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December 1984

Side Impact Aggressiveness Attributes: MDB-to-Car Side Impact Test of a 26° Crabbed Moving Deformable Barrier to a 1981 Volkswagen Rabbit at 38.8 mph.

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16. Abstract

This test report documents one of a series of twelve crash tests to evaluate the side impact aggressiveness attributes of various deformable barrier face configurations. The configurations to be used are designated as "Lowered Stiffness", "Altered Profile" and "Lowered Bumper". Testing was conducted on a 1981 Volkswagen Rabbit 2-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 designated as "Lowered Bumper", crabbed to 26°, at 38.8 mph. Occupant responses of two side impact dummies were measured. One dummy was located in the driver's designated seating position and one was located in the left rear passenger position. The test date was November 20, 1984 and the ambient temperature was 34° F.

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SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to evaluate the side impact aggressiveness of a deformable barrier face designated as "Lowered Bumper". In all, there will be twelve crash tests involving deformable barrier faces designated as "Lowered Stiffness", "Altered Profile" and "Lowered Bumper". The vehicle was tested using conditions not currently contained in a Federal Motor Vehicle Safety Standard.

INTRODUCTION

A stationary 1981 Volkswagen Rabbit 2-door hatchback was impacted on the left side by a Moving Deformable Barrier (MDB) on November 20, 1984. The barrier face was designated as "Lowered Bumper" and was assembled from two existing faces in order to obtain the correct dimensions. The test was to simulate an intersection collision with the striking vehicle traveling at 35 mph and the struck vehicle traveling at 17.5 mph. The orientation angle of the striking vehicle was 90° counterclockwise with respect to the longitudinal axis of the struck vehicle. The impact point was to be 37 inches forward of the vehicle center of gravity which is defined by accident investigation to be the midpoint of the wheelbase.

To simulate this collision, the MDB was to be towed into the stationary Volkswagen Rabbit at 39.1 mph with the MDB's wheels crabbed clockwise to 26°. The actual test speed was 38.8 mph and the actual impact point was 35.5 inches forward of the midpoint of the Volkswagen Rabbit's wheelbase.

The vehicle was structurally unmodified, but contained additional padding in the driver's door, the left rear quarter panel and the left rear side header.

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

SECTION 2.0
GENERAL TEST AND VEHICLE PARAMETER DATA

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

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagen of America, Inc.

MAKE/MODEL: Volkswagen Rabbit VIN: 1VWCB9170BV035597

BODY STYLE: 2-Door Hatchback MODEL YEAR: 1981

NHTSA NO.: R & D COLOR: Grey

ENGINE DATA: TYPE: Transverse CYLINDERS: 4 DISPLACEMENT 1600 cc

TRANSMISSION DATA: 4 Speed Manual

DATE VEHICLE RECEIVED: 11/7/84 ODOMETER READING: 44729

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING	No	AUTOMATIC TRANSMISSION	No
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	Yes	AIR CONDITIONING	No
RADIO	Yes	ANTI-SKID BRAKE	No
CLOCK	Yes	REAR WINDOW DEFROSTER	Yes
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: Volkswagen of America, Inc.

DATE OF MANUFACTURE: 11/80

GVWR: 2822 LBS.,

GAWR: FRONT 1609 LBS., REAR 1278 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 27 psi; REAR 31 psi

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

BIAS PLY, BELTED, OR RADIAL: Radial

PLY RATING: 4

IS SPARE TIRE "SPACE SAVER"? No

IS SPARE TIRE STANDARD EQUIPMENT? Yes

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

RIGHT FRONT	640	LBS.	RIGHT REAR	390	LBS.
LEFT FRONT	670	LBS.	LEFT REAR	380	LBS.
TOTAL FRONT WEIGHT	1310	LBS.	(63.0 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	770	LBS.	(37.0 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	2080	LBS.			

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 24	;LF 24 1/8	;RR 24 5/16	;LR 24 1/8
PRE-TEST ATTITUDE:	RF 22 5/8	;LF 23 1/8	;RR 21 1/8	;LR 21 5/8
POST-TEST ATTITUDE:	RF 21 5/16	;LF 22 3/4	;RR 20 5/8	;LR 20 5/8

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 185 LBS. CARGO:

RIGHT FRONT	700	LBS.	RIGHT REAR	585	LBS.
LEFT FRONT	720	LBS.	LEFT REAR	605	LBS.
TOTAL FRONT WEIGHT	1420	LBS.	(52.4 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1290	LBS.	(47.6 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	2710	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: 5.0 GALLONS

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

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: Yes FUEL INJECTION: Yes

DOES ELECTRIC FUEL PUMP OPERATE WITH IGNITION SWITCH "ON" AND THE ENGINE NOT OPERATING? No

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 27 psi; REAR 31 psi

RECOMMENDED TIRE SIZE: 155 SR 13 LOAD RANGE X B, C,

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

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

CARGO LOAD 185 LBS.

TOTAL 785 LBS.

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

TEST CONDITIONS

TEST NUMBER: 841120

DATE OF TEST: November 20, 1984 TIME OF TEST: 15:30

WIND VELOCITY: 3-6 mph 342° NW HUMIDITY: DNA

AMBIENT TEMPERATURE AT IMPACT AREA: 34° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 81° F

SUBJECT VEHICLE DATA

	ACTUAL	INTENDED
VEHICLE TEST WEIGHT (LBS.)	2610	2613
MDB TEST WEIGHT (LBS.)	2990	3000
MDB VELOCITY (MPH)*	38.8	39.1
IMPACT POINT (INCHES)**	35.5	37.0

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 vehicle's wheelbase.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER 06	PASSENGER U02
Head	Roof, Left Window Sill, Right B-Pillar & Frame	Window Frame, Roof, Hatchback Frame
Chest	Inner Door Panel, Left Window Sill	Rear Quarter Panel
Abdomen	Inner Door Panel	Rear Quarter Panel
Left Knee	Right Knee	Right Knee
Right Knee	Left Knee	Left Knee

DOOR OPENING:

	LEFT	RIGHT
Front	Hard*	Easy
Rear	DNA	DNA

SEAT MOVEMENT:

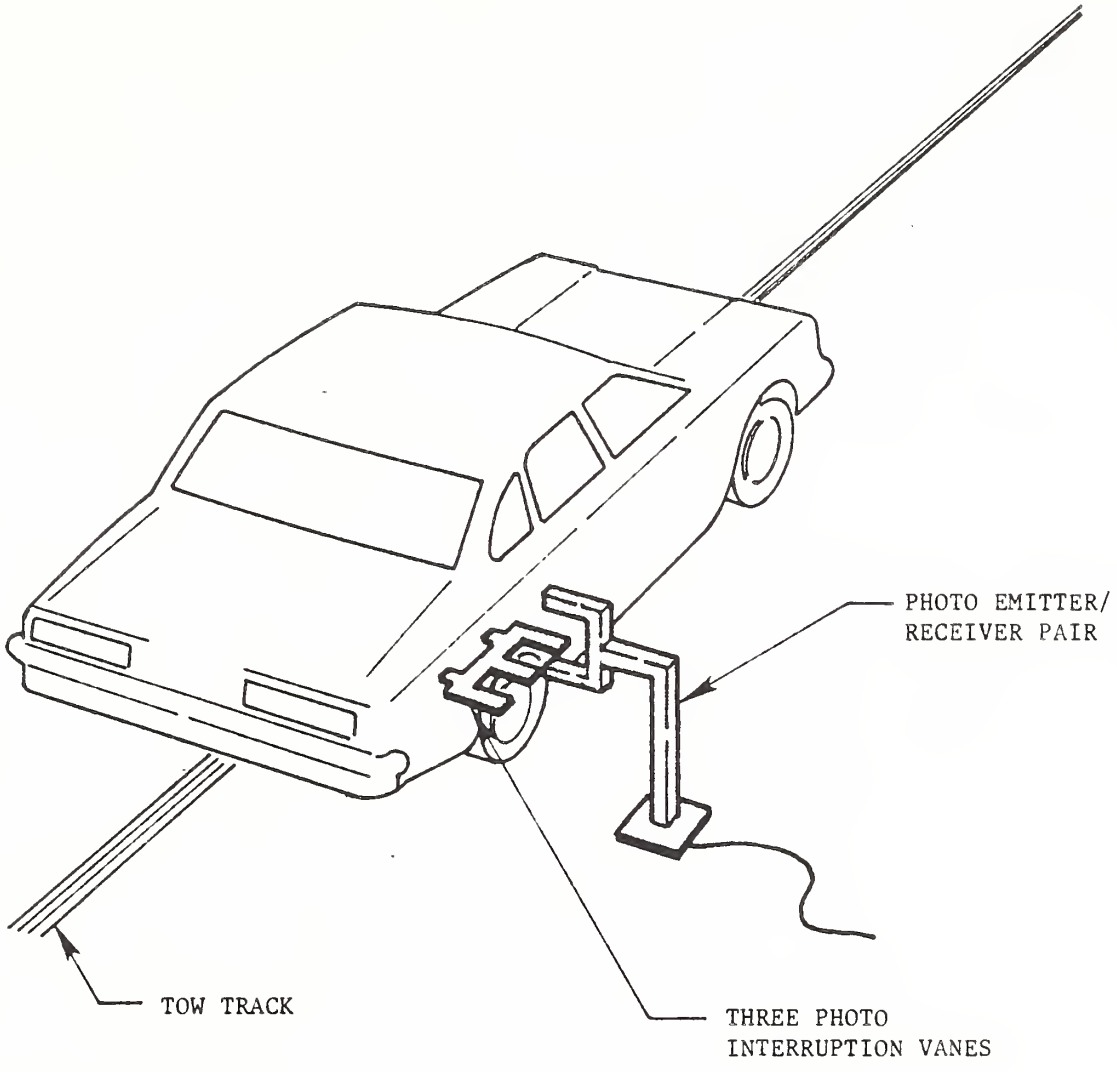
	SEAT BACK FAILURE	SEAT SHIFT
Front	Yes	No
Rear	Yes	No

GLAZING DAMAGE: Windshield cracked

OTHER NOTABLE IMPACT EFFECTS:

*Door had to be opened to remove instrumentation.

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
= 2080 + 2 X 174 + 185 lbs.
= 2613 lbs.

To achieve test weight, the battery was removed and 5.0 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.

*Unloaded Delivered Weight = Measured Weight + Estimated 10 Gallons Fuel
= 2020 + 60 lbs
= 2080 lbs

TEST ANOMALIES

The door accelerometer in Position 10, LFDYG4, failed approximately 15 msec after impact.

SECTION 3.0
DATA REQUIRED BY R & D

The following pages are included in this section:

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

DUMMY TEMPERATURE CONTROL AND POSITIONING

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

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

DUMMY PLACEMENT AND POSITIONING

SIDE IMPACT DUMMY	DRIVER DSP	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: Volkswagen Rabbit

FRONT SEAT TYPE: ___ BENCH
X BUCKET
___ SPLIT BENCH

ADJUSTER TYPE: X MANUAL
___ POWER

BUCKET SEAT BACK TYPE: ___ FIXED
X ADJUSTABLE

TECHNICIANS:
1. B. Miller
2. R. Benavides
3. M. Garrison

POSITIONING DATE: 11/20/84

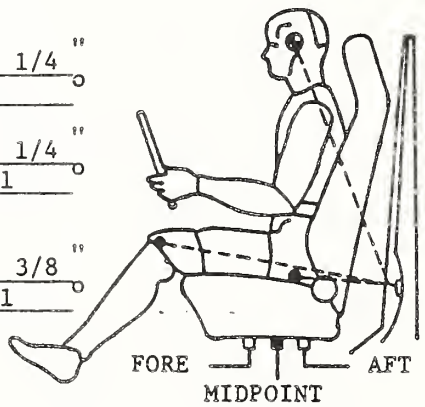
AMBIENT TEMP.: 72° F. TIME: 8:25

DRIVER DUMMY # 06

HEAD 20 1/4 "
TARGET* 30 °

KNEE 32 1/4 "
JOINT 101 °

APPROX. "H" POINT 18 3/8 " 121 °

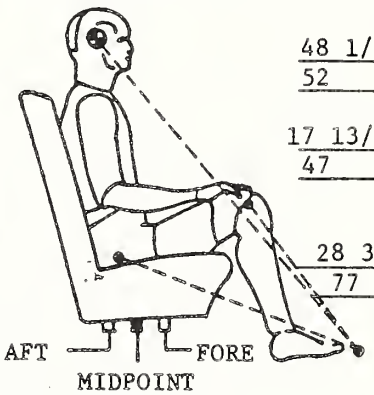


REAR PASSENGER DUMMY # U02

48 1/2 "HEAD
52 °TARGET**

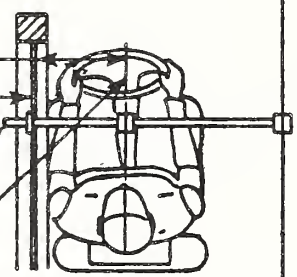
17 13/16"KNEE
47 °JOINT

APPROX. 28 3/8" "H"
77 °POINT



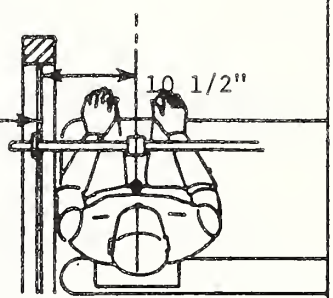
DOOR GLASS HEIGHT*** 11 5/16" 11 1/2"

LATERAL BAR ADJUSTABLE POINTER



DRIVER DUMMY # 06

DOOR GLASS HEIGHT DNA 10 1/2"

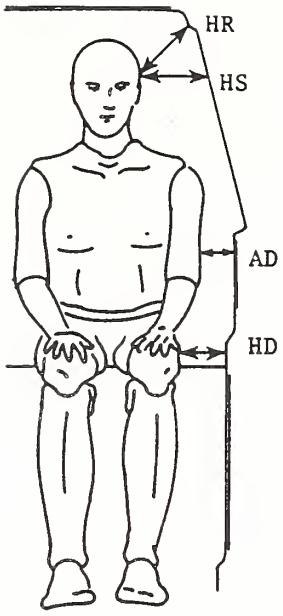


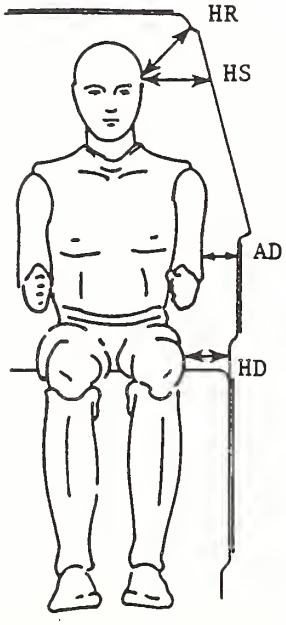
PASSENGER DUMMY # U02

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

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

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



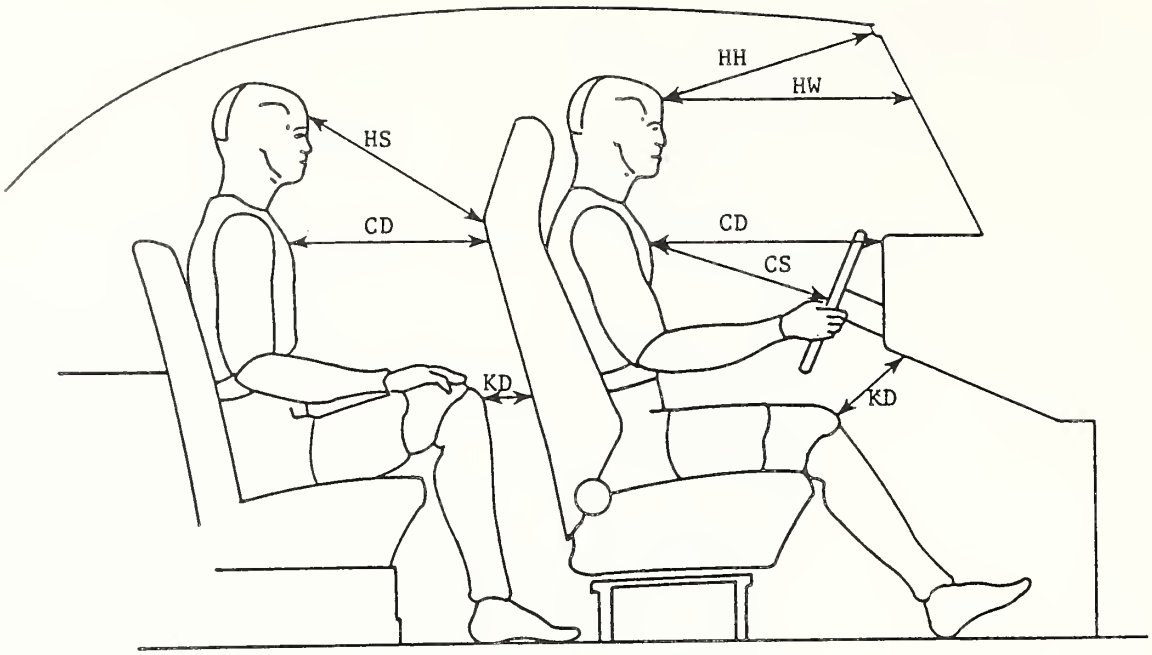


	DRIVER 06	PASSENGER U02
HR	6 1/2	4 11/16*
HS	8	7 1/2
AD	1/2*	0*
HD	2 3/4*	2 1/8*

ALL MEASUREMENTS IN INCHES

*Measurements were made from the dummy to the modified padding.

DUMMY LATERAL CLEARANCE DIMENSIONS



	DRIVER 06	PASSENGER U02
HH	17 1/8	DNA
HW	21 1/8	DNA
HS	DNA	24 3/4
CD	20 1/16	16 13/16
CS	13 1/2	DNA
KDL	4 1/2	2 1/4
KDR	4 3/8	2 7/8

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the left hip of the dummy contacted the inner panel as the door caved in. As the buttocks swung to the right, the dummy's left shoulder and chest contacted the window sill and the door panel. The head then hit the left window sill. The dummy travelled to the passenger's side of the car as the buttocks lifted. As the back slid down the window sill the head hit the roof, the upper window frame and the B-pillar. The driver came to rest sitting in the passenger's seat, facing left. The legs were extended and the head was resting between the B-pillar and the side of the passenger's head rest.

PASSENGER

During impact, the rear quarter panel caved in contacting the dummy's left leg and hip. The head hit the side header, roof and hatchback frame as the passenger rebounded from the impact. The dummy came to rest in an upright position. His hips were moved to the right while the legs were swung left and the torso was also leaning towards the left.

VEHICLE EXTERIOR PROFILES AND STATIC CRUSH

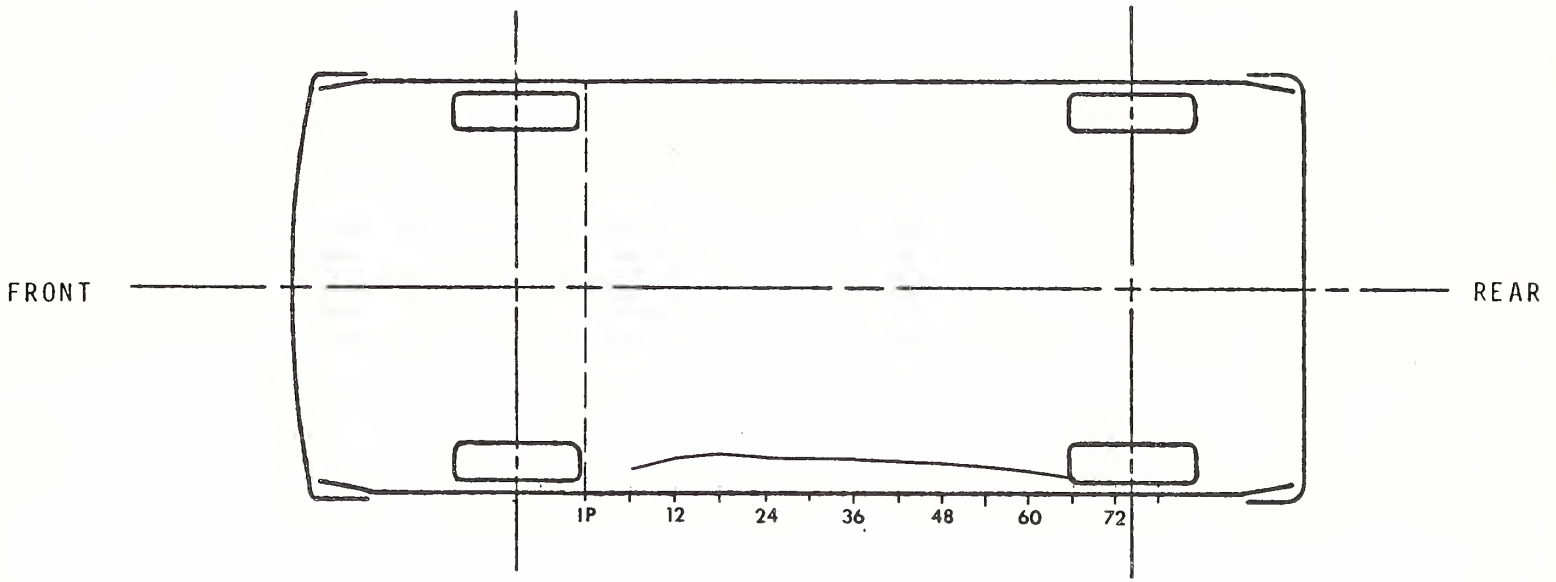
ZERO DISTANCE AT PROJECTED IMPACT POINT*

LOCATION	HEIGHT (in)	6	0	6	12	18	24	30	36	42	48	54	60	66	72	78
PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Axle Height	10.6	X	X	20.1	20.1	20.1	20.1	20.1	20.1	20.2	20.4	20.3	20.3	20.4	X	X
H-Point	20.3	X	16.5	17.9	17.9	17.9	17.9	17.9	17.9	17.9	18.0	18.2	18.3	18.4	X	X
Mid Door	24.8	16.6	17.9	17.8	17.8	17.8	17.8	17.7	17.7	17.8	17.8	17.9	17.9	17.8	18.1	X
Window Sill	35.1	X	20.0	19.6	19.5	19.4	19.0	19.3	19.3	19.2	19.2	19.2	19.4	19.5	19.6	19.8
Window Top	53.3	X	X	X	X	X	27.1	26.9	26.9	26.8	26.8	26.8	26.9	26.9	27.1	27.5
POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Axle Height	10.6	X	X	28.8	32.6	32.7	32.3	32.1	31.4	31.0	30.4	29.7	27.9	26.1	X	X
H-Point	20.3	X	24.0	26.5	30.1	30.3	30.5	30.6	30.6	30.6	30.8	31.5	30.6	29.2	X	X
Mid Door	24.8	22.3	24.2	24.6	29.6	29.6	29.7	29.6	29.6	29.8	29.9	30.5	29.9	29.0	27.2	X
Window Sill	35.1	X	22.6	23.0	27.3	28.8	29.8	30.5	30.6	30.8	31.1	31.6	31.4	30.8	27.4	23.2
Window Top	53.3	X	X	X	X	X	30.1	29.6	29.4	29.2	29.0	29.0	28.8	28.6	28.9	28.6
STATIC CRUSH (IN)																
Axle Height	10.6	X	X	8.7	12.5	12.6	12.2	12.0	11.3	10.8	10.0	9.4	7.6	5.7	X	X
H-Point	20.3	X	7.5	8.6	12.2	12.4	12.6	12.7	12.7	12.7	12.8	13.3	12.3	10.8	X	X
Mid Door	24.8	5.7	6.3	6.8	11.8	11.8	11.2	11.9	11.9	12.0	12.1	12.6	12.0	11.2	9.1	X
Window Sill	35.1	X	2.6	3.4	7.8	9.4	10.8	11.2	3.7	11.6	11.9	12.4	12.0	11.3	7.8	3.4
Window Top	53.3	X	X	X	X	X	3.0	2.7	2.5	2.4	2.2	2.2	1.9	1.7	1.8	1.1

* 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

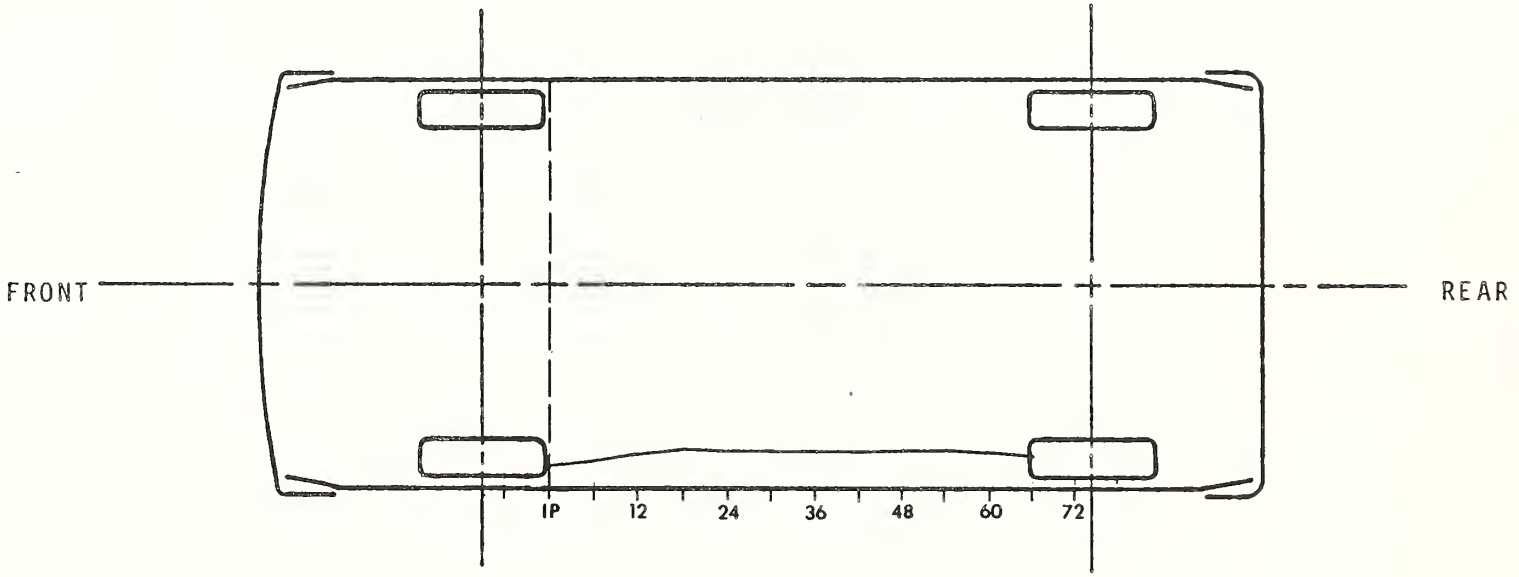


PROFILE LEVEL EQUALS AXLE HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Length of Car = 155.3"
Width of Car = 63.5"

Maximum Crush = 12.6"
Approximate Length of Crush = 60.0"

VEHICLE EXTERIOR STATIC CRUSH PROFILE

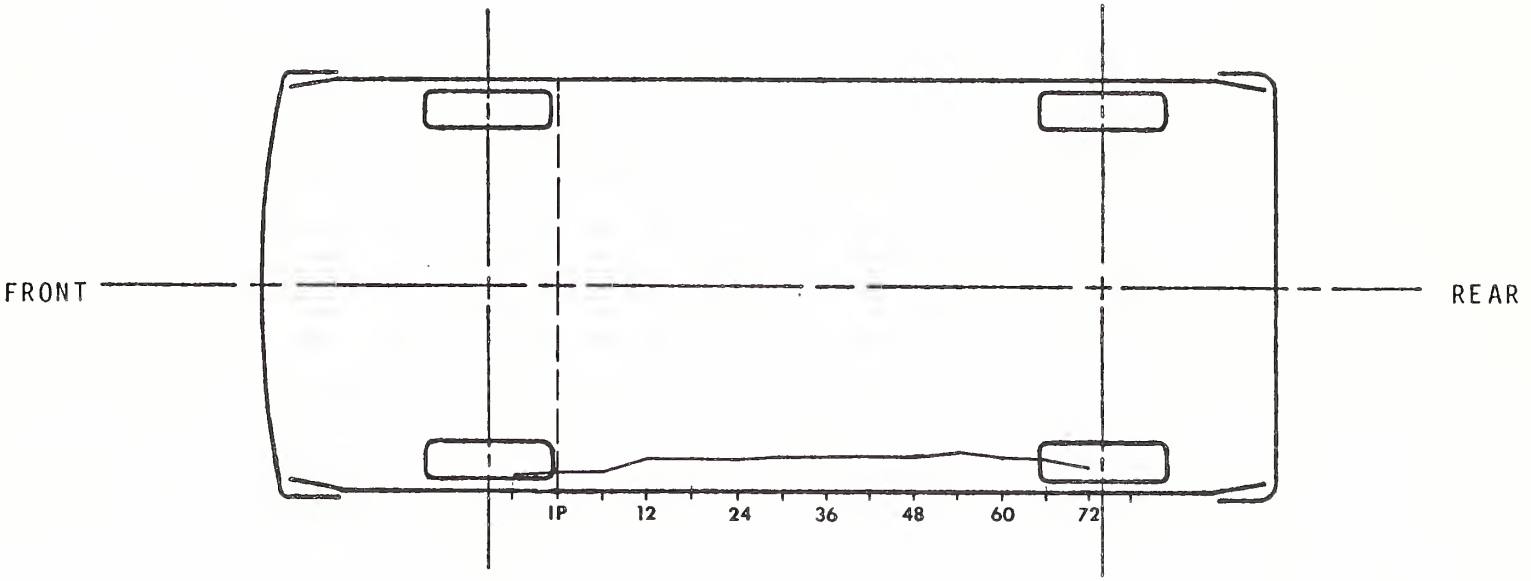


PROFILE LEVEL EQUALS H-POINT HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Length of Car = 155.3"
Width of Car = 63.5"

Maximum Crush = 13.3"
Approximate Length of Crush = 66"

VEHICLE EXTERIOR STATIC CRUSH PROFILE

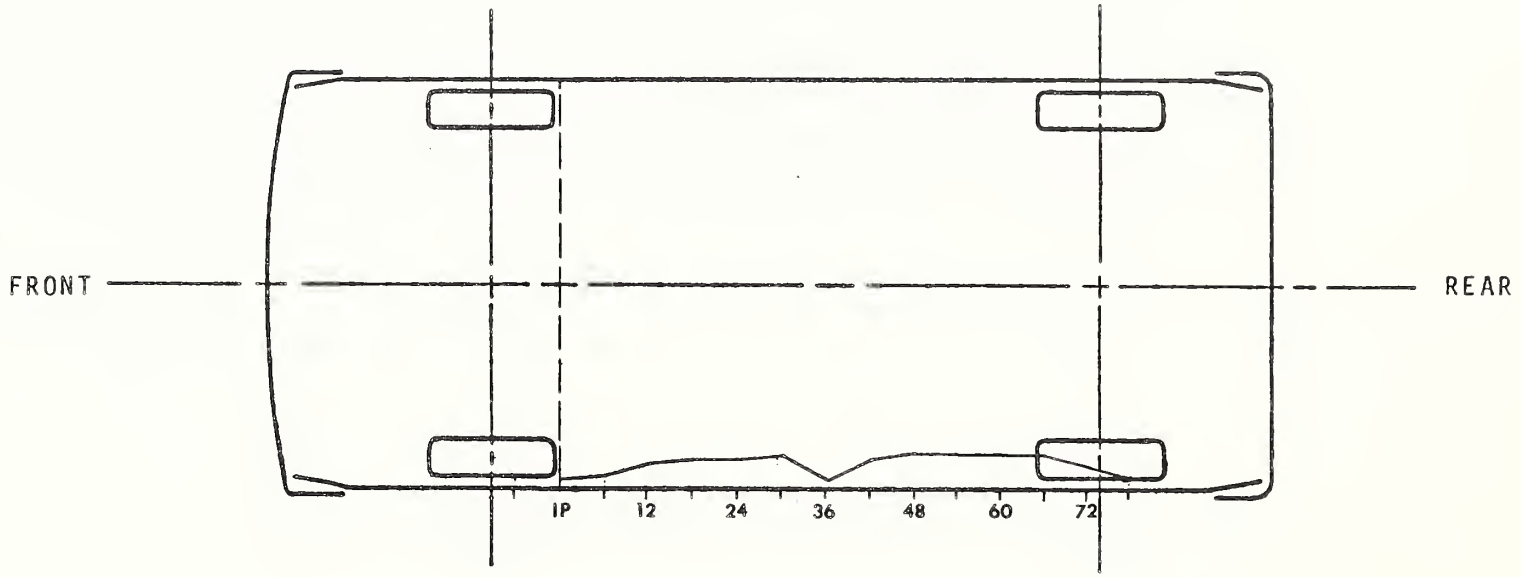


PROFILE LEVEL EQUALS MID-DOOR HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Length of Car = 155.3"
Width of Car = 63.5"

Maximum Crush = 12.6"
Approximate Length of Crush = 78"

VEHICLE EXTERIOR STATIC CRUSH PROFILE

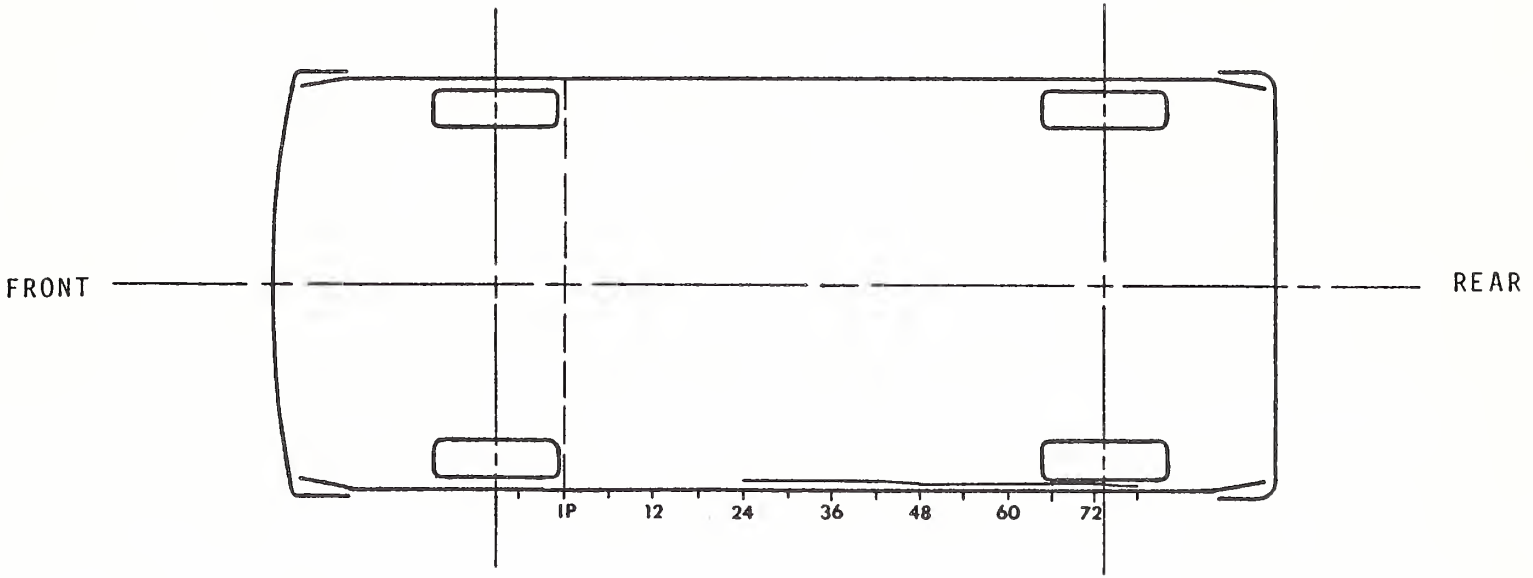


PROFILE LEVEL EQUALS WINDOW SILL HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Length of Car = 155.3"
Width of Car = 63.5"

Maximum Crush = 12.4"
Approximate Length of Crush = 78"

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Length of Car = 155.3"
Width of Car = 63.5"

Maximum Crush = 3.0"
Approximate Length of Crush = 54"

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	87.90	314.38	79.83	79.38	24.98	155.63	38.31	47.13
LATERAL	47.27	44.00	23.66	276.75	123.81	47.63	22.91	156.00
VERTICAL	35.21	314.25	66.89	62.25	44.26	55.38	34.61	46.25
RESULTANT		101.17 @ 79.38				130.24 @ 47.63		
HIC	852.30	from 37.63 to 89.00			1065.79	from 44.25 to 55.25		
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	38.71	47.50	25.02	57.50	6.35	80.00	21.58	41.87
LATERAL (P)***	103.86	38.75	40.64	55.63	80.65	43.75	2.89	87.50
LATERAL (R)***	107.09	38.75	40.02	55.63	82.82	43.75	2.51	88.13
VERTICAL	12.52	48.13	17.50	39.38	6.76	33.75	13.24	50.63
RESULTANT (P)		108.00 @ 38.75				83.31 @ 43.75		
RESULTANT (R)		111.10 @ 38.75				85.41 @ 43.75		
DELTA V (MPH)****		33.6 @ 51.88 (P)				28.2 @ 83.75 (P)		
		35.1 @ 51.88 (R)				28.9 @ 85.00 (R)		
LOWER SPINE								
LONGITUDINAL	35.40	45.00	24.25	33.13	34.98	55.00	27.47	34.38
LATERAL (P)	128.12	35.63	25.13	53.75	98.05	38.13	26.75	56.87
LATERAL (R)	128.02	35.63	22.11	60.62	99.43	38.13	31.91	56.87
VERTICAL	14.92	30.62	3.21	78.13	10.20	34.38	0.93	64.38
RESULTANT (P)		129.71 @ 35.00				100.79 @ 38.13		
RESULTANT (R)		129.72 @ 35.00				102.13 @ 38.13		
DELTA V (MPH)		39.7 @ 48.13 (P)				35.2 @ 53.12 (P)		
		40.0 @ 49.37 (R)				36.4 @ 53.12 (R)		
LEFT UPPER RIB								
LATERAL (P)	98.69	31.88	8.33	82.50	73.52	35.00	9.25	56.87
LATERAL (R)	106.75	31.88	8.19	83.75	77.51	35.00	12.90	56.87
DELTA V (MPH)		31.2 @ 67.50 (P)				26.4 @ 55.00 (P)		
		31.2 @ 64.38 (R)				28.4 @ 55.00 (R)		
LEFT LOWER RIB								
LATERAL (P)	87.06	31.25	64.65	60.62	122.70	25.00	17.36	19.38
LATERAL (R)	95.48	31.25	66.16	60.62	72.51	25.00	21.40	52.50
DELTA V (MPH)		35.0 @ 56.88 (P)				33.2 @ 50.63 (P)		
		35.0 @ 56.87 (R)				28.5 @ 50.63 (R)		
PELVIS ACCELERATION								
LONGITUDINAL	7.72	61.38	38.57	40.50	---	--- o	---	---o
LATERAL	108.32	27.25	7.40	44.25	---	--- o	8.96	114.75
VERTICAL	22.57	56.88	4.67	63.00	---	--- o	---	---o
RESULTANT		108.81 @ 27.25				--- @ ---o		
DELTA V (MPH)		33.4 @ 63.13				--- @ ---o		

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 †	1.83	54.38	---	---ε	1.84	50.00	---	---ε

* LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: UPWARD

**LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: DOWNWARD

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

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

†Compression: Positive

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

εThere were no negative values in the time interval of interest.

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	83.5	23.6	10.0					
	(LONGITUDINAL)		Δ V = -0.9 mph @ 90.25 msec			5.57	60.50	8.98	20.00
	(LATERAL)		Δ V = 18.5 mph @ 90.25 msec			25.65	29.38	2.91	73.38
	(VERTICAL)					12.44	24.75	7.58	37.00
	(RESULTANT)						27.10 @ 20.25		
2	RIGHT SILL AT REAR SEAT	61.6	23.6	8.5					
	(LONGITUDINAL)		Δ V = -0.3 mph @ 90.25 msec			6.10	59.13	9.76	21.13
	(LATERAL)		Δ V = 22.9 mph @ 90.25 msec			30.74	40.88	0.59	85.88
	(VERTICAL)					13.18	27.00	7.88	40.13
	(RESULTANT)						31.84 @ 40.75		
3	REAR DECK OVER AXLE	32.0	0.0	6.7					
	(LONGITUDINAL)		Δ V = -6.2 mph @ 90.25 msec			8.15	22.13	17.79	40.25
	(LATERAL)		Δ V = 26.5 mph @ 90.25 msec			35.96	41.13	2.05	90.25
	(VERTICAL)					8.55	52.00	9.27	26.25
	(RESULTANT)						40.08 @ 40.88		
4	LEFT SILL AT REAR SEAT	62.2	-23.6	8.5					
	(LATERAL)		Δ V = 10.2 mph @ 39.25 msec			81.13	21.38	27.15	13.00
5	LEFT SILL AT FRONT SEAT	83.5	-23.5	10.0					
	(LATERAL)		Δ V = 7.4 mph @ 21.13 msec		τ	46.40	21.25	56.51	26.63
6	LEFT FRONT DOOR CENTERLINE	82.6	-25.6	23.5					
	(LATERAL)		Δ V = 30.4 mph @ 22.75 msec			254.28	17.88	38.80	24.88
7	RIGHT REAR COMPARTMENT	31.0	15.2	13.8					
	(LONGITUDINAL)					4.88	58.38	6.79	44.63
8	MIDREAR OF LEFT FRONT DOOR	62.3	-26.0	24.2					
	(LATERAL)		Δ V = 24.5 mph @ 21.13 msec			149.47	13.00	37.20	39.75
9	UPPER LEFT FRONT DOOR CENTERLINE	83.5	-26.0	32.7					
	(LATERAL)		Δ V = 33.4 mph @ 19.88 msec		τ	314.77	20.75	193.51	27.63
10	MIDFRONT OF LEFT FRONT DOOR	101.4	-25.8	21.9					
	(LATERAL)		Δ V = ---	---Y		---	---Y	---	---Y
11	UPPER REAR OF LEFT REAR DOOR	72.2	25.8	32.9					
	(LATERAL)		Δ V = 36.4 mph @ 23.88 msec			251.67	21.00	105.07	90.00

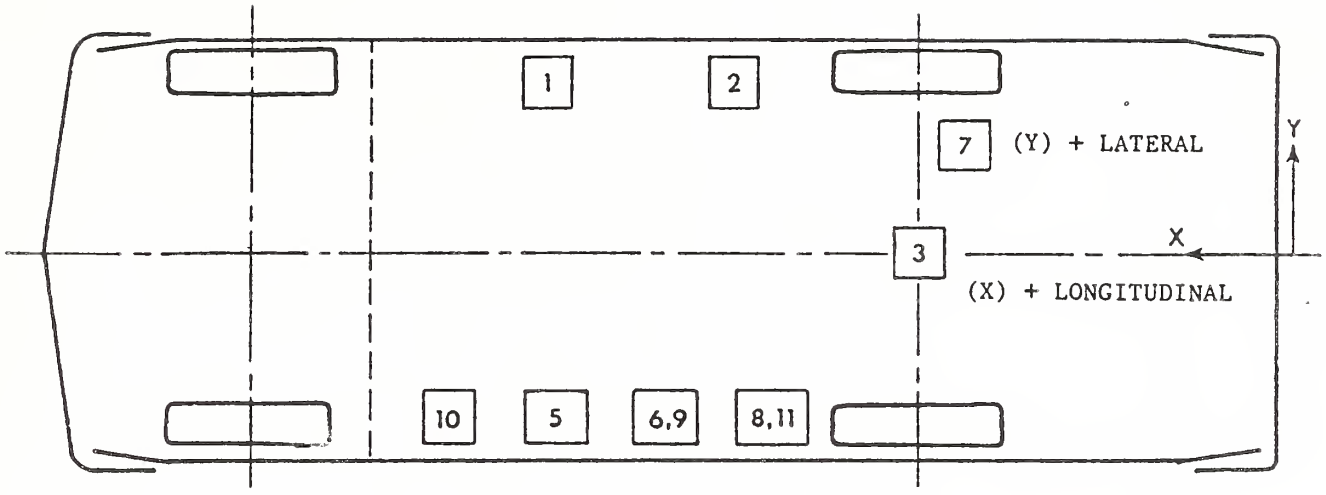
* Reference: X - Rear Bumper (+ Forward), Y - Vehicle Centerline (+ To Right), Z - Ground Level (+ Up)

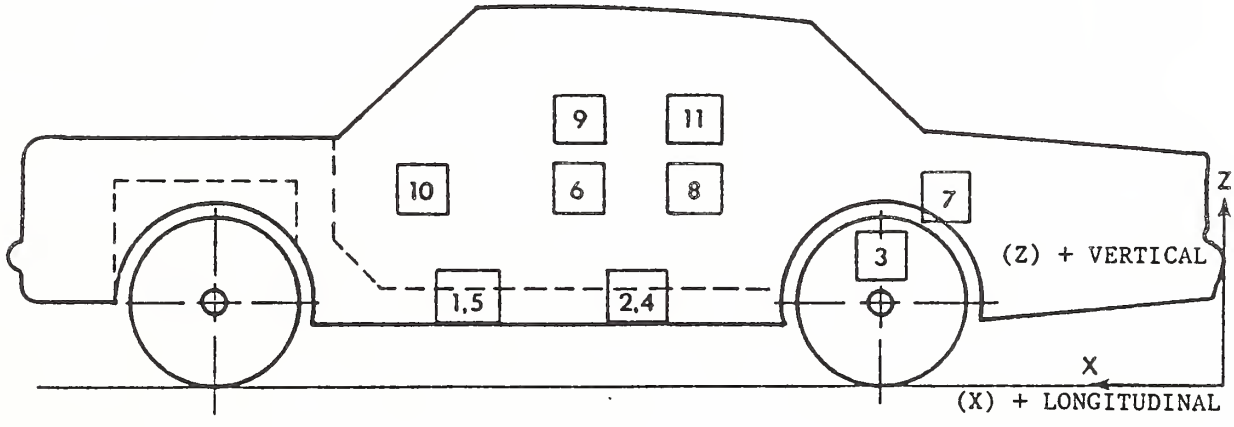
All measurements of accelerometer locations in inches.

τ This Delta V appears unrealistic

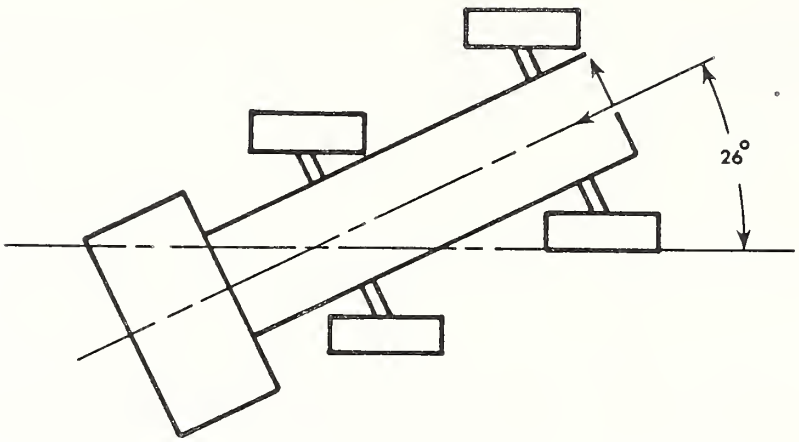
Y See TEST ANOMALIES

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 = -17.9 mph @ 90.25 msec			0.78	81.13	21.10	42.88
	(LATERAL)	Δ V = -3.8 mph @ 90.25 msec			4.50	63.25	10.36	45.50
	(VERTICAL)				21.69	56.13	17.12	62.25
	(RESULTANT)					26.61 @ 33.75		
2	FRONT FRAME MEMBER	130.3	0.0	11.3				
	(LONGITUDINAL)	Δ V = -18.9 mph @ 90.25 msec			0.74	0.88	21.45	43.25
3	REAR FRAME MEMBER	23.3	0.0	11.5				
	(LONGITUDINAL)	Δ V = -16.5 mph @ 90.25 msec			1.43	89.50	20.91	42.88

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

All measurements of accelerometer locations in inches.

HIGH SPEED CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead	Photosonic 1B	8	470	Vehicle dynamics
2	Overhead	Photosonic 1B	25	450	Close-up of impact point
3	Onboard MDB	Photosonic 1B	25	505	Close-up of impact point
4	Onboard MDB	Photosonic 1B	13	510	Driver kinematics
5	Ground level - right	Photosonic 1B	25	503	Overall view
6	Ground level - left	Photosonic 1B	17	500	Overall view
7	Onboard vehicle	Photosonic 1B	8	805	Driver kinematics - front view
8	Onboard vehicle	Photosonic 1B	8	815	Driver kinematics
9	Onboard vehicle	Photosonic 1B	8	810	Passenger kinematics

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

LOCATIONS OF OFFBOARD HIGH SPEED CAMERAS

CAMERA NO.	X	Y	Z
1	0	0	25'
2	0	0	25'
5	24'10"	58'8"	45"
6	-20'11"	-11'	45"

Origin of Coordinate System is Point of Impact

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

NON-GOVERNMENT FURNISHED TRANSDUCER INFORMATION

PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NUMBER	SERIAL NUMBER	MFGR.	DATE OF LAST CALIBRATION	SENSITIVITY	DESIRED FULL SCALE (ENGR. UNITS)
BCGXG	Accel	4-202-0001	18845	Bell Howell	11/8/84	0.237 MV/G	50 G
BCGYG	Accel	4-202-0001	18858	Bell Howell	11/8/84	0.238 MV/G	50 G
BCGZG	Accel	4-202-0001	18857	Bell Howell	11/8/84	0.240 MV/G	50 G
BFCXG	Accel	4-202-0001	18240	Bell Howell	11/8/84	0.239 MV/G	50 G
BRCXG	Accel	4-202-0001	19022	Bell Howell	11/8/84	0.220 MV/G	50 G

