BREED AIR BAG PROGRAM

DOT# 758-A
DOT# 759-B

1979 FORD LTD BUMPER TEST AT 5.1 MPH AND CRASH TEST INTO A FIXED BARRIER AT 12.2 MPH

PREPARED BY:
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FINAL REPORT
AUGUST 1984

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
400 SEVENTH STREET, S.W.
WASHINGTON, D.C. 20590

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16. Abstract

This test report documents a crash test conducted under NHTSA Contract DTNH22-82-A-08401 involving a 1979 Ford LTD 4-door sedan retrofitted with a Breed air bag and a knee bolster. The test vehicle underwent a 5.1 mph bumper test on July 26, 1984 at an ambient temperature of 73°F. The vehicle was then impacted into a fixed, non-yielding barrier at 12.2 mph. The ambient temperature was 78°F. Vehicle accelerations and air bag sensors were measured for the bumper test. For the barrier crash, vehicle accelerations, air bag sensors and occupant responses were measured. All testing was conducted at the TRCO Crash Test Facility in East Liberty, Ohio.

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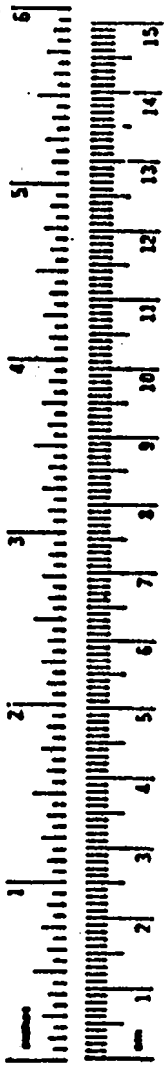
METRIC CONVERSION FACTORS

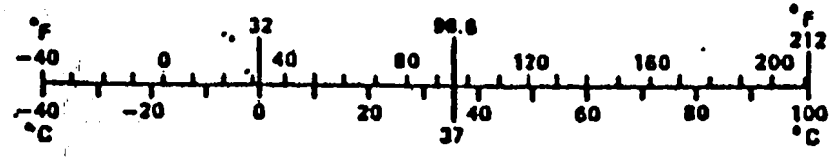
Approximate Conversions to Metric Measures

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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LIST OF PHOTOGRAPHS CONTD

SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The purpose of this crash test was to demonstrate the effectiveness of the Breed All Mechanical Air Bag System and knee restraint when retrofitted in an otherwise unmodified vehicle. The vehicle was tested using conditions in excess of those currently contained in a Federal Motor Vehicle Safety Standard.

INTRODUCTION

A 1979 Ford LTD 4-door Sedan which was supplied by NHTSA underwent a 5.1 mph bumper test on July 26, 1984 and then was towed into a fixed, rigid barrier at 12.2 mph. These tests were conducted to determine the firing velocity of the air bag and to demonstrate the effectiveness of the Breed air bag and knee restraint system when used without the vehicle's production belt restraint. Additionally, a standard Romeo-Kojyo air bag sensor was mounted on the left front inner fender well to determine firing time and acceleration levels for this non-standard position. The intended test speeds were 4.8 and 12 mph respectively; actual speeds were 5.1 and 12.2 mph.

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 photographs for test 840726A. Appendix B contains pre-test and post-test vehicle and dummy photographs for test 840726B. Appendix C contains Data Plots for test 840726A. Appendix D contains Data Plots for test 840726B.

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: Ford Motor Company

MAKE/MODEL: Ford LTD VIN: 9B63F135862

BODY STYLE: 4-Door Sedan MODEL YEAR: 1979

NHTSA NO.: R & D COLOR: Grey

ENGINE DATA: TYPE: V8 CYLINDERS: 8 DISPLACEMENT 302 CID

TRANSMISSION DATA: 2-speed Automatic

DATE VEHICLE RECEIVED: 7/13/84 ODOMETER READING: 76956

DEALER'S NAME AND ADDRESS: Bob Chapman Ford
Marysville, Ohio

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	Yes	AIR CONDITIONING	Yes
RADIO	Yes	ANTI-SKID BRAKE	No
CLOCK	No	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: Ford Motor Company

DATE OF MANUFACTURE: 11/78

GVWR: 5347 LBS.,

GAWR: FRONT 2714 LBS., REAR 2683 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 28 psi; REAR 32 psi

TIRES ON VEHICLE (MFGR. & LINE, SIZE): Goodyear Arriva P 205/75 R 14

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 MAXIMUM FLUIDS):

RIGHT FRONT	1100	LBS.	RIGHT REAR	880	LBS.
LEFT FRONT	1065	LBS.	LEFT REAR	870	LBS.
TOTAL FRONT WEIGHT	2165	LBS.	(55.3 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1750	LBS.	(44.7 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	3915	LBS.			

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 27 1/2	;LF 27 1/2	;RR 26 15/16	;LR 26 11/16
PRE-TEST ATTITUDE:	RF 26 5/8	;LF 26 3/4	;RR 24 3/8	;LR 24 3/4
POST-TEST ATTITUDE:	RF 26 1/2	;LF 26 9/16	;RR 24 1/4	;LR 24 5/8

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 200 LBS. CARGO:

RIGHT FRONT	1160	LBS.	RIGHT REAR	1020	LBS.
LEFT FRONT	1110	LBS.	LEFT REAR	1010	LBS.
TOTAL FRONT WEIGHT	2270	LBS.	(52.8 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	2030	LBS.	(47.2 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	4300	LBS.			

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 420 LBS.

	PRE-TEST	POST-TEST	DIFF.
LEFT BUMPER SHOCK LENGTH	3.0"	3.31"	0.31"
RIGHT BUMPER SHOCK LENGTH	3.38"	3.38"	0"

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: 0 GALLONS (92-94% OF USEABLE)

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 19.0 GALLONS

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: No FUEL INJECTION: No

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

VEHICLE REBOUND AND CRUSH (ALL DIMENSIONS IN INCHES)

OVERALL LENGTH OF TEST VEHICLE:	PRE-TEST:	R 205 3/4	;L 205 7/8
	POST-TEST:	R 205 3/4	;L 205 7/8
TOTAL CRUSH:		R 0	;L 0

FOR FRONTAL IMPACTS, DISTANCE FROM FRONT OF TEST VEHICLE TO BARRIER AFTER IMPACT: CENTER: 4 ;R 5 7/8 ;L 6 15/16

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 28 psi; REAR 32 psi

RECOMMENDED TIRE SIZE: FR 78 14 LOAD RANGE B, X C,

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

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

CARGO LOAD 200 LBS.

TOTAL 1100 LBS.

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

TEST CONDITIONS

TEST NUMBER: 840726A

DATE OF TEST: 7/26/84 TIME OF TEST: 12:23 PM

WIND VELOCITY: DNA HUMIDITY: 45%

AMBIENT TEMPERATURE AT IMPACT AREA: 73°F

SUBJECT VEHICLE DATA

	ACTUAL	INTENDED
TEST WEIGHT (LBS.)	4300	4280
VEHICLE ORIENTATION (DEGREES)	0	0
VEHICLE VELOCITY (mph)	5.1	4.8

DUMMIES - DNA

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 27 1/2	;LF 27 1/2	;RR 26 15/16	;LR 26 11/16
PRE-TEST ATTITUDE:	RF 26 1/2	;LF 26 9/16	;RR 24 1/4	;LR 24 5/8
POST-TEST ATTITUDE:	RF 26 3/4	;LF 26 11/16	;RR 24 3/4	;LR 24 3/8

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 200 LBS. CARGO:

RIGHT FRONT	1070 LBS.	RIGHT REAR	1030	LBS.
LEFT FRONT	1120 LBS.	LEFT REAR	1050	LBS.
TOTAL FRONT WEIGHT	2190	LBS. (51.3 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	2080	LBS. (48.7 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	4270	LBS.		

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 120 LBS.

	PRE-TEST	POST-TEST	DIFF.
LEFT BUMPER SHOCK LENGTH	3.31"	1.63"	1.68"
RIGHT BUMPER SHOCK LENGTH	3.38"	2.38"	1.0"

TEST VOLUME: 9.2 GALLONS (92-94% OF USABLE)

VEHICLE REBOUND AND CRUSH (ALL DIMENSIONS IN INCHES)

OVERALL LENGTH OF TEST VEHICLE:	PRE-TEST:	R 205 3/4	;L 205 7/8
	POST-TEST:	R 203 7/8	;L 201 1/4
TOTAL CRUSH:		R 1 7/8	;L 4 5/8

FOR FRONTAL IMPACTS, DISTANCE FROM FRONT OF TEST VHICLE TO BARRIER AFTER IMPACT: CENTER: 12 1/4 ;R 12 3/16 ;L 13 11/16

TEST CONDITIONS

TEST NUMBER: 840726B

DATE OF TEST: 7/26/84 TIME OF TEST: 4:30 PM

WIND VELOCITY: DNA HUMIDITY: 54%

AMBIENT TEMPERATURE AT IMPACT AREA: 70°F

TEMPERATURE IN OCCUPANT COMPARTMENT: 70°F

SUBJECT VEHICLE DATA

	ACTUAL	INTENDED
TEST WEIGHT (LBS.)	4270	4280
VEHICLE ORIENTATION (DEGREES)	0	0
VEHICLE VELOCITY (mph)	12.2	12.0

DUMMIES

	DRIVER	MIDDLE PASSENGER	RT. FRONT PASSENGER	LEFT REAR PASSENGER	RT. REAR PASSENGER
TYPE:	572				
SERIAL NO.:	187				
INSTRUMENTATION:					
HEAD ACCEL.:	Yes				
CHEST ACCEL.:	Yes				
FEMUR L.C.'S:	Yes				
OTHER:	Pelvis				

RESTRAINT SYSTEM: Breed Air Bag and Knee Bolster

VISIBLE DUMMY CONTACT POINTS:

	DRIVER 187	PASSENGER DNA
Head	Contacted Air Bag Only	
Chest	Contacted Air Bag Only	
Abdomen	Contacted Air Bag, Lower Steering Wheel Rim	
Left Knee	Contacted Bolster Only	
Right Knee	Contacted Bolster Only	

DOOR OPENING:

	LEFT	RIGHT
Front	Difficult	Difficult
Rear	Normal	Normal

SEAT MOVEMENT:

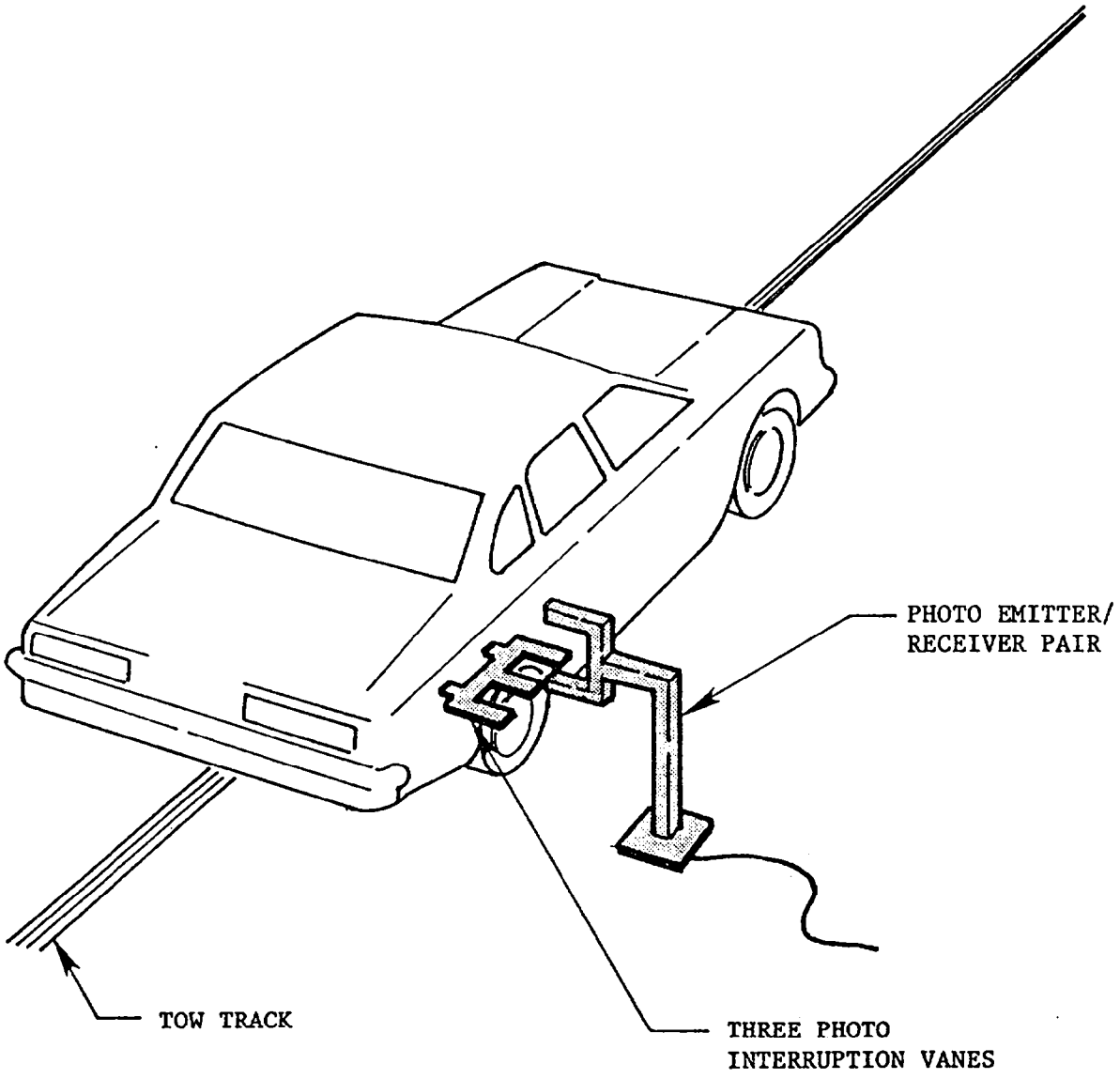
	SEAT BACK FAILURE	SEAT SHIFT
Front	No	No
Rear	NA	NA

GLAZING DAMAGE: None

OTHER NOTABLE IMPACT EFFECTS:

Cowling cracked and deformed; front fenders displaced to rear; hood bent.

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 164 lbs. +
Cargo Weight
= 3915 + 1 X 165 + 200 lbs.
= 4280 lbs.

To achieve test weight, 420 pounds of sand ballast was added for Test 840726A. For Test 840726B, 120 pounds of sand ballast and 9.2 gallons of stoddard solvent were added. The weight of the test vehicle was measured by placing each wheel on a Loadmeter Corporation Hiway Loadometer.

TEST ANOMALIES

The air bag ignition sensor, ABT3, was discovered to have a burnt wire after the 12.2 mph test. The wire separated during the 12.2 mph test at approximately 54 msec.

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

DUMMY TEMPERATURE CONTROL AND POSITIONING

The vehicle was kept inside the temperature controlled crash test building until approximately 30 minutes prior to the test. Temperature inside the vehicle and ambient temperature in the crash building 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 dummy in the test vehicle.

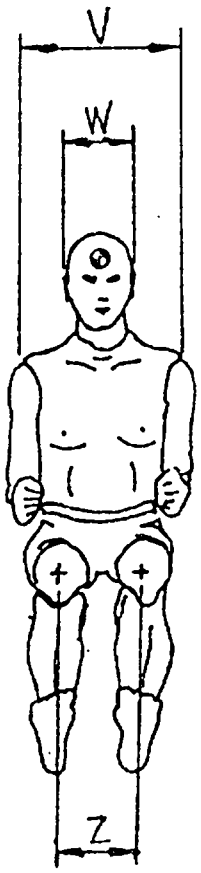
DUMMY PLACEMENT AND POSITIONING

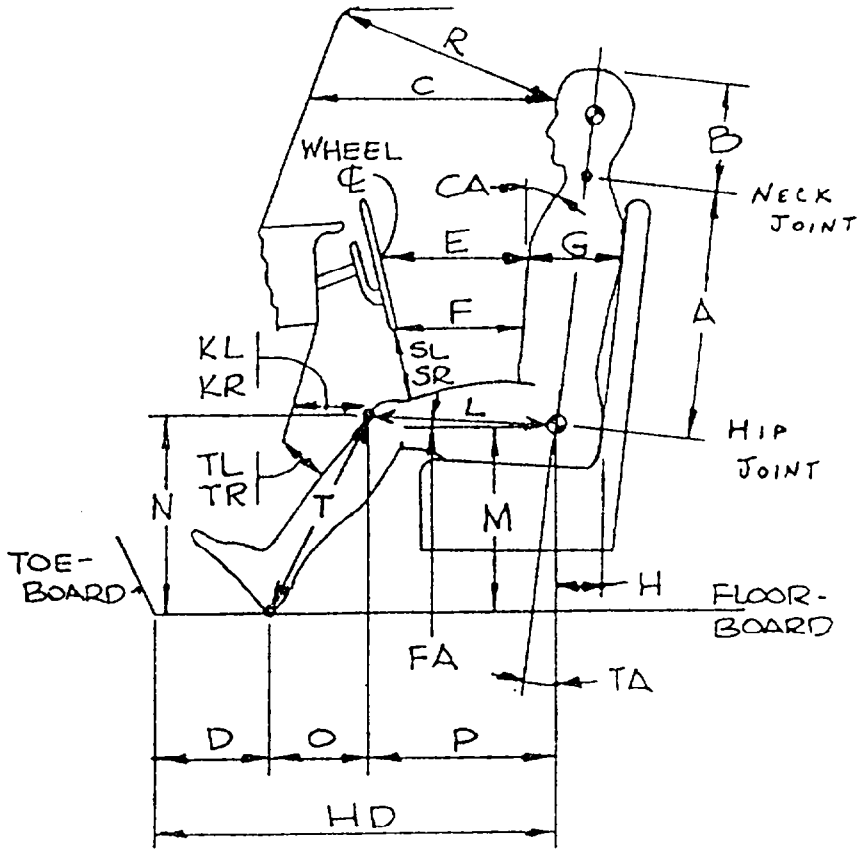
PART 572 DUMMY	DRIVER DSP	PASSENGER DSP
HEAD	Surface of transverse instrument mounting platform is horizontal & midsagittal plane falls in longitudinal plane.	Surface of transverse instrument mounting platform is horizontal & midsagittal plane falls in longitudinal plane.
UPPER TORSO	Placed against seat back. Midsagittal plane is vertical & longitudinal & passes through center point of steering wheel rim.	Placed against seat back. Midsagittal plane is vertical, longitudinal, & the same distance from vehicle longitudinal centerline as driver dummy midsagittal plane.
UPPER ARMS	Initially placed against seat back & tangent to side of upper torso. Push arms rearward into seat back with bending at elbows.	Initially placed against seat back & tangent to side of upper torso. Push arms rearward into seat back with bending at elbows. Remains tangent.
LOWER ARMS	Initially placed against the outside of the thighs. Centerline as close as possible in a vertical plane.	Initially placed against the outside of the thighs. Centerline as close as possible in a vertical plane.
HAND PALMS	Palms contact outer part of steering wheel rim at horizontal centerline.	Palms contact the outsides of the thighs.
HAND THUMBS	Placed over steering wheel rim.	
HAND LITTLE FINGERS		Barely in contact with the seat cushion.
LOWER TORSO	Centered on bucket seat cushion. Midsagittal plane is vertical & longitudinal. For bench seat, midsagittal plane is vertical & longitudinal & passes through center point of plane described by steering wheel rim.	Centered on bucket seat cushion. Midsagittal plane is vertical & longitudinal. For bench seat, midsagittal plane is vertical, and same distance from vehicle longitudinal centerline as driver dummy midsagittal plane.
UPPER LEGS (thighs or femurs)	Placed against seat cushion. Plane defined by femur and tibia centerlines is as close as possible to vertical.	Placed against seat cushion. Plane defined by femur and tibia centerlines is as close as possible to vertical.
RIGHT KNEE	Knees initially set 14.5" apart between pivot bolt head outer surfaces.	Located so that plane defined by femur and tibia centerlines is as close as possible to vertical.

PART 572 DUMMY	DRIVER DSP	PASSENGER DSP
LEFT KNEE	Outer surface of pivot bolt head is 5.9" from midsagittal plane of dummy.	Located as above.
LOWER LEGS	Plane defined by femur and tibia centerlines is as close as possible to vertical longitudinal plane.	Plane defined by femur and tibia centerlines is as close as possible to vertical longitudinal plane.
RIGHT FOOT	Placed on undepressed accelerometer pedal -- rearmost point of heel on floorpan in plane of pedal.	Centerline falls in vertical longitudinal plane. Placed on toeboard -- rearmost point of heel on floorpan as close as possible to intersection of toeboard and floorpan.
LEFT FOOT	Placed on towboard -- 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 toeboard -- rearmost point of heel on floorpan as close as possible to intersection of toeboard and floorpan.

DUMMY IN-VEHICLE POSITION RECORDING SHEET

BREED VERSION (Not Standard)





Seat @ Mid-Postion

ALL MEASUREMENTS TO THE NEAREST 1/4 INCH, AND WHOLE DEGREE.

Measurements A,B,L are parallel to the dummy inclination; SL,SR,TL,TR,R are "shortest distance" measurements; all the rest are horizontal and vertical.

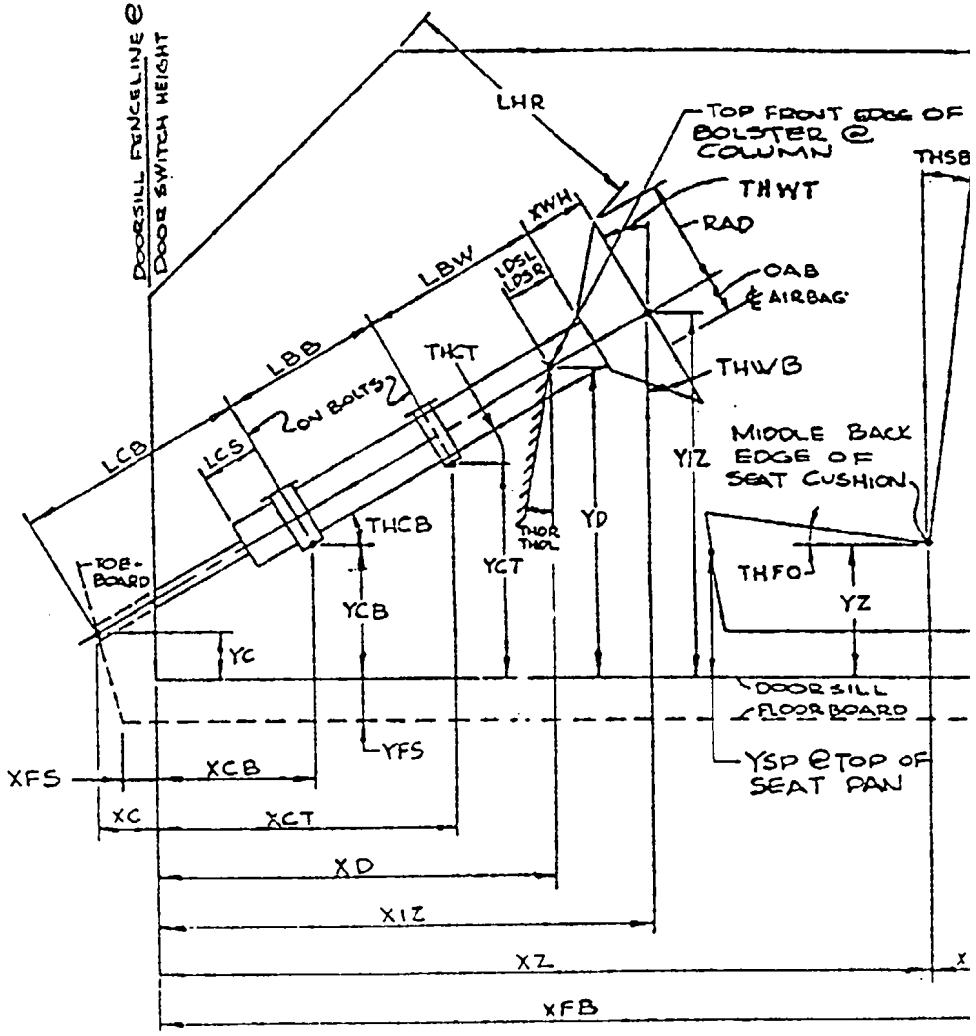
A = 21.25	B = 9.5	KL = 4.5	L = 18.0	T = 19.5
C = 27.25	E = 12.0	KR = 4.75	G = 9.5	
M = 9.5	N = 12.25	F = 6.75	P = 18.0	
R = 19.5	V = 17.5	O = 15.25	Z = 10.0	
HD = 37.5	CA = 27°	W = 6.25	FA = 12°	
D = 4.75	TR = 2.5	TA = 20°	SR = 2.5	
H = 4.75	TL = 2.25	LA = NA	SL = 2.25	

CAR PARAMETERS, PRE & POST TEST

	PRE	POST		PRE	POST
LBW=	15.0	15.0	XD=	10.25	10.5
LBB=	8.5	8.75	YD=	14.75	15.0
LCB=	7.0	6.50	LDSL=	5.25	5.75
XC=	14.25	15.25	LDSR=	5.5	5.75
YC=	8.75	8.75	XBP=	1.5	0.75
YIZ=	21.0	21.5	XFB=	35.5	35.5
XIZ=	17.75	17.25	XFS=	7.5	6.25
XZ=	34.0	34.5	LHR=	11.5	12.0
YZ=	4.75	5.25	YSP=	2.0	NA
THCT=	19°	23.°	XFS=	2.75	3.0
THCB=	19°	21°	LCS=	1.25	1.5
THWT=	20°	35°	OAB=	0.75	NA
THWB=	20°	28°	XCB=	-8.0	-8.0
THFO=	13°	12°	YCB=	10.25	10.0
THSB=	24°	24°	XCT=	0.25	0.0
THDL=	44°	56°	YCT=	14.0	13.75
THDR=	45°	55°			

	PRE	POST			
		N	S	E	W
RAD=	7.13	6.75	7.25	7.25	7.25
XWH=	4.5	3.0	4.5	4.25	4.0

ALL DIMENSIONS TO NEAREST 1/4 INCH & WHOLE DEGREE



DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the dummy moved forward on the seat until the upper torso and head contacted and were enfolded by the air bag. At the same time, the knees came forward to strike the knee bolster and the hands travelled from the steering wheel to the dash. The dummy rebounded from the air bag, striking the head restraint at the top of the seat with the back of the head.

The dummy came to rest in an upright position leaning slightly to the right and facing forward. The air bag was still in contact with the torso.

PART 572 DUMMY DATA SUMMARY

TEST NO. 840726B

DRIVER DUMMY

	POSITIVE DIRECTIONS* MAX (g)	TIME (msec)		NEGATIVE DIRECTIONS** MAX (g)	TIME (msec)
HEAD ACCELERATION					
LONGITUDINAL	2.25	60.25		17.30	89.63
LATERAL	4.56	78.00		3.88	86.13
VERTICAL	8.00	68.38		8.38	77.38
RESULTANT		17.68	max @	89.63	
HIC		24.73	from	76.13 to	148.75
DELTA V (MPH)		-18.6	@	180.00	
DELTA X (INCHES)		-14.2	@	180.00	
CHEST ACCELERATION					
LONGITUDINAL	1.89	167.50		19.90	101.13
LATERAL	4.28	88.75		1.69	62.50
VERTICAL	2.54	156.63		7.42	90.25
RESULTANT		21.06	max @	101.50	
DELTA V (MPH)		-15.7	@	144.00	
DELTA X (INCHES)		-15.2	@	180.00	
PELVIS ACCELERATION					
LONGITUDINAL	4.30	115.13		34.05	84.88
LATERAL	9.81	73.63		6.23	85.38
VERTICAL	4.85	73.38		11.55	99.38
RESULTANT		34.84	@	84.88	
DELTA V (MPH)		-17.7	@	108.00	
DELTA X (INCHES)		-19.9	@	180.00	

	MAX (lb)	TIME (msec)	MAX (lb)	TIME (msec)
FEMUR FORCE***				
LEFT	354.13	51.75	1097.66	78.13
RIGHT	314.44	51.63	1013.90	83.88

* LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: DOWNWARD

** LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD

*** COMPRESSION: NEGATIVE

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY
TEST NO. 840726A

NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX (g)	POSITIVE DIRECTION TIME (msec)		NEGATIVE DIRECTION MAX (g)	NEGATIVE DIRECTION TIME (msec)
1	STEERING COLUMN HUB	124.0	-15.0	32.5					
	POSTERIOR	Δ V = -5.1 mph @ 113.50 msec Δ X = -7.4 in @ 180.00 msec			0.90	124.63		3.96	61.00
	LATERAL				2.24	124.88		3.59	41.63
	INFERIOR				1.72	24.13		0.74	56.88
	RESULTANT					4.99	@	43.00	
2	LEFT B PILLAR	101.0	-29.5	15.5					
	LONGITUDINAL	Δ V = -5.6 mph @ 111.25 msec Δ X = -8.7 in @ 180.00 msec			0.61	176.75		4.21	52.38
	LATERAL				0.62	78.00		0.82	55.25
	VERTICAL				1.01	19.00		0.51	105.63
	RESULTANT					4.25	@	52.50	
3	RIGHT B PILLAR	99.5	30.0	15.5					
	LONGITUDINAL	Δ V = -5.5 mph @ 111.50 msec Δ X = -8.4 in @ 180.00 msec			0.63	166.13		4.17	42.75
	LATERAL				0.40	4.13		0.67	24.00
	VERTICAL				0.67	156.00		1.06	48.50
	RESULTANT					4.19	@	42.63	
4	FIREWALL	152.0	-24.5	26.5					
	LONGITUDINAL	Δ V = -5.3 mph @ 109.75 msec Δ X = -8.0 in @ 180.00 msec			0.83	176.25		4.92	30.00
5	RIGHT FENDER WELL INNER	185.5	29.5	32.0					
	LONGITUDINAL	Δ V = -5.4 mph @ 108.75 msec Δ X = -8.2 in @ 180.00 msec			0.68	175.75		4.26	36.38

* REFERENCE: X - REAR BUMPER (+ FORWARD), Y - VEHICLE CENTERLINE (+ TO RIGHT)
Z - GROUND (+ UP)

ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS IN INCHES

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY
TEST NO. 840726B

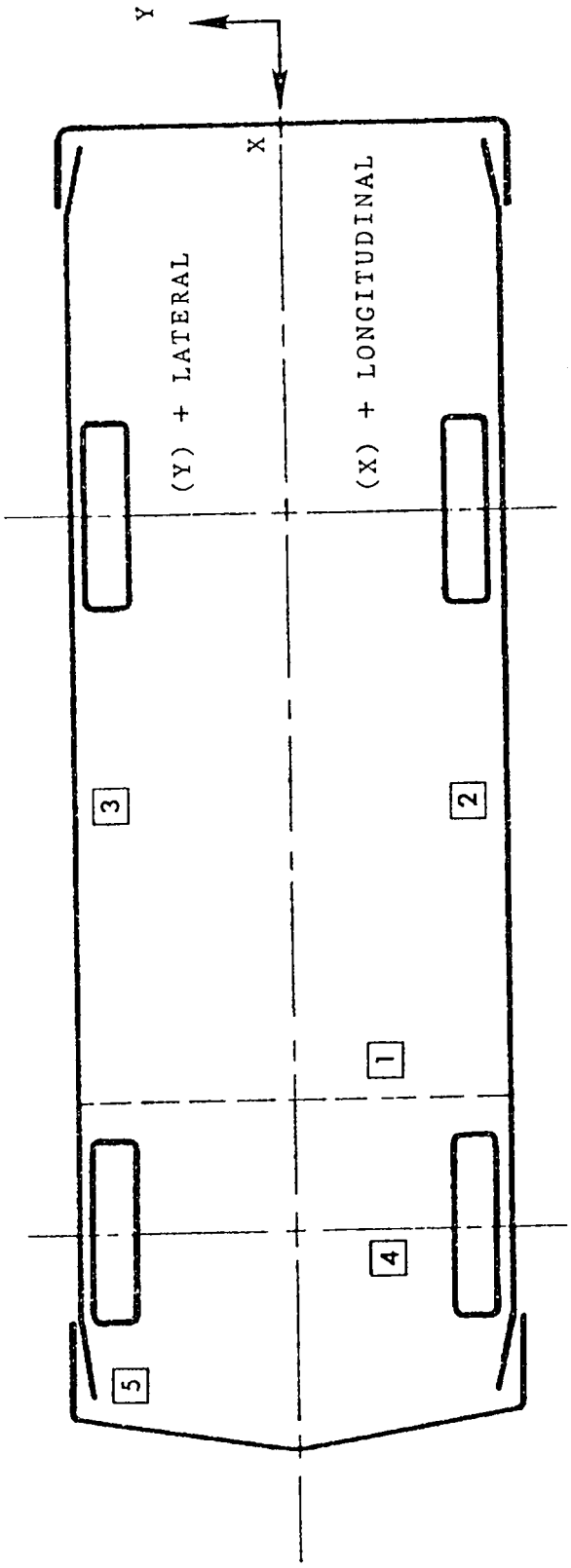
NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX (g)	POSITIVE DIRECTION TIME (msec)		NEGATIVE DIRECTION MAX (g)	NEGATIVE DIRECTION TIME (msec)
1	STEERING COLUMN HUB	124.0	-15.0	32.5					
	POSTERIOR	Δ V = -14.3 mph @ 162.13 msec Δ X = -21.3 in @ 180.00 msec			9.23	88.25		20.39	82.25
	LATERAL				18.58	83.00		9.15	72.75
	INFERIOR				22.44	100.25		44.89	83.25
	RESULTANT					52.15	@	83.13	
2	LEFT B PILLAR	101.0	-29.5	15.5					
	LONGITUDINAL	Δ V = -14.3 mph @ 85.50 msec Δ X = -22.2 in @ 180.00 msec			1.69	92.00		16.46	47.25
	LATERAL				3.63	46.25		2.72	80.25
	VERTICAL				4.54	46.00		2.64	94.50
	RESULTANT					17.27	@	47.00	
3	RIGHT B PILLAR	99.5	30.0	15.5					
	LONGITUDINAL	Δ V = -14.6 mph @ 164.88 msec Δ X = -22.8 in @ 180.00 msec			1.15	104.75		16.25	47.63
	LATERAL				1.81	107.75		3.53	45.88
	VERTICAL				3.32	47.00		5.41	74.00
	RESULTANT					16.78	@	47.38	
4	FIREWALL	152.0	-24.5	26.5					
	LONGITUDINAL	Δ V = -14.5 mph @ 110.25 msec Δ X = -22.4 in @ 180.00 msec			5.13	116.00		18.55	46.38
5	RIGHT FENDER WELL INNER	185.5	29.5	32.0					
	LONGITUDINAL	Δ V = -13.2 mph @ 156.88 msec Δ X = -20.9 in @ 180.00 msec			1.43	177.63		32.57	43.75

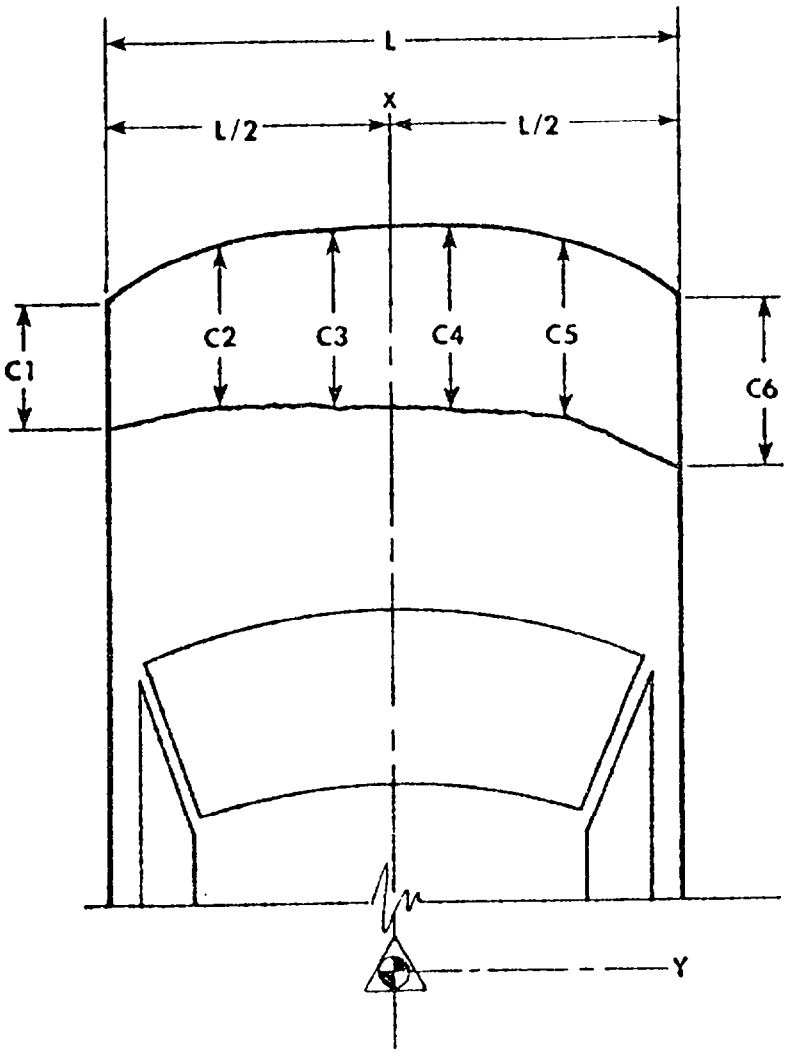
AIR BAG FIRING TIME = 44.61 msec

* REFERENCE: X - REAR BUMPER (+ FORWARD), Y - VEHICLE CENTERLINE (+ TO RIGHT)
Z - GROUND (+ UP)

ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS IN INCHES

VEHICLE ACCELEROMETER LOCATIONS





NOTE: C1 through C6 are spaced equally apart

VEHICLE 1979 FORD LTD

	PRE-TEST	POST-TEST	CRUSH
L	68.5	68.5	0
C1	39.88	44.5	4.62
C2	39.75	44.25	4.50
C3	38.25	43.25	5.0
C4	38.50	42.88	4.38
C5	40.0	42.88	2.88
C6	40.5	42.38	1.88
D	DNA	DNA	DNA

ALL MEASUREMENTS IN INCHES
Measurements taken 16' forward of the rear axle centerline

HIGH SPEED CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Right Front	Photosonic 1B	8	1005	Dummy kinematics
2	Right Rear	Photosonic 1B	8	990	Dummy kinematics
3	Right Side Closeup	Photosonic 1B	8	997	Dummy kinematics
4	Left Closeup	Photosonic 1B	25	962	Vehicle impact
5	Right Side Overall	Photosonic 1B	25	995	Vehicle impact
6	Right Side Overall	Kodak	25	24	Overall view of impact
7	Right Closeup	Photosonic 1B	50	497	Vehicle impact

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.

