DOT-HS-806 691

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

MDB-TO-CAR SIDE IMPACT TEST OF A 19° CRABBED MOVING DEFORMABLE BARRIER TO A 1981 PLYMOUTH HORIZON AT 34.4 MPH

PREPARED BY:
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FINAL REPORT
MARCH 1984

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
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400 SEVENTH STREET, S.W.
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16. Abstract

This test report documents one of a series of thirteen crash tests to evaluate side impact protection in various vehicle models. Testing was conducted on a 1981 Plymouth Horizon 4-door Hatchback at the TRCO Crash Test Facility, East Liberty, Ohio. The test vehicle was impacted on the left side by a moving deformable barrier, crabbed to 19°, at 34.4 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 February 9, 1984 and the ambient temperature was 46°F.

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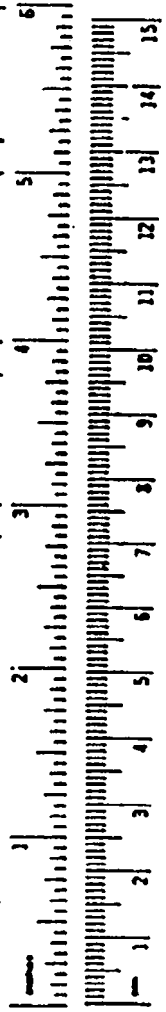
METRIC CONVERSION FACTORS

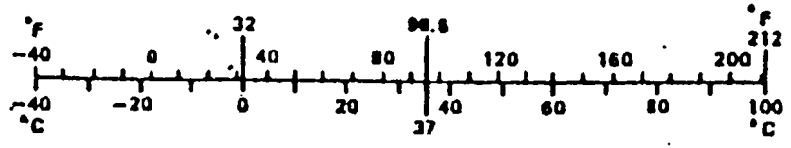
Approximate Conversions to Metric Measures

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



Approximate Conversions from Metric Measures

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



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SECTION 1.0

PURPOSE AND INTRODUCTION

PURPOSE

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

INTRODUCTION

A stationary 1981 Plymouth Horizon 4-door hatchback was impacted on the left side by a Moving Deformable Barrier (MDB) on February 9, 1984. The test was to simulate an intersection collision with the striking vehicle traveling at 26 mph and the struck vehicle traveling at 13 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 Plymouth Horizon at 34.4 mph with the MDB's wheels crabbed clockwise to 19°. The actual test speed was 34.4 mph and the actual impact point was 38. inches forward of the midpoint of the Plymouth Horizon's wheelbase.

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

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

SECTION 2.0

GENERAL TEST AND VEHICLE PARAMETER DATA

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

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Chrysler Corporation

MAKE/MODEL: Plymouth Horizon VIN: 1P3BL18A1BD286584

BODY STYLE: 4-Door Hatchback MODEL YEAR: 1981

NHTSA NO.: R & D COLOR: Burnt Orange

ENGINE DATA: TYPE: Transverse CYLINDERS: 4 DISPLACEMENT: 105 CID

TRANSMISSION DATA: 4 Speed Manual

DATE VEHICLE RECEIVED: 1/31/84 ODOMETER READING: 4013

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING	No	AUTOMATIC TRANSMISSION	No
POWER BRAKES	No	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	No	AIR CONDITIONING	No
RADIO	No	ANTI-SKID BRAKE	No
CLOCK	No	REAR WINDOW DEFROSTER	No
OTHER			

REMARKS:

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

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

VEHICLE MANUFACTURED BY: Chrysler Corporation

DATE OF MANUFACTURE: 4/81

GVWR: 3275 LBS.,

GAWR: FRONT 1760 LBS., REAR 1565 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 35 psi; REAR 35 psi

TIRES ON VEHICLE (MFGR. & LINE, SIZE): Goodyear Viva P175/75 R 13

BIAS PLY, BELTED, OR RADIAL: Radial

PLY RATING: 3

IS SPARE TIRE "SPACE SAVER"? Yes

IS SPARE TIRE STANDARD EQUIPMENT? Yes

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

RIGHT FRONT	670 LBS.	RIGHT REAR	390 LBS.
LEFT FRONT	710 LBS.	LEFT REAR	390 LBS.

TOTAL FRONT WEIGHT 1380 LBS. (63.9 % OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 780 LBS. (36.1 % OF TOTAL VEHICLE WEIGHT)

TOTAL DELIVERED WEIGHT 2160 LBS.

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 24 3/16	;LF 24 1/4	;RR 24 3/16	;LR 24 9/16
PRE-TEST ATTITUDE:	RF 24 1/16	;LF 23 7/8	;RR 22 9/16	;LR 22 3/8
POST-TEST ATTITUDE:	RF 23 1/8	;LF 23 3/4	;RR 21 13/16	;LR 22 5/16

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 122 LBS. CARGO:

RIGHT FRONT	700 LBS.	RIGHT REAR	570 LBS.
LEFT FRONT	760 LBS.	LEFT REAR	600 LBS.

TOTAL FRONT WEIGHT 1460 LBS. (55.5 % OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 1170 LBS. (44.5 % OF TOTAL VEHICLE WEIGHT)

TOTAL TEST WEIGHT 2630 LBS.

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

TEST FLUID DATA

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

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY*: NA GALLONS

TEST VOLUME: 4.0 GALLONS

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): No Owners Manual

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: No FUEL INJECTION: No

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

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 35 psi; REAR 35 psi

RECOMMENDED TIRE SIZE: P 175/75 R 13 LOAD RANGE X B, C,

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

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

CARGO LOAD 115 LBS.

TOTAL 865 LBS.

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

TEST CONDITIONS

TEST NUMBER: 840209

DATE OF TEST: February 9, 1984 TIME OF TEST: 1350

WIND VELOCITY: 3-5 mph 210° SSW HUMIDITY: NA

AMBIENT TEMPERATURE AT IMPACT AREA: 46° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 76° F

SUBJECT VEHICLE DATA

	ACTUAL	INTENDED
VEHICLE TEST WEIGHT (LBS.)	2630	2623
MDB TEST WEIGHT (LBS.)	2990	3000
MDB VELOCITY (MPH)*	34.4	34.4
IMPACT POINT (INCHES)**	38.	37

DUMMIES

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

RESTRAINT SYSTEM: Both dummies were unrestrained

* As measured over final one foot of travel.

** As measured forward of the midpoint of the test vehicles wheelbase.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER 06	PASSENGER U02
Head	Side Glass, Barrier Face Top	C-Pillar
Chest	Driver Door Panel	Left Rear Door Panel
Abdomen	Driver Door Panel	Left Rear Door Panel
Left Knee	Driver Door Panel	Left Rear Door Panel
Right Knee	Left Knee	Left Knee

DOOR OPENING:

	LEFT	RIGHT
Front	Tools Required	Easy
Rear	Tools Required	Easy

SEAT MOVEMENT:

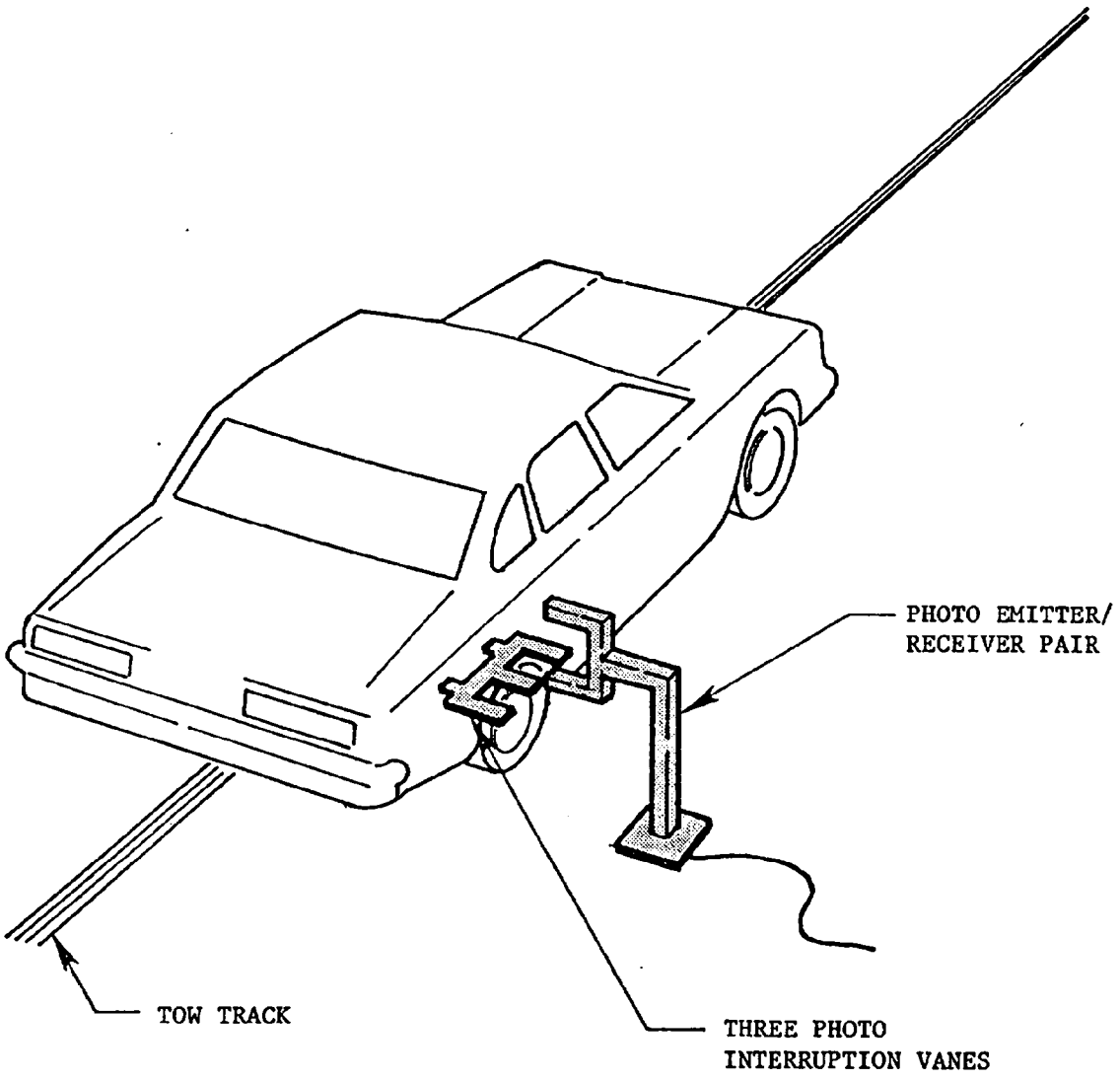
	SEAT BACK FAILURE	SEAT SHIFT
Front	No	Yes
Rear	No	No

GLAZING DAMAGE: Windshield cracked on left side, left front and rear door glass shattered.

OTHER NOTABLE IMPACT EFFECTS:

Driver door separated from top hinge.

IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane is located two inches before impact.

The vanes have one foot spacing.

VEHICLE TEST WEIGHT CALCULATION

Test Weight = Unloaded Delivered Weight +
Number of Dummies X 174 lbs. +
Cargo Weight
= 2160 + 2 X 174 + 115 lbs.
= 2623 lbs.

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

TEST ANOMALIES

Cable separation occurred in data channel HEDXG1 - Driver Head Acceleration X Axis at approximately 79 msec. No peak levels, peak resultant or HIC are reported.

SECTION 3.0

DATA REQUIRED BY R&D

The following pages are included in this section:

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

DUMMY TEMPERATURE CONTROL AND POSITIONING

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

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

DUMMY PLACEMENT AND POSITIONING

SIDE IMPACT DUMMY*	DRIVER DSP	REAR PASSENGER DSP
HEAD	Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.	Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.
UPPER TORSO	Placed against seat back. Midsagittal plane is vertical and centered on bucket seat.	Placed against seat back. Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.
LOWER TORSO	Midsagittal plane is vertical and centered on bucket seat.	Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.
UPPER LEGS (thighs or femurs)	Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.	Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.
KNEES	Knees set 14.5" apart between pivot bolt head outer surfaces. Outer surface of right knee pivot bolt is 8.6" from midsagittal plane of dummy. Outer surface of left knee pivot bolt is 5.9" from midsagittal plane of dummy.	Located so that planes defined by femur and tibia centerlines are as close as possible to vertical.
LOWER LEGS	Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.	Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.
RIGHT FOOT	Placed on undepressed accelerator pedal -- rearmost point of heel on floorplan in plane of pedal.	Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.
LEFT FOOT	Placed on toeboard -- rearmost point of heel on floorpan as close as possible to intersection of toeboard and floorpan. Centerline falls in vertical longitudinal plane.	Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.

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

DUMMY IN-VEHICLE POSITION RECORDING SHEET

VEHICLE NHTSA NO. R & D

MFR./MAKE/MODEL: Plymouth Horizon

FRONT SEAT TYPE: ___ BENCH
X BUCKET
___ SPLIT BENCH

ADJUSTER TYPE: X MANUAL
___ POWER

BUCKET SEAT BACK TYPE: X FIXED
___ ADJUSTABLE

TECHNICIANS:
1. D. LeVally
2. N. Echeverria
3. R. Benevides

POSITIONING DATE: 2/9/84

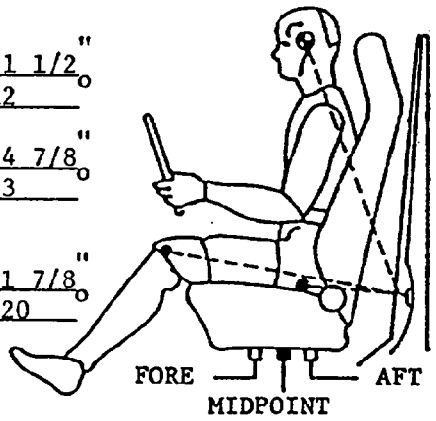
AMBIENT TEMP.: 72° F. TIME: 8:30

DRIVER DUMMY # 06

HEAD TARGET* 21 1/2" 12°

KNEE JOINT 24 7/8" 93°

APPROX. "H" POINT 11 7/8" 120°

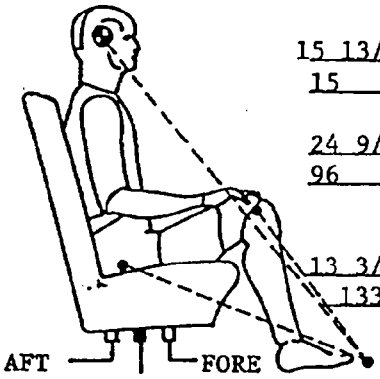


REAR PASSENGER DUMMY # U02

15 13/16" HEAD 15° TARGET**

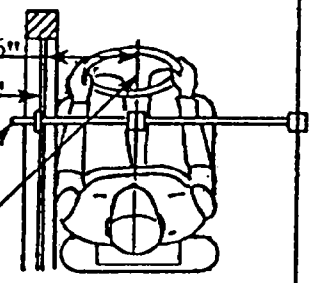
24 9/16" KNEE 96° JOINT

APPROX. 13 3/4" "H" 133° POINT



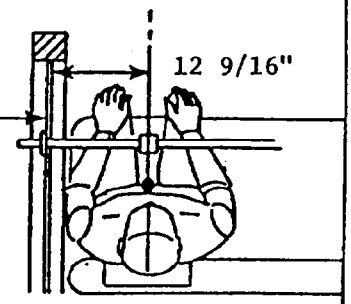
DOOR GLASS HEIGHT*** 12 13/16" 9 1/2"

LATERAL BAR ADJUSTABLE POINTER



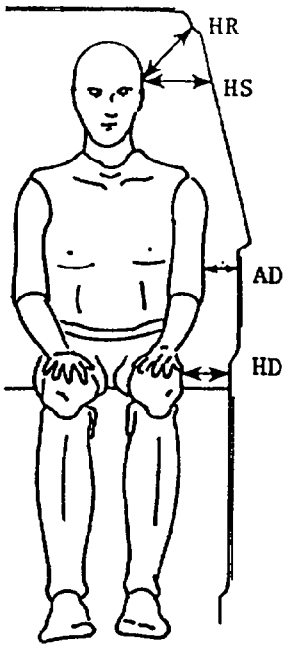
DRIVER DUMMY # 06

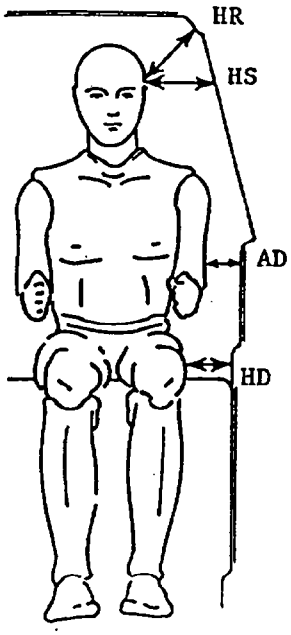
DOOR GLASS HEIGHT 10" 12 9/16"



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 top of rear seat striker bolt (not as shown) and all angles referenced to vertical.
***Door glass height is set equal to the dummy nose level.

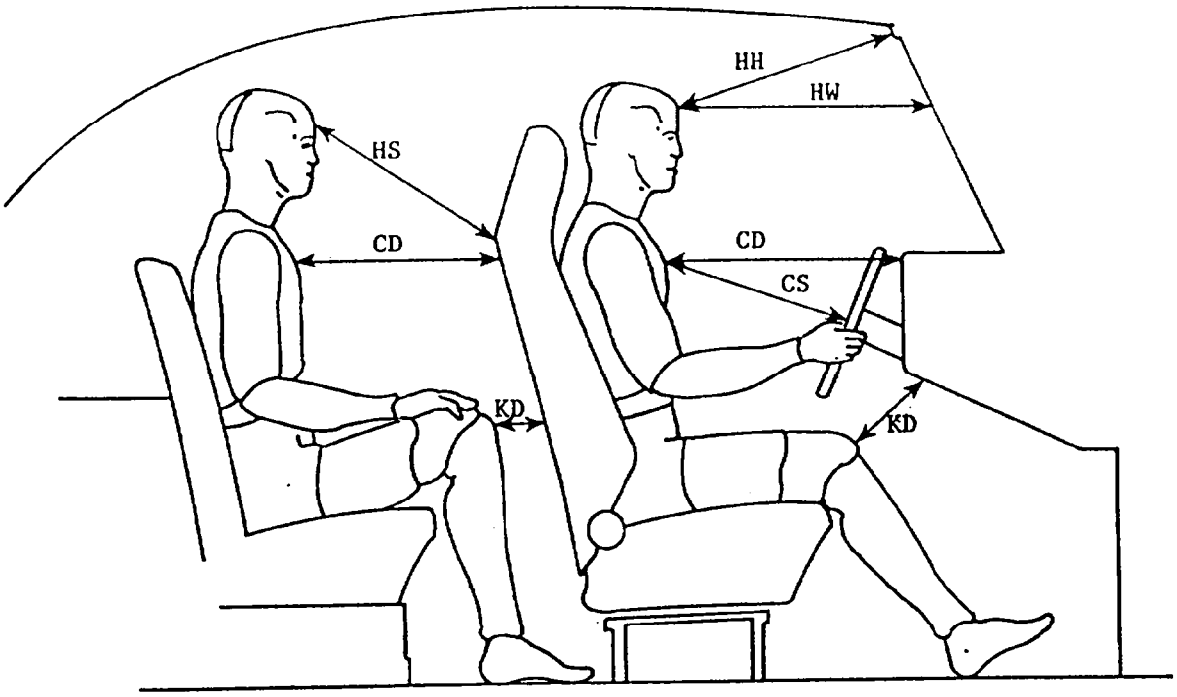




	DRIVER 06	PASSENGER U02
HR	7 5/16	7 3/4
HS	8 13/16	8 13/16
AD	4	4 3/4
HD	6 1/4	7 1/4

ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



	DRIVER 06	PASSENGER U02
HH	9 1/8	DNA
HW	14 1/4	DNA
HS	DNA	21 13/16
CD	19	17 1/8
CS	16 15/16	DNA
KDL	7 1/4	3 5/8
KDR	8 1/4	3 1/16

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the dummy's torso contacted the driver's door and the head contacted the driver's side window and the top of the moving deformable barrier face. The dummy rebounded rearward across the front occupant compartment. The buttocks struck the front passenger's window sill and it's head and shoulder's struck the roof. The dummy rebounded from the passenger's side and came to rest sitting upright in the front passenger's seat facing the driver's door.

PASSENGER

During impact, the dummy's torso struck the left rear passenger's door and the head contacted the C-Pillar. The dummy rebounded laterally partially across the rear occupant compartment and leaned toward the right side. The dummy was prevented from falling over onto it's right side because it's feet were trapped beneath the driver's seat. The dummy came to rest sitting upright and leaning toward the right side.

VEHICLE EXTERIOR PROFILES AND STATIC CRUSH

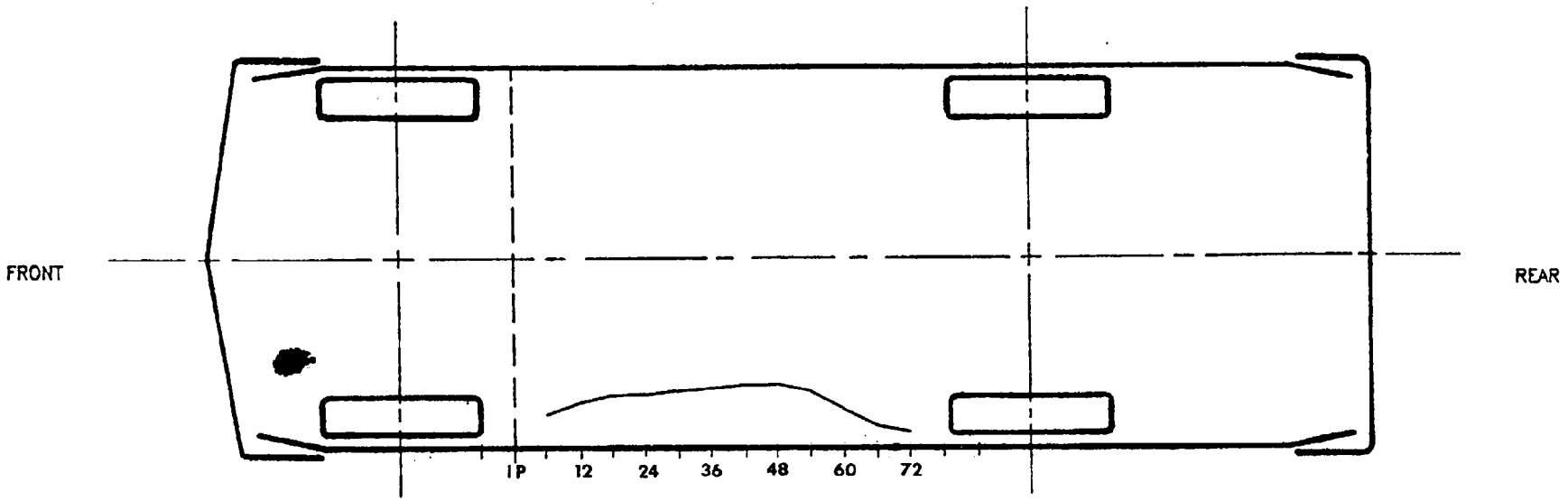
ZERO DISTANCE AT PROJECTED IMPACT POINT*

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	9.1	X	X	19.1	18.9	18.8	18.8	18.9	18.8	18.8	18.7	18.6	18.7	18.8	18.8	X
H-Point	20.4	X	15.9	15.8	15.6	15.6	15.6	15.6	15.6	15.6	15.5	15.5	15.5	15.5	15.6	X
Mid Door	22.9	14.8	16.0	15.8	15.6	15.6	15.6	15.6	15.6	15.5	15.6	15.5	15.5	15.6	15.6	14.9
Window Sill	34.1	X	18.6	X	18.0	17.9	17.9	17.8	17.8	17.8	17.8	17.7	17.7	17.7	17.6	X
Window Top	54.0	X	X	X	X	X	X	25.5	25.4	25.3	25.2	25.1	25.1	25.1	25.2	25.4
POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Axle Height	9.1	X	X	24.4	27.0	27.5	28.0	28.6	28.9	29.3	28.8	27.5	24.6	22.2	21.3	X
H-Point	20.4	X	21.8	23.6	28.1	31.0	32.1	32.4	31.4	30.8	29.7	27.1	24.9	22.4	19.9	X
Mid Door	22.9	19.2	19.4	22.4	27.2	30.2	31.0	30.9	30.4	29.7	29.3	26.6	24.3	21.9	19.6	18.1
Window Sill	34.1	X	20.4	X	23.6	27.6	29.6	29.9	29.1	28.7	28.2	25.4	22.8	20.5	19.3	X
Window Top	54.0	X	X	X	X	X	X	29.4	29.5	29.9	30.2	29.5	29.0	28.6	28.2	28.0
STATIC CRUSH (IN)																
Axle Height	9.1	X	X	5.3	8.1	8.7	9.2	9.7	10.1	10.5	10.1	8.9	5.9	3.4	2.5	X
H-Point	20.4	X	5.9	7.8	12.5	15.4	16.5	16.8	15.8	15.2	14.2	11.6	9.4	6.9	4.3	X
Mid Door	22.9	4.4	3.4	6.6	11.6	14.6	15.4	15.3	14.8	14.2	13.7	11.1	8.8	6.3	4.0	3.2
Window Sill	34.1	X	1.8	X	5.6	9.7	11.7	12.1	11.3	10.9	10.4	7.7	5.1	2.8	1.7	X
Window Top	54.0	X	X	X	X	X	X	3.9	4.1	4.6	5.0	4.4	3.9	3.5	3.0	2.6

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

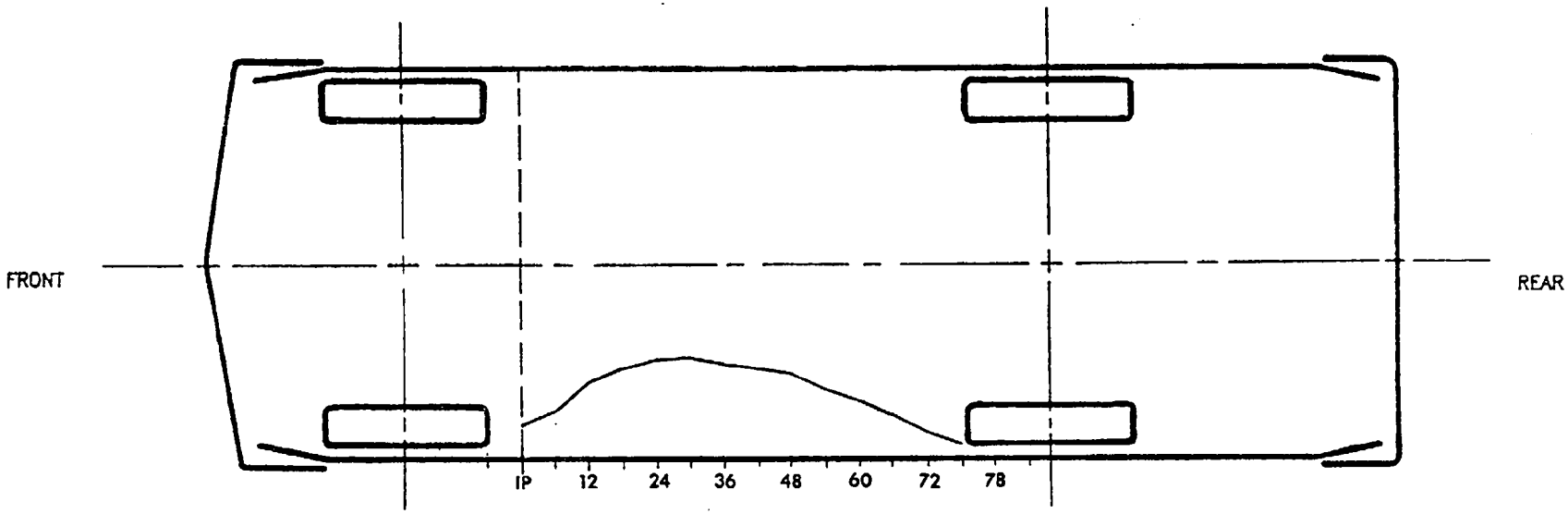
** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



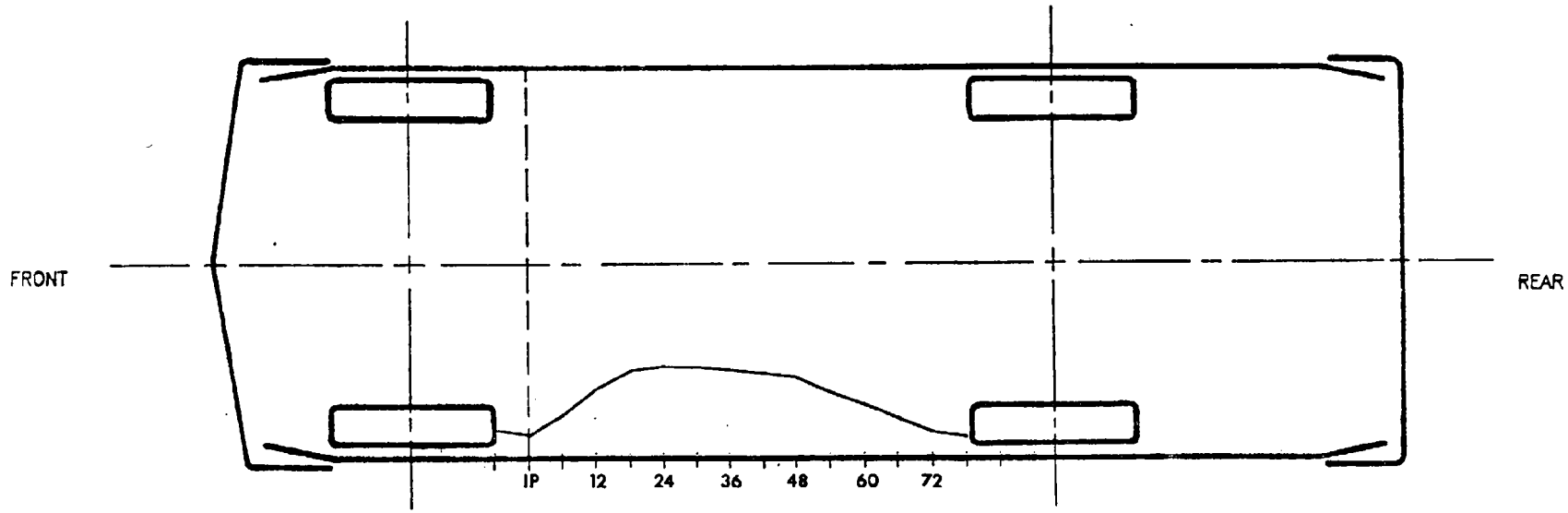
PROFILE LEVEL EQUALS AXLE HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



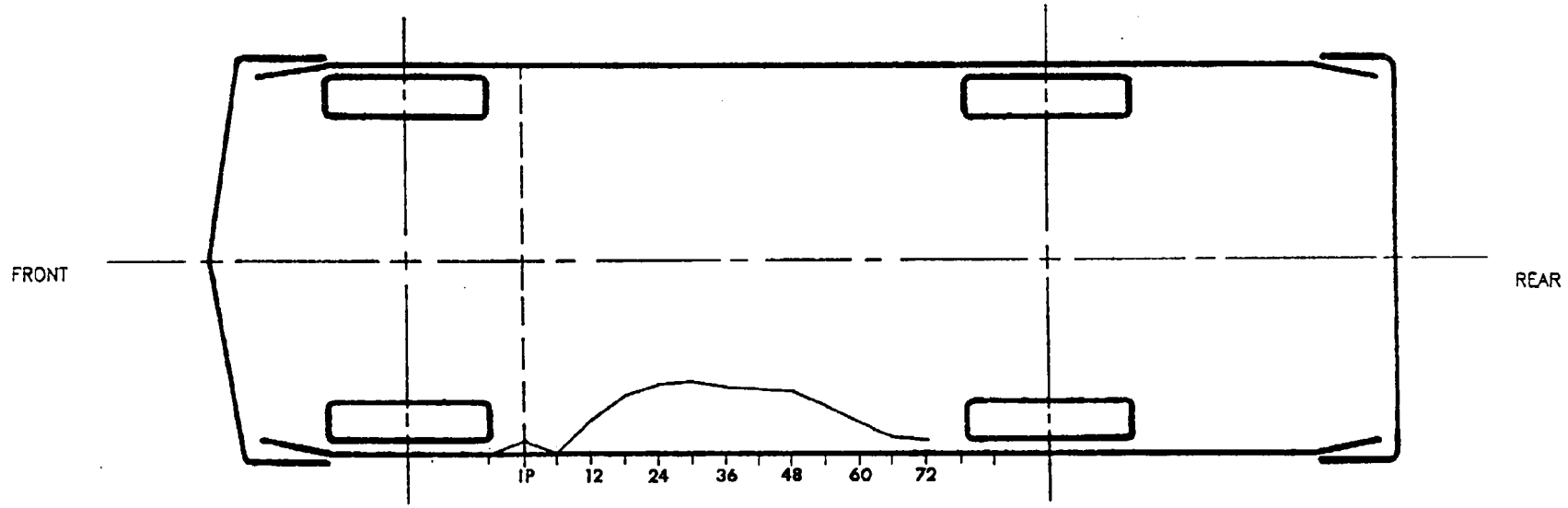
PROFILE LEVEL EQUALS H-POINT HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



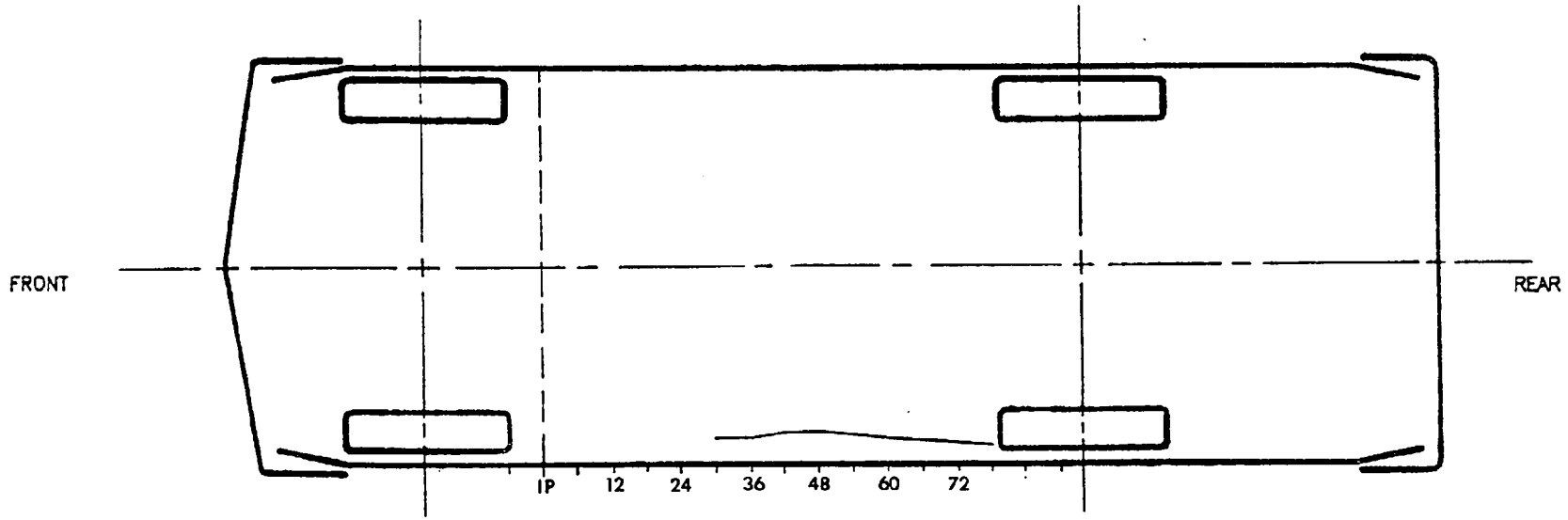
PROFILE LEVEL EQUALS MID-DOOR HEIGHT
IP EQUALS PROJECTED IMPACT POINT

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 DIRECTION*		NEGATIVE DIRECTION**		POSITIVE DIRECTION*		NEGATIVE DIRECTION**	
	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
HEAD ACCELERATION								
LONGITUDINAL	---	--- Y	---	--- Y	8.72	110.38	35.92	90.88
LATERAL	38.27	309.75	14.37	98.63	110.24	90.50	12.84	109.50
VERTICAL	16.04	316.63	71.69	95.13	28.62	118.75	49.93	89.75
RESULTANT		---	--- Y			123.71 @ 90.50		
HIC		---	--- Y		433.51 from 88.88 to 93.25			
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	22.41	311.88	27.34	71.88	8.67	148.13	31.31	117.50
LATERAL (P)***	95.36	73.75	23.10	89.38	38.30	104.38	10.70	153.75
LATERAL (R)***	98.52	73.75	23.59	89.38	39.00	104.38	10.43	153.75
VERTICAL	11.83	95.63	12.89	73.75	5.74	78.75	14.13	120.63
RESULTANT (P)		98.96 @ 73.75				40.85 @ 105.00		
RESULTANT (R)		102.00 @ 73.75				41.54 @ 105.00		
DELTA V (MPH)****		23.6 @ 83.13 (P)				20.5 @ 144.38 (P)		
		24.8 @ 83.75 (R)				21.1 @ 144.38 (R)		
LOWER SPINE								
LONGITUDINAL	32.37	75.62	43.78	65.63	3.74	182.50	21.16	116.25
LATERAL (P)	104.56	65.00	41.06	88.13	35.38	105.00	3.28	183.12
LATERAL (R)	105.10	65.00	40.08	88.13	36.05	105.00	3.32	182.50
VERTICAL	17.91	68.75	6.20	90.00	5.83	89.38	9.30	120.63
RESULTANT (P)		113.65 @ 65.63				36.75 @ 106.25		
RESULTANT (R)		114.15 @ 65.63				37.38 @ 106.25		
DELTA V (MPH)		33.3 @ 81.88 (P)				20.5 @ 150.62 (P)		
		34.1 @ 82.50 (R)				21.1 @ 151.25 (R)		
LEFT UPPER RIB								
LATERAL (P)	85.94	61.25	10.24	114.37	30.83	109.38	5.08	159.38
LATERAL (R)	86.08	61.25	11.94	114.37	30.68	110.00	4.05	186.88
DELTA V (MPH)		26.3 @ 94.38 (P)				24.4 @ 168.13 (P)		
		26.5 @ 94.38 (R)				23.0 @ 153.13 (R)		
LEFT LOWER RIB								
LATERAL (P)	97.01	60.00	37.33	91.25	28.05	105.00	5.85	250.00
LATERAL (R)	97.58	60.62	43.00	90.62	28.35	105.00	4.57	250.00
DELTA V (MPH)		28.9 @ 87.38 (P)				20.8 @ 185.00 (P)		
		29.6 @ 87.38 (R)				23.0 @ 186.25 (R)		
PELVIS ACCELERATION								
LONGITUDINAL	15.85	198.00	54.50	61.00	7.09	75.88	33.17	65.00
LATERAL	162.16	58.25	16.47	72.00	35.93	96.38	20.34	83.50
VERTICAL	9.24	65.50	5.63	62.38	5.91	103.13	5.17	122.25
RESULTANT		164.15 @ 58.25				37.86 @ 96.38		
DELTA V (MPH)		29.4 @ 107.13				23.8 @ 201.75		

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE DIRECTION*		NEGATIVE DIRECTION**		POSITIVE DIRECTION*		NEGATIVE DIRECTION**	
	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)
RIB DEFLECTION †	0.04	190.38	1.90	119.13	0.15	255.00	1.17	116.00

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

ϒ SEE TEST ANOMALIES

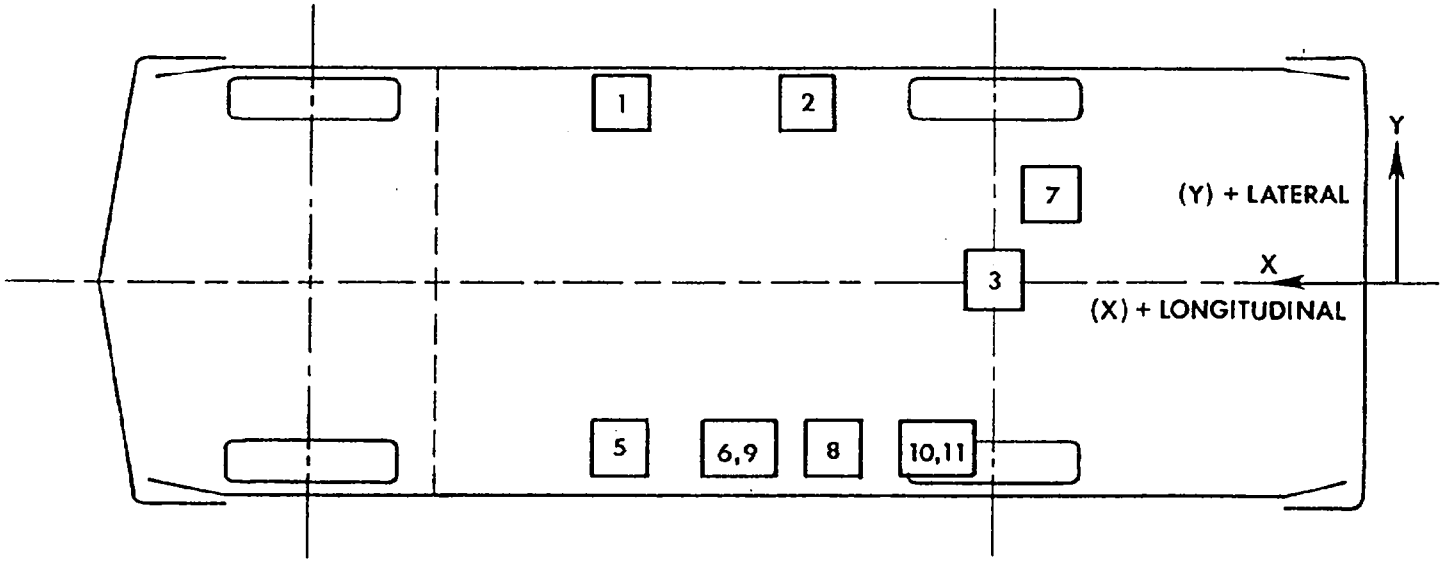
VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

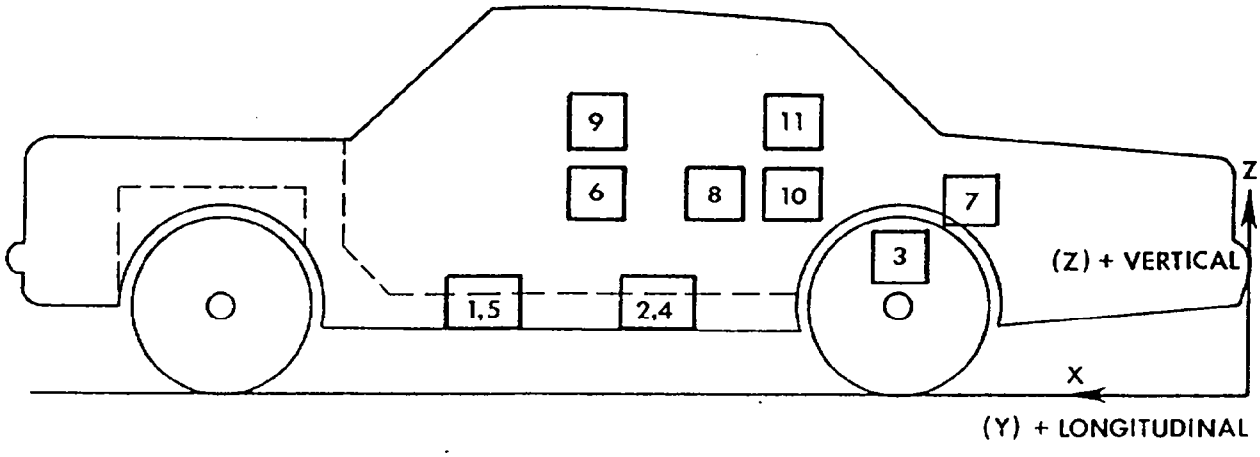
NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX (g)	POSITIVE DIRECTION TIME (msec)	NEGATIVE DIRECTION MAX (g)	NEGATIVE DIRECTION TIME (msec)
1	RIGHT SILL AT FRONT SEAT	97.4	23.6	9.8				
	(LONGITUDINAL)	Δ V = -6.4 mph @ 140.00 msec			2.54	118.88	5.92	107.13
	(LATERAL)	Δ V = 10.6 mph @ 140.00 msec			13.75	84.00	4.31	137.63
	(VERTICAL)				9.90	96.75	6.88	56.88
	(RESULTANT)					15.34 @ 84.63		
2	RIGHT SILL AT REAR SEAT	64.5	23.8	9.0				
	(LONGITUDINAL)	Δ V = -4.6 mph @ 140.00 msec			3.92	73.75	6.37	96.00
	(LATERAL)	Δ V = 14.7 mph @ 140.00 msec			14.97	106.25	4.26	136.63
	(VERTICAL)				6.50	96.63	6.58	129.63
	(RESULTANT)					15.74 @ 106.38		
3	REAR DECK OVER AXLE	34.8	0.0	18.1				
	(LONGITUDINAL)	Δ V = -8.5 mph @ 140.00 msec			3.11	197.25	13.88	82.13
	(LATERAL)	Δ V = 19.6 mph @ 140.00 msec			20.00	104.13	2.42	135.63
	(VERTICAL)				7.62	148.13	8.99	92.38
	(RESULTANT)					22.66 @ 104.38		
4	LEFT SILL AT REAR SEAT	64.8	-23.3	10.9				
	(LATERAL)	Δ V = 1.2 mph @ 81.75 msec			61.33	82.50	36.10	30.00
5	LEFT SILL AT FRONT SEAT	97.3	-23.6	10.4				
	(LATERAL)	Δ V = 6.5 mph @ 93.50 msec			36.88	13.88	42.61	20.75
6	LEFT FRONT DOOR CENTERLINE	92.4	-26.3	21.4				
	(LATERAL)	Δ V = 21.0 mph @ 47.88 msec			52.37	17.50	24.85	33.63
7	RIGHT REAR COMPARTMENT	27.8	-15.3	18.1				
	(LONGITUDINAL)				4.04	128.88	8.84	83.00
8	MIDREAR OF LEFT FRONT DOOR	84.1	-26.1	24.9				
	(LATERAL)	Δ V = 17.2 mph @ 60.25 msec			50.09	20.50	45.62	129.25
9	UPPER LEFT FRONT DOOR CENTERLINE	92.4	-26.4	30.0				
	(LATERAL)	Δ V = 13.7 mph @ 45.38 msec			46.36	22.50	118.71	64.63
10	MIDREAR OF LEFT REAR DOOR	57.9	-27.1	20.9				
	(LATERAL)	Δ V = 18.9 mph @ 66.13 msec			70.35	59.38	146.42	90.38
11	UPPER LEFT REAR DOOR CENTERLINE	57.9	-26.9	30.4				
	(LATERAL)	Δ V = 21.4 mph @ 82.38 msec			88.52	79.75	79.21	65.50

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

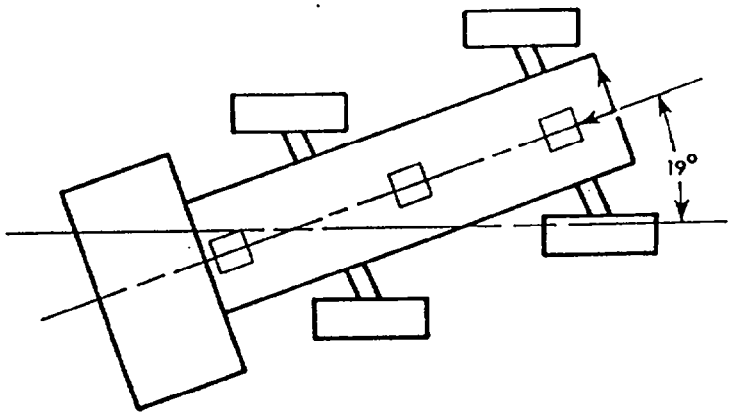
All measurements of accelerometer locations in inches.

VEHICLE ACCELEROMETER LOCATIONS





MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY



NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX (g)	POSITIVE DIRECTION TIME (msec)	NEGATIVE DIRECTION MAX (g)	NEGATIVE DIRECTION TIME (msec)
1	CENTER OF GRAVITY	74.5	0.0	11.5				
	(LONGITUDINAL)	Δ V = -14.5 mph @ 140.00 msec			0.64	170.88	9.14	88.00
	(LATERAL)	Δ V = -1.9 mph @ 140.00 msec			2.29	26.38	3.09	105.13
	(VERTICAL)				10.99	114.88	13.36	122.25
	(RESULTANT)					13.57 @ 122.25		
2	FRONT FRAME MEMBER	130.3	0.0	11.3				
	(LONGITUDINAL)	Δ V = -14.7 mph @ 140.00 msec			0.38	204.00	9.12	85.88
3	REAR FRAME MEMBER	23.3	0.0	11.5				
	(LONGITUDINAL)	Δ V = -13.9 mph @ 140.00 msec			1.41	203.00	8.52	86.13

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

All measurements of accelerometer locations in inches.

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

HIGH SPEED CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead	Photosonics 1B	8	782	Vehicle Dynamics
2	Overhead	Photosonics 1B	25	757	Close-up of impact point
3	Onboard MDB	Photosonics 1B	25	515	Close-up of impact point
4	Onboard MDB	Stalex	13	502	Driver kinematics
5	Ground level - right	Photosonics 1B	25	750	Overall view
6	Ground level - left	Photosonics 1B	17	732	Overall view
7	Onboard vehicle	Photosonics 1B	8	800	Driver kinematics - front view
8	Onboard vehicle	Photosonics 1B	8	805	Driver kinematics
9	Onboard vehicle	Photosonics 1B	8	800	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.

NON-GOVERNMENT FURNISHED TRANSDUCER INFORMATION

PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NUMBER	SERIAL NUMBER	MFGR.	DATE OF LAST CALIBRATION	SENSITIVITY	DESIRED FULL SCALE (ENGR. UNITS)
BCGXG	Accel	4-202-0001	18845	Bell Howell	12/7/83	.237 MV/G	50 G
BCGYG	Accel	4-202-0001	18858	Bell Howell	12/7/83	.240 MV/G	50 G
BCGZG	Accel	4-202-0001	18857	Bell Howell	12/7/83	.240 MV/G	50 G
BFCXG	Accel	4-202-0001	18240	Bell Howell	12/7/83	.240 MV/G	50 G
BRCXG	Accel	4-202-0001	19022	Bell Howell	12/7/83	.222 MV/G	50 G

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

APPENDIX A

PHOTOGRAPHS

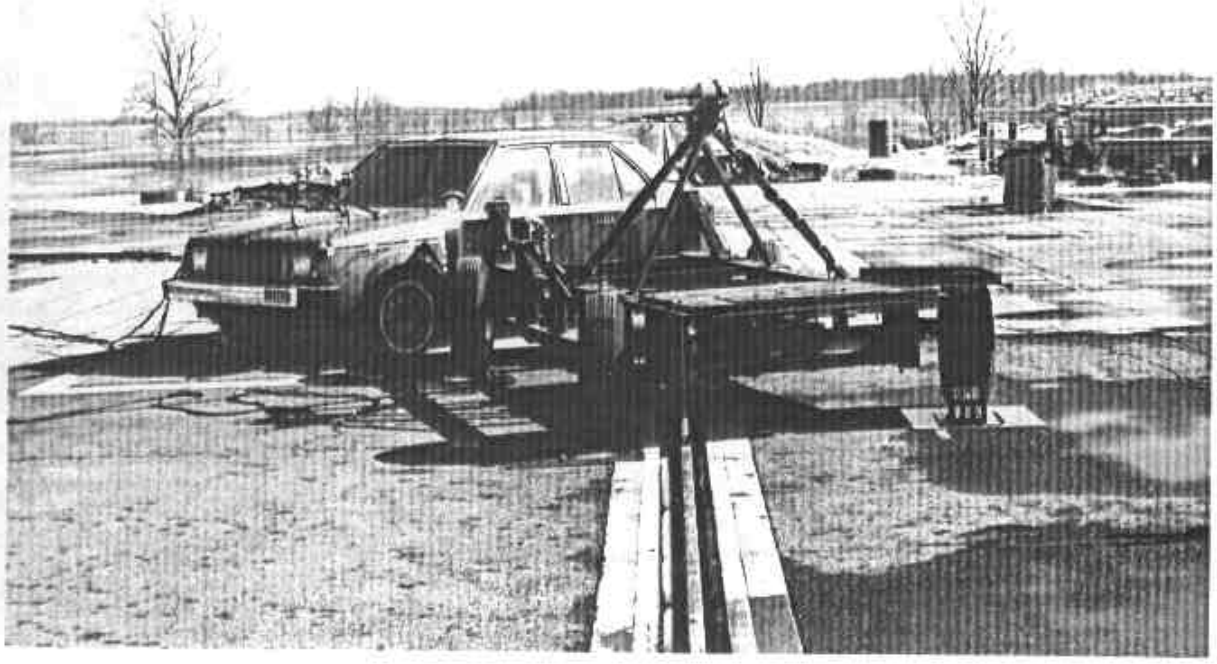


Figure A-1. PRE-TEST OVERALL - VIEW 1

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

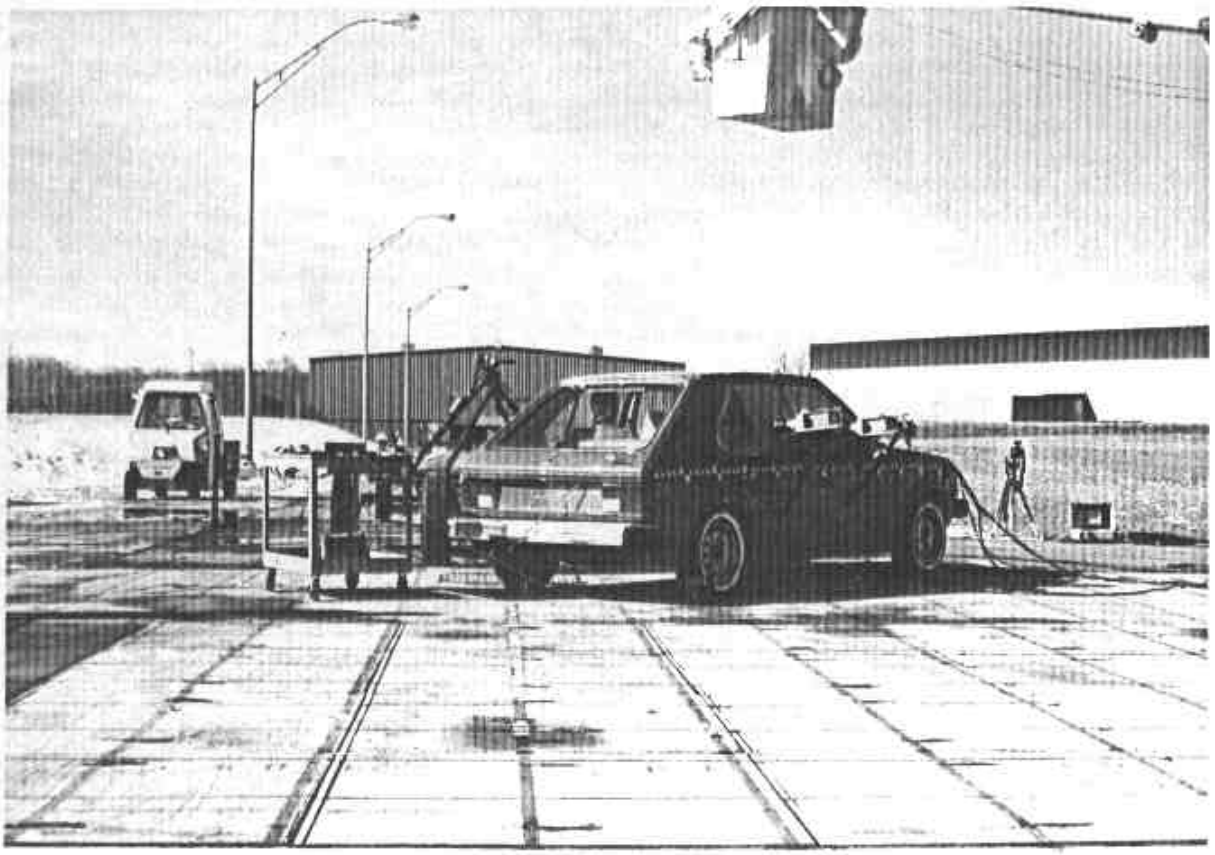


Figure A-3. PRE-TEST OVERALL - VIEW 3

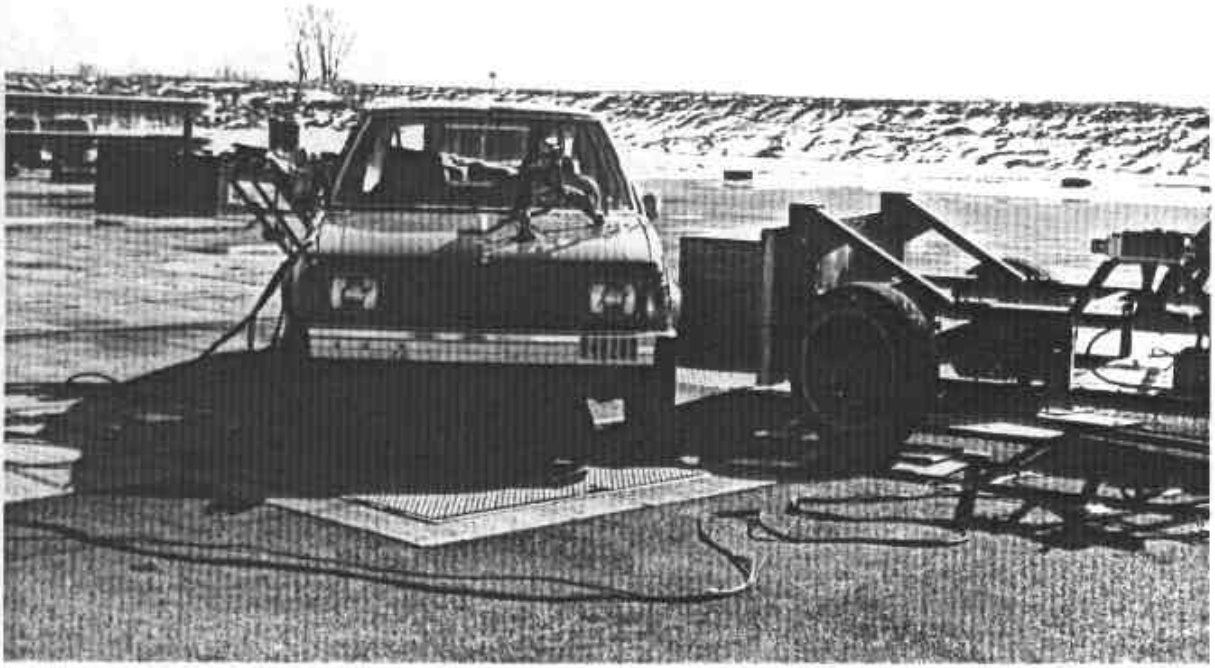


Figure A-4. PRE-TEST OVERALL - VIEW 4

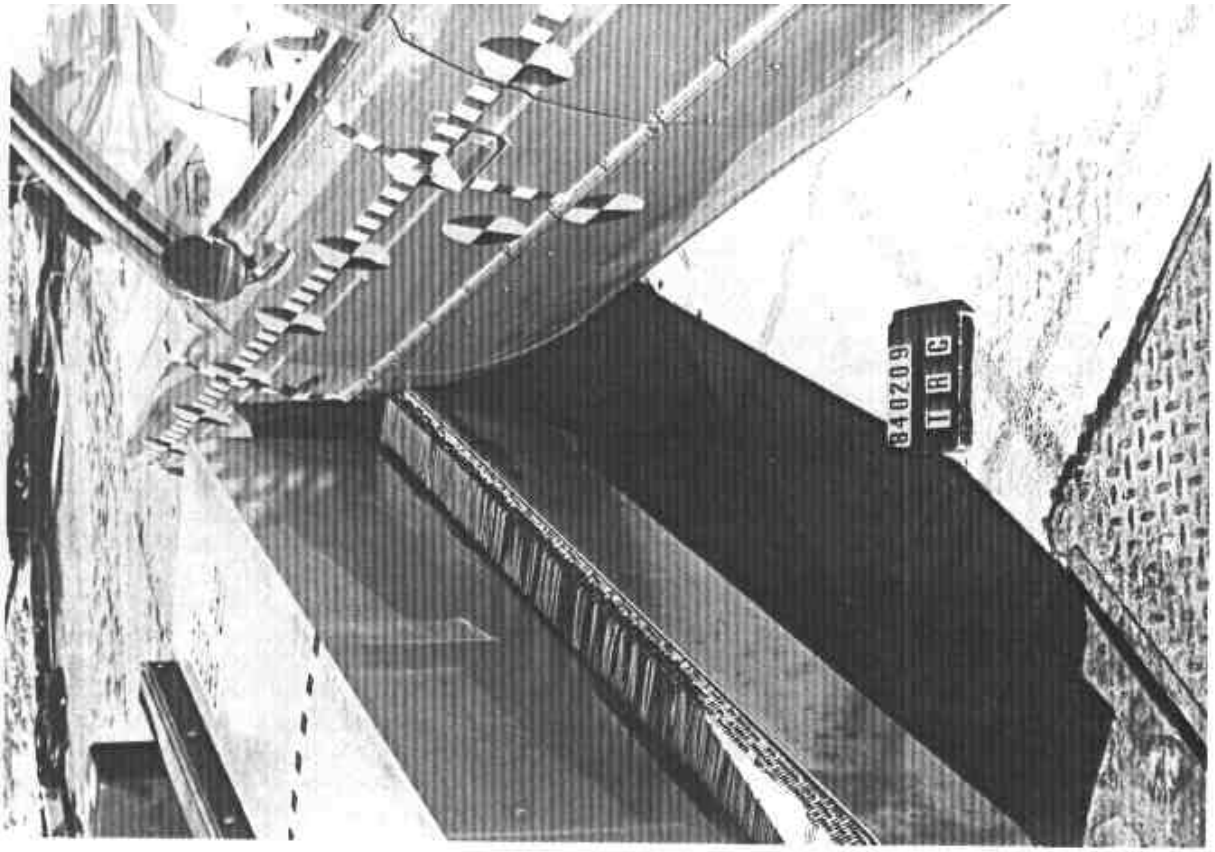


Figure A-5. PRE-TEST CLOSEUP - VIEW 1

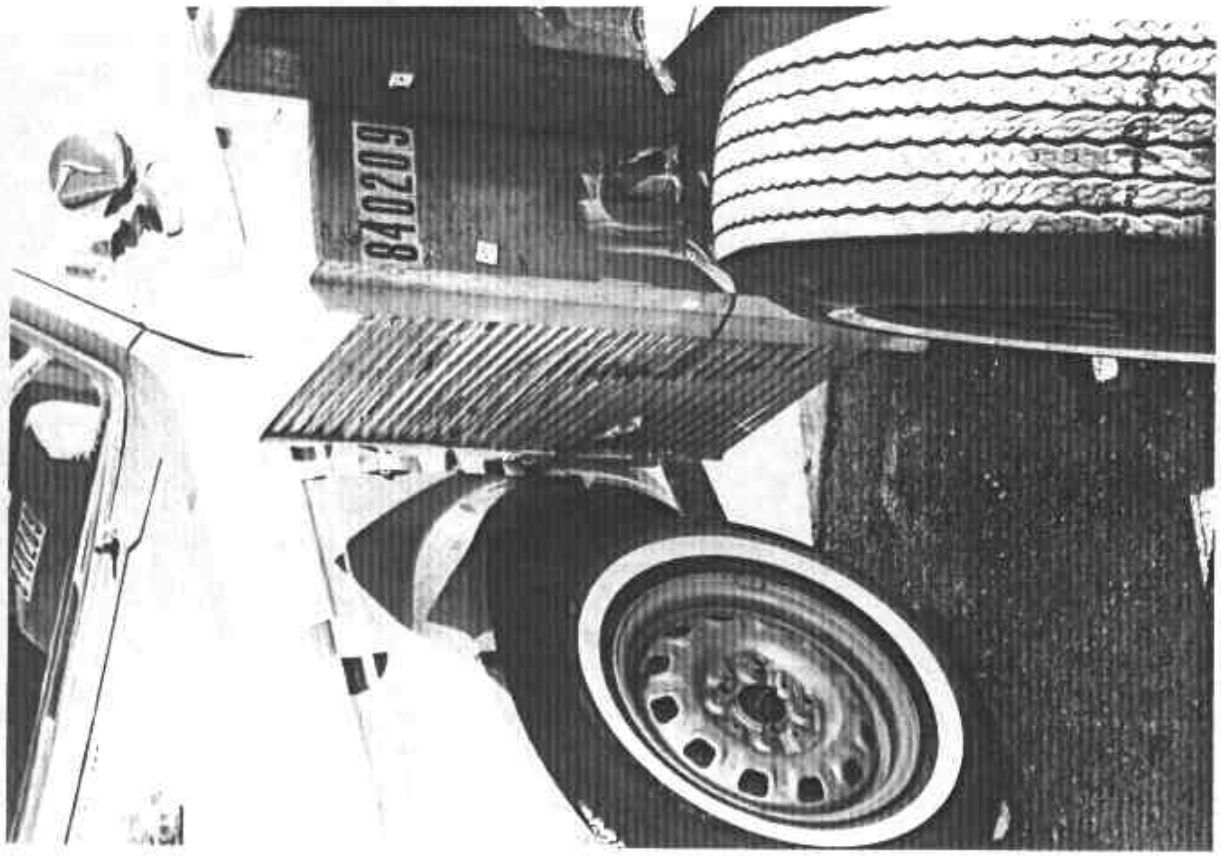


Figure A-6. PRE-TEST CLOSEUP - VIEW 2

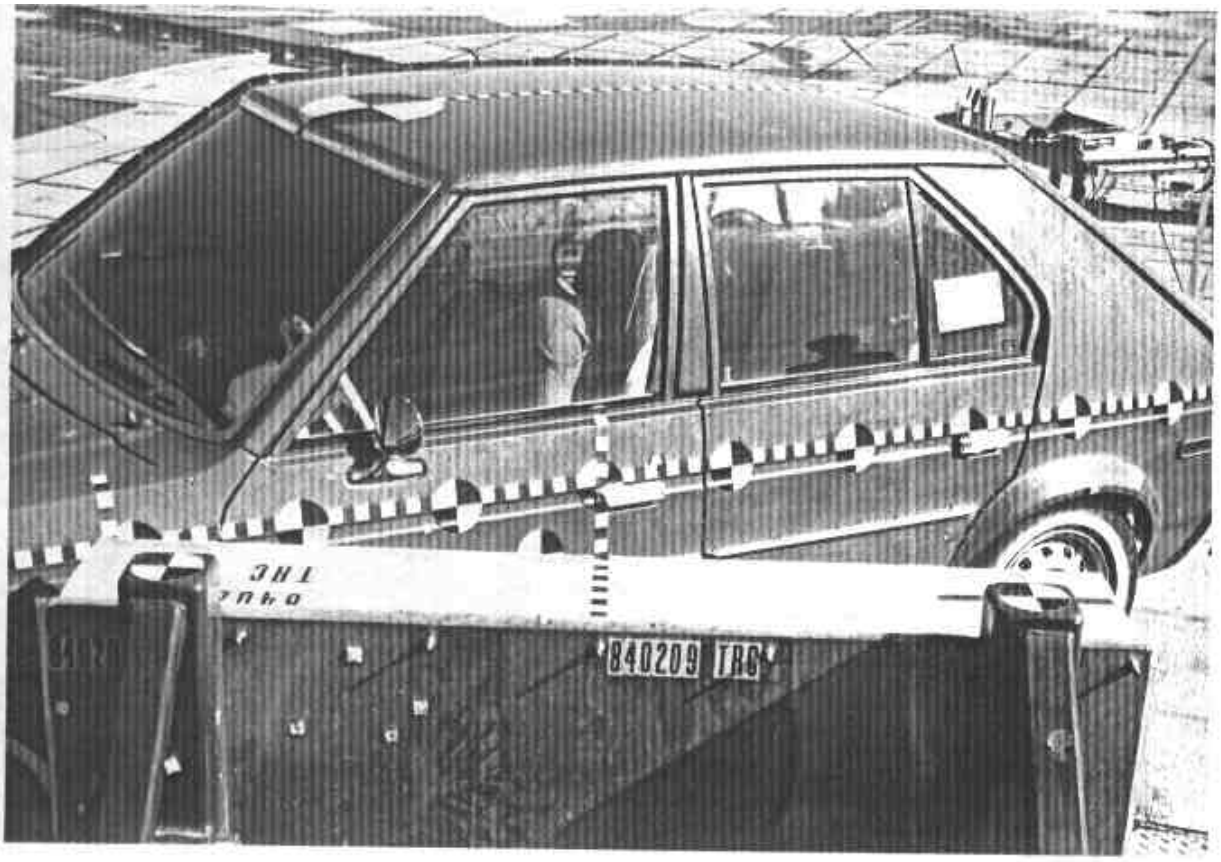


Figure A-7. PRE-TEST CLOSEUP - VIEW 3

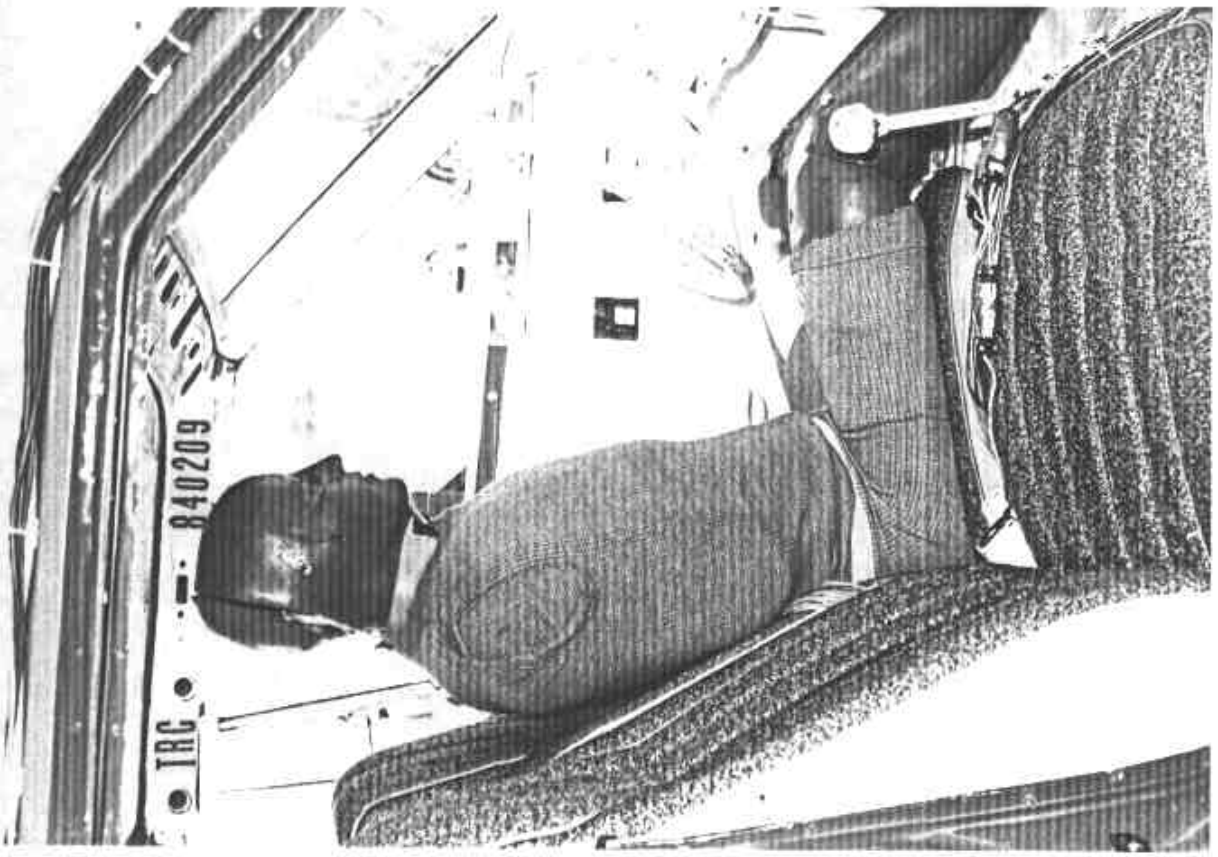


Figure A-8. PRE-TEST DRIVER DUMMY - VIEW 1

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

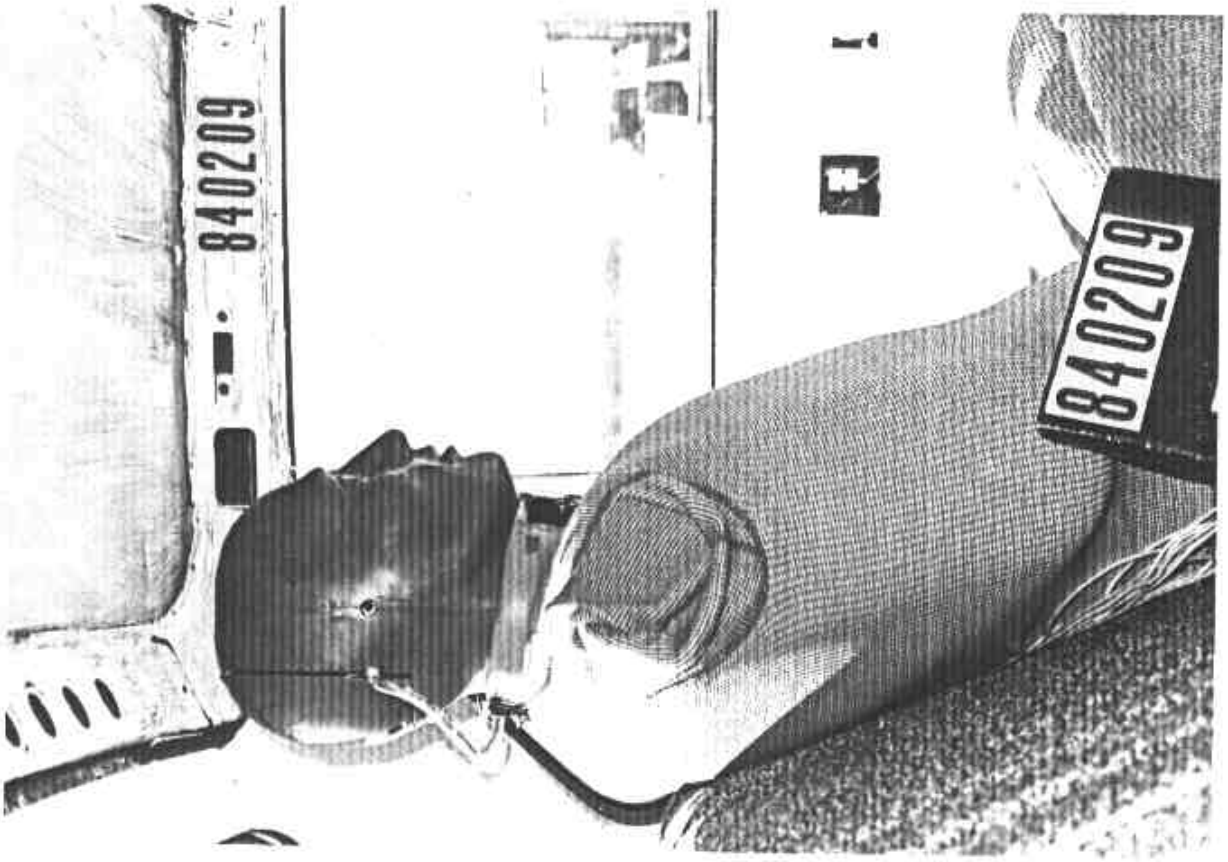


Figure A-10. PRE-TEST PASSENGER DUMMY - VIEW 1

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

Figure A-12. CRASH EVENT PHOTOGRAPH

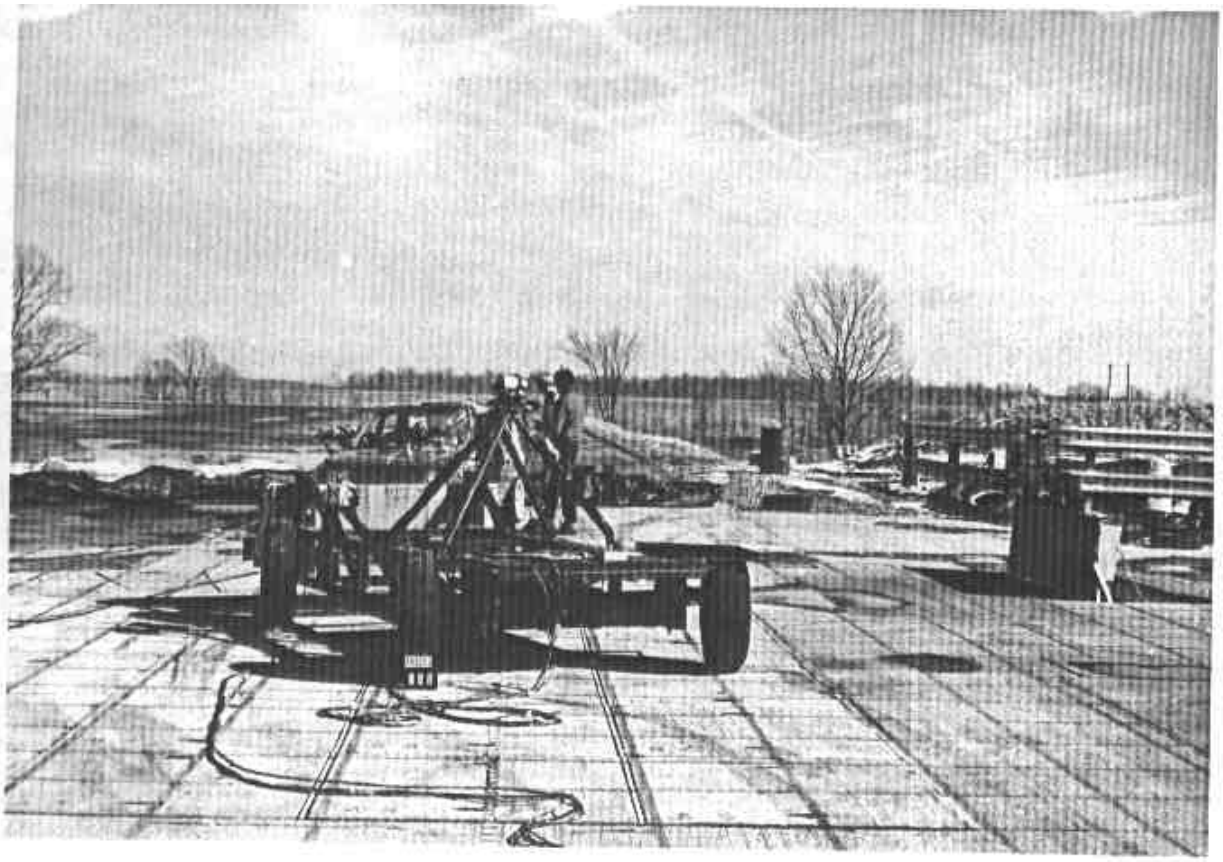


Figure A-13. POST-TEST OVERALL - VIEW 1

Figure A-14. POST-TEST OVERALL - VIEW 2

Figure A-15. POST-TEST OVERALL - VIEW 3

Figure A-16. POST-TEST OVERALL - VIEW 4

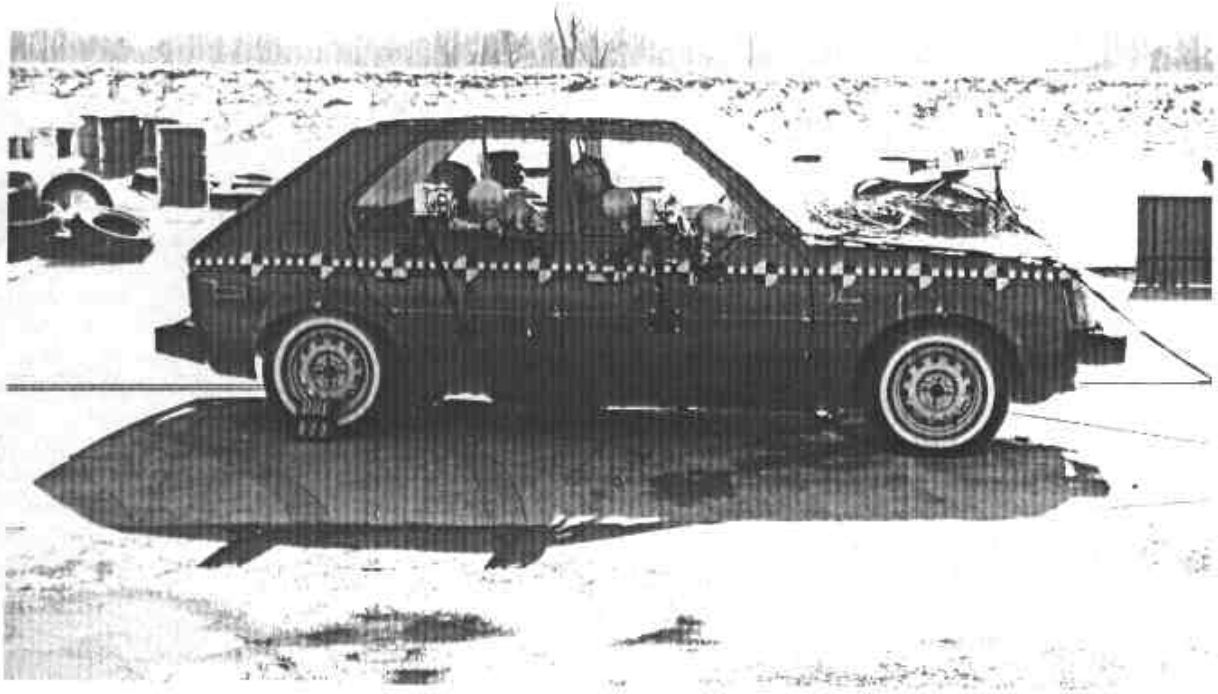


Figure A-17. POST-TEST CLOSEUP - VIEW 1

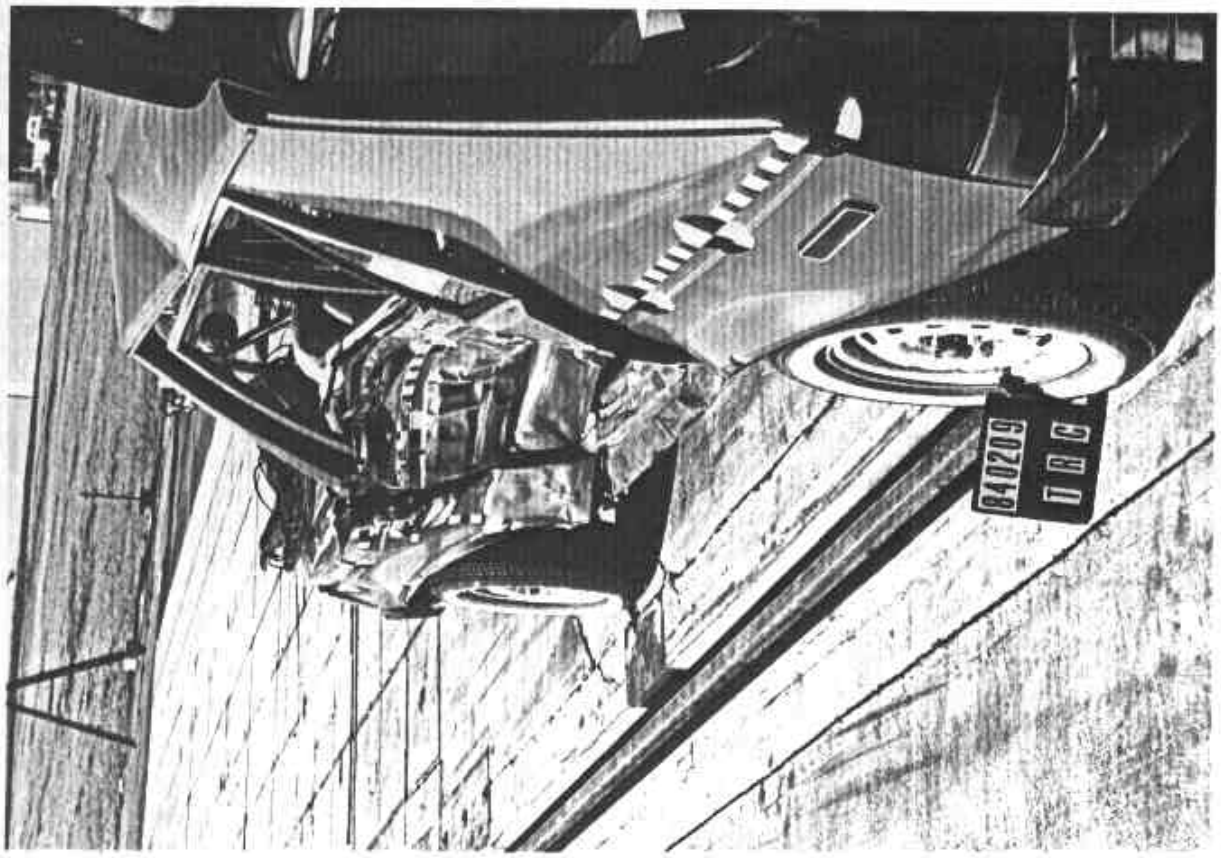


Figure A-18. POST-TEST CLOSEUP - VIEW 2

Figure A-19. POST-TEST DRIVER DUMMY - VIEW 1

Figure A-20. POST-TEST DRIVER DUMMY - VIEW 2

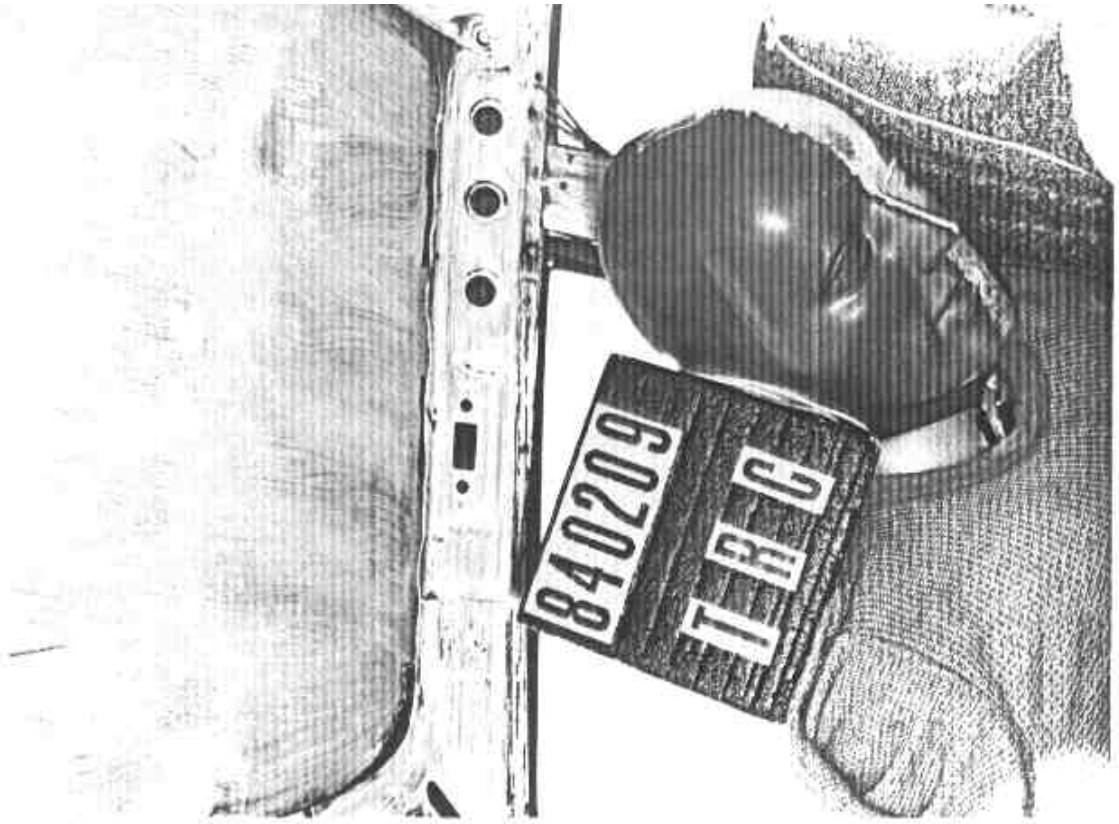


Figure A-21. POST-TEST DRIVER DUMMY - VIEW 3

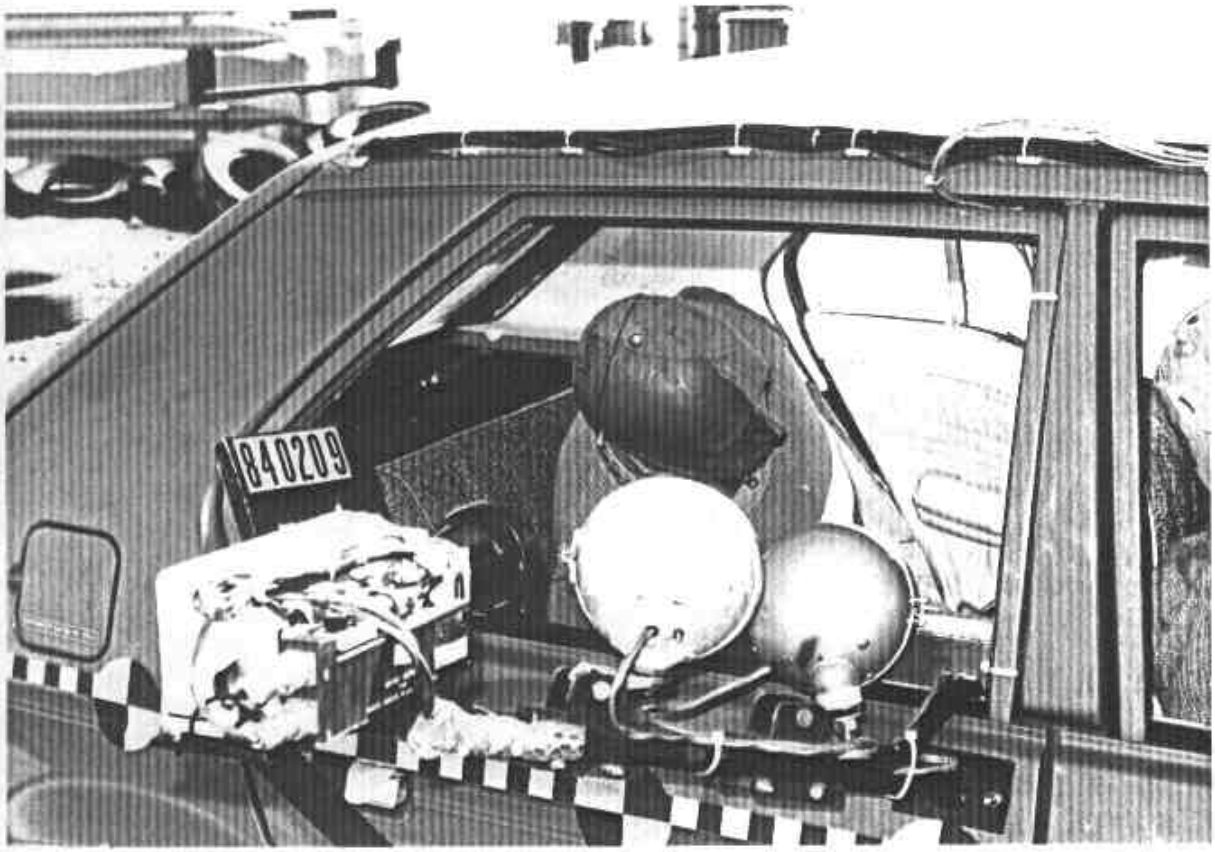


Figure A-22. POST-TEST PASSENGER DUMMY - VIEW 1

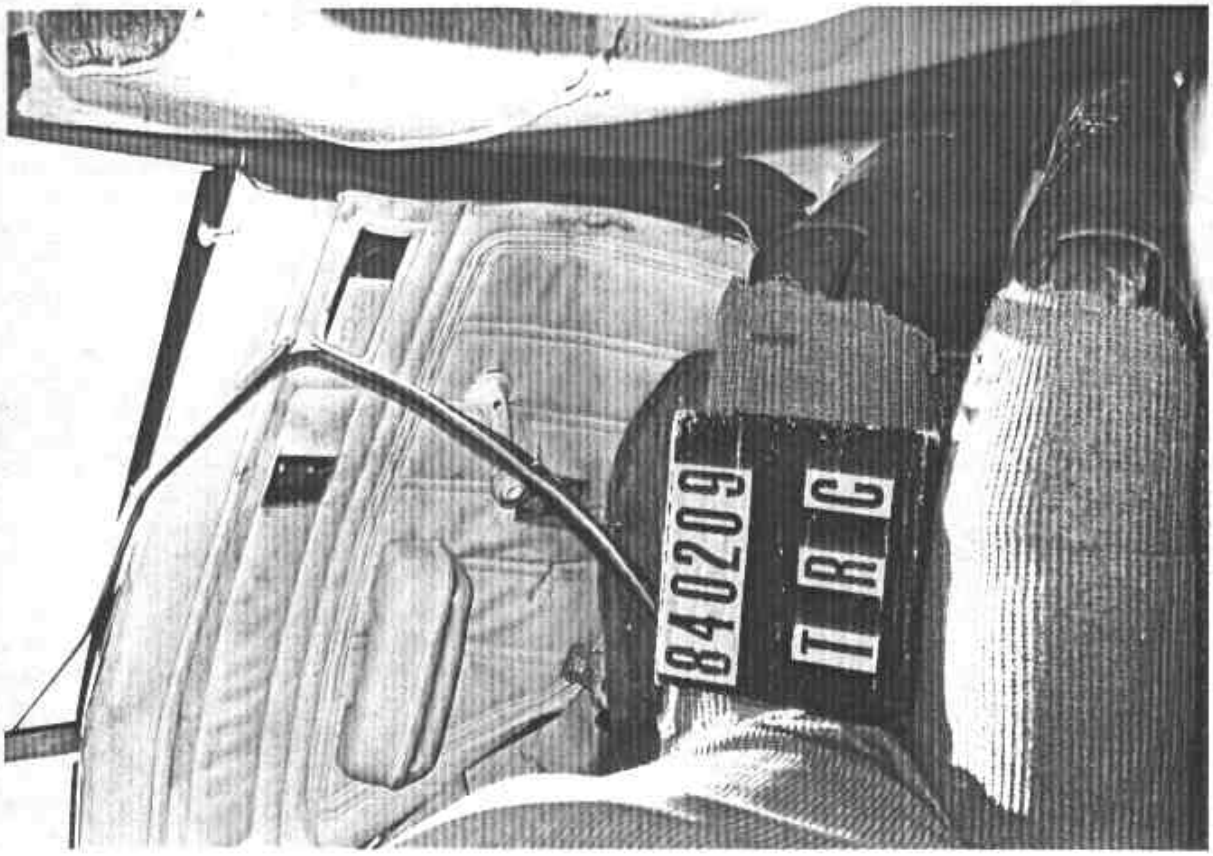


Figure A-23. POST-TEST PASSENGER DUMMY - VIEW 2

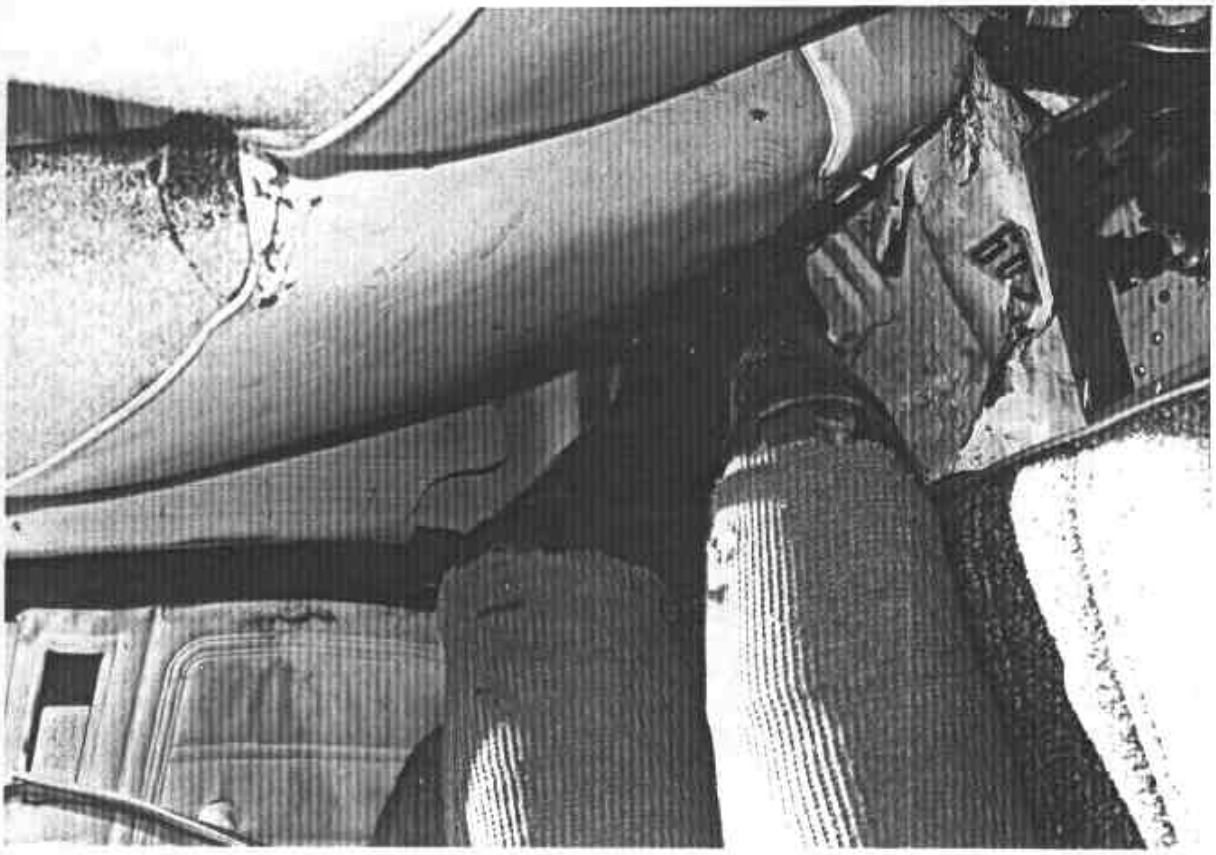


Figure A-24. POST-TEST PASSENGER DUMMY - VIEW 3

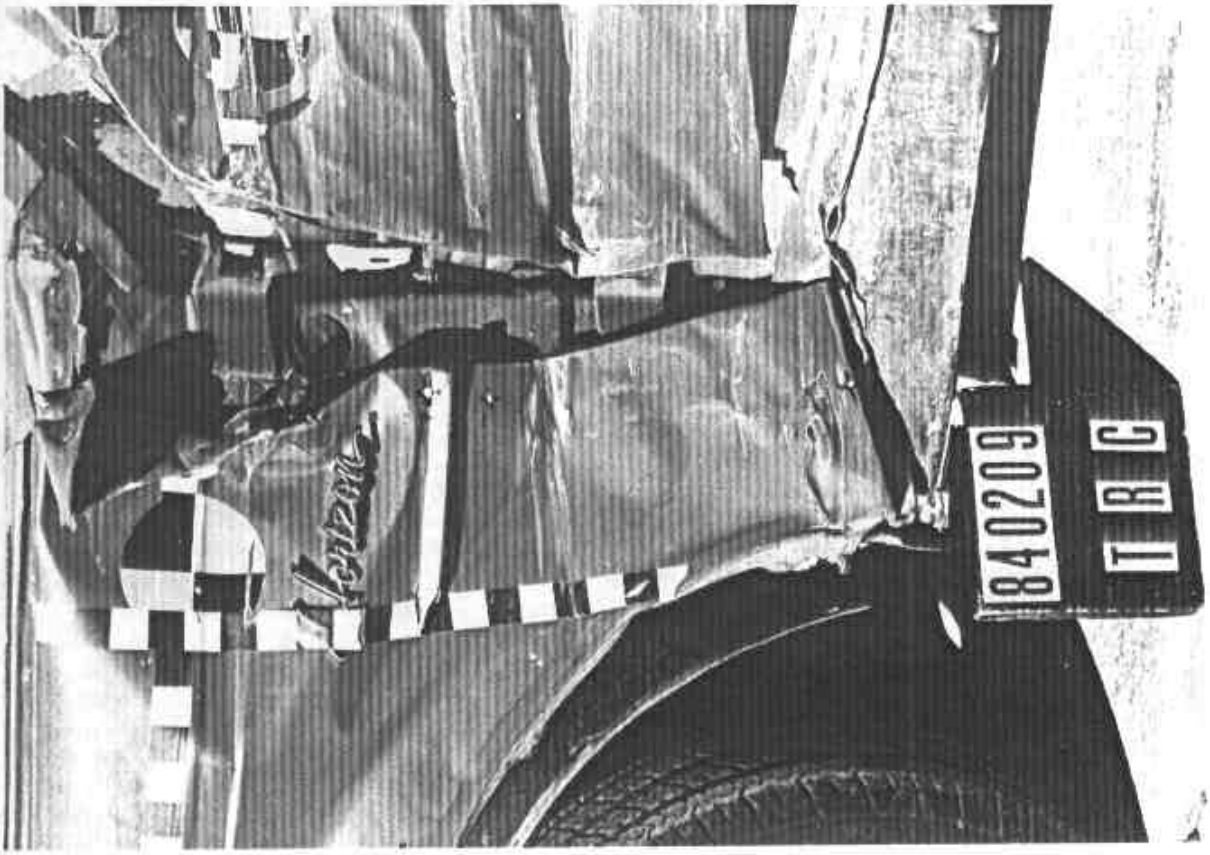


Figure A-25. VEHICLE DAMAGE - VIEW 1

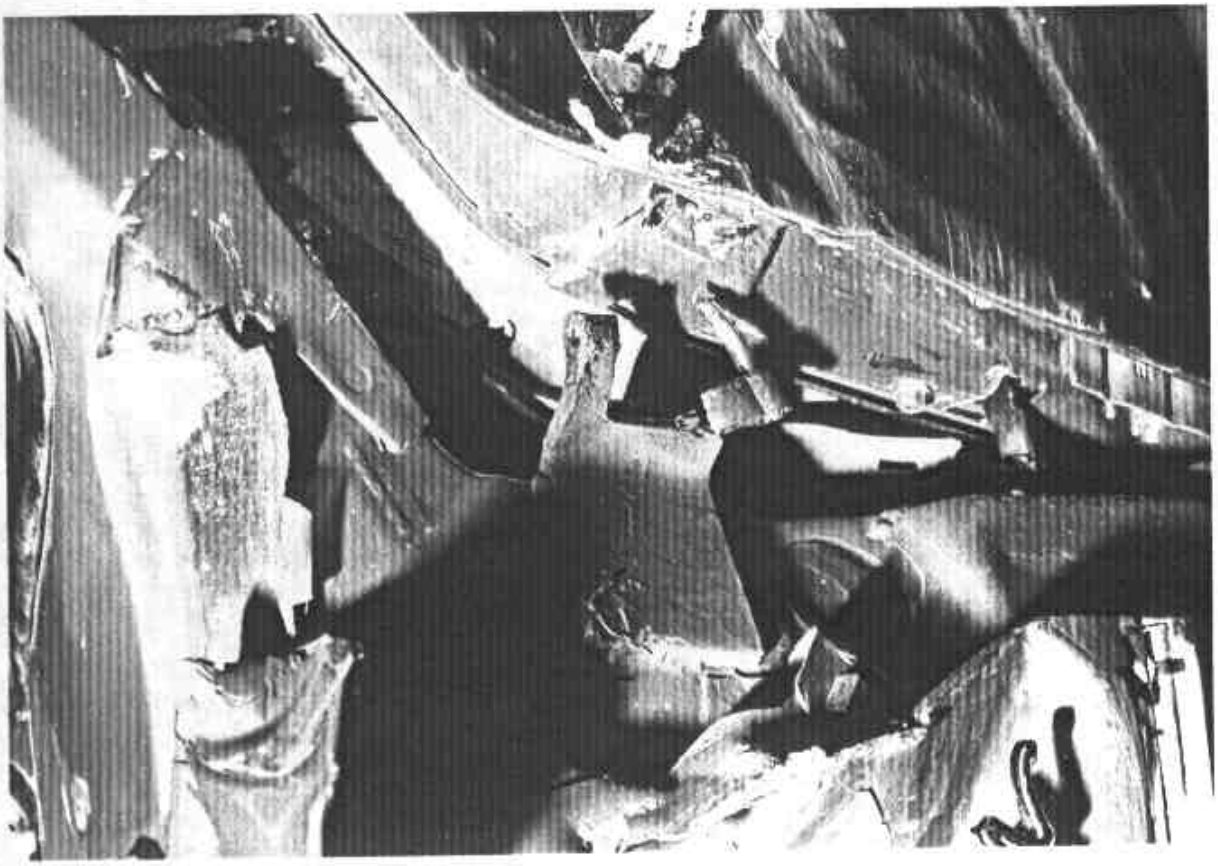


Figure A-26. VEHICLE DAMAGE - VIEW 2

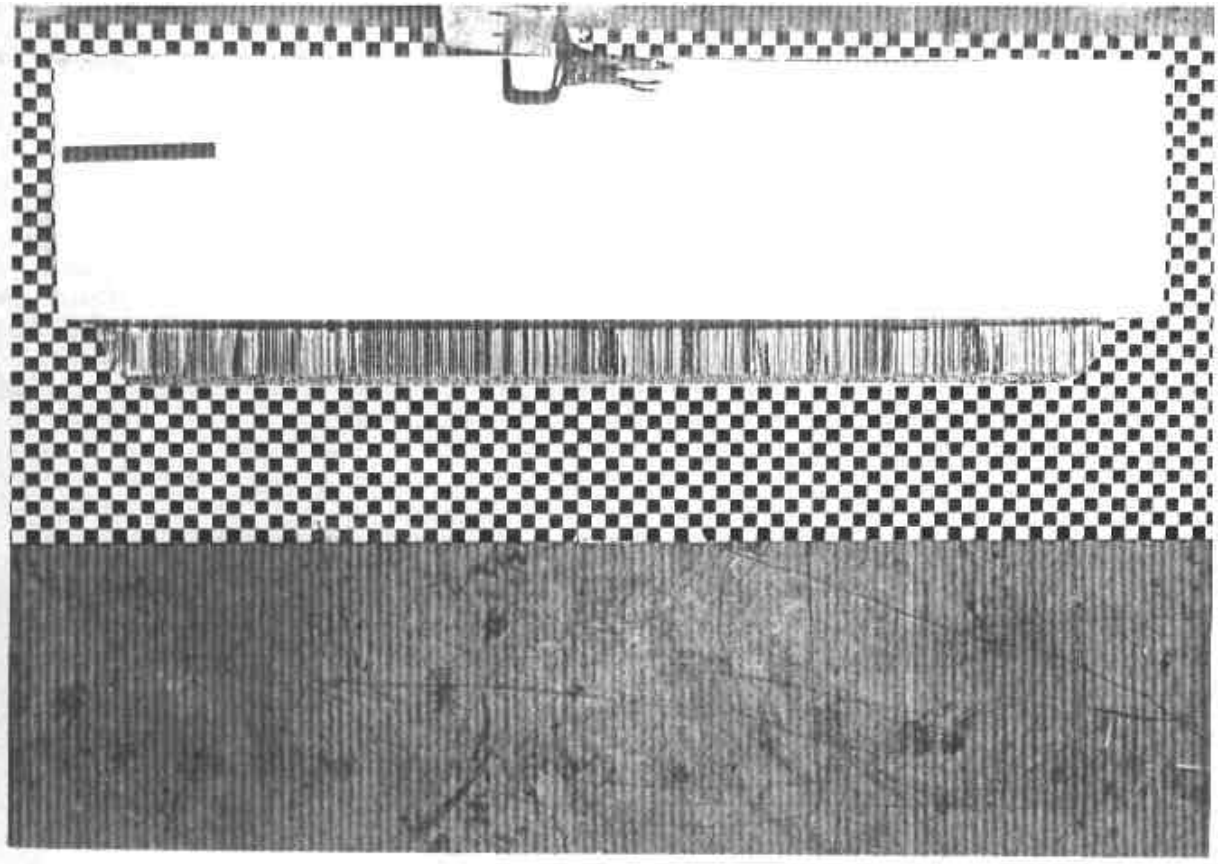


Figure A-27. PRE-TEST MDB FACE - VIEW 1

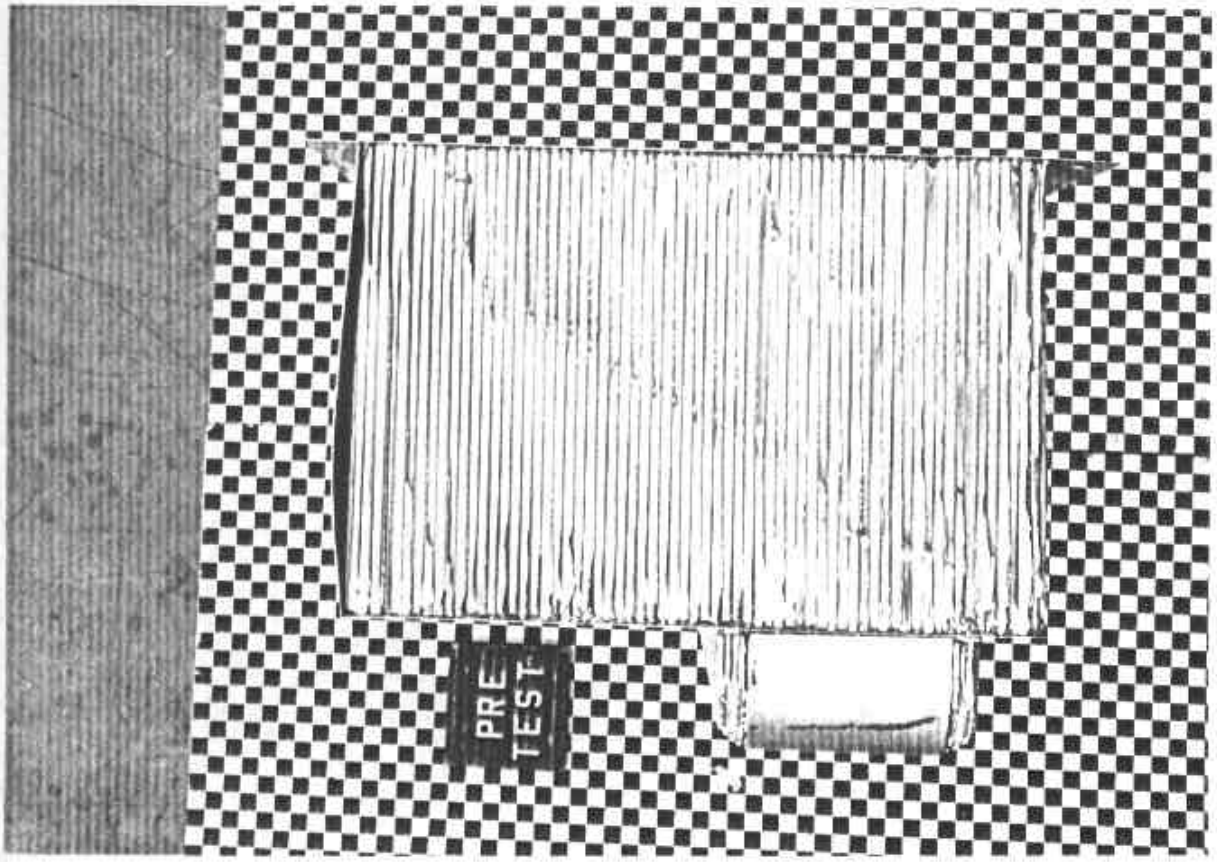


Figure A-28. PRE-TEST MDB FACE - VIEW 2

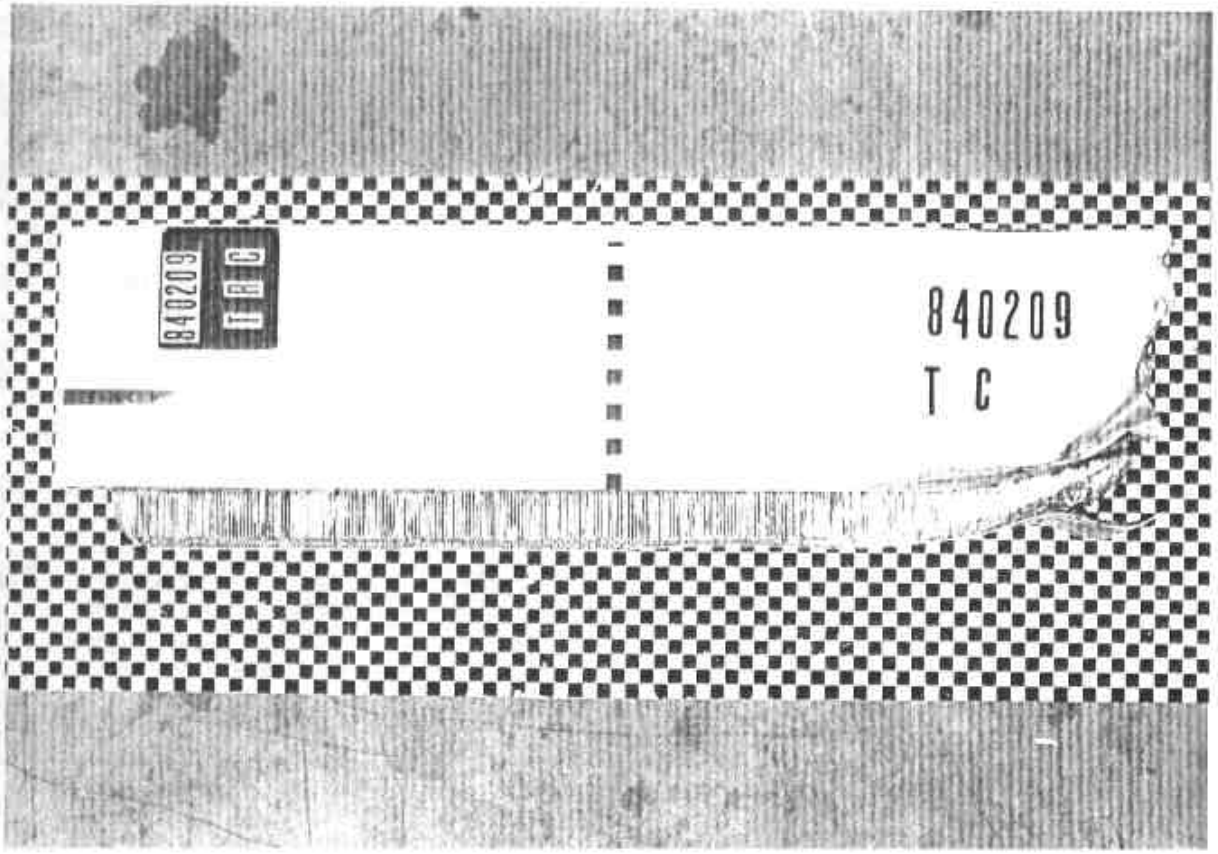


Figure A-29. POST-TEST MDB FACE - VIEW 1

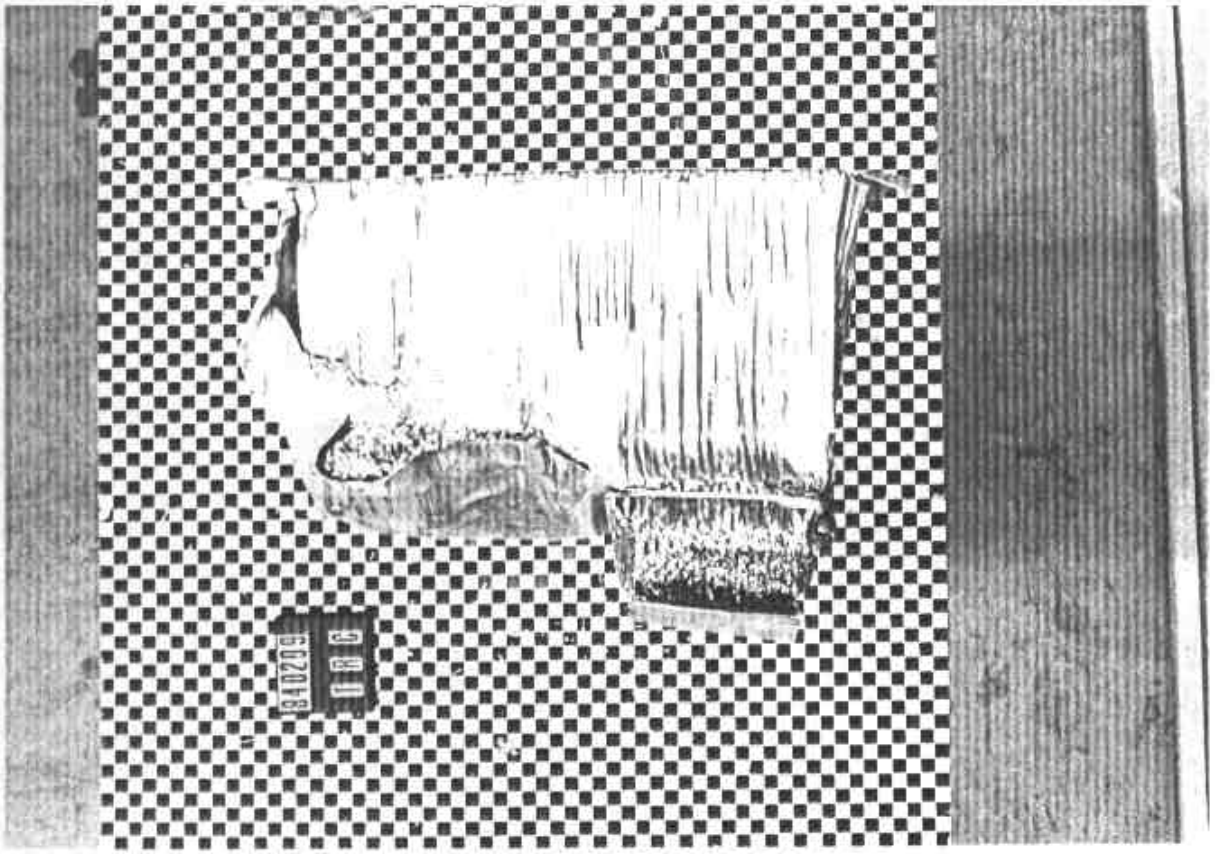
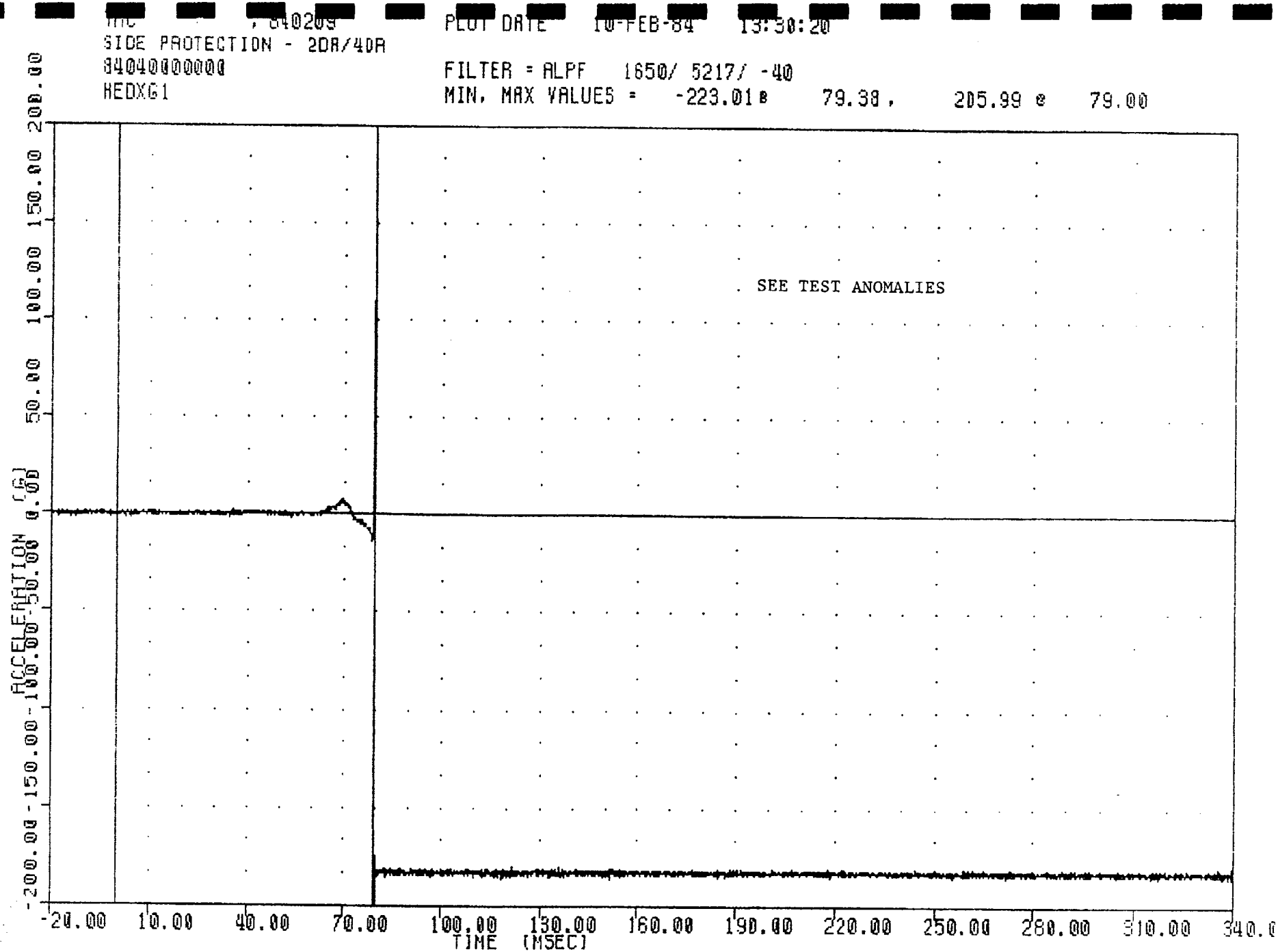