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

APPENDIX A

PHOTOGRAPHS

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

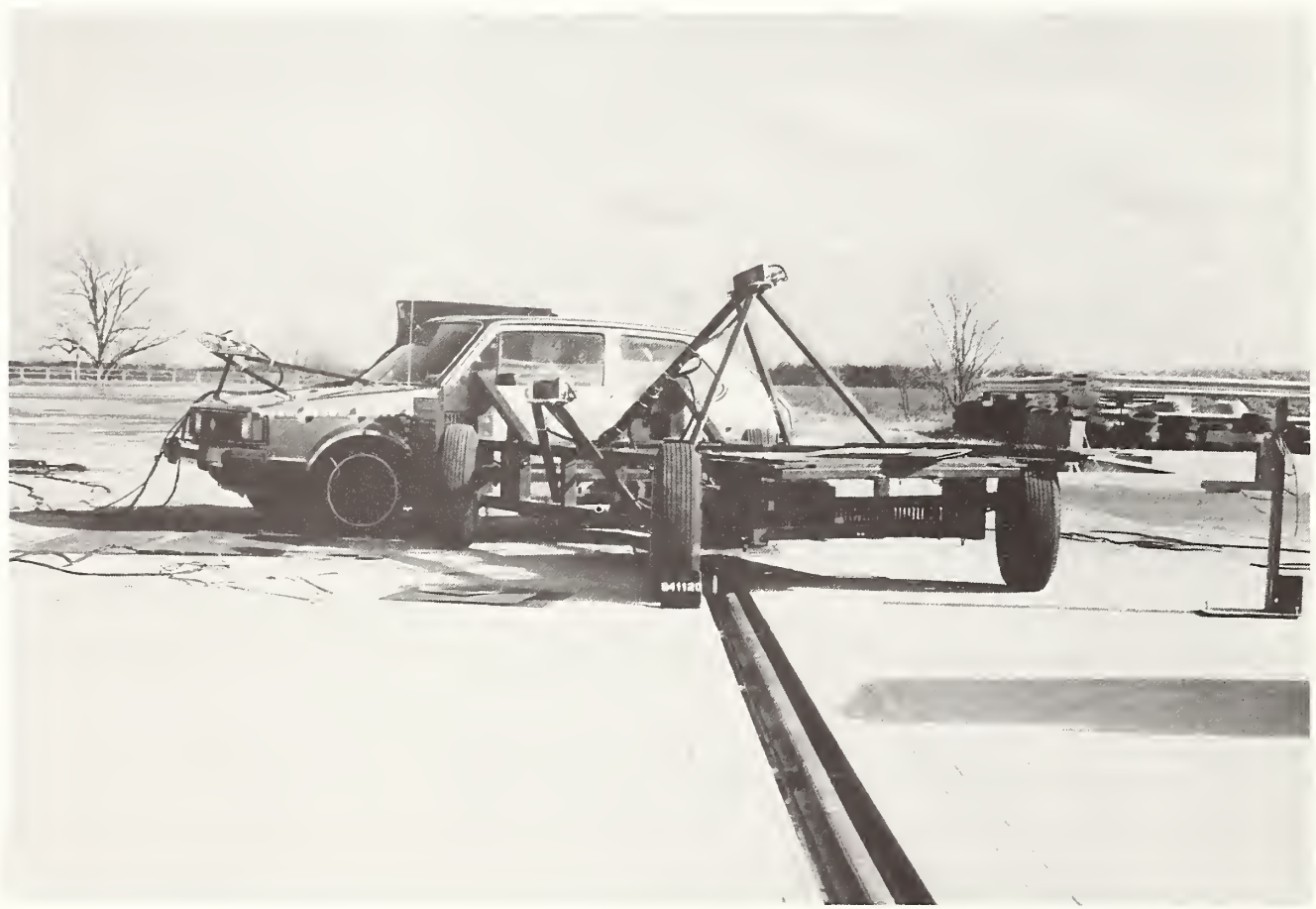


Figure A-2. PRE-TEST OVERALL - VIEW 2

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

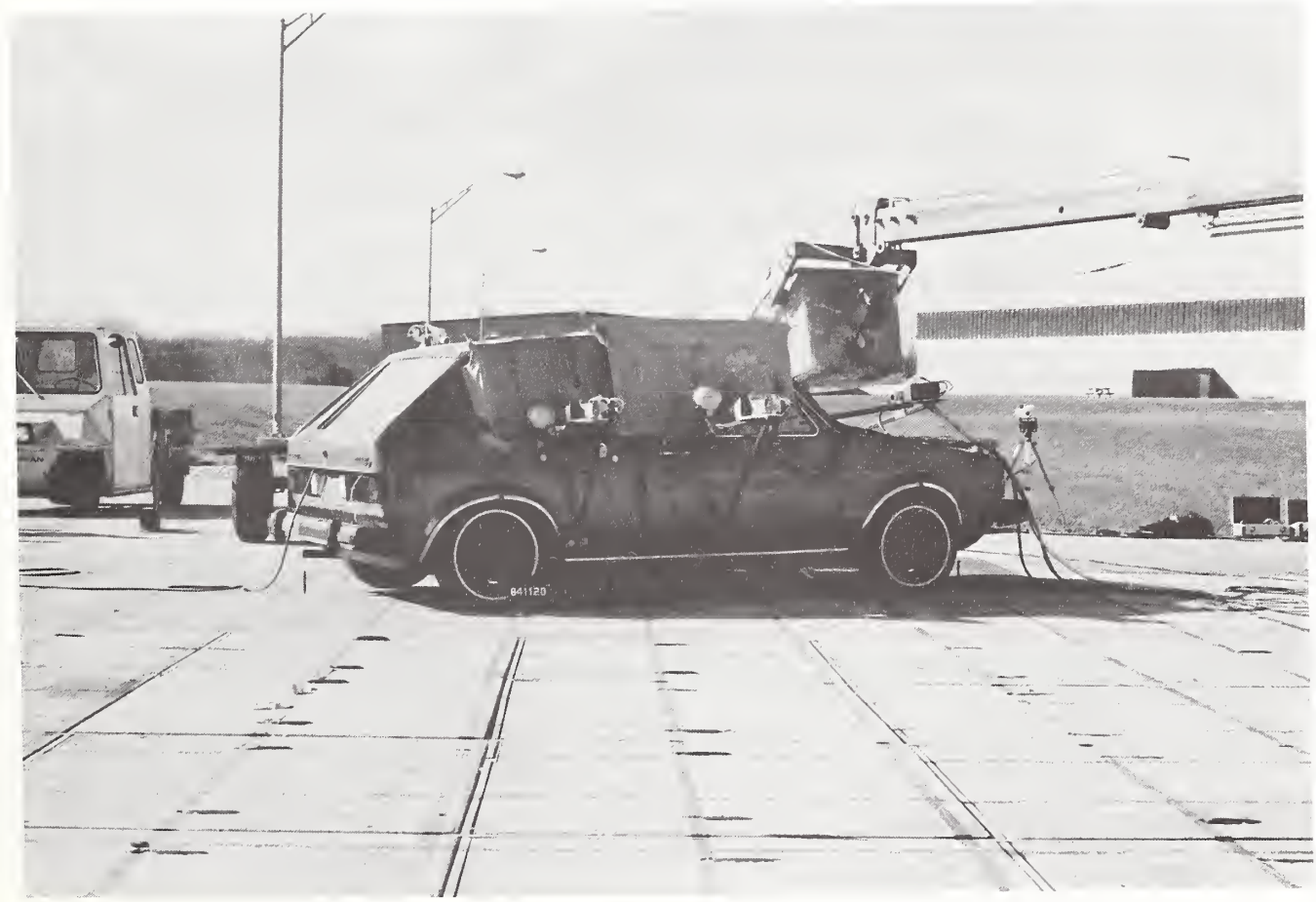


Figure A-4. PRE-TEST OVERALL - VIEW 4

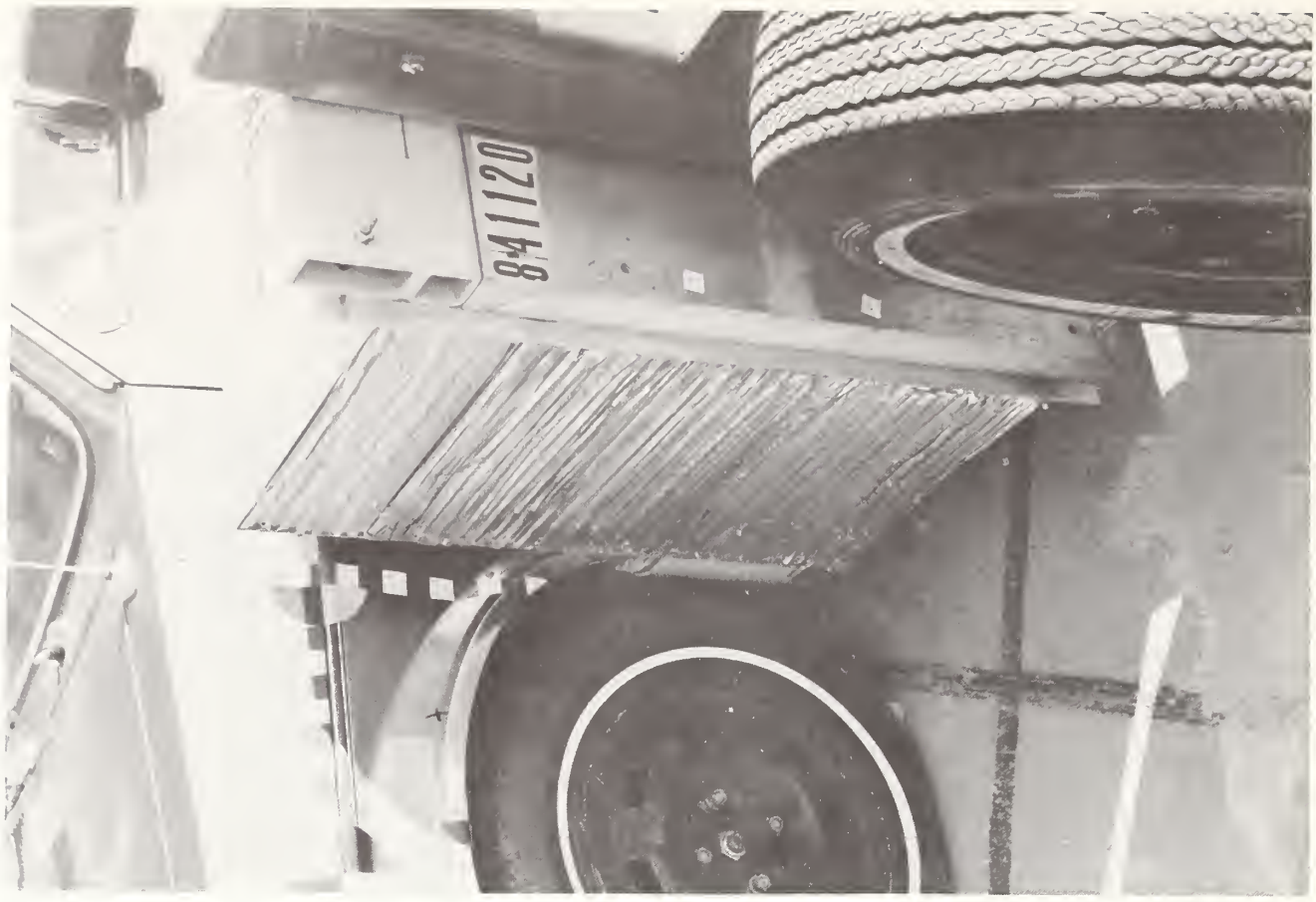


Figure A-5. PRE-TEST CLOSEUP - VIEW 1

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

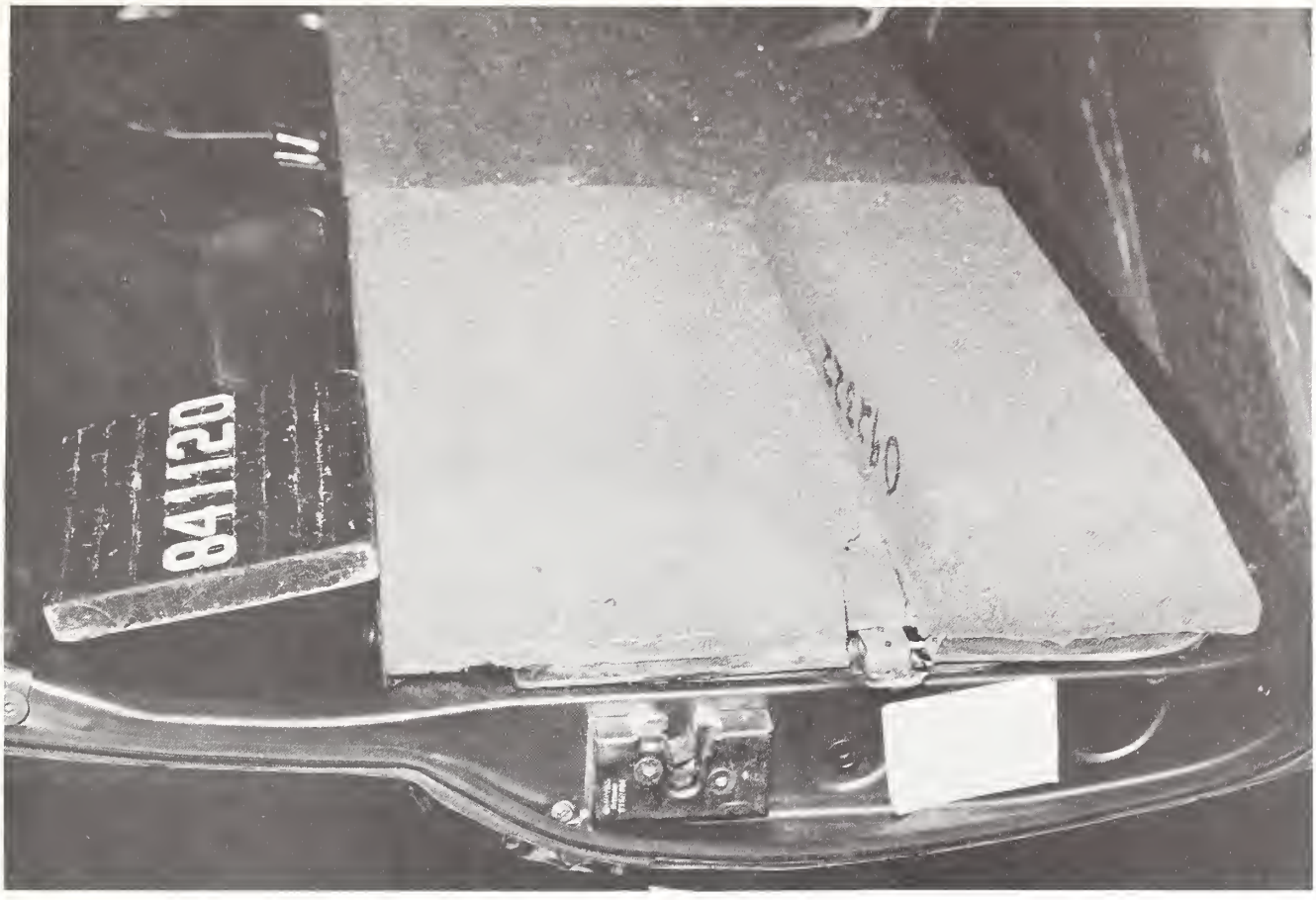


Figure A-7. PADDING MODIFICATION

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

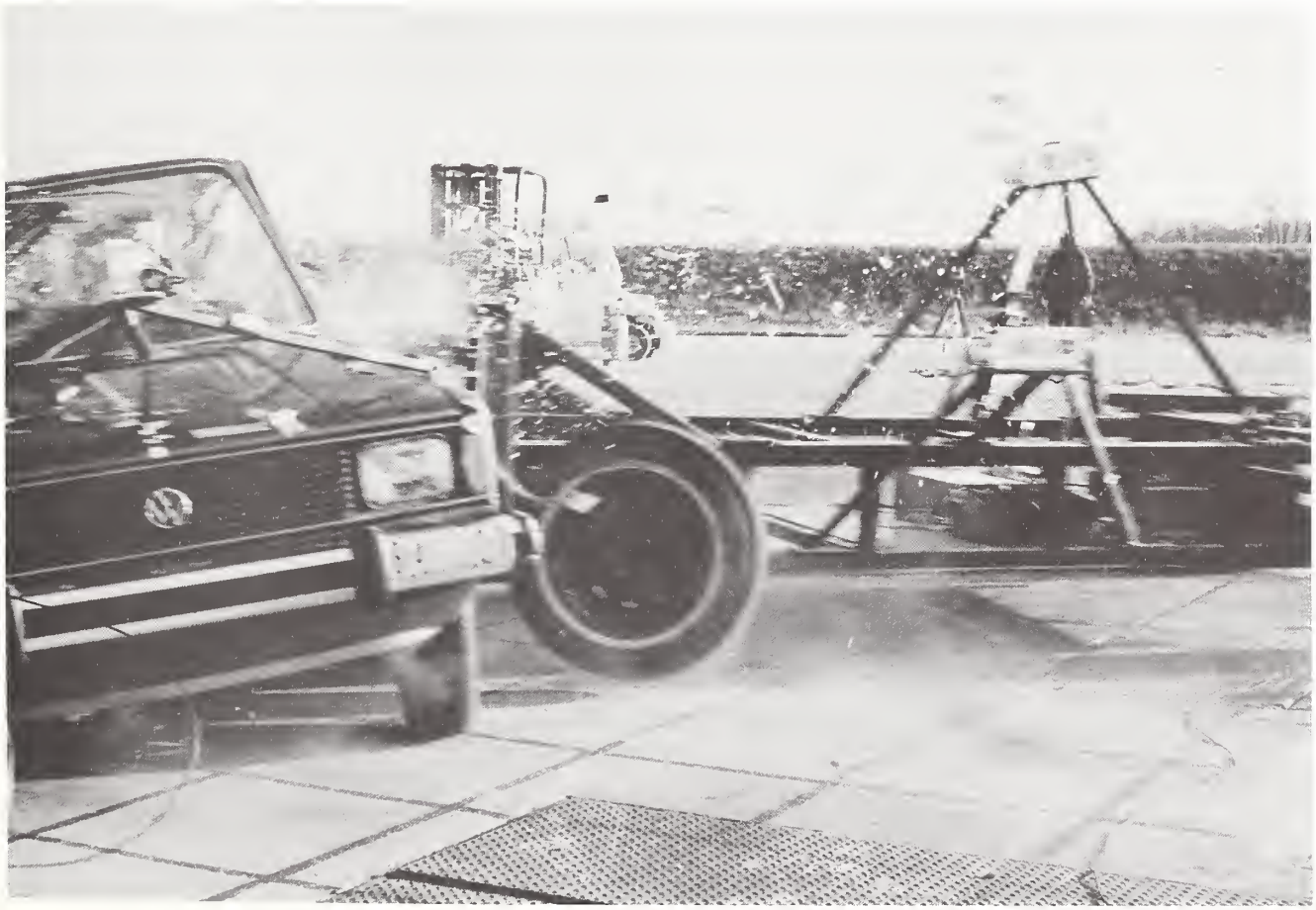


Figure A-12. CRASH EVENT PHOTOGRAPH

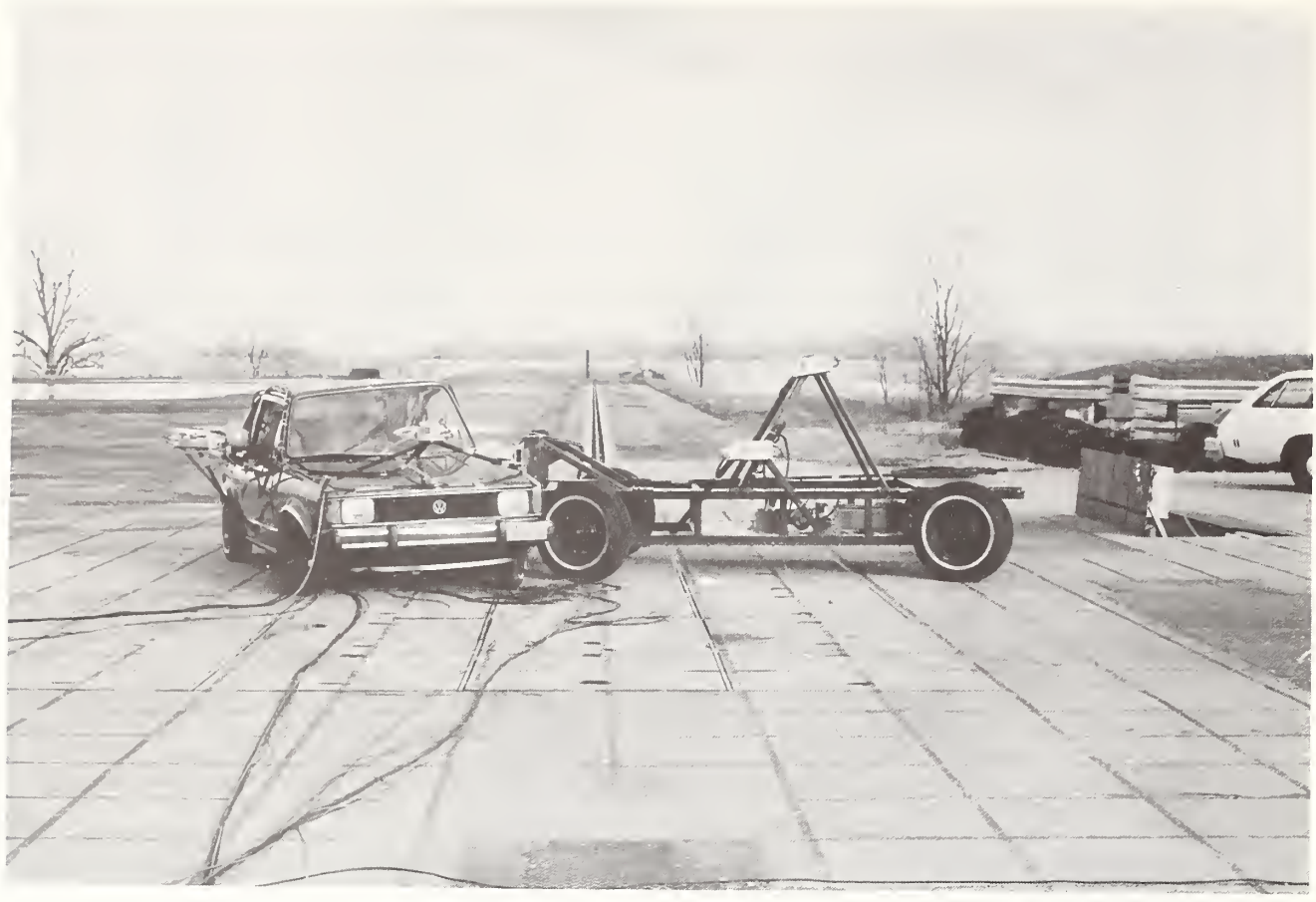


Figure A-13. POST-TEST OVERALL - VIEW 1

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 DRIVER DUMMY - VIEW 1

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

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

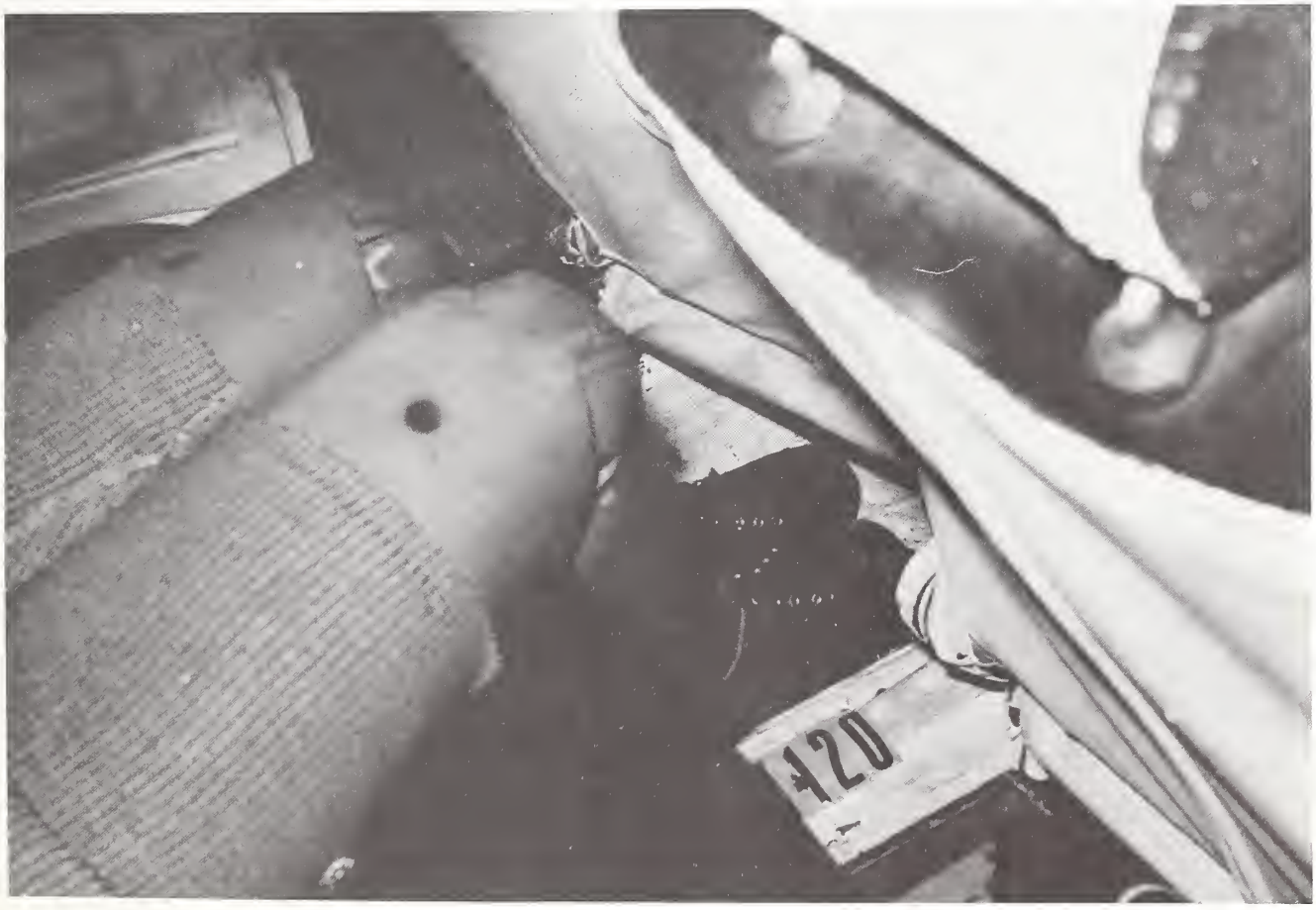


Figure A-20. POST-TEST PASSENGER DUMMY - VIEW 2

Figure A-21. POST-TEST DUMMIES OVERALL

Figure A-22. VEHICLE DAMAGE

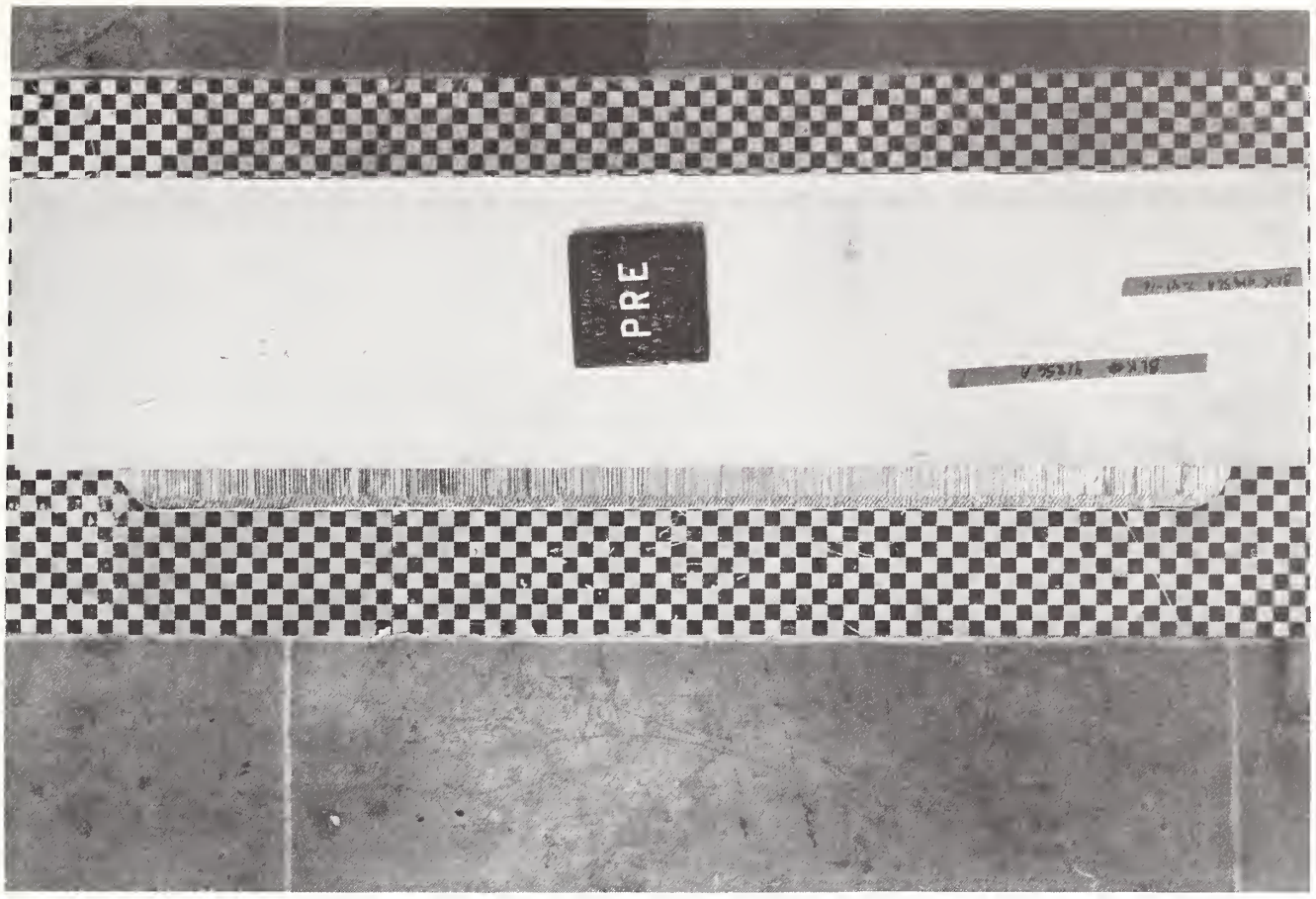


Figure A-23. PRE-TEST MDB FACE - VIEW 1

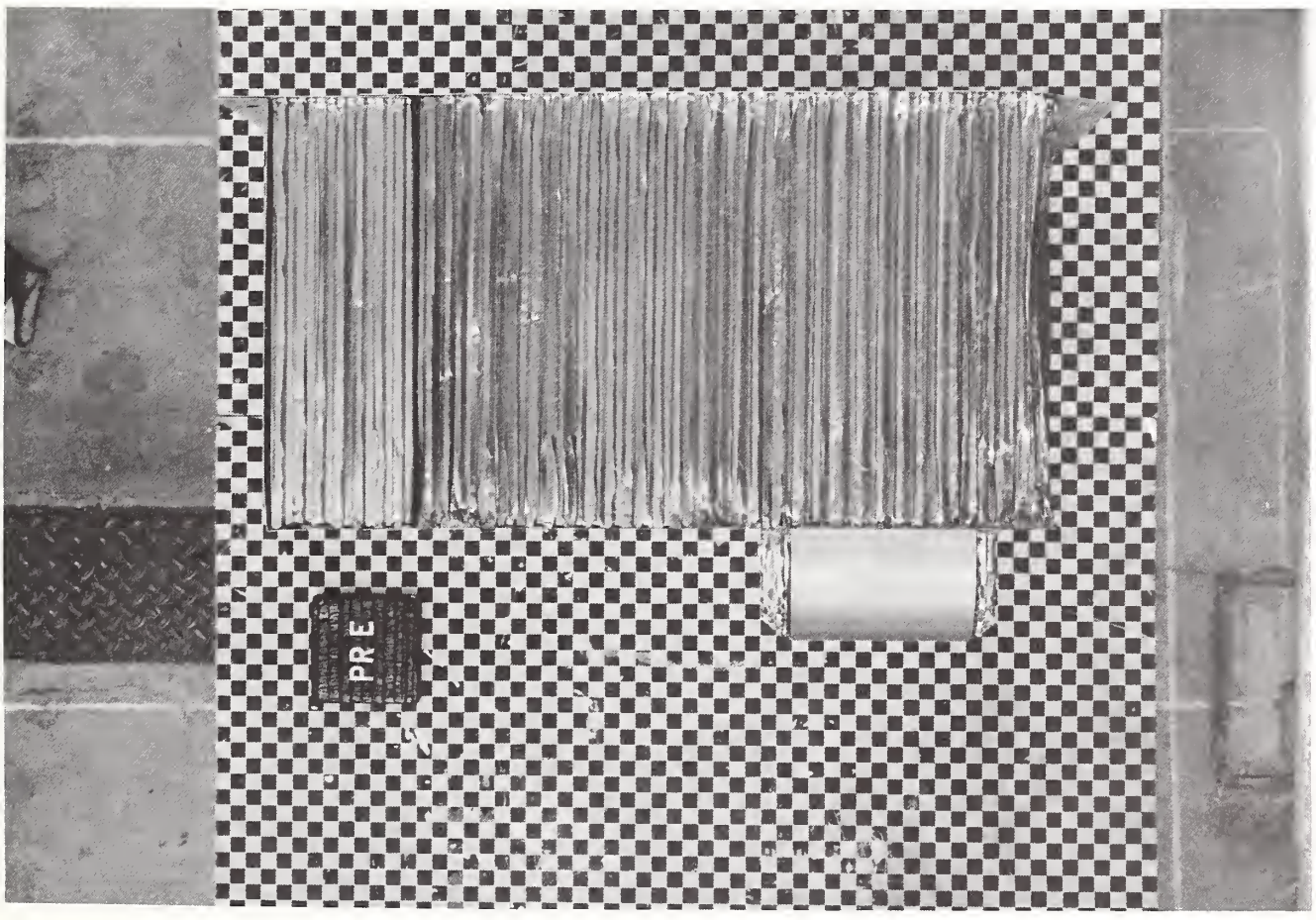


Figure A-24. PRE-TEST MDB FACE - VIEW 2

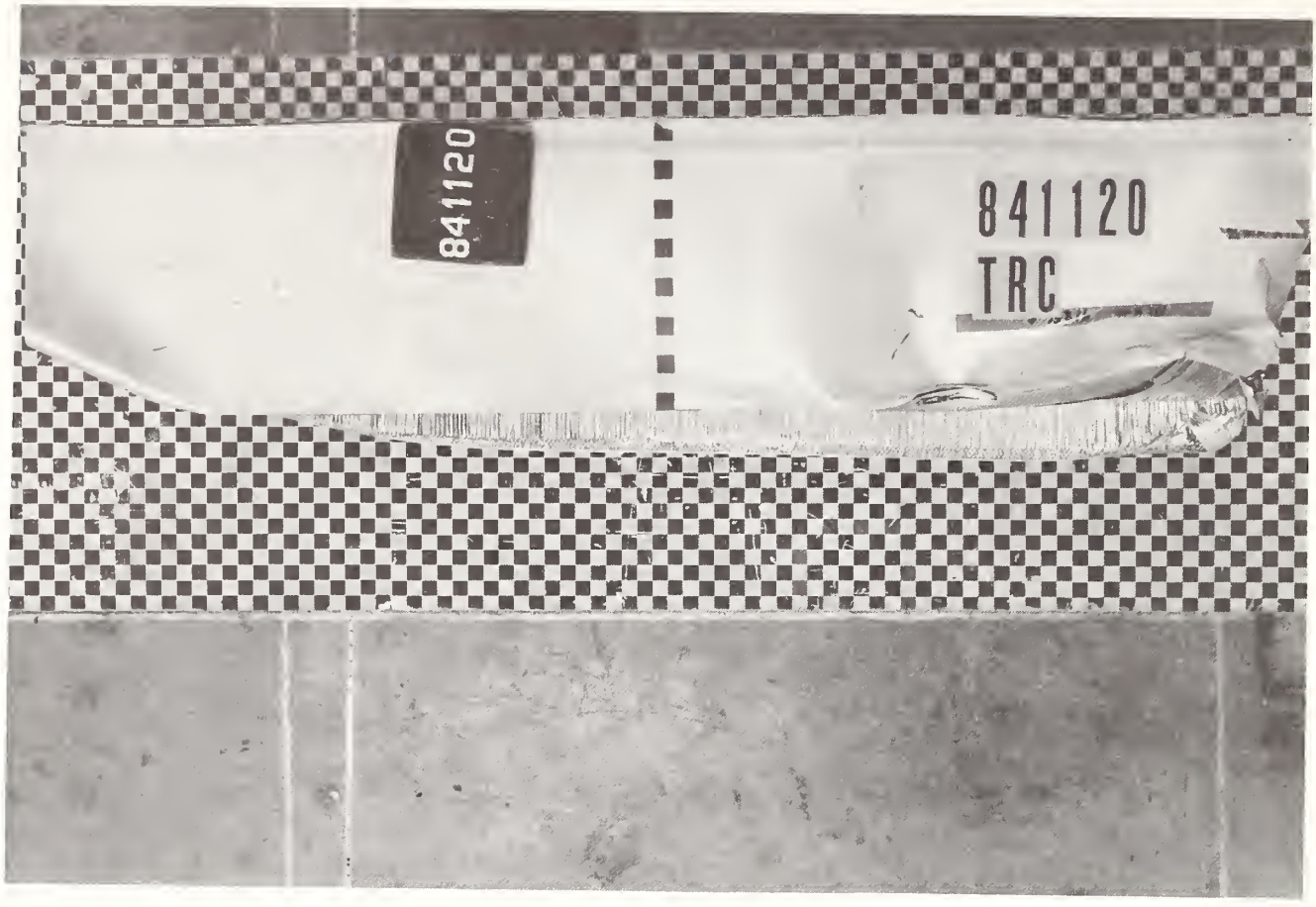


Figure A-25. POST-TEST MDB FACE - VIEW 1

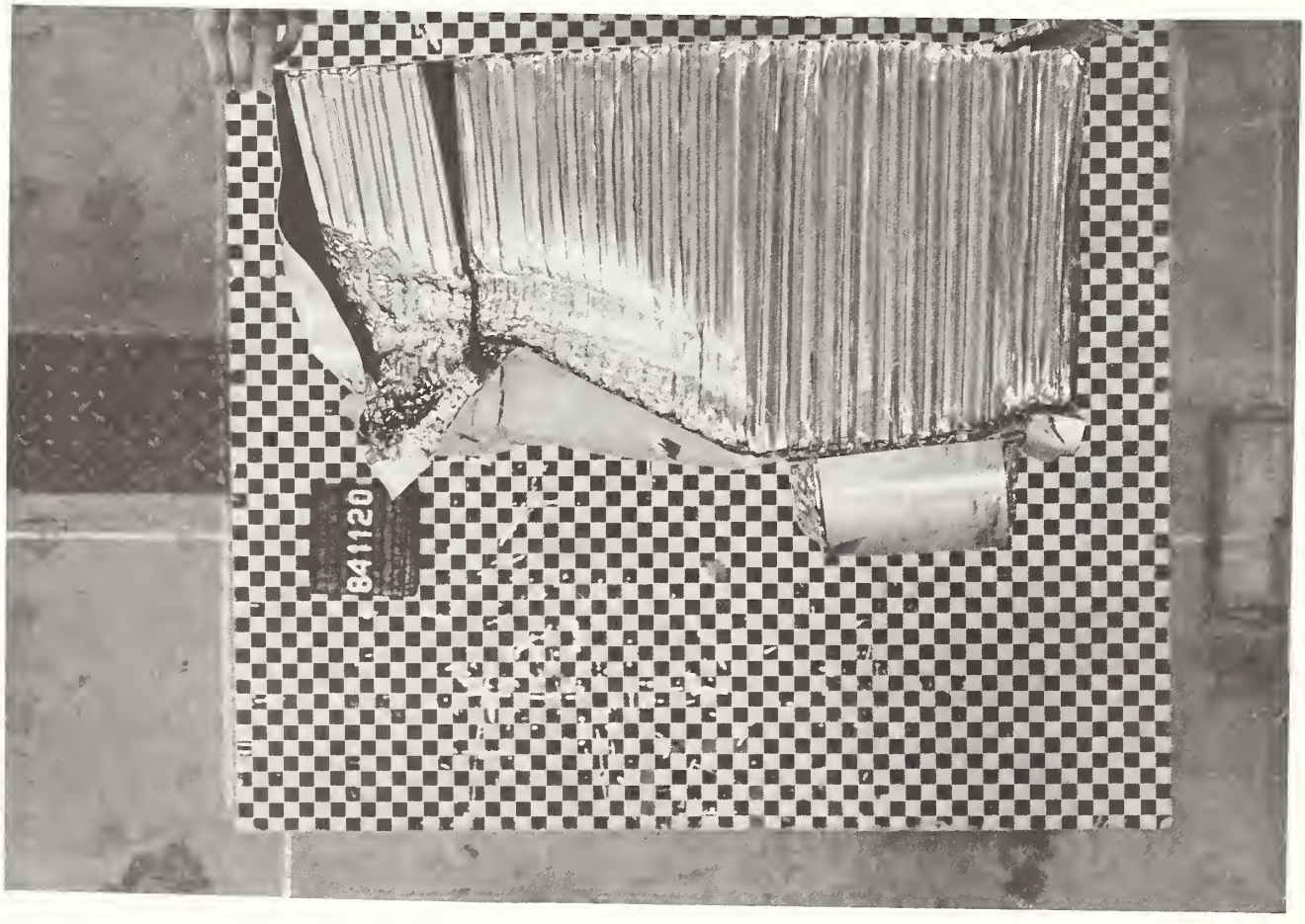
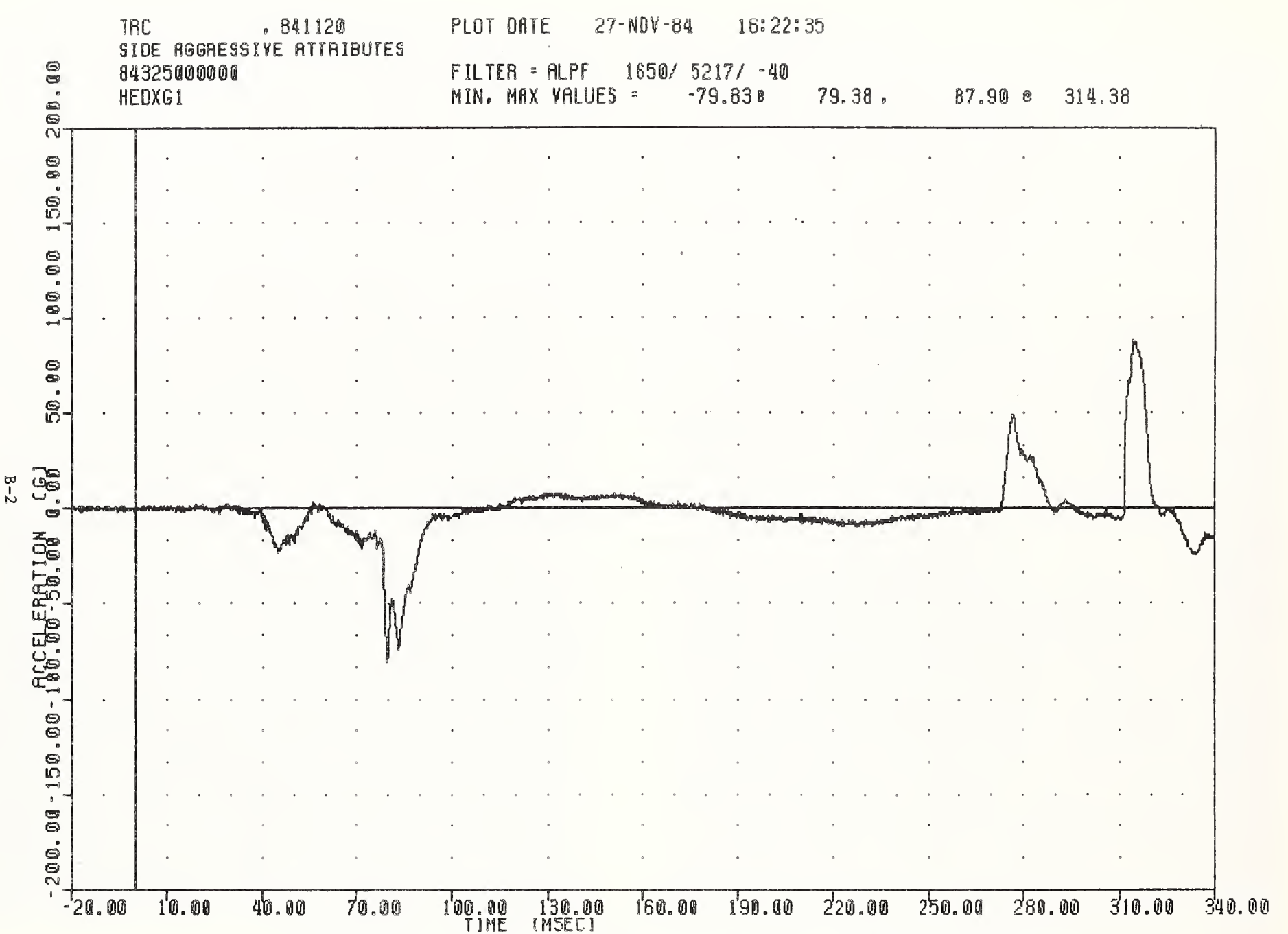


Figure A-26. POST-TEST MDB FACE - VIEW 2

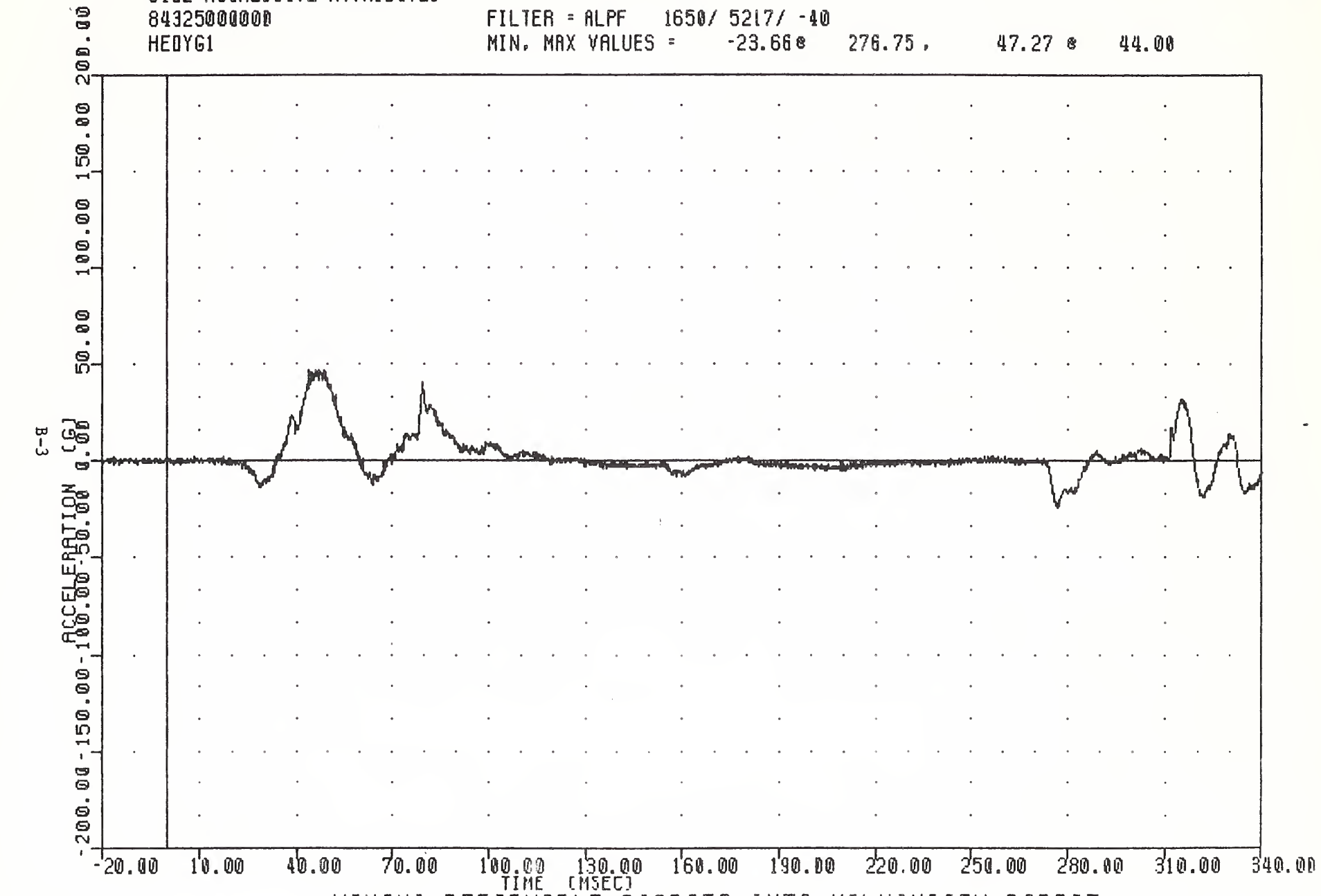
APPENDIX B

DATA PLOT PRESENTATION

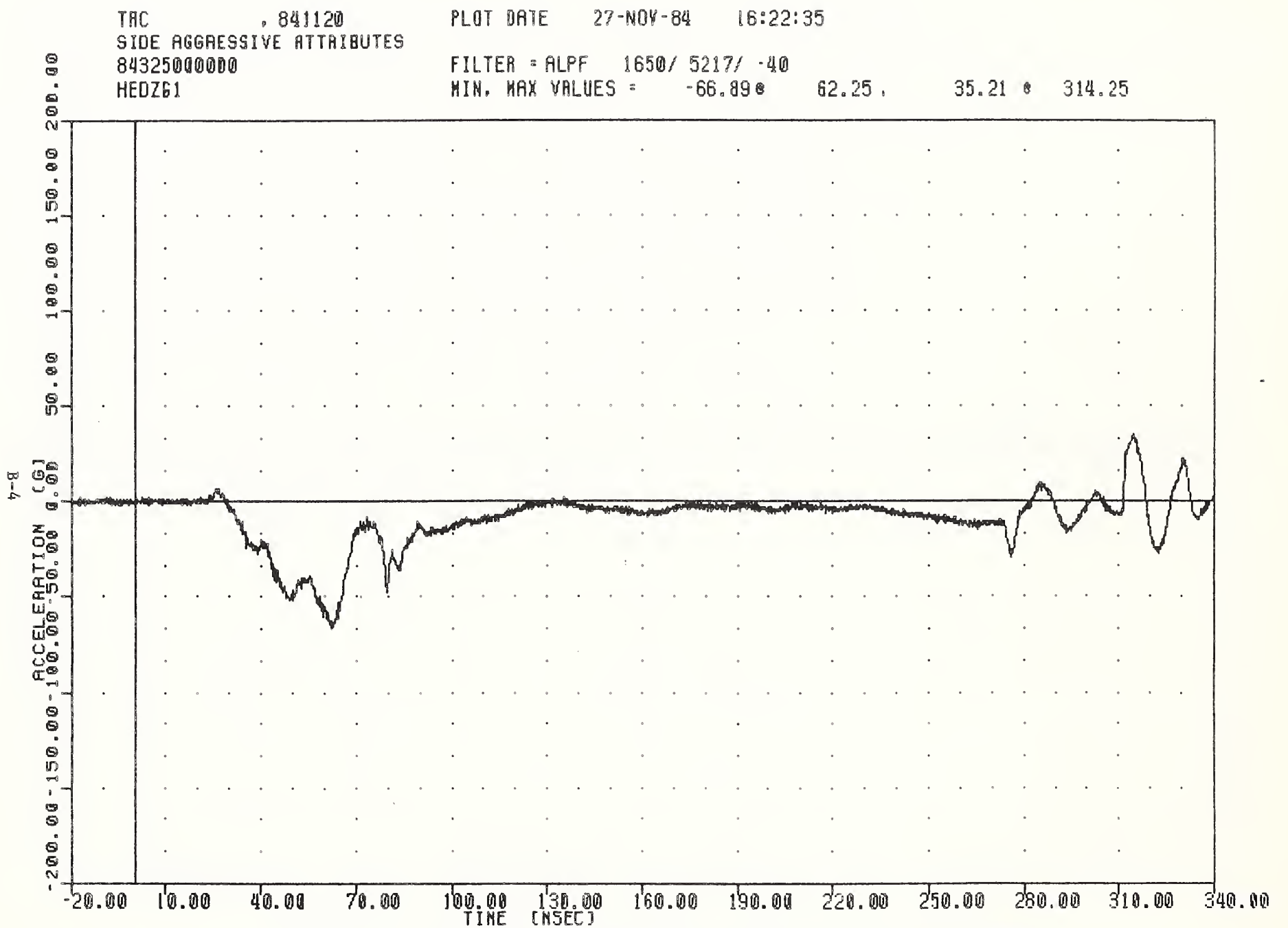
Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. The data was filtered according to SAE J211, except dummy thorax data which was filtered using the HSRI filter.



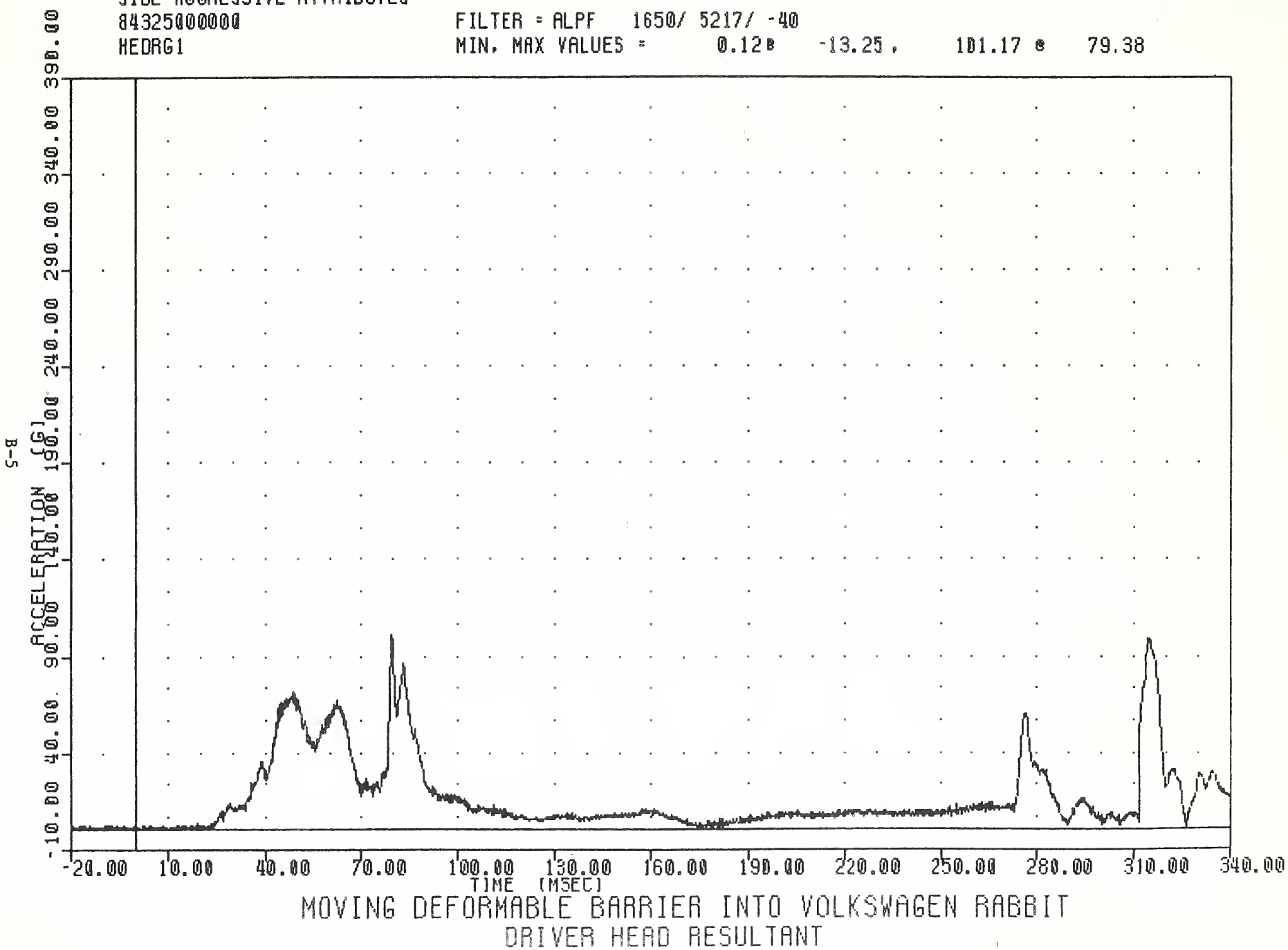
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION X AXIS



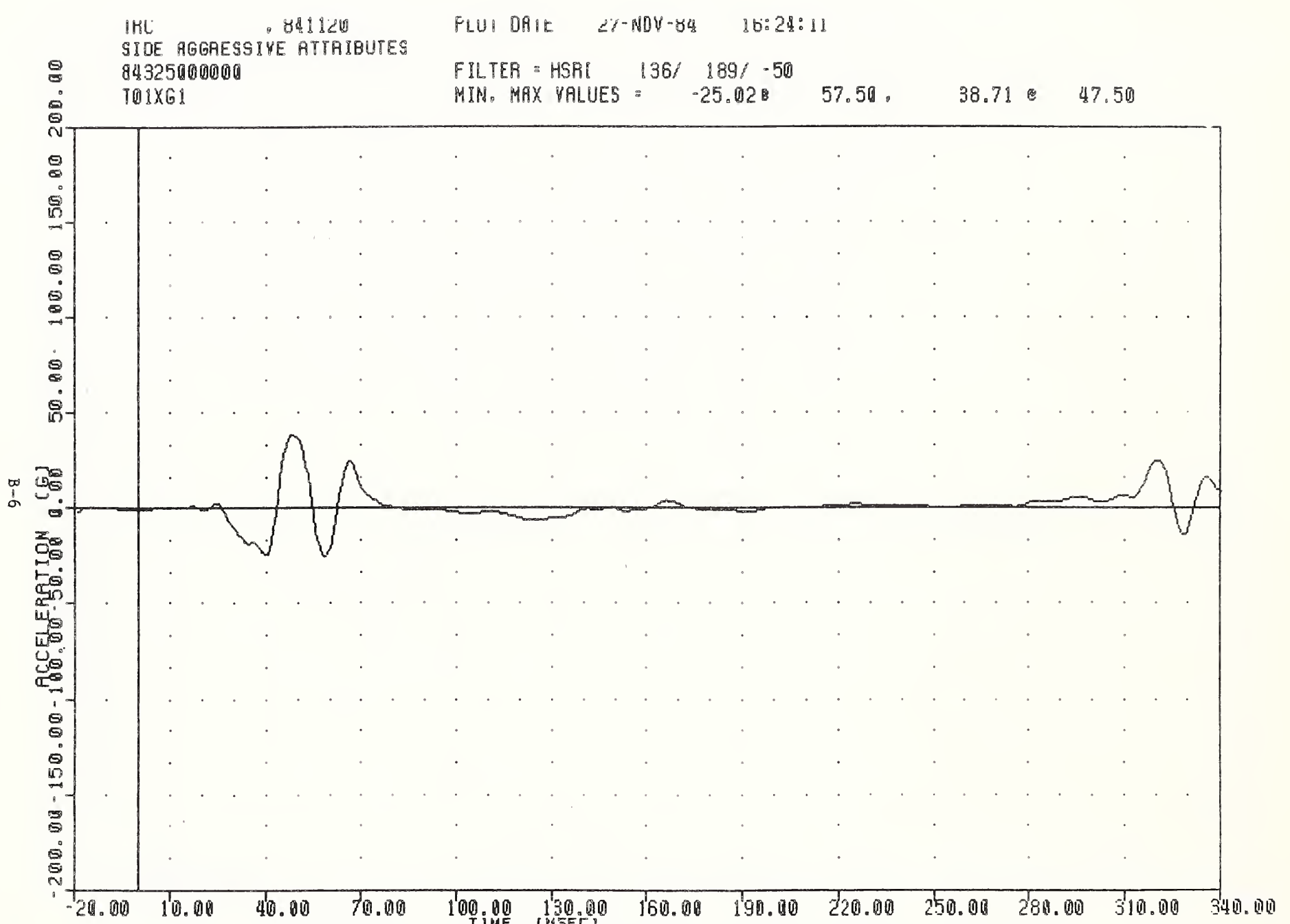
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION Y AXIS



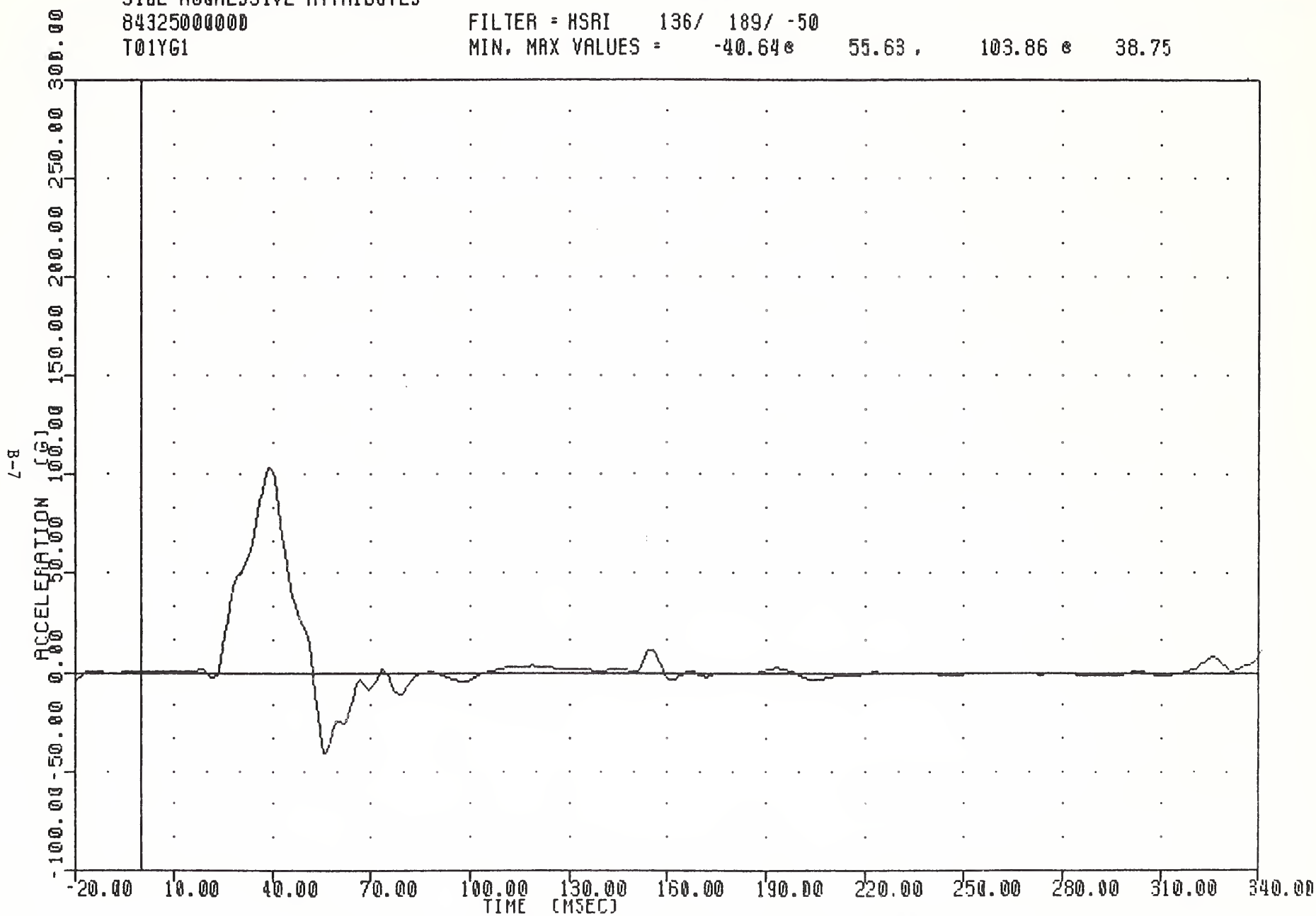
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION Z AXIS



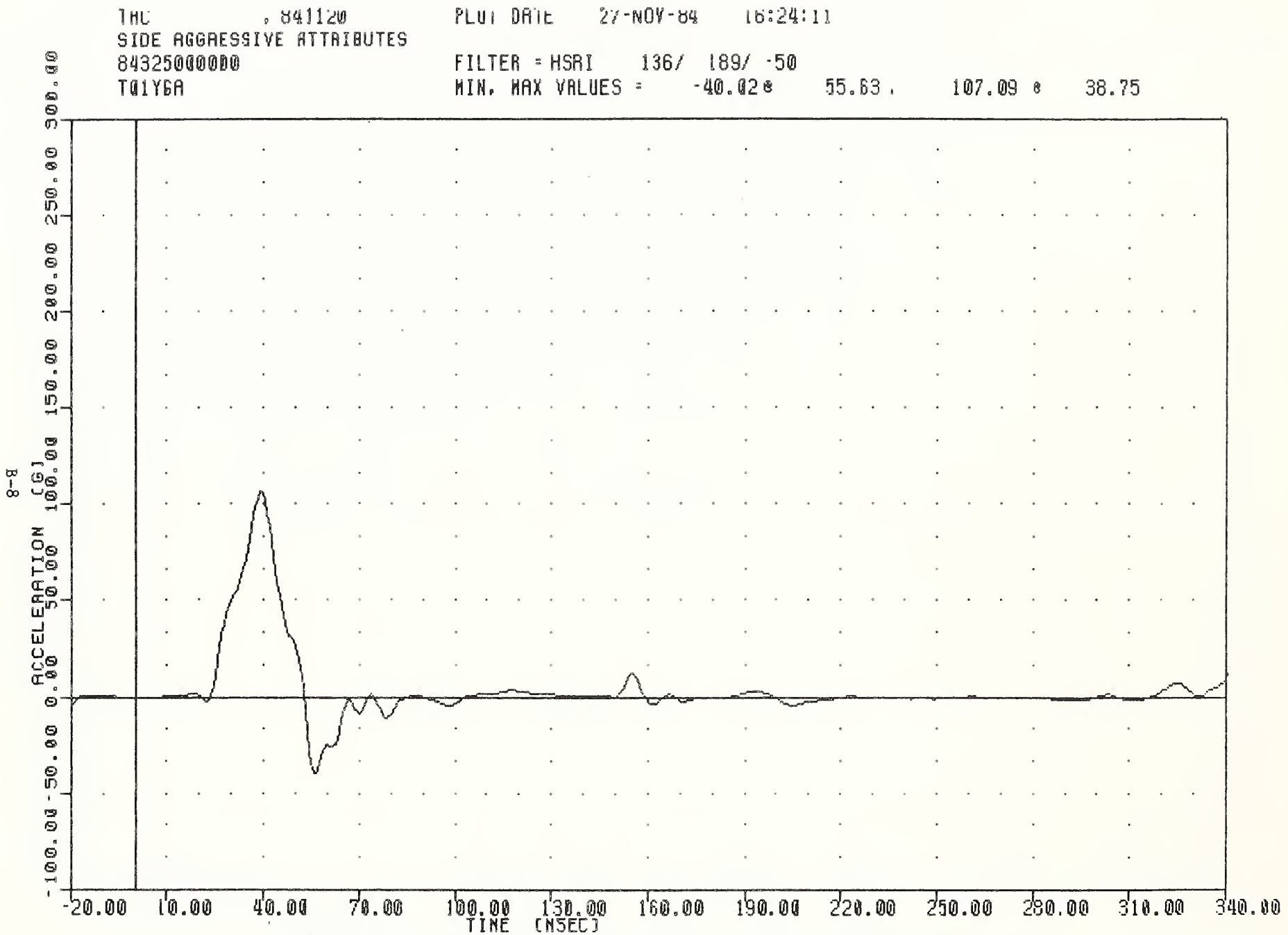
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD RESULTANT



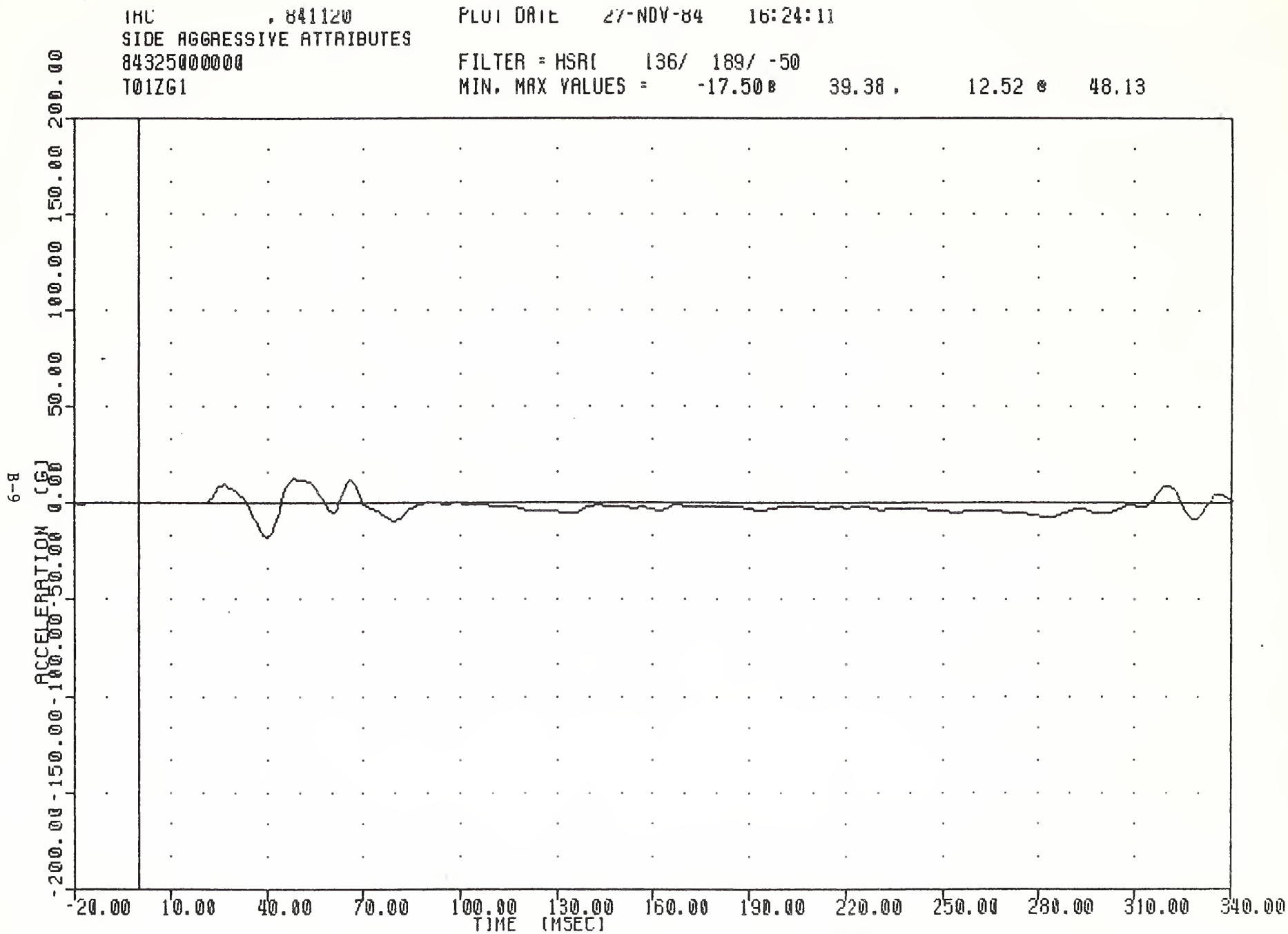
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION X AXIS



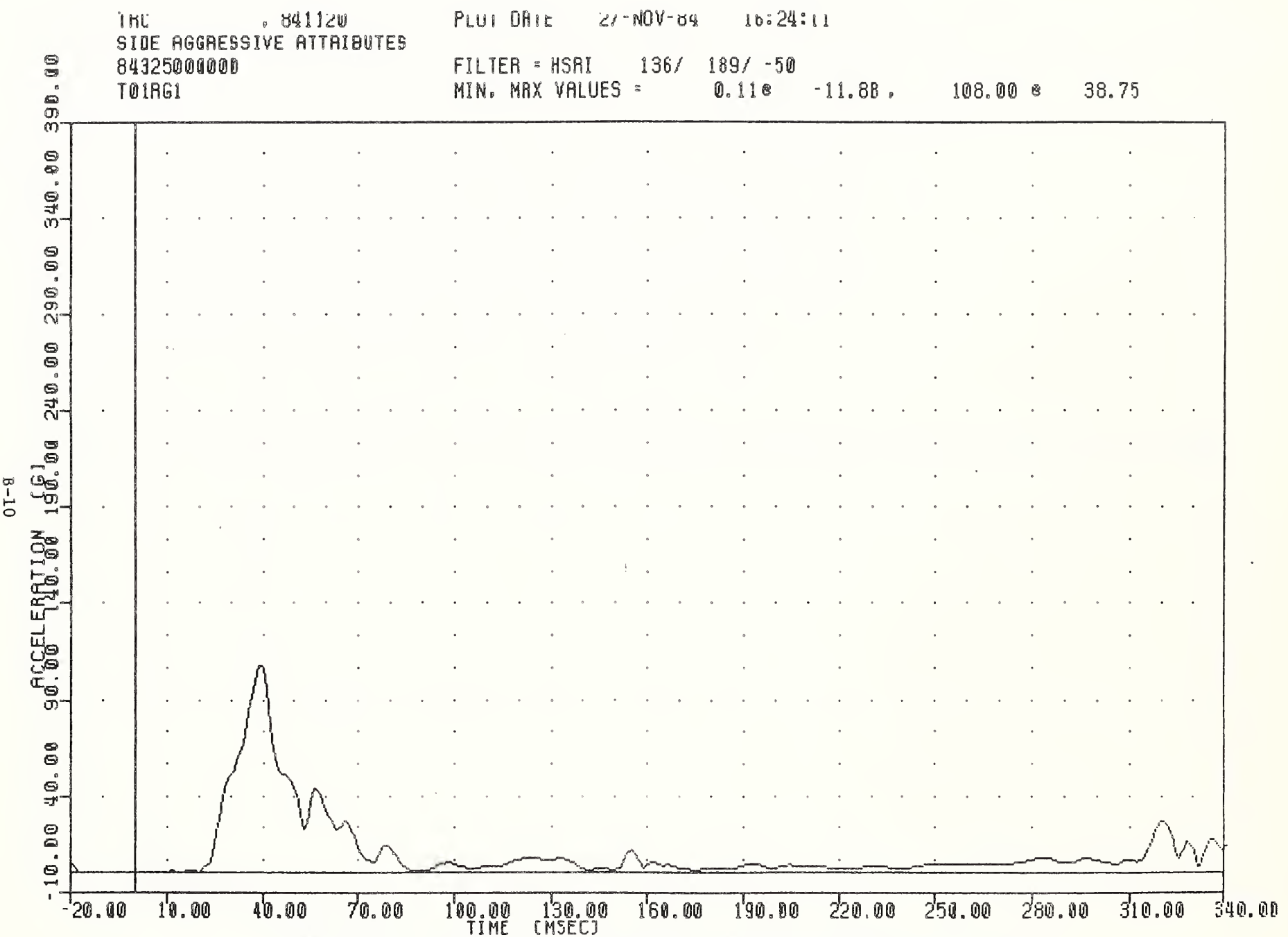
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION Y AXIS



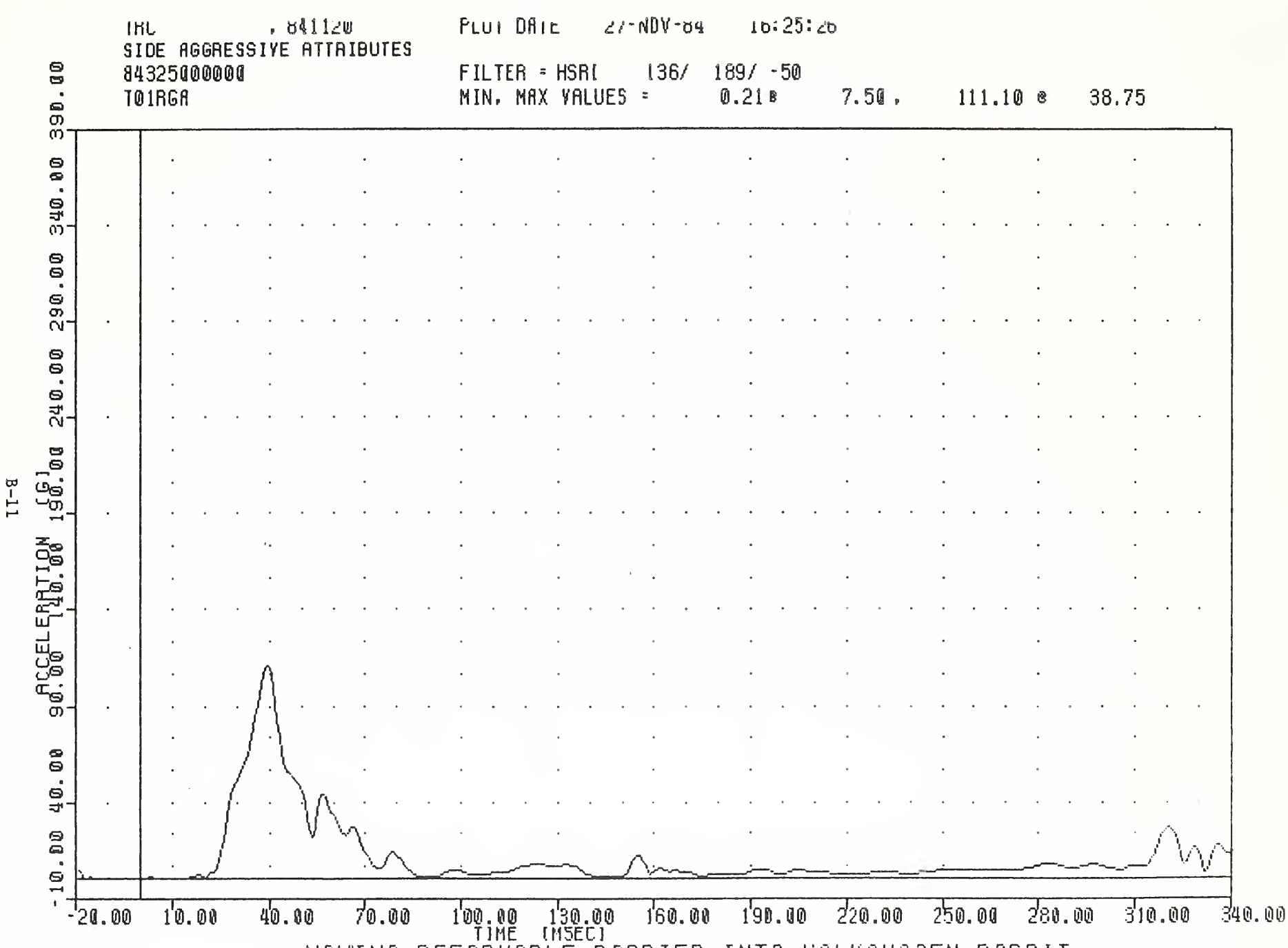
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION -2 Y AXIS



