

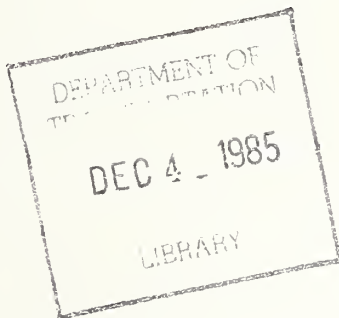
TL
242
.S872
1985



Department
of Transportation
National Highway
Traffic Safety
Administration

DOT HS 806 796

Test Report



June 1984

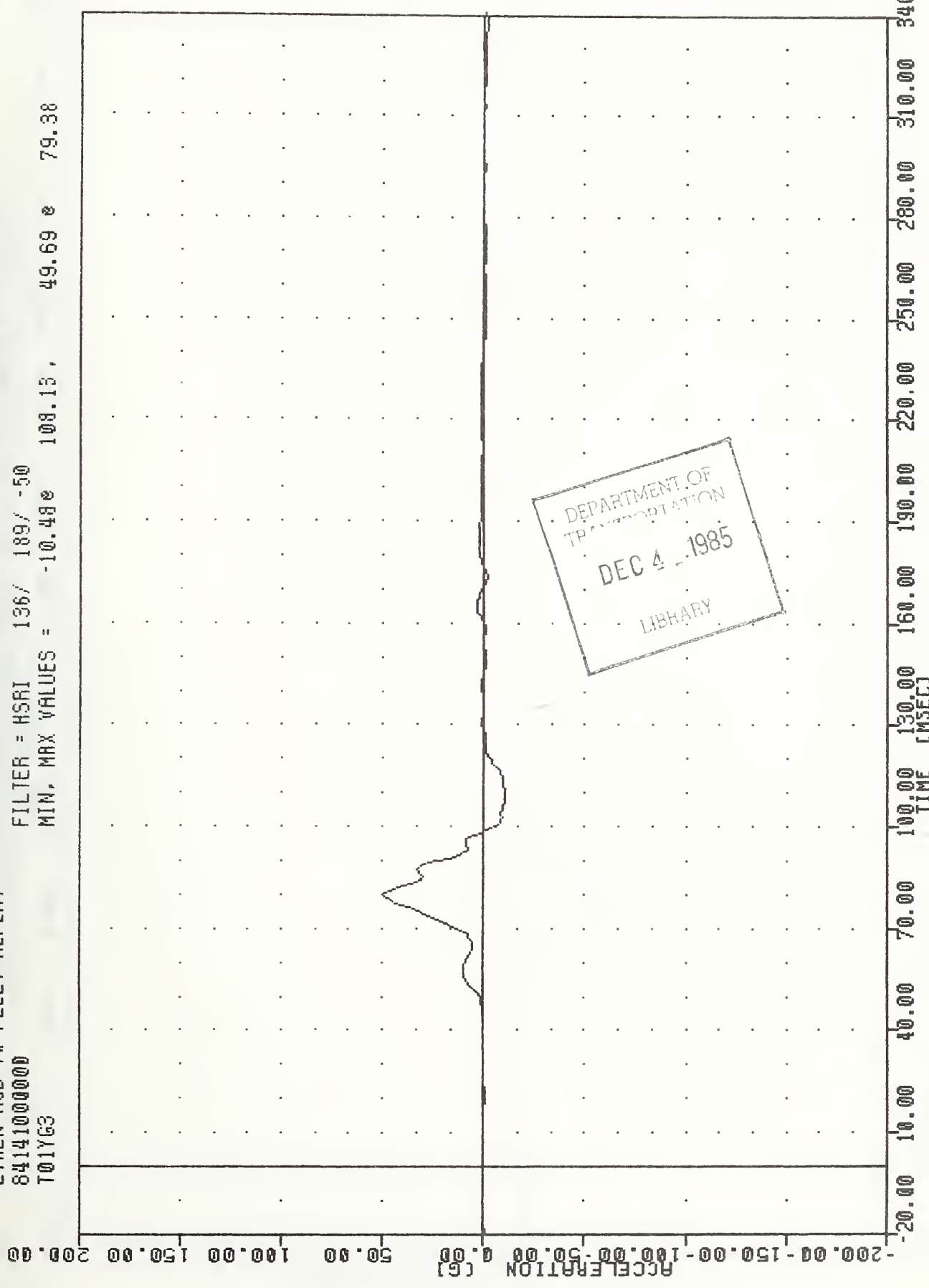
Evaluation of NHTSA Modified Volkswagen Rabbits MDB-to-Car Side
Impact Test of a 19° Crabbed Moving Deformable Barrier to a
1977 Volkswagen Rabbit at 45.8 MPH

TL
242
5872
1985

Stultz, J.
Evaluation of NHTSA modified Volkswagen Rabbit MDS-t
impact test of a 19 crashed moving deformable barrier to a 1977
Volkswagen Rabbit at 50 mph

PLOT DATE 5-JUN-84 14:03:51
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -10.48e 108.13e

TRC 840529
EVALN MOD YW FLEET REPEAT
84141000000
T01Y63

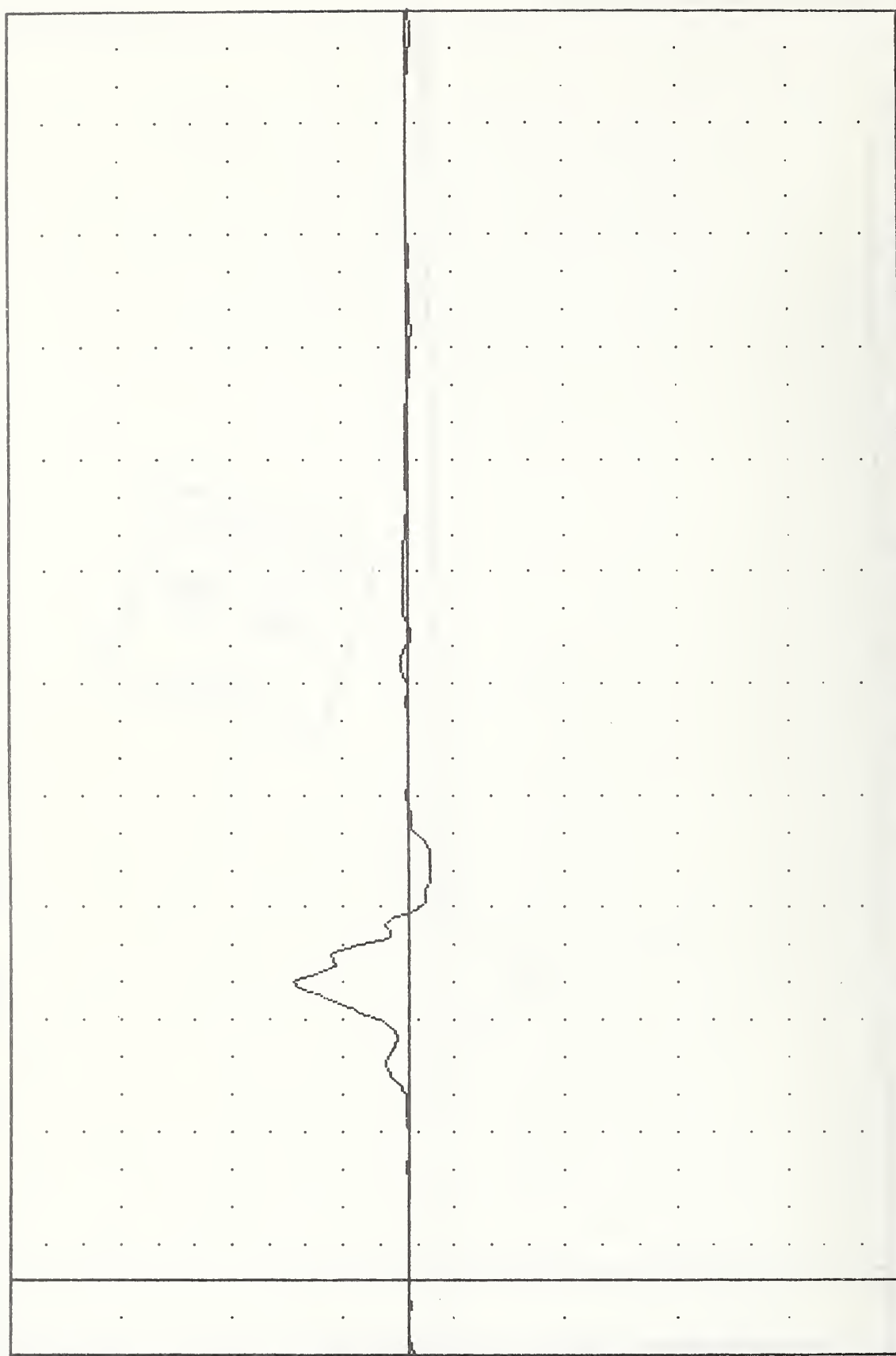


DEPARTMENT OF
TRANSPORTATION
DEC 4 1985
LIBRARY

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE ACCELERATION Y AXIS

TAC , 840529 PLOT DATE 5-JUN-84 14:03:51
 EVALN MOD VW FLEET REPEAT
 84141000000
 T01Y5C
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -9.41e 108.13 , 51.93 e 79.38

ACCELERATION (G)
 -220.00 -170.00 -120.00 -70.00 -20.00
 00.00 50.00 100.00 150.00

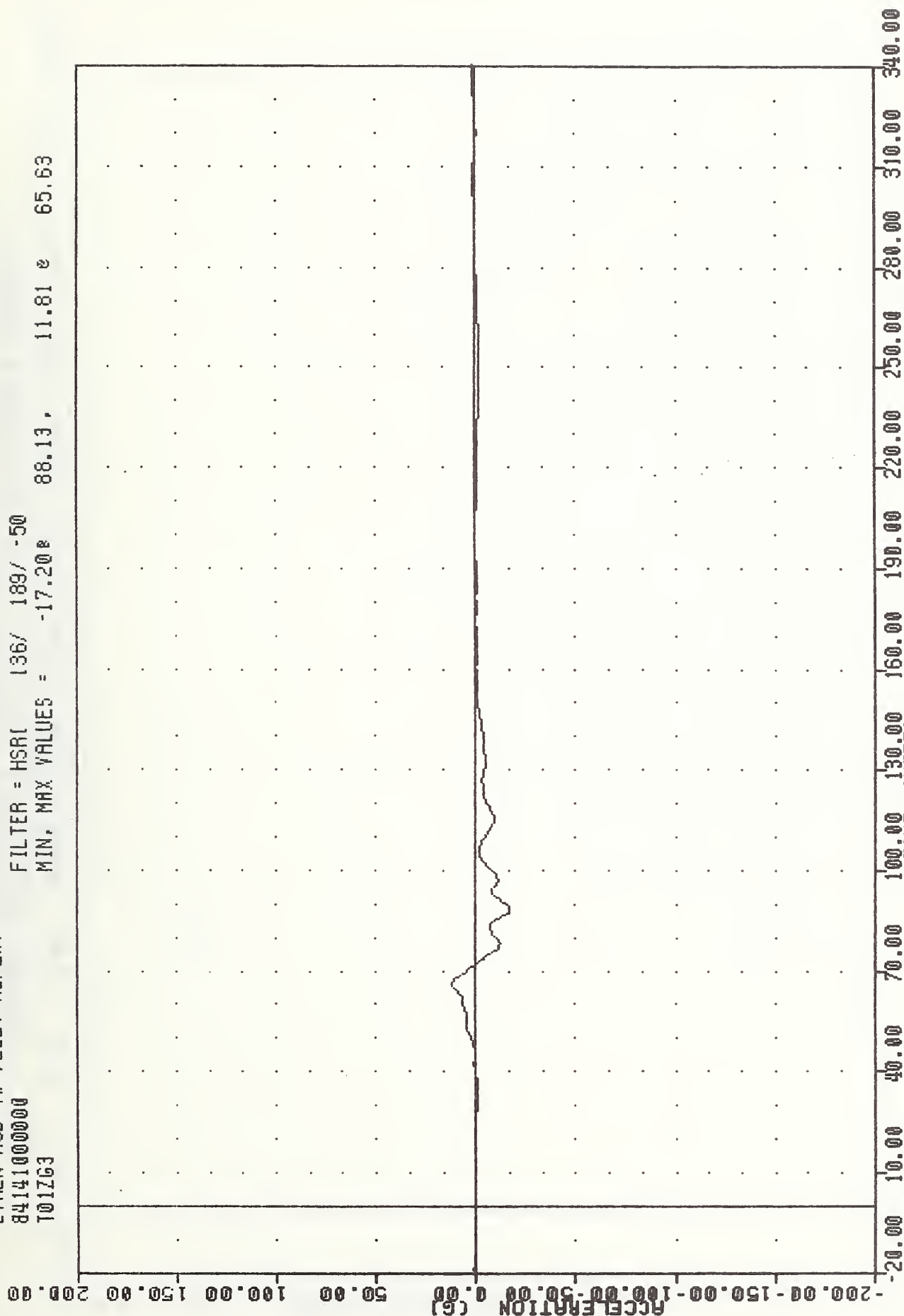


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE ACCELERATION -2 Y AXIS

TRC , 840529
EVALN MOD VW FLEET REPERT
84141000000
T01Z63

PLOT DATE 5-JUN-84 14:03:51

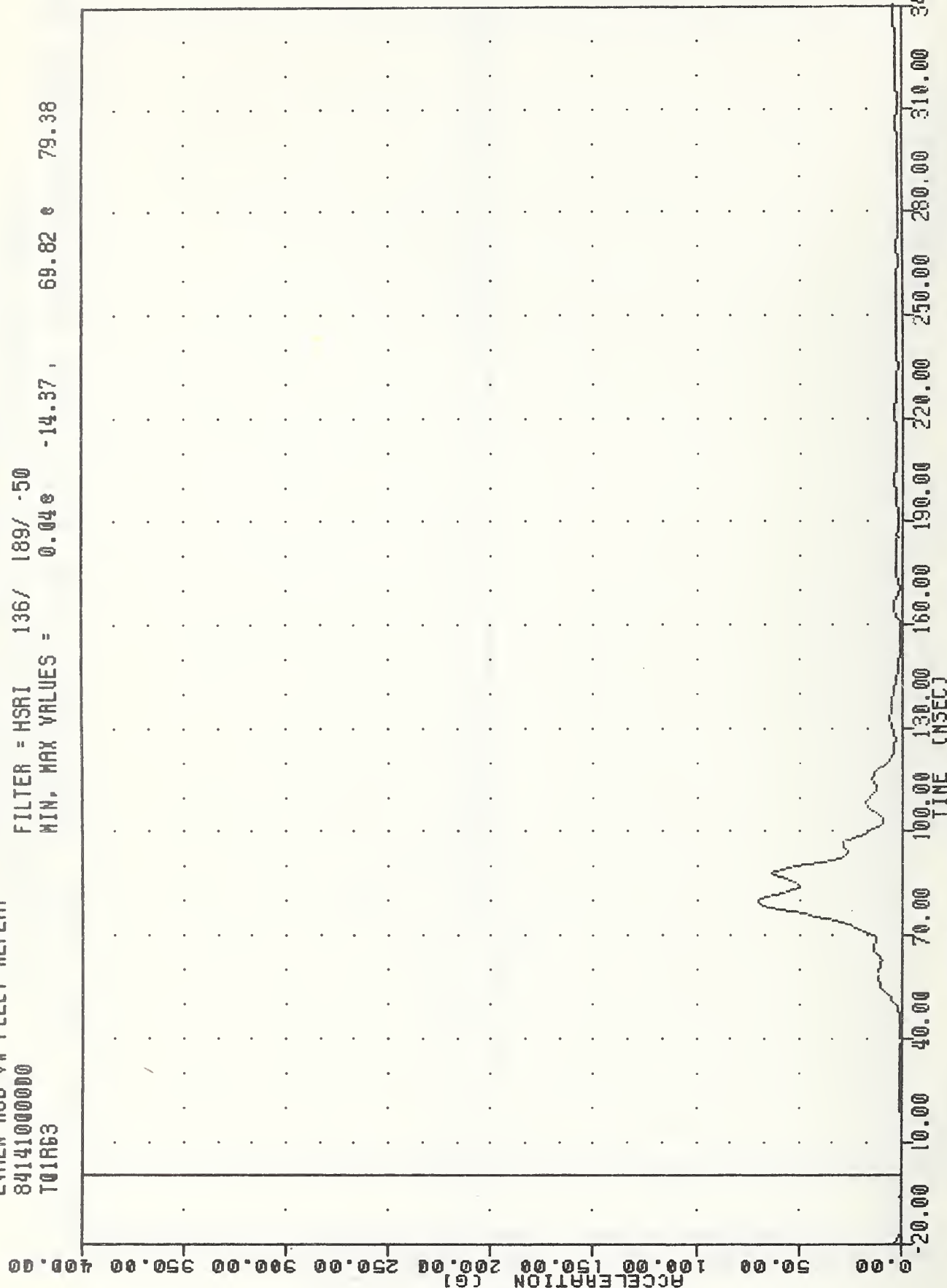
FILTER = HSR1 136/ 189/ -50
MIN. MAX VALUES = -17.208 88.13 11.81 65.63



TAC , 840529
EVALN MOD V4 FLEET REPEAT
84141000000
T01R63

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = 0.04e -14.37 , 69.82 e 79.38

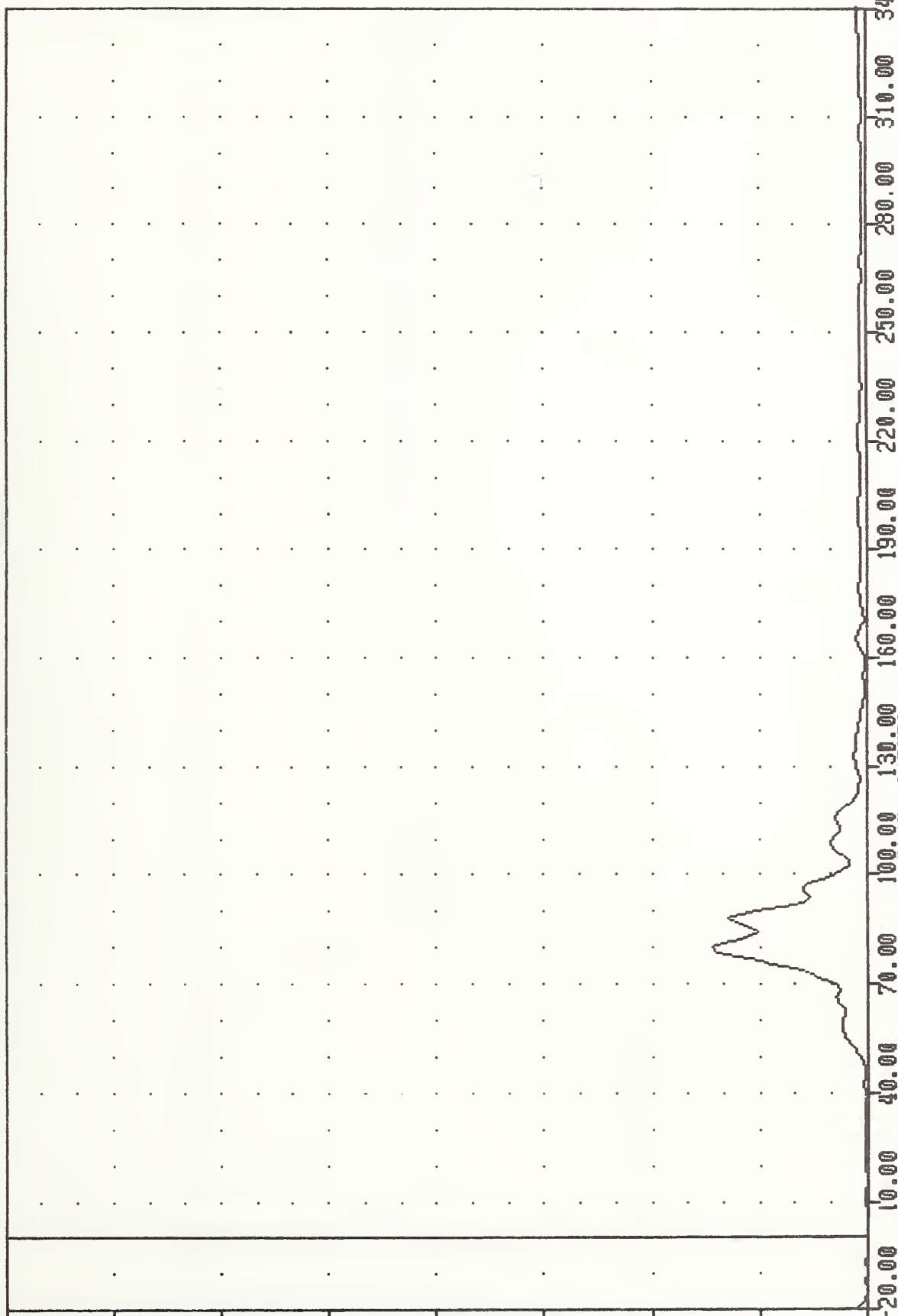


TAC
EVALN NOD VW FLEET REPEAT
84141000000
T01R63

PLOT DATE 5-JUN-84 14:05:09

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.03e 4.38 , 71.43 e 79.38

ACCELERATION (G)

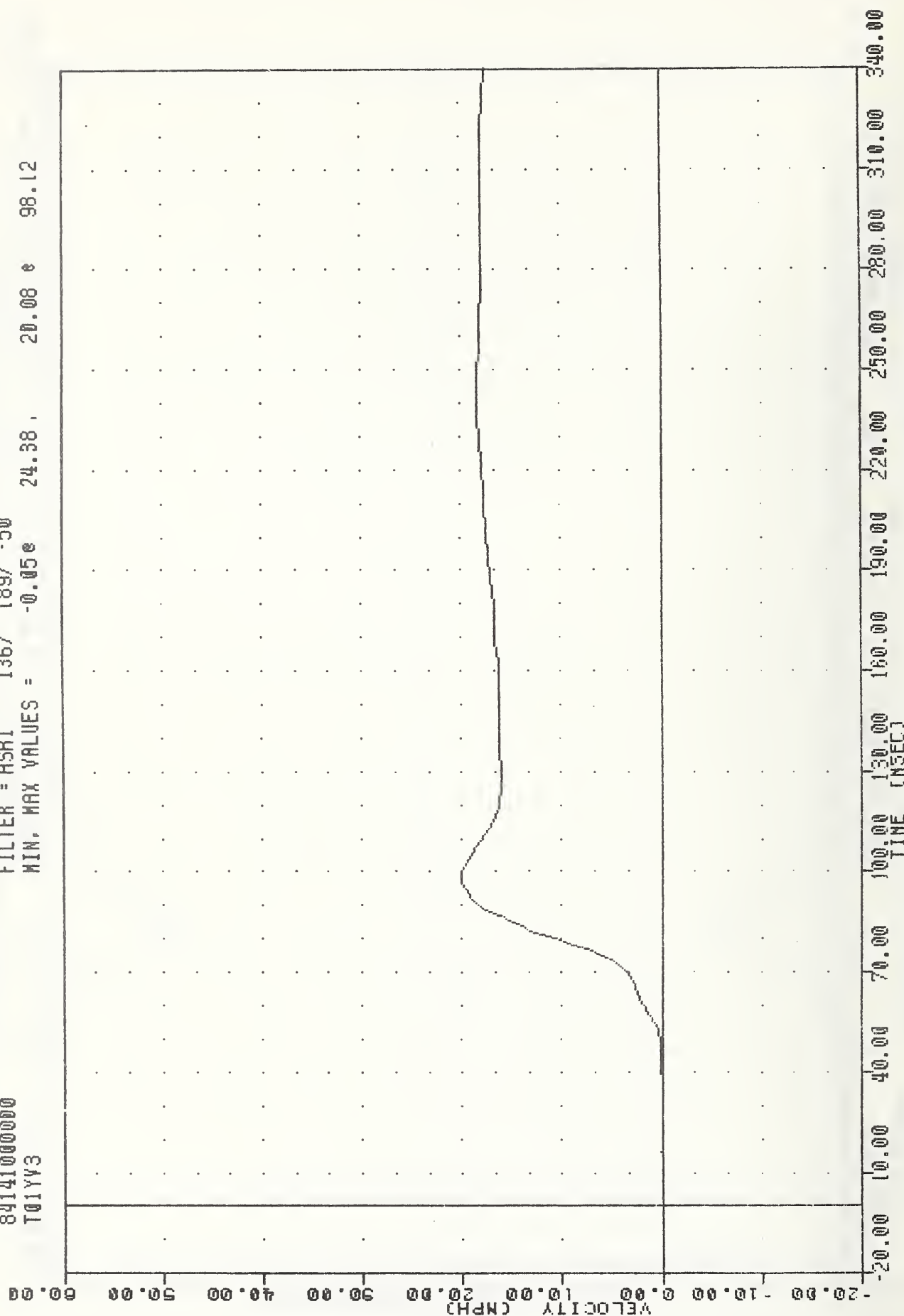


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE RESULTANT USING T01YGC

TRC , 840529
EVALN MOD VM FLEET REPEAT
84141000000
T01YV3

PLOT DATE 5-JUN-84 14:05:35

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -0.05e 24.38, 20.08 e 98.12



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T01YV3

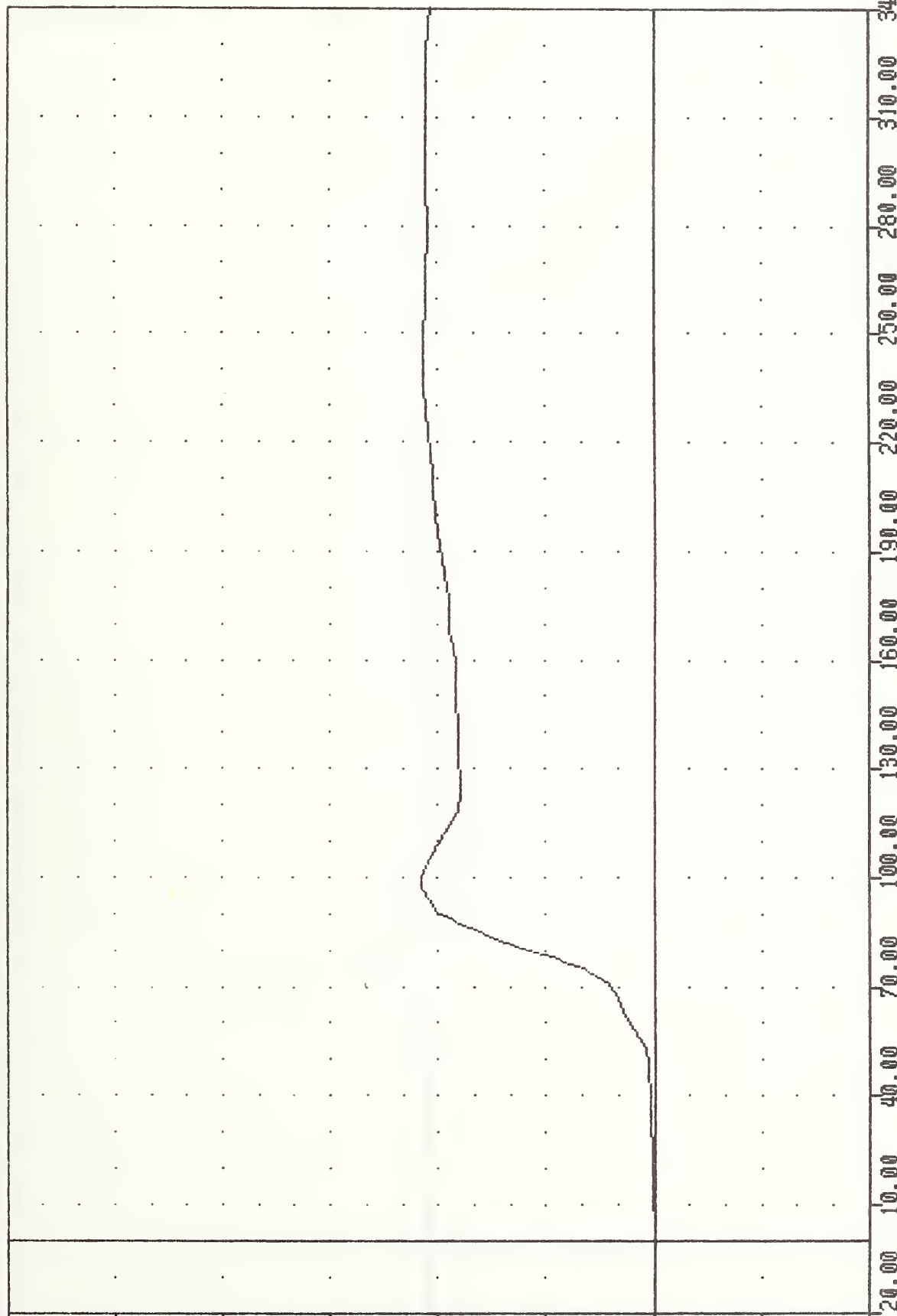
TRC , 840529
EVALN MOD VW FLEET REPERT
84141000000
T01YVC

PLOT DATE 5-JUN-84 14:05:35

FILTER = HSR1 136/ 189/ -50

MIN, MAX VALUES = -0.06e -16.87, 21.62 e 98.12

VELOCITY (MPH)

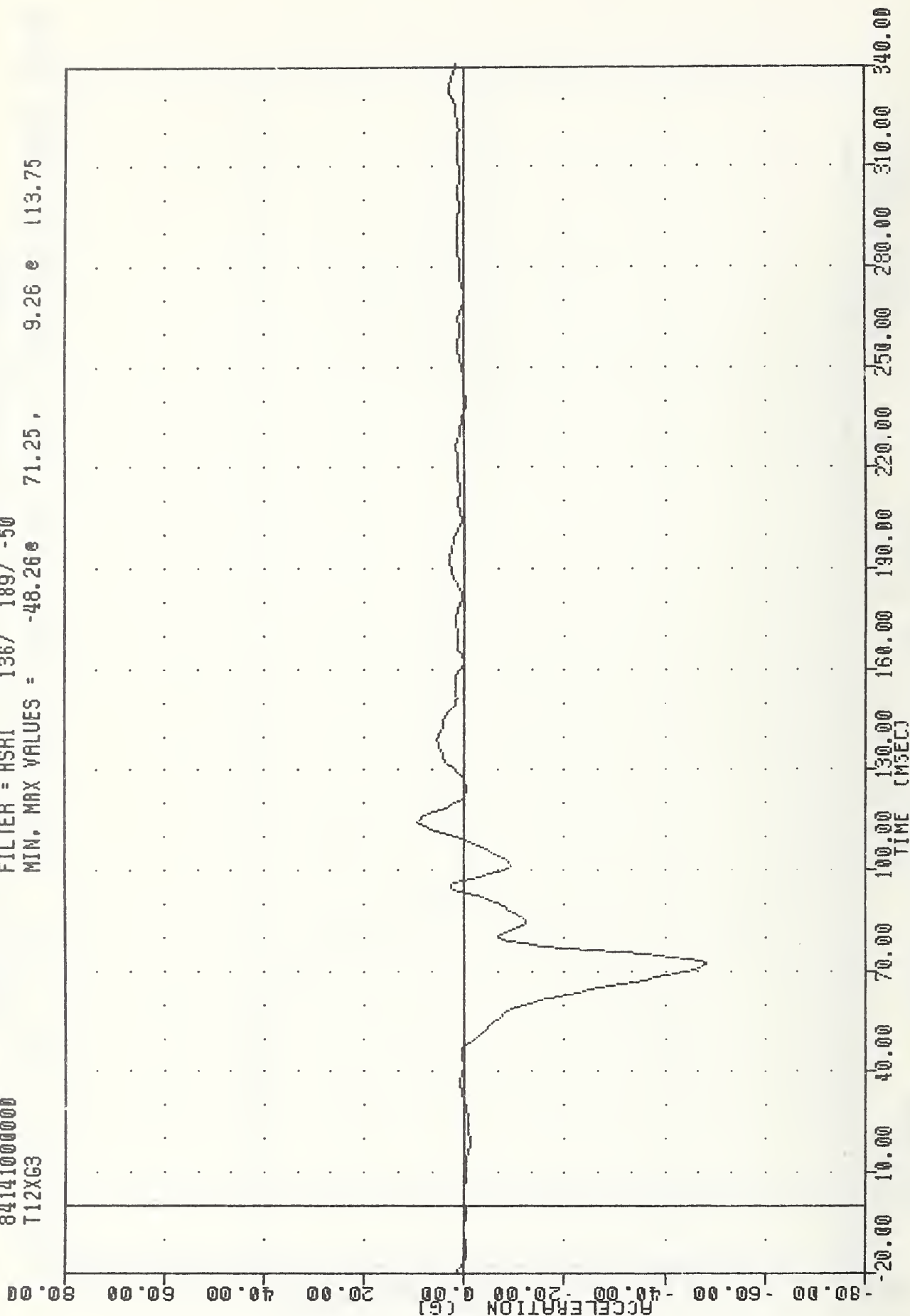


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T01YGC

TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
T12XG3

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -48.26 71.25 , 9.26 e 113.75

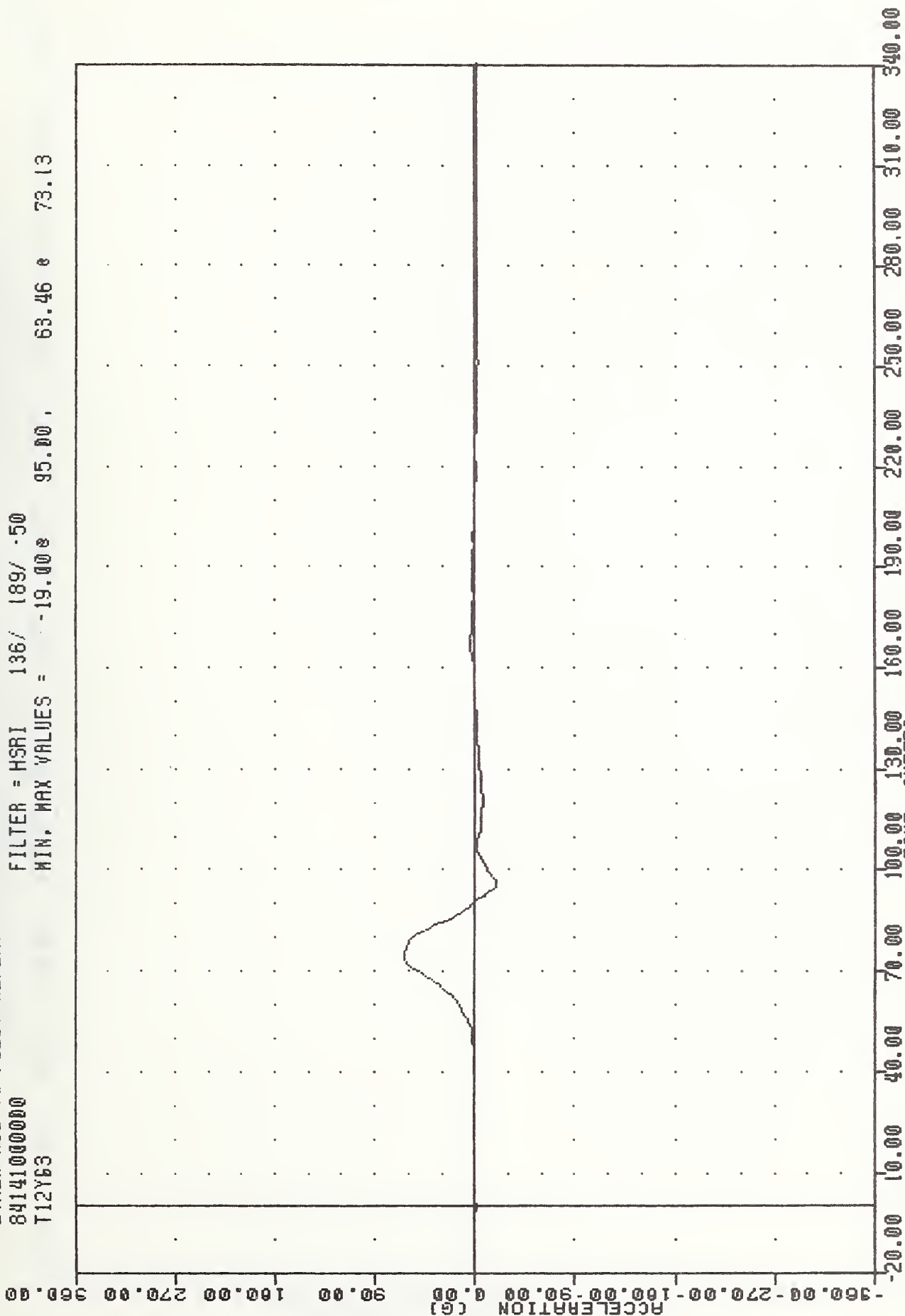


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE ACCELERATION X AXIS

TAC
EVALN MOD VW FLEET REPEAT
84141000000
T12Y63

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -19.00 95.00 63.46 73.13



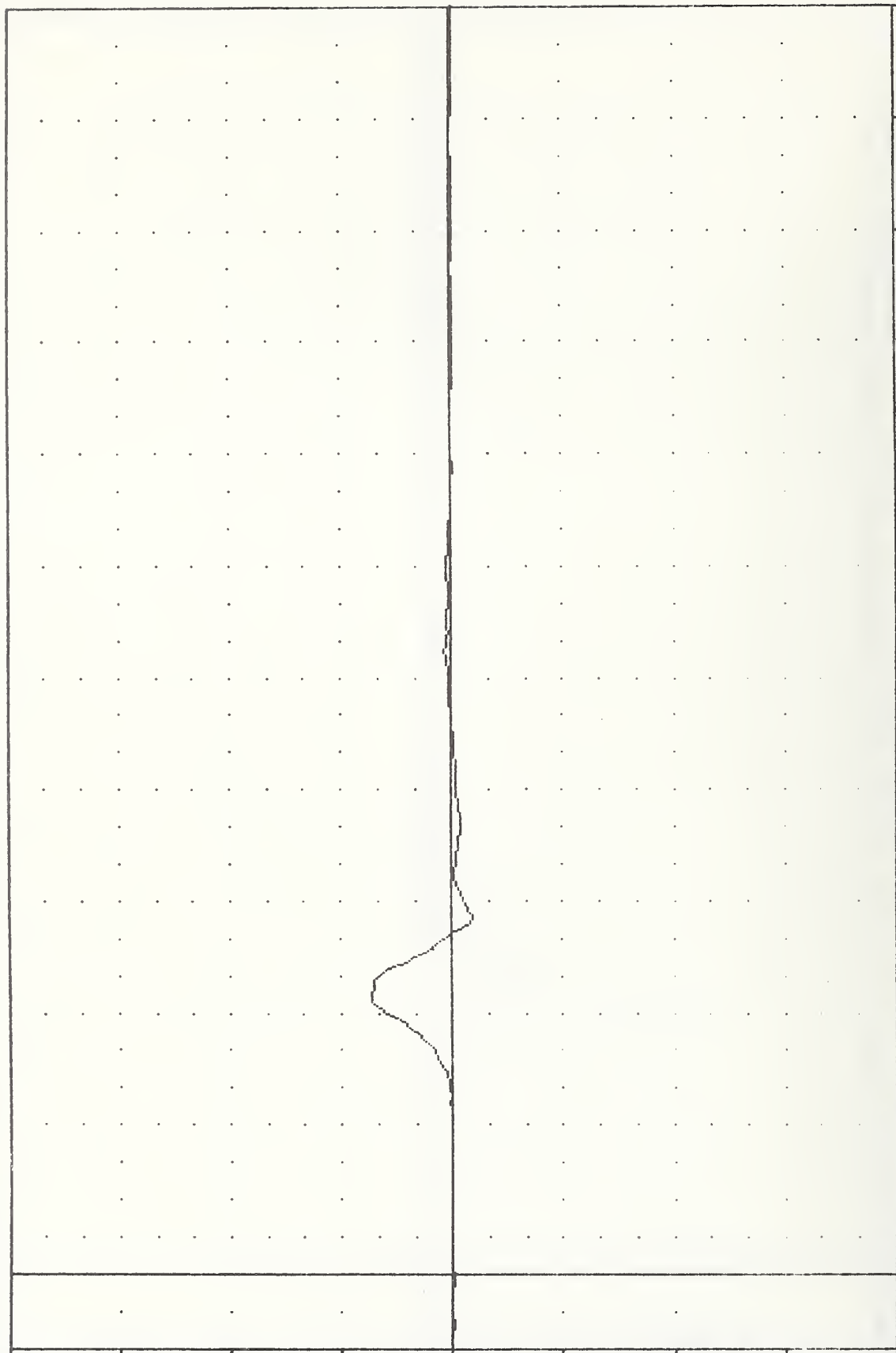
TRC , 840529
 EVALN MOD VW FLEET REPEAT
 84141000000
 T12YGC

PLUI DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -16.47 95.00 65.16 73.13

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE ACCELERATION -2 Y AXIS

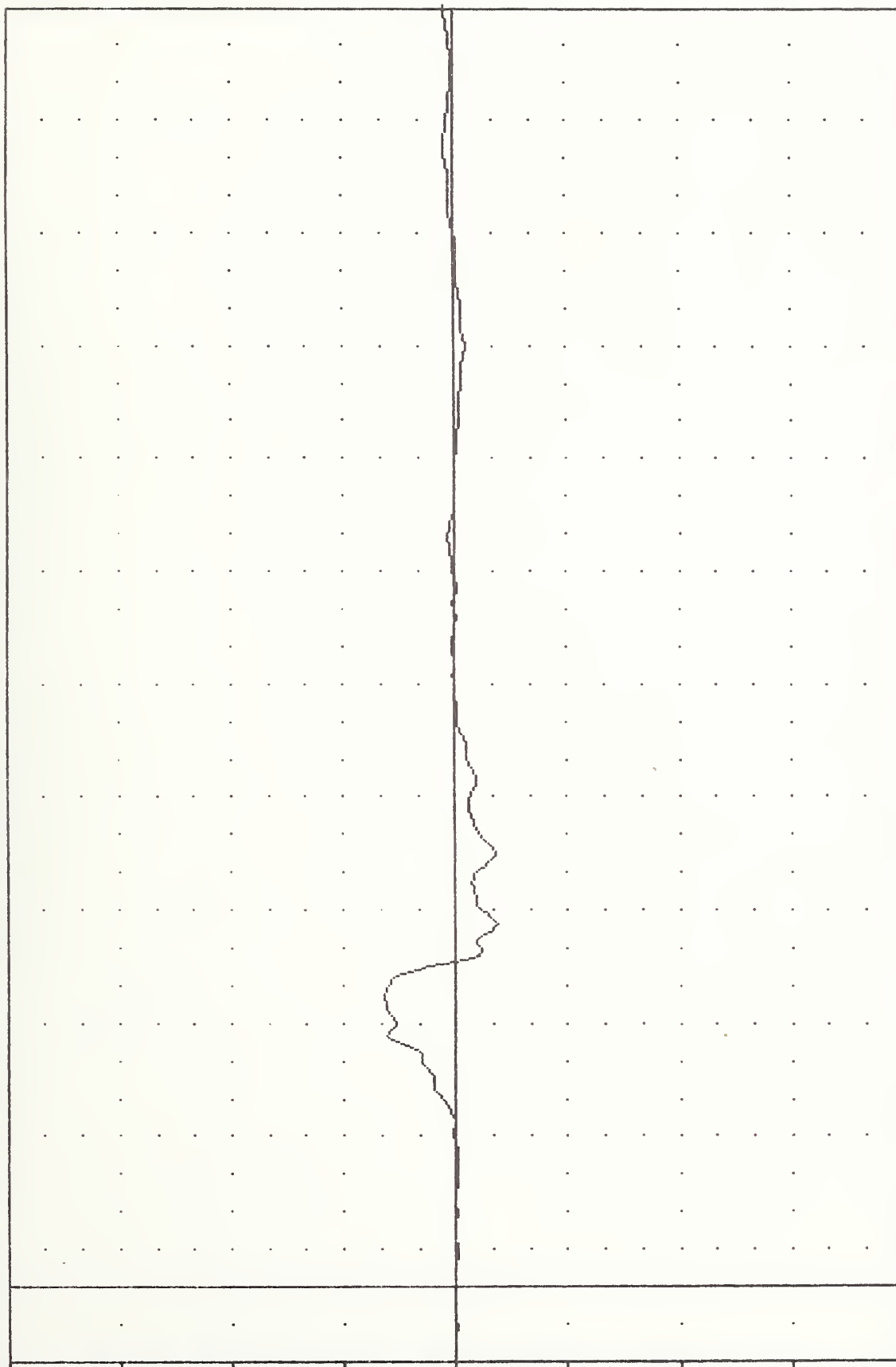
TRC
 EVALN MOD VW FLEET REPEAT
 84141000000
 T12ZG3

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -7.38e 95.63, 12.69 e 76.25

ACCELERATION (G)



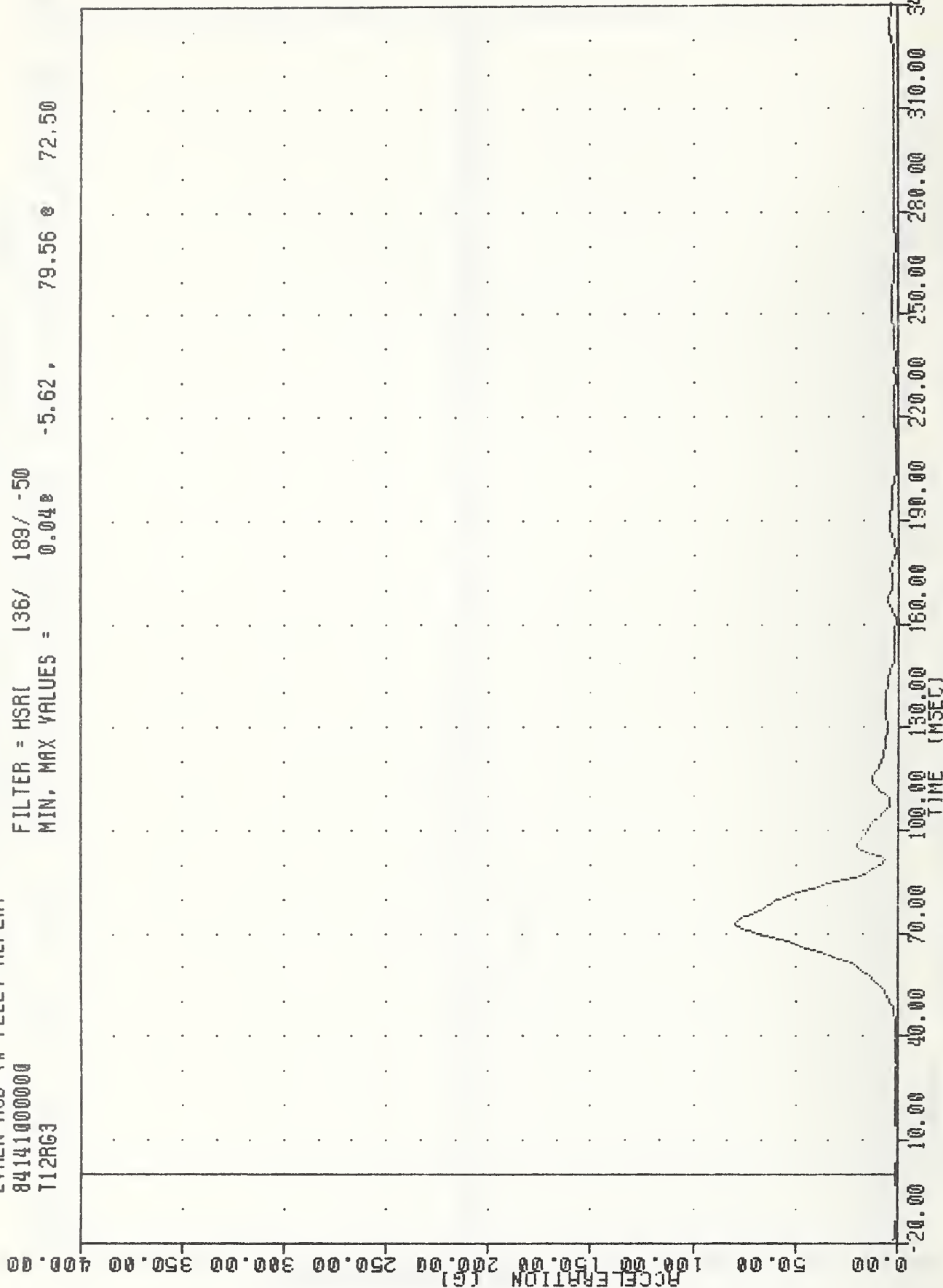
TIME CMSEC

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE ACCELERATION Z AXIS

TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
712RG3

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSR1 136/ 189/ -50
MIN. MAX VALUES = 0.048 -5.62, 79.56 72.50

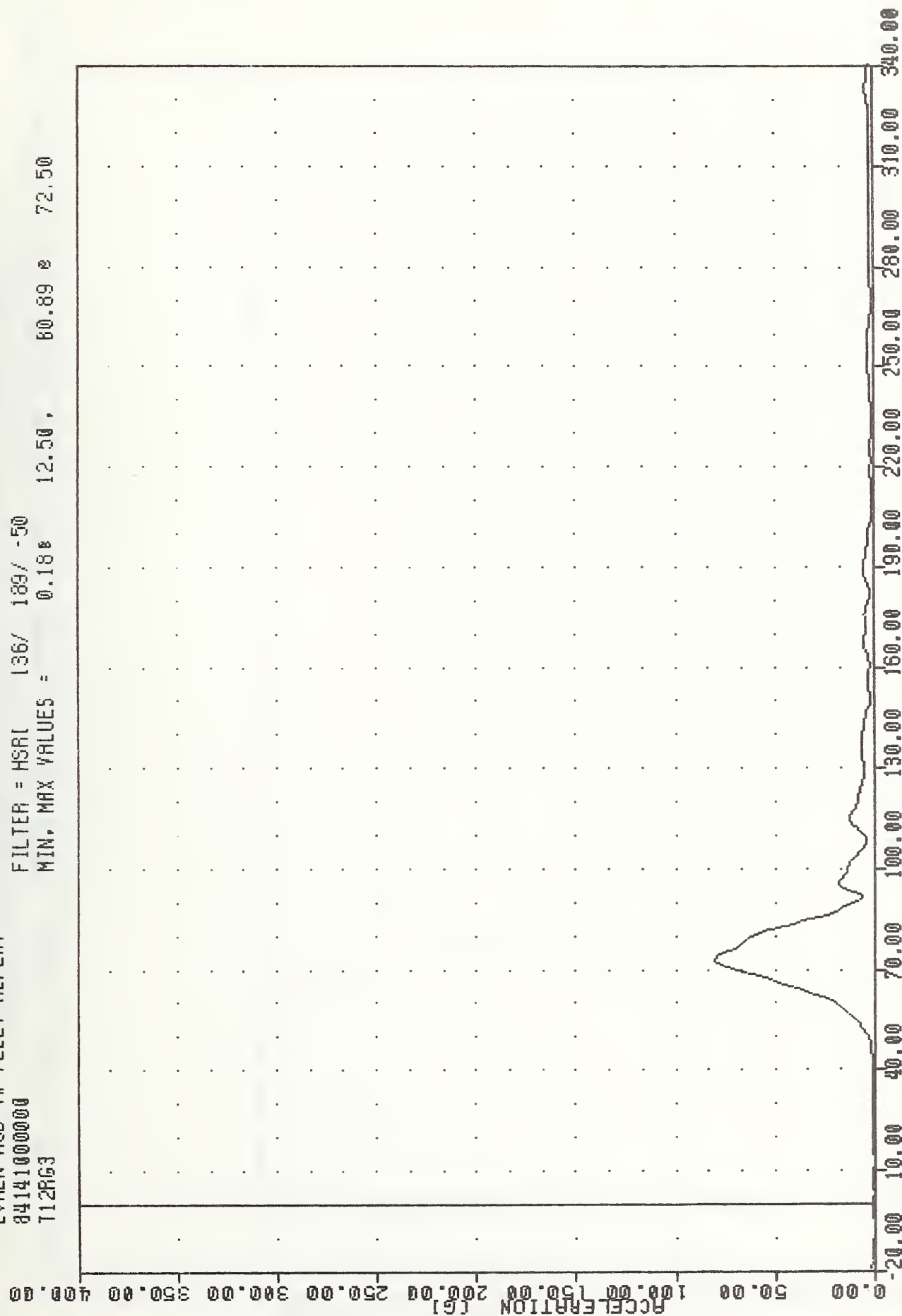


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE RESULTANT

TRC
EVALN MOD VW FLEET REPERT
84141000000
T12R63

PLOT DATE 5-JUN-84 14:05:09

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.188 12.50 60.89 72.50

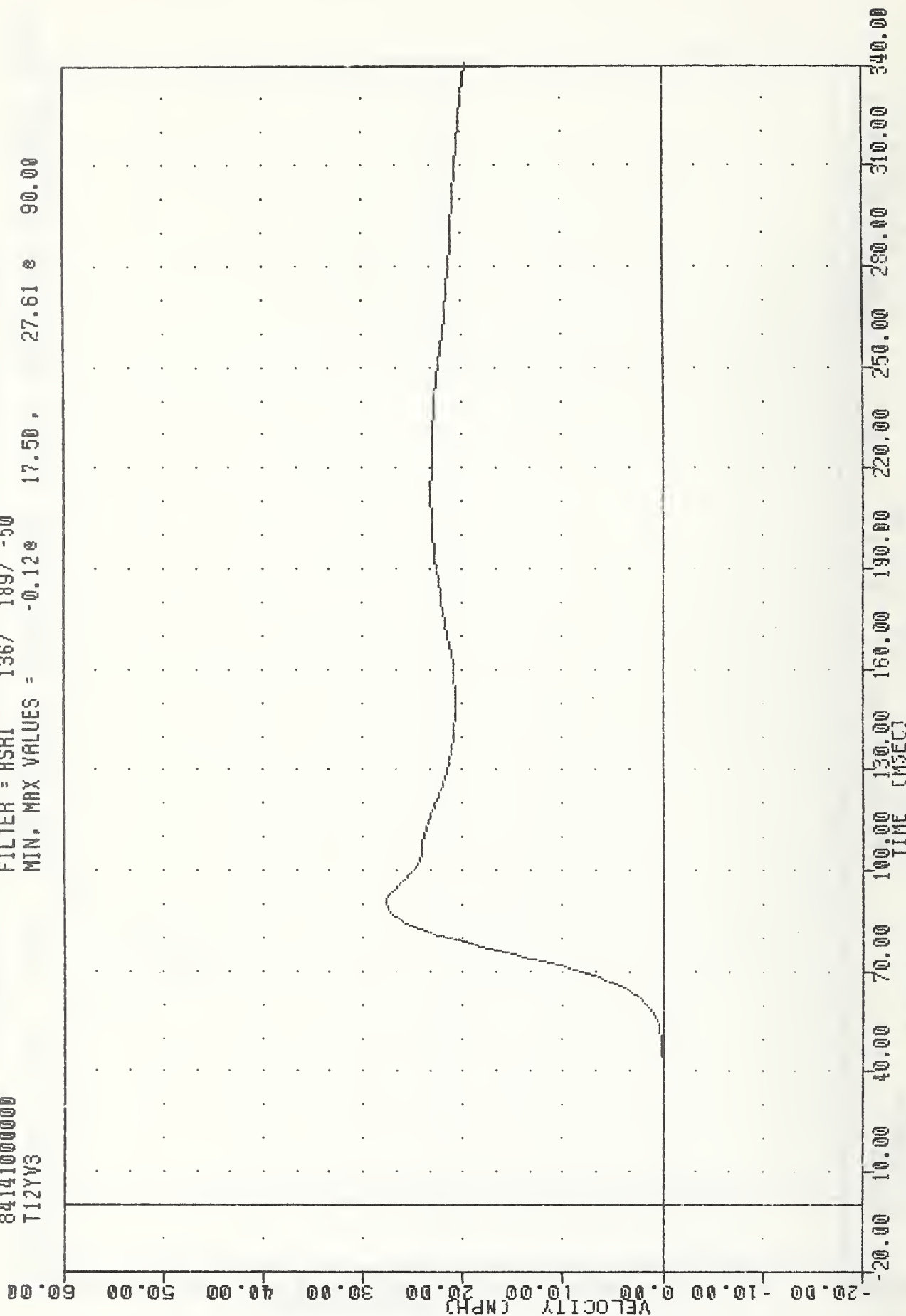


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE RESULTANT USING T12Y6C

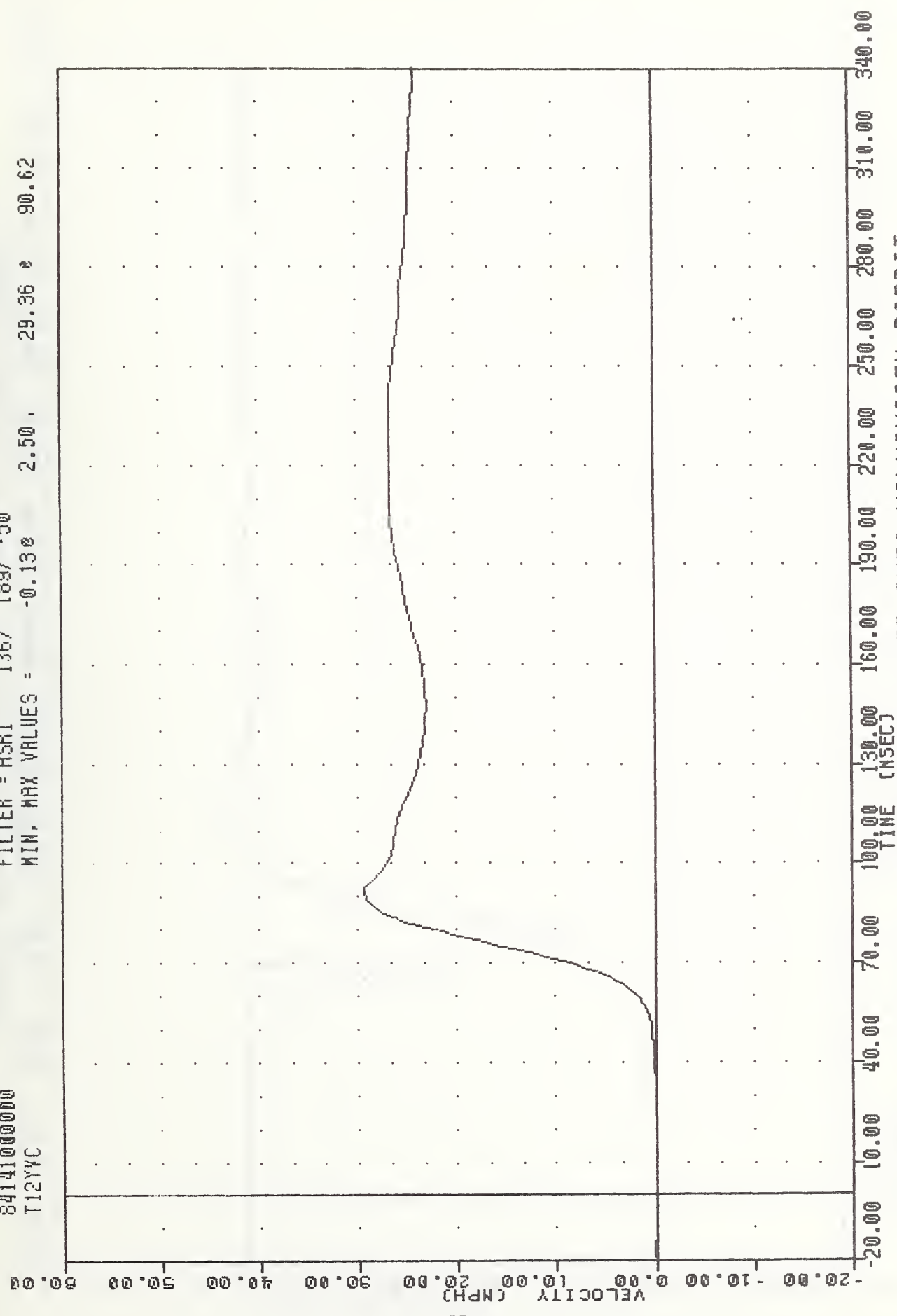
TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
T12YV3

PLOT DATE 5-JUN-84 14:05:35

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -0.12 17.50, 27.61 90.00



TAC 840529
 EVALM MOD V# FLEET REPEAT
 84141000000
 T12YVC
 PLOT DATE 5-JUN-84 14:05:35
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.130 2.50 , 29.36 e 90.62



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YGC

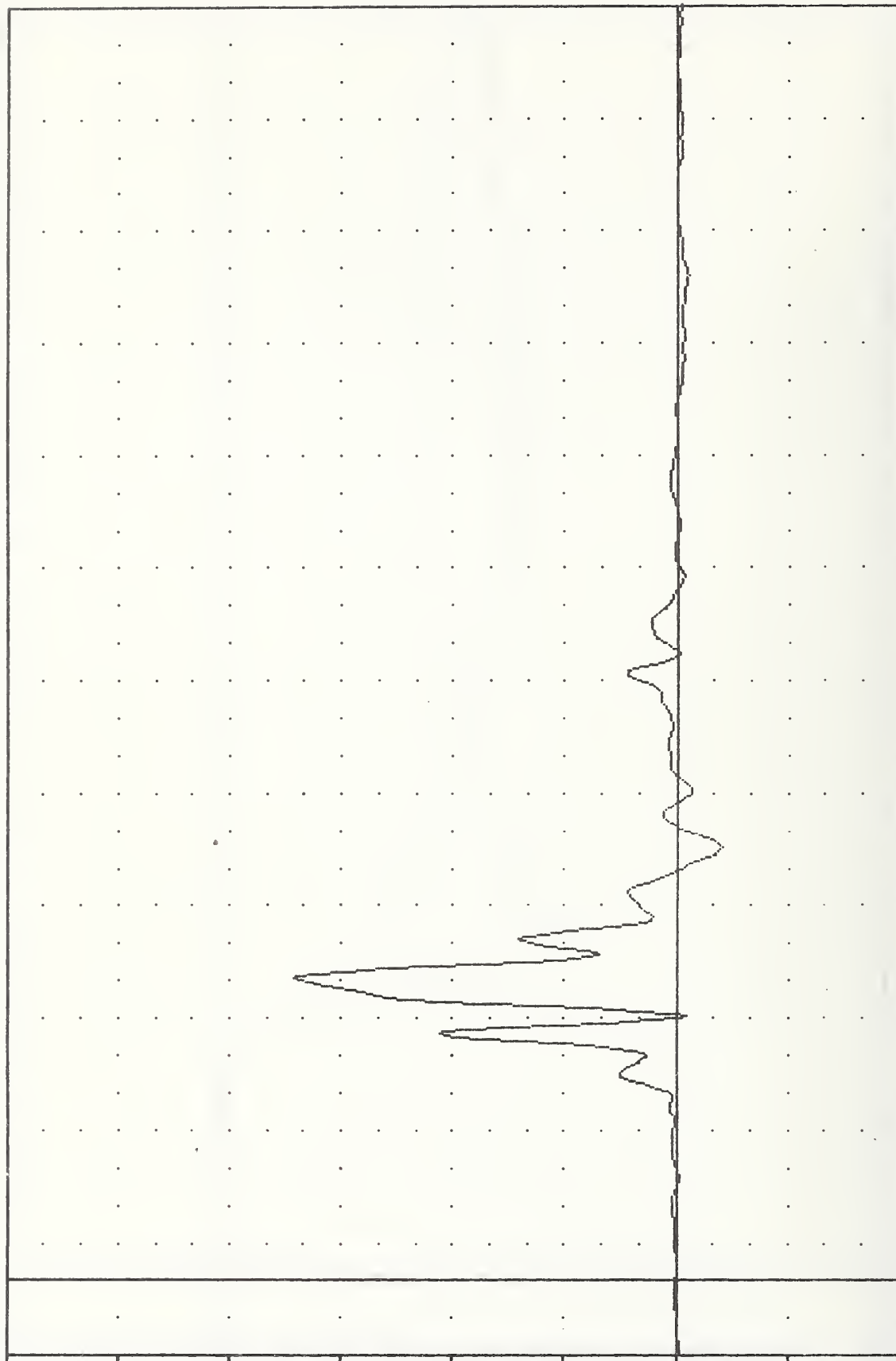
TRC , 840529
EVALN MOD VV FLEET REPEAT
84141000000
LURY63

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ .50

MIN, MAX VALUES = -8.08e 115.00 , 68.56 e 80.00

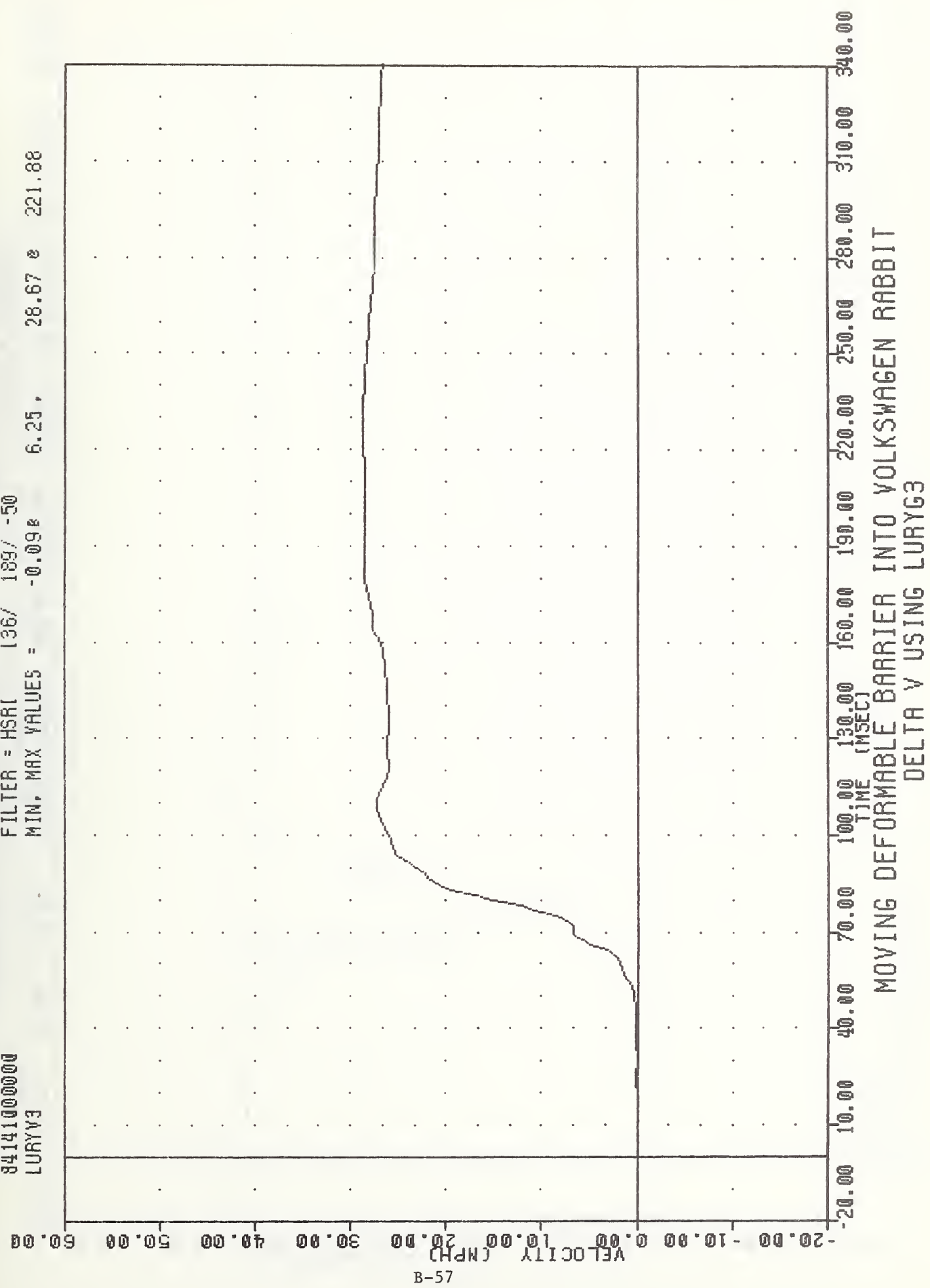
ACCELERATION (G)



-40.00 -20.00 0.00 20.00 40.00 60.00 80.00 100.00 120.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT UPPER RIB ACCELERATION Y AXIS

TRC , 840529
 EVALN MOD VW FLEET REPERT
 84141000000
 LURYV3
 PLOT DATE 5-JUN-84 14:05:35
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.098 6.25 , 28.67 e 221.88



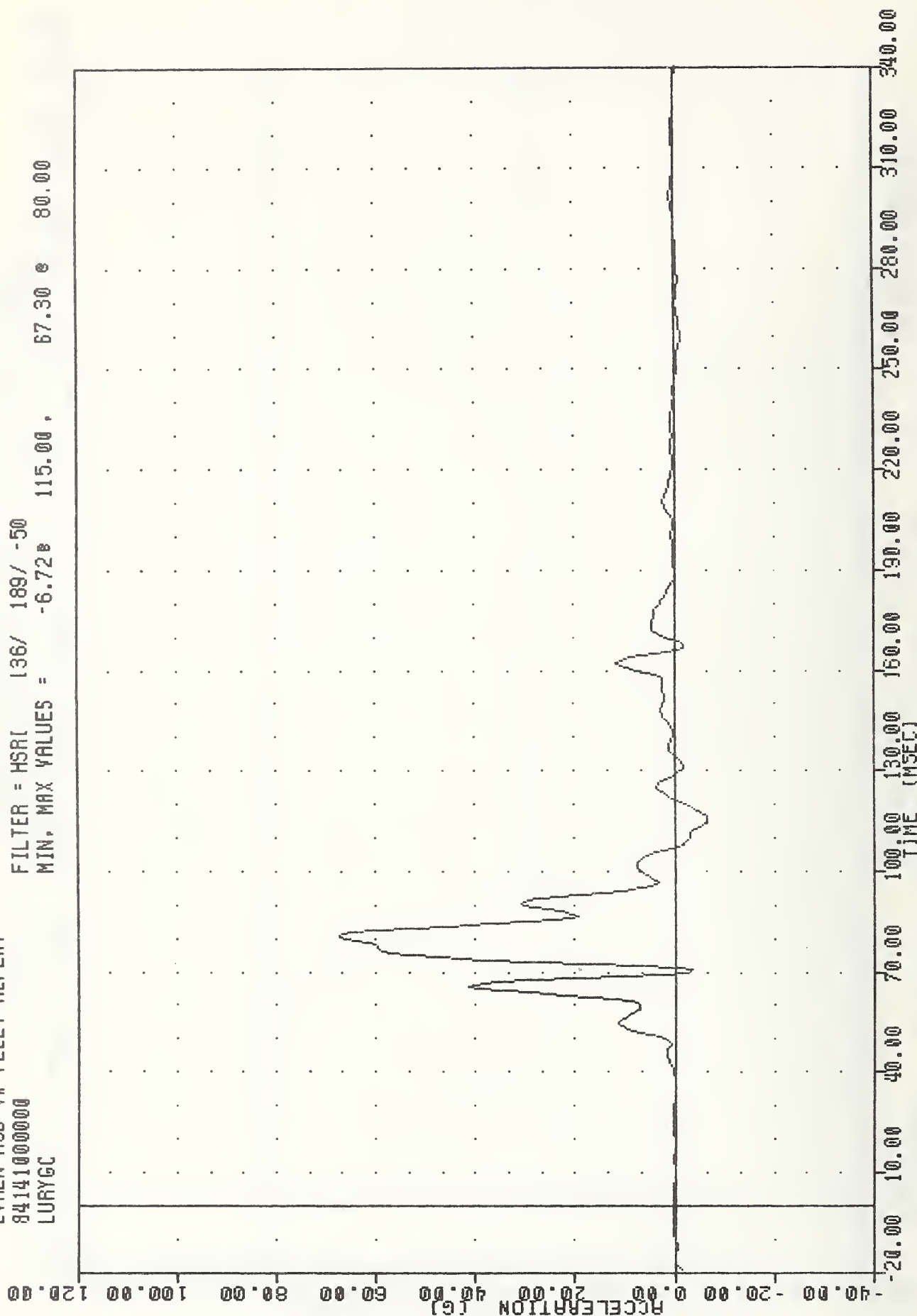
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LURYG3

TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
LURYGC

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSR(136/ 189/ -50

MIN, MAX VALUES = -6.728 115.00, 67.30 80.00



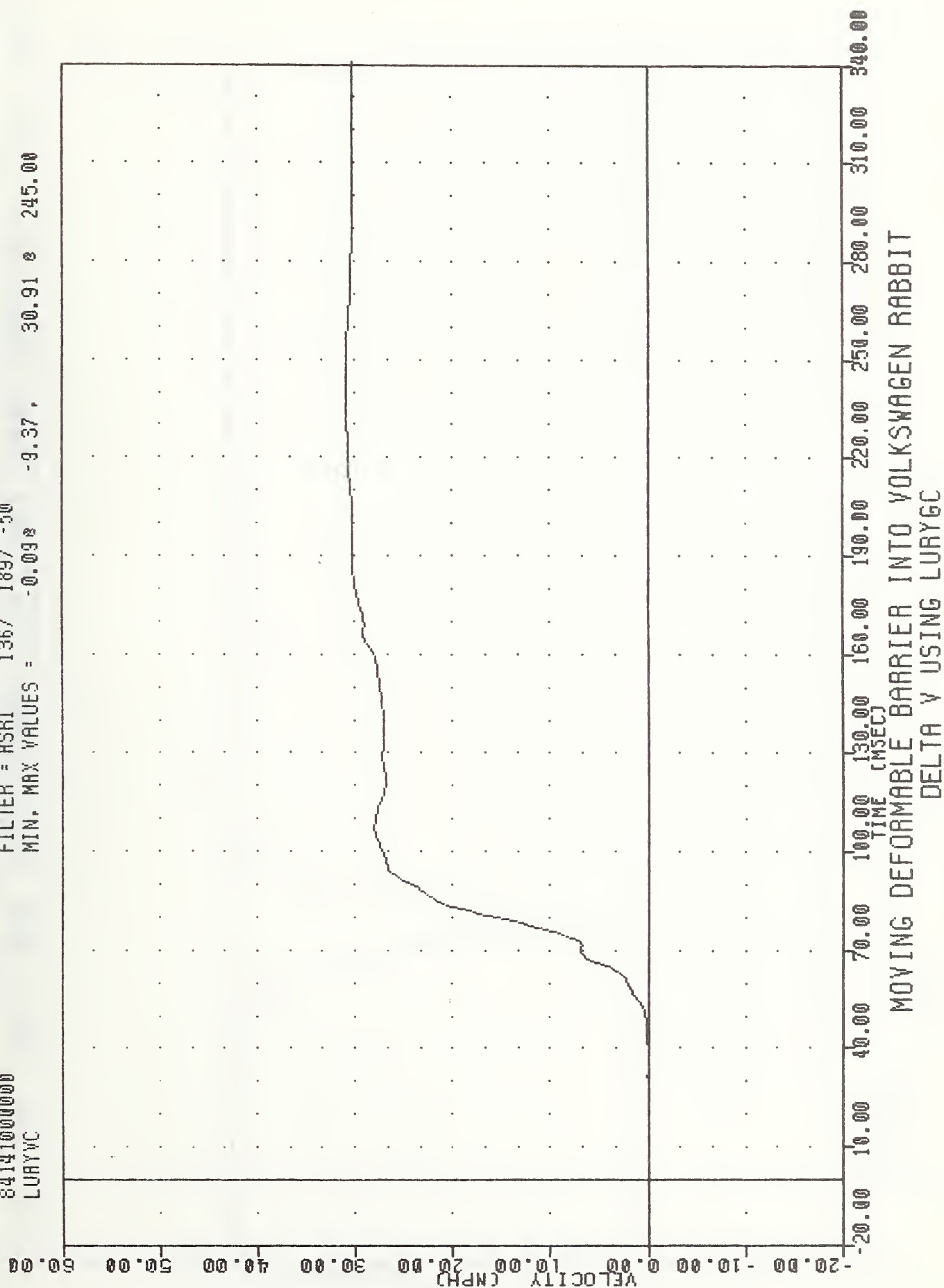
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT UPPER RIB ACCELERATION -2 Y AXIS

