

HS-266937

DOT 880

MVMA SIDE IMPACT TESTING

MDB-TO-CAR SIDE IMPACT TEST OF
A 26° CRABBED MOVING DEFORMABLE BARRIER
TO A 1985 FORD LTD
AT 33.5 MPH

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

TEST REPORT
TEST NO.: 850808
TEST DATE: AUGUST 8, 1985
TEST CONDITIONS: MODIFIED STRUCTURE, DUMMY
SEATED AGAINST PADDED DOOR PANEL

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

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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	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



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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 August 8, 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 37.1 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 padded panel. A side impact dummy (SID) was seated in the right front passenger seat with its shoulder just touching the padded door.

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: 1FABP39AXFG215182

BODY STYLE: 4-Door Sedan

MODEL YEAR: 1985

NHTSA NO.: DNA

COLOR: Midnight Blue Metallic

ENGINE DATA: TYPE: Inline CYLINDERS: 4 DISPLACEMENT 140 cu. in.

TRANSMISSION DATA: Automatic

DATE VEHICLE RECEIVED: 8/1/85

ODOMETER READING: 568

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? NO (Test Modifications)
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 30 psi; REAR 30 psi

TIRES ON VEHICLE (MFGR. & LINE, SIZE): General Ameriway Radial P195/75R14

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	799	LBS.	RIGHT REAR	691	LBS.
LEFT FRONT	812	LBS.	LEFT REAR	672	LBS.
TOTAL FRONT WEIGHT	1611		LBS. (54.17 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1363		LBS. (45.83 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	2974		LBS.		

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 26 3/16	;LF 26 5/16	;RR 24 3/16	;LR 24 5/16
PRE-TEST ATTITUDE:	RF 25 7/8	;LF 26 1/4	;RR 22 7/8	;LR 23 3/8
POST-TEST ATTITUDE:	RF 26 3/4	;LF 26	;RR 22 1/4	;LR 22 9/16

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 114 LBS. CARGO:

RIGHT FRONT	875	LBS.	RIGHT REAR	825	LBS.
LEFT FRONT	774	LBS.	LEFT REAR	775	LBS.
TOTAL FRONT WEIGHT	1649		LBS. (50.75% OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1600		LBS. (49.25 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	3249		LBS.		

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

TEST FLUID DATA

TEST FLUID TYPE: RED STODDARD SOLVENT 2; SPEC. GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY*: NA GALLONS 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 30 psi; REAR 30 psi

RECOMMENDED TIRE SIZE: P195/75R14 LOAD RANGE X B, C,

VEHICLE CAPACITY: TYPES OF SEATS: Bench

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 3 FRONT

CARGO LOAD 100 LBS. 3 REAR

TOTAL 1000 LBS. 6 TOTAL

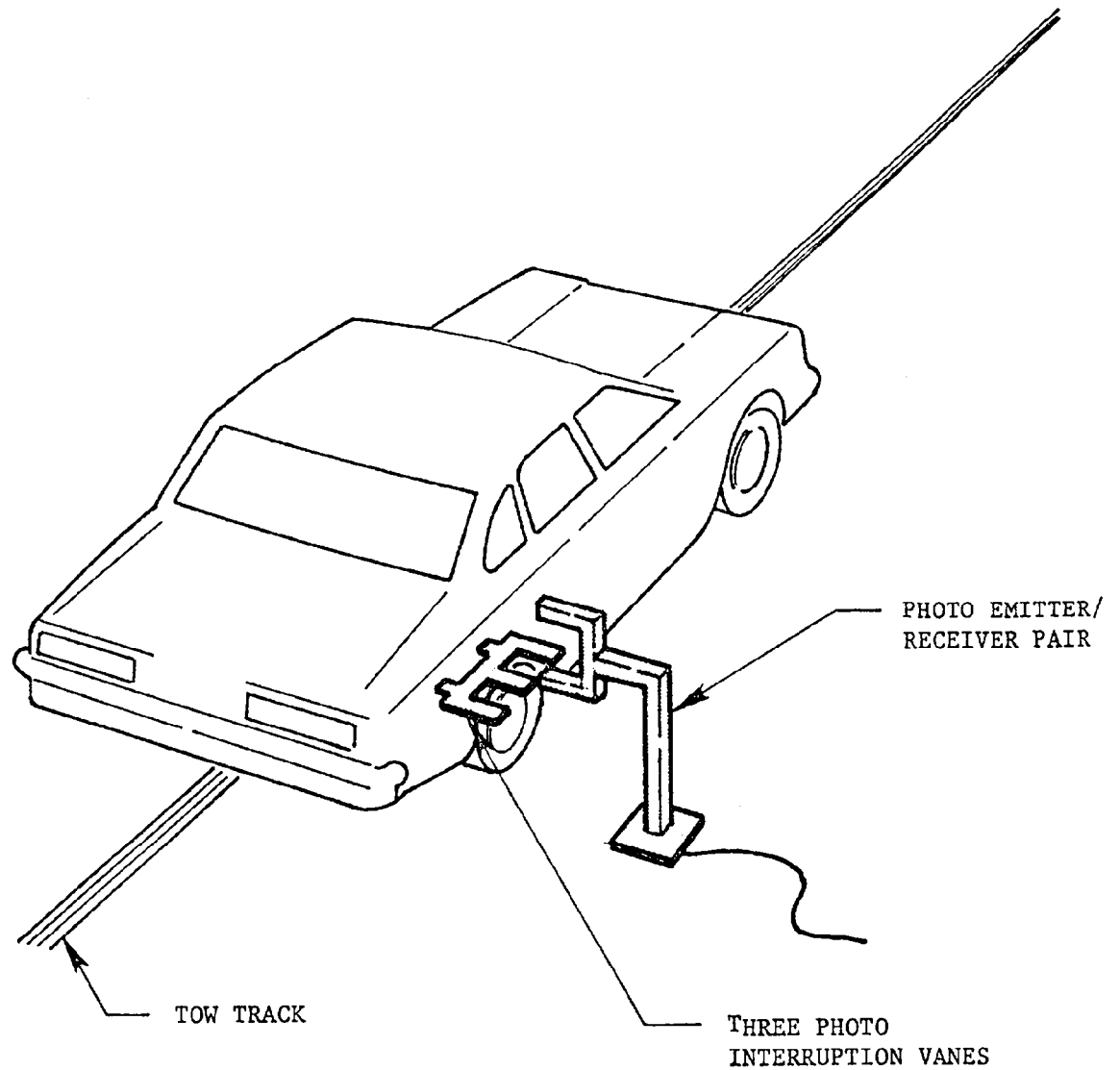
*WITH ENTIRE FUEL SYSTEM FILLED WITH FUEL TANK THROUGH CARBURETOR BOWL.

VEHICLE TEST WEIGHT CALCULATION

$$\begin{aligned}\text{Test Weight} &= \text{Unloaded Delivered Weight} + \\ &\quad \text{Number of Dummies X 174 lbs.} + \\ &\quad \text{Cargo Weight} \\ &= 2974 + 1 \times 174 + 100 \text{ lbs.} \\ &= 3248 \text{ lbs.}\end{aligned}$$

To achieve test weight the battery was 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 clears emitter/receiver 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: BENCH
 BUCKET
 X SPLIT BENCH

ADJUSTER TYPE: X MANUAL
 POWER

BUCKET SEAT BACK TYPE: X FIXED
 ADJUSTABLE

TECHNICIANS:

1. G. Watters

POSITIONING DATE: 8/08/85

2. J. Claridge

AMBIENT TEMP: 70 °F TIME: 10:00

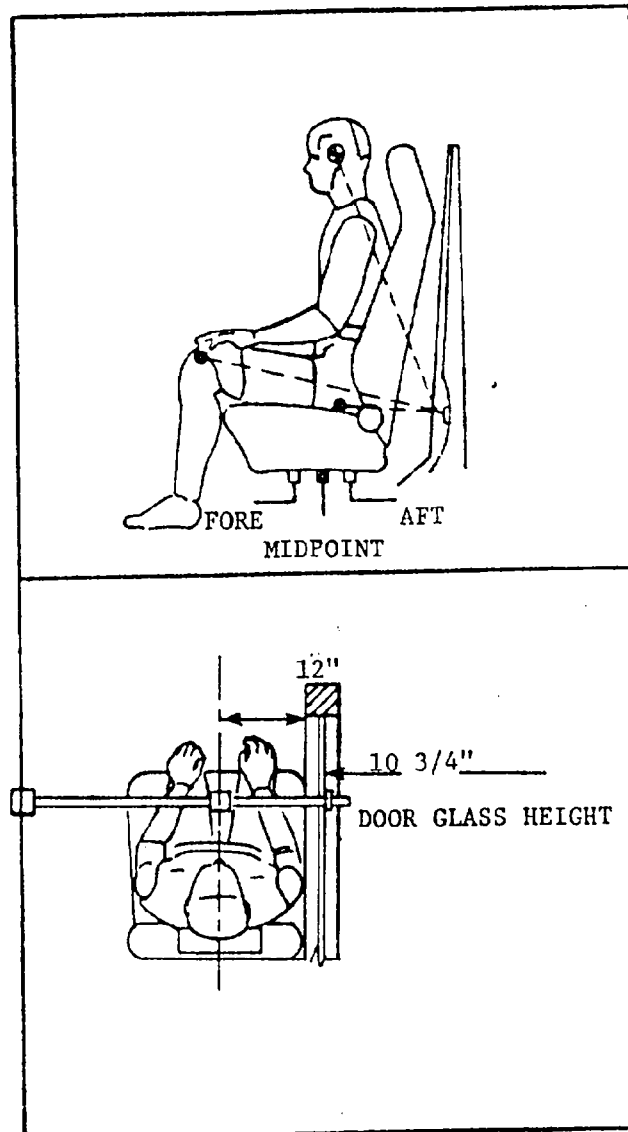
3.

FRONT PASSENGER DUMMY

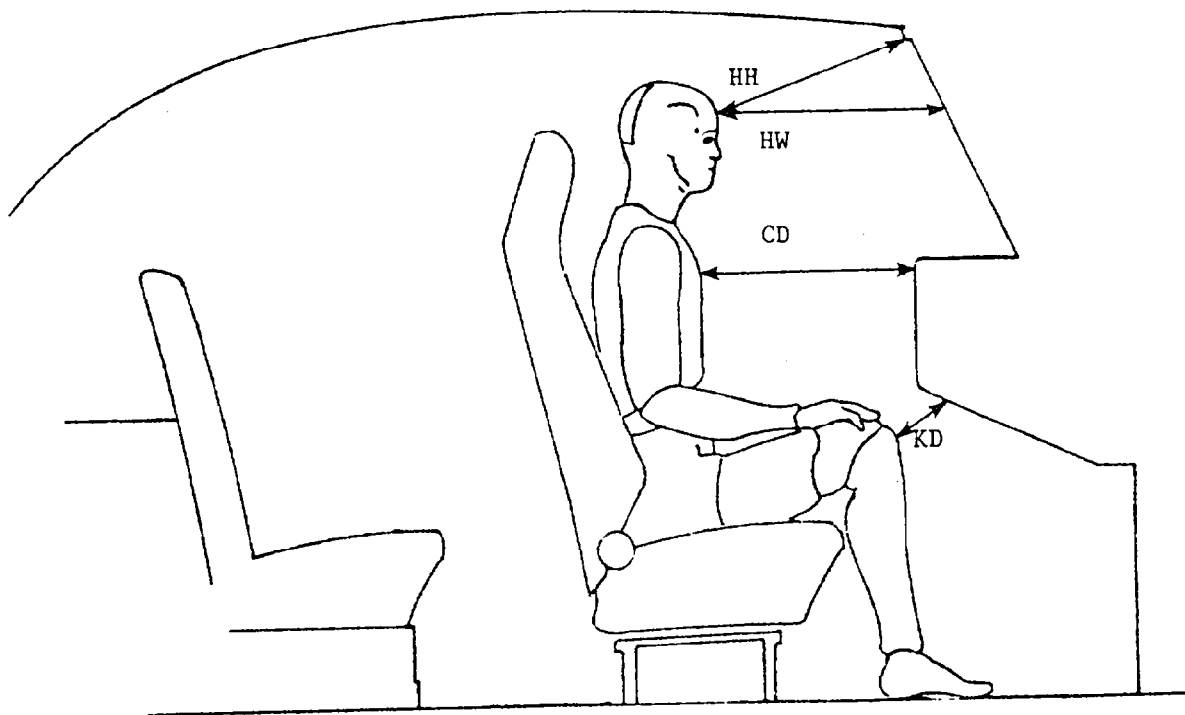
20 3/8 " HEAD
5 " TARGET*

89 " KNEE
24 1/4 " JOINT

APPROX.
11 3/16 " "H"
115 " POINT



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

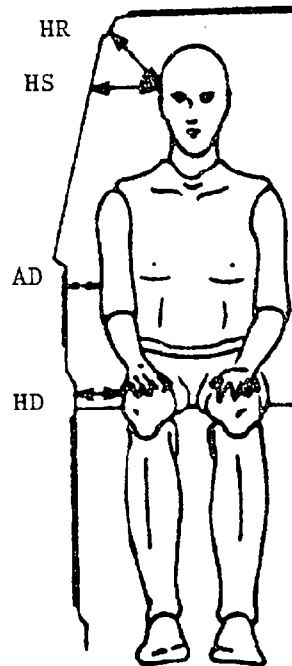


PASSENGER 119

HH	12 1/2
HW	18 9/16
CD	20 1/2
KDL	6 3/8
KDR	6 1/8

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSION



PASSENGER 119

HR	7 1/4
HS	9 1/2
AD	0
HD	1/4

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"
4	0	0	+40'
5	+1'	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

HIGH SPEED CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Documentary	Beaulieu	18-86	24	Documentary
2	Panning	Kodak	16	24	Real Time
3	MDB Wide	Photosonic 1B	13	978	View Impact
4	Overhead Tight	Photosonic 1B	25	923	View Impact
5	Overhead Wide	Photosonic 1B	8	993	Vehicle Crush
6	Right	Photosonic 1B	25	1003	Vehicle Crush
7	Left	Photosonic 1B	13	865	Vehicle Crush
8	Onboard Windshield	Photosonic 1B	8	985	Dummy Kinematics
9	Onboard Roof	Photosonic 1B	8	1000	Dummy Kinematics
10	Onboard Door	Photosonic 1B	8	1003	Dummy 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.

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	BA30
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	AR86
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	AS36
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
BRXG	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: 850808

DATE OF TEST: August 8, 1985

TIME OF TEST: 1324

WIND VELOCITY: 2-4 mph 163° NE

HUMIDITY: NA

AMBIENT TEMPERATURE AT IMPACT AREA: 76° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 82° F

DUMMY TEMPERATURE: 77° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	3249	3248
MDB TEST WEIGHT (LBS.)	2991	2992
MDB VELOCITY (MPH)	33.6	33.5
IMPACT POINT (INCHES)	37.1	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.:			119		
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	9.29	27.25	21.84	93.75
LATERAL	9.34	65.25	18.07	47.63
VERTICAL	42.83	65.25	3.74	322.75
RESULTANT	45.90 @ 65.25			
HIC	159.26 from 40.38 to 99.25			
DELTA V (MPH)	-10.897 @ 132.88			
CHEST ACCELERATION				
UPPER SPINE				
LONGITUDINAL	10.20	33.75	10.39	68.13
LATERAL (P)***	10.33	59.38	47.86	33.13
LATERAL (R)***	10.90	59.38	47.17	33.13
VERTICAL	6.17	93.75	7.88	58.75
RESULTANT (P)	48.95 @ 33.13			
RESULTANT (R)	48.28 @ 33.13			
DELTA V (MPH)***	-21.72 @ 56.38 (P)			
	-20.97 @ 55.75 (R)			
LOWER SPINE				
LONGITUDINAL	7.02	73.75	14.14	60.00
LATERAL (P)****	5.88	60.62	56.11	33.13
LATERAL (R)	7.99	60.62	52.51	32.50
VERTICAL				
RESULTANT (P)	56.36 @ 32.50			
RESULTANT (R)	52.94 @ 31.88			
DELTA V (MPH)	-25.46 @ 58.50 (P)			
	-23.65 @ 50.38 (R)			
RIGHT UPPER RIB				
LATERAL (P)	9.12	70.00	48.53	22.50
LATERAL (R)	9.82	70.00	50.24	22.50
DELTA V (MPH)	-20.27 @ 60.88 (P)			
	-20.85 @ 61.12 (R)			
RIGHT LOWER RIB				
LATERAL (P)	8.27	63.75	43.63	36.88
LATERAL (R)	6.13	63.75	44.13	36.88
DELTA V (MPH)	-22.24 @ 63.00 (P)			
	-22.49 @ 62.38 (R)			
PELVIS ACCELERATION				
LONGITUDINAL	6.26	117.88	18.10	39.25
LATERAL	6.43	188.25	45.60	39.63
VERTICAL	1.73	178.50	12.38	50.50
RESULTANT	49.47 @ 39.38			
DELTA V (MPH)	-26.91 @ 61.38			

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	PASSENGER DUMMY			
	POSITIVE		NEGATIVE	
	DIRECTION*		DIRECTION**	
	MAX	TIME	MAX	TIME
	(in)	(msec)	(in)	(msec)
RIB DEFLECTION	0.04	166.25	1.83	56.75

* 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

See TEST ANOMALIES

VISIBLE DUMMY CONTACT POINTS:

	DRIVER DNA	PASSENGER 119
Head	_____	<u>Right window sill</u> <u>Top of door padding</u>
Chest	_____	<u>Door padding</u>
Abdomen	_____	<u>Door padding</u>
Left Knee	_____	<u>Right knee</u>
Right Knee	_____	<u>Door padding</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>Normal</u>	<u>With difficulty</u>
Rear	<u>Normal</u>	<u>DNA</u>

SEAT MOVEMENT:

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

GLAZING DAMAGE:

All right side door glass except rear door wing
window was shattered. Front windshield was cracked.

OTHER NOTABLE IMPACT EFFECTS:

DUMMY KINEMATIC SUMMARY

During impact, the dummy's right leg and right side of the torso pushed into the inner door padding. The dummy's head rotated to the right, and struck the top of the door padding and the window sill. The dummy became air born until the buttocks lodged behind the steering wheel, while the upper torso swung up and to the left. The dummy rebounded from the left side of the car and came to rest sitting near the center of the seat.

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

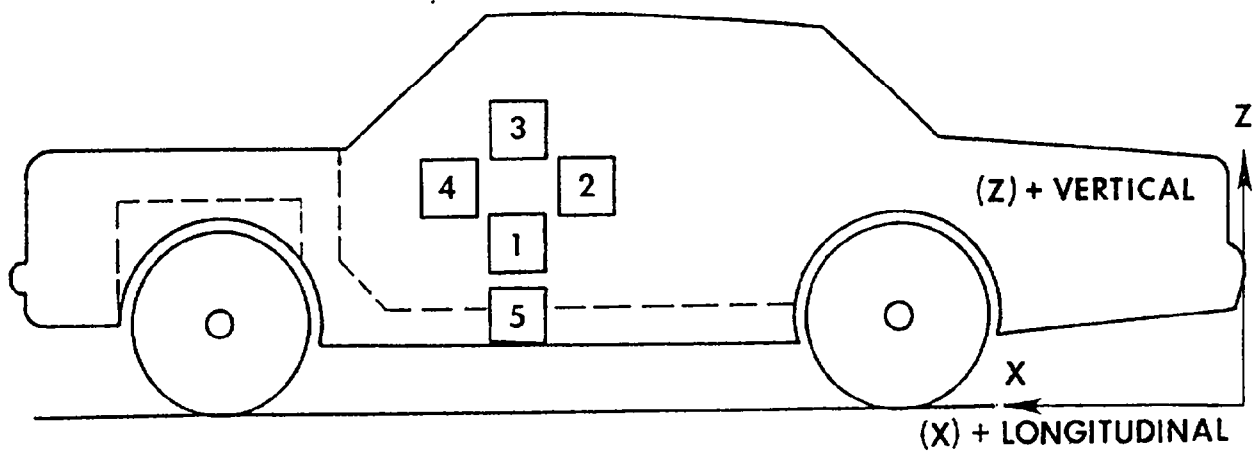
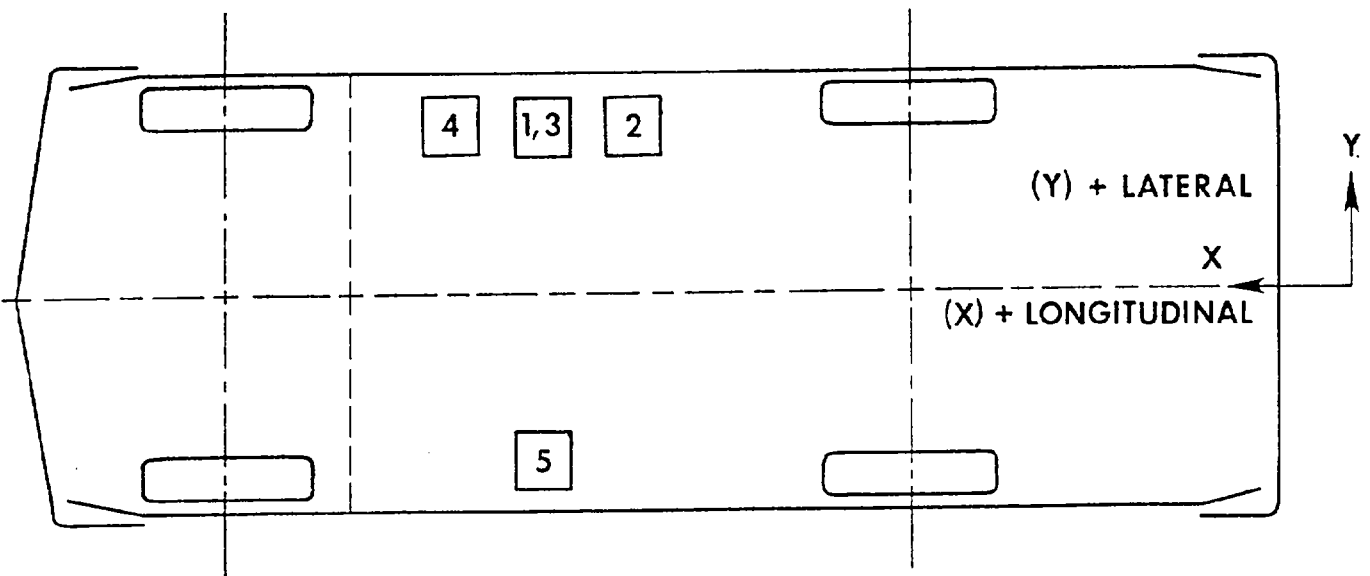
NO.	LOCATION	X*	Y*	Z*	POSITIVE**		NEGATIVE***	
					DIRECTION MAX (g)	TIME (msec)	DIRECTION MAX (g)	TIME (msec)
1	RIGHT FRONT DOOR CENTERLINE (LATERAL) V = -22.91 @ 19.25	112.9	28.8	22.1	41.91	28.63	160.33	12.25
2	MIDREAR OF RIGHT FRONT DOOR (LATERAL) Δ V = -12.86 @ 35.00	102.1	28.8	24.8	89.26	15.50	106.88	9.88
3	UPPER RIGHT FRONT DOOR CENTERLINE (LATERAL) Δ V = -17.92 @ 20.38	113.2	28.5	24.8	107.19	28.38	107.95	14.13
4	MIDFRONT OF RIGHT FRONT DOOR (LATERAL) Δ V = -23.73 @ 22.63	122.2	28.7	23.8	61.79	29.88	144.72	11.38
5	LEFT SILL AT FRONT SEAT (LONGITUDINAL) (LATERAL) Δ V = -13.89 @ 56.62 (VERTICAL) (RESULTANT)	118.6	-26.8	12.1	3.57 2.48 6.40	52.38 74.50 38.25 26.91 @ 22.38	7.22 26.57 9.16	26.25 22.38 26.75

* 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	12.0	X	17.6	17.6	17.5	17.4	17.3	17.2	17.2	17.2	17.2	17.2	17.2	17.1	17.2	X
H-Point	22.2		12.8	13.4	13.4	13.4	13.4	13.4	13.5	13.5	13.5	13.6	13.6	13.9	14.0	X
Window Sill	36.5		15.8	15.8	15.7	15.9	15.9	15.9	16.0	16.0	16.0	16.1	16.4	16.4	16.6	16.9
Window Top	55.0	24.1	23.9	23.9	23.9	24.0	24.0	24.1	24.2	24.5	X	X	X	X	X	X

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

Axle Height	12.0	X	20.8	21.9	22.6	23.6	23.5	23.4	24.3	25.0	25.8	26.1	26.9	25.0	24.2	X
H-Point	22.2		15.6	24.8	27.8	27.0	25.5	22.1	22.3	23.6	24.1	24.5	24.6	24.4	24.5	23.6
Window Sill	36.5		19.0	22.8	25.9	26.9	26.2	21.5	20.9	21.1	21.3	21.6	21.7	21.6	20.8	19.9
Window Top	55.0	26.5	26.7	26.9	27.0	27.0	27.3	27.6	27.8	28.0	28.5	X	X	X	X	X

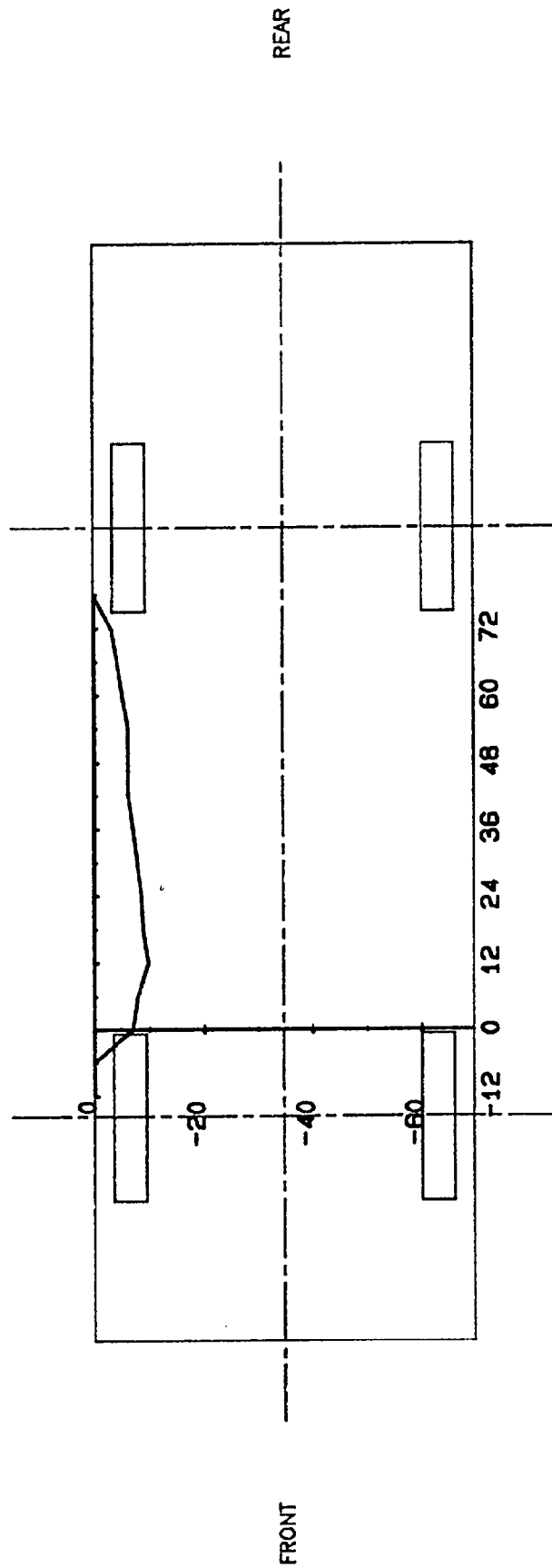
STATIC CRUSH (IN)

Axle Height	12.0	X	3.2	4.3	5.1	6.2	6.2	6.2	7.1	7.8	8.6	8.9	9.7	7.9	7.0	X
H-Point	22.2		2.8	11.4	14.4	13.6	12.1	8.7	8.9	10.1	10.6	11.0	11.0	10.8	10.6	9.6
Window Sill	36.5		3.2	7.0	10.2	11.0	10.3	5.6	5.0	5.1	5.3	5.6	5.2	4.4	3.6	3.0
Window Top	55.0	2.4	2.8	3.0	3.1	3.3	3.6	3.7	3.8	4.0	X	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.

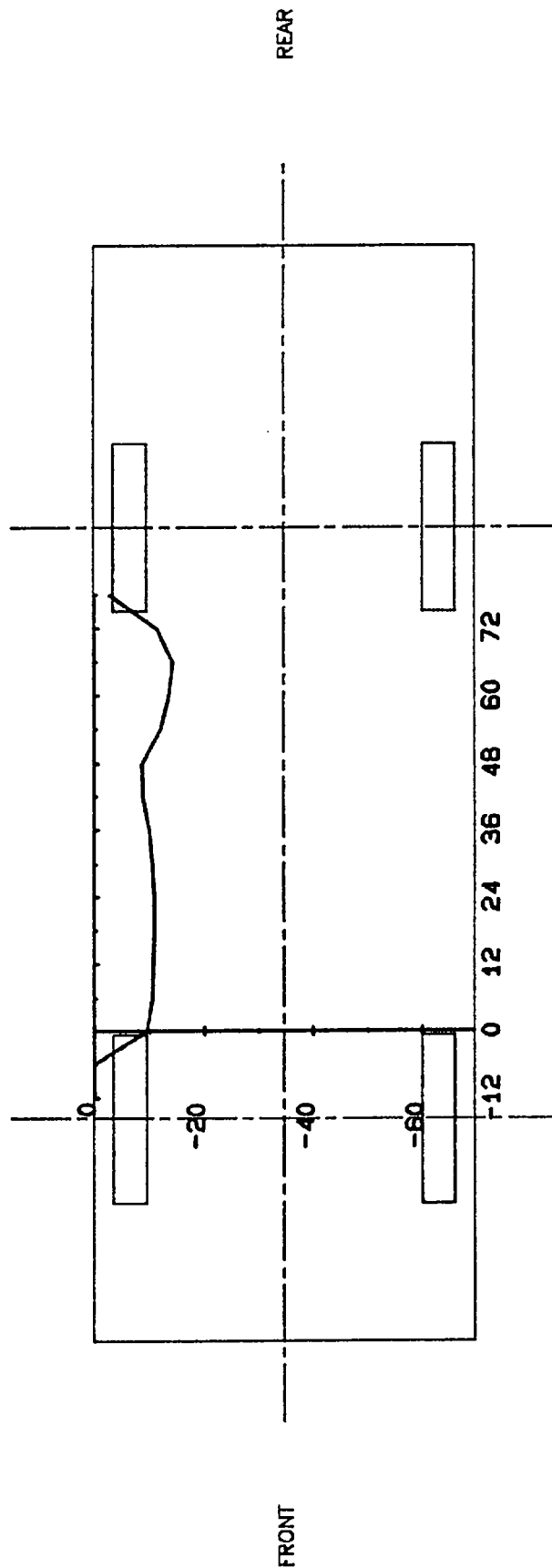
** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



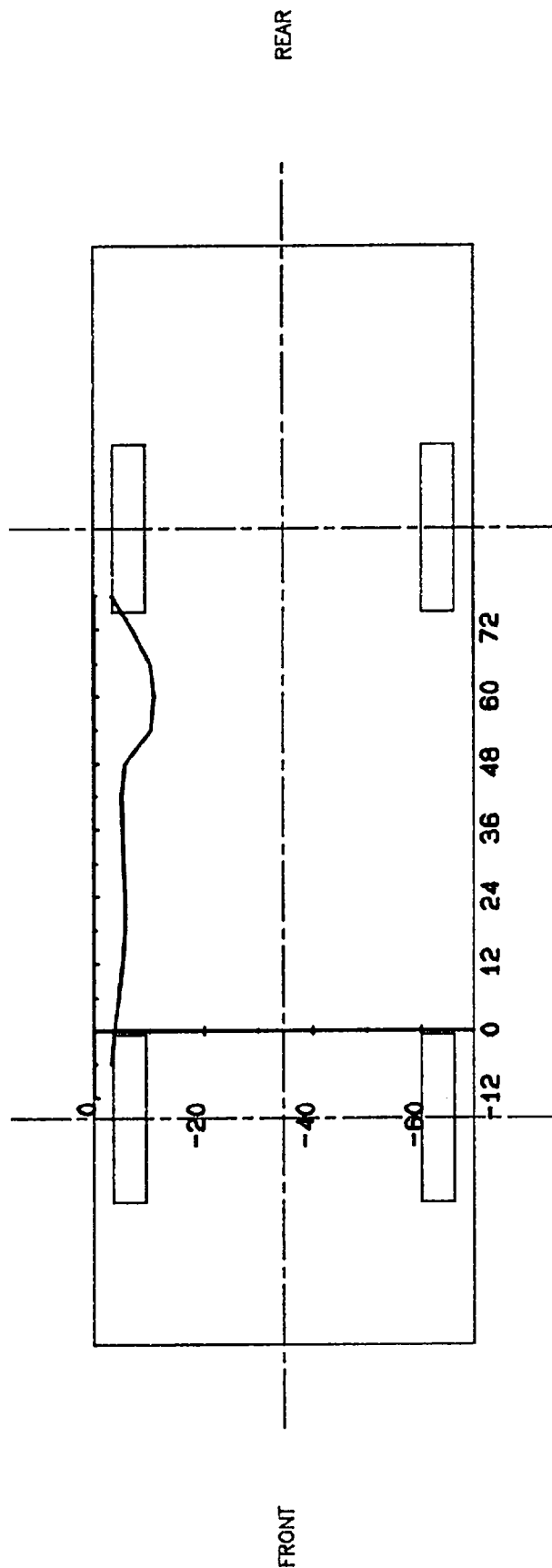
PROFILE LEVEL EQUALS AXLE HEIGHT WHICH IS 12.0" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.033

VEHICLE EXTERIOR STATIC CRUSH PROFILE



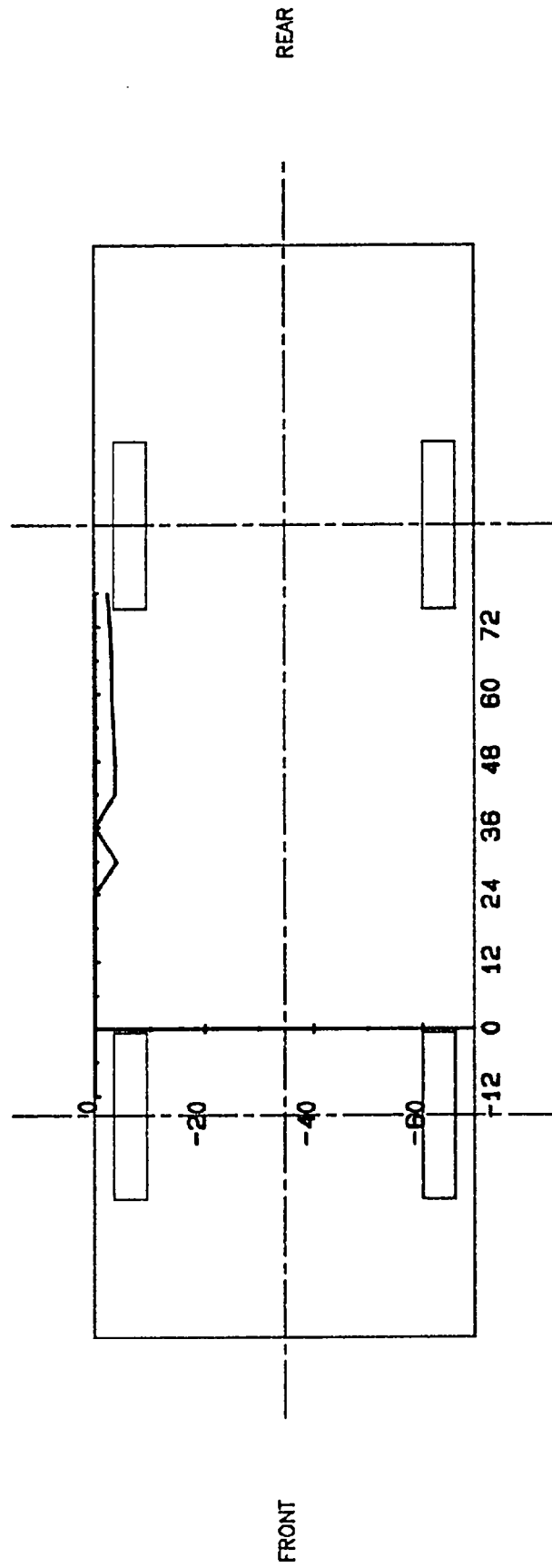
PROFILE LEVEL EQUALS H-POINT HEIGHT WHICH IS 22.2" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.033

VEHICLE EXTERIOR STATIC CRUSH PROFILE



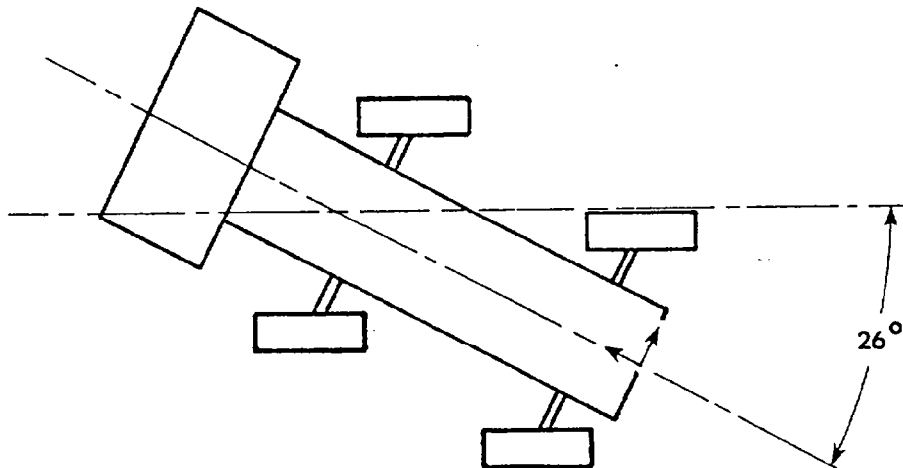
PROFILE LEVEL EQUALS WINDOW SILL HEIGHT WHICH IS 36.5" ABOVE GROUND LEVEL
 (0,0) EQUALS PROJECTED IMPACT POINT
 SCALE FACTOR EQUALS 0.033

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT WHICH IS 55.0" 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)	$\Delta V = -19.9 \text{ mph @ } 129.88 \text{ msec}$			0.36	336.50	18.11	32.50
	(LATERAL)	$\Delta V = 4.3 \text{ mph @ } 129.88 \text{ msec}$			8.16	27.63	2.08	52.50
	(VERTICAL)				9.43	56.00	5.92	30.38
	(RESULTANT)					19.28 @ 31.00		
2	REAR FRAME MEMBER	18.5	-19.2	11.9				
	(LONGITUDINAL)	$\Delta V = -14.8 \text{ mph @ } 129.88 \text{ msec}$			1.14	145.25	13.80	31.63
	(LATERAL)	$\Delta V = -0.5 \text{ mph @ } 129.88 \text{ msec}$			2.89	97.63	5.68	35.75

* 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.

TEST ANOMALIES

The lower spine Z-axis accelerometer, T12ZG2, did not record accurate data due to a shift in the data.