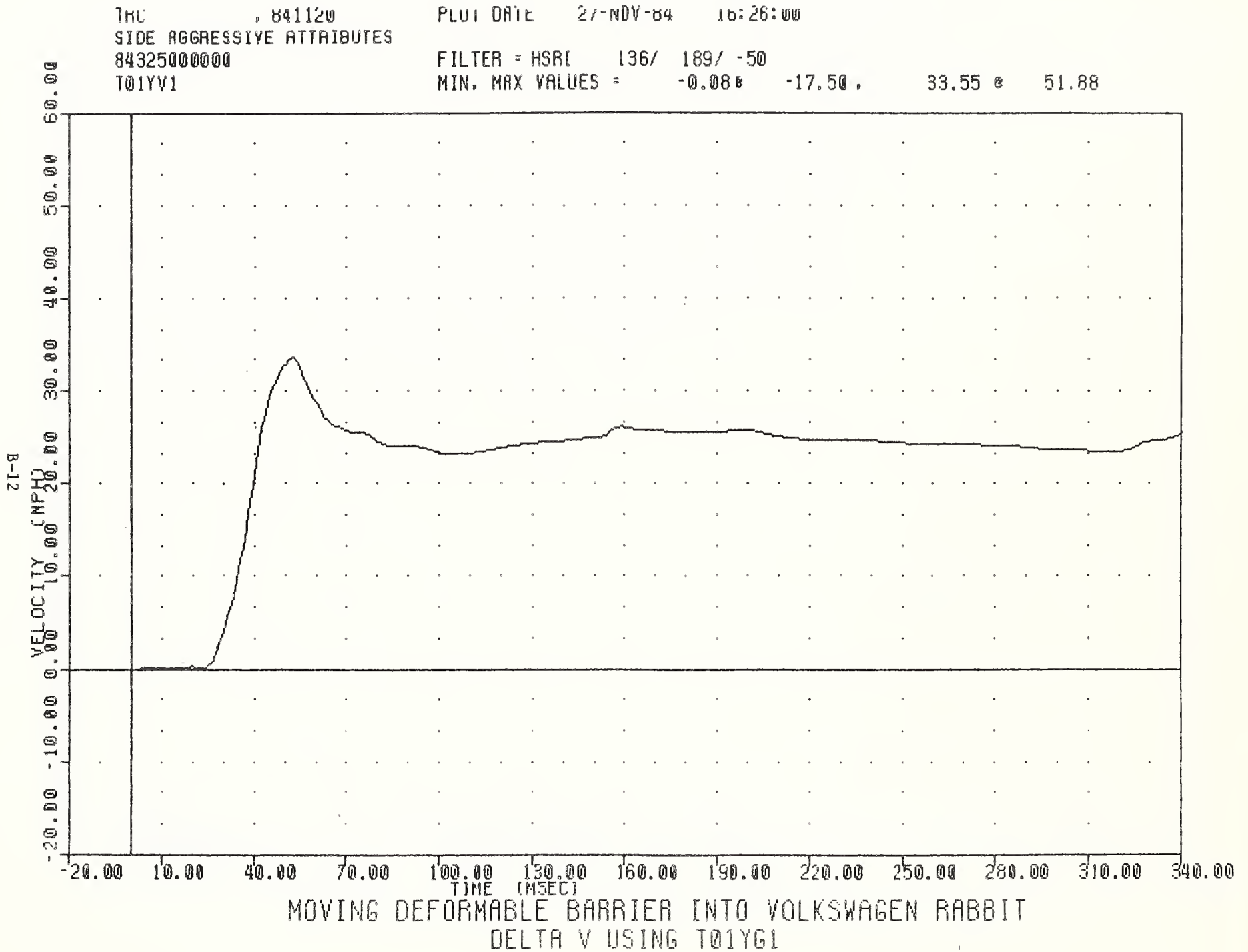
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION Z AXIS



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE RESULTANT



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


THC , 841120
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MIN, MAX VALUES = -0.08 @ -17.50 , 33.55 @ 51.88
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10.00
0.00
-10.00
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70.00
100.00
130.00
160.00
190.00
220.00
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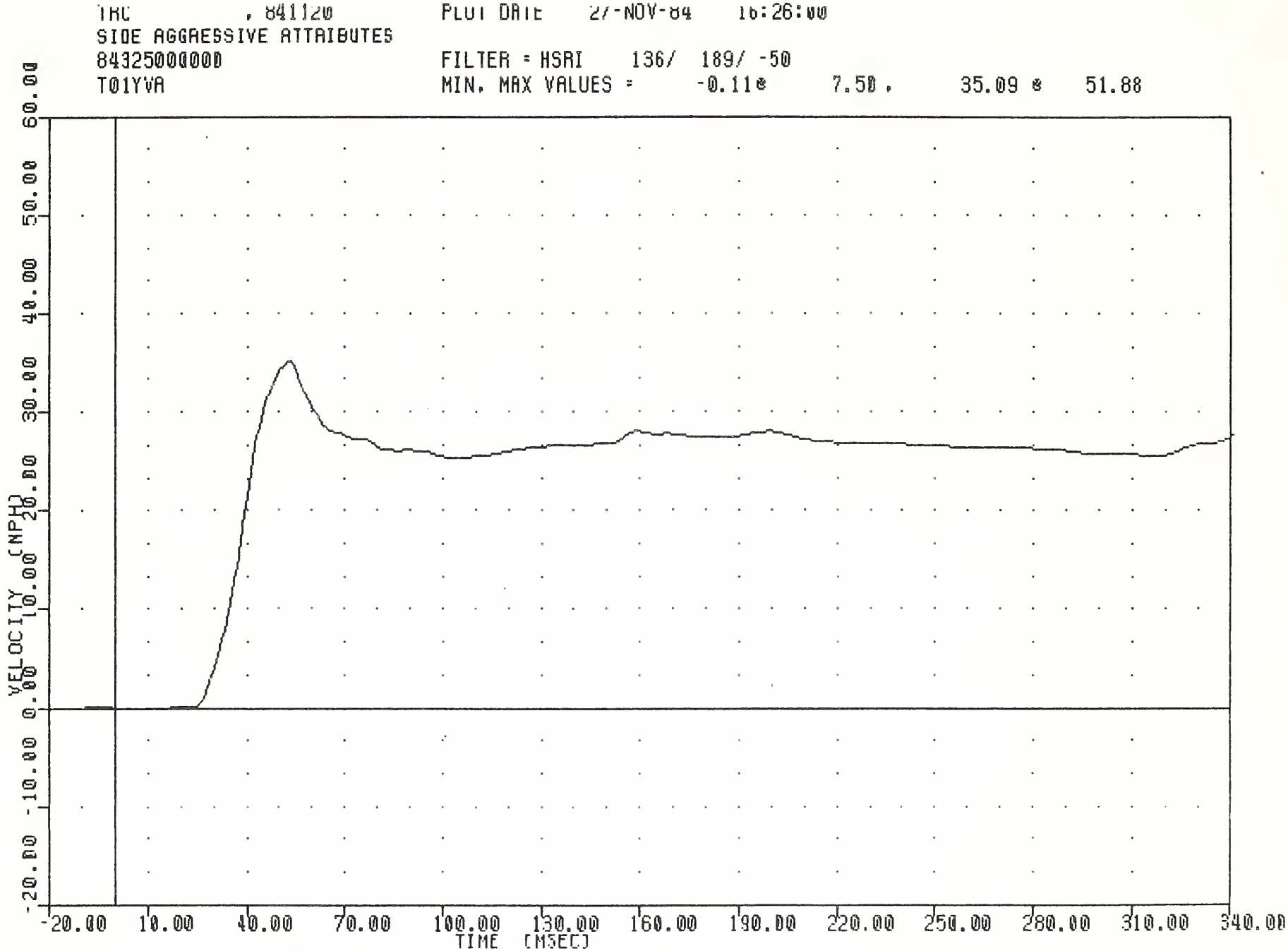
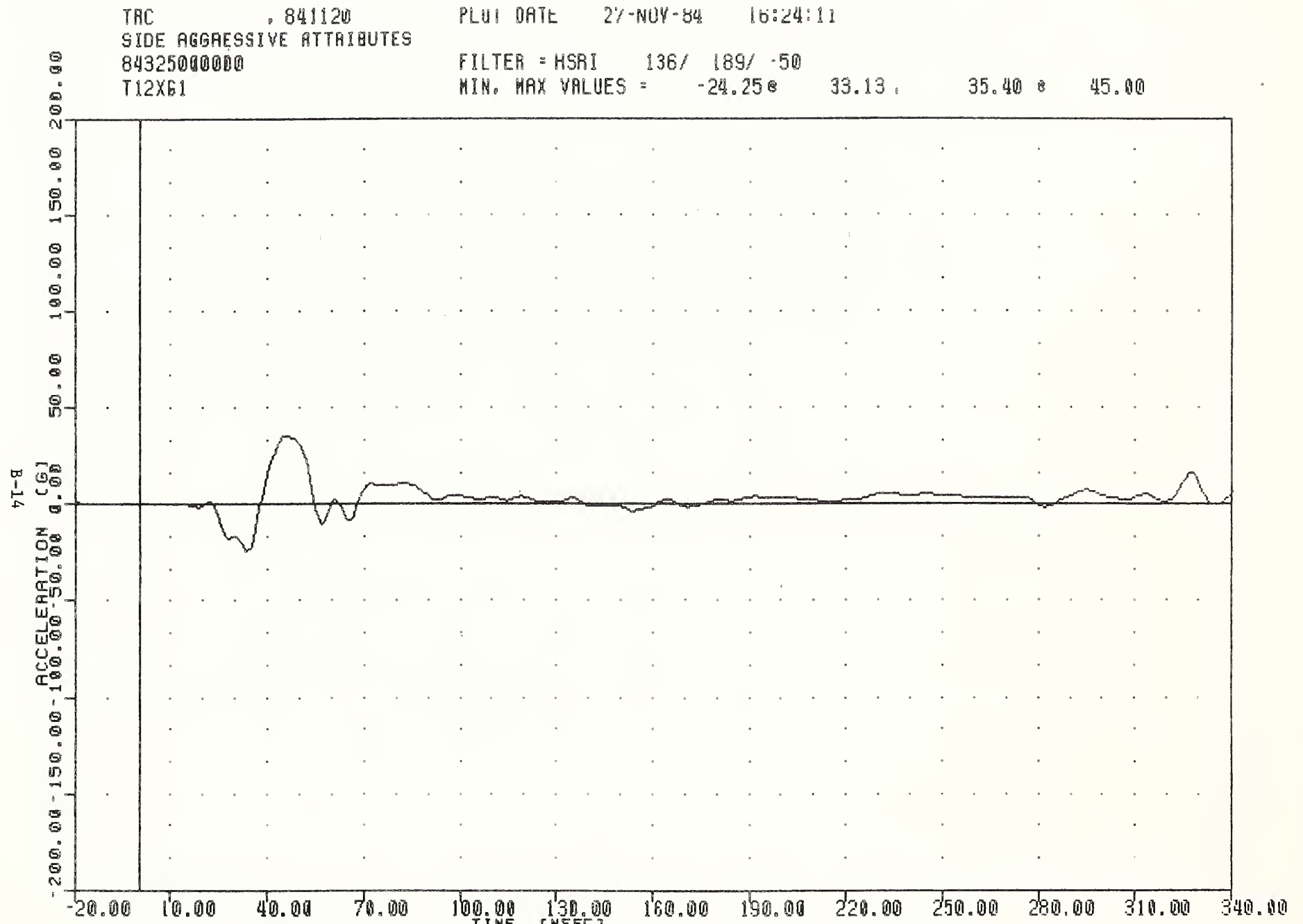
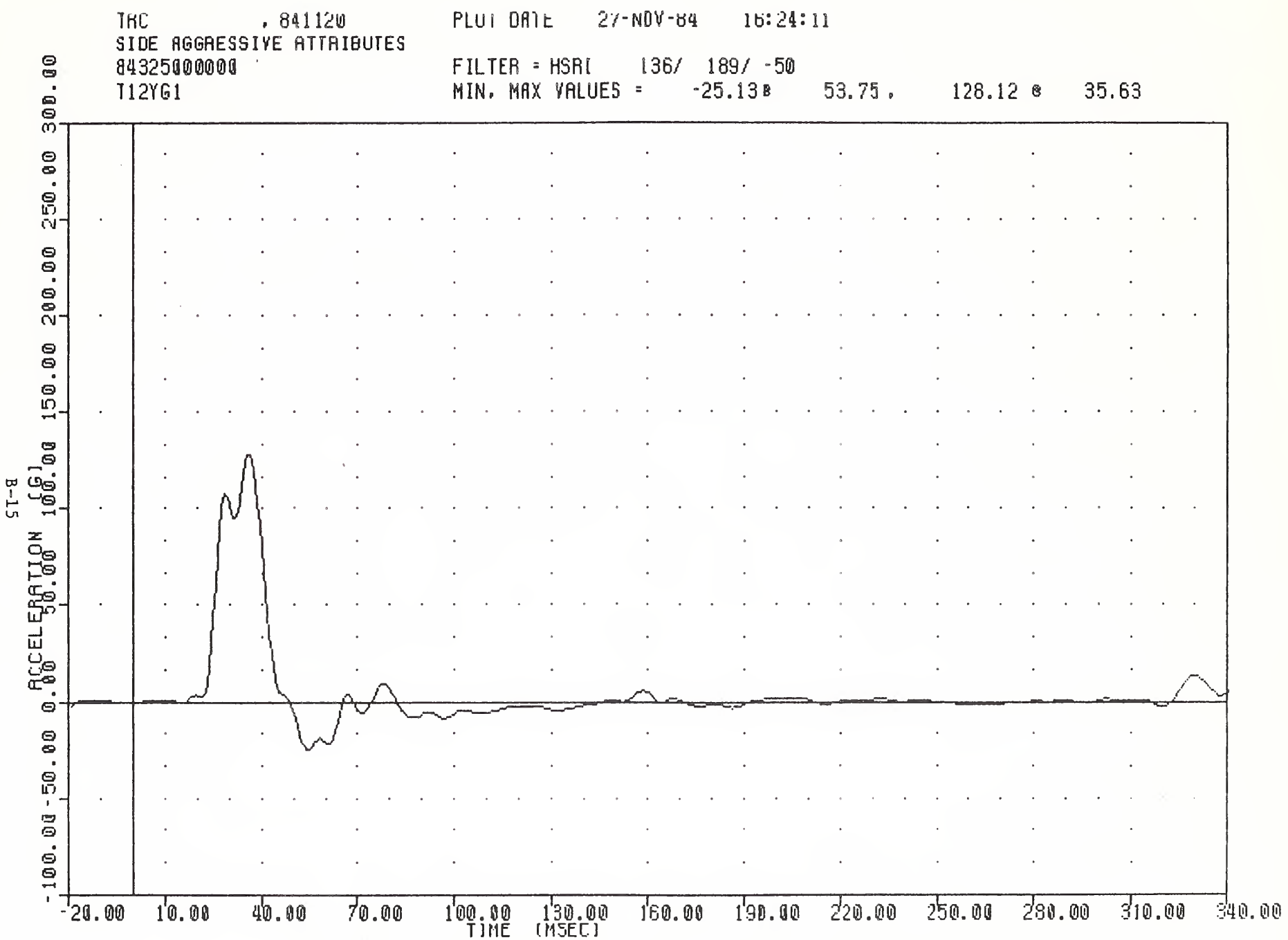
340.00
TIME (MSEC)
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T01YG1



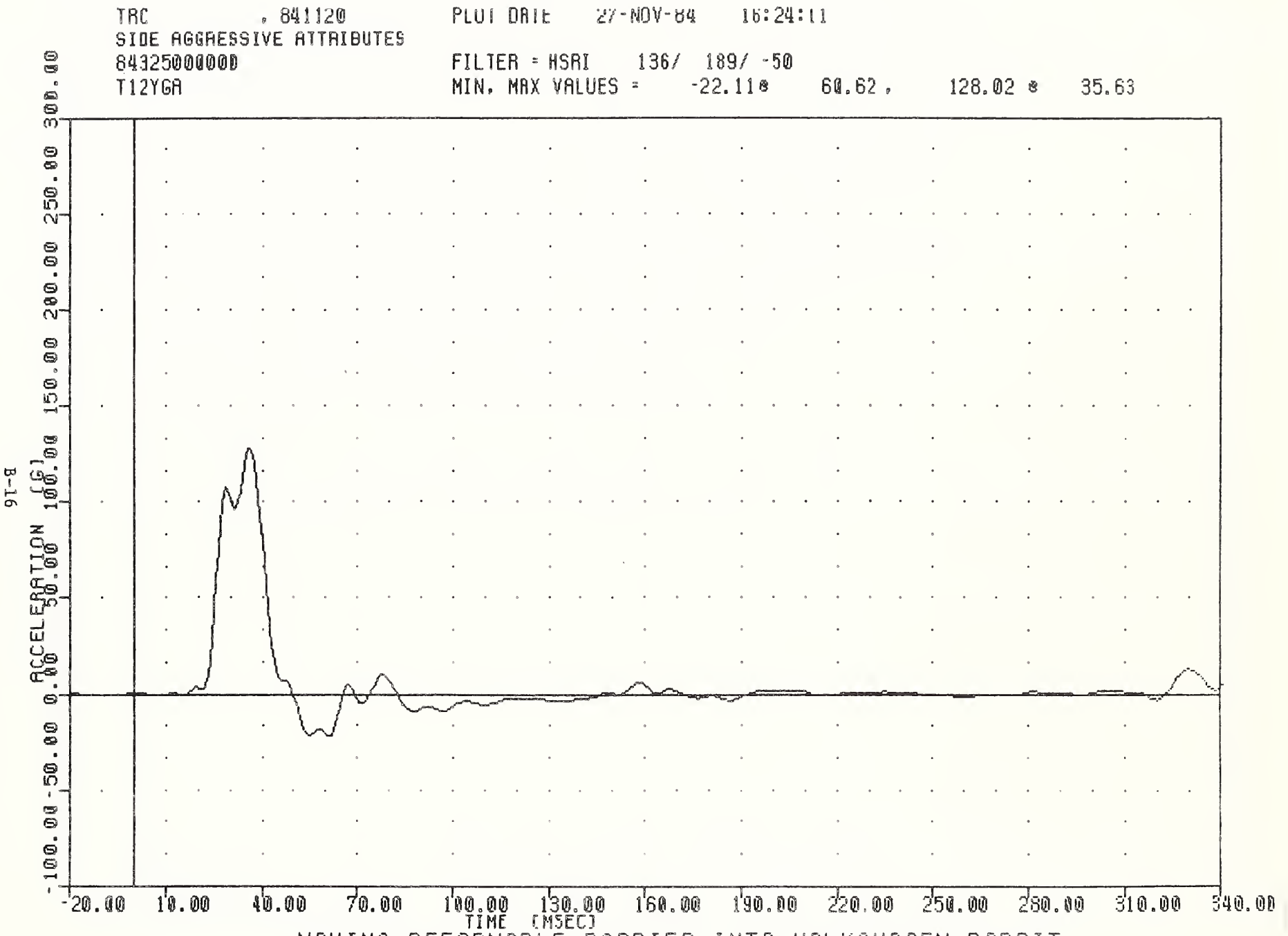
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T01YGA



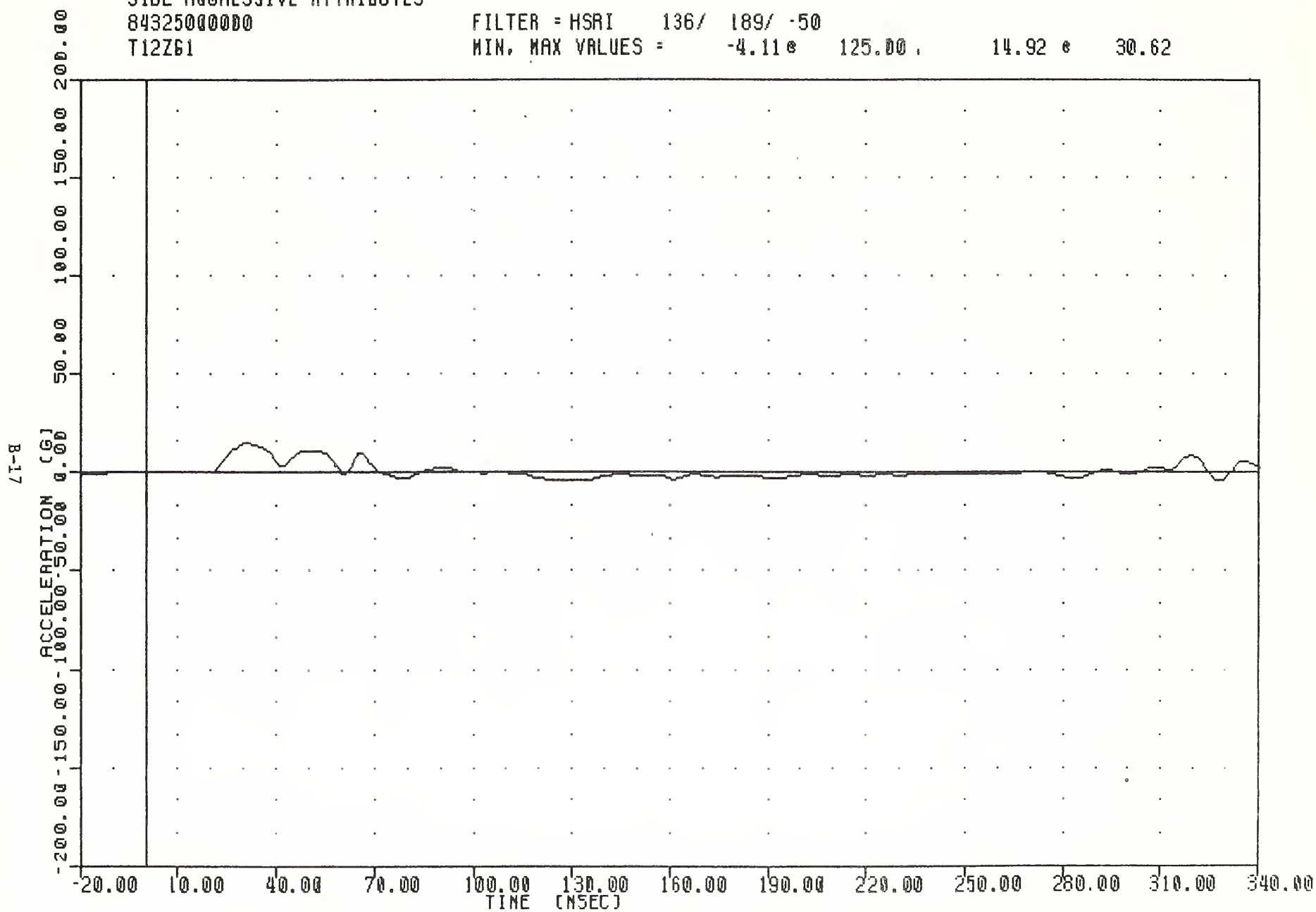
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION X AXIS



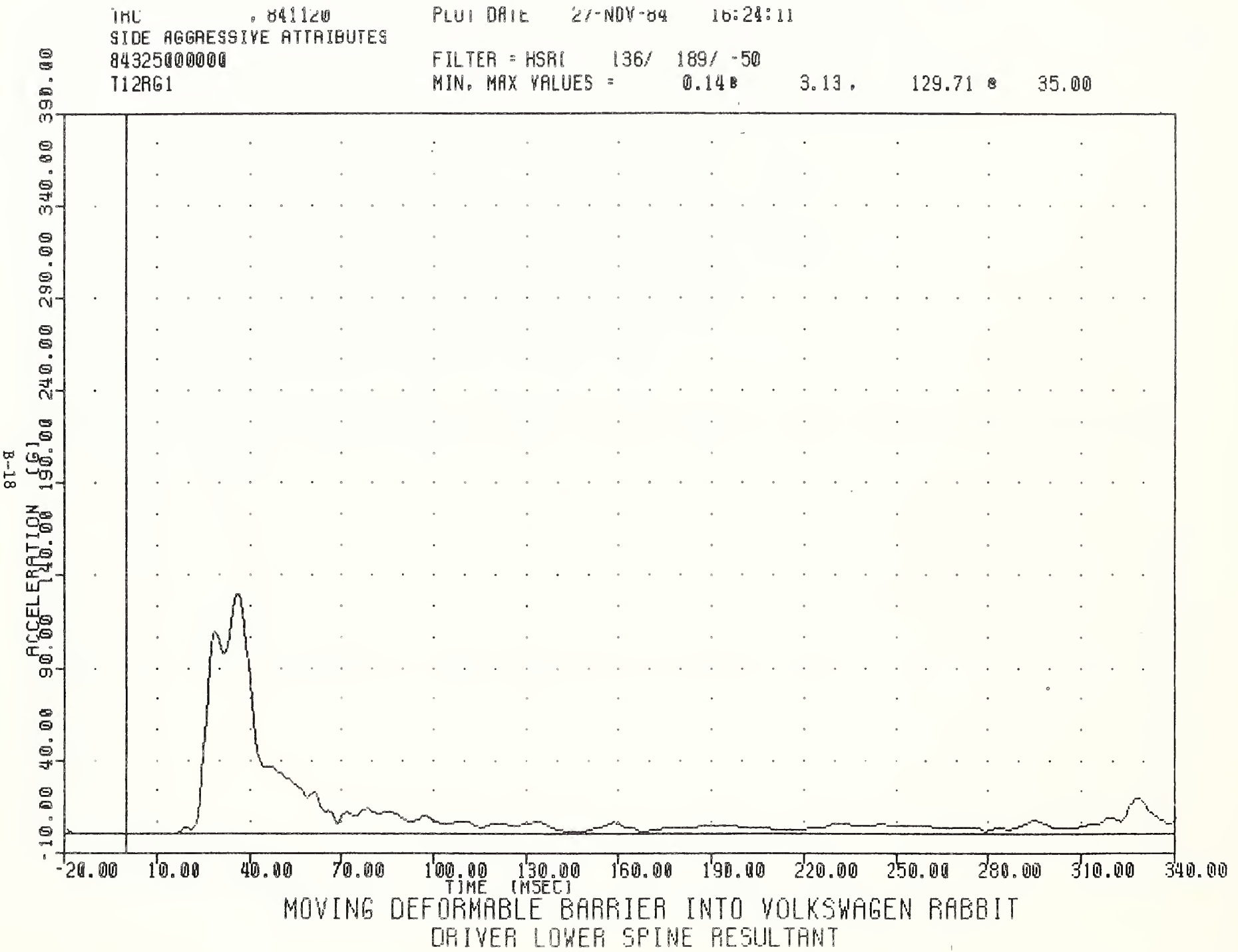
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION Y AXIS



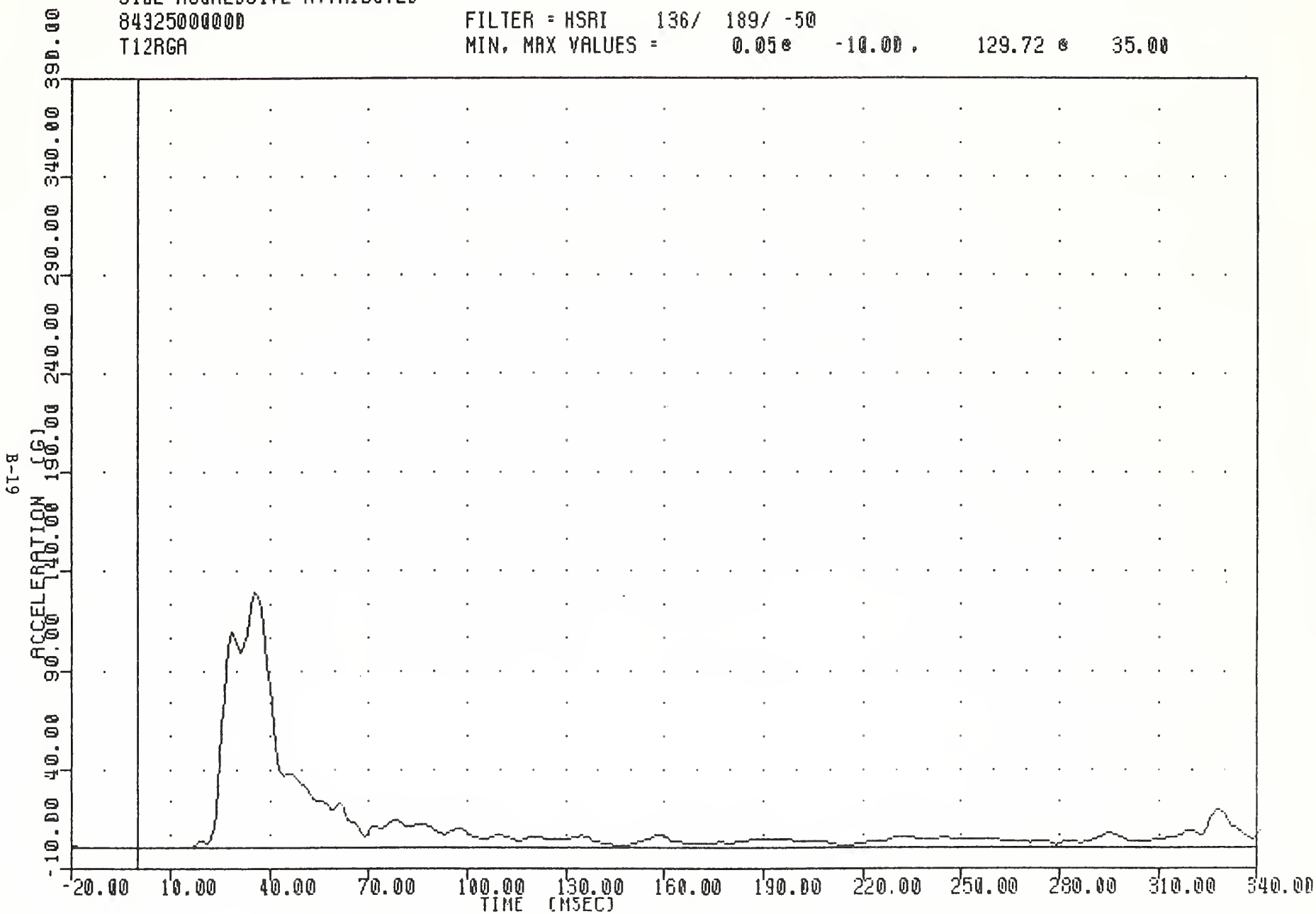
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION -2 Y AXIS



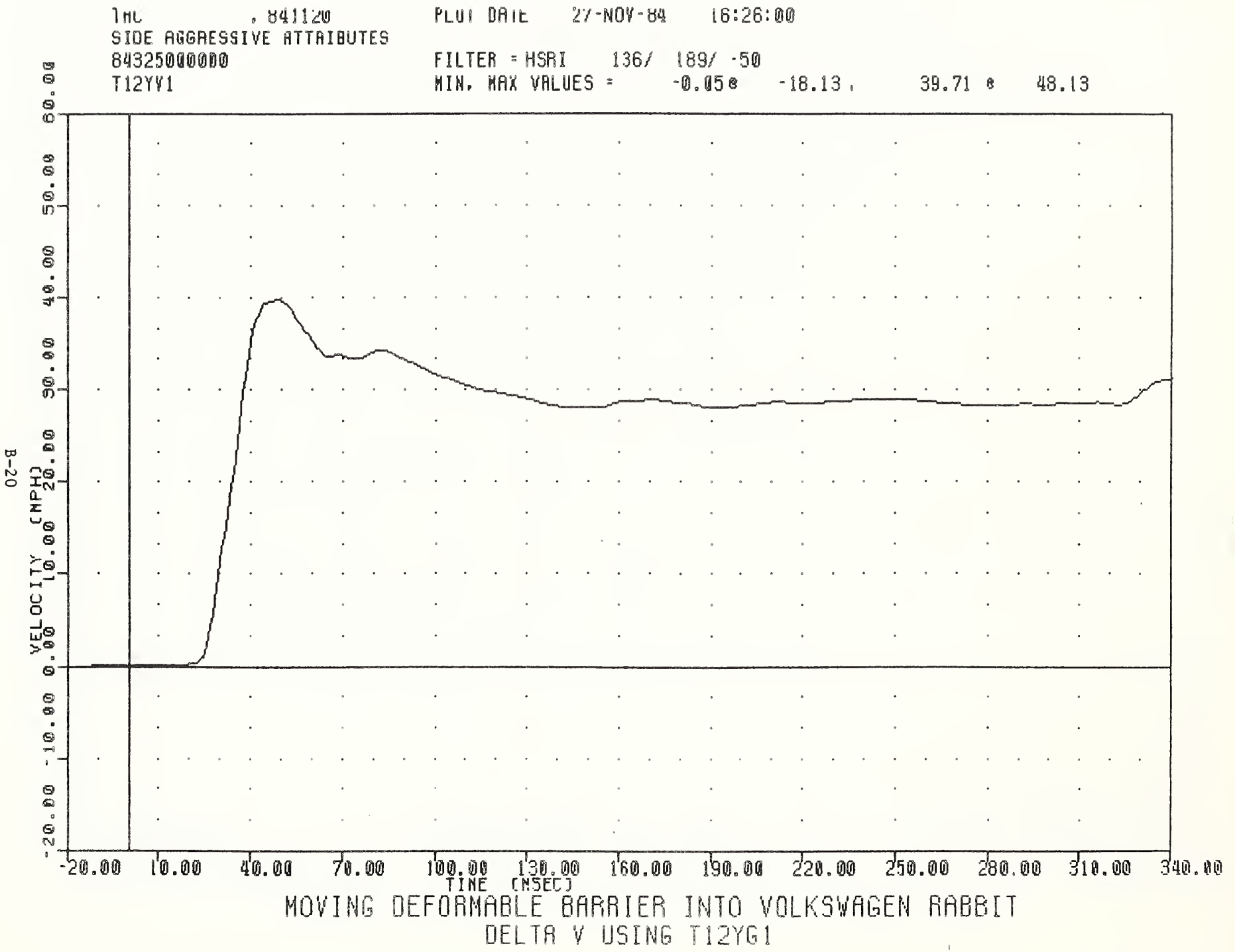
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION Z AXIS



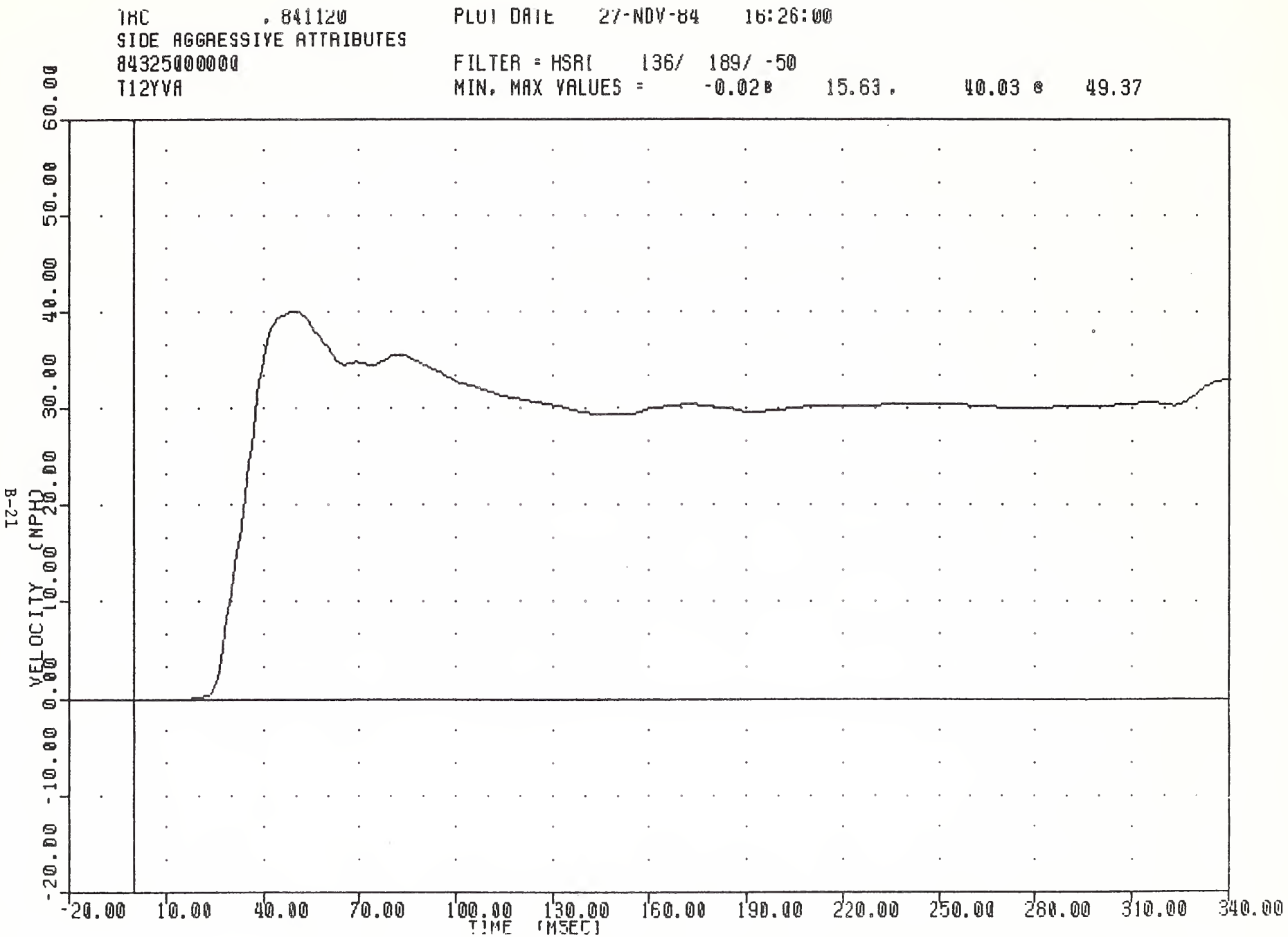
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE RESULTANT



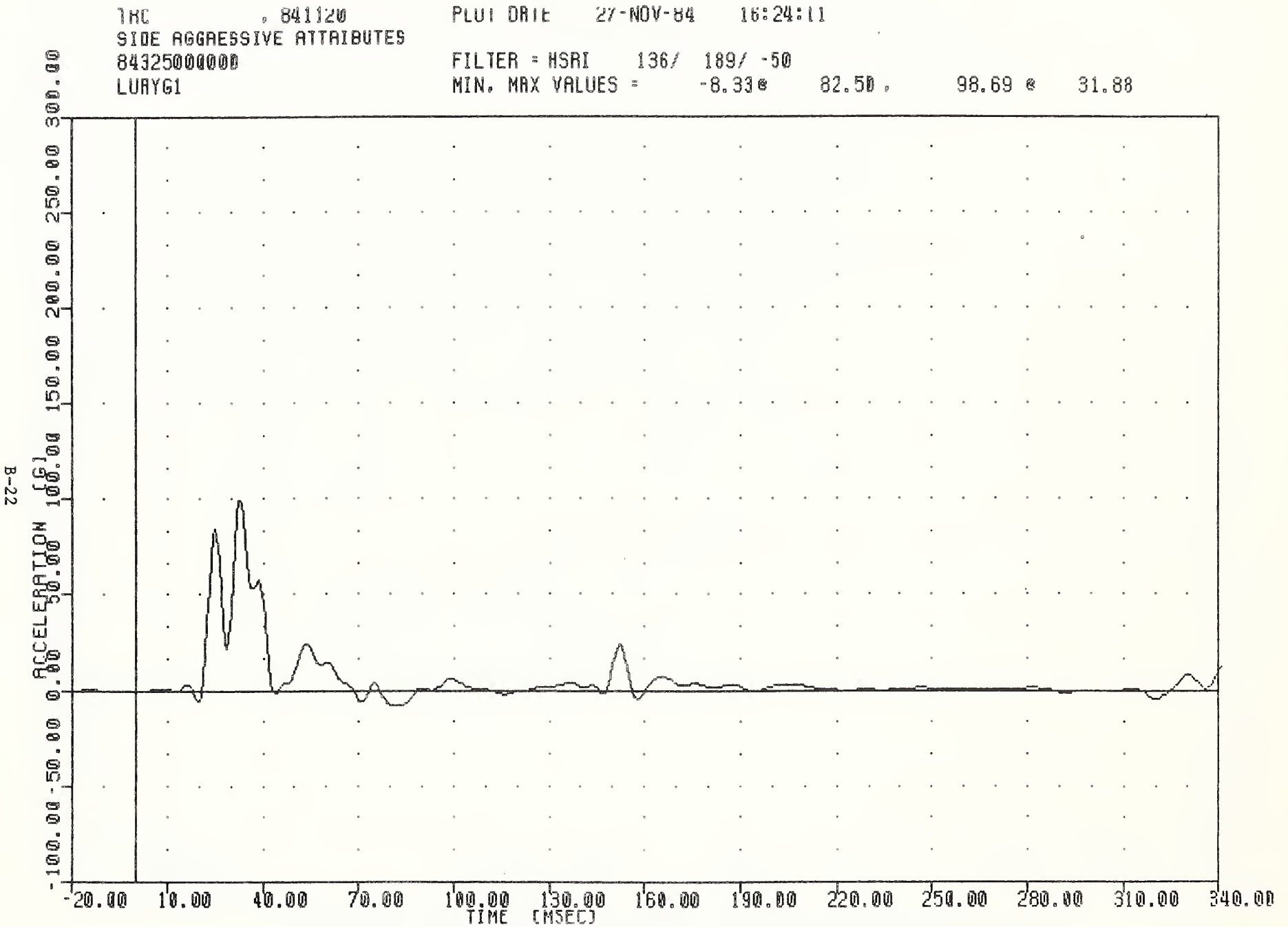
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE RESULTANT USING T12YGA.



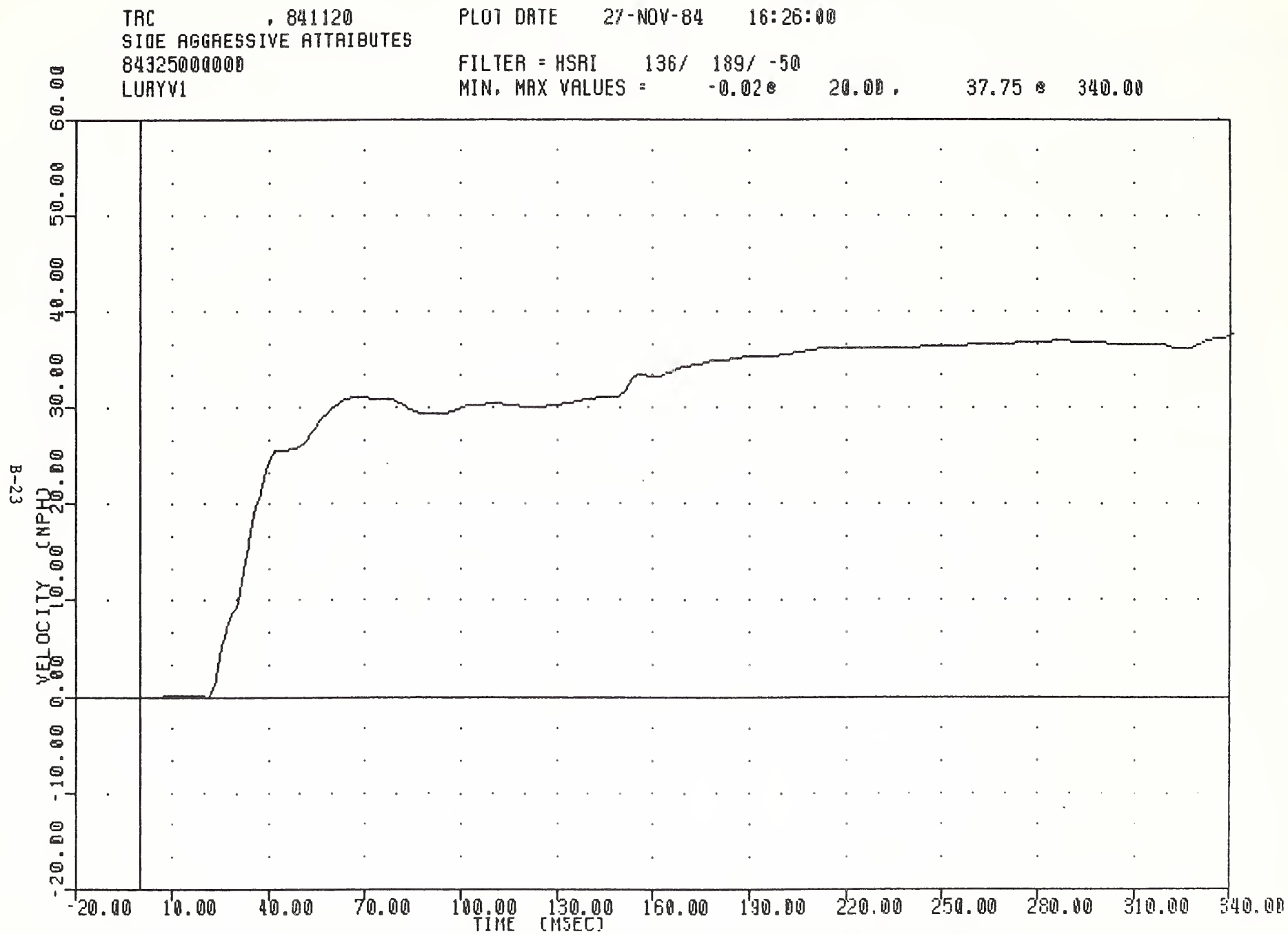
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12YG1



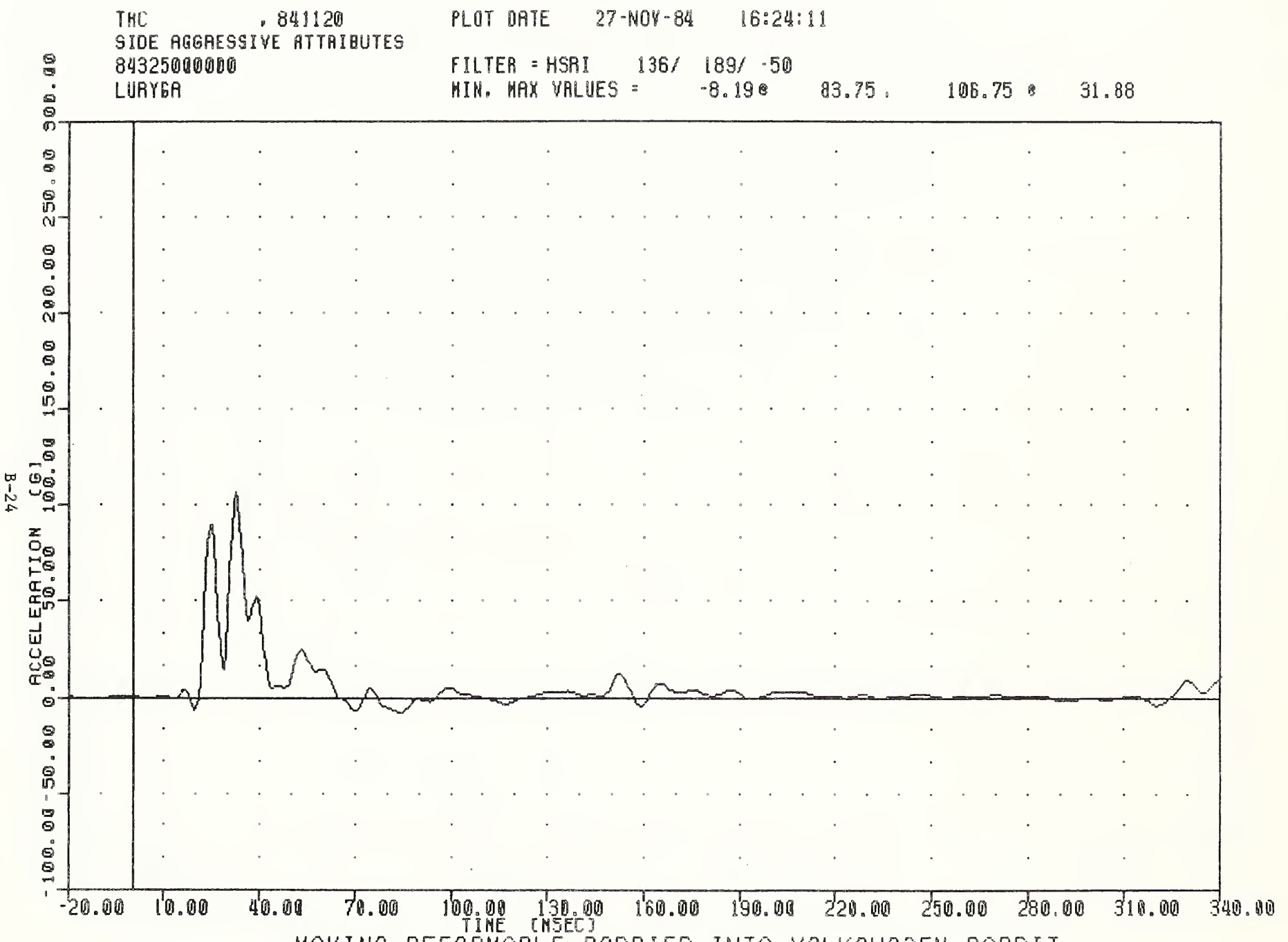
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12YGA



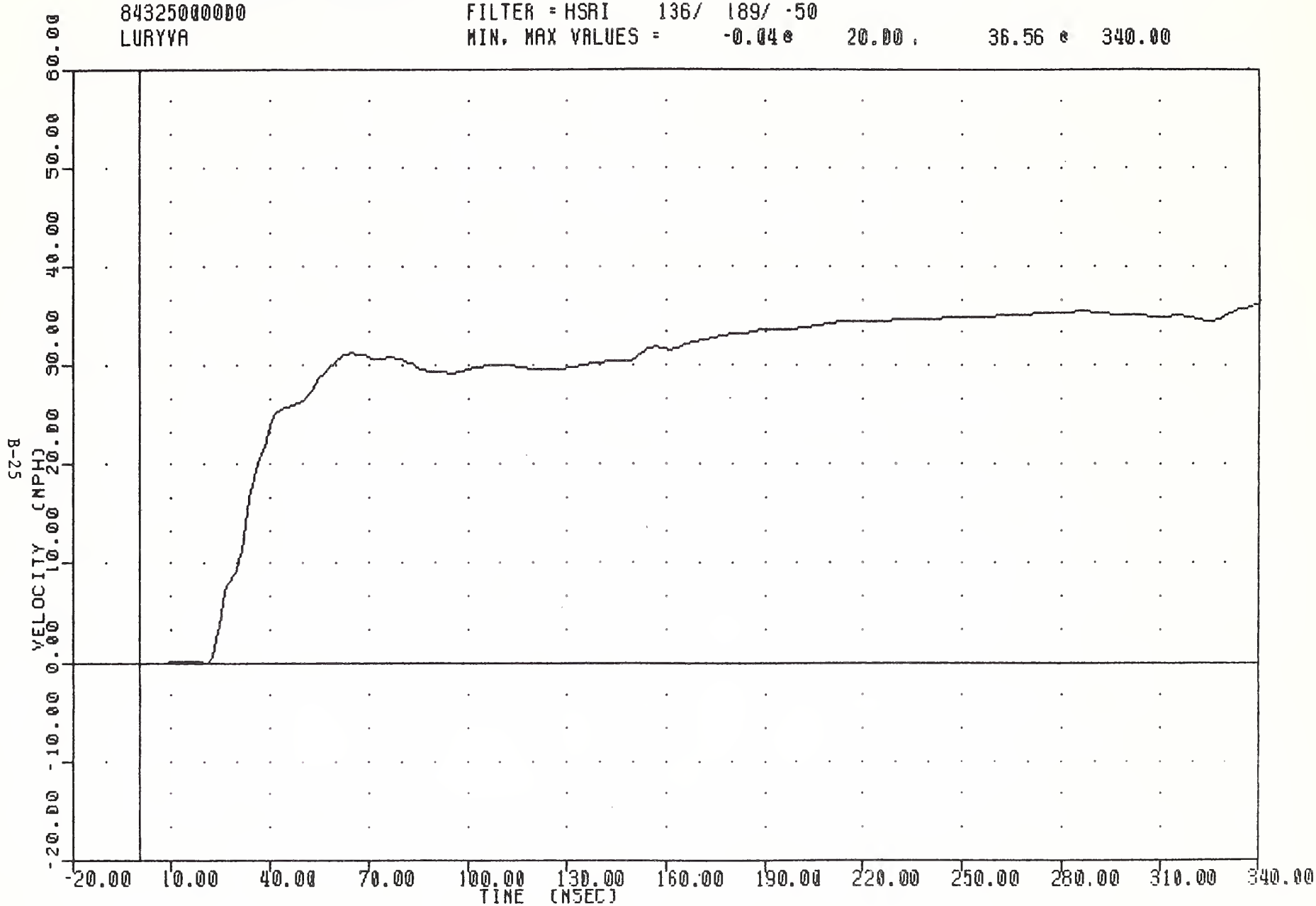
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT UPPER RIB ACCELERATION Y AXIS



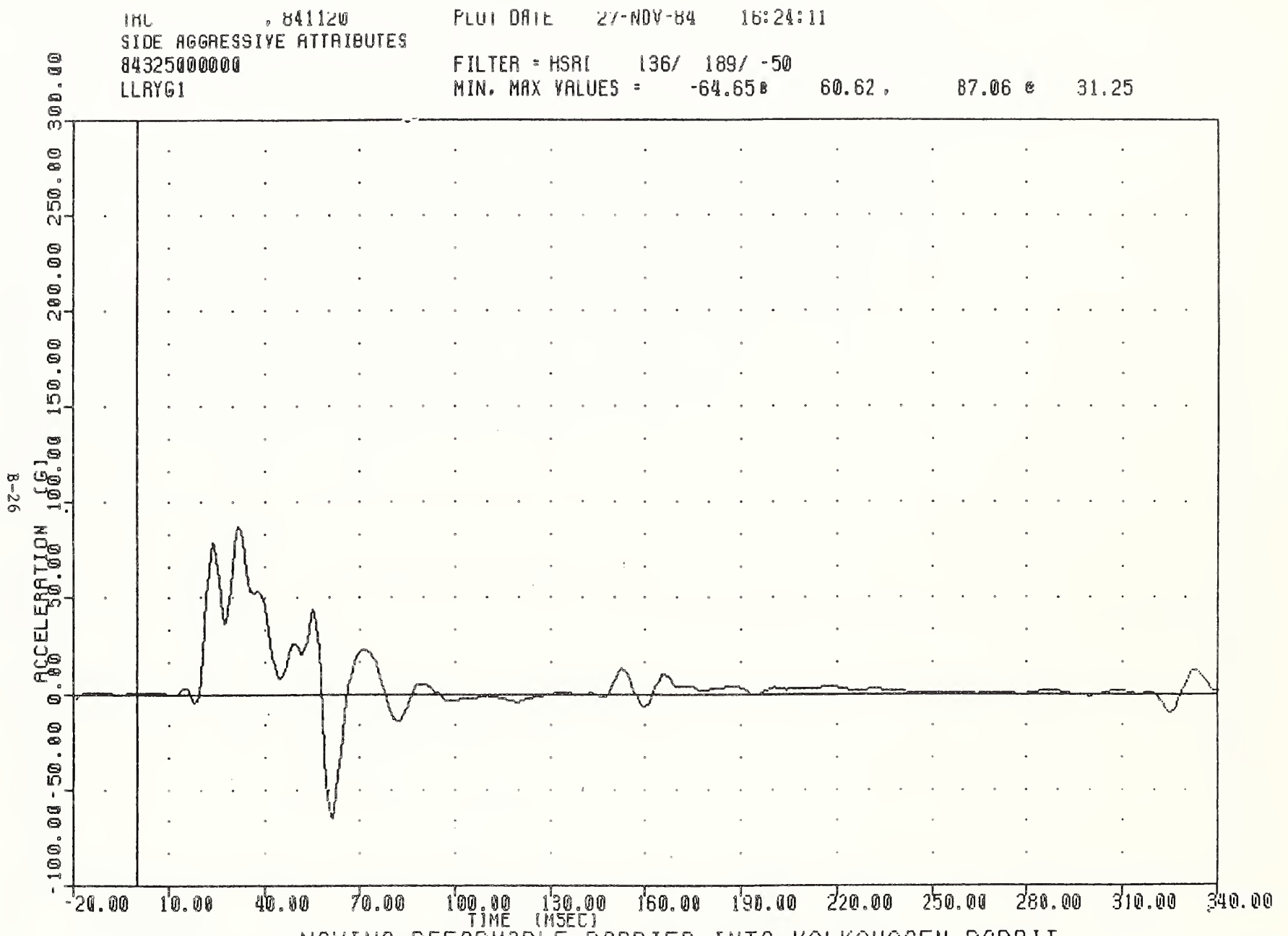
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LURYG1



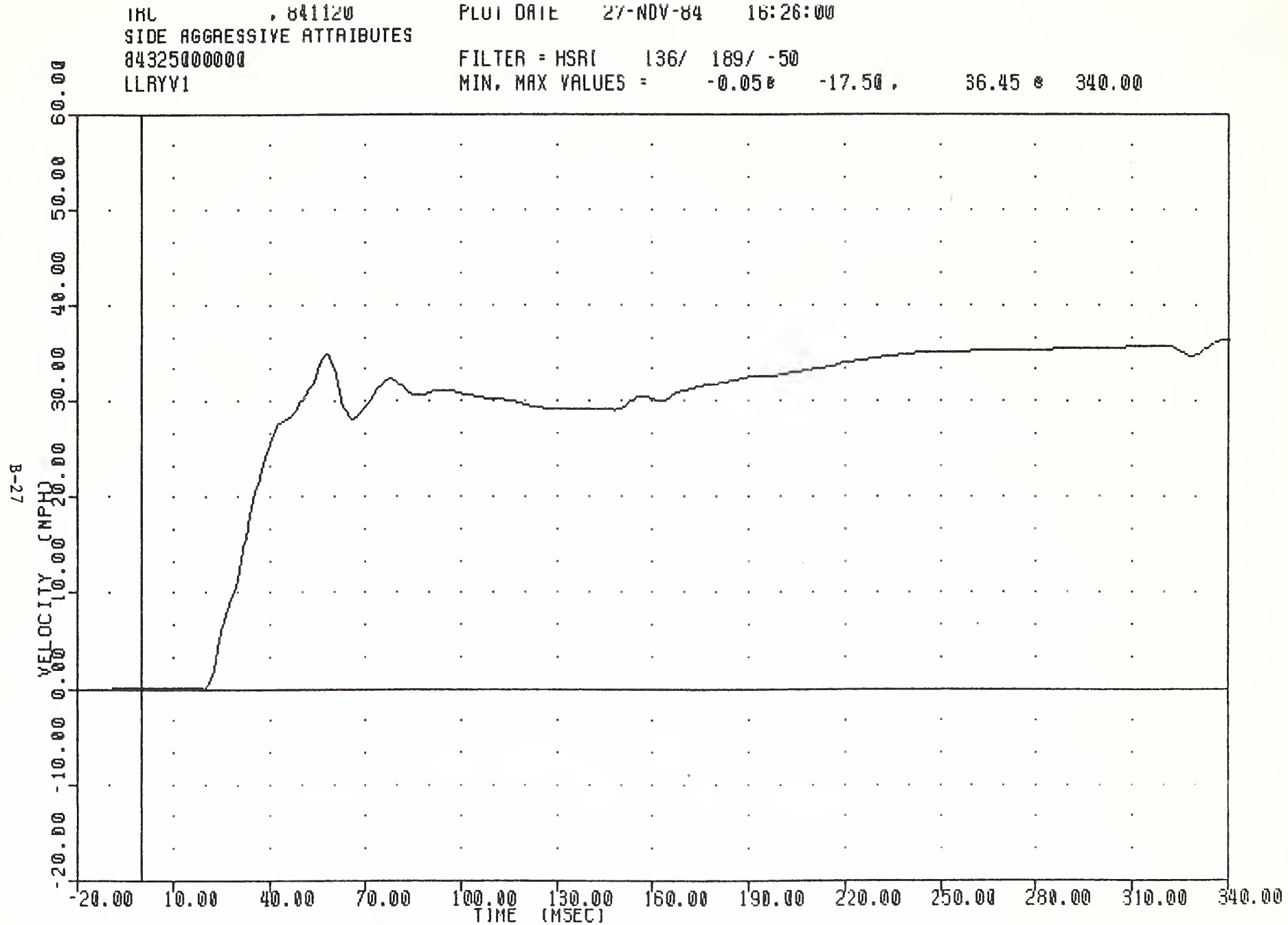
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT UPPER RIB ACCELERATION -2 Y AXIS



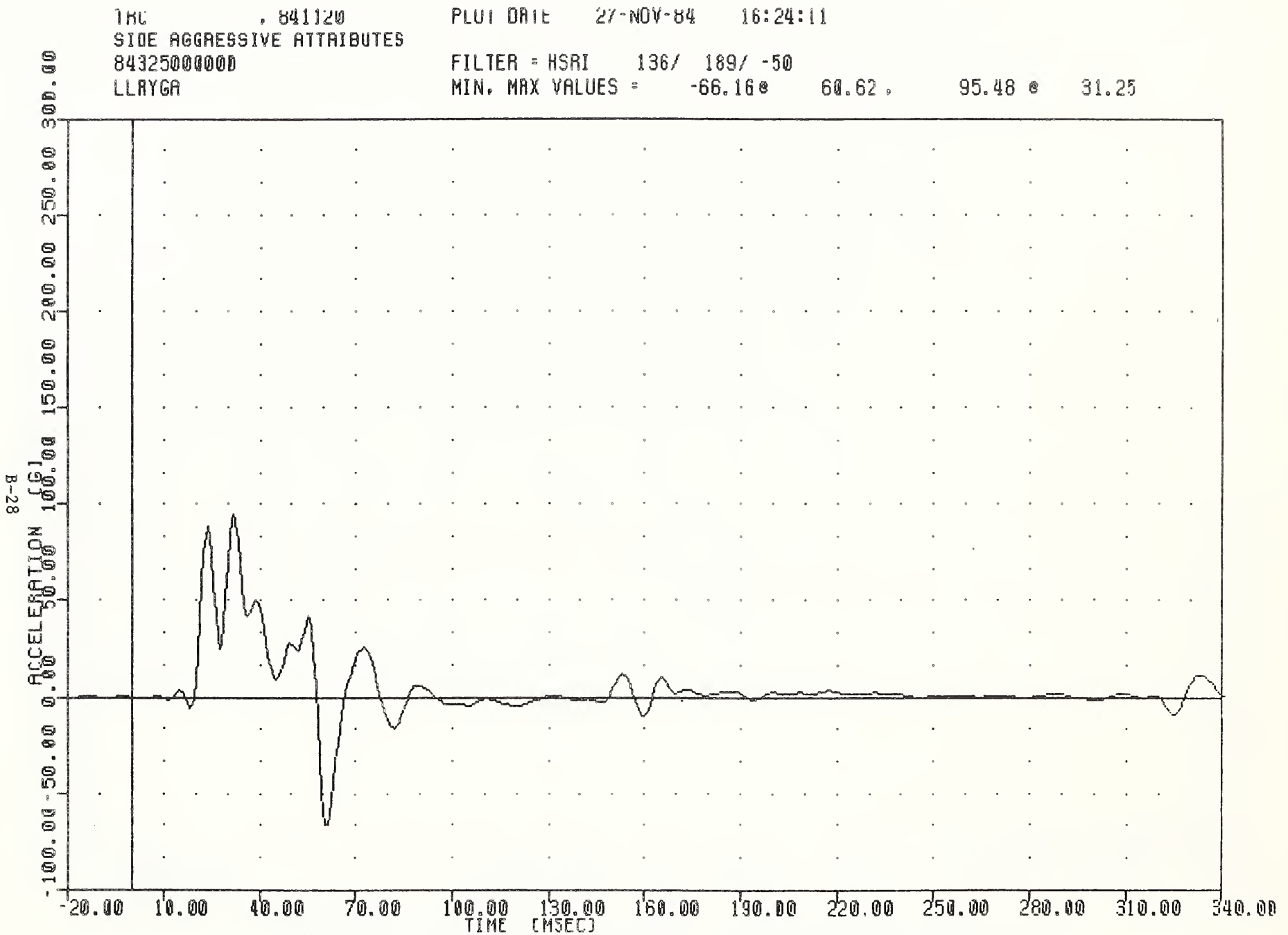
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LURYGA