APPENDIX A

PHOTOGRAPHS - TEST 840726A

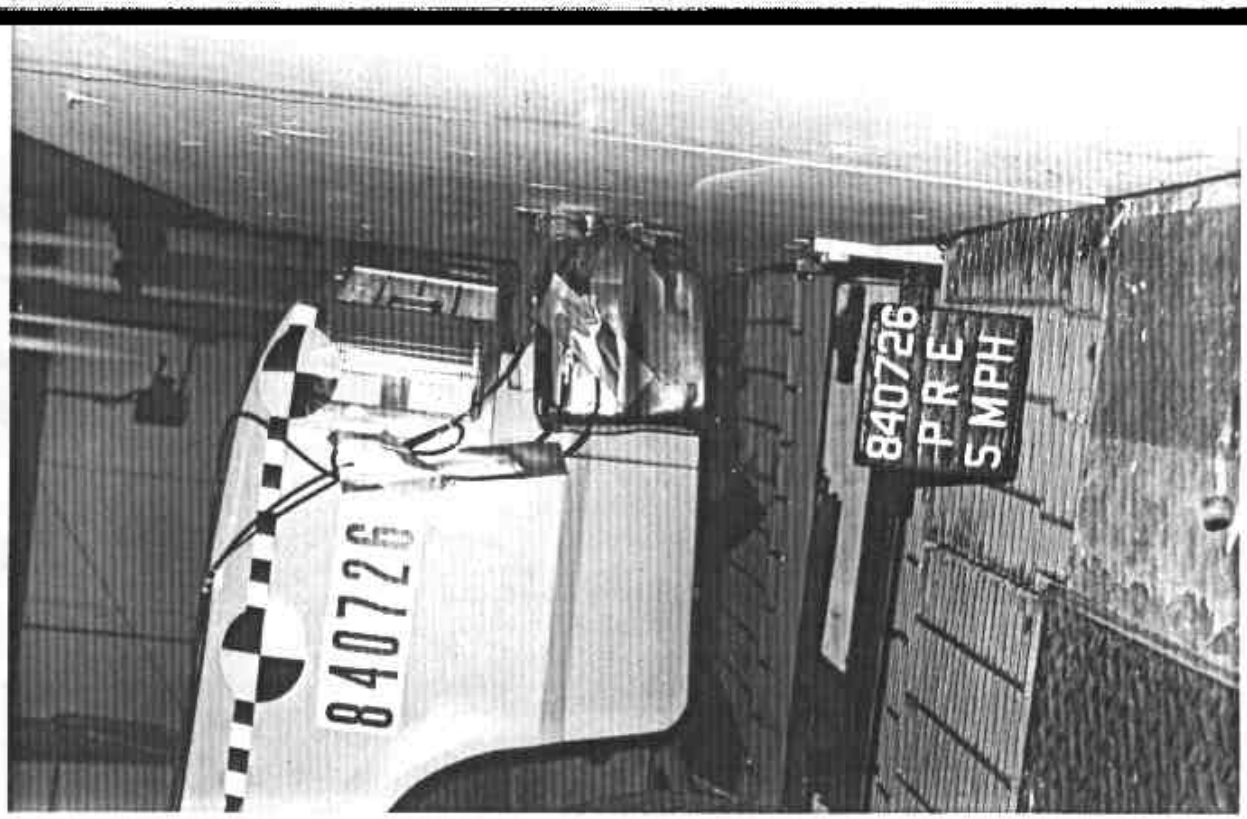


Figure A-1. PRE-TEST CLOSEUP - VIEW 1

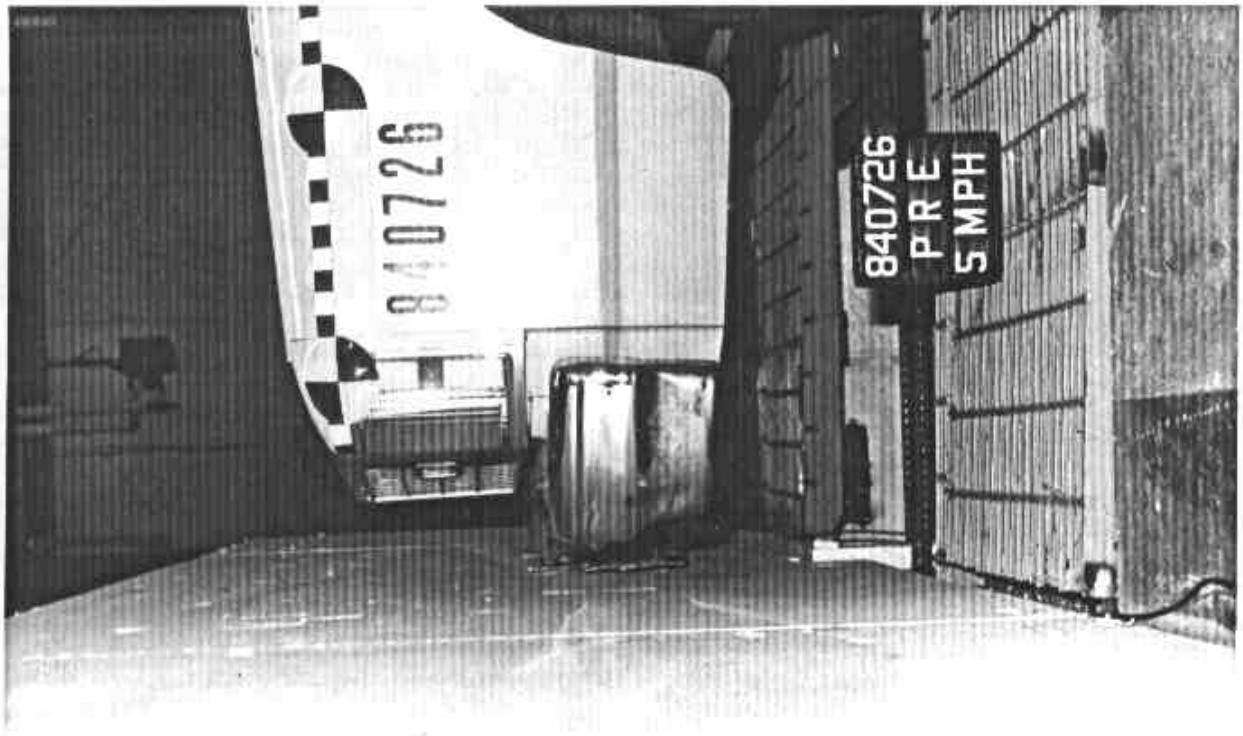


Figure A-2. PRE-TEST CLOSEUP - VIEW 2

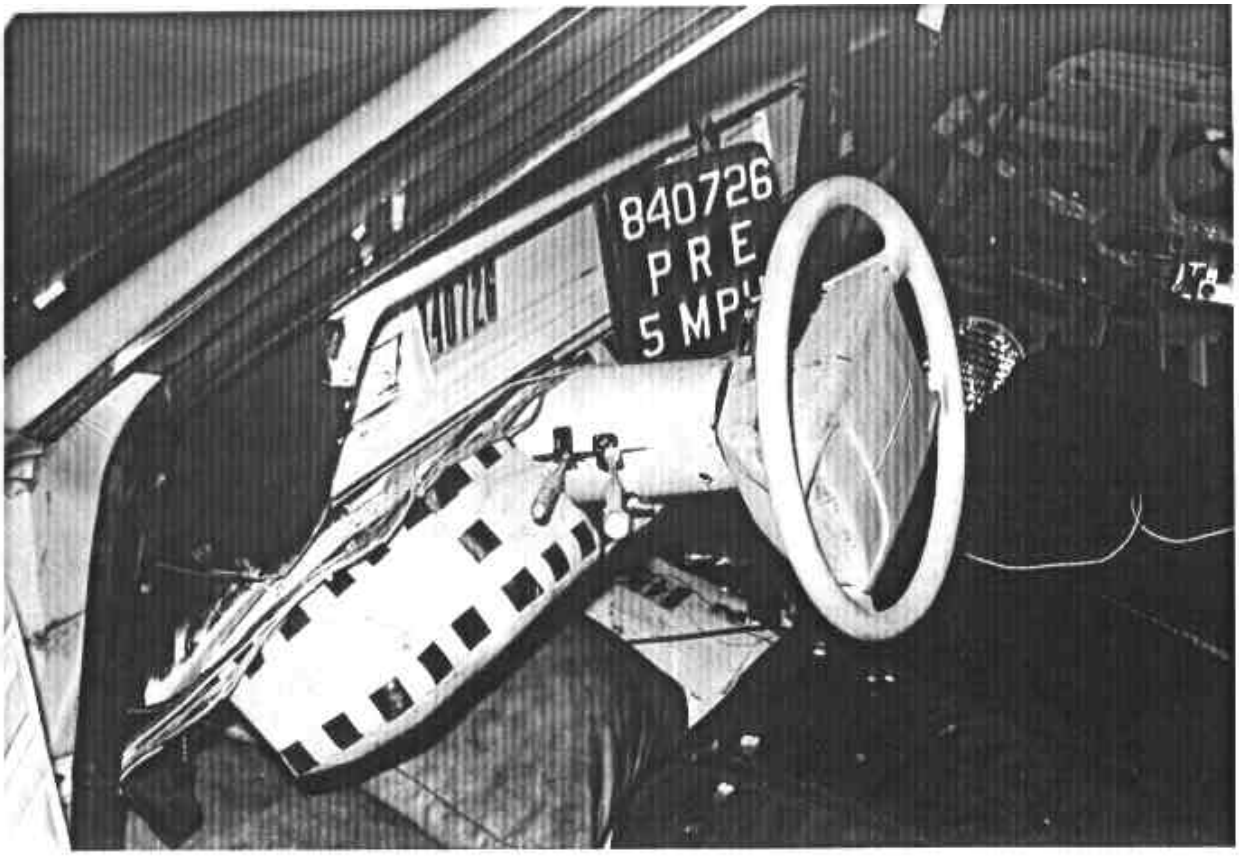


Figure A-3. PRE-TEST CLOSEUP - VIEW 3

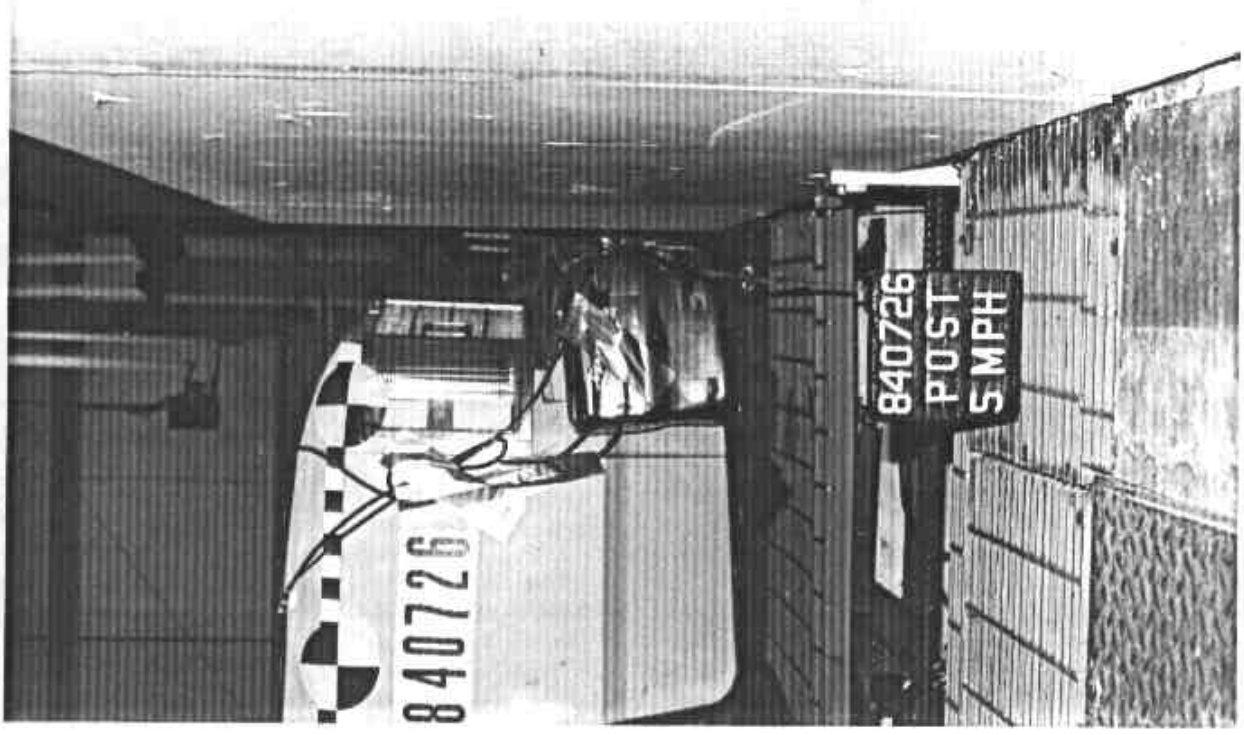


Figure A-4. POST-TEST CLOSEUP - VIEW 1

Figure A-5. POST-TEST CLOSEUP - VIEW 2

APPENDIX B

PHOTOGRAPHS - TEST 840726B

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

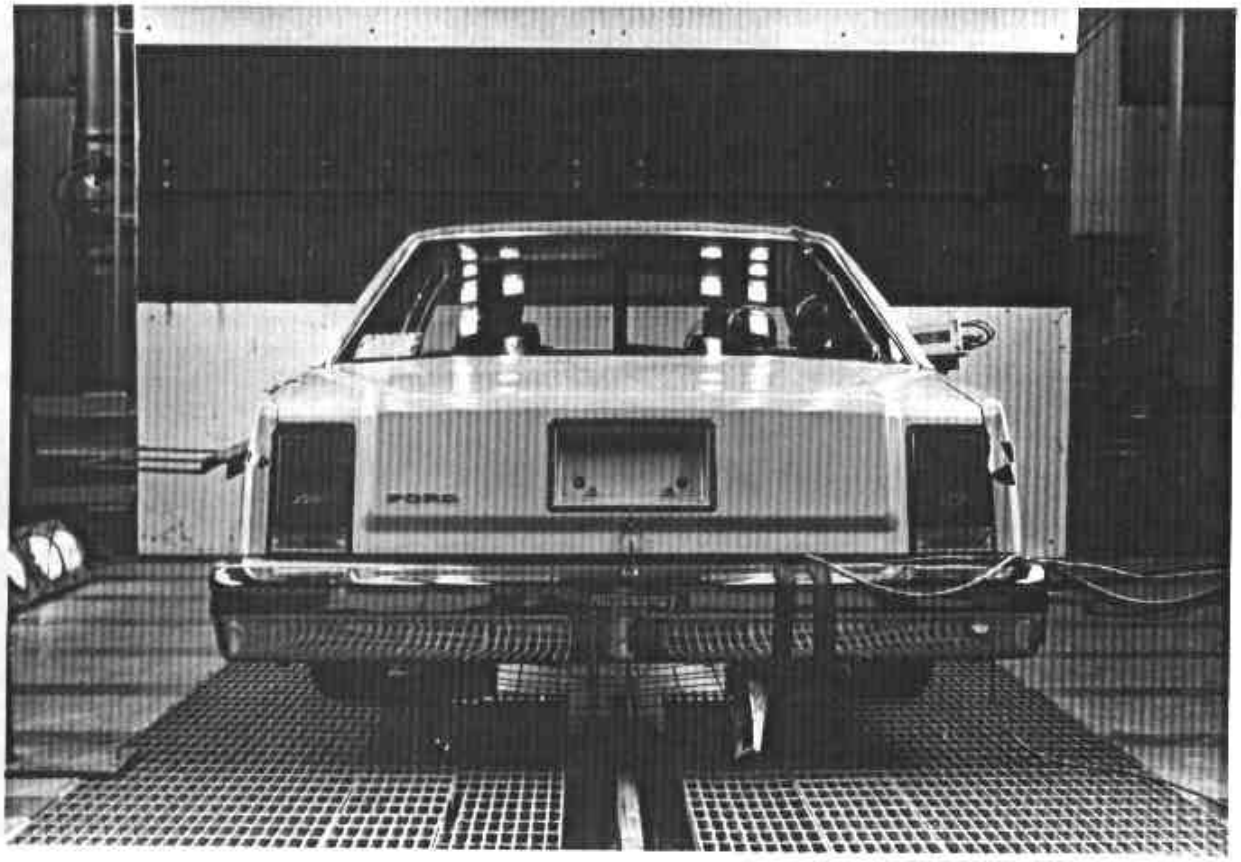


Figure B-2. PRE-TEST OVERALL - VIEW 2

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

Figure B-4. PRE-TEST DRIVER DUMMY - VIEW 1

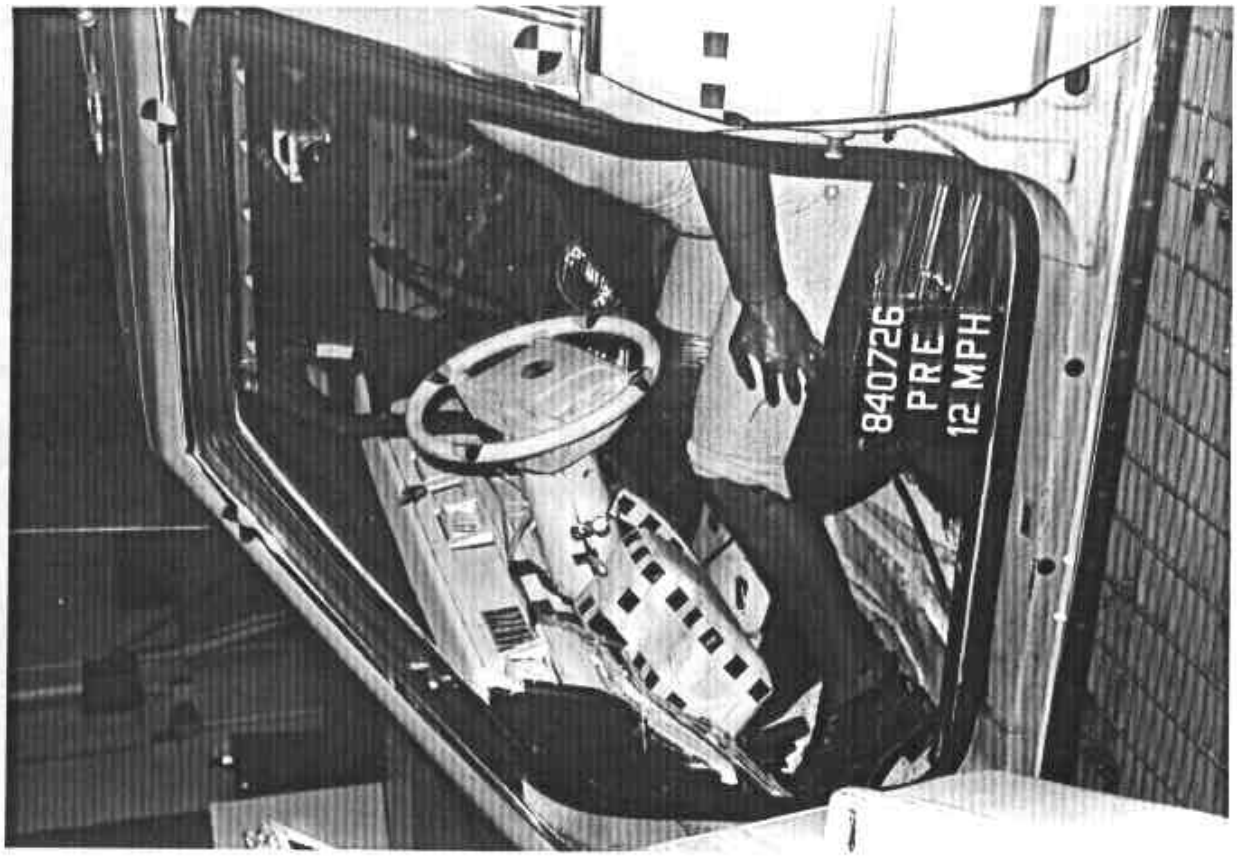


Figure B-5. PRE-TEST DRIVER DUMMY - VIEW 2

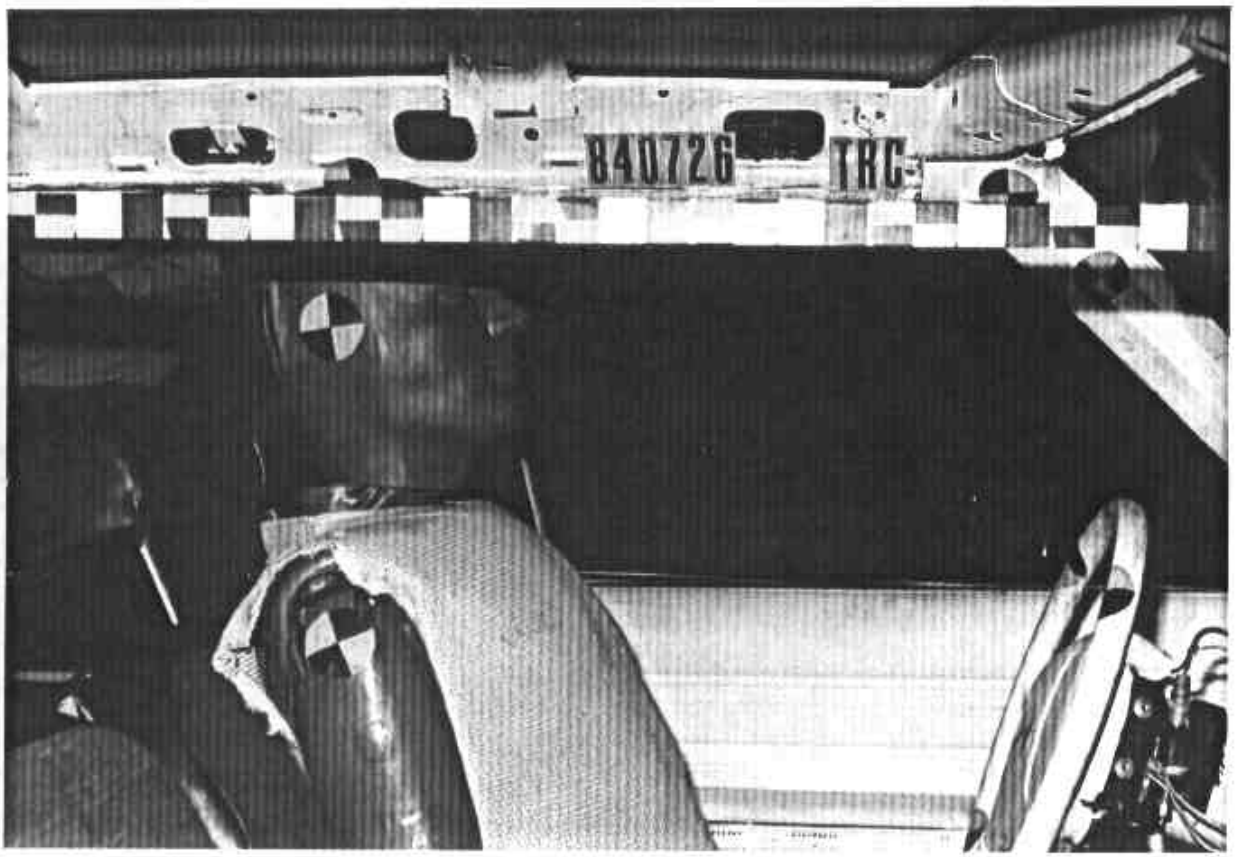


Figure B-6. PRE-TEST DRIVER DUMMY CLOSEUP - VIEW 1

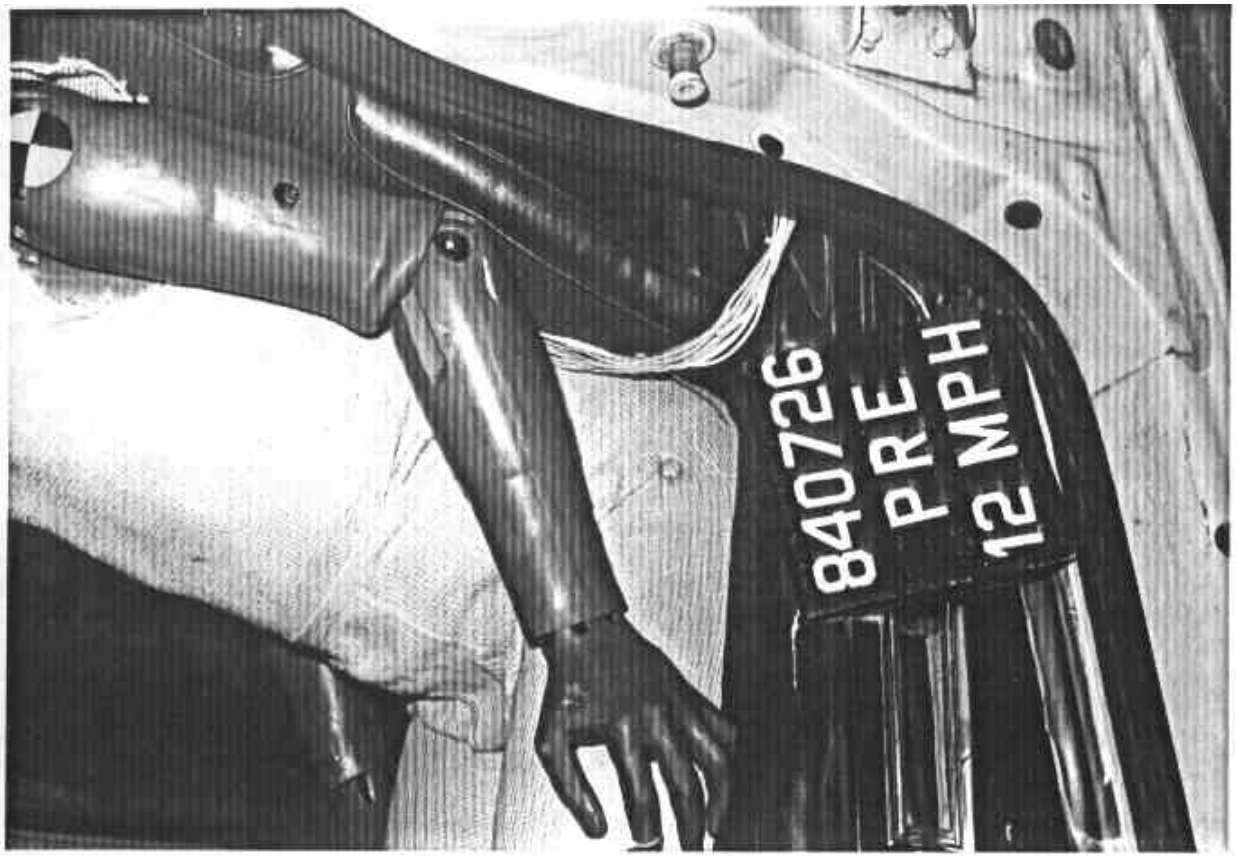


Figure B-7. PRE-TEST DRIVER DUMMY CLOSEUP - VIEW 2

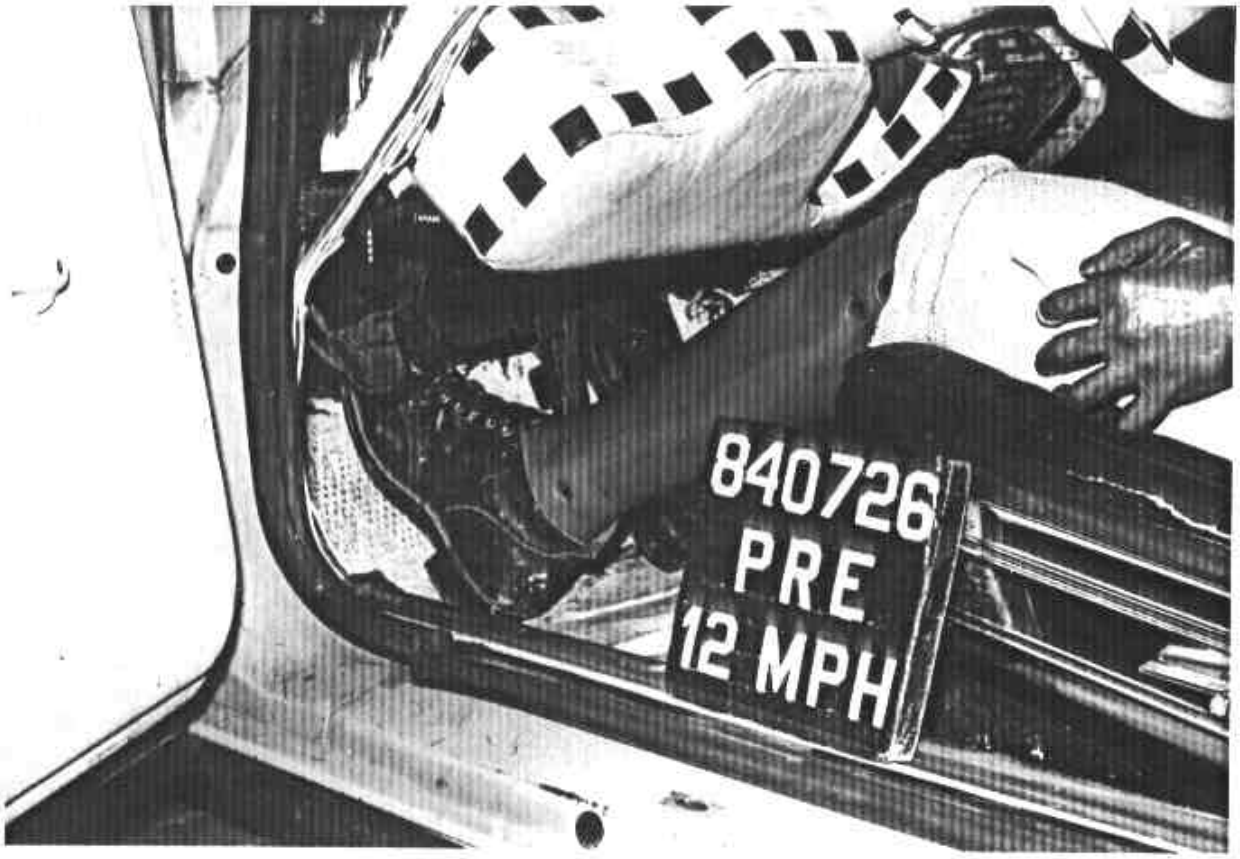


Figure B-8. PRE-TEST DRIVER DUMMY CLOSEUP - VIEW 3

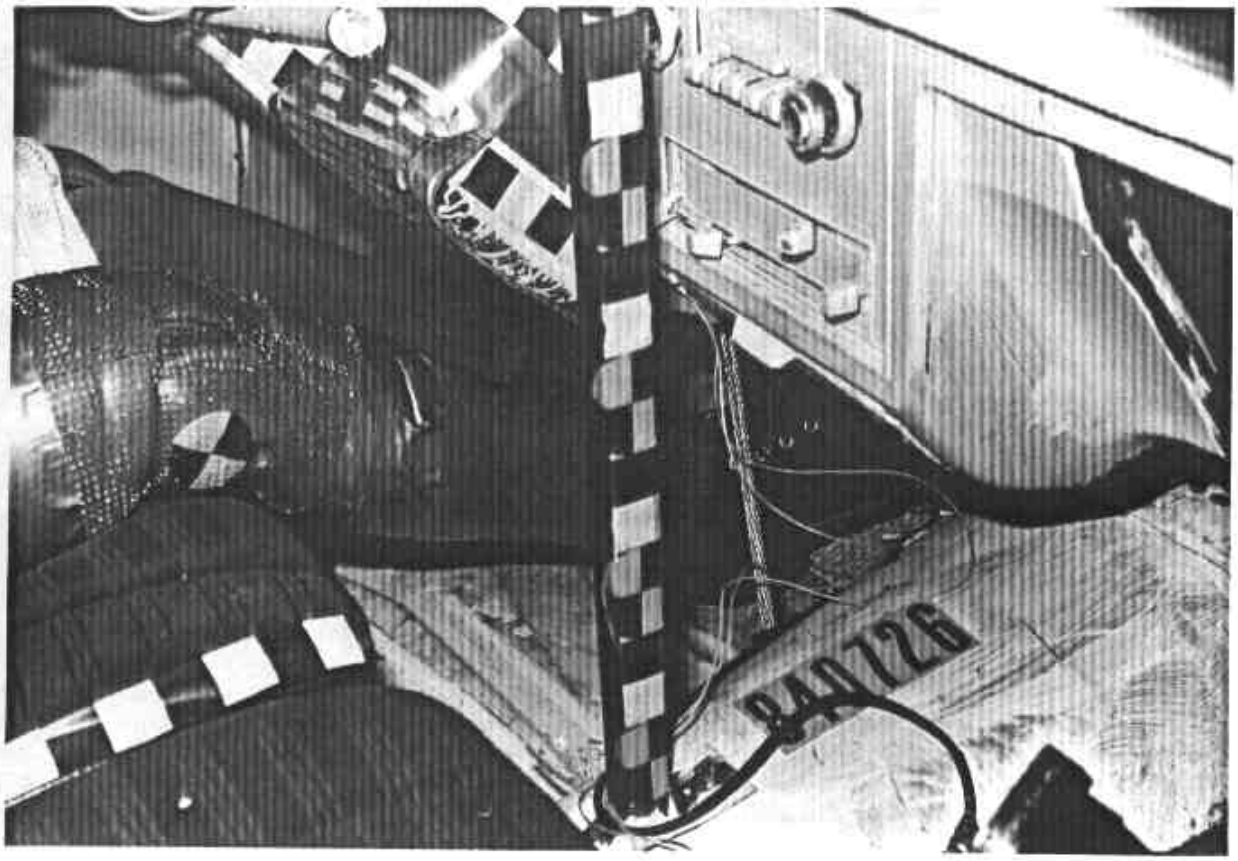


Figure B-9. PRE-TEST DRIVER DUMMY CLOSEUP - VIEW 4

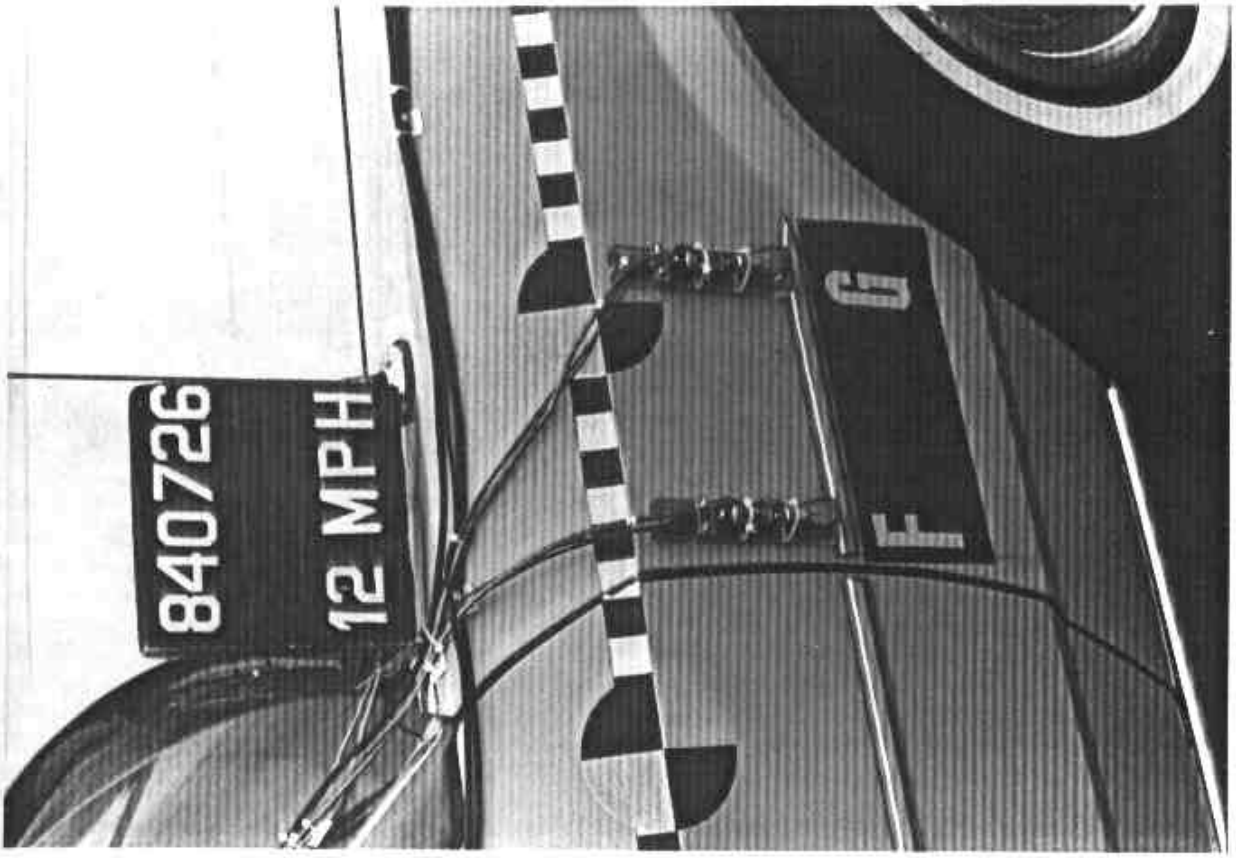


Figure B-10. PRE-TEST INSTRUMENTATION - VIEW 1

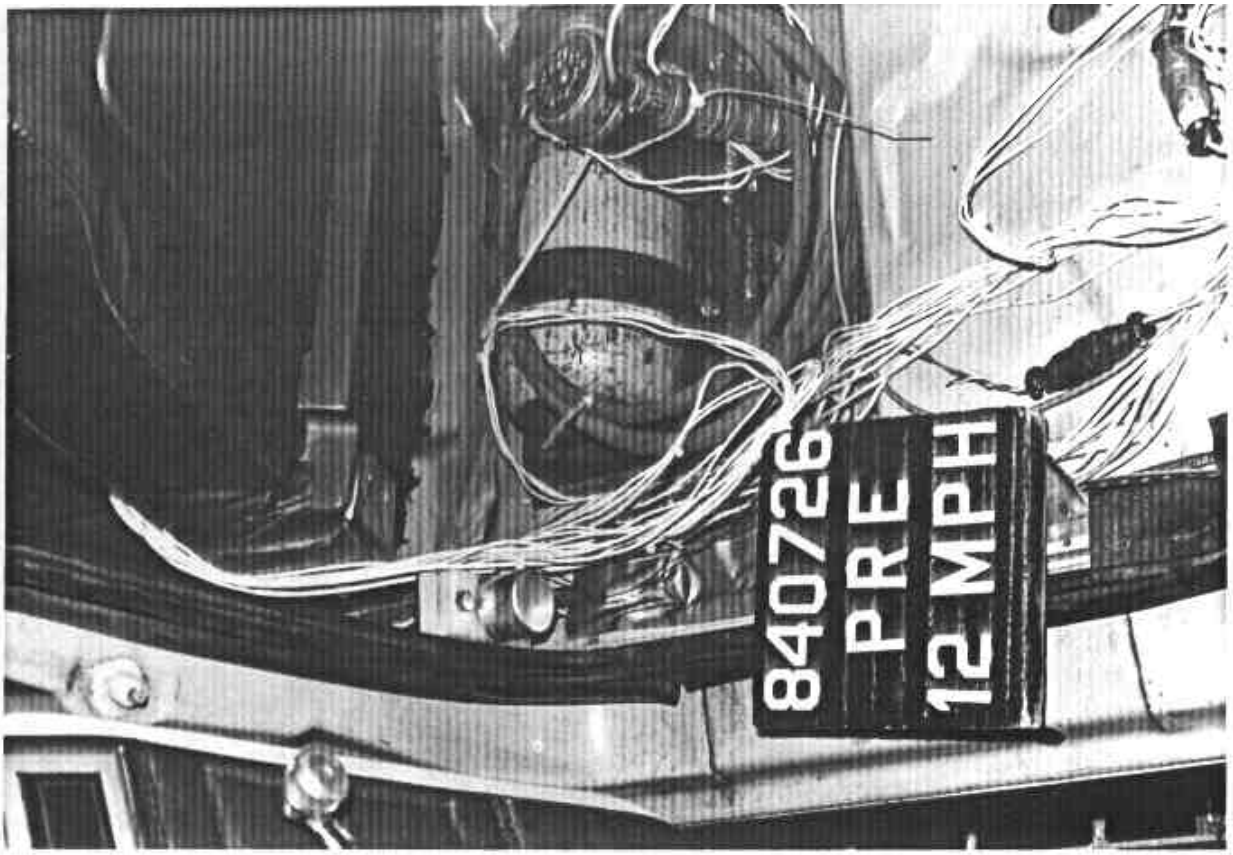


Figure B-11. PRE-TEST INSTRUMENTATION - VIEW 2

Figure B-12. POST-TEST OVERALL - VIEW 1

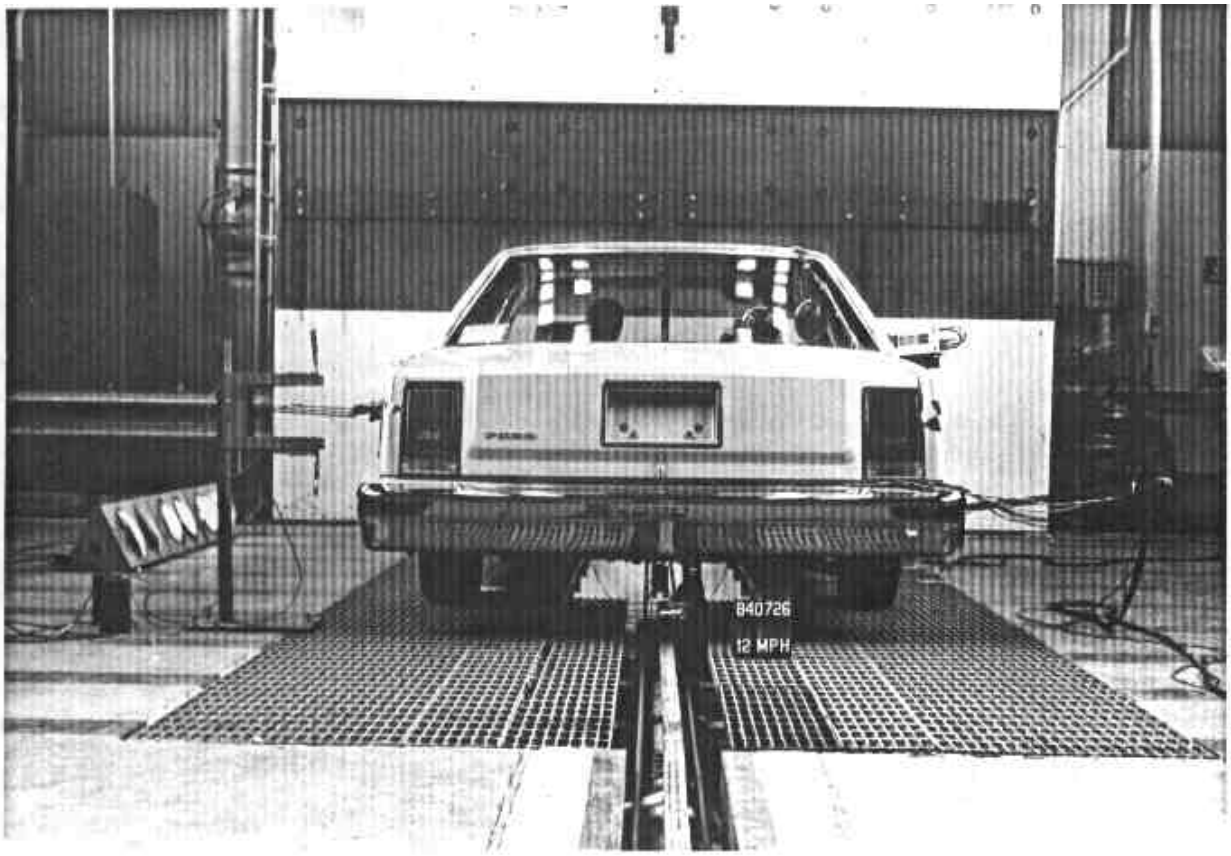


Figure B-13. POST-TEST OVERALL - VIEW 2

Figure B-14. POST-TEST OVERALL - VIEW 3

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

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

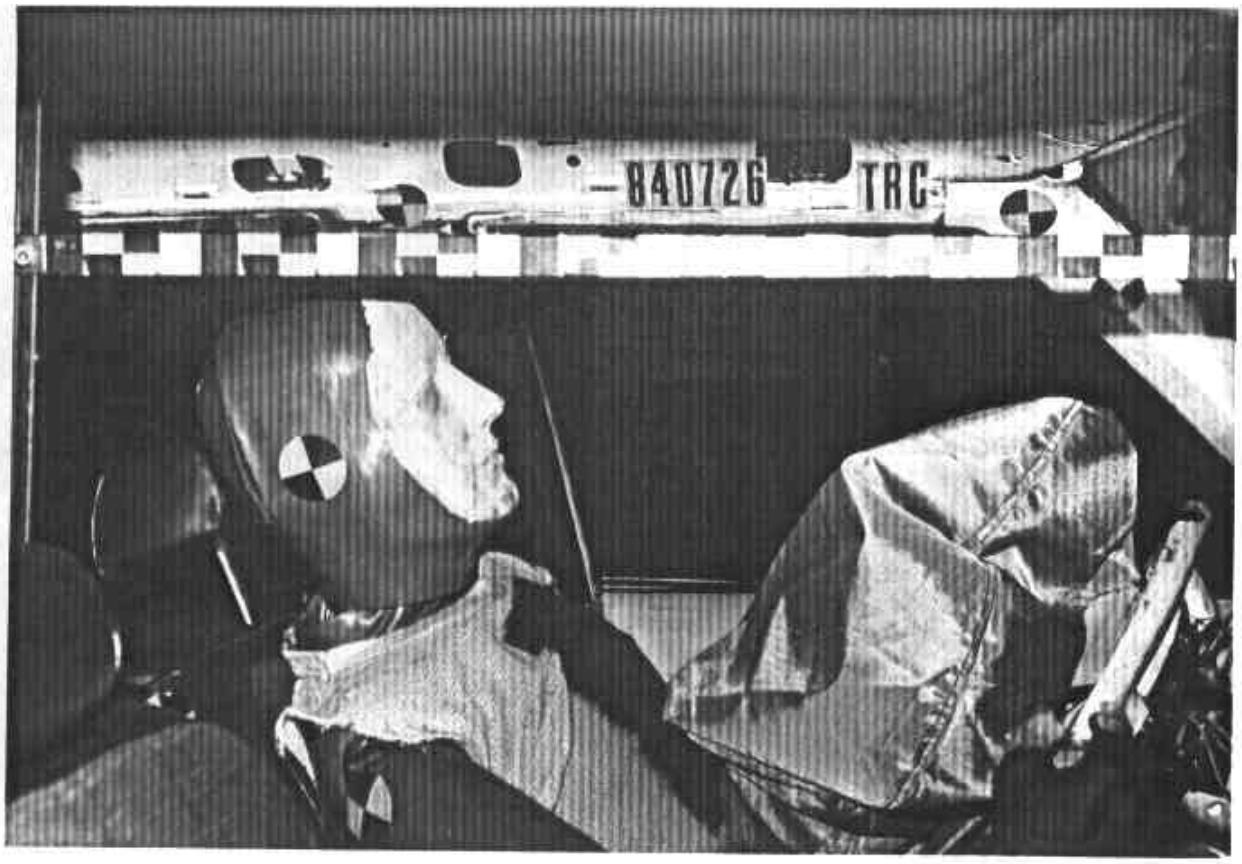


Figure B-17. POST-TEST DRIVER DUMMY CLOSEUP - VIEW 1

Figure B-18. POST-TEST DRIVER DUMMY CLOSEUP - VIEW 2

Figure B-19. POST-TEST DRIVER DUMMY CLOSEUP - VIEW 3

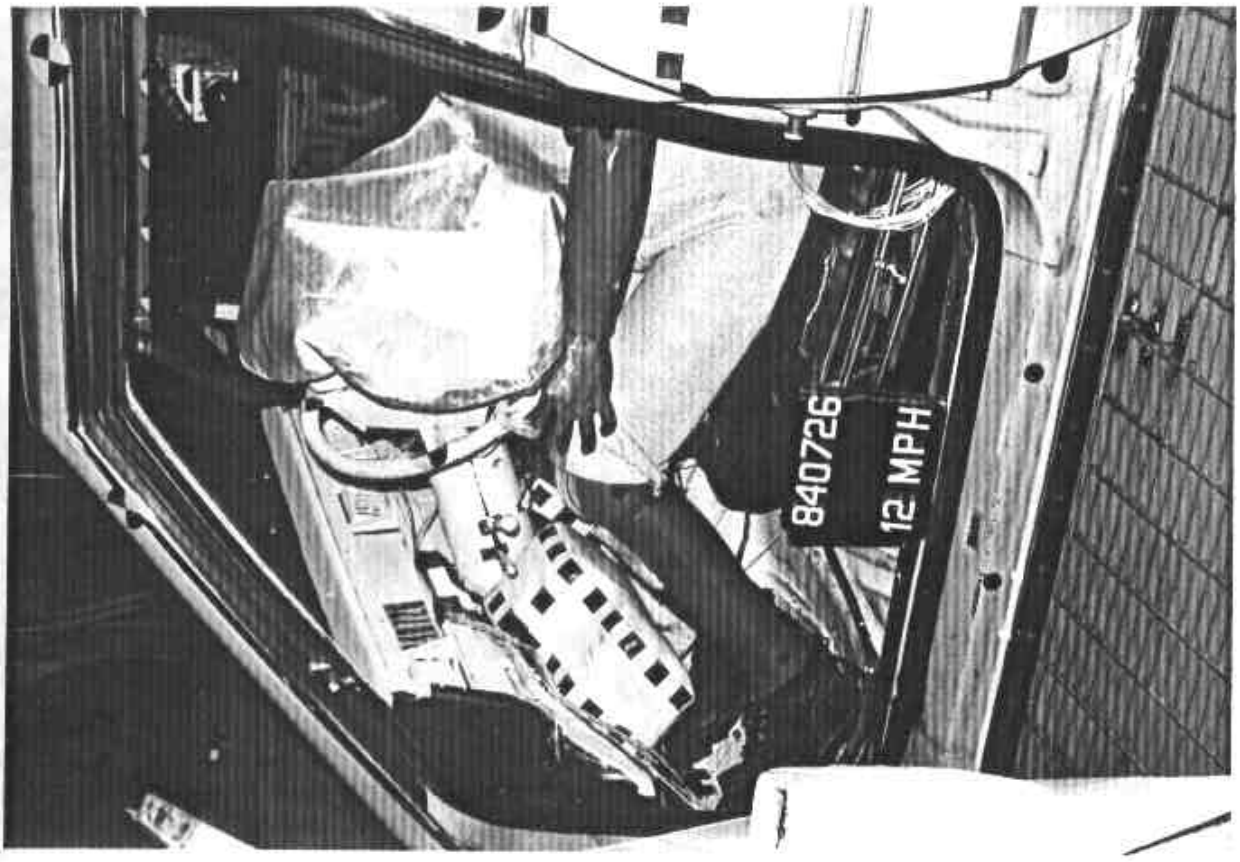