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 , 850808

NYMA SIDE IMPACT TESTING

852200000000

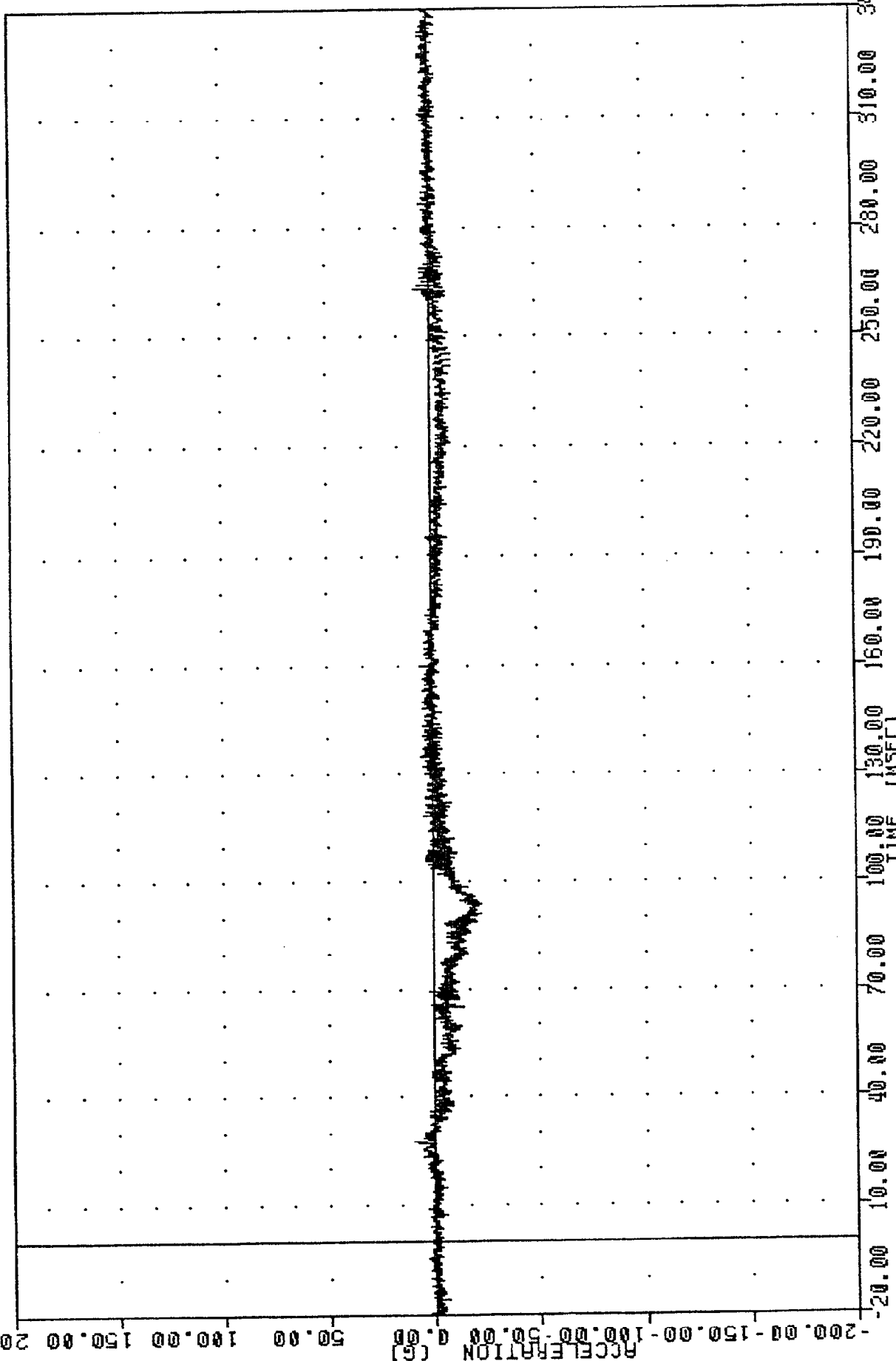
HEDXG2

PLOT DATE 15-AUG-85 14:16:42

FILTER = ALPF 1650/ 5217/ -40

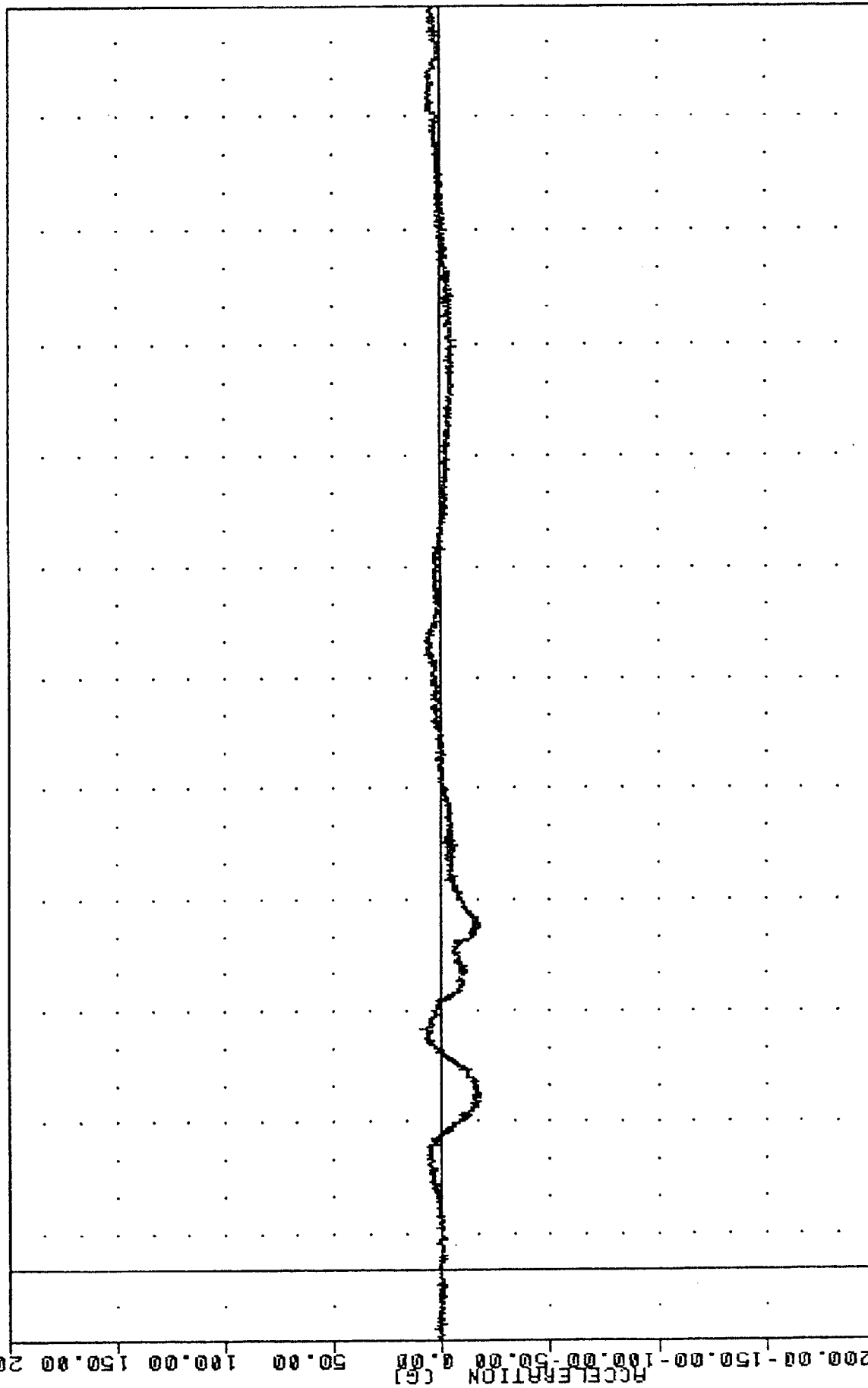
MIN. MAX VALUES = -21.848 93.75, 9.29 e 27.25

ACCELERATION (G)



NYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
PASSENGER HEAD ACCELERATION X AXIS

TRC
 850808
 MVNA SIDE IMPACT TESTING
 852200000000
 HEDYG2
 PLOT DATE 15-AUG-85 14:16:42
 FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = -18.07% 47.63, 9.34 % 65.25

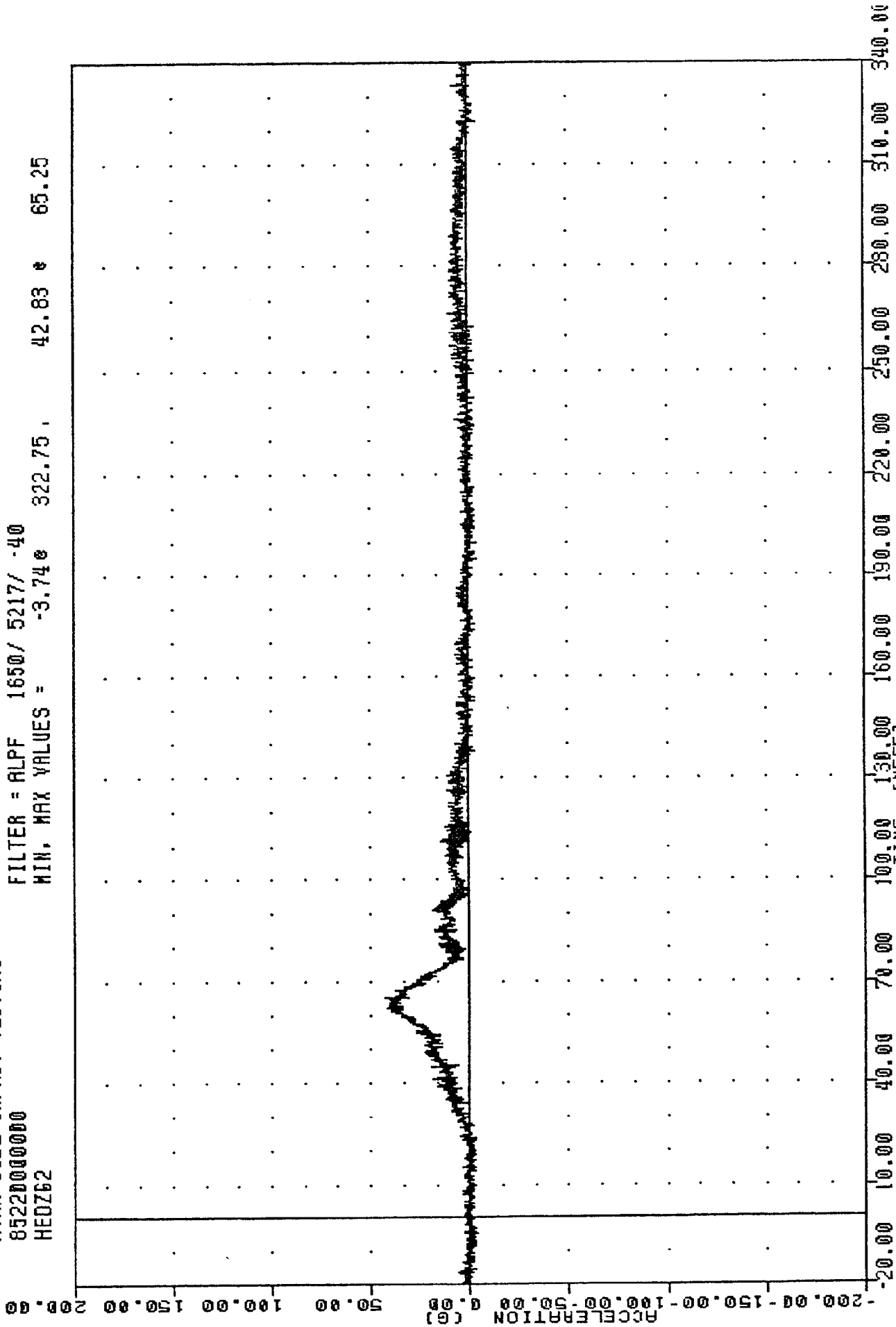


MVNA SIDE IMPACT TEST -- MODIFIED STRAUCURE/PADDED/NEAR SEATING
 PASSENGER HEAD ACCELERATION Y AXIS

TRC
MVMA SIDE IMPACT TESTING
852200000000
HEADZ62

PLUT DATE 15-AUG-85 14:16:42

FILTER = ALPF 1650/ 5217/ -40
MIN. MAX VALUES = -3.74 42.83 65.25

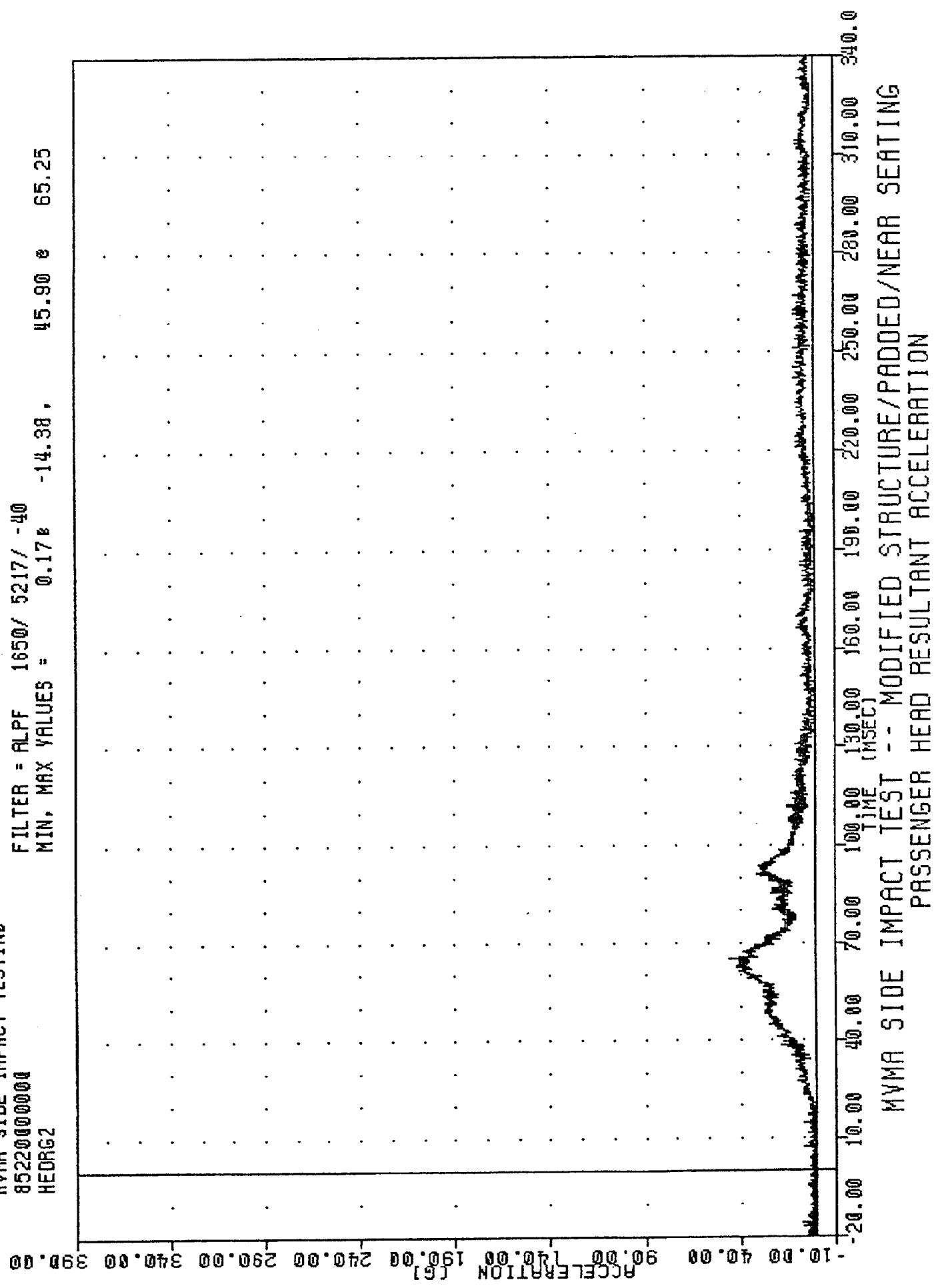


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
PASSENGER HEAD ACCELERATION Z AXIS

TRC
NYMA SIDE IMPACT TESTING
85220000000
HEORG2

PLOT DATE 15-AUG-85 14:16:42

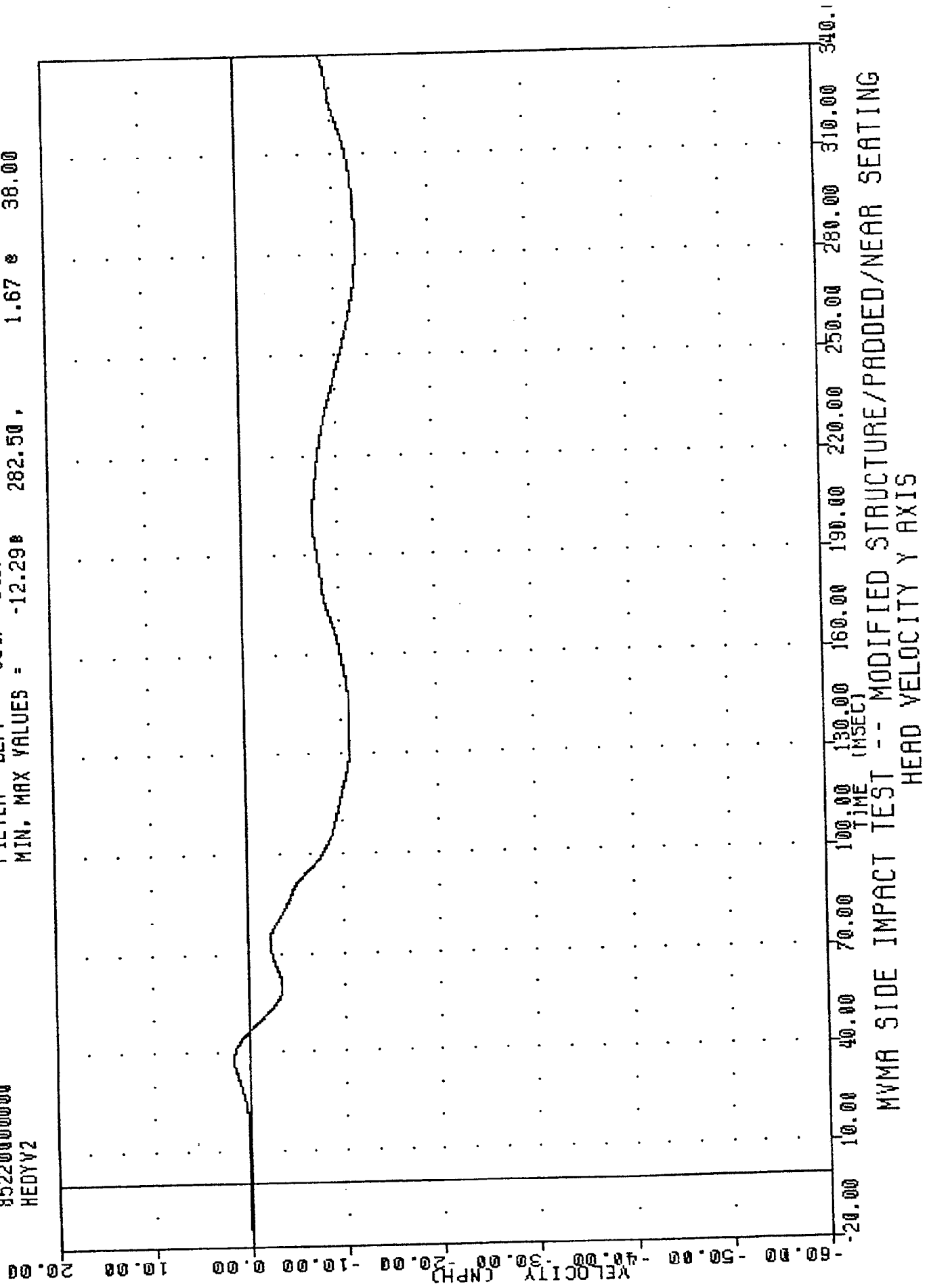
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = 0.178 -14.38, 45.90 65.25



TRC
 852200000000
 HEDYV2
 MVMA SIDE IMPACT TESTING
 852200000000

PLOT DATE 15-MAR-83 12:25:37

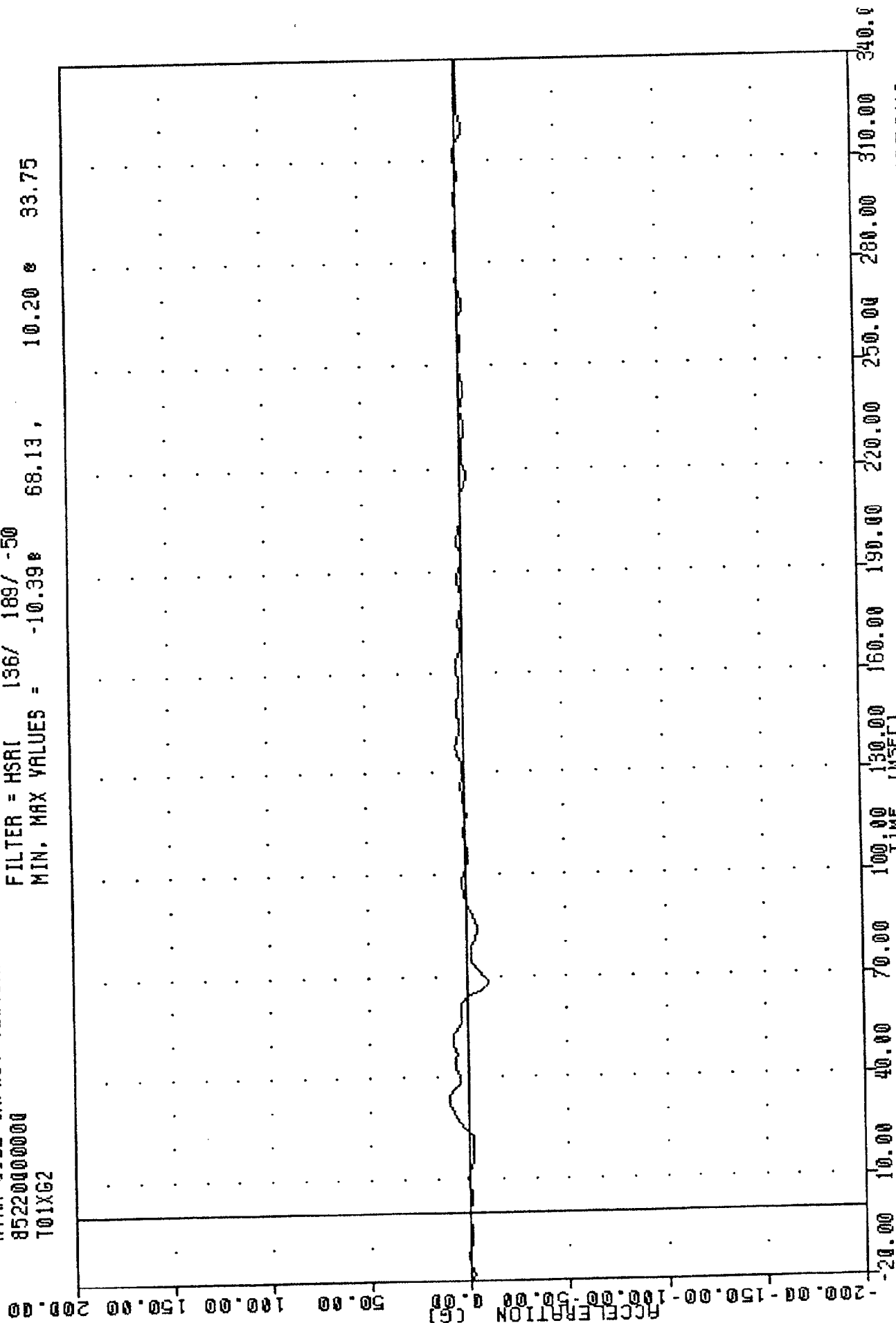
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -12.29 282.50 1.67 38.00



TRC
 NVMA SIDE IMPACT TESTING
 852200000000
 T01XG2

PLOT DATE 15-AUG-85 12:23:18

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -10.39e 68.13, 10.20 e 33.75

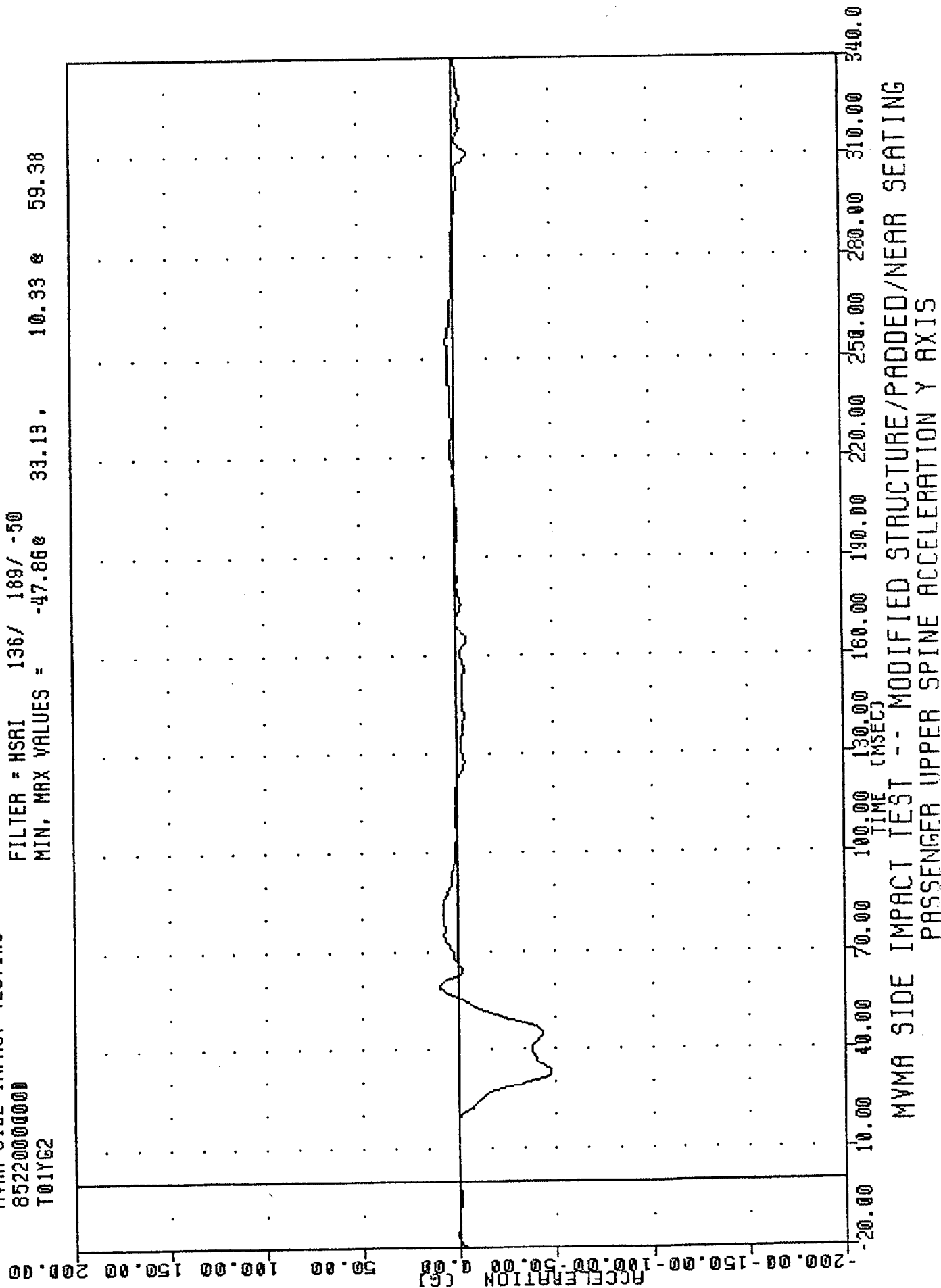


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 PASSENGER UPPER SPINE ACCELERATION X AXIS

TRC
 MAMA SIDE IMPACT TESTING
 852200000000
 T01YG2

PLOT DATE 15-AUG-85 12:23:18

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -47.86 33.13, 10.33 59.38



MAMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 PASSENGER UPPER SPINE ACCELERATION Y AXIS

TAC , 850808 PLOT DATE 15-AUG-85 12:23:18

MYMA SIDE IMPACT TESTING

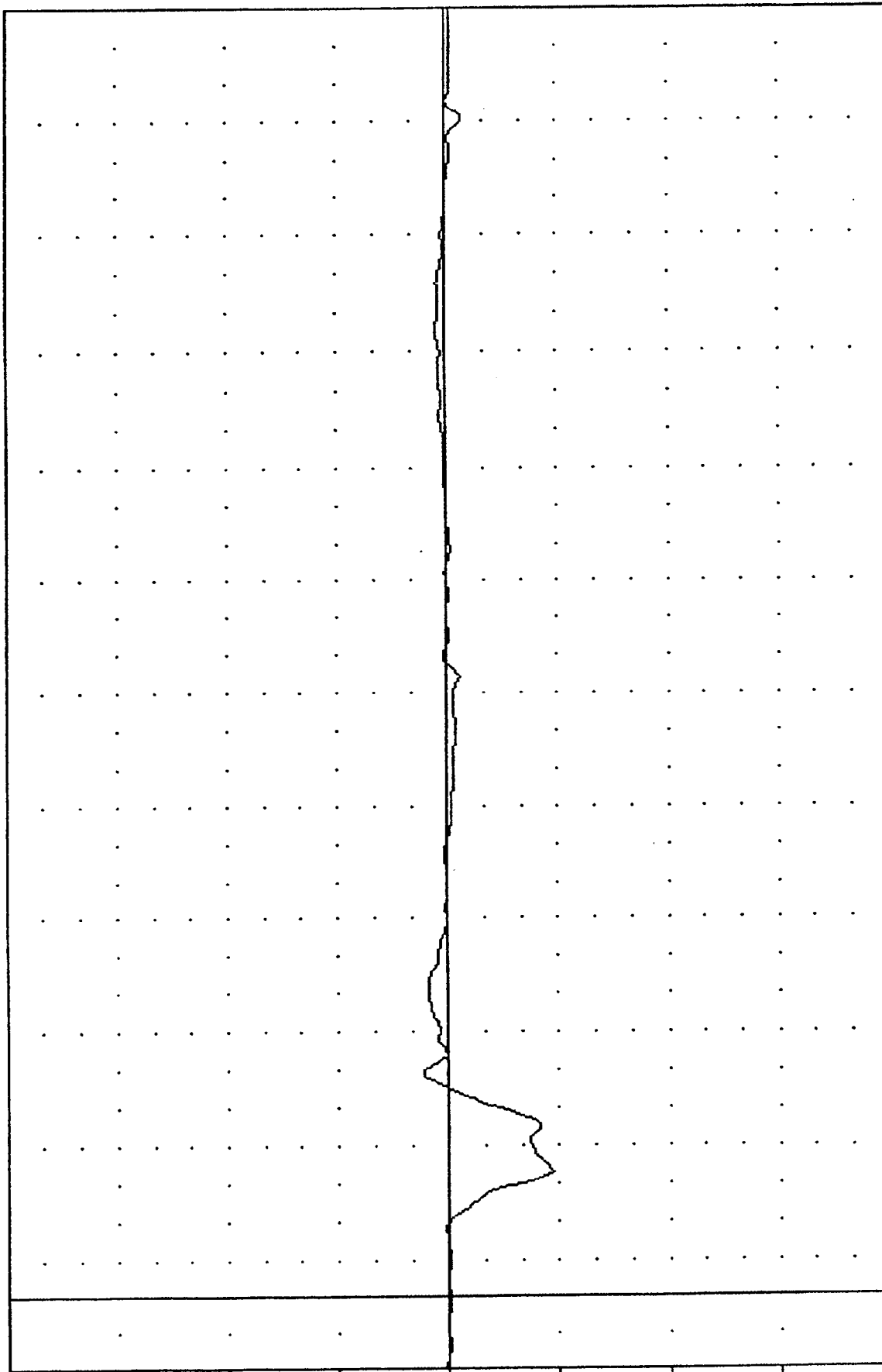
85220000000

T01Y68

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -47.17 33.13 10.90 59.38

ACCELERATION (G)



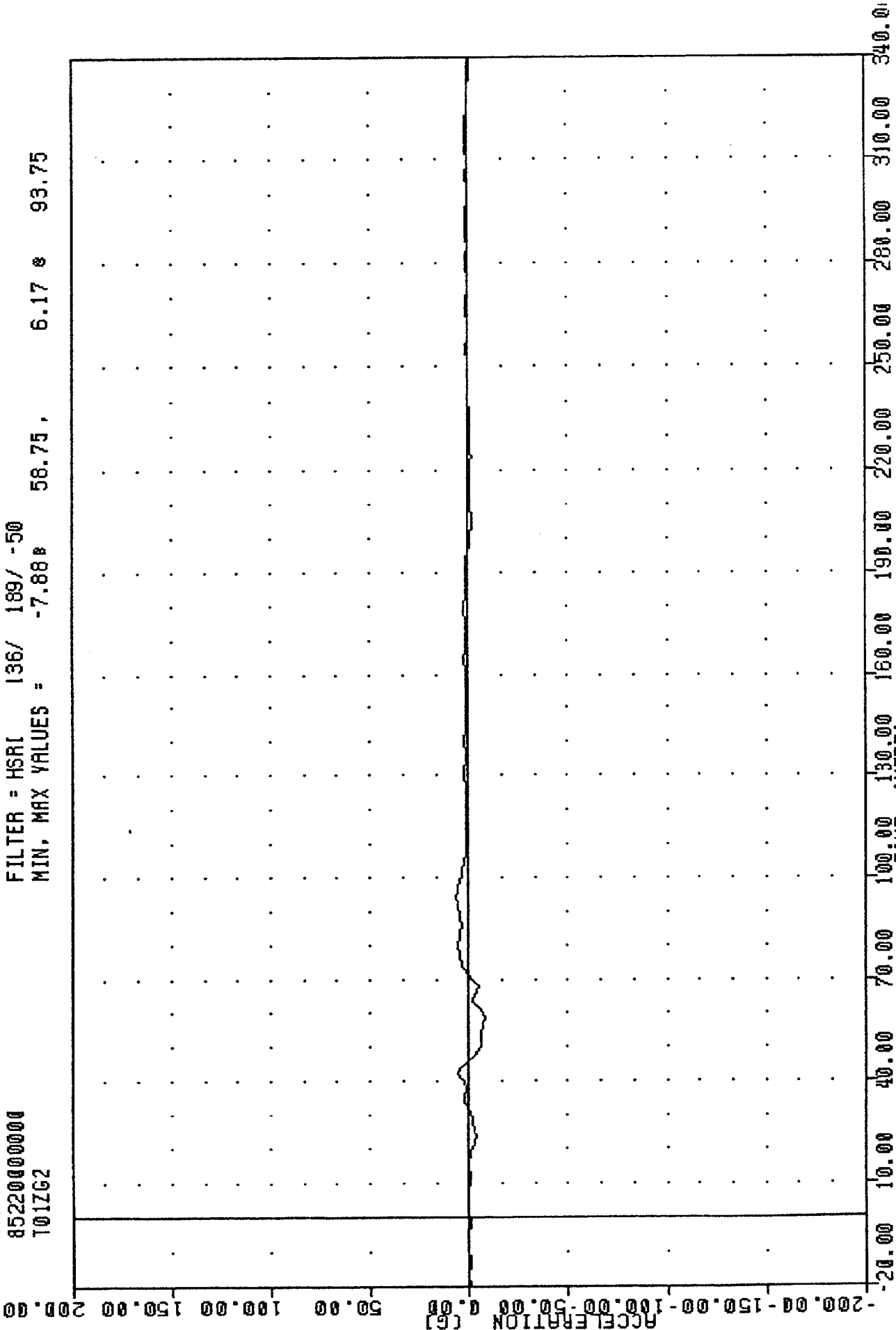
MYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING

PASSENGER UPPER SPINE ACCELERATION -2 Y AXIS

TRC
 NYMA SIDE IMPACT TESTING
 852200000000
 T01ZG2

PLOT DATE 15-AUG-85 12:23:18

FILTER = HSR1 136/ 189/ -50
 MIN, MAX VALUES = -7.88 58.75, 6.17 93.75

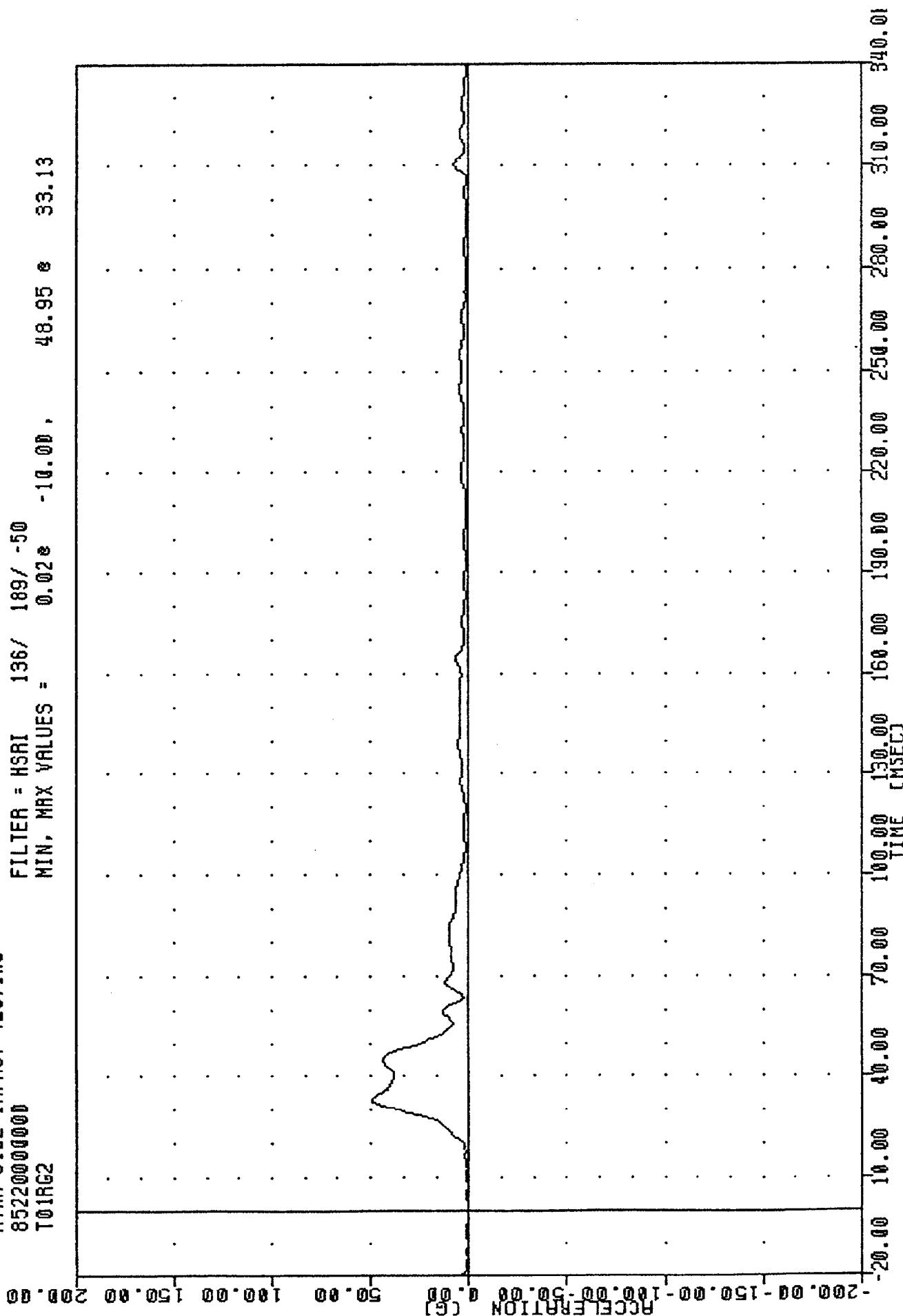


NYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 PASSENGER UPPER SPINE ACCELERATION Z AXIS

TRC
 850808
 MVMA SIDE IMPACT TESTING
 85220000000
 T01RG2

PLOT DATE 15-AUG-85 12:23:18

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.02e -10.00, 48.95 e 33.13



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

TRC

, 850808

MVMA SIDE IMPACT TESTING

85220000000

T01R6B

PLOT DATE

15-AUG-85

12:23:18

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.050 -10.00 , 48.28 33.13

200.00

150.00

100.00

50.00

0.00

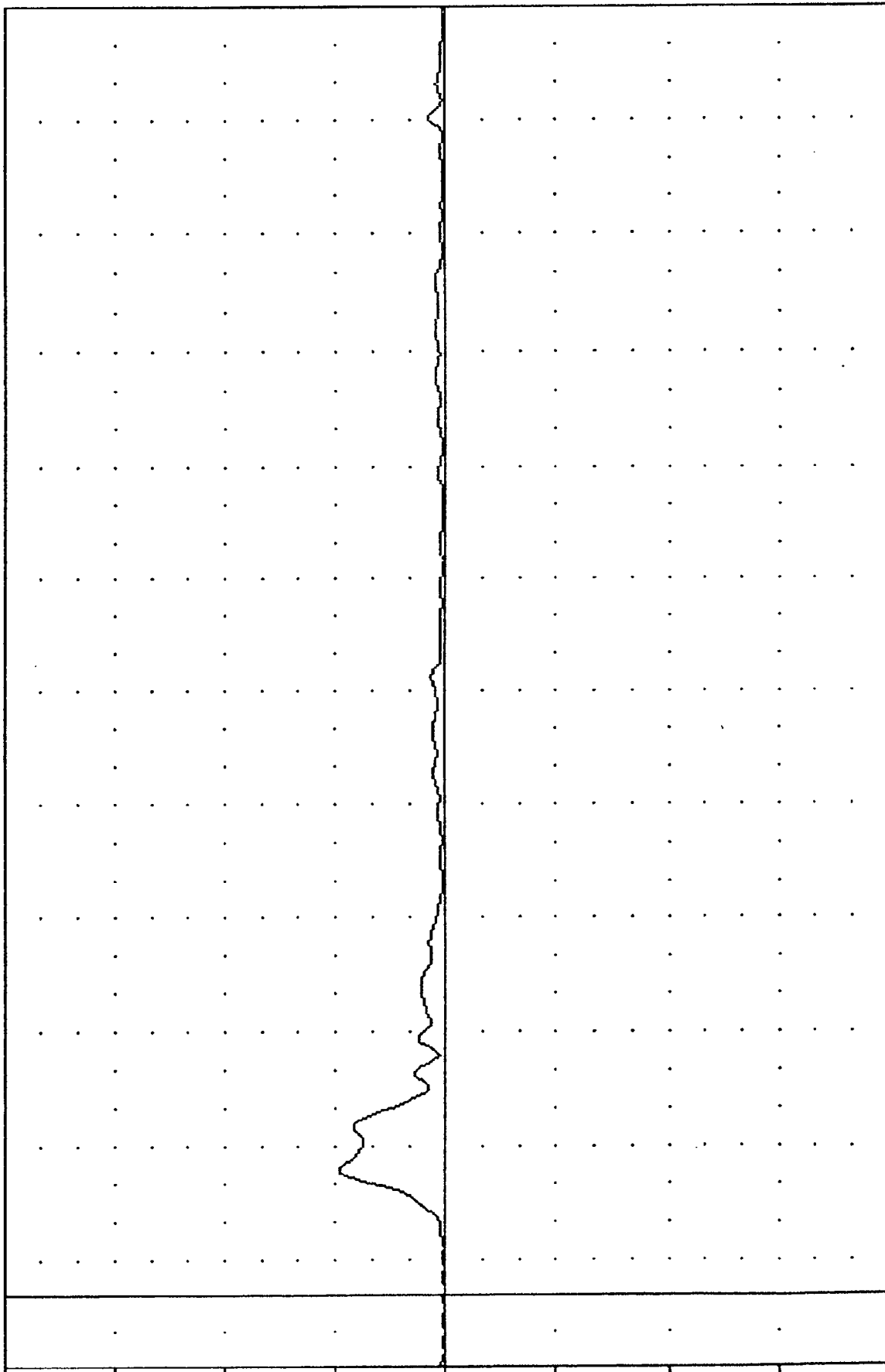
-50.00

-100.00

-150.00

-200.00

ACCELERATION (G)



