

May 1984
Final Report

DOT HS-806 647

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US Department
of Transportation
National Highway
Traffic Safety
Administration

AIRBAG DEMONSTRATION PROGRAM

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1. Report No. DOT HS-806 647	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle ✓ AIRBAG DEMONSTRATION PROGRAM		5. Report Date May 1984	6. Performing Organization Code NRD-21
7. Author(s) Robert C. Esser	8. Performing Organization Report No. RD 583-2		
9. Performing Organization Name and Address Vehicle Research and Test Center P.O. Box 37 East Liberty, Ohio 43319		10. Work Unit No. (TRAVIS)	11. Contract or Grant No.
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Washington, D.C. 20590		13. Type of Report and Period Covered FINAL -- March - May 1984	
14. Sponsoring Agency Code			
15. Supplementary Notes			
16. Abstract Sled tests were performed using a driver-only airbag system in conjunction with seat belts to determine injury criteria using 50th percentile dummy.			
17. Key Words AIRBAG DEMONSTRATION SLED TESTS		18. Distribution Statement Document is available to the U.S. public through the National Technical Information Service, Springfield, Virginia 22161	
19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price



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1 Introduction

The tests discussed in this report are supplemental to the tests described in the phase one report of the same name. This entire test series deals with retrofitting driver air bags into police fleet vehicles. The steering column used for these tests was a tilt-wheel type column which allowed the steering wheel to be positioned to any one of five positions. Throughout the twenty tests performed with the LTD test buck during Phase I of this program, the steering wheel was not tested in any position other than one position down from center. Upon further consideration, it was decided to perform two additional tests with the steering wheel tilted to its full-up position.

1.2 Objective

The objective of Phase II of this program was to evaluate the effect of having the tiltable steering wheel in its fully up position.

The Vehicle Research and Test Center (VRTC) was asked to conduct two sled tests to provide additional required data for the system evaluation phase of this project. As in Phase I, FMVSS 208 requirements were used to judge system performance. The sled buck used was the same 1978 Ford LTD. The tests were performed using a 50th percentile Part 572 male dummy in both fully belted and non-belted conditions in conjunction with the air bag system. Testing was performed on April 4 and 5 1984 as follows:

1. The first test of phase II, Run 30 in the overall numbering sequence, was performed with an airbag installed and the dummy fully belted. The tiltable steering wheel was mistakenly adjusted to one notch down from the fully up position.
2. The second test of phase II, Run 31, was performed with an airbag installed and the dummy non-belted. The tiltable steering wheel was in the fully up position.

2.0 Results

Tables 1 and 2 summarize the data obtained from these tests. Appendices one, two and three follow with the placement chart, photographs, and the data charts respectively. An anomaly exists in the data from the pelvis Y axis for test 30. This also effects the pelvis resultant data for the same test. For this reason, neither should be considered valid.

Table 1 Ford LTD
VRTC Sled Tests

Date	Run	Dummy	Restraint	Vent	HIC	G's	Maximum Speed	Peak Femur Loads Left	Right	Peak Resultants Chest	Head
Apr 4	30	50th	AB,KB,3pt	25mm	458	23.4	33.8	536	618	43.8	87.2
Apr 5	31	50th	AB,KB	25mm	283	23.7	33.9	1798	2473	47.2	199.4

AB - Air Bag KB - Knee bar 3PT - Lap and Shoulder Belt

TABLE 2 Steering Wheel and Steering Column Stroke
Ford LTD

Test	UR	UL	LR	LL	Column
30	15mm	28mm	-10mm	-1mm	26mm
31	20mm	18mm	58mm	48mm	48mm

UL - rim stroke at location of upper left spoke
 UR - rim stroke at location of upper right spoke
 LR - rim stroke at location of lower right spoke
 LL - rim stroke at location of lower left spoke

Negative measurements indicate an extension of the wheel spoke instead of a collapse.

Appendix 1

Placement Chart

TEST NO. RD583-2-30431

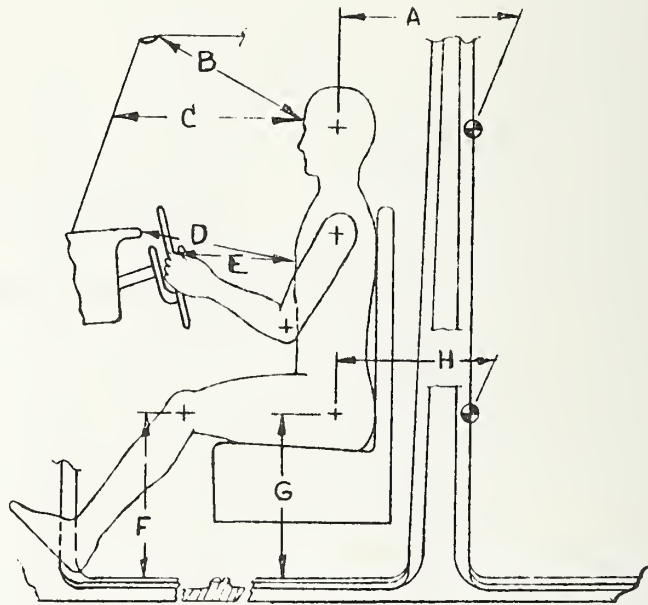
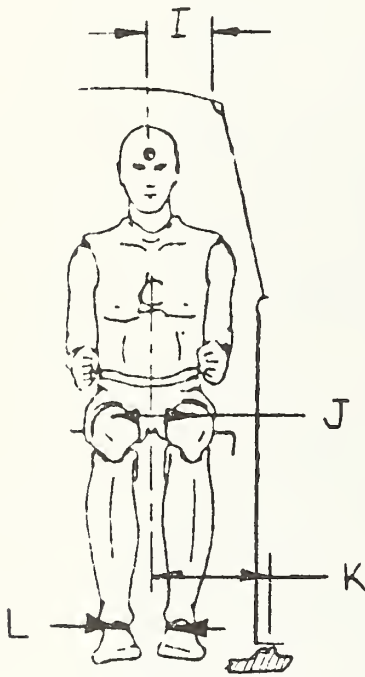
CUSTOMER V.R.T.O.

TRC TEST NO. 282 & 283

DATE 4/4 TO 4/5/84

DUMMY 50TH

VEHICLE FORD LTD



A = $8 \frac{15}{16}$
 B = $14 \frac{3}{8}$
 C = 21
 D = $20 \frac{5}{8}$

E = $9 \frac{5}{8}$
 F = $9 \frac{15}{16}$
 G = 7
 H = 16

I = $8 \frac{1}{2}$
 J = 9
 K = 15
 L = 7

SEAT POSITION - MIDDLE

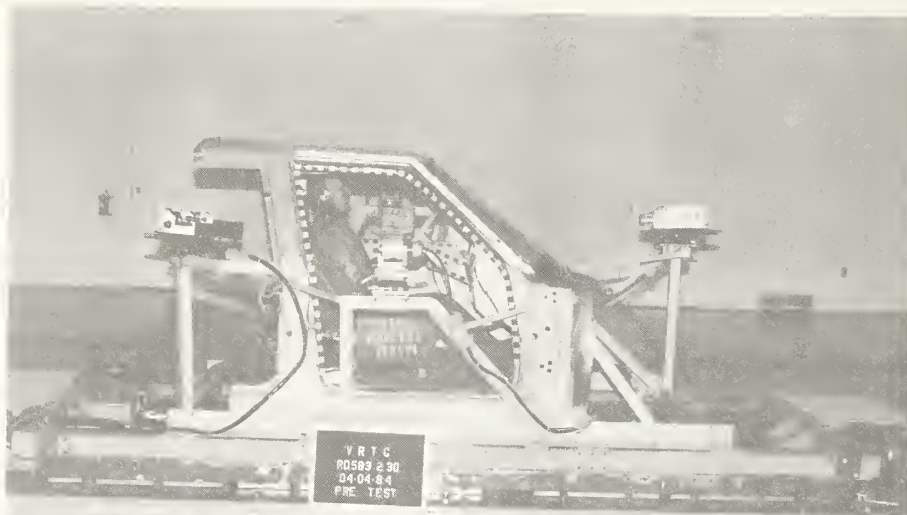
PRE TEST TILT POSITION ——— FULL UP

HEAD REST POSITION ——— FULL UP

SEAT BACK ANGLE — 22°

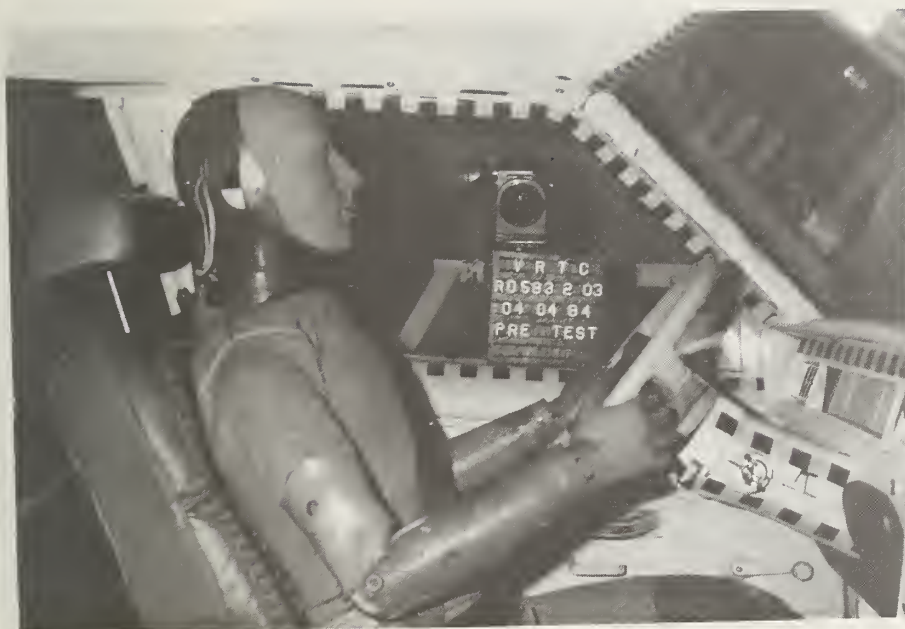
Appendix 2

Photographs



Test Buck
Overall view

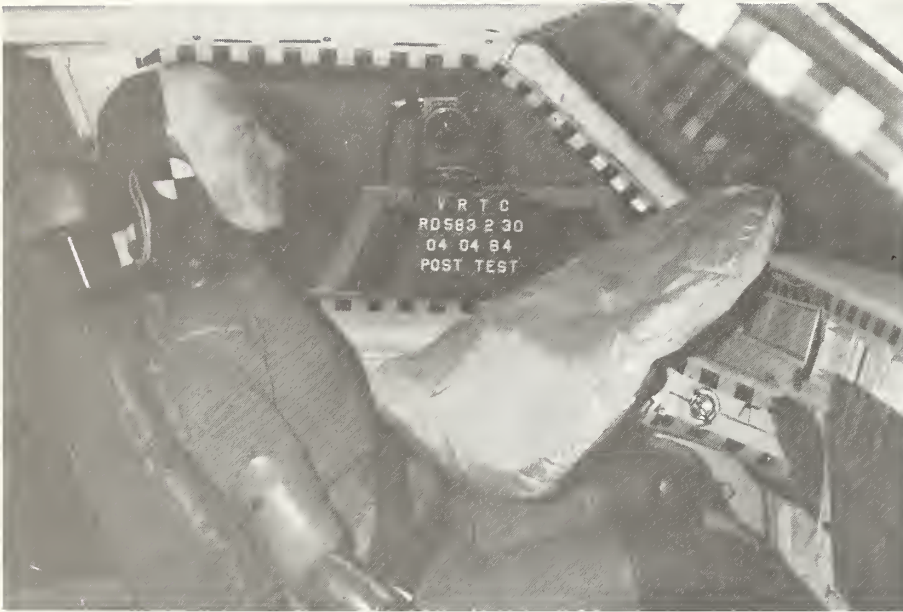
V R T C
R0589 2 30
24 04 84
PRE TEST



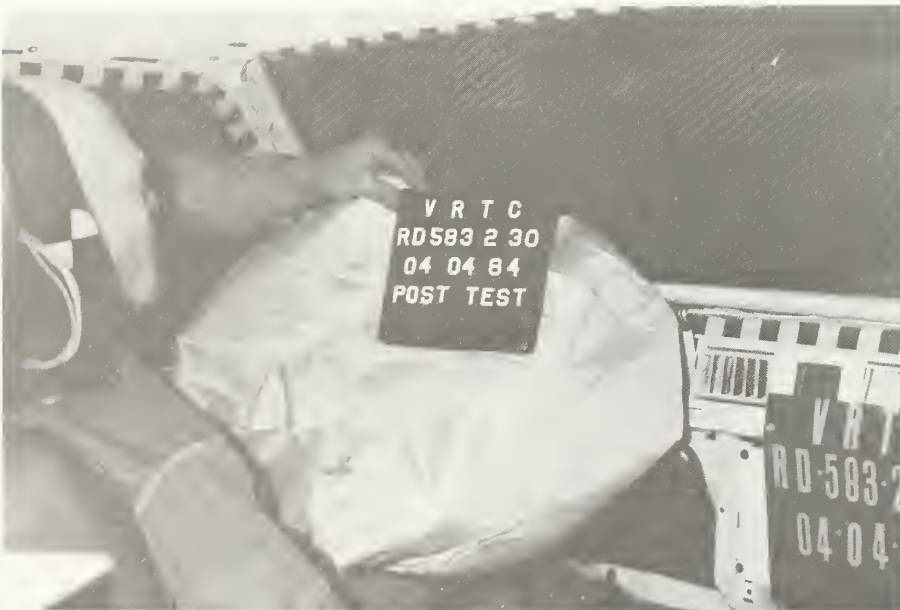
Test 30 Wheel Position
Pre test



Test 30 Wheel Position
Post test



Test 30 Airbag Position
Post test



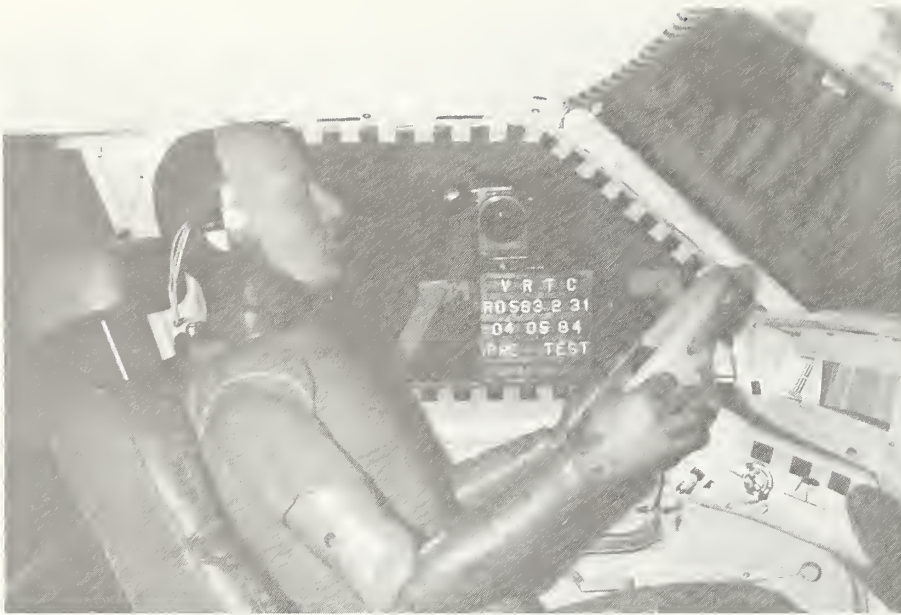
Test 30 Facial Impact
Area, Post test



Test 30, Right Knee
Impact Area, Post test



Test 30, Left Knee Impact area
Post test



Test 31, Wheel Position
Pre test



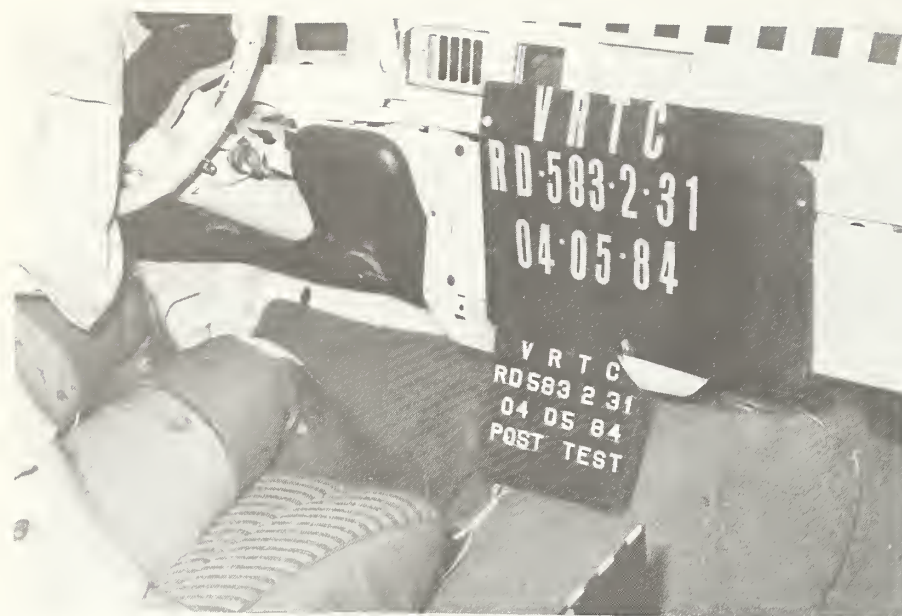
Test 31, Wheel Position
Post test



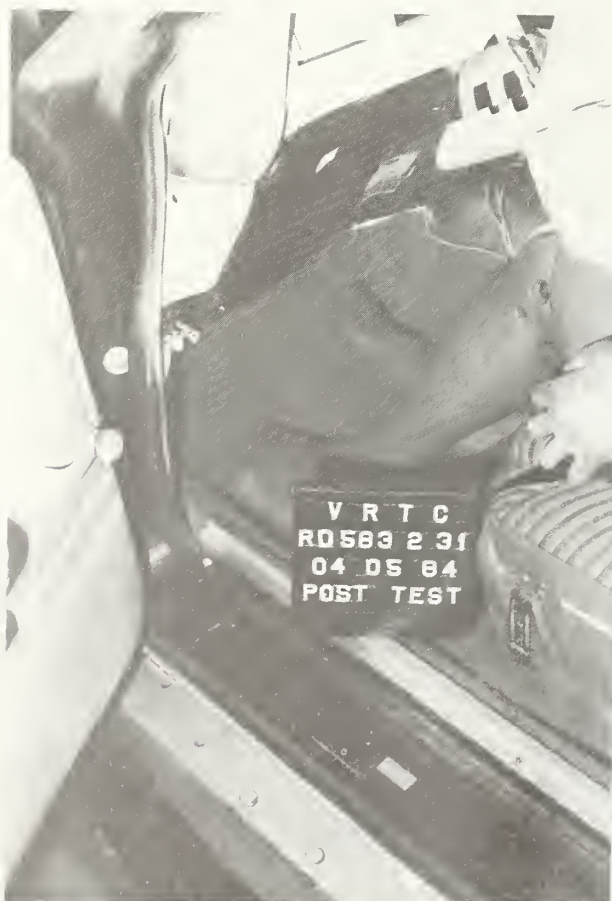
Test 31, Bag Position
Post test



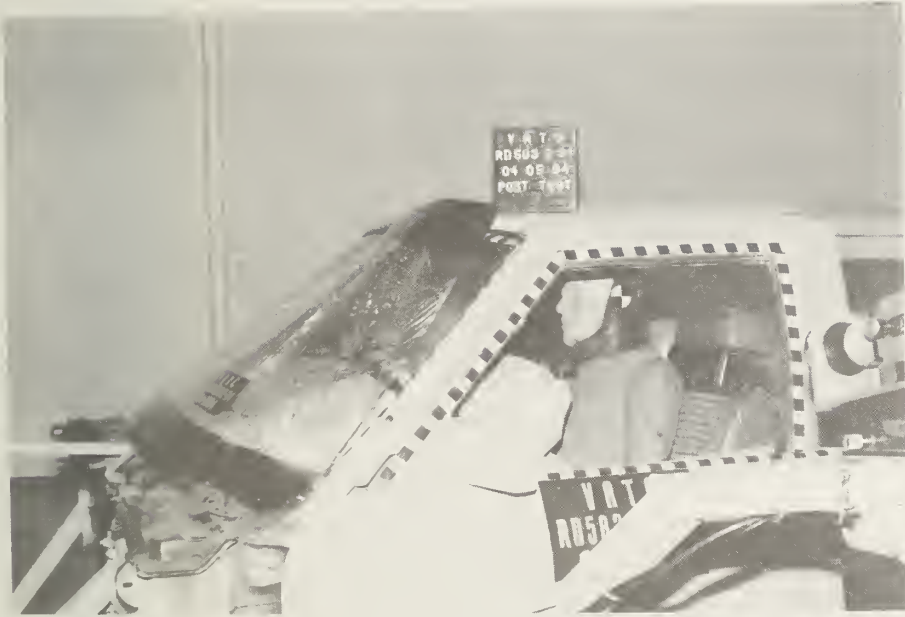
Test 31, Facial Impact
Area, Post test



Test 31, Right Knee
Impact Area, Post test



Test 31, Left Knee Impact Area
Post test



Test 31,
Windshield damage

Appendix 3

Data Charts

Explanation of terms

SPSW = Sled Position Switch Opening (Start of Movement)
SLDXGC = Sled Acceleration
SLDXVC = Integrated Sled Velocity
SLDXV = Sled Velocity
FTUXG = Floor Pan Acceleration
ABFT1 = Air Bag Firing Event
HEDXG1 = Head Acceleration, X Axis
HEDXV1 = Head Velocity, X Axis
HEDYG1 = Head Acceleration, Y Axis
HEDZG1 = Head Acceleration, Z Axis
CSTXG1 = Chest Acceleration, X Axis
CSTXV1 = Chest Velocity, X Axis
CSTYG1 = Chest Acceleration, Y Axis
CSTZG1 = Chest Acceleration, Z Axis
PEVXG1 = Pelvis Acceleration, X Axis
PEVYG1 = Pelvis Acceleration, Y Axis
PEVZG1 = Pelvis Acceleration, Z Axis
CSTXD = Chest Deflection
LFMF1 = Left Femur Load
RFMF1 = Right Femur Load
SHBF1 = Shoulder Belt Force
HEDRG1 = Head Resultant Acceleration
CSTRG1 = Chest Resultant Acceleration
PEVRG1 = Pelvis Resultant Acceleration
SCAPG2 = Steering Wheel Acceleration, Anterior-Posterior
SCAPV2 = Steering Wheel Velocity, Anterior-Posterior
SCAMG2 = Steering Wheel Acceleration, Median-Lateral
SCAIG2 = Steering Wheel Acceleration, Inferior-Superior
SCAPG1 = Lower Steering Column Acceleration, Anterior-Posterior

Since the steering column is mounted at a 15 degree angle from horizontal, the accelerometers for the steering column and the steering wheel which were mounted parallel to the steering column, are also offset 15 degrees from horizontal. Since they are not on a true X-Y-Z relationship with the other accelerometers mounted on the sled they were labeled anterior-posterior, median-lateral, and inferior-superior respectively.

	Min value	Max value	Units	Filter
1	SPSW	-1.167 @	4.250	1650/ 521B/ -40
2	SLDXGC	-0.524 @	123.625	100/ 316/ -40
3	SLDXVC	0.000 @	-30.000	100/ 316/ -40
4	SLDXV	-0.253 @	348.250	100/ 316/ -40
5	FTUXG	-1.739 @	131.250	100/ 316/ -40
6	ABFT1	-0.840 @	25.250	1650/ 521B/ -40
7	HEDXG1	-55.677 @	97.125	1650/ 5214/ -40
8	HEDXV1	-44.802 @	147.250	1650/ 5214/ -40
9	HEDYG1	-10.451 @	174.250	1650/ 5214/ -40
10	HEDZG1	-22.795 @	96.250	1650/ 5214/ -40
11	CSTXG1	-41.628 @	77.750	300/ 949/ -40
12	CSTXV1	-41.006 @	176.875	300/ 949/ -40
13	CSTYG1	-1.556 @	30.250	300/ 949/ -40
14	CSTZG1	-7.417 @	186.125	300/ 949/ -40
15	PEVXG1	-45.674 @	74.375	300/ 949/ -40
16	PEVYG1	-6.182 @	96.500	300/ 949/ -40
17	PEVZG1	-5.560 @	187.500	300/ 949/ -40
18	CSTXD	-0.003 @	161.125	300/ 949/ -40
19	LFMF1	-535.947 @	73.500	1000/ 3162/ -40
20	RFMF1	-618.353 @	77.500	1000/ 3162/ -40
21	SCAPG2	-49.634 @	32.250	100/ 316/ -40
22	SCAPV2	-22.033 @	120.000	100/ 316/ -40
23	SCAMG2	-12.214 @	59.000	100/ 316/ -40
24	SCAIG2	-58.450 @	60.125	100/ 316/ -40
25	SCAPG1	-30.648 @	61.625	100/ 316/ -40
26	HEDRG1	0.028 @	-29.250	1650/ 5214/ -40
27	CSTRG1	0.007 @	-4.875	300/ 949/ -40
28	PEVRG1	0.010 @	-24.250	300/ 949/ -40
29	SHBF1	-5.061 @	29.750	100/ 316/ -40

* * * HIC computation for TRC282I 4-APR-84 15:32:23

HEDRG1 VRTC RD583-2-30 84095 AIRBAG DEMONSTRATION PROGRAM

Using time range = 0.000 to 220.000 msec Peak accel = 87.18 @ 174.000

HIC = 457.91 Interval from 71.875 [816] to 109.875 [1120]

HIC = 333.47 Interval from 90.125 [962] to 105.125 [1082]

Elapsed time = 21.11 sec

Enter channel [stop time] -->

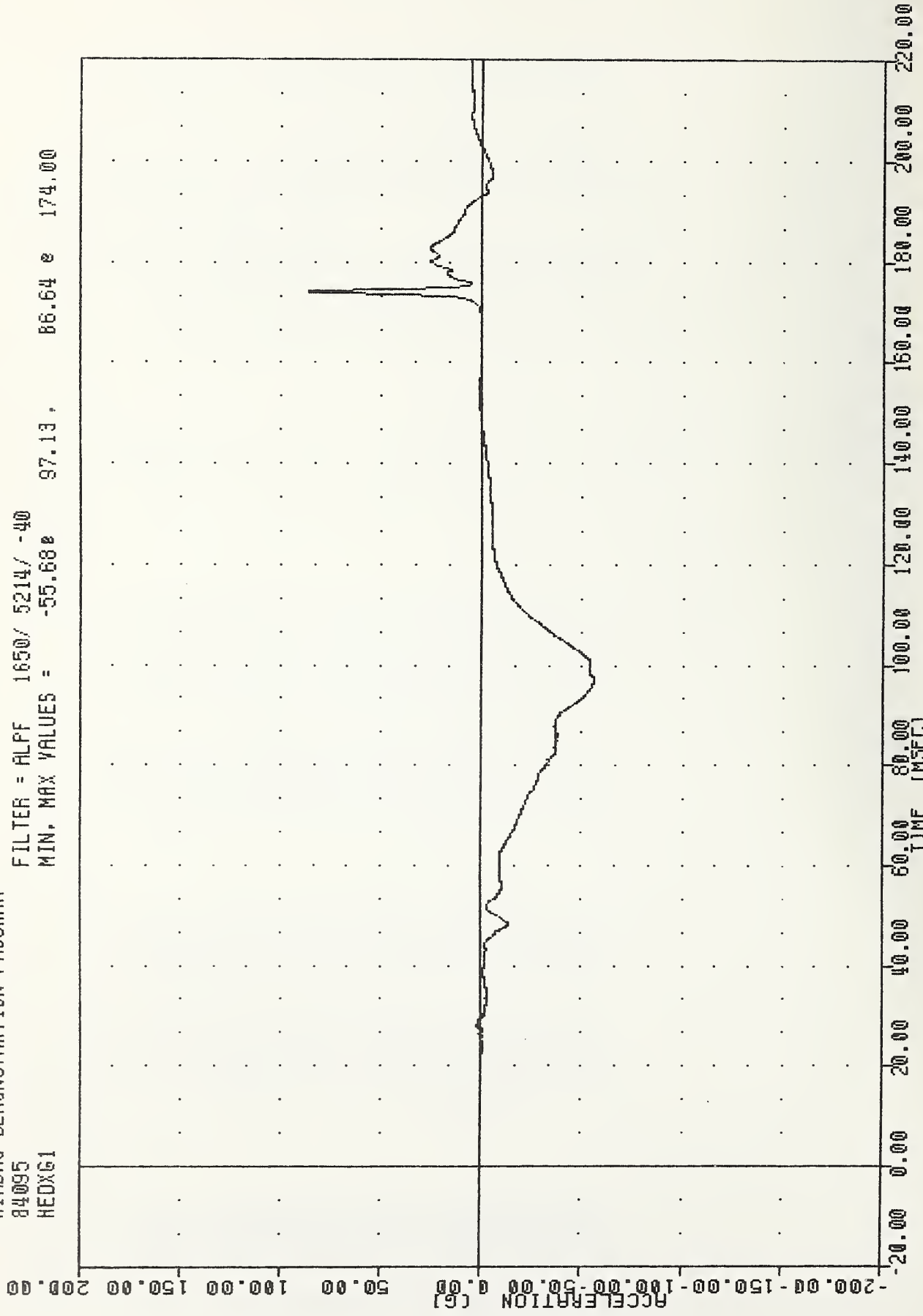
VRTC , R0583-2-30
AIRBAG DEMONSTRATION PROGRAM
84095
HEDXG1