Figure B-20. POST-TEST DRIVER DUMMY CLOSEUP - VIEW 4

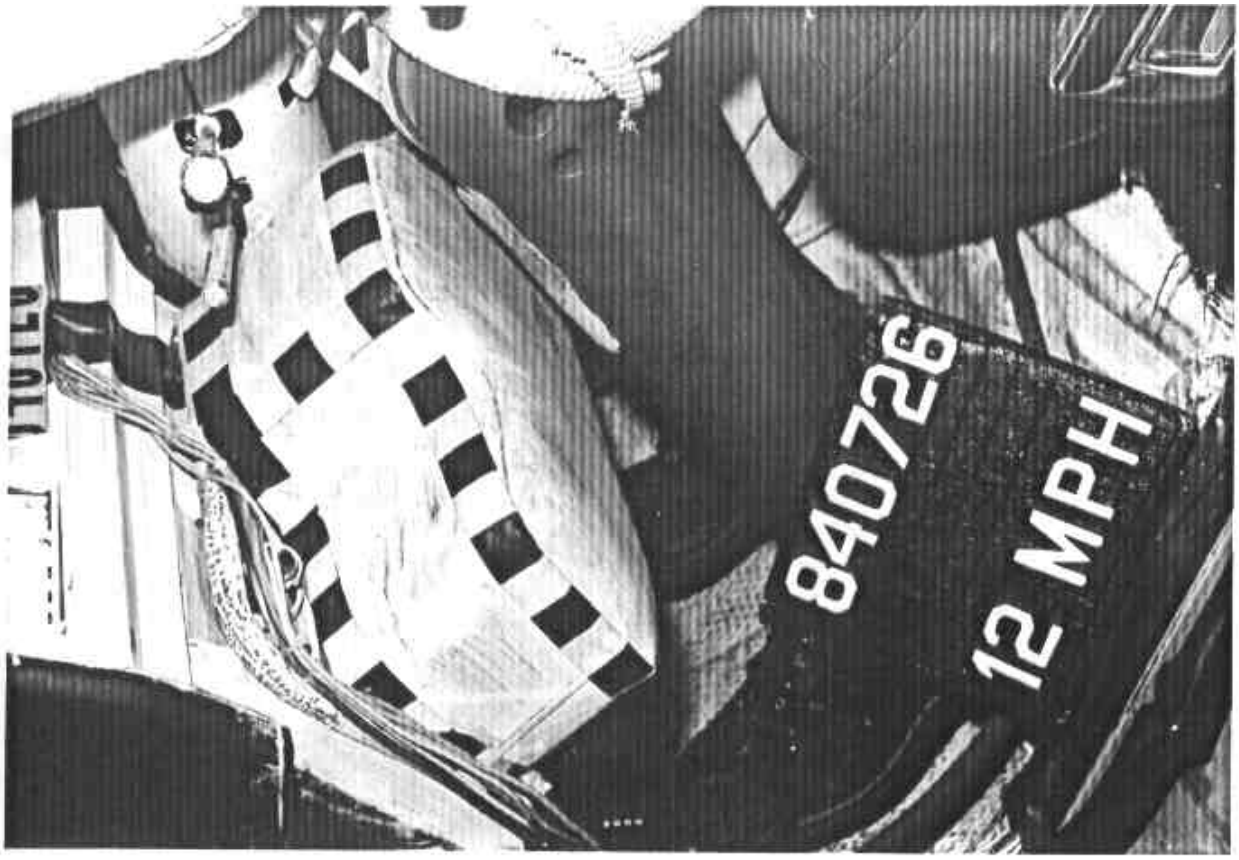


Figure B-21. POST-TEST DRIVER DUMMY CLOSEUP - VIEW 5

Figure B-22. POST-TEST DRIVER DUMMY CLOSEUP - VIEW 6

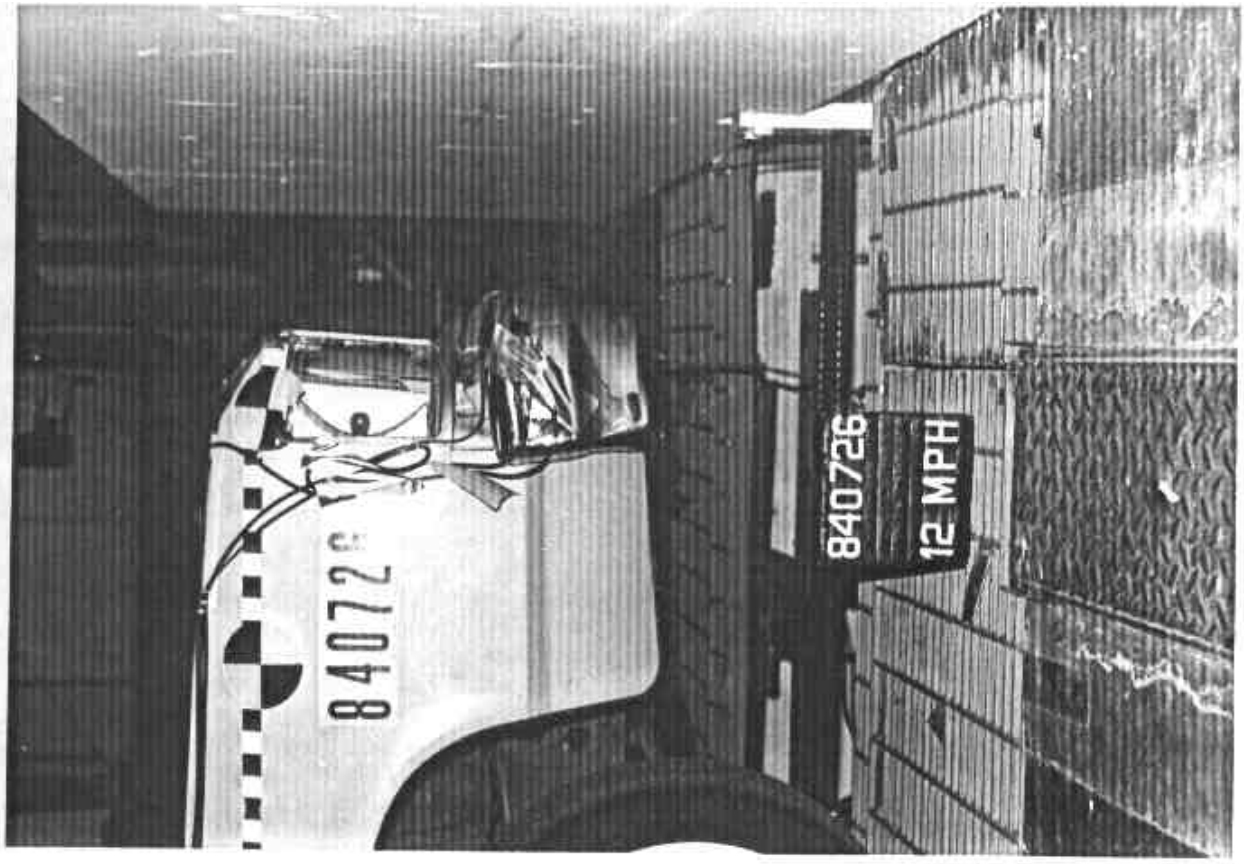


Figure B-23. POST-TEST VEHICLE DAMAGE - VIEW 1

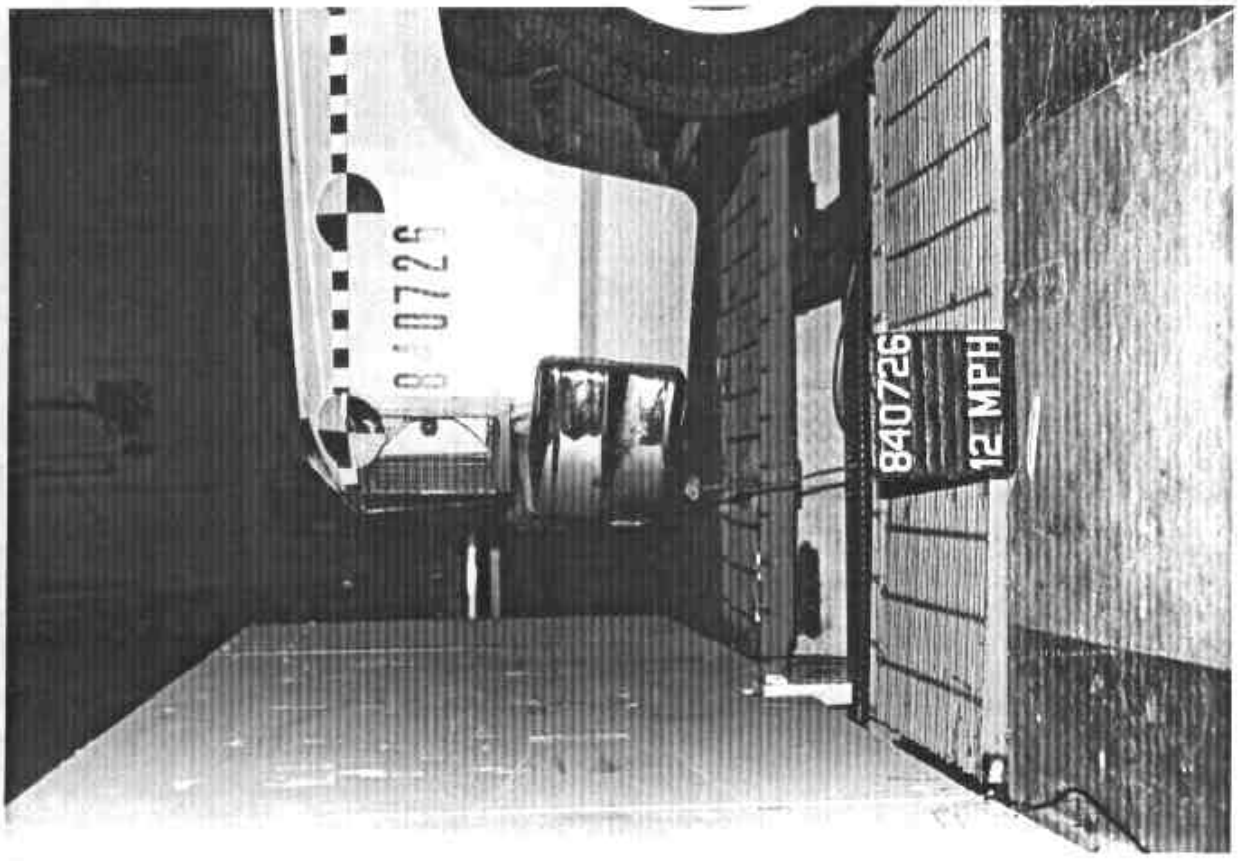
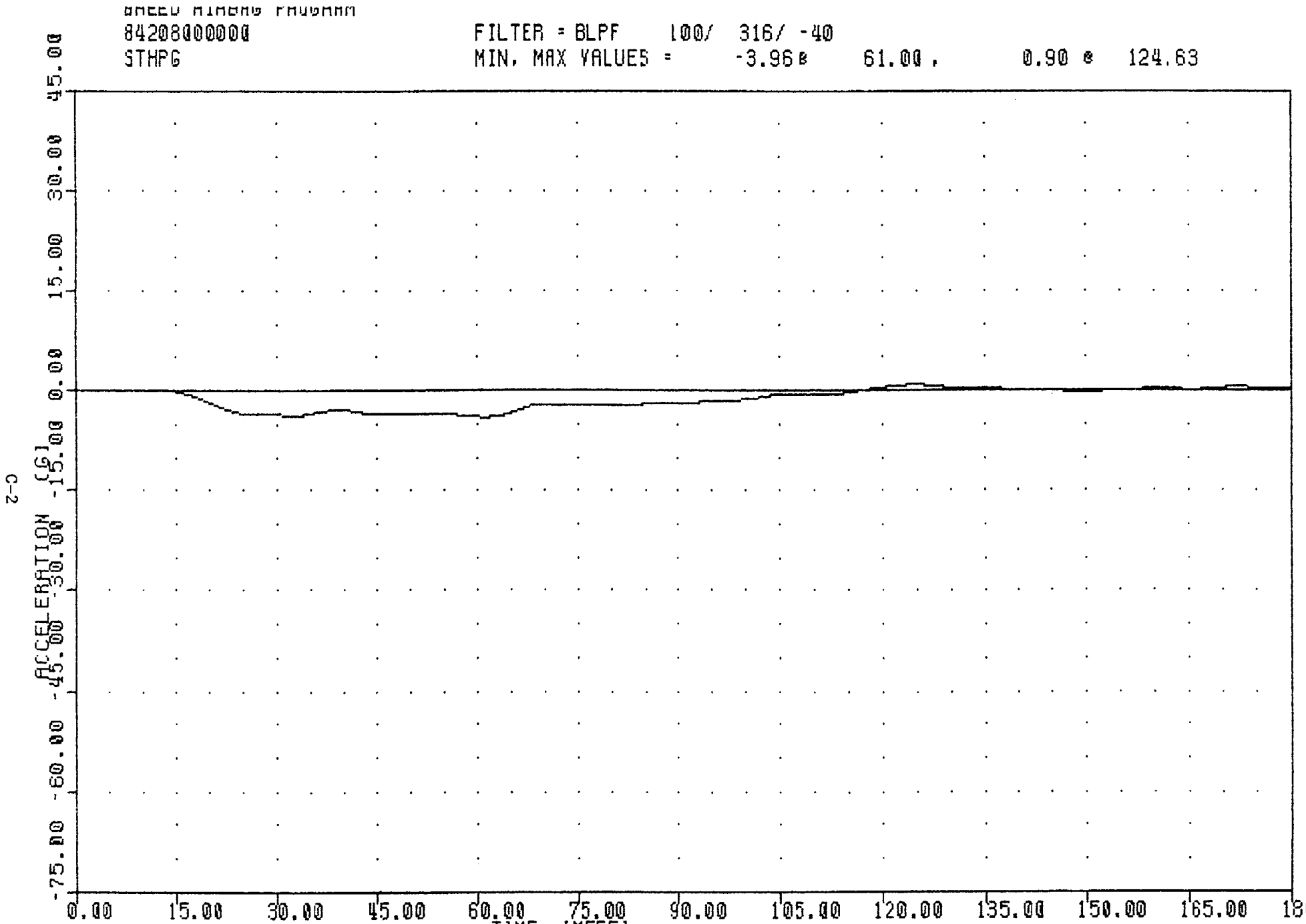


Figure B-24. POST-TEST VEHICLE DAMAGE - VIEW 2

APPENDIX C

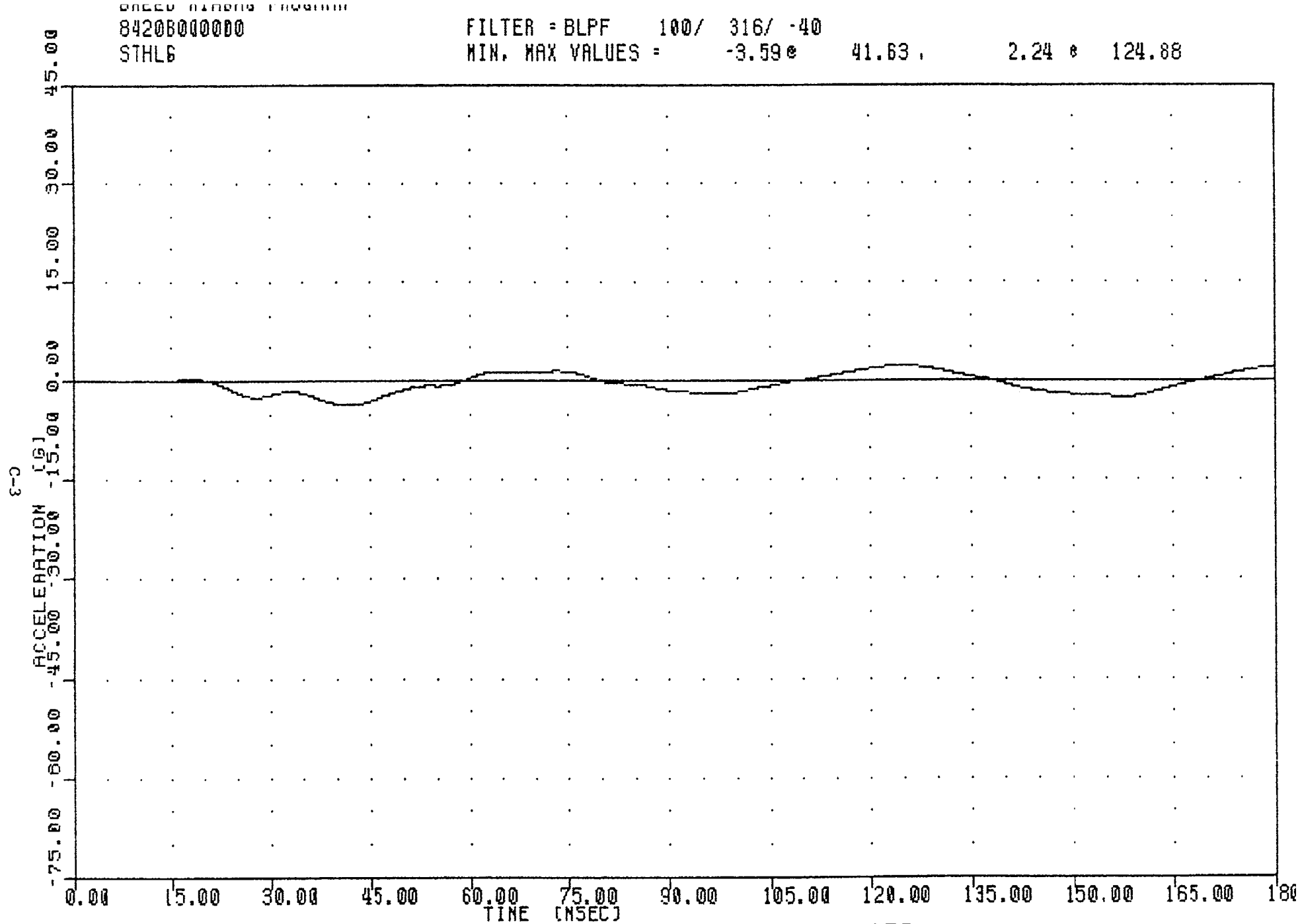
DATA PLOT PRESENTATION - TEST 840726A

Data plots generated from the bumper 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.



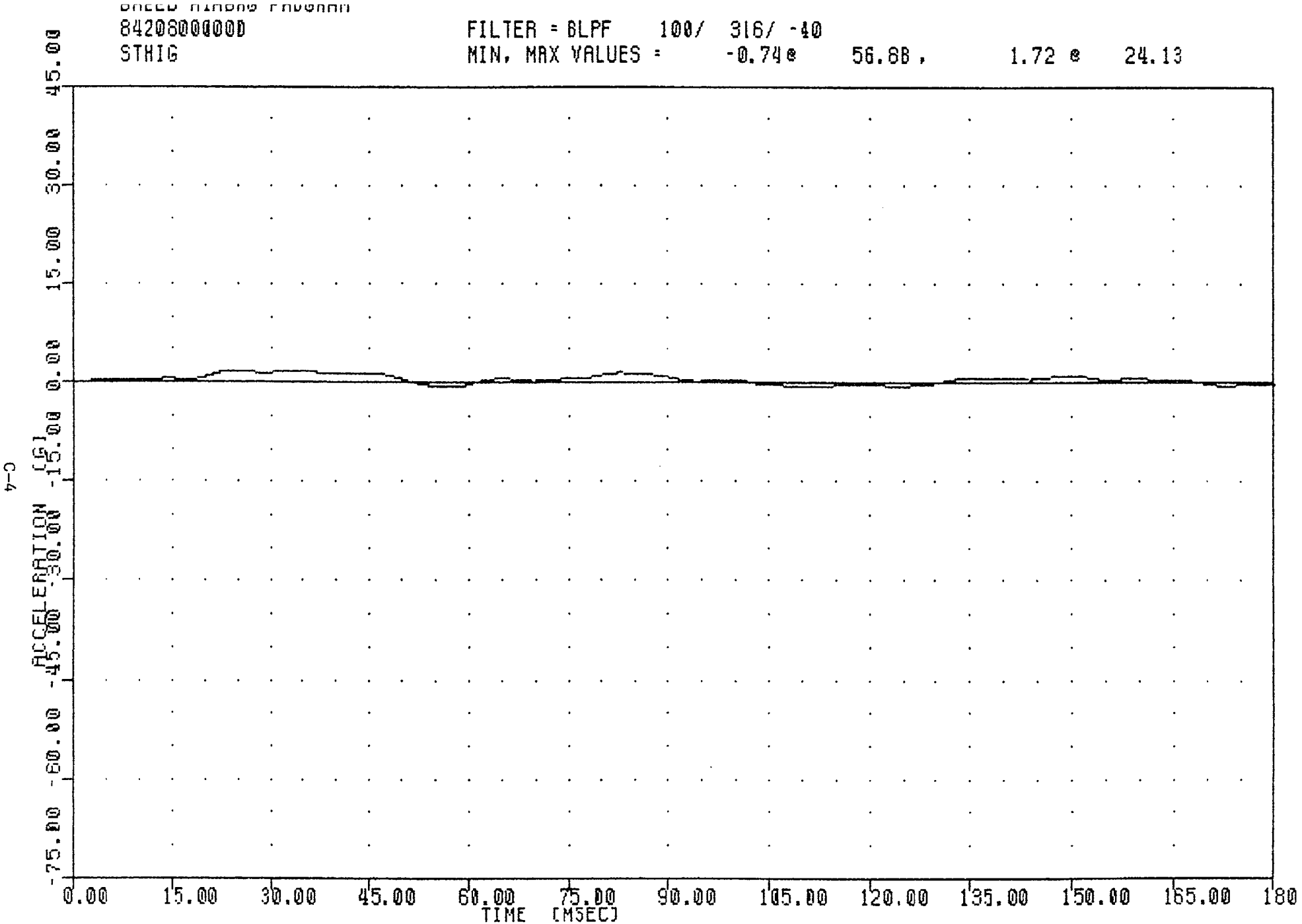
FORD LTD INTO FIXED BARRIER

STEERING COLUMN HUB ACCELERATION POSTERIOR



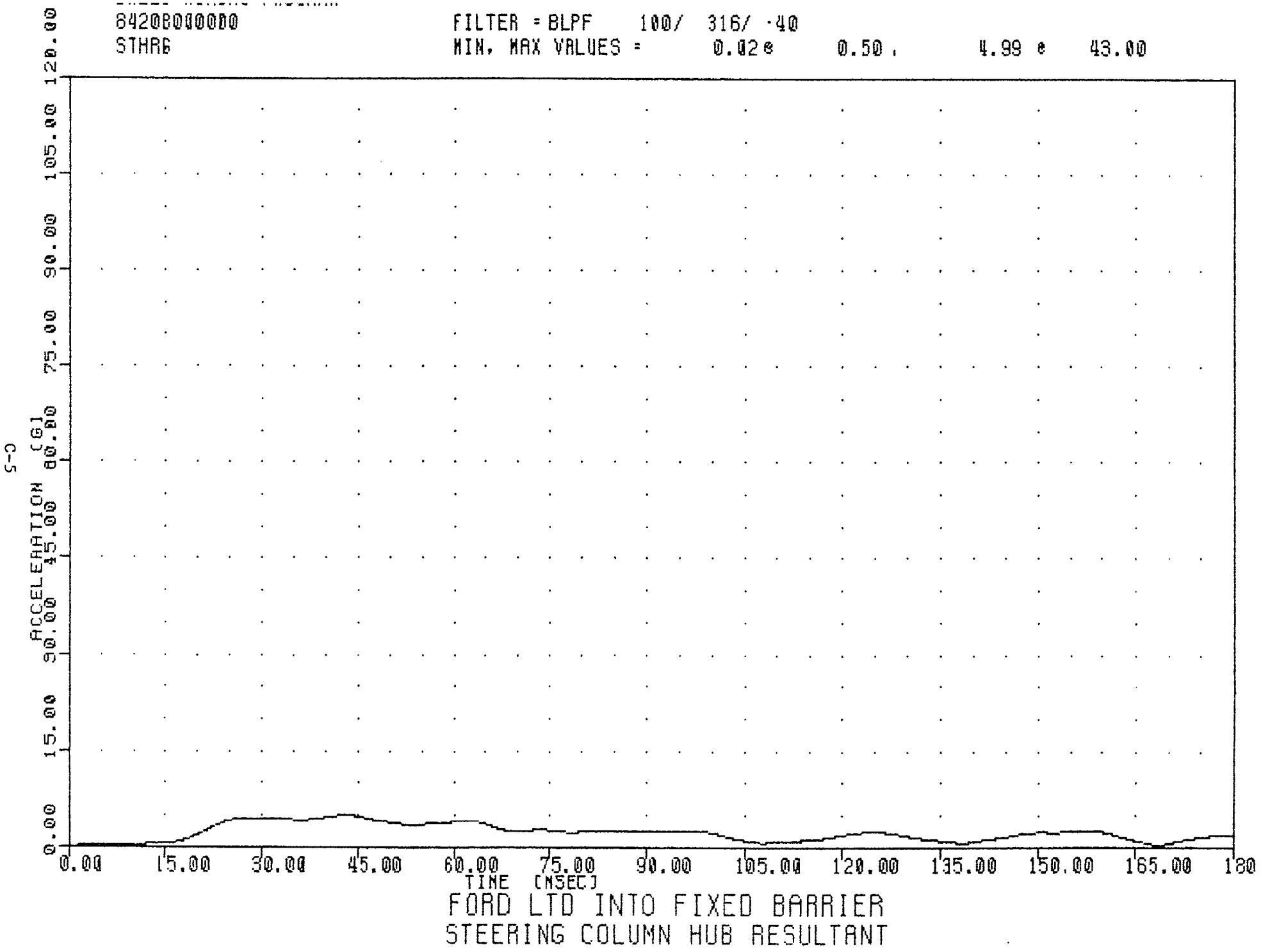
FORD LTD INTO FIXED BARRIER

STEERING COLUMN HUB ACCELERATION LATERAL

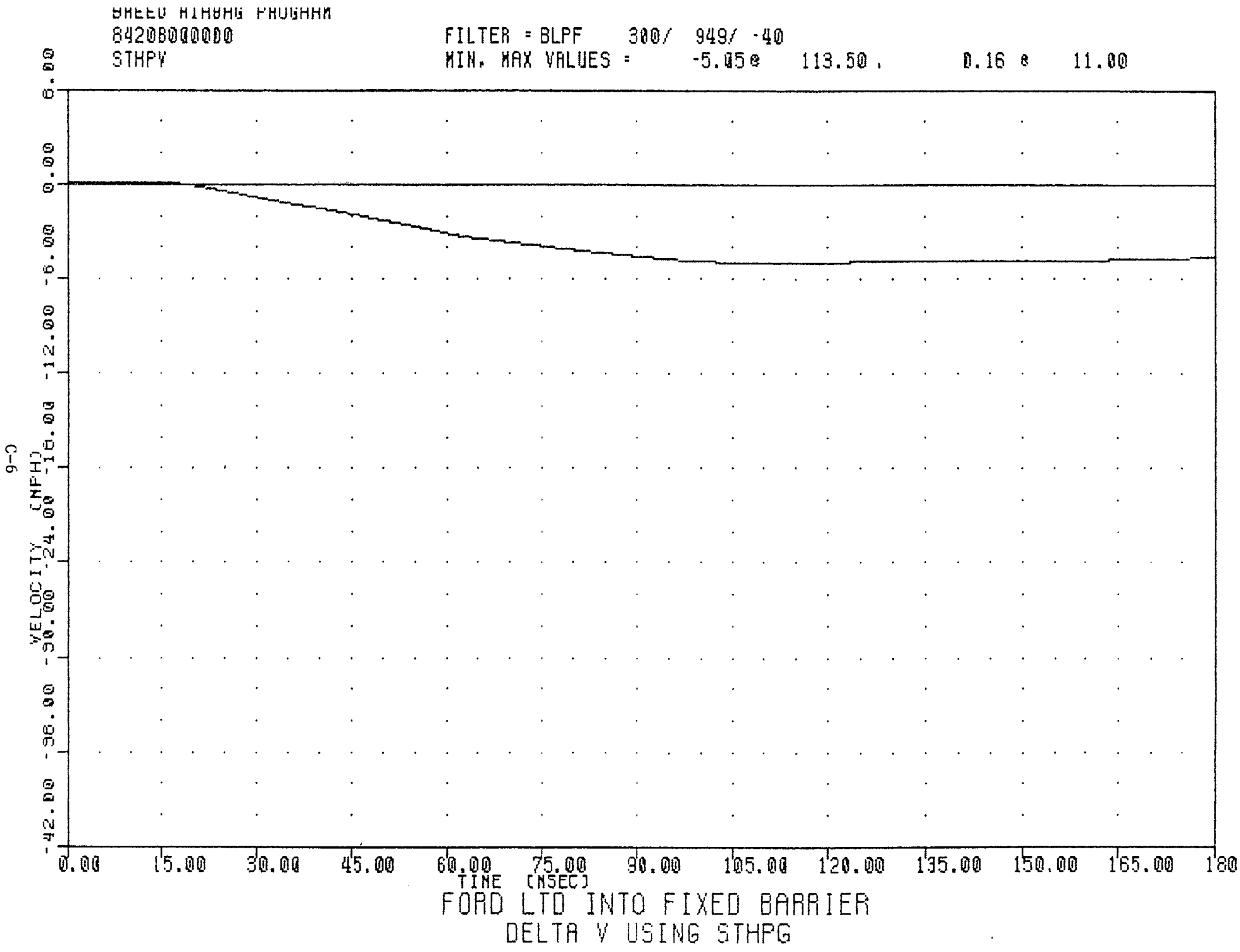


FORD LTD INTO FIXED BARRIER

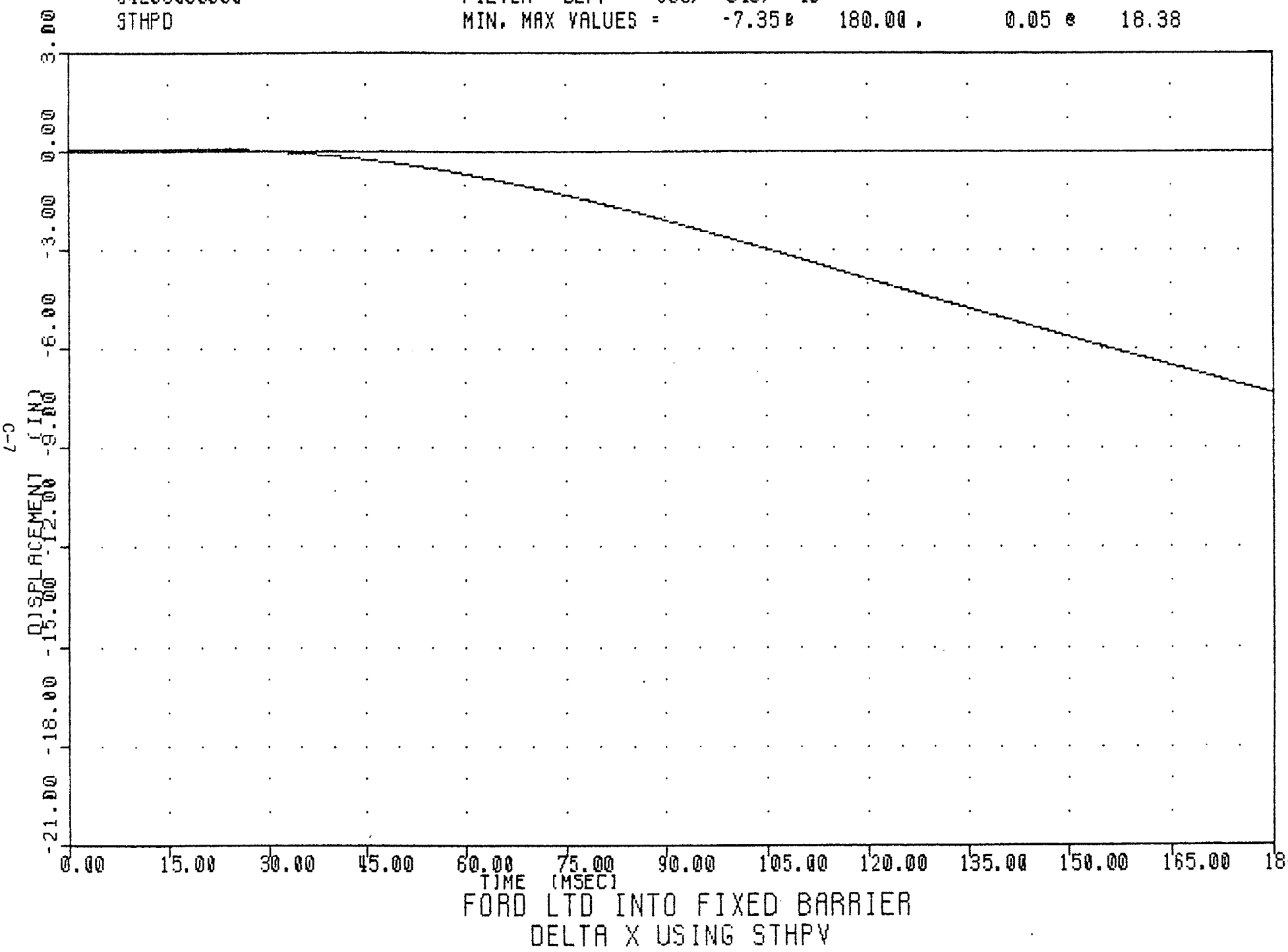
STEERING COLUMN HUB ACCELERATION INFERIOR



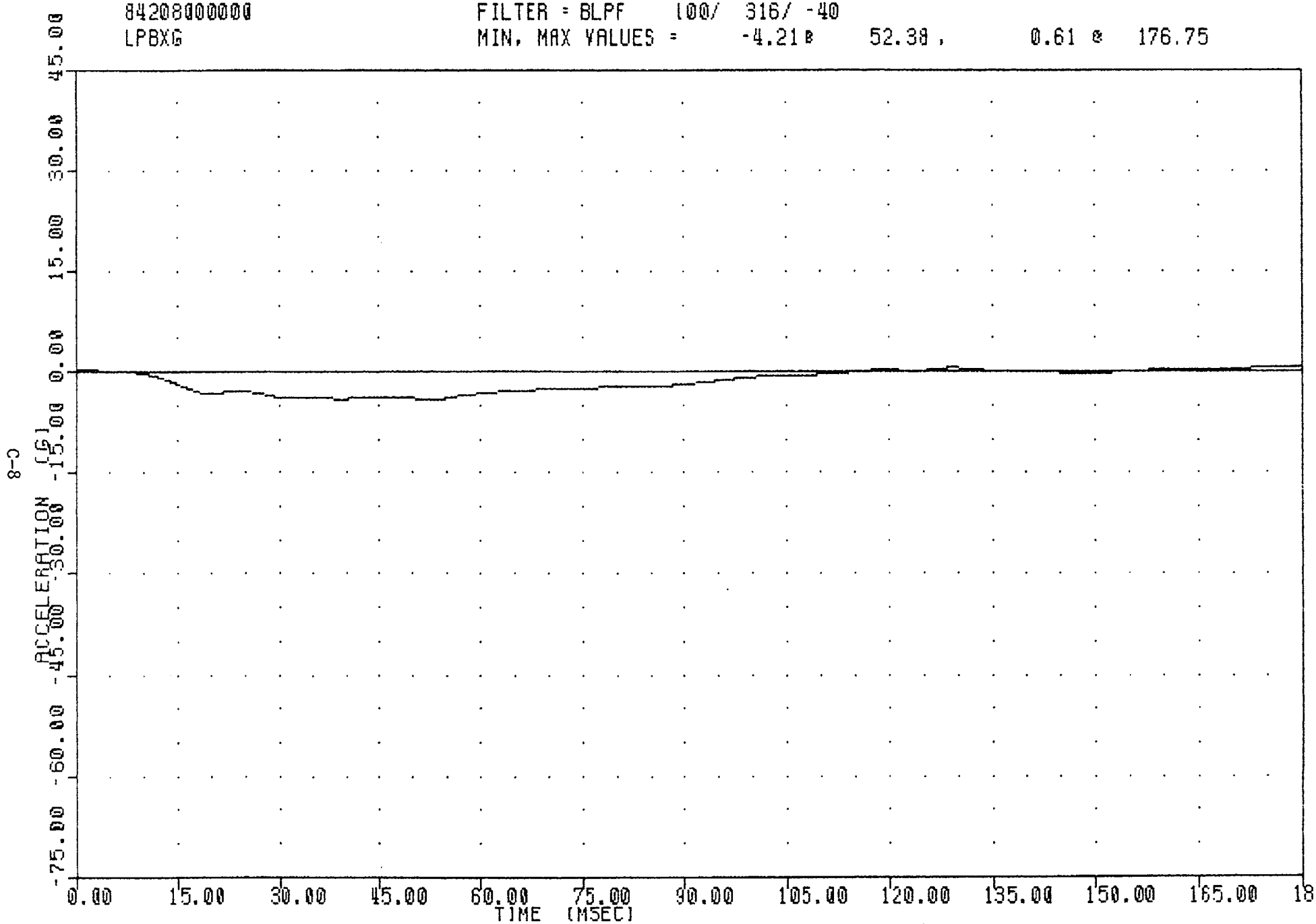
FORD LTD INTO FIXED BARRIER
STEERING COLUMN HUB RESULTANT

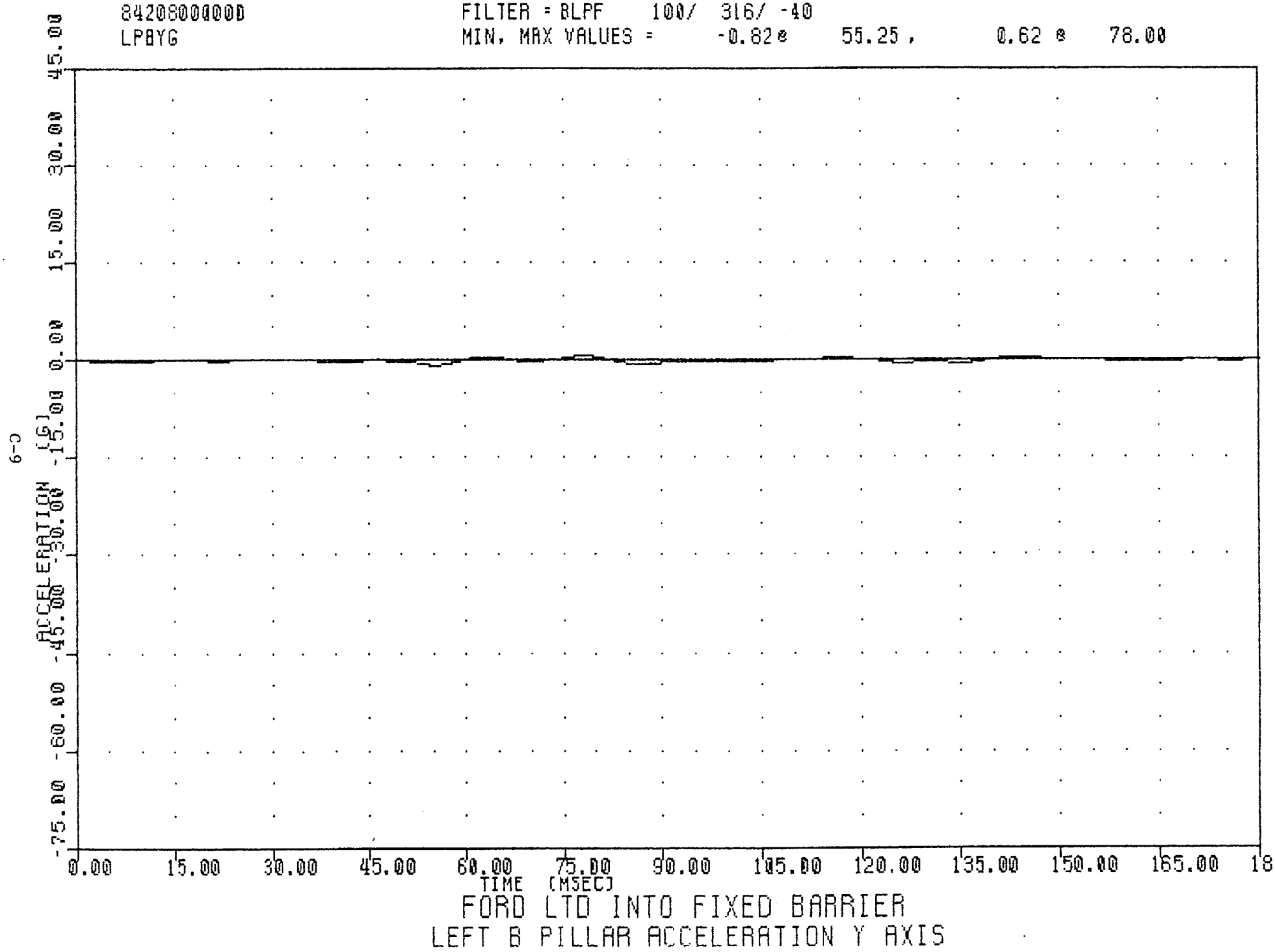


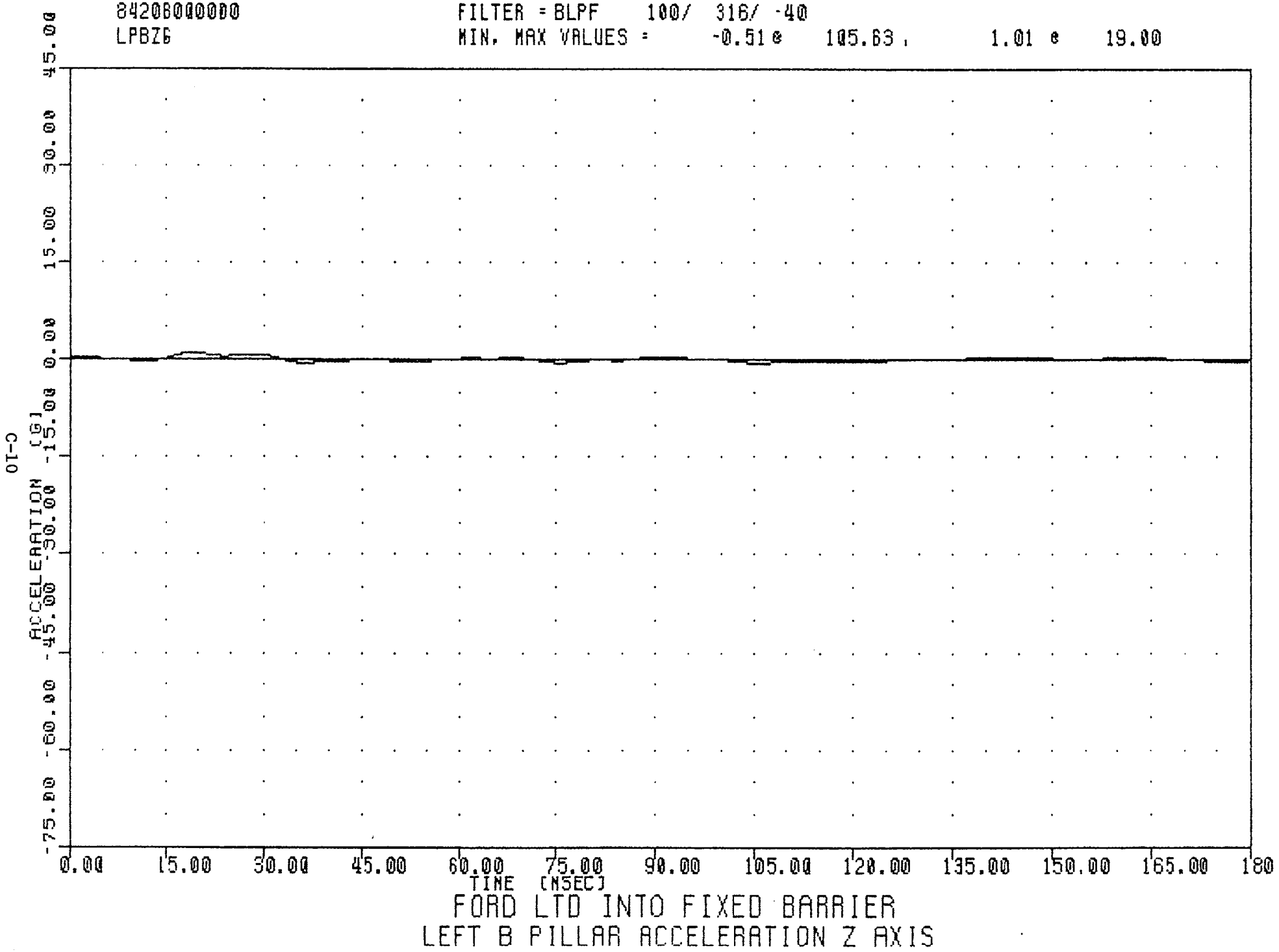
FORD LTD INTO FIXED BARRIER
DELTA V USING STHPG



FORD LTD INTO FIXED BARRIER
DELTA X USING STHPV


BREED AIRBAG PROGRAM
84208000000
LPBXG
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -4.21 @ 52.38 , 0.61 @ 176.75
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
-75.00
ACCELERATION (G)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
LEFT B PILLAR ACCELERATION X AXIS

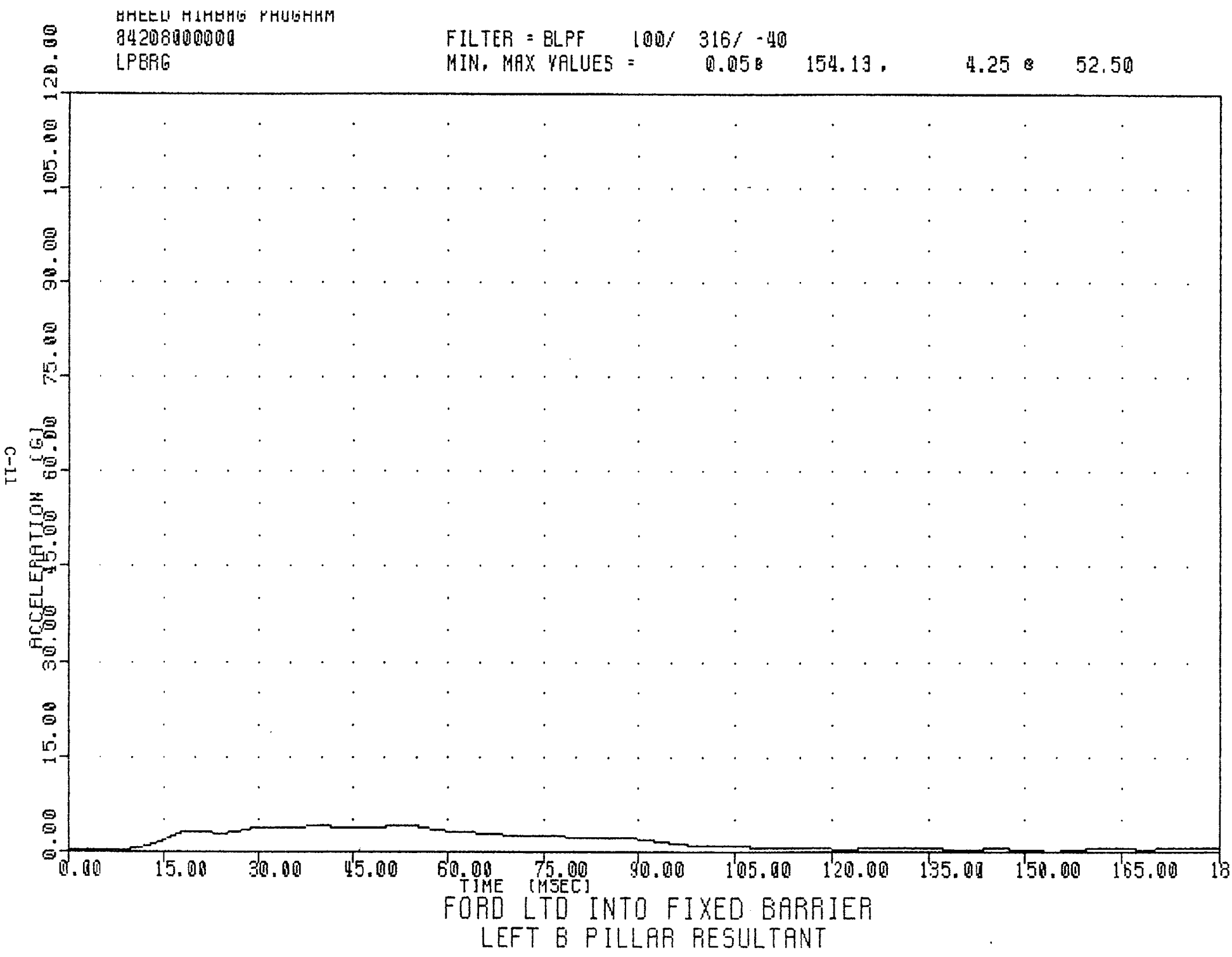

BREED AIRBAG PROGRAM
84208004000
LPBYG
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -0.82 @ 55.25 , 0.62 @ 78.00
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
-75.00
ACCELERATION (G)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
LEFT B PILLAR ACCELERATION Y AXIS