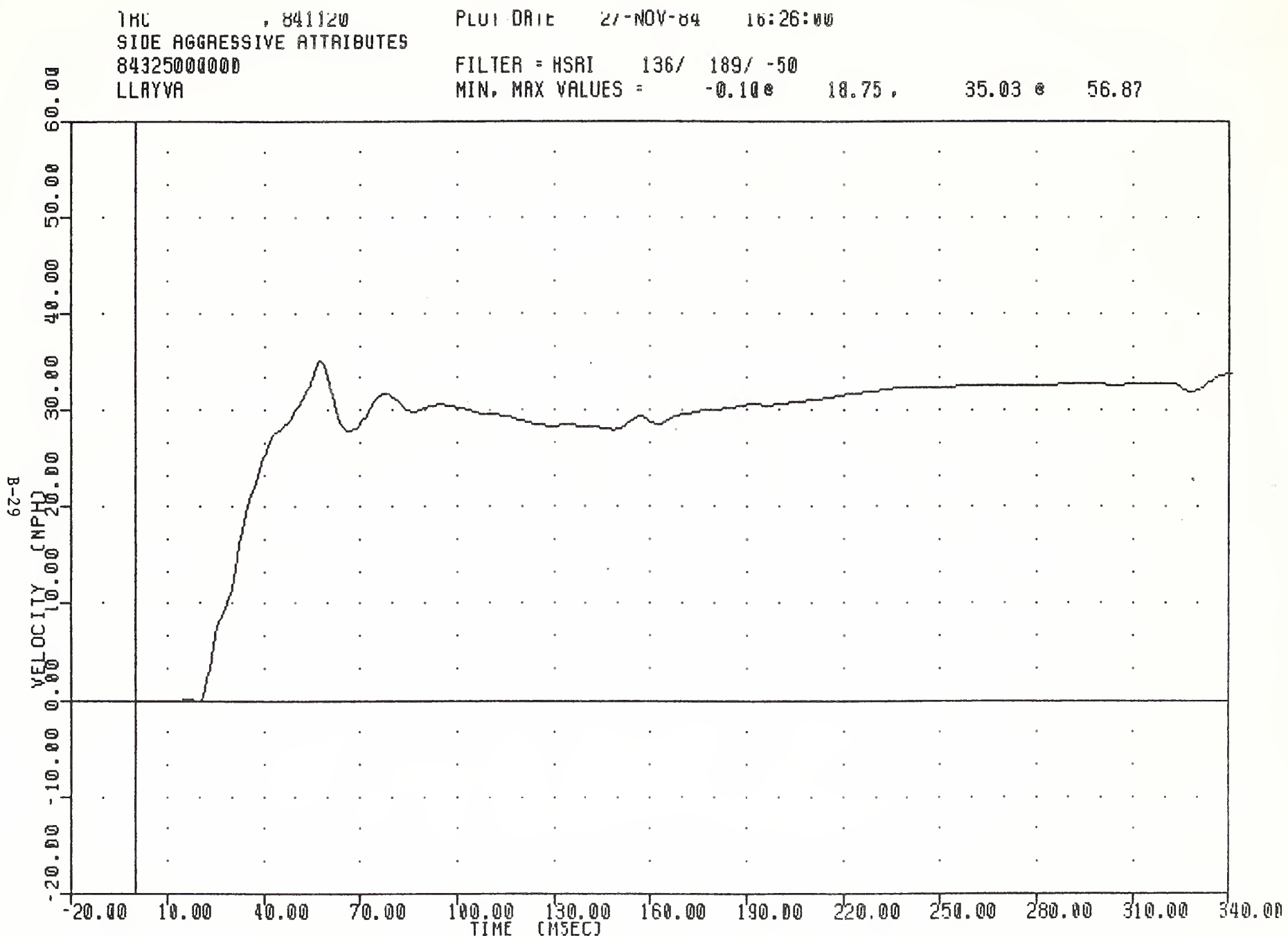
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT LOWER RIB ACCELERATION Y AXIS



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLRYG1



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


TRC , 841120
PLOT DATE 27-NOV-84 16:26:00
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MIN, MAX VALUES = -0.10 @ 18.75 , 35.03 @ 56.87
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-20.00
VELOCITY (MPH)
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100.00
130.00
160.00
190.00
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310.00
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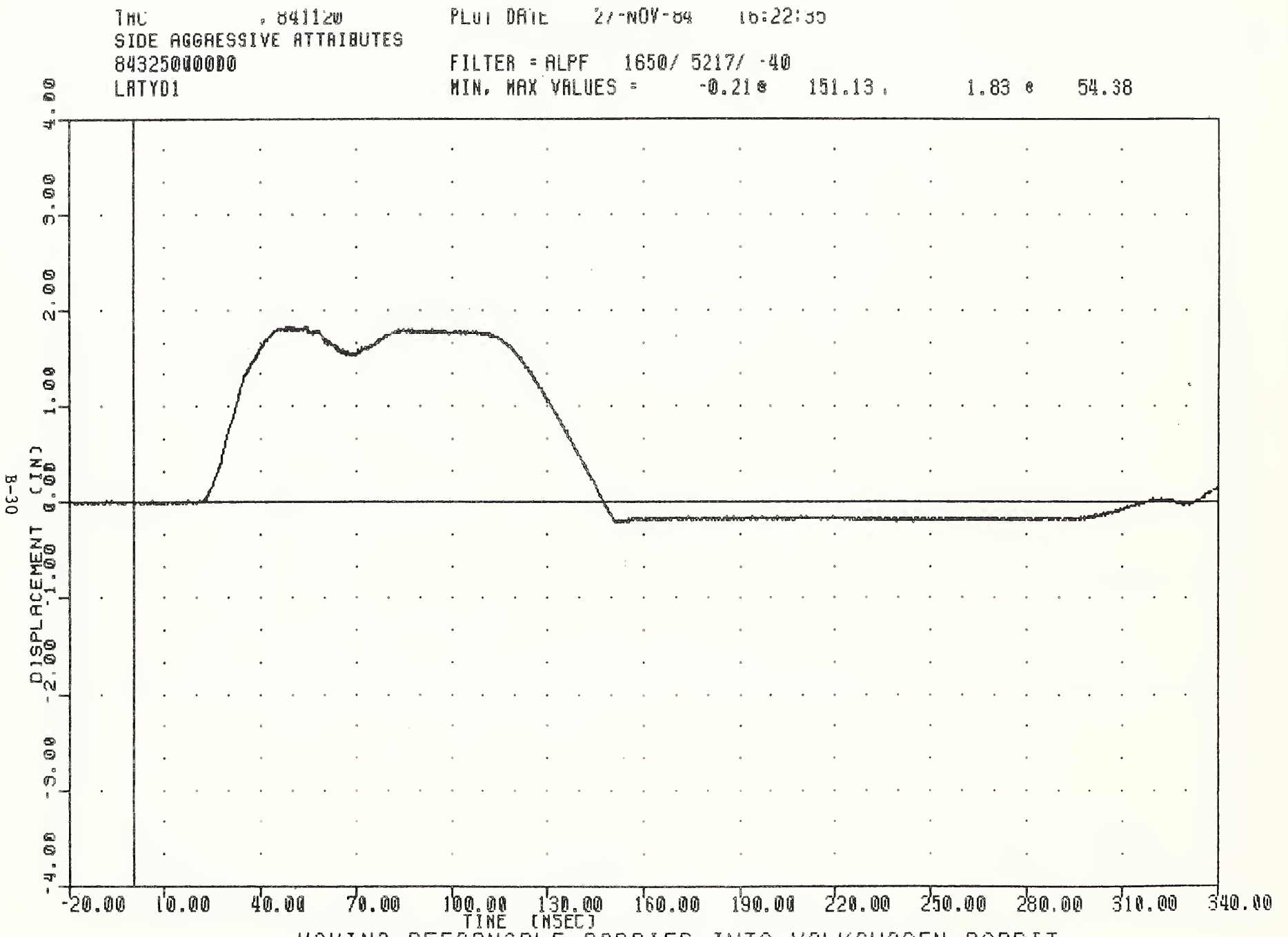
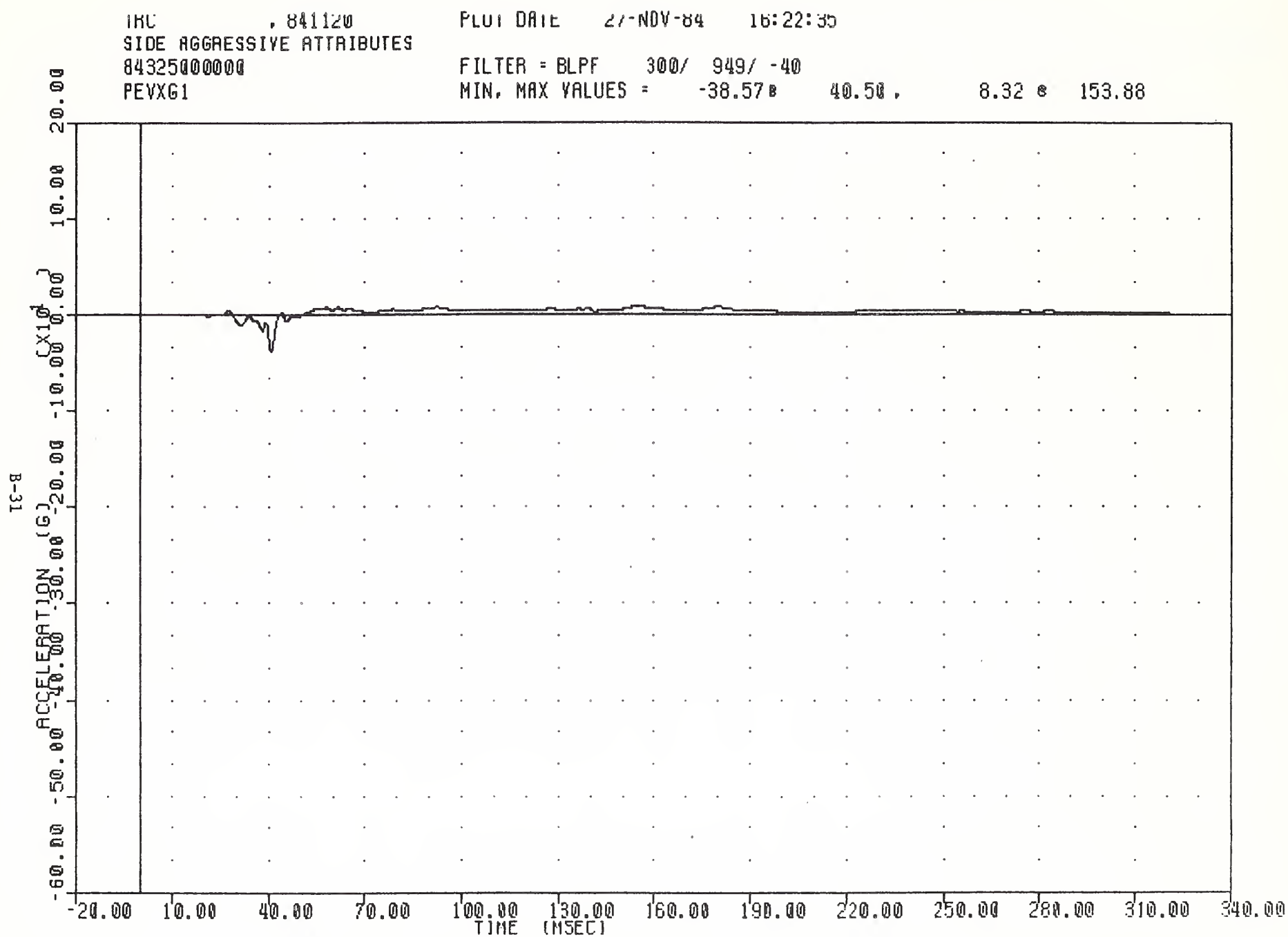
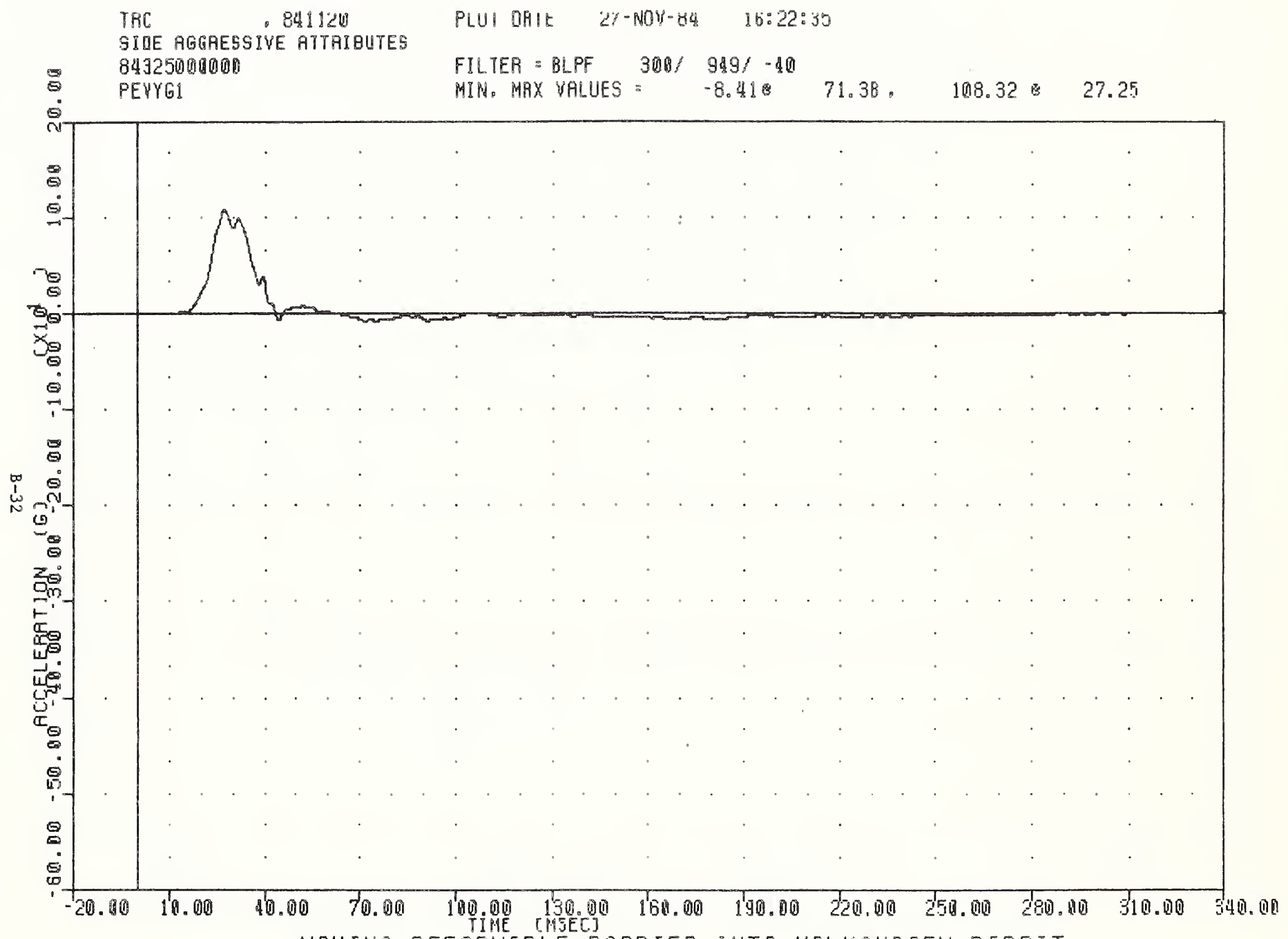
TIME (MSEC)
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLRYGA



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



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS ACCELERATION X AXIS



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS ACCELERATION Y AXIS

TAC , 841120 PLOT DATE 27-NOV-84 16:22:35
SIDE AGGRESSIVE ATTRIBUTES
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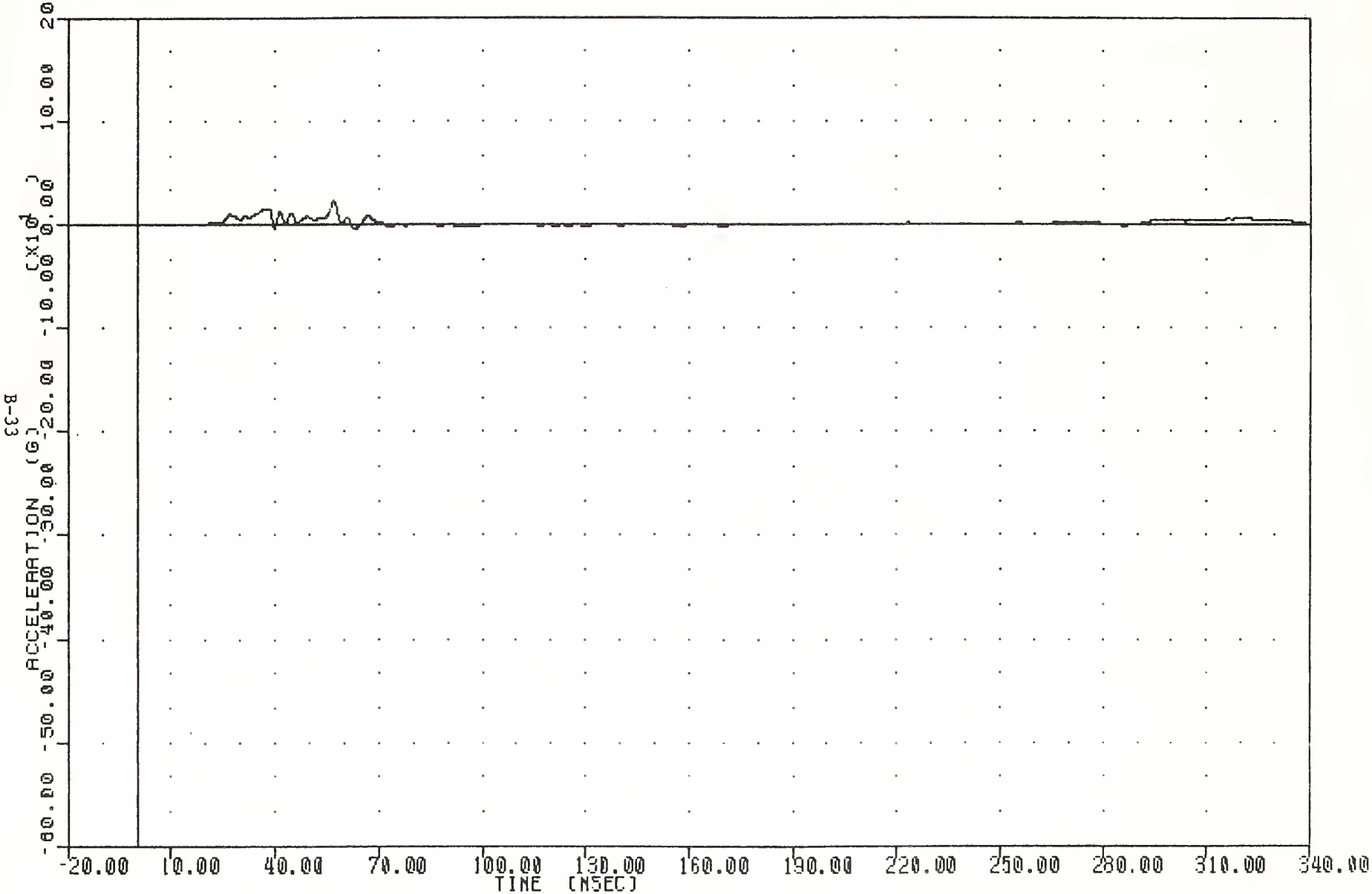
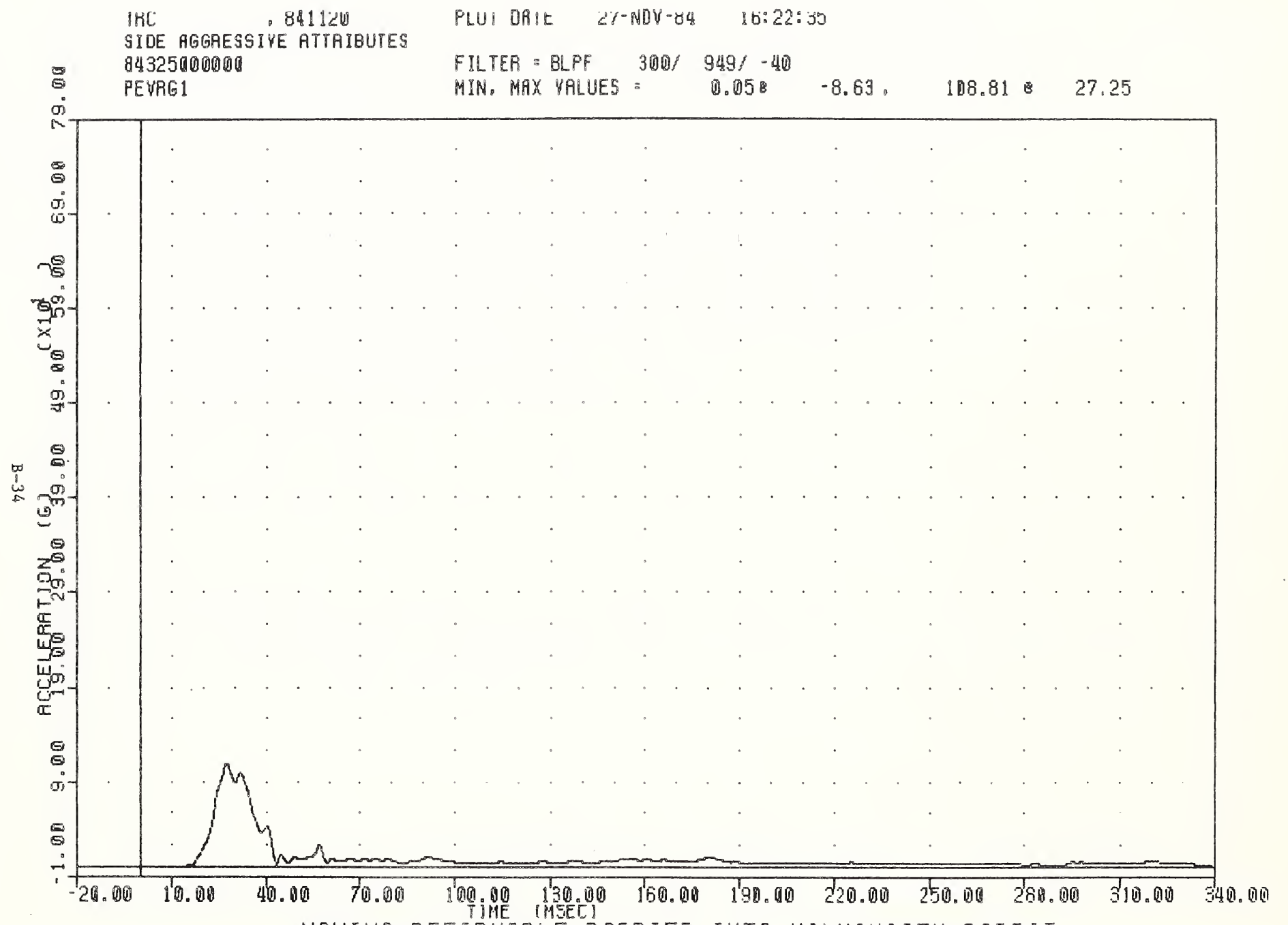
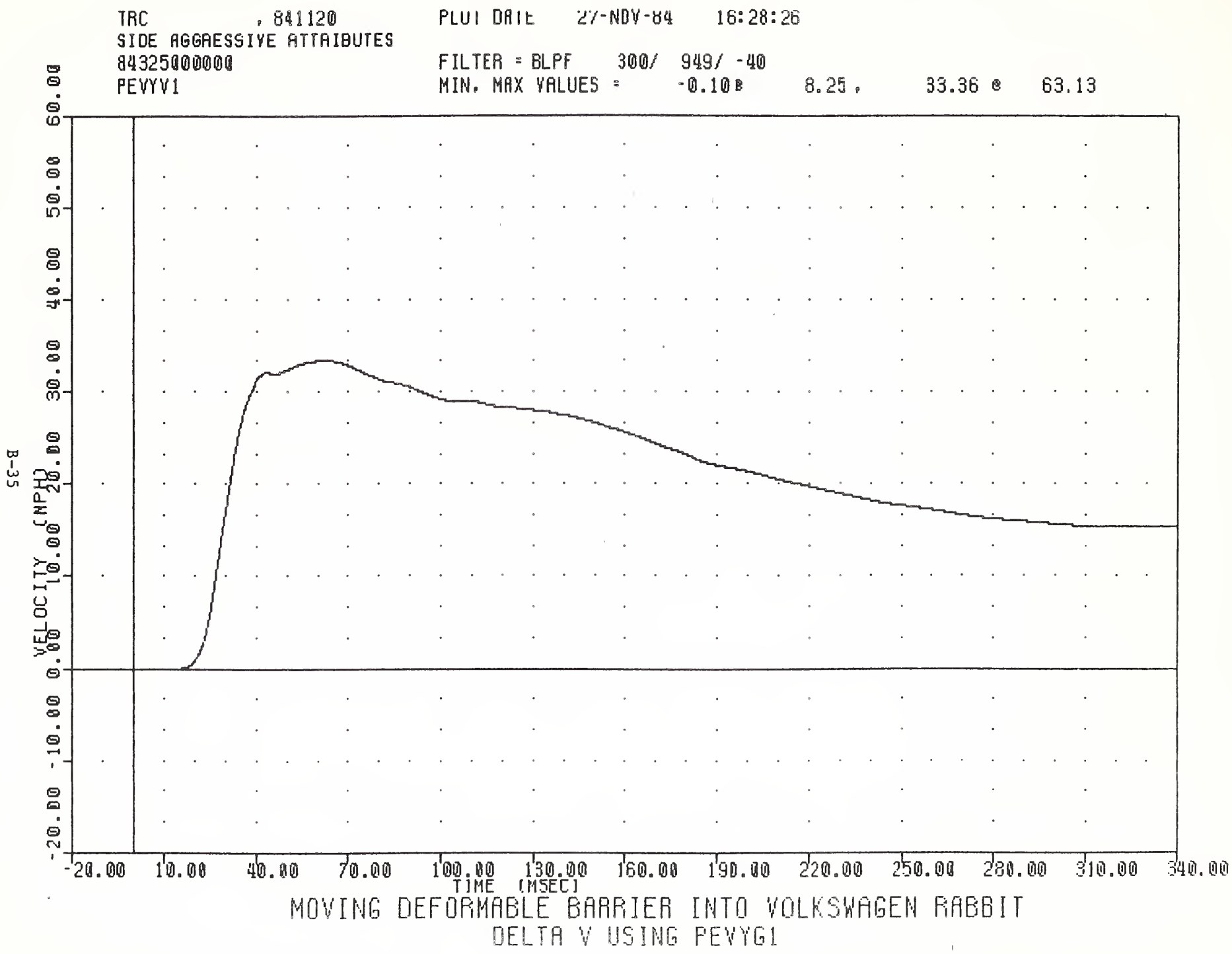


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS ACCELERATION Z AXIS



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS RESULTANT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0.00
-10.00
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100.00
130.00
160.00
190.00
220.00
250.00
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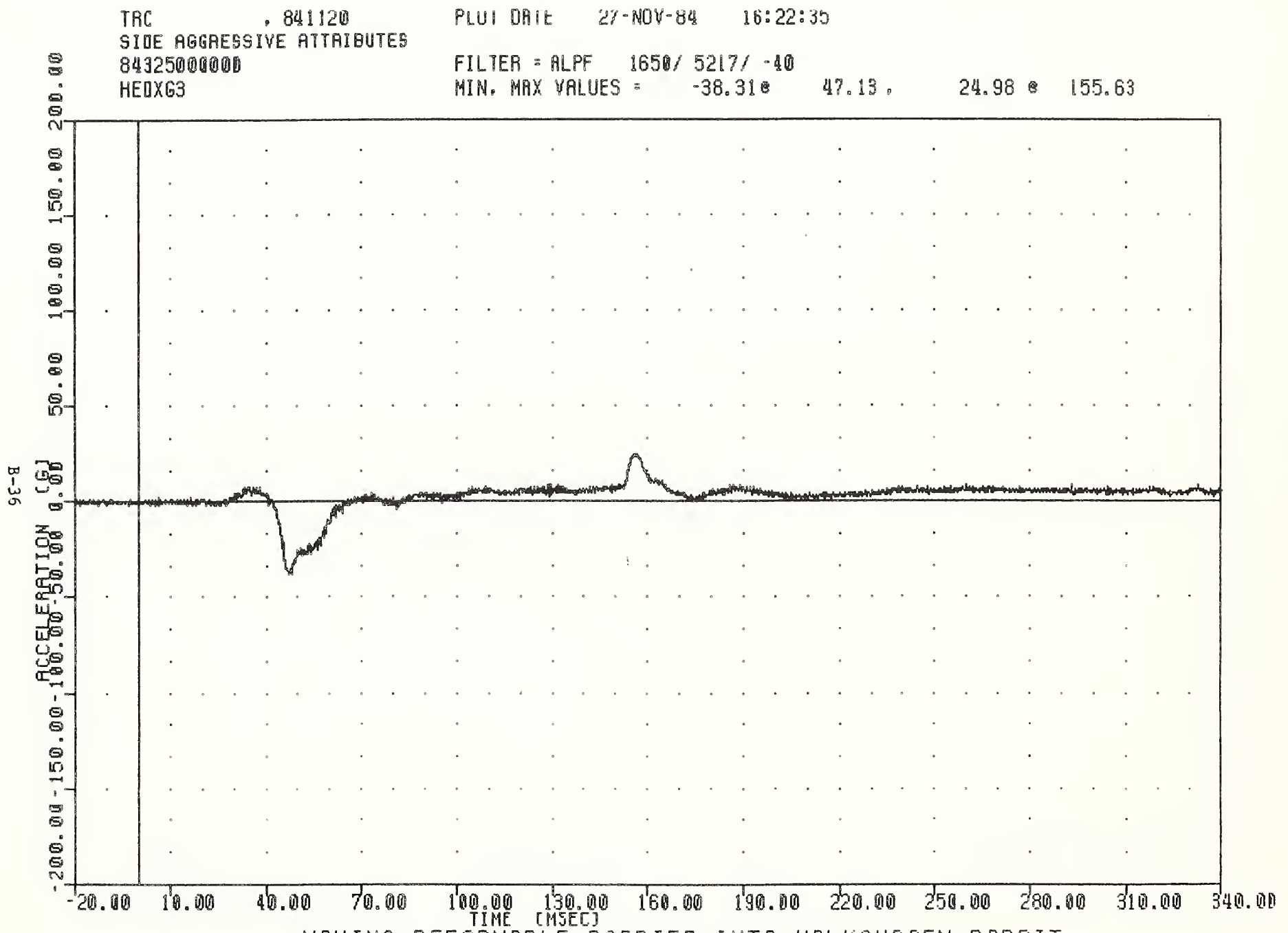
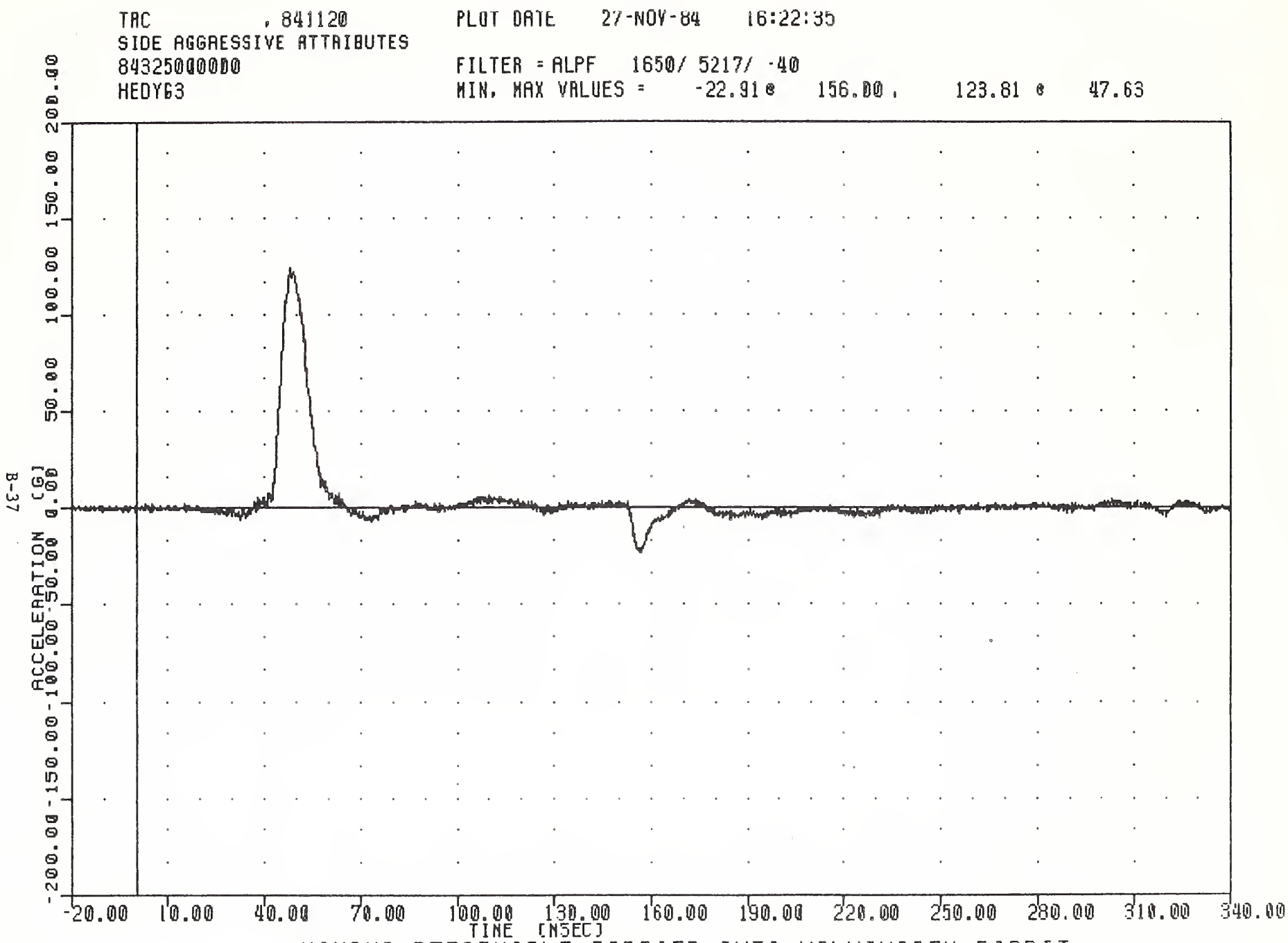
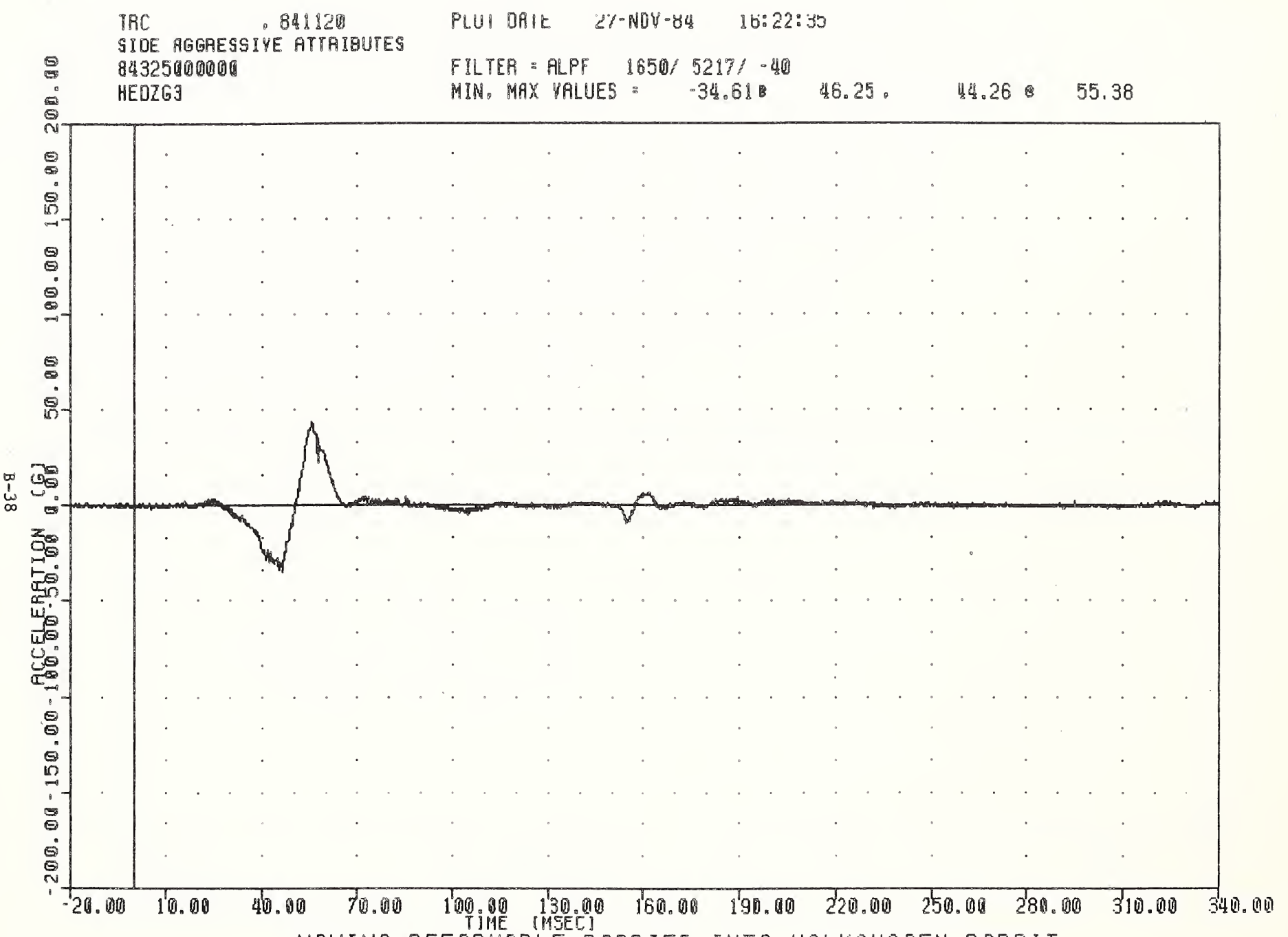
310.00
340.00
TIME (MSEC)
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING PEVYG1



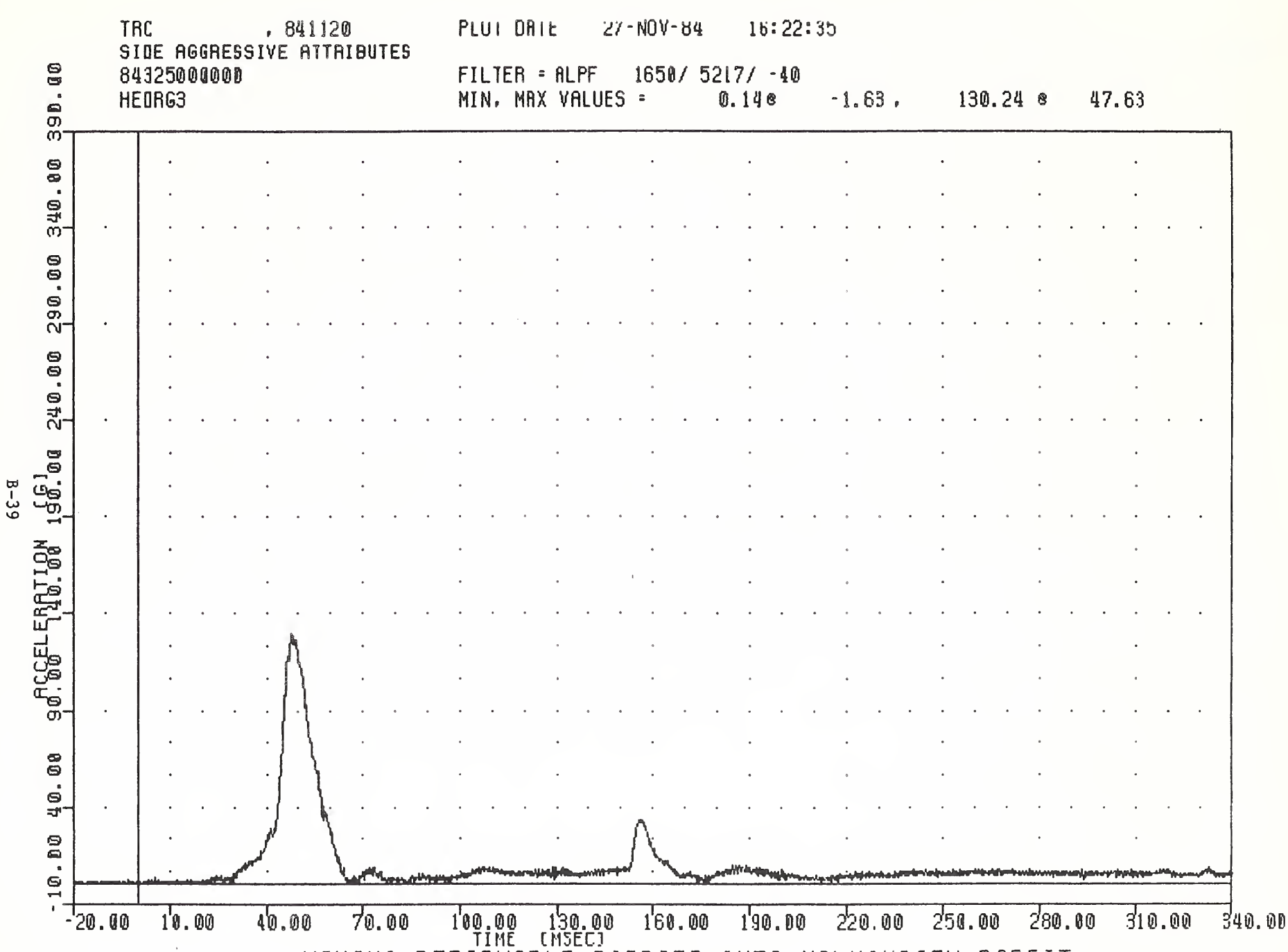
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION X AXIS



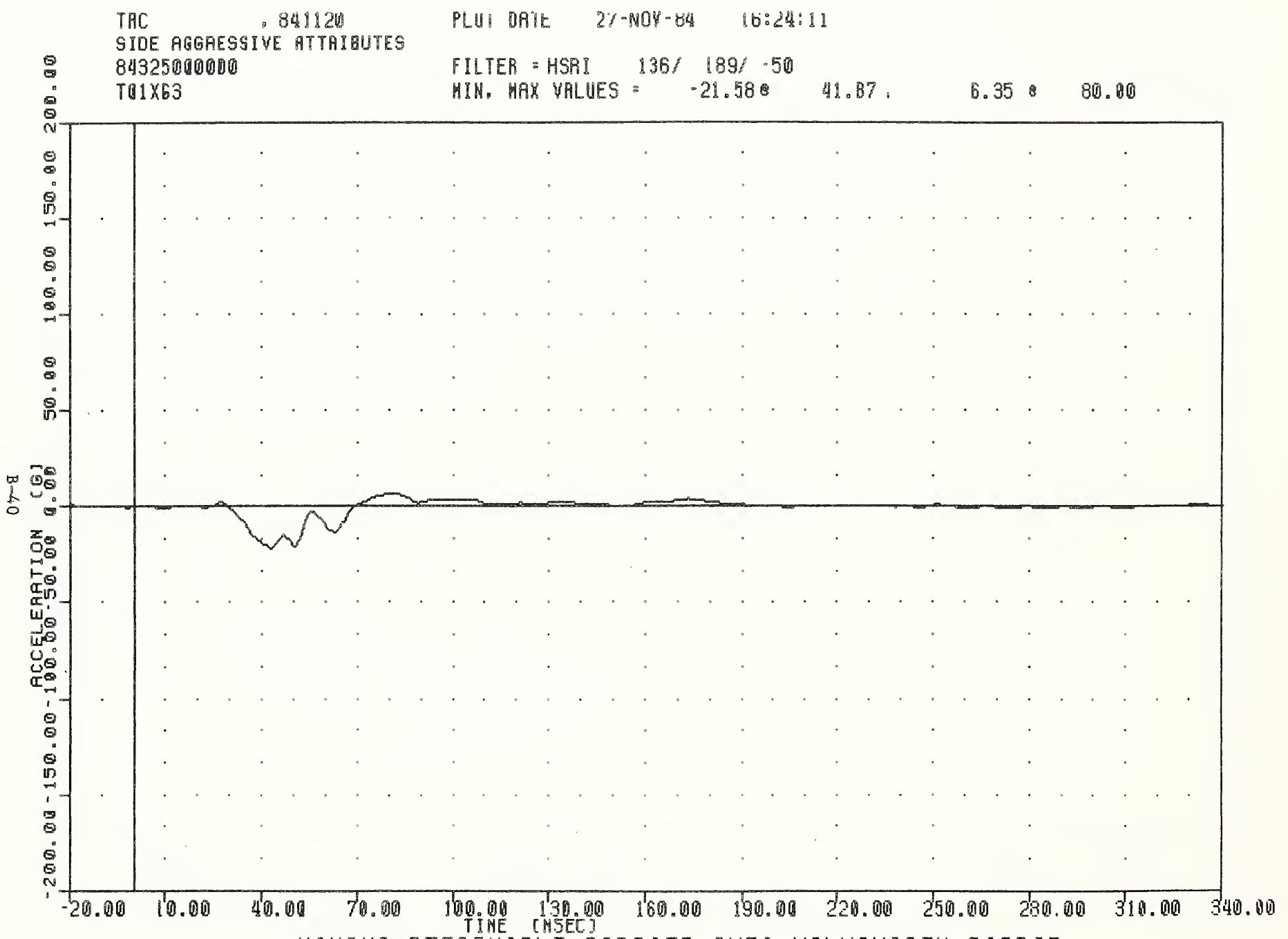
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION Y AXIS



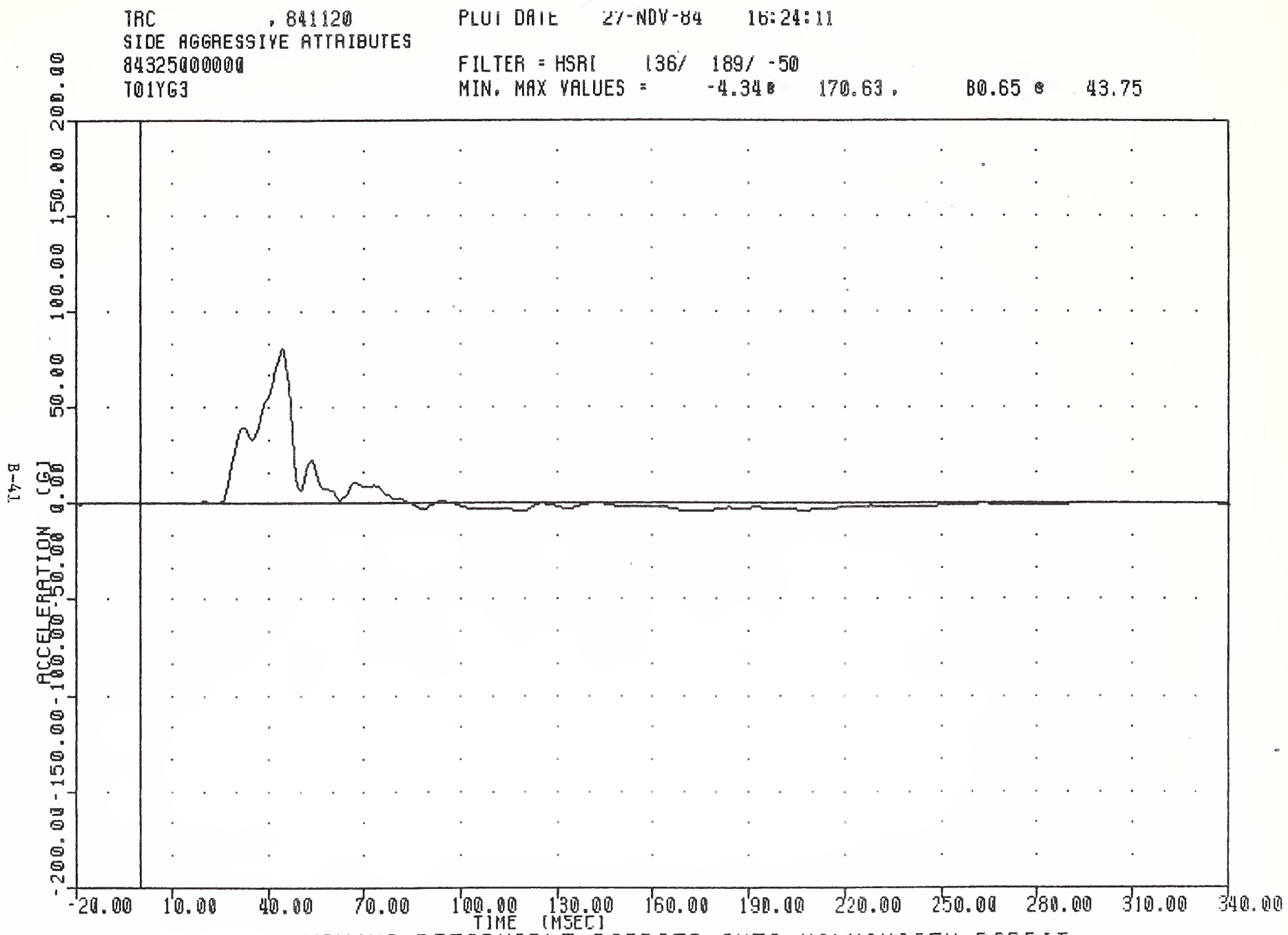
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION Z AXIS



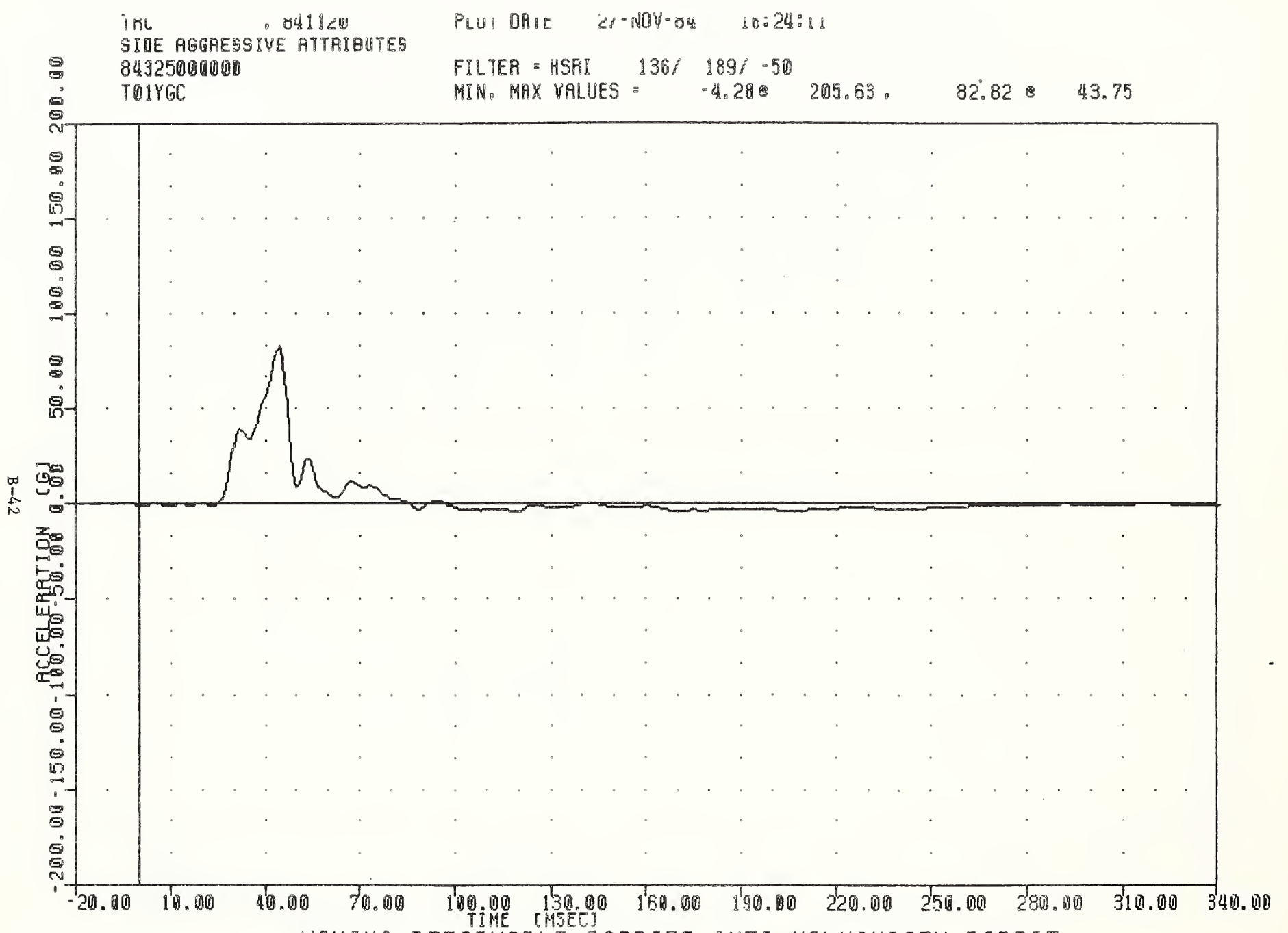
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD RESULTANT



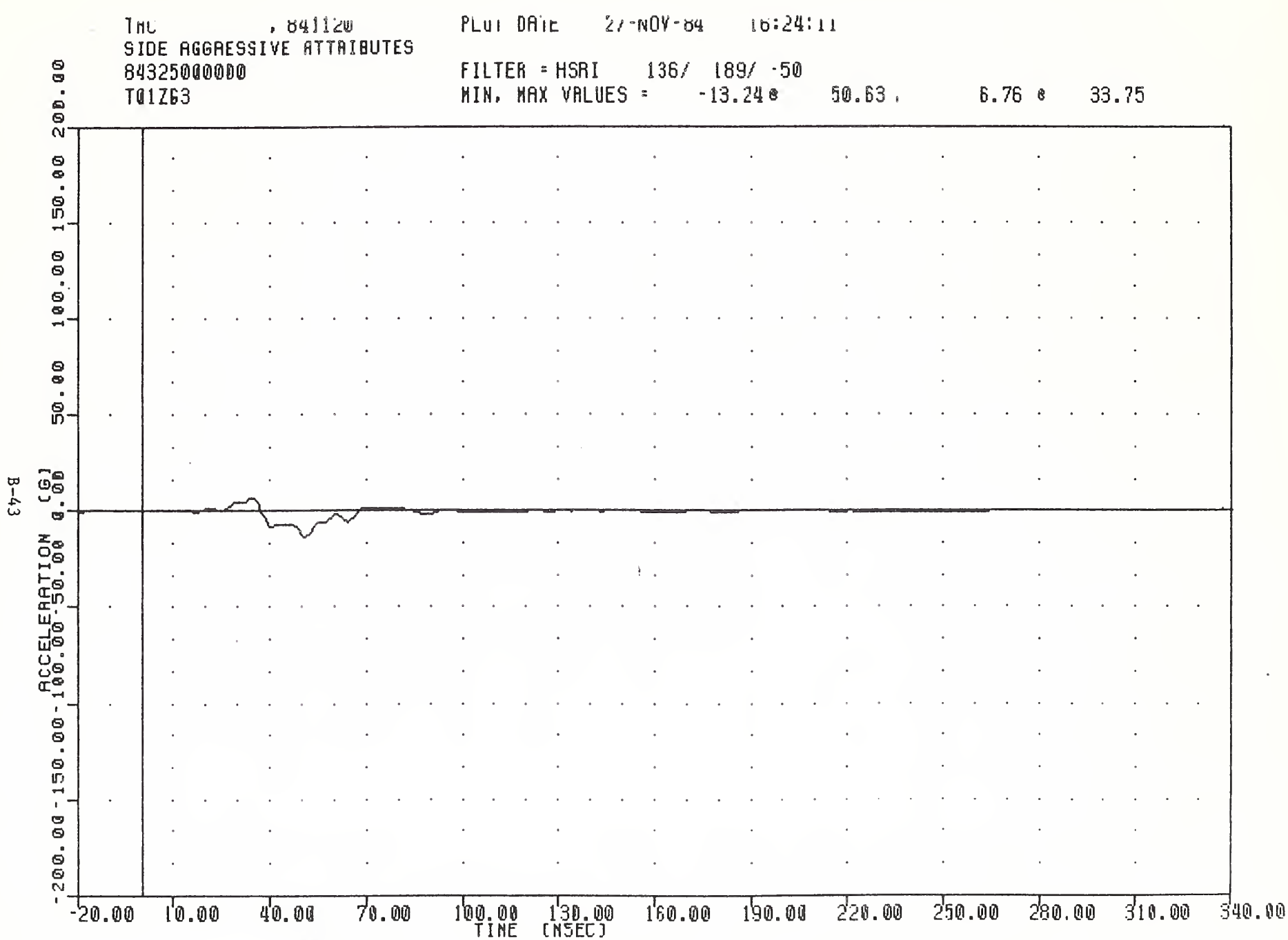
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE ACCELERATION X AXIS



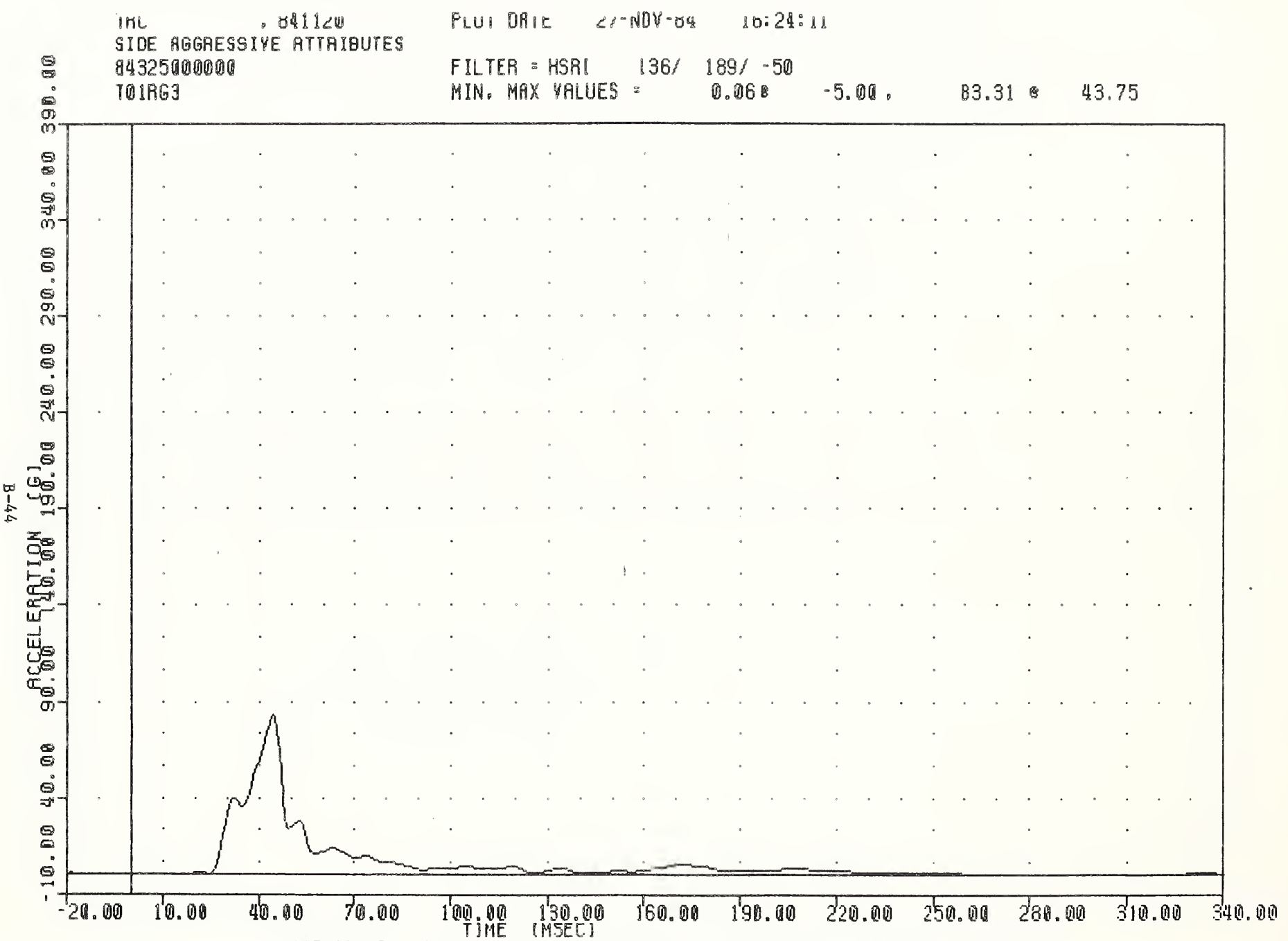
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE ACCELERATION Y AXIS