Figure A-30. POST-TEST MDB FACE - VIEW 2

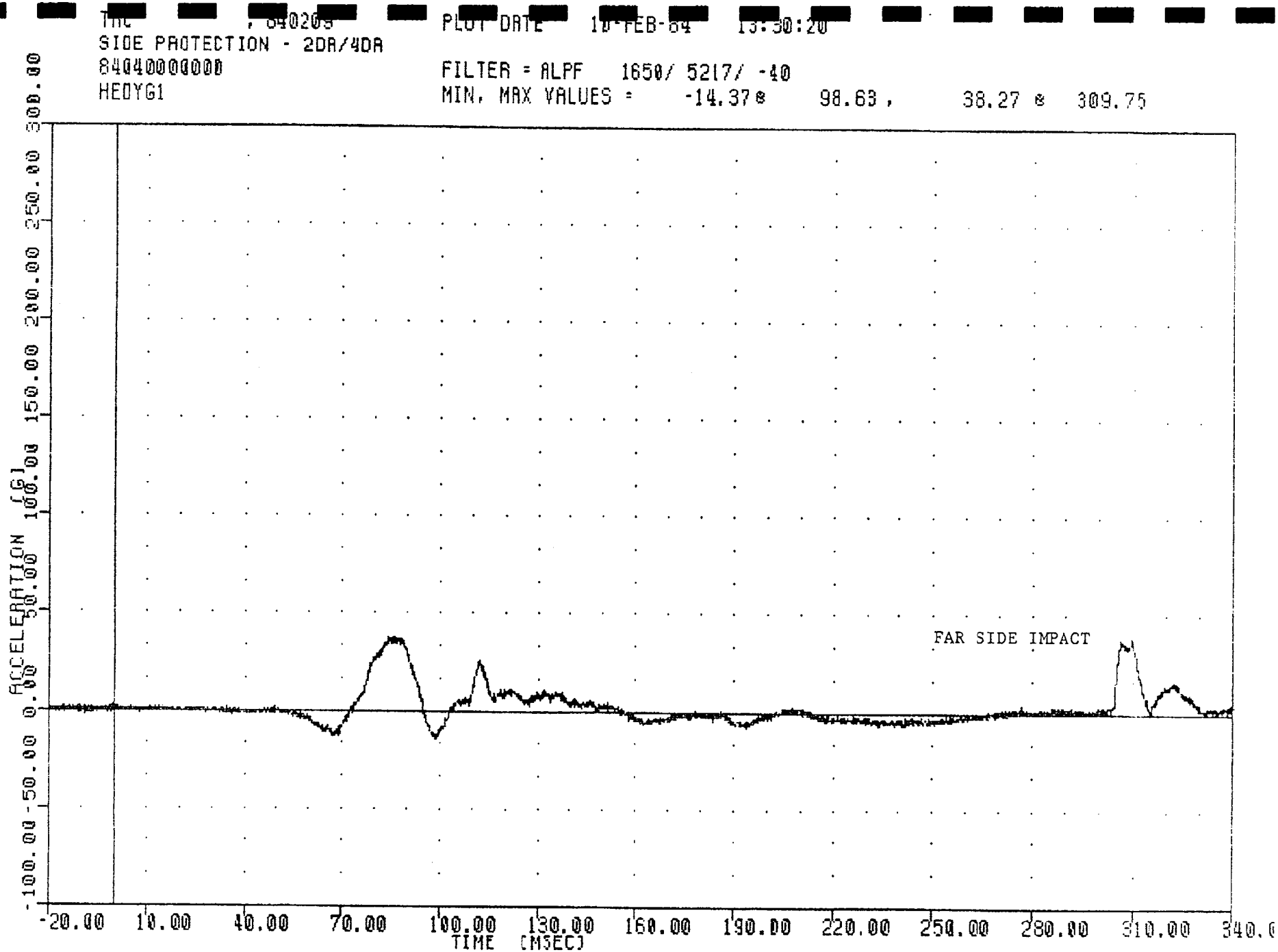
APPENDIX B

DATA PLOT PRESENTATION

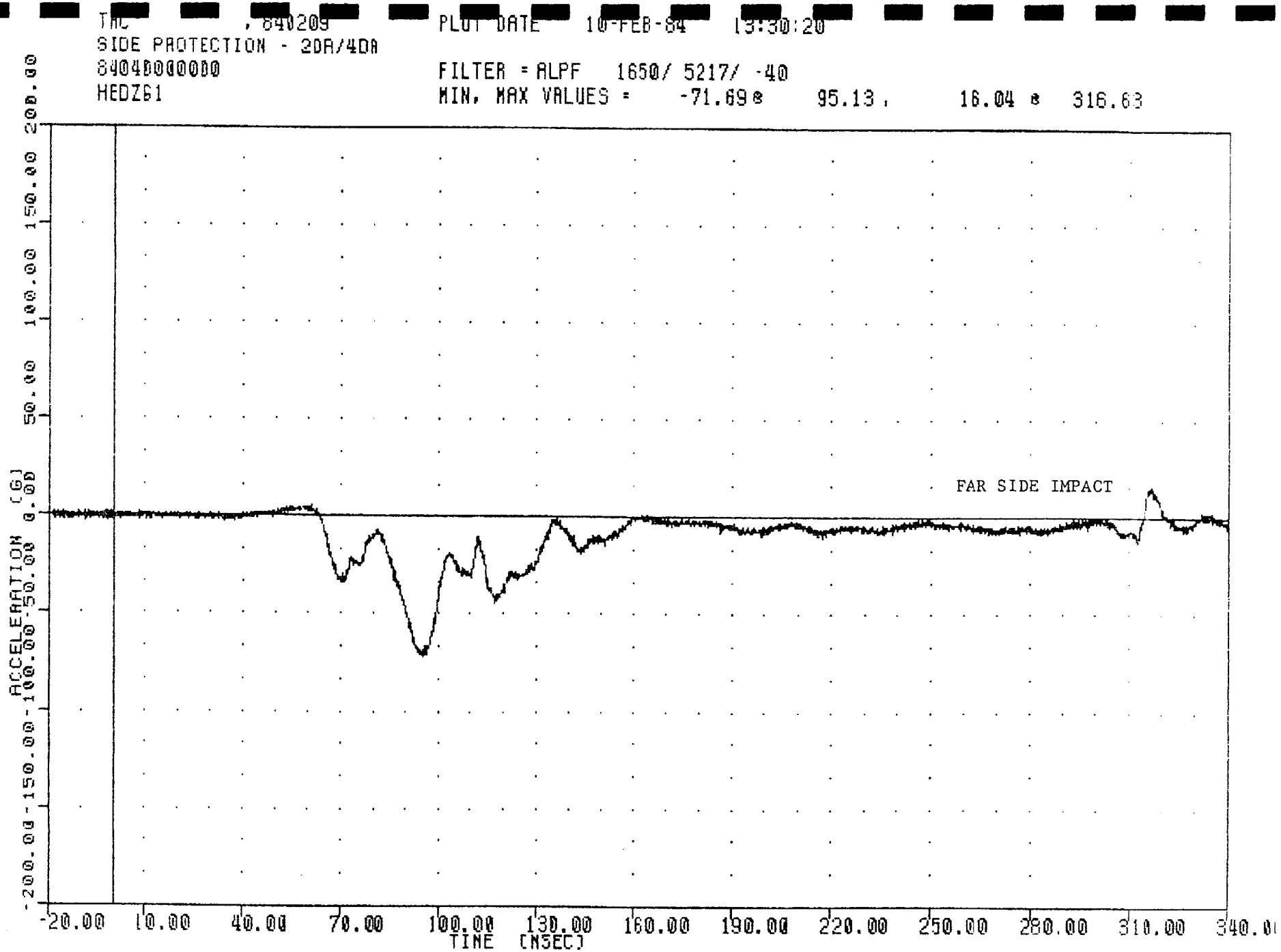
Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data were filtered according to SAE J211, except that dummy thorax data were filtered using the HSRI filter.



MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER HEAD ACCELERATION X AXIS



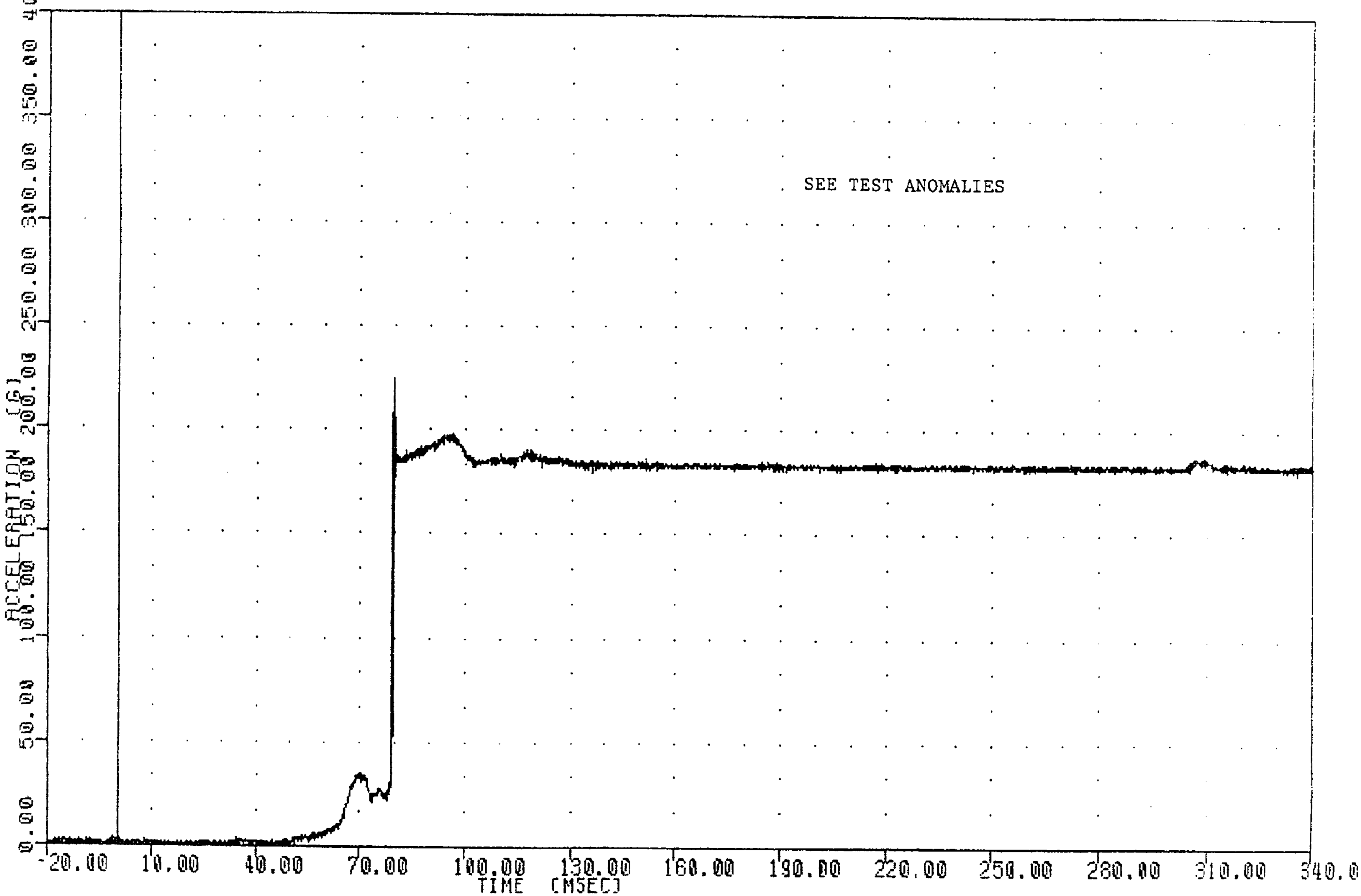
MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER HEAD ACCELERATION Y AXIS



MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER HEAD ACCELERATION Z AXIS

[redacted] 840203 [redacted] PLOT DATE [redacted] FEB-84 [redacted] 15:30:20
SIDE PROTECTION - 2DA/4DA
84040000000D
HEDRG1

FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = 0.04@ 2.63 , 224.89 @ 79.38



MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER HEAD RESULTANT

[redacted] PLOT DATE 10-FEB-84 13:31:10

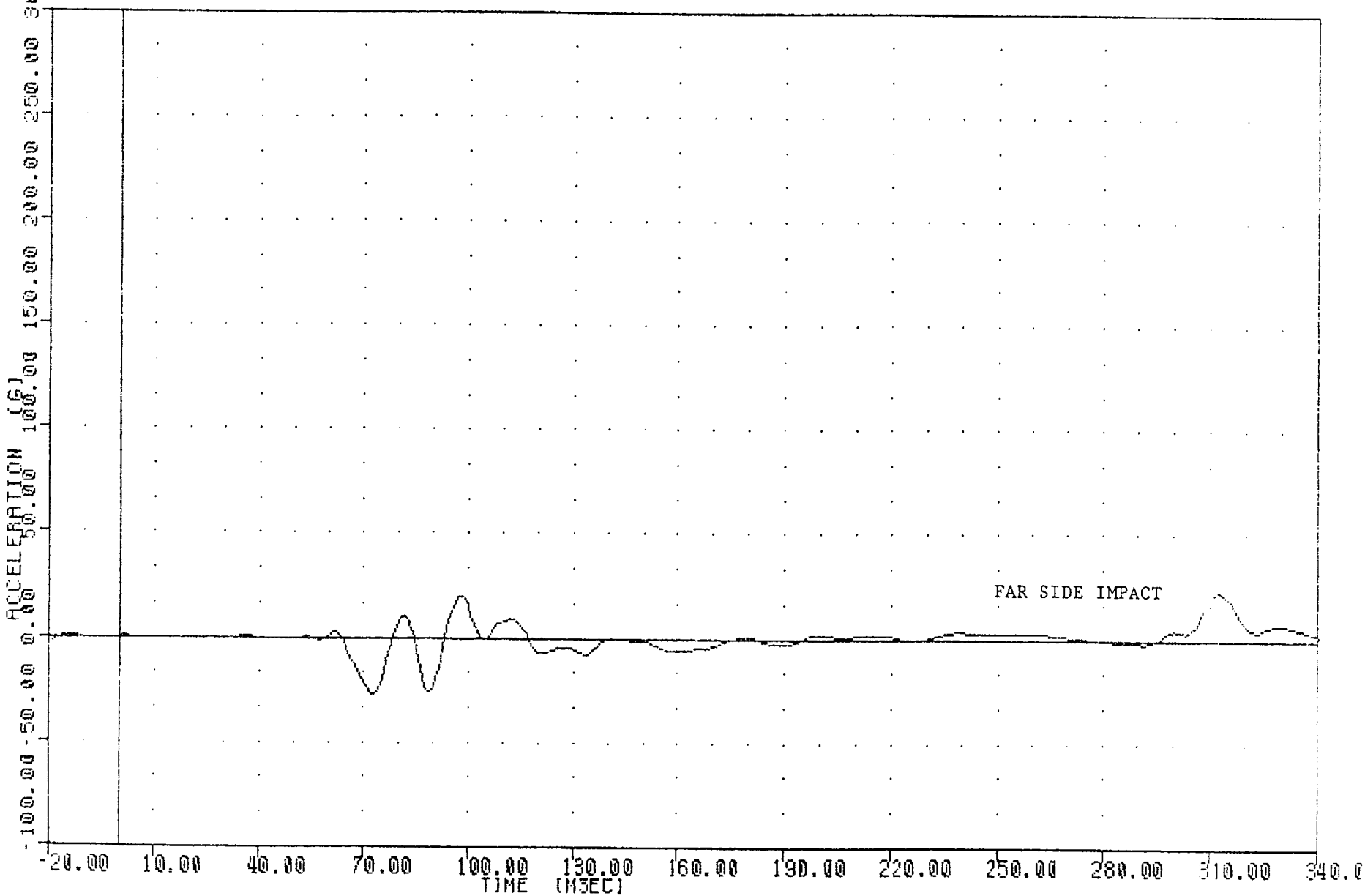
SIDE PROTECTION - 2DR/4DR

840400000000

T01XG1

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -27.34 @ 71.88 , 22.41 @ 311.88



MOVING DEFORMABLE BARRIER INTO HORIZON

DRIVER UPPER SPINE ACCELERATION X AXIS

[redacted] PLOT DATE [redacted] 10-FEB-84 13:31:10

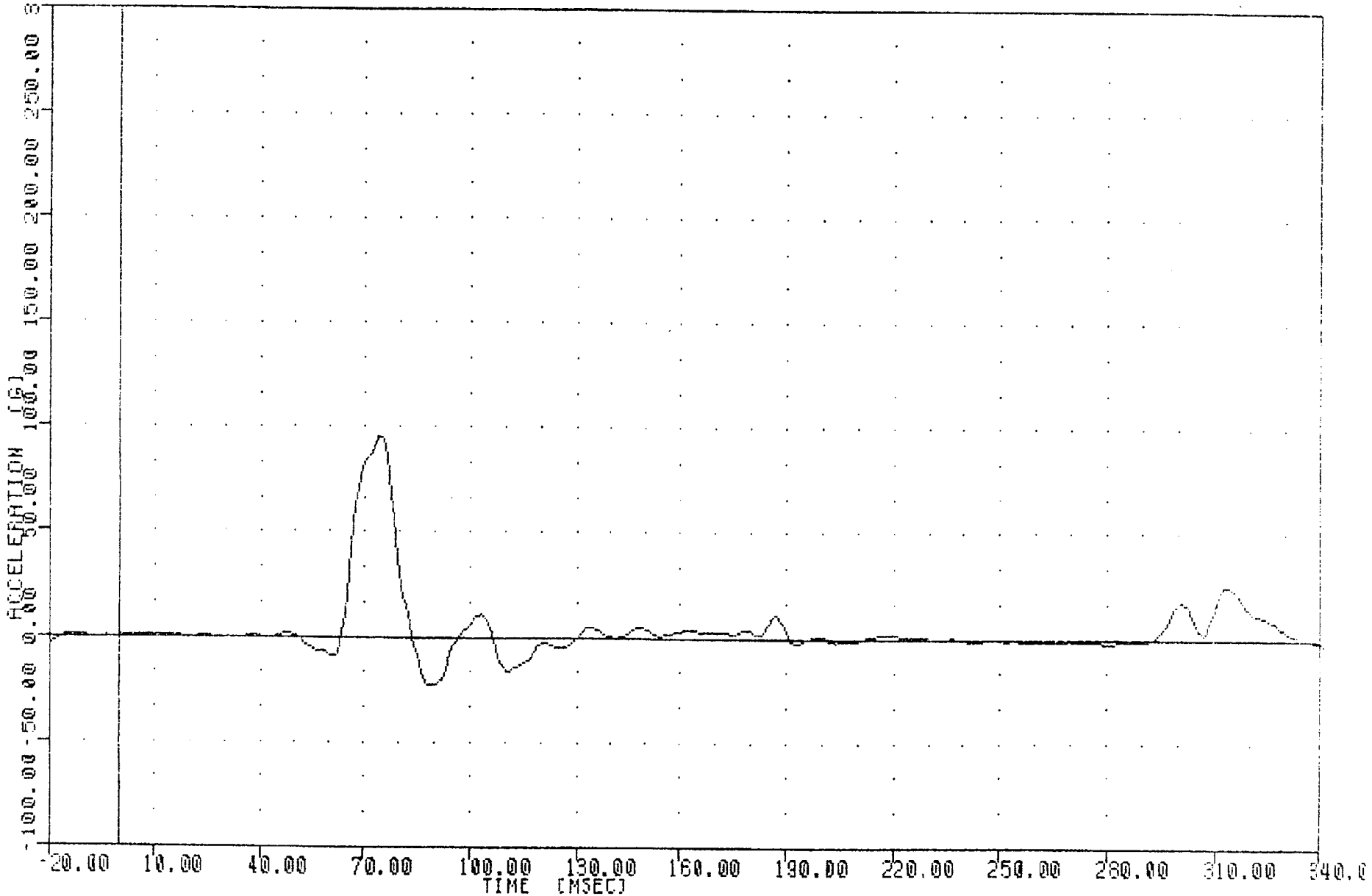
SIDE PROTECTION - 2DA/4DA

84040000000

T01YG1

FILTER = HSRI 136/ 189/ -50

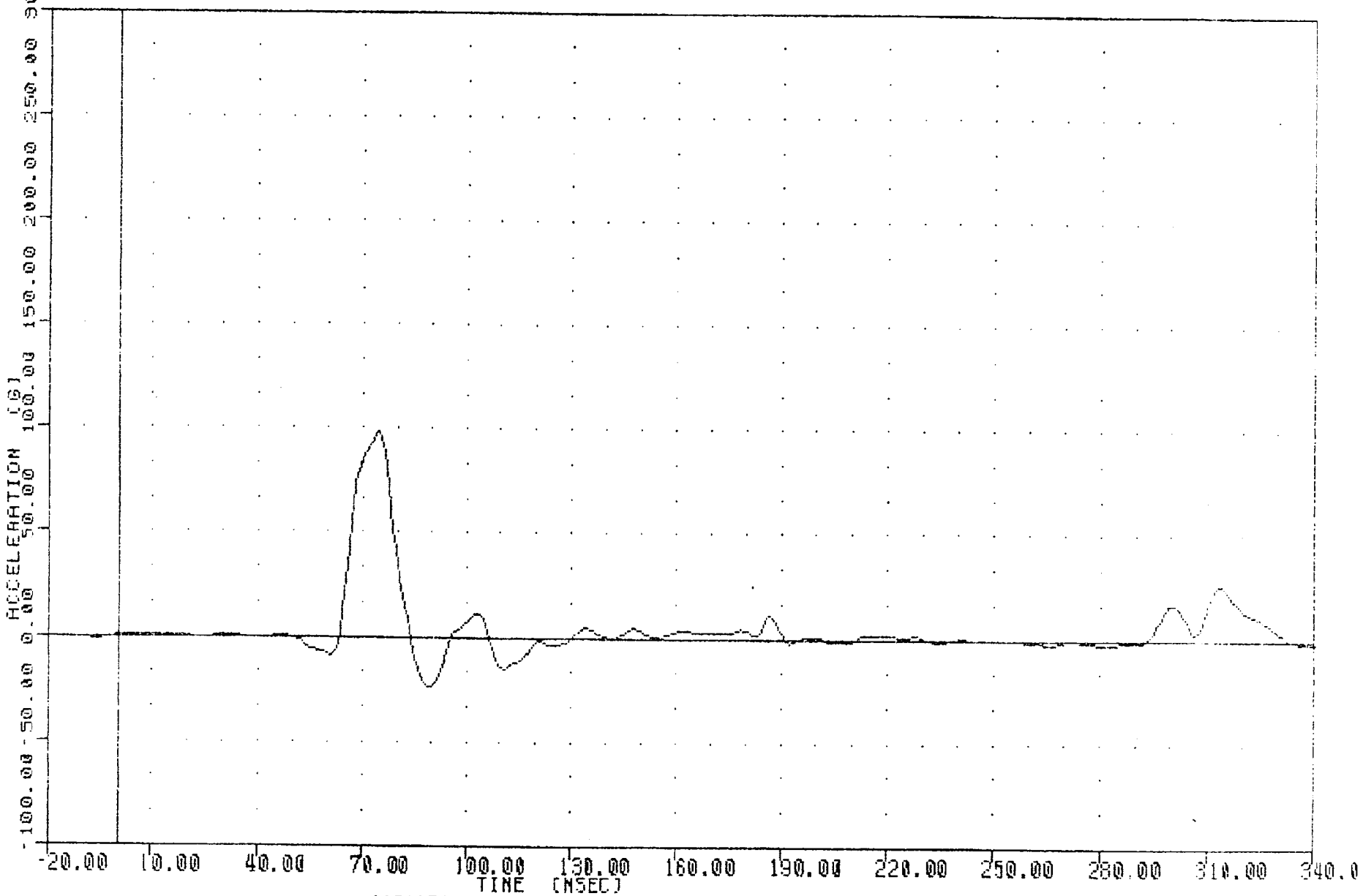
MIN, MAX VALUES = -23.10 @ 89.38 , 95.36 @ 73.75



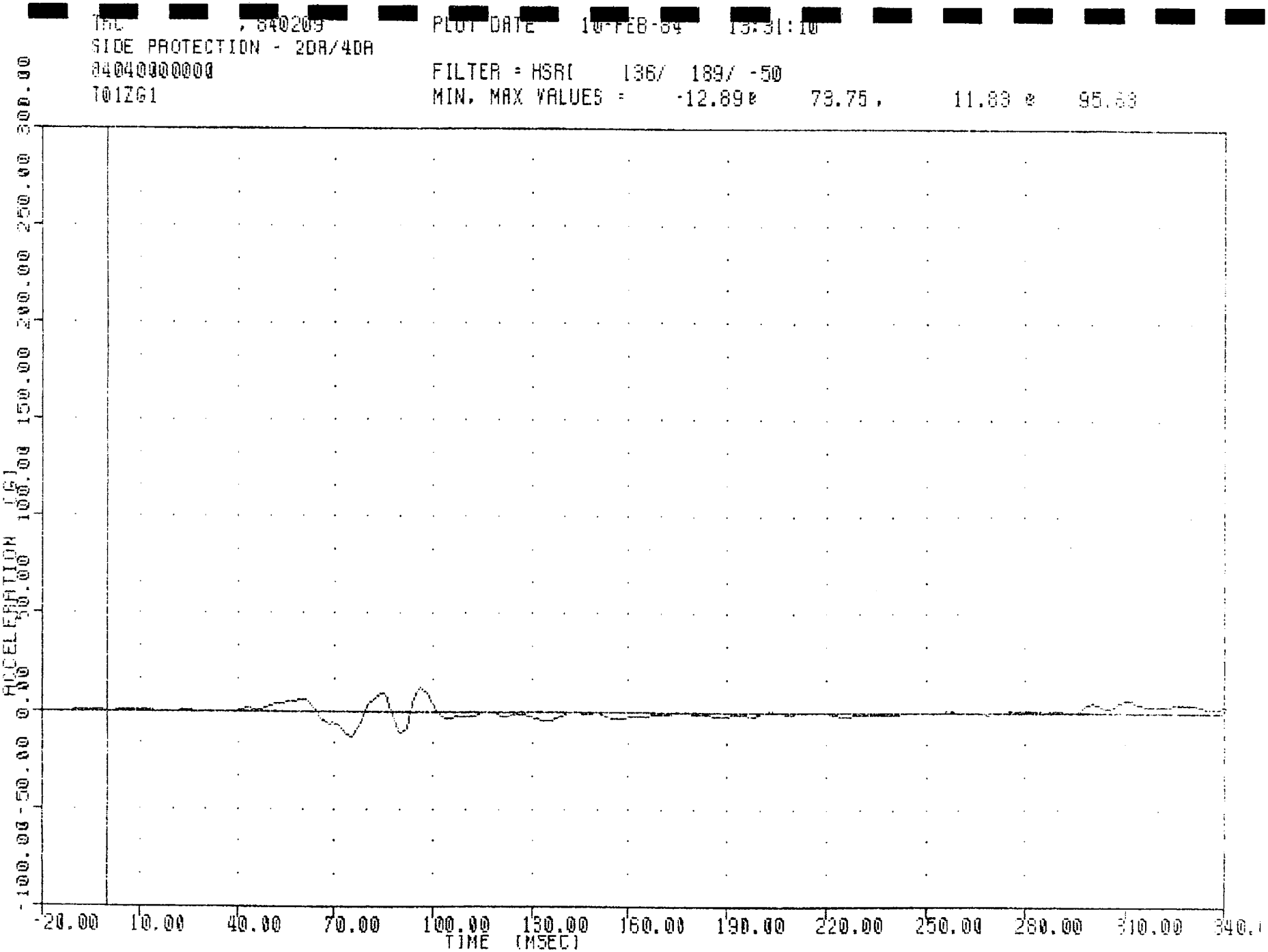
MOVING DEFORMABLE BARRIER INTO HORIZON

DRIVER UPPER SPINE ACCELERATION Y AXIS

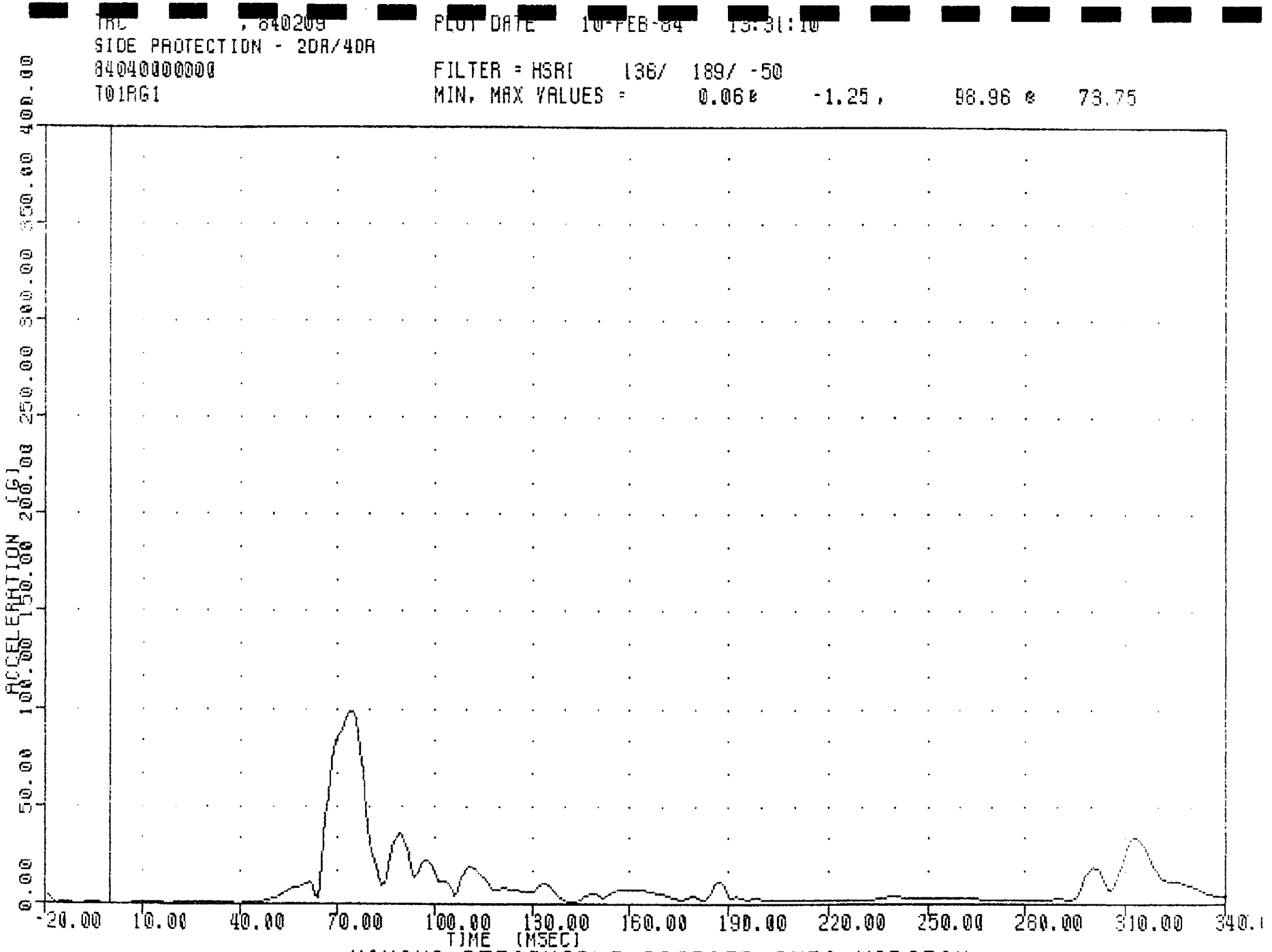
[redacted] , 840209 PLOT DATE 10-FEB-84 13:31:10
SIDE PROTECTION - 20A/4DA
8404D0000000
TQ1Y6A
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -23.59 @ 89.38 , 98.52 @ 73.75



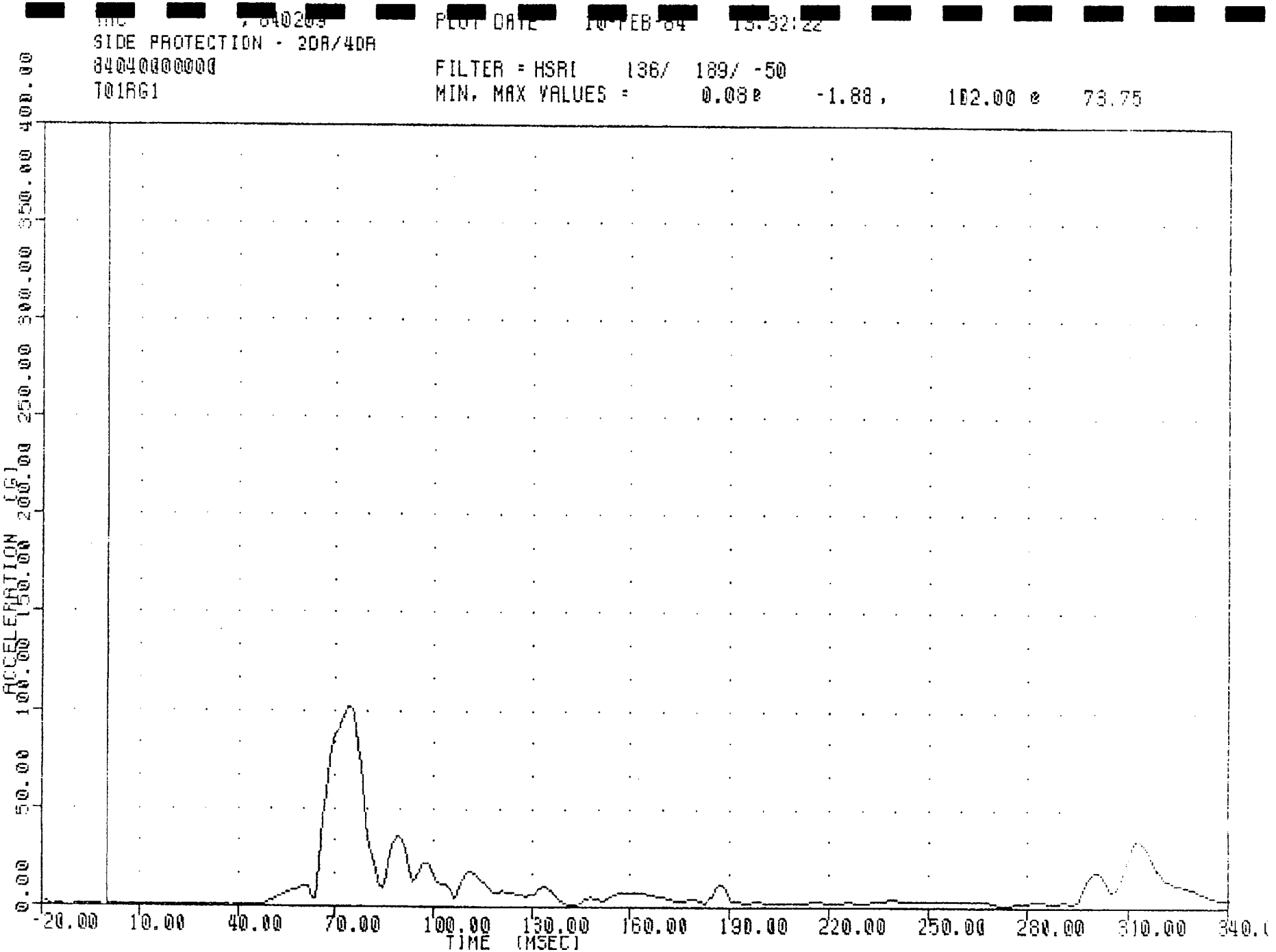
MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER UPPER SPINE ACCELERATION -2 Y AXIS



MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER UPPER SPINE ACCELERATION Z AXIS



MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER UPPER SPINE RESULTANT

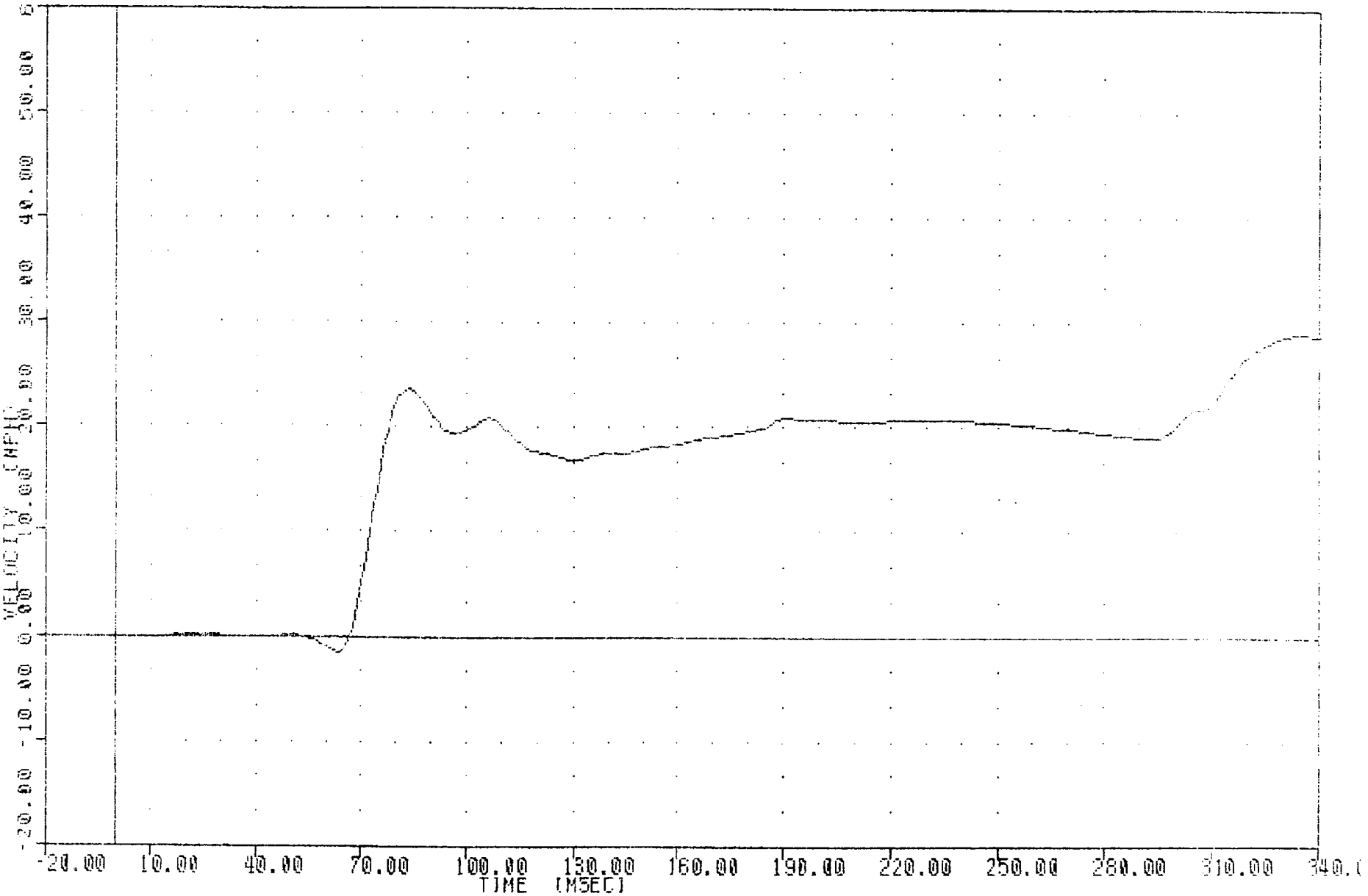


MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER UPPER SPINE RESULTANT USING T01YGA

[redacted]

SIDE PROTECTION - 2DR/4DR
340400000000
T01YV1

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -1.50 @ 62.50 , 28.88 @ 334.38

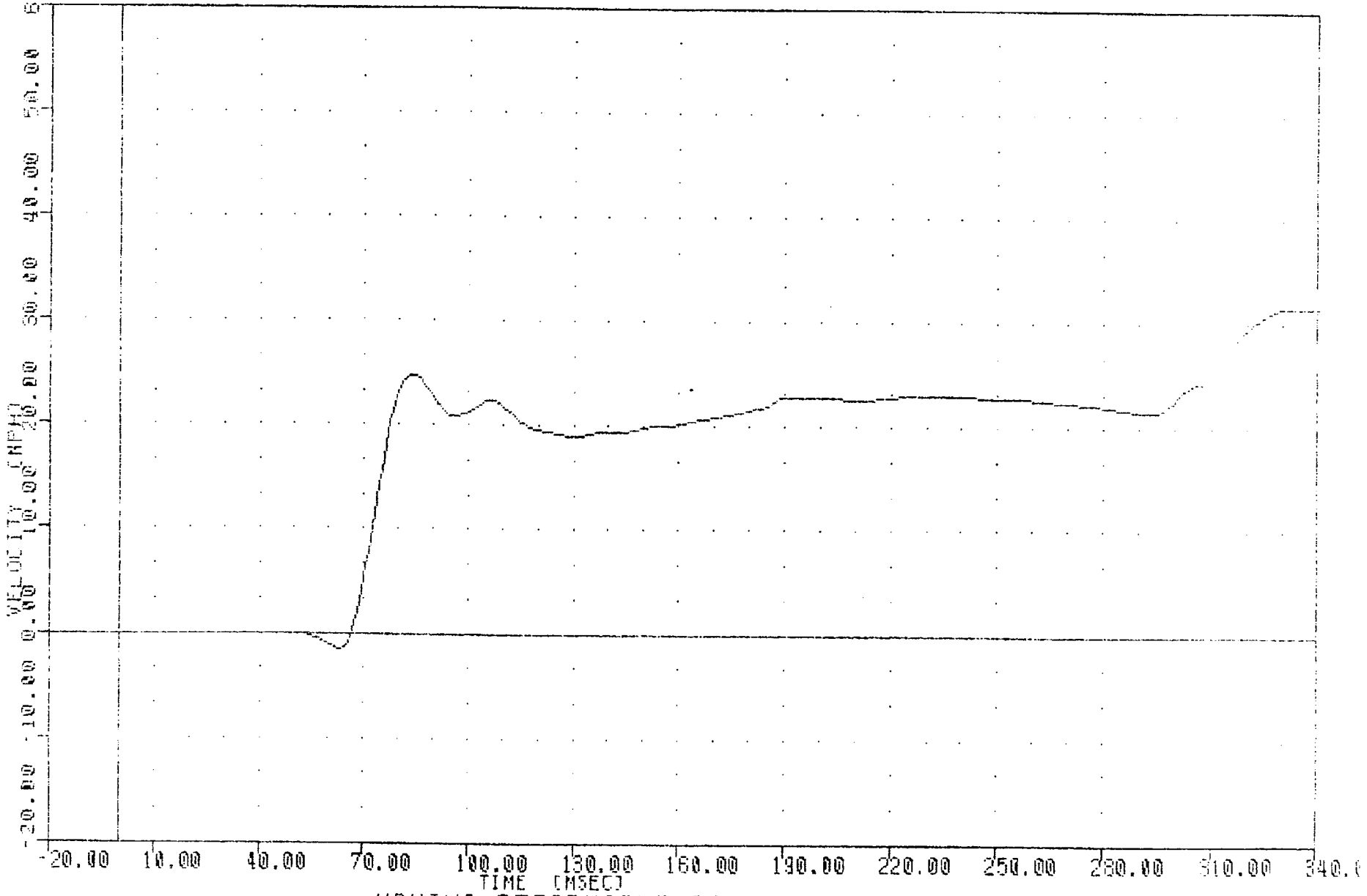


MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING T01YG1

[redacted]02[redacted] P[redacted]DA[redacted] [redacted]EB-[redacted] [redacted]82:[redacted]

SIDE PROTECTION - 2DA/4DA
84040000000
T01YVA

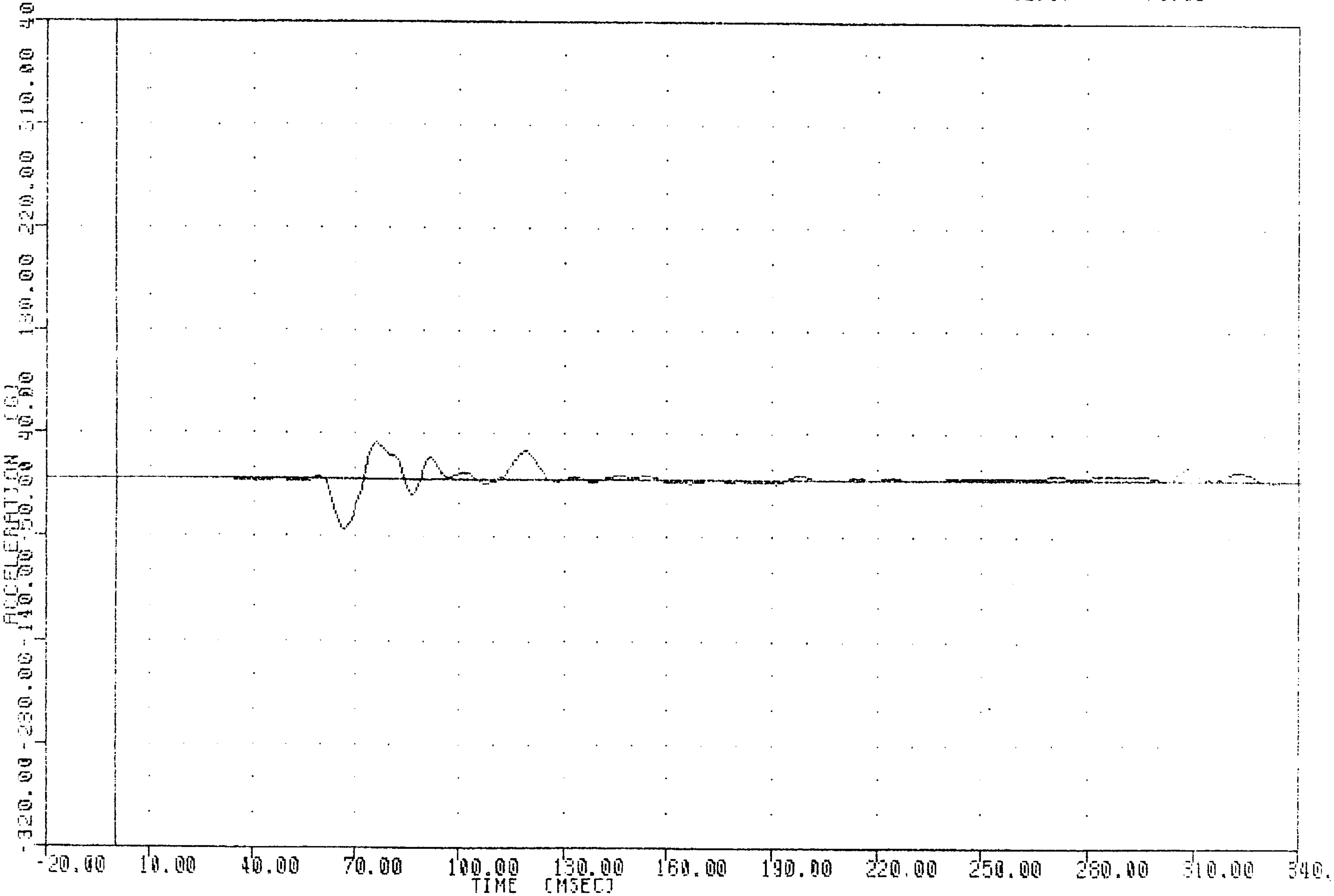
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -1.59 @ 62.50 , 31.61 @ 332.50



MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING T01YGA

T[redacted] , [redacted]0205[redacted] PL[redacted] DATE [redacted] 1[redacted] FEB-[redacted] [redacted]:31:1[redacted]
SIDE PROTECTION - 20A/40A
84040000000
T12XG1

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -43.78 @ 65.63 , 32.37 @ 75.82



MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER LOWER SPINE ACCELERATION X AXIS

[redacted] PLOT DATE = 10-FEB-04 [redacted]

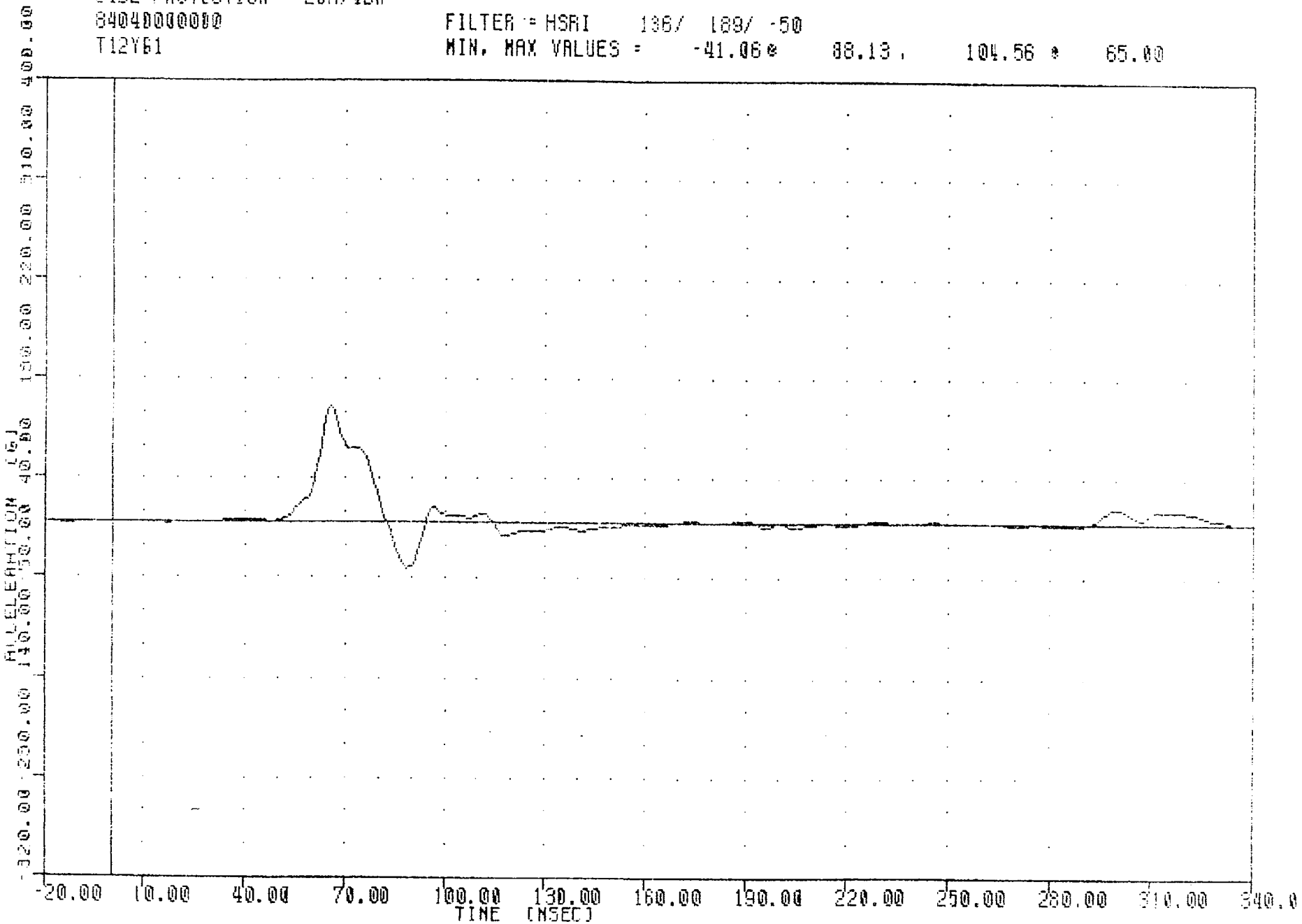
SIDE PROTECTION - 20A/4DA

8404000000000

T12YG1

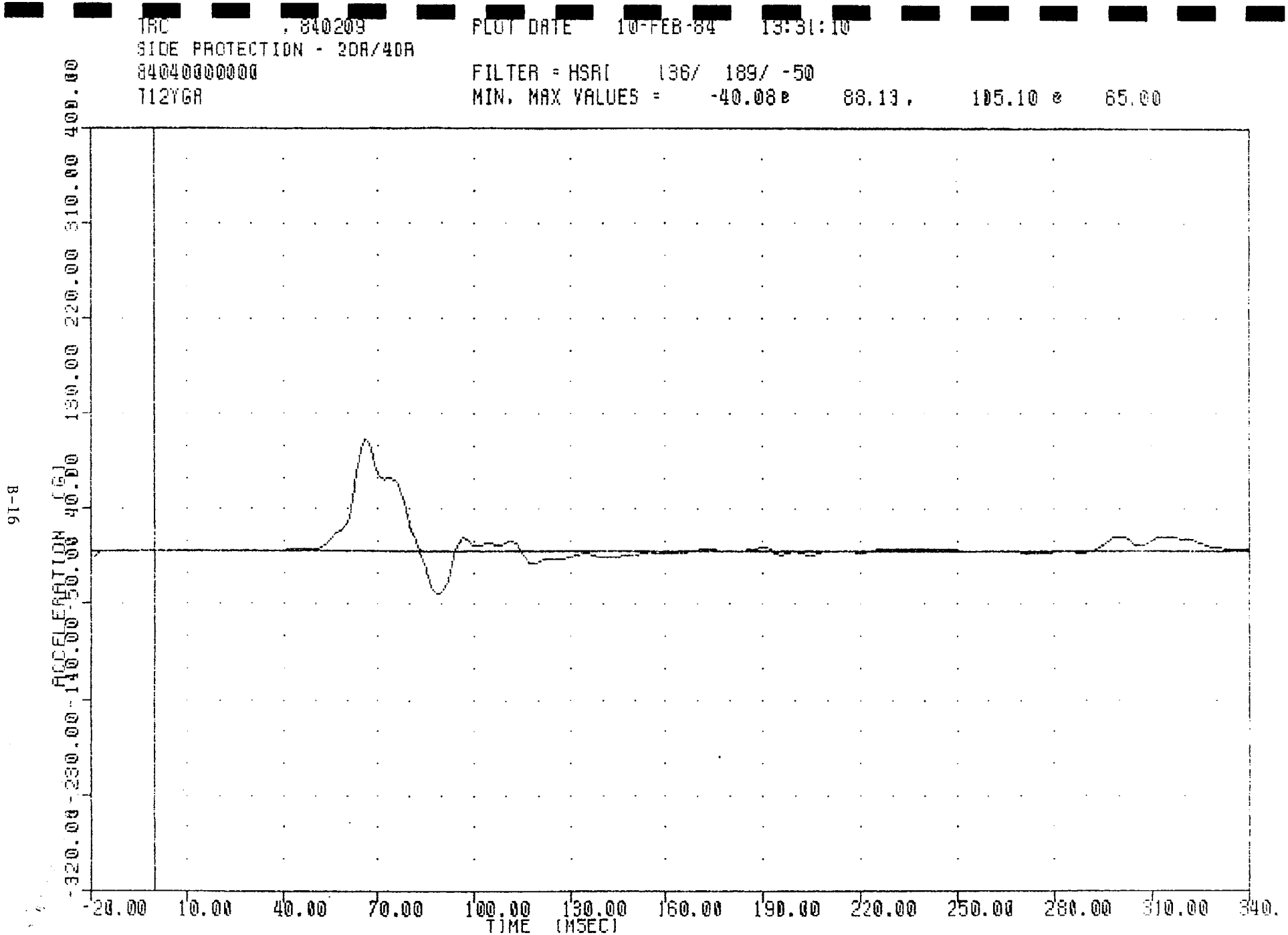
FILTER = HSRI 136/ 188/ -50

MIN, MAX VALUES = -41.06 @ 88.13 , 104.56 @ 65.00



MOVING DEFORMABLE BARRIER INTO HORIZON

DRIVER LOWER SPINE ACCELERATION Y AXIS



MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER LOWER SPINE ACCELERATION -2 Y AXIS

[redacted] PLOT DATE 10-FEB-84 13:31:10

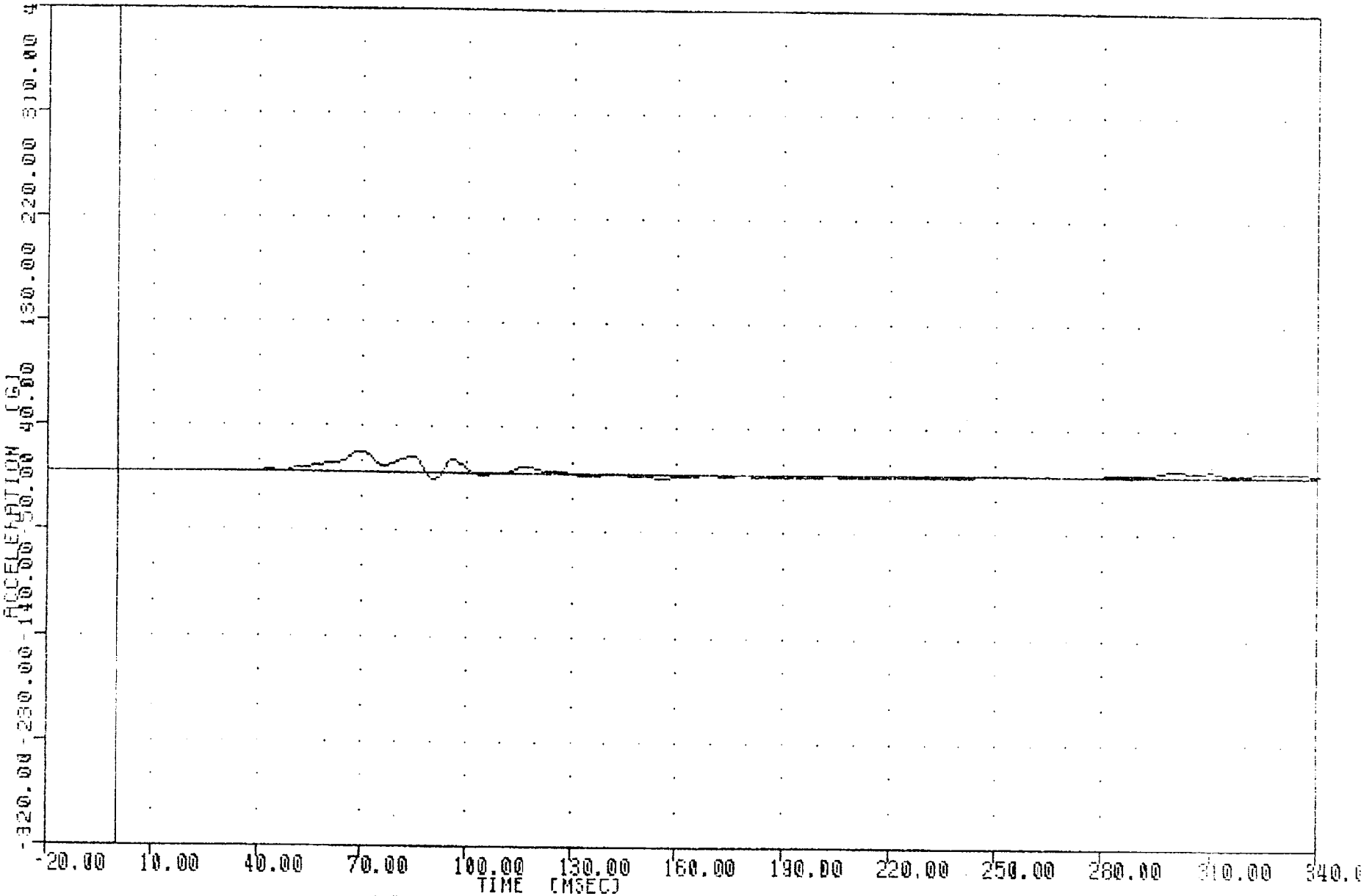
SIDE PROTECTION - 2DR/4DR

8404000000D

T12ZG1

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES : -6.20 @ 90.00 , 17.91 @ 68.75



MOVING DEFORMABLE BARRIER INTO HORIZON

DRIVER LOWER SPINE ACCELERATION Z AXIS

[redacted] PLOT DATE 10-FEB-84 13:31:10

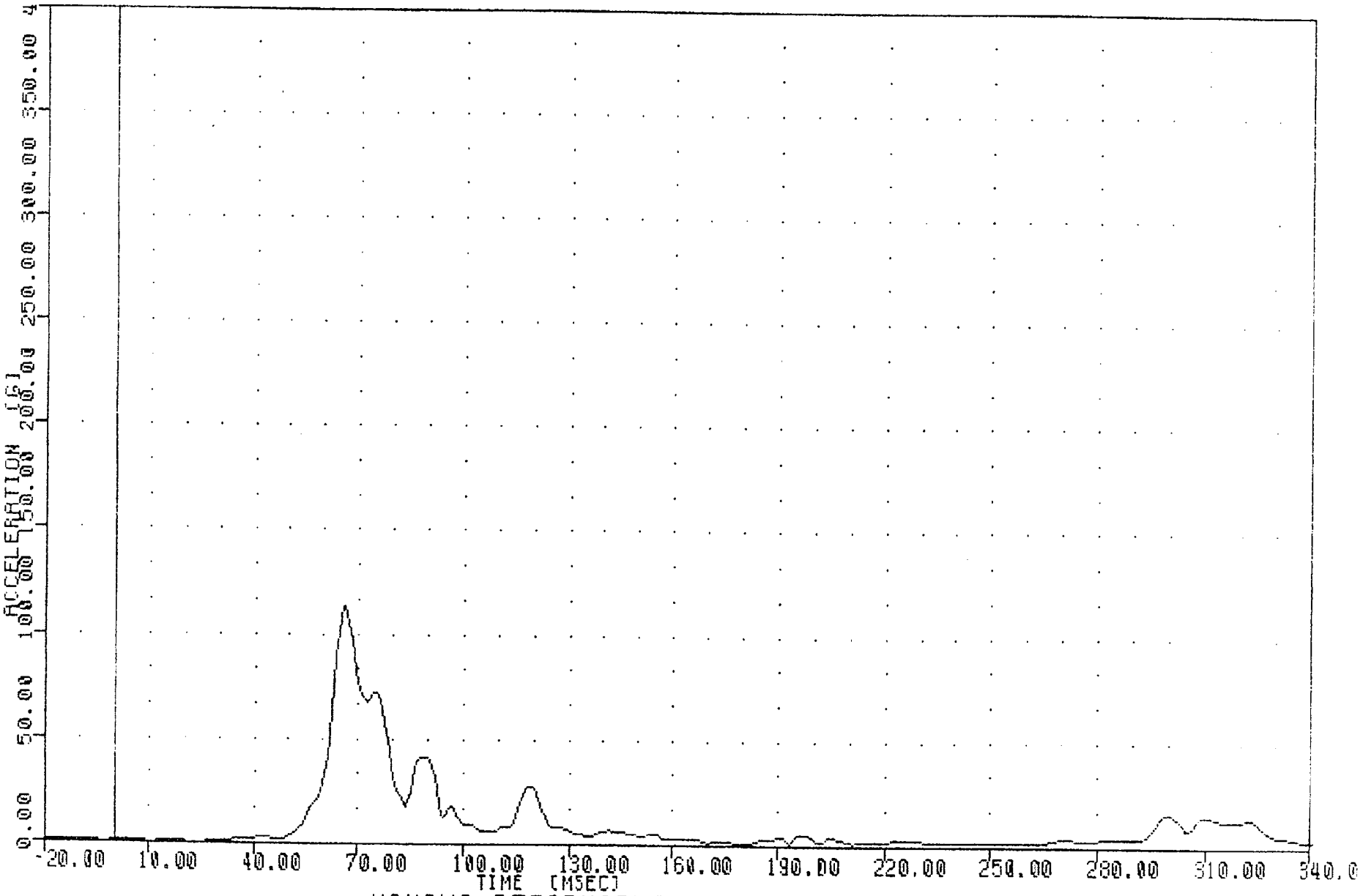
SIDE PROTECTION - 2DR/4DR

8404000000D

T12RG1

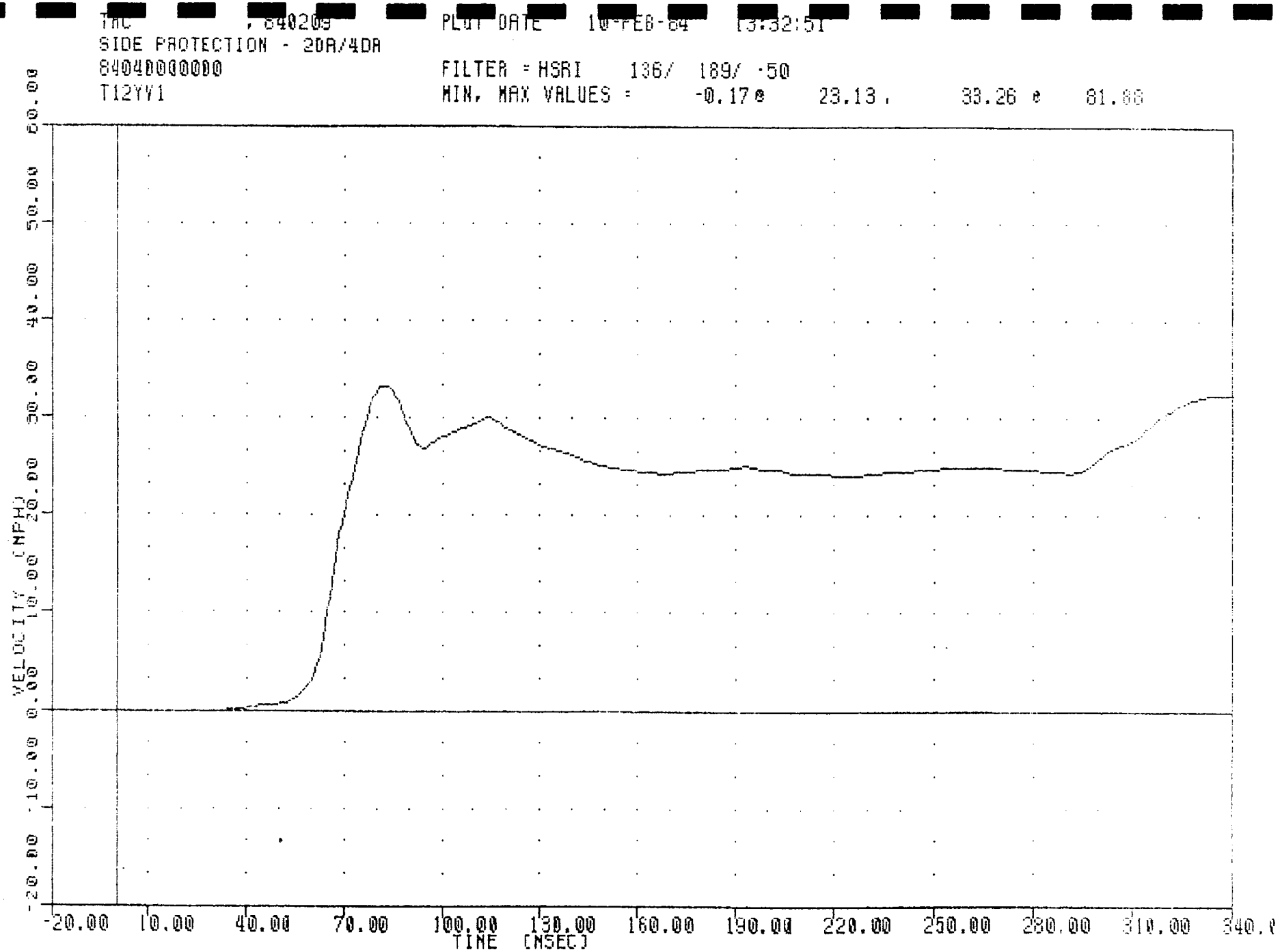
FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.07@ 23.75, 113.65@ 65.63



MOVING DEFORMABLE BARRIER INTO HORIZON

DRIVER LOWER SPINE RESULTANT



MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING T12YG1

[redacted] PLOT DATE [redacted] 10-FEB-04 [redacted] 15:32:22

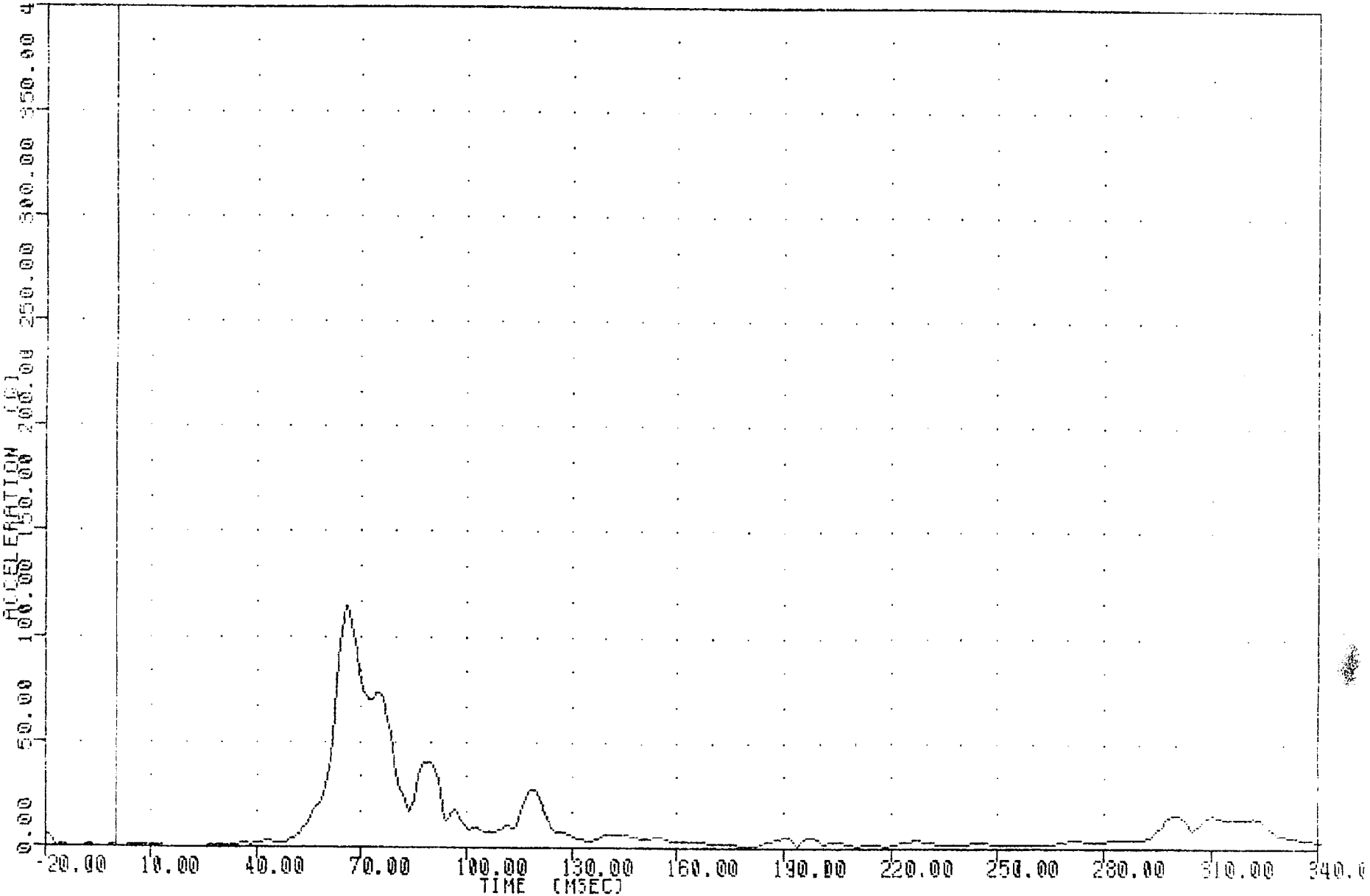
SIDE PROTECTION - 2DA/4DA

84040000000

T12RG1

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.06@ 23.75, 114.15@ 65.63



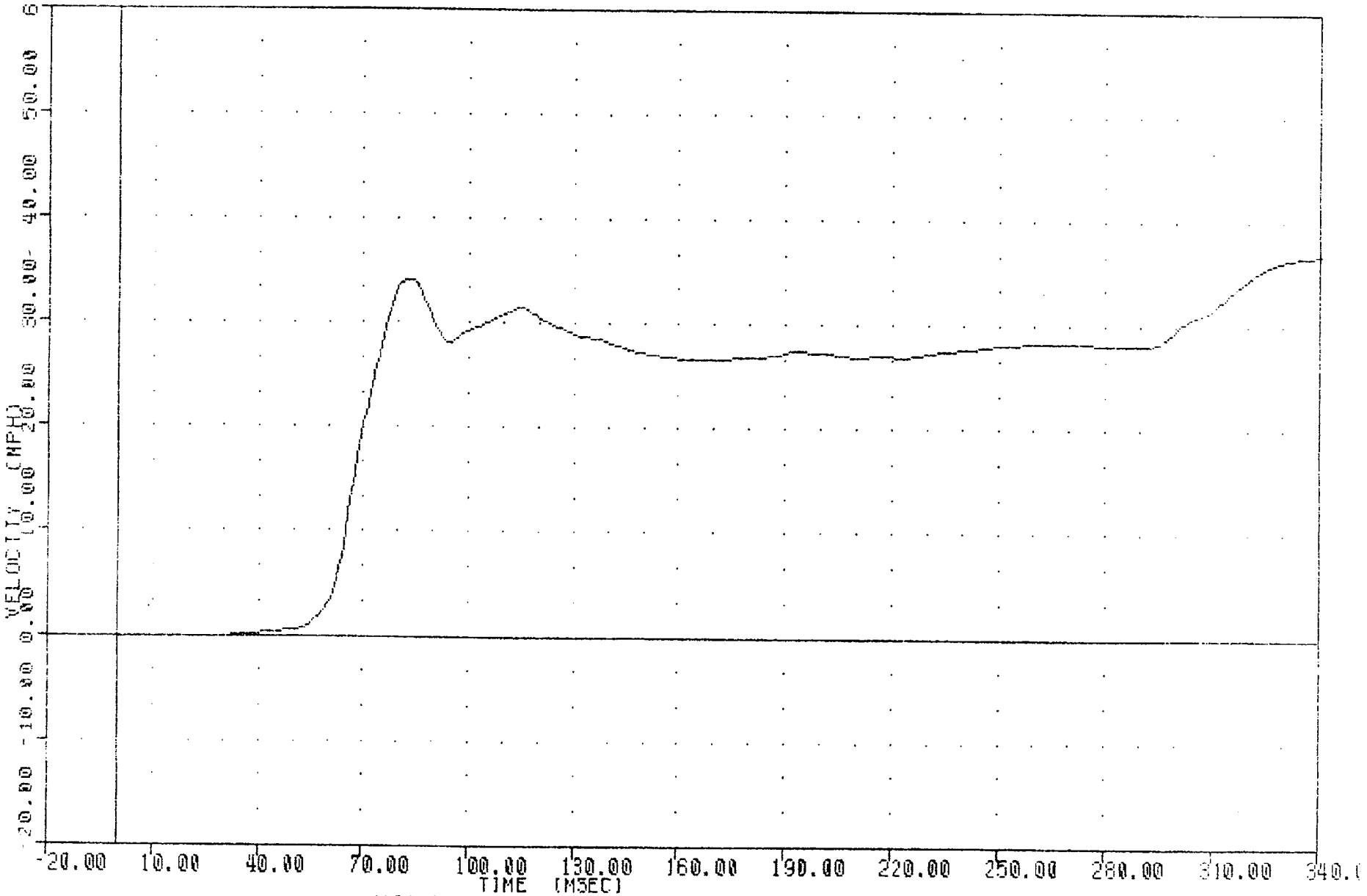
MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER LOWER SPINE RESULTANT USING T12YGA

[redacted]

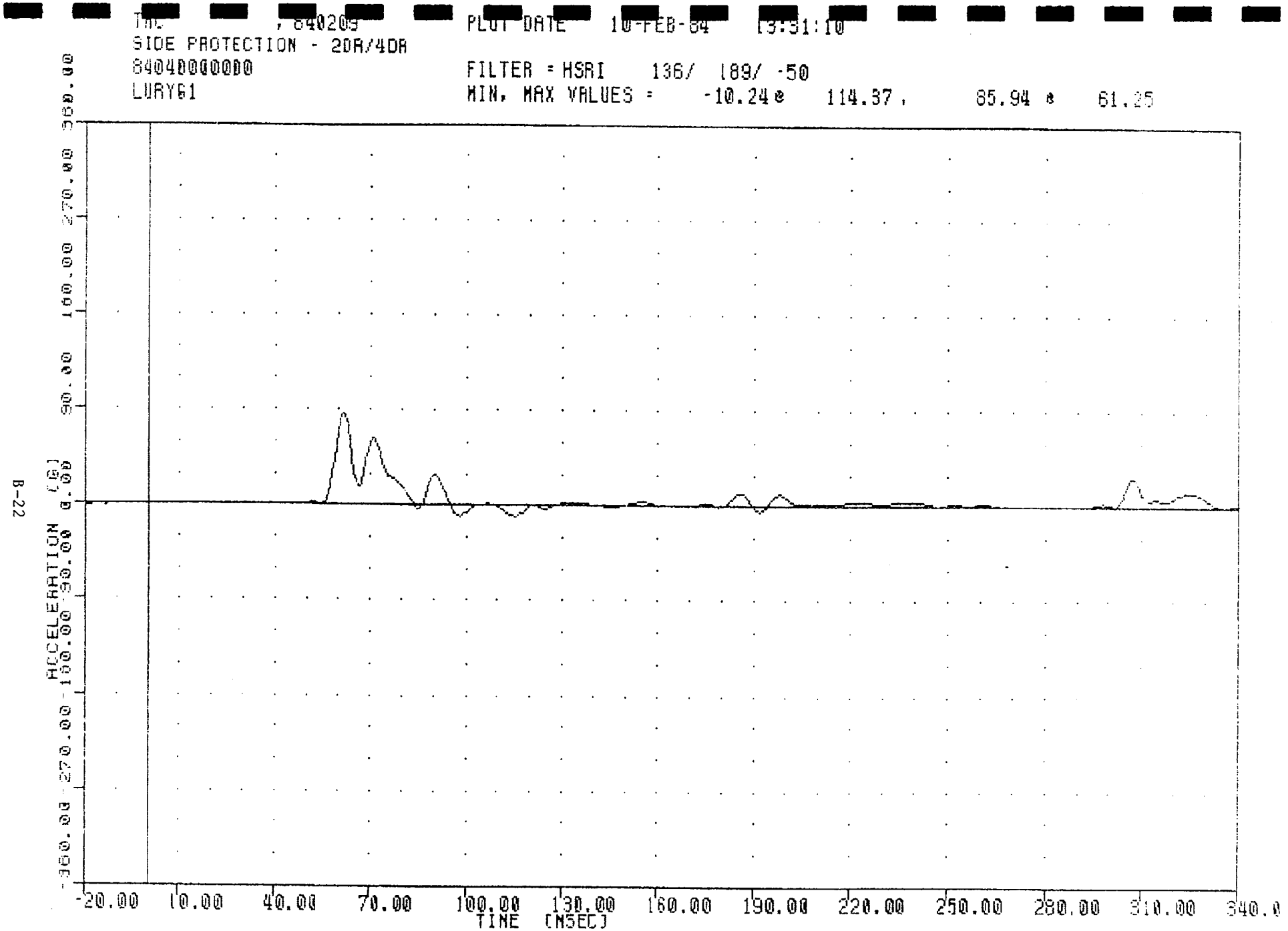
SIDE PROTECTION - 2DA/4DA
340400000000
T12YVA

[redacted] PLOT DATE [redacted] 10 FEB 84 13:32:31

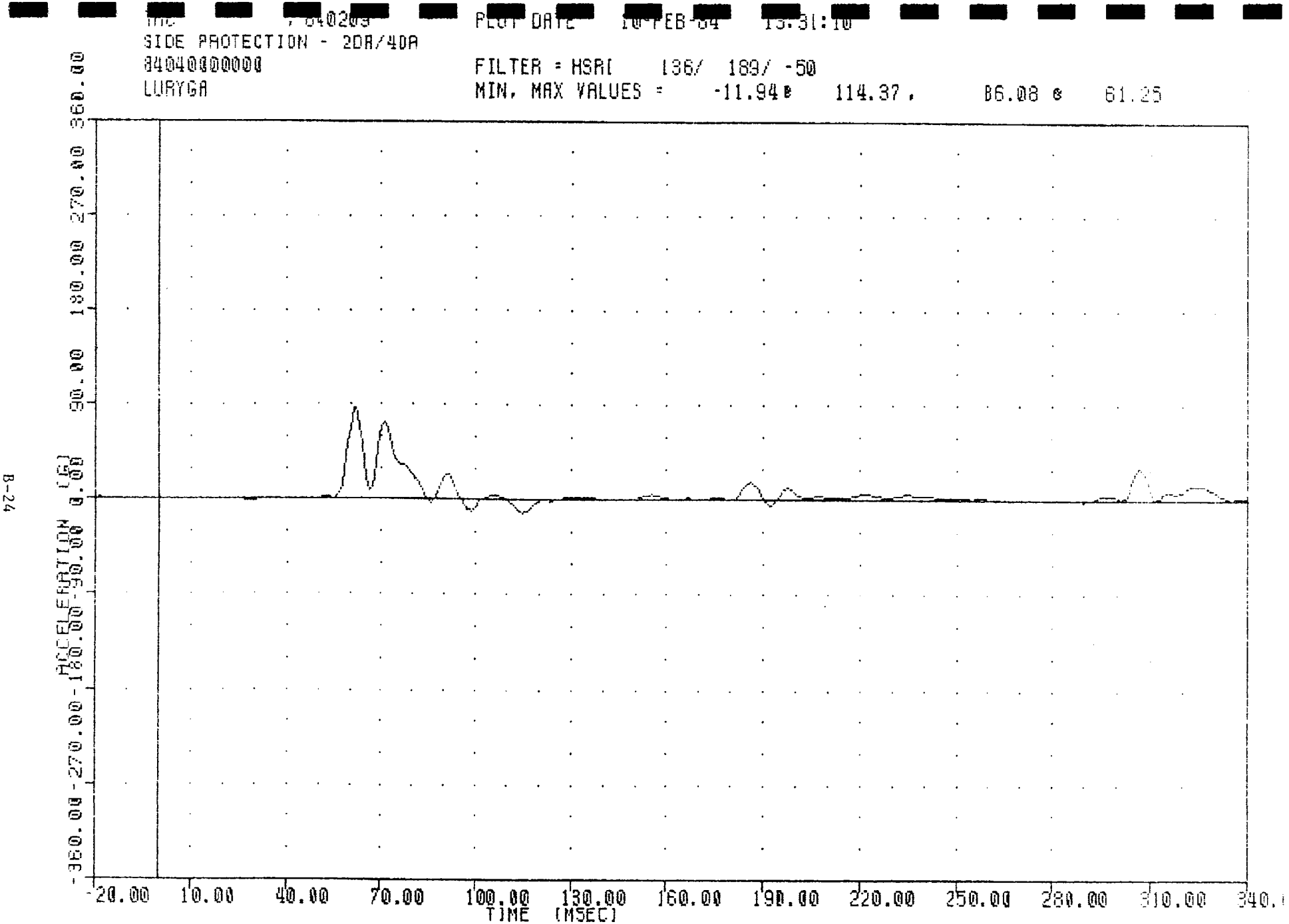
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -0.13@ -17.50, 36.75 @ 340.00



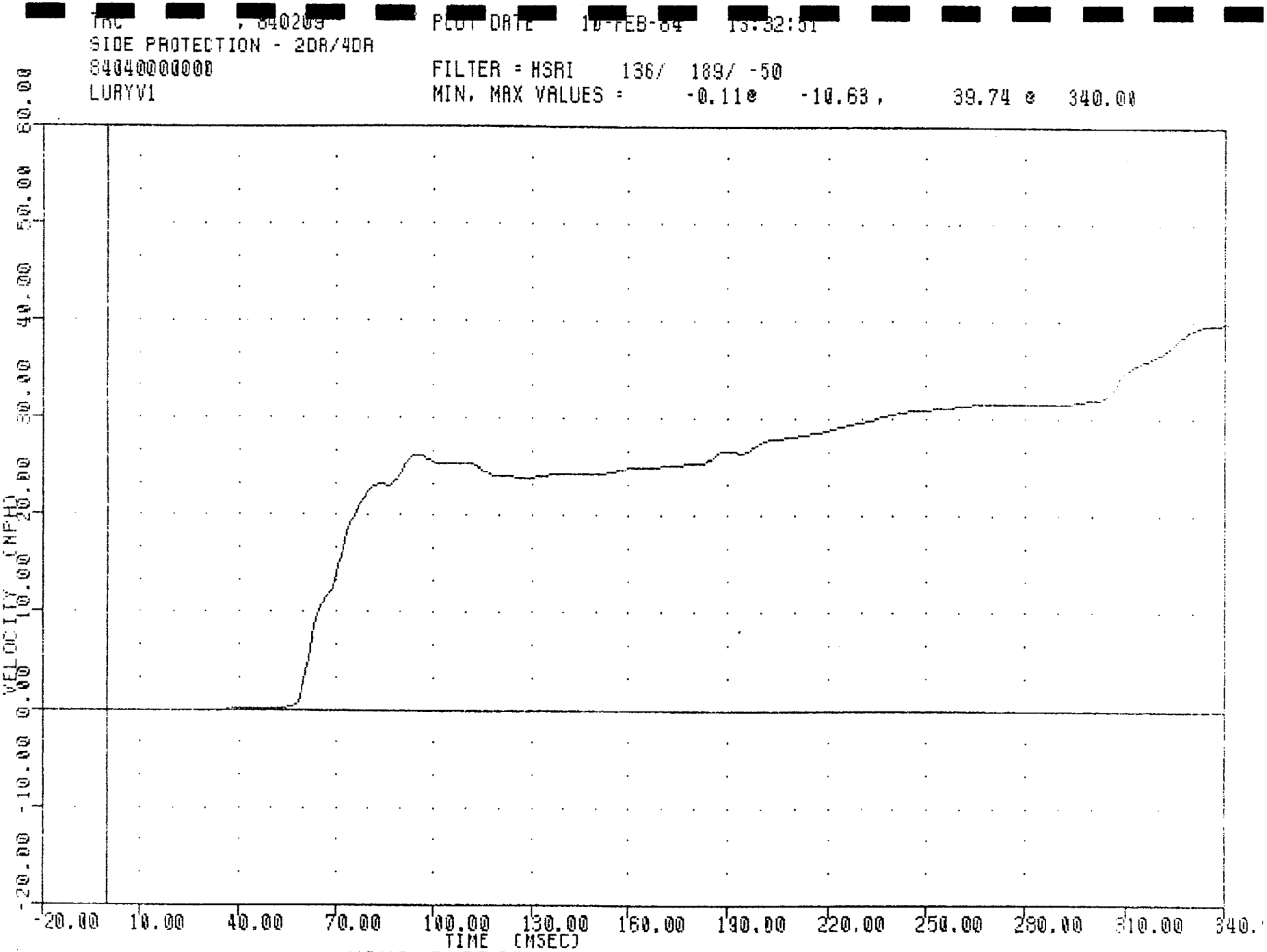
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING T12YGA



MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER LEFT UPPER RIB ACCELERATION Y AXIS



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


TNC , 840203 PLOT DATE 10-FEB-84 13:32:51
SIDE PROTECTION - 2DA/4DA
8404000000
LURYV1
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -0.11@ -10.63 , 39.74 @ 340.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
VELOCITY (MPH)
-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.
TIME (MSEC)
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LURYG1

[redacted] PLOT DATE [redacted] 16-FEB-84 [redacted] 15:32:51

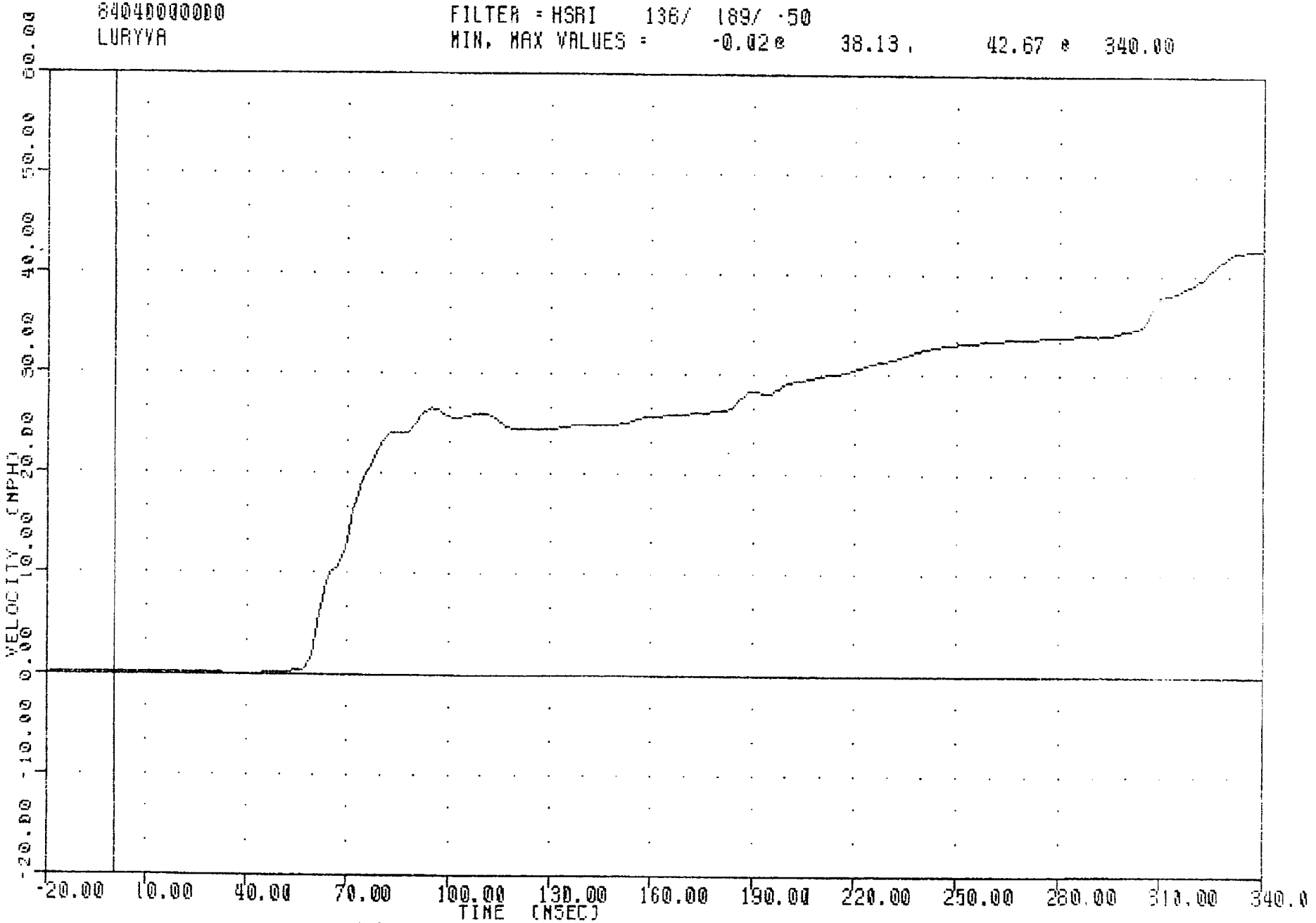
SIDE PROTECTION - 20A/4DA

84040000000

LURYVA

FILTER = HSRI 136/ 189/ .50

MIN, MAX VALUES = -0.02 @ 38.13 , 42.67 @ 340.00



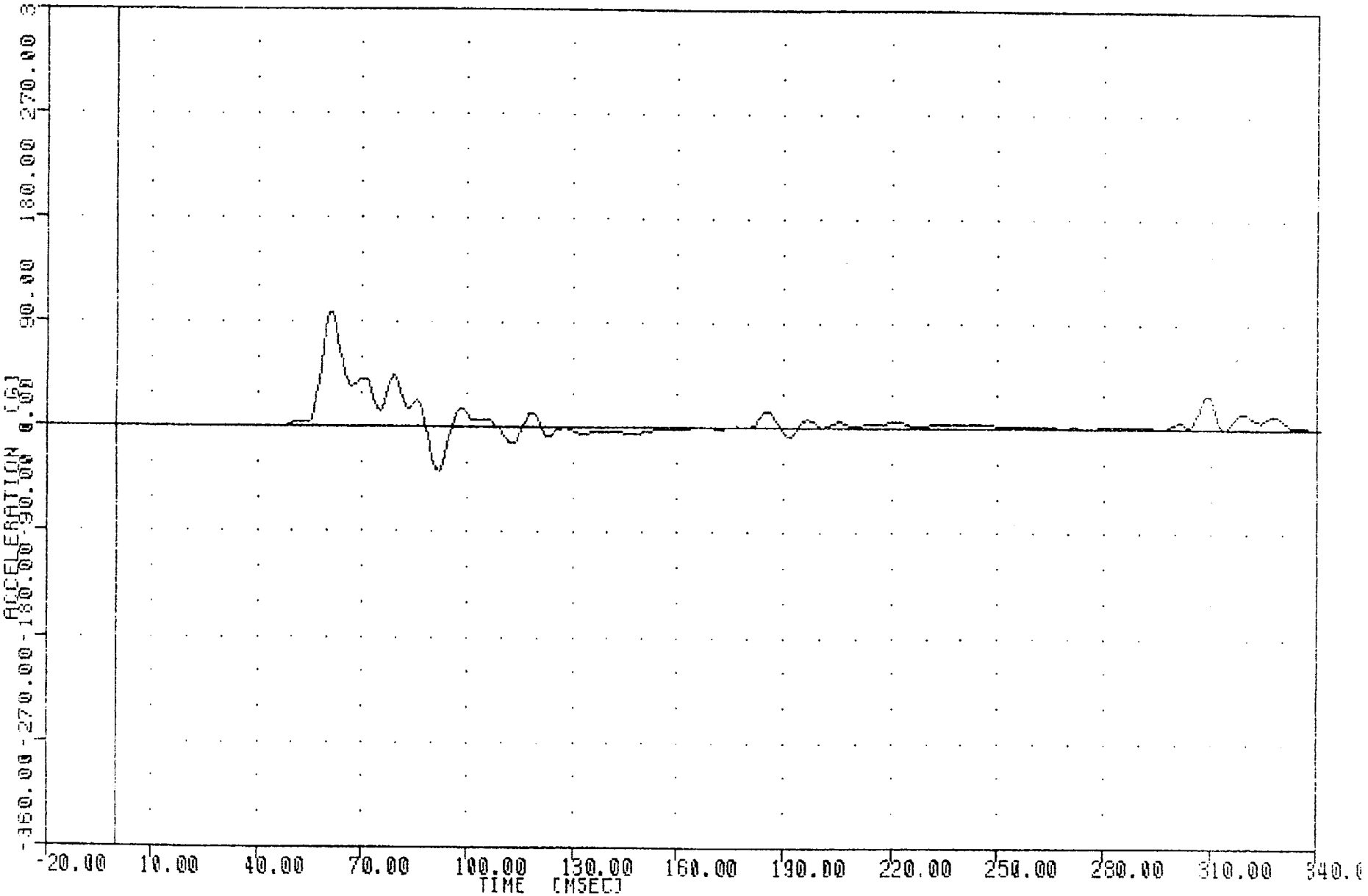
MOVING DEFORMABLE BARRIER INTO HORIZON

DELTA V USING LURYGA

[redacted]

SIDE PROTECTION - 2DA/4DA
84040000000
LLAYG1

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -37.33 @ 91.25 , 97.01 @ 60.00

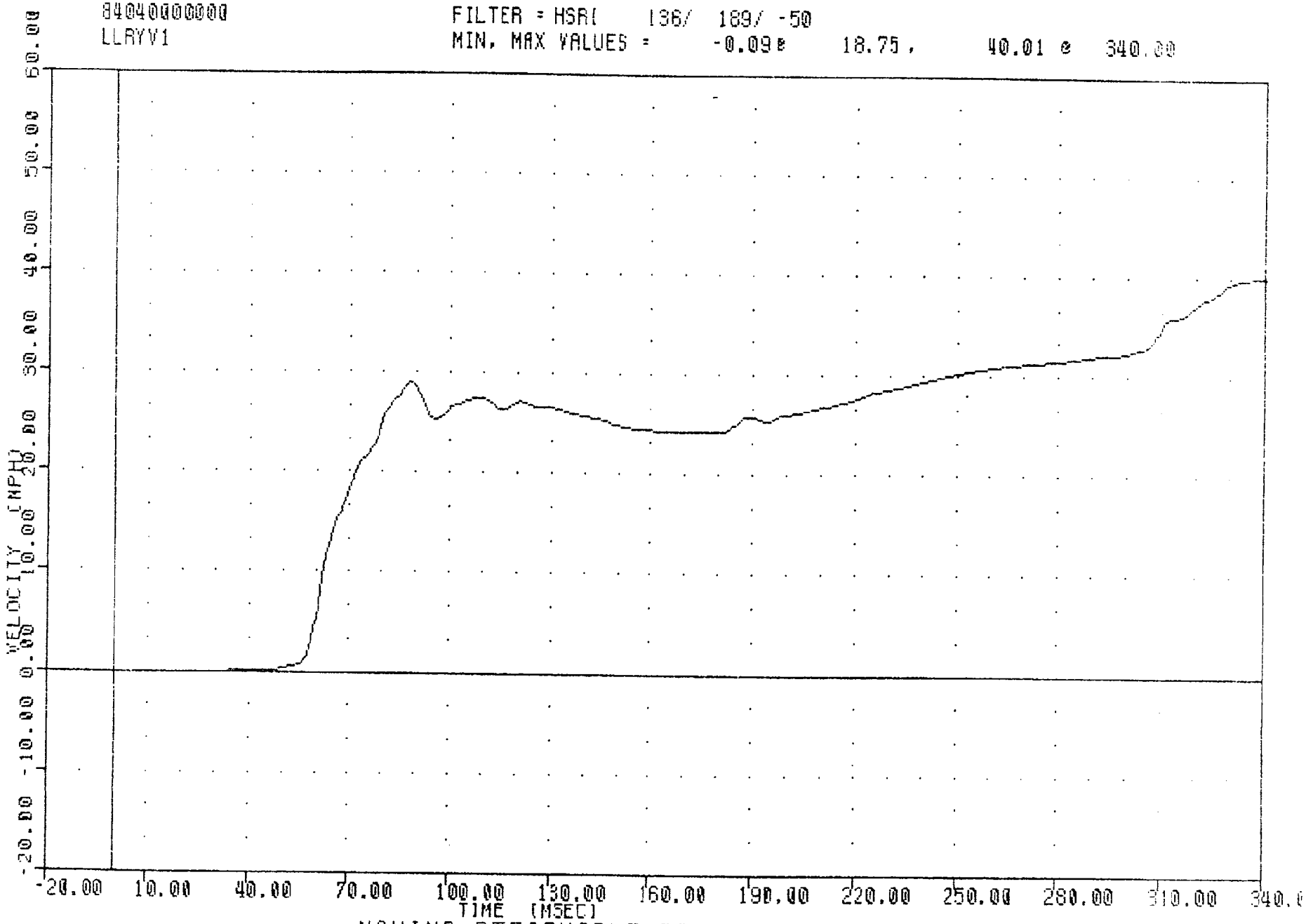


MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER LEFT LOWER RIB ACCELERATION Y AXIS

[redacted]

SIDE PROTECTION - 2DA/4DA
840400000000
LLRYV1

FILTER = HSR(136/ 189/ -50
MIN, MAX VALUES = -0.09 @ 18.75 , 40.01 @ 340.00



MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LLRYG1

[redacted]

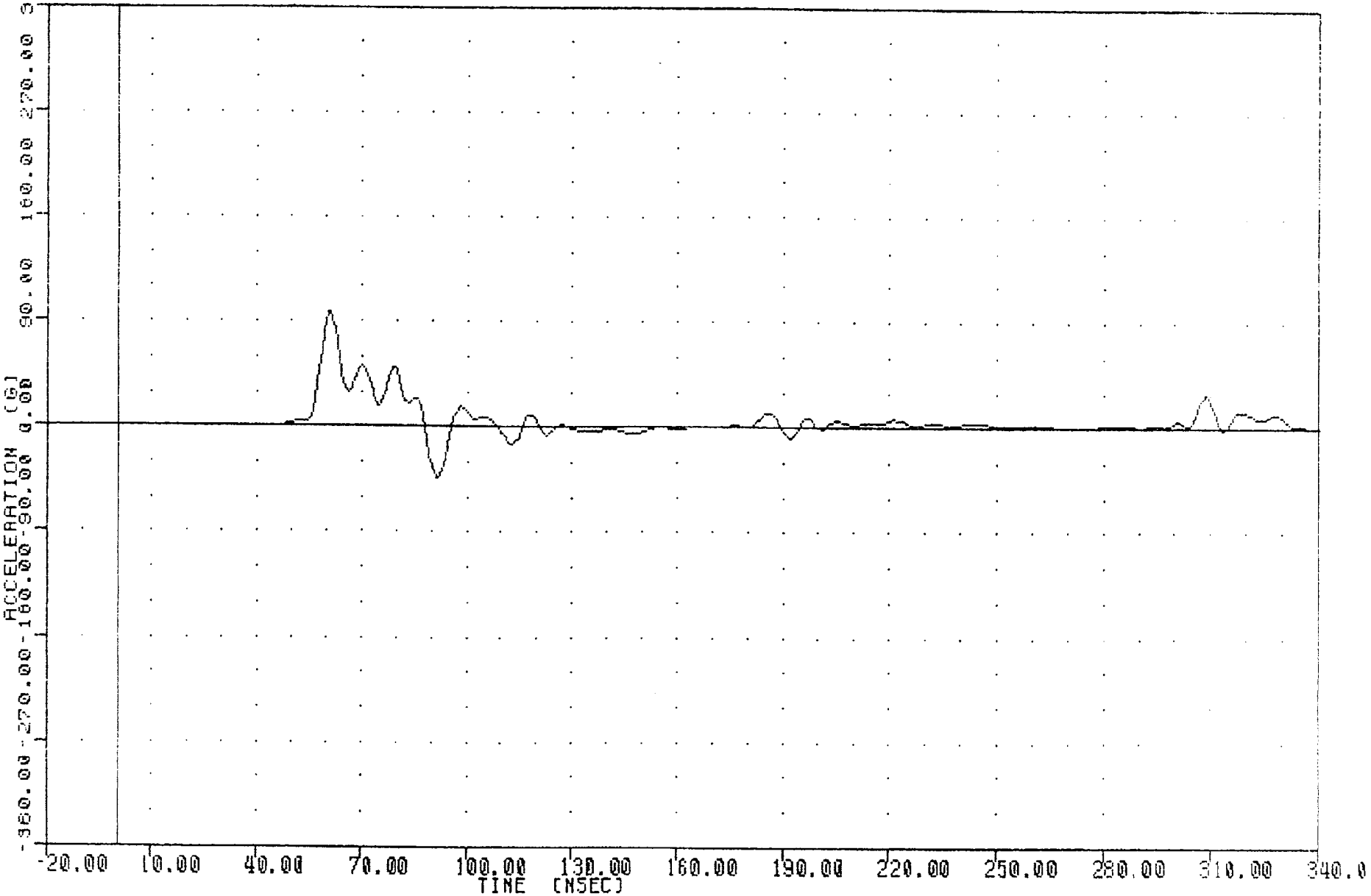
SIDE PROTECTION - 2DR/4DR

840400000000

LLRY6R

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -43.00 @ 90.62 , 97.58 @ 60.62