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

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

TRC 850808 PLOT DATE 15-AUG-85 12:25:37

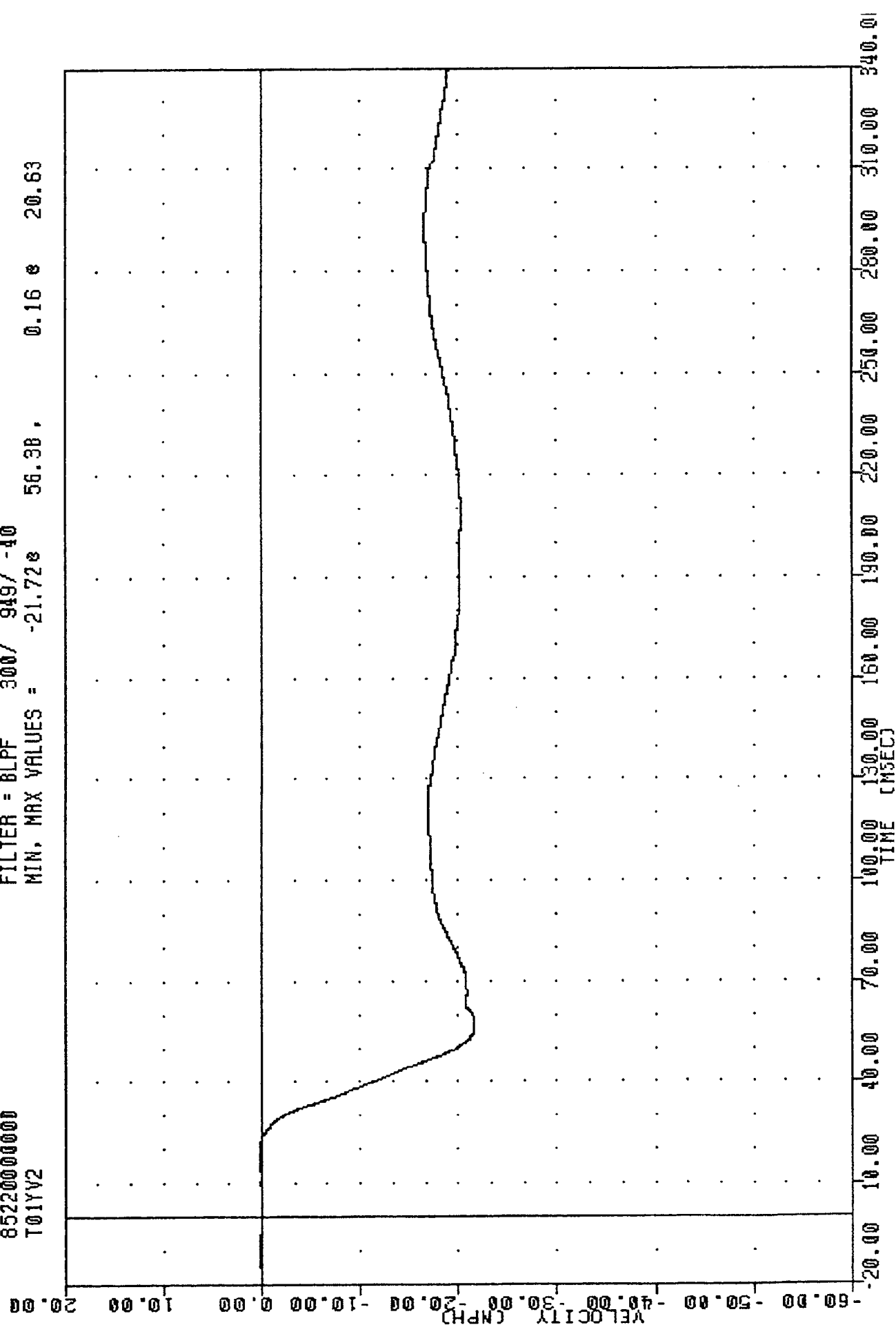
MVMA SIDE IMPACT TESTING

852200000000

T01YV2

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -21.72 56.38 0.16 20.63

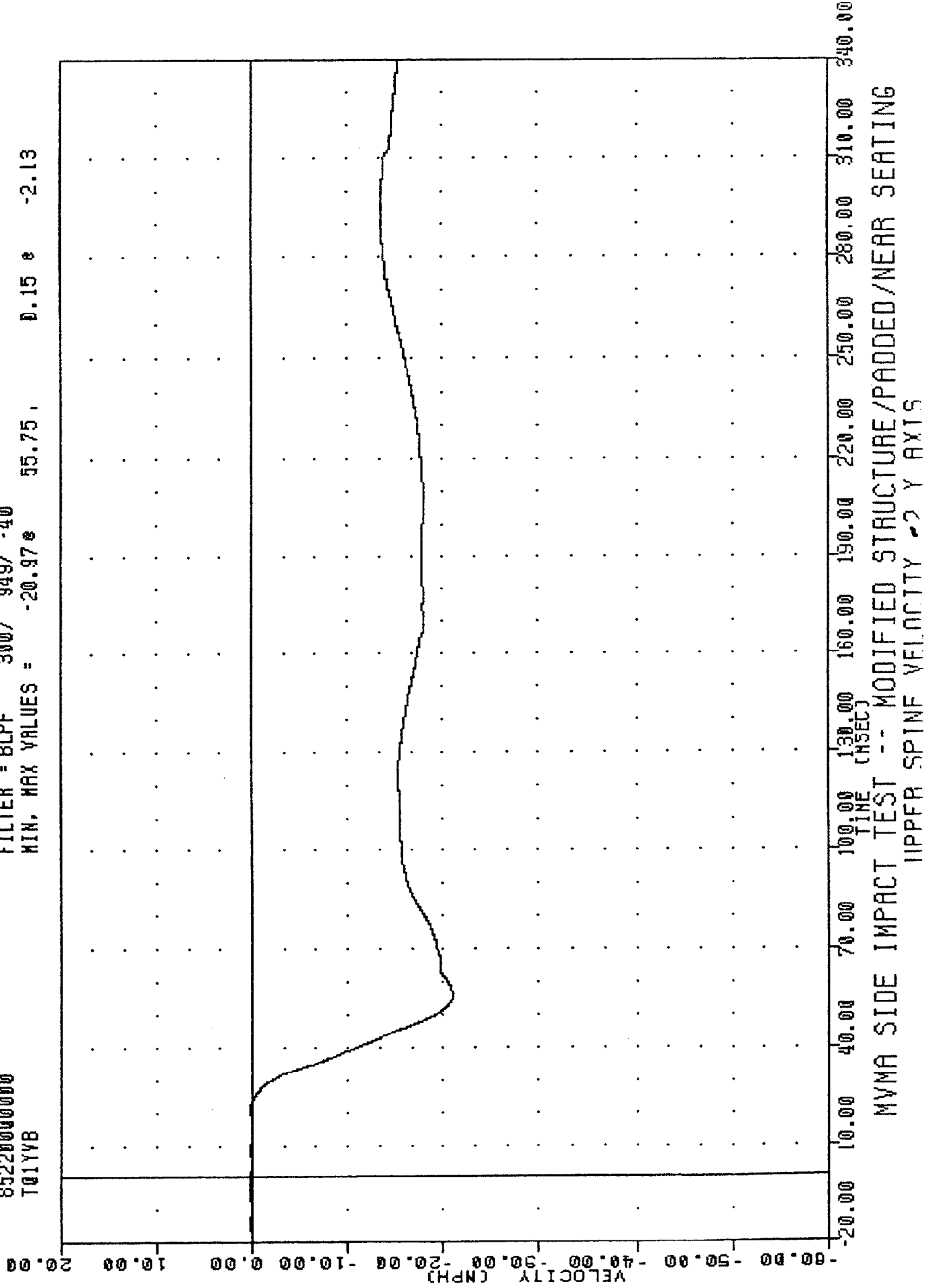


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
UPPER SPINE VELOCITY Y AXIS

TRC
MVMA SIDE IMPACT TESTING
852200000000
T01YVB

PLOT DATE 15-AUG-85 12:25:37

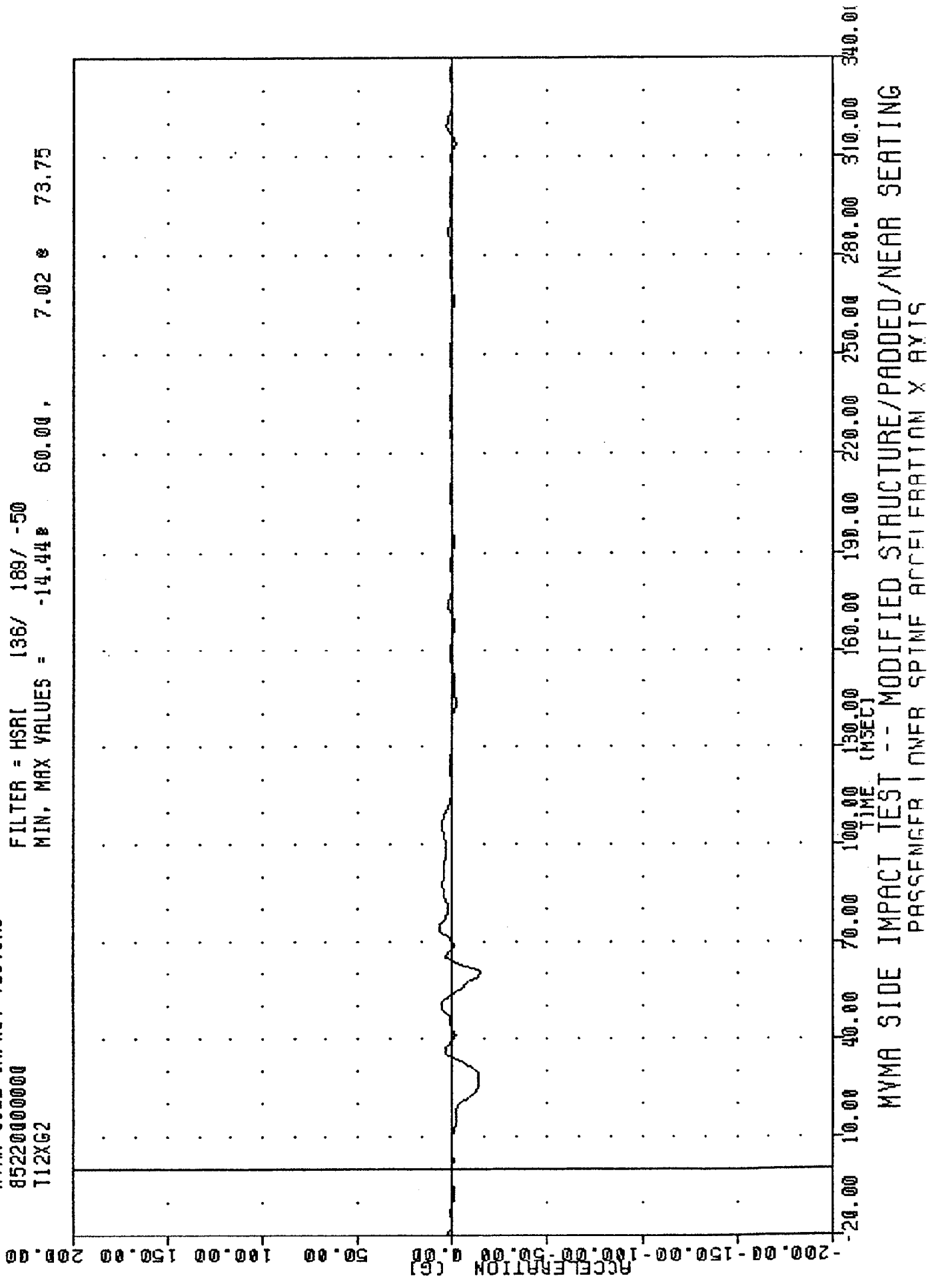
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -20.97 55.75, 0.15 -2.13



TRC
NVMA SIDE IMPACT TESTING
852200000000
T12XG2

PLOT DATE 15-AUG-85 12:23:18

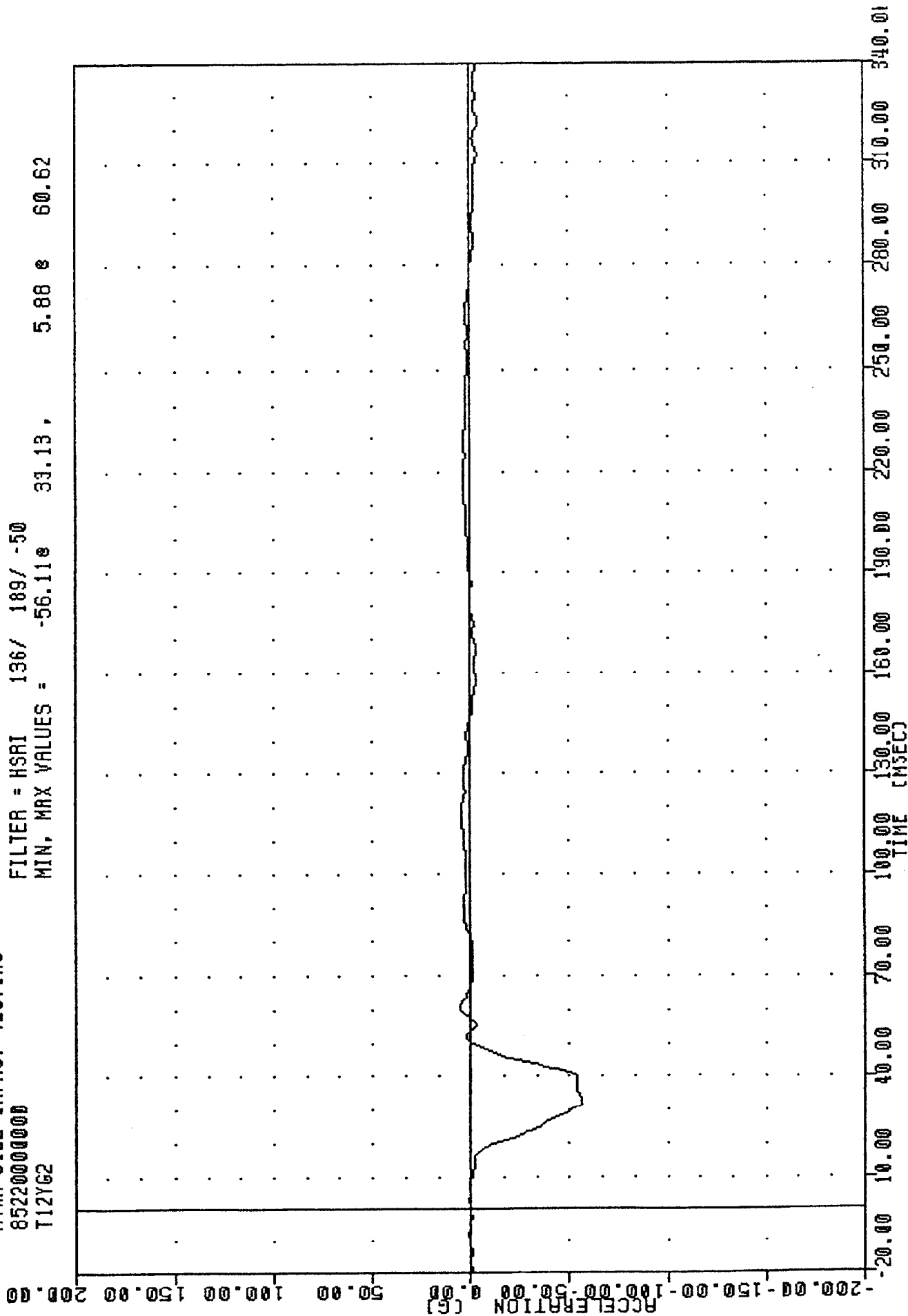
FILTER = HSR1 136/ 189/ -50
MIN, MAX VALUES = -14.44 60.00 , 7.02 73.75



TRC
 MYNA SIDE IMPACT TESTING
 852200000000
 T12YG2

PLOT DATE 15-AUG-85 12:23:18

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -56.11e 33.13, 5.88 e 60.62



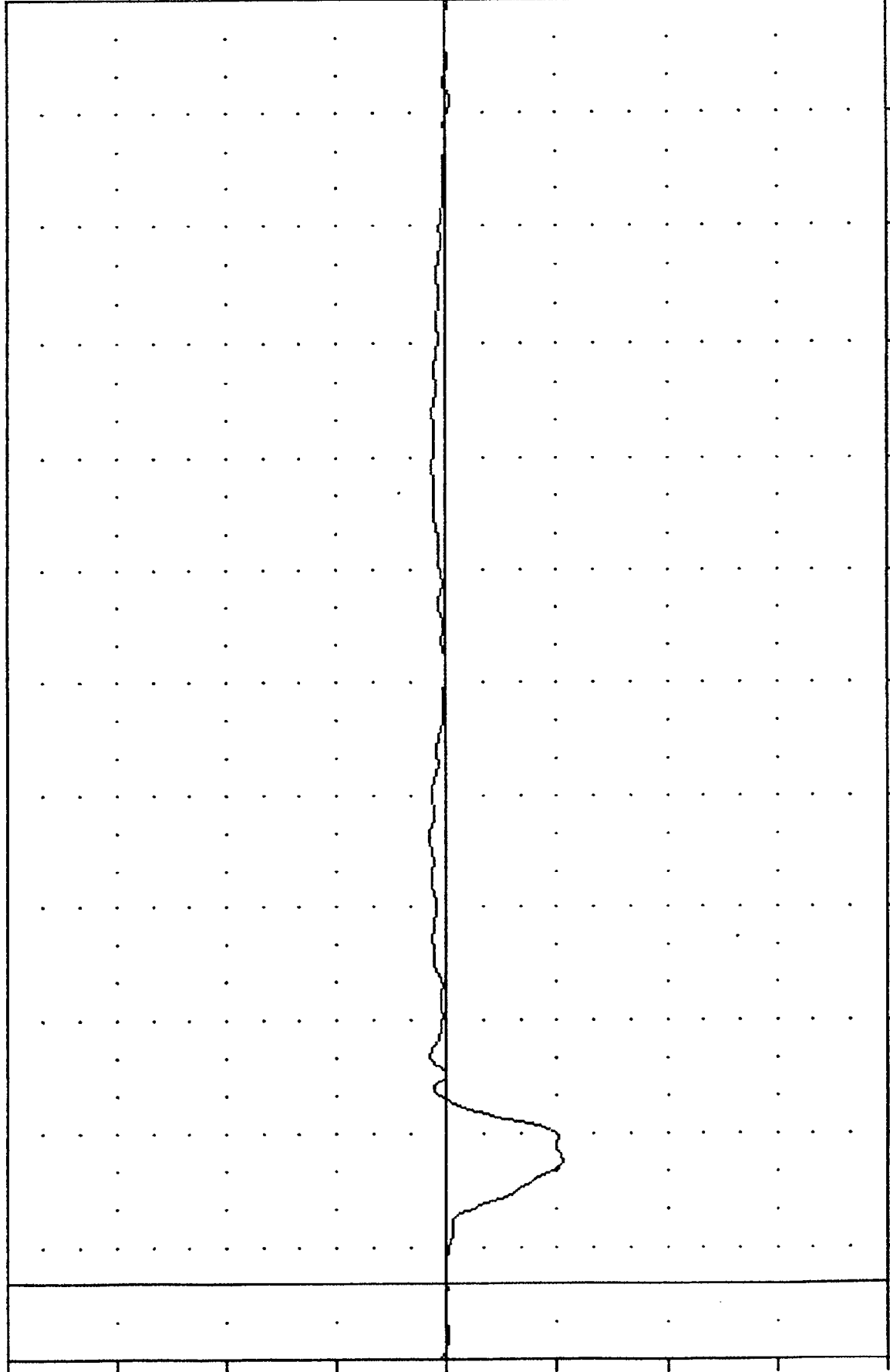
TRC , 850808
 MVMA SIDE IMPACT TESTING
 85220000000
 T12Y6B

PLOT DATE 15-AUG-85 12:23:18

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -52.51 32.50 , 7.99 60.62

ACCELERATION (G)



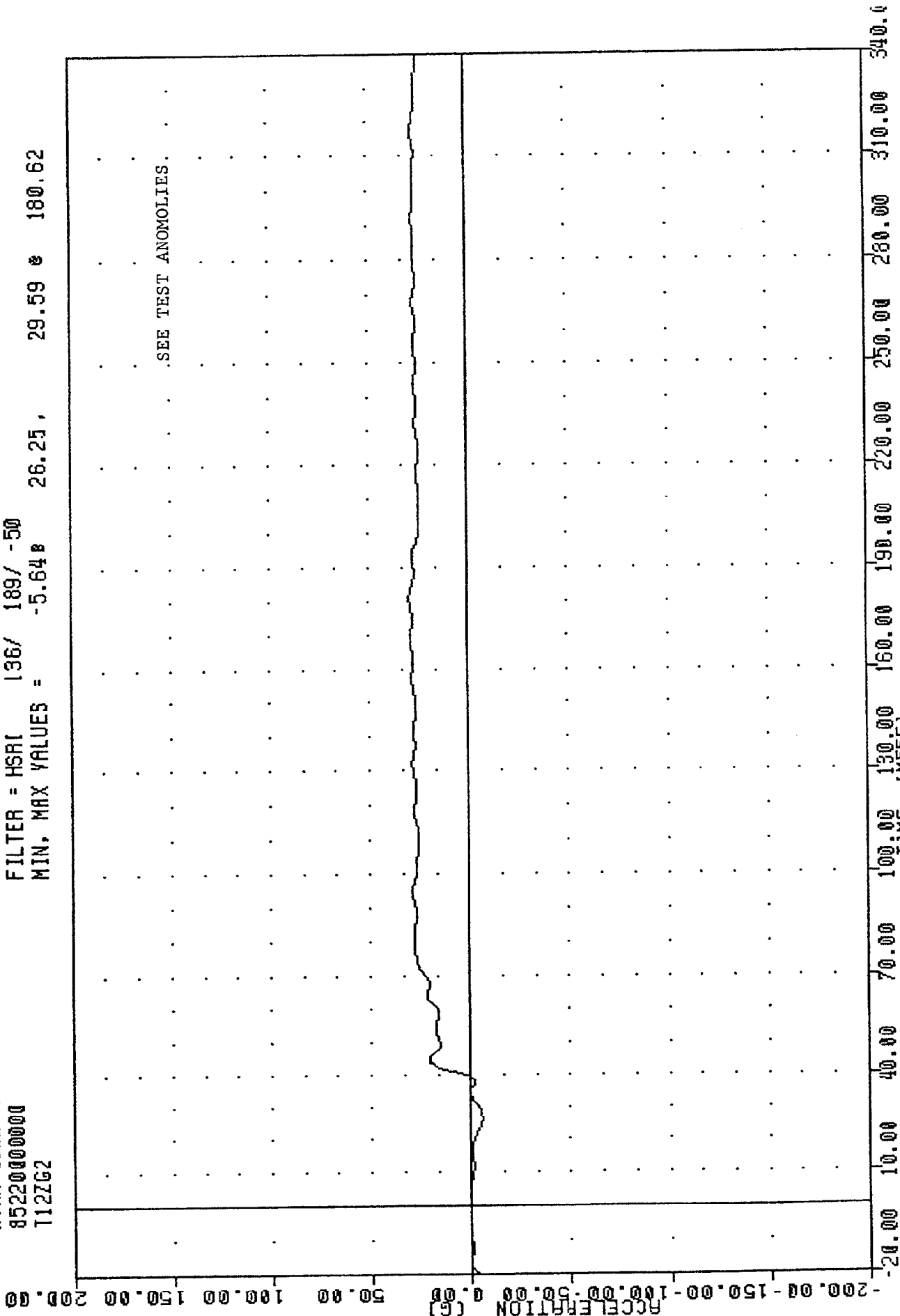
TIME (msec)

MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 PASSENGER LOWER SPINE ACCELERATION - Y AXIS

TRC
NYMA SIDE IMPACT TESTING
852200000000
T12ZG2

PLOT DATE 15 AUG 63 14:17:04

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -5.648 26.25, 29.59 & 180.62

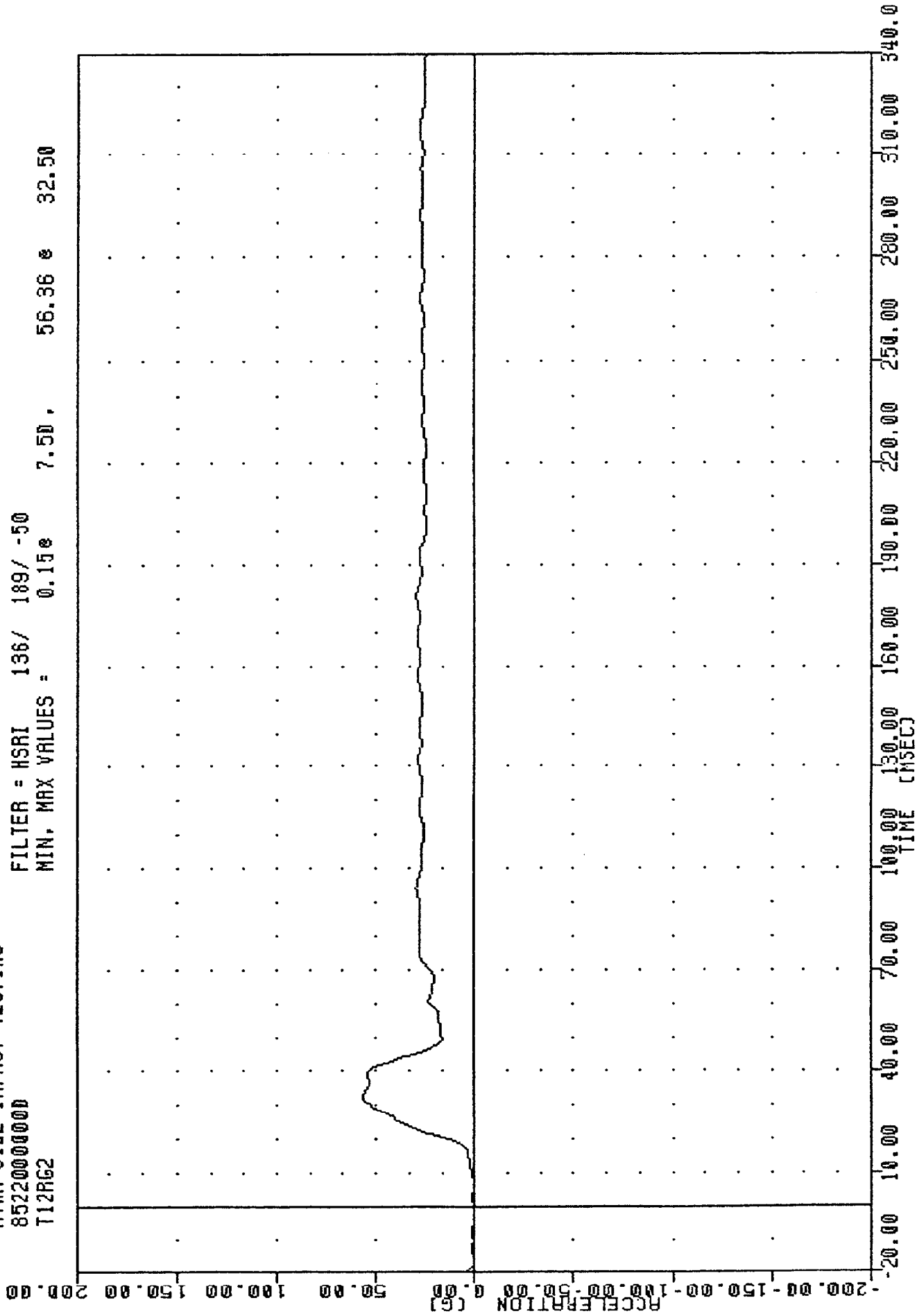


NYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
PASSENGER LOWER SPINE ACCELERATION Z AXIS

TAC 830808
 MVNA SIDE IMPACT TESTING
 852200000000
 T12RG2

PLOT DATE 13-AUG-85 14:17:04

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.15e 7.50, 56.36 e 32.50

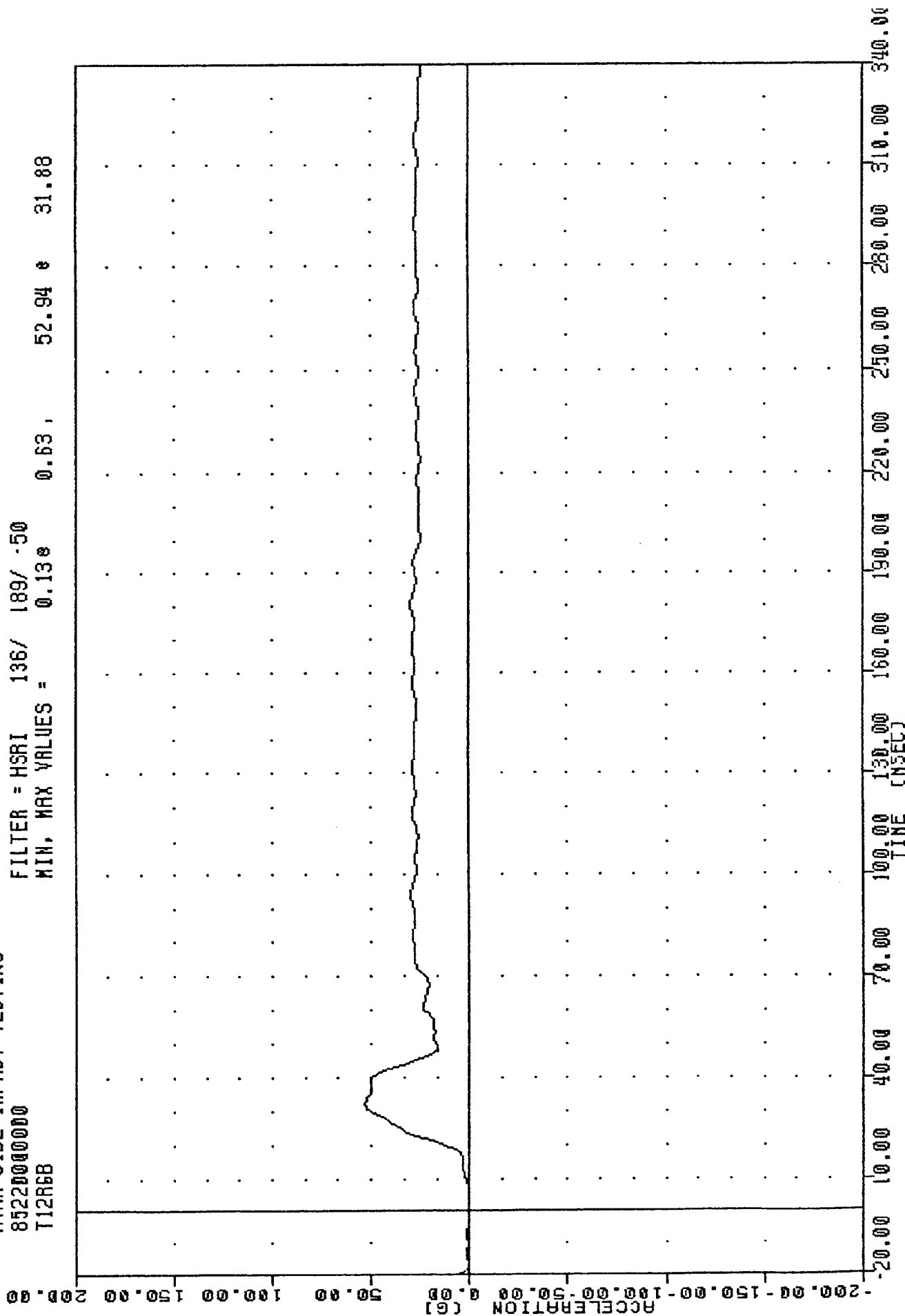


MVNA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 PASSENGER LOWER SPINE RESULTANT ACCELERATION

TRC 850808
 MVMA SIDE IMPACT TESTING
 852200000000
 T12R6B

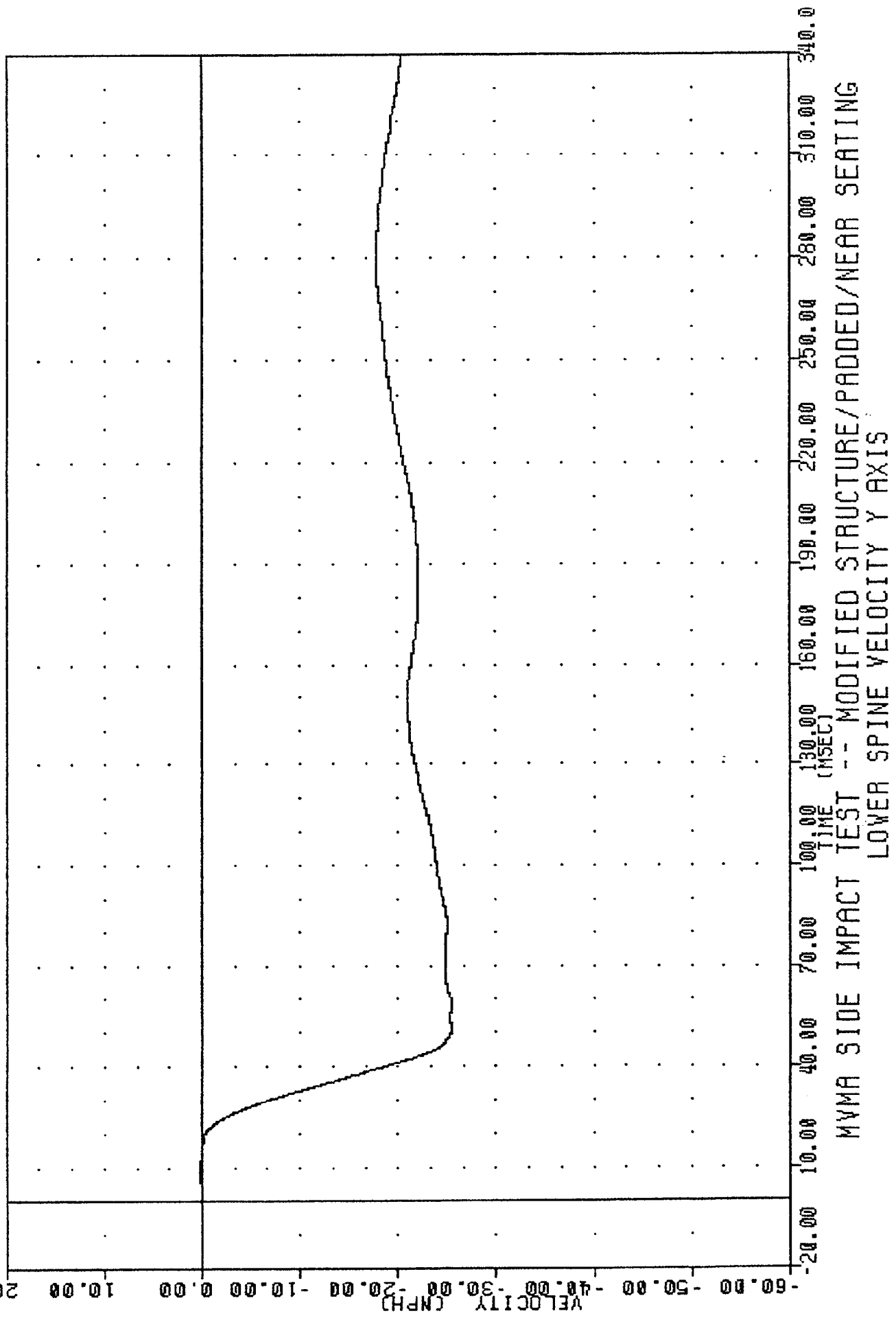
PLUT DATE 15-AUG-85 14:17:04

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.13e 0.63, 52.94 e 31.88



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

TRC 850808
 NVMA SIDE IMPACT TESTING
 852200000000
 T12YV2
 PLOT DATE 15-AUG-85 12:25:37
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -25.46 58.50 0.12 9.38

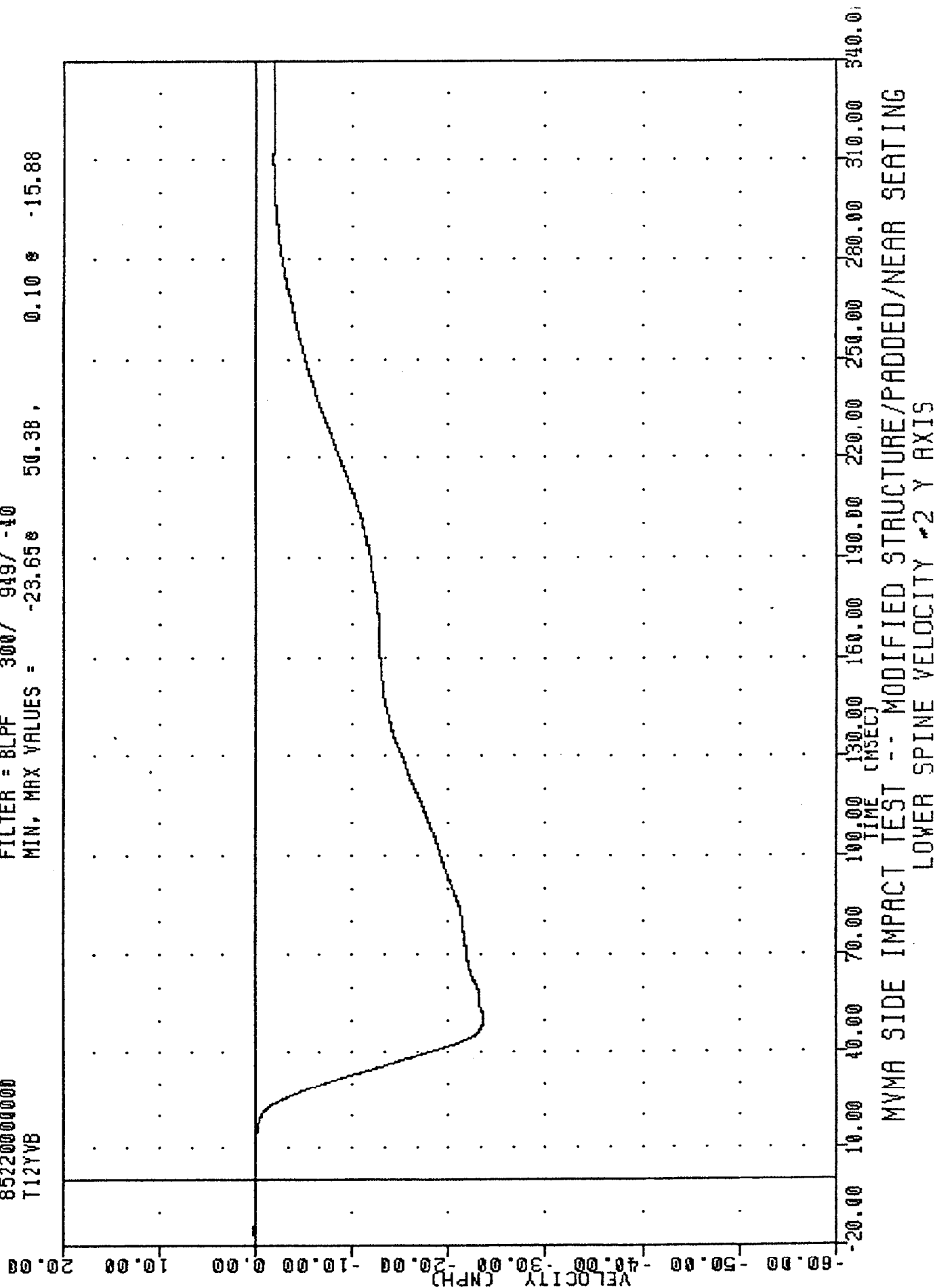


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 LOWER SPINE VELOCITY Y AXIS

TRC
 , 850808
 MVNA SIDE IMPACT TESTING
 852200000000
 T12YVB

PLOT DATE 15-AUG-85 12:25:37

FILTER = BLPF 300/ 949/ -10
 MIN, MAX VALUES = -23.650 50.38, 0.10 0 -15.88

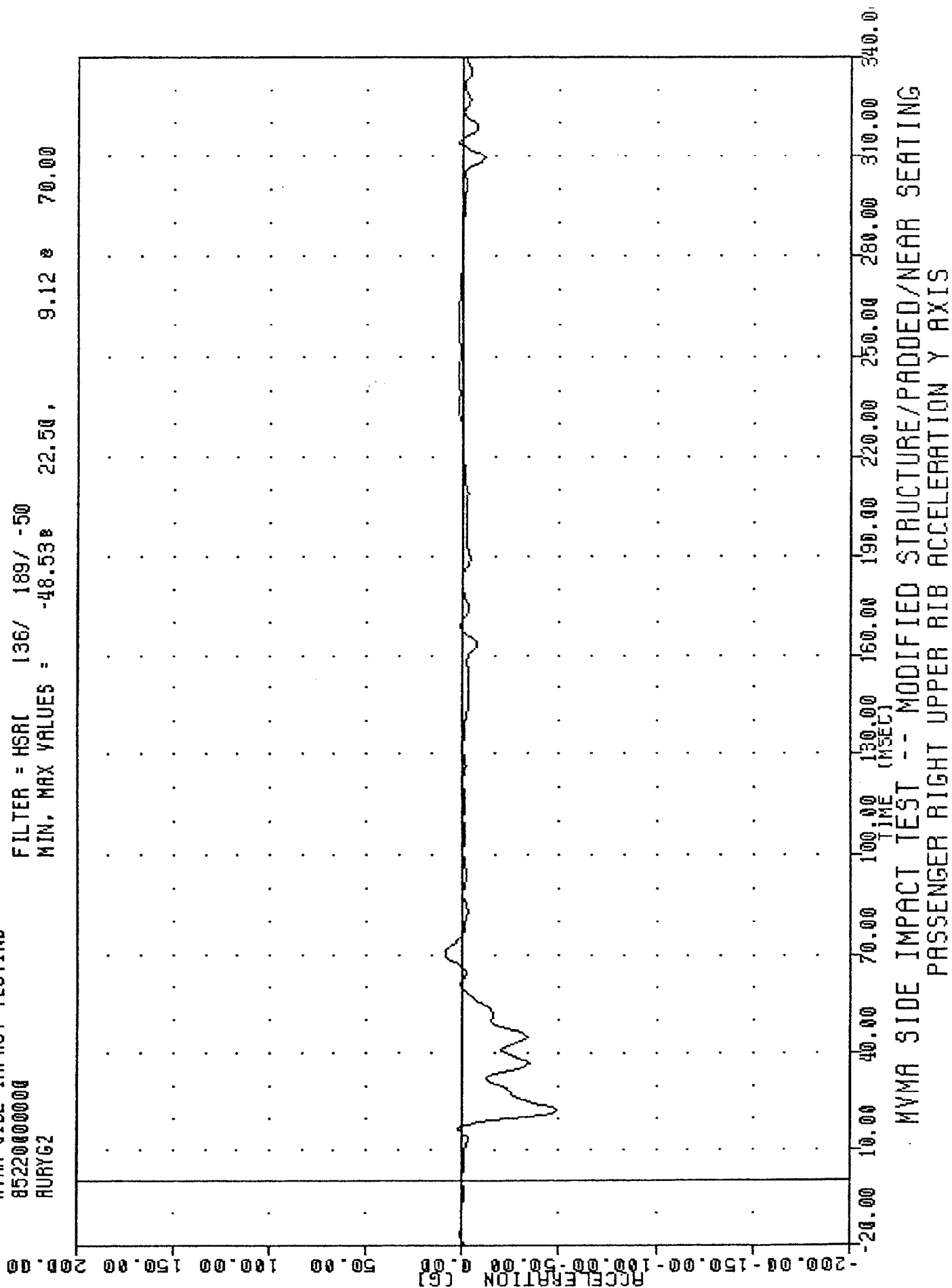


MVNA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 LOWER SPINE VELOCITY -2 Y AXIS

