the foot perpendicular to the lower leg by twisting the foot about the ankle.
4. Prior to the crash test the dummy's longitudinal and lateral head locations are rechecked. The dummy is then visually checked.

DUMMY IN-VEHICLE POSITION RECORDING SHEET

MFR./MAKE/MODEL: Ford LTD

FRONT SEAT TYPE: X BENCH
 BUCKET
 SPLIT BENCH

ADJUSTER TYPE: X MANUAL
 POWER

BUCKET SEAT BACK TYPE: X FIXED
 ADJUSTABLE

TECHNICIANS:
 1. J. Clarridge

POSITIONING DATE: October 18, 1985

2. K. Watkins

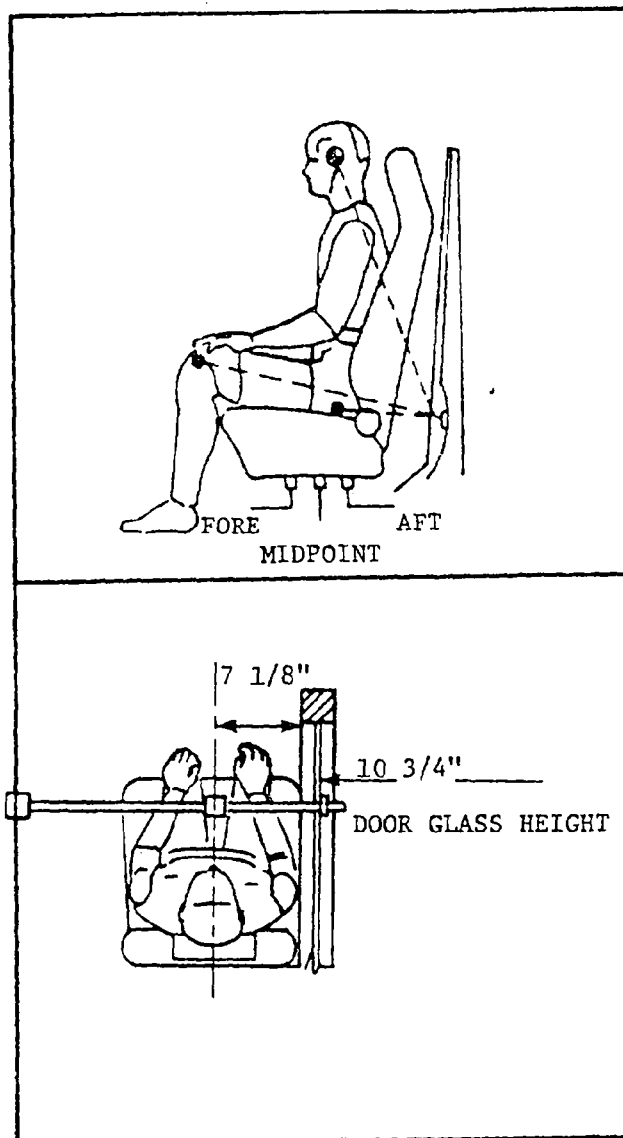
AMBIENT TEMP: 66 °F TIME: 9:00 A.M. 3.

FRONT PASSENGER DUMMY # 016

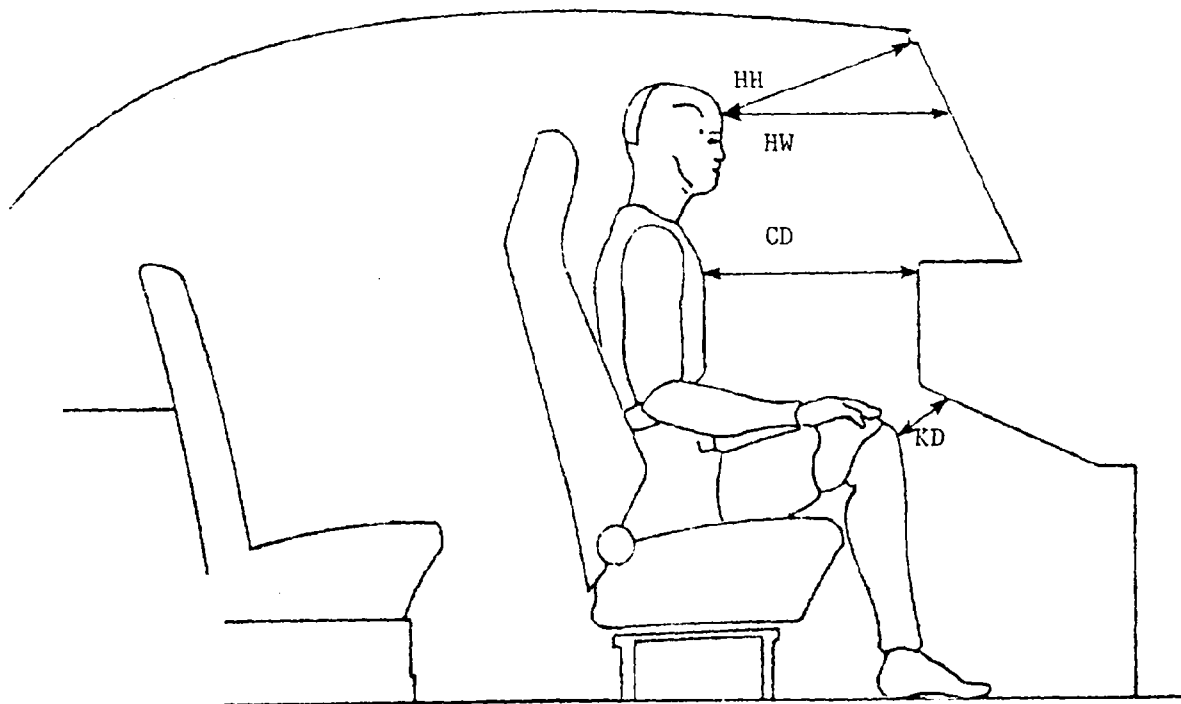
20 15/16" HEAD
5" TARGET*

26 1/8" KNEE
89" JOINT

APPROX.
11 3/4" "H"
109" POINT



*All passenger dummy dimensions referenced to top of front door striker bolt and all angles referenced to vertical.

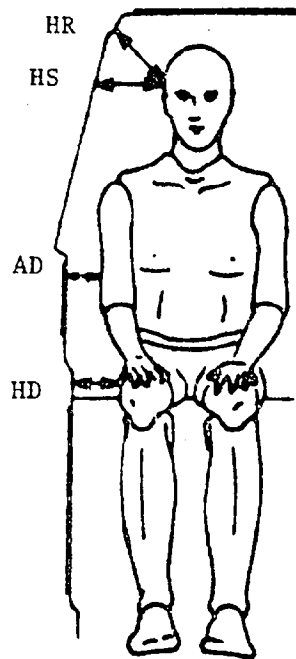


PASSENGER
#016

HH	11 9/16
HW	17 1/2
CD	19 5/8
KDL	4 5/8
KDR	4 3/4

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSION



PASSENGER #016

HR	4 1/8
HS	4
AD	0
HD	3/4

ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS

LOCATIONS OF OFFBOARD HIGH SPEED CAMERAS

CAMERA NO.	X	Y	Z
7	-6'11 1/2"	-25'10 1/2"	+ 3'3"
6	-23'4 3/4"	+41'6 1/2"	+ 3'1"
5	+1'	0	+40'
4	0	0	+40'

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

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Documentary	Beaulieu	12-120	24	Documentary
2	R. Panning	Kodak	16	24	Real Time
3	Onboard MDB	Photosonic 1B	13	1005	View Impact
4	Overhead Tight	Photosonic 1B	25	1000	View Impact
5	Overhead Wide	Photosonic 1B	8	708	Vehicle Crush
6	Right	Photosonic 1B	25	1000	Vehicle Crush
7	Left	Photosonic 1B	13	1003	Vehicle Crush
8	Onboard Windshield	Photosonic 1B	8	998	Dummy Kinematics
9	Onboard Roof	Photosonic 1B	8	985	Dummy Kinematics
10	Onboard Door	Photosonic 1B	8	853	Dummy Kinematics

TRANSDUCER INFORMATION

PARAMETER BEING MEASURED	LOCATION	TYPE OF TRANSDUCER	MFGR	MODEL NUMBER	SERIAL NUMBER
HEDXG2	HEAD CENTER OF GRAVITY	ACCEL.	ENDEVCO	2264	AY95
HEDYG2	HEAD CENTER OF GRAVITY	ACCEL.	ENDEVCO	2264	BA26
HEDZG2	HEAD CENTER OF GRAVITY	ACCEL.	ENDEVCO	2264	AY90
T01XG2	UPPER SPINE	ACCEL.	ENDEVCO	2264	AR93
T01YG2	UPPER SPINE	ACCEL.	ENDEVCO	2264	AN61
T01YGB	UPPER SPINE	ACCEL.	ENDEVCO	2264	AZ77
T01ZG2	UPPER SPINE	ACCEL.	ENDEVCO	2264	AN37
T12XG2	LOWER SPINE	ACCEL.	ENDEVCO	2264	AZ55
T12YG2	LOWER SPINE	ACCEL.	ENDEVCO	2264	BA64
T12YGB	LOWER SPINE	ACCEL.	ENDEVCO	2264	AZ74
T12ZG2	LOWER SPINE	ACCEL.	ENDEVCO	2264	BA30
RURYG2	RIGHT UPPER RIB	ACCEL.	ENDEVCO	2264	AR82
RURYGB	RIGHT UPPER RIB	ACCEL.	ENDEVCO	2264	AZ24
RLRYG2	RIGHT LOWER RIB	ACCEL.	ENDEVCO	2264	AN60
RLRYGB	RIGHT LOWER RIB	ACCEL.	ENDEVCO	2264	AY78
PEVXG2	PELVIS	ACCEL.	ENDEVCO	2264	AR78
PEVYG2	PELVIS	ACCEL.	ENDEVCO	2264	AN01
PEVZG2	PELVIS	ACCEL.	ENDEVCO	2264	AJ35
RRTYD2	RIGHT RIB TO SPINE DISPLACEMENT	LINEAR POT.	BOURNS	5184	4081-191
RFDYG1	RIGHT FRONT DOOR-POSITION 1	ACCEL.	ENDEVCO	2264	AT26
RFDYG2	RIGHT FRONT DOOR-POSITION 2	ACCEL.	ENDEVCO	2264	AS95
RFDYG3	RIGHT FRONT DOOR-POSITION 3	ACCEL.	ENDEVCO	2264	BC29
RFDYG4	RIGHT FRONT DOOR-POSITION 4	ACCEL.	ENDEVCO	7264	AN86
LFSXG	LEFT FRONT SILL	ACCEL.	B & H*	4-202-0001	18840
LFSYG	LEFT FRONT SILL	ACCEL.	B & H	4-202-0001	18236
LFSZG	LEFT FRONT SILL	ACCEL.	B & H	4-202-0001	18837
BCGXG	BARRIER CENTER OF GRAVITY	ACCEL.	B & H	4-202-0001	18851
BCGYG	BARRIER CENTER OF GRAVITY	ACCEL.	B & H	4-202-0001	18859
BCGZG	BARRIER CENTER OF GRAVITY	ACCEL.	B & H	4-202-0001	18836
BRCXG	BARRIER REAR CROSS MEMBER	ACCEL.	B & H	4-202-0001	19022
BRCYG	BARRIER REAR CROSS MEMBER	ACCEL.	B & H	4-202-0001	18237

*Bell & Howell

SECTION 3.0
CRASH TEST DATA

The following pages are included in this section:

1. Test conditions
2. Dummy accelerometer data summary
3. Dummy contact points and kinematic summary
4. Vehicle accelerometer locations and data summary
5. Vehicle static crush table and profiles
6. Deformable moving barrier accelerometer locations and data summary
7. Test anomalies

TEST CONDITIONS

TEST NUMBER: 851018

DATE OF TEST: October 18, 1985

TIME OF TEST: 12:26

WIND VELOCITY: 4-15 mph 207°

HUMIDITY: NA

AMBIENT TEMPERATURE AT IMPACT AREA: 71° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 78° F

DUMMY TEMPERATURE: 71° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	3240	3250
MDB TEST WEIGHT (LBS.)	2991	2992
MDB VELOCITY (MPH)	33.6	33.5
IMPACT POINT (INCHES)	37.2	37.0

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		
SERIAL NO.:			016		
INSTRUMENTATION:					
HEAD ACCEL.:			3		
CHEST ACCEL.:			12		
FEMUR L.C.'S:			0		
OTHER:			3 Pelvis 1 Rib Disp.		

RESTRAINT SYSTEM: Dummy was unrestrained.

SIDE IMPACT DUMMY DATA SUMMARY

	PASSENGER DUMMY			
	POSITIVE		NEGATIVE	
	DIRECTION*		DIRECTION**	
	MAX	TIME	MAX	TIME
	(g)	(msec)	(g)	(msec)
HEAD ACCELERATION				
LONGITUDINAL	13.15	57.63	16.57	102.75
LATERAL	19.75	56.75	38.17	43.88
VERTICAL	39.13	58.25	13.07	25.38
RESULTANT		44.38 @ 58.25		
HIC	184.23	from 32.75 to 94.25		
DELTA V (MPH)		-11.6 @ 146.75		
CHEST ACCELERATION				
UPPER SPINE				
LONGITUDINAL	20.40	33.75	19.37	47.50
LATERAL (P)****	43.36	61.87	62.41	38.75
LATERAL (R)****	43.48	61.87	62.02	38.75
VERTICAL	7.66	80.63	8.41	53.75
RESULTANT (P)****		63.56 @ 33.13		
RESULTANT (R)****		62.04 @ 38.75		
DELTA V (MPH)***		-25.6 @ 57.13 (P)		
		-24.9 @ 56.63 (R)		
LOWER SPINE				
LONGITUDINAL	29.20	47.50	26.46	31.88
LATERAL (P)****	14.94	58.75	96.18	30.00
LATERAL (R)****	15.39	58.13	95.49	30.00
VERTICAL	3.73	81.25	10.40	29.38
RESULTANT (P)****		99.04 @ 30.62		
RESULTANT (R)****		98.21 @ 30.62		
DELTA V (MPH)***		-29.3 @ 50.13 (P)		
		-28.9 @ 49.75 (R)		
RIGHT UPPER RIB				
LATERAL (P)****	11.55	46.88	55.09	24.38
LATERAL (R)****	---	---	---	---
DELTA V (MPH)***		-22.2 @ 68.25 (P)		
		--- @ --- (R) γ		
RIGHT LOWER RIB				
LATERAL (P)****	3.34	66.25	60.23	30.62
LATERAL (R)****	4.46	65.63	57.15	31.25
DELTA V (MPH)***		-26.2 @ 74.38 (P)		
		-24.2 @ 72.50 (R)		
PELVIS ACCELERATION				
LONGITUDINAL	6.26	139.13	41.00	30.00
LATERAL	5.31	296.88	99.73	25.63
VERTICAL	4.96	35.88	27.14	33.75
RESULTANT		102.05 @ 25.63		
DELTA V (MPH)***		-25.2 @ 97.75		

SIDE IMPACT DUMMY DATA SUMMARY CONTD

PASSENGER DUMMY

	<u>POSITIVE</u>		<u>NEGATIVE</u>	
	<u>DIRECTION*</u>		<u>DIRECTION**</u>	
	<u>MAX</u>	<u>TIME</u>	<u>MAX</u>	<u>TIME</u>
	<u>(in)</u>	<u>(msec)</u>	<u>(in)</u>	<u>(msec)</u>
RIB DEFLECTION	0.13	175.88	1.72	92.25

* LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: DOWNWARD

**LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD

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

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

γ SEE TEST ANOMALIES

VISIBLE DUMMY CONTACT POINTS:

	DRIVER	PASSENGER #016
Head	<u>DNA</u>	<u>Right front window sill</u>
Chest	<u>DNA</u>	<u>Inner door panel</u>
Abdomen	<u>DNA</u>	<u>Inner door panel</u>
Left Knee	<u>DNA</u>	<u>Right knee</u>
Right Knee	<u>DNA</u>	<u>Left knee</u>

DOOR OPENING:

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

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>None</u>	<u>None</u>
Rear	<u>None</u>	<u>None</u>

GLAZING DAMAGE:

All right side door glass was shattered.

Right side of windshield was cracked.

OTHER NOTABLE IMPACT EFFECTS:

DUMMY KINEMATIC SUMMARY

During impact, the dummy's right leg and right side of its torso contacted the inner door panel. The dummy's head rotated down and to the right and struck the right front door window sill as the dummy's pelvis began moving to the left across the occupant compartment. The dummy came to rest sitting on the driver's side of the bench seat, leaning against the driver's door with its feet still on the passenger's side of the vehicle.

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

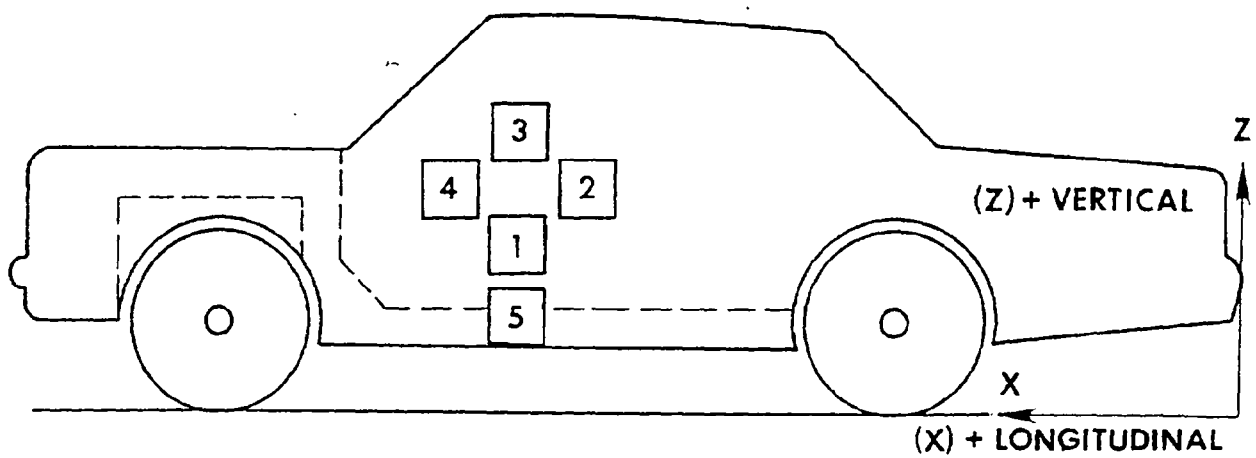
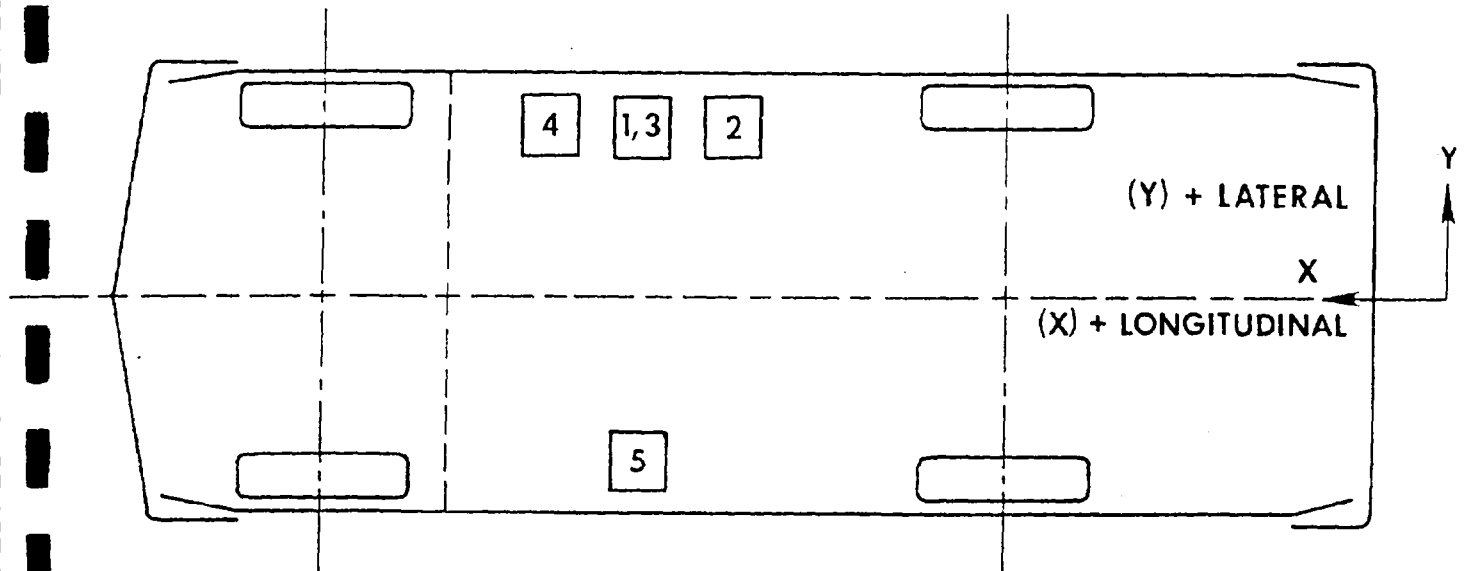
NO.	LOCATION	X*	Y*	Z*	POSITIVE** DIRECTION		NEGATIVE*** DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	RIGHT FRONT DOOR CENTERLINE (LATERAL)	112.5 $\Delta V = -19.4$ mph @	28.8 40.38 msec	22.5	18.83	56.50	138.01	12.38
2	MIDREAR OF RIGHT FRONT DOOR (LATERAL)	101.8 $\Delta V = -18.9$ mph @	28.4 41.50 msec	24.0	87.33	16.50	153.88	10.63
3	UPPER RIGHT FRONT DOOR CENTERLINE (LATERAL)	112.8 $\Delta V = -13.2$ mph @	28.3 32.88 msec	29.1	94.74	70.75	105.60	14.25
4	MIDFRONT OF RIGHT FRONT DOOR (LATERAL)	122.0 $\Delta V = -16.7$ mph @	28.8 30.75 msec	22.8	101.12	18.13	123.74	11.25
5	LEFT SILL AT FRONT SEAT (LONGITUDINAL) (LATERAL) (VERTICAL) (RESULTANT)	119.9 $\Delta V = -14.3$ mph @	-26.2 139.13 msec	12.9	4.12 3.25 4.93	61.75 64.25 12.38 28.75 @	6.15 28.35 10.15 13.00	24.75 13.00 18.50

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

LONGITUDINAL: FORWARD *LONGITUDINAL: REARWARD
LATERAL: RIGHTWARD LATERAL: LEFTWARD
VERTICAL: DOWNWARD VERTICAL: UPWARD

All measurements of accelerometer locations in inches.

VEHICLE ACCELEROMETER PLACEMENT



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

LOCATION	HEIGHT (in)	78	72	66	60	54	48	42	36	30	24	18	12	6	0	6
		PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)														
Axle Height	11.6	X	18.3	17.8	17.8	17.6	17.6	17.4	17.4	17.4	17.4	17.3	17.3	17.2	17.2	X
H-Point	22.3		12.8	13.7	13.5	13.4	13.4	13.4	13.5	13.6	13.7	13.8	13.9	13.9	13.9	X
Window Sill	35.5		15.8	15.8	15.6	15.6	15.9	16.1	16.1	16.1	16.3	16.6	16.5	16.6	16.5	16.8
Window Top	54.5		23.9	24.0	24.0	23.7	23.8	23.8	24.0	24.0	23.9	X	X	X	X	X

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

Axle Height	11.6	X	21.6	21.8	21.9	22.6	22.8	22.8	23.0	23.1	23.4	24.0	24.4	21.5	20.2	X
H-Point	22.3		16.5	25.8	27.5	26.0	24.5	21.5	23.2	23.5	23.5	23.3	23.3	21.4	17.8	X
Window Sill	35.5		19.1	23.6	26.1	25.8	25.3	22.8	21.8	21.6	21.5	20.8	20.3	18.6	18.4	18.0
Window Top	54.5		25.8	26.1	25.9	26.0	26.4	26.5	26.5	26.5	X	X	X	X	X	X

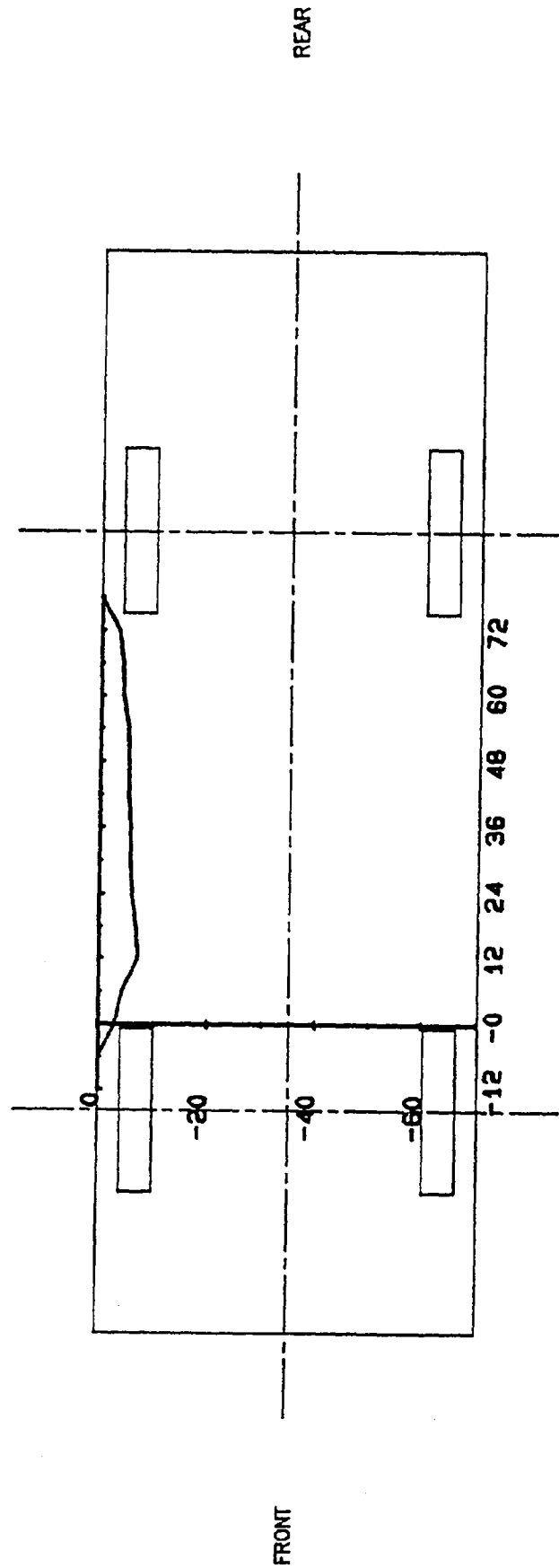
STATIC CRUSH (IN)

Axle Height	11.6	X	3.3	4.0	4.1	5.0	5.2	5.2	5.6	5.7	6.0	6.7	7.1	4.3	3.0	X
H-Point	22.3		3.7	12.1	14.0	12.6	11.1	8.1	9.8	10.0	9.9	9.5	9.5	7.5	3.9	X
Window Sill	35.5		3.3	7.8	10.5	10.2	9.7	6.9	5.7	5.5	5.4	4.2	3.8	2.0	1.9	1.2
Window Top	54.4		1.9	2.1	1.9	2.2	2.2	2.6	2.5	2.5	2.6	X	X	X	X	X

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

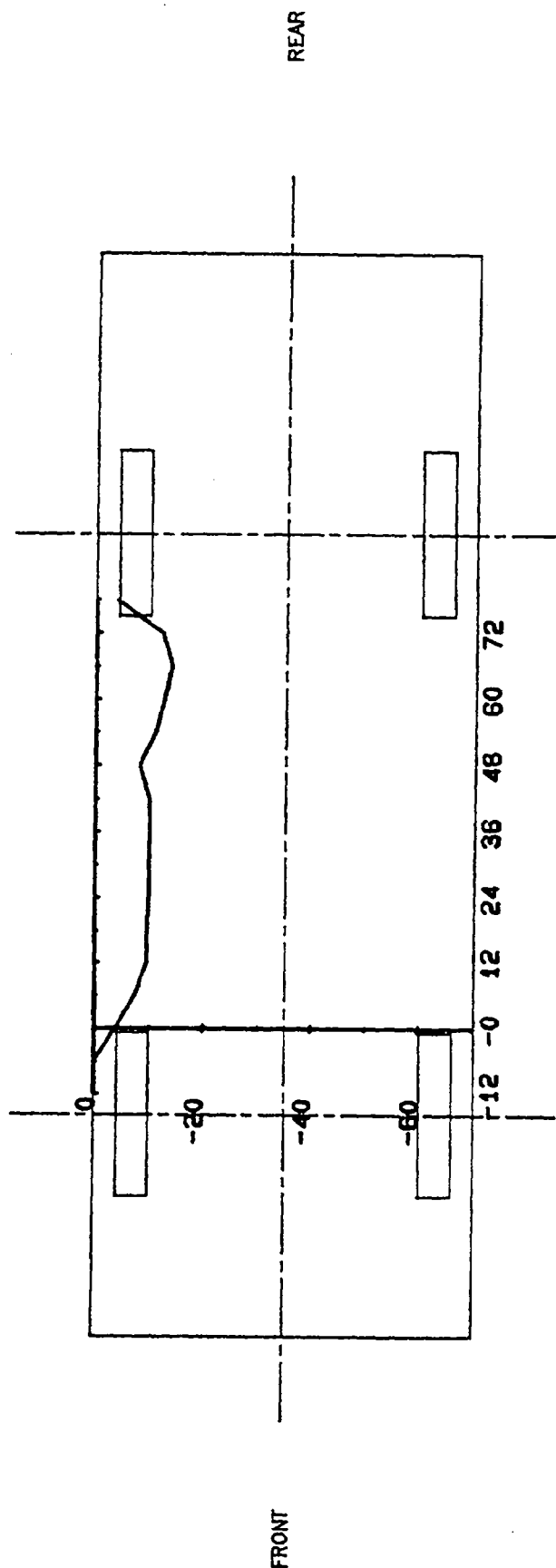
** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



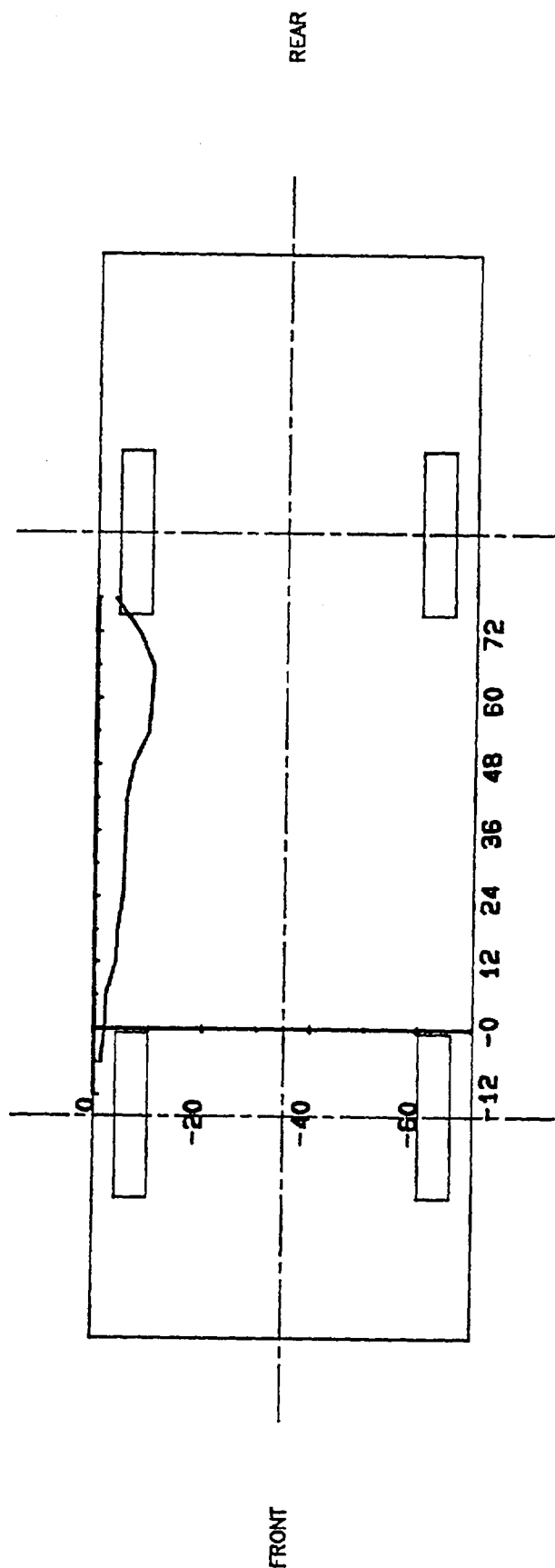
PROFILE LEVEL EQUALS AXLE HEIGHT WHICH IS 11.6" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.033

VEHICLE EXTERIOR STATIC CRUSH PROFILE



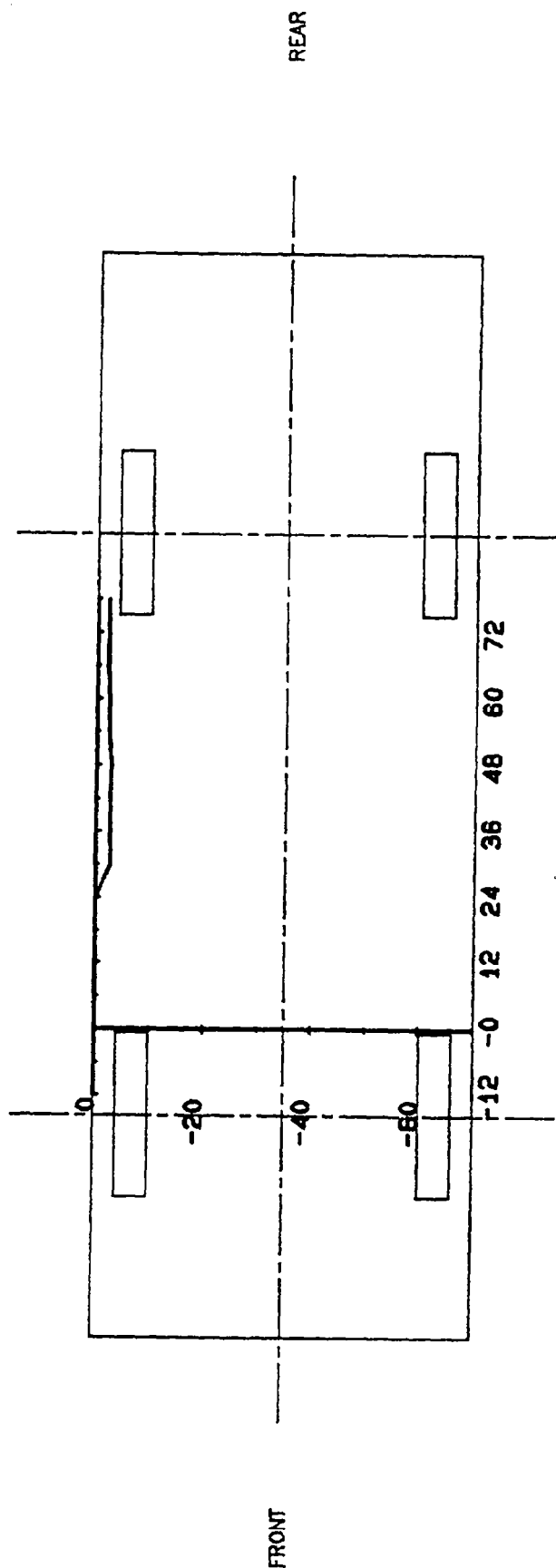
PROFILE LEVEL EQUALS H-POINT HEIGHT WHICH IS 22.3" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.033

VEHICLE EXTERIOR STATIC CRUSH PROFILE



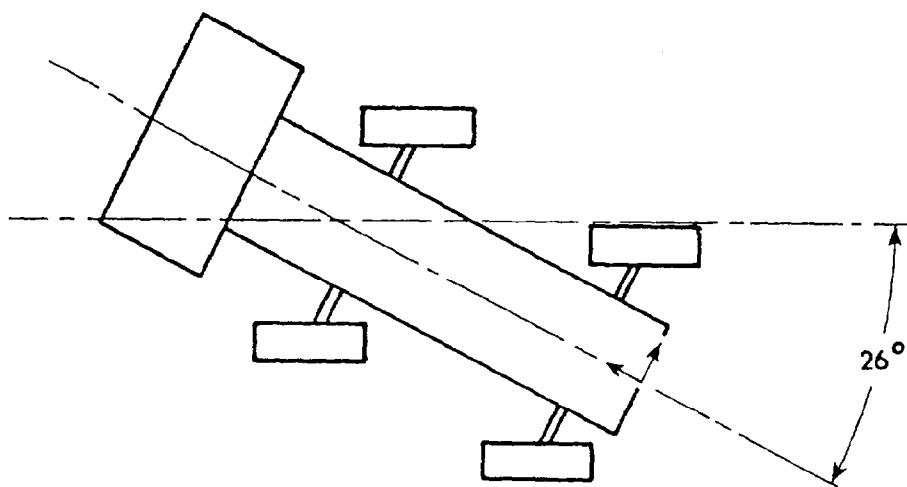
PROFILE LEVEL EQUALS WINDOW SILL HEIGHT WHICH IS 35.5" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.033

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT WHICH IS 54.5" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.033

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	73.0	0.9	11.9				
	(LONGITUDINAL) $\Delta V = -20.6$ mph @ 153.25 msec				---	---	17.67	35.63
	(LATERAL) $\Delta V = +4.9$ mph @ 153.25 msec				8.22	29.50	1.31	21.13
	(VERTICAL)				5.56	44.75	7.19	38.75
	(RESULTANT)					17.72 @	38.13	
2	REAR FRAME MEMBER	18.5	-19.2	11.9				
	(LONGITUDINAL) $\Delta V = -15.3$ mph @ 153.25 msec				---	---	14.30	38.50
	(LATERAL) $\Delta V = +0.6$ mph @ 153.25 msec				4.33	96.25	6.44	22.25

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

LONGITUDINAL: FORWARD *LONGITUDINAL: REARWARD
 LATERAL: RIGHTWARD LATERAL: LEFTWARD
 VERTICAL: DOWNWARD VERTICAL: UPWARD

All measurements of accelerometer locations in inches.

X There were no positive values in the time interval of interest.

TEST ANOMALIES

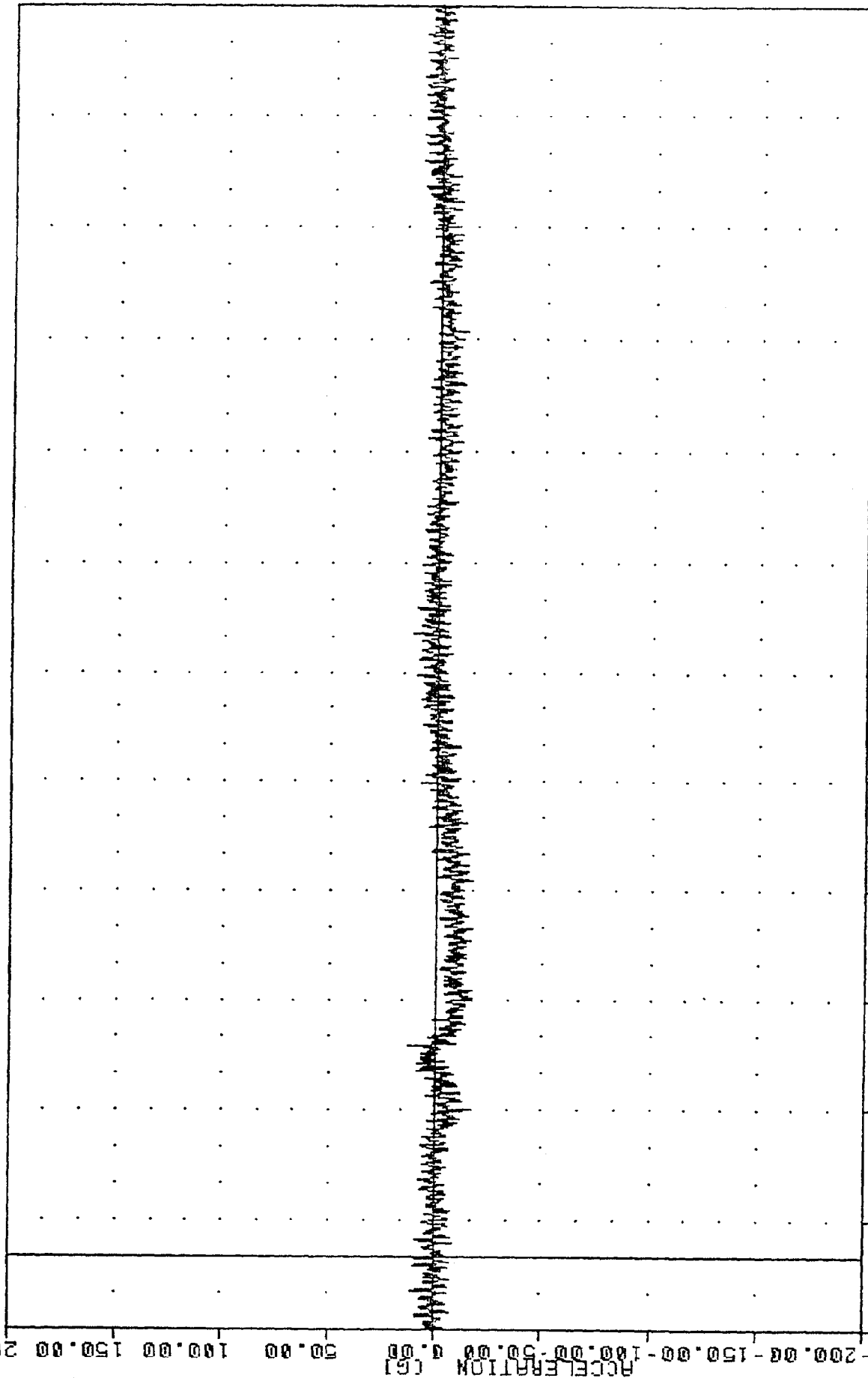
The dummy's right upper rib redundant accelerometer, RURYGB, did not return to zero following the test, therefore the acceleration and velocity (RURYVB) data are invalid.

APPENDIX A

DATA PLOTS

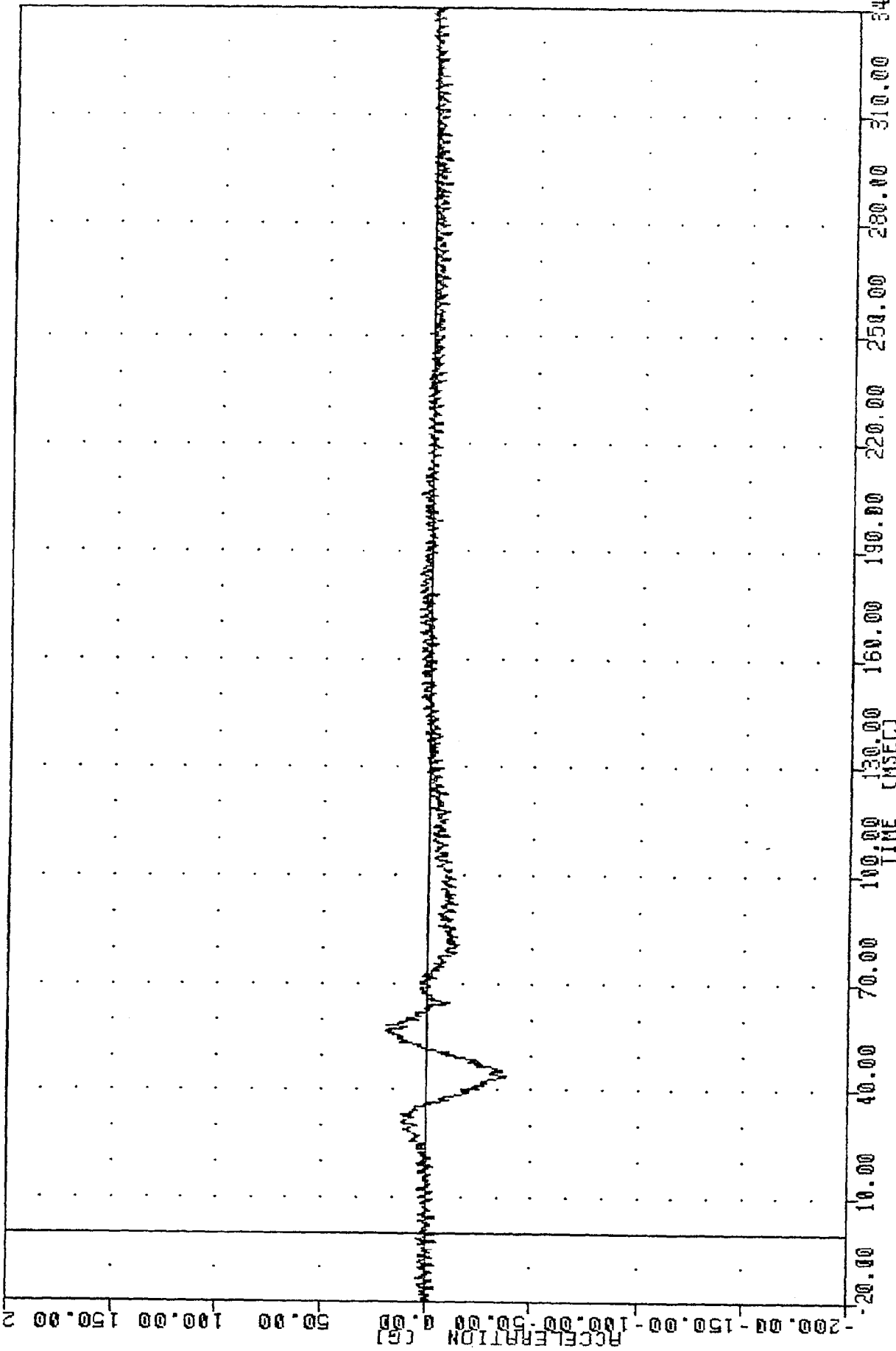
Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data were filtered according to SAE J211, except that dummy thorax data were filtered using the HSRI filter.