TRC , 840529
 EVALN MOD VW FLEET REPEAT
 84141000000
 LURYVC

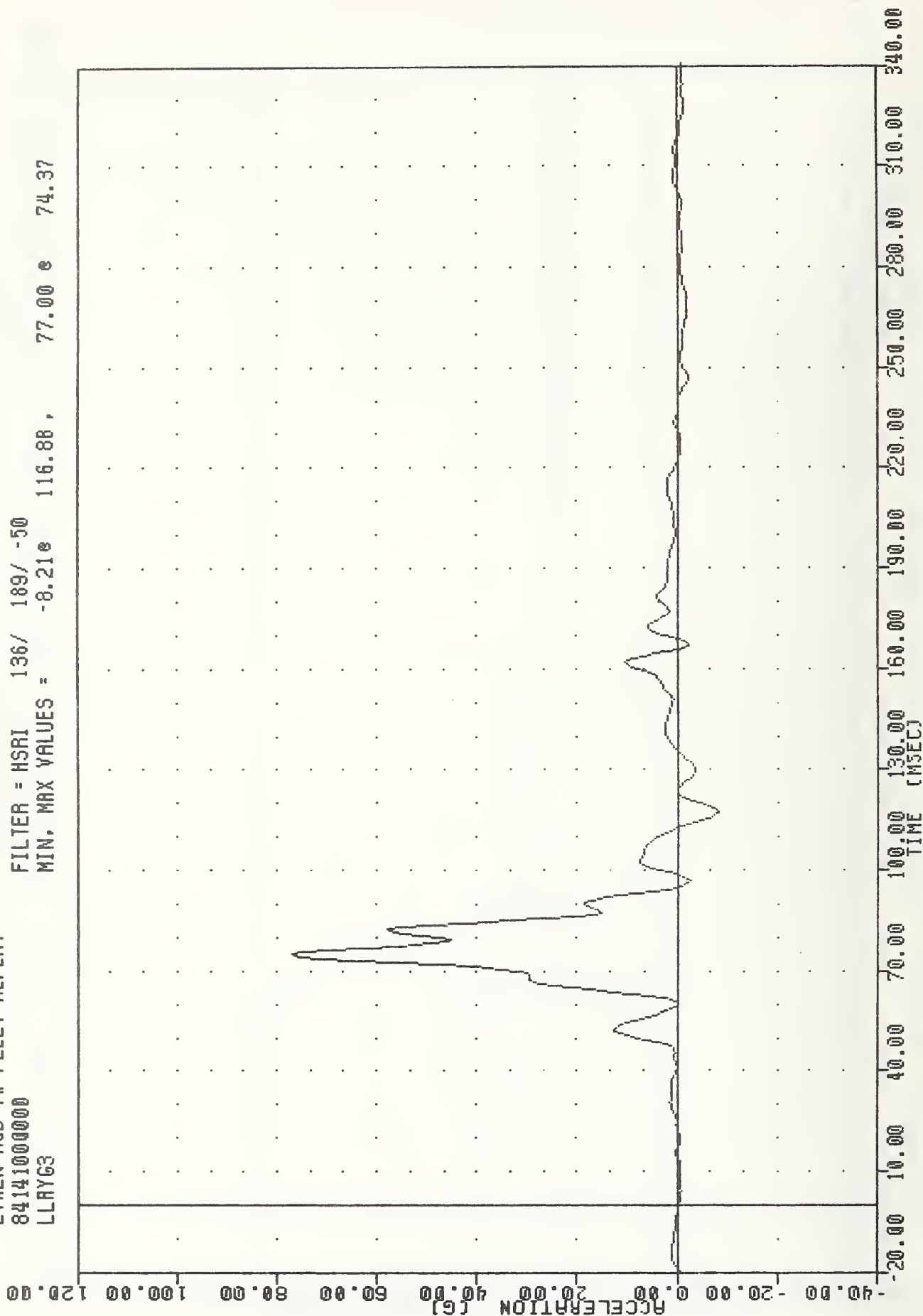
PLOT DATE 5-JUN-84 14:05:35

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.098 -9.37 , 30.91 0 245.00



TRC , 840529
 EVALN MOD YW FLEET REPEAT
 84141000000
 LLAY63
 PLOT DATE 5-JUN-84 14:03:51
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -8.21e 116.88, 77.00 e 74.37

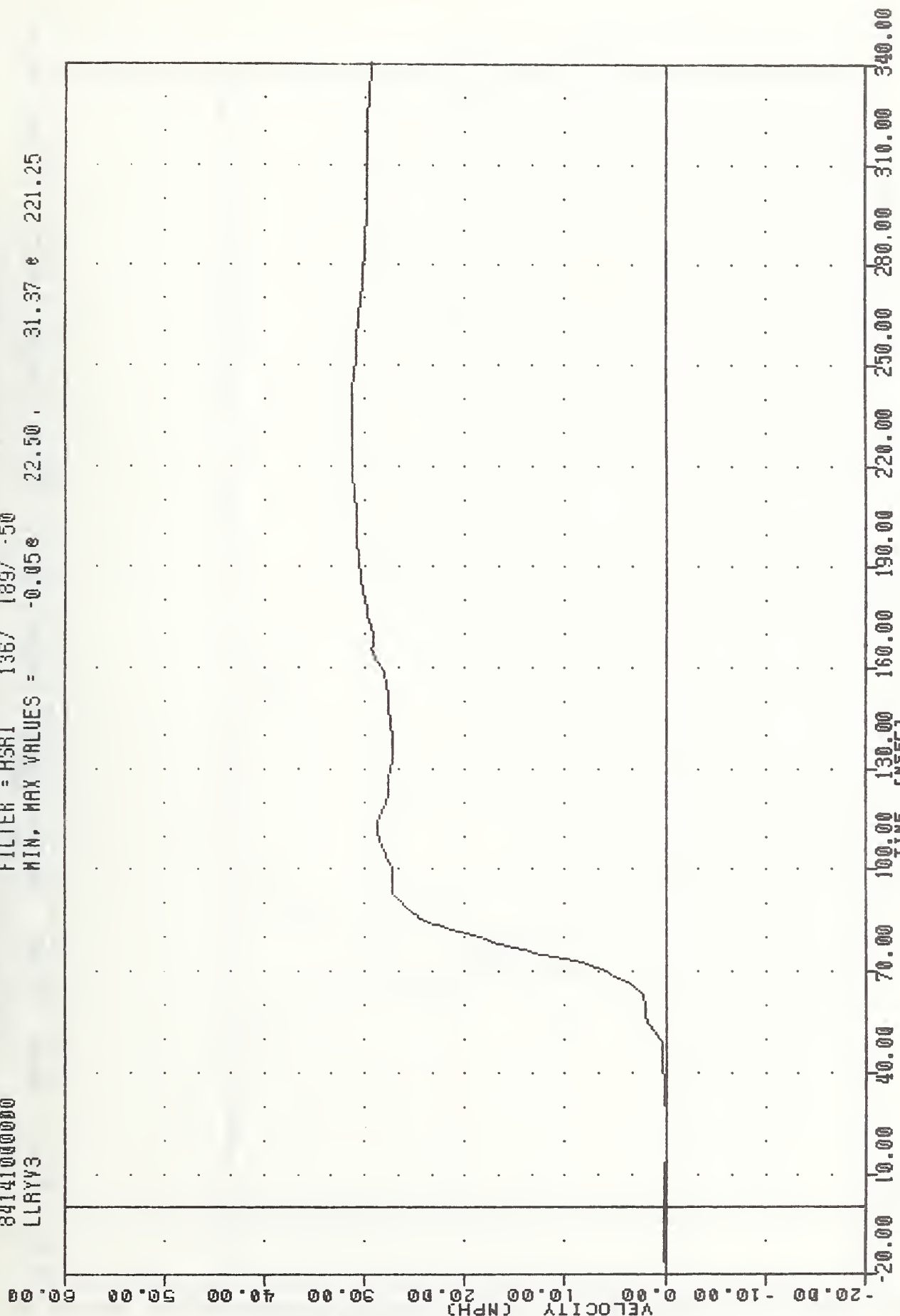


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LEFT LOWER RIB ACCELERATION Y AXIS

TAC
 EVALN NOD VM FLEET REPEAT
 84141000000
 LLYYV3

PLOT DATE 5-JUN-84 14:05:35

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.050 22.50 31.37 221.25



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LLYYV3

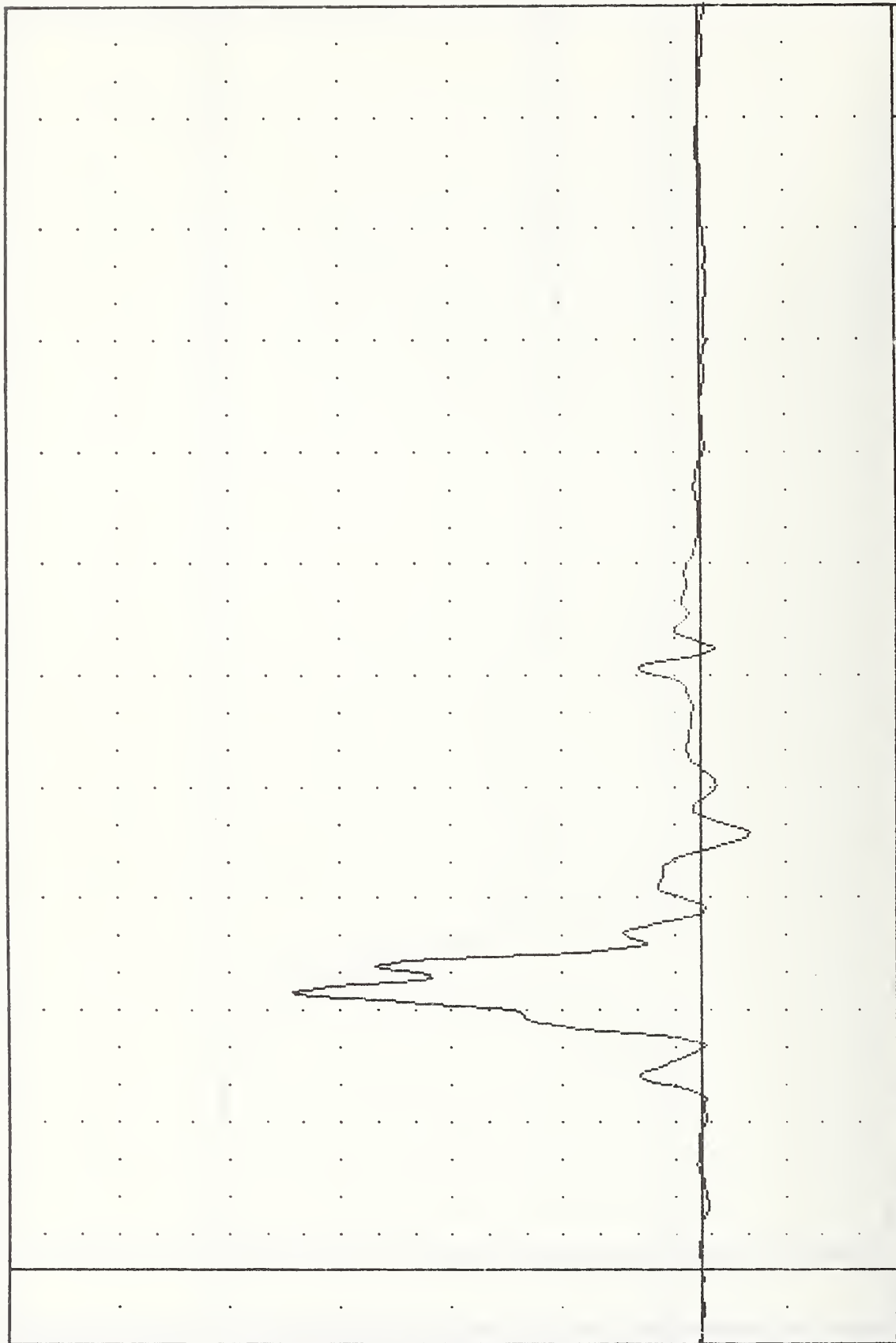
TAC , 840529
 EVALN MOD VW FLEET REPEAT
 84141000000
 LLY6C

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -8.56e 116.88 , 73.51 e 74.37

ACCELERATION (G)



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

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LEFT LOWER RIB ACCELERATION #2 Y AXIS

TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
LLRYVC

PLOT DATE 5-JUN-84 14:05:35

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.078 24.38, 30.99 & 217.50

VELOCITY (MPH)

60.00

50.00

40.00

30.00

20.00

10.00

0.00

-10.00

-20.00

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

TIME (MSEC)

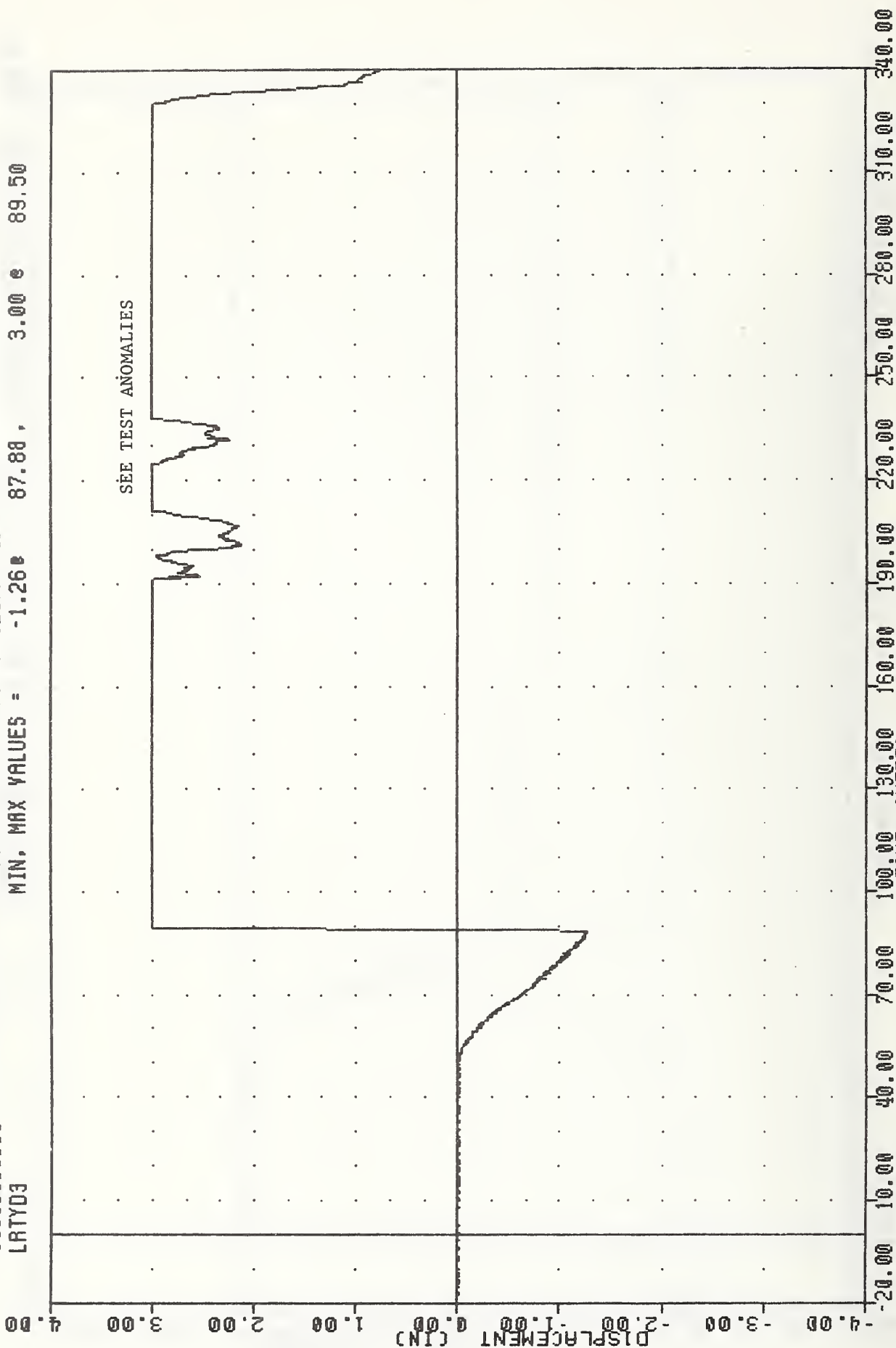
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLRYGC

TRC , 840529
EVALN MOD VW FLEET REPERT
84141000000
LRTYD3

PLOT DATE 5-JUN-84 14:01:58

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -1.26e 87.88, 3.00 e 89.50



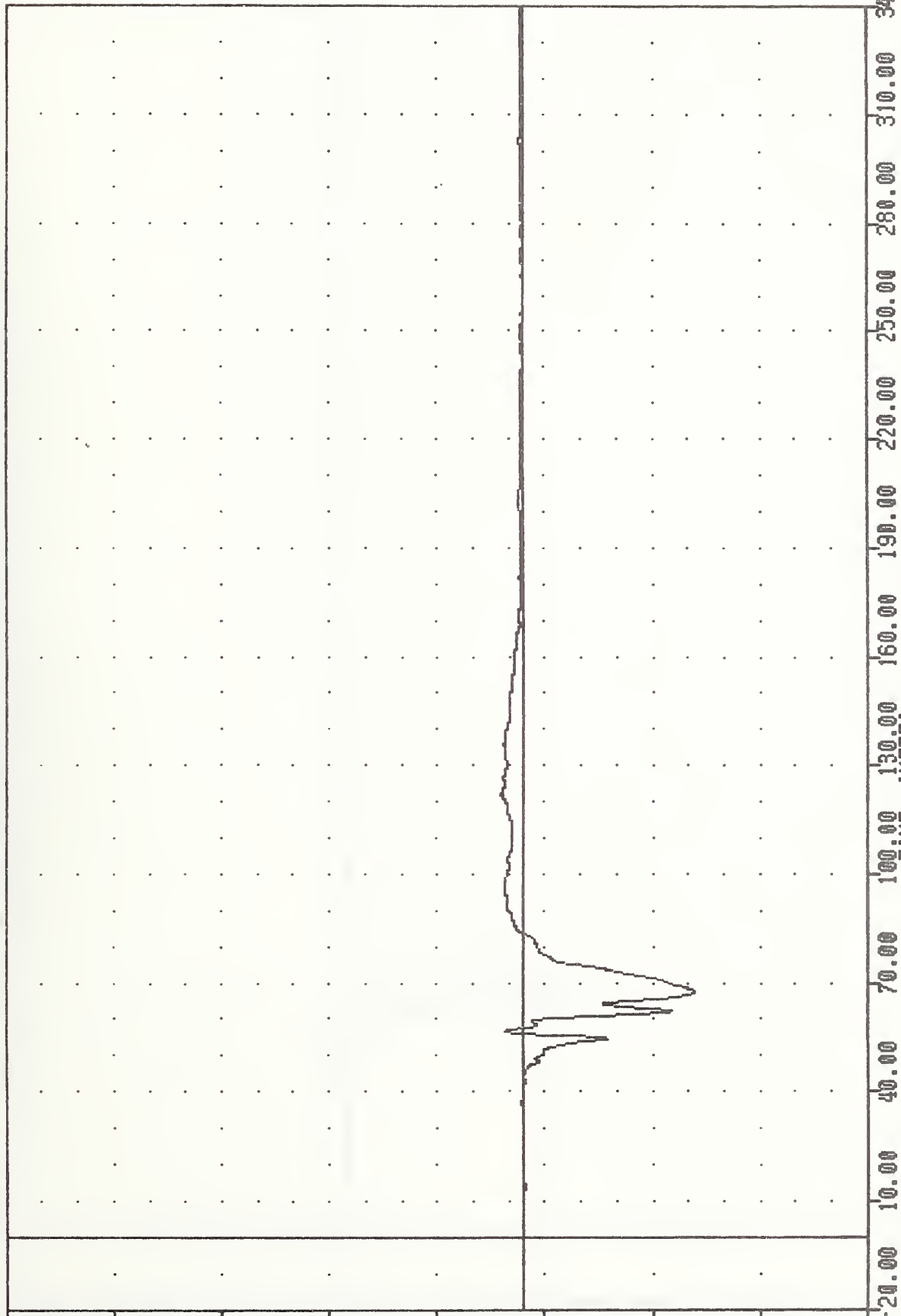
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT RIB TO SPINE DISPLACEMENT INCHES

TRC
EVALN MOD VW FLEET REPERT
84141000000
PEVXG3

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -79.73e 67.38, 10.09 e 121.88

ACCELERATION [G]
-160.00 -110.00 -60.00 -10.00 40.00 90.00 140.00 190.00 240.00

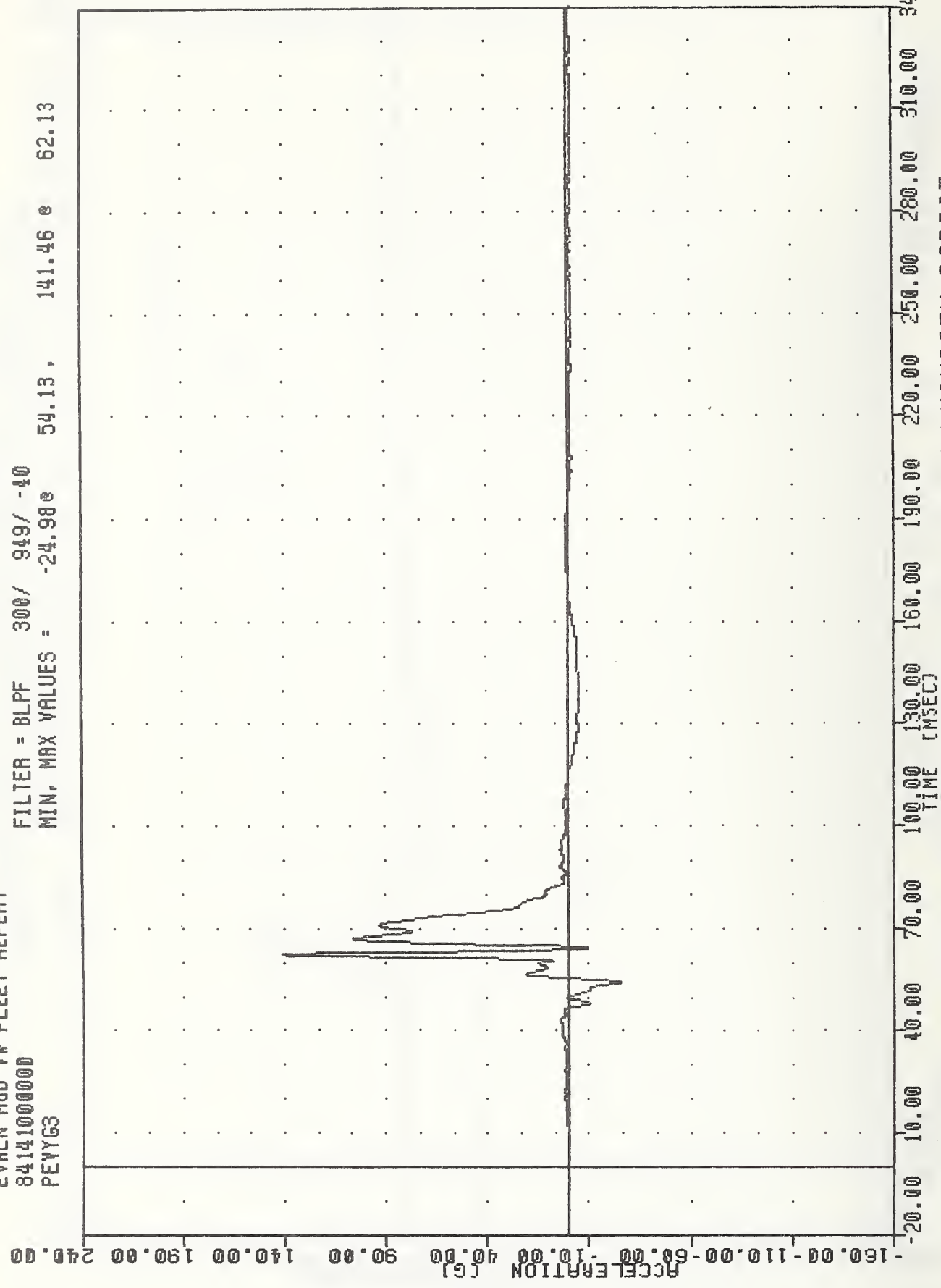


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS ACCELERATION X AXIS

TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
PEVYG3

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -24.98e 54.13, 141.46 e 62.13



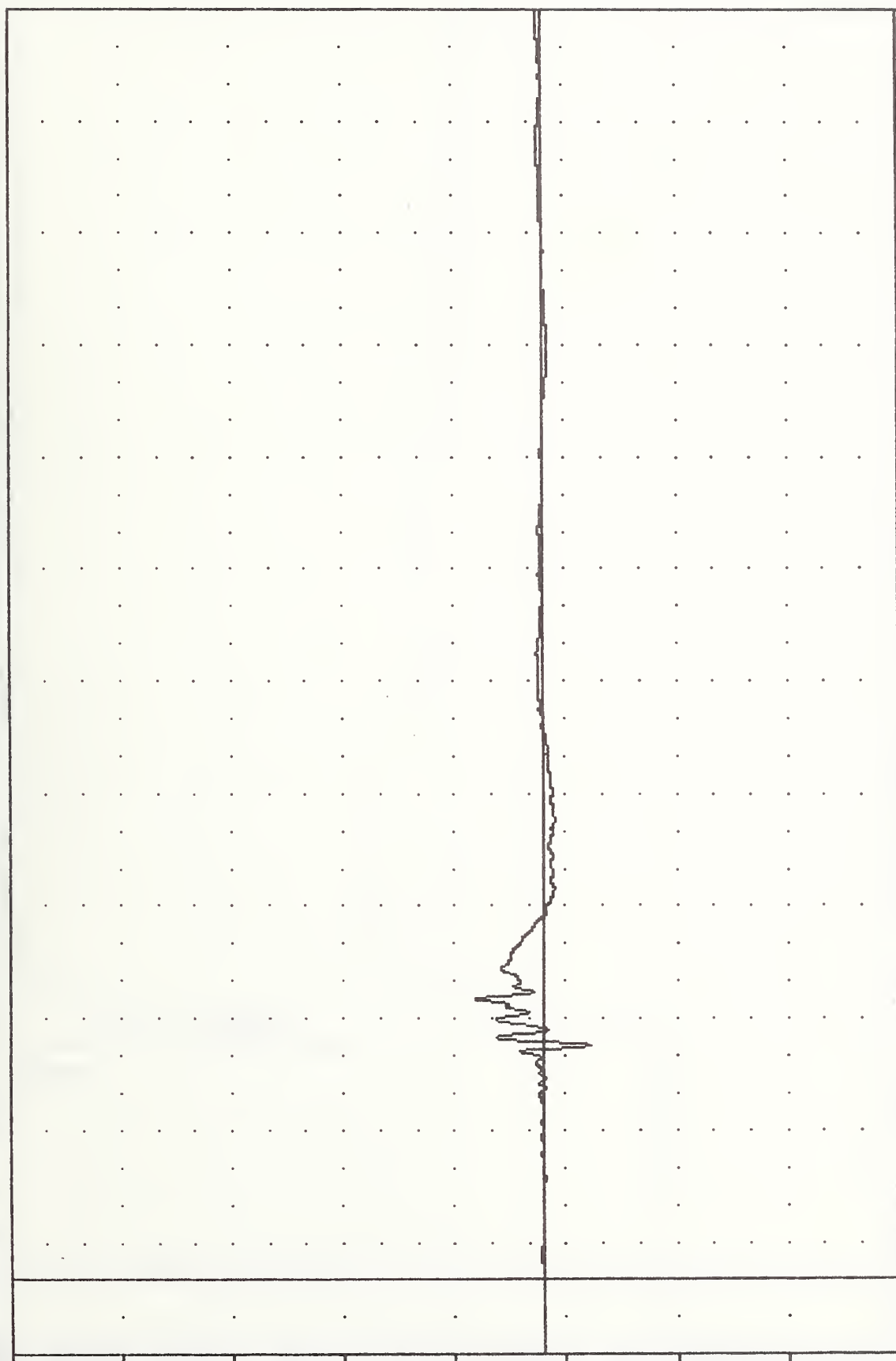
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS ACCELERATION Y AXIS

TAC
EVALN MOD V# FLEET REPEAT
84141000000
PEVZ63

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -20.880 62.50, 31.10 0 75.00

ACCELERATION (G)



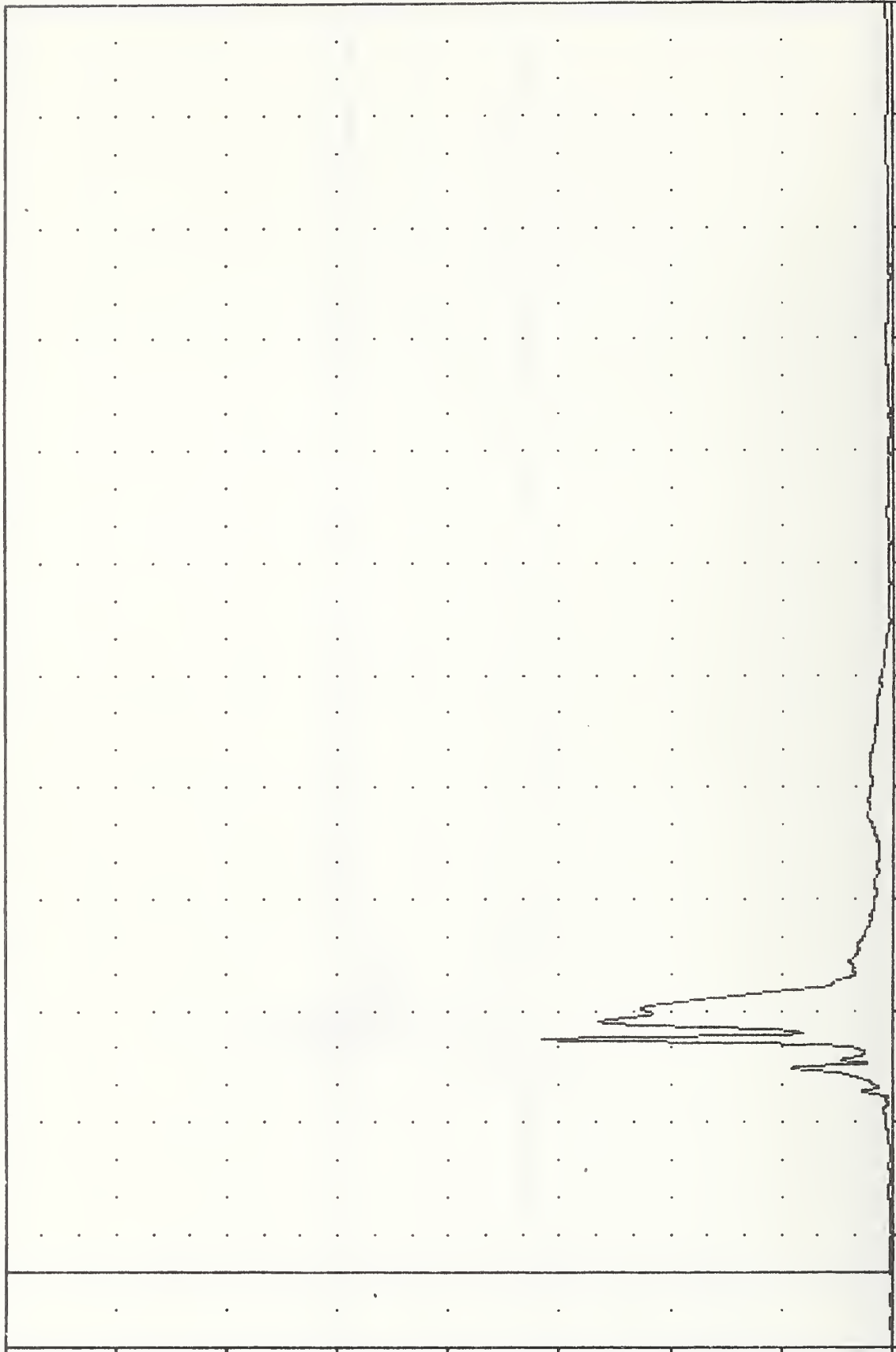
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS ACCELERATION Z AXIS

TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
PEVRG3

PLOT DATE 5-JUN-84 14:03:22

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.028 -3.38, 158.15 e 62.13

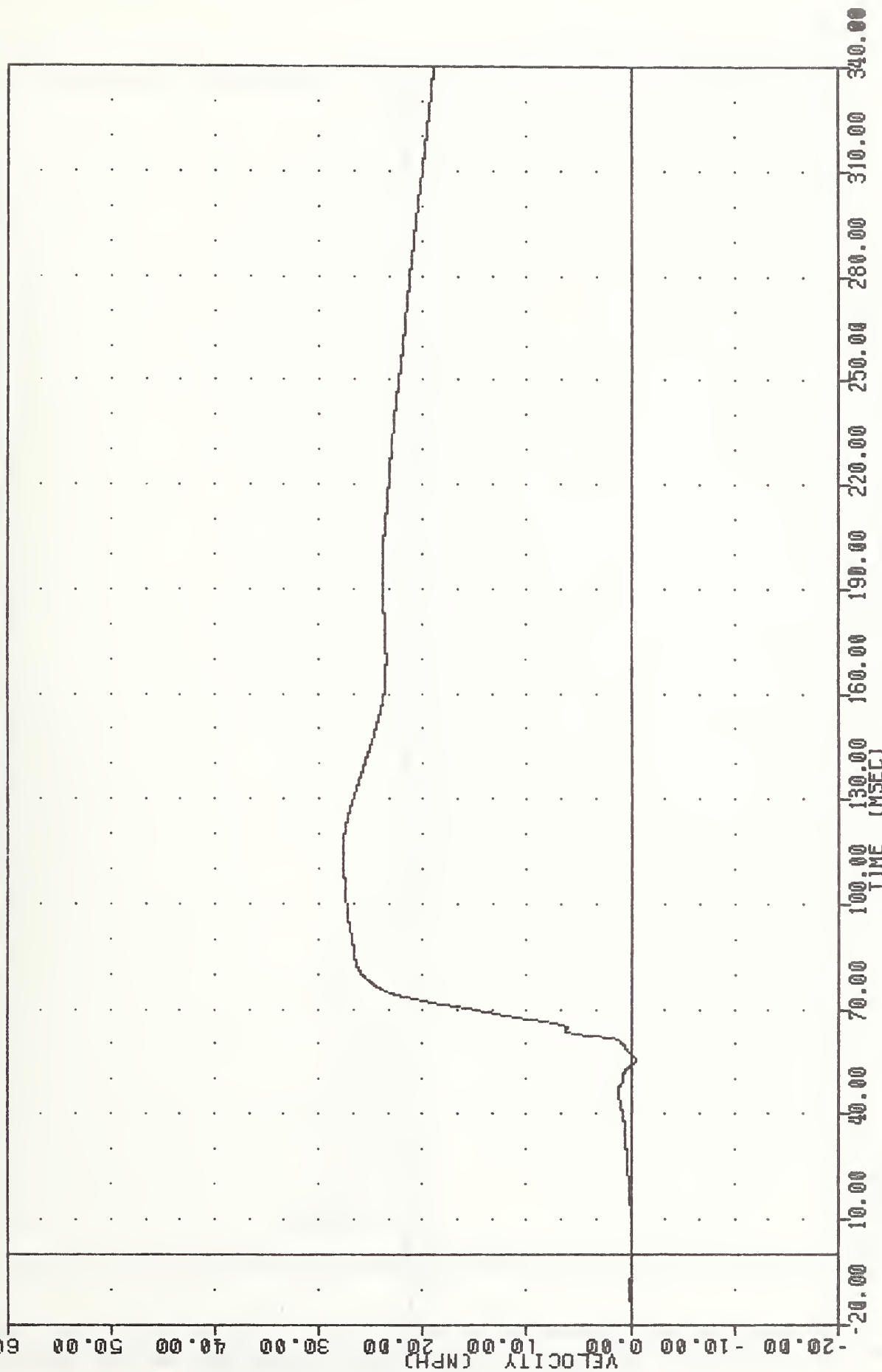
ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS RESULTANT

TRC , 840529
EVALN MOD VW FLEET REPERT
84141000000
PEVYV3

PLOT DATE 5-JUN-84 14:06:39
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.618 55.38 , 27.71 e 112.63



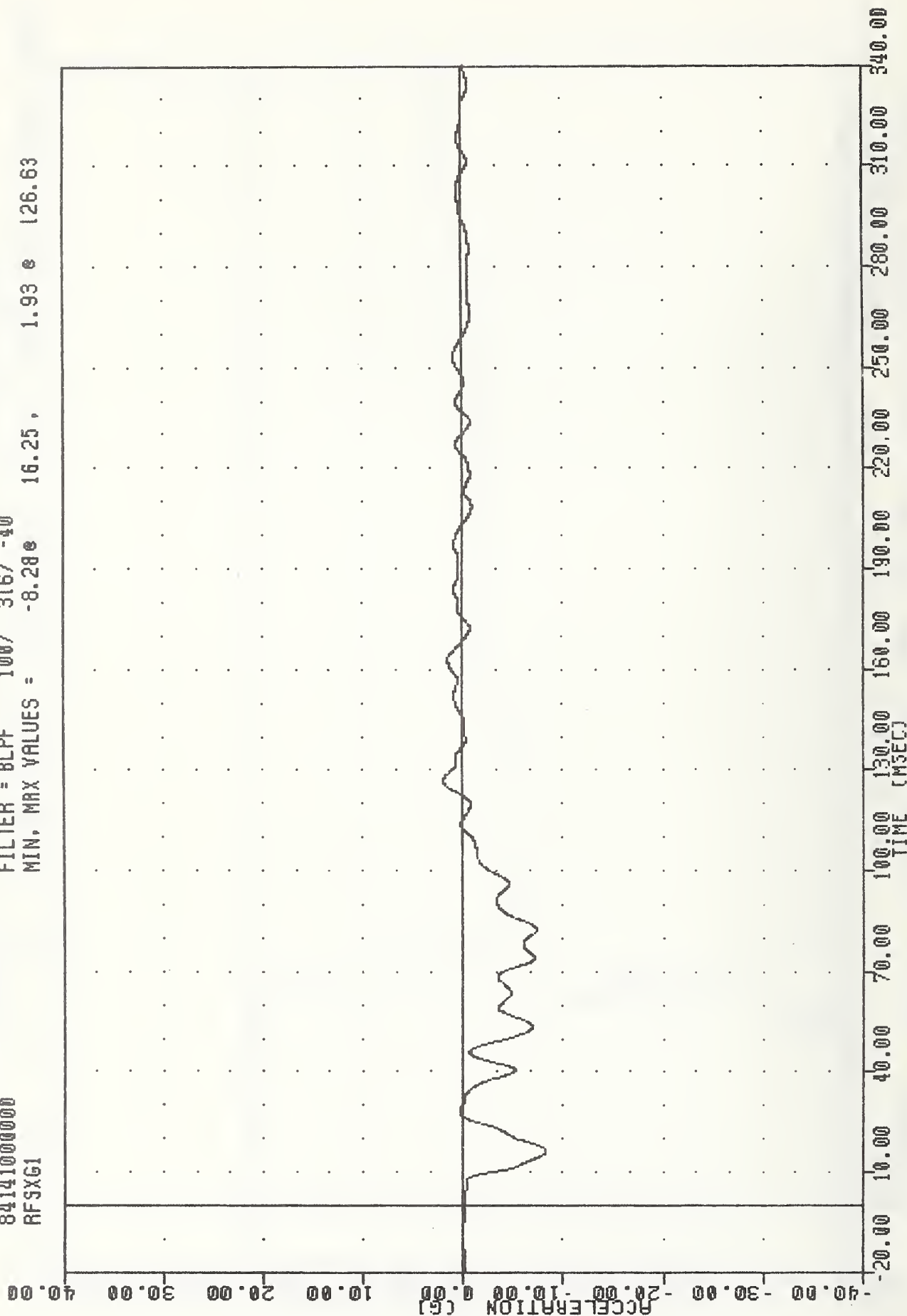
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING PEVY3

TRC
EVALN MOD YW FLEET REPEAT
84141000000
RFSXG1

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40

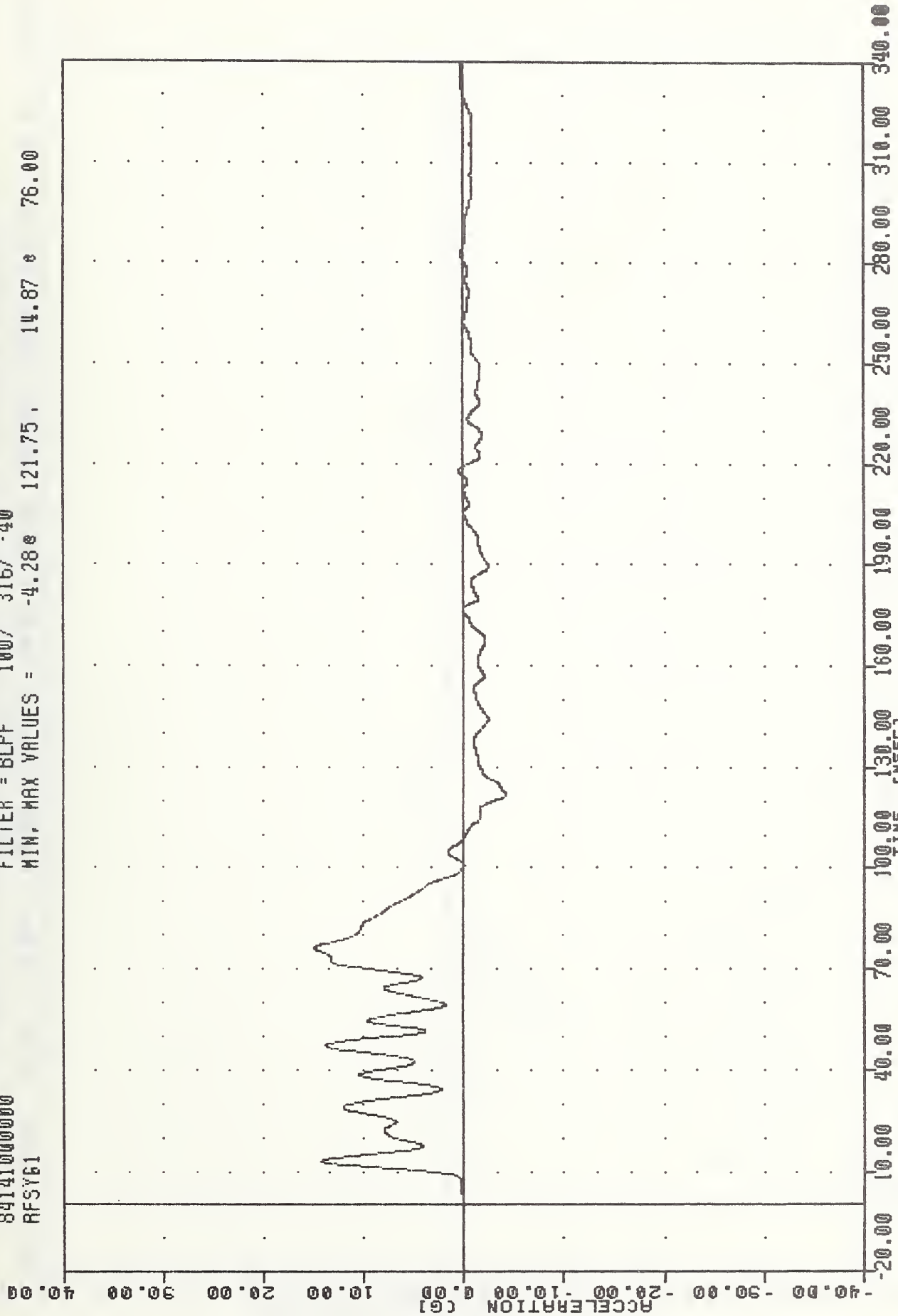
MIN, MAX VALUES = -8.28e 16.25, 1.93 e 126.63



TAC 84W529
 EVALM MOD VH FLEET REPEAT
 84141000000
 RFSY61

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -4.28e 121.75, 14.87 e 76.00



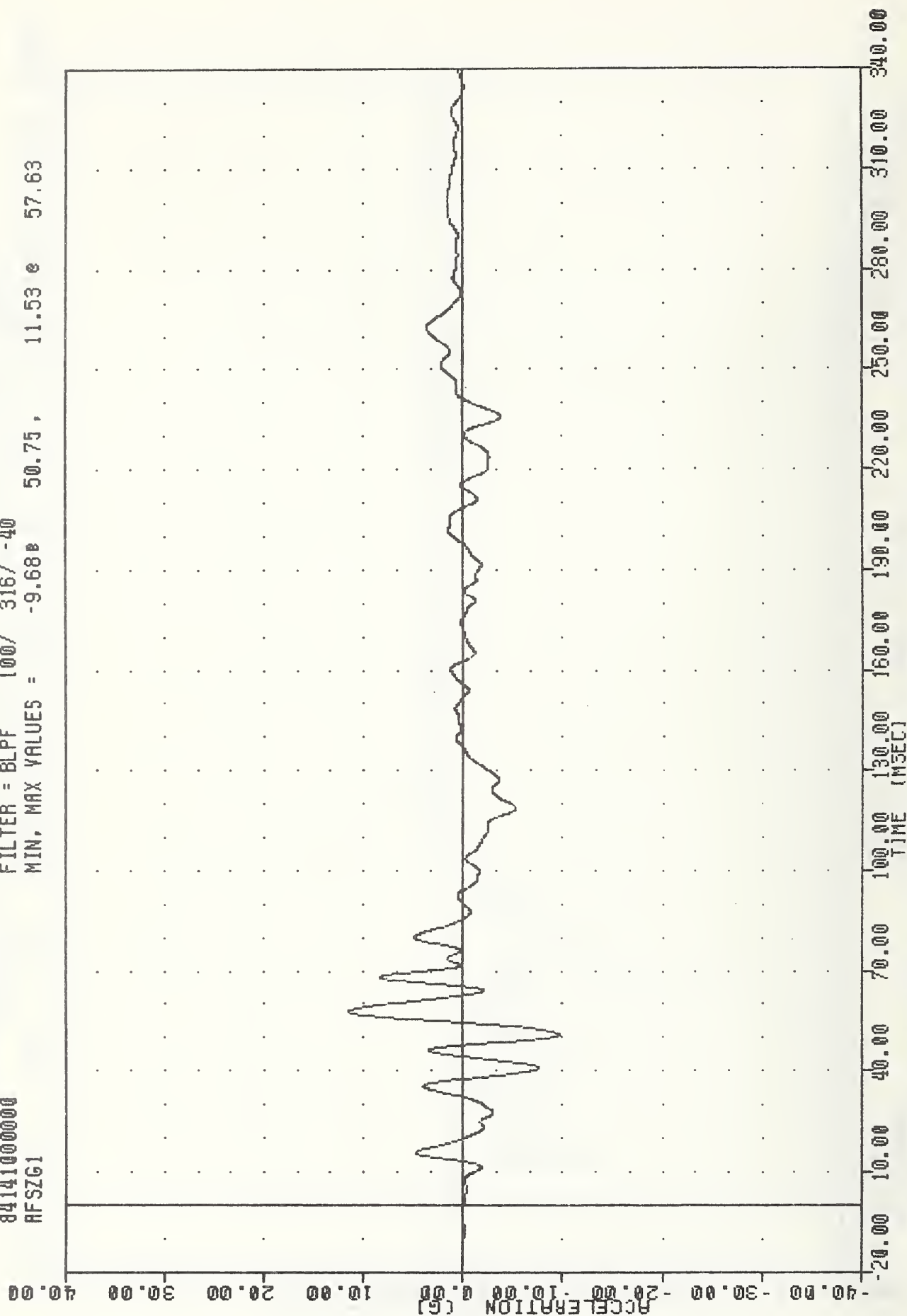
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE RIGHT FRONT SILL ACCELERATION Y AXIS

TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
AFSG61

PLOT DATE 5-JUN-84 14:01:58

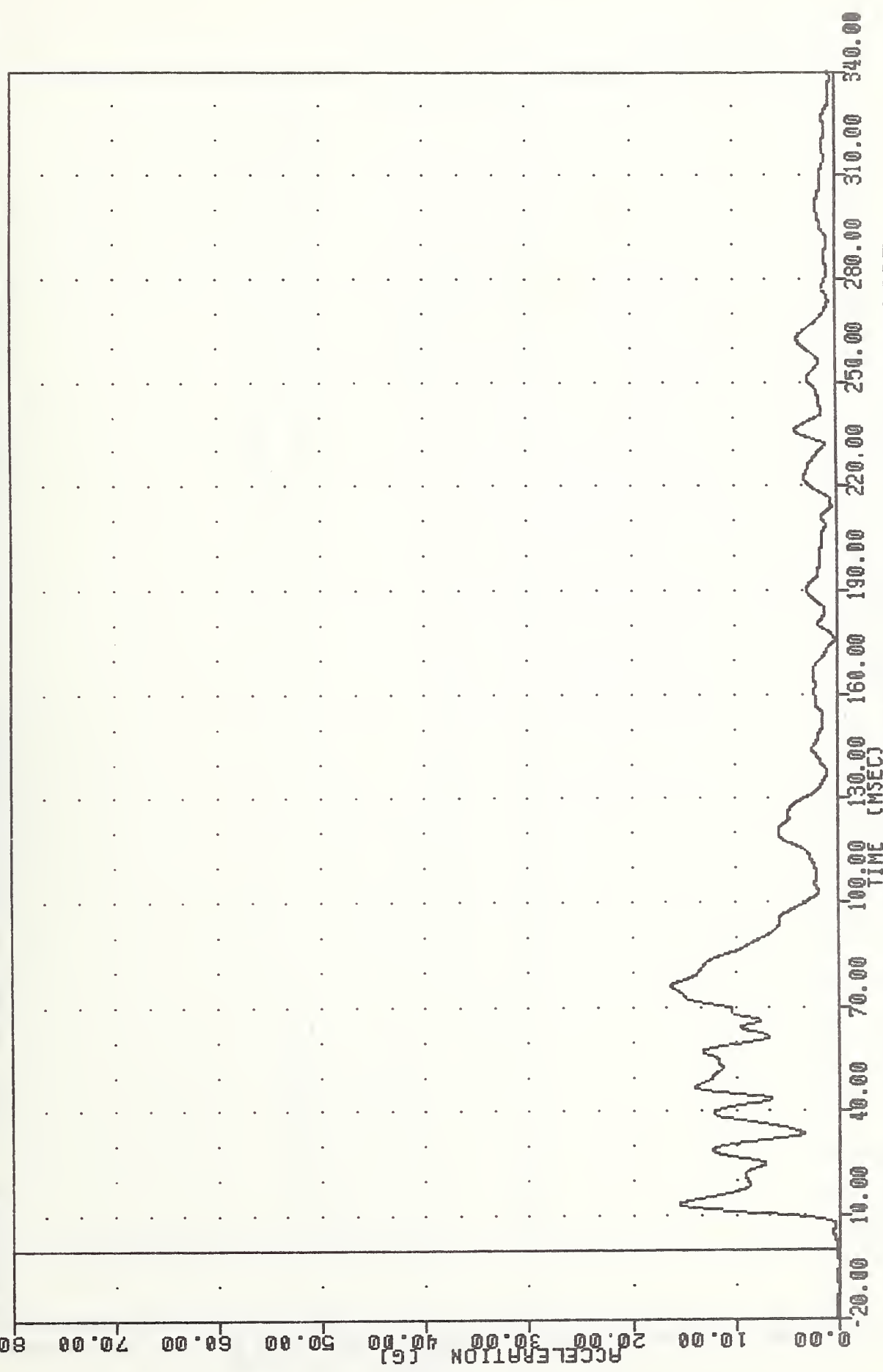
FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -9.68e 50.75, 11.53 e 57.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL ACCELERATION Z AXIS

TRC , 840529
 EVALN MOD YW FLEET REPEAT
 84141000000
 RFSRG1
 PLOT DATE 5-JUN-84 14:03:22
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = 0.04e -11.3B, 16.24 e 75.88



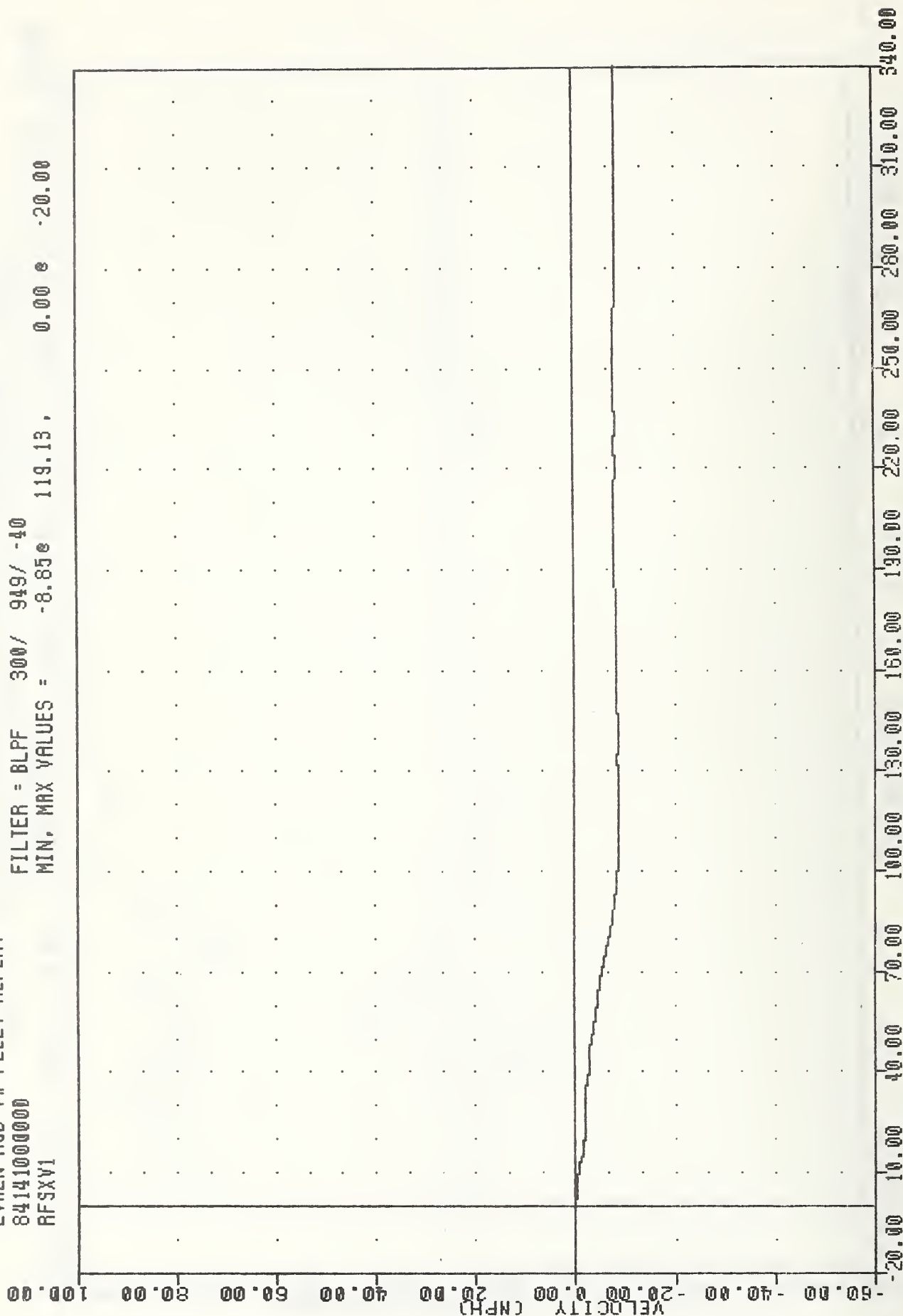
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE RIGHT FRONT SILL RESULTANT

TRC , 840529
 EVALN MOD YW FLEET REPEAT
 84141000000
 RFSXV1

PLOT DATE 5-JUN-84 14:06:39

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -8.85e 119.13, 0.00 e -20.00



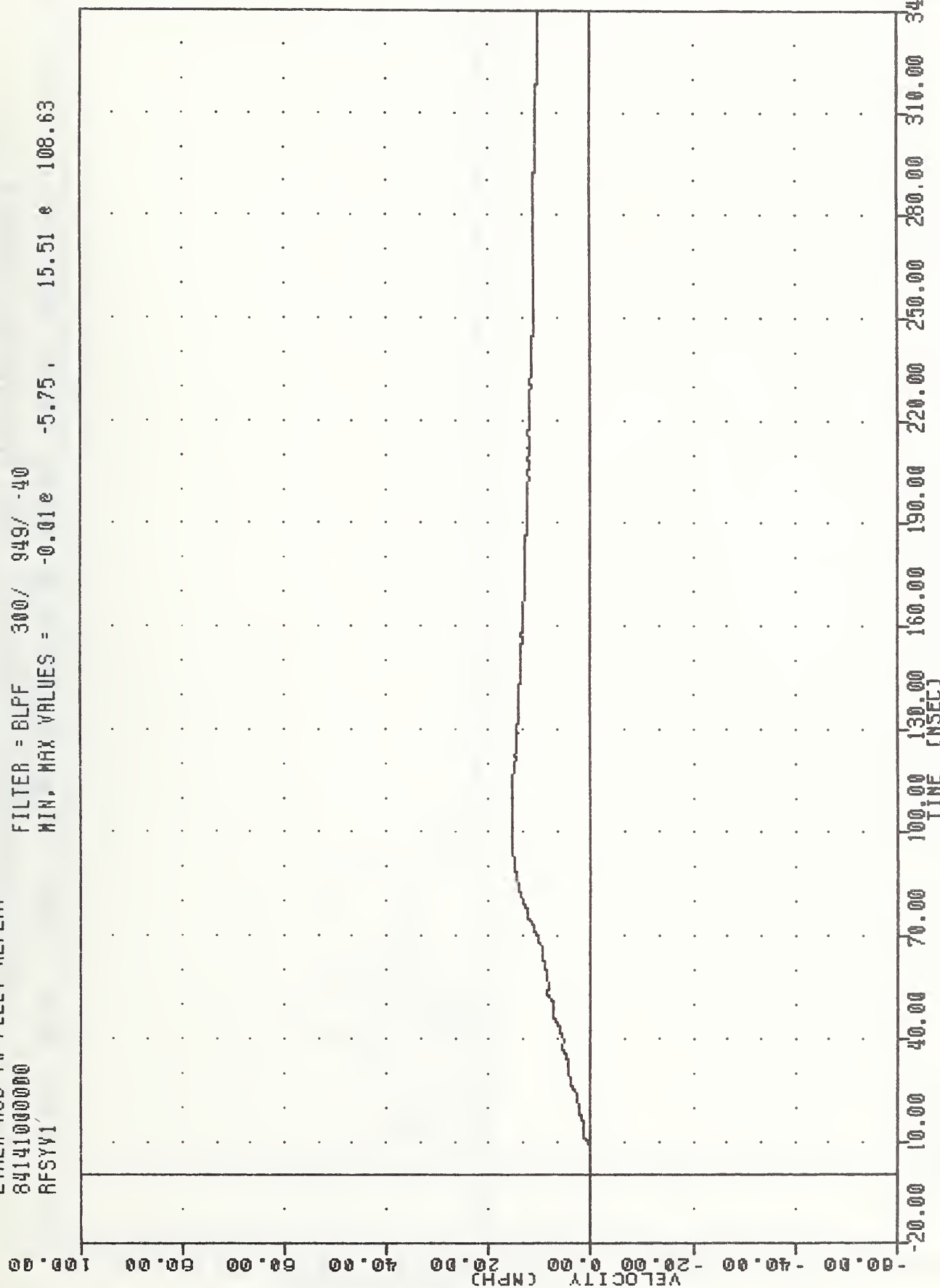
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING RFSXGI

TAC
EVALM MOD V# FLEET REPEAT
84141000000
RFSYV1

, 840529

PLOT DATE 5-JUN-84 14:06:39

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.01e -5.75, 15.51 e 108.63



B-75

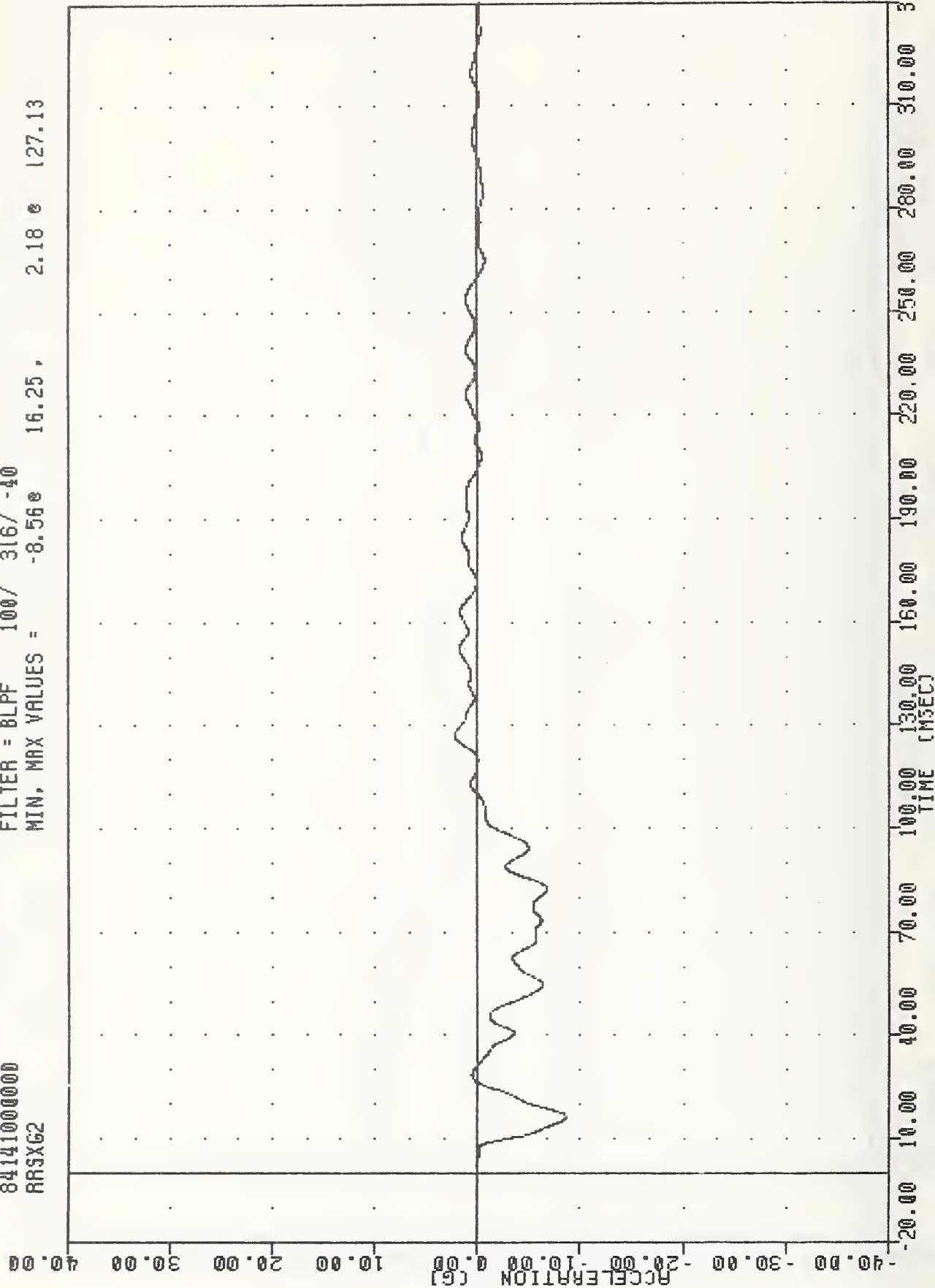
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RFSYG1

TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
RRSXG2

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -8.56e 16.25, 2.18 e 127.13



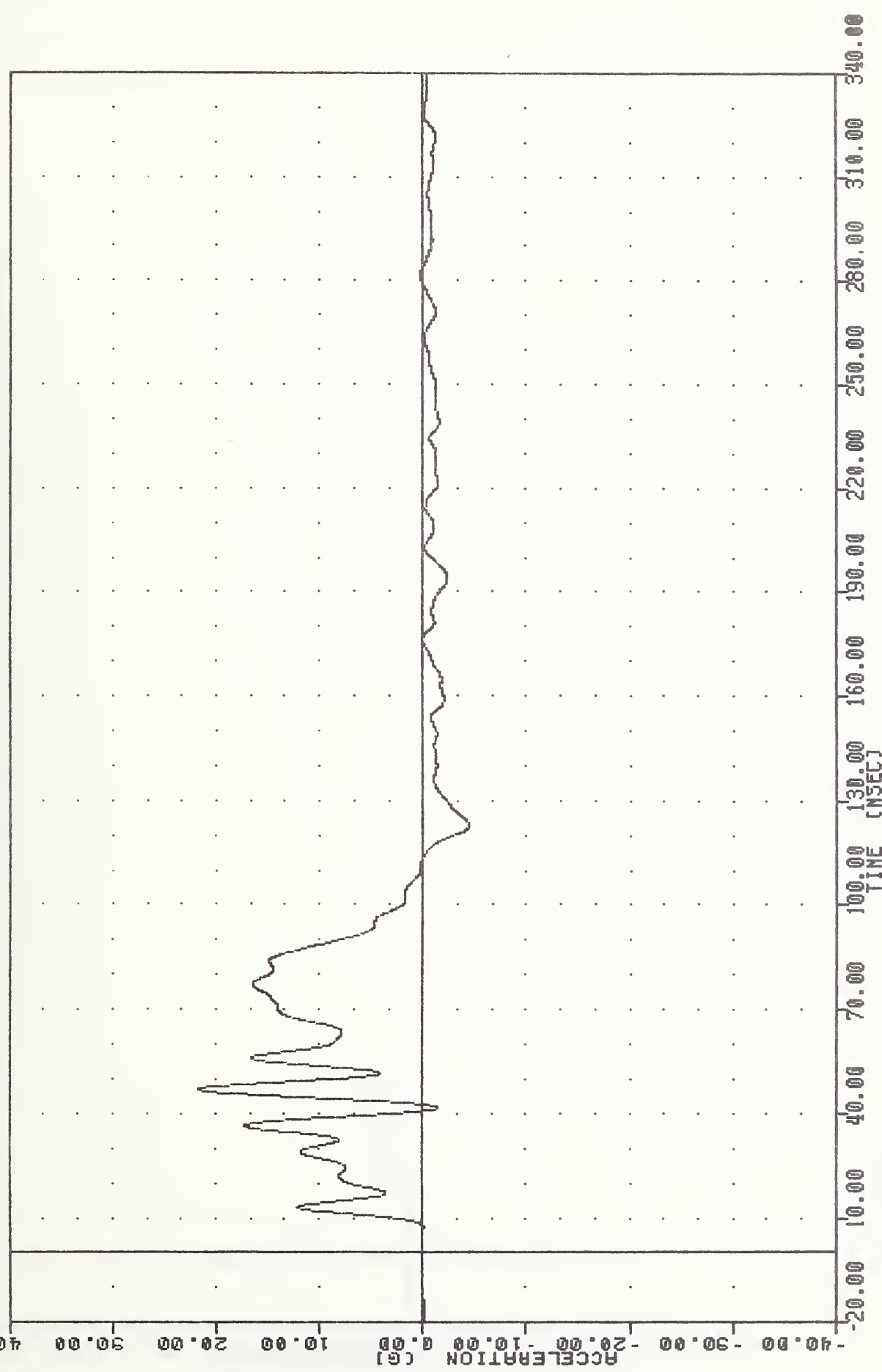
B-76

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION X AXIS

PLOT DATE 5-JUN-84 14:01:58

TAC , 840529
EVALN MOD VM FLEET REPEAT
84141000000
RASY62

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -4.41e 122.63 , 21.66 e 46.88



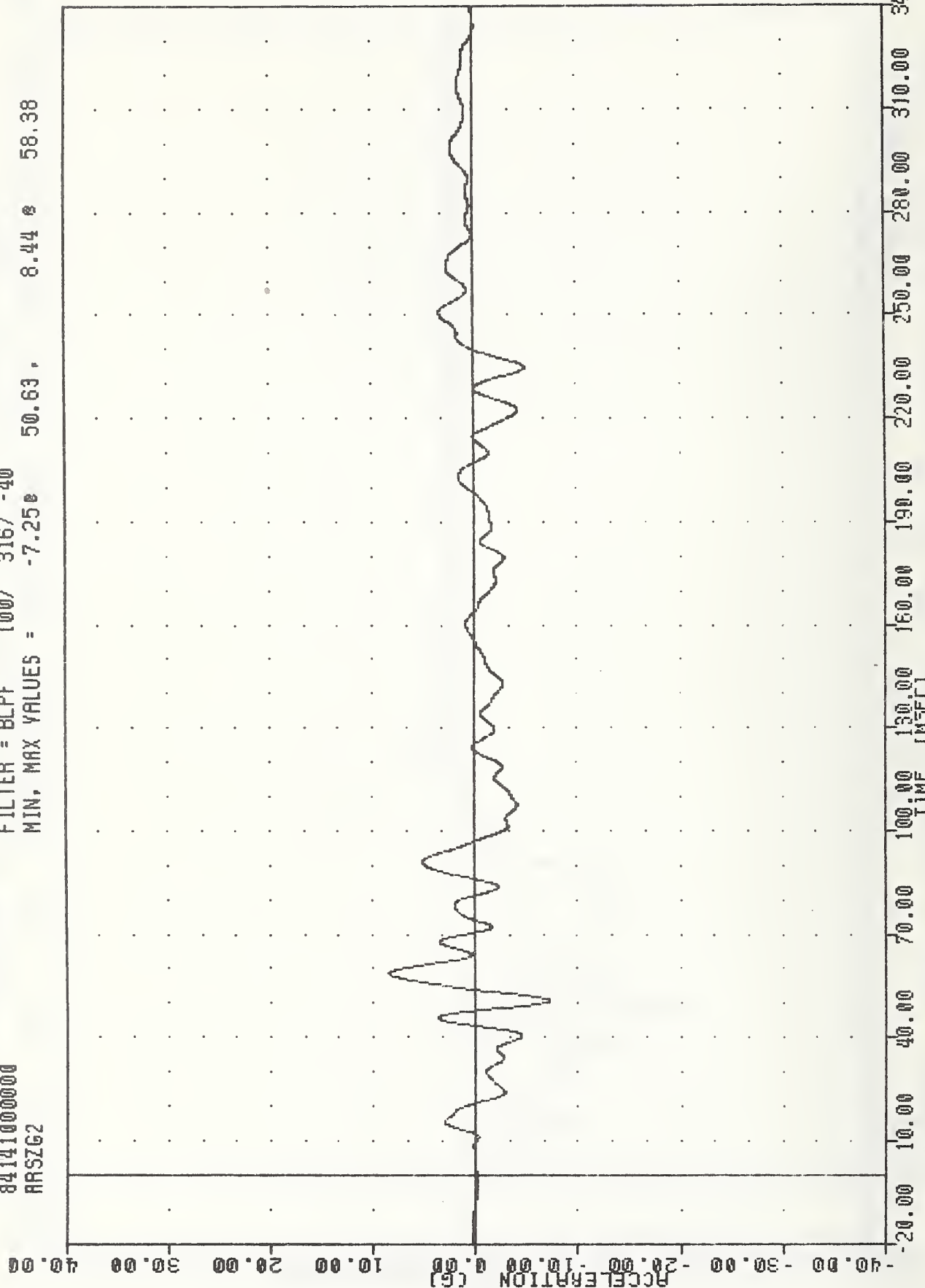
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION Y AXIS

TRC , 840529
EVALN MOD YW FLEET REPERT
84141000000
RRSZG2

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -7.25e 50.63, 8.44 e 58.38



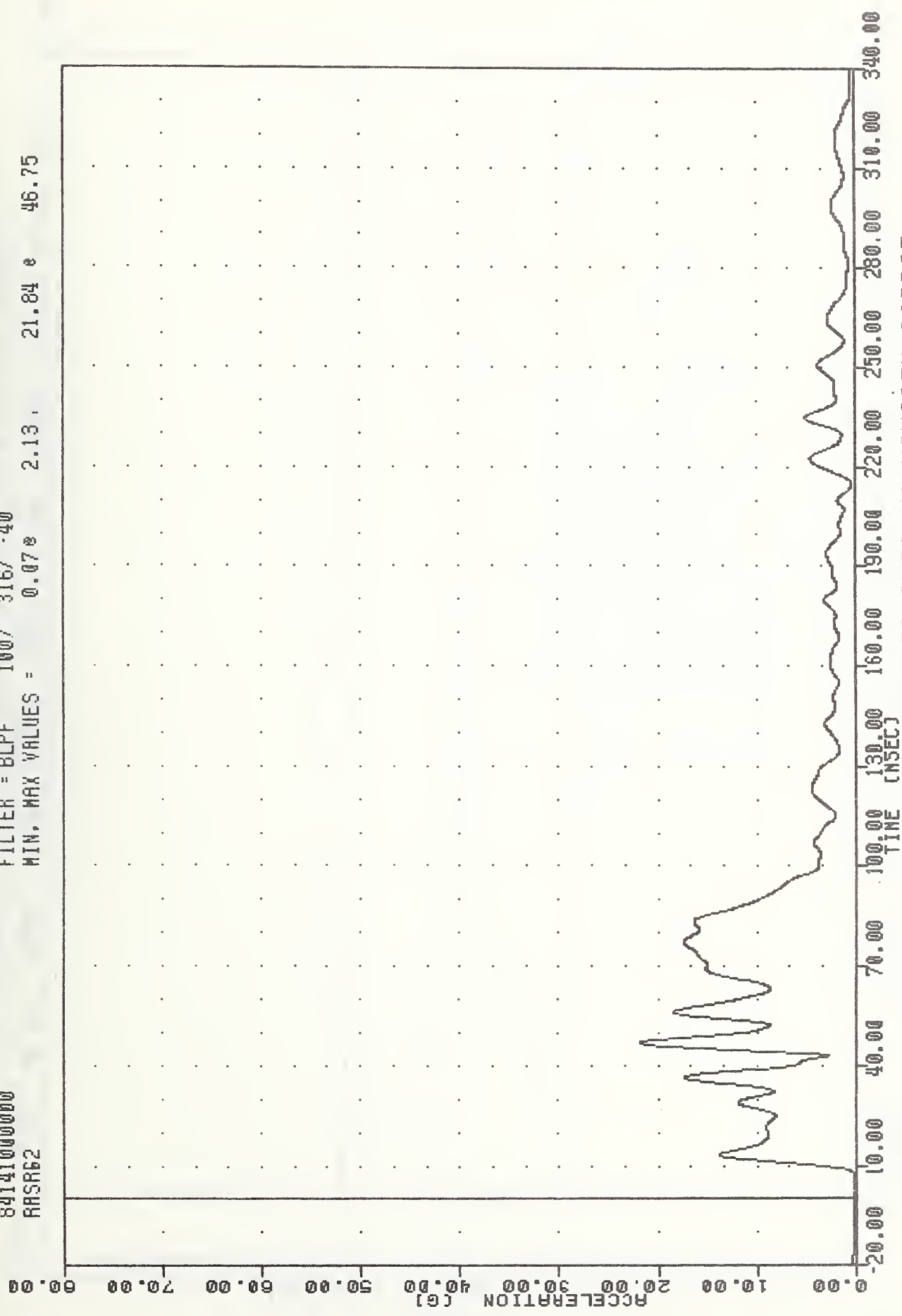
B-78

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION Z AXIS

TAC , 840529
EVALN MOD VM FLEET REPEAT
84141000000
RARS62

PLOT DATE 5-JUN-84 14:03:22

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = 0.078 2.13, 21.84 e 46.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL RESULTANT