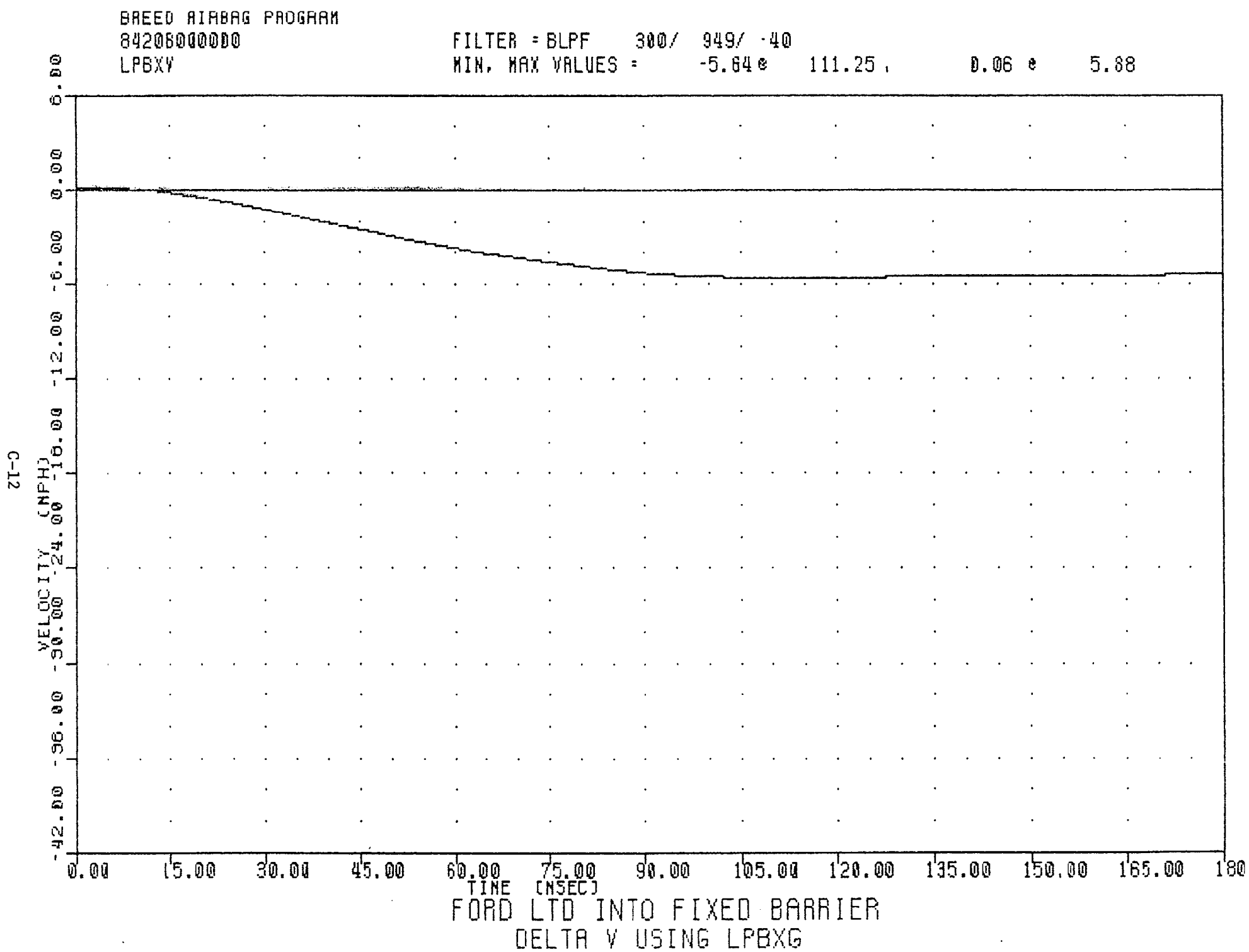
C-10

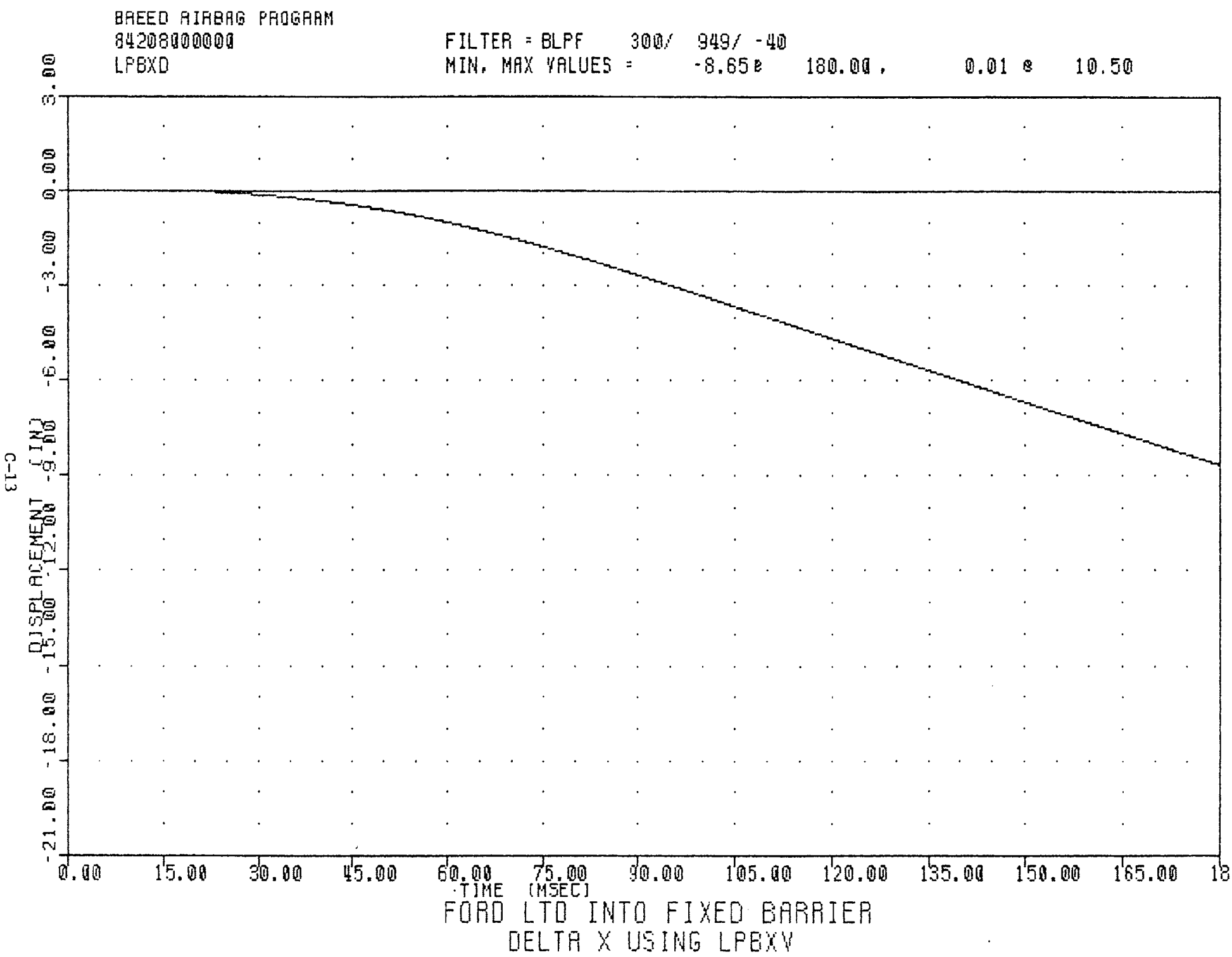
FORD LTD INTO FIXED BARRIER

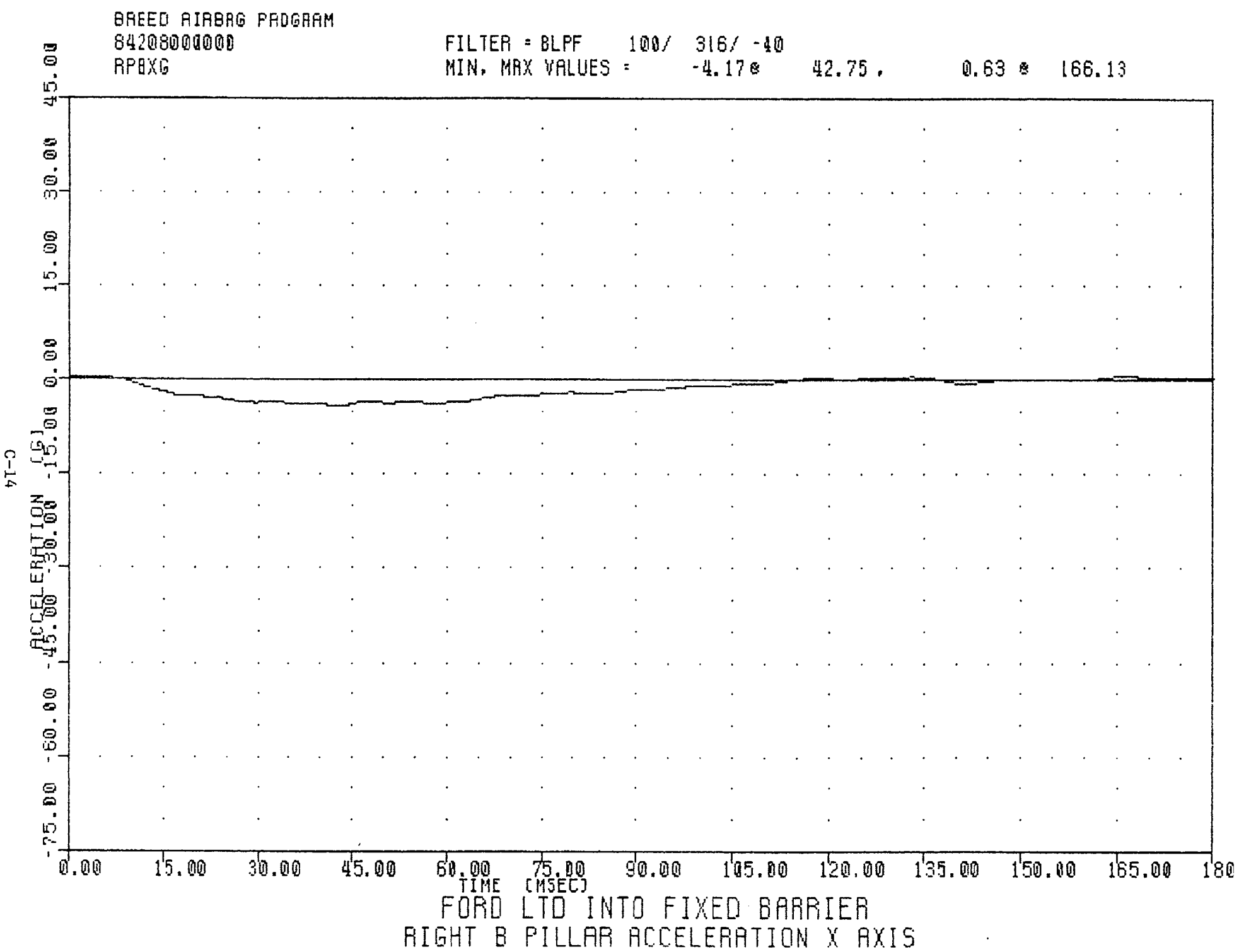
LEFT B PILLAR ACCELERATION Z AXIS



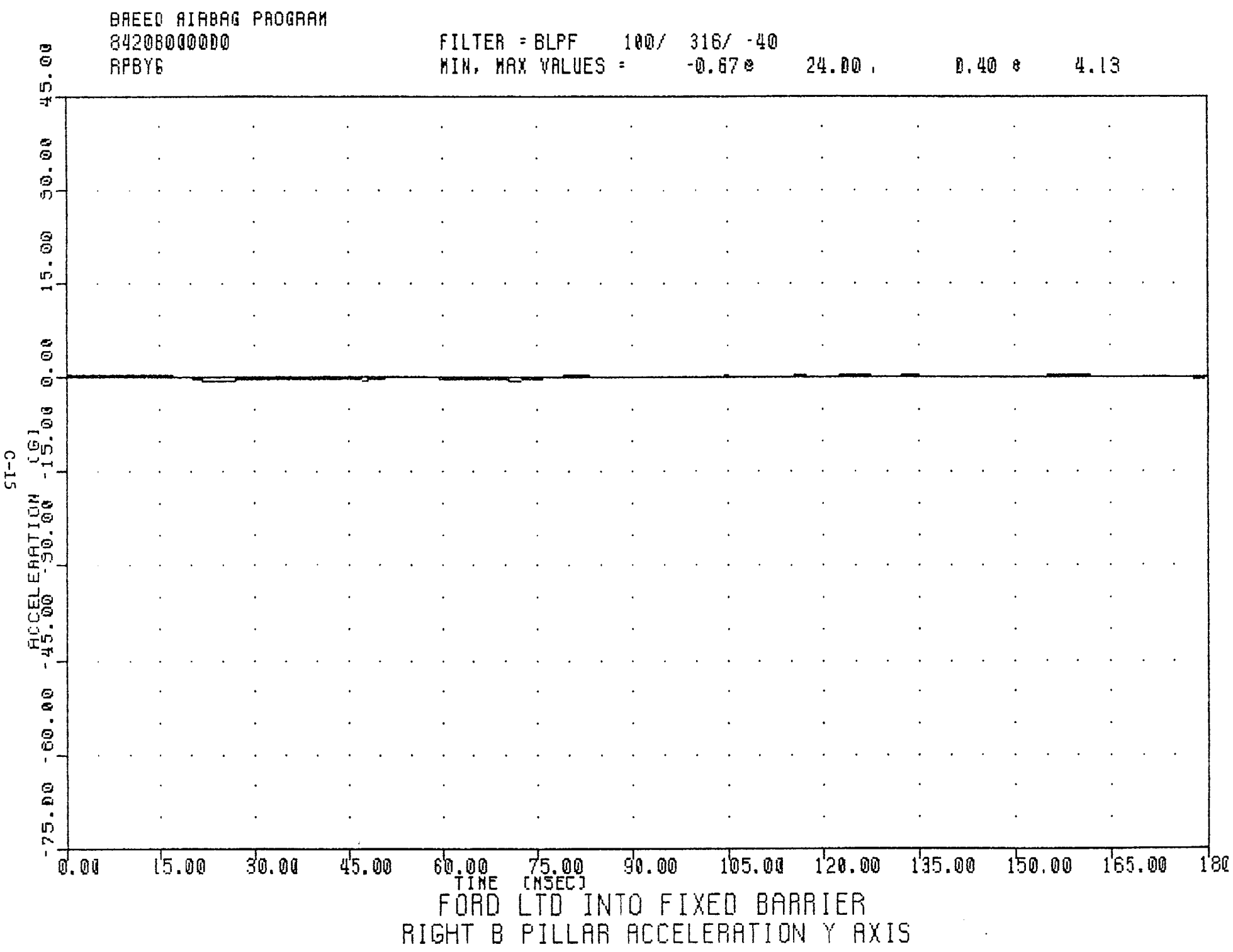
FORD LTD INTO FIXED BARRIER
LEFT B PILLAR RESULTANT


BREED AIRBAG PROGRAM
84206000000
LPBXV
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -5.64 @ 111.25 , 0.06 @ 5.88
6.00
0.00
-6.00
-12.00
-18.00
-24.00
-30.00
-36.00
-42.00
VELOCITY (MPH)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA V USING LPBXG

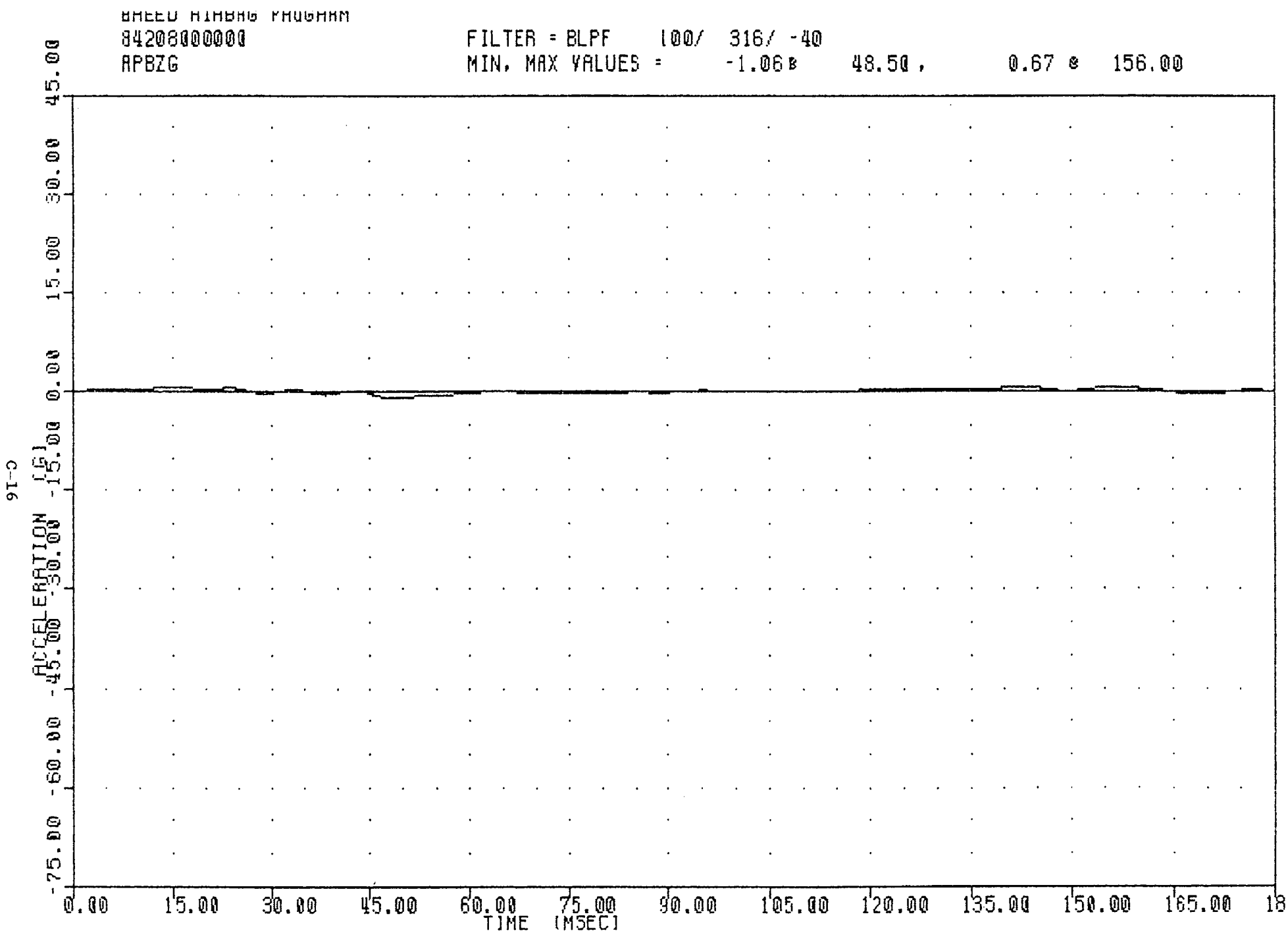

BREED AIRBAG PROGRAM
842080000000
LPBXD
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -8.65 @ 180.00 , 0.01 @ 10.50
3.00
0.00
-3.00
-6.00
-9.00
-12.00
-15.00
-18.00
-21.00
DISPLACEMENT (IN)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA X USING LPBXV

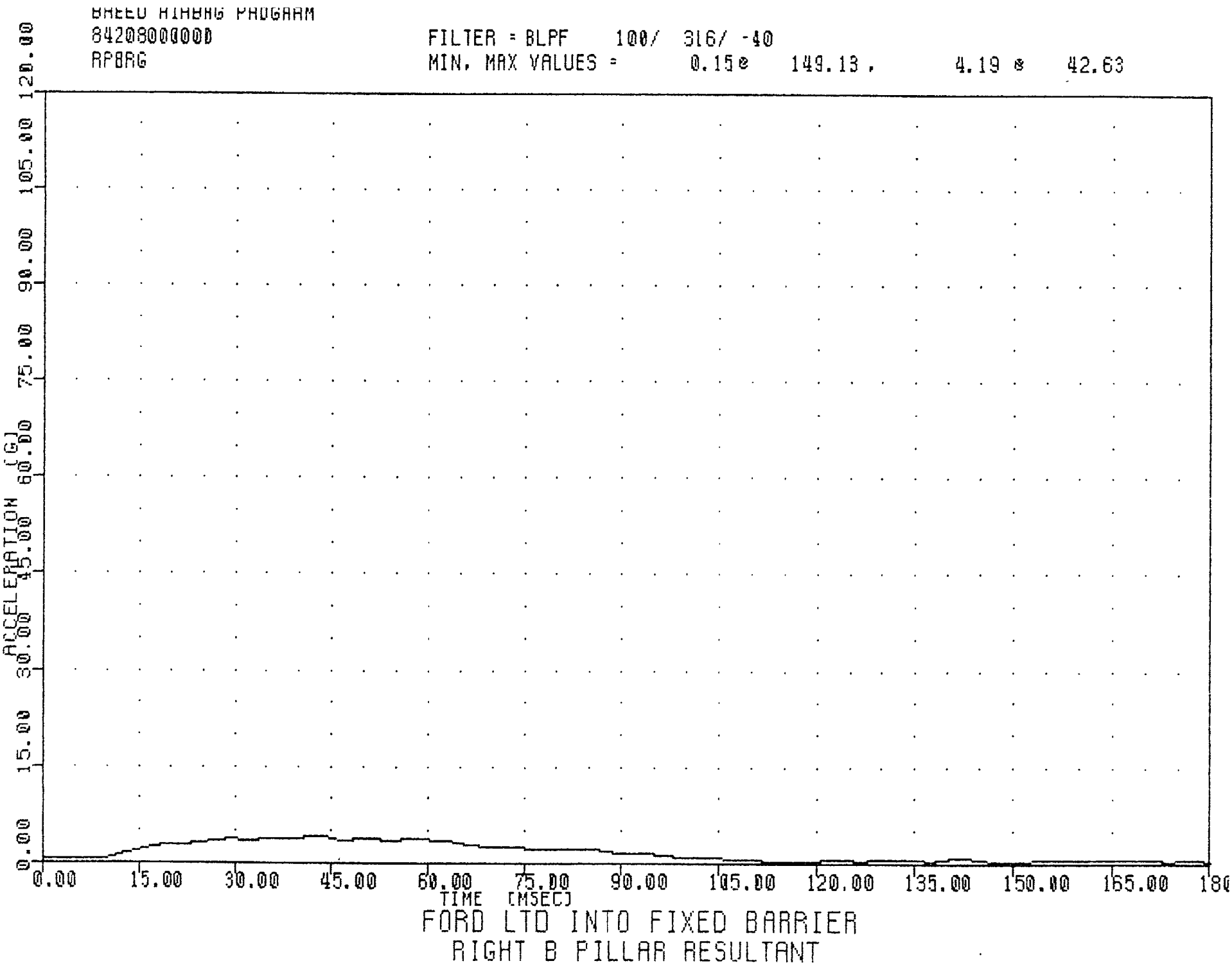


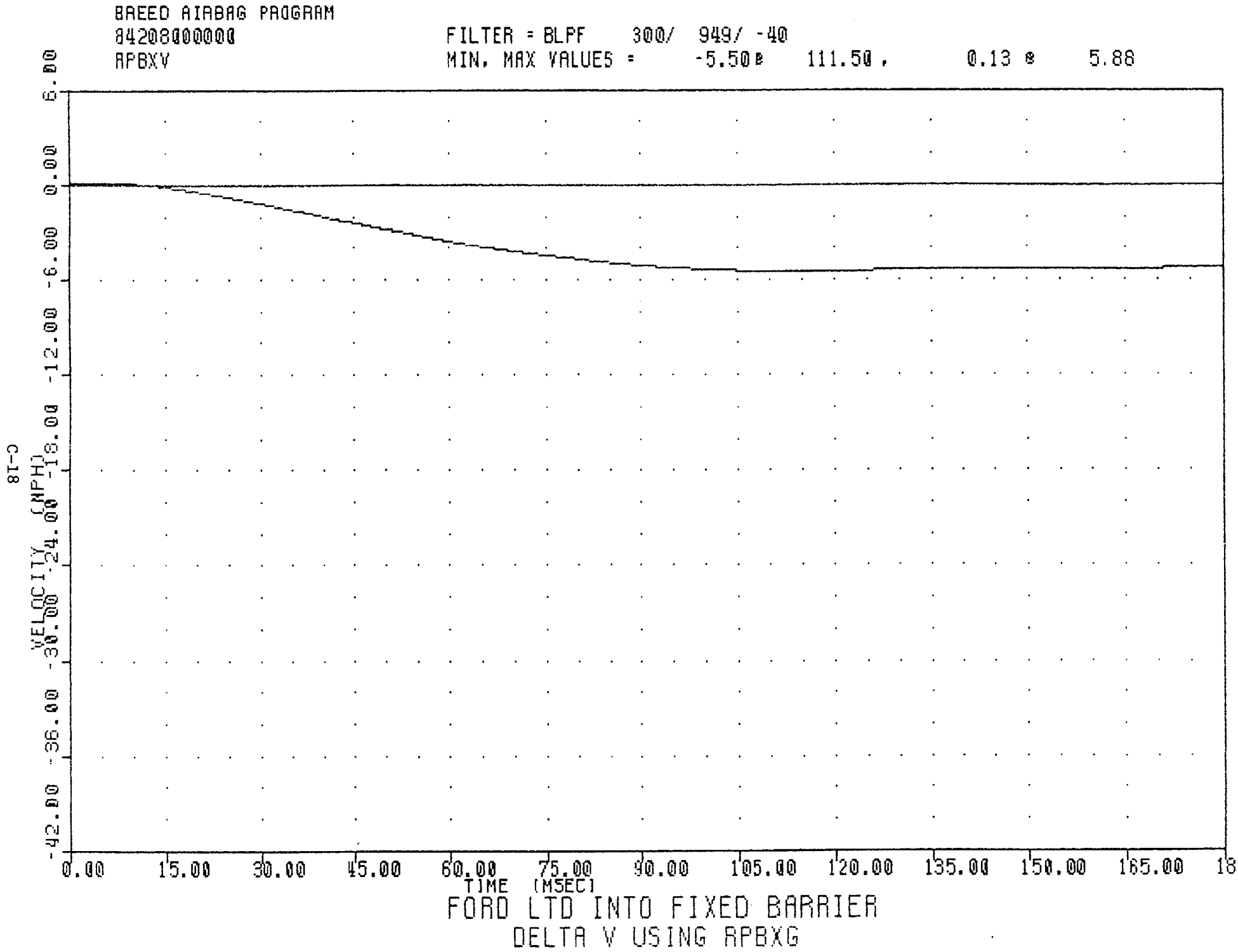
FORD LTD INTO FIXED BARRIER
RIGHT B PILLAR ACCELERATION X AXIS

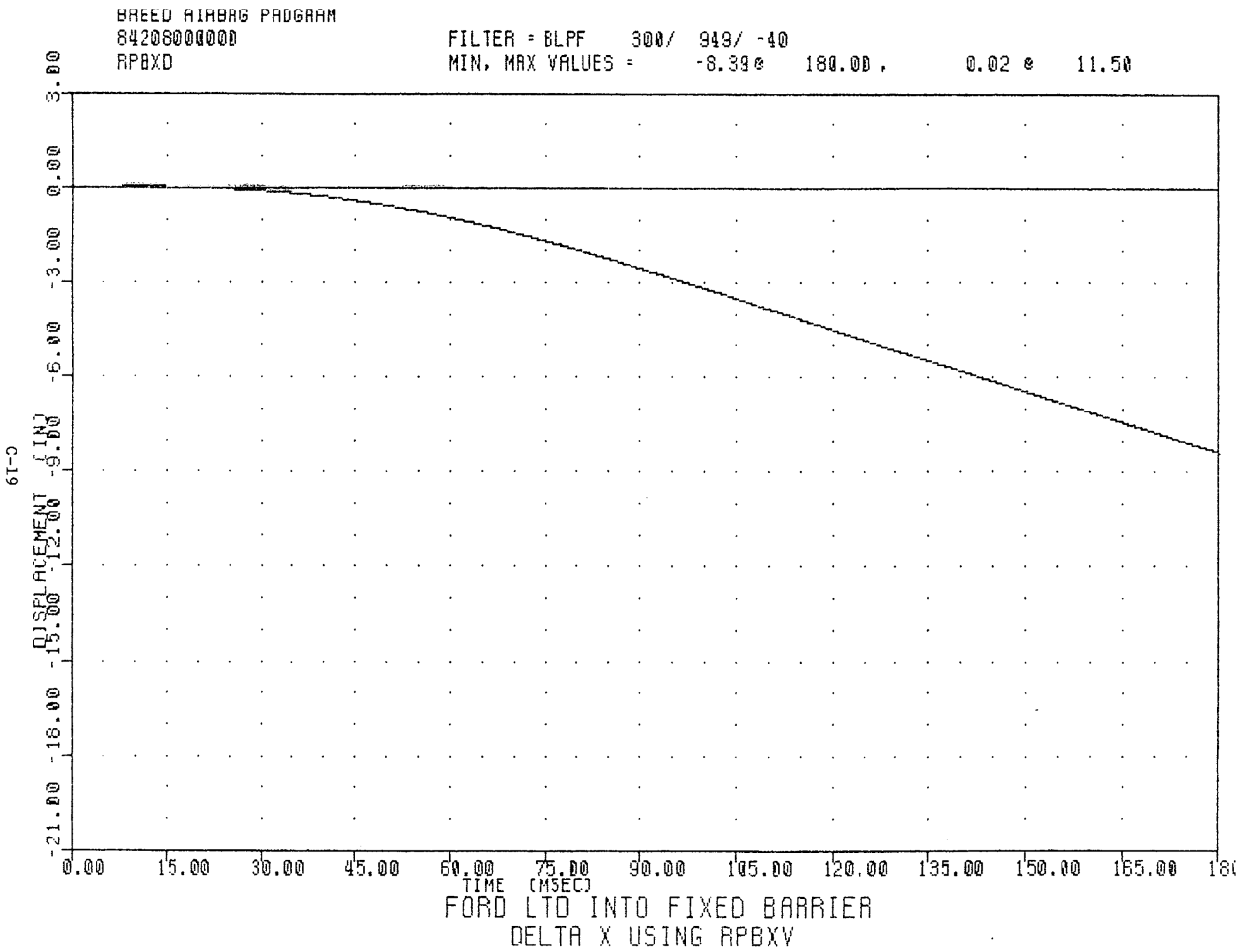


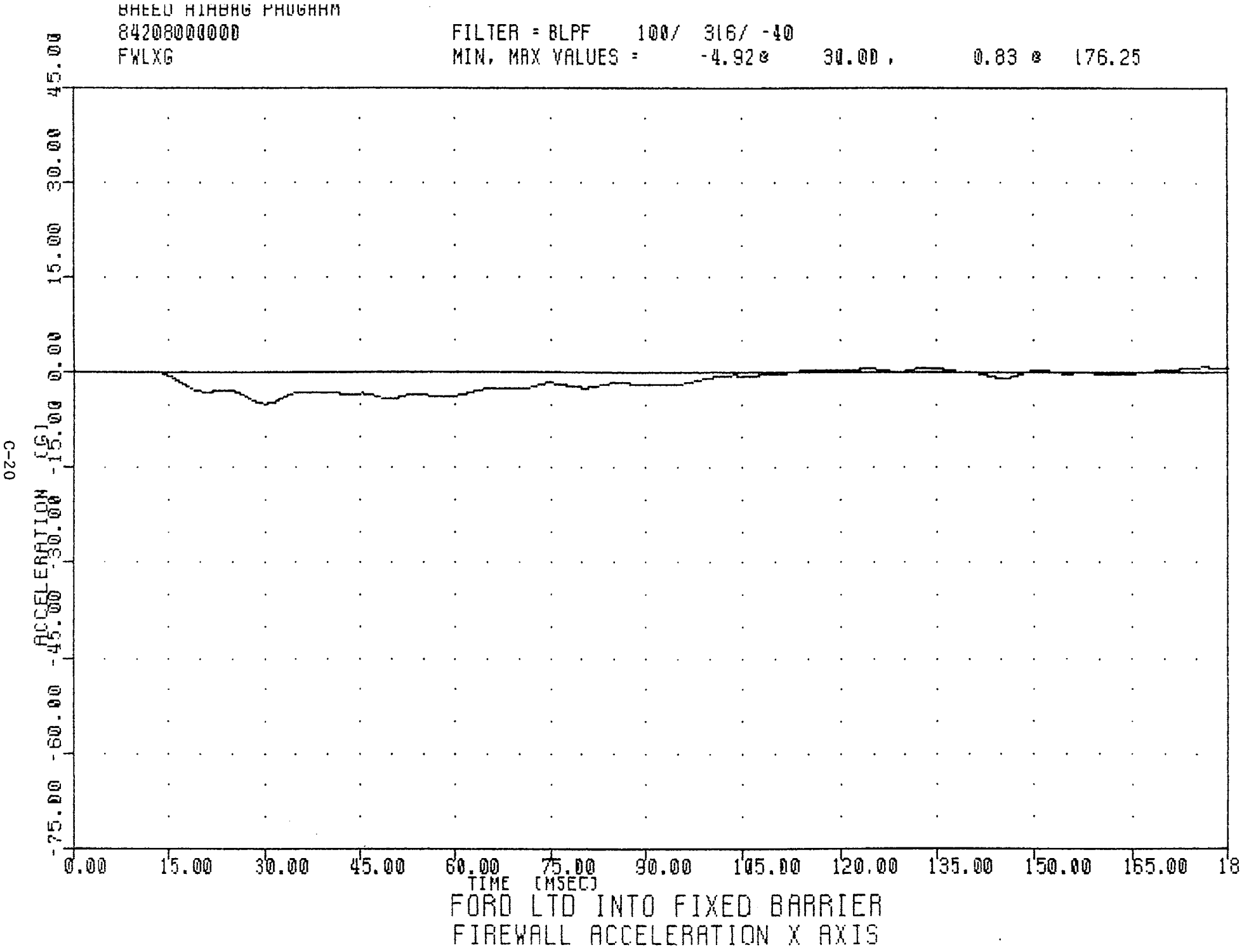
FORD LTD INTO FIXED BARRIER
RIGHT B PILLAR ACCELERATION Y AXIS

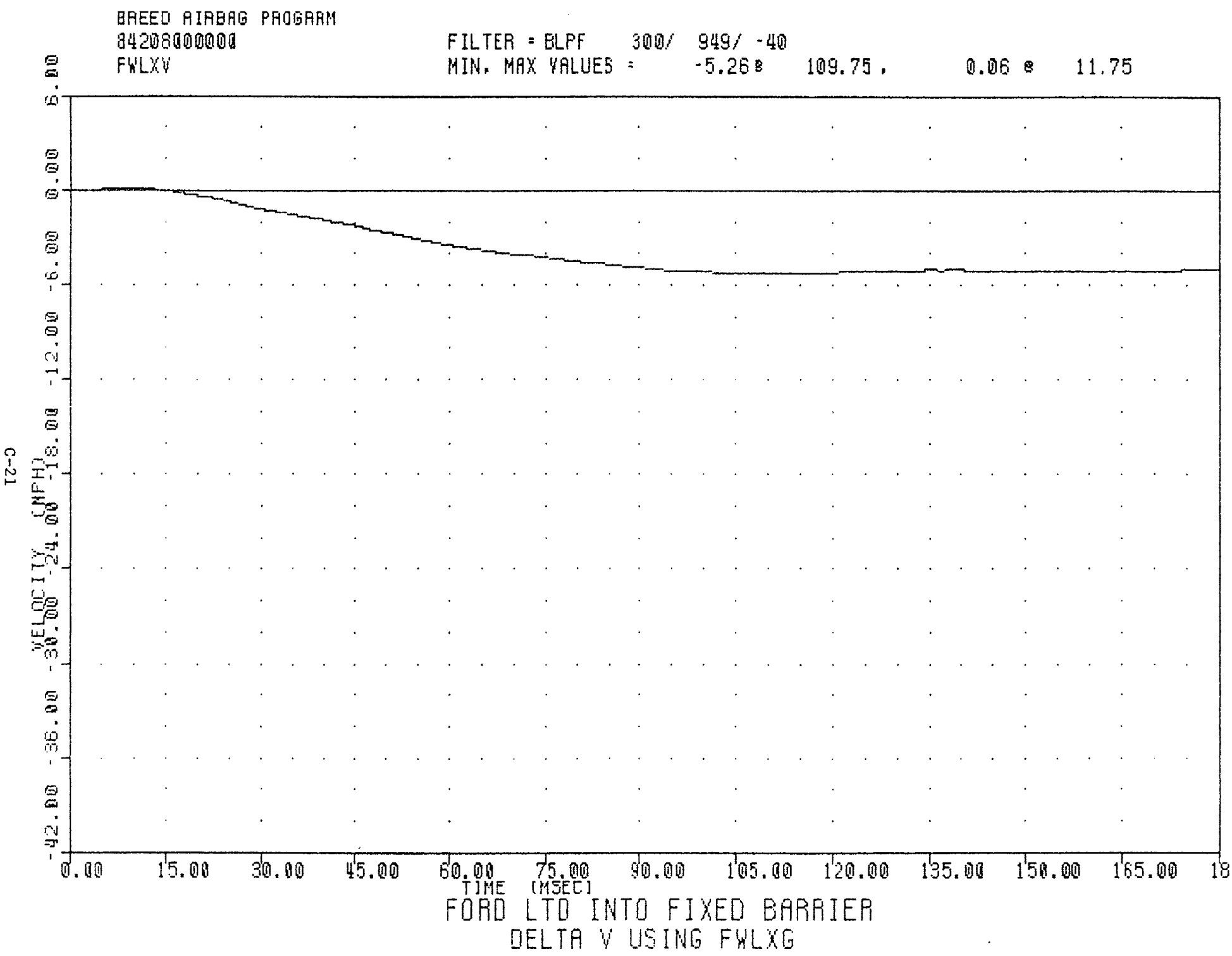

SHEED AIMBAG PROGRAM
84208000000
RPBZG
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -1.06 @ 48.50 , 0.67 @ 156.00
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
-75.00
ACCELERATION (G)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
RIGHT B PILLAR ACCELERATION Z AXIS


BREED AIRBAG PROGRAM
84208000000
RPBRG
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = 0.15@ 149.13, 4.19@ 42.63
ACCELERATION [G]
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME [MSEC]
FORD LTD INTO FIXED BARRIER
RIGHT B PILLAR RESULTANT

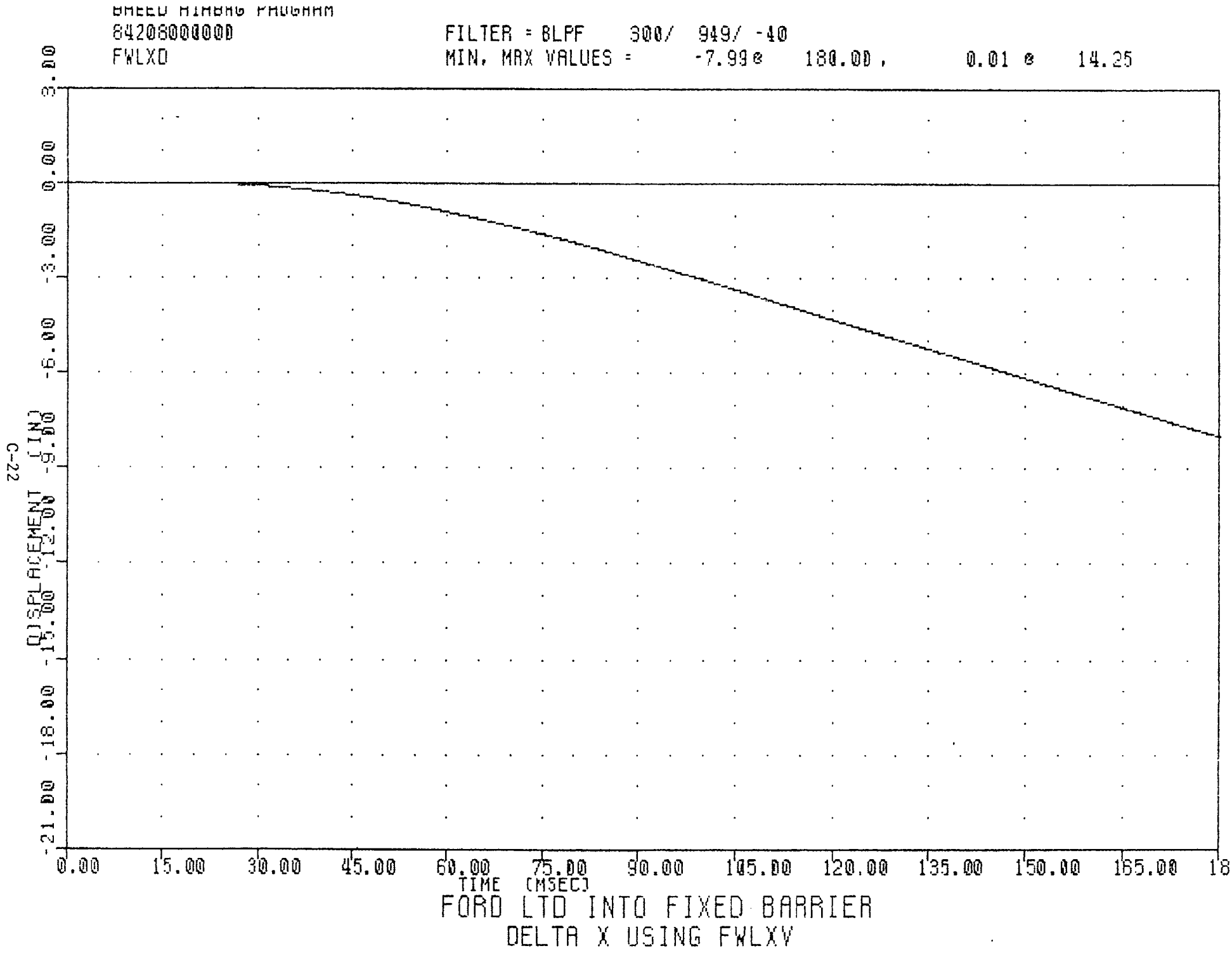

BREED AIRBAG PROGRAM
84208000000
RPBXV
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -5.50 @ 111.50 , 0.13 @ 5.88
6.00
0.00
-6.00
-12.00
-18.00
-24.00
-30.00
-36.00
-42.00
VELOCITY (MPH)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA V USING RPBXG


BREED AIRBAG PROGRAM
84208000000
RPBXD
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -8.39 @ 180.00 , 0.02 @ 11.50
3.00
0.00
-3.00
-6.00
-9.00
-12.00
-15.00
-18.00
-21.00
DISPLACEMENT (IN)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA X USING RPBXV

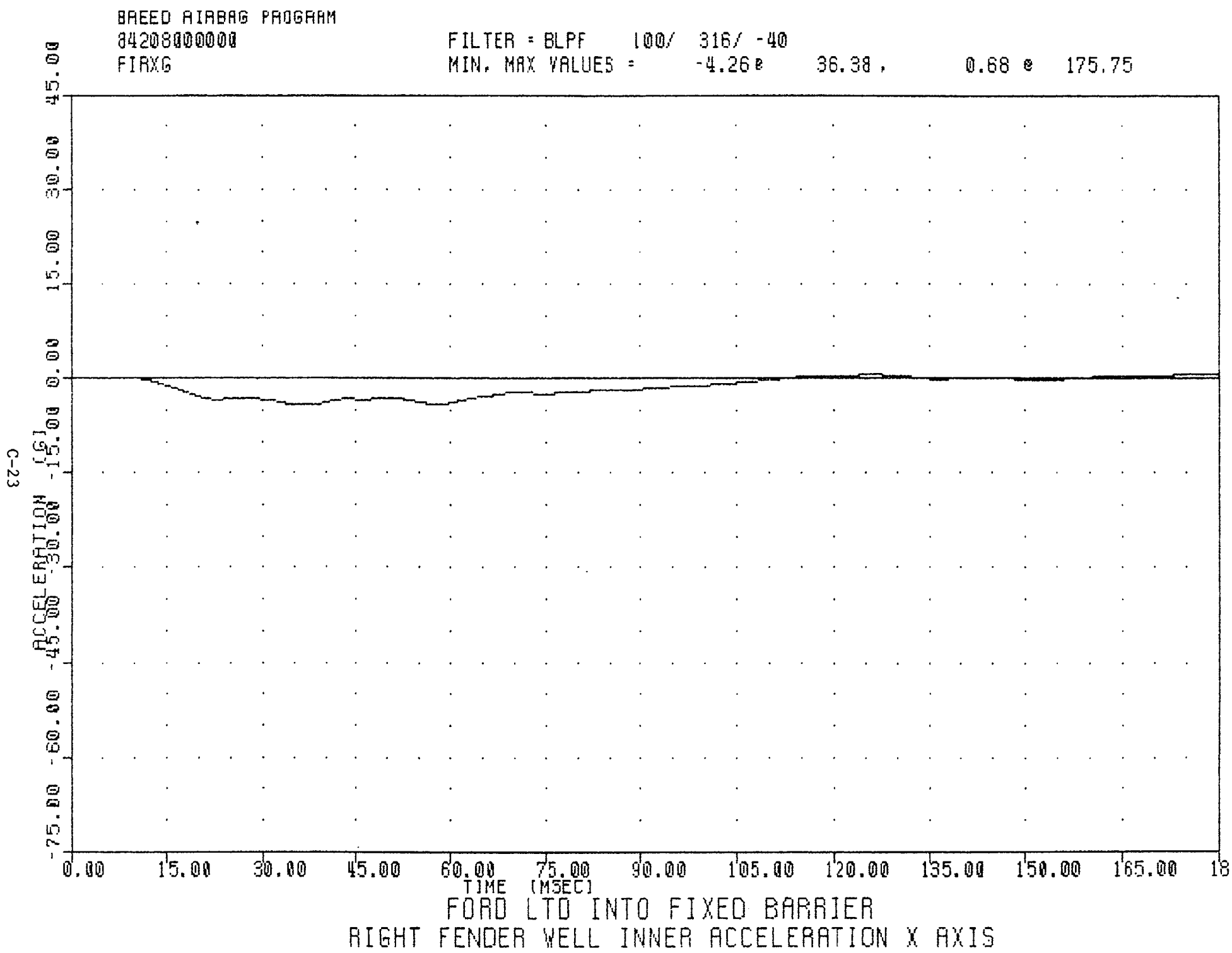

BREED AIRBAG PROGRAM
84208000000
FWLXG
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -4.92 @ 30.00 , 0.83 @ 176.25
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
-75.00
ACCELERATION (G)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
FIREWALL ACCELERATION X AXIS