TRC 851018
 NVMA SIDE IMPACT TESTING
 85291000000
 HEDXG2
 PLOT DATE 24-OCT-85 10:33:50
 FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -16.572 102.75, 13.15 57.63



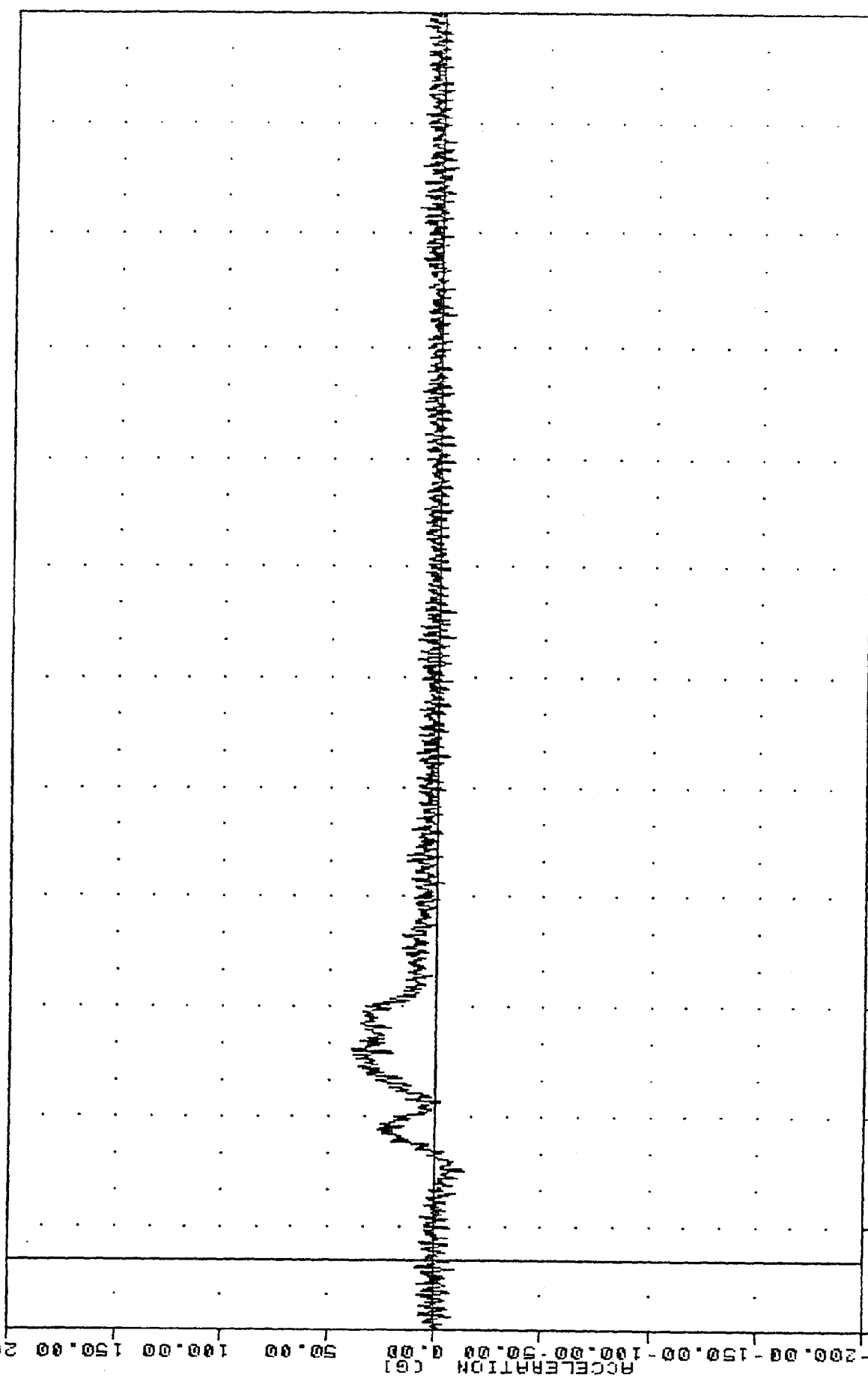
-20.00 10.00 40.00 70.00 100.00 150.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 NVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER HEAD ACCELERATION X AXIS

TRC 851018
 MVMA SIDE IMPACT TESTING
 85291000000
 HEDYG2
 PLOT DATE 24 OCT 85 16:33:50
 FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = -38.17 43.88 19.75 56.75



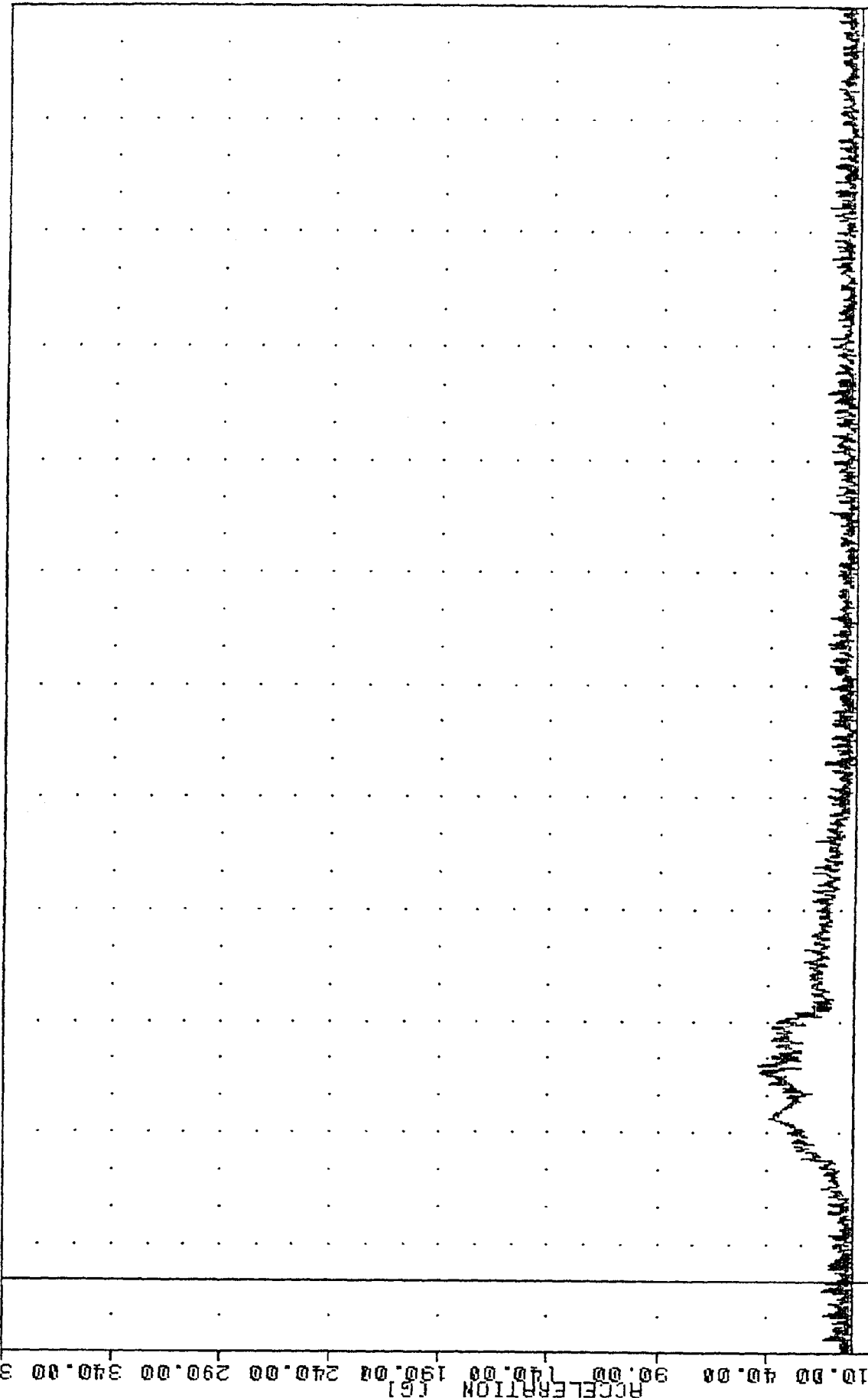
MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER HEAD ACCELERATION Y AXIS

TRC 851018
 MYMA SIDE IMPACT TESTING
 85291000000
 HEDZ62
 FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -13.07g 25.38, 39.13 g 58.25
 PLT DATE 24 OCT 85 10:33:50



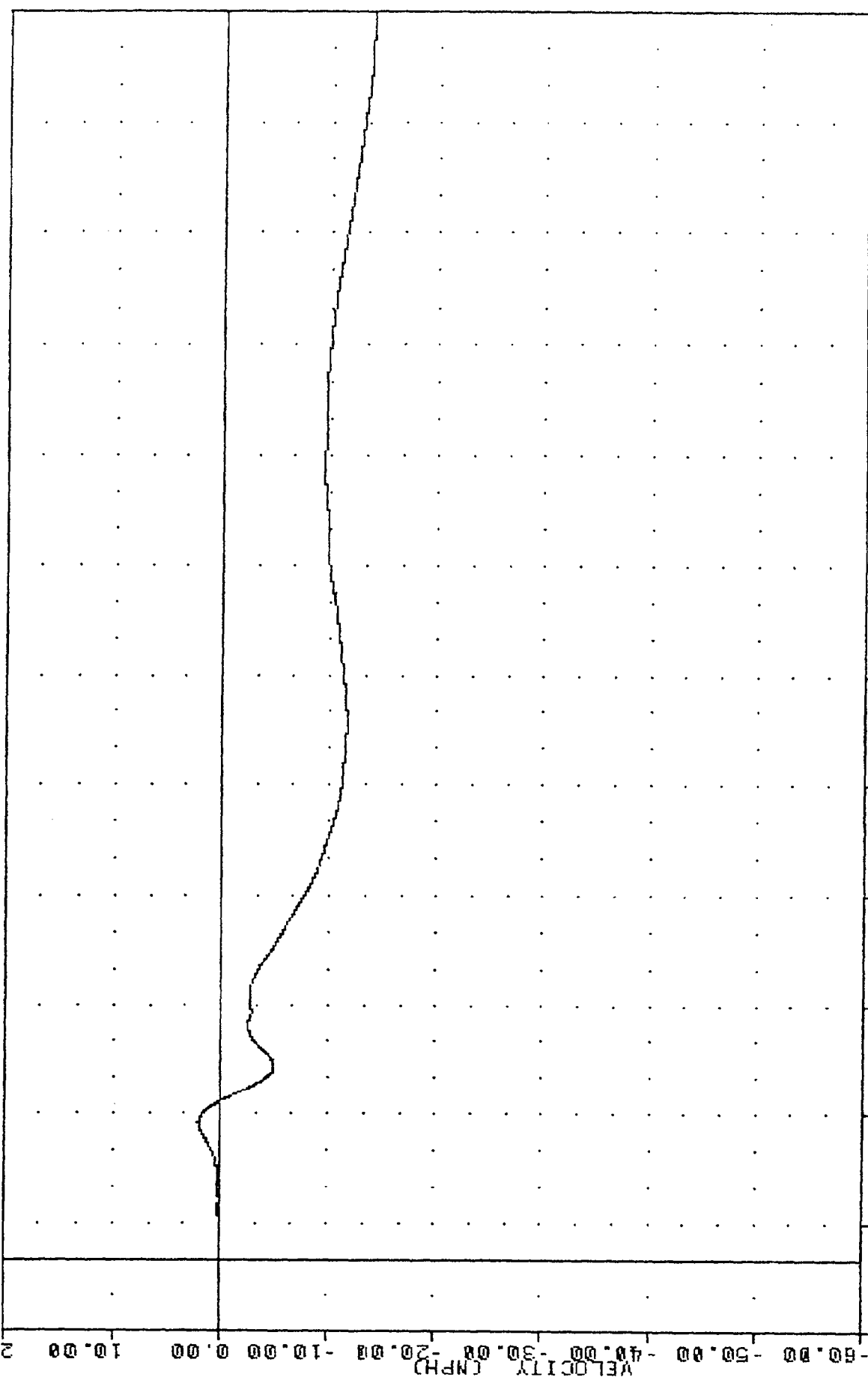
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (msec)
 MYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER HEAD ACCELERATION Z AXIS

TRC 051018
 NVMA SIDE IMPACT TESTING
 85291000000
 HEDRG2
 PLT DATE 2 OCT 85 13:00
 FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = 0.228 11.13, 44.38 58.25



-10.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00
 TIME (MSEC)
 NVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER HEAD RESULTANT ACCELERATION

TRC 25101
 NVMA SIDE IMPACT TESTING
 85291000000
 HEDYV2
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -13.80e 340.00, 2.01 e 37.50
 26:



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)
 NVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
 HEAD VELOCITY Y AXIS

TR 01
 NVMA SIDE IMPACT TESTING
 85291000000
 T01XG2

PL 2 T-8

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -19.37e 47.50, 20.40 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

TIME (MSEC)

ACCELERATION (G)

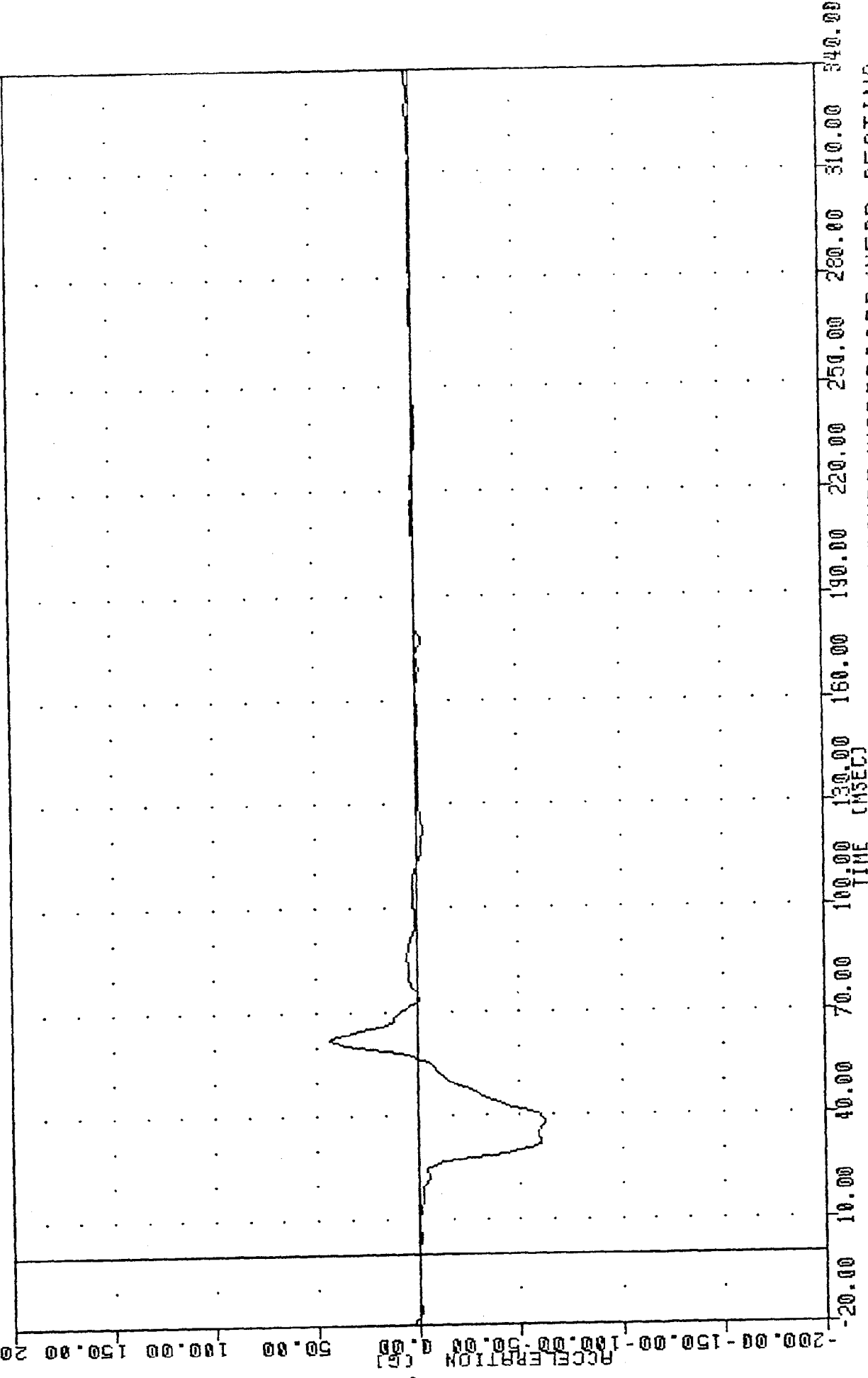
MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING

PASSENGER UPPER SPINE ACCELERATION X AXIS

TRC 851018 24-OCT-85 16:35:51

MYNA SIDE IMPACT TESTING
85291000000
T01YG2

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -62.418 38.75, 43.36 e 61.87

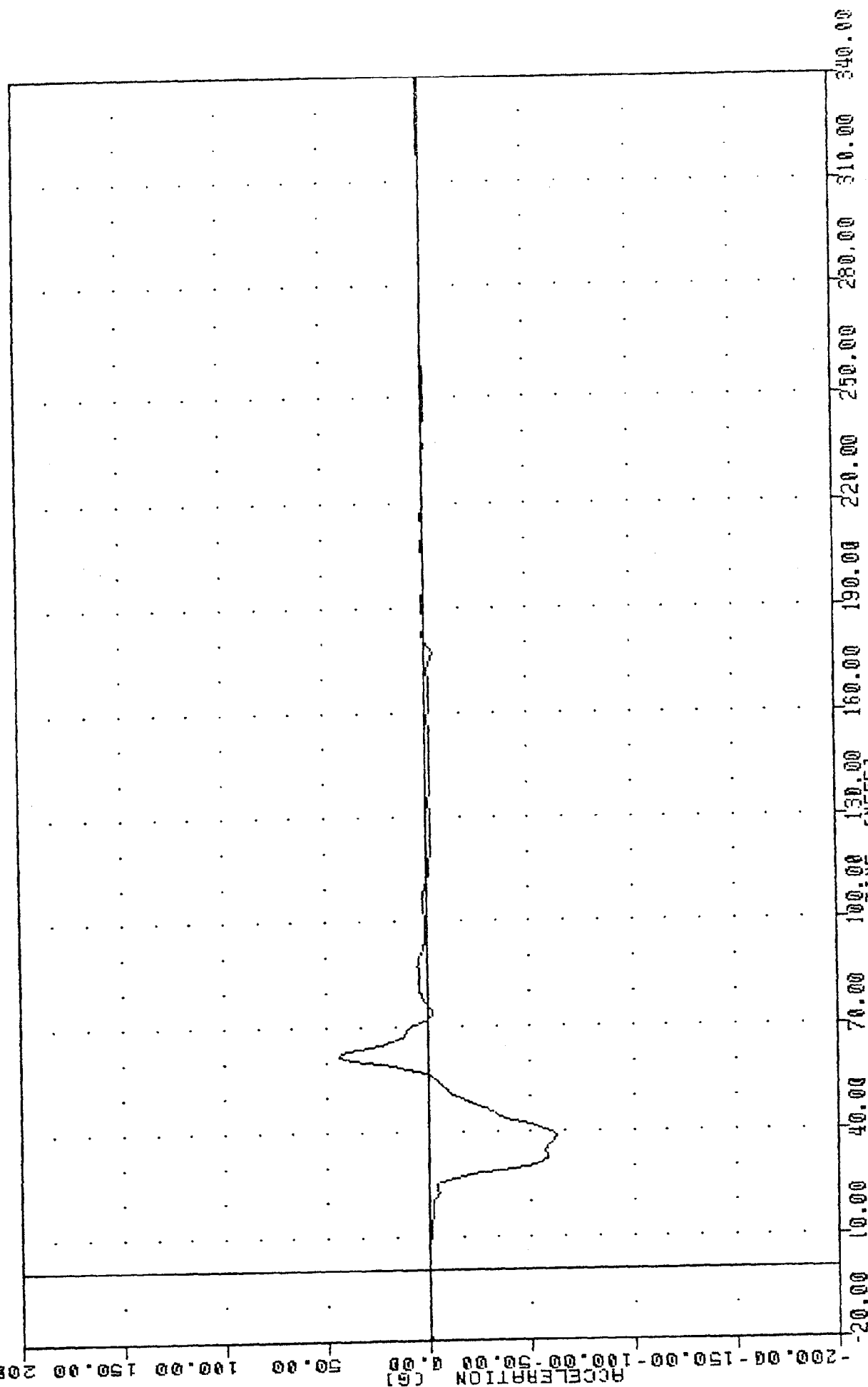


MYNA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER UPPER SPINE ACCELERATION Y AXIS

PLOT DATE 24-OCT-85 16:35:51

TRC 851018
MVMA SIDE IMPACT TESTING
85291000000
T01Y6B

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -62.02 43.48 61.87



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER UPPER SPINE ACCELERATION -2 Y AXIS

TRC 851018

NVMA SIDE IMPACT TESTING

85291000000

T01ZG2

PLOT DATE 24-OCT-85 16:35:31

FILTER = HSRI 136/ 189/ -50

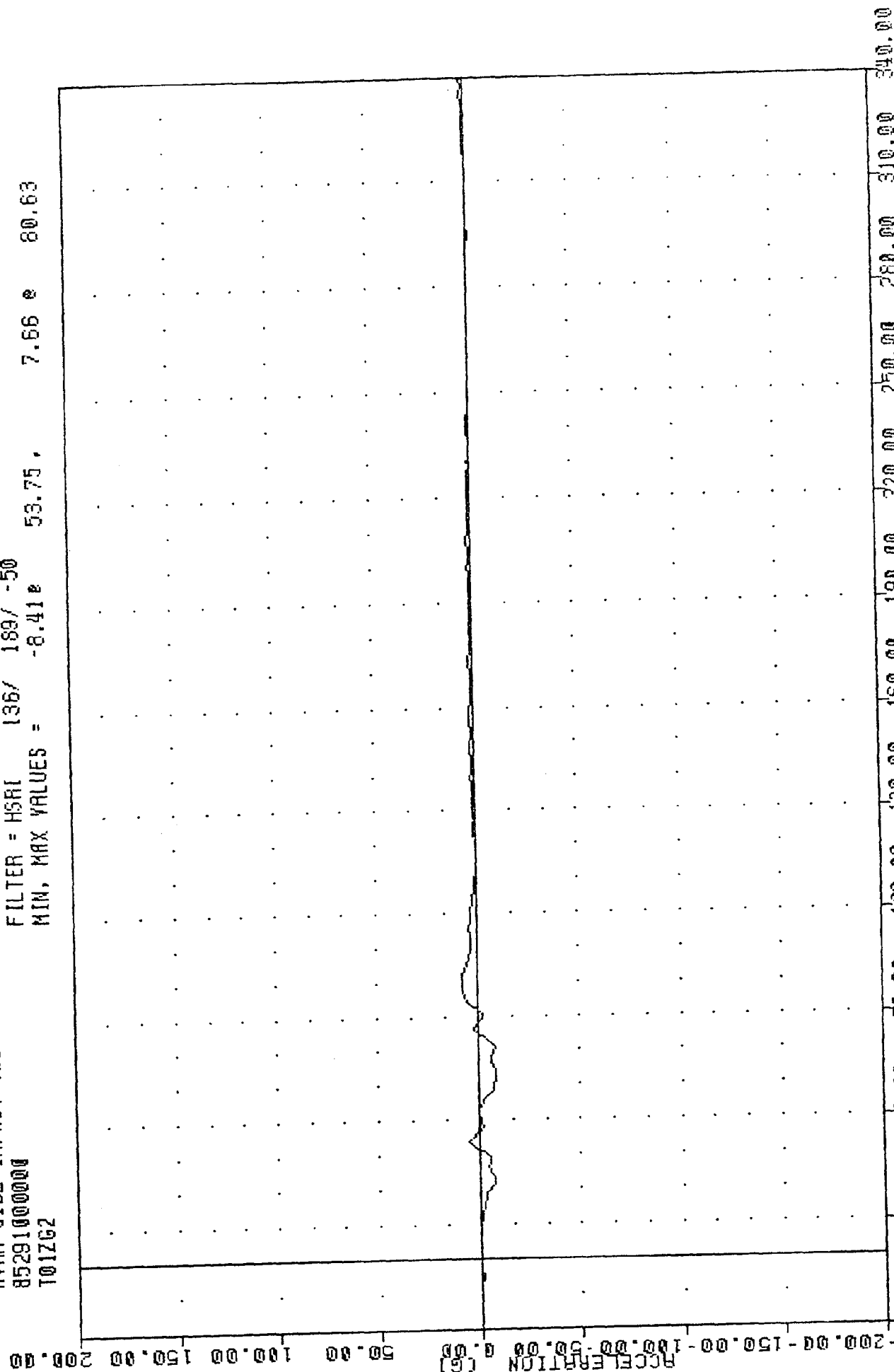
MIN, MAX VALUES =

-8.41

53.75

7.66

80.63

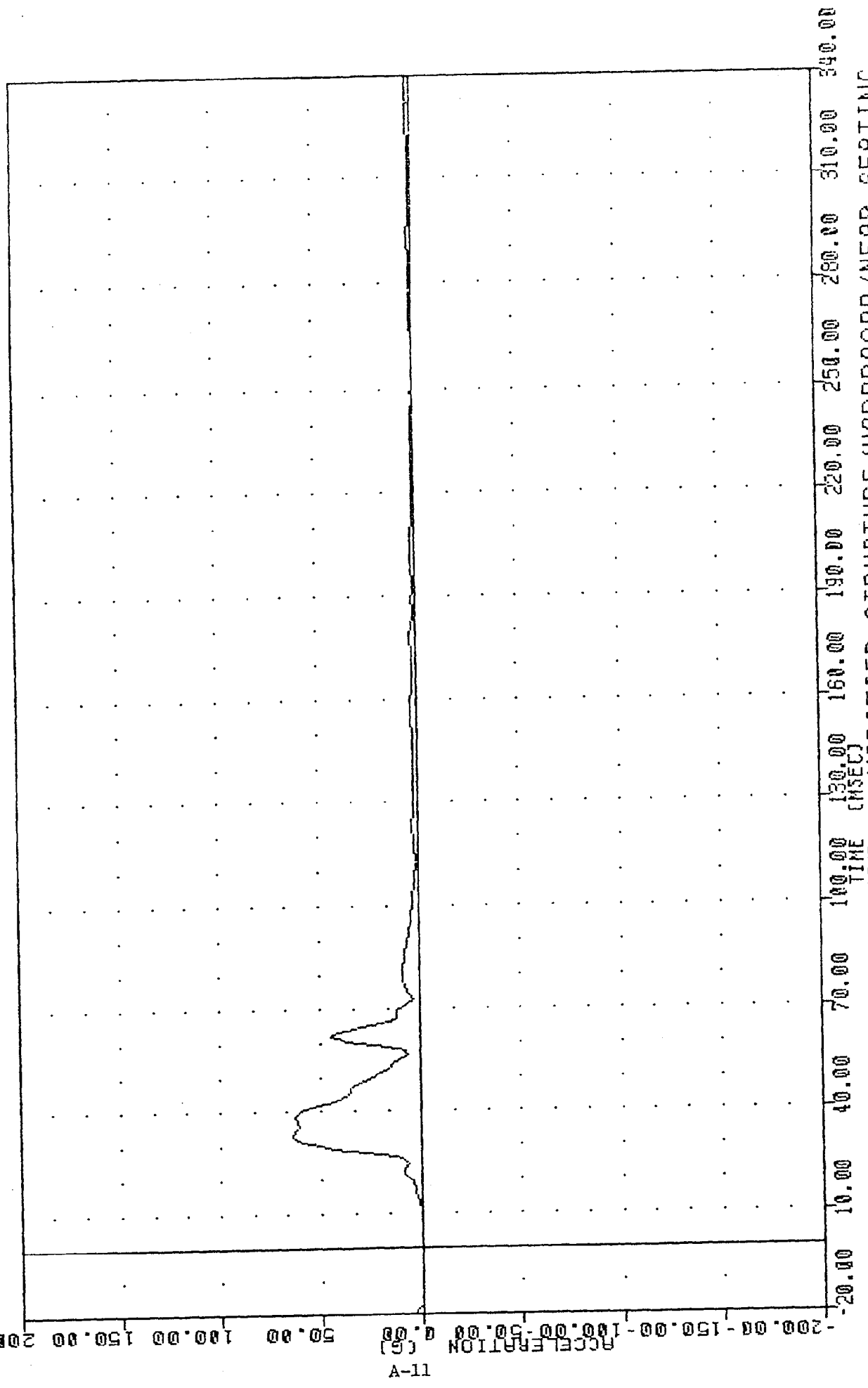


NVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER UPPER SPINE ACCELERATION Z AXIS

TRC 851018 24-OCT-85 16:35:51

MYMA SIDE IMPACT TESTING
85291000000
T01RG2

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = 0.06e 10.00, 63.56 e 33.13

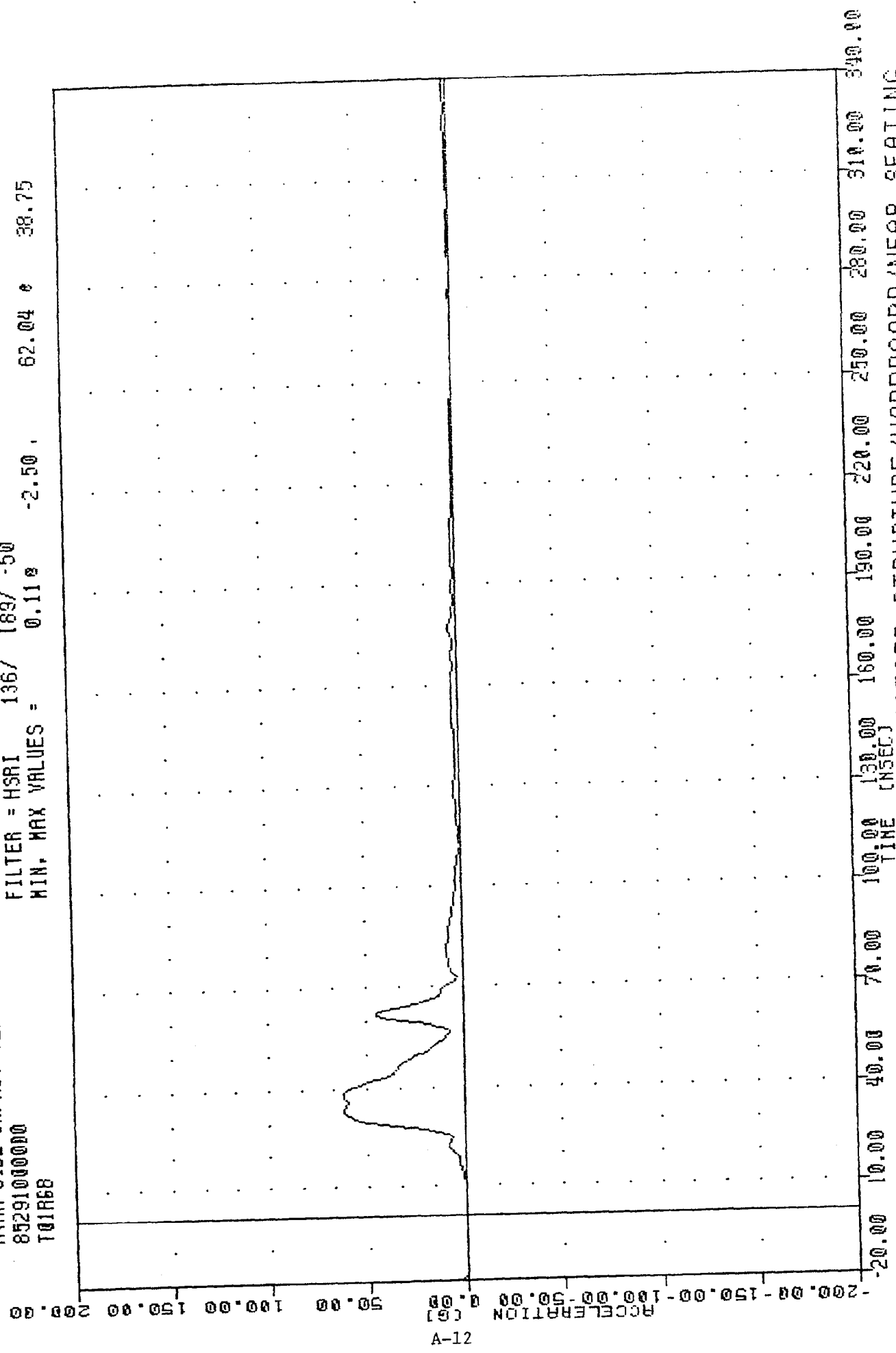


MYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER UPPER SPINE RESULTANT ACCELERATION

PLT DATE 24-OCT-85 16:35:51

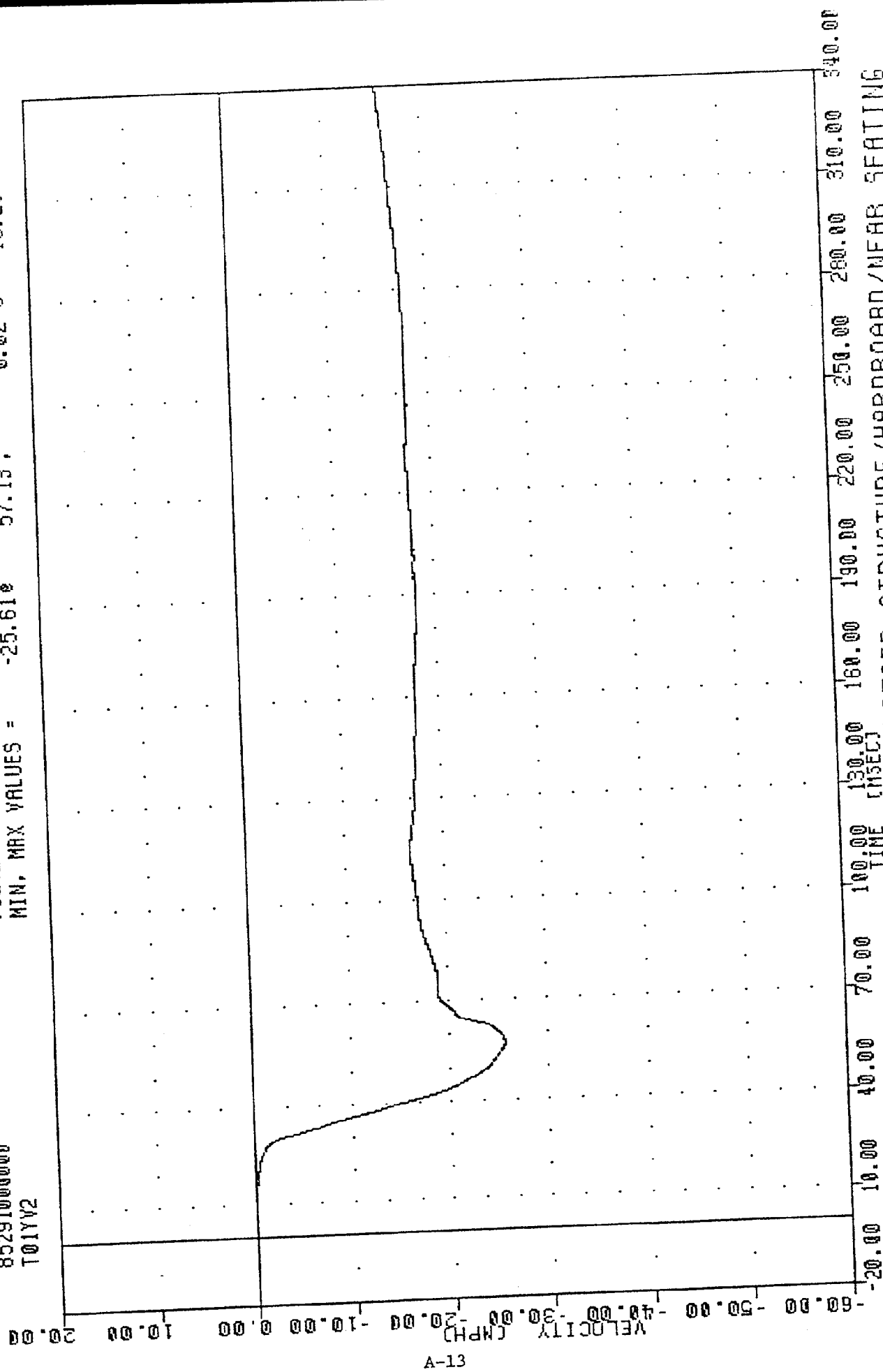
JRC 854018
MVMA SIDE IMPACT TESTING
85291000000
TQIR68

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.118 -2.50 62.04 38.75



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER UPPER SPINE RESULTANT ACCELERATION -2

TRC 854118
 NVMA SIDE IMPACT TESTING
 85291000000
 T01YV2
 PLOT DATE 24-OCT-85 16:36:44
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -25.61e 57.13, 0.02 e -15.25



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
 UPPER SPINE VELOCITY Y AXIS

854018 24-OCT-85 16:36:44

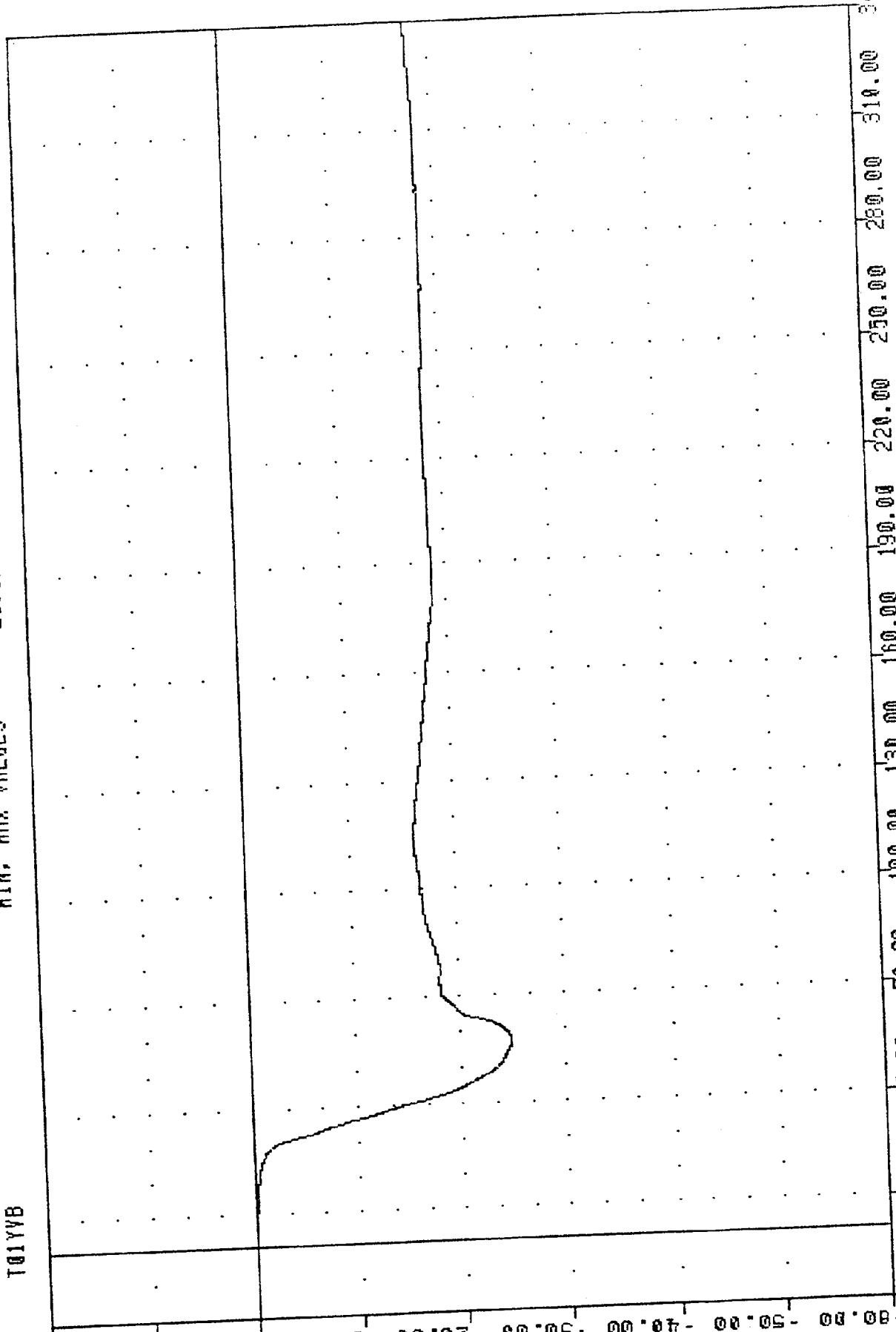
THC 854018
MVMA SIDE IMPACT TESTING

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -24.87 56.63, 0.00 20.00

85291000000

T01YVB

41-A
VELOCITY (MPH)
-80.00
-60.00
-40.00
-20.00
0.00
10.00
20.00



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

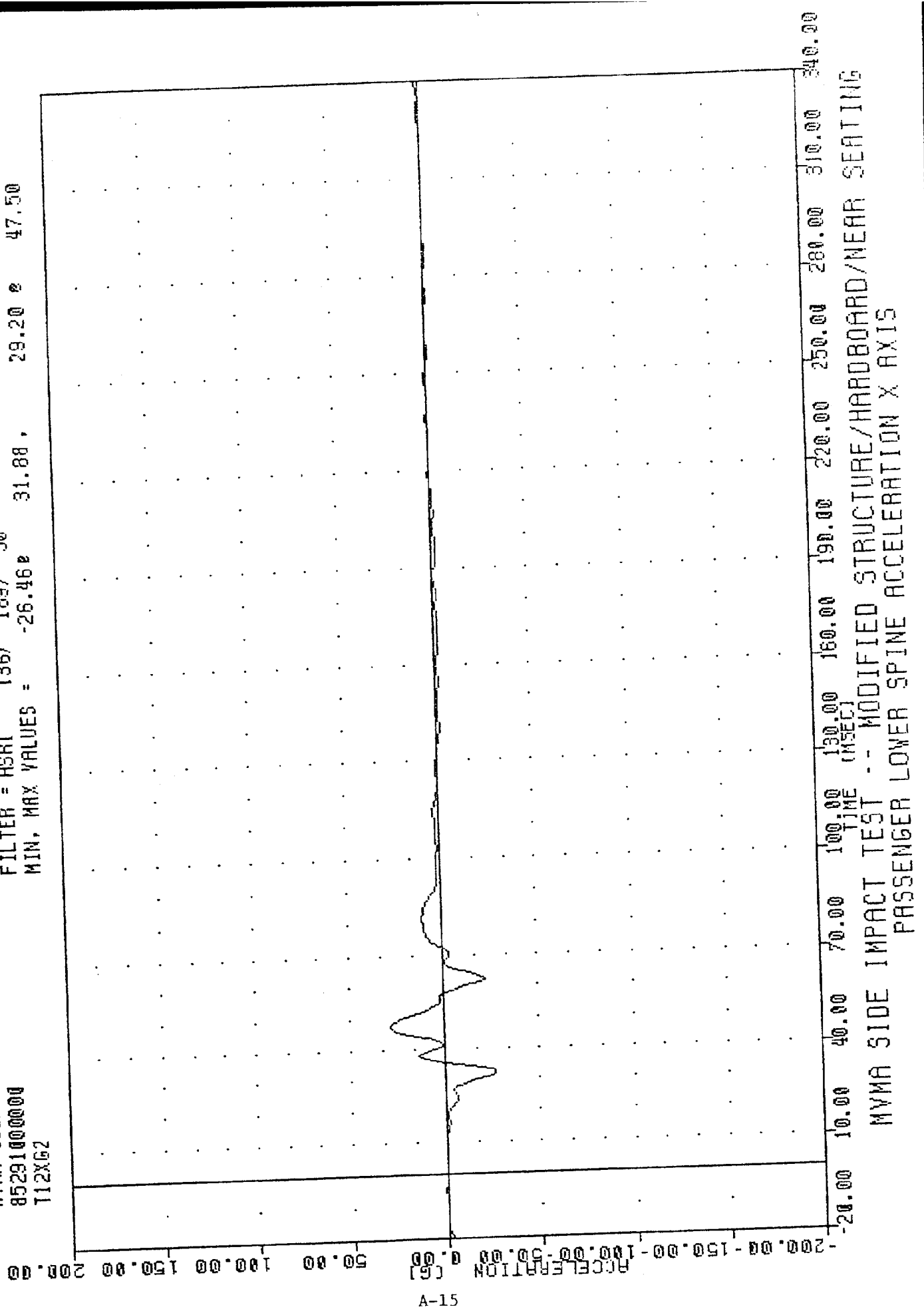
TIME (MSEC)

MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
UPPER SPINE VELOCITY - 2 Y AXIS

PLOT DATE 24-OCT-85 16:35:51

TRC 854018
NVMA SIDE IMPACT TESTING
85291000000
T12XG2

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -26.46 31.88, 29.20 47.50



MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER LOWER SPINE ACCELERATION X AXIS

TRC 851018 PLOT DATE 24-OCT-85 16:35:51

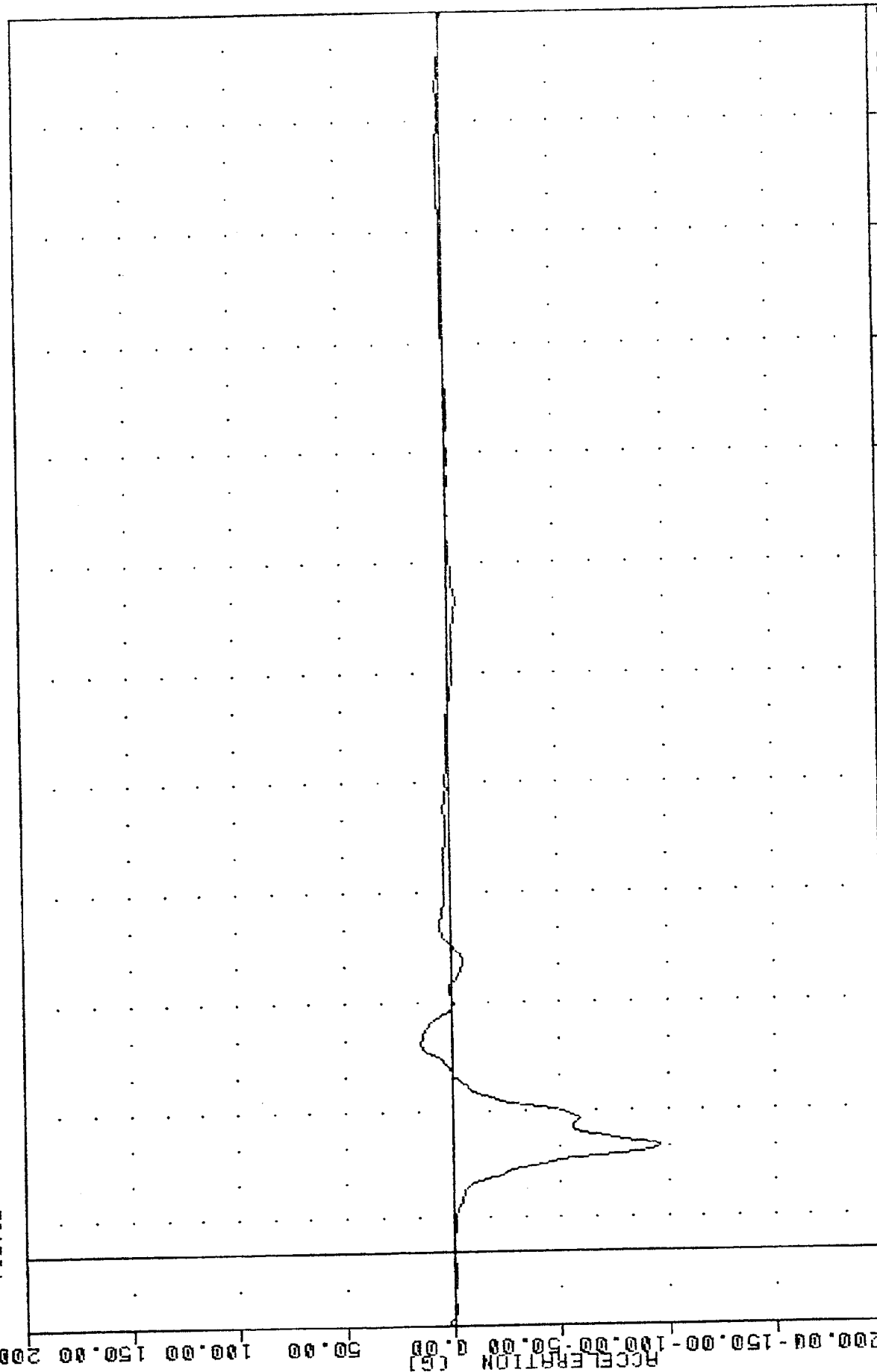
MYNA SIDE IMPACT TESTING

85291000000

T12Y62

FILTER = HSRI 136/ 189/ -50

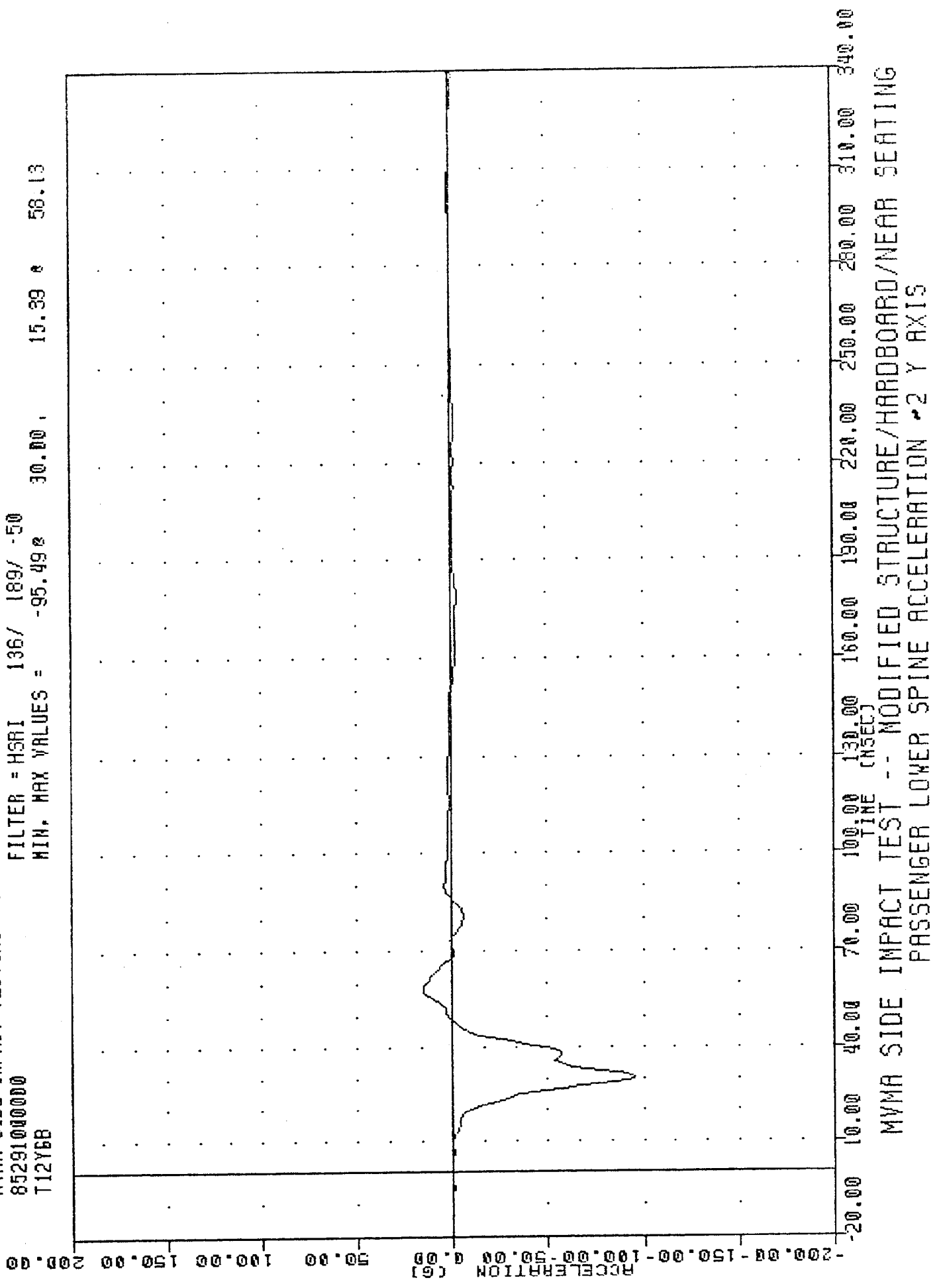
MIN, MAX VALUES = -96.18e 30.00, 14.94 e 58.75



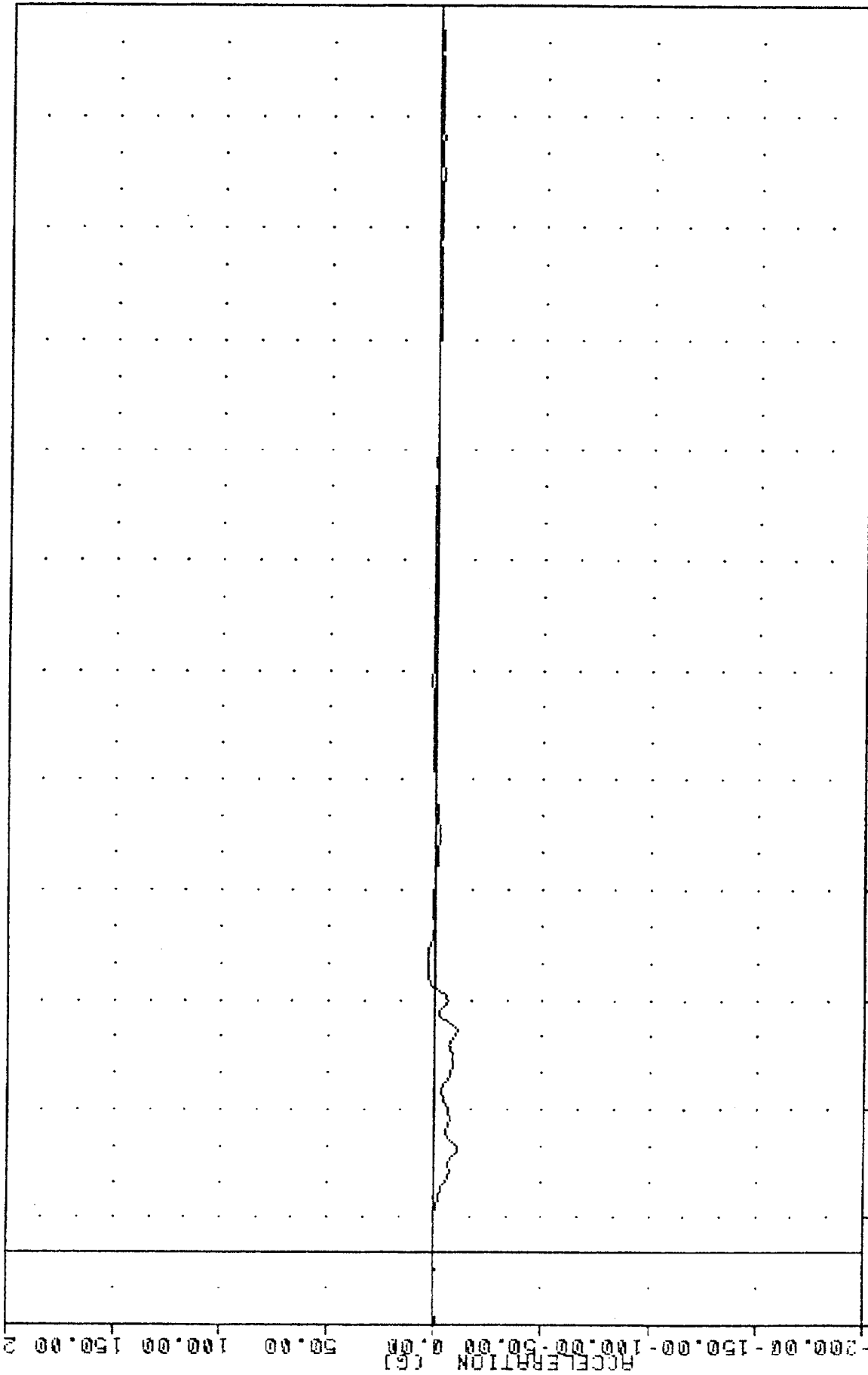
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)
MYNA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER LOWER SPINE ACCELERATION Y AXIS

TRC 951018 24-OCT-85 18:35:51
 MVMA SIDE IMPACT TESTING
 85291000000
 T12Y6B
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -95.492 30.00 15.39 58.13



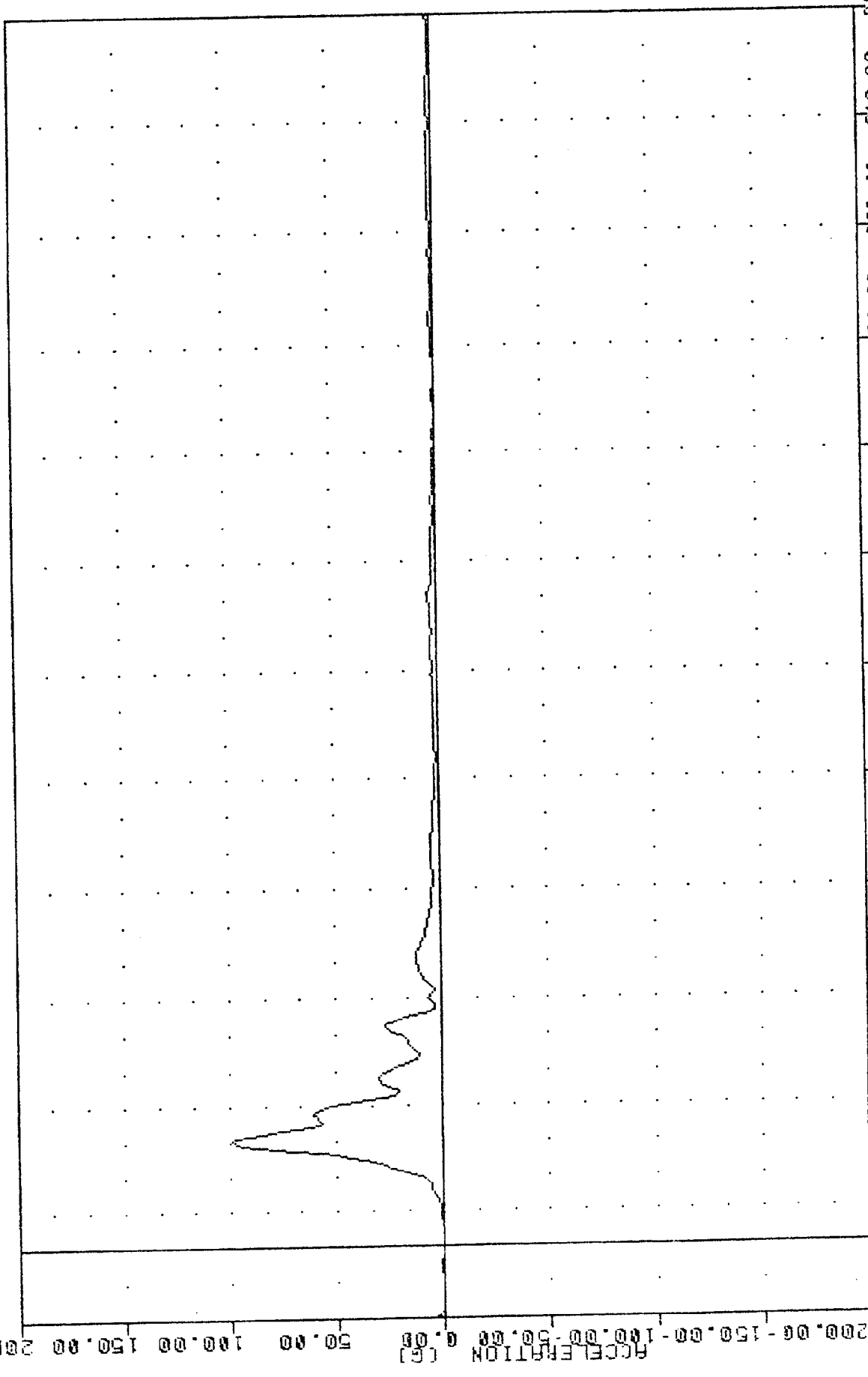
MVMA SIDE IMPACT TESTING
 85291000000
 112762
 FILTER = HSR1
 MIN, MAX VALUES = -10.40 29.38 3.73 81.25
 136/ 189/ -50



-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00
 MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER LOWER SPINE ACCELERATION Z AXIS