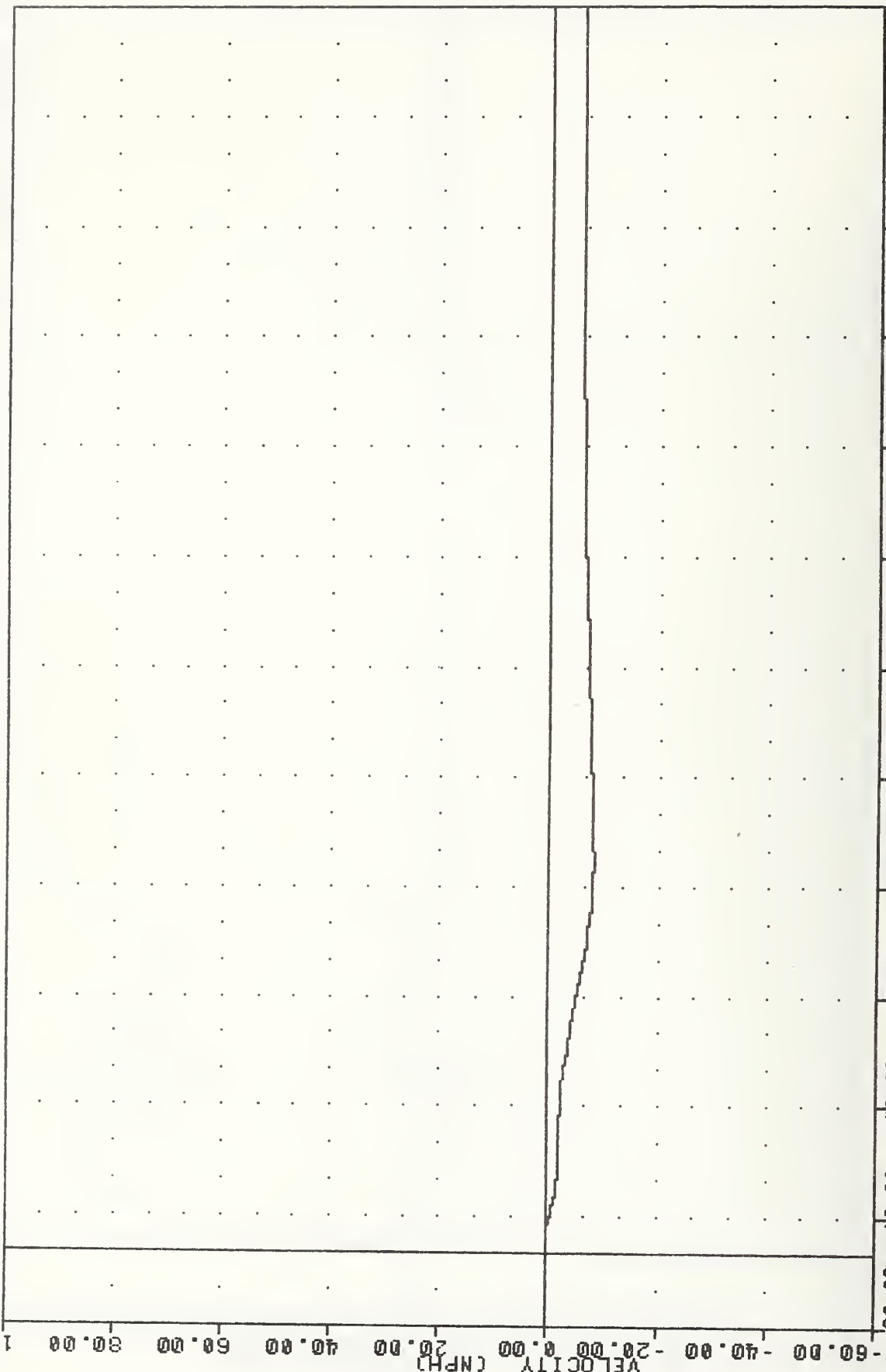
TRC
EVALN MOD VW FLEET REPERT
84141000000
ARSXV2

PLOT DATE 5-JUN-84 14:06:39

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -8.13e 108.00, 0.01 e 1.75

100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
-60.00
-80.00
-100.00

B-80

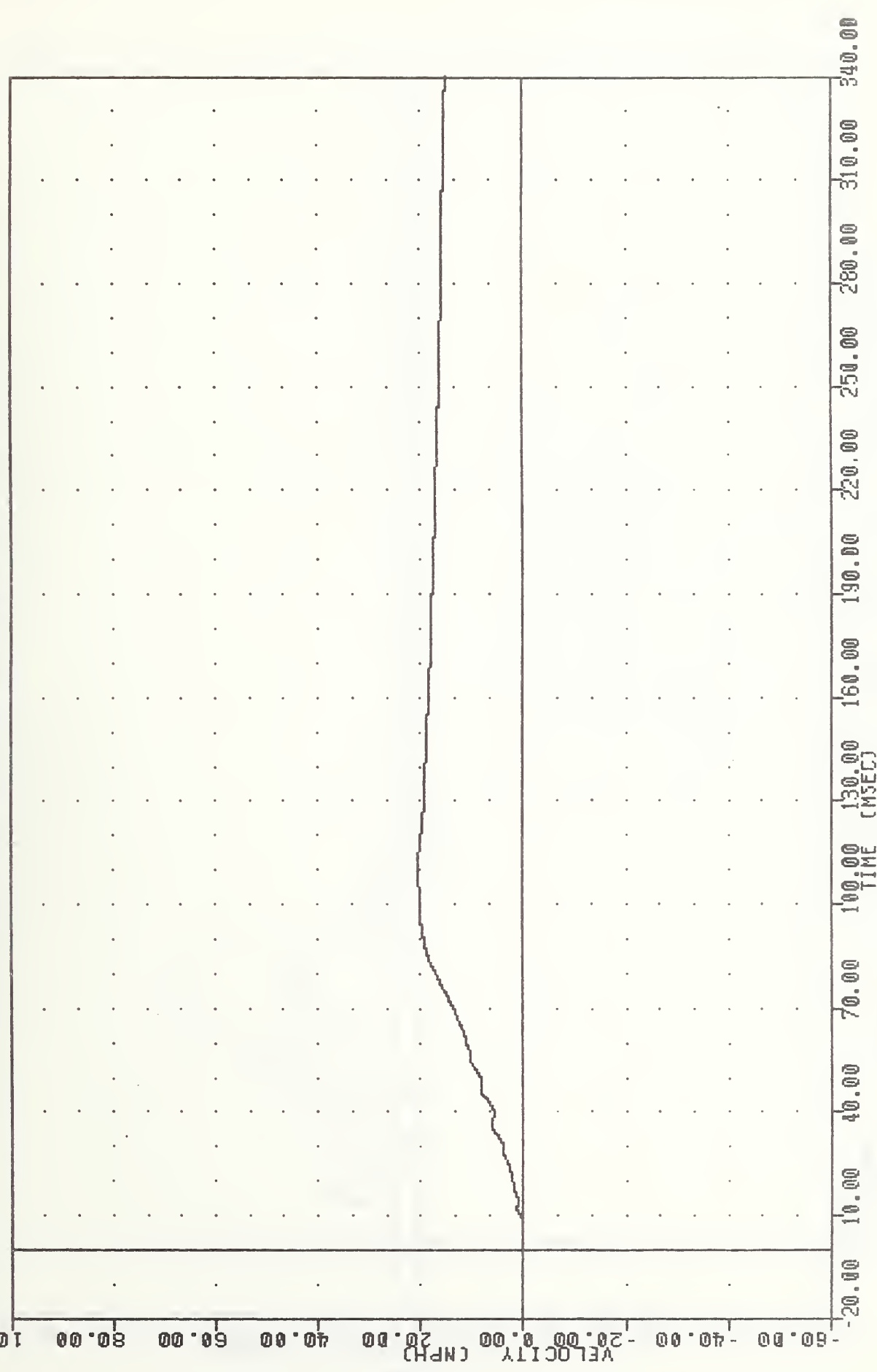


20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DEL TO V USING ARCVG2

TRC , 840529
EVALN MOD YV FLEET REPEAT
84141000000
RRSYV2

PLOT DATE 5-JUN-84 14:06:39
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.01e -13.88, 20.38 e 110.38



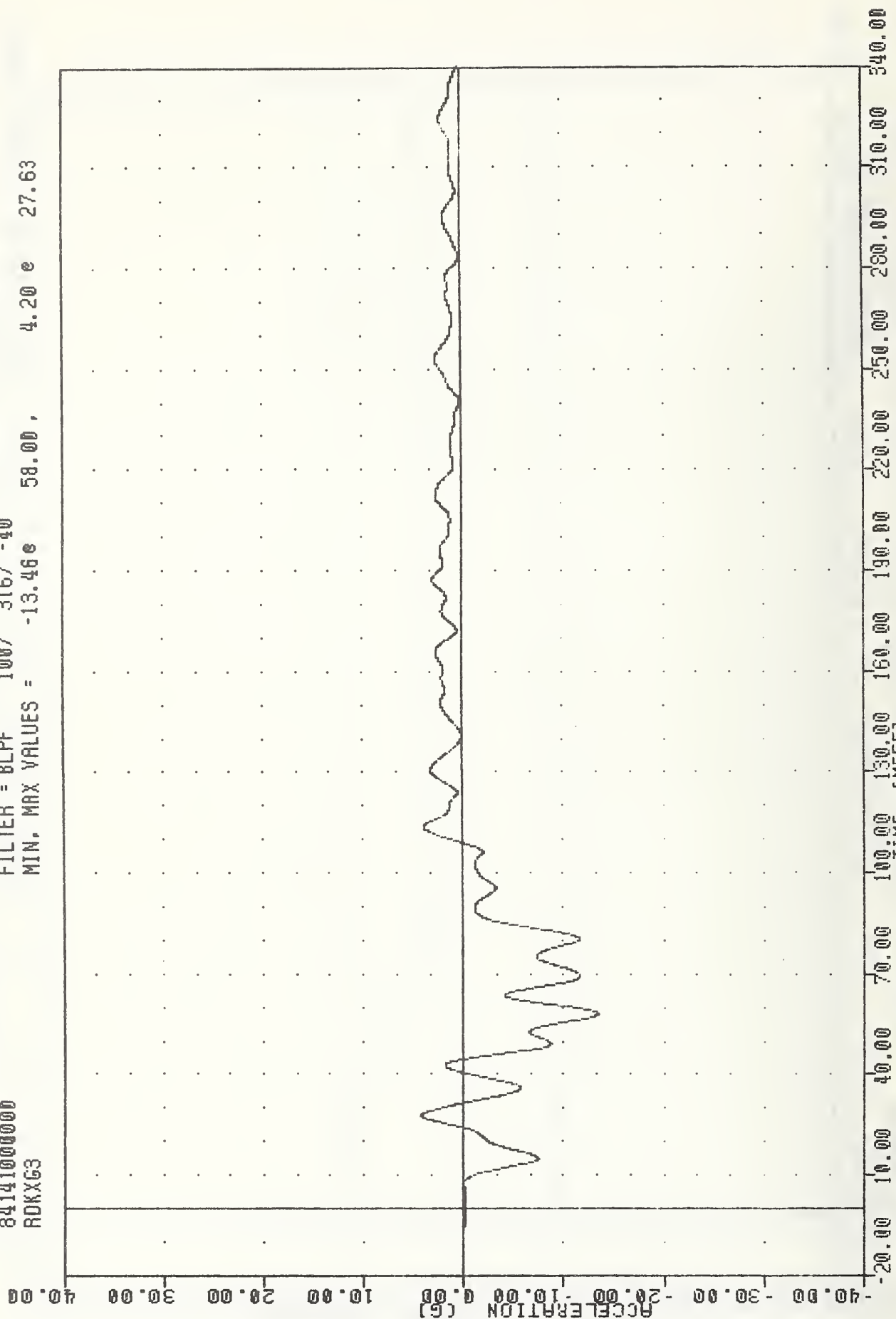
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RRSYG2

TRC
EVALN MOD VV FLEET REPEAT
84141000000
RDKX63

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -13.46e 58.00, 4.20 e 27.63



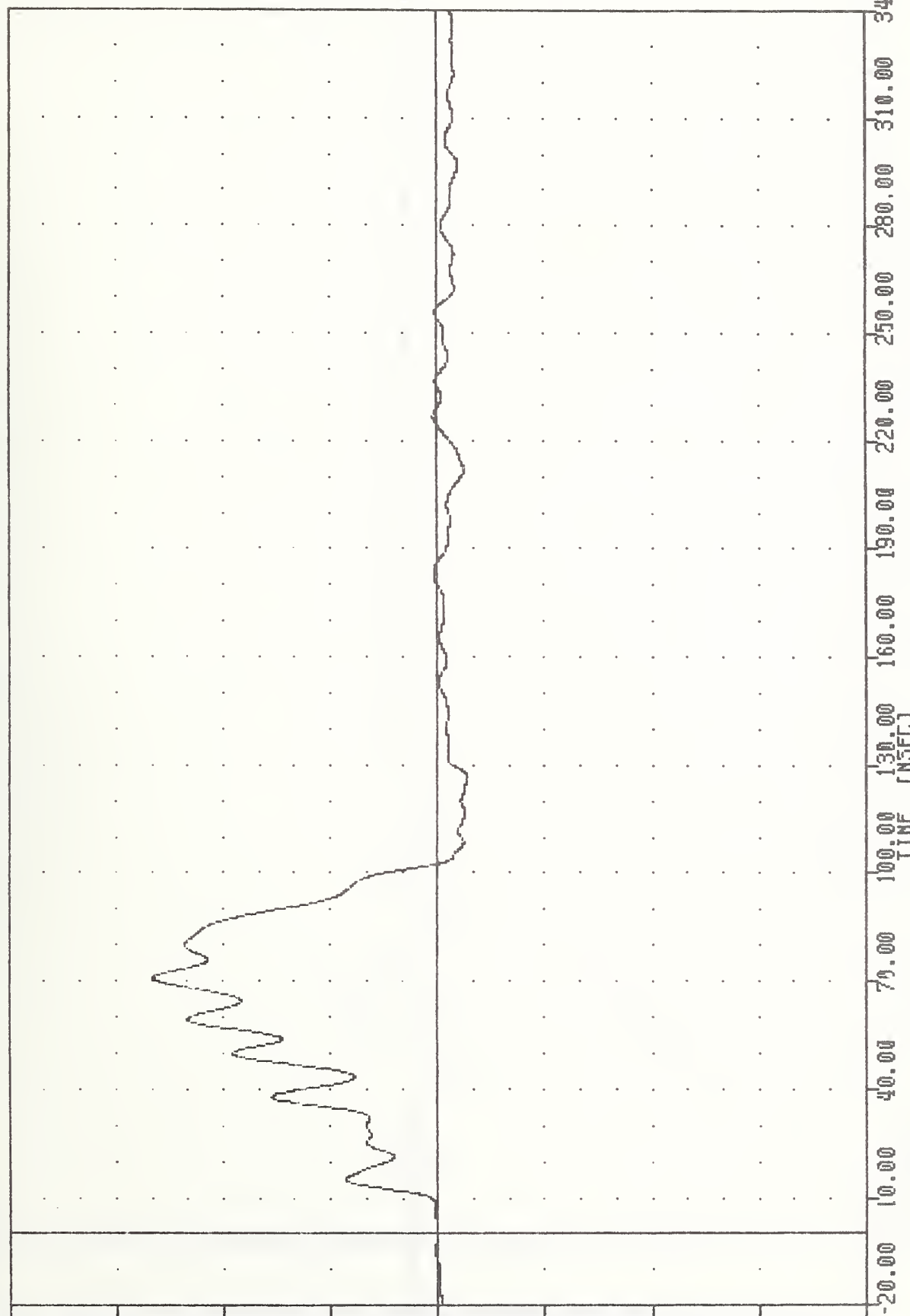
TAC , 84W529
EVALN MOD VN FLEET REPEAT
84141000000
RDKY63

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -2.77e 126.50, 26.54 e 70.75

ACCELERATION (G)

B-83



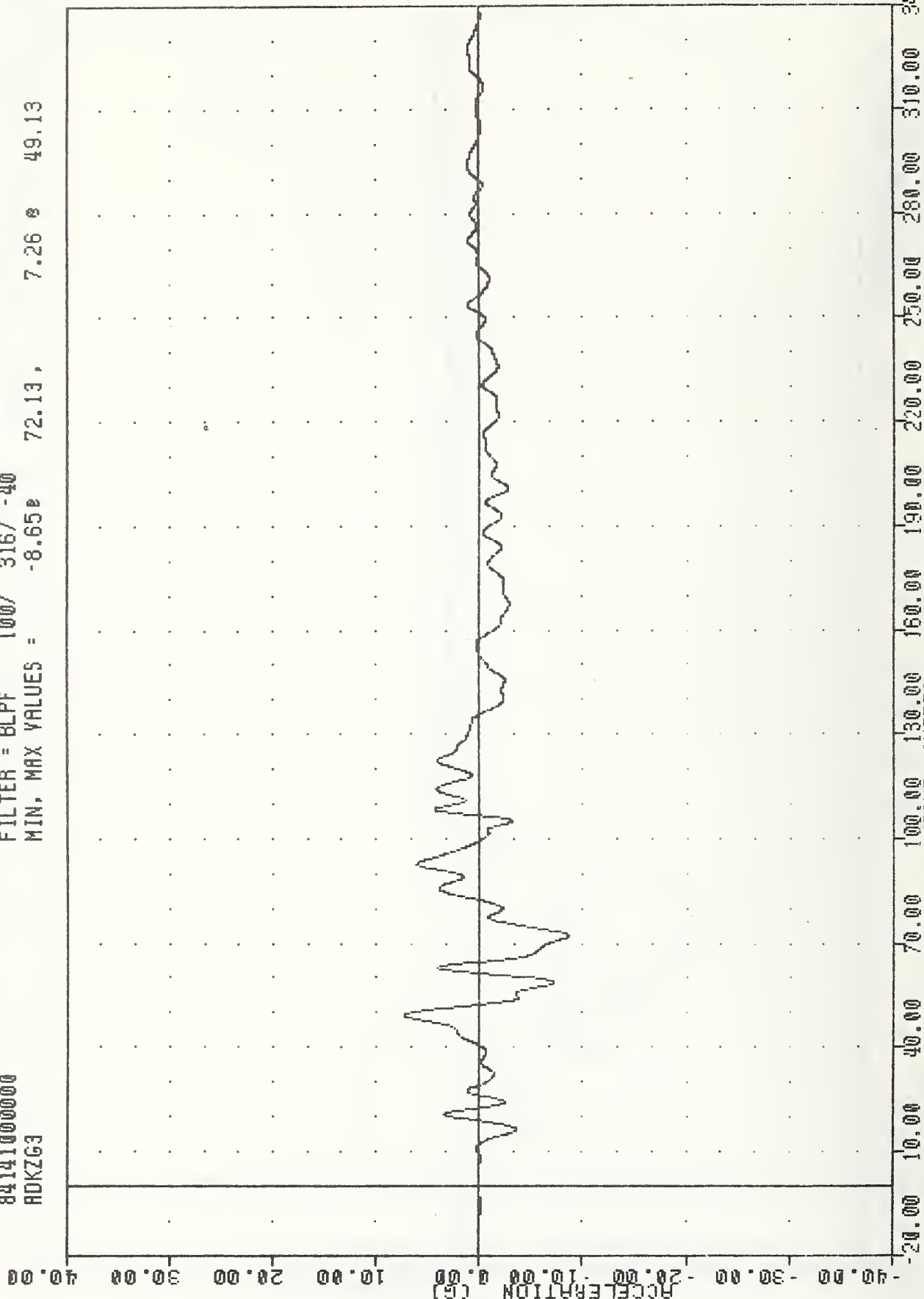
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION Y AXIS

TRC
EVALN MOD VW FLEET REPERT
84141000000
ADKZG3

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -8.65e 72.13, 7.26 e 49.13



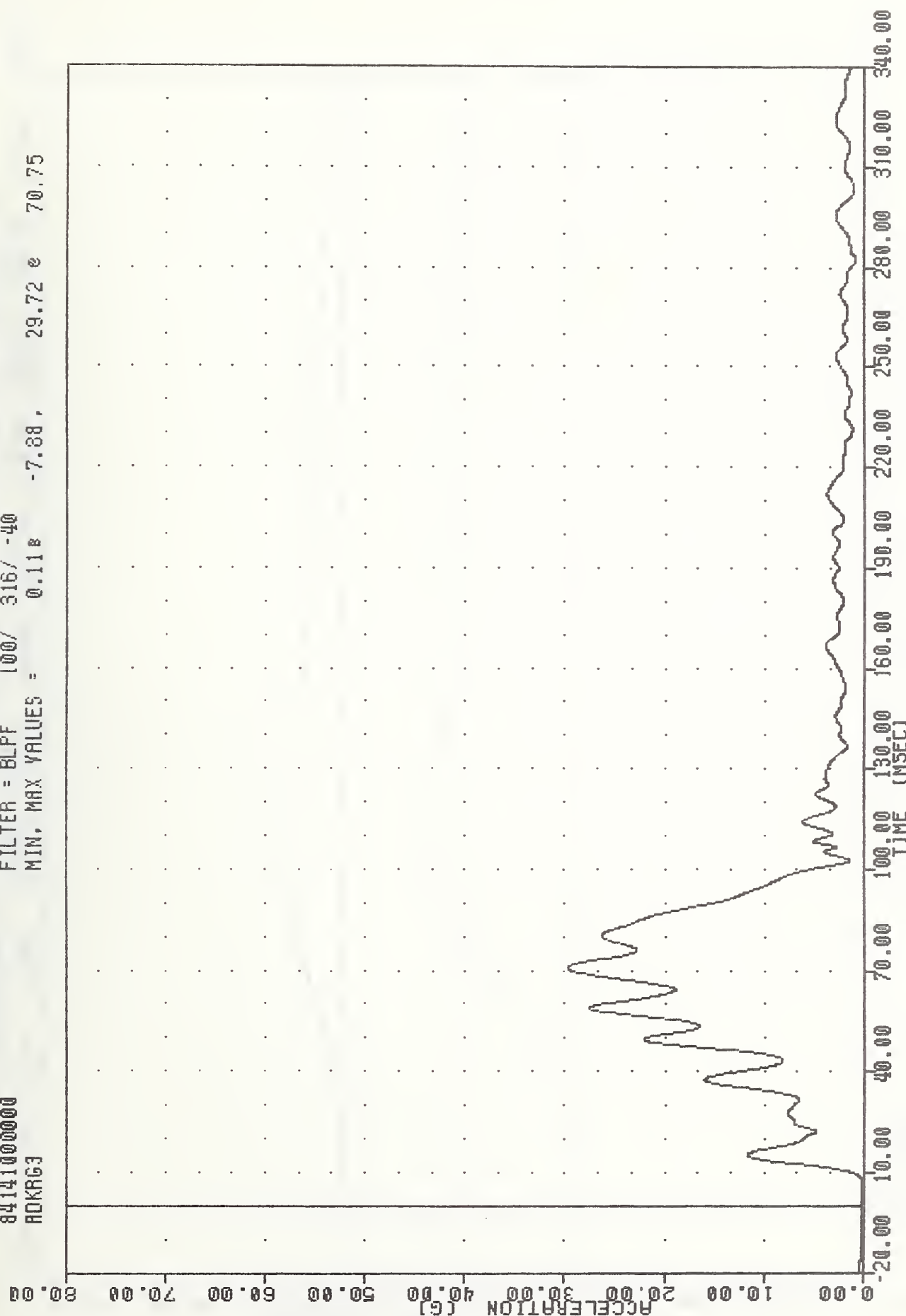
B-84

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION Z AXIS

TRC , 840529
EVALN MOD VW FLEET REPERT
84141000000
RDKRG3

PLOT DATE 5-JUN-84 14:03:22

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = 0.118 -7.88, 29.72 e 70.75

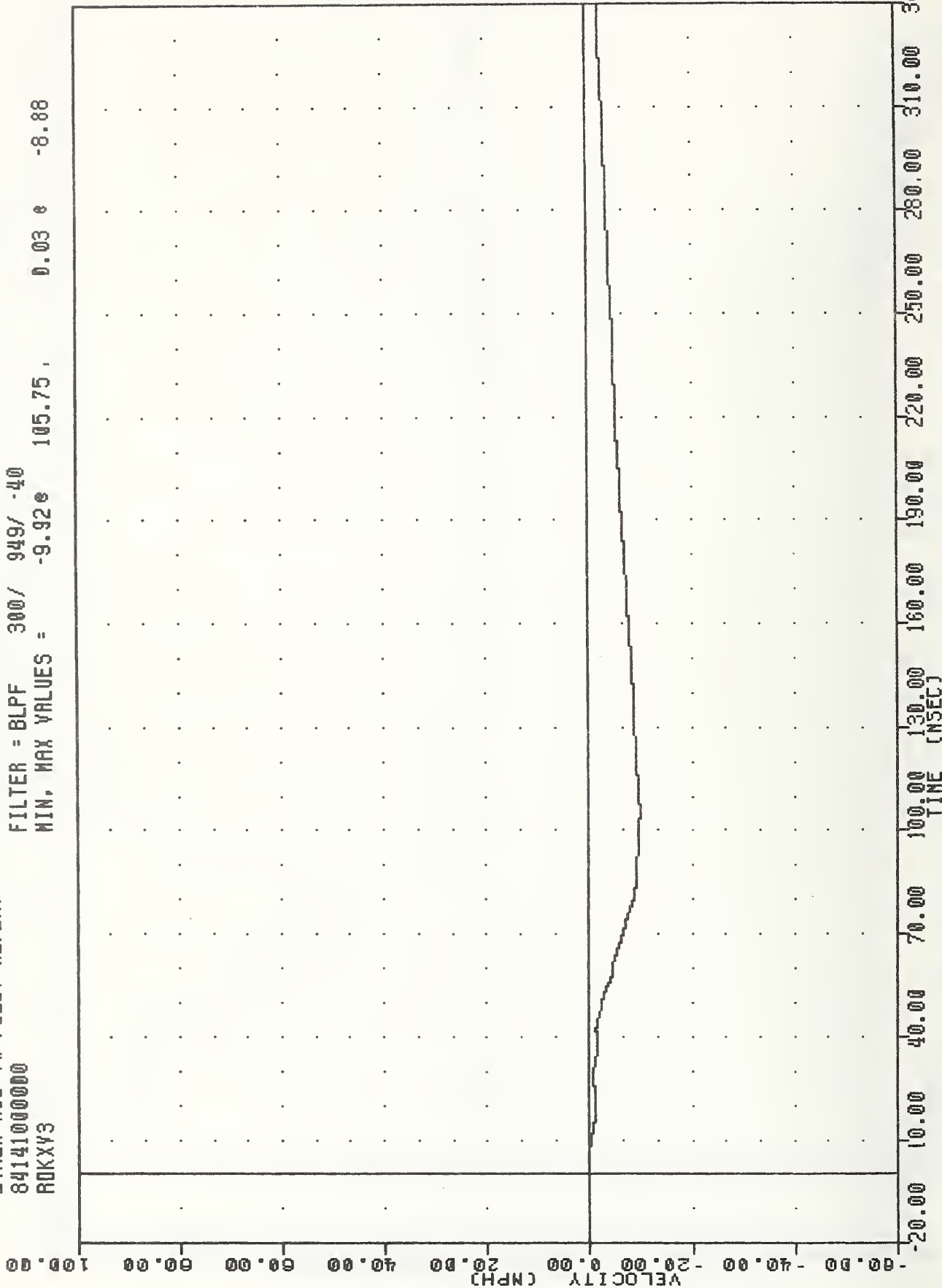


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK RESULTANT

TAC , 840529
 EVALN MOD VM FLEET REPEAT
 84141000000
 ROKXV3

PLOT DATE 5-JUN-84 14:06:39

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -9.92 0.03 105.75 -8.88



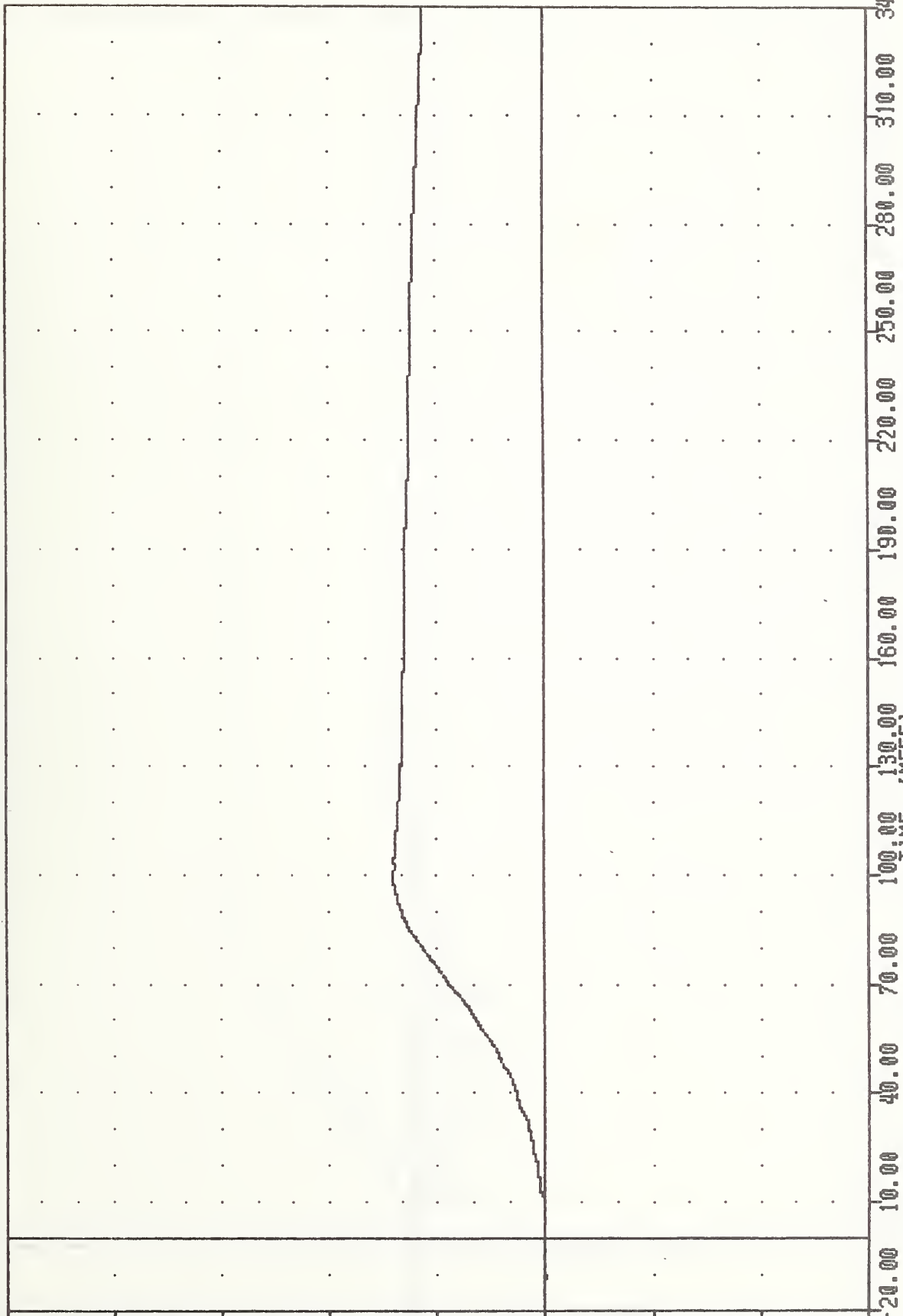
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING ROKXG3

TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
ADKYV3

PLOT DATE 5-JUN-84 14:06:39

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.04e -10.63, 28.04 e 99.13

VELOCITY (MPH)



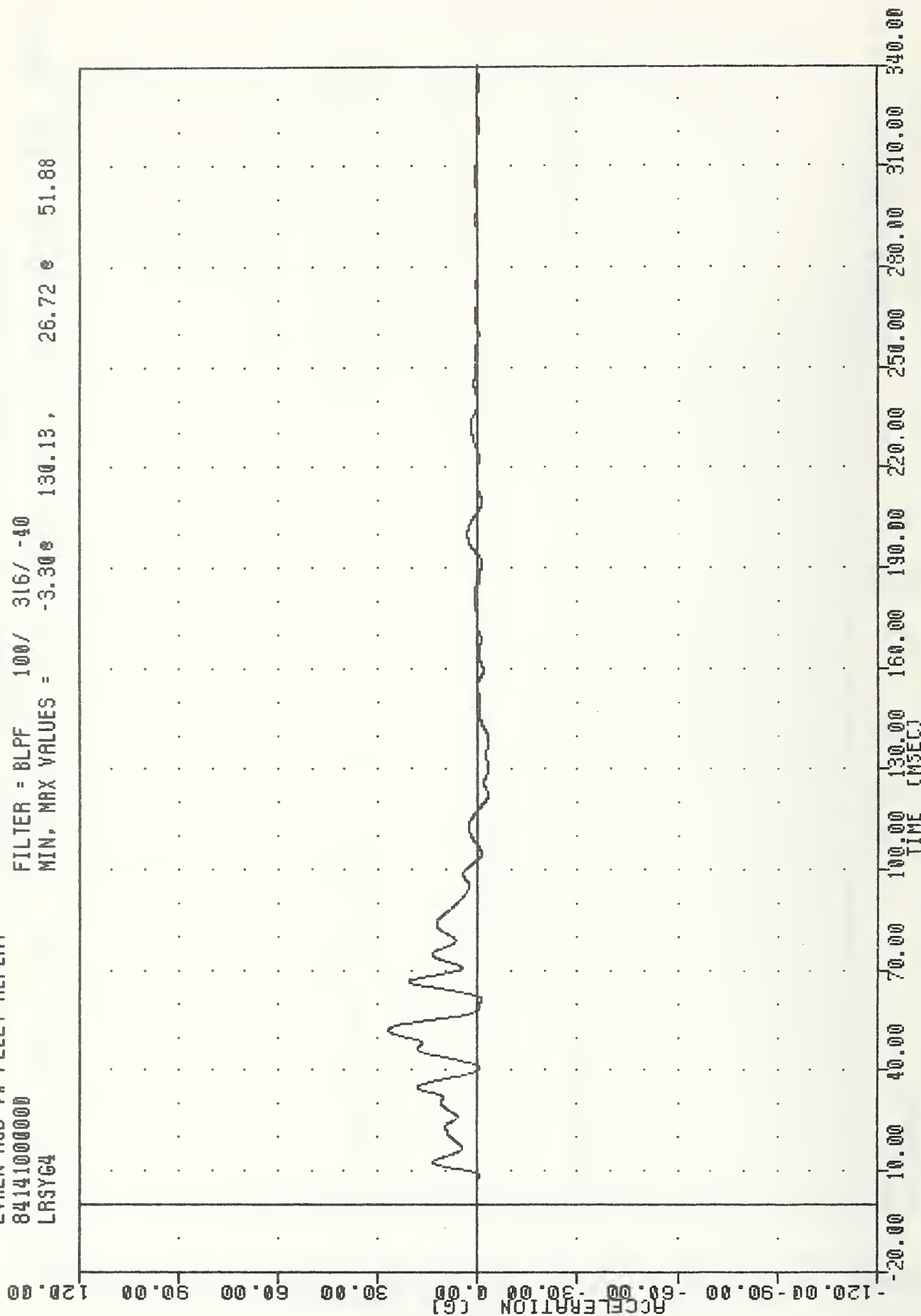
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING ADKYG3

TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
LRSYG4

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -3.30s 130.13, 26.72 s 51.88

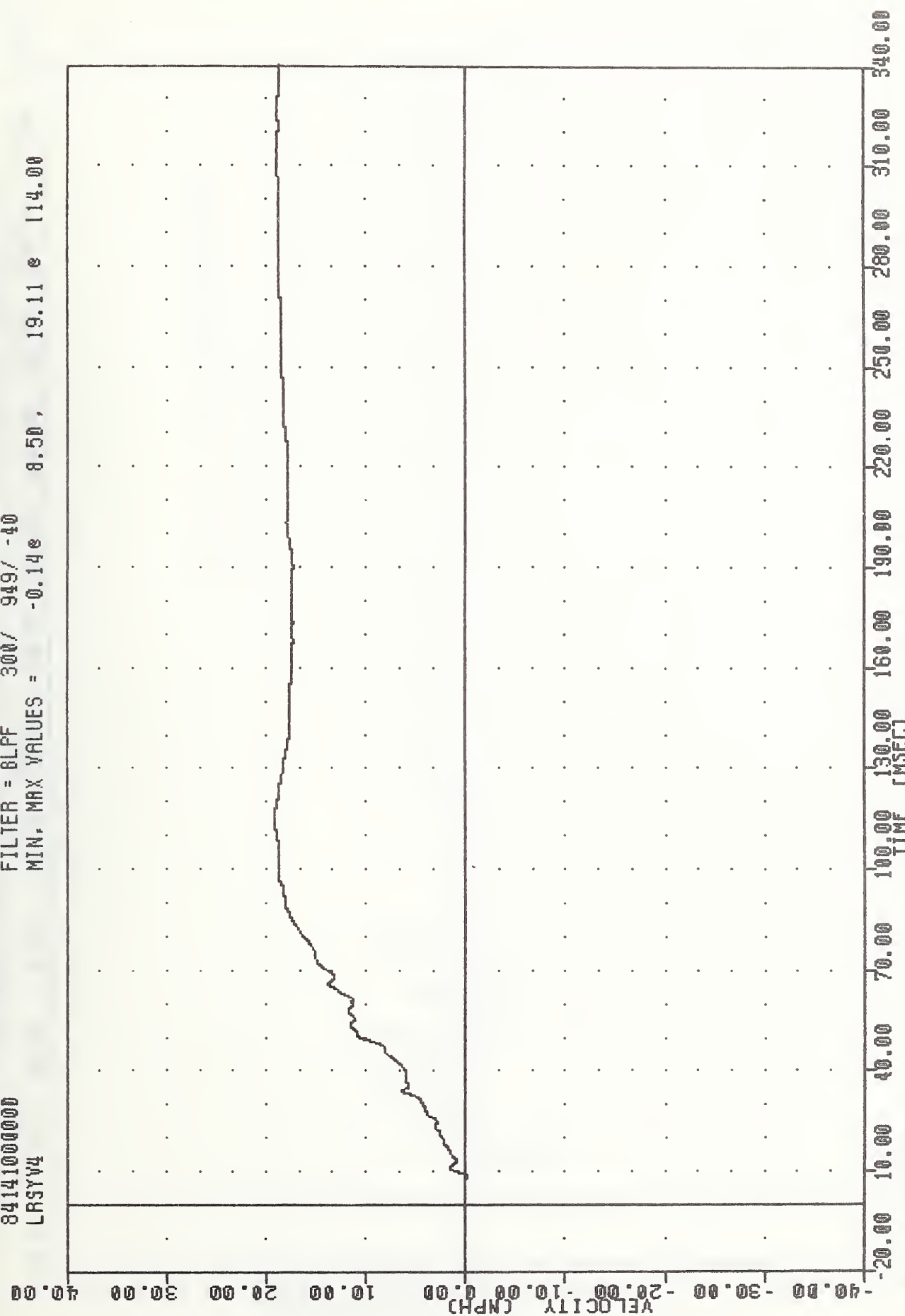


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT REAR SILL ACCELERATION Y AXIS

TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
LRSYV4

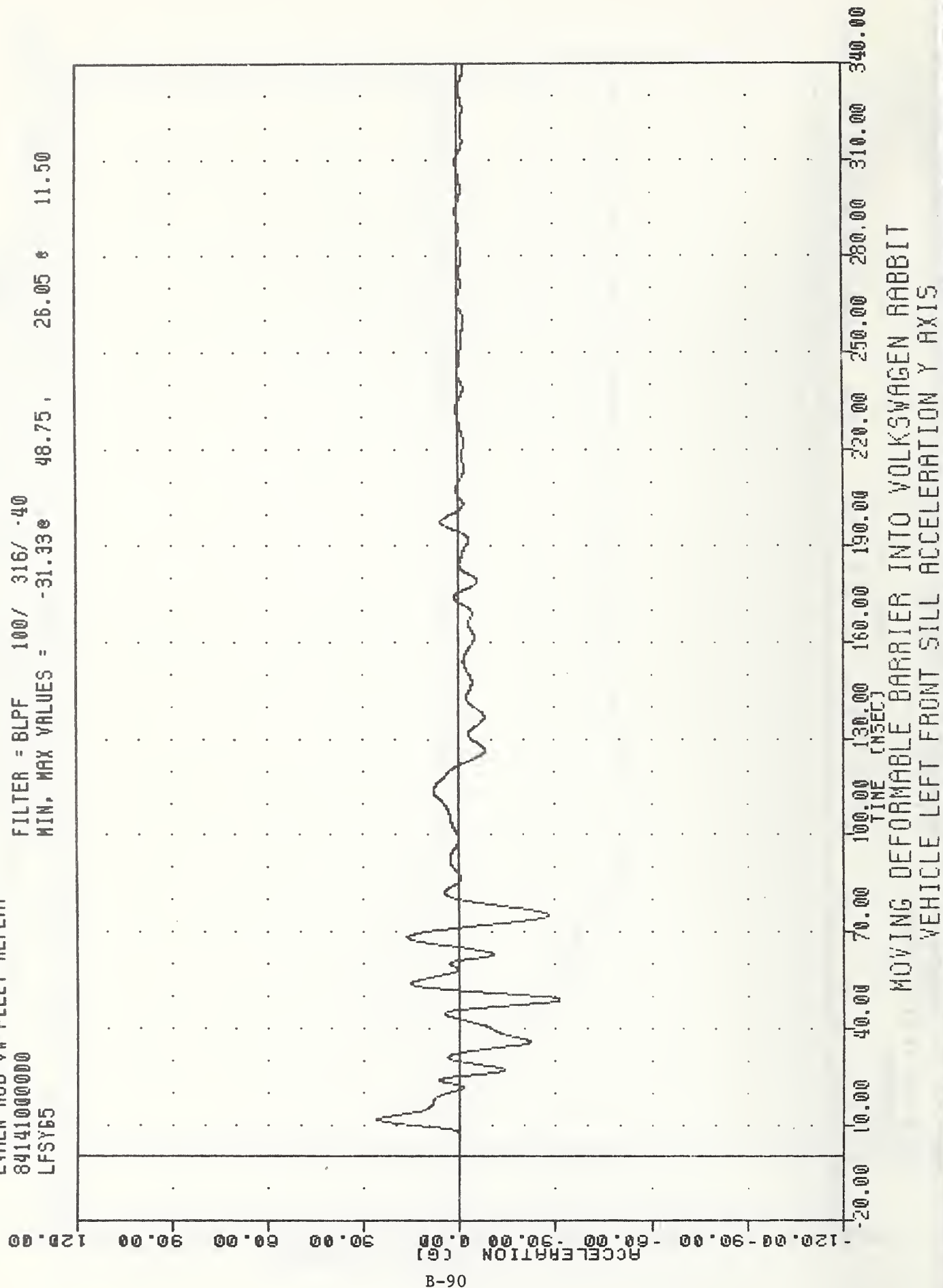
PLOT DATE 5-JUN-84 14:06:39

FILTER = 8LPF 300/ 949/ -40
MIN, MAX VALUES = -0.14e 8.50, 19.11 e 114.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LRSY64

TRC , 840529
 EVALN MOD VN FLEET REPEAT
 84141000000
 LFSY65
 PLOT DATE 5-JUN-84 14:01:58
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -31.33e 48.75, 26.05 e 11.50



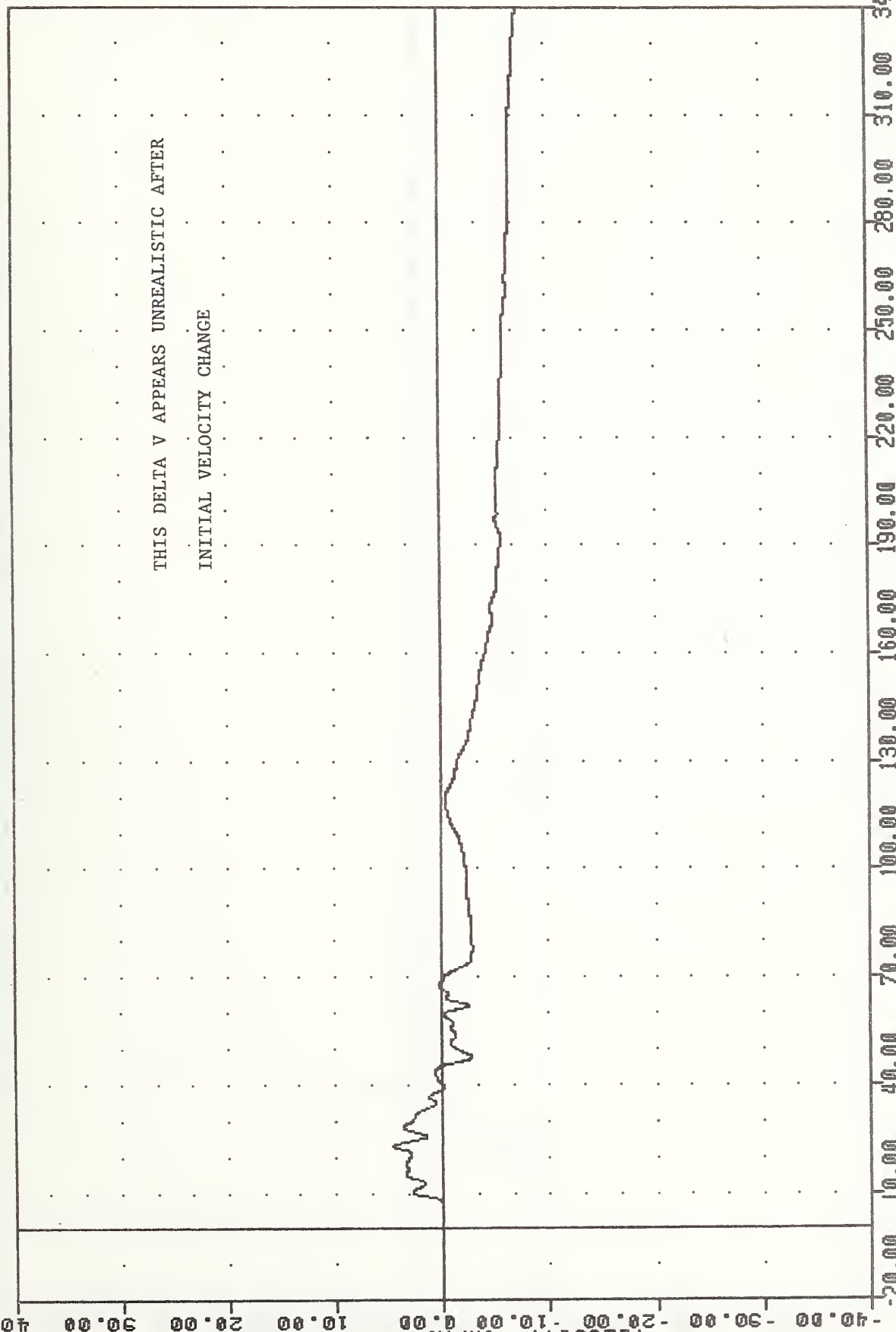
TAC , 840529
EVALN MOD V4 FLEET REPEAT
84141000000
LFSYV5

PLOT DATE 5-JUN-84 14:06:39

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -7.32 340.00 , 4.71 23.00

VELOCITY (NPH)

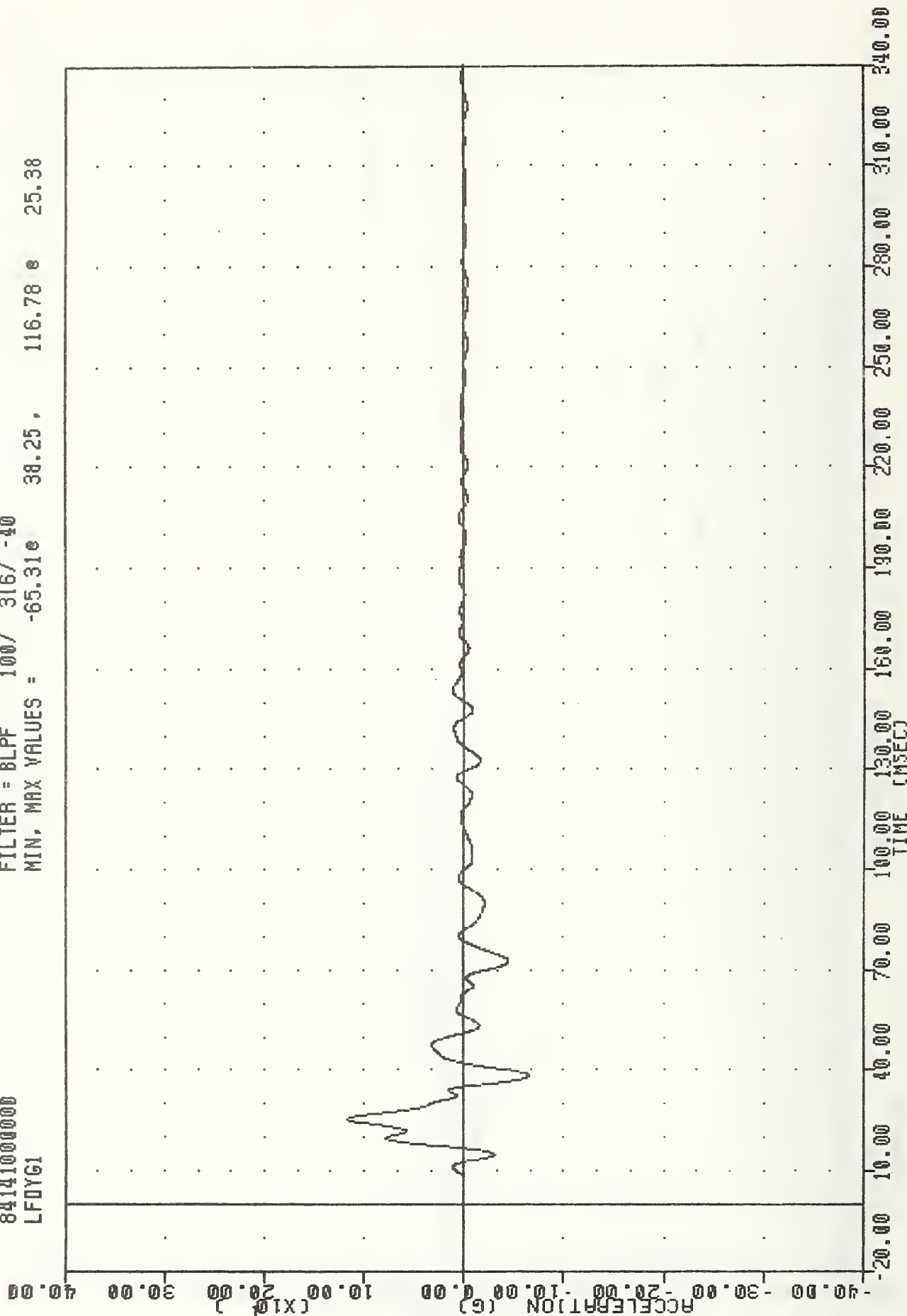


TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
LF0Y61

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40

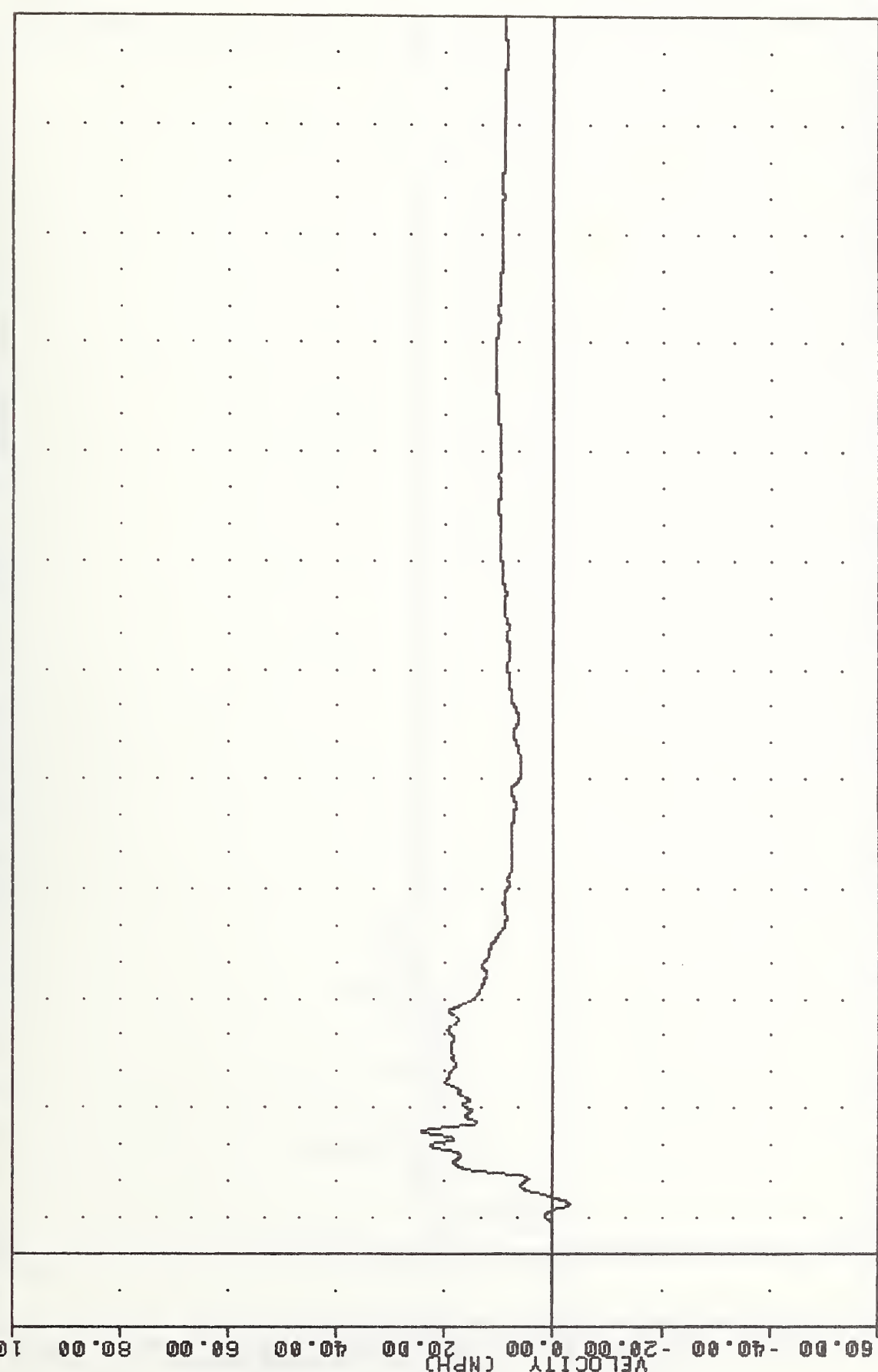
MIN, MAX VALUES = -65.31e 38.25, 116.78 e 25.38



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

TRC , 840529
EVALN MOD VW FLEET REPERT
84141000000
LFDYV1

PLOT DATE 5-JUN-84 14:06:39
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -3.068 13.63 , 24.29 @ 33.50



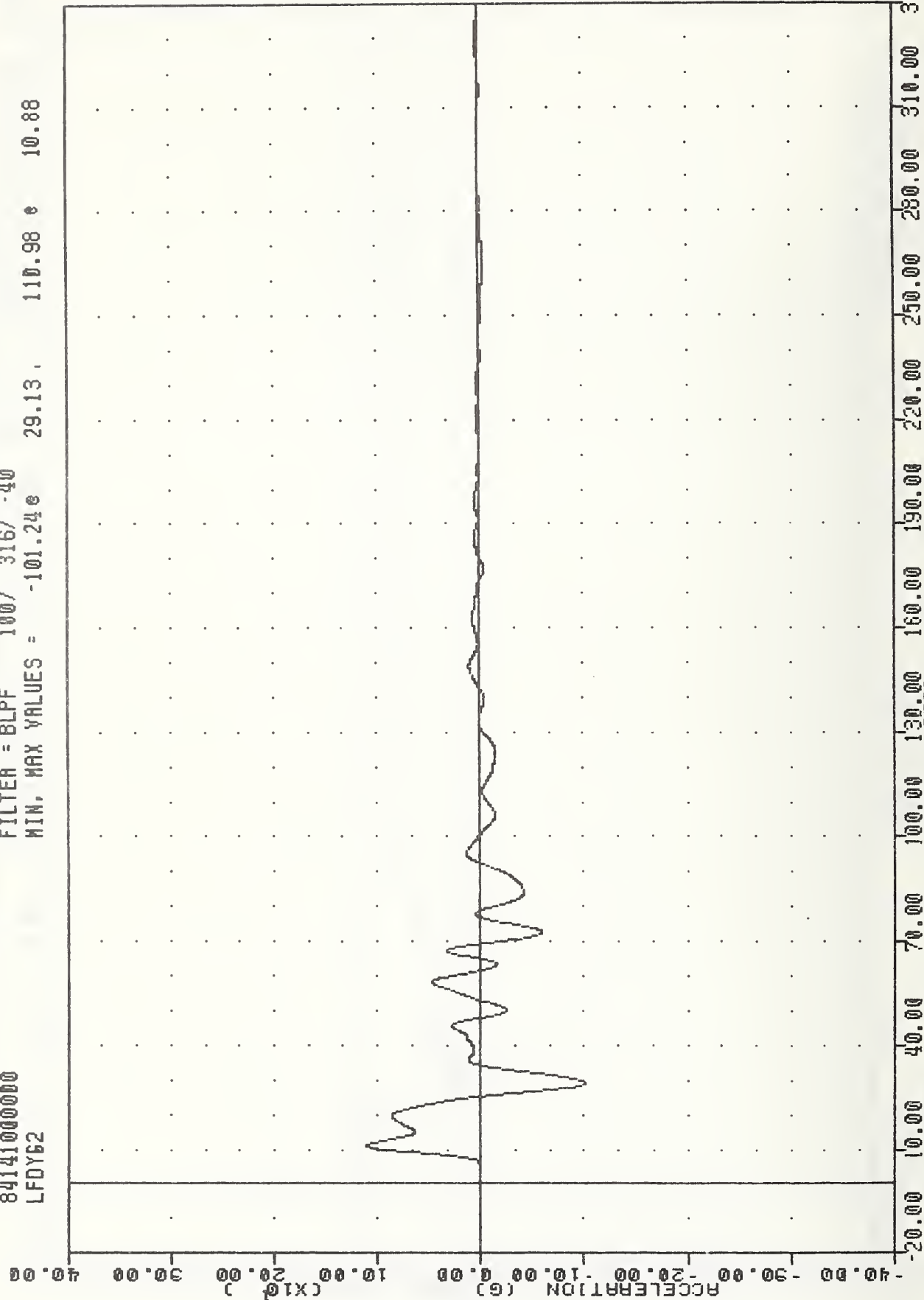
-20.00 0.00 20.00 40.00 60.00 80.00 100.00
0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYGI

TAC , 840529
EVALN MOD VM FLEET REPEAT
84141000000
LFDY62

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -101.240 29.13, 110.98 0 10.88



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MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 8) ACCELERATION Y AXIS

PLOT DATE 5-JUN-84 14:06:39

EVALN MOD YW FLEET REPEAT

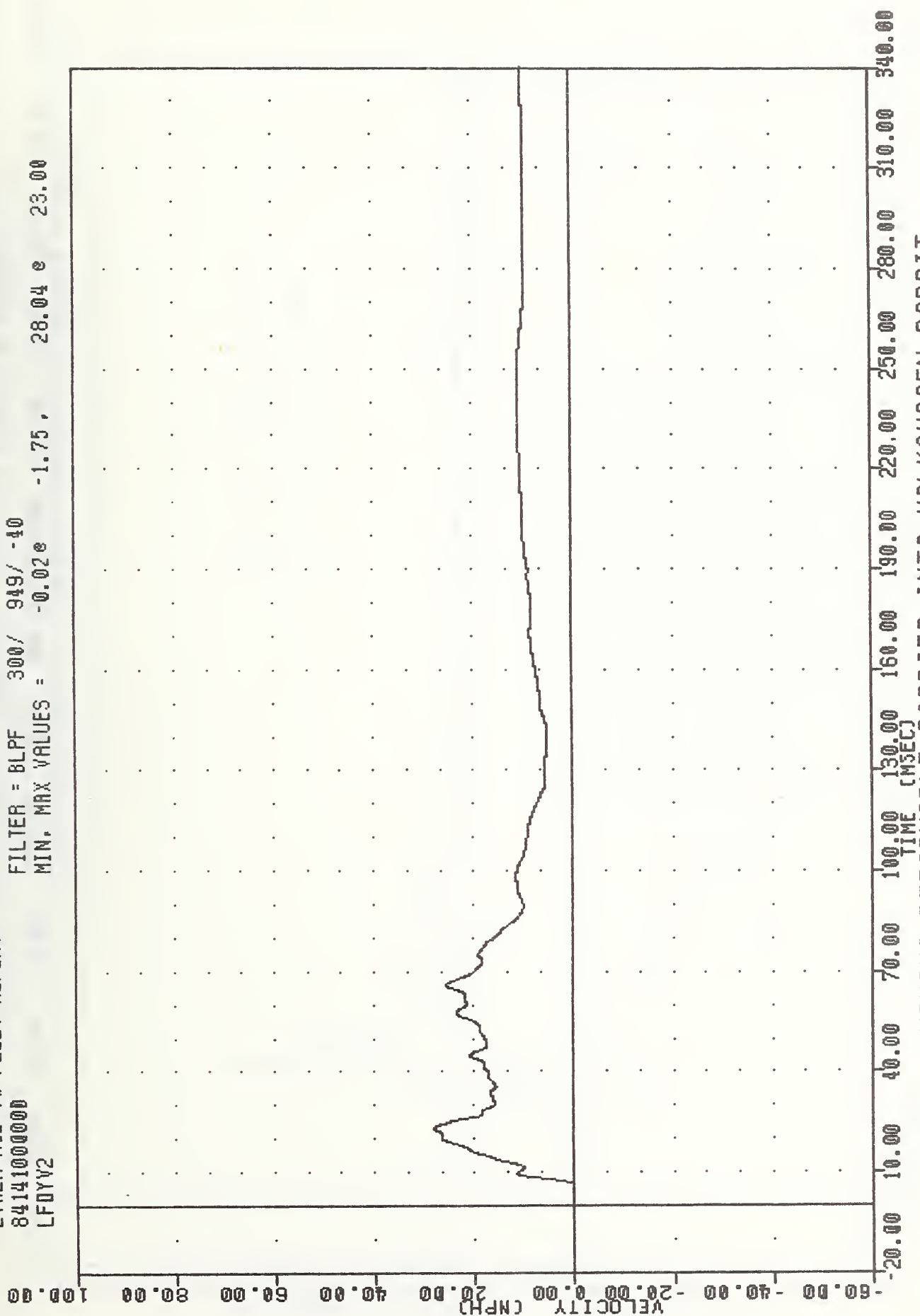
84141000000

LFDYV2

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.02e

-1.75, 28.04 e 23.00

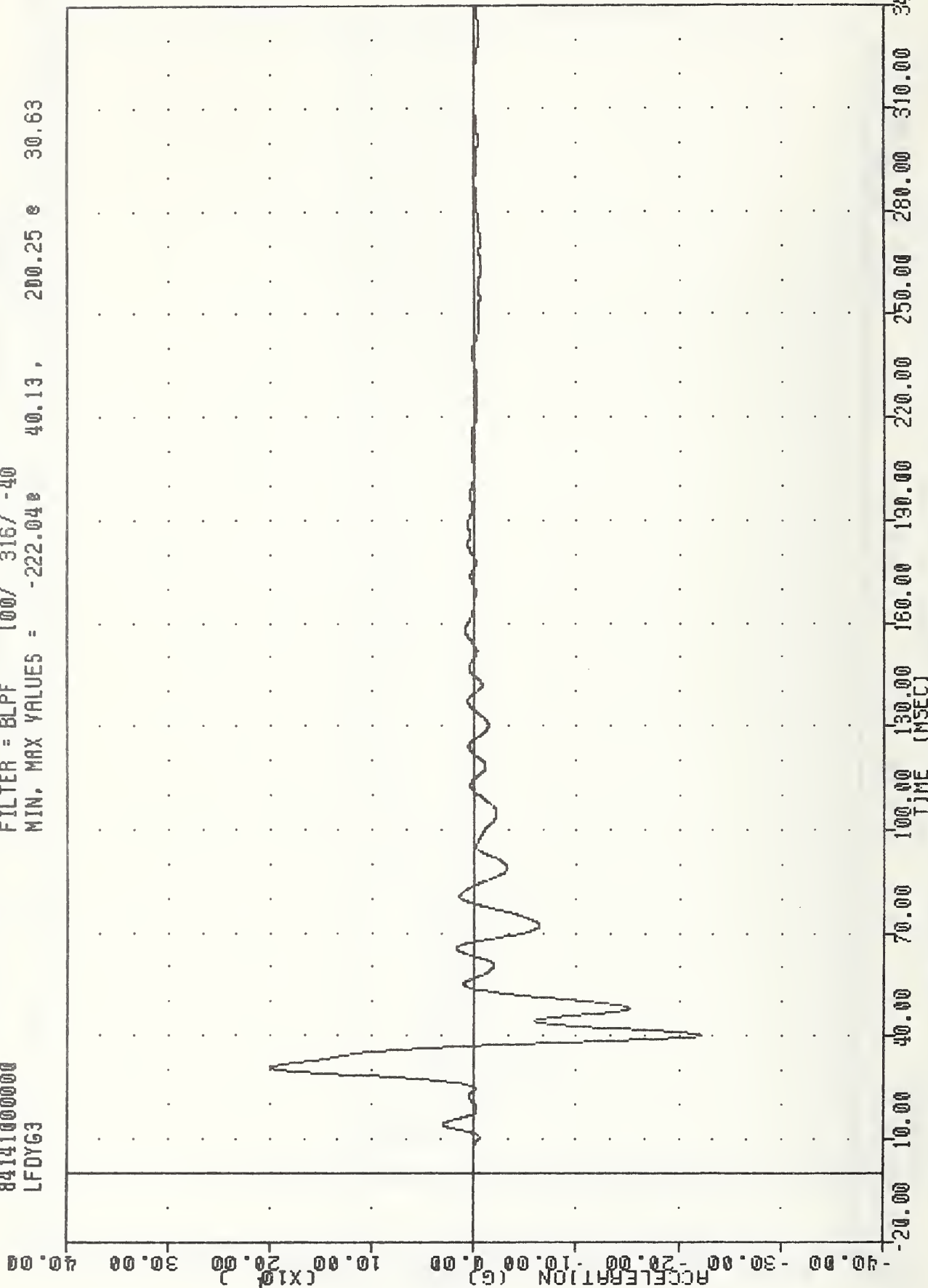


TRC
EVALN MOD VW FLEET REPERT
84141000000
LFDY63

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -222.048 40.13, 200.25 30.63



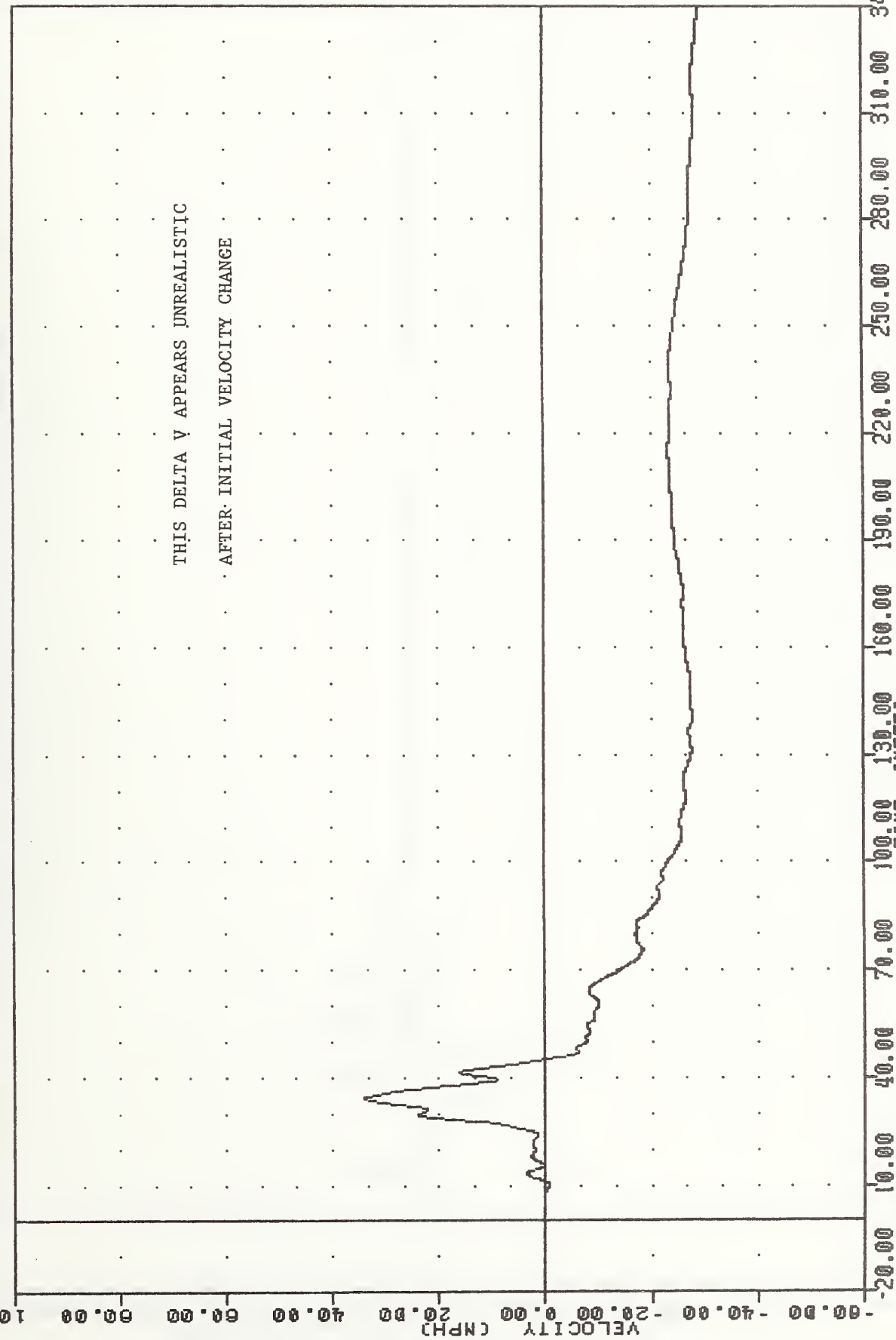
B-96

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

TRC 840529 5-JUN-84 14:06:39

EVALN MOD V# FLEET REPEAT
84141000000
LFDYV3

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -29.06 340.00, 34.00 34.13



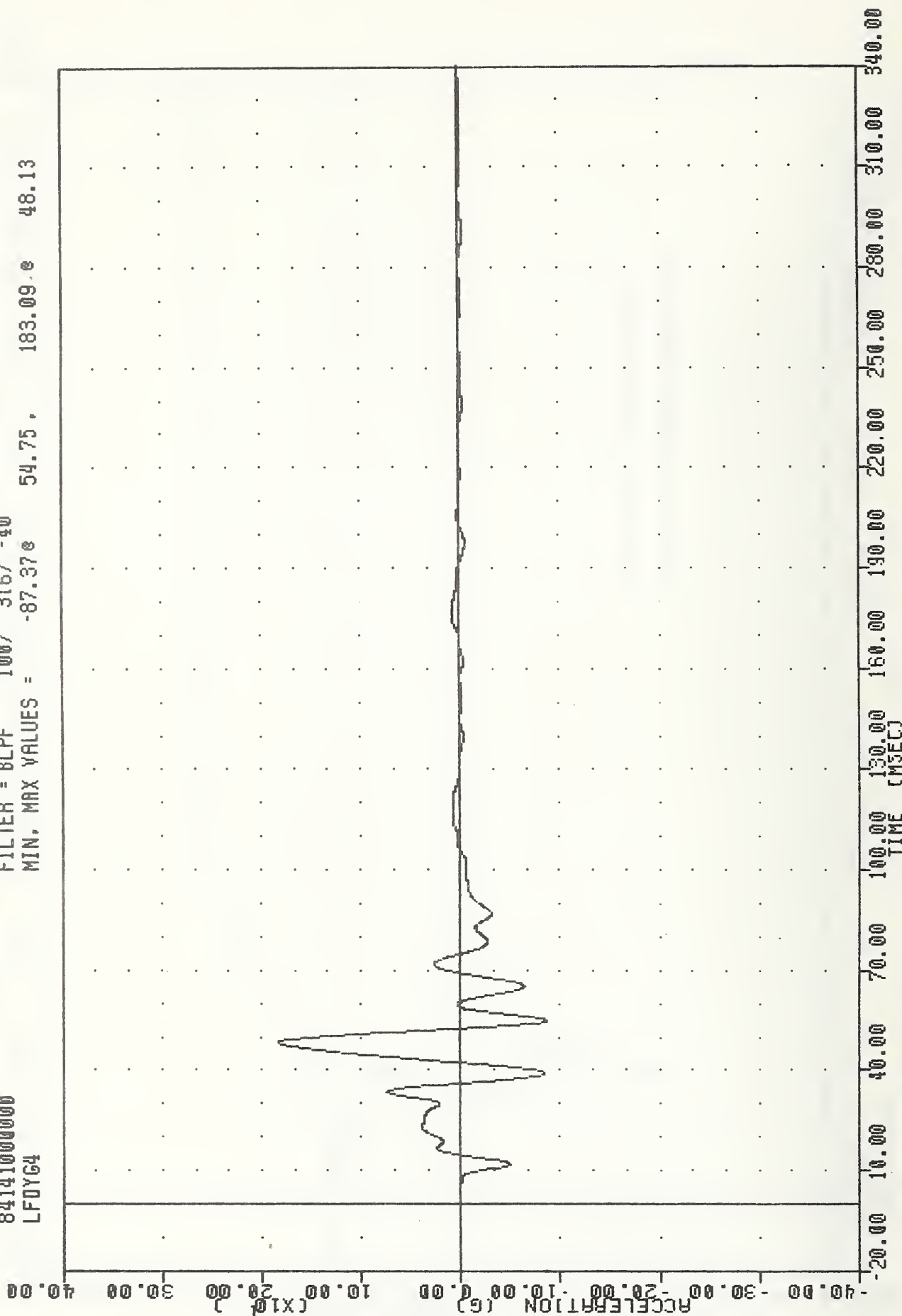
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYV3