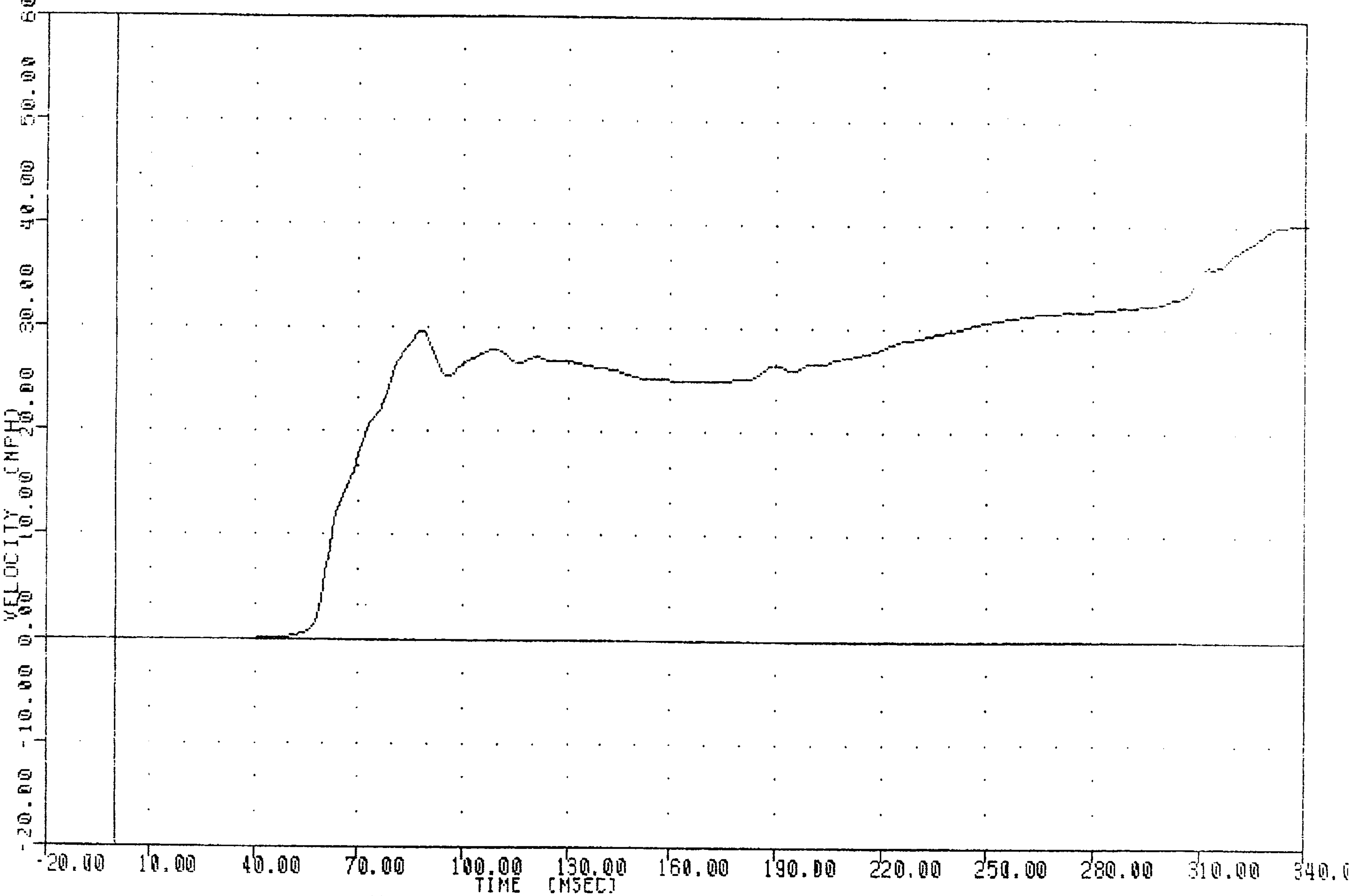


MOVING DEFORMABLE BARRIER INTO HORIZON

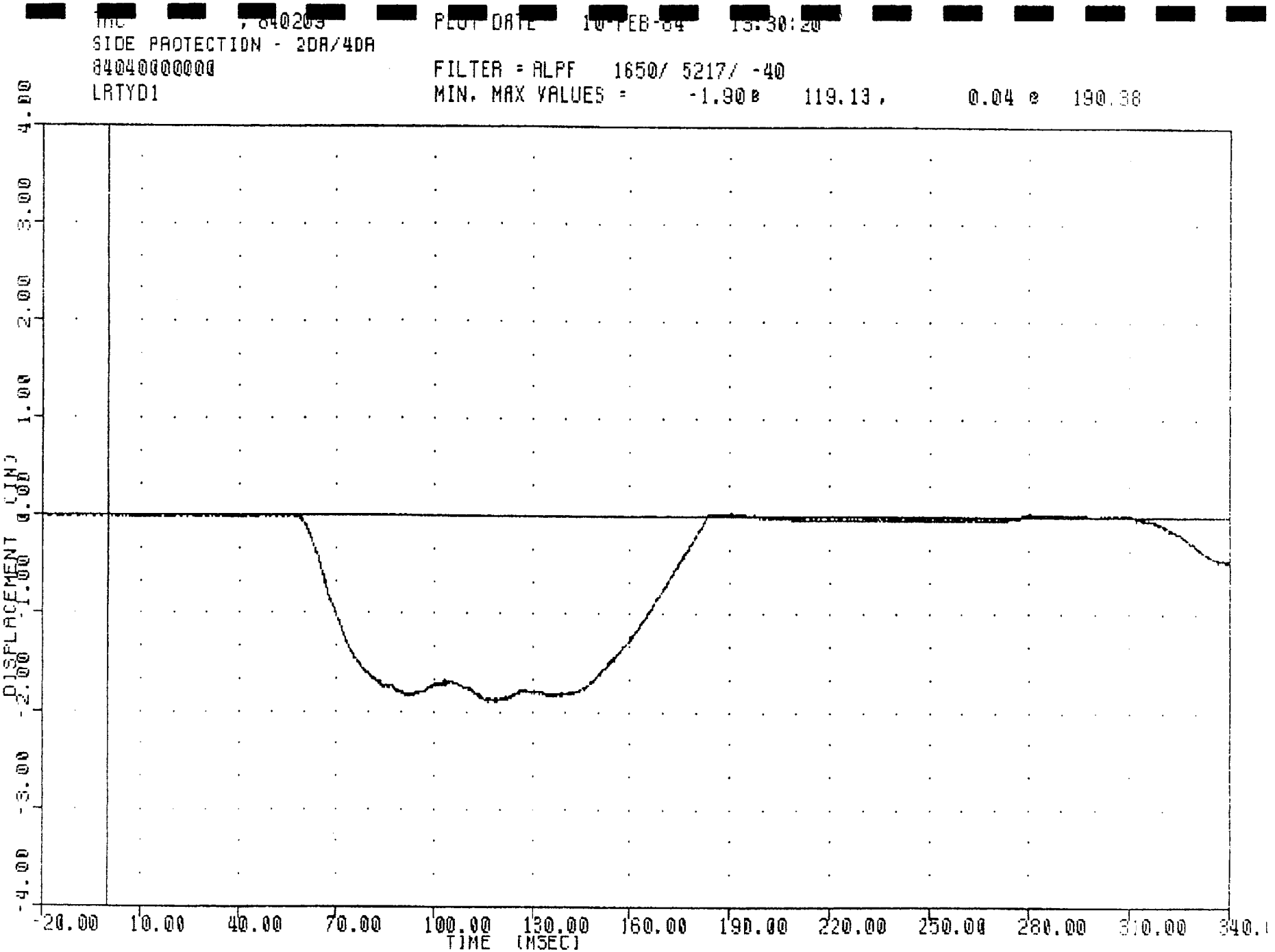
DRIVER LEFT LOWER RIB ACCELERATION -2 Y AXIS

THC [redacted] 840203 [redacted] PLOT DATE [redacted] 10 FEB 84 [redacted] 15:32:51 [redacted]
SIDE PROTECTION - 2DA/4DA
84040000000
LLAYVA

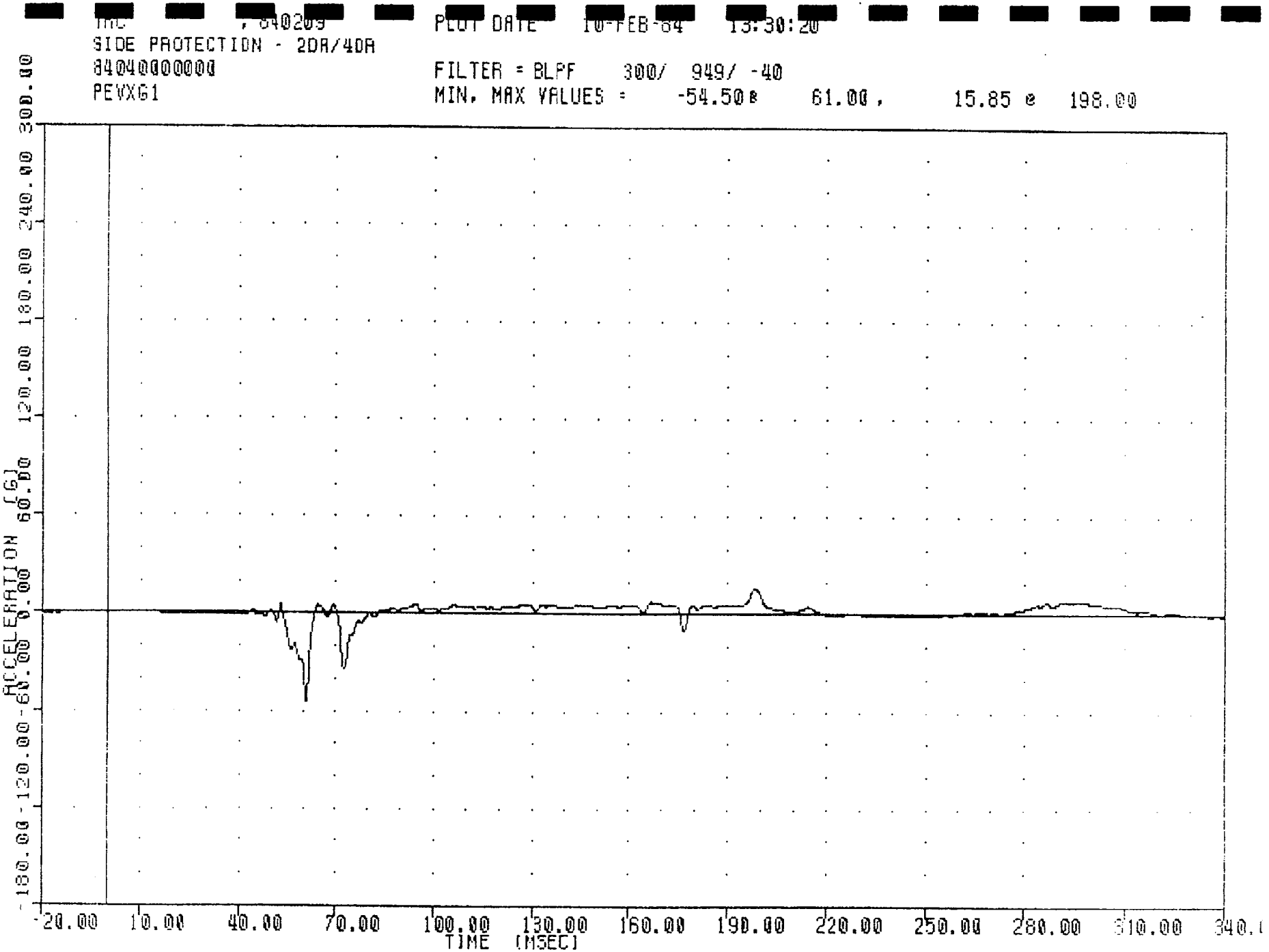
FILTER = HSRI   136/ 189/ -50
MIN, MAX VALUES =   -0.04 @   20.00 ,   40.21 @   340.00



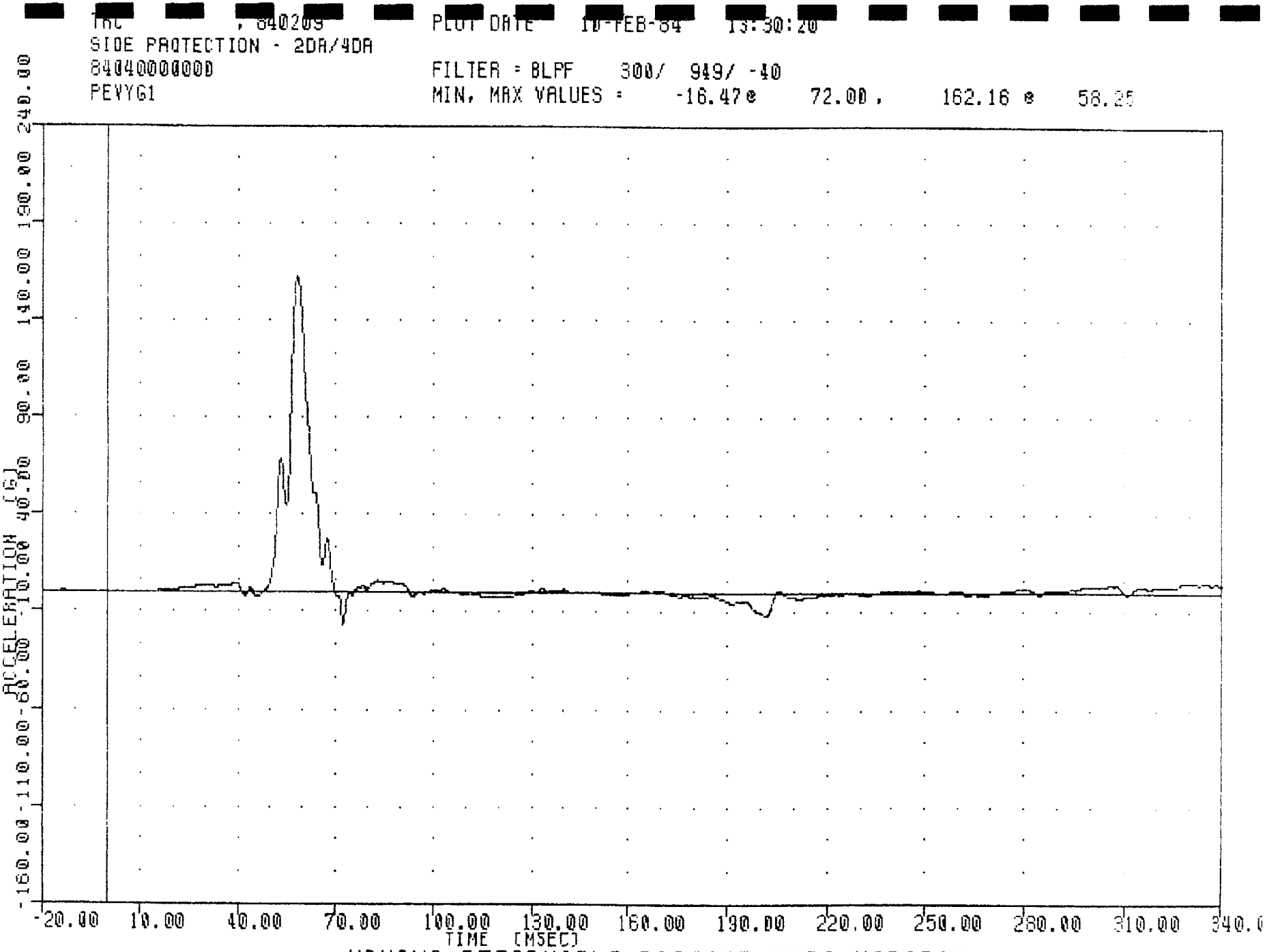
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LLAYGA



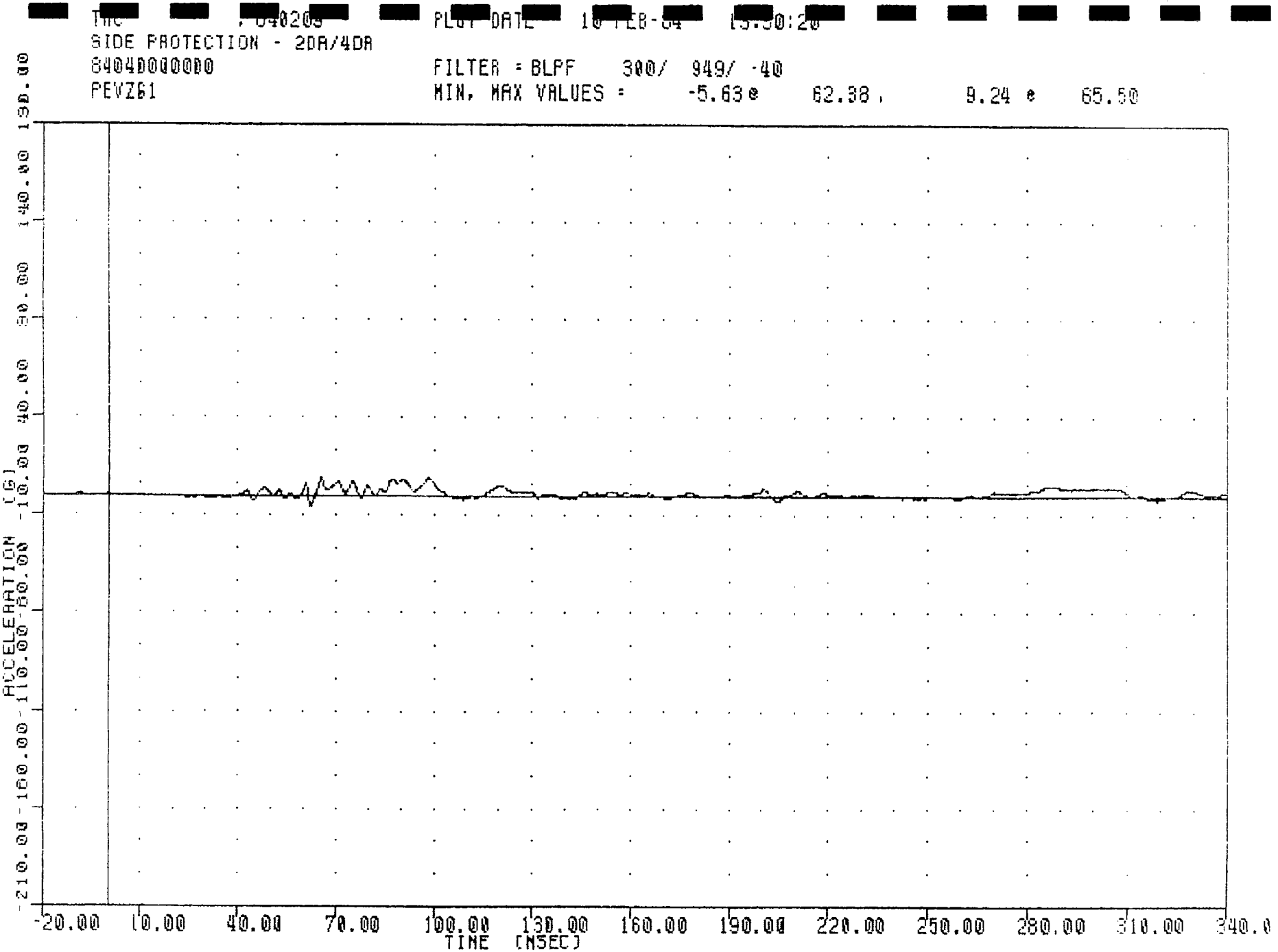
MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER LEFT RIB TO SPINE DISPLACEMENT INCHES



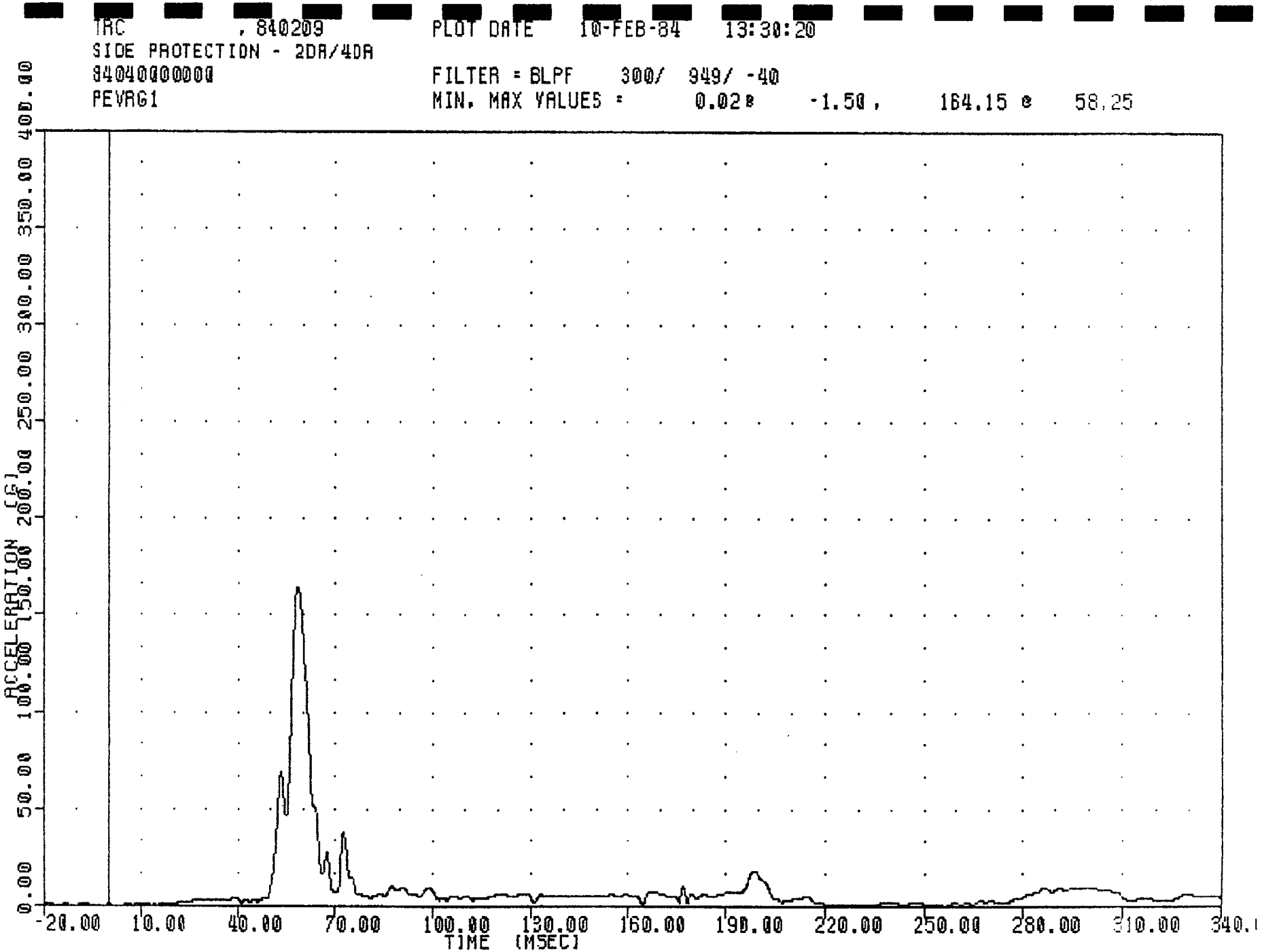
MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER PELVIS ACCELERATION X AXIS



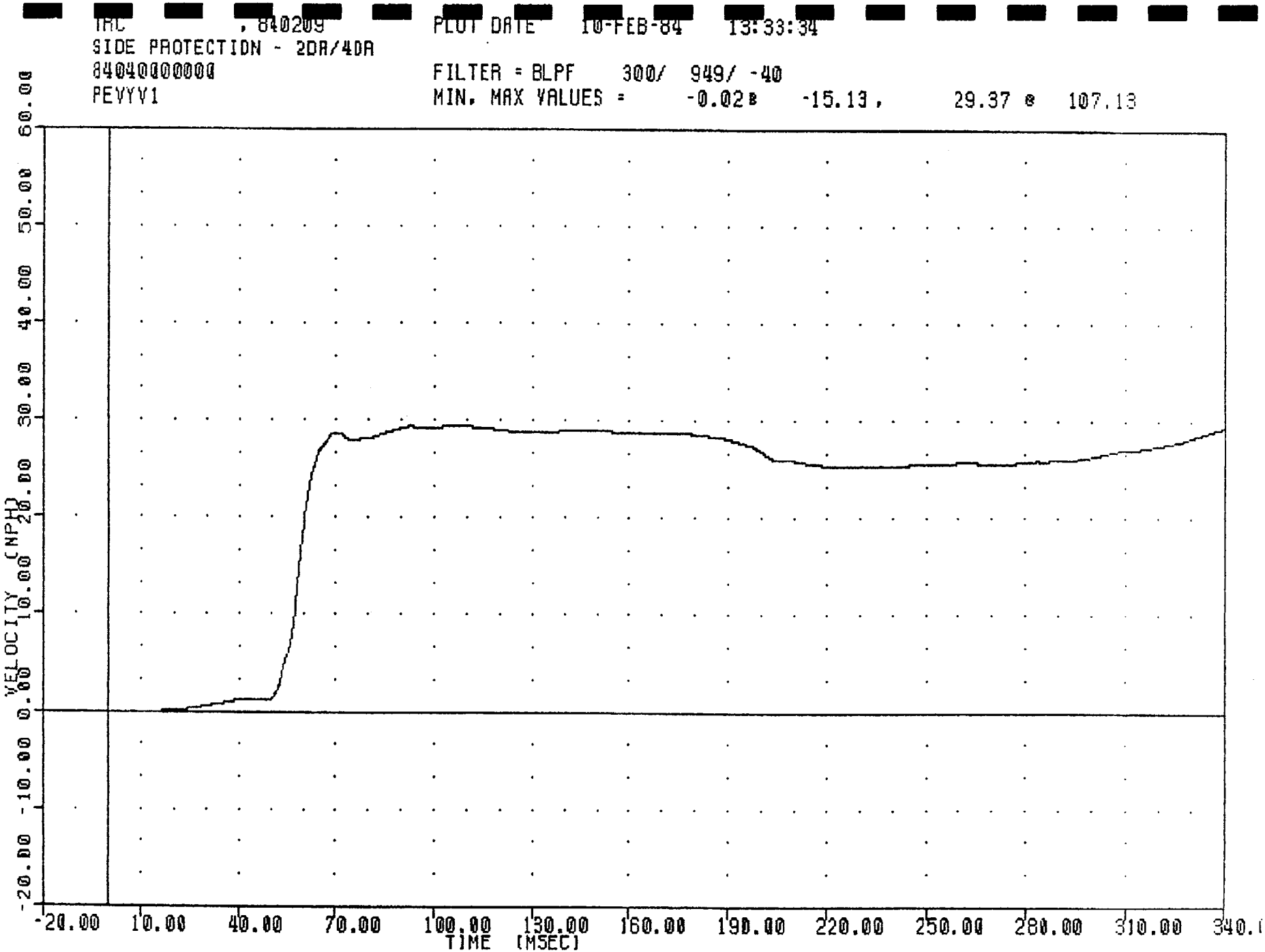
MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER PELVIS ACCELERATION Y AXIS



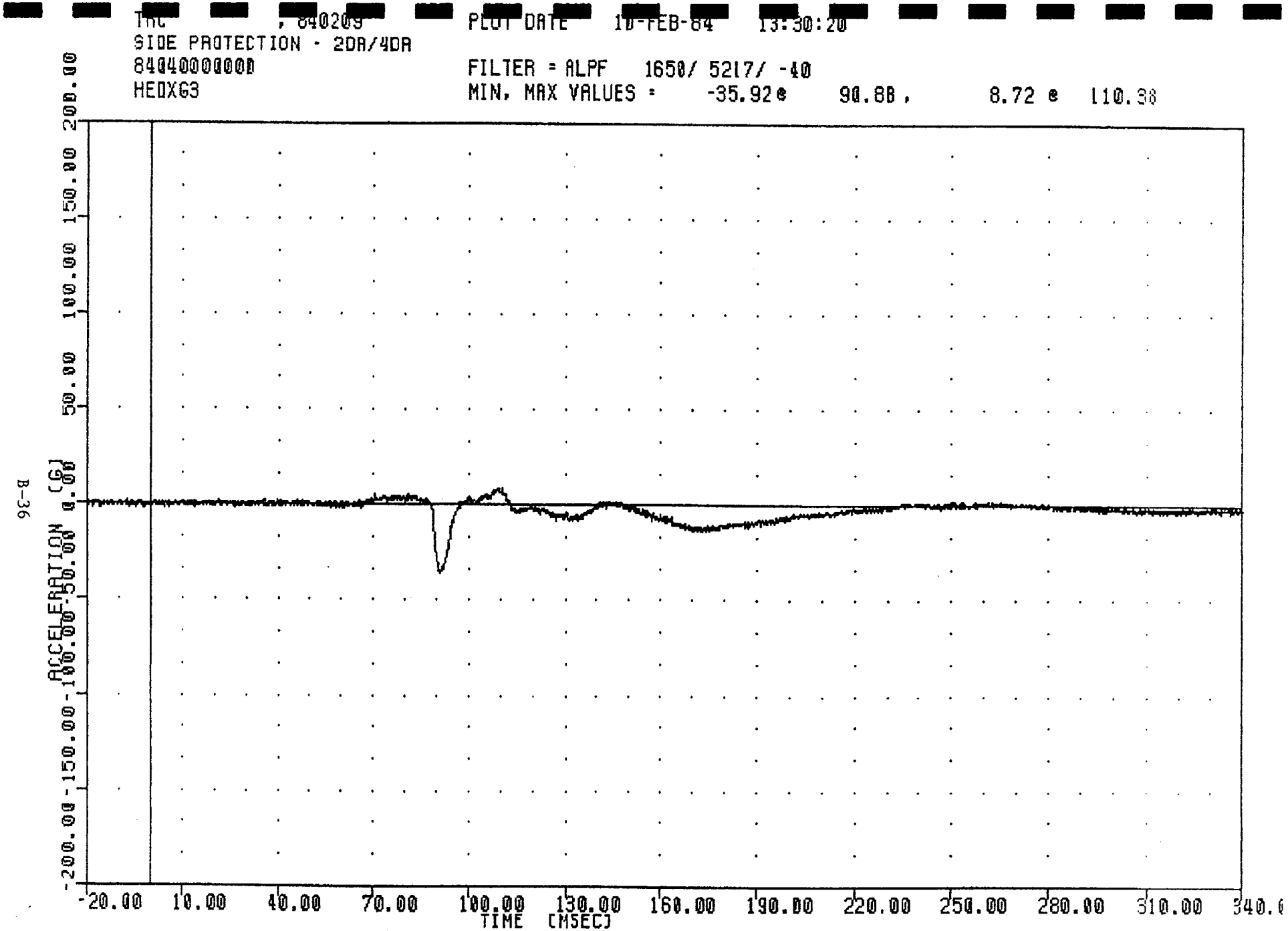
MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER PELVIS ACCELERATION Z AXIS



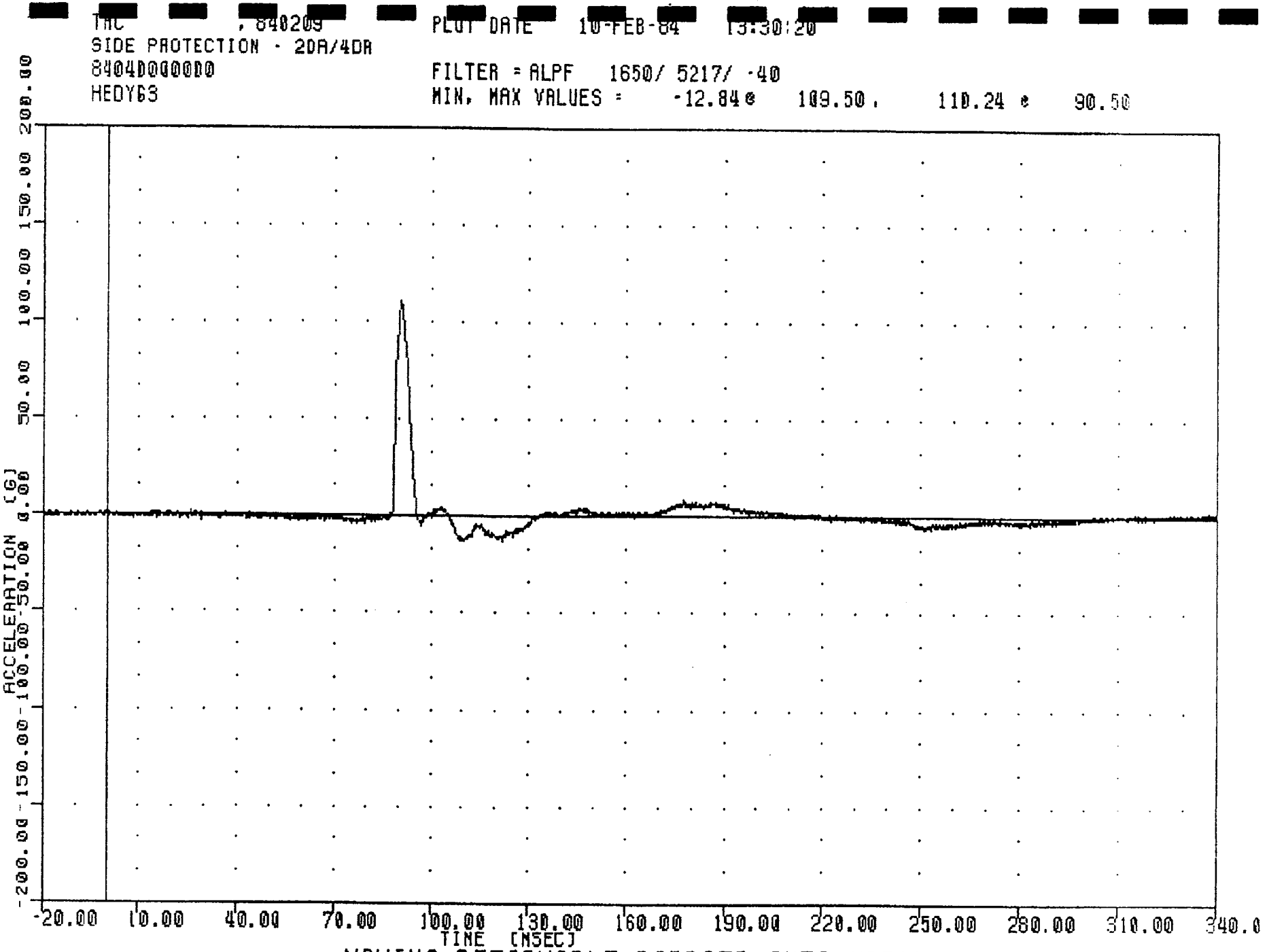
MOVING DEFORMABLE BARRIER INTO HORIZON
DRIVER PELVIS RESULTANT



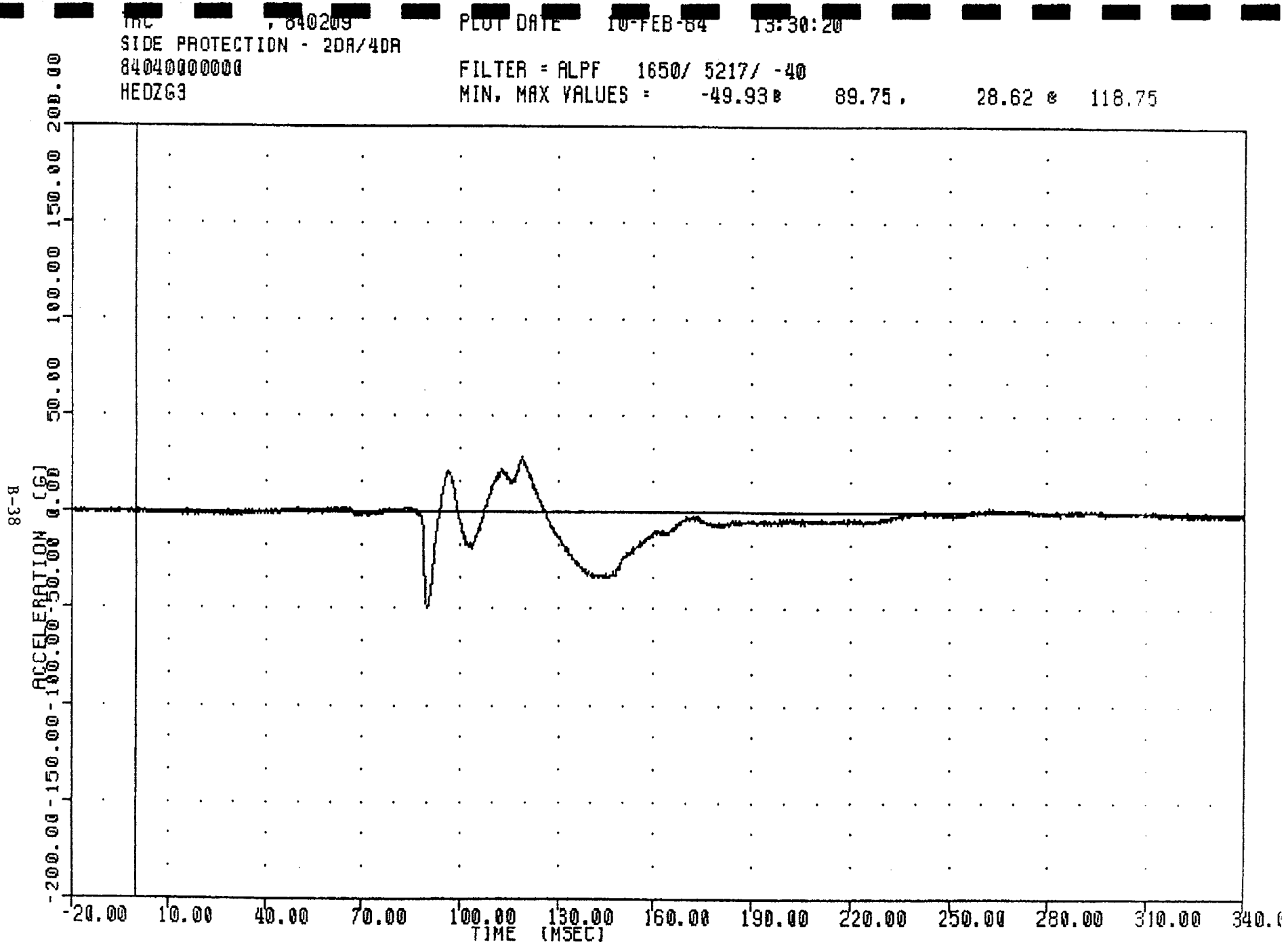
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING PEVYG1



MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER HEAD ACCELERATION X AXIS



MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER HEAD ACCELERATION Y AXIS



MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER HEAD ACCELERATION Z AXIS

[redacted] PLOT DATE [redacted] 16-FEB-84 [redacted]

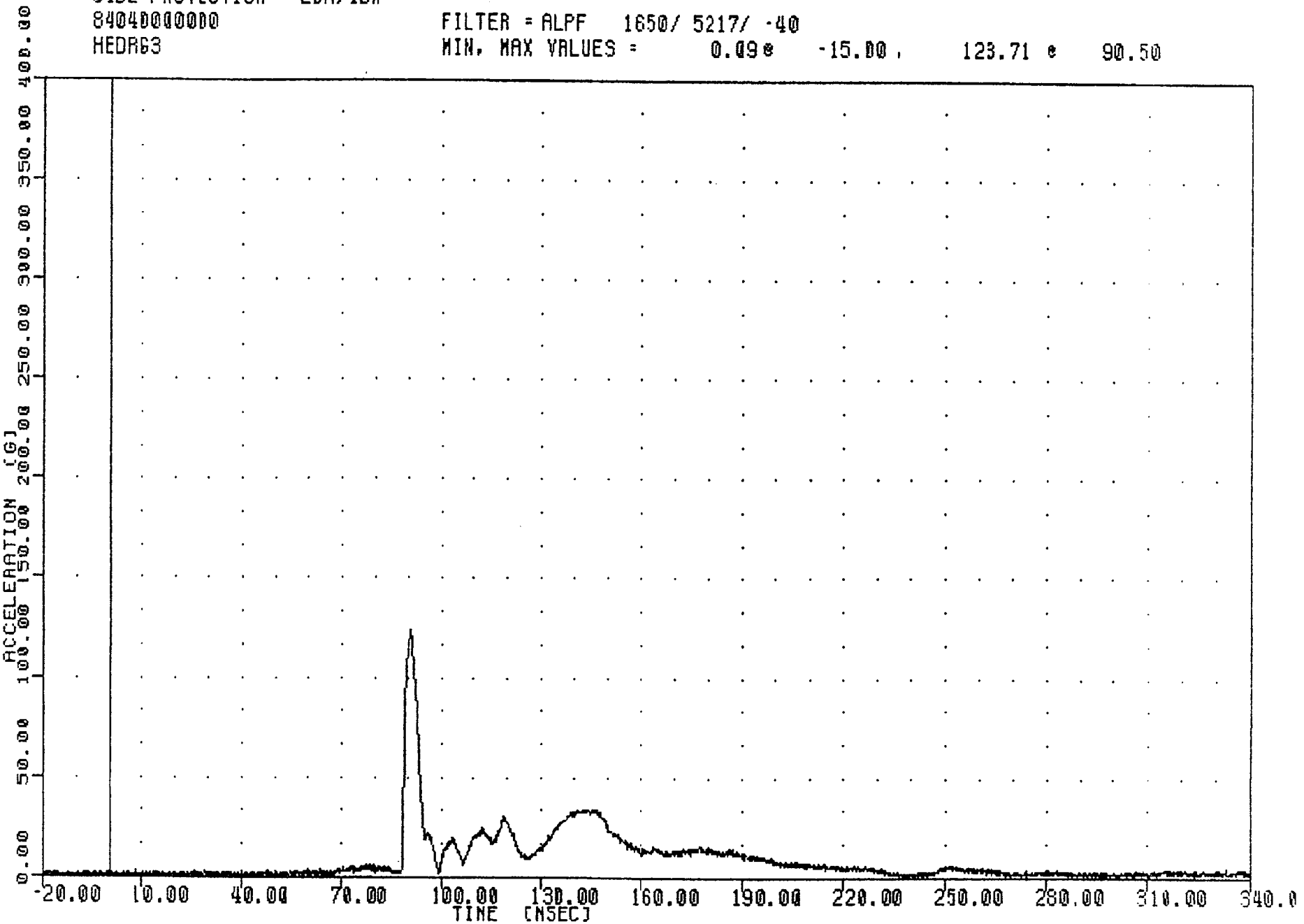
SIDE PROTECTION - 2DA/4DA

840400000000

HEDR63

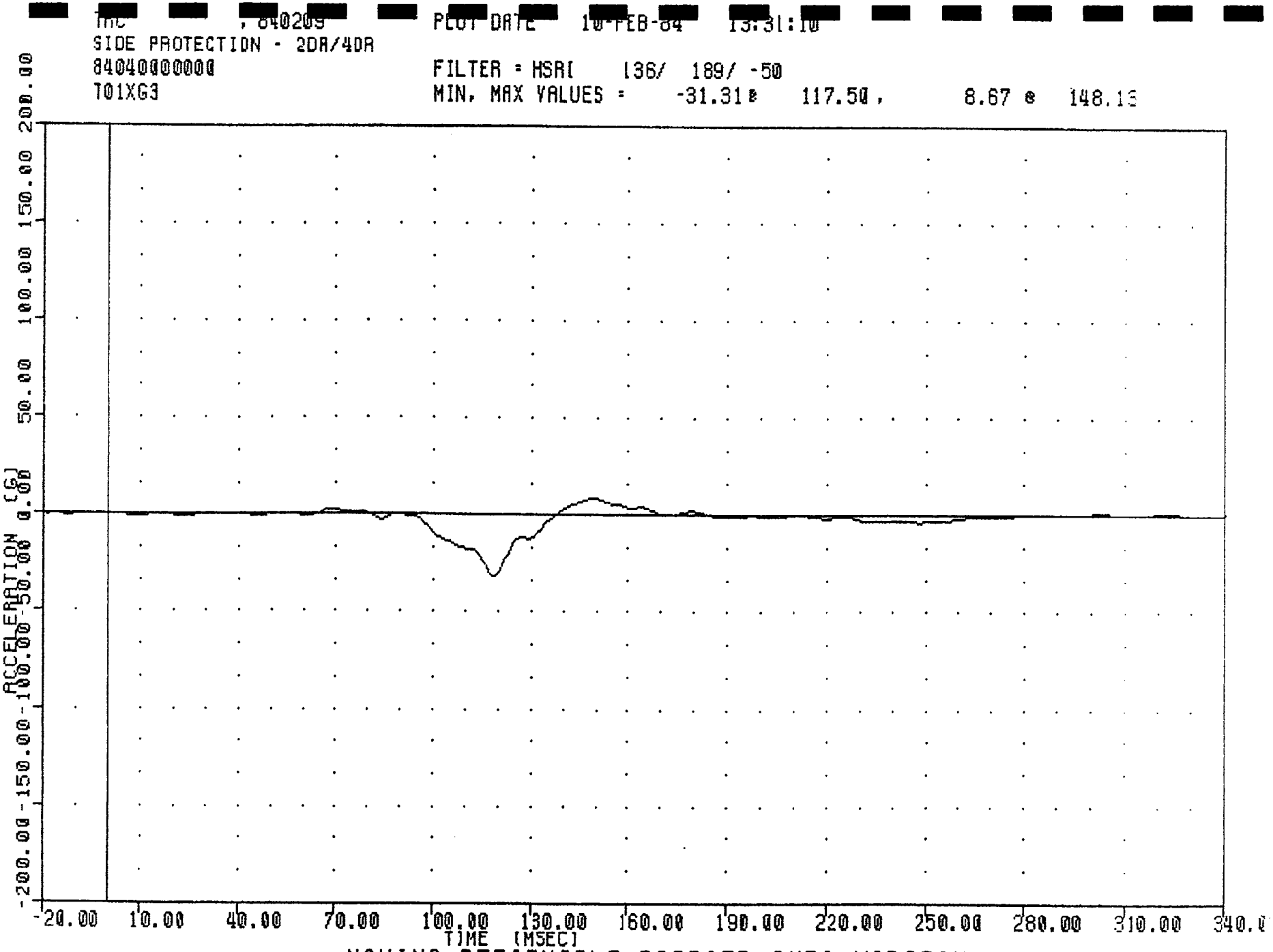
FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = 0.09 @ -15.00 , 123.71 @ 90.50



MOVING DEFORMABLE BARRIER INTO HORIZON

PASSENGER HEAD RESULTANT



MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER UPPER SPINE ACCELERATION X AXIS

[redacted] PLOT DATE [redacted] 15:31:10

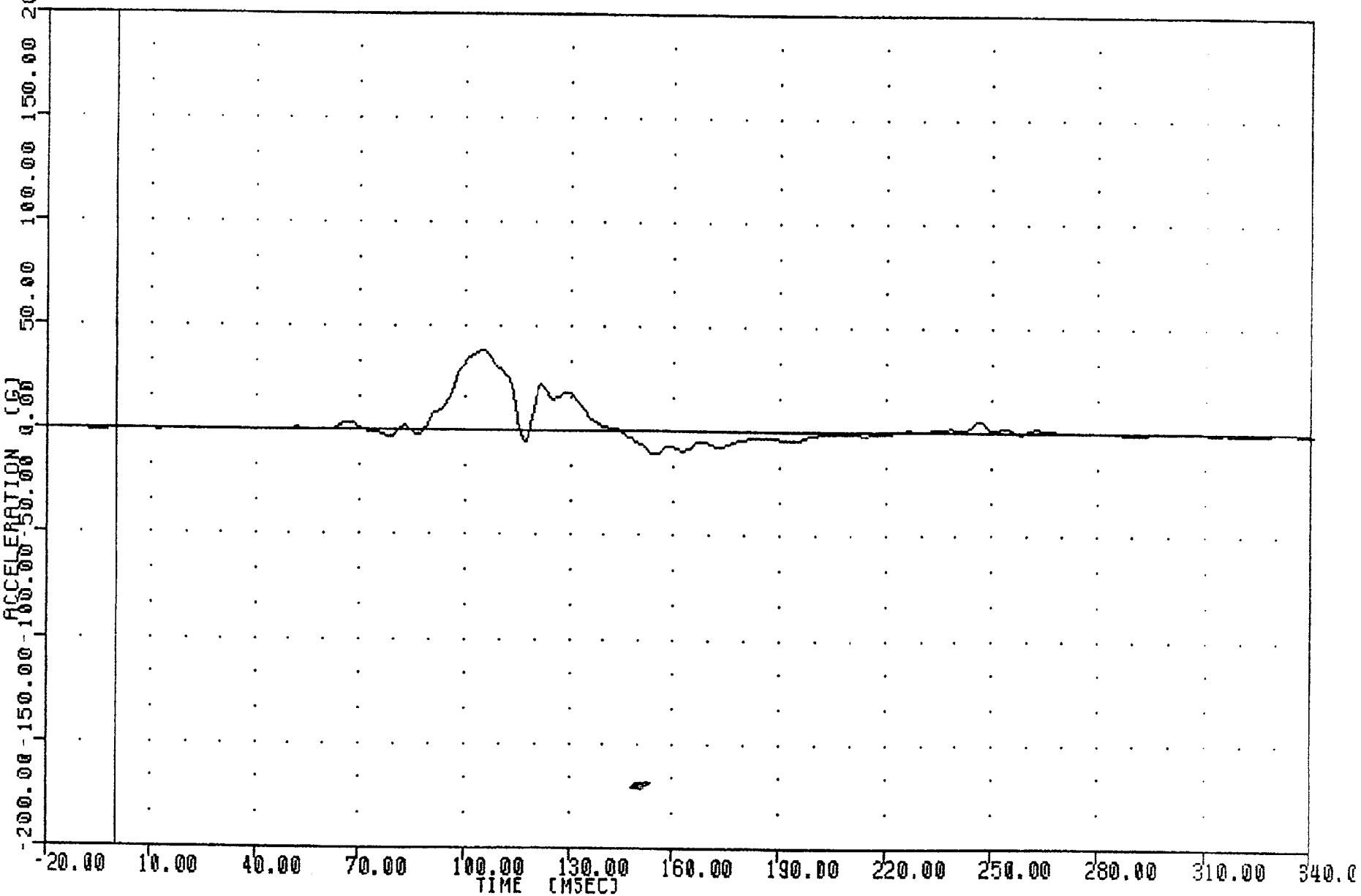
SIDE PROTECTION - 2DR/4DR

8404000000D

T01YG3

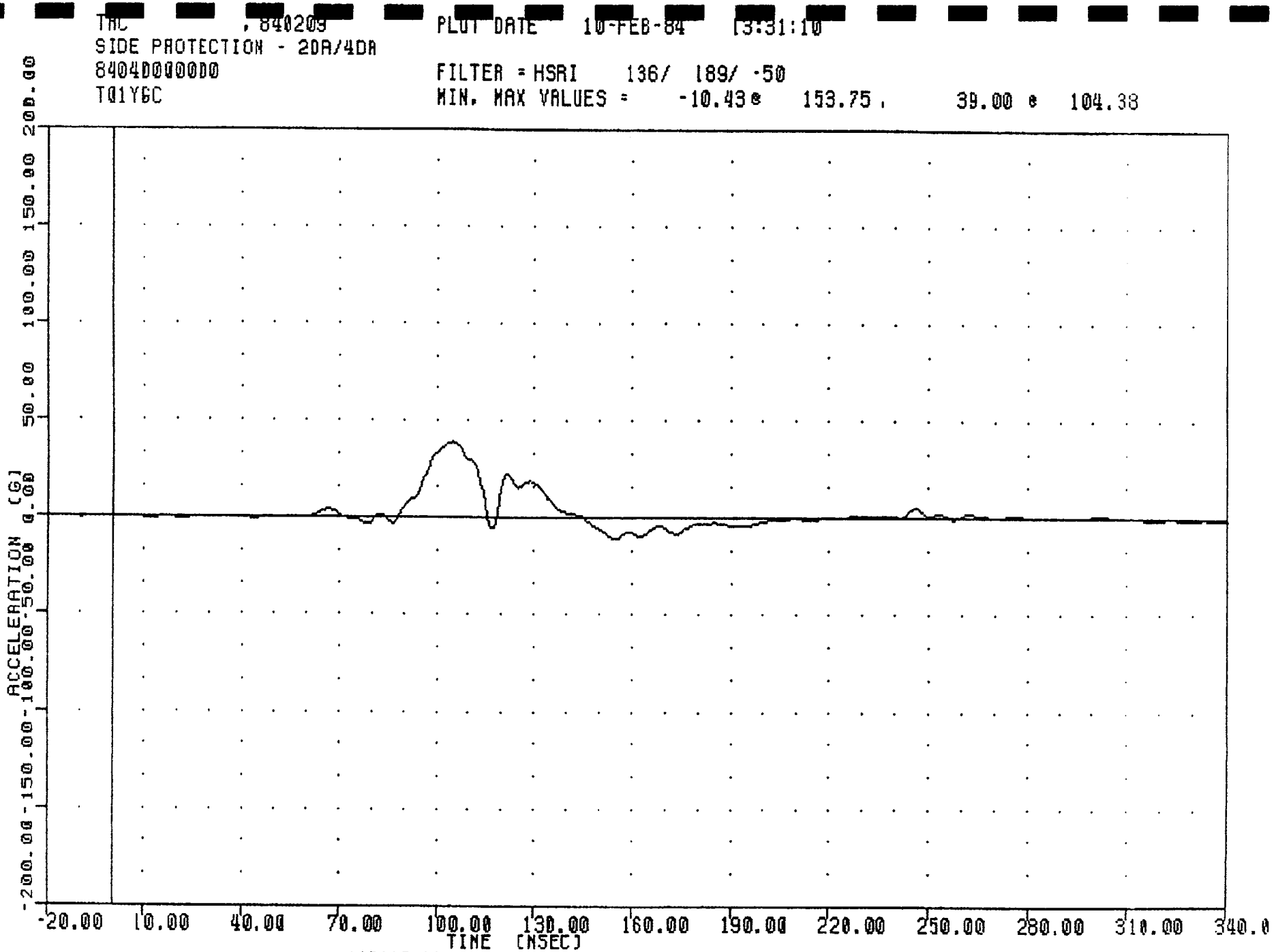
FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -10.70 @ 153.75 , 38.30 @ 104.38

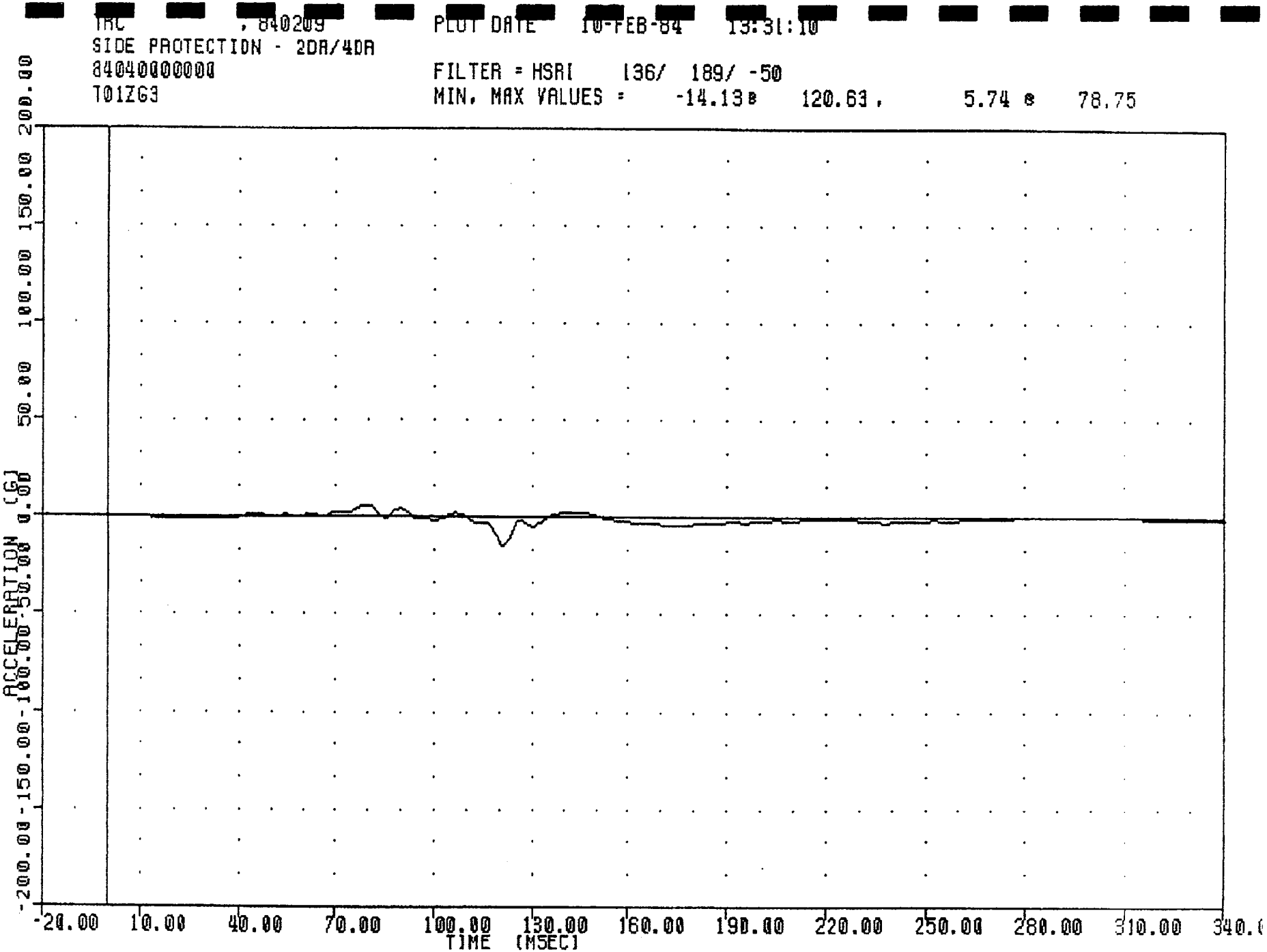


MOVING DEFORMABLE BARRIER INTO HORIZON

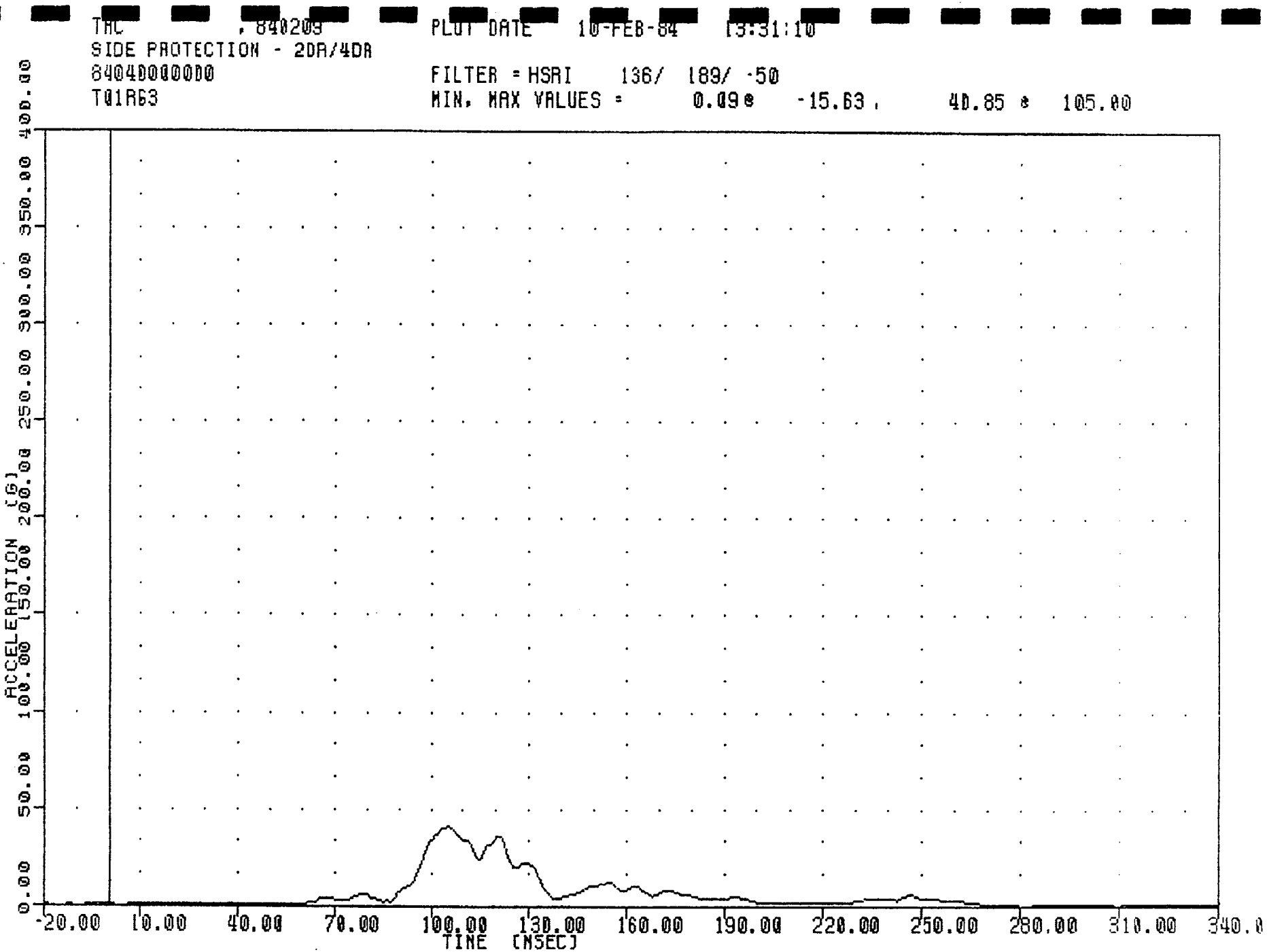
PASSENGER UPPER SPINE ACCELERATION Y AXIS



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



MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER UPPER SPINE ACCELERATION Z AXIS



MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER UPPER SPINE RESULTANT

[redacted] PLOT DATE [redacted]

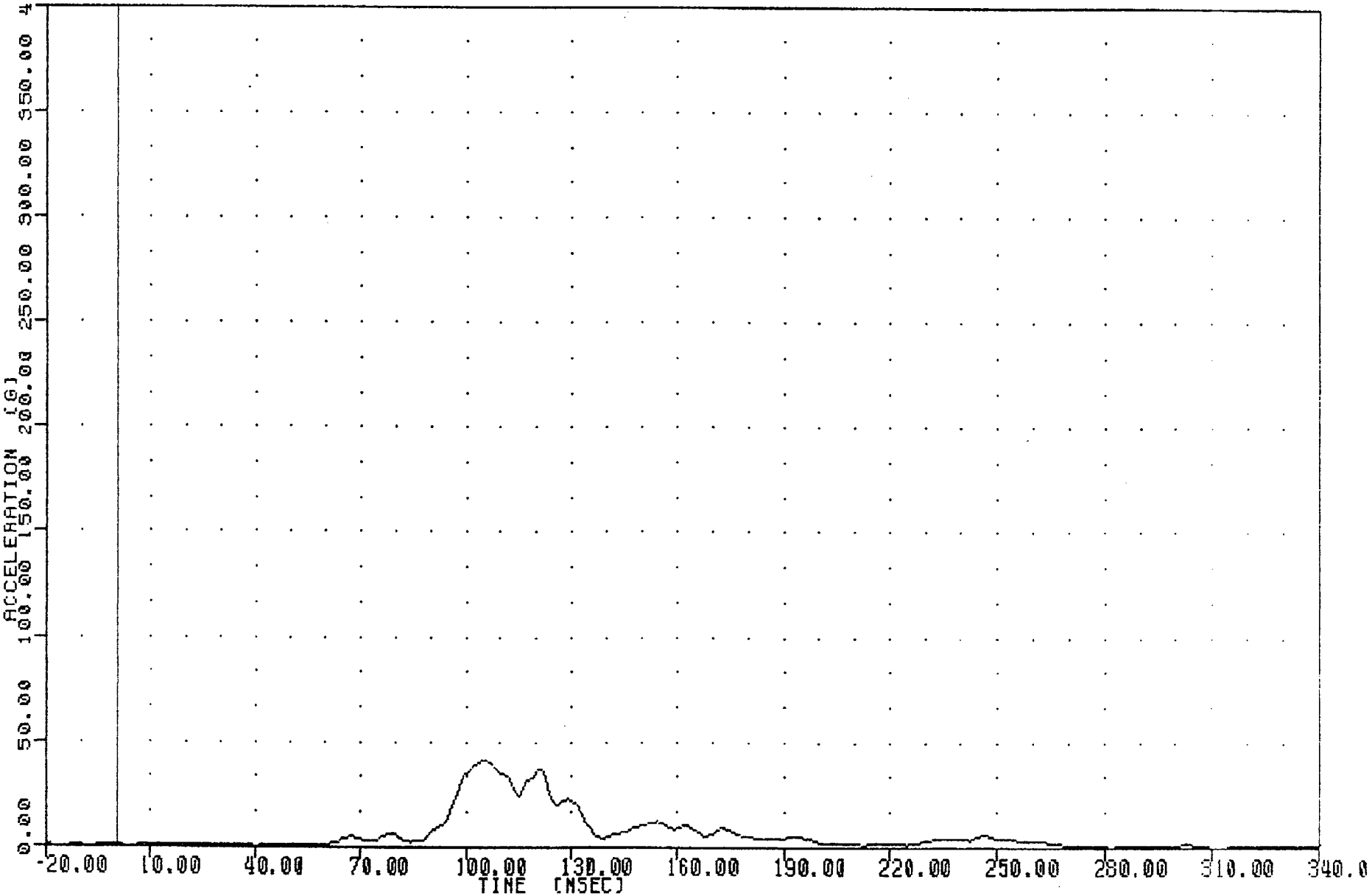
SIDE PROTECTION - 2DA/4DA

840400000000

T01R63

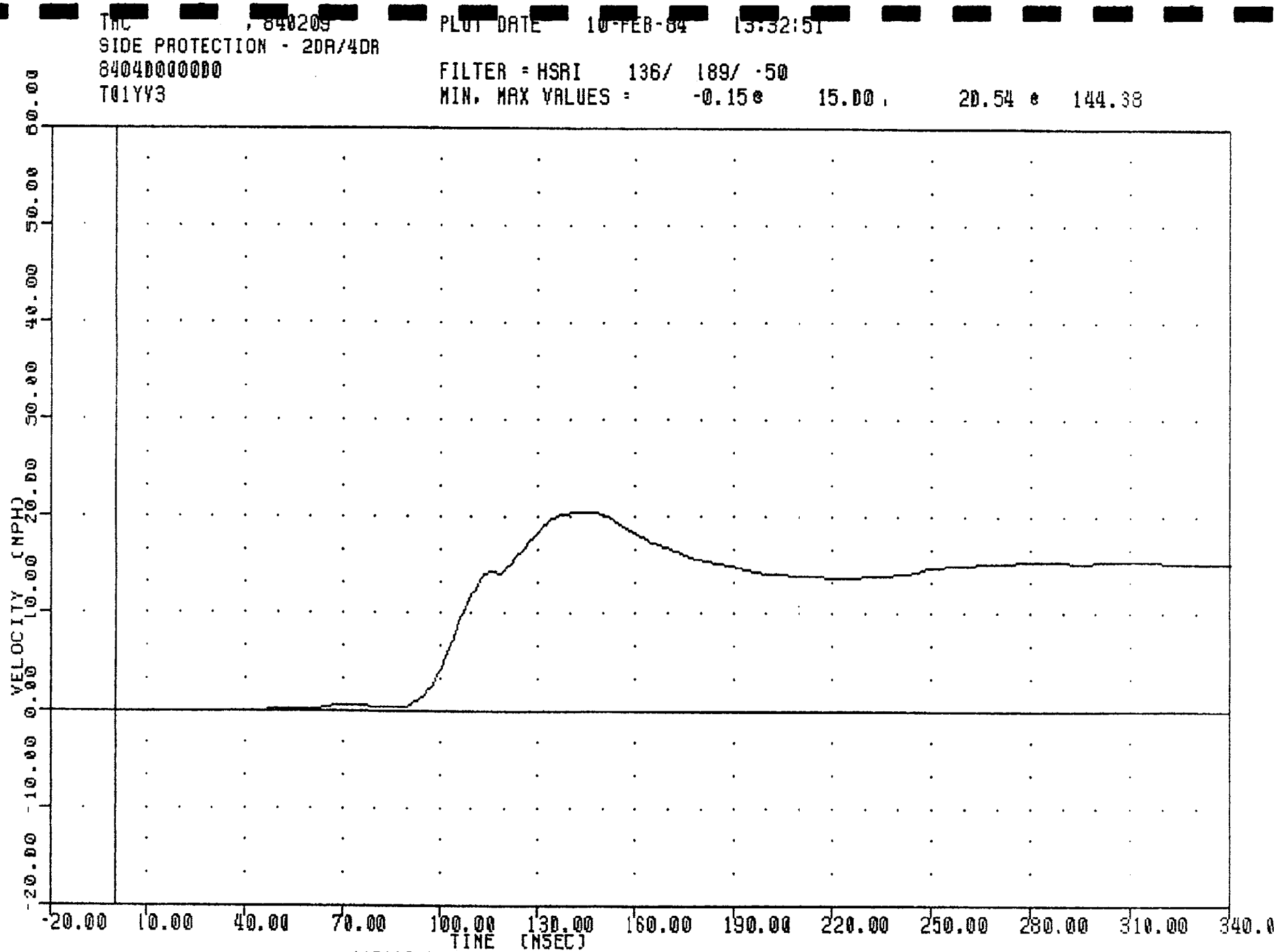
FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.08 @ -8.13 , 41.54 @ 105.00

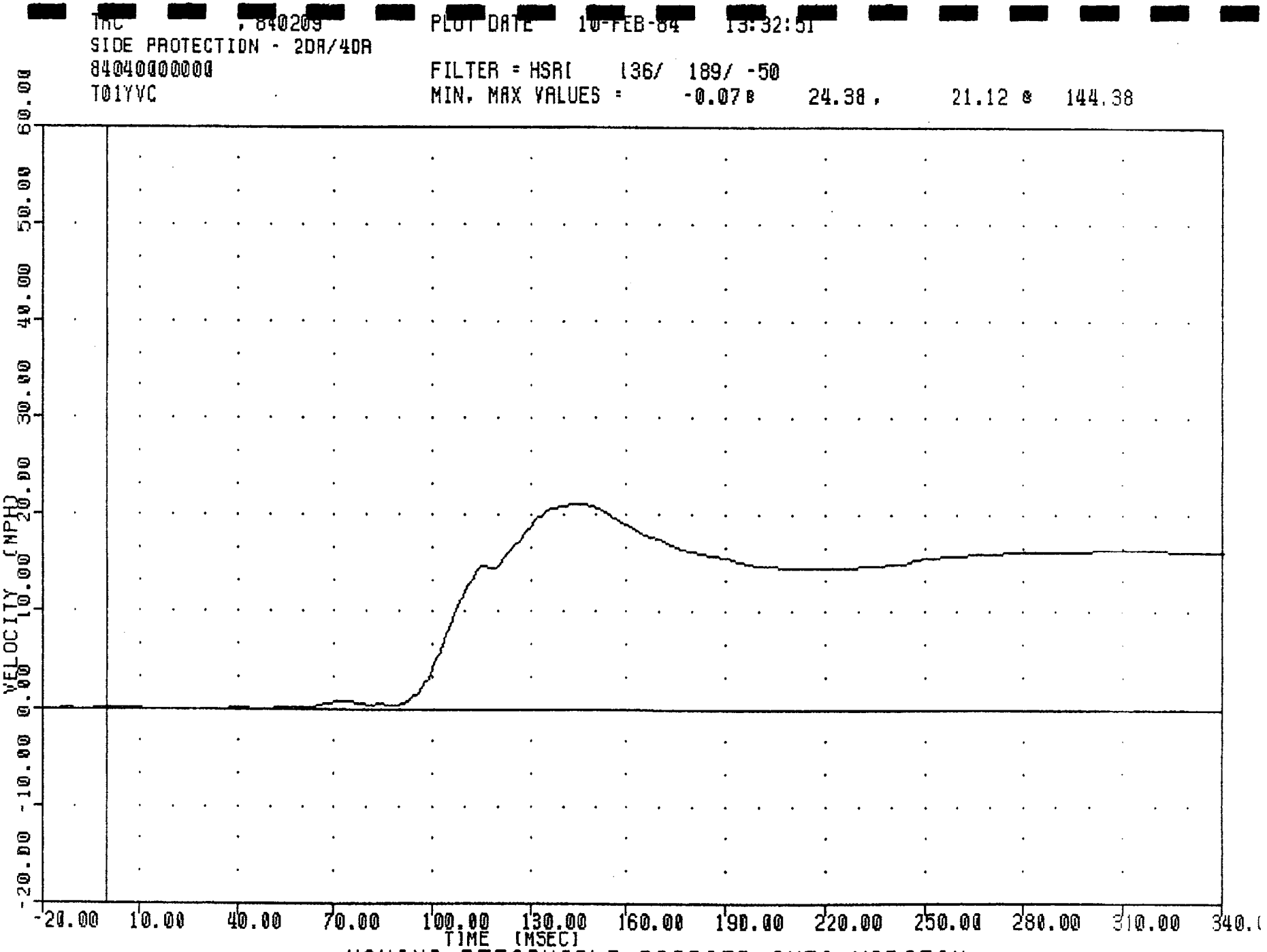


MOVING DEFORMABLE BARRIER INTO HORIZON

PASSENGER UPPER SPINE RESULTANT USING T01YGC

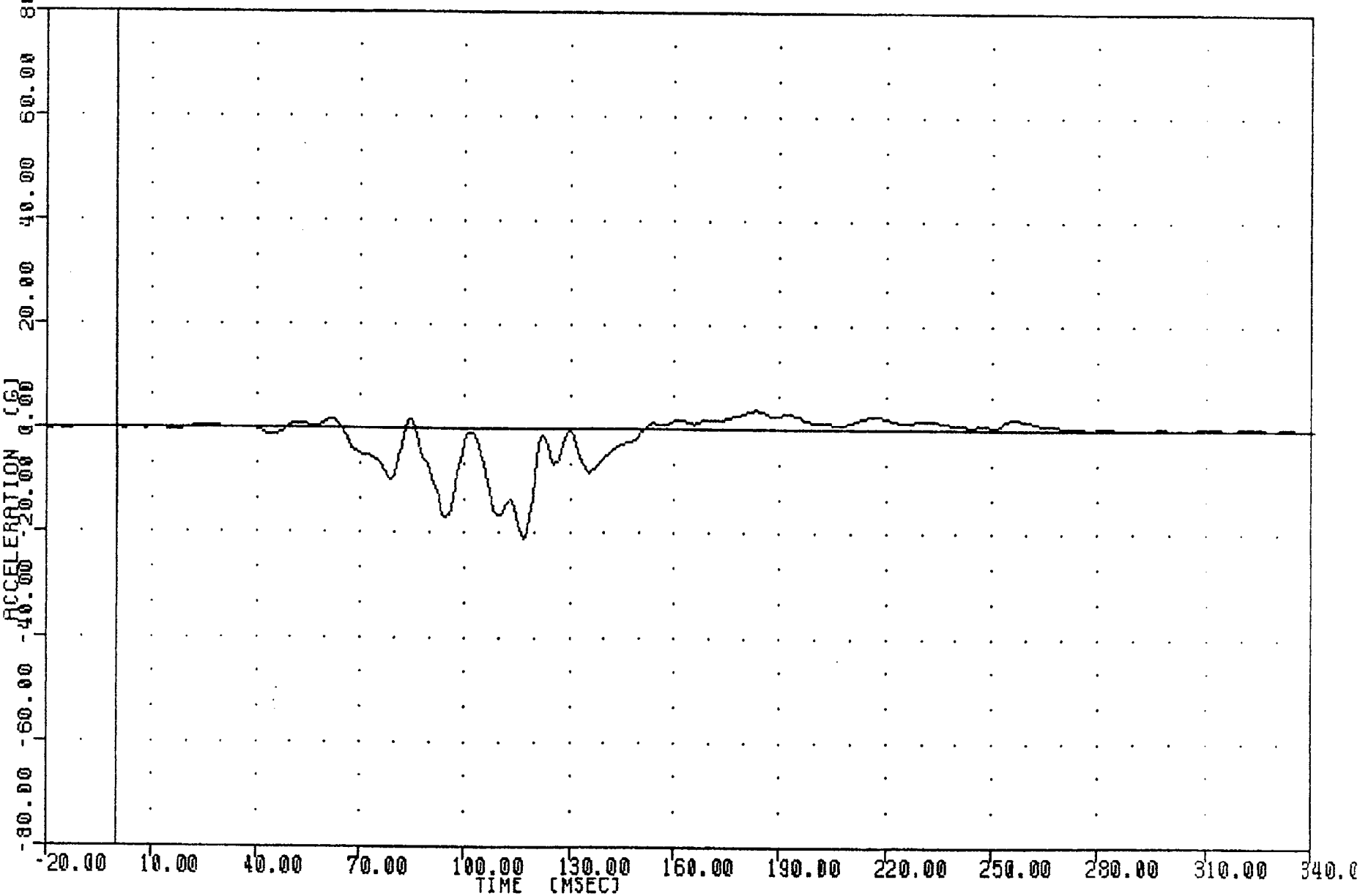


MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING T01YG3



MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING T01YGC

[redacted] , 840203 PLOT DATE 10-FEB-84 13:31:10
SIDE PROTECTION - 2DR/4DR
84040000000
T12XG3
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -21.16 @ 116.25 , 3.74 @ 182.50



MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER LOWER SPINE ACCELERATION X AXIS

[redacted] PLOT DATE 10-FEB-84 15:31:10

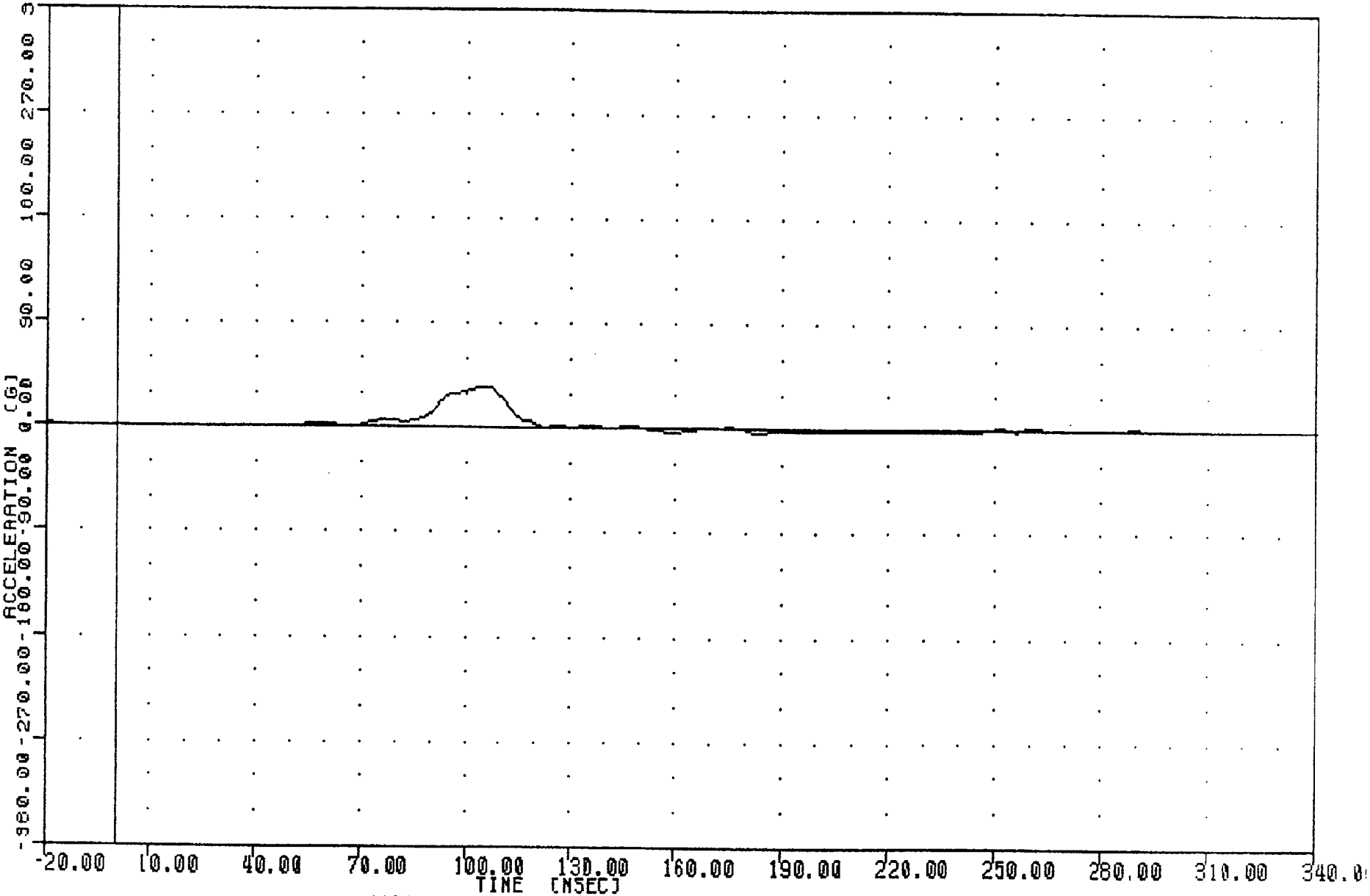
SIDE PROTECTION - 2DR/4DR

8404D0000000

T12YG3

FILTER = HSRI 136/ 189/ -50

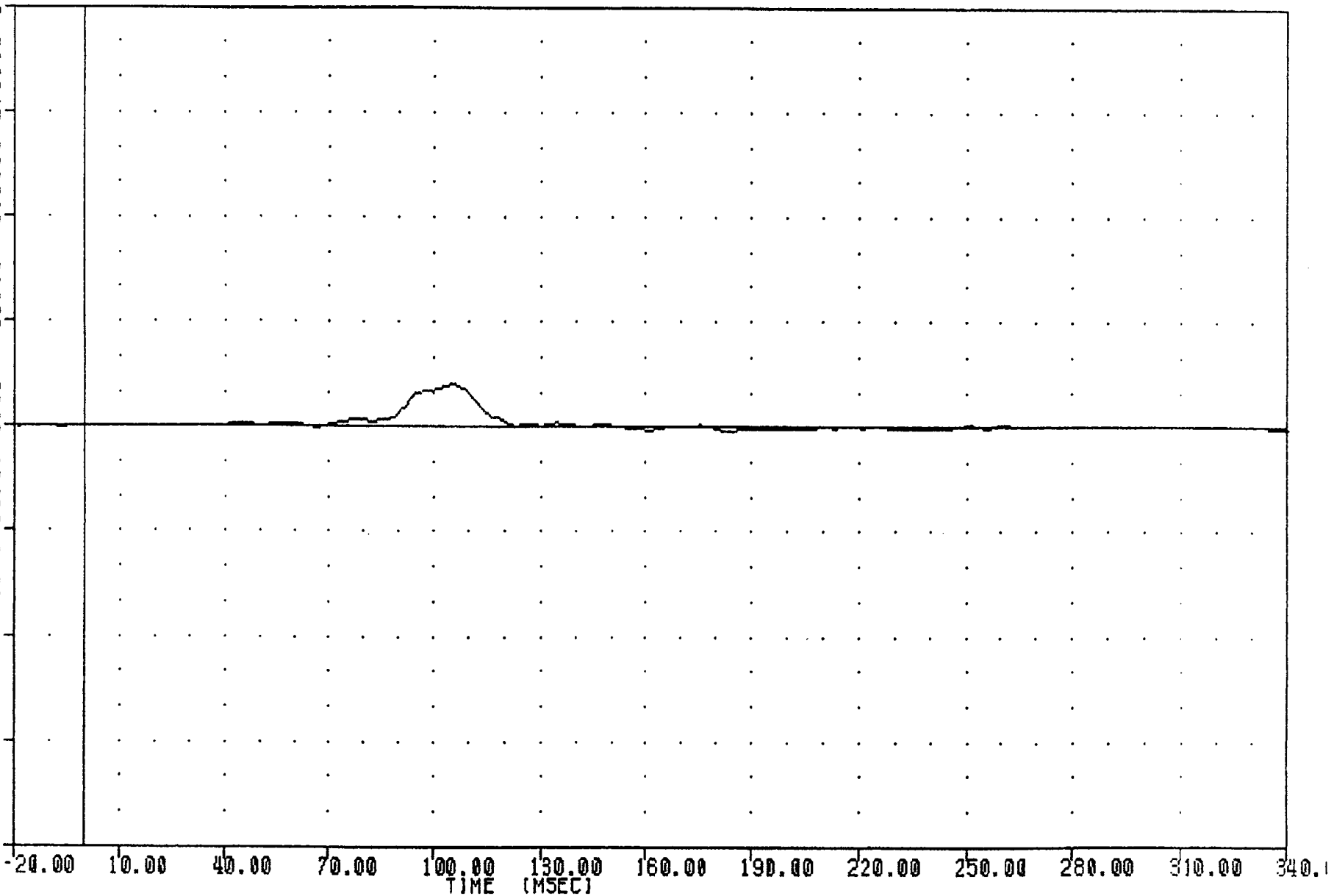
MIN. MAX VALUES = -3.28 @ 183.12 , 35.38 @ 105.00



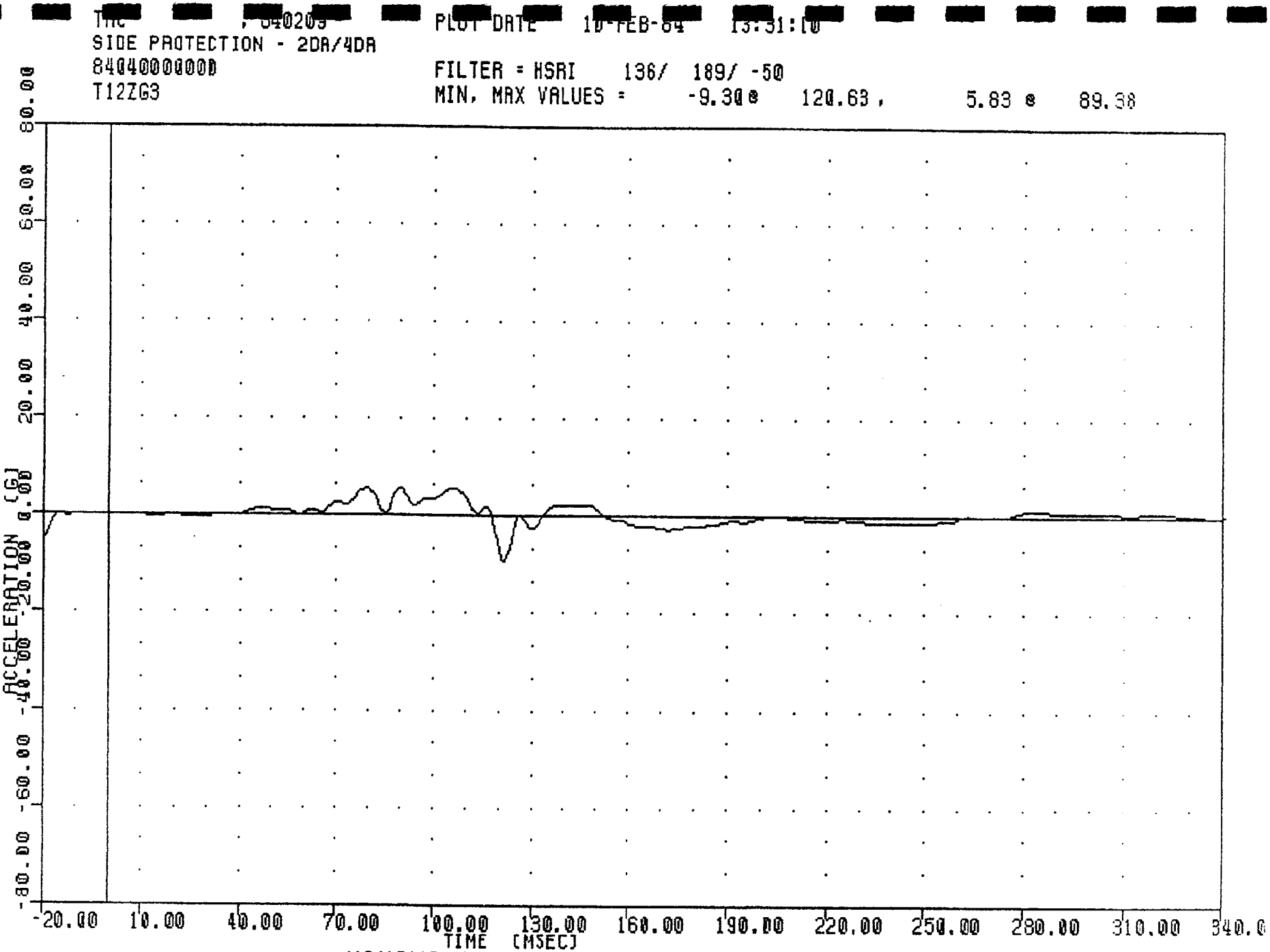
MOVING DEFORMABLE BARRIER INTO HORIZON

PASSENGER LOWER SPINE ACCELERATION Y AXIS

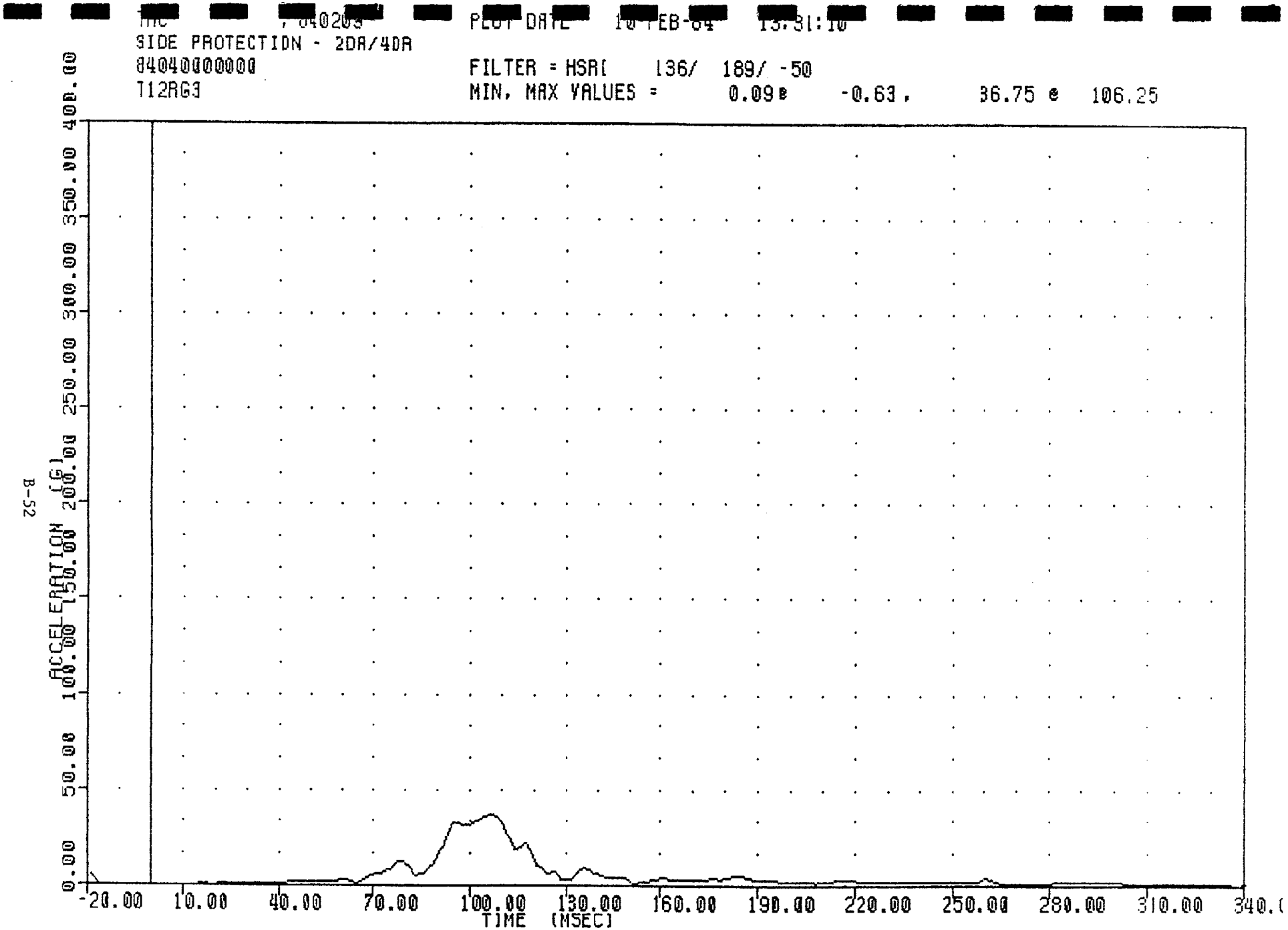
[redacted] , 040209 PLOT DATE = 10 FEB 04 15:31:10
SIDE PROTECTION - 2DR/4DR
840400000000
T12YGC
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -3.32 @ 182.50 , 36.05 @ 105.00



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

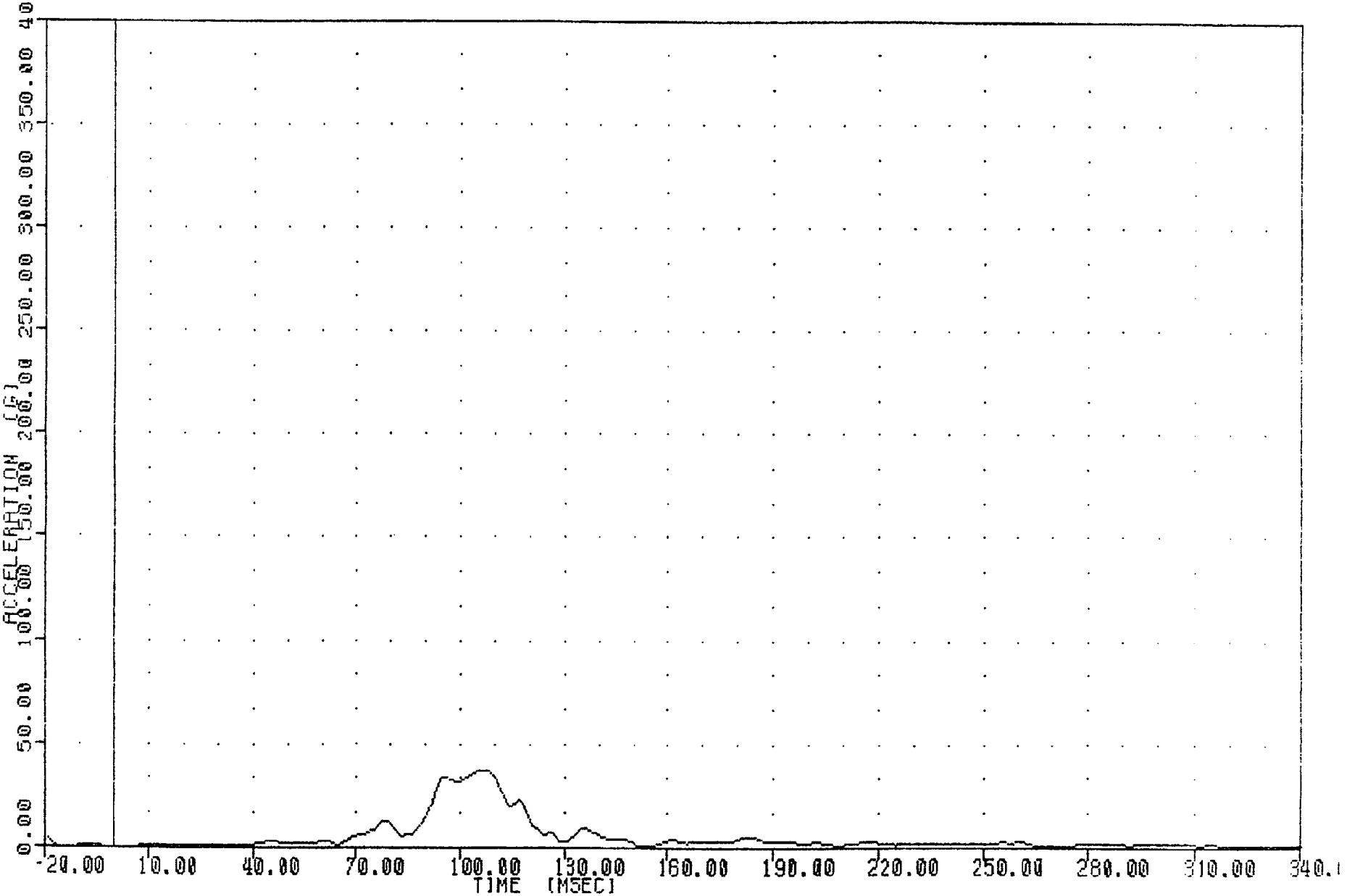


MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER LOWER SPINE ACCELERATION Z AXIS

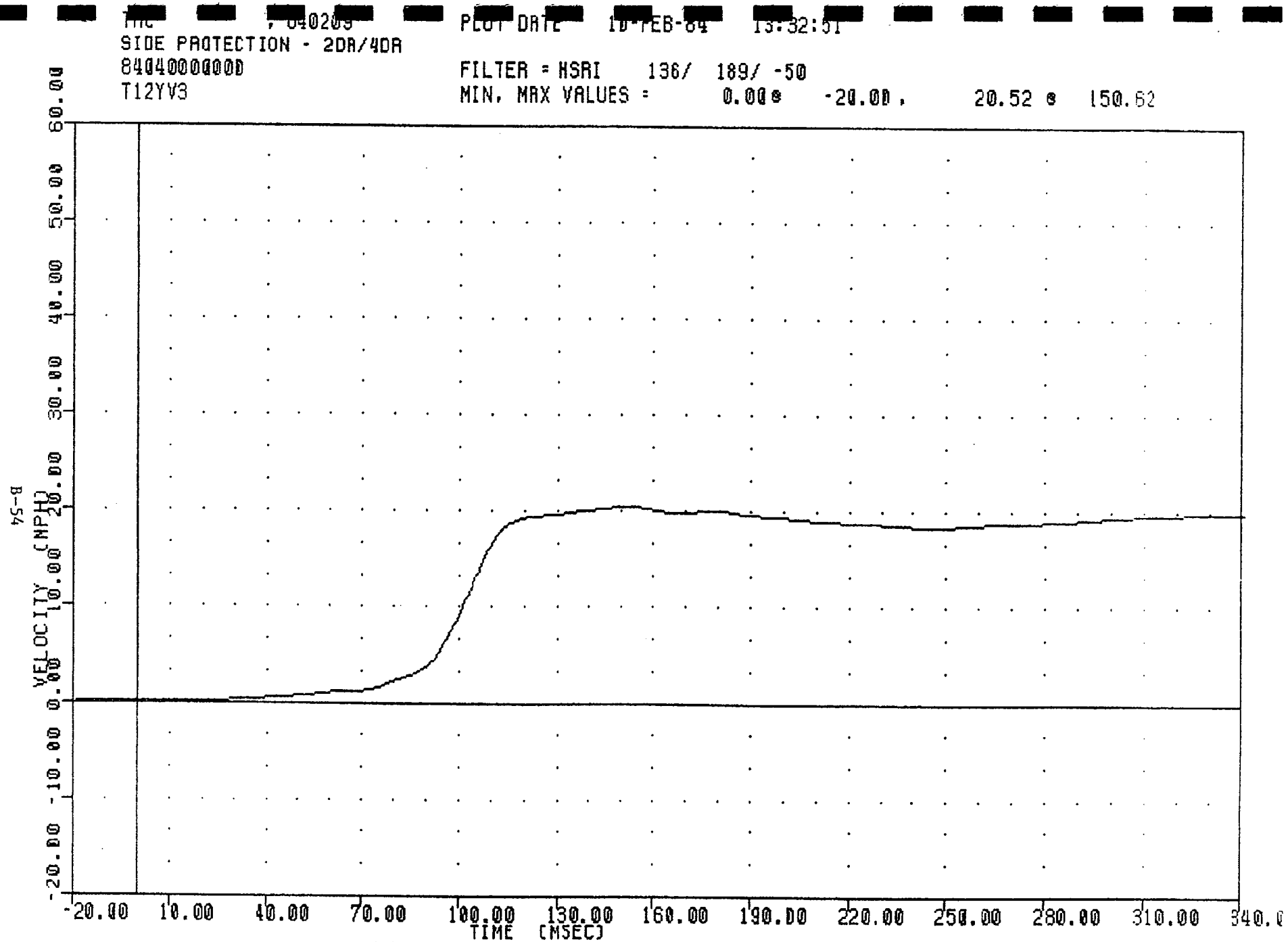


MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER LOWER SPINE RESULTANT

TRC , 840209 PLOT DATE 10-FEB-84 13:32:22
SIDE PROTECTION - 2DR/4DR
840400000000 FILTER = HSRI 136/ 189/ -50
T12RG3 MIN, MAX VALUES = 0.11 @ -1.25 , 37.38 @ 106.25



MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER LOWER SPINE RESULTANT USING T12YGC



MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING T12YG3

[redacted] PLOT DATE 10-FEB-84 13:32:51

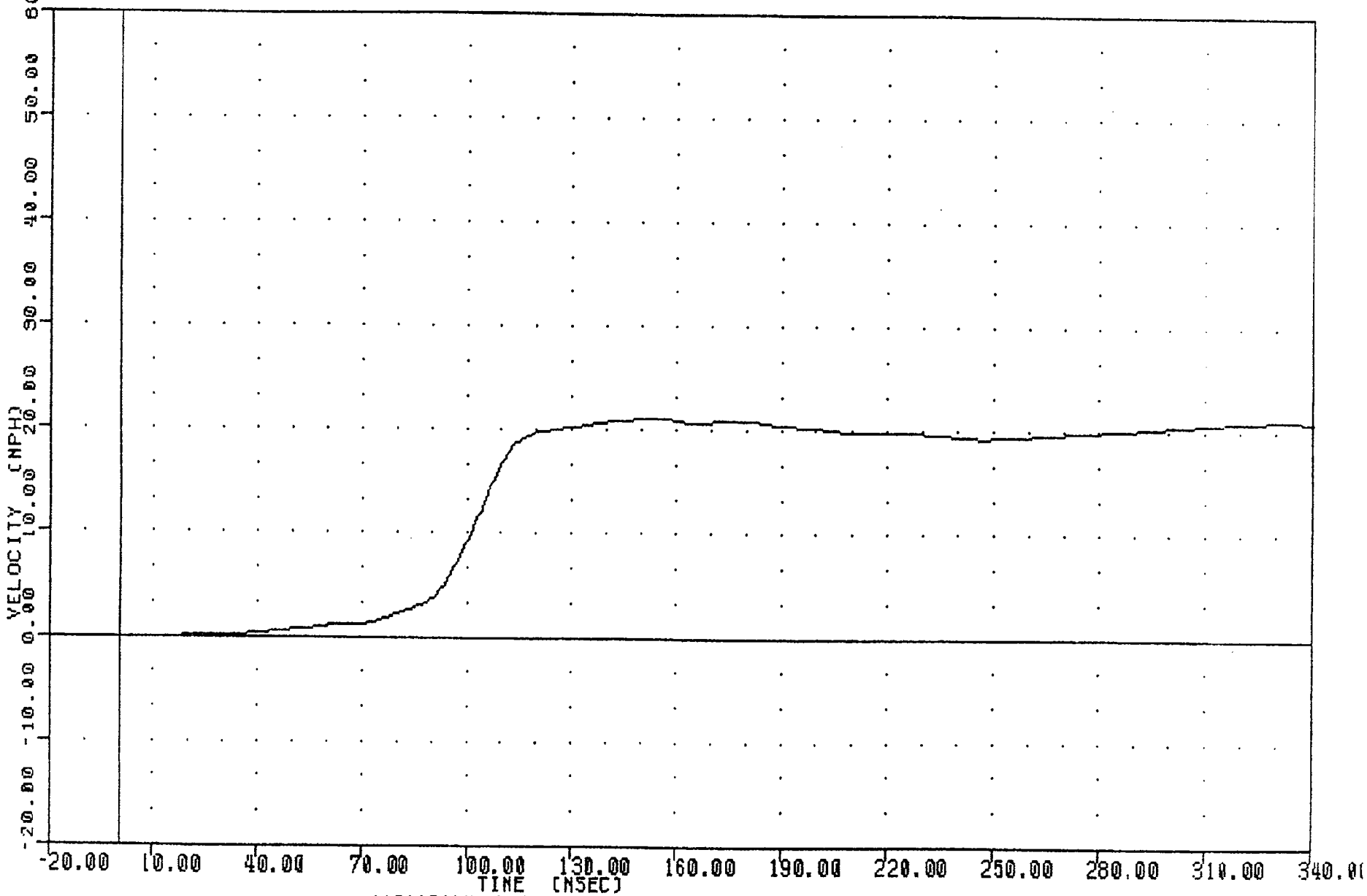
SIDE PROTECTION - 2DR/4DR

8404D0000D0

T12YVC

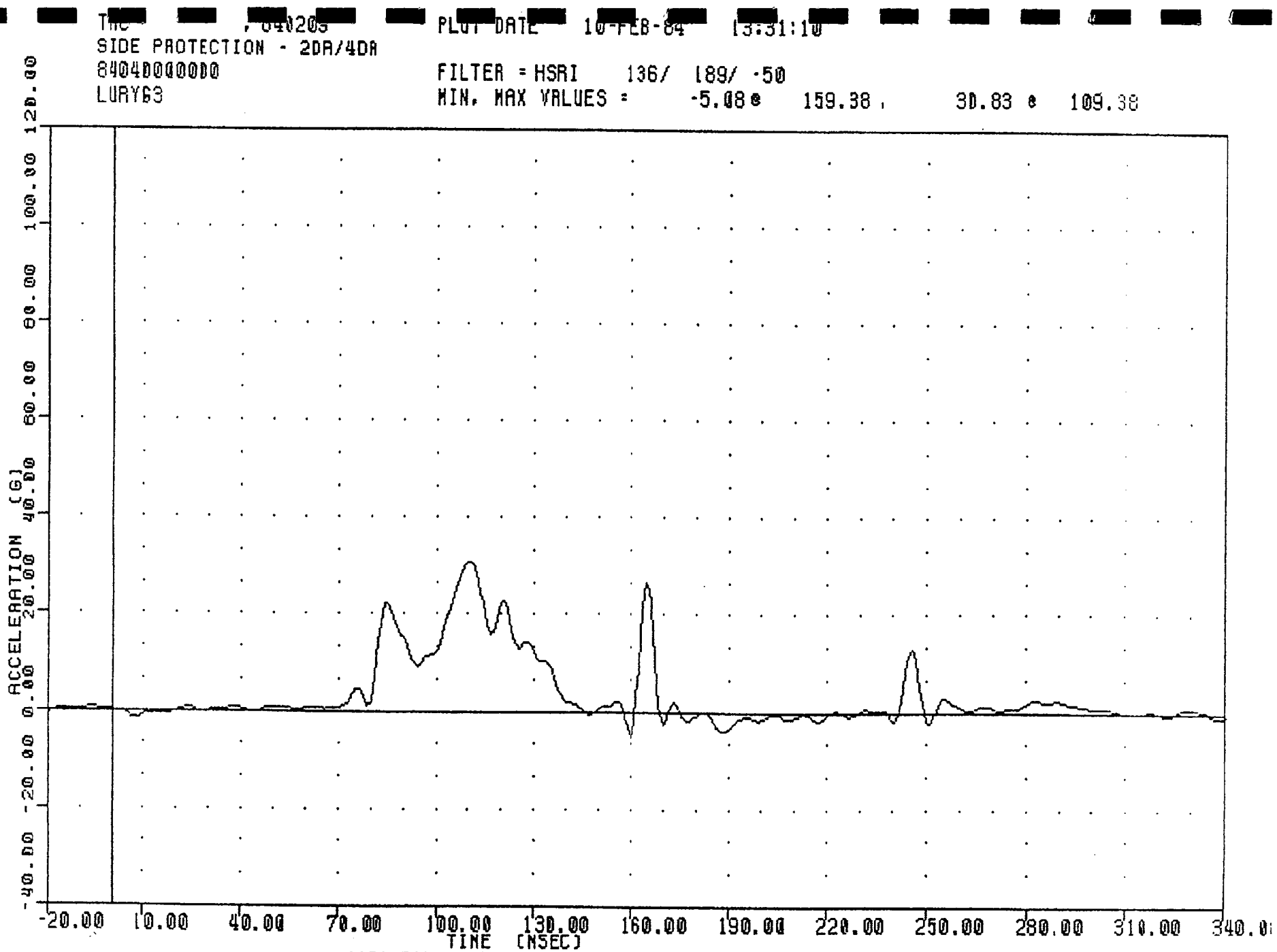
FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.13 @ -1.88 , 21.11 @ 151.25