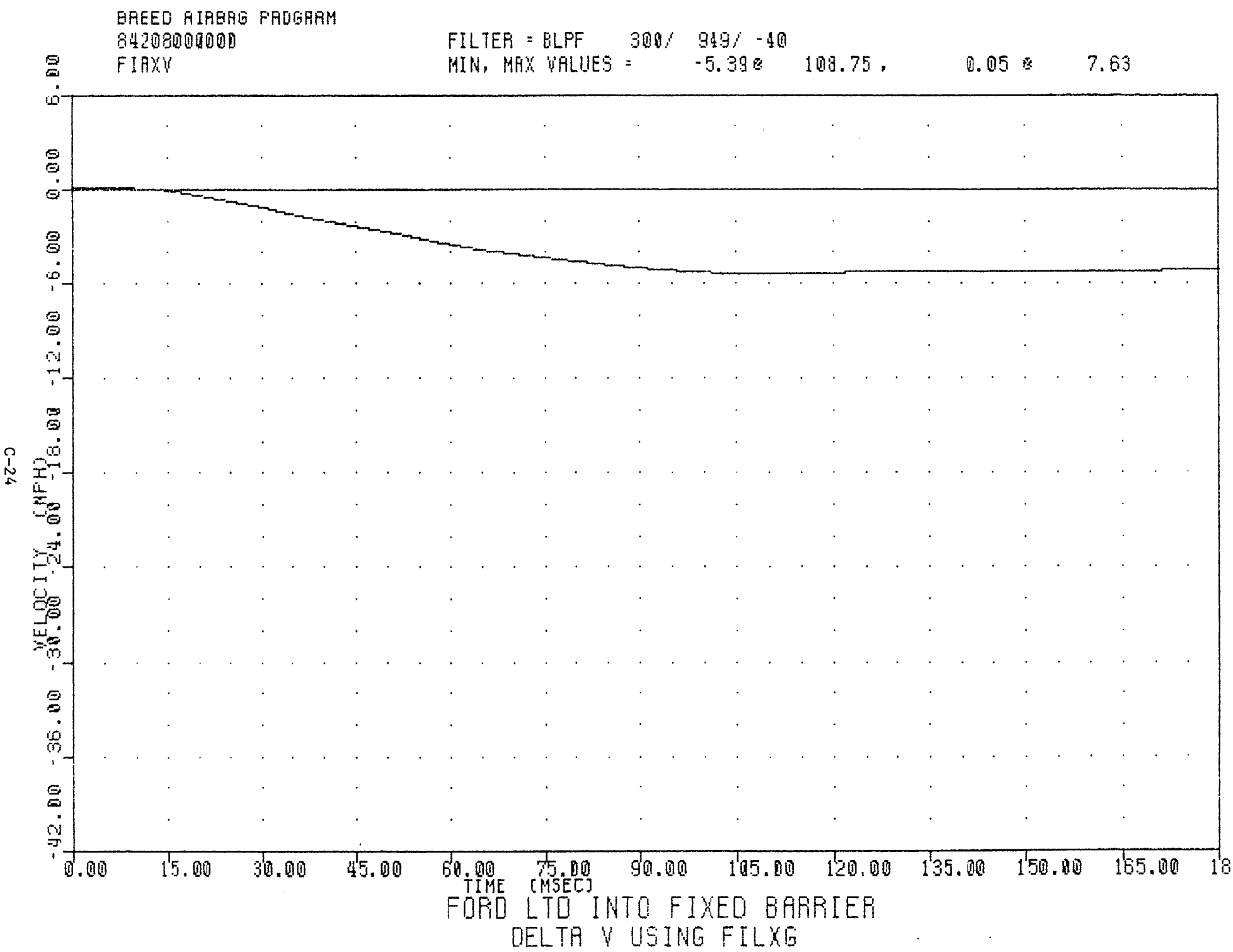
FORD LTD INTO FIXED BARRIER
DELTA V USING FWLXG



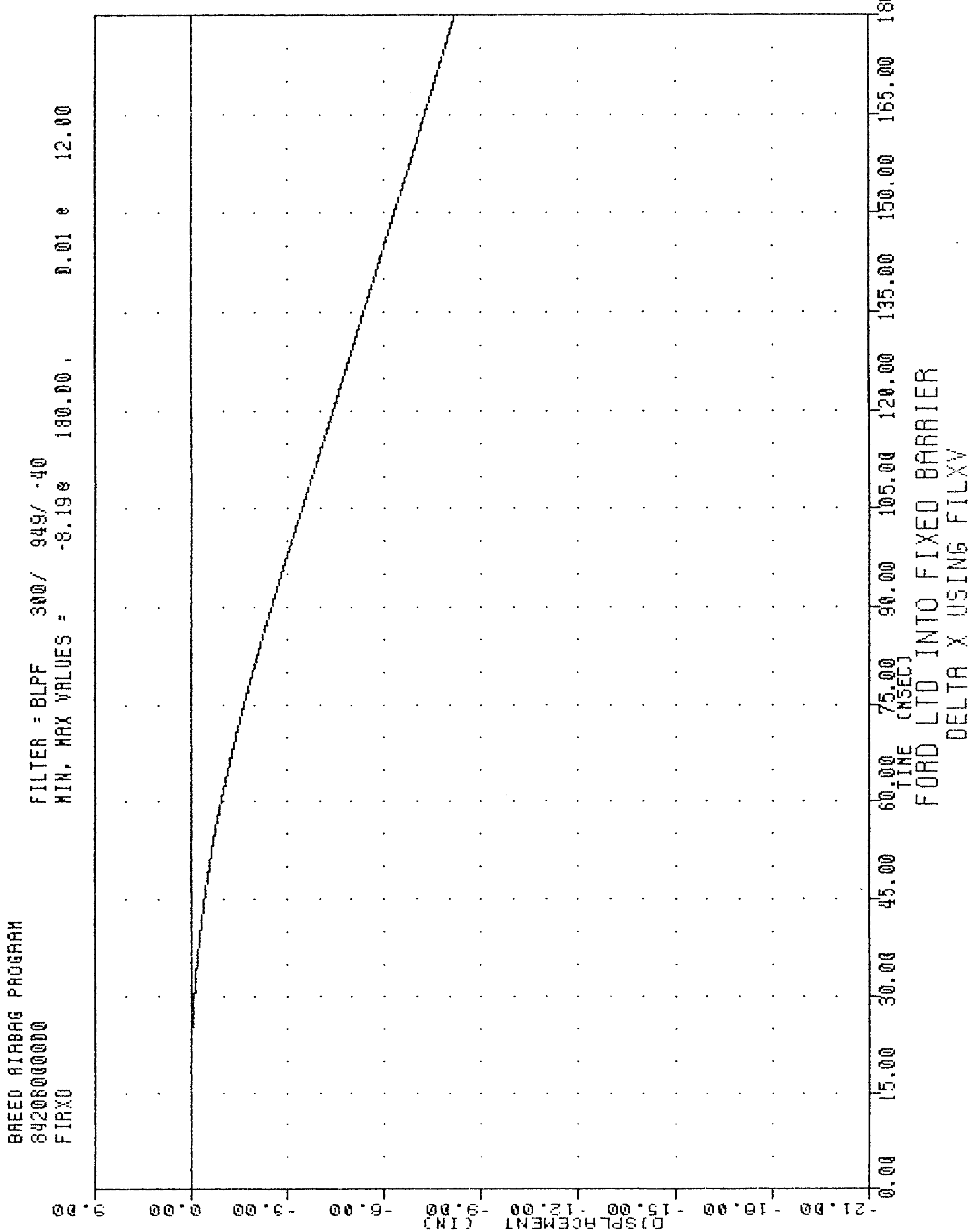
FORD LTD INTO FIXED BARRIER
DELTA X USING FWLXV

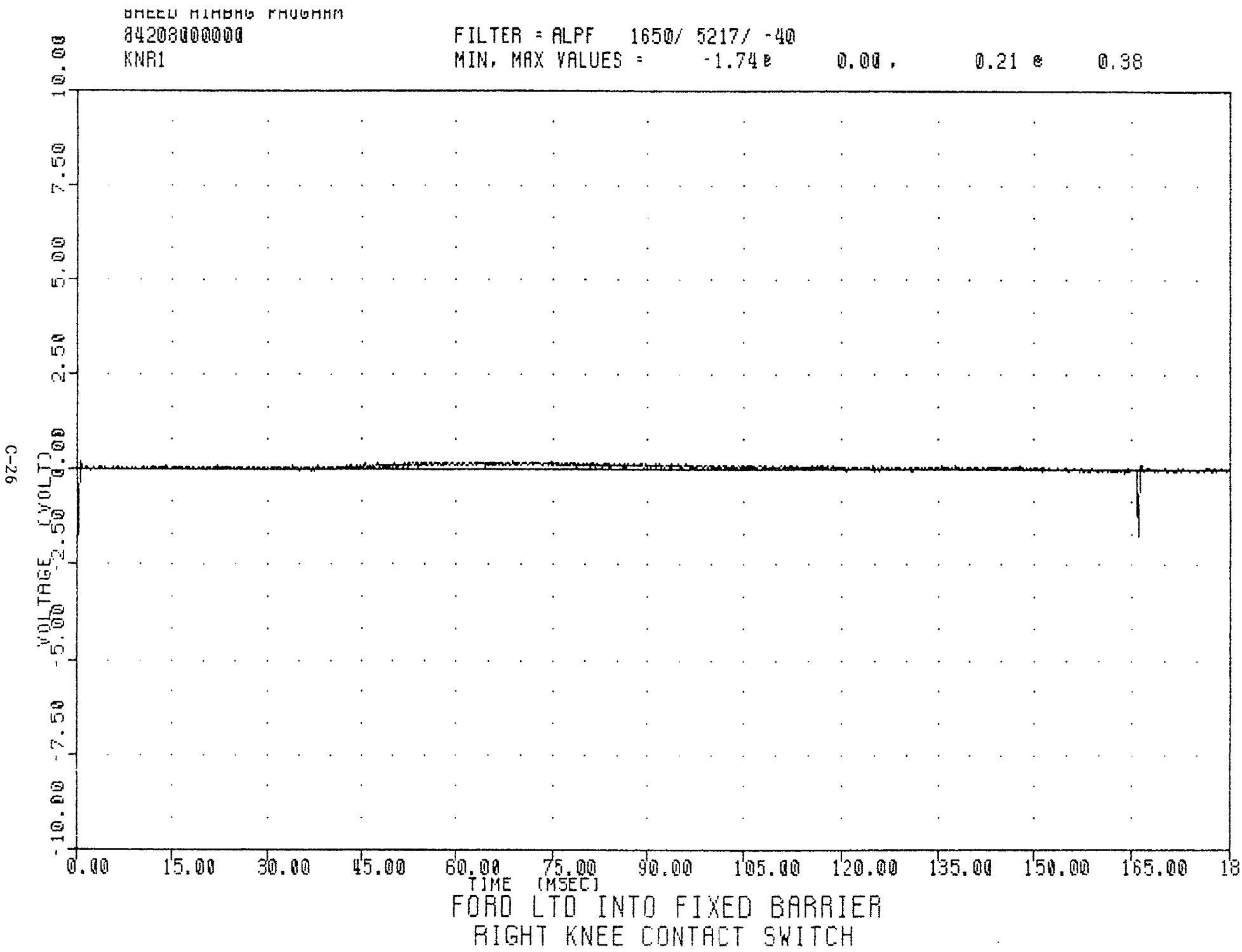


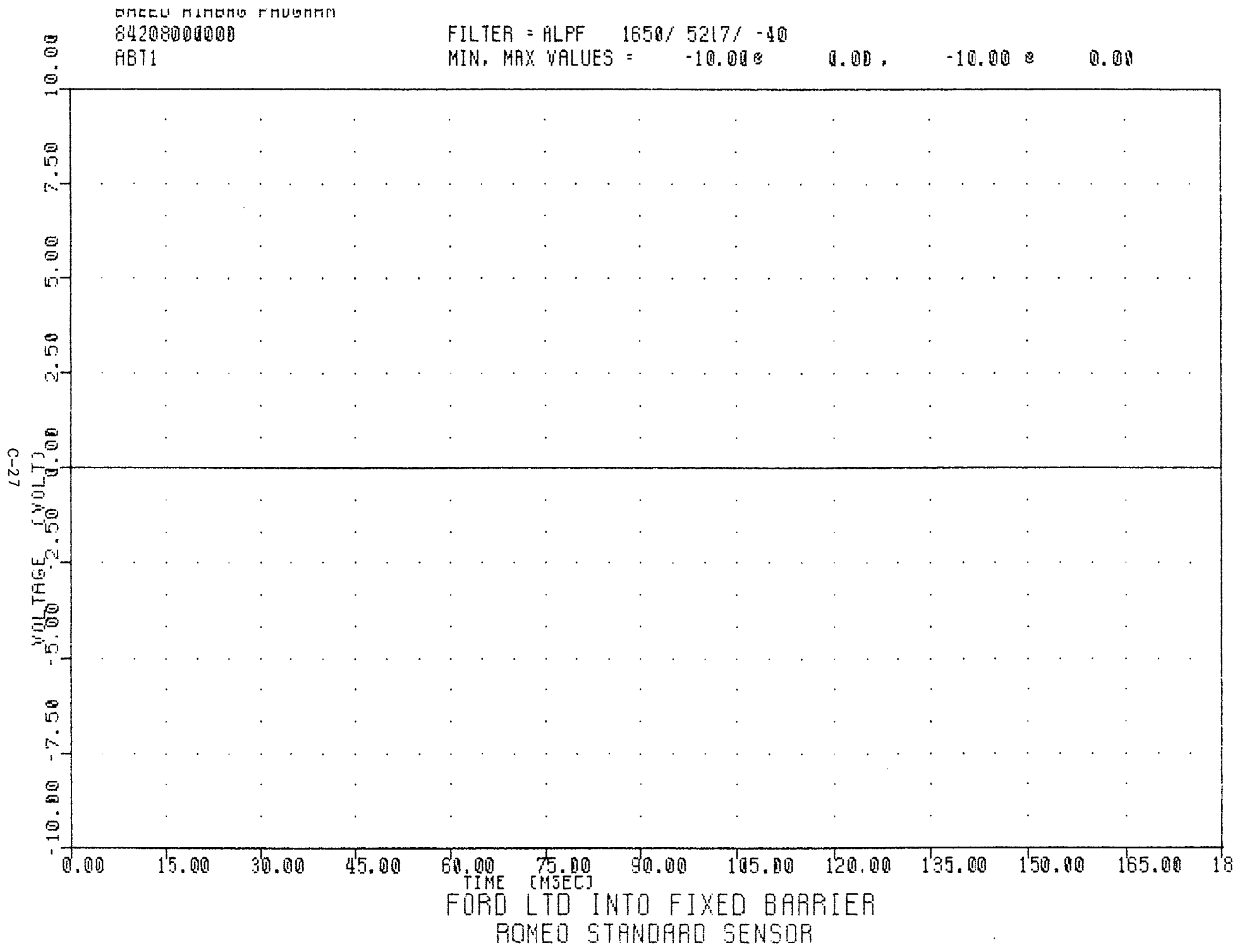
FORD LTD INTO FIXED BARRIER
RIGHT FENDER WELL INNER ACCELERATION X AXIS



FORD LTD INTO FIXED BARRIER
DELTA V USING FILXG

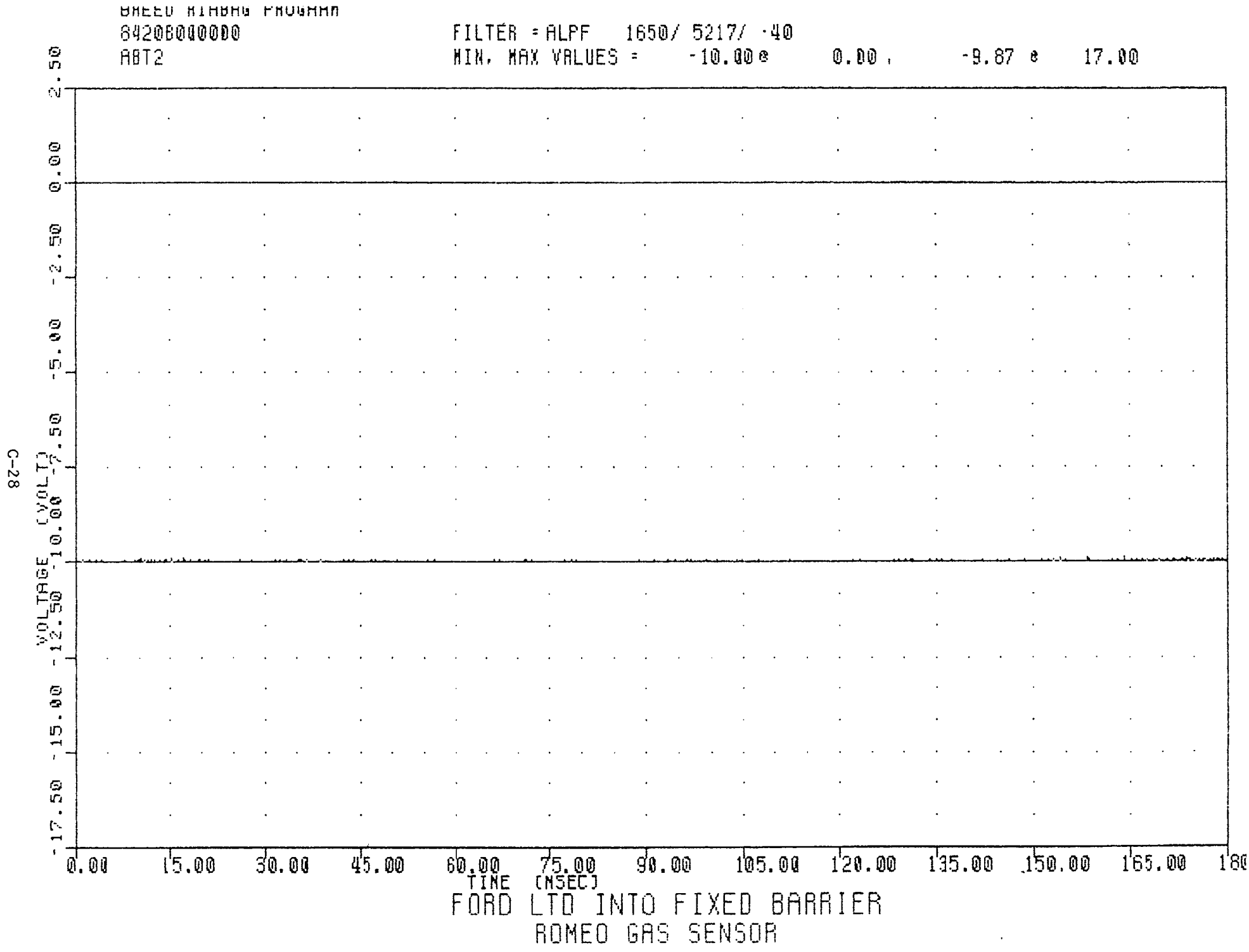

BREED AIRBAG PROGRAM
8420B0000D0
FIRXO
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -8.19 @ 180.00 , 0.01 @ 12.00
FORD LTD INTO FIXED BARRIER
DELTA X USING FILXV
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
3.00
0.00
-3.00
-6.00
-9.00
-12.00
-15.00
-18.00
-21.00
DISPLACEMENT (IN)


842080000000
KNR1
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -1.74 @ 0.00 , 0.21 @ 0.38
10.00
7.50
5.00
2.50
0.00
-2.50
-5.00
-7.50
-10.00
VOLTAGE (VOLT)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
RIGHT KNEE CONTACT SWITCH

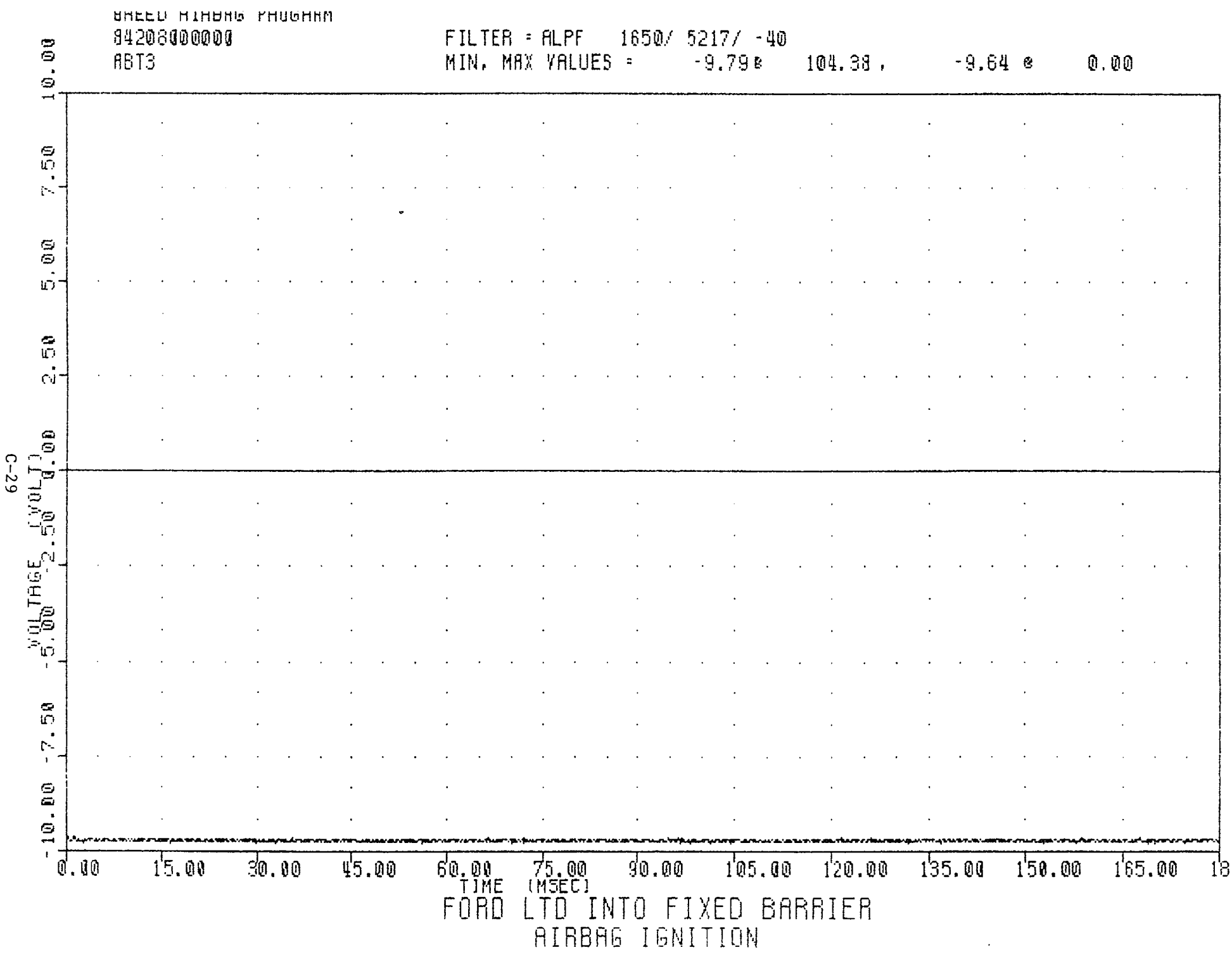


FORD LTD INTO FIXED BARRIER

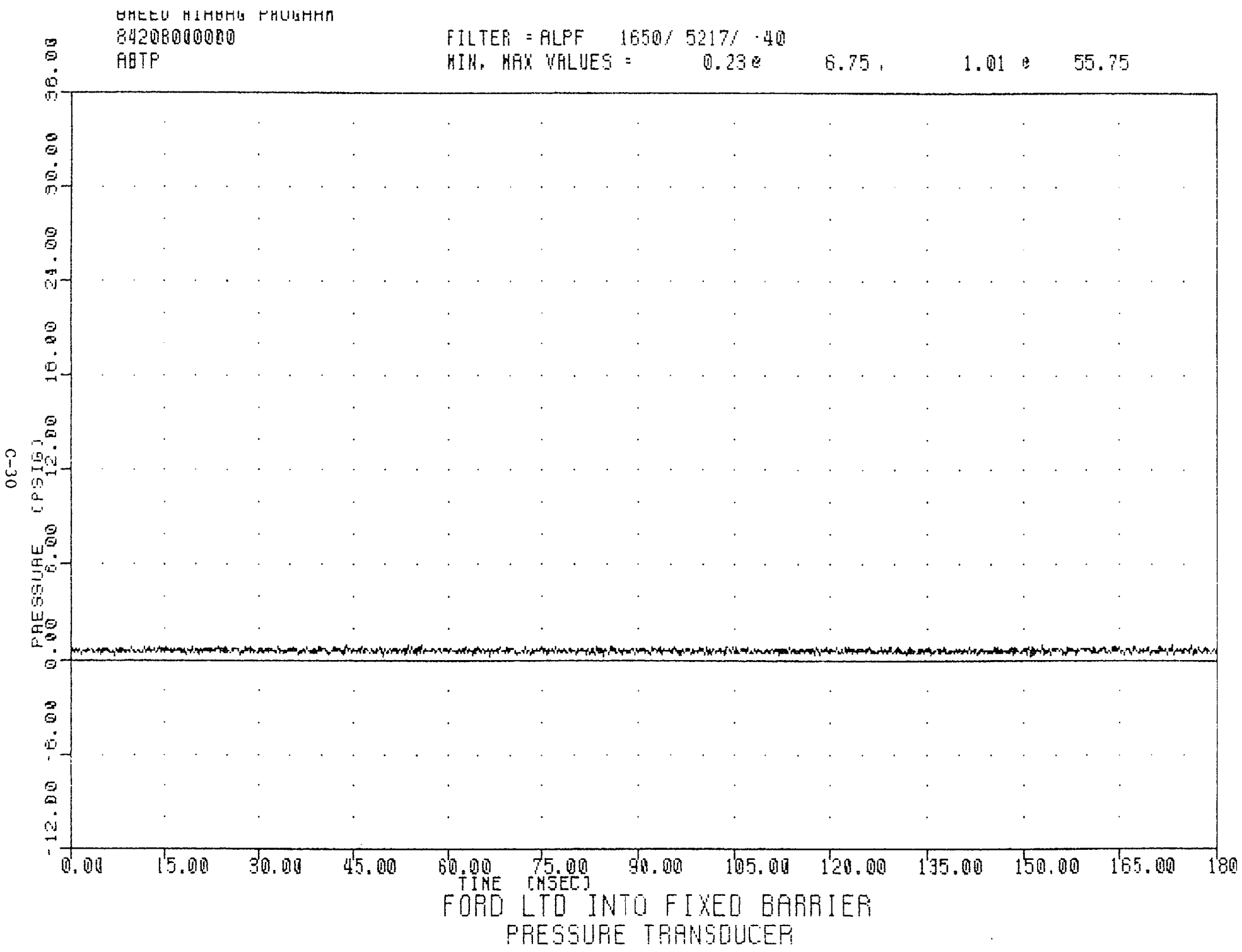
ROMEO STANDARD SENSOR

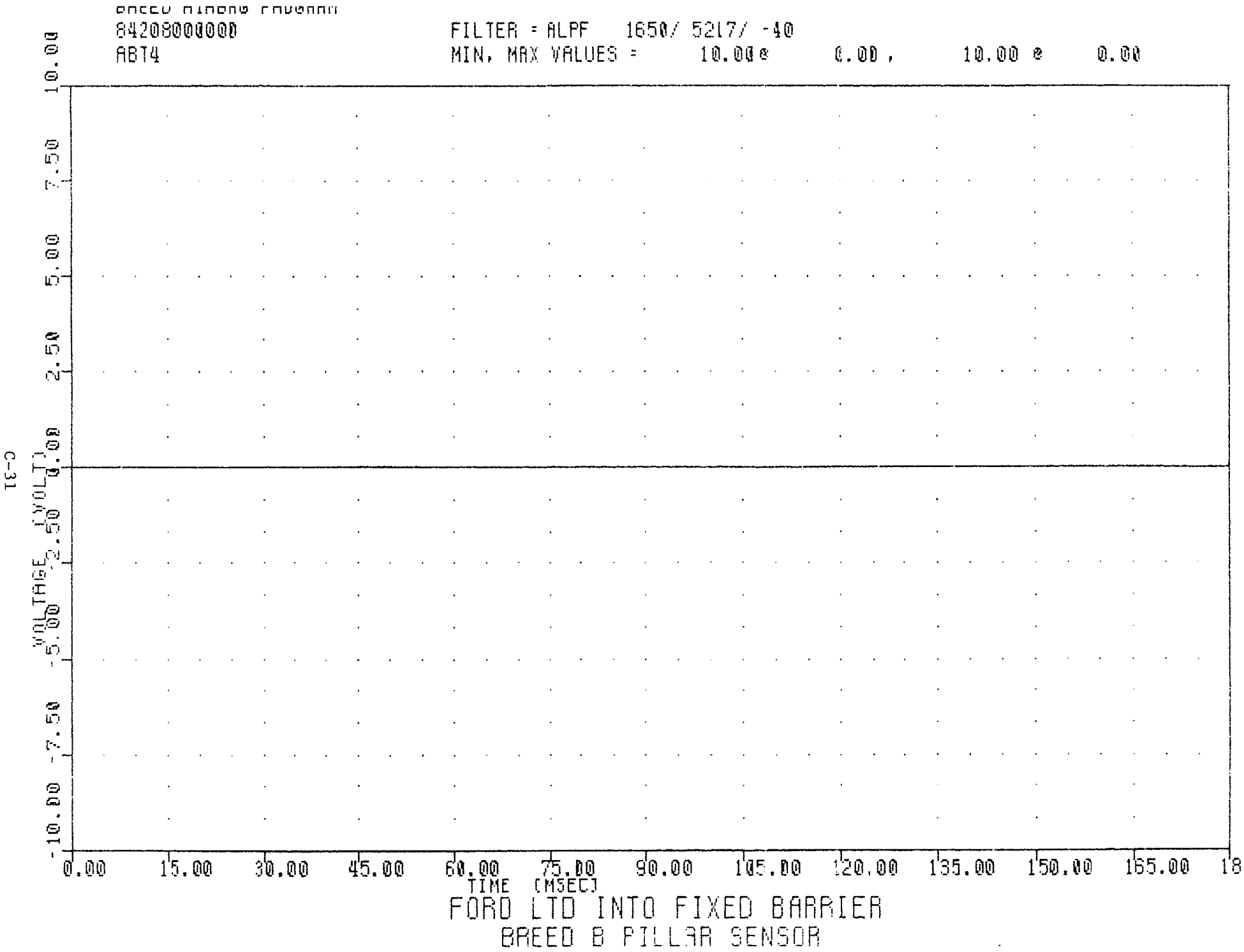


FORD LTD INTO FIXED BARRIER
ROMEO GAS SENSOR



FORD LTD INTO FIXED BARRIER
AIRBAG IGNITION

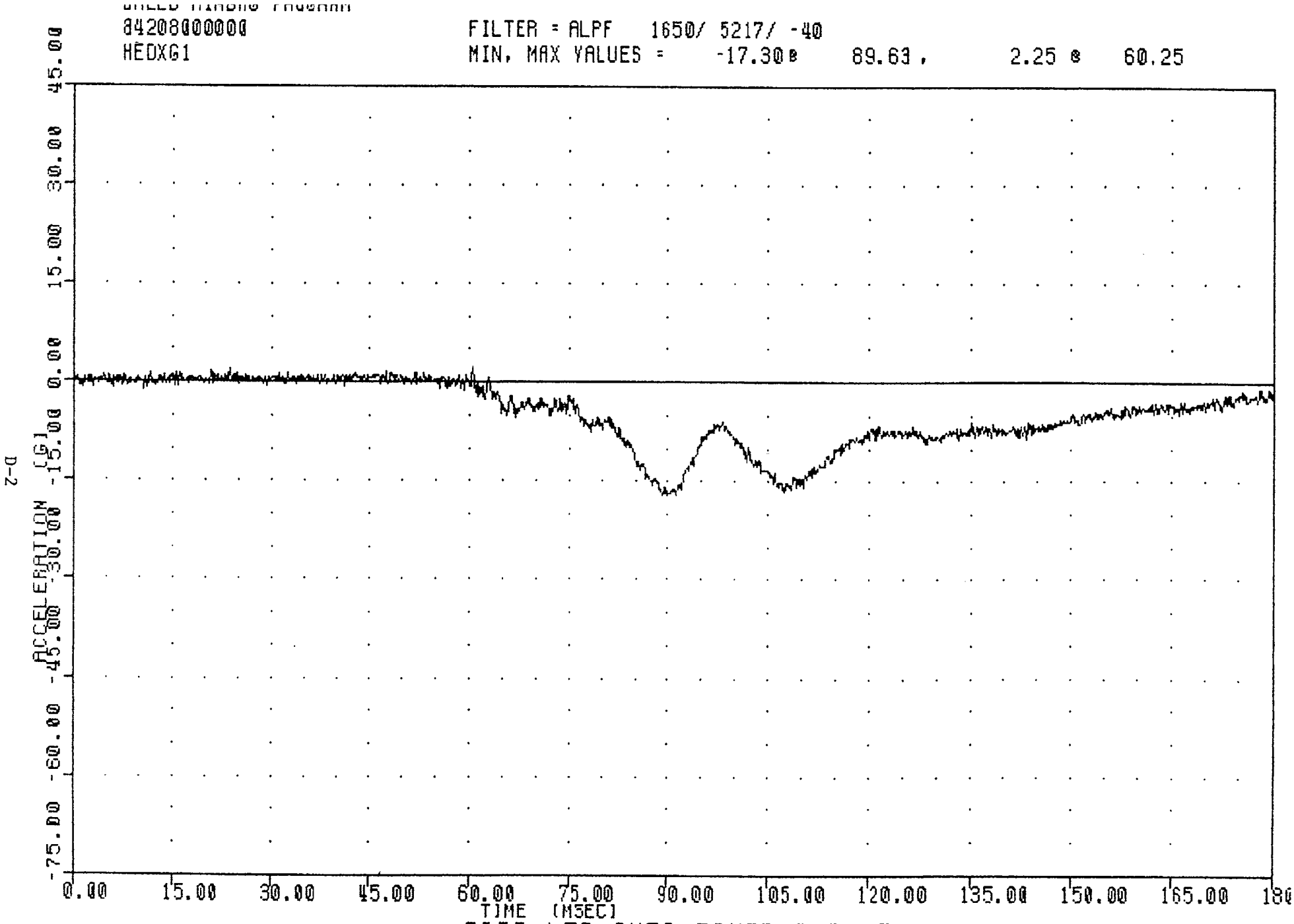

SPEED AIRBAG PROGRAM
8420B000000
ABTP
FILTER = ALPF 1650/ 5217/ .40
MIN, MAX VALUES = 0.23@ 6.75, 1.01 @ 55.75
36.00
30.00
24.00
18.00
12.00
6.00
0.00
-6.00
-12.00
PRESSURE (PSIG)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
PRESSURE TRANSDUCER


84208000000
ABT4
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = 10.00@ 0.00 , 10.00 @ 0.00
10.00
7.50
5.00
2.50
0.00
-2.50
-5.00
-7.50
-10.00
VOLTAGE (VOLT)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
BREED B PILLAR SENSOR

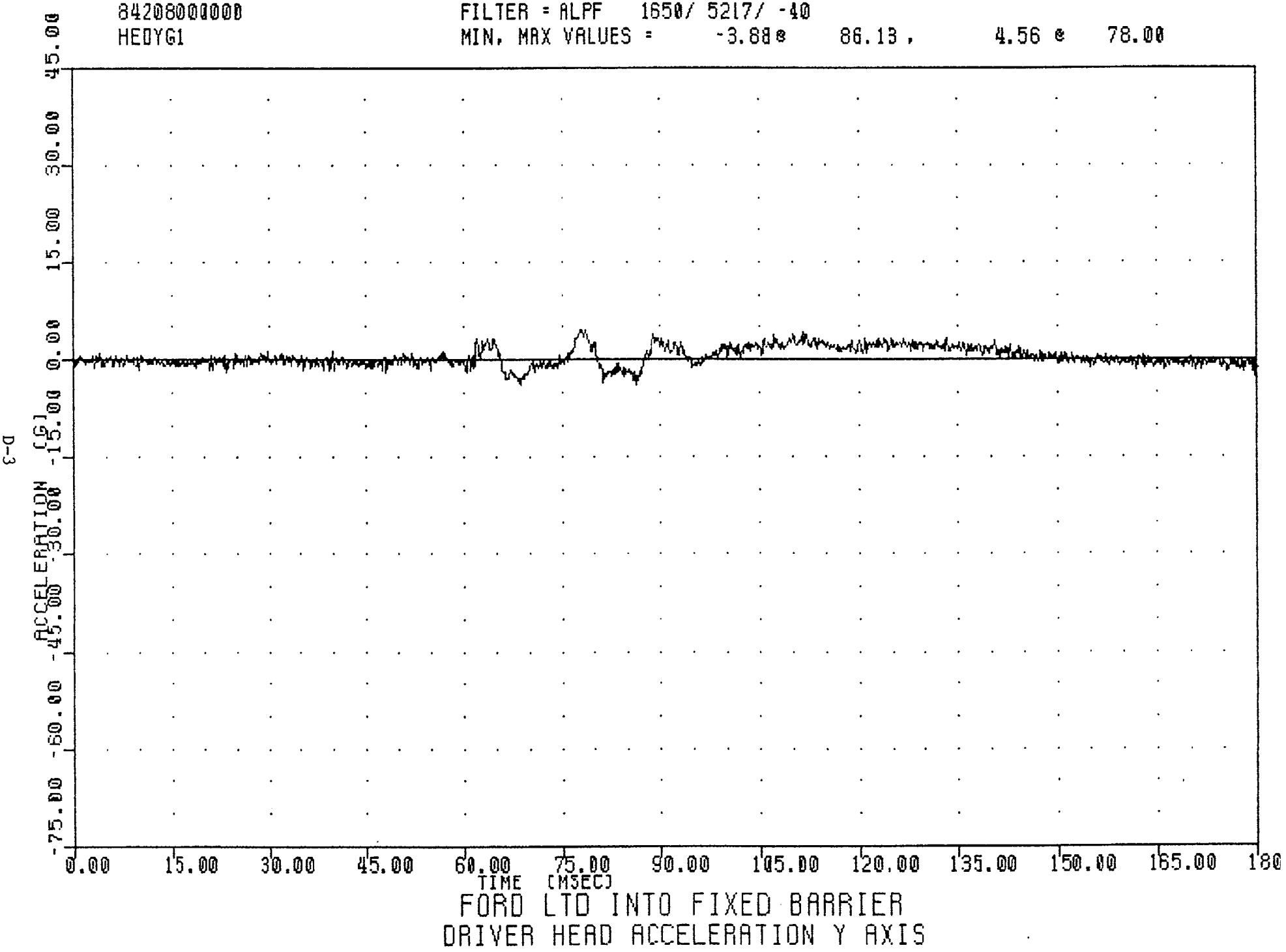
APPENDIX D

DATA PLOT PRESENTATION - TEST 840726B

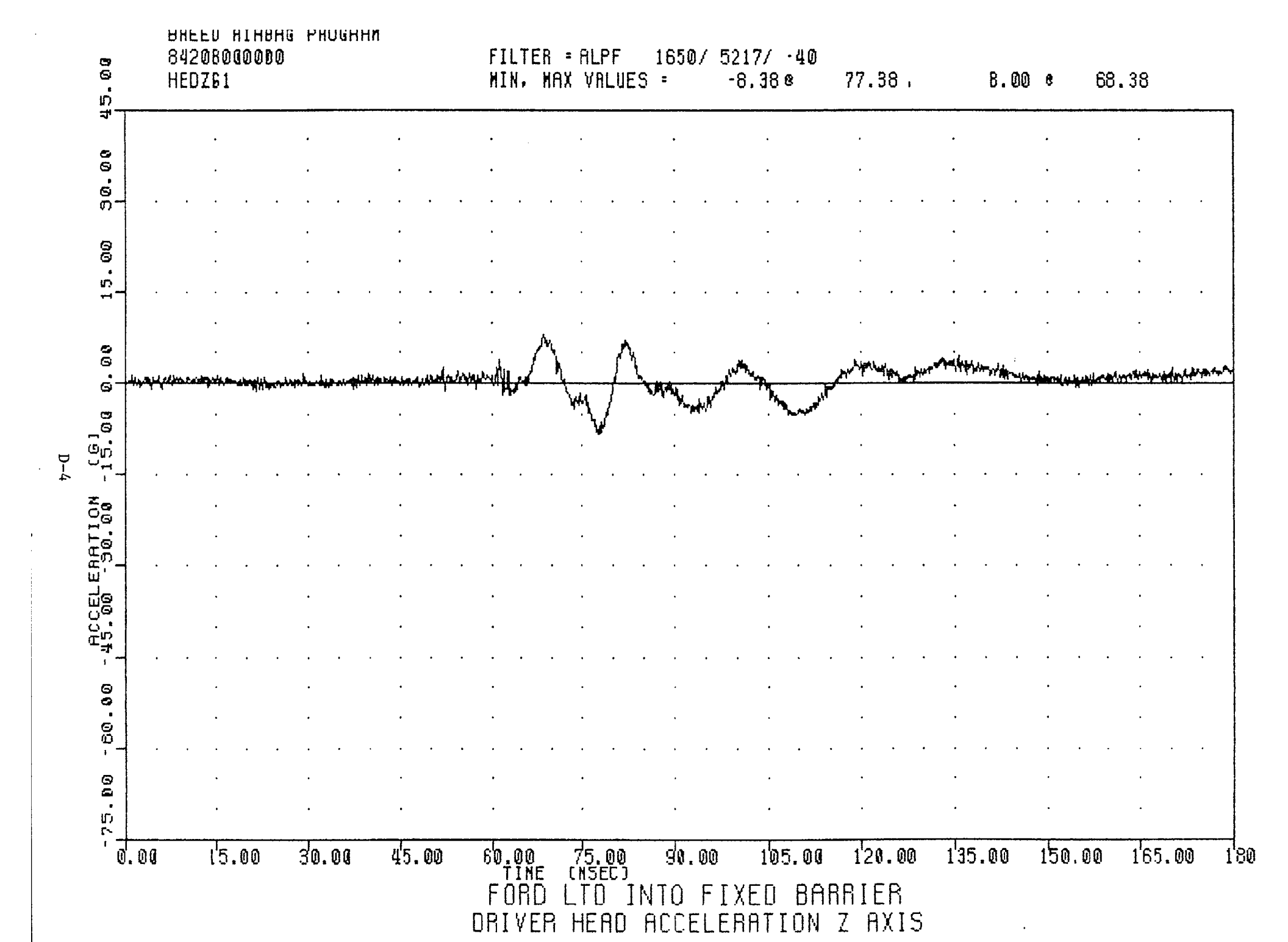
Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data were filtered according to SAE J211.