TRC , 840524
EVALN MOD YW FLEET REPEAT
84141000000
LFDY64

PLUT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -87.37e 54.75, 183.09.e 48.13



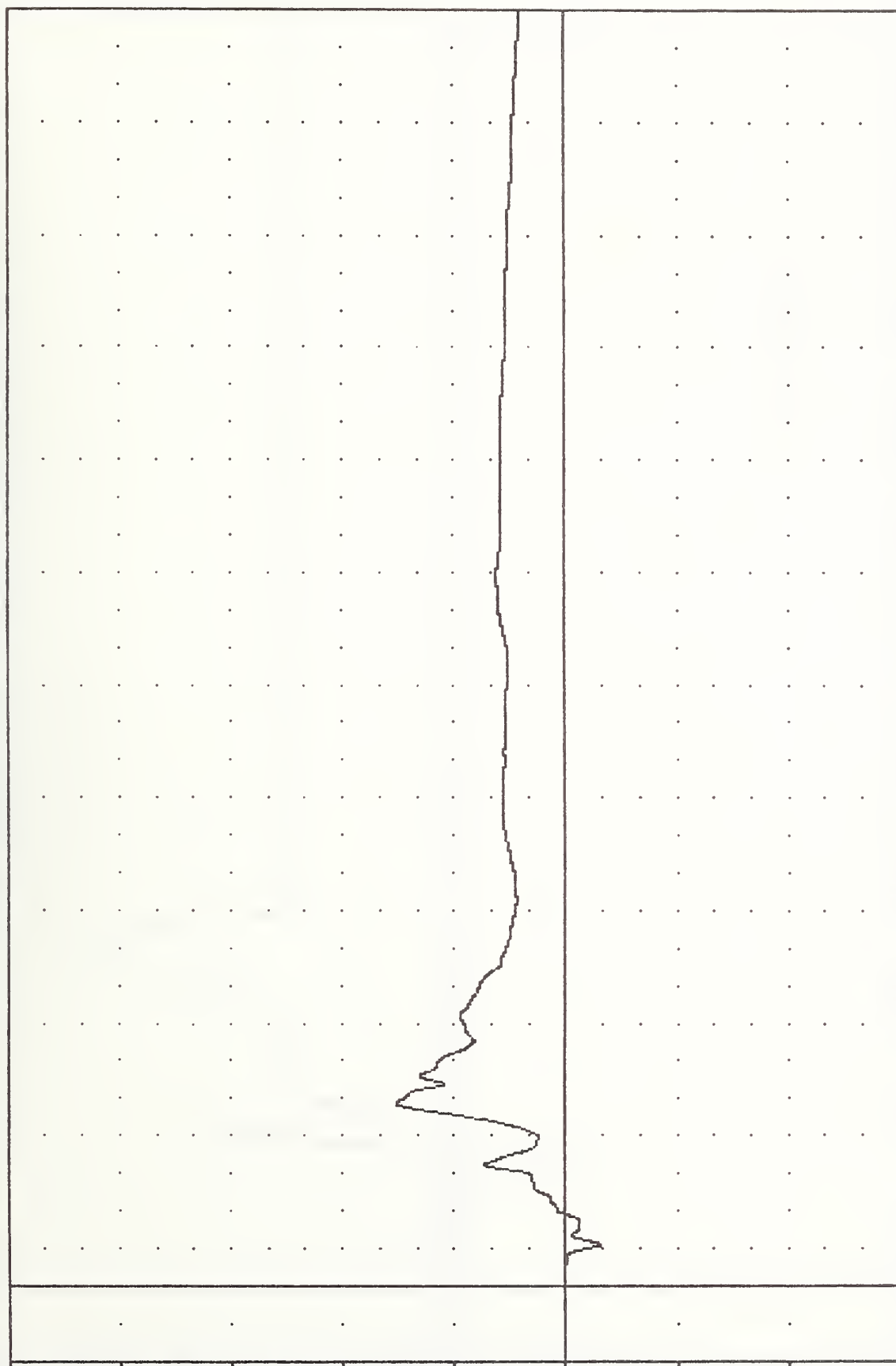
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 10) ACCELERATION Y AXIS

TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
LFDYV4

PLOT DATE 5-JUN-84 14:06:39

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -6.23e 10.75, 30.39 e 48.50

VELOCITY (NPH)



TIME (MSEC)

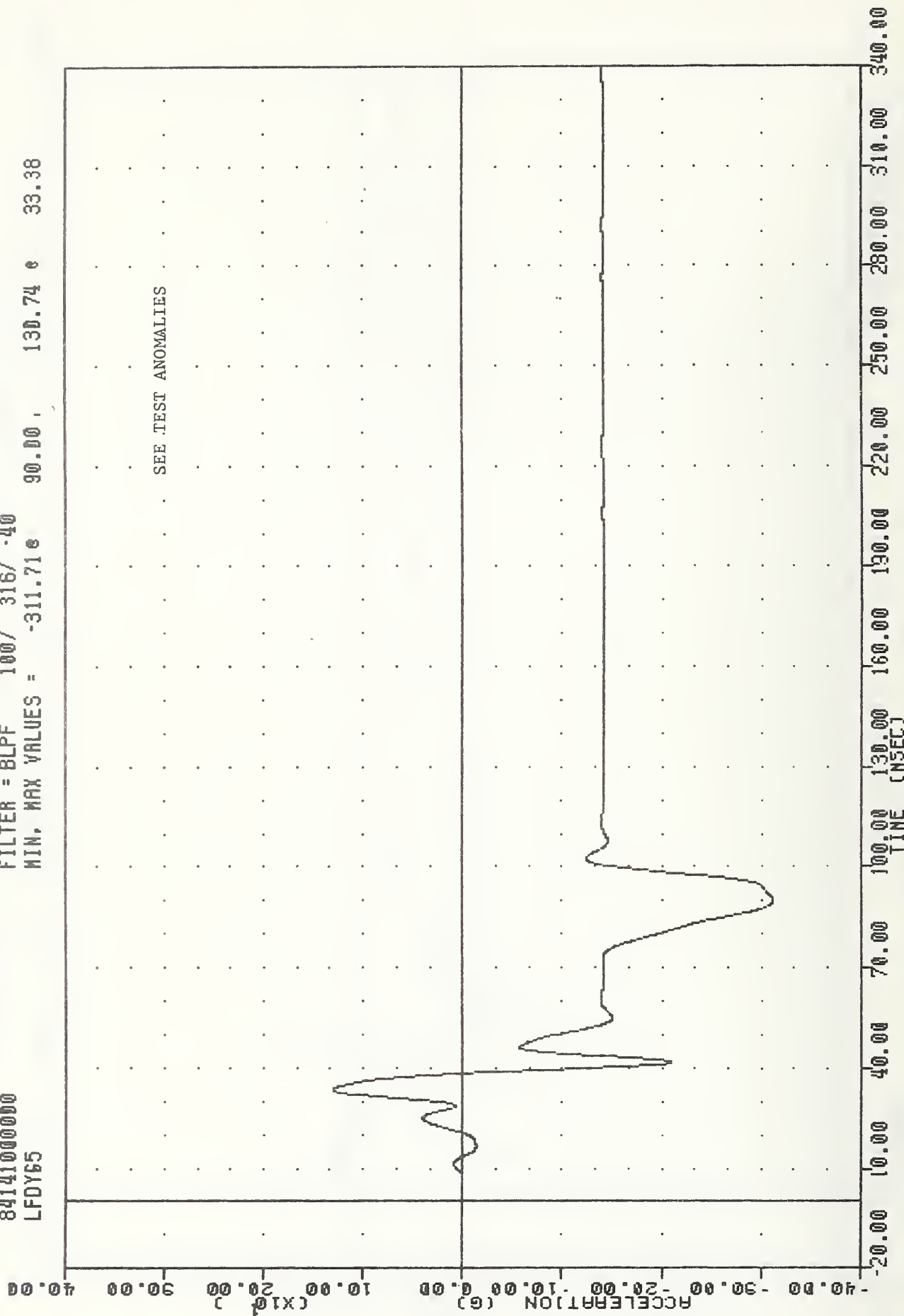
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYV4

TAC
EVALN MOD V# FLEET REPEAT
84141000000
LFDY65

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -311.71e 90.00, 130.74 e 33.38



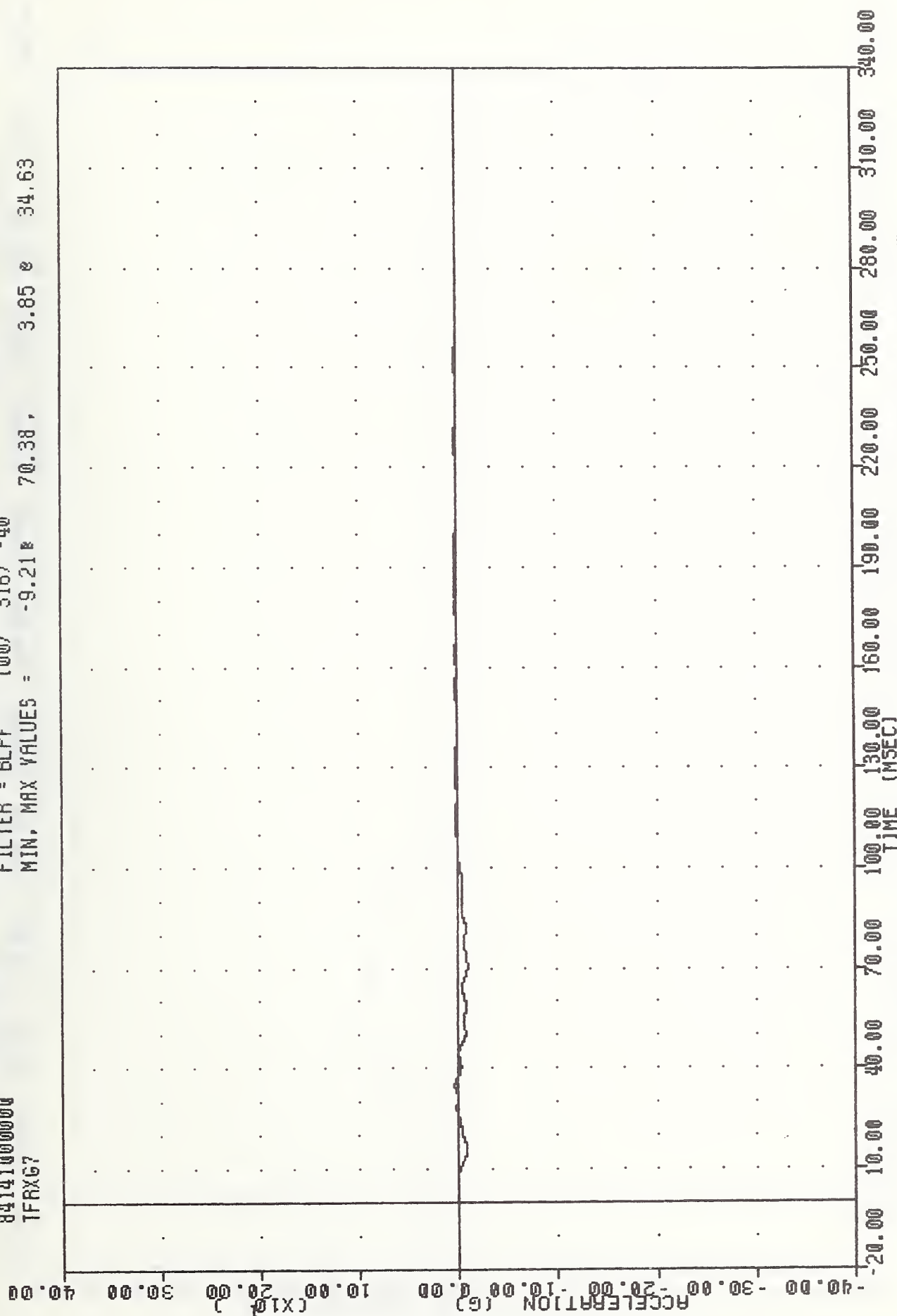
B-100

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 11) ACCELERATION Y AXIS

TRC , 840529
EVALN MOD VW FLEET REPERT
84141000000
TFRXG7

PLOT DATE 5-JUN-84 14:01:58

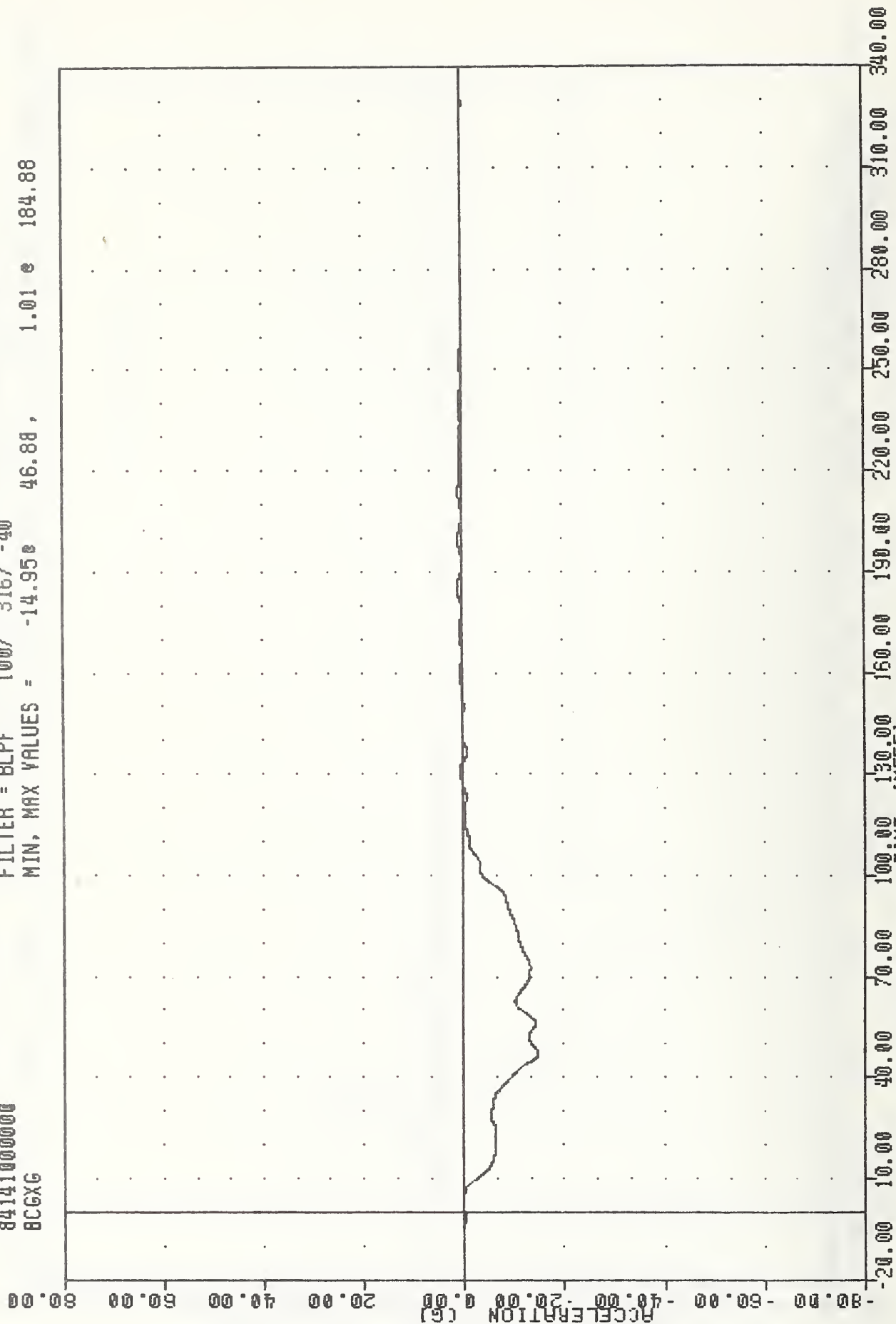
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -9.21 70.38 3.85 e 34.63



TRC
EVALN MOD VV FLEET REPEAT
84141000000
BCCXG

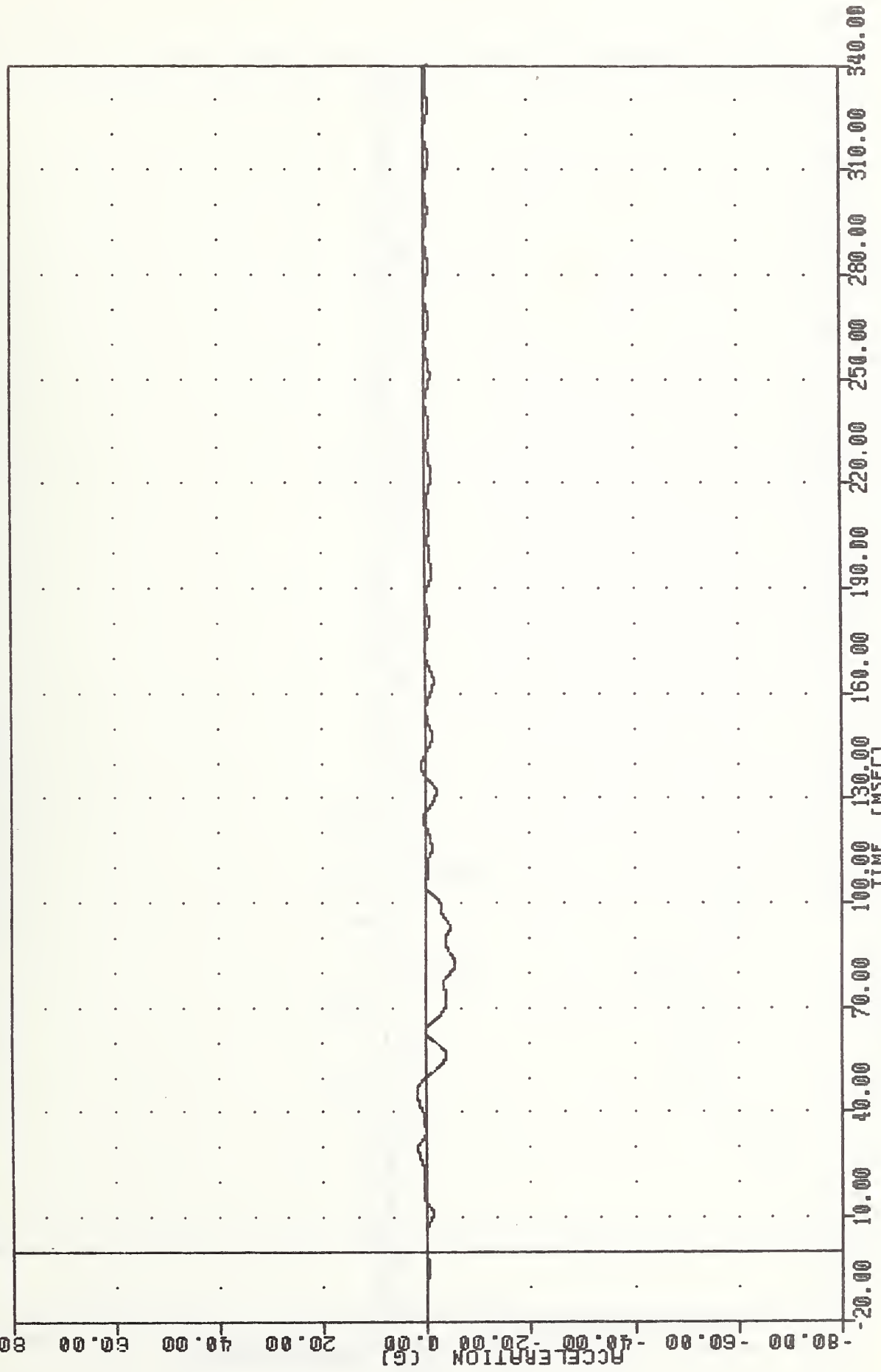
PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -14.950 46.88, 1.01 e 184.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER CENTER OF GRAVITY X AXIS

TRC
 EVALN MOD YW FLEET REPEAT
 84141000000
 BCGYG
 PLOT DATE 5-JUN-84 14:01:58
 FILTER = 8LPF 100/ 316/ -40
 MIN. MAX VALUES = -5.50e 82.50, 1.84 e 45.88



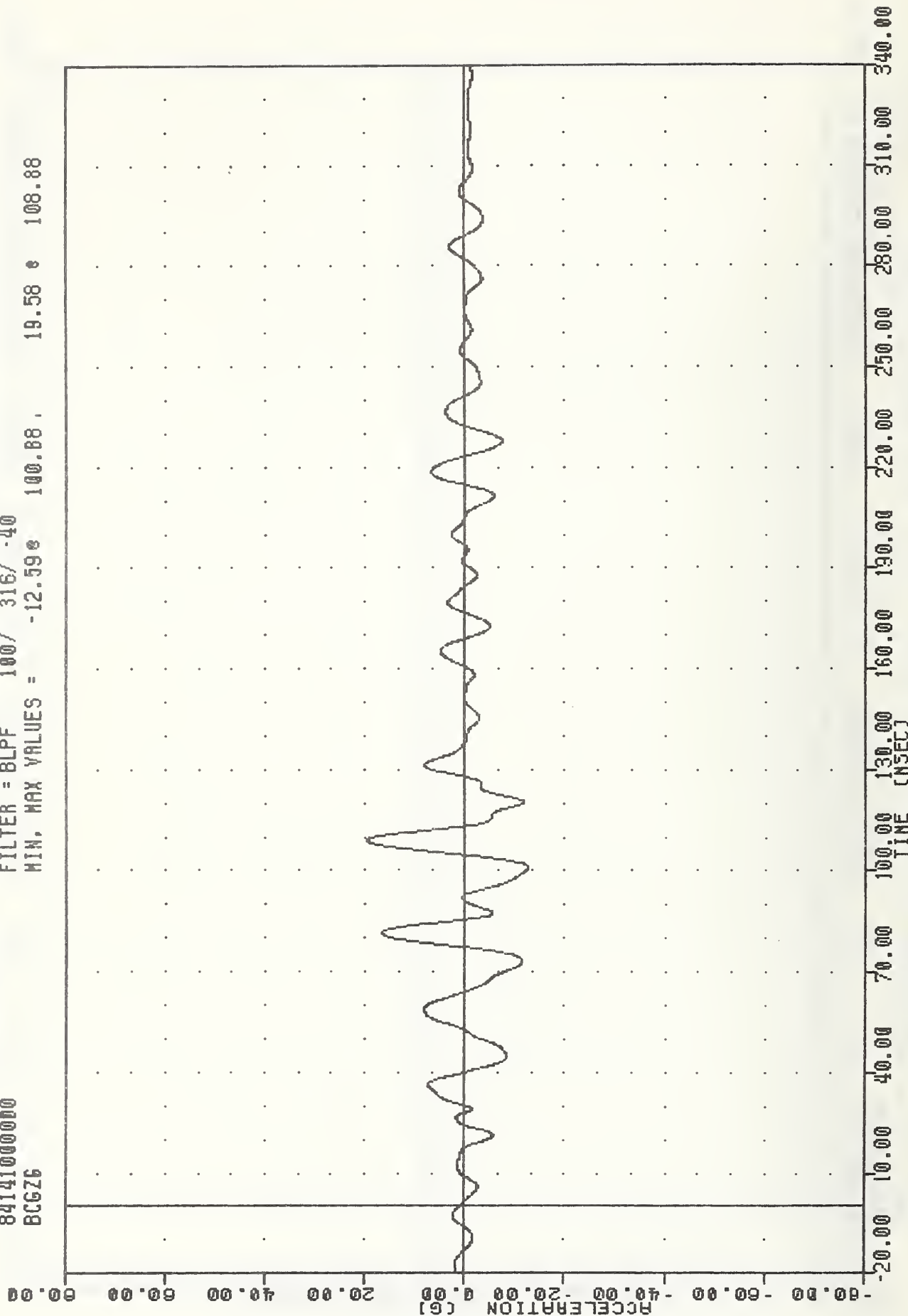
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 BARRIER CENTER OF GRAVITY Y AXIS

TAC
EVALN MOD V# FLEET REPEAT
84141000000
BCGZ6

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40

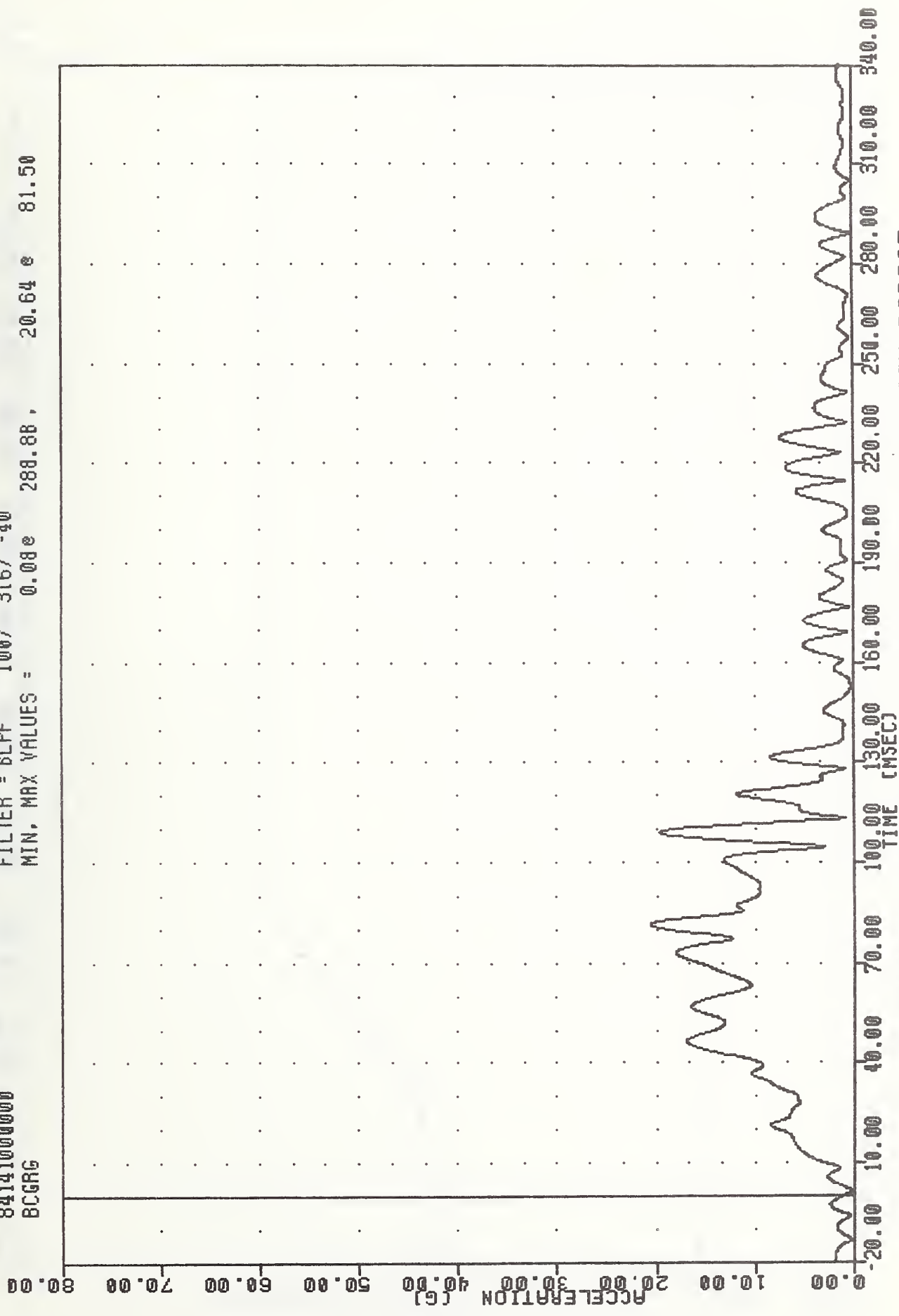
MIN, MAX VALUES = -12.59 100.88 19.58 108.88



TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
BCGRG

PLOT DATE 5-JUN-84 14:03:22

FILTER = 6LPF 100/ 316/ -40
MIN. MAX VALUES = 0.08e 288.88, 20.64 e 81.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER CG RESULTANT

TAC
EVALN MOD YW FLEET REPEAT
84141000000
BCGXV

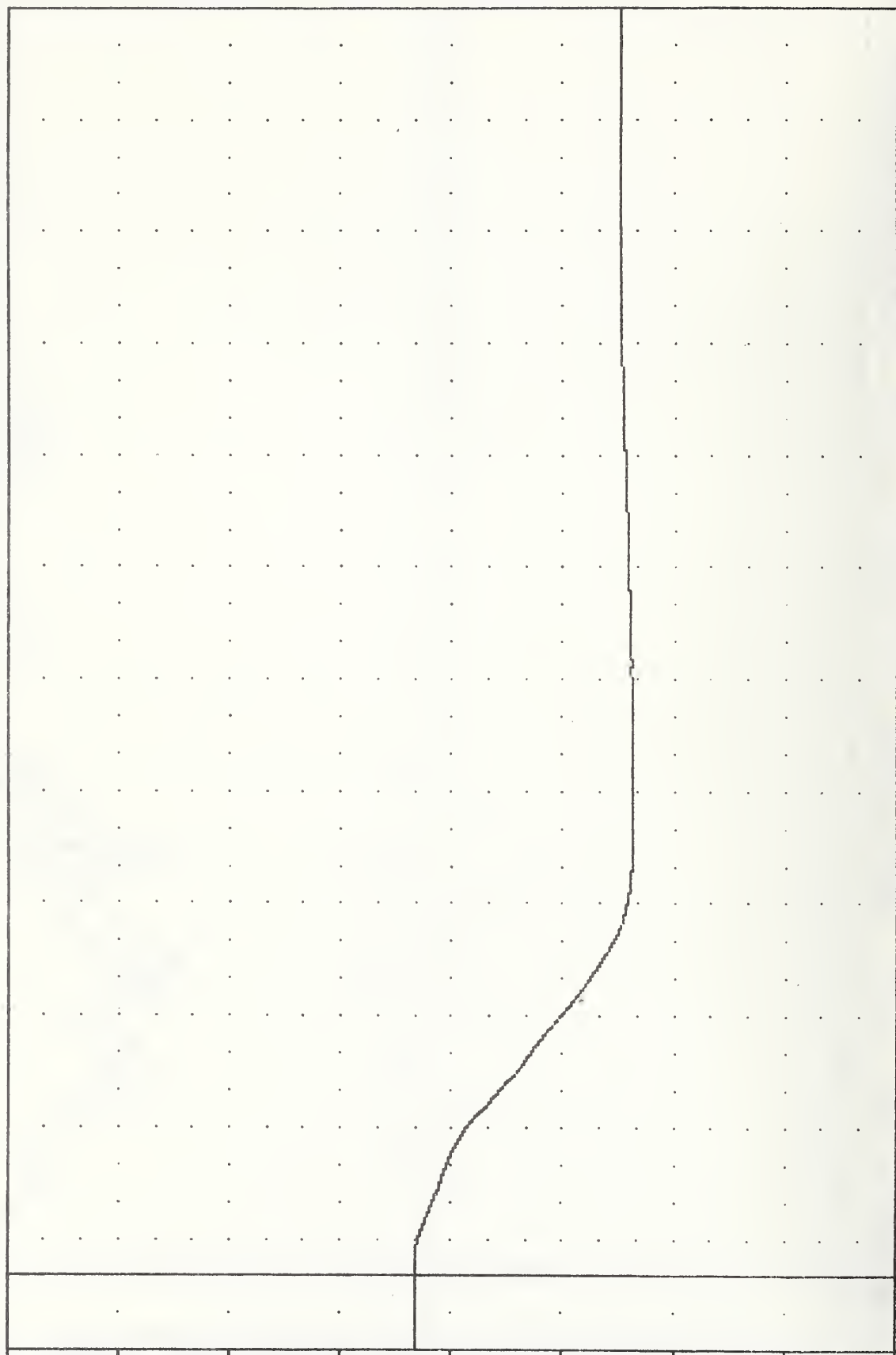
PLOT DATE 5-JUN-84 14:06:39

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = 23.72 122.50 , 43.34 6 -8.25

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

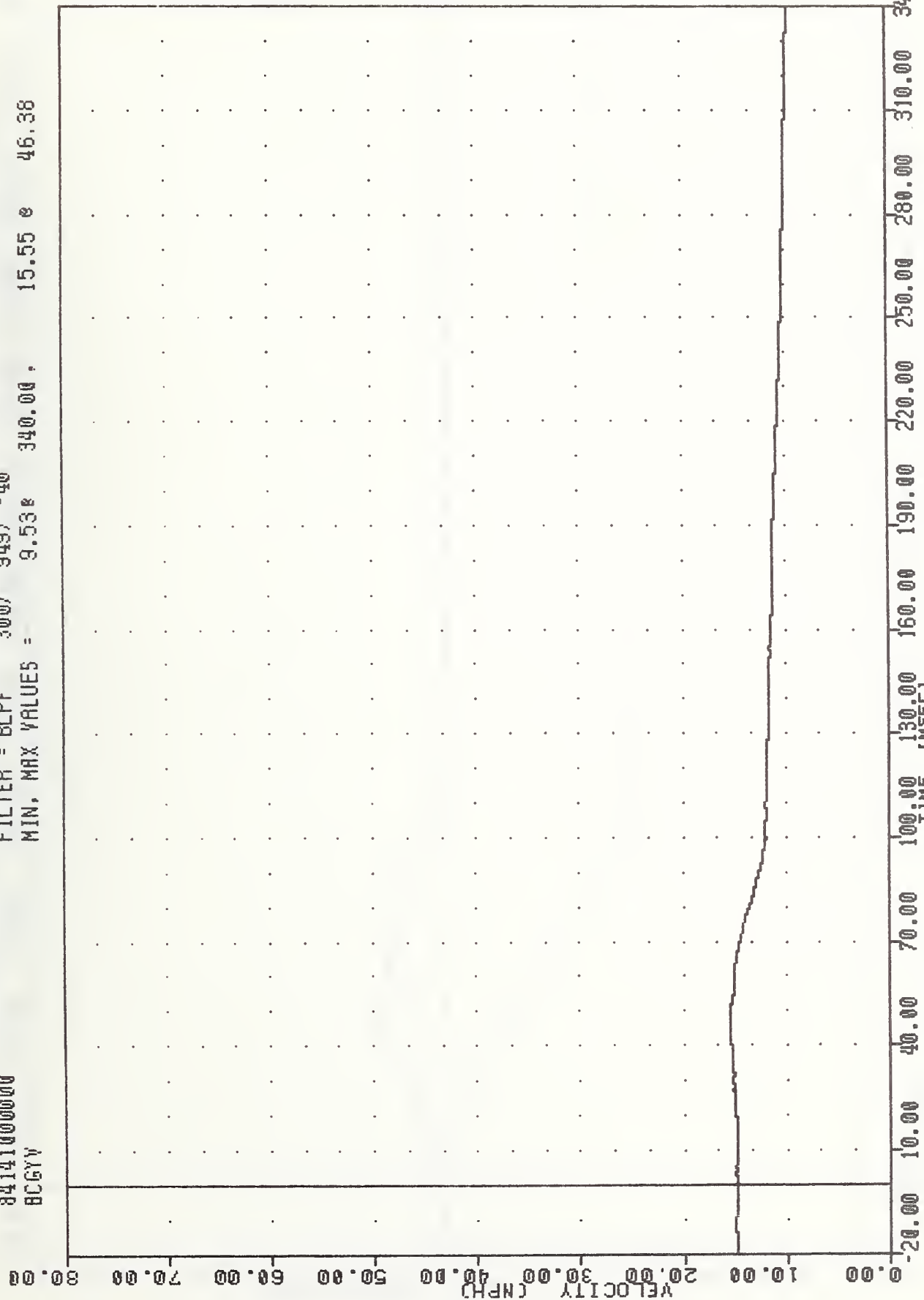
B-106



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BCGXG

TRC , 840529
 EVALN MOD VW FLEET REPEAT
 84141000000
 BCGYV

PLOT DATE 5-JUN-84 14:06:39
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 9.53% 340.00, 15.55 % 46.38



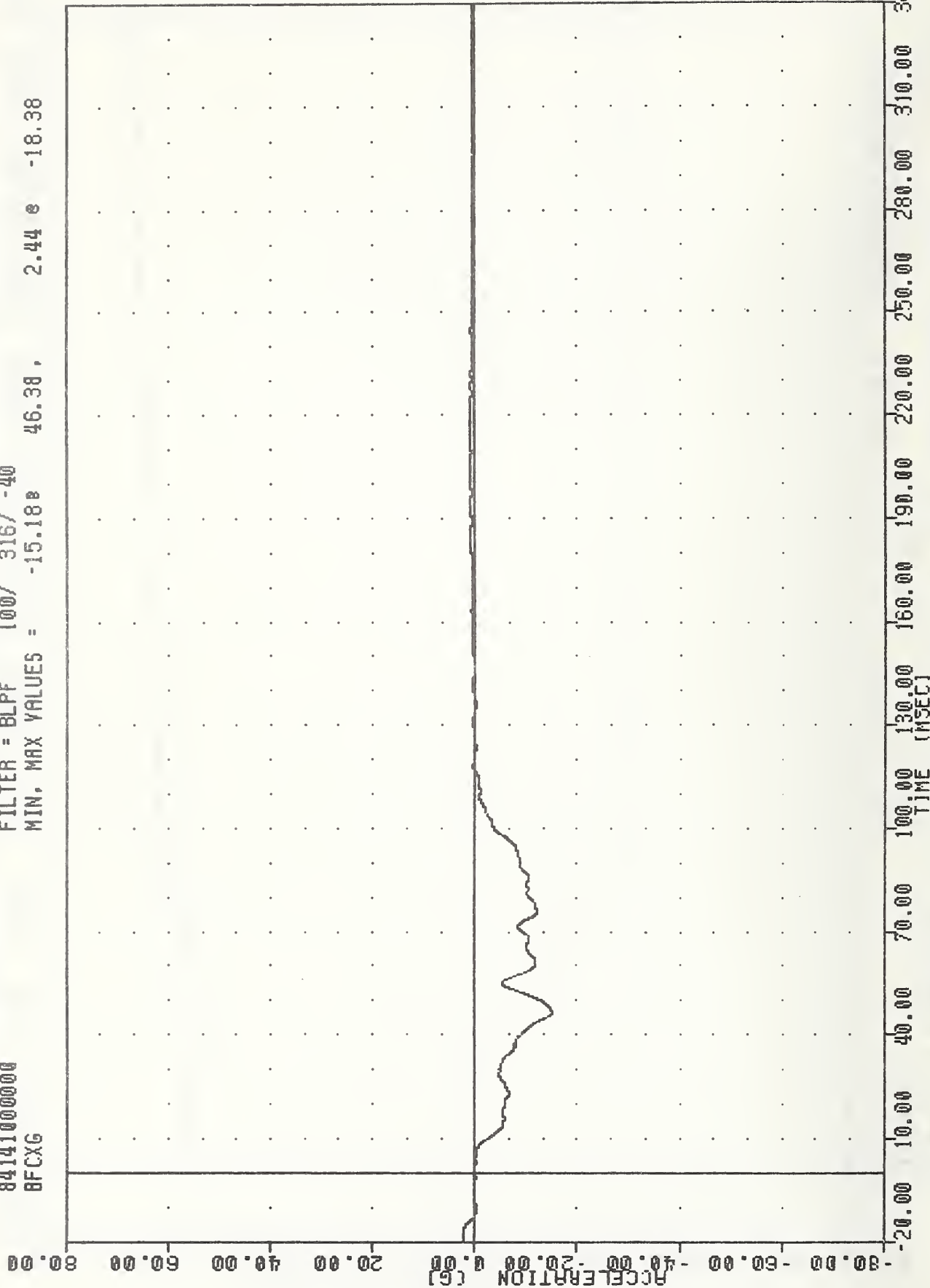
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING BCGYG

TRC , 840529
EVALN MOD VW FLEET REPERT
84141000000
BFCXG

PLOT DATE 5-JUN-84 14:01:58

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -15.18g 46.38 , 2.44 g -18.38

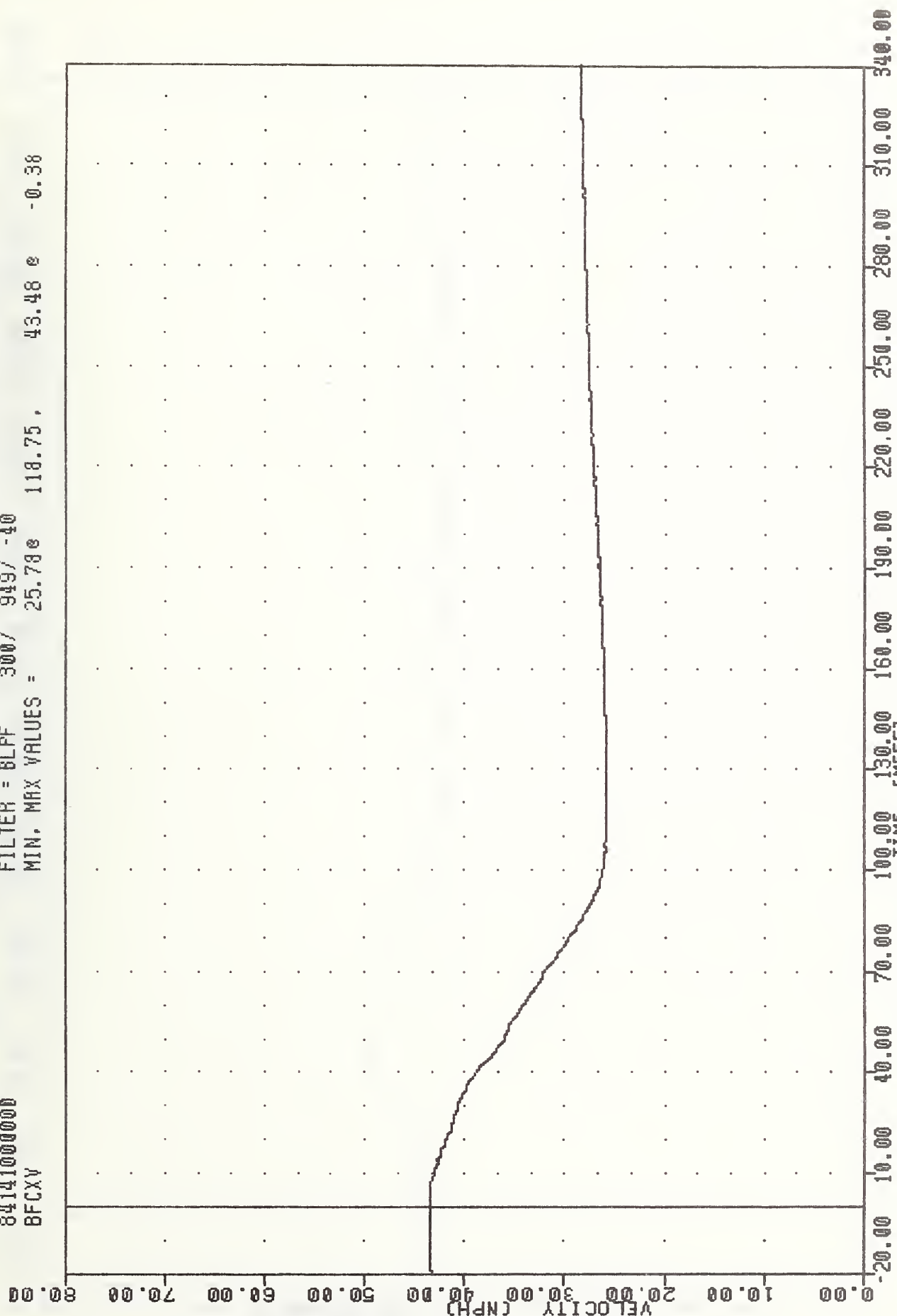


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER FRONT CROSSMEMBER ACCELERATION X AXIS

TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
BFCXV

PLUT DATE 5-JUN-84 14:06:39

FILTER = 8LPF 300/ 949/ -40
MIN. MAX VALUES = 25.78 118.75, 43.48 0 -0.38



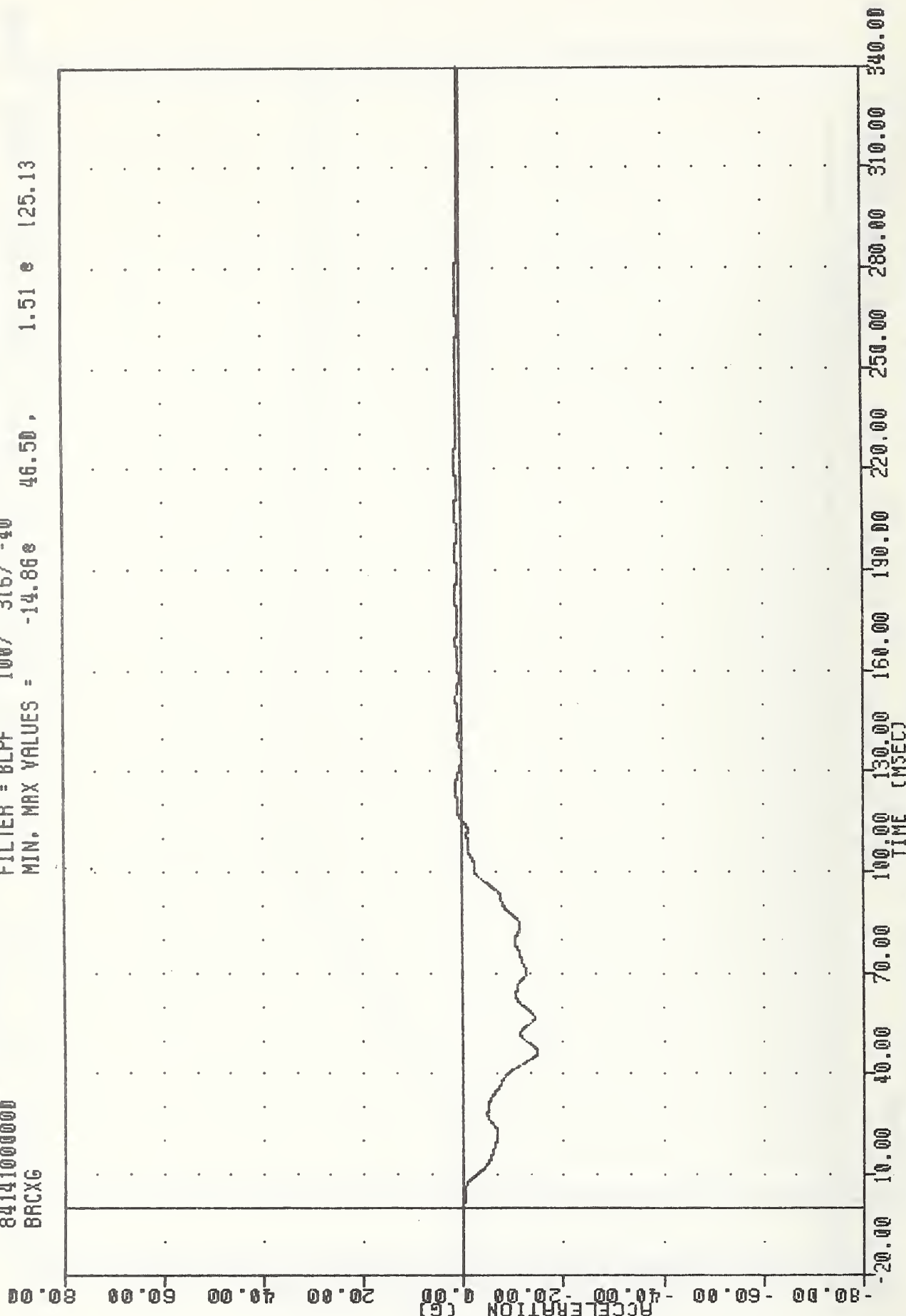
B-109

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BFCXG

TRC , 840529
EVALN MOD VV FLEET REPEAT
84141000000
BRCXG

PLOT DATE 5-JUN-84 14:01:58

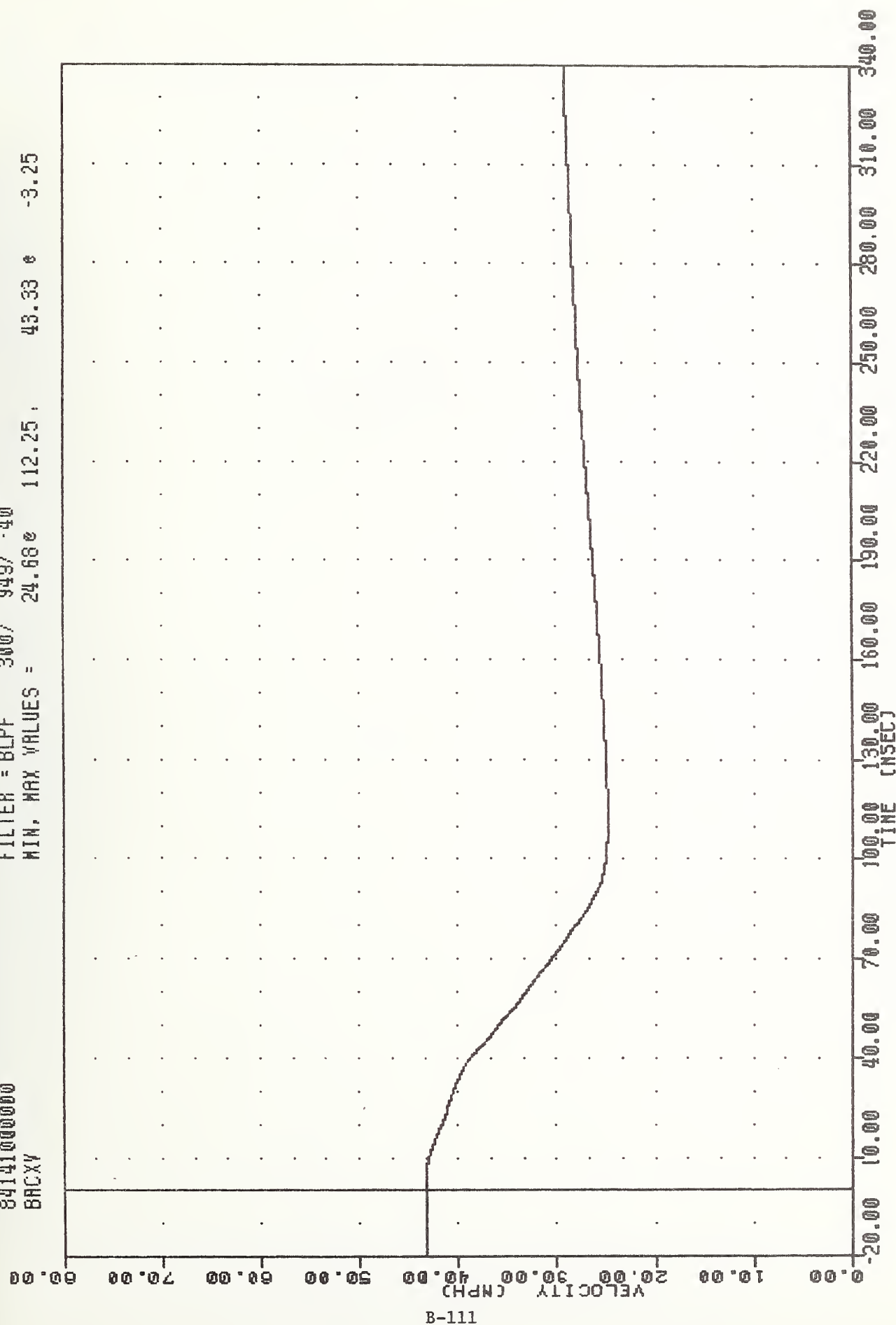
FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -14.86e 46.50, 1.51 e 125.13



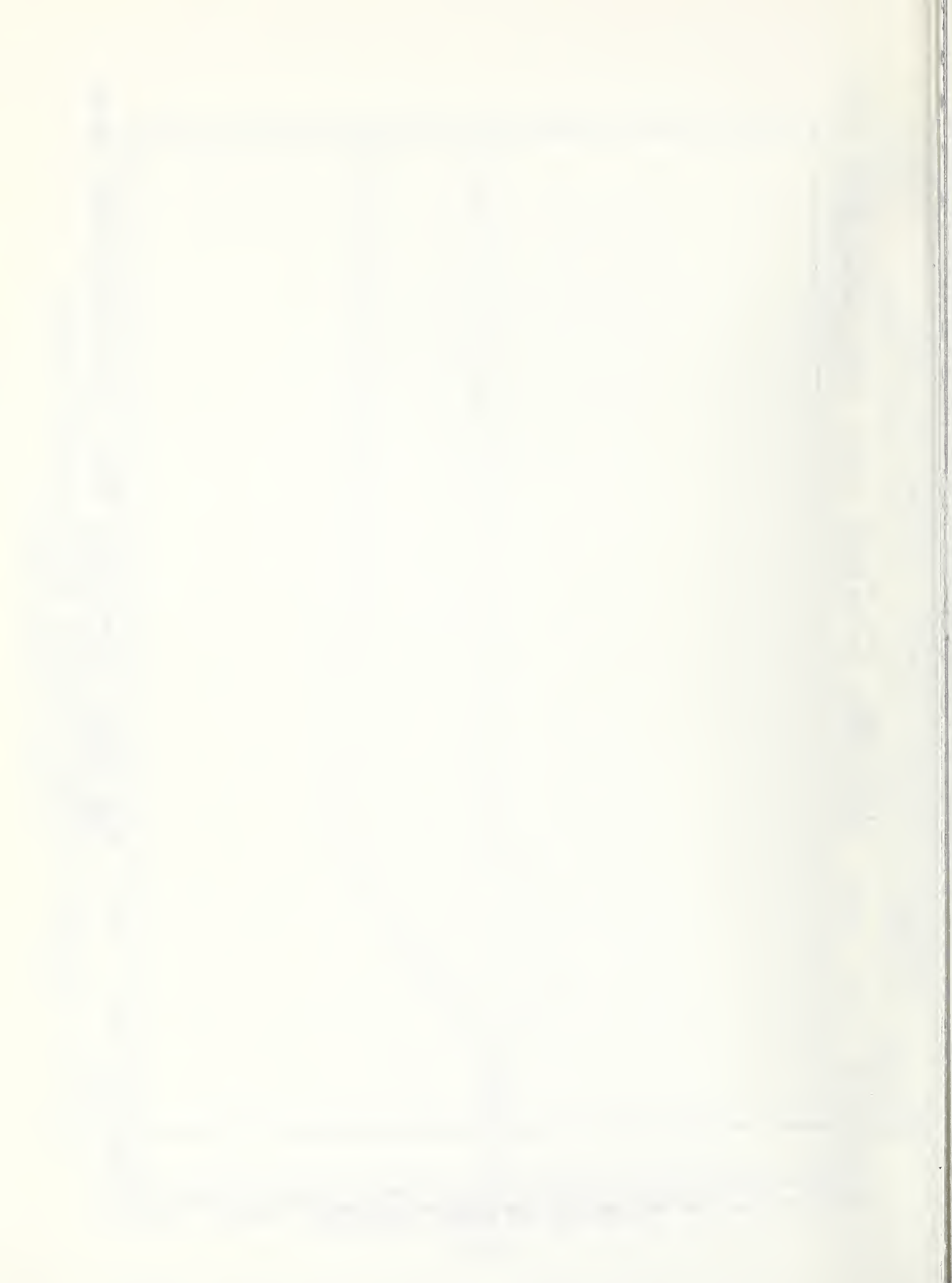
TAC
EVALN MOD V# FLEET REPEAT
84141000000
BRCXY

PLOT DATE 5-JUN-84 14:06:39

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 24.68e 112.25, 43.33 e -3.25

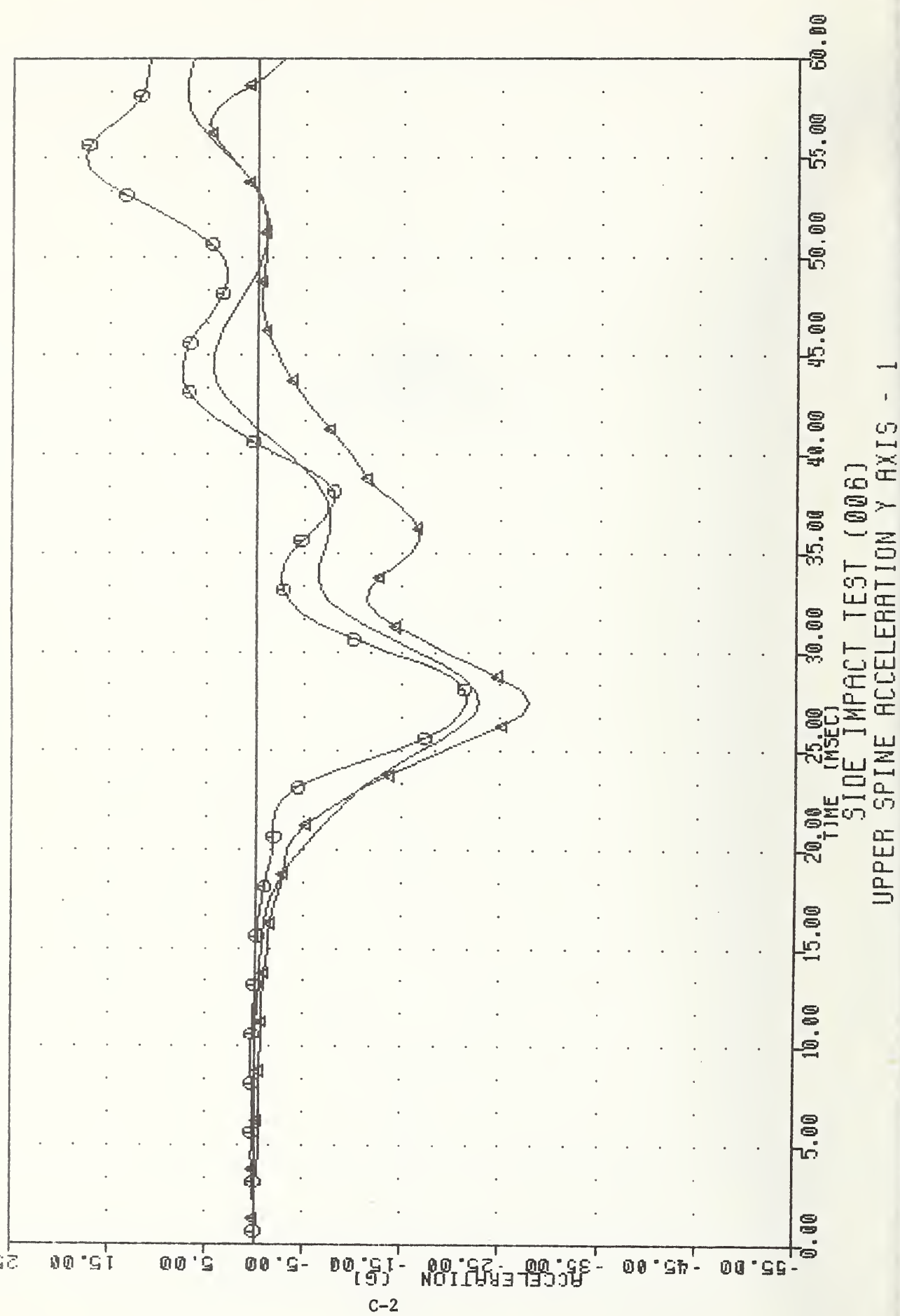


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BRCXG



APPENDIX C
DUMMY CERTIFICATION

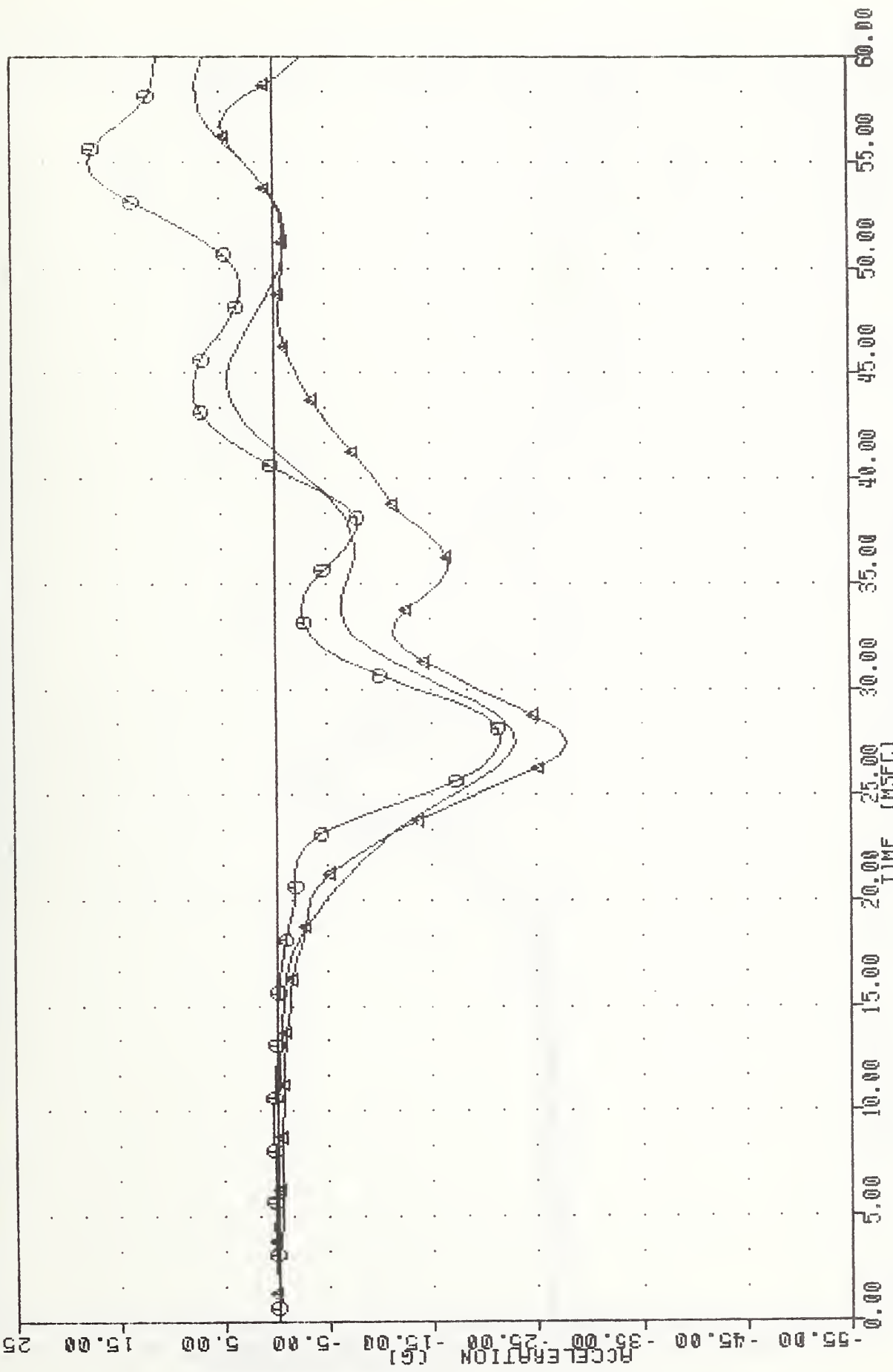
PRIC SHL92 , 21006103 SID THORAX 006 BODY 318 CAL103 84138 PLOT DATE 21-MAY-84 15:39:20
 T01Y61 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -22.82 7.20 58.13
 MN-250 0 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -21.68 17.54 54.38
 MN-250 4 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -27.91 26.87 4.73 56.25



SIDE IMPACT TEST (006)

UPPER SPINE ACCELERATION Y AXIS - 1

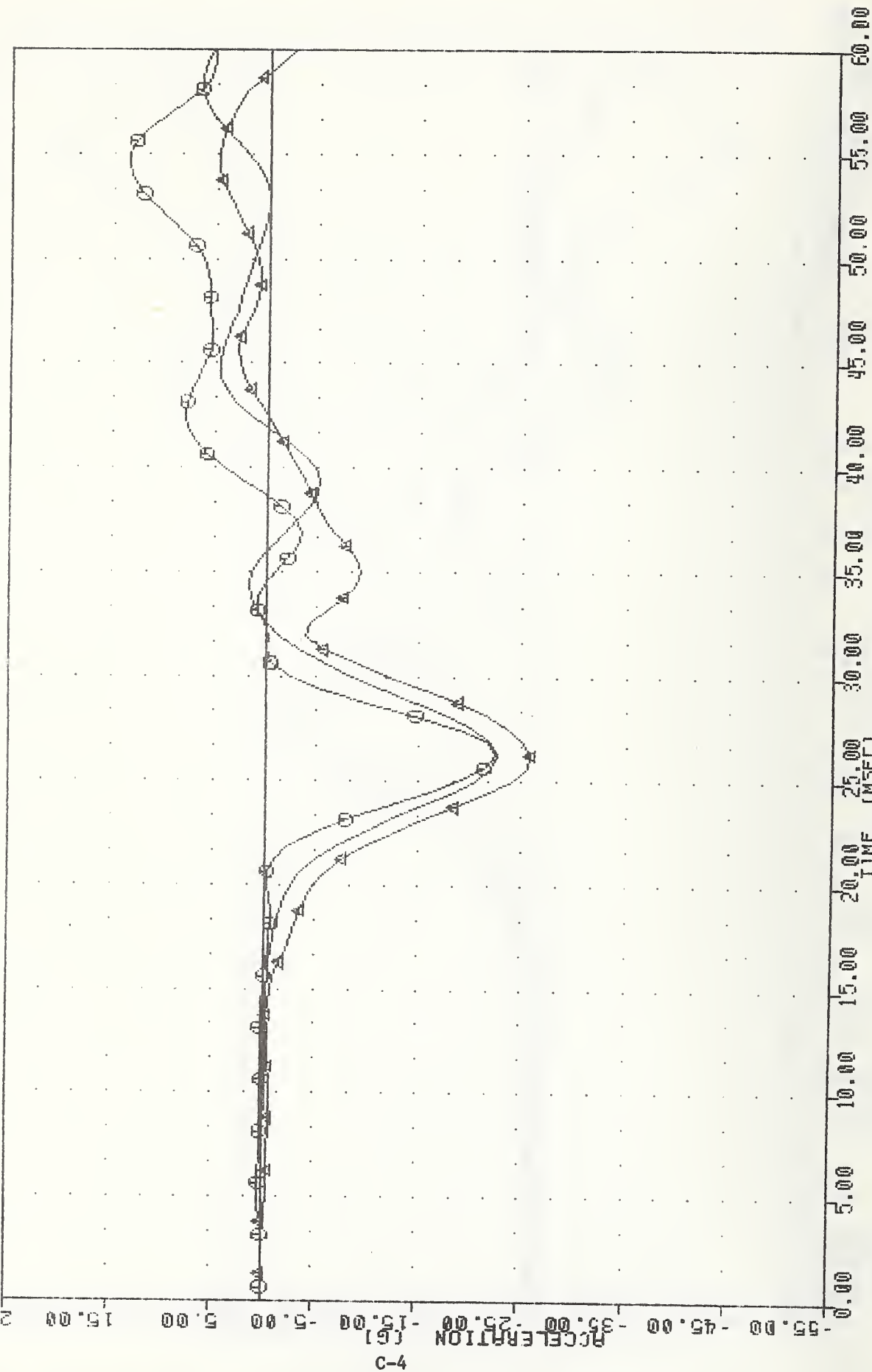
VRIC SRL92 , S1006103 S10 THORAX 006 BODY 318 CAL103 84138 PLOT DATE 21-MAY-84 15:40:38
 TO1YGA FILTER : HSRI 136/ 189/ -50 MIN, MAX = -23.03 26.87 7.23 58.13
 MN-2SD 0 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -21.58 26.87 17.54 54.38
 MN-2SD 4 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -27.91 26.87 4.78 56.25



SIDE IMPACT TEST (006)

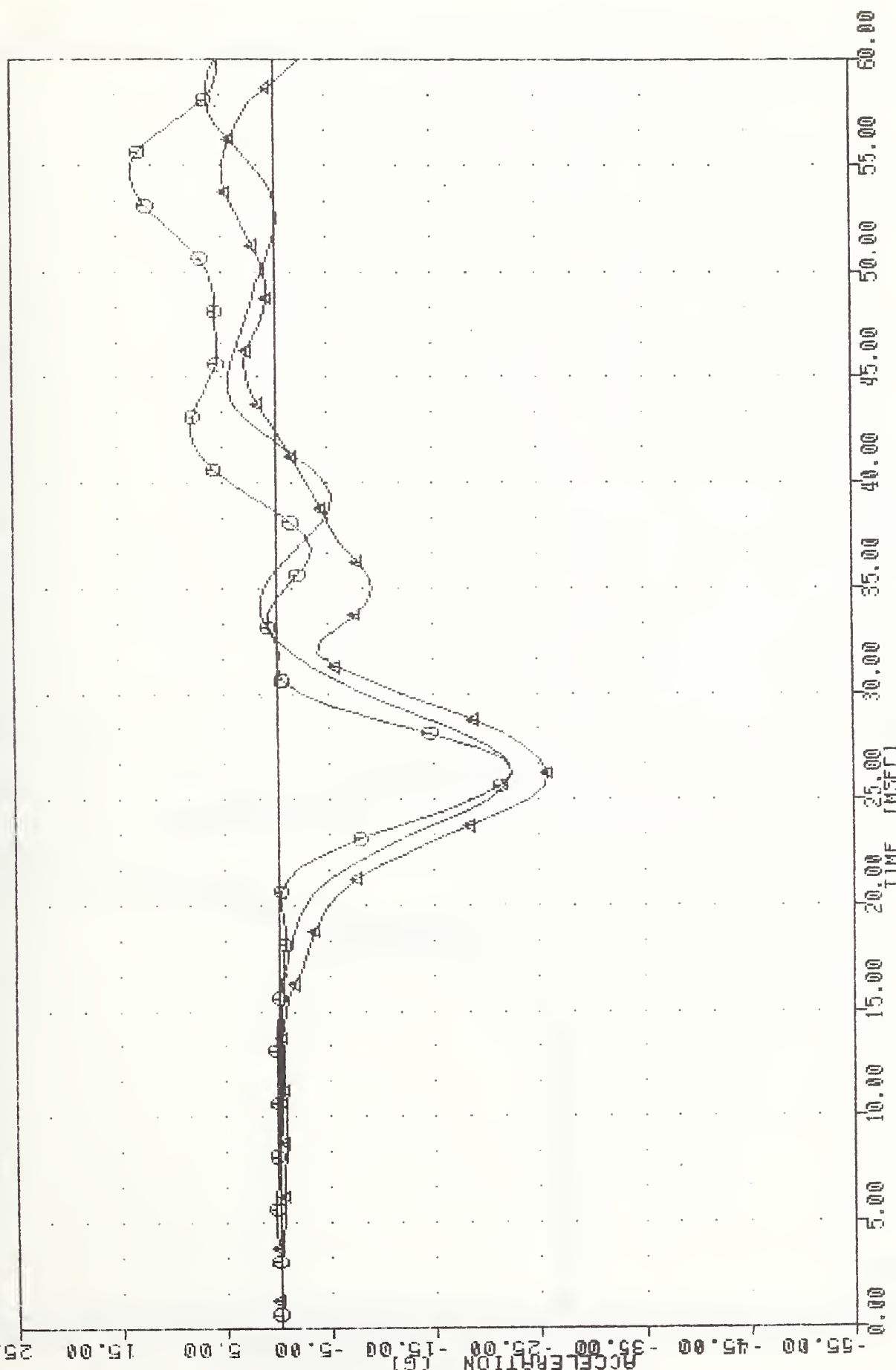
UPPER SPINE ACCELERATION Y AXIS - A

VHC SHL92 • S1006103 SID THORAX 006 BODY 318 LAL103 84138 PLOT DATE 21-MAY-84 15:43:02
 T12Y61 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -22.55 25.63 6.45 58.13
 MN-250 0 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -22.37 25.63 13.54 53.75
 MN-250 4 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -25.84 25.63 4.85 53.75