101010101

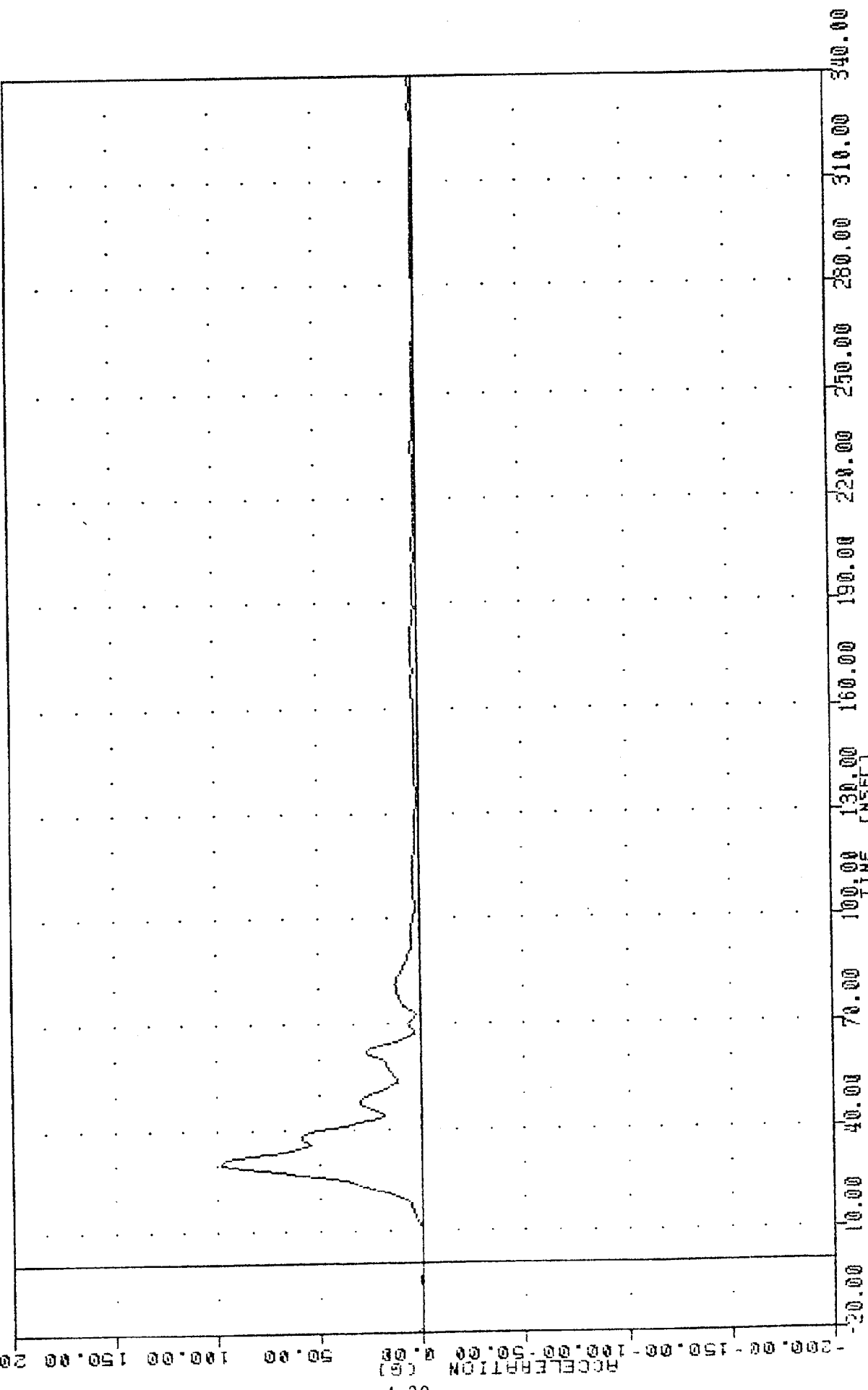
TEST NAME: IMPACT TESTING
85291000000
T12RG2
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.06g 3.13, 99.04 g 30.62



ACCELERATION (G)
TIME (msec)
MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER LOWER SPINE RESULTANT ACCELERATION

TEST NAME: 24 OCT 00 10:00:01

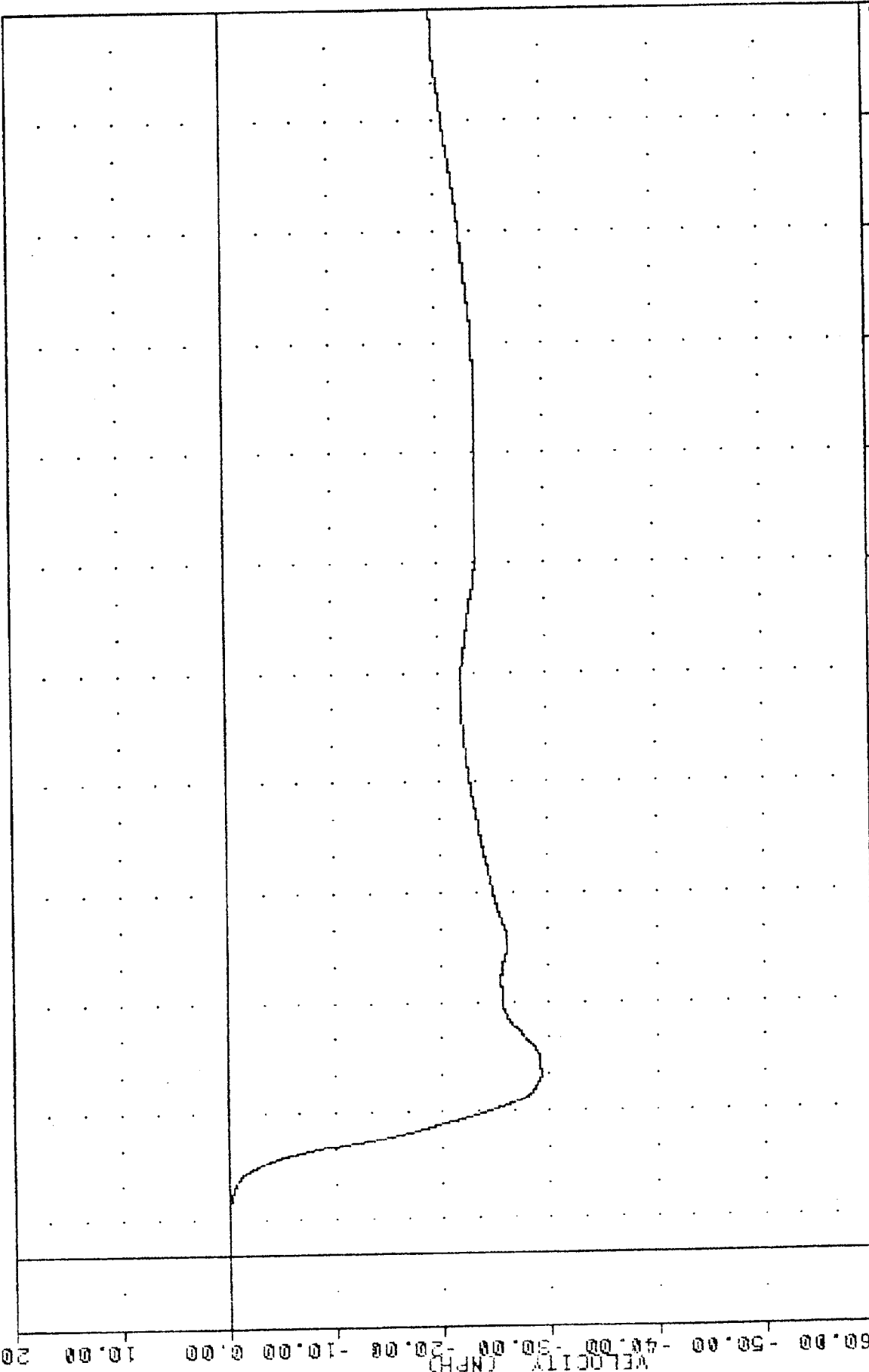
MVMA SIDE IMPACT TESTING
85291000000
T12R6B
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.078 2.50 98.21 e 30.62



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER LOWER SPINE RESULTANT ACCELERATION #2

PLT DML 24 OCT 03 10:30:44

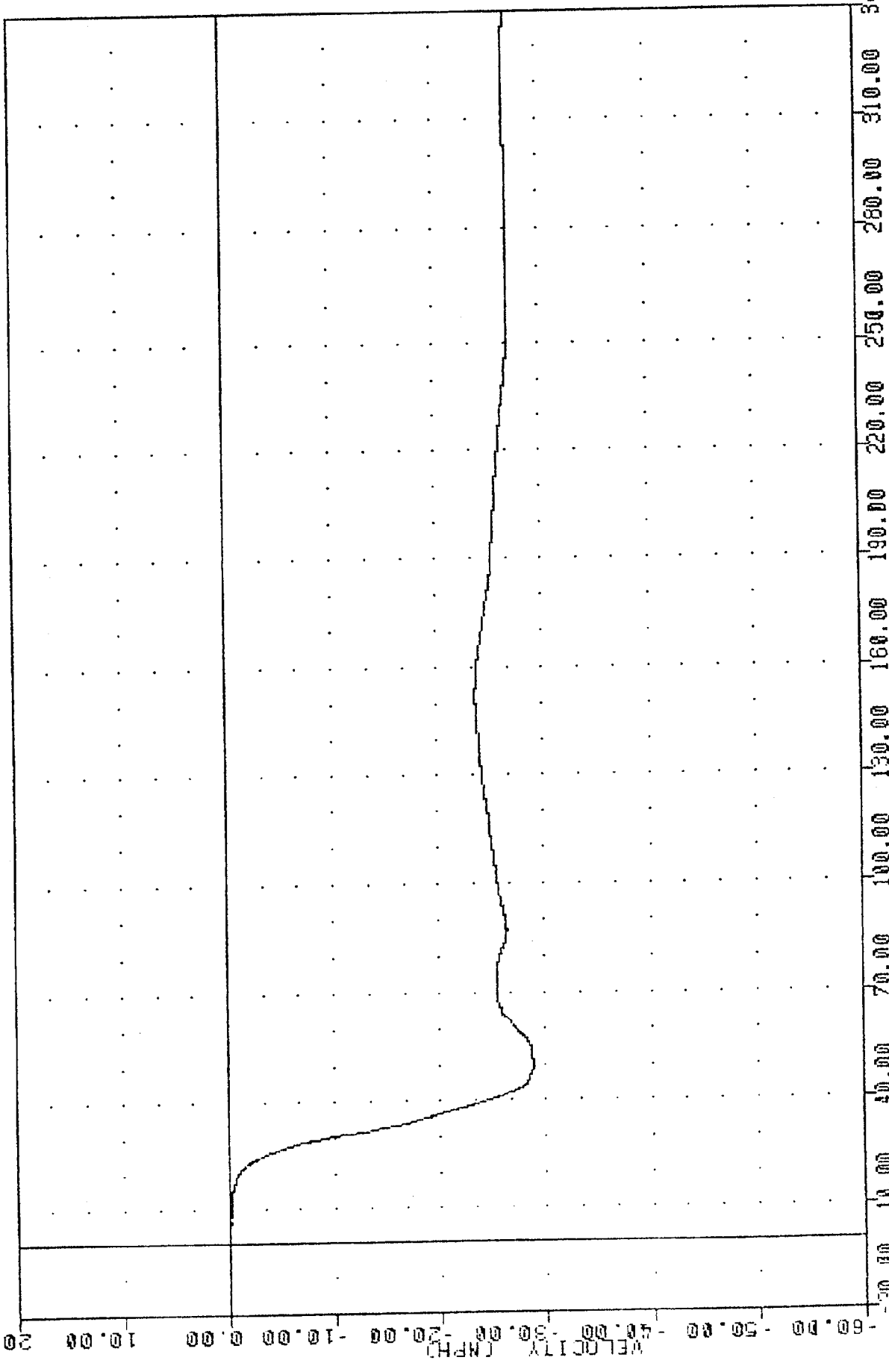
85291000000
T12TV2
MIN, MAX VALUES = -29.25 50.13, 0.06 6.00
FILTER = BLPF 300/ 949/ -40



20.00
10.00
0.00
-10.00
-20.00
-30.00
-40.00
-50.00
-60.00
TIME (MSEC)
0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00
NVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
LOWER SPINE VELOCITY Y AXIS

TEST DATE 23 OCT 88

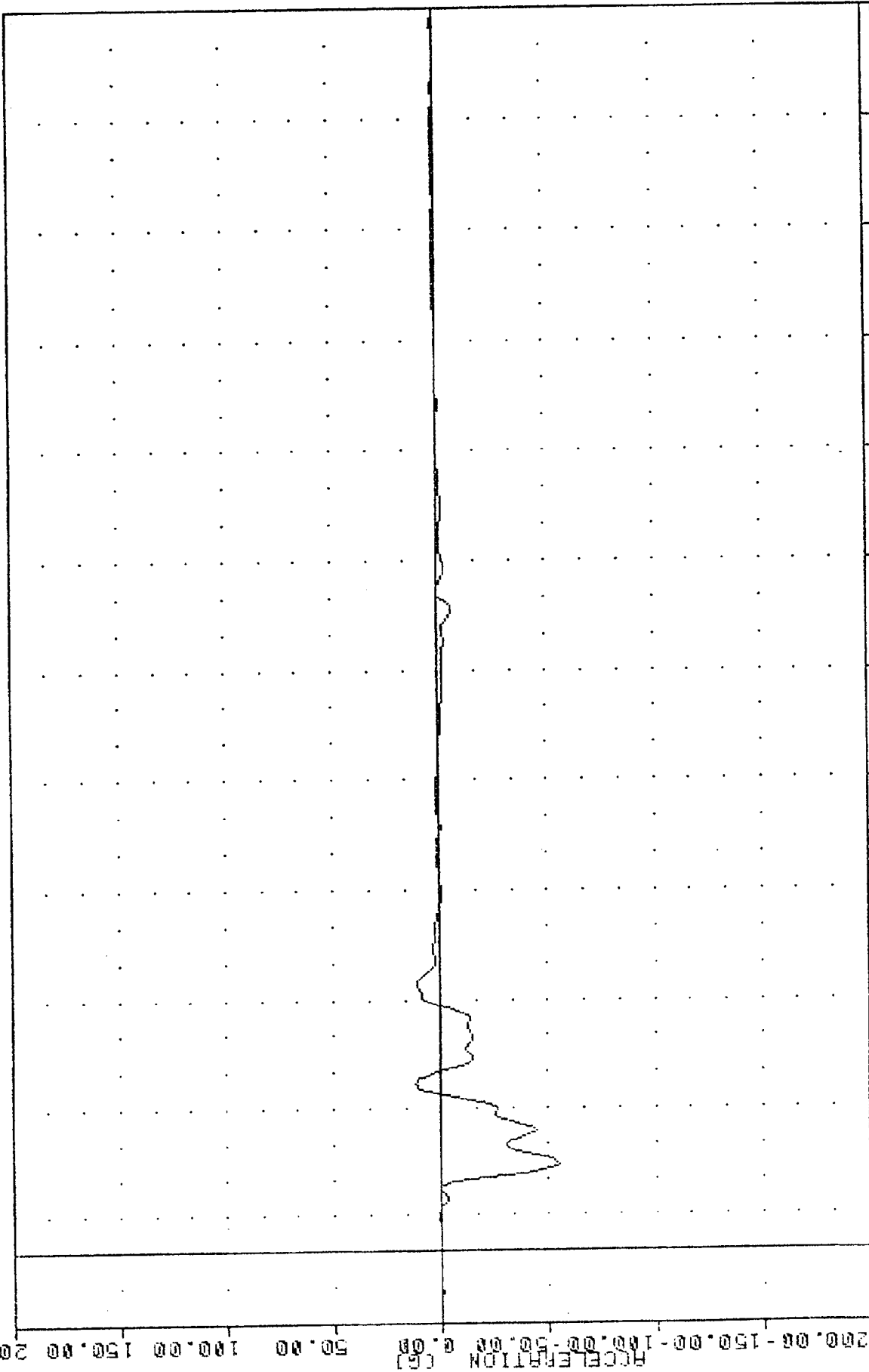
WVMA SIDE IMPACT TESTING
85291000000
T12YVB
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -28.92 49.75, 0.00 20.00



WVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
LOWER SPINE VELOCITY - 2 Y AXIS

TEST DATE 24 OCT 03 10:33:31

MYNR SIDE IMPACT TEST
85291000000
RURY62
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -55.098 24.38 11.55 46.88



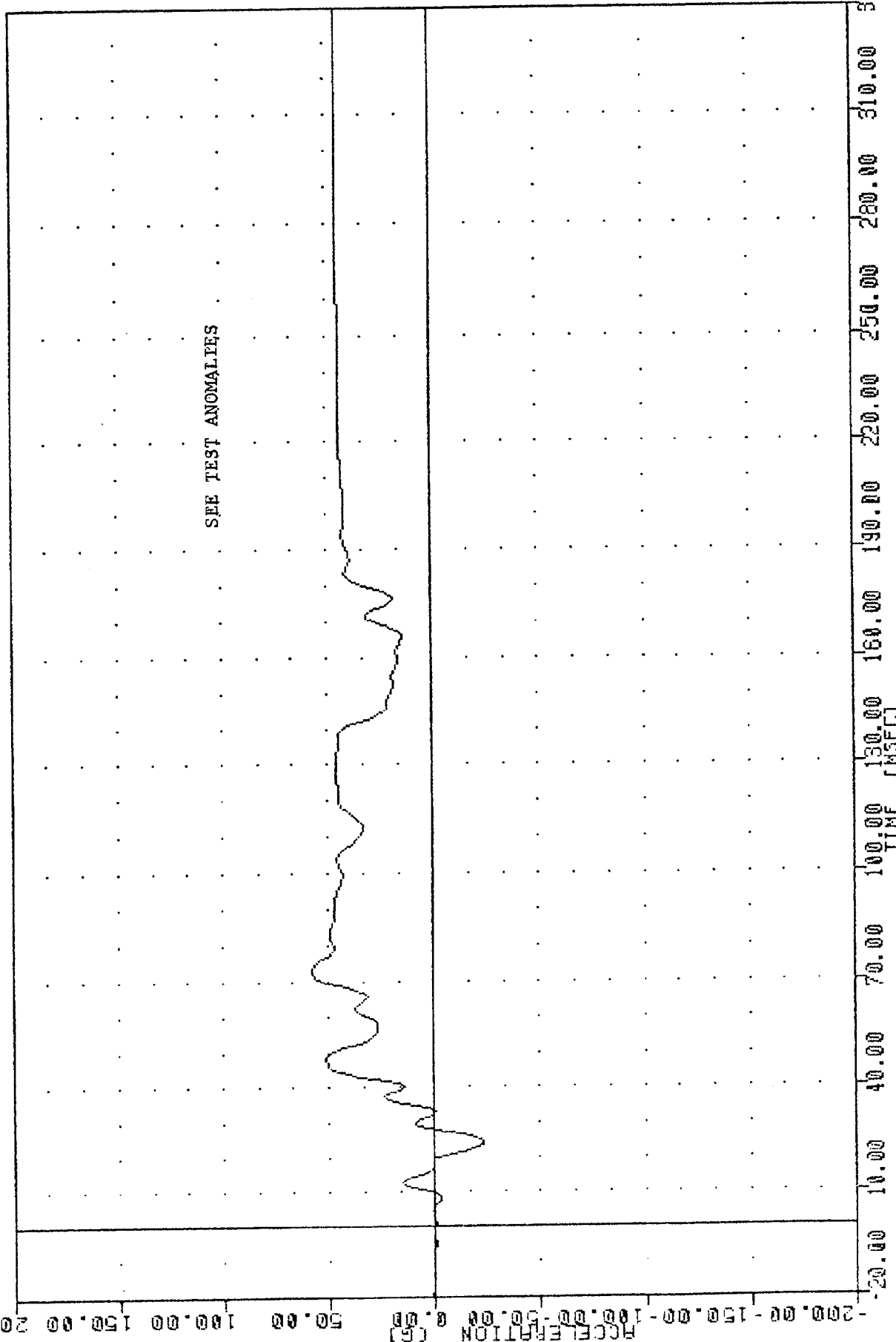
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MYNA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER RIGHT UPPER RIB ACCELERATION Y AXIS

TEST DATE 24 OCT 83 16:33:31

TEST NO. 85291000000
TEST NAME: PASSENGER RIGHT UPPER RIB ACCELERATION -2 Y AXIS
TEST TYPE: IMPACT

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -23.580 24.38 57.65 72.50



MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER RIGHT UPPER RIB ACCELERATION -2 Y AXIS

PLUT DATE 24-OCT-85 16:36:44

TRC 851018

MYMA SIDE IMPACT TESTING

85291000000

RURYV2

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -22.96 257.75 0.04 -15.25

20.00

10.00

0.00

-10.00

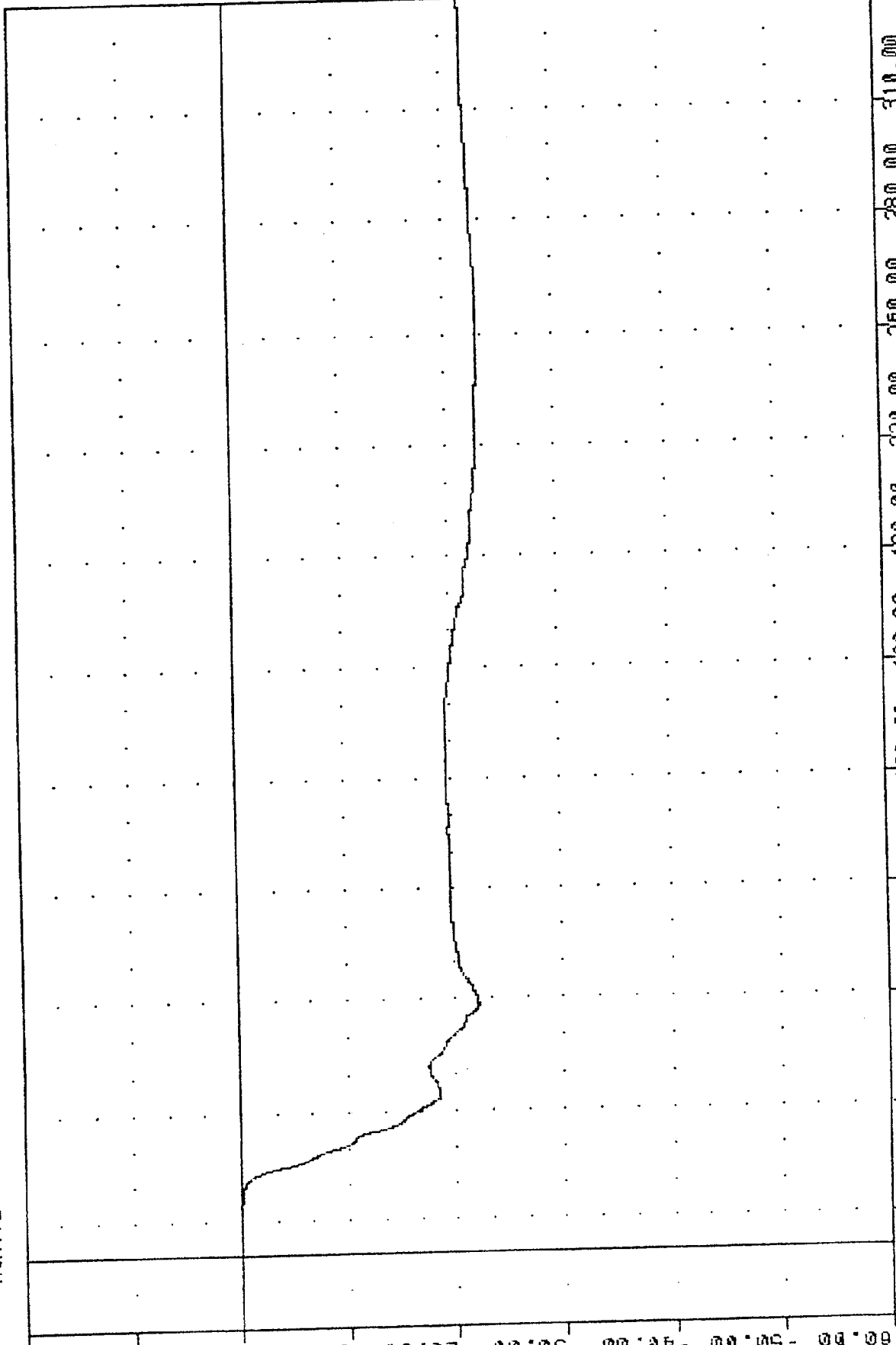
-20.00

-30.00

-40.00

-50.00

-60.00



-20.00 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

MYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
RIGHT UPPER RIB VELOCITY Y AXIS

TEST DATE 24 OCT 03 10:30:44

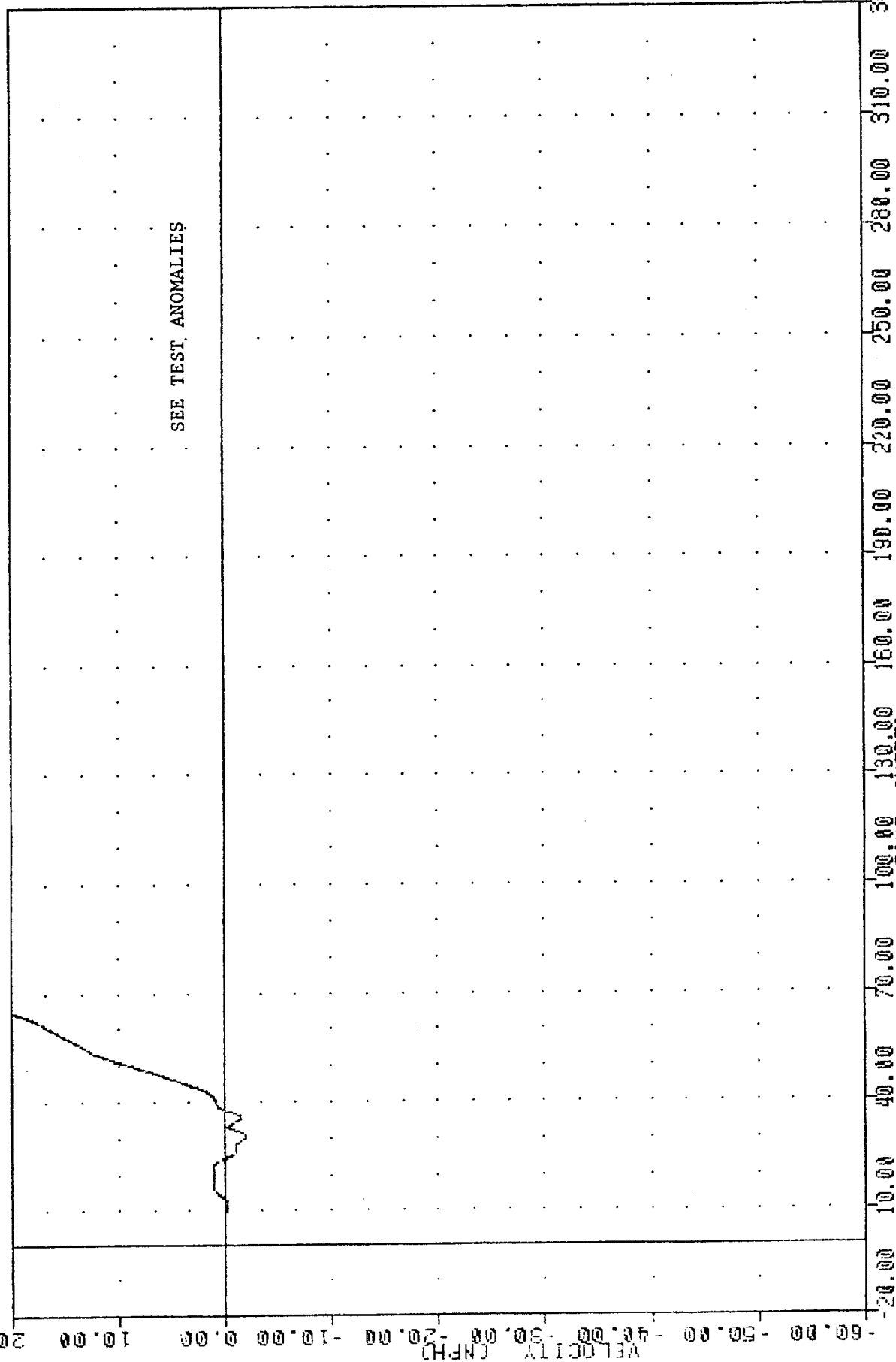
TEST NAME: MVMA SIDE IMPACT TESTING

85291000000

RURYVB

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -1.97e 31.00, 266.82 e 340.00



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
RIGHT UPPER RIB VELOCITY -2 Y AXIS

PLUT DATE 24-OCT-85 16:35:51

THC , 851018

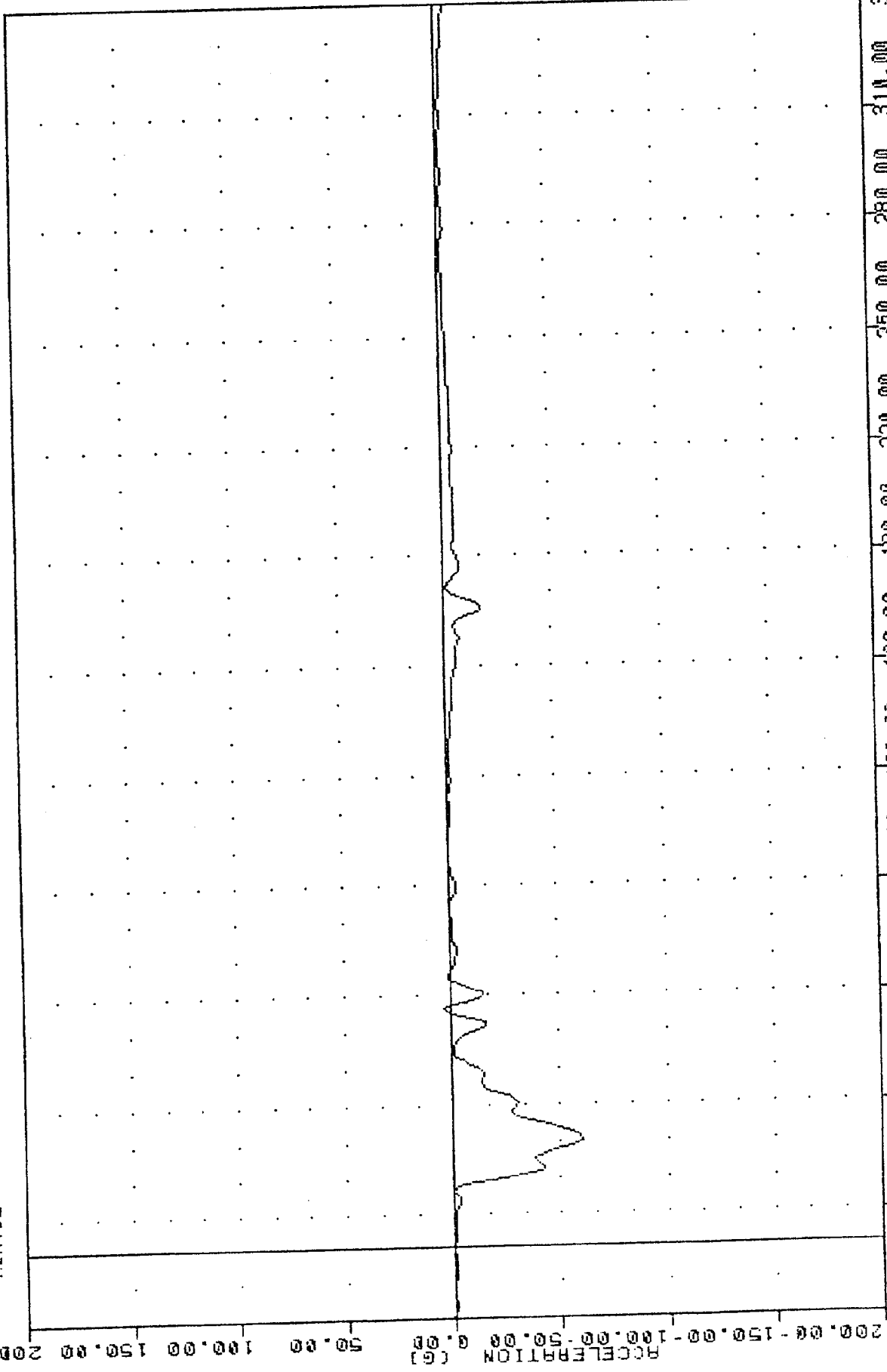
MYMA SIDE IMPACT TESTING

85291000000

RLRY62

FILTER = HSRI 136/ 189/ .50

MIN. MAX VALUES = -60.23 30.62 , 3.34 66.25



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

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

MYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER RIGHT LOWER RIB ACCELERATION Y AXIS

TRC 851018 24-OCT-89 16:33:31

851018

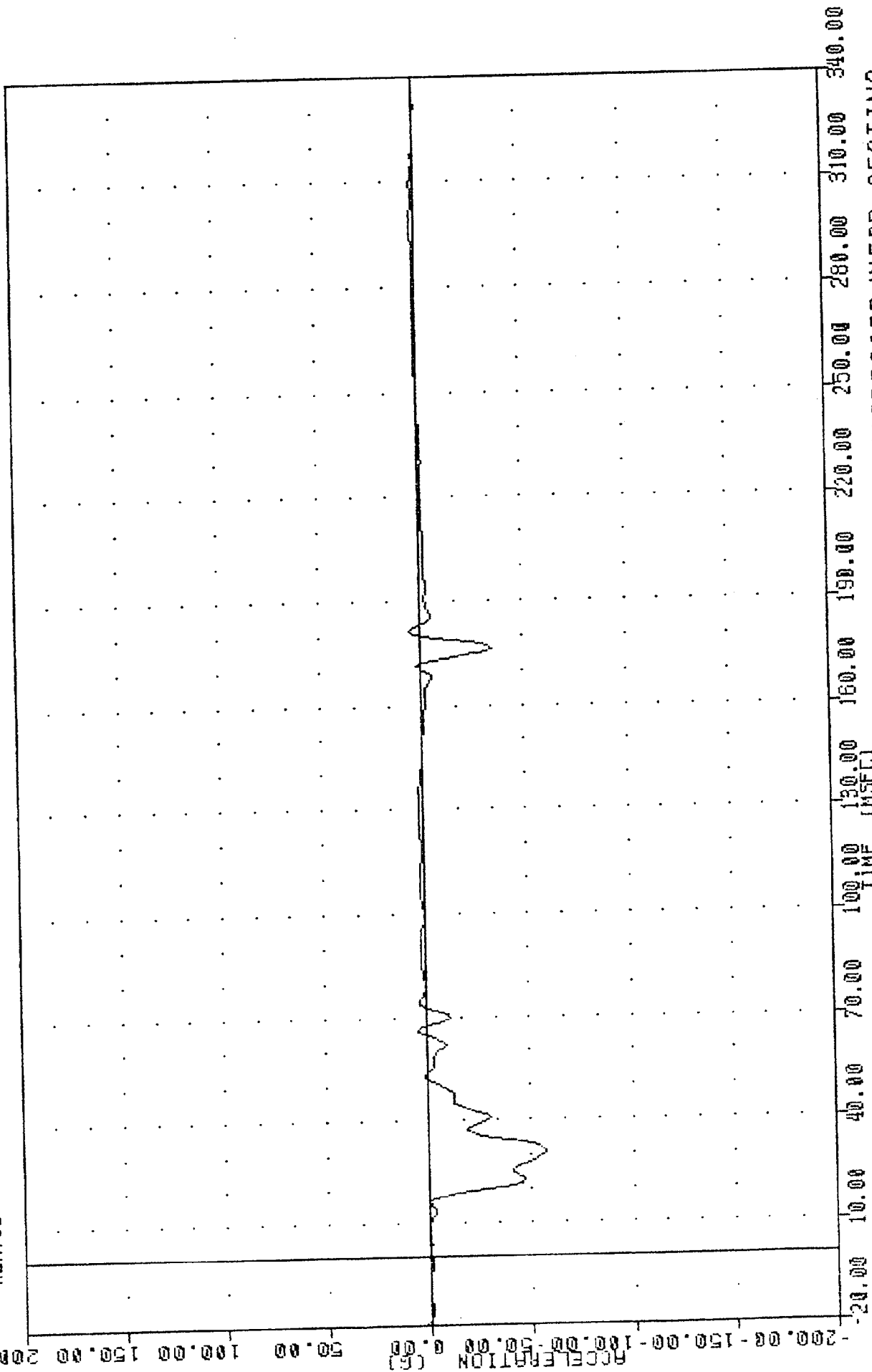
851018

851018

FILTER = HSRI 136/ 189/ -50

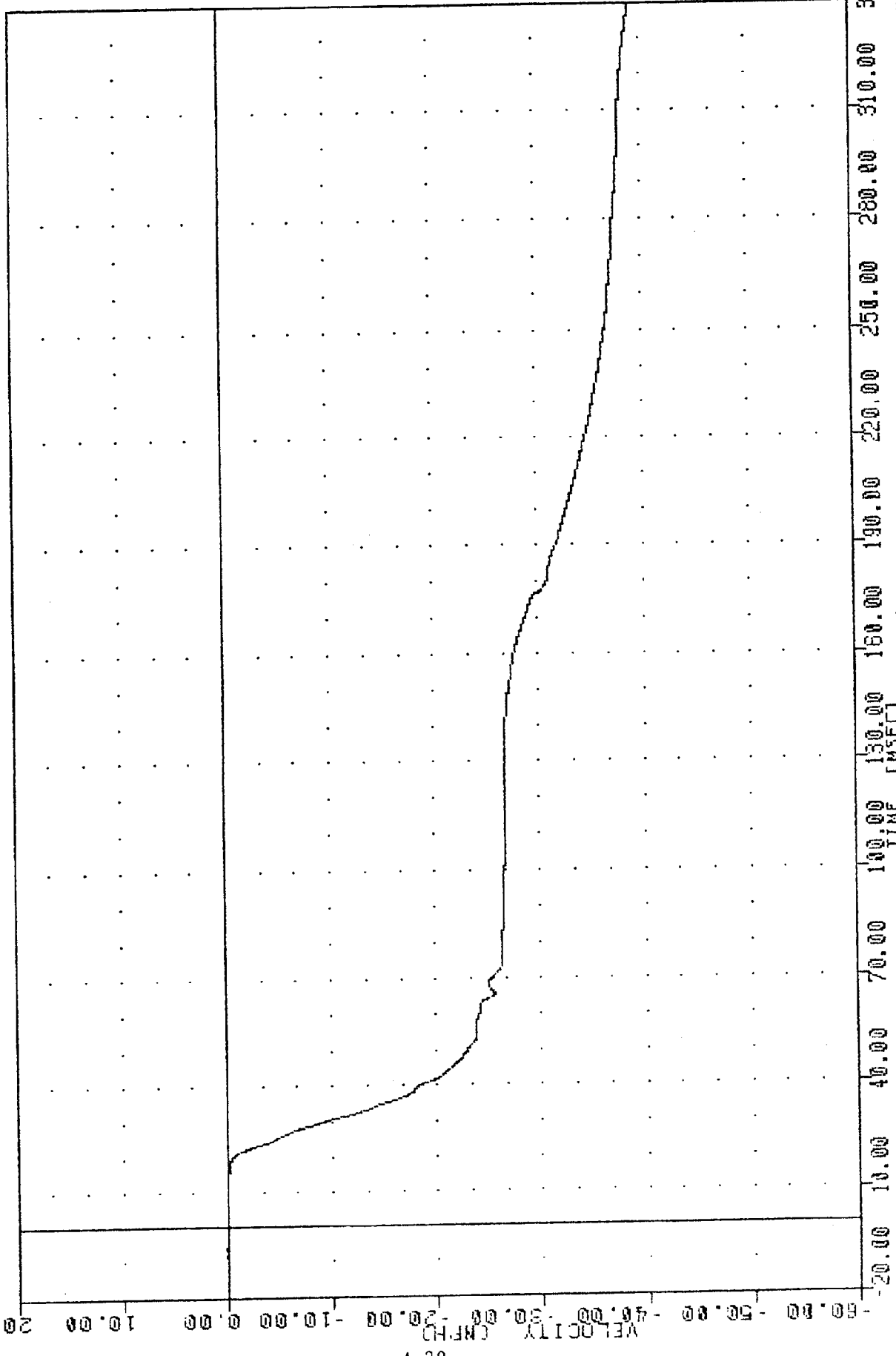
MIN. MAX VALUES = -57.15% 31.25, 5.26 & 181.25

ALRYGB



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER RIGHT LOWER RIB ACCELERATION #2 Y AXIS

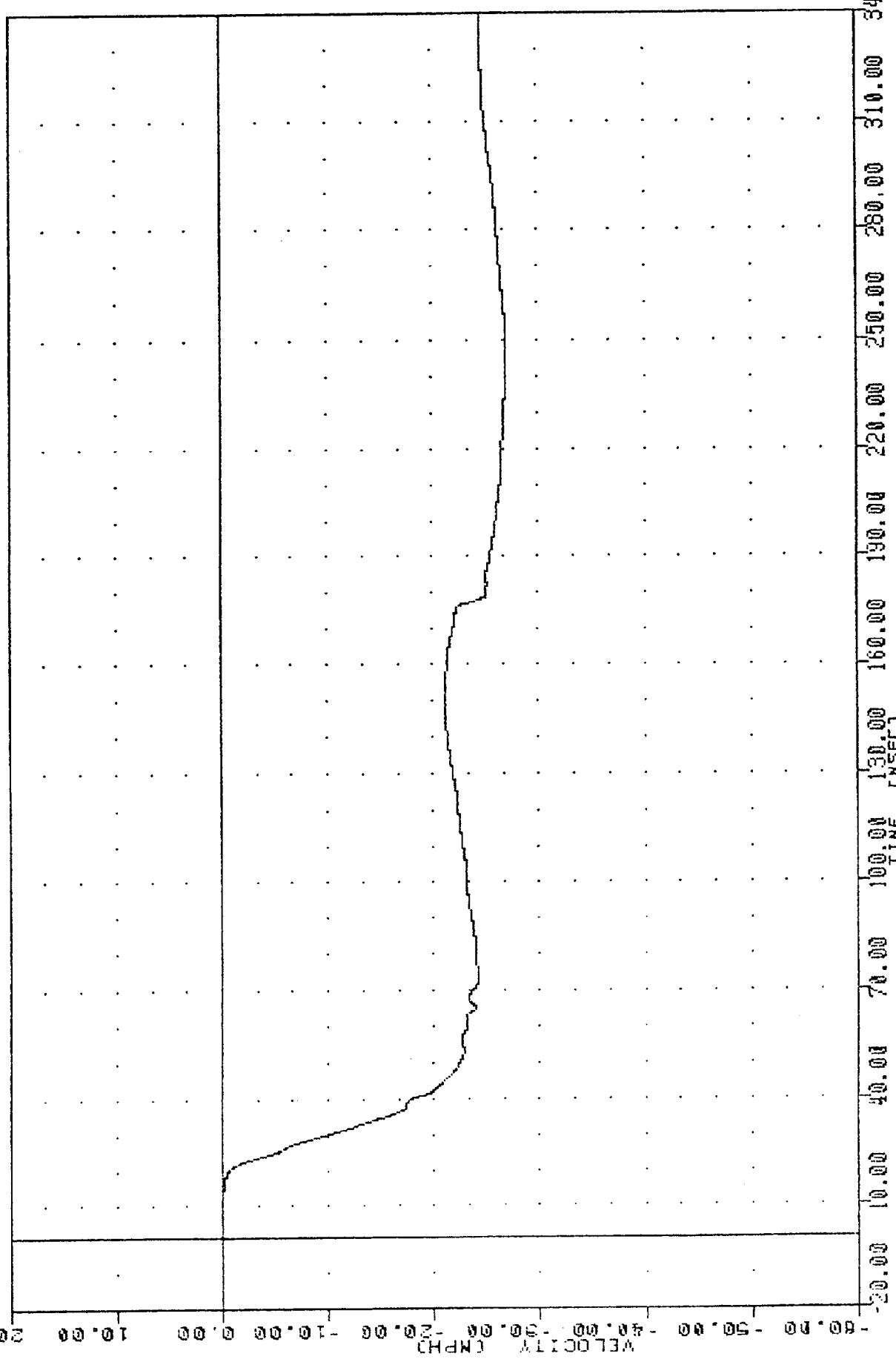
MVNA SIDE IMPACT TESTING
 85291000000
 RLYV2
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -39.168 340.00, 0.10 8 -8.25



MVNA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
 RIGHT LOWER RIB VELOCITY

TEST DATE 21 OCT 69 10:30:44

MVMA SIDE IMPACT TESTING
85251000000
FLYVB
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -26.95 244.38 0.03 -17.75



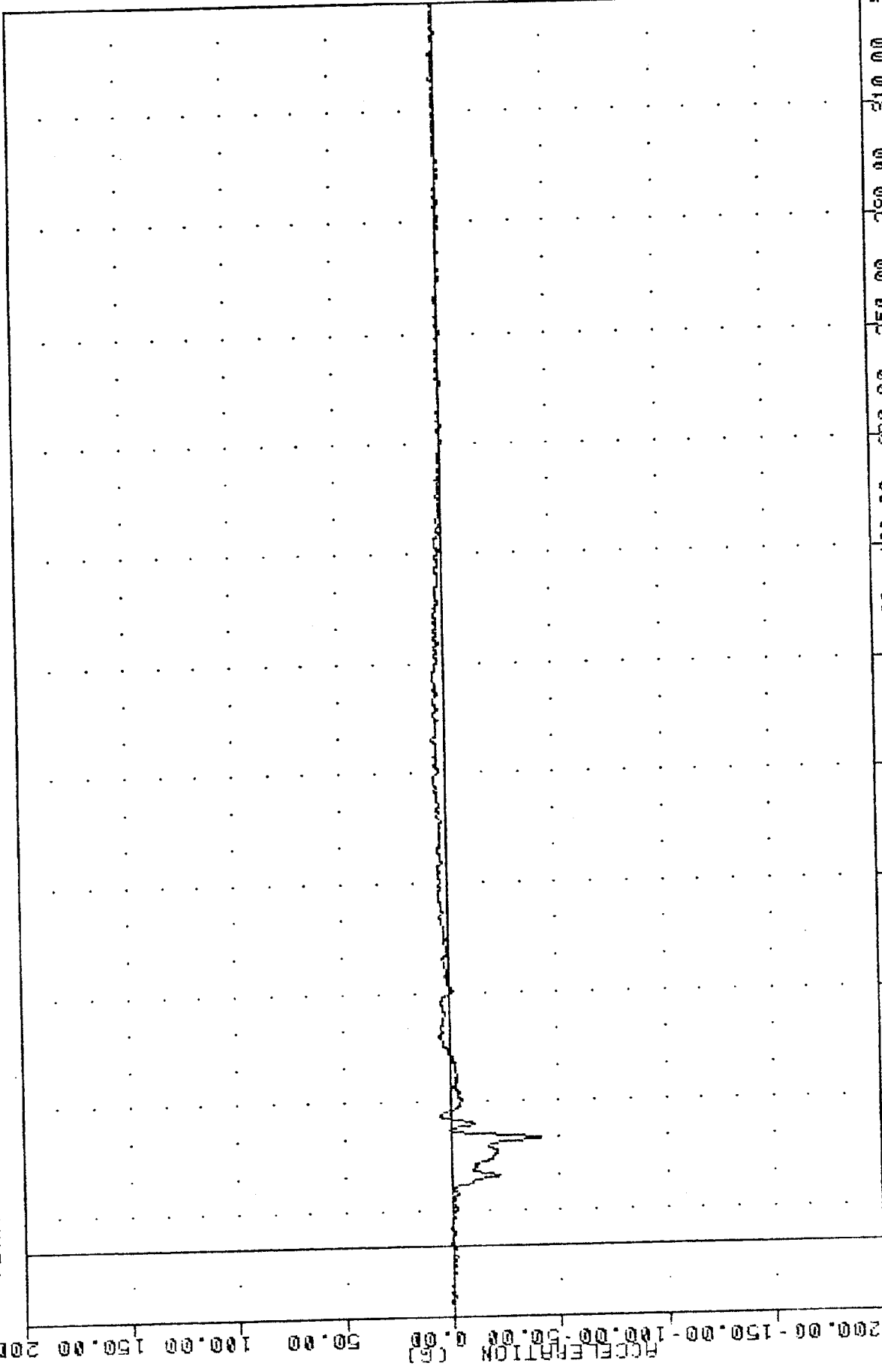
MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
RIGHT LOWER RIB VELOCITY #2 Y AXIS

PLT DATE 24-OCT-80 16:35:30

TRC , 801018

NA E 100CT 000TIN
85291000000
PEVXG2

FILTER = 8LPF 300/ 949/ -40
MIN, MAX VALUES = -41.000 30.00, 6.26 139.13



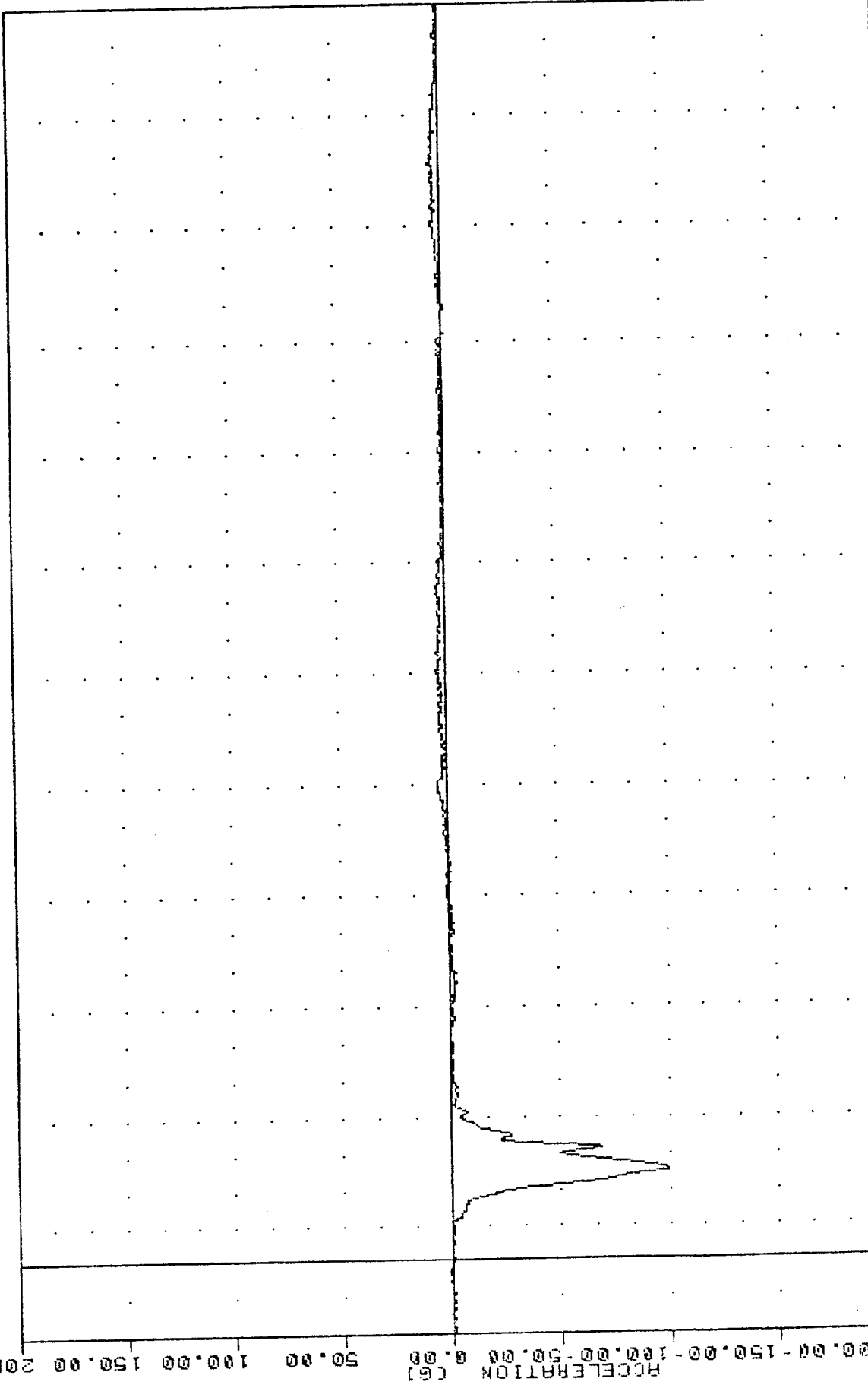
-200.00 -150.00 -100.00 -50.00 0.00 50.00 100.00 150.00 200.00

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

WVHA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER PELVIS ACCELERATION X AXIS

TEST DATE 24 OCT 83 10:35:00

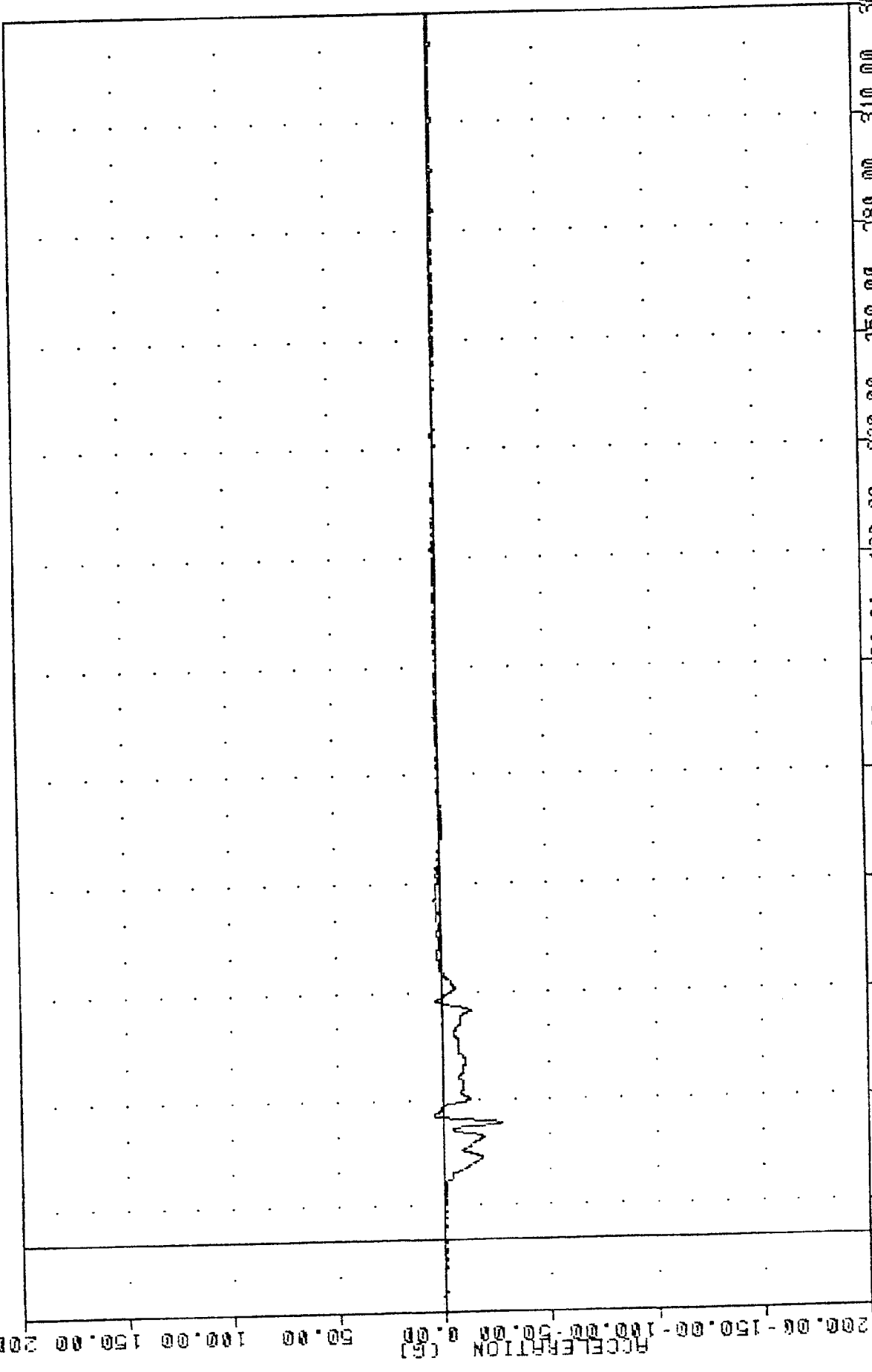
MA E IMPACT CONTINUITY
85291000000
PEVY62
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -99.73 25.63 5.31 296.88