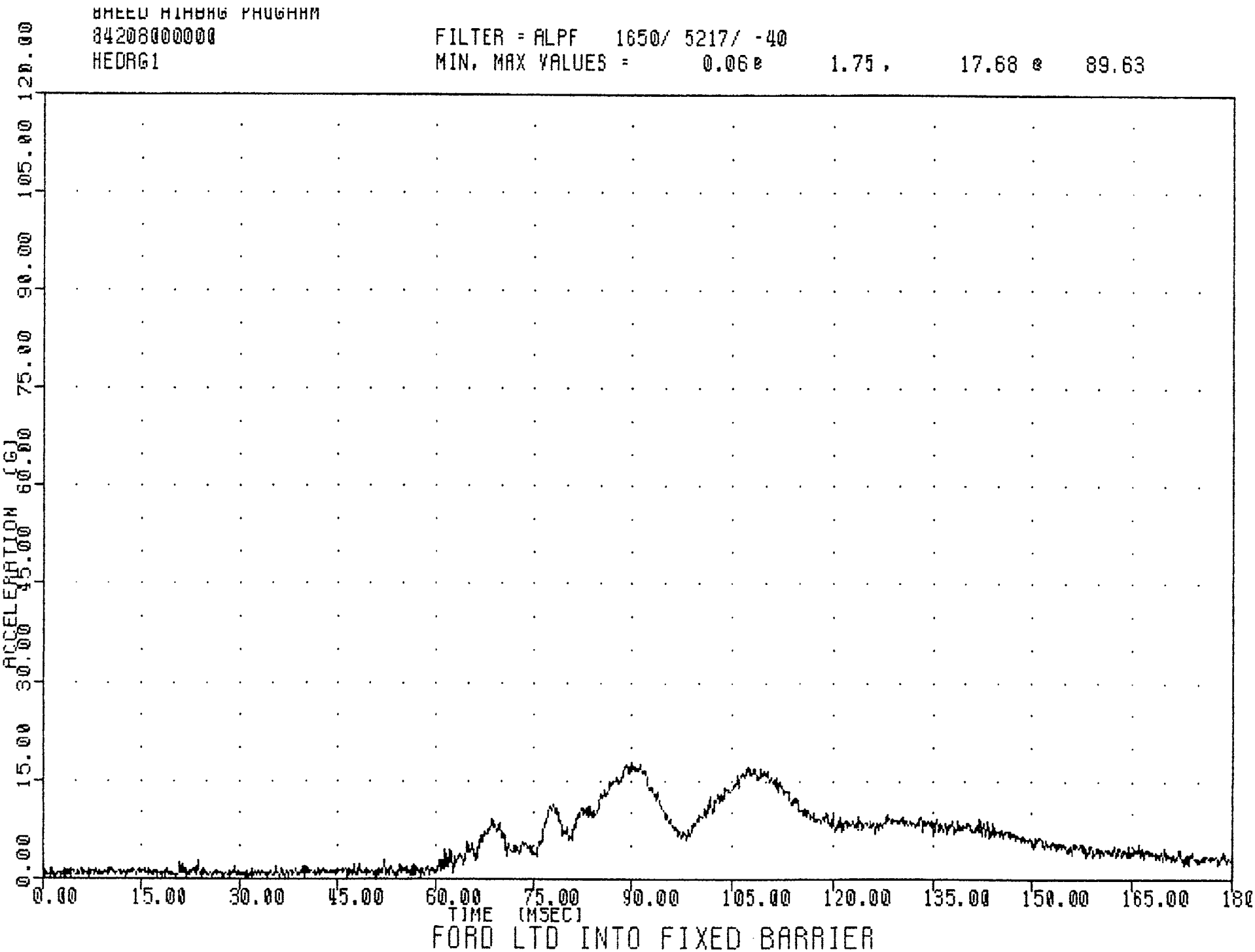


FORD LTD INTO FIXED BARRIER
DRIVER HEAD ACCELERATION X AXIS

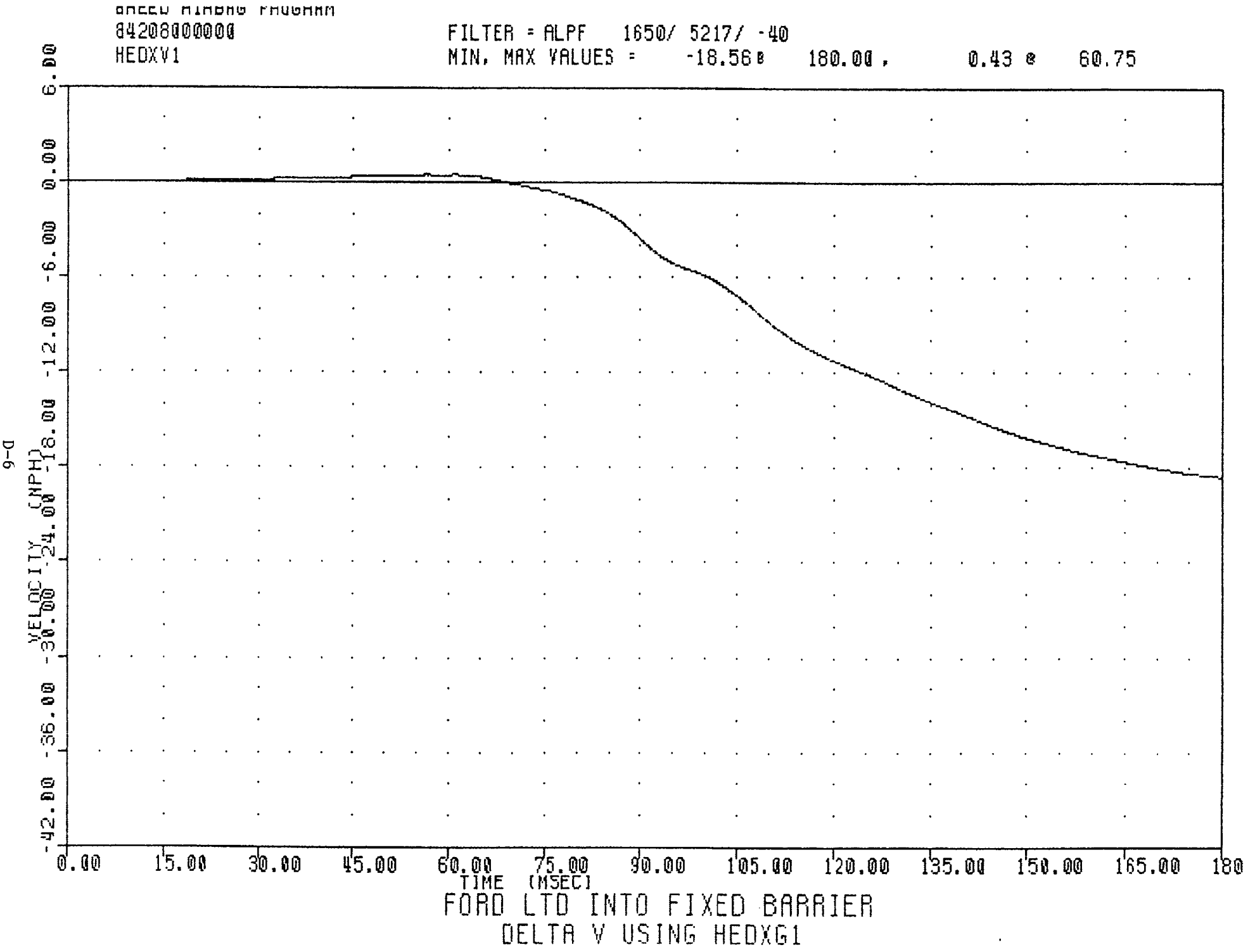


FORD LTD INTO FIXED BARRIER
DRIVER HEAD ACCELERATION Y AXIS

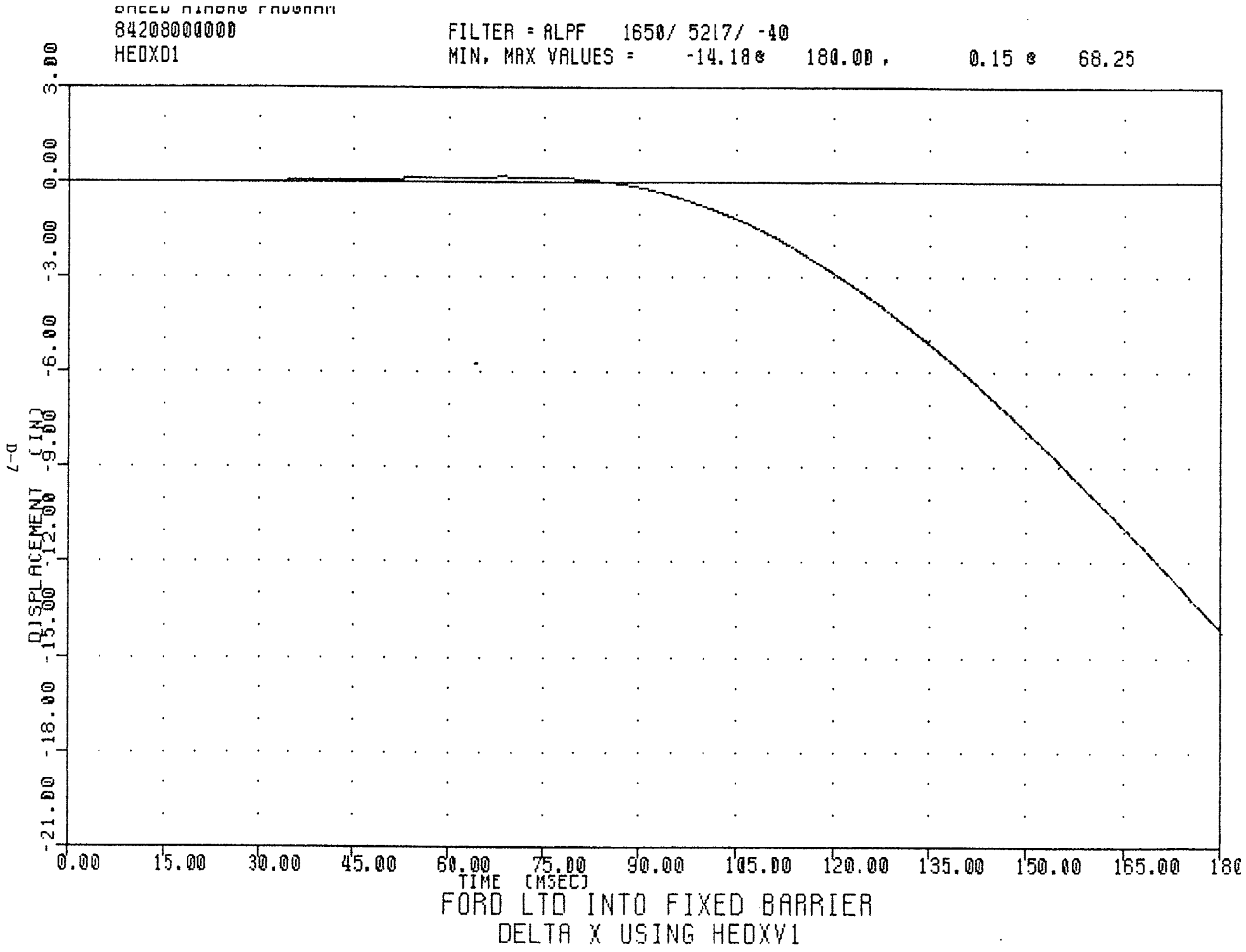

BREED AIRBAG PROGRAM
84208000000
HEDZ61
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -8.38 @ 77.38 , 8.00 @ 68.38
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
-75.00
ACCELERATION (G)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DRIVER HEAD ACCELERATION Z AXIS



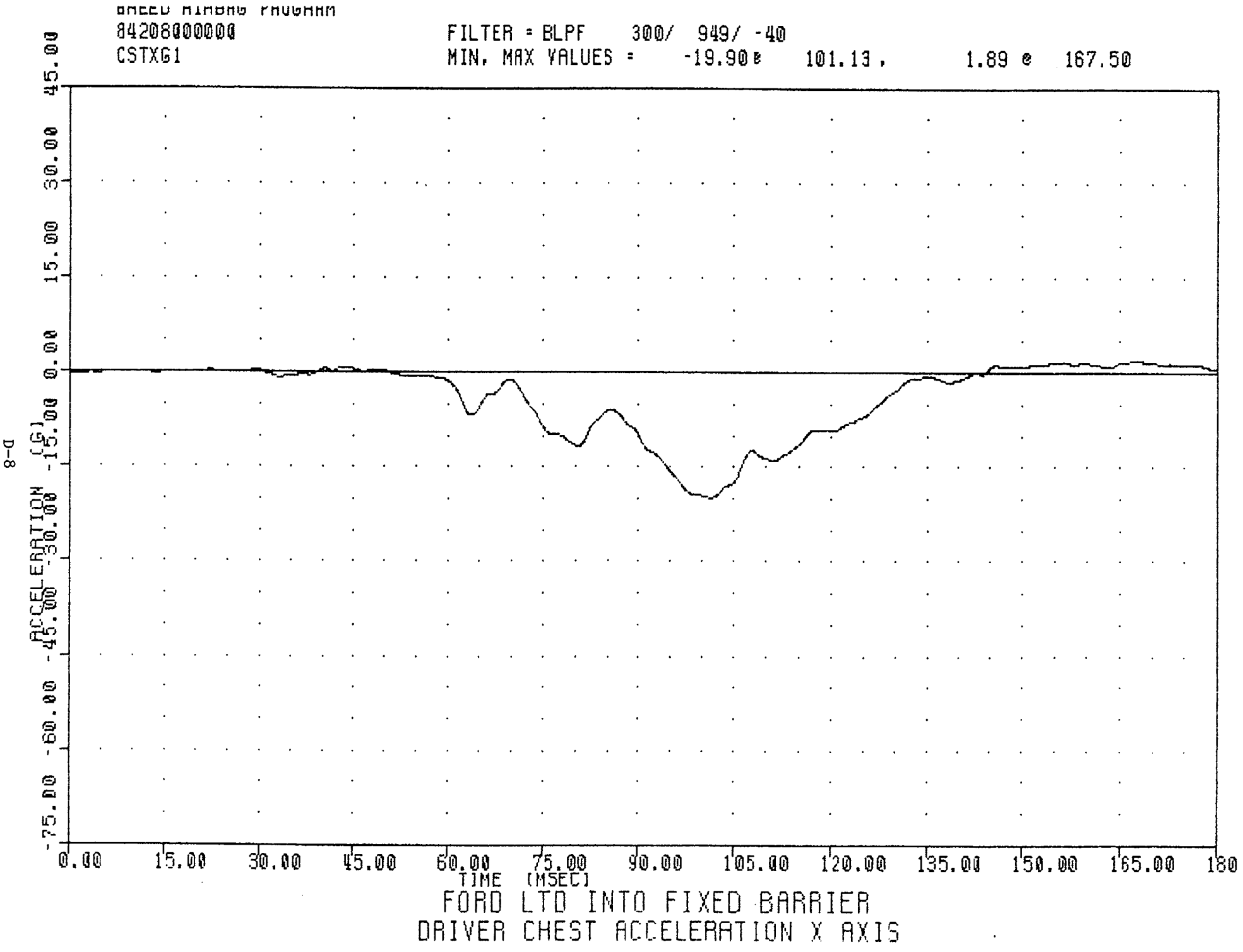
FORD LTD INTO FIXED BARRIER
DRIVER HEAD RESULTANT



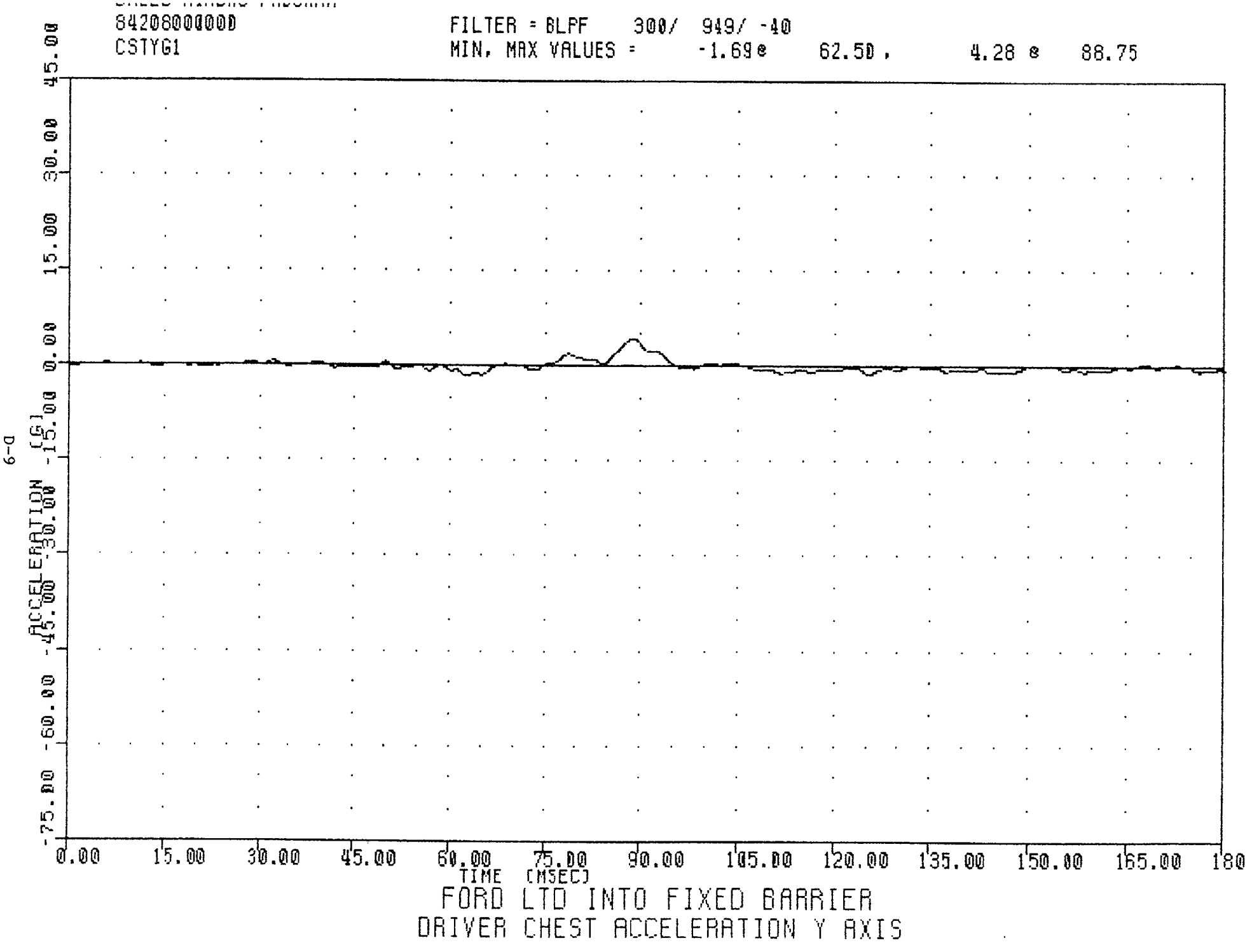
FORD LTD INTO FIXED BARRIER
DELTA V USING HEDXG1



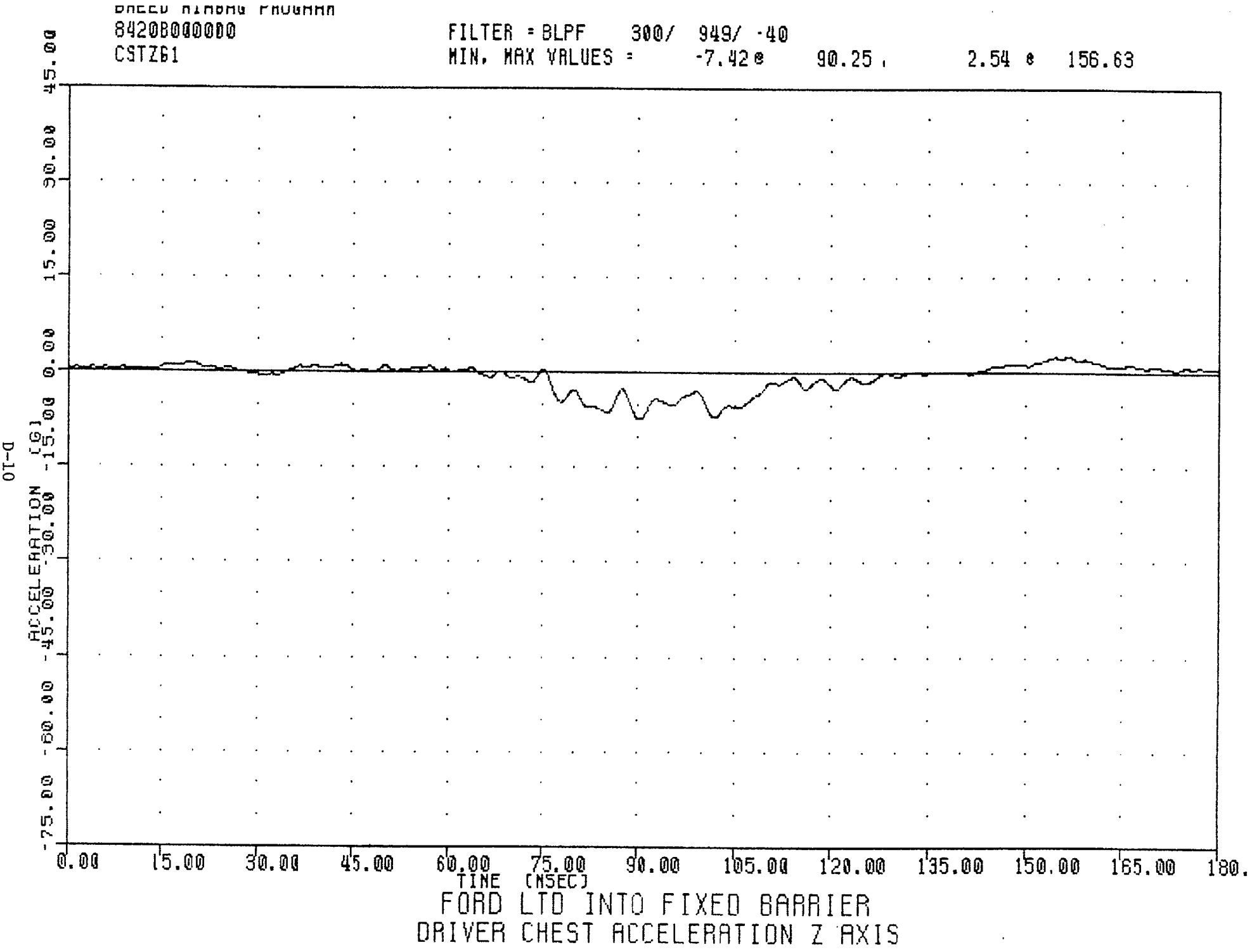
FORD LTD INTO FIXED BARRIER
DELTA X USING HEDXV1



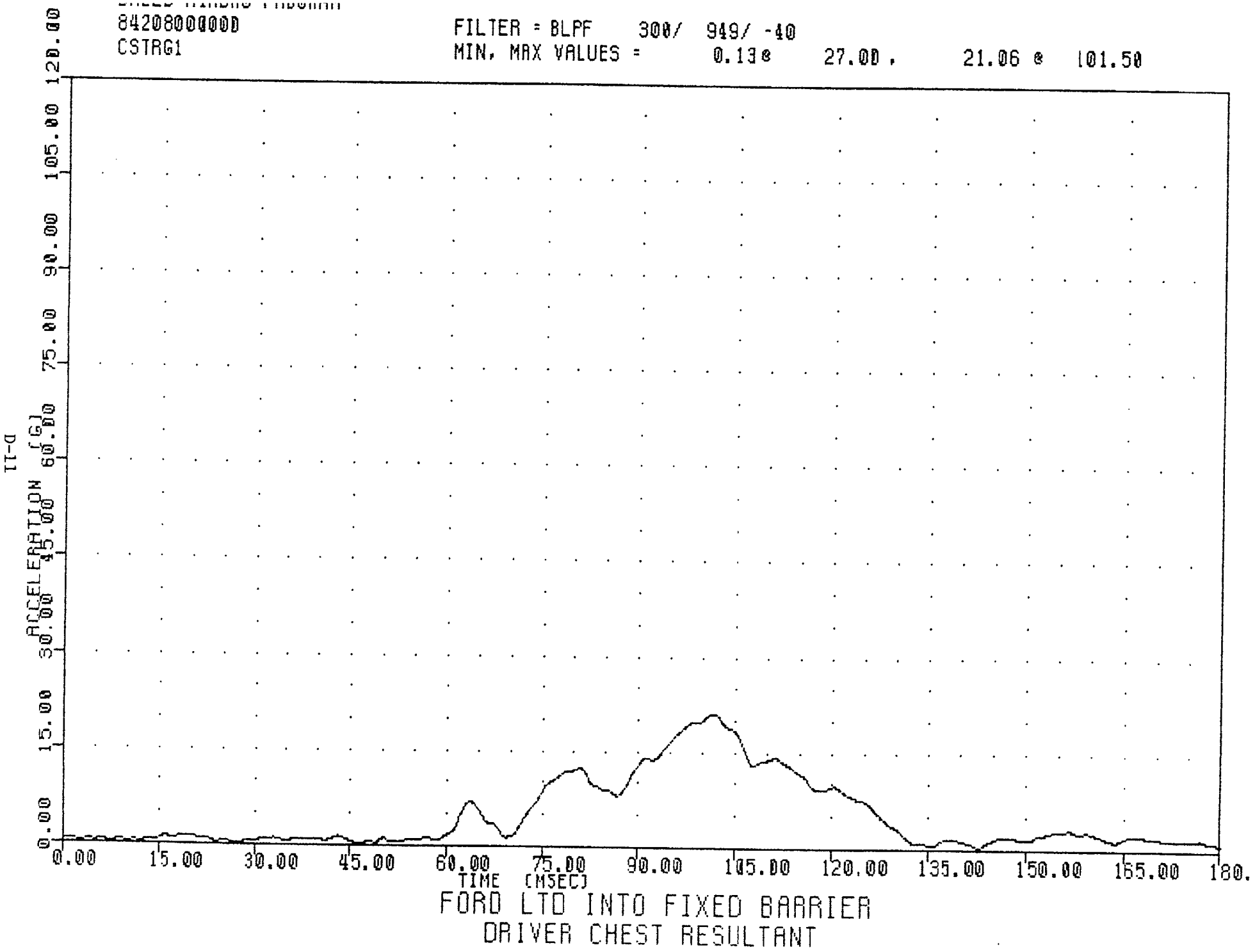
FORD LTD INTO FIXED BARRIER
DRIVER CHEST ACCELERATION X AXIS

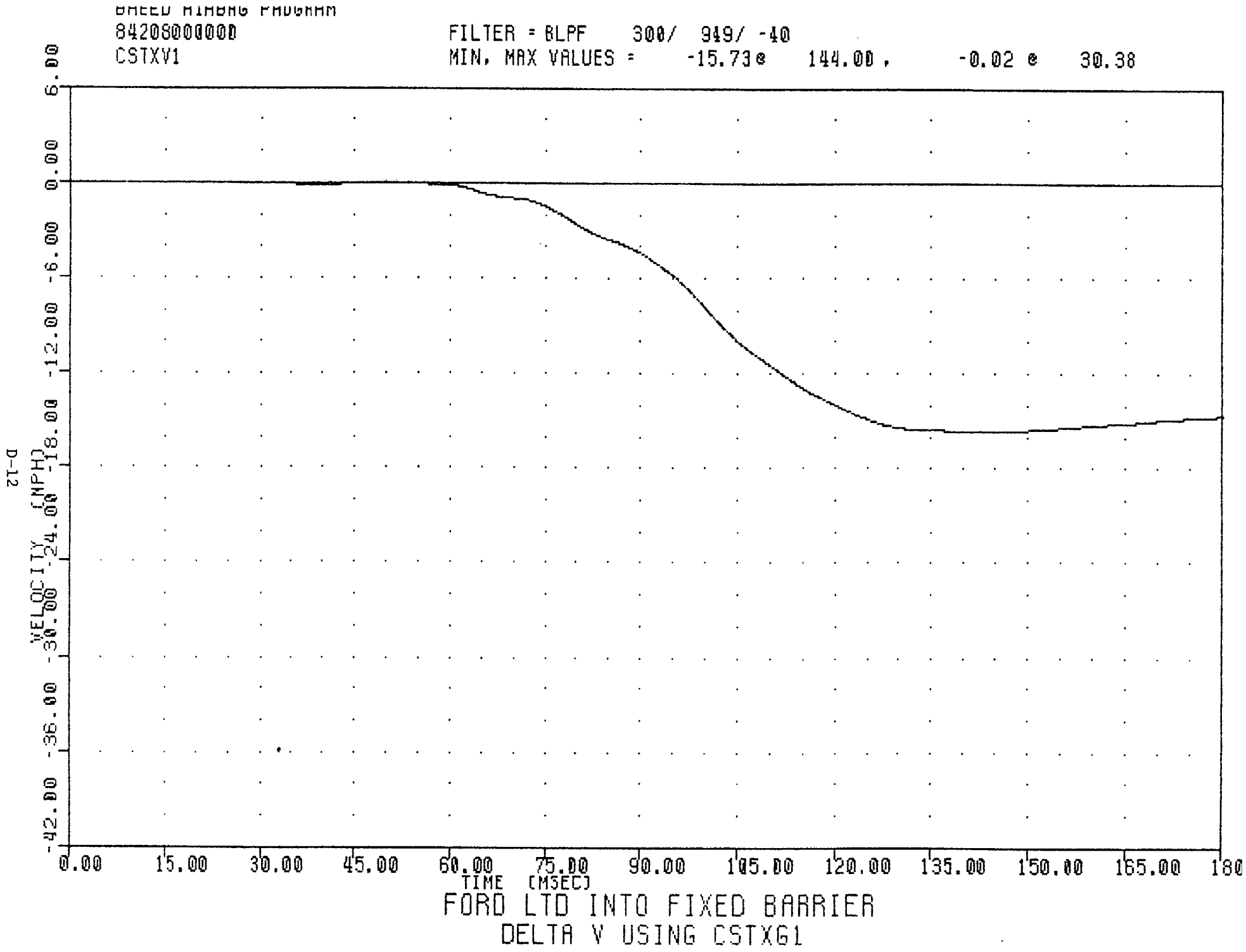

84208000000
CSTYG1
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -1.69 @ 62.50 , 4.28 @ 88.75
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
-75.00
ACCELERATION (G)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DRIVER CHEST ACCELERATION Y AXIS

6-a

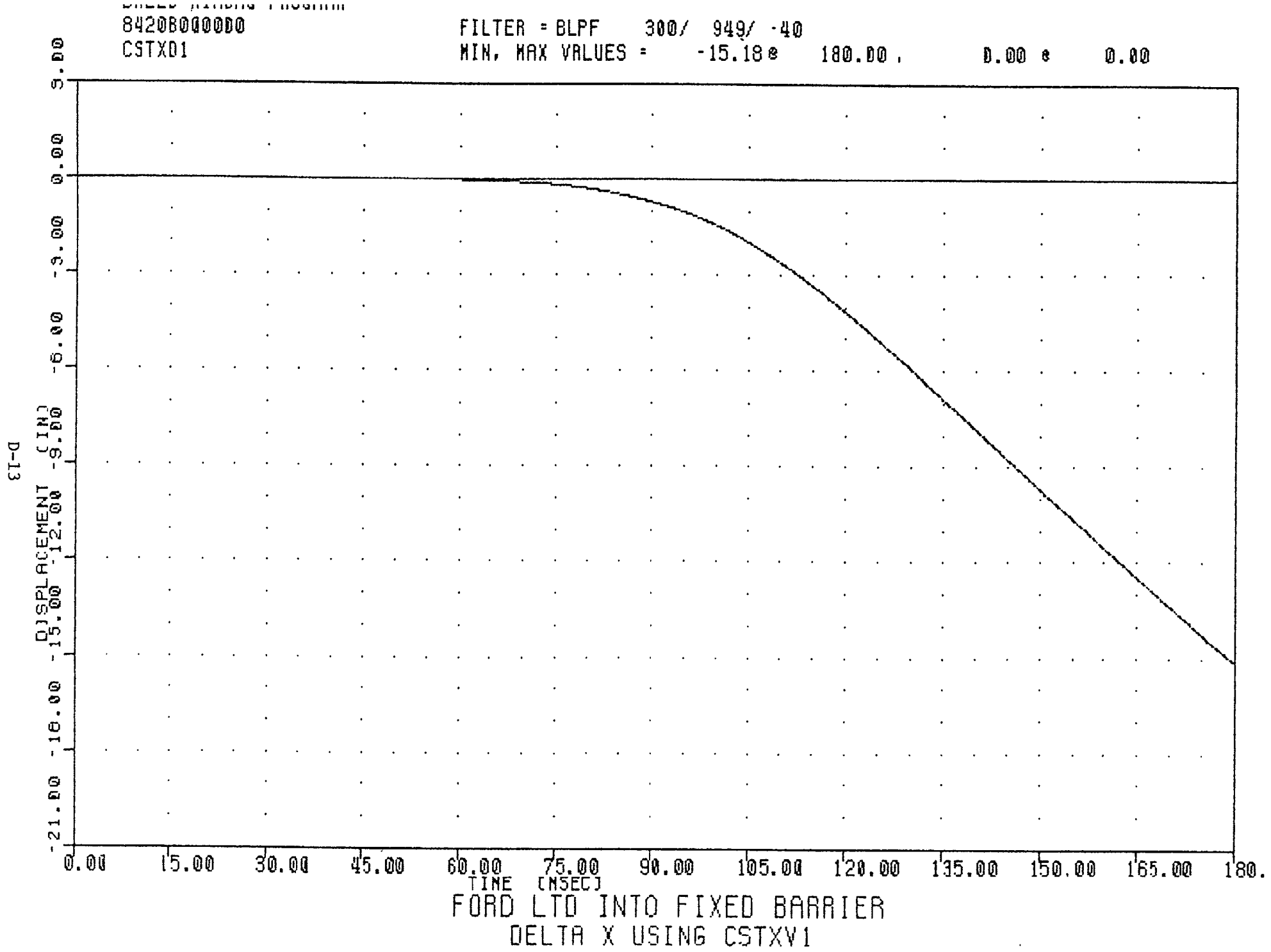


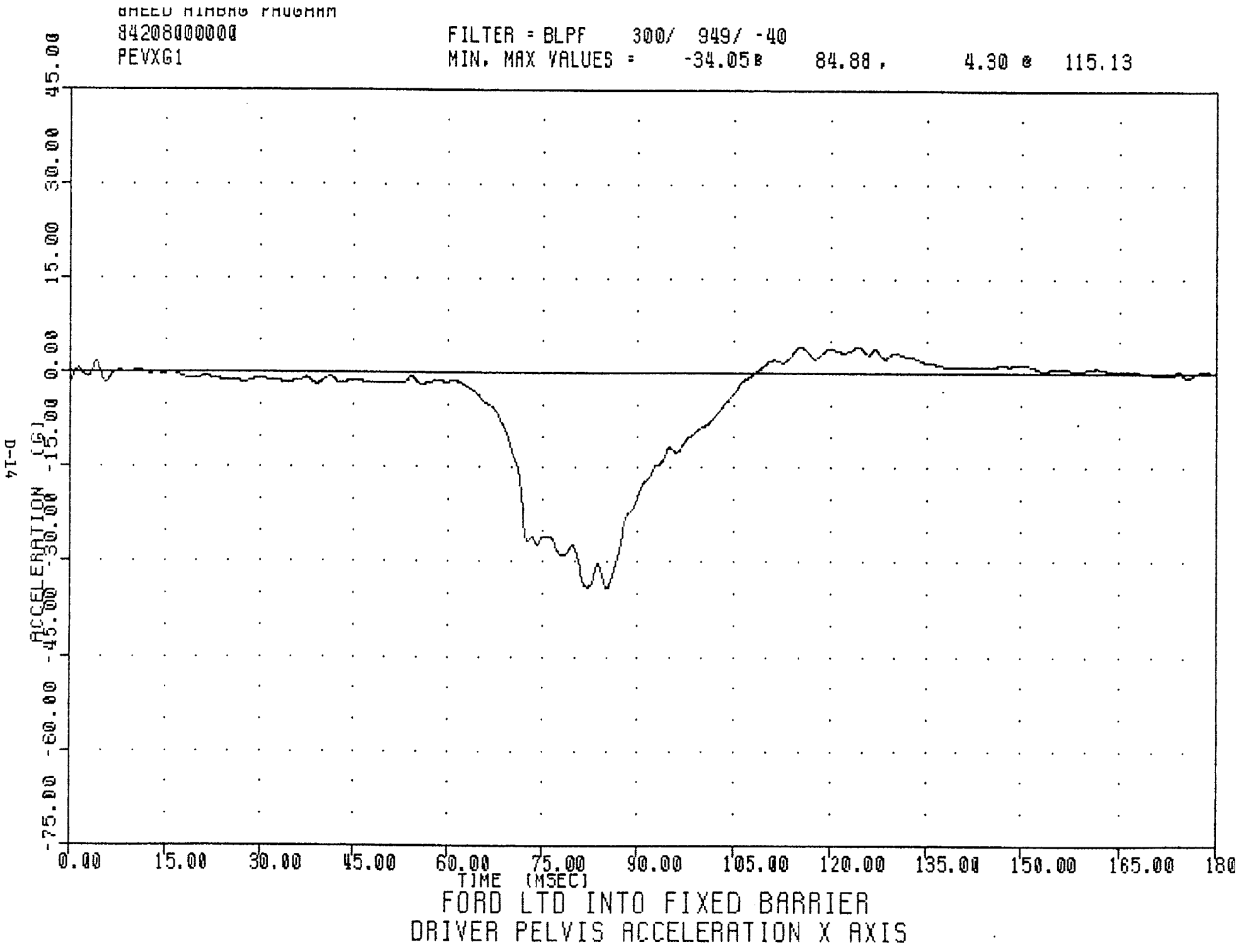
FORD LTD INTO FIXED BARRIER
DRIVER CHEST ACCELERATION Z AXIS


842080000D
CSTRG1
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.13@ 27.00, 21.06 @ 101.50
ACCELERATION [G]
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180.
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DRIVER CHEST RESULTANT

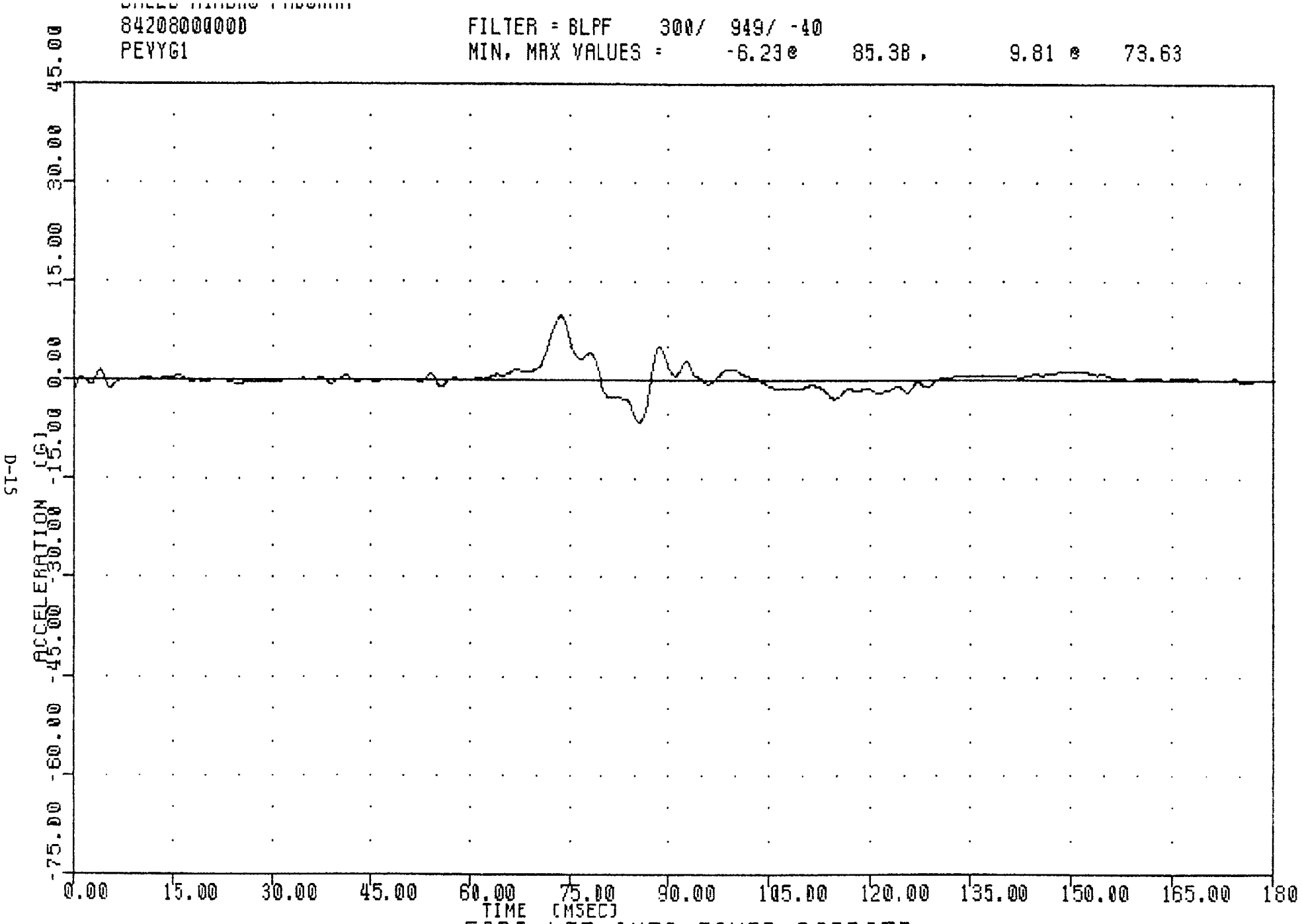


FORD LTD INTO FIXED BARRIER
DELTA V USING CSTXG1

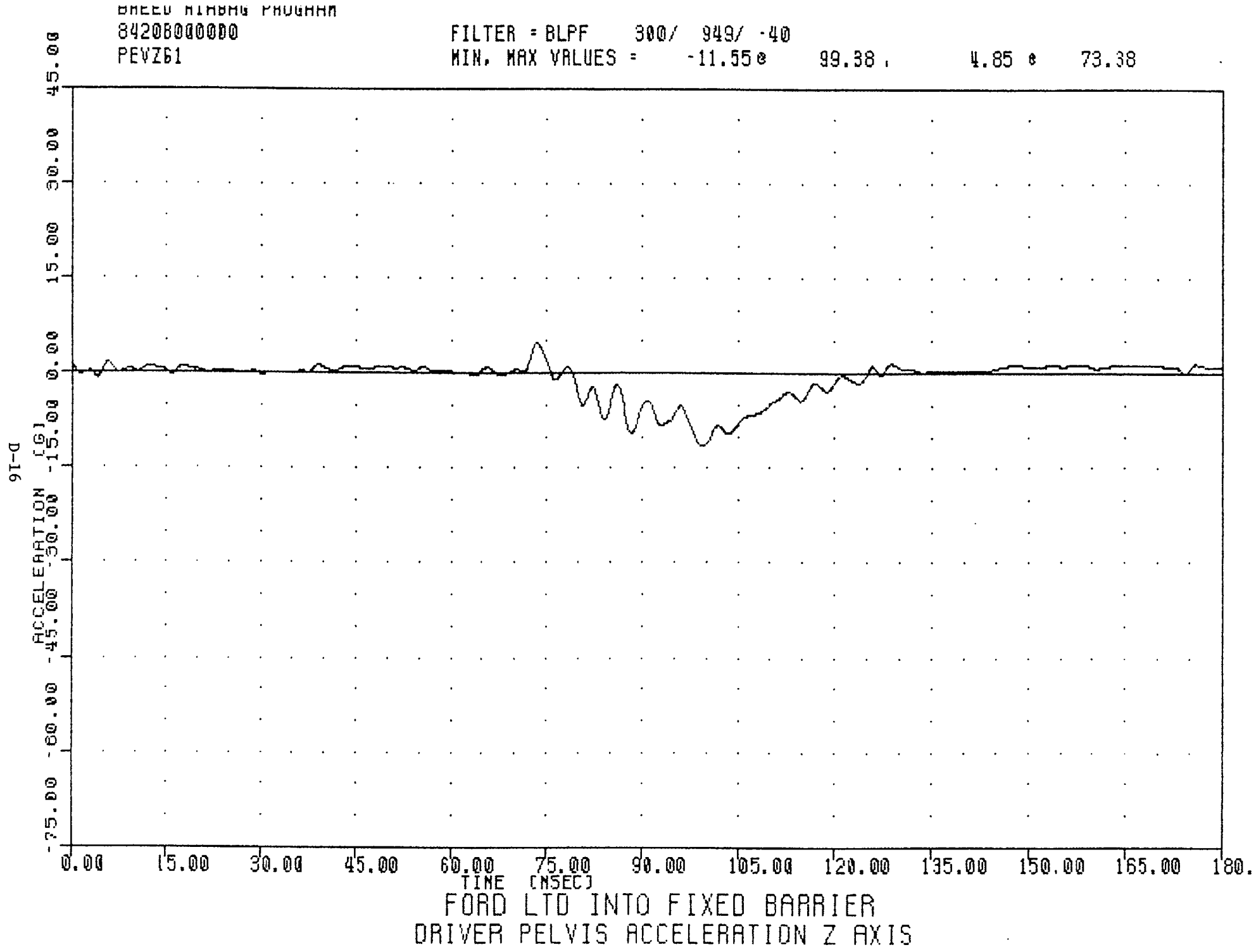

8420B0000D0
CSTXD1
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -15.18 @ 180.00 , 0.00 @ 0.00
9.00
0.00
-3.00
-6.00
-9.00
-12.00
-15.00
-18.00
-21.00
DISPLACEMENT (IN)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180.
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA X USING CSTXV1