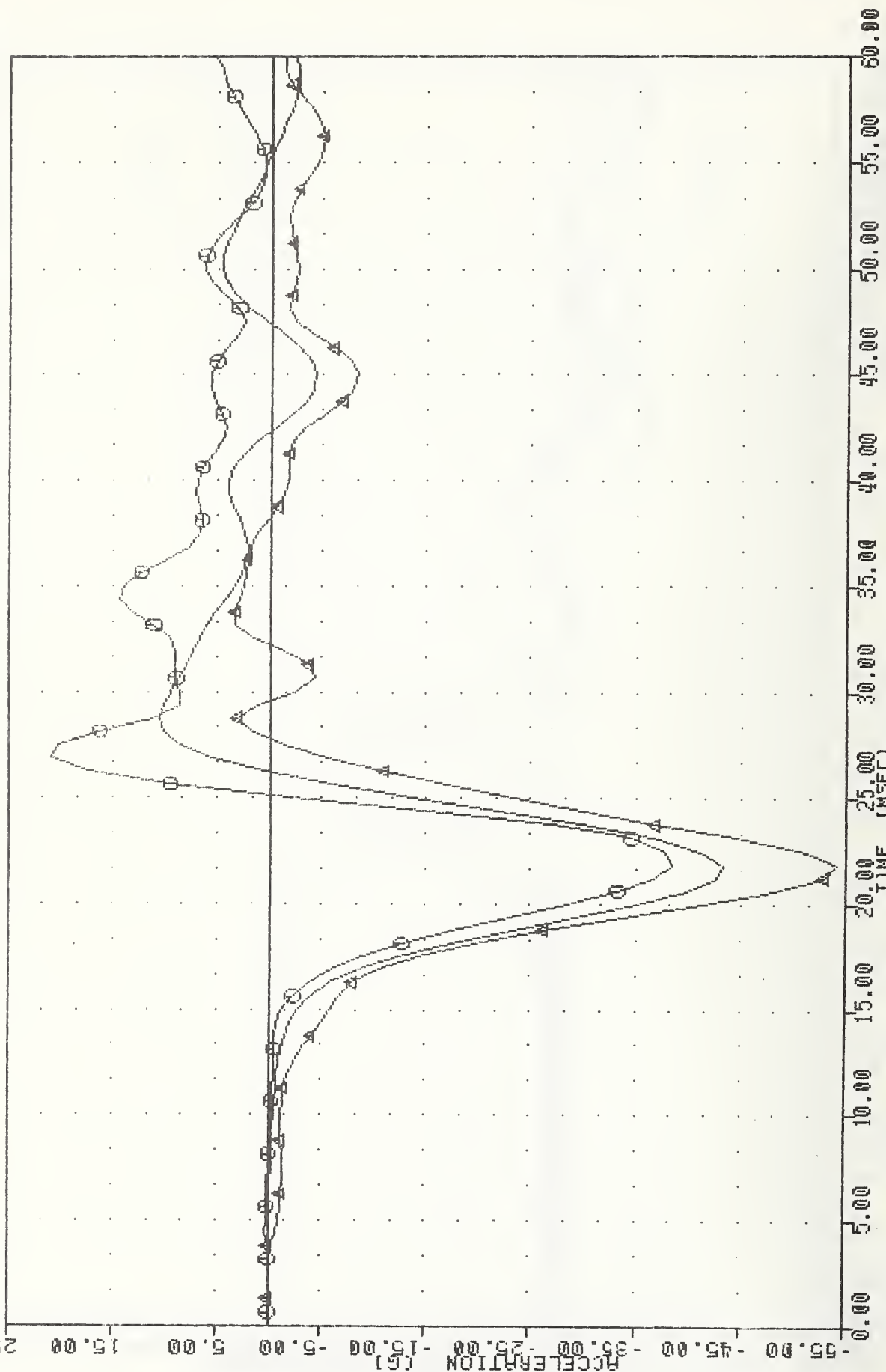
SIDE IMPACT TEST (006)
 LOWER SPINE ACCELERATION Y AXIS - 1

VRIC SAL92 • S1006103 SID THORAX 006 BODY 318 CAL103 84138 PLOT DATE 21-MAY-84 15:44:05
 T12YGA FILTER : HSRI 136/ 189/ -50 MIN. MAX = -22.40 6.372 57.50
 MN-2SD 0 136/ 189/ -50 MIN. MAX = -22.97 13.540 53.75
 MN-2SD 1 136/ 189/ -50 MIN. MAX = -25.84 4.850 53.75



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

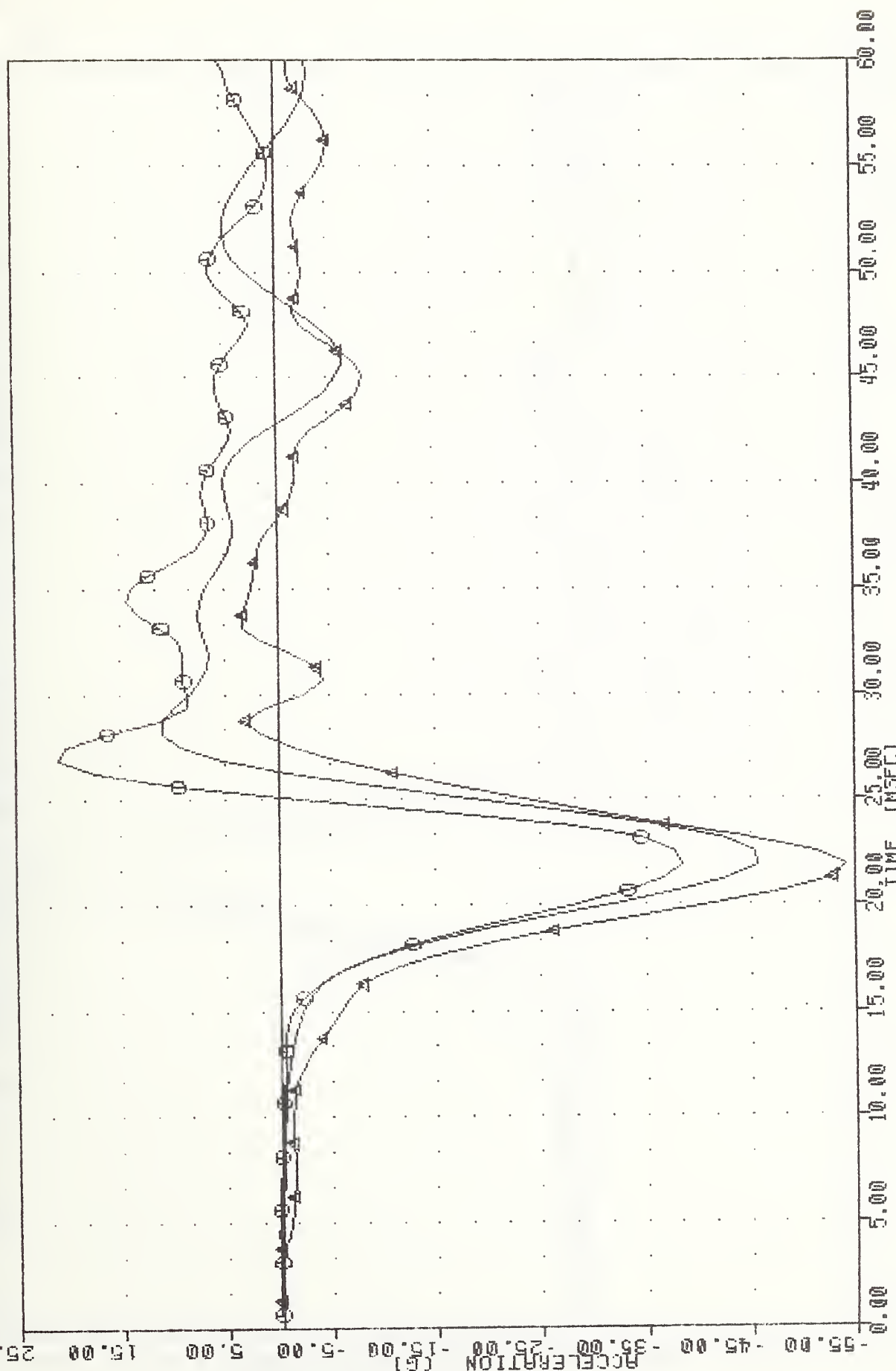
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 MN-2SD 0 FILTER = HSRI 136/ 189/ -50 MIN. MAX = -38.44 21.25 20.92 26.26
 MN-2SD 1 FILTER = HSRI 136/ 189/ -50 MIN. MAX = -54.08 21.25 3.31 33.13



SIDE IMPACT TEST (006)

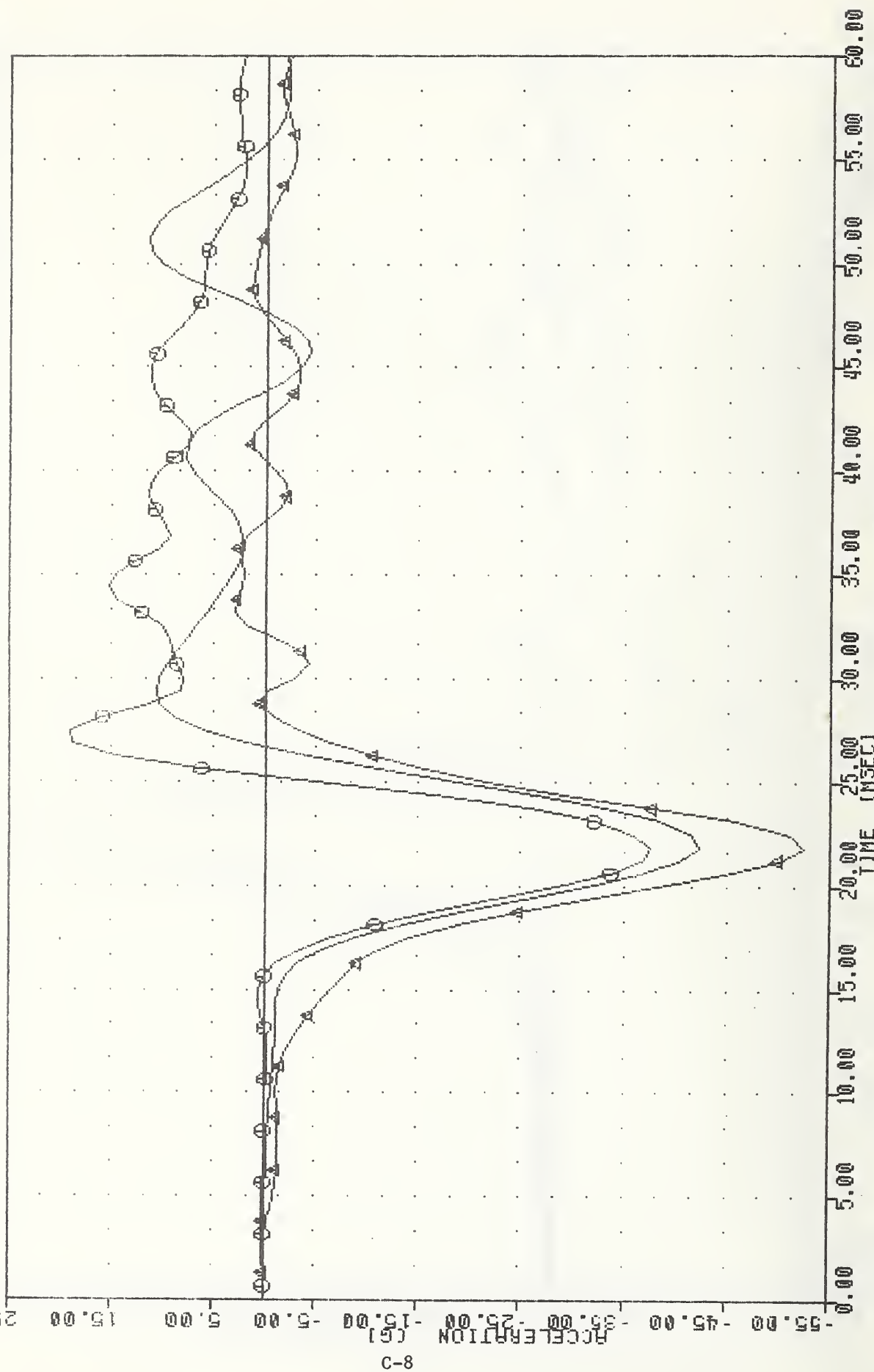
LEFT UPPER RIB ACCELERATION Y AXIS - 1

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 PLOT DATE 21-MAY-84 15:48:07
 21.25 10.86
 21.25 20.92
 21.25 3.31
 28.13
 26.25
 33.13



LEFT UPPER RIB ACCELERATION Y AXIS - A
 SIDE IMPACT TEST (0006)

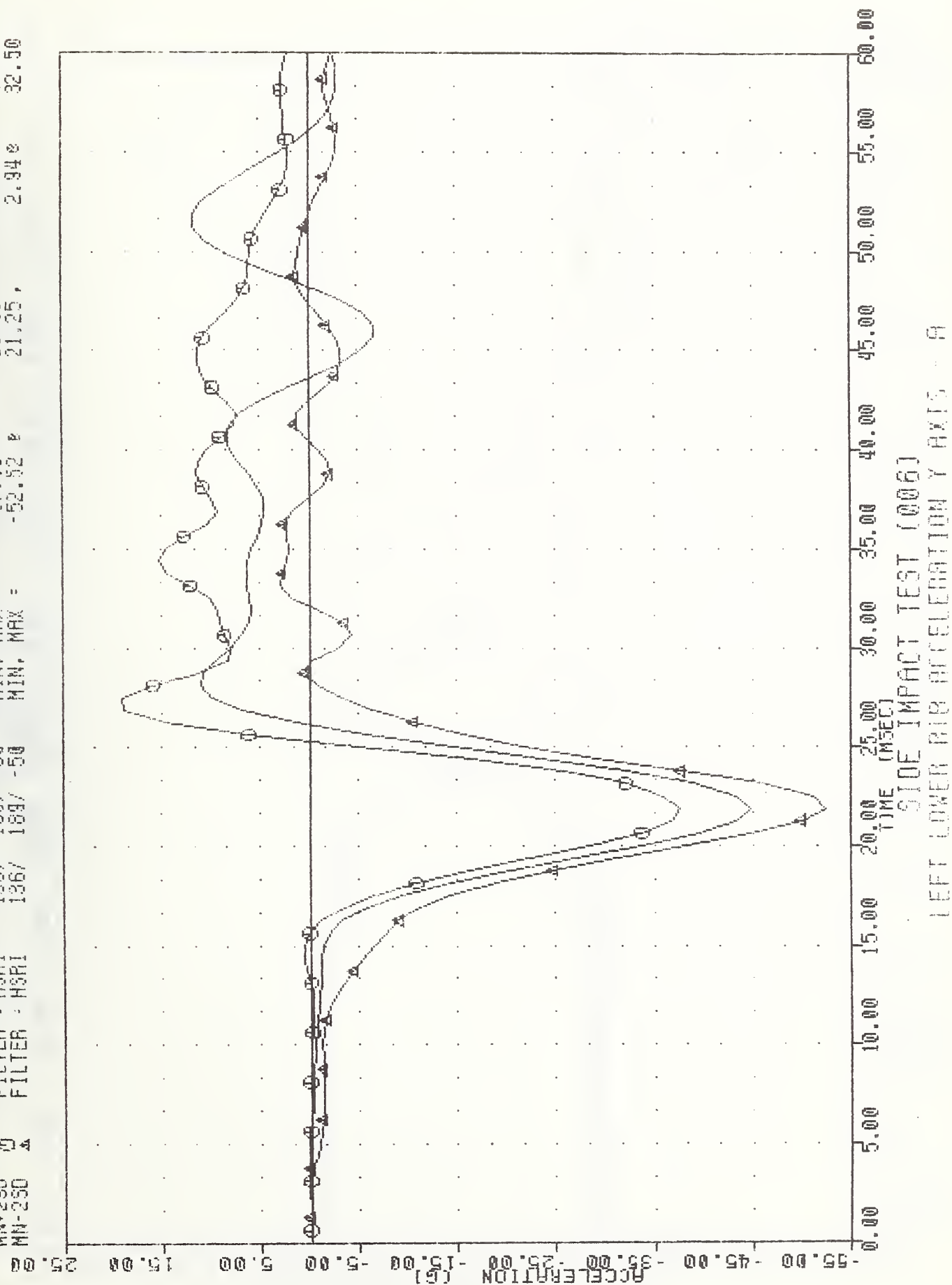
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 MN-250 A FILTER = HSRI 136/ 189/ -50 MIN, MAX = -52.52 2.94 32.50



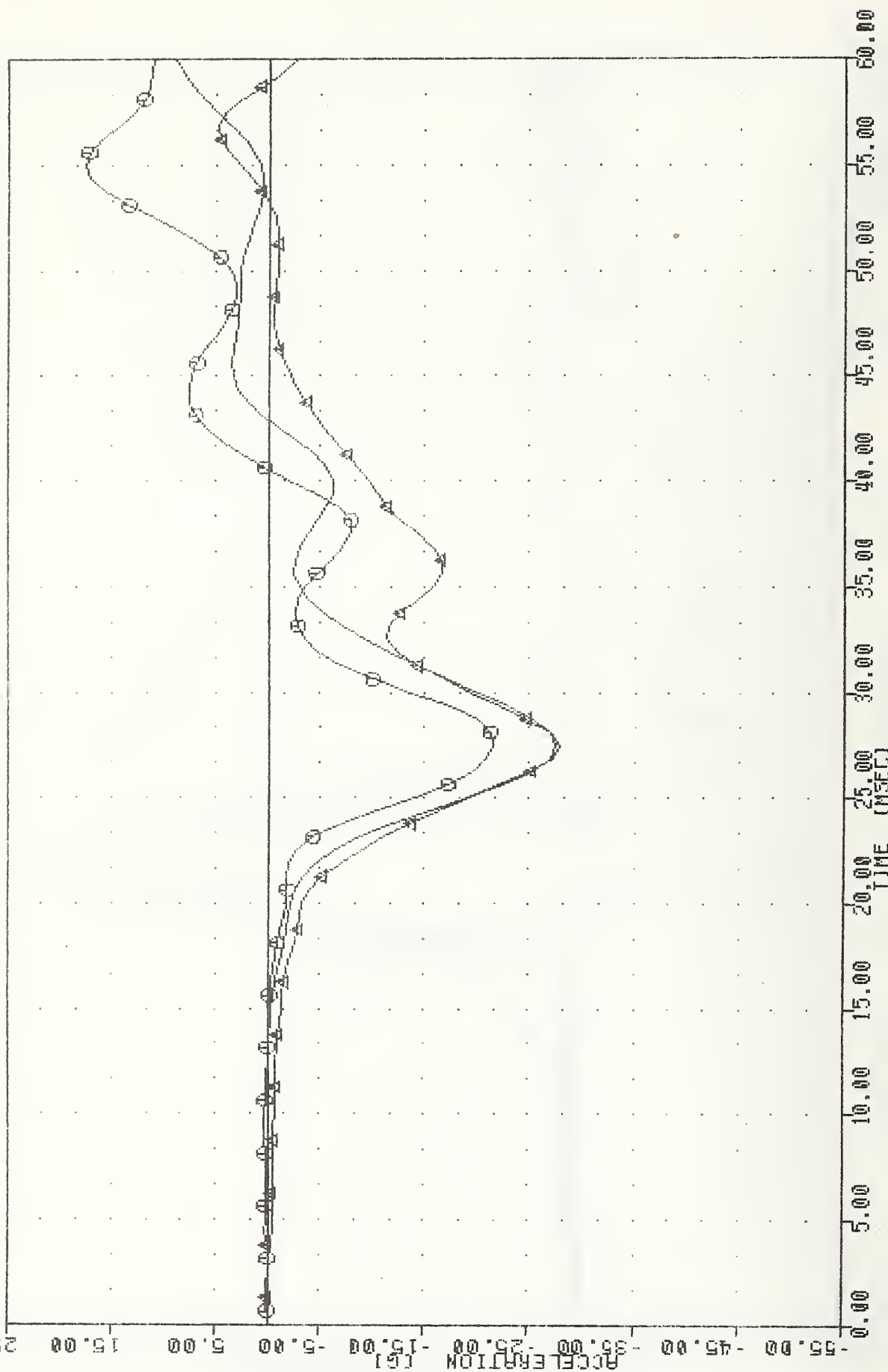
SIDE IMPACT TEST (006)

LEFT LOWER RIB ACCELERATION Y AXIS - 1

WHIC SHL92 , S1006103 S10 THORAX 005 BODY 318 CAL103 84138 PLOT DATE 21-MAY-84 15:47:12
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 MN-250 FILTER : HSR1 136/ 189/ -50 MIN. MAX = -37.66 26.87
 MN-250 FILTER : HSR1 136/ 189/ -50 MIN. MAX = -52.52 32.50



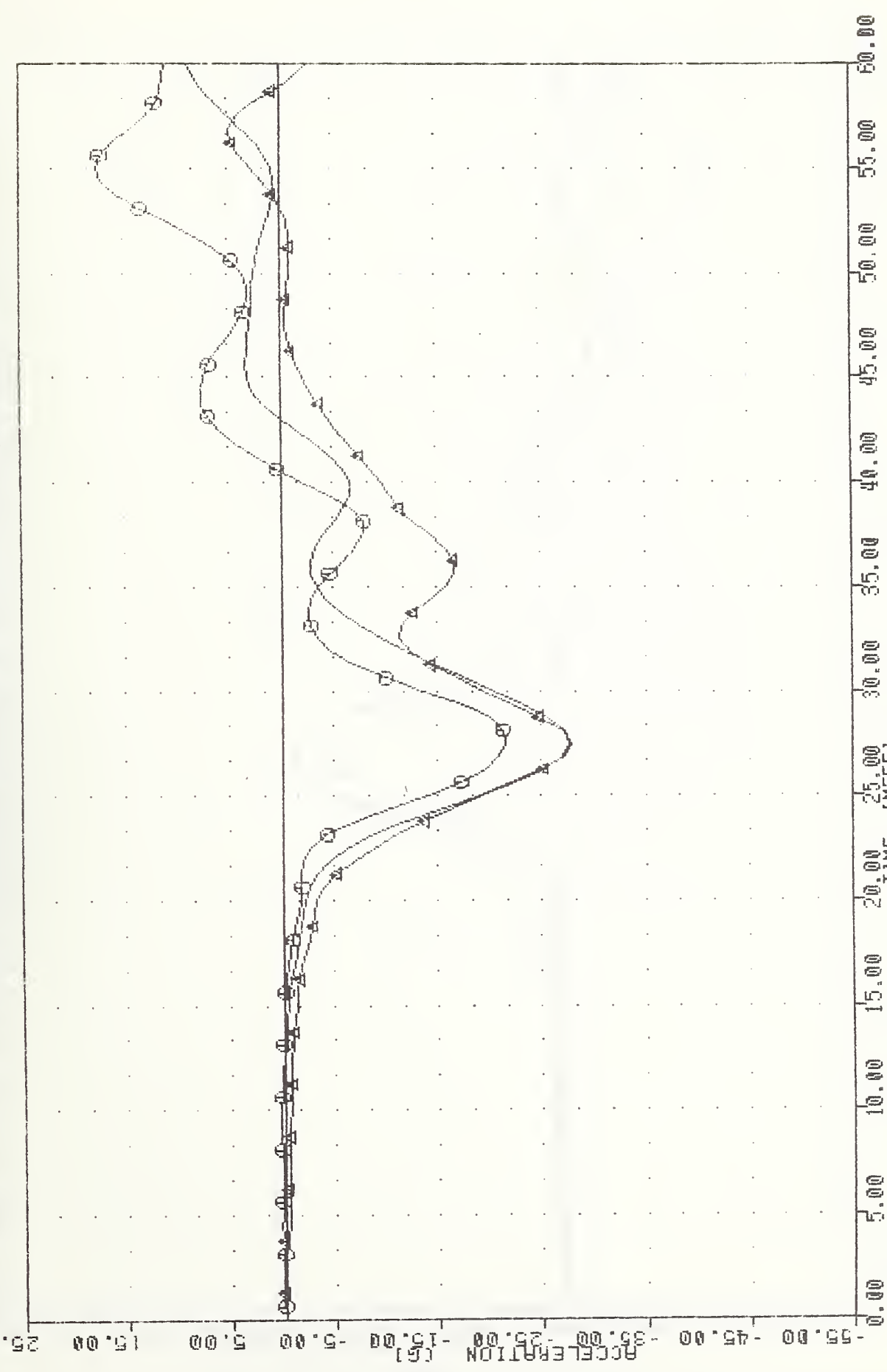
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 MN+250 0 FILTER = HSRI 136/ 183/ -50 MIN. MAX = -21.58 17.54 54.38
 MN-250 4 FILTER = HSRI 136/ 183/ -50 MIN. MAX = -27.91 26.87 4.78 56.25



SIDE IMPACT TEST (U02)

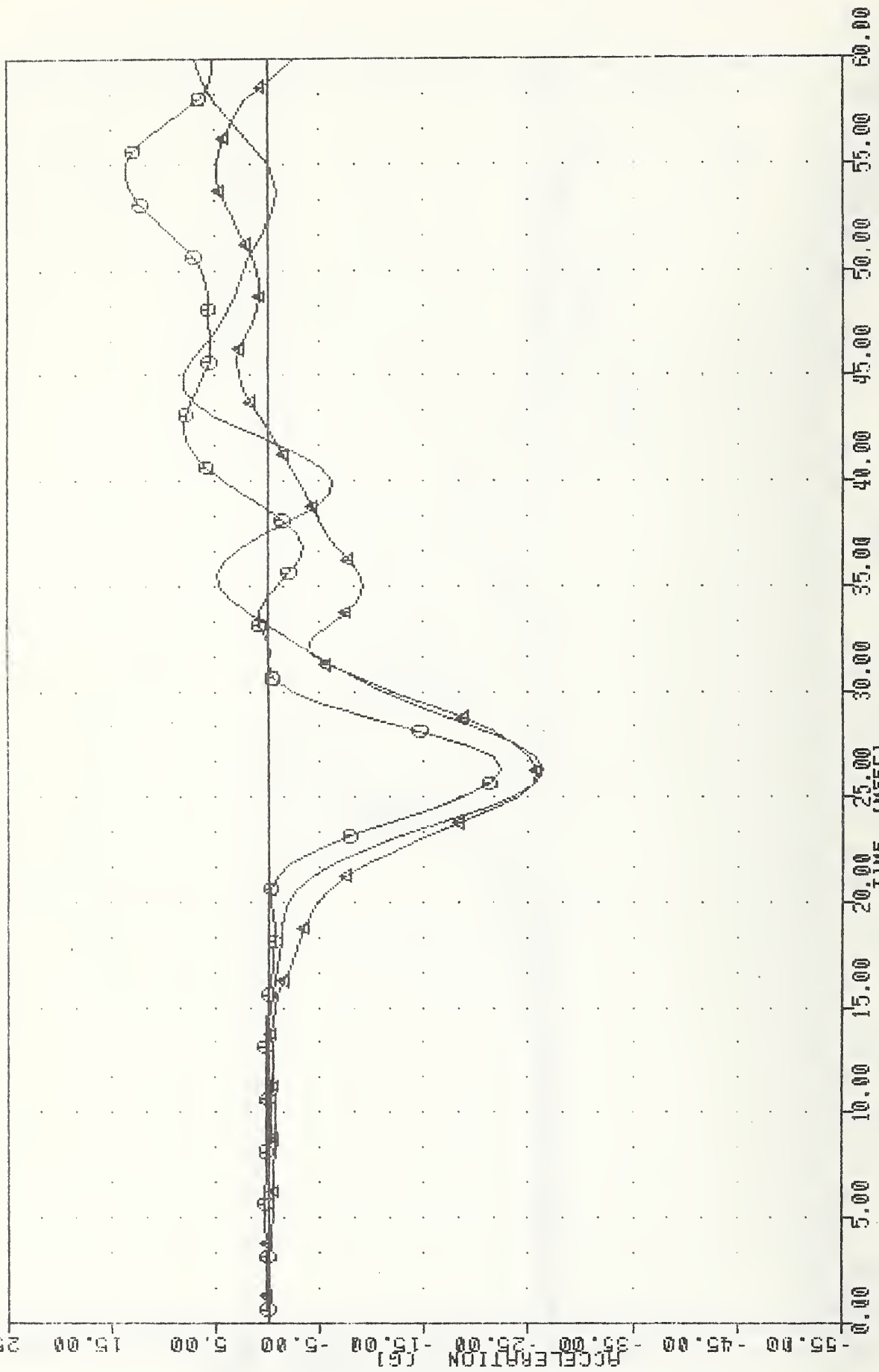
UPPER SPINE ACCELERATION Y AXIS - 1

VRIC SRL92 , 31U02102 SJD THORAX UN2 BODY 830 CAL102 84137 21-MAY-84 15:55:46
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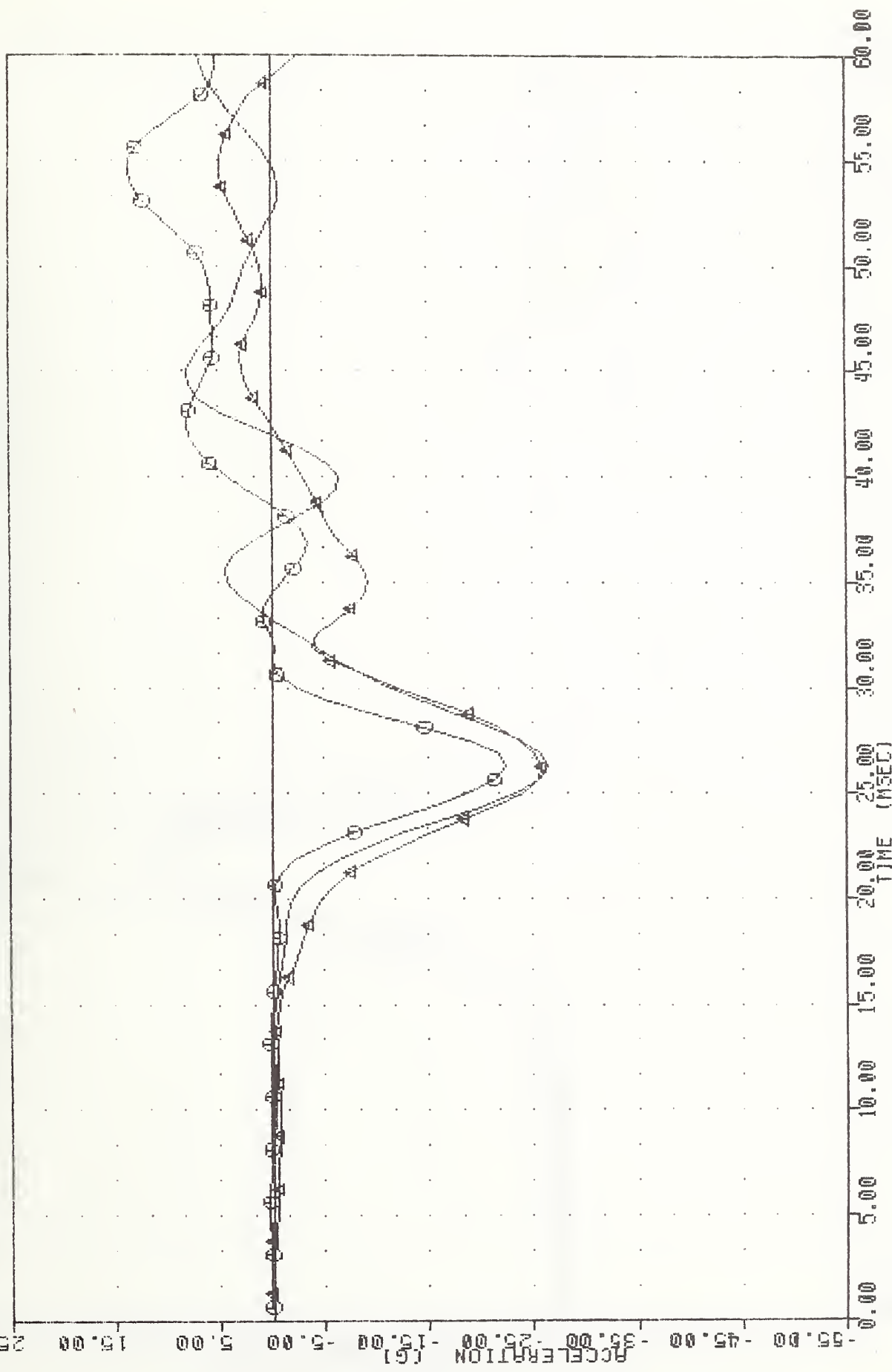
SIDE IMPACT TEST (U02)
 UPPER SPINE ACCELERATION Y AXIS - A

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 MN-250 FILTER : HSRI 136/ 189/ -50 MIN. MAX = -25.84 25.63 53.75



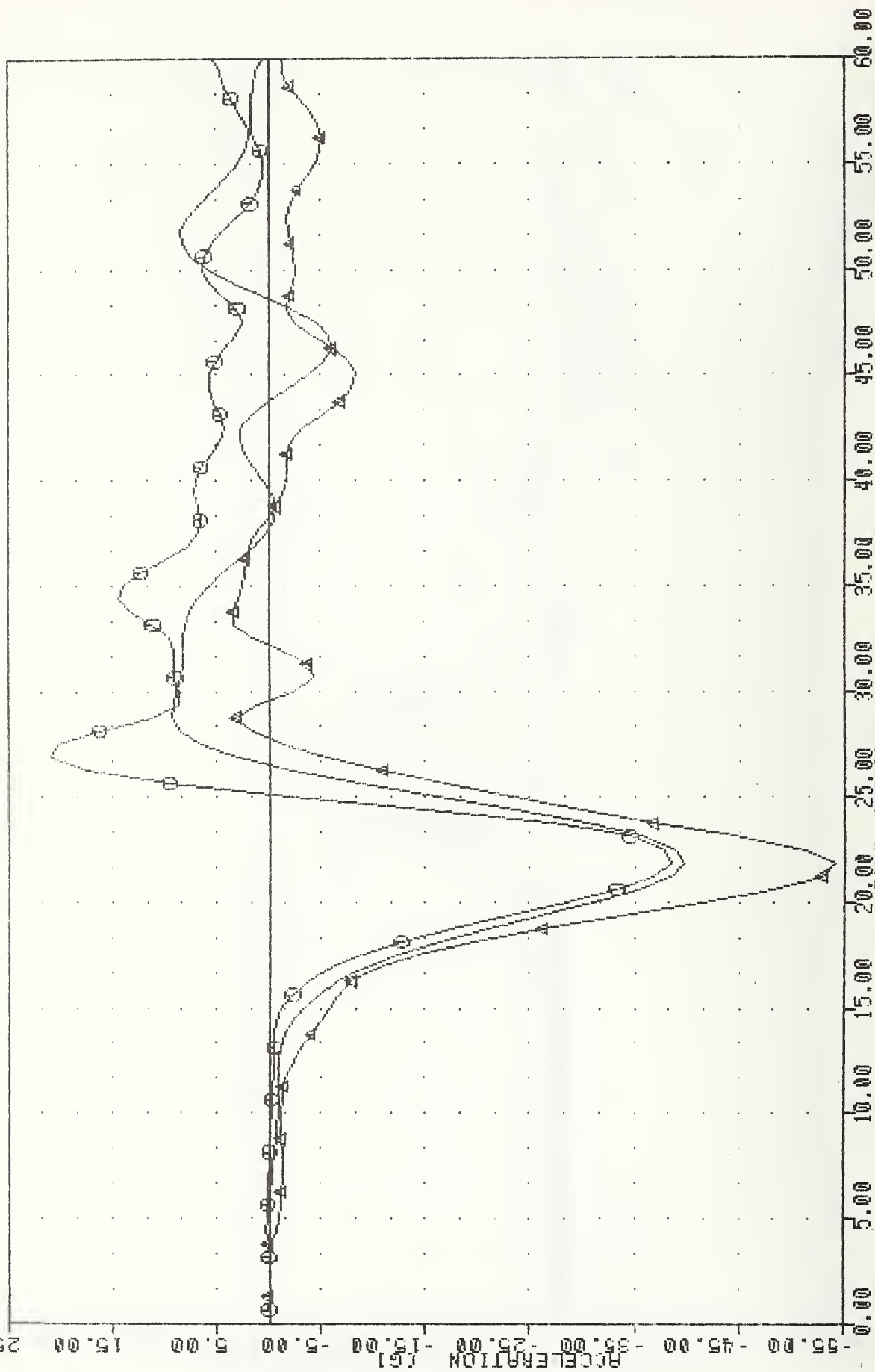
SIDE IMPACT TEST (U02)
 LOWER SPINE ACCELERATION Y AXIS - 1

VRIC 3HL92 , SIU02102 SID THORAX U02 BODY 830 CAL102 84137 PLOT DATE 21-MAY-84 15:57:24
 T12YGA FILTER : HSRI 136/ 189/ -50 MIN, MAX = -26.34 25.63 44.38
 MN-250 0 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -22.97 25.63 53.75
 MN-250 A FILTER : HSRI 136/ 189/ -50 MIN, MAX = -25.64 25.63 53.75



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

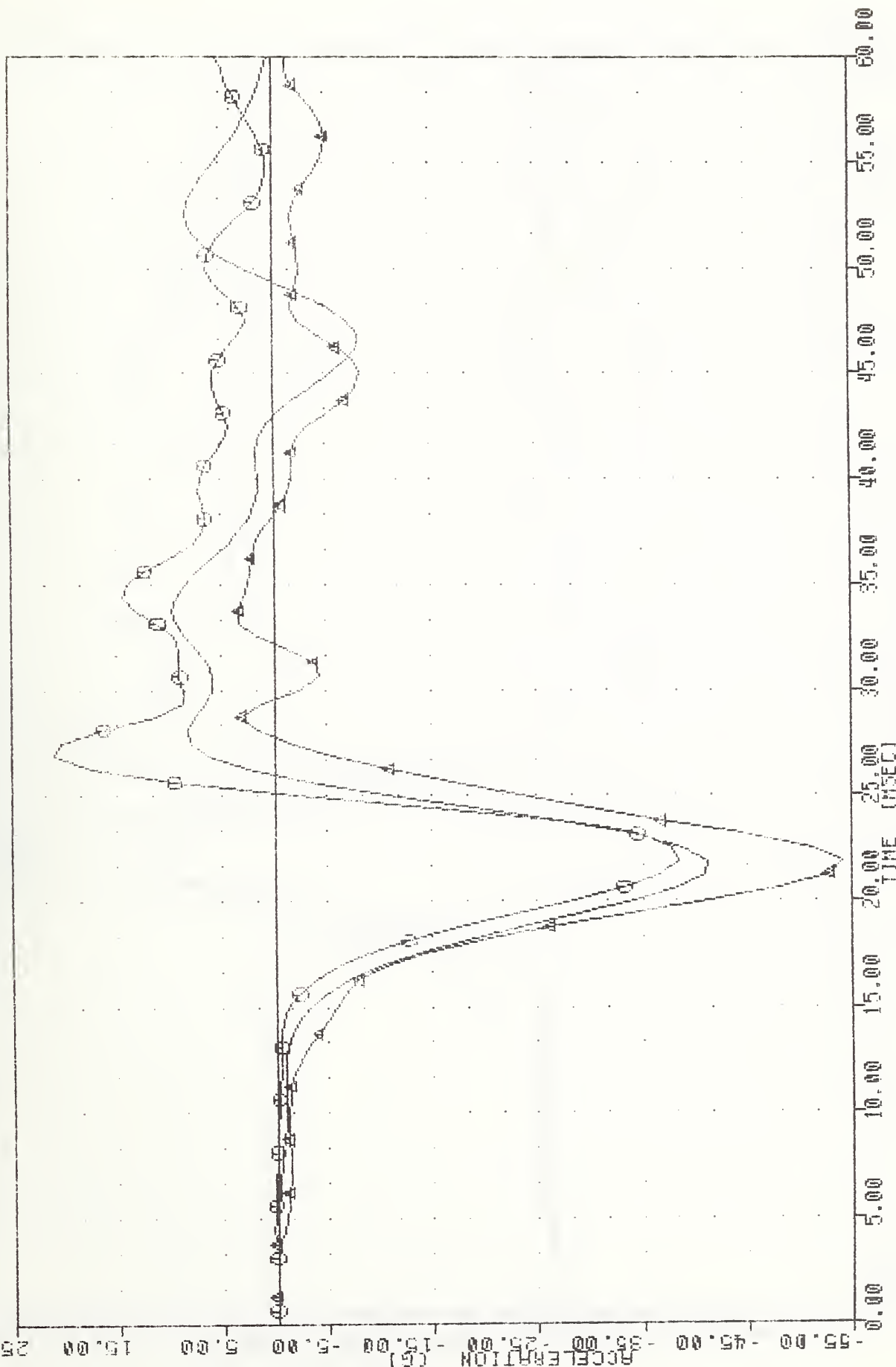
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 MN-280 Q FILTER : HSRI 136/ 189/ -50 MIN, MAX = -38.44 9.138 26.25
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SIDE IMPACT TEST (U02)

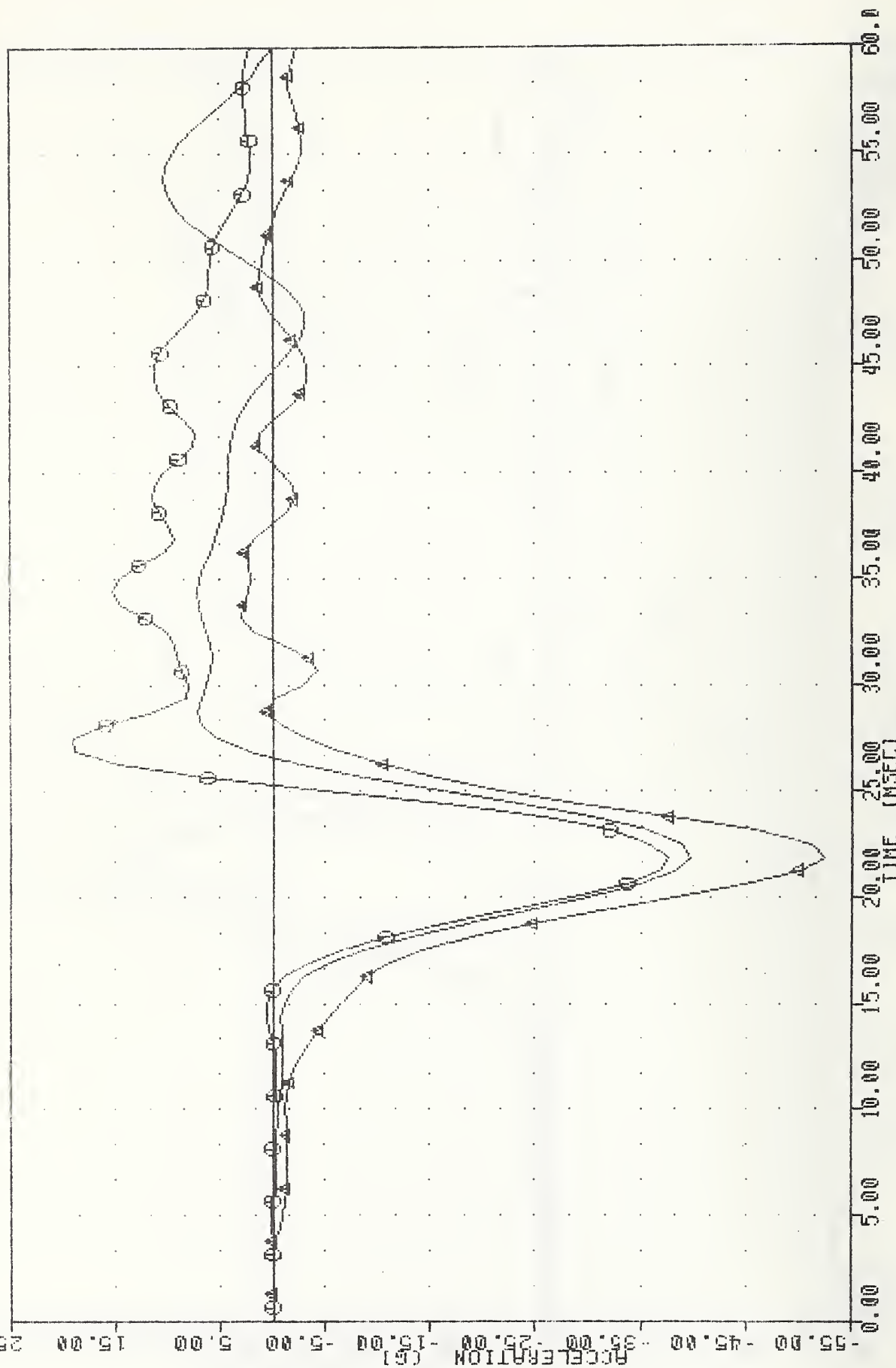
LEFT UPPER RIB ACCELERATION Y AXIS -1

VRLC SH192 . SIUM2102 310 THORAX U02 BODY 830 CAL102 84137 PLOT DATE 21-MAY-84 18:01:34
 LURY68 FILTER : HSRI 136/ 189/ -50 MIN. MAX = -41.20 21.25 9.57 33.13
 MN-280 0 FILTER : HSRI 136/ 189/ -50 MIN. MAX = -38.44 21.25 20.92 26.26
 MN-280 A FILTER : HSRI 136/ 189/ -50 MIN. MAX = -54.06 21.25 3.11 33.13



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

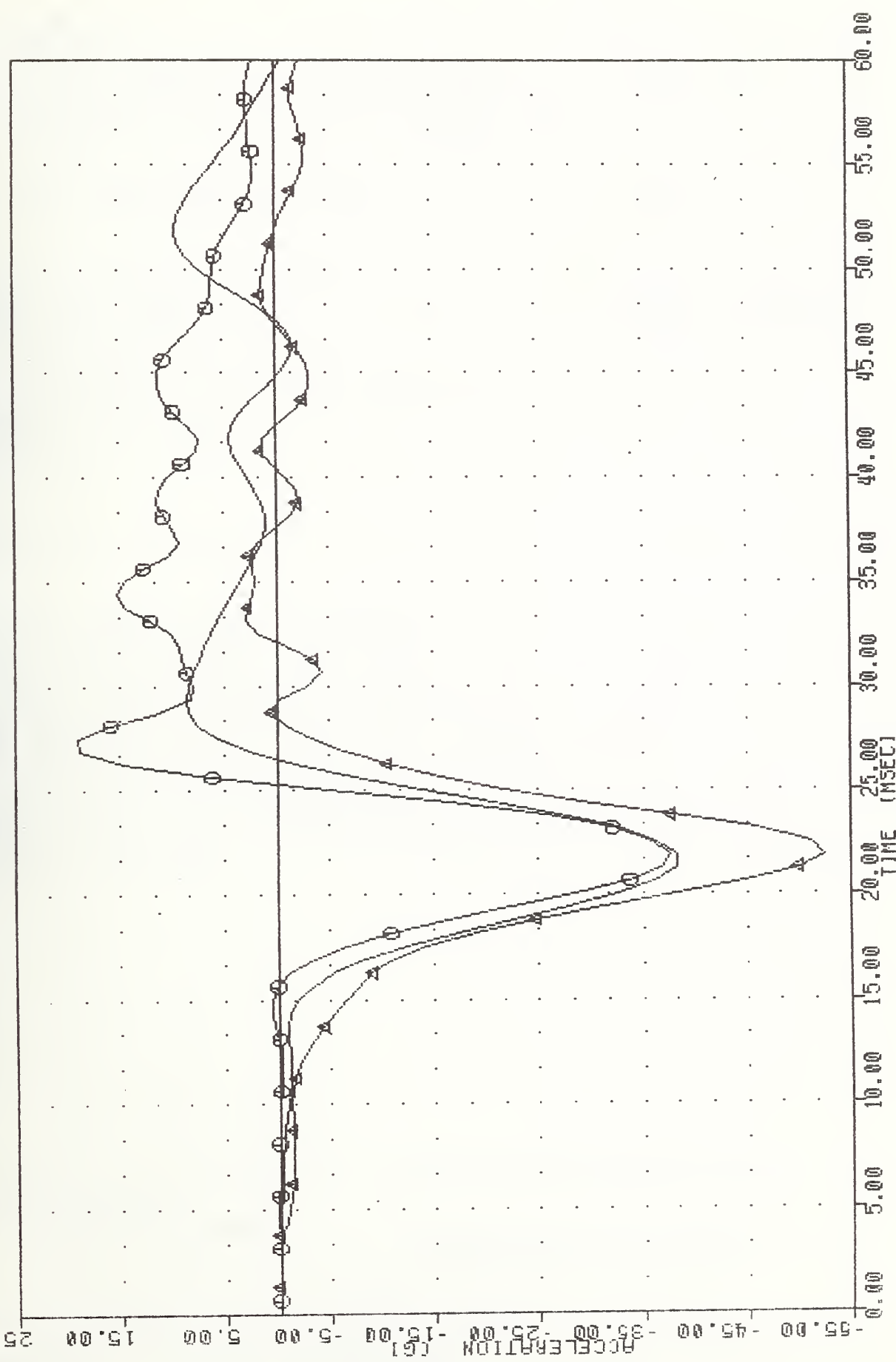
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 MN-250 0 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -37.66 19.00 26.87
 MN-250 A FILTER : HSRI 136/ 189/ -50 MIN, MAX = -52.62 2.94 32.50



SIDE IMPACT TEST (U02)

LEFT LOWER RIB ACCELERATION Y AXIS -1

VMC SRL92 , SIU02102 S10 THORAX U02 BODY 830 CAL102 84137 PLOT DATE 21-MAY-84 15:59:33
 LLRYGA FILTER : HSRI 136/ 189/ -50 MIN, MAX = -38.36 9.42 51.25
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 MN-2SD 0 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -52.52 2.94 26.87



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



1. Report No. DOT HS-806 796	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle EVALUATION OF NHTSA MODIFIED VOLKSWAGEN RABBITS MDB-TO-CAR SIDE IMPACT TEST OF A 19° CRABBED MOVING DEFORMABLE BARRIER TO A 1977 VOLKSWAGEN RABBIT AT 45.8 MPH		5. Report Date JUNE 1984	
		6. Performing Organization Code	
7. Author(s) J. Stultz, Project Engineer, TRCO		8. Performing Organization Report No. 840529	
9. Performing Organization Name and Address Vehicle Research and Test Center St. Rt. 33, Logan County East Liberty, Ohio 43319		10. Work Unit No. (TRAIS)	
		11. Contract or Grant No. DTNH22-82-A-08401	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration 400 Seventh Street, S.W. Washington, DC 20590		13. Type of Report and Period Covered TEST REPORT May 1984	
		14. Sponsoring Agency Code	
15. Supplementary Notes			
16. Abstract This test report documents the repeat of a crash test conducted under NHTSA Contract DTNH22-82-A-08401, Task Order SRL 26 entitled "Side Impact Evaluation", the purpose of which was to evaluate the NHTSA's Modified Volkswagen Rabbits. Testing was conducted on a 1977 Volkswagen Rabbit 2-door hatchback with structural modification designated as Optimized at the TRCO Crash Test Facility, East Liberty, Ohio. The test vehicle was impacted on the left side by a moving deformable barrier, crabbled to 19°, at 45.8 mph. Occupant responses of two side impact dummies were measured. One dummy was located in the driver's designated seating position and one was located in the left rear seating position. The test date was May 29, 1984 and the ambient temperature was 50° F.			
17. Key Words Occupant Response Moving Barrier Crash Testing		18. Distribution Statement Available from: National Technical Information Service Springfield, Virginia 22161	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages	22. Price



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SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to repeat a crash test conducted under NHTSA Contract DTNH22-82-A-08401, Task Order SRL 26 entitled "Side Impact Evaluation". The purpose of the tests conducted under SRL 26 was to evaluate the NHTSA fleet of modified Volkswagen Rabbits with and without padding. The vehicle was tested using conditions not currently contained in a Federal Motor Vehicle Safety Standard.

INTRODUCTION

A stationary 1977 Volkswagen Rabbit 2-door hatchback was impacted on the left side by a Moving Deformable Barrier (MDB) on May 29, 1984. The test was to simulate an intersection collision with the striking vehicle traveling at 35 mph and the struck vehicle traveling at 17.5 mph. The orientation angle of the striking vehicle was 60° counterclockwise with respect to the longitudinal axis of the struck vehicle. The impact point 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 Volkswagen Rabbit at 46.3 mph with the MDB's wheels crabbed clockwise to 19°. The actual test speed was 45.8 mph and the actual impact point was 37.5 inches forward of the midpoint of the Volkswagen Rabbit's wheelbase.

The vehicle was structurally modified to the level designated "Optimized". The driver door and left rear occupant wall contained three inches of padding.

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



SECTION 2.0
GENERAL TEST AND VEHICLE PARAMETER DATA

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

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagenwerk AG

MAKE/MODEL: Volkswagen Rabbit

VIN: 1773092939

BODY STYLE: 2-Door Hatchback

MODEL YEAR: 1977

NHTSA NO.: R & D

COLOR: Red

ENGINE DATA: TYPE: Transverse

CYLINDERS: 4

DISPLACEMENT 97 CID

TRANSMISSION DATA: 4 Speed Manual

DATE VEHICLE RECEIVED: 5/9/84

ODOMETER READING: 65615

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING No
POWER BRAKES No
POWER SEATS No
POWER WINDOWS No
TINTED GLASS No
RADIO Yes
CLOCK No
OTHER

AUTOMATIC TRANSMISSION No
AUTOMATIC SPEED CONTROL No
TILTING STEERING WHEEL No
TELESCOPING STEERING WHEEL No
AIR CONDITIONING No
ANTI-SKID BRAKE No
REAR WINDOW DEFROSTER Yes

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? No, structurally optimized modification
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: Fair

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

VEHICLE MANUFACTURED BY: Volkswagenwerk AG

DATE OF MANUFACTURE: 9/76

GVWR: 2777 LBS.,

GAWR: FRONT 1609 LBS., REAR 1278 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 27 psi; REAR 27 psi

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

BIAS PLY, BELTED, OR RADIAL: Radial

PLY RATING: 3

IS SPARE TIRE "SPACE SAVER"? No

IS SPARE TIRE STANDARD EQUIPMENT? Yes

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

RIGHT FRONT	580	LBS.	RIGHT REAR	330	LBS.
LEFT FRONT	570	LBS.	LEFT REAR	370	LBS.
TOTAL FRONT WEIGHT	1150		LBS. (62.2 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	700		LBS. (37.8 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	1850		LBS.		

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 24 7/8	;LF 24 1/4	;RR 24 1/4	;LR 23 7/8
PRE-TEST ATTITUDE:	RF 24	;LF 23 3/8	;RR 21 7/8	;LR 21 5/16
POST-TEST ATTITUDE:	RF 23 5/16	;LF 22 3/4	;RR 21 1/8	;LR 21 13/16

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 272 LBS. CARGO:

RIGHT FRONT	670	LBS.	RIGHT REAR	540	LBS.
LEFT FRONT	670	LBS.	LEFT REAR	590	LBS.
TOTAL FRONT WEIGHT	1340		LBS. (54.3 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1130		LBS. (45.7 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	2470		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*: 9.9 GALLONS

TEST VOLUME: 5.0 GALLONS

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

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: Yes

FUEL INJECTION: Yes

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

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 27 psi; REAR 27 psi

RECOMMENDED TIRE SIZE: 155 SR 13

LOAD RANGE X B, C,

VEHICLE CAPACITY:

TYPES OF SEATS:

Front - Bucket
Rear - Bench

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT

2 REAR

CARGO LOAD 262 LBS.

4 TOTAL

TOTAL 862 LBS.

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

TEST CONDITIONS

TEST NUMBER: 840529

DATE OF TEST: May 29, 1984

TIME OF TEST: 16:30

WIND VELOCITY: 8-16 mph 279° NNW

HUMIDITY: 59%

AMBIENT TEMPERATURE AT IMPACT AREA: 50° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 76° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2470	2460
MDB TEST WEIGHT (LBS.)	2990	3000
MDB VELOCITY (MPH)*	45.8	46.3
IMPACT POINT (INCHES)**	37.5	37

DUMMIES

	<u>DRIVER</u>	<u>MIDDLE PASSENGER</u>	<u>RT. FRONT PASSENGER</u>	<u>LEFT REAR PASSENGER</u>	<u>RT. REAR PASSENGER</u>
TYPE:	SID			SID	
SERIAL NO.:	06			U02	
INSTRUMENTATION:					
HEAD ACCEL.:	Yes			Yes	
CHEST ACCEL.:	Yes (Upper/Lower)			Yes (Upper/Lower)	
FEMUR L.C.'S:	No			No	
OTHER:	Pelvis/Ribs			Pelvis/Ribs	

RESTRAINT SYSTEM: Both dummies were unrestrained

* As measured over final one foot of travel.

** As measured forward of the midpoint of the vehicle's wheelbase.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER 06	PASSENGER U02
Head	<u>Side Window, Window Sill</u>	<u>Side Header, Side Window</u>
Chest	<u>Padding</u>	<u>Padding</u>
Abdomen	<u>Padding</u>	<u>Padding</u>
Left Knee	<u>Padding</u>	<u>Left Rear Quarter Panel</u>
Right Knee	<u>Left Knee</u>	<u>Left Knee</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>DNA*</u>	<u>Easy</u>
Rear	<u>DNA</u>	<u>DNA</u>

SEAT MOVEMENT:

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

GLAZING DAMAGE:

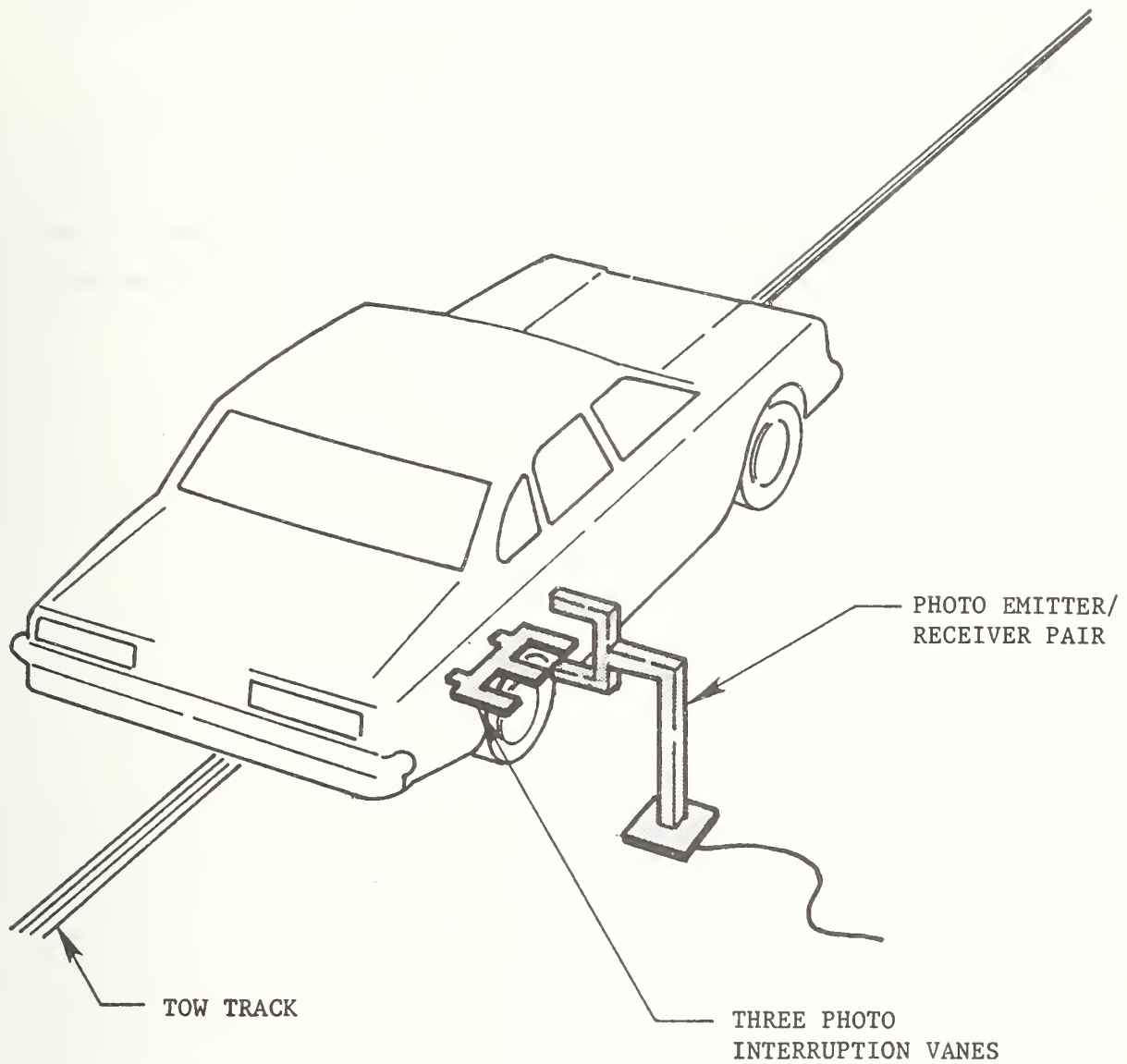
Windshield cracked and separated from mounting; all
driver's side windows shattered; no backlight
damage.

OTHER NOTABLE IMPACT EFFECTS:

Driver door separated from hinges.

* The driver's door was to remain closed for subsequent door opening effort studies.

IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane is located two inches before impact.

The vanes have one foot spacing.

VEHICLE TEST WEIGHT CALCULATION

$$\begin{aligned}\text{Test Weight} &= \text{Unloaded Delivered Weight} + \\ &\quad \text{Number of Dummies} \times 174 \text{ lbs.} + \\ &\quad \text{Cargo Weight} \\ &= 1850 + 2 \times 174 + 262 \text{ lbs.} \\ &= 2460 \text{ lbs.}\end{aligned}$$

To achieve test weight, 5 gallons of Stoddard Solvent was added in the fuel tank. The weight of the test vehicle was measured by placing each wheel on a Loadmeter Corporation Hiway Loadometer.

TEST ANOMALIES

1) Wire separation occurred in data channel LRTYD3 - Passenger Left Rib to Spine Displacement. No peak levels are reported

2) Cable separation occurred in data channel LFDYG5 - Vehicle Left Front Door (Position 11) Acceleration Y Axis. No peak levels or delta velocity are reported.



SECTION 3.0
DATA REQUIRED BY R & D

The following pages are included in this section:

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

DUMMY TEMPERATURE CONTROL AND POSITIONING

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

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

DUMMY PLACEMENT AND POSITIONING

SIDE IMPACT DUMMY*

DRIVER DSP

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

REAR PASSENGER DSP

Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.

Placed against seat back. Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.

Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.

Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.

Located so that planes defined by femur and tibia centerlines are as close as possible to vertical.

Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.

Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.

Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.

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

DUMMY IN-VEHICLE POSITION RECORDING SHEET

VEHICLE NHTSA NO. R & D

MFR./MAKE/MODEL: Volkswagen Rabbit

FRONT SEAT TYPE: BENCH
 X BUCKET
 SPLIT BENCH

ADJUSTER TYPE: X MANUAL
 POWER

BUCKET SEAT BACK TYPE: FIXED
 X ADJUSTABLE

TECHNICIANS:

1. J. Kokoruda

2. N. Echeverria

3. M. Garrison

POSITIONING DATE: 5/29/84

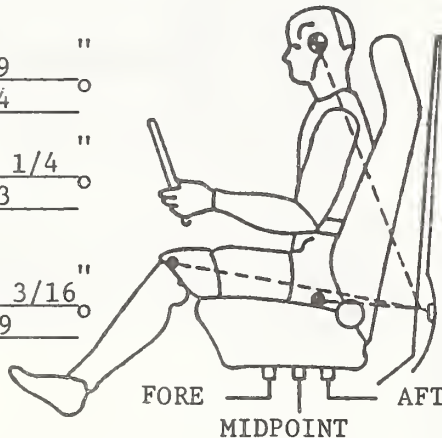
AMBIENT TEMP.: 68° F. TIME: 9:30

DRIVER DUMMY # 06

HEAD 19 "
 TARGET* 34 °

KNEE 33 1/4 "
 JOINT 103 °

APPROX.
 "H" 19 3/16 "
 POINT 119 °

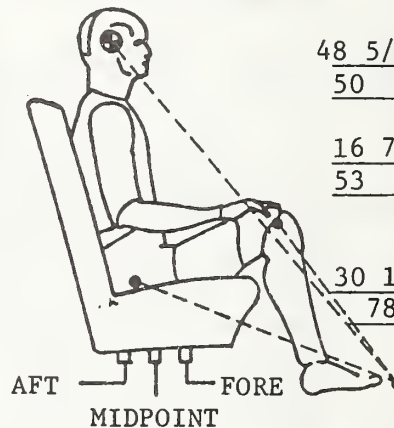


REAR PASSENGER DUMMY # U02

48 5/16 "HEAD
50 °TARGET**

16 7/8 "KNEE
53 °JOINT

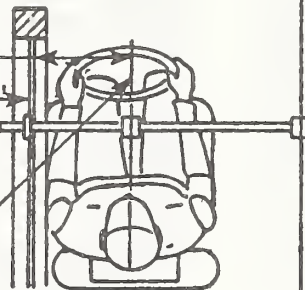
APPROX.
30 1/4 " "H"
78 °POINT



DOOR
 GLASS
 HEIGHT*** 10 3/4 "

11 1/4 "

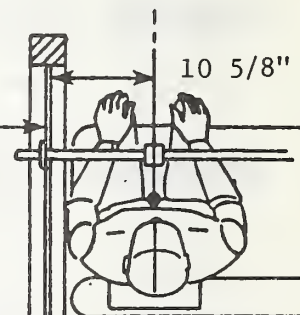
LATERAL BAR
 ADJUSTABLE
 POINTER



DRIVER
 DUMMY #
 06

DOOR
 GLASS
 HEIGHT 10 5/8 "

DNA

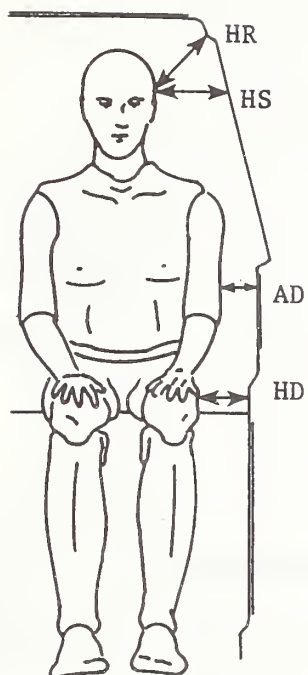


PASSENGER
 DUMMY #
 U02

*All driver dummy dimensions referenced to top of striker bolt and all angles referenced to vertical.

**All passenger dummy dimensions referenced to front seat back latch bolt with front seat in mid-position and all angles referenced to vertical.

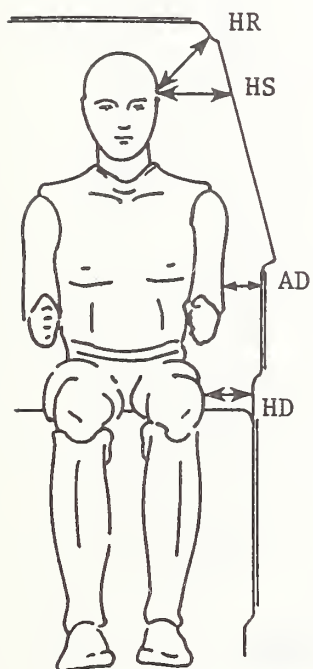
***Door glass height is equal on the right and left side of vehicle at dummy nose level.



DRIVER
06

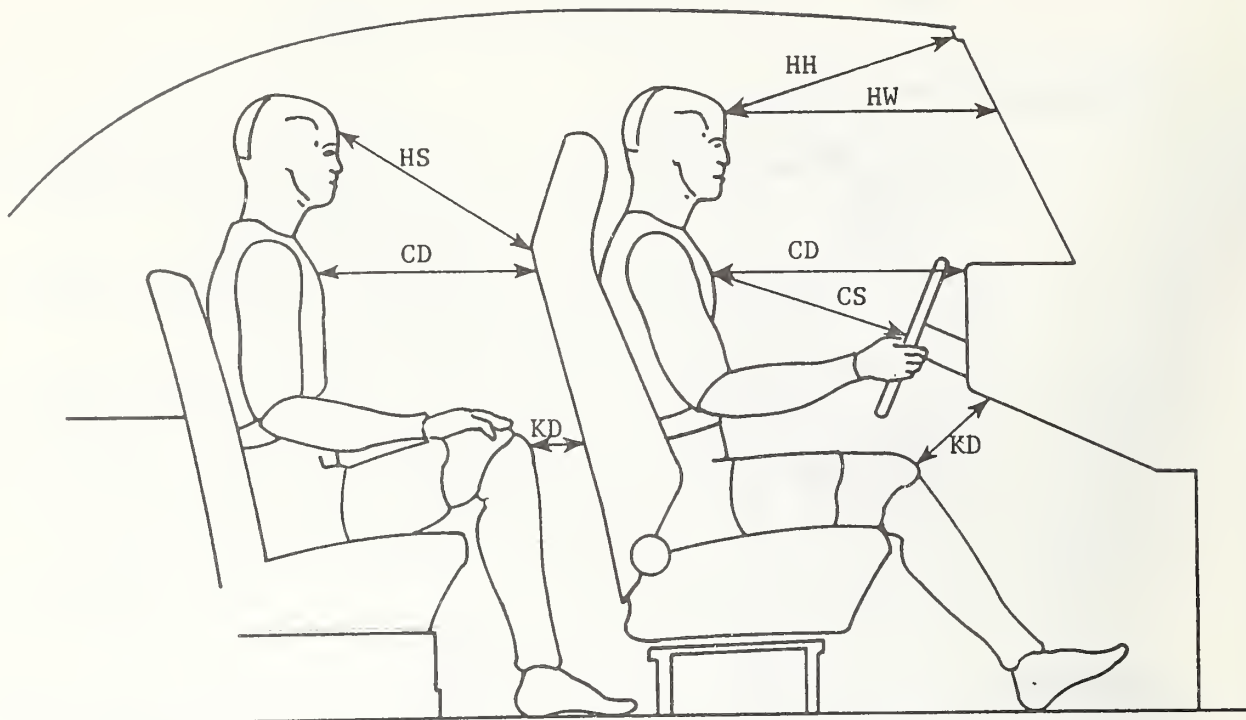
PASSENGER
U02

HR	6 3/8	5 1/2
HS	8	8 3/8
AD	1/2	1/2
HD	2 1/2	3 1/2



ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



DRIVER
06

PASSENGER
U02

HH	14 1/8	DNA
HW	21 3/8	DNA
HS	DNA	25 15/16
CD	20 1/4	18 3/4
CS	13 1/8	DNA
KDL	8 3/8	3 7/8
KDR	8 3/8	3 3/8

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the dummy's torso contacted the padded driver's door and the head contacted the driver's window and window sill. The dummy rebounded from the driver's door across the front occupant compartment and its buttocks struck the front passenger's window sill. The dummy came to rest sitting in the right front passenger seat with it's upper torso wedged between the two front seats.

PASSENGER

During impact, the dummy's torso contacted the padded left rear occupant side wall and the head contacted the side header and side window. The dummy rebounded from the padded side wall and remained upright throughout the event. The dummy came to rest seated upright and facing forward.