PLOT DATE 4-APR-84 15:21:14

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86.64 e 174.00

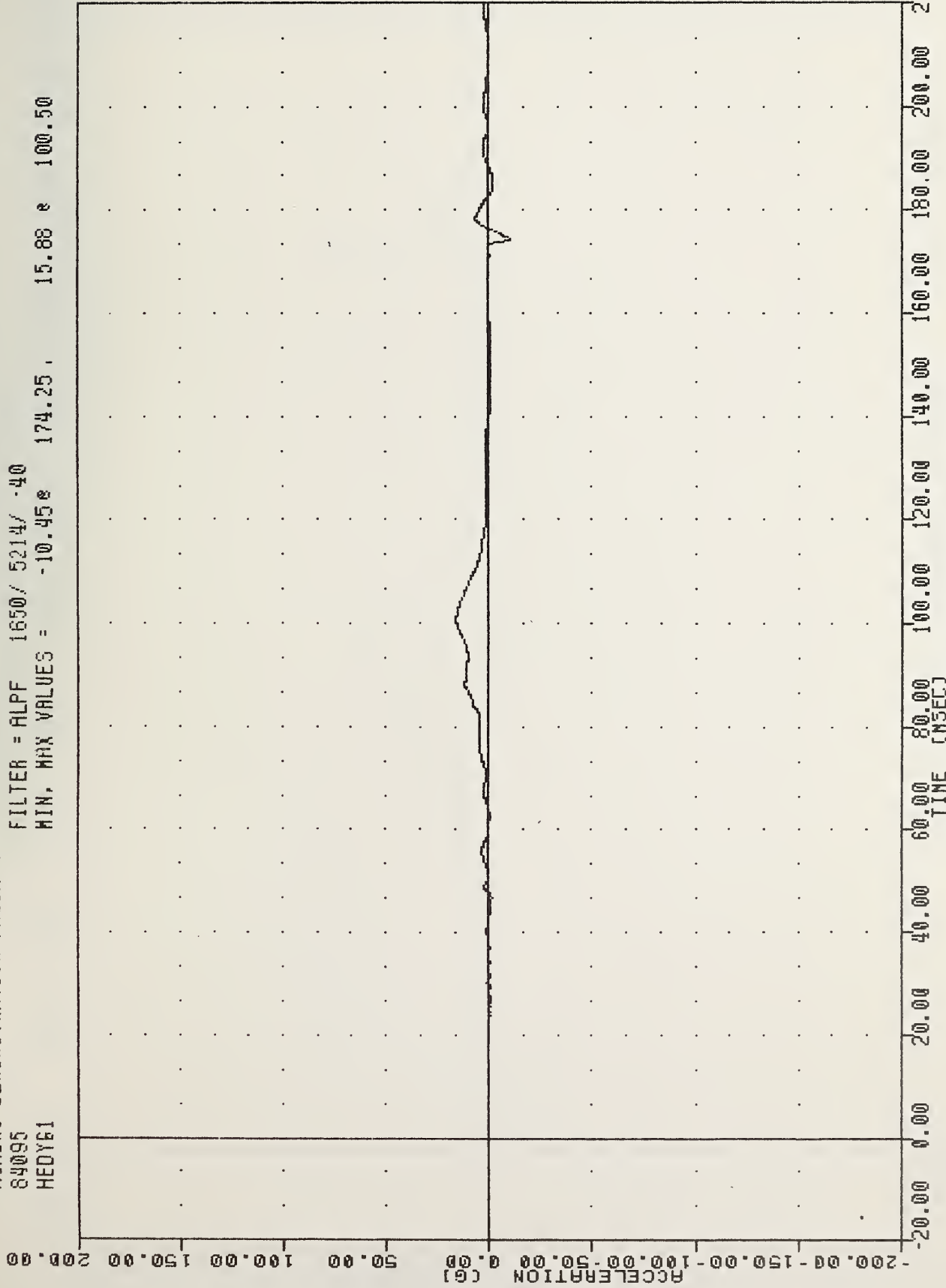


AIRBAG DEMONSTRATION PROGRAM
HEAD ACCELERATION X AXIS 50TH PERCENTILE

VATC
AIRBAG DEMONSTRATION PROGRAM
84095
HEDY61

PLUT DATE 4-APR-84 15:21:14

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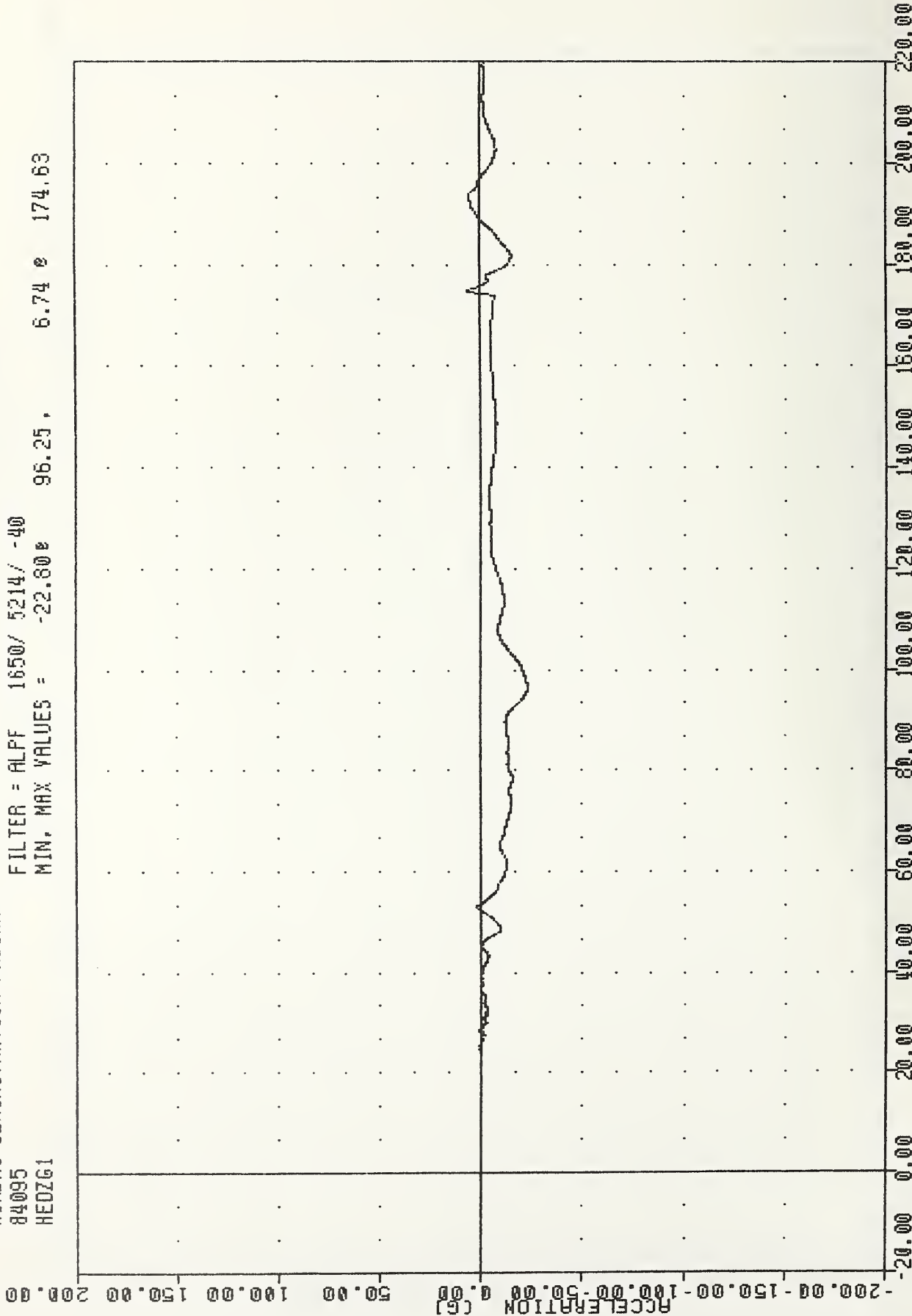


AIRBAG DEMONSTRATION PROGRAM
HEAD ACCELERATION Y AXIS 50TH PERCENTILE

VRTC , R0583-2-30
AIRBAG DEMONSTRATION PROGRAM
84095
HEDZG1

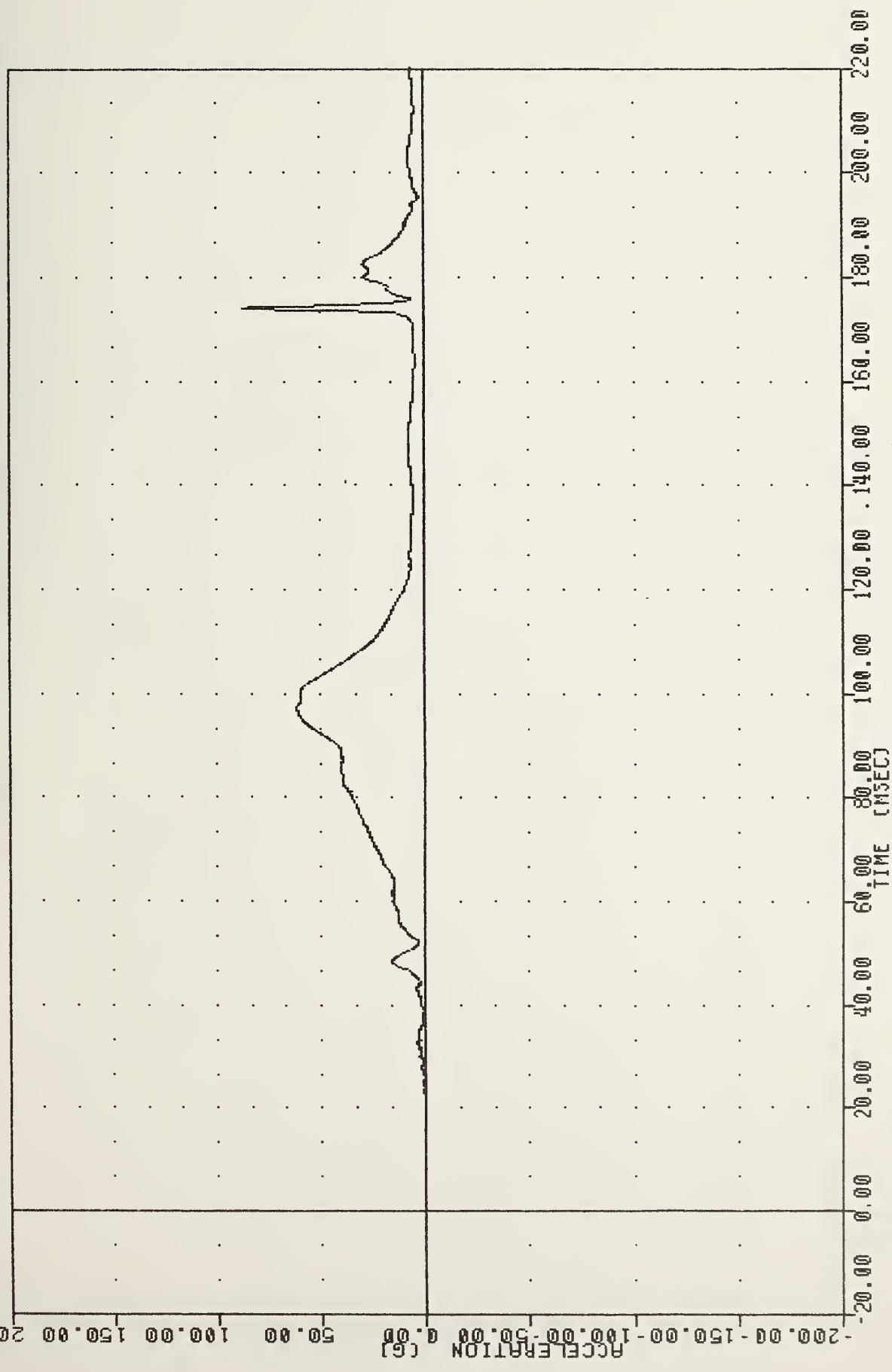
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AIRBAG DEMONSTRATION PROGRAM
HEAD ACCELERATION Z AXIS 50TH PERCENTILE

VRTC , RD583-2-30 PLOT DATE 4-APR-84 15:21:14
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 HEADRG1



AIRBAG DEMONSTRATION PROGRAM
 HEAD RESULTANT ACCELERATION 50TH PERCENTILE

VRTC , RD583-2-30
AIRBAG DEMONSTRATION PROGRAM
84095
HEADXVI

PLOT DATE 4-APR-84 15:21:14

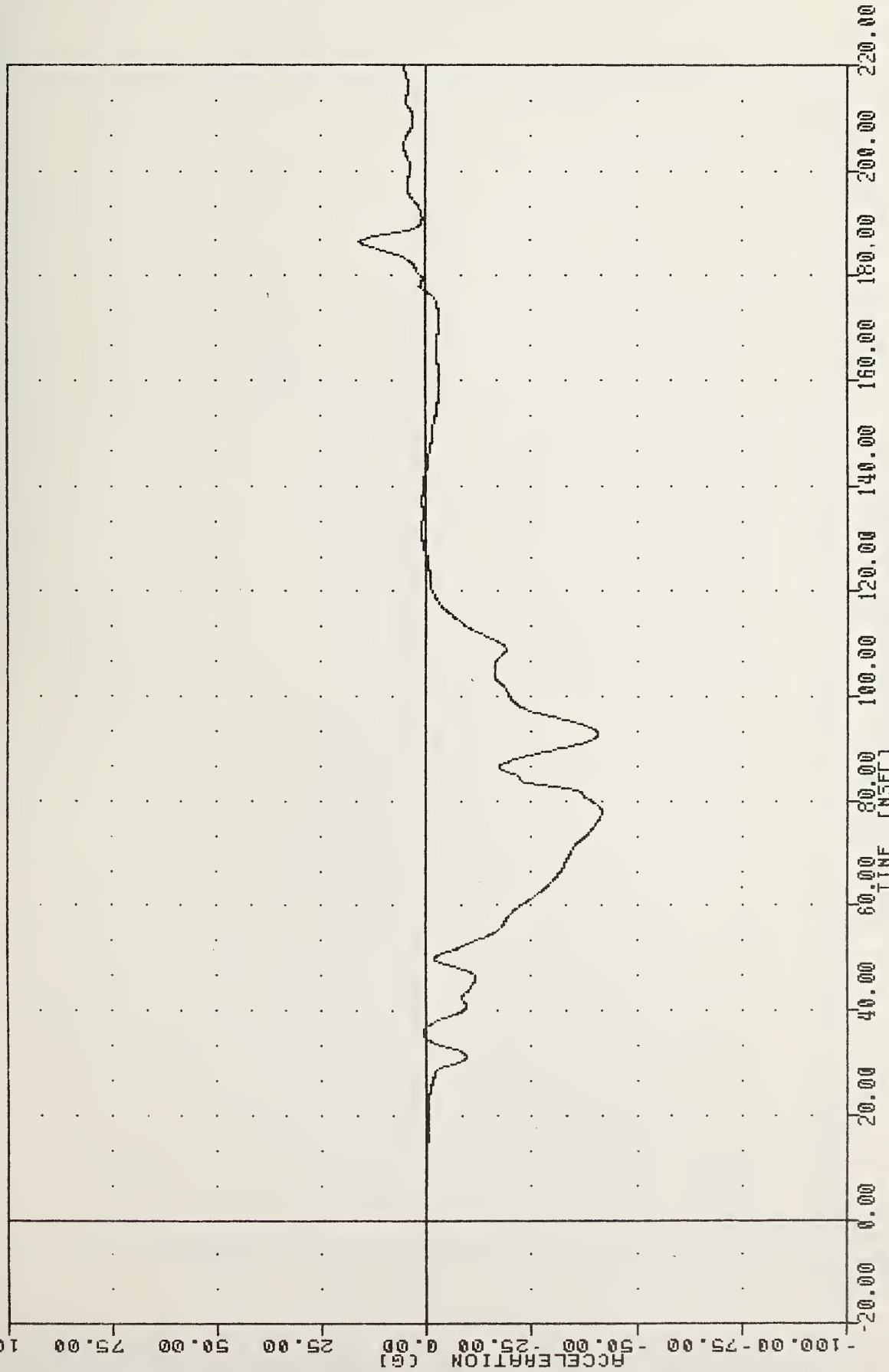
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AIRBAG DEMONSTRATION PROGRAM
HEAD VELOCITY X AXIS 50TH PERCENTILE

VBTC , RD583-2-30 PLOT DATE 4-APR-84 15:21:14
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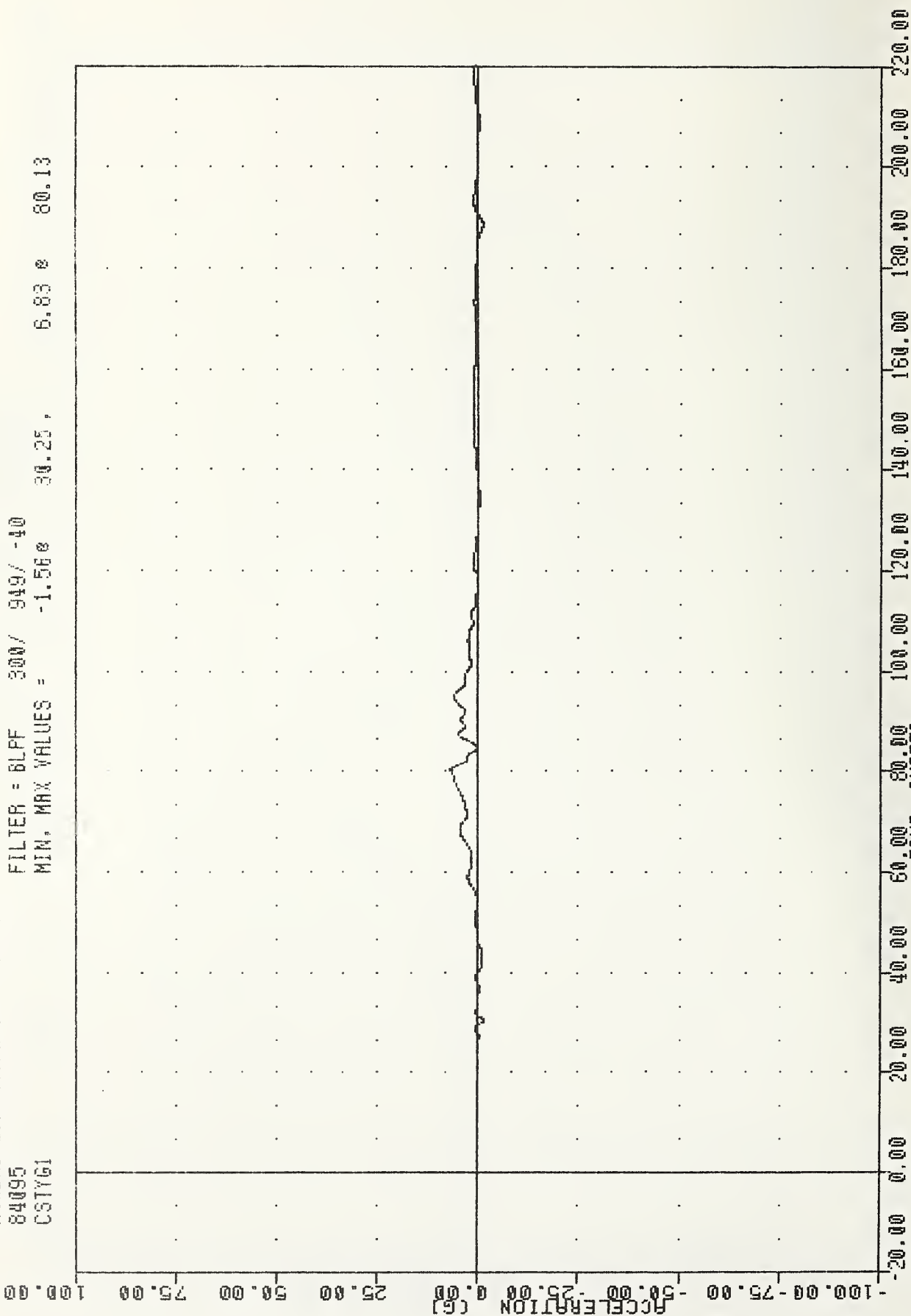


AIRBAG DEMONSTRATION PROGRAM
 CHEST ACCELERATION X AXIS 50TH PERCENTILE

VRIC , RD583-2-30
AIRBAG DEMONSTRATION PROGRAM
84095
CSTYGI

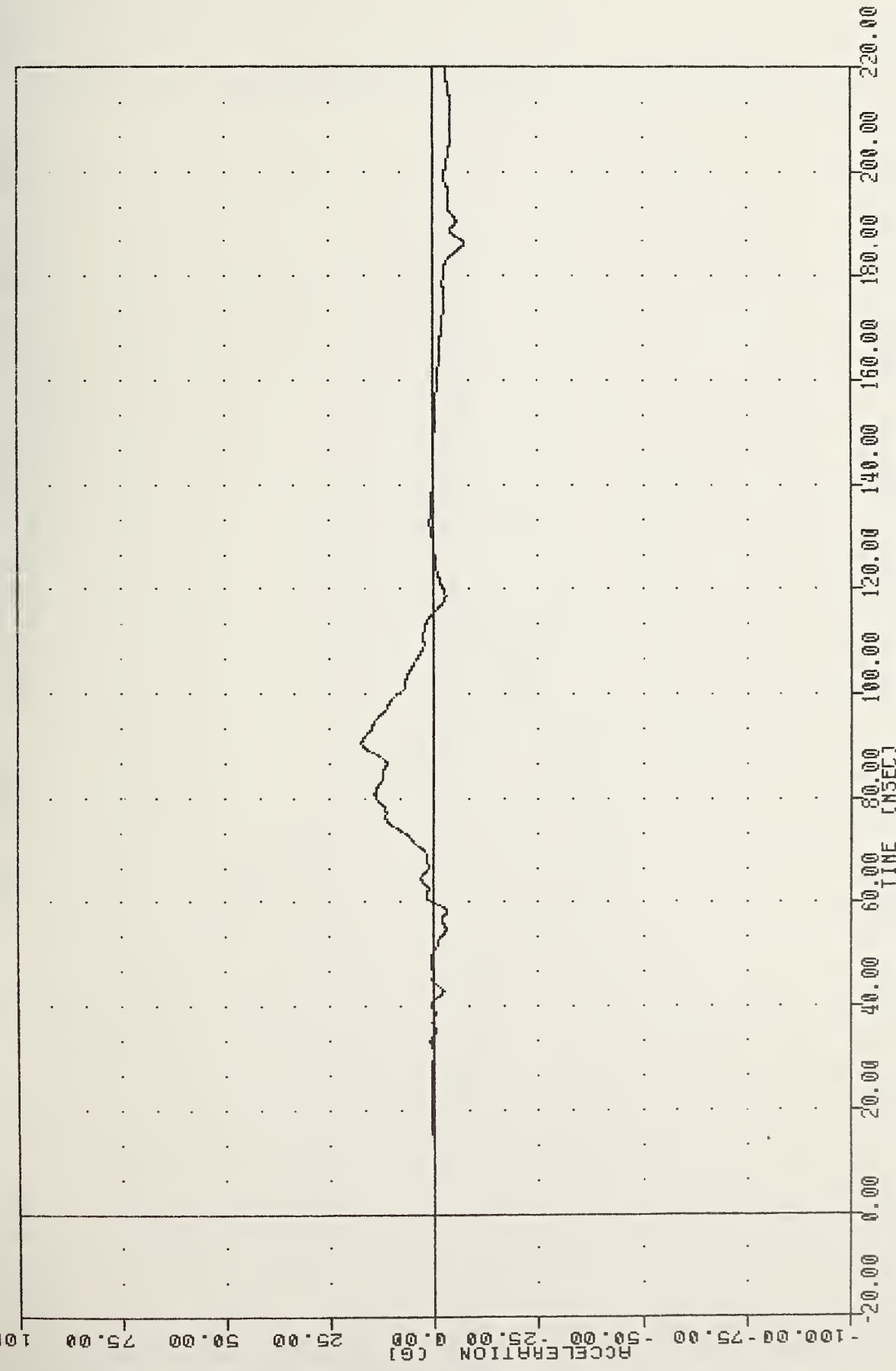
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AIRBAG DEMONSTRATION PROGRAM
CHEST ACCELERATION Y AXIS 50TH PERCENTILE

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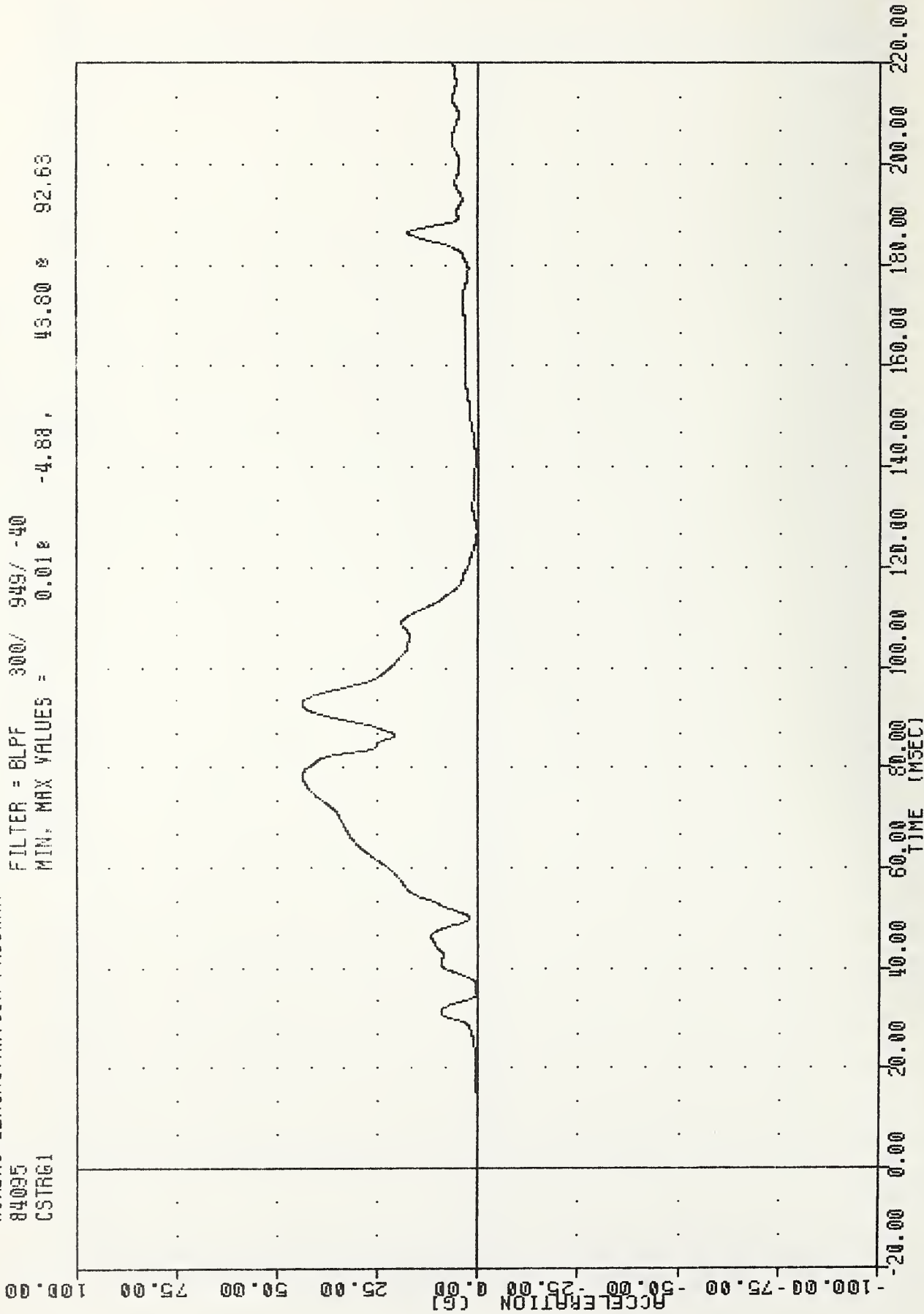
AIRBAG DEMONSTRATION PROGRAM
 CHEST ACCELERATION Z AXIS 50TH PERCENTILE

VRTC , R0583-2-30
AIRBAG DEMONSTRATION PROGRAM
84095
CSTRG1

PLOT DATE 4-APR-84 15:21:14

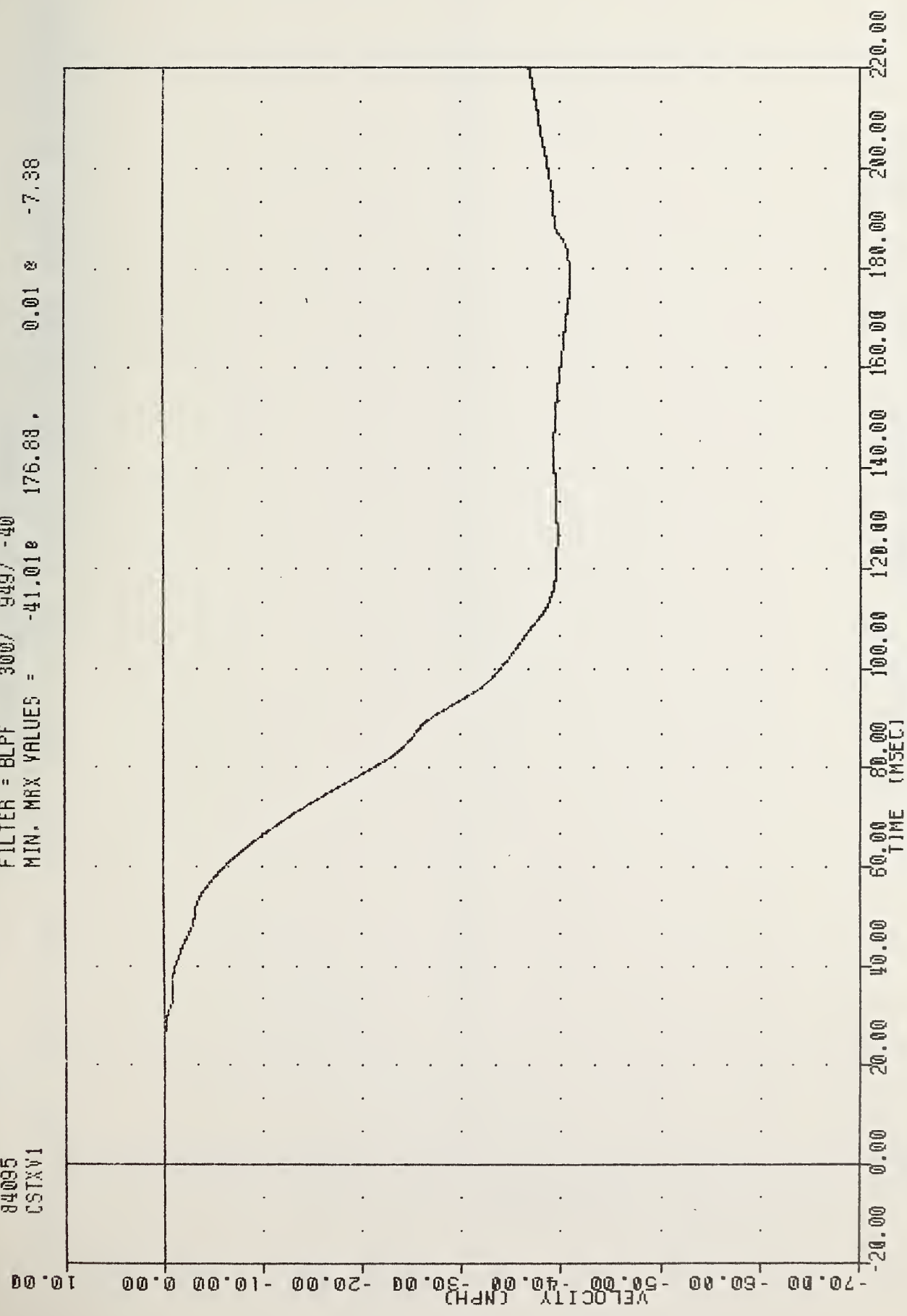
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AIRBAG DEMONSTRATION PROGRAM
CHEST RESULTANT ACCELERATION 50TH PERCENTILE

VRTC , R0583-2-30 PLOT DATE 4-APR-84 15:21:14
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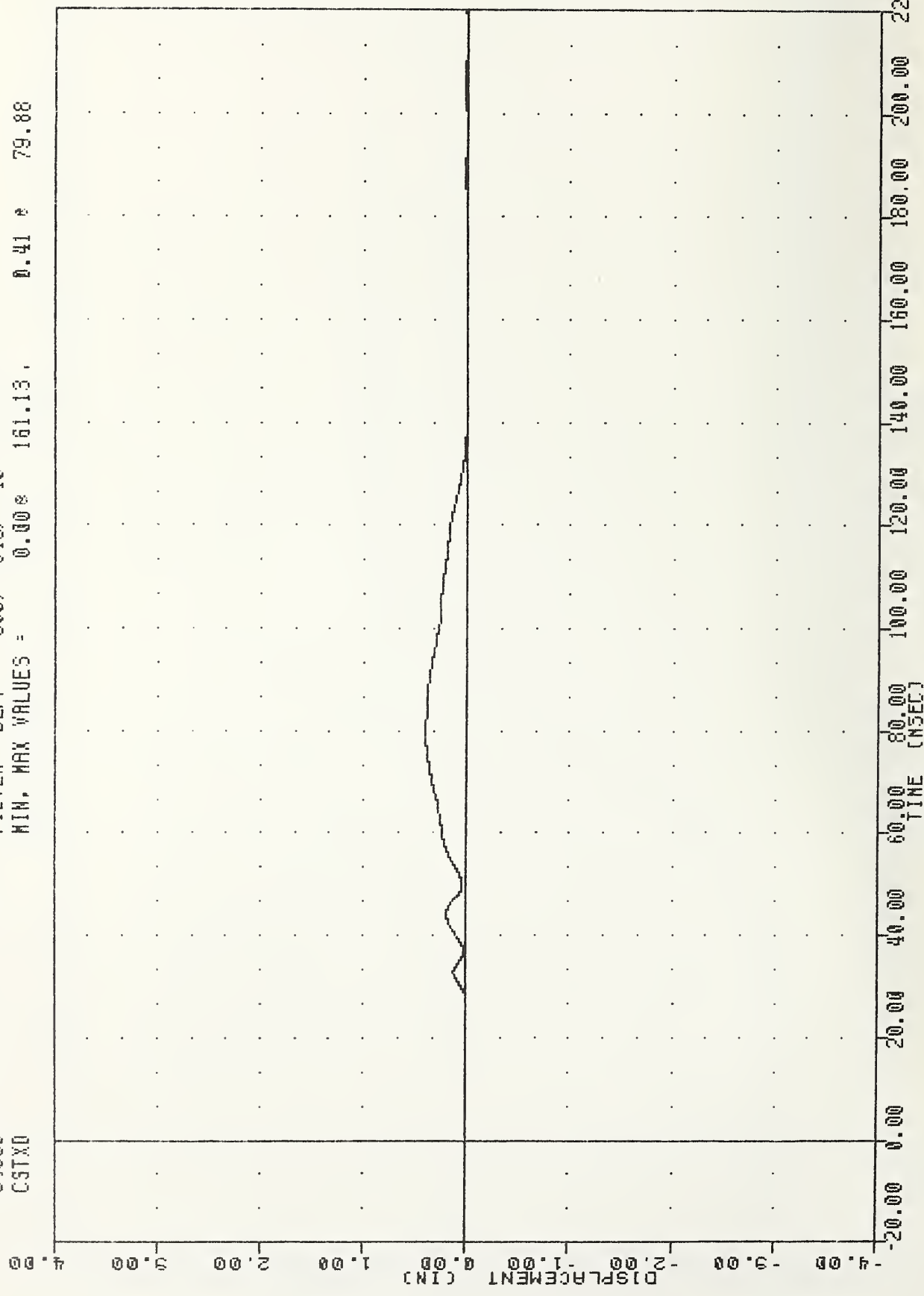
AIRBAG DEMONSTRATION PROGRAM
 CHEST VELOCITY X AXIS 50TH PERCENTILE