MOVING DEFORMABLE BARRIER INTO HORIZON

DELTA V USING T12YGC

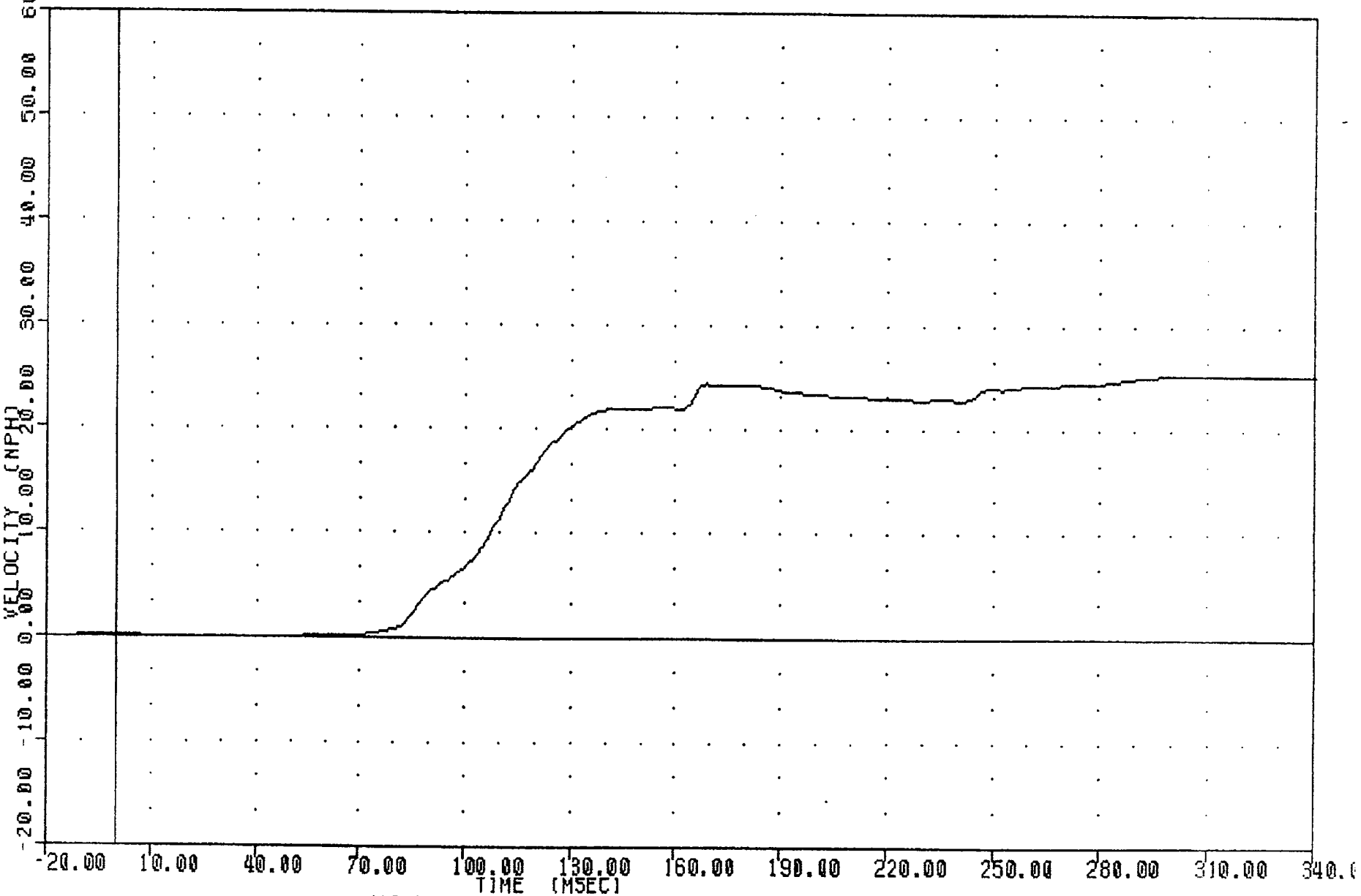


MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER LEFT UPPER RIB ACCELERATION Y AXIS

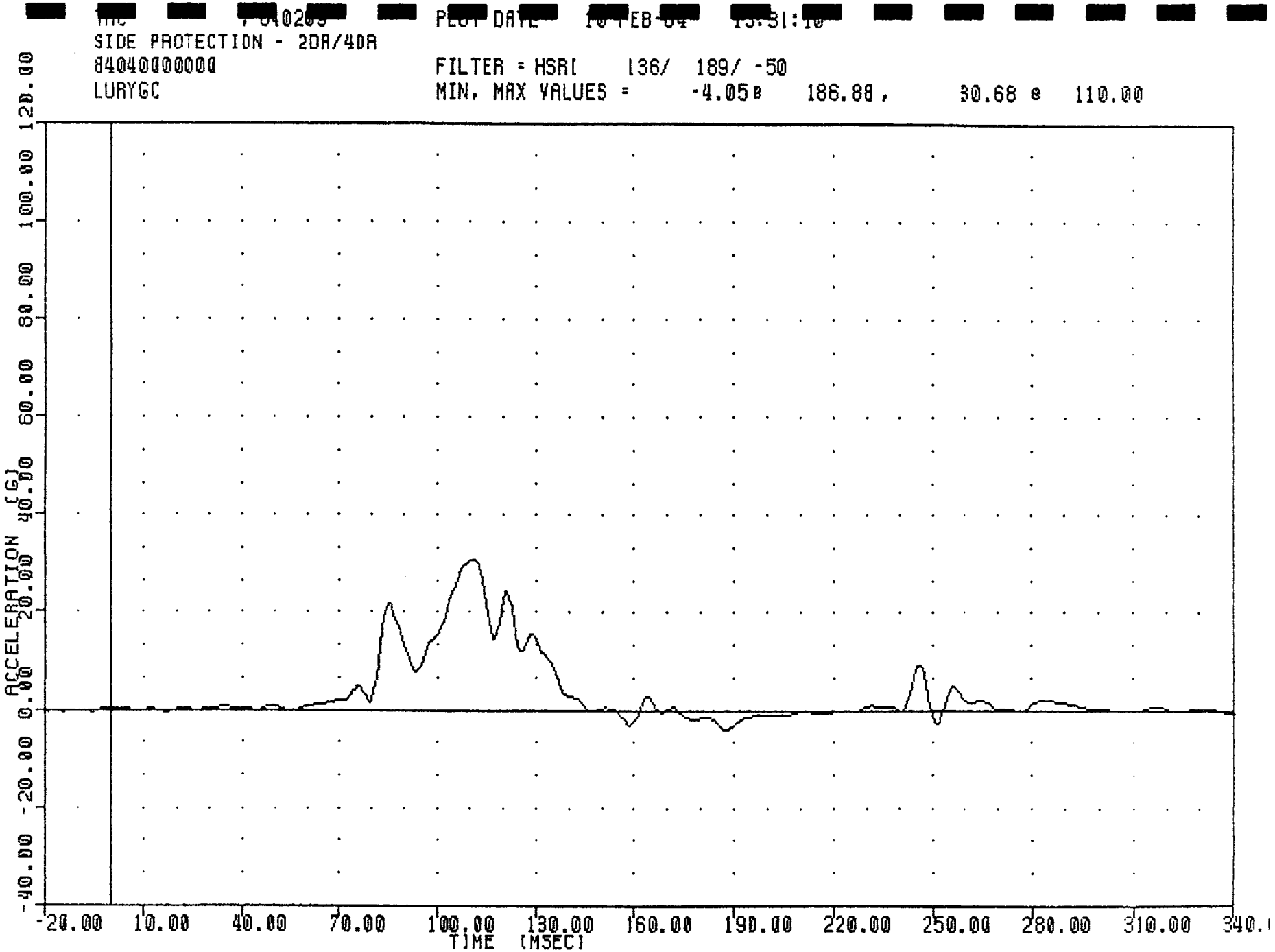
[redacted]

SIDE PROTECTION - 2DR/4DR
840400000000
LURYV3

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -0.19 @ 20.00 , 25.43 @ 333.75



MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LURYG3

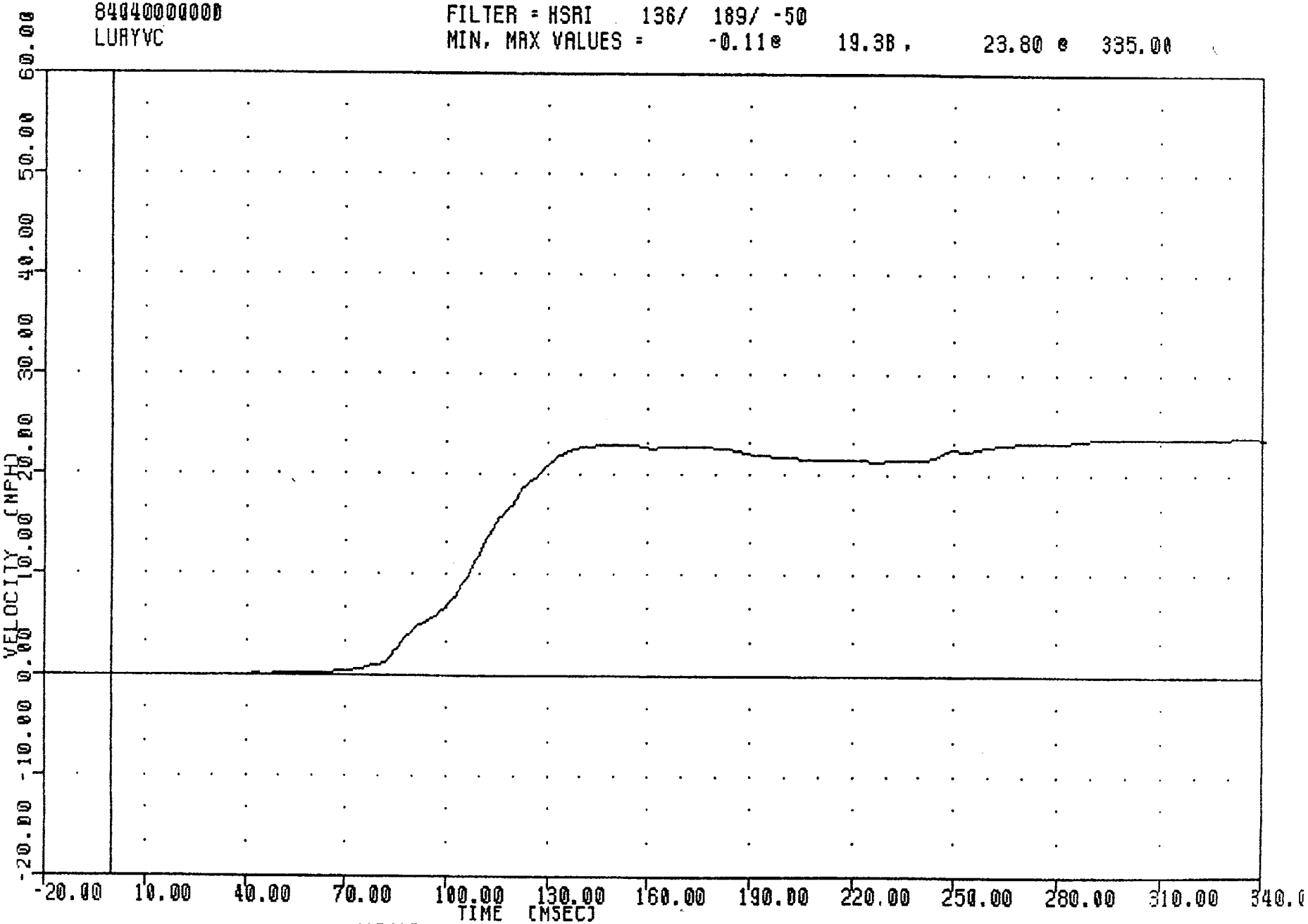


MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER LEFT UPPER RIB ACCELERATION -2 Y AXIS

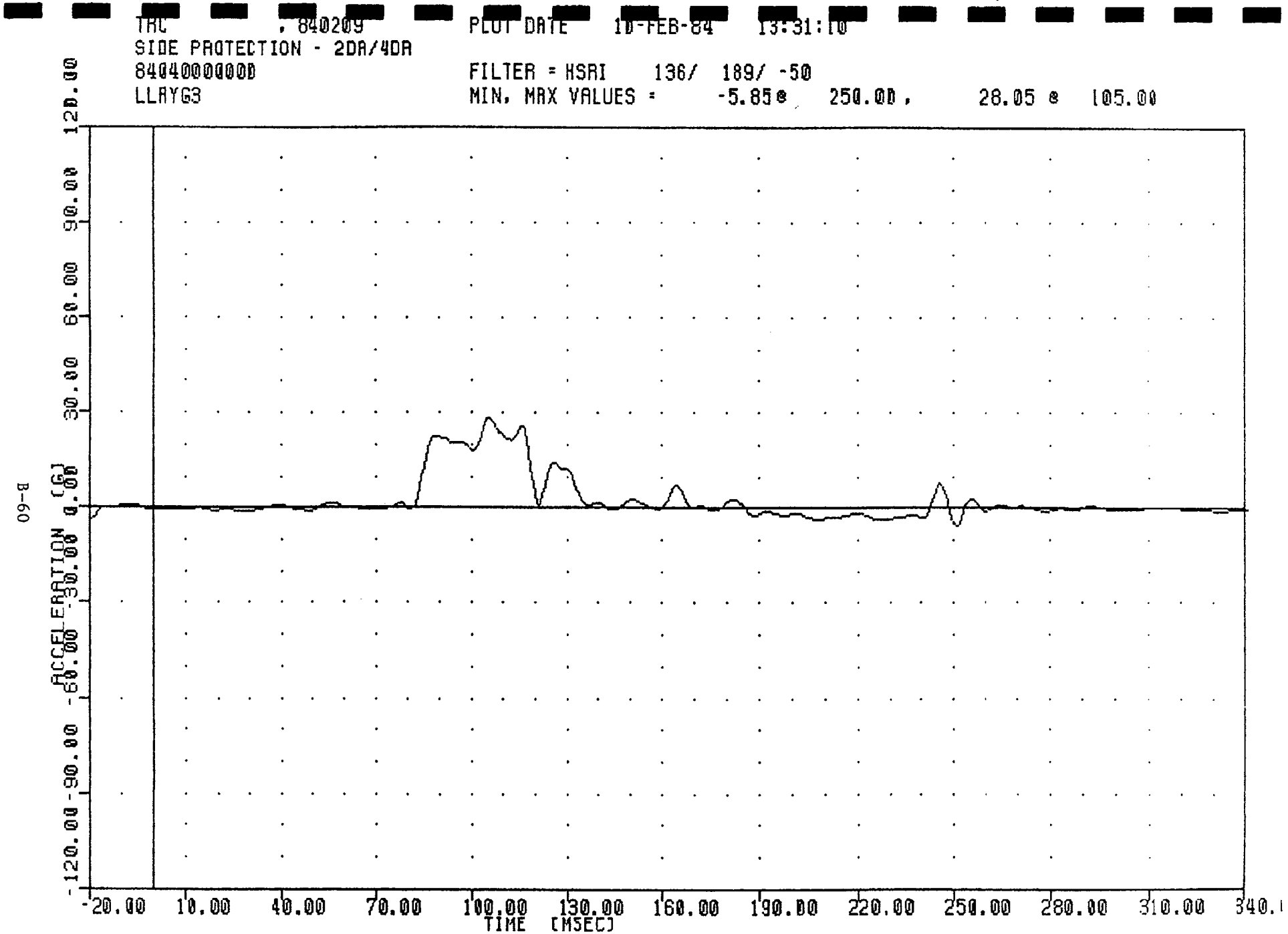
[redacted] PLOT DATE [redacted]

SIDE PROTECTION - 2DA/4DA
84040000000
LURYVC

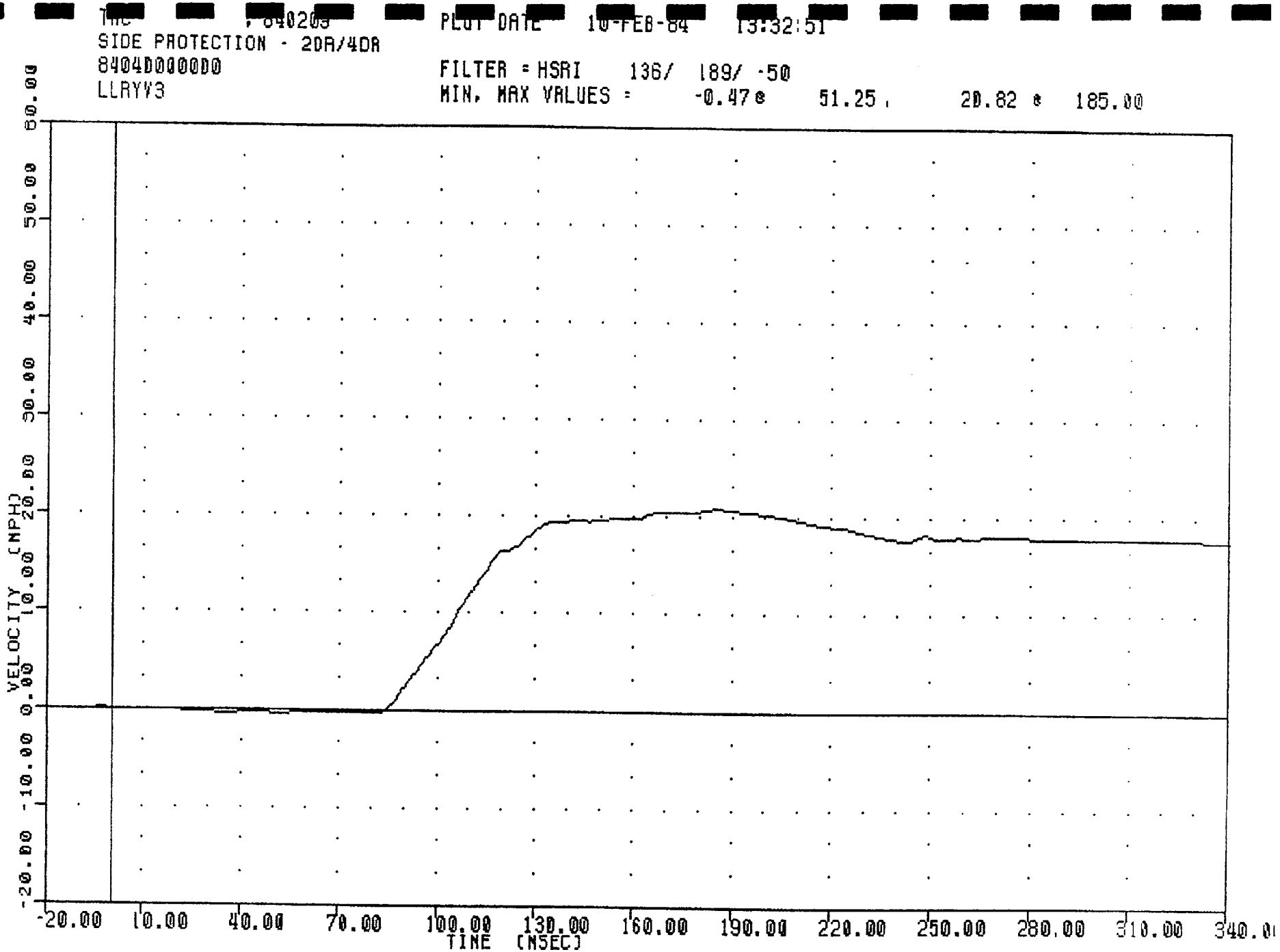
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -0.11 @ 19.38 , 23.80 @ 335.00



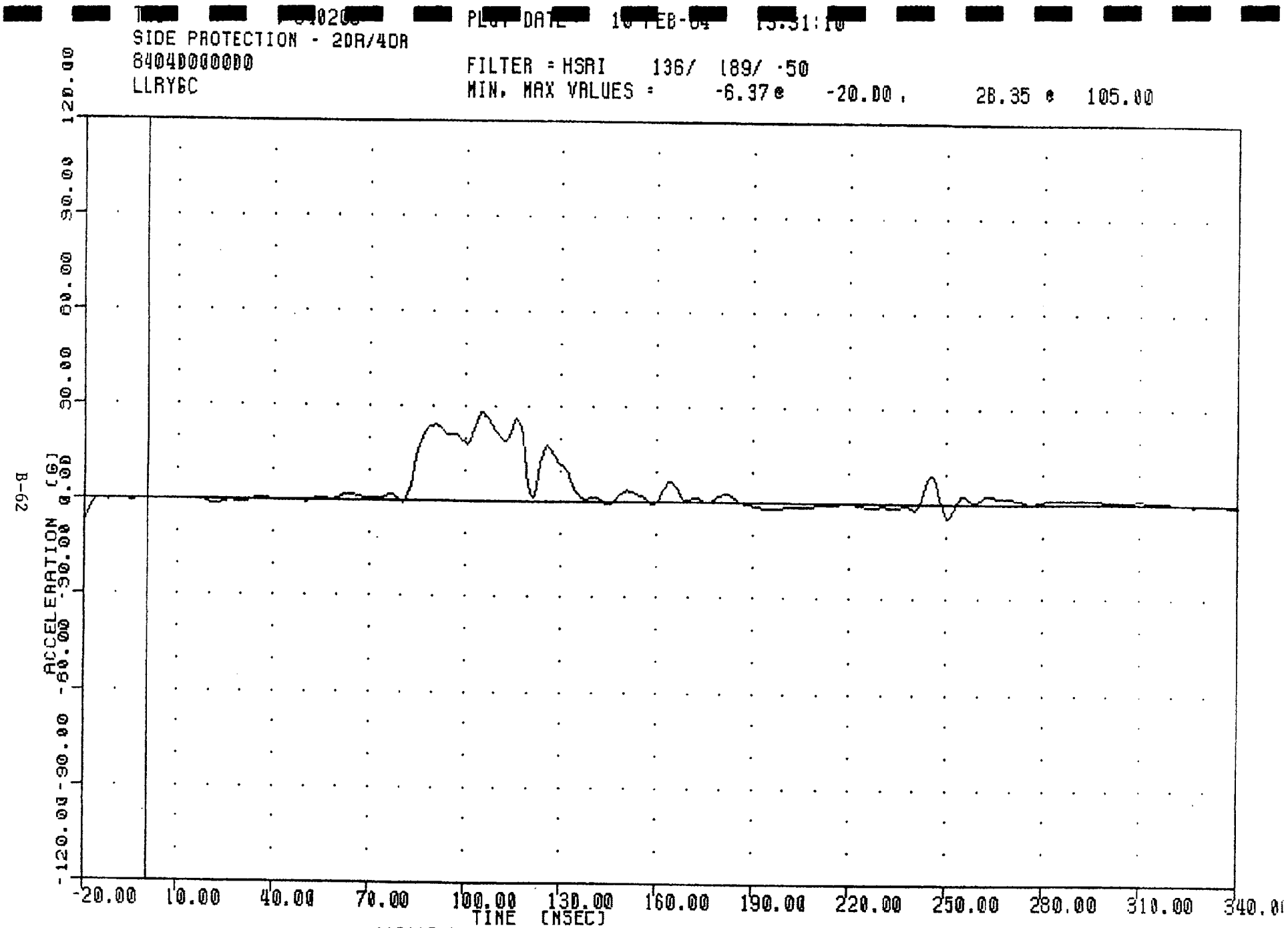
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LURYGC



MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER LEFT LOWER RIB ACCELERATION Y AXIS



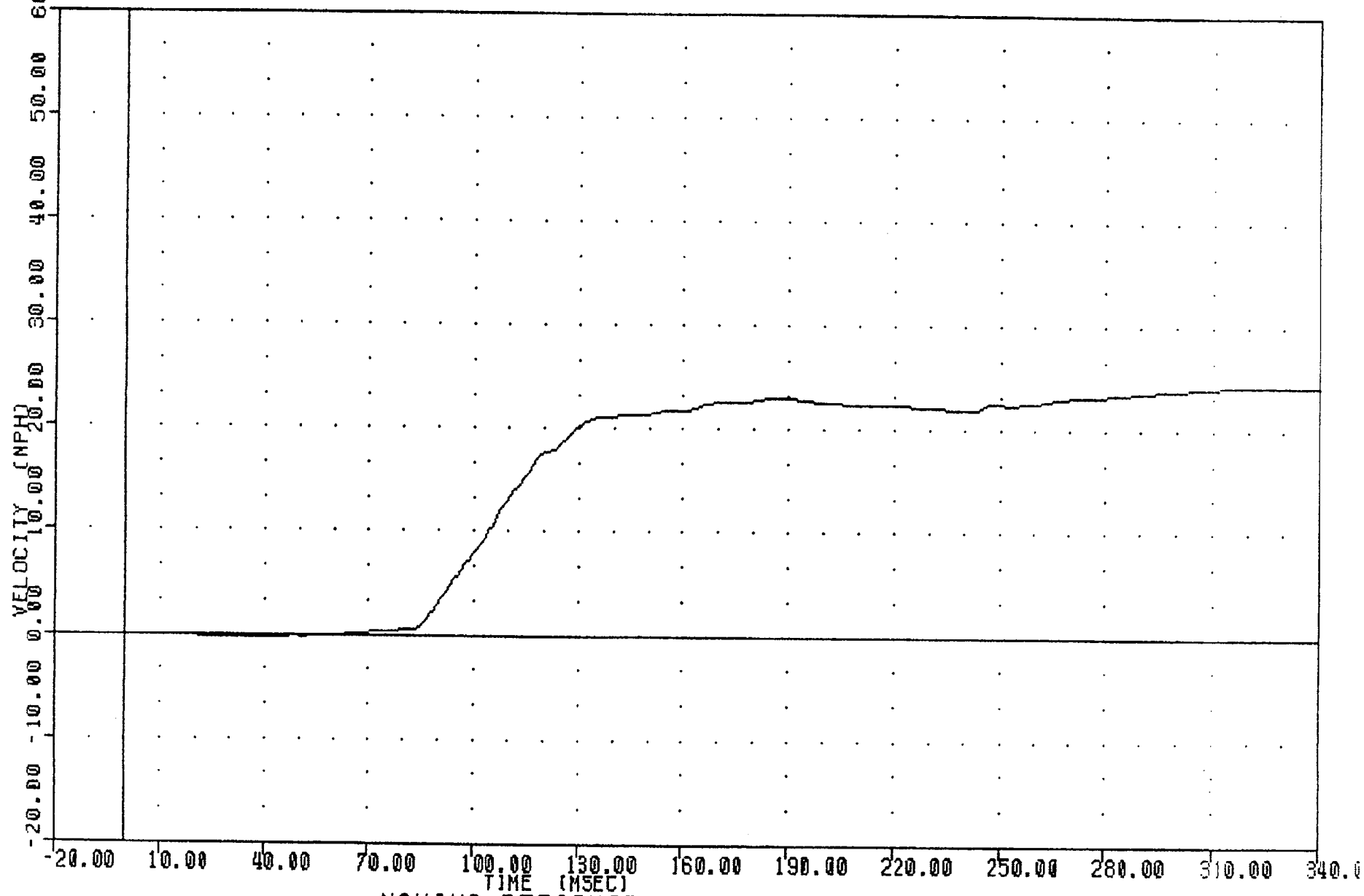
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LLRYG3



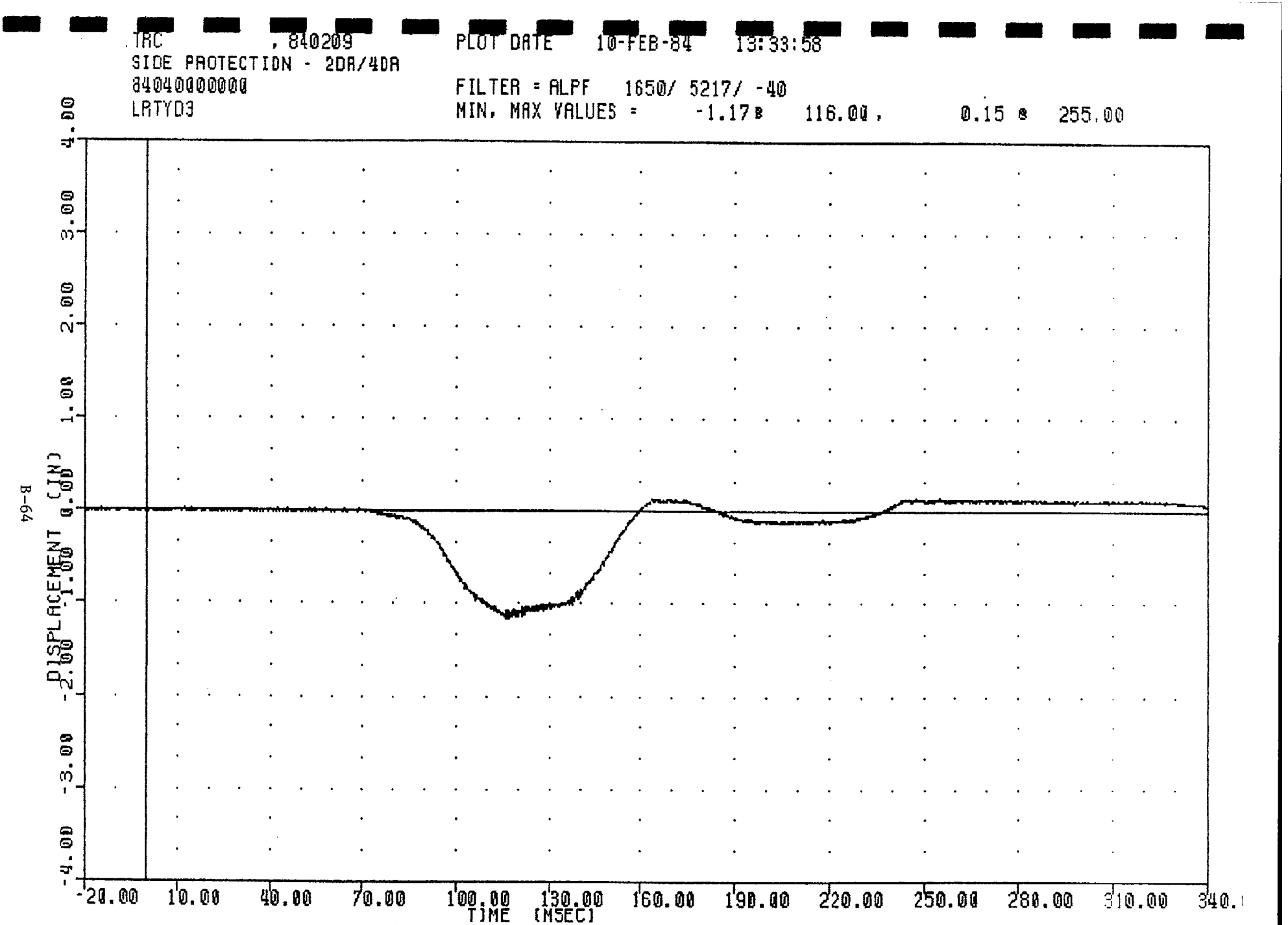
MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER LEFT LOWER RIB ACCELERATION -2 Y AXIS

SIDE PROTECTION - 2DR/4DR
84040000000
LLRYVC

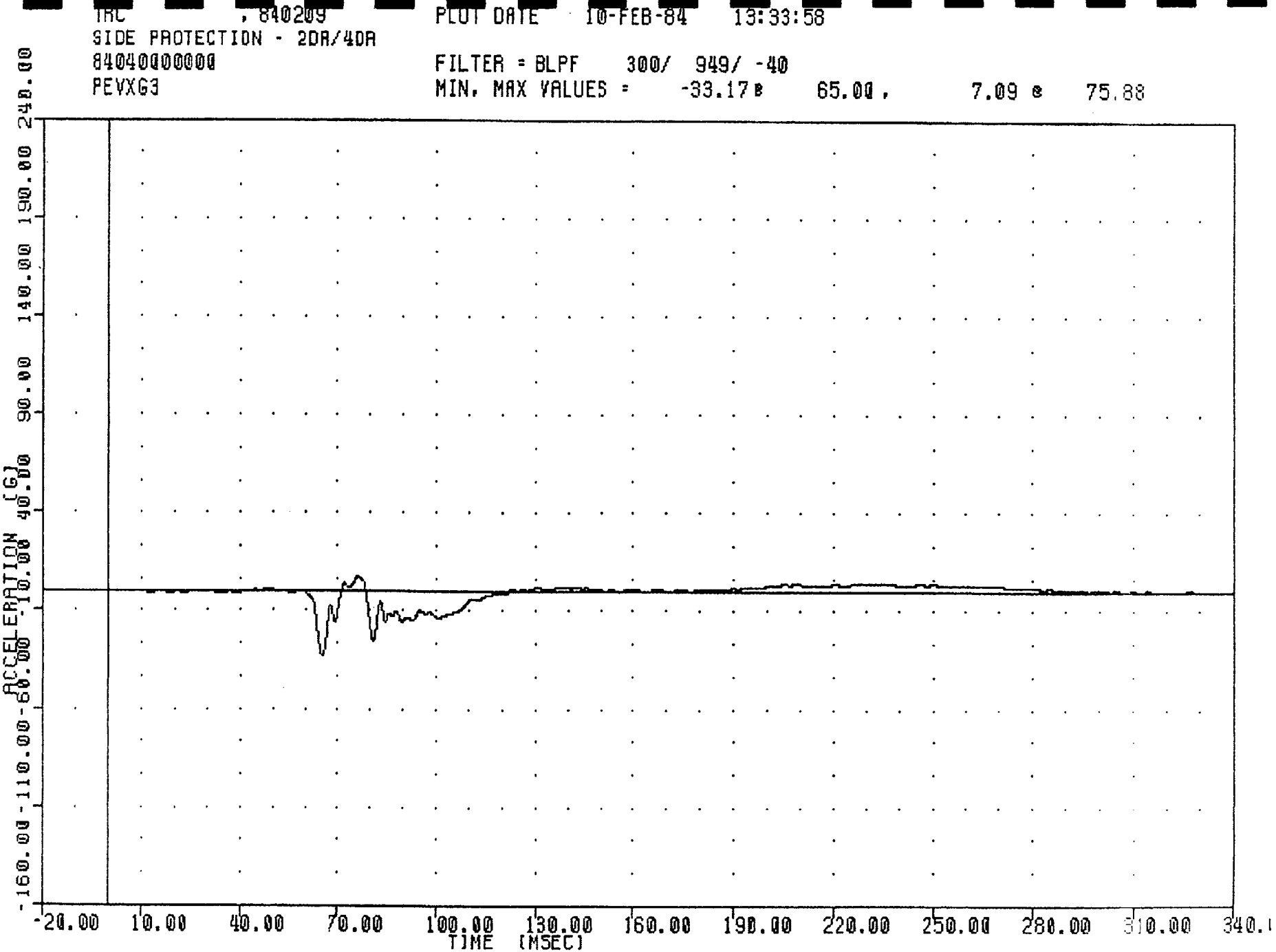
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -0.33 @ 31.88 , 24.36 @ 335.00



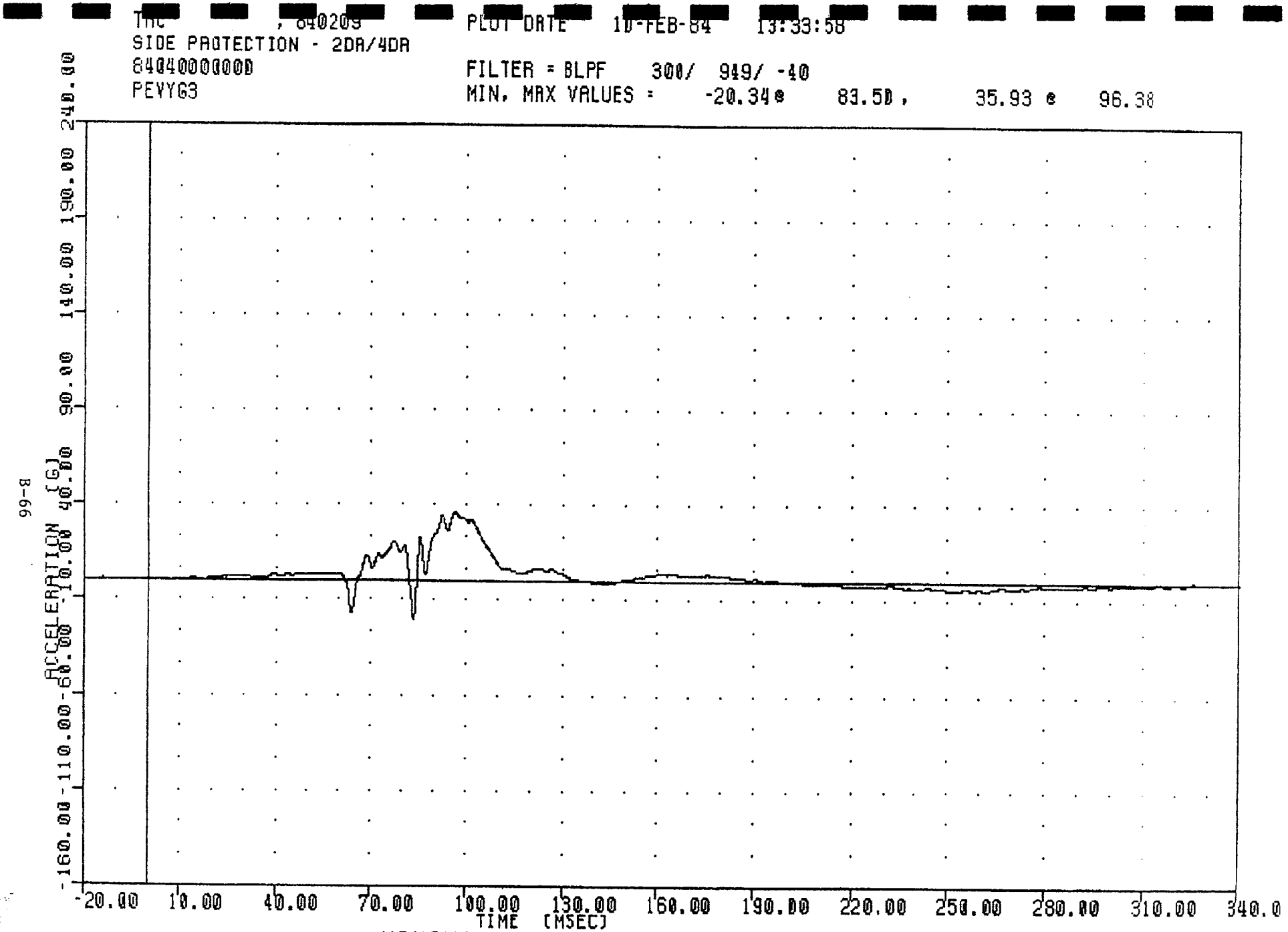
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LLRYGC



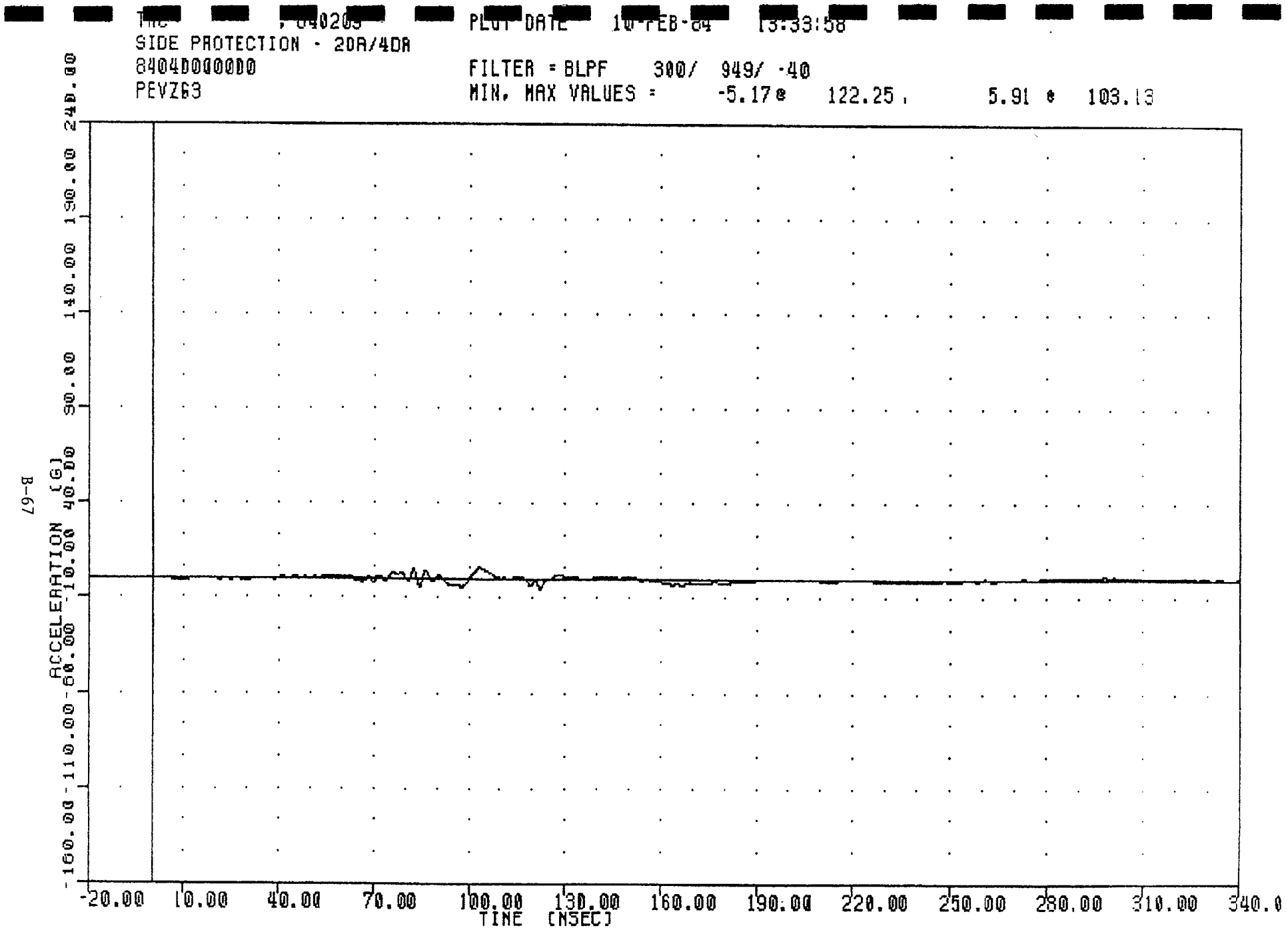
MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER LEFT RIB TO SPINE DISPLACEMENT INCHES



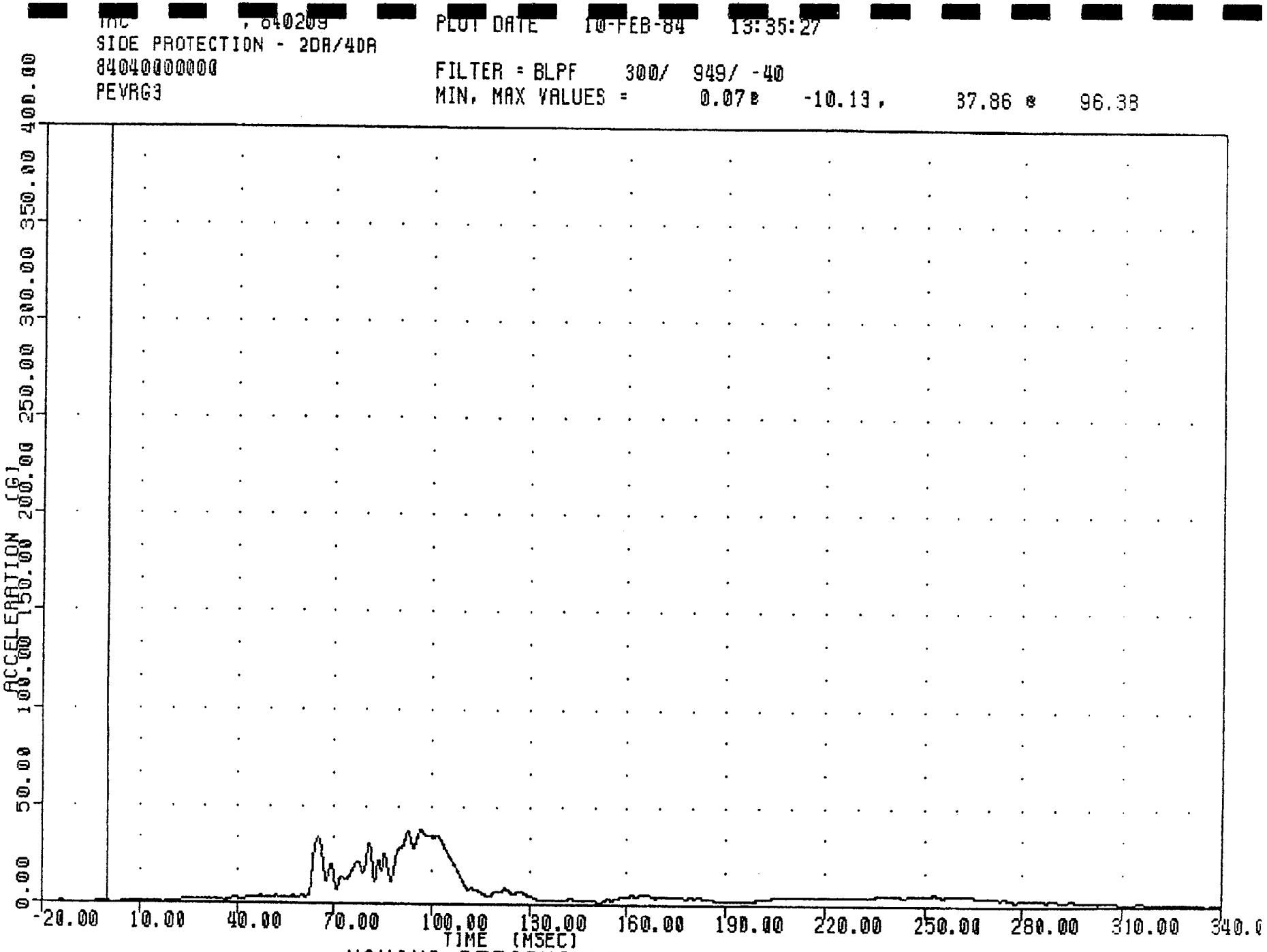
MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER PELVIS ACCELERATION X AXIS



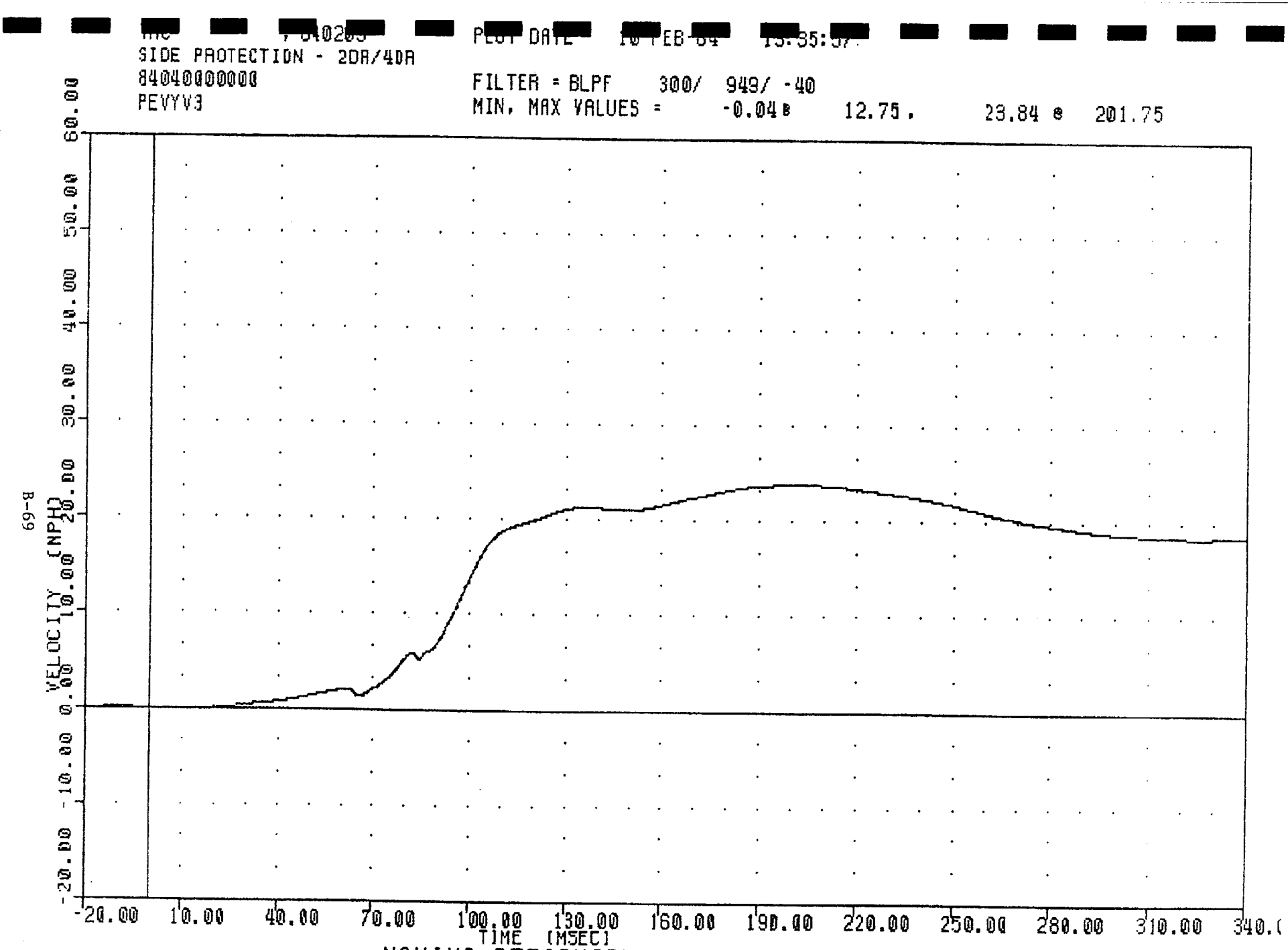
MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER PELVIS ACCLERATION Y AXIS



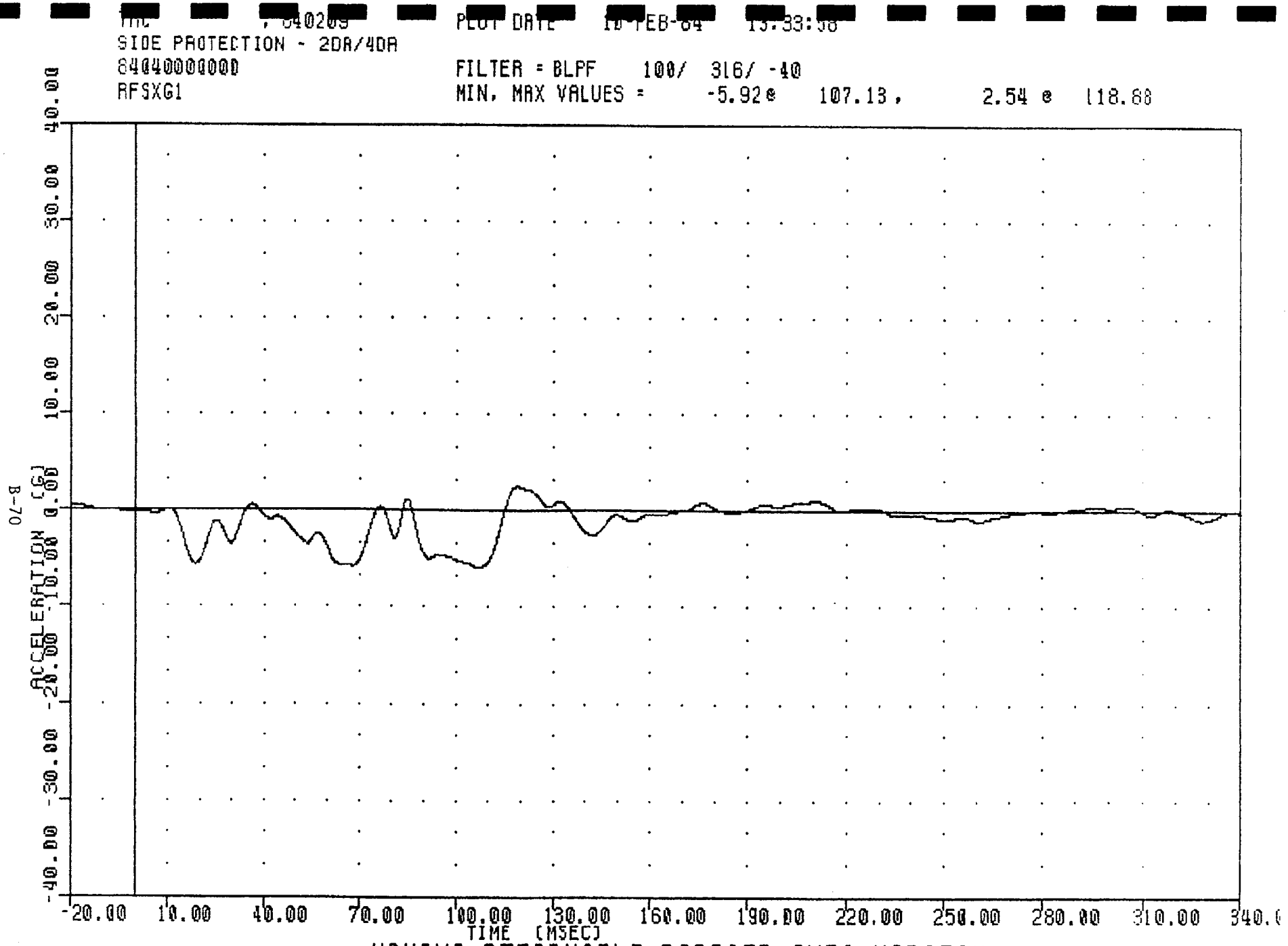
MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER PELVIS ACCELERATION Z AXIS



MOVING DEFORMABLE BARRIER INTO HORIZON
PASSENGER PELVIS RESULTANT



MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING PEVYG3



MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE RIGHT FRONT SILL ACCELERATION X AXIS

[redacted] PLOT DATE 10-FEB-04 13:33:58

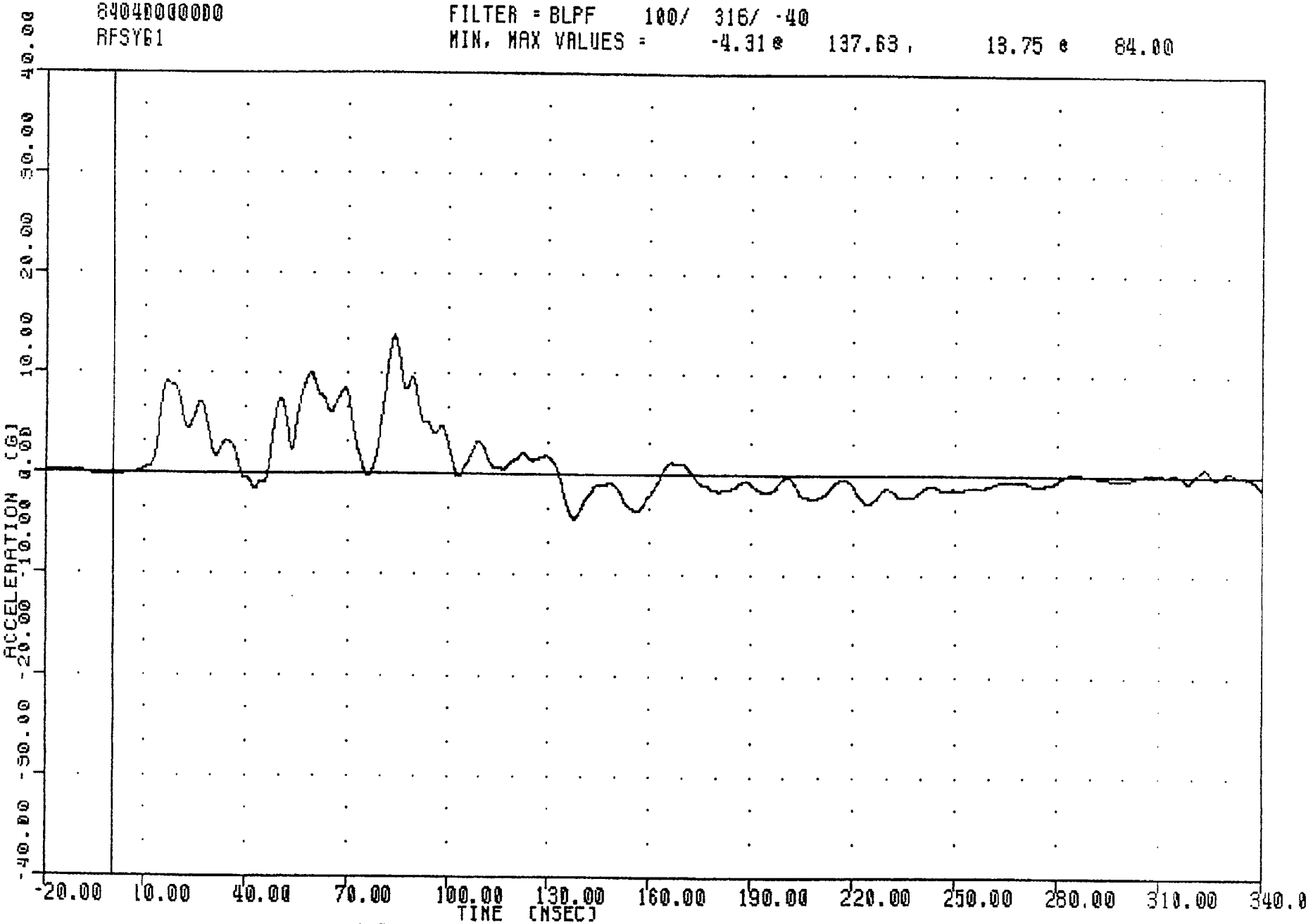
SIDE PROTECTION - 2DR/4DR

840400000D0

RFSYG1

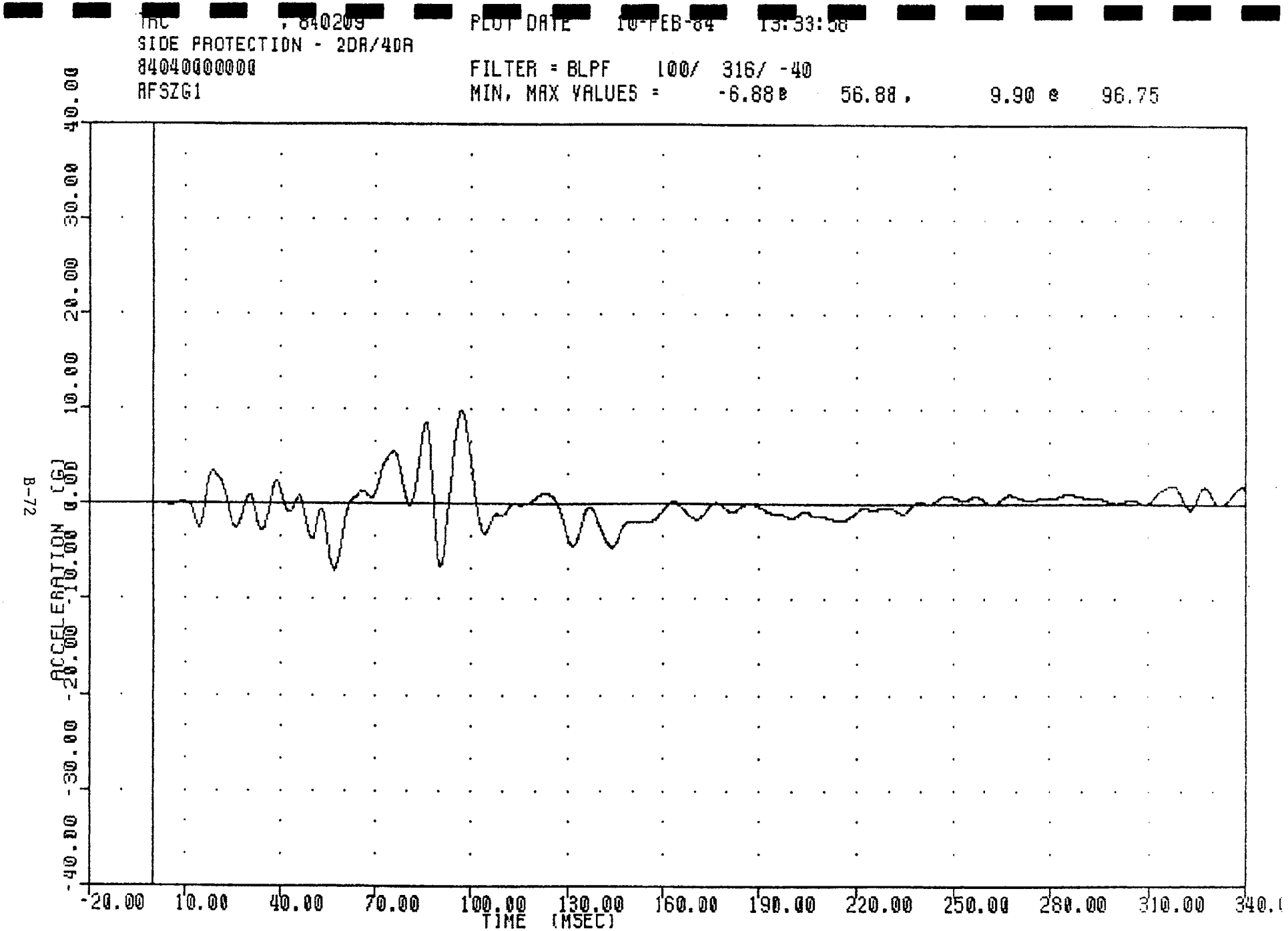
FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -4.31 @ 137.63 , 13.75 @ 84.00

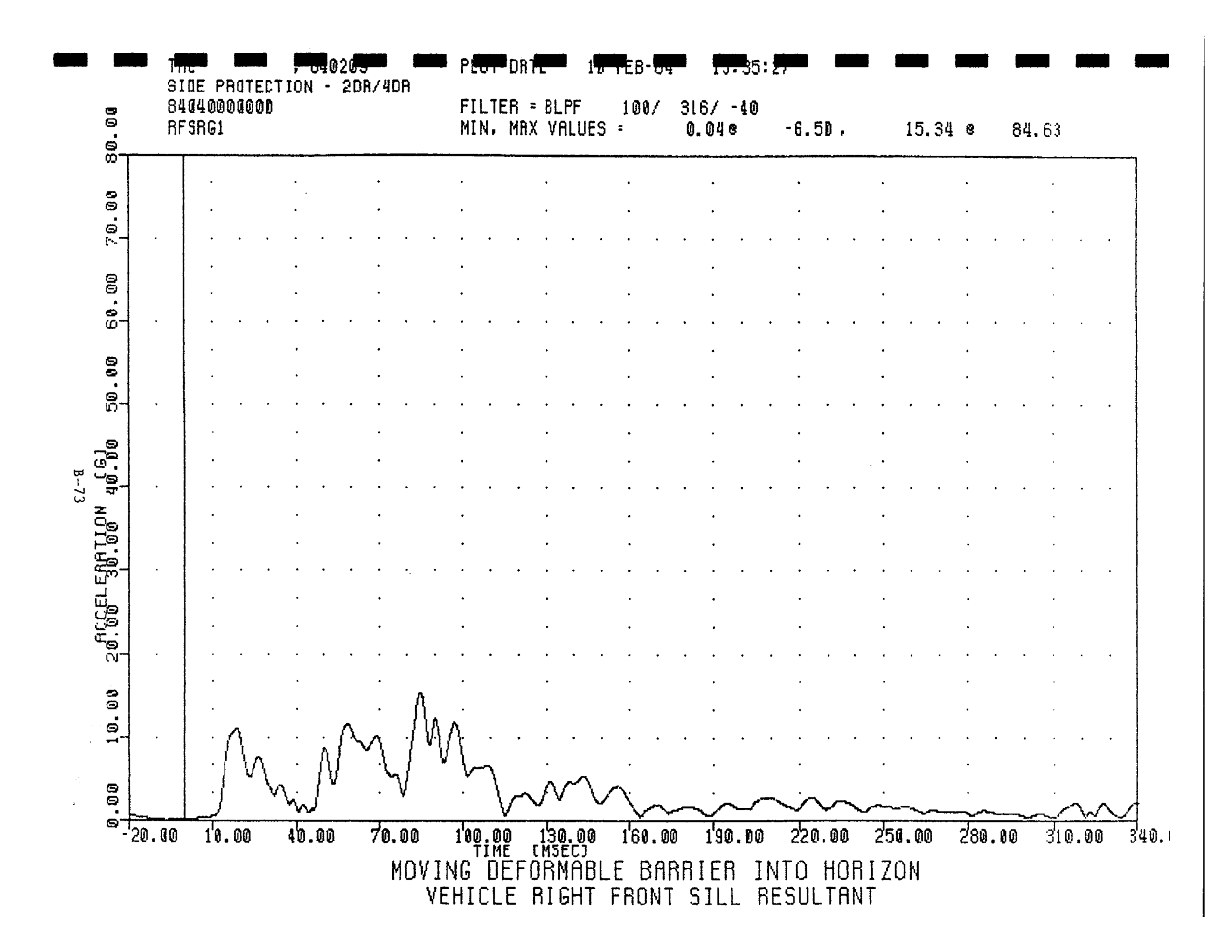


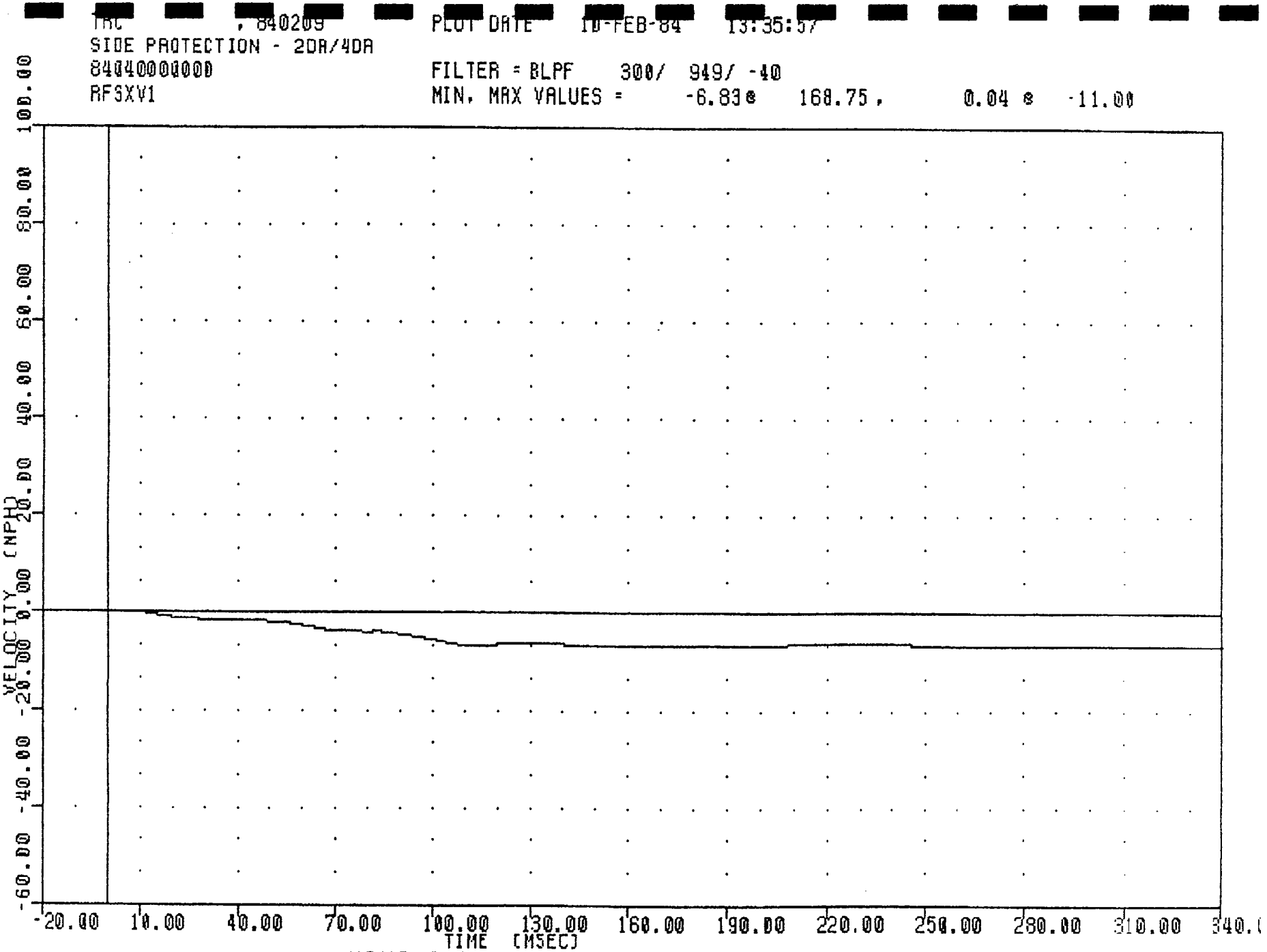
MOVING DEFORMABLE BARRIER INTO HORIZON

VEHICLE RIGHT FRONT SILL ACCELERATION Y AXIS

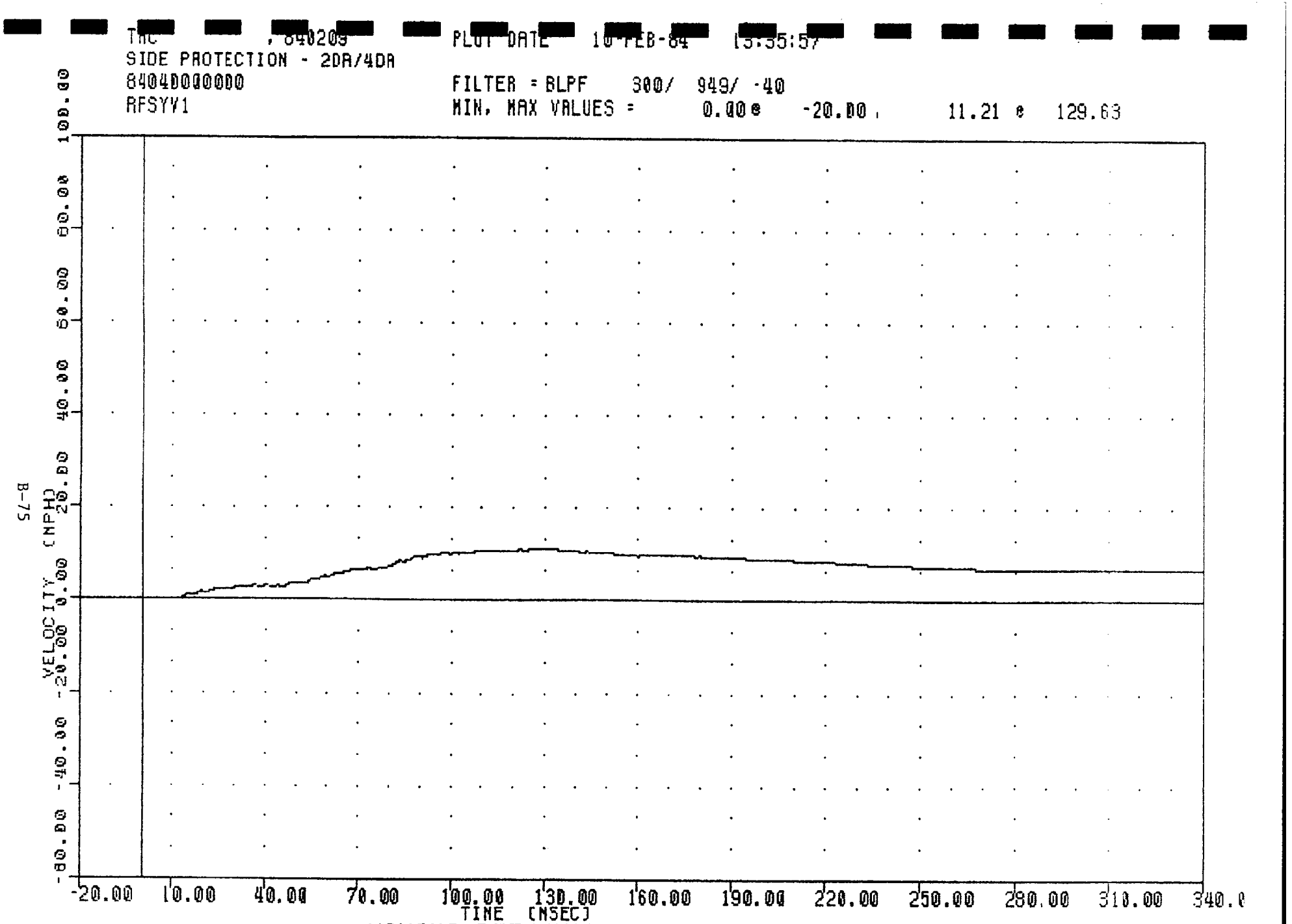


MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE RIGHT FRONT SILL ACCELERATION Z AXIS

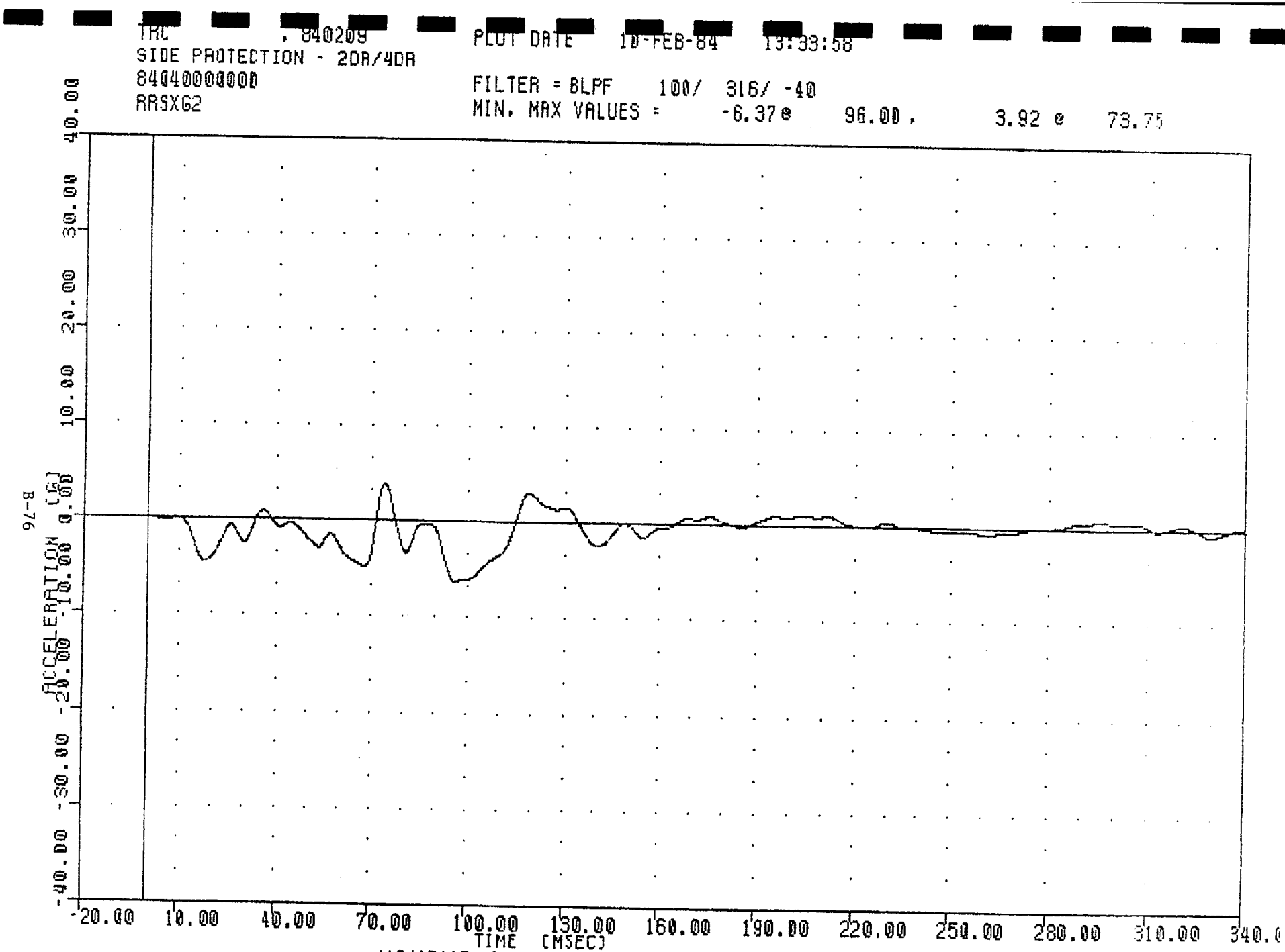

SIDE PROTECTION - 2DR/4DR
FILTER = BLPF 100/ 316/ -40
RFSRG1
MIN, MAX VALUES = 0.04 @ -6.50 , 15.34 @ 84.63
ACCELERATION [G]
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.0
TIME [MSEC]
MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE RIGHT FRONT SILL RESULTANT



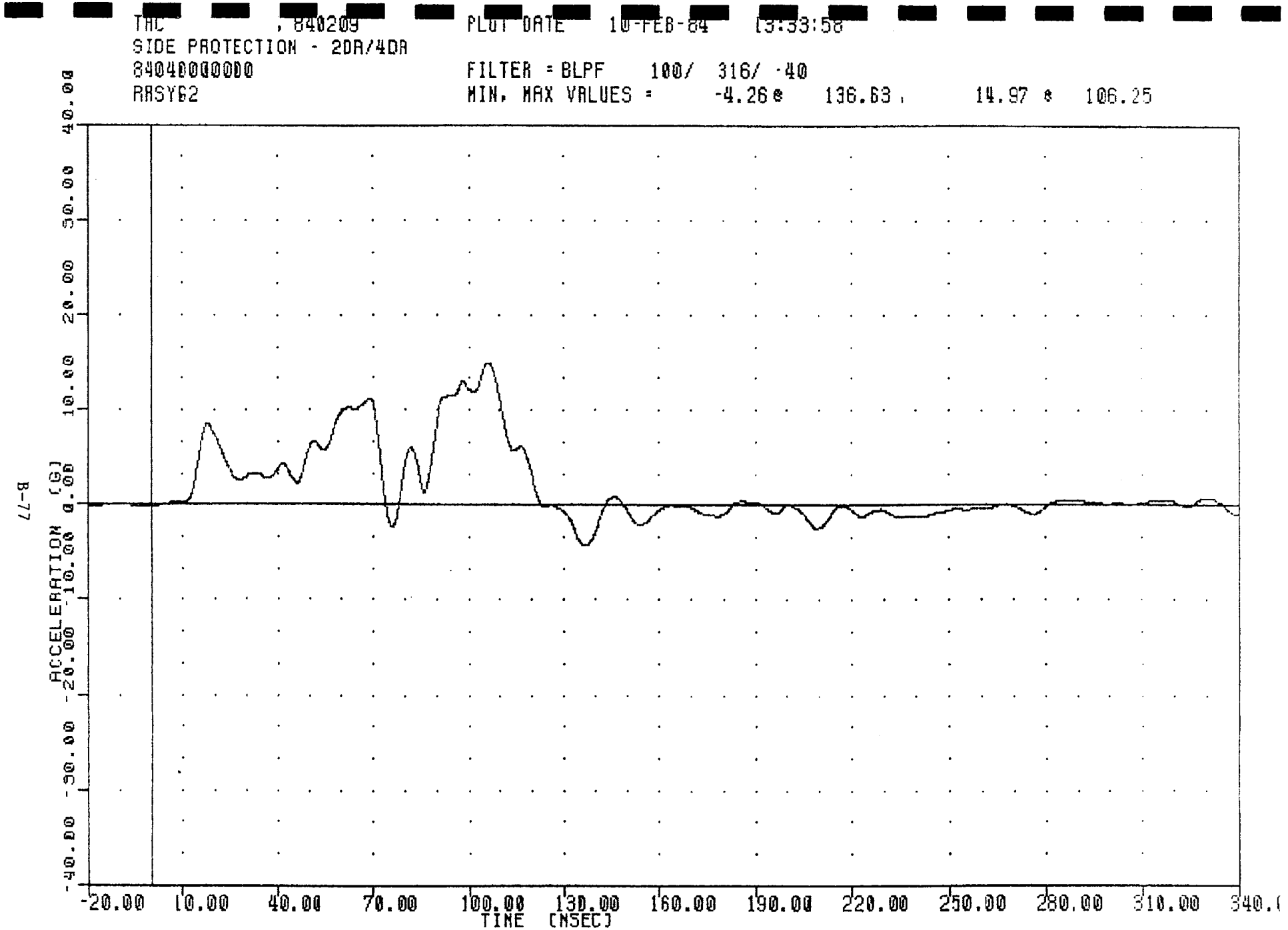
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING RFSXG1



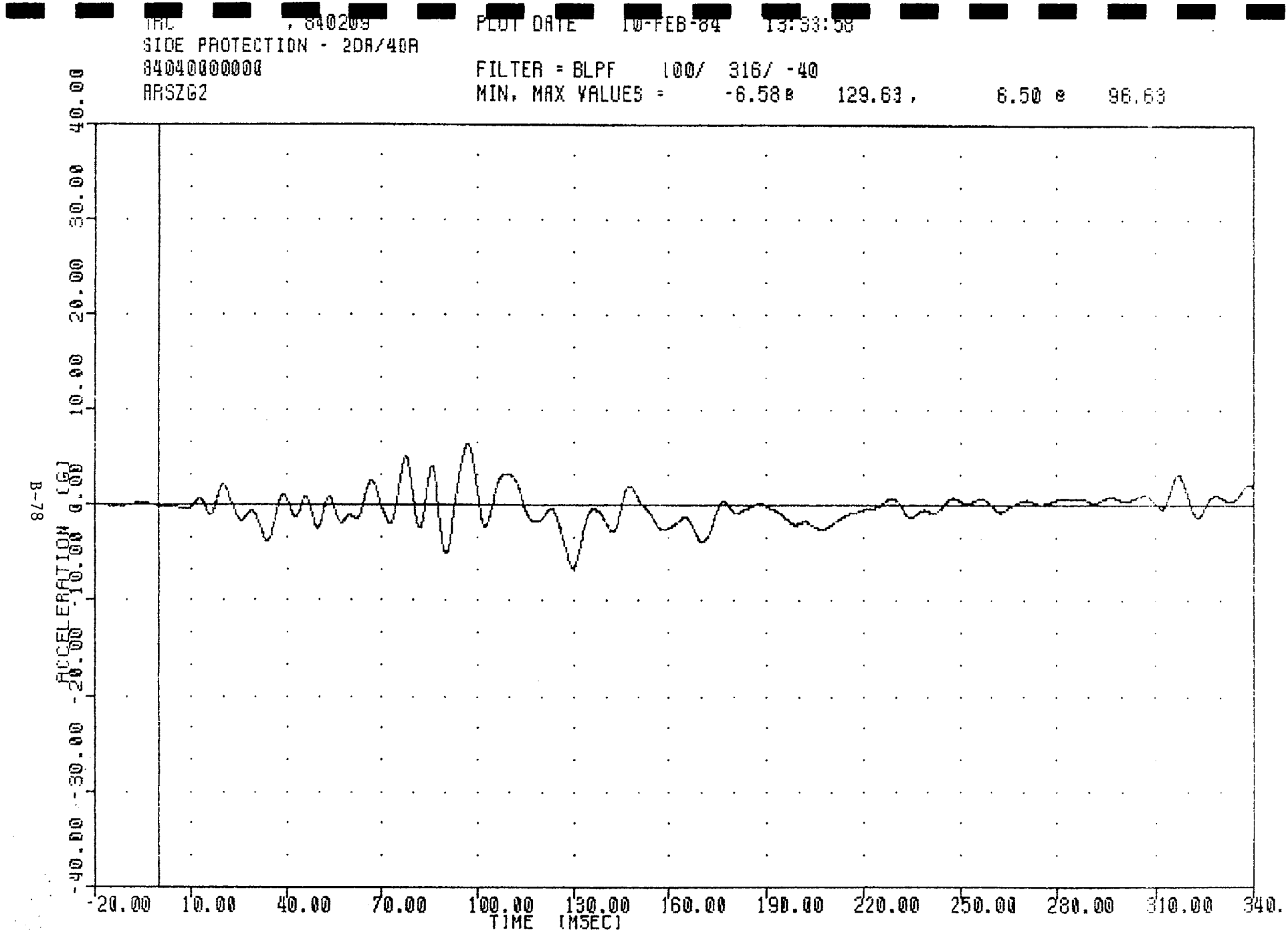
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING RFSYG1



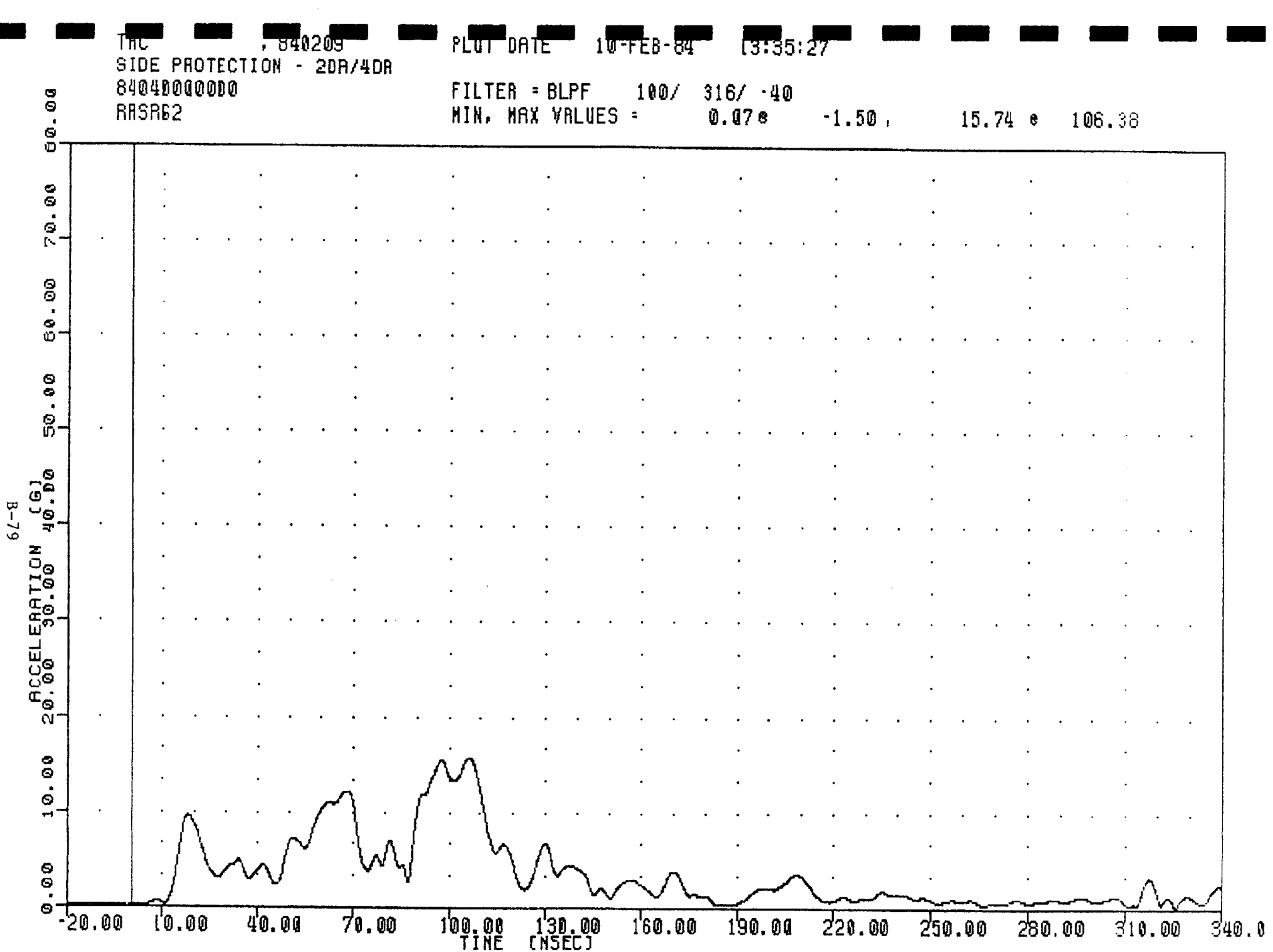
MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE RIGHT REAR SILL ACCELERATION X AXIS



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



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



MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE RIGHT REAR SILL RESULTANT

[redacted] PLOT DATE [redacted] 15:35:37

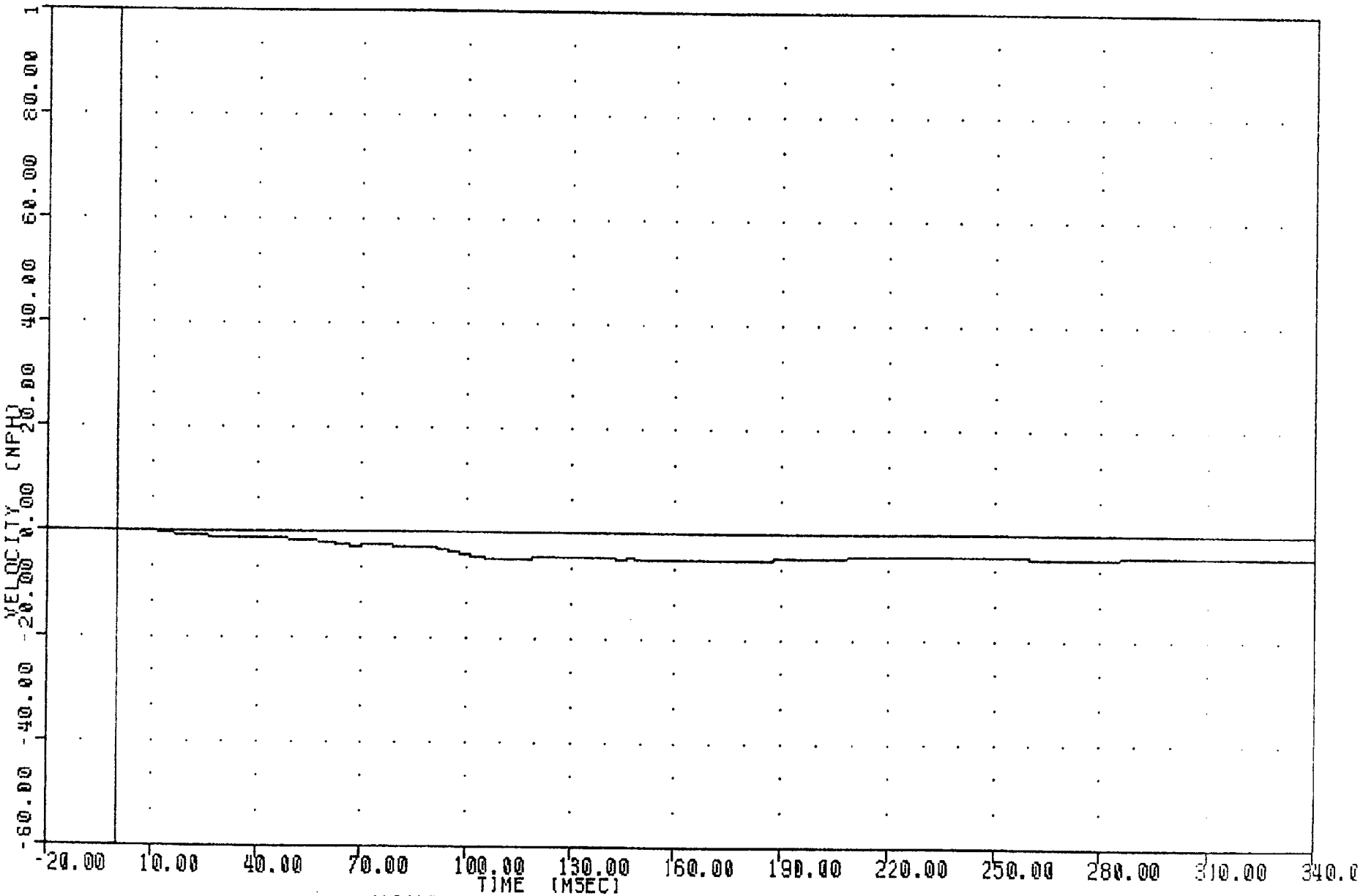
SIDE PROTECTION - 2DA/4DA

840400000000

ARSXV2

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -5.07 @ 111.50 , 0.01 @ -4.00

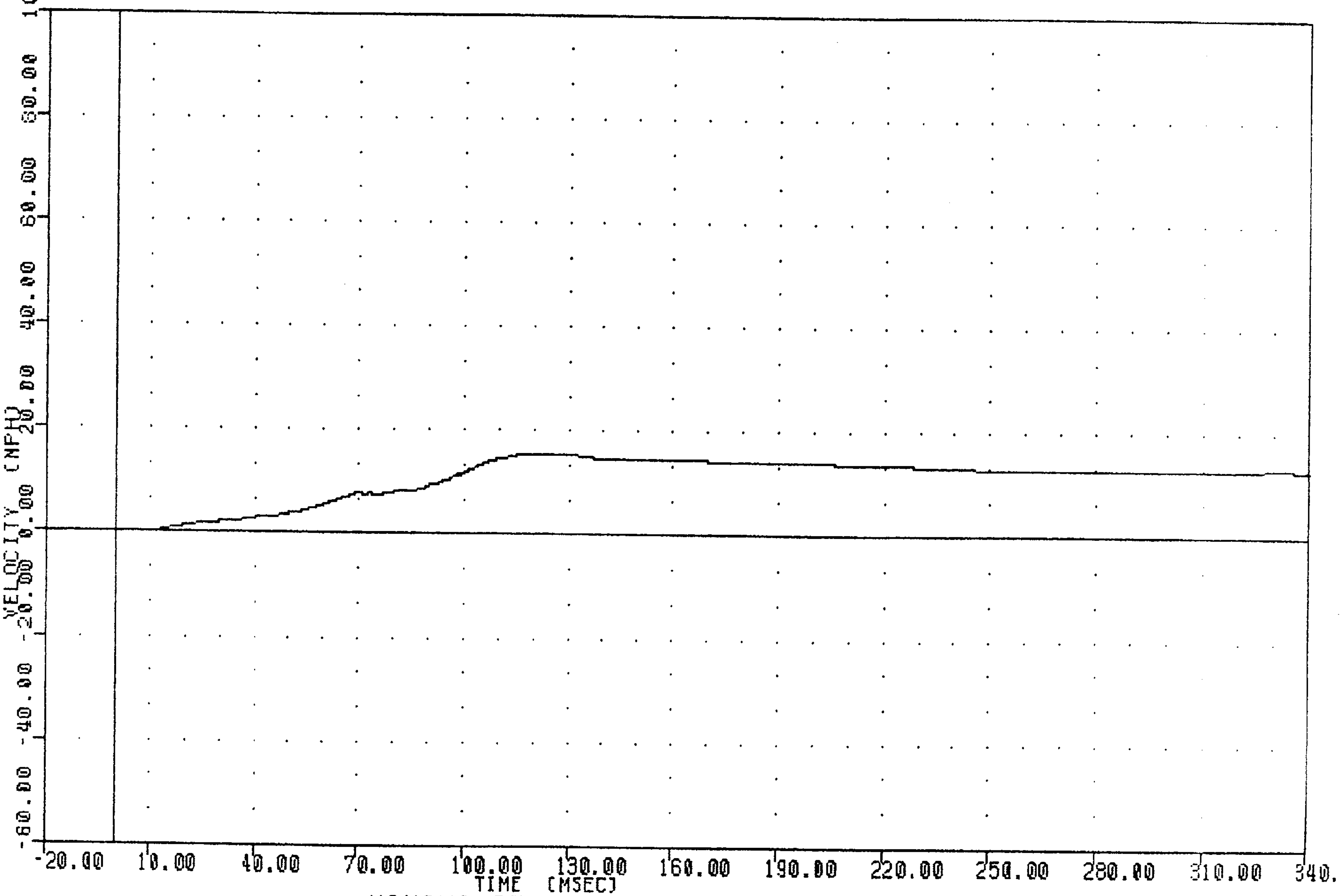


MOVING DEFORMABLE BARRIER INTO HORIZON

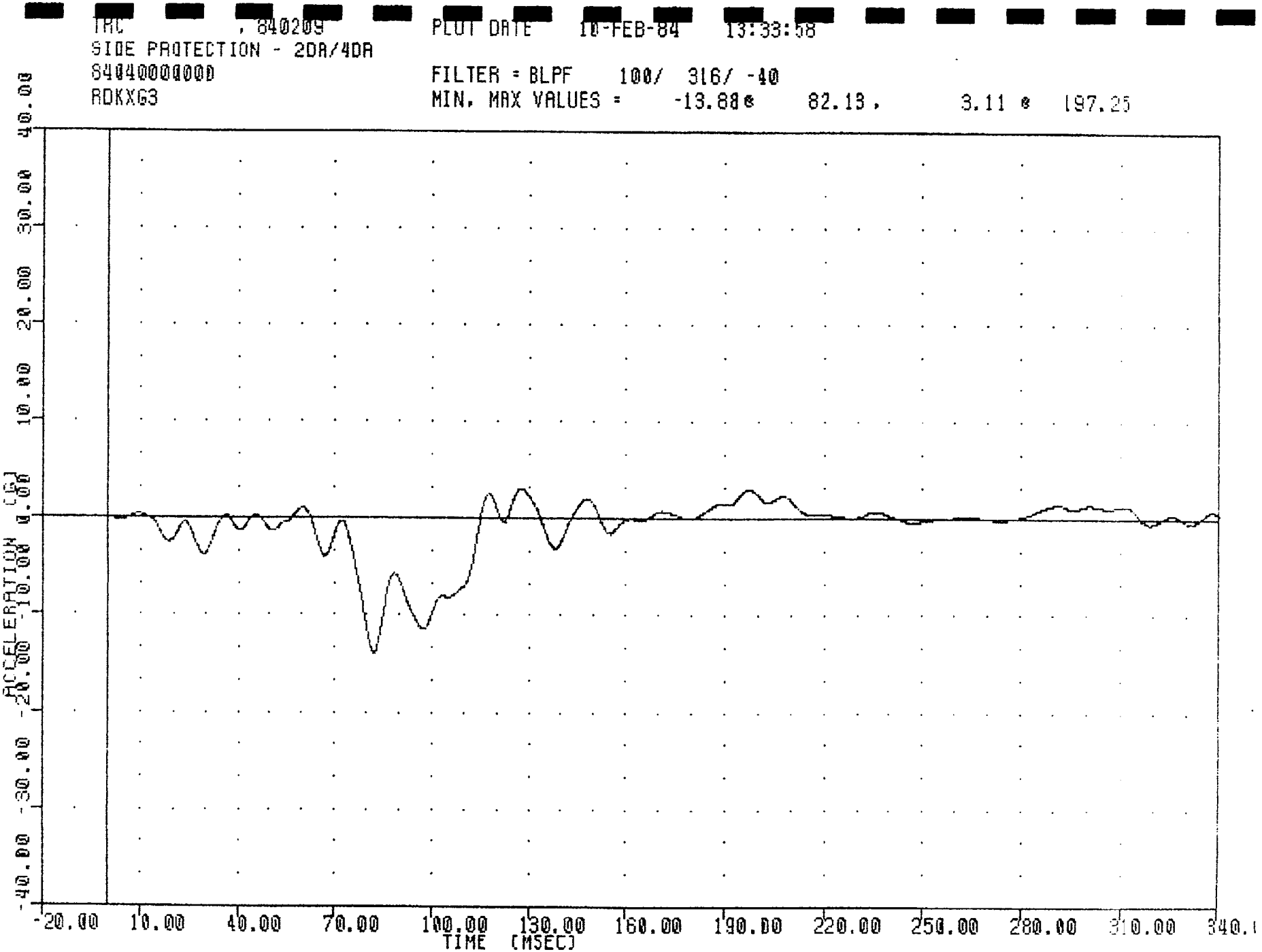
DELTA V USING ARSXG2

TRC , 840205 PLOT DATE 10-FEB-84 15:35:37
SIDE PROTECTION - 2DR/4DR
84040000000
RRSYV2

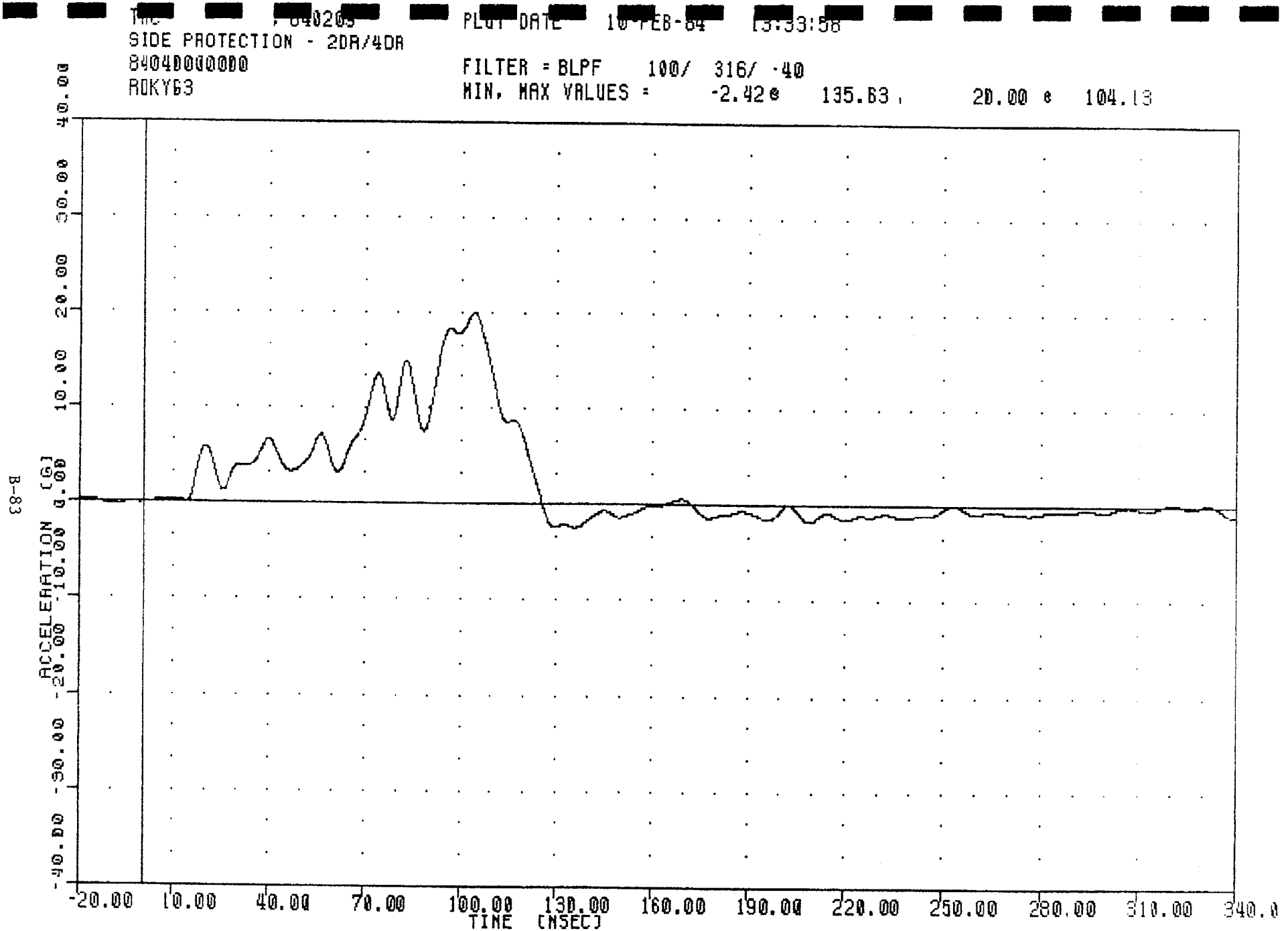
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.01@ -17.75 , 15.55 @ 125.25



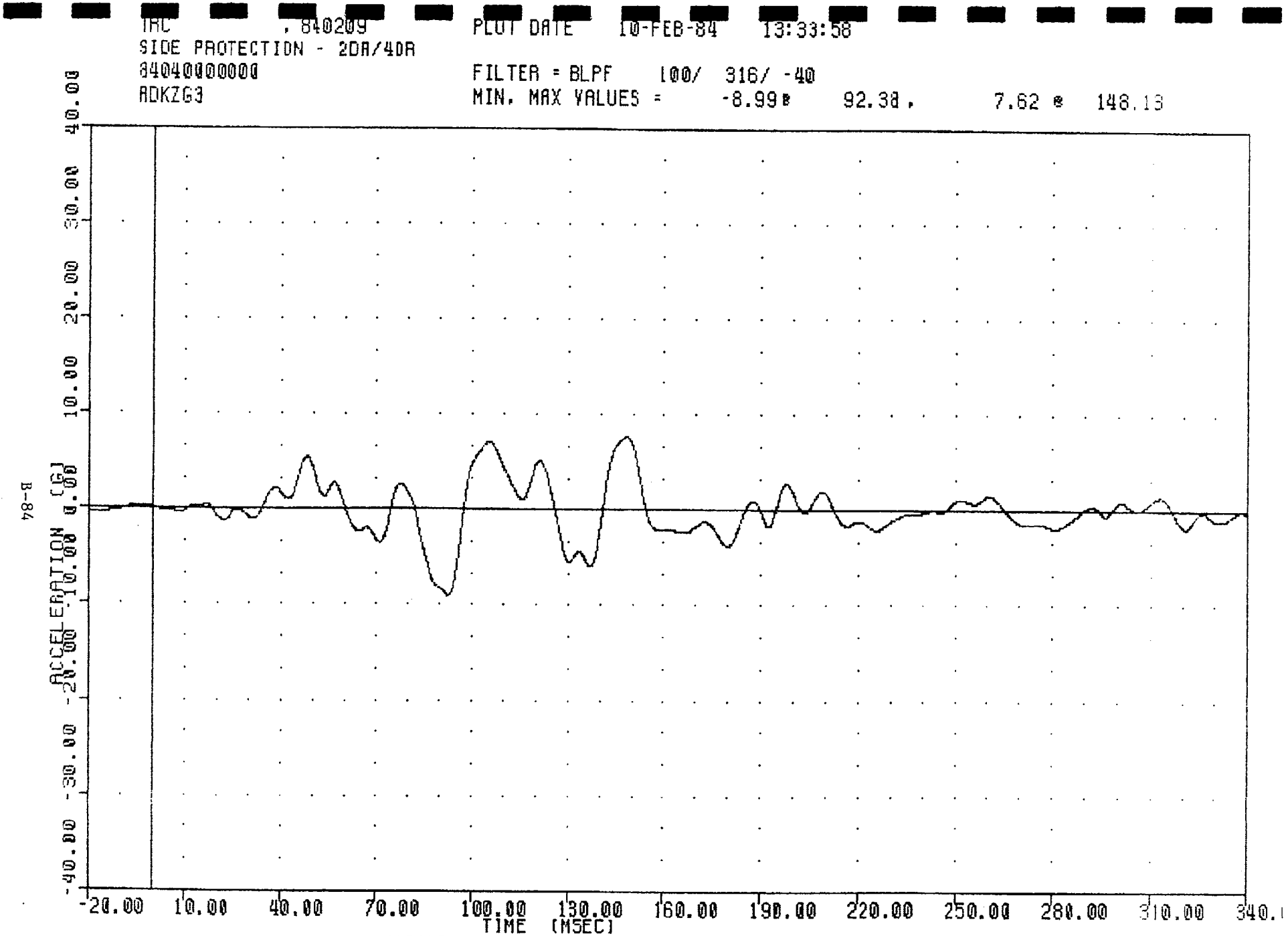
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING RRSYG2



MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE REAR DECK ACCELERATION X AXIS



MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE REAR DECK ACCELERATION Y AXIS



MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE REAR DECK ACCELERATION Z AXIS

[redacted] PLOT DATE [redacted] 15:35:27

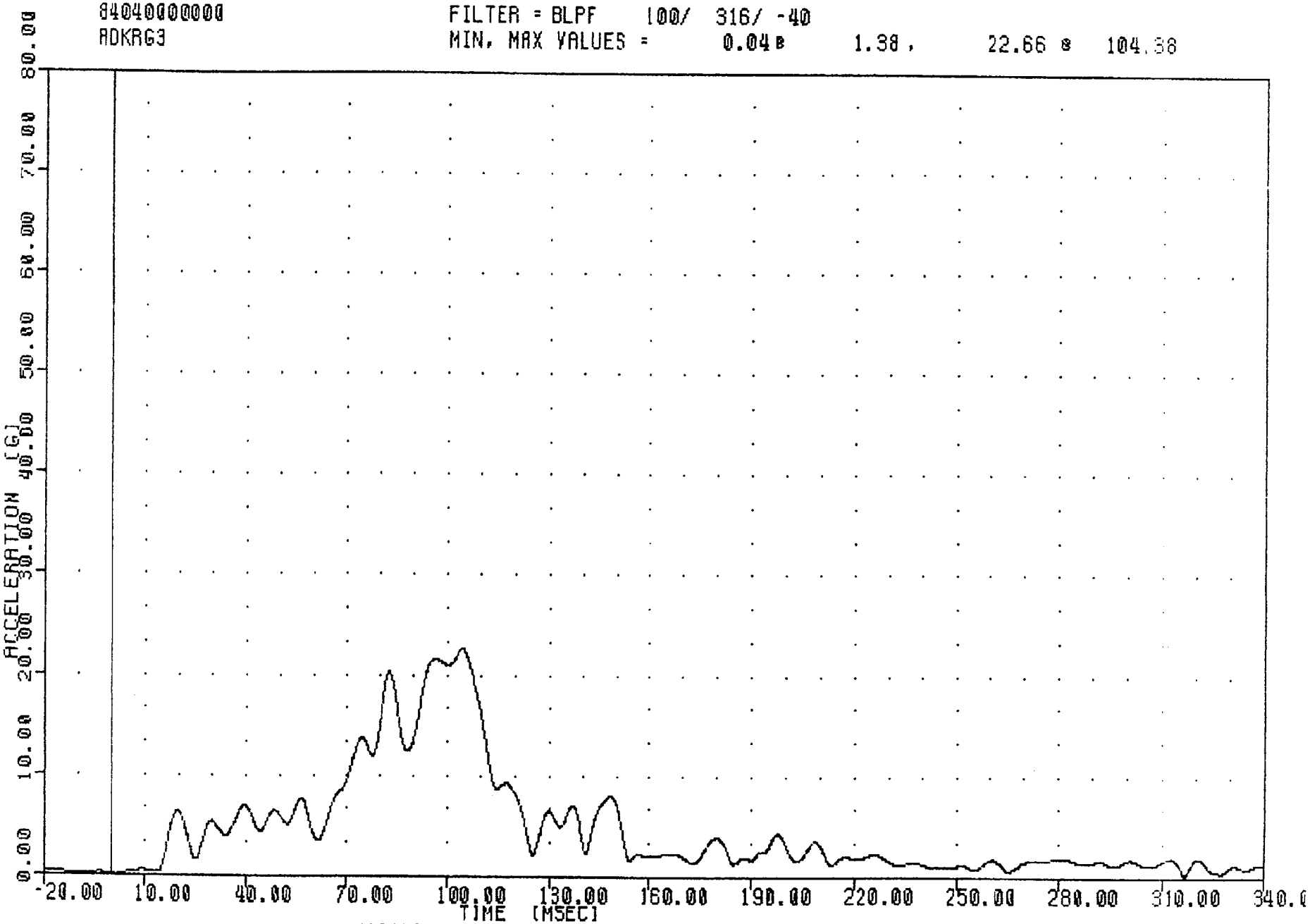
SIDE PROTECTION - 2DR/4DR

84040000000

RDKRG3

FILTER = BLPF 100/ 316/ -40

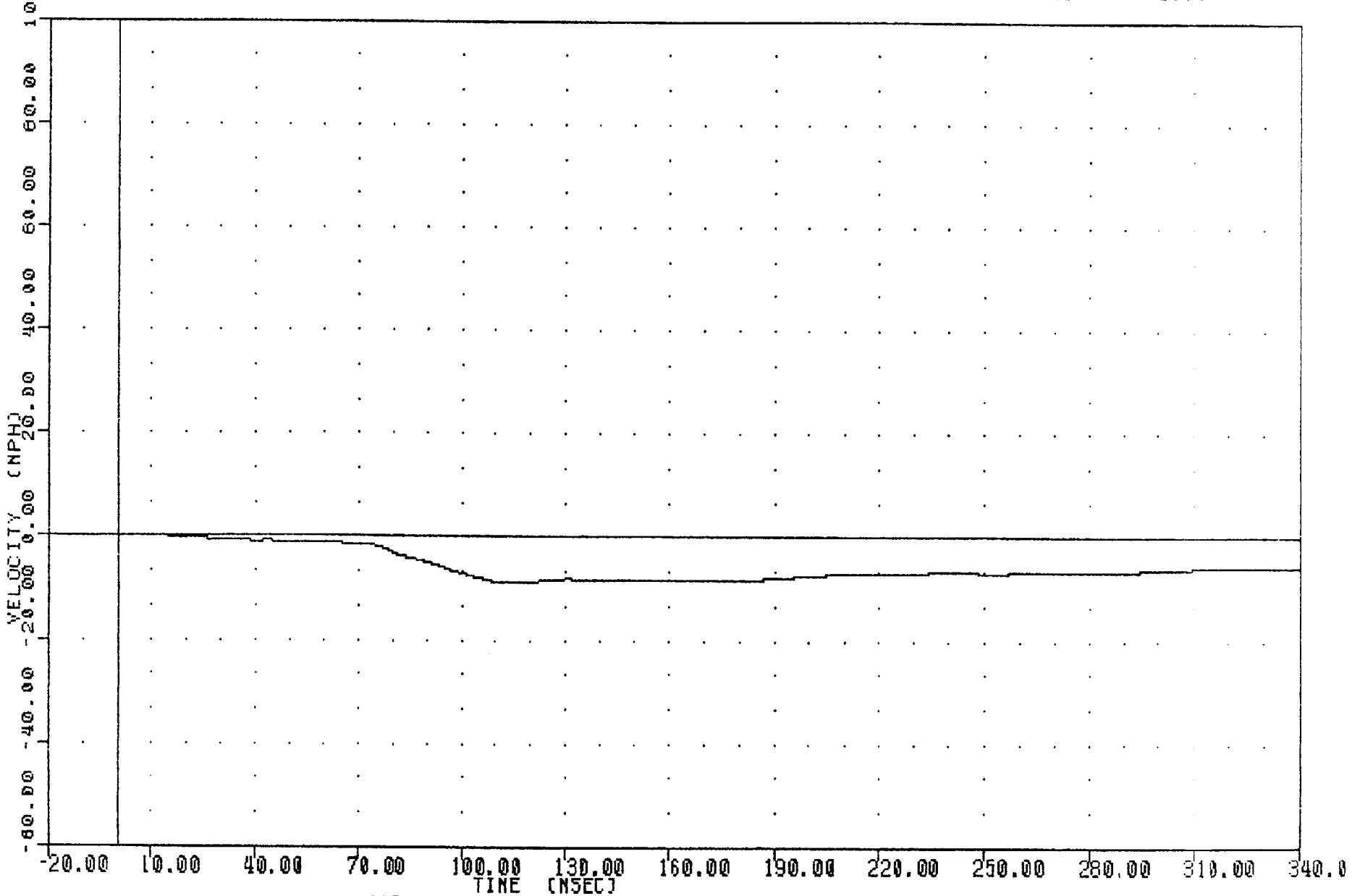
MIN, MAX VALUES = 0.04 @ 1.38 , 22.66 @ 104.38