ACCELERATION (G)
TIME (msec)
MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER PELVIS ACCELERATION Y AXIS

PLUT DATE 24 OCT 83 10:33:30

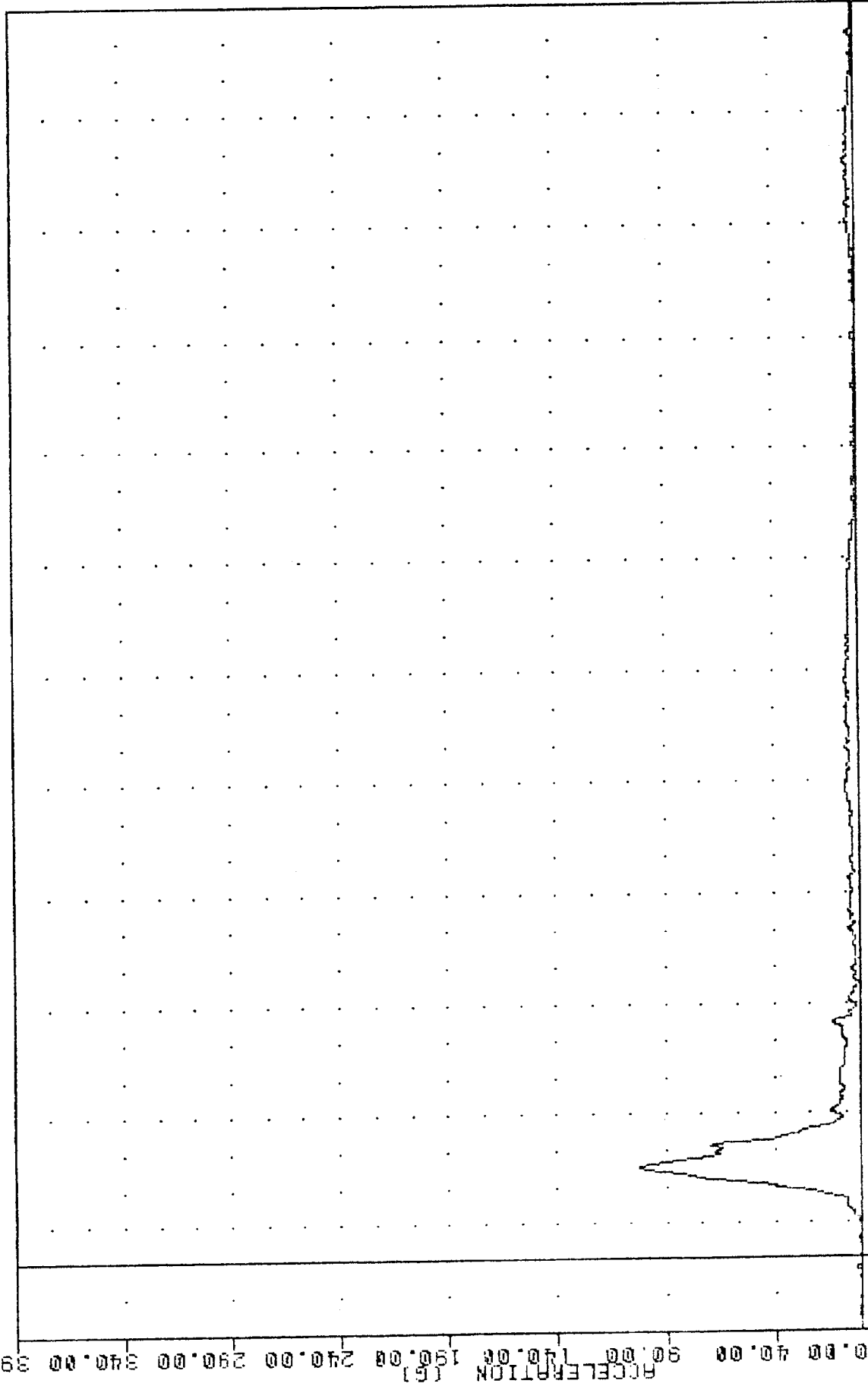
IRL
MACT
85291000000
PEVZG2
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -27.148 33.75, 4.96 e 35.88



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
MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER PELVIS ACCELERATION Z AXIS

PLT01 DMTL 23 OCT 83 10:33:30

NYNRC DE IMPACT TESTING
85291000000
PENRG2
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.098 2.88, 102.05 & 25.63



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

NYNRC SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER PELVIS RESULTANT ACCELERATION

PLT DATE 24-01-83 16:36.44

85291000000

PEVTV2

85291000000

PEVTV2

FILTER = BLPF

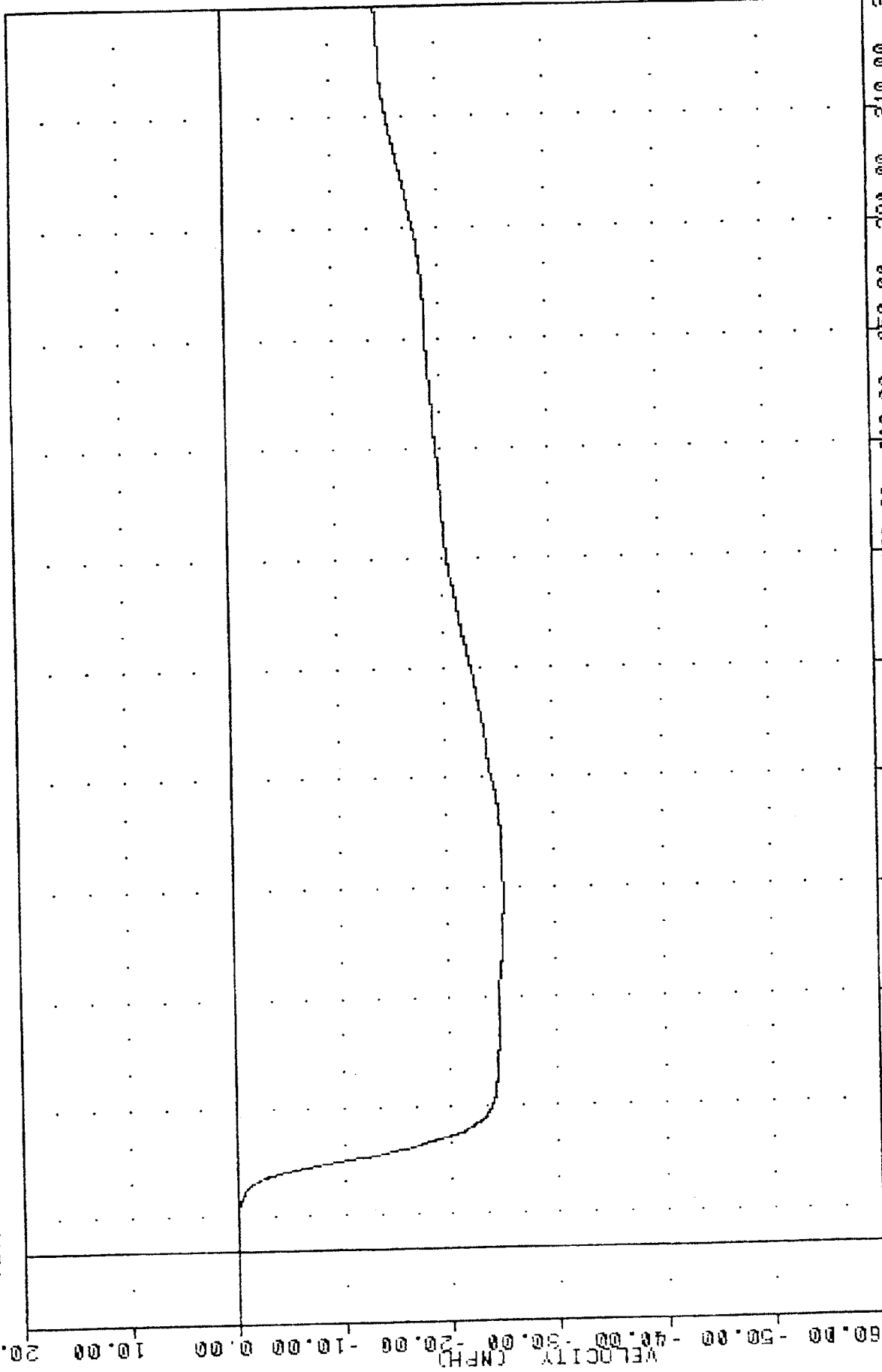
MIN, MAX VALUES =

-25.22%

97.75,

0.07 s

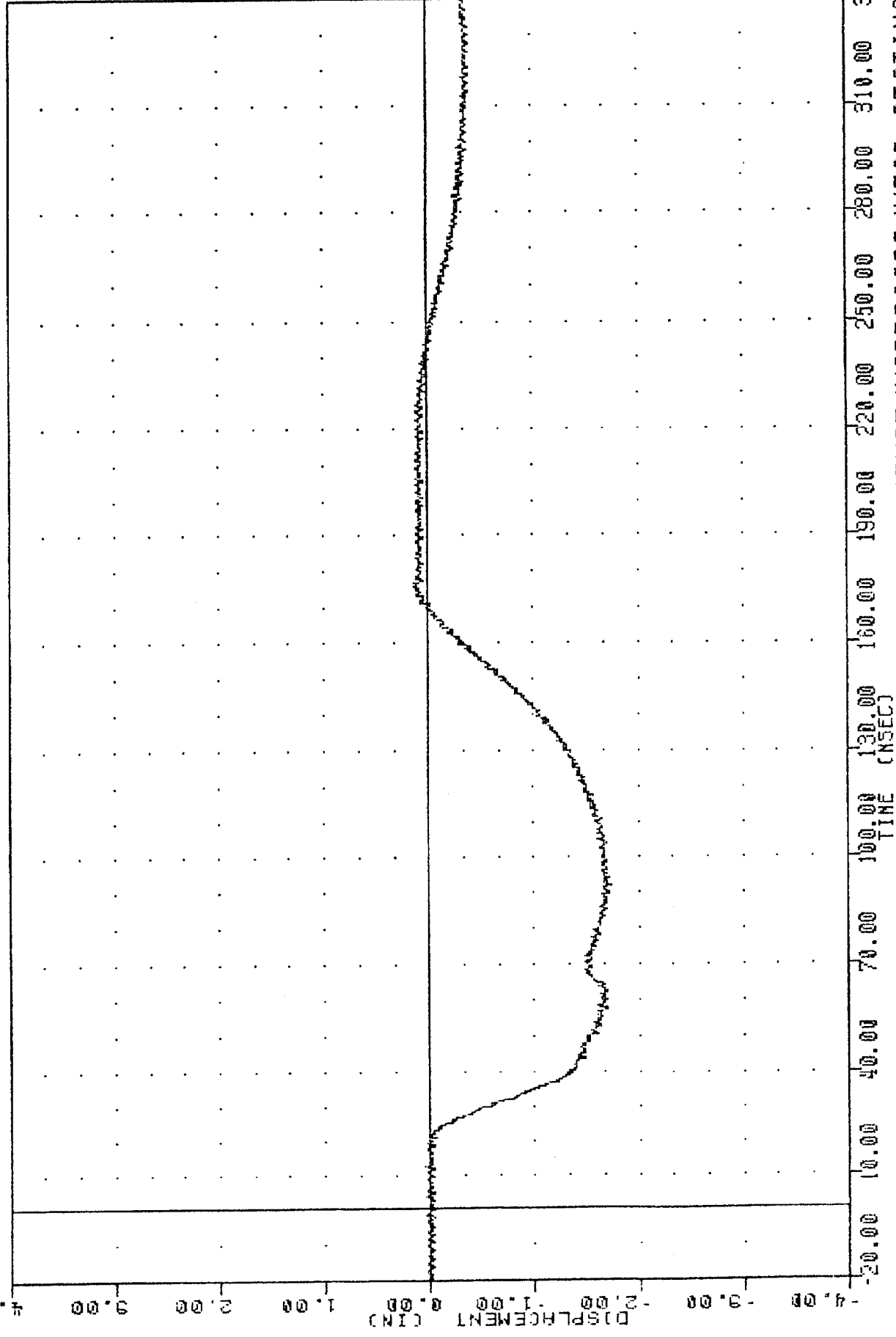
4.38



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PELVIS VELOCITY Y AXIS

TEST DATE 24 OCT 80 10:53:30

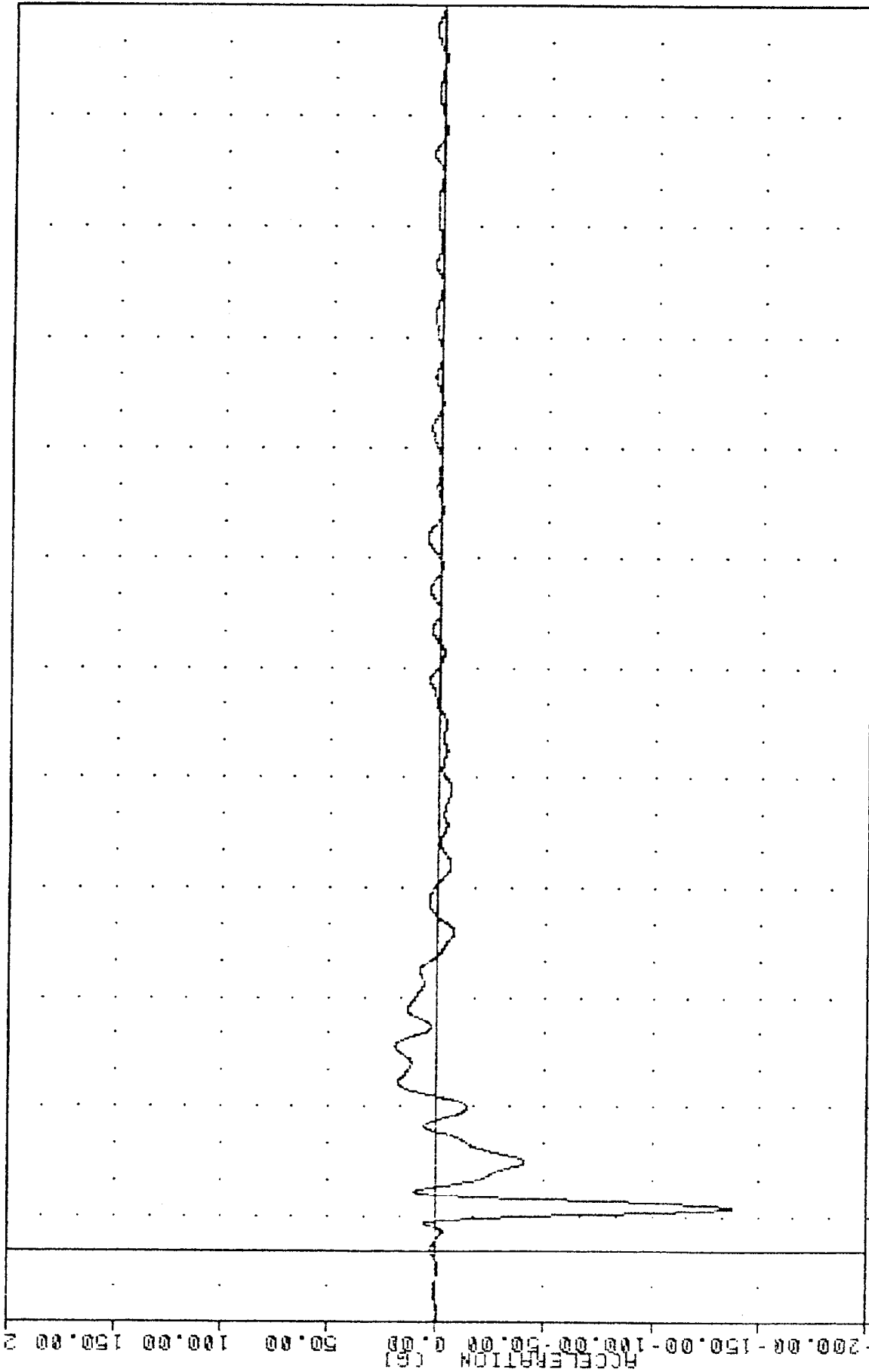
MMMA SIDE IMPACT CONTINUED
85291000000
RATYD2
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -1.728 92.25, 0.13 e 175.88



MMMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER RIGHT RIB TO SPINE DISPLACEMENT INCHES

INSTRUMENT 24 OCT 63 10:39:30

85291000000
AFDYG1
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -138.01 12.38 , 18.83 56.50



20.00 10.00 0.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
VEHICLE RIGHT FRONT DOOR (POSITION 1) ACCELERATION Y AXIS

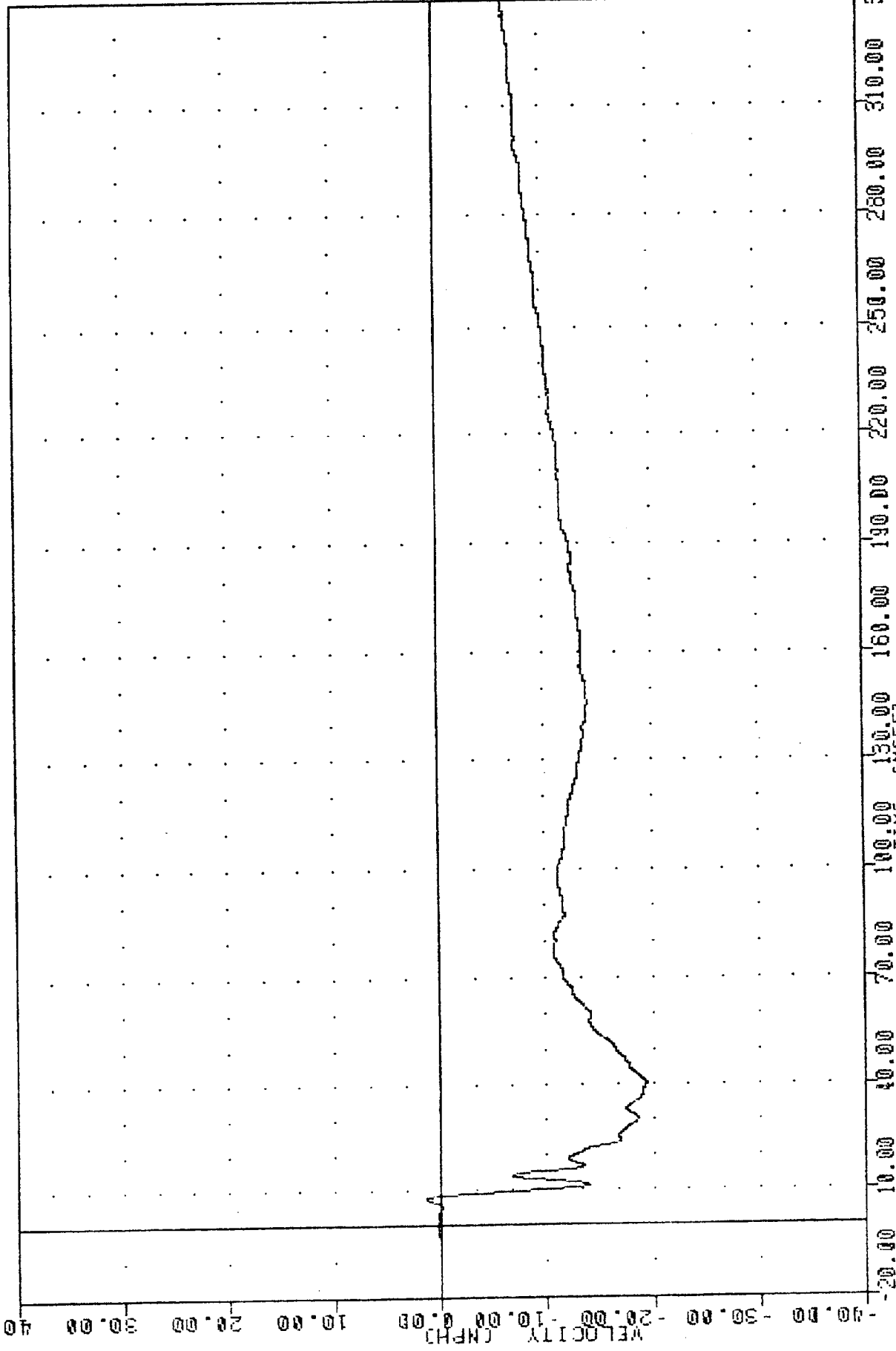
PLT DATE 24 DEC 83 16:36:44

INC , CONTIN

85291000000
RFDYV1

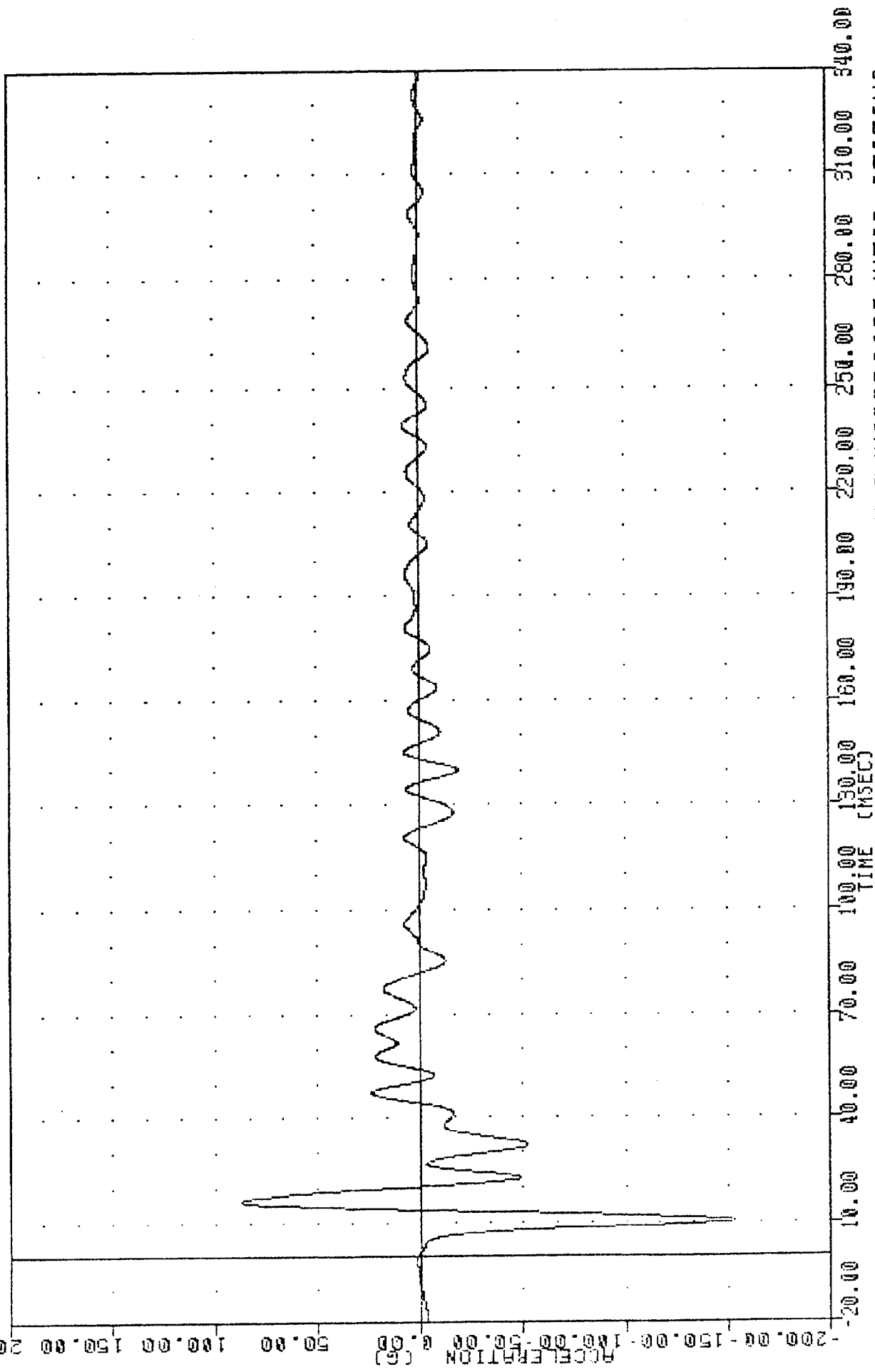
FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -19.388 40.38, 1.38 7.63



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
RIGHT FRONT DOOR POSITION 1) VELOCITY Y AXIS

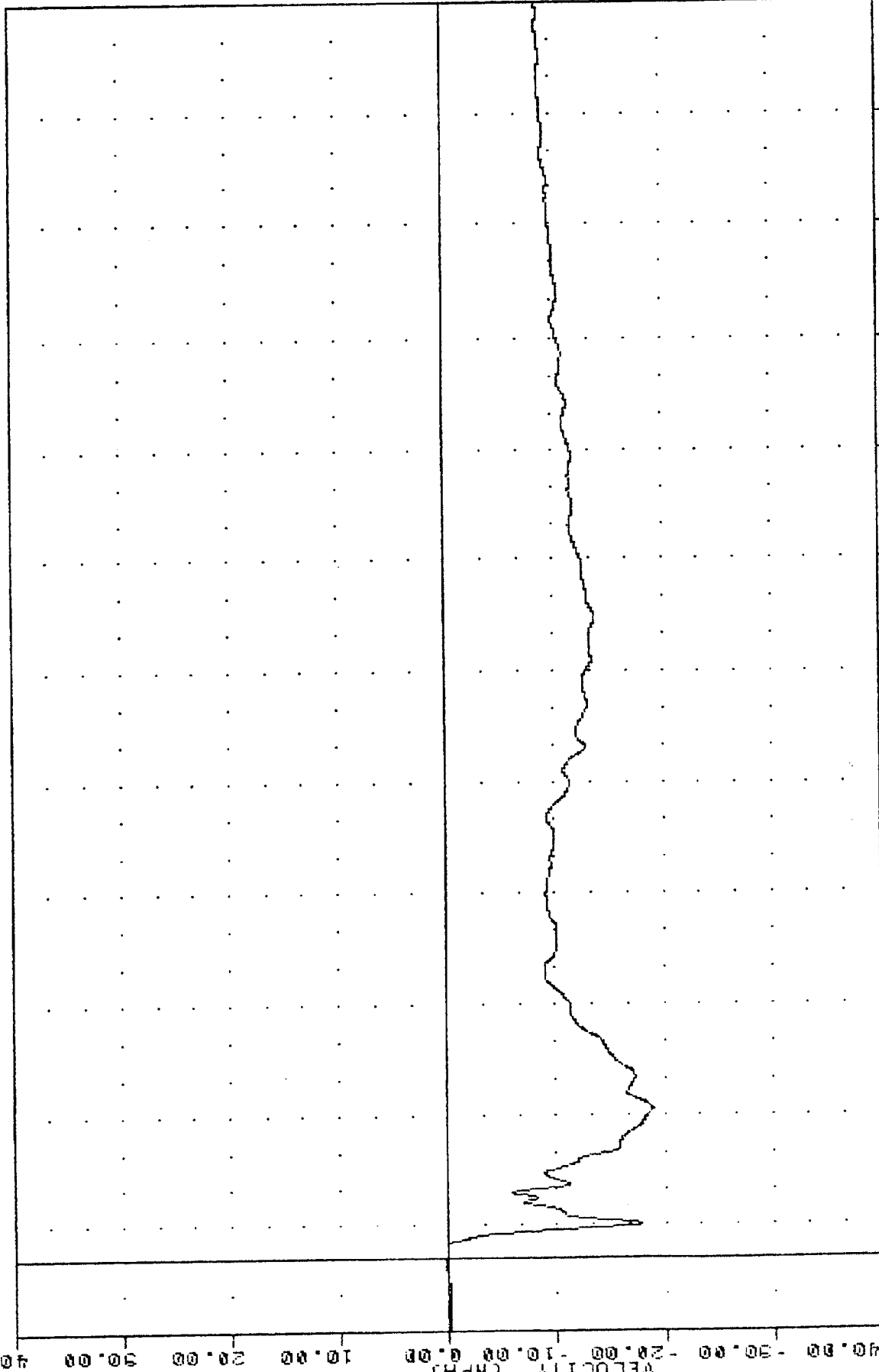
MVNA SIDE IMPACT TESTING
 85291000000
 RFDY62
 FILTER = 8LPP
 10N/ 316/ -40
 MIN, MAX VALUES = -153.88 10.63, 87.33 16.50



MVNA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
 VEHICLE RIGHT FRONT DOOR (POSITION 2) ACCELERATION Y AXIS

TEST DATE 24 OCT 83 10:30:44

MYMA SIDE IMPACT TEST
85291000000
RF01V2
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -18.94 41.50, 0.24 8 -2.13



MYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
RIGHT FRONT DOOR (POSITION 2) VELOCITY Y AXIS

MMMA SIDE IMPACT TESTING

05291000000

RFOY63

FILTER = BLPF

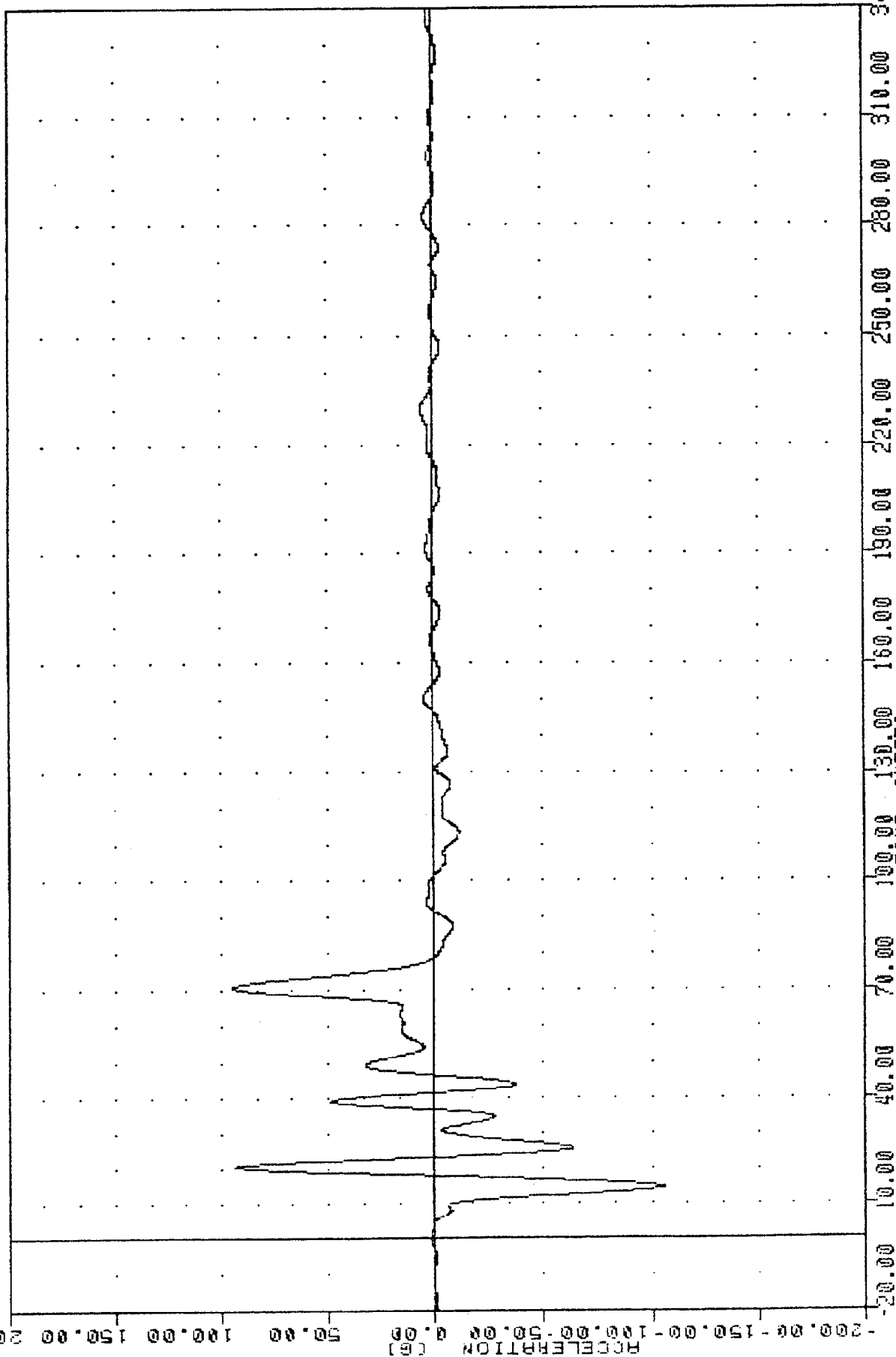
100/ 316/ -40

MIN, MAX VALUES = -105.60e

14.25,

94.74 e

70.75

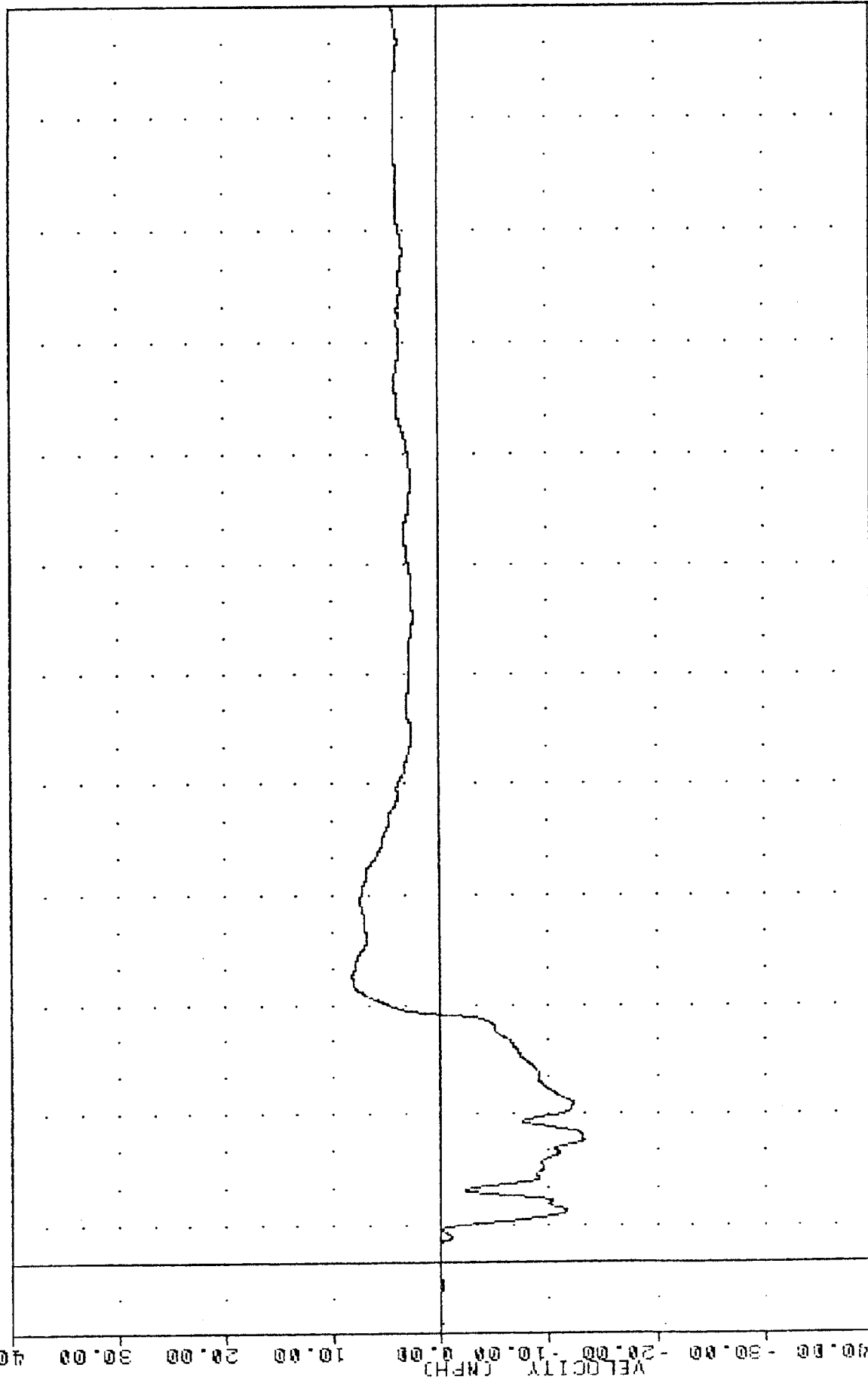


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MMMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
VEHICLE RIGHT FRONT DOOR (POSITION 3) ACCELERATION Y AXIS

PLT DATE 24-01-89 16:36:44

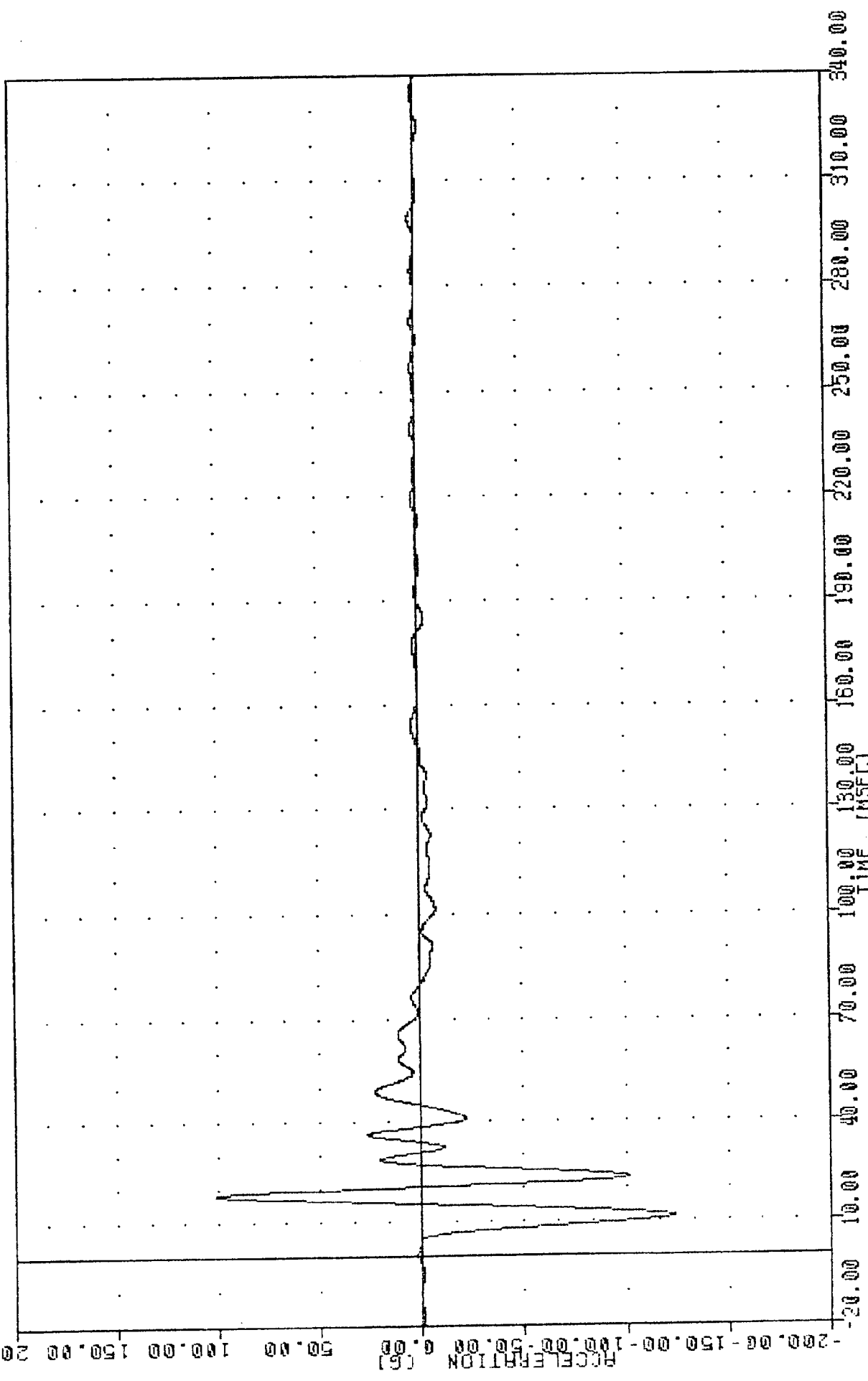
85291000000
AFDYV3
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -13.218 32.88, 8.24 & 77.63



WVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
RIGHT FRONT DOOR (POSITION 3) VELOCITY Y AXIS

TEST DATE 24 OCT 83 10:33:30

NVMA DE FACT TESTING
85291000000
AFDYG4
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -123.74 11.25, 101.12 18.13



NVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
VEHICLE RIGHT FRONT DOOR (POSITION 4) ACCELERATION Y AXIS

MVMA SIDE IMPACT TESTING

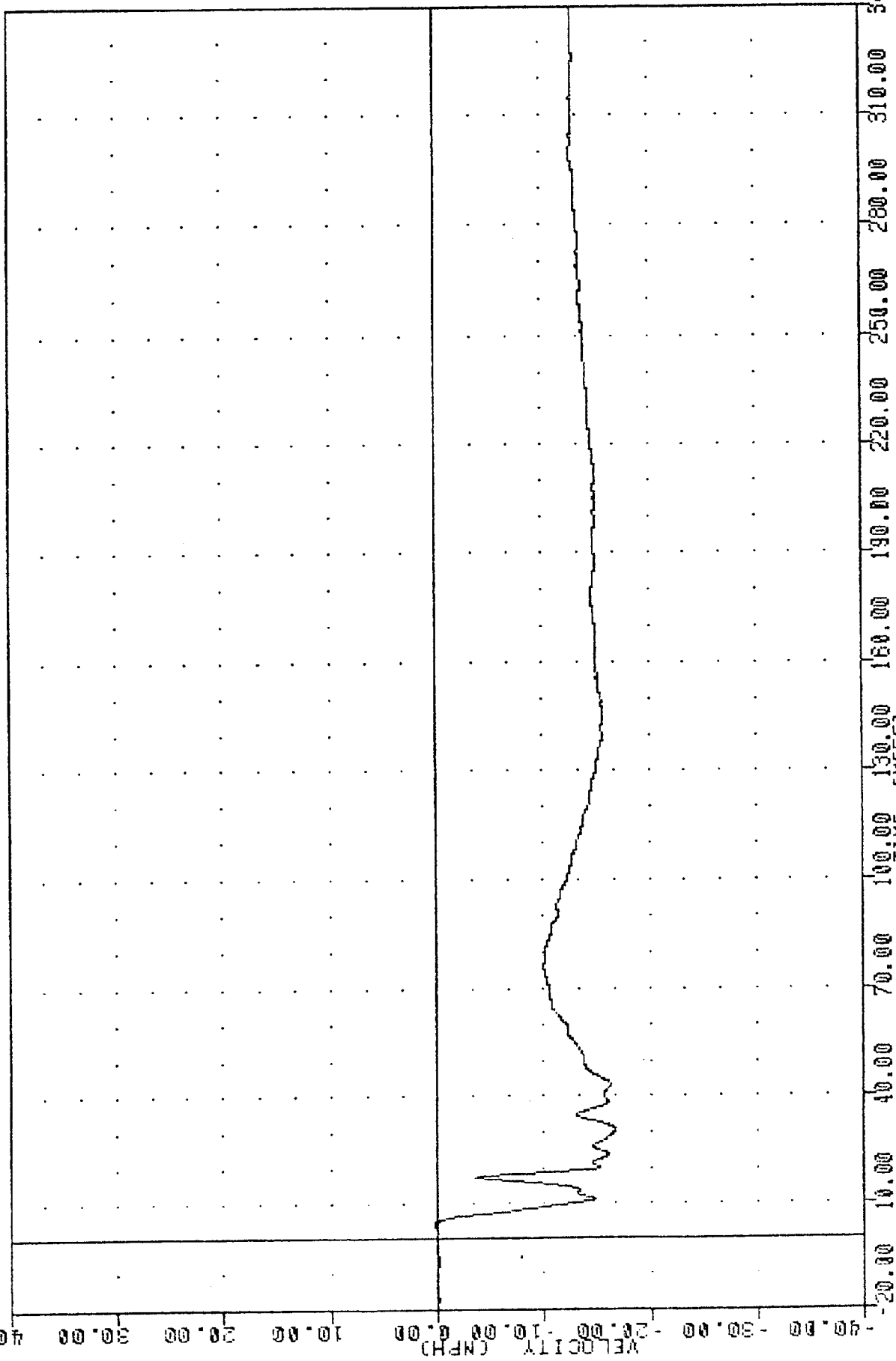
03251001000

RFDYV4

FILTER = BLPF

300V/ 949/ -40

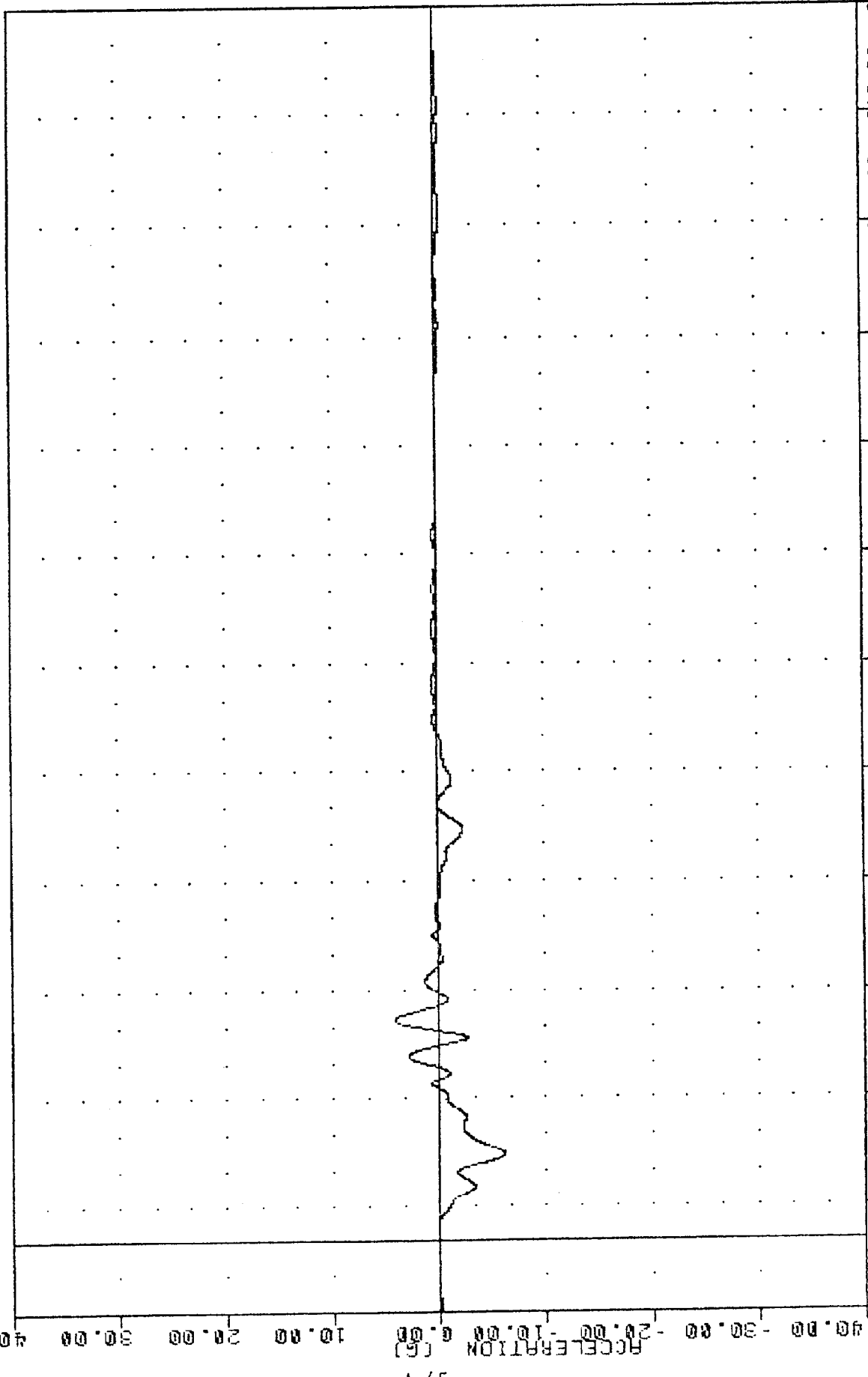
MIN. MAX VALUES = -16.69e 30.75. 0.30 e 4.13



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
RIGHT FRONT DOOR (POSITION 4) VELOCITY Y AXIS

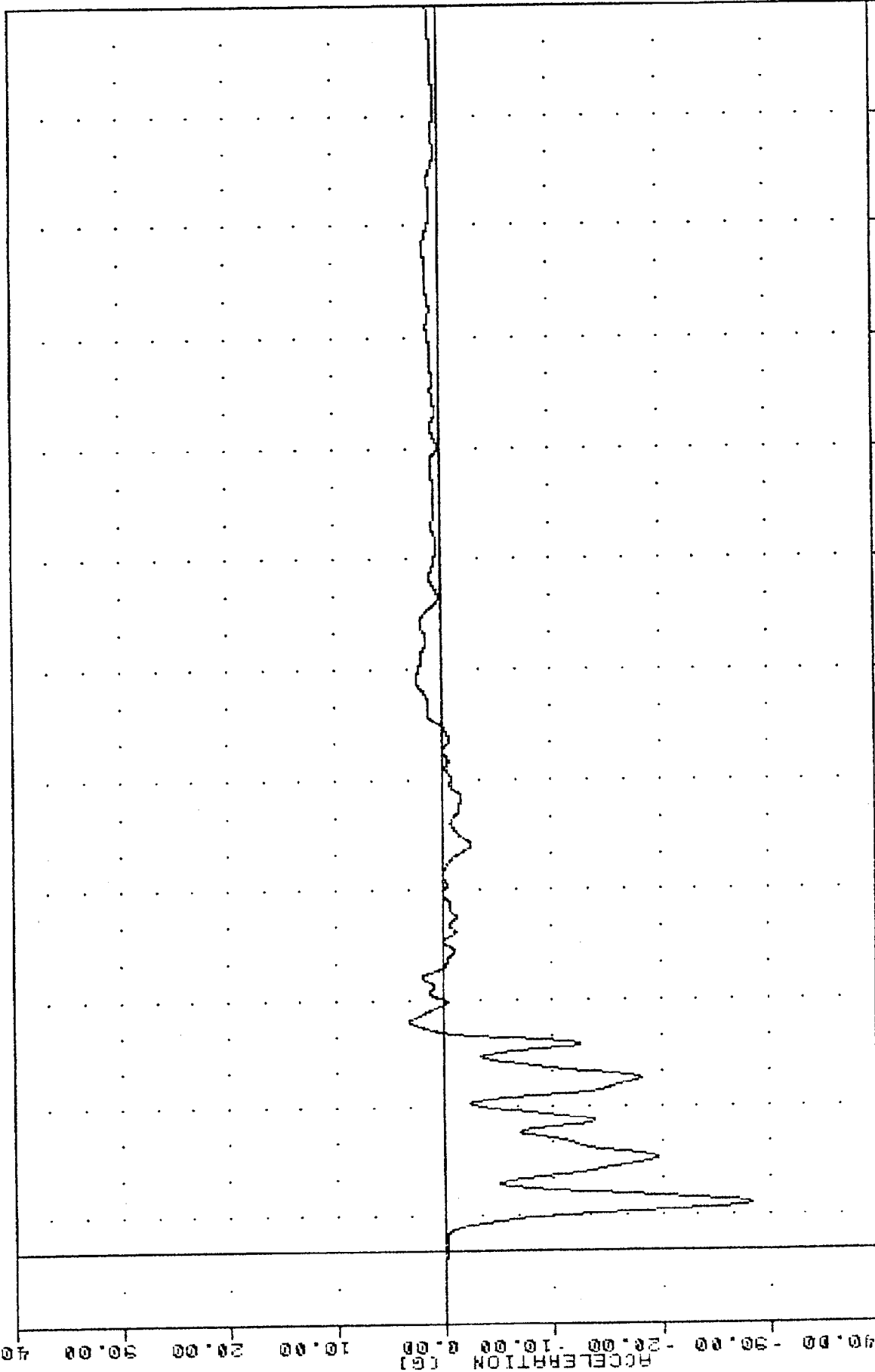
TEST DATE 24 OCT 83 10:30:30

MYNA SIDE IMPACT TESTING
85291000000
LF3XG
MIN, MAX VALUES = -6.15g 24.75, 4.12 g 61.75
FILTER = BLPF 100/ 316/ -40



-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)
MYNA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
VEHICLE LEFT FRONT SILL ACCELERATION X AXIS