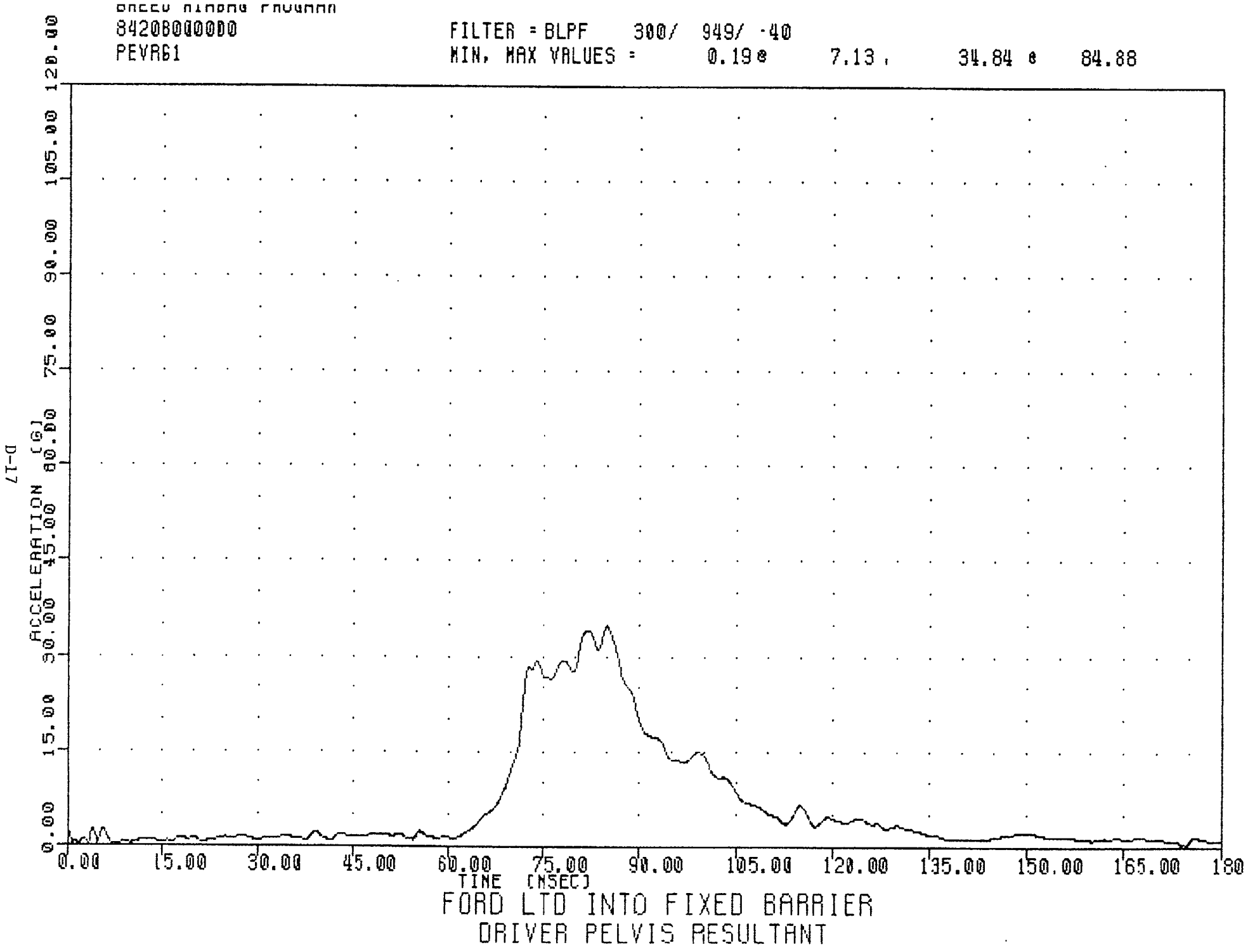
FORD LTD INTO FIXED BARRIER
DRIVER PELVIS ACCELERATION X AXIS



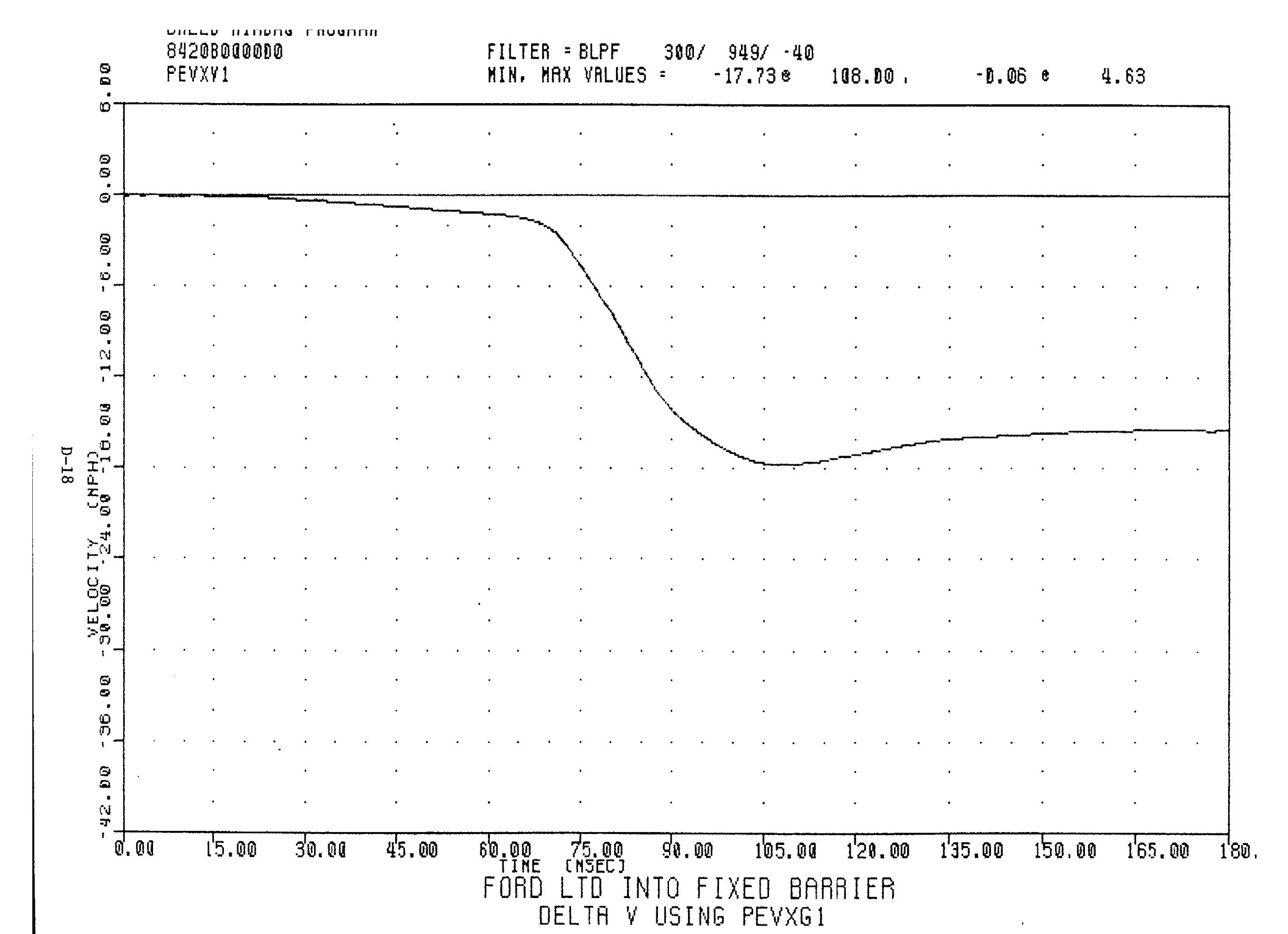
FORD LTD INTO FIXED BARRIER
DRIVER PELVIS ACCELERATION Y AXIS

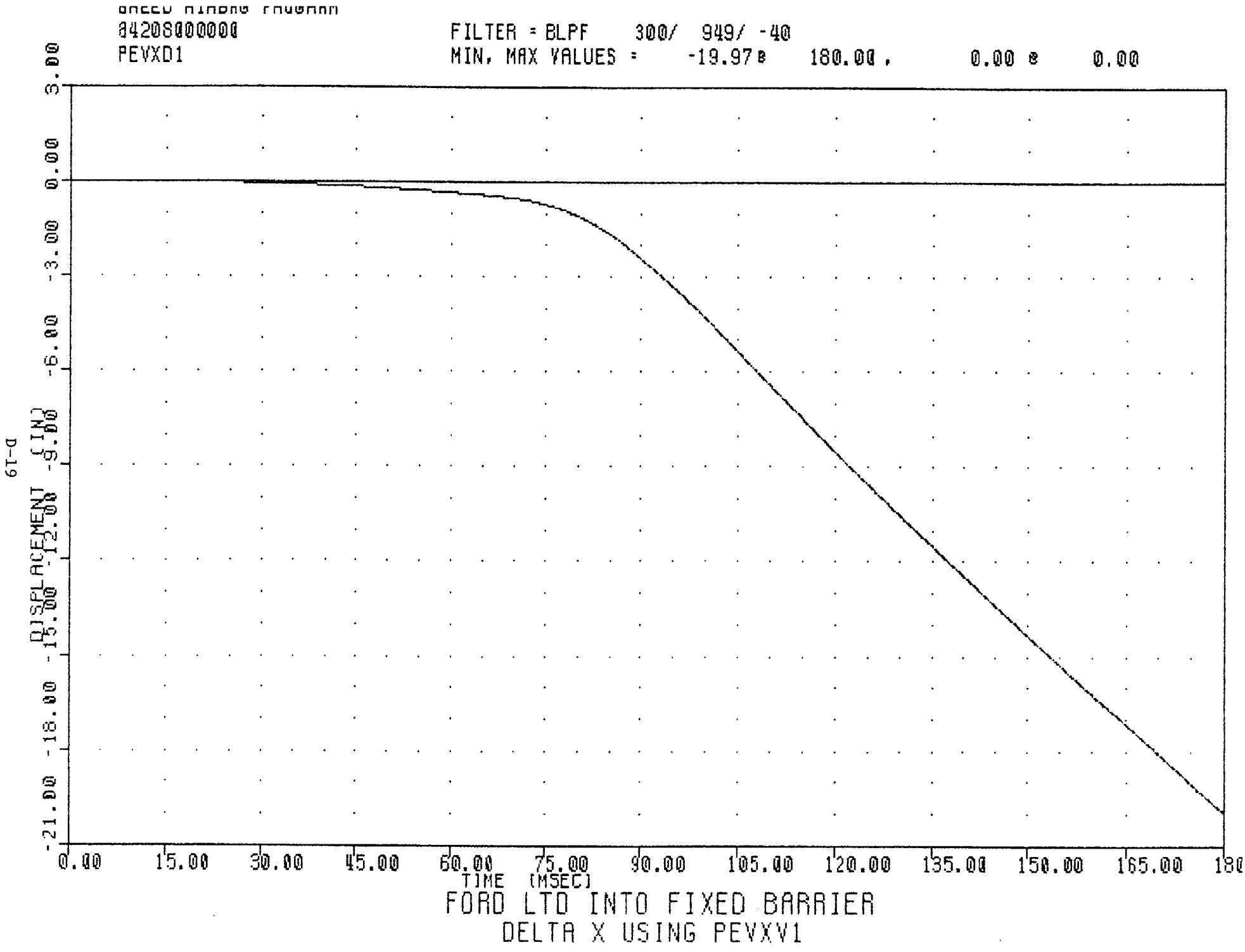


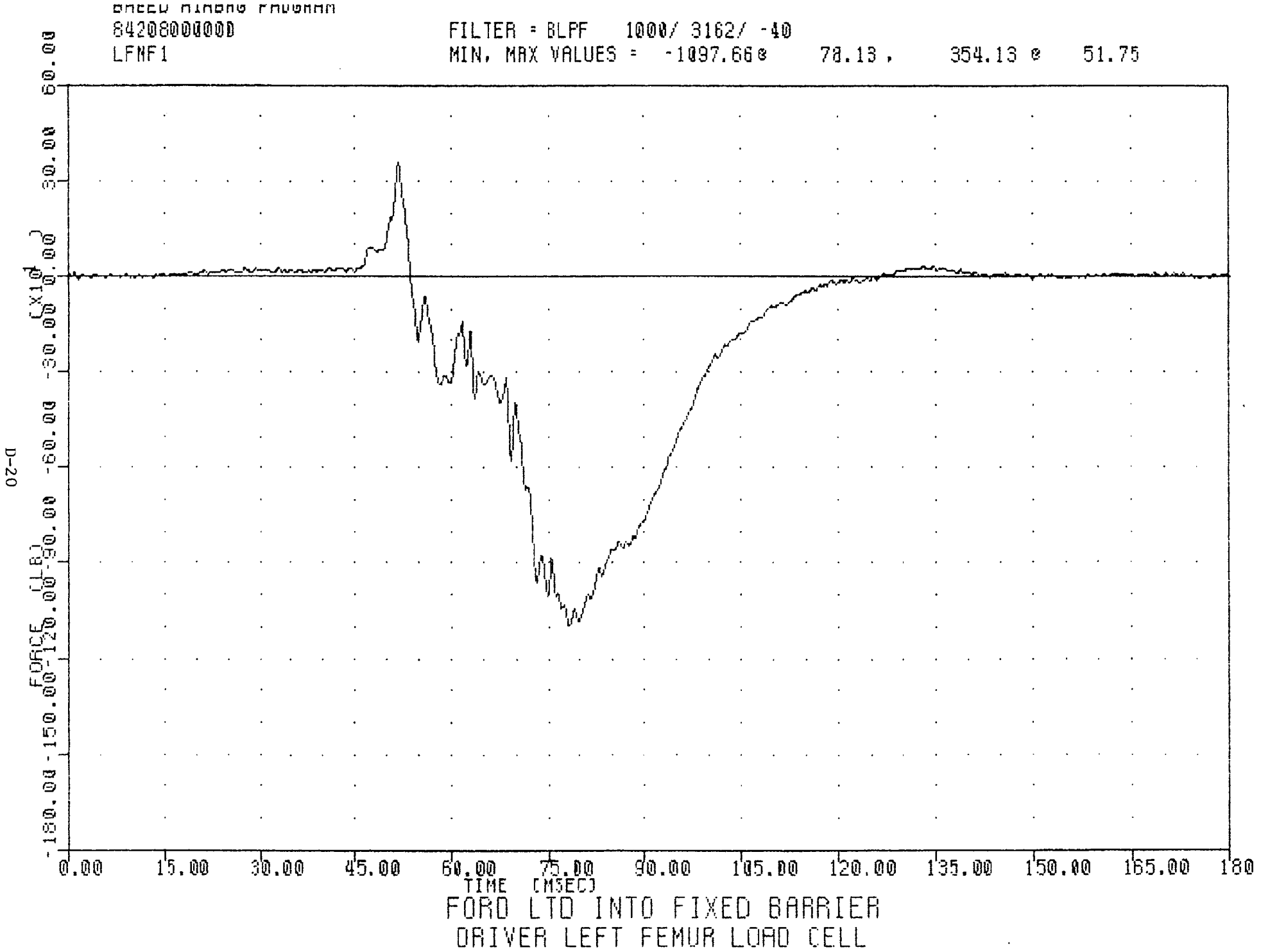
FORD LTD INTO FIXED BARRIER
DRIVER PELVIS ACCELERATION Z AXIS

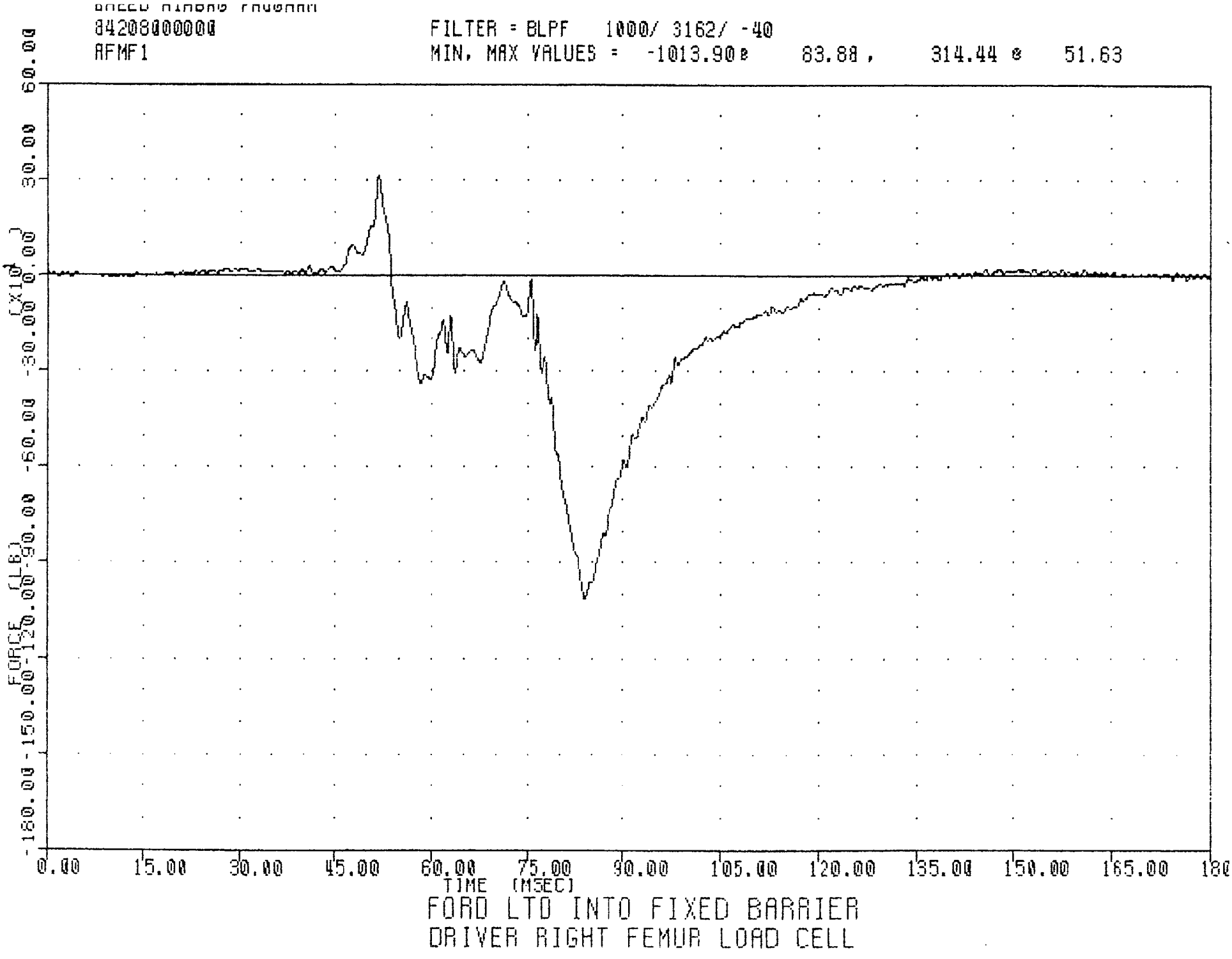


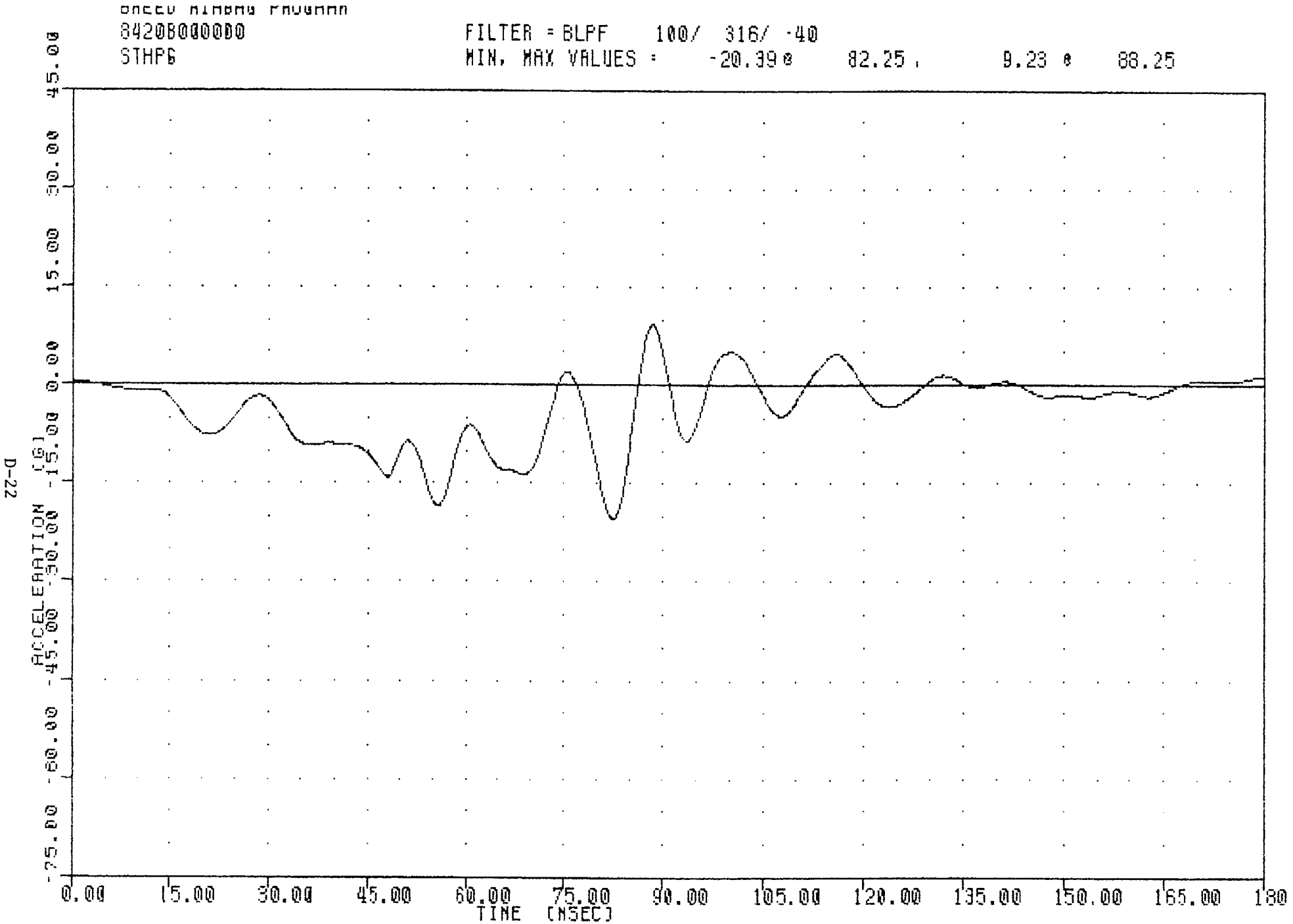
FORD LTD INTO FIXED BARRIER
DRIVER PELVIS RESULTANT


8420B0000D0
PEVXV1
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -17.73 @ 108.00 , -0.06 @ 4.63
6.00
0.00
-6.00
-12.00
-18.00
-24.00
-30.00
-36.00
-42.00
VELOCITY (MPH)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180.
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA V USING PEVXG1


FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -19.97 @ 180.00 , 0.00 @ 0.00
3.00
0.00
-3.00
-6.00
-9.00
-12.00
-15.00
-18.00
-21.00
DISPLACEMENT (IN)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA X USING PEVXV1

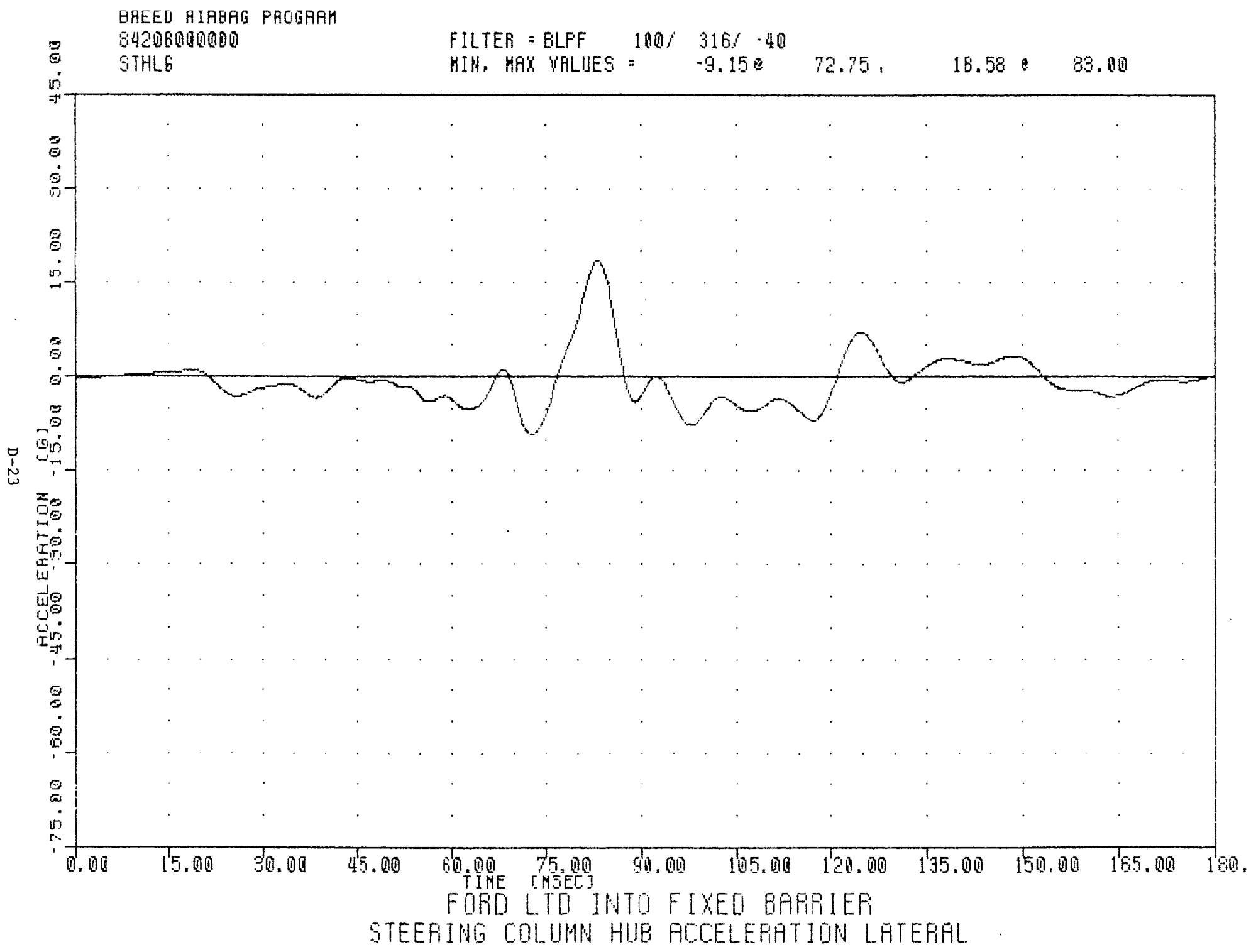

SPEED MINING PROGRAM
84208000000
LFNF1
FILTER = BLPF 1000/ 3162/ -40
MIN, MAX VALUES = -1097.66 @ 78.13 , 354.13 @ 51.75
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00
-150.00
-180.00
FORCE (LB) (X10)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DRIVER LEFT FEMUR LOAD CELL


842080000000
AFMF1
FILTER = BLPF 1000/ 3162/ -40
MIN, MAX VALUES = -1013.90 @ 63.88 , 314.44 @ 51.63
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00
-150.00
-180.00
FORCE (LB) [X10]
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DRIVER RIGHT FEMUR LOAD CELL

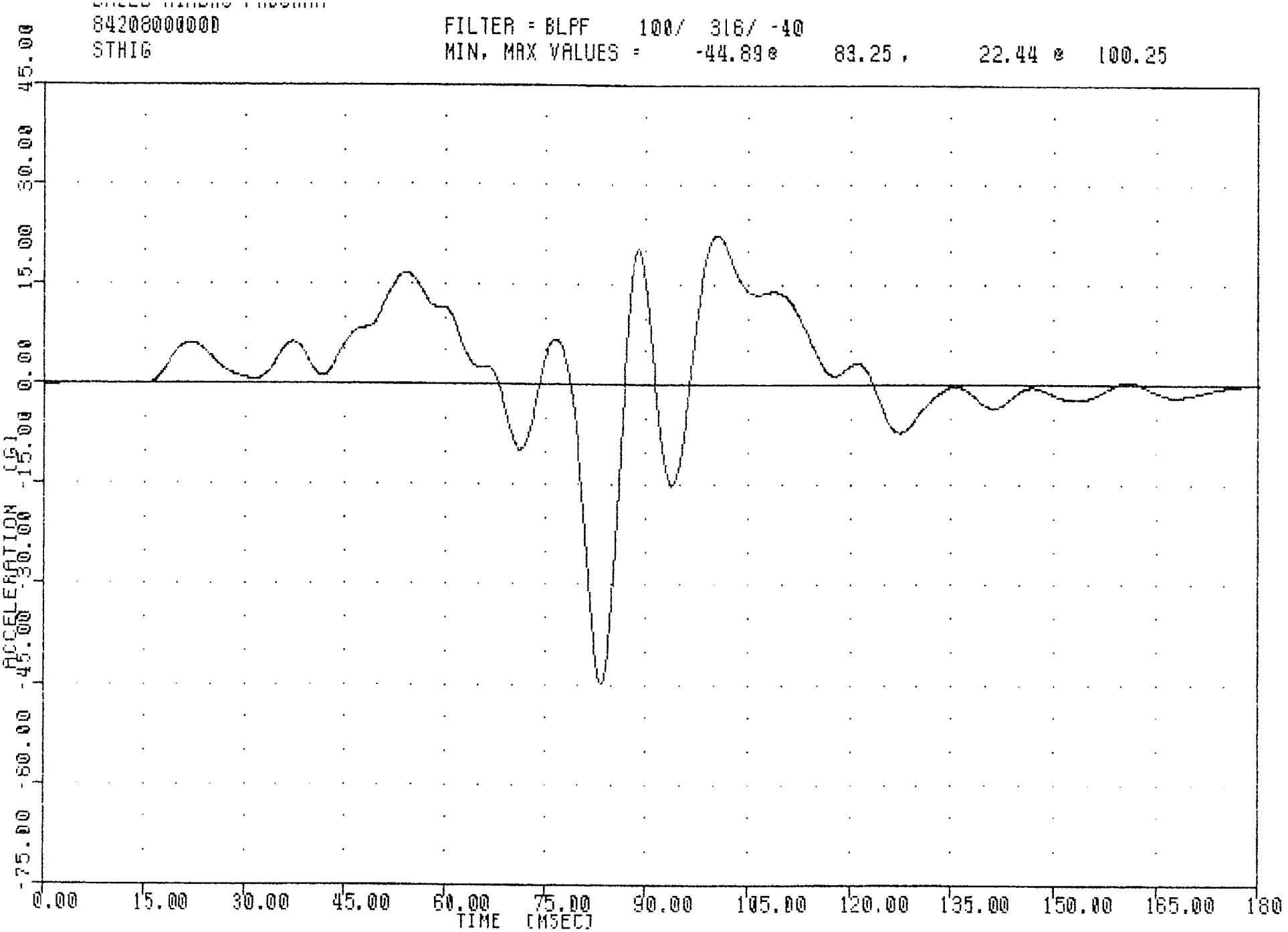


FORD LTD INTO FIXED BARRIER

STEERING COLUMN HUB ACCELERATION POSTERIOR

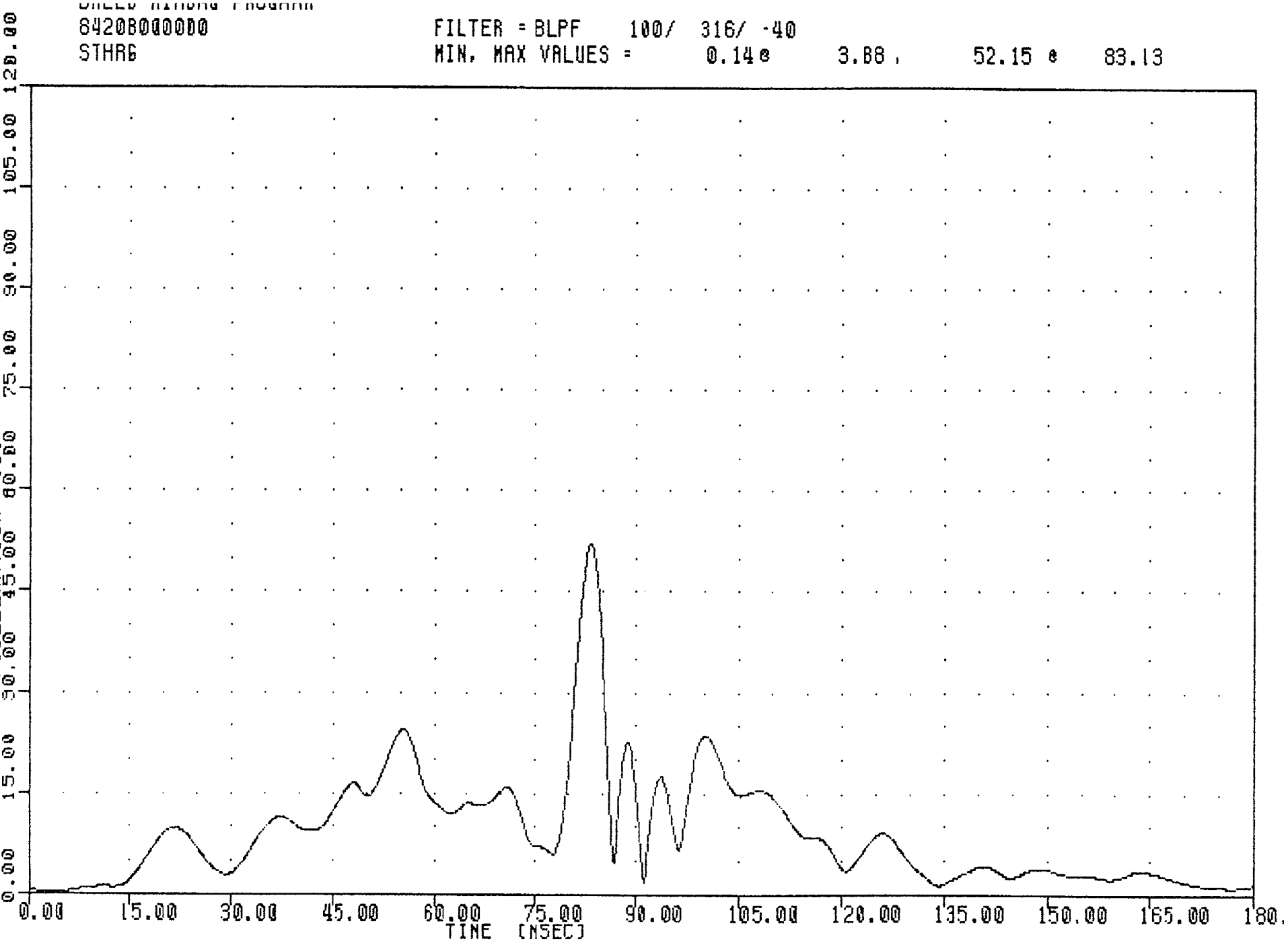


FORD LTD INTO FIXED BARRIER
STEERING COLUMN HUB ACCELERATION LATERAL

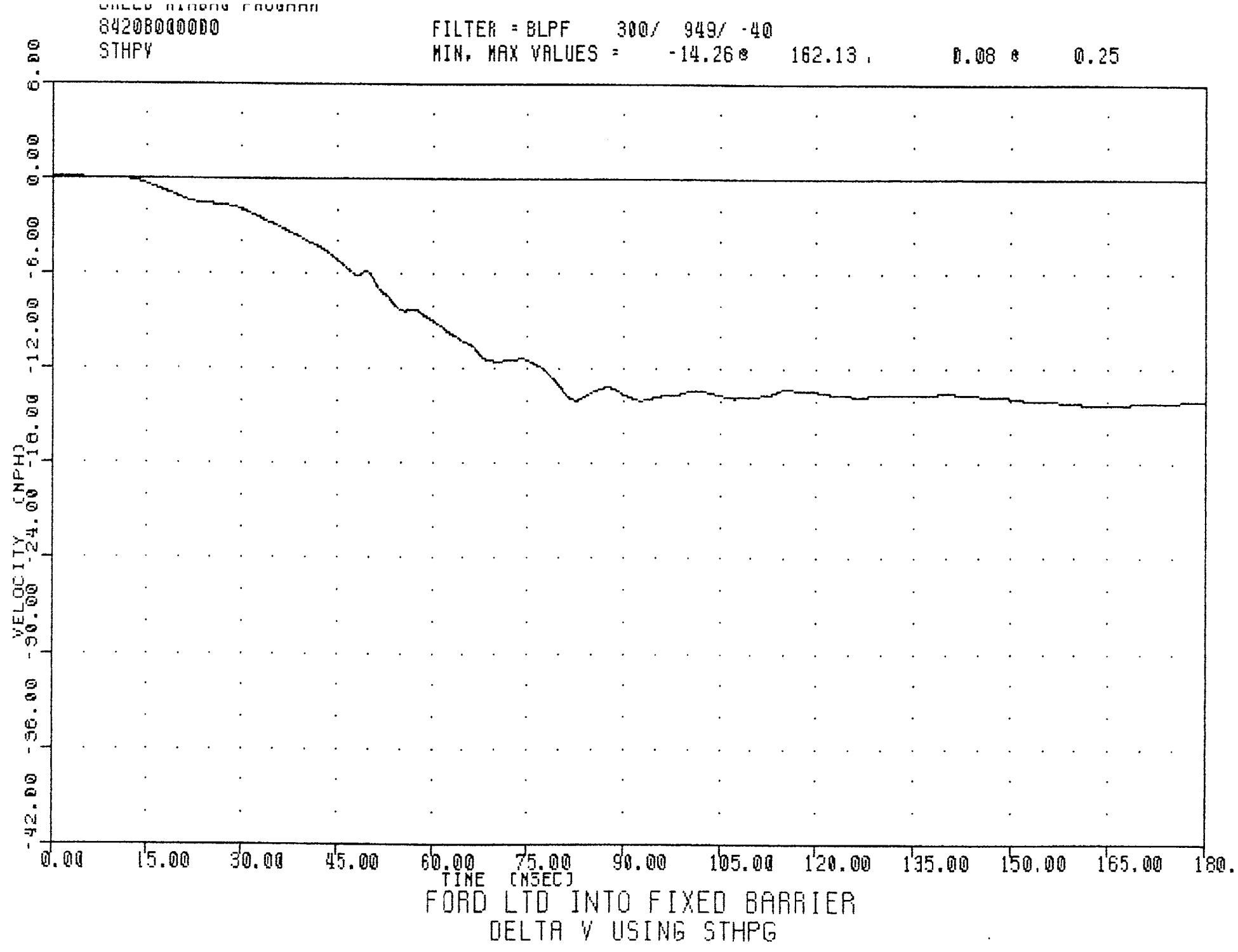


FORD LTD INTO FIXED BARRIER

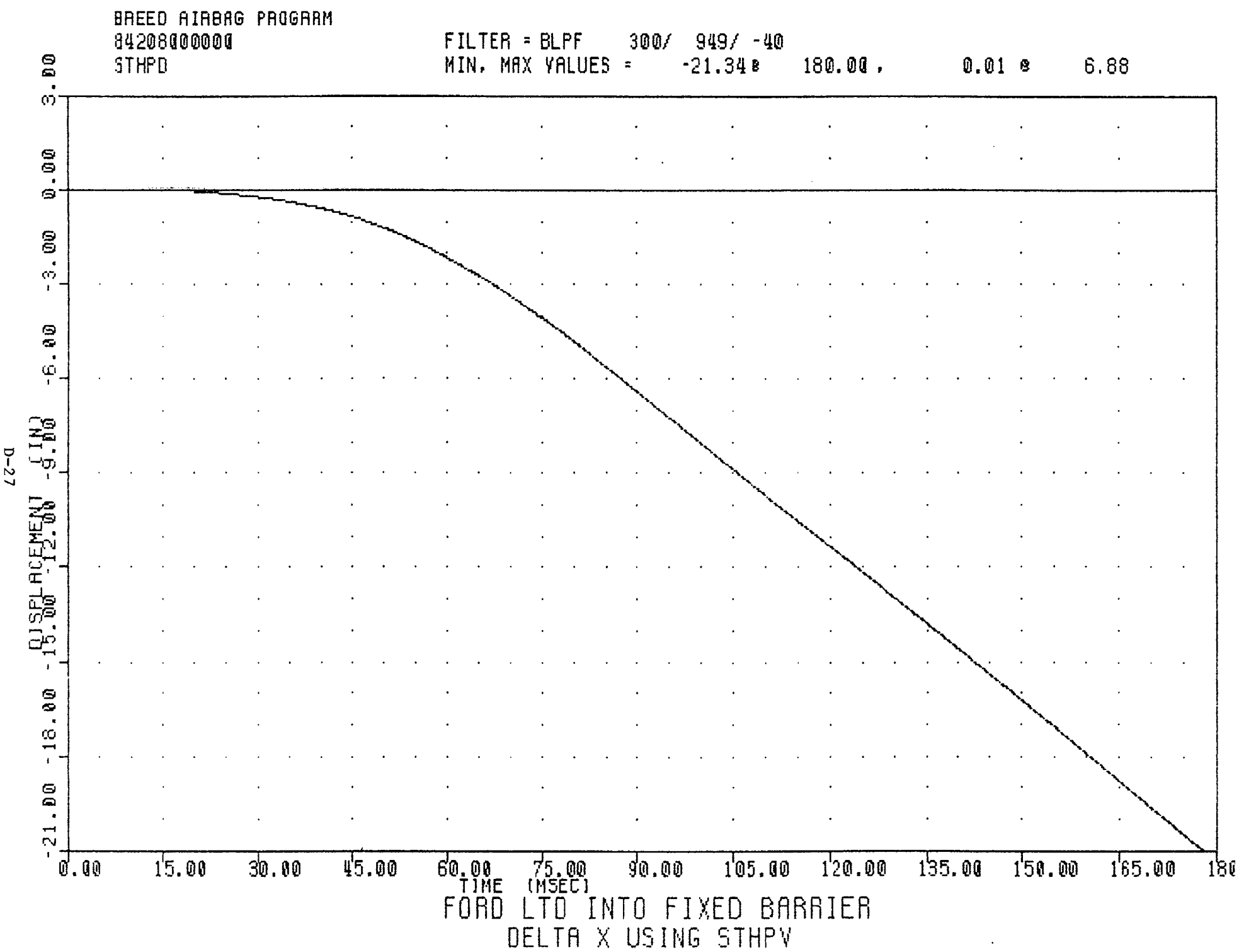
STEERING COLUMN HUB ACCELERATION INFERIOR

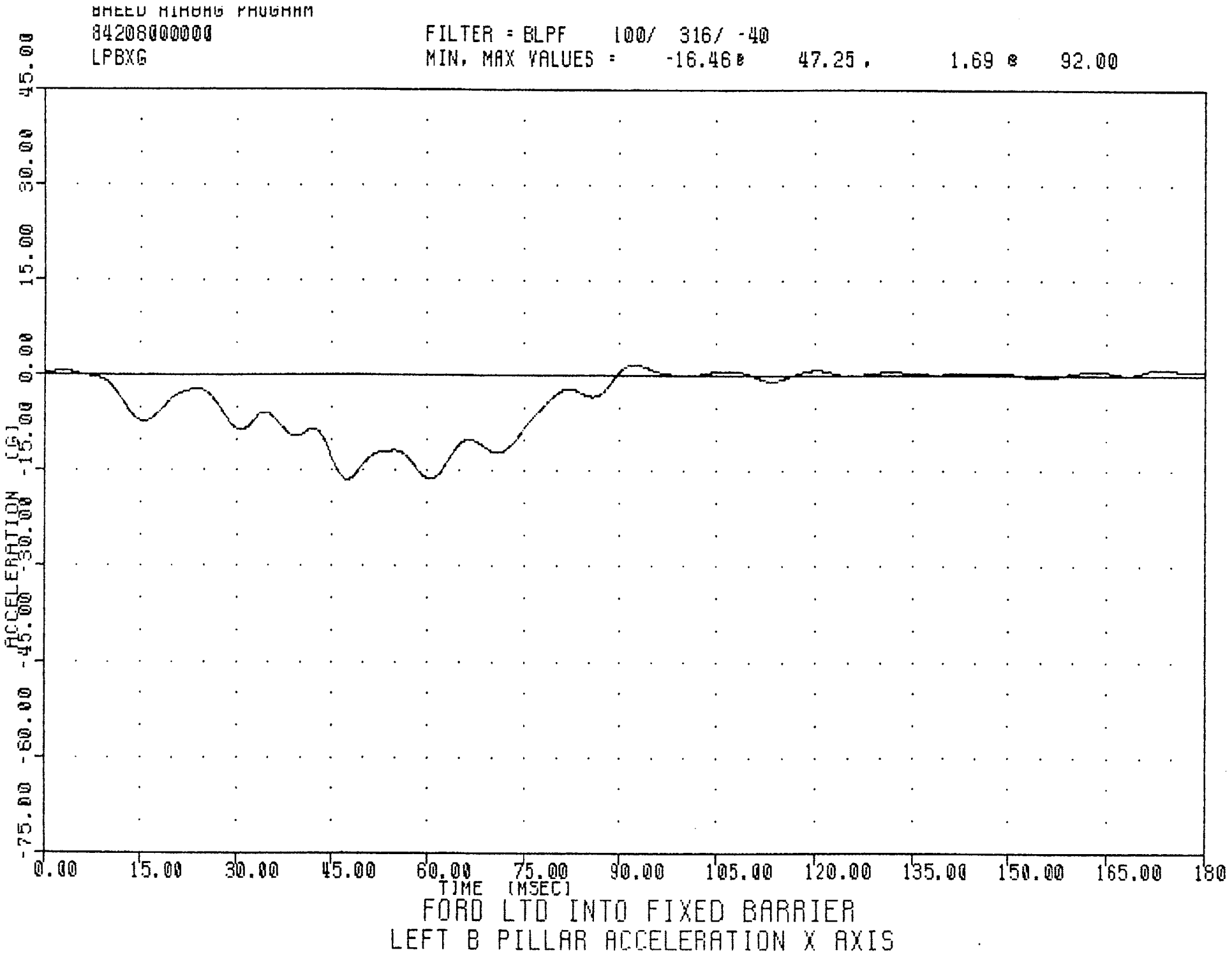


FORD LTD INTO FIXED BARRIER
STEERING COLUMN HUB RESULTANT

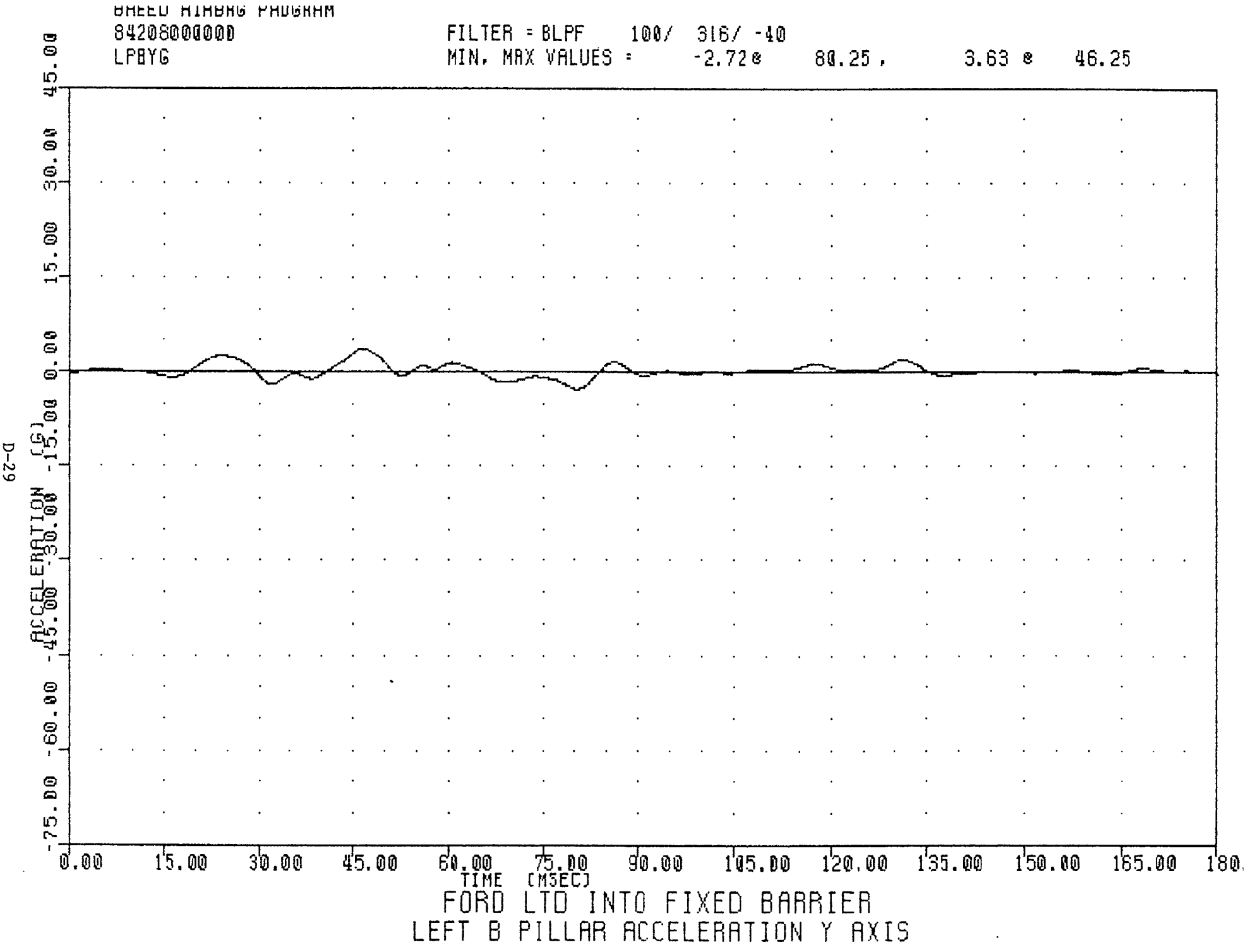


FORD LTD INTO FIXED BARRIER
DELTA V USING STHPG

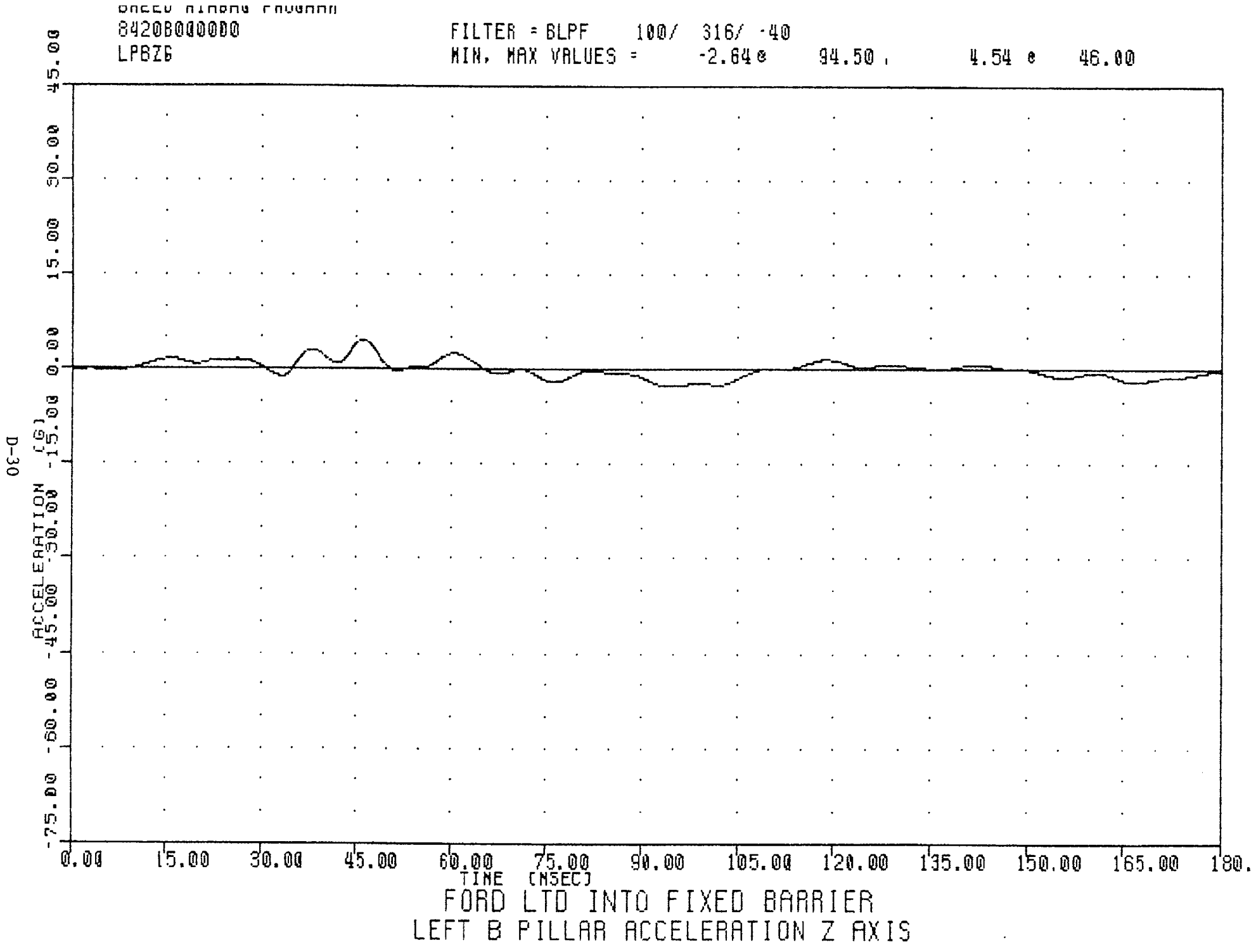

BREED AIRBAG PROGRAM
84208000000
STHPD
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -21.34 @ 180.00 , 0.01 @ 6.88
3.00
0.00
-3.00
-6.00
-9.00
-12.00
-15.00
-18.00
-21.00
DISPLACEMENT (IN)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA X USING STHPV