TRC , 850808
 NYMA SIDE IMPACT TESTING
 852200000000
 RURYG2

PLOT DATE 15-AUG-85 16:10:18

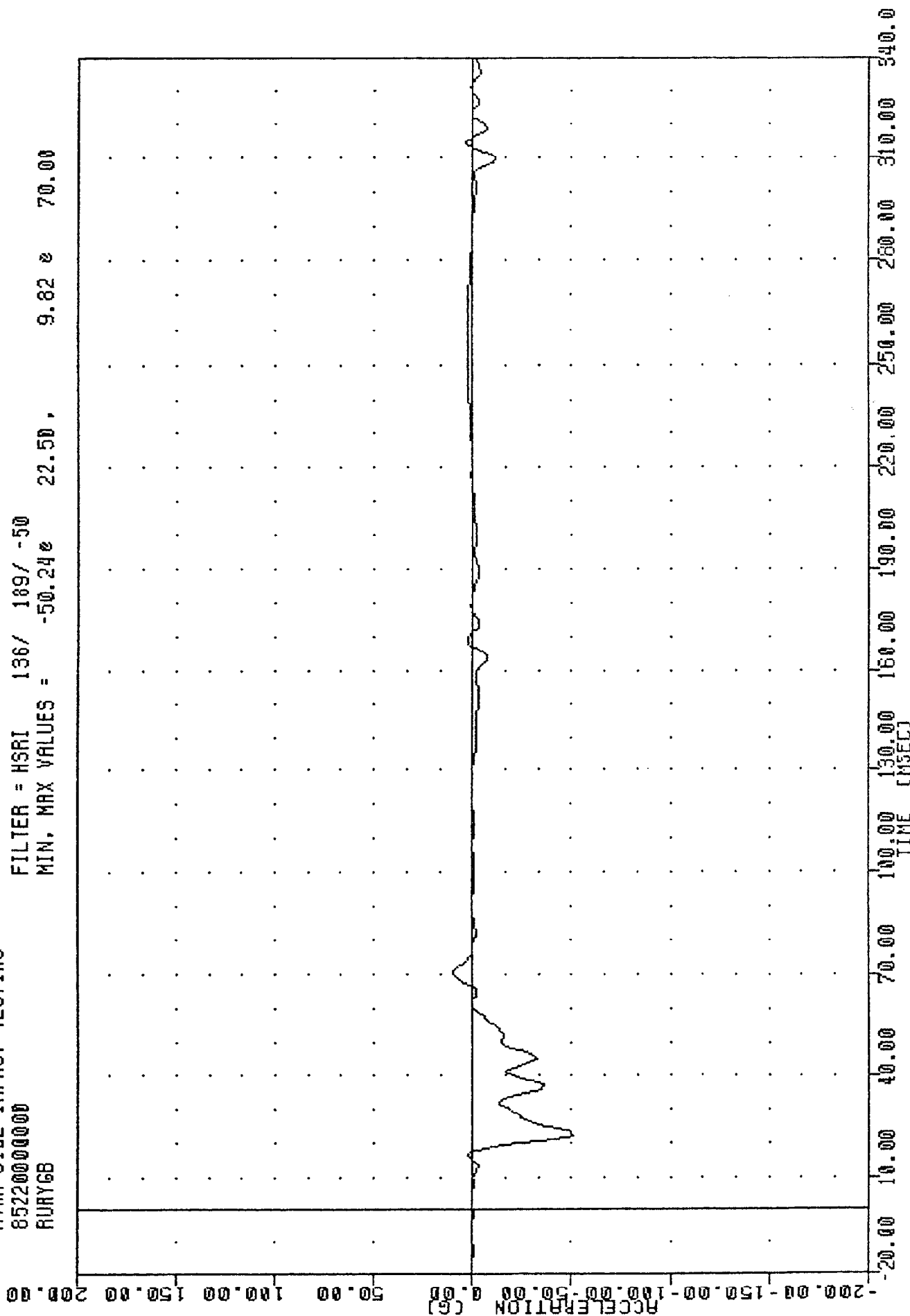
FILTER = HSRL 136/ 189/ -50
 MIN, MAX VALUES = -48.538 22.50, 9.12 8 70.00



TRC
MVMA SIDE IMPACT TESTING
852200000000
RURYGB

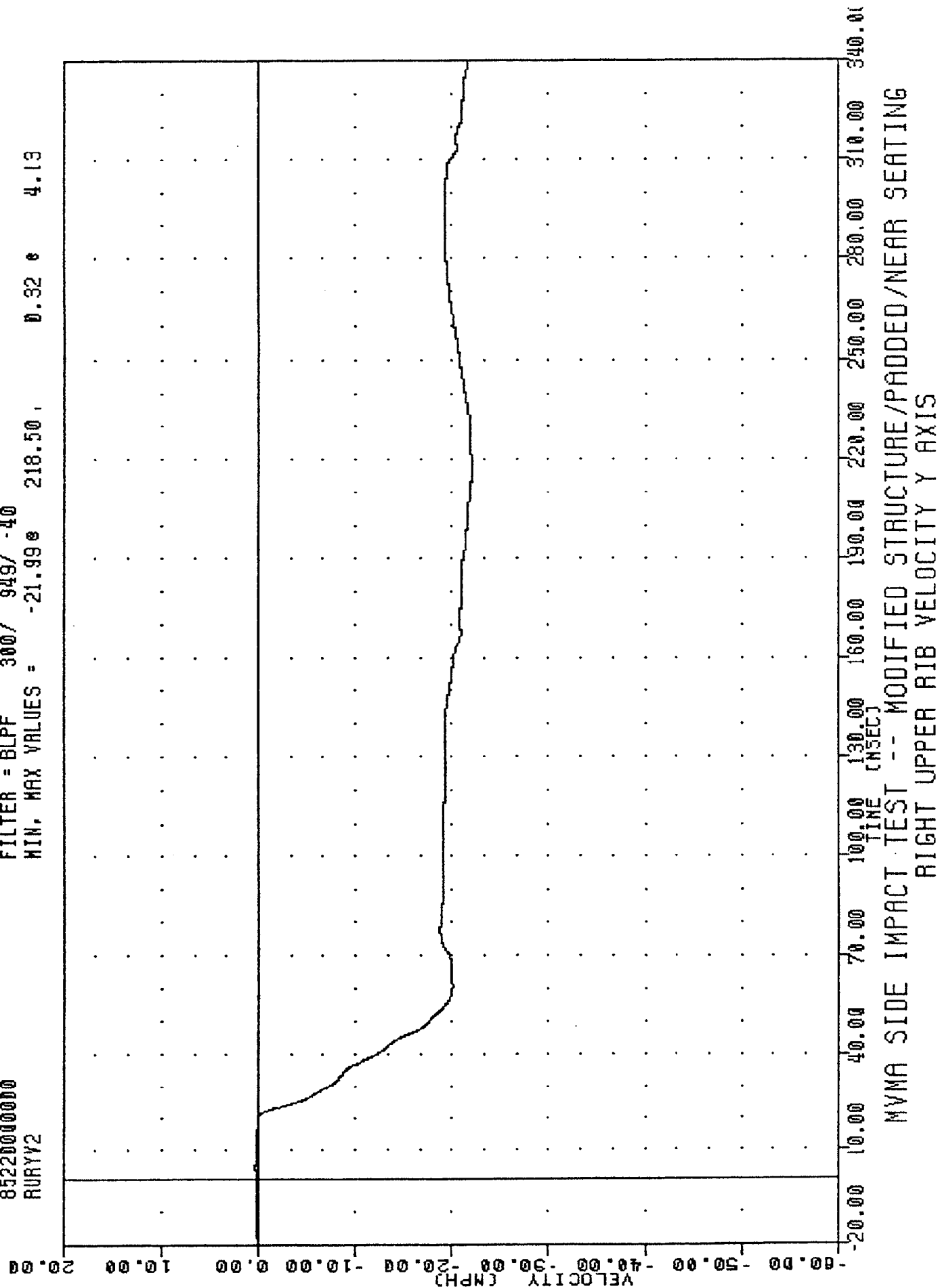
PLOT DATE 15-AUG-85 14:17:04

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -50.240 22.50, 9.82 0 70.00



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

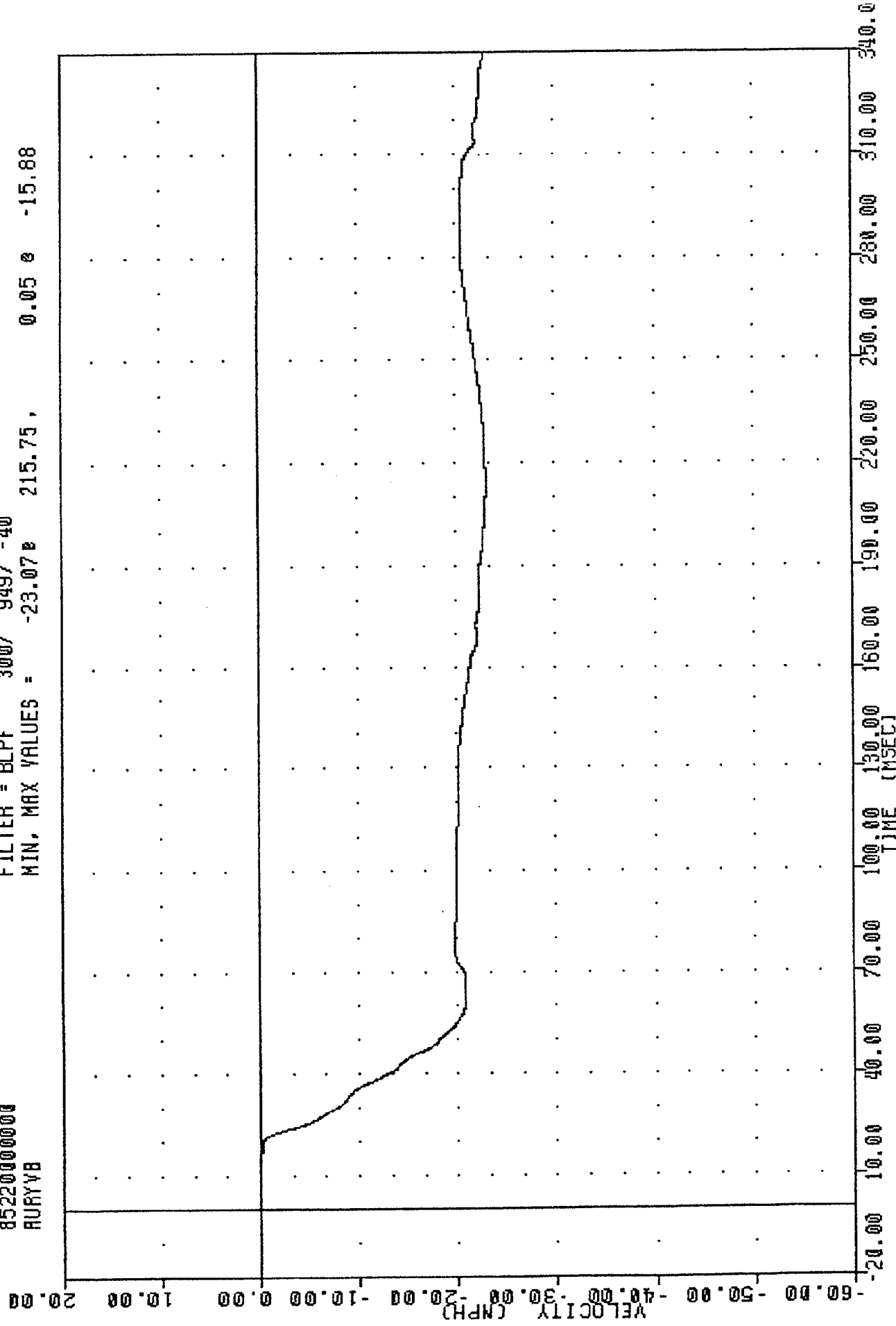
TRC 850808
 MVMA SIDE IMPACT TESTING
 85220000000
 RURYV2
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -21.99 218.50 0.32 4.13
 PLOT DATE 15-AUG-85 12:25:37



TRC 850808 15-AUG-85 12:25:37

MYMA SIDE IMPACT TESTING
852200000000
RURYVB

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -23.07 215.75, 0.05 0 -15.88

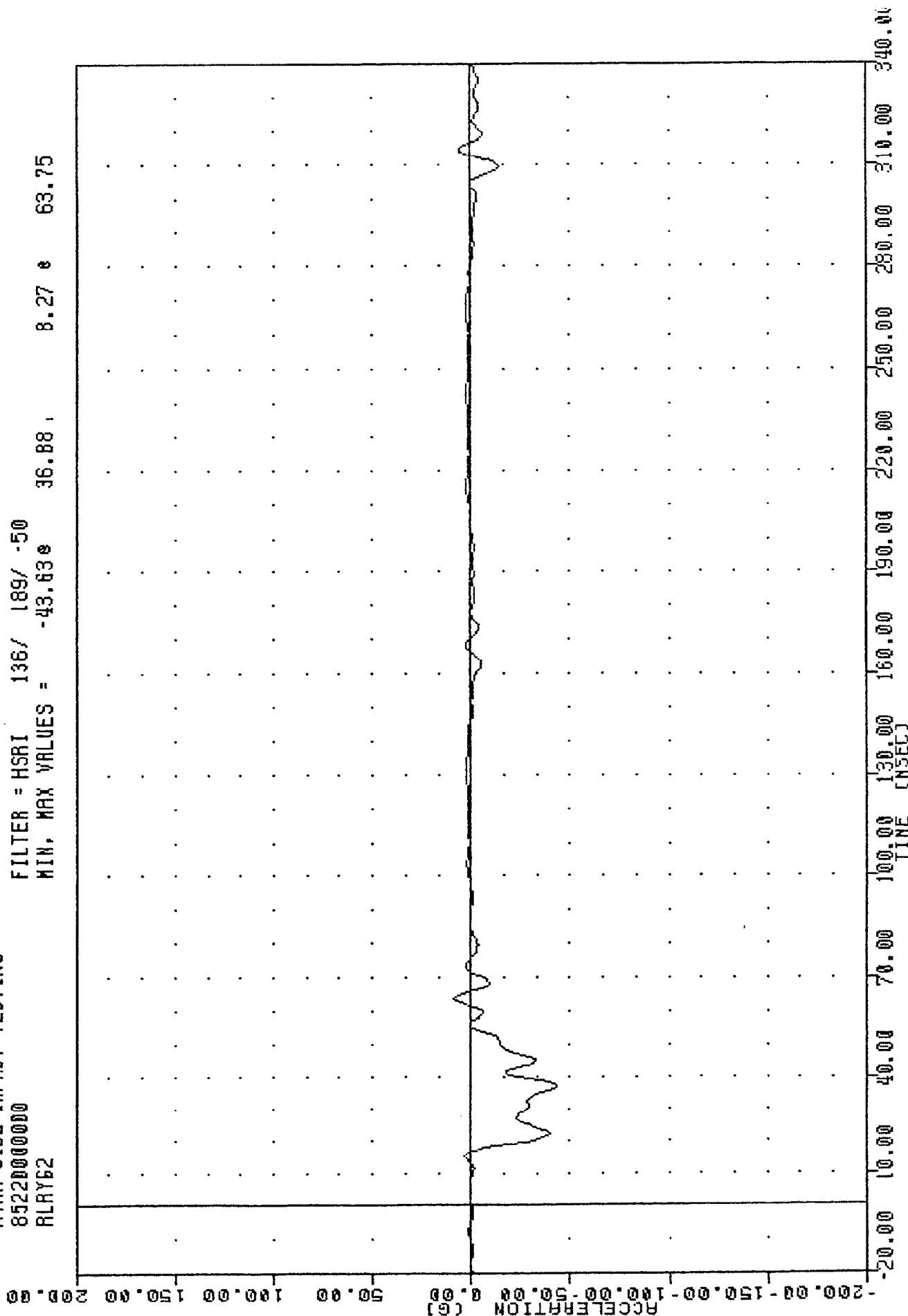


MYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
RIGHT UPPER RIB VELOCITY -2 Y AXIS

TAC 852200000000
 NYMA SIDE IMPACT TESTING
 RLY62

PLUT DATE 15-HUG-85 14:17:04

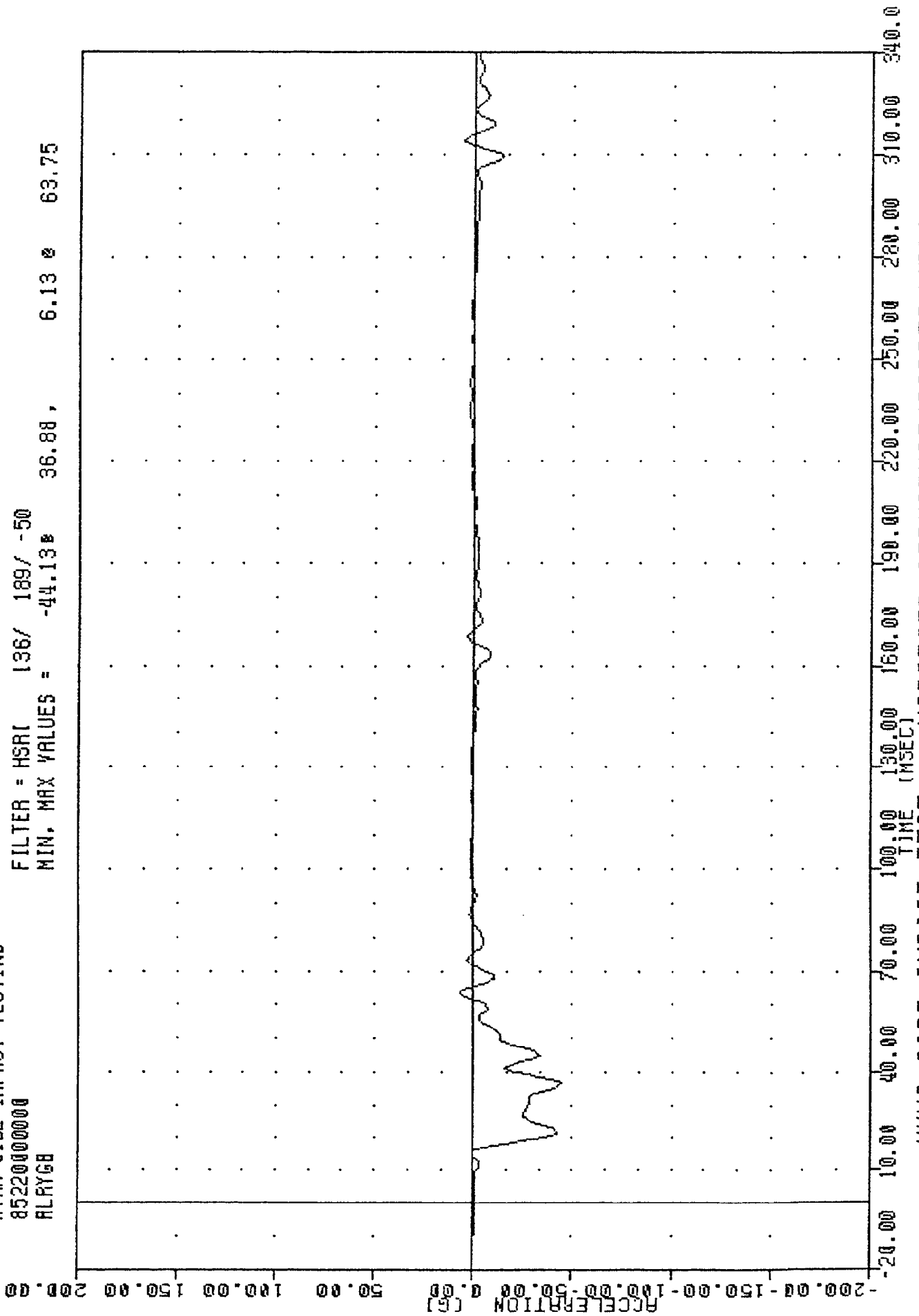
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -43.63 36.88 8.27 63.75



TRC 830808
 NYMA SIDE IMPACT TESTING
 852200000000
 RLYGB

PLOT DATE 15-AUG-85 14:17:04

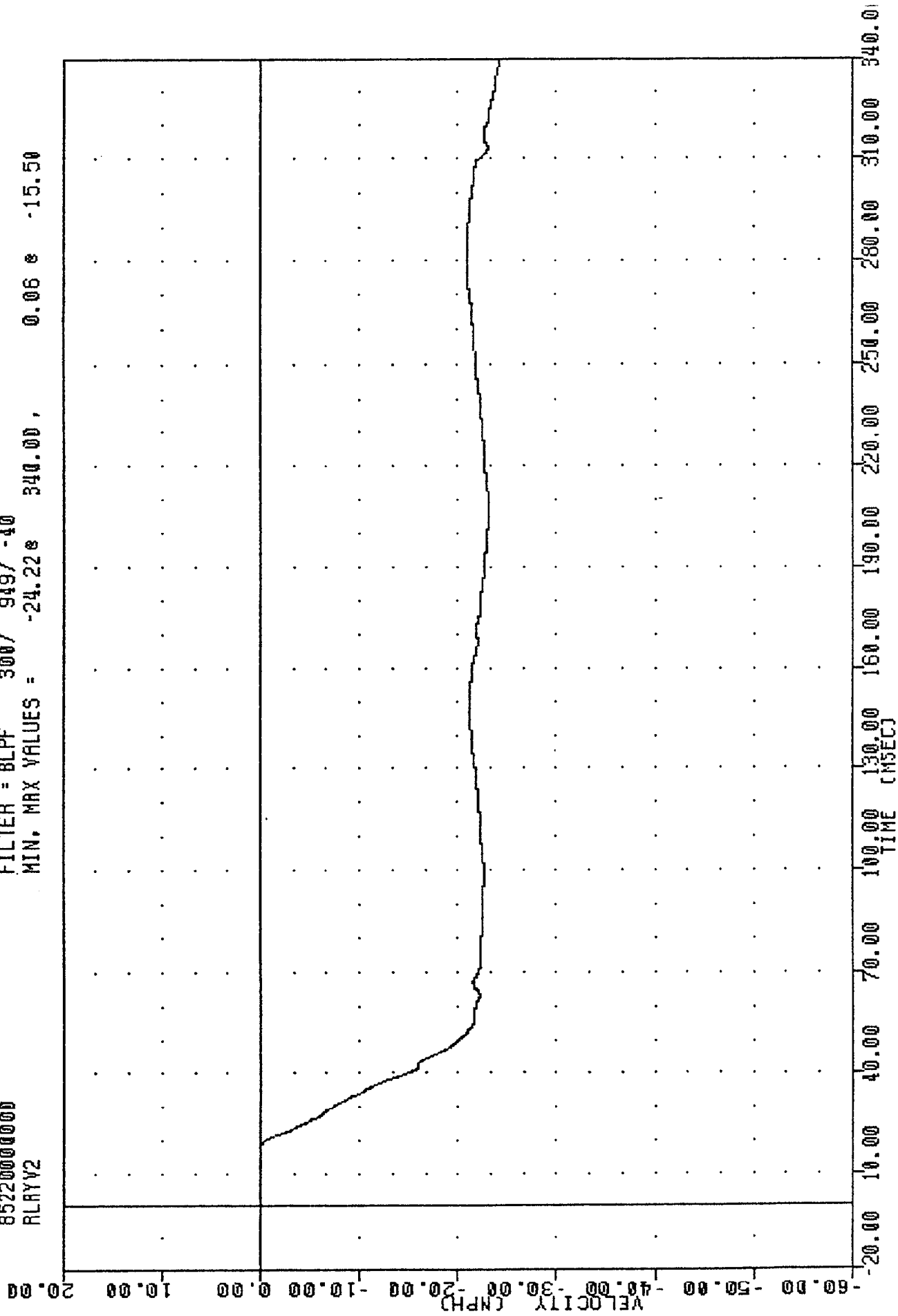
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -44.13 36.88, 6.13 63.75



TRC 852200000000
 MYNA SIDE IMPACT TESTING
 852200000000
 RLRYV2

PLOT DATE 15-MAR-83 12:25:37

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -24.22e 340.00, 0.06e -15.50



MYNA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 RIGHT LOWER RIB VELOCITY

TRC 852200000000

MYMA SIDE IMPACT TESTING

852200000000

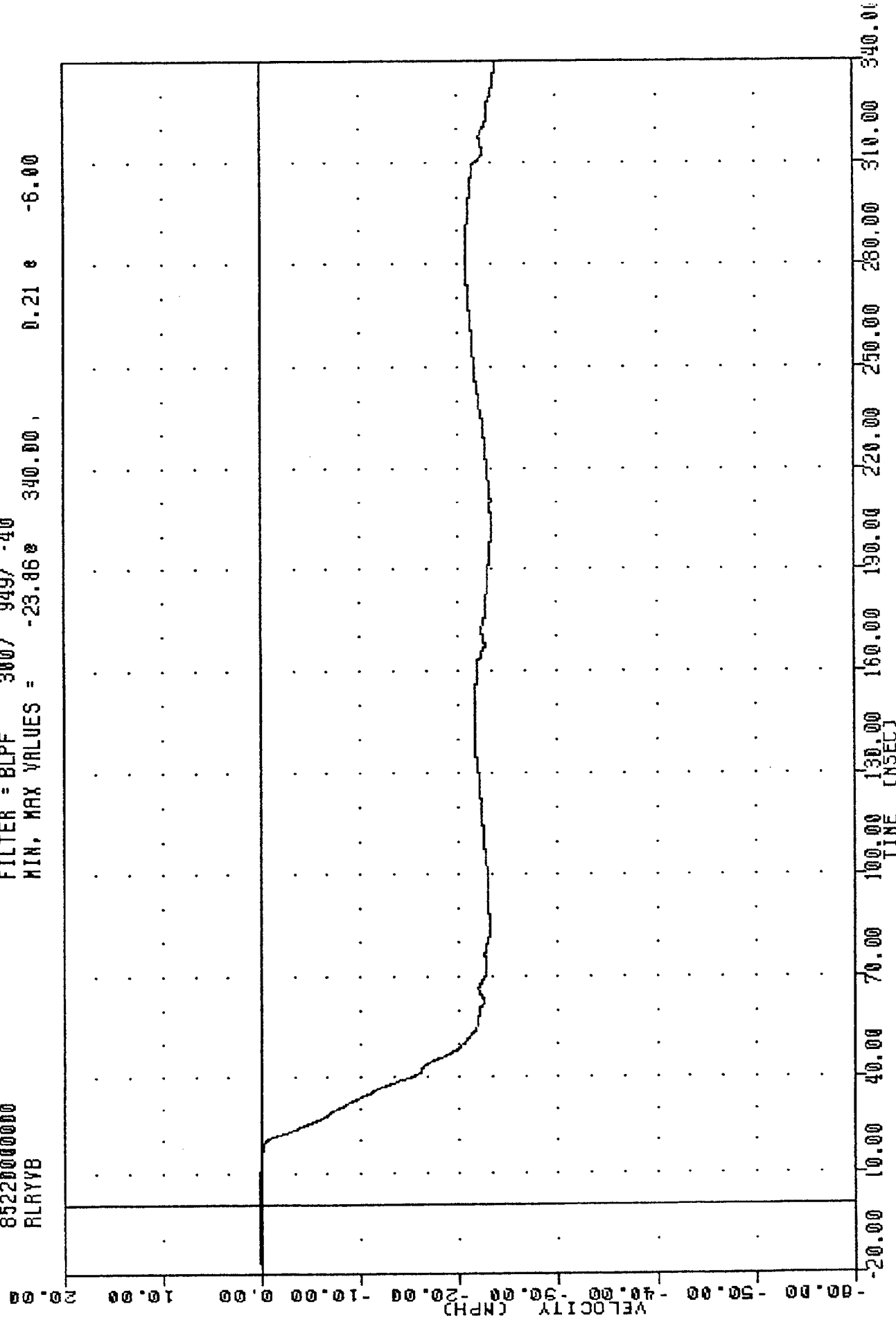
PLRYVB

15-AUG-85

12:25:37

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -23.86 340.00 0.21 e -6.00



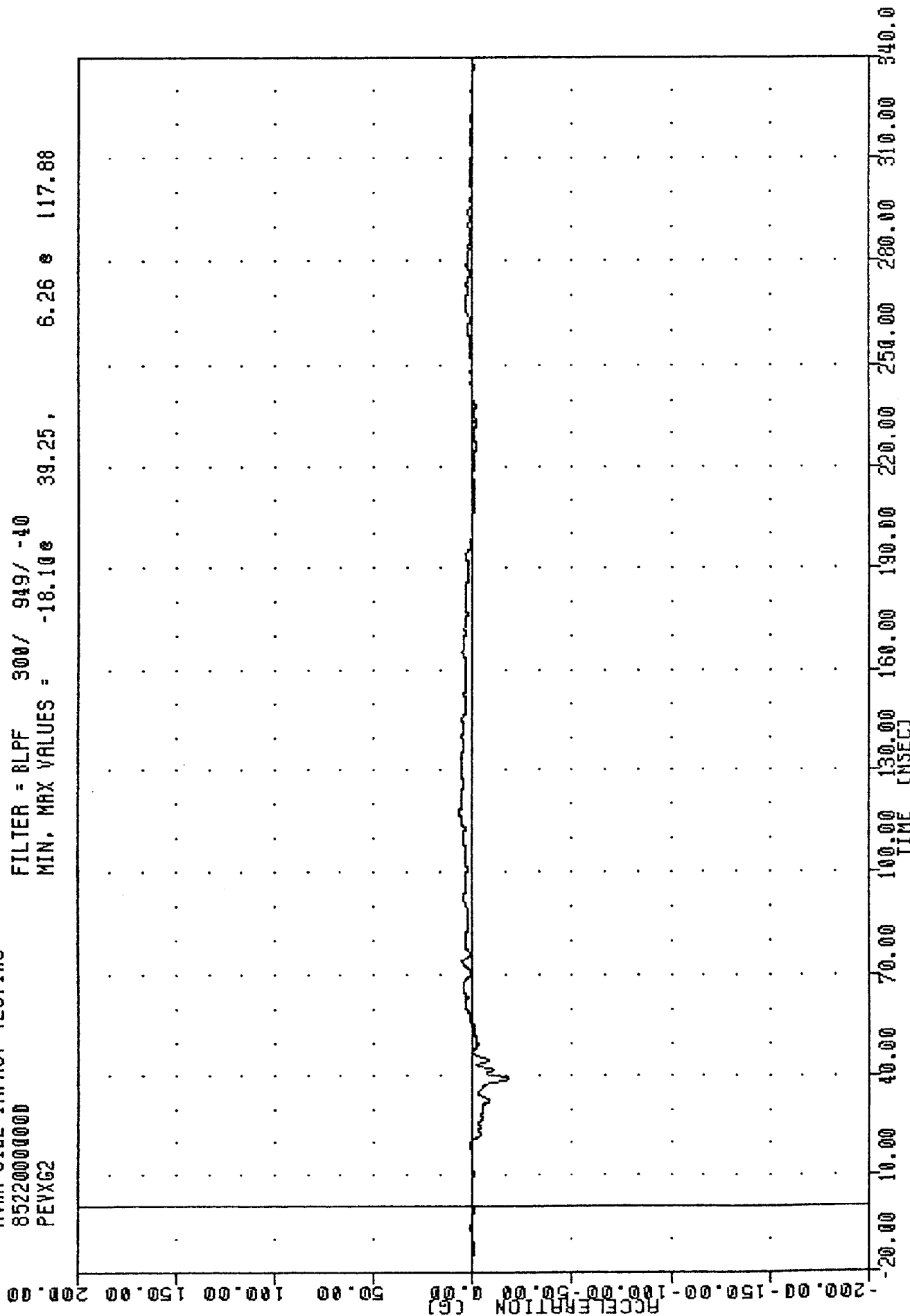
MODIFIED STRUCTURE/PADDED/NEAR SEATING

RIGHT LOWER RIB VELOCITY #2 Y AXIS

TRC
MVMA SIDE IMPACT TESTING
852200000000
PEYXG2

PLOT DATE 15-AUG-85 14:16:42

FILTER = 8LPF 300/ 949/ -40
MIN, MAX VALUES = -18.10e 39.25, 6.26 e 117.88

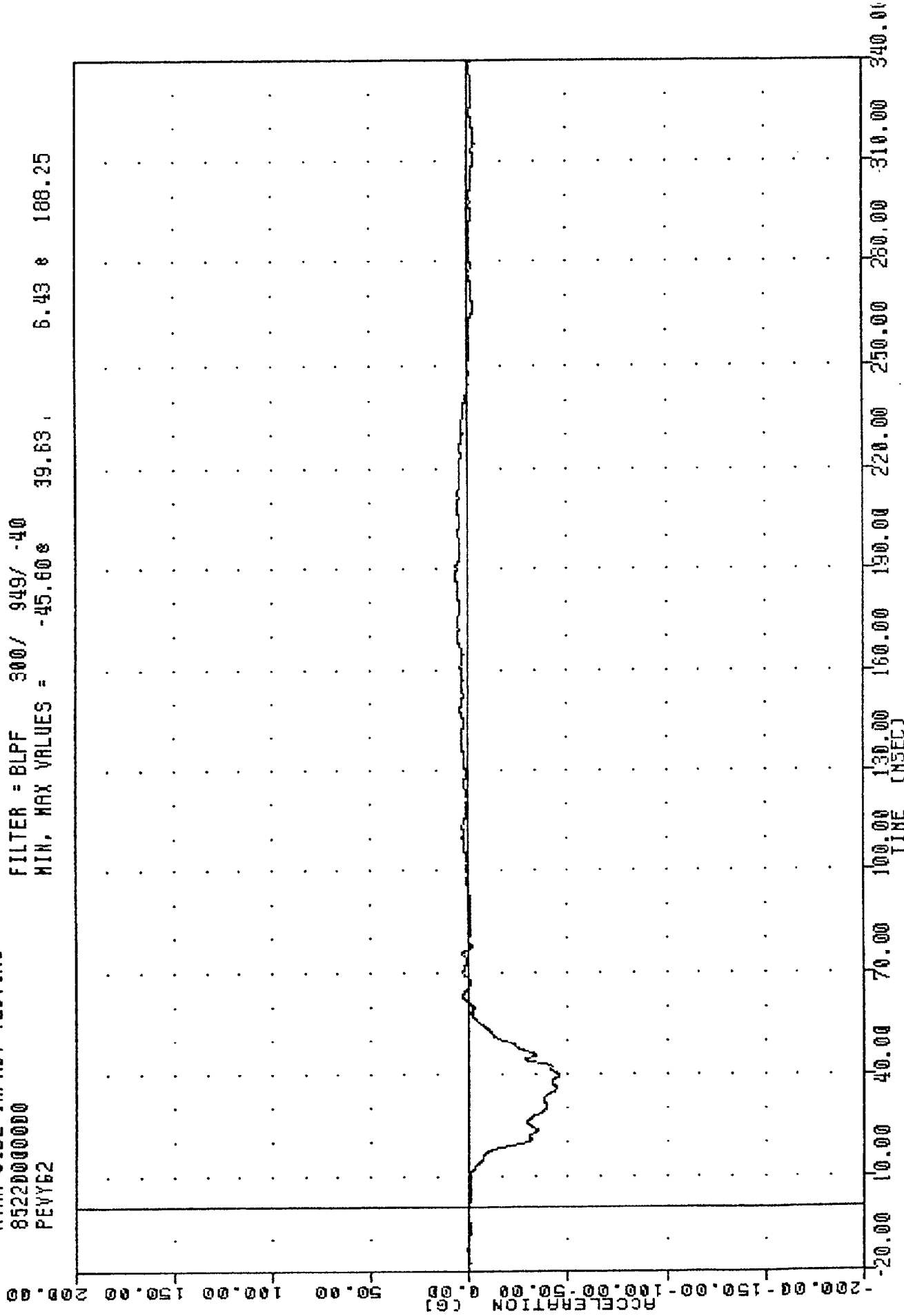


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
PASSENGER PELVIS ACCELERATION X AXIS

TRC
 MVMA SIDE IMPACT TESTING
 852200000000
 PEVY62

PLOT DATE 15-AUG-85 12:24:13

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -45.60 39.63 6.43 188.25

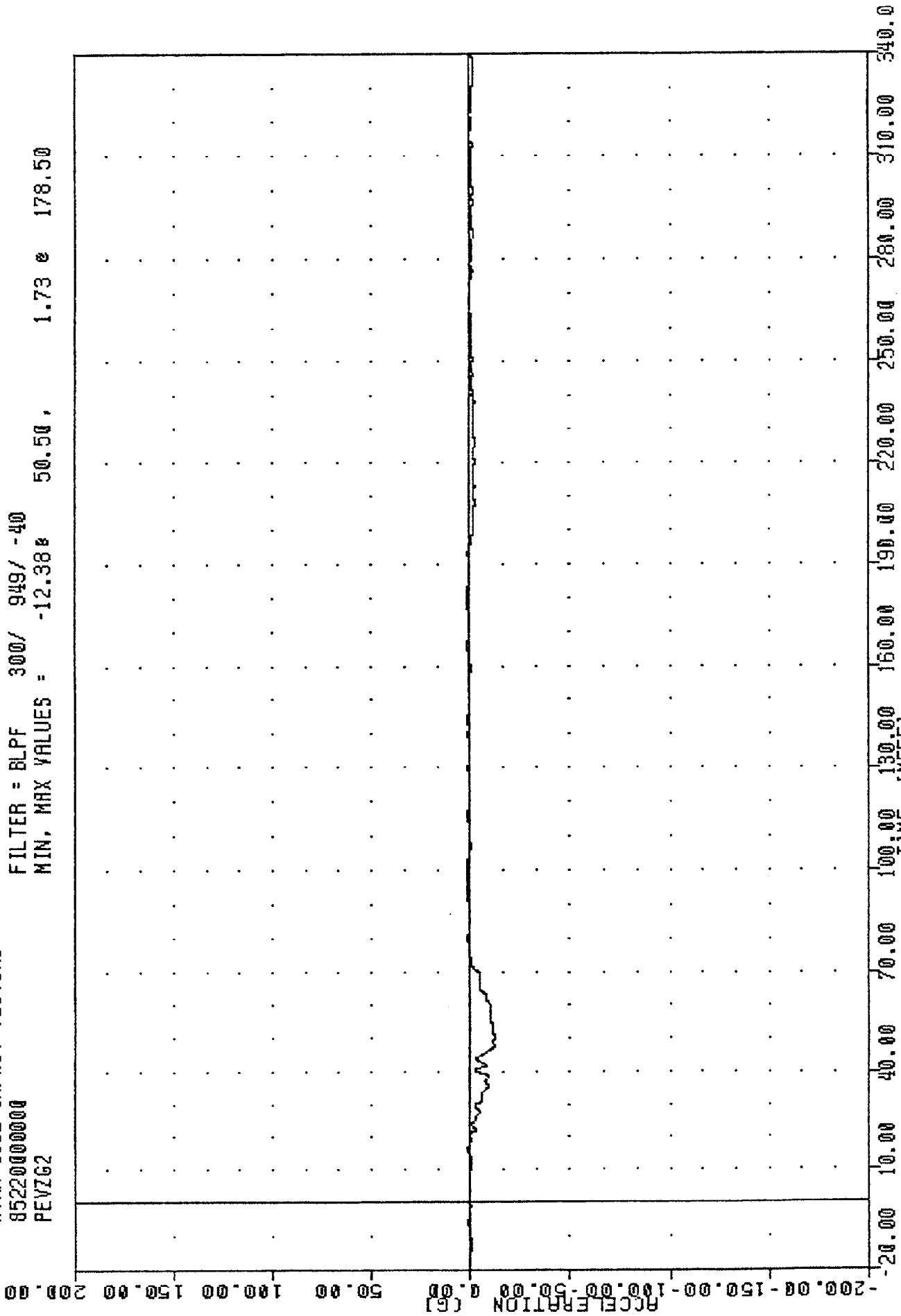


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 PASSENGER PELVIS ACCELERATION Y AXIS

TRC
 852200000000
 PEVZG2

PLUT DATE 15-AUG-85 12:24:13

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -12.38% 50.50, 1.73 e 178.50