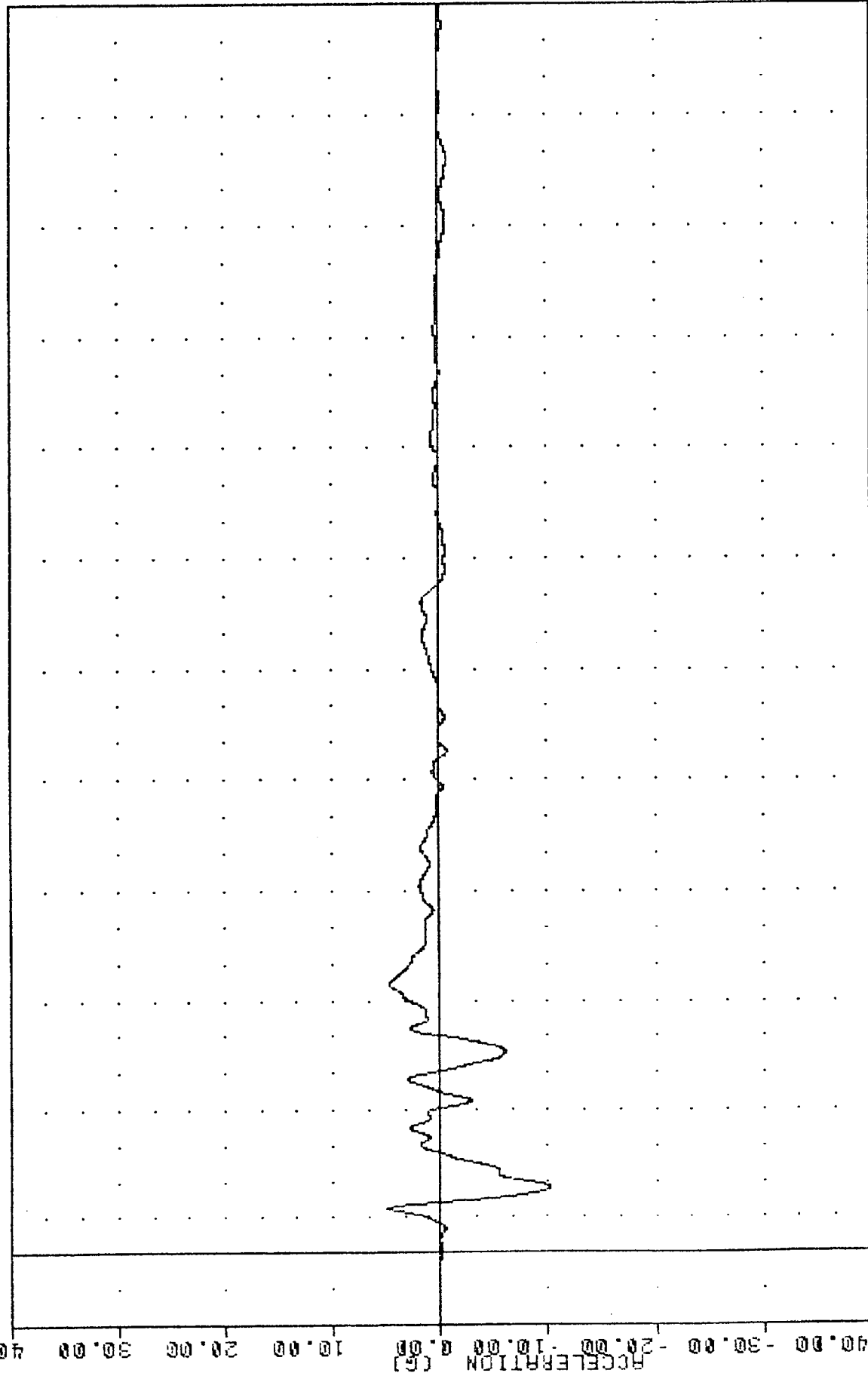
MVMA SIDE IMPACT TESTING
 85291000000
 LFSYG
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -28.35 13.00 3.25 64.25



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
 VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS

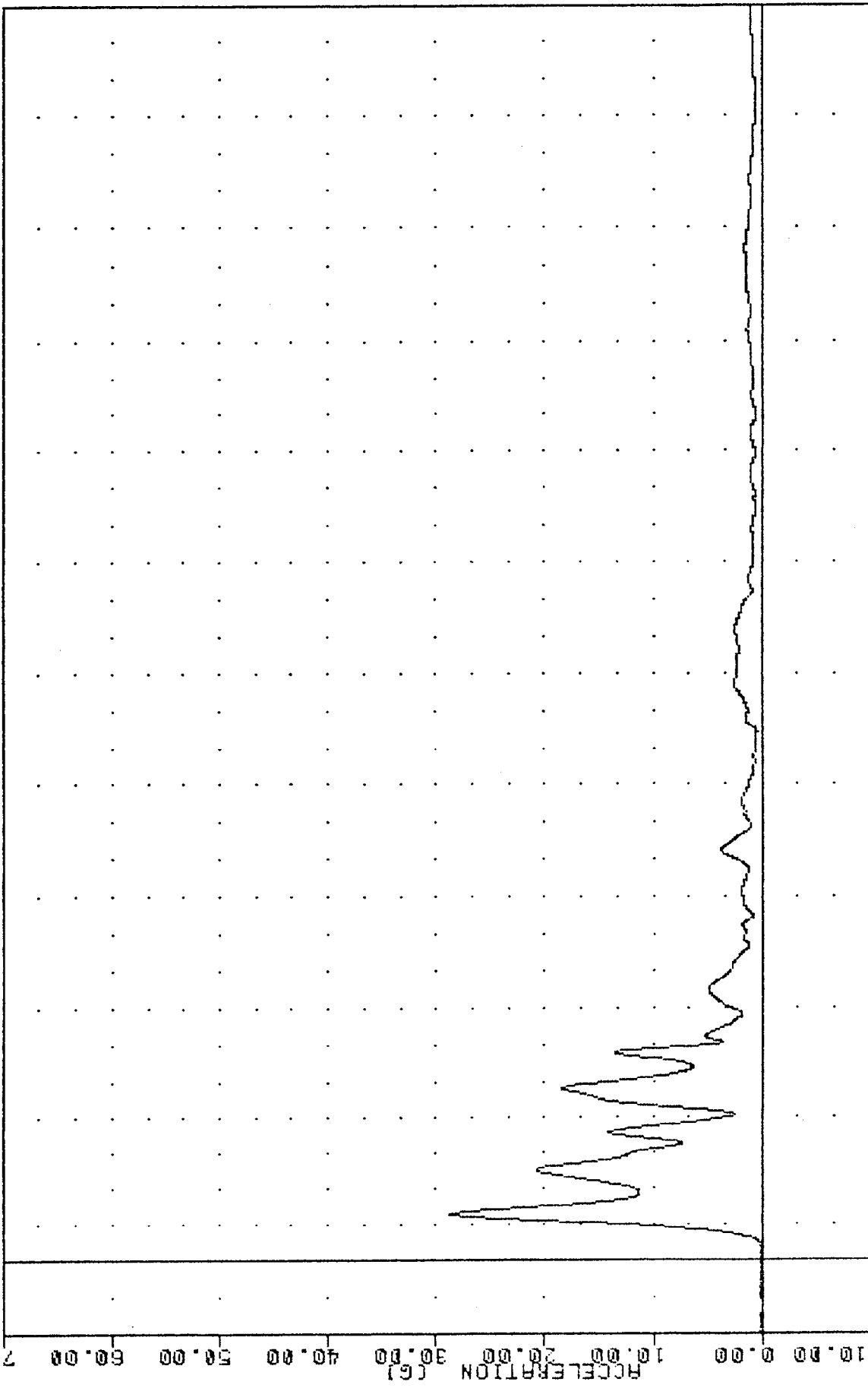
TEST DATE 24 OCT 83 16:33:00

NVMA SIDE IMPACT TEST
8529100000
LFSZG
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -10.15 18.50, 4.93 12.38



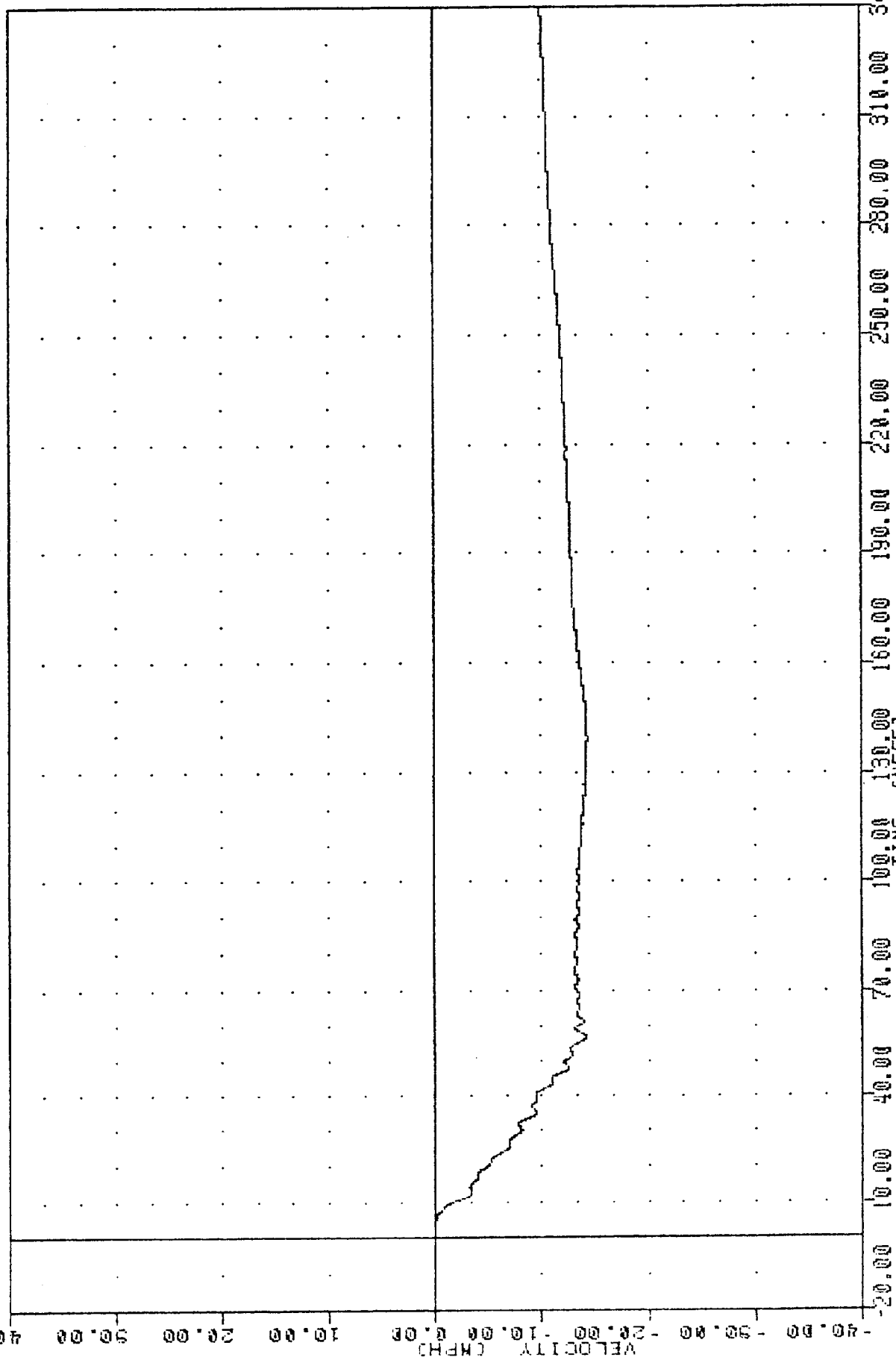
24.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (msec)
NVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
VEHICLE LEFT FRONT SILL ACCELERATION Z AXIS

MVNA SIDE IMPACT TESTING
 85291000000
 LFSRG
 FILTER = 8LPF 100/ 316/ -40
 MIN, MAX VALUES = 0.03g -13.13, 28.75 g 13.00



-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00
 TIME (msec)
 MVNA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
 VEHICLE LEFT FRONT SILL RESULTANT

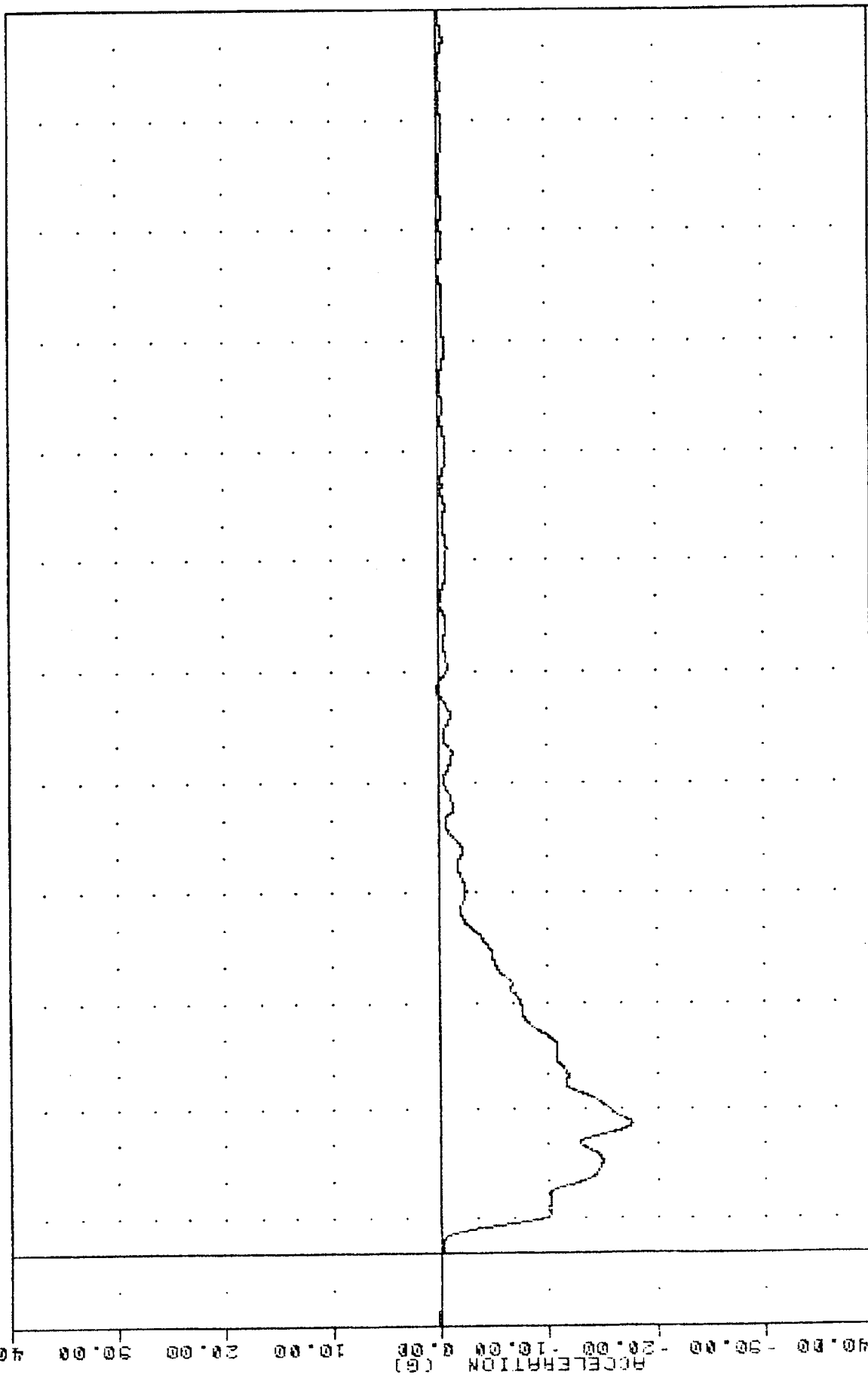
MVMA SIDE IMPACT TESTING
 85291000000
 LFSYW
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -14.28 139.13 0.01 -6.00



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
 LEFT FRONT SILL VELOCITY Y AXIS

TEST DATE 24 OCT 83 10:35:30

MMMA SIDE IMPACT TESTING
852910000000
BCGXB
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -17.67g 35.63, 0.30g -20.00



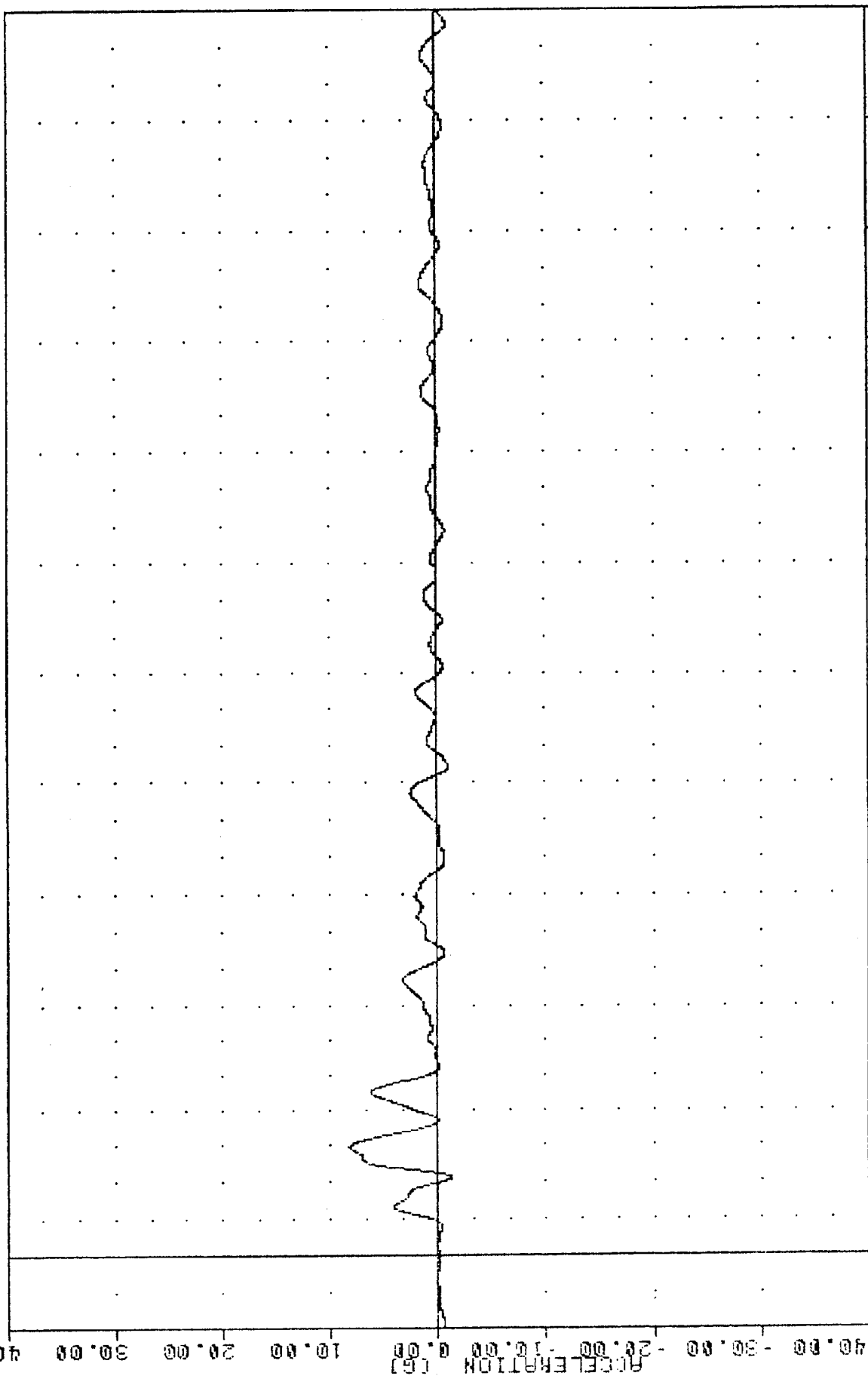
-40.00 -30.00 -20.00 -10.00 0.00 10.00 20.00 30.00 40.00
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (msec)
MMMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
BARRIER CENTER OF GRAVITY X AXIS

NYMP SIDE IMPACT TESTING
 85291000000
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -1.318 21.13, 8.22 @ 29.50
 BCGYG

8529100000
HC6YG

FILTER = BLP

MIN. MAX. VALUES =



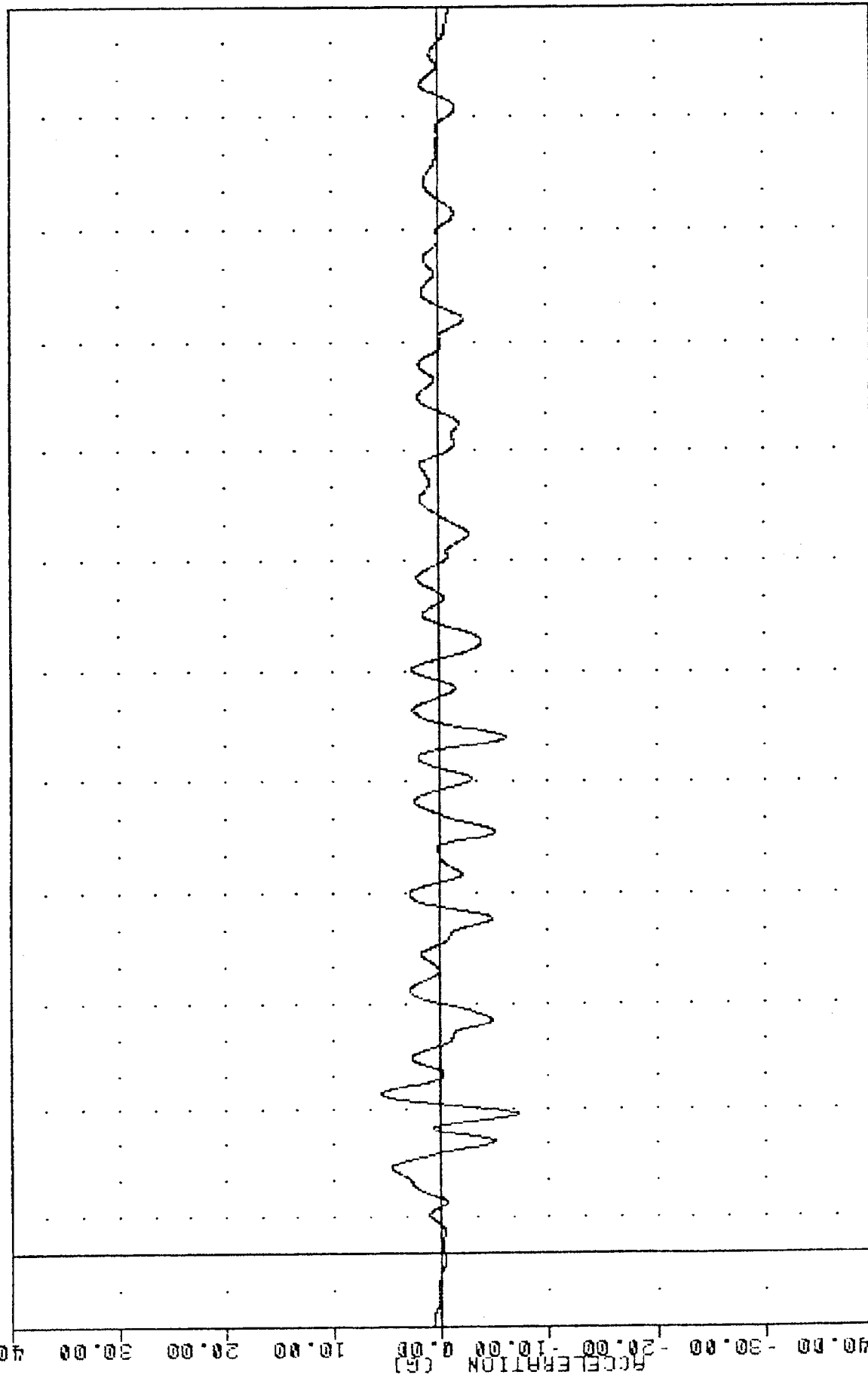
TIME (MSEC)	280.00	310.00	340.00
-20.00			
10.00			
40.00			
70.00			
100.00			
130.00			
160.00			
190.00			
220.00			
250.00			
280.00			

TIME (MSECT)

MMMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
BARRIER CENTER OF GRAVITY Y AXIS

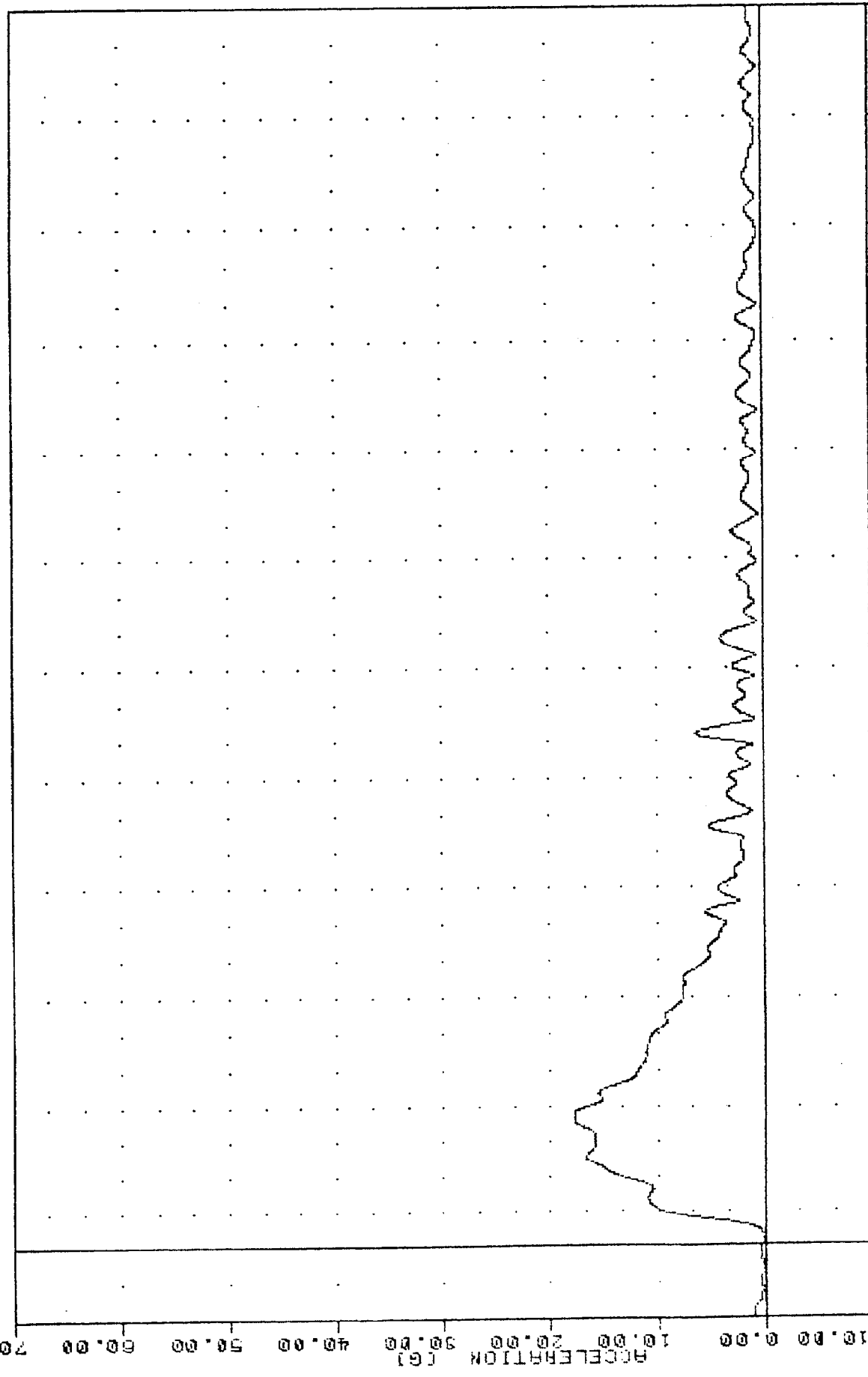
FILE NAME: 24 OCT 83 10:30:30

MINA SIDE IMPACT TEST
85291000000
BCGZ6
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -7.19e 38.75, 5.56 e 44.75



-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 (MSEC)
MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
BARRIER CENTER OF GRAVITY Z AXIS

85291000000
BCGR6
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -5.25, 17.72 & 38.13



-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

MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

NVMA SIDE IMPACT TESTING

05291300000

BCGXV

FILTER = BLPT

MIN. MAX VALUES =

3000/

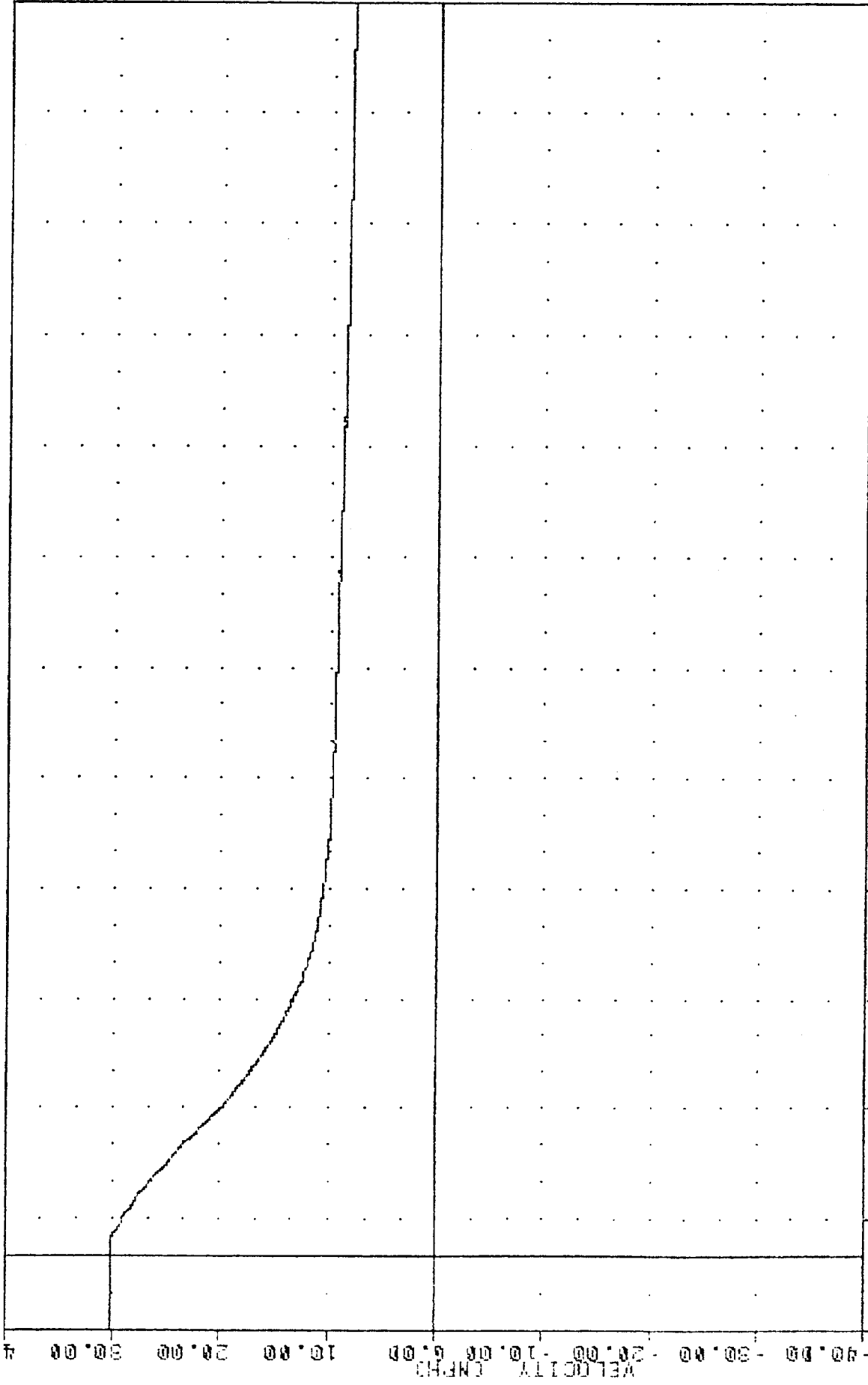
949/ -40

8.13e

339.13,

30.23 e

-3.13



TIME (MSEC)

NVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
BARRIER CENTER OF GRAVITY VELOCITY X AXIS

MVNR SIDE IMPACT TESTING

052910000000

BCGYW

FILTER = BLPT

MIN. MAX VALUES =

3000

5490

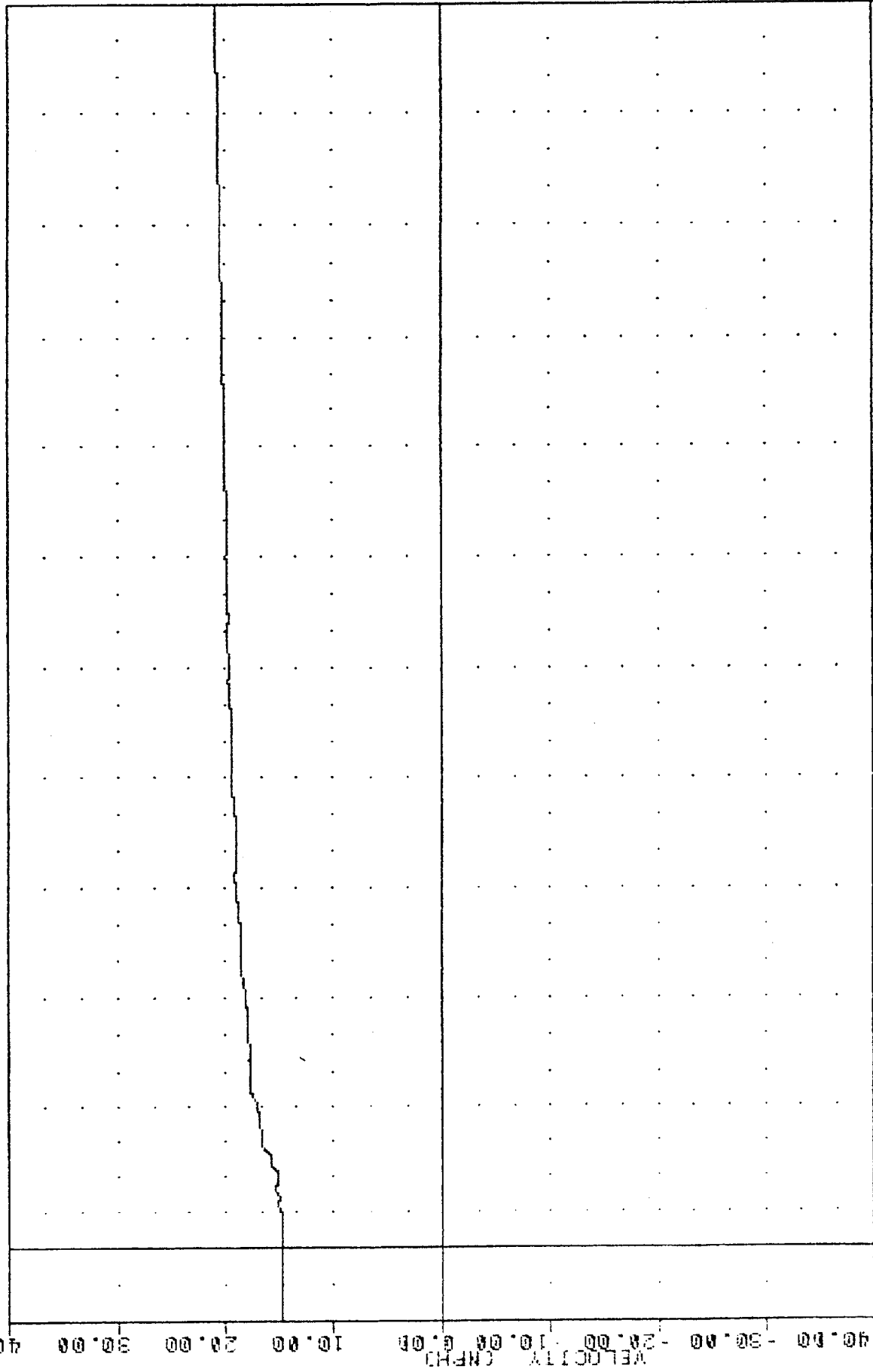
-40

14.580

7.38

20.93

331.13



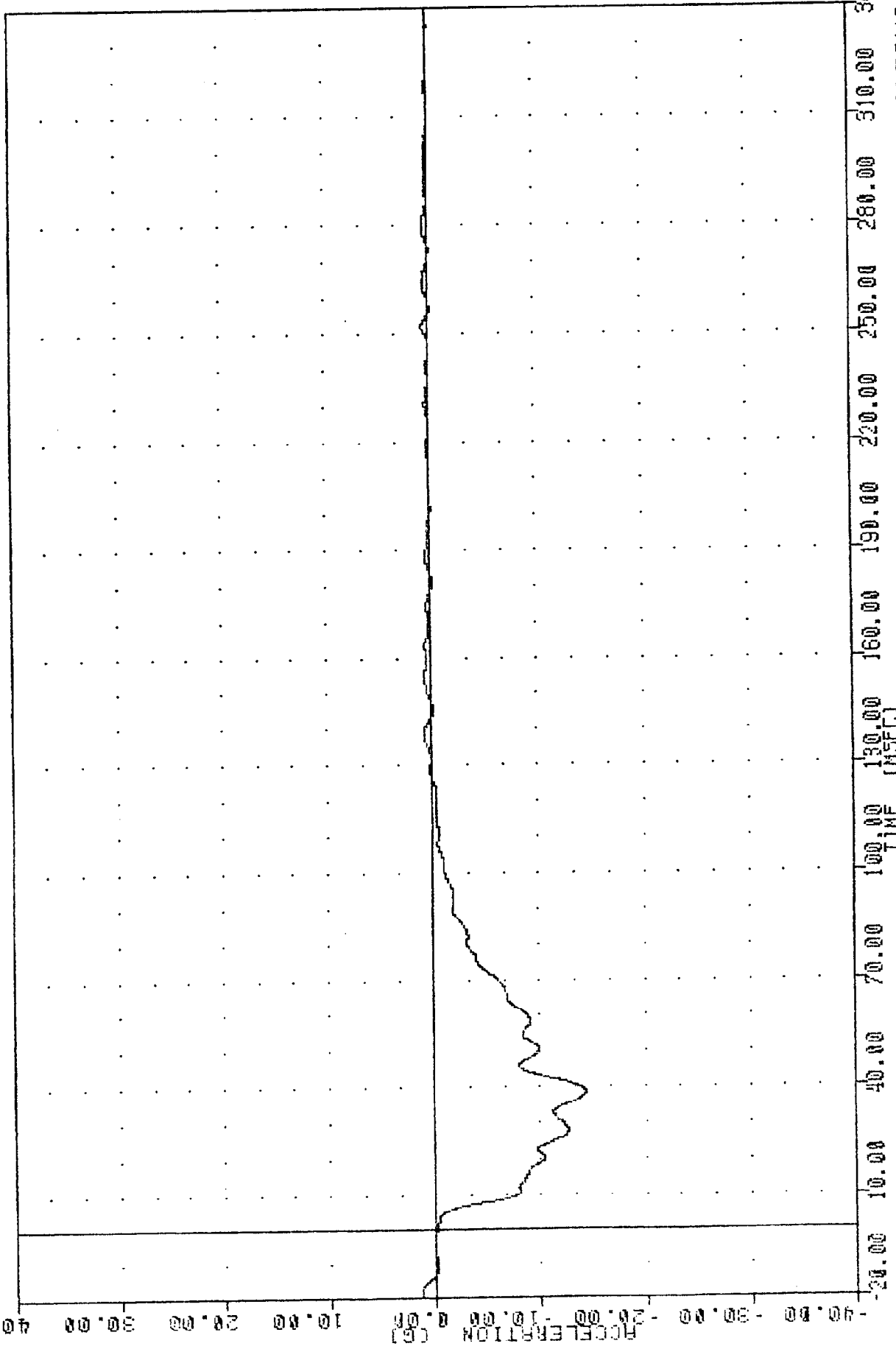
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

MVNR SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
BARRIER CENTER OF GRAVITY VELOCITY Y AXIS

PLT DATE 24 OCT 00 10:33:30

IRL , 091016

85291000000
BRCXG
FILTER = 8LPF 100/ 316/ -40
MIN. MAX VALUES = -14.30e 38.50 , 1.36 e -18.13



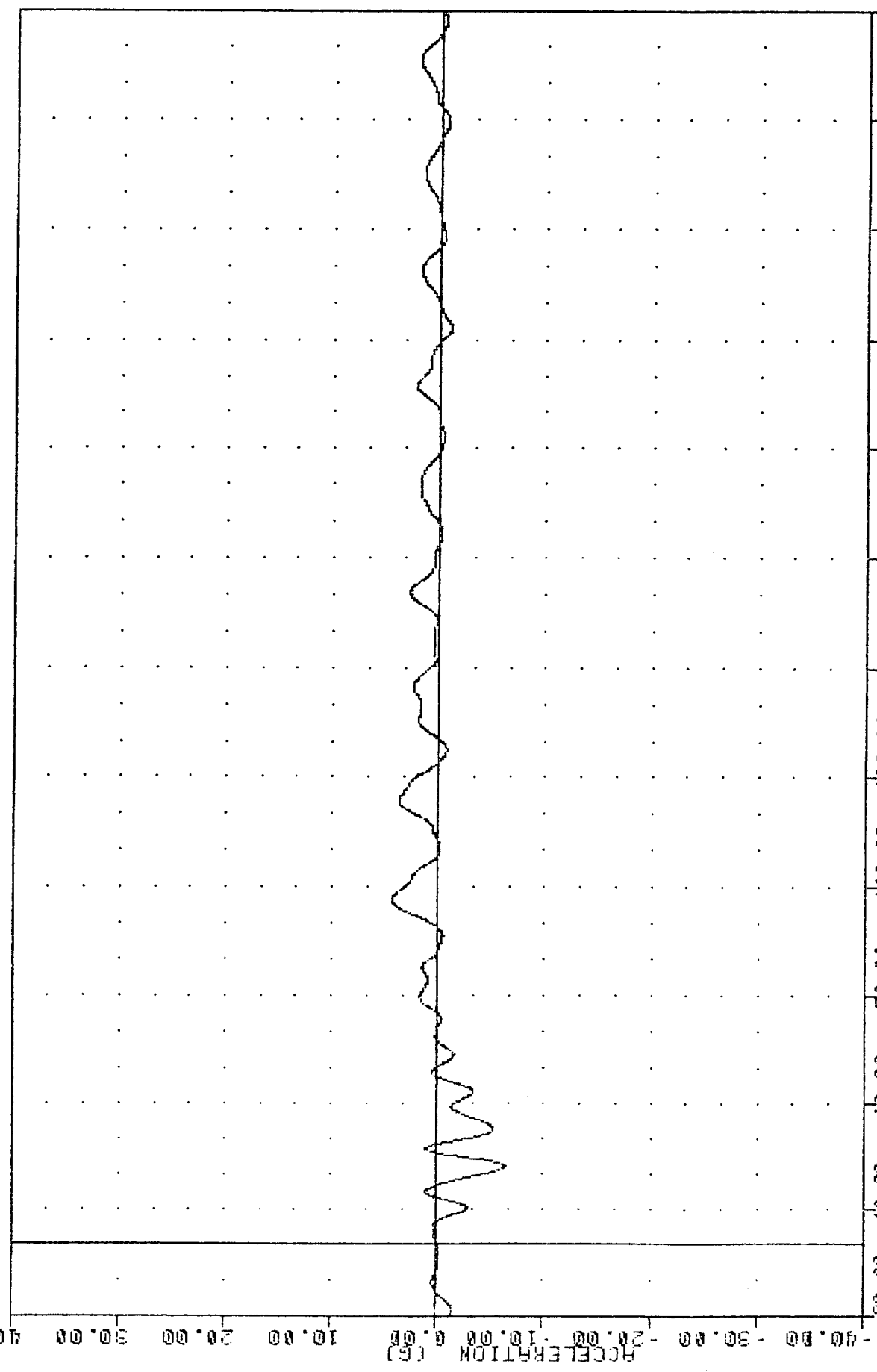
MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
BARRIER REAR CROSSMEMBER ACCELERATION X AXIS

TEST DATE 24 OCT 03 10:33:30

85291000000
BRCYG

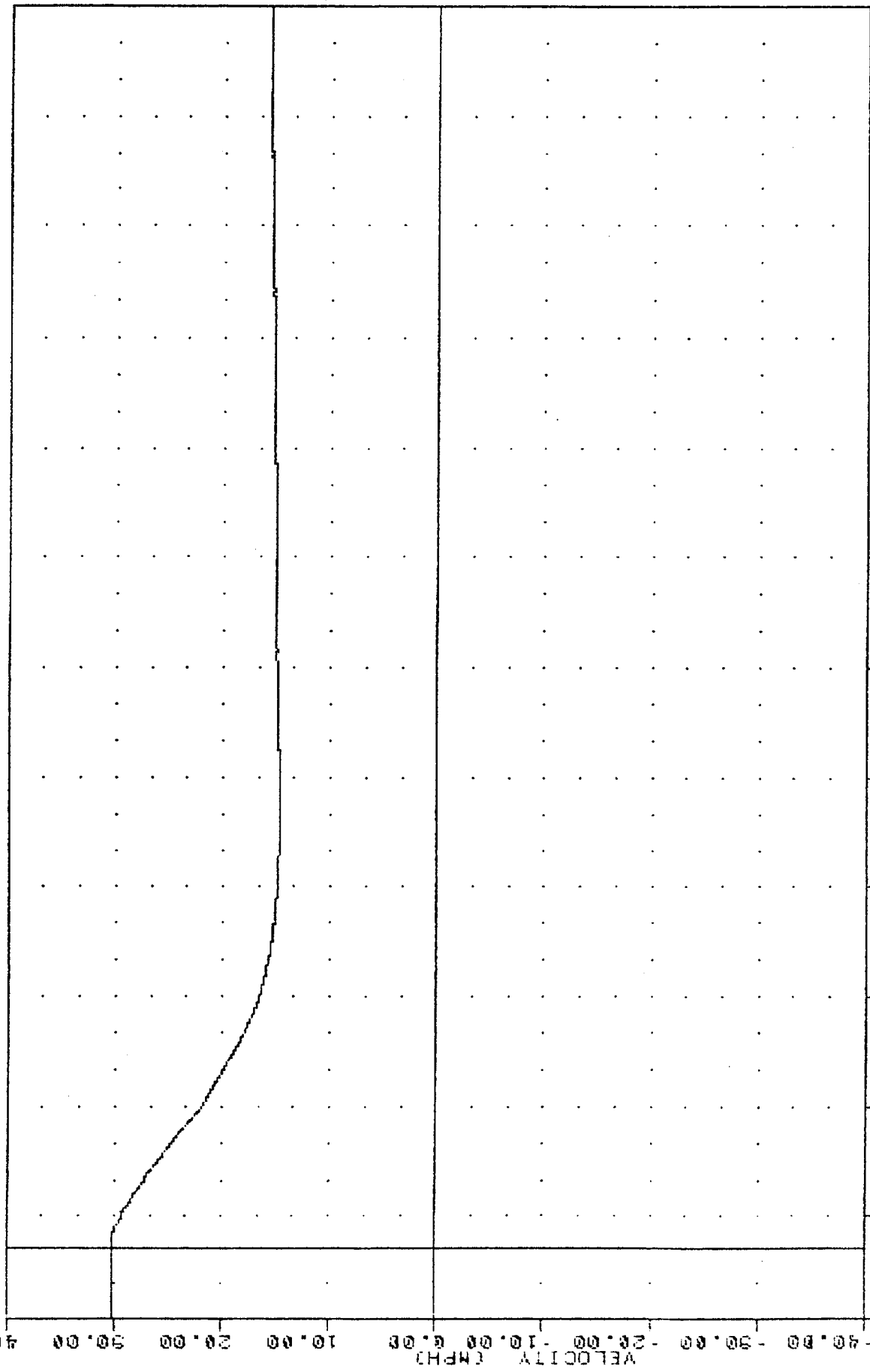
FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -6.44e 22.25, 4.33 e 96.25



MYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
BARRIER REAR CROSSMEMBER ACCELERATION Y AXIS

85291000000
BACXY
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 14.66 122.25, 30.27 0 -17.50



MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
BARRIER REAR CROSSMEMBER VELOCITY X AXIS

INCHES 7 031910 23 OCT 83 10:30:44

WMA SIDE
85291000000
BRCYV

FILTER = BLPF

949/ -40

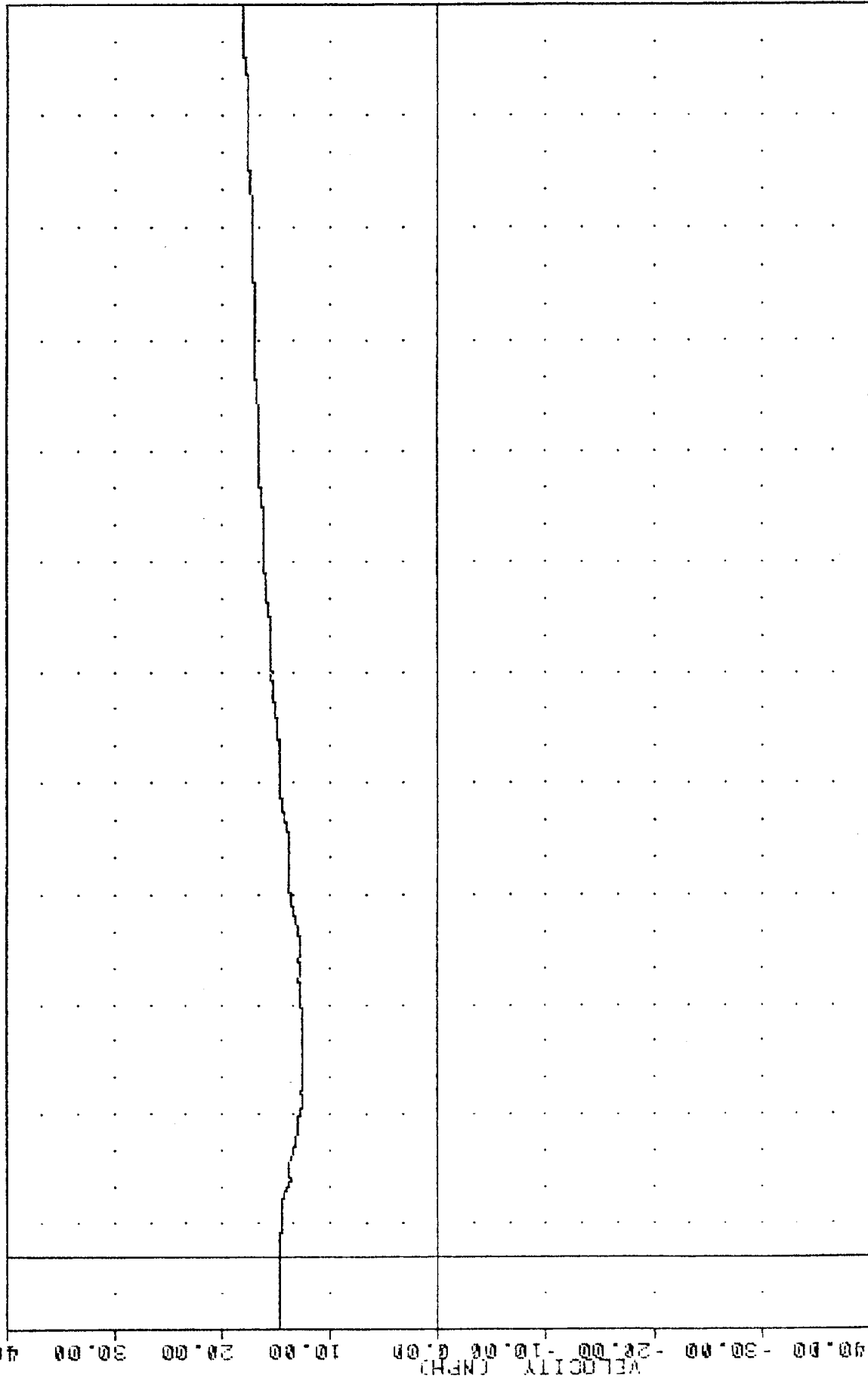
MIN, MAX VALUES =

12.47

62.88,

18.06

332.38



WMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/HARDBOARD/NEAR SEATING
BARRIER REAR CROSSMEMBER VELOCITY Y AXIS

APPENDIX B
DUMMY CERTIFICATION

PRE-TEST

SIDE IMPACT DUMMY CALIBRATION

SIDE IMPACT DUMMY CALIBRATION
DUMMY SERIAL NUMBER 016
CALIBRATION 08

TEST/ DATE	CHANNEL	FILTER CLASS	PEAK ACCELERATION (g)	
			SPECIFICATION*	TEST RESULT
HEAD 10/15/85	HEAD Y-AXIS	1000	150-175	169.96
THORAX 10/16/85	UPPER SPINE Y-AXIS			
	PRIMARY	180	16-24.6	21.50
	REDUNDANT	180	16-24.6	21.23
	LOWER SPINE Y-AXIS			
	PRIMARY	180	17.6-26.4	20.41
	REDUNDANT	180	17.6-26.4	20.56
	RIGHT UPPER RIB Y-AXIS			
	PRIMARY	180	36-50	40.48
	REDUNDANT	180	36-50	41.17
	RIGHT LOWER RIB Y-AXIS			
	PRIMARY	180	36-50	40.11
	REDUNDANT	180	36-50	40.65
PELVIS 10/15/85	PELVIS Y-AXIS	180	50-65	41.92

*Side impact test specifications currently in use by VRTC-NHTSA.