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

LOCATION	HEIGHT (in)	6	0	6	12	18	24	30	36	42	48	54	60	66	72	78
		PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)														
Axle Height	10.5	X	X	19.9	19.8	19.8	19.8	19.8	19.8	19.9	19.9	20.1	20.1	20.3	X	X
H-Point	20.0	X	16.9	17.9	17.8	17.8	17.8	17.8	17.8	17.8	17.9	17.9	18.1	18.1	17.9	X
Mid Door	23.5	16.3	17.8	17.6	17.6	17.5	17.5	17.5	17.4	17.5	17.5	17.7	17.8	17.9	18.1	X
Window Sill	33.5	19.7	19.4	19.2	19.1	19.0	19.0	19.0	19.1	19.1	19.2	19.1	19.1	19.3	19.4	19.6
Window Top	52.5	X	X	X	X	X	26.6	26.3	26.1	26.1	26.1	26.2	23.3	26.5	26.9	27.4

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

Axle Height	10.5	X	X	22.8	27.2	27.8	27.9	27.0	25.9	25.0	24.3	23.3	21.9	20.9	X	X
H-Point	20.0	X	24.7	26.4	35.6	36.8	37.1	36.3	34.8	33.1	31.2	28.7	27.0	24.4	22.1	X
Mid Door	23.5	22.1	24.2	24.1	34.7	36.3	36.5	35.5	33.9	31.8	30.1	28.4	25.8	23.4	21.3	X
Window Sill	33.5	20.8	20.9	21.3	33.4	37.3	38.4	37.3	34.6	32.5	30.2	28.8	25.4	22.8	21.0	20.3
Window Top	52.5	X	X	X	X	X	27.5	27.1	27.0	27.0	27.1	27.1	27.1	27.1	27.4	27.8

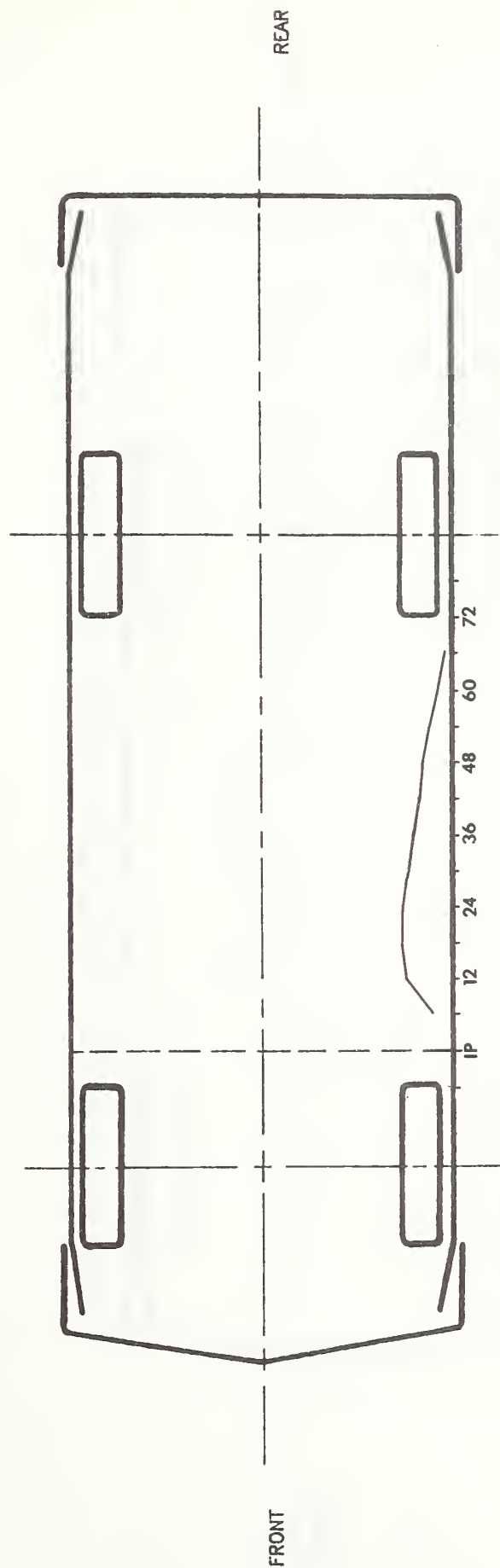
STATIC CRUSH (IN)

Axle Height	10.5	X	X	2.9	7.4	8.0	8.1	7.2	6.1	5.1	4.4	3.2	1.8	0.6	X	X
H-Point	20.0	X	7.8	8.5	17.8	19.0	19.3	18.5	17.0	15.3	13.3	10.8	8.9	6.3	4.2	X
Mid Door	23.5	5.8	6.4	6.5	17.1	18.8	19.0	18.0	16.5	14.3	12.6	10.7	8.0	5.5	1.9	X
Window Sill	33.5	1.1	1.5	2.1	14.3	18.3	19.4	18.3	15.5	13.4	11.0	9.7	6.3	3.5	1.6	0.7
Window Top	52.5	X	X	X	X	X	0.9	0.8	0.9	0.9	1.0	0.9	3.8	0.6	0.5	0.4

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

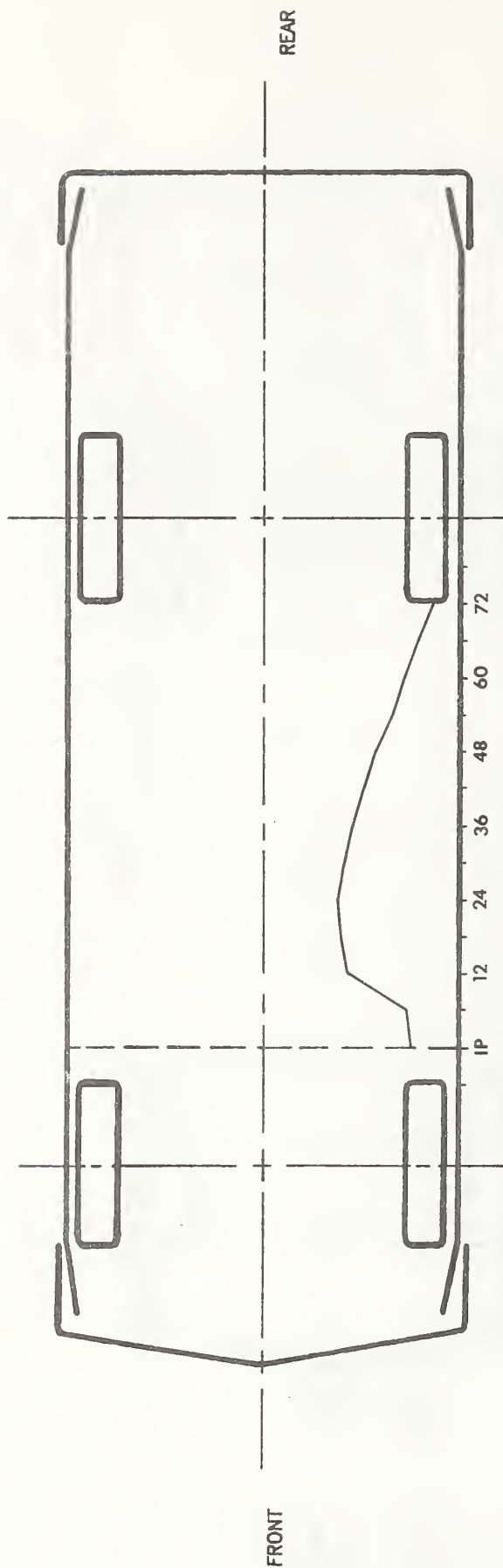
** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



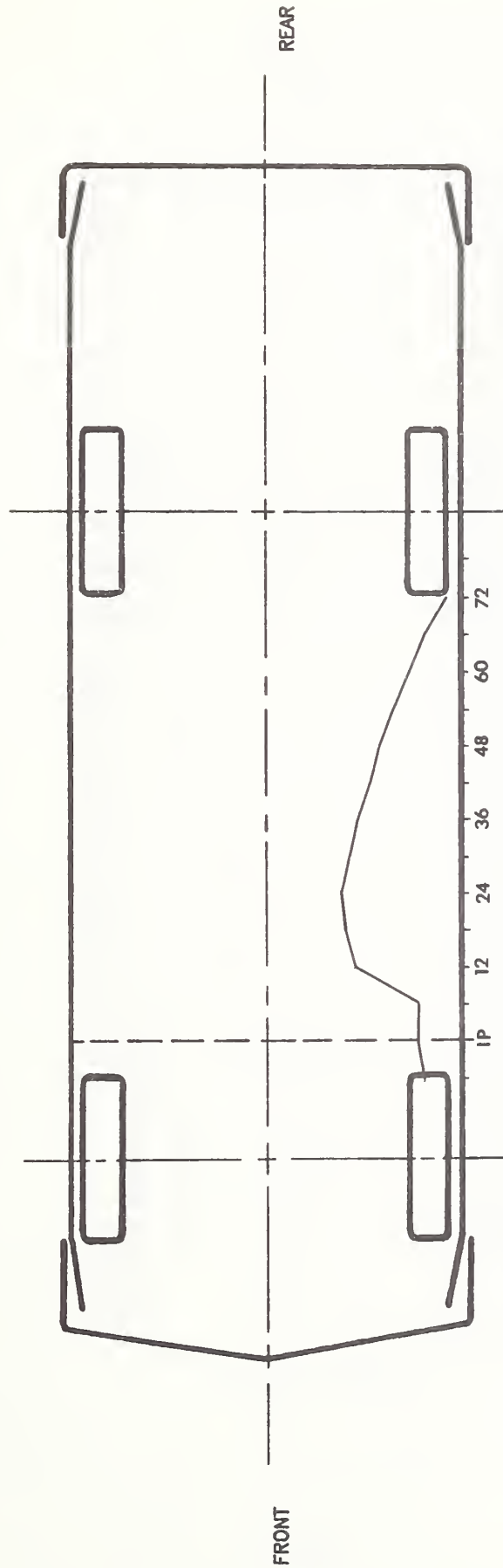
PROFILE LEVEL EQUALS AXLE HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



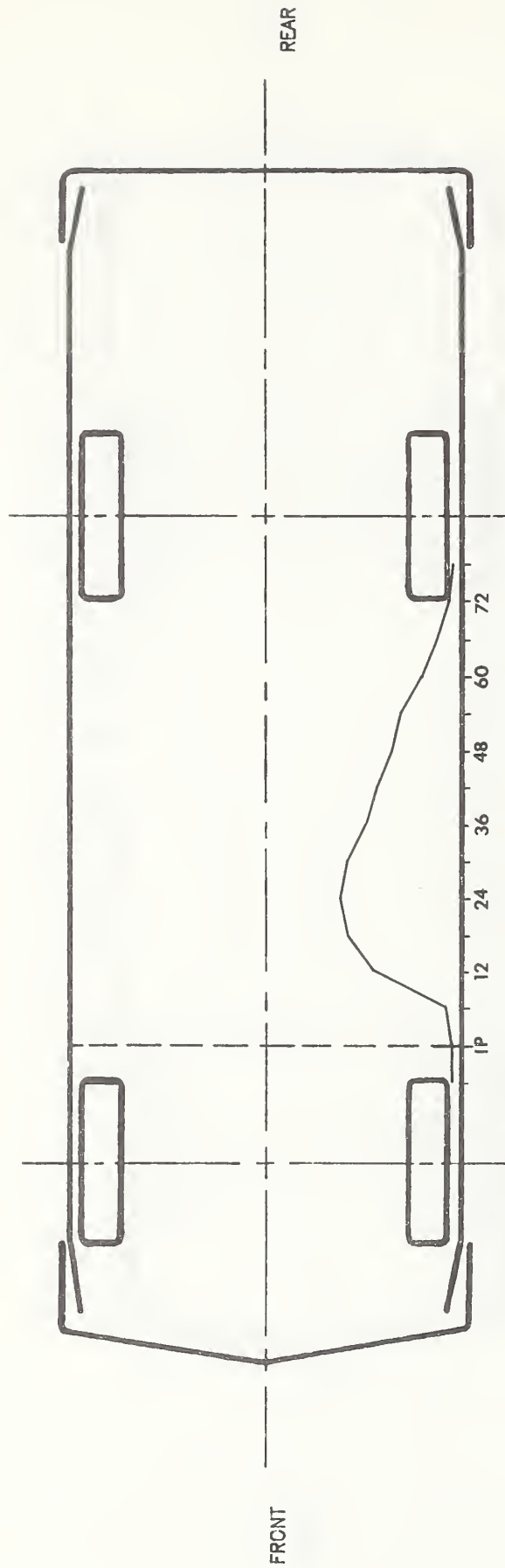
PROFILE LEVEL EQUALS H-POINT HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



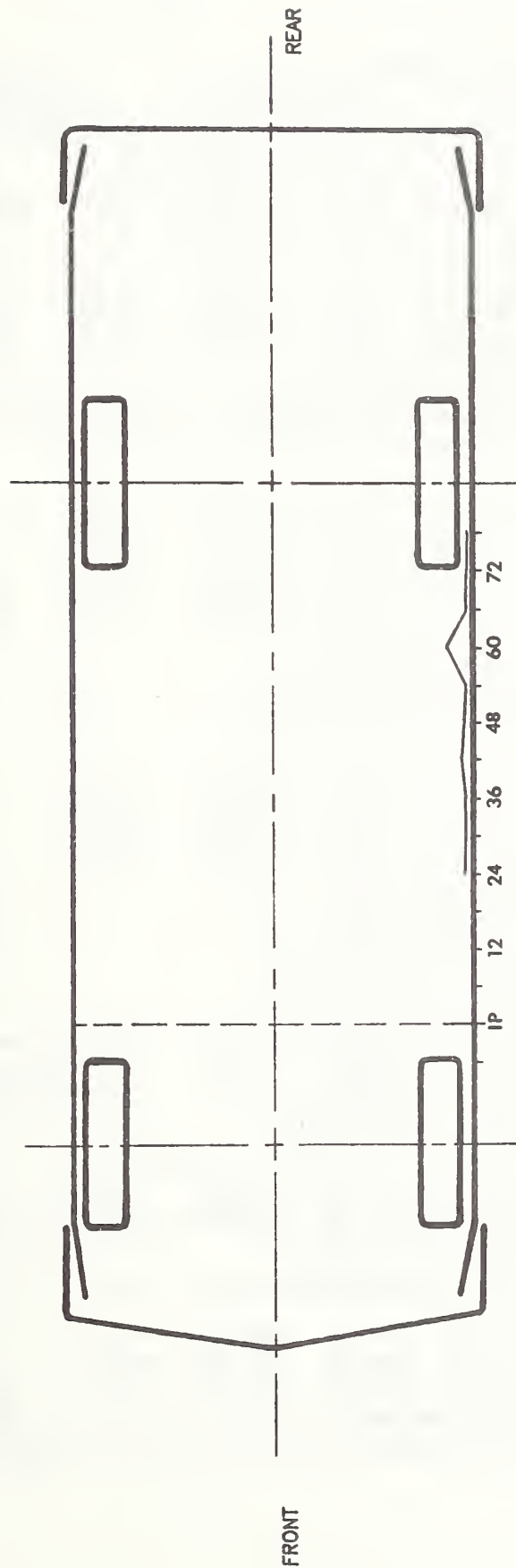
PROFILE LEVEL EQUALS MID-DOOR HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW SILL HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT
 IP EQUALS PROJECTED IMPACT POINT

SIDE IMPACT DUMMY DATA SUMMARY

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE		NEGATIVE		POSITIVE		NEGATIVE	
	DIRECTION*		DIRECTION**		DIRECTION*		DIRECTION**	
	MAX	TIME	MAX	TIME	MAX	TIME	MAX	TIME
	(g)	(msec)	(g)	(msec)	(g)	(msec)	(g)	(msec)
HEAD ACCELERATION								
LONGITUDINAL	80.71	225.75	163.96	81.50	21.69	89.38	40.43	102.38
LATERAL	83.08	81.50	23.79	72.88	57.58	64.13	35.26	88.13
VERTICAL	12.23	207.00	113.08	70.38	102.48	88.88	46.06	76.25
RESULTANT		188.16 @	83.50			108.60 @	88.88	
HIC	3763.40	from 56.00 to 87.25			667.00	from 59.75 to 107.38		
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	37.42	213.75	50.28	53.12	13.56	107.50	51.95	87.50
LATERAL (P)***	166.83	52.50	42.74	68.13	49.69	79.38	10.48	108.13
LATERAL (R)***	169.99	52.50	41.19	68.13	51.93	79.38	9.41	108.13
VERTICAL	11.98	61.25	36.19	52.50	11.81	65.63	17.20	88.13
RESULTANT (P)		177.89 @	52.50			69.82 @	79.38	
RESULTANT (R)		180.86 @	52.50			71.43 @	79.38	
DELTA V (MPH)****		36.4 @	61.88 (P)			20.1 @	98.12 (P)	
		38.0 @	64.38 (R)			21.6 @	98.12 (R)	
LOWER SPINE								
LONGITUDINAL	56.92	57.50	47.14	48.13	9.26	113.75	48.26	71.25
LATERAL (P)	160.21	49.37	33.63	62.50	63.46	73.13	19.00	95.00
LATERAL (R)	161.77	49.37	31.44	67.50	65.16	73.13	16.47	95.00
VERTICAL	20.36	48.13	8.23	200.63	12.69	76.25	7.38	95.63
RESULTANT (P)		166.35 @	49.37			79.56 @	72.50	
RESULTANT (R)		167.85 @	49.37			80.89 @	72.50	
DELTA V (MPH)		47.4 @	60.00 (P)			27.6 @	90.00 (P)	
		48.1 @	60.00 (R)			29.4 @	90.62 (R)	
LEFT UPPER RIB								
LATERAL (P)	100.92	46.88	12.29	80.63	68.56	80.00	8.08	115.00
LATERAL (R)	116.13	51.25	12.17	71.25	67.30	80.00	6.72	115.00
DELTA V (MPH)		37.6 @	69.38 (P)			27.2 @	108.75 (P)	
		38.5 @	69.38 (R)			28.0 @	106.25 (R)	
LEFT LOWER RIB								
LATERAL (P)	133.97	45.00	55.08	66.25	77.00	74.37	8.21	116.88
LATERAL (R)	125.06	45.00	57.41	65.63	73.51	74.37	8.56	116.88
DELTA V (MPH)		40.3 @	63.38 (P)			28.7 @	111.88 (P)	
		41.7 @	63.75 (R)			28.1 @	112.50 (R)	
PELVIS ACCELERATION								
LONGITUDINAL	56.35	89.75	304.10	58.50 o	10.09	121.88	79.73	67.38
LATERAL	122.30	47.88	368.84	58.25 o	141.46	62.13	24.98	54.13
VERTICAL	64.41	59.63	207.20	57.63 o	31.10	75.00	20.88	62.50
RESULTANT		494.16 @	58.13 o			158.15 @	62.13	
DELTA V (MPH)		---	@ --- o			27.7 @	112.63	

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	<u>DRIVER DUMMY</u>				<u>PASSENGER DUMMY</u>			
	<u>POSITIVE</u>		<u>NEGATIVE</u>		<u>POSITIVE</u>		<u>NEGATIVE</u>	
	<u>DIRECTION*</u>		<u>DIRECTION**</u>		<u>DIRECTION*</u>		<u>DIRECTION**</u>	
	<u>MAX</u>	<u>TIME</u>	<u>MAX</u>	<u>TIME</u>	<u>MAX</u>	<u>TIME</u>	<u>MAX</u>	<u>TIME</u>
	<u>(in)</u>	<u>(msec)</u>	<u>(in)</u>	<u>(msec)</u>	<u>(in)</u>	<u>(msec)</u>	<u>(in)</u>	<u>(msec)</u>
RIB DEFLECTION †	0.13	179.38	1.93	60.25	---	--- γ	---	--- γ

* LONGITUDINAL: FORWARD
 LATERAL: RIGHTWARD
 VERTICAL: UPWARD

**LONGITUDINAL: REARWARD
 LATERAL: LEFTWARD
 VERTICAL: DOWNWARD

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

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

† Compression: Negative

γ See TEST ANOMALIES

o The CTM has judged that intermittent rattling has occurred in these channels and, therefore, the peak values reported are questionable as are applicable resultants and Delta V's.

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

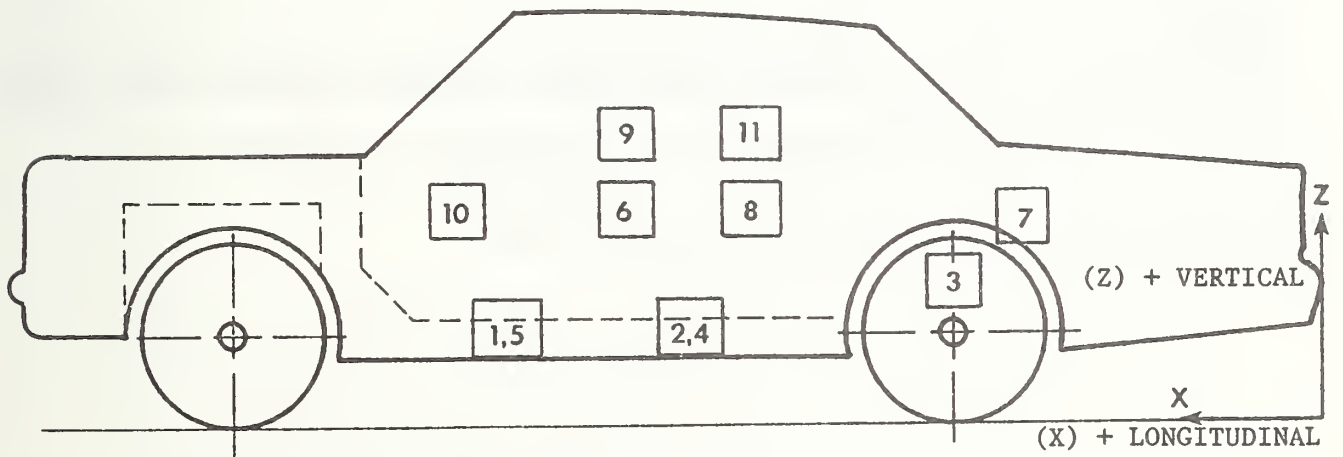
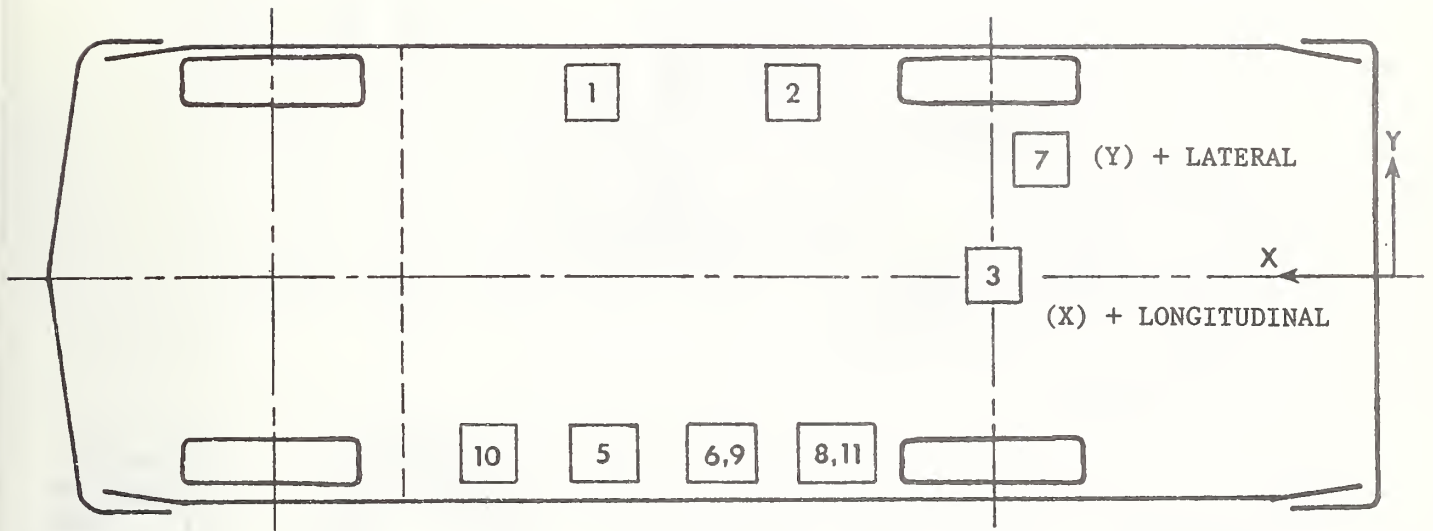
NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	RIGHT SILL AT FRONT SEAT	83.5	23.5	9.8				
	(LONGITUDINAL)	$\Delta V = -8.8$ mph @ 120.00 msec			1.93	126.63	8.28	16.25
	(LATERAL)	$\Delta V = 14.9$ mph @ 120.00 msec			14.87	76.00	4.28	121.75
	(VERTICAL)				11.53	57.63	9.68	50.75
	(RESULTANT)					16.24 @ 75.88		
2	RIGHT SILL AT REAR SEAT	61.6	23.6	8.9				
	(LONGITUDINAL)	$\Delta V = -8.1$ mph @ 120.00 msec			2.18	127.13	8.56	16.25
	(LATERAL)	$\Delta V = 19.9$ mph @ 120.00 msec			21.66	46.88	4.41	122.63
	(VERTICAL)				8.44	58.38	7.25	50.63
	(RESULTANT)					21.84 @ 46.75		
3	REAR DECK OVER AXLE	32.0	0.0	6.9				
	(LONGITUDINAL)	$\Delta V = -9.2$ mph @ 120.00 msec			4.20	27.63	13.46	58.00
	(LATERAL)	$\Delta V = 27.1$ mph @ 120.00 msec			26.54	70.75	2.77	126.50
	(VERTICAL)				7.26	49.13	8.65	72.13
	(RESULTANT)					29.72 @ 70.75		
4	LEFT SILL AT REAR SEAT	61.2	-23.5	9.0				
	(LATERAL)	$\Delta V = 19.1$ mph @ 114.00 msec			26.72	51.88	3.30	130.13
5	LEFT SILL AT FRONT SEAT	83.5	-23.5	10.4				
	(LATERAL)	$\Delta V = 4.7$ mph @ 23.00 msec			26.05	11.50	31.33	48.75
6	LEFT FRONT DOOR CENTERLINE	80.5	-26.0	23.4				
	(LATERAL)	$\Delta V = 24.3$ mph @ 33.50 msec			116.78	25.38	65.31	38.25
7	RIGHT REAR COMPARTMENT	31.0	-15.4	13.9				
	(LONGITUDINAL)				3.85	34.63	9.21	70.38
8	MIDREAR OF LEFT FRONT DOOR	60.4	-26.2	23.4				
	(LATERAL)	$\Delta V = 28.0$ mph @ 23.00			110.98	10.88	101.24	29.13
9	UPPER LEFT FRONT DOOR CENTERLINE	81.5	-26.1	32.3				
	(LATERAL)	$\Delta V = 34.0$ mph @ 34.13 msec			200.25	30.63	222.04	40.13
10	MIDFRONT OF LEFT FRONT DOOR	99.9	-26.2	21.8				
	(LATERAL)	$\Delta V = 30.4$ mph @ 48.50 msec			183.09	48.13	87.37	54.75
11	UPPER REAR OF LEFT REAR DOOR	70.5	25.9	32.6				
	(LATERAL)	---	---	--- Y	---	--- Y	---	--- Y

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

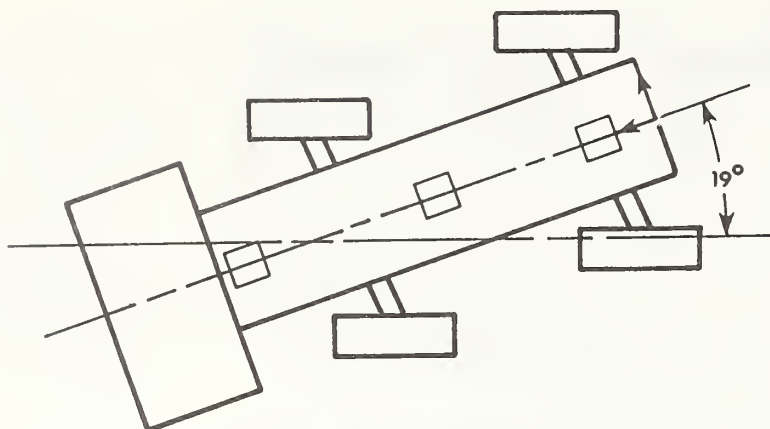
All measurements of accelerometer locations in inches.

γ See TEST ANOMALIES

VEHICLE ACCELEROMETER LOCATIONS



MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY



NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	CENTER OF GRAVITY	74.5	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -19.5 \text{ mph @ } 120.00 \text{ msec}$			1.01	184.88	14.95	46.88
	(LATERAL)	$\Delta V = -3.1 \text{ mph @ } 120.00 \text{ msec}$			1.84	45.88	5.50	82.50
	(VERTICAL)				19.58	108.88	12.59	100.88
	(RESULTANT)				20.64 @ 81.50			
2	FRONT FRAME MEMBER	130.3	0.0	11.3				
	(LONGITUDINAL)	$\Delta V = -17.4 \text{ mph @ } 120.00 \text{ msec}$			0.99	219.88	15.18	46.38
3	REAR FRAME MEMBER	23.3	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -18.4 \text{ mph @ } 120.00 \text{ msec}$			1.51	125.13	14.86	46.50

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

All measurements of accelerometer locations in inches.

HIGH SPEED CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead	Photosonic 1B	8	828	Vehicle Dynamics
2	Overhead	Photosonic 1B	25	790	Close-up of impact point
3	Onboard MDB	Photosonic 1B	25	490	Close-up of impact point
4	Onboard MDB	Stalex	13	503	Driver kinematics
5	Ground level - right	Photosonic 1B	25	758	Overall view
6	Ground level - left	Photosonic 1B	17	838	Overall view
7	Onboard vehicle	Photosonic 1B	8	815	Driver kinematics - front view
8	Onboard vehicle	Photosonic 1B	8	798	Driver kinematics
9	Onboard vehicle	Photosonic 1B	8	795	Passenger kinematics

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

LOCATIONS OF OFFBOARD HIGH SPEED CAMERAS

CAMERA NO.	X	Y	Z
1	0	0	25'
2	0	0	25'
5	26'4"	60'	45"
6	-19'7"	-11'3"	45"

Origin of Coordinate System is Point of Impact

+X = Forward with Respect to Striking Vehicle's Velocity Vector
+Y = Rightward with Respect to Striking Vehicle's Velocity Vector
+Z = Upward with Respect to Striking Vehicle's Velocity Vector

NON-GOVERNMENT FURNISHED TRANSDUCER INFORMATION

PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NUMBER	SERIAL NUMBER	MFR.	DATE OF LAST CALIBRATION	SENSITIVITY	DESIRED FULL SCALE (ENGR. UNITS)
BOGXG	Accel	4-202-0001	18845	Bell Howell	5/2/84	0.237 MV/G	50 G
BOGYG	Accel	4-202-0001	18858	Bell Howell	5/2/84	0.236 MV/G	50 G
BOGZG	Accel	4-202-0001	18857	Bell Howell	5/2/84	0.239 MV/G	50 G
BFCXG	Accel	4-202-0001	18240	Bell Howell	5/2/84	0.239 MV/G	50 G
BRCXG	Accel	4-202-0001	19022	Bell Howell	5/2/84	0.220 MV/G	50 G

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



APPENDIX A
PHOTOGRAPHS

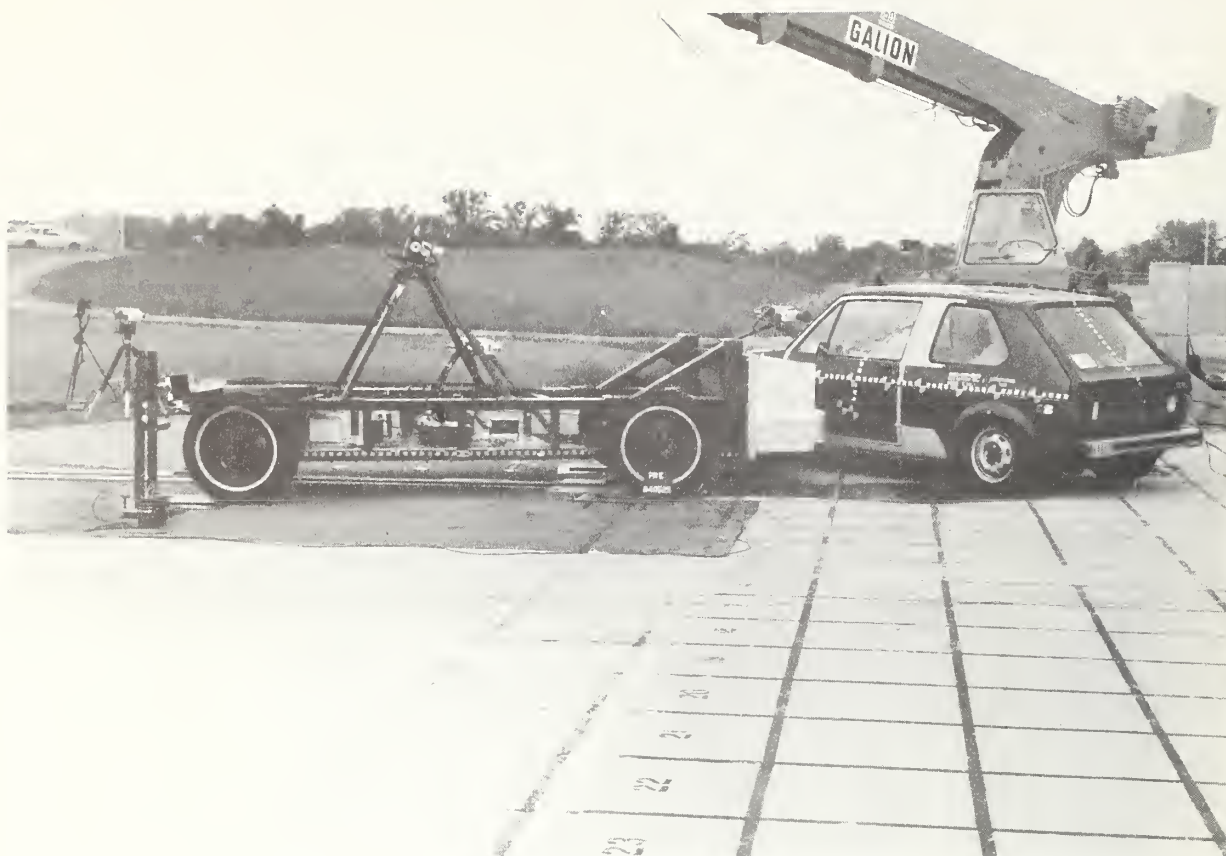


Figure A-1. PRE-TEST OVERALL - VIEW 1

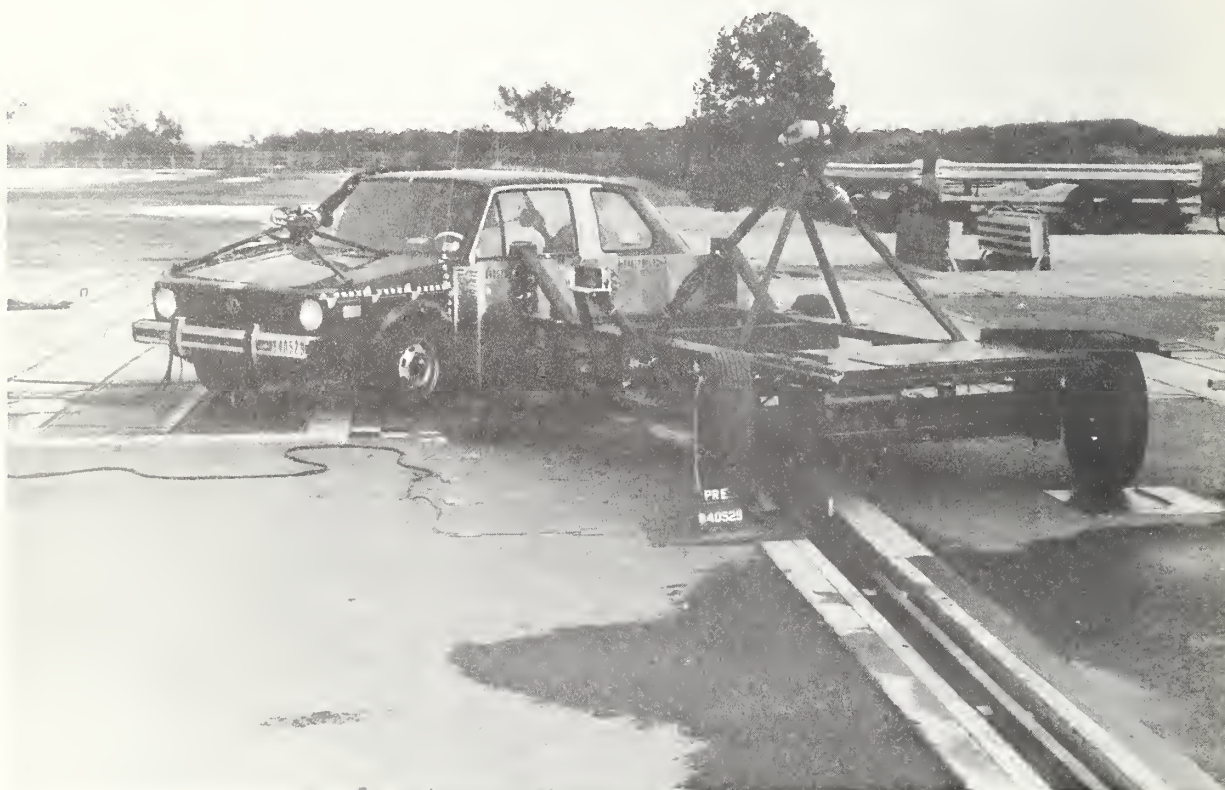


Figure A-2. PRE-TEST OVERALL - VIEW 2



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

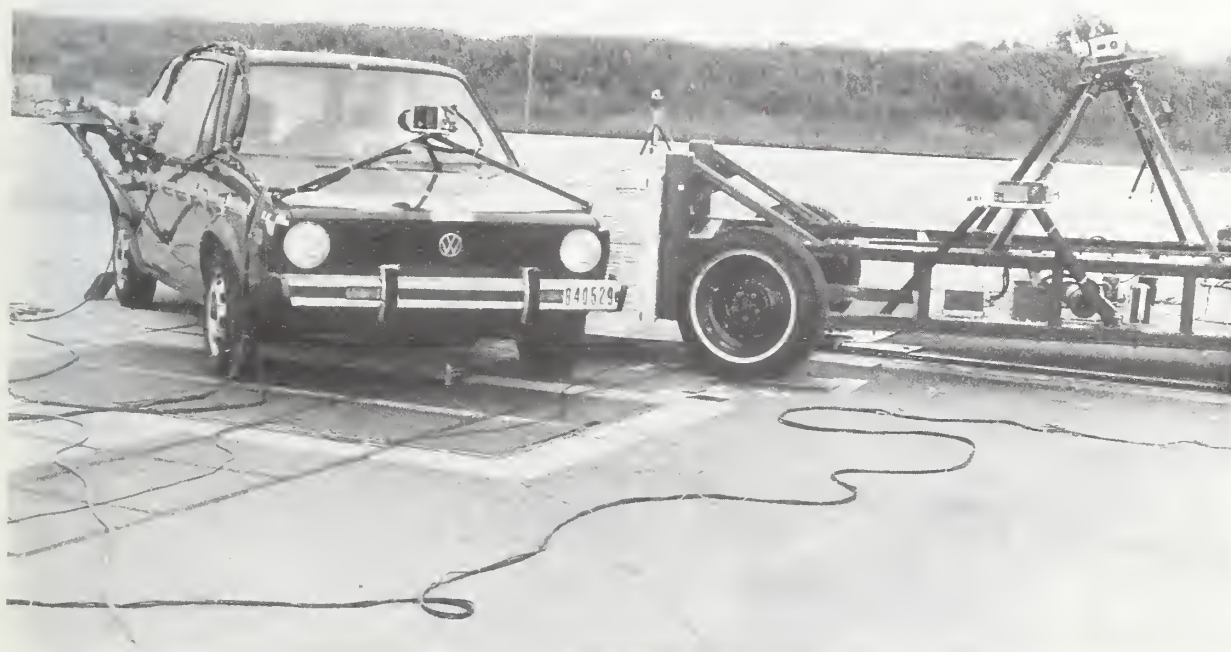


Figure A-4. PRE-TEST OVERALL - VIEW 4

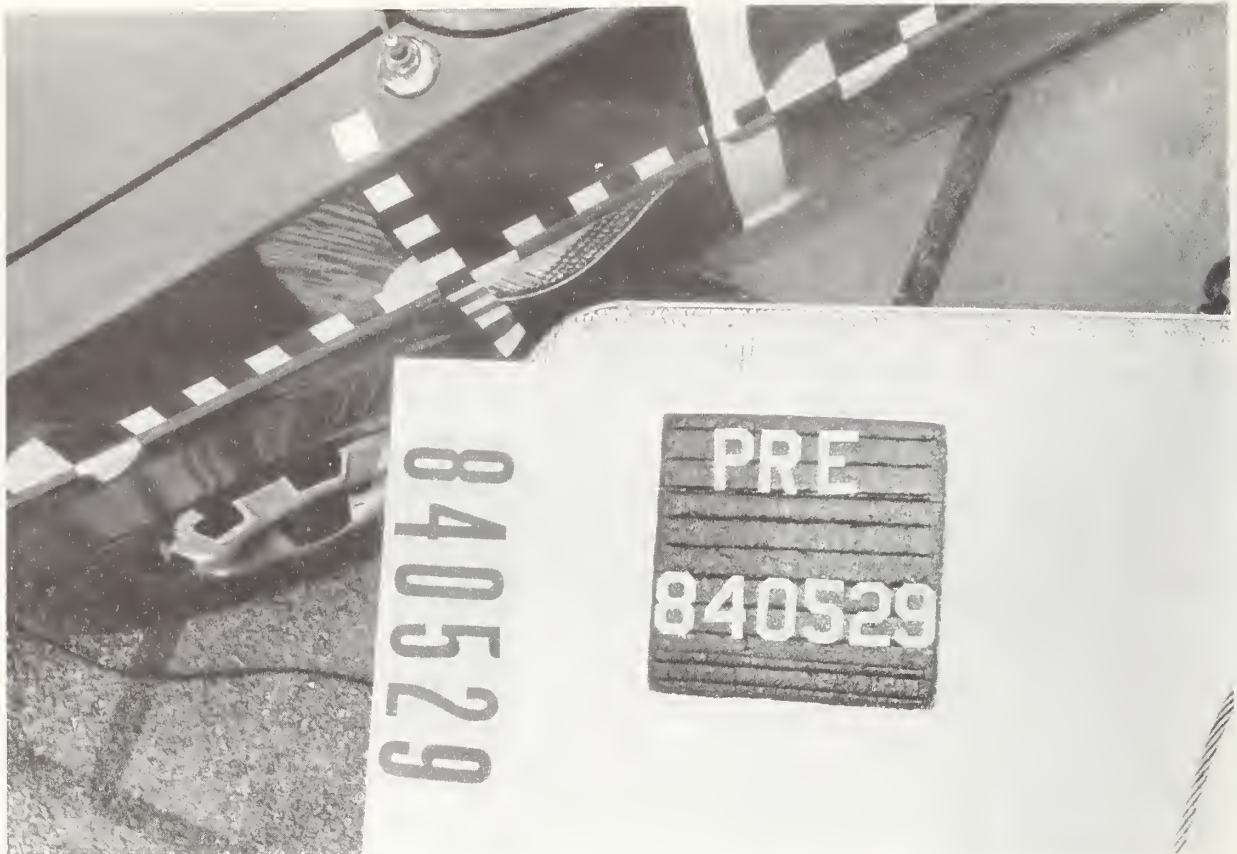


Figure A-5. PRE-TEST CLOSEUP



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



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



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



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



Figure A-10. CRASH EVENT PHOTOGRAPH



Figure A-11. POST-TEST OVERALL - VIEW 1



Figure A-12. POST-TEST OVERALL - VIEW 2

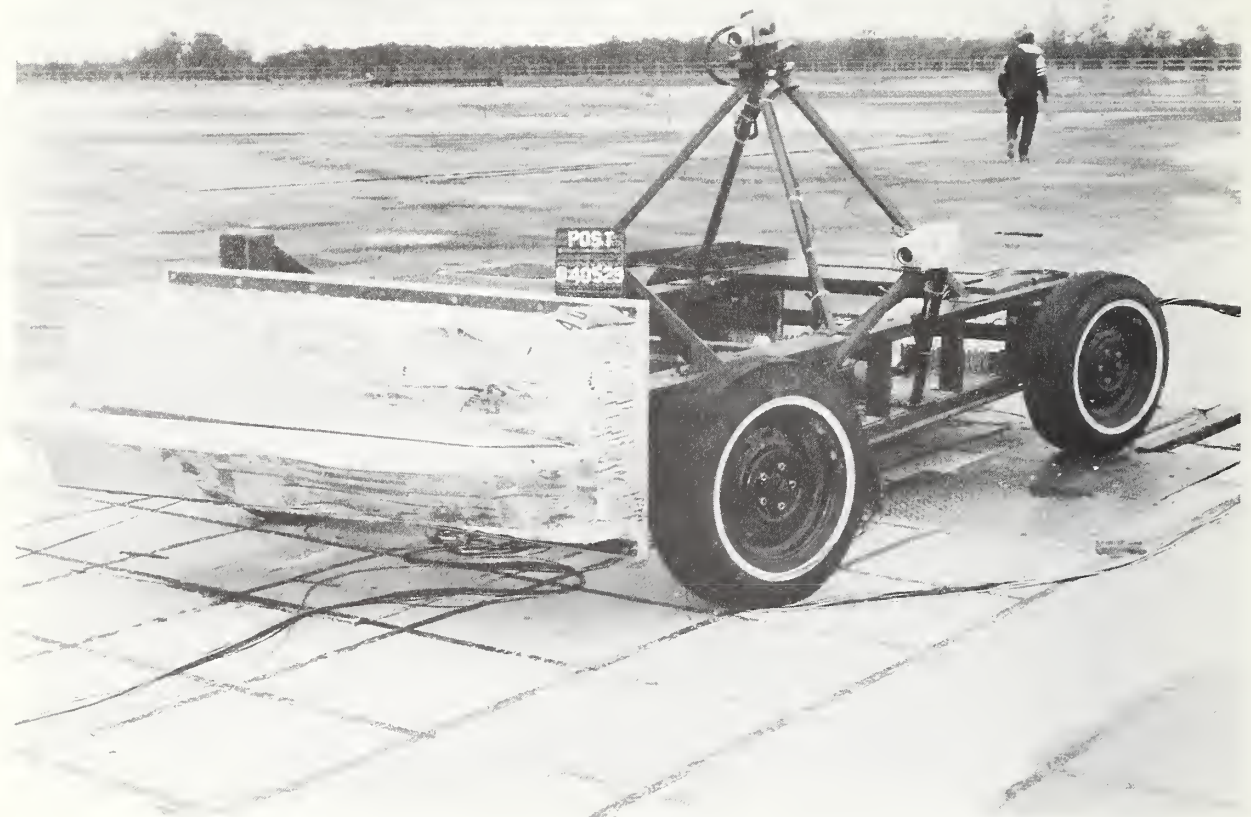


Figure A-14. POST-TEST OVERALL - VIEW 4



Figure A-15. POST-TEST DRIVER DUMMY - VIEW 1



Figure A-16. POST-TEST DRIVER DUMMY - VIEW 2



Figure A-17. POST-TEST PASSENGER DUMMY - VIEW 1

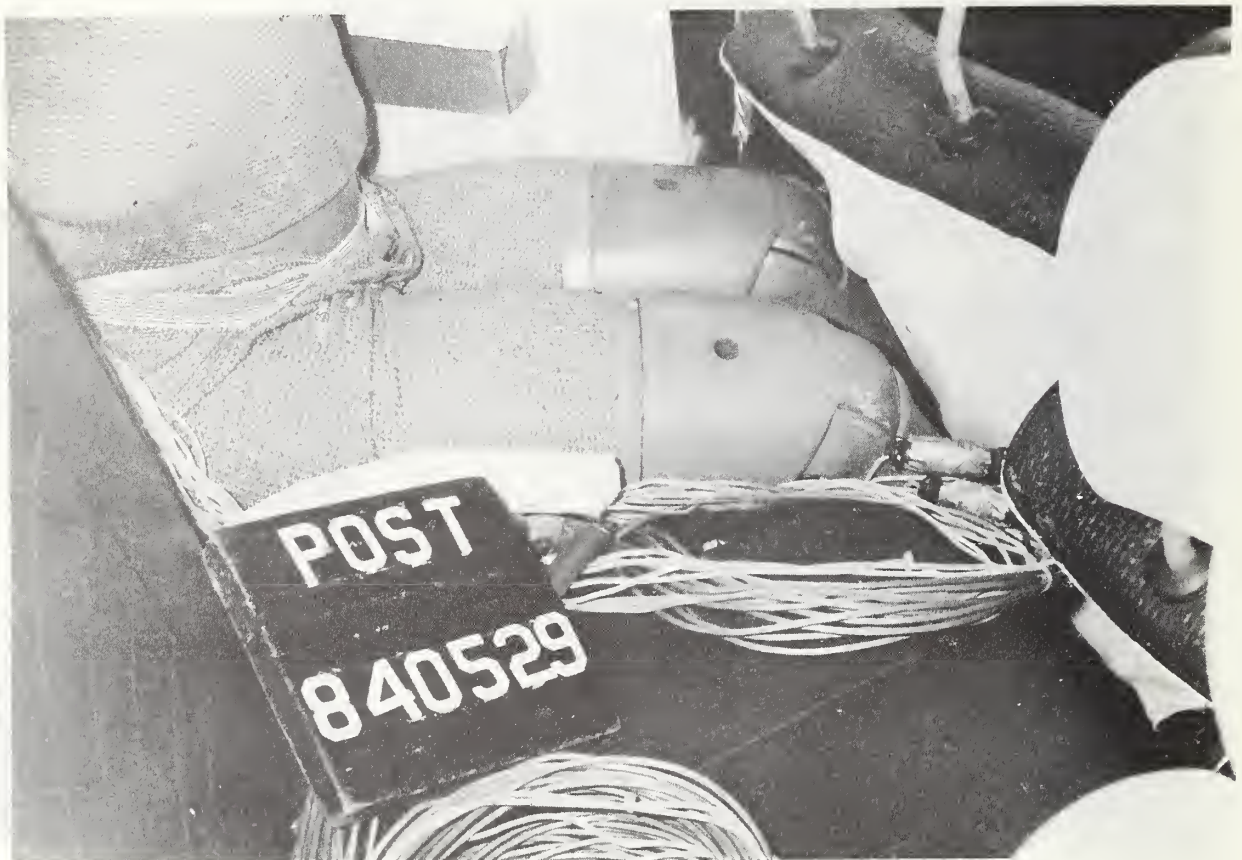


Figure A-18. POST-TEST PASSENGER DUMMY - VIEW 2

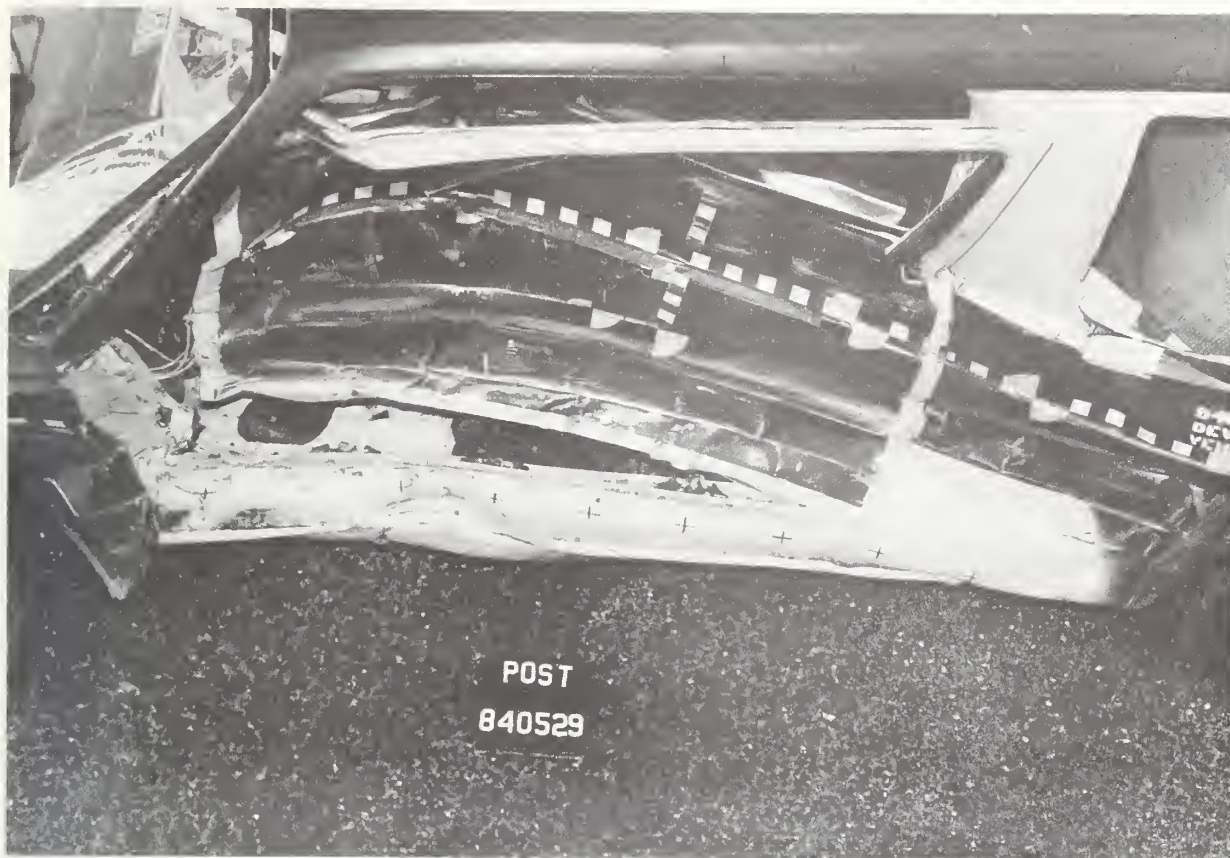


Figure A-19. POST-TEST VEHICLE DAMAGE

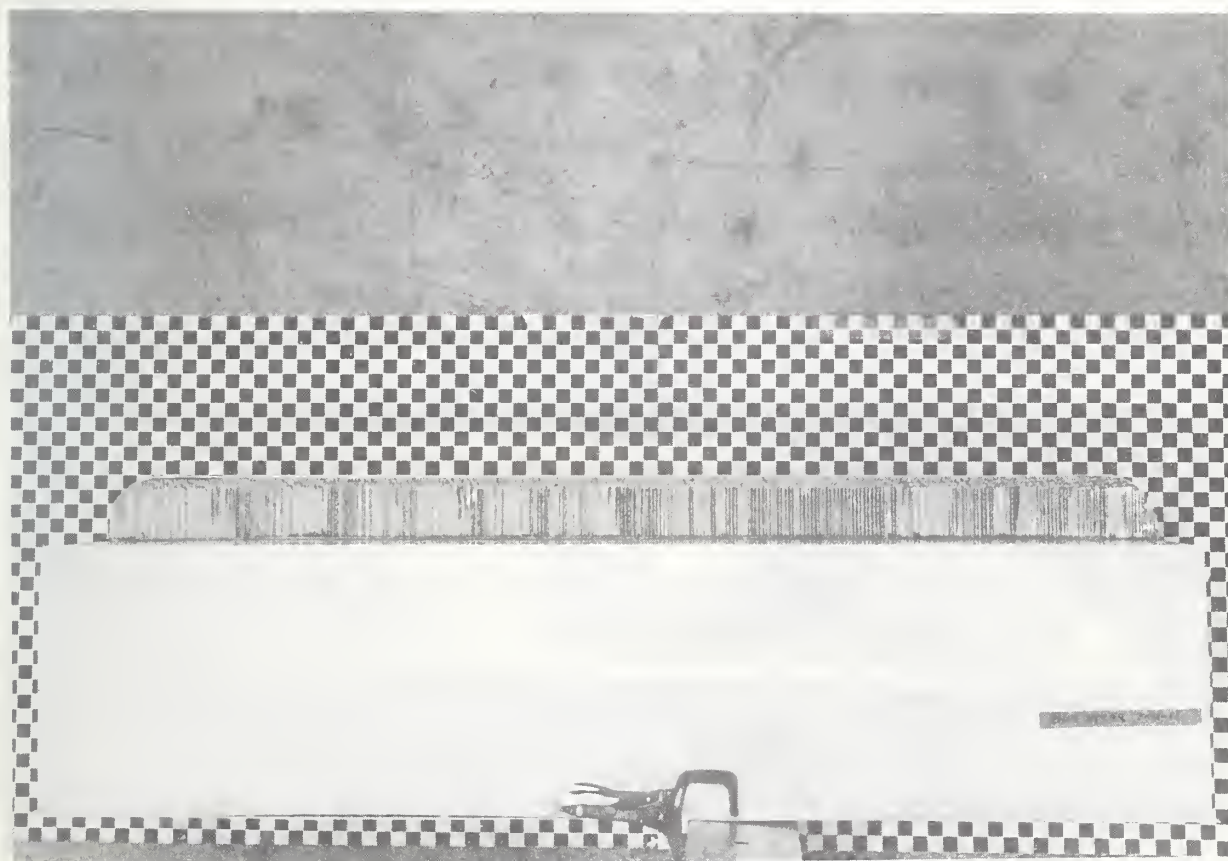


Figure A-20. PRE-TEST MDB FACE - VIEW 1

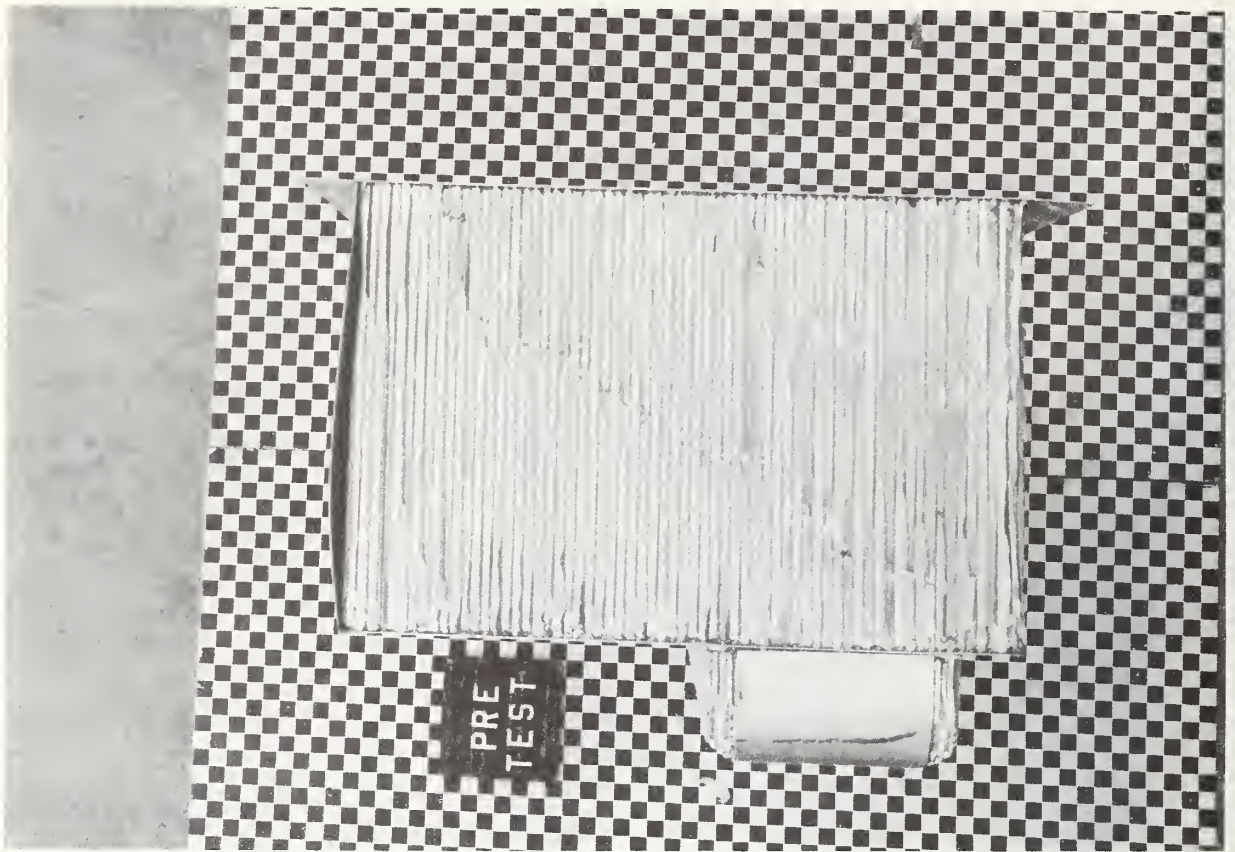


Figure A-21. PRE-TEST MDB FACE - VIEW 2

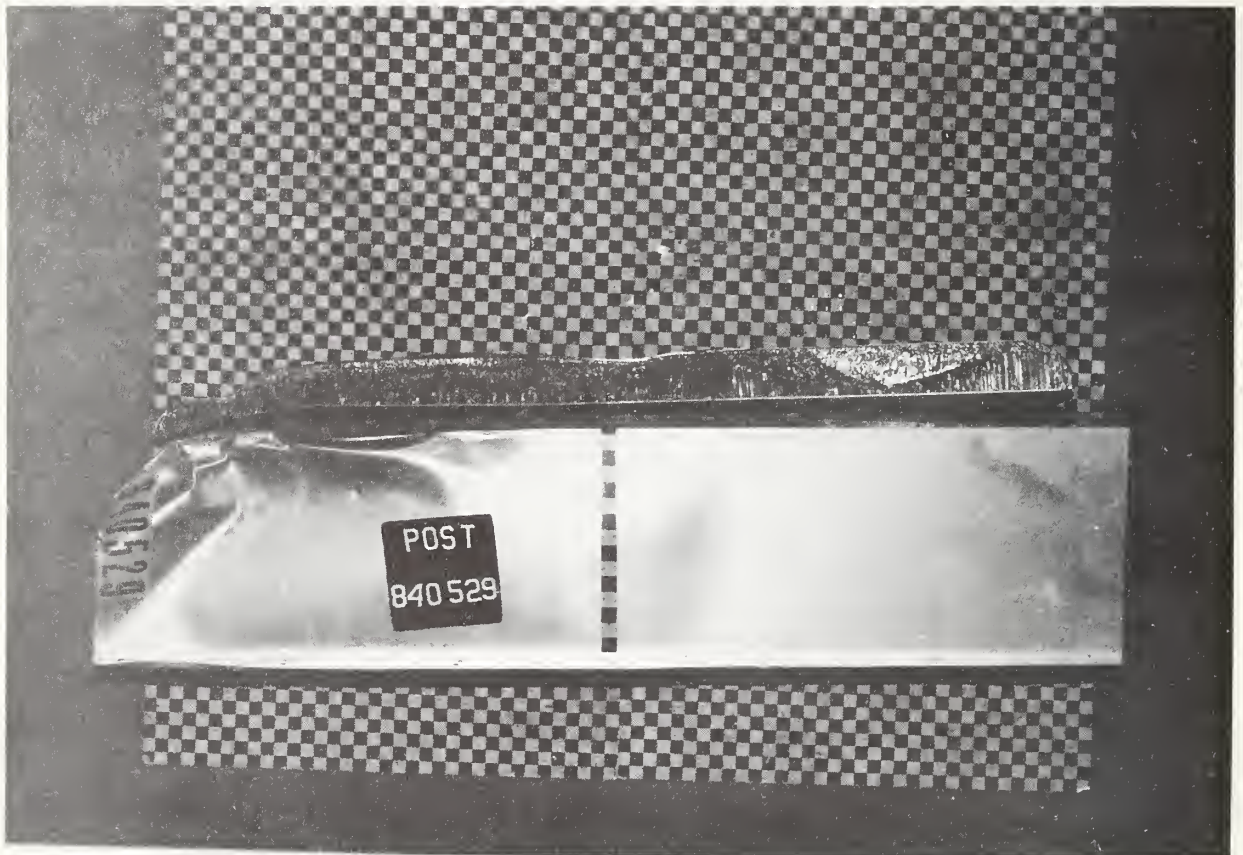


Figure A-22. POST-TEST MDB FACE - VIEW 1

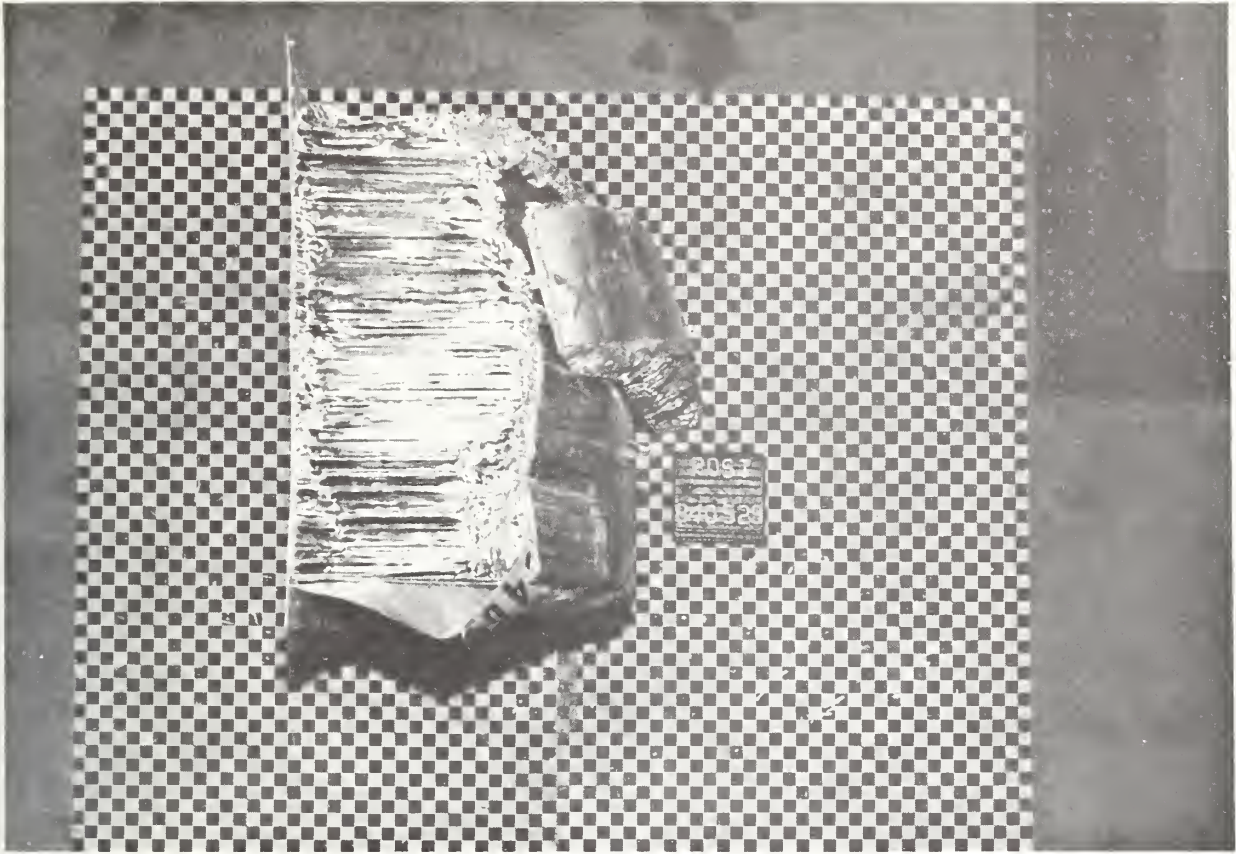


Figure A-23. POST-TEST MDB FACE - VIEW 2



APPENDIX B
DATA PLOT PRESENTATION

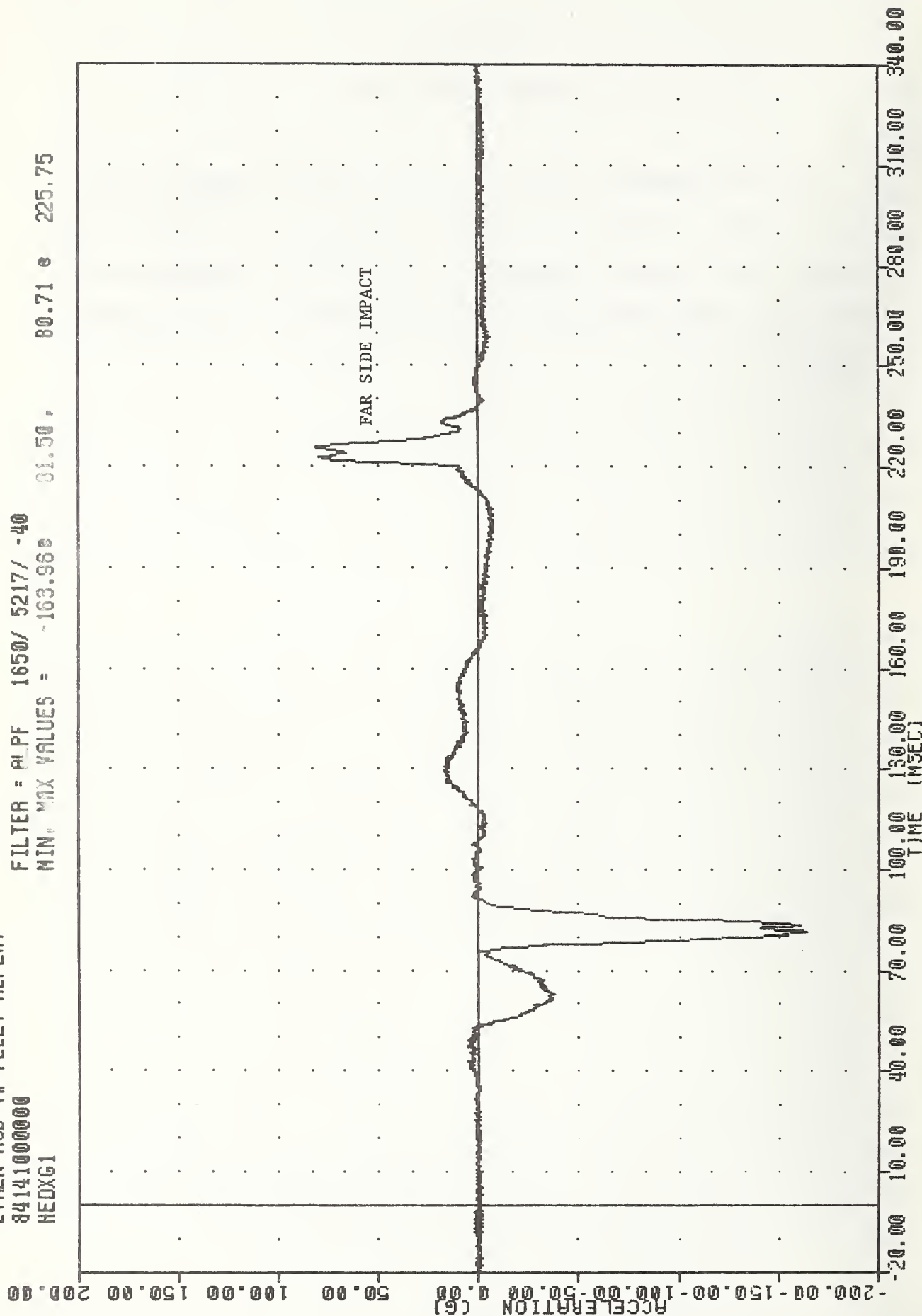
Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data were filtered according to SAE J211, except that dummy thorax data were filtered using the HSRI filter.