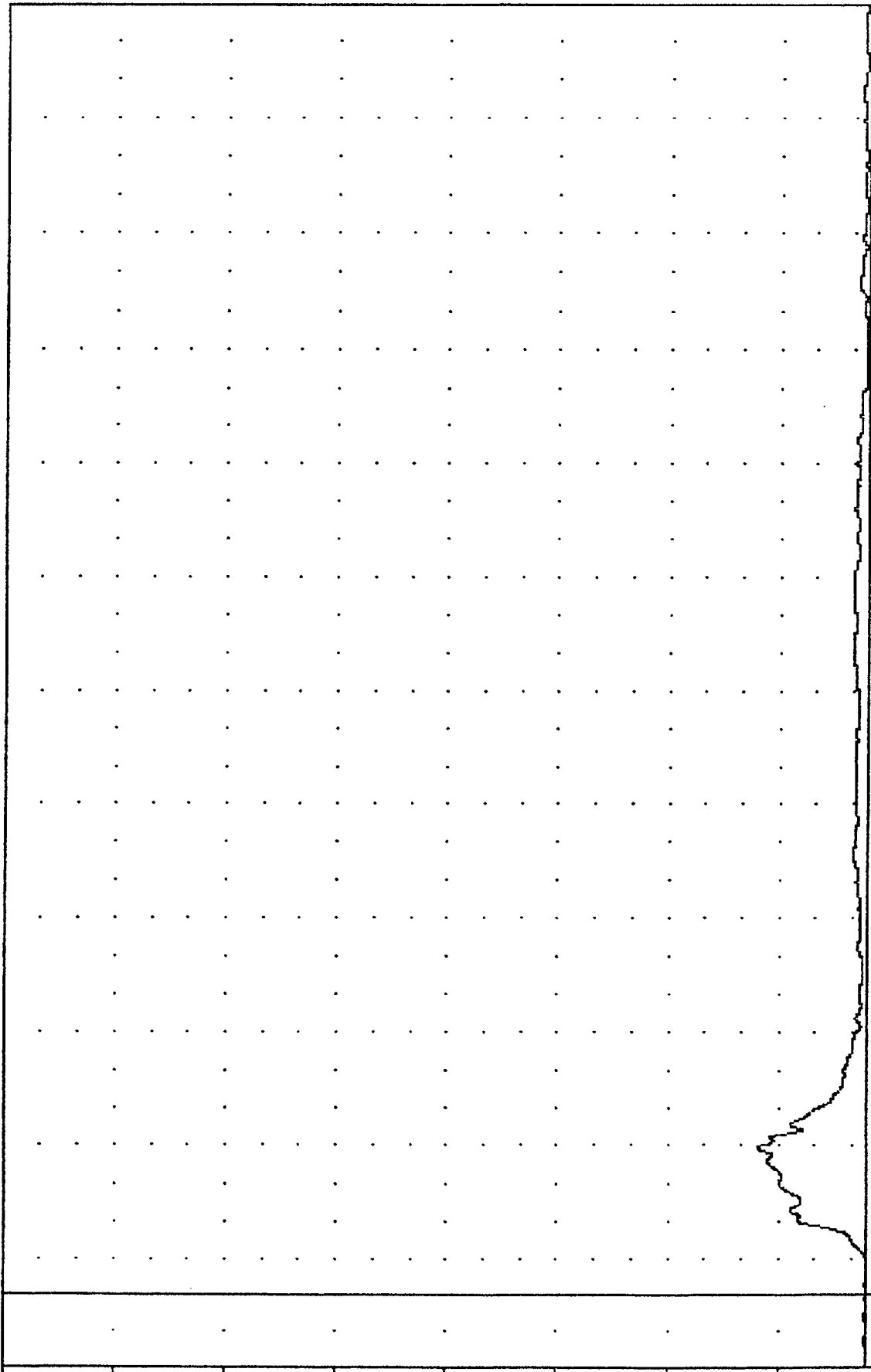
MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 PASSENGER PELVIS ACCELERATION Z AXIS

TRC
MVMA SIDE IMPACT TESTING
852200000000
PEYRG2

PLOT DATE 15-AUG-85 12:24:13

FILTER = 8LPF 300/ 949/ -40
MIN, MAX VALUES = 0.13e -2.50, 49.47 e 39.38

ACCELERATION (G)



-20.00 10.00 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/PADDED/NEAR SEATING
PASSENGER PELVIS RESULTANT ACCELERATION

TRC 850808 PLOT DATE 15-AUG-85 12:25:37

NYMA SIDE IMPACT TESTING

852200000000

PEVYV2

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -26.918 61.38, 0.05 0 -10.88

20.00

10.00

0.00

-10.00

-20.00

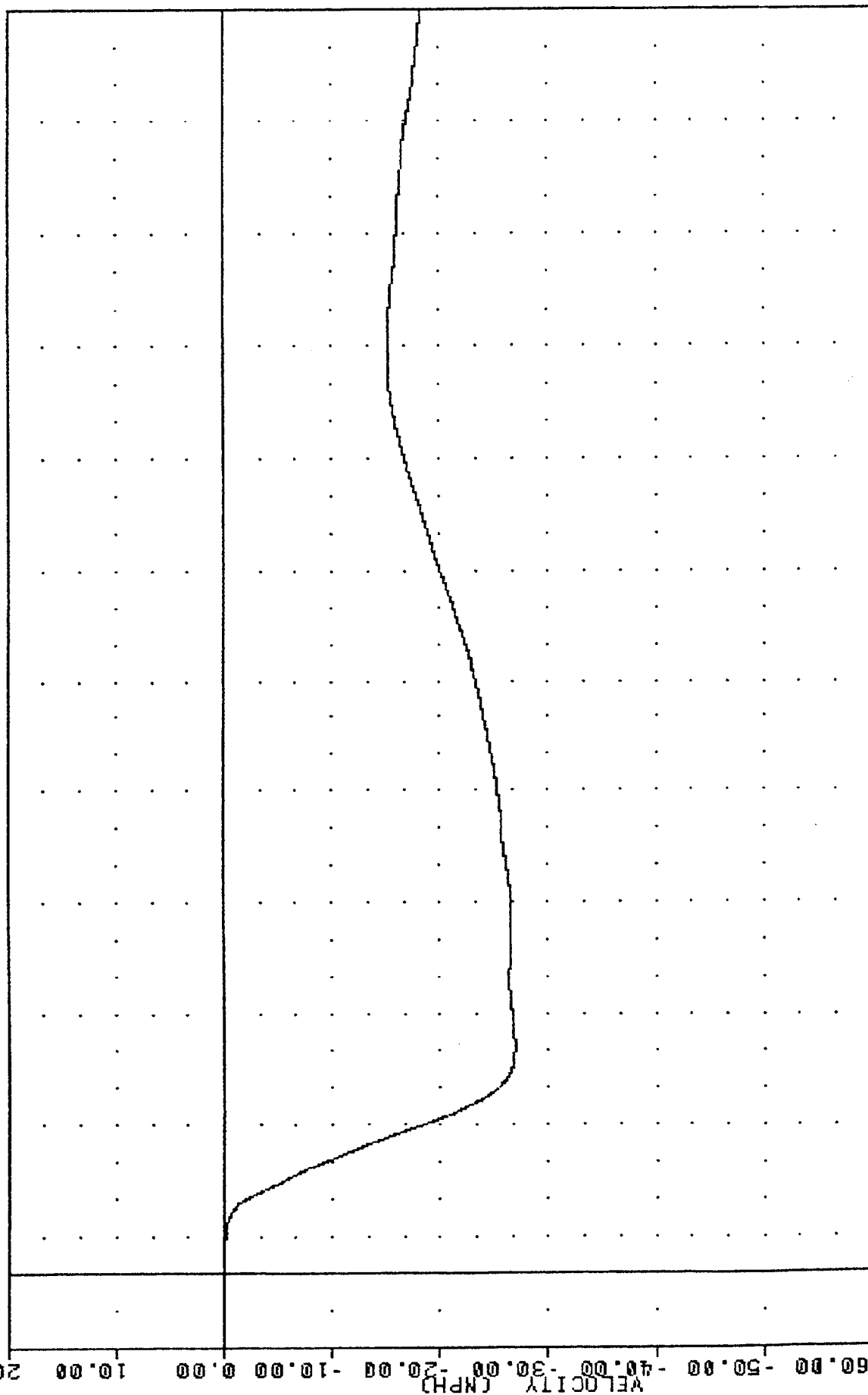
-30.00

-40.00

-50.00

-60.00

A-25

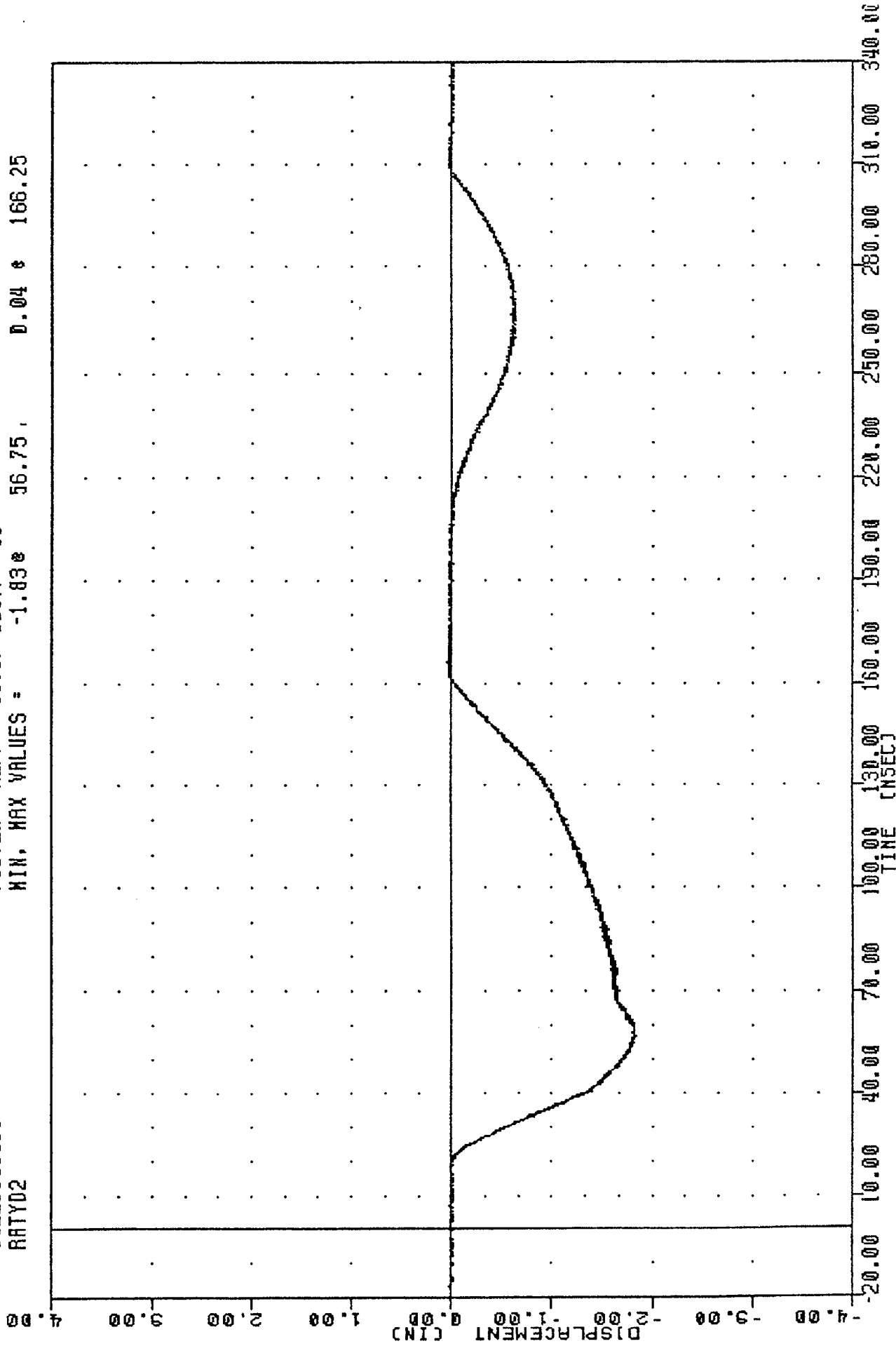


NYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
PELVIS VELOCITY Y AXIS

TRC 850808
 MVMA SIDE IMPACT TESTING
 852200000000
 RRTYD2

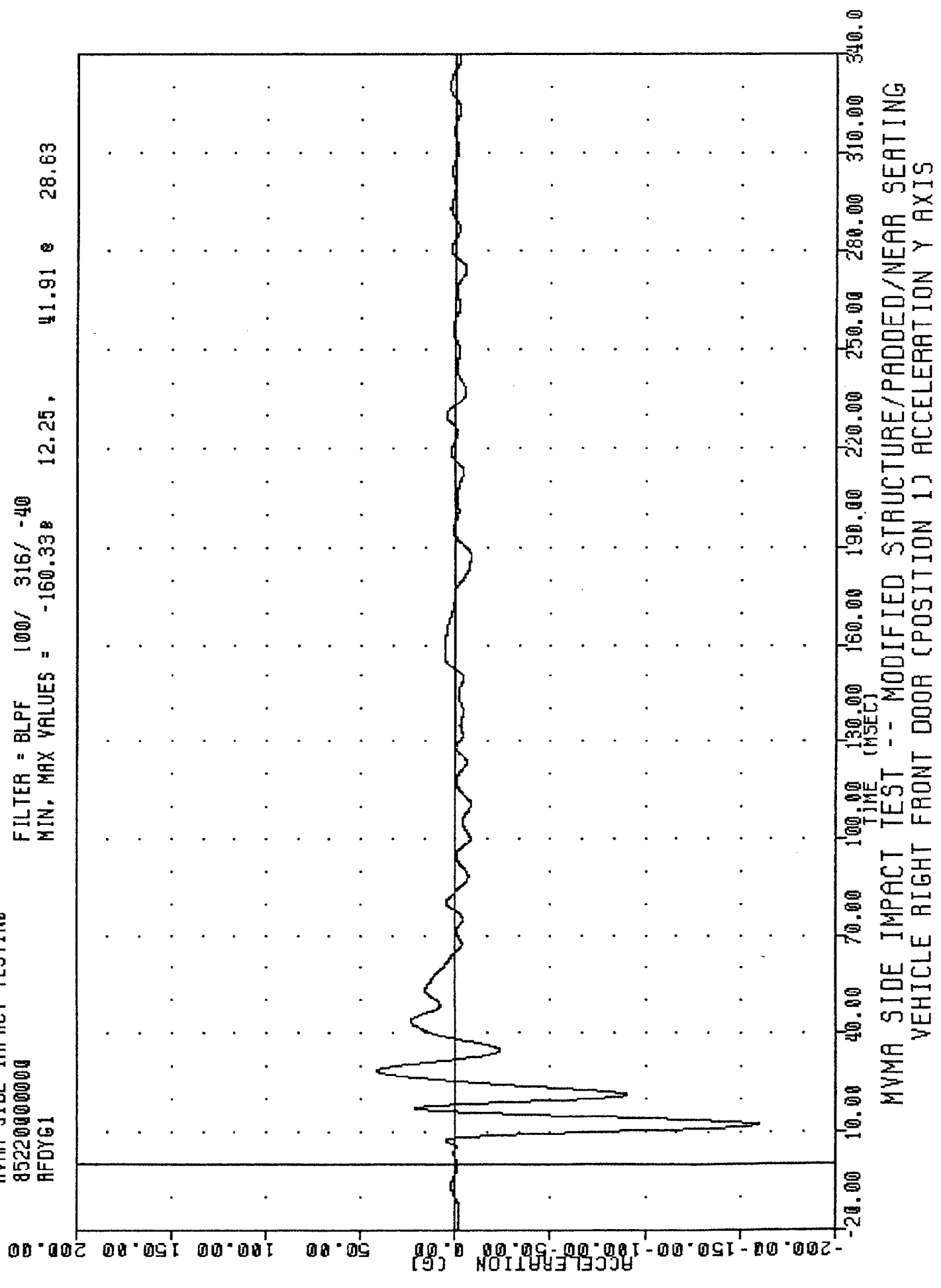
PLOT DATE 15-AUG-85 12:24:13

FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = -1.83 56.75 , D.04 166.25



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

TRC 850808
 NVMA SIDE IMPACT TESTING
 852200000000
 RFDY61
 PLOT DATE 15-AUG-85 12:24:13
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -160.33 12.25 41.91 28.63

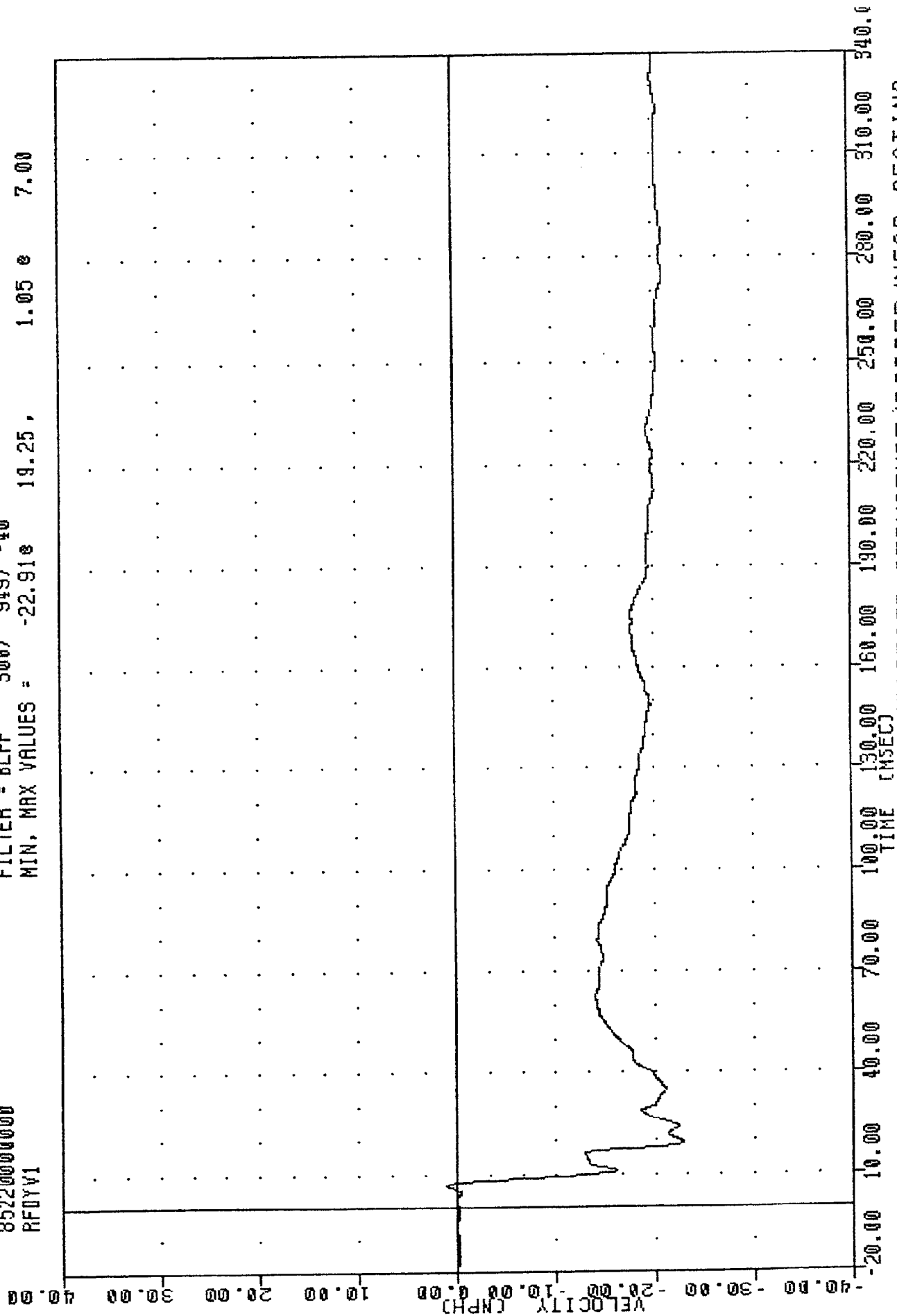


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 VEHICLE RIGHT FRONT DOOR (POSITION 1) ACCELERATION Y AXIS

TRC 850808
 MVMA SIDE IMPACT TESTING
 852200000000
 RFDYV1

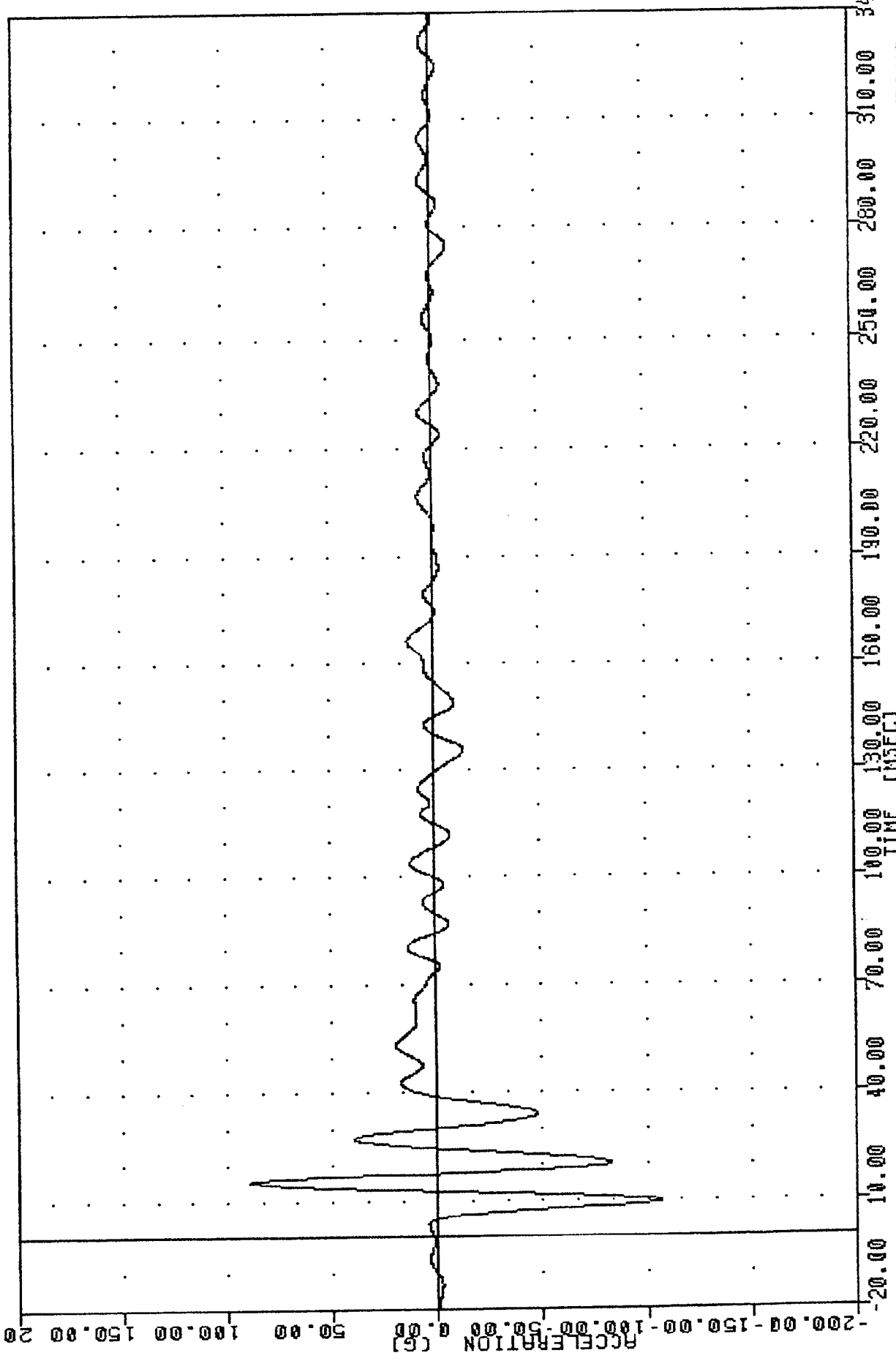
PLOT DATE 15 AUG 85 12:25:37

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -22.918 19.25, 1.05 e 7.00



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

TRC
 850808
 MYNA SIDE IMPACT TESTING
 852200000000
 RFOY62
 PLOT DATE 15-AUG-85 12:24:13
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -106.88 9.88 89.26 15.50

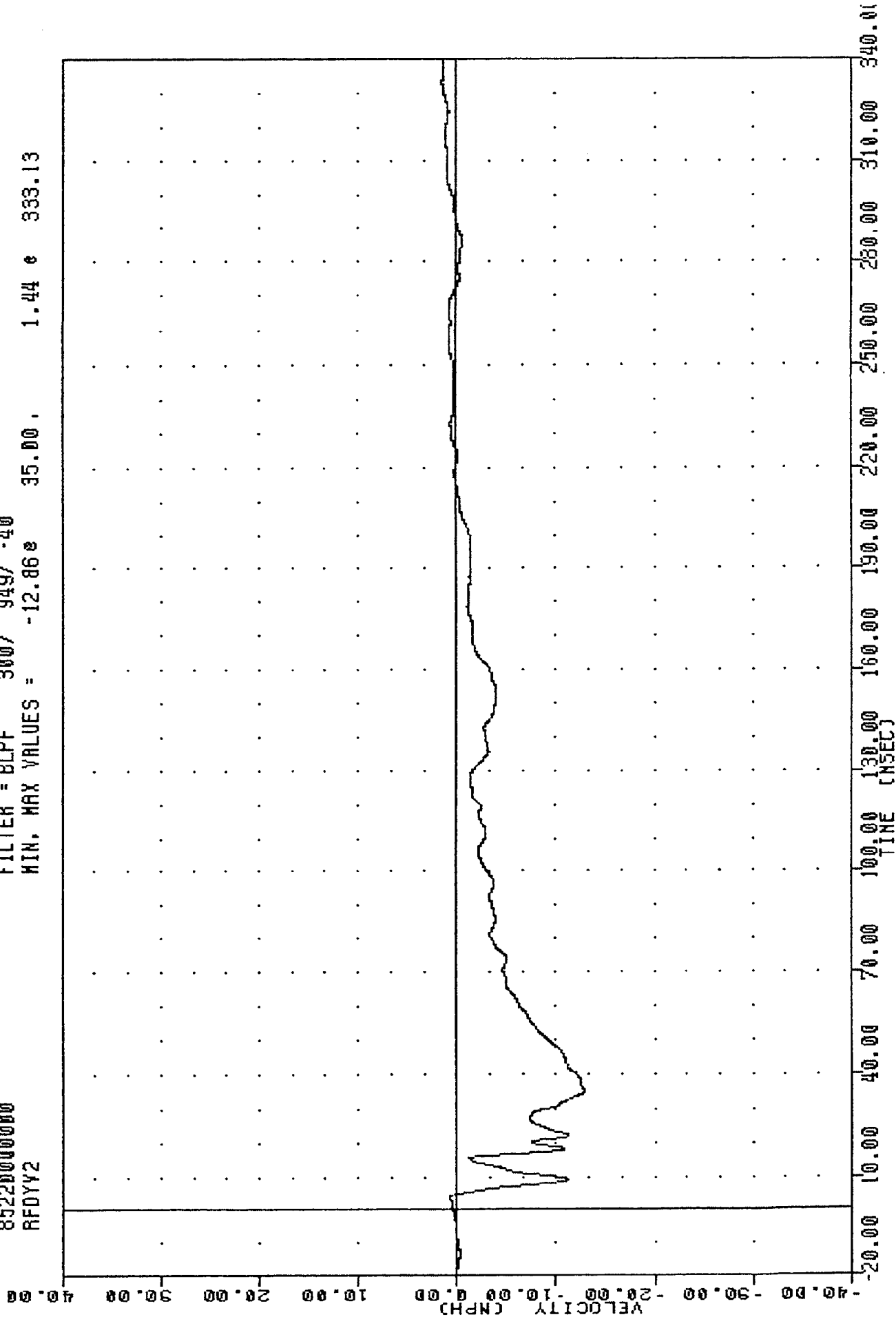


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 VEHICLE RIGHT FRONT DOOR (POSITION 2) ACCELERATION Y AXIS

TAC , 850808
 MVMA SIDE IMPACT TESTING
 852200000000
 RFDYV2

PLOT DATE 15-AUG-85 12:25:37

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -12.86e 35.00, 1.44 e 333.13

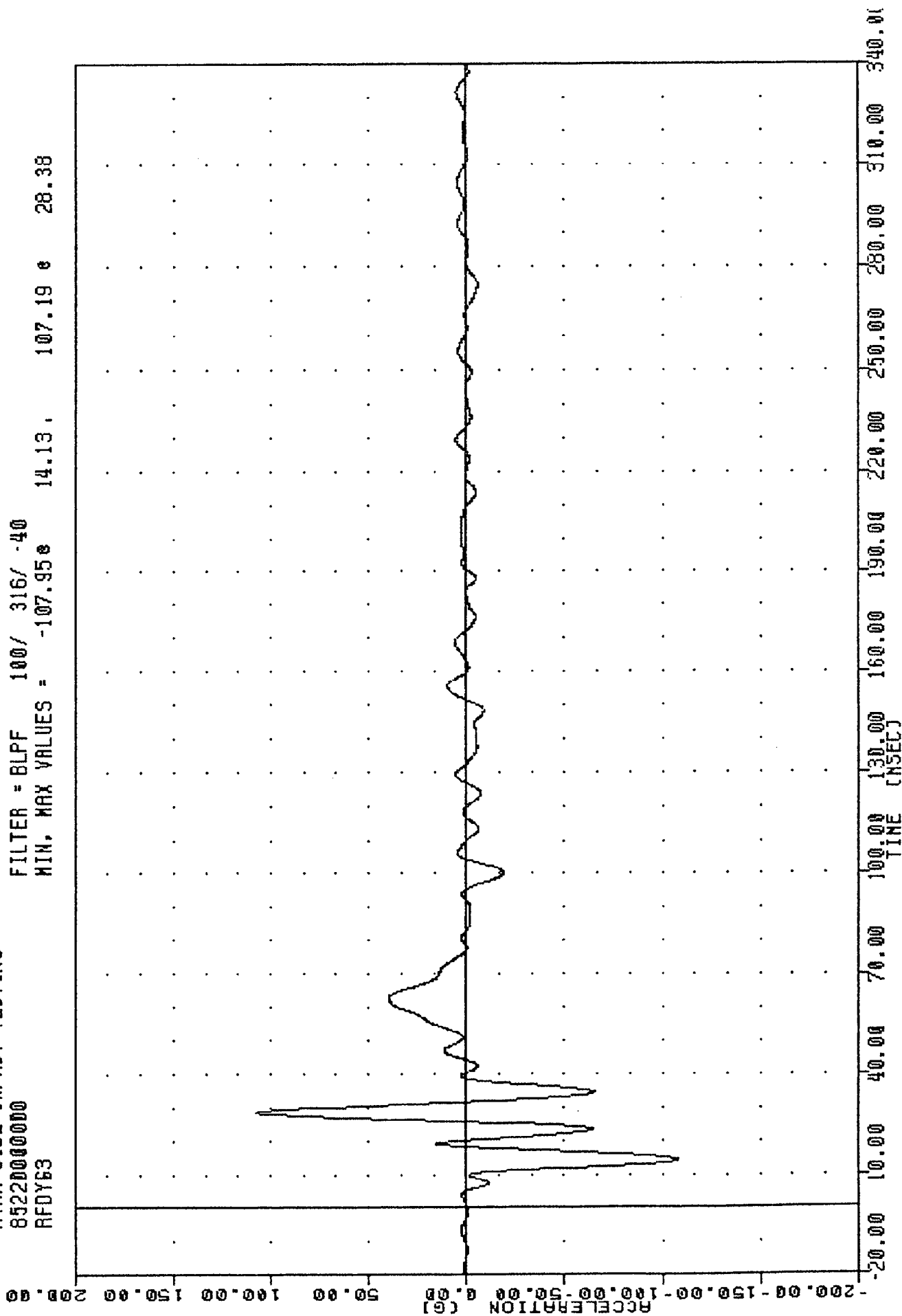


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 RIGHT FRONT DOOR (POSITION 2) VELOCITY Y AXIS

TAC 850808
 NVMA SIDE IMPACT TESTING
 852200000000
 RFDY63

PLOT DATE 15-AUG-85 12:24:13

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -107.95 14.13 107.19 28.38

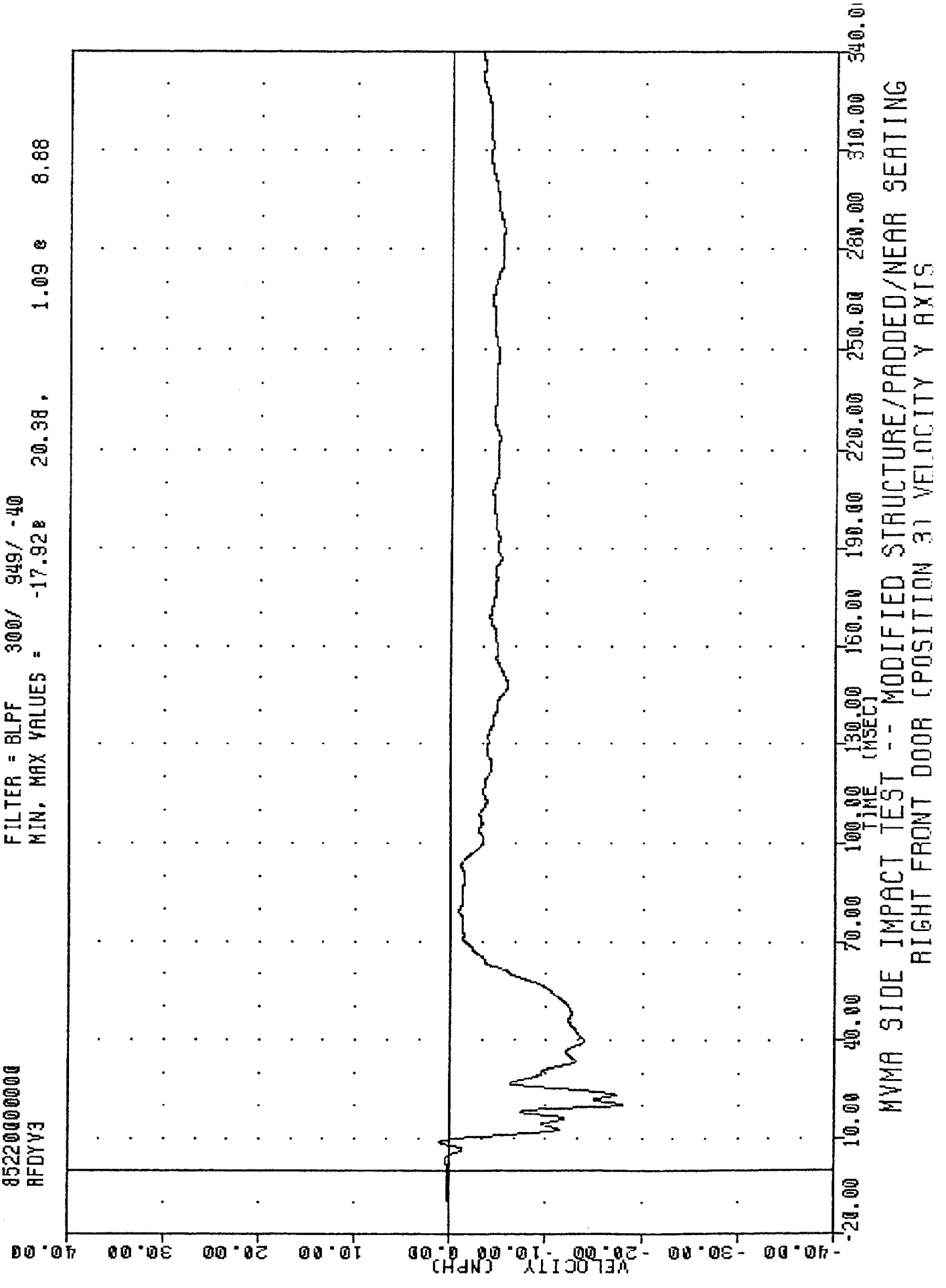


NVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 VEHICLE RIGHT FRONT DOOR (POSITION 3) ACCELERATION Y AXIS

TRC
 NVMA SIDE IMPACT TESTING
 852200000000
 RFDYV3

PLOT DATE 15-AUG-85 12:25:37

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -17.928 20.38, 1.09 8.88

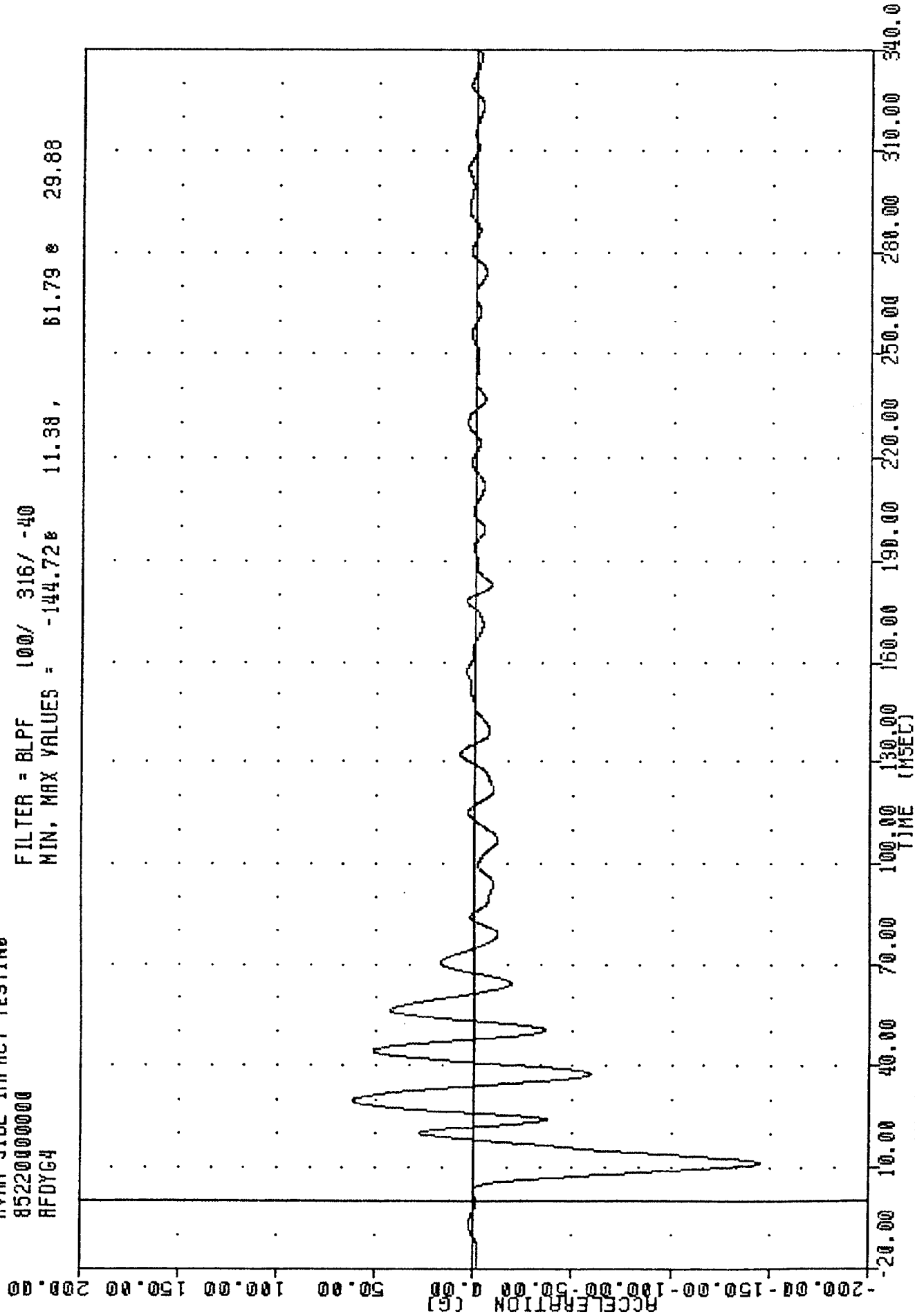


MODIFIED STRUCTURE/PADDED/NEAR SEATING
 RIGHT FRONT DOOR (POSITION 3) VELOCITY Y AXIS

TRC
MVMA SIDE IMPACT TESTING
852200000000
AFDYG4

PLOT DATE 15-AUG-85 12:24:13

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -144.72 11.38, 61.79 29.88



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

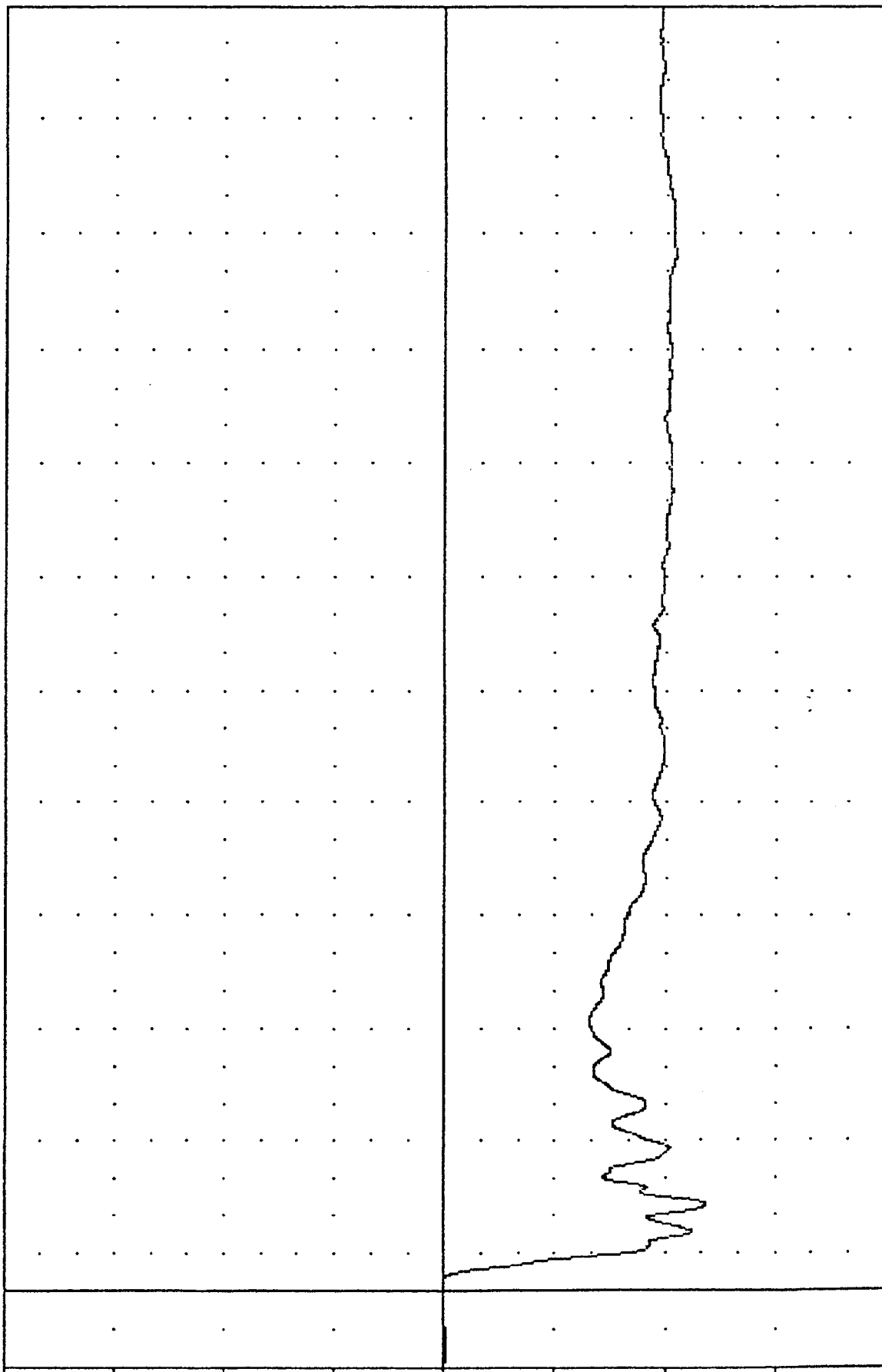
TRC , 850808
 MVMA SIDE IMPACT TESTING
 852200000000
 RFDYV4