Side Impact Dummy
Damage Checklist

Dummy S/N 016

<u>OK</u>	<u>Damaged</u>	
<u>X</u>	<u> </u>	Outer skin on entire dummy (gashes, rips, etc.)
<u>X</u>	<u> </u>	Head - Gashes, rips, general appearance, etc.
<u>X</u>	<u> </u>	Neck - broken or cracks in rubber
<u>X</u>	<u> </u>	Spine - broken or cracks in rubber
<u>X</u>	<u> </u>	Ribs - check all ribs for damage (bent or broken), damping material separation.
<u>X</u>	<u> </u>	Rib Attach Leather - breaks in leather at ribs
<u>X</u>	<u> </u>	Bourns Pot. - bent shaft - electrical discontinuity
<u>X</u>	<u> </u>	Accelerometer Leads - torn cables
<u>X</u>	<u> </u>	Accelerometer Mountings (Head, Thorax, Pelvis) - check for secure mounting
<u>X</u>	<u> </u>	Retrofit Kit (Calspan) - check for bent brackets, sagging rib cage
<u>X</u>	<u> </u>	Thorax support wire and springs - check for damage
<u>X</u>	<u> </u>	Overall smooth stroking of thorax left to right (no interference)
<u> </u>	<u> </u>	Other

If upon visual examination, damage is apparent in any of these areas, a VRTC representative is to be consulted for a decision on repair or replacement of parts.

Repair or Replacement Approved By:

Signature _____

Date _____

Comments on repair or replacement of parts:

No visual damage

TRC Personnel

Checked By:

Gregg Willh
Signature

Oct 7 1985
Date

VRTC Personnel

Checked and Approved for Testing By:

Signature _____

Date _____

SH01608 15-OCT-85 16:05:15

SH01608 08

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -9.92 7.00 1.15 13.50

85288
PISXG

30.00

20.00

10.00

0.00

-10.00

-20.00

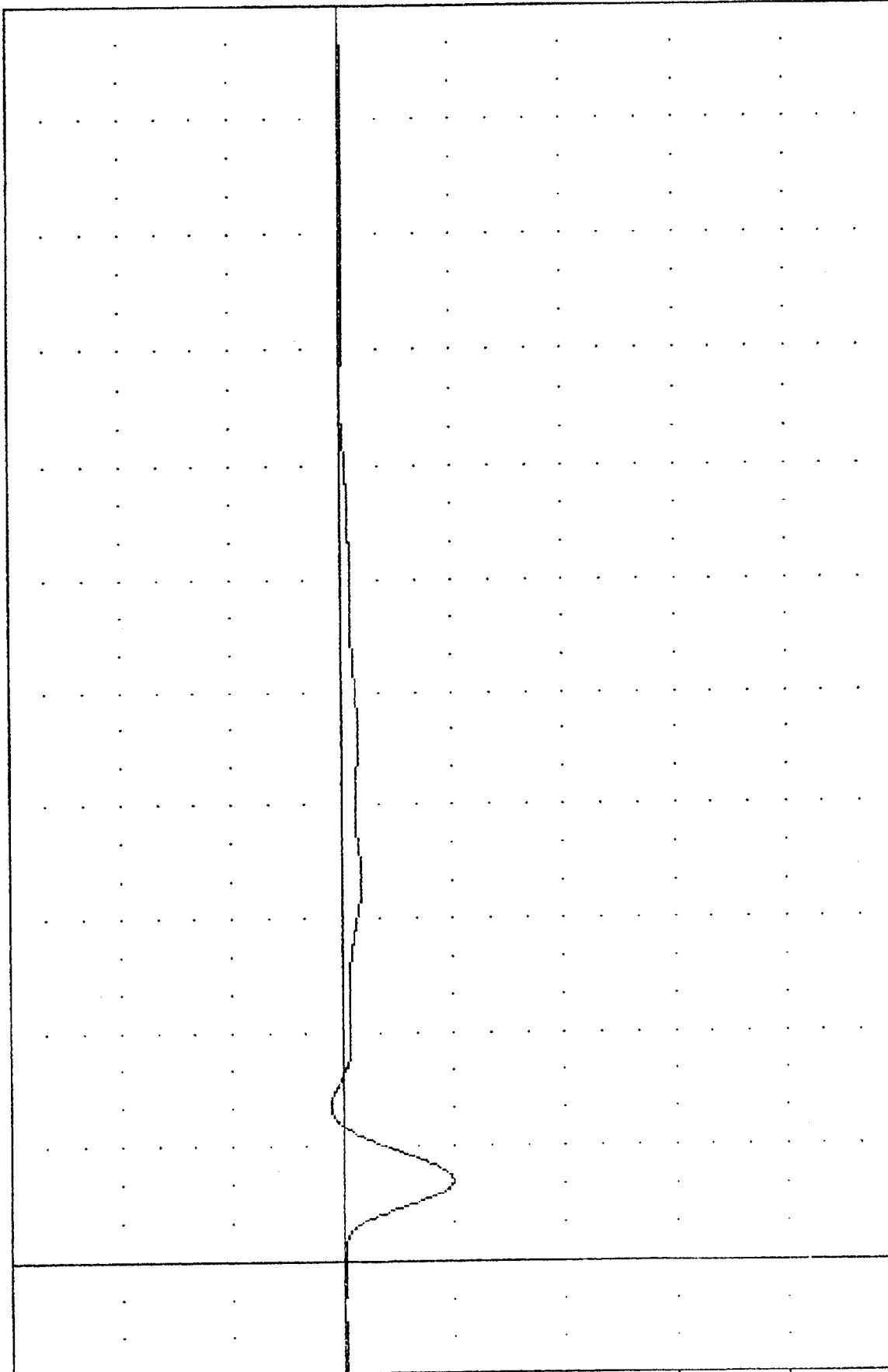
-30.00

-40.00

-50.00

-60.00

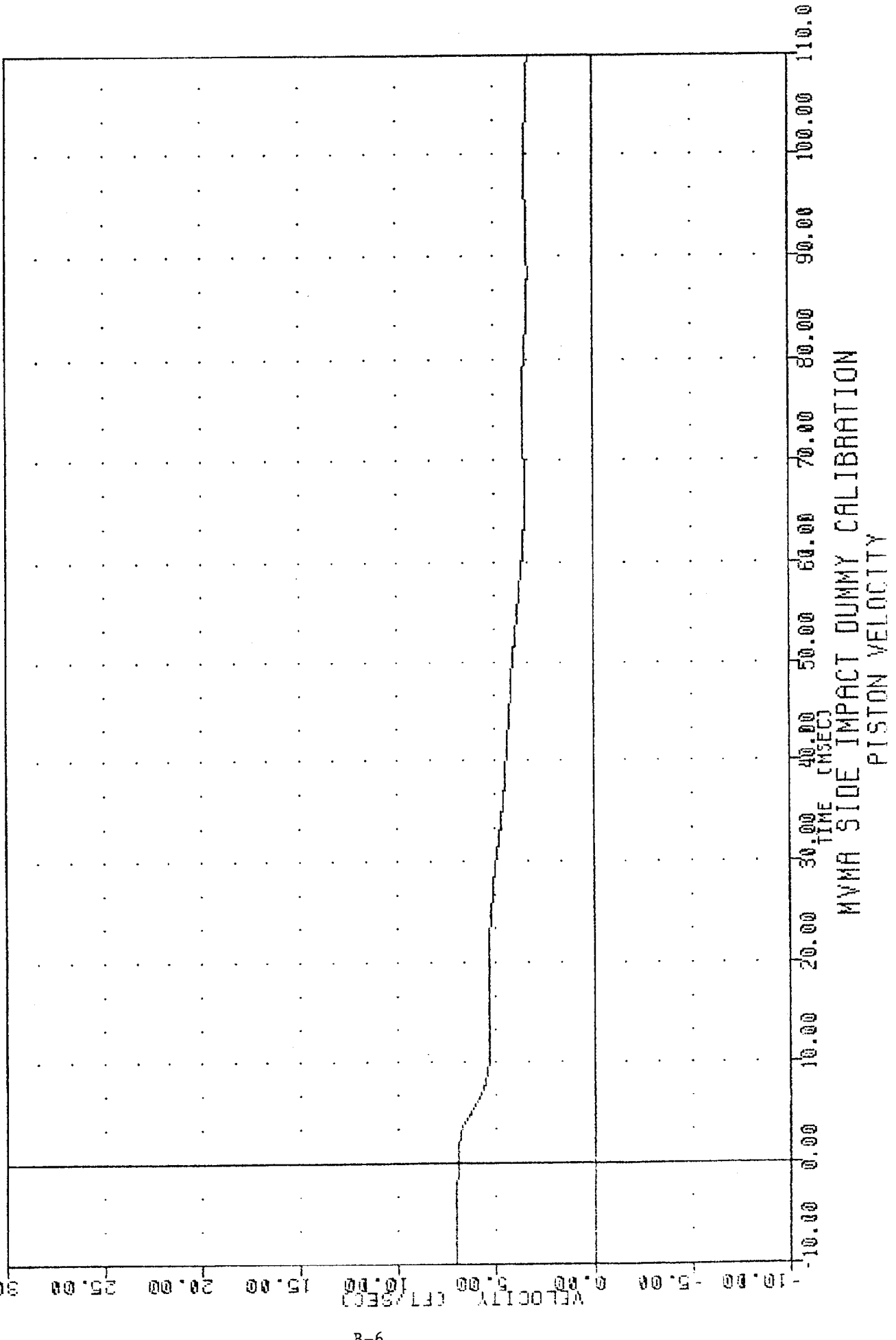
ACCELERATION (G)



TIME (INSEC) 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00

MVMA SIDE IMPACT DUMMY CALIBRATION
PISTON ACCELERATION

MVMA SIG 0.6 REMB IMPACT CMC 08 PLOT DATE 15-OCT-85 16:05:15
 85288 FILTER = ALPF 1650/ 5214/ -40
 PI3KV MIN. MAX VALUES = 3.278 109.75, 7.11 8 -4.13



PLOT DATE 15-OCT-85 16:05:15

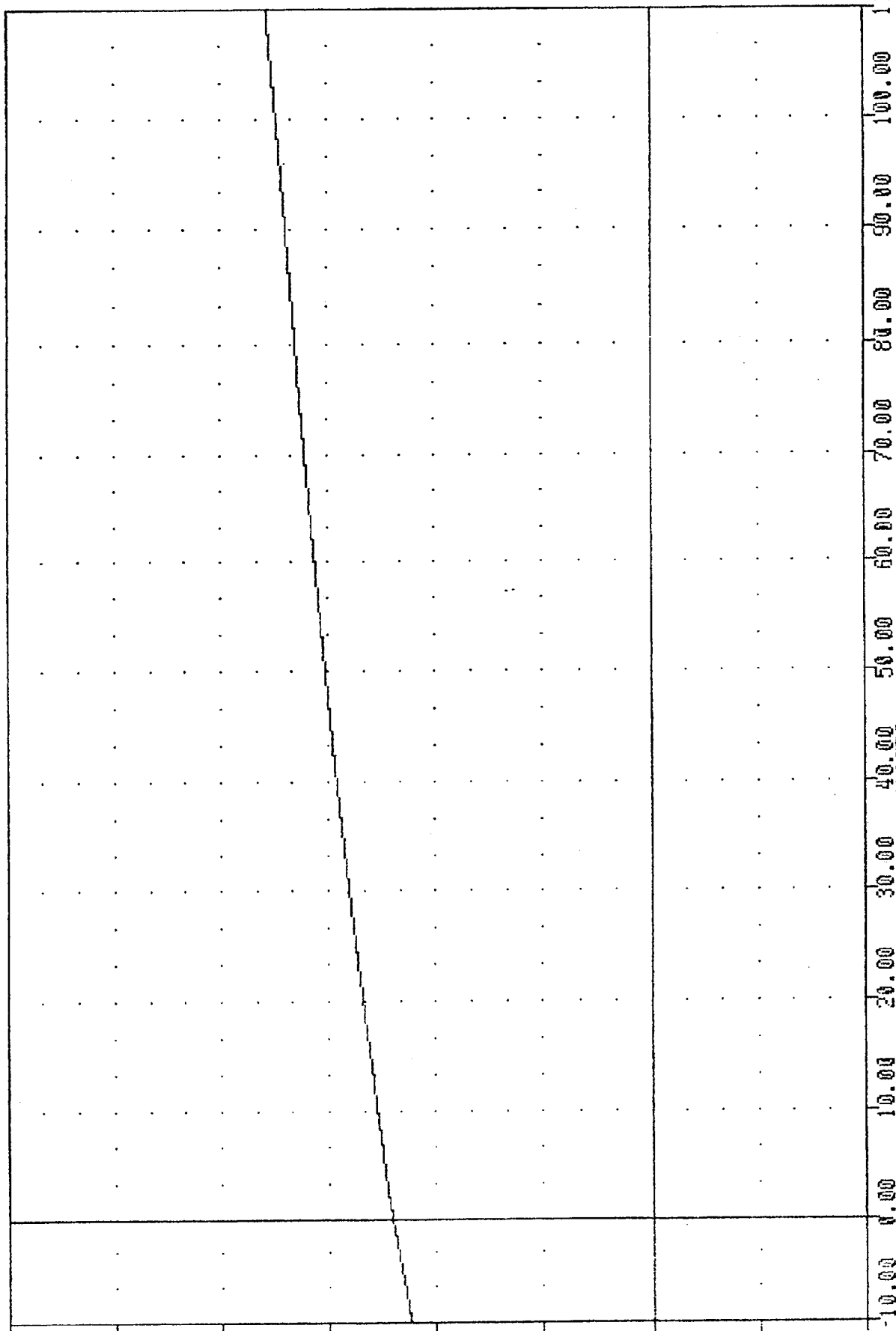
SH01608
SID 016 HEND IMPACT CAL 00

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = 11.16e -10.00, 17.81 e 110.00

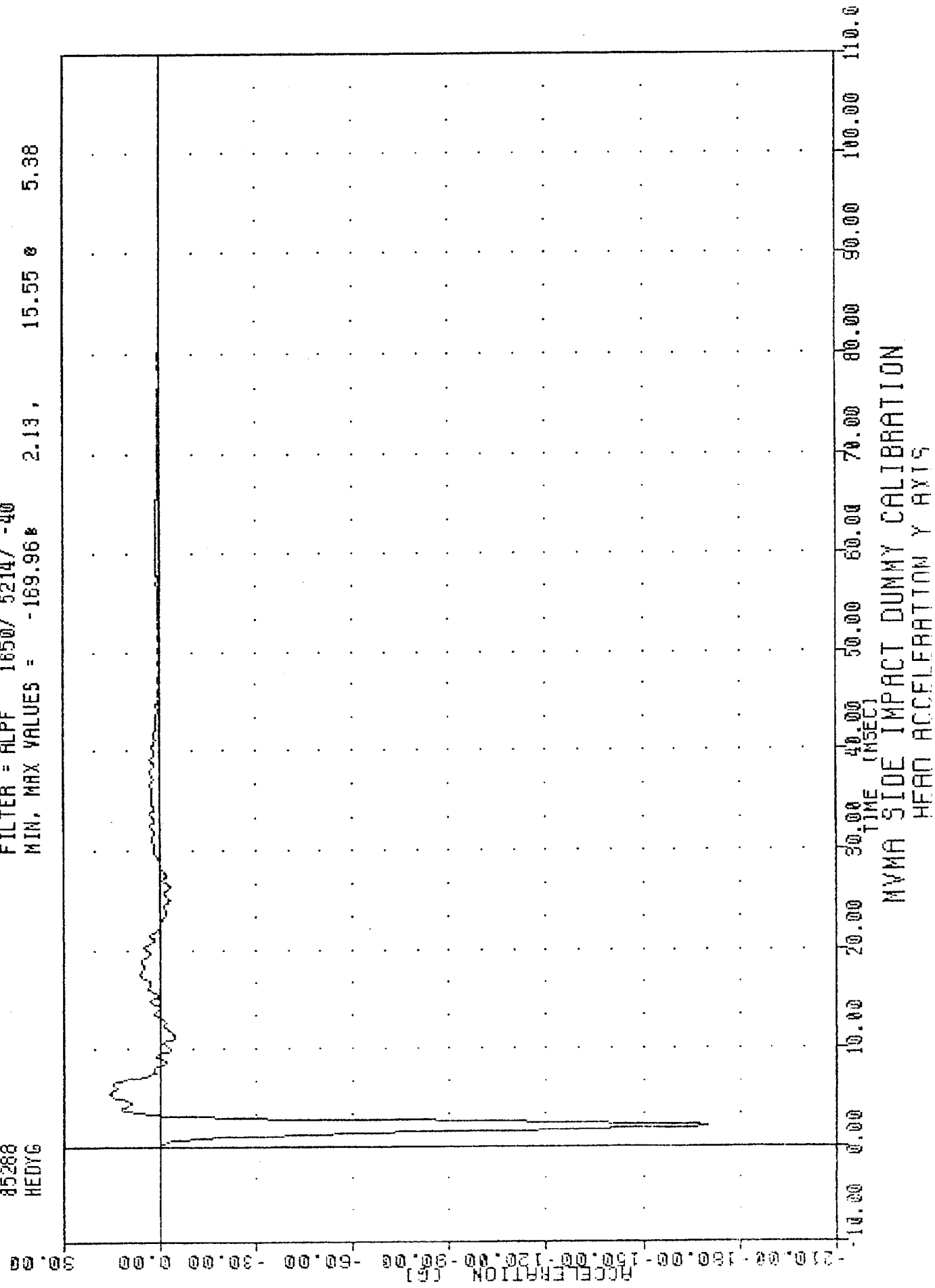
PISXD

DISPLACEMENT (IN)



MVMA SIDE IMPACT DUMMY CALIBRATION
PISTON DISPLACEMENT

NVMA 85268 HEDYG
 S16-016 HEDY Impact CHC 08
 PLOT DATE 15-OCT-85 16:05:15
 FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -169.96 2.13, 15.55 5.38



PLOT DATE 18-OCT-85 10:34:09

SI01608

SI01608

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -18.98 30.13, -0.22 89.50

85289

PISXG

30.00

20.00

10.00

0.00

-10.00

-20.00

-30.00

-40.00

-50.00

-10.00

0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00

TIME (MSEC)
MVMA SIDE IMPACT DUMMY CALIBRATION
PISTON ACCELERATION

PLOT DATE 16-OCT-85 10:34:09

SI 1608

MAX AC

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = 1.10e 110.00, 13.84 e -0.75

85269

PI3XV

30.00

25.00

20.00

15.00

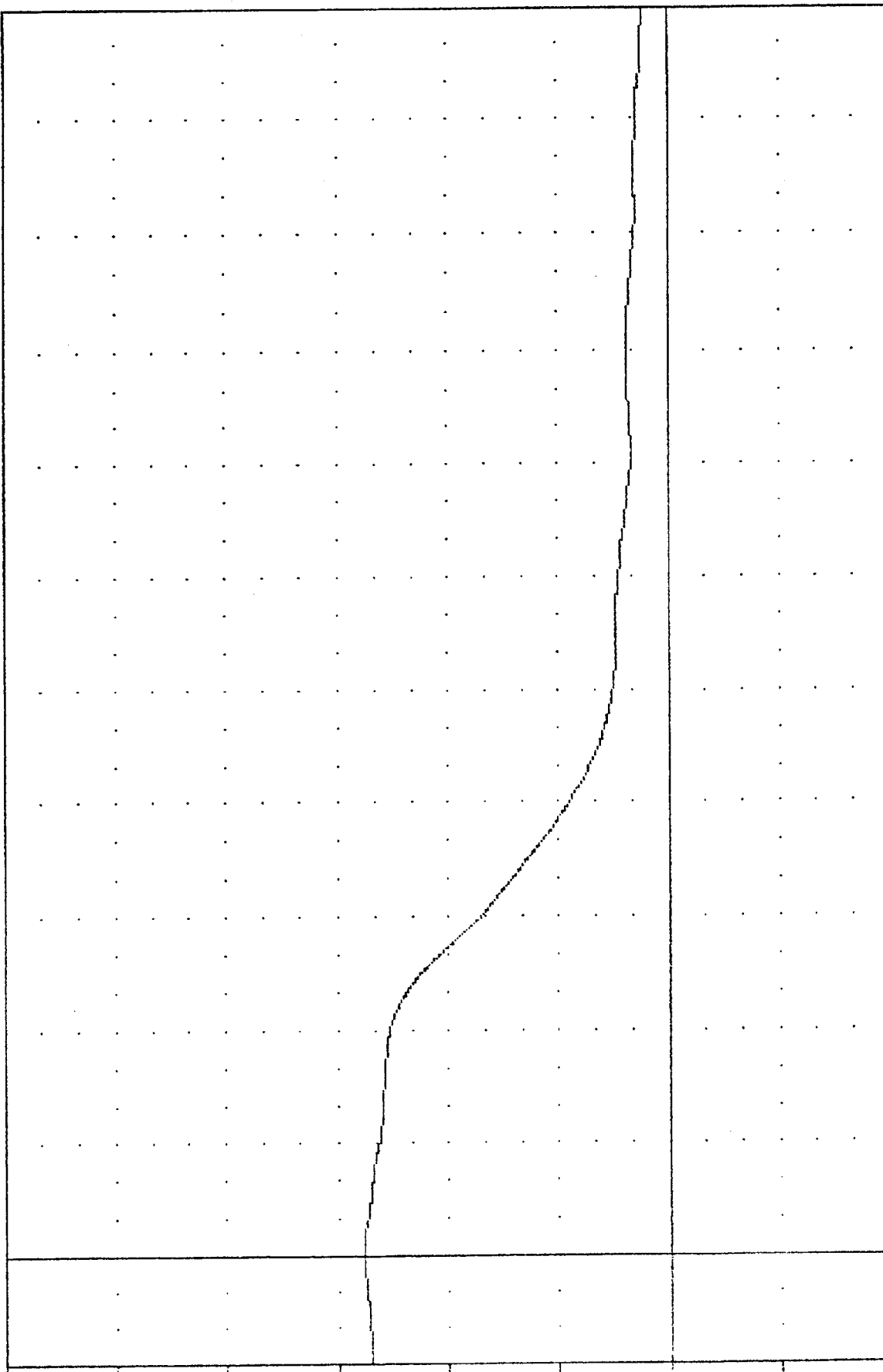
10.00
VELOCITY (FT/SEC)

5.00

0.00

-5.00

-10.00

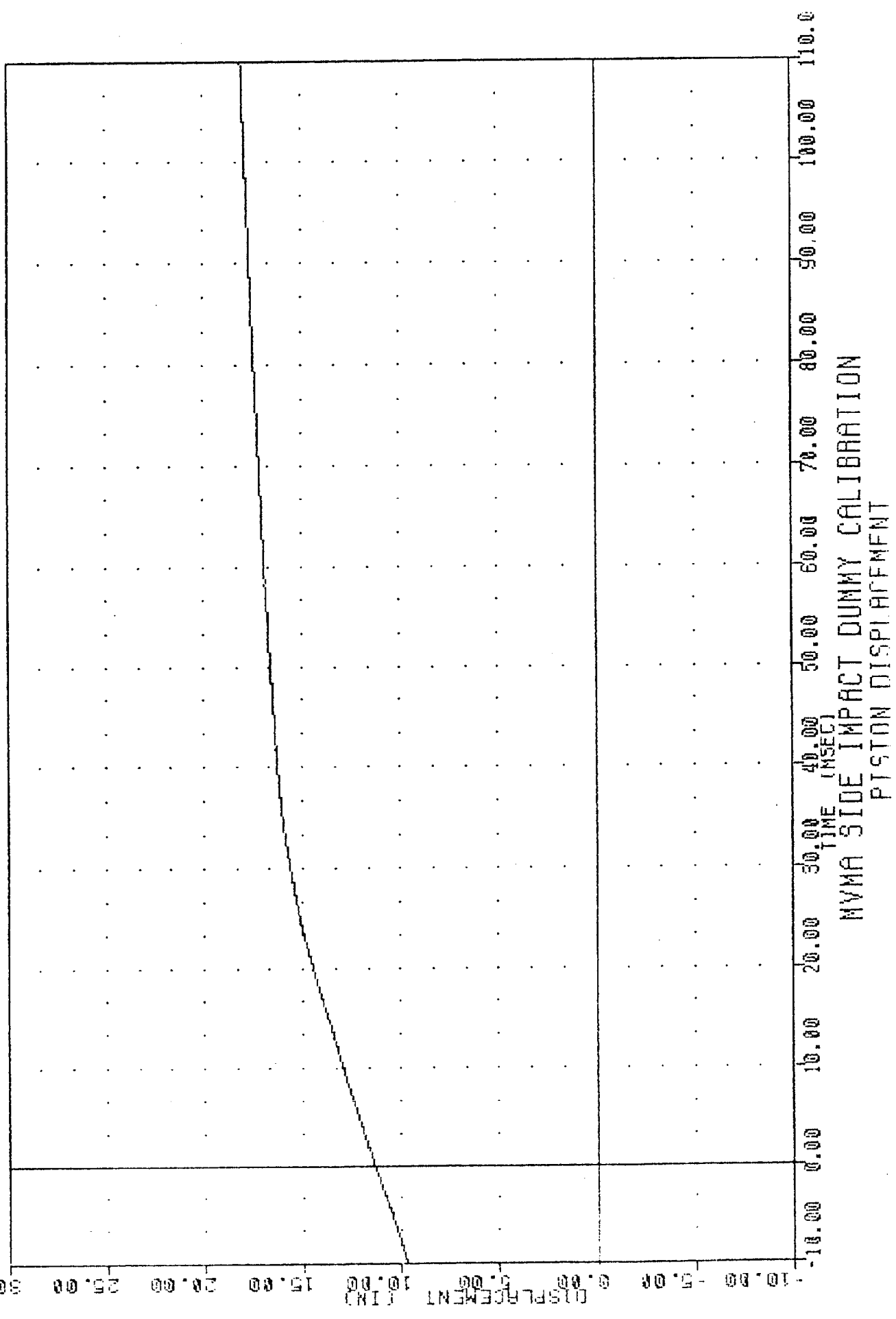


110.00

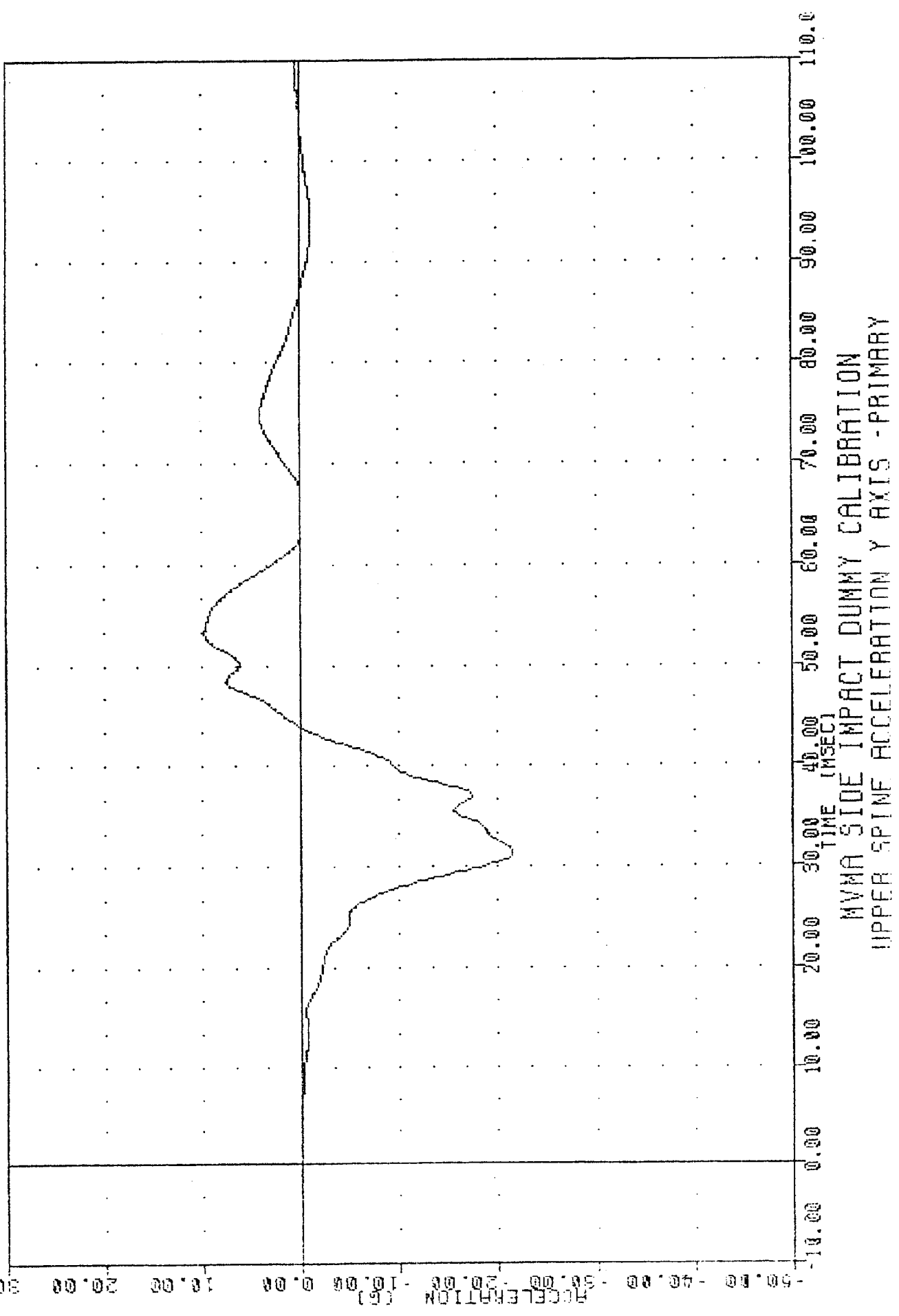
MYMA SIDE IMPACT DUMMY CALIBRATION

PISTON VELOCITY

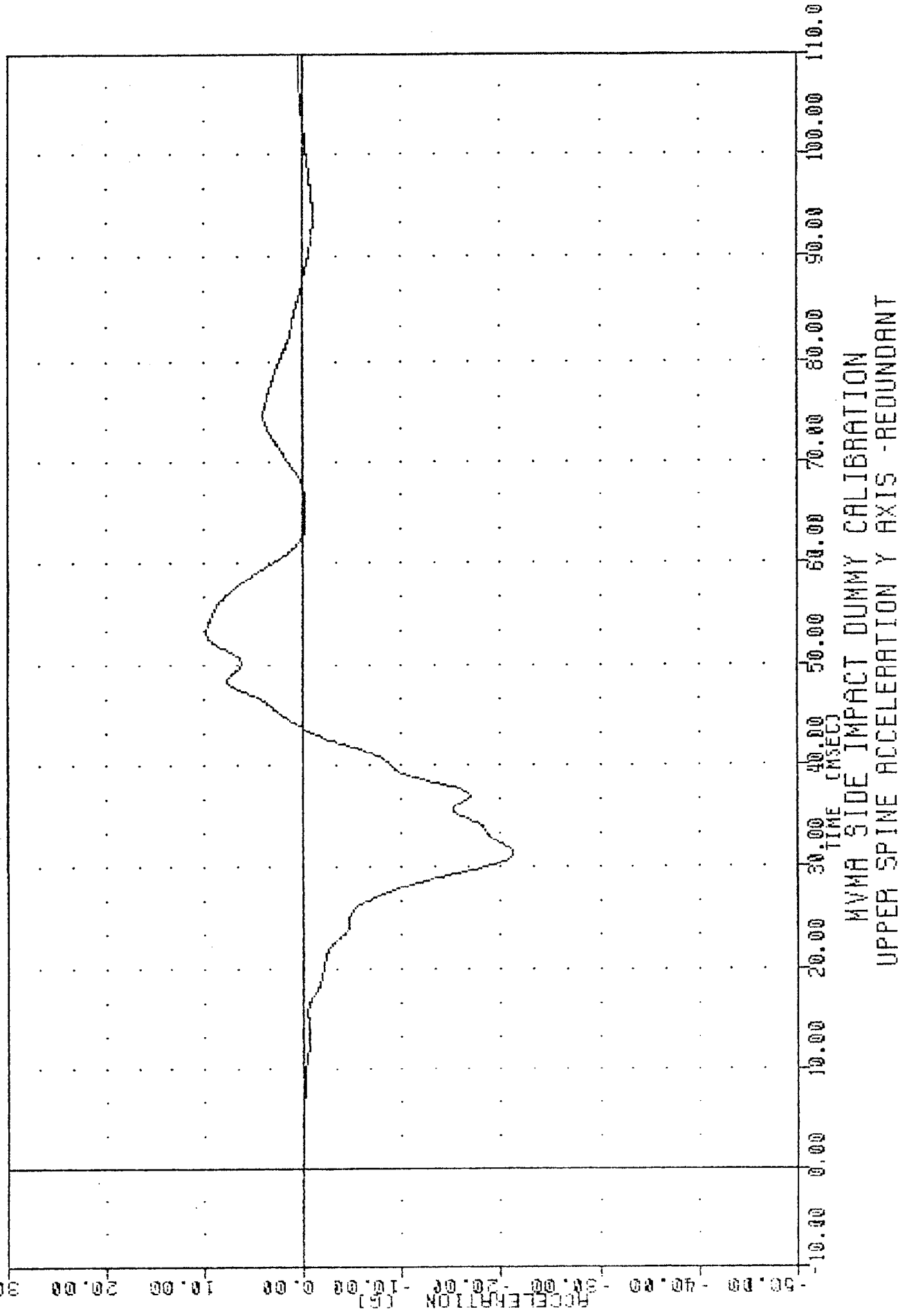
NVMA 85289
 310-216
 P15XD
 FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 9.68 18.03 109.88
 PLOT DATE 18-OCT-85 13:36:30
 SIG1608
 MAX IMPACT CAL 08
 MIN, MAX VALUES = -10.00 100.00 110.00



NMMA
 5101608
 51016
 85289
 701Y62
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -21.50B 31.38, 9.68 e 53.25



MVHR
 85289
 T01Y08
 16-0CT-85 10:34:09
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -21.28 31.25, 9.72 53.13



FLUT DATE 18-OCT-85 10:34:08

VIEW 08

MAX

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -20.41 30.50 9.01 50.88

85289

T12762

ACCELERATION (G)

30.00

20.00

10.00

0.00

-10.00

-20.00

-30.00

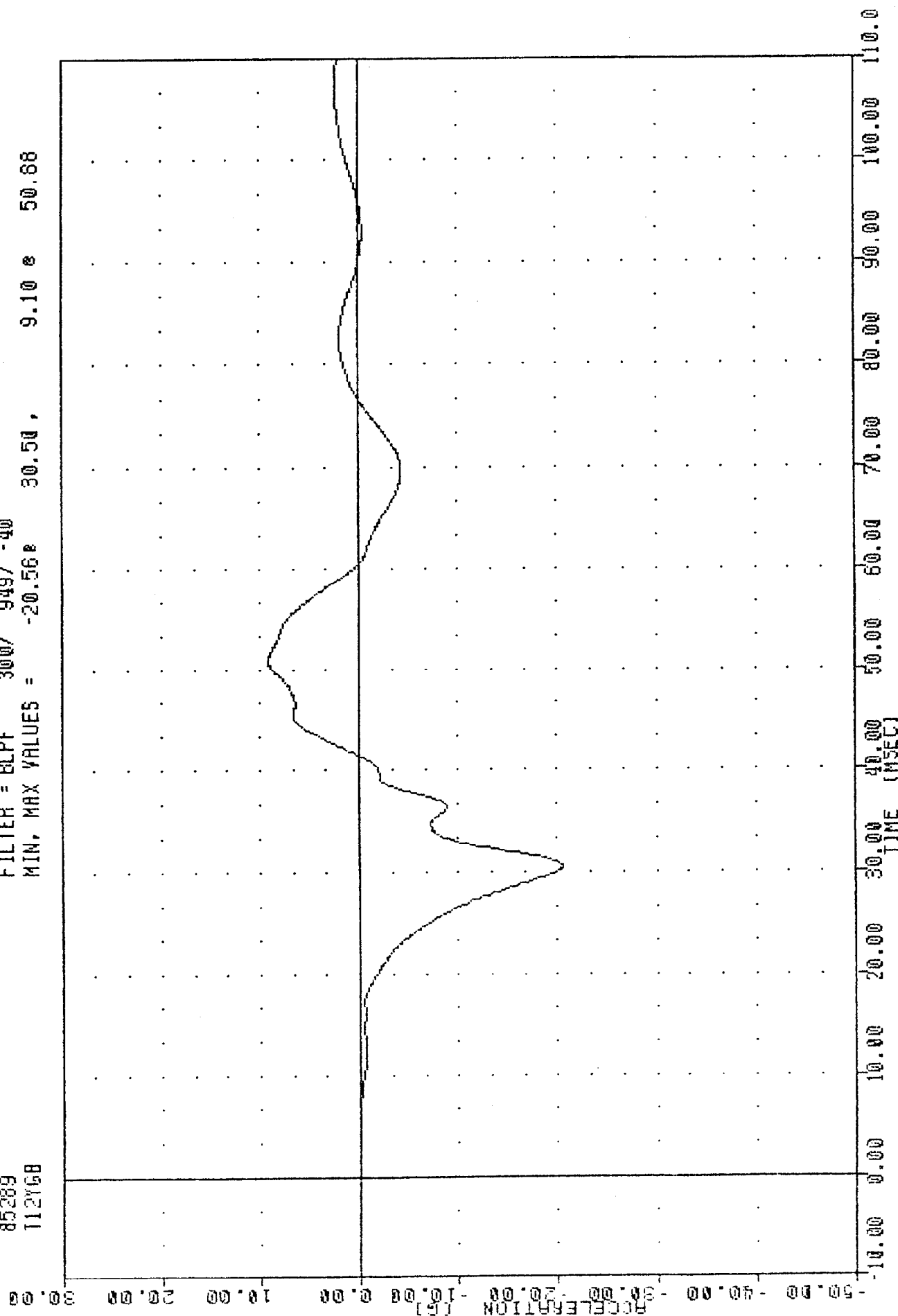
-40.00

-50.00

TIME (NSEC) 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00

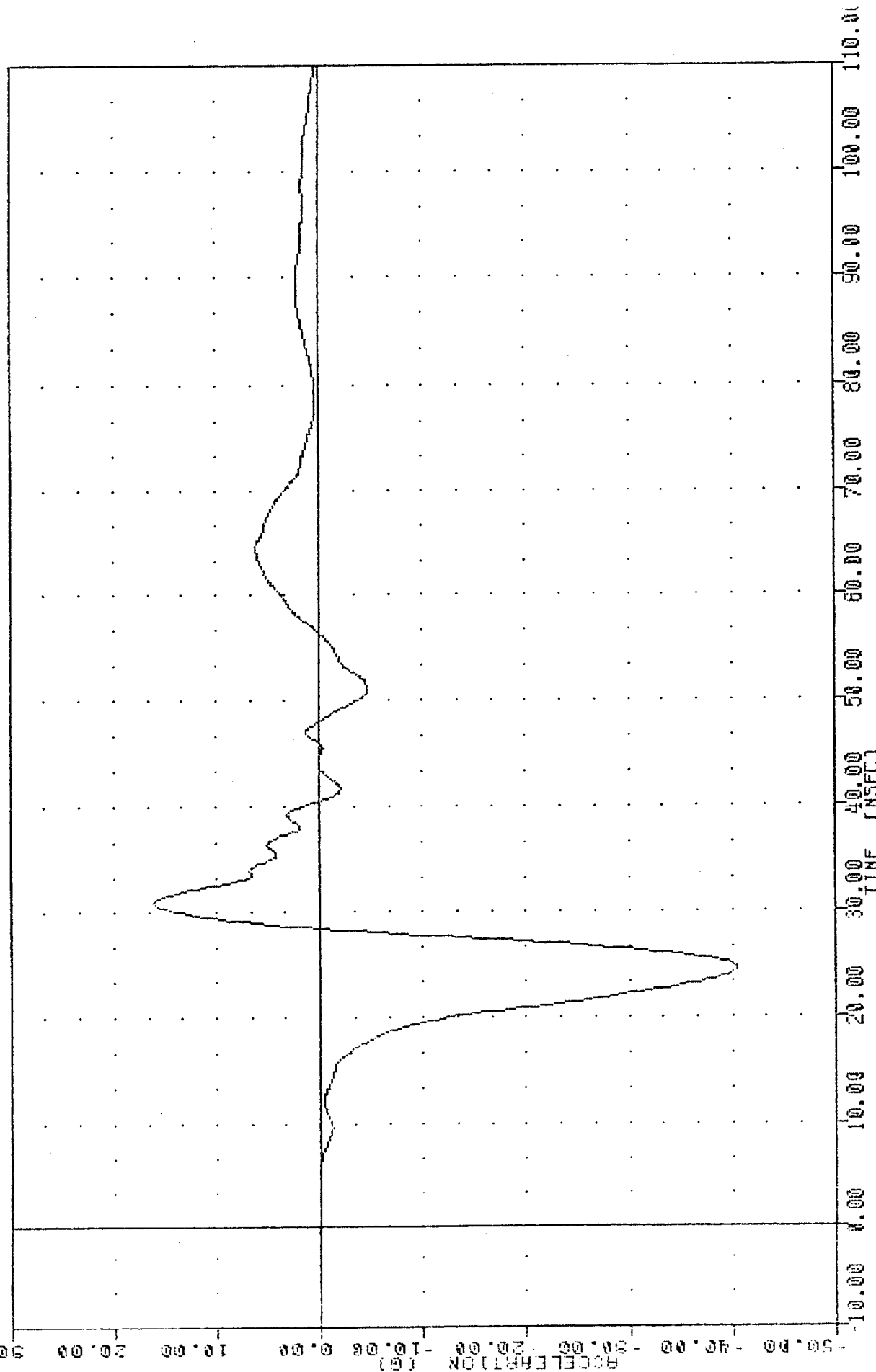
MVMA SIDE IMPACT DUMMY CALIBRATION
LOWER SPINE ACCELERATION Y AXIS -PRIMARY

NVMA 85289
 112YGB
 85289
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -20.568 30.50, 9.10 50.88
 18-OCT-85 10:34:09



NVMA SIDE IMPACT DUMMY CALIBRATION
 LOWER SPINE ACCELERATION Y AXIS -REDUNDANT

MWMA 85289 RURT62
 MAX ACTUAL Q
 FILTER = BLPF 300 / 949 / -40
 MIN, MAX VALUES = -40.480 24.63 16.04 31.00
 PLOT DATE 18-DEC-85 10:34:09



MWMA SIDE IMPACT DUMMY CALIBRATION
 RIGHT UPPER RIB ACCELERATION Y AXIS -PRIMARY

PLOT DATE 18-OCT-85 10:34:09

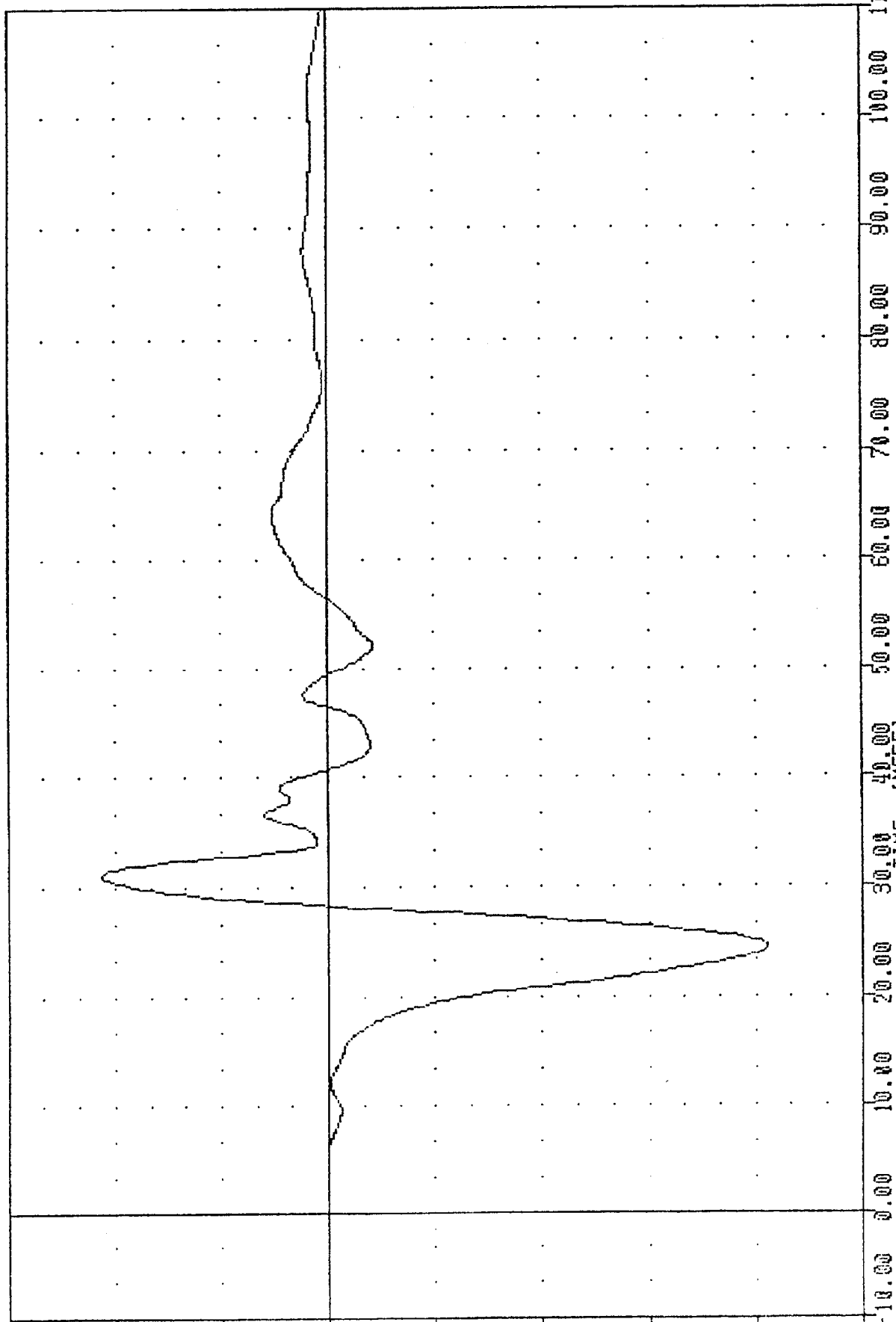
ST01608
MAX IMPACT CHL 05

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -41.17 24.50 21.27 31.00

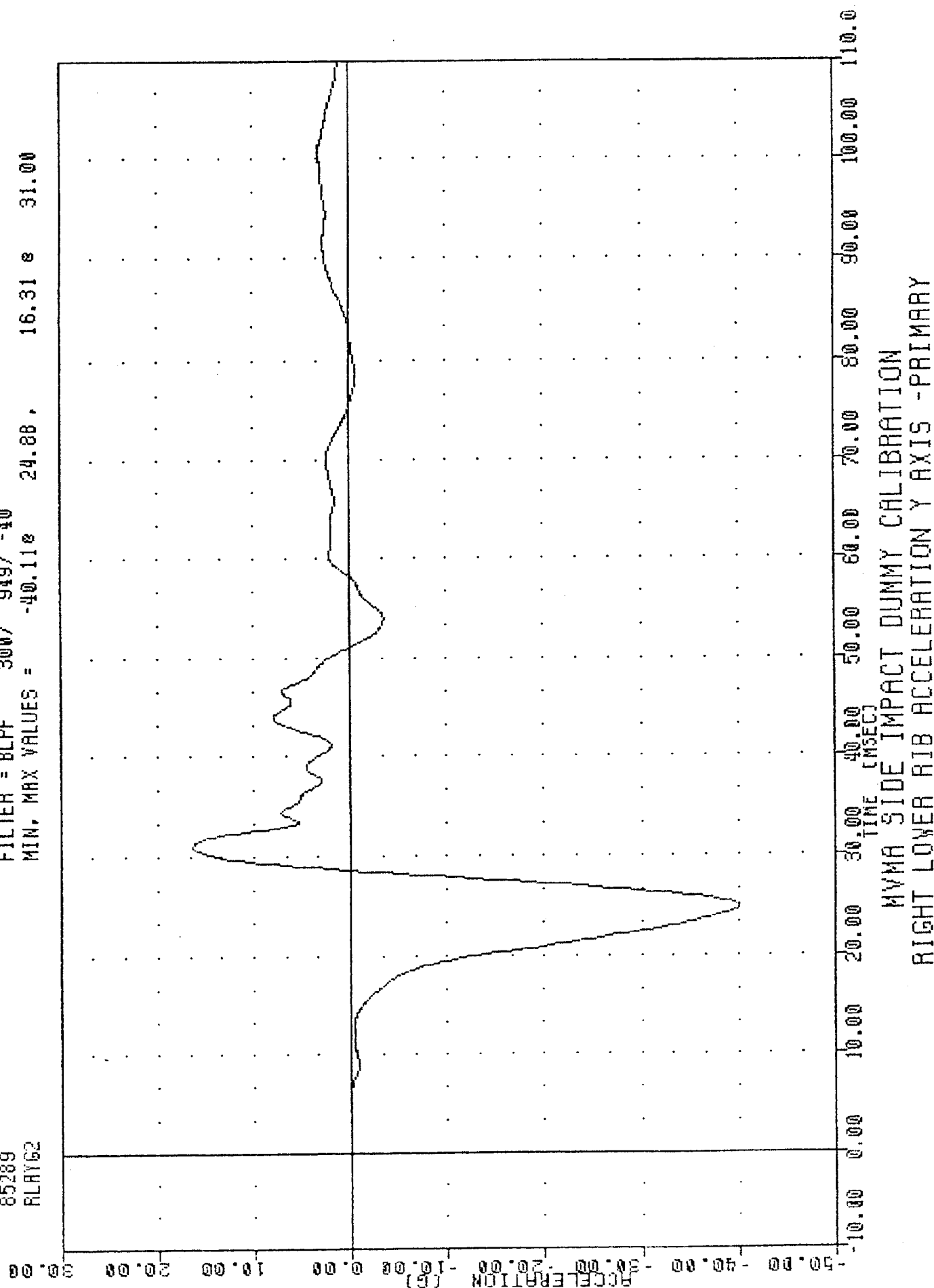
85289
AURYGB

ACCELERATION (G)



MYMA SIDE IMPACT DUMMY CALIBRATION
RIGHT UPPER RIB ACCELERATION Y AXIS -REDUNDANT

MVMA 6 3101503 18-OCT-85 10:24:09
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -40.110 24.88, 16.31 8 31.00
 85289
 RLAY62