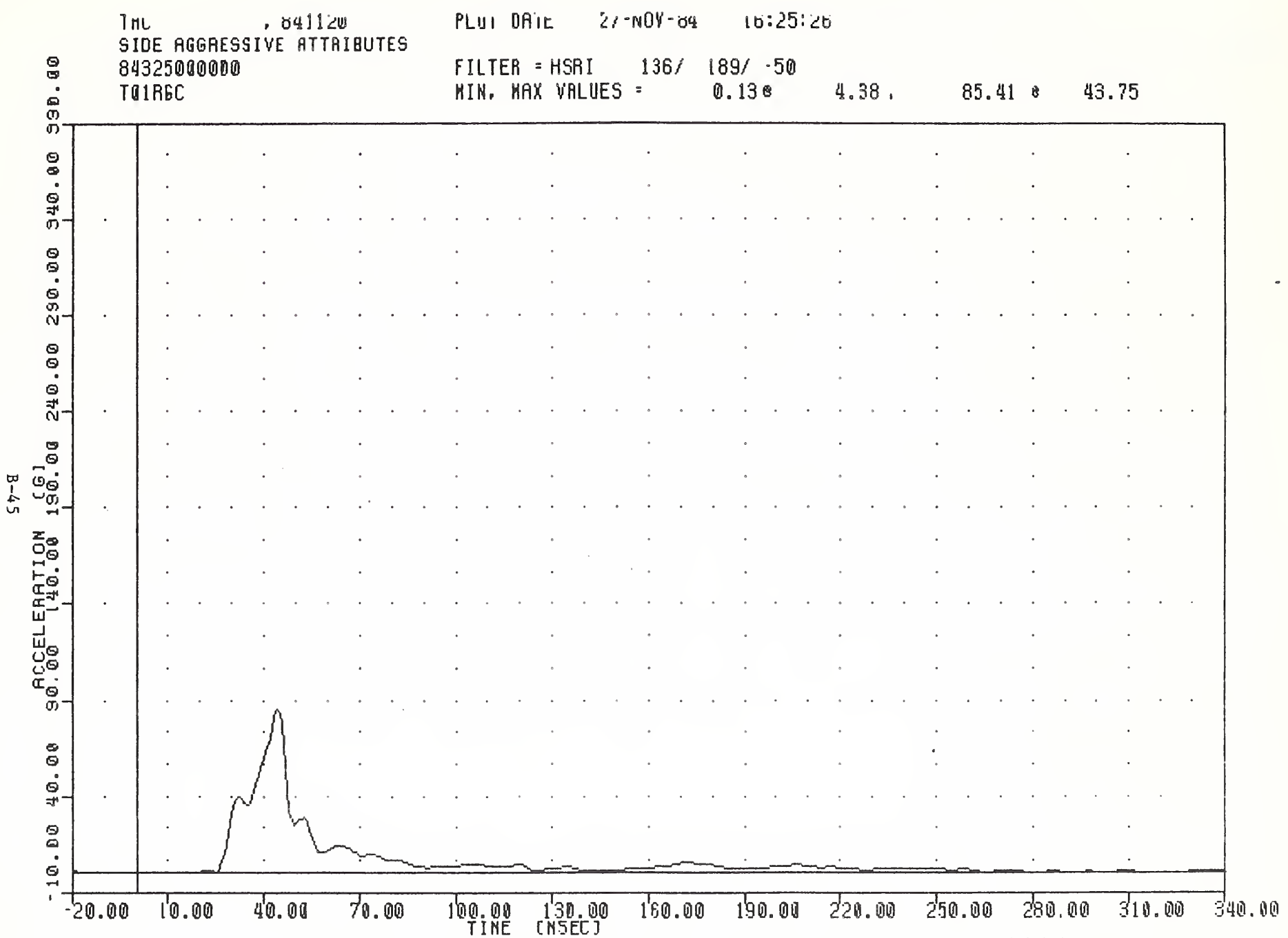
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE ACCELERATION -2 Y AXIS



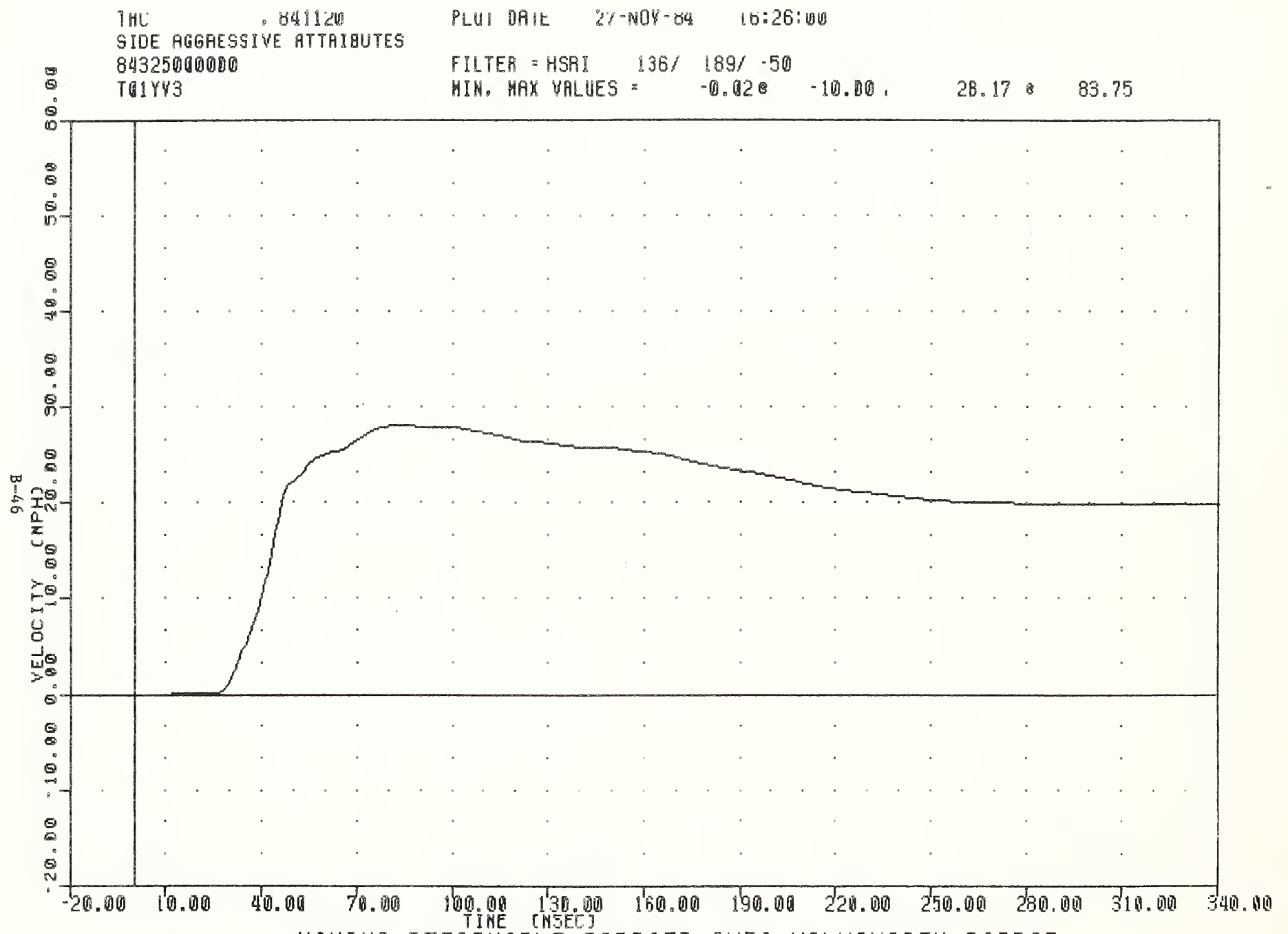
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE ACCELERATION Z AXIS



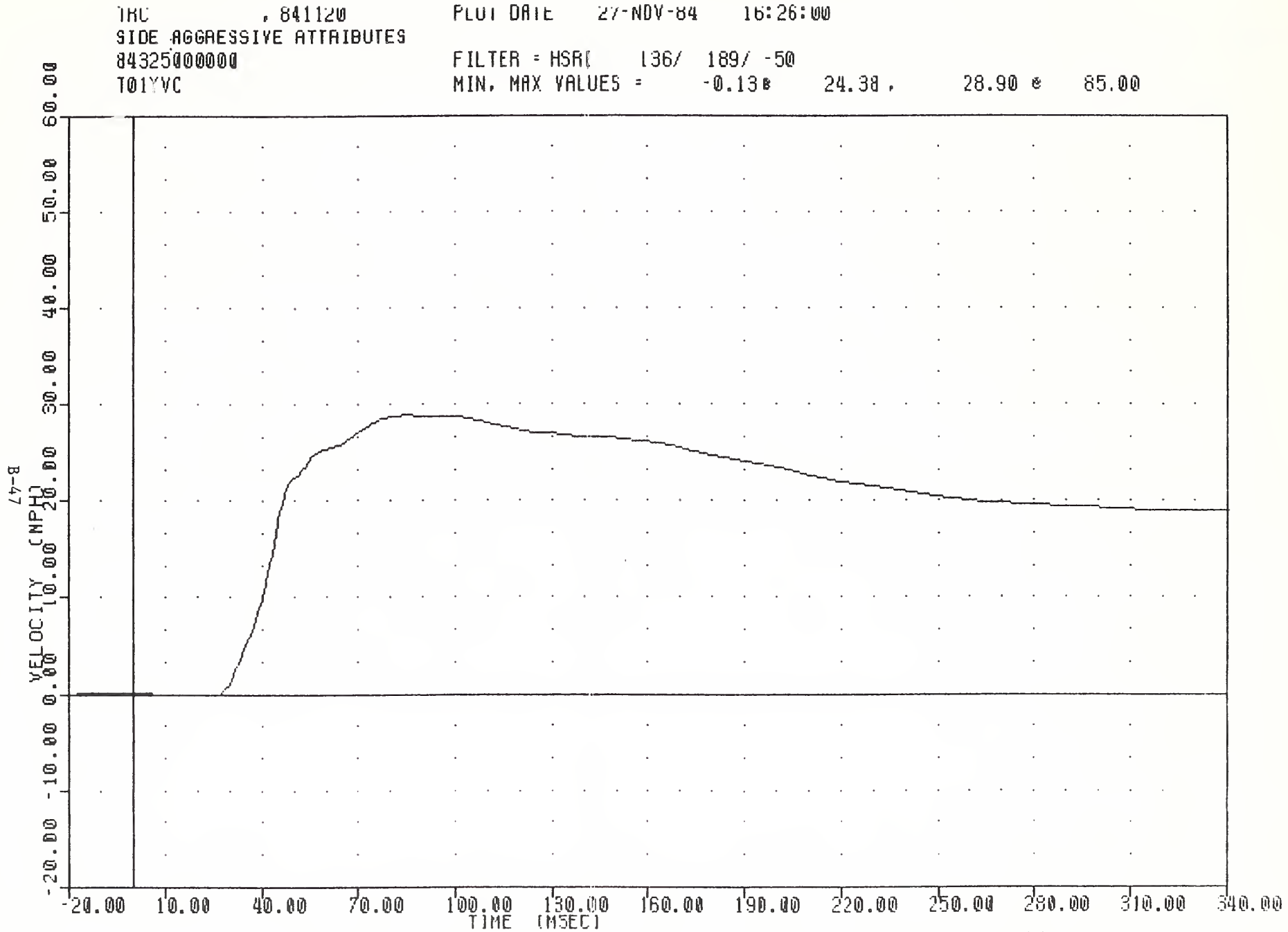
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE RESULTANT



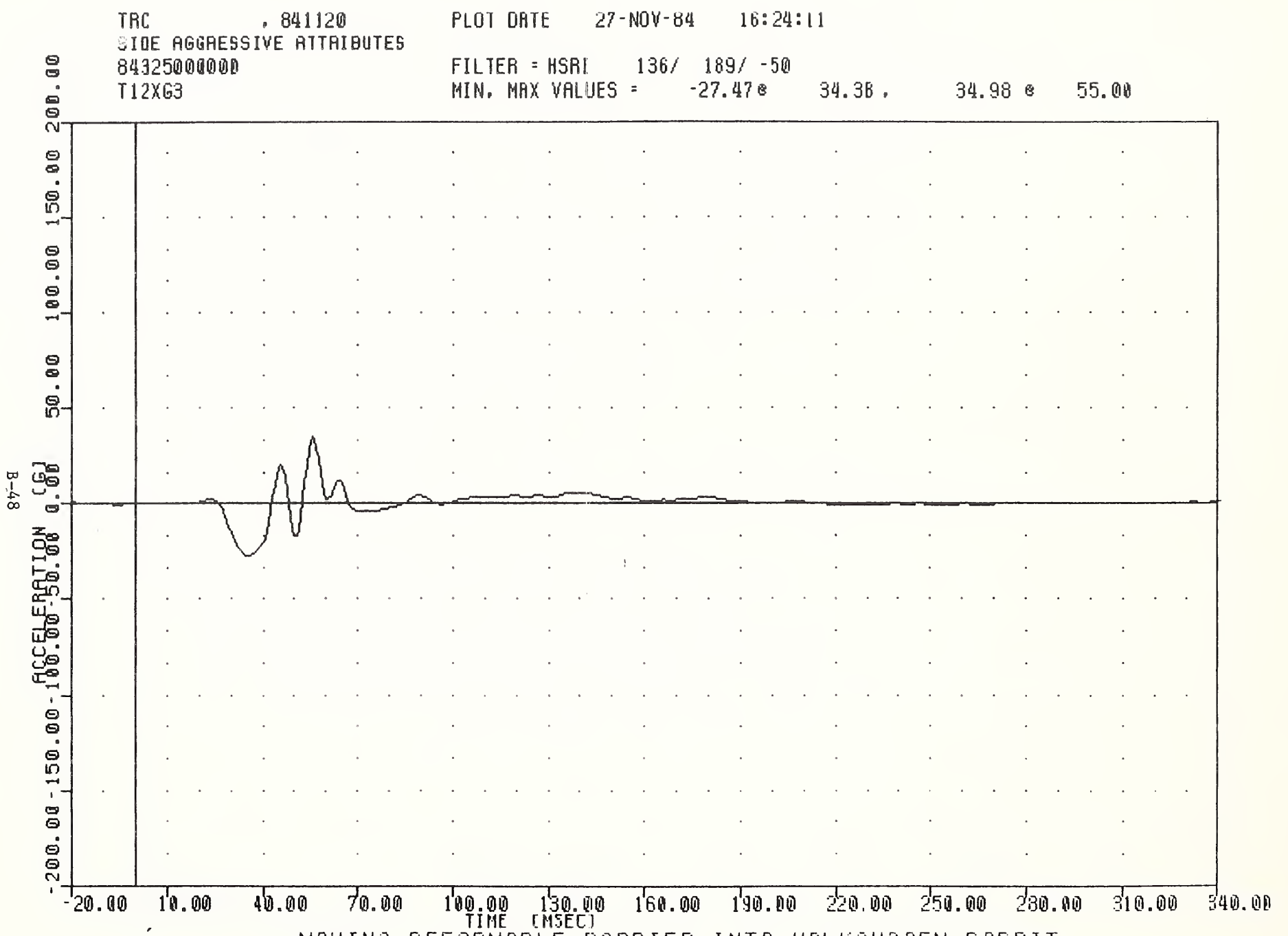
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE RESULTANT USING T01YGC



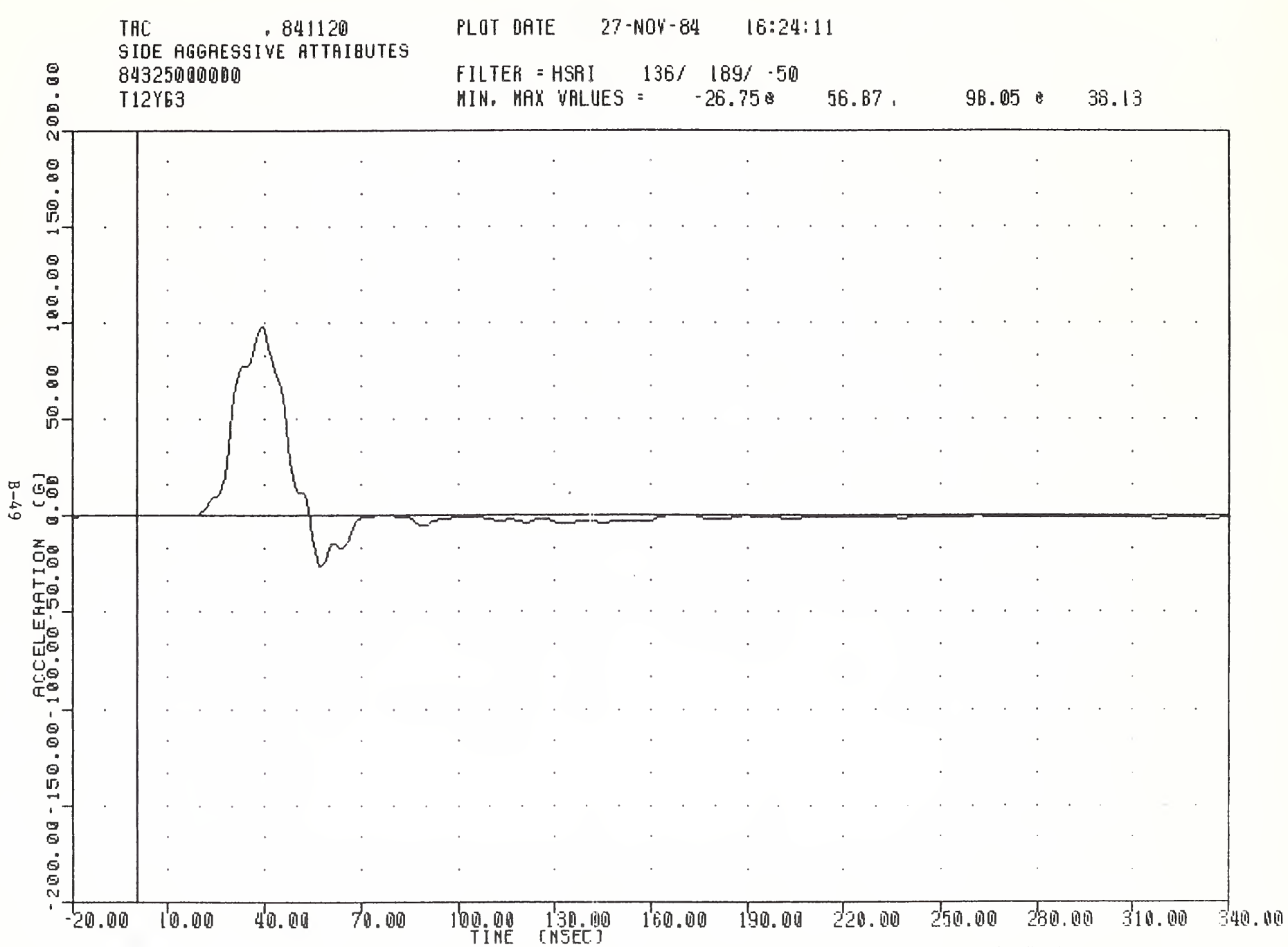
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T01YG3



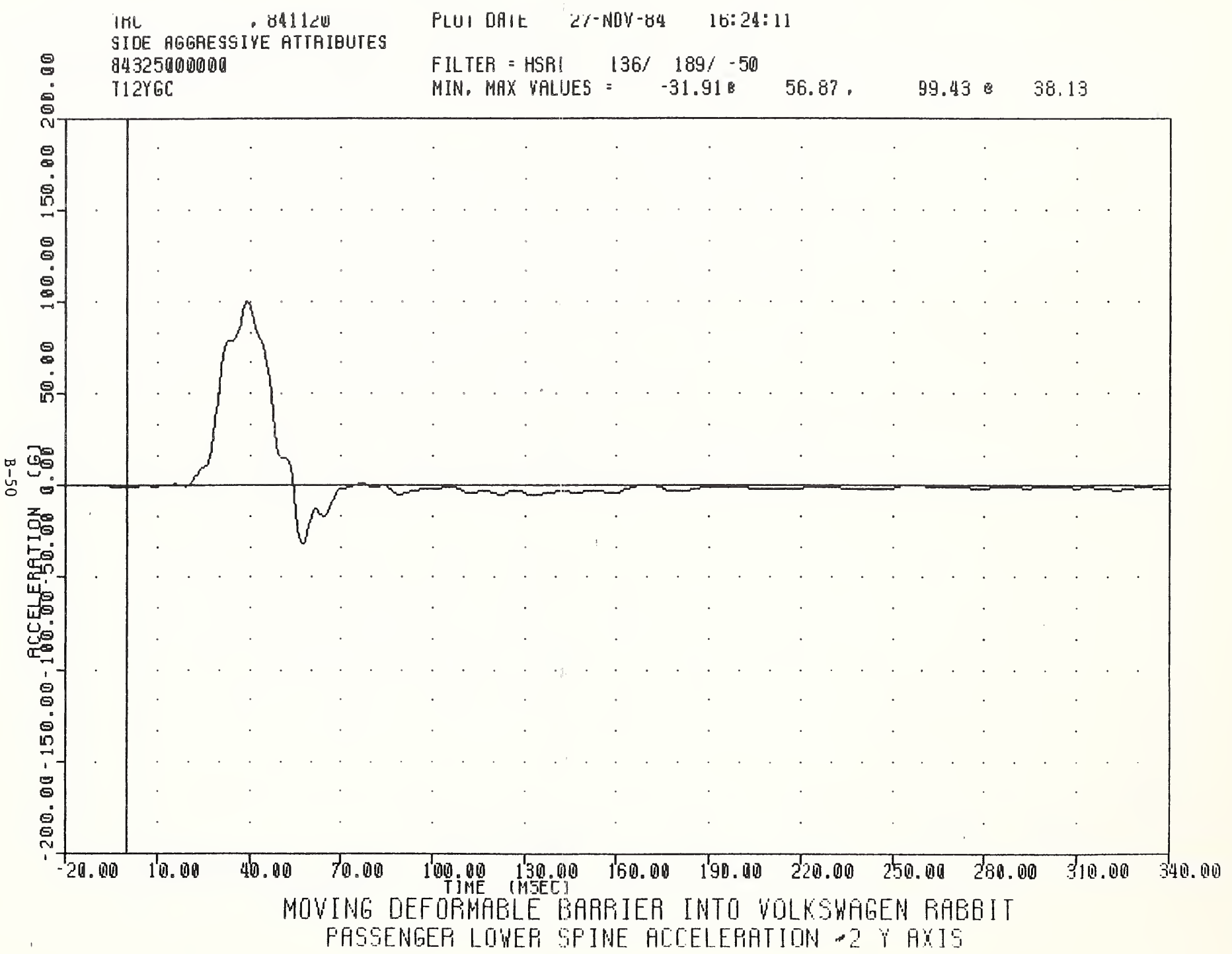
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T01YGC



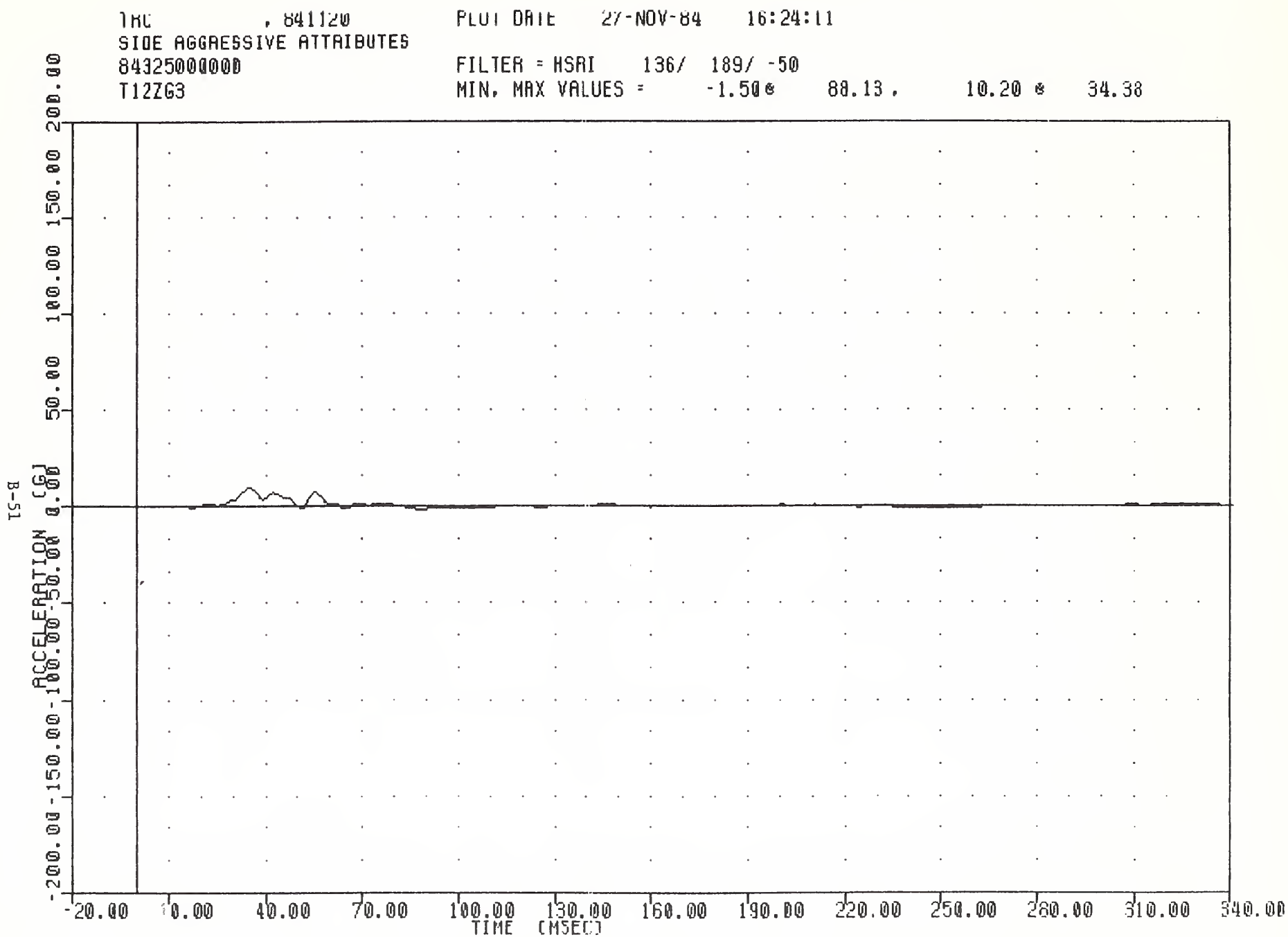
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE ACCELERATION X AXIS



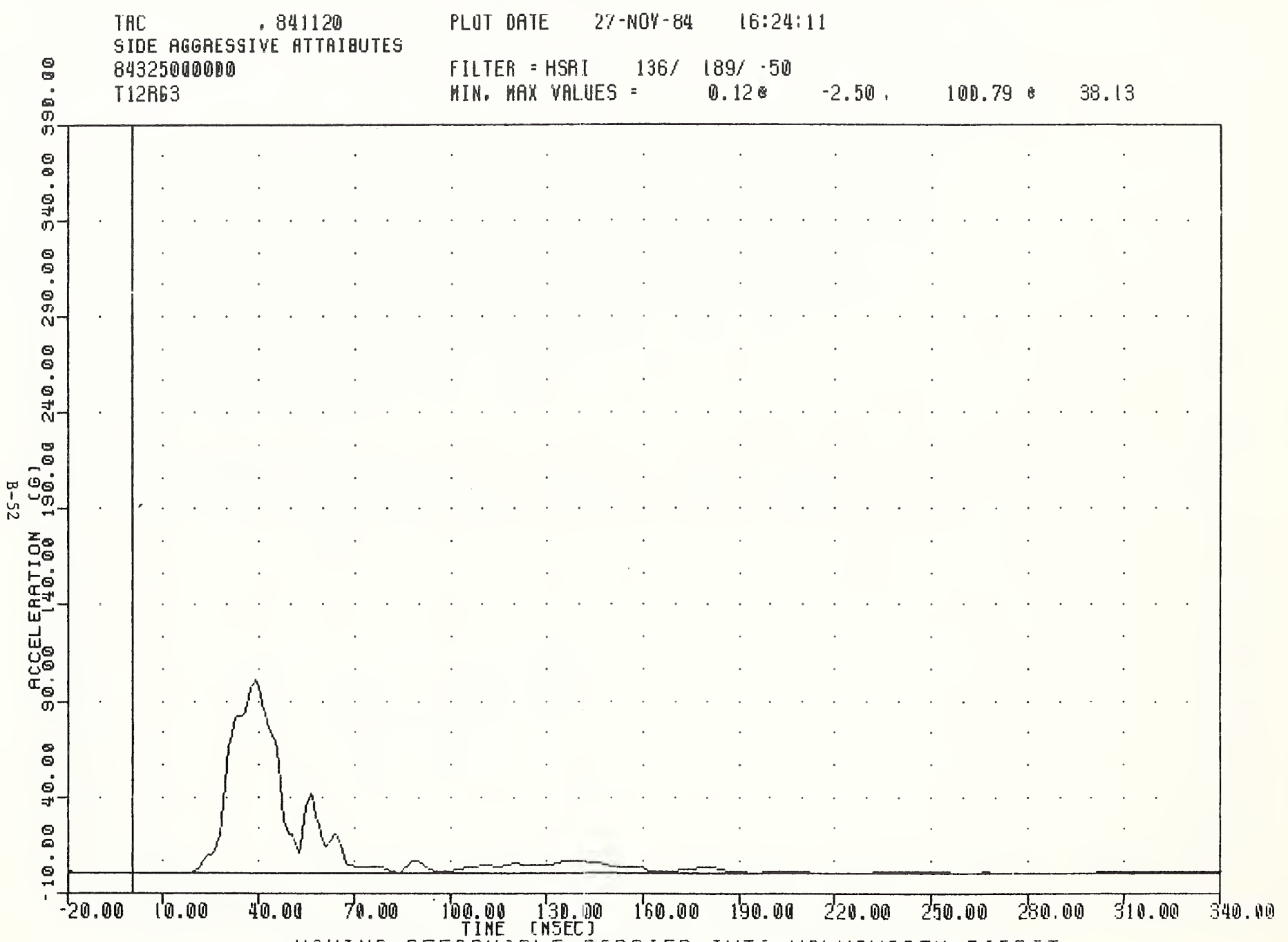
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE ACCELERATION Y AXIS



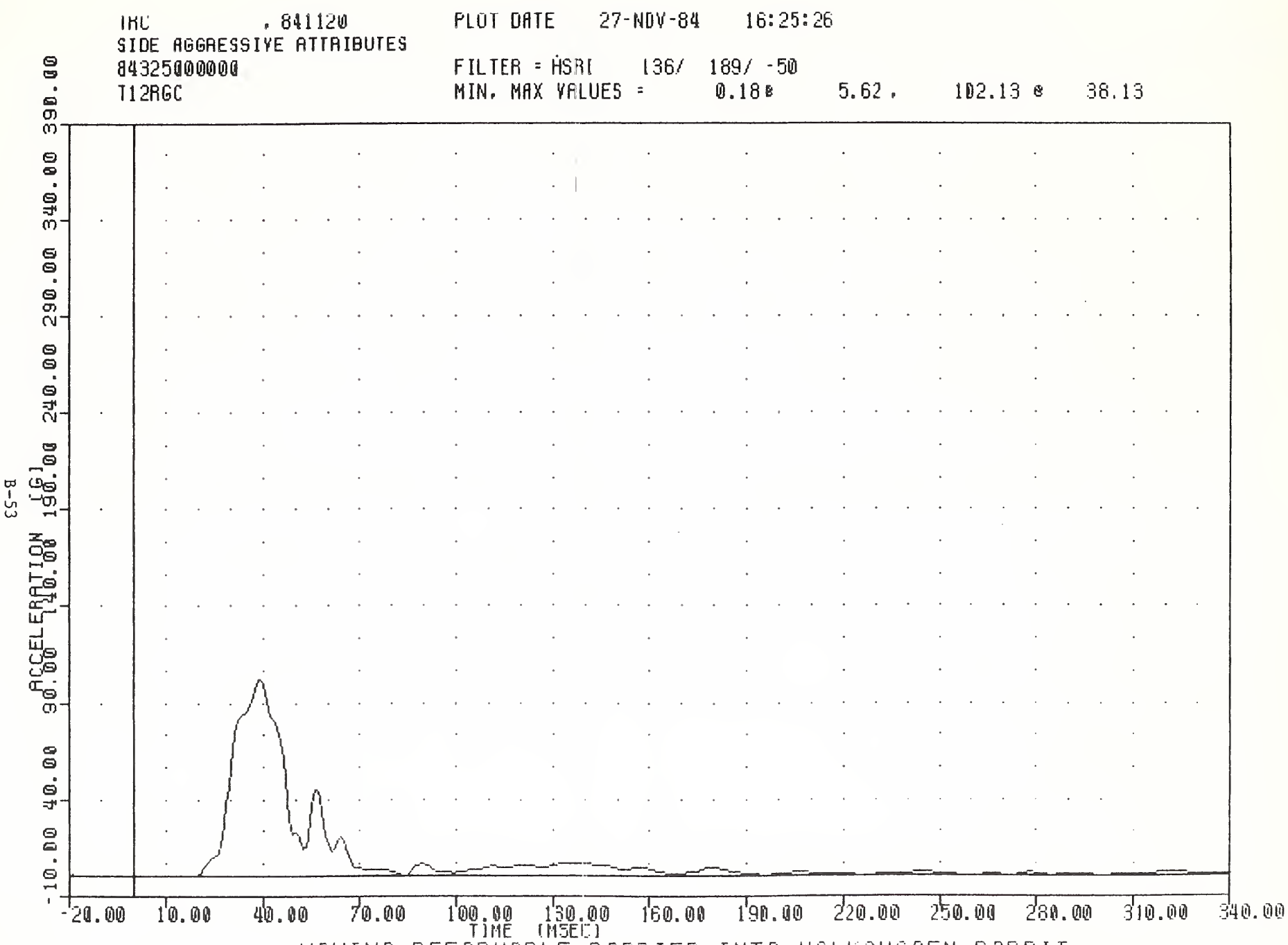
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE ACCELERATION -Z Y AXIS



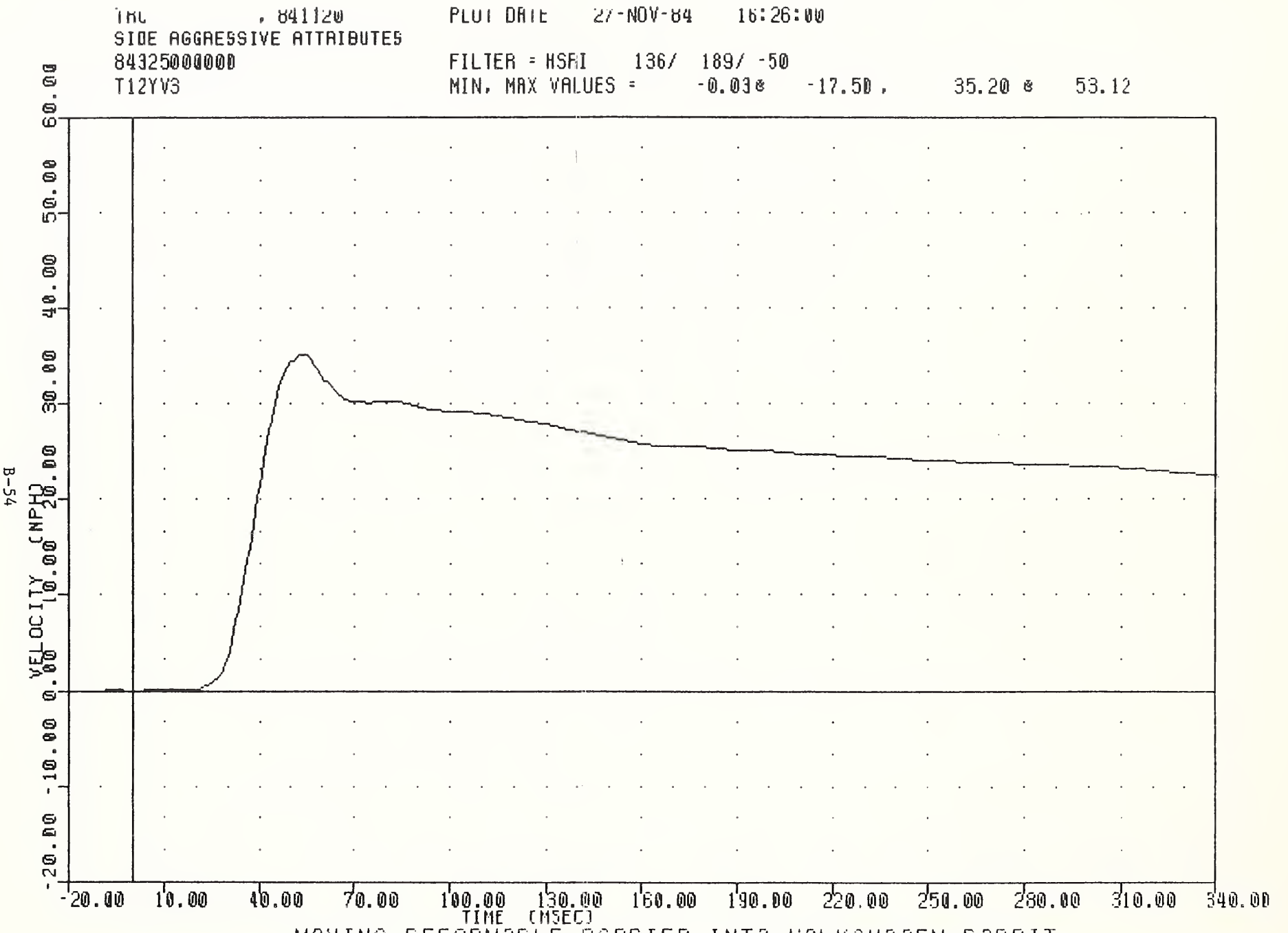
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE ACCELERATION Z AXIS



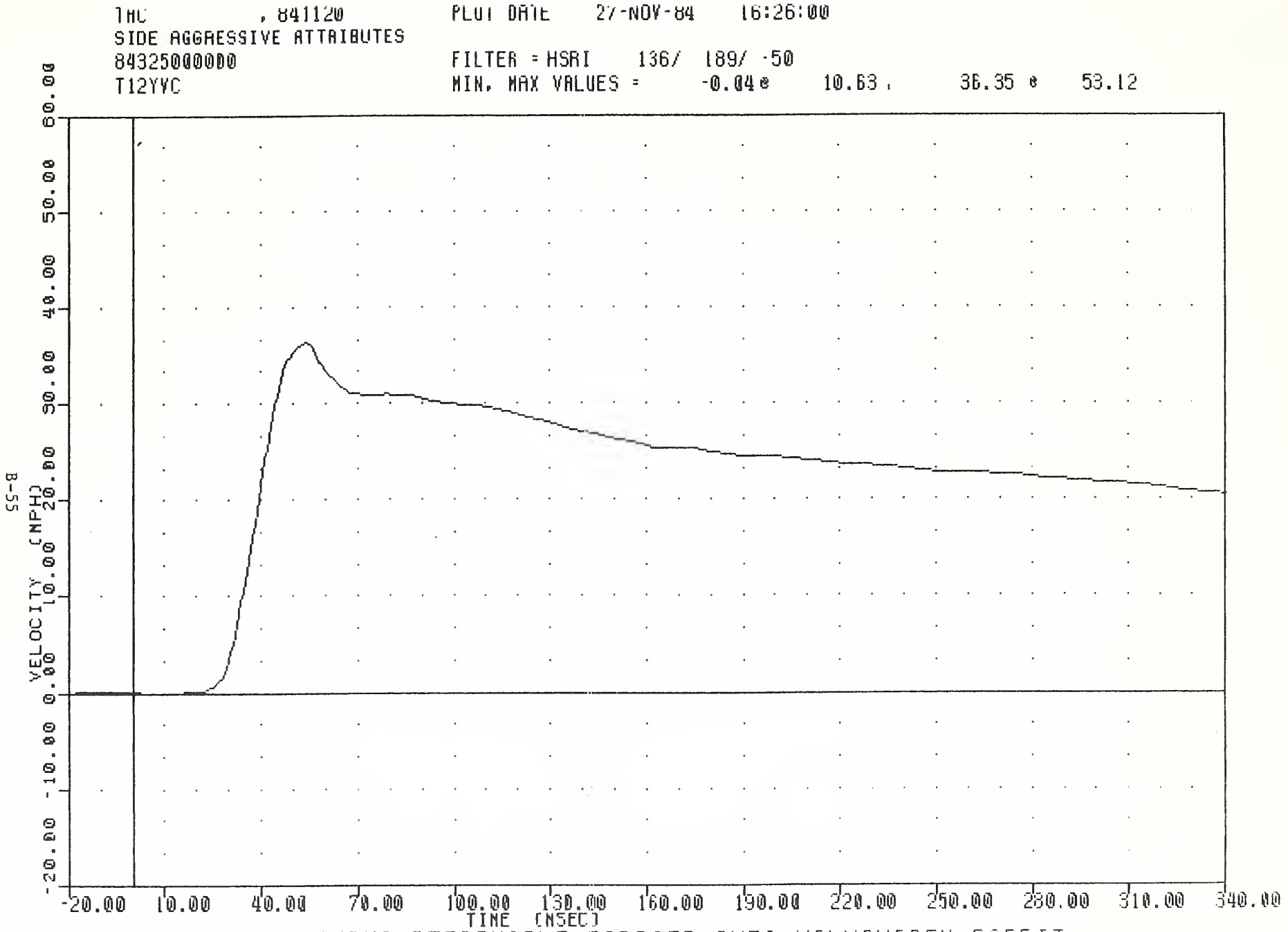
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE RESULTANT



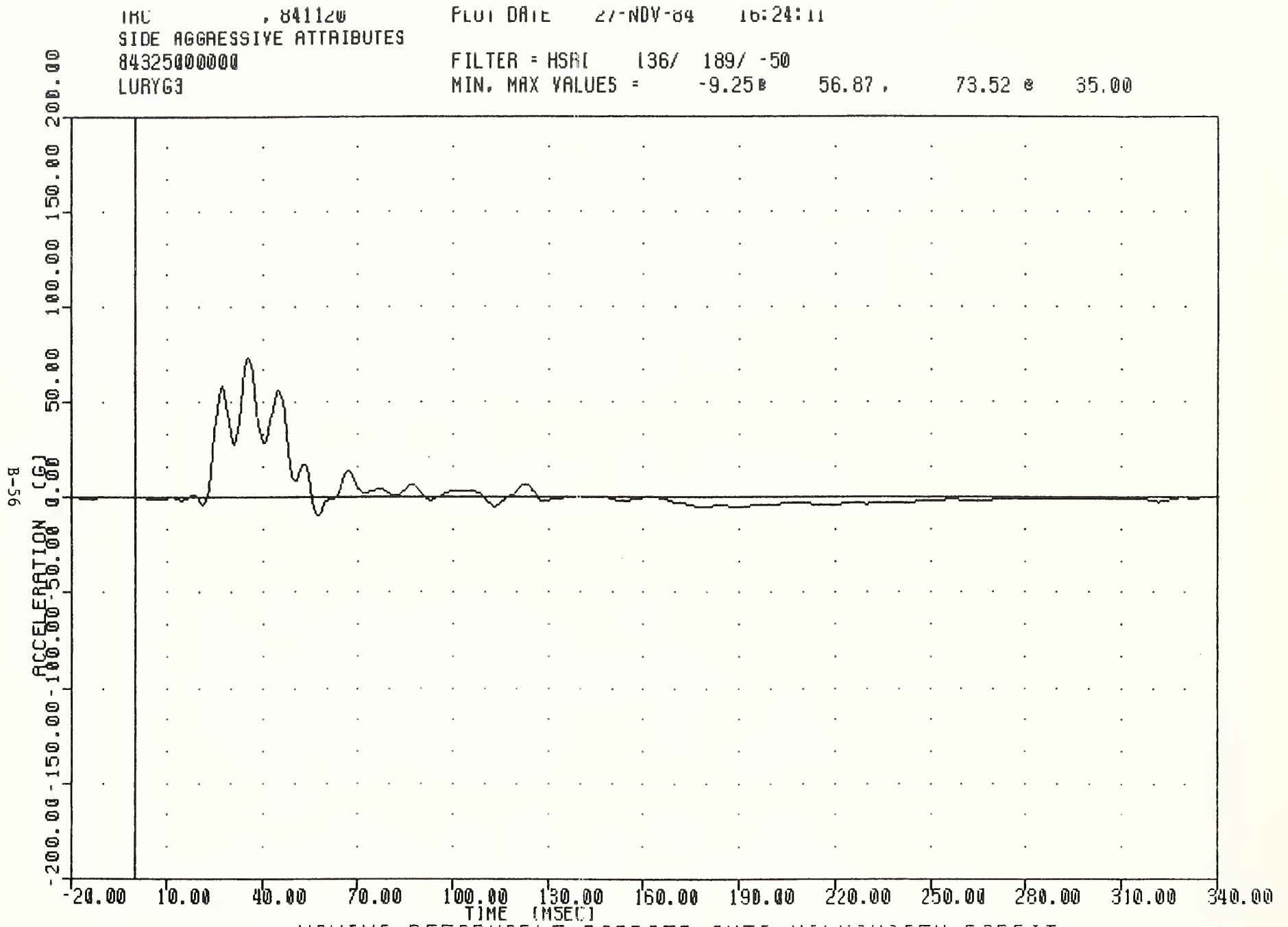
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE RESULTANT USING T12YGC



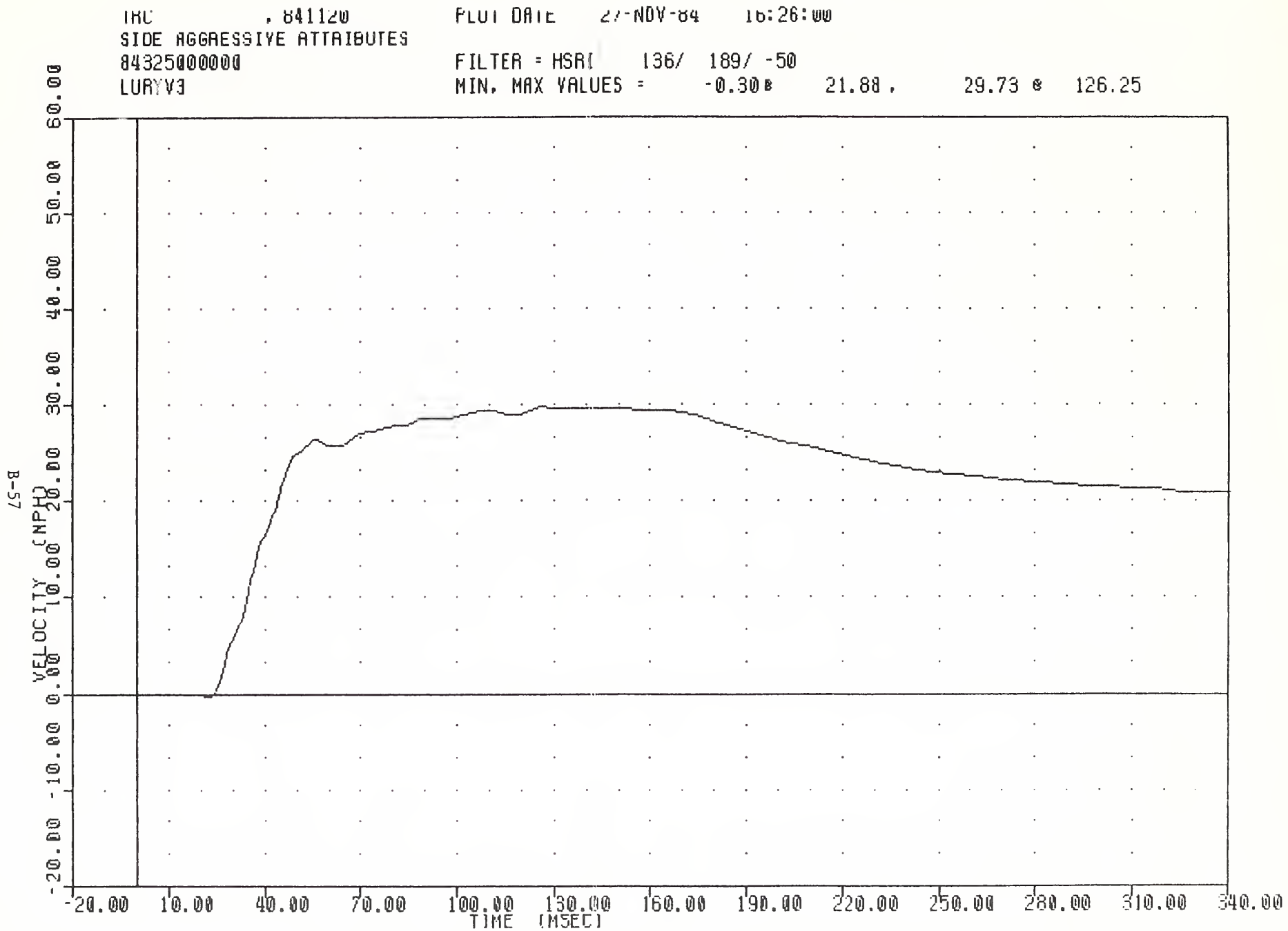
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12YG3



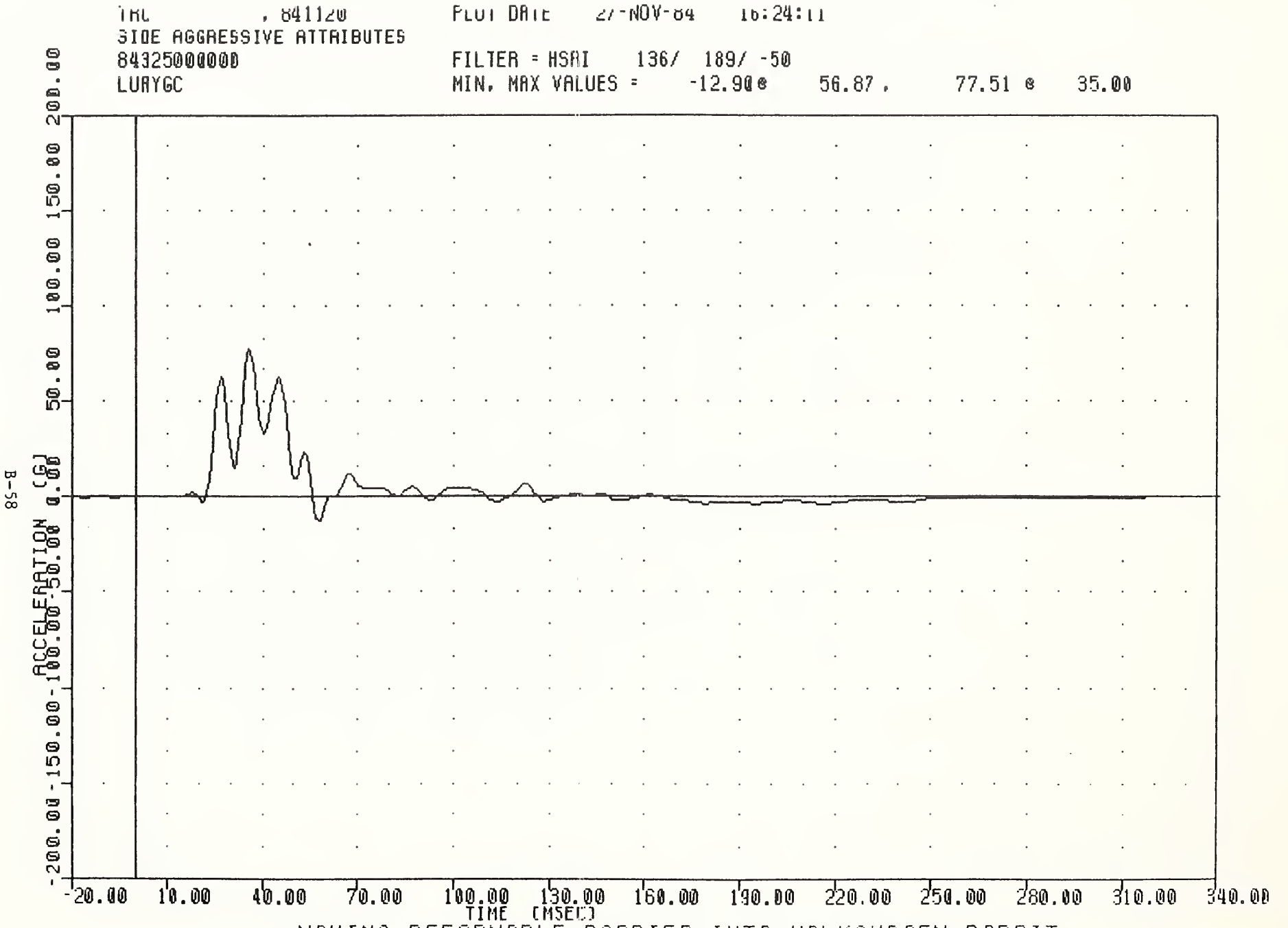
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12YGC



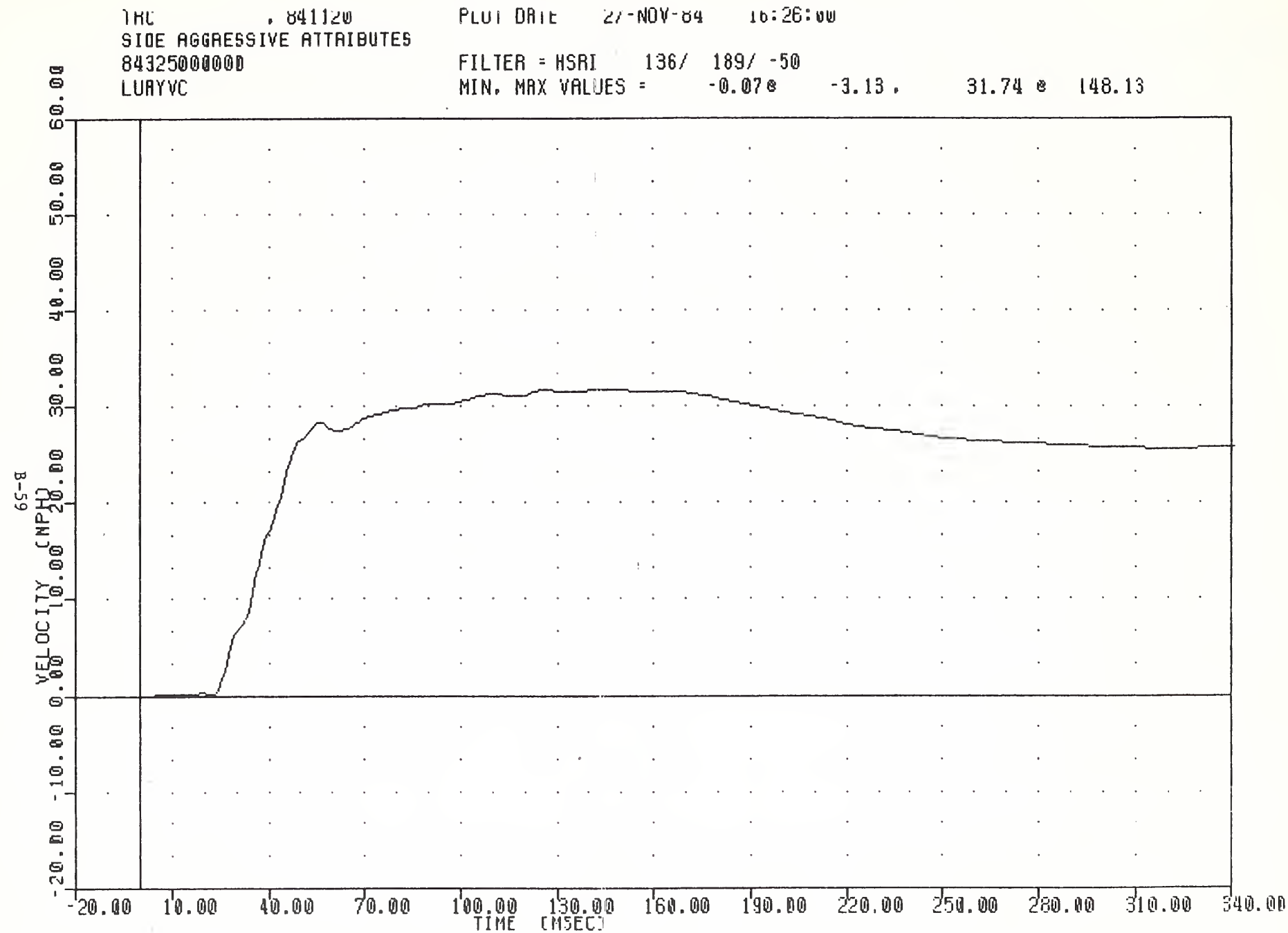
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT UPPER RIB ACCELERATION Y AXIS



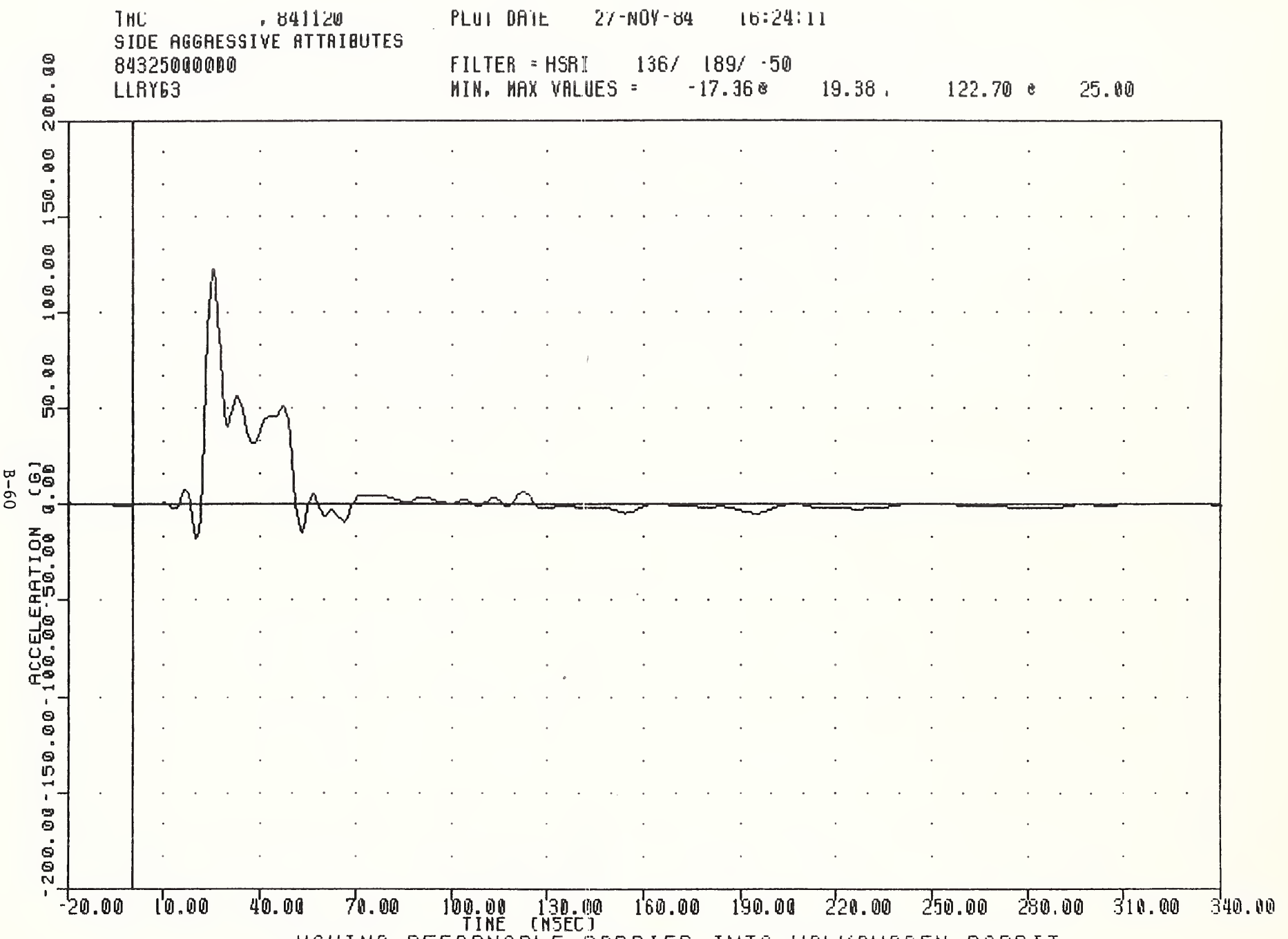
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LURYG3



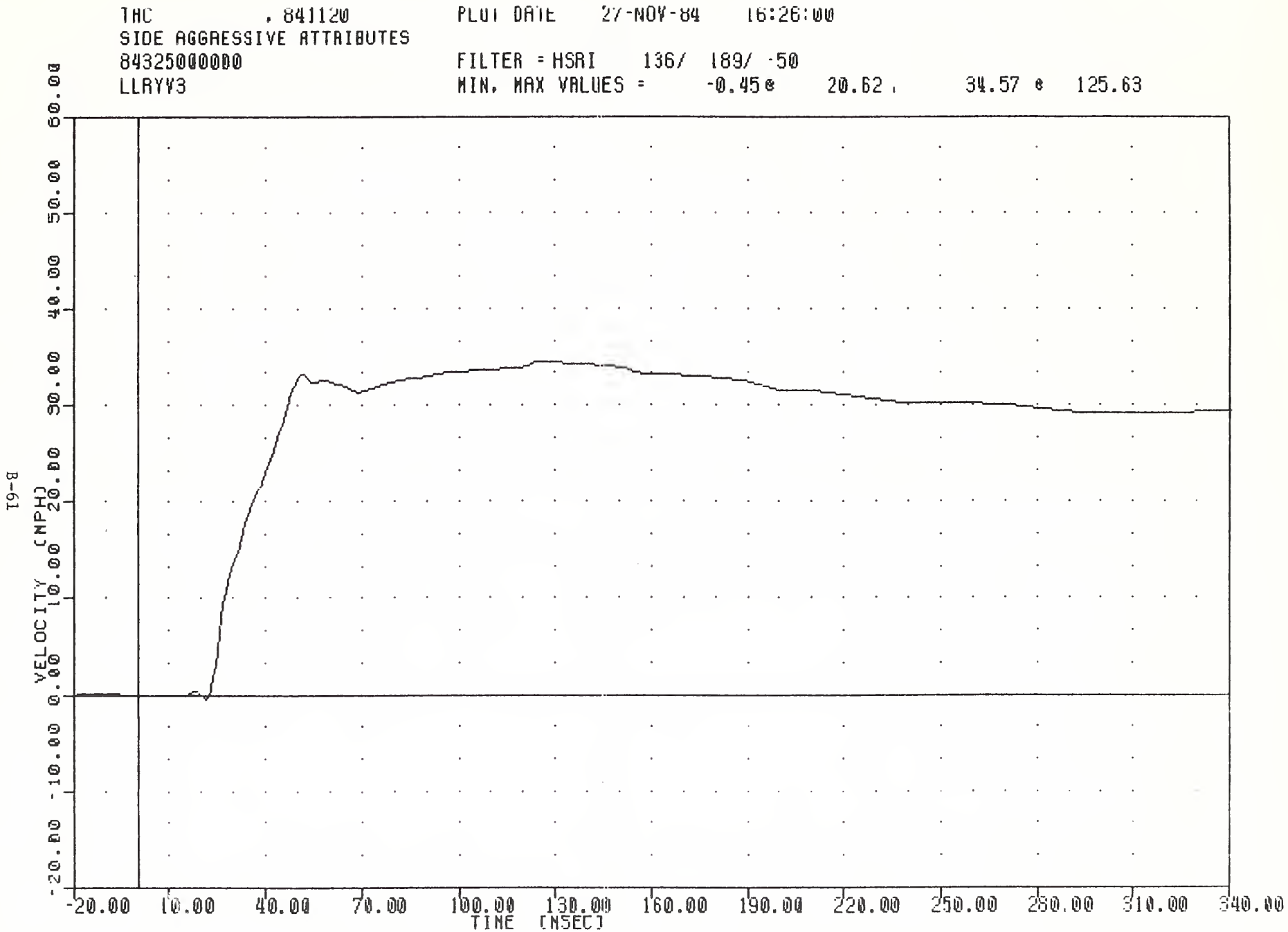
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT UPPER RIB ACCELERATION -2 Y AXIS