PLOT DATE 15-AUG-85 12:25:37

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -23.73e 22.63, 0.11 e 3.25

VELOCITY (MPH)



TIME (MSEC)

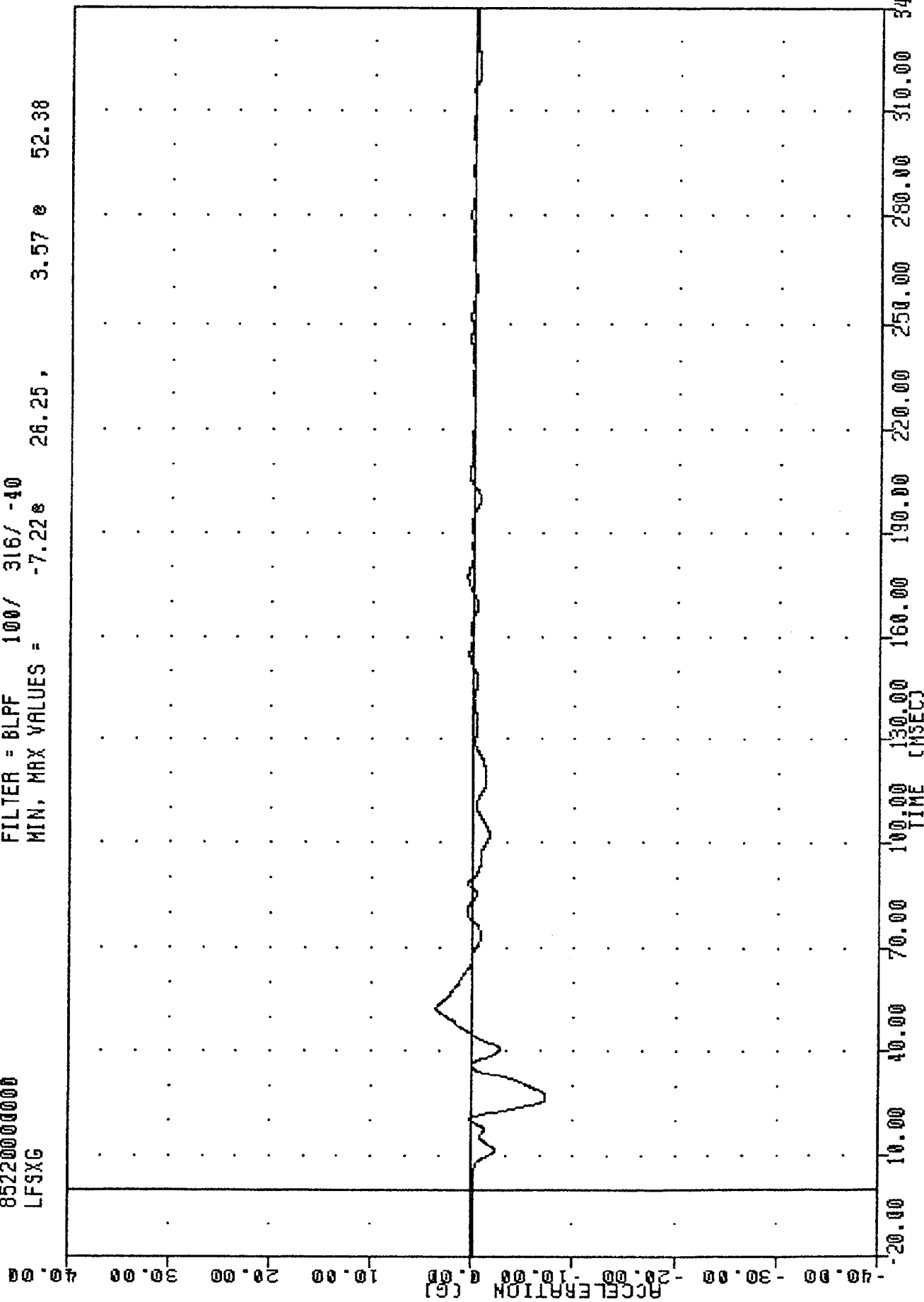
MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 RIGHT FRONT DOOR (POSITION 4) VELOCITY Y AXIS

TRC , 850808
 MVMA SIDE IMPACT TESTING
 852200000000
 LFSXG

PLOT DATE 15-AUG-85 12:24:13

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -7.22e 26.25, 3.57 e 52.38

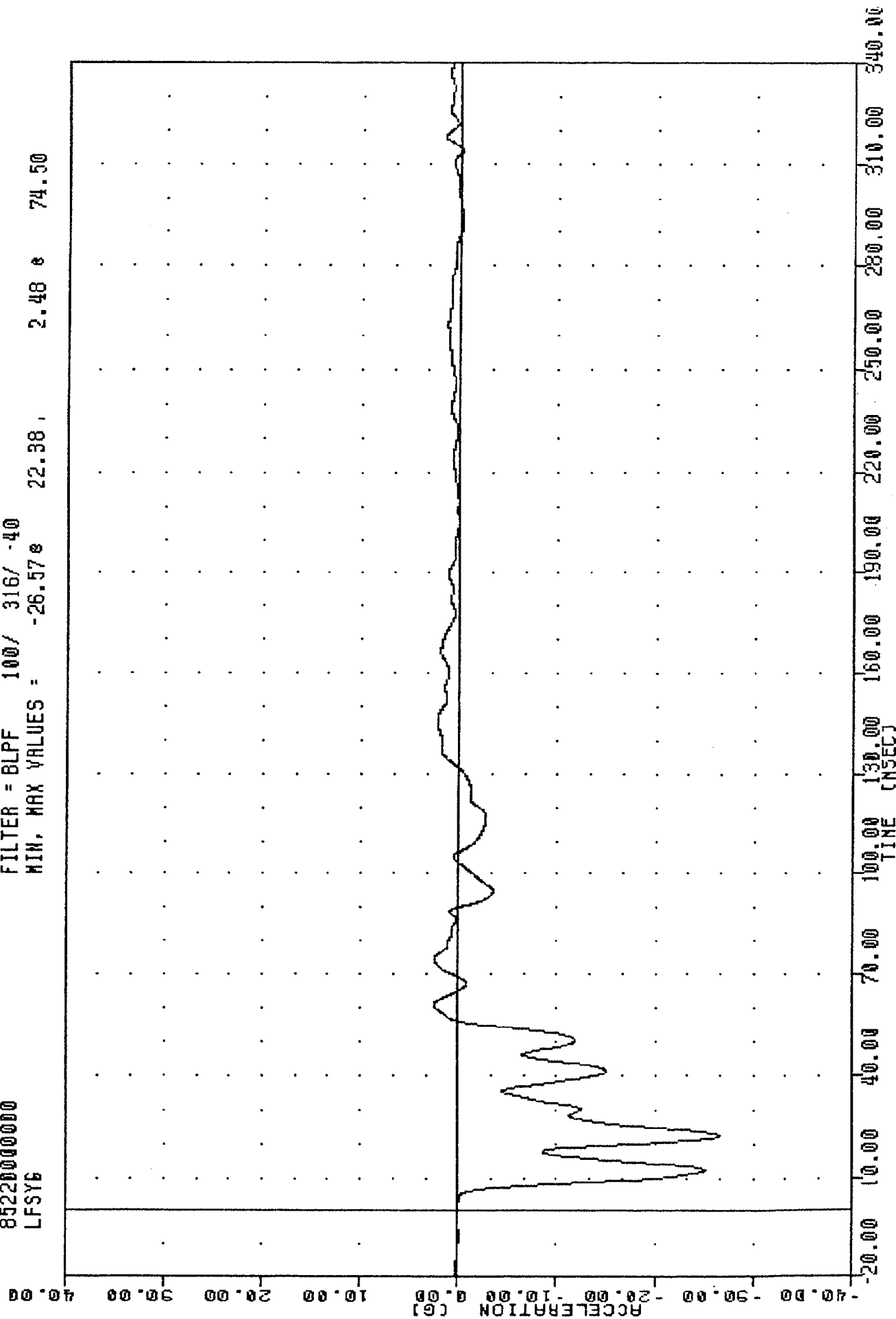


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 VEHICLE LEFT FRONT SILL ACCELERATION X AXIS

TRC
 MYMA SIDE IMPACT TESTING
 852200000000
 LFSYB

PLOT DATE 15-AUG-85 12:24:13

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -26.57e 22.38 , 2.48 e 74.50



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

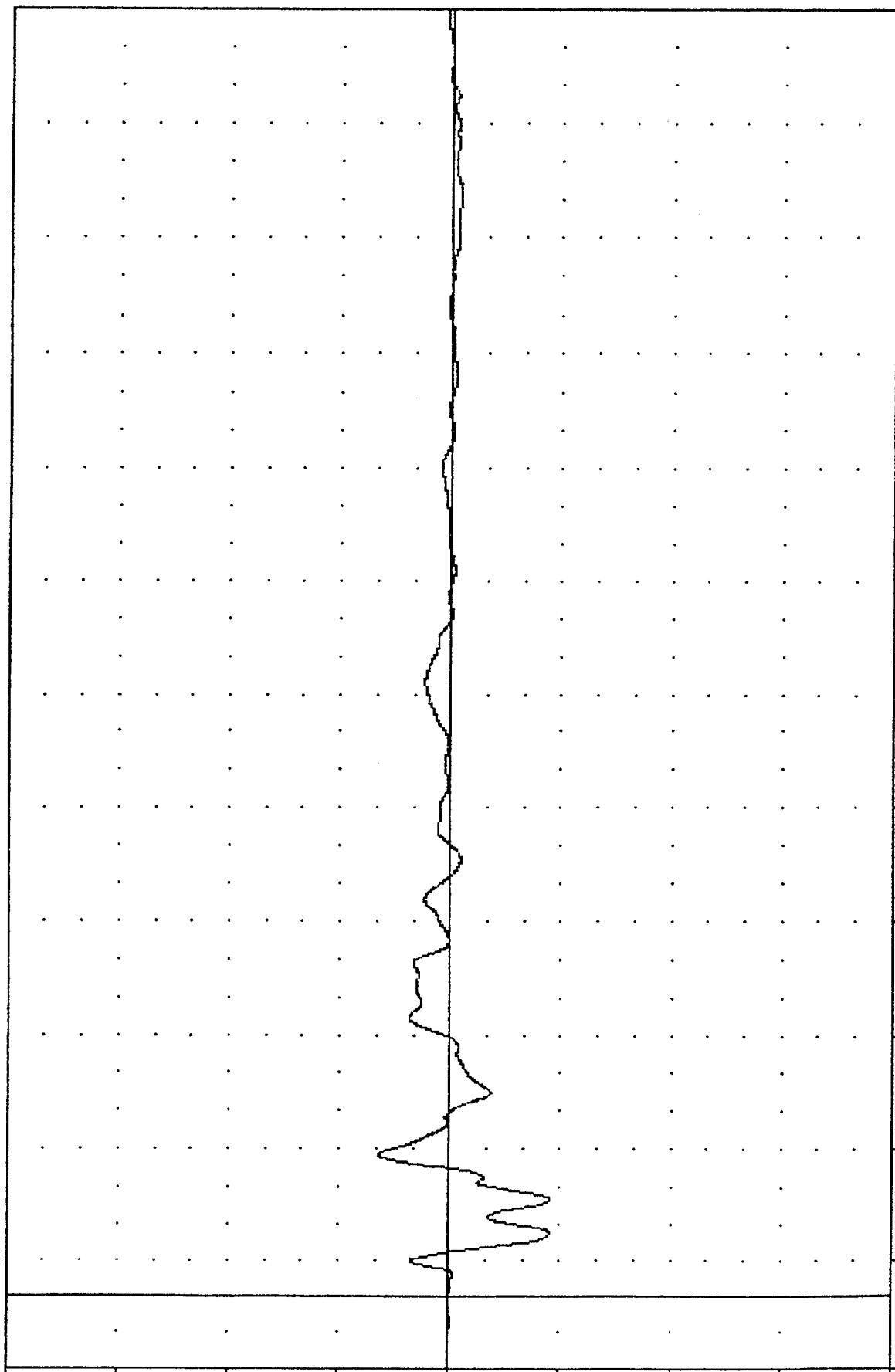
TRC , 850808
NVA SIDE IMPACT TESTING
852200000000
LFSIG

PLOT DATE 15-AUG-85 12:24:13

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -9.16e 26.75, 6.40 e 38.25

ACCELERATION (G)



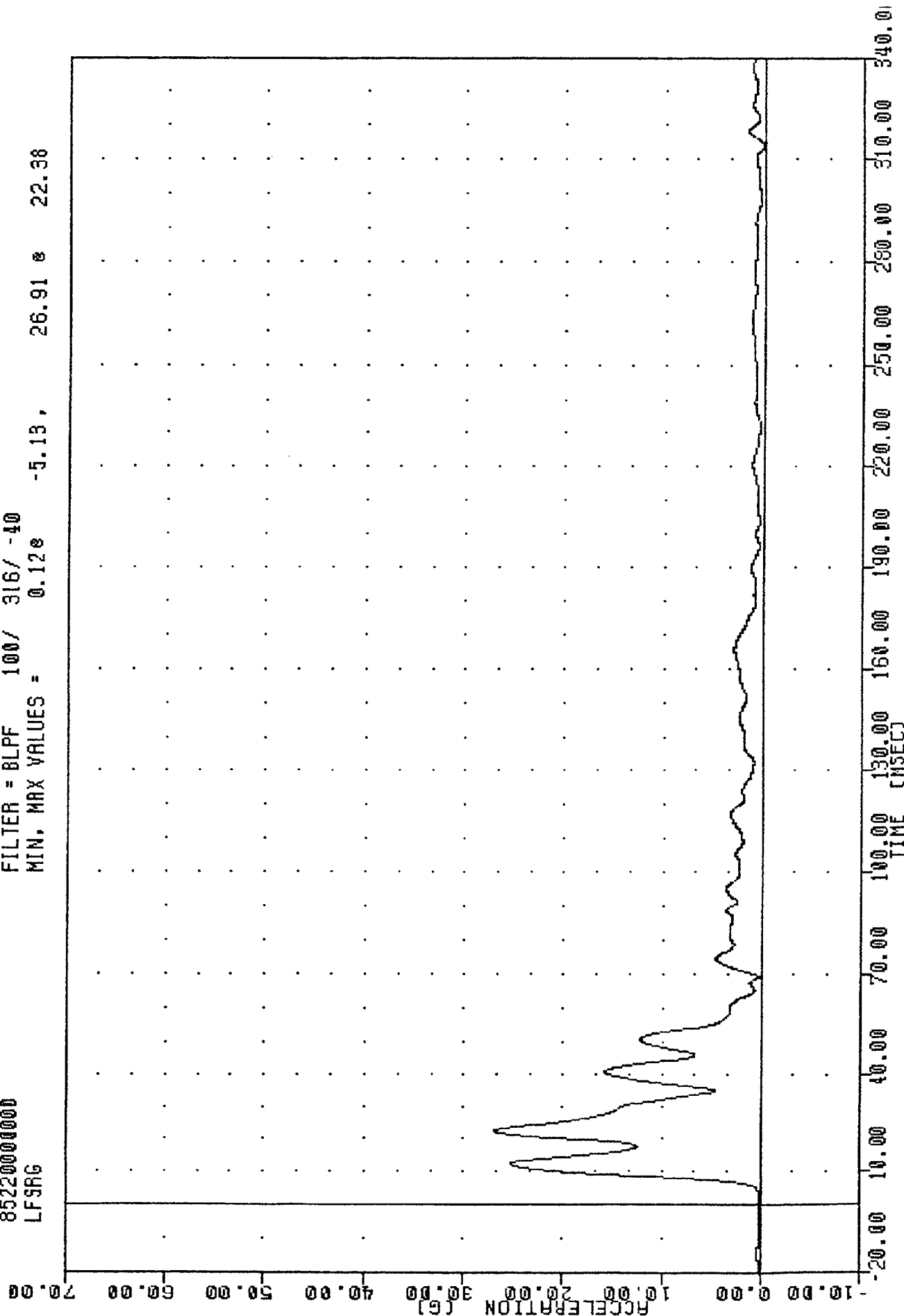
TIME (MSEC)

NVA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
VEHICLE LEFT FRONT SILL ACCELERATION 7 AXIS

TRC , 850808
 MVMA SIDE IMPACT TESTING
 852200000000
 LFSRG

PLOT DATE 15-AUG-85 12:24:13

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = 0.128 -5.13, 26.91 & 22.38



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 VEHICLE LEFT FRONT SILL RESULTANT

TAC
 852200000000
 LFSYV

, 850808

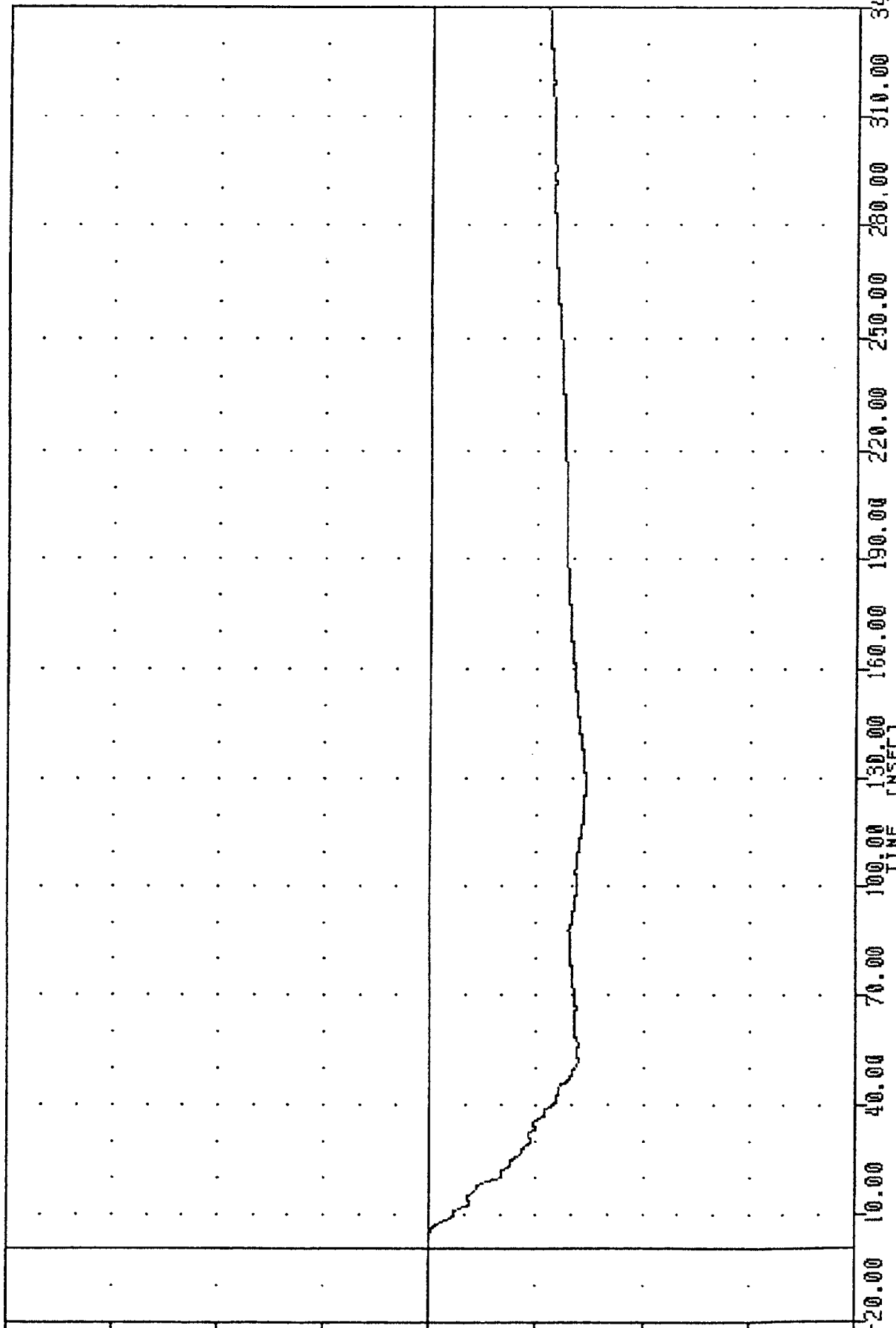
MVMA SIDE IMPACT TESTING

PLOT DATE 15-AUG-85 12:25:37

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -14.53e 129.00, 0.02 e -1.88

VELOCITY (MPH)

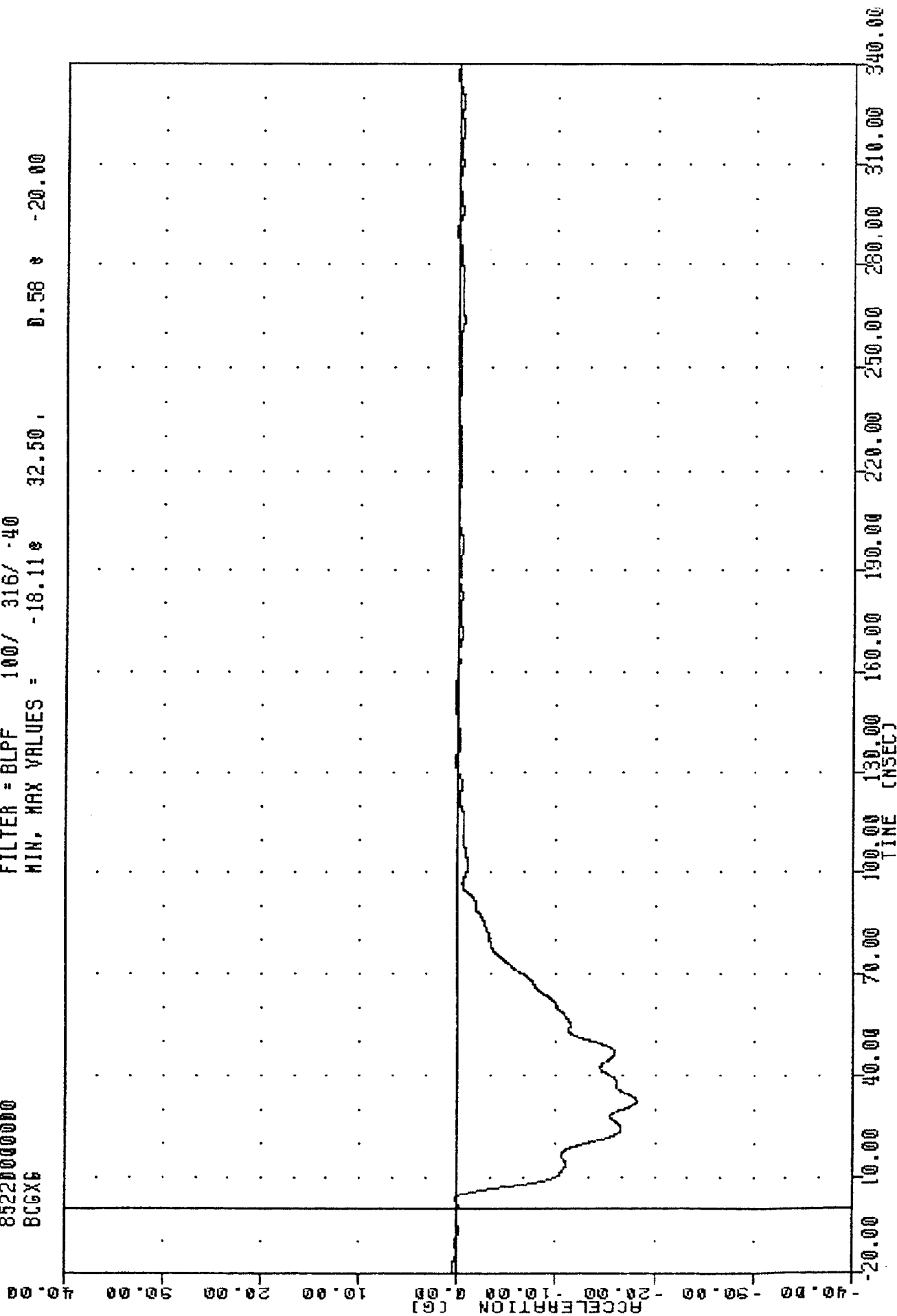


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 LEFT FRONT SILL VELOCITY Y AXIS

TAC
MVMA SIDE IMPACT TESTING
85220000000
BCGX6

PLOT DATE 15-AUG-85 12:24:13

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -18.11* 32.50, 0.58 * -20.00



MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
BARRIER CENTER OF GRAVITY X AXIS

TRC

, 850808

NYMA SIDE IMPACT TESTING

852200000000

BCGYG

PLOT DATE

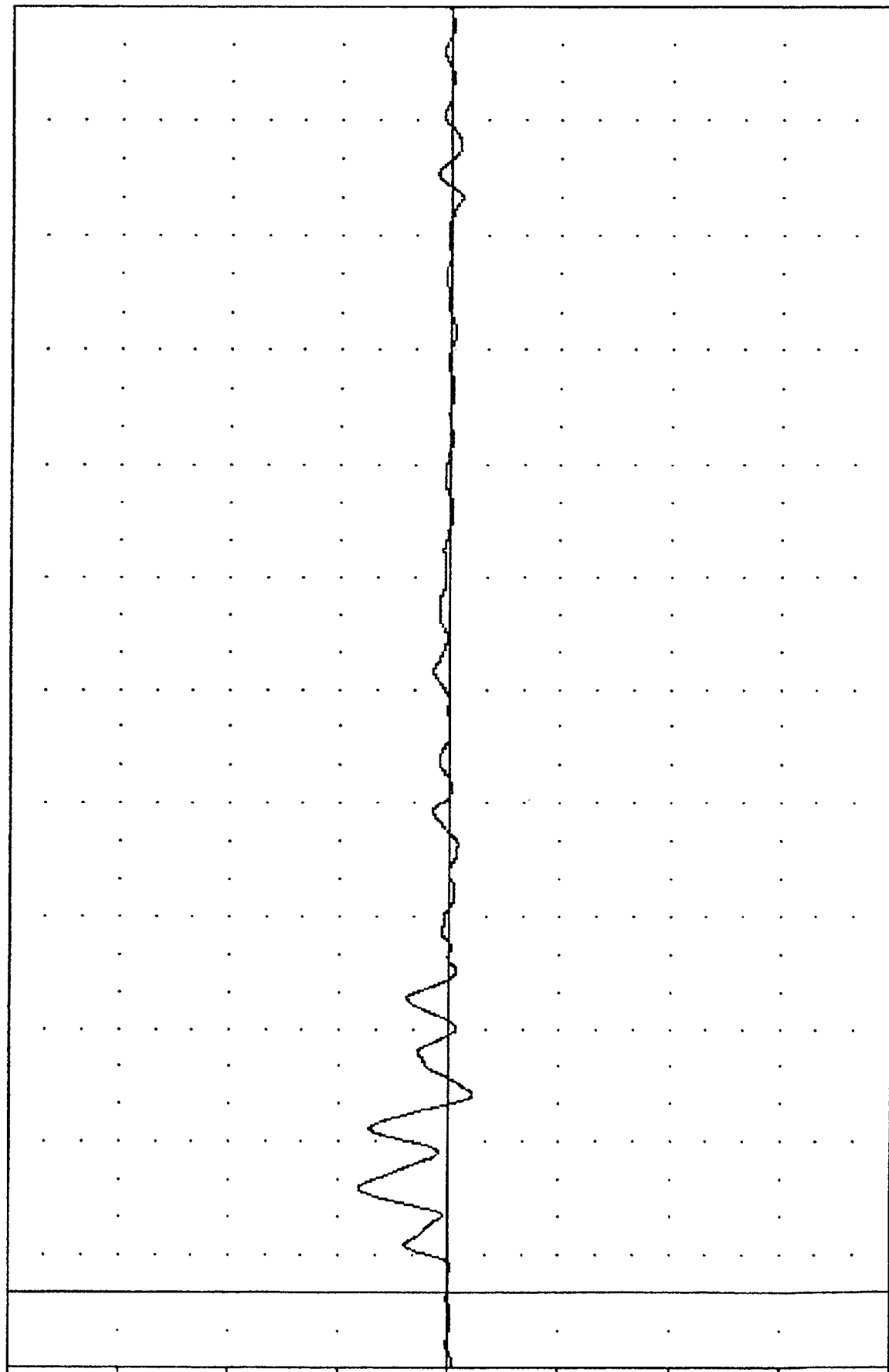
15-AUG-85

12:24:13

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -2.08 52.50, 8.16 27.63

ACCELERATION (G)



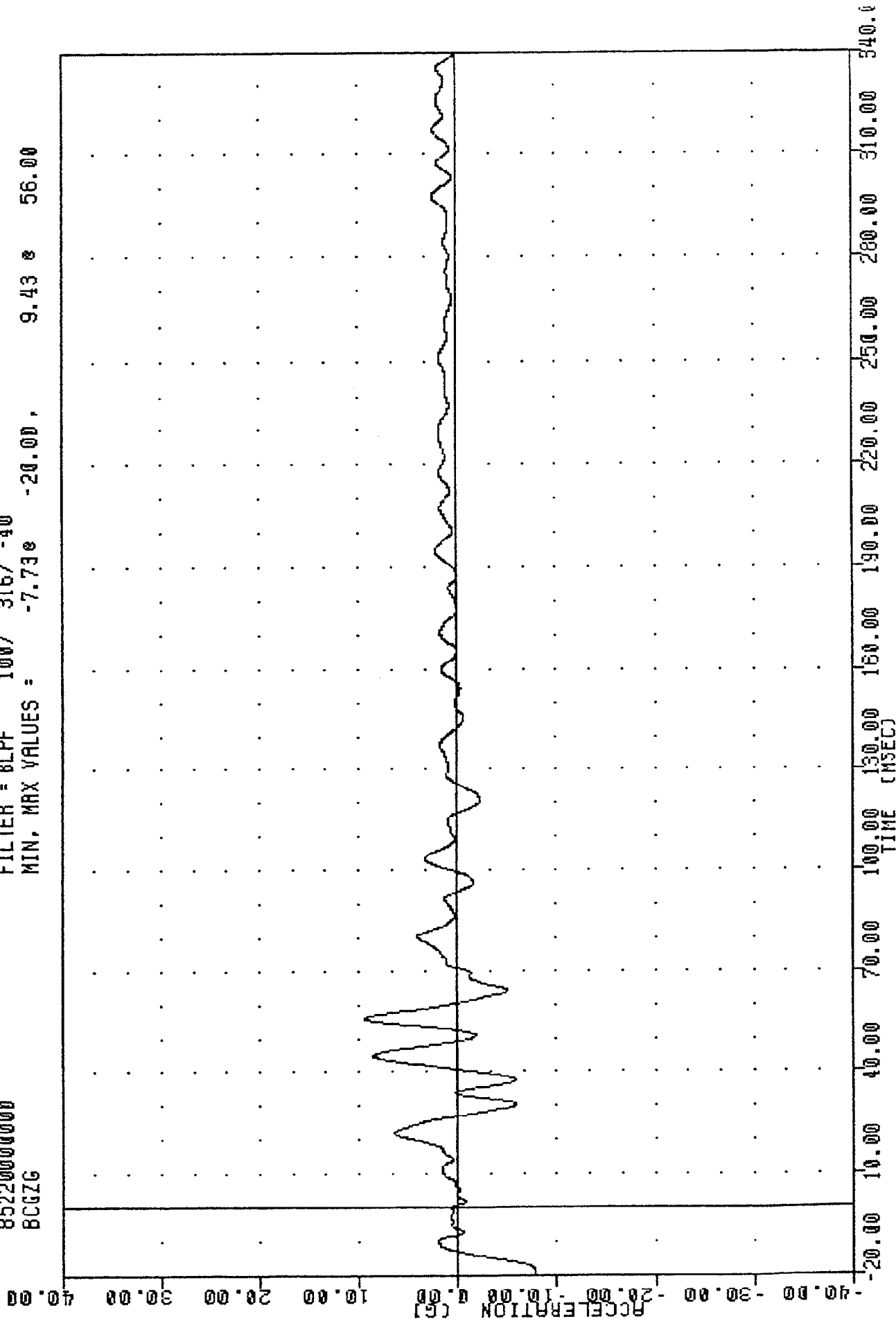
TIME (MSEC)

NYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
BARRIER CENTER OF GRAVITY Y AXIS

TRC , 850808
 MVMA SIDE IMPACT TESTING
 852200000000
 BCGZG

PLOT DATE 15-AUG-85 12:24:13

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -7.73e -20.00, 9.43 e 56.00

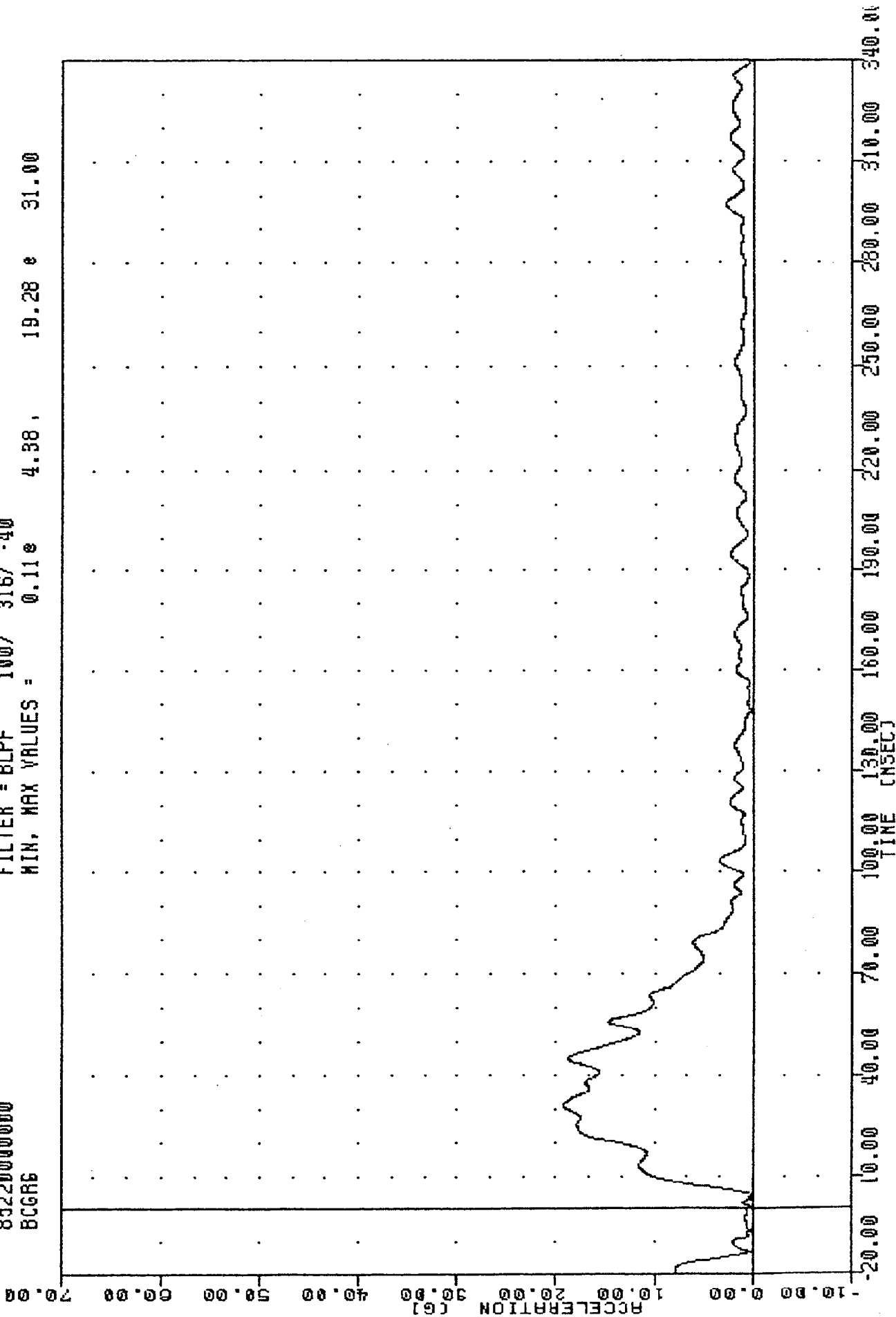


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 BARRIER CENTER OF GRAVITY Z AXIS

TRC , 830808
 MVMA SIDE IMPACT TESTING
 852200000000
 BCGRB

PLOT DATE 15 JUN 85 12:24:15

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = 0.11e 4.38 , 19.28 e 31.00