VRTC RD583-2-30
AIRBAG DEMONSTRATION PROGRAM
84095
CSTXD

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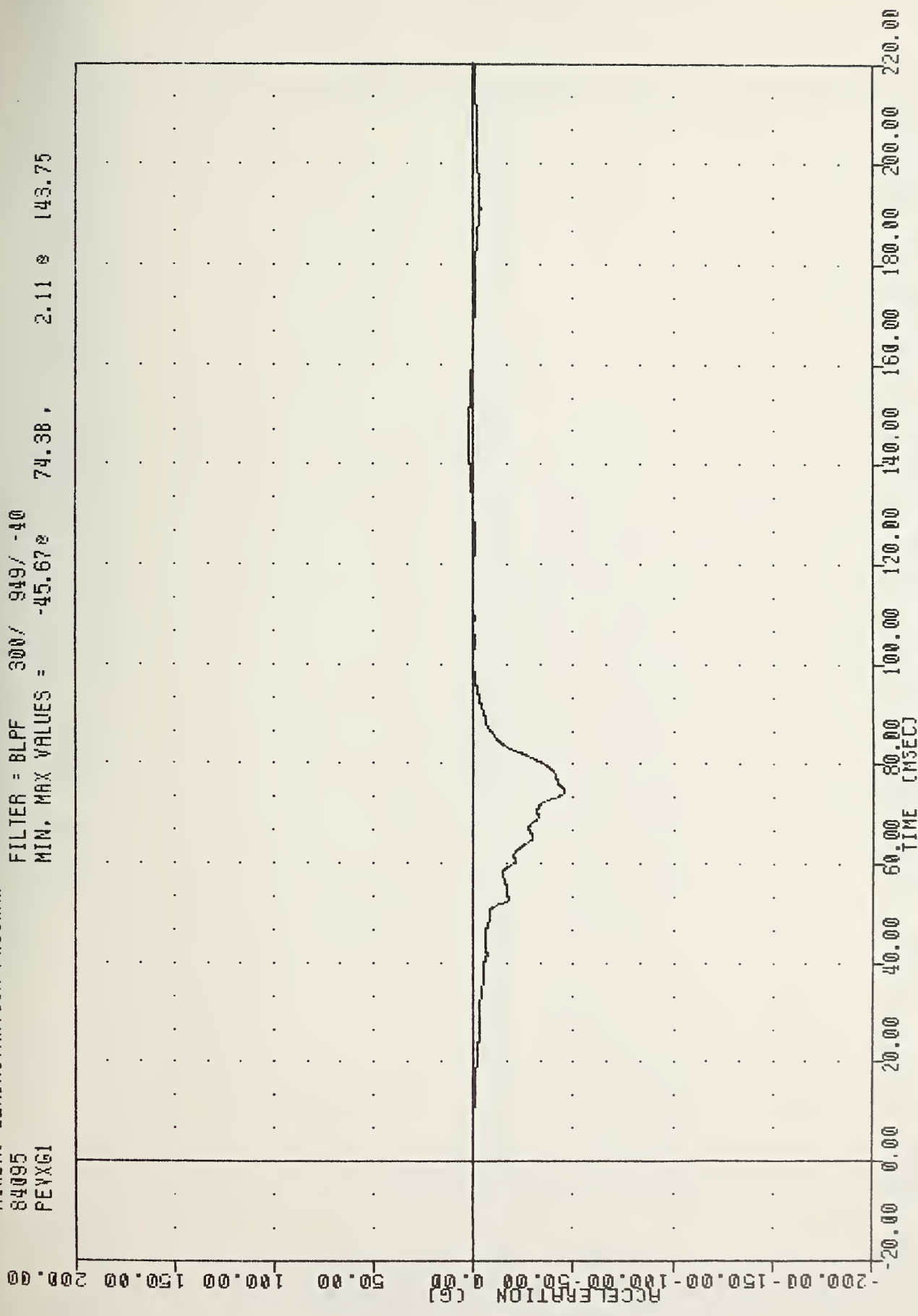
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AIRBAG DEMONSTRATION PROGRAM
CHEST DISPLACEMENT 50TH PERCENTILE

Unit 585 - 30
 AIRBAG DEMONSTRATION PROGRAM
 84095
 PEYXG1

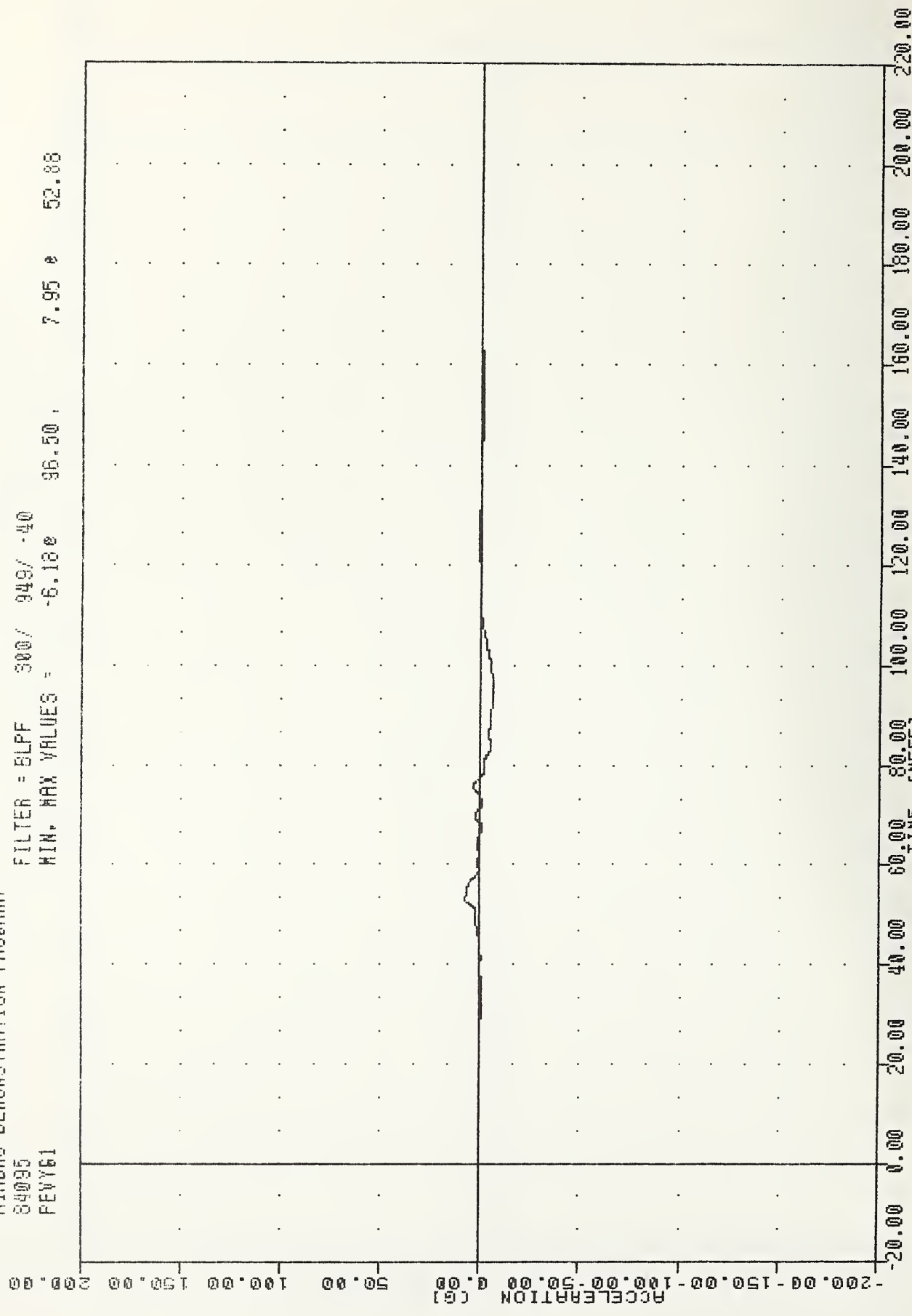
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AIRBAG DEMONSTRATION PROGRAM
 PELVIS ACCELERATION X AXIS 50TH PERCENTILE

Unit: .00583 z 30
 AIRBAG DEMONSTRATION PROGRAM
 84095
 PEVY61

Plot Date: 4-nov-84 10:41:14
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AIRBAG DEMONSTRATION PROGRAM
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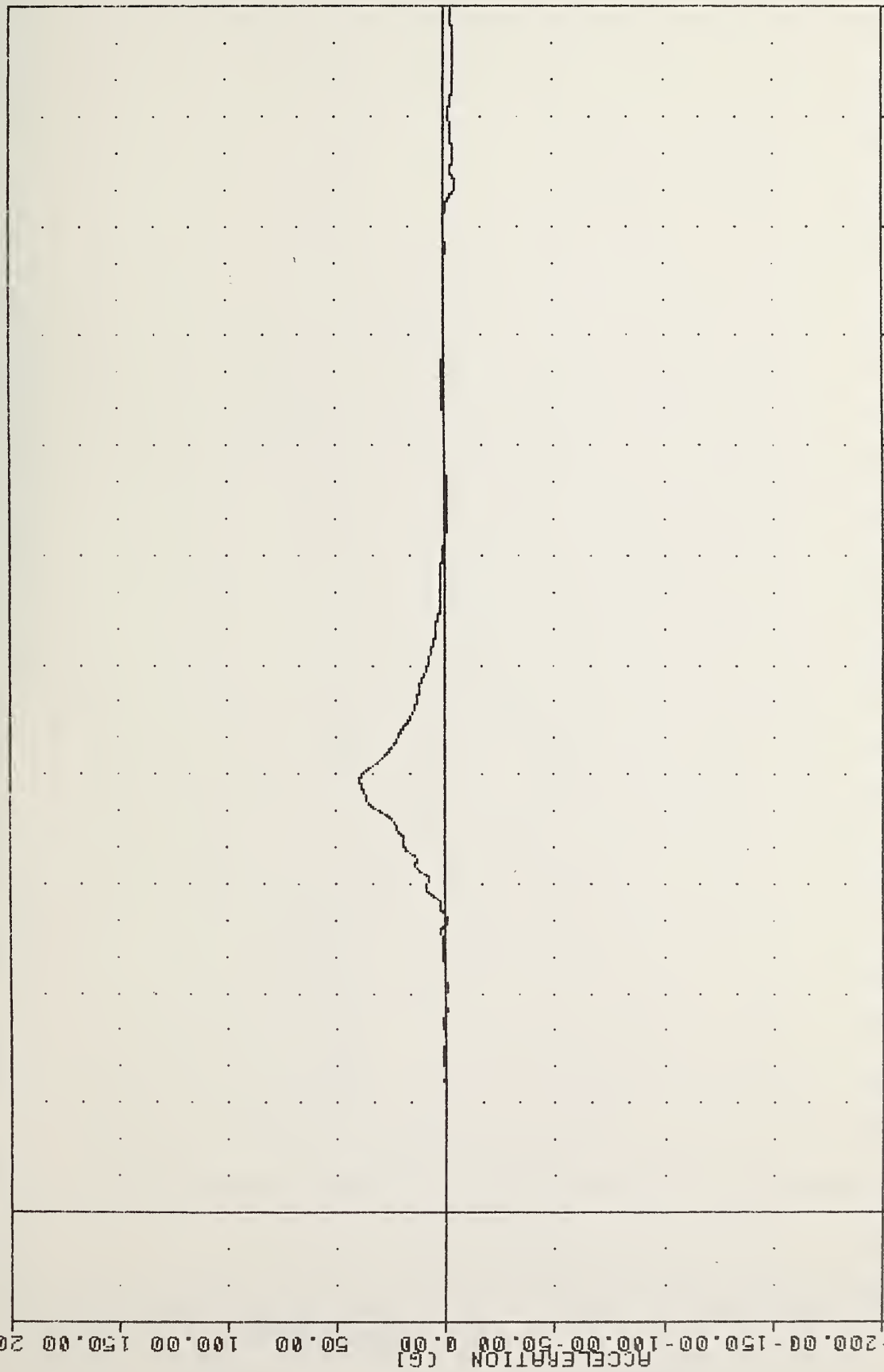
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84095
PEVZG1

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ACCELERATION (G)



200.00
150.00
100.00
50.00
0.00
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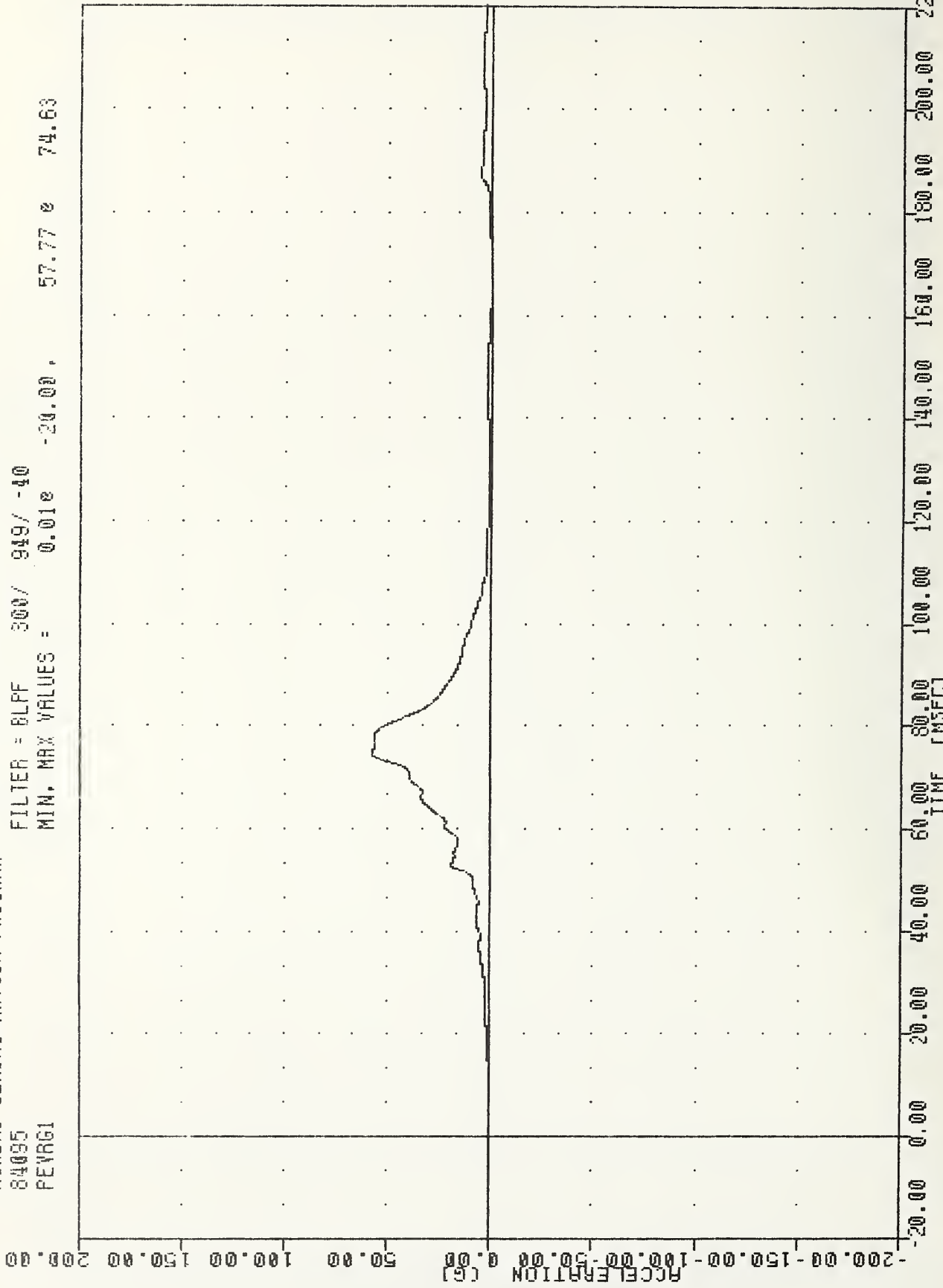
AIRBAG DEMONSTRATION PROGRAM
PELVIS ACCELERATION Z AXIS 50TH PERCENTILE

Unit no585 2.30
AIRBAG DEMONSTRATION PROGRAM
84095
PEVRG1

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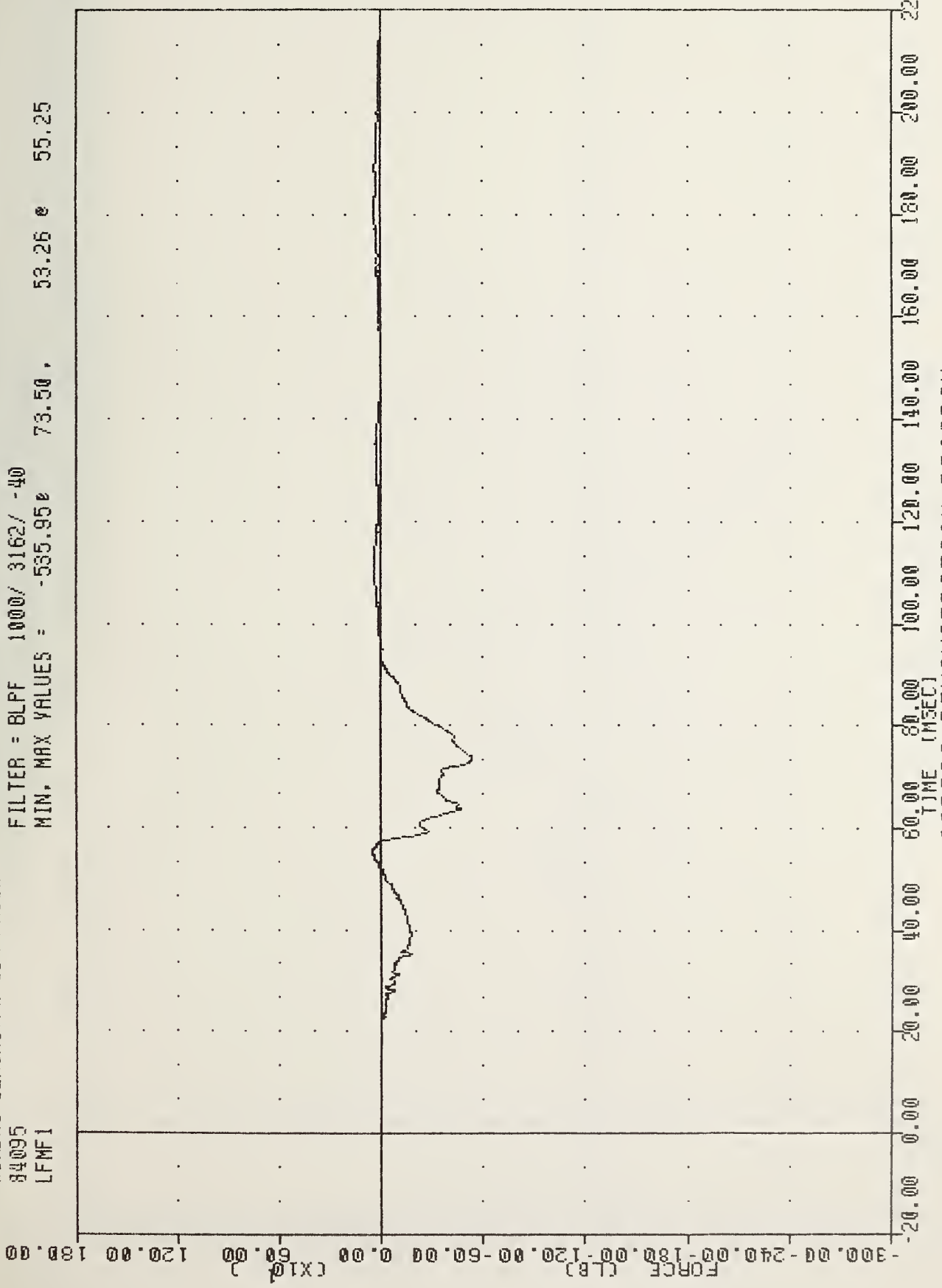


AIRBAG DEMONSTRATION PROGRAM
PELVIS RESULTANT ACCELERATION 50TH PERCENTILE

VOLIC 84095 LFMF1
 AIRBAG DEMONSTRATION PROGRAM

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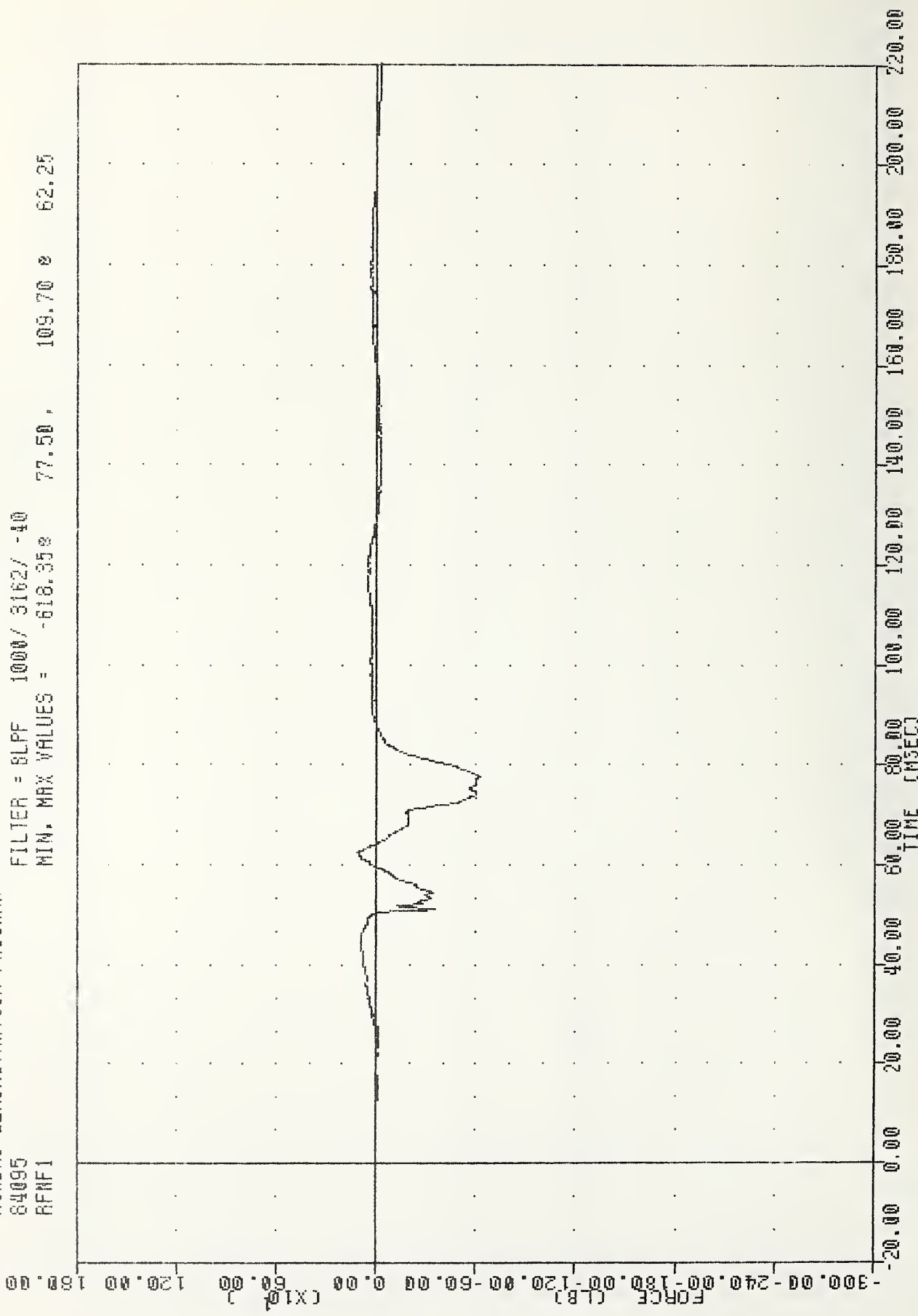
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AIRBAG DEMONSTRATION PROGRAM
 LEFT FEMUR FORCE IN LBS 50TH PERCENTILE

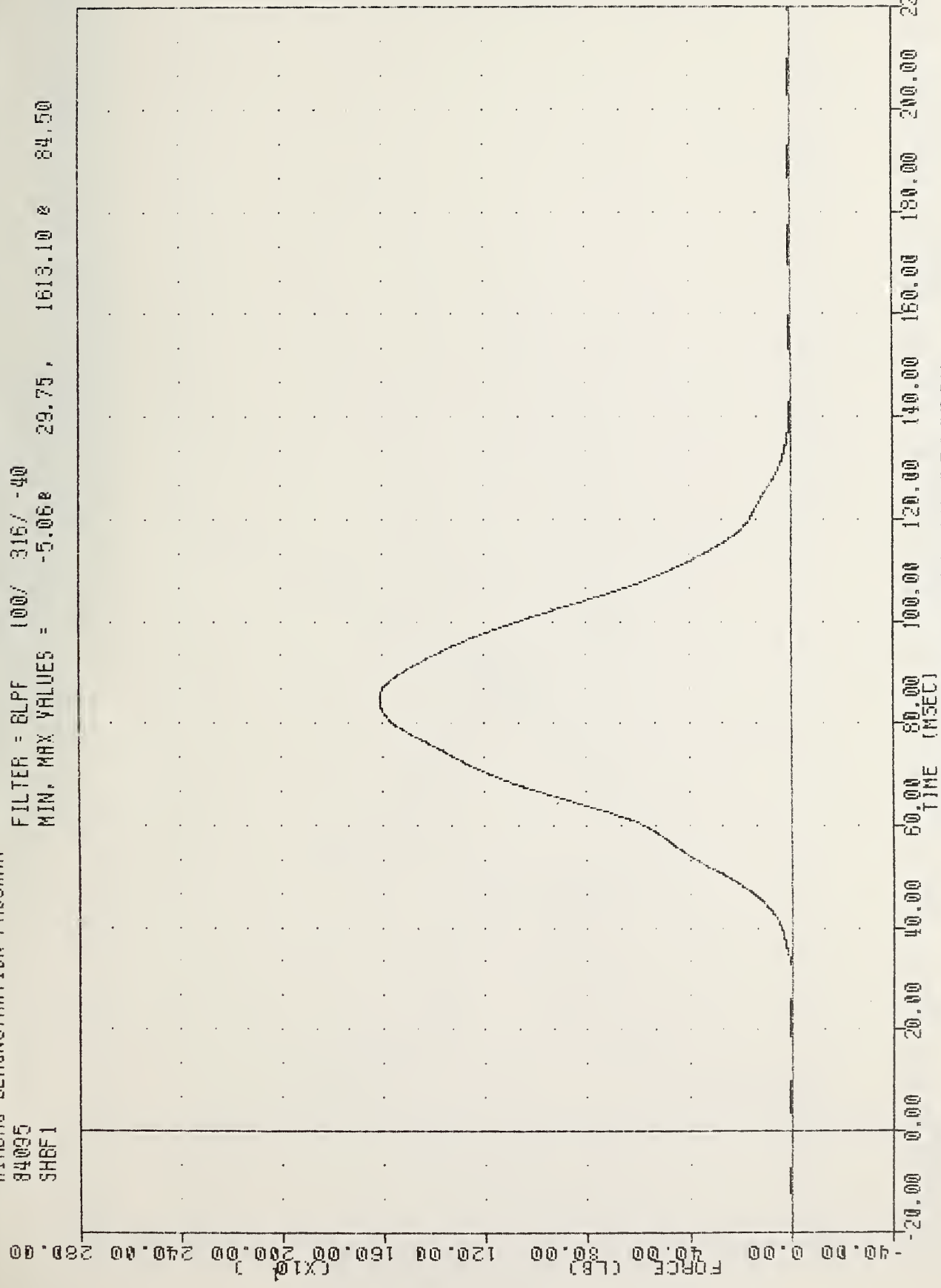
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AIRBAG DEMONSTRATION PROGRAM
64095
AFNF1

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AIRBAG DEMONSTRATION PROGRAM
RIGHT FEMUR FORCE IN LBS 50TH PERCENTILE

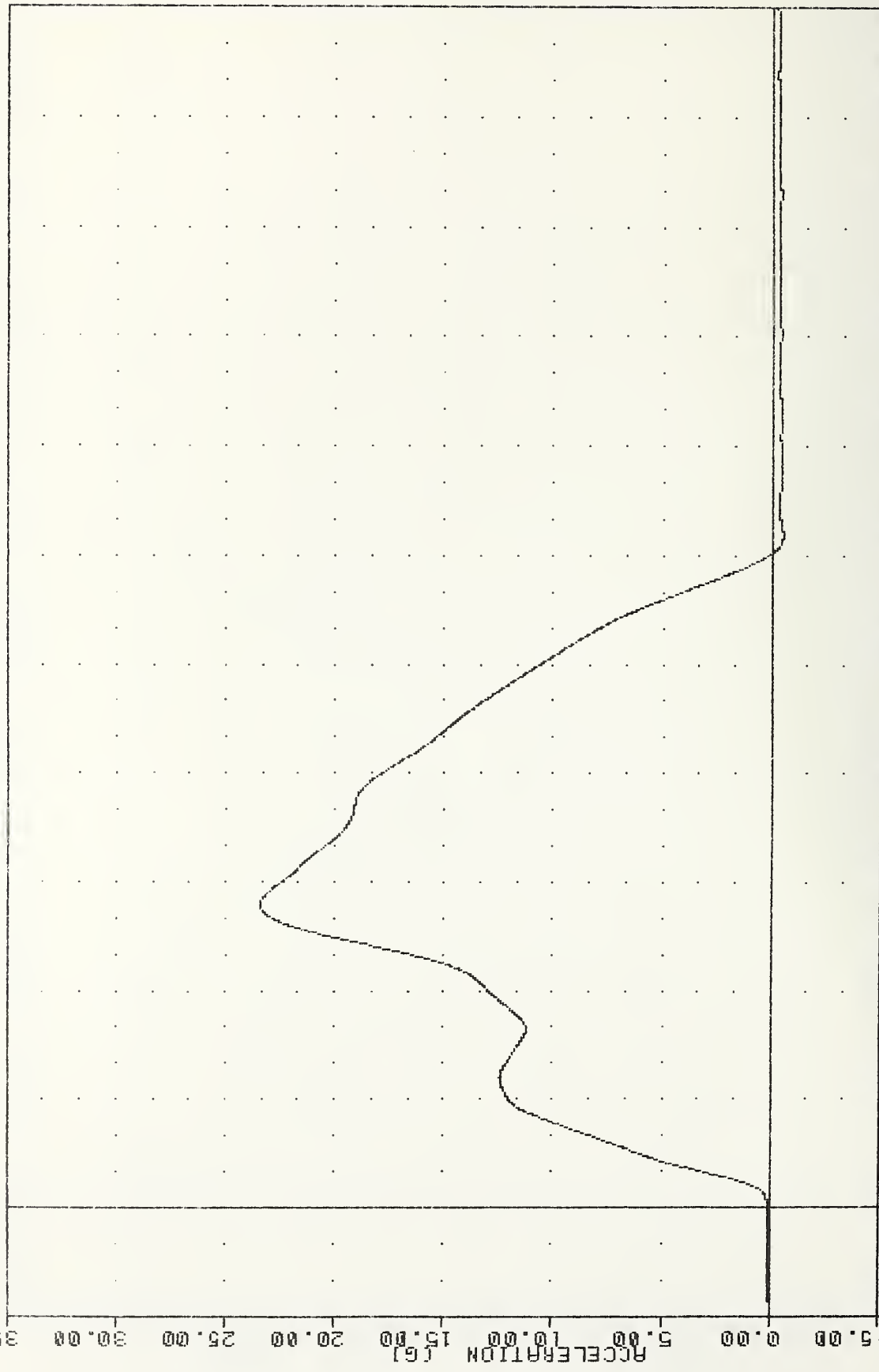
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AIRBAG DEMONSTRATION PROGRAM
 SHOULDER BELT FORCE 50TH PERCENTILE