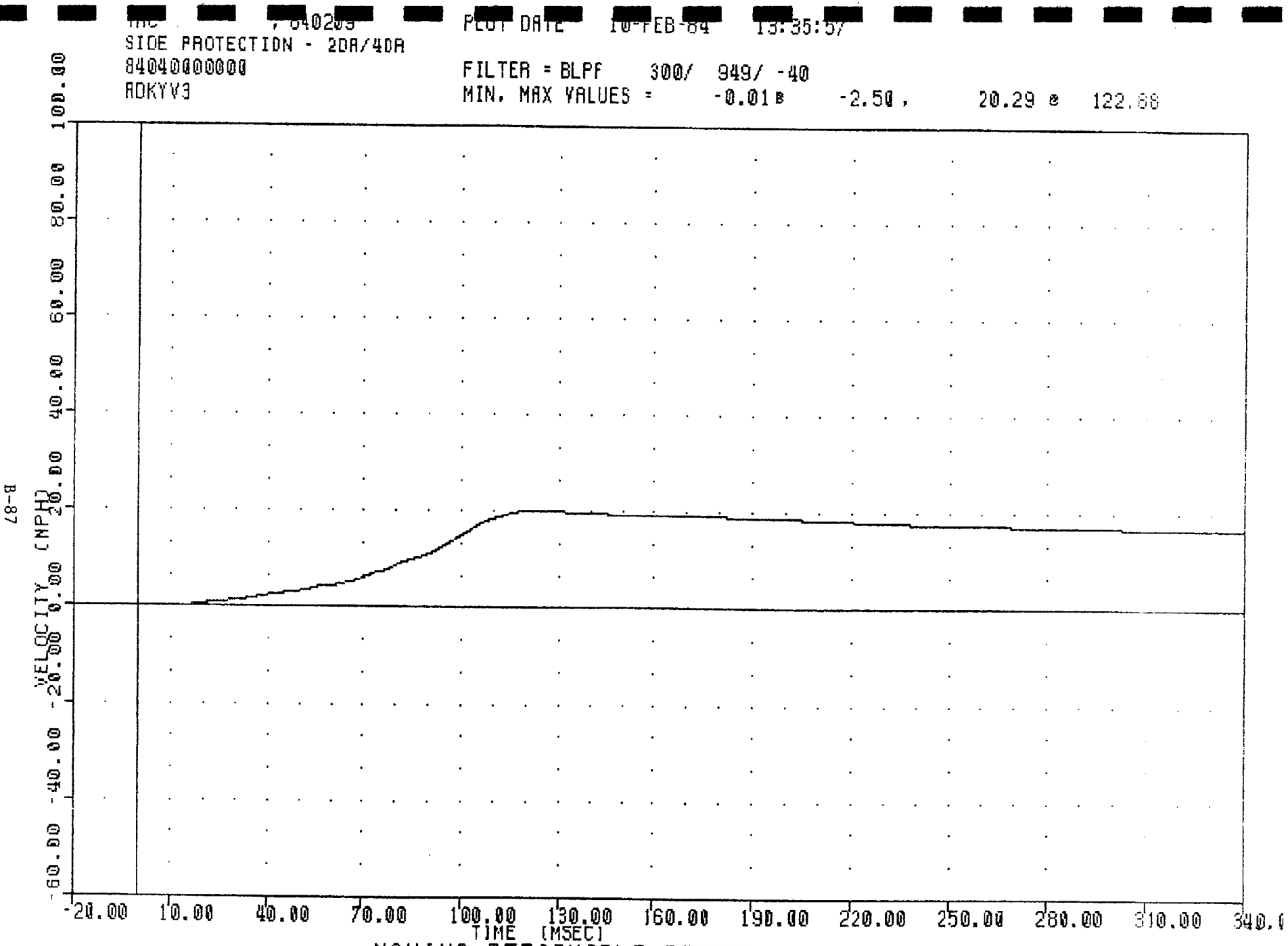
MOVING DEFORMABLE BARRIER INTO HORIZON

VEHICLE REAR DECK RESULTANT

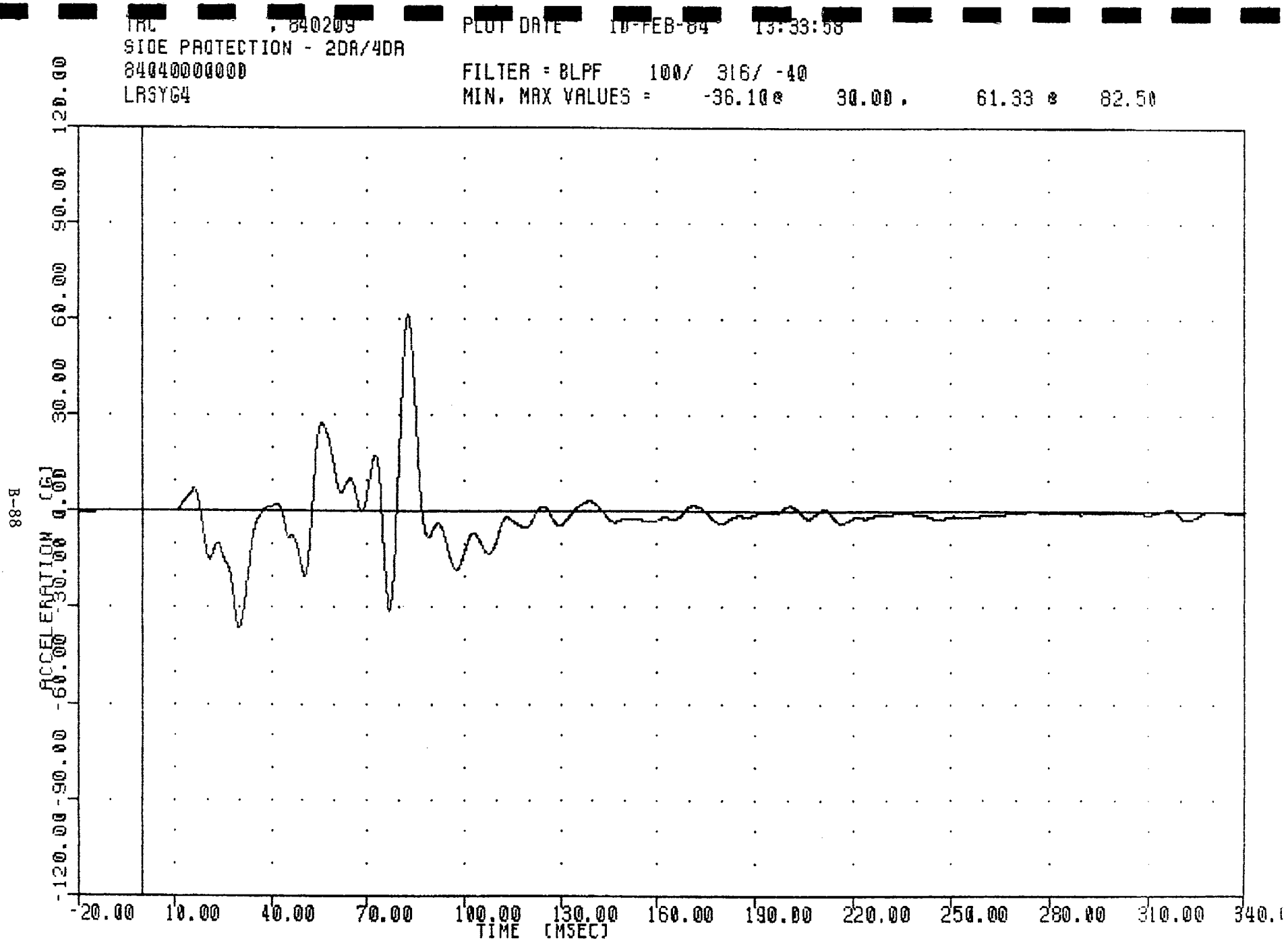
THC , 840209 PLOT DATE 10-FEB-84 13:35:57
SIDE PROTECTION - 2DA/4DA
84040000000
RDKXV3
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -8.75 @ 111.00 , 0.03 @ 8.75



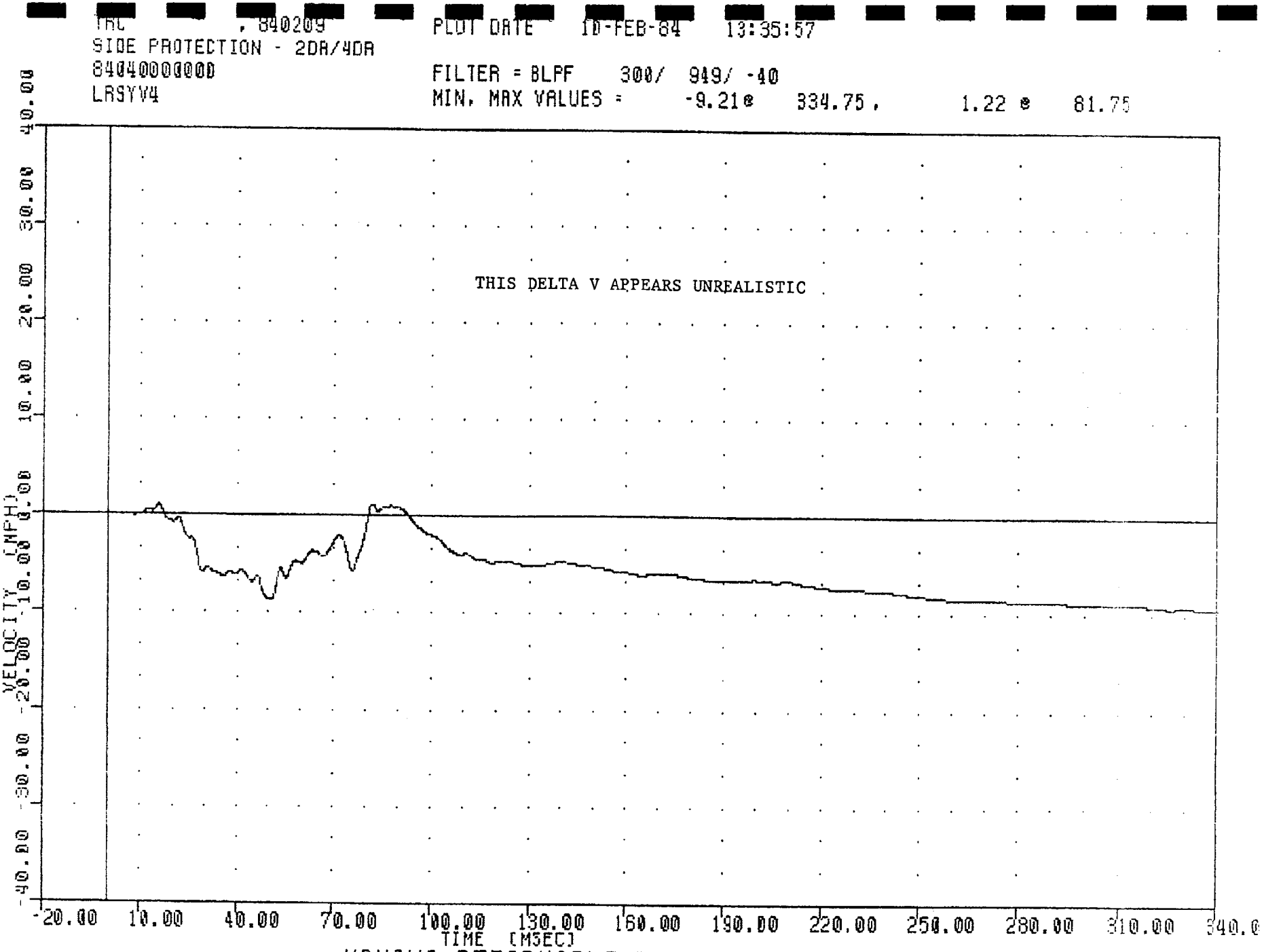
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING RDKXG3



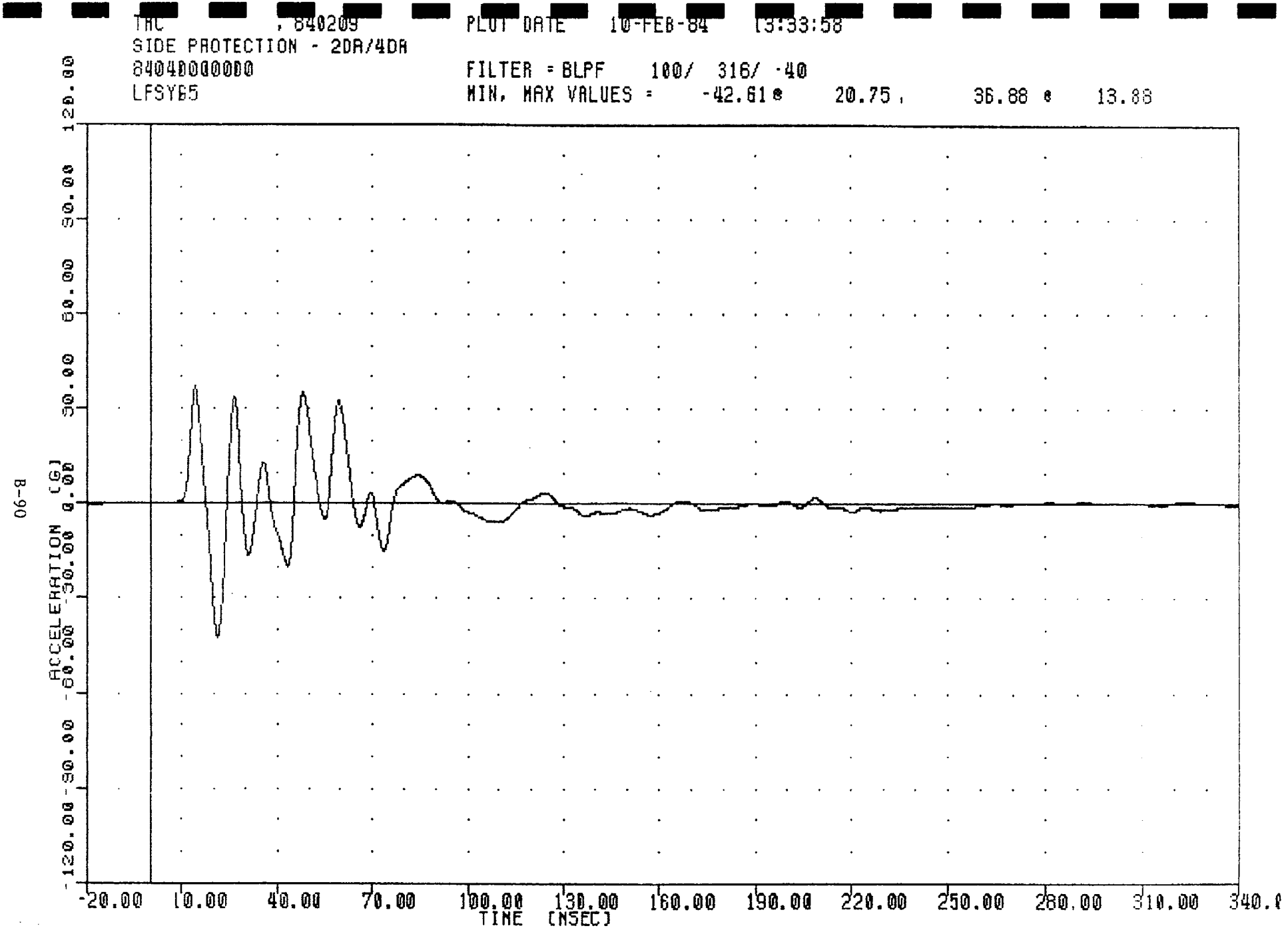
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING RDKYG3



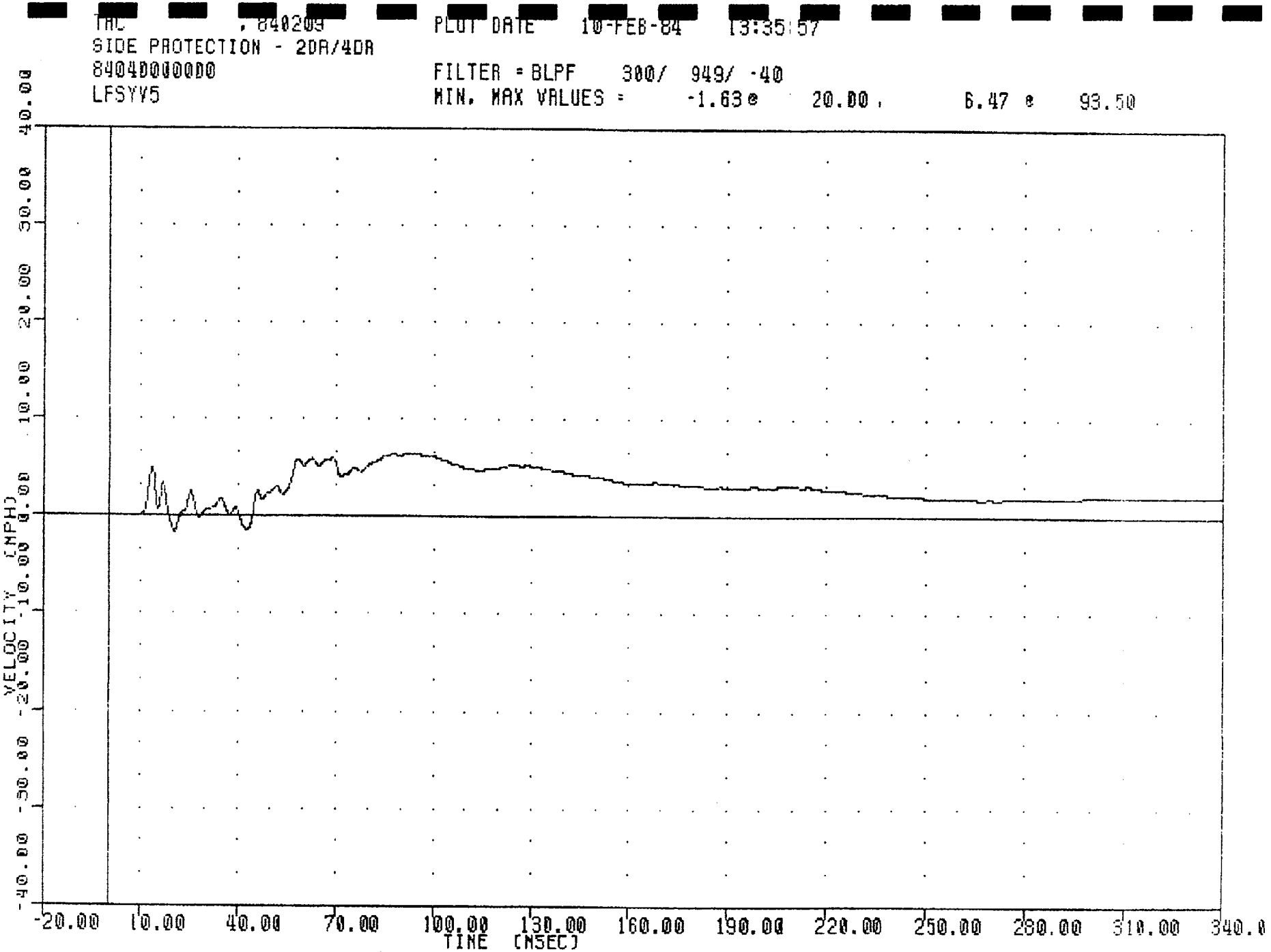
MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE LEFT REAR SILL ACCELERATION Y AXIS



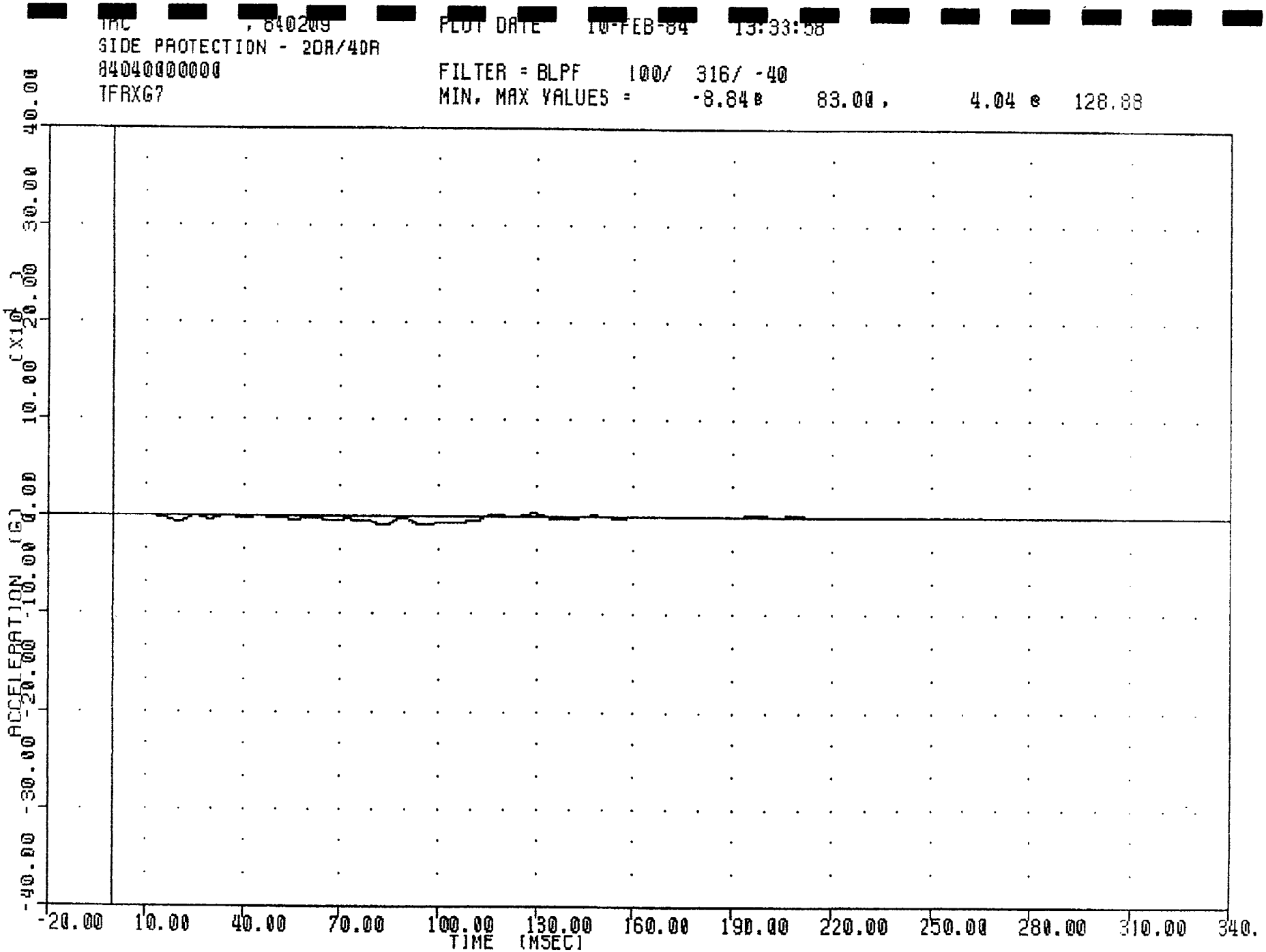
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LRSYG4



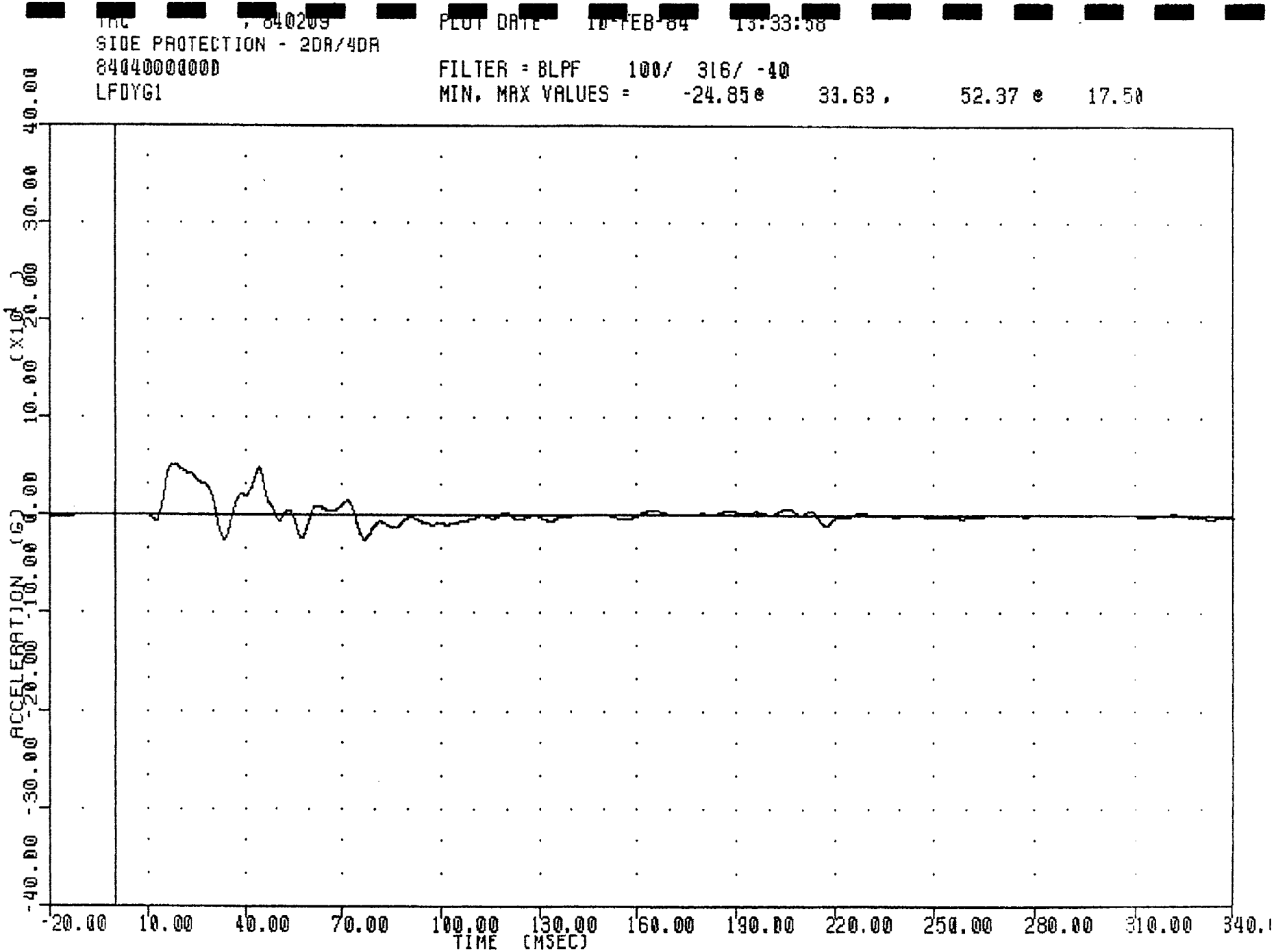
MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS



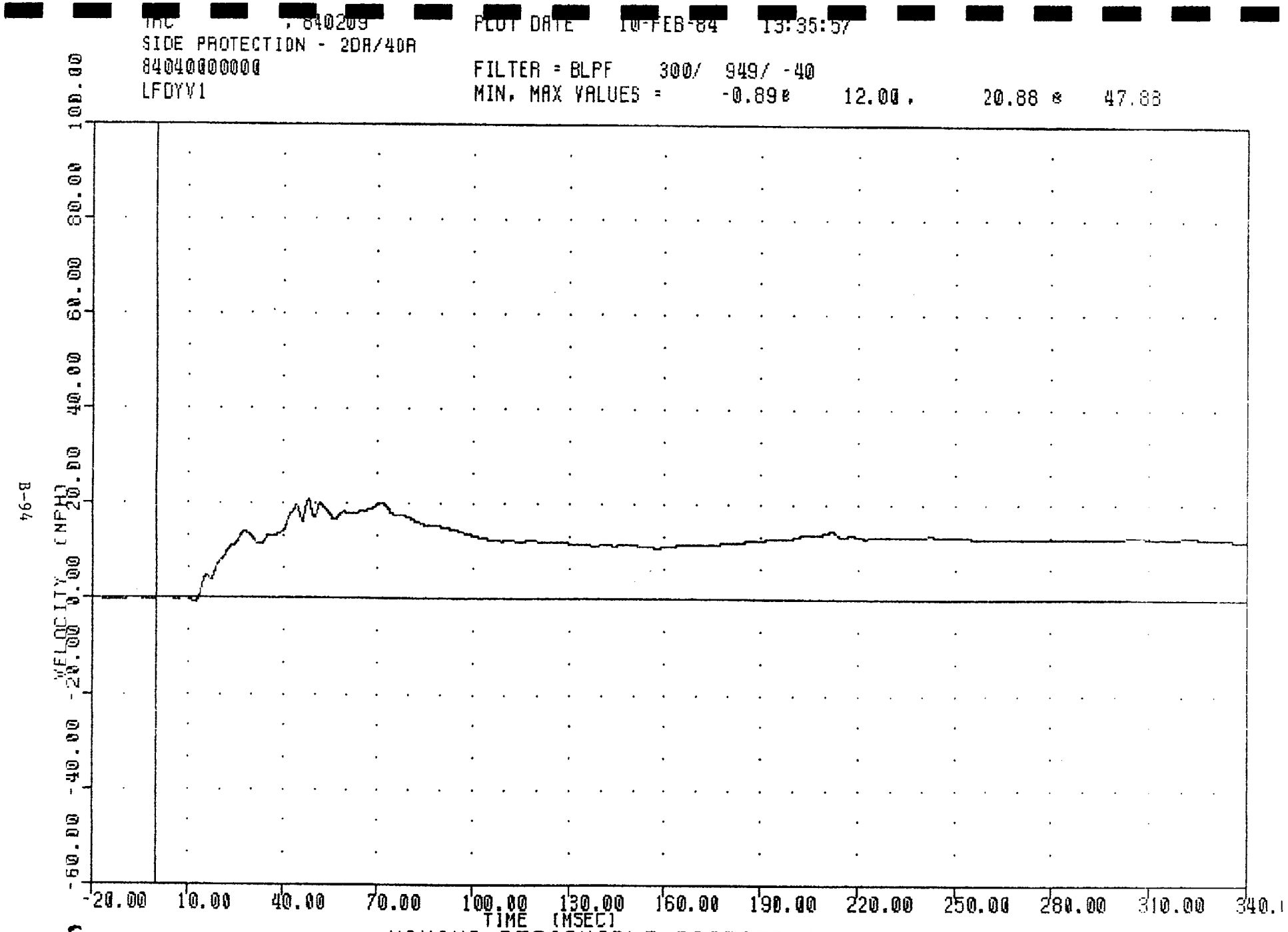
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LFSYG5



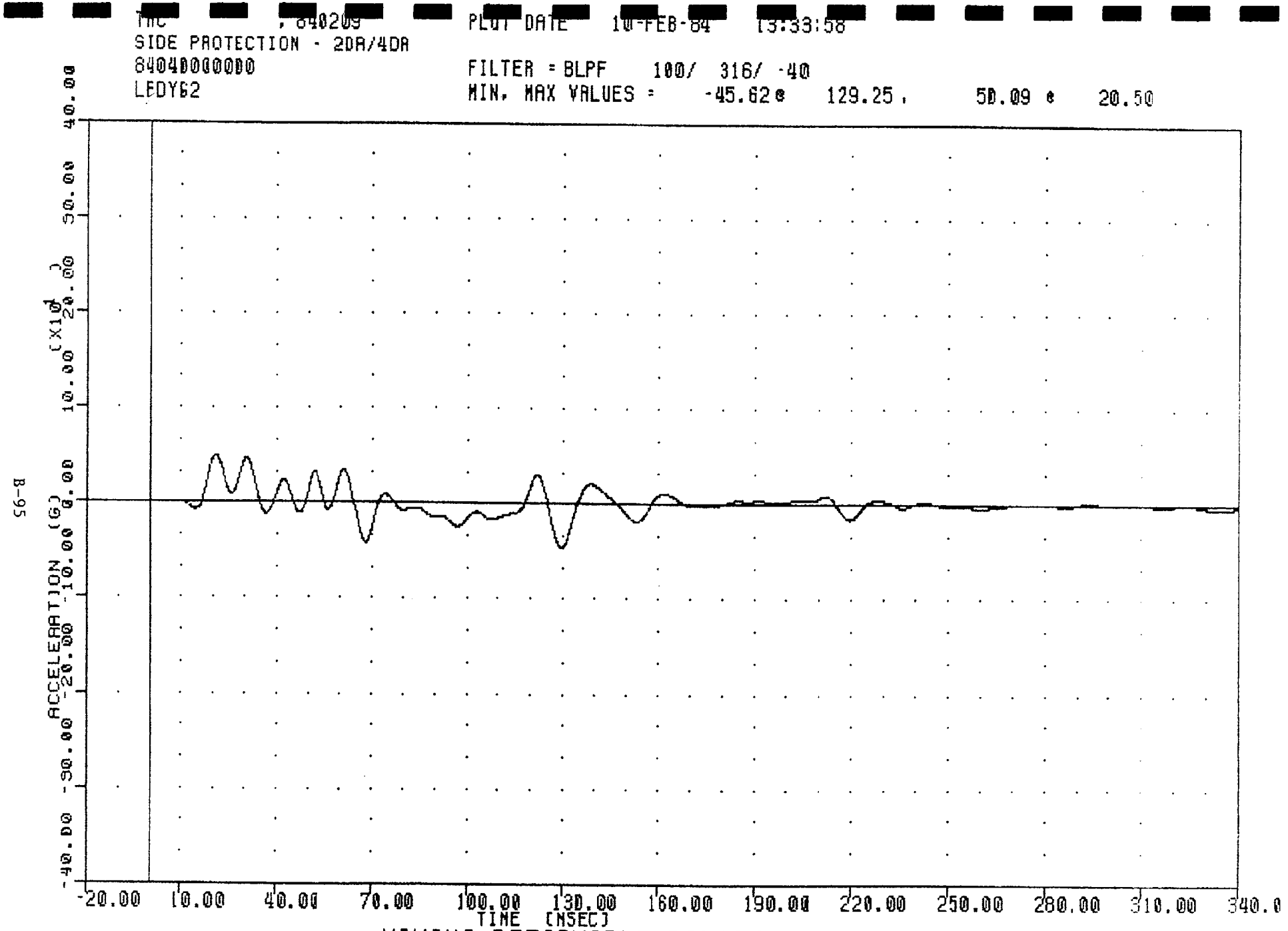
MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE TRUNK FLOOR RIGHT ACCELERATION X AXIS



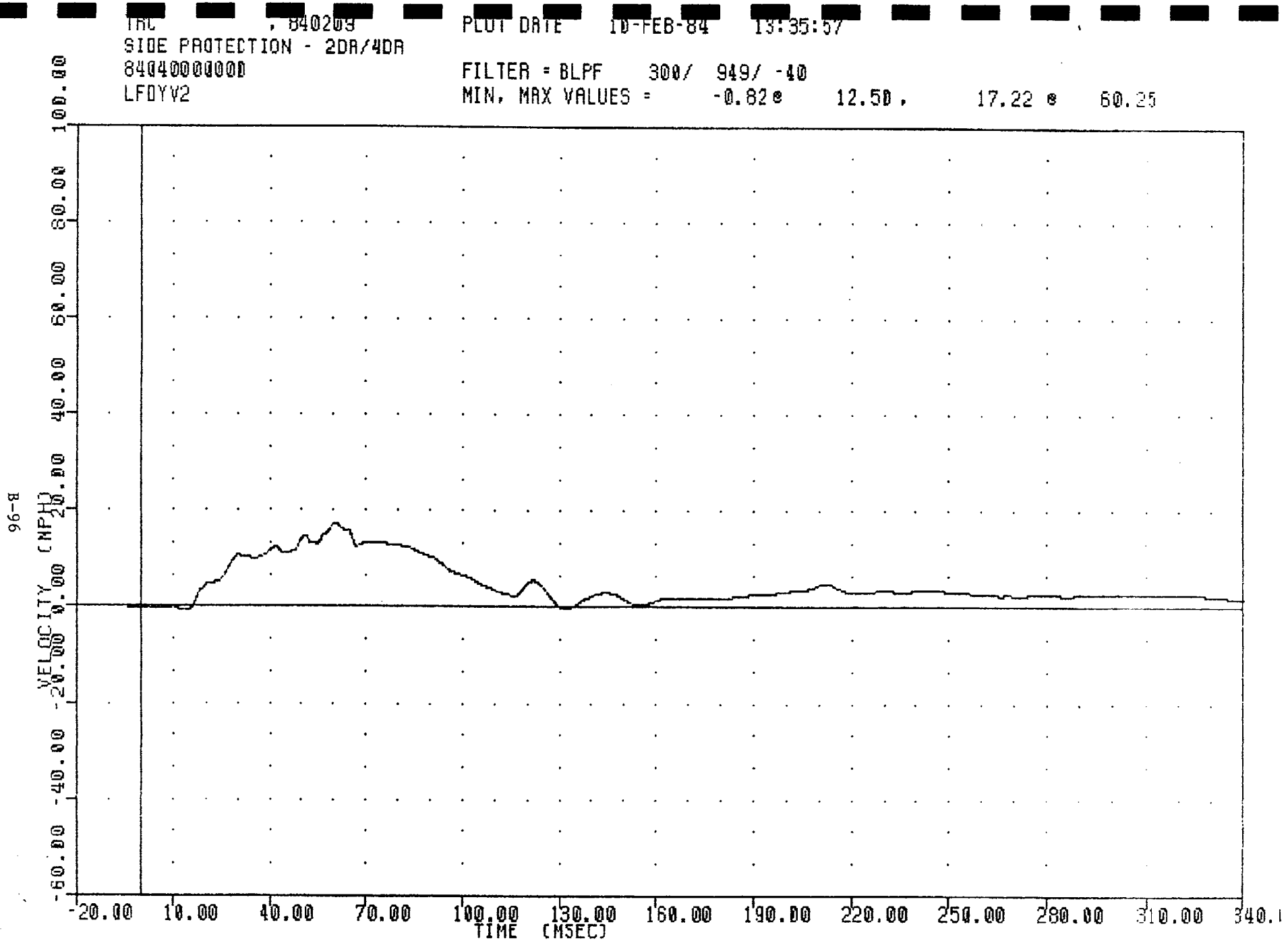
MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE LEFT FRONT DOOR (POSITION 6) ACCELERATION Y AXIS



MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LFDYG1

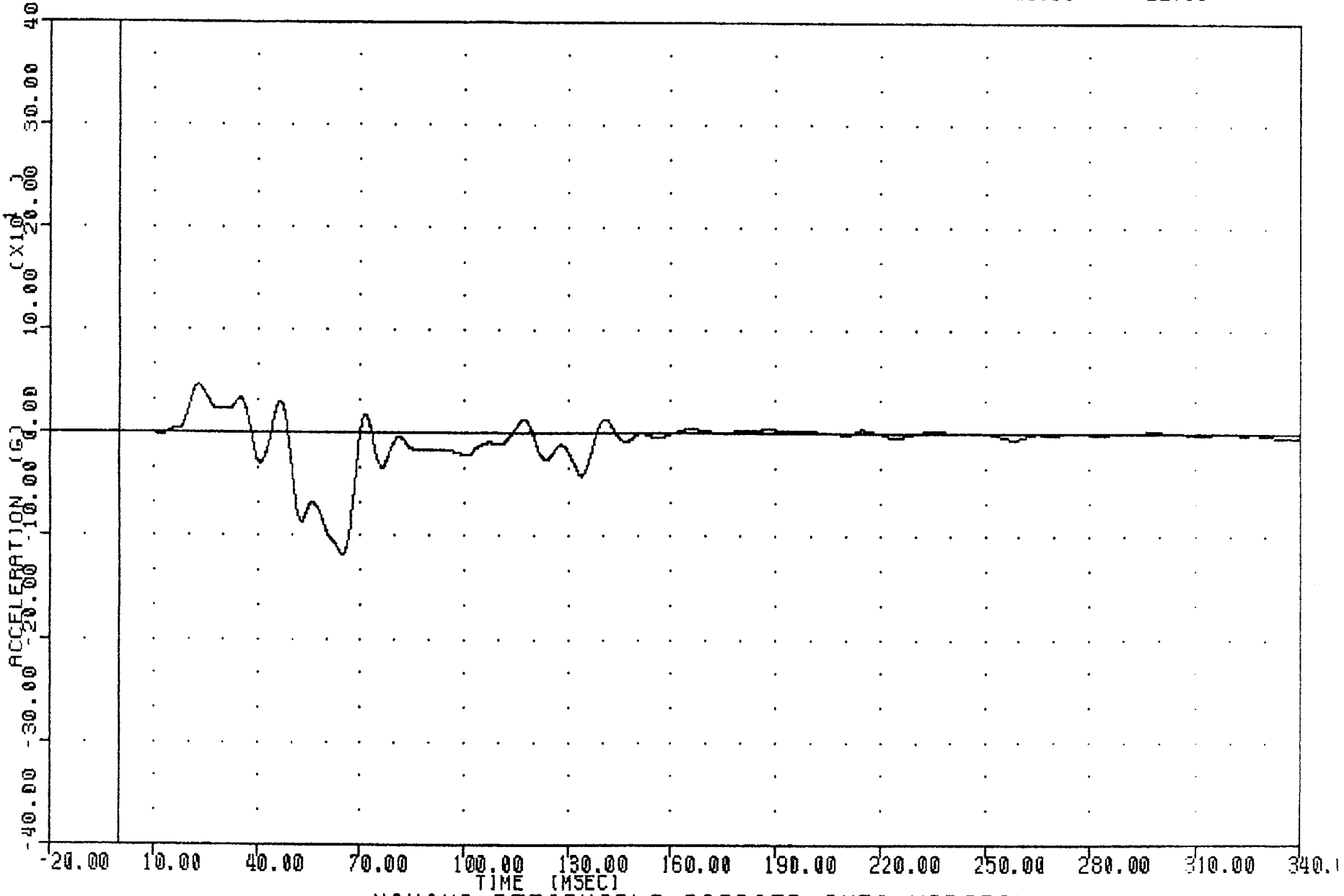


MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE LEFT FRONT DOOR (POSITION 8) ACCELERATION Y AXIS

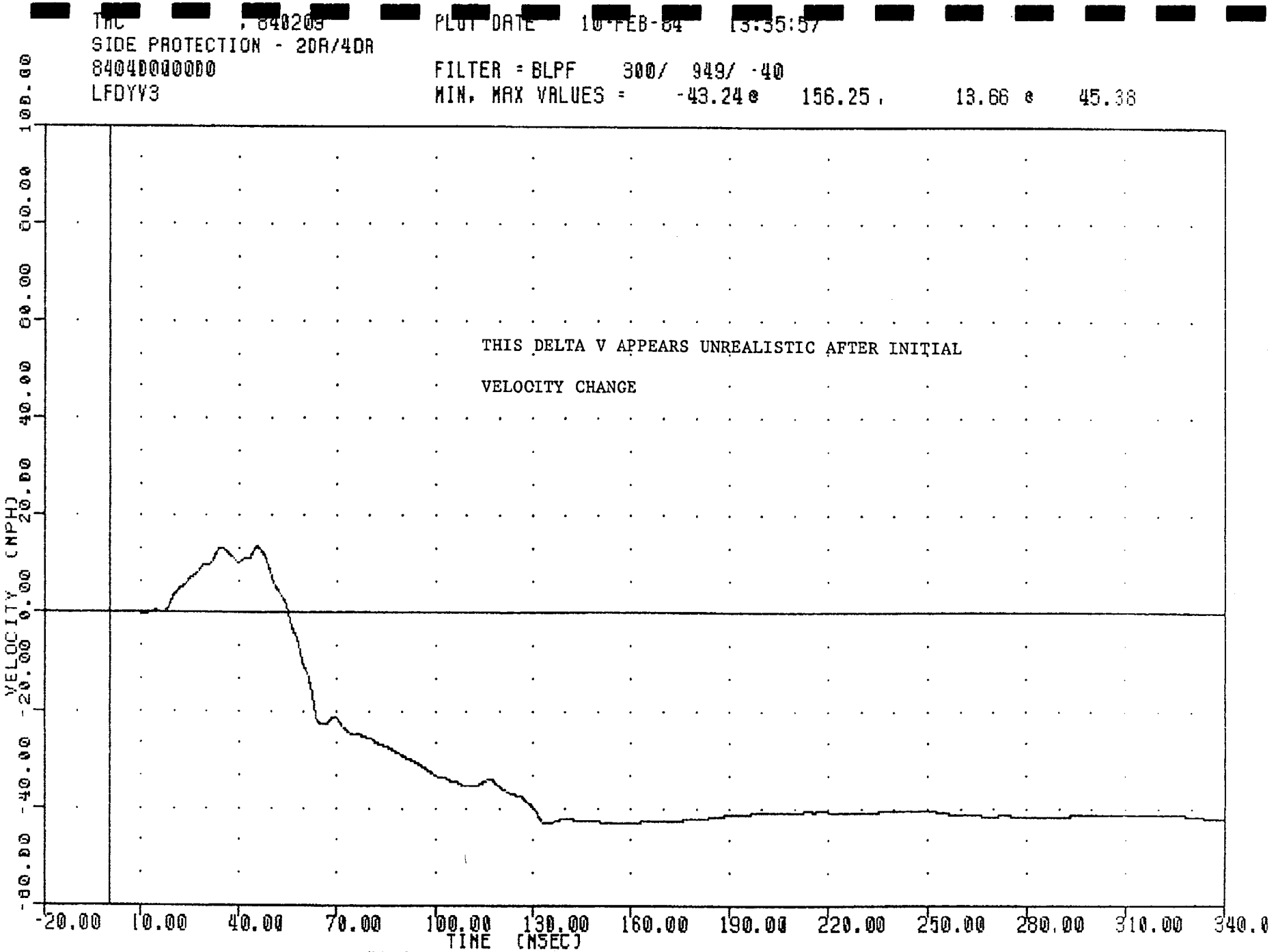


MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LFDYG2

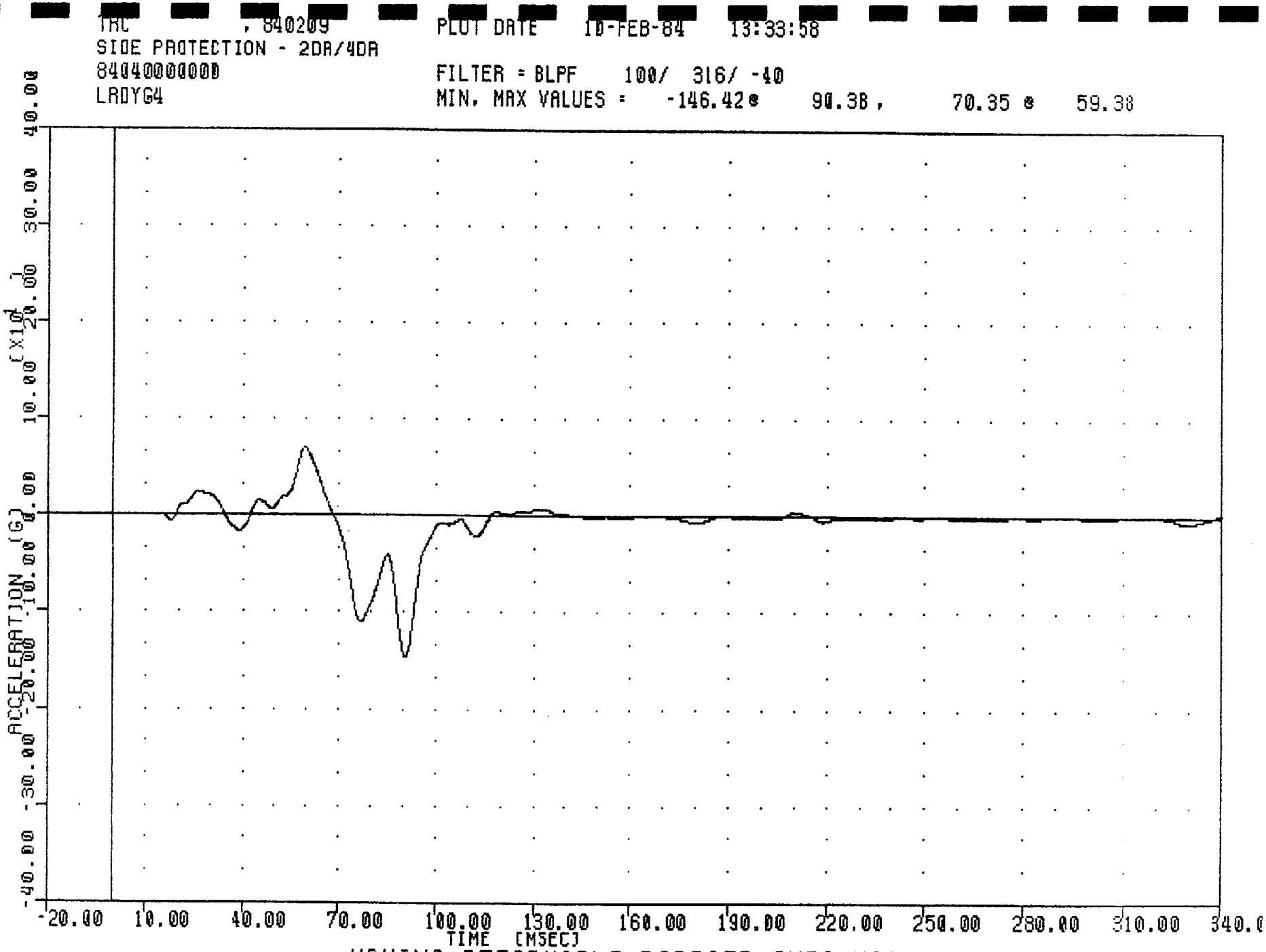
[redacted] , 840209 PLOT DATE = 10 FEB 84 15:33:58
SIDE PROTECTION - 2DR/4DR
840400000000
LFDYG3
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -118.71 @ 64.63 , 46.36 @ 22.50



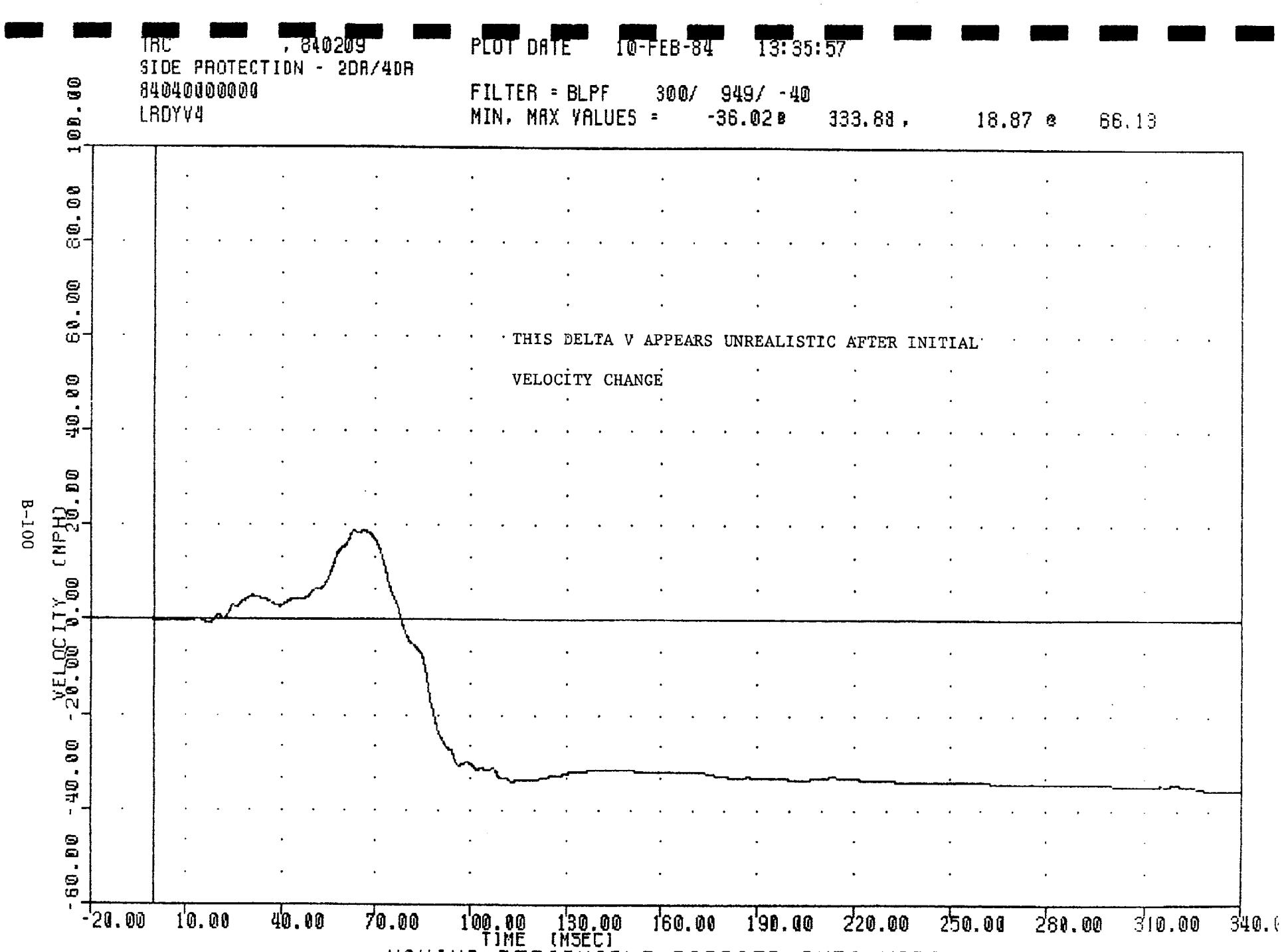
MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE LEFT FRONT DOOR (POSITION 9) ACCELERATION Y AXIS



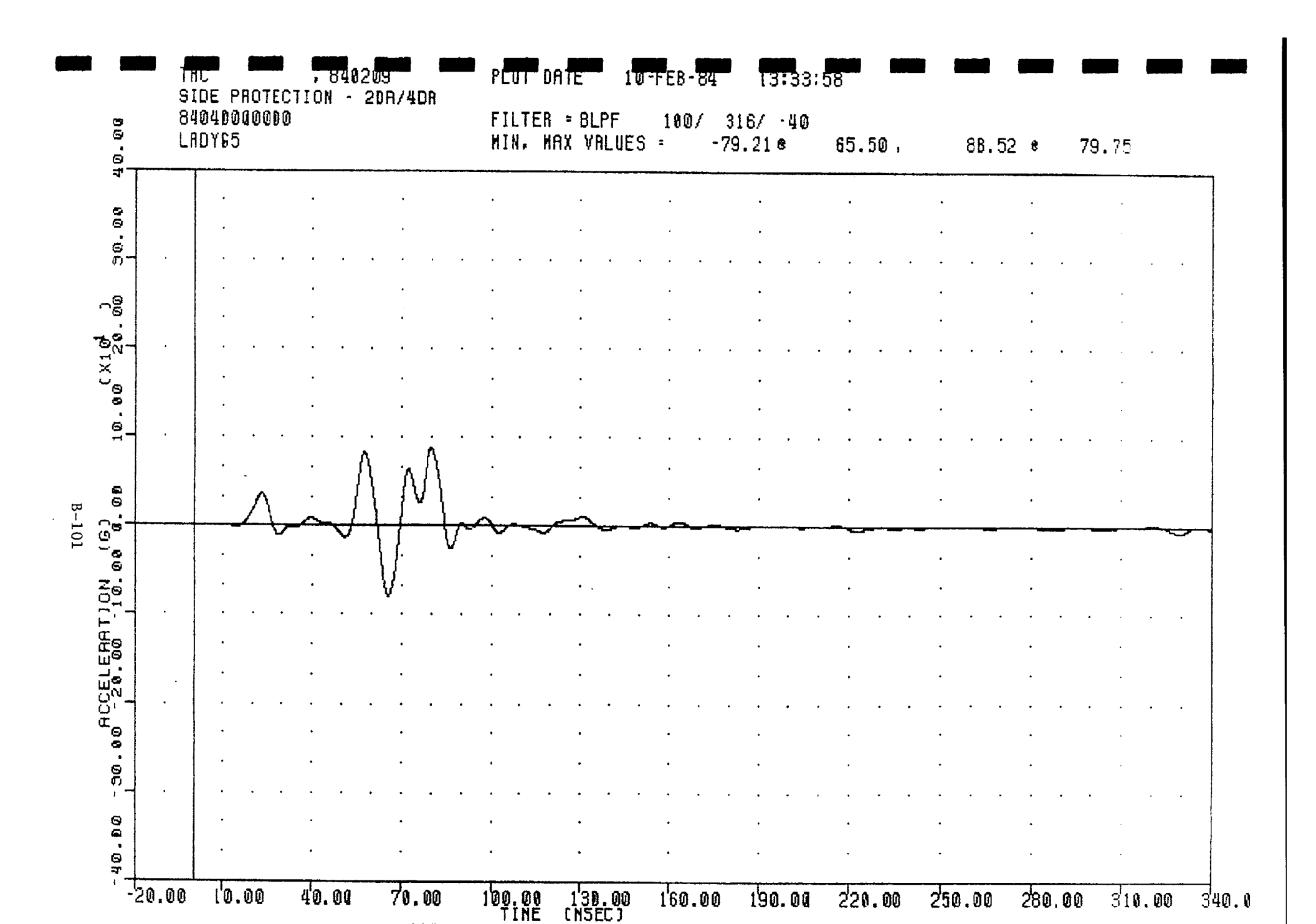
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LFDYG3



MOVING DEFORMABLE BARRIER INTO HORIZON
VEHICLE LEFT REAR DOOR (POSITION 10) ACCELERATION Y AXIS

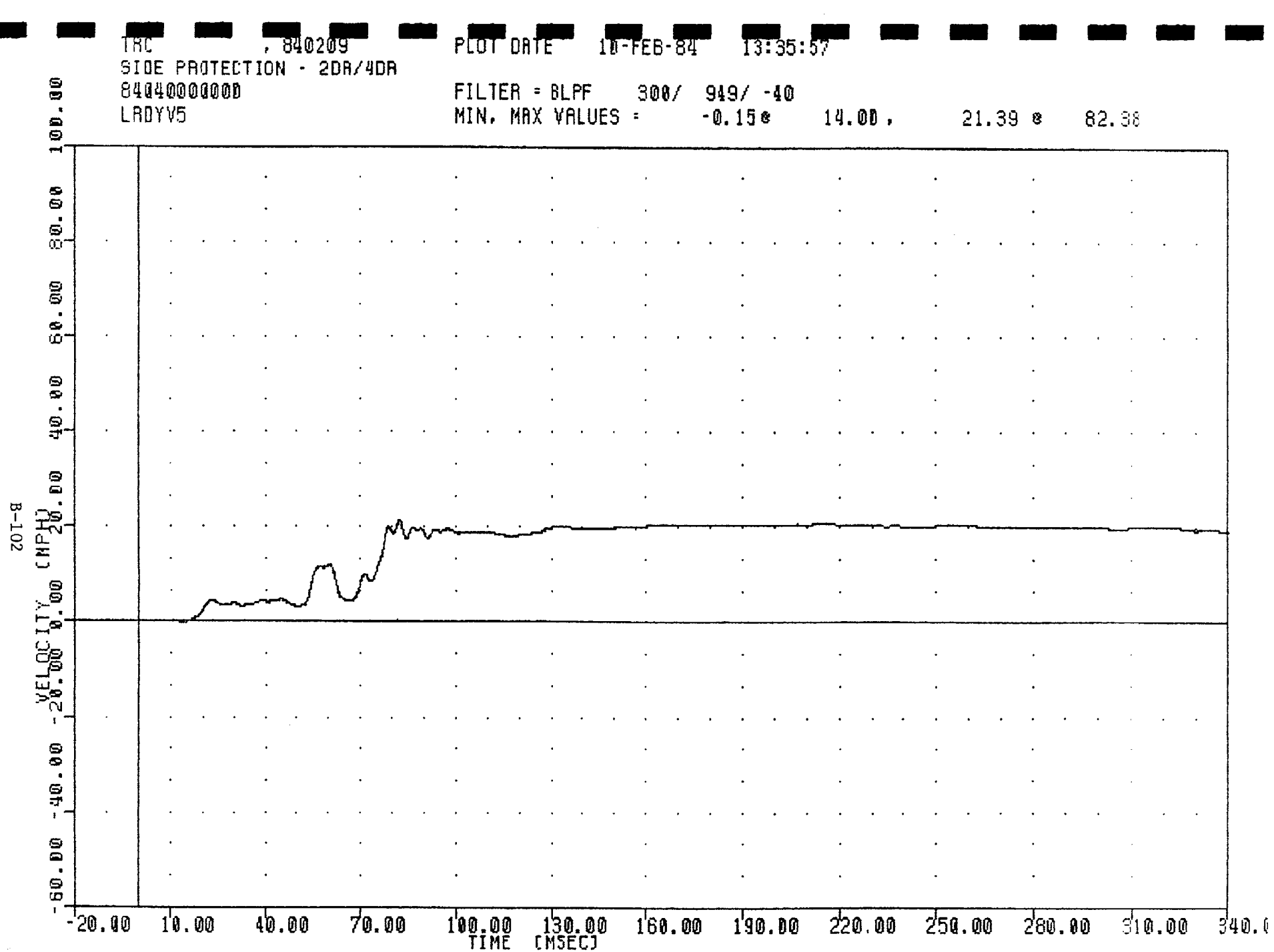


MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LRDYG4

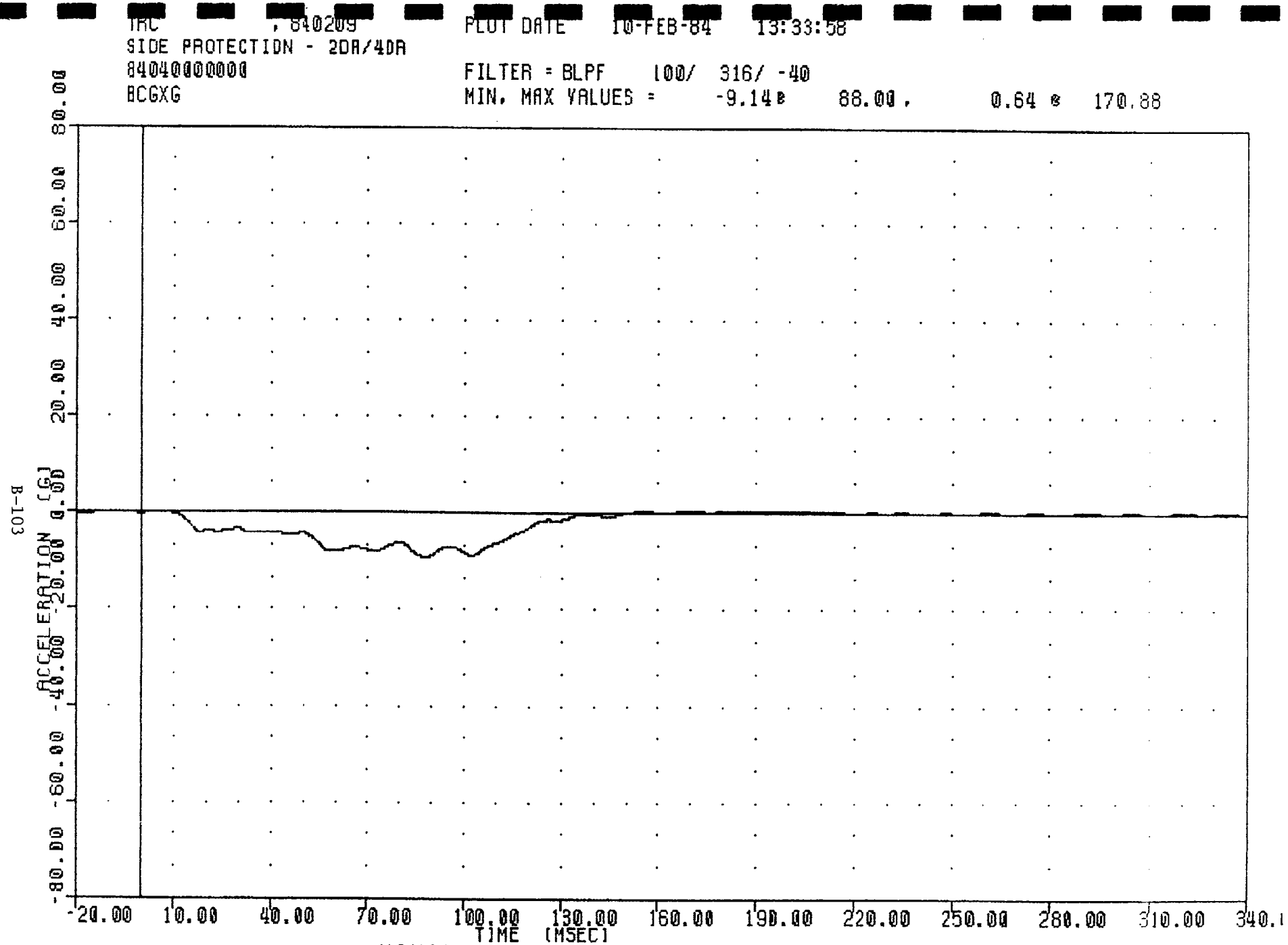


MOVING DEFORMABLE BARRIER INTO HORIZON

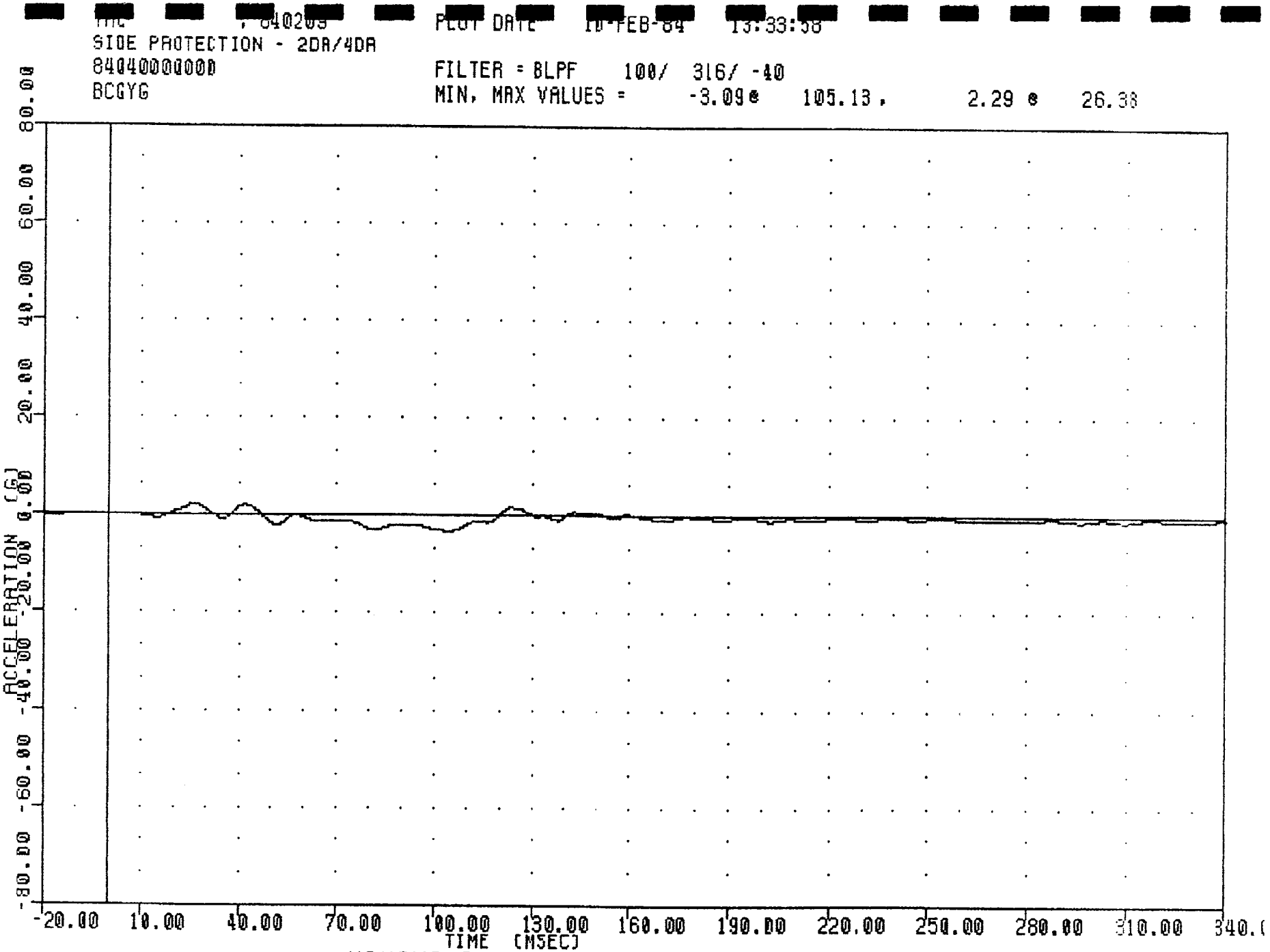
VEHICLE LEFT REAR DOOR (POSITION 11) ACCELERATION Y AXIS



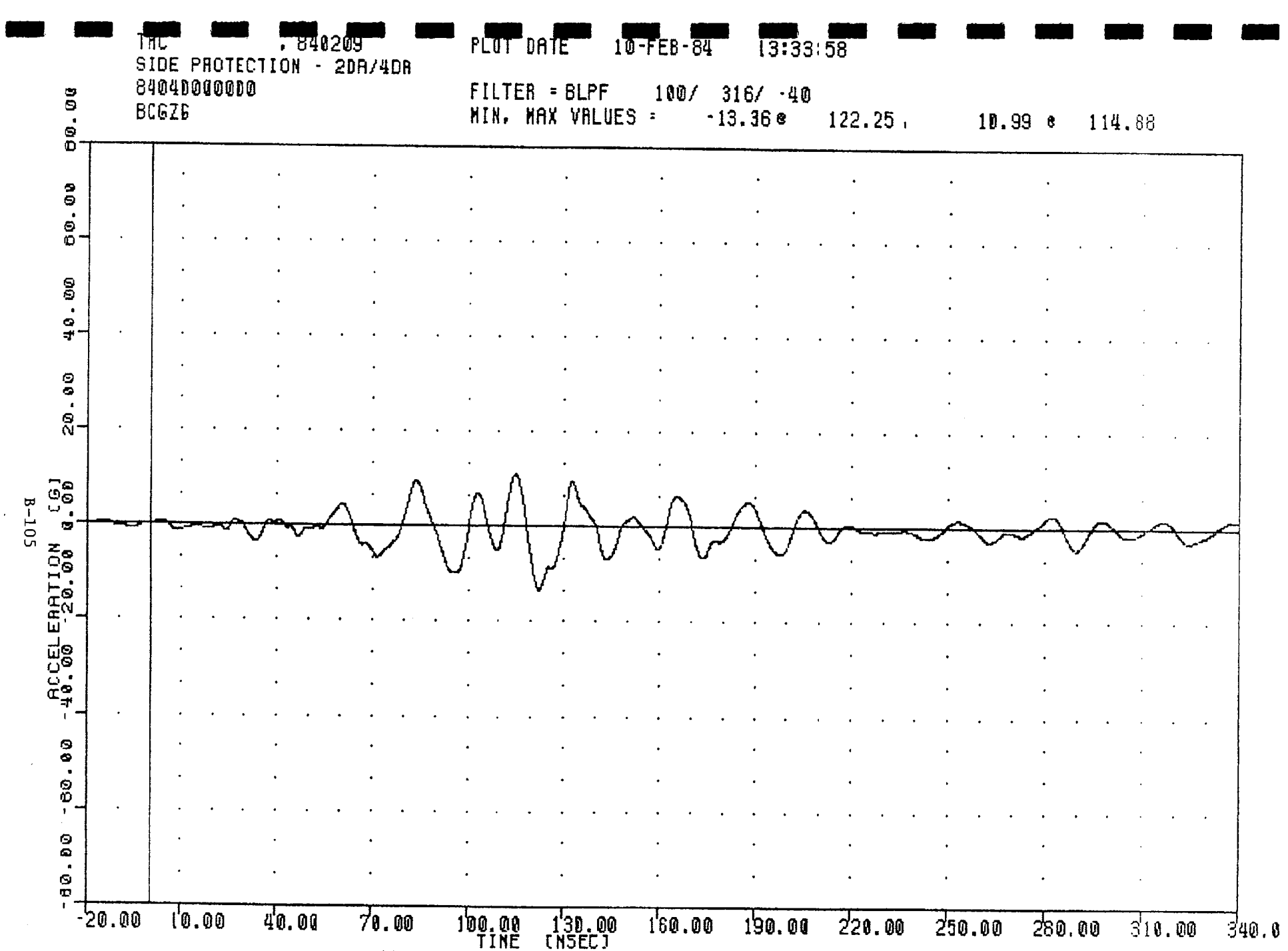
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING LRDYG5



MOVING DEFORMABLE BARRIER INTO HORIZON
BARRIER CENTER OF GRAVITY X AXIS

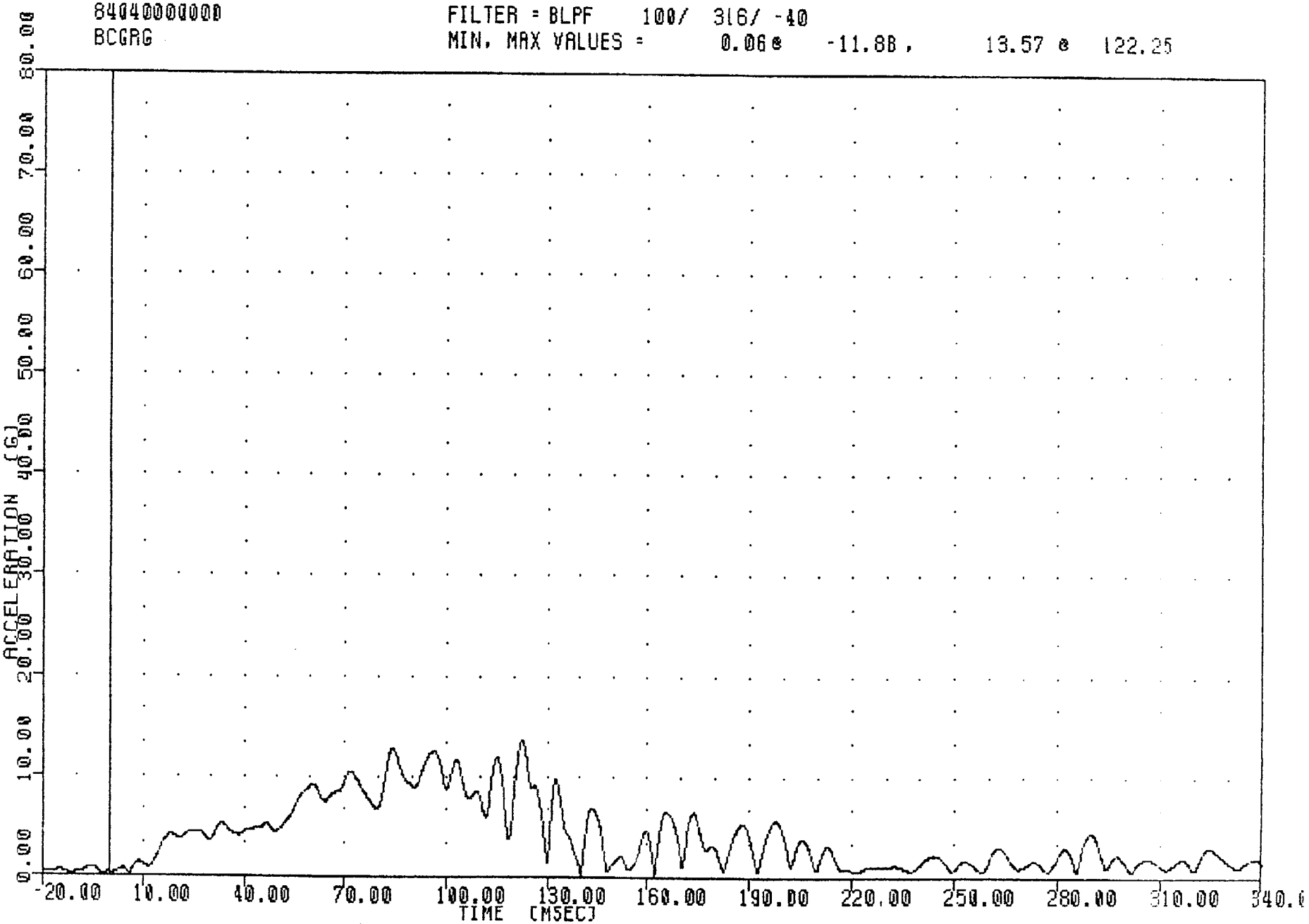


MOVING DEFORMABLE BARRIER INTO HORIZON
BARRIER CENTER OF GRAVITY Y AXIS

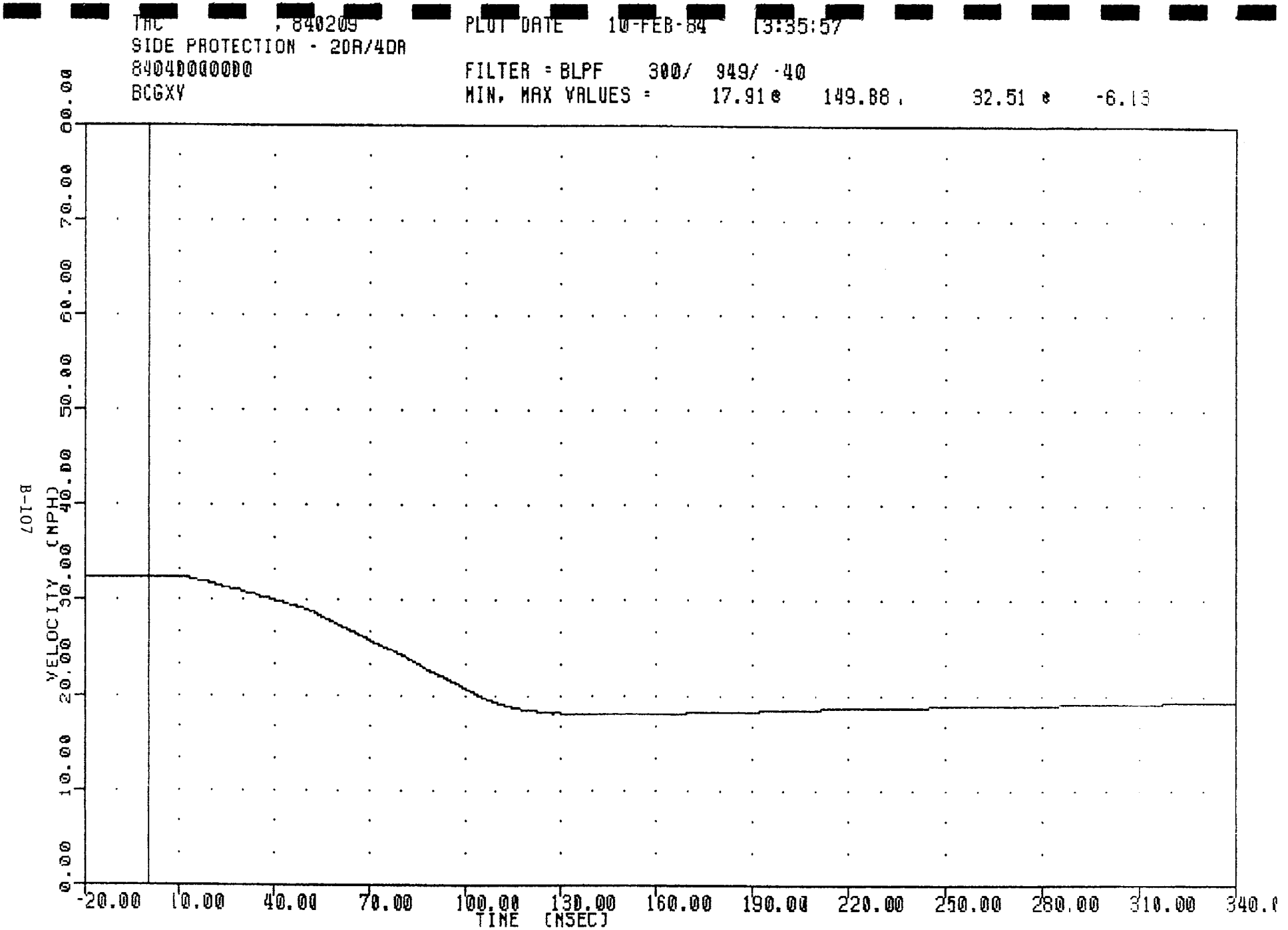


MOVING DEFORMABLE BARRIER INTO HORIZON
BARRIER CENTER OF GRAVITY Z AXIS

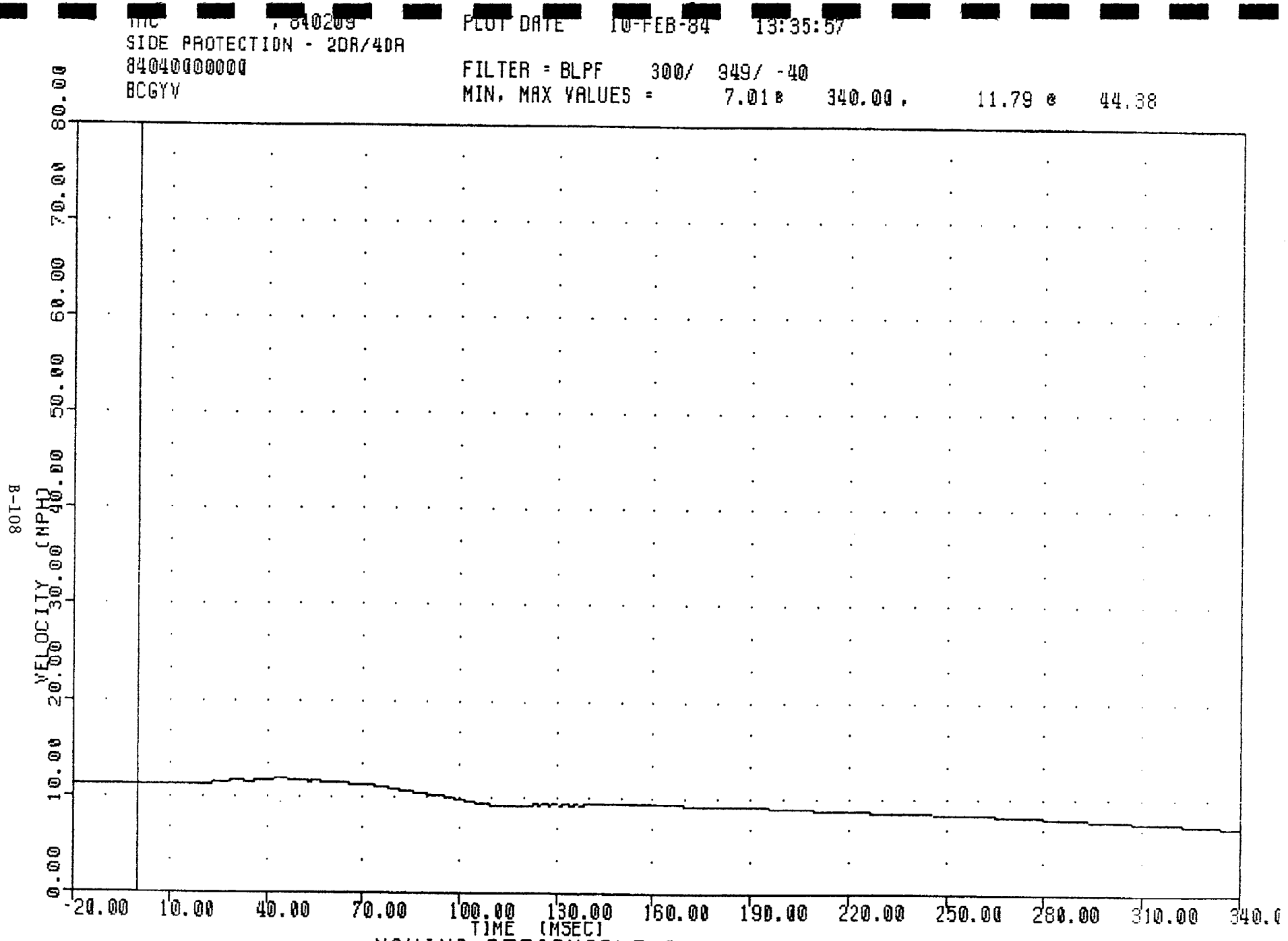
TMC , 840209 PLOT DATE 10-FEB-84 13:35:27
SIDE PROTECTION - 2DR/4DR
84040000000
BCGRG
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = 0.06 @ -11.88 , 13.57 @ 122.25



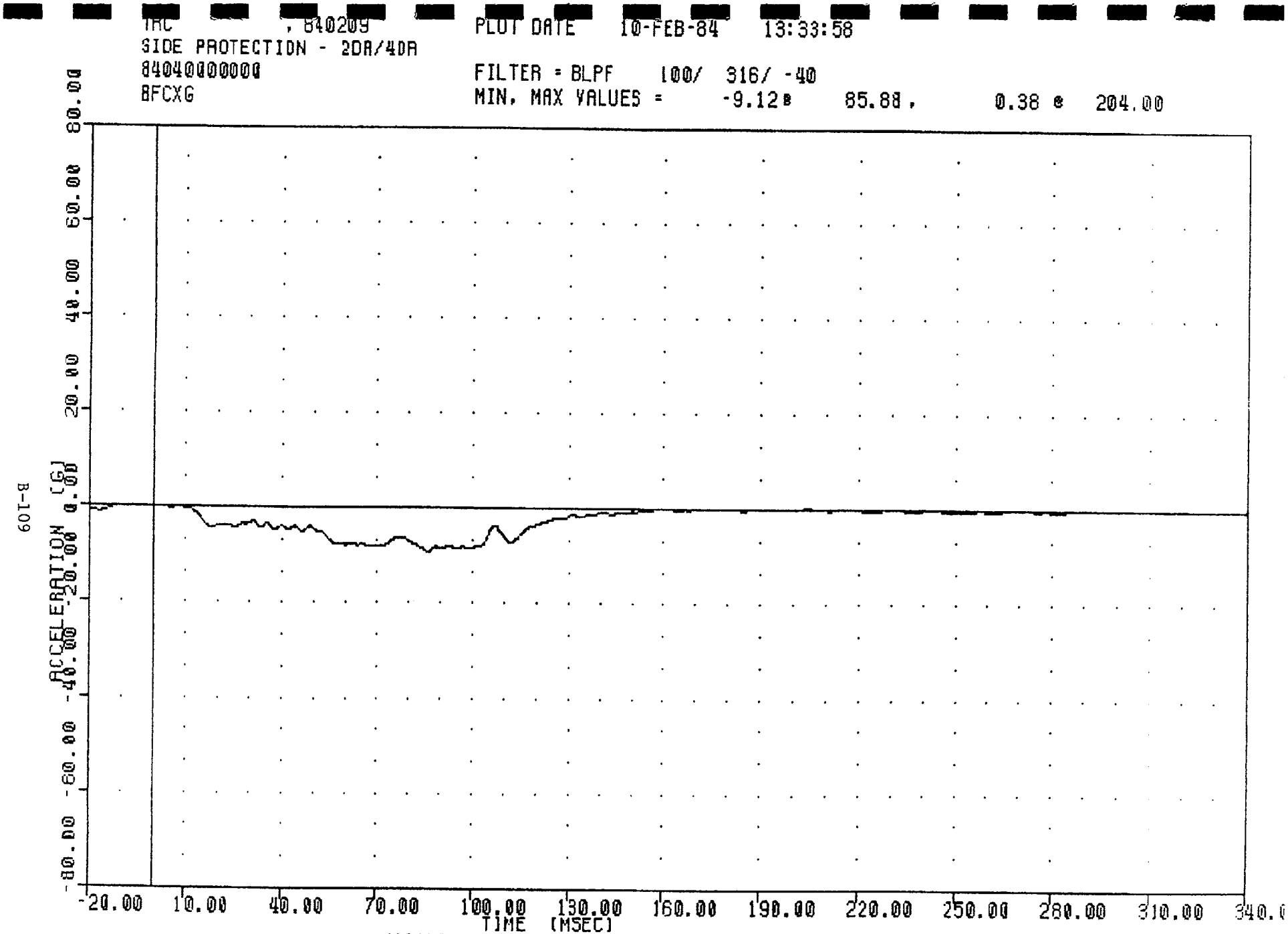
MOVING DEFORMABLE BARRIER INTO HORIZON
BARRIER CG RESULTANT



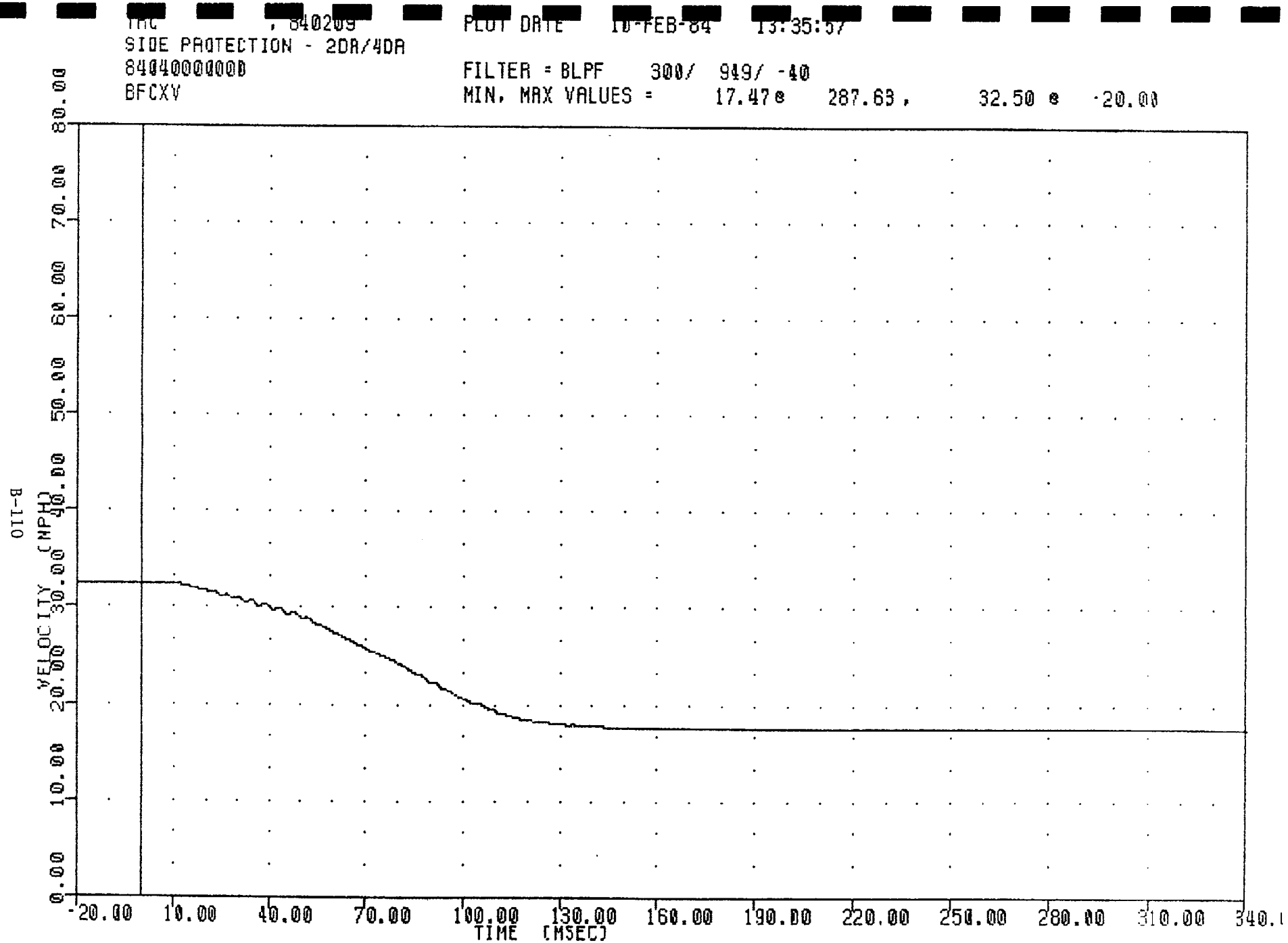
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING BCGXG



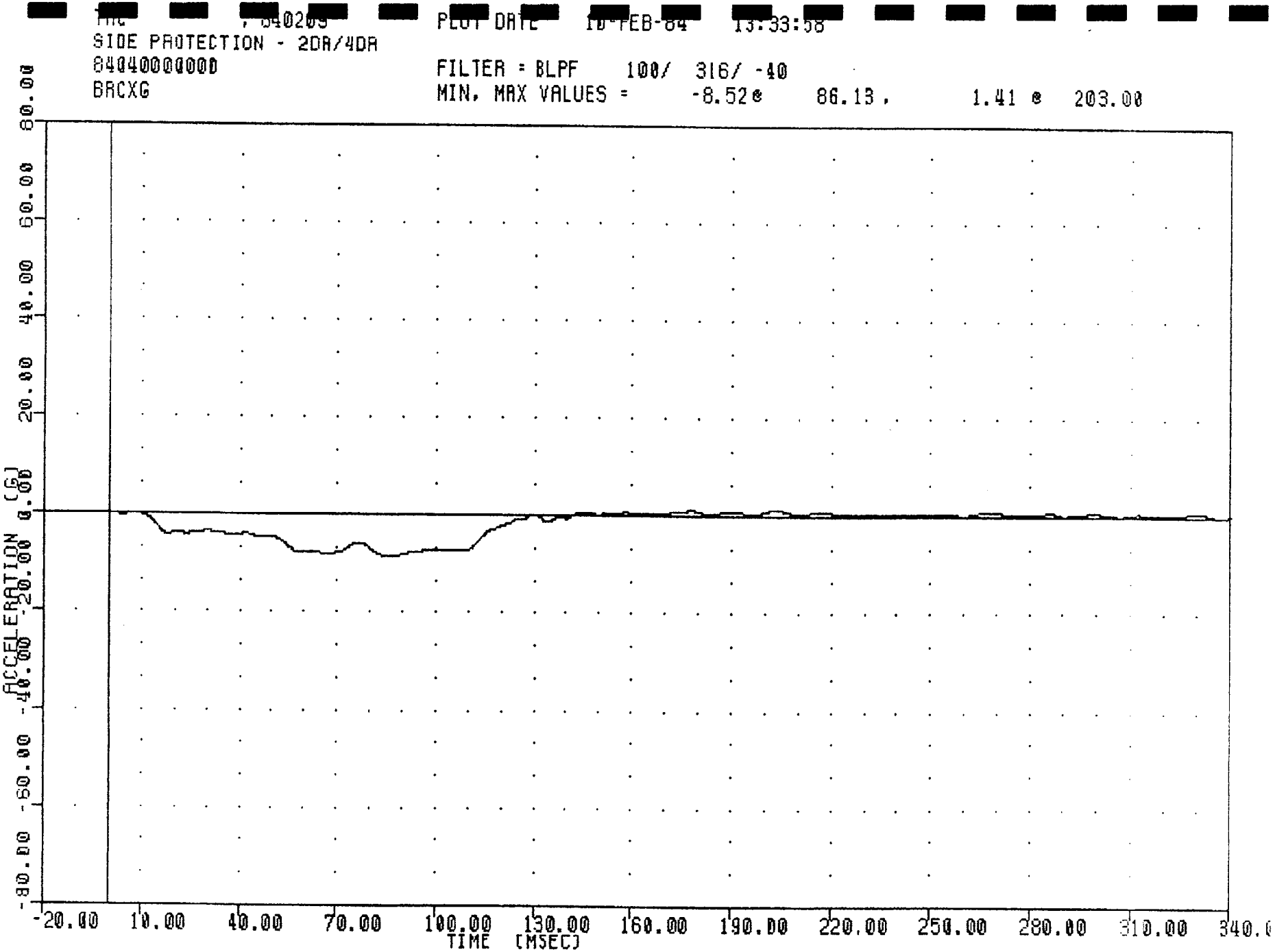
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING BCGYG



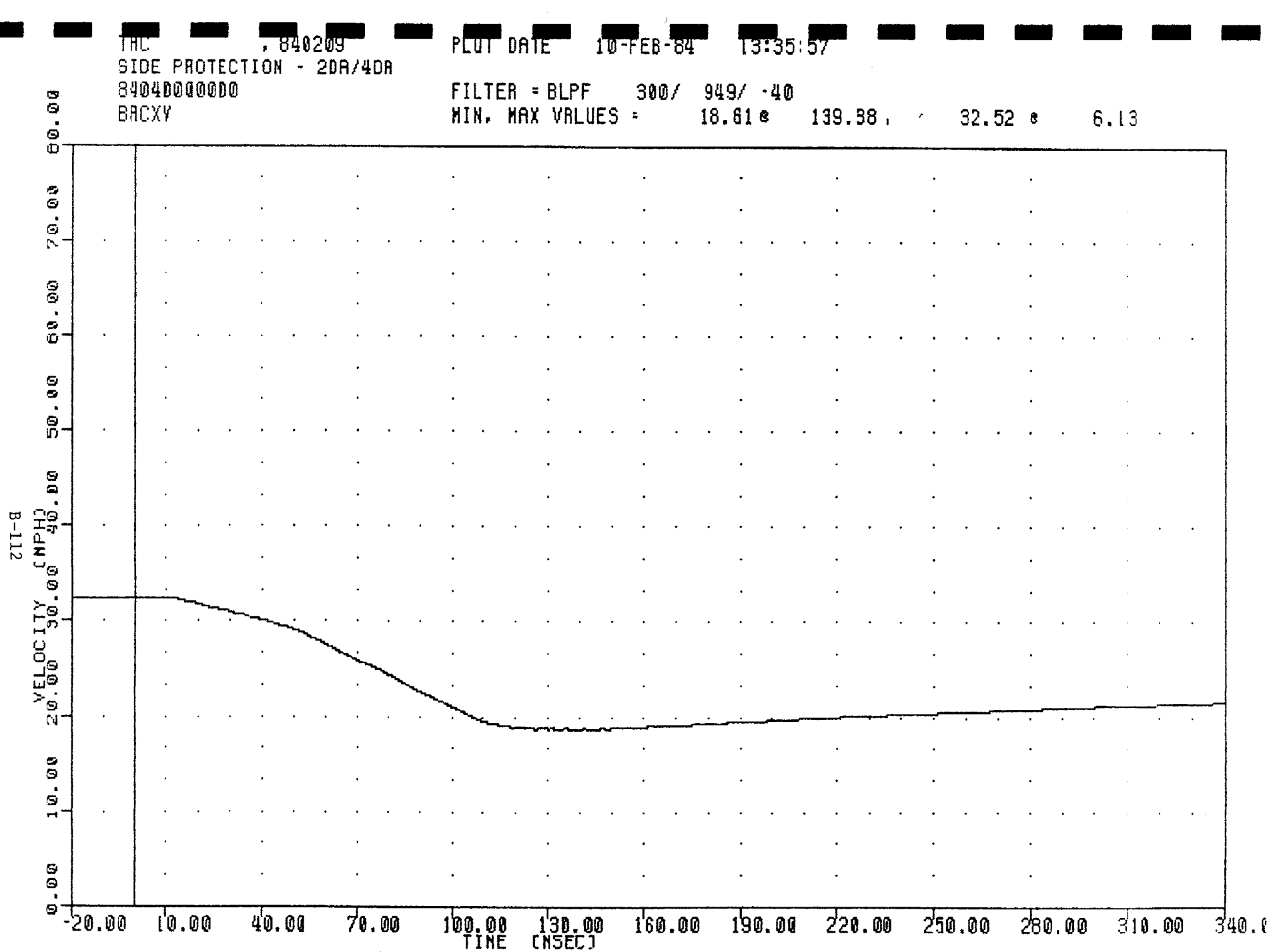
MOVING DEFORMABLE BARRIER INTO HORIZON
BARRIER FRONT CROSSMEMBER ACCELERATION X AXIS



MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING BFCXG



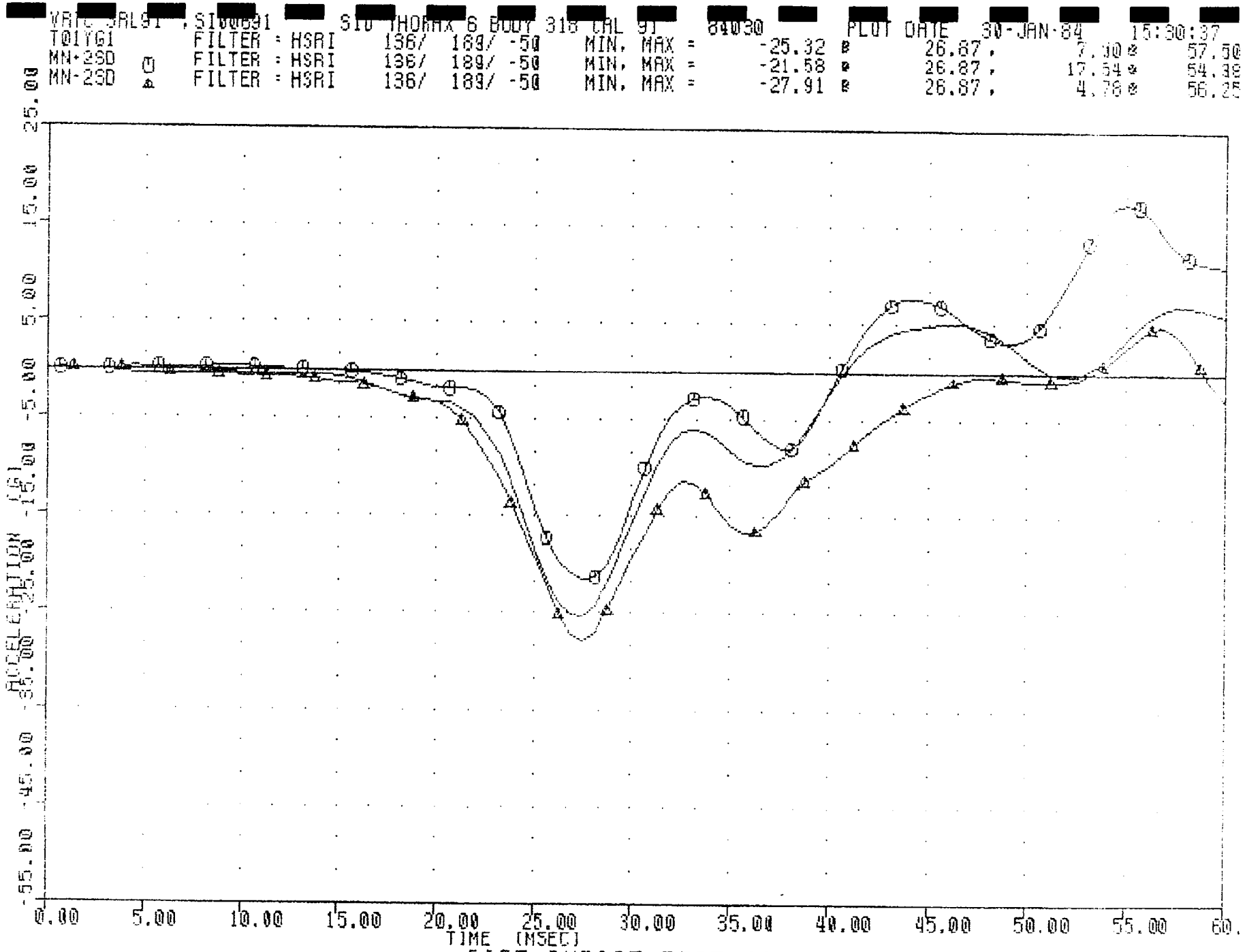
MOVING DEFORMABLE BARRIER INTO HORIZON
BARRIER REAR CROSSMEMBER ACCELERATION X AXIS