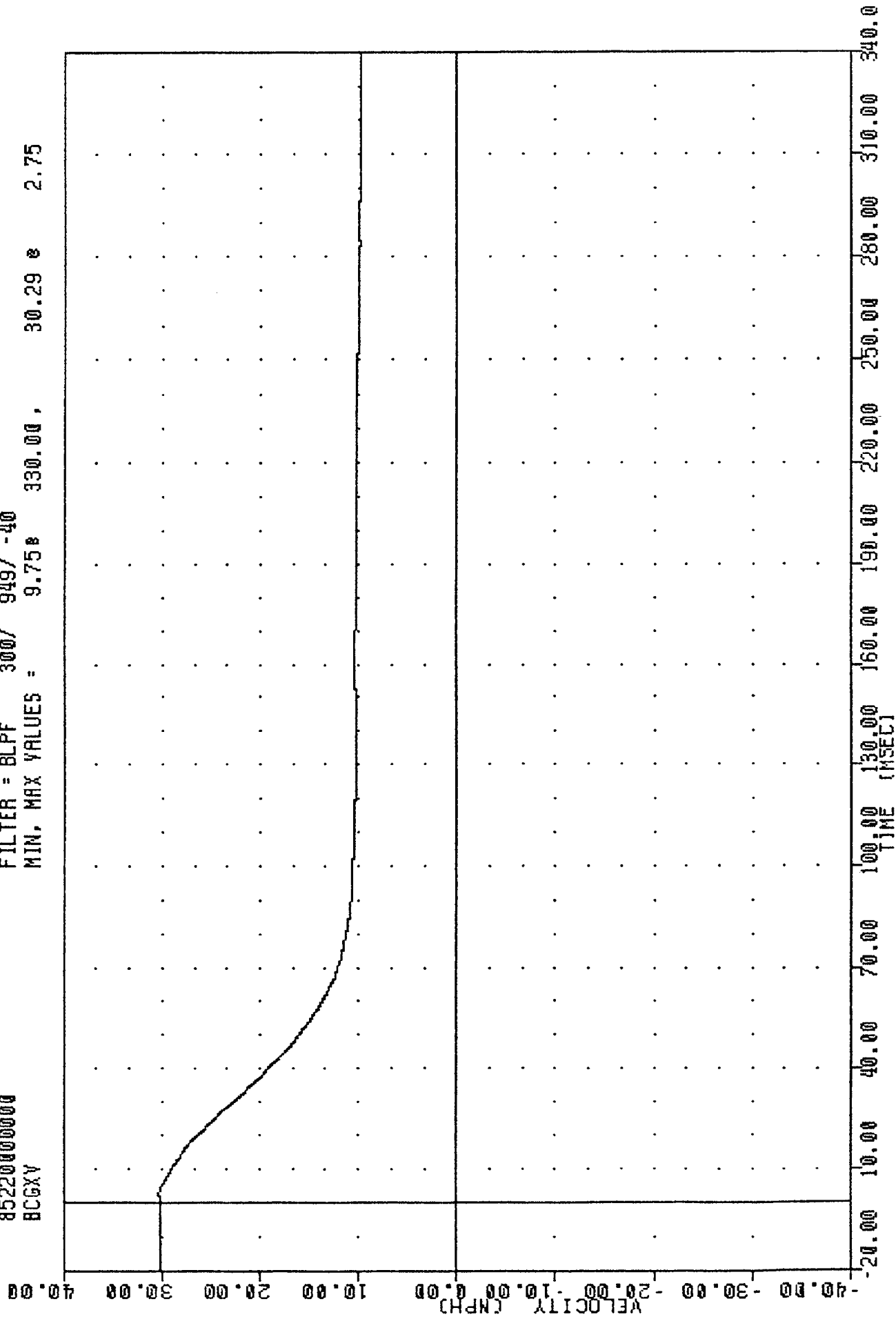


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

TRC
 , 850808
 MVMA SIDE IMPACT TESTING
 85220000000
 BCGXV

PLOT DATE 15-AUG-85 16:06:21

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 9.75 330.00, 30.29 2.75

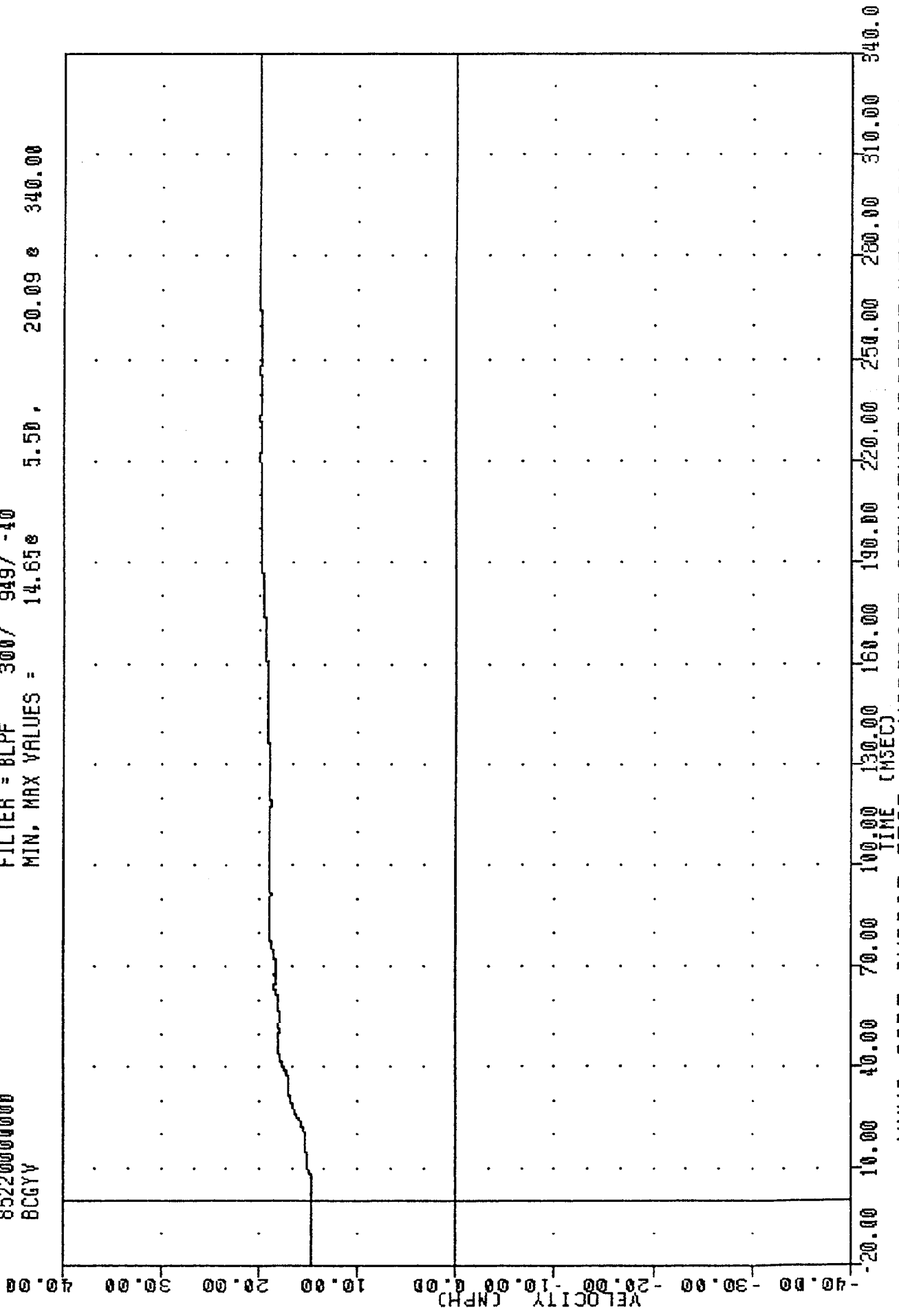


MVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 BARRIER CENTER OF GRAVITY VELOCITY X AXIS

TRC
 850808
 MVNA SIDE IMPACT TESTING
 852200000000
 BCGYV

PLOT DATE 15-AUG-85 12:25:37

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 14.65e 5.50, 20.09 e 340.00

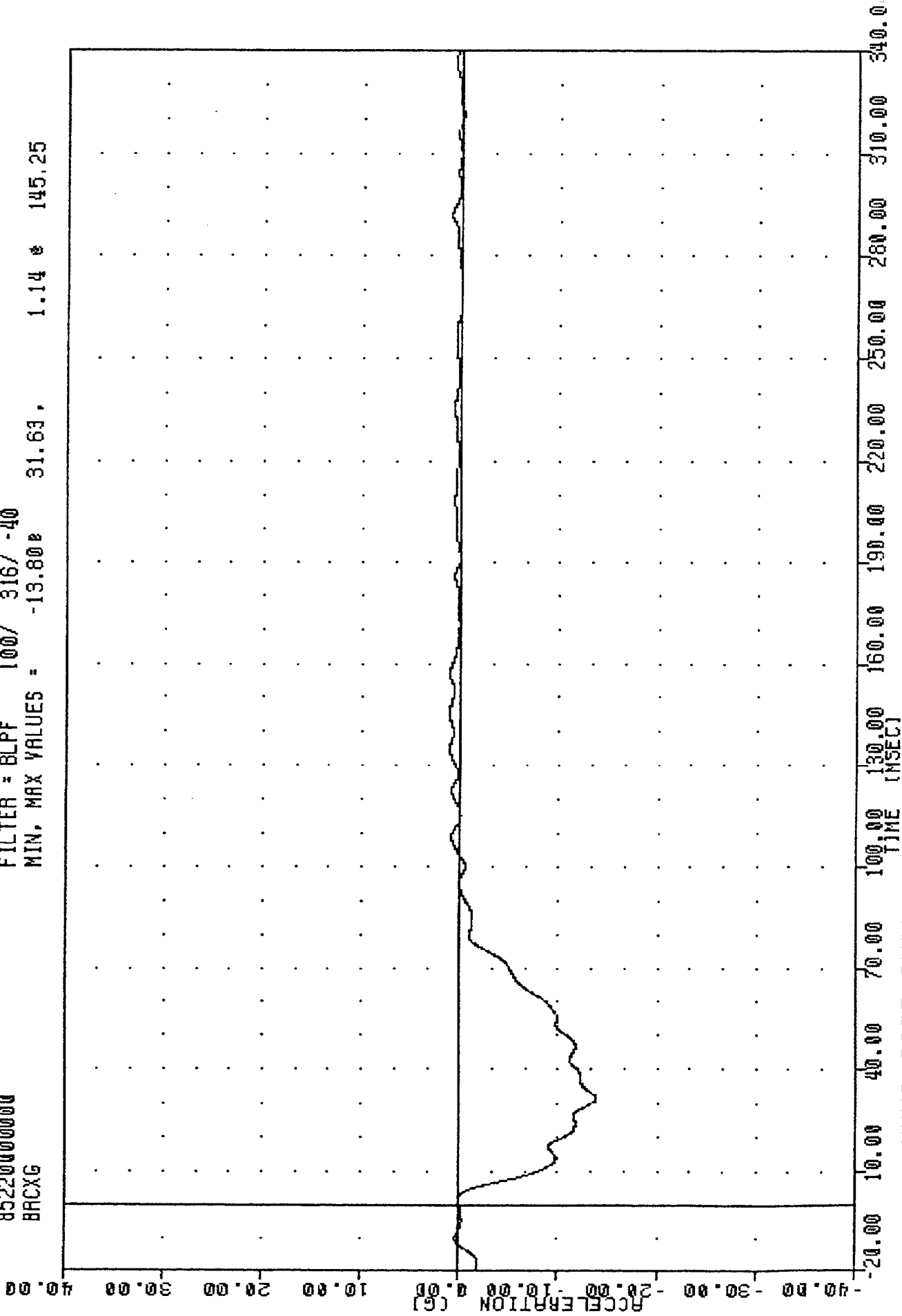


MVNA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 BARRIER CENTER OF GRAVITY VELOCITY Y AXIS

TRC 850808
 NYMA SIDE IMPACT TESTING
 85220000000
 BRCXG

PLOT DATE 15-HUG-85 12:24:13

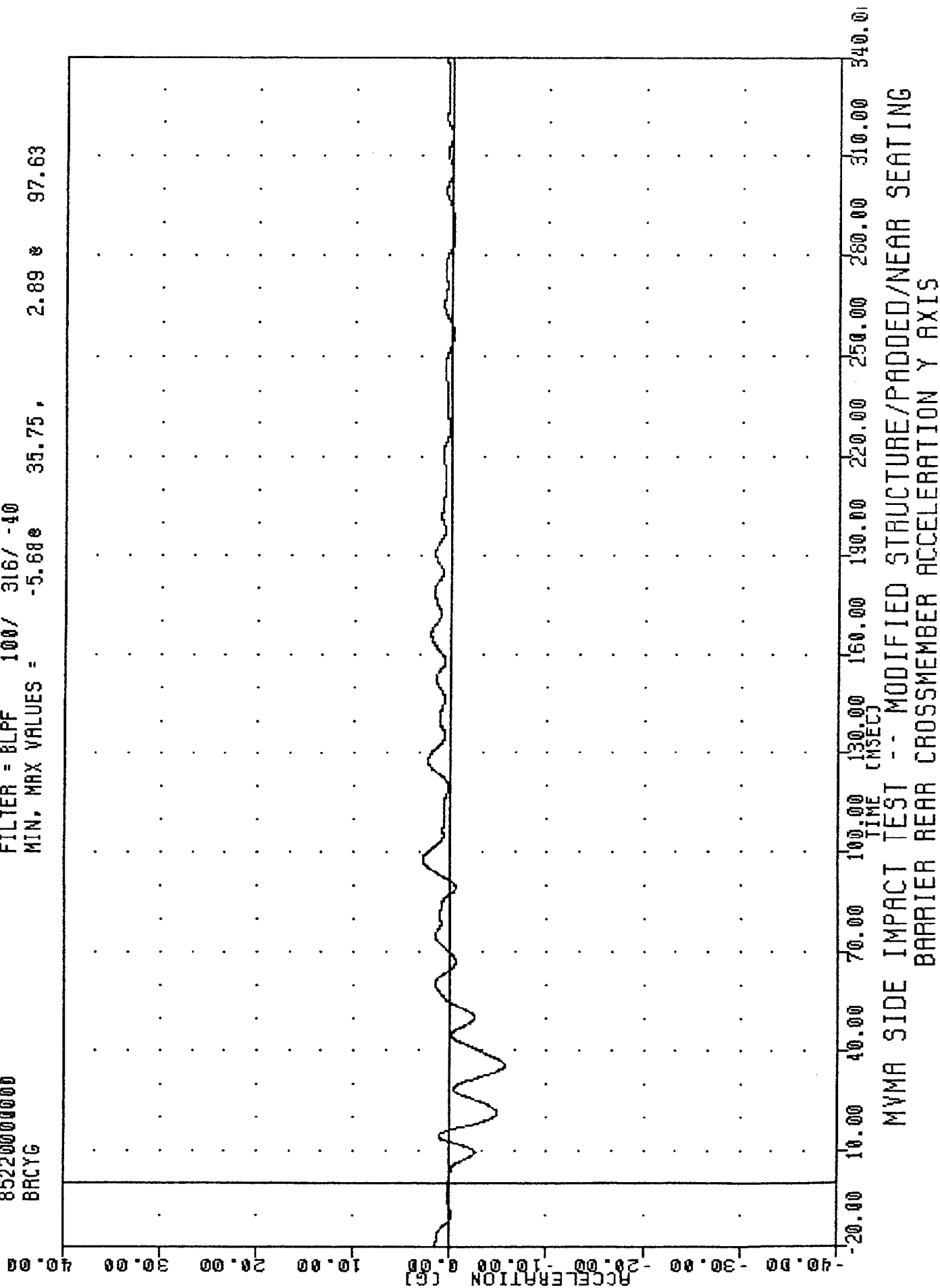
FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -13.80 31.63, 1.14 145.25



TRC
MVMA SIDE IMPACT TESTING
852200000000
BRCYG

PLOT DATE 15-AUG-85 12:24:13

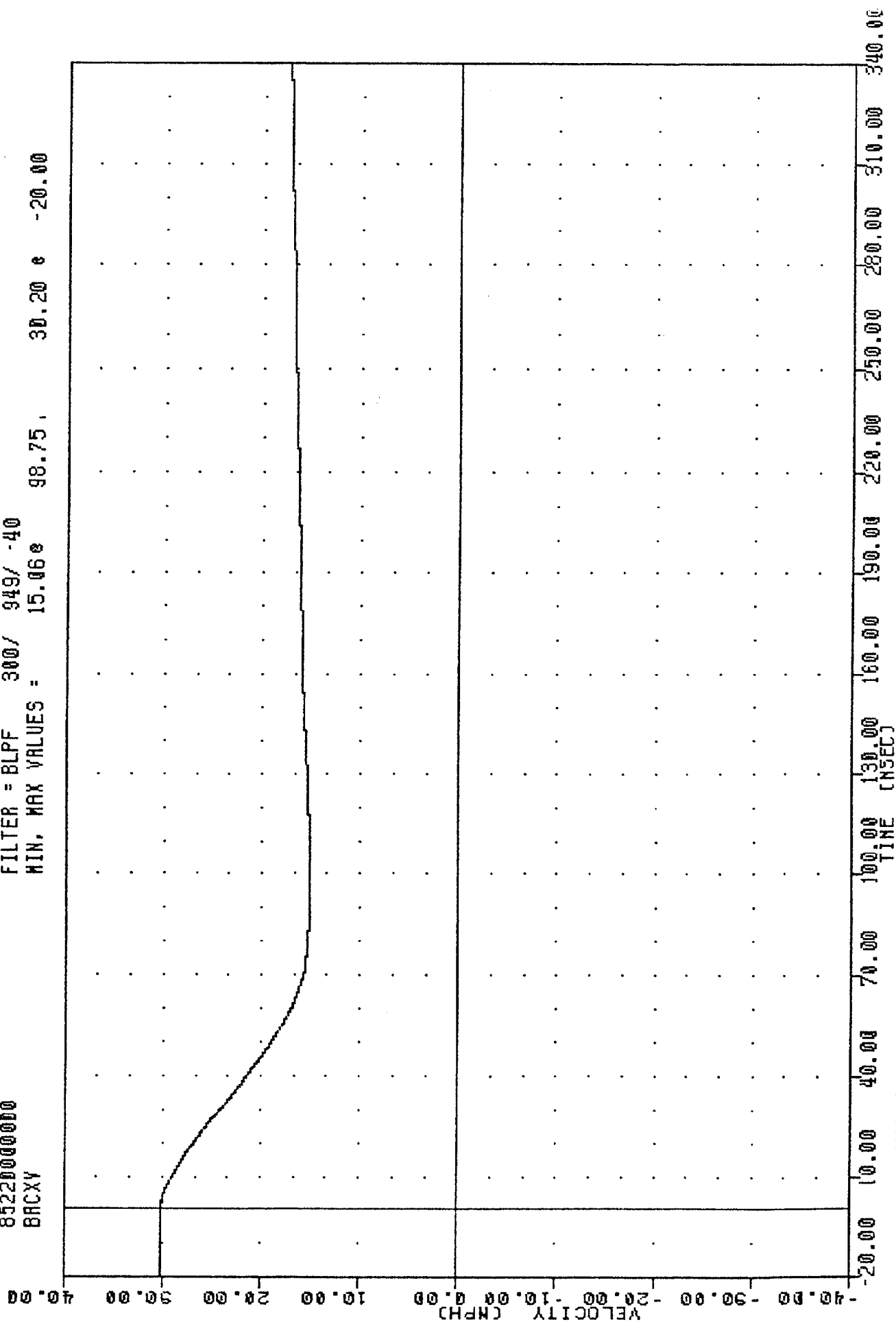
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -5.68e 35.75, 2.89 e 97.63



TRC 850808 PLOT DATE 15-AUG-85 16:06:21

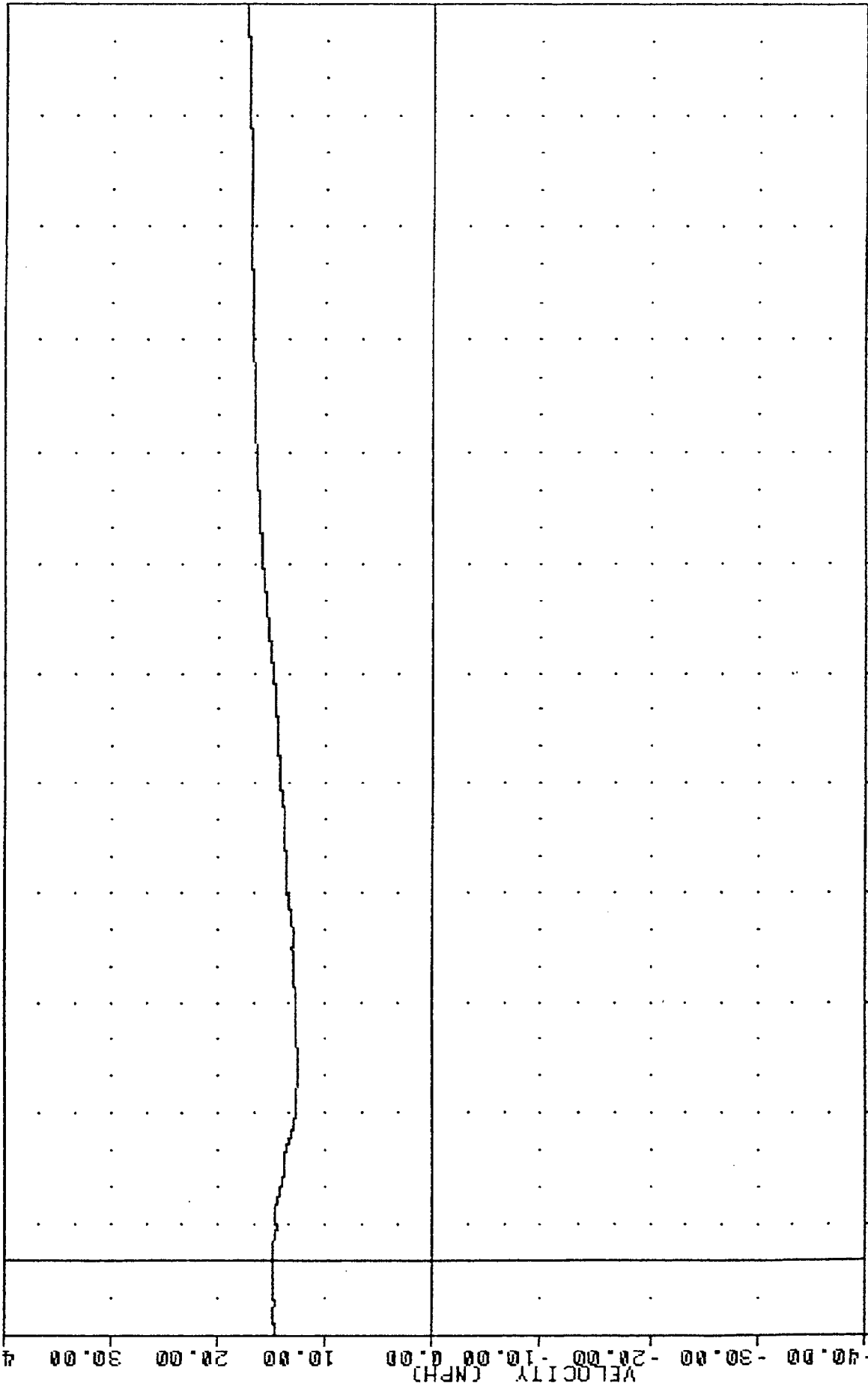
MYMA SIDE IMPACT TESTING
852200000000
BRCXY

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 15.06e 98.75, 30.20 e -20.00



MYMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
BARRIER REAR CROSSMEMBER VELOCITY X AXIS

TRC
 852200000000
 NVMA SIDE IMPACT TESTING
 850808
 PLOT DATE 15-AUG-85 12:25:37
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 12.53 51.13, 17.45 339.88



-40.00
 -30.00
 -20.00
 -10.00
 0.00
 10.00
 20.00
 30.00
 40.00
 TIME (MSEC)
 0.00 50.00 100.00 150.00 200.00 250.00 300.00 340.00
 NVMA SIDE IMPACT TEST -- MODIFIED STRUCTURE/PADDED/NEAR SEATING
 BARRIER REAR CROSSMEMBER VELOCITY Y AXIS

APPENDIX B
DUMMY CERTIFICATION

SIDE IMPACT DUMMY CALIBRATION

SIDE IMPACT DUMMY CALIBRATION
DUMMY SERIAL NUMBER 119
CALIBRATION 06

TEST/ DATE	CHANNEL	FILTER CLASS	PEAK ACCELERATION (g)	
			SPECIFICATION*	TEST RESULT
HEAD 8/6/85	HEAD Y-AXIS	1000	150-175	170.10
THORAX 8/6/85	UPPER SPINE Y-AXIS			
	PRIMARY	180	16-24.6	19.83
	REDUNDANT	180	16-24.6	19.58
	LOWER SPINE Y-AXIS			
	PRIMARY	180	17.6-26.4	17.60
	REDUNDANT	180	17.6-26.4	17.78
	RIGHT UPPER RIB Y-AXIS			
	PRIMARY	180	36-50	42.78
	REDUNDANT	180	36-50	42.89
	RIGHT LOWER RIB Y-AXIS			
	PRIMARY	180	36-50	43.32
	REDUNDANT	180	36-50	43.14
PELVIS 8/7/85	PELVIS Y-AXIS	180	50-65	62.76

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

Part 572 Dummy
Damage Checklist

Dummy S/N 119

<u>OK</u>	<u>Damaged</u>	
<u> </u>	<u> </u>	Outer skin on entire dummy (gashes, rips, etc.)
<u> </u>	<u> </u>	Head - Gashes, rips, general appearance, etc.
<u> </u>	<u> </u>	Neck - broken or cracks in rubber
<u> </u>	<u> </u>	Spine - broken or cracks in rubber
<u> </u>	<u> </u>	Ribs - check all ribs for damage (bent or broken), damping material separation.
<u> </u>	<u> </u>	Bourns Pot. - bent shaft - electrical discontinuity
<u> </u>	<u> </u>	Accelerometer Leads - torn cables
<u> </u>	<u> </u>	Accelerometer Mountings (Head, Thorax, Pelvis) - check for secure mounting
<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:

Visual inspection OK.

TRC Personnel
Checked By:

Signature _____

Date _____

VRTC Personnel

Checked and Approved for Testing By:

Signature _____

Date _____

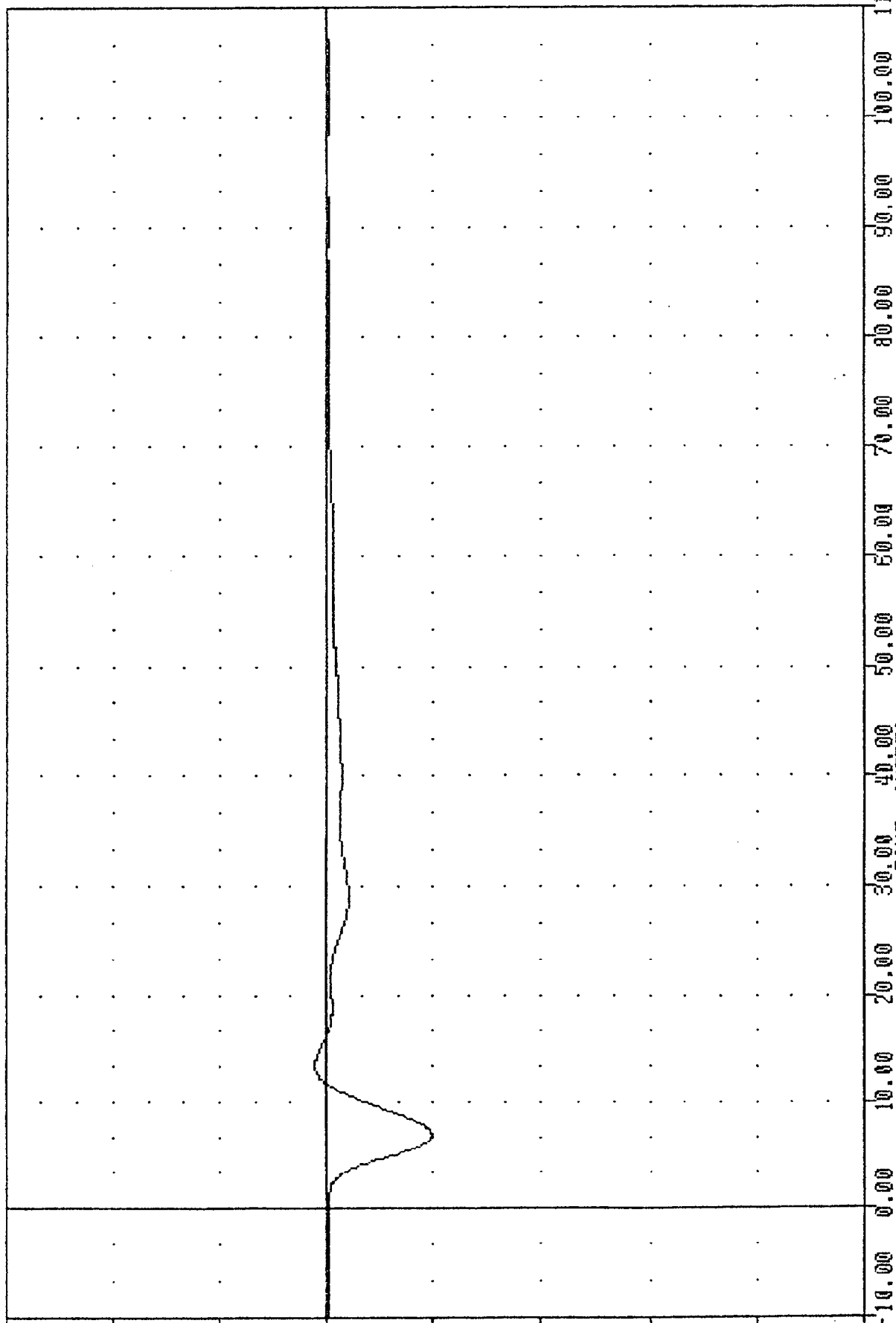
PART 572 CALIBRATION

NVMA
SID 119 HEAD IMPACT CAL 06
85218
PISXG

PLOT DATE 6-AUG-85 15:32:07

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -9.86 7.00, 1.03 13.38

ACCELERATION (G)

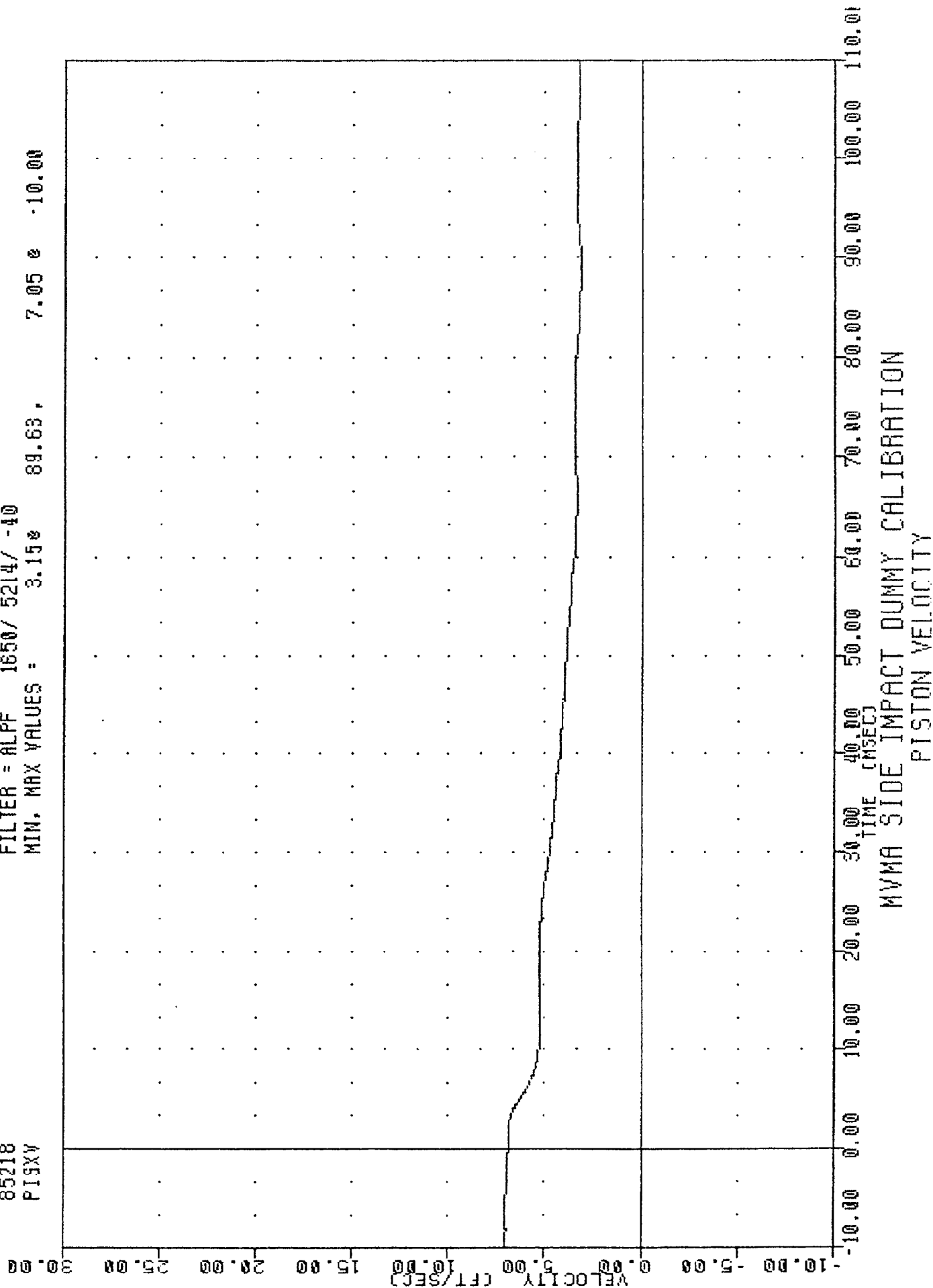


TIME (msec)
NVMA SIDE IMPACT DUMMY CALIBRATION
PISTON ACCELERATION

MVNA
 SID 119 HEAD IMPACT CAL 06
 85218
 PISXV

PLOT DATE 8-AUG-85 15:32:07

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 3.15 89.63 7.05 -10.00



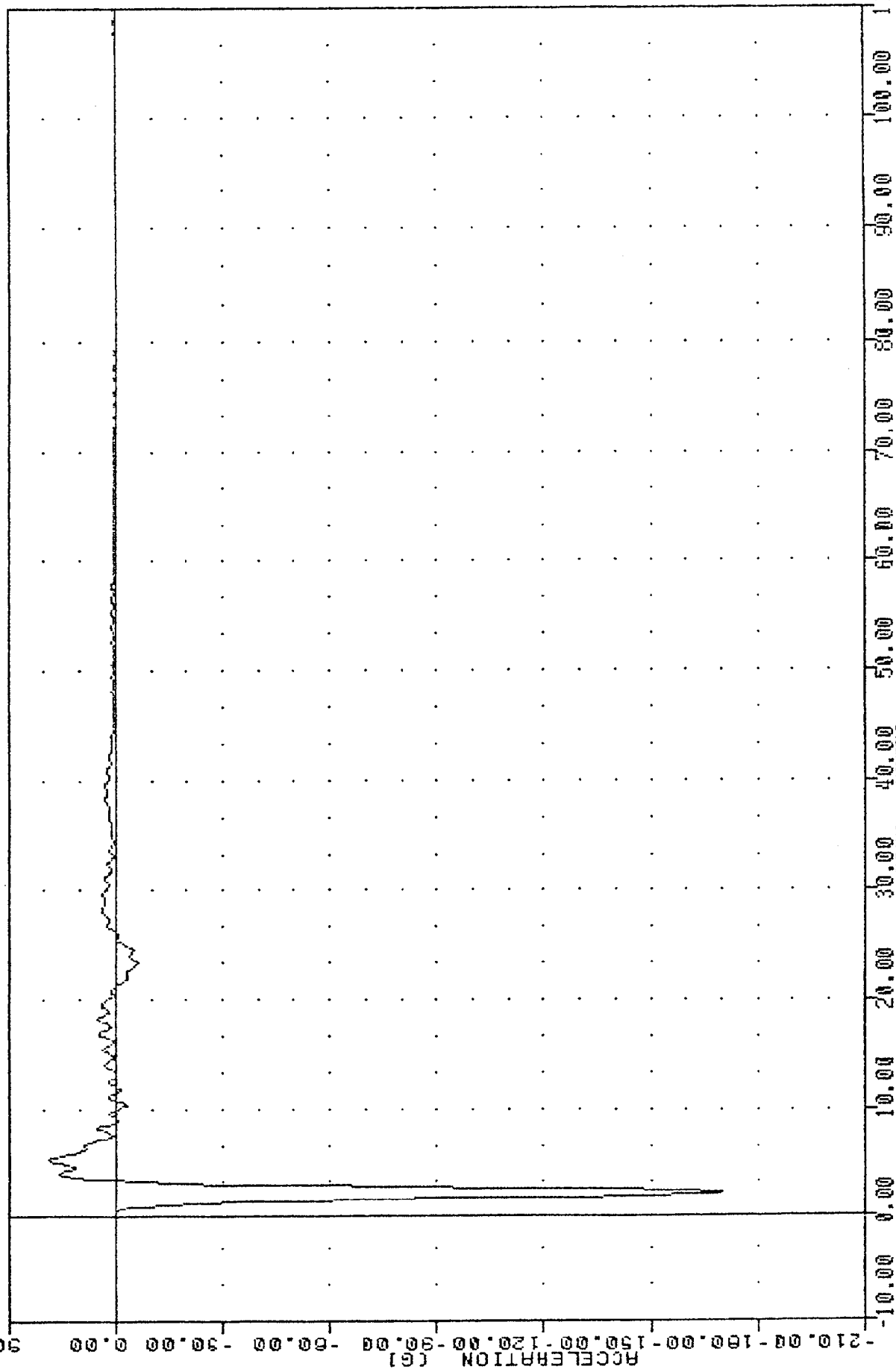
PLOT DATE 6-AUG-85 15:32:07

MYMA SH11906
SID 119 HEAD IMPACT CAL DG

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -170.100 2.25 , 18.80 & 5.38

85218
HEDY6

90.00



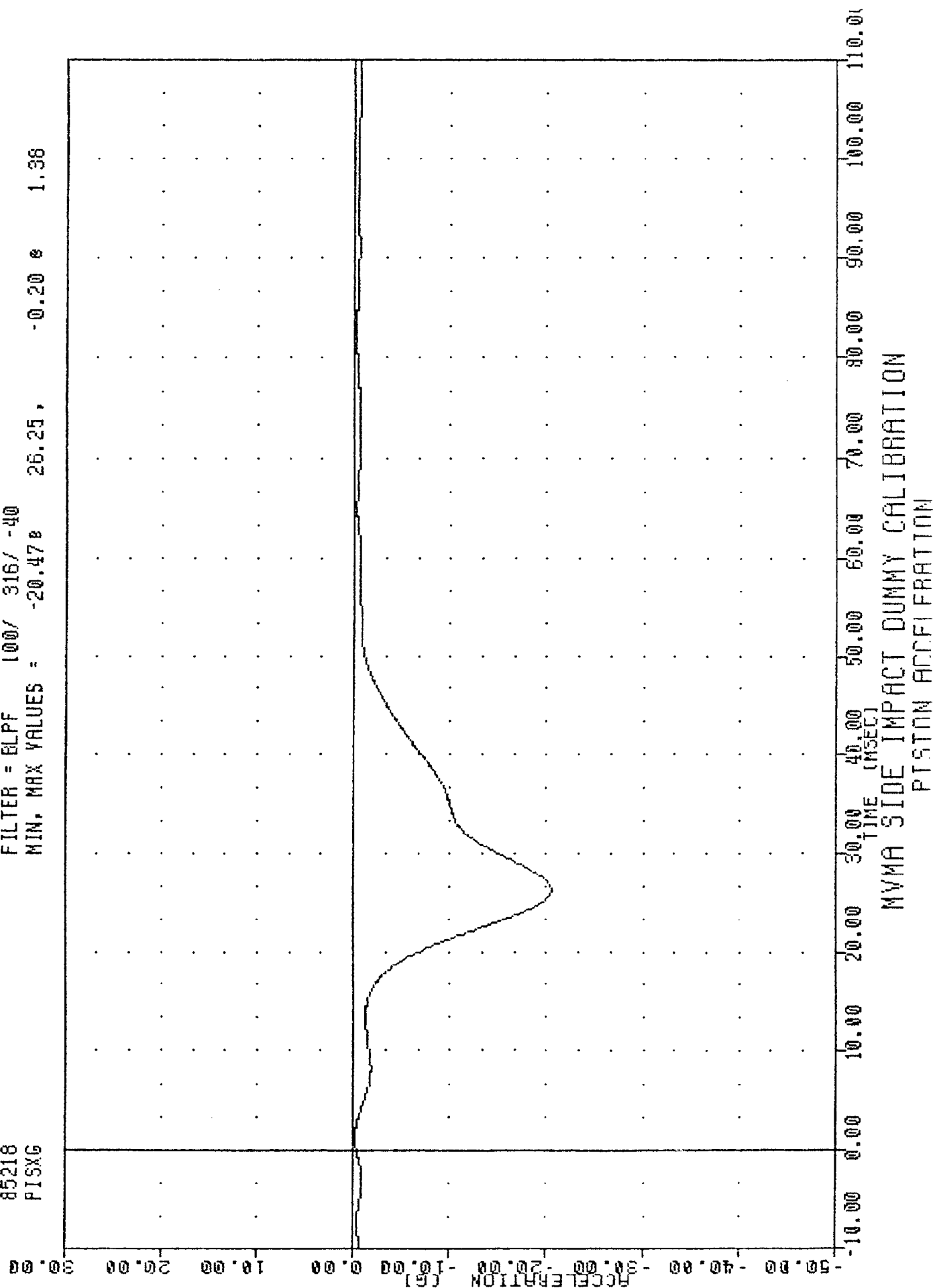
MYMA SIDE IMPACT DUMMY CALIBRATION
HEAD ACCELERATION Y AXIS

NVMA
SID 119 THORAX IMPACT CAL 06
85218
PISXG

PLOT DATE 6-AUG-85 16:04:52

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -20.478 26.25, -0.208 1.38



PLOT DATE 8-AUG-85 16:04:52

MVMA , ST11906
SID 119 THORAX IMPACT CAL 06

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = 1.228 109.25, 14.068 -2.38

85218
PI9XV

30.00

25.00

20.00

15.00

10.00

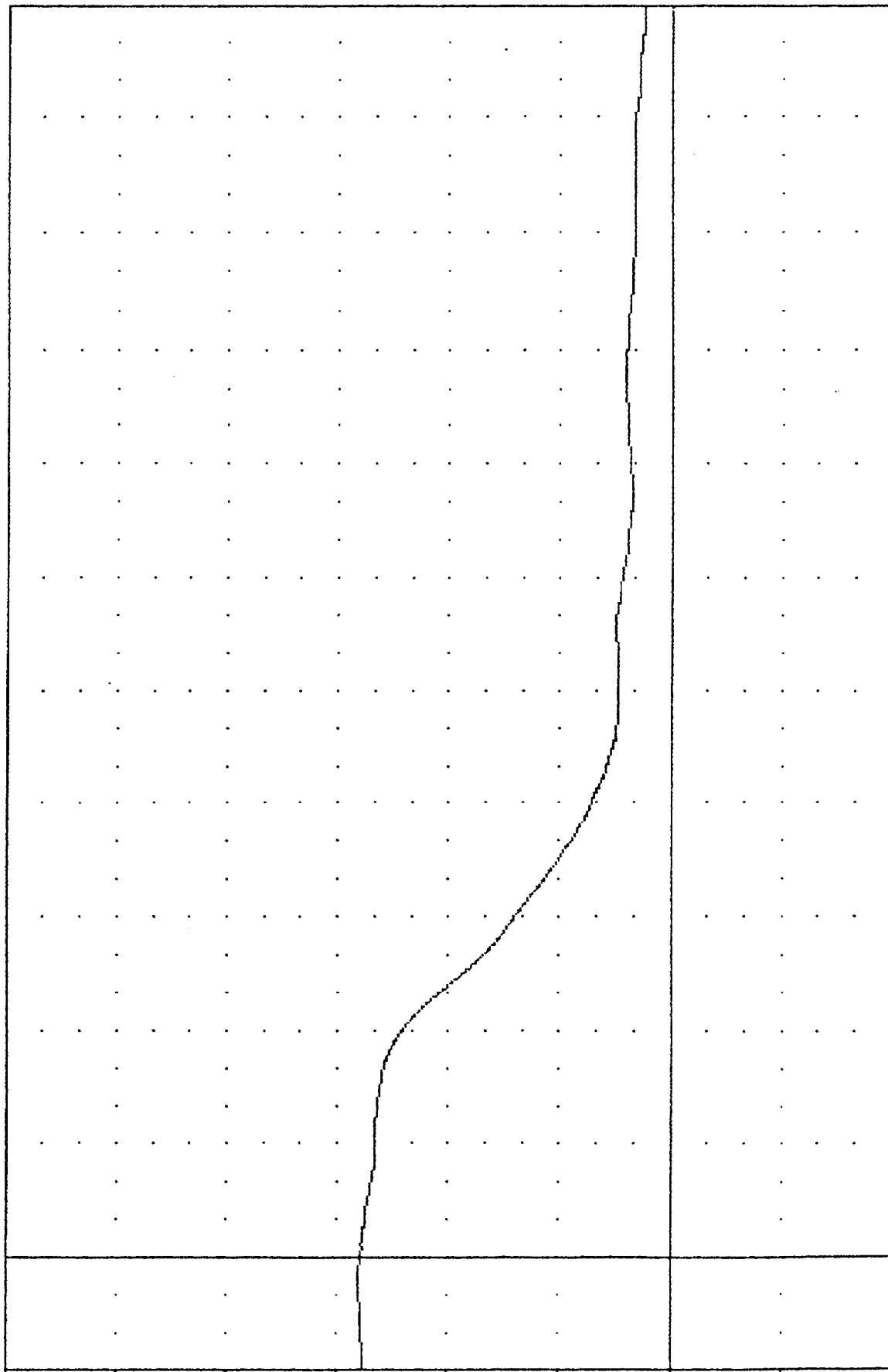
5.00

0.00

-5.00

-10.00

VELOCITY (FT/SEC)