84095
 SLOX6C
 AIRBAG DEMONSTRATION PROGRAM
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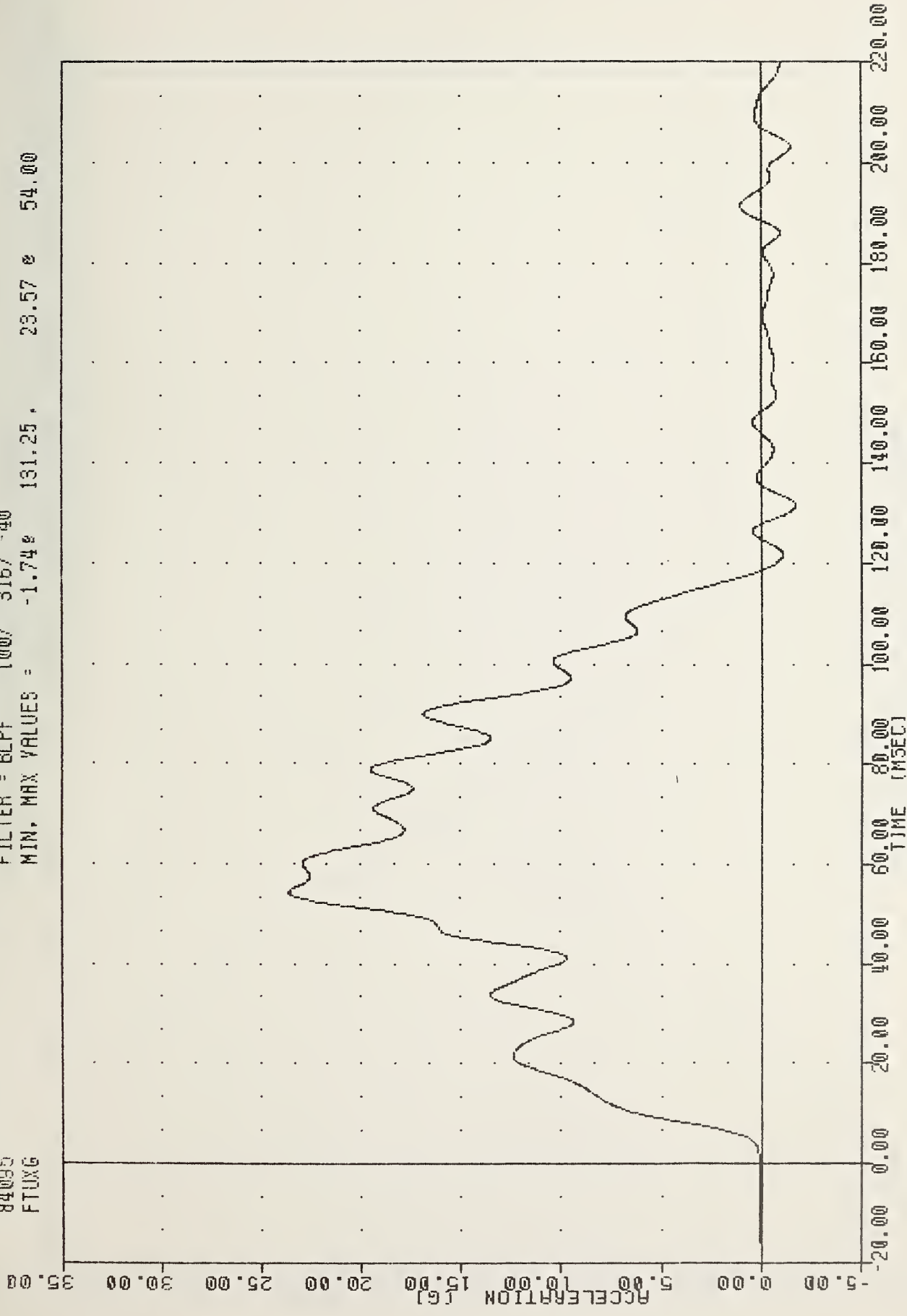
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 TIME (MSEC)

AIRBAG DEMONSTRATION PROGRAM
 SLED ACCELERATION

Unit 84095
AIRBAG DEMONSTRATION PROGRAM
FTUXG

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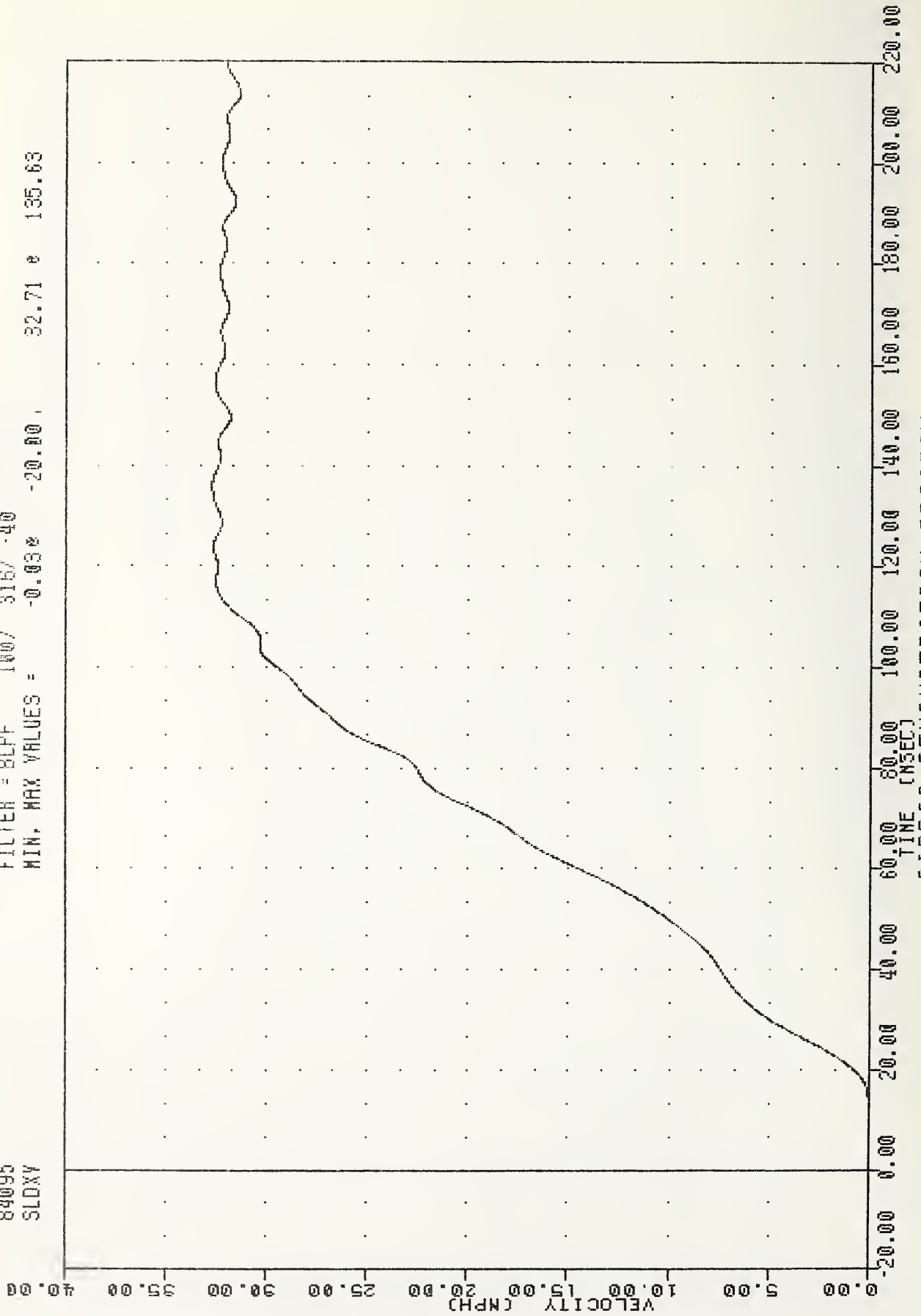
AIRBAG DEMONSTRATION PROGRAM
FLOOR PAN TUNNEL ACCELERATION

Unit : nu588-2-30
AIRBAG DEMONSTRATION PROGRAM
84095
SLDXV

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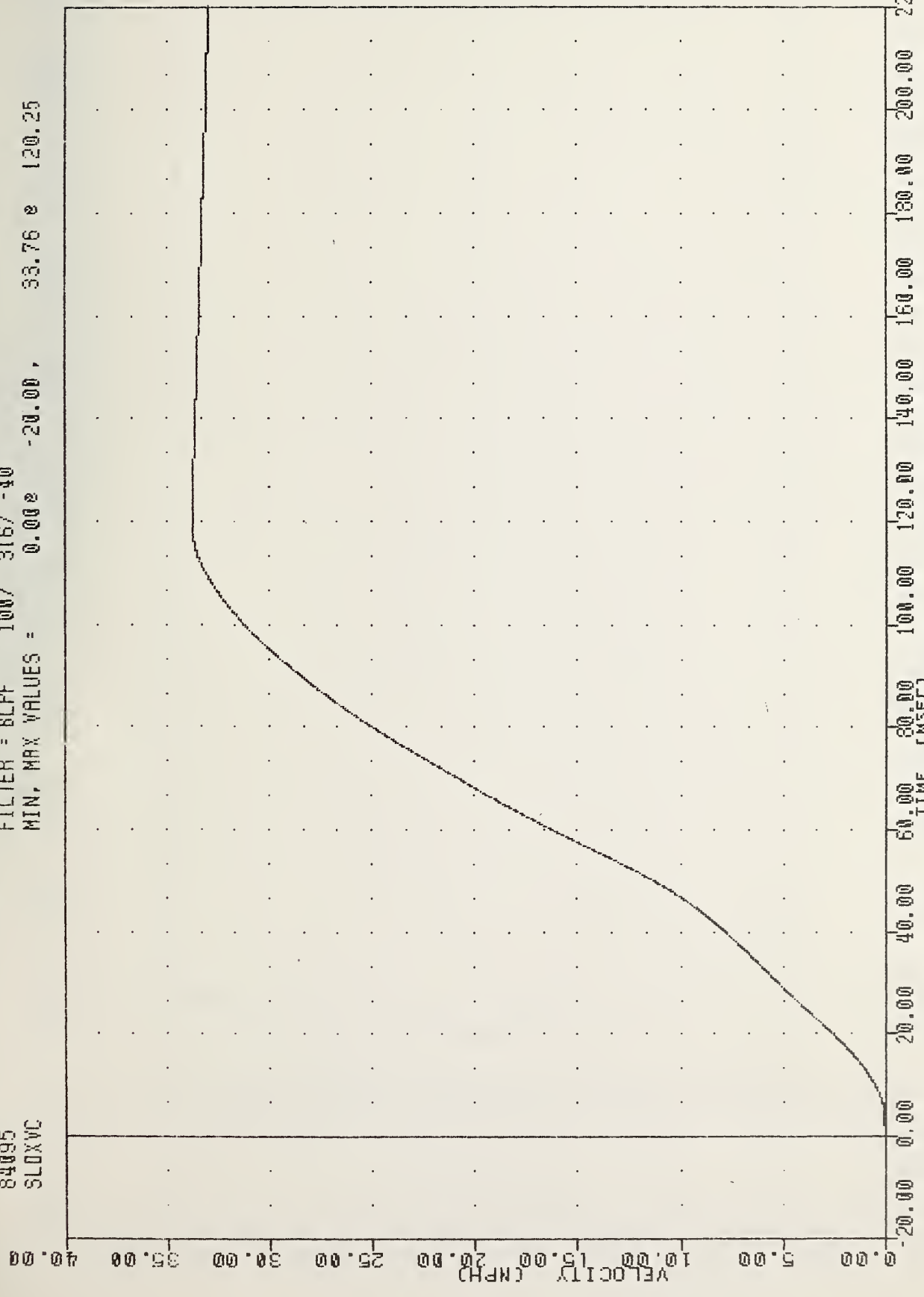
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AIRBAG DEMONSTRATION PROGRAM
SLED VELOCITY

PLUI DR1c 4-HPR-84 10:21:14
FILTER = 8LFF 100/ 316/ -40
MIN, MAX VALUES = 0.00e -20.00, 33.76 e 120.25

NOIC , n0585-2-30
AIRBAG DEMONSTRATION PROGRAM
84095
SLOXVC



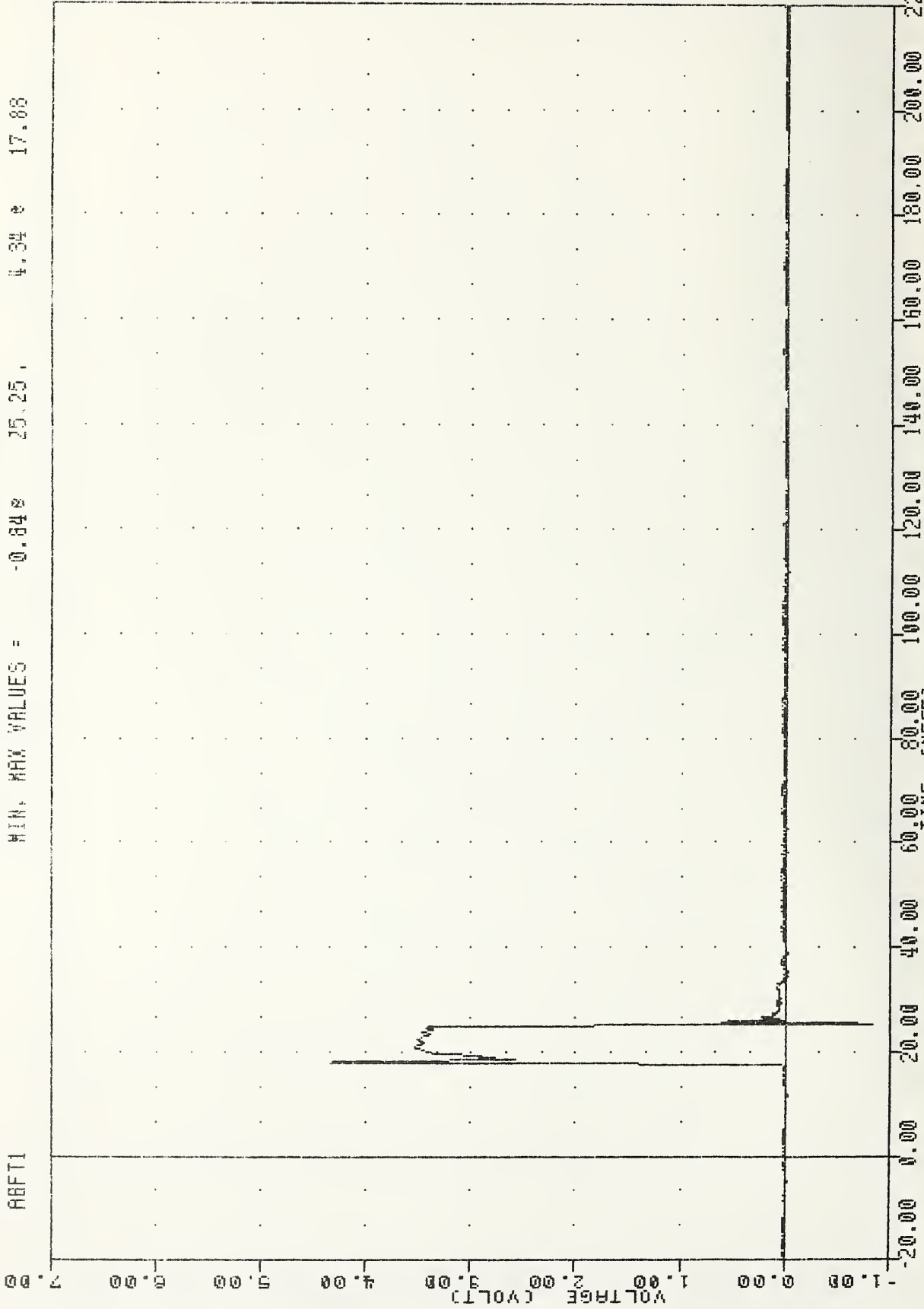
AIRBAG DEMONSTRATION PROGRAM
INTEGRATED SLED VELOCITY

WHILE RUS63-2-30
AIRBAG DEMONSTRATION PROGRAM
84095
ABFT1

TEST DATE 4-MAR-84 15:21:14

FILTER = BLPF 1650/ 5216/ -40

MIN, MAX VALUES = -0.84e 25.25, 4.34 e 17.68



AIRBAG DEMONSTRATION PROGRAM
AIR BAG FIRING EVENT 50TH PERCENTILE

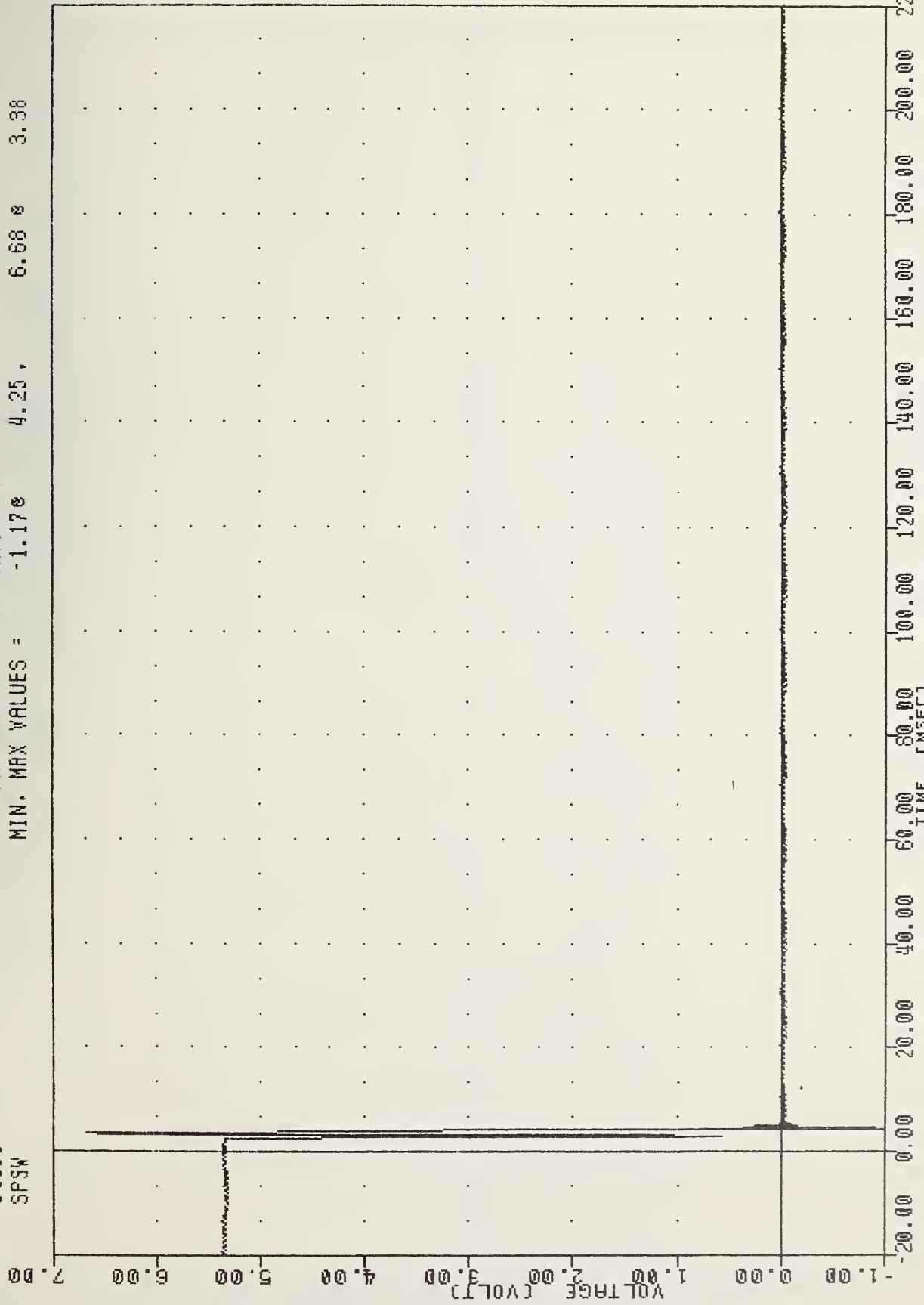
PLU1 DATE 4-MFR-84 15:21:14

VH10 , NU583-2-30
AIRBAG DEMONSTRATION PROGRAM

FILTER = 8LPF 1650/ 5218/ -40

MIN. MAX VALUES = -1.17e 4.25, 6.68 e 3.38

SPSW



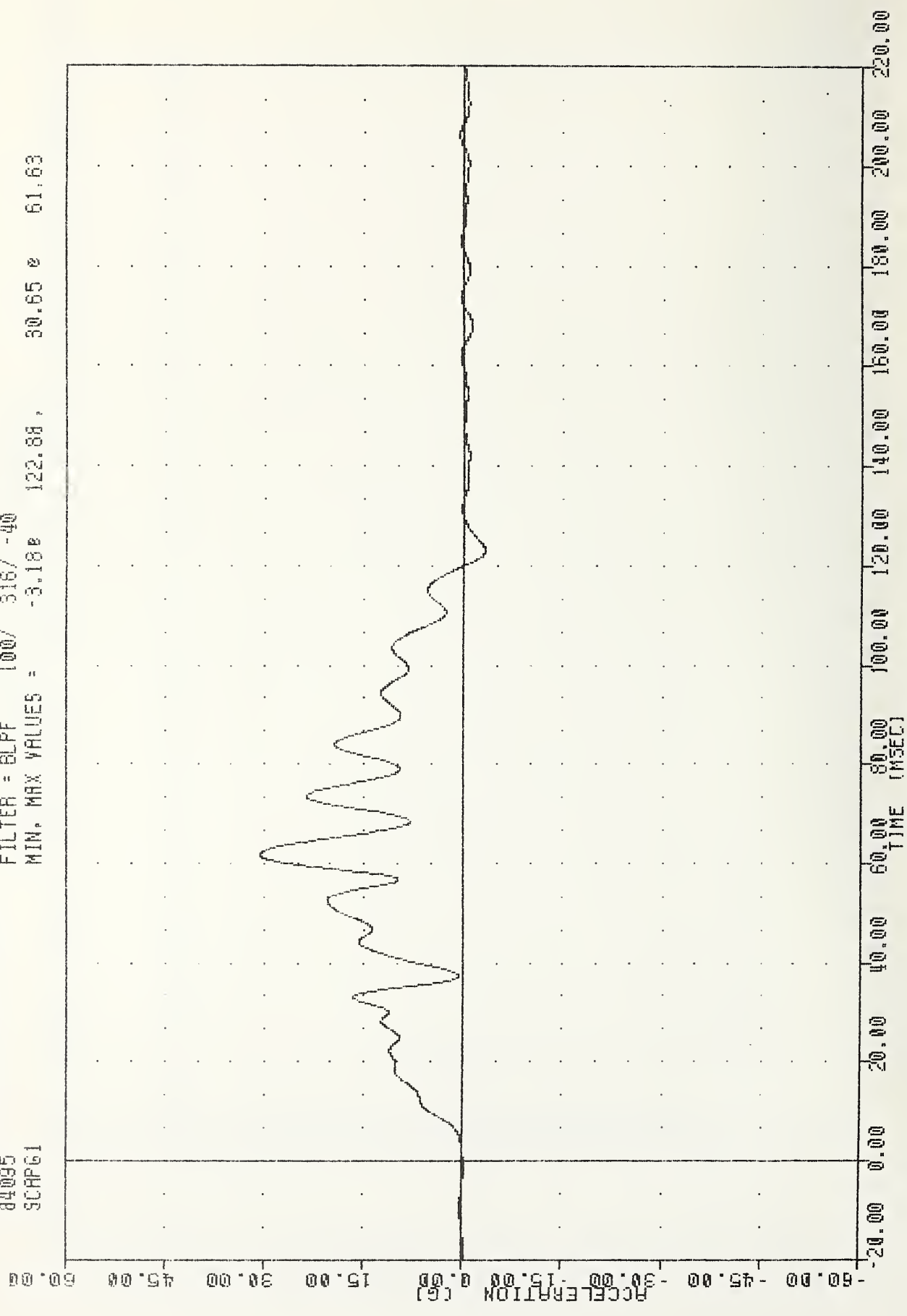
TIME (MSEC)	VOLTAGE (VOLTS)
60.00	0.00
80.00	0.00
100.00	0.00
120.00	0.00
140.00	0.00
150.00	0.00
160.00	0.00
180.00	0.00
200.00	0.00
220.00	0.00

AIRBAG DEMONSTRATION PROGRAM
SLED POSITION SWITCH

VRTC
AIRBAG DEMONSTRATION PROGRAM
84095
SCAPG1

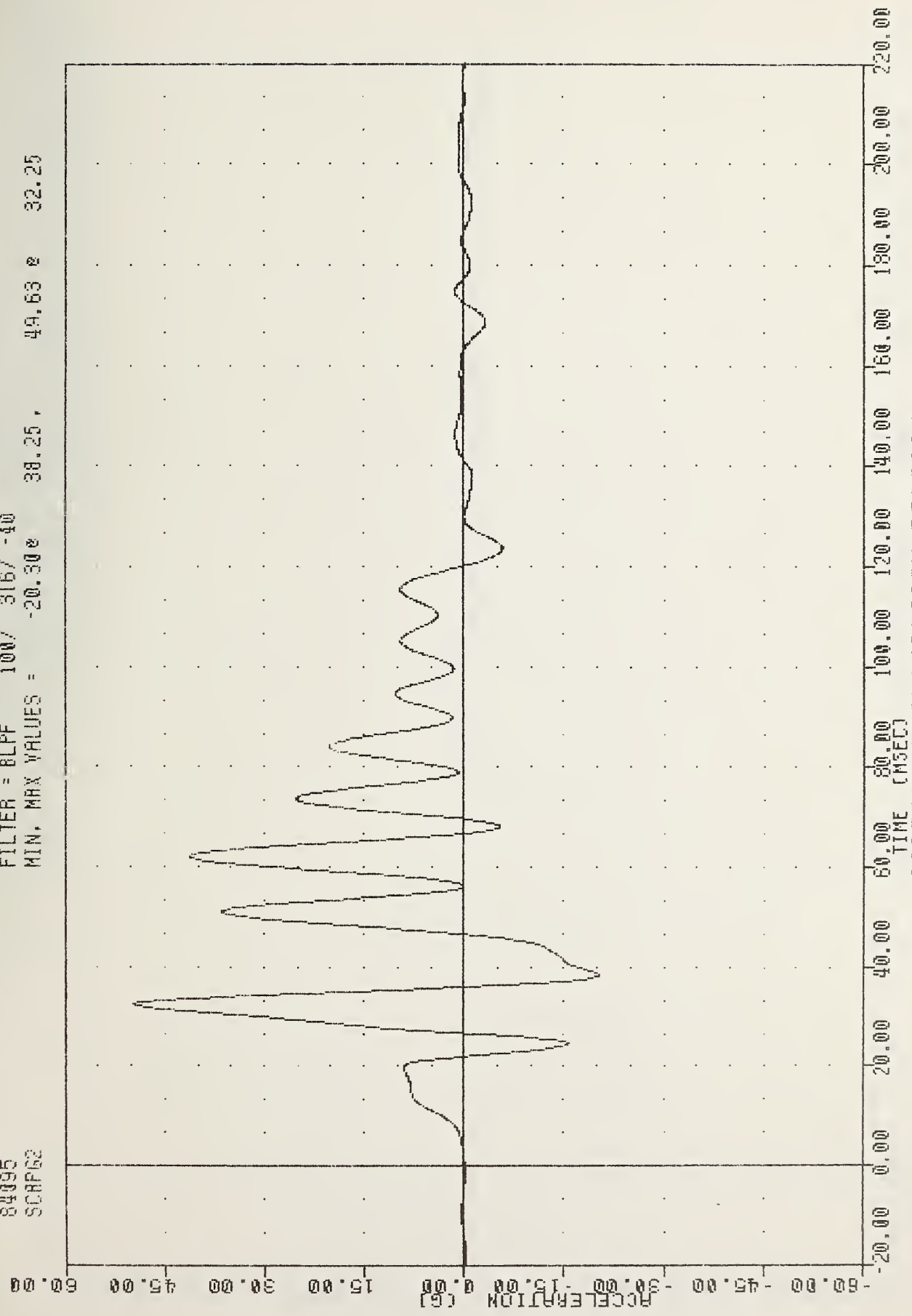
PLOT DATE 5-APR-84 15:51:29

FILTER = BLPF 100/ 516/ -40
MIN. MAX VALUES = -3.18e 30.65 e 61.63



AIRBAG DEMONSTRATION PROGRAM
STEERING COLUMN ACCELERATION AP AXIS LOWER

VATIC , RD583-2-30 PLOT DATE 5-APR-84 15:51:29
 AIRBAG DEMONSTRATION PROGRAM
 84095 FILTER = BLPF 100/ 316/ -40
 SCAP62 MIN. MAX VALUES = -20.30e 38.25 , 49.63 e 32.25