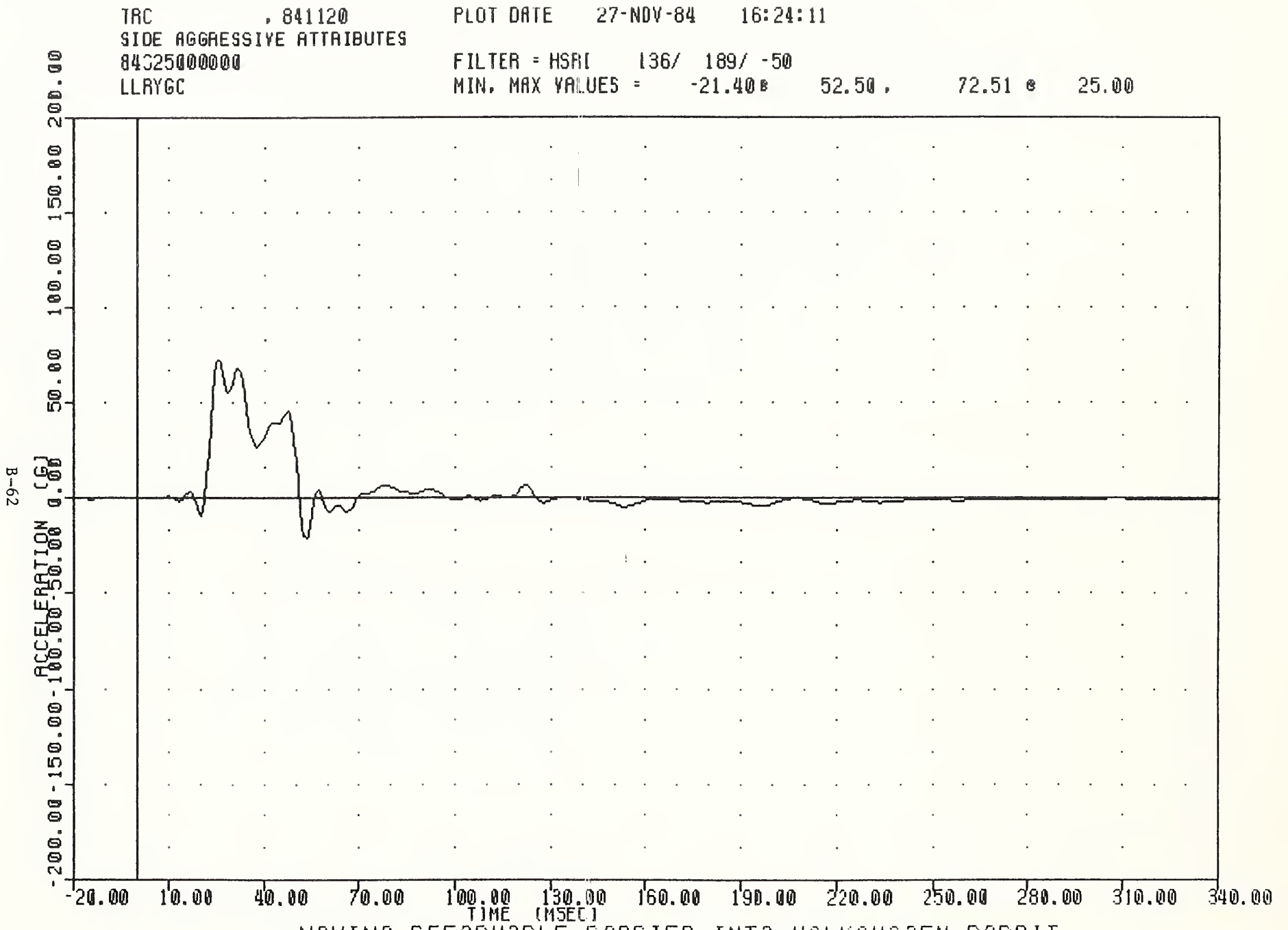
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LURYGC



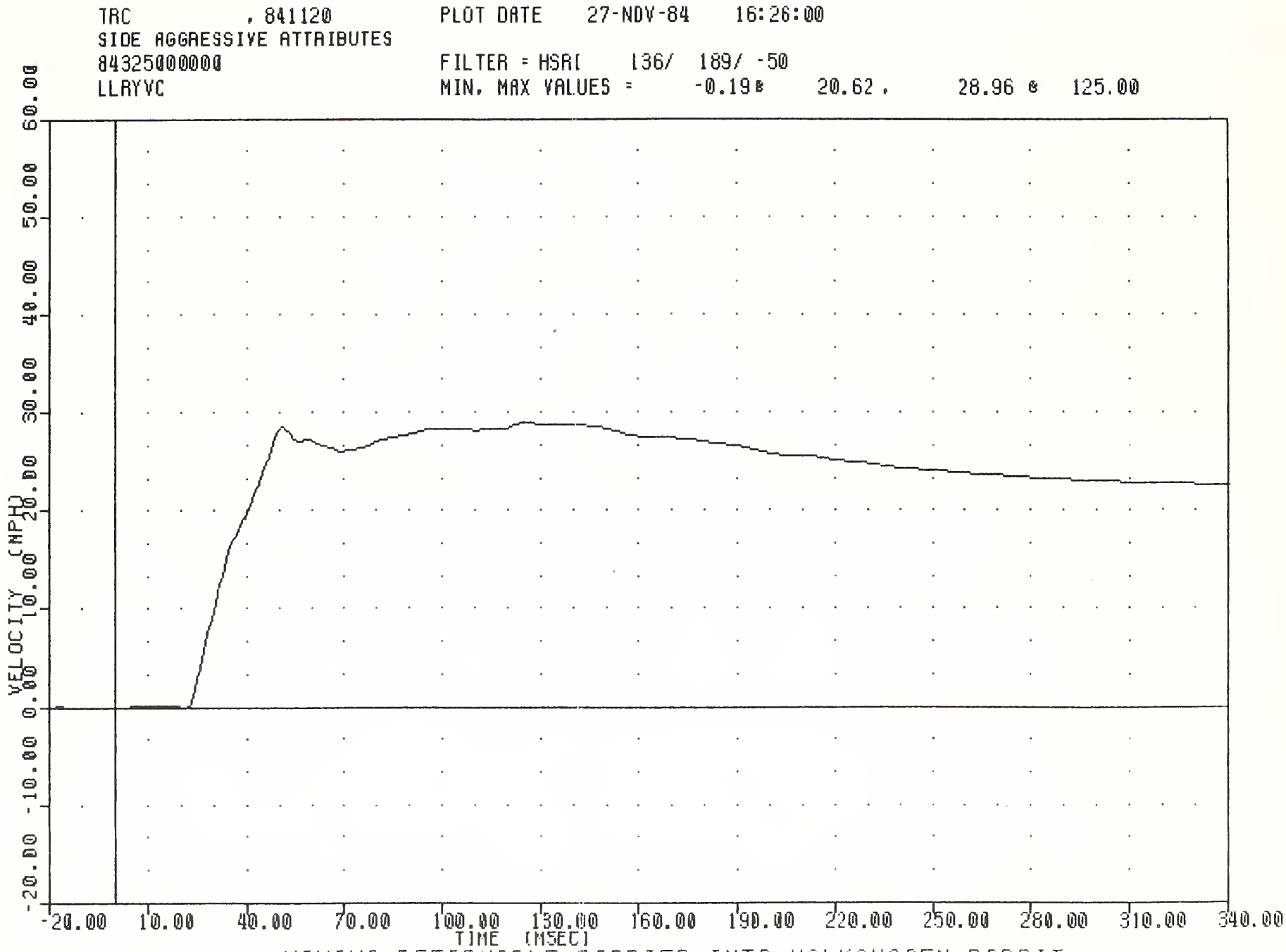
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT LOWER RIB ACCELERATION Y AXIS



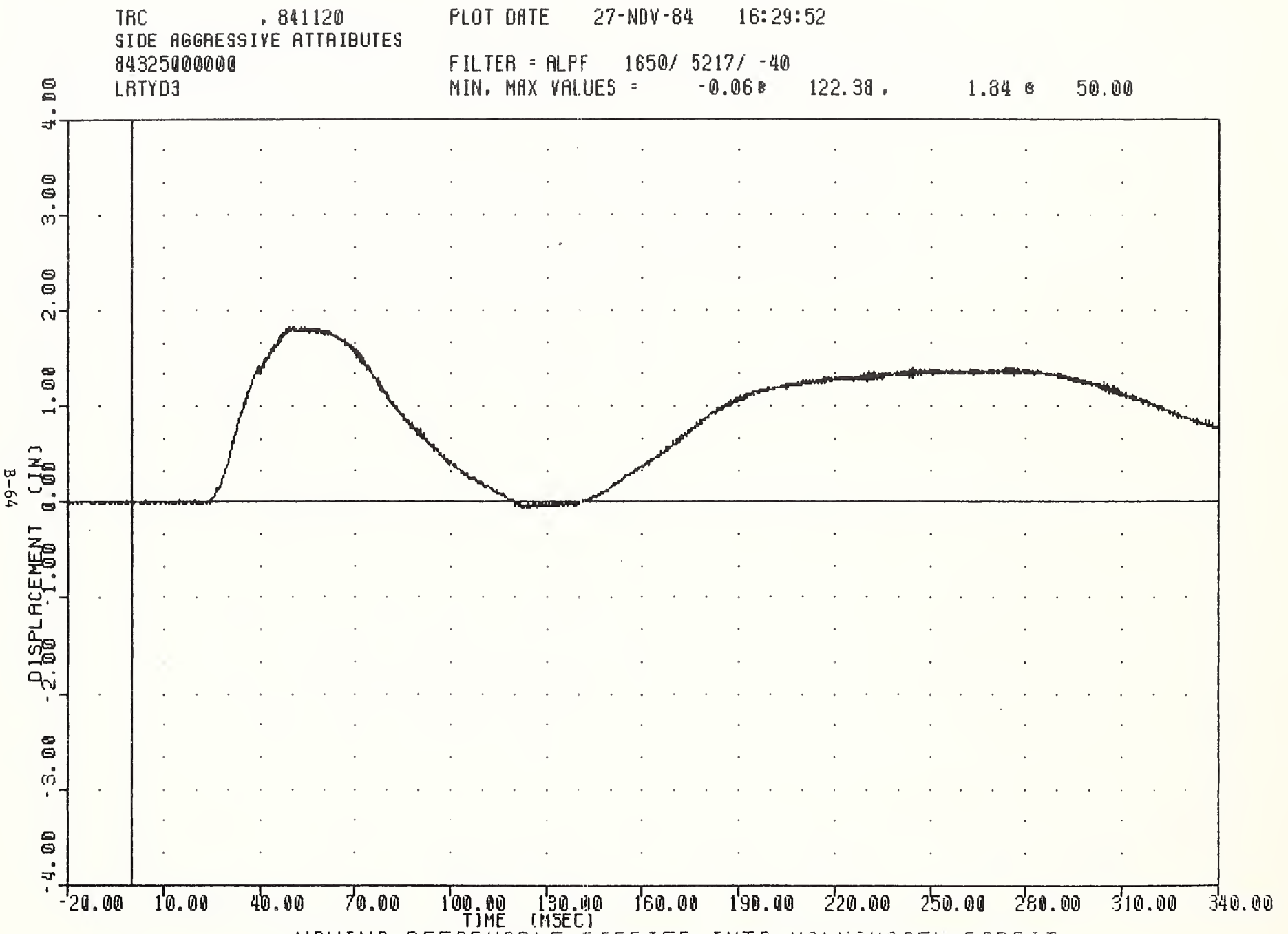
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLRYG3



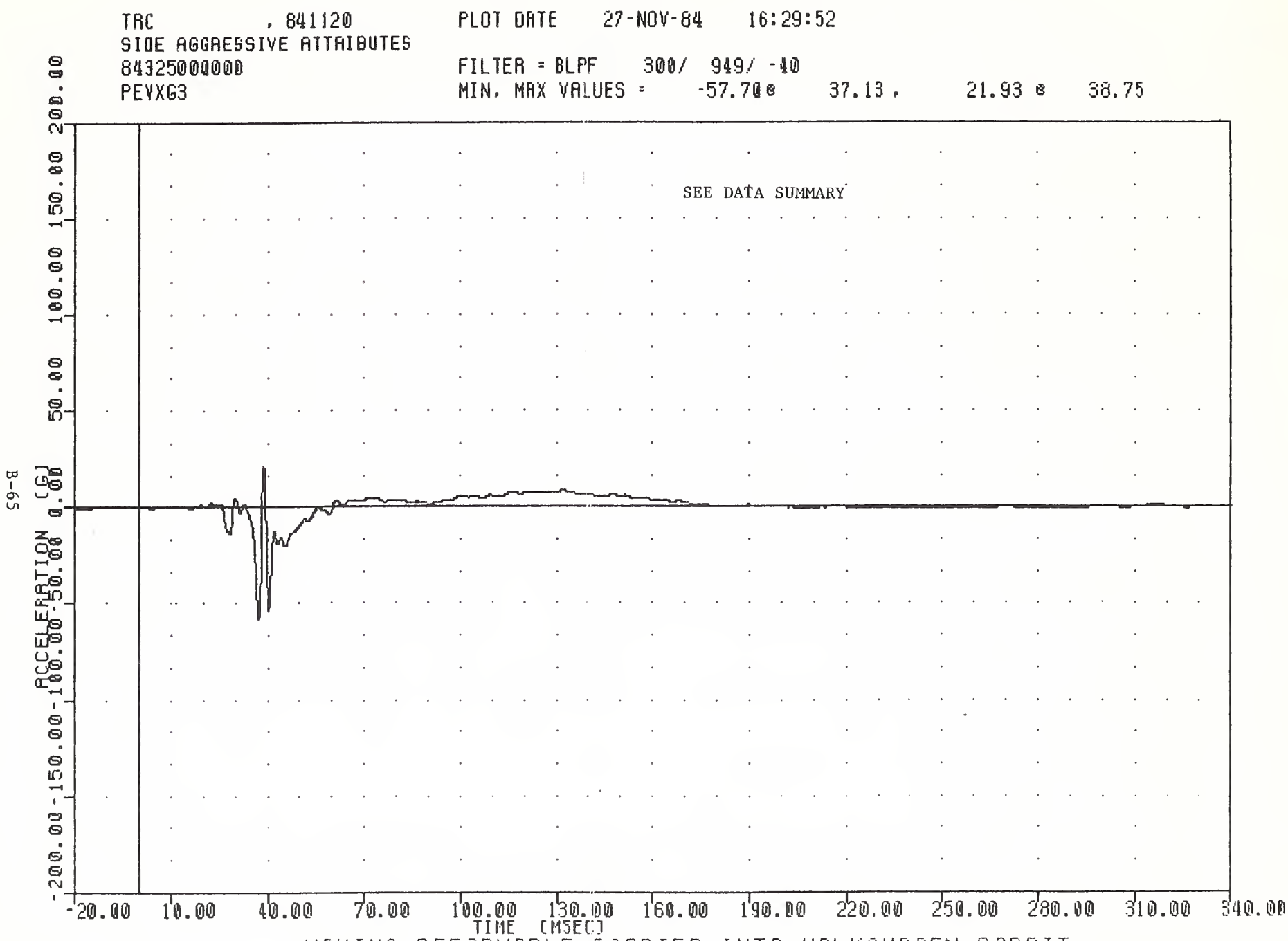
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT LOWER RIB ACCELERATION -2 Y AXIS



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLRYGC



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


TRC , 841120
PLOT DATE 27-NOV-84 16:29:52
SIDE AGGRESSIVE ATTRIBUTES
8432500Q000D
FILTER = BLPF 300/ 949/ -40
PEVXG3
MIN, MAX VALUES = -57.70 @ 37.13 , 21.93 @ 38.75
SEE DATA SUMMARY
ACCELERATION (G)
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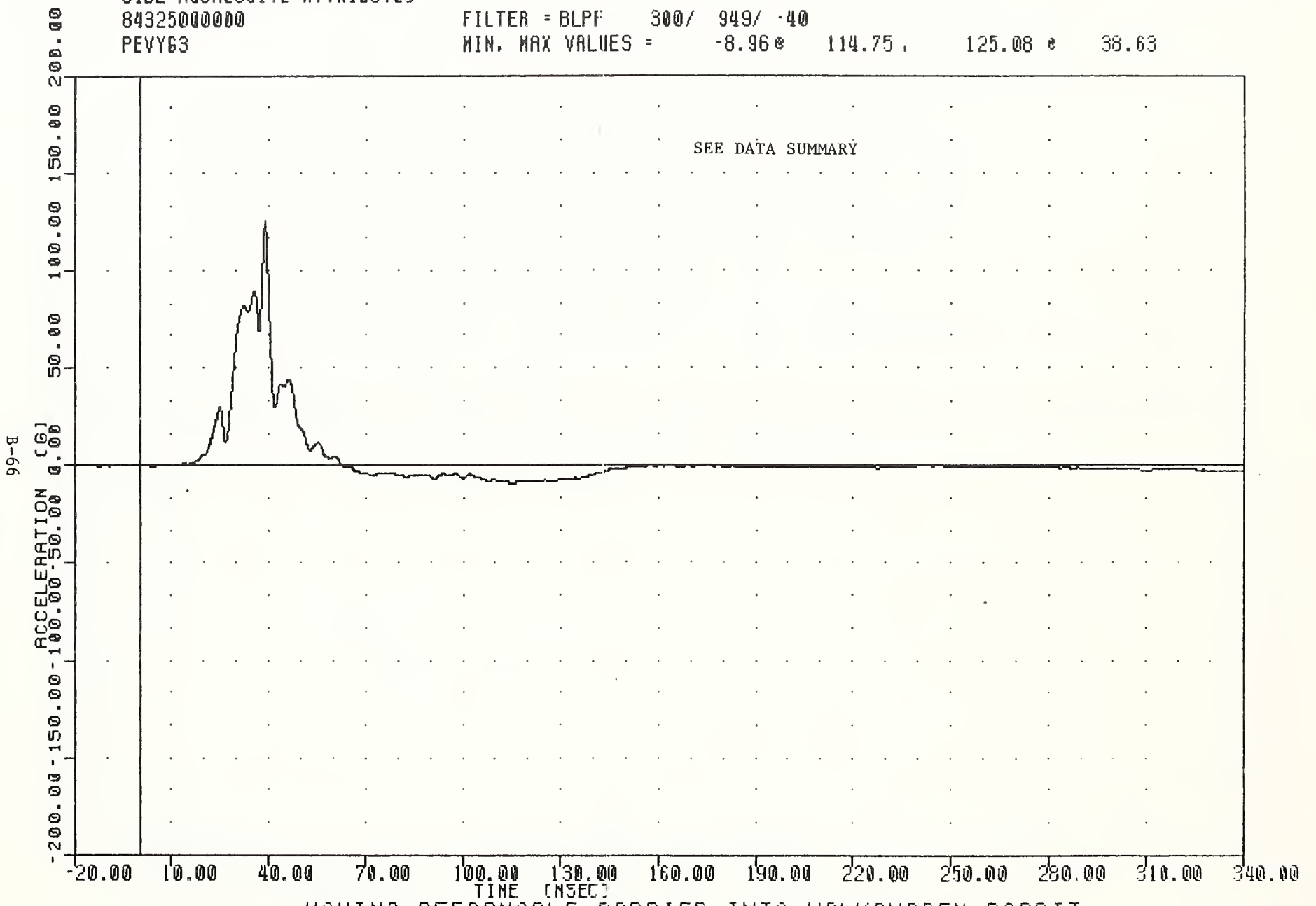
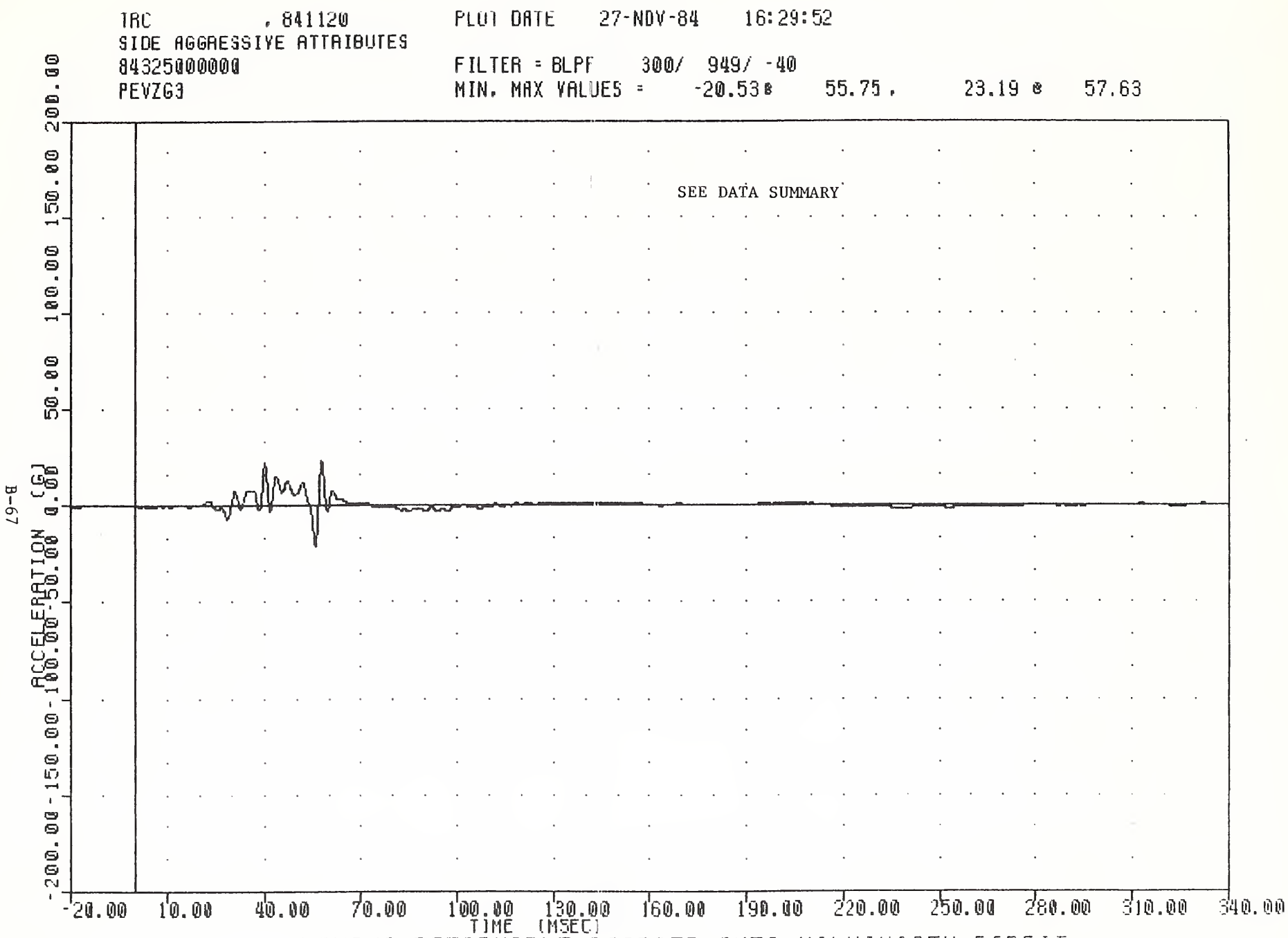
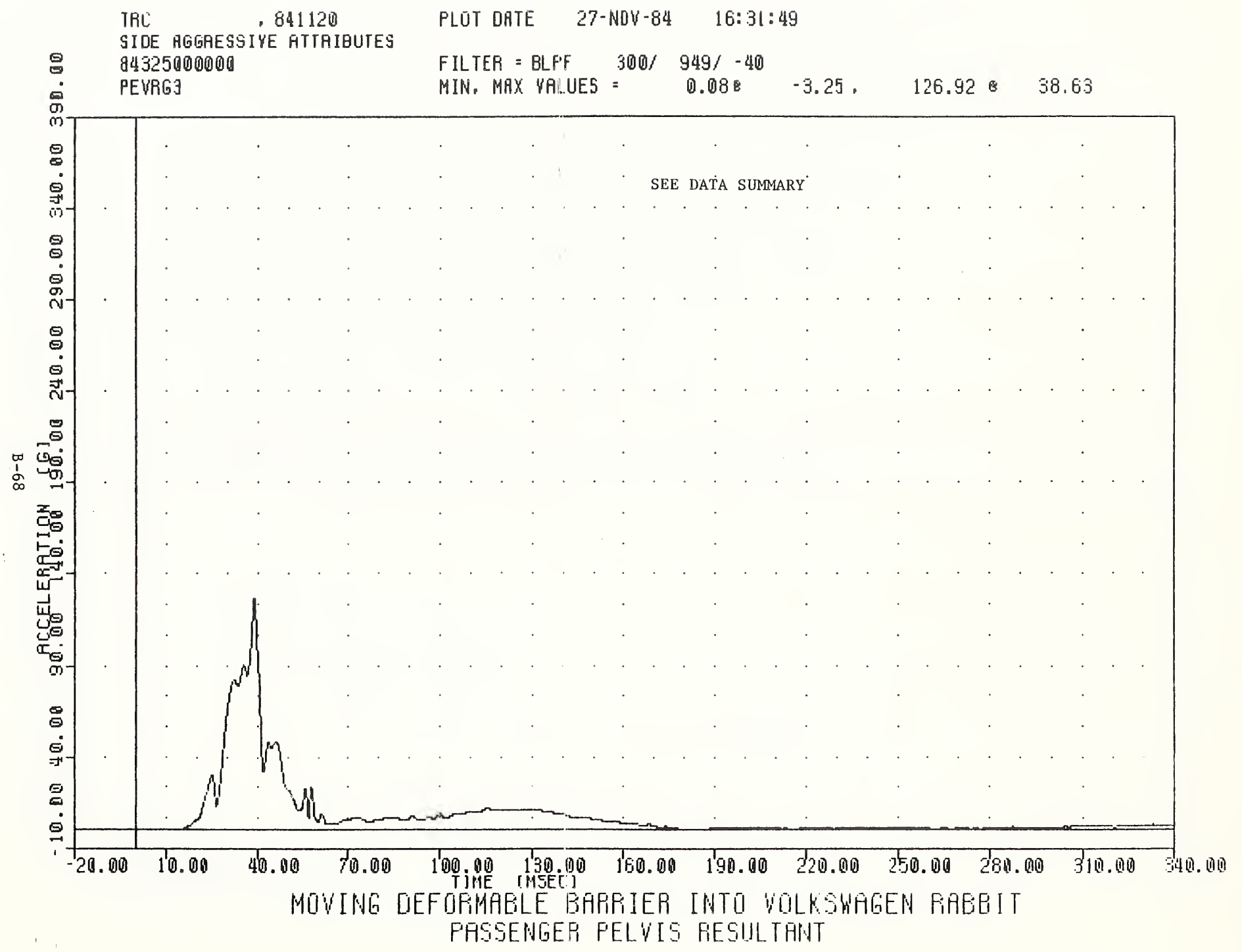
150.00
100.00
50.00
0.00
-50.00
-100.00
-150.00
-200.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS ACCELERATION X AXIS



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS ACCELERATION Y AXIS



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS ACCELERATION Z AXIS


TRC , 841120
PLOT DATE 27-NOV-84 16:31:49
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SEE DATA SUMMARY
ACCELERATION (G)
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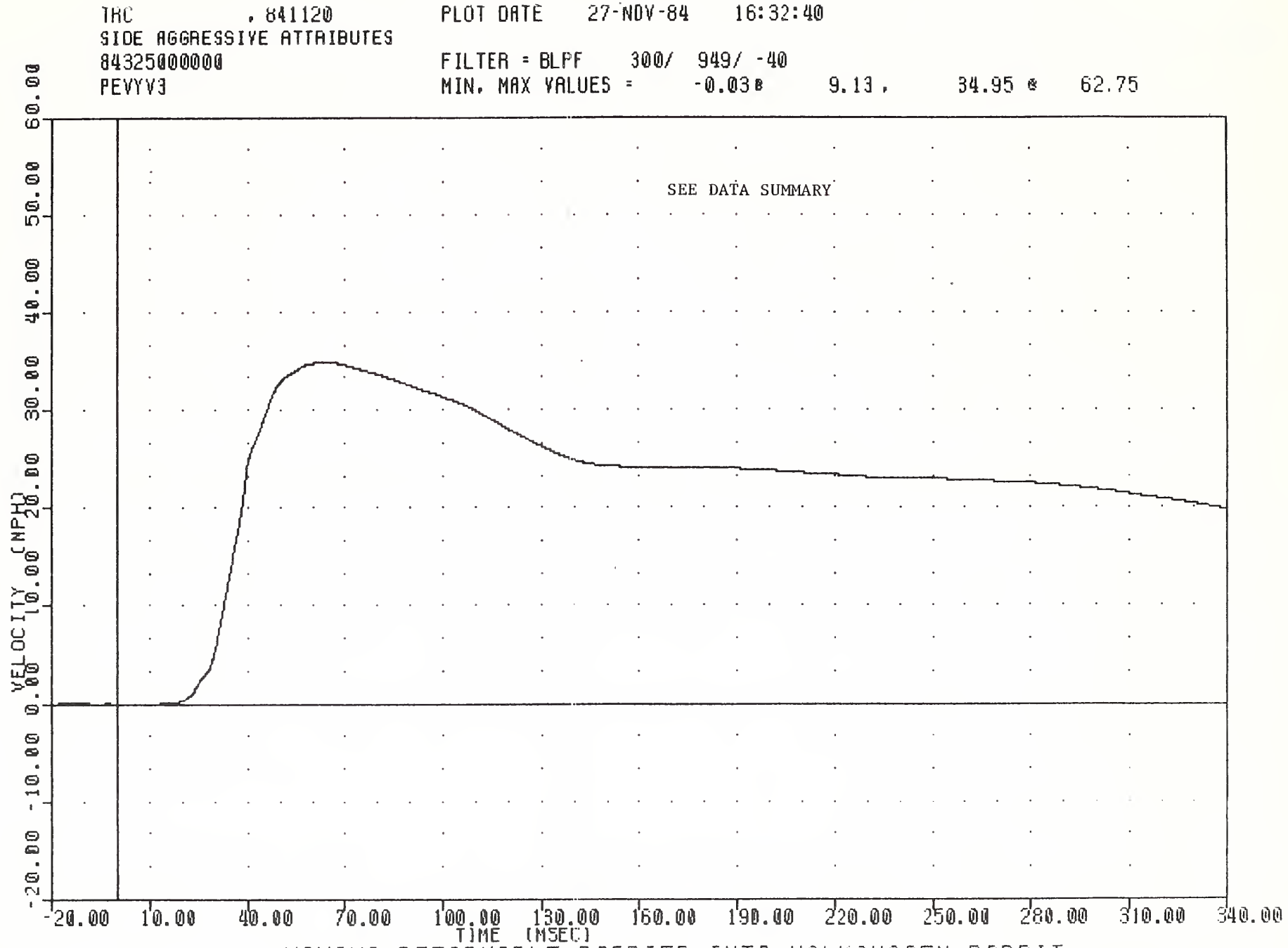
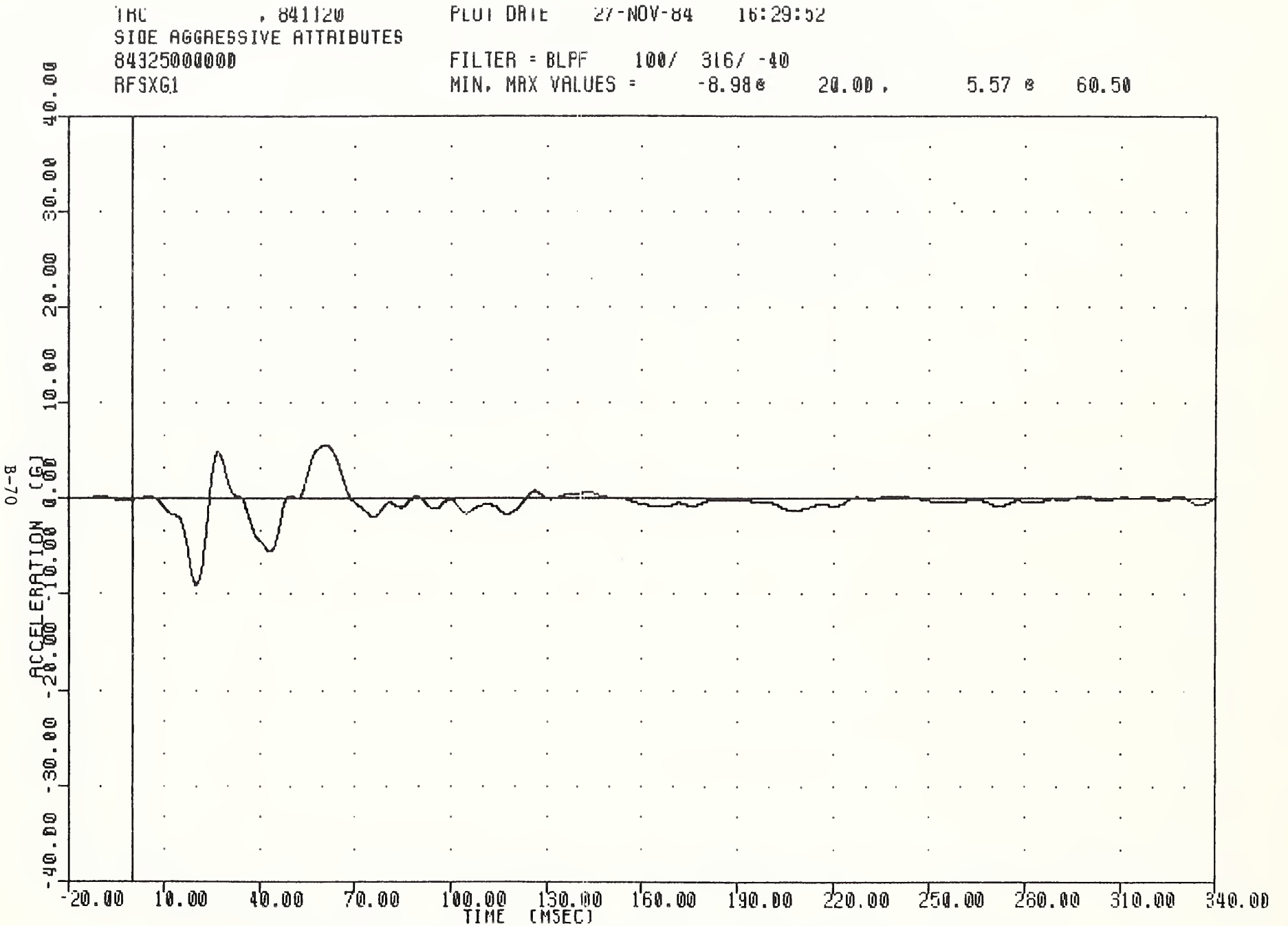
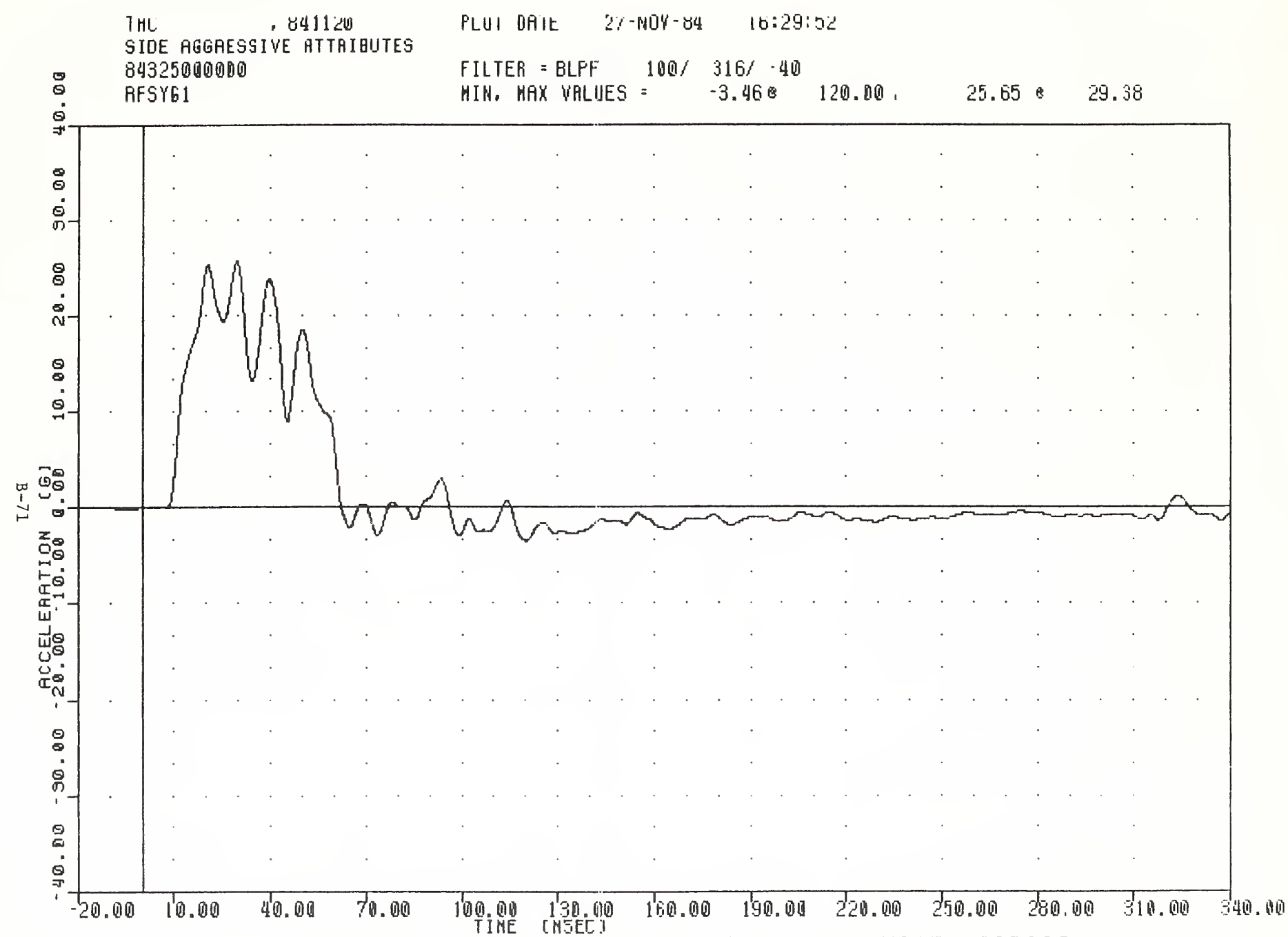
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER PELVIS RESULTANT



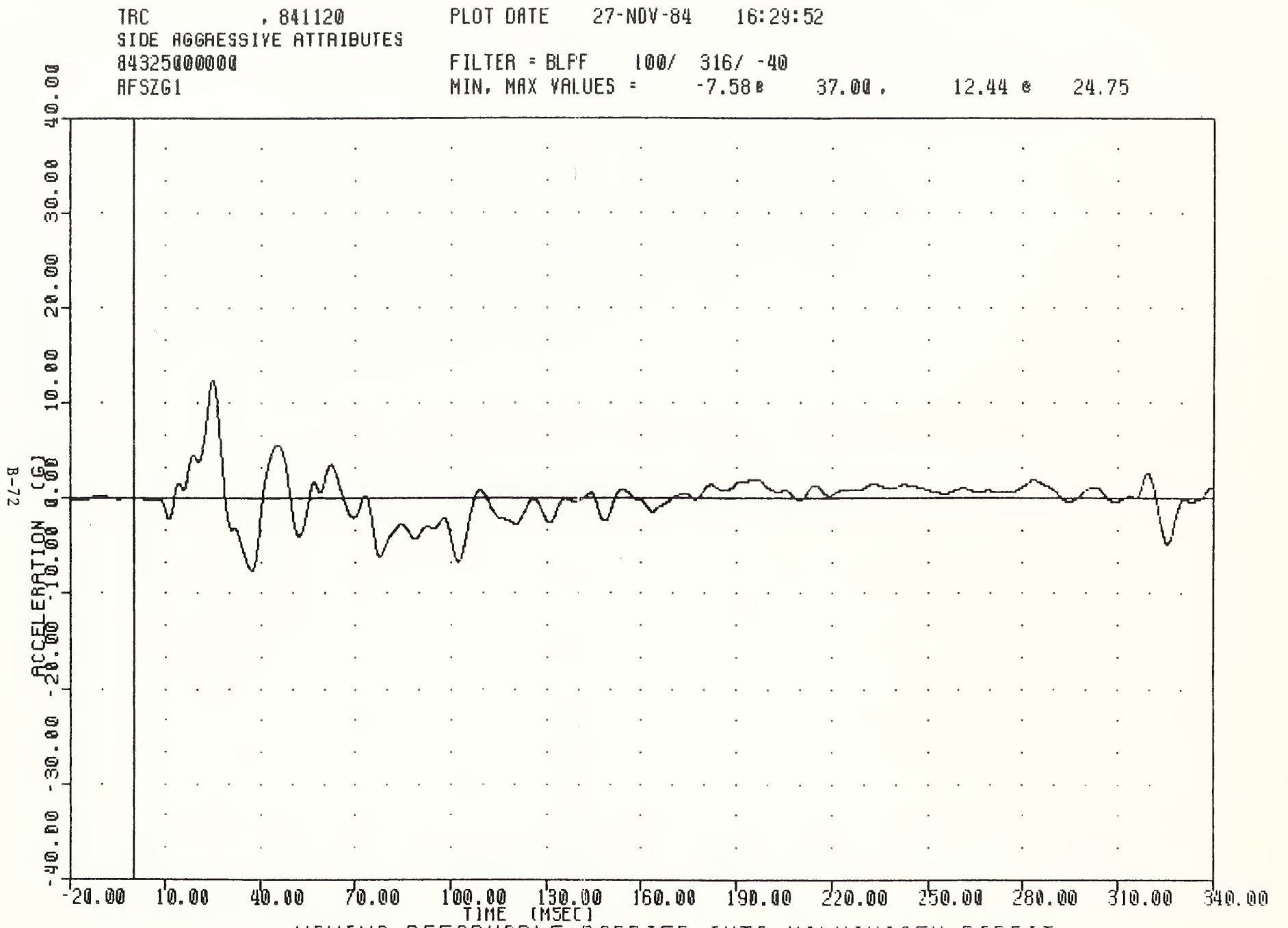
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING PEVYG3



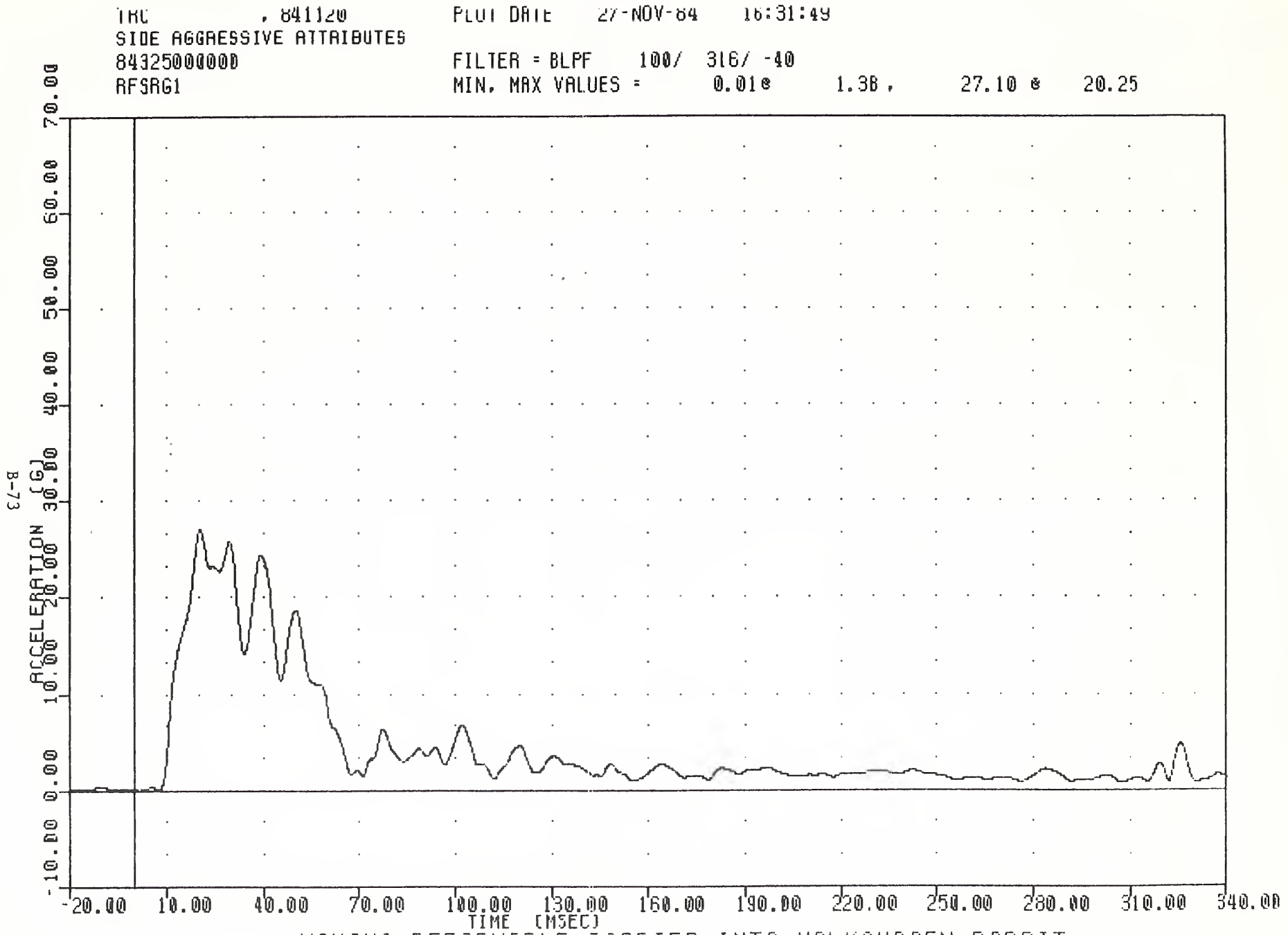
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL ACCELERATION X AXIS



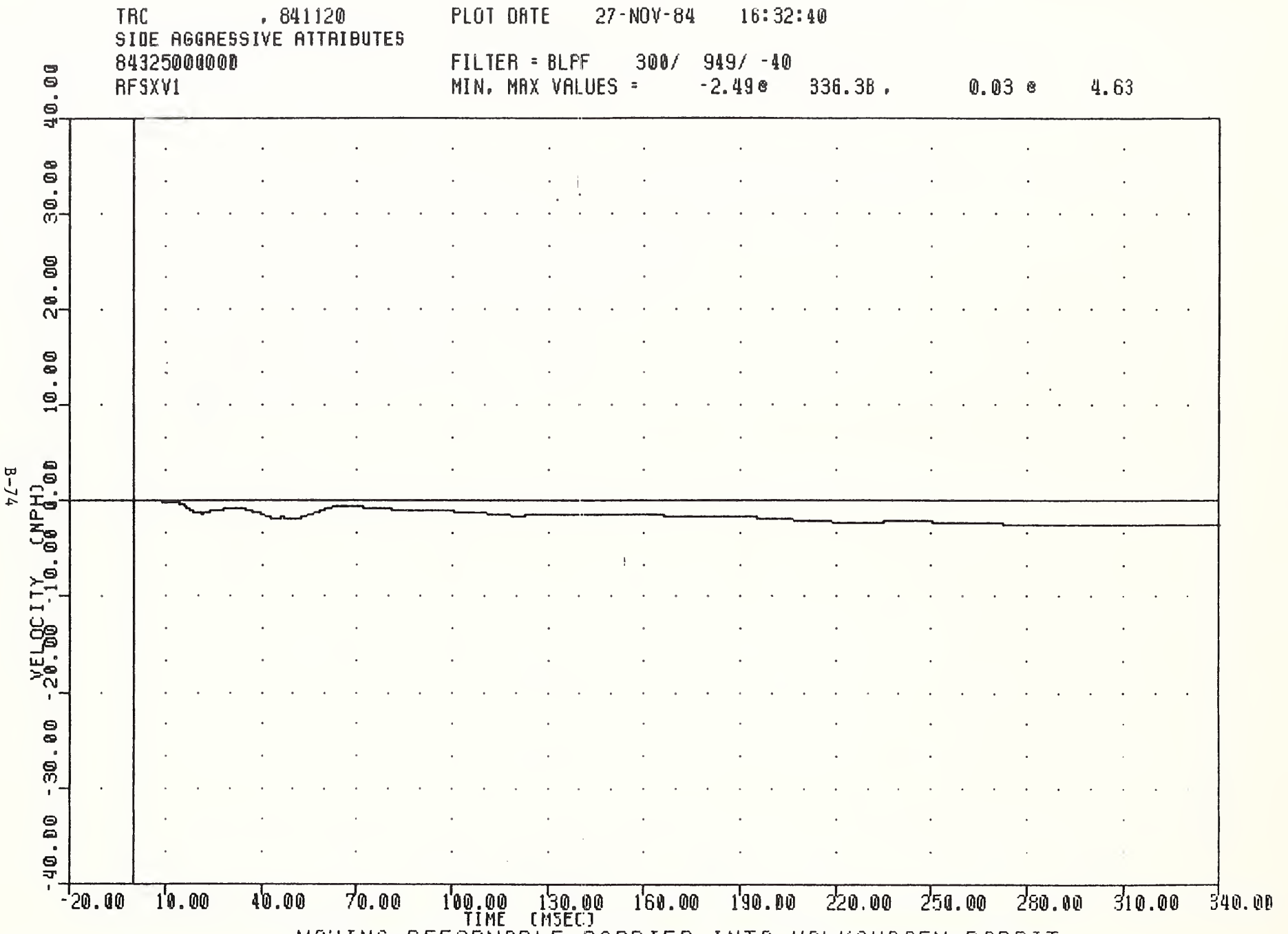
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL ACCELERATION Y AXIS



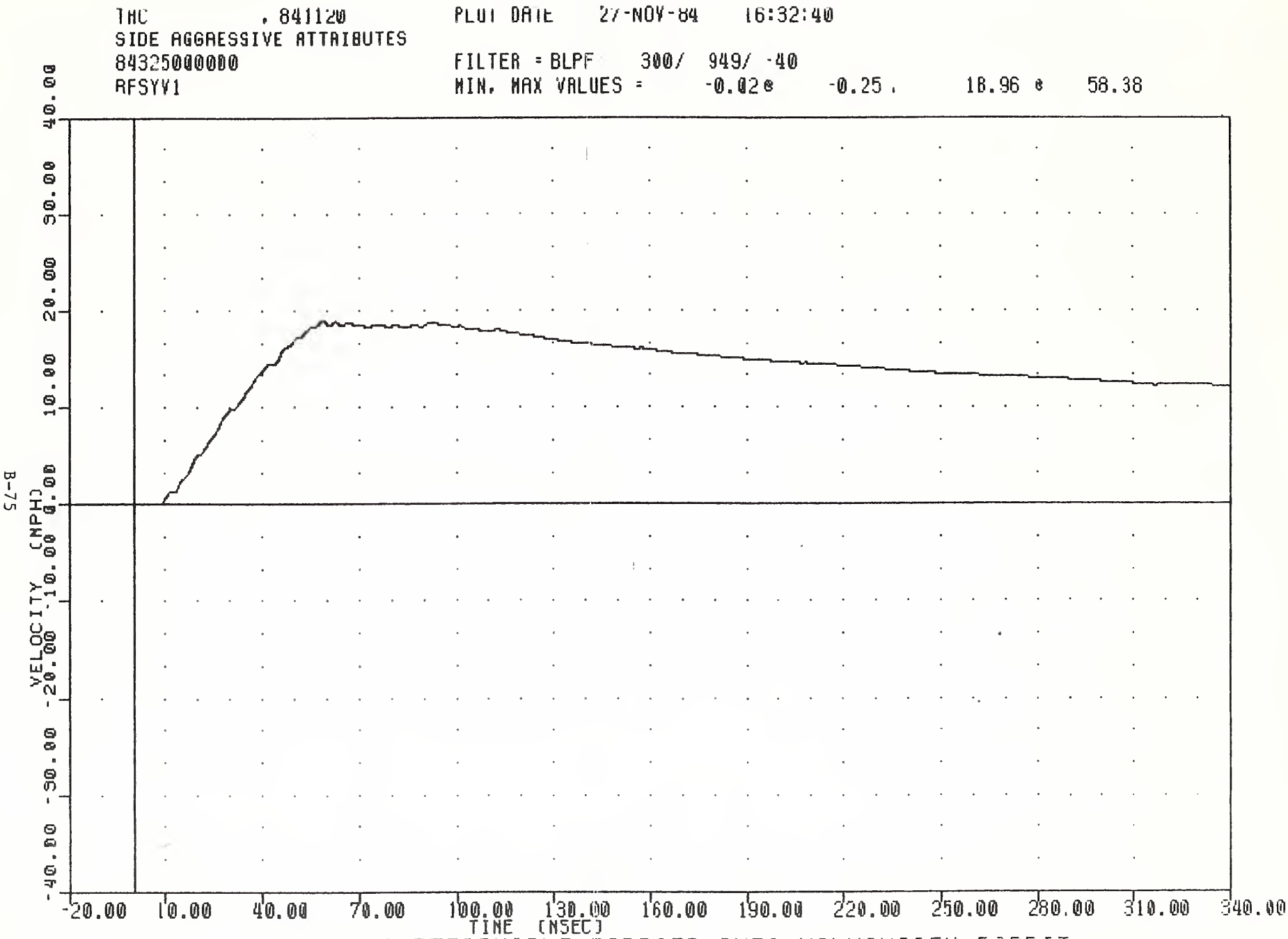
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL ACCELERATION Z AXIS



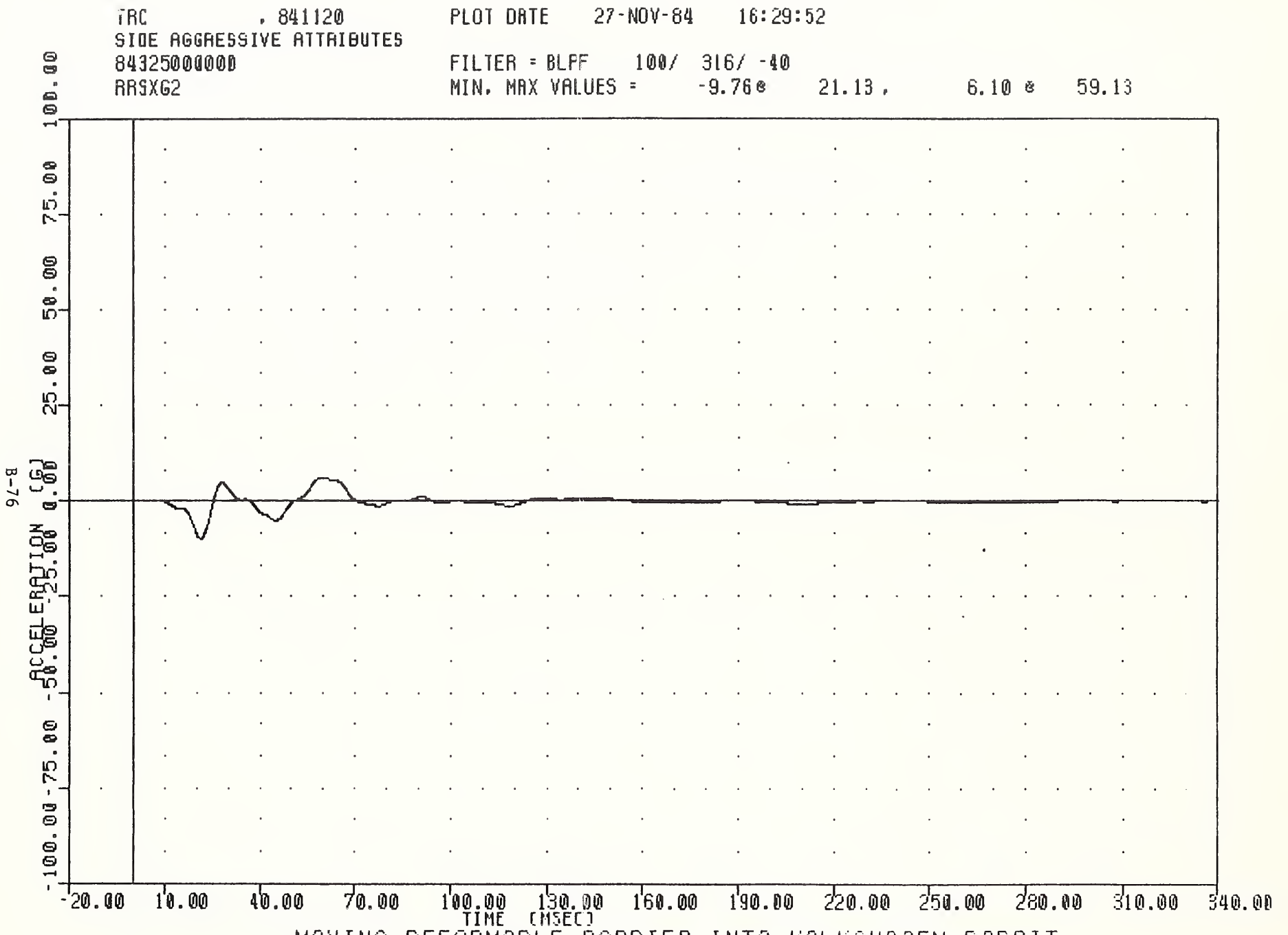
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL RESULTANT



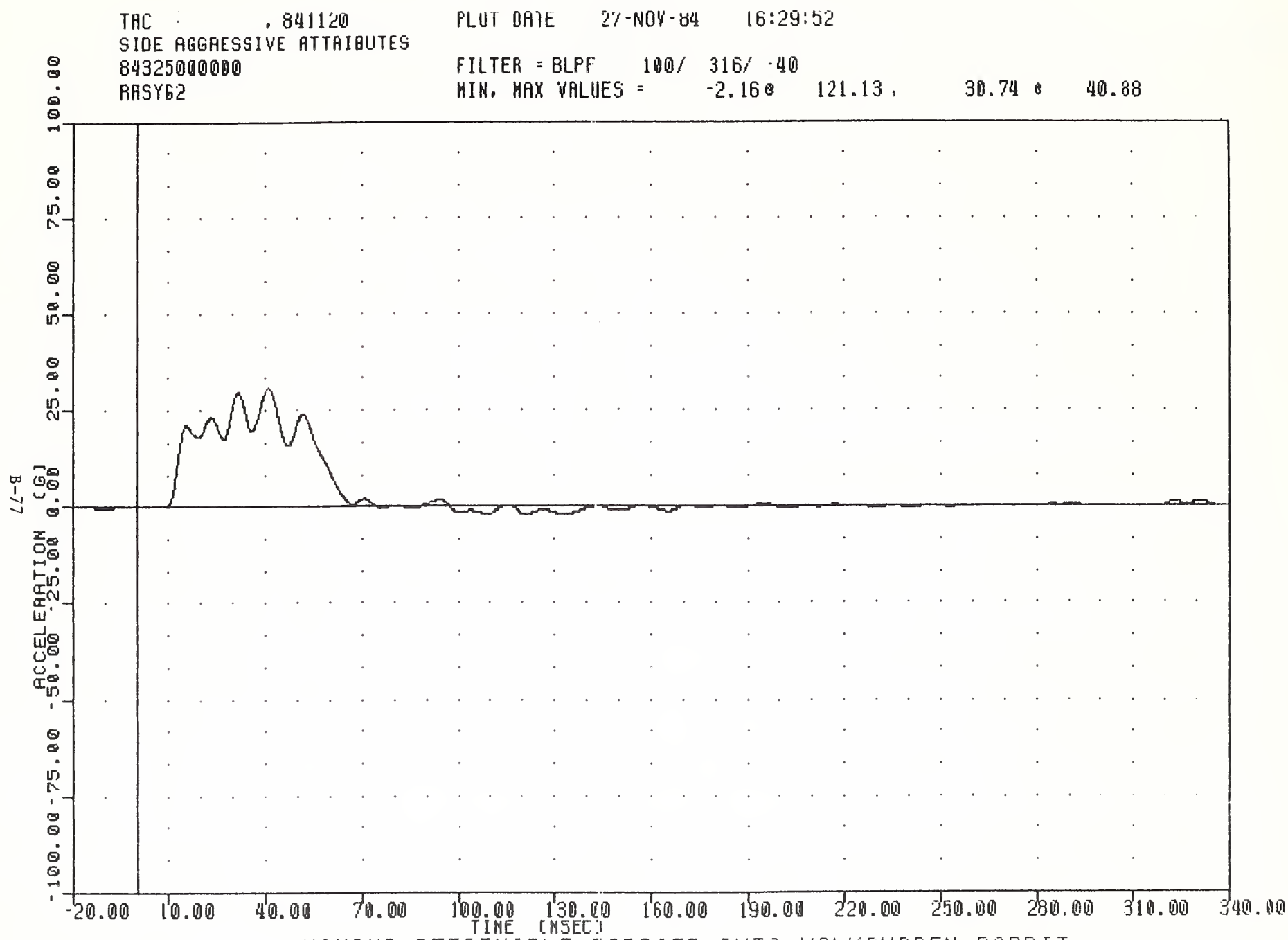
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RFSXG1



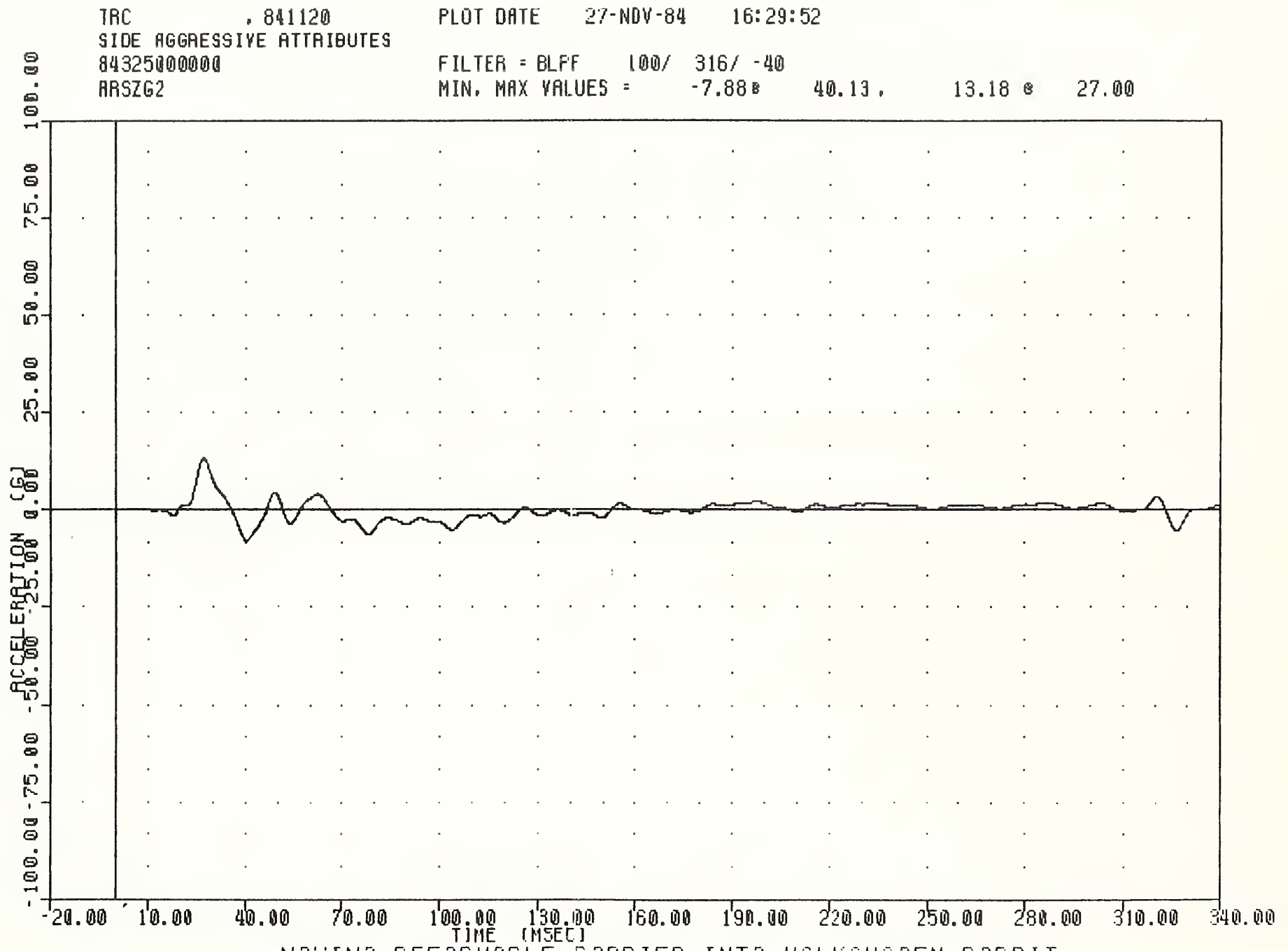
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RFSYG1