TRC
EVALN MOD YW FLEET REPERT
84141000000
HEDXG1

PLOT DATE 5-JUN-84 14:01:03

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -163.968 81.50, 80.71 e 225.75



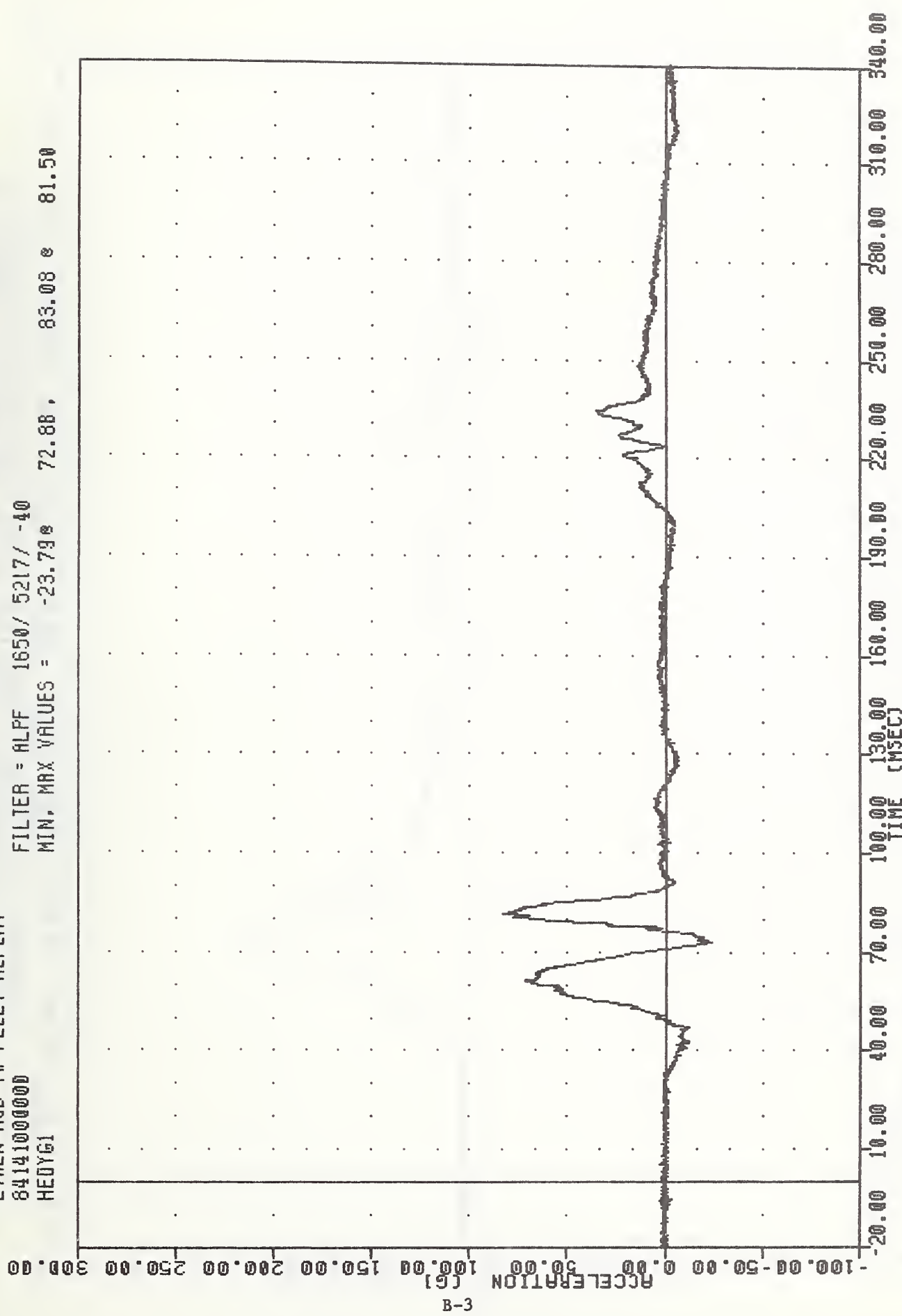
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION X AXIS

TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
HEDYG1

PLOT DATE 5-JUN-84 14:01:03

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -23.79 72.88 , 83.08 81.50



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MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION Y AXIS

TAC , 840529
 EVALN NOD VH FLEET REPEAT
 84141000000
 HEDZ61

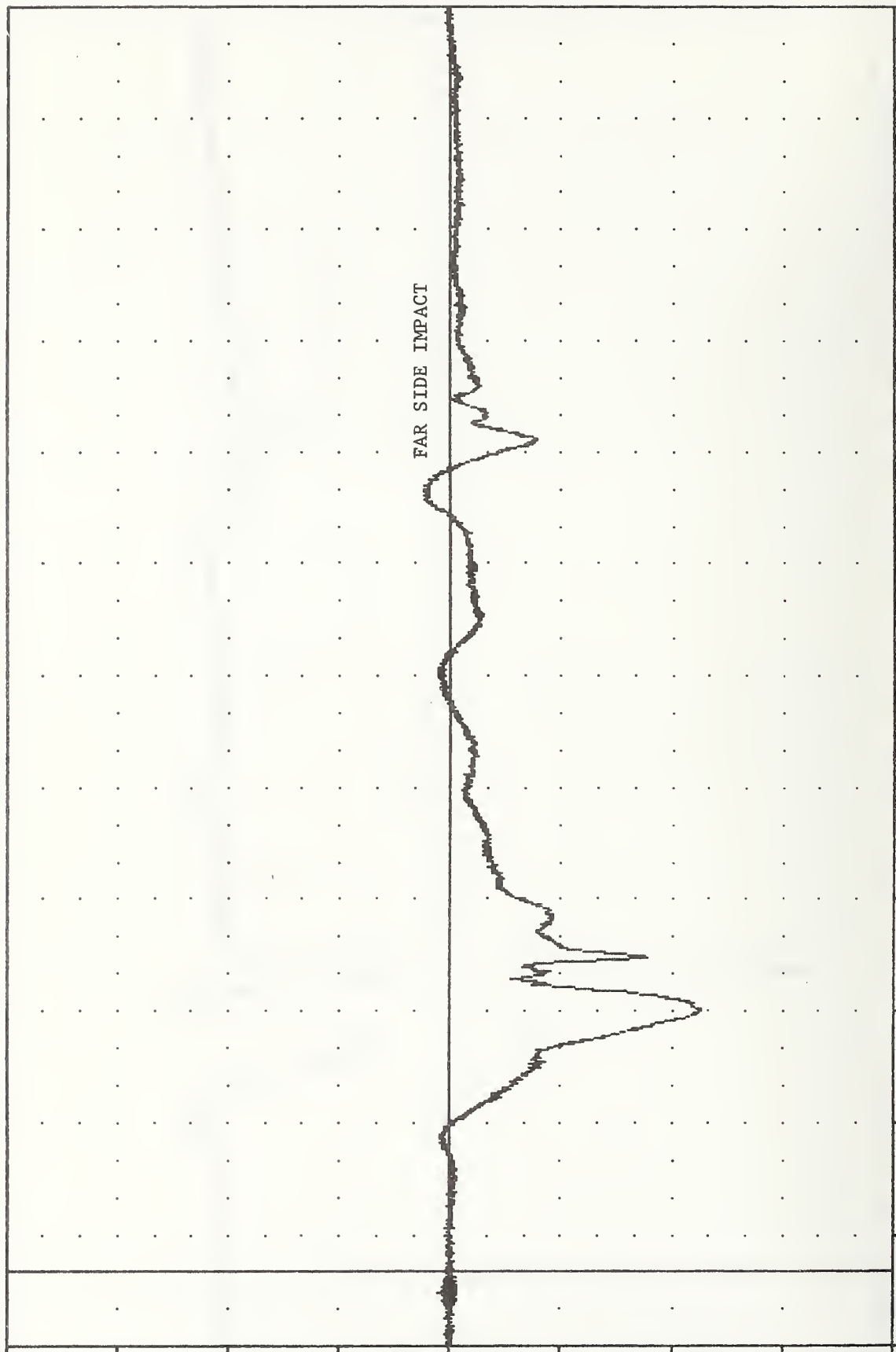
PLOT DATE 5-JUN-84 14:01:03

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -113.08e 70.38, 12.23 e 207.00

ACCELERATION (G)

B-4

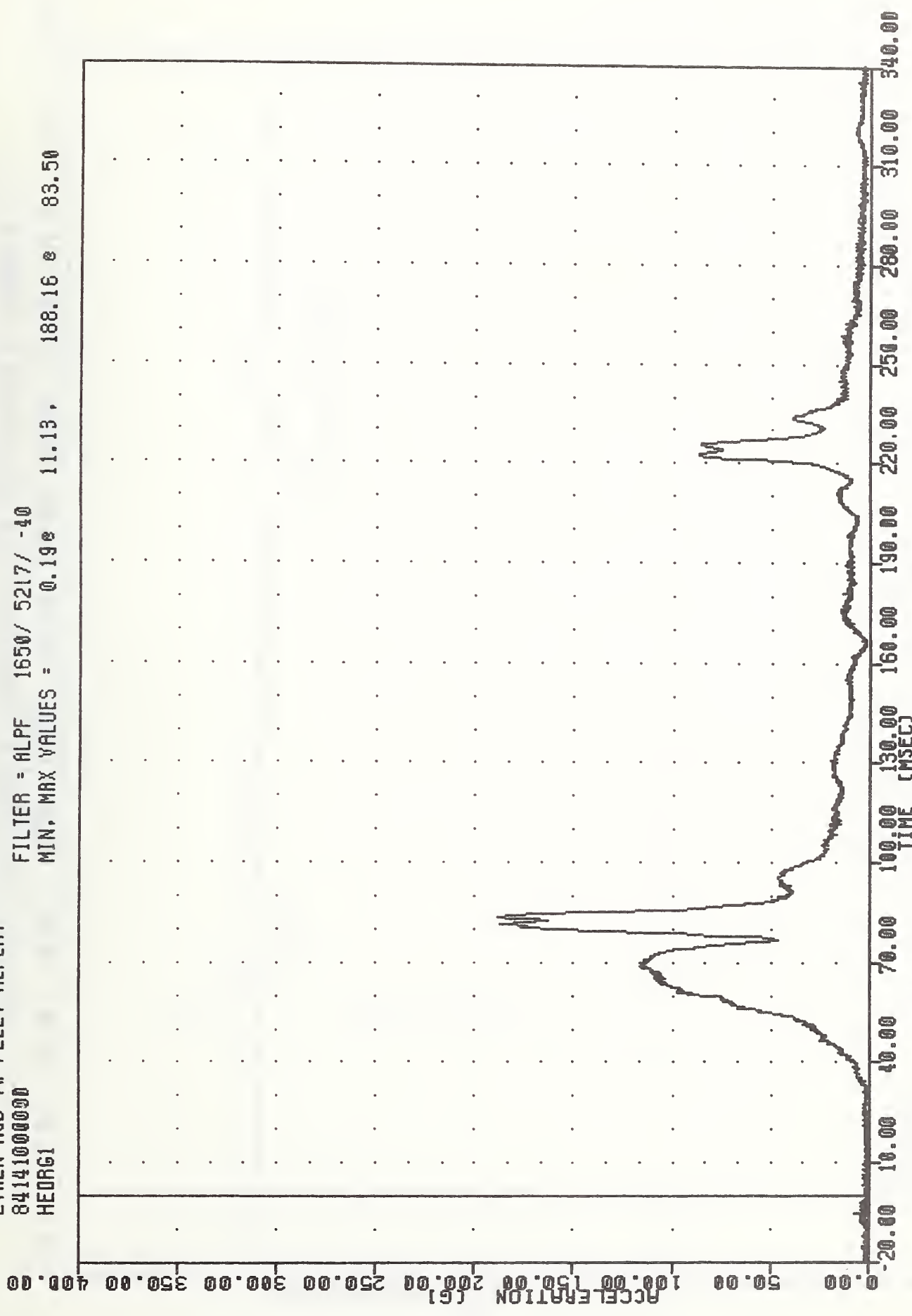


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER HEAD ACCELERATION Z AXIS

TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
HEORC1

PLOT DATE 5-JUN-84 14:01:03

FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = 0.19g 11.13, 188.16 g 83.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD RESULTANT

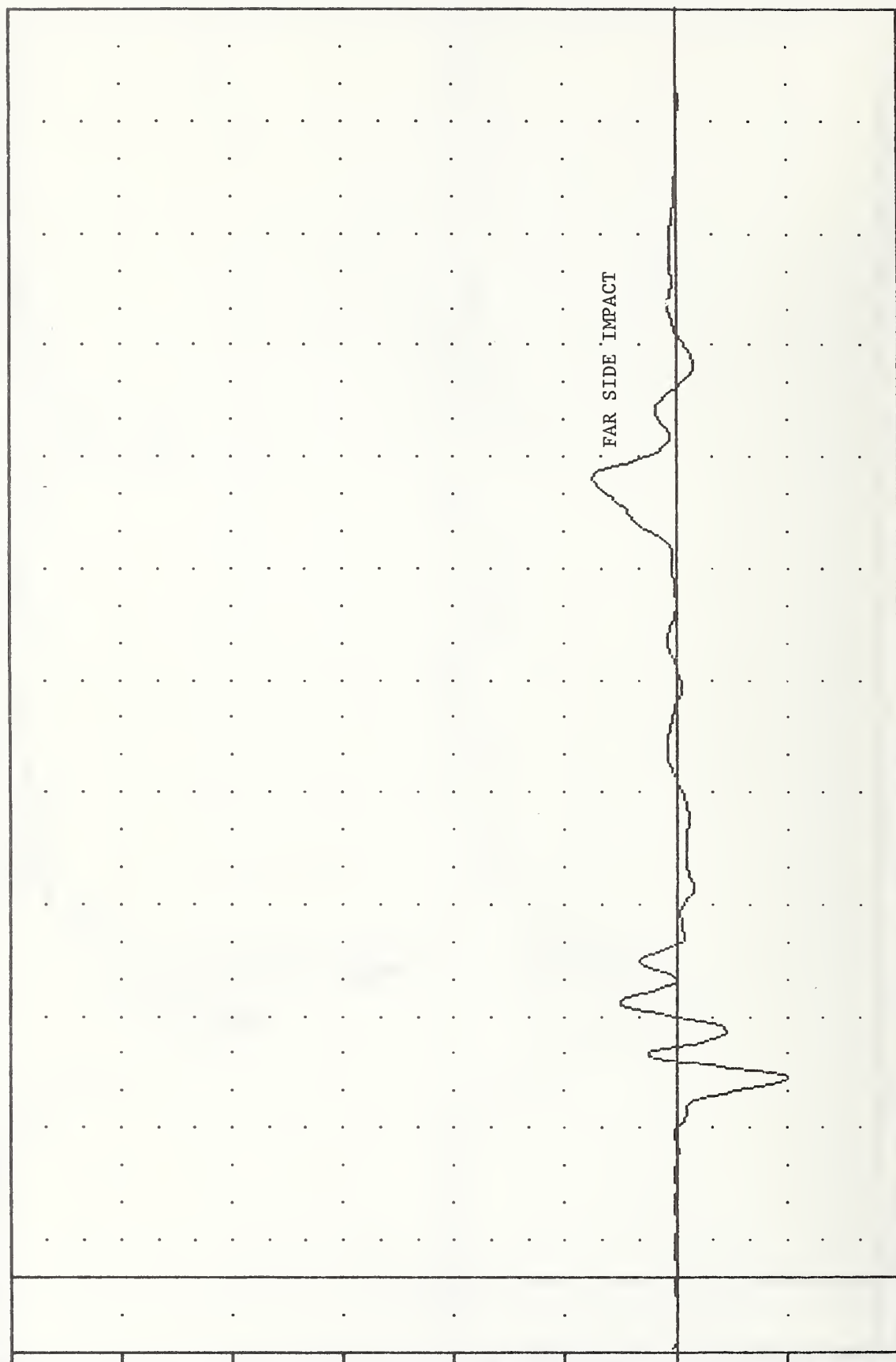
TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
T01XG1

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -50.28 53.12 , 37.42 e 213.75

ACCELERATION (G)



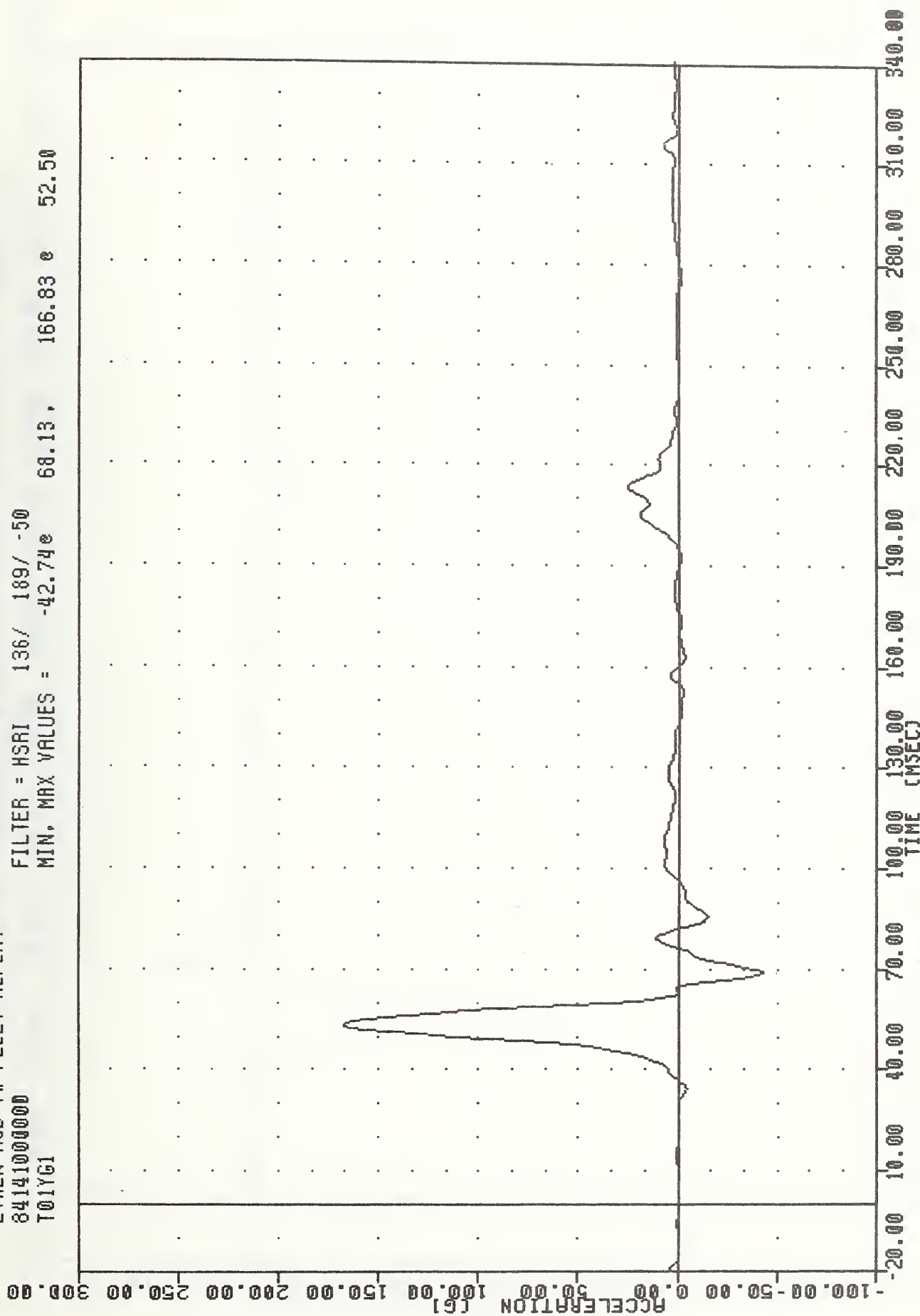
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION X AXIS

TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
T01YG1

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -42.74e 68.13. 166.83 e 52.50



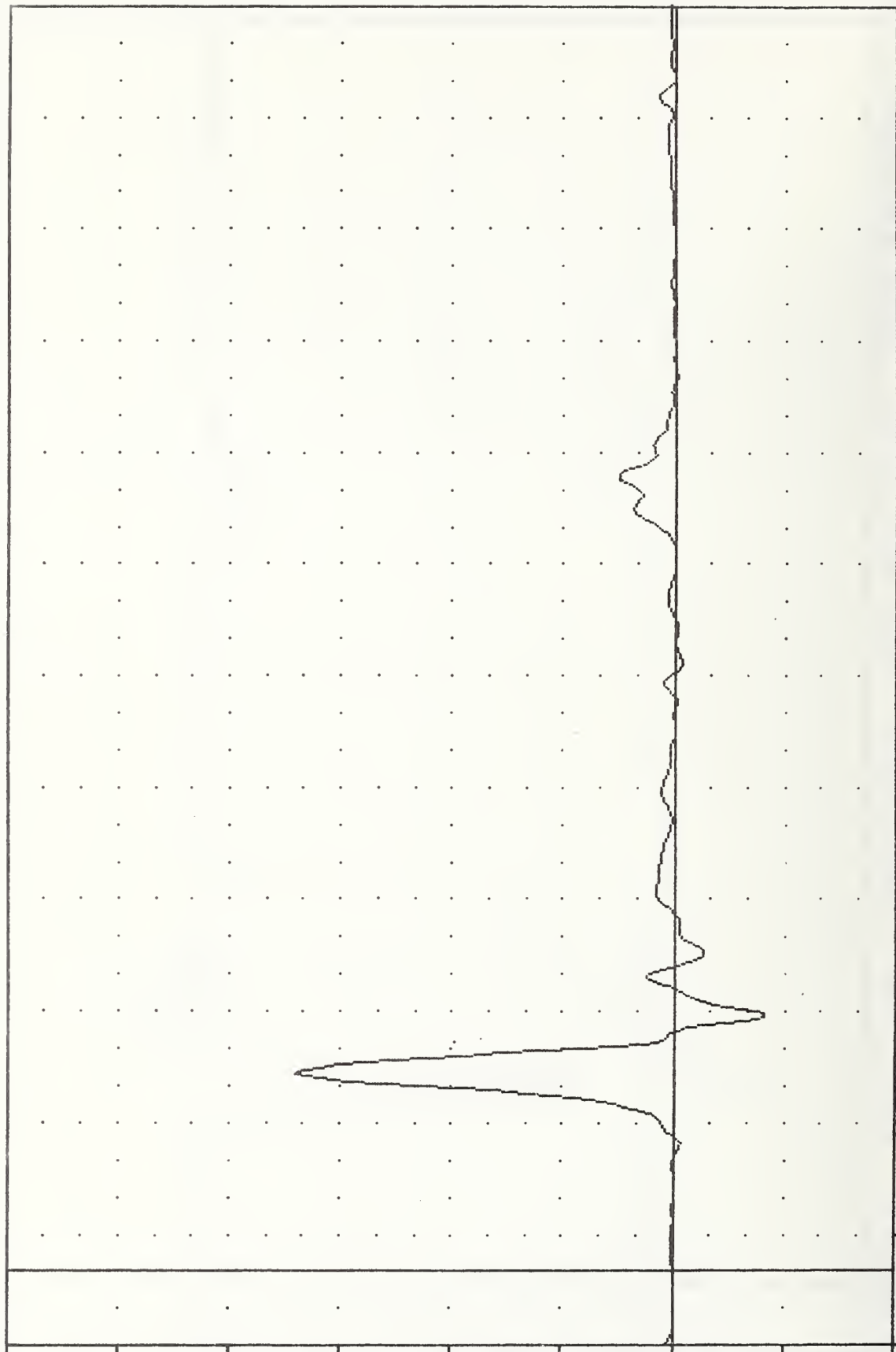
TAC
EVALN MOD YN FLEET REPEAT
84141000000
T01Y6A

PLOT DATE 5-JUN-84 14:03:51

FILTER = H3RI 136/ 189/ -50

MIN. MAX VALUES = -41.19e 68.13, 169.99 e 52.50

ACCELERATION (G)

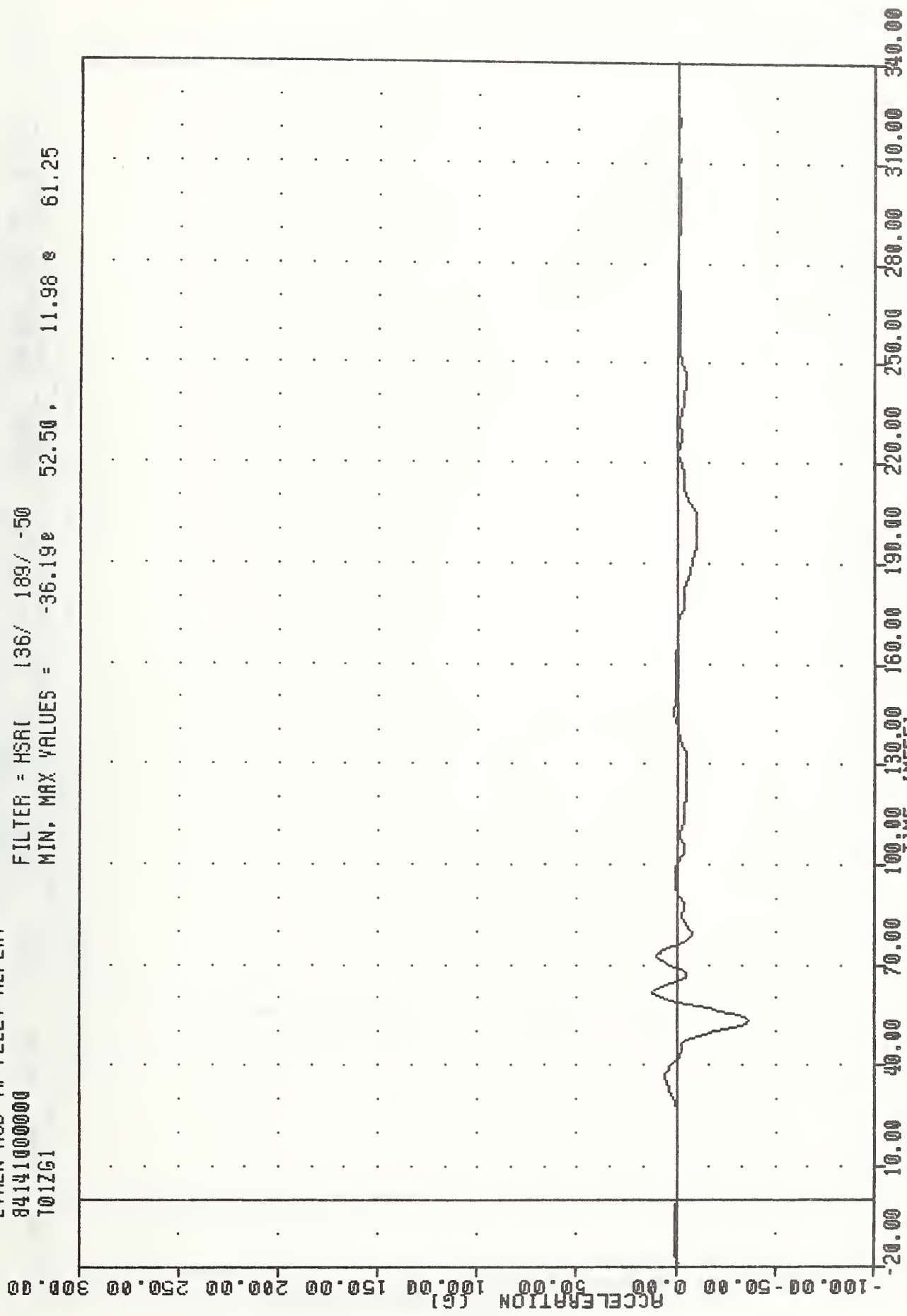


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION #2 Y AXIS

TRC , 840529
EVALN MOD VW FLEET REPERT
84141000000
T01ZG1

PLOT DATE 5-JUN-84 14:03:51
FILTER = HSR(136/ 189/ -50
MIN, MAX VALUES = -36.19e 52.50, 11.98 e 61.25

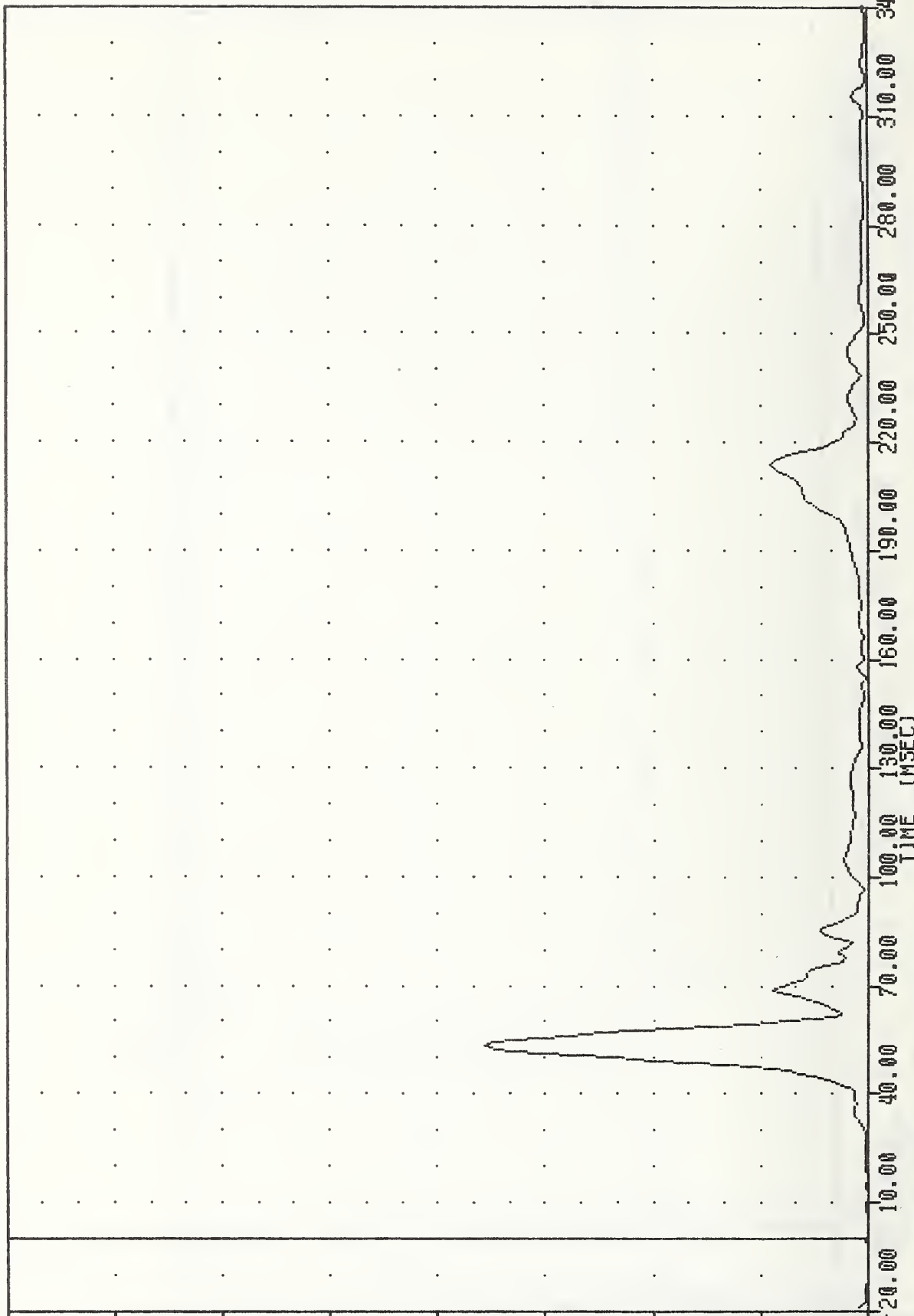


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION Z AXIS

TRC
EVALN MOD VW FLEET REPERT
84141000000
T01RG1

PLOT DATE 5-JUN-84 14:03:51
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = 0.08e 2.50 . 177.89 e 52.50

ACCELERATION (G)

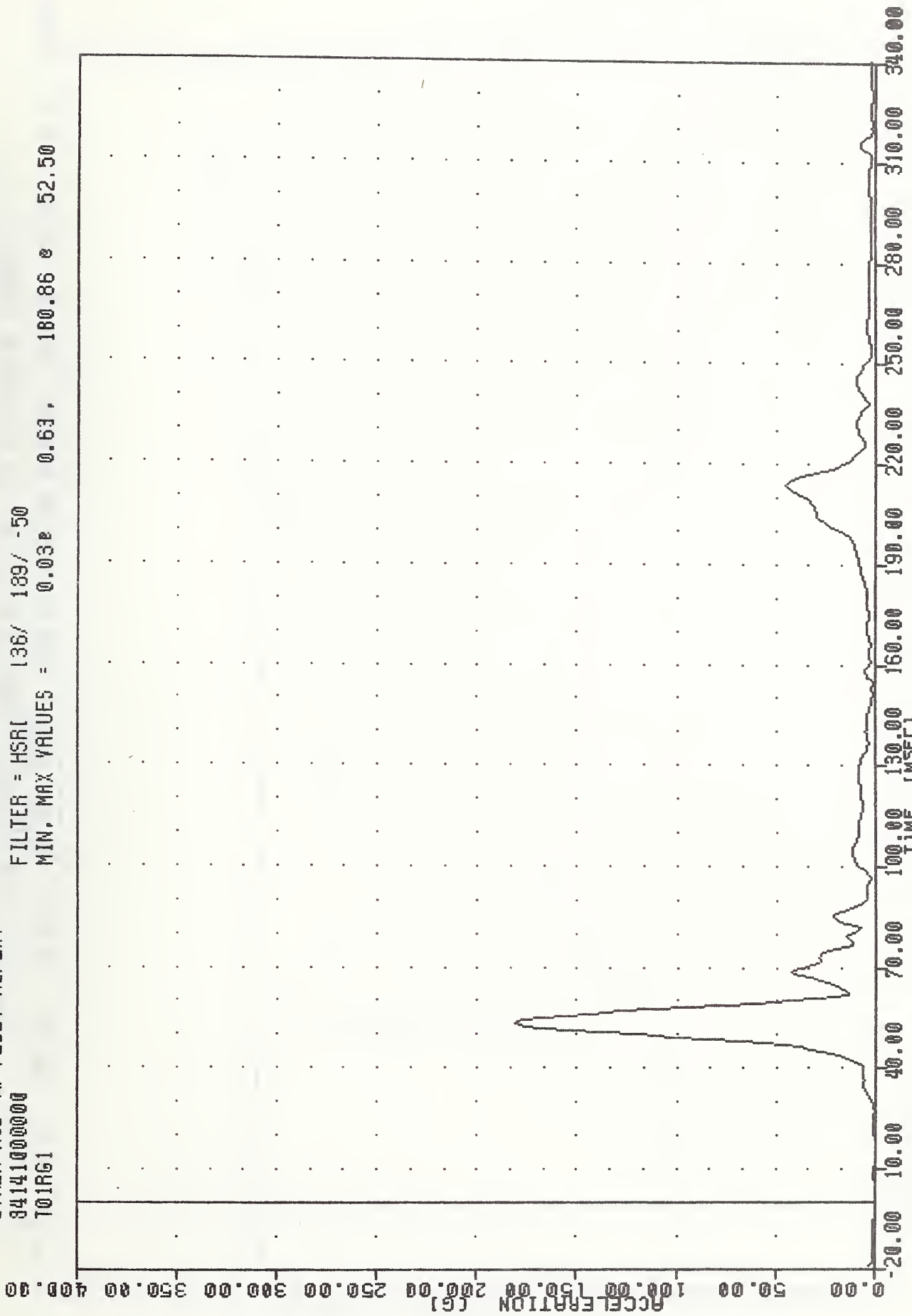


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE RESULTANT

TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
T01RG1

PLOT DATE 5-JUN-84 14:05:09

FILTER = HSRL 136/ 189/ -50
MIN. MAX VALUES = 0.03e 0.63, 180.86 e 52.50



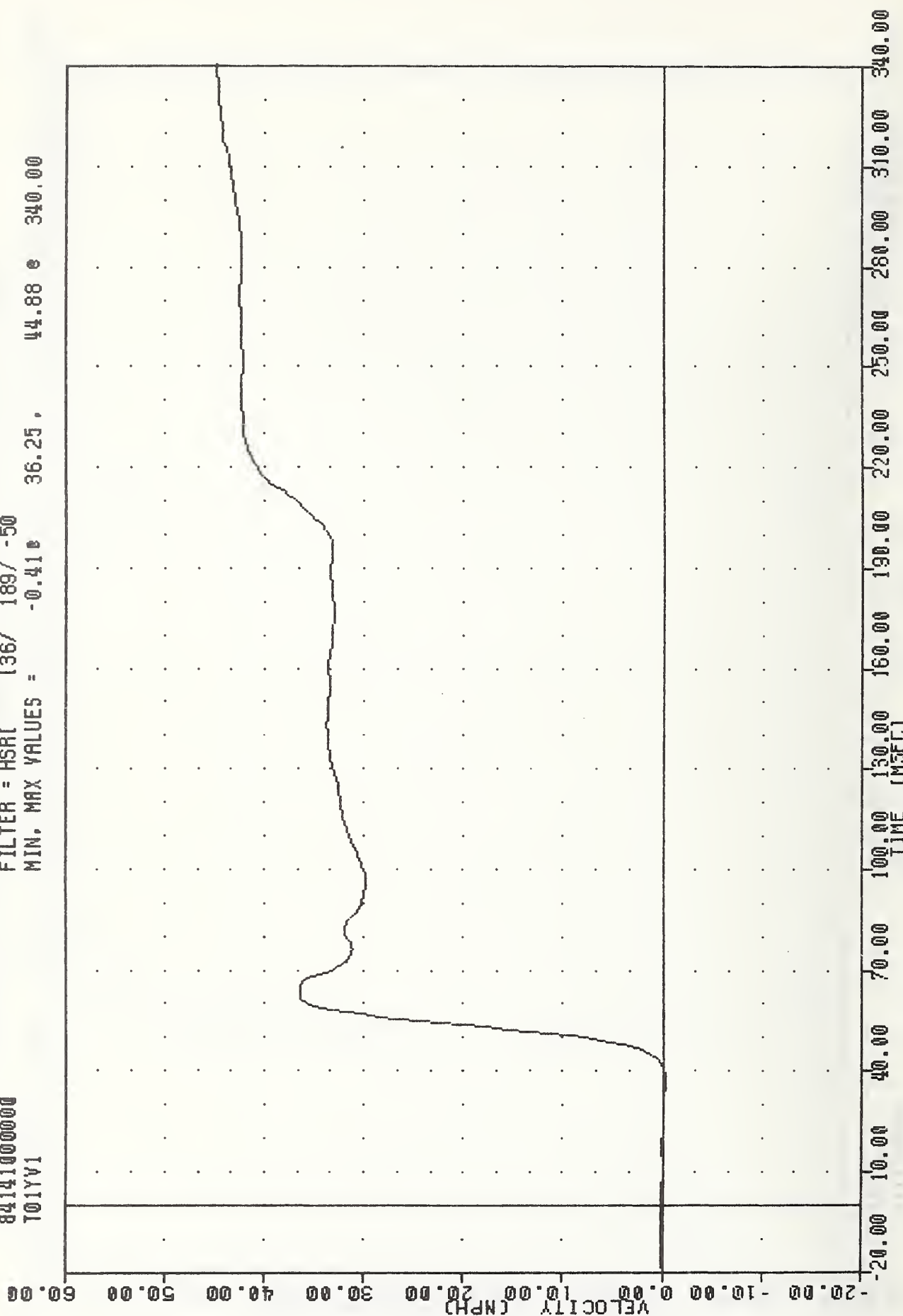
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE RESULTANT USING T01YGA

TRC , 840529
EVALN MOD VW FLEET REPERT
84141000000
T01YV1

PLOT DATE 5-JUN-84 14:05:35

FILTER = HSR1 136/ 189/ -50

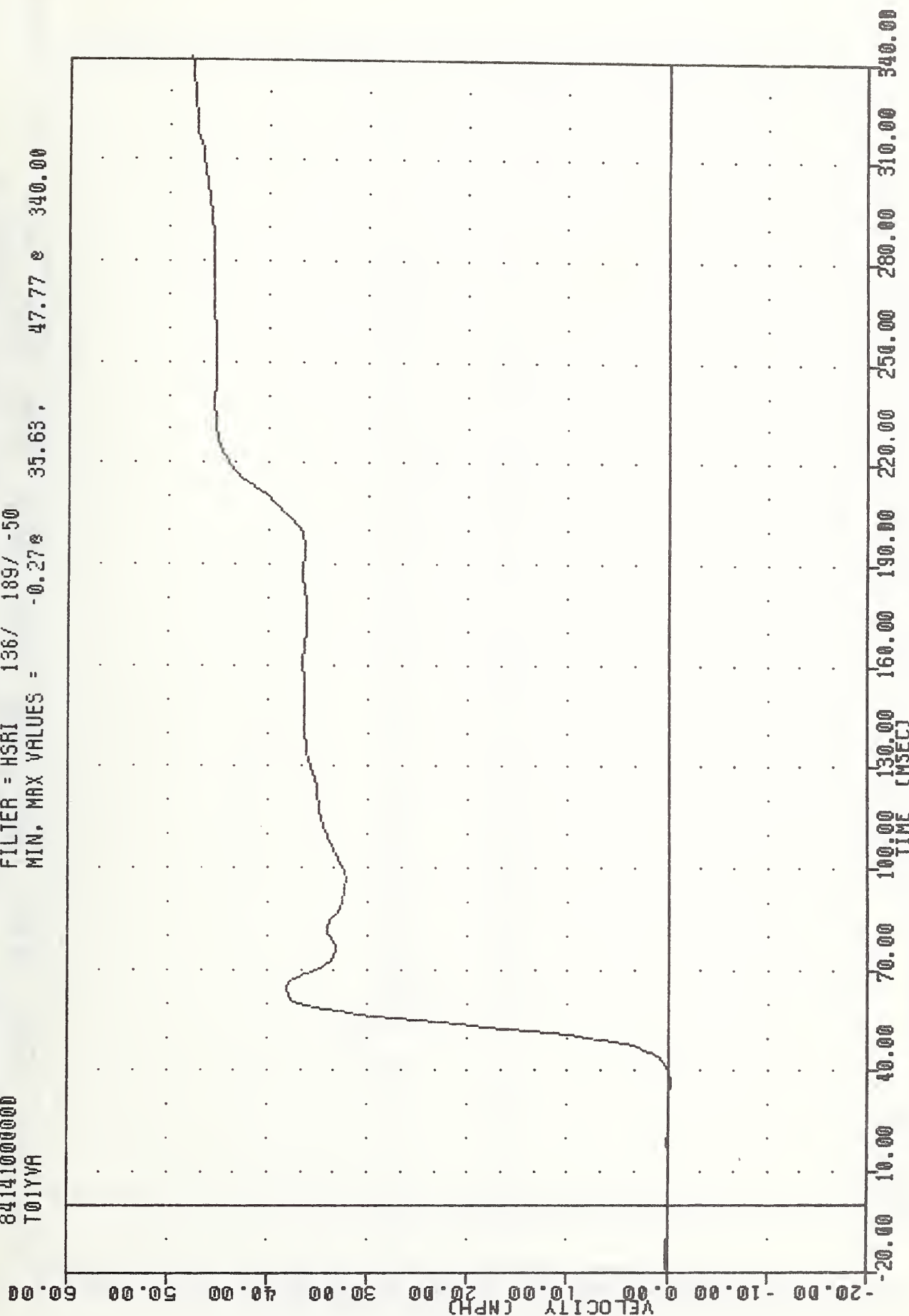
MIN. MAX VALUES = -0.418 36.25. 44.88 e 340.00



TRC
EVALN MOD VW FLEET REPEAT
84141000000
T01YVA

PLOT DATE 5-JUN-84 14:05:35

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -0.278 35.63, 47.77 e 340.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T01Y6A

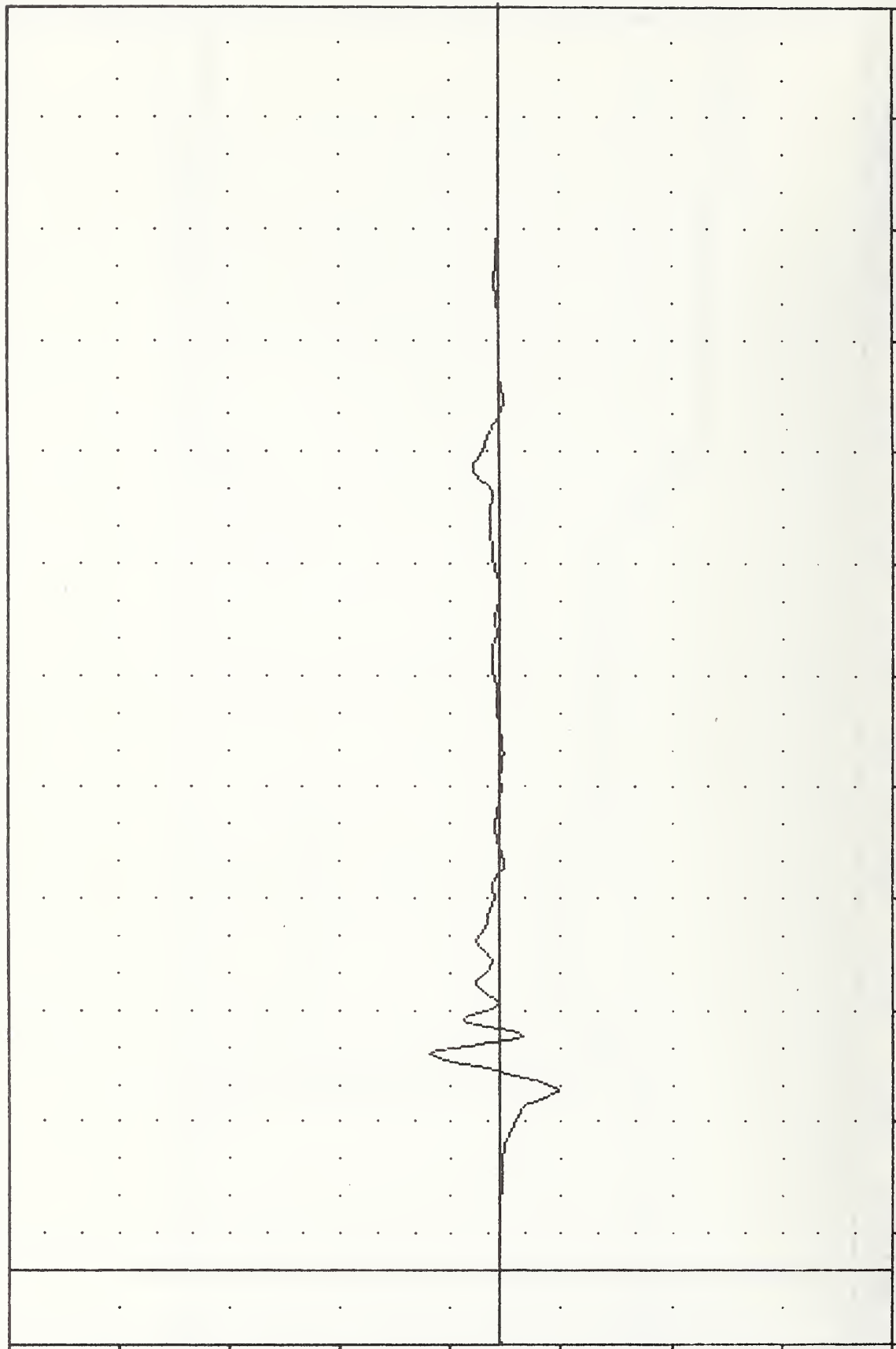
TRC
EVALN MOD YW FLEET REPEAT
84141000000
T12XG1

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -47.14e 48.13, 56.92 e 57.50

ACCELERATION (G)



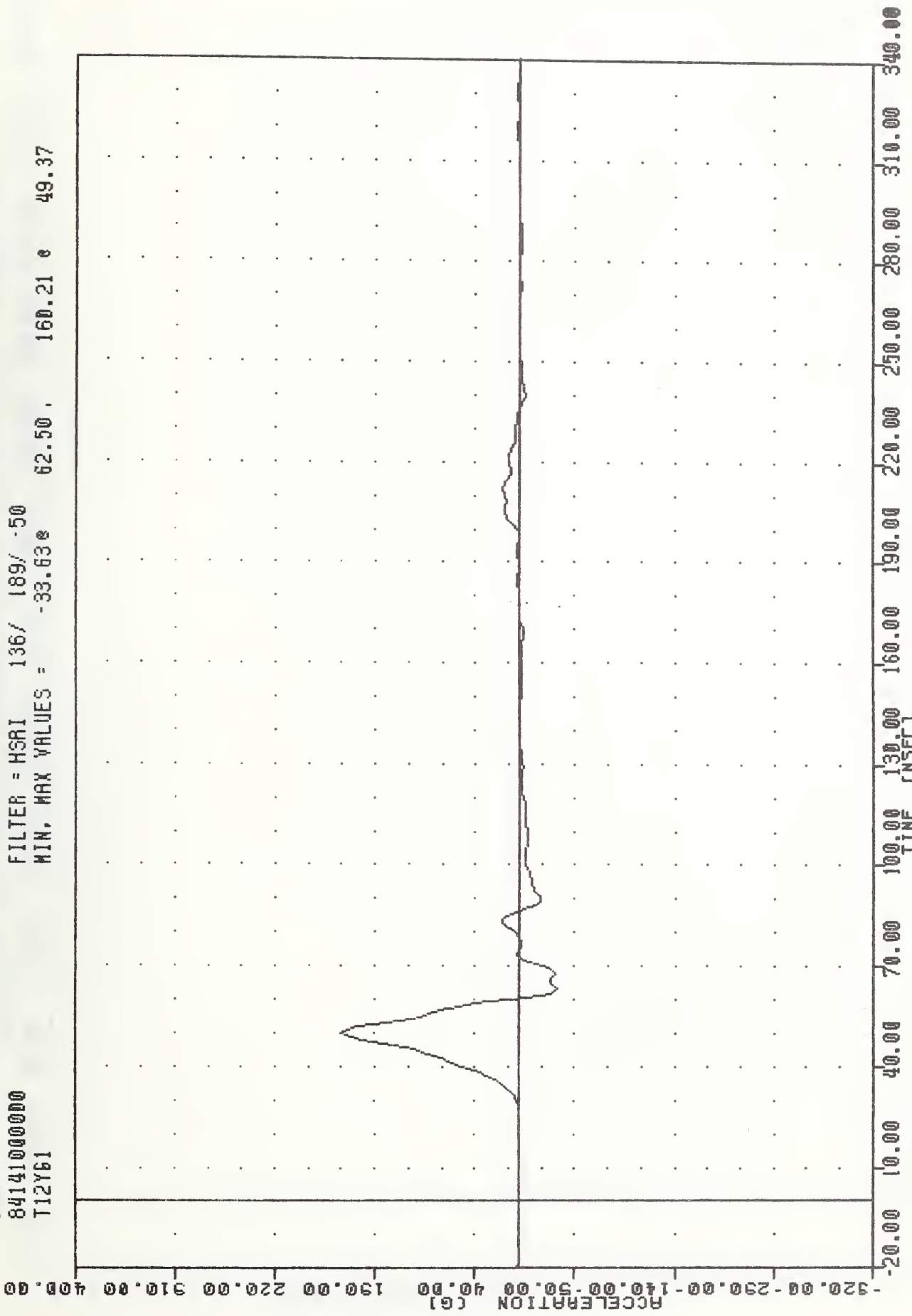
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION X AXIS

TAC
EVALN MOD YW FLEET REPEAT
84141000000
T12Y61

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -33.63 62.50, 160.21 49.37



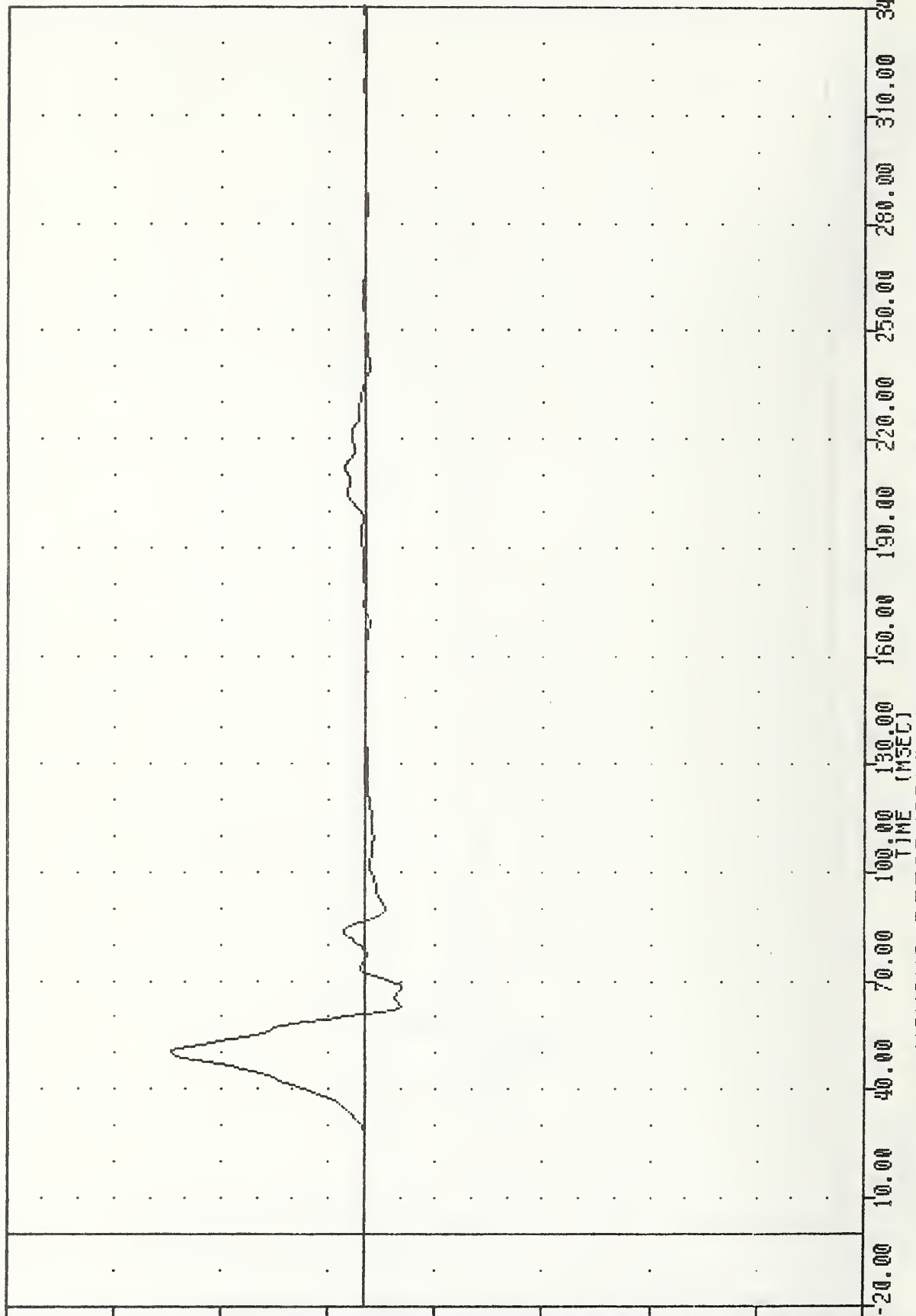
TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
T12YGR

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSR1 136/ 189/ -50

MIN, MAX VALUES = -31.44e 67.50, 161.77 e 49.37

ACCELERATION (G)

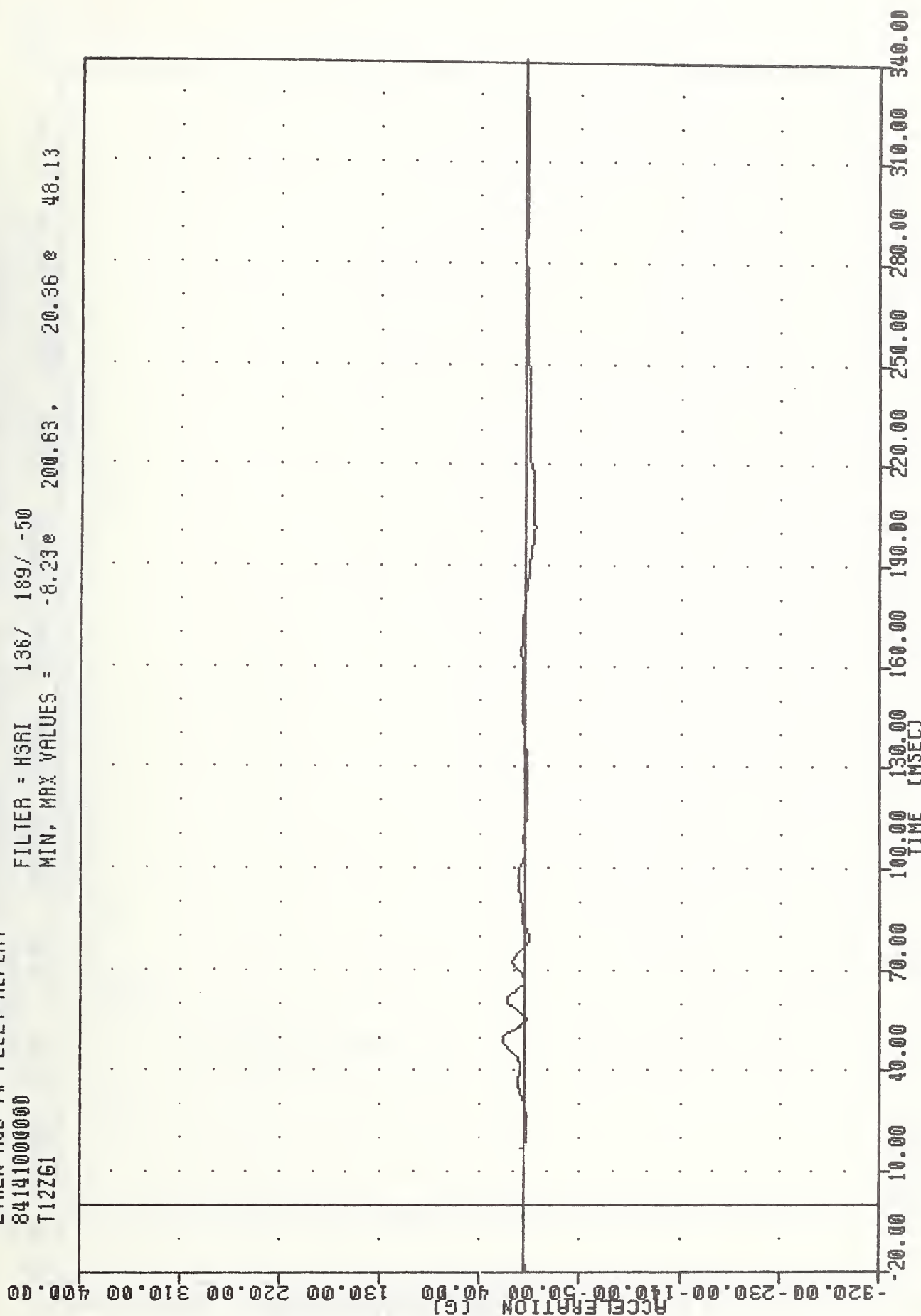


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION #2 Y AXIS

TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
T12ZG1

PLOT DATE 5-JUN-84 14:03:51

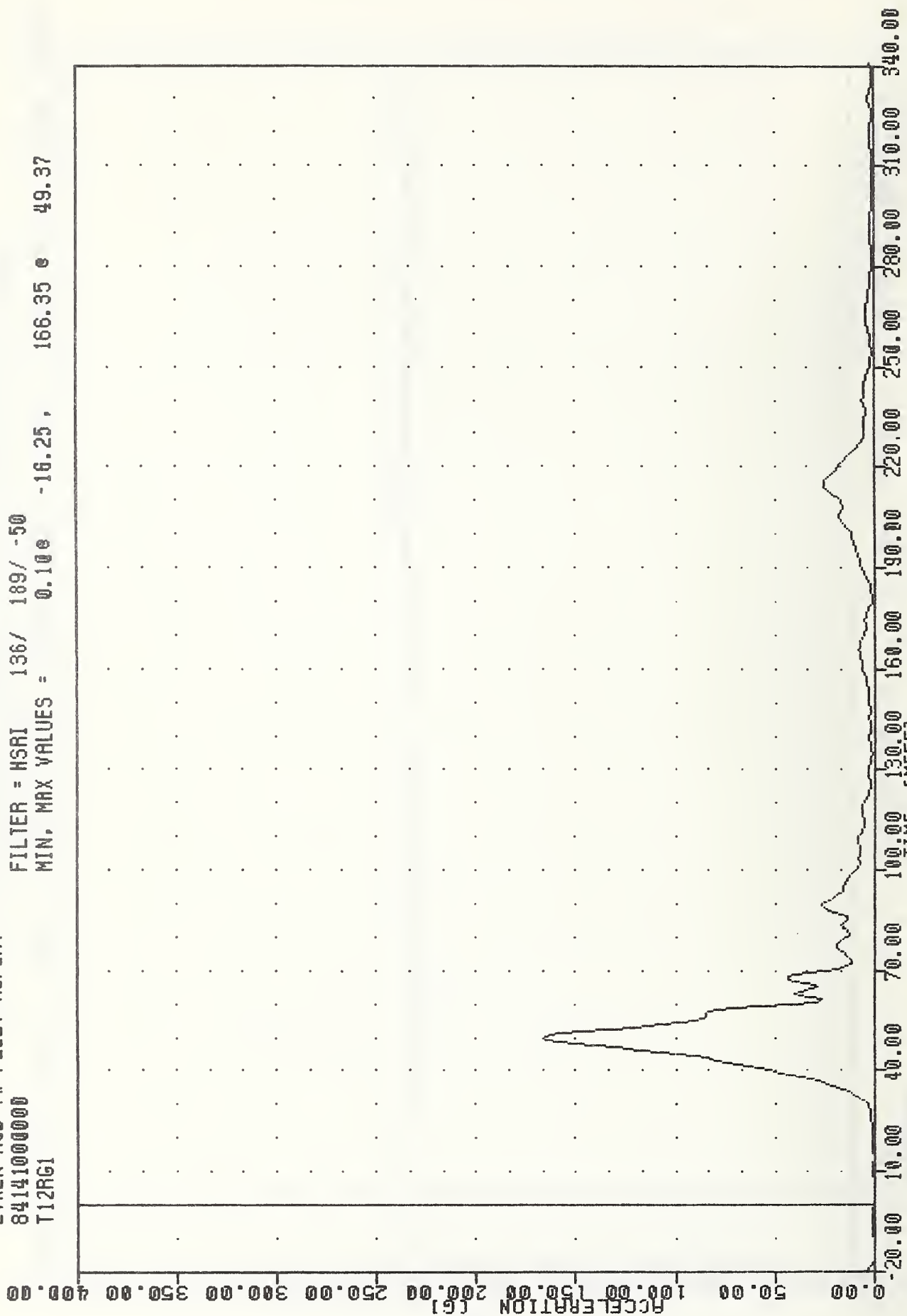
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -8.23e 200.63, 20.36 e 48.13



TRC
EVALN MOD YW FLEET REPEAT
84141000000
T12RG1

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = 0.100 -16.25, 166.35 0 49.37



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE RESULTANT

TRC , 840529 PLOT DATE 5-JUN-84 14:05:09

EVALN MOD YW FLEET REPEAT

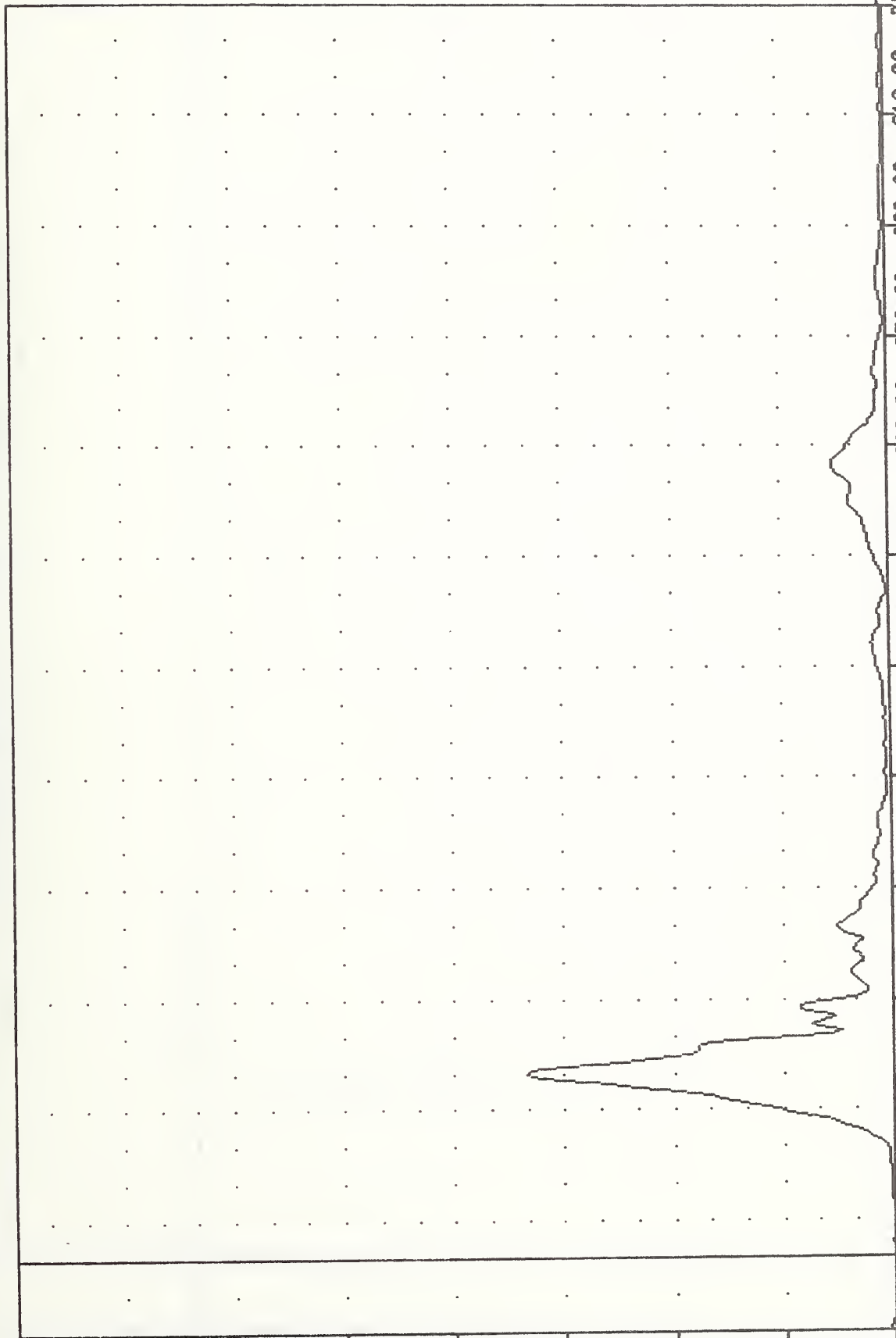
84141000000

T12RG1

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.05e -16.87, 167.85 e 49.37

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE RESULTANT USING T12YGA

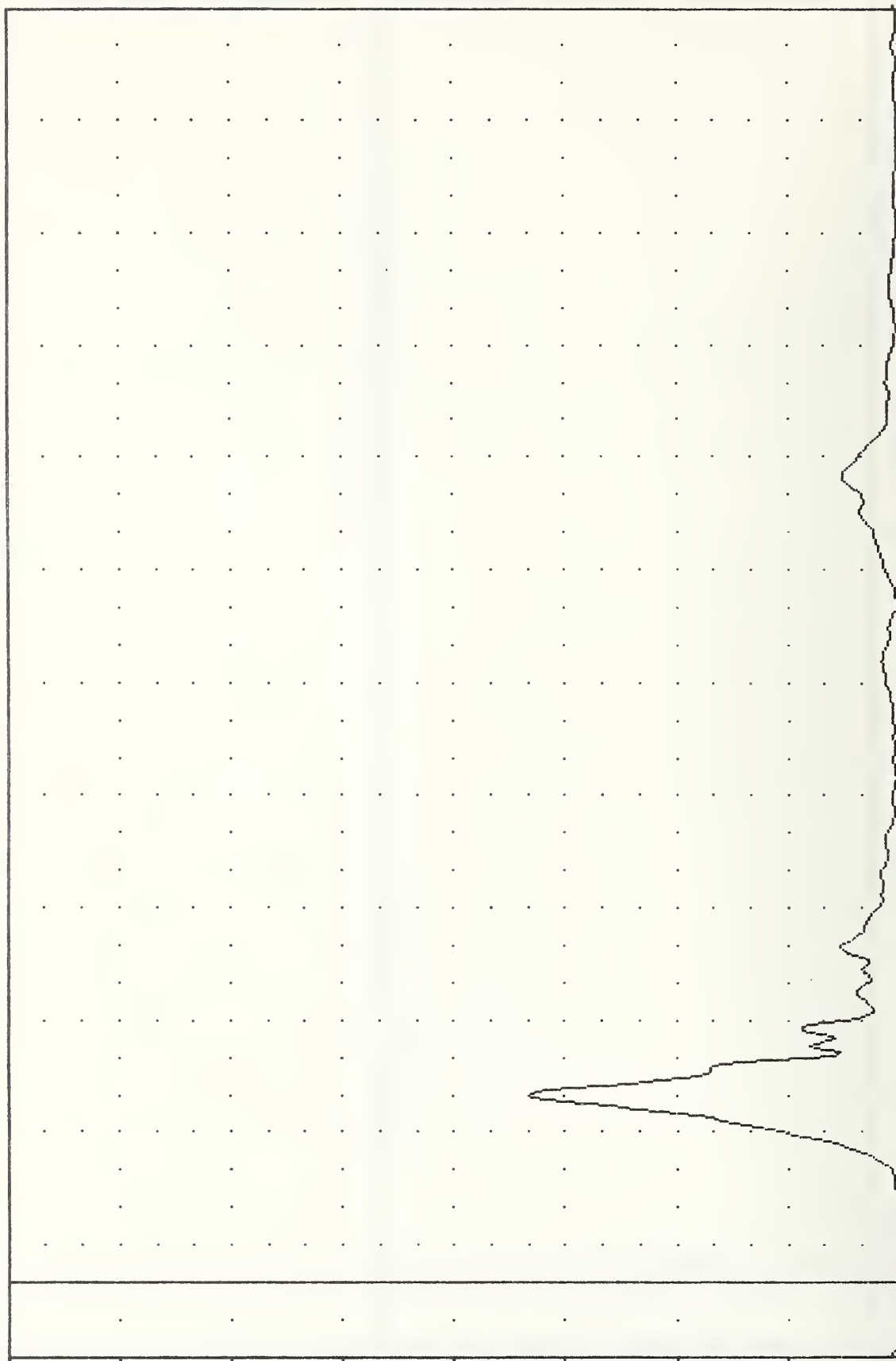
TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
T12RG1

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.10e -16.25, 166.35 e 49.37

ACCELERATION (G)

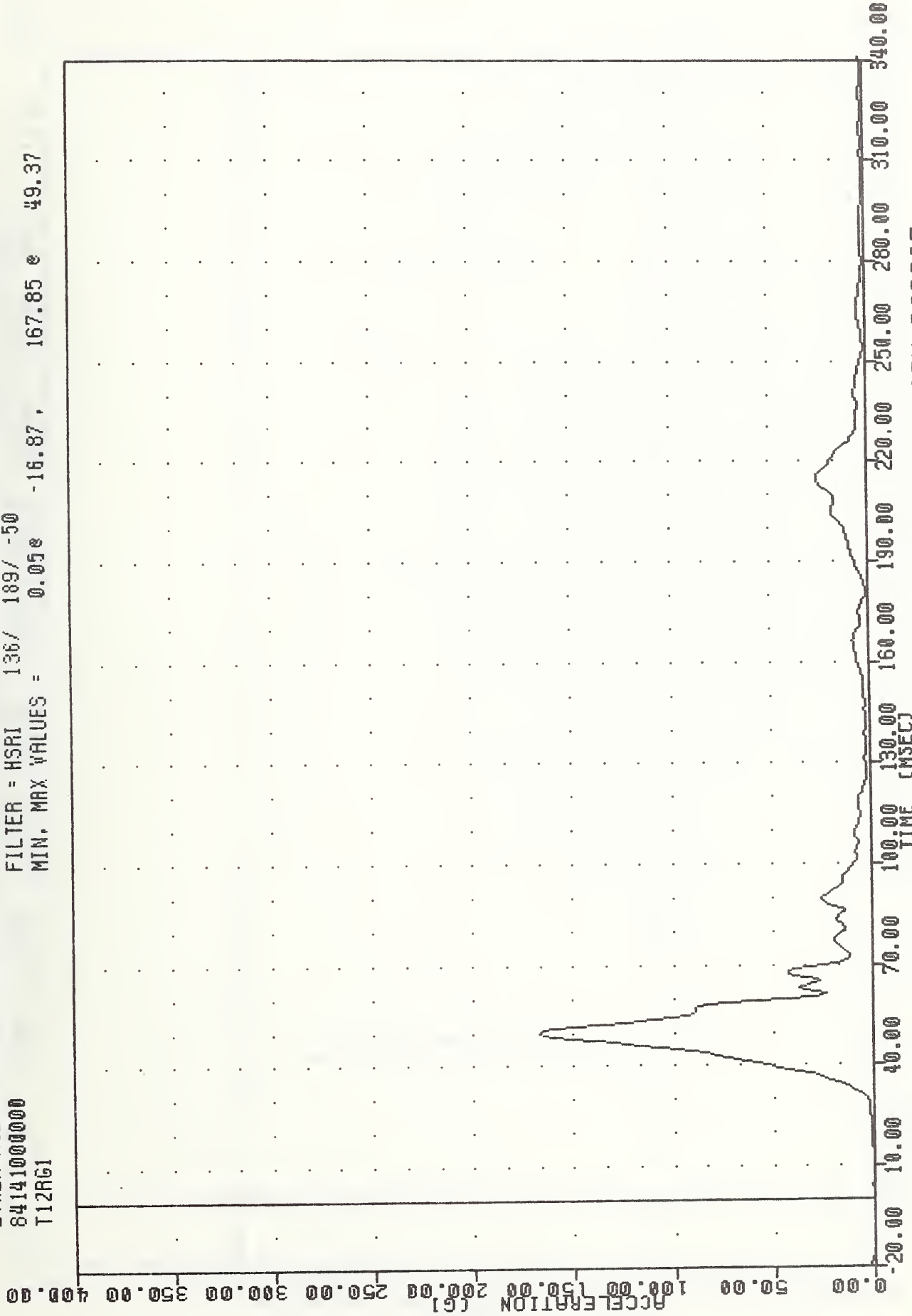


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MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE RESULTANT

TRC
 EVALN MOD YW FLEET REPEAT
 84141000000
 T12RG1

PLOT DATE 5-JUN-84 14:05:09
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = 0.05e -16.87, 167.85 e 49.37

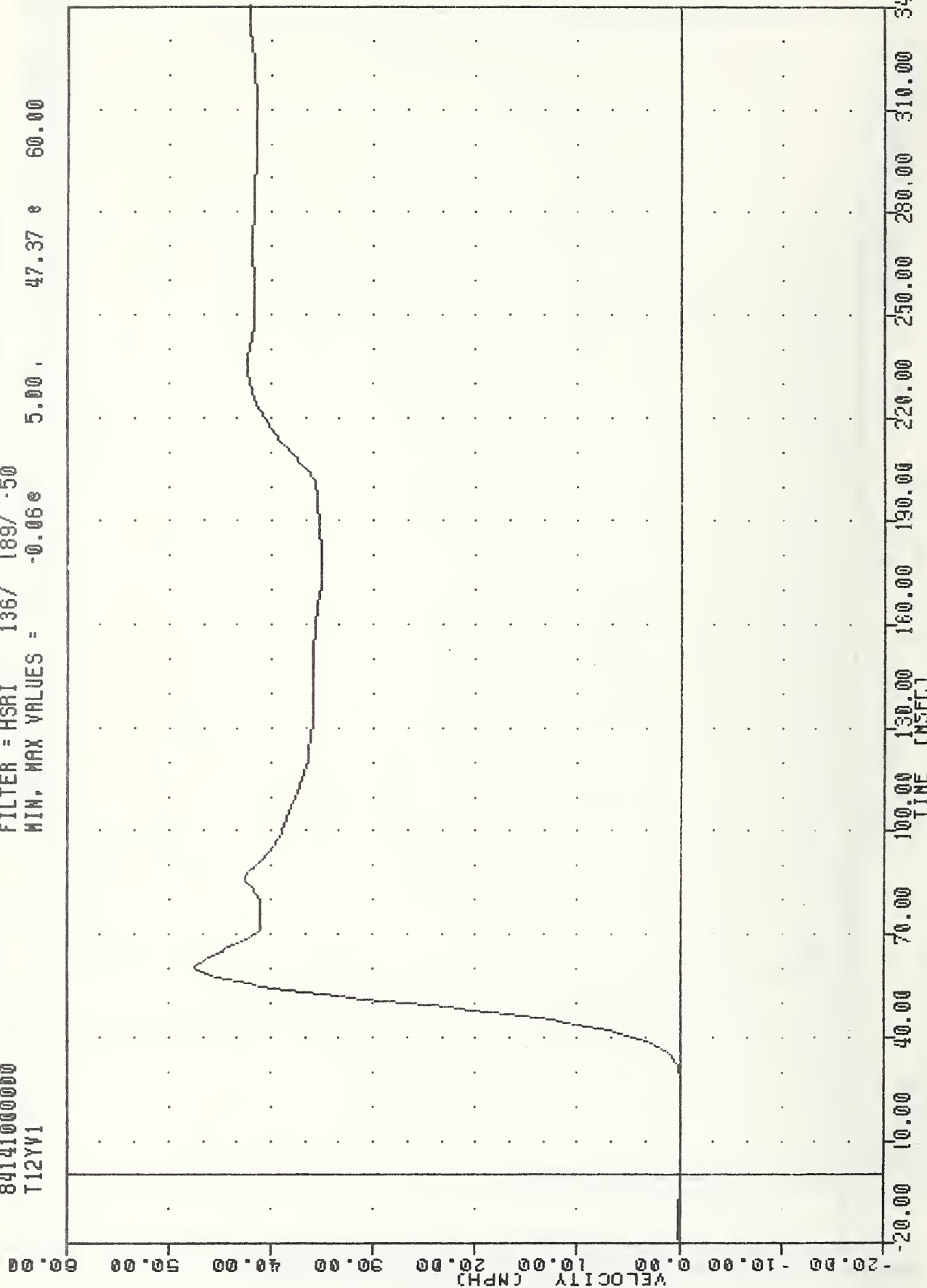


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LOWER SPINE RESULTANT USING T12YGA

TAC
EVALN MOD VV FLEET REPEAT
84141000000
T12YV1

PLOT DATE 5-JUN-84 14:05:35

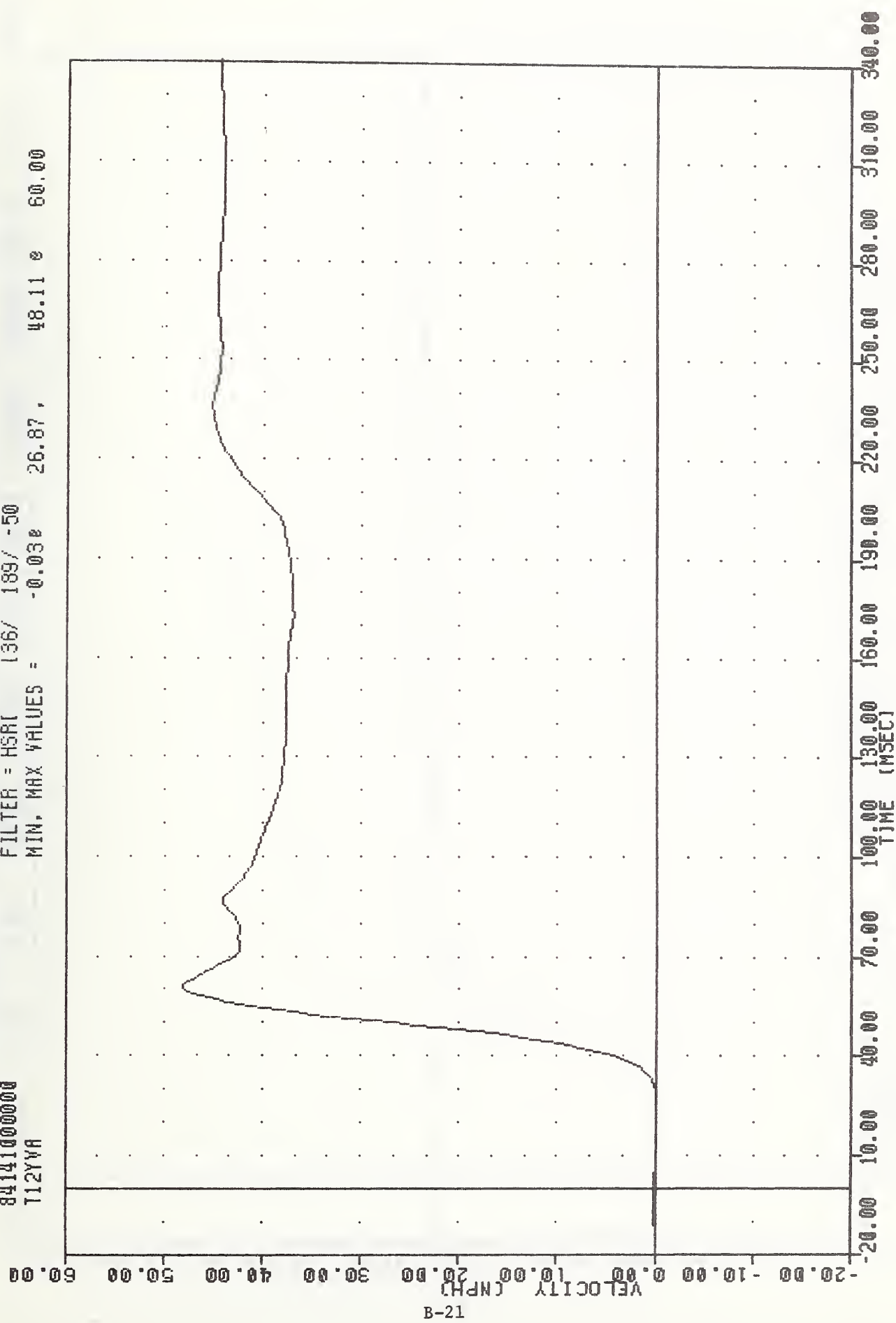
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -0.06e 5.00, 47.37 e 60.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12Y61

TRC , 840529
 EVALN MOD VW FLEET REPERT
 84141000000
 T12YVA

PLOT DATE 5-JUN-84 14:05:35
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.030 26.87, 48.11 0 60.00