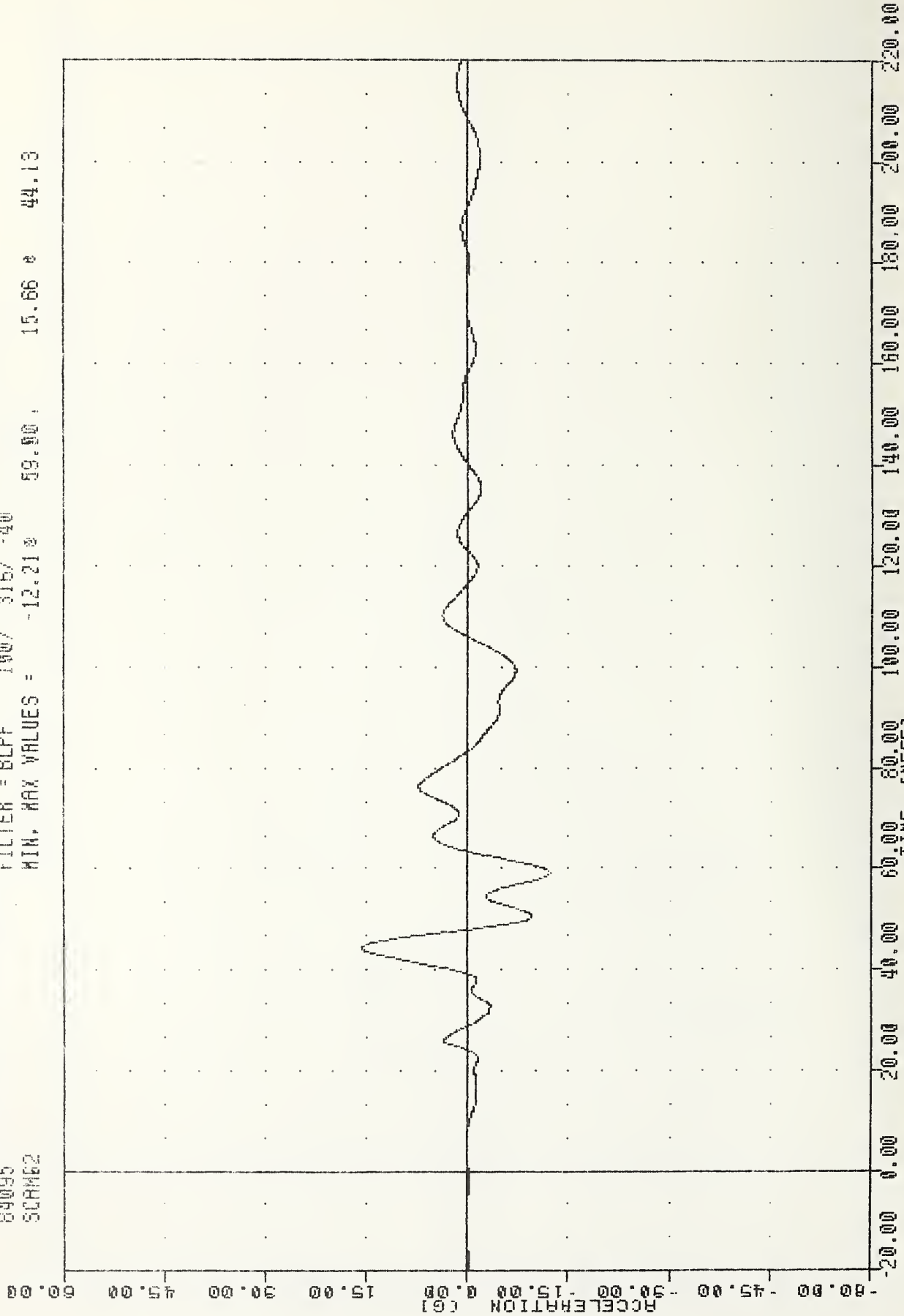
AIRBAG DEMONSTRATION PROGRAM
 STEERING COLUMN ACCELERATION HP AXIS UPPER

VATIC
AIRBAG DEMONSTRATION PROGRAM
84095
SCHEM2

PLOT DATE 5-APR-84 15:51:29

FILTER = BLPF 100/ 316/ -40

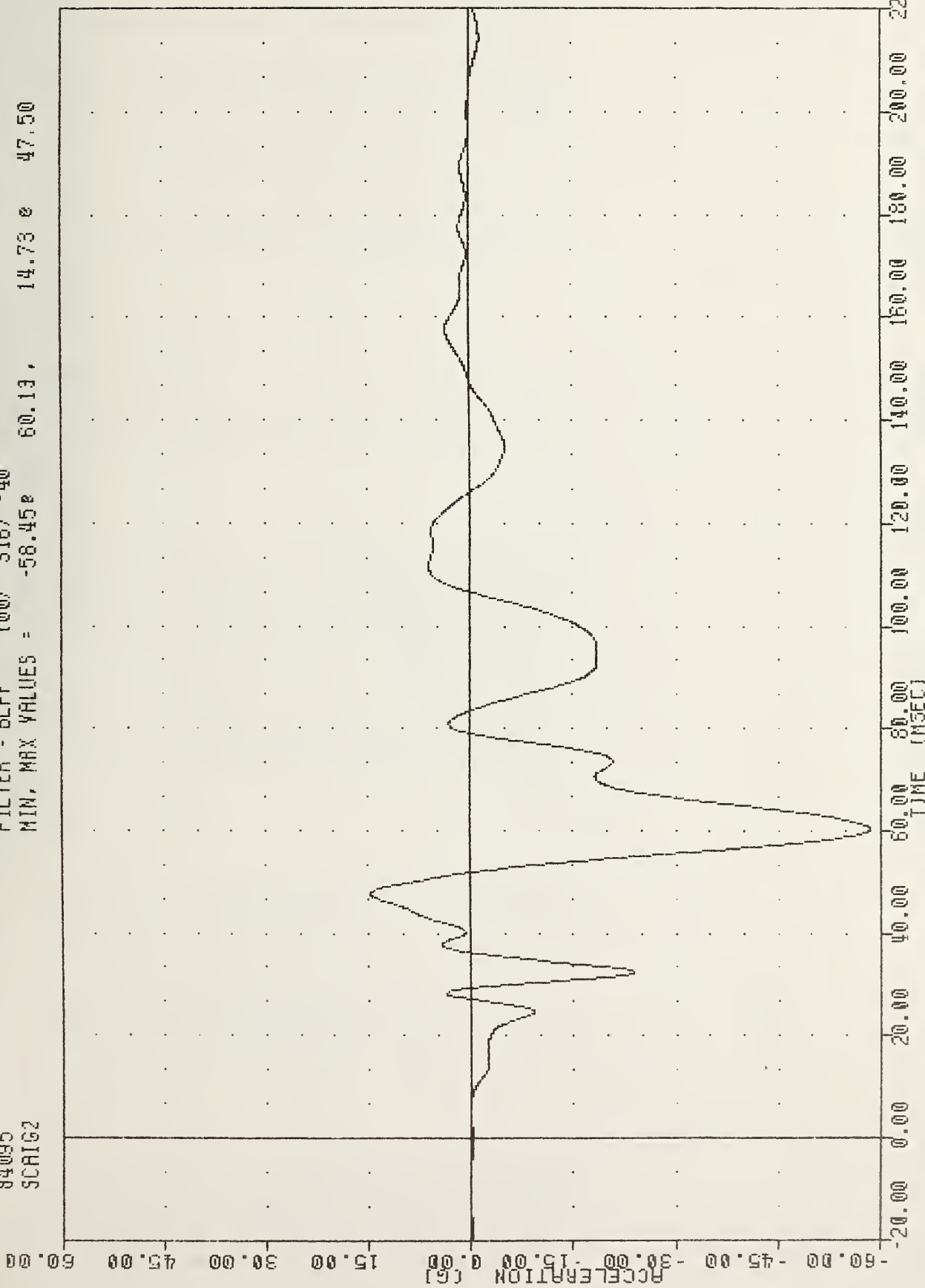
MIN. MAX VALUES = -12.21 59.50 15.66 e 44.13



AIRBAG DEMONSTRATION PROGRAM
STEERING COLUMN ACCELERATION ML AXIS UPPER

PLOT DATE 5-APR-84 15:51:29
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = 60.13, 14.73 e 47.50

VATC , R0583-2-30
AIRBAG DEMONSTRATION PROGRAM
84095
SCALG2



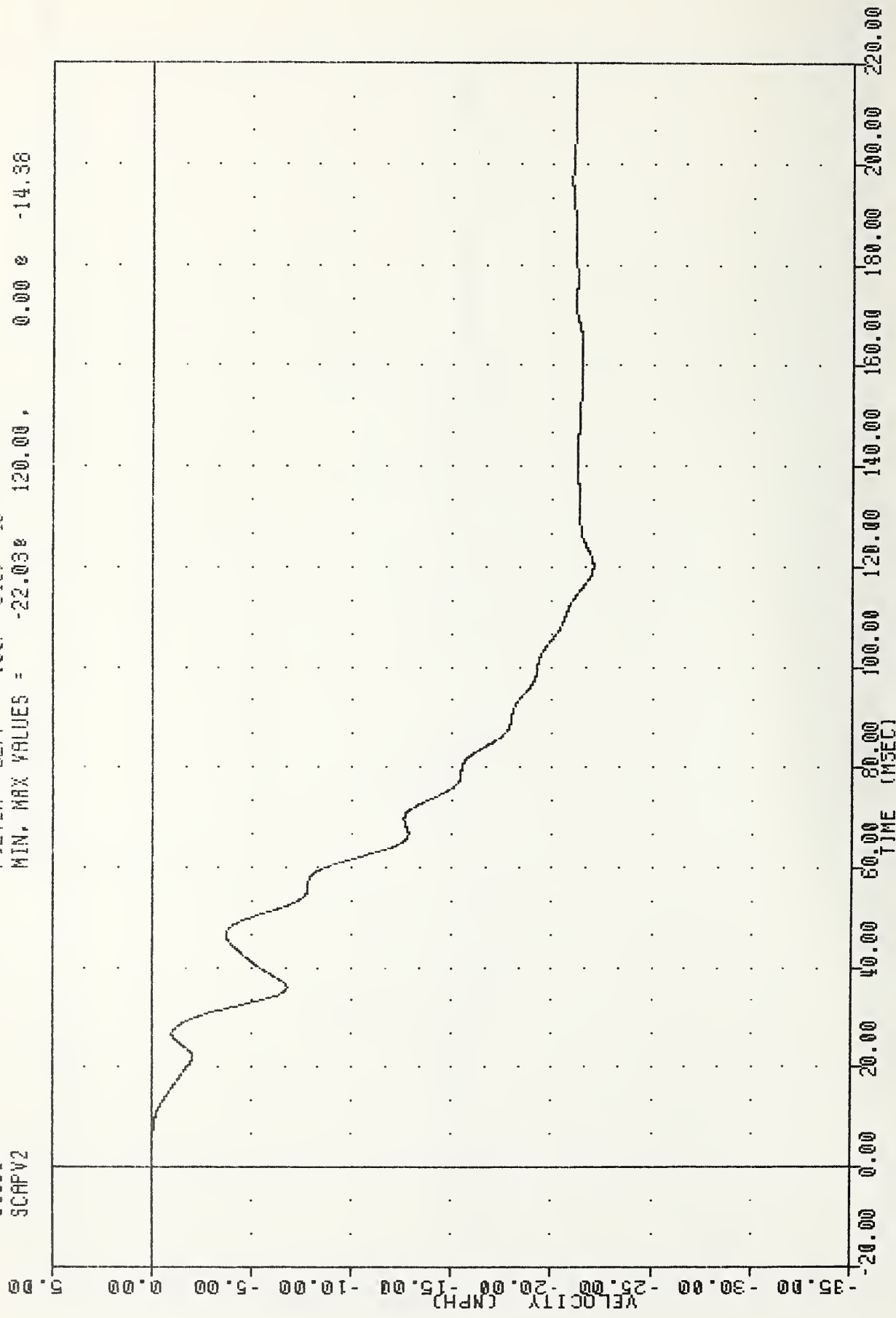
AIRBAG DEMONSTRATION PROGRAM
STEERING COLUMN ACCELERATION IS AXIS UPPER

VRTC , R0583-2-30
AIRBAG DEMONSTRATION PROGRAM
84095
SCAFV2

PLOT DATE 6-APR-84 10:05:21

FILTER = BLPF 100/ 318/ -40

MIN. MAX VALUES = -22.03e 120.00 , 0.00 e -14.38



AIRBAG DEMONSTRATION PROGRAM
STEERING COLUMN VELOCITY AP AXIS UPPER

TRC2831
AIRBAG DEMONSTRATION PROGRAM

33.0 mph

84096

VRTC

RD583-2-31
6-APR-84 10:04:43

	Min value	Max value	Units	Filter
1	-0.981 @	5.368 @	volt	1650/ 5218/ -40
2	-0.733 @	23.675 @	g	100/ 316/ -40
3	0.000 @	33.878 @	mph	100/ 316/ -40
4	-0.259 @	32.767 @	mph	100/ 316/ -40
5	-2.885 @	26.701 @	g	100/ 316/ -40
6	-0.787 @	4.391 @	volt	1650/ 5218/ -40
7	-199.348 @	81.115 @	g	1650/ 5214/ -40
8	-140.315 @	0.028 @	mph	1650/ 5214/ -40
9	-3.934 @	5.885 @	g	1650/ 5214/ -40
10	-25.194 @	9.709 @	g	1650/ 5214/ -40
11	-43.444 @	42.315 @	g	300/ 949/ -40
12	-38.406 @	0.001 @	mph	300/ 949/ -40
13	-4.323 @	22.258 @	g	300/ 949/ -40
14	-9.459 @	2.959 @	g	300/ 949/ -40
15	-93.926 @	3.085 @	g	300/ 949/ -40
16	-39.989 @	134.436 @	g	300/ 949/ -40
17	-6.112 @	28.870 @	g	300/ 949/ -40
18	-0.001 @	0.863 @	in	300/ 949/ -40
19	-1798.325 @	28.407 @	lb	1000/ 3162/ -40
20	-2473.139 @	28.188 @	lb	1000/ 3162/ -40
21	-57.467 @	19.273 @	g	100/ 316/ -40
22	-17.937 @	0.008 @	mph	100/ 316/ -40
23	-19.079 @	16.678 @	g	100/ 316/ -40
24	-47.557 @	39.122 @	g	100/ 316/ -40
25	-33.097 @	2.312 @	g	100/ 316/ -40
26	0.020 @	199.385 @	g	1650/ 5214/ -40
27	0.007 @	47.222 @	g	300/ 949/ -40
28	0.004 @	135.859 @	g	300/ 949/ -40

* * * HIC computation for TRC283I 5-APR-84 16:27:25

HEDRG1 VRTC RD583-2-31 84096 AIRBAG DEMONSTRATION PROGRAM

Using time range = 0.000 to 220.000 msec Peak accel = 44.78 @ 101.500

HIC = 283.37 Interval from 72.000 [817] to 118.375 [1188]

HIC = 173.41 Interval from 95.125 [1002] to 110.125 [1122]

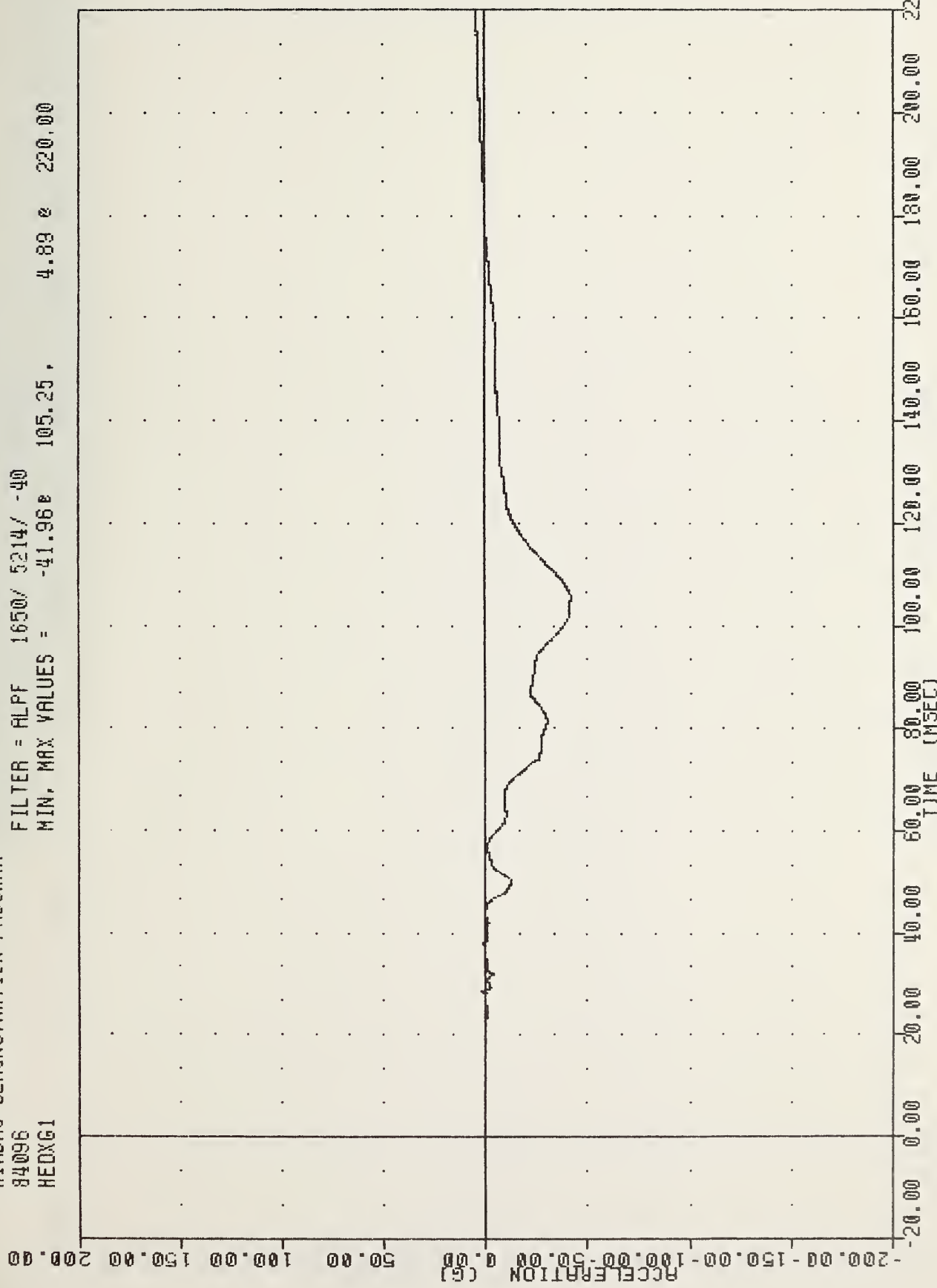
Elapsed time = 13.14 sec

Enter channel [,stop time] -->EXIT

Enter input filespec -->EXIT

\$

VRTC , R0583-2-31 PLOT DATE 5-APR-84 15:12:17
 AIRBAG DEMONSTRATION PROGRAM
 84096 FILTER = ALPF 1650/ 5214/ -40
 HEDXG1 MIN. MAX VALUES = -41.96e 105.25 , 4.89 e 220.00

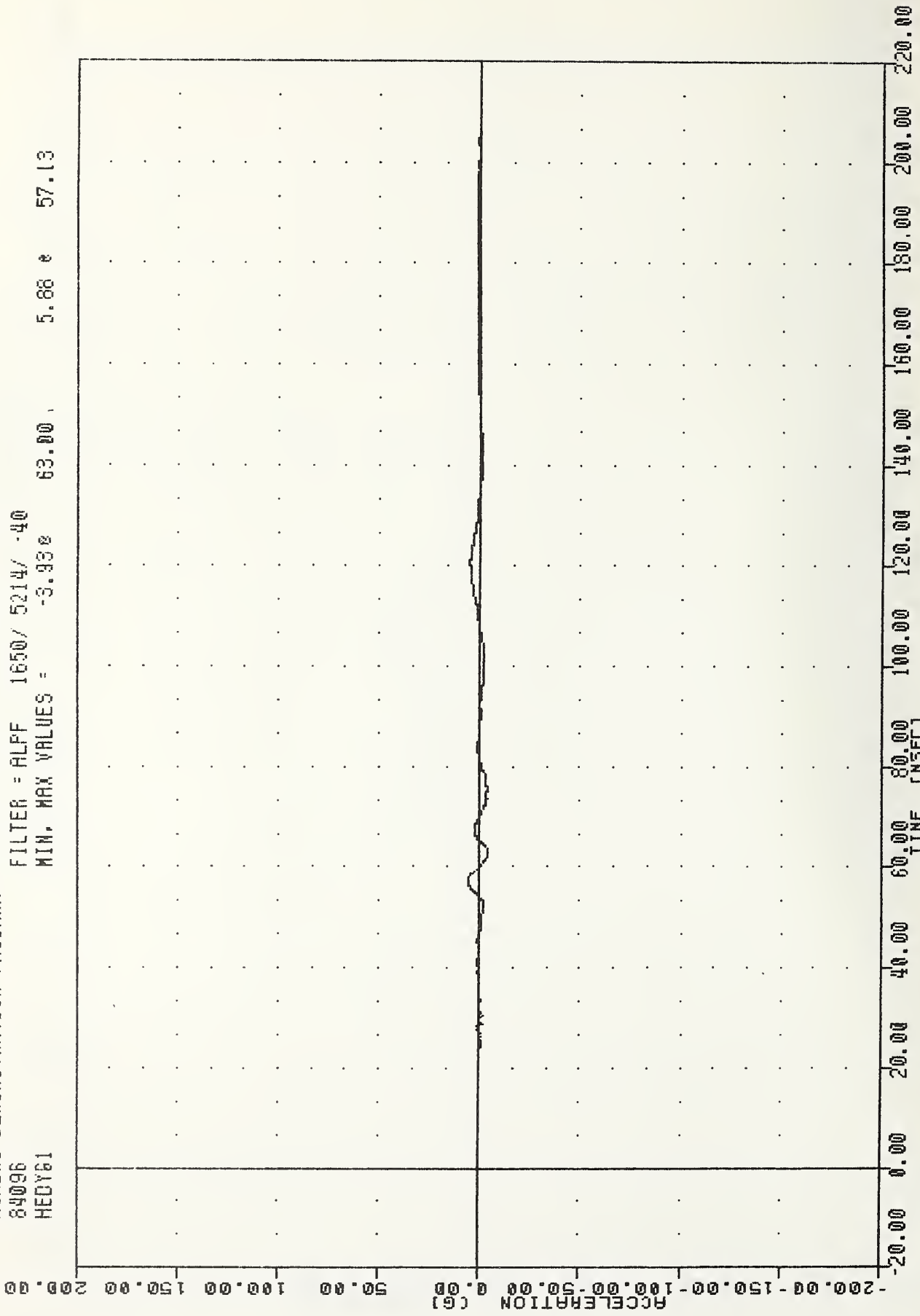


AIRBAG DEMONSTRATION PROGRAM
 HEAD ACCELERATION X AXIS 50TH PERCENTILE

WAIL , NUS83-2-51
AIRBAG DEMONSTRATION PROGRAM
84096
HEDY61

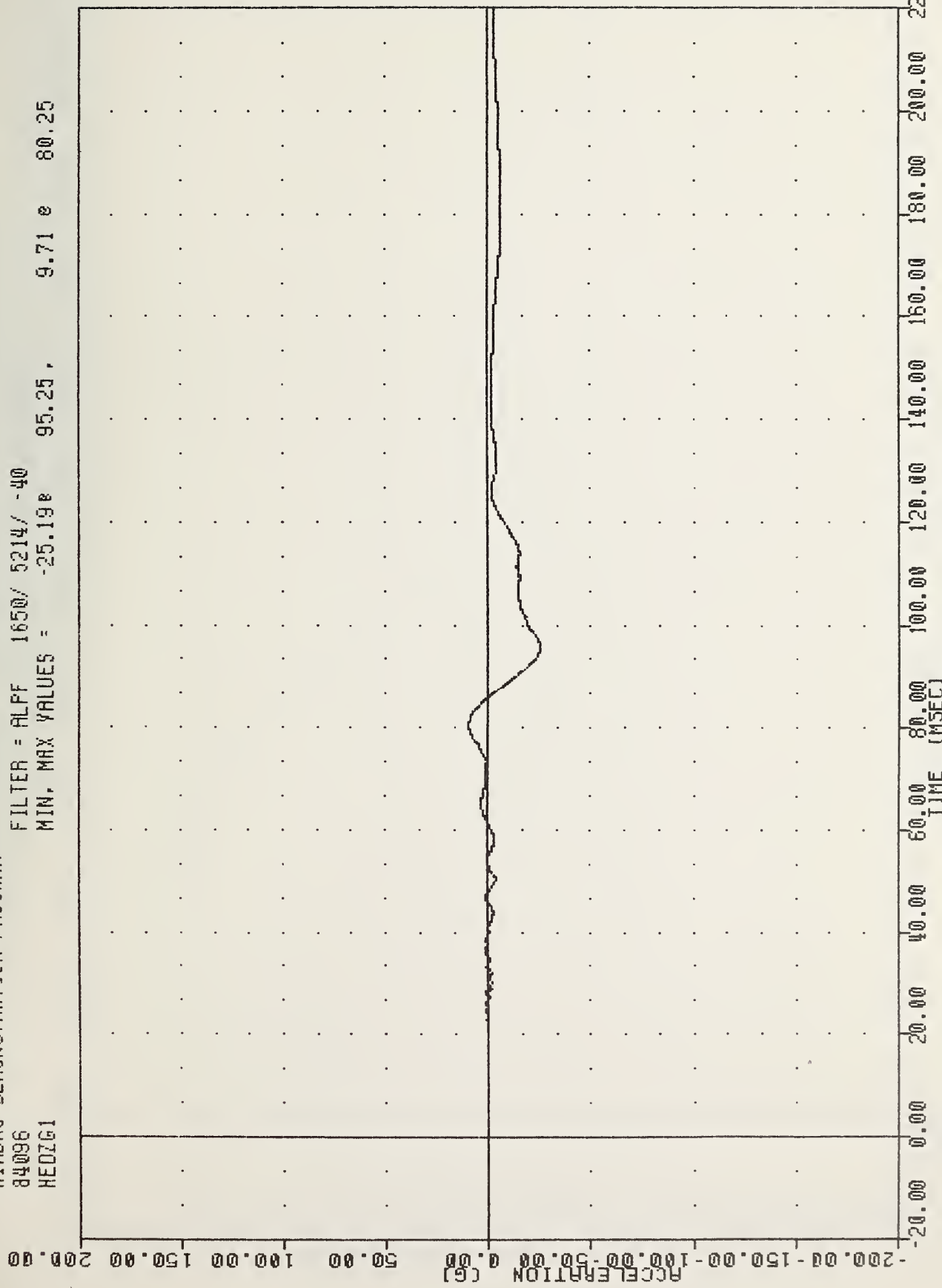
PLU1 DATE 5-MAR-84 15:12:17

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -3.93E 63.00 , 5.88 E 57.13



AIRBAG DEMONSTRATION PROGRAM
HEAD ACCELERATION Y AXIS 50TH PERCENTILE

Vhlc , RUC583-2-31 PLUI DATE 5-APR-84 13:12:17
 AIRBAG DEMONSTRATION PROGRAM
 84096 FILTER = ALPF 1650/ 5214/ -40
 HEDZG1 MIN, MAX VALUES = -25.19e 95.25, 9.71 e 80.25

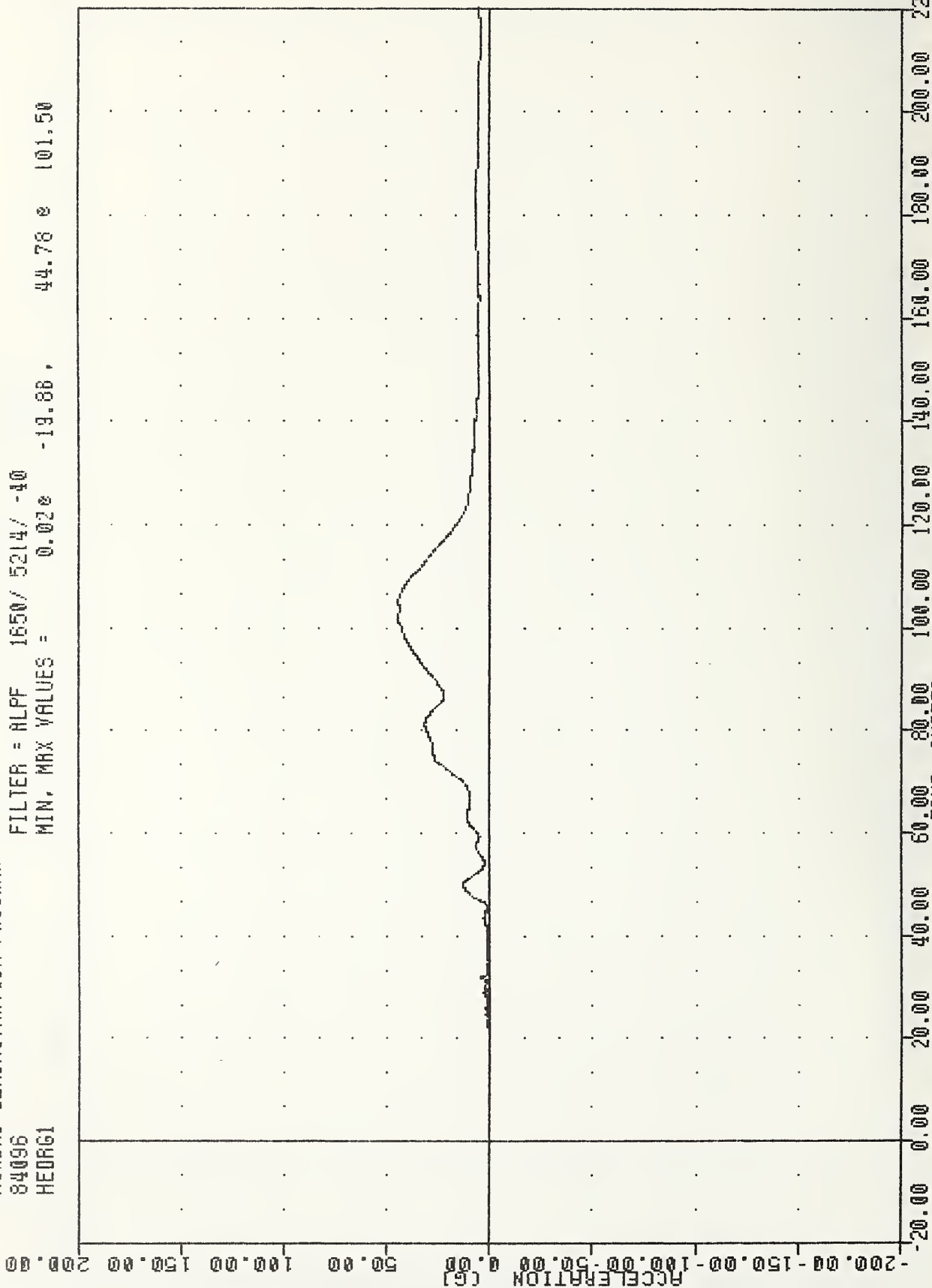


AIRBAG DEMONSTRATION PROGRAM
 HEAD ACCELERATION Z AXIS 50TH PERCENTILE

WHIL , NU583-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
HEADG1

PLU1 DATE 5-MAR-84 10:12:17

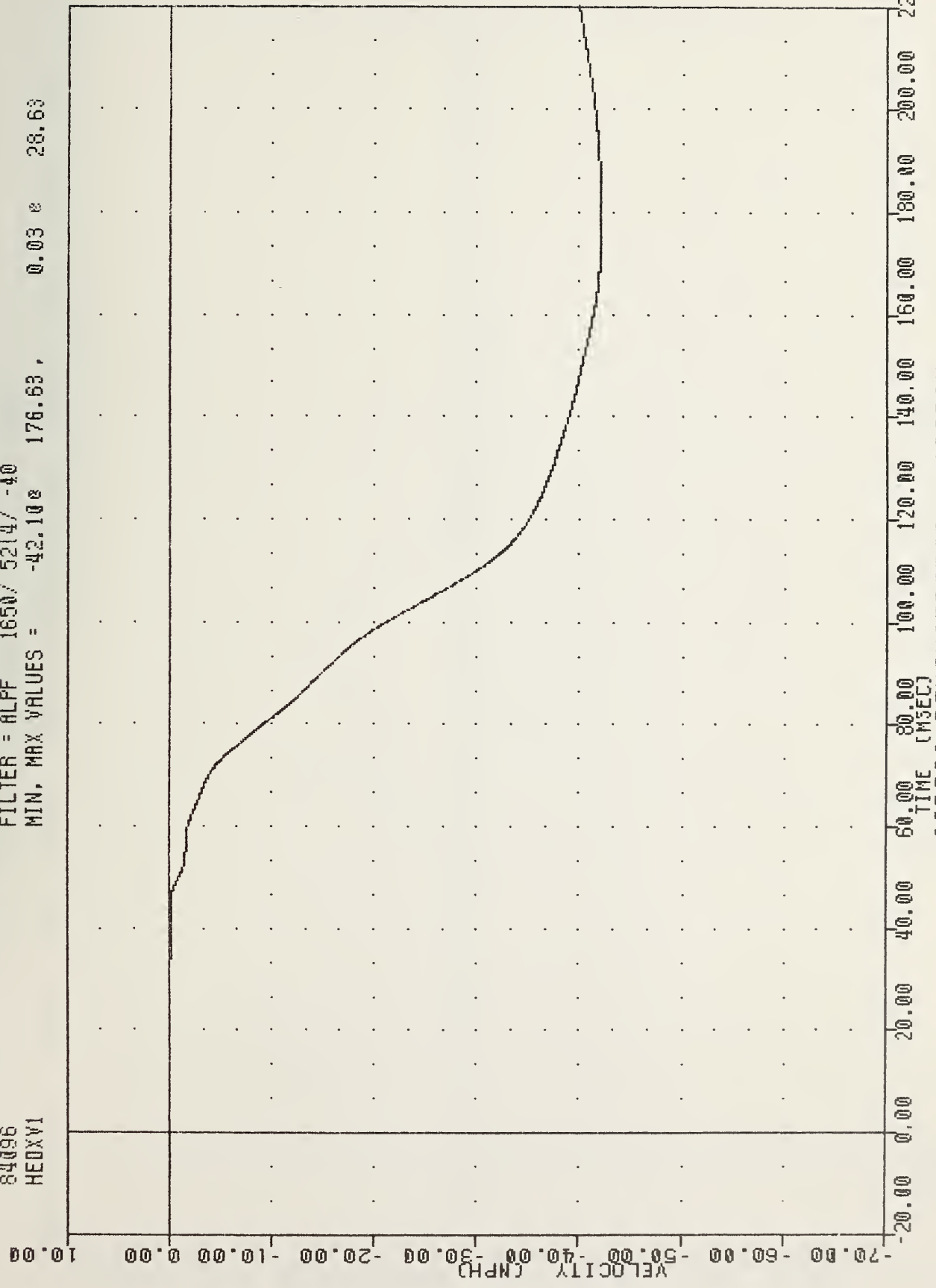
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.020 -19.88, 44.78 101.50