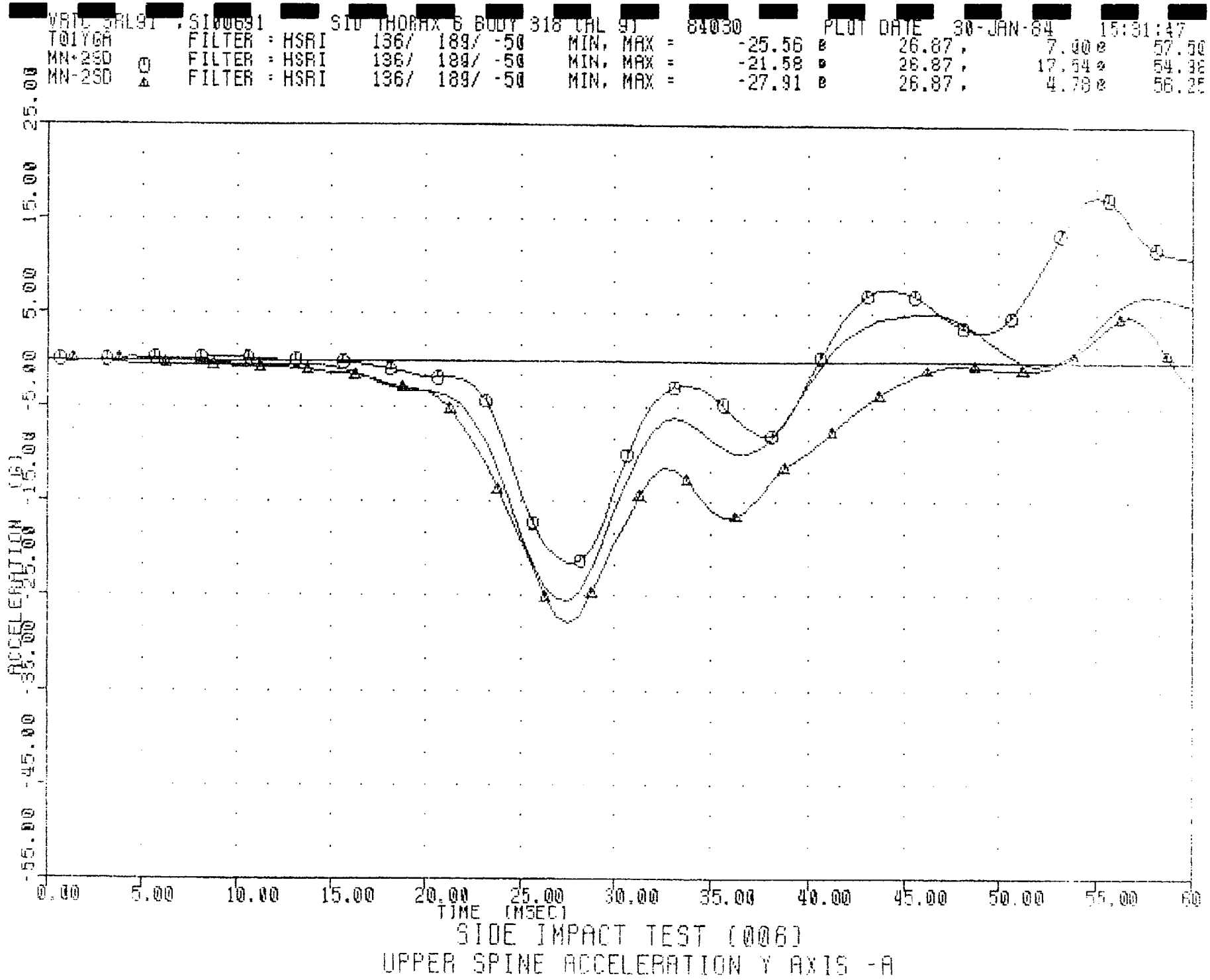
MOVING DEFORMABLE BARRIER INTO HORIZON
DELTA V USING BRCXG

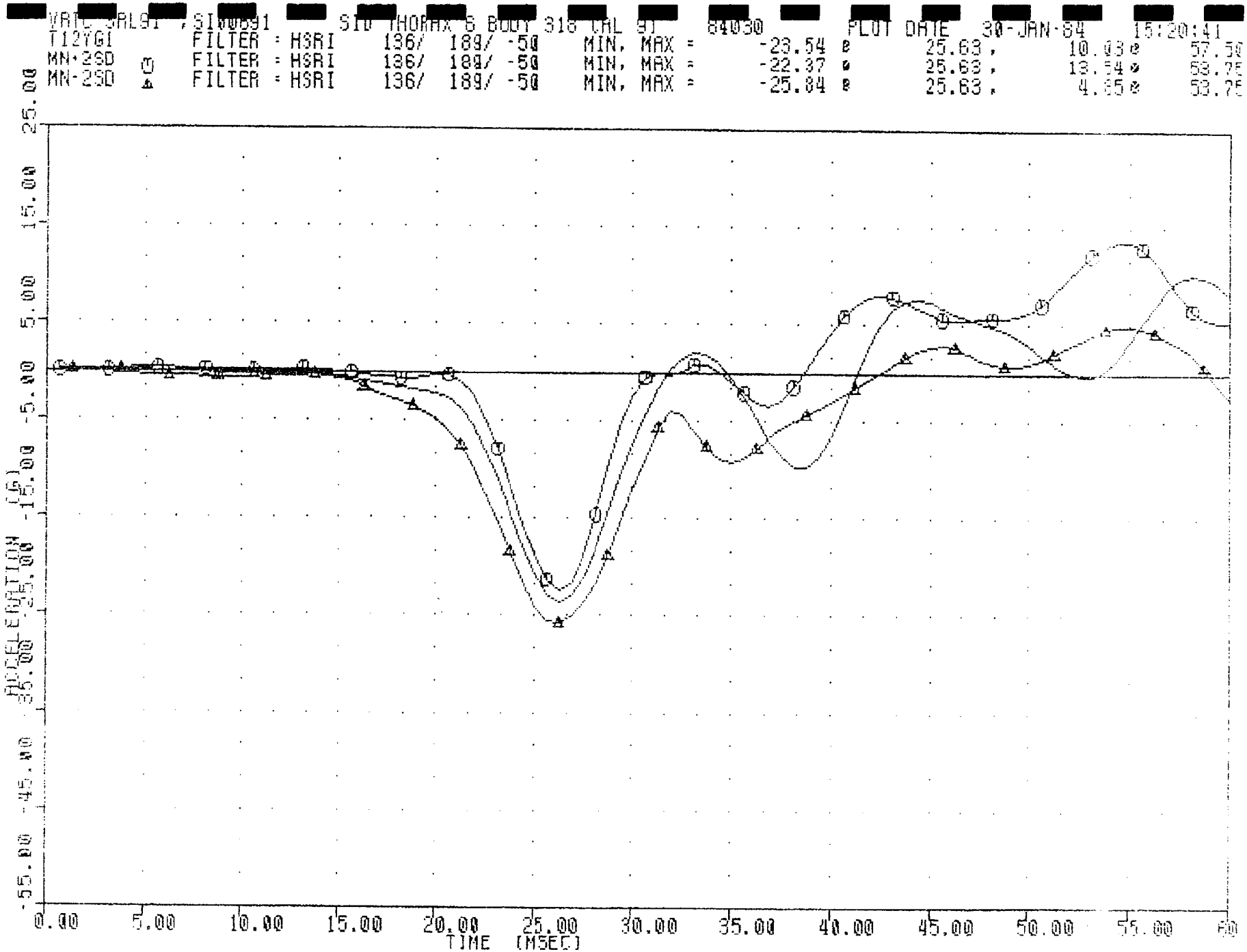
APPENDIX C

DUMMY CERTIFICATION



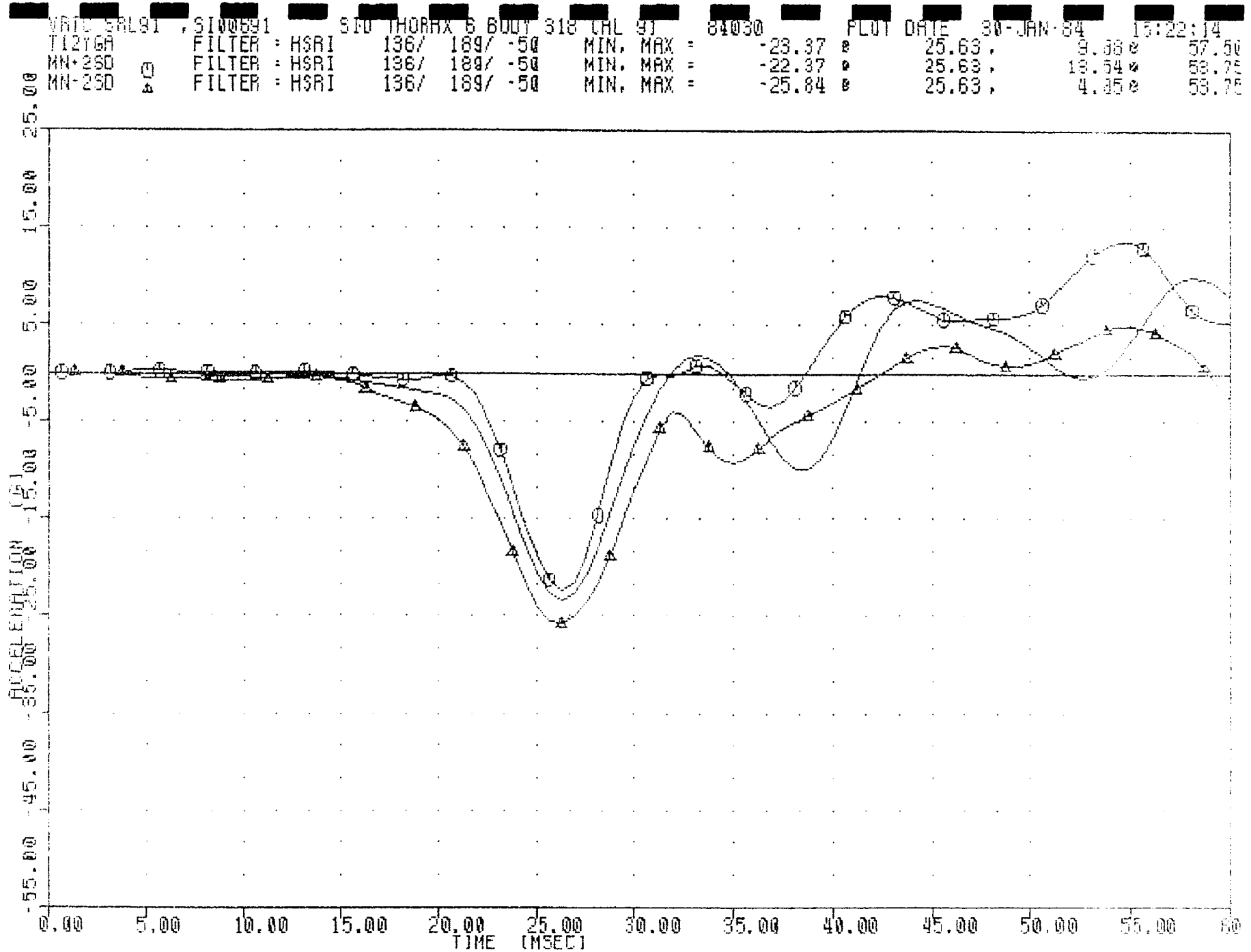
SIDE IMPACT TEST (006)
UPPER SPINE ACCELERATION Y AXIS -1

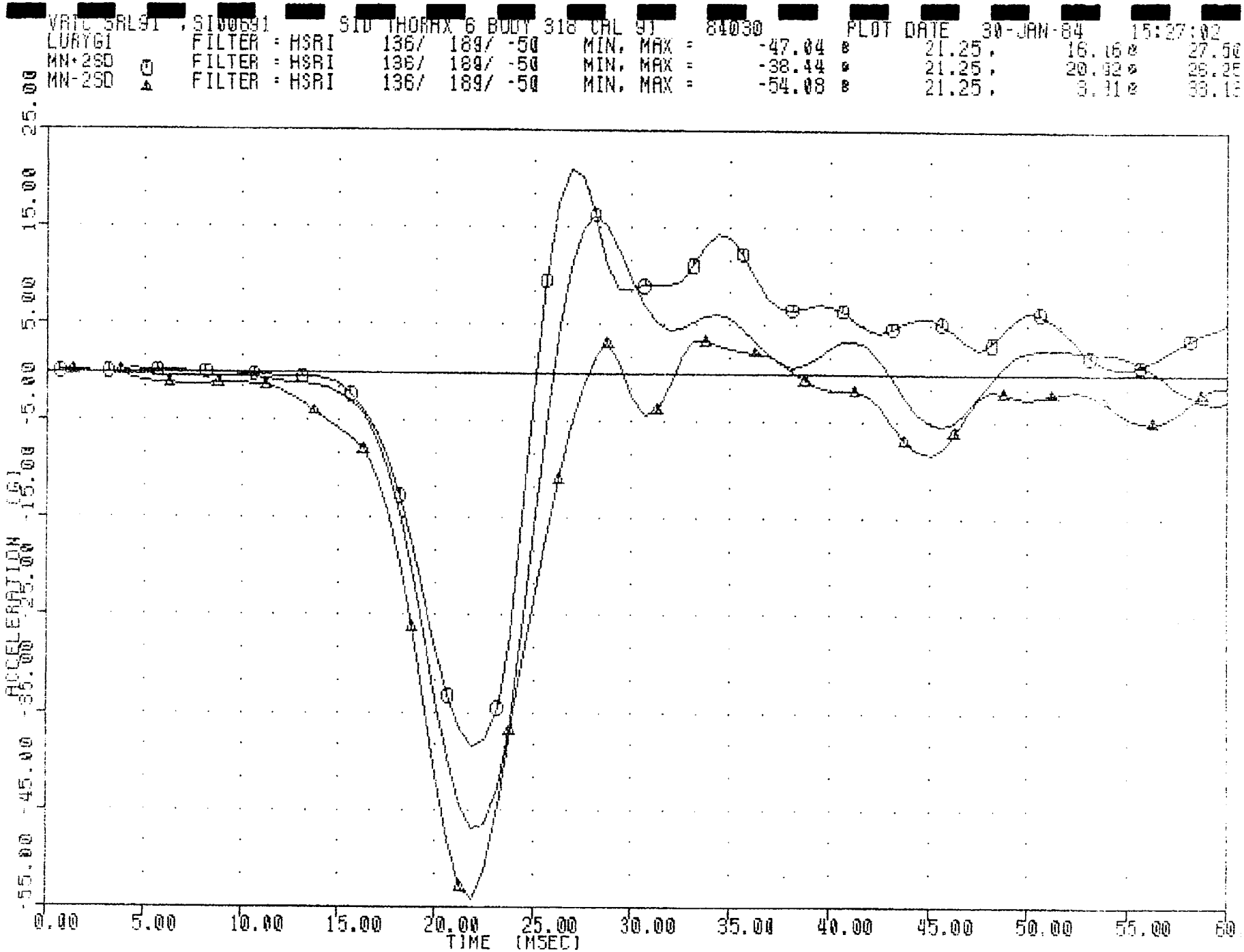

VRTC ,SRL91 ,SI00691 SID THORAX 6 BODY 318 CAL 91 84030 PLOT DATE 30-JAN-84 15:31:47
T01YGA FILTER : HSRI 136/ 189/ -50 MIN, MAX = -25.56 @ 26.87 , 7.00 @ 57.50
MN+2SD FILTER : HSRI 136/ 189/ -50 MIN, MAX = -21.58 @ 26.87 , 17.64 @ 54.38
MN-2SD FILTER : HSRI 136/ 189/ -50 MIN, MAX = -27.91 @ 26.87 , 4.78 @ 56.25
25.00
15.00
5.00
-5.00
-15.00
-25.00
-35.00
-45.00
-55.00
ACCELERATION (G)
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
55.00
60
TIME (MSEC)
SIDE IMPACT TEST (006)
UPPER SPINE ACCELERATION Y AXIS -A

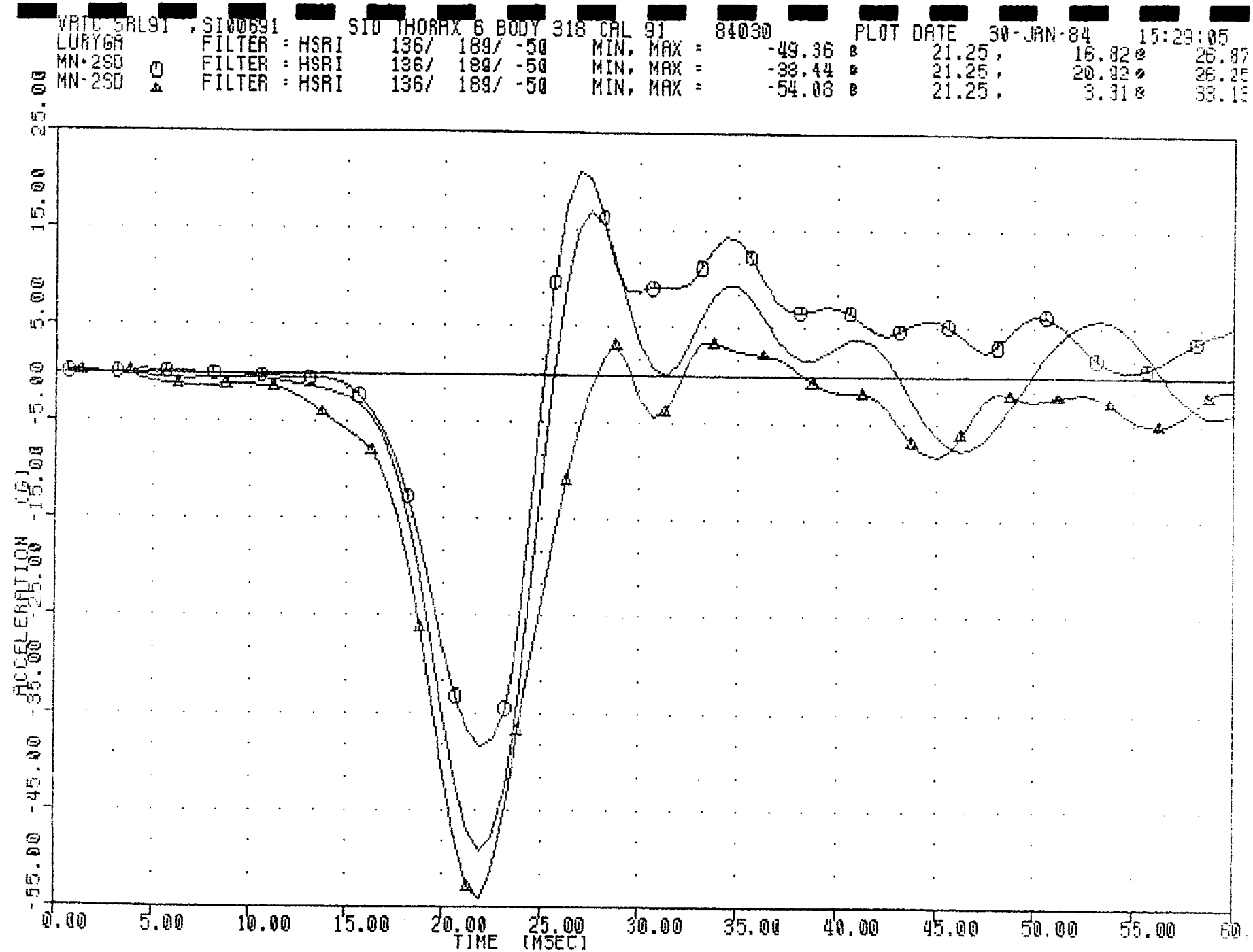


SIDE IMPACT TEST (006)

LOWER SPINE ACCELERATION Y AXIS -1

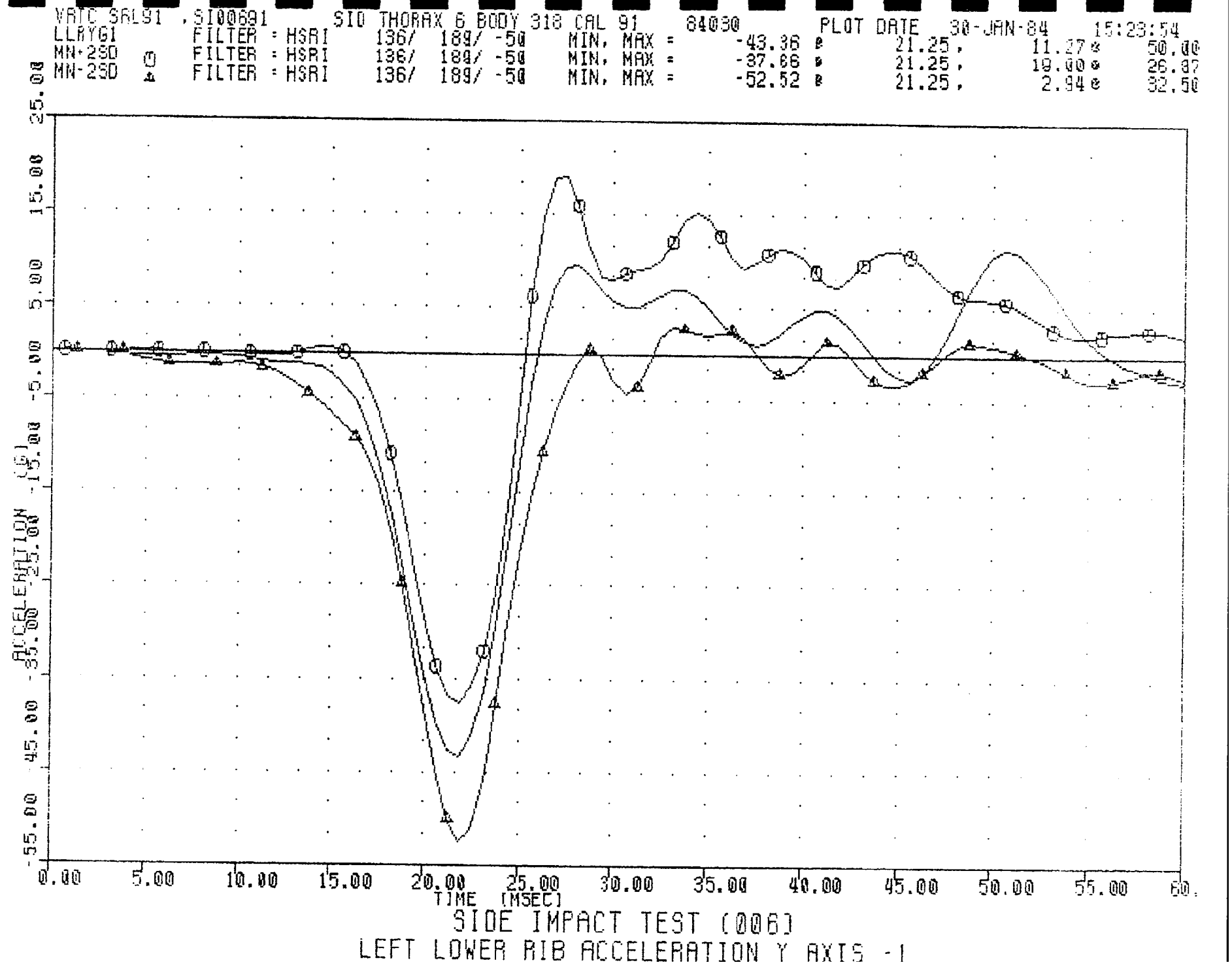

VAIL SRL91 ,SI00691 SID THORAX 6 BOOT 318 CAL 91 84030 PLOT DATE 30-JAN-84 15:22:14
T12TGA FILTER = HSRI 136/ 189/ -50 MIN, MAX = -28.37 @ 25.63 , 9.88 @ 57.50
MN+2SD FILTER = HSRI 136/ 189/ -50 MIN, MAX = -22.37 @ 25.63 , 18.54 @ 58.75
MN-2SD FILTER = HSRI 136/ 189/ -50 MIN, MAX = -25.84 @ 25.63 , 4.45 @ 58.75
25.00
15.00
5.00
-5.00
-15.00
-25.00
-35.00
-45.00
-55.00
ACCELERATION (G)
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
55.00
60
TIME (MSEC)
SIDE IMPACT TEST (006)
LOWER SPINE ACCELERATION Y AXIS -A

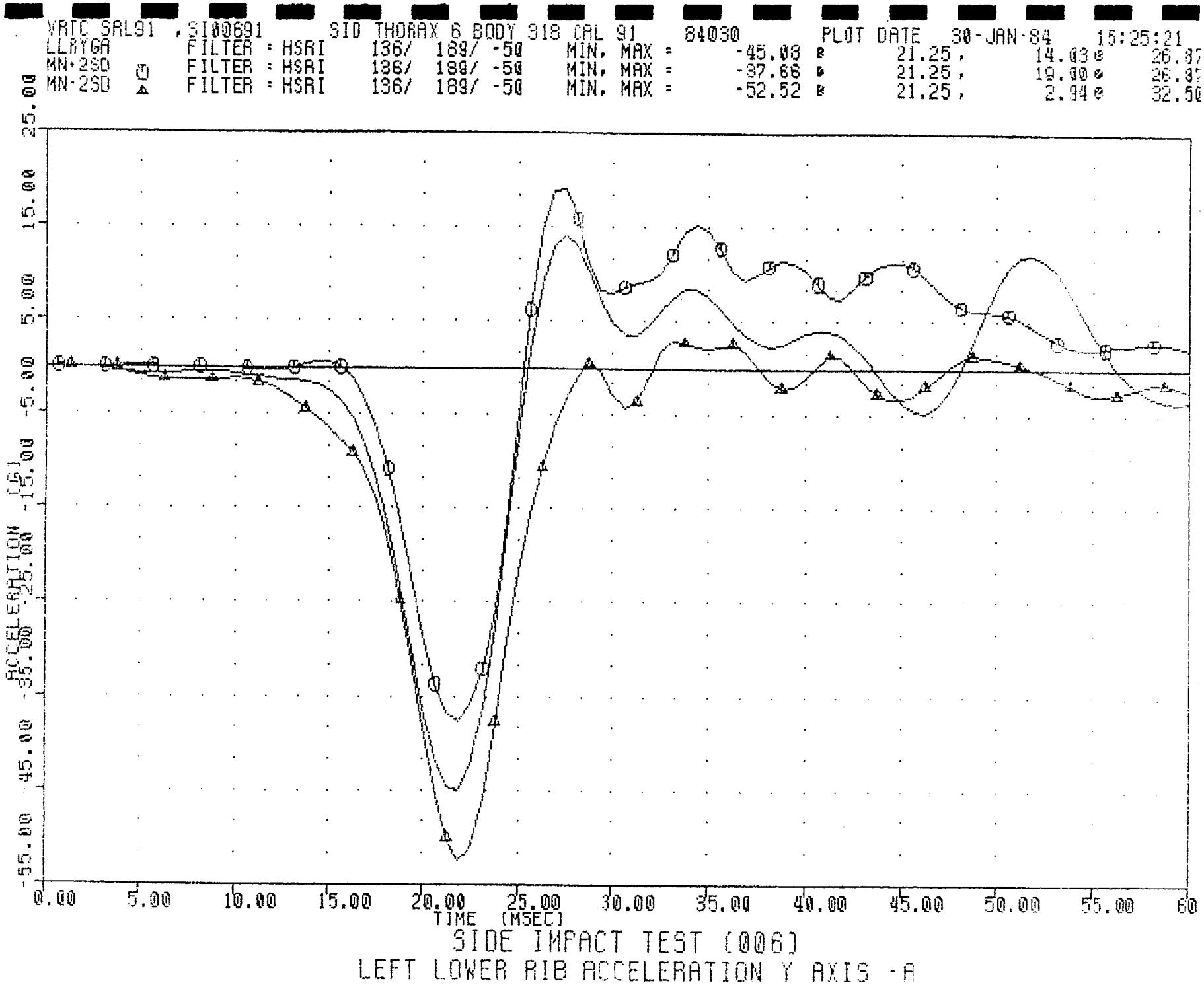

VAIL SRL91 ,SI00691 SID THORAX 6 BODY 318 CAL 91 84030 PLOT DATE 30-JAN-84 15:37:02
LURYGI FILTER = HSRI 136/ 189/ -50 MIN, MAX = -47.04 @ 21.25, 16.06 @ 27.50
MN+2SD FILTER = HSRI 136/ 189/ -50 MIN, MAX = -38.44 @ 21.25, 20.02 @ 26.25
MN-2SD FILTER = HSRI 136/ 189/ -50 MIN, MAX = -54.08 @ 21.25, 3.11 @ 33.13
ACCELERATION (G)
25.00
15.00
5.00
-5.00
-15.00
-25.00
-35.00
-45.00
-55.00
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
55.00
60
TIME (MSEC)
SIDE IMPACT TEST (006)
LEFT UPPER RIB ACCELERATION Y AXIS -1



SIDE IMPACT TEST (006)

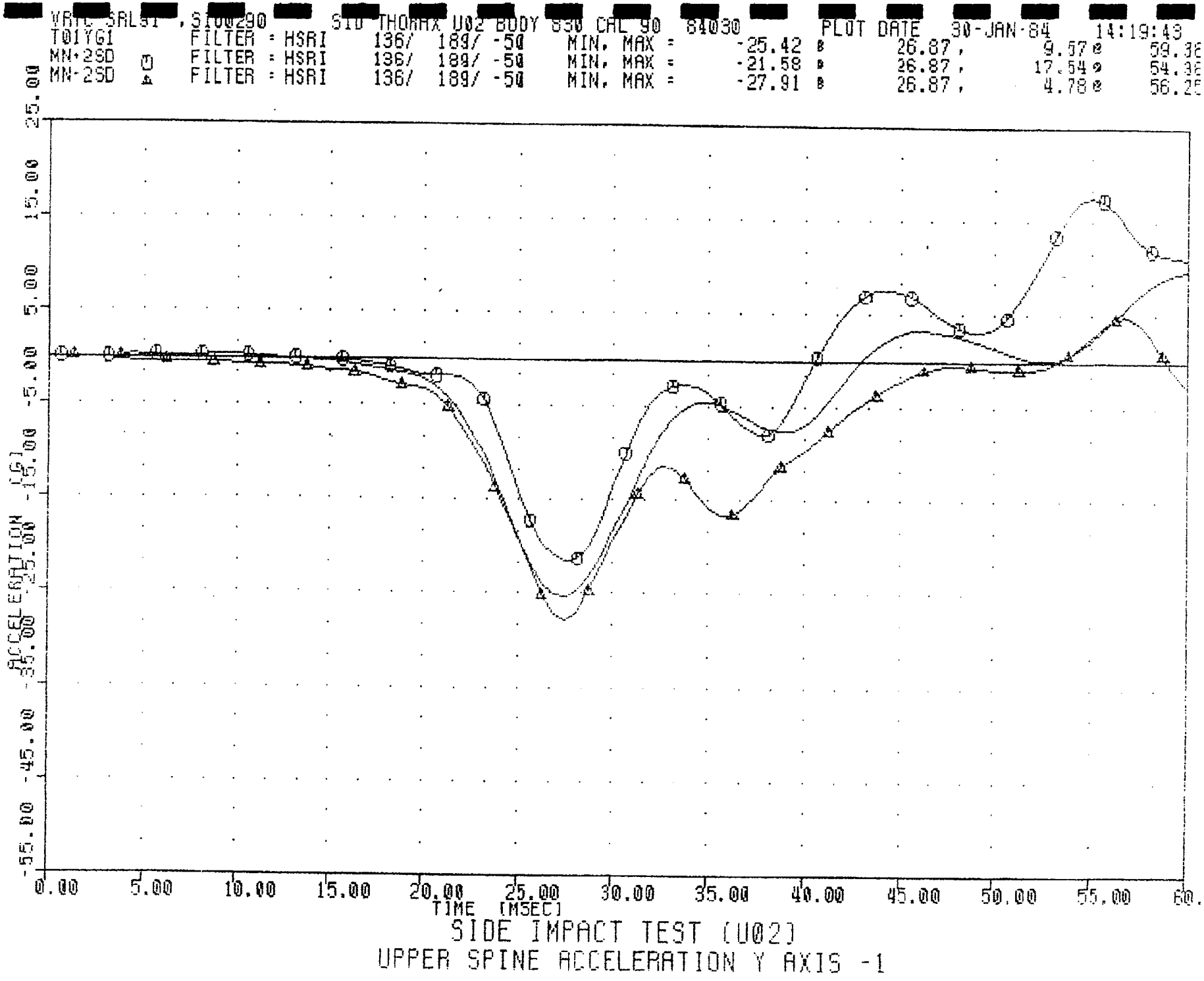
LEFT UPPER RIB ACCELERATION Y AXIS -A

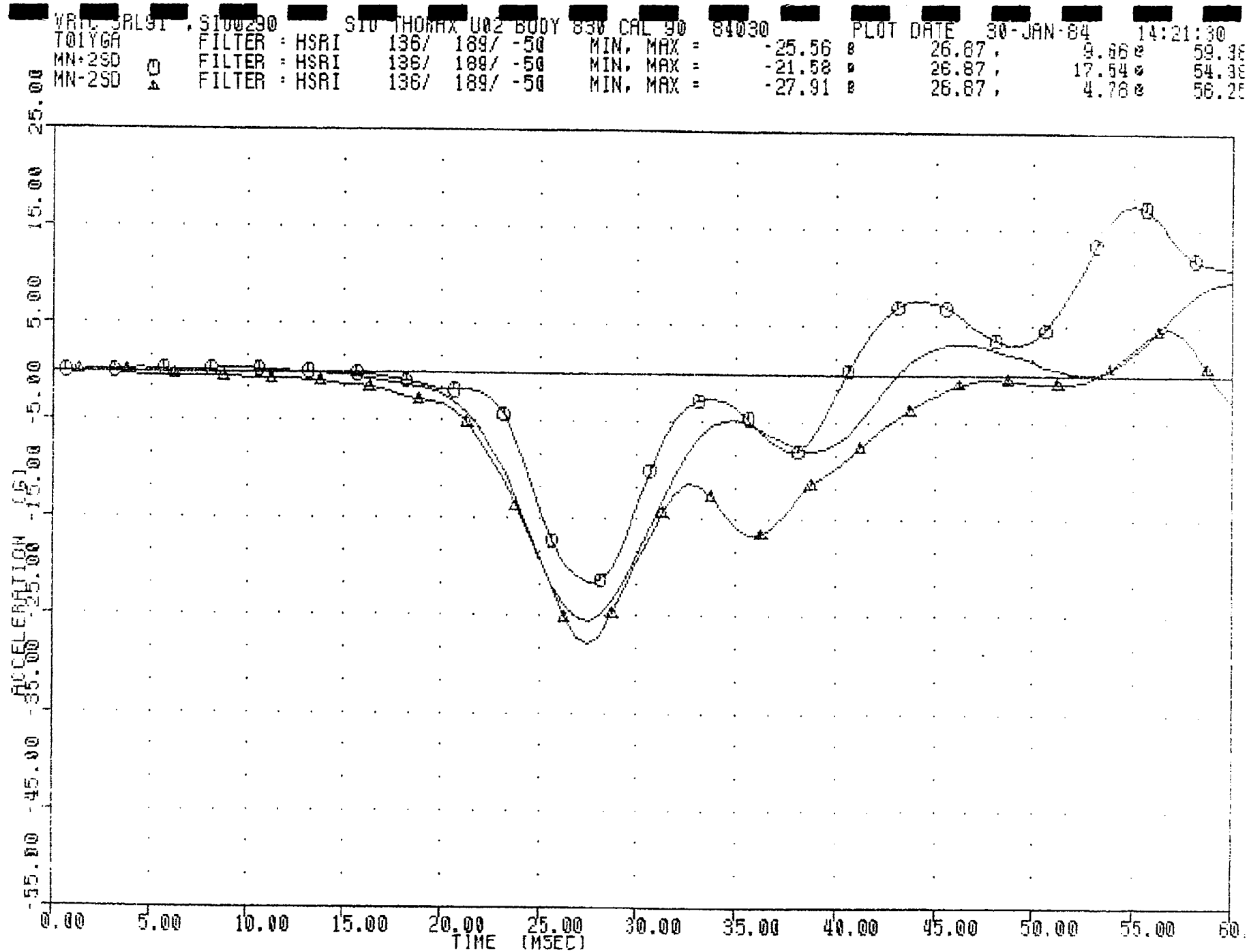

VRTC SRLS1 ,SI00691 SID THORAX & BODY 318 CAL 91 84030 PLOT DATE 30-JAN-84 15:23:54
LLRYG1 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -43.36 @ 21.25, 11.27 @ 50.00
MN-2SD FILTER = HSRI 136/ 189/ -50 MIN, MAX = -37.66 @ 21.25, 19.00 @ 26.87
MN-2SD FILTER = HSRI 136/ 189/ -50 MIN, MAX = -52.52 @ 21.25, 2.94 @ 32.50
ACCELERATION (G)
25.00
15.00
5.00
-5.00
-15.00
-25.00
-35.00
-45.00
-55.00
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
55.00
60.
TIME (MSEC)
SIDE IMPACT TEST (006)
LEFT LOWER RIB ACCELERATION Y AXIS -1



SIDE IMPACT TEST (006)

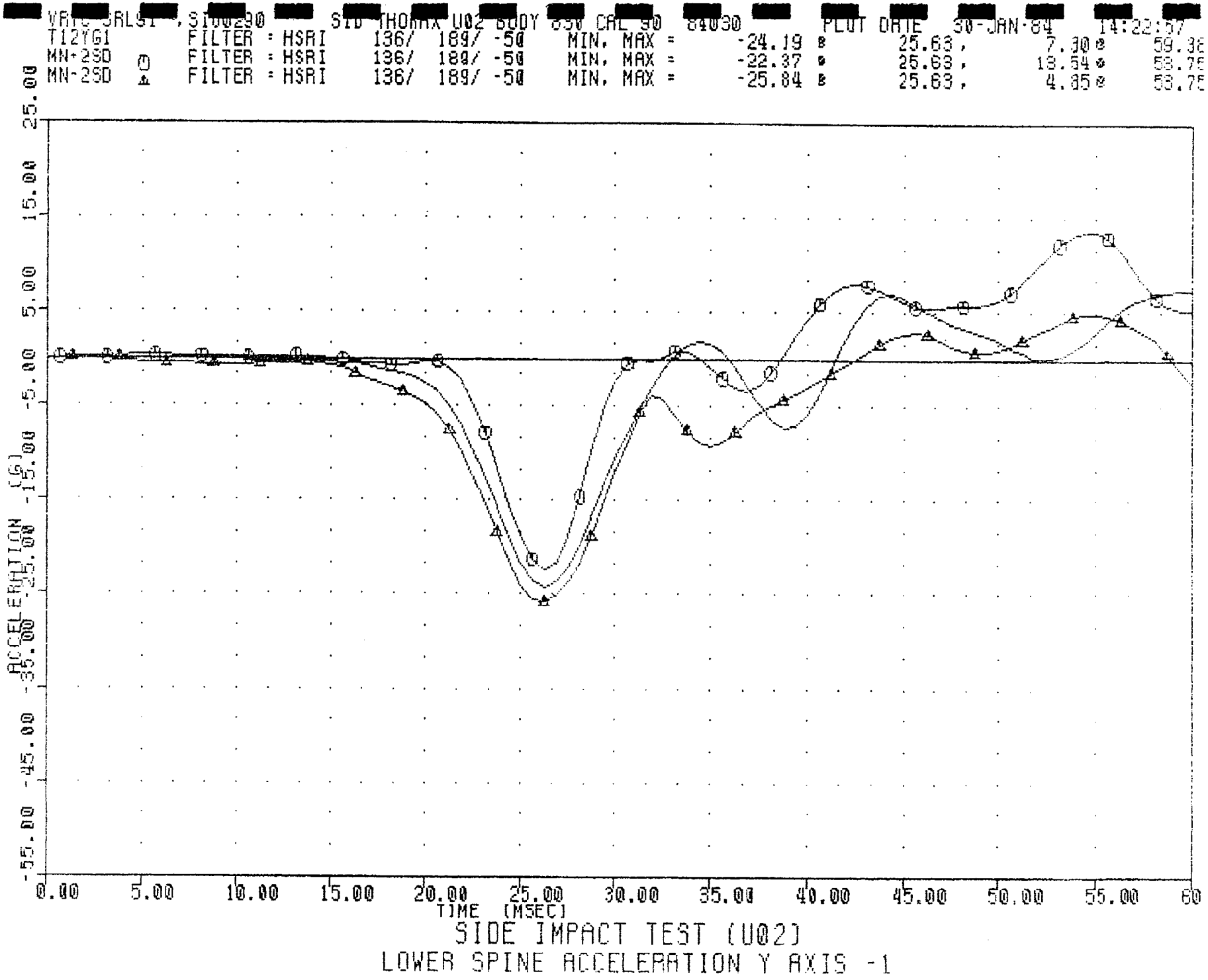
LEFT LOWER RIB ACCELERATION Y AXIS -A


VRTC SRL91 ,S1UU290 SID THORAX U02 BODY 830 CAL 90 84030 PLOT DATE 30-JAN-84 14:19:43
T01YG1 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -25.42 @ 26.87 , 9.57 @ 59.38
MN+2SD FILTER = HSRI 136/ 189/ -50 MIN, MAX = -21.58 @ 26.87 , 17.54 @ 54.38
MN-2SD FILTER = HSRI 136/ 189/ -50 MIN, MAX = -27.91 @ 26.87 , 4.78 @ 56.25
25.00
15.00
5.00
-5.00
-15.00
-25.00
-35.00
-45.00
-55.00
ACCELERATION (G)
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
55.00
60.
TIME (MSEC)
SIDE IMPACT TEST (U02)
UPPER SPINE ACCELERATION Y AXIS -1



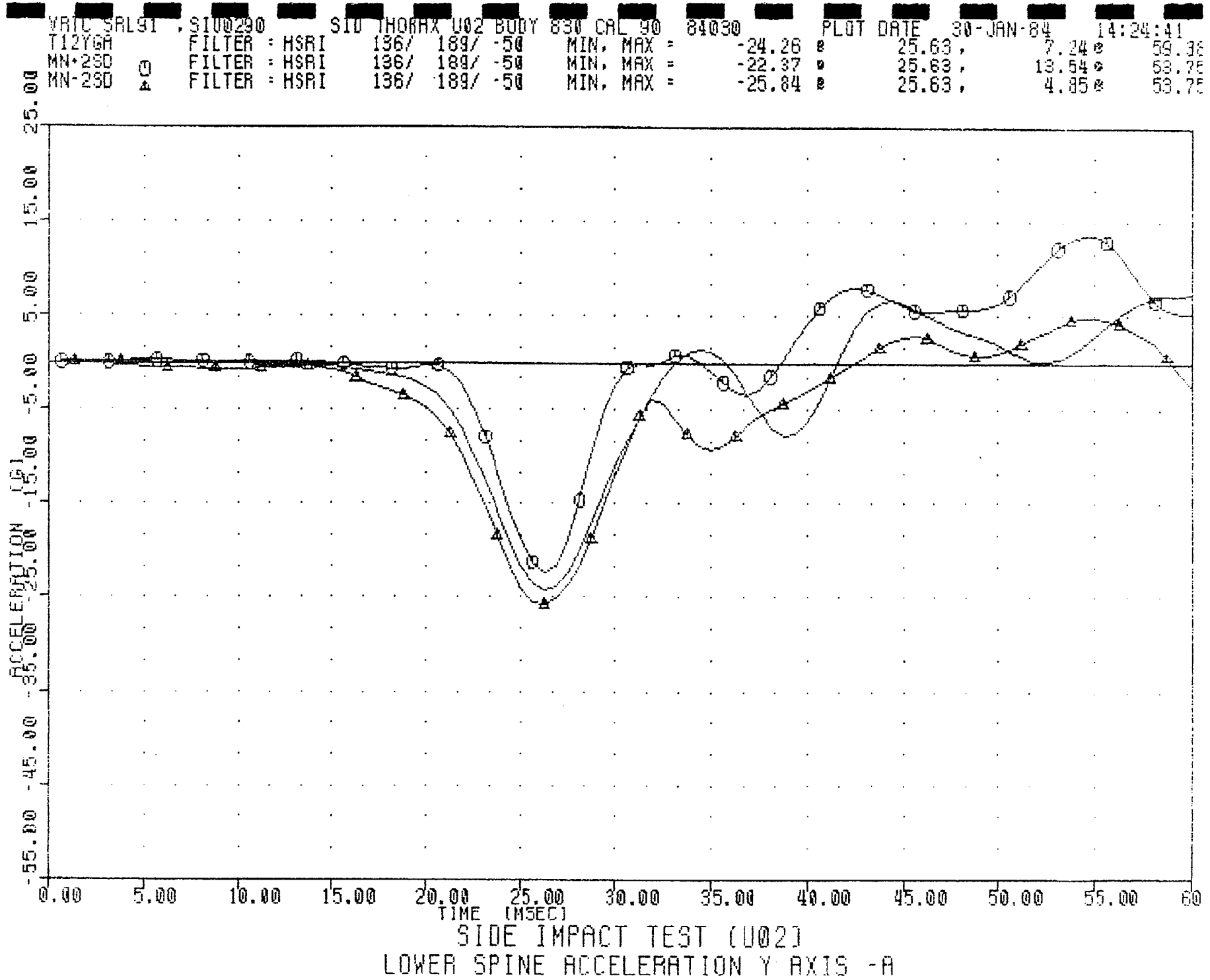
SIDE IMPACT TEST (U02)

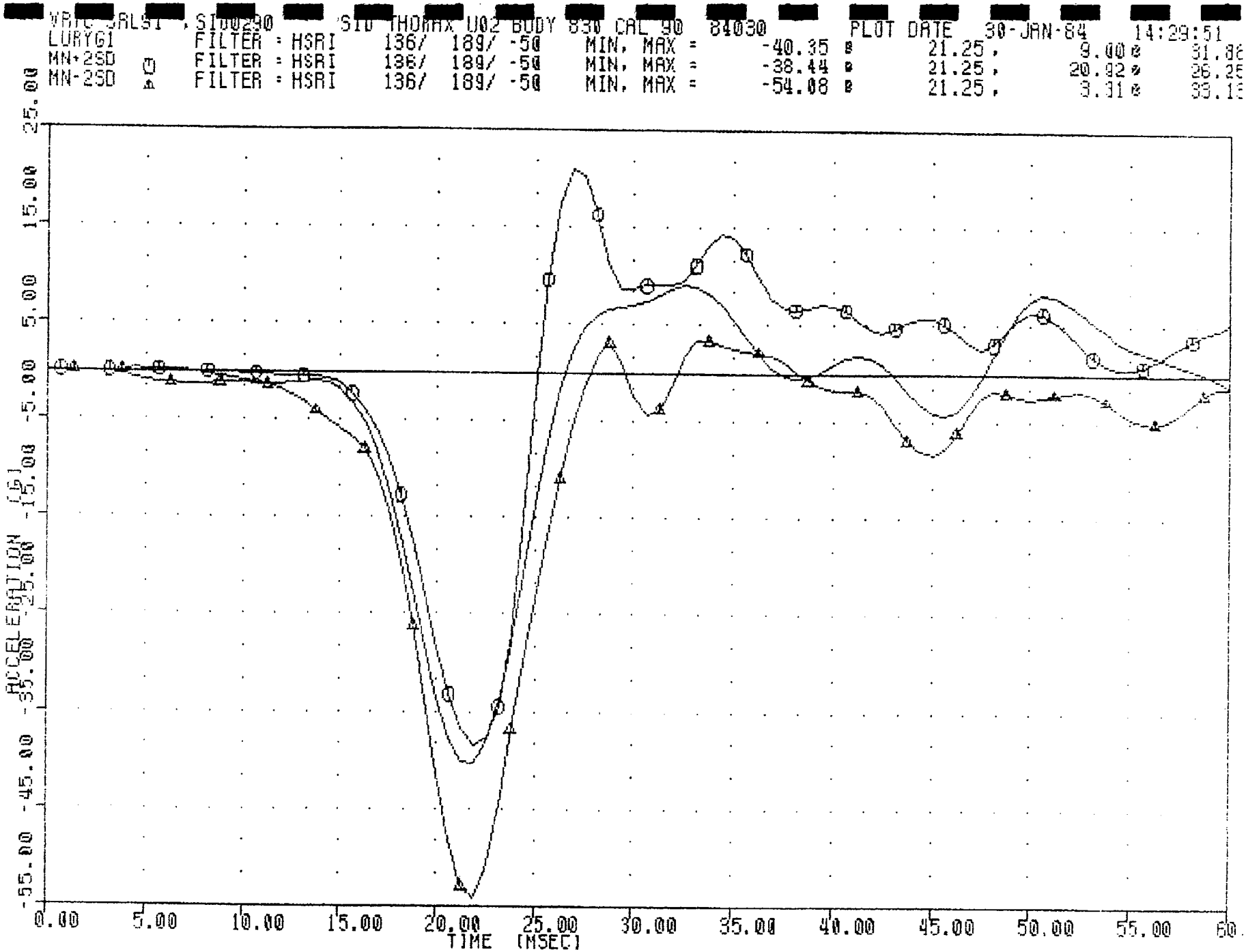
UPPER SPINE ACCELERATION Y AXIS -A



SIDE IMPACT TEST (U02)

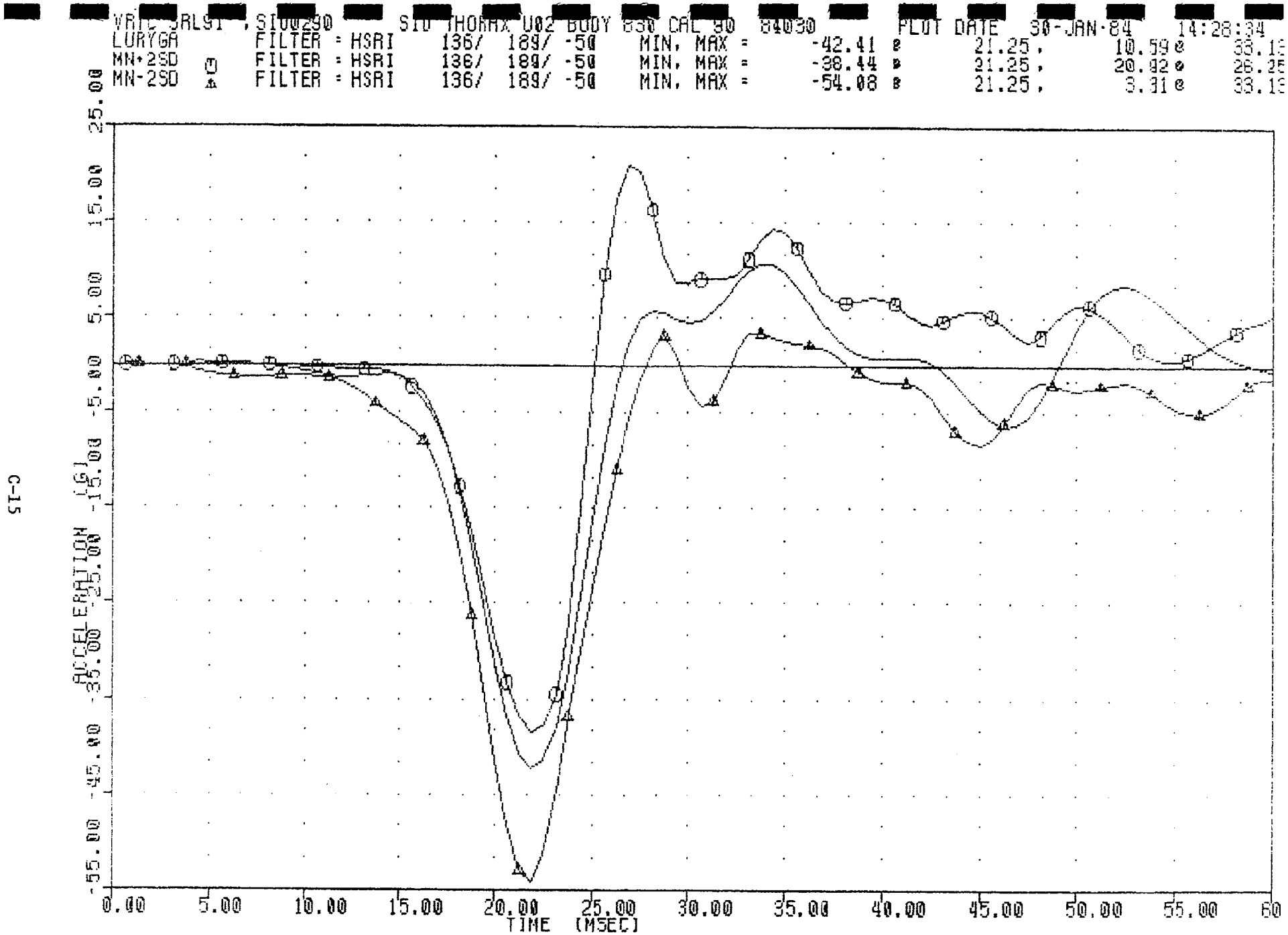
LOWER SPINE ACCELERATION Y AXIS -1


VRTC SRL91 ,SID0290 SID THORAX U02 BODY 830 CAL 90 84030 PLOT DATE 30-JAN-84 14:24:41
T12YGA FILTER = HSRI 136/ 189/ -50 MIN, MAX = -24.26 @ 25.63 , 7.24 @ 59.38
MN+2SD FILTER = HSRI 136/ 189/ -50 MIN, MAX = -22.37 @ 25.63 , 13.54 @ 53.75
MN-2SD FILTER = HSRI 136/ 189/ -50 MIN, MAX = -25.84 @ 25.63 , 4.85 @ 53.75
25.00
15.00
5.00
-5.00
-15.00
-25.00
-35.00
-45.00
-55.00
ACCELERATION (G)
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
55.00
60
TIME (MSEC)
SIDE IMPACT TEST (U02)
LOWER SPINE ACCELERATION Y AXIS -A



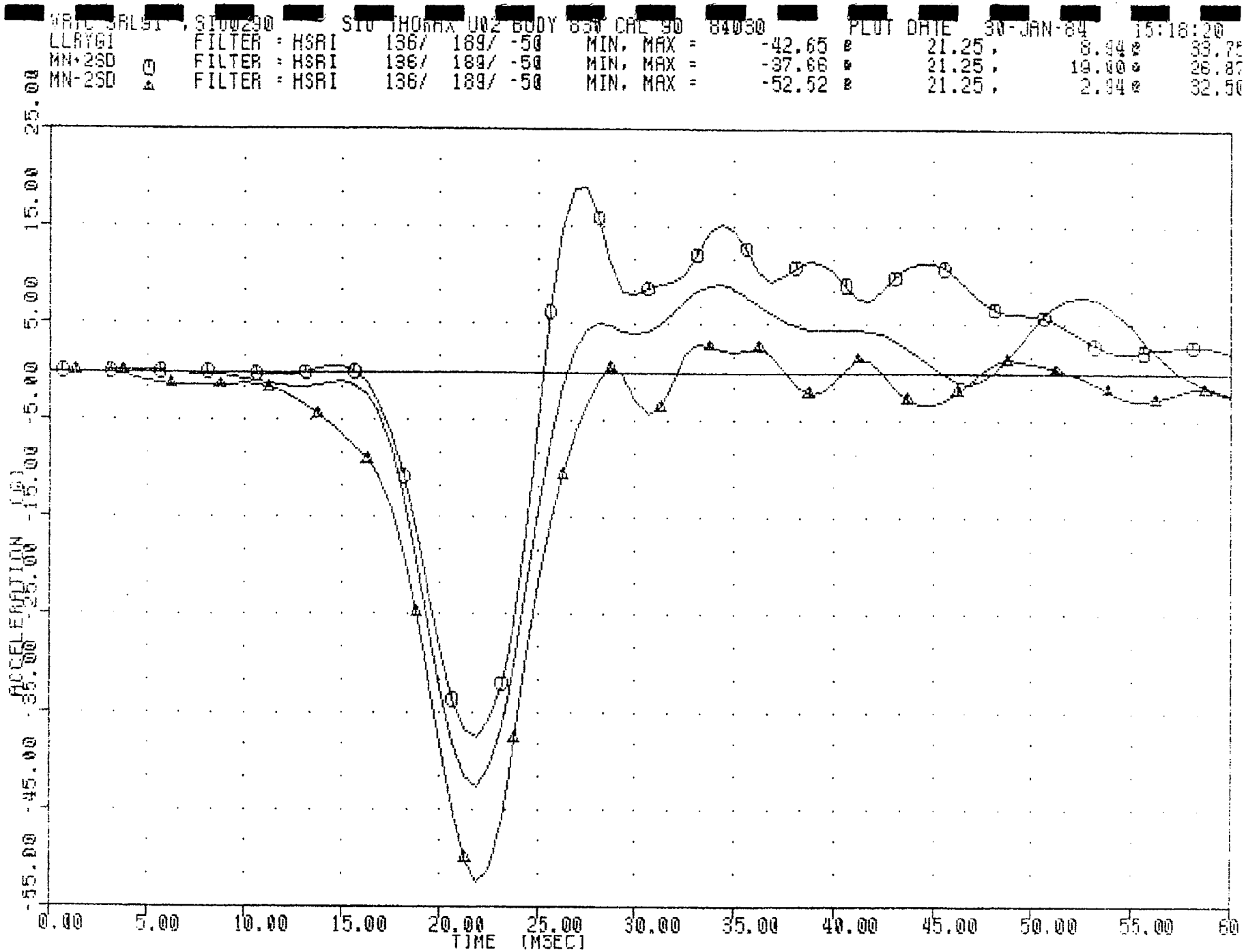
SIDE IMPACT TEST (U02)

LEFT UPPER RIB ACCELERATION Y AXIS -1



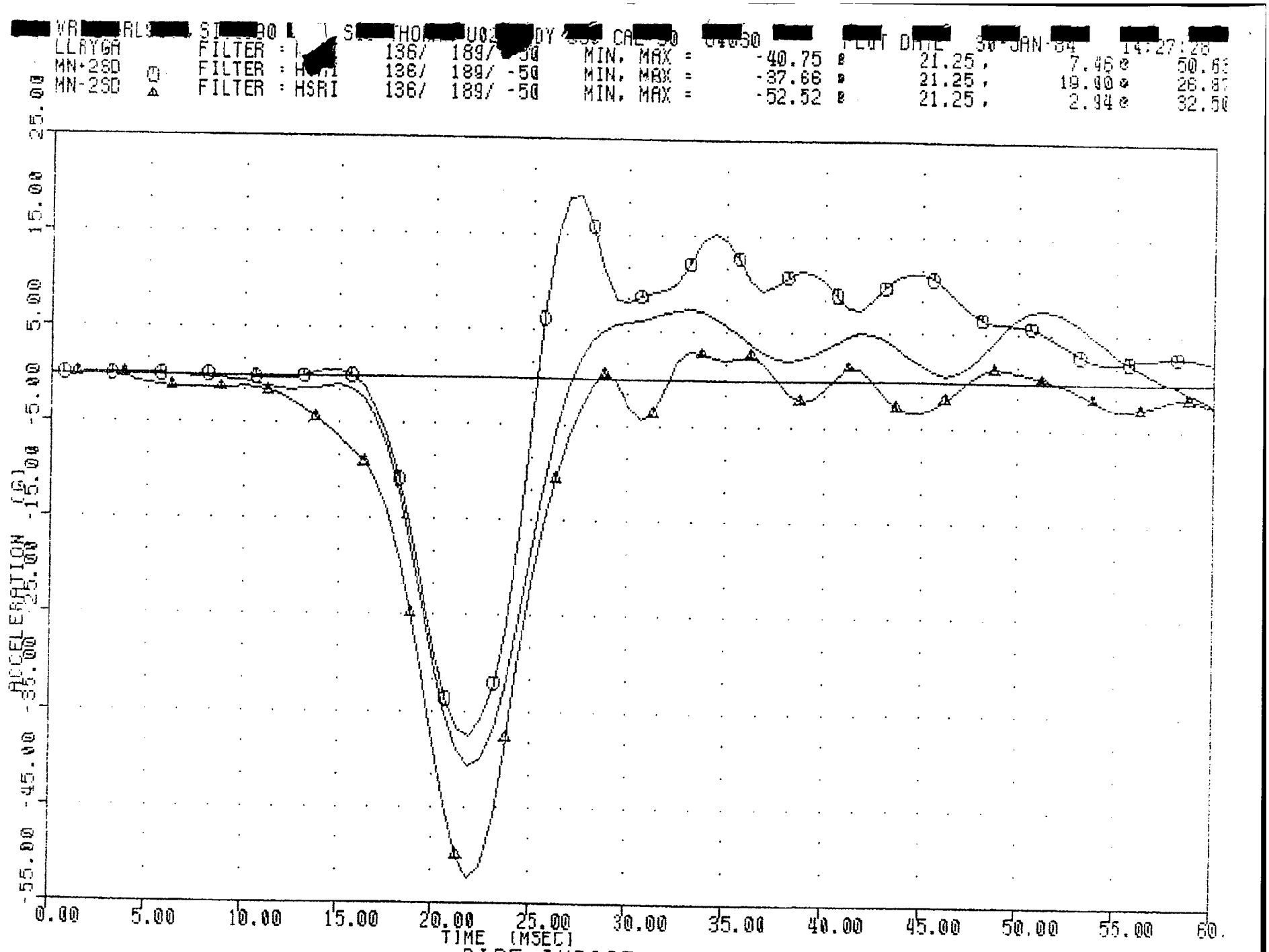
SIDE IMPACT TEST (U02)

LEFT UPPER RIB ACCELERATION Y AXIS -A



SIDE IMPACT TEST (U02)

LEFT LOWER RIB ACCELERATION Y AXIS -1



SIDE IMPACT TEST (U02)

LEFT LOWER RIB ACCELERATION Y AXIS -A

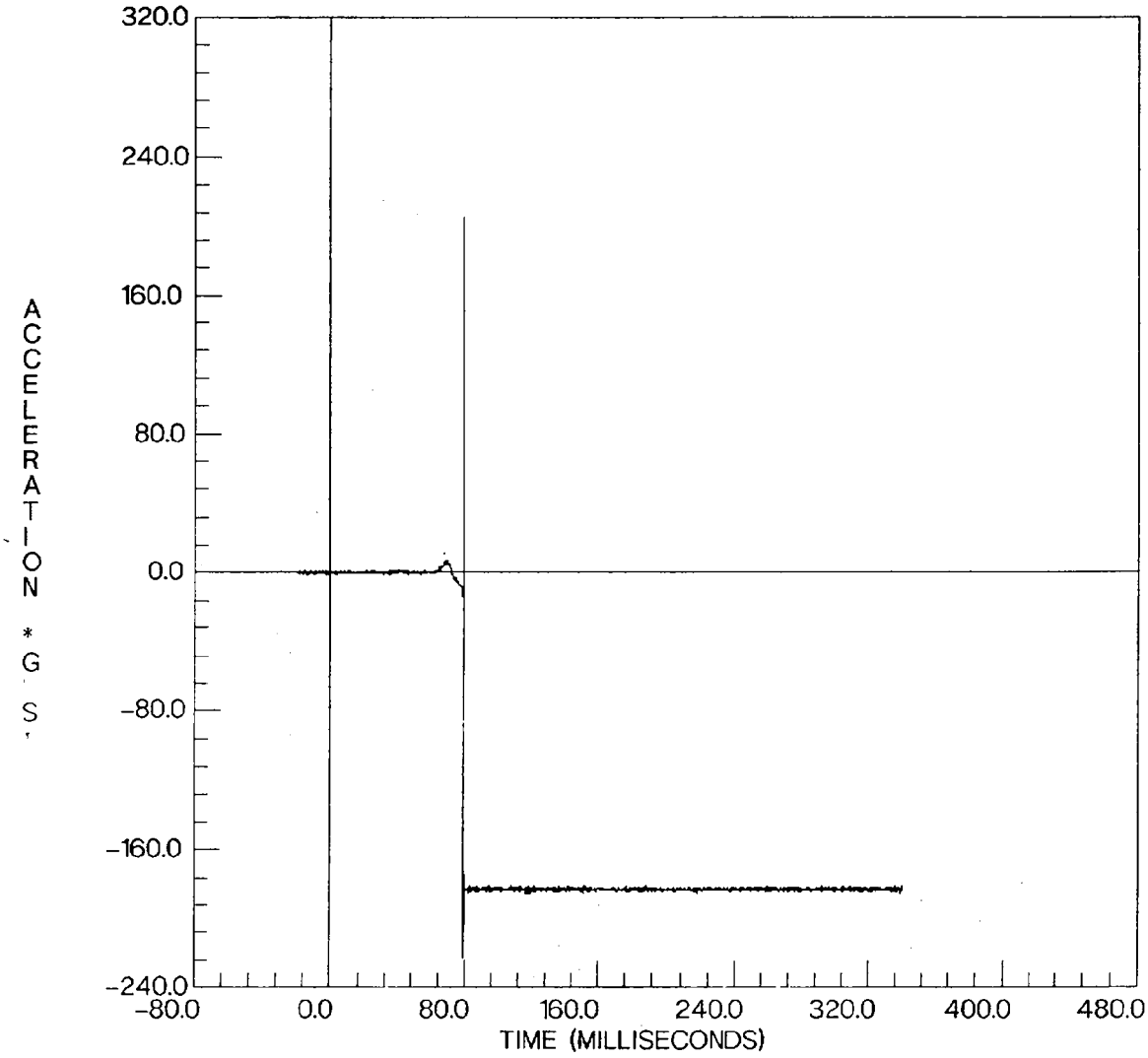
V0691AA00.001

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
HEAD CG

XG AXIS
YMIN =-223.0100 at 79.37500 msec
YMAX = 205.9900 at 79.00000 msec

FILTER CUTOFF: 1650Hz
DATA LOSS

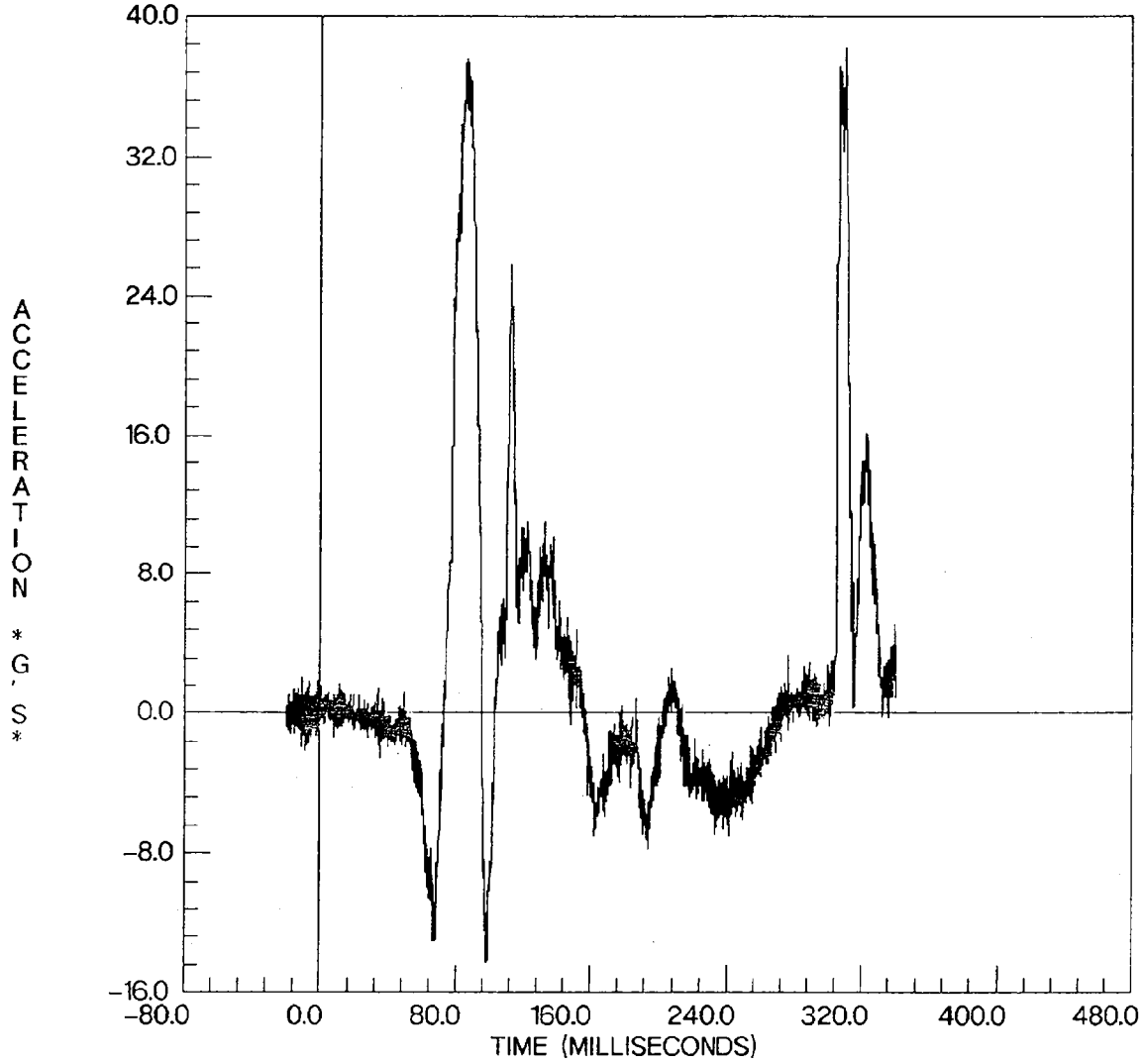


V0691AA00.002

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
HEAD CG
AS MEASURED
FILTER CUTOFF: 1650Hz

YG AXIS
YMIN =-14.37200 at 98.62500 msec
YMAX = 38.26800 at 309.7500 msec

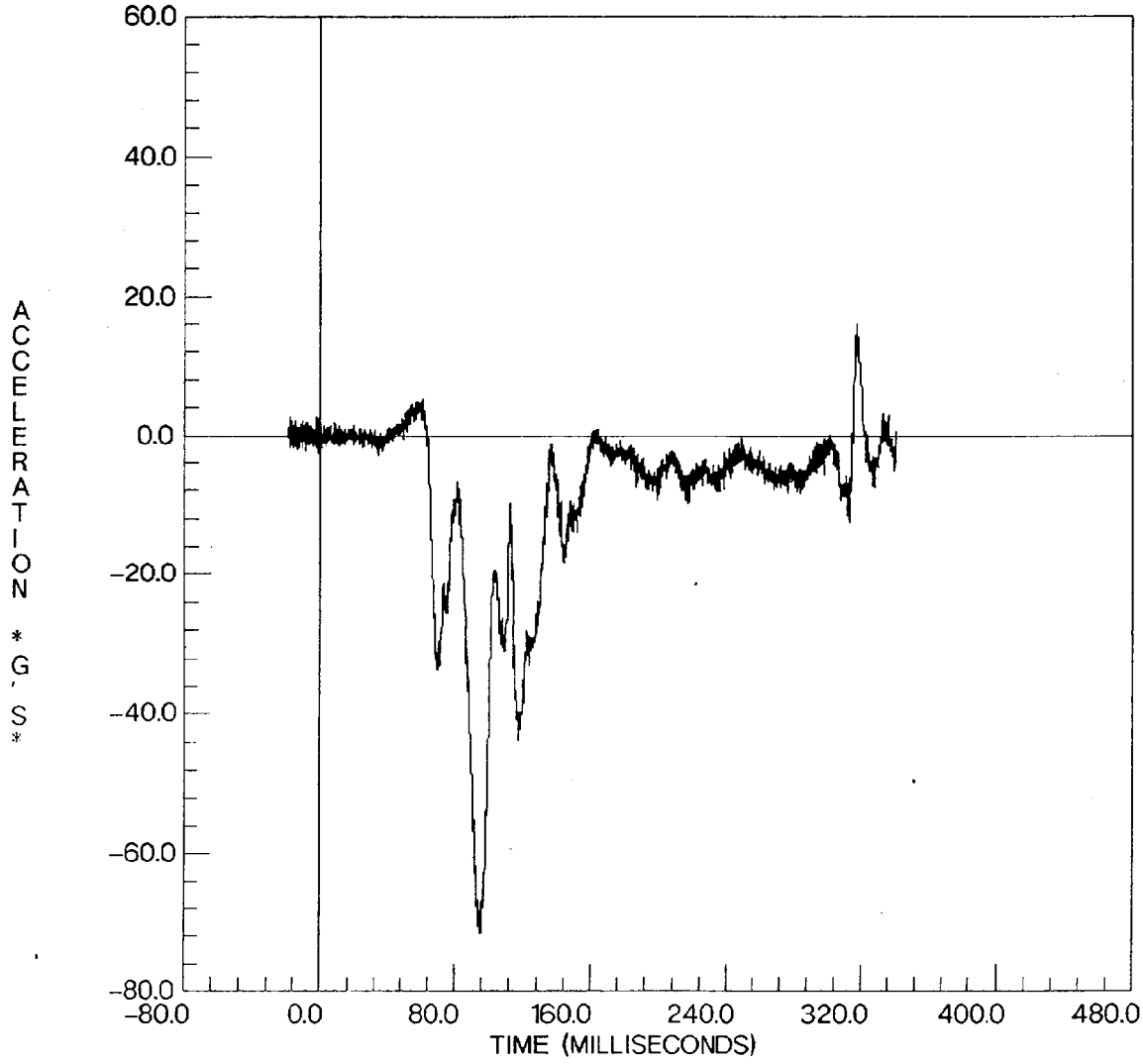


V0691AA00.003

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
HEAD CG
AS MEASURED
FILTER CUTOFF: 1650Hz

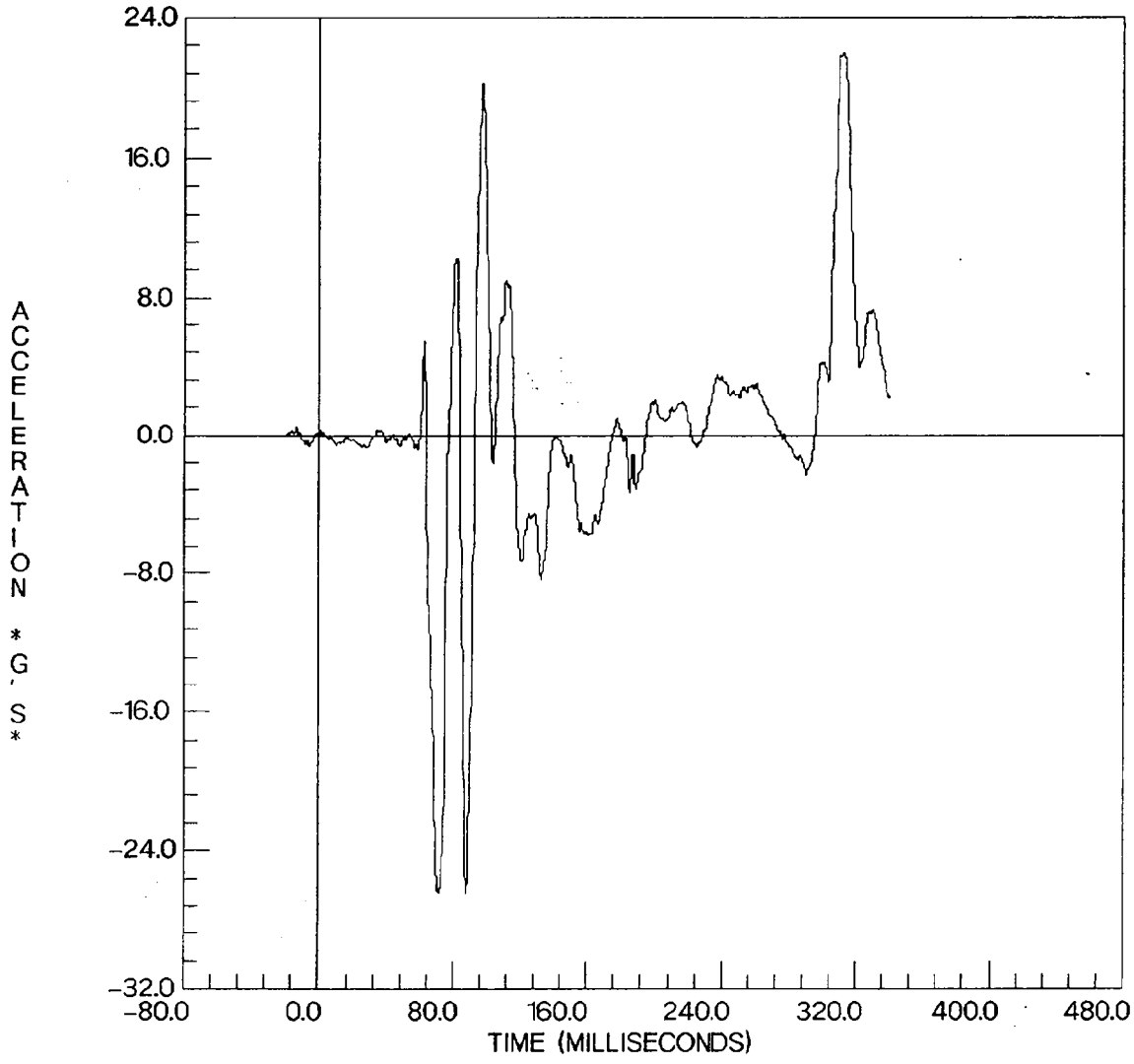
ZG AXIS
YMIN =-71.68600 at 95.12500 msec
YMAX = 16.04000 at 316.6250 msec



V0691AFE0.004

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
SPINE - UPPER XG AXIS
FILTERED YMIN =-26.48626 at 87.75000 msec
FILTER CUTOFF: 300Hz YMAX = 21.98504 at 312.2500 msec

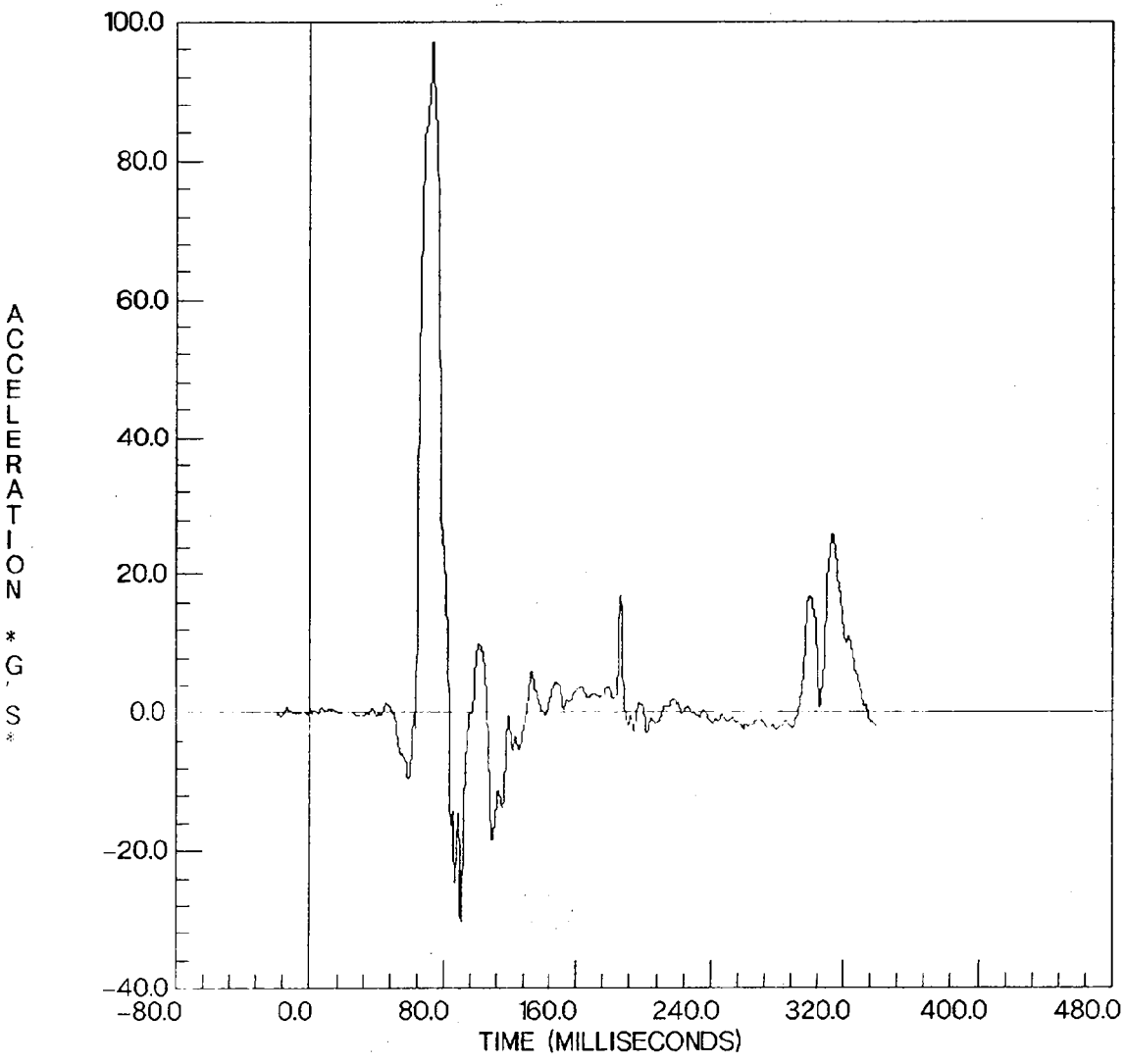


V0691AFE0.005

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
SPINE - UPPER
FILTERED
FILTER CUTOFF: 300Hz
T01YG1=PRIMARY

YG AXIS
YMIN =-30.47001 at 90.37500 msec
YMAX = 97.16309 at 73.50000 msec

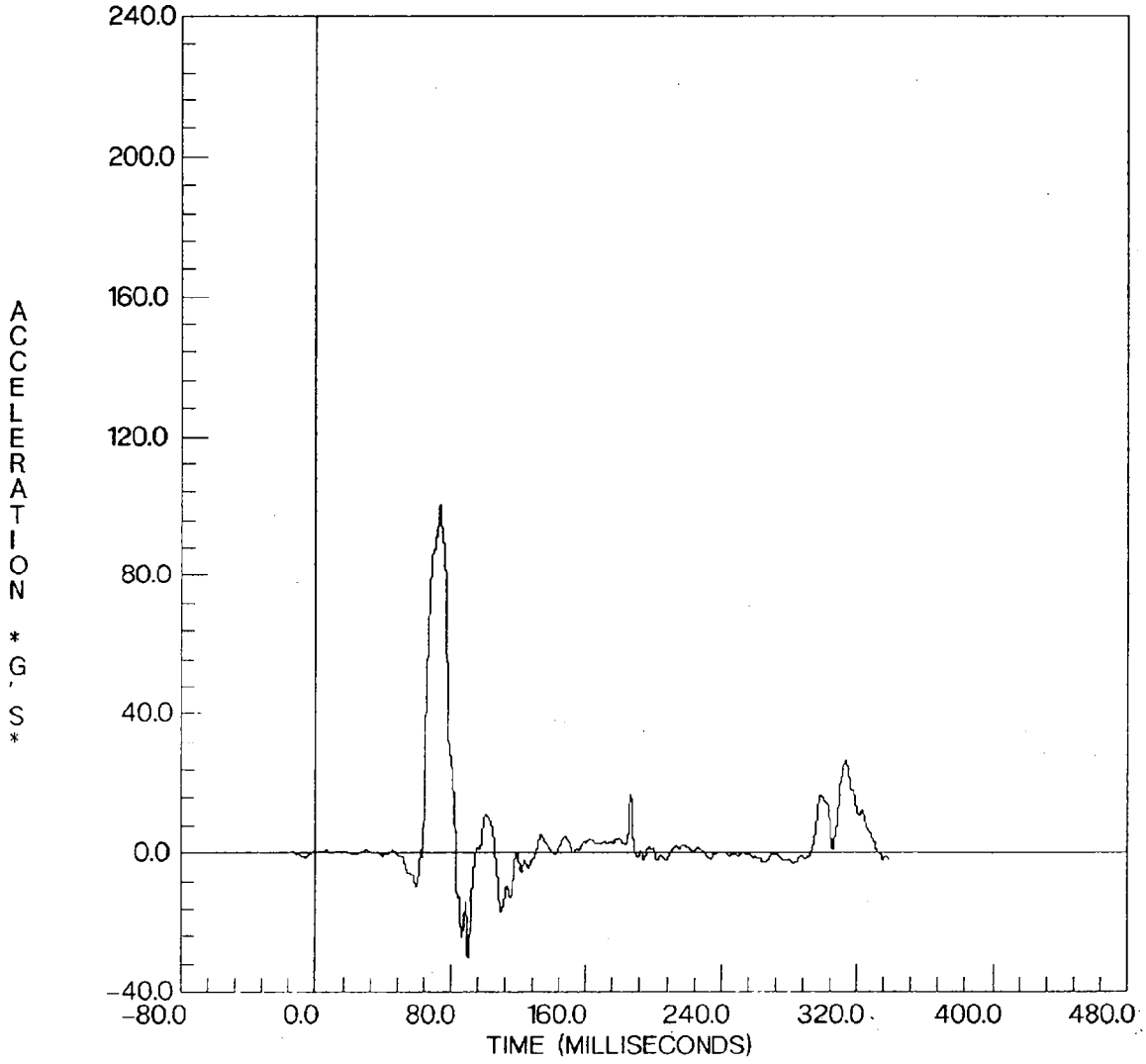


V0691AFE0.006

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
SPINE - UPPER
FILTERED
FILTER CUTOFF: 300Hz
T01YGA=REDUNDANT

YG AXIS
YMIN =-30.72635 at 90.37500 msec
YMAX = 100.4124 at 73.50000 msec

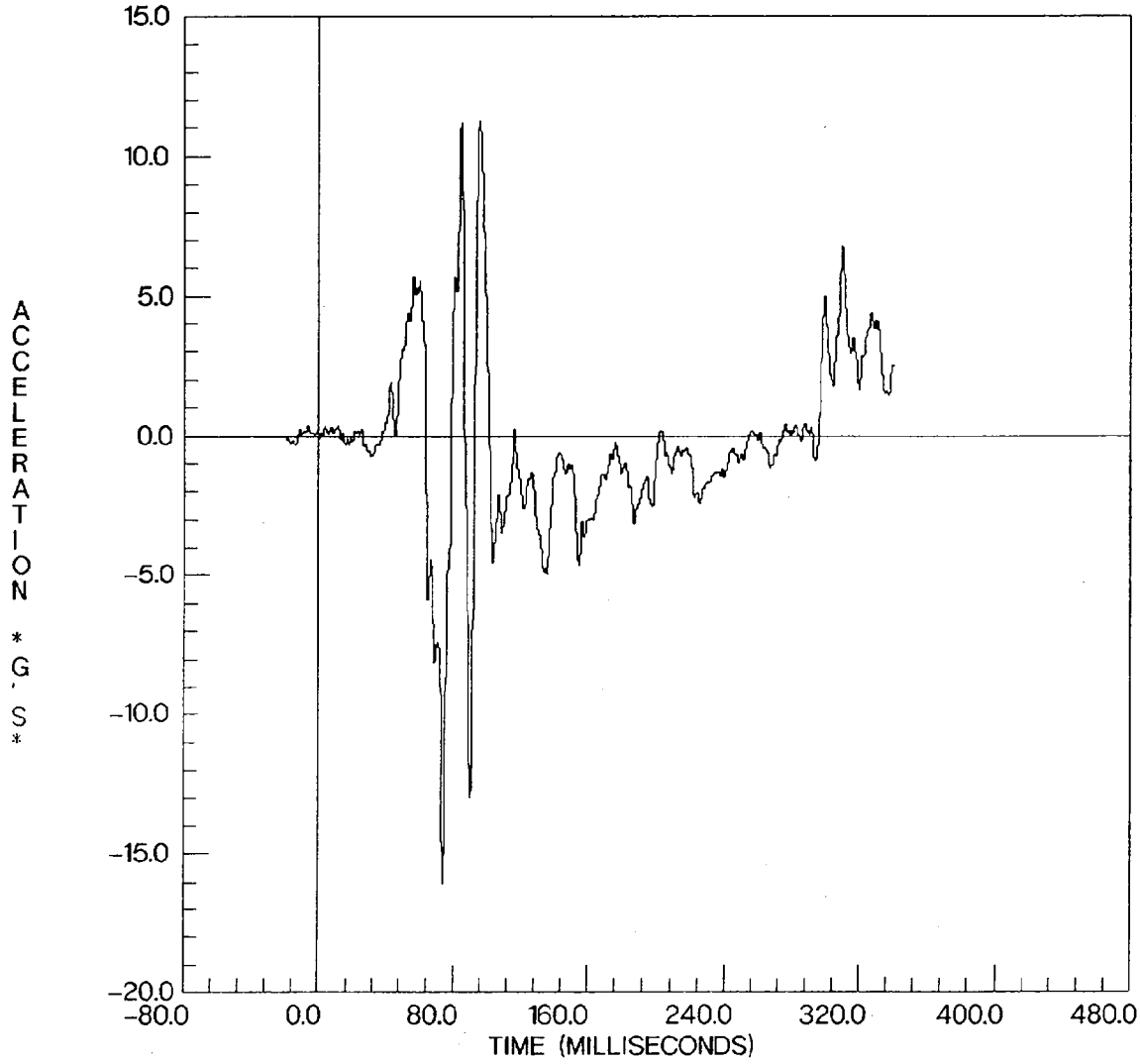


V0691AFE0.007

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
SPINE - UPPER
FILTERED
FILTER CUTOFF: 300Hz

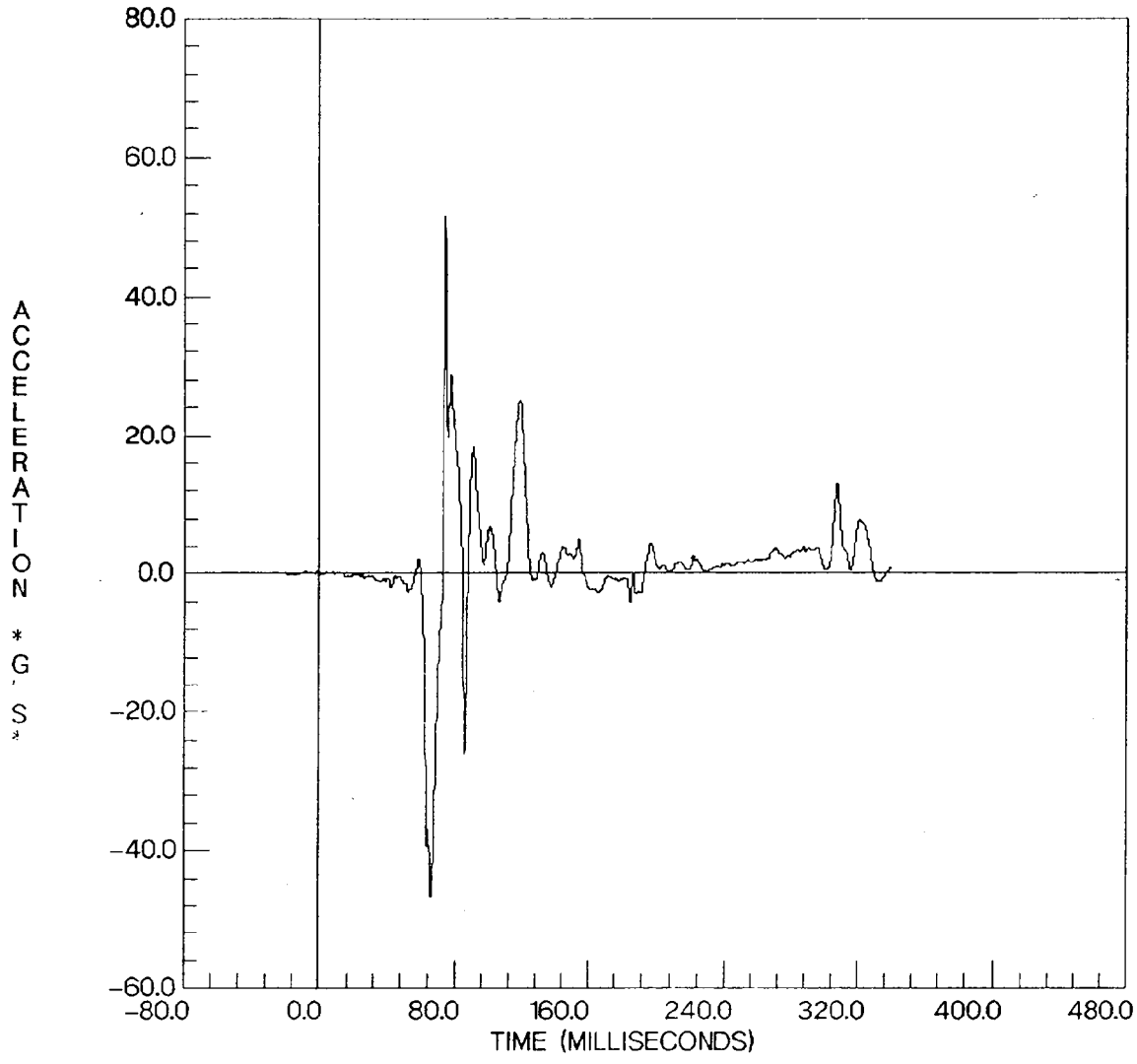
ZG AXIS
YMIN =-16.09545 at 73.87500 msec
YMAX = 11.31772 at 95.00000 msec



V0691AFE0.008

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
SPINE - LOWER XG AXIS
FILTERED YMIN =-46.71849 at 65.87500 msec
FILTER CUTOFF: 300Hz YMAX = 51.51812 at 74.12500 msec

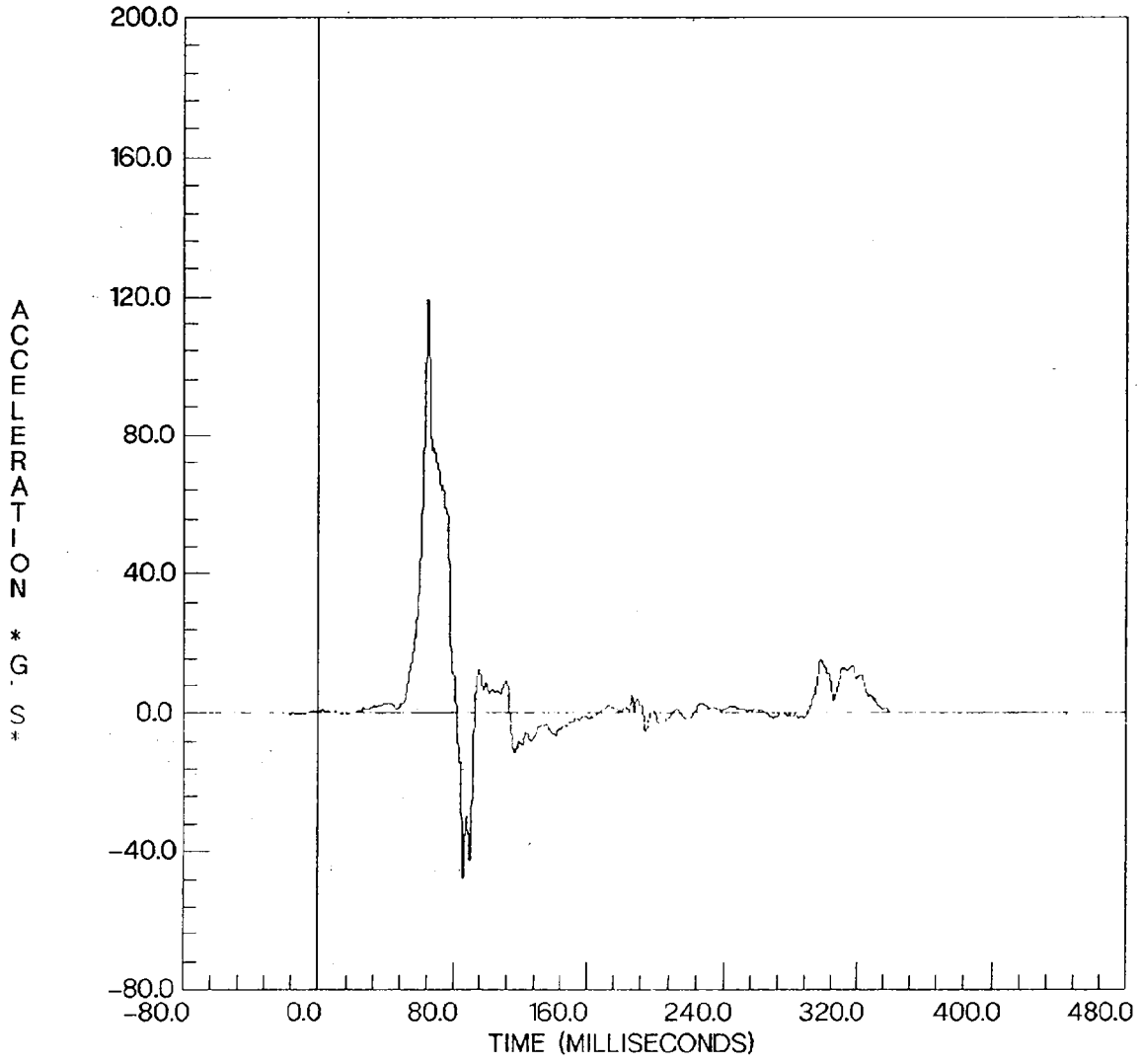


V0691AFE0.009

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
SPINE - LOWER
FILTERED
FILTER CUTOFF: 300Hz
T12YG1=PRIMARY

YG AXIS
YMIN =-47.92204 at 86.00000 msec
YMAX = 119.4358 at 64.62500 msec

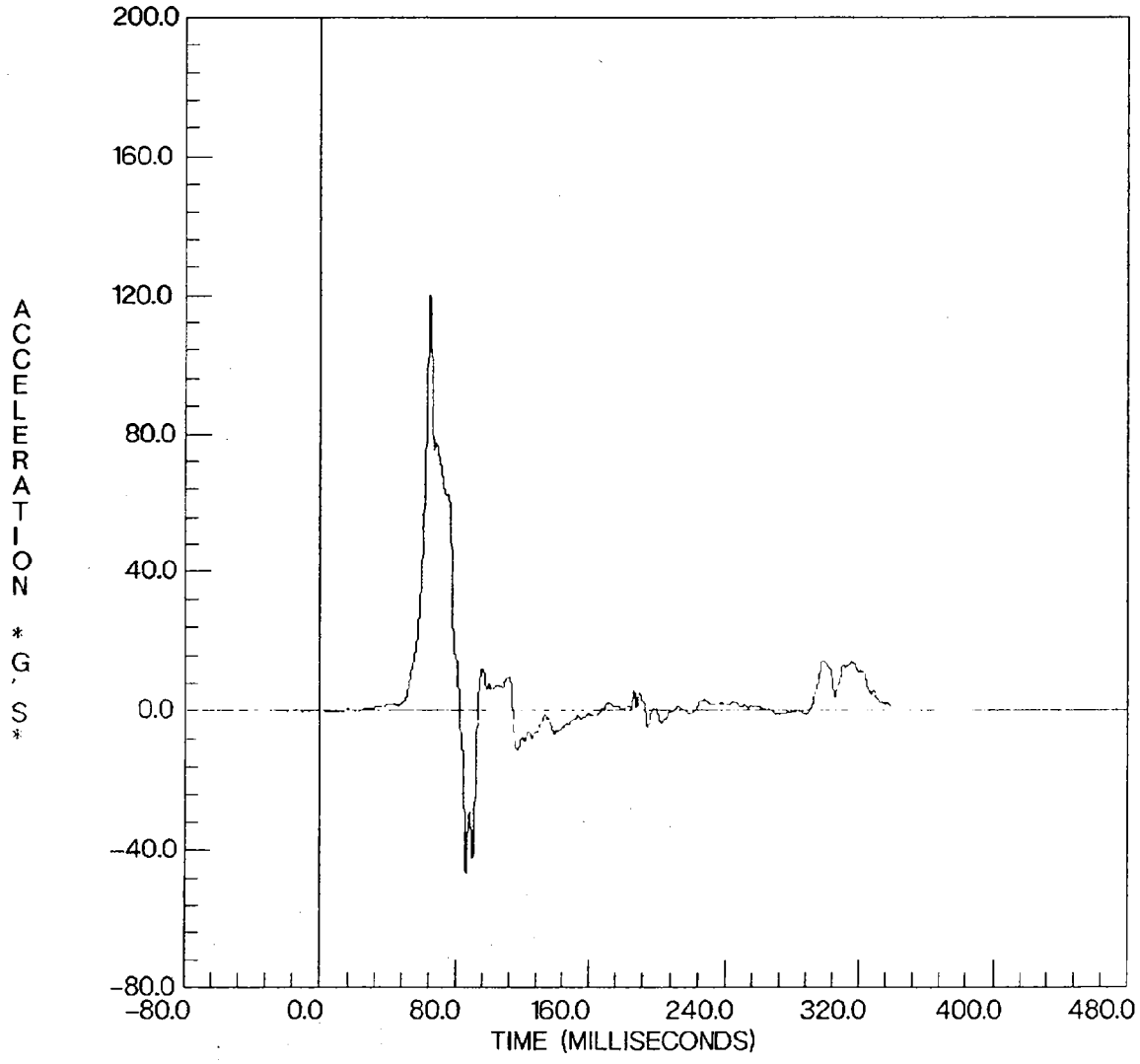


V0691AFE0.010

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
SPINE - LOWER
FILTERED
FILTER CUTOFF: 300Hz
T12YGA=REDUNDANT

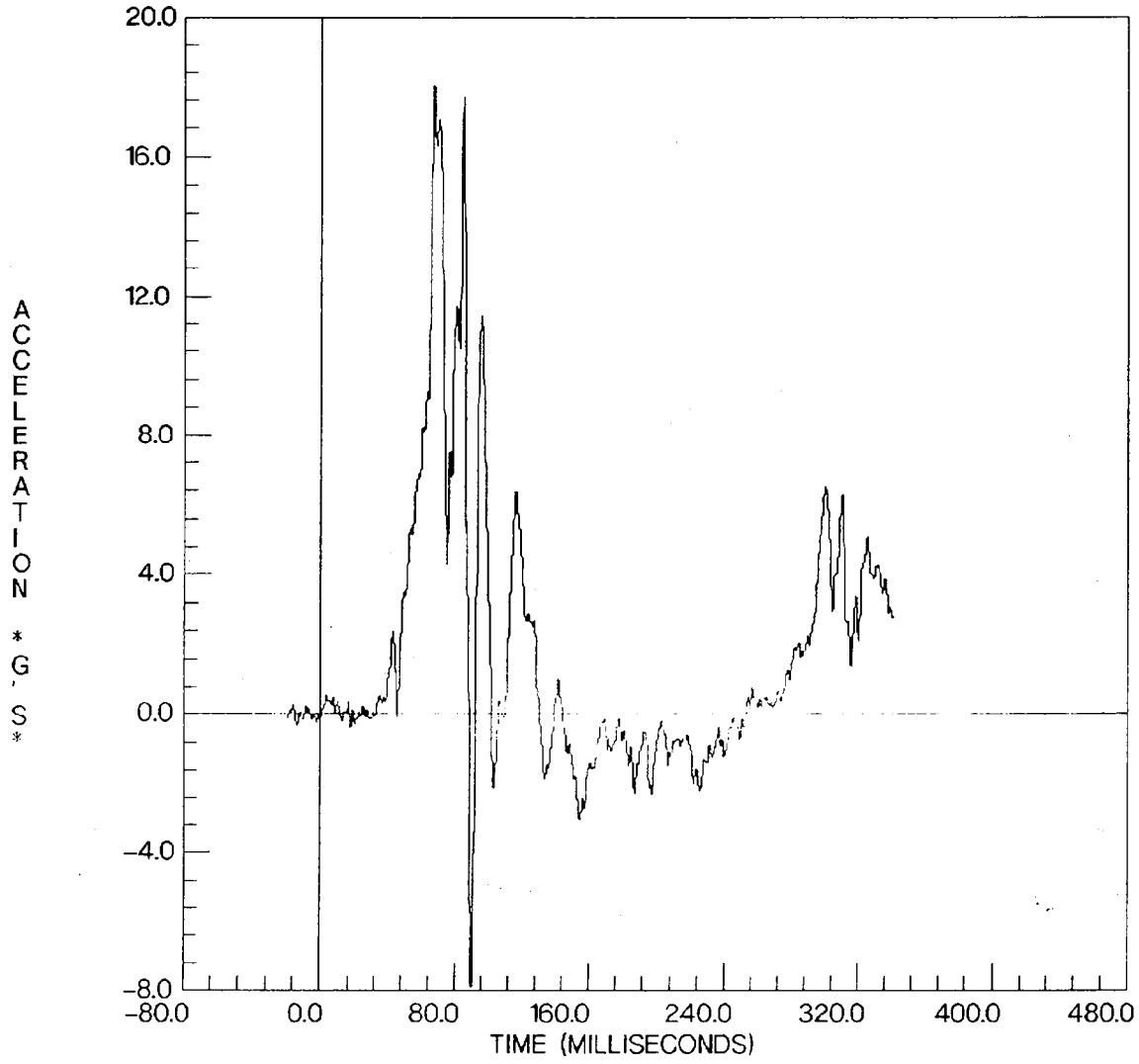
YG AXIS
YMIN =-46.46764 at 86.00000 msec
YMAX = 120.0505 at 64.75000 msec



V0691AFE0.011

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
SPINE - LOWER ZG AXIS
FILTERED YMIN =-7.907299 at 90.25000 msec
FILTER CUTOFF: 300Hz YMAX = 18.03544 at 66.75000 msec

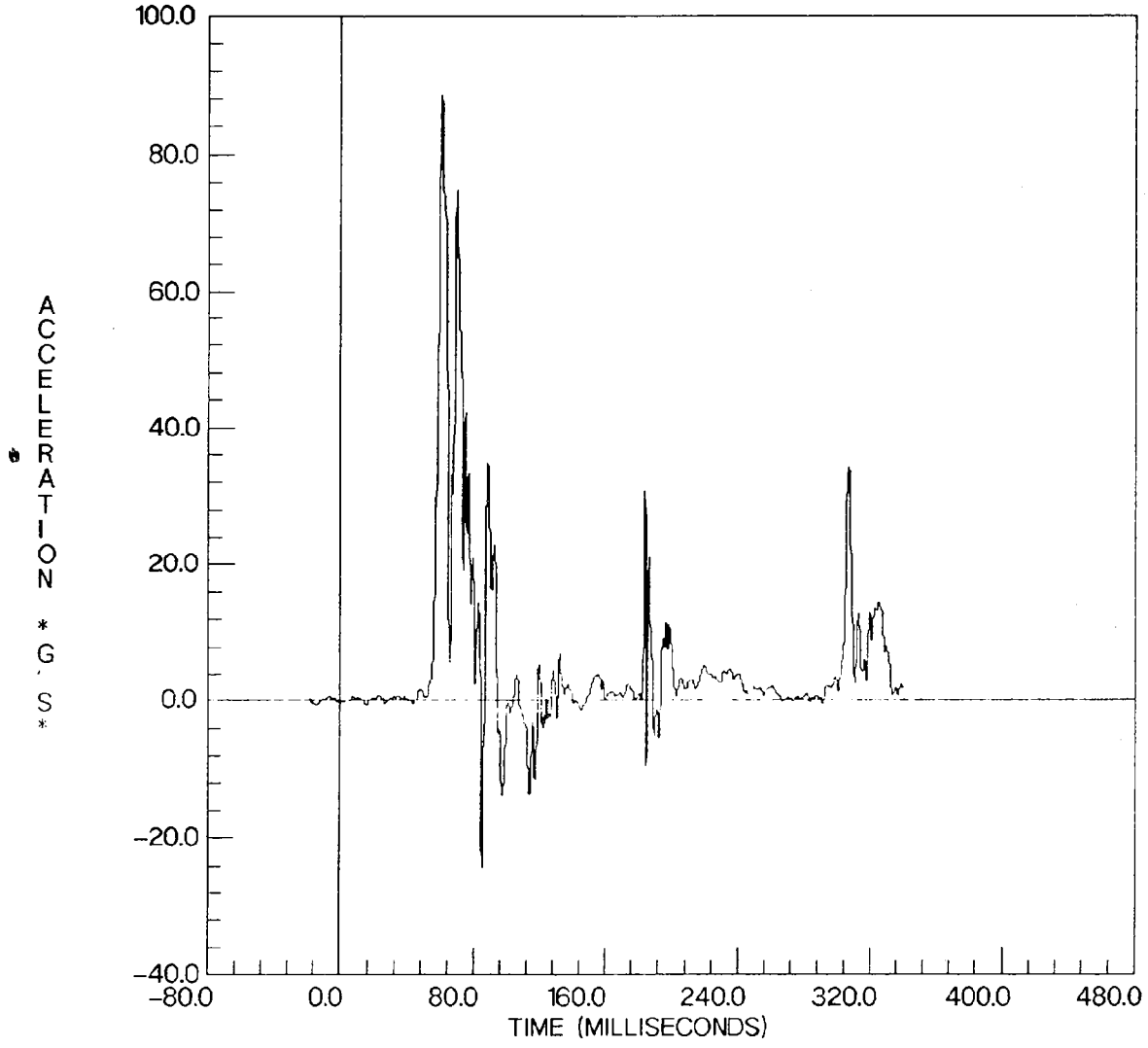


V0691AFE0.012

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
RIB - LEFT UPPER
FILTERED
FILTER CUTOFF: 300Hz
LURYG1=PRIMARY

YG AXIS
YMIN =-24.41033 at 85.12500 msec
YMAX = 88.54939 at 60.37500 msec

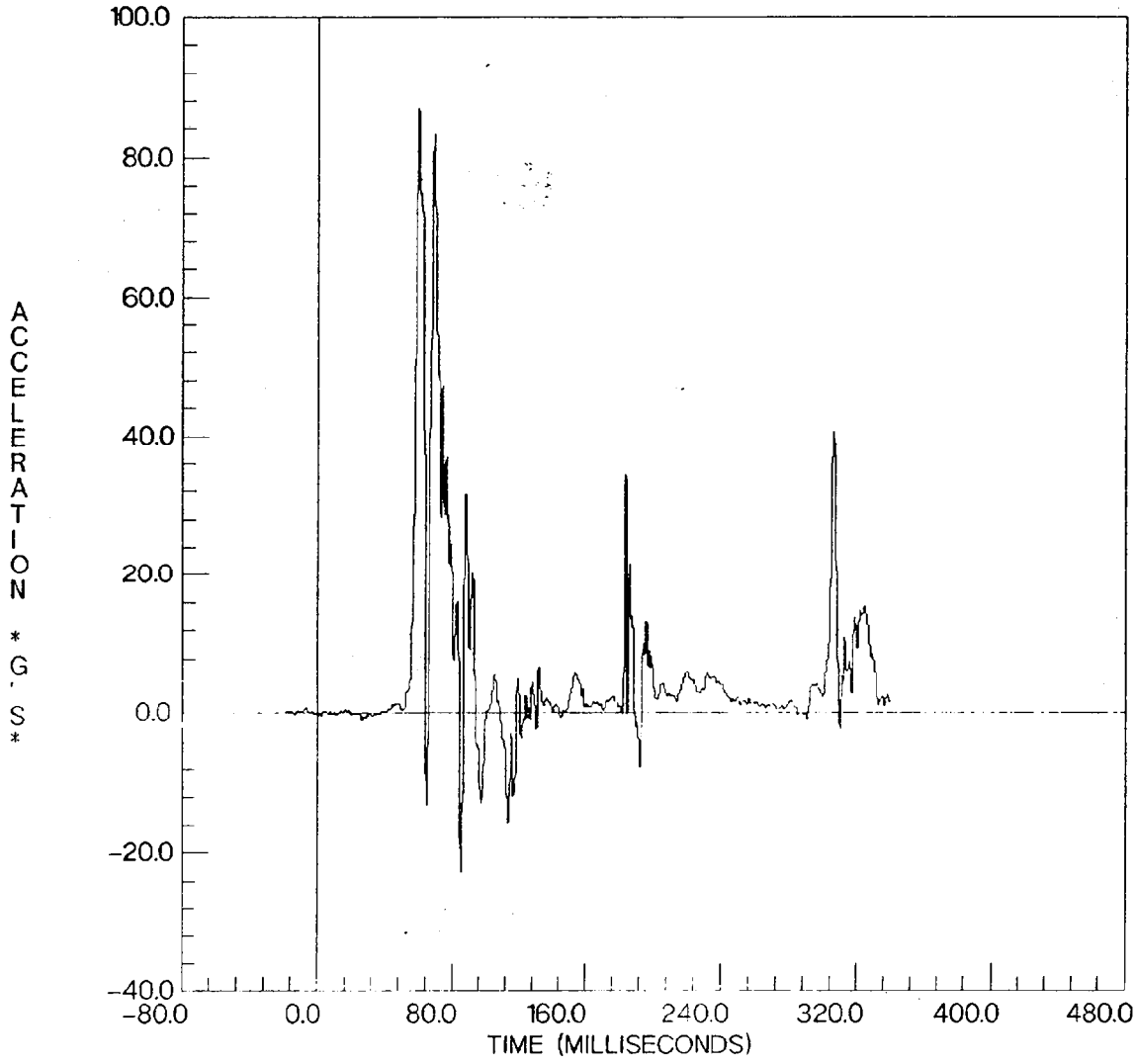


V0691AFE0.013

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
RIB - LEFT UPPER
FILTERED
FILTER CUTOFF: 300Hz
LURYGA=REDUNDANT

YG AXIS
YMIN =-22.87805 at 85.37500 msec
YMAX = 86.93190 at 60.50000 msec

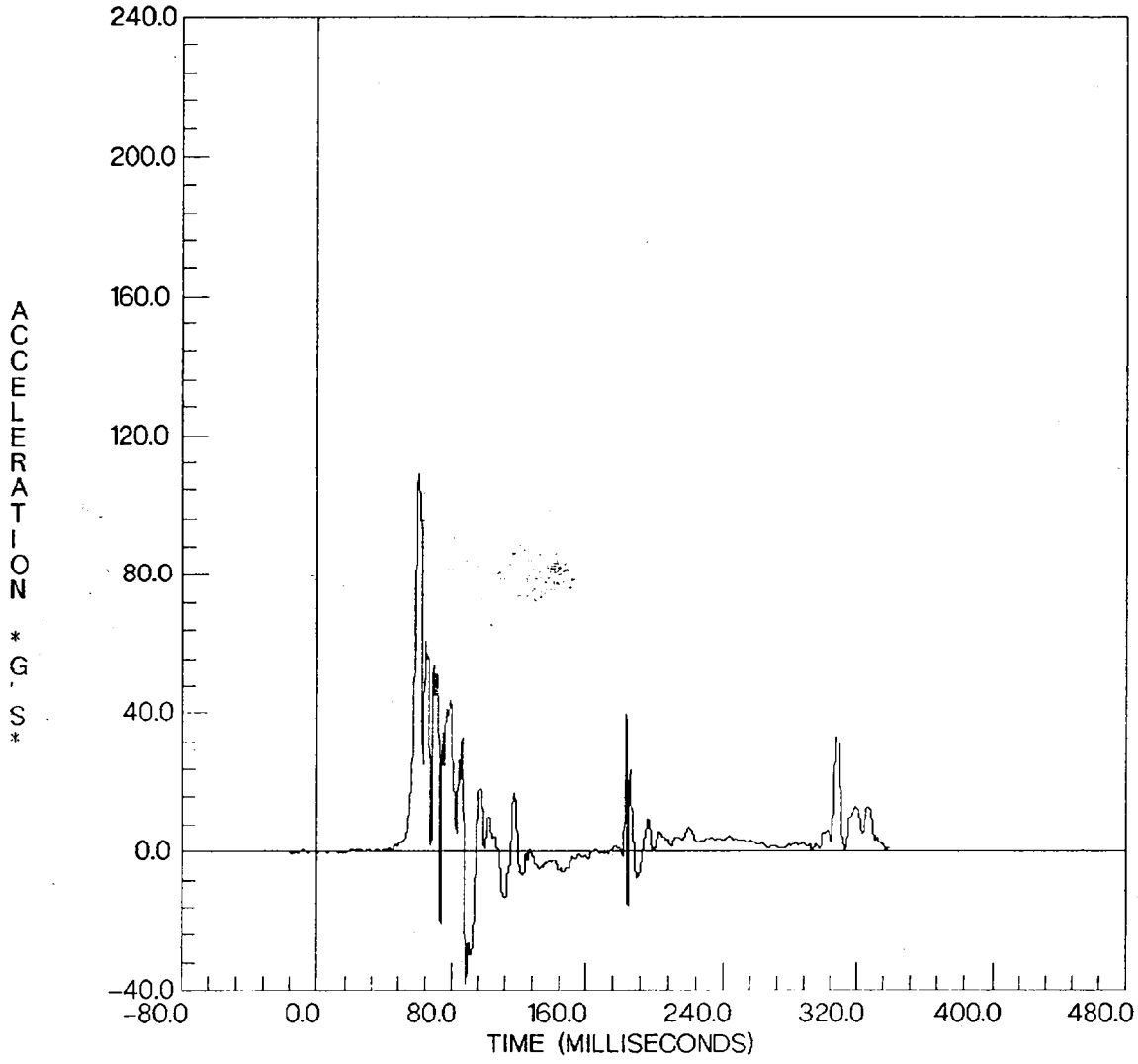


V0691AFE0.014

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
RIB - LEFT LOWER
FILTERED
FILTER CUTOFF: 300Hz
LLRYG1=PRIMARY

YG AXIS
YMIN =-38.20008 at 88.75000 msec
YMAX = 108.9062 at 59.87500 msec

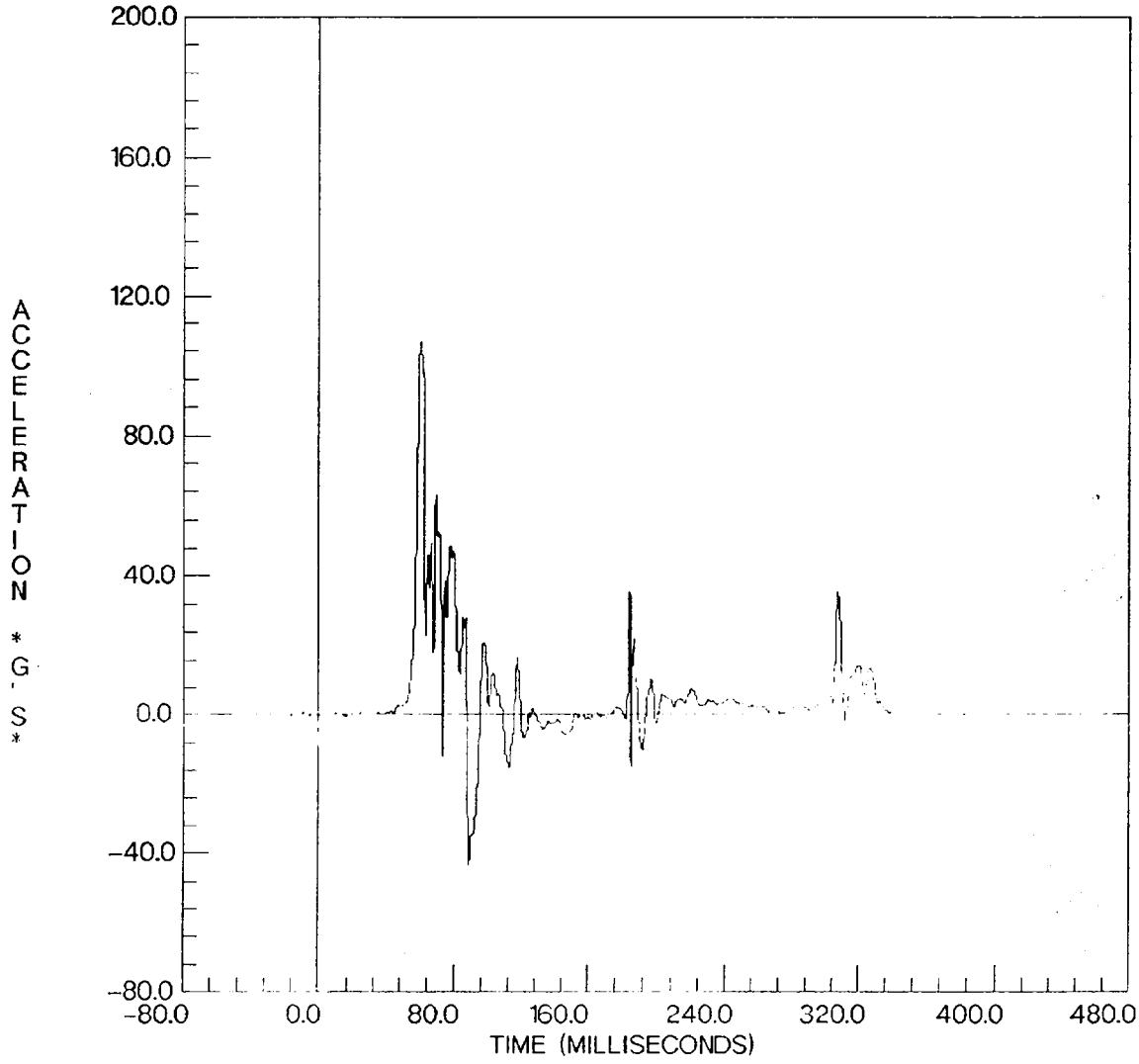


V0691AFE0.015

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
RIB - LEFT LOWER
FILTERED
FILTER CUTOFF: 300Hz
LLRYGA=REDUNDANT

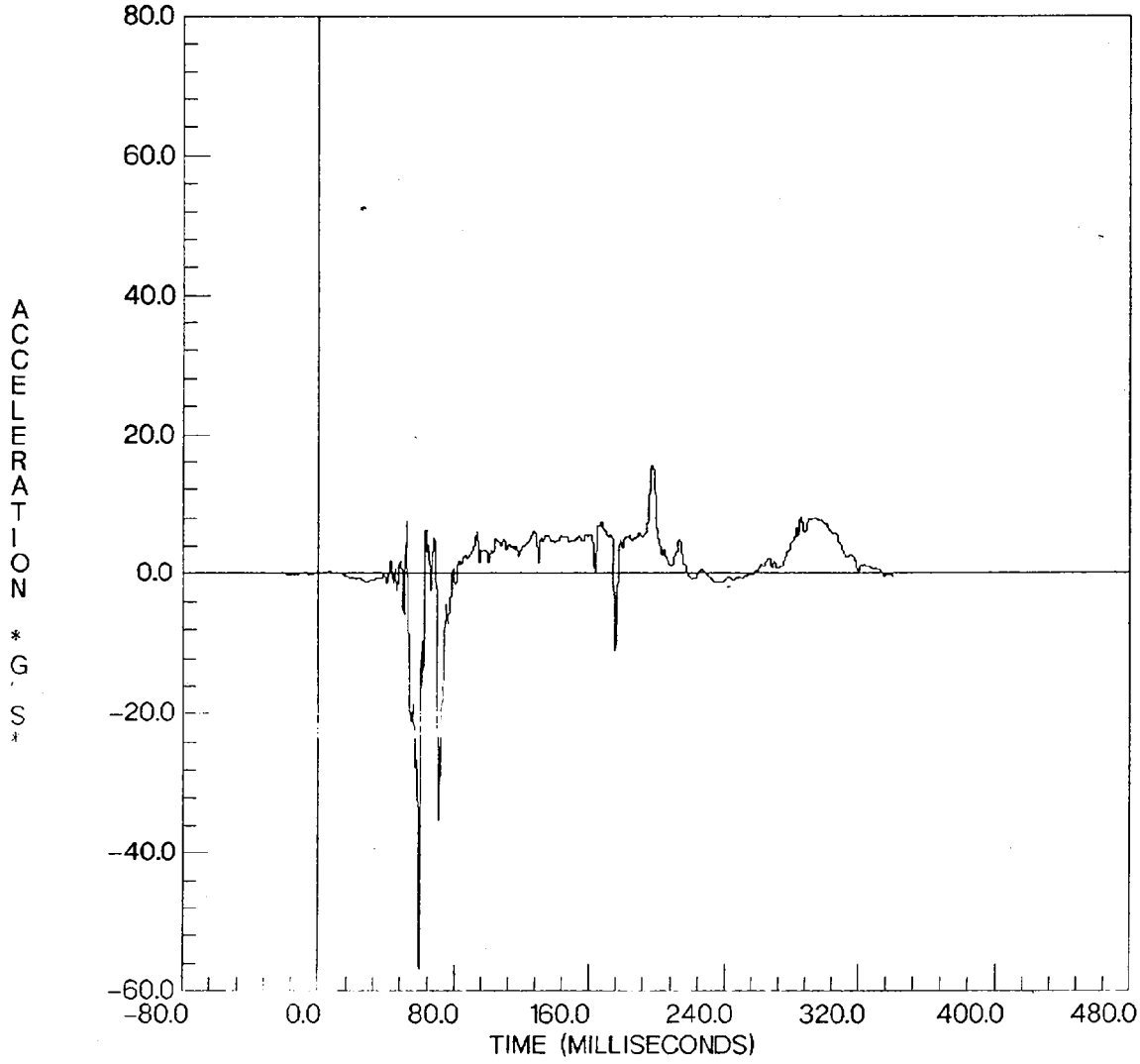
YG AXIS
YMIN =-43.37202 at 88.87500 msec
YMAX = 106.6795 at 59.87500 msec