10:34:08

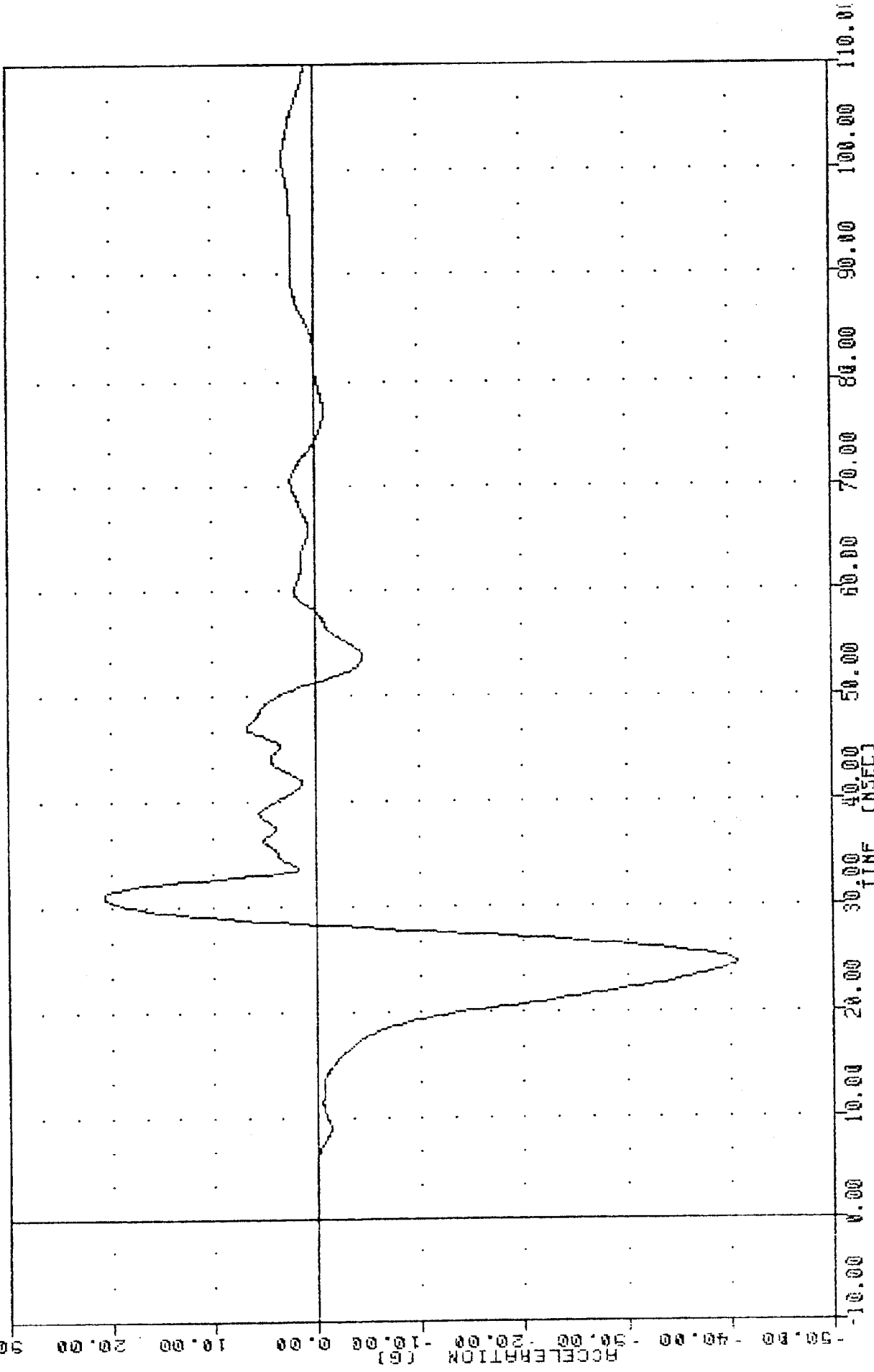
10:00:00

10:00:00

10:00:00

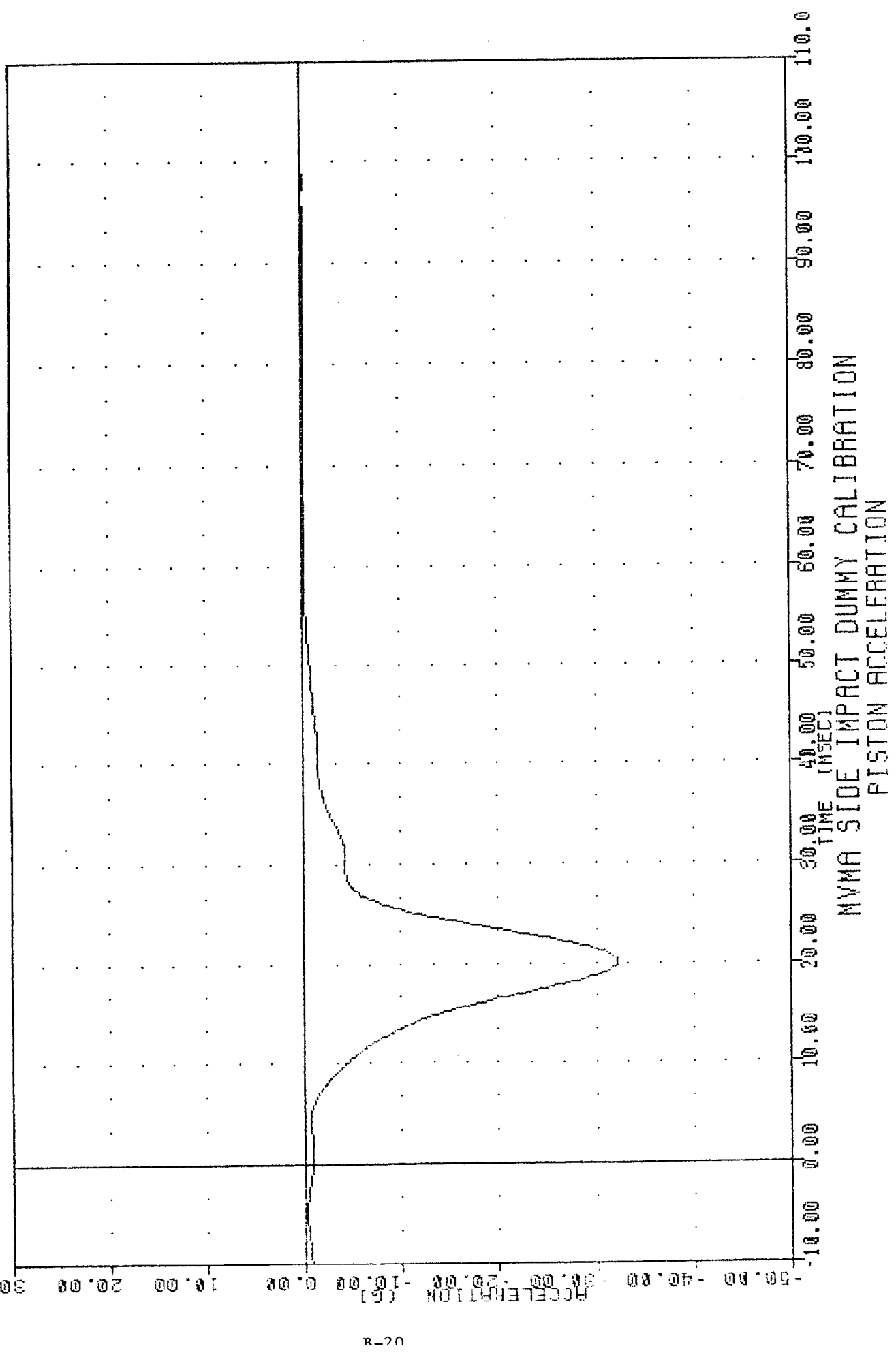
10:00:00

85289
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -40.648 24.75 20.68 31.13



MVMA SIDE IMPACT DUMMY CALIBRATION
RIGHT LOWER RIB ACCELERATION Y AXIS -REDUNDANT

NVMA 816-016 PELVIC IMPACT CAL 08
 SP01608
 85288
 PISXG
 PLOT DATE 15-OCT-85 16:05:53
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -32.288 20.00, -0.068 101.75



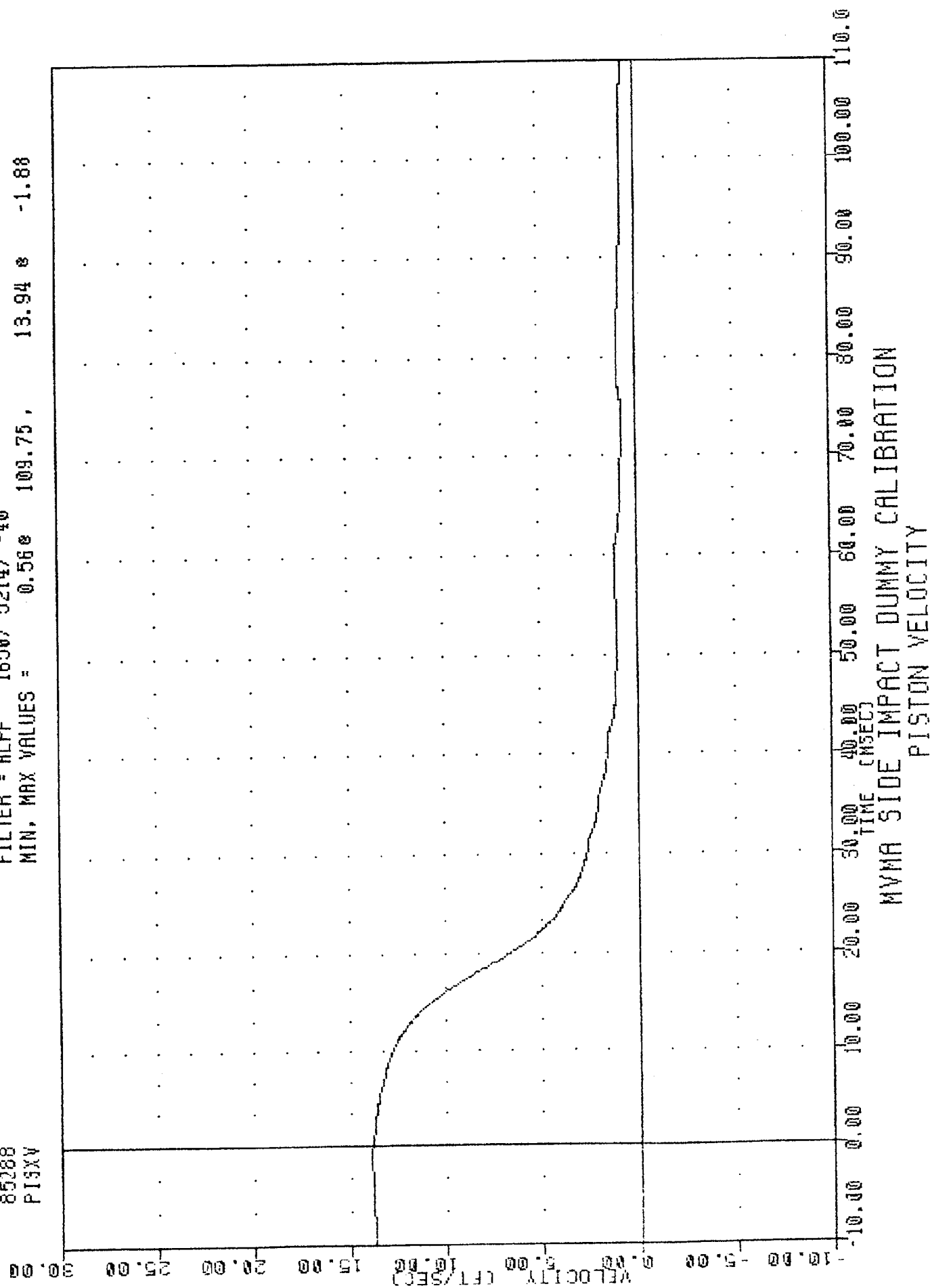
PLOT DATE 15-OCT-85 16:05:53

MVNA S18016 PELVIC IMPACT CAL 00

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = 0.56e 109.75, 13.94 e -1.88

85288
PI3XV



NOV 18 1985 13:36:30

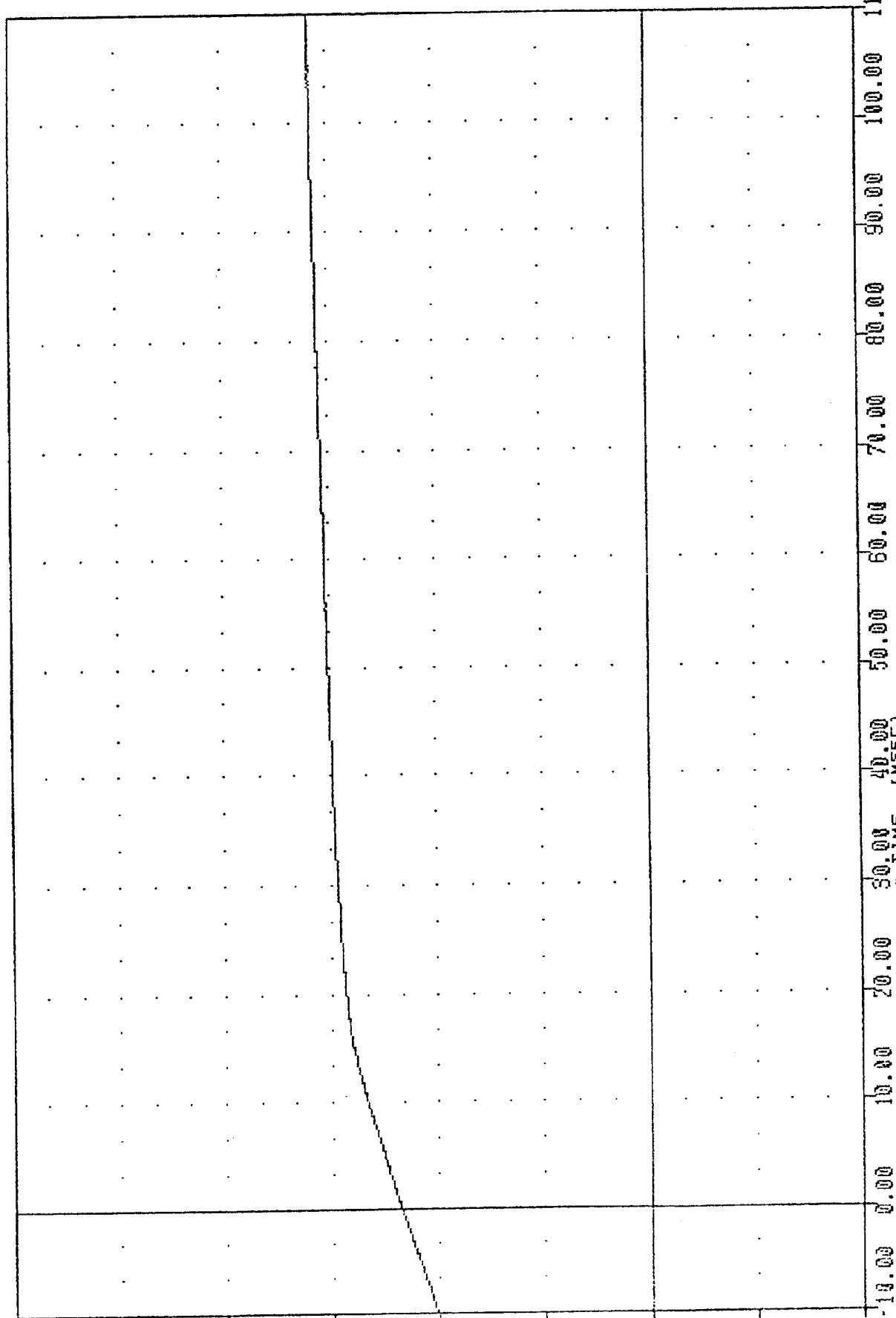
SP01608
VIC PRG AL

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = 10.118 -10.00, 15.87 110.00

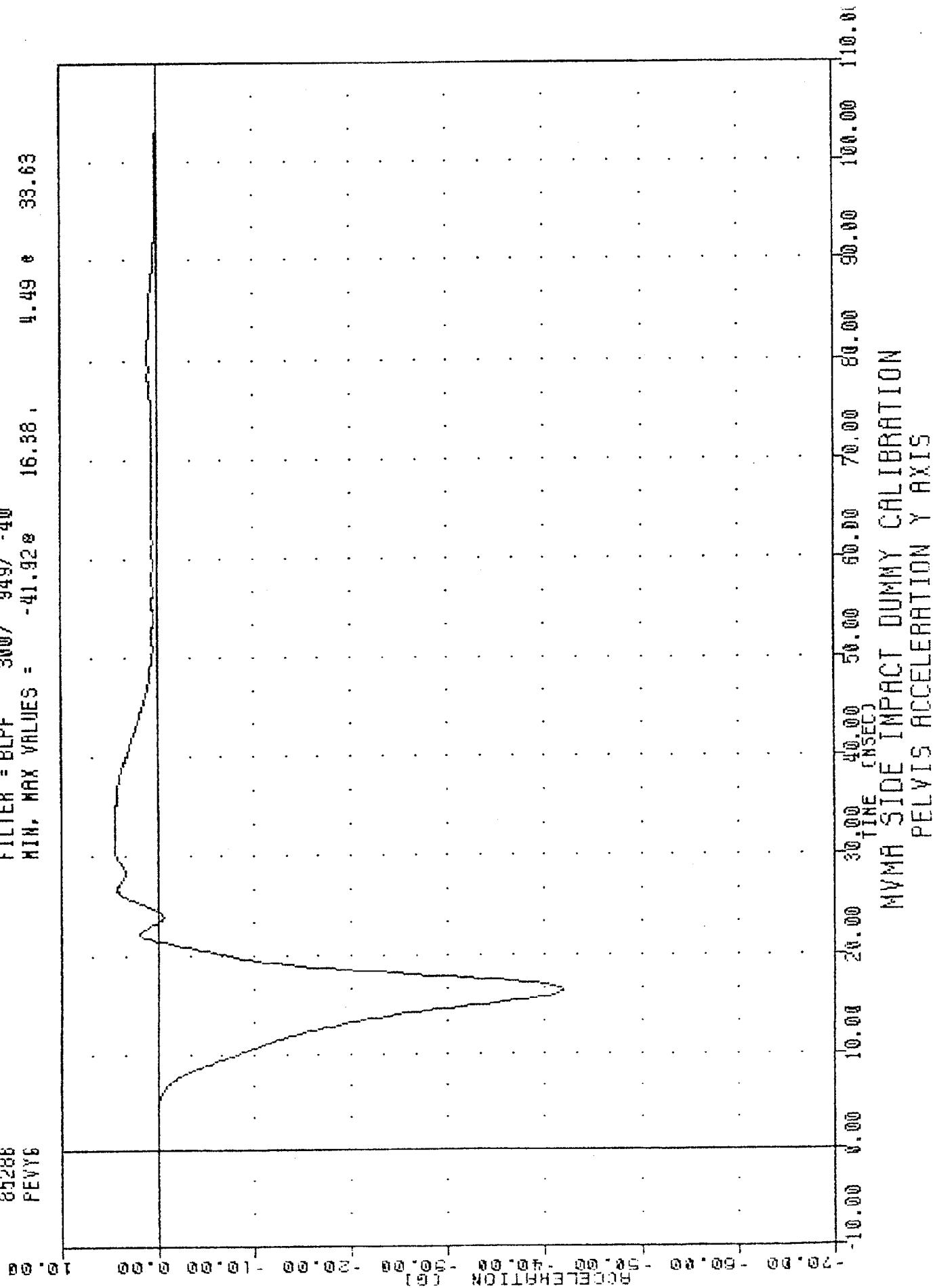
PISXD

DISPLACEMENT (IN)



NVMA SIDE IMPACT DUMMY CALIBRATION
PISTON DISPLACEMENT

MVMA, SP01608, 15-OCT-85, 16:05:53
 SID 038 PELVIC IMPACT CHL 06
 85288
 PEVY6
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -41.928 16.38, 4.49 33.63



POST-TEST
SIDE IMPACT DUMMY CALIBRATION

SIDE IMPACT DUMMY CALIBRATION
DUMMY SERIAL NUMBER 016
CALIBRATION 09

TEST/ DATE	CHANNEL	FILTER CLASS	PEAK ACCELERATION (g)	
			SPECIFICATION*	TEST RESULT
HEAD 10/22/85	HEAD Y-AXIS	1000	150-175	154.81
THORAX 10/22/85	UPPER SPINE Y-AXIS			
	PRIMARY	180	16-24.6	22.20
	REDUNDANT	180	16-24.6	22.00
	LOWER SPINE Y-AXIS			
	PRIMARY	180	17.6-26.4	21.99
	REDUNDANT	180	17.6-26.4	22.23
	RIGHT UPPER RIB Y-AXIS			
	PRIMARY	180	36-50	42.29
	REDUNDANT	180	36-50	43.30
	RIGHT LOWER RIB Y-AXIS			
	PRIMARY	180	36-50	40.31
	REDUNDANT	180	36-50	40.83
PELVIS 10/23/85	PELVIS Y-AXIS	180	50-65	44.04

*Side impact test specifications currently in use by VRTC-NHTSA.

Side Impact Dummy
Damage Checklist

Dummy S/N 016

<u>OK</u>	<u>Damaged</u>	
<u>X</u>	<u> </u>	Outer skin on entire dummy (gashes, rips, etc.)
<u>X</u>	<u> </u>	Head - Gashes, rips, general appearance, etc.
<u>X</u>	<u> </u>	Neck - broken or cracks in rubber
<u>X</u>	<u> </u>	Spine - broken or cracks in rubber
<u>X</u>	<u> </u>	Ribs - check all ribs for damage (bent or broken), damping material separation.
<u>X</u>	<u> </u>	Rib Attach Leather - breaks in leather at ribs
<u>X</u>	<u> </u>	Bourns Pot. - bent shaft - electrical discontinuity
<u>X</u>	<u> </u>	Accelerometer Leads - torn cables
<u>X</u>	<u> </u>	Accelerometer Mountings (Head, Thorax, Pelvis) - check for secure mounting
<u>X</u>	<u> </u>	Retrofit Kit (Calspan) - check for bent brackets, sagging rib cage
<u>X</u>	<u> </u>	Thorax support wire and springs - check for damage
<u>X</u>	<u> </u>	Overall smooth stroking of thorax left to right (no interference)
<u>X</u>	<u> </u>	Other

If upon visual examination, damage is apparent in any of these areas, a VRTC representative is to be consulted for a decision on repair or replacement of parts.

Repair or Replacement Approved By:

Signature _____

Date _____

Comments on repair or replacement of parts:

Visual OK, Sent to Cal Lab for Post Sid, and 572 cal.

TRC Personnel
Checked By:

Signature _____

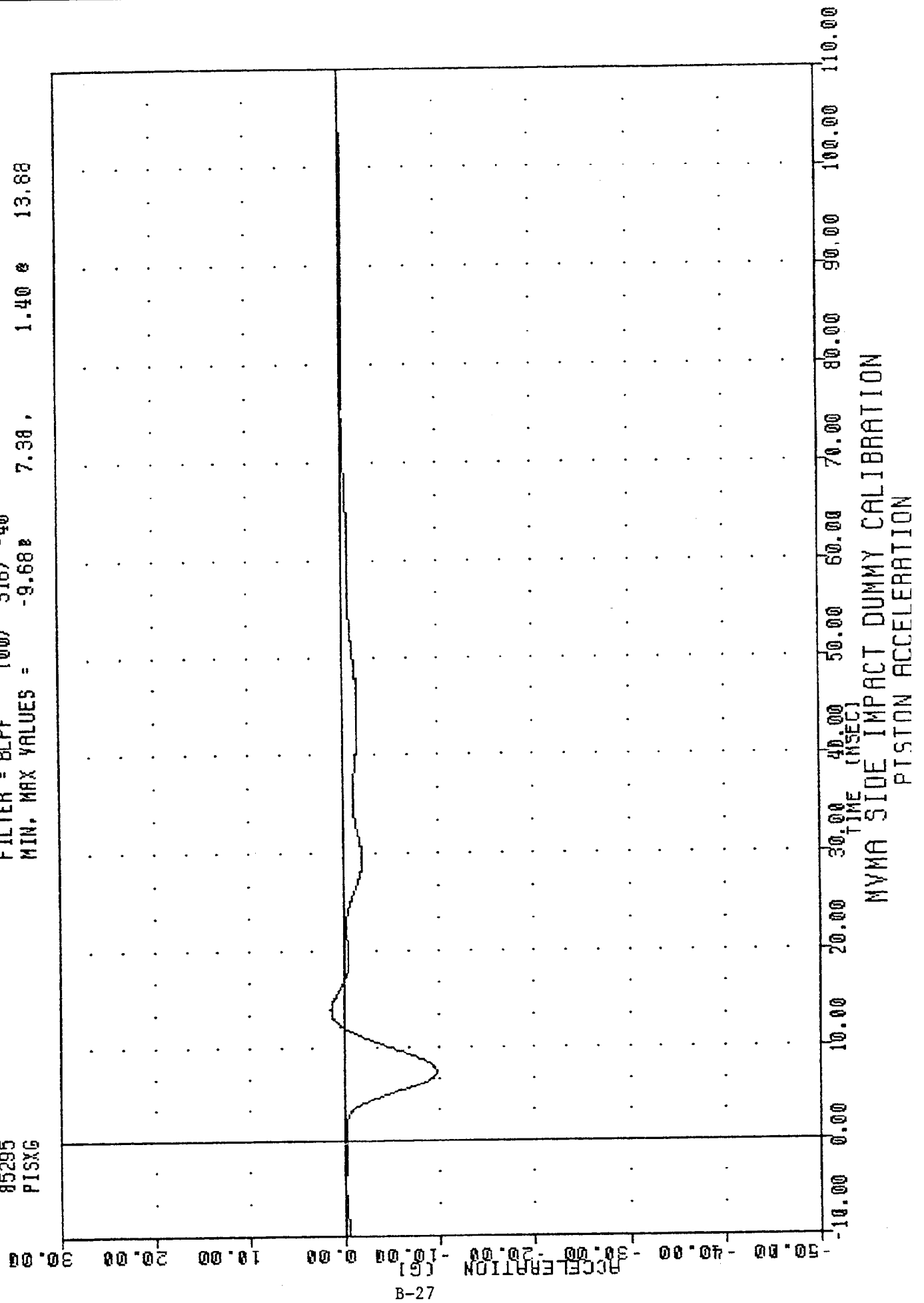
Date _____

VRTC Personnel
Checked and Approved for Testing By:

Signature _____

Date _____
B-26

NYMA 16000 22 OCT 85 15:50:19
 SID 016 HEAD IMPACT CAL 08
 85295
 PISXG
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -9.68 7.38 1.40 13.88



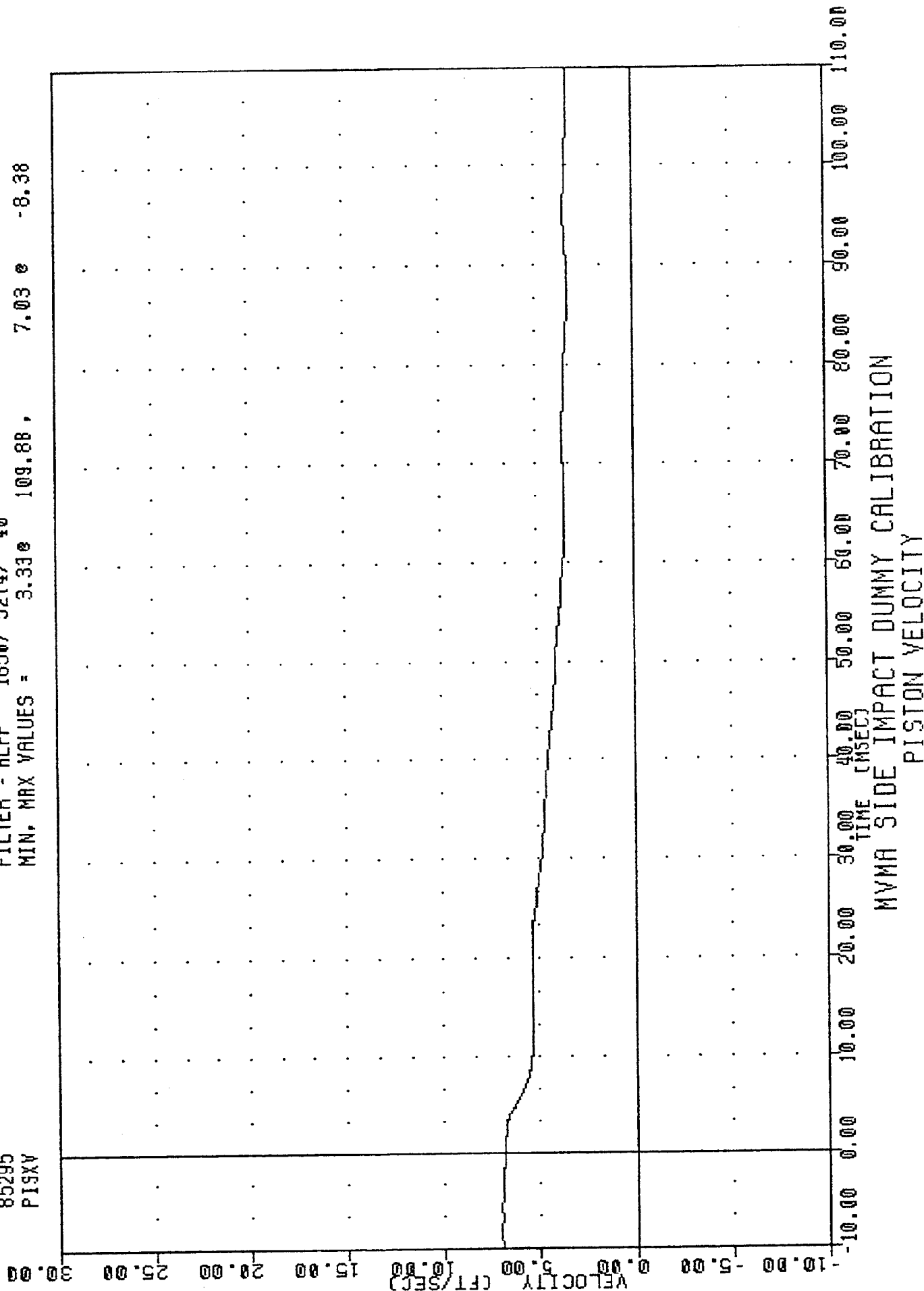
NYMA SIDE IMPACT DUMMY CALIBRATION
 PISTON ACCELERATION

MVMA
 SIO 016 HEAD IMPACT CAL 09
 85295
 PISXV

PLOT DATE 22-OCT-85 15:50:18

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = 3.330 109.88, 7.030 -8.38



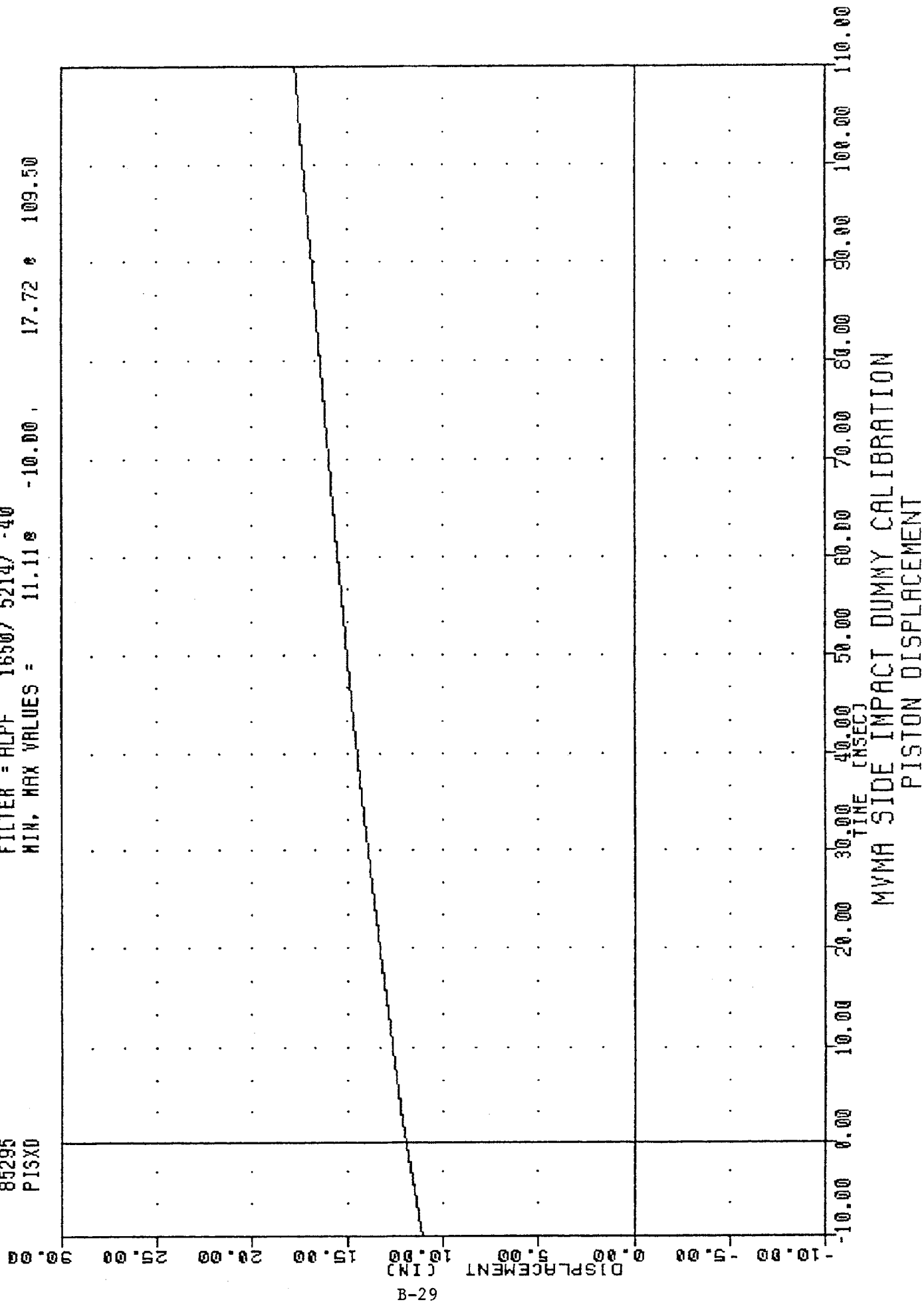
MVMA SIDE IMPACT DUMMY CALIBRATION
 PISTON VELOCITY

MYMA
 SID 018 HEAD IMPACT CHL 09
 85295
 PISXD

PLOT DATE 22-OCT-85 15:50:18

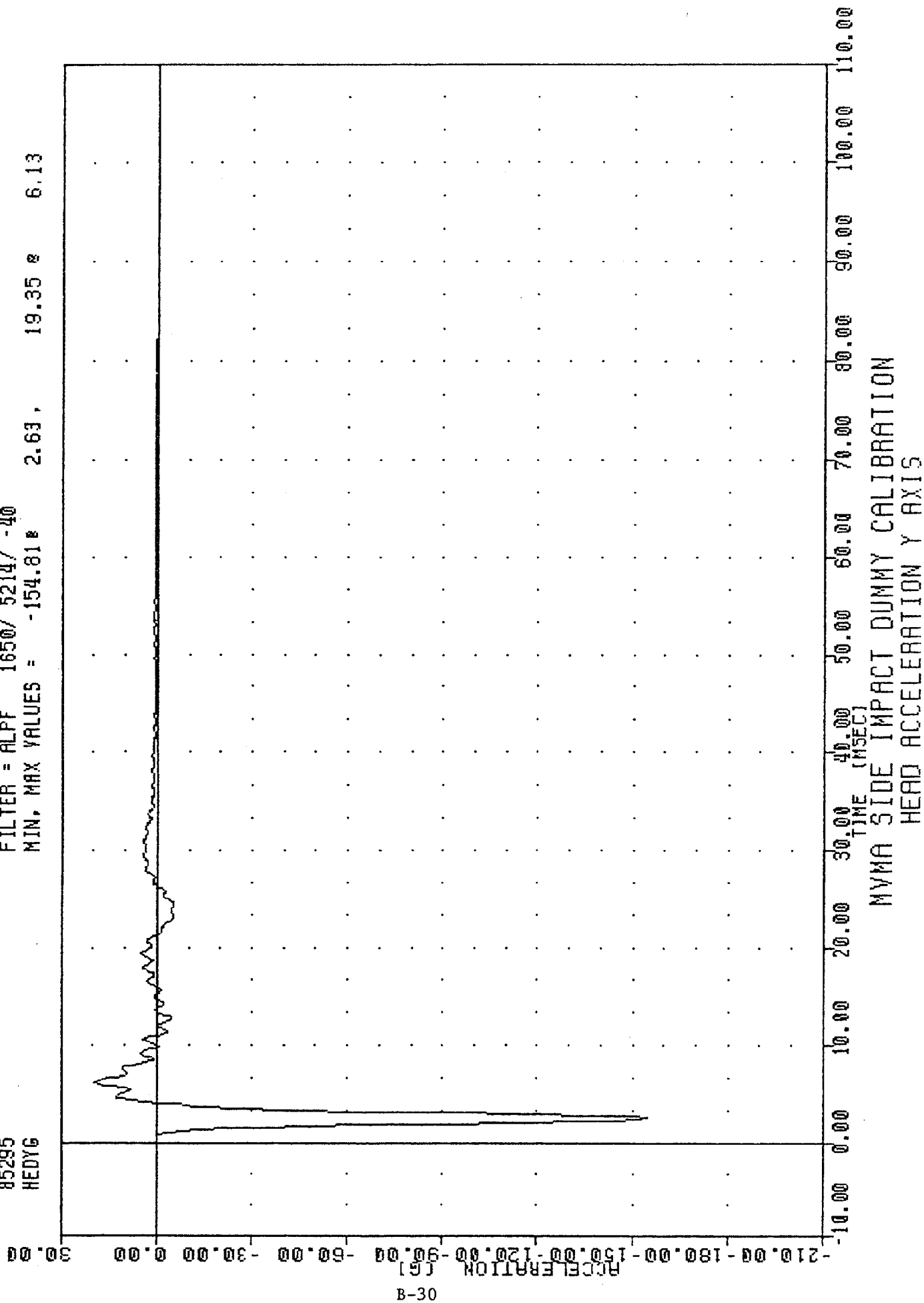
FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = 11.118 -10.00 17.72 109.50

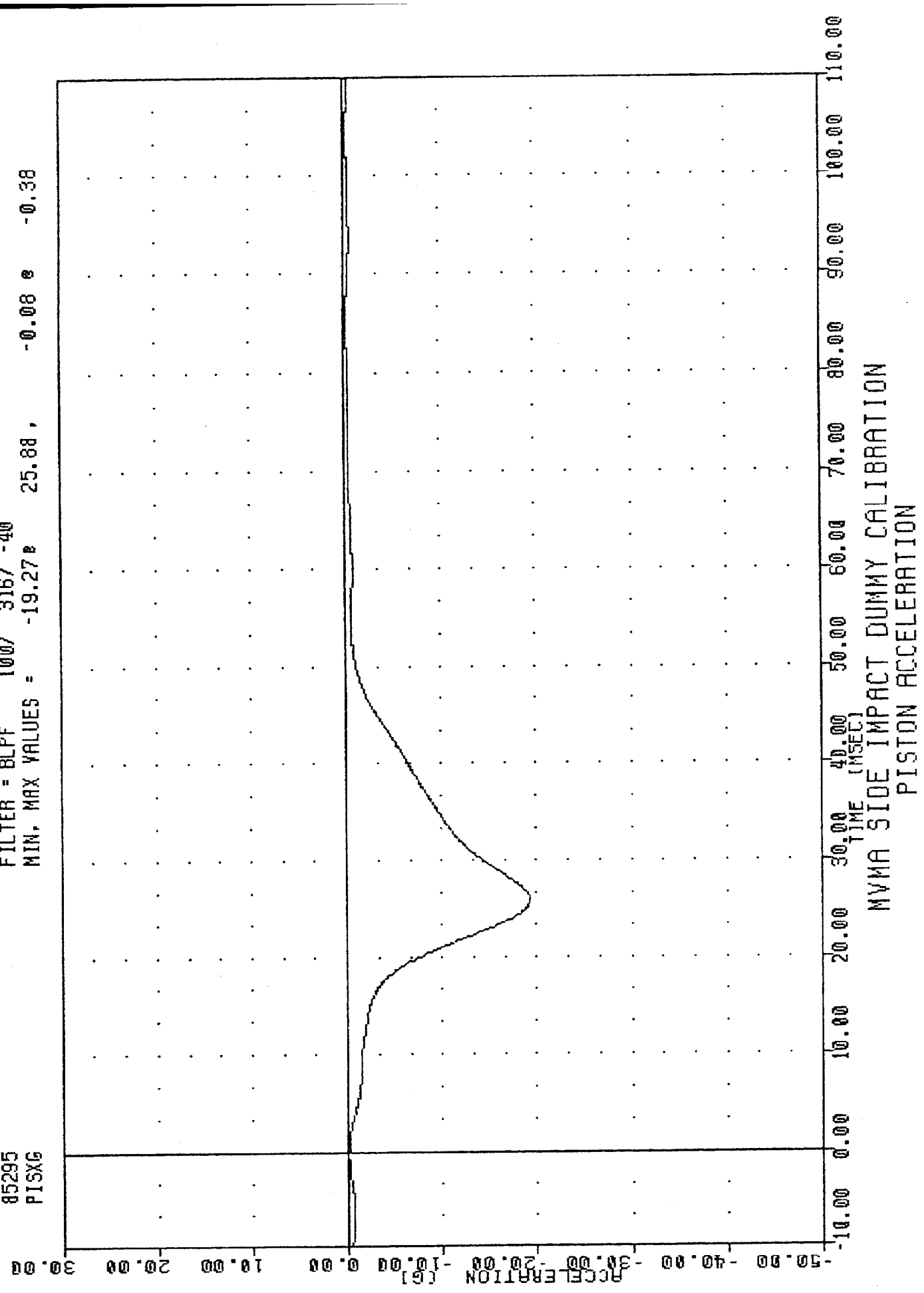


MYMO 016000 22 OCT 85 15:50:10
SID 016 HEAD IMPACT CAL 08

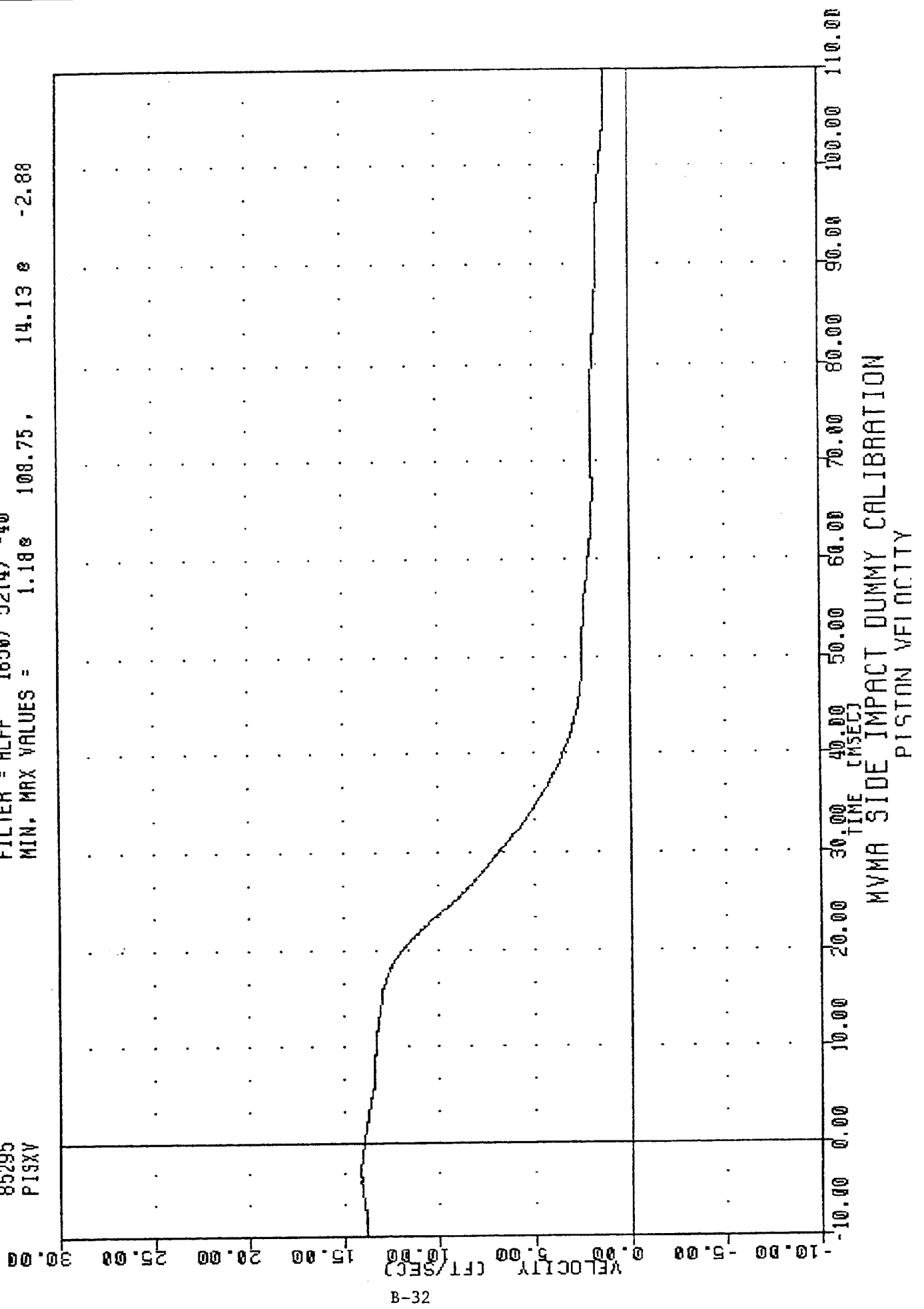
85295
HEDYG
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -154.81 2.63 19.35 6.13



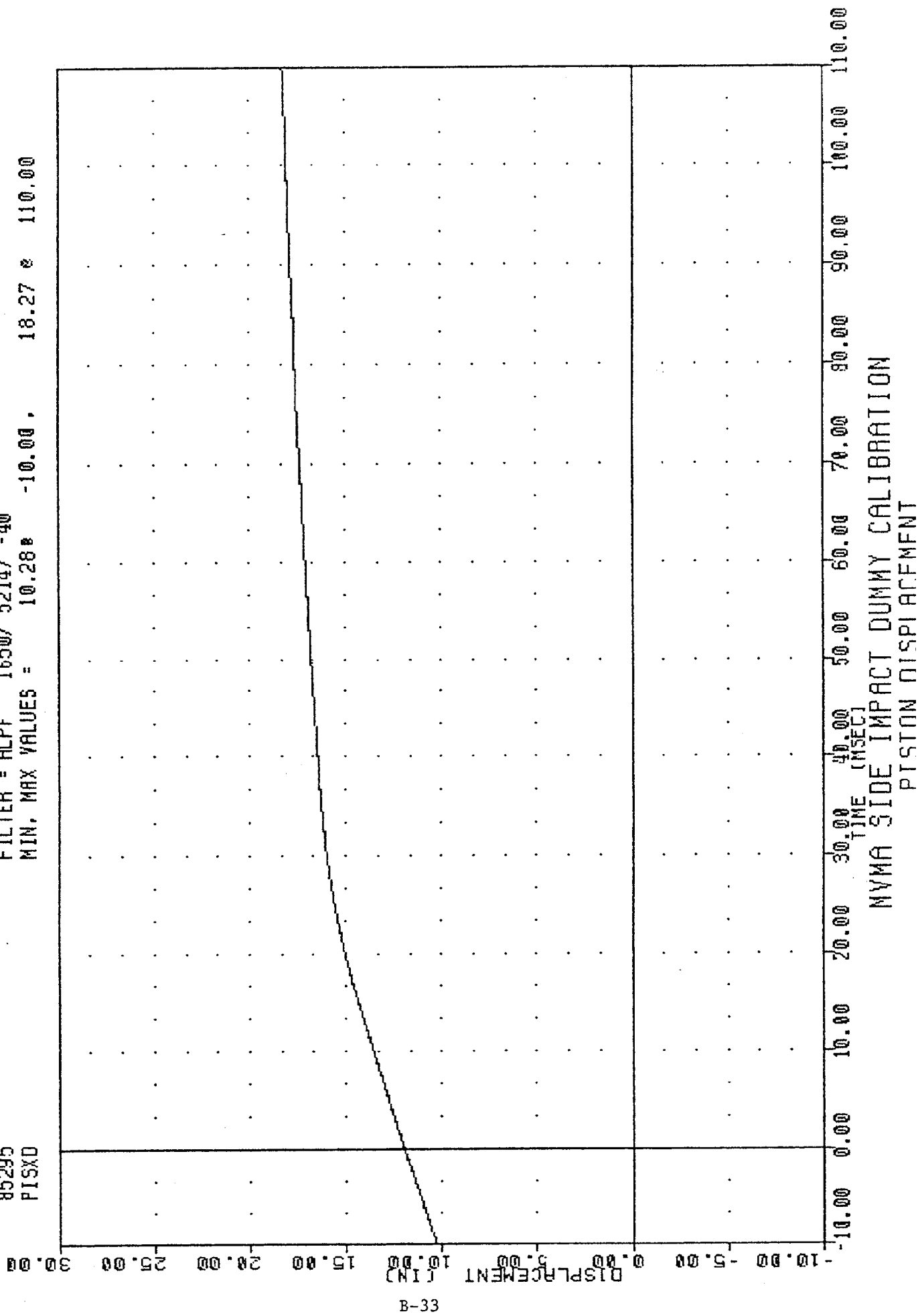
NYNRB
 STU 016 THORAX IMPACT CRL 08
 85295
 PISXG
 PLOT DATE 22-OCT-85 14:05:47
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -19.27 25.88, -0.08 0 -0.38



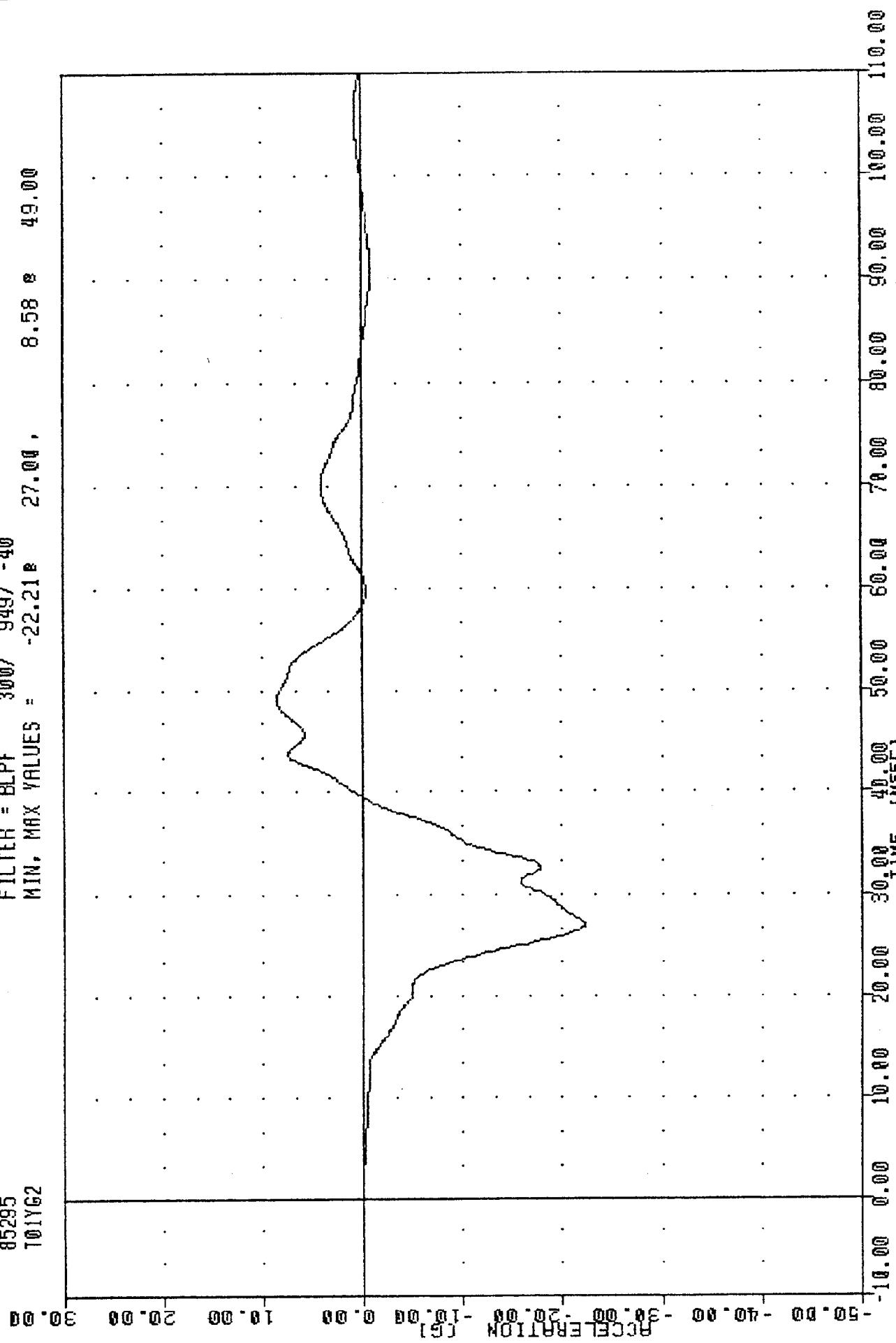
MVMA SID 016 THORAX IMPACT CAL 08
 85295
 PISXY
 FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 1.18 108.75, 14.13 8 -2.88
 PLT DATE 22 OCT 85 11:25:42



NVMA SID 016 THORAX IMPACT CAL 09
 85295
 PISXD
 FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 10.28 -10.00, 18.27 e 110.00
 PLOT DATE 31 OCT 85 09:27:31

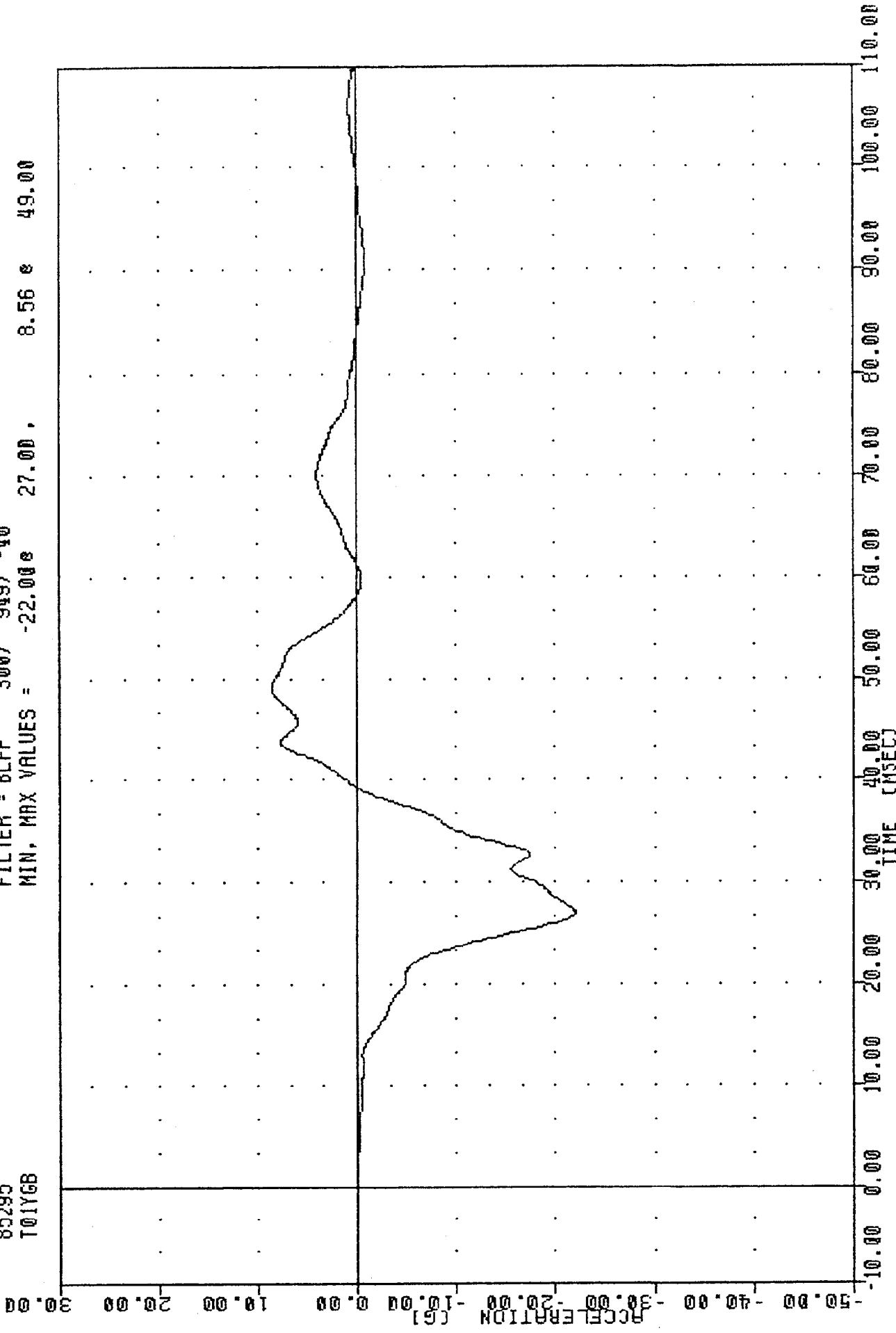


NYMA
 SIO 016 THORAX IMPACT CAL 09
 85295
 T01Y62
 PLOT DATE 22-OCT-85 14:05:47
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -22.21 27.00, 8.58 49.00