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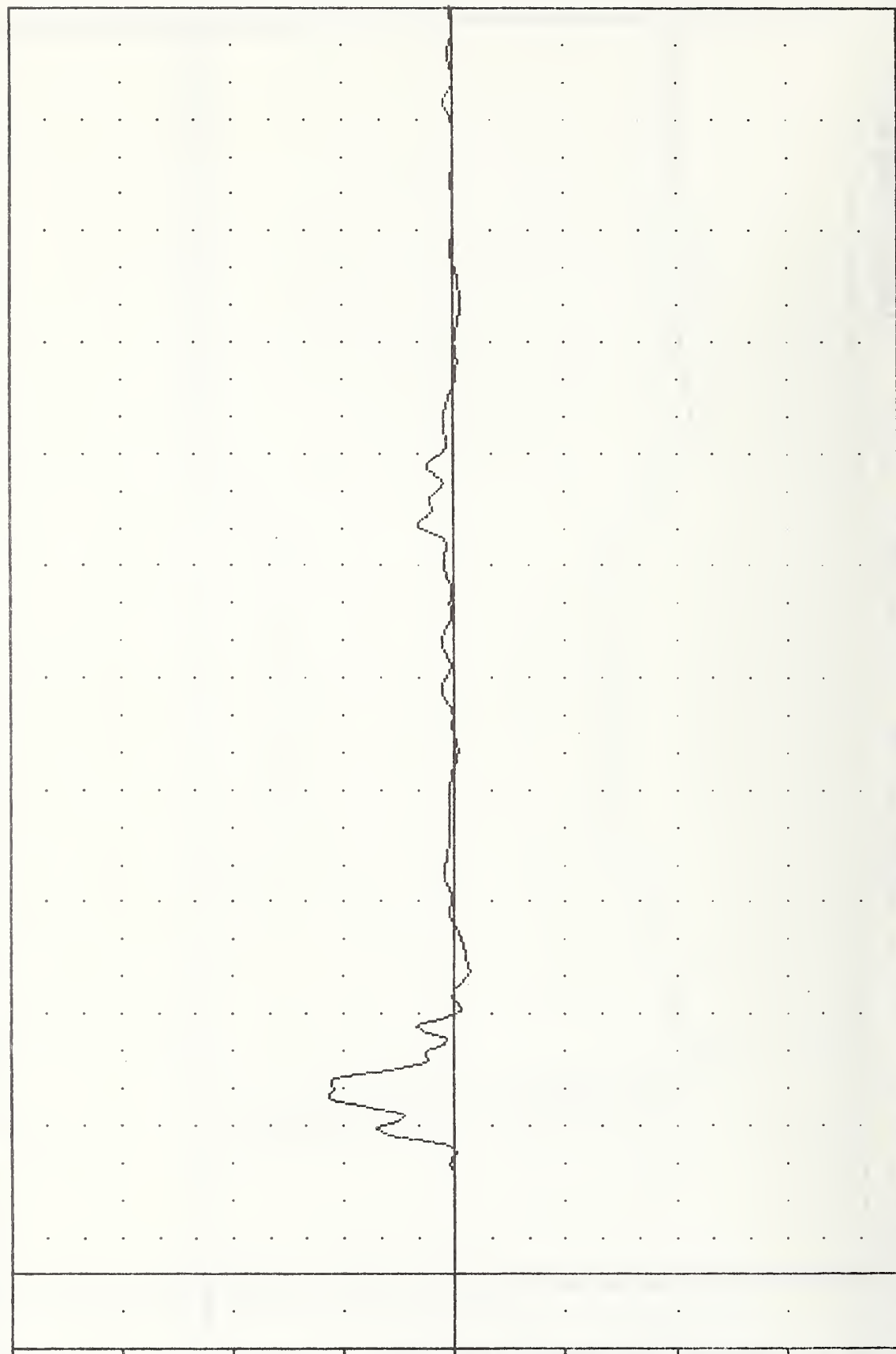
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YGA

TRC
 EVALN MOD YH FLEET REPEAT
 84141000000
 LURY61

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ .50
 MIN, MAX VALUES = -12.29e 80.63, 100.92 e 46.88

ACCELERATION (G)



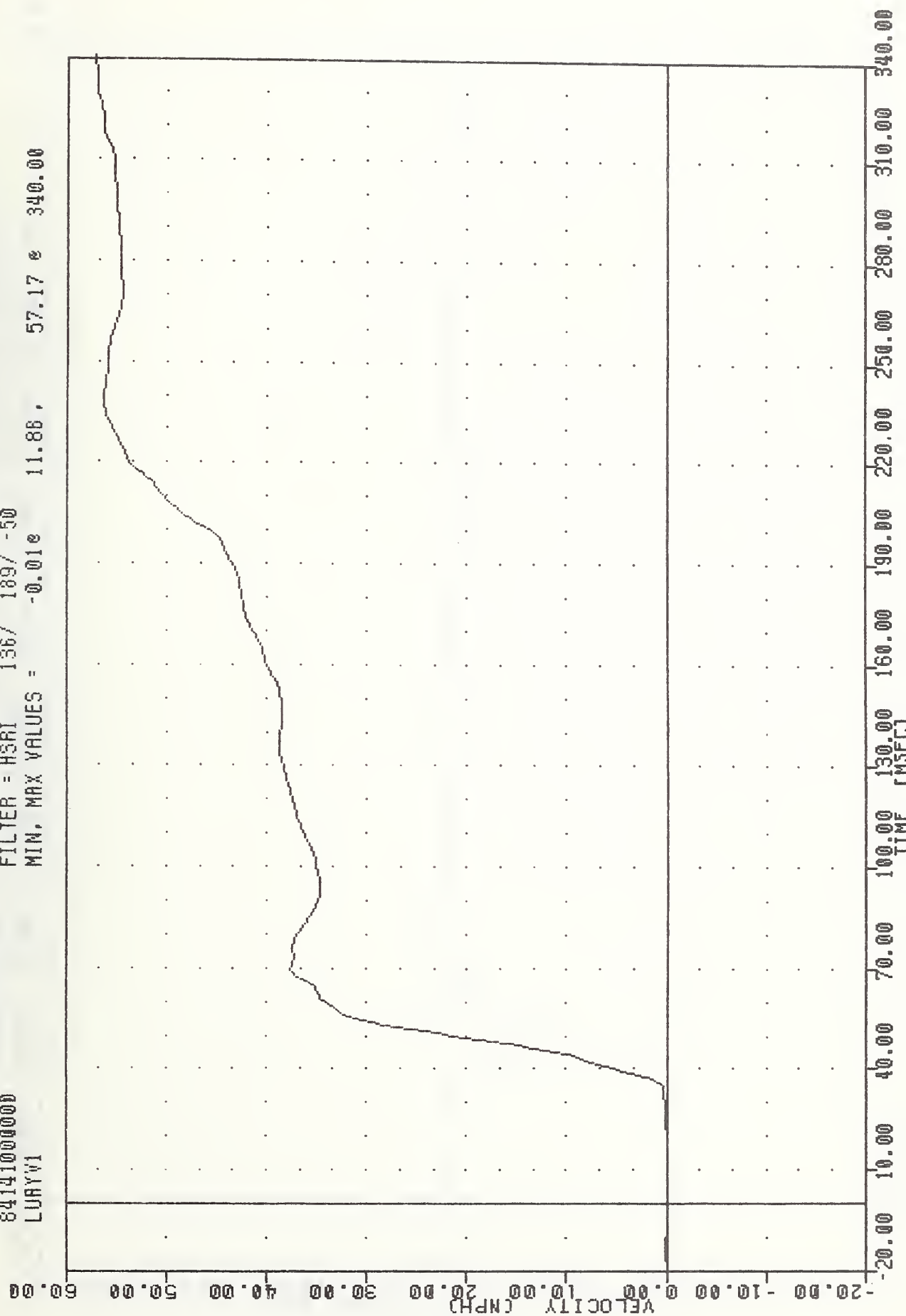
-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LEFT UPPER RIB ACCELERATION Y AXIS

TRC
EVALN MOD VW FLEET REPEAT
84141000000
LURYV1

PLOT DATE 5-JUN-84 14:05:35

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -0.01e 11.86, 57.17 e 340.00



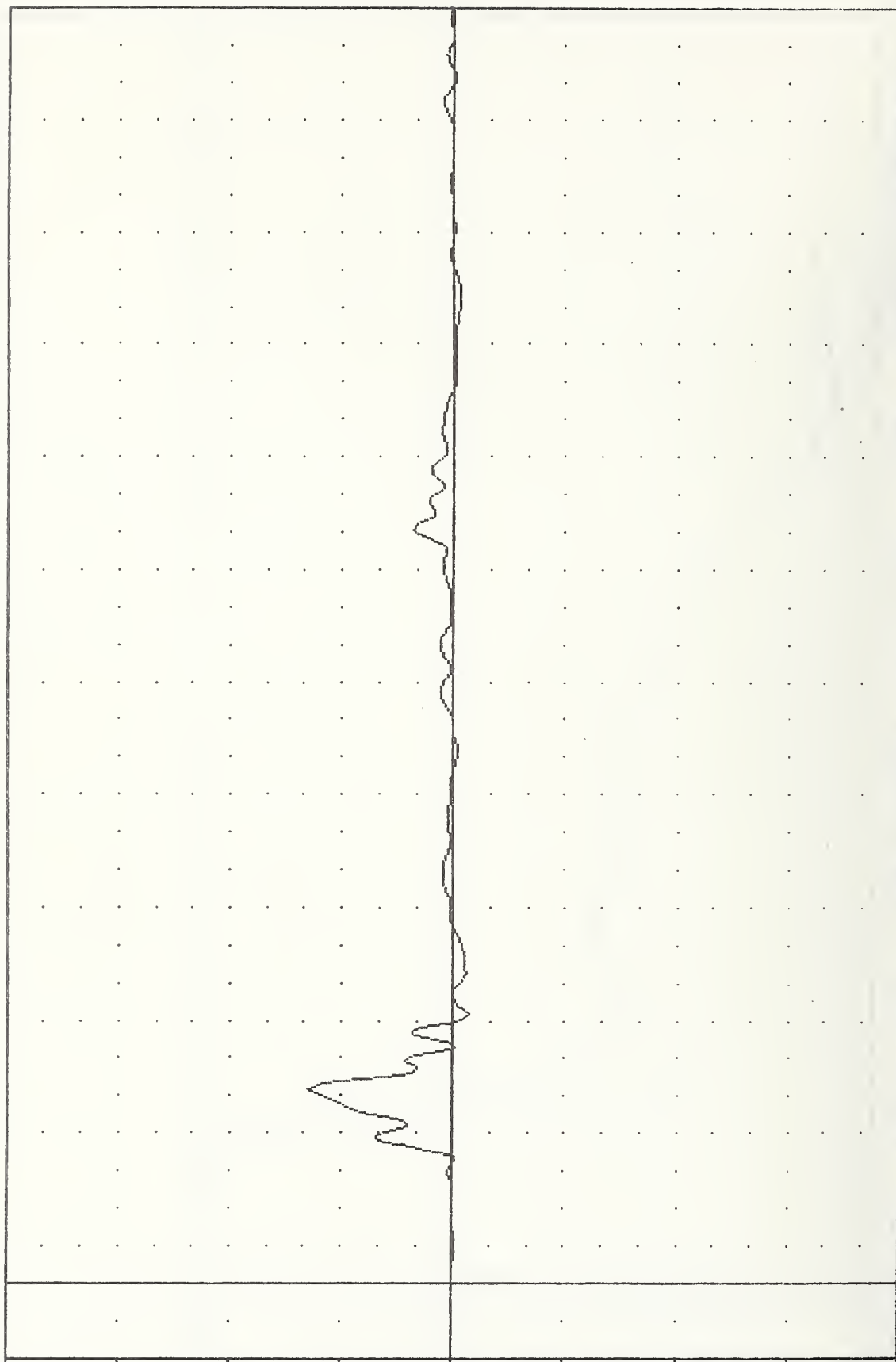
TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
LURYGA

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -12.17 71.25, 116.13 51.25

ACCELERATION (G)



-360.00 -270.00 -180.00 -90.00 0.00 90.00 180.00 270.00 360.00

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

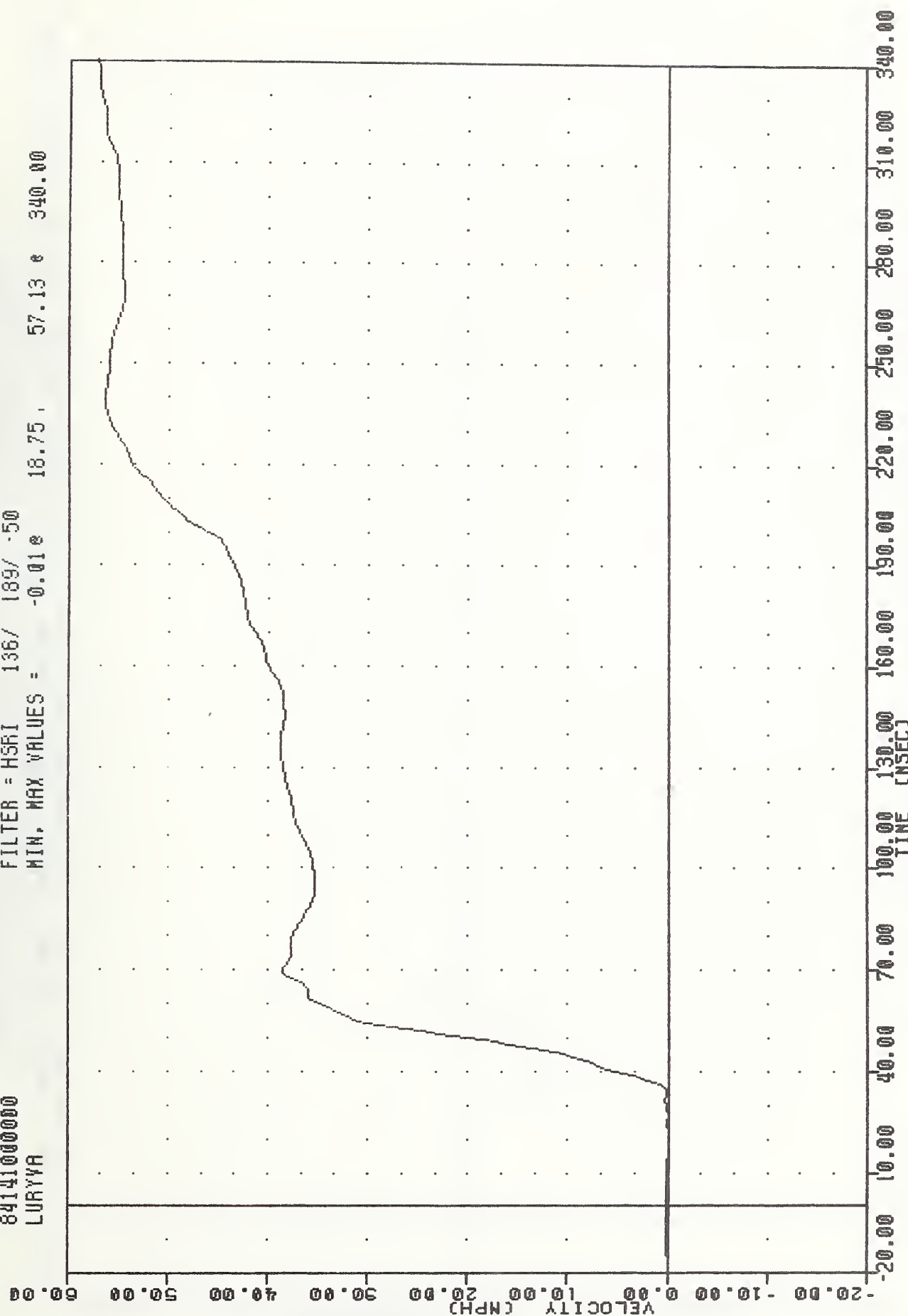
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT UPPER RIB ACCELERATION -2 Y AXIS

TAC , 840529
EVALN MOD VM FLEET REPEAT
84141000000
LURYVA

PLOT DATE 5-JUN-84 14:05:35

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.01e 18.75 , 57.13 e 340.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LURYGA

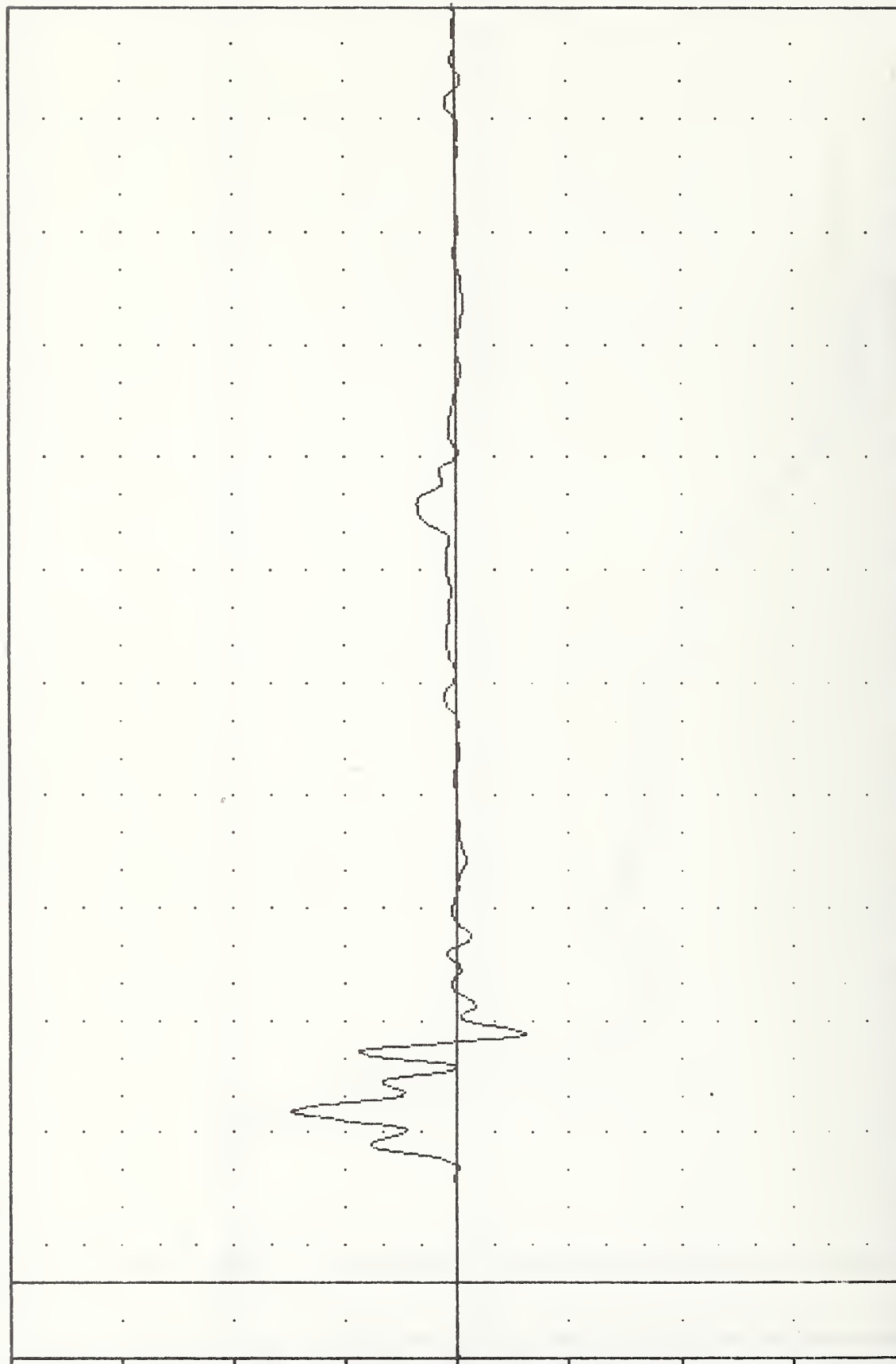
TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
LLAYG1

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -55.08e 66.25, 133.97 e 45.00

ACCELERATION (G)



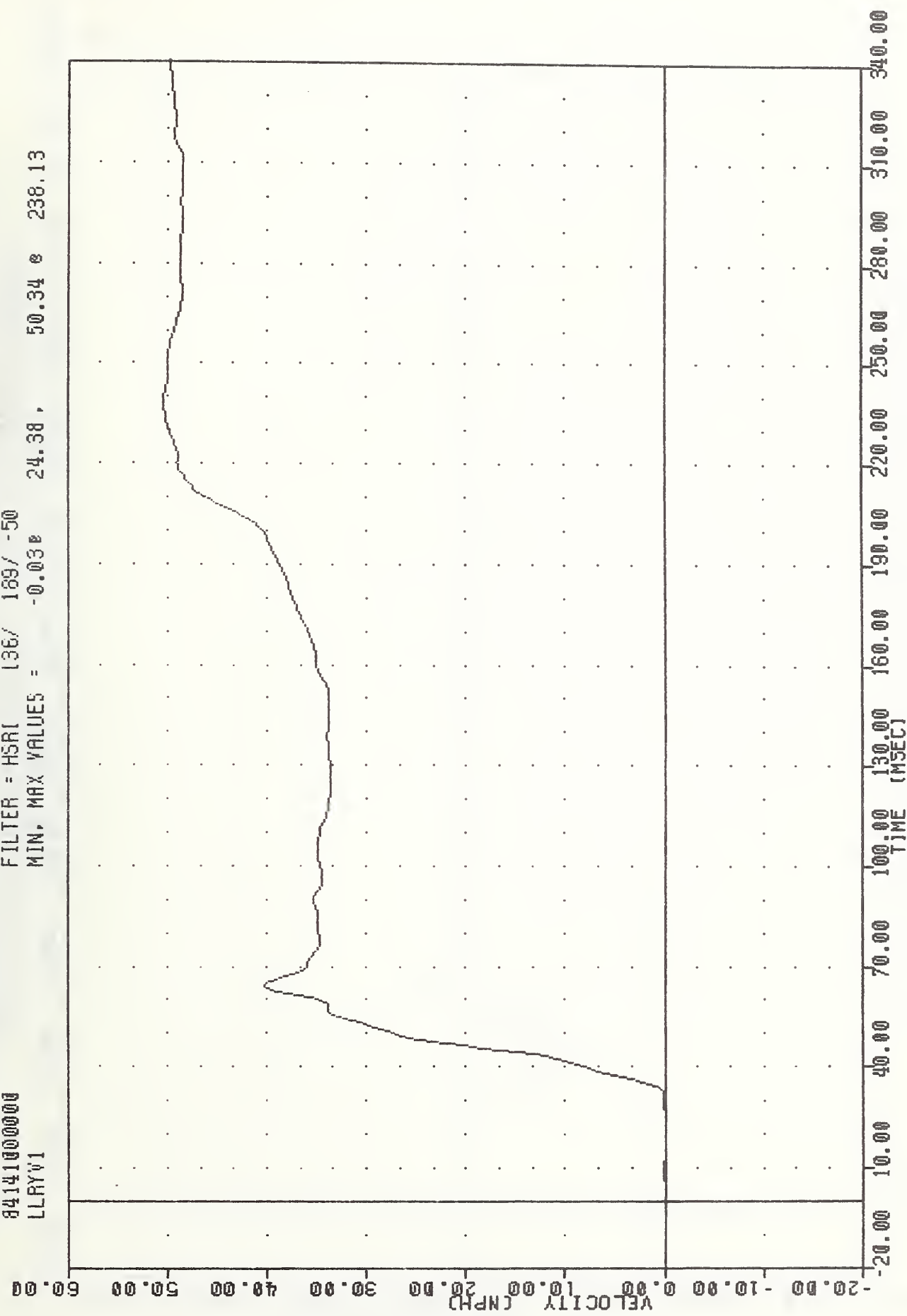
20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT LOWER RIB ACCELERATION Y AXIS

TRC
 EVALN MOD VW FLEET REPERT
 84141000000
 LLRYV1

PLOT DATE 5-JUN-84 14:05:30

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.03e 24.38, 50.34 e 238.13

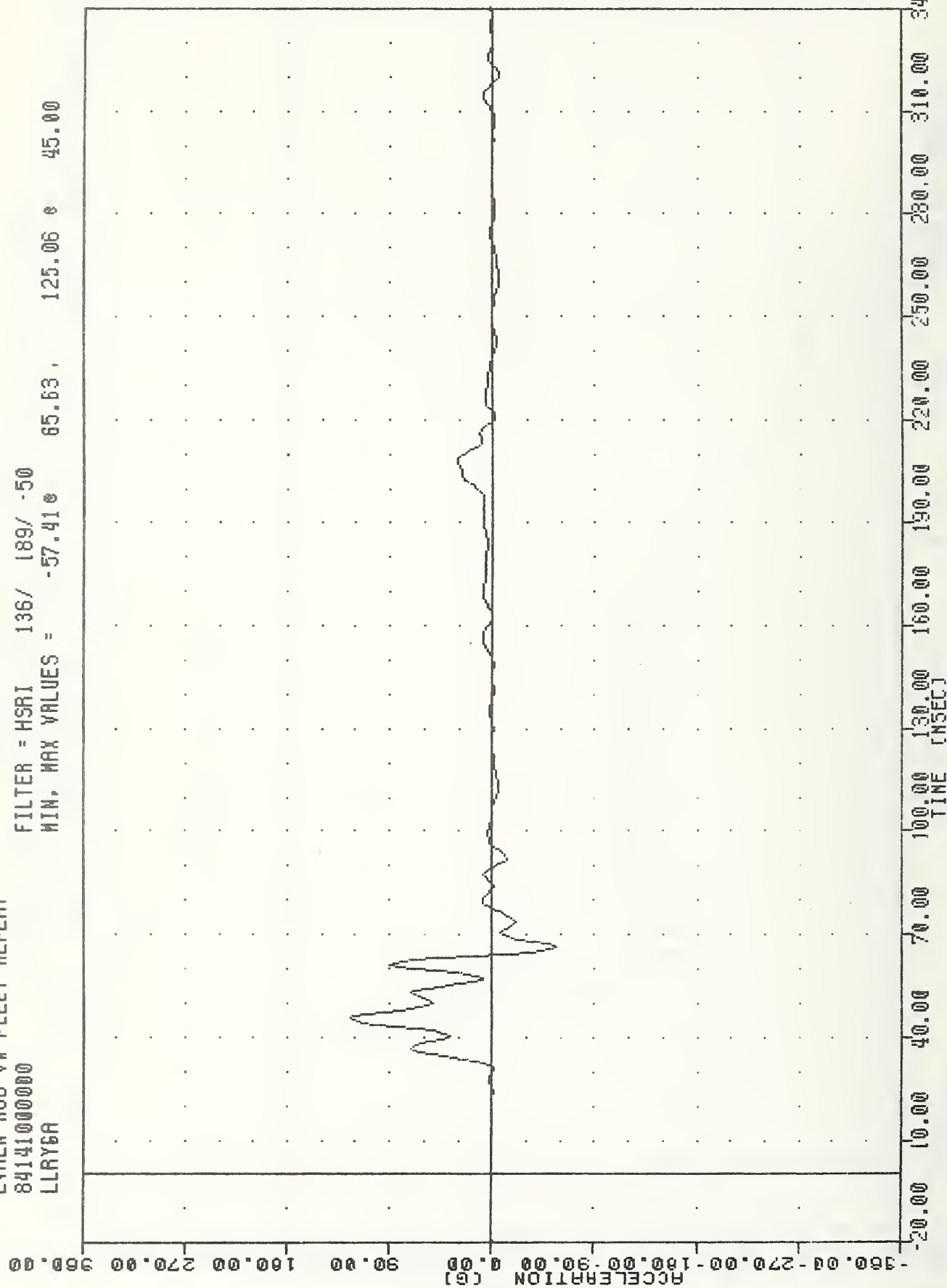


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LLRYG1

TAL
EVALN MOD VV FLEET REPEAT
84141000000
LLAY6A

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -57.41 65.63, 125.06 45.00

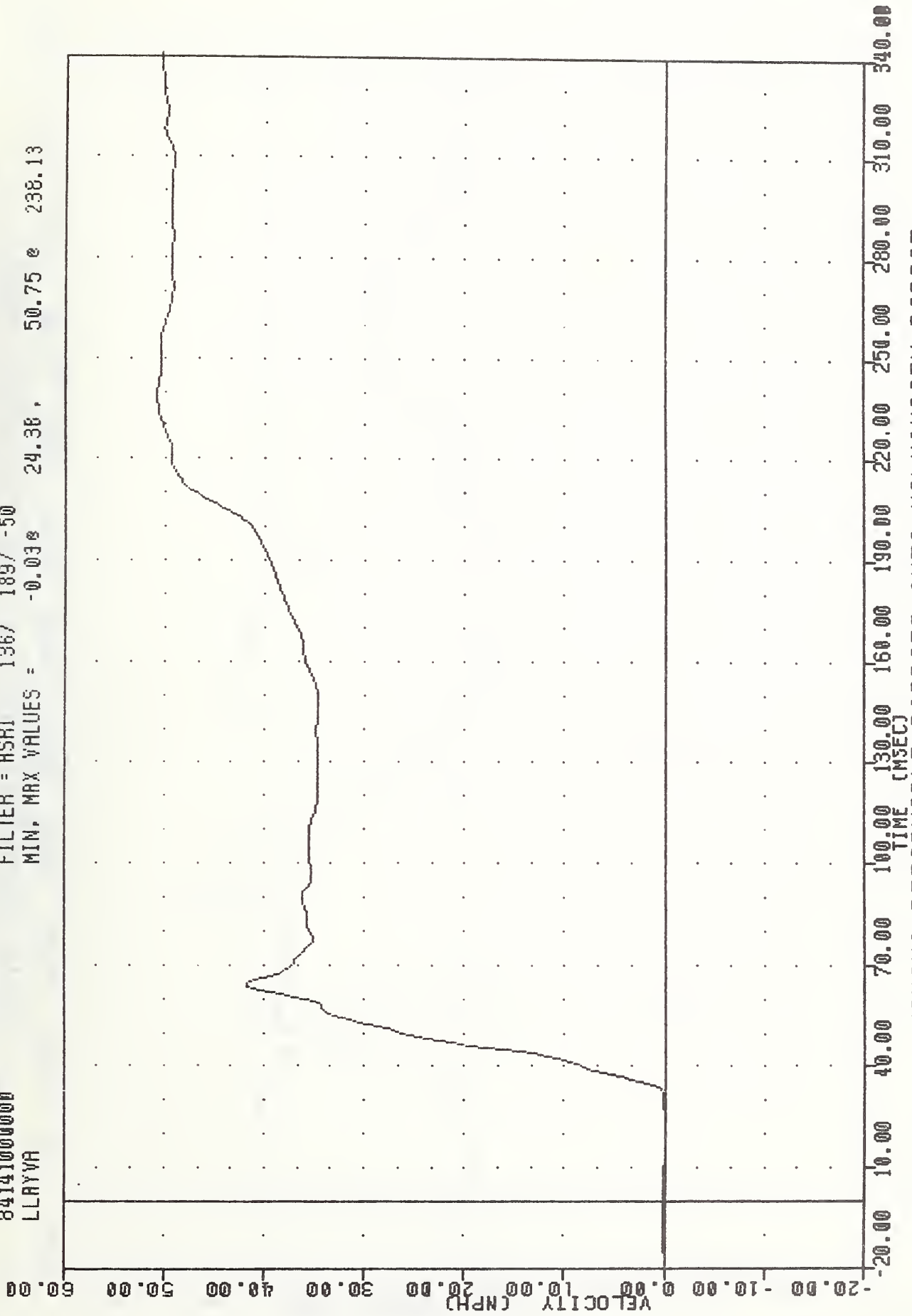


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MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT LOWER RIB ACCELERATION -2 Y AXIS

TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
LLAYVA

PLUT DATE 5-JUN-84 14:05:35
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -0.038 24.38, 50.75 e 238.13



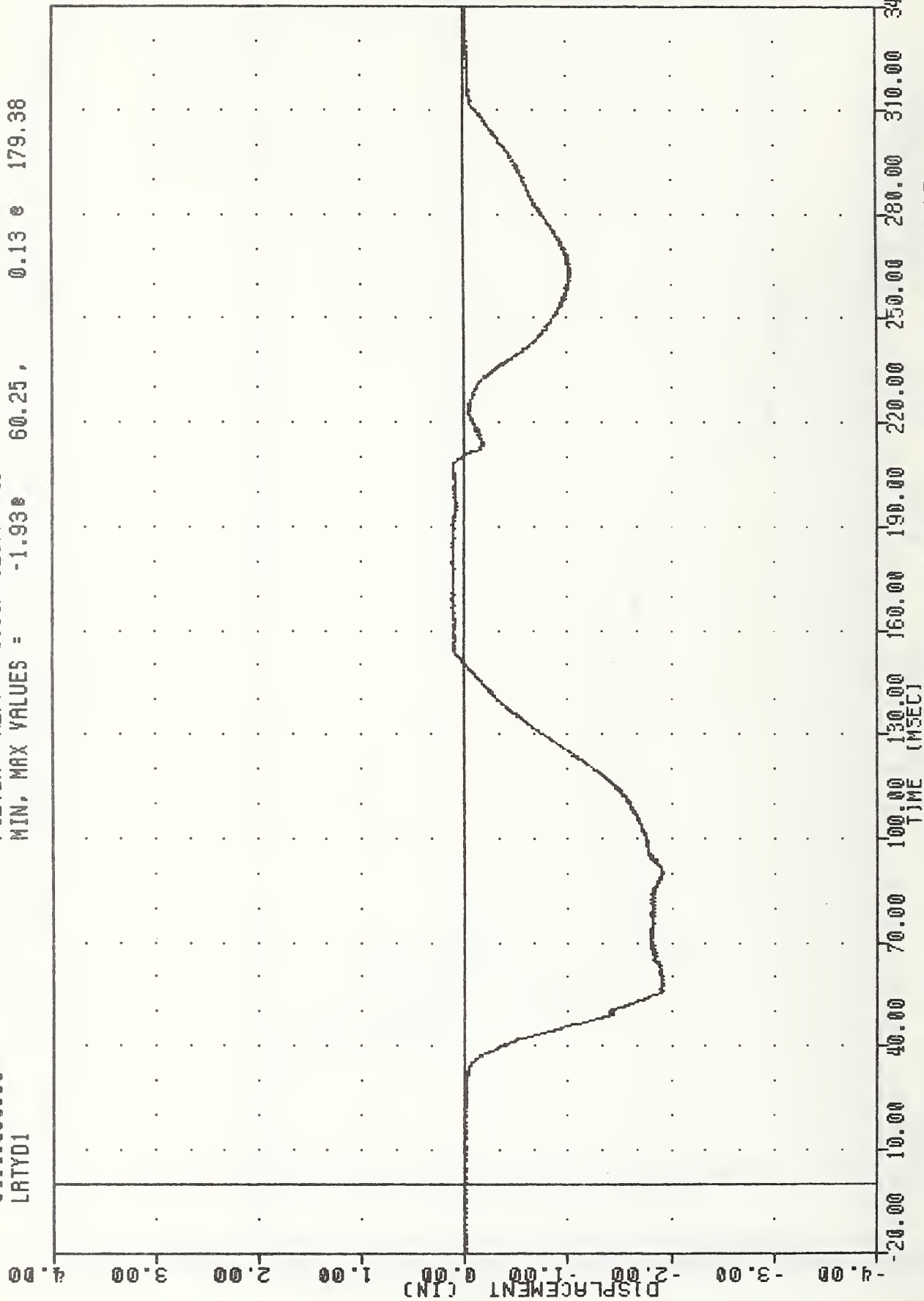
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLAYGA

TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
LRTYD1

PLUT DATE 5-JUN-84 14:01:03

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -1.93 60.25, 0.13 179.38

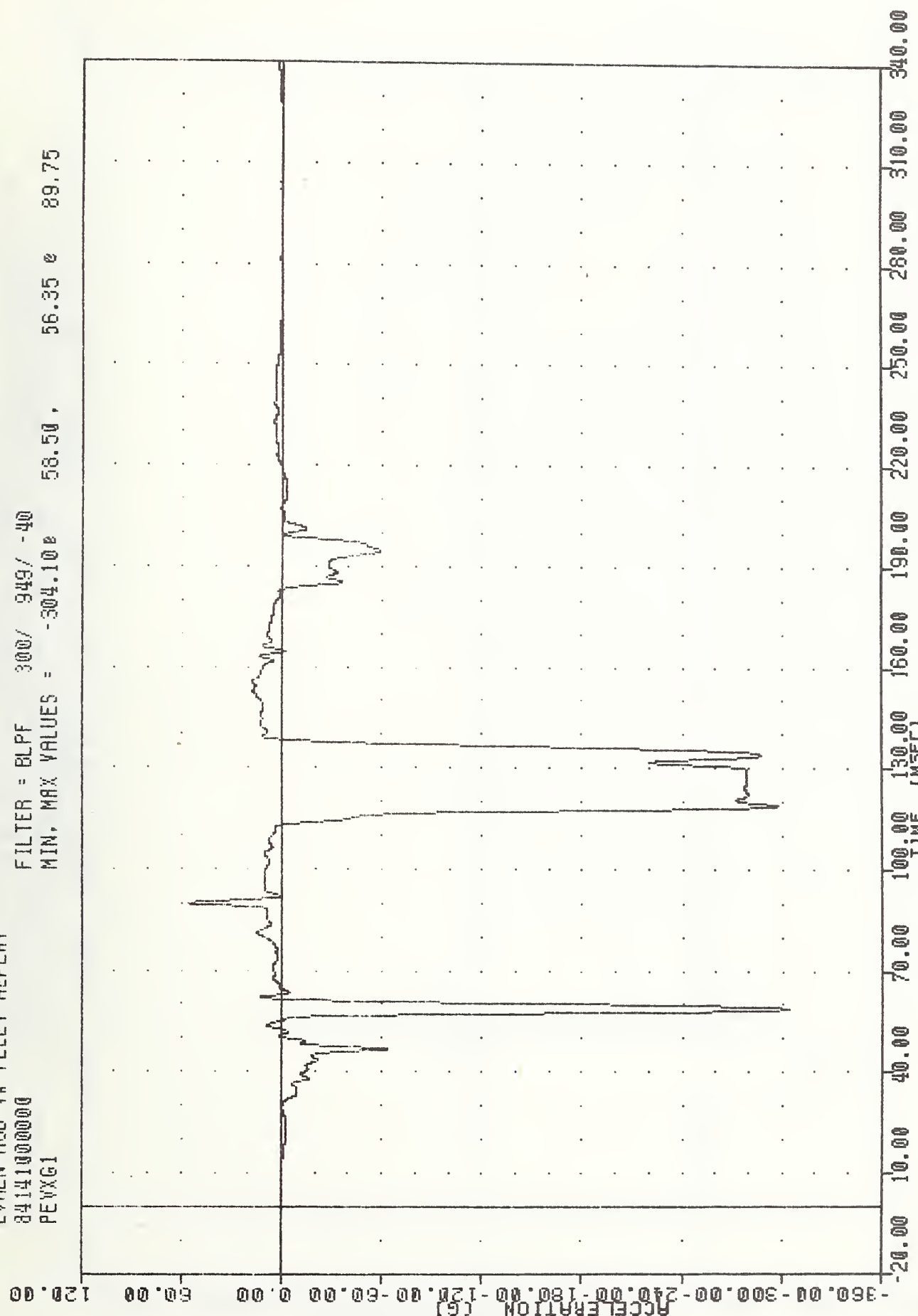


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT RIB TO SPINE DISPLACEMENT INCHES

TRC , 840529
EVALN MOD VW FLEET REPEAT
84141000000
PEVXG1

PLUT DATE 6-JUN-84 13:48:55

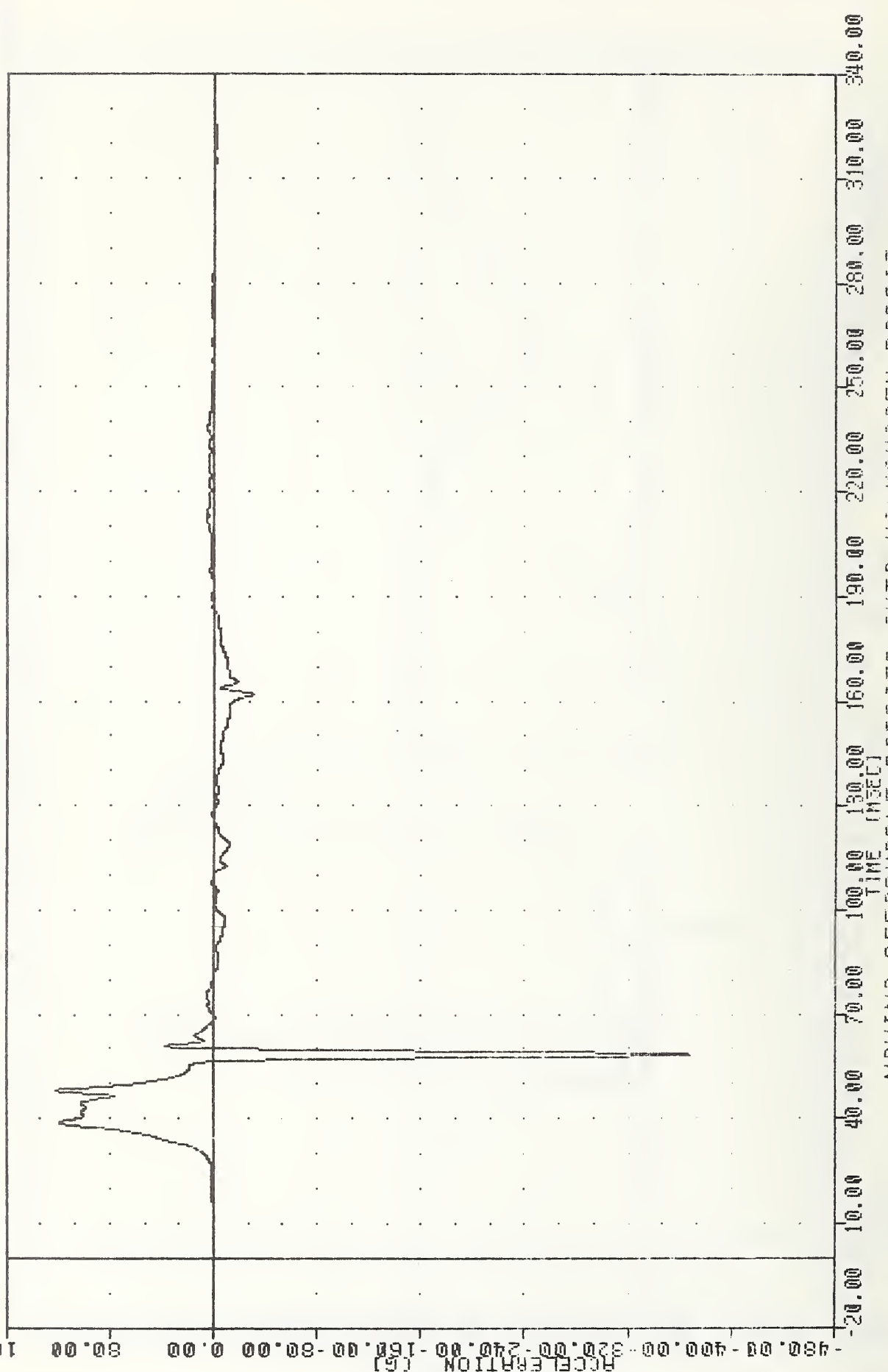
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -304.10e 58.50 , 56.35 e 89.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS ACCELERATION X AXIS

TRC , 840529
EVALN MOD VW FLEET REPERT
84141000000
PEVYG1

PLOT DATE 6-JUN-84 09:00:16
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -368.848 58.25 , 122.30 8 47.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS ACCELERATION Y AXIS

TAC , 840529 5-JUN-84 14:01:03

EVALM MOD VW FLEET REPEAT

84141000000

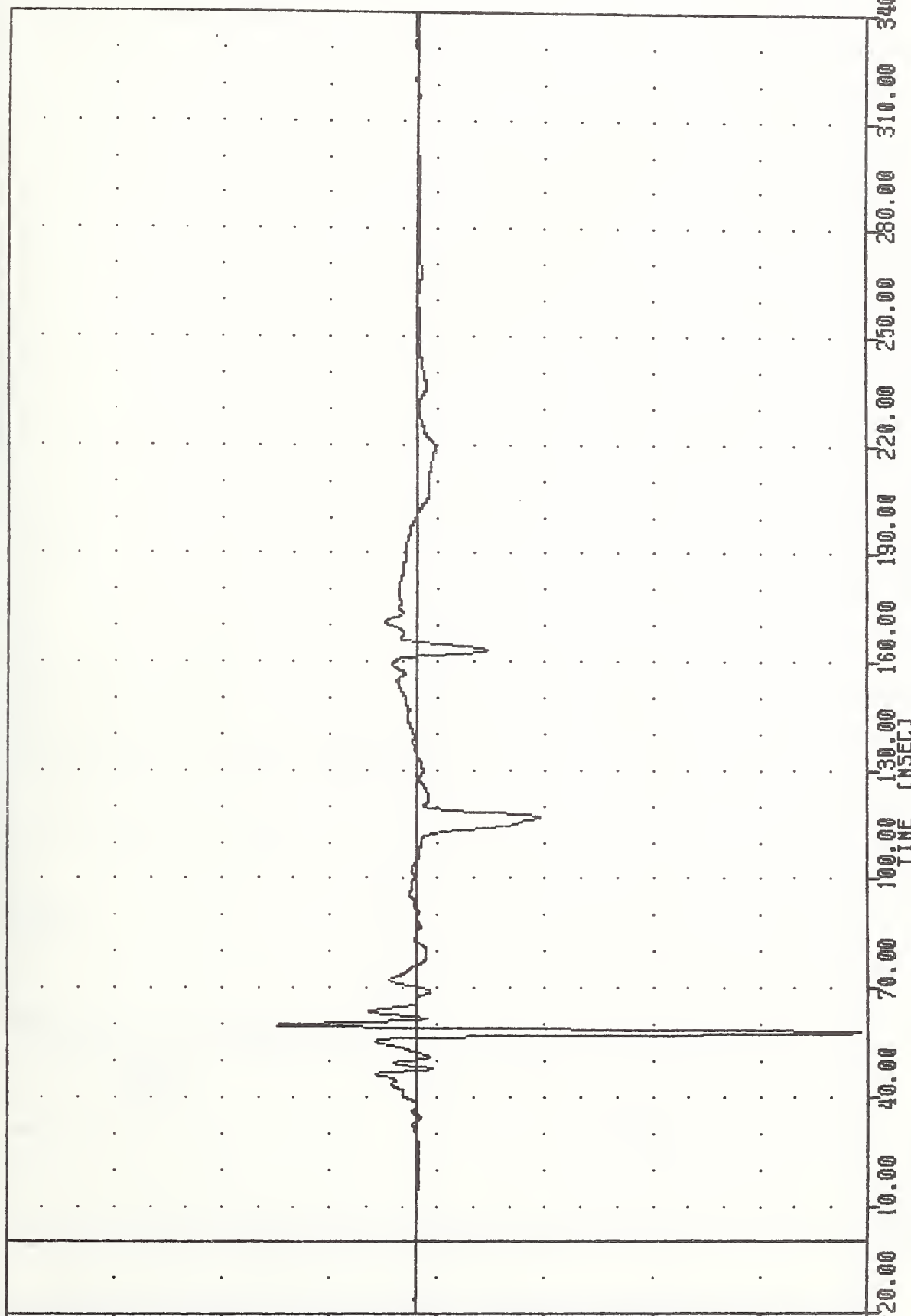
PEVZ61

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -207.200 57.63 , 64.41 * 59.63

ACCELERATION (G)

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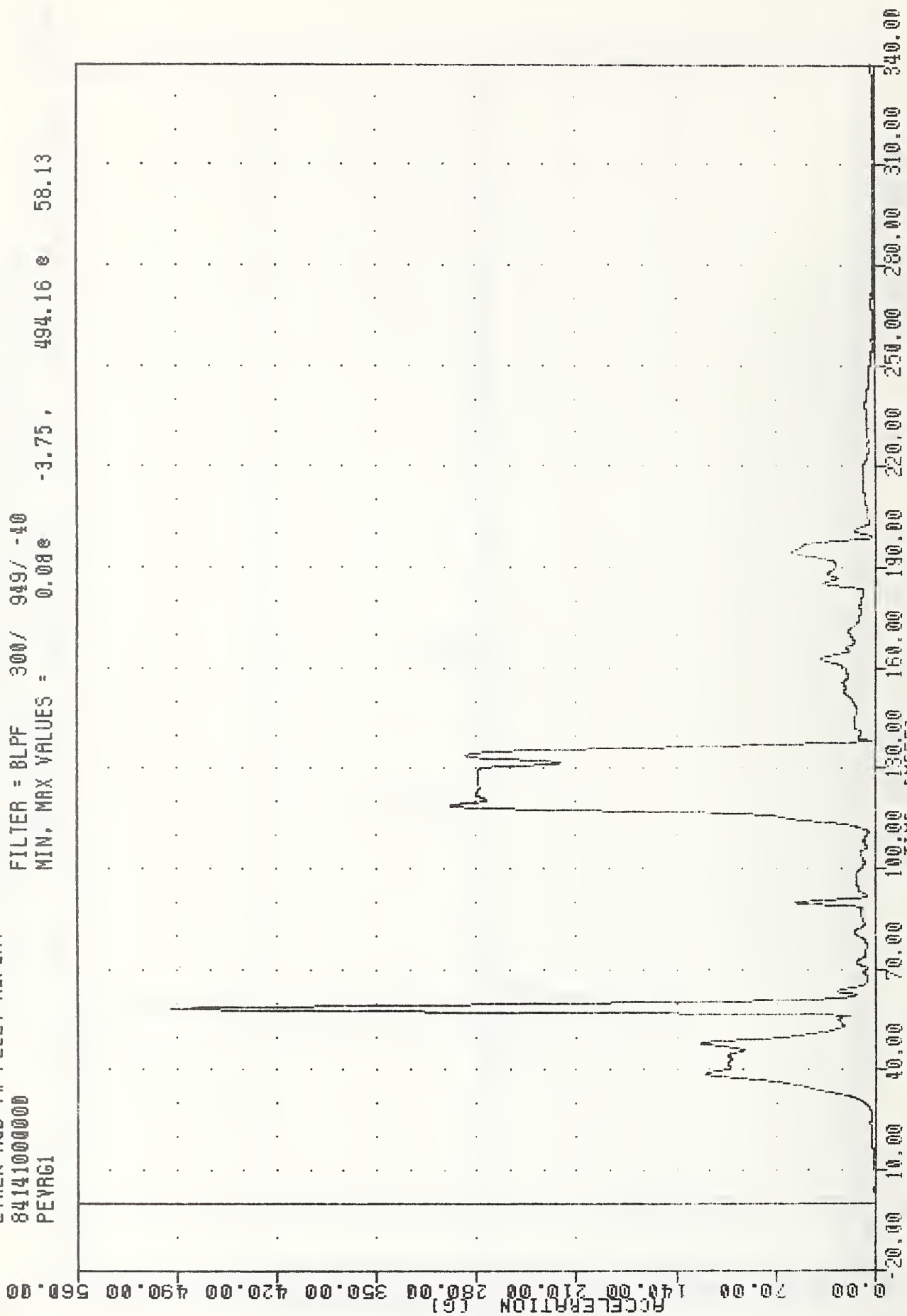
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS ACCELERATION Z AXIS

TRC
EVALN MOD VW FLEET REPEAT
84141000000
PEYRG1

PLOT DATE 6-JUN-84 09:00:16

FILTER = BLPF 300/ 949/ -10

MIN. MAX VALUES = 0.08e -3.75, 494.16 e 58.13

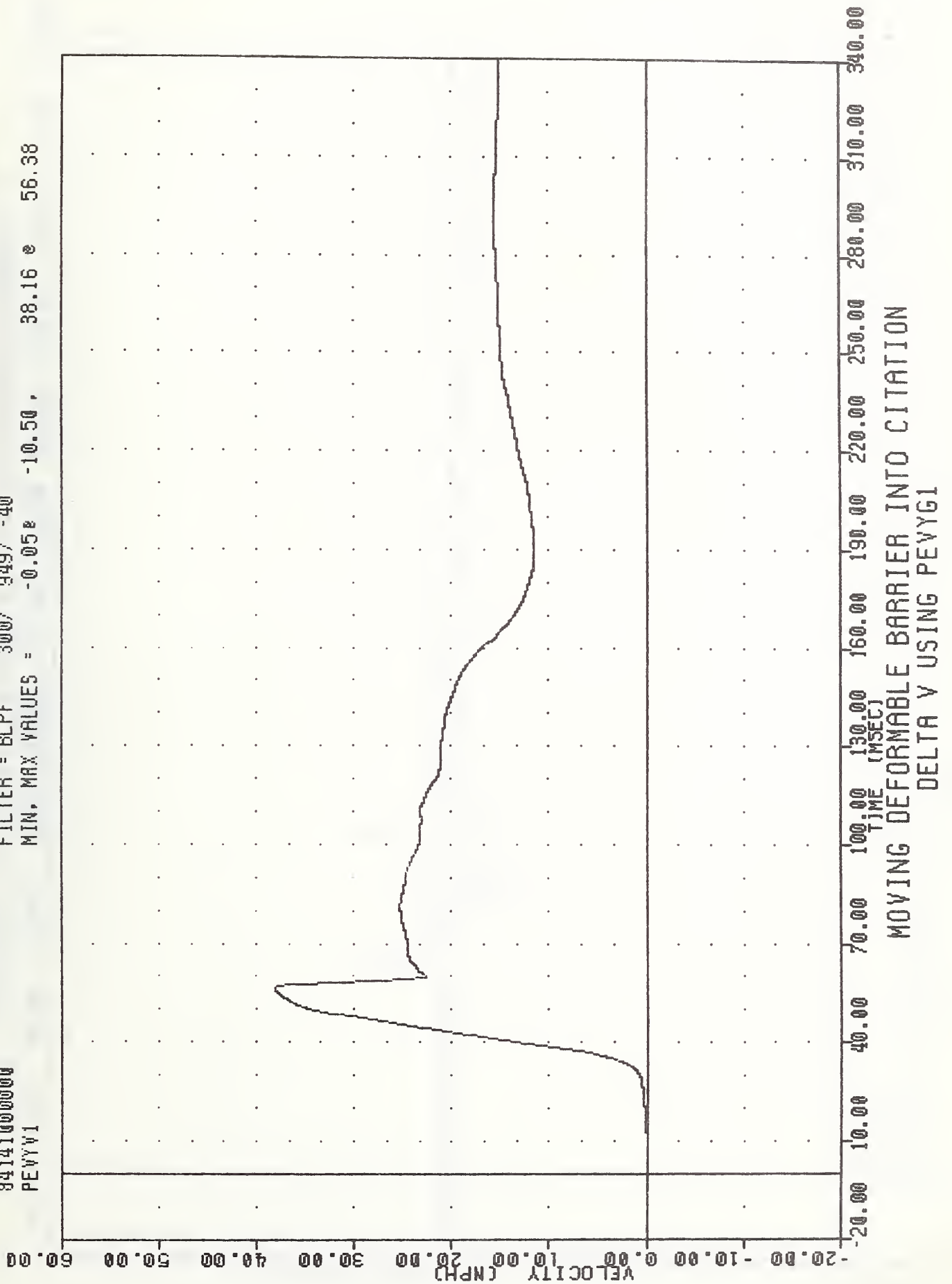


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS RESULTANT

TRC 840529
EVALN MOD VW FLEET REPEAT
84141000000
PEVYV1

PLOT DATE 5-JUN-84 14:06:19

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.058 -10.50, 38.16 56.38



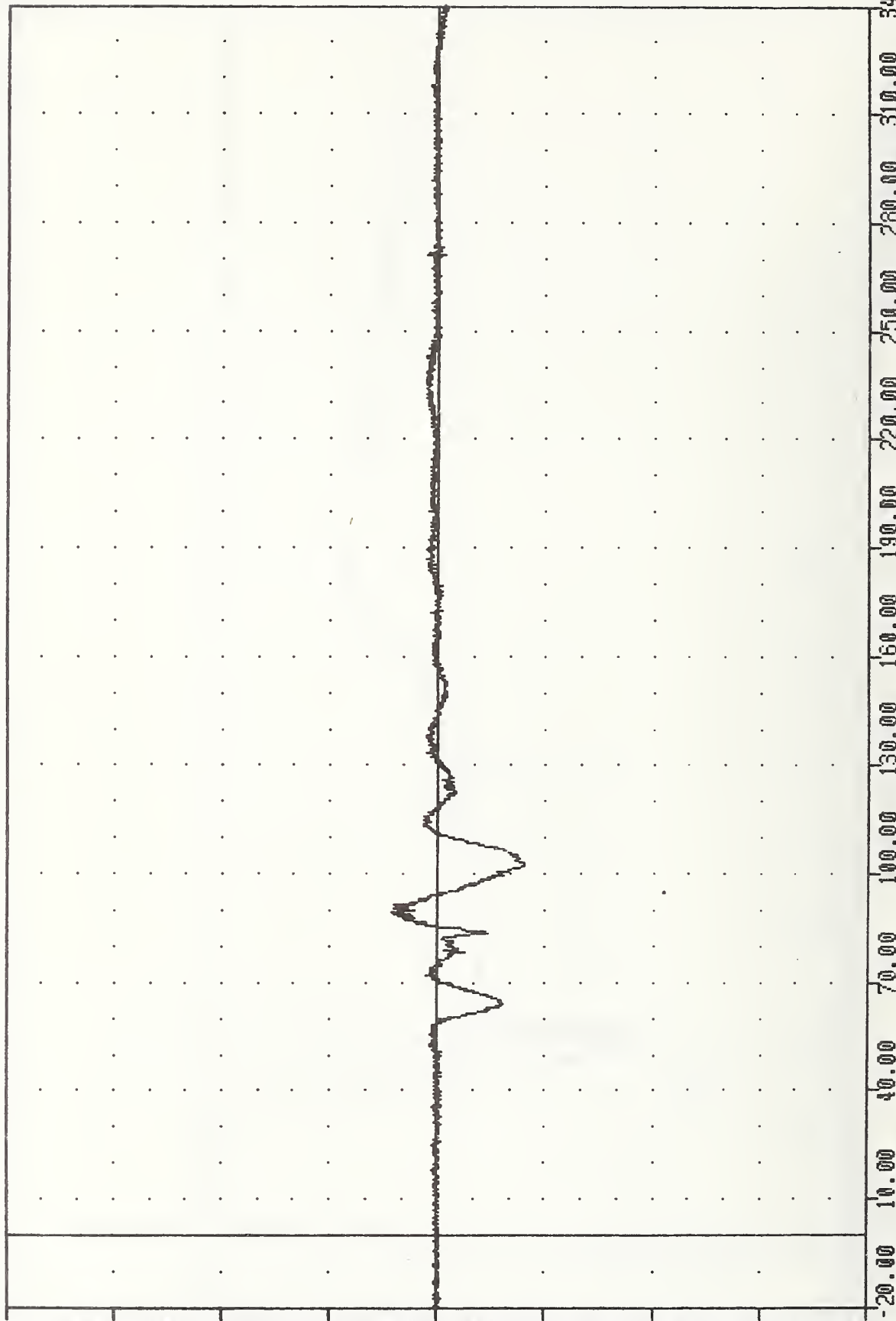
TRC , 840529
EVALN MOD YW FLEET REPEAT
84141000000
HEDXG3

PLOT DATE 5-JUN-84 14:01:03

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -40.43e 102.38, 21.69 e 89.38

ACCELERATION (G)

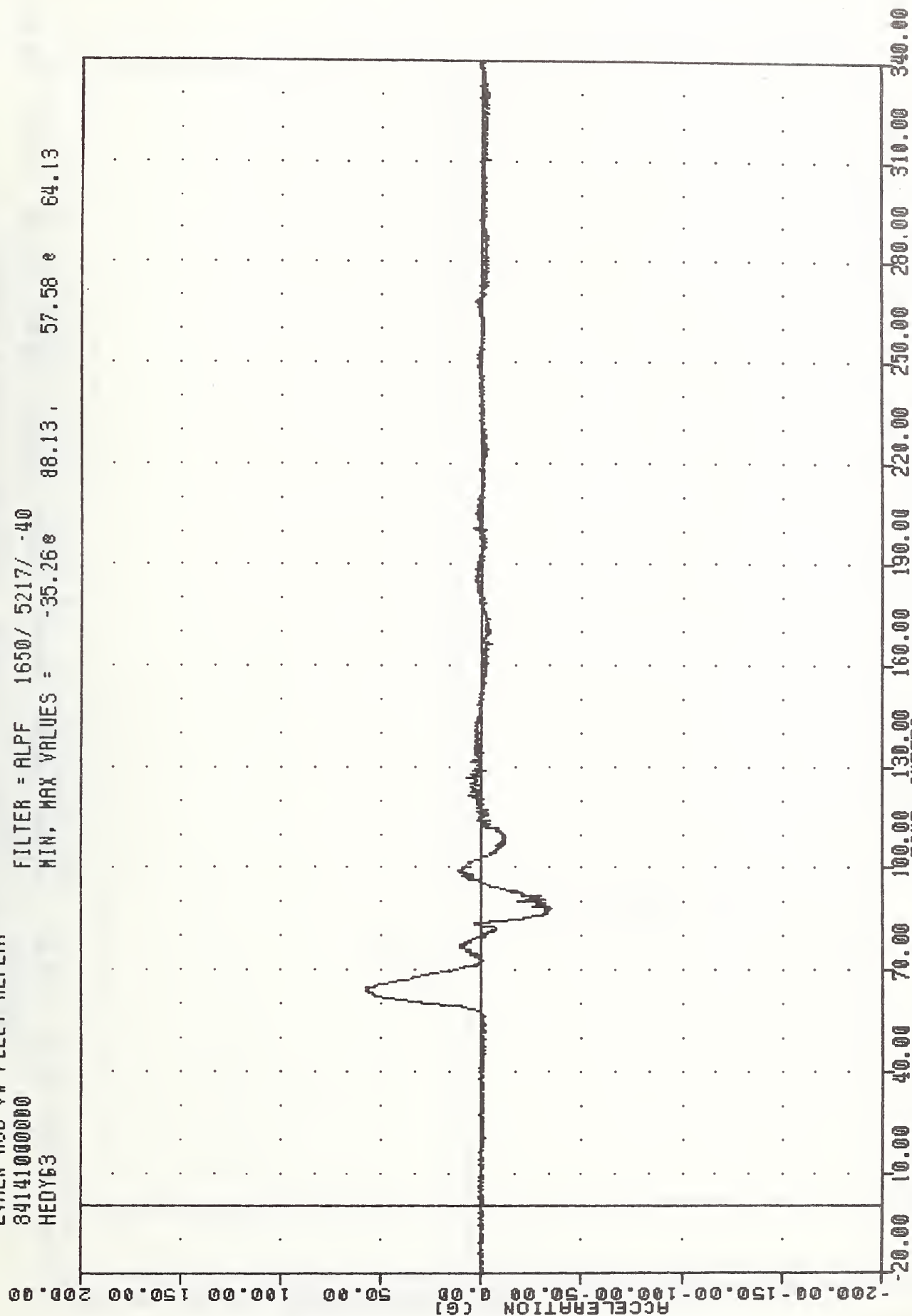


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION X AXIS

TAC
 EVALN MOD VV FLEET REPEAT
 84141000000
 HEDY63

PLOT DATE 5-JUN-84 14:01:03

FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -35.26e 88.13, 57.58 e 64.13

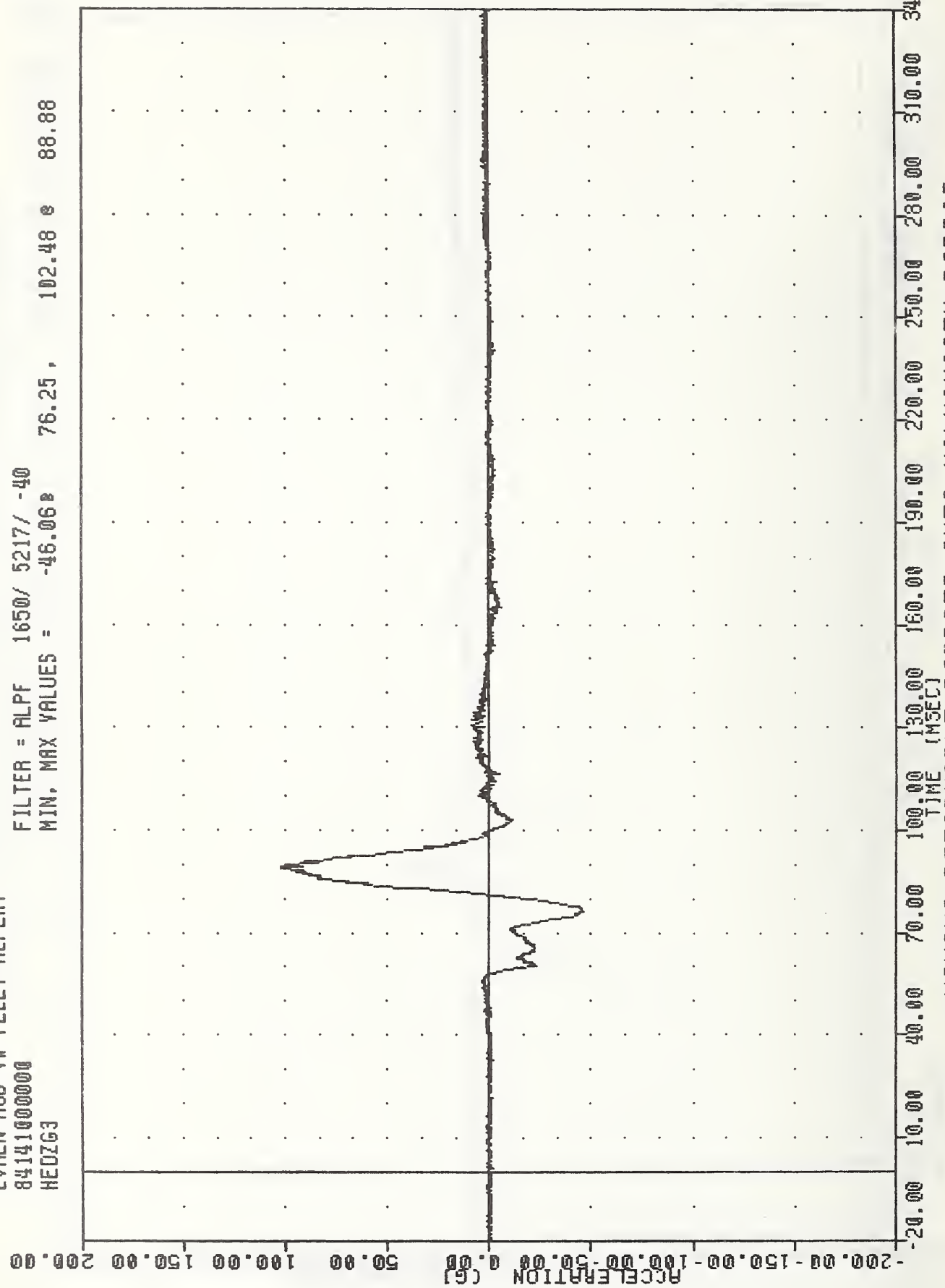


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER HEAD ACCELERATION Y AXIS

TRC , 840529
 EVALN MOD VW FLEET REPERT
 84141000000
 HEDZG3

PLOT DATE 5-JUN-84 14:01:03

FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -46.068 76.25 , 102.48 88.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER HEAD ACCELERATION Z AXIS

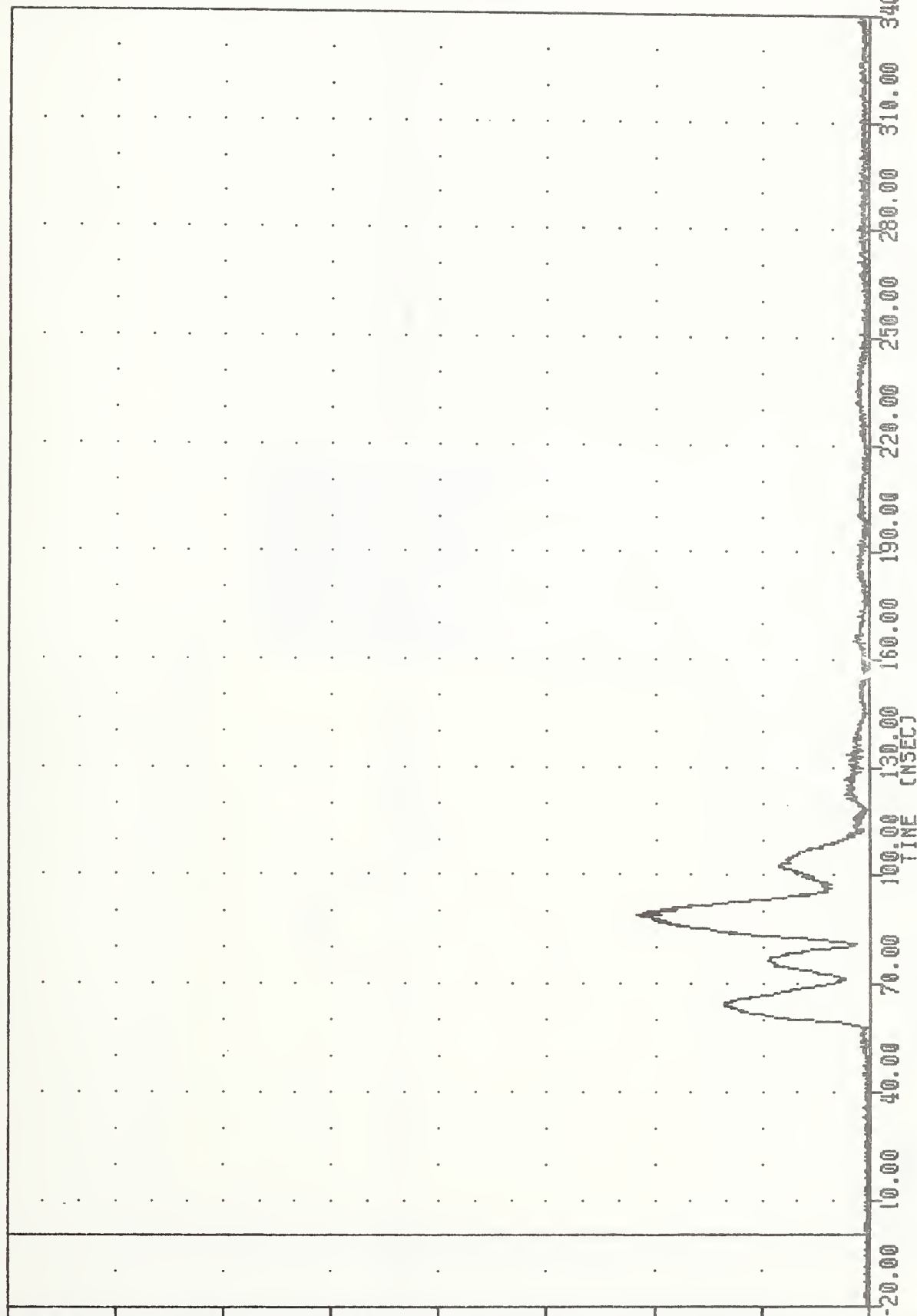
TAC , 840529
EVALN MOD VH FLEET REPEAT
84141000000
HEDR63

PLOT DATE 5-JUN-84 14:01:03

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = 0.188 10.13 , 108.60 e 88.88

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD RESULTANT

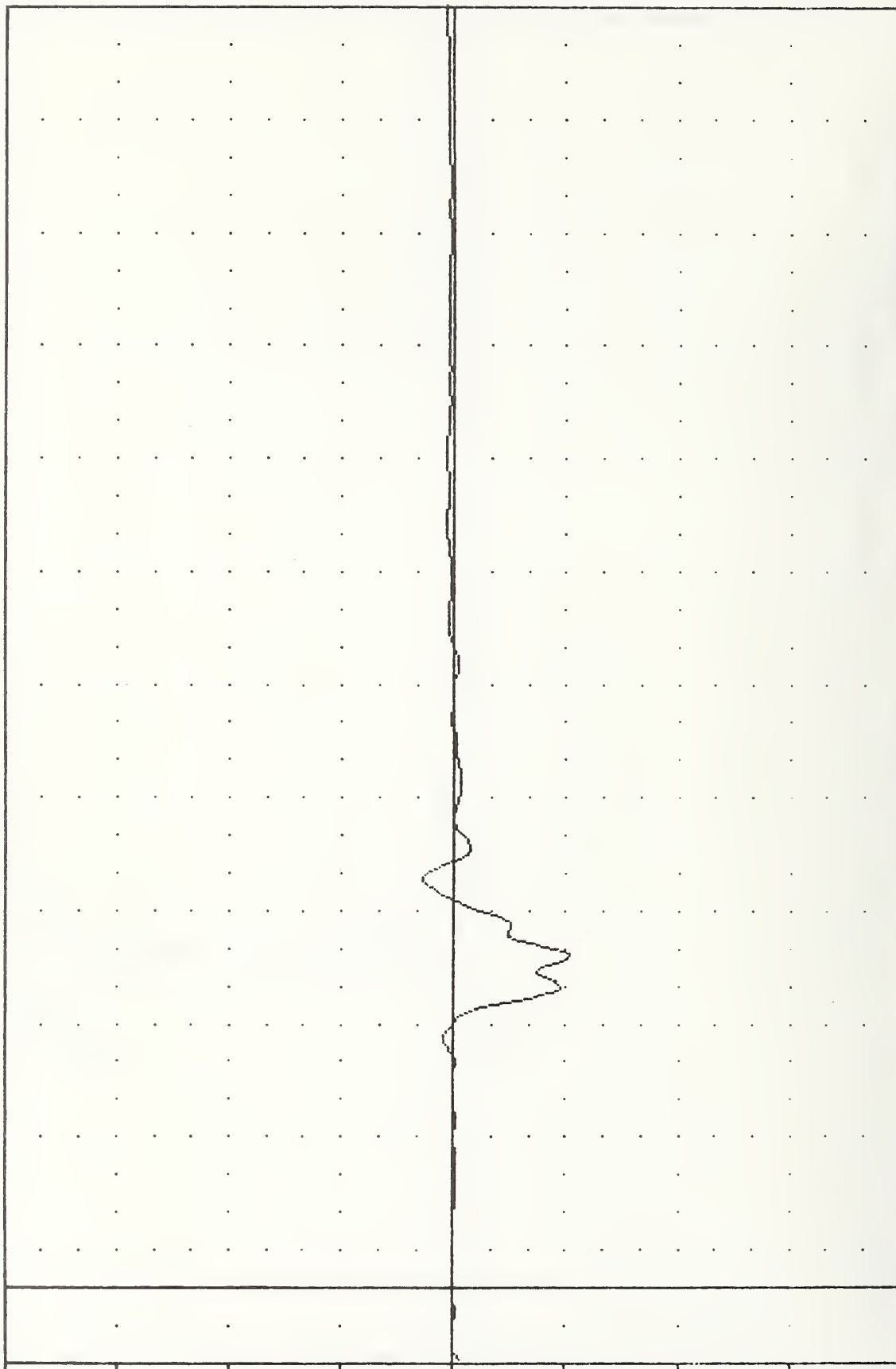
TRC , 840529
 EVALN MOD VW FLEET REPEAT
 84141000000
 T01XG3

PLOT DATE 5-JUN-84 14:03:51

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -51.95g 87.50, 13.56g 107.50

ACCELERATION (G)



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

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE ACCELERATION X AXIS

TL 242 .S872

Stultz, J.

Evaluation of
Volkswagen

Form DOT F 1720
FORMERLY FORM DO