V0691AFE0.016

TRC OF OHIO 840209 34.40 mph ITV

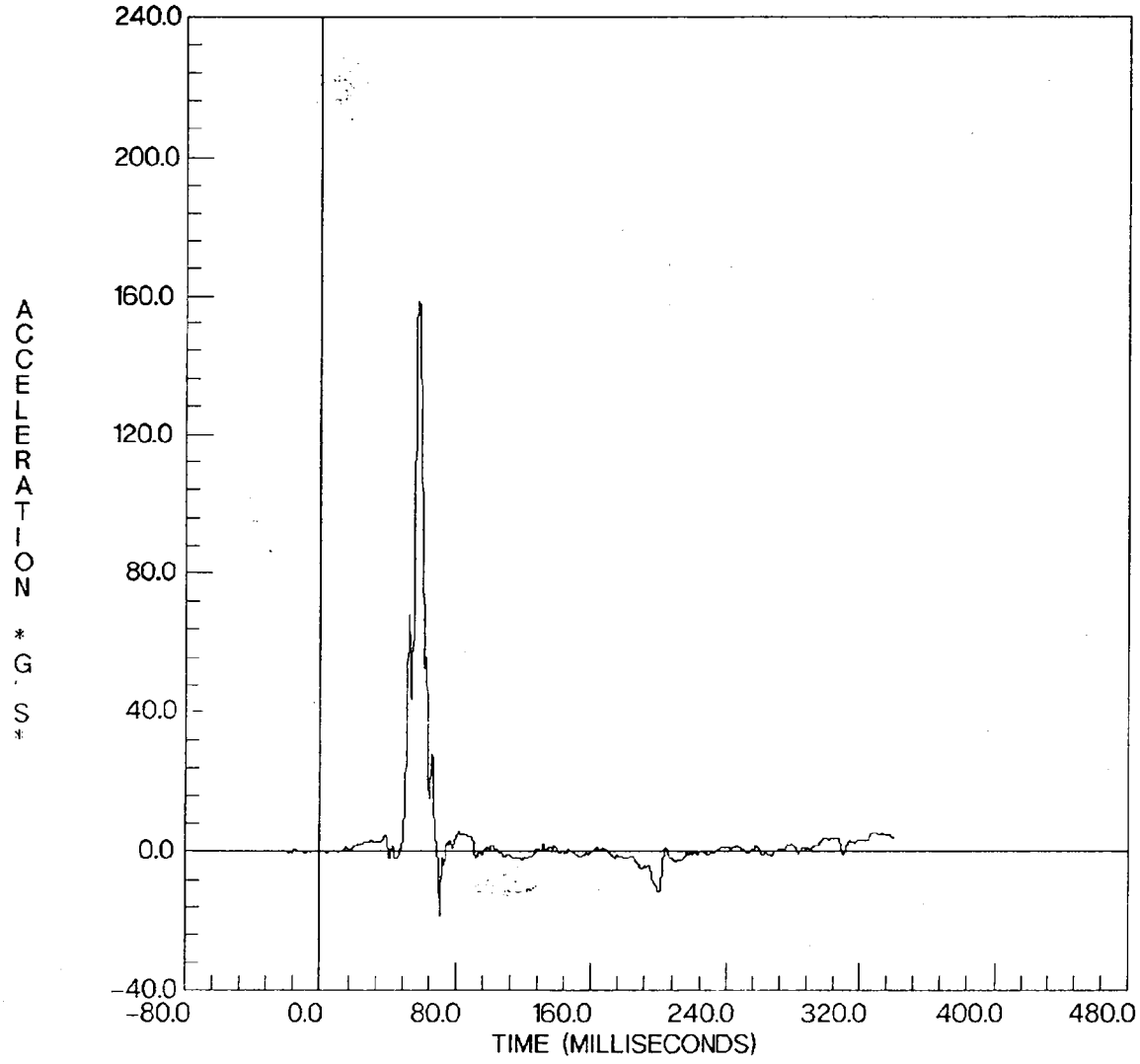
81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
PELVIS - CENTER XG AXIS
FILTERED YMIN =-56.92741 at 59.50000 msec
FILTER CUTOFF: 300Hz YMAX = 15.59441 at 196.2500 msec



V0691AFE0.017

TRC OF OHIO 840209 34.40 mph ITV

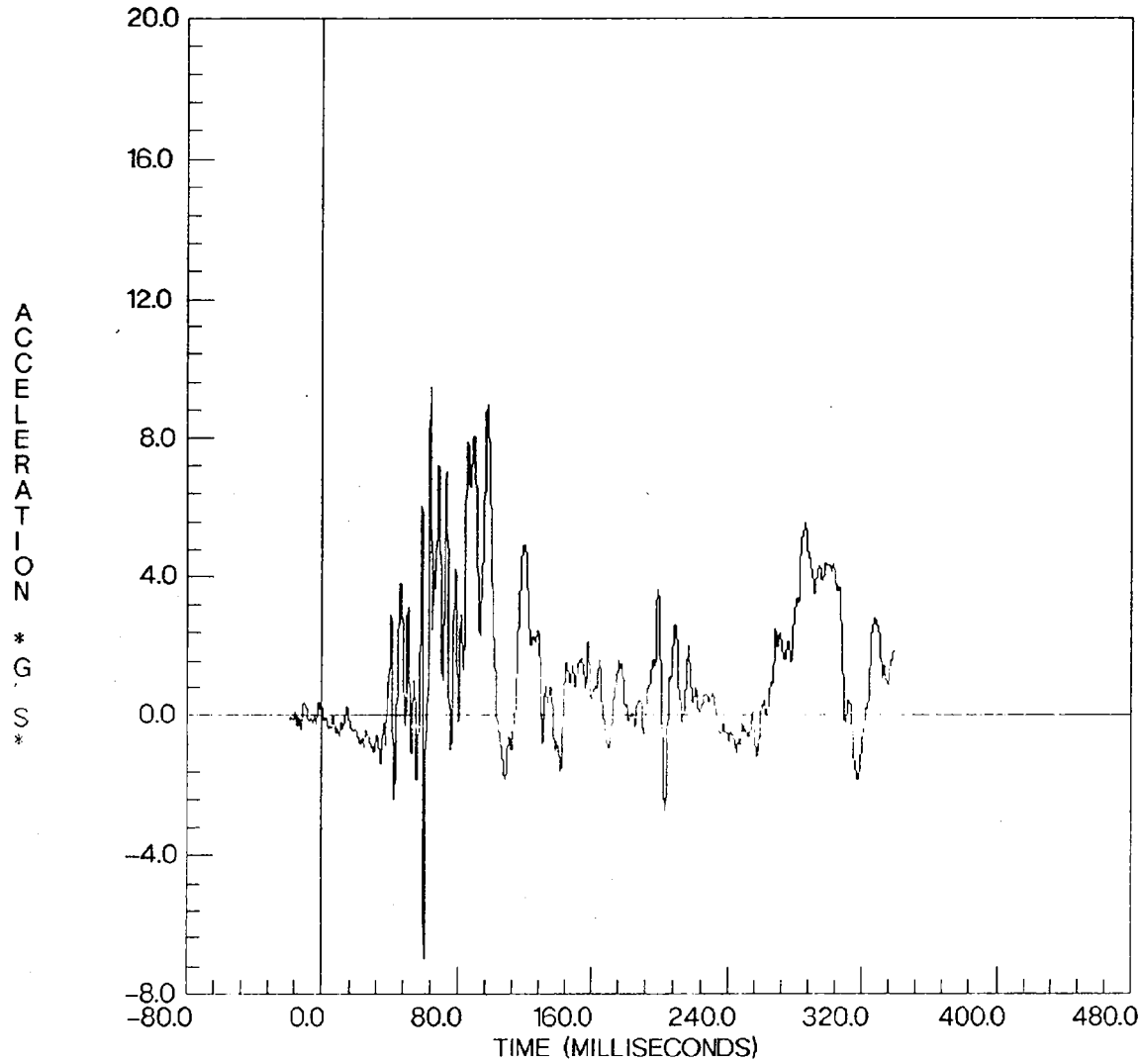
81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
PELVIS - CENTER YG AXIS
FILTERED YMIN =-18.87100 at 70.50000 msec
FILTER CUTOFF: 300Hz YMAX = 158.8547 at 57.00000 msec



V0691AFE0.018

TRC OF OHIO 840209 34.40 mph ITV

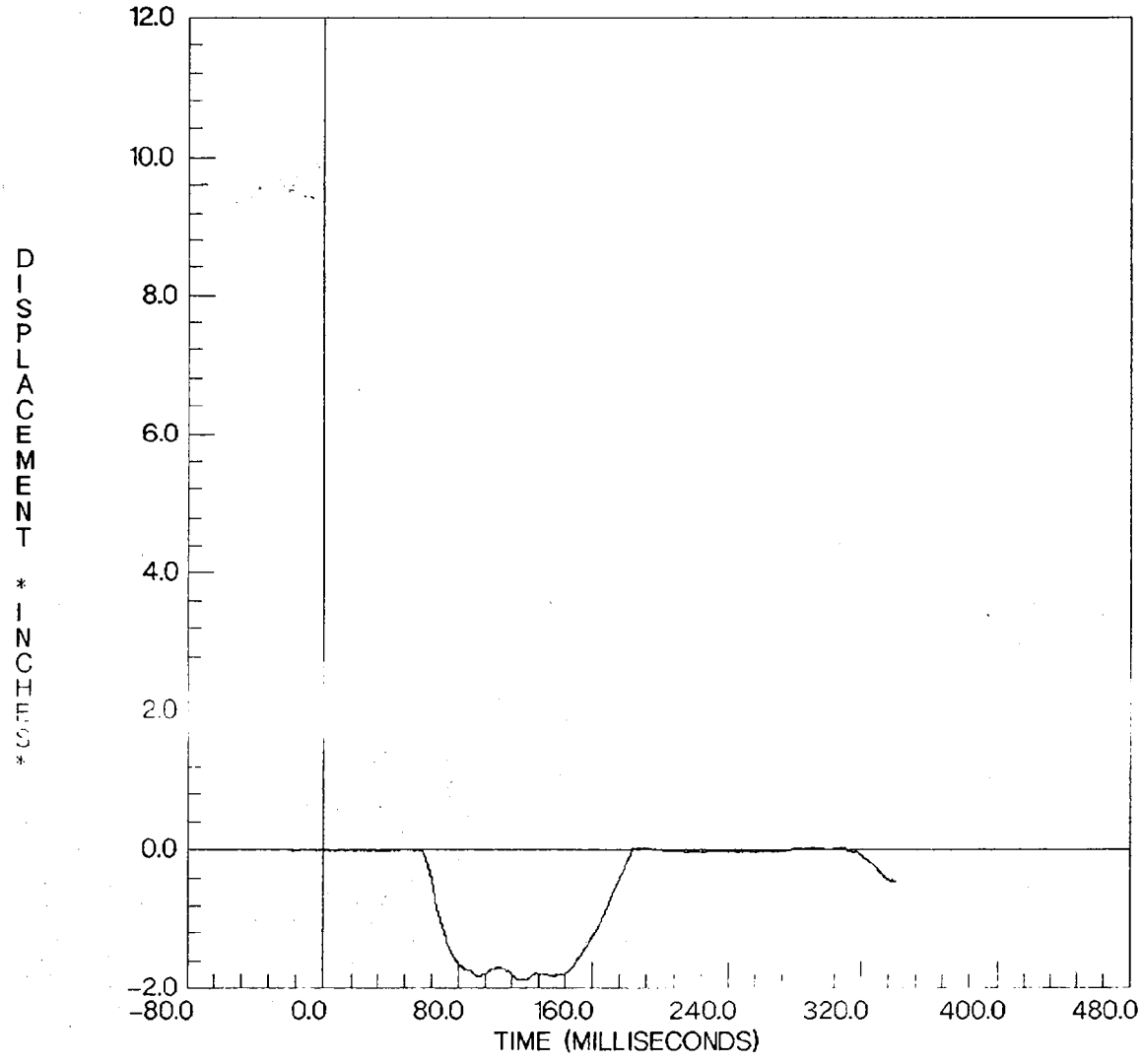
81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
PELVIS - CENTER ZG AXIS
FILTERED YMIN =-6.990566 at 60.75000 msec
FILTER CUTOFF: 300Hz YMAX = 9.478252 at 64.00000 msec



V0691DA00.019

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID
SEAT TRACK - LEFT REAR YG AXIS
YMIN =-1.897300 at 119.1250 msec
FILTER CUTOFF: 1650Hz YMAX =0.0425980 at 190.3750 msec
LEFT RIB TO SPINE DISPLACEMENT



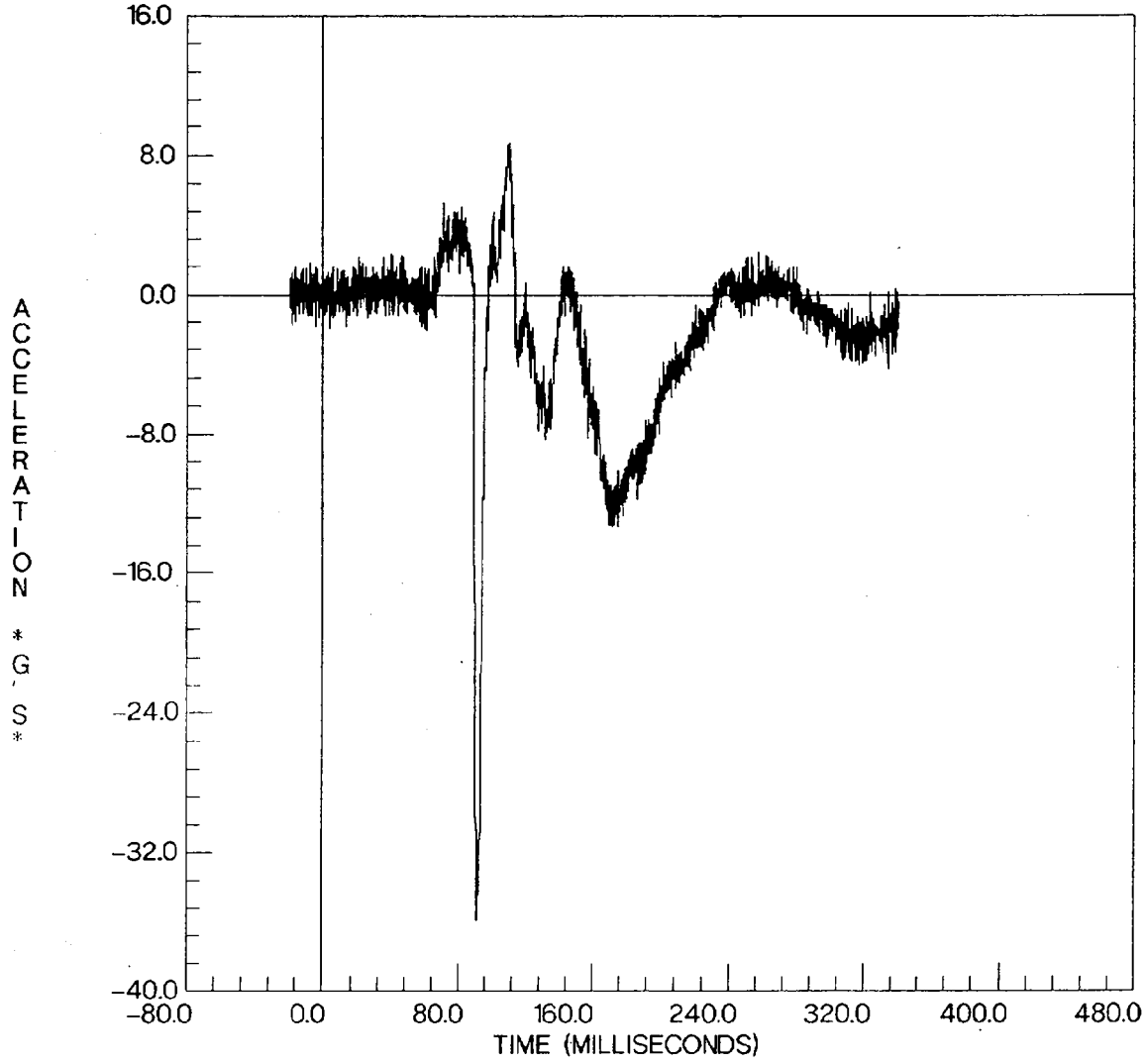
V0691AA00.020

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
HEAD CG

XG AXIS
YMIN =-35.91500 at 90.87500 msec
YMAX = 8.721900 at 110.3750 msec

FILTER CUTOFF: 1650Hz
HEDXG3



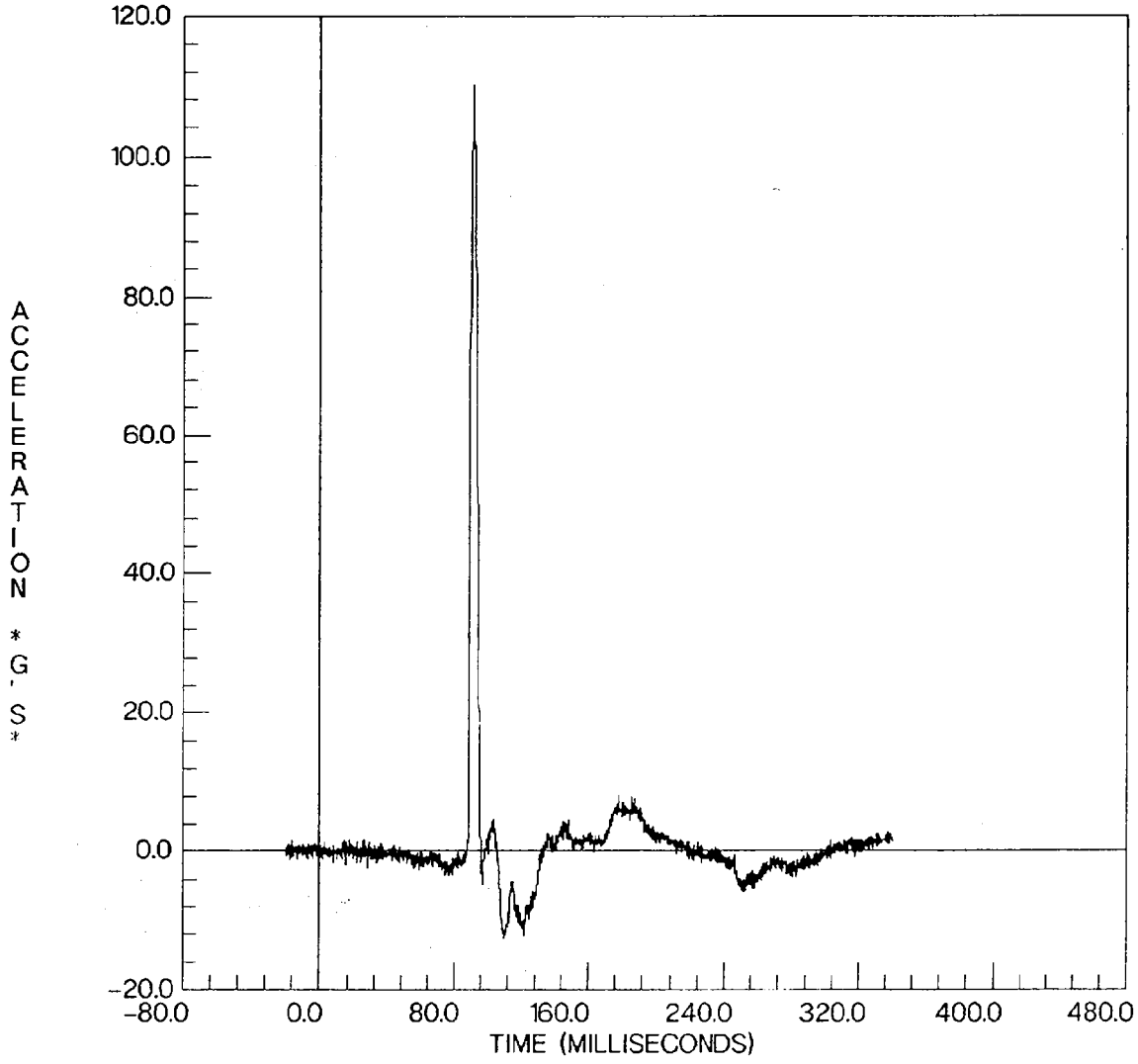
V0691AA00.021

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
HEAD CG

YG AXIS
YMIN =-12.83600 at 109.5000 msec
YMAX = 110.2400 at 90.50000 msec

FILTER CUTOFF: 1650Hz
HEDYG3



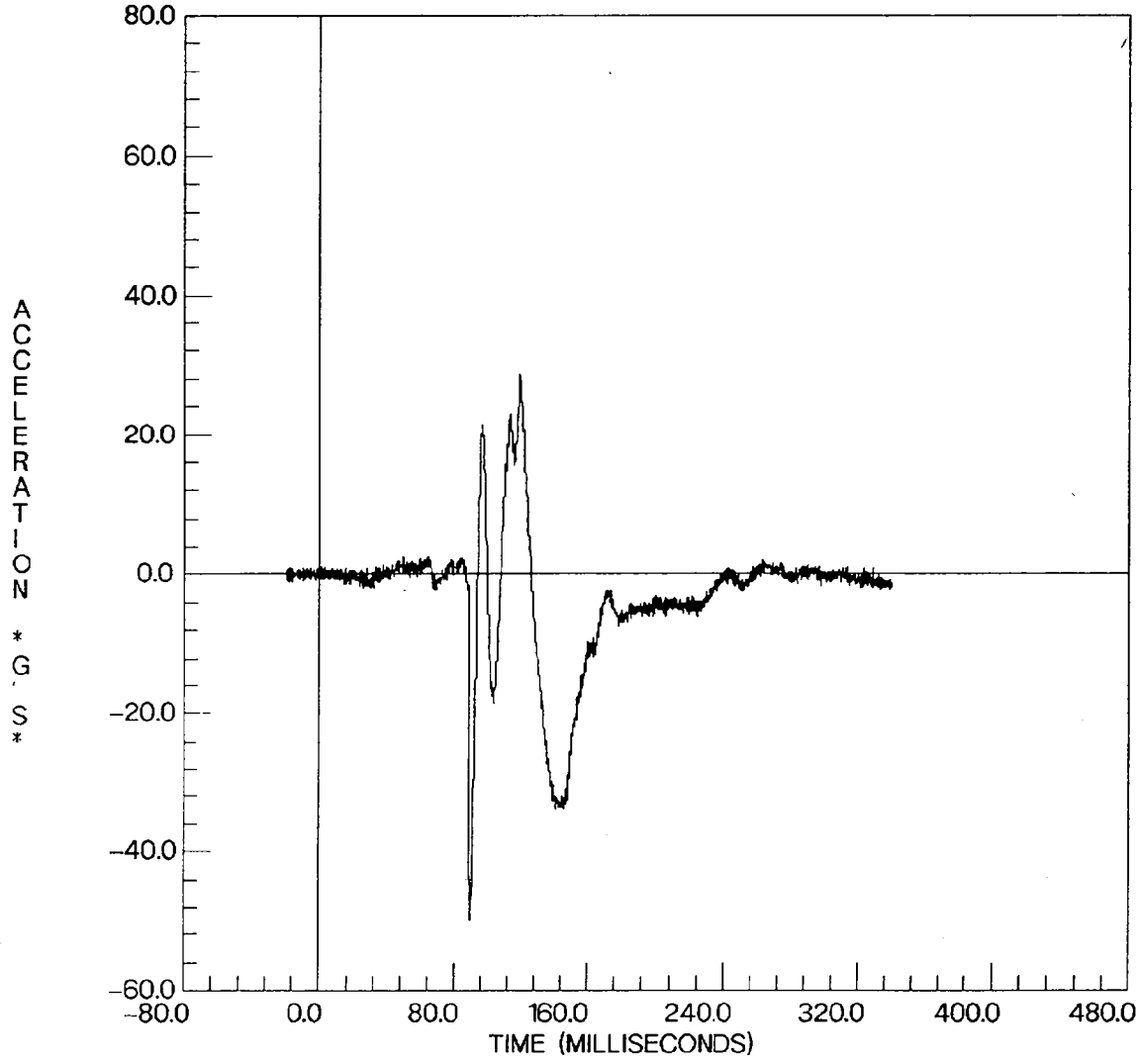
V0691AA00.022

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
HEAD CG

ZG AXIS
YMIN =-49.92600 at 89.75000 msec
YMAX = 28.62300 at 118.7500 msec

FILTER CUTOFF: 1650Hz
HEDZG3

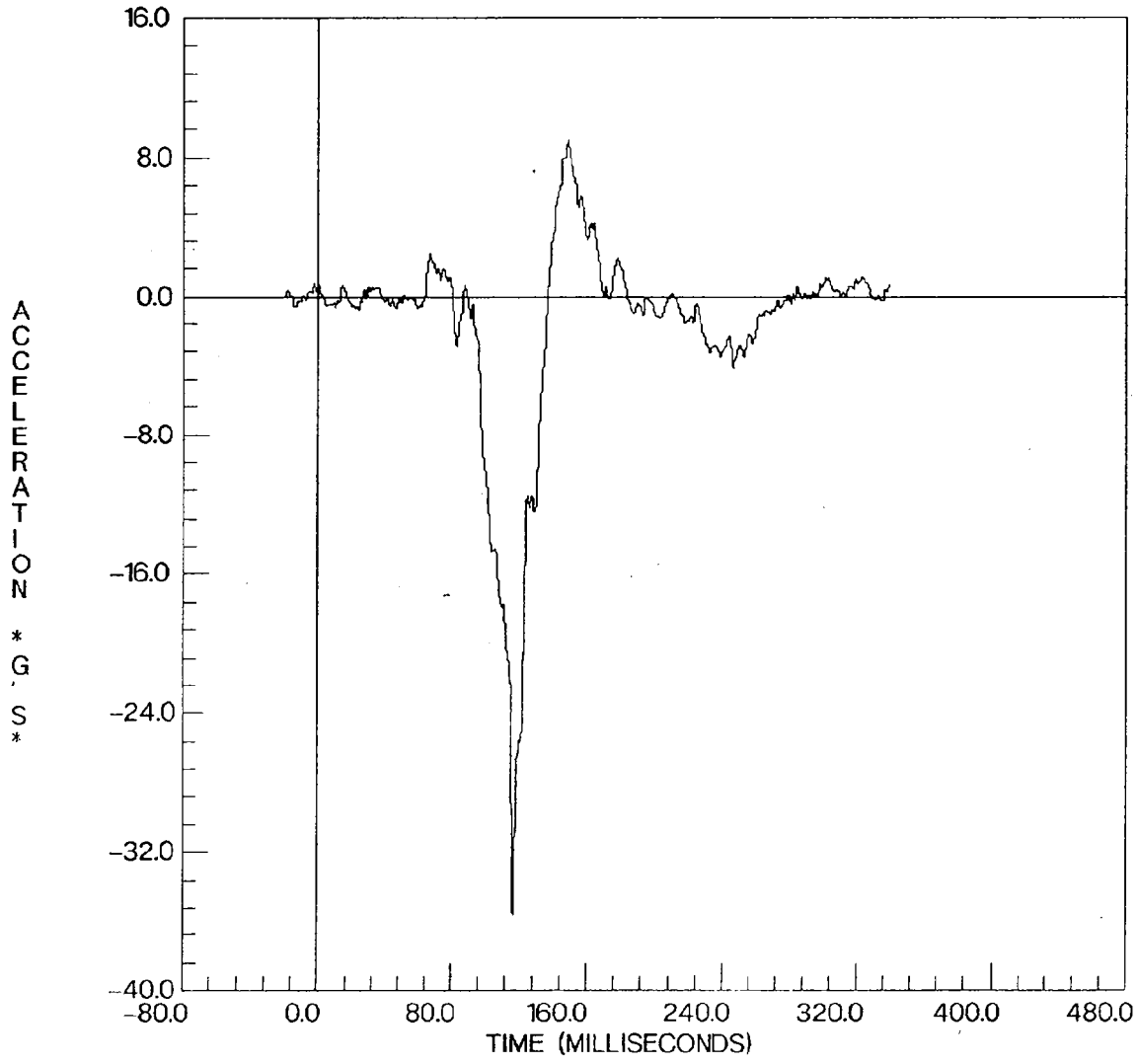


V0691AFE0.023

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
SPINE - UPPER
FILTERED
FILTER CUTOFF: 300Hz
T01XG3

XG AXIS
YMIN =-35.64983 at 116.7500 msec
YMAX = 8.977954 at 147.7500 msec

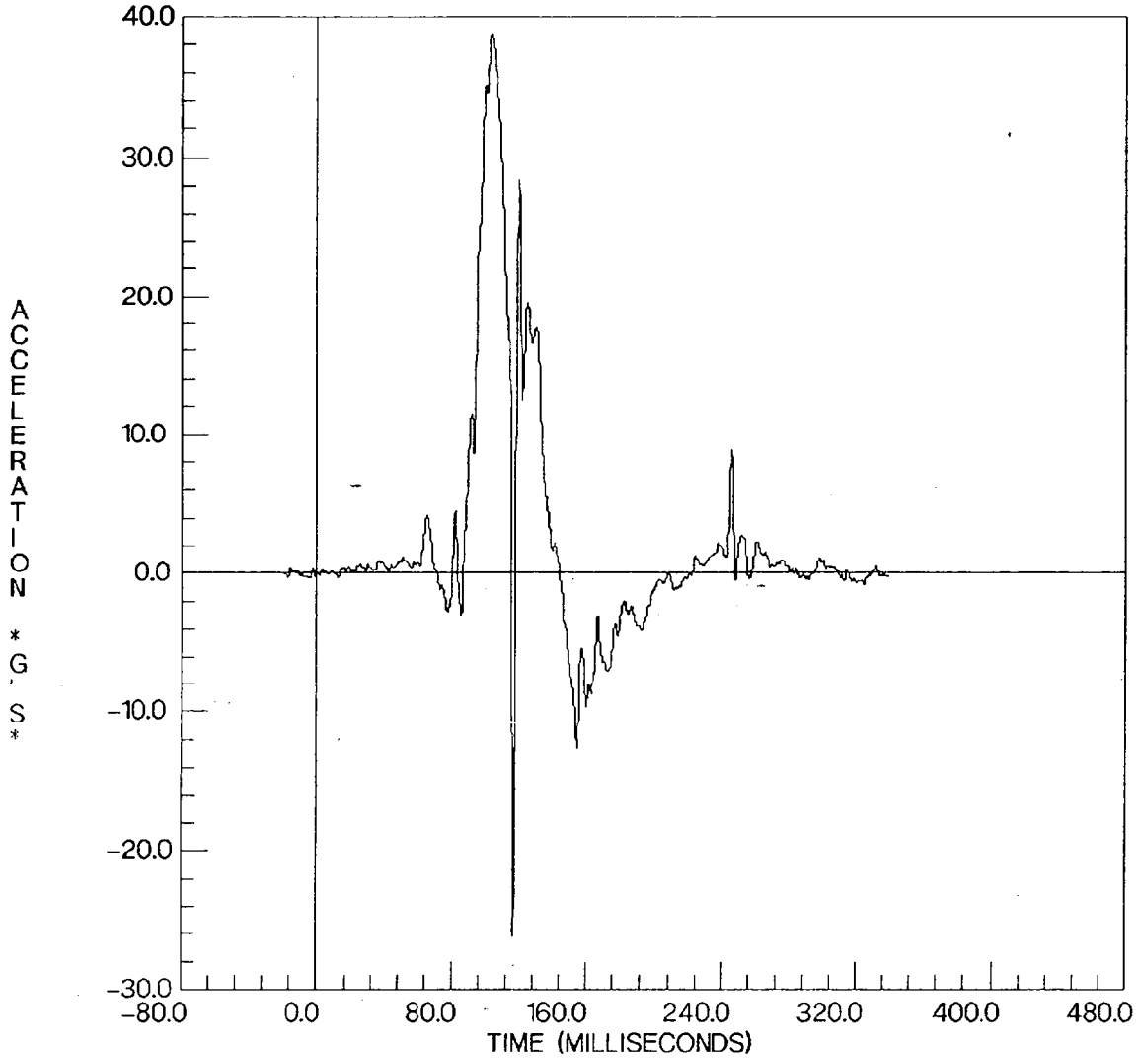


V0691AFE0.024

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
SPINE - UPPER
FILTERED
FILTER CUTOFF: 300Hz
T01YG3=PRIMARY

YG AXIS
YMIN =-26.27739 at 116.5000 msec
YMAX = 38.84017 at 103.2500 msec

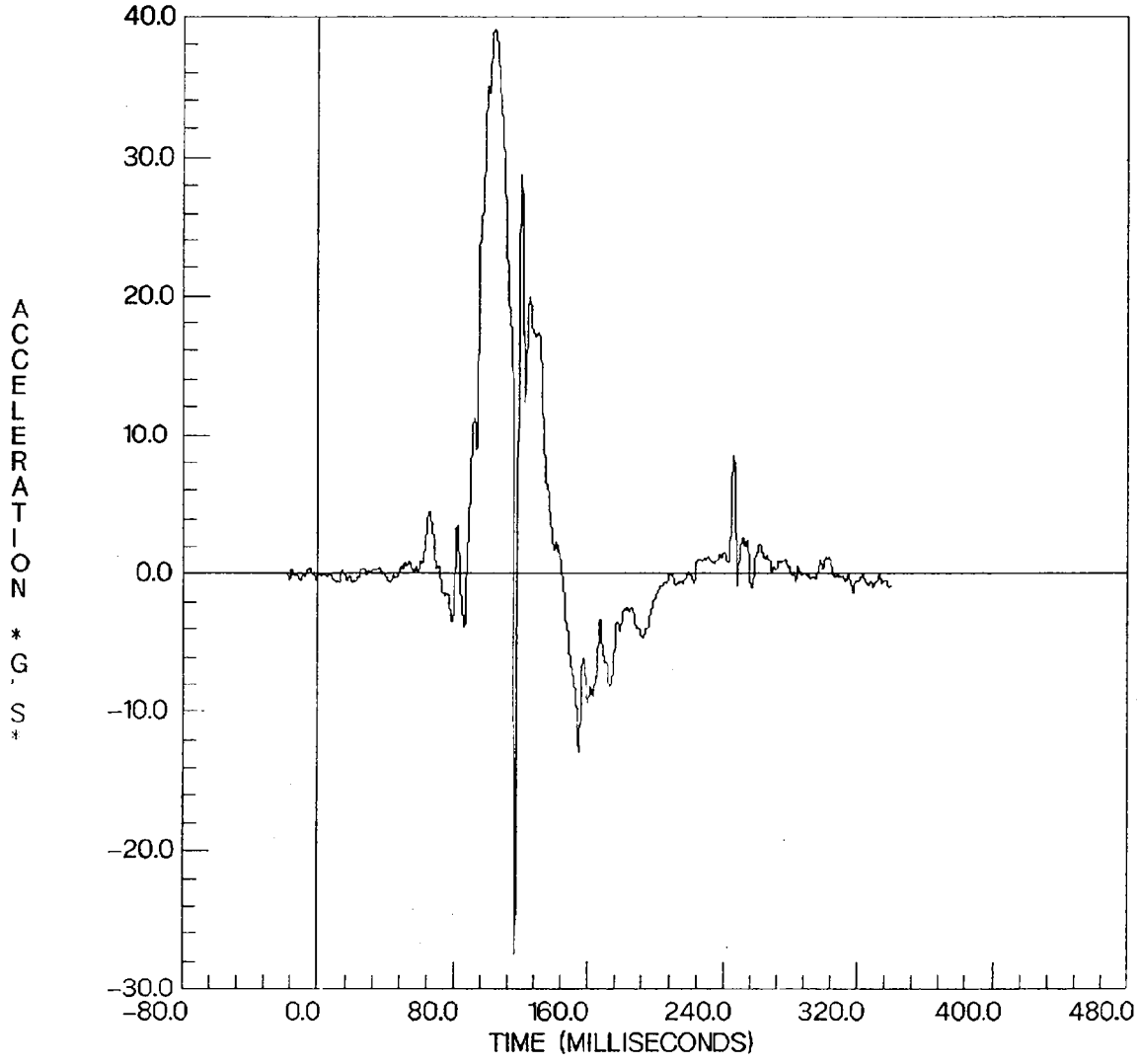


V0691AFE0.025

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
SPINE - UPPER
FILTERED
FILTER CUTOFF: 300Hz
T01YGC=REDUNDANT

YG AXIS
YMIN =-27.53603 at 116.3750 msec
YMAX = 39.14799 at 103.7500 msec

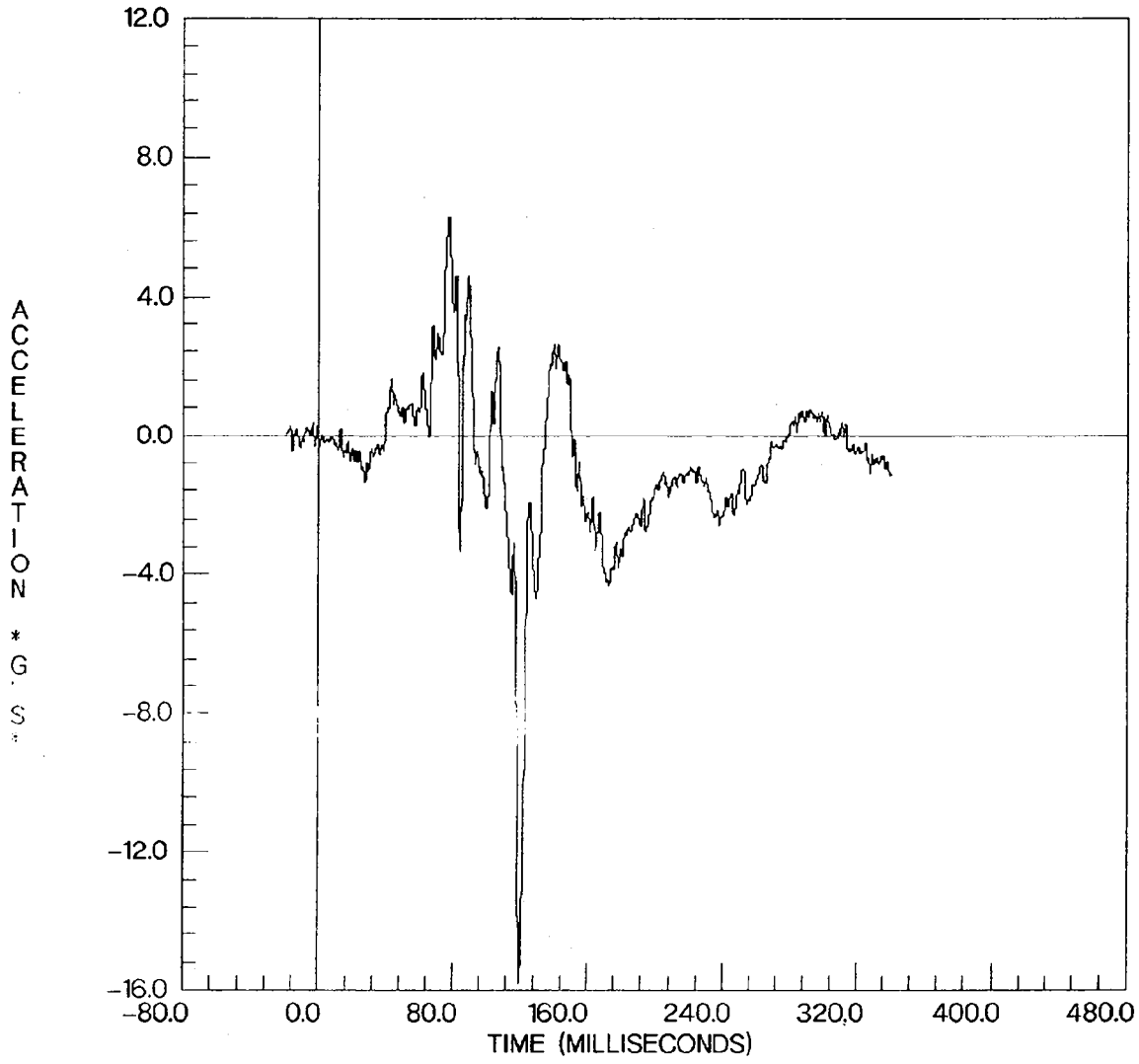


V0691AFE0.026

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
SPINE - UPPER
FILTERED
FILTER CUTOFF: 300Hz
T01ZG3

ZG AXIS
YMIN =-15.82424 at 119.5000 msec
YMAX = 6.289058 at 77.37500 msec

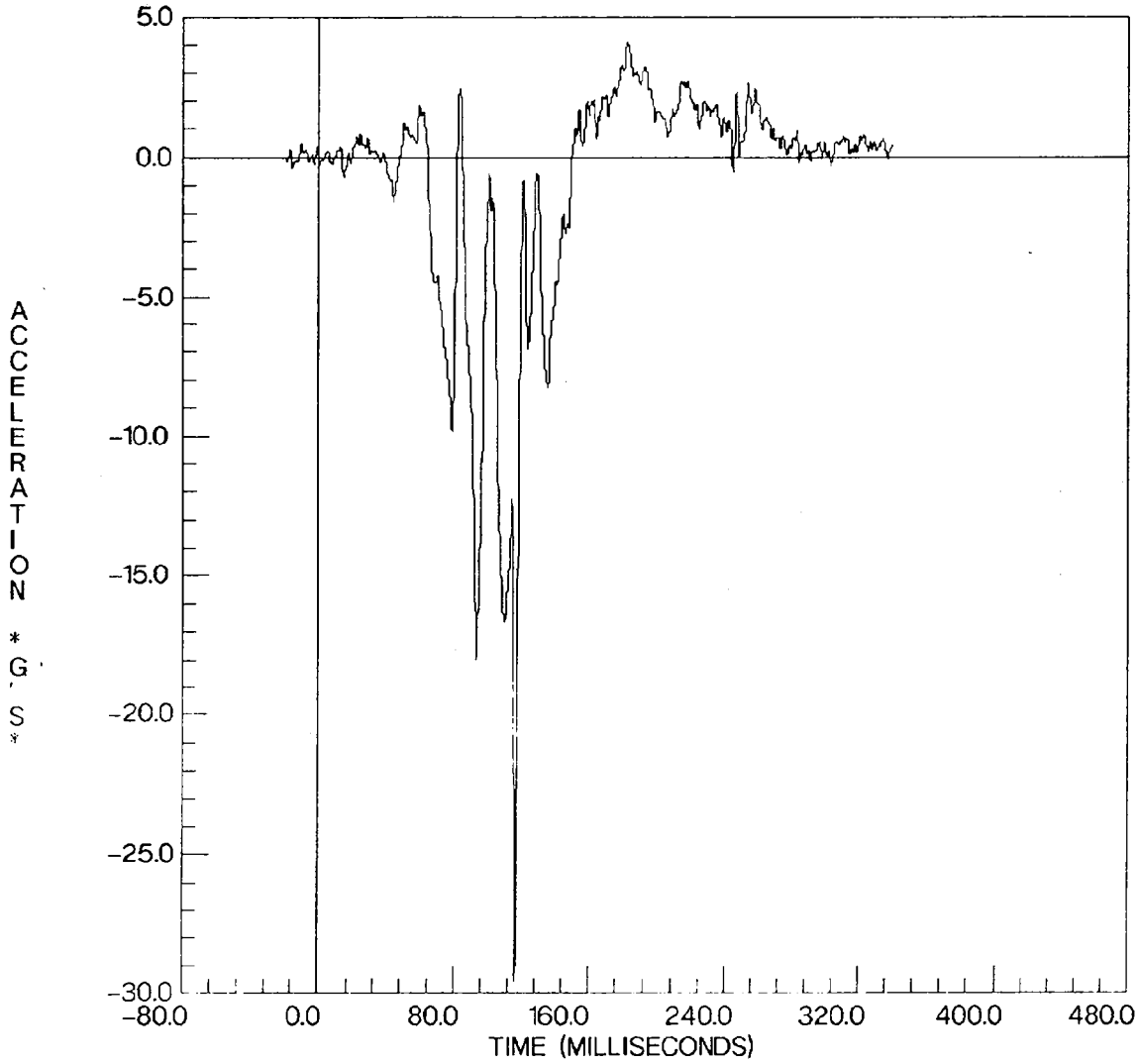


V0691AFE0.027

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
SPINE - LOWER
FILTERED
FILTER CUTOFF: 300Hz
T12XG3

XG AXIS
YMIN =-29.62423 at 116.5000 msec
YMAX = 4.130205 at 182.0000 msec

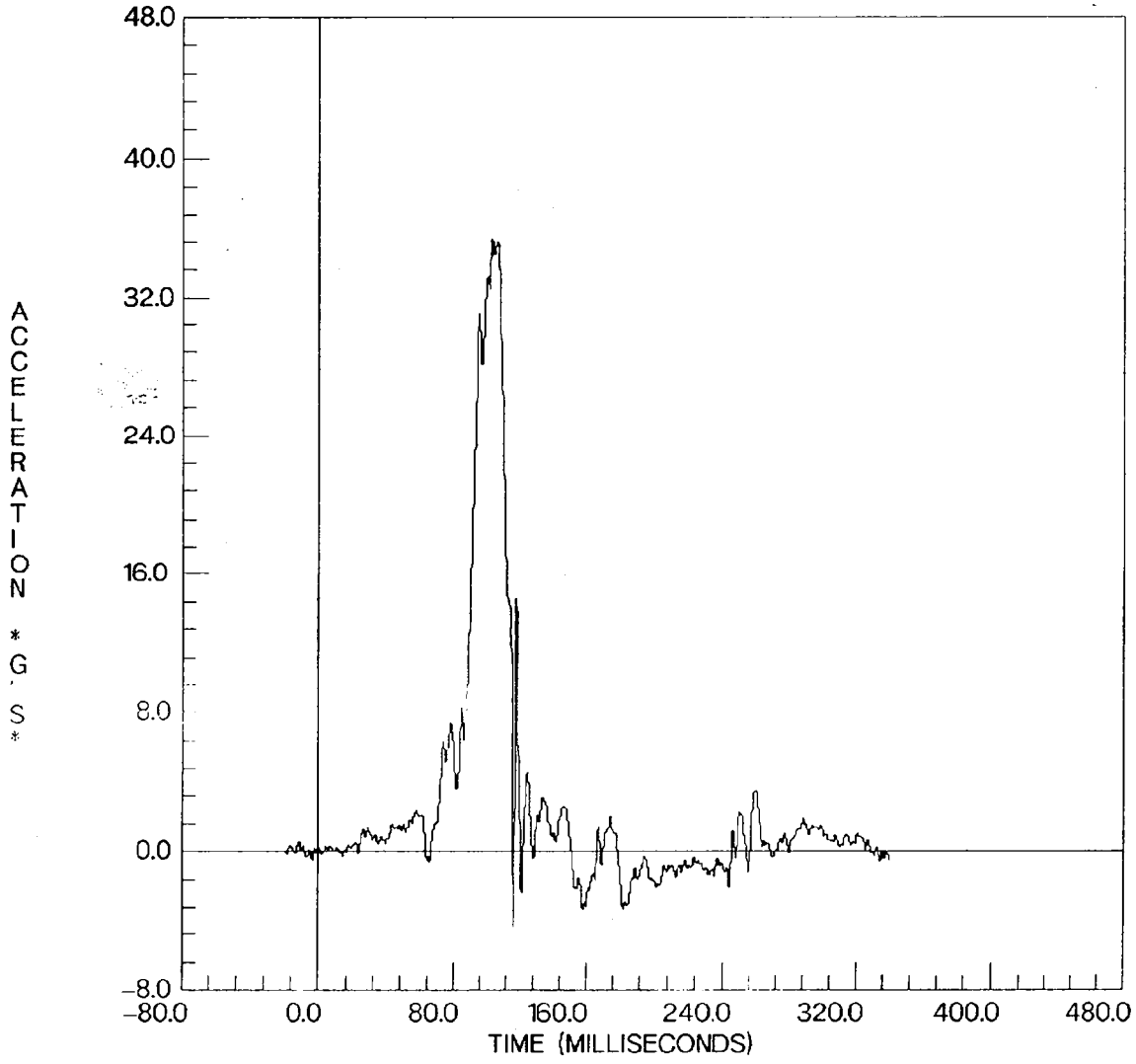


V0691AFE0.028

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
SPINE - LOWER
FILTERED
FILTER CUTOFF: 300Hz
T12YG3=PRIMARY

YG AXIS
YMIN =-4.362935 at 116.1250 msec
YMAX = 35.40406 at 102.6250 msec

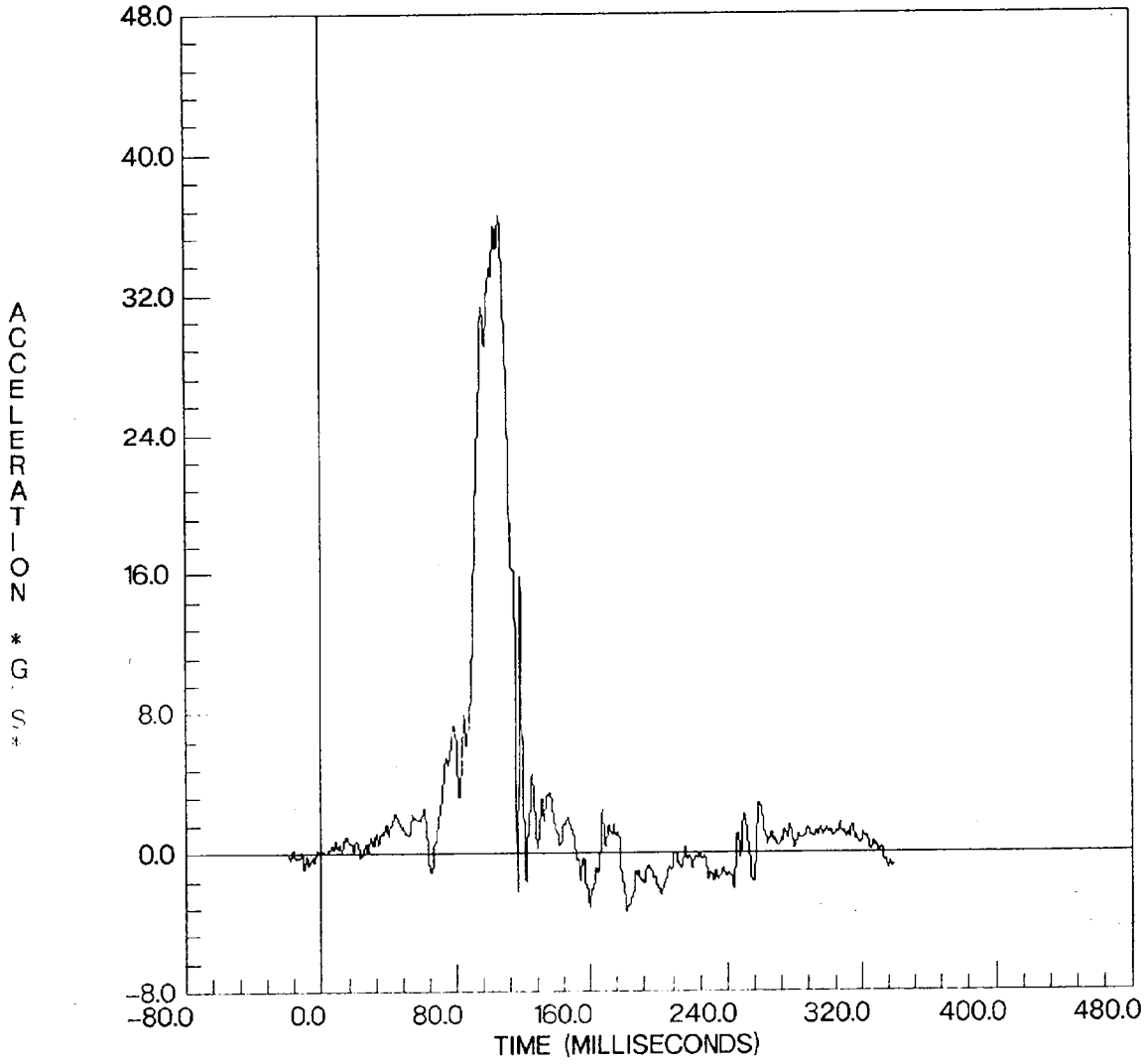


V0691AFE0.029

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
SPINE - LOWER
FILTERED
FILTER CUTOFF: 300Hz
T12YGC=REDUNDANT

YG AXIS
YMIN =-3.427348 at 181.5000 msec
YMAX = 36.50444 at 105.7500 msec

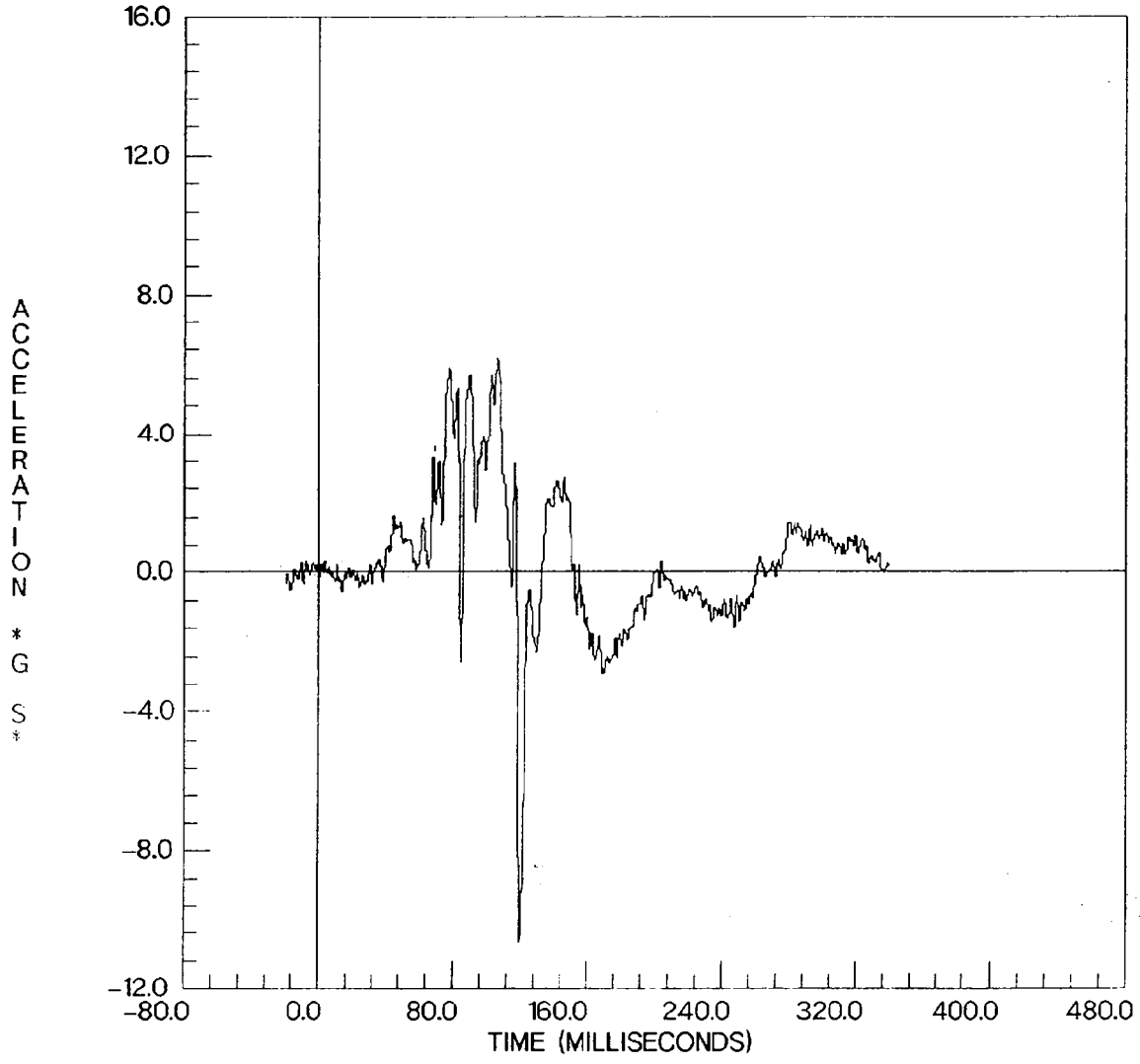


V0691AFE0.030

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
SPINE - LOWER
FILTERED
FILTER CUTOFF: 300Hz
T12ZG3

ZG AXIS
YMIN =-10.69416 at 119.7500 msec
YMAX = 6.140228 at 105.7500 msec

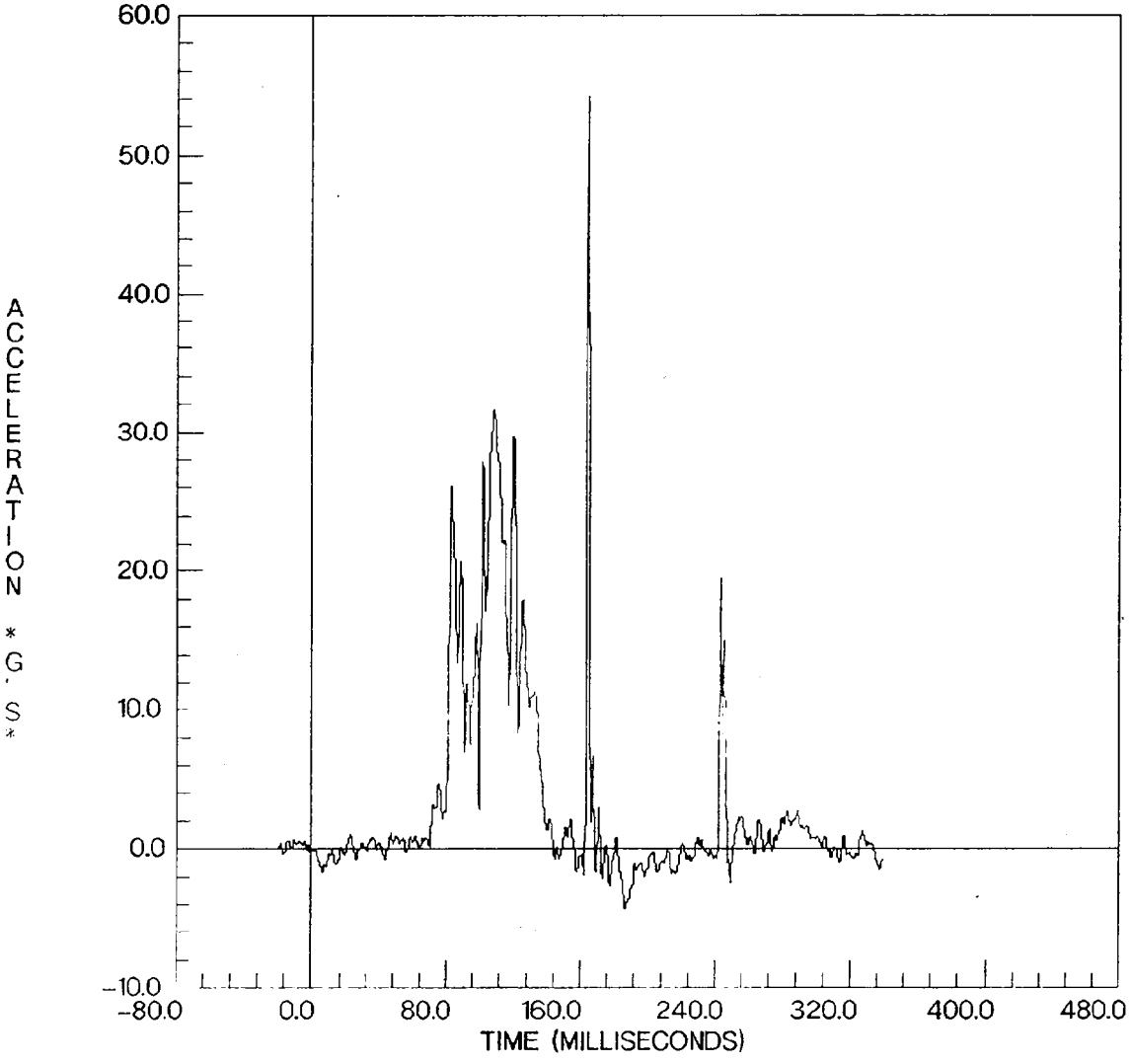


V0691AFE0.031

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
RIB - LEFT UPPER
FILTERED
FILTER CUTOFF: 300Hz
LURYG3=PRIMARY

YG AXIS
YMIN =-4.329036 at 186.7500 msec
YMAX = 54.26453 at 163.7500 msec

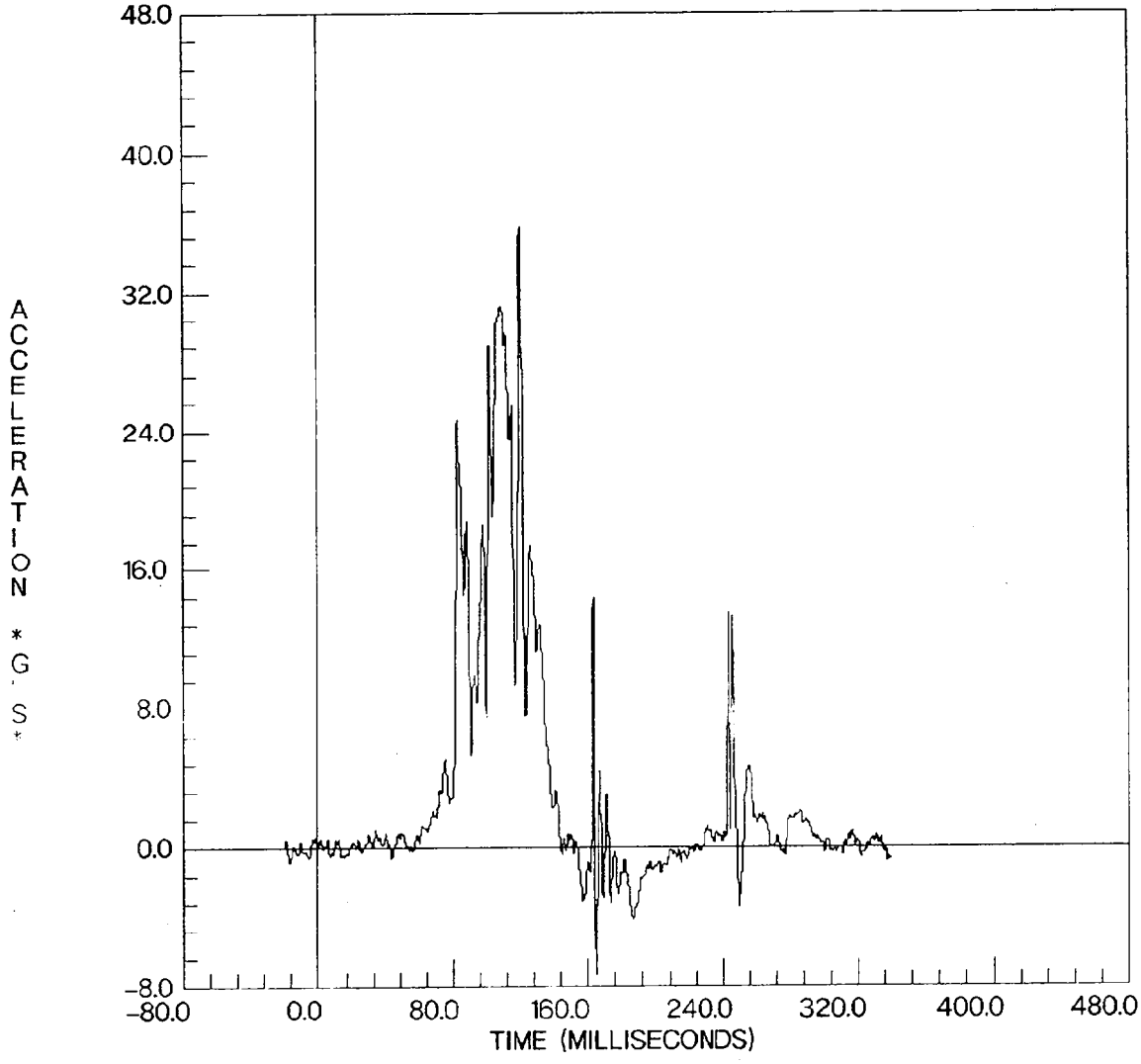


V0691AFE0.032

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
RIB - LEFT UPPER
FILTERED
FILTER CUTOFF: 300Hz
LURYGC=REDUNDANT

YG AXIS
YMIN =-7.326614 at 164.7500 msec
YMAX = 35.87071 at 120.1250 msec

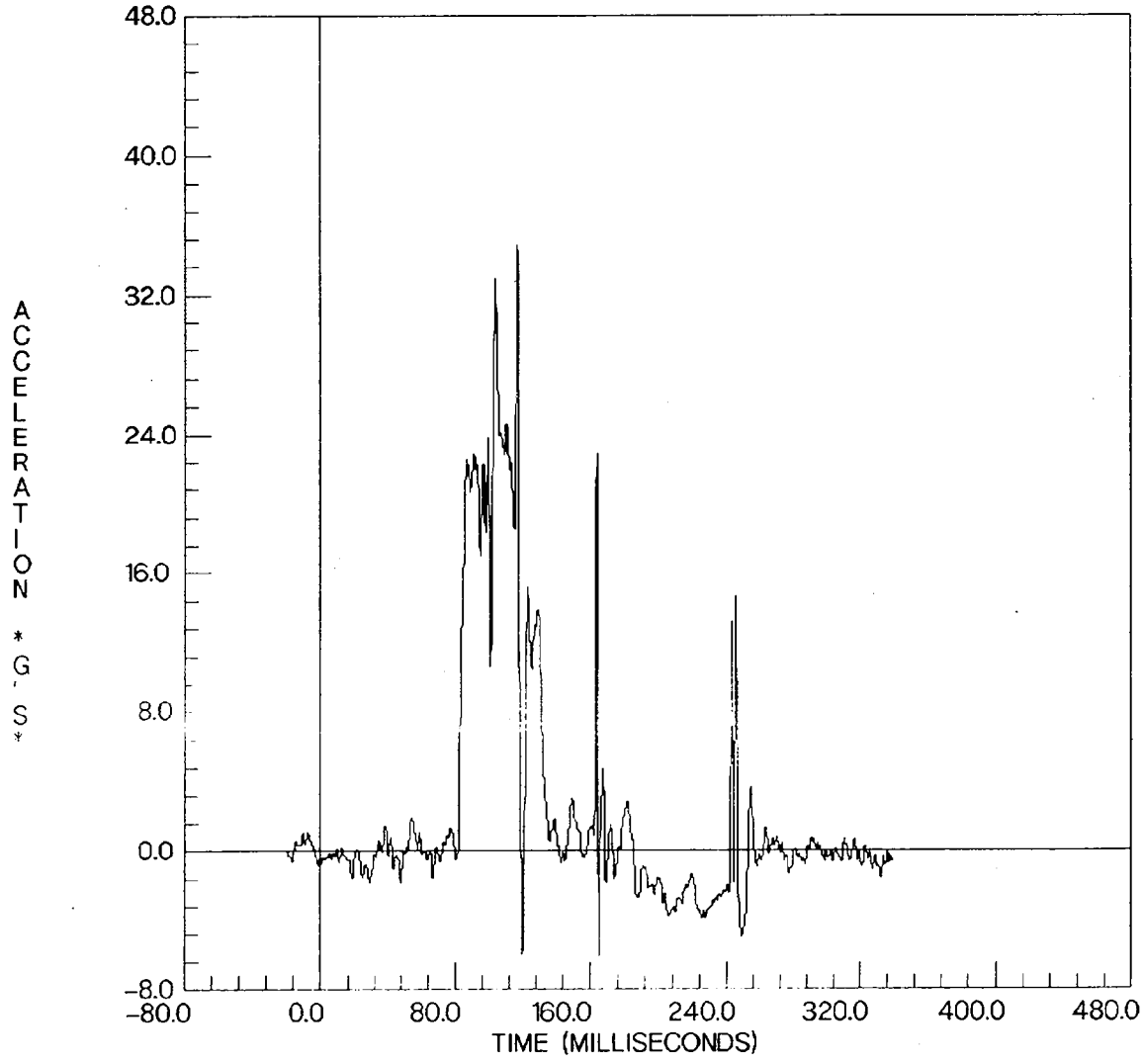


V0691AFE0.033

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
RIB - LEFT LOWER
FILTERED
FILTER CUTOFF: 300Hz
LLRYG3=PRIMARY

YG AXIS
YMIN =-6.078742 at 164.8750 msec
YMAX = 34.88910 at 116.6250 msec

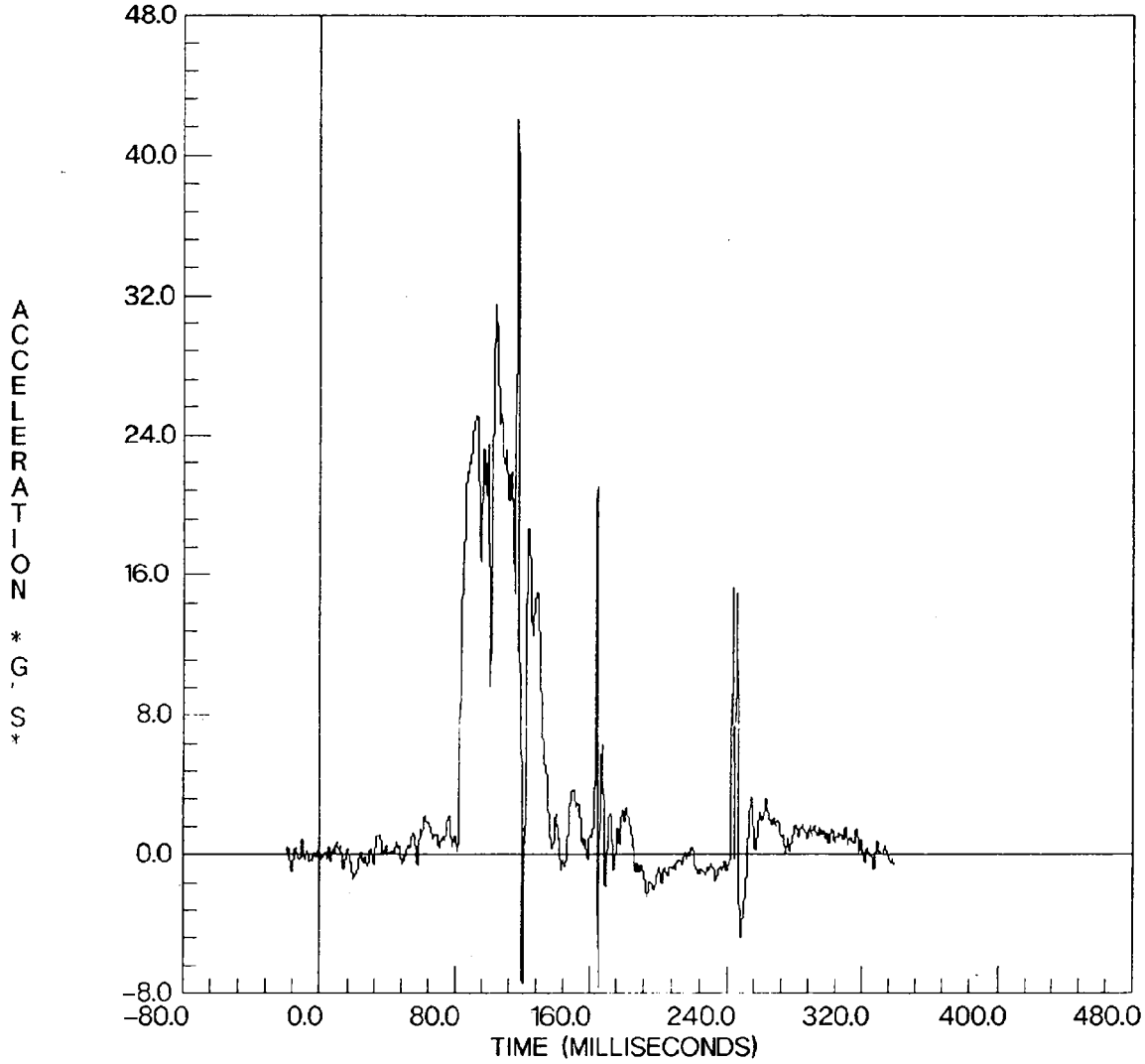


V0691AFE0.034

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
RIB - LEFT LOWER
FILTERED
FILTER CUTOFF: 300Hz
LLRYGC=REDUNDANT

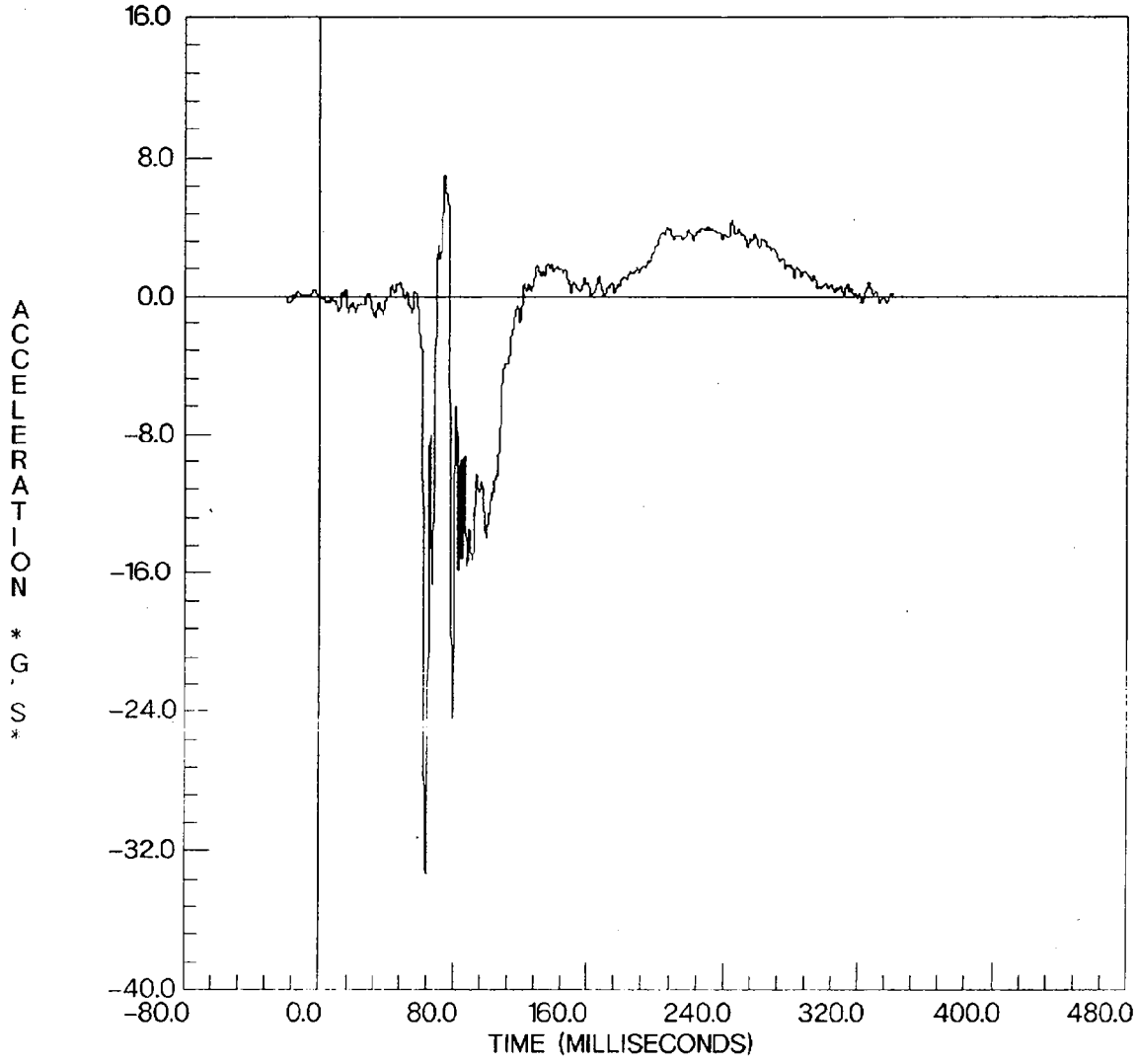
YG AXIS
YMIN =-7.666697 at 164.7500 msec
YMAX = 42.09297 at 116.5000 msec



V0691AFE0.035

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
PELVIS - CENTER XG AXIS
FILTERED YMIN =-33.31002 at 63.75000 msec
FILTER CUTOFF: 300Hz YMAX = 7.071335 at 74.37500 msec
PEVXG3

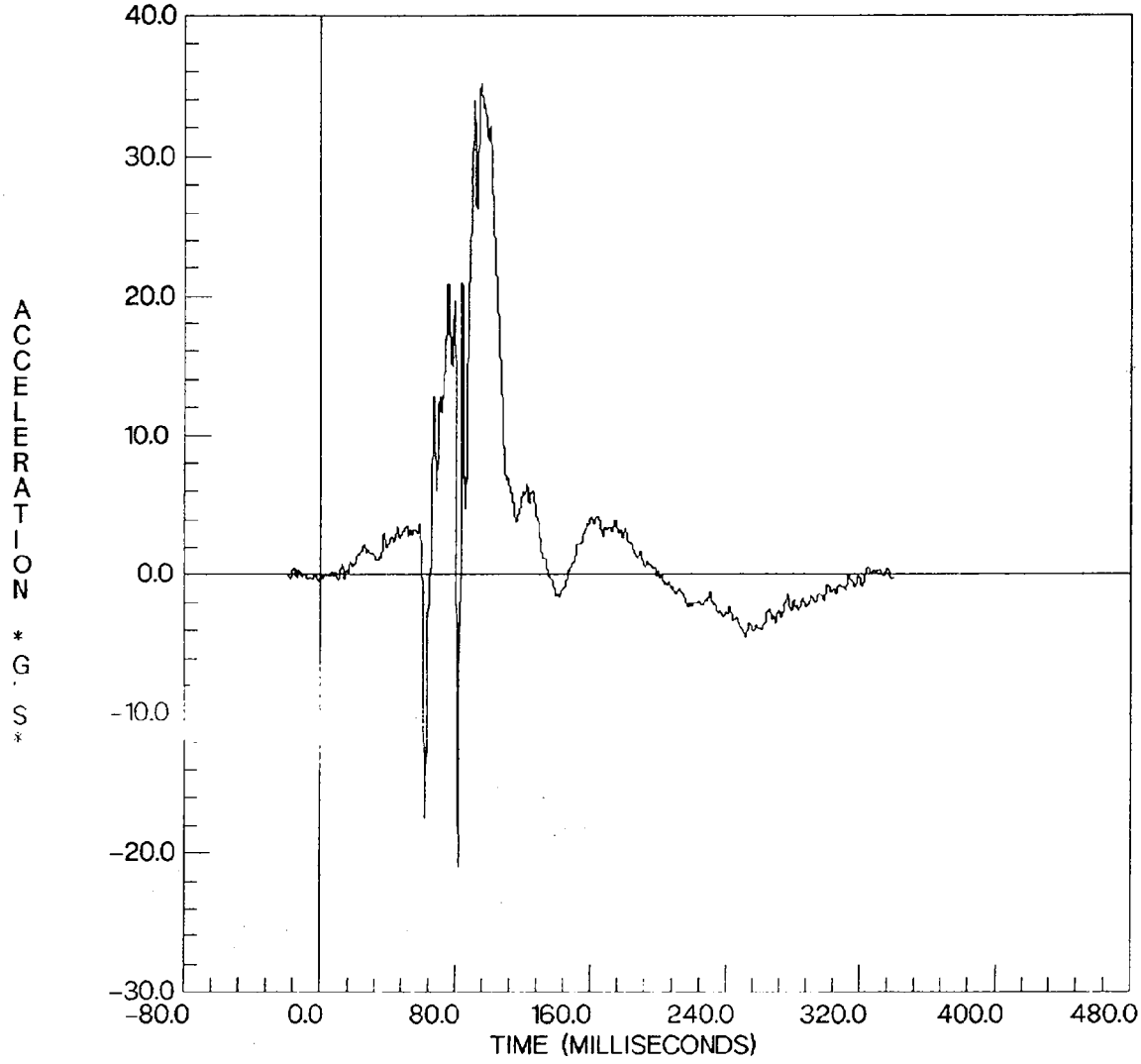


V0691AFE0.036

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
PELVIS - CENTER
FILTERED
FILTER CUTOFF: 300Hz
PEVYG3

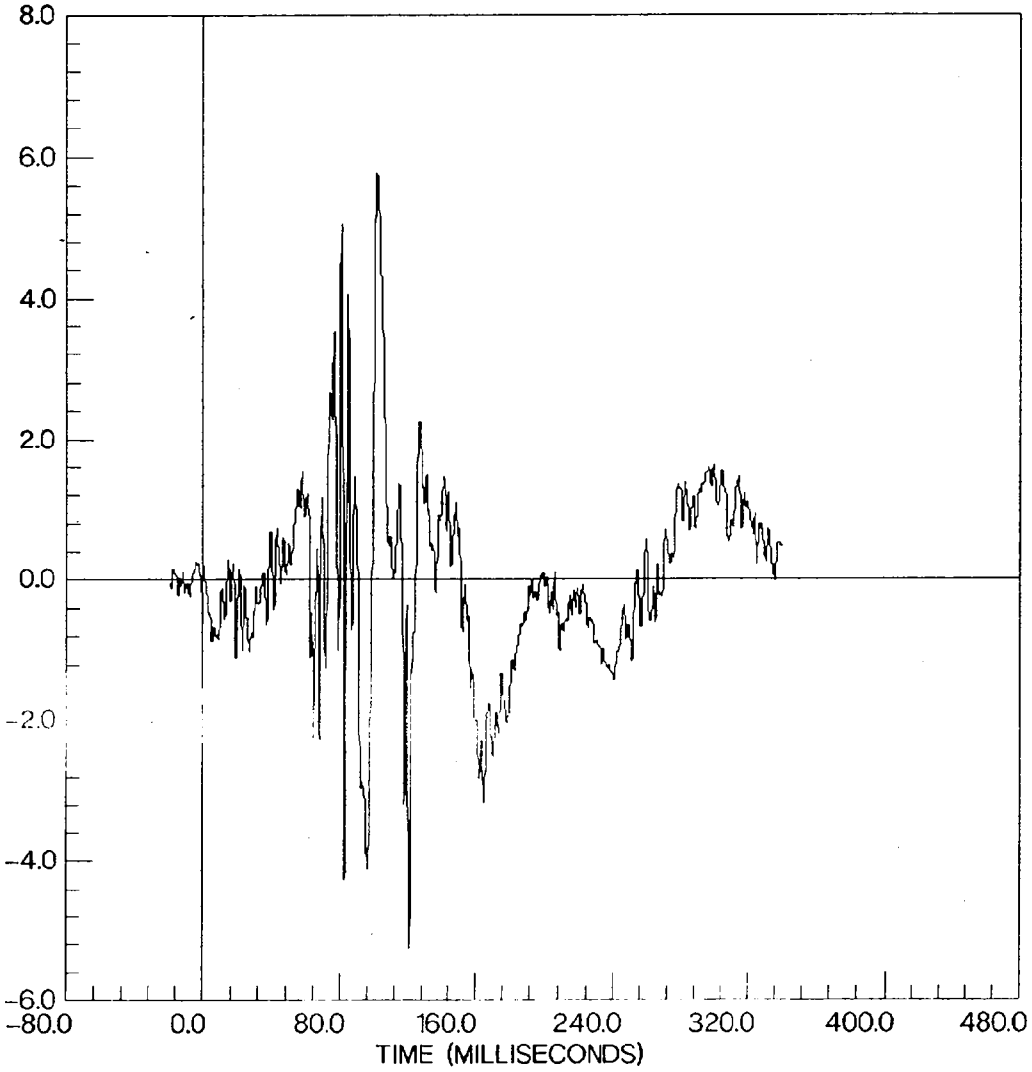
YG AXIS
YMIN =-21.03490 at 82.00000 msec
YMAX = 35.13813 at 94.87500 msec



V0691AFE0.037

TRC OF OHIO 840209 34.40 mph ITV

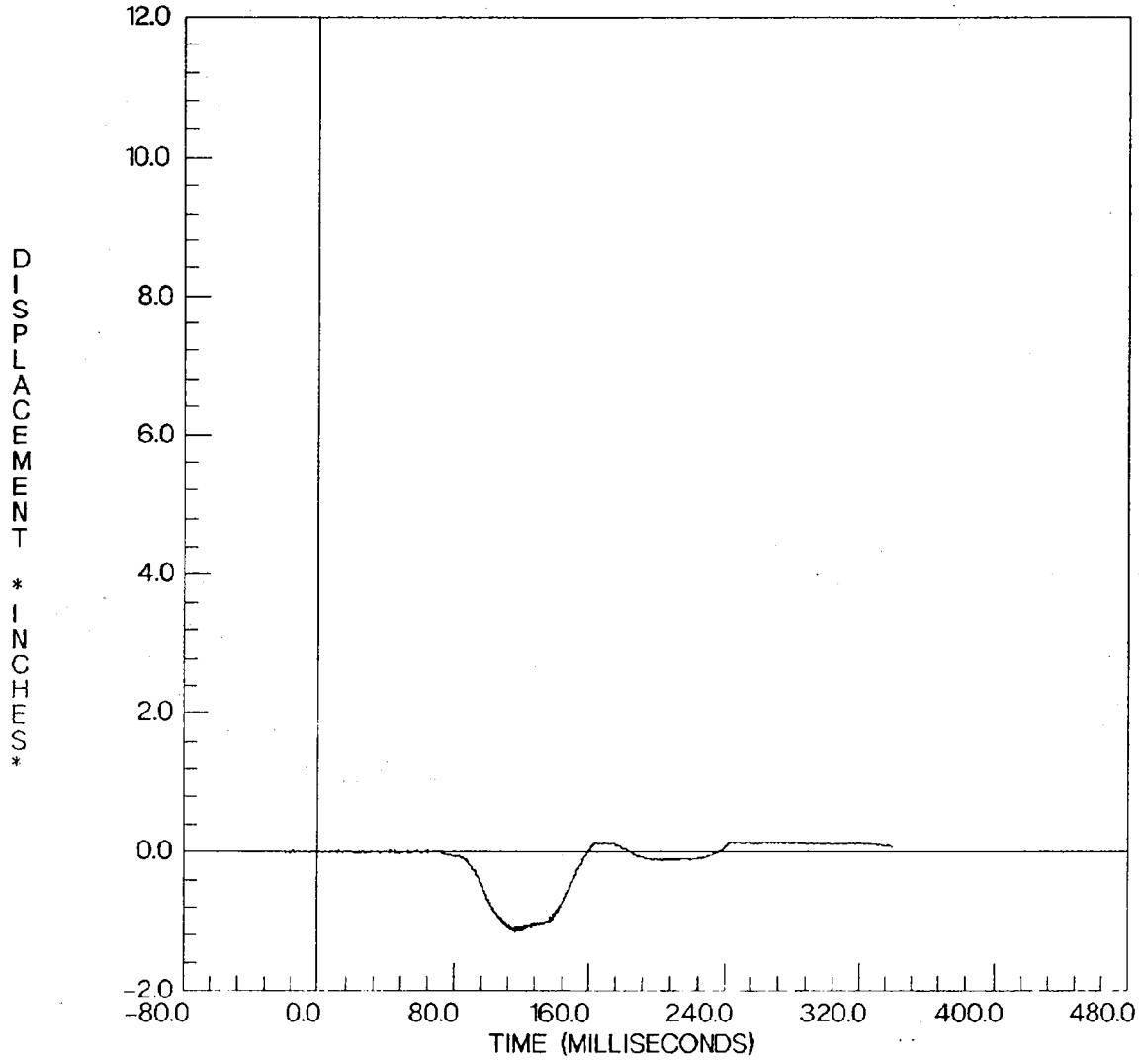
81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
PELVIS - CENTER ZG AXIS
FILTERED YMIN =-5.282119 at 120.6250 msec
FILTER CUTOFF: 300Hz YMAX = 5.793616 at 101.7500 msec
PEVZG3



V0691DA00.038

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID
SEAT TRACK - LEFT REAR YG AXIS
YMIN =-1.166200 at 116.0000 msec
FILTER CUTOFF: 1650Hz YMAX = 0.152690 at 255.0000 msec
LEFT RIB TO SPINE DISPLACEMENT