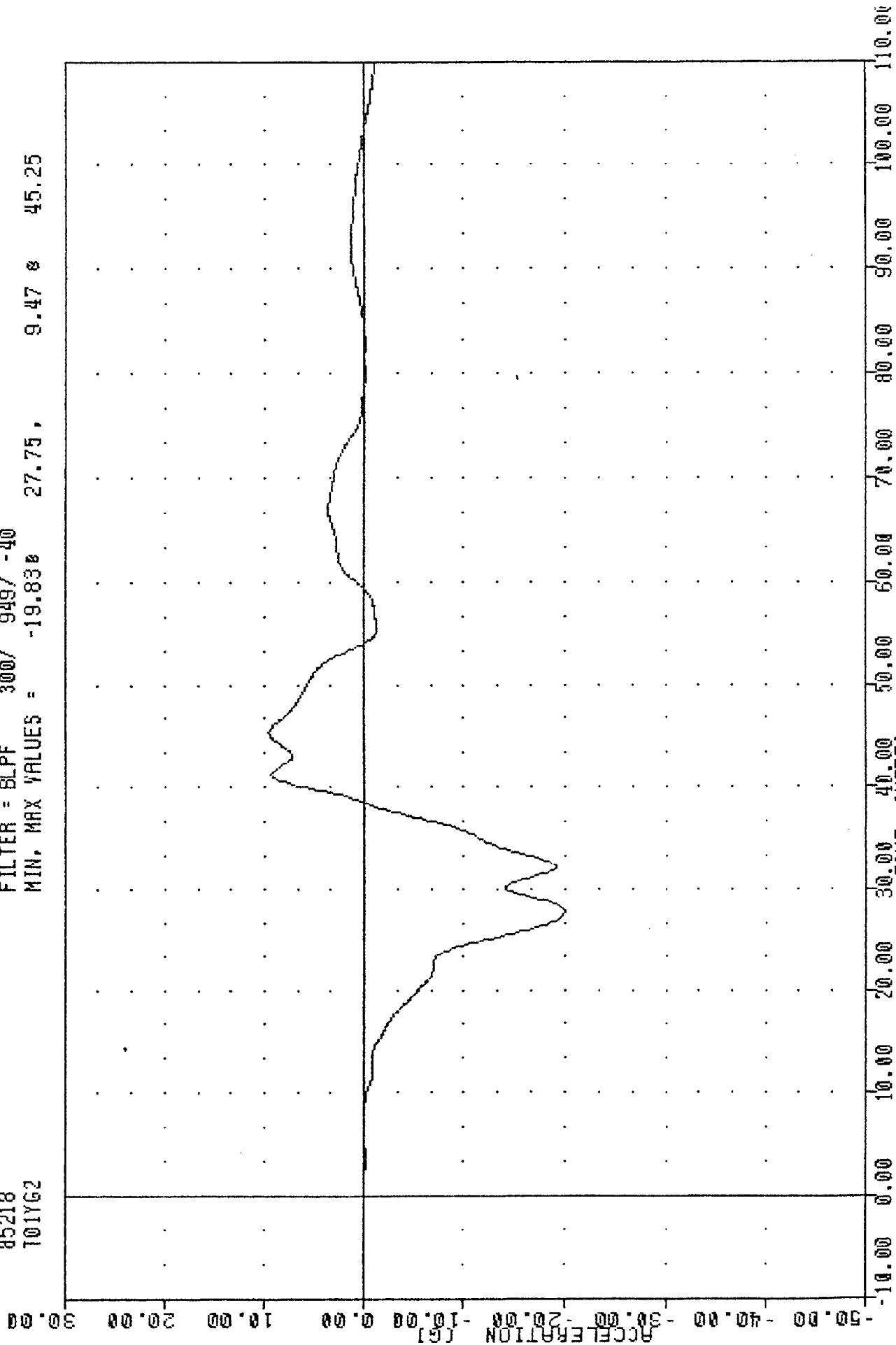
TIME (MSEC)

MVMA SIDE IMPACT DUMMY CALIBRATION
PISTON VELOCITY

MVMA
SID 119 THORAX IMPACT CAL 06
85218
T01YG2

PLOT DATE 6-AUG-85 16:04:52

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -19.838 27.75, 9.47 8 45.25



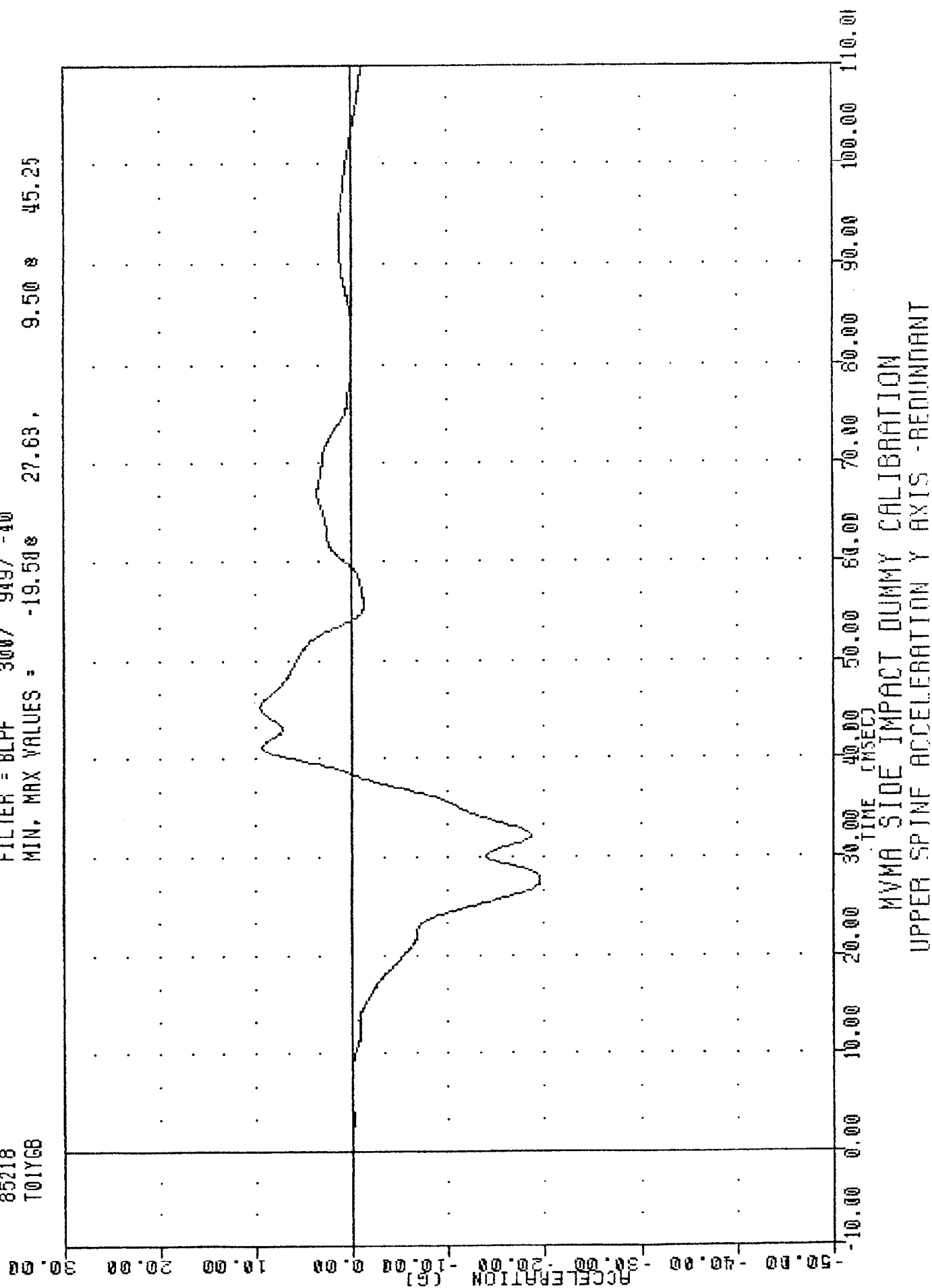
MVMA SIDE IMPACT DUMMY CALIBRATION
UPPER SPINE ACCELERATION Y AXIS - PRIMARY

MVNA
 ST11906
 SID 119 THORAX IMPACT CAL 06
 85218
 T01Y68

PLOT DATE 6-AUG-85 16:04:52

FILTER = 8LPF 300/ 919/ -40

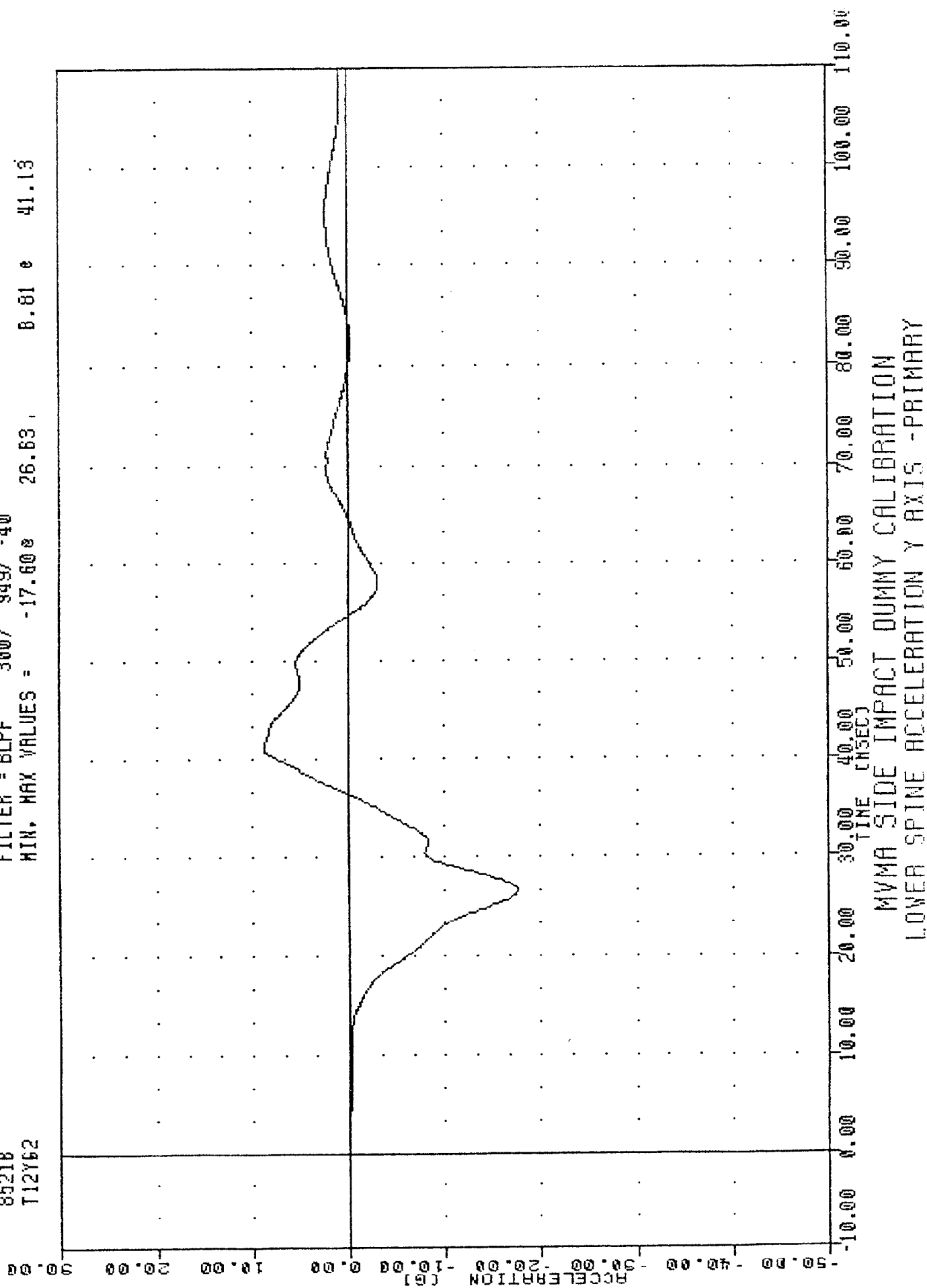
MIN, MAX VALUES = -19.58g 27.63, 9.50g 45.25



MVMA
 SID 118 THORAX IMPACT CAL 06
 85218
 T12Y62

PLOT DATE 6-AUG-85 16:04:52

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -17.608 26.63 8.81 e 41.13

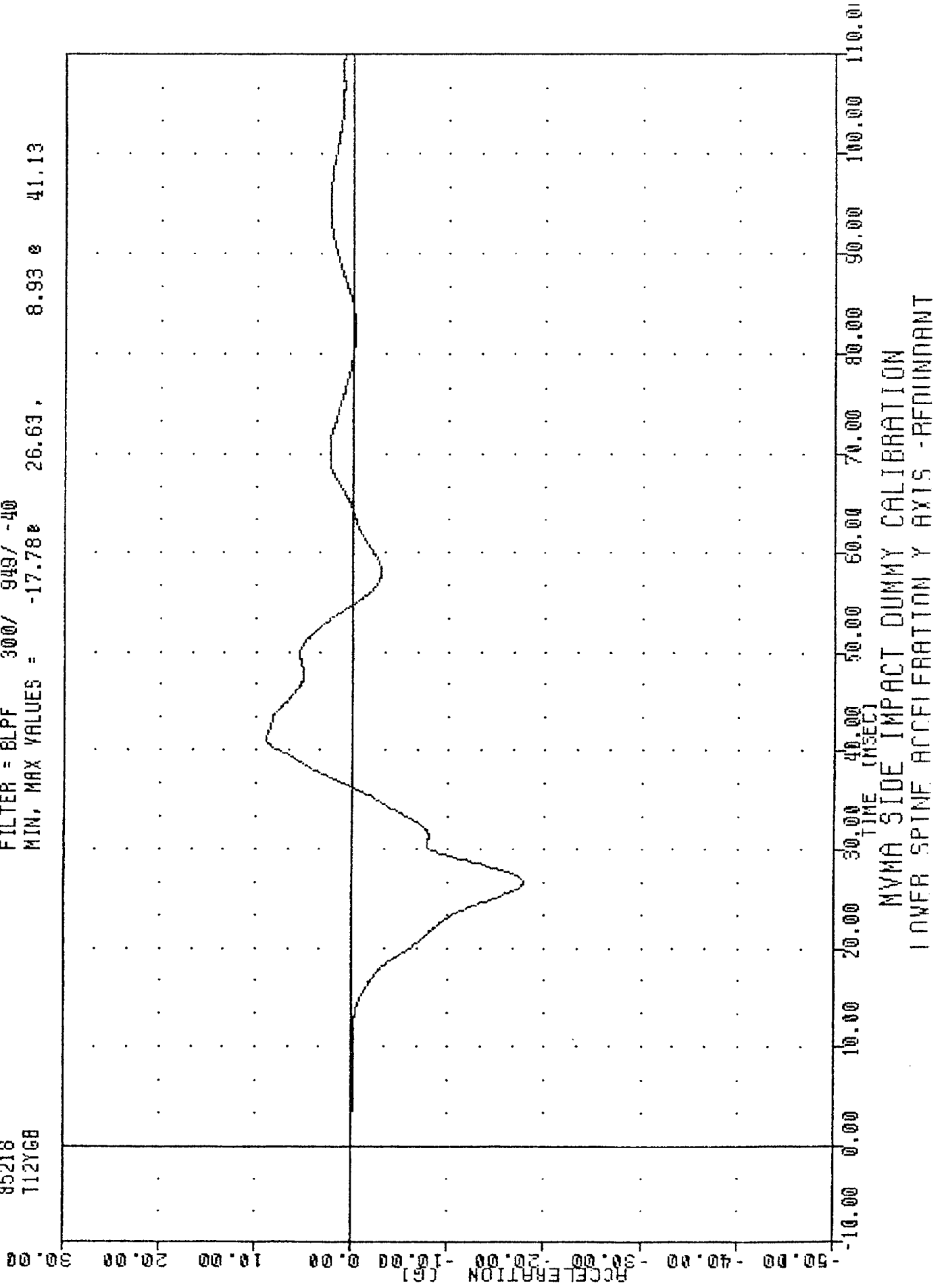


NVMA
SID 119 THORAX IMPACT CAL 06
85218
112YGB

PLOT DATE 6-AUG-85 16:04:52

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -17.78e 26.63e

8.93 e 41.13

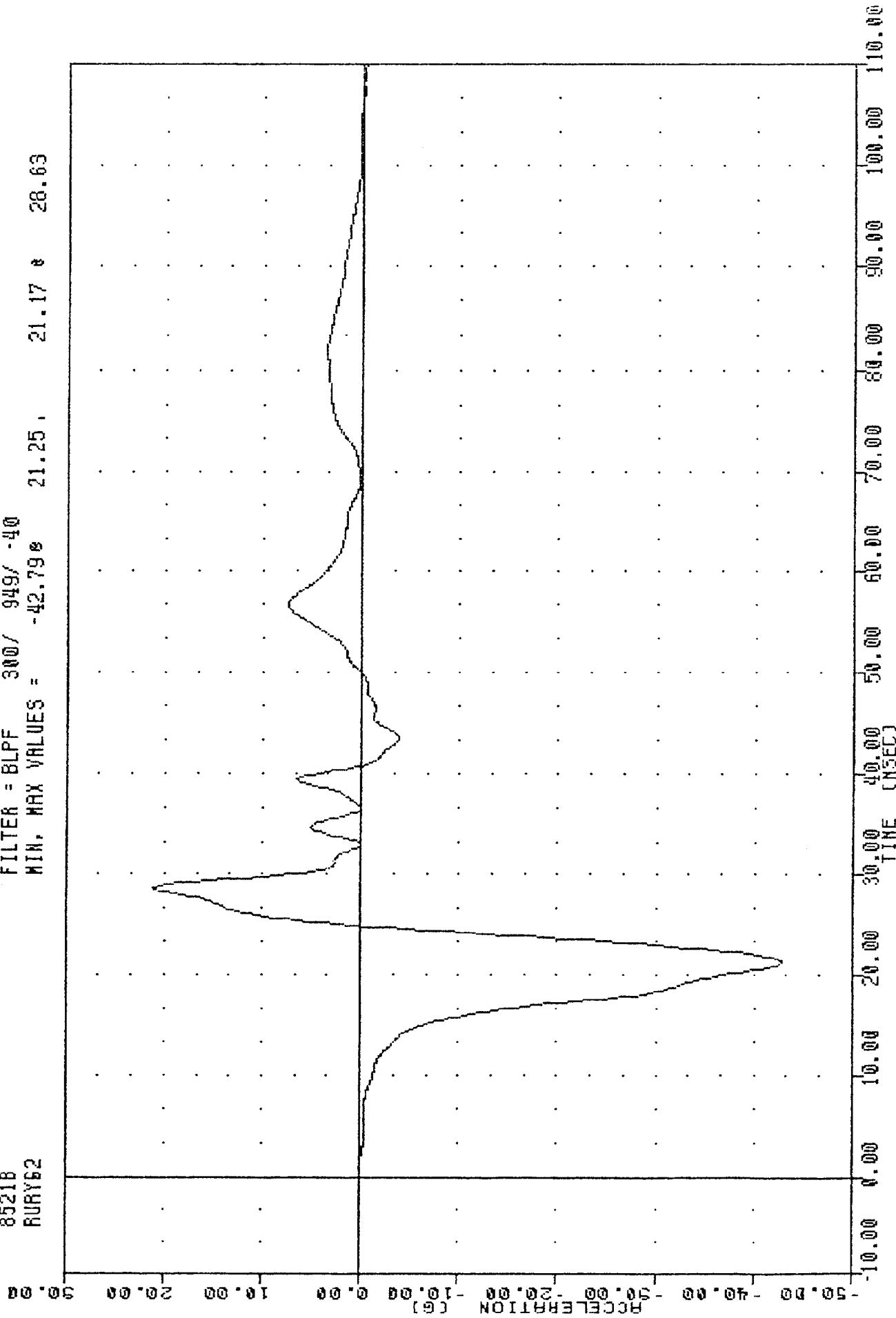


PLOT DATE 6-AUG-85 16:04:52

MVMA , ST11906
SID 119 THORAX IMPACT CAL 06

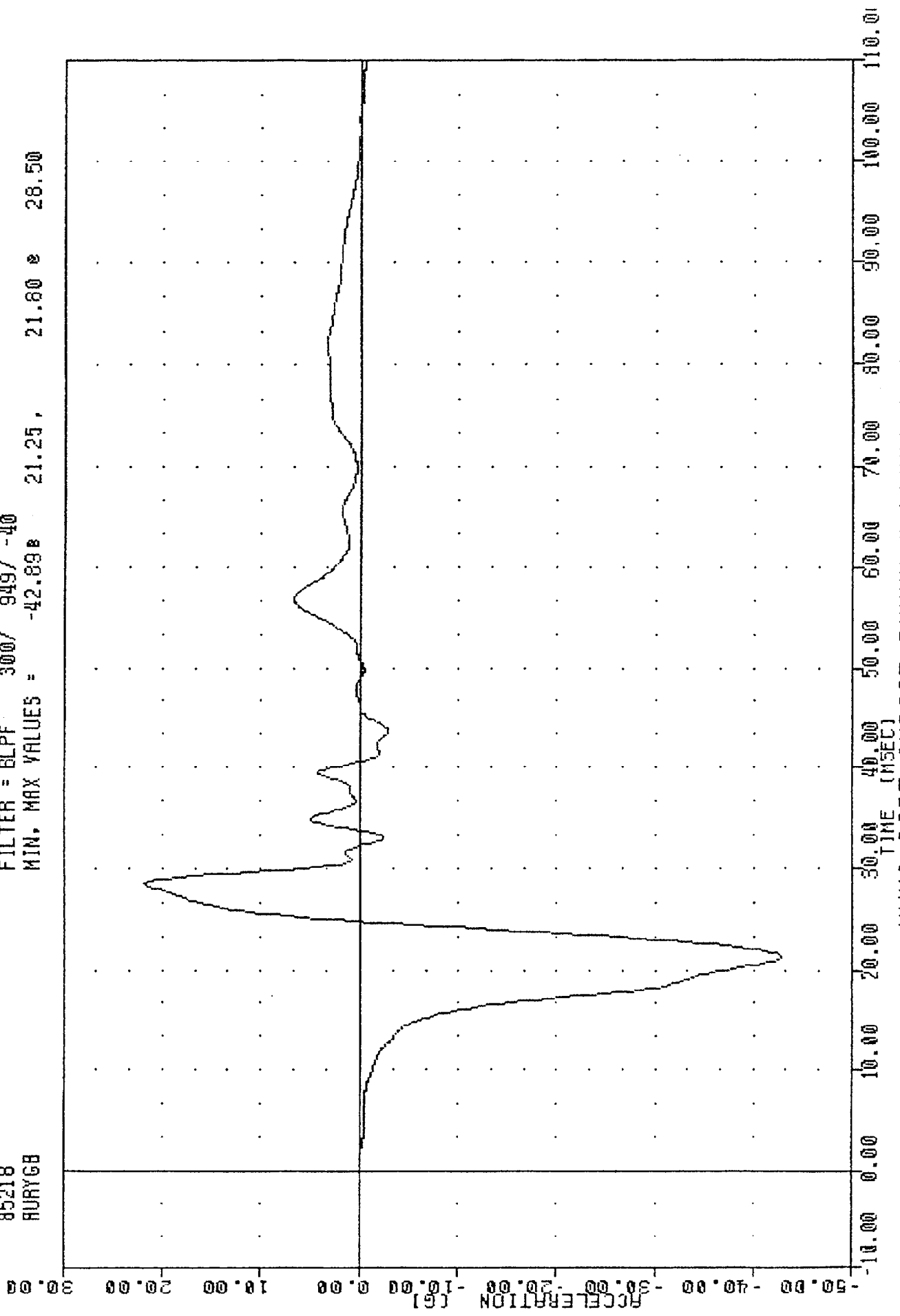
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -42.79g 21.25 , 21.17 g 28.63

85218
RURY62



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

NYMA
 SID 119 THORAX IMPACT CAL 06
 85218
 HURYGB
 PLOT DATE 6-AUG-85 16:04:52
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -42.89 21.25, 21.80 28.50

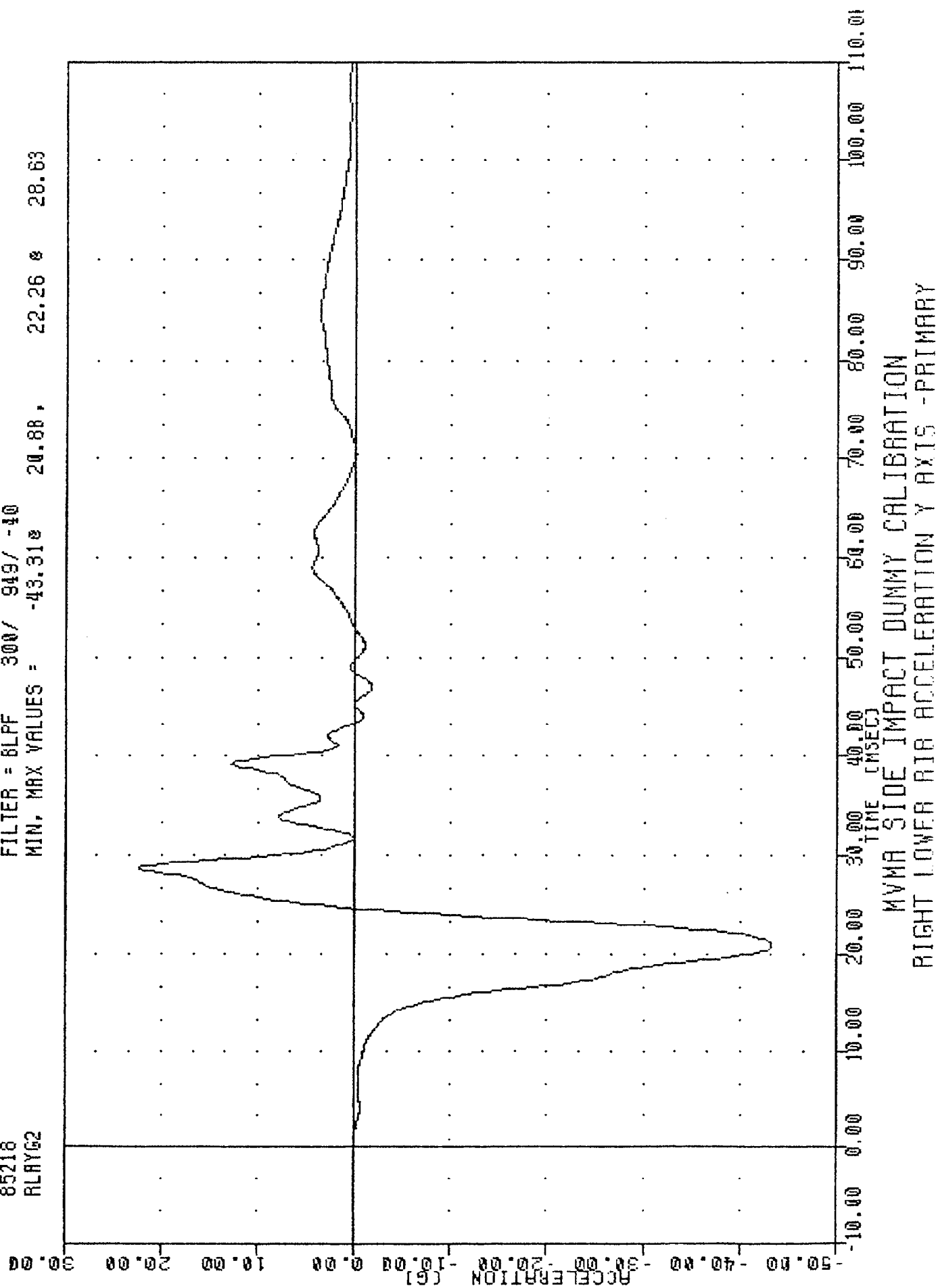


NYMA SIDE IMPACT DUMMY CALIBRATION
 RIGHT UPPER RIB ACCELERATION Y AXIS -REDUNDANT

MVMA
 SID 119 THORAX IMPACT CAL 06
 85218
 RLYG2

PLOT DATE 6-AUG-85 16:04:52

FILTER = 8LPF 300/ 949/ -40
 MIN, MAX VALUES = -43.31 20.88, 22.26 28.63

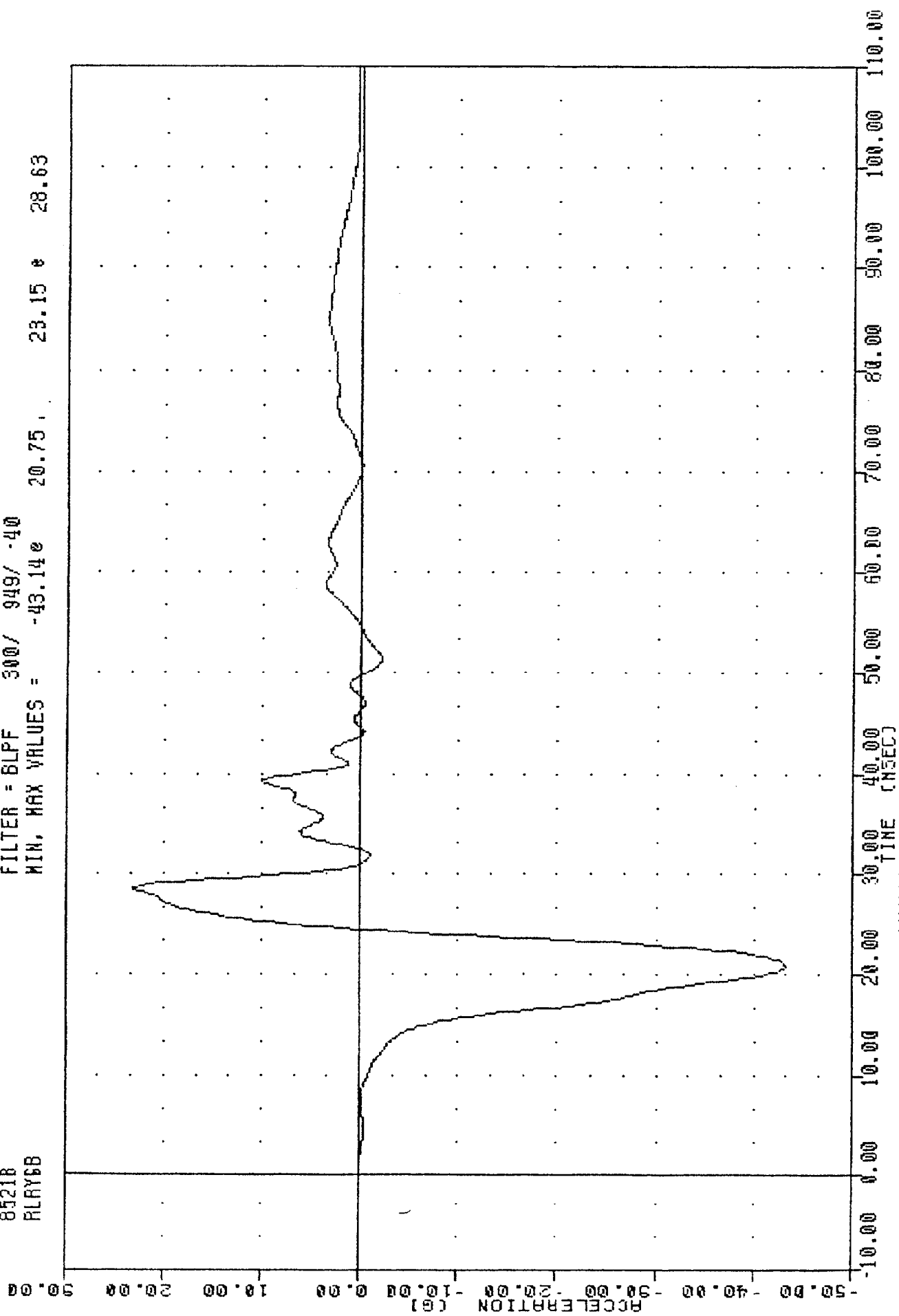


MVMA SIDE IMPACT DUMMY CALIBRATION
 RIGHT LOWER RIB ACCELERATION Y AXIS -PRIMARY

MYMA , ST11906
 SID 119 THORAX IMPACT CAL 06
 8521B
 RLRY5B

PLOT DATE 6-AUG-85 16:04:52

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -43.14e 20.75 , 23.15 e 28.63

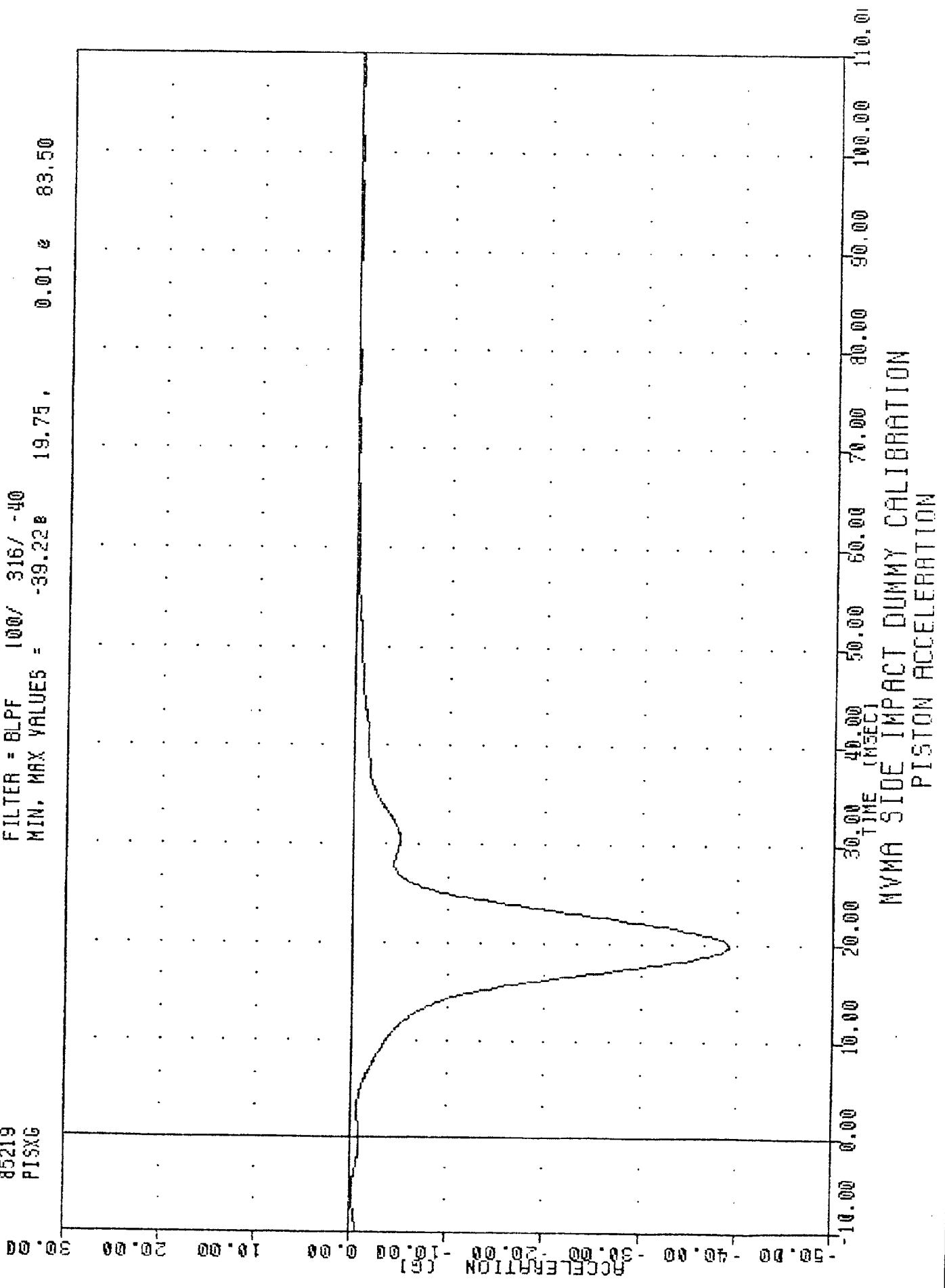


MYMA SIDE IMPACT DUMMY CALIBRATION
 RIGHT LOWER RIB ACCELERATION Y AXIS -REDUNDANT

NVMA , SP11906
SID 118 PELVIC IMPACT CAL 06
85219
PISXC

PLOT DATE 7-AUG-85 10:14:29

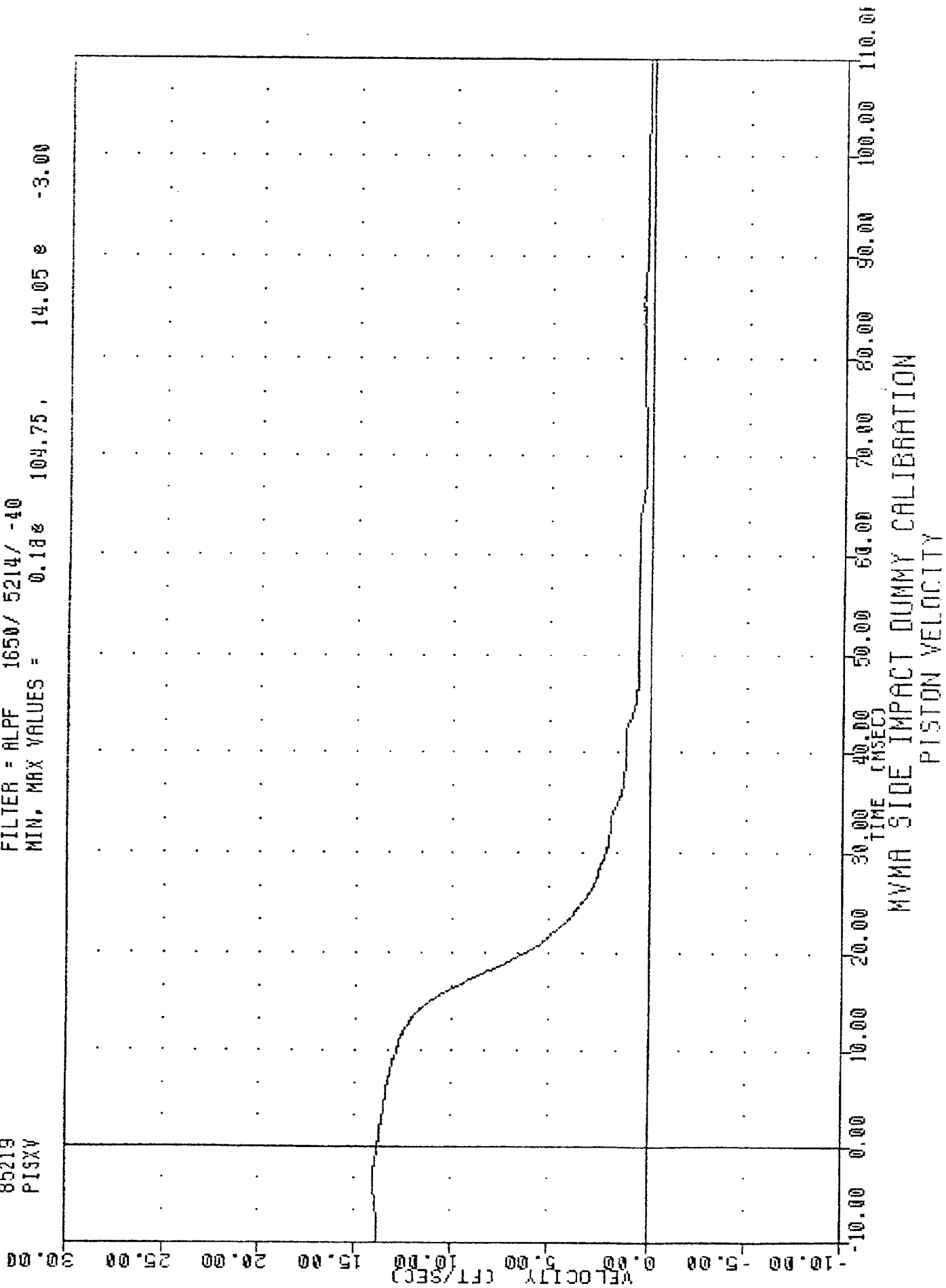
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -39.220 19.75, 0.01 & 83.50



MVMA
SID 119 PELVIC IMPACT CAL 06
85219
PISXY

PLOT DATE 7-AUG-85 10:14:29

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.18e 104.75, 14.05 e -3.00



PLOT DATE 7-AUG-85 10:14:29

SP11906
SID 119 PELVIC IMPACT CAL 06

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -62.76 16.25 10.76 22.00

65219
PEVY6