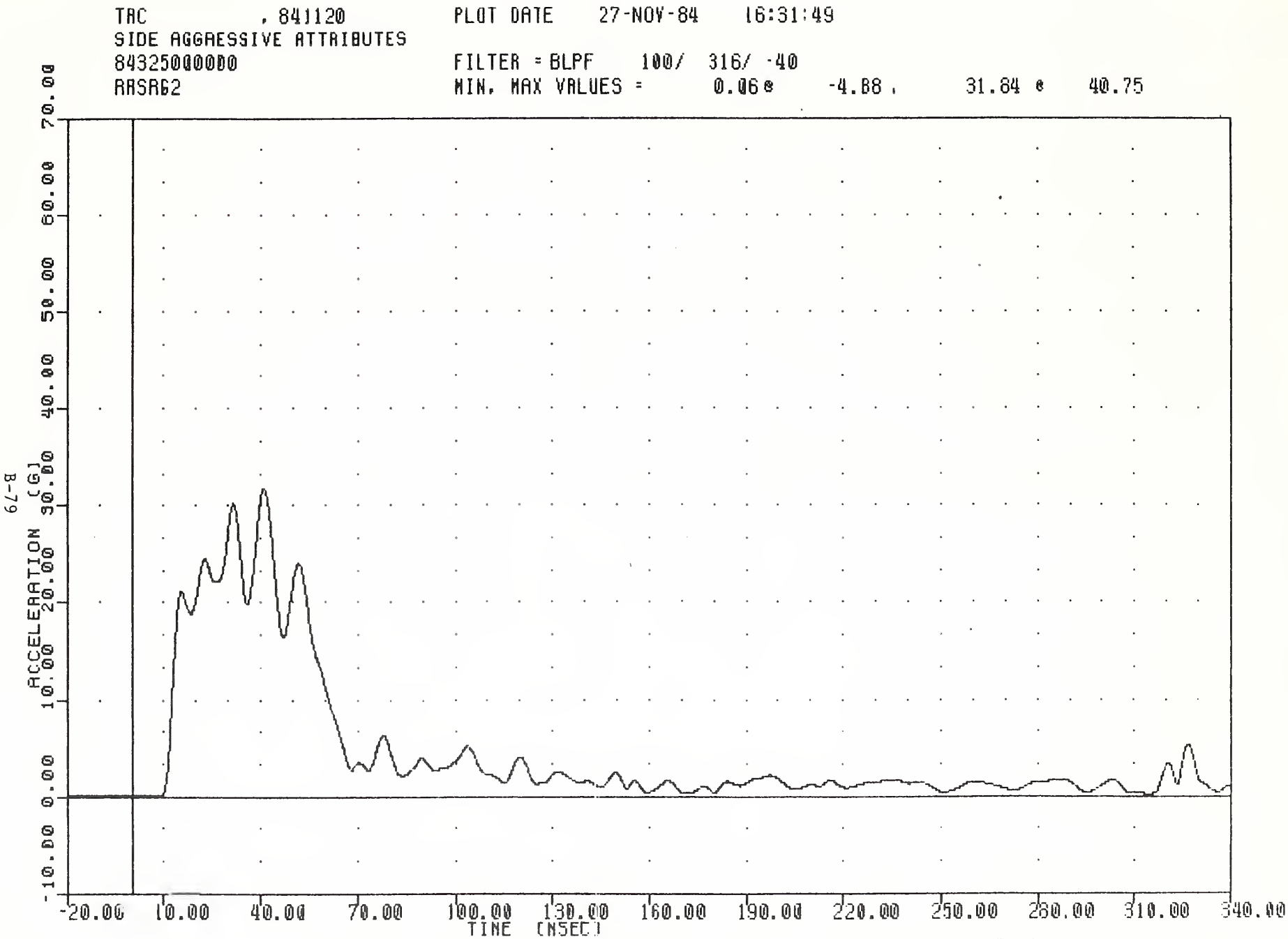
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION X AXIS



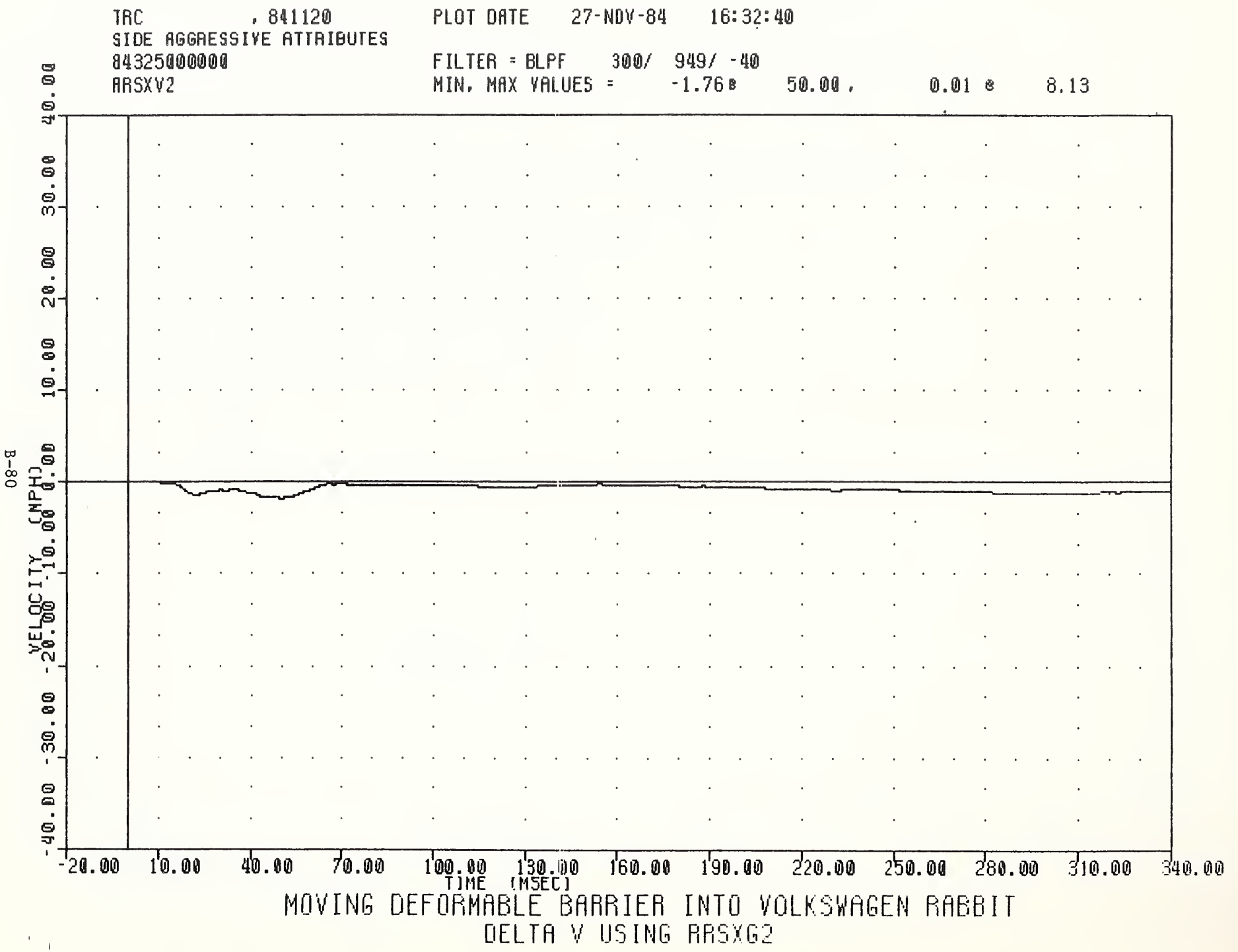
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION Y AXIS



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



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL RESULTANT


TRC , 841120
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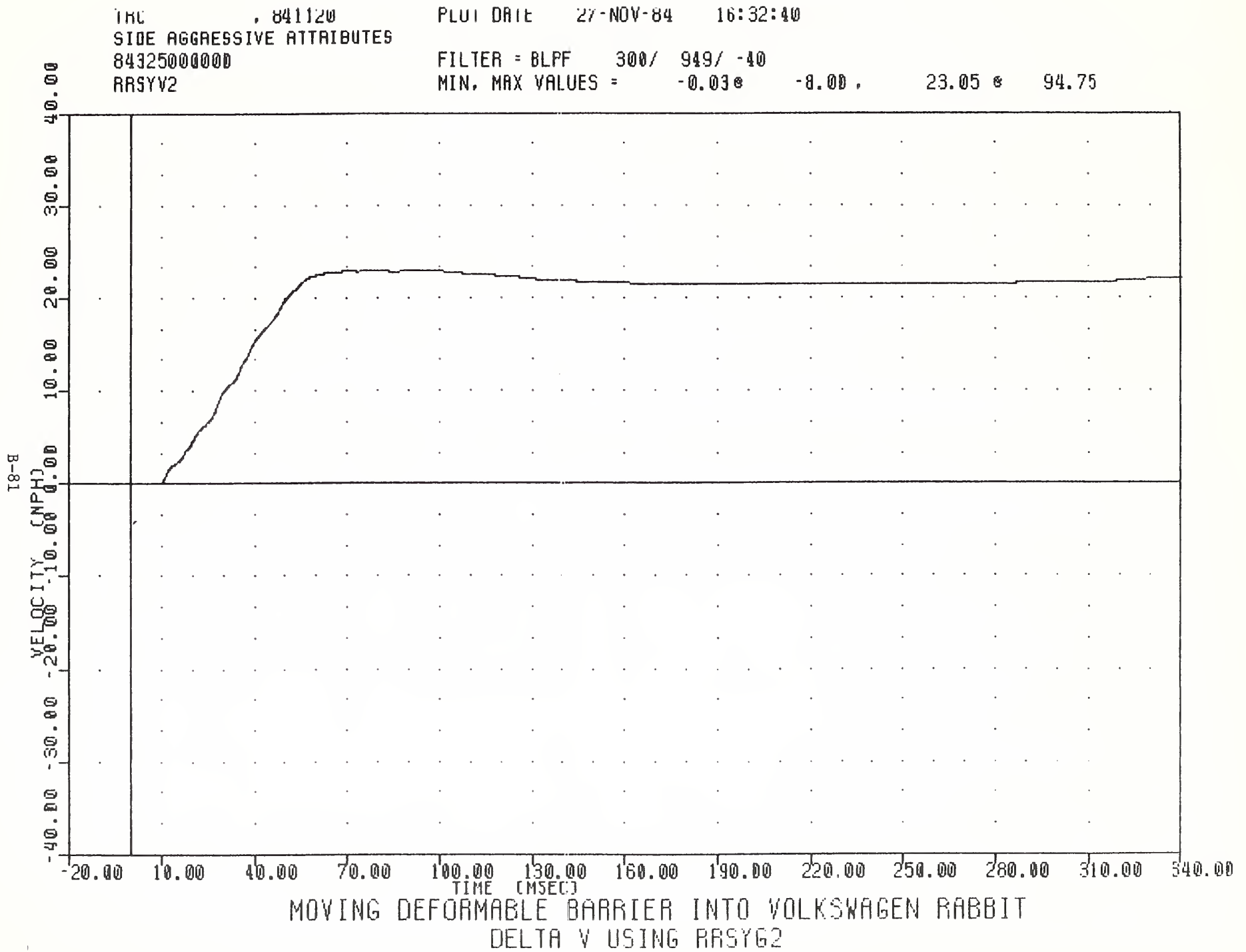
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
-40.00
VELOCITY (MPH)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING ARSXG2



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RRSYG2

TRC , 841120 PLOT DATE 27-NOV-84 16:29:52
SIDE AGGRESSIVE ATTRIBUTES
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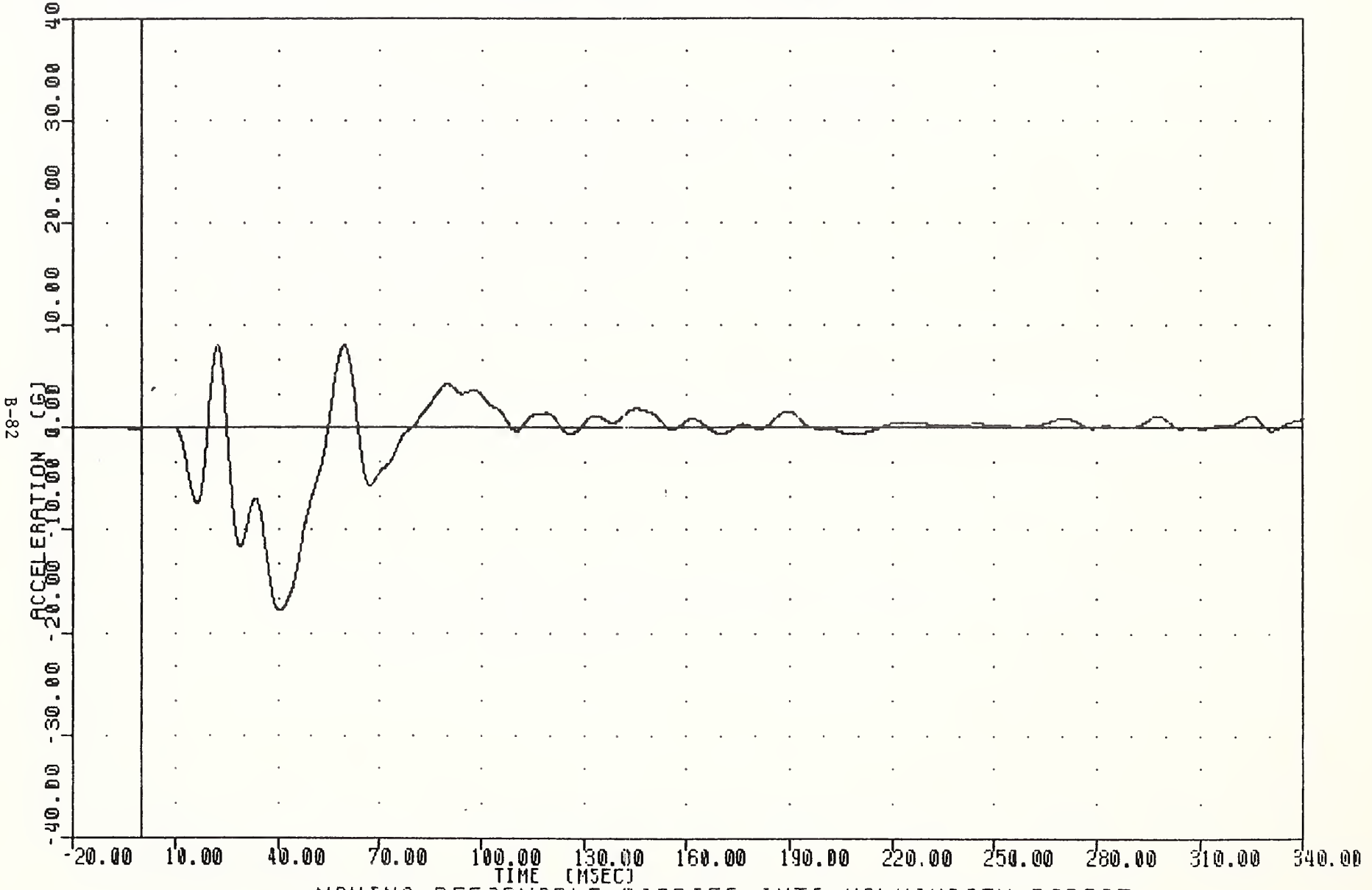
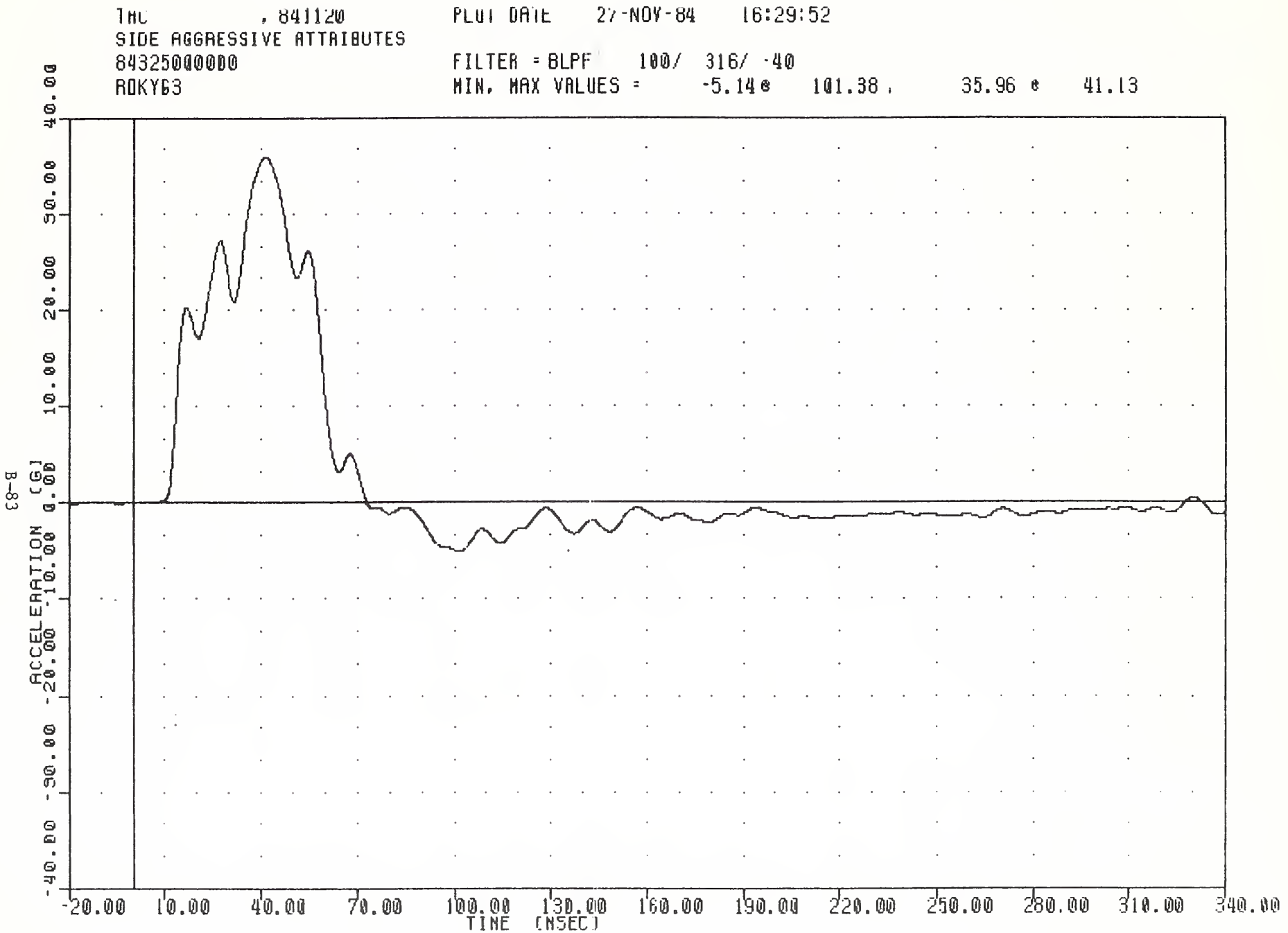
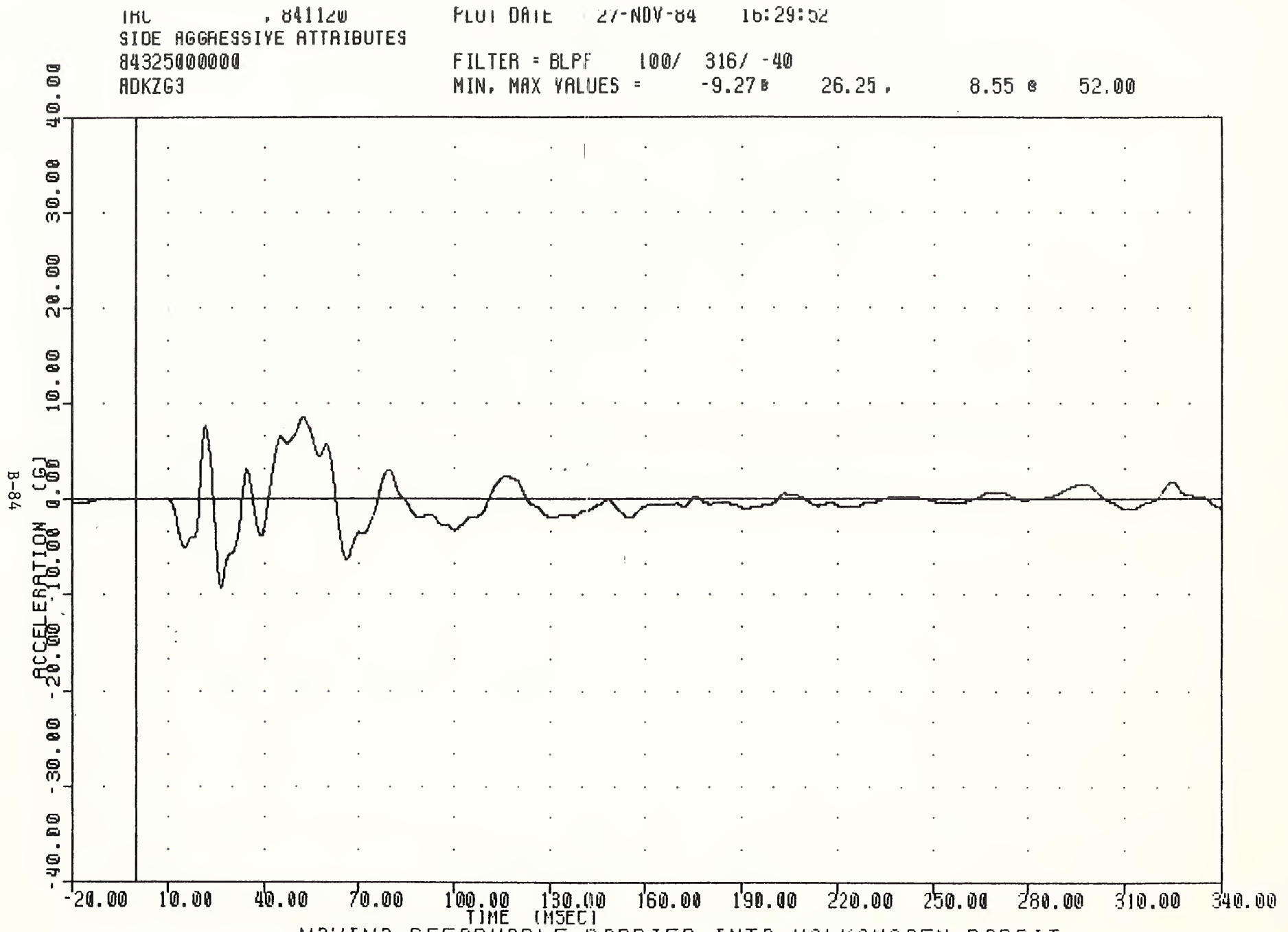


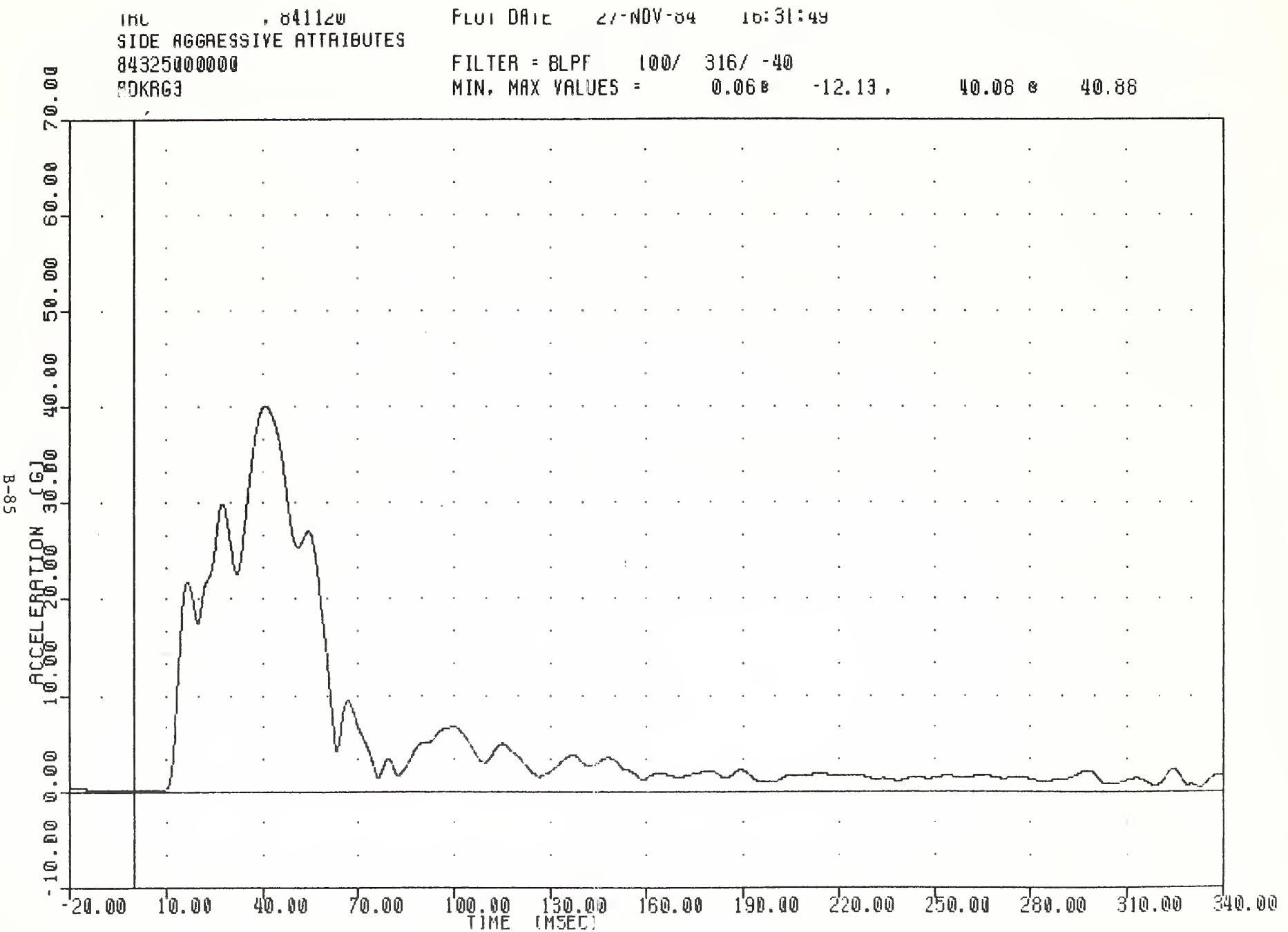
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION X AXIS



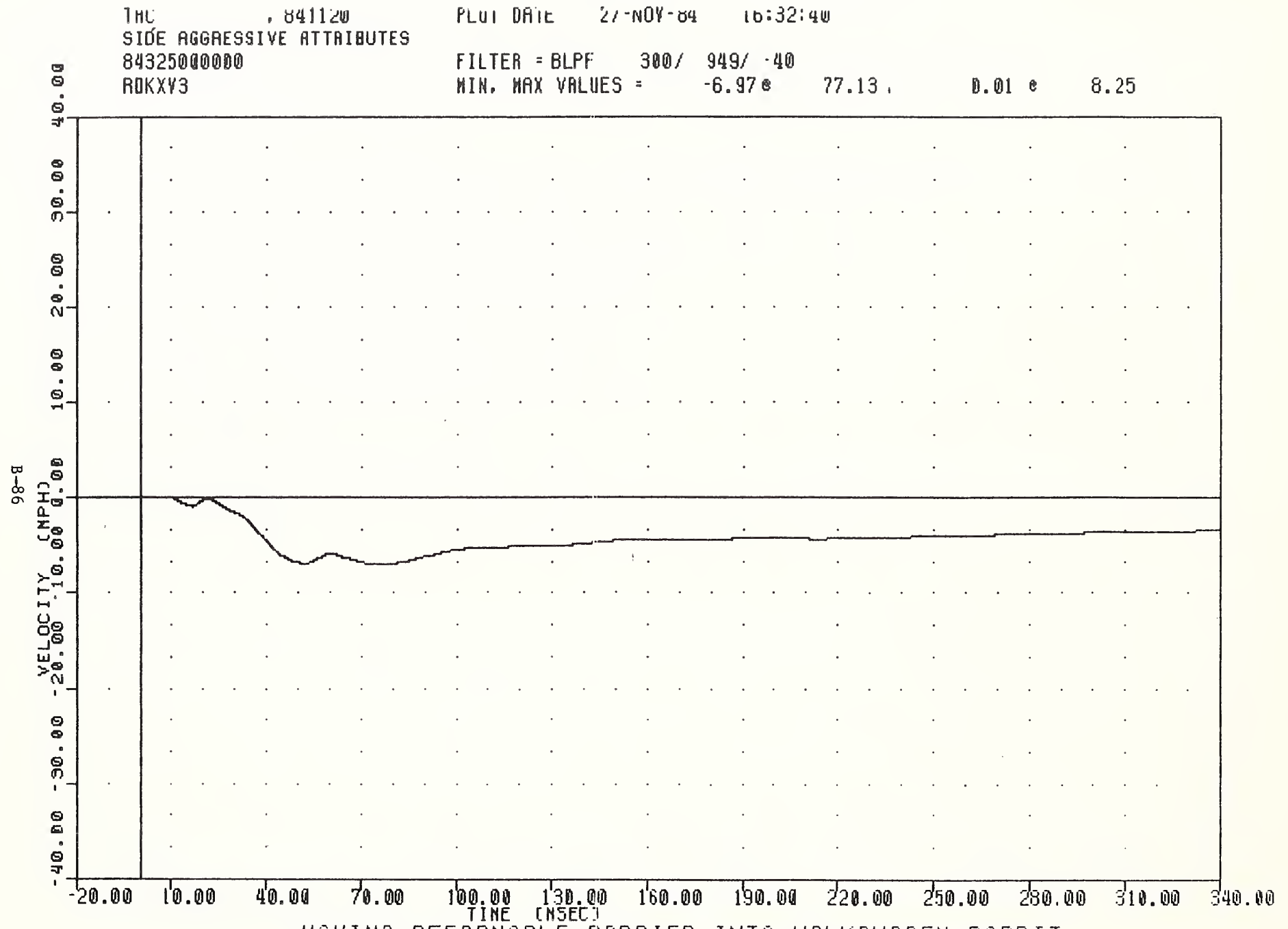
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION Y AXIS



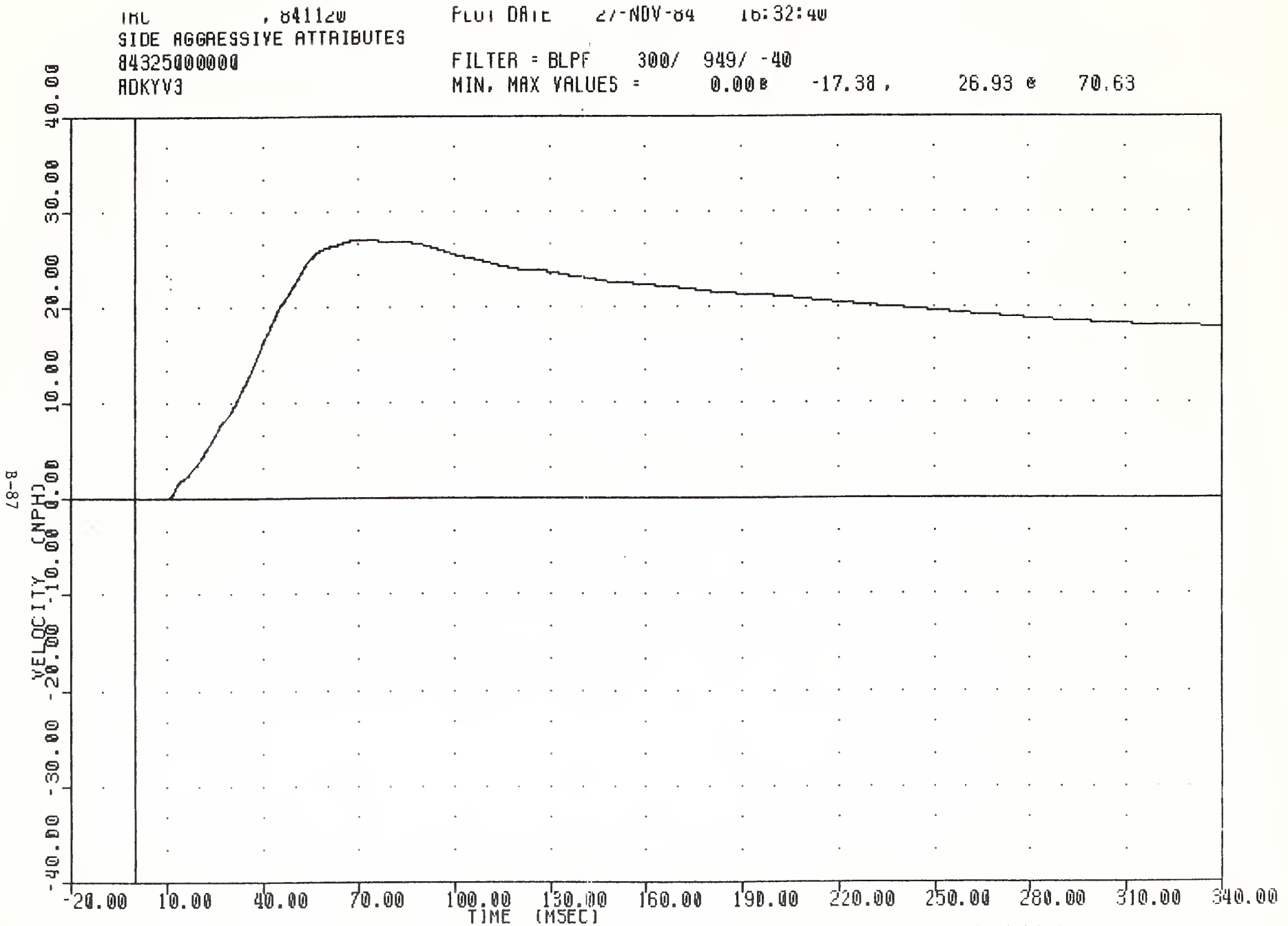
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION Z AXIS



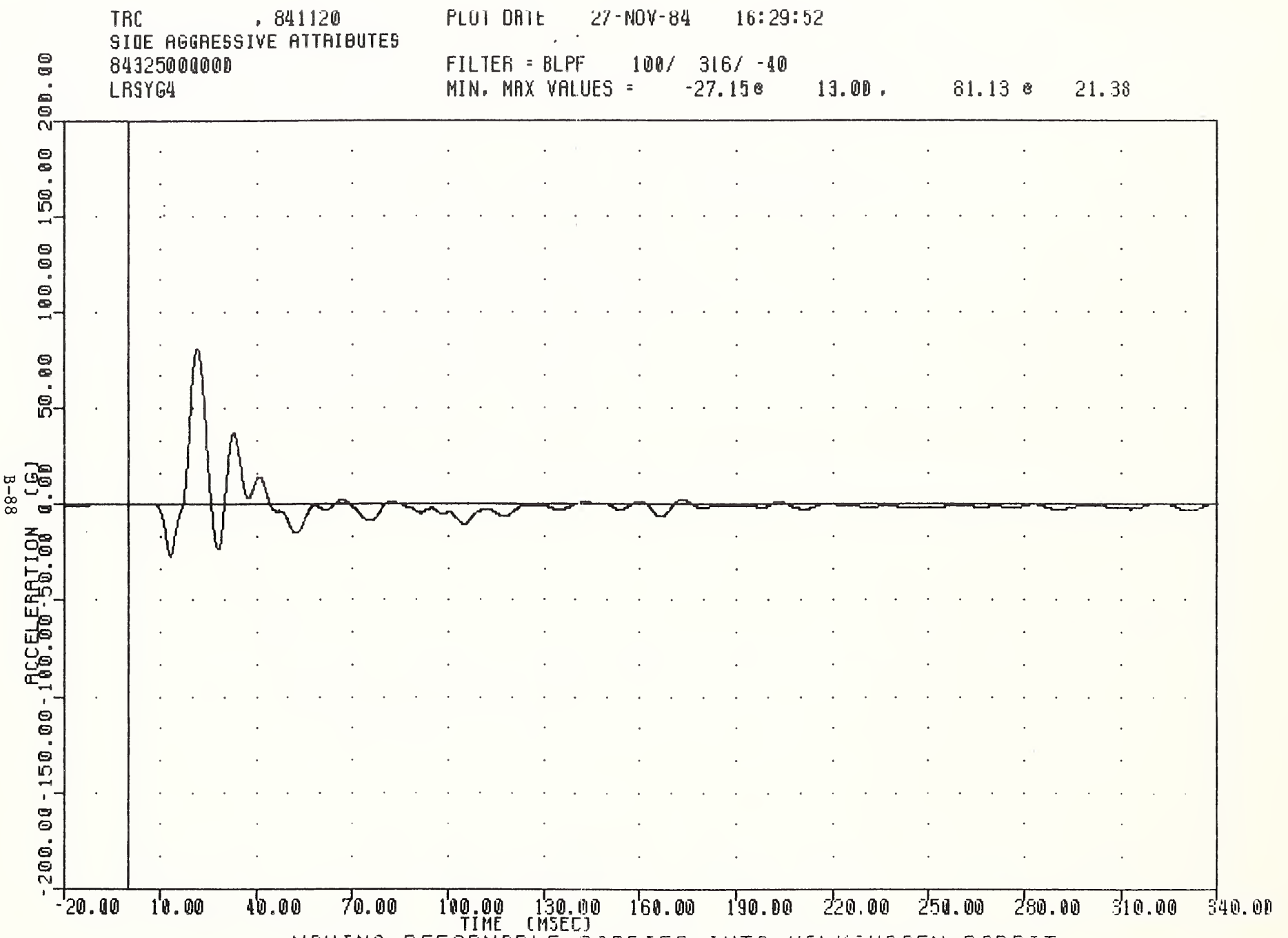
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK RESULTANT



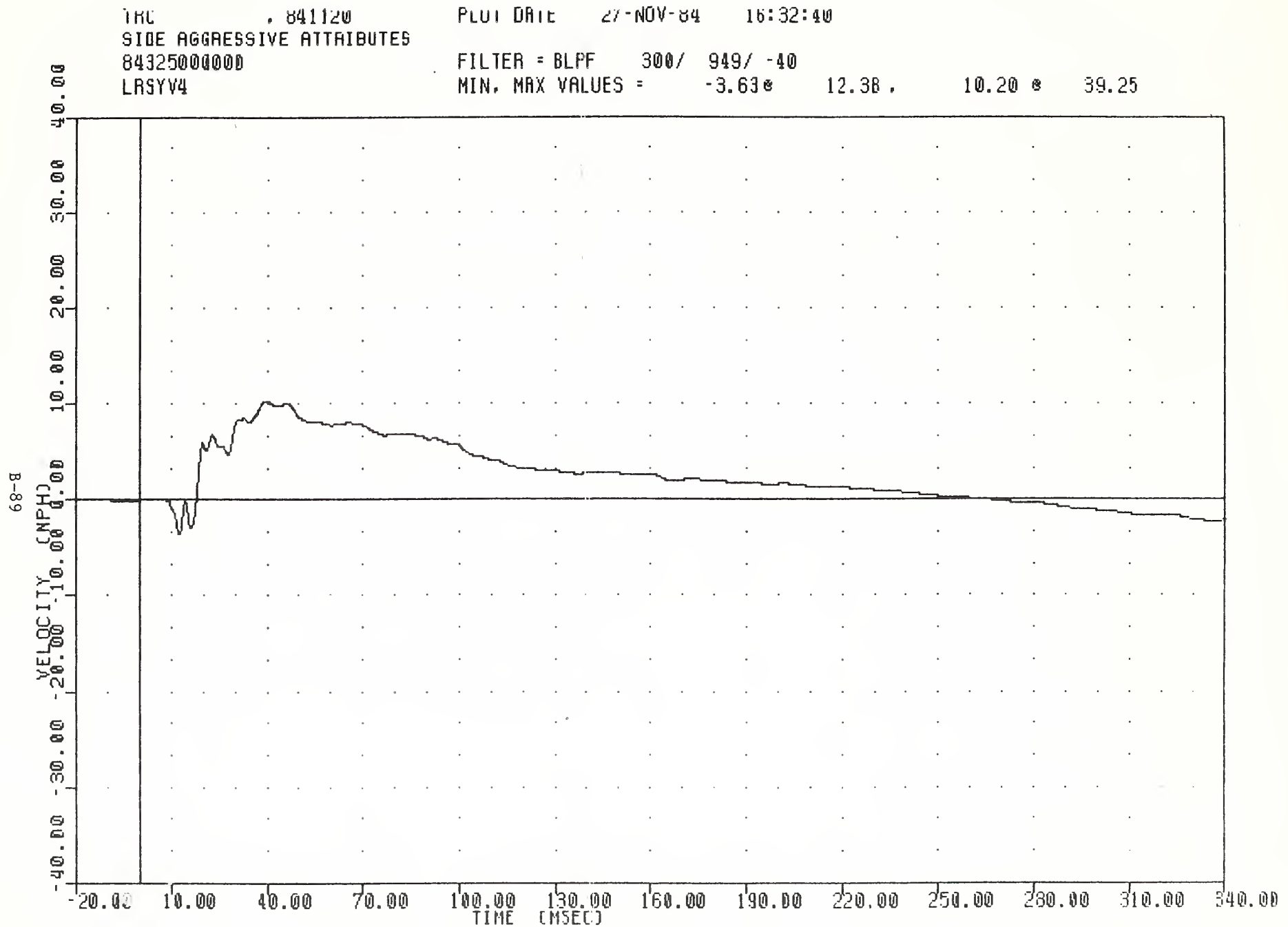
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING ROKXG3



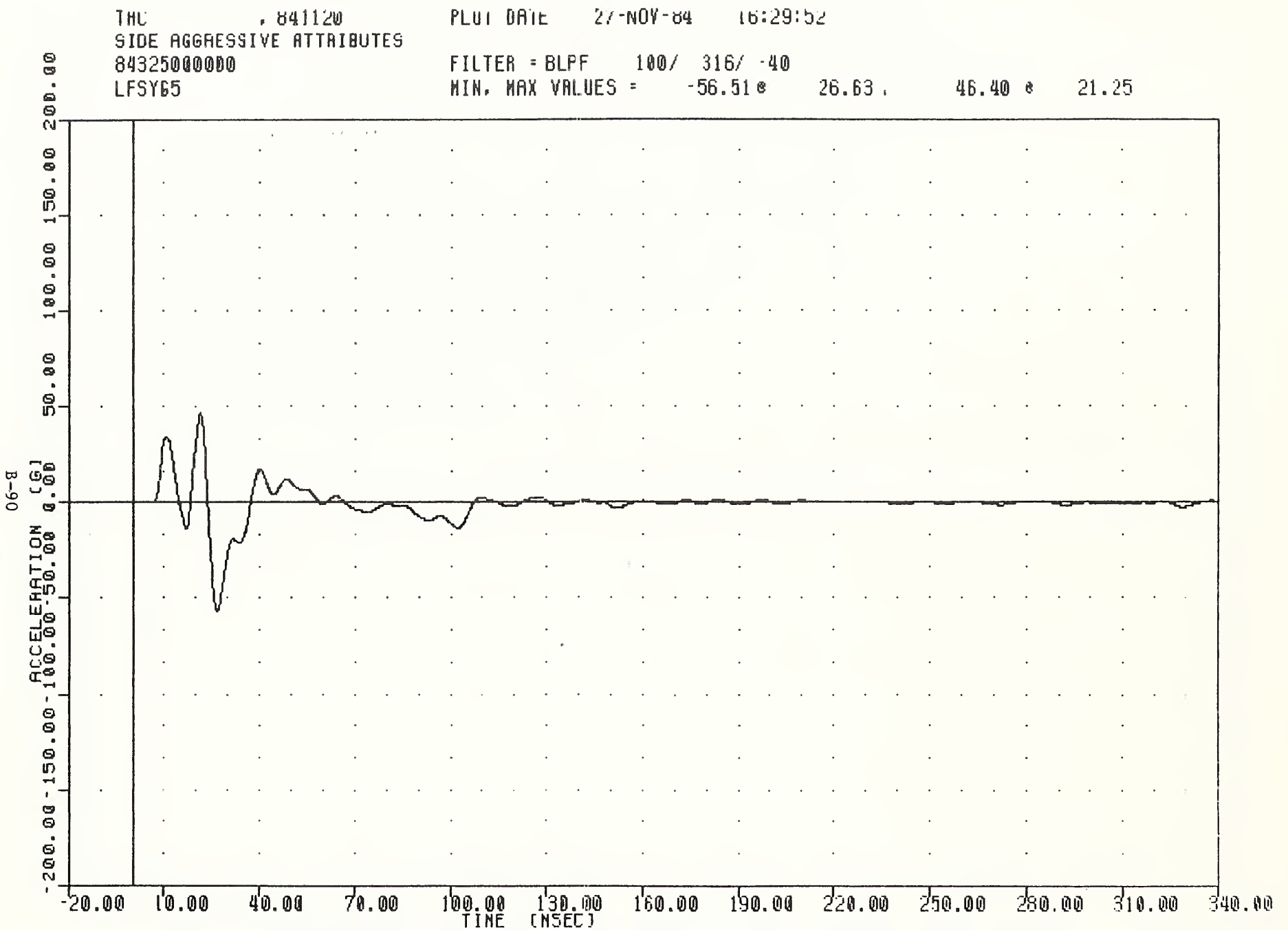
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RDKYG3



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



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LRSYG4



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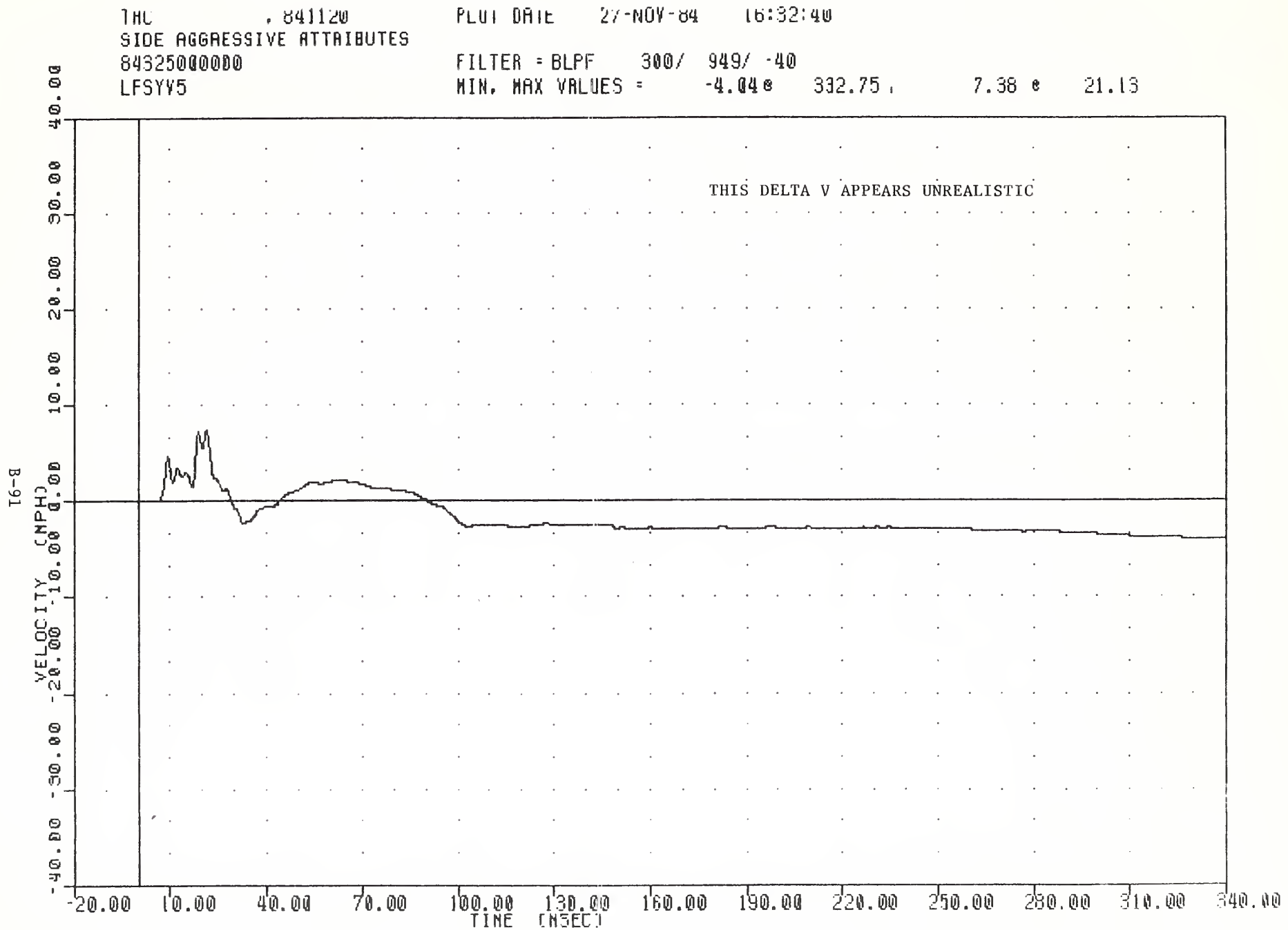
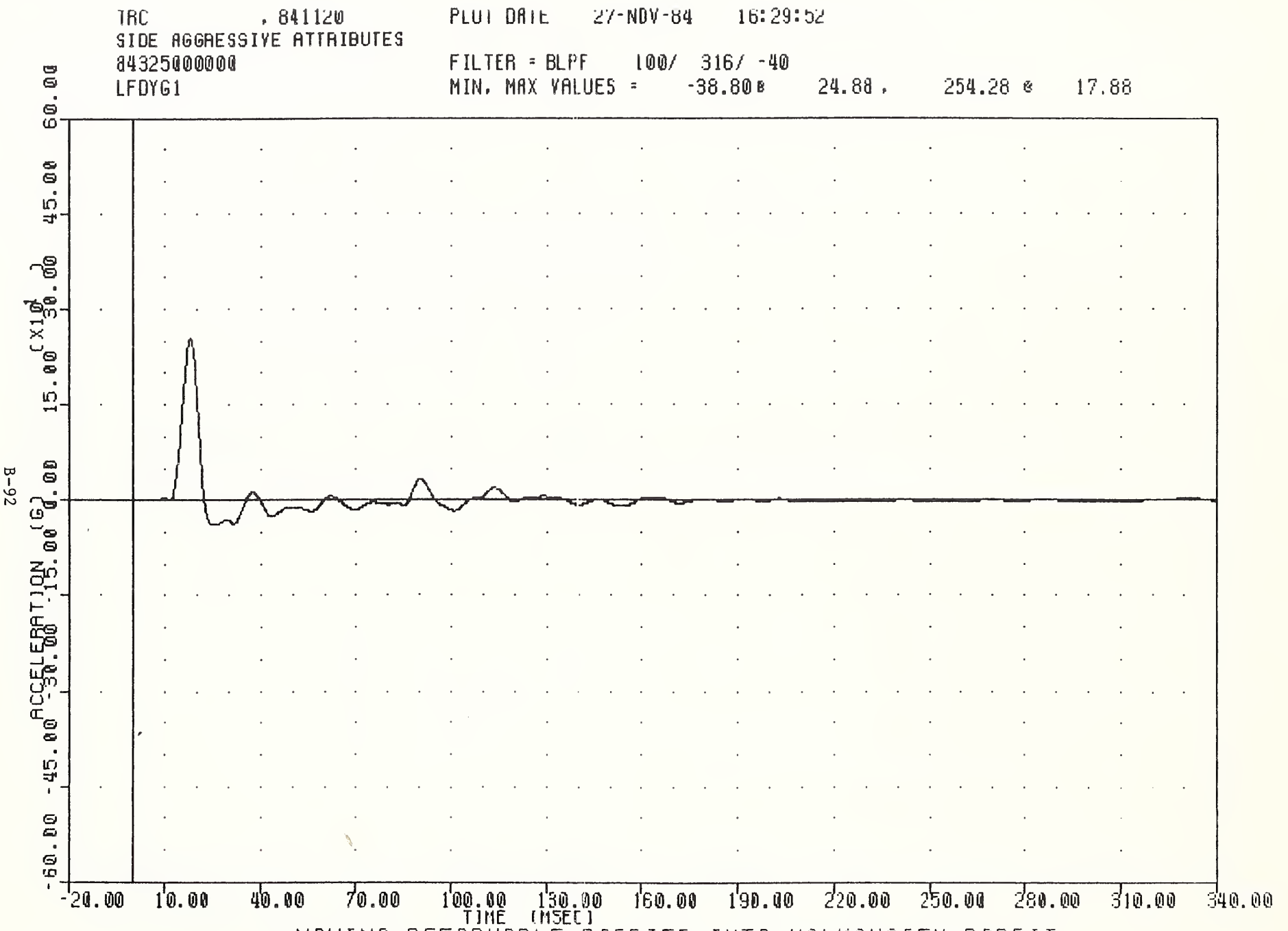
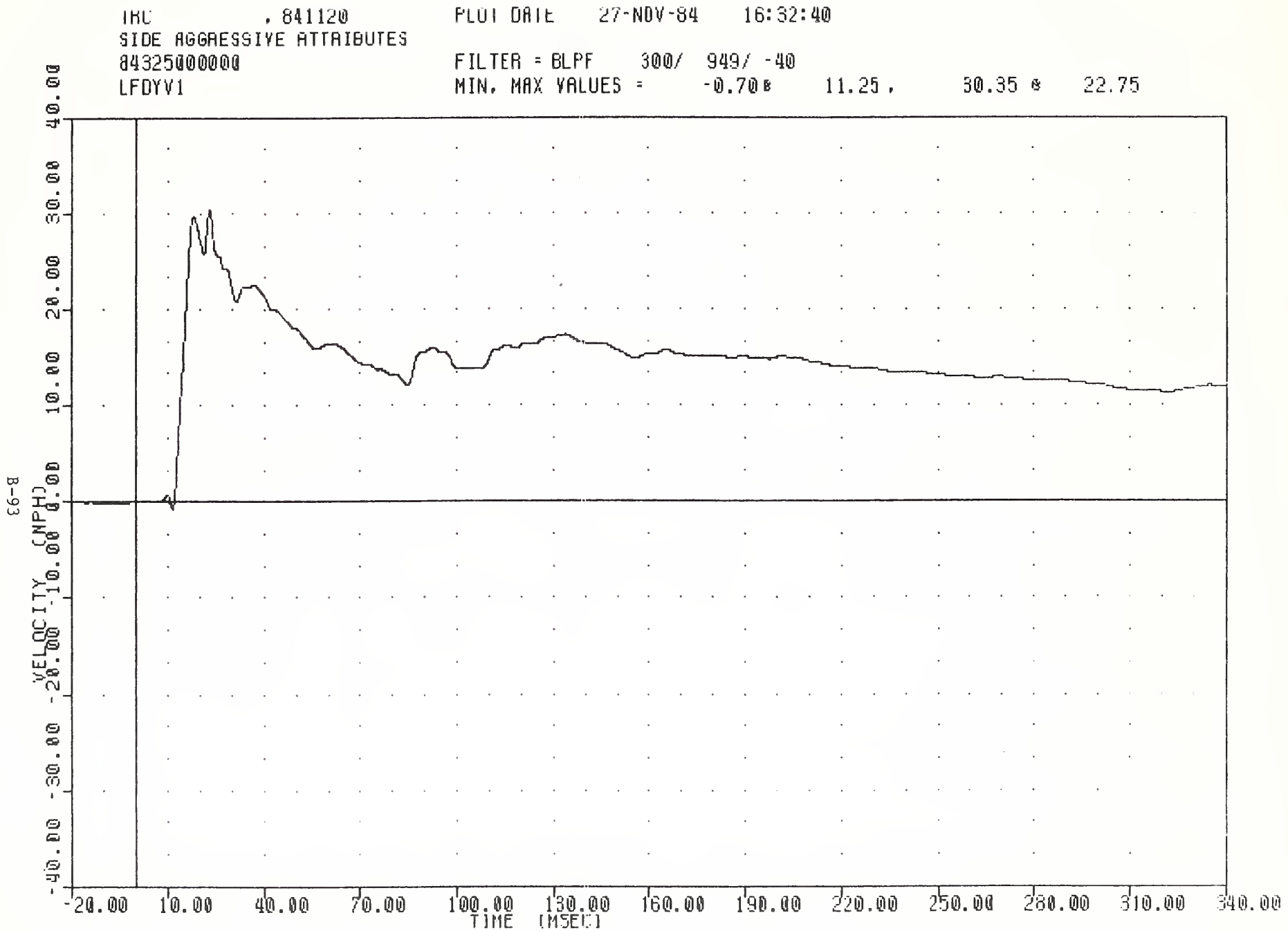
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS



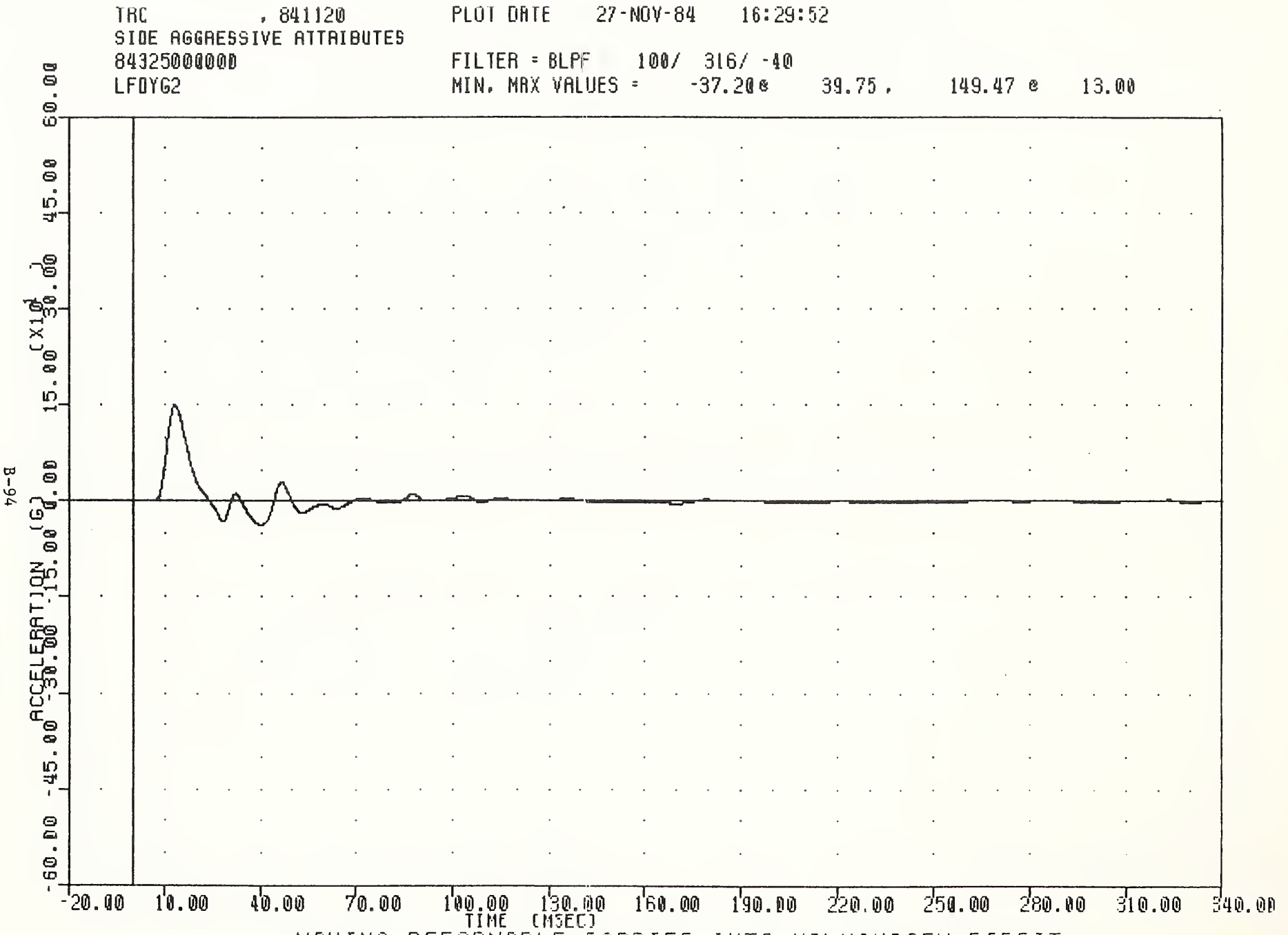
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFSYG5



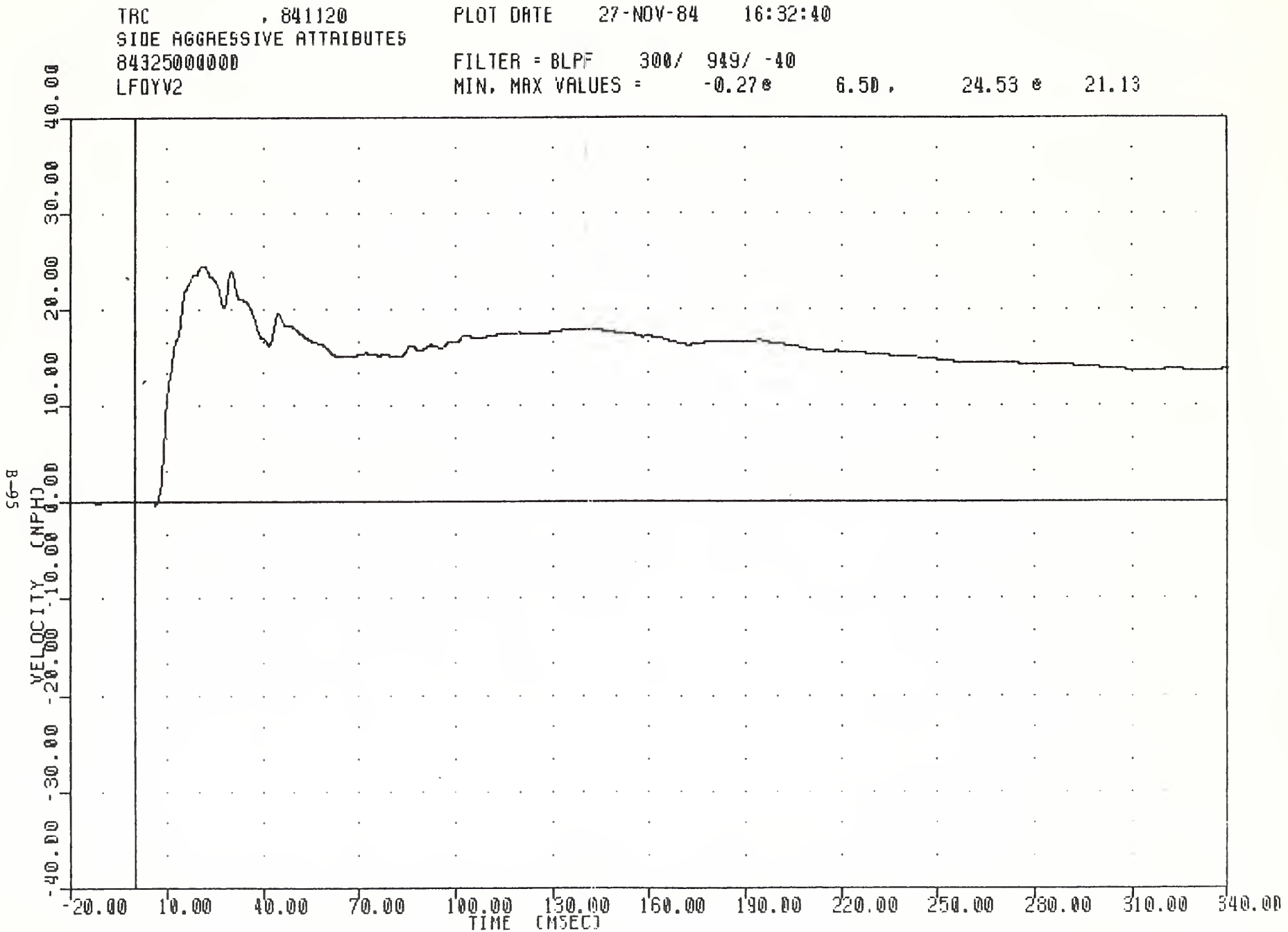
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 6) ACCELERATION Y AXIS