AIRBAG DEMONSTRATION PROGRAM
HEAD RESULTANT ACCELERATION 50TH PERCENTILE

WHIL , M0583-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
HEADXV1

PLUI ORTE 5-MPR-84 10:12:17
FILTER = ALPF 165N/ 5214/ -40
MIN, MAX VALUES = -42.10e 176.63 , 0.03 e 28.63

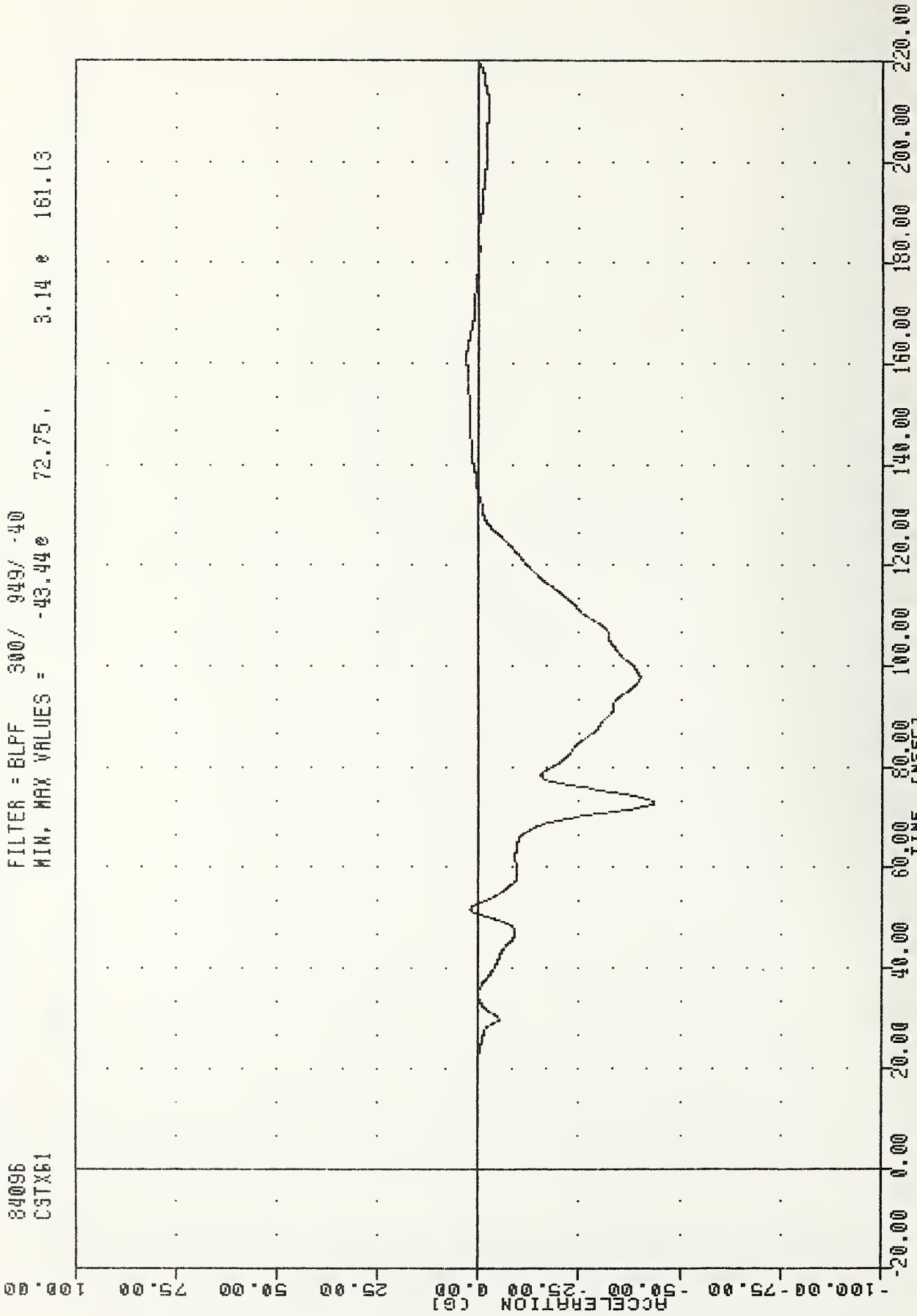


AIRBAG DEMONSTRATION PROGRAM
HEAD VELOCITY X AXIS 50TH PERCENTILE

MAIL , 04083-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
CSTX61

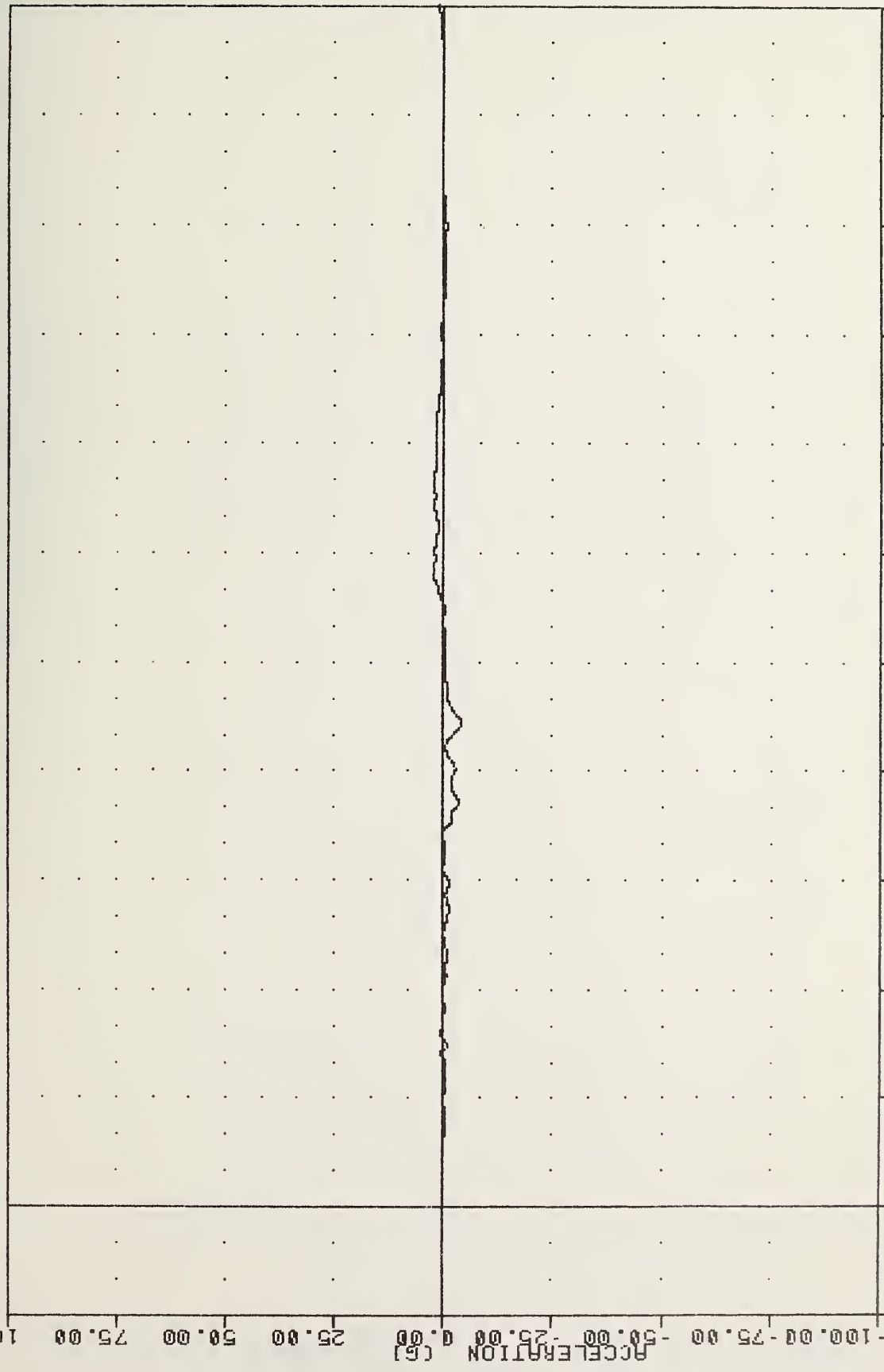
PLU DATE 5-MAR-84 15:12:17

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -43.44e 72.75, 3.14 e 161.13



AIRBAG DEMONSTRATION PROGRAM
CHEST ACCELERATION X AXIS 50TH PERCENTILE

FILE NO583-2-31 PLOT DATE 5-APR-84 13:12:17
 AIRBAG DEMONSTRATION PROGRAM
 84096 FILTER = 6LPF 300/ 949/ -40
 CSTY61 MIN, MAX VALUES = 88.75, 2.33 e 132.38



-100.00
 -75.00
 -50.00
 -25.00
 0.00
 25.00
 50.00
 75.00
 100.00

ACCELERATION (G)

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

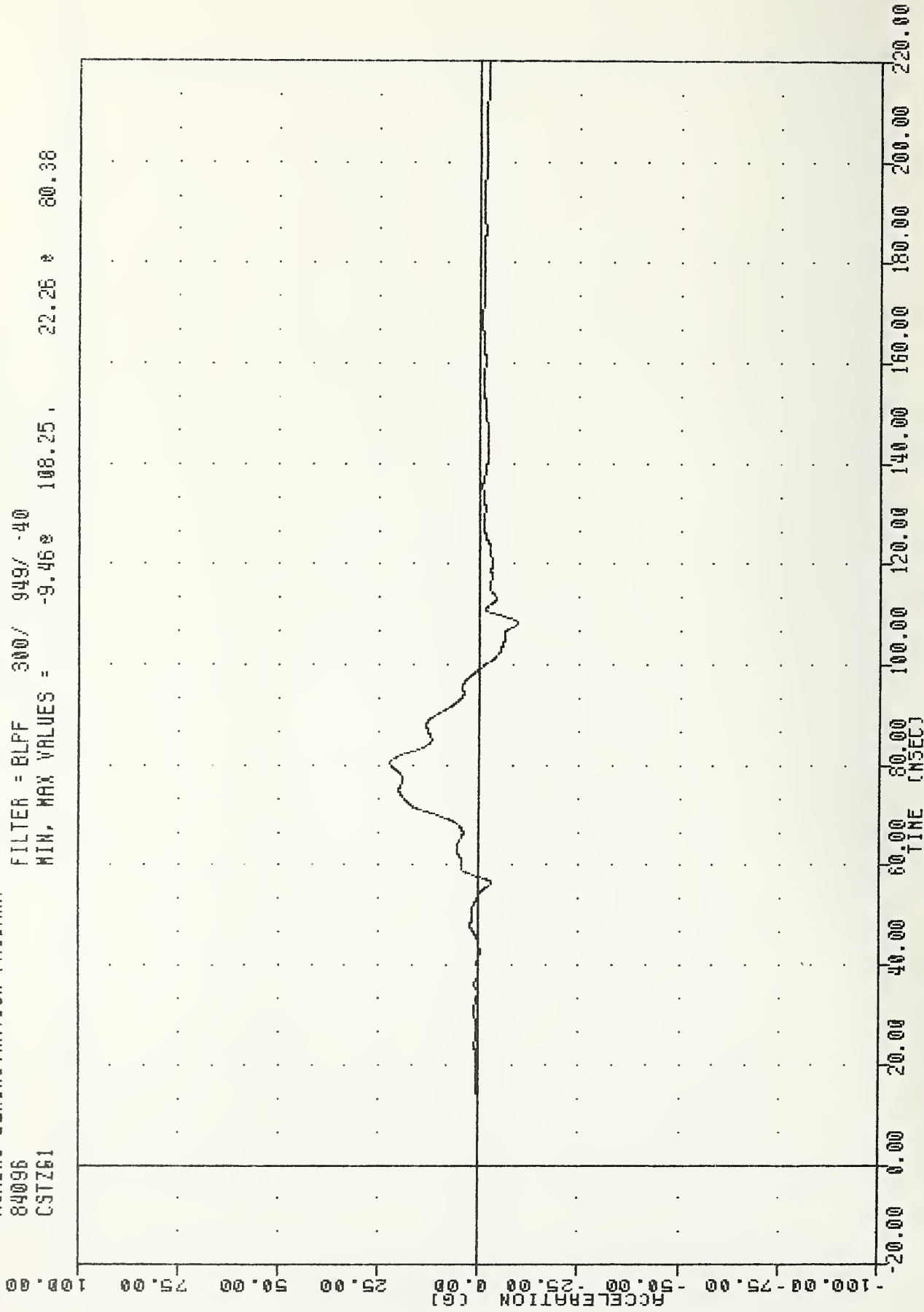
TIME (MSEC)

AIRBAG DEMONSTRATION PROGRAM
 CHEST ACCELERATION Y AXIS 50TH PERCENTILE

VRIC , 00383-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
CSTZ61

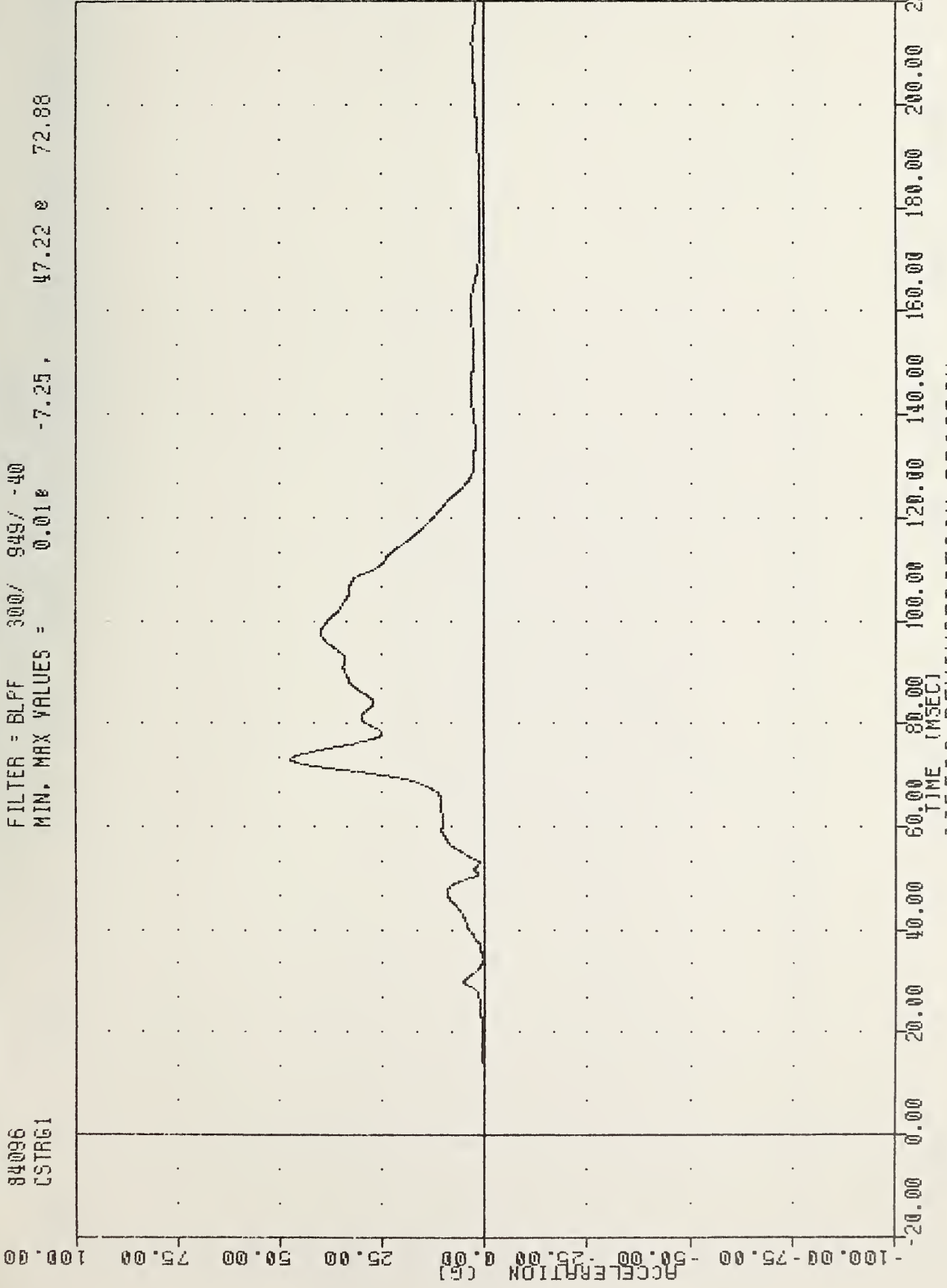
PLU1 DATE 5-MAR-84 15:12:17

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -9.46e 108.25 , 22.26 e 80.38



AIRBAG DEMONSTRATION PROGRAM
CHEST ACCELERATION Z AXIS 50TH PERCENTILE

Vh1L , HV583-2-31 FLUI DATE 5-HVF-64 15:12:17
 AIRBAG DEMONSTRATION PROGRAM
 84086 FILTER = BLFF 300/ 949/ -40
 CSTRG1 MIN. MAX VALUES = 0.01e -7.25, 47.22 e 72.88



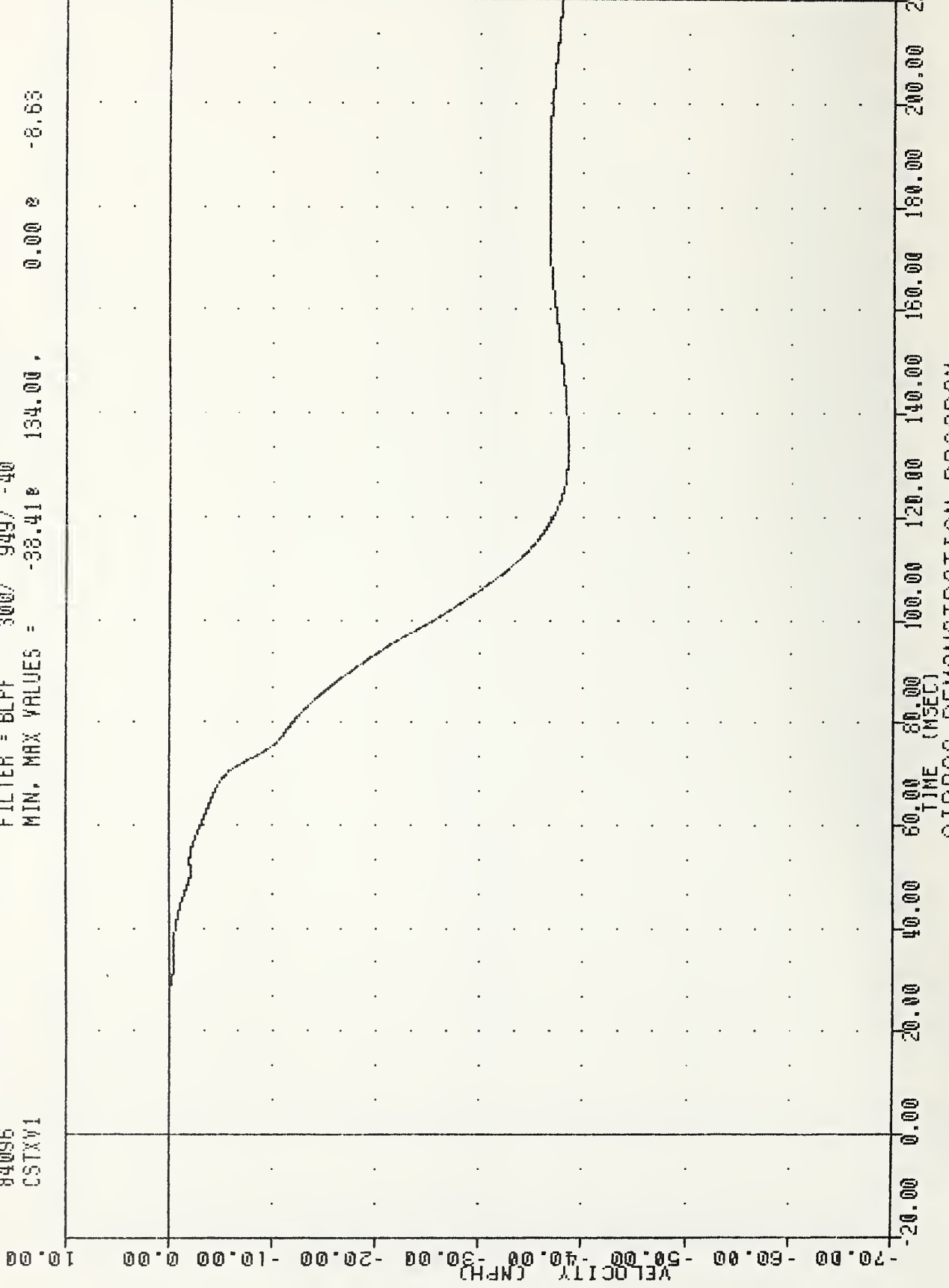
AIRBAG DEMONSTRATION PROGRAM
 CHEST RESULTANT ACCELERATION 50TH PERCENTILE

VRIC , HU583-2-31
AIRBAG DEMONSTRATION PROGRAM
84086
CSTXV1

PLU1 DATE 5-MAR-64 15:12:17

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -35.41e 134.00, 0.00 e -8.63



AIRBAG DEMONSTRATION PROGRAM
CHEST VELOCITY X AXIS 50TH PERCENTILE

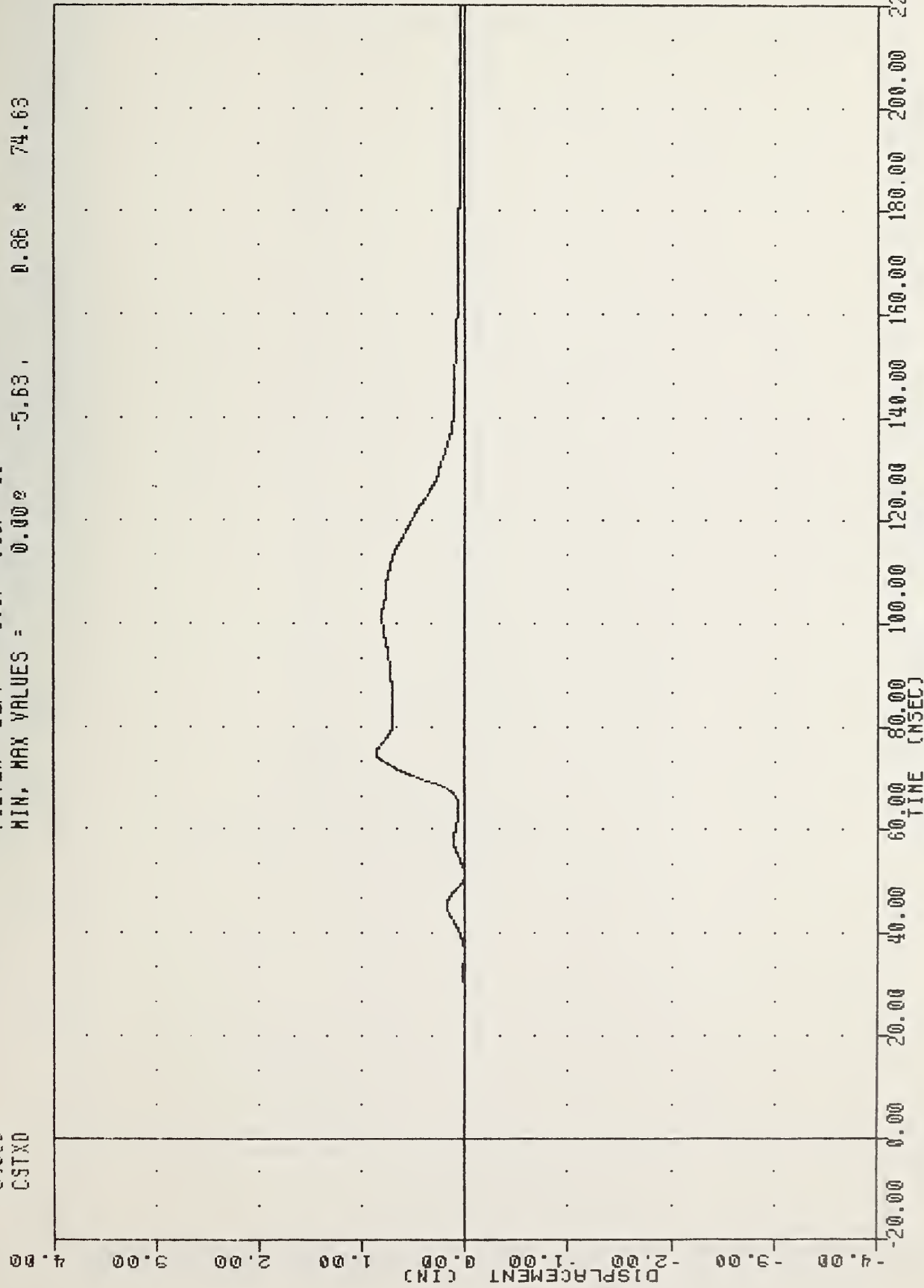
PL01 DATE 5-HFR-84 15:12:17

VRTL , HV83-2-31
AIRBAG DEMONSTRATION PROGRAM

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = 0.00e -5.63 , 0.86 e 74.63

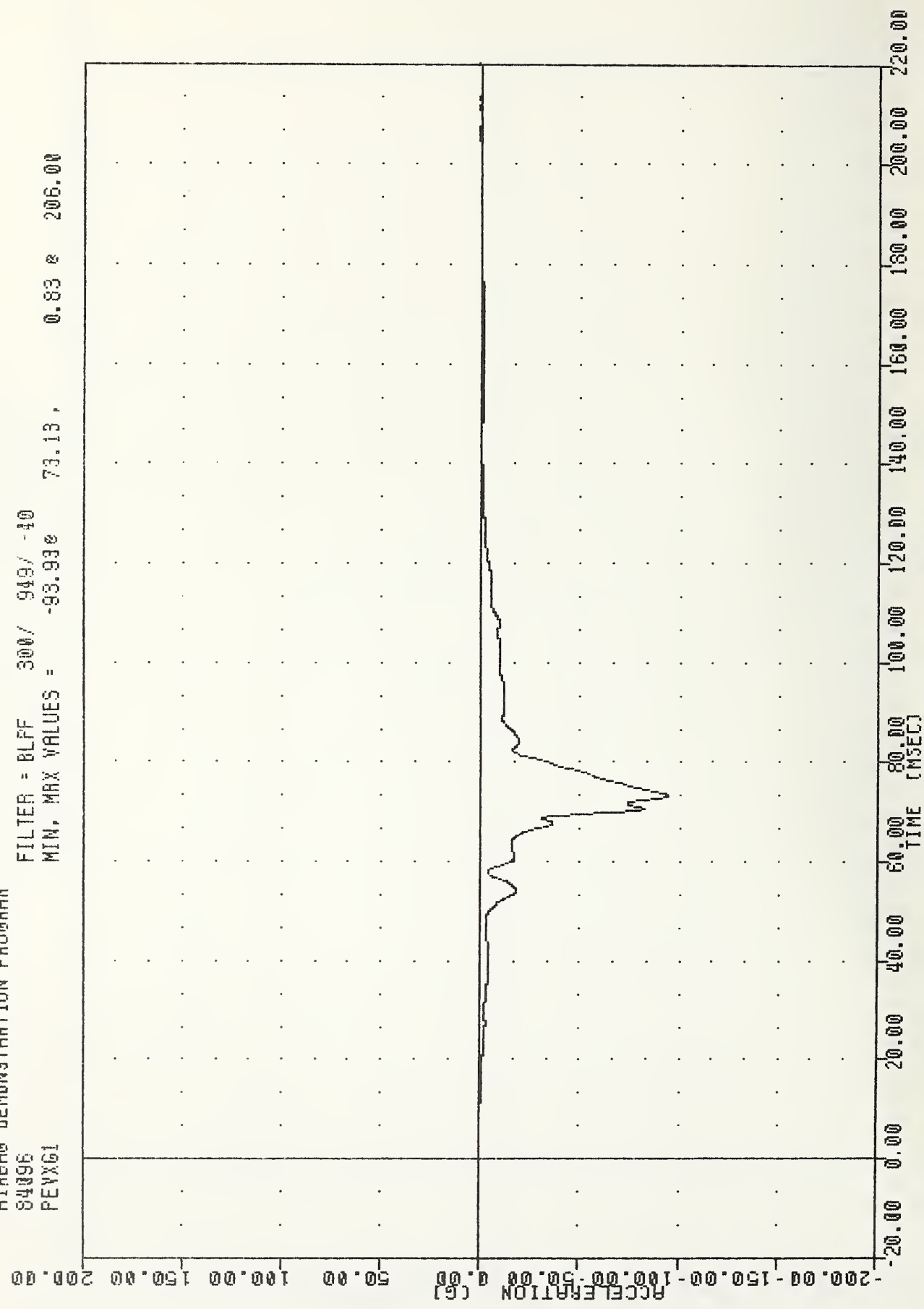
CSTXD



AIRBAG DEMONSTRATION PROGRAM
CHEST DISPLACEMENT 50TH PERCENTILE

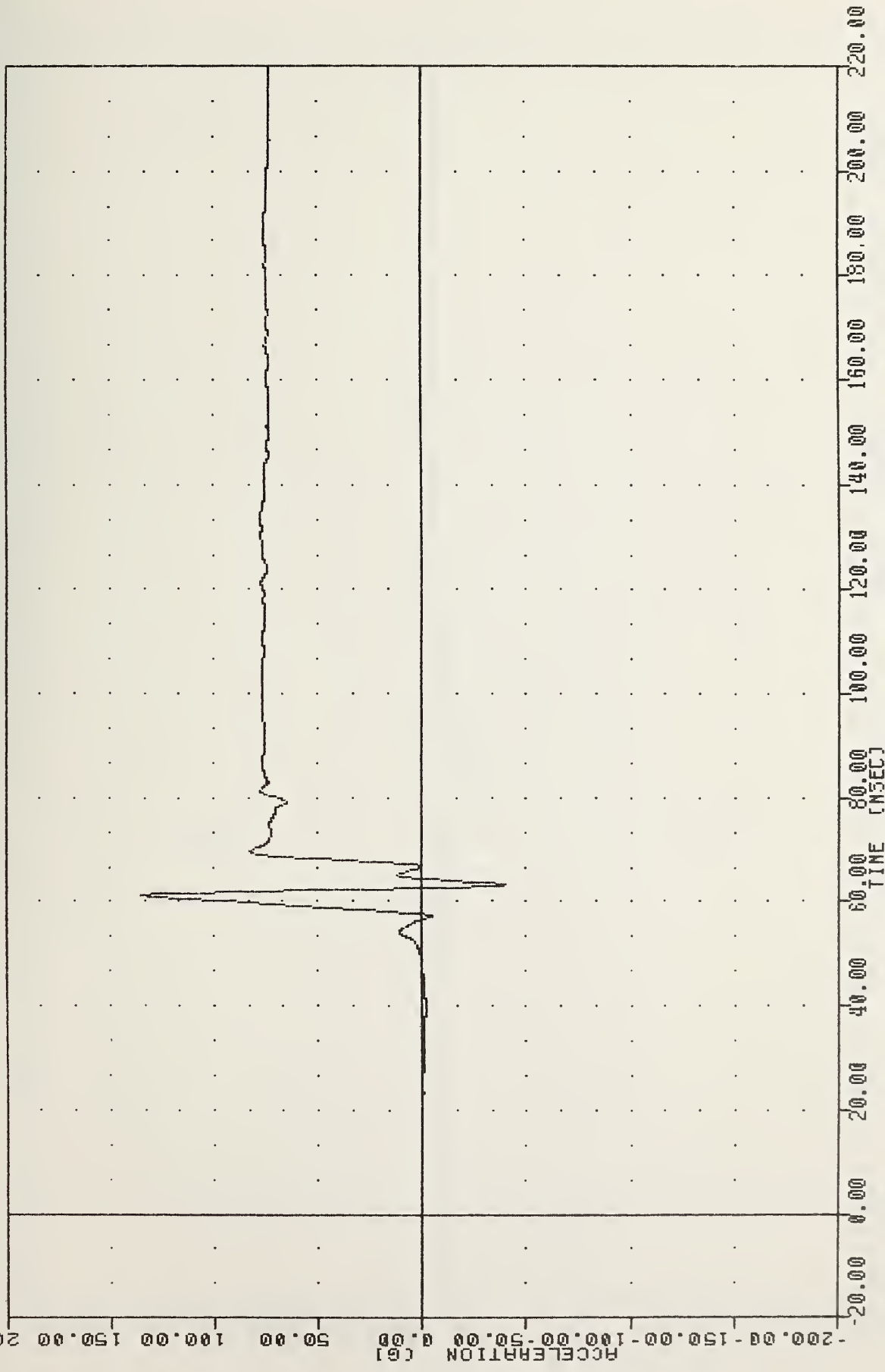
VHIC , RU583-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
PEXG1