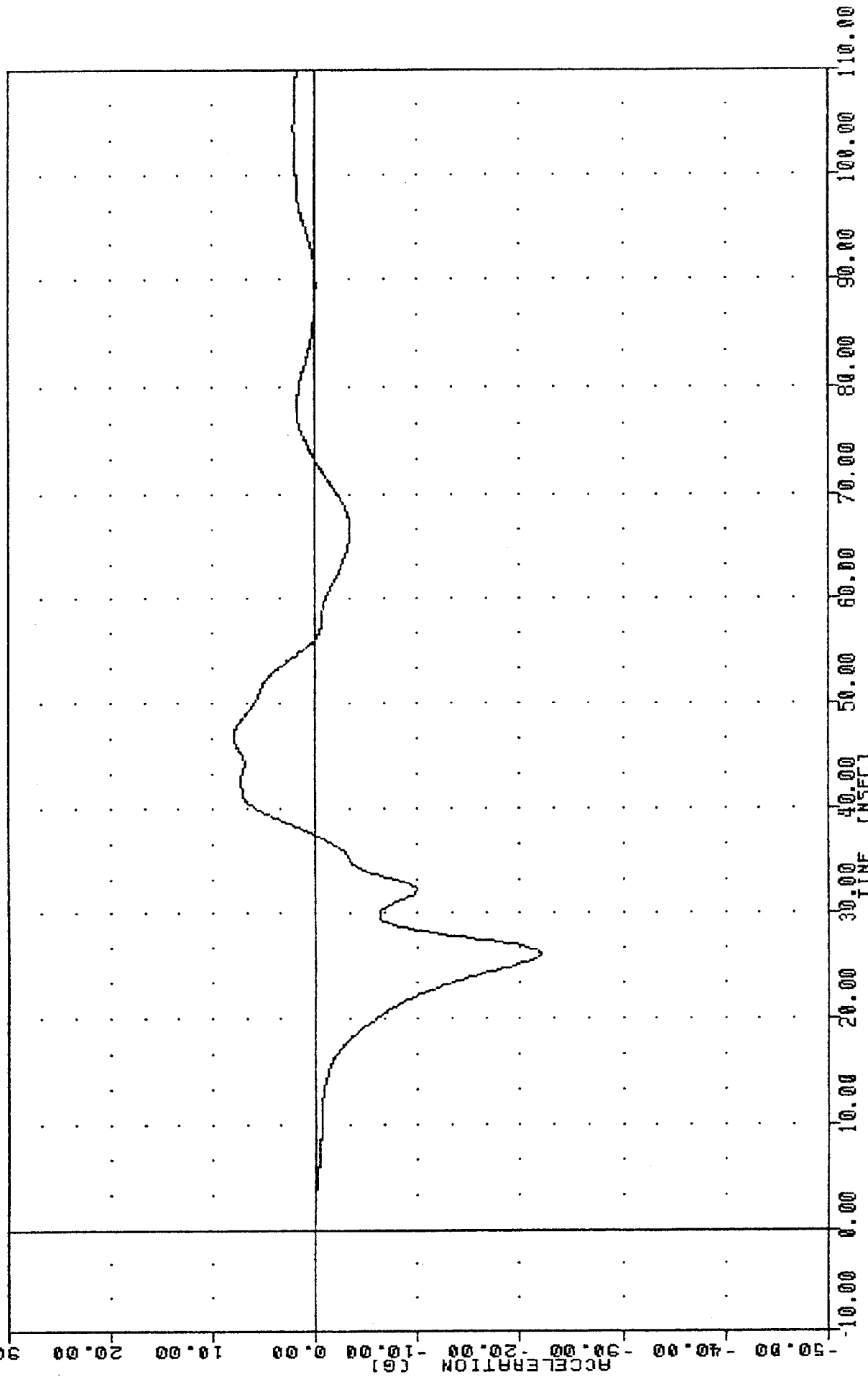
MVMA SIDE IMPACT DUMMY CALIBRATION
 UPPER SPINE ACCELERATION Y AXIS -PRIMARY

MVMA 85295 T01YGB
 ST01600
 THORAX IMPACT CAL 08
 PLOT DATE 22 OCT 85 11:05:47
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -22.000 27.000 8.56 49.00



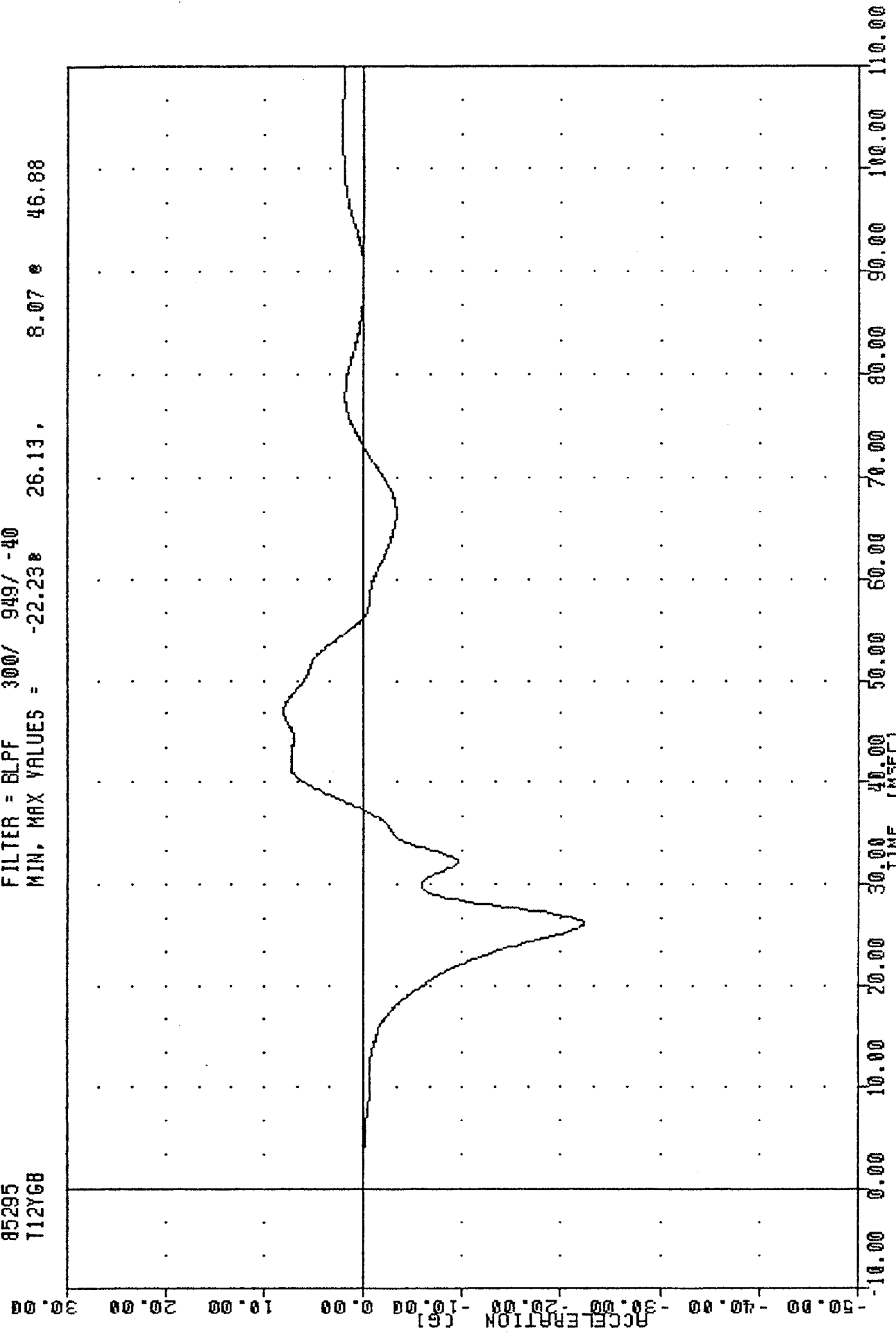
MVMA SIDE IMPACT DUMMY CALIBRATION
 UPPER SPINE ACCELERATION Y AXIS - REDUNDANT

MVMA, STA1600, PLOT DATE 22 OCT 85, 14:05:47
 SID 016 THORAX IMPACT CAL 09
 85295
 T12Y62
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -21.99g 26.13, 7.94 g 46.88



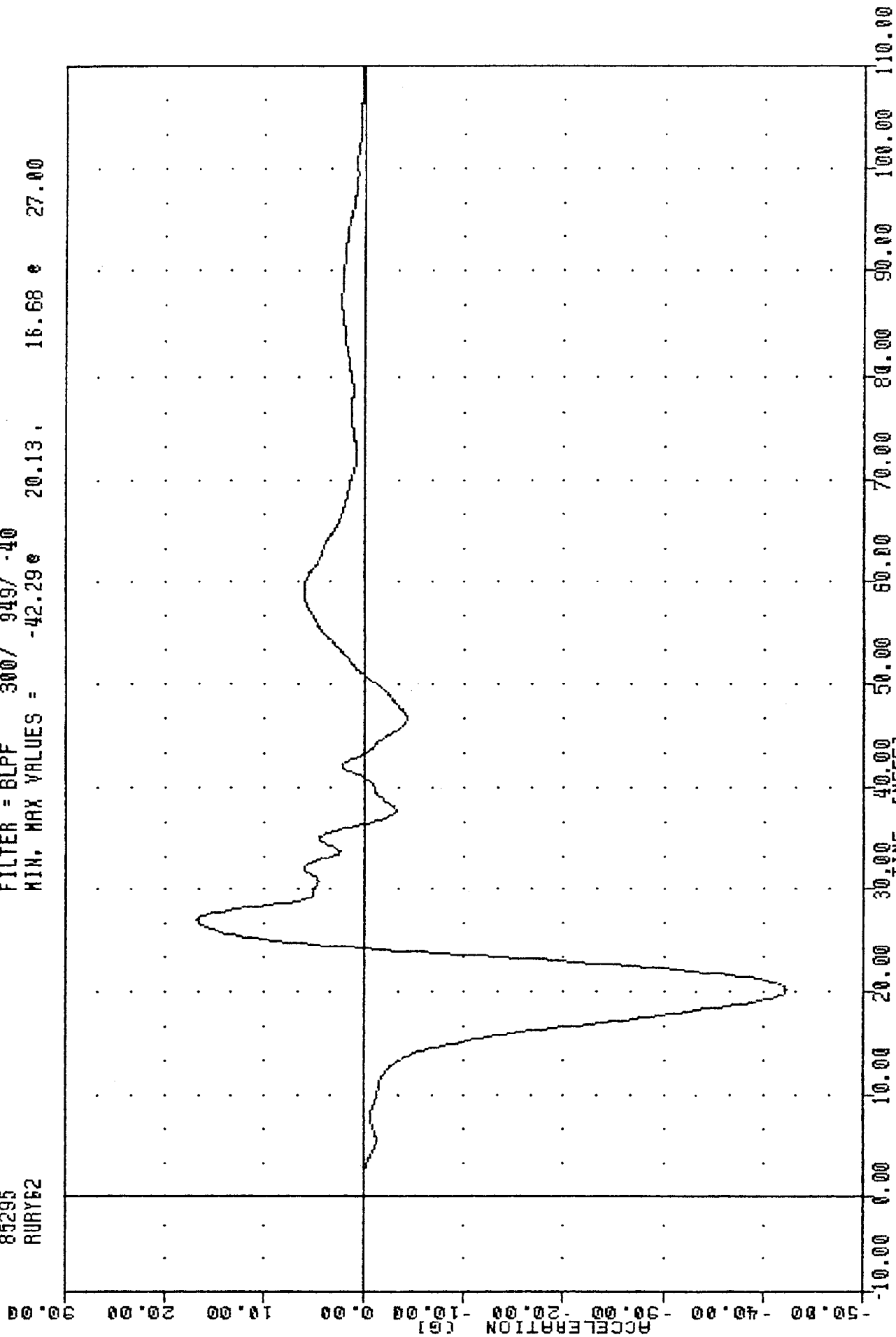
MVMA SIDE IMPACT DUMMY CALIBRATION
 LOWER SPINE ACCELERATION Y AXIS -PRIMARY

NYMA SID 016 THORAX IMPACT CAL 08
 85295
 712YGB
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -22.23 26.13, 8.07 46.88
 PLOT DATE 22-05T-85 14:05:42



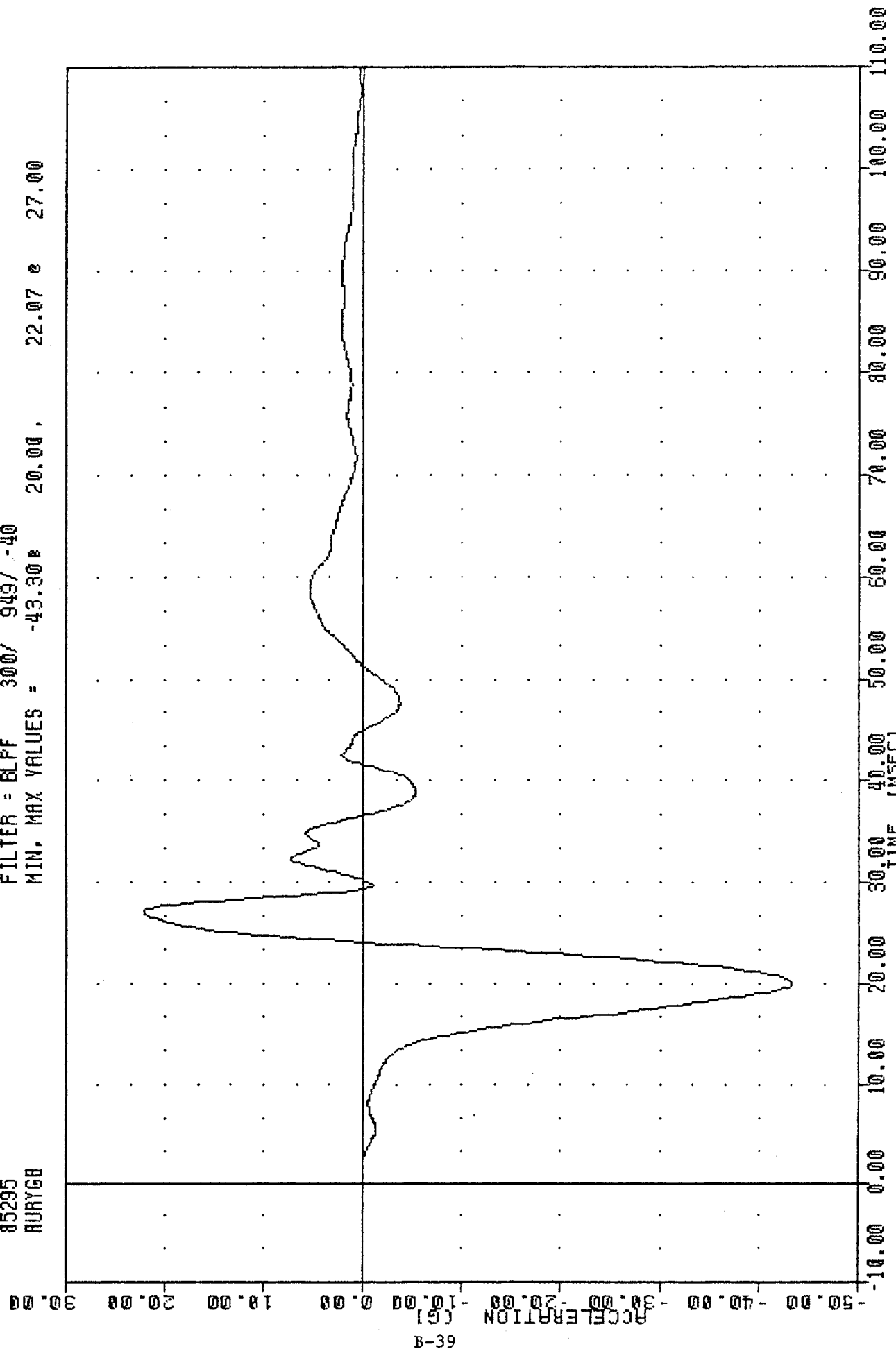
MVMA SIDE IMPACT DUMMY CALIBRATION
 LOWER SPINE ACCELERATION Y AXIS - REDUNDANT

MVMA 85295 STA1609 22-OCT-85 14:05:47
 SID 016 THORAX IMPACT CHL 09
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -42.29e 20.13, 16.68 e 27.00



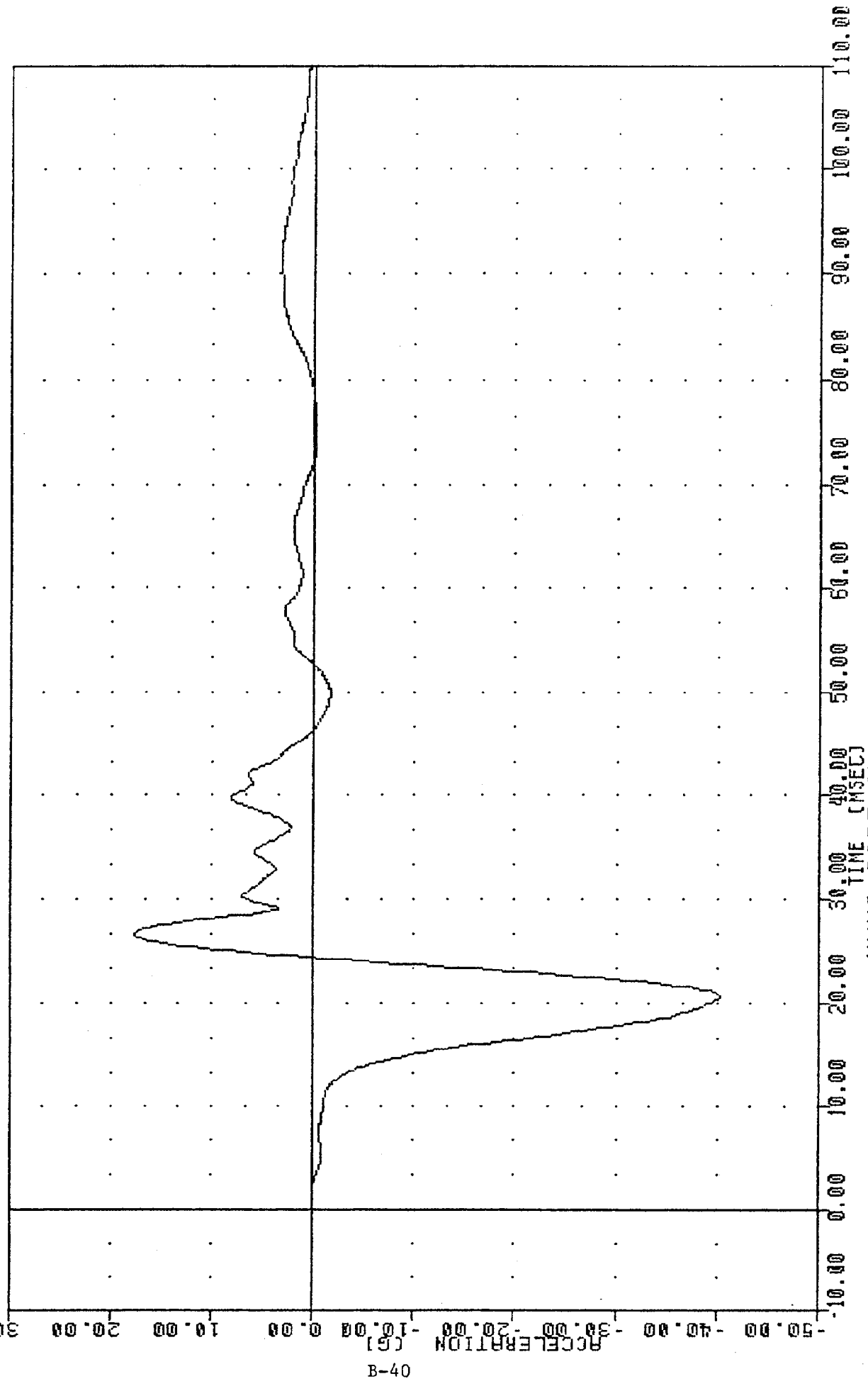
MVMA SIDE IMPACT DUMMY CALIBRATION
 RIGHT UPPER RIB ACCELERATION Y AXIS -PRIMARY

NVMA
 SIU 016 THORAX IMPACT CAL 09
 85295
 RURYGB
 PLOT DATE 22-OCT-85 14:05:43
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -43.30e 20.00. 22.07 e 27.00



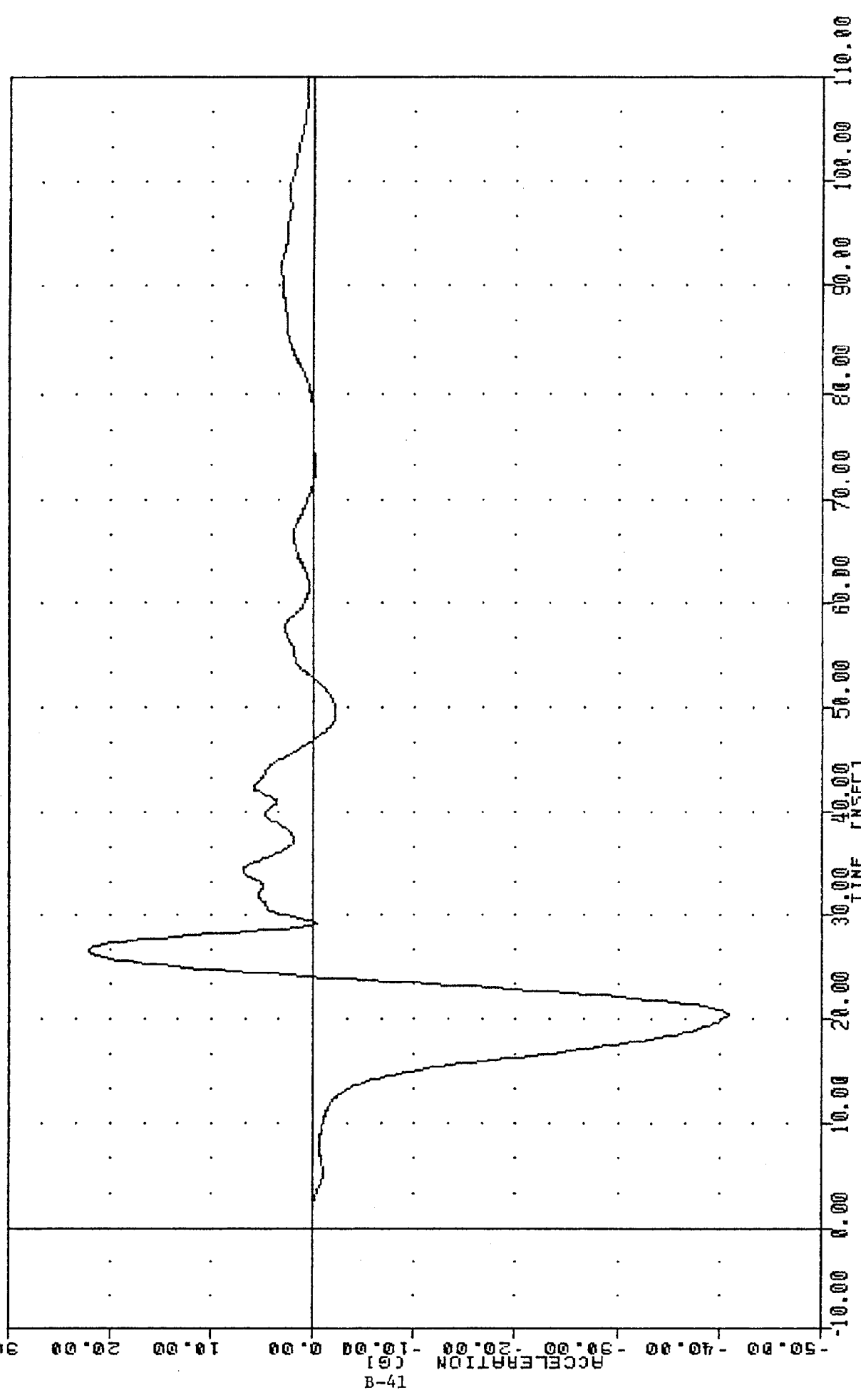
MVMA SIDE IMPACT DUMMY CALIBRATION
 RIGHT UPPER RIB ACCELERATION Y AXIS - REDUNDANT

MVNA
 ST01609
 31-OCT-85 09:07:31
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -40.310 20.63 / 17.64 @ 26.63
 85295
 RLRY62



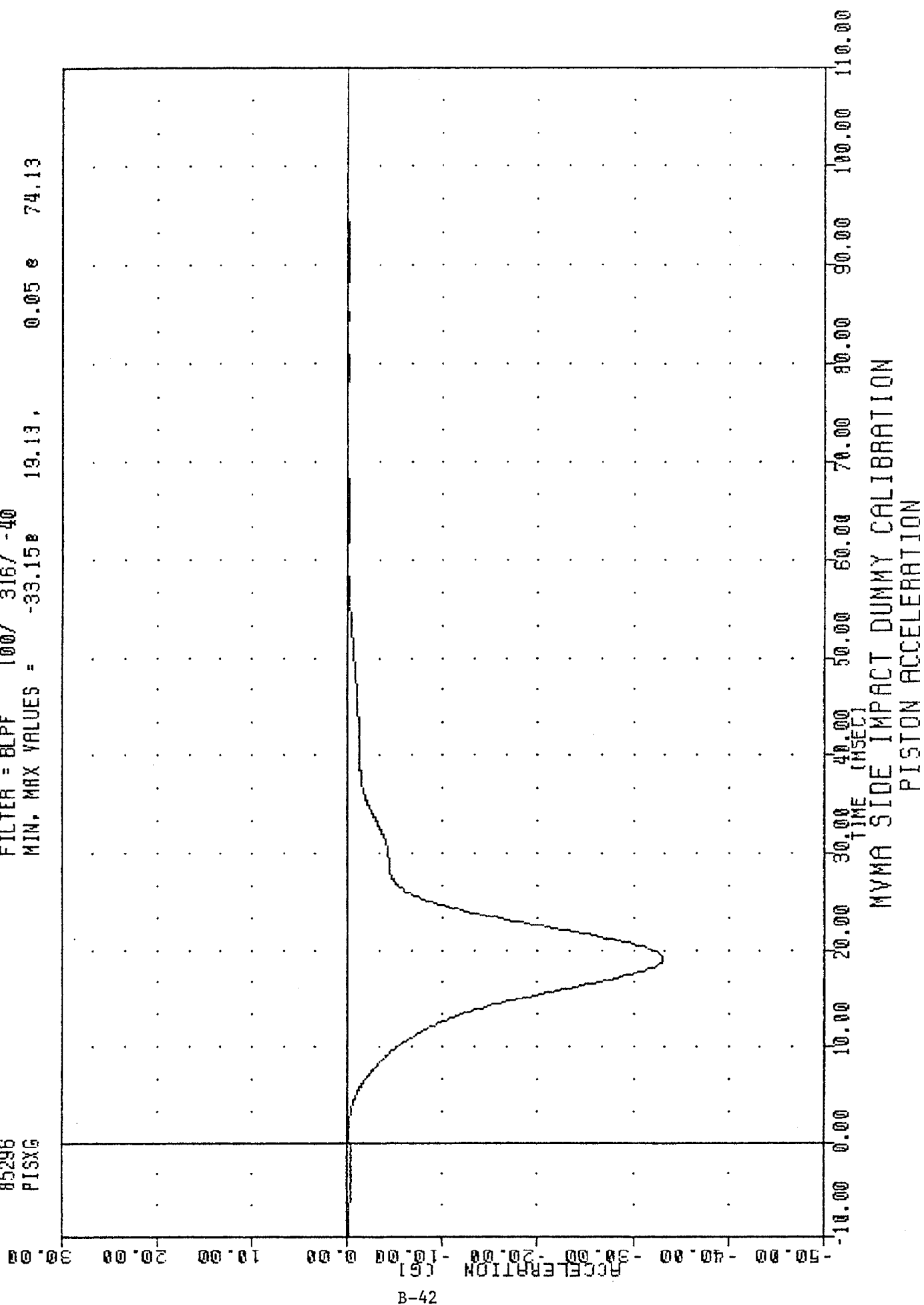
MVNA SIDE IMPACT DUMMY CALIBRATION
 RIGHT LOWER RIB ACCELERATION Y AXIS -PRIMARY

MVMA 85295 RLRYSB
 SID 016 THORAX IMPACT CRL 08
 STA1600
 PLOT DATE 22 OCT 85 14:05:47
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -40.830 20.50 22.04 e 26.63



MVMA SIDE IMPACT DUMMY CALIBRATION
 RIGHT LOWER RIB ACCELERATION Y AXIS - REDUNDANT

NVMA SP01600
 SIO 016 PELVIC IMPACT CAL 08
 85296
 PISXG
 PLOT DATE 23-OCT-85 00:40:00
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -33.15e 19.13, 0.05 e 74.13



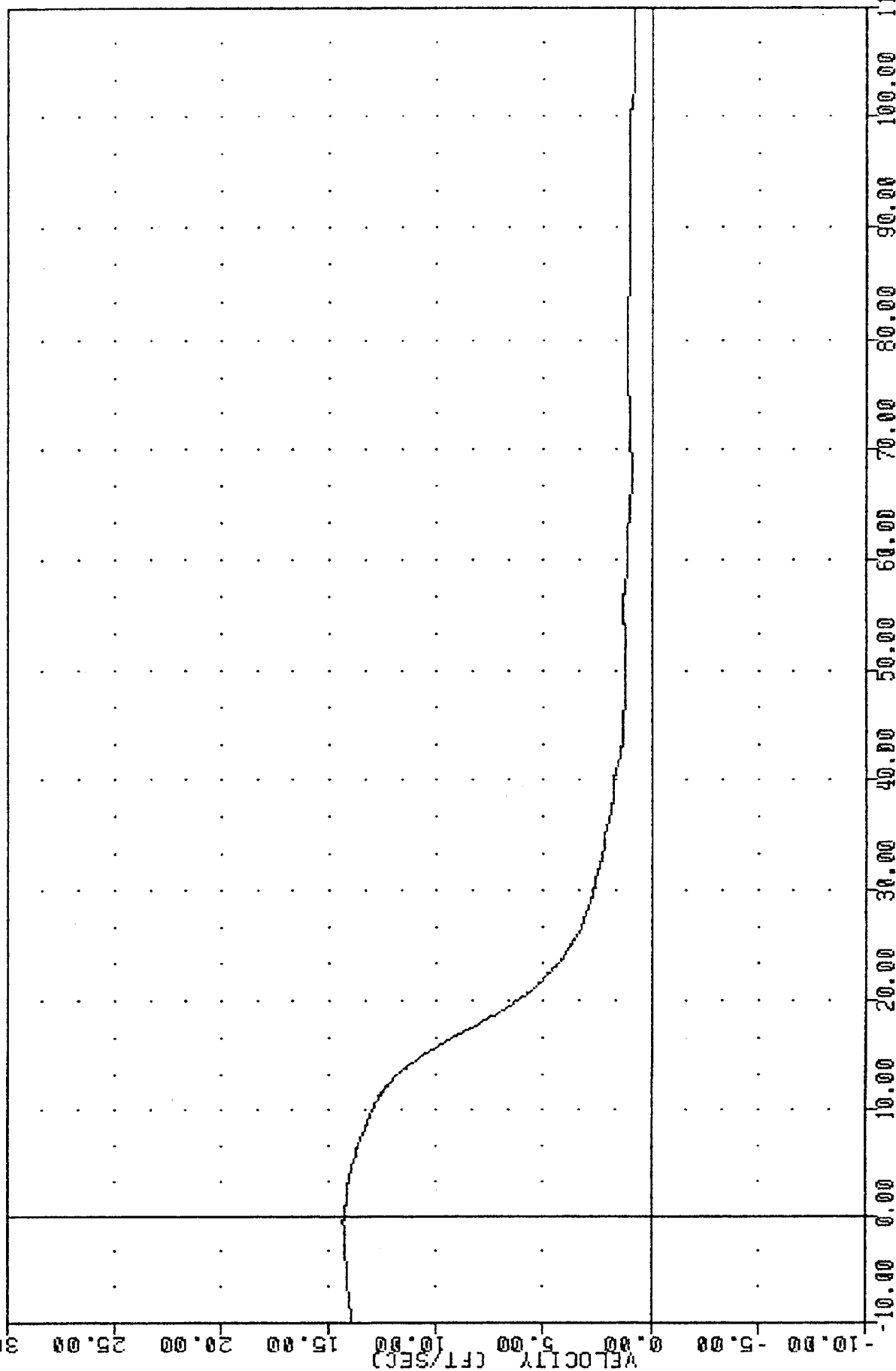
FLIGHT DATE 23-OCT-85 08:40:02

SP01600
SIO 016 PELVIC IMPACT CAL 08

FILTER = ALPF 1650/ 5214/ -40

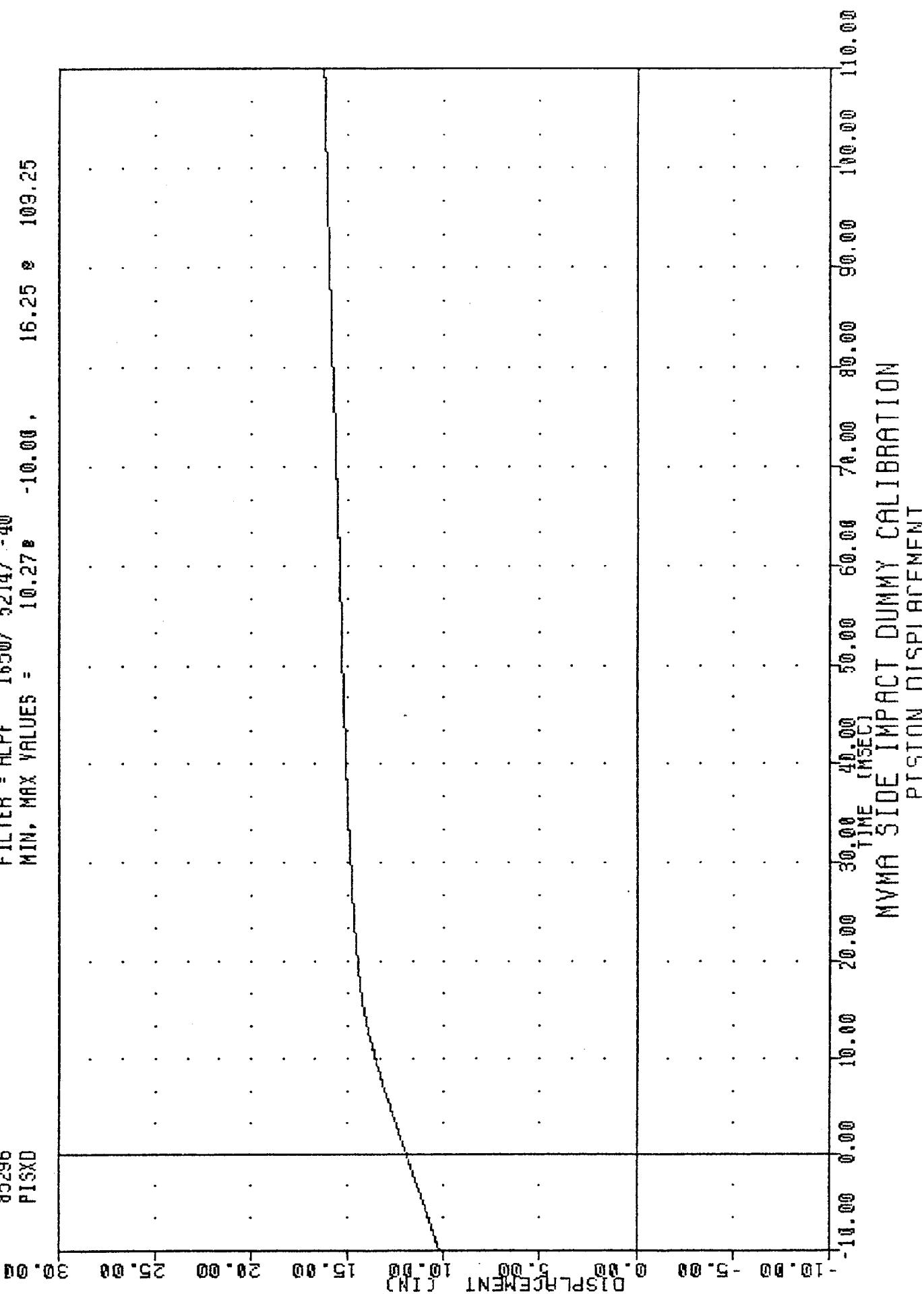
MIN, MAX VALUES = 0.78e 105.75, 14.32 e -0.75

85296
PI3XV

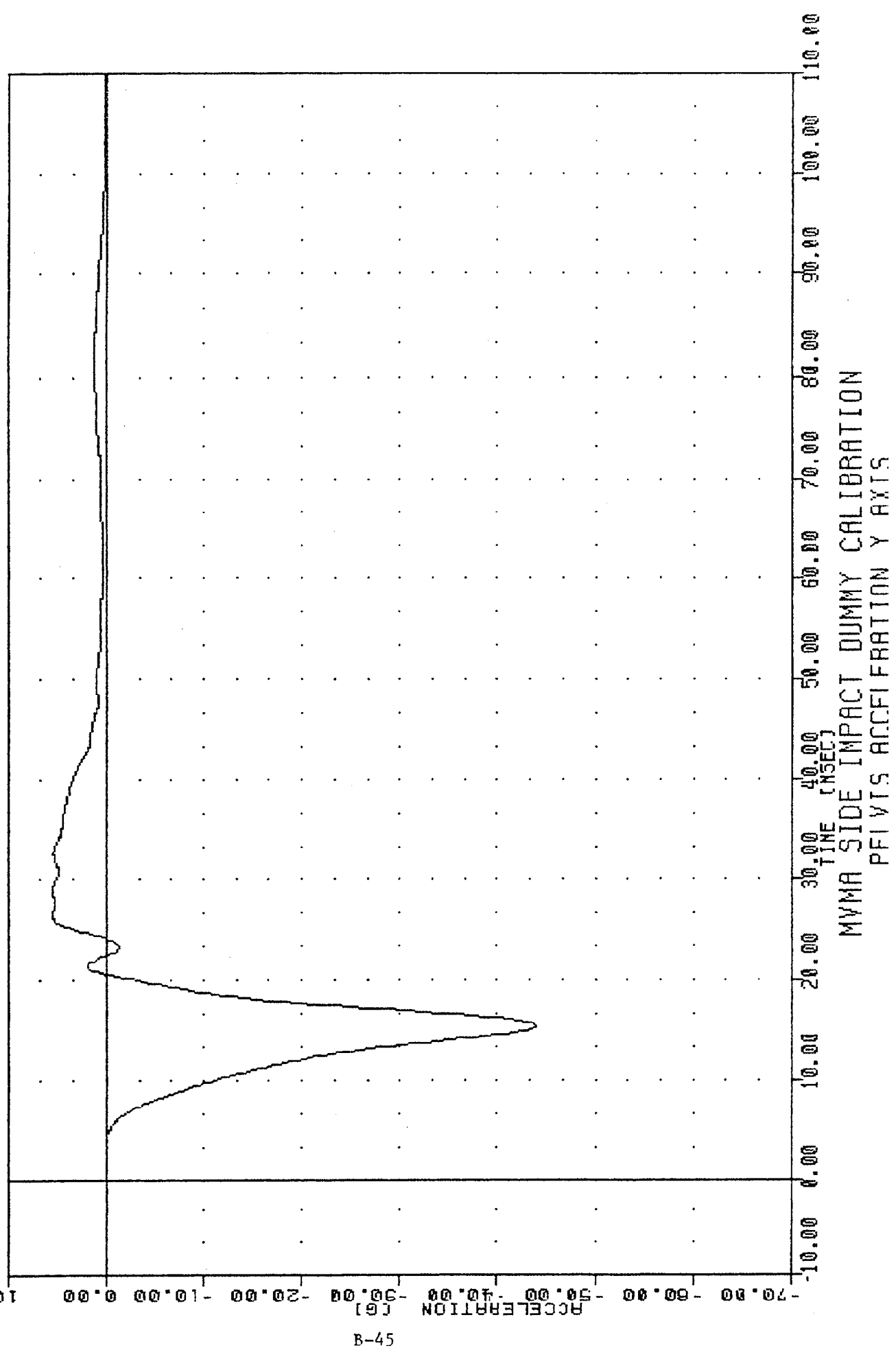


MVMA SIDE IMPACT DUMMY CALIBRATION
PISTON VELOCITY

NVMA SID 016 PELVIC IMPACT CAL 09
 85296
 PISXD
 FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 10.27e -10.00, 16.25 e 109.25
 PLOT DATE 31-05-85 08:27:34



MYMA SID 016 PELVIC IMPACT CAL 05
 85296
 PEVY6
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -44.04e 15.38, 5.47 e 28.88
 PLOT DATE 23 OCT 85 08:49:03



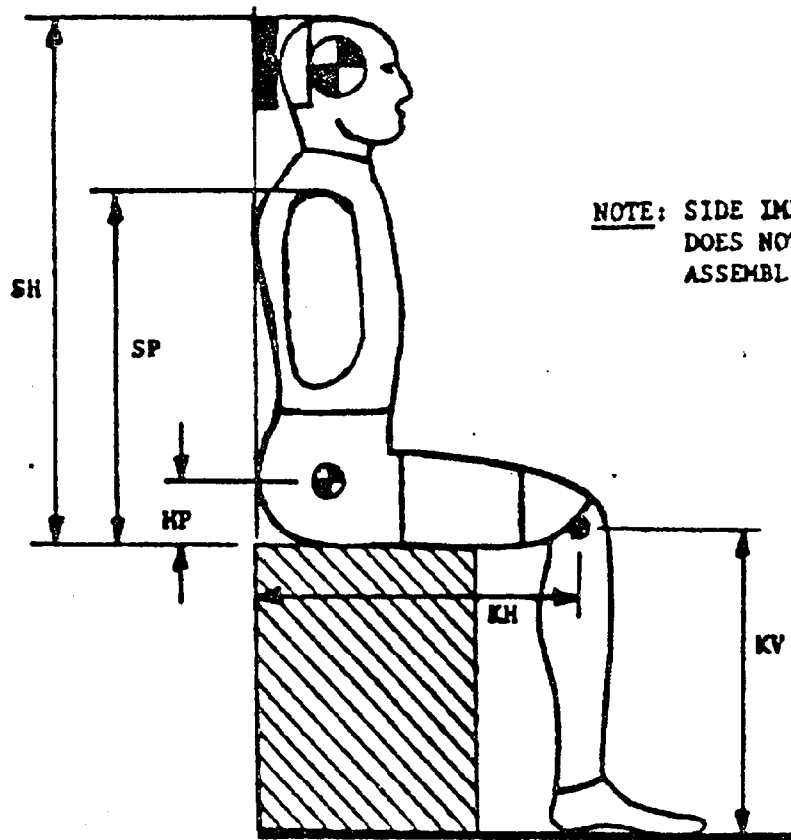
MYMA SIDE IMPACT DUMMY CALIBRATION
 PFI VTS ACCELERATION Y AXIS

POST-TEST

PART 572 DUMMY CALIBRATION

SIDE IMPACT DUMMY CONFIGURATION VERIFICATION TEST DATA

NHTSA DUMMY I.D. NO.: 0 1 6



NOTE: SIDE IMPACT DUMMY (SID)
DOES NOT HAVE ANY ARM
ASSEMBLIES

	P. 572 SPECIFICATION	PRE-TEST	POST-TEST
DATE OF CONFIGURATION VERIFICATION		DNA	10/23/85
VERIFICATION NUMBER FOR DUMMY*		DNA	Cal. 02
SH - Seated Height- - - - -	35.6 to 35.8"	DNA	35.6
SP - Shoulder Height- - - -		DNA	DNA
HP - Hip Pivot Height - - - -	3.9" ref.	DNA	3.9
KH - Knee Pivot from back line- -	20.1 to 20.7"	DNA	20.7
KV - Knee Pivot from floor- - -	19.3 to 19.9"	DNA	19.4
SW - Shoulder Width - - - - -		DNA	DNA
HW - Hip Width- - - - -	14.0 to 15.4"	DNA	14.5

TECHNICIAN'S NAME: Hary L. Phelps

* Sequential number beginning with "1" at the start of each
fiscal year's crash test program

TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572

23-OCT-85

TEMPERATURE 70.00 F
MVMA LF01602

RELATIVE HUMIDITY 66.00 %
572/SID 016 LUMBAR FLEX CAL 02

DEFLECTION	SPECIFICATION	TEST RESULTS
0 Deg.	0 LBS	0.00 LBS
20 Deg	22.00 - 34.00 LBS	30.00 LBS
30 Deg	34.00 - 46.00 LBS	36.00 LBS
40 Deg	46.00 - 58.00 LBS	47.00 LBS
NET RETURN ANGLE	< 12 DEG	1.53 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Harry L. Phelps

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMINAL COMPRESSION TEST

PART 572

23-OCT-85

TEMPERATURE 70.00 F
MVMA AB01602RELATIVE HUMIDITY 66.00 %
572 SN 016 ABDOM COMPR CAL 02

TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0 IN.	10 LBS	10 LBS
.50 IN.	23.00 - 36.00 LBS	32.89 LBS
.75 IN.	36.00 - 50.00 LBS	43.16 LBS
1.00 IN.	50.00 - 63.00 LBS	57.13 LBS
1.30 IN.	73.00 - 88.00 LBS	81.25 LBS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Gary S. Phelps

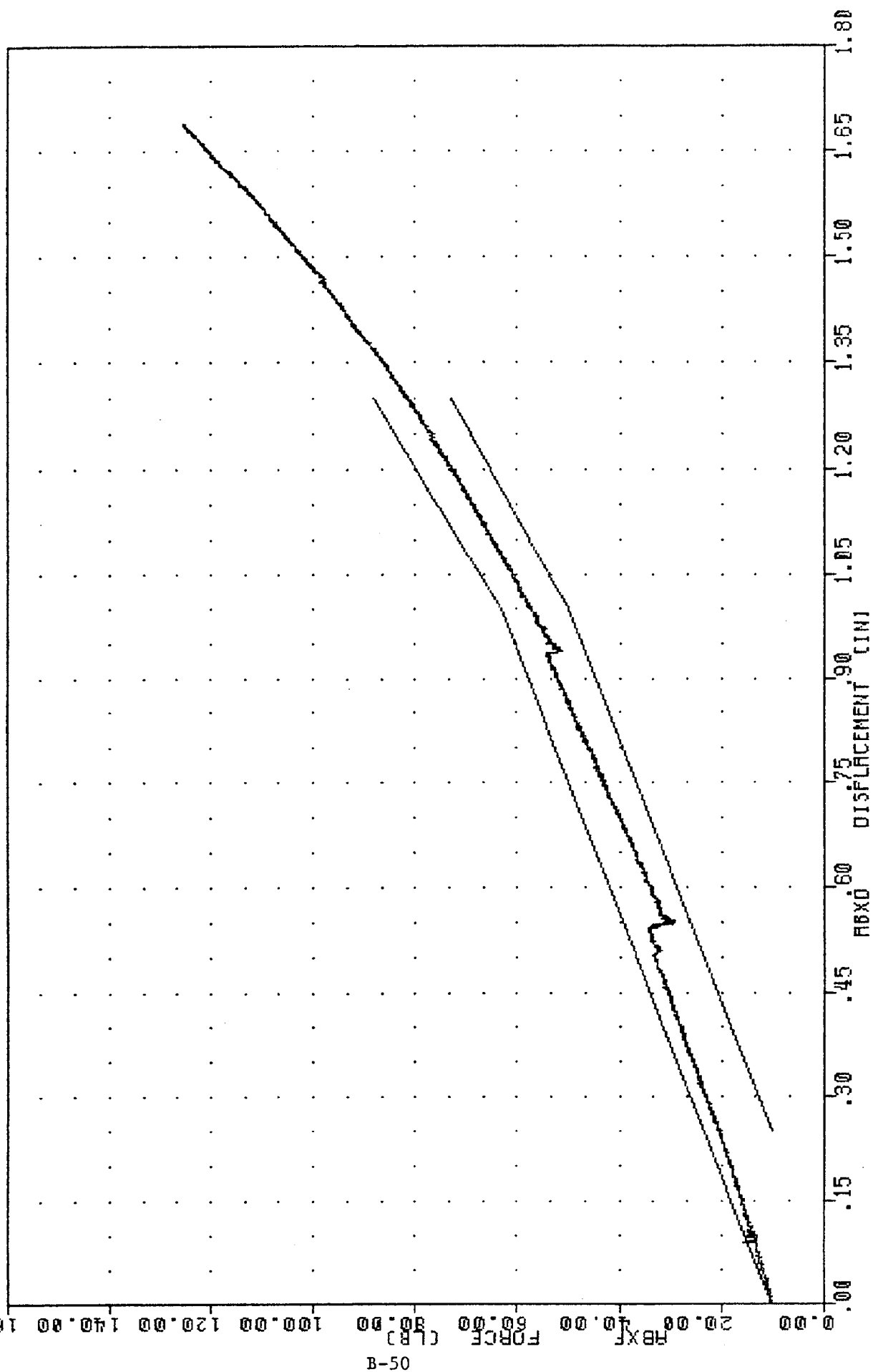
MYWA
ABXD
ABXF

BR01607
[REDACTED]
FILTER = ALPF
FILTER = ALPF

572 SN A16 P80DM COVER COL 02 [REDACTED] 95296
1630J/ 5214/-40 MIN, MAX = 0.00 1.69
1650J/ 5214/-40 MIN, MAX = 9.89 1.69

[REDACTED] FLOT RATE [REDACTED] 0.00 1.69
[REDACTED] 0.00 1.69

1:52:16



ABDOMINAL COMPRESSION VS DISPLACEMENT

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

PART 572

24-OCT-85

TEMPERATURE 70 F
MVMA HD01602RELATIVE HUMIDITY 70 %
572 00 016 HEAD DROP CAL 02

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	258.81 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MS	1.15 MS
PEAK LATERAL ACCELERATION	10 G MAX	-2.38 G
IS ACCELERATION CURVE UNIMODAL?		YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Larry L. Phelps

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572

24-OCT-85

TEMPERATURE 71.00 F
MVMA HN01602

RELATIVE HUMIDITY 70.00 %
572 SN 016 HEAD/NECK CAL 02

Test Parameter	Specification	Test Results
Pendulum velocity	21.5 to 25.5 fps	22.86 fps
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 ms. max	2.22 ms.
T2 - T3: 20 - 20 G	25 - 30 ms.	26.38 ms.
T3 - T4: 20 - 5 G	10 ms. max	9.04 ms.
Avg. G level T2 - T3	20 - 24 G	22.03 G
Maximum Rotation Angle	63 - 73 deg.	64.74 deg.
Peak Head Resultant Accel	26 G max	22.24 G

Test Parameter	Specification	Test Results
Rotation Angle	Time	Chordal Disp.
(degrees)	(ms.)	(in.)
0	-2.0 - +2.0	-0.5 - +0.5
30	25.6 - 34.4	2.1 - 3.1
60	40.3 - 51.7	4.3 - 5.3
max	53.2 - 66.8	5.0 - 6.0
60	67.0 - 83.0	4.3 - 5.3
30	85.4 - 104.6	2.1 - 3.1
0	101.0 - 123.0	-0.5 - +0.5

* DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Gary L. Phelps

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

24-OCT-85

TEMPERATURE 71 F
MUMA TL01602

RELATIVE HUMIDITY 70 %
572 SN016 L.S.THORAX CAL 02

TEST PARAMETER	LOW SPEED TEST	
	SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	13.86-14.14 FT/SEC	14.14 FT/SEC
PEAK DEFLECTION	1.1 INCHES MAX.	0.98 INCHES
PEAK RESISTIVE FORCE	1,450. POUNDS MAX.	1271. POUNDS
INTERNAL HYSTERESIS	50% - 70%	57.7%

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Gary L. Phelps

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

24-OCT-85

TEMPERATURE 71 F
MUMA TH01602RELATIVE HUMIDITY 70 %
572 SN 016 H.S. THORAX CAL 02

TEST PARAMETER	HIGH SPEED TEST	
	SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	21.78-22.22 FT/SEC	22.22 FT/SEC
PEAK DEFLECTION	1.7 INCHES MAX.	1.57 INCHES
PEAK RESISTIVE FORCE	2,250. POUNDS MAX.	1945. POUNDS
INTERNAL HYSTERESIS	50% - 70%	56.0%

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Gay L. Phelps

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

24-OCT-85

TEMPERATURE 70 F
RIGHT KNEE
MVMA RK01602

RELATIVE HUMIDITY 70 %
572 SN 016 R.KNEE IMP CAL 02

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.96 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LBS.	2235.33 LBS.
DURATION ABOVE 1000 LBS.	≥ 1.7 MS.	1.70 MS.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Larry L. Phelps

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

24-OCT-85

TEMPERATURE 70 F
LEFT KNEE
MVMA LK01602

RELATIVE HUMIDITY 70 %
572 SN 016 L.KNEE IMP CAL 02

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.96 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LBS.	1943.44 LBS.
DURATION ABOVE 1000 LBS.	>=1.7 MS.	1.77 MS.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Gary L. Phelps