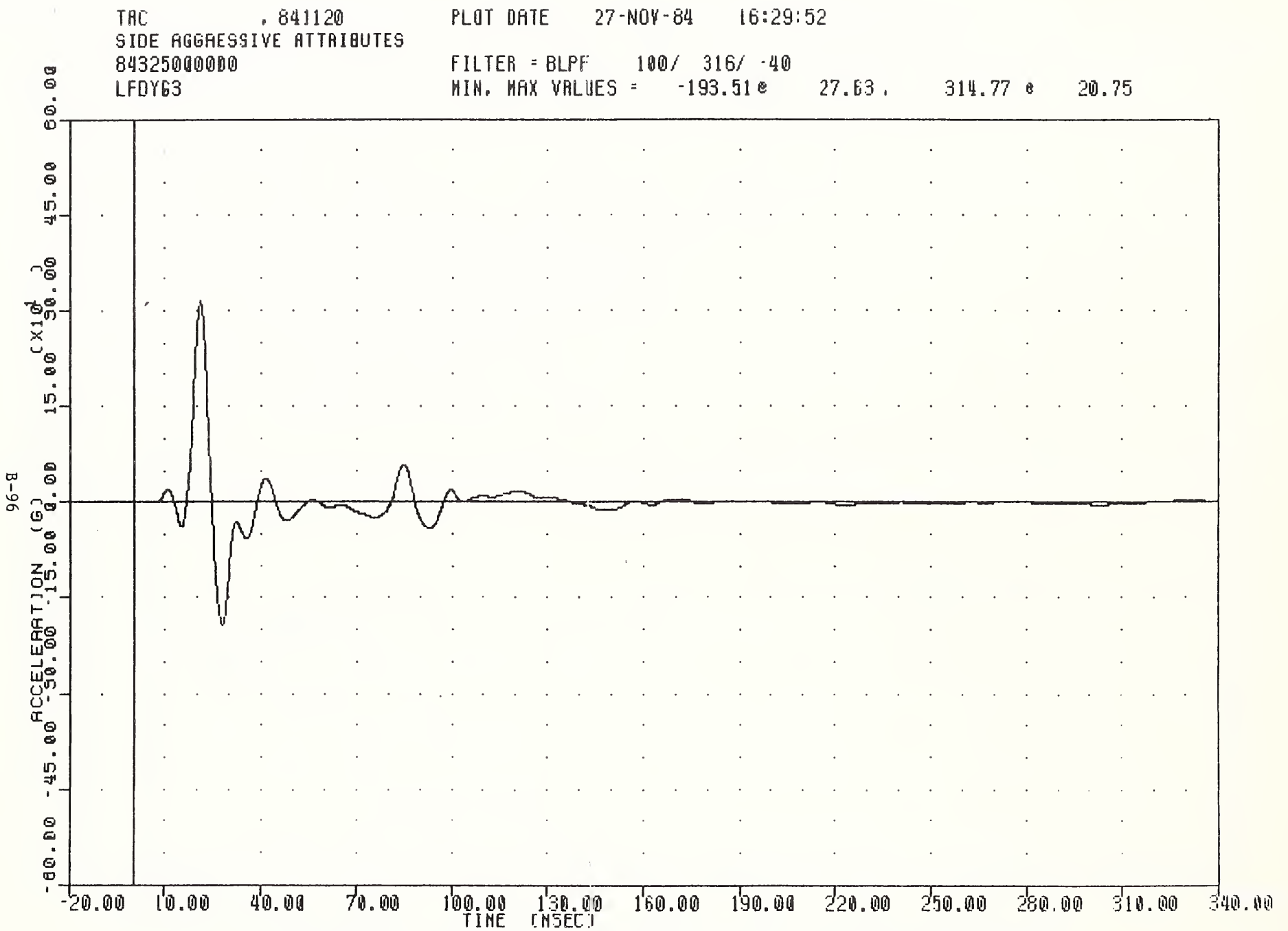
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYG1



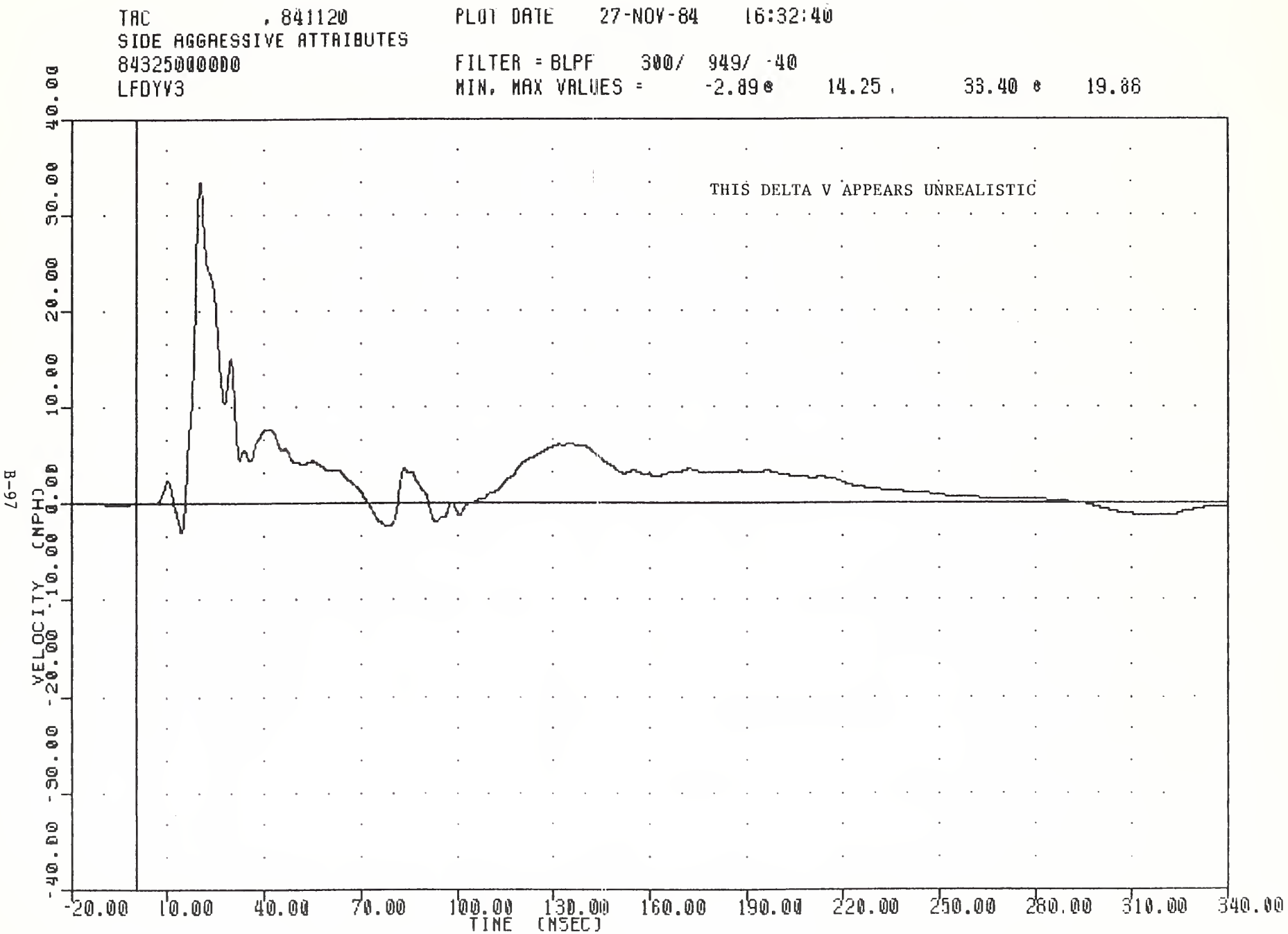
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 8) ACCELERATION Y AXIS



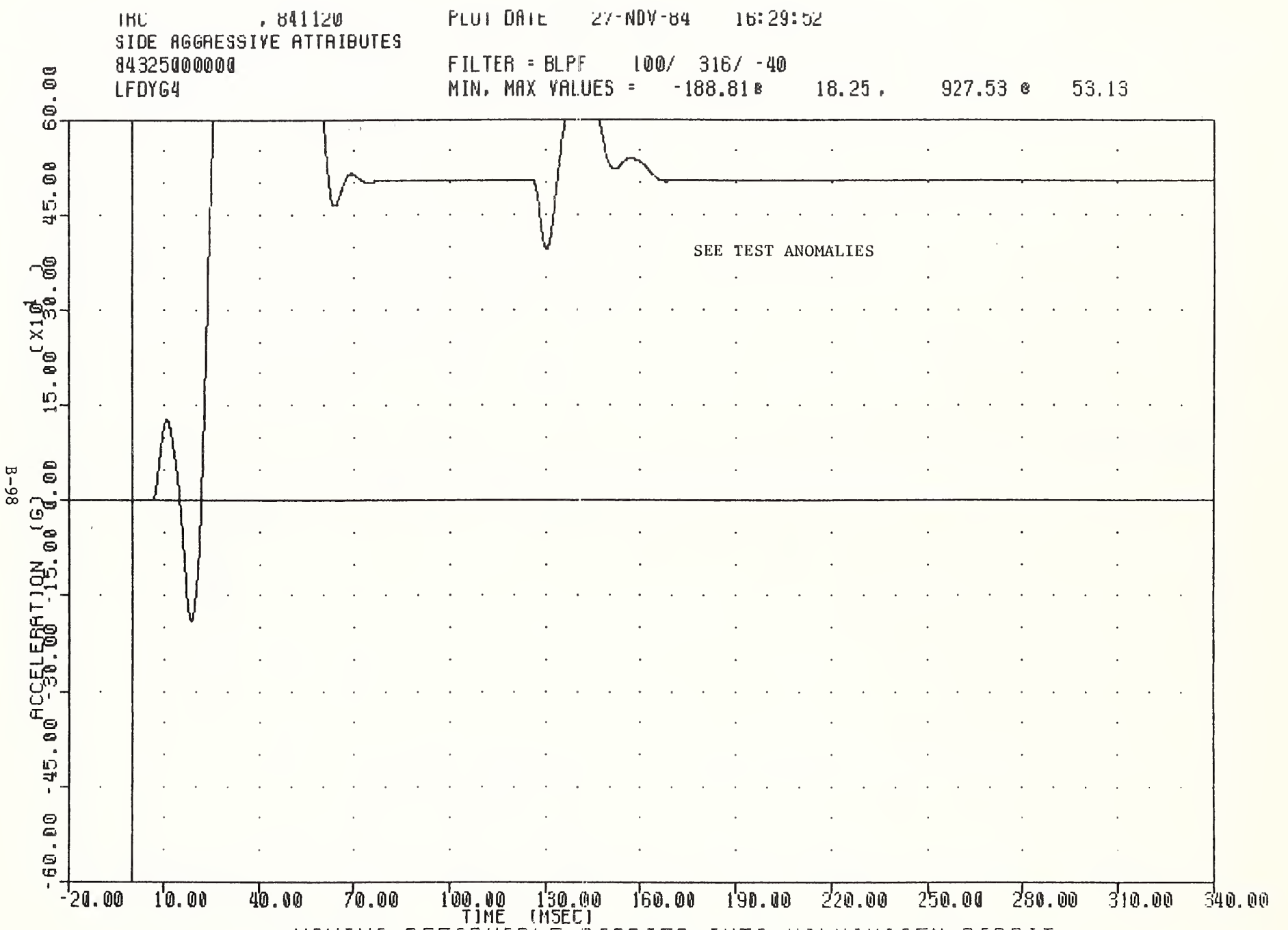
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYG2



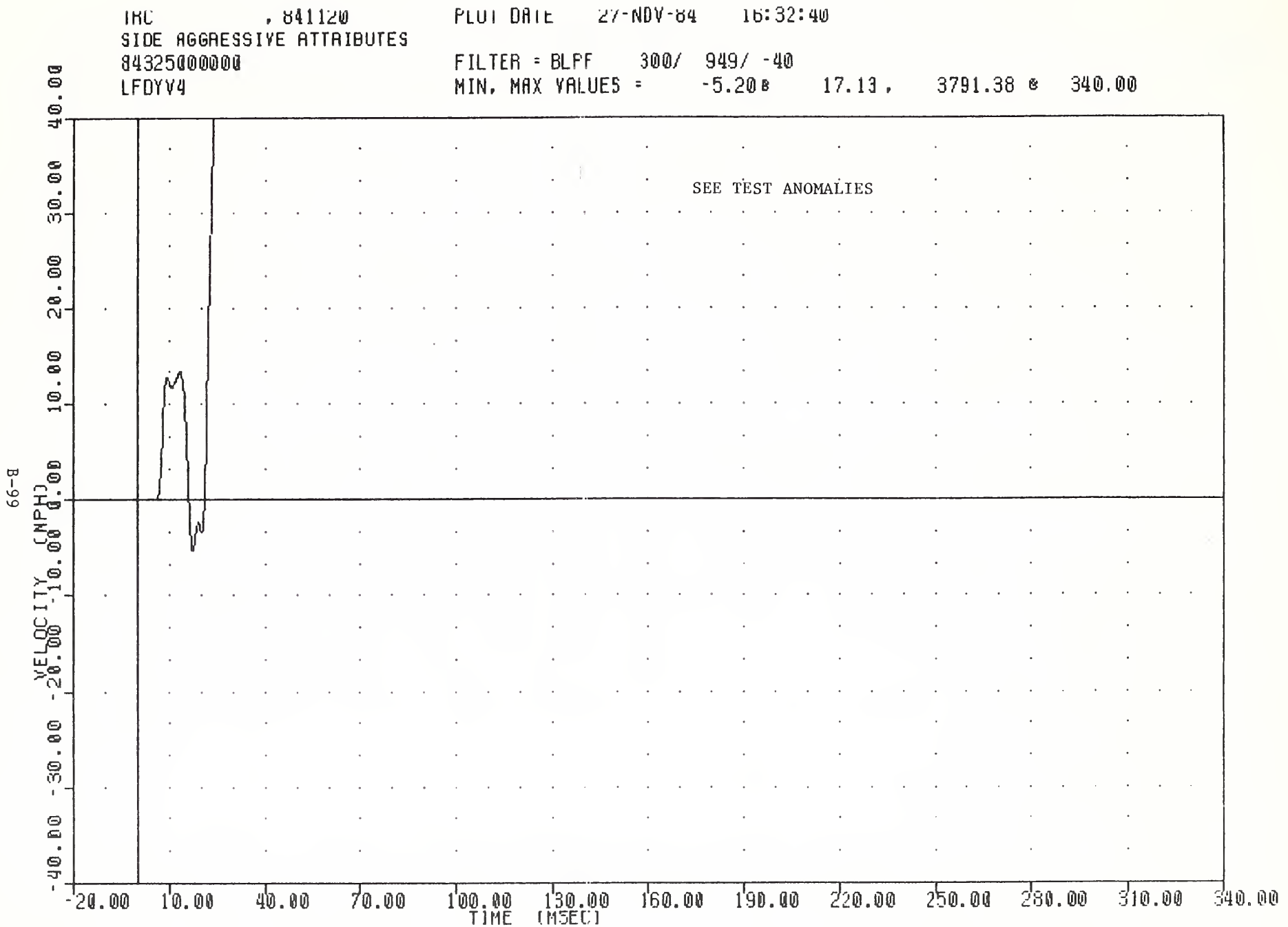
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 9) ACCELERATION Y AXIS



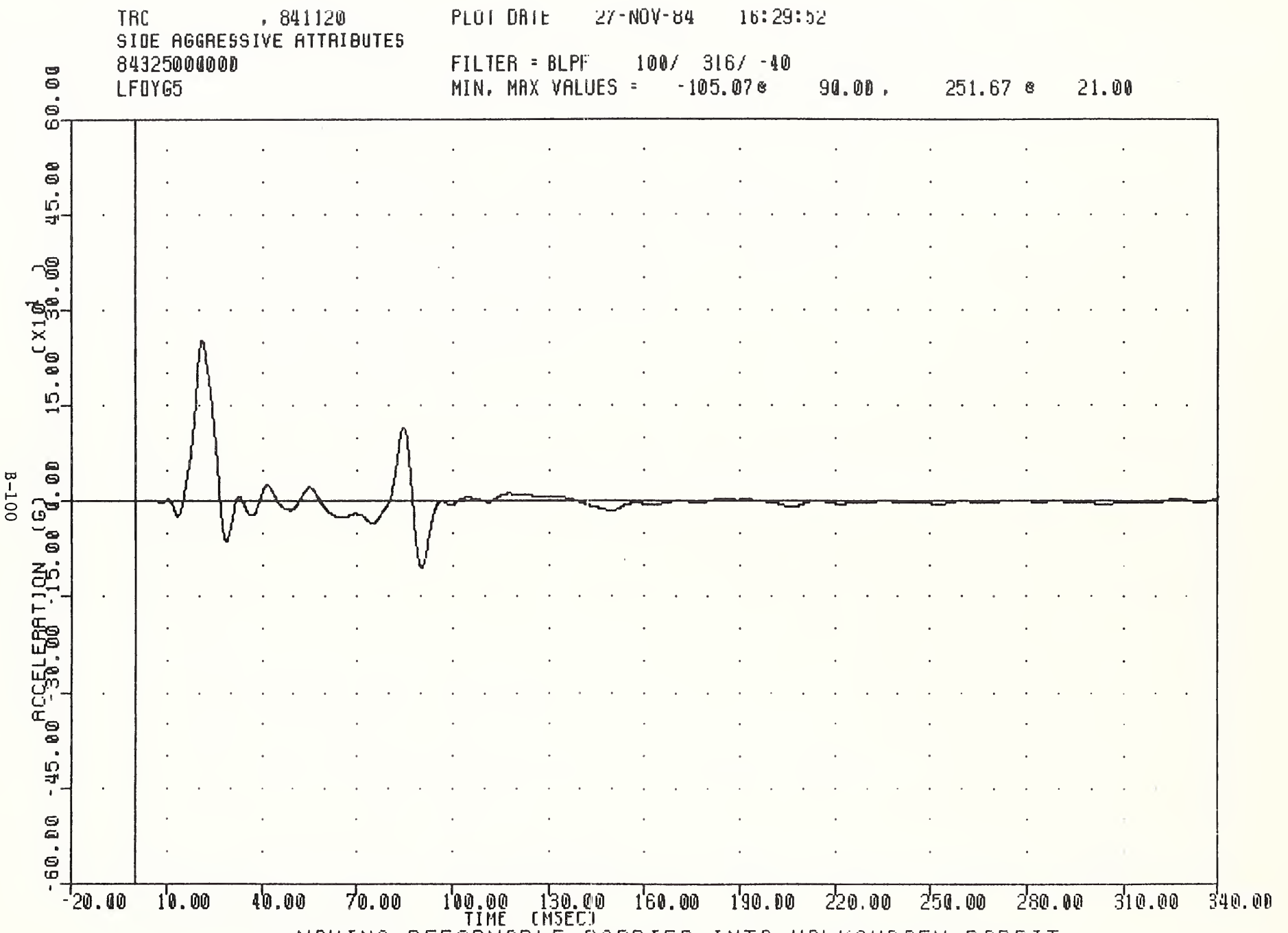
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYG3



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

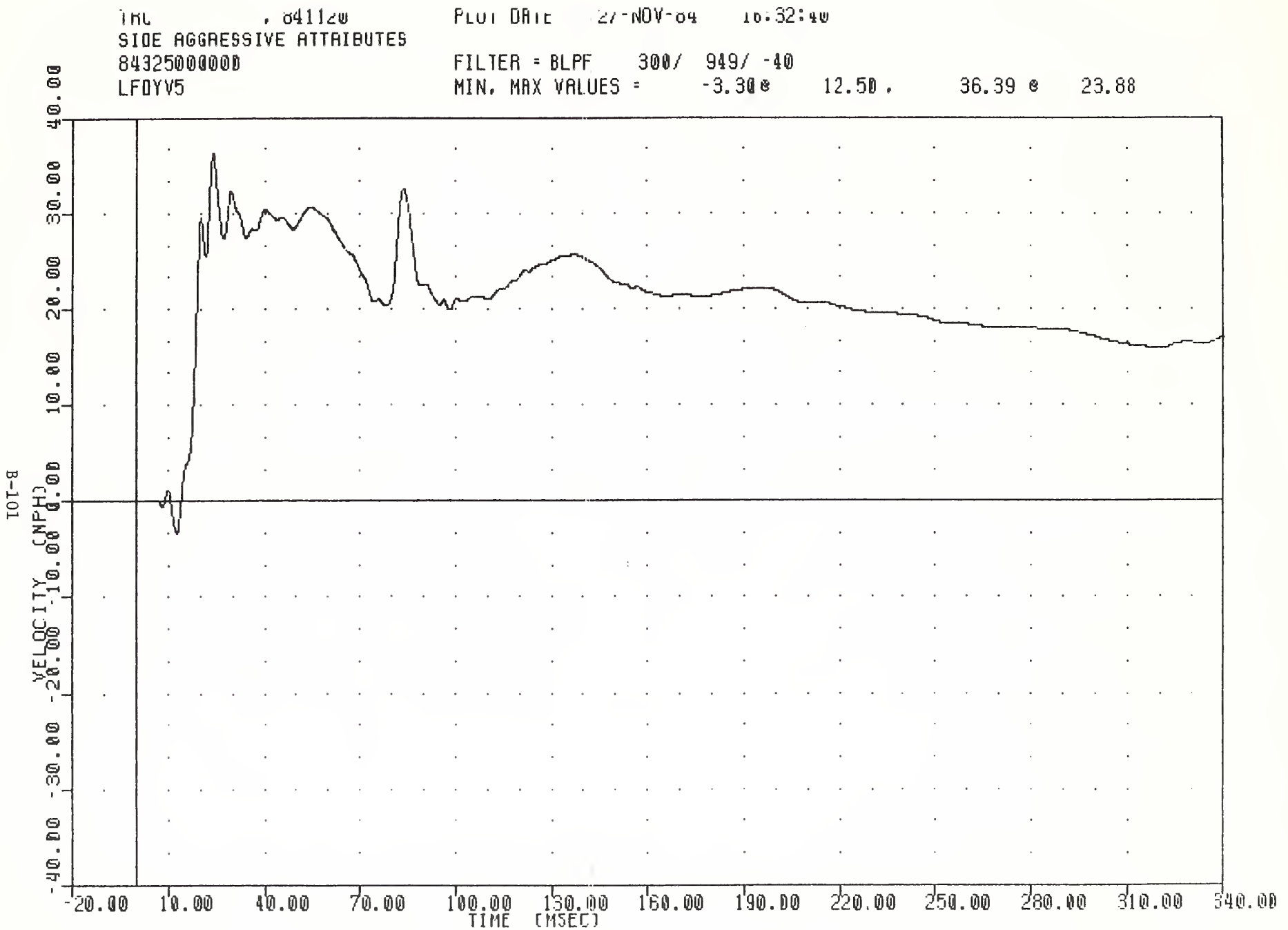


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYG4



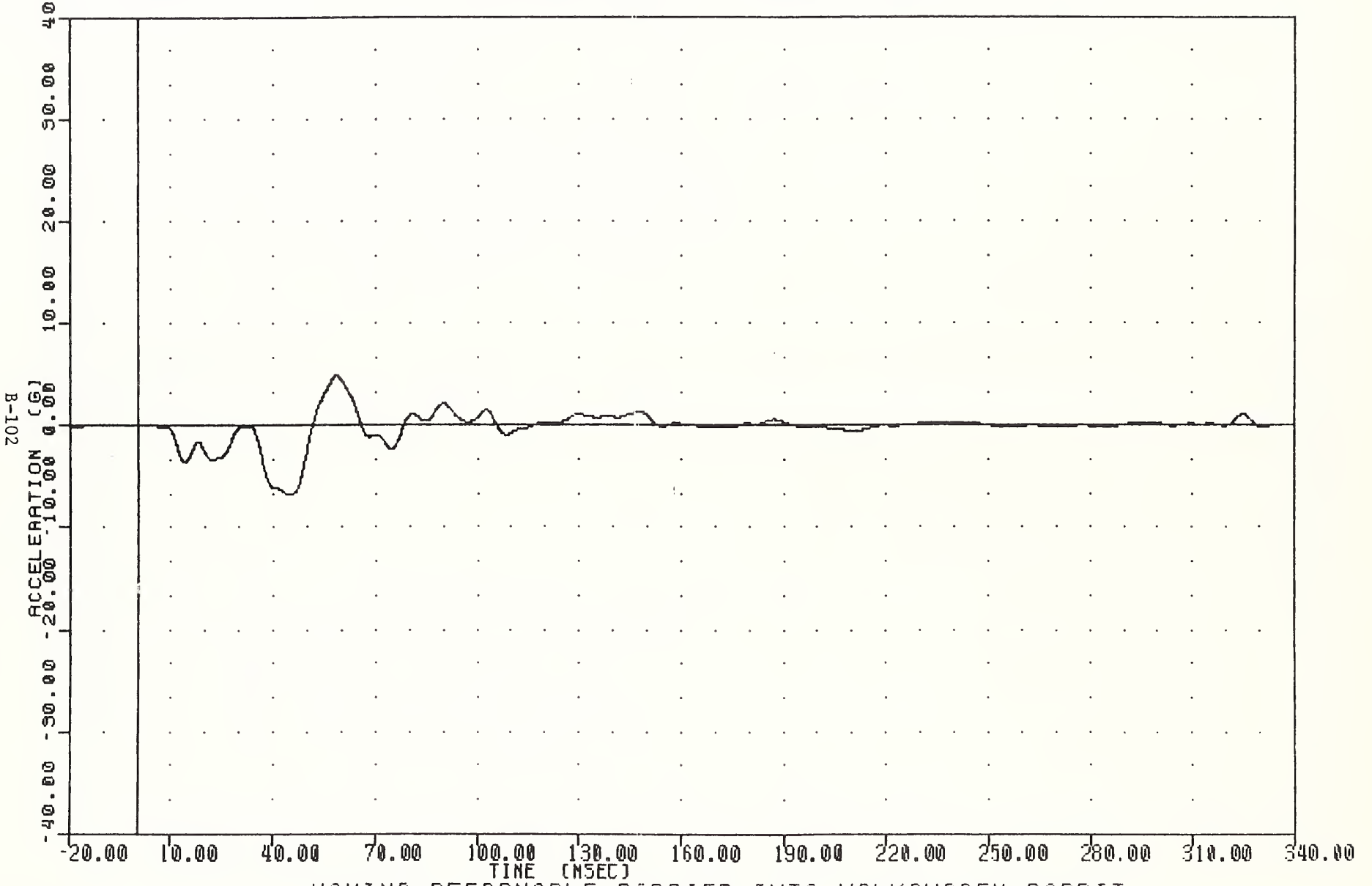
B-100

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



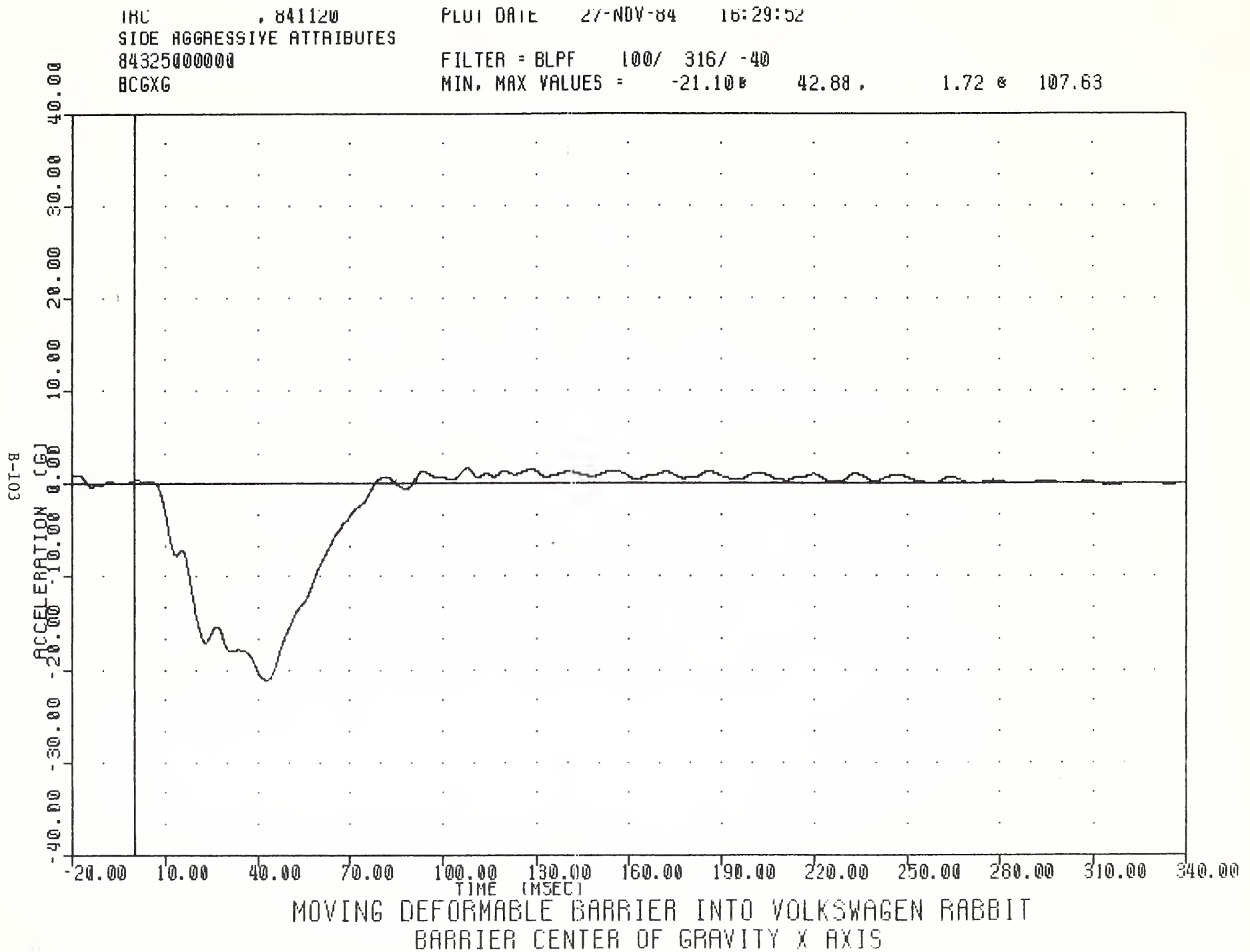
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFDYG5

TAC , 841120 PLOT DATE 27-NOV-84 16:29:52
SIDE AGGRESSIVE ATTRIBUTES
84325000000 FILTER = BLPF 100/ 316/ -40
TFRXG7 MIN. MAX VALUES = -6.79 @ 44.63 , 4.88 @ 58.38

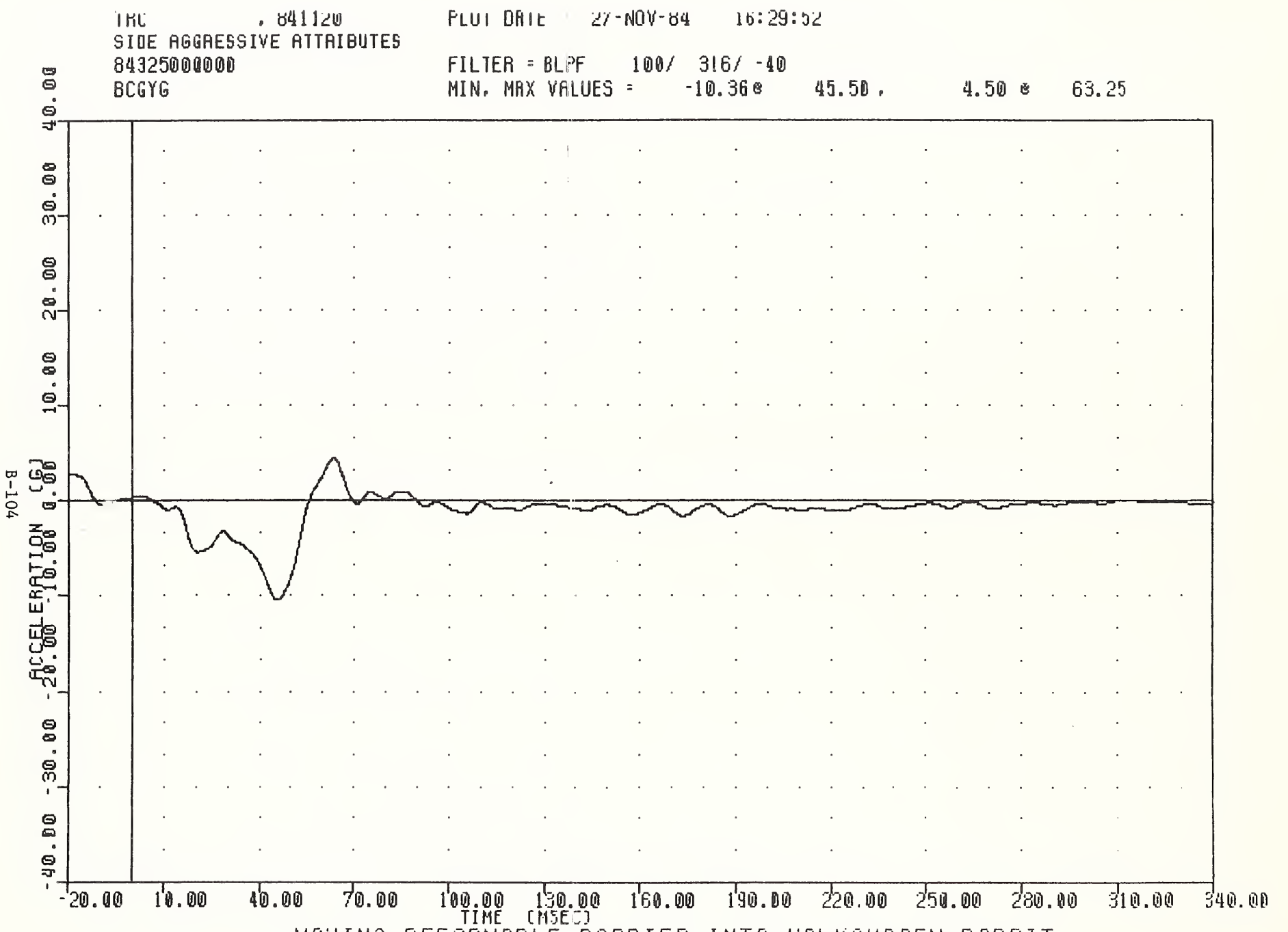


B-102

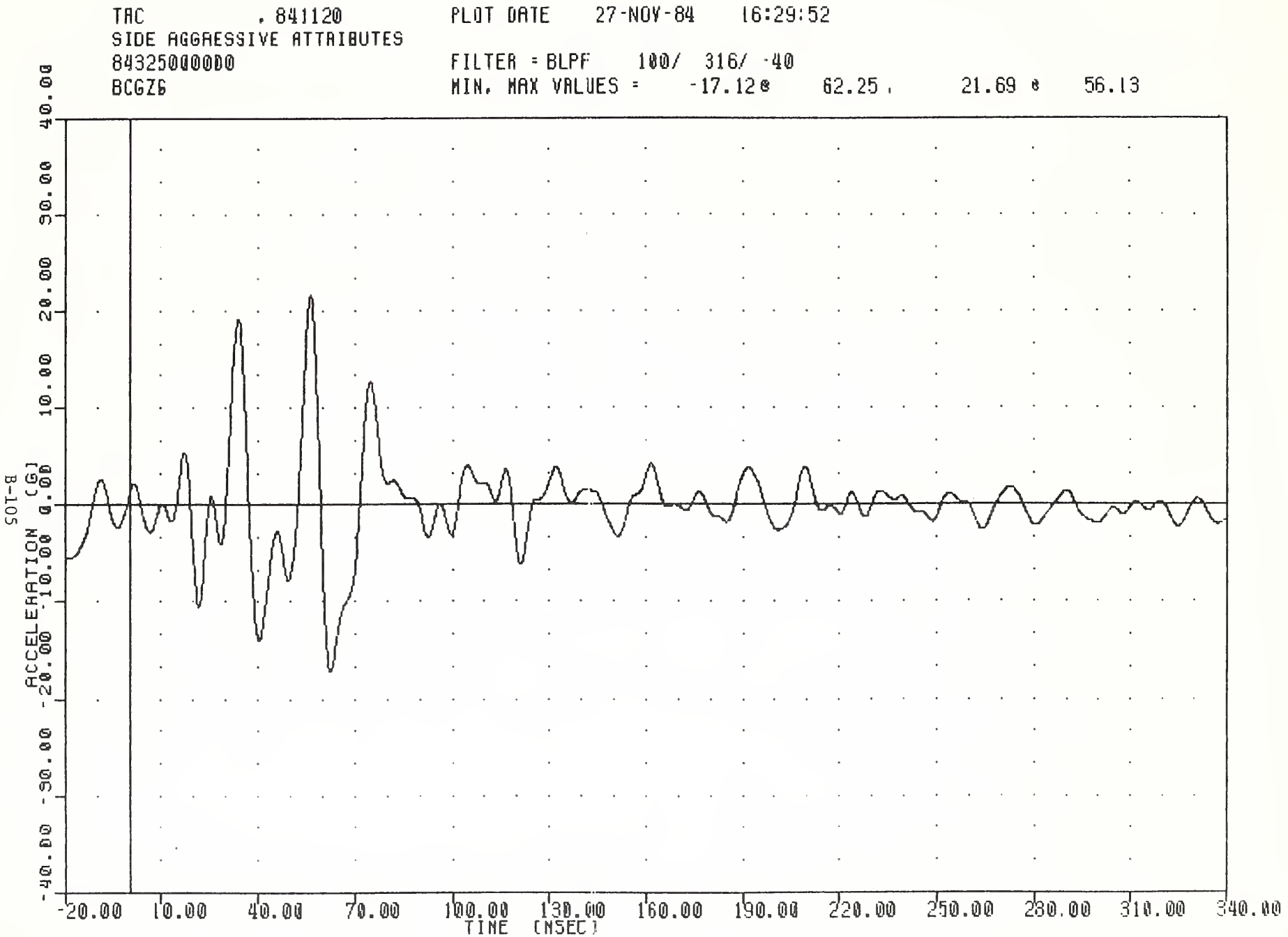
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE TRUNK FLOOR RIGHT ACCELERATION X AXIS



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

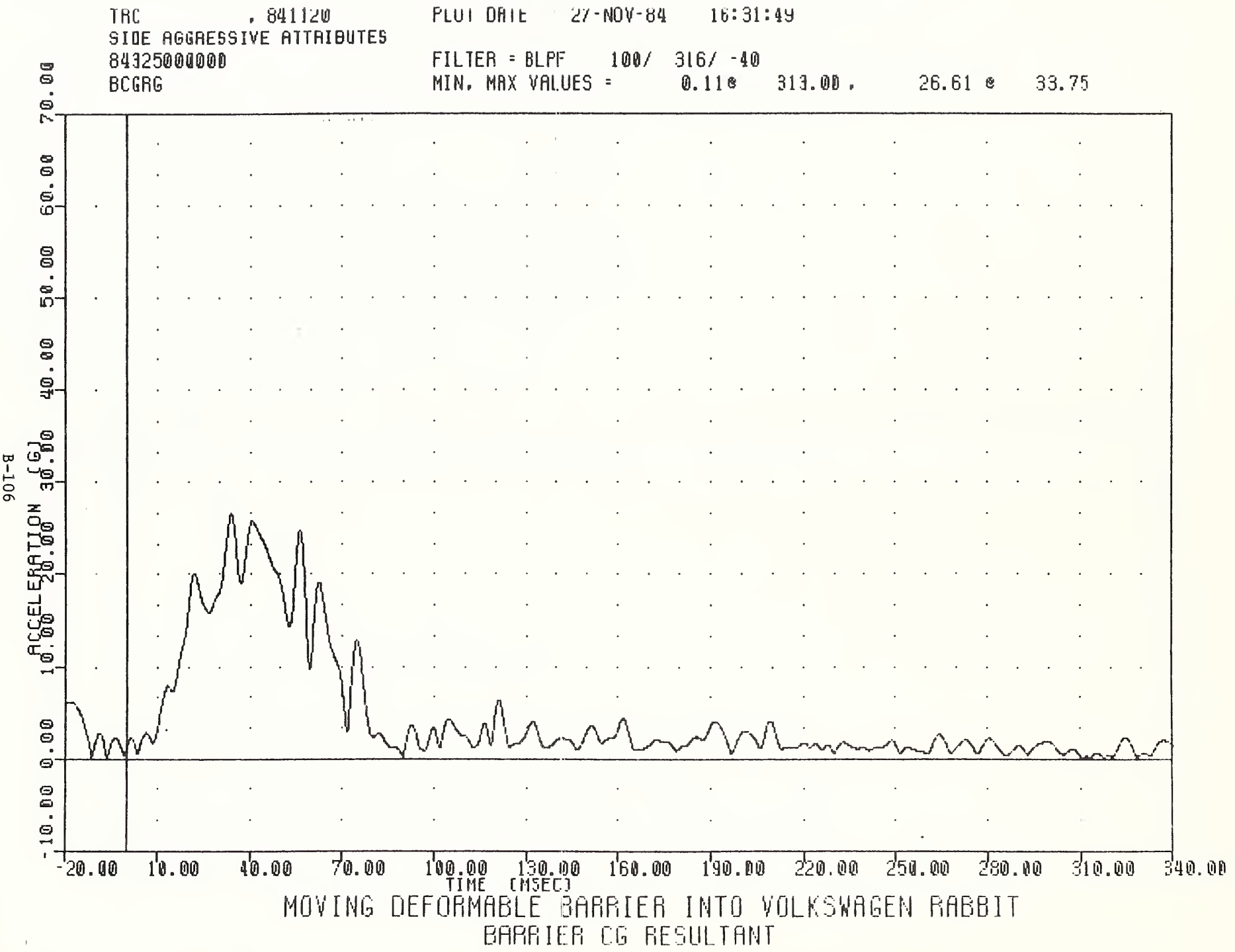


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER CENTER OF GRAVITY Y AXIS

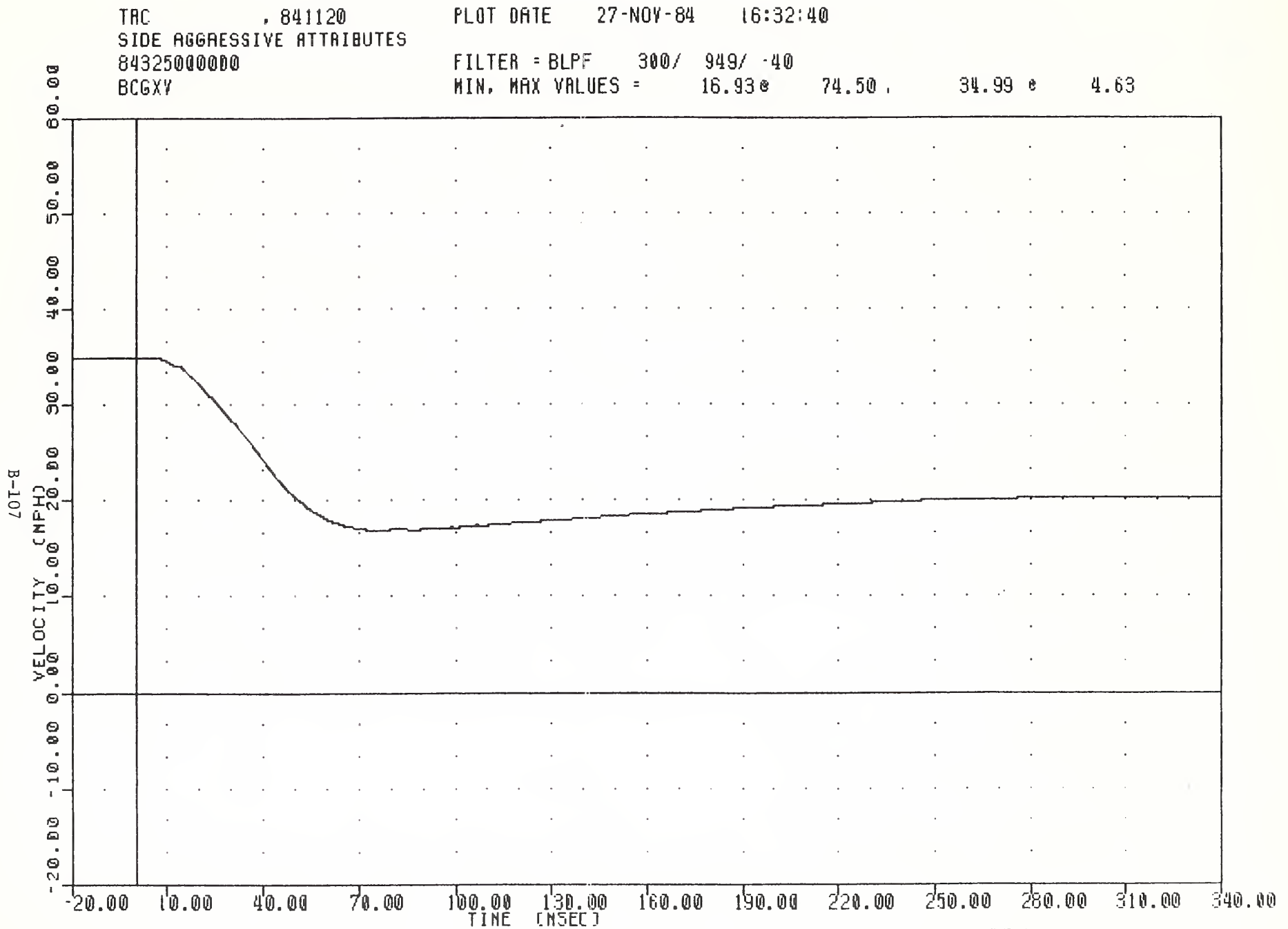


B-105

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

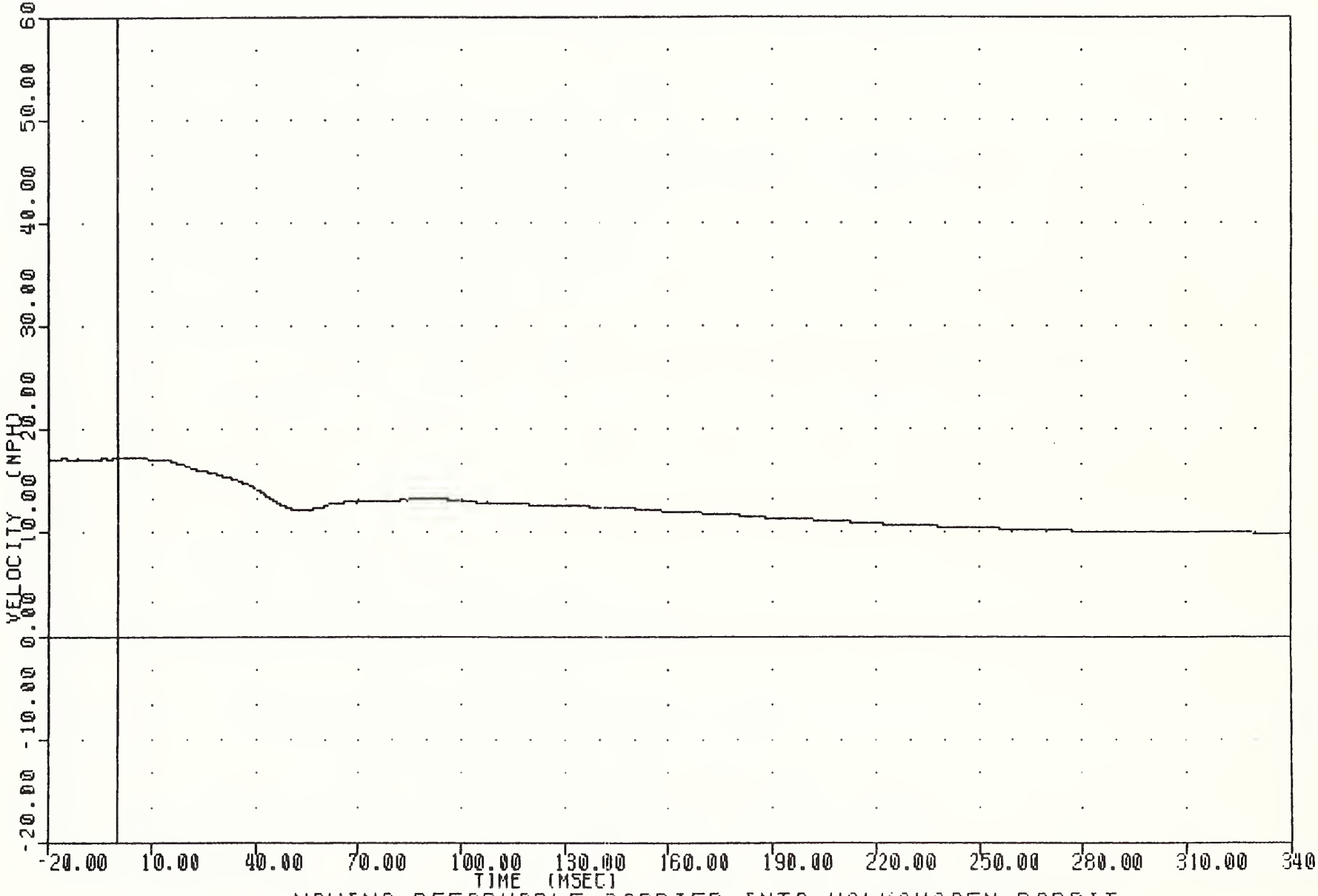


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER CG RESULTANT

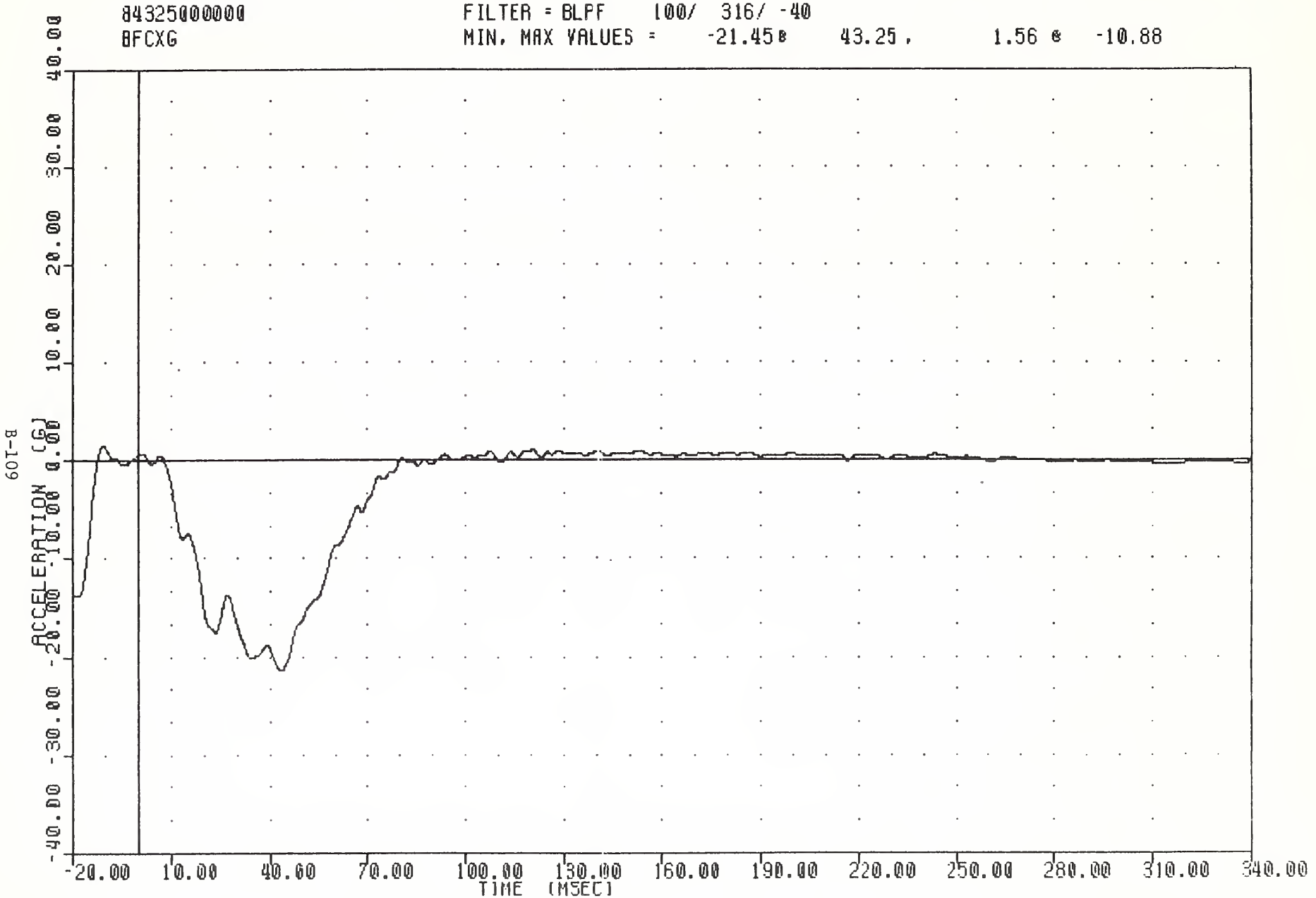


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BCGXG

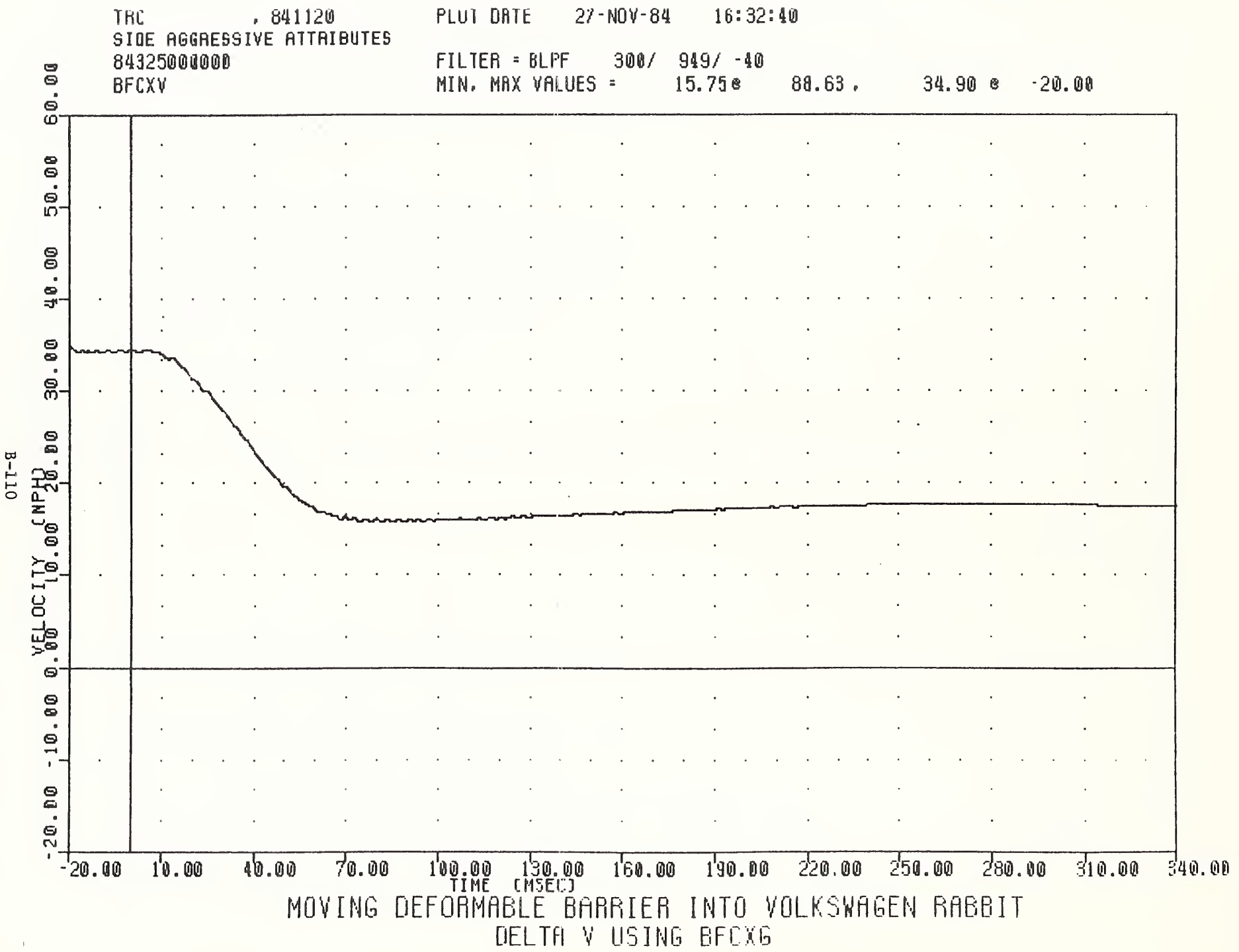
TRC . 841120 PLOT DATE 27-NOV-84 16:32:40
SIDE AGGRESSIVE ATTRIBUTES
84325000000 FILTER = BLPF 300/ 949/ -40
BCGYV MIN, MAX VALUES = 9.91 @ 340.00 , 17.26 @ 3.75



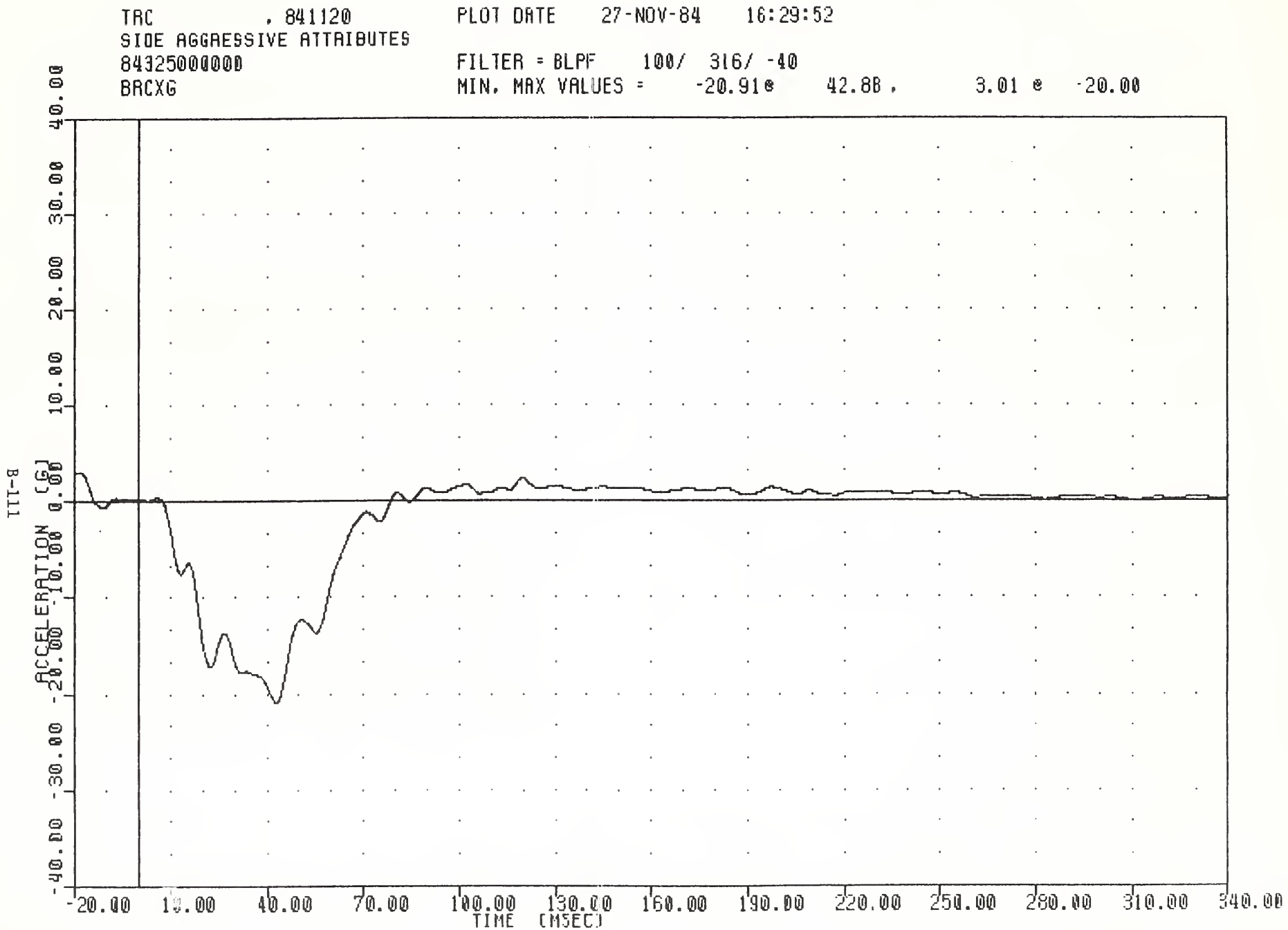
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BCGYG



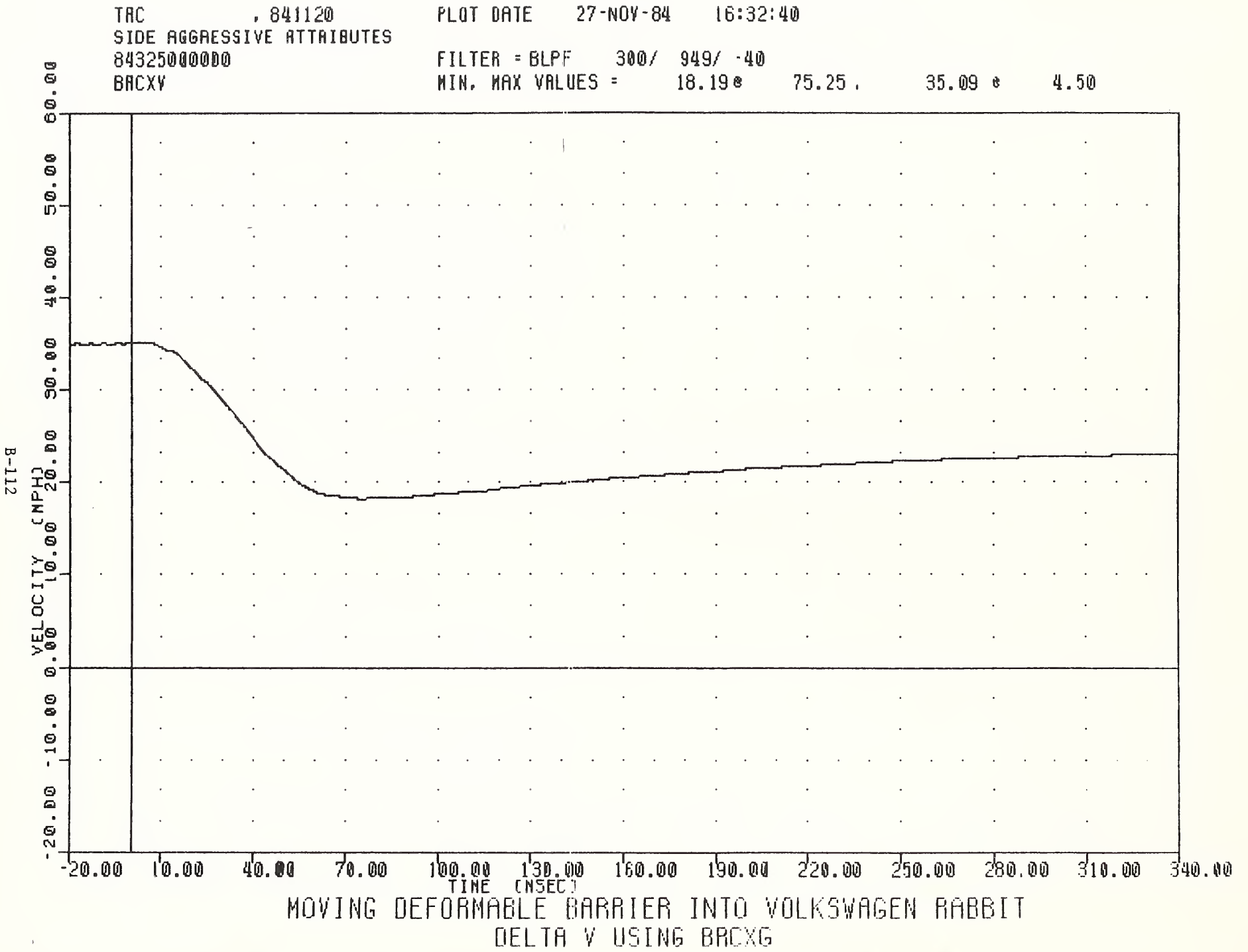
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER FRONT CROSSMEMBER ACCELERATION X AXIS



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BFCXG



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



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BRCXG