PLOT DATE 5-APR-84 13:12:17
FILTER = BLFF 300/ 949/ -10
MIN, MAX VALUES = -93.93e 73.13, 0.83 e 206.00



AIRBAG DEMONSTRATION PROGRAM
PELVIS ACCELERATION X AXIS 50TH PERCENTILE

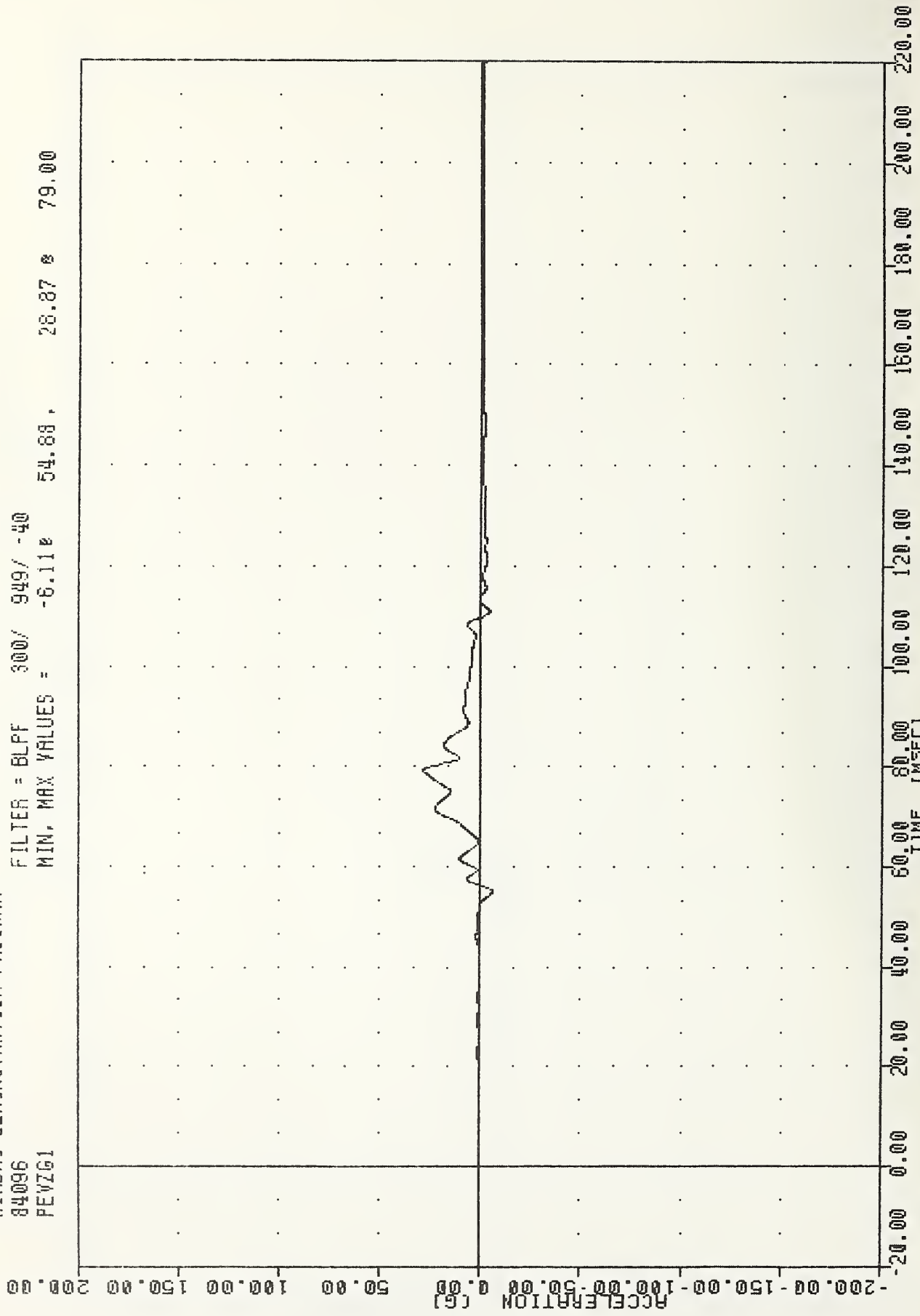
VRIU , HU583-2-31 PLOT DATE 5-APR-84 15:12:17
 AIRBAG DEMONSTRATION PROGRAM
 84056 FILTER = 6LPF 300/ 949/ -40
 PEY61 MIN. MAX VALUES = -39.99e 63.13 , 134.44 e 61.13



AIRBAG DEMONSTRATION PROGRAM
 PELVIS ACCELERATION Y AXIS 50TH PERCENTILE

WHIC R0588-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
PEVZG1

PLU1 DATE 5-APR-84 15:12:17
FILTER = BLFF 300/ 949/ -40
MIN. MAX VALUES = -8.11e 54.88 , 28.87 e 79.00



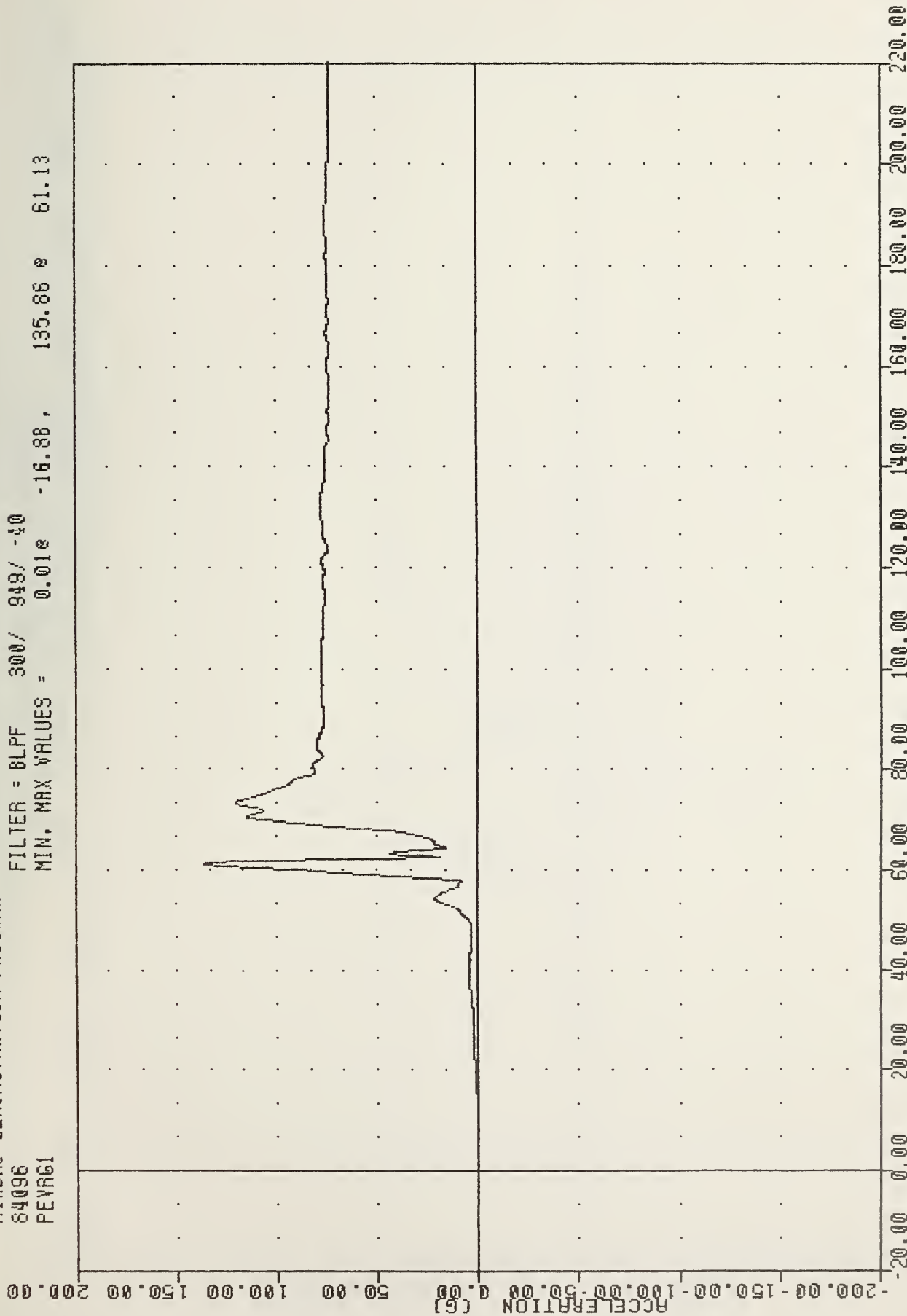
AIRBAG DEMONSTRATION PROGRAM
PELVIS ACCELERATION Z AXIS 50TH PERCENTILE

VRTC , RD583-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
PEYRG1

PLOT DATE 5-APR-84 15:12:17

FILTER = BLPF 300/ 949/ -40

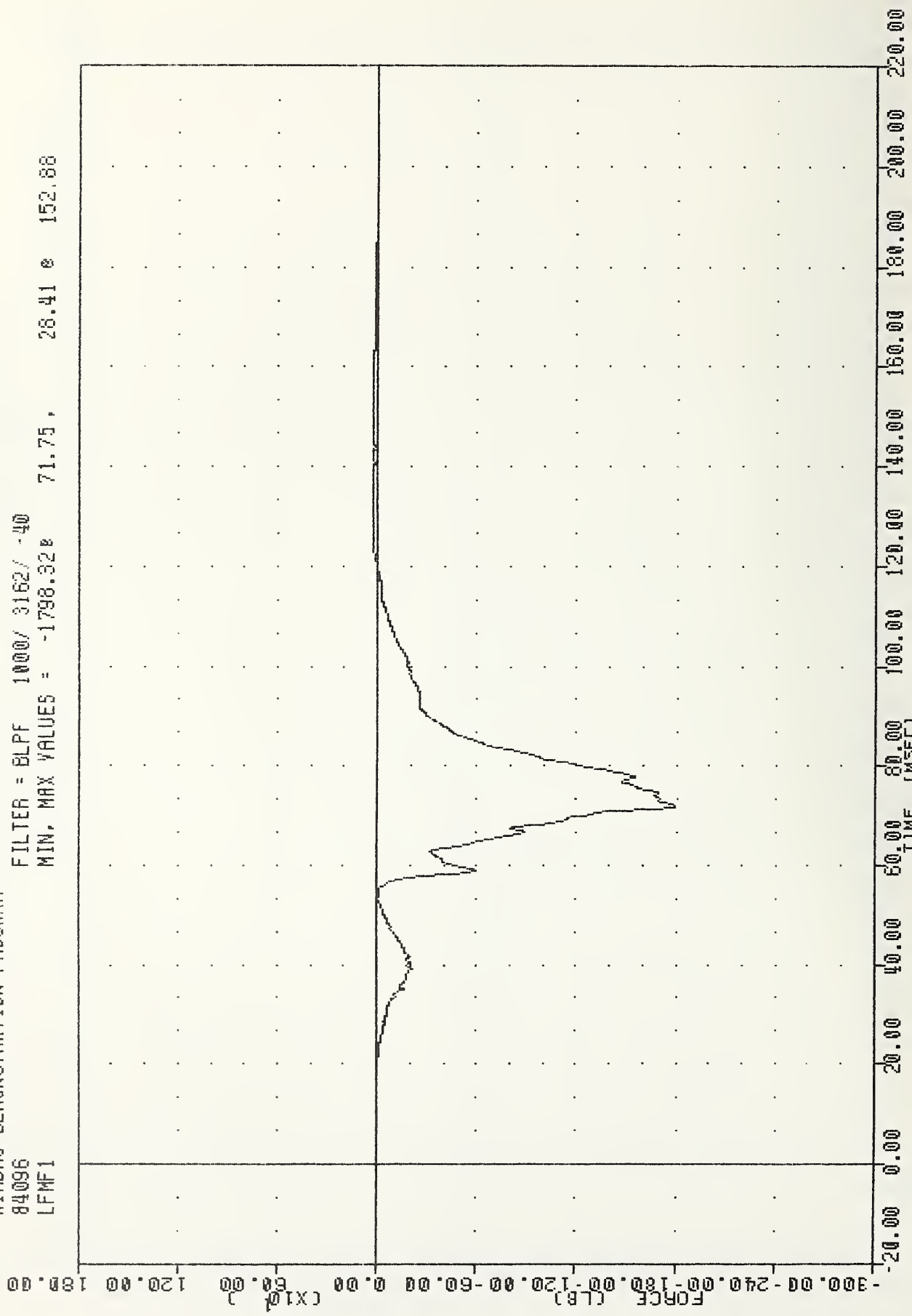
MIN. MAX VALUES = 0.01g -16.88g 135.86g 61.13



AIRBAG DEMONSTRATION PROGRAM
PELVIS RESULTANT ACCELERATION 50TH PERCENTILE

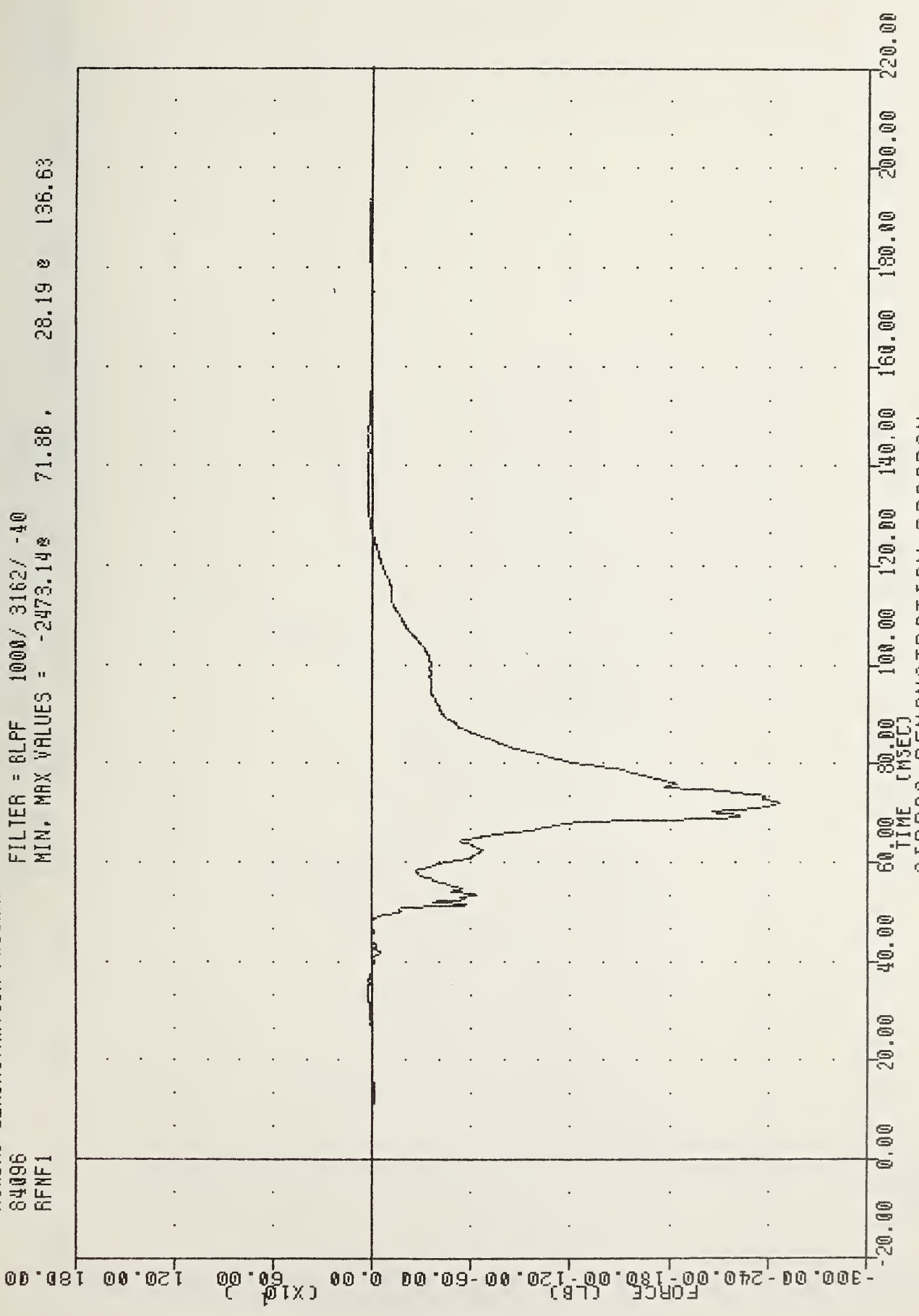
VRTC R0583-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
LFMF1

PLOT DATE 5-APR-84 15:12:17
FILTER = BLPF 1000/ 3162/ -40
MIN. MAX VALUES = -1798.32% 71.75, 28.41 & 152.88



AIRBAG DEMONSTRATION PROGRAM
LEFT FEMUR FORCE IN LBS 50TH PERCENTILE

VRIC RD583-2-31 PLOT DATE 5-APR-64 15:12:17
AIRBAG DEMONSTRATION PROGRAM
84096 FILTER = 6LPF 1000/ 3162/ -40
RFNF1 MIN. MAX VALUES = -2473.14# 71.88, 28.19 e 136.63



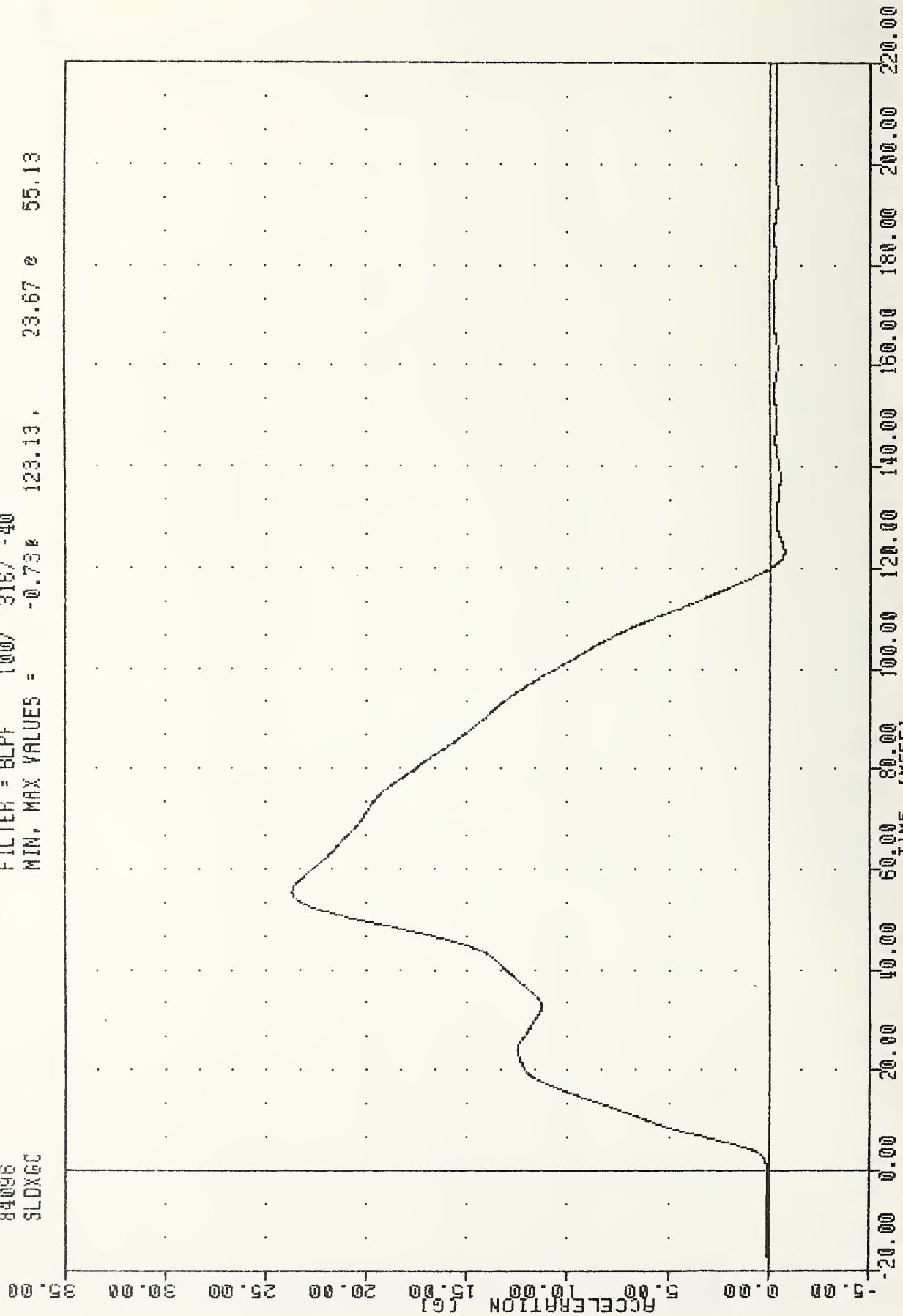
AIRBAG DEMONSTRATION PROGRAM
RIGHT FEMUR FORCE IN LBS 50TH PERCENTILE

VRTC R0583-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
SLOXGC

PLOT DATE 5-APR-84 15:12:17

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -0.73g 23.67g 55.13



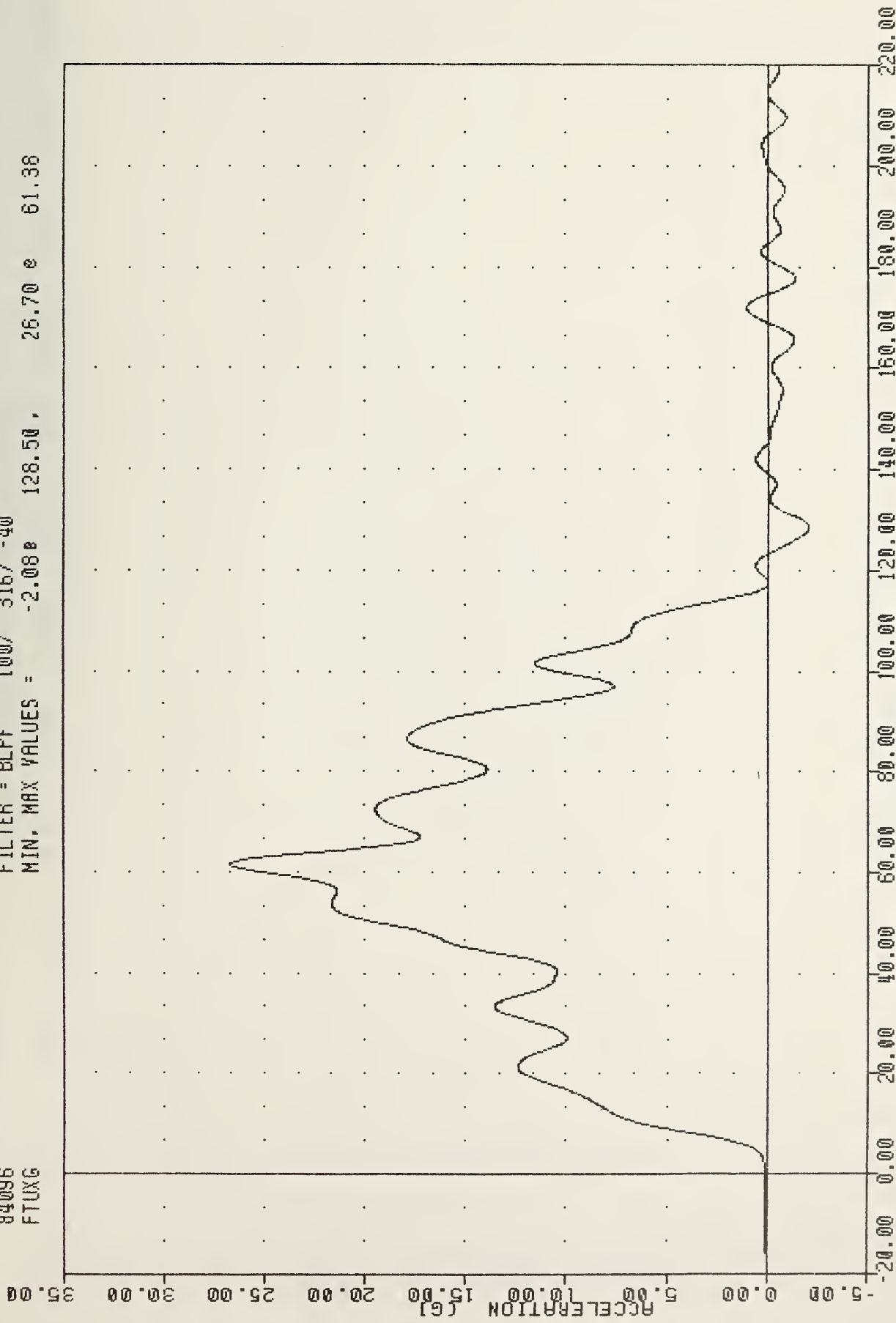
AIRBAG DEMONSTRATION PROGRAM
SLED ACCELERATION

VRIL , HU583-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
FTUXG

FLOI DATE 5-APR-84 15:12:17

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -2.08e 128.50 , 26.70 e 61.36



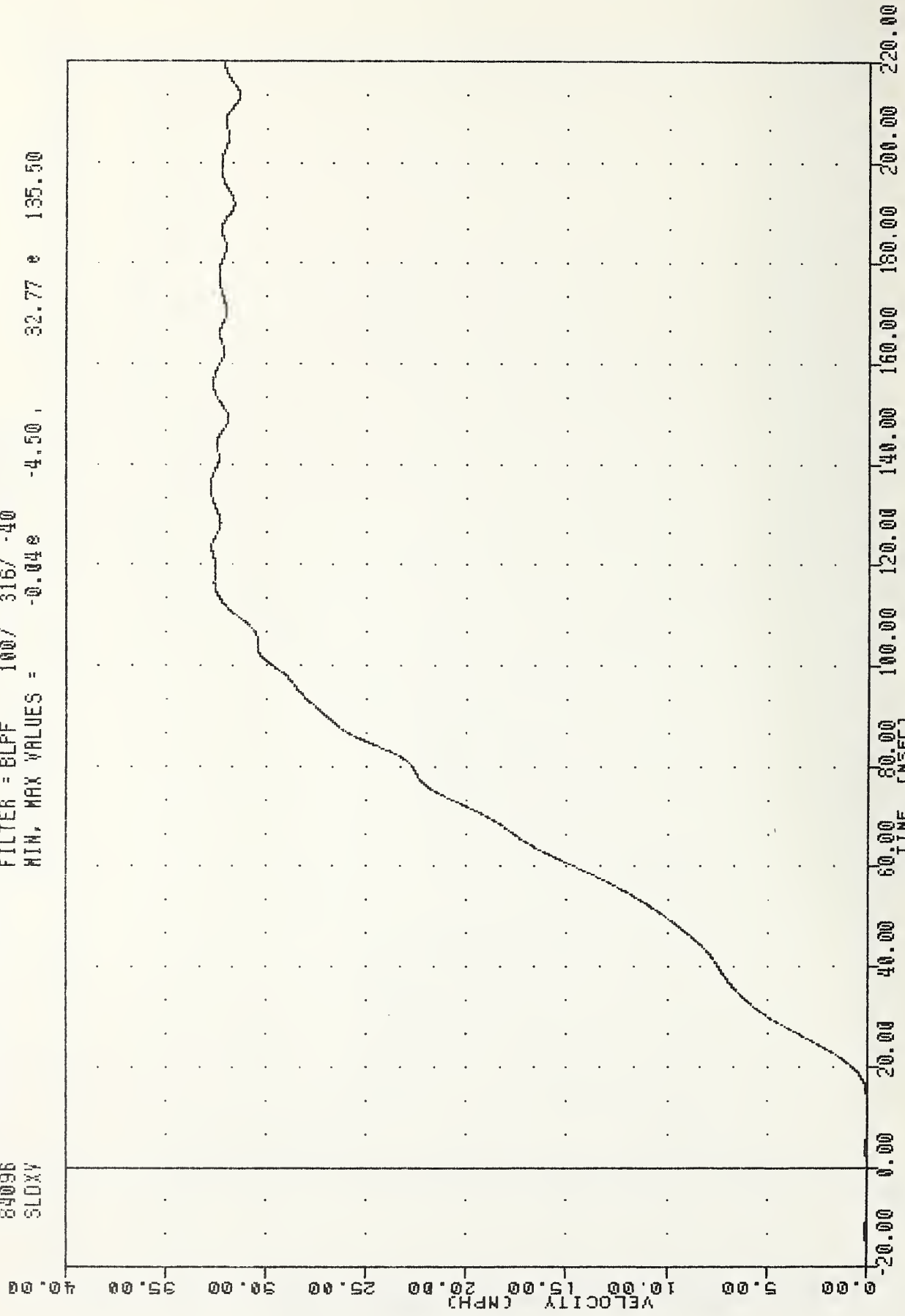
AIRBAG DEMONSTRATION PROGRAM
FLOOR PAN TUNNEL ACCELERATION

VRIC , NUS63-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
SLOXY

PLOT DATE 5-APR-84 15:12:17

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -0.04e -4.50, 32.77 e 135.50



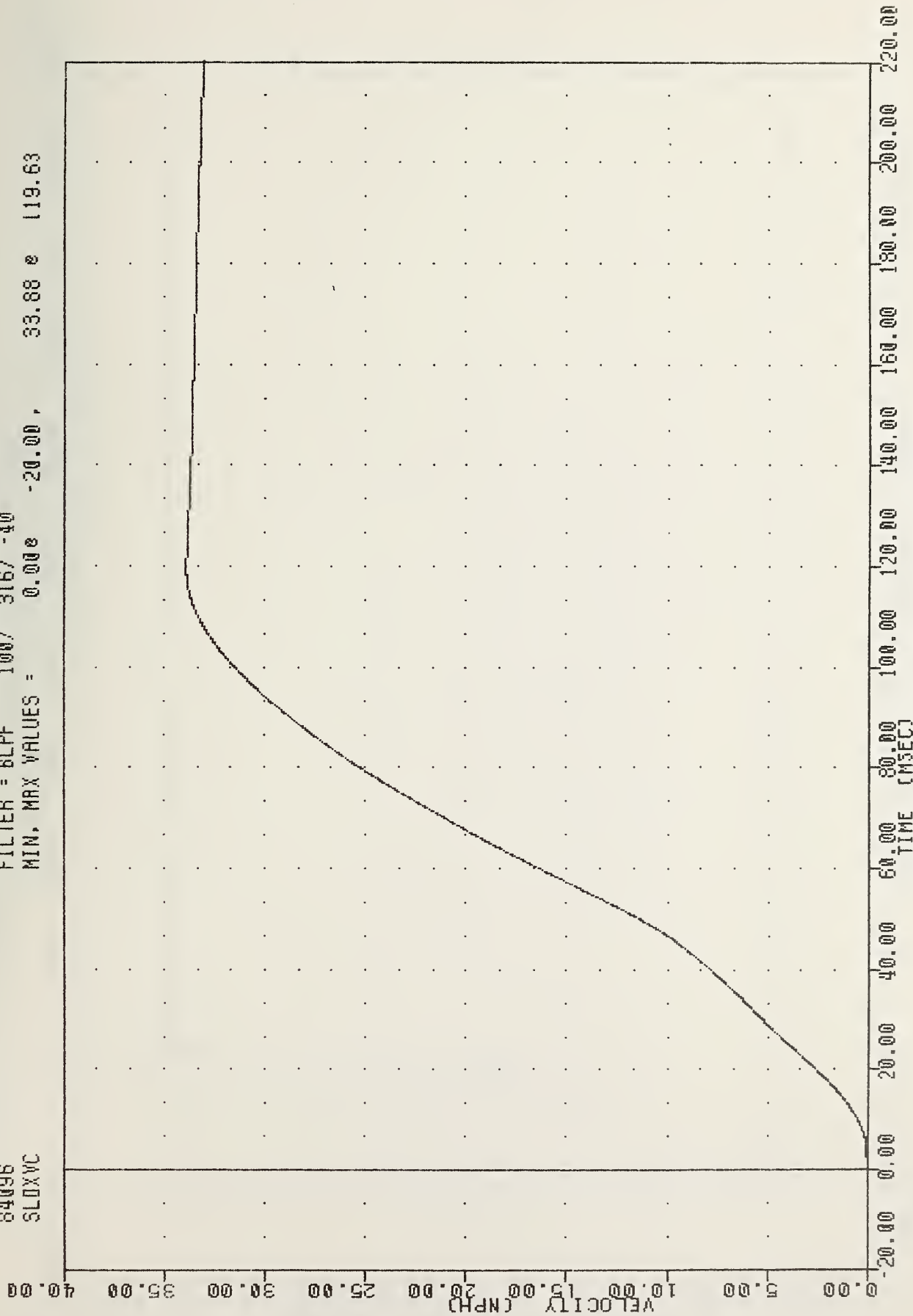
AIRBAG DEMONSTRATION PROGRAM
SLED VELOCITY