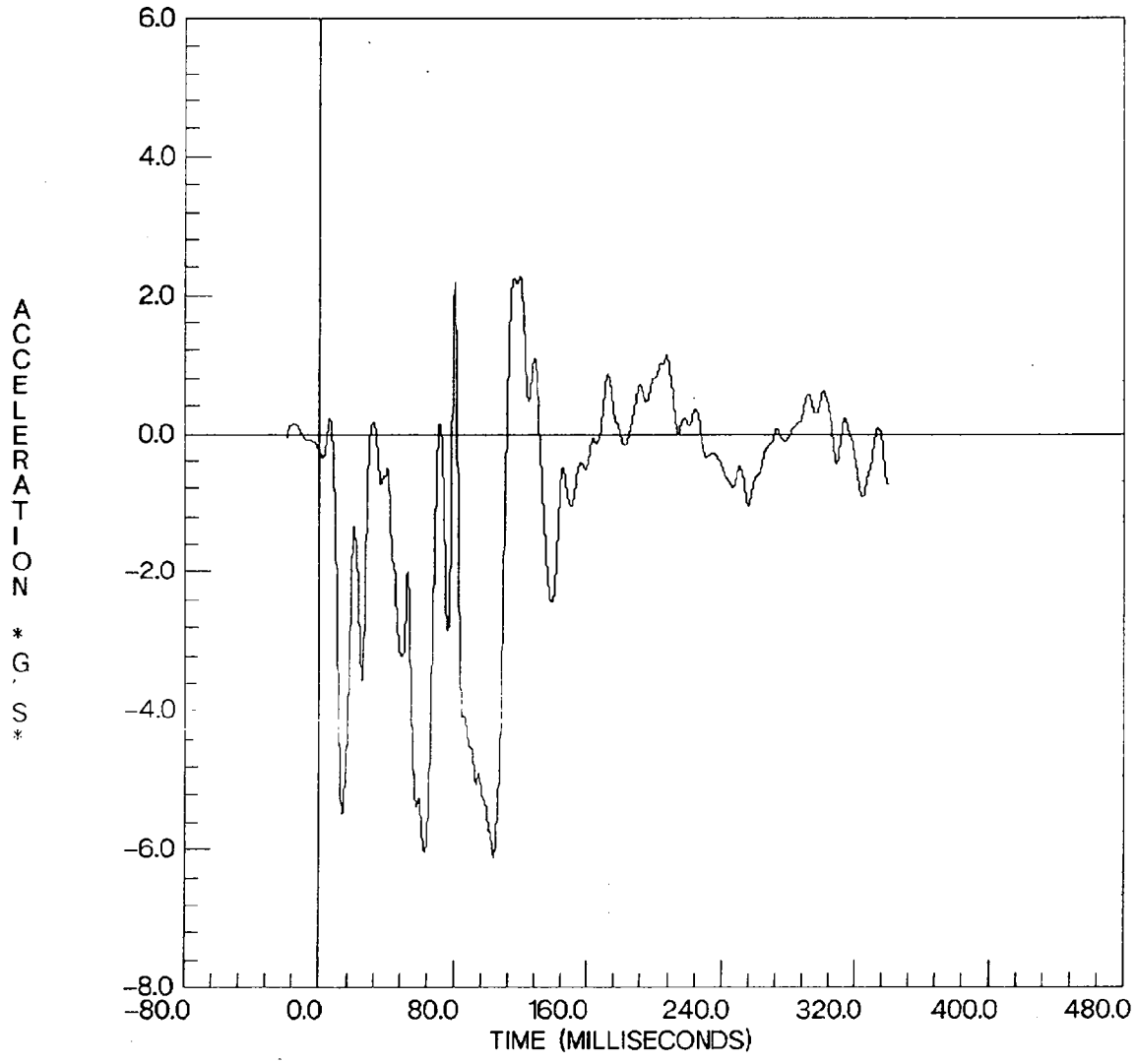
V0691AFD0.039

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

SILL - RIGHT FRONT
FILTERED
FILTER CUTOFF: 100Hz

XG AXIS
YMIN =-6.113423 at 103.3750 msec
YMAX = 2.267261 at 118.5000 msec



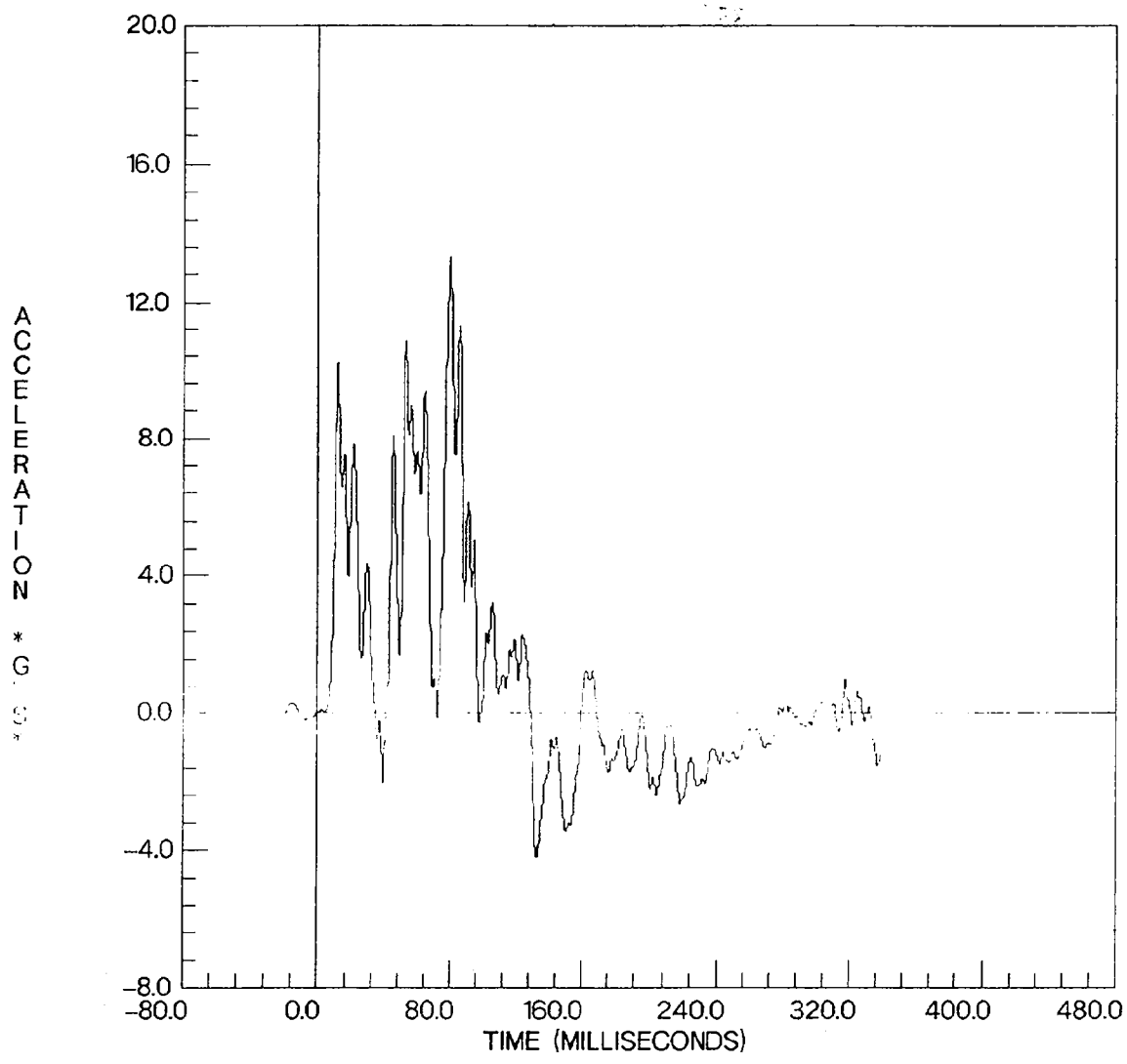
V0691AFD0.040

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

SILL - RIGHT FRONT
FILTERED
FILTER CUTOFF: 100Hz

YG AXIS
YMIN =-4.205722 at 132.6250 msec
YMAX = 13.35641 at 79.75000 msec



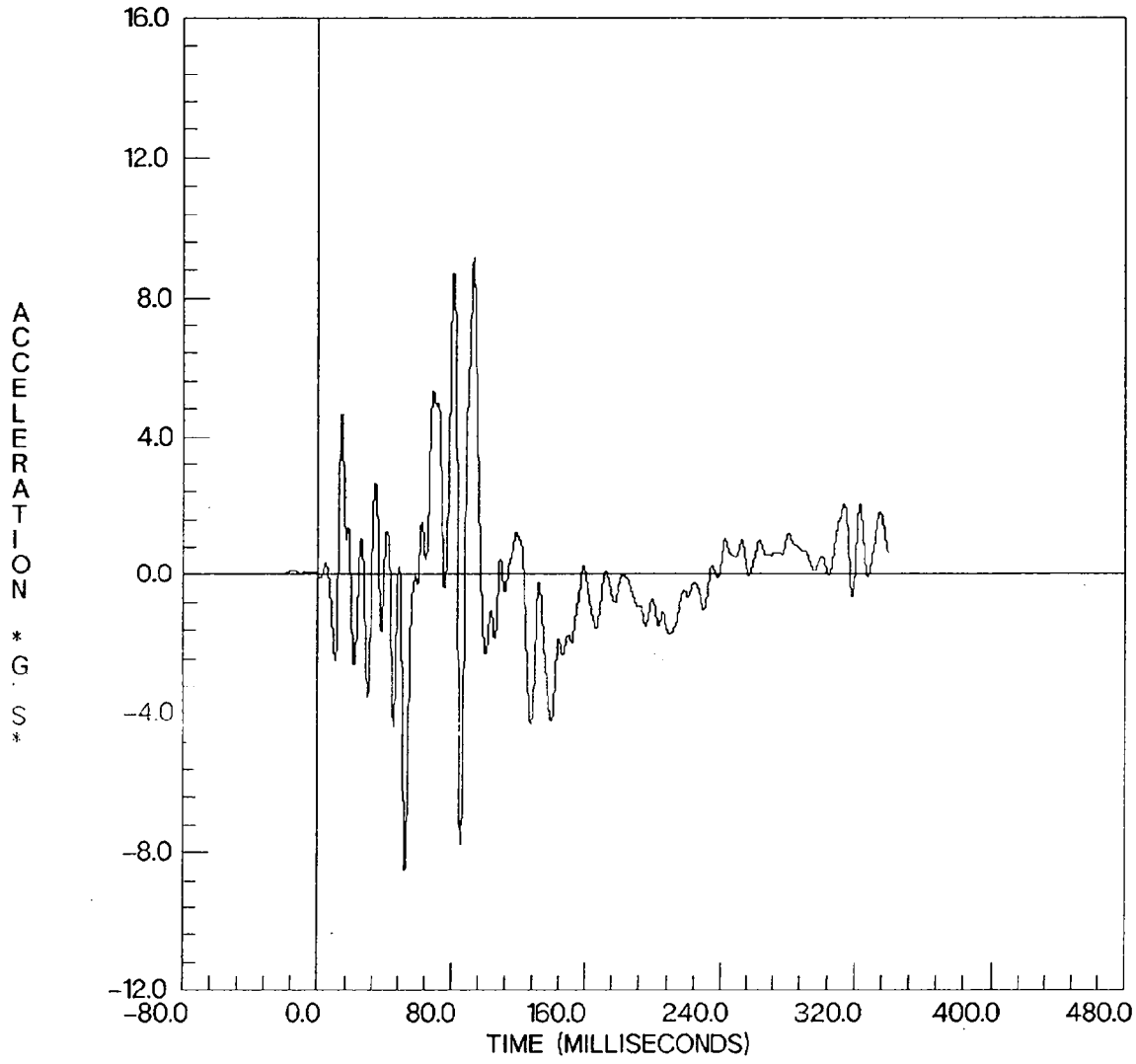
V0691AFD0.041

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

SILL - RIGHT FRONT
FILTERED
FILTER CUTOFF: 100Hz

ZG AXIS
YMIN =-8.494411 at 52.00000 msec
YMAX = 9.169165 at 92.62500 msec



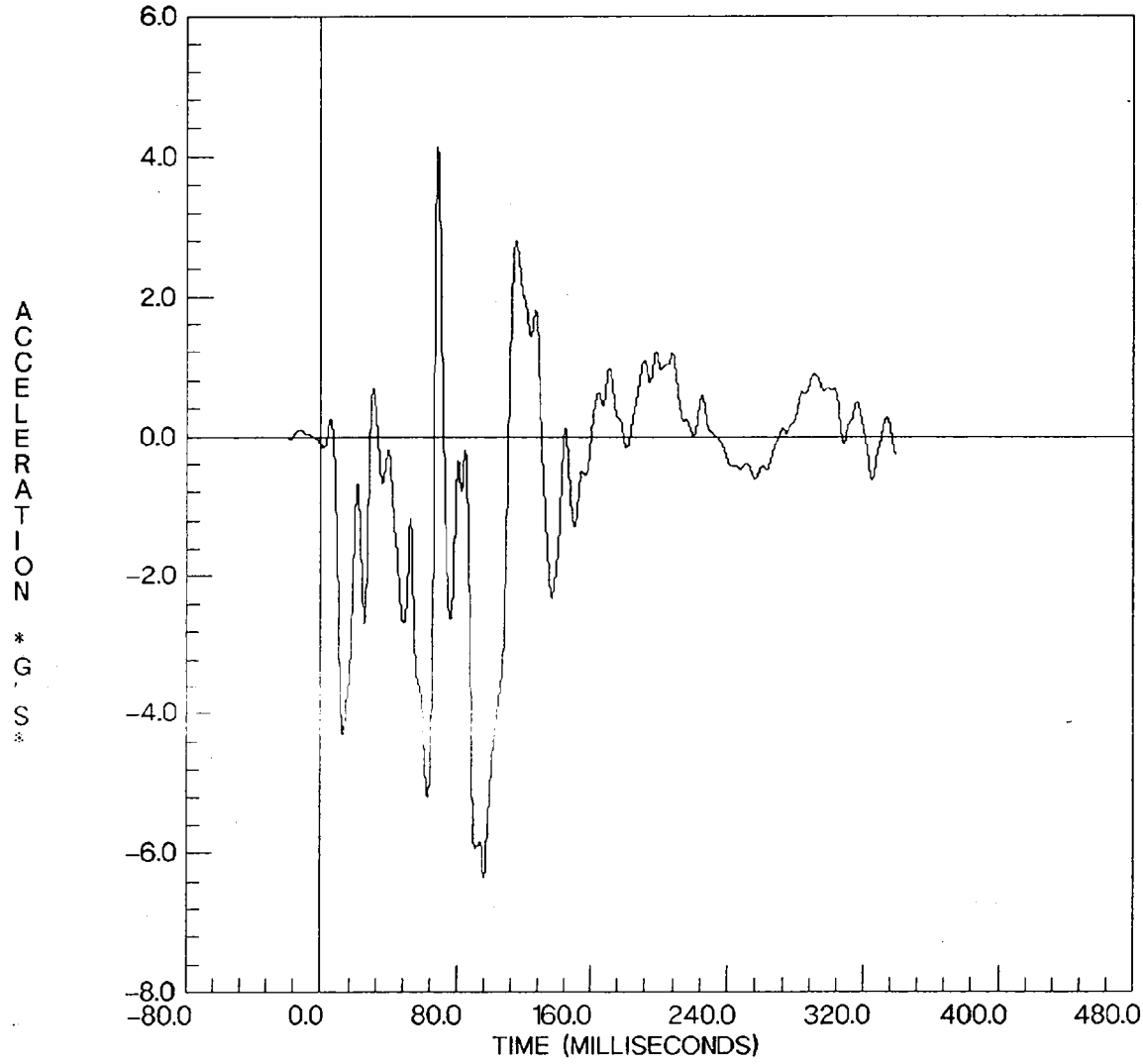
V0691AFD0.042

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

SILL - RIGHT REAR
FILTERED
FILTER CUTOFF: 100Hz

XG AXIS
YMIN =-6.371121 at 96.12500 msec
YMAX = 4.141102 at 68.75000 msec



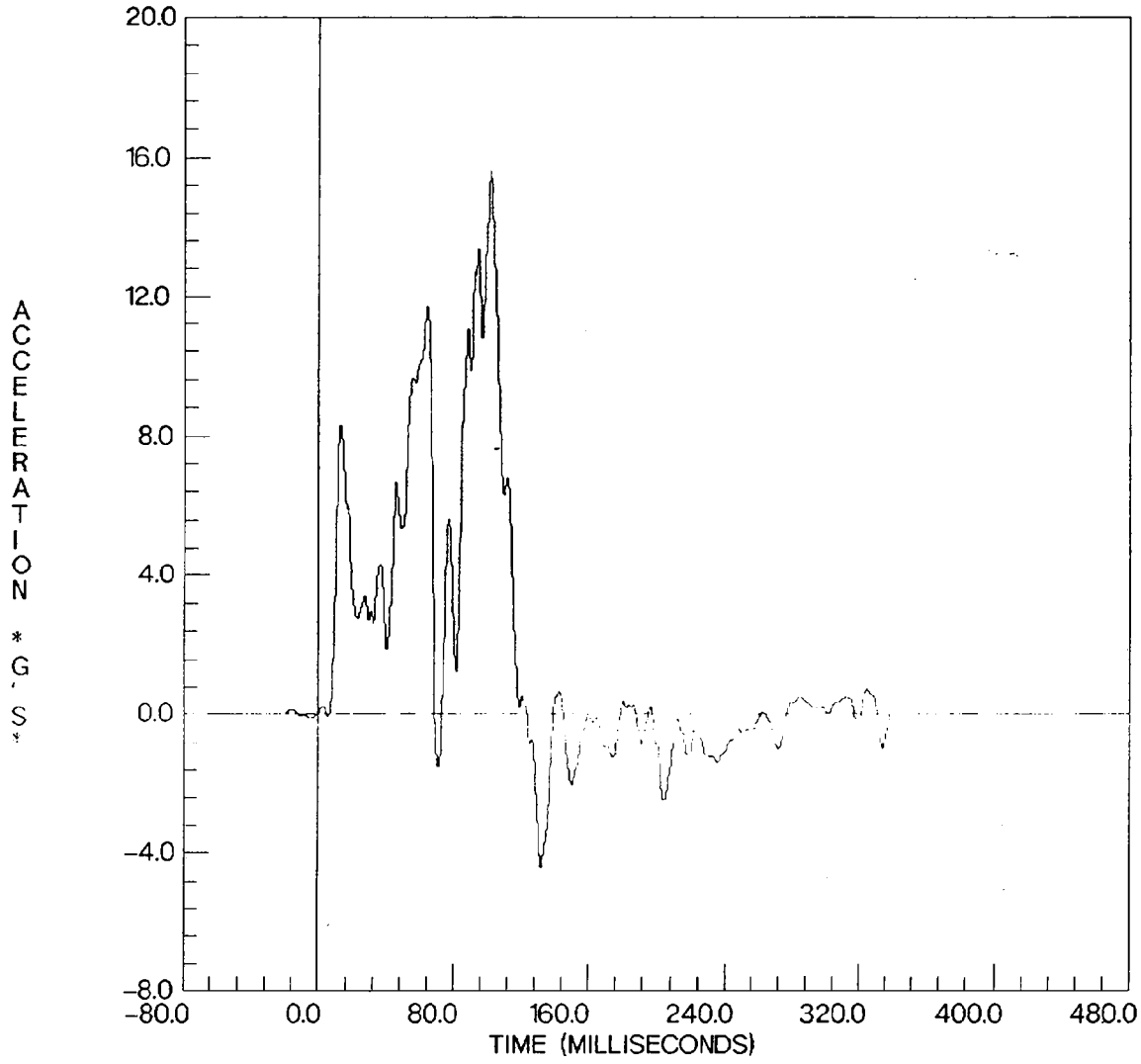
V0691AFD0.043

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

SILL - RIGHT REAR
FILTERED
FILTER CUTOFF: 100Hz

YG AXIS
YMIN =-4.408386 at 131.5000 msec
YMAX = 15.64024 at 101.5000 msec



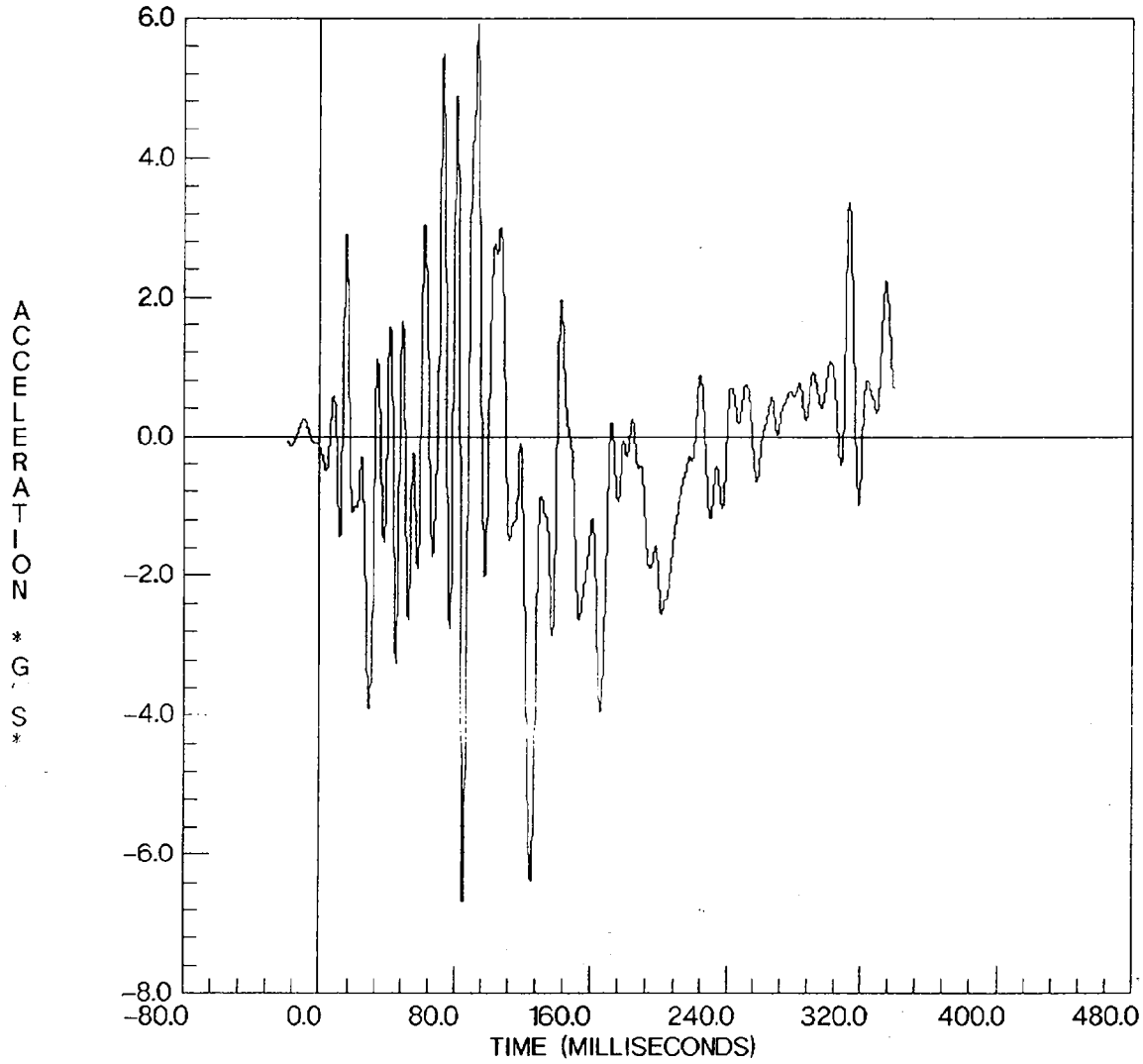
V0691AFD0.044

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

SILL - RIGHT REAR
FILTERED
FILTER CUTOFF: 100Hz

ZG AXIS
YMIN =-6.683077 at 84.87500 msec
YMAX = 5.929084 at 92.87500 msec



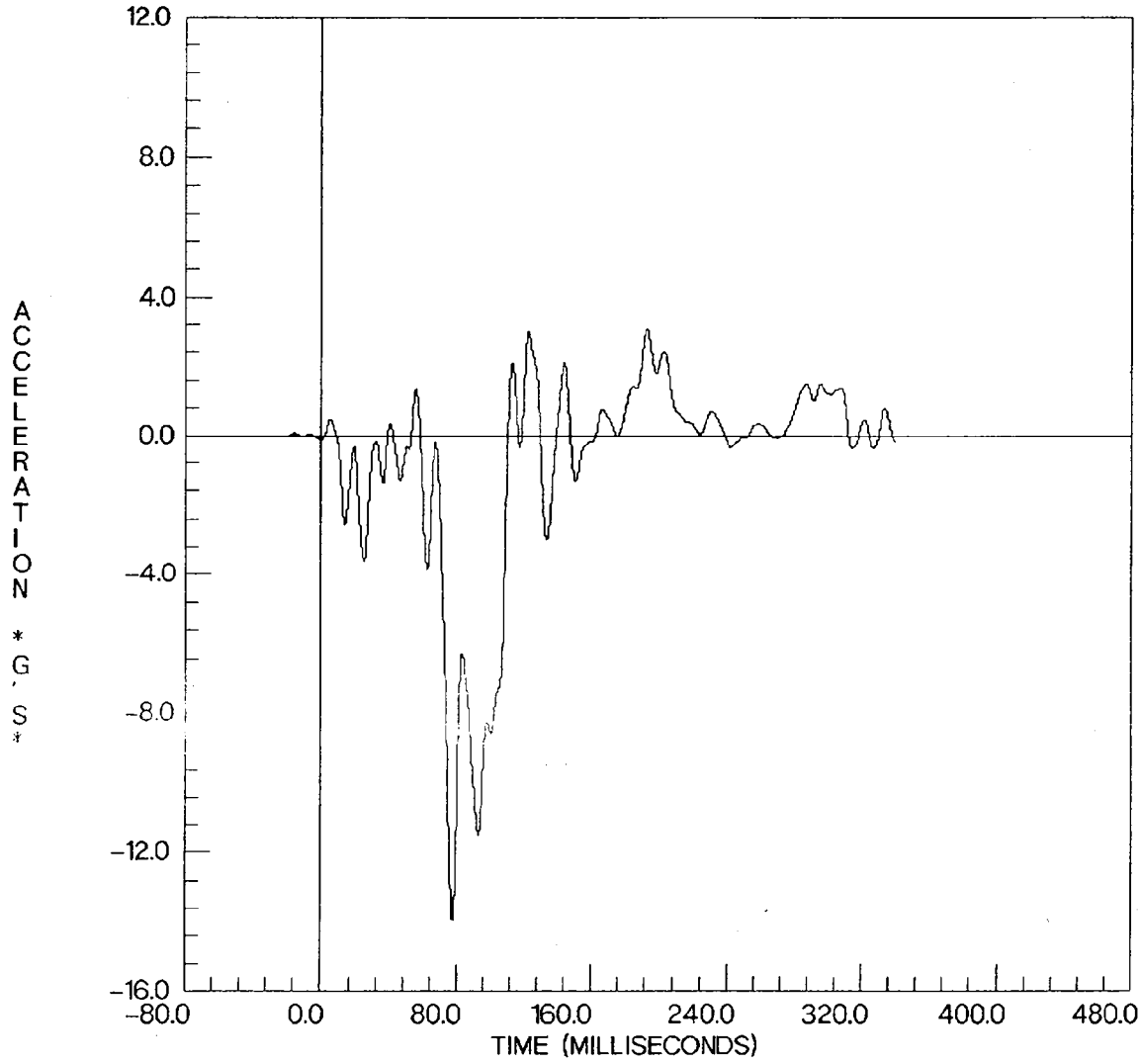
V0691AFD0.045

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

REAR DECK
FILTERED
FILTER CUTOFF: 100Hz

XG AXIS
YMIN =-13.95648 at 77.62500 msec
YMAX = 3.075167 at 192.5000 msec



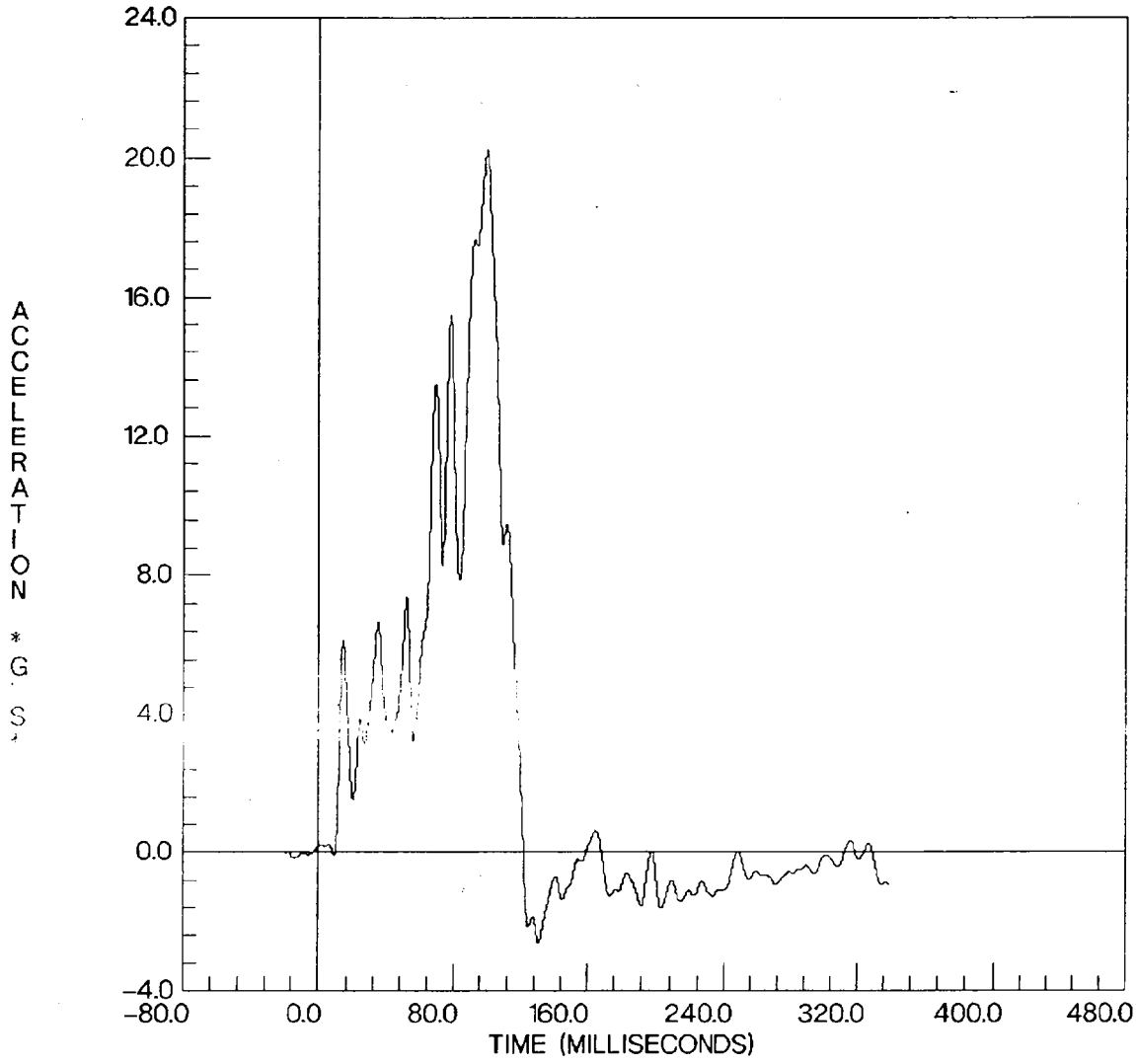
V0691AFD0.046

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

REAR DECK
FILTERED
FILTER CUTOFF: 100Hz

YG AXIS
YMIN =-2.625086 at 130.6250 msec
YMAX = 20.23344 at 99.62500 msec



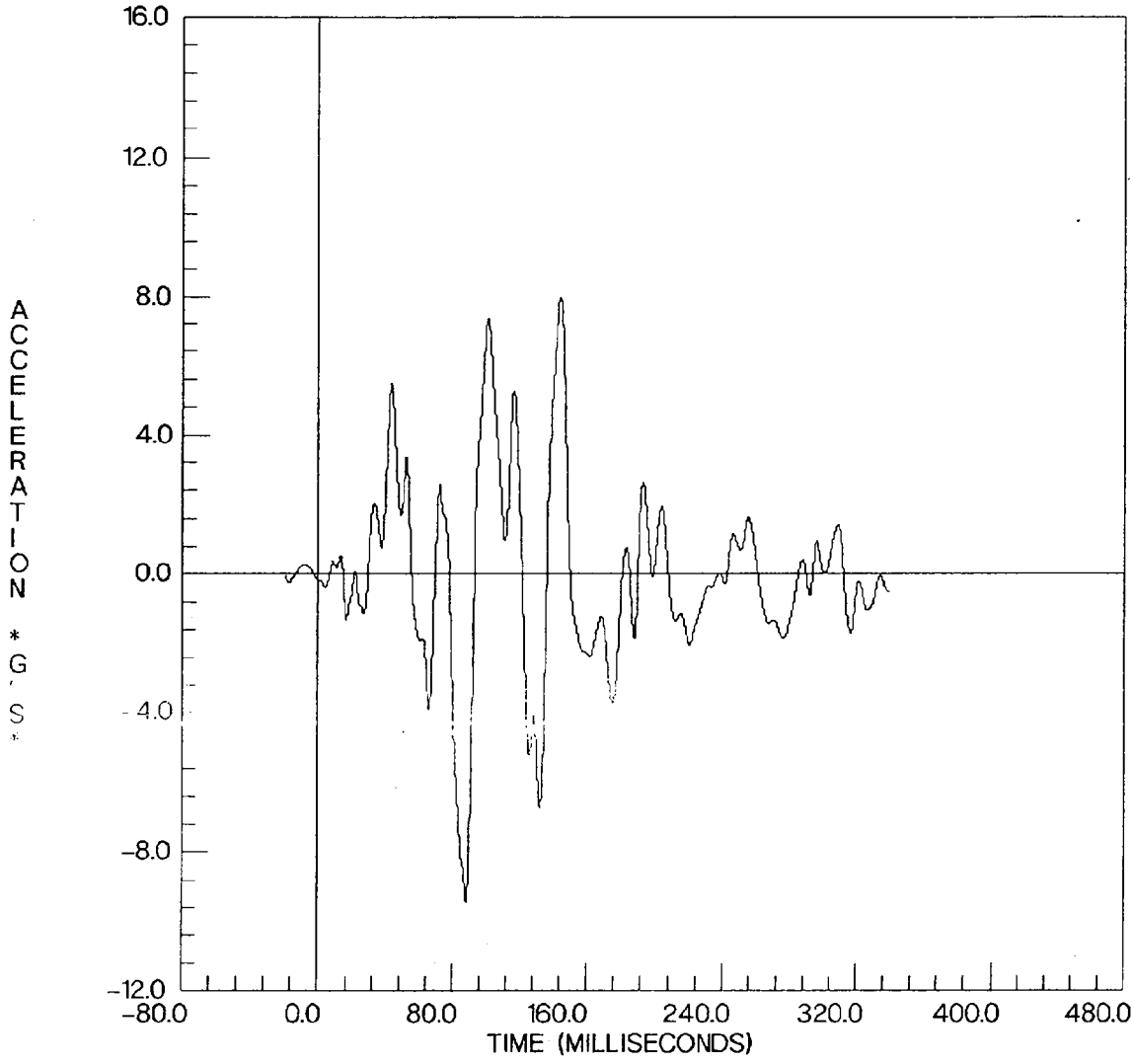
V0691AFD0.047

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

REAR DECK
FILTERED
FILTER CUTOFF: 100Hz

ZG AXIS
YMIN =-9.443806 at 88.37500 msec
YMAX = 7.972700 at 144.0000 msec



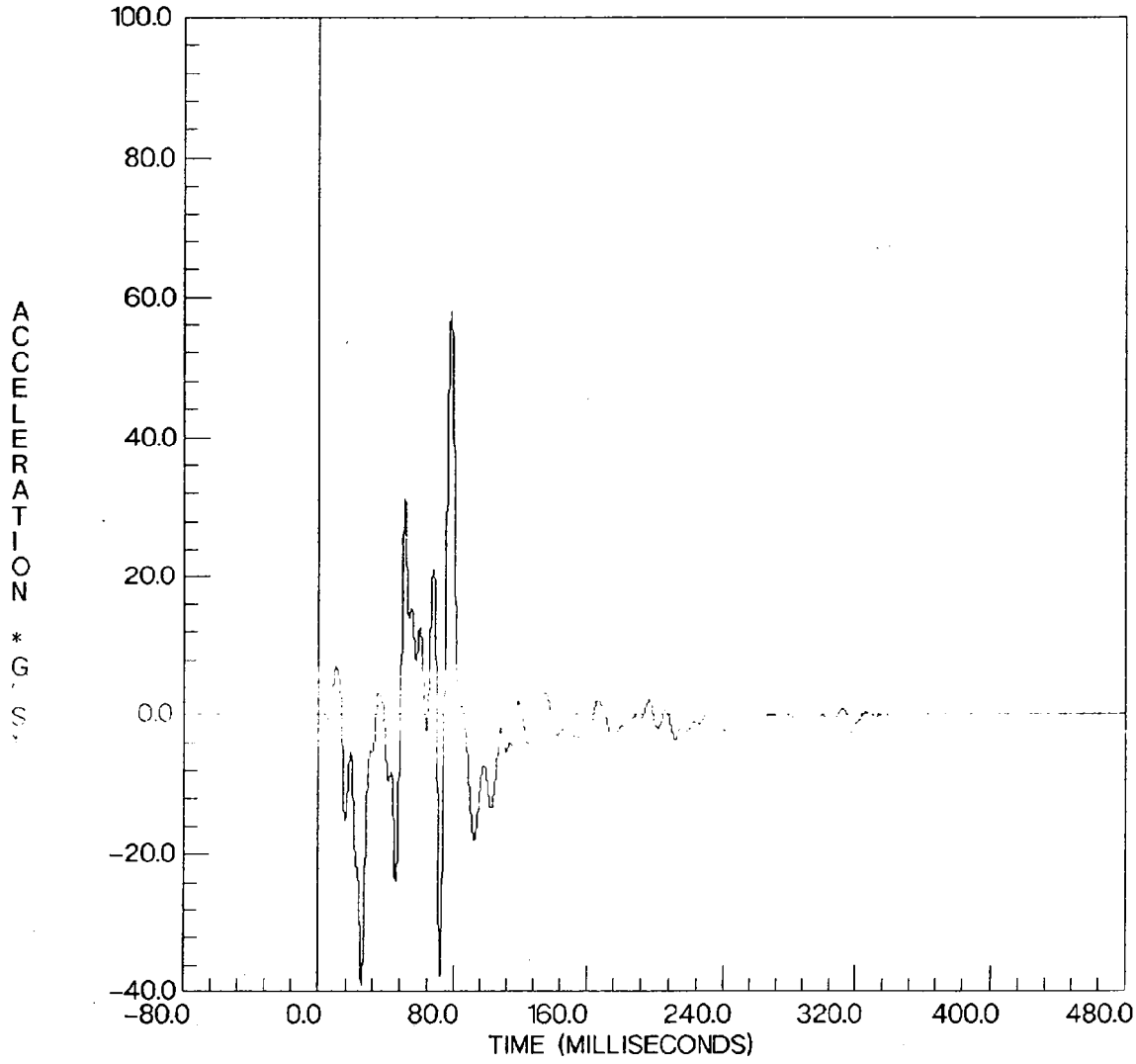
V0691AFD0.048

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

SILL - LEFT REAR
FILTERED
FILTER CUTOFF: 100Hz

YG AXIS
YMIN =-39.28767 at 25.87500 msec
YMAX = 58.12289 at 77.87500 msec



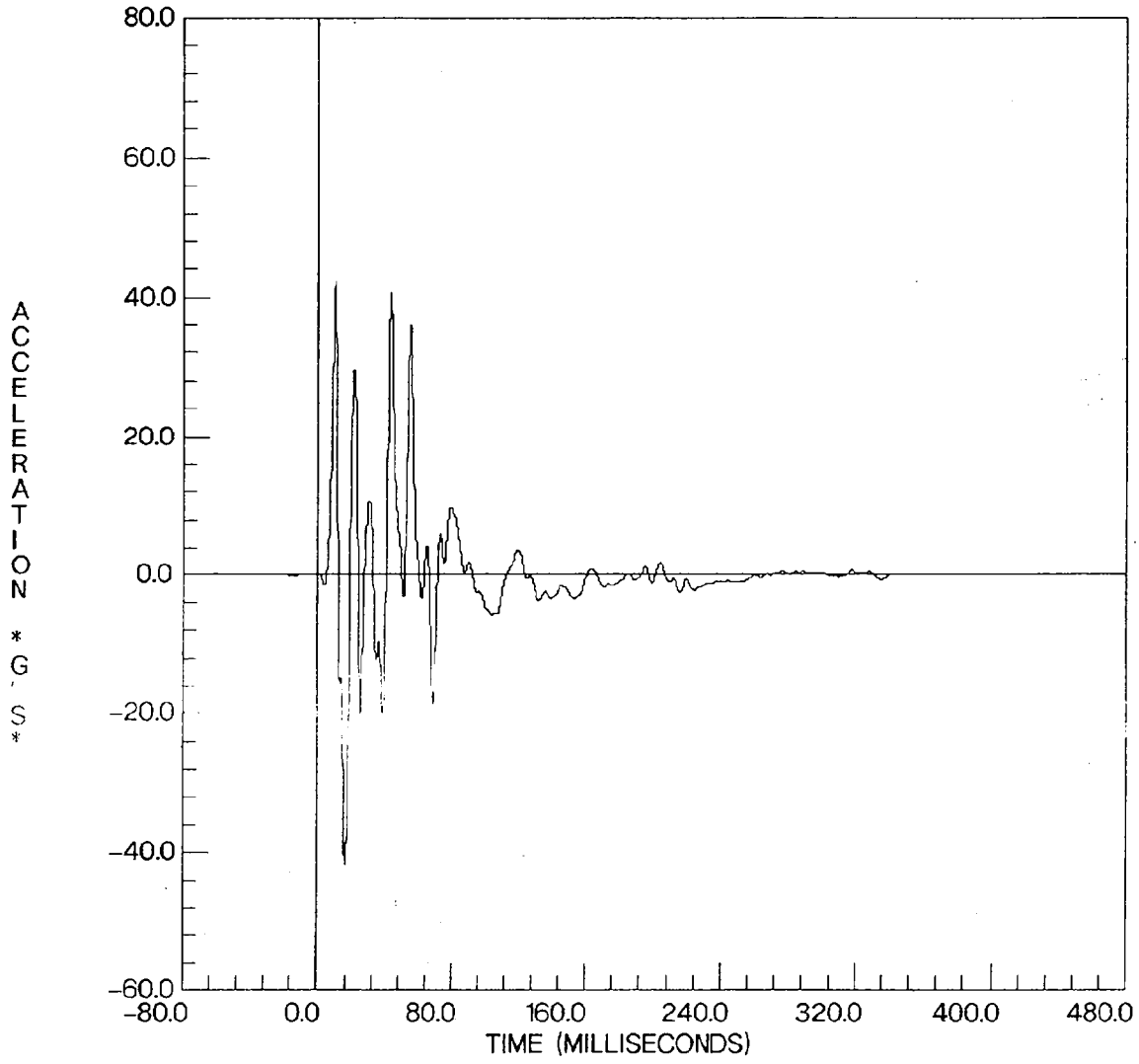
V0691AFD0.049

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

SILL - LEFT FRONT
FILTERED
FILTER CUTOFF: 100Hz

YG AXIS
YMIN =-41.72081 at 16.37500 msec
YMAX = 42.23278 at 9.875000 msec



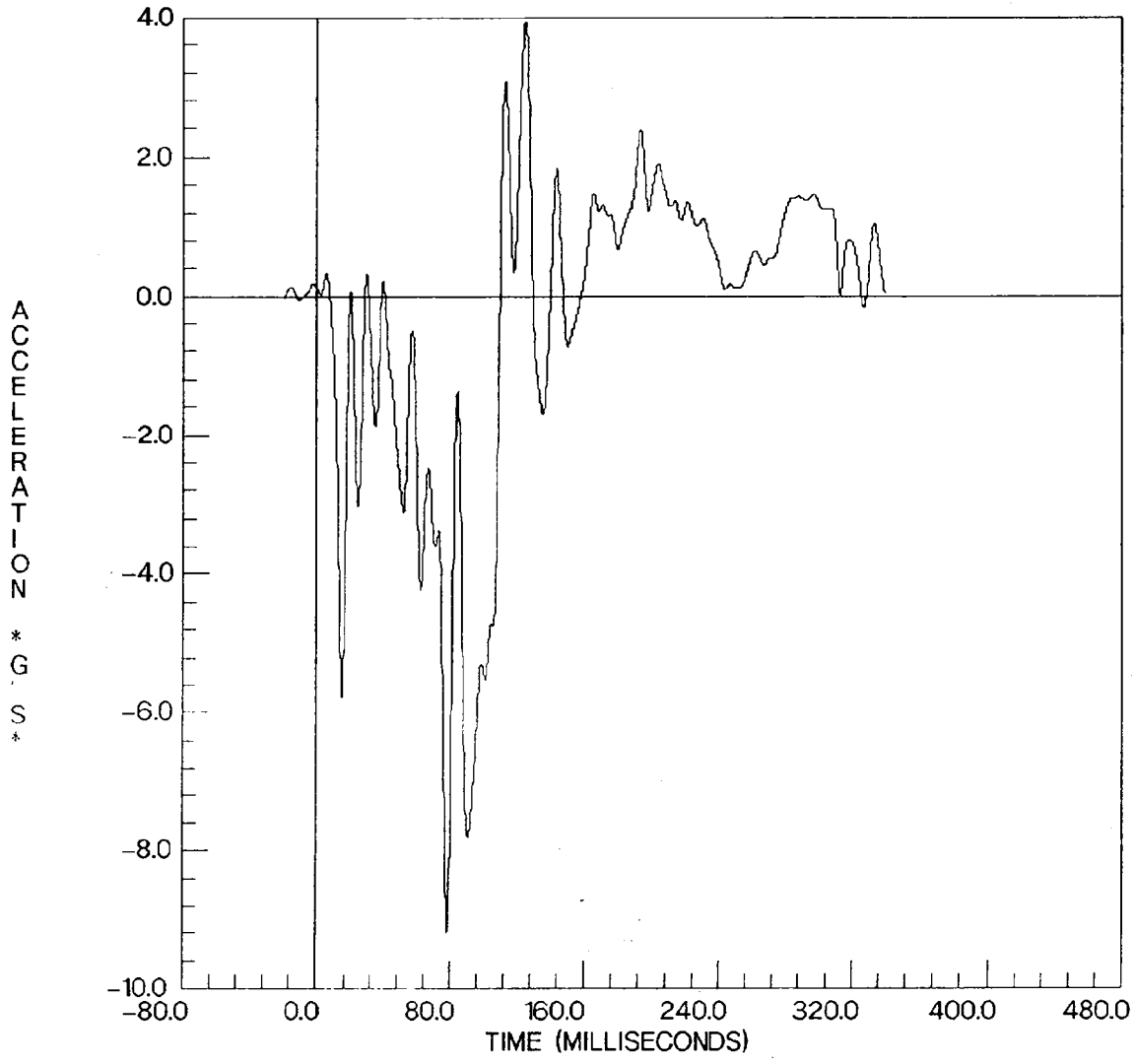
V0691AFD0.050

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

TRUCK FLOOR - RIGHT
FILTERED
FILTER CUTOFF: 100Hz

XG AXIS
YMIN =-9.208614 at 78.37500 msec
YMAX = 3.924487 at 124.3750 msec



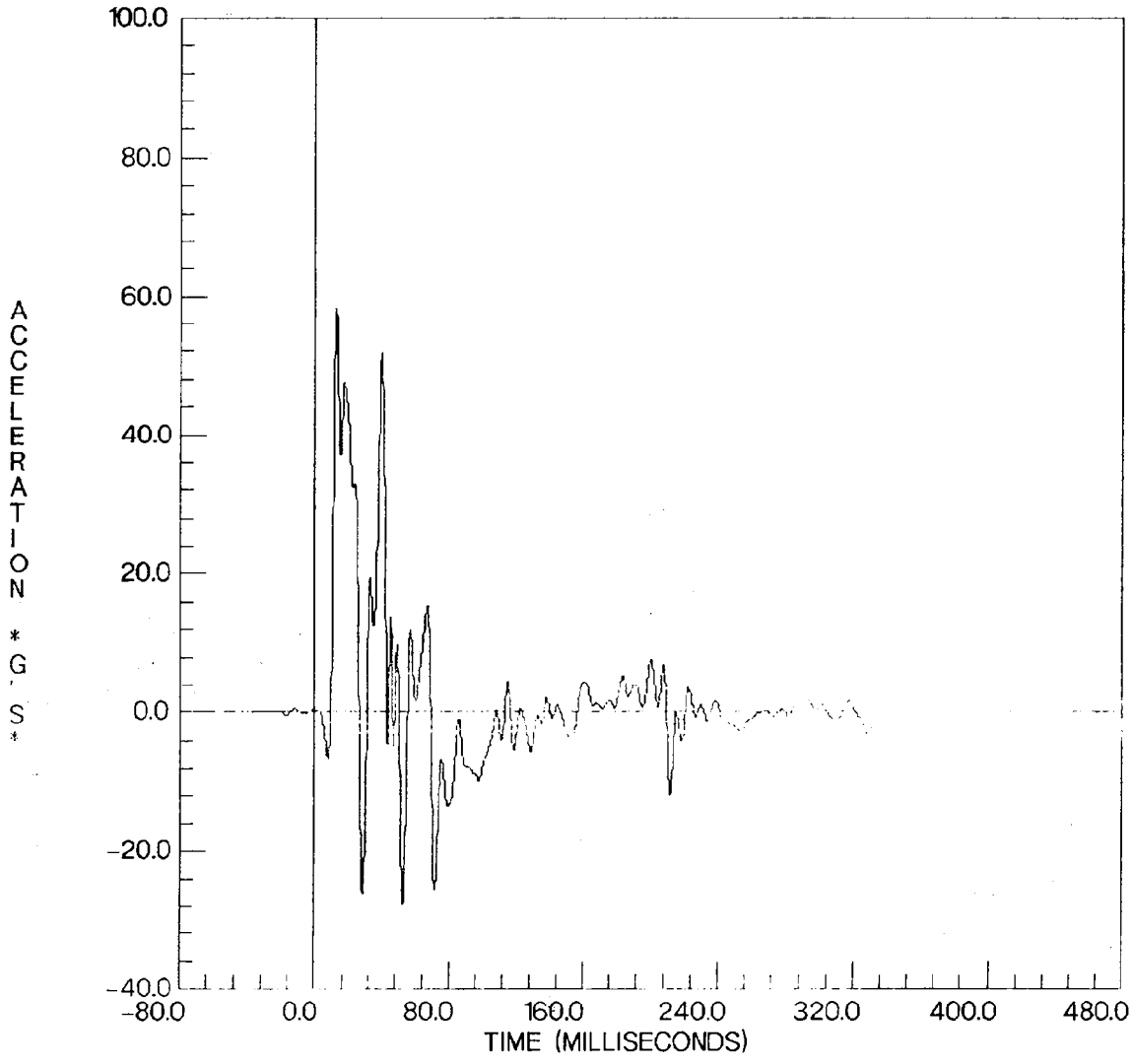
V0691AFD0.051

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

DOOR - LEFT FRONT
FILTERED
FILTER CUTOFF: 100Hz
LEFT FRONT DOOR POSITION 6

YG AXIS
YMIN =-27.68069 at 53.00000 msec
YMAX = 58.29241 at 12.50000 msec



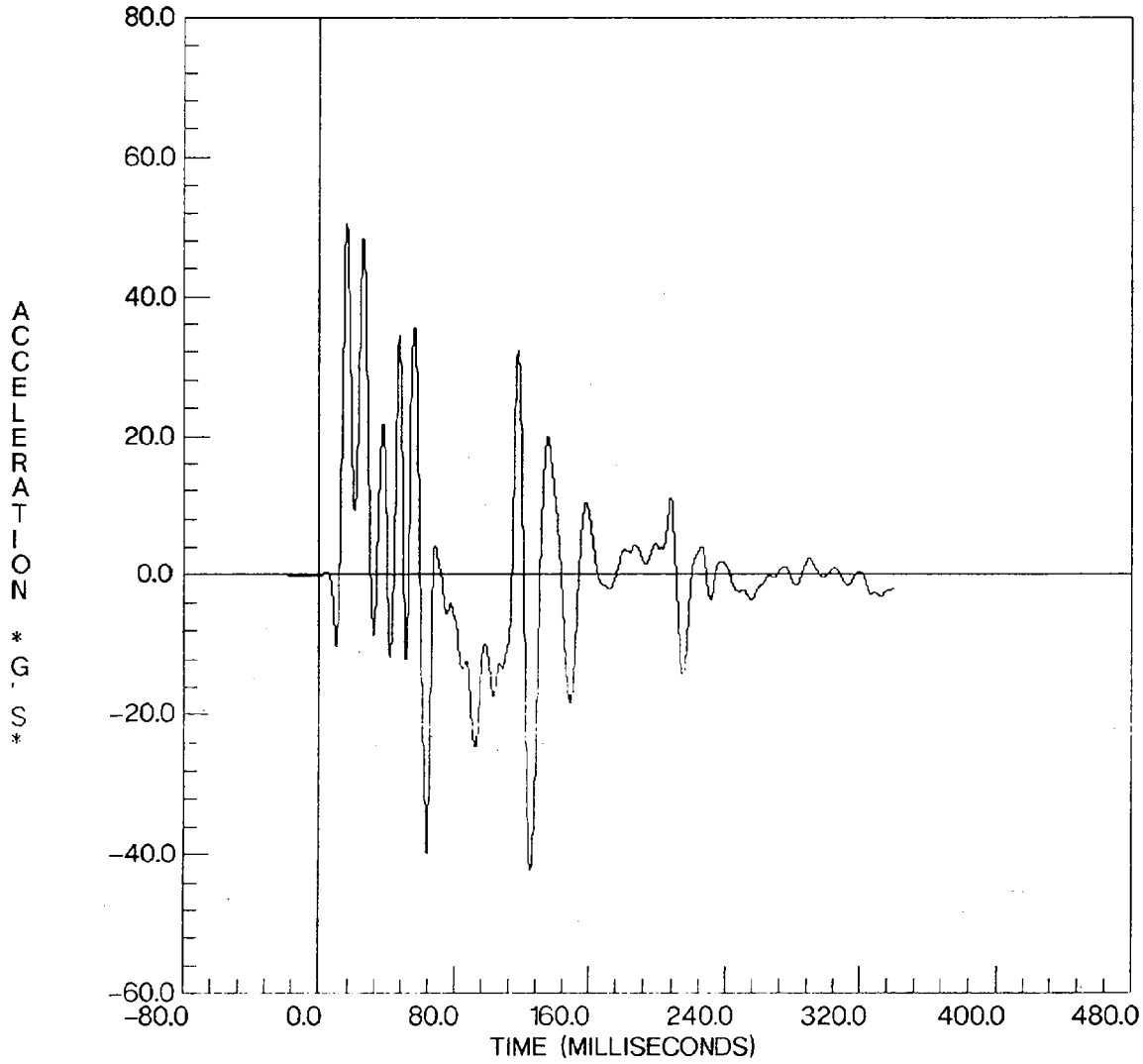
V0691AFD0.052

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

DOOR - LEFT FRONT
FILTERED
FILTER CUTOFF: 100Hz
LEFT FRONT DOOR POSITION 8

YG AXIS
YMIN =-42.34294 at 124.7500 msec
YMAX = 50.49724 at 15.62500 msec



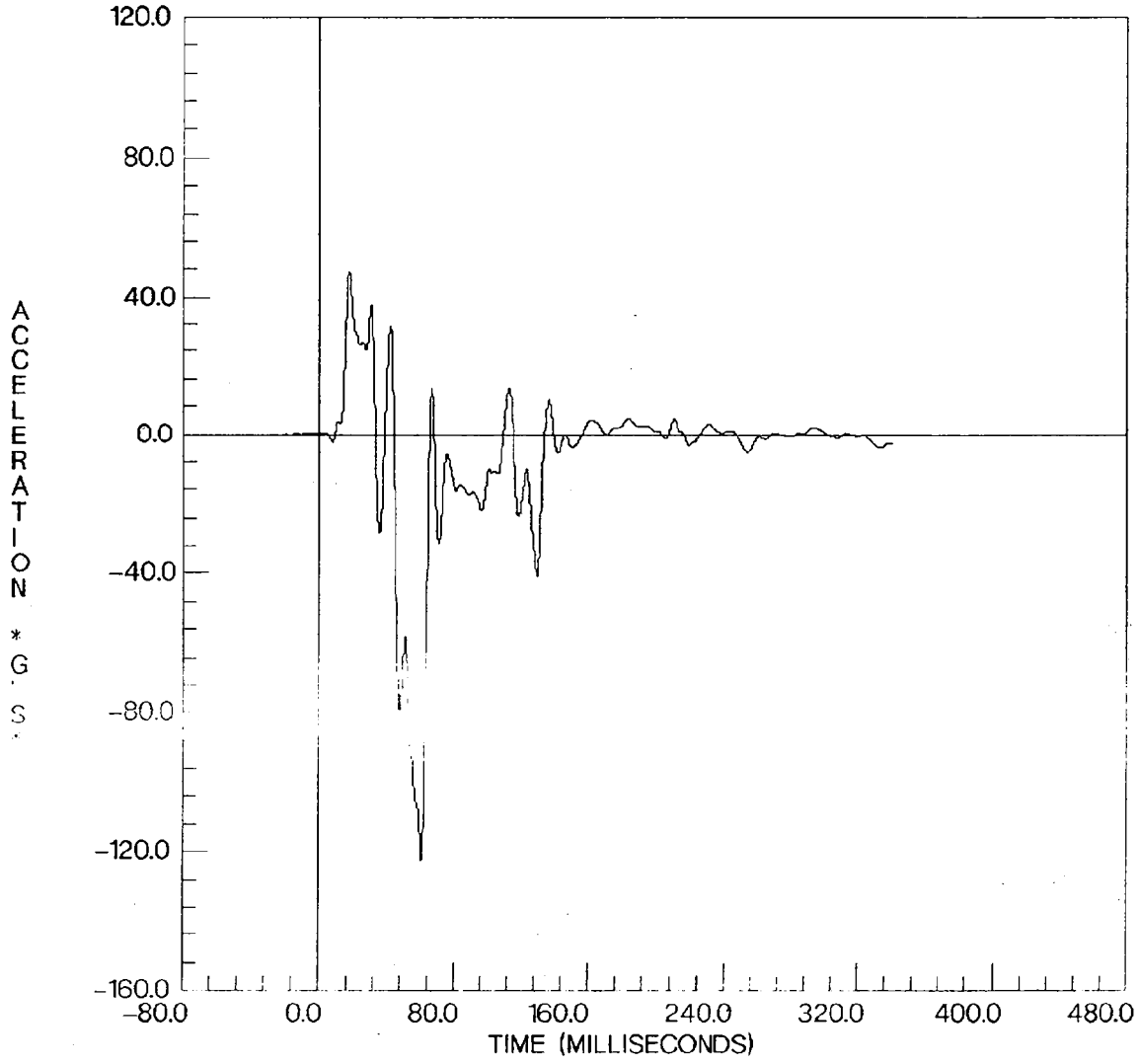
V0691AFD0.053

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

DOOR - LEFT FRONT
FILTERED
FILTER CUTOFF: 100Hz
LEFT FRONT DOOR POSITION 9

YG AXIS
YMIN =-122.7172 at 60.62500 msec
YMAX = 47.86271 at 17.62500 msec



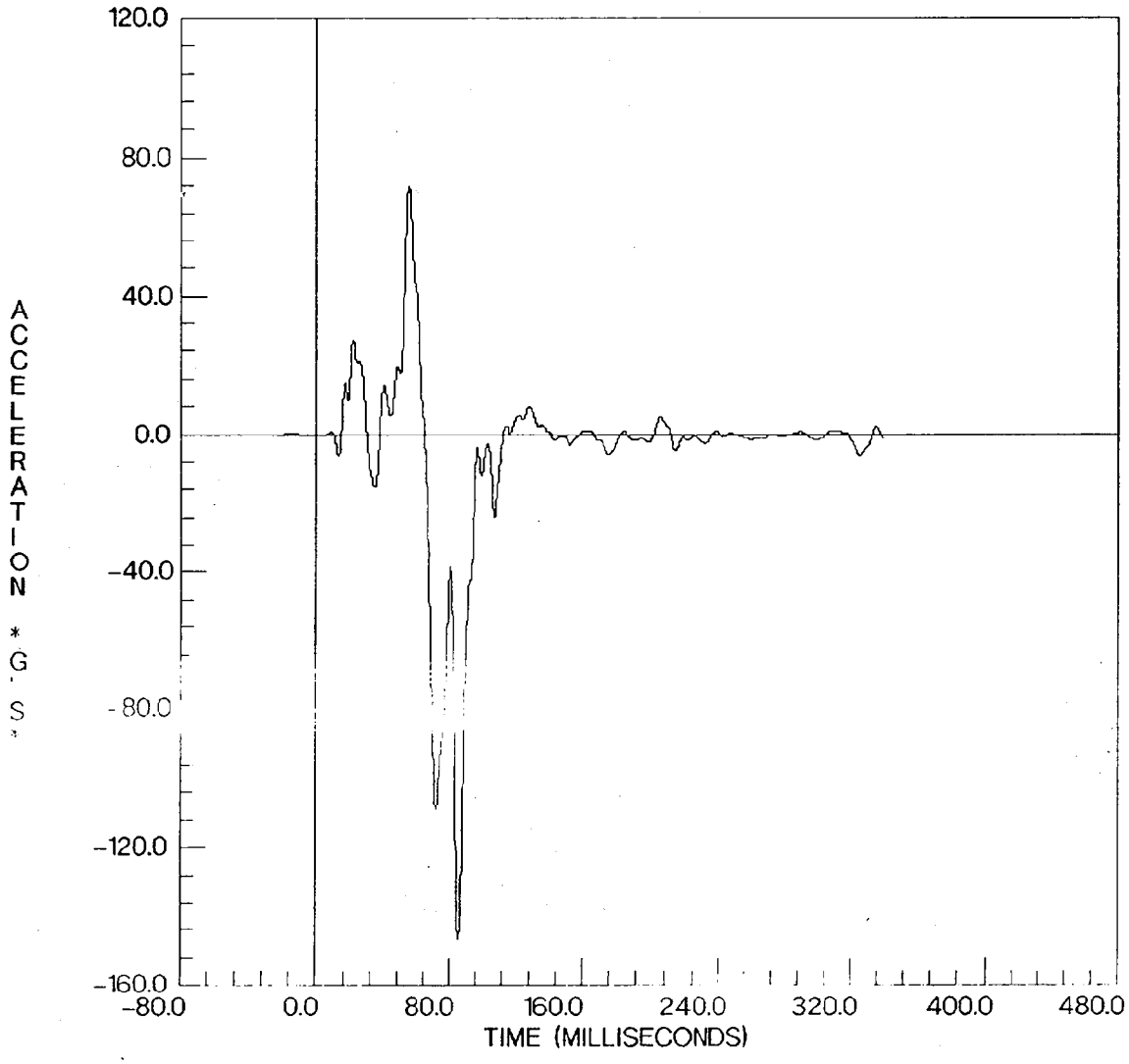
V0691AFD0.054

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

DOOR - LEFT REAR
FILTERED
FILTER CUTOFF: 100Hz
LEFT REAR DOOR POSITION 10

YG AXIS
YMIN =-146.9816 at 85.37500 msec
YMAX = 72.12779 at 54.87500 msec



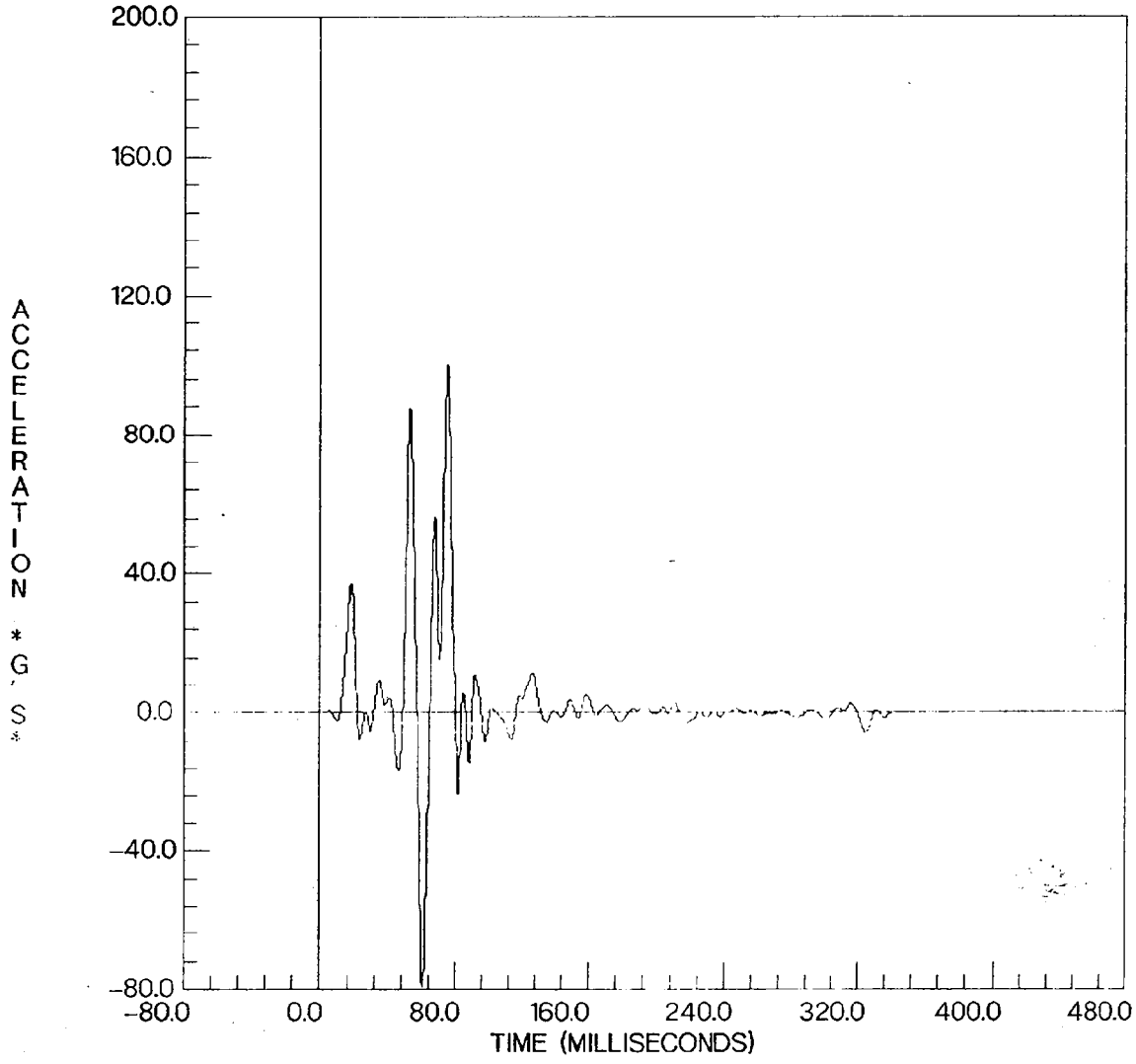
V0691AFD0.055

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2

DOOR - LEFT REAR
FILTERED
FILTER CUTOFF: 100Hz
LEFT REAR DOOR POSITION 11

YG AXIS
YMIN =-79.68889 at 60.87500 msec
YMAX = 100.0770 at 75.25000 msec



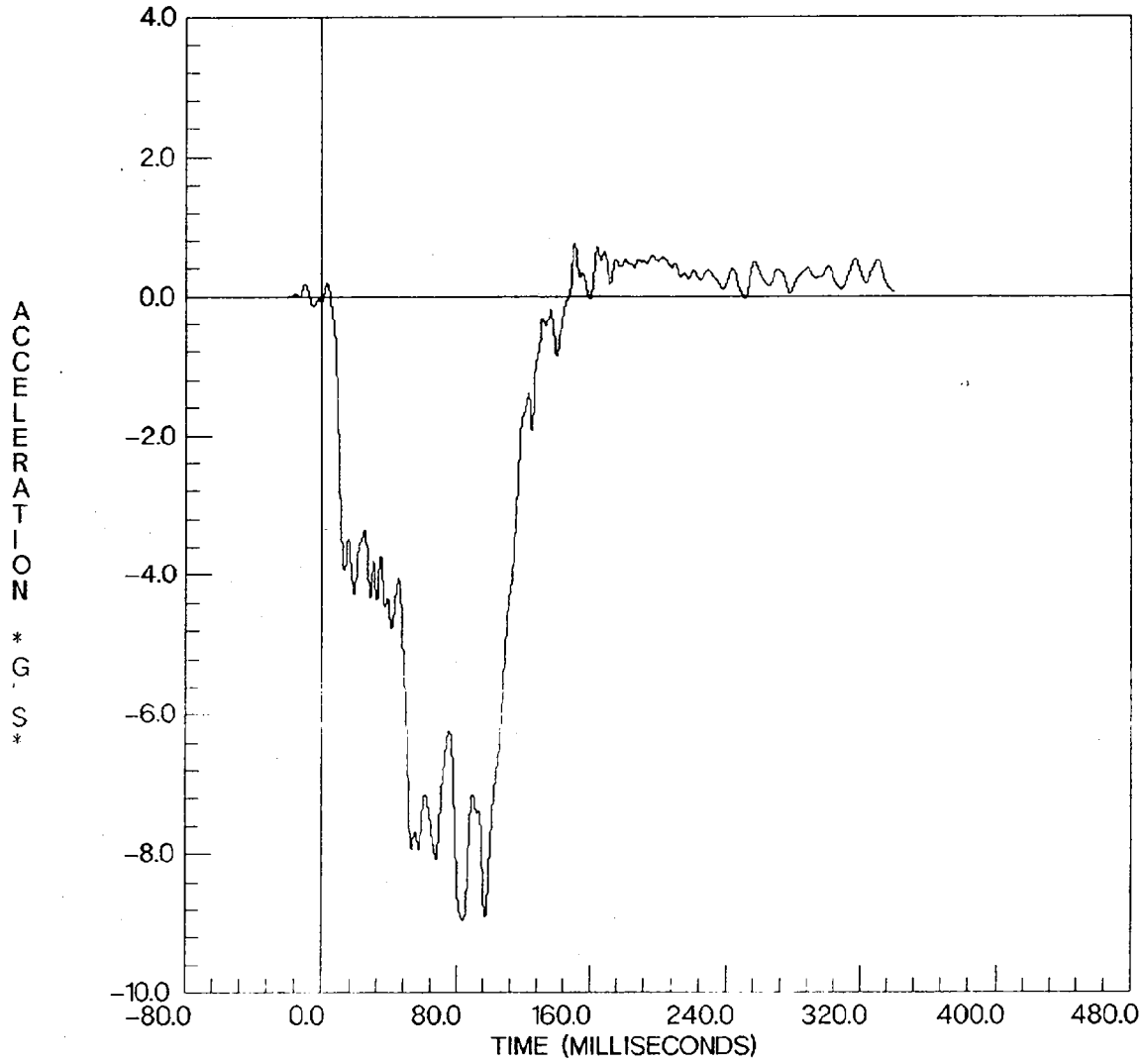
V0691AFD0.056

TRC OF OHIO 840209 34.40 mph ITV

99 NHTSA DEFORMABLE IMPACTOR NOT APPLICABLE
VEH 1

IMPACTOR CG
FILTERED
FILTER CUTOFF: 100Hz

XG AXIS
YMIN =-8.970689 at 84.12500 msec
YMAX = 0.764770 at 149.8750 msec



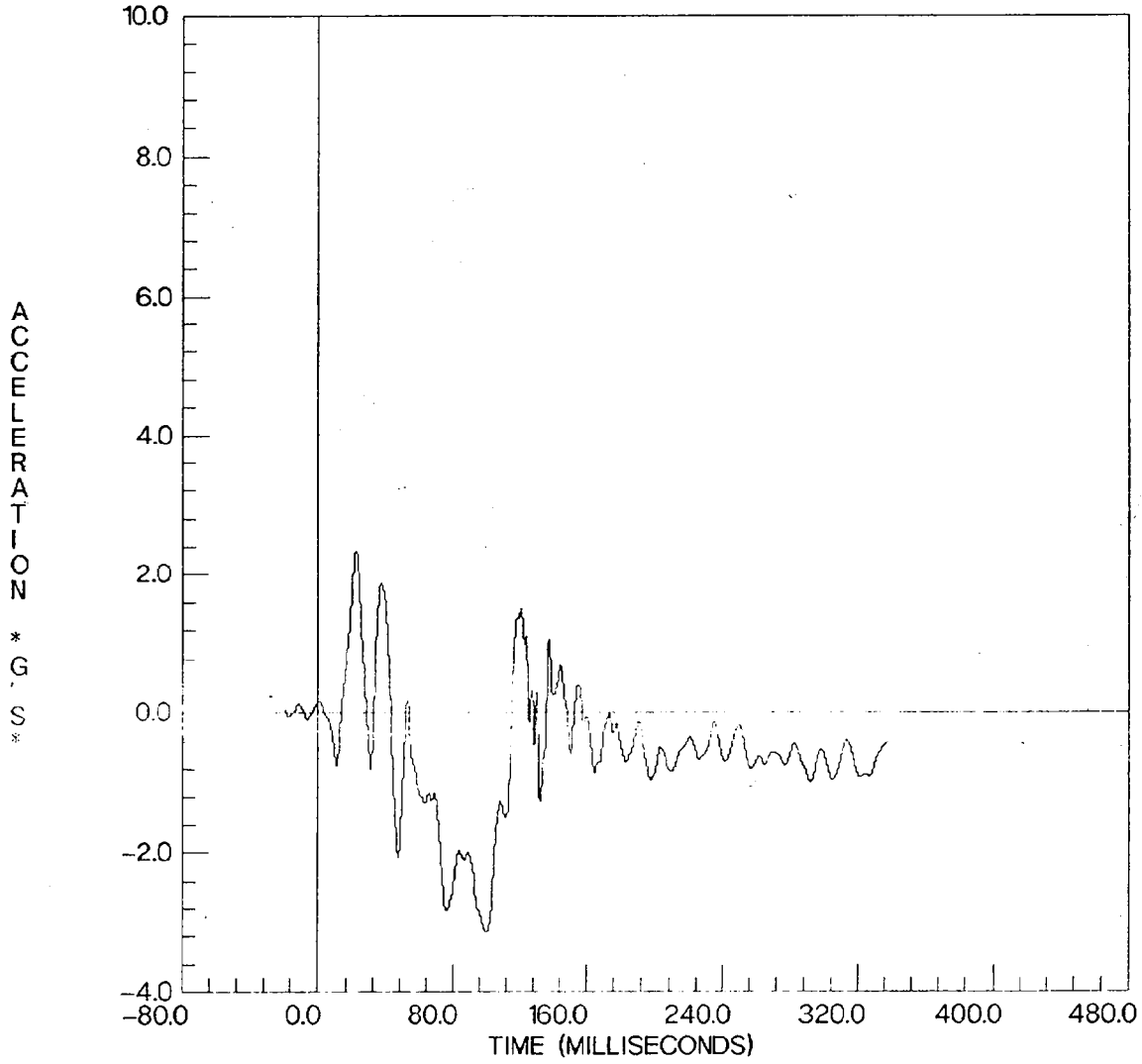
V0691AFD0.057

TRC OF OHIO 840209 34.40 mph ITV

99 NHTSA DEFORMABLE IMPACTOR NOT APPLICABLE
VEH 1

IMPACTOR CG
FILTERED
FILTER CUTOFF: 100Hz

YG AXIS
YMIN =-3.139046 at 100.2500 msec
YMAX = 2.339998 at 21.87500 msec



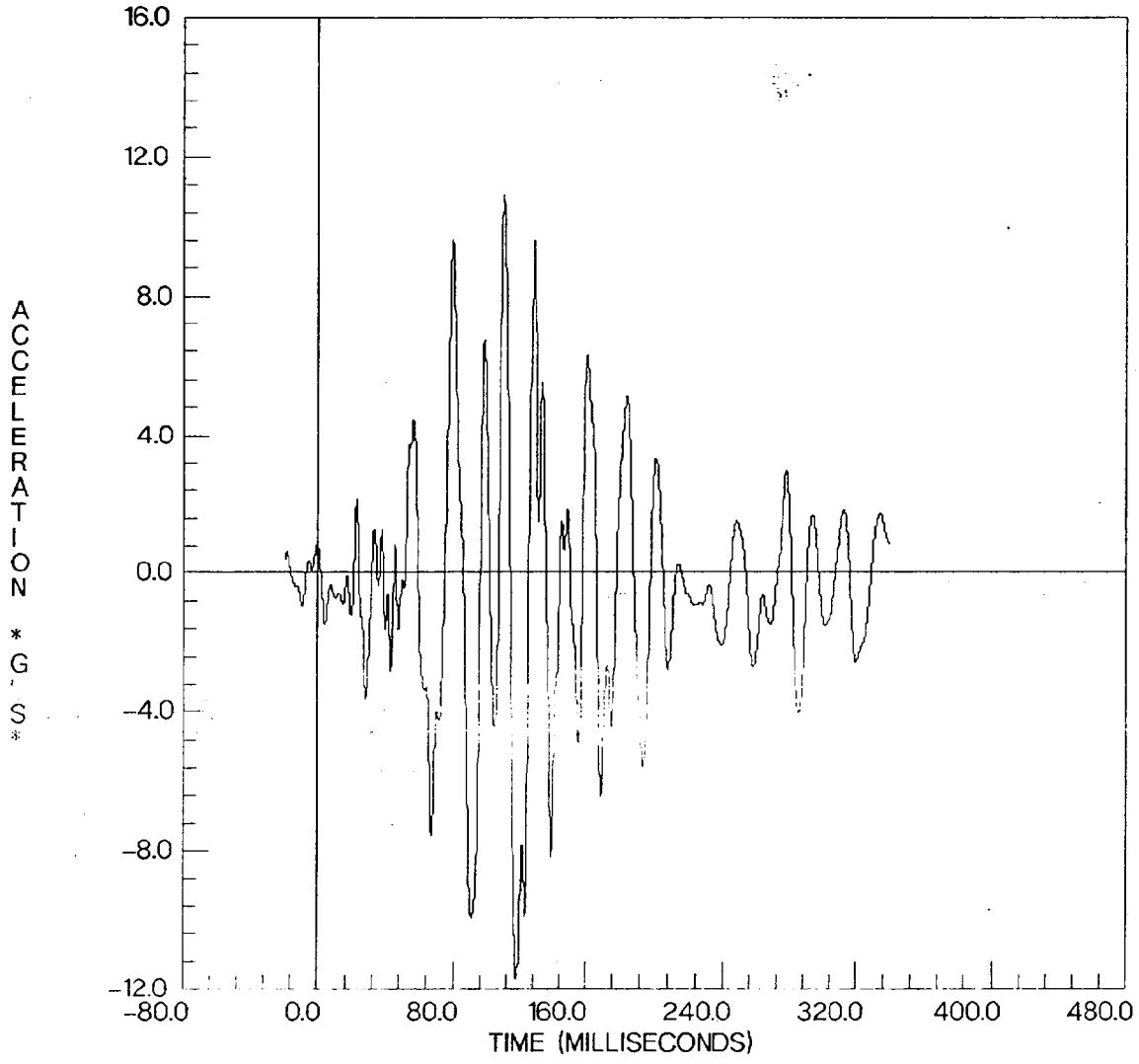
V0691AFD0.058

TRC OF OHIO 840209 34.40 mph ITV

99 NHTSA DEFORMABLE IMPACTOR NOT APPLICABLE
VEH 1

IMPACTOR CG
FILTERED
FILTER CUTOFF: 100Hz

ZG AXIS
YMIN =-11.76144 at 118.1250 msec
YMAX = 10.88551 at 110.0000 msec

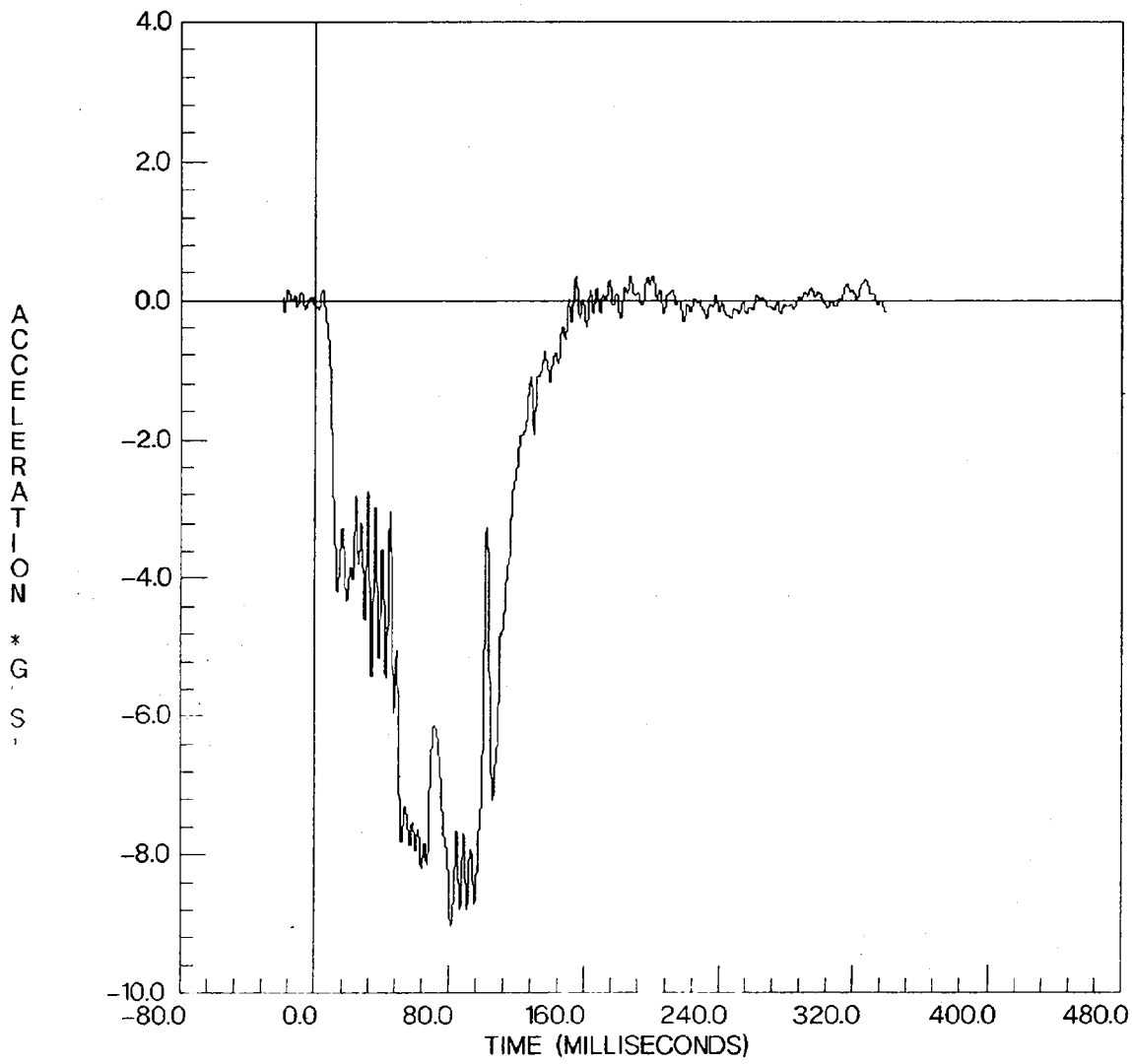


V0691AFD0.059

TRC OF OHIO 840209 34.40 mph ITV

99 NHTSA DEFORMABLE IMPACTOR NOT APPLICABLE
VEH 1

IMPACTOR CROSSMEMBER - FR XG AXIS
FILTERED YMIN =-9.040884 at 81.25000 msec
FILTER CUTOFF: 100Hz YMAX = 0.359673 at 187.0000 msec

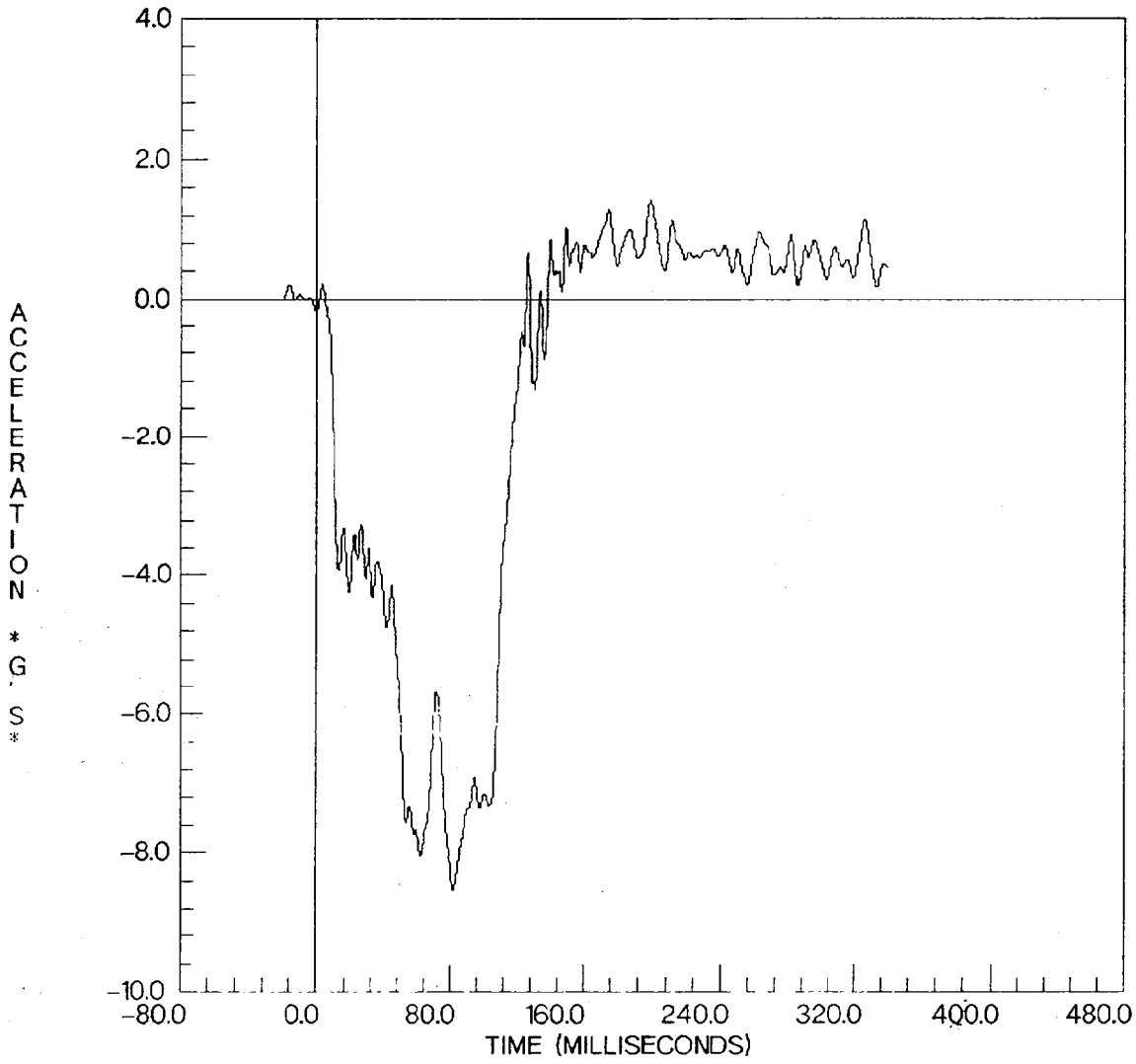


V0691AFD0.060

TRC OF OHIO 840209 34.40 mph ITV

99 NHTSA DEFORMABLE IMPACTOR NOT APPLICABLE
VEH 1

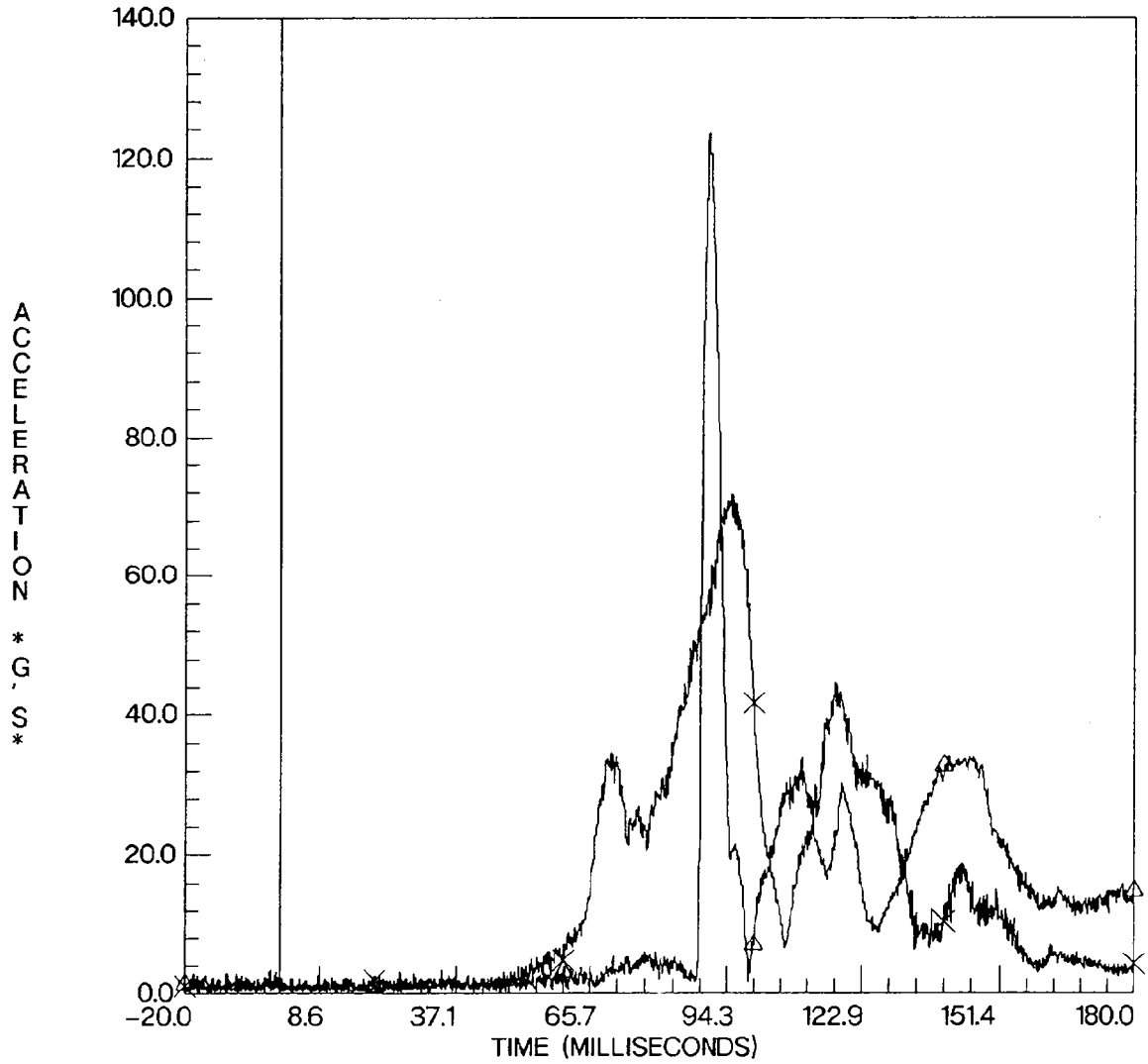
IMPACTOR CROSSMEMBER - RE XG AXIS
FILTERED YMIN =-8.550946 at 81.87500 msec
FILTER CUTOFF: 100Hz YMAX = 1.414397 at 198.1250 msec



TRC 691 HEAD RESULT

× V0691AC00.R1H 840209 ITV 81 PLYMOUTH HORIZON VEH2
OCCUPANT 1 HEAD CG YZ AXIS 1650Hz

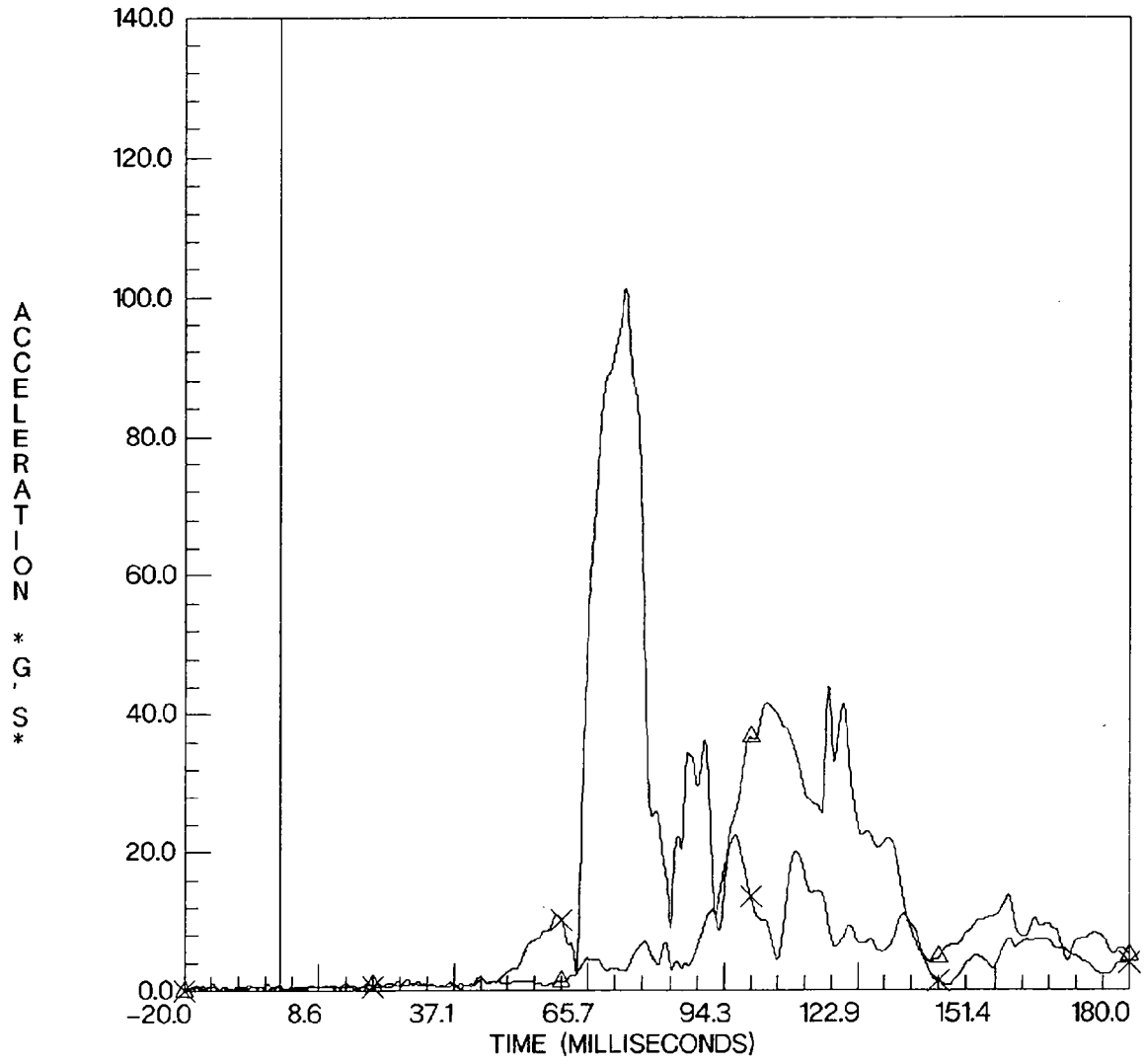
△ V0691AN00.R4H 840209 ITV 81 PLYMOUTH HORIZON VEH2
OCCUPANT 4 HEAD CG RS AXIS 1650Hz



TRC 691 CHEST RESULT

× V0691ACE0.R1S 840209 ITV 81 PLYMOUTH HORIZON VEH2
OCCUPANT 1 SPINE - UPPER RS AXIS 300Hz

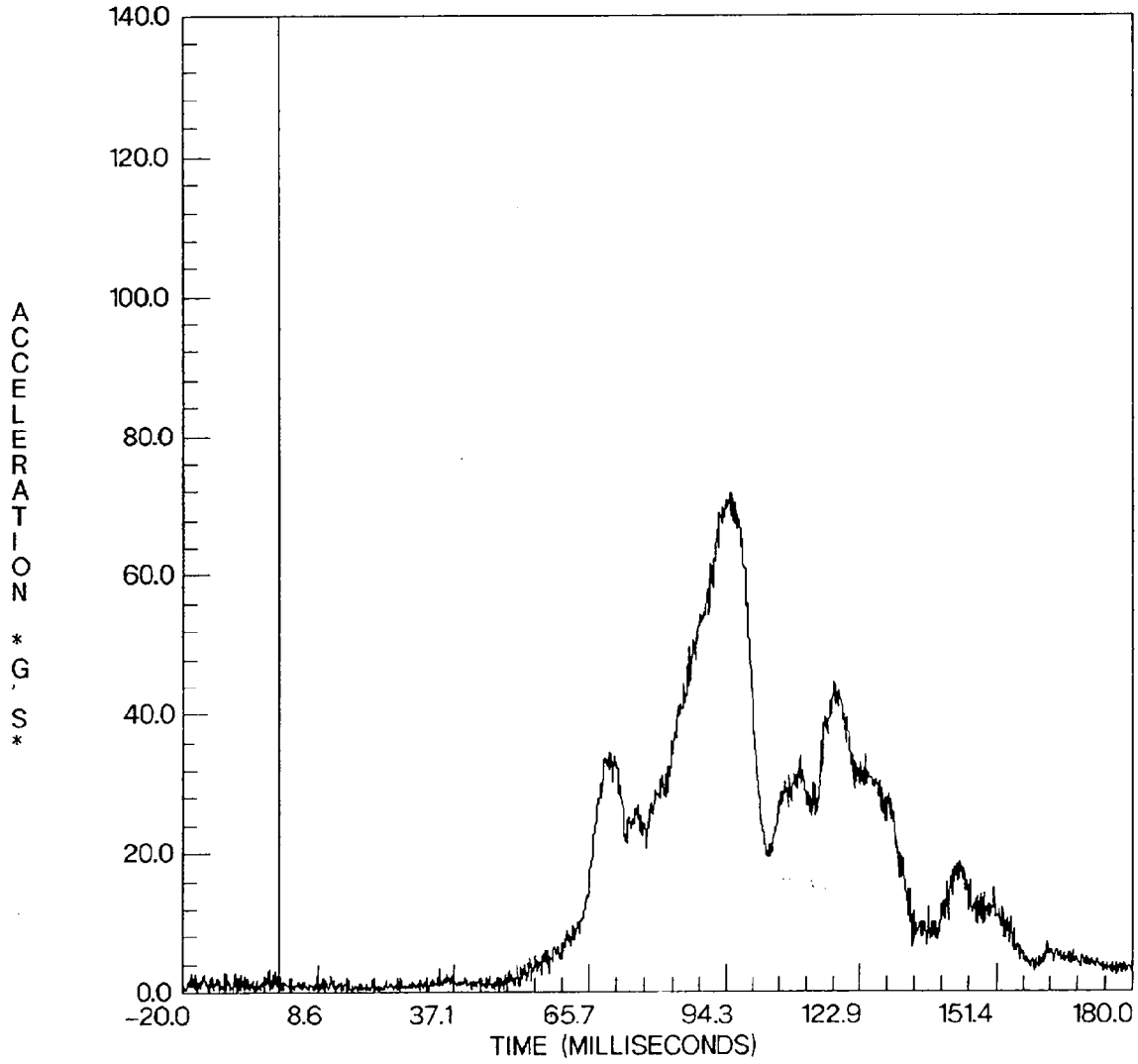
△ V0691ACE0.R4S 840209 ITV 81 PLYMOUTH HORIZON VEH2
OCCUPANT 4 SPINE - UPPER RS AXIS 300Hz



V0691AC00.R1H

TRC OF OHIO 840209 34.40 mph ITV

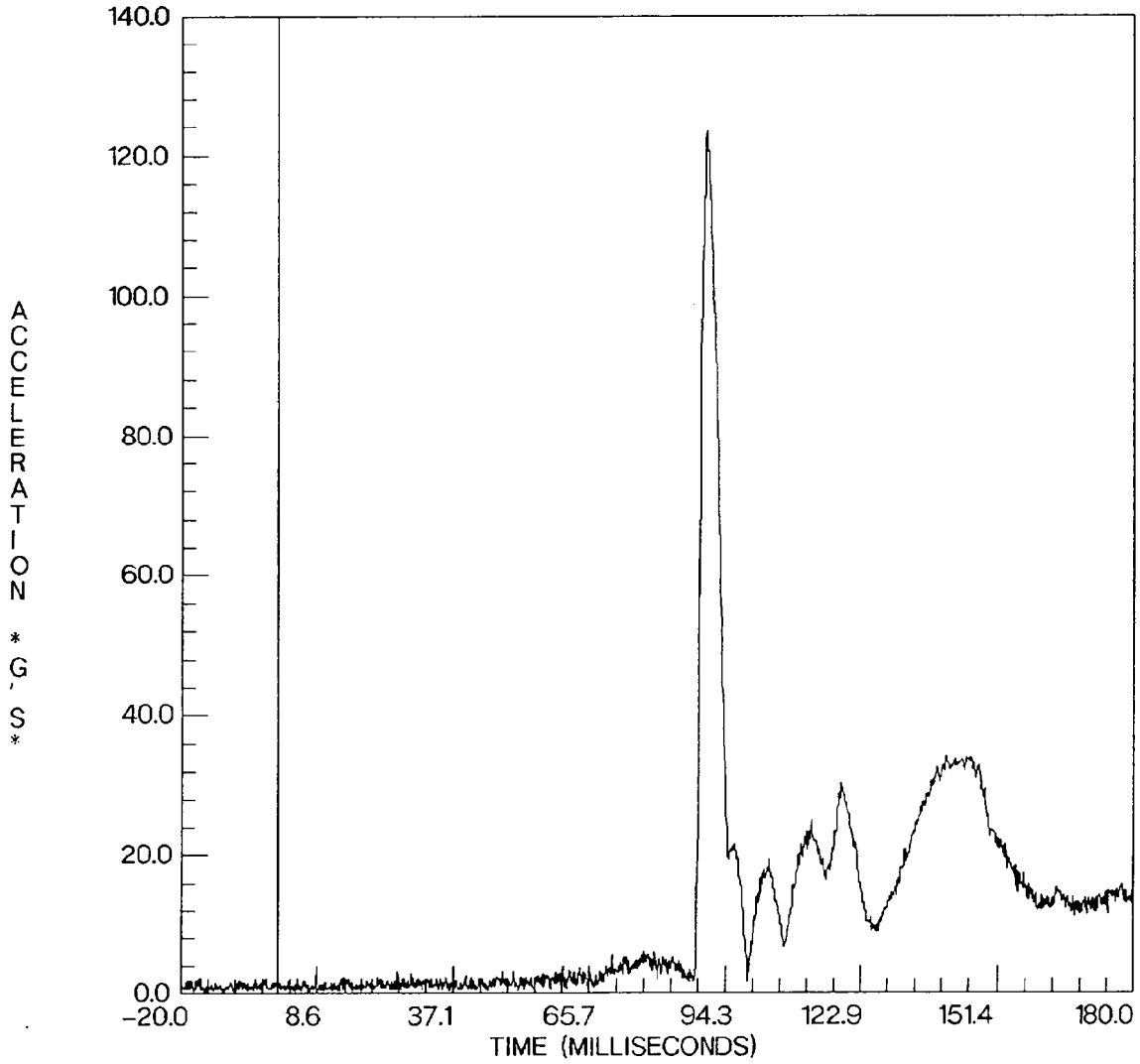
81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID HIC = 519.3841
HEAD CG YZ AXIS
COMPUTED YMIN =0.0359537 at 2.625000 msec
FILTER CUTOFF: 1650Hz YMAX = 71.75635 at 95.62500 msec



V0691AN00.R4H

TRC OF OHIO 840209 34.40 mph ITV

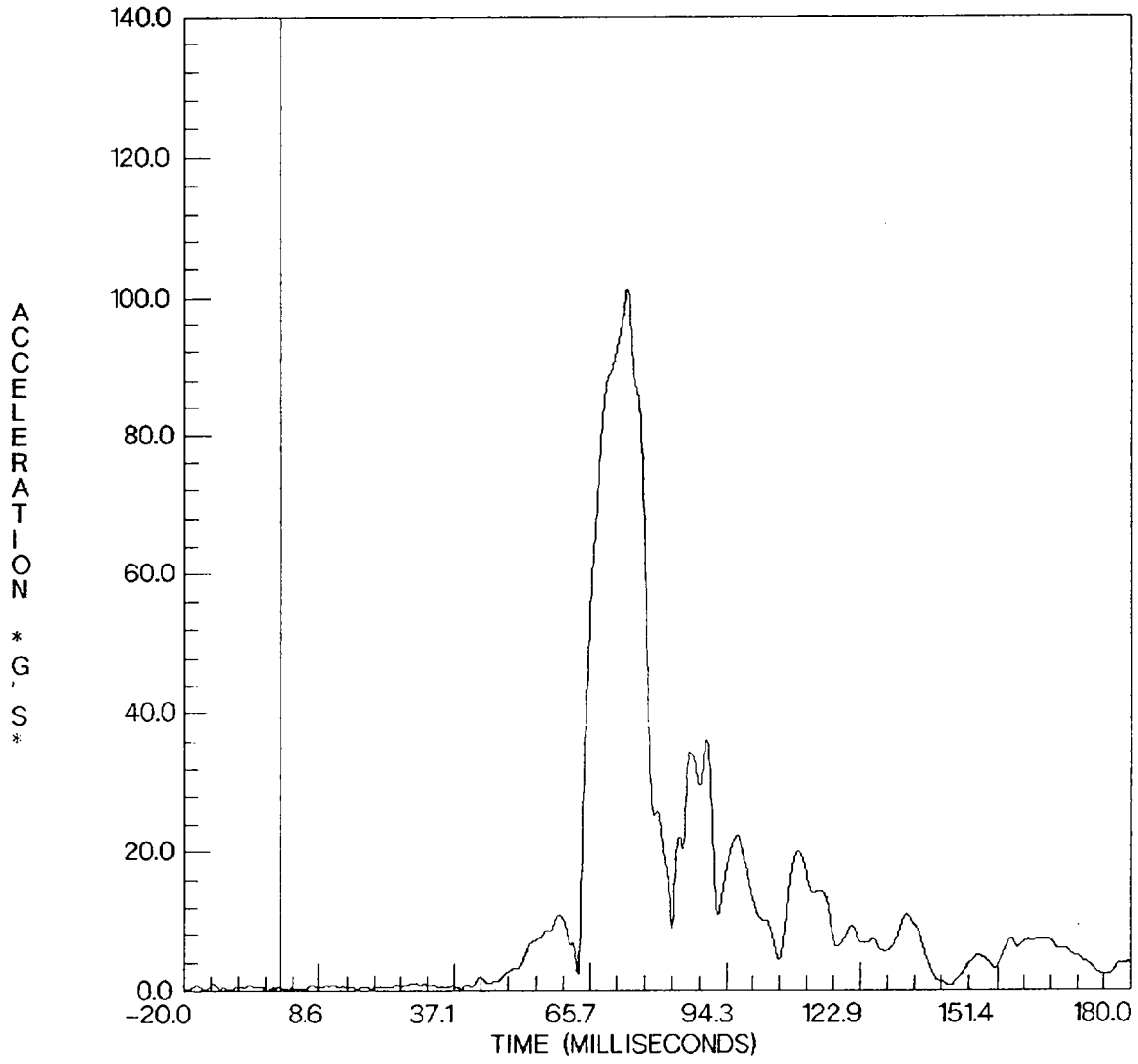
81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID HIC = 433.5087
HEAD CG RS AXIS
NONSTANDARD YMIN =0.0917118 at -15.00000 msec
FILTER CUTOFF: 1650Hz YMAX = 123.7065 at 90.50000 msec



V0691ACE0.R1S

TRC OF OHIO 840209 34.40 mph ITV

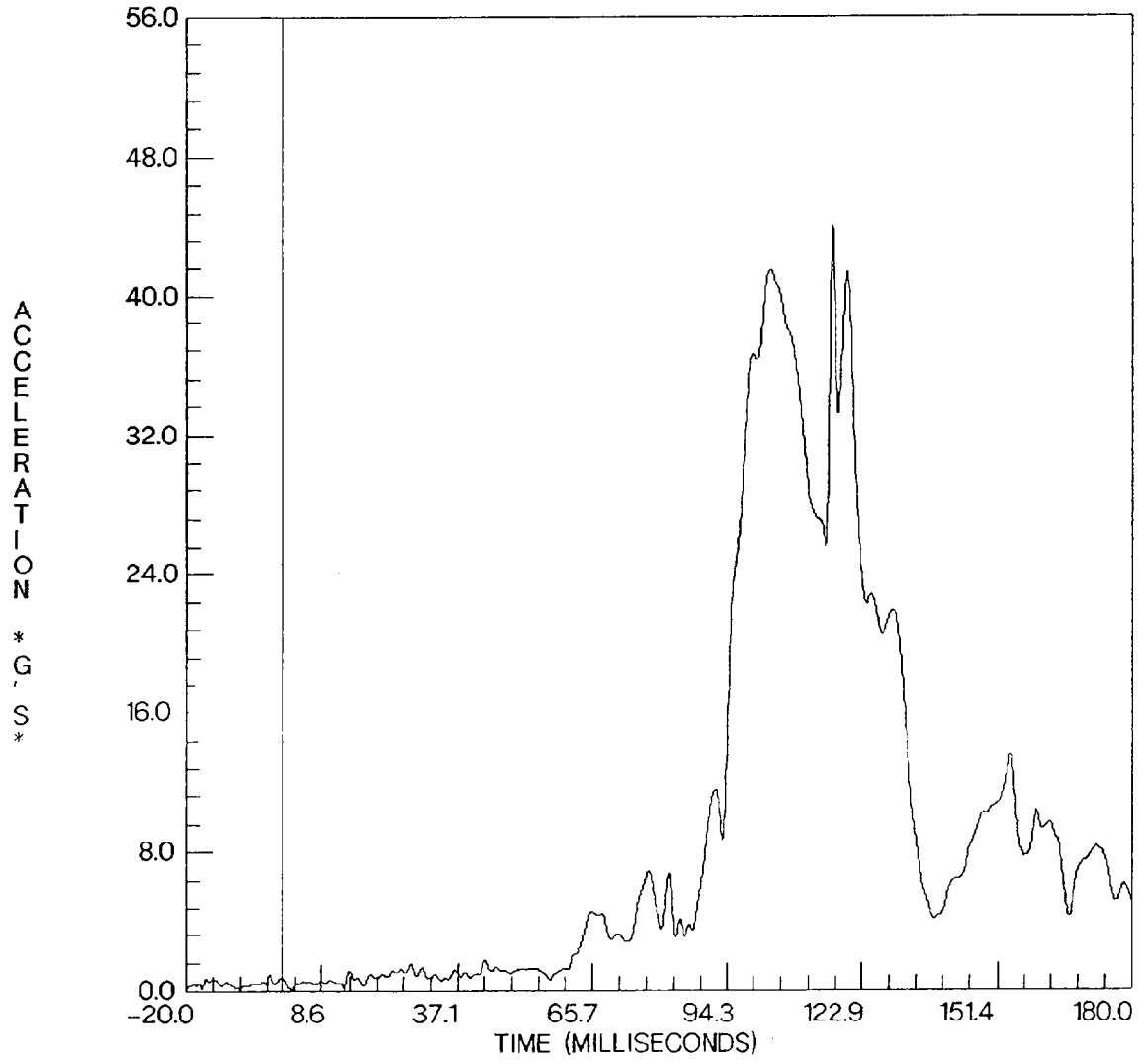
81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 1 SID CSI = 967.6319 CLIP3M = 92.99309
SPINE - UPPER RS AXIS
COMPUTED YMIN =0.0500805 at -2.625000 msec
FILTER CUTOFF: 300Hz YMAX = 101.2664 at 73.50000 msec



V0691ACE0.R4S

TRC OF OHIO 840209 34.40 mph ITV

81 PLYMOUTH HORIZON FOUR DOOR SEDAN
VEH 2
OCCUPANT LOC 4 SID CSI = 230.9362 CLIP3M = 40.72754
SPINE - UPPER RS AXIS
COMPUTED YMIN =0.0374051 at -2.625000 msec
FILTER CUTOFF: 300Hz YMAX = 43.99666 at 116.5000 msec



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HARD COPY REFERENCE NUMBER	CONTRACT NUMBER	TEST PERFORMER	TEST TITLE
691	DTNH2282A08401	TRC	SIDE PROTECTION - 2DR/4DR

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TEST INFORMATION
FOR TEST 691

TEST TITLE: SIDE PROTECTION - 2DR/4DR

TEST DATE: 02/09/84 ENTRY DATE: 01-MAR-84

HARD COPY REFERENCE NUMBER: 691 CONTRACT NUMBER: DTNH2282A08401

TEST PERFORMER: TRC OF OHIO TEST REFERENCE NUMBER: 840209

TEST CONFIGURATION: IMPACTOR INTO VEHICLE

TEST TYPE: BASELINE TEST

TEST OBJECTIVES: EXTRAPOLATION OF S-1 BENEFITS INTO PRODUCTION VEHICLE FLEET

CLOSING SPEED: 34.40 IMPANG ANGLE: 300

TEST TRACK SURFACE: CONCRETE TEST TRACK CONDITIONS: DRY

IMPACT POINT: -6.50 OFFSET DISTANCE: 999.90

RECORDER TYPE: FM MULTIPLEXOR TAPE RECORDER DATA LINK TO RECORDER: UMBILICAL CABLE

SYSTEM OF MEASUREMENT: ENGLISH

AMBIENT TEMPERATURE: 46

DESCRIPTION OF OTHER ANOMALIES:

TOTAL CURVE: 60

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VEHICLE INFORMATION
FOR TEST 691

VEHICLE IDENTIFICATION NUMBER: 1

MAKE: NHTSA MODEL: DEFORMABLE IMPACTOR YEAR: 99 TEST WEIGHT: 2990

ENGINE TYPE: NOT APPLICABLE ENGINE DISPLACEMENT: 999999999999

TRANSMISSION TYPE: NOT APPLICABLE BODY TYPE: NOT APPLICABLE

VEHICLE LENGTH: 162.00 VEHICLE WIDTH: 72.00 WHEELBASE: 999.90

VEHICLE C.G. DISTANCE BEHIND FRONT AXLE: 99.90

STEERING COLUMN COLLAPSE MECHANISM: NOT APPLICABLE STEERING COLUMN ATTACHMENT TO DASH: NOT APPLICABLE

VEHICLE MODIFICATION INDICATOR: RESEARCH VEHICLE

GENERAL DESCRIPTION OF VEHICLE MODIFICATIONS: 19.0 DEGREE CRABBED BOGEY WITH DSL-1285 FACE

PDOF ANGLE: 999 TRAVEL ANGLE: 19 VEHICLE SPEED: 34.40 VEHICLE DAMAGE INDEX: 9999999

BUMPER ENGAGEMENT: NOT APPLICABLE

SILL ENGAGEMENT: NOT APPLICABLE A-PILLAR ANGAGEMENT: NOT APPLICABLE

LENGTH OF DIRECT CONTACT DAMAGE: 999.90 MAXIMUM CRUSH DISTANCE: 99.90

DISTANCE BETWEEN CENTER OF DAMAGE AREA AND C.G. AXIS: 99.90

POINT NUMBER 1: 99.90 POINT NUMBER 2: 99.90 POINT NUMBER 3: 99.90

POINT NUMBER 4: 99.90 POINT NUMBER 5: 99.90 POINT NUMBER 6: 99.90

ANGLE OF MOVING TEST CART: 0

VEHICLE ORIENTATION ON MOVING CART: 0

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VEHICLE INFORMATION
FOR TEST 691

VEHICLE IDENTIFICATION NUMBER: 2

MAKE: PLYMOUTH MODEL: HORIZON YEAR: 81 TEST WEIGHT: 2623

ENGINE TYPE: 4 CYLINDER TRANSVERSE FRONT ENGINE DISPLACEMENT: 1750

TRANSMISSION TYPE: MANUAL - FRONT WHEEL DRIVE BODY TYPE: FOUR DOOR SEDAN

VEHICLE LENGTH: 162.50 VEHICLE WIDTH: 66.60 WHEELBASE: 99.40

VEHICLE C.G. DISTANCE BEHIND FRONT AXLE: 44.20

STEERING COLUMN COLLAPSE MECHANISM: CONVOLUTED TUBE STEERING COLUMN ATTACHMENT TO DASH: UNKNOWN

VEHICLE MODIFICATION INDICATOR: PRODUCTION VEHICLE

GENERAL DESCRIPTION OF VEHICLE MODIFICATIONS:

PDOF ANGLE: 310 TRAVEL ANGLE: 0 VEHICLE SPEED: 0.00 VEHICLE DAMAGE INDEX: 10LYEW3

BUMPER ENGAGEMENT: NOT APPLICABLE

SILL ENGAGEMENT: DIRECT ENGAGEMENT A-PILLAR ANGAGEMENT: DIRECT ENGAGEMENT

LENGTH OF DIRECT CONTACT DAMAGE: 72.00 MAXIMUM CRUSH DISTANCE: 16.80

DISTANCE BETWEEN CENTER OF DAMAGE AREA AND C.G. AXIS: -4.50

POINT NUMBER 1: 4.30 POINT NUMBER 2: 9.40 POINT NUMBER 3: 15.20

POINT NUMBER 4: 16.80 POINT NUMBER 5: 12.50 POINT NUMBER 6: 5.90

ANGLE OF MOVING TEST CART: 0

VEHICLE ORIENTATION ON MOVING CART: 0

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OCCUPANT INFORMATION
FOR TEST 691

VEHICLE CONTAINING OCCUPANT: 2

SEATING POSITION: LEFT FRONT SEAT

SEAT POSITION: CENTER POSITION

OCCUPANT TYPE: HSRI SIDE IMPACT DUMMY

DUMMY SIZE PERCENTILE: 50 PERCENTILE

AGE: 0 HEIGHT: 0 WEIGHT: 0 SEX: NOT APPLIC

MANUFACTURER OF DUMMY AND SERIAL NUMBER: ALDERSON RESEARCH LABORATORIES 06

CLEARANCE DISTANCES:

HEAD TO WINDSHIELD HEADER: 9.10
HEAD TO SIDE HEADER: 7.30
CHEST TO DASH: 19.00
ARM TO DOOR: 4.00
KNEES TO DASH: 7.80

HEAD TO WINDSHIELD: 14.30
HEAD TO SIDE WINDOW: 8.80
CHEST TO STEERING WHEEL: 16.90
HIP TO DOOR: 6.30

RESTRAINT: NONE

AIR BAG/BELT DEPLOYMENT: NOT APPLICABLE

KNEE RESTRAINT DESCRIPTION: DASHPANEL

HEAD CONTACT REGION: SIDE WINDOW

CHEST OR ABDOMEN CONTACT REGION: OTHER

LEG CONTACT REGION: OTHER

HEAD INJURY: 519.380
LOW BOUNDARY: 66.500

UPPER BOUNDARY: 130.125

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OCCUPANT INFORMATION
FOR TEST 691

VEHICLE CONTAINING OCCUPANT: 2

SEATING POSITION: LEFT REAR SEAT

SEAT POSITION: NONADJUSTABLE SEAT

OCCUPANT TYPE: HSRI SIDE IMPACT DUMMY

DUMMY SIZE PERCENTILE: 50 PERCENTILE

AGE: 0 HEIGHT: 0 WEIGHT: 0 SEX: NOT APPLIC

MANUFACTURER OF DUMMY AND SERIAL NUMBER: ALDERSON RESEARCH LABORATORIES U02

CLEARANCE DISTANCES:

HEAD TO WINDSHIELD HEADER: 99.90
HEAD TO SIDE HEADER: 7.80
CHEST TO DASH: 17.10
ARM TO DOOR: 4.80
KNEES TO DASH: 3.30

HEAD TO WINDSHIELD: 99.90
HEAD TO SIDE WINDOW: 8.80
CHEST TO STEERING WHEEL: 99.90
HIP TO DOOR: 7.30

RESTRAINT: NONE

AIR BAG/BELT DEPLOYMENT: NOT APPLICABLE

KNEE RESTRAINT DESCRIPTION: SEAT BACK

HEAD CONTACT REGION: C PILLAR

CHEST OR ABDOMEN CONTACT REGION: OTHER

LEG CONTACT REGION: OTHER

HEAD INJURY: 433.510
LOW BOUNDARY: 88.875

UPPER BOUNDARY: 93.250

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SENSOR TYPE	SEN. LOC.	OCCUPANT ATTACHMENT	REGION ATTACHED	AXIS	CRVE NO.	NFP	NLP	DAS.	PREF. FREQ.	DATA QUALITY
ACCELEROMETER	2	LEFT FRONT SEA	HEAD CG	XG	1	-160	2720	NO	1650	DATA LOSS
ACCELEROMETER	2	LEFT FRONT SEA	HEAD CG	YG	2	-160	2720	AM	1650	
ACCELEROMETER	2	LEFT FRONT SEA	HEAD CG	ZG	3	-160	2720	AM	1650	
ACCELEROMETER	2	LEFT FRONT SEA	SPINE - UPPER	XG	4	-160	2720	AM	1650	
ACCELEROMETER	2	LEFT FRONT SEA	SPINE - UPPER	YG	5	-160	2720	AM	1650	T01YG1=PRIMARY
ACCELEROMETER	2	LEFT FRONT SEA	SPINE - UPPER	YG	6	-160	2720	AM	1650	T01YGA=REDUNDANT
ACCELEROMETER	2	LEFT FRONT SEA	SPINE - UPPER	ZG	7	-160	2720	AM	1650	
ACCELEROMETER	2	LEFT FRONT SEA	SPINE - LOWER	XG	8	-160	2720	AM	1650	
ACCELEROMETER	2	LEFT FRONT SEA	SPINE - LOWER	YG	9	-160	2720	AM	1650	T12YG1=PRIMARY
ACCELEROMETER	2	LEFT FRONT SEA	SPINE - LOWER	YG	10	-160	2720	AM	1650	T12YGA=REDUNDANT
ACCELEROMETER	2	LEFT FRONT SEA	SPINE - LOWER	ZG	11	-160	2720	AM	1650	
ACCELEROMETER	2	LEFT FRONT SEA	RIB - LEFT UPPER	YG	12	-160	2720	AM	1650	LURYG1=PRIMARY

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ACCELEROMETER	2	LEFT FRONT SEA	RIB - LEFT UPPER	YG	13	-160	2720	AM	1650	LURYGA=REDUNDANT
ACCELEROMETER	2	LEFT FRONT SEA	RIB - LEFT LOWER	YG	14	-160	2720	AM	1650	LLRYG1=PRIMARY
ACCELEROMETER	2	LEFT FRONT SEA	RIB - LEFT LOWER	YG	15	-160	2720	AM	1650	LLRYGA=REDUNDANT
ACCELEROMETER	2	LEFT FRONT SEA	PELVIS - CENTER	XG	16	-160	2720	AM	1650	
ACCELEROMETER	2	LEFT FRONT SEA	PELVIS - CENTER	YG	17	-160	2720	AM	1650	
ACCELEROMETER	2	LEFT FRONT SEA	PELVIS - CENTER	ZG	18	-160	2720	AM	1650	
DISPLACEMENT TR	2	LEFT FRONT SEA	SEAT TRACK - LEFT	YG	19	-160	2720	QD	1650	LEFT RIB TO SPINE DI
ACCELEROMETER	2	LEFT REAR SEAT	HEAD CG	XG	20	-160	2720	AM	1650	HEDXG3
ACCELEROMETER	2	LEFT REAR SEAT	HEAD CG	YG	21	-160	2720	AM	1650	HEDYG3
ACCELEROMETER	2	LEFT REAR SEAT	HEAD CG	ZG	22	-160	2720	AM	1650	HEDZG3
ACCELEROMETER	2	LEFT REAR SEAT	SPINE - UPPER	XG	23	-160	2720	AM	1650	T01XG3
ACCELEROMETER	2	LEFT REAR SEAT	SPINE - UPPER	YG	24	-160	2720	AM	1650	T01YG3=PRIMARY

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ACCELEROMETER	2	LEFT REAR SEAT	SPINE - UPPER	YG	25	-160	2720	AM	1650	T01YGC=REDUNDANT
ACCELEROMETER	2	LEFT REAR SEAT	SPINE - UPPER	ZG	26	-160	2720	AM	1650	T01ZG3
ACCELEROMETER	2	LEFT REAR SEAT	SPINE - LOWER	XG	27	-160	2720	AM	1650	T12XG3
ACCELEROMETER	2	LEFT REAR SEAT	SPINE - LOWER	YG	28	-160	2720	AM	1650	T12YG3=PRIMARY
ACCELEROMETER	2	LEFT REAR SEAT	SPINE - LOWER	YG	29	-160	2720	AM	1650	T12YGC=REDUNDANT
ACCELEROMETER	2	LEFT REAR SEAT	SPINE - LOWER	ZG	30	-160	2720	AM	1650	T12ZG3
ACCELEROMETER	2	LEFT REAR SEAT	RIB - LEFT UPPER	YG	31	-160	2720	AM	1650	LURYG3=PRIMARY
ACCELEROMETER	2	LEFT REAR SEAT	RIB - LEFT UPPER	YG	32	-160	2720	AM	1650	LURYGC=REDUNDANT
ACCELEROMETER	2	LEFT REAR SEAT	RIB - LEFT LOWER	YG	33	-160	2720	AM	1650	LLRYG3=PRIMARY
ACCELEROMETER	2	LEFT REAR SEAT	RIB - LEFT LOWER	YG	34	-160	2720	AM	1650	LLRYGC=REDUNDANT
ACCELEROMETER	2	LEFT REAR SEAT	PELVIS - CENTER	XG	35	-160	2720	AM	1650	PEVXG3
ACCELEROMETER	2	LEFT REAR SEAT	PELVIS - CENTER	YG	36	-160	2720	AM	1650	PEVYG3

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ACCELEROMETER	2	LEFT REAR SEAT	PELVIS - CENTER	ZG	37	-160	2720	AM	1650	PEVZG3
DISPLACEMENT TR	2	LEFT REAR SEAT	SEAT TRACK - LEFT	YG	38	-160	2720	AM	1650	LEFT RIB T0 SPINE DI
ACCELEROMETER	2	NOT APPLICABLE	SILL - RIGHT FRONT	XG	39	-160	2720	AM	1650	
ACCELEROMETER	2	NOT APPLICABLE	SILL - RIGHT FRONT	YG	40	-160	2720	AM	1650	
ACCELEROMETER	2	NOT APPLICABLE	SILL - RIGHT FRONT	ZG	41	-160	2720	AM	1650	
ACCELEROMETER	2	NOT APPLICABLE	SILL - RIGHT REAR	XG	42	-160	2720	AM	1650	
ACCELEROMETER	2	NOT APPLICABLE	SILL - RIGHT REAR	YG	43	-160	2720	AM	1650	
ACCELEROMETER	2	NOT APPLICABLE	SILL - RIGHT REAR	ZG	44	-160	2720	AM	1650	
ACCELEROMETER	2	NOT APPLICABLE	REAR DECK	XG	45	-160	2720	AM	1650	
ACCELEROMETER	2	NOT APPLICABLE	REAR DECK	YG	46	-160	2720	AM	1650	
ACCELEROMETER	2	NOT APPLICABLE	REAR DECK	ZG	47	-160	2720	AM	1650	
ACCELEROMETER	2	NOT APPLICABLE	SILL - LEFT REAR	YG	48	-160	2720	AM	1650	

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ACCELEROMETER	2	NOT APPLICABLE	SILL - LEFT FRONT	YG	49	-160	2720	AM	1650	
ACCELEROMETER	2	NOT APPLICABLE	TRUCK FLOOR - RIGH	XG	50	-160	2720	AM	1650	
ACCELEROMETER	2	NOT APPLICABLE	DOOR - LEFT FRONT	YG	51	-160	2720	AM	1650	LEFT FRONT DOOR POSI
ACCELEROMETER	2	NOT APPLICABLE	DOOR - LEFT FRONT	YG	52	-160	2720	AM	1650	LEFT FRONT DOOR POSI
ACCELEROMETER	2	NOT APPLICABLE	DOOR - LEFT FRONT	YG	53	-160	2720	AM	1650	LEFT FRONT DOOR POSI
ACCELEROMETER	2	NOT APPLICABLE	DOOR - LEFT REAR	YG	54	-160	2720	AM	1650	LEFT REAR DOOR POSIT
ACCELEROMETER	2	NOT APPLICABLE	DOOR - LEFT REAR	YG	55	-160	2720	AM	1650	LEFT REAR DOOR POSIT
ACCELEROMETER	1	NOT APPLICABLE	IMPACTOR CG	XG	56	-160	2720	AM	1650	
ACCELEROMETER	1	NOT APPLICABLE	IMPACTOR CG	YG	57	-160	2720	AM	1650	
ACCELEROMETER	1	NOT APPLICABLE	IMPACTOR CG	ZG	58	-160	2720	AM	1650	
ACCELEROMETER	1	NOT APPLICABLE	IMPACTOR CROSSMEMB	XG	59	-160	2720	AM	1650	
ACCELEROMETER	1	NOT APPLICABLE	IMPACTOR CROSSMEMB	XG	60	-160	2720	AM	1650	