VEHICLE NO. HUS63-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
SLOXXYC

PLOT DATE 5-APR-84 15:12:17

FILTER = 6LPF 100/ 316/ -40

MIN. MAX VALUES = 0.00e -20.00, 33.88 e 119.63



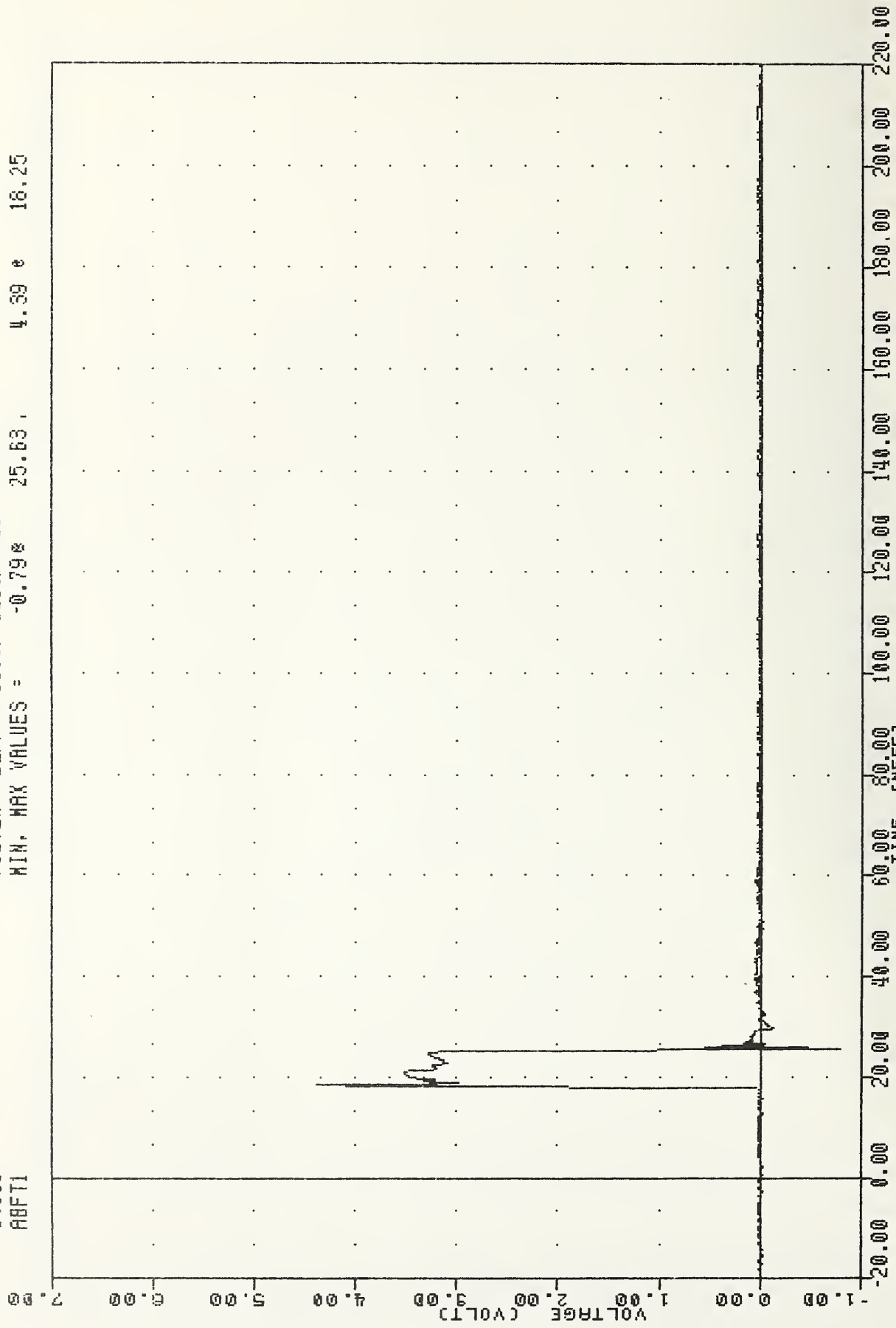
AIRBAG DEMONSTRATION PROGRAM
INTEGRATED SLED VELOCITY

VAIL
AIRBAG DEMONSTRATION PROGRAM
84096
ABFT1

PLT DATE 5-MAR-84 15:12:17

FILTER = BLPF 1650/ 5218/ -40

MIN. MAX VALUES = -0.79 25.63 4.39 16.25



AIRBAG DEMONSTRATION PROGRAM
AIR BAG FIRING EVENT 50TH PERCENTILE

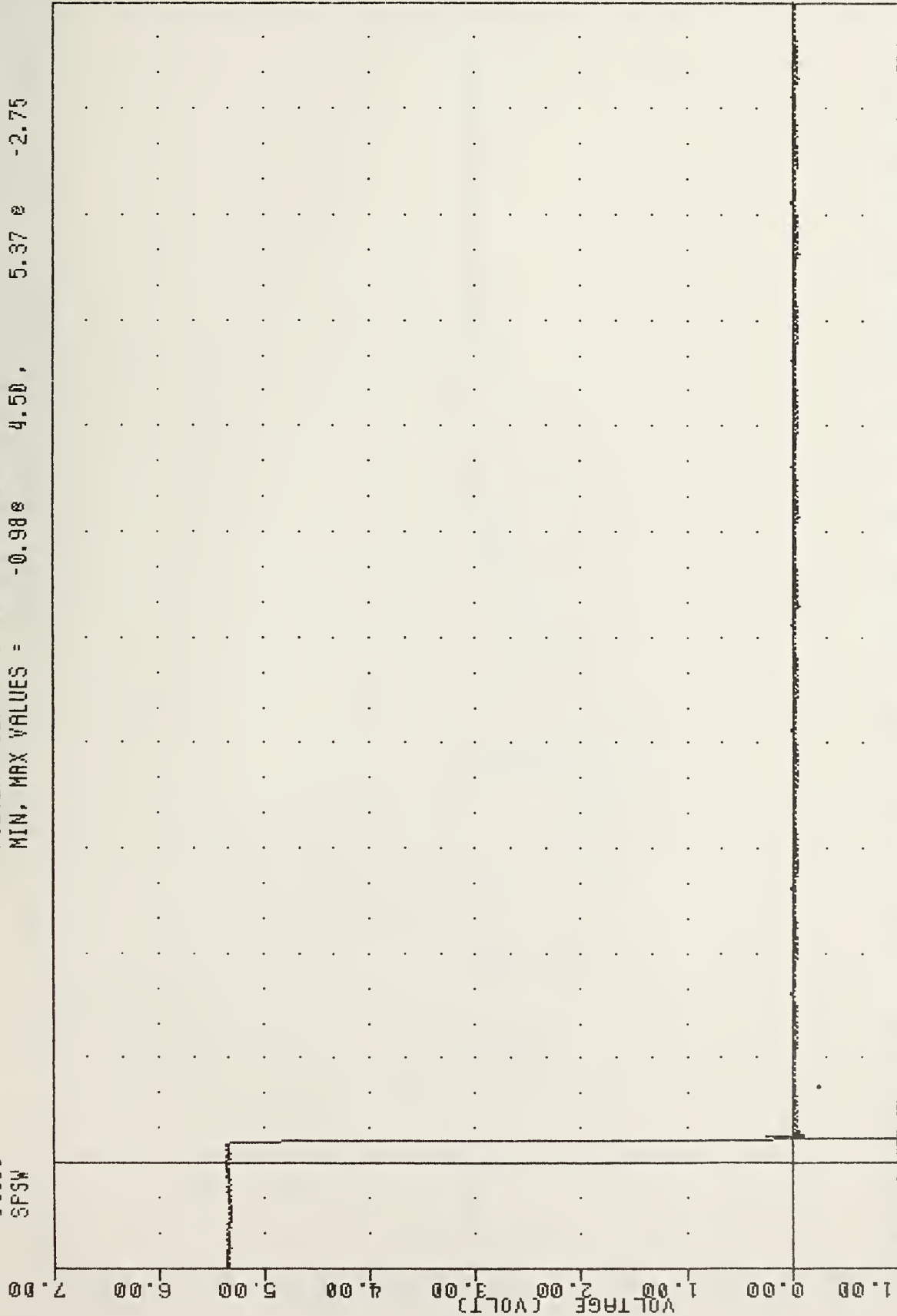
VRTC AD583-2-31
AIRBAG DEMONSTRATION PROGRAM
64096
SPSW

PLOT DATE 5-APR-84 15:12:17

FILTER = 8LPF 1650/ 5218/ -40

MIN, MAX VALUES = -0.98e 4.50,

5.37 e -2.75

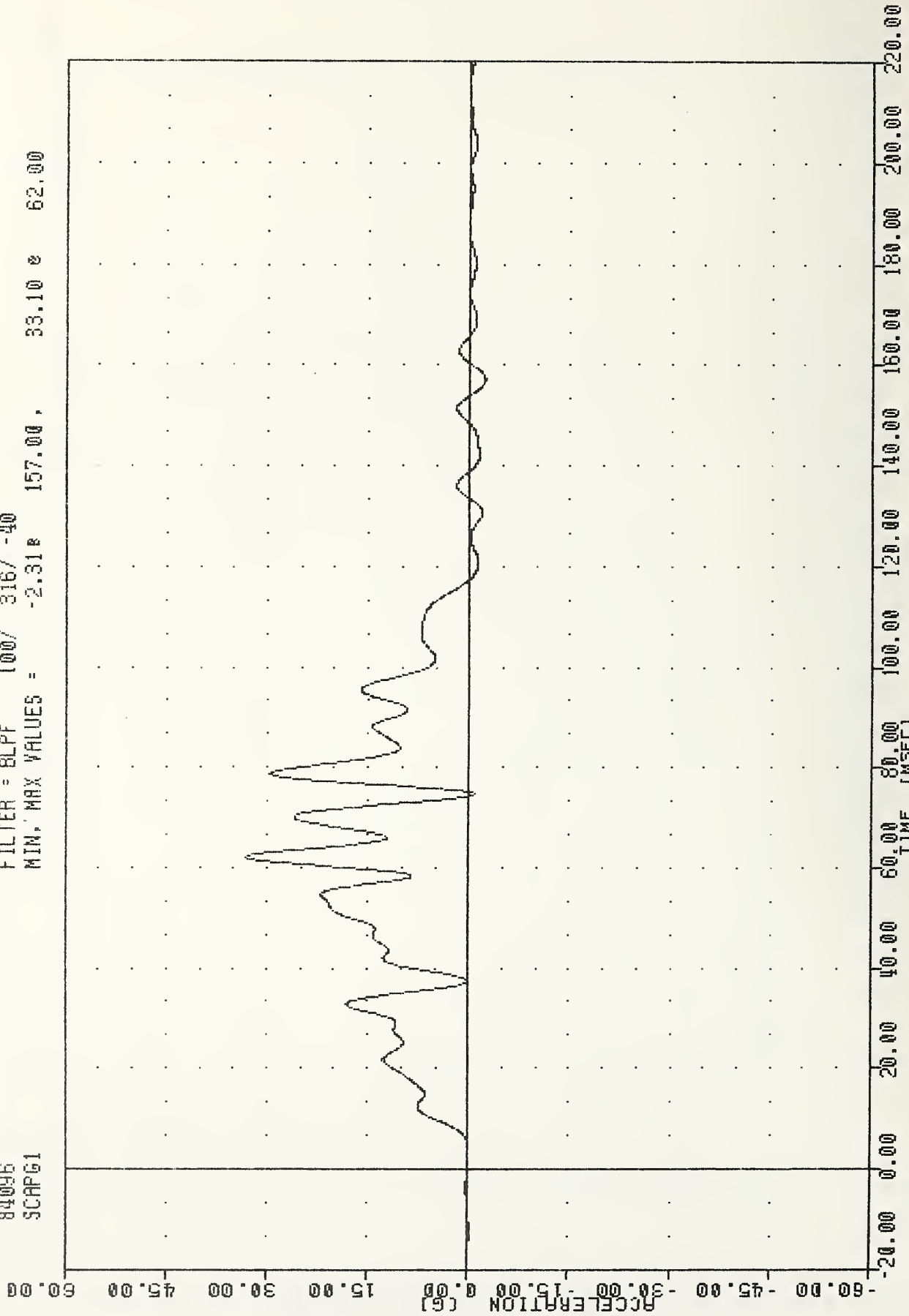


AIRBAG DEMONSTRATION PROGRAM
SLED POSITION SWITCH

VRTC RD583-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
SCAF61

PLOT DATE 5-APR-84 15:47:55

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -2.31E 157.00 33.10 E 62.00



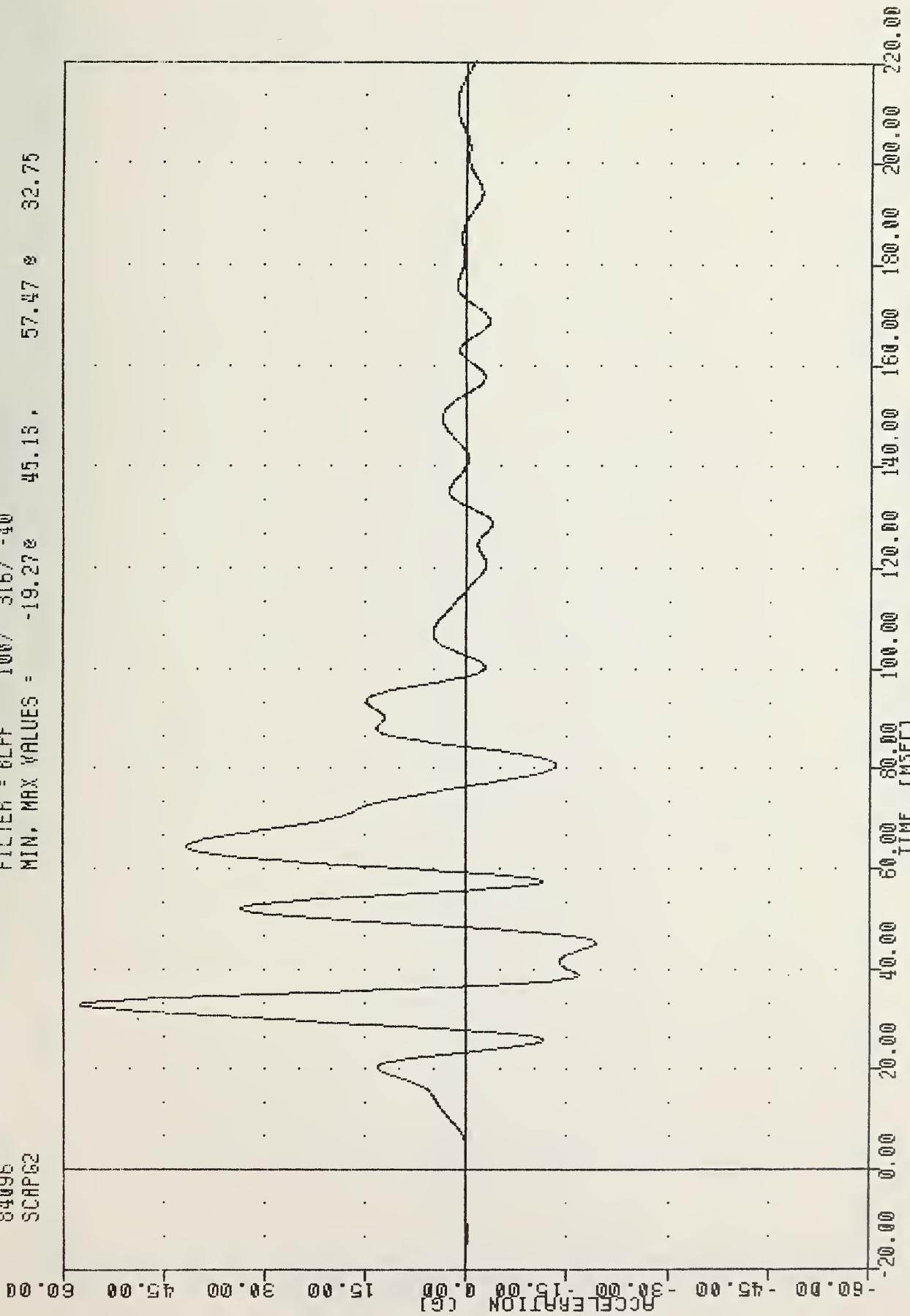
AIRBAG DEMONSTRATION PROGRAM
STEERING COLUMN ACCELERATION AP AXIS LOWER

VRTC RD583-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
SCAP62

PLOT DATE 5-APR-84 15:47:55

FILTER = 0LFF 100/ 316/ -40

MIN. MAX VALUES = -19.27e 45.15, 57.47 e 32.75



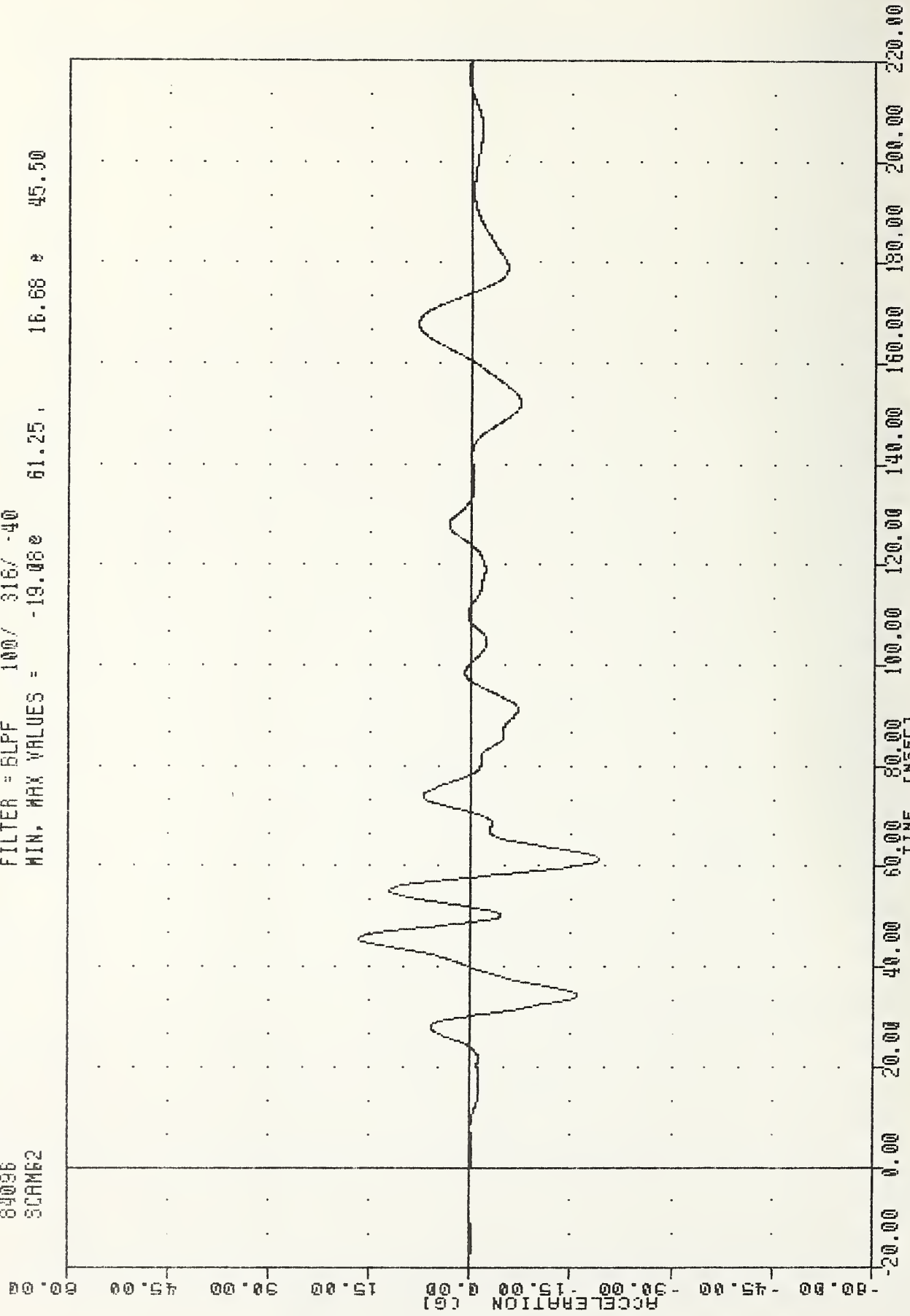
AIRBAG DEMONSTRATION PROGRAM
STEERING COLUMN ACCELERATION AP AXIS UPPER

WATC , RD583-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
SCAME2

PLOT DATE 5-APR-84 15:47:55

FILTER = 5LPF 100/ 316/ -40

MIN. MAX VALUES = -19.08e 61.25 , 16.68 e 45.50

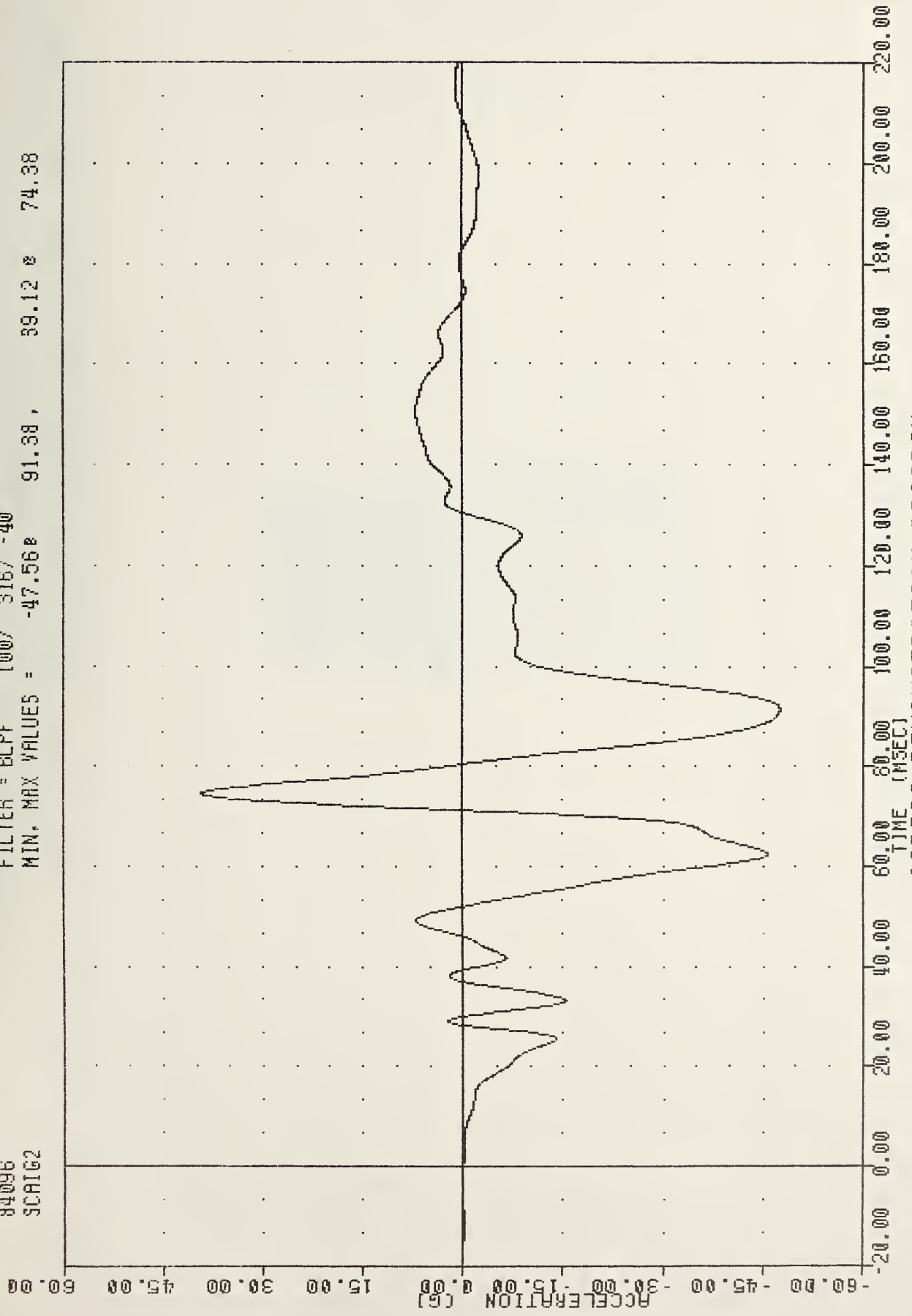


AIRBAG DEMONSTRATION PROGRAM
STEERING COLUMN ACCELERATION NL AXIS UPPER

VRTC , R0583-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
SCR1G2

PLOT DATE 5-APR-84 15:47:55

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -47.56g 91.38 , 39.12 g 74.38



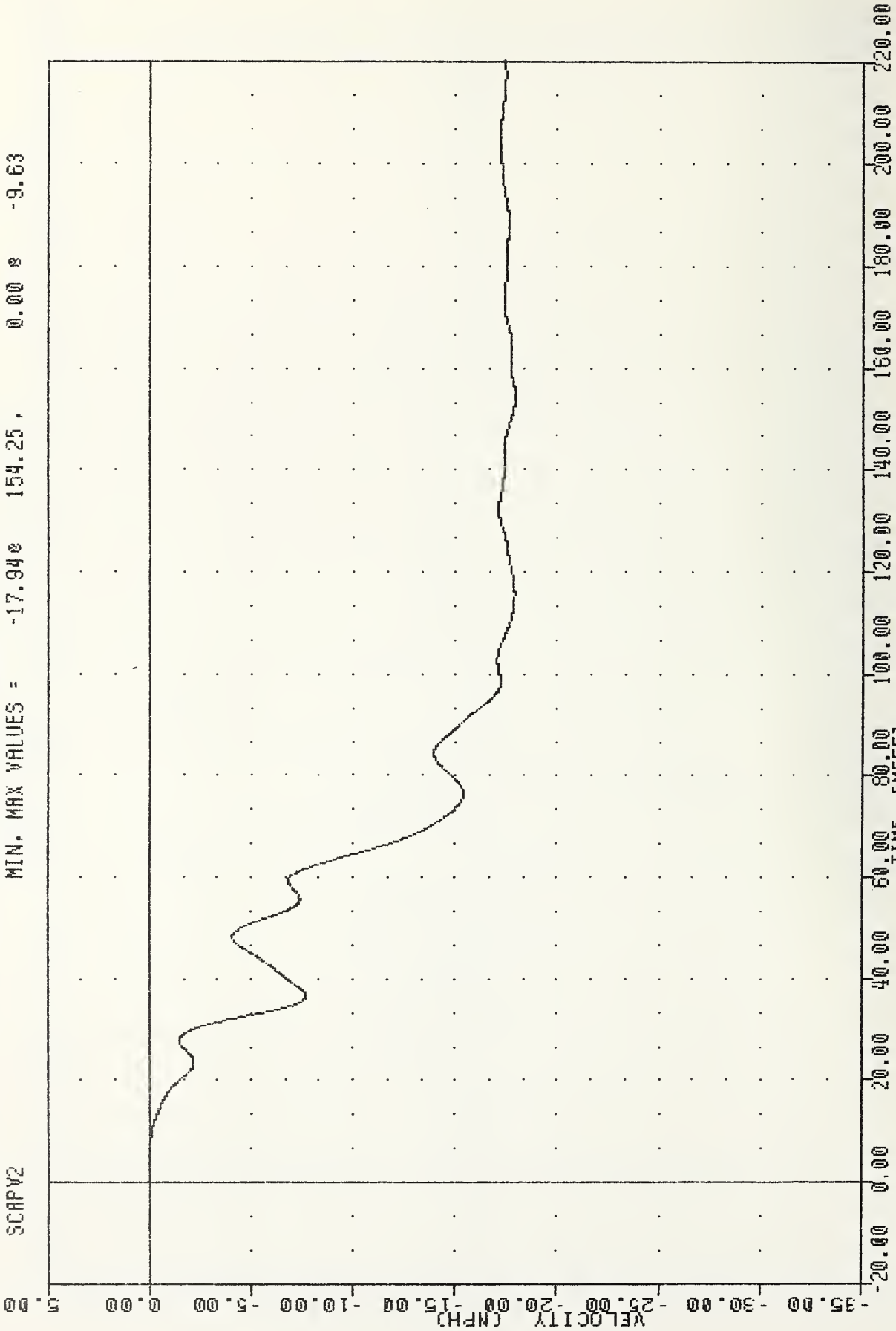
AIRBAG DEMONSTRATION PROGRAM
STEERING COLUMN ACCELERATION IS AXIS UPPER
-75-

VRTC , RD583-2-31
AIRBAG DEMONSTRATION PROGRAM
84096
SCAPV2

PLOT DATE 5-APR-84 15:12:17

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -17.94e 154.25 . 0.00 e -9.63



AIRBAG DEMONSTRATION PROGRAM
STEERING COLUMN VELOCITY AP AXIS UPPER

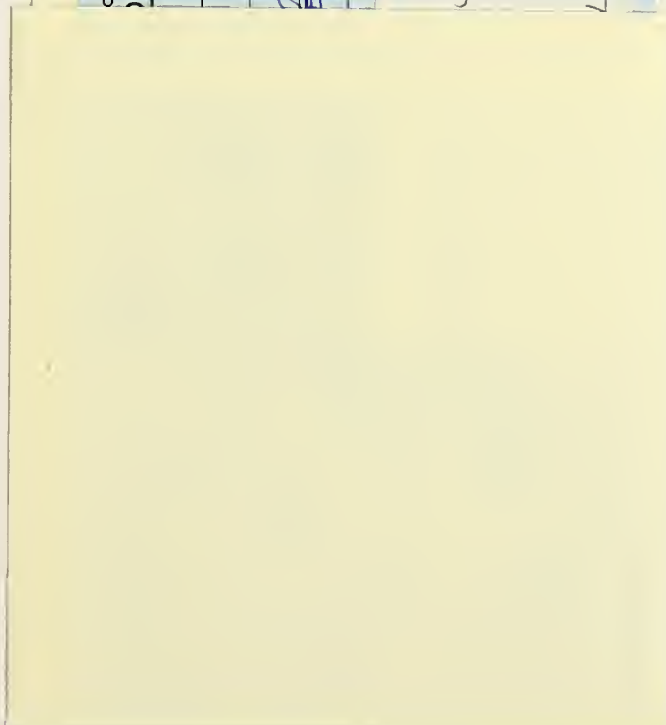
TL 242 .E87

Esser, R.

Airbag demo

Yei ~~Esser~~

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