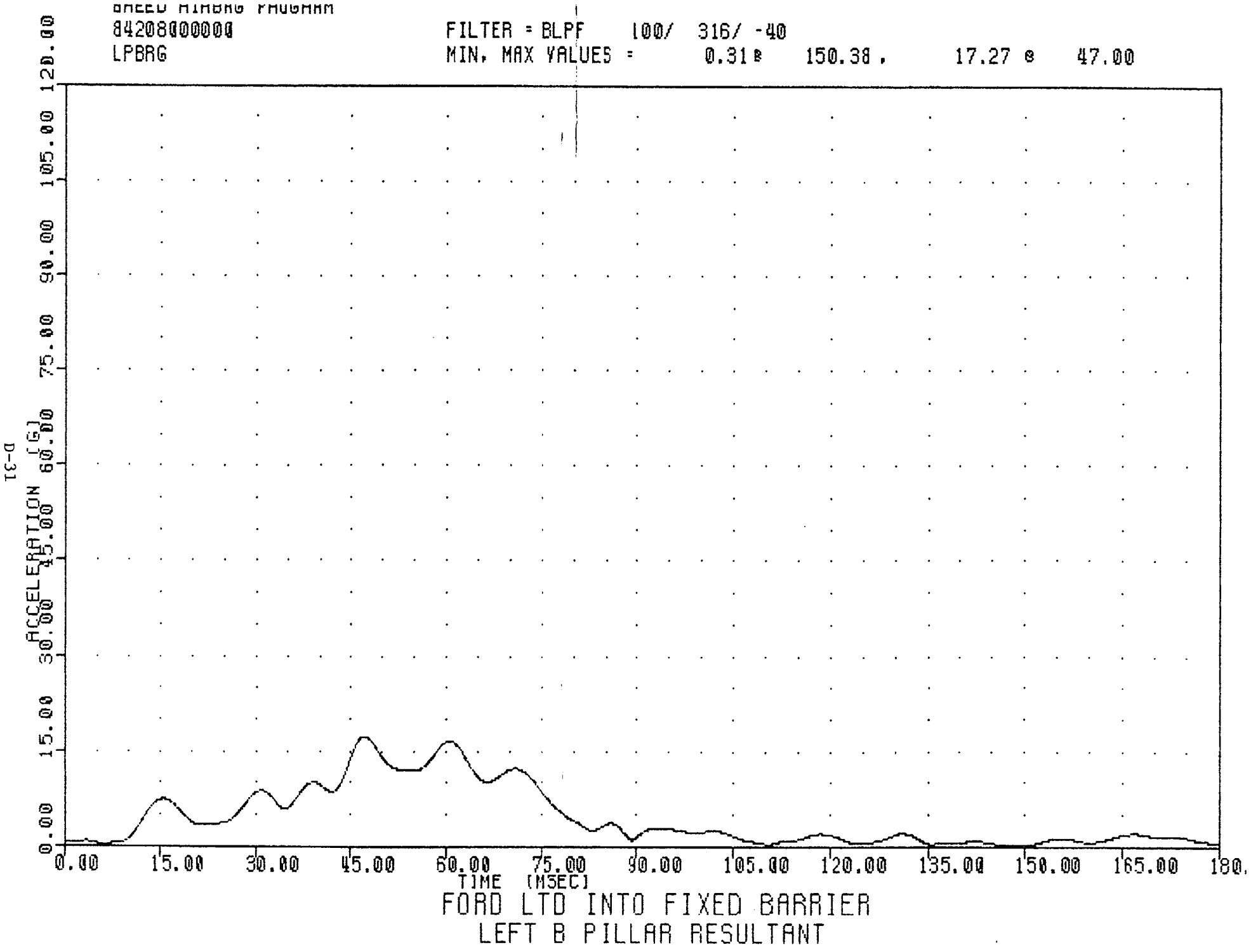
FORD LTD INTO FIXED BARRIER
LEFT B PILLAR ACCELERATION X AXIS



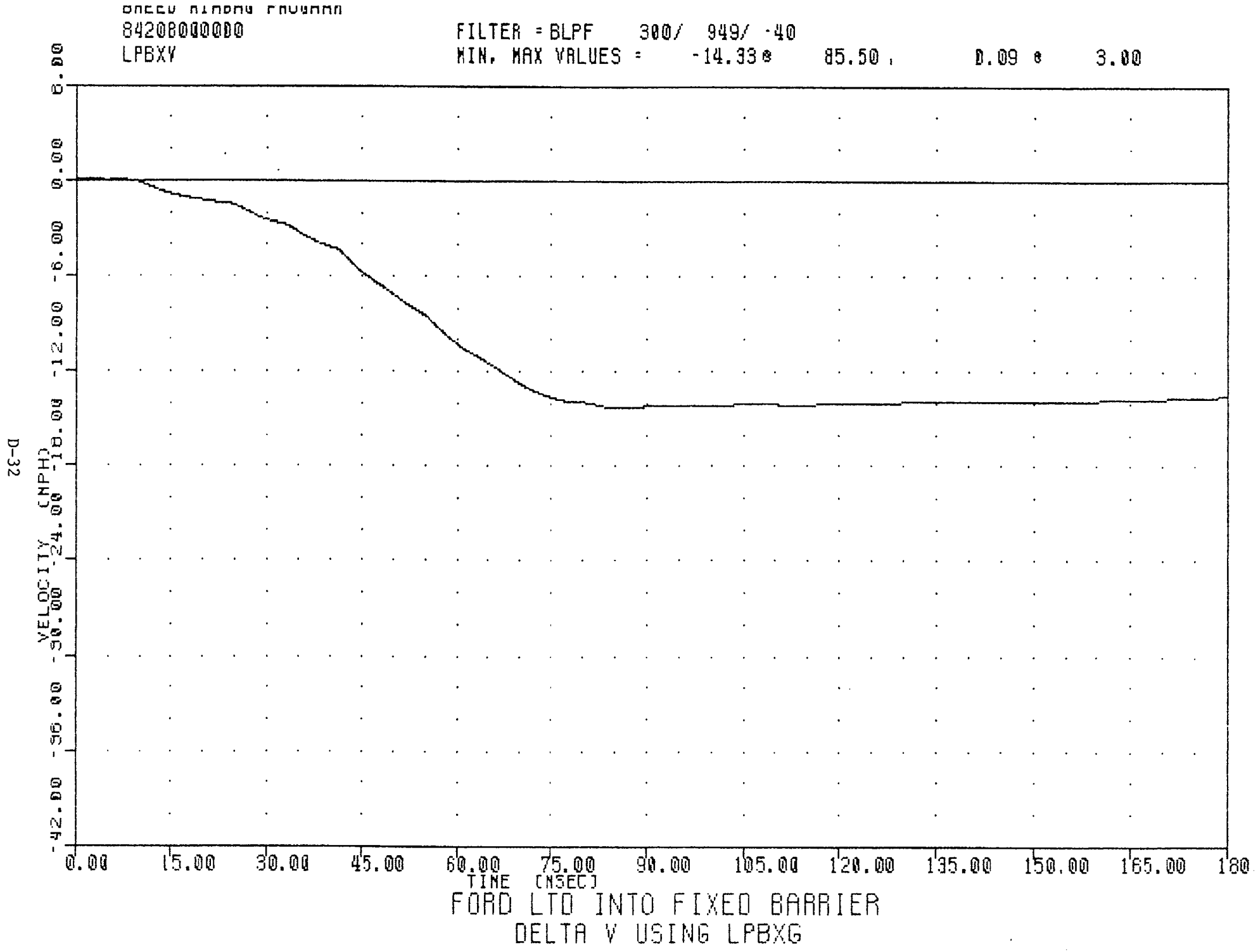
FORD LTD INTO FIXED BARRIER
LEFT B PILLAR ACCELERATION Y AXIS



FORD LTD INTO FIXED BARRIER
LEFT B PILLAR ACCELERATION Z AXIS

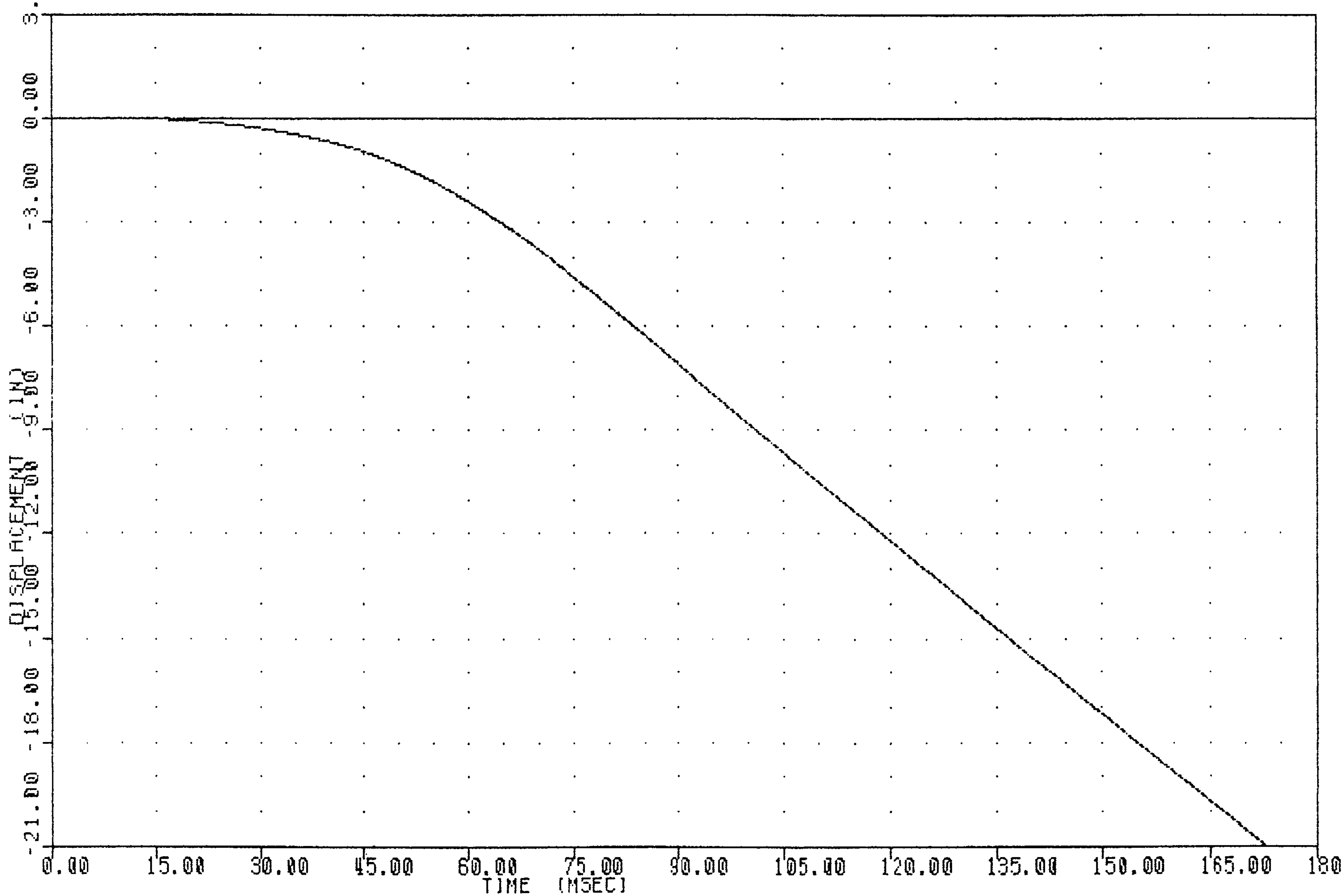


FORD LTD INTO FIXED BARRIER
LEFT B PILLAR RESULTANT

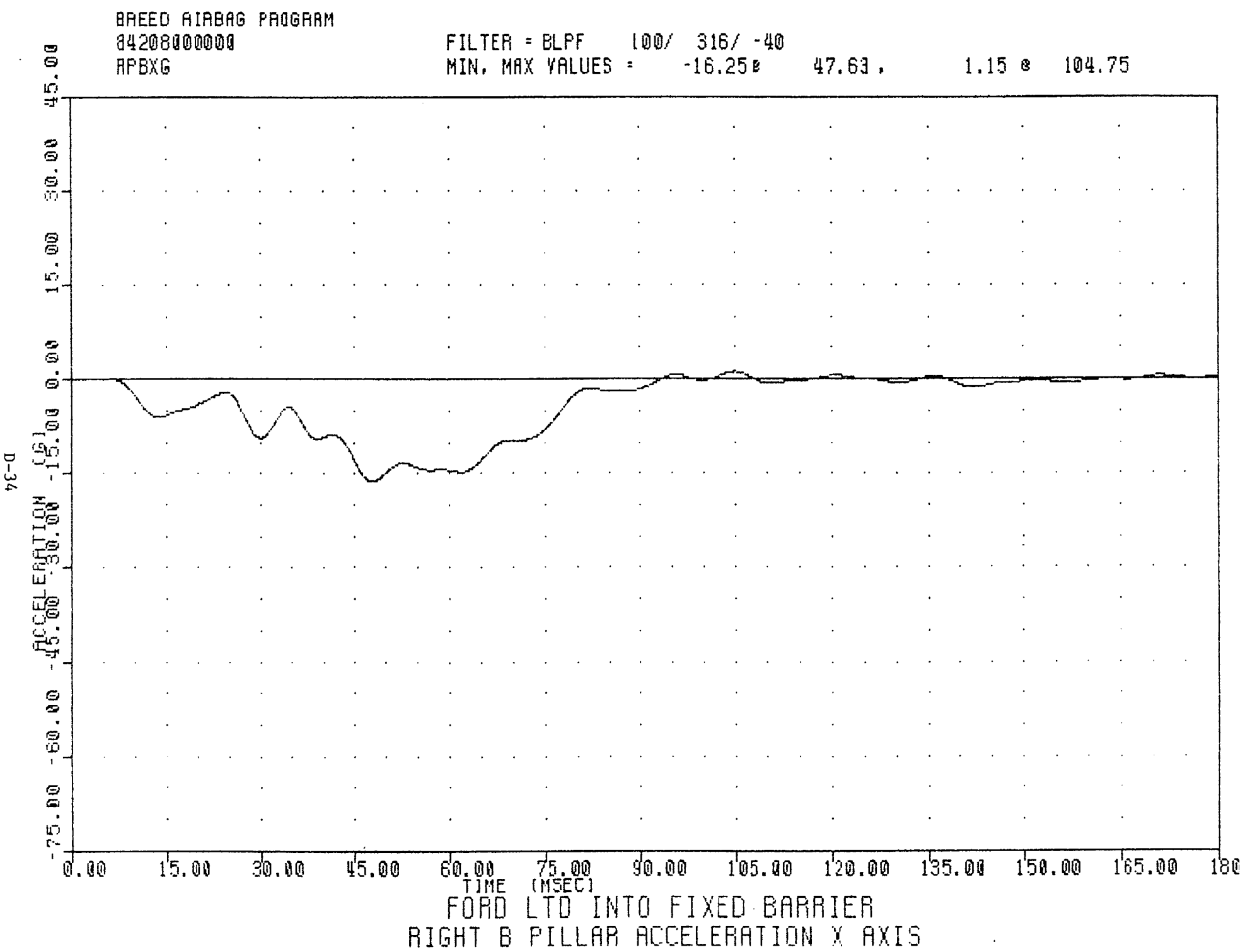

SPEED AIRBAG PROGRAM
842080000000
LPBXV
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -14.33 @ 85.50 , 0.09 @ 3.00
0.00
-6.00
-12.00
-18.00
-24.00
-30.00
-36.00
-42.00
VELOCITY (MPH)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA V USING LPBXG

84208000000
LPBXD

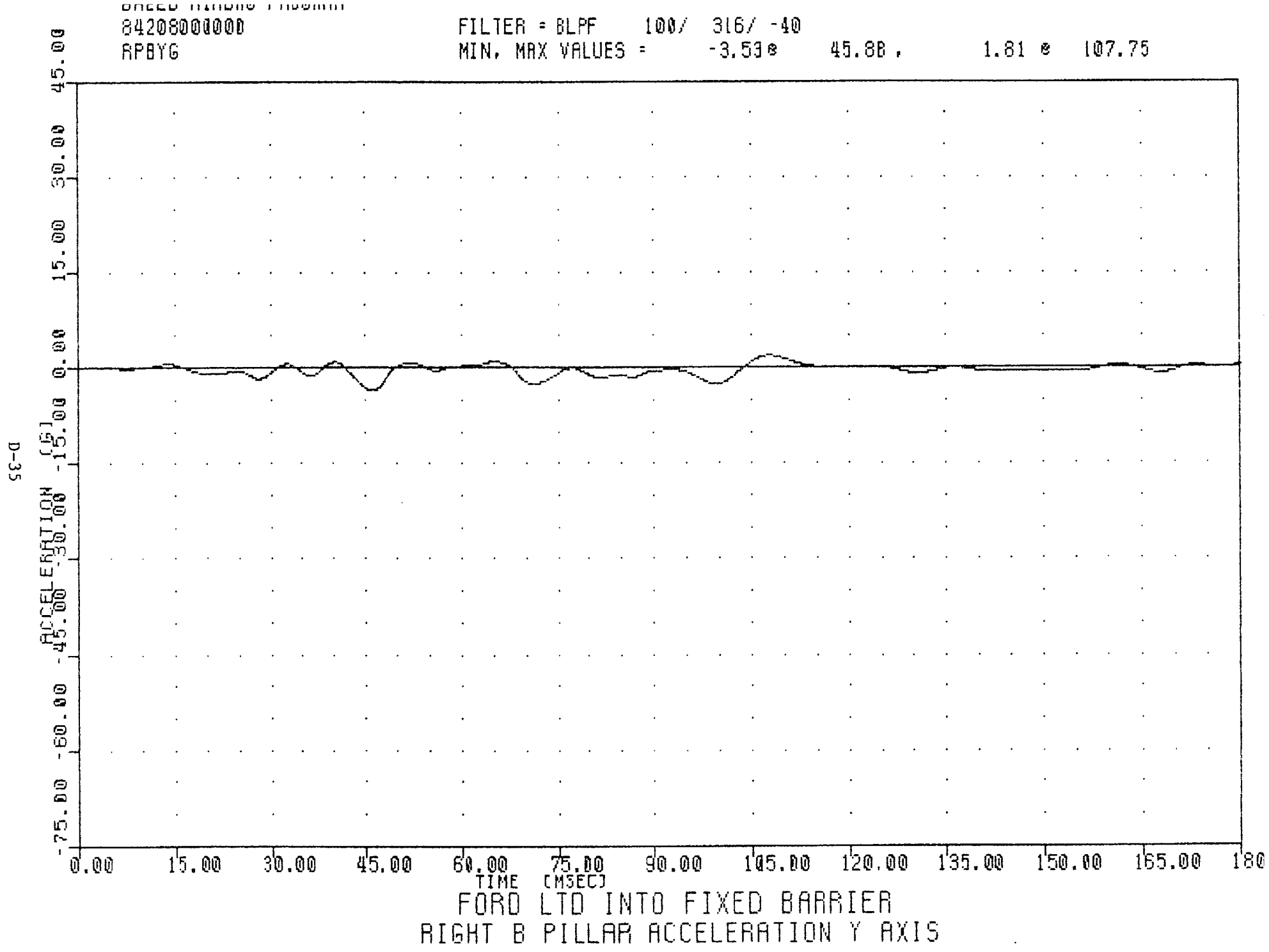
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -22.17 @ 180.00 , 0.01 @ 8.50



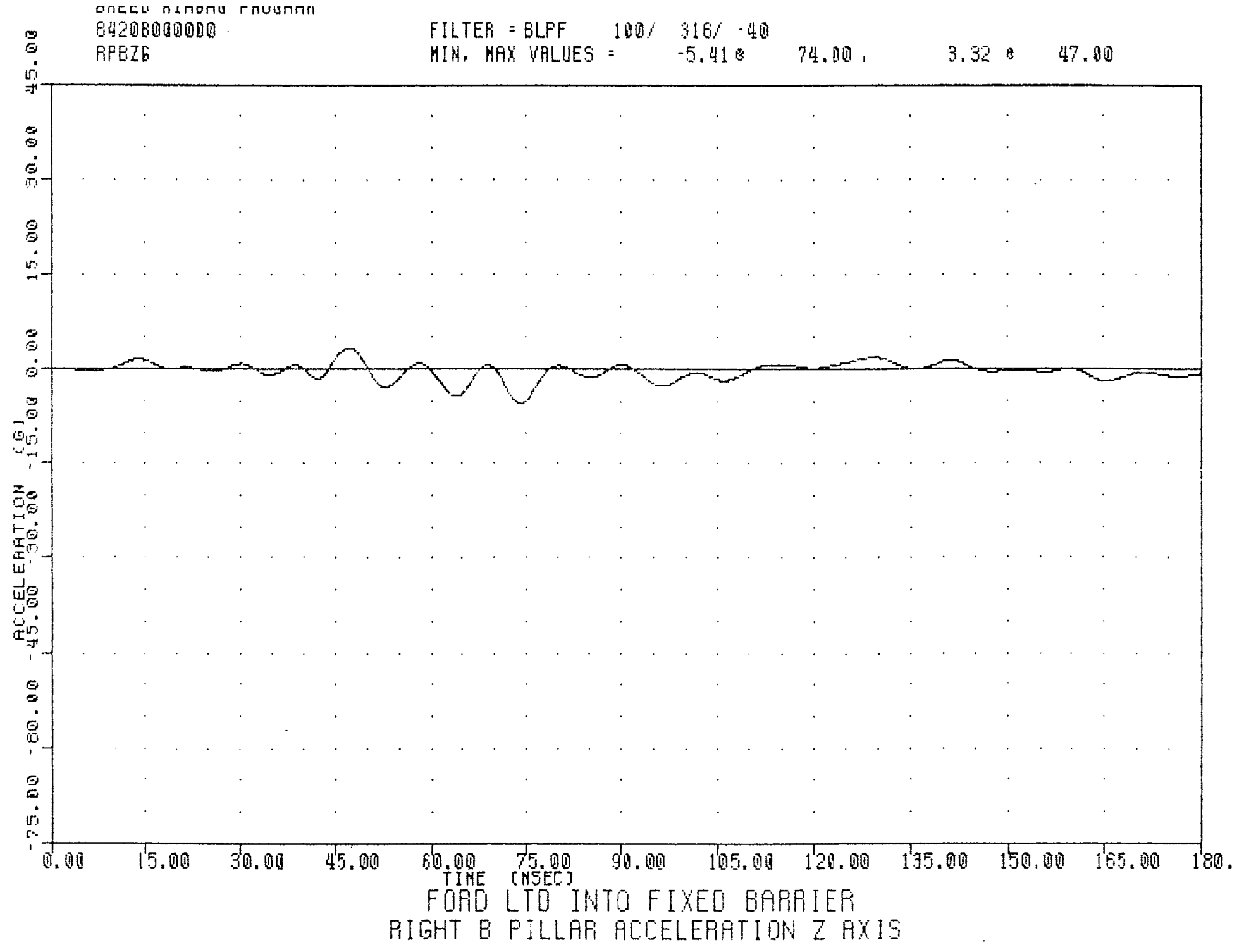
FORD LTD INTO FIXED BARRIER
DELTA X USING LPBXV



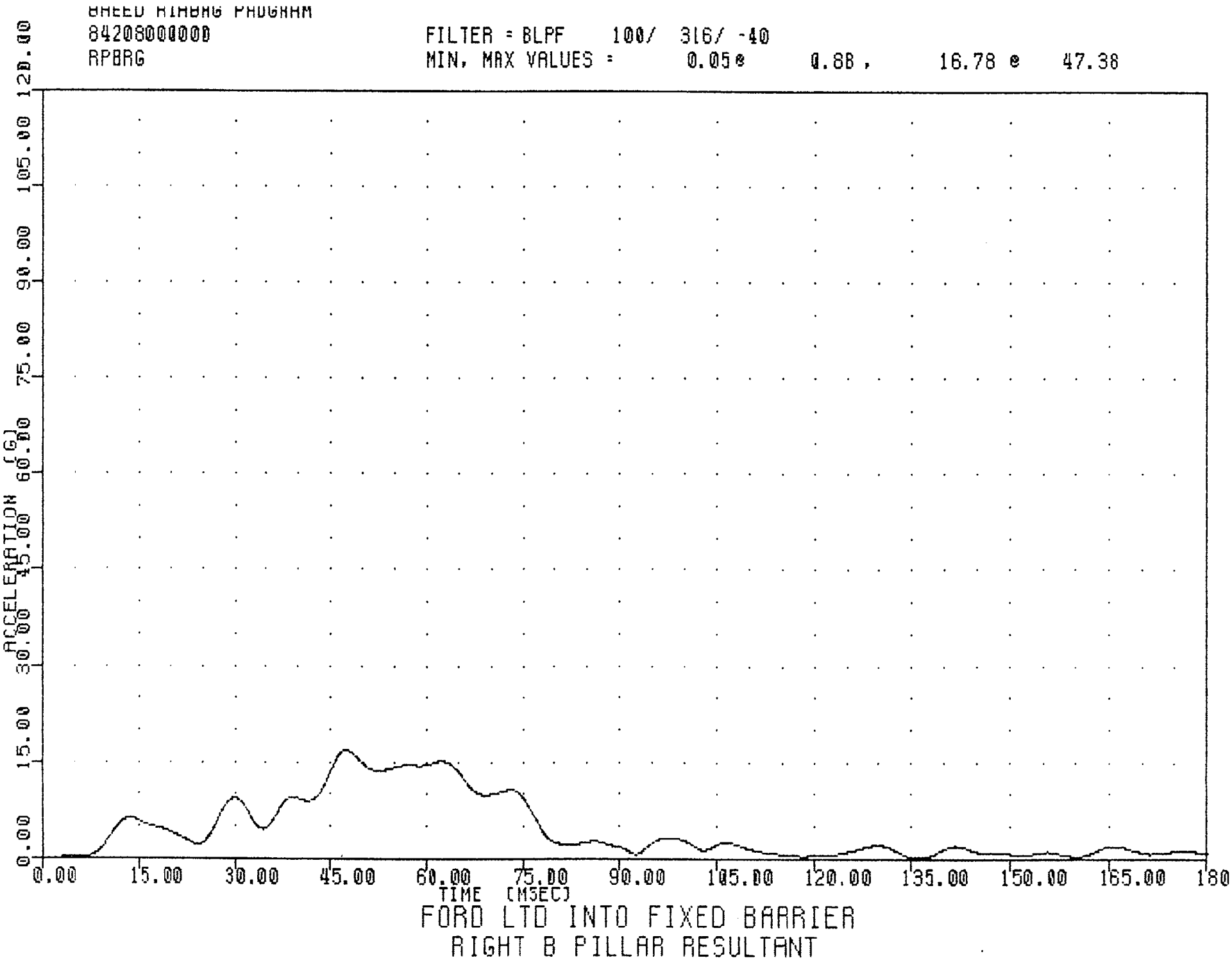
FORD LTD INTO FIXED BARRIER
RIGHT B PILLAR ACCELERATION X AXIS



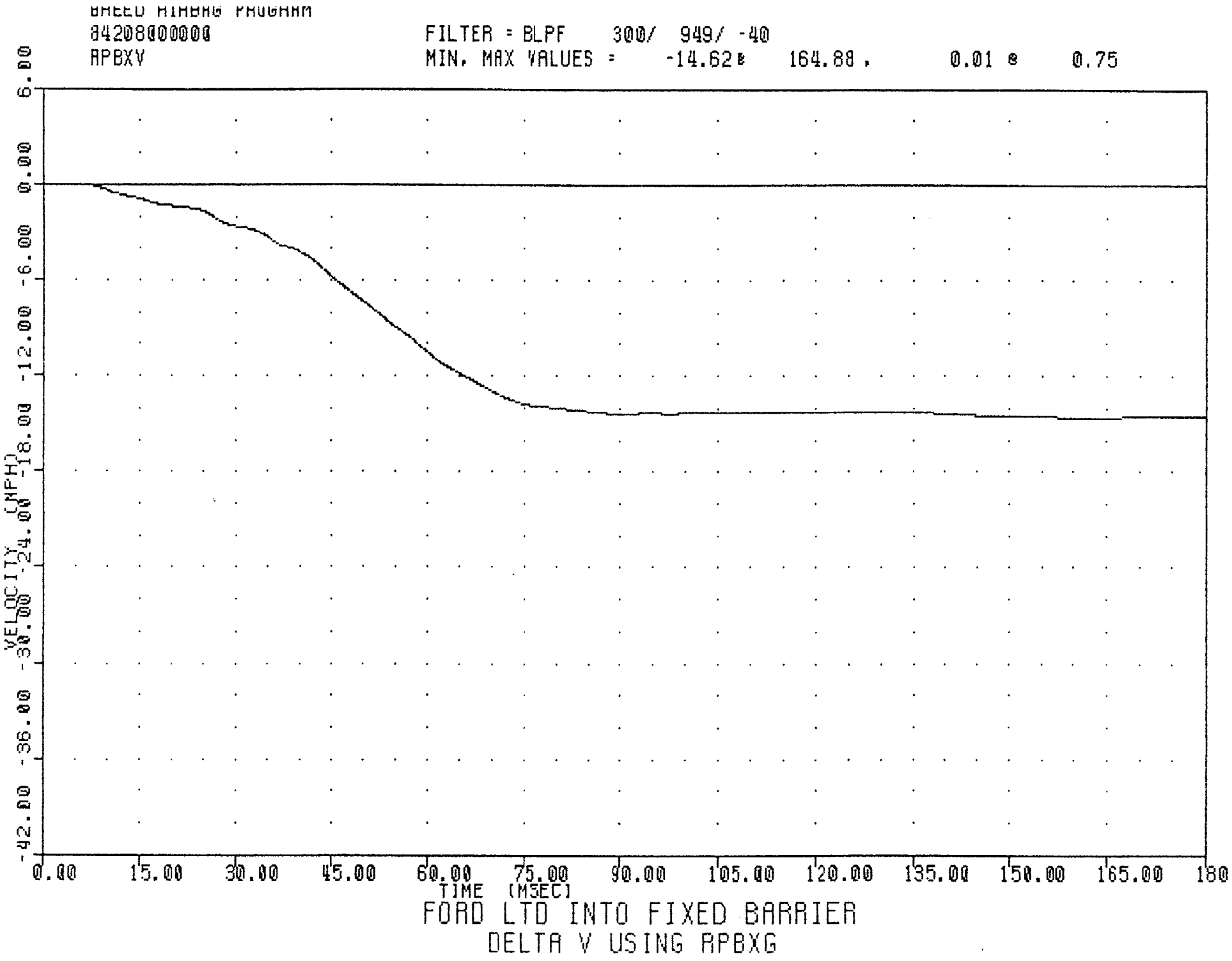
FORD LTD INTO FIXED BARRIER
RIGHT B PILLAR ACCELERATION Y AXIS

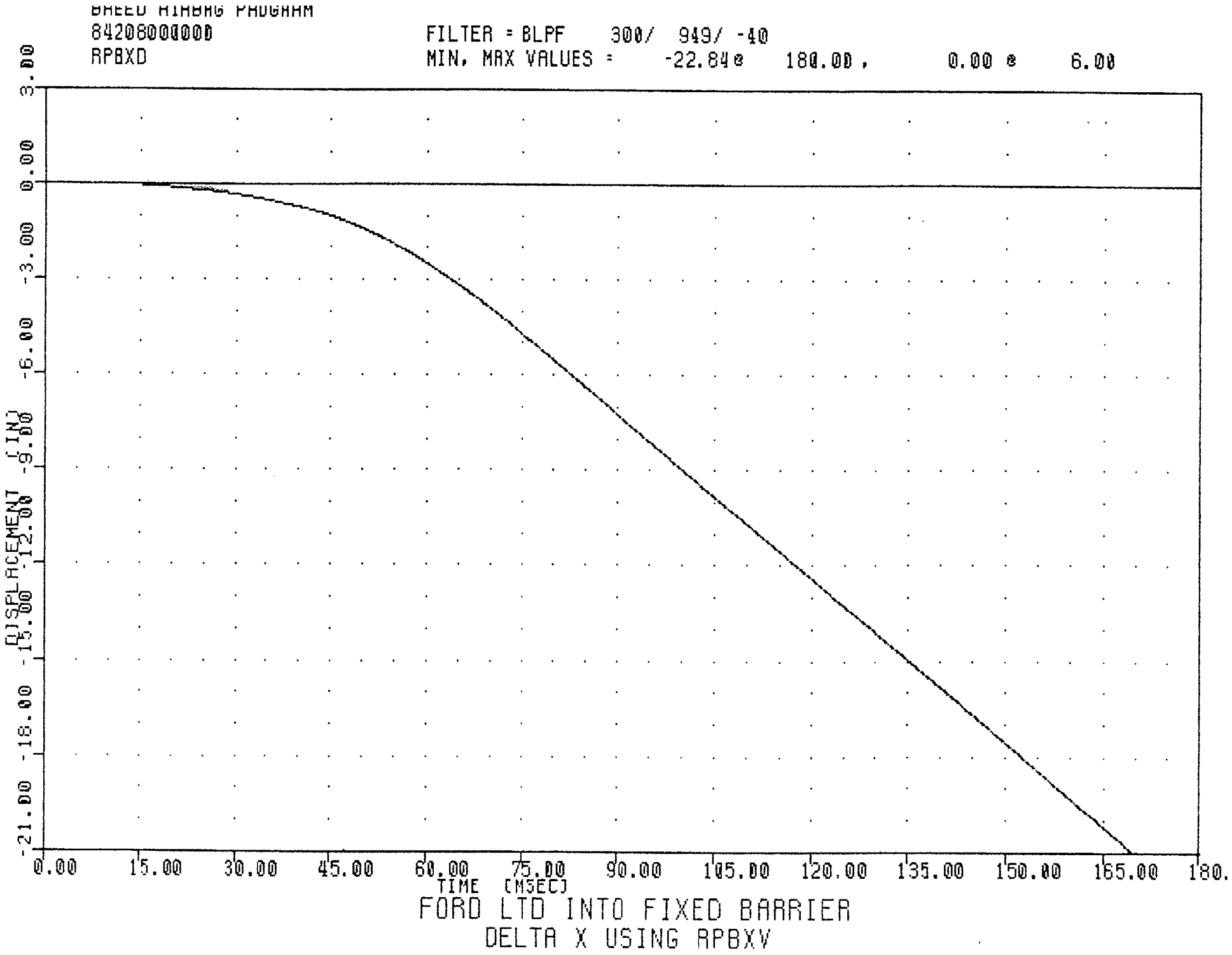


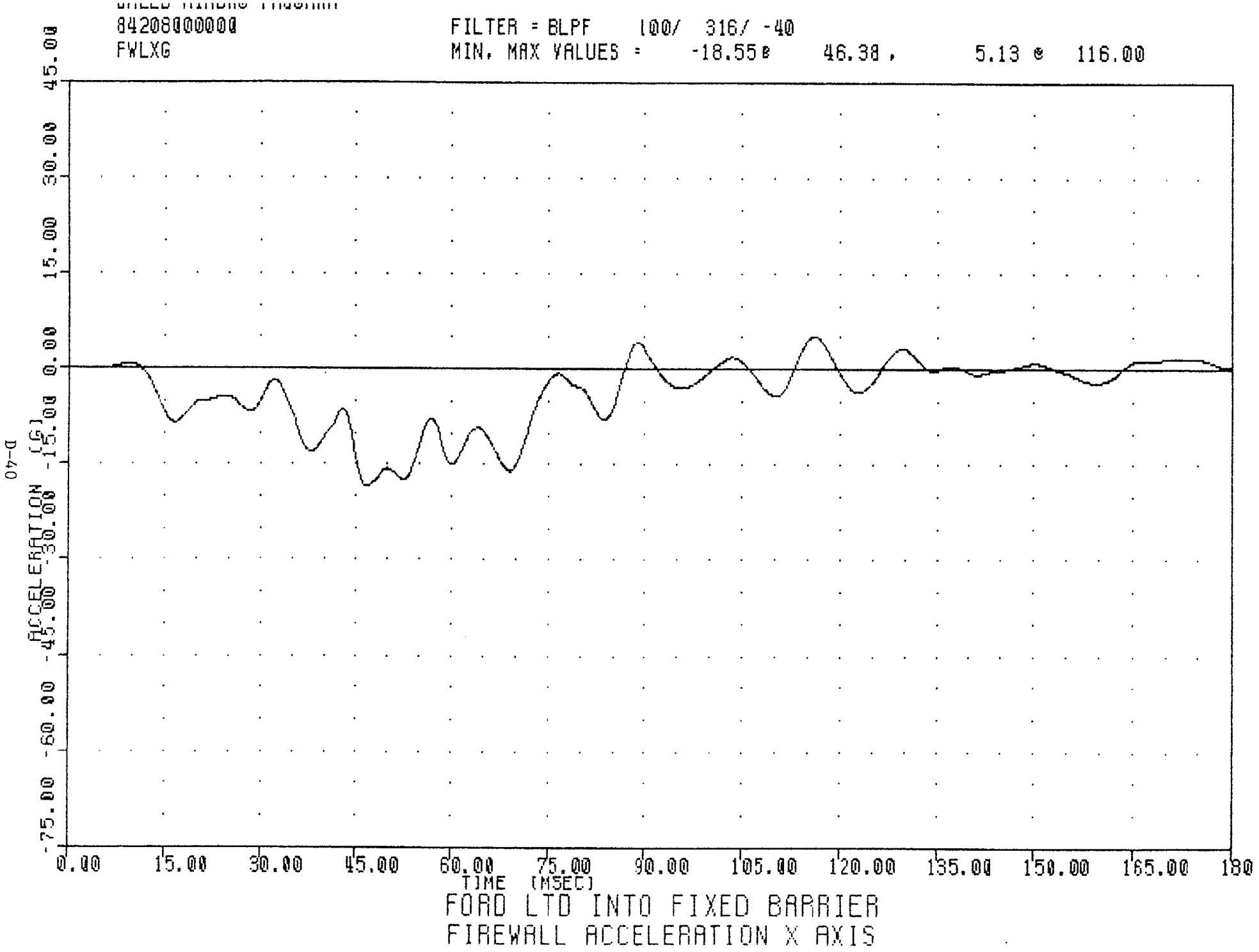
FORD LTD INTO FIXED BARRIER
RIGHT B PILLAR ACCELERATION Z AXIS

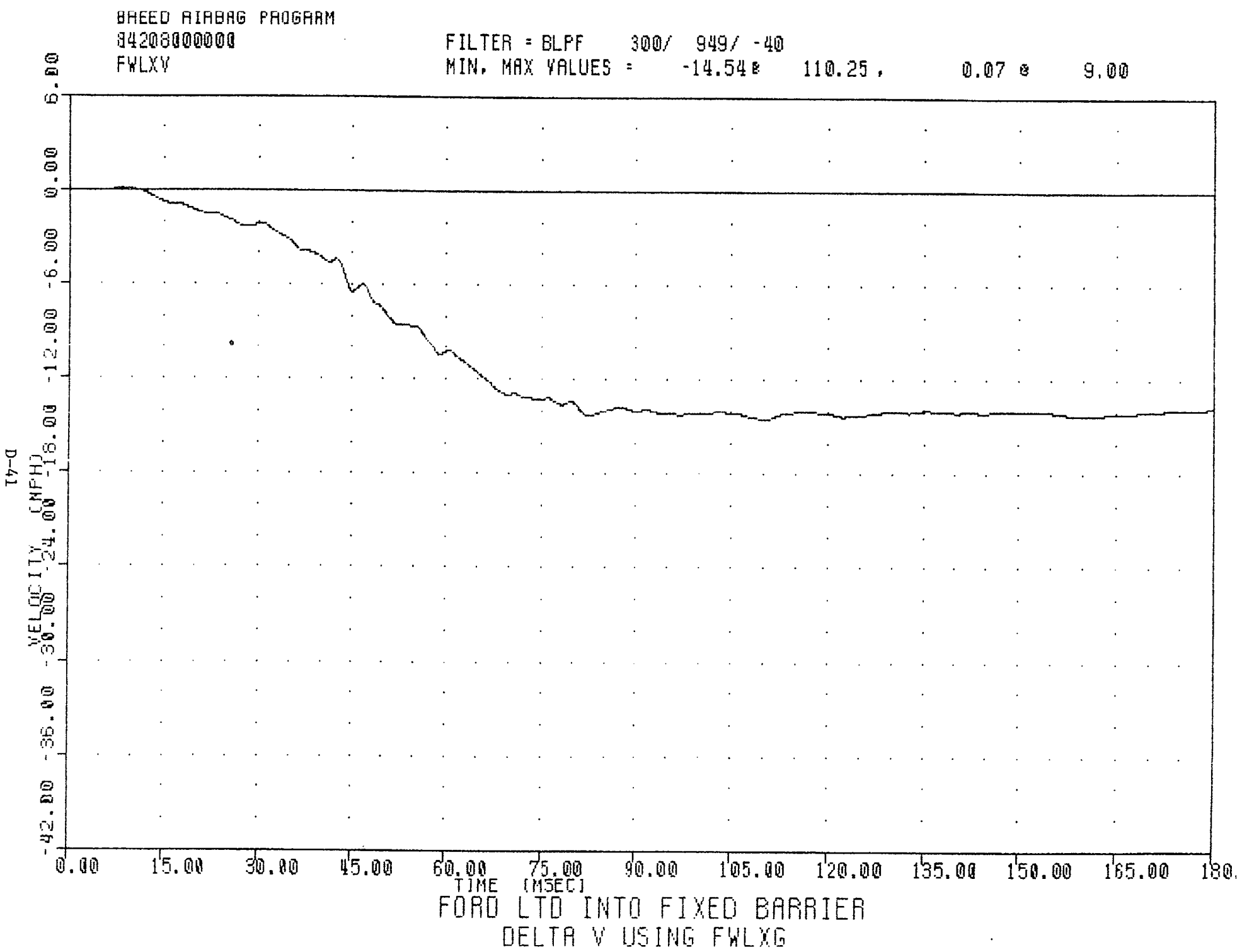


FORD LTD INTO FIXED BARRIER
RIGHT B PILLAR RESULTANT

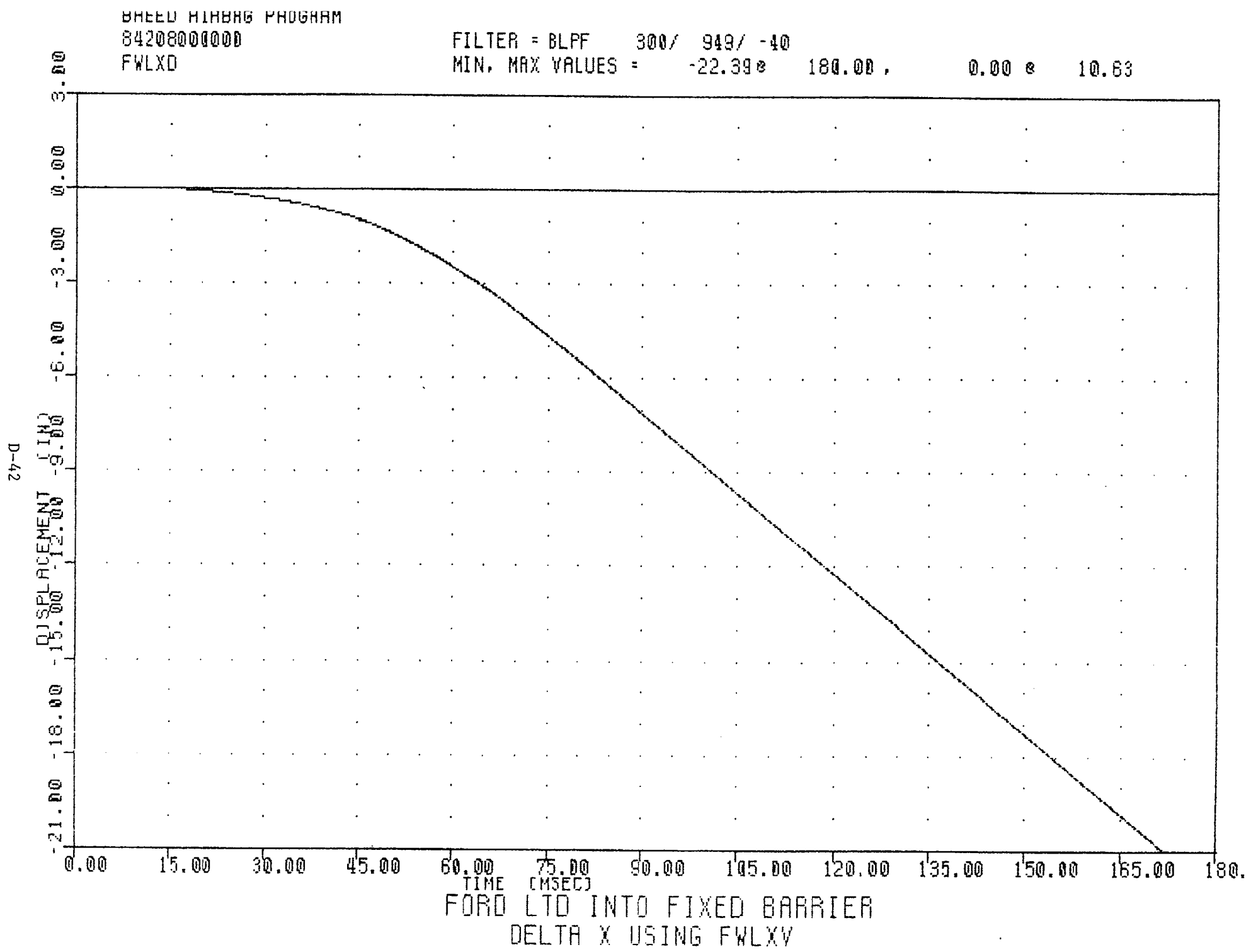

SHELL AIRBAG PROGRAM
842080000000
RPBXV
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -14.62 @ 164.88 , 0.01 @ 0.75
6.00
0.00
-6.00
-12.00
-18.00
-24.00
-30.00
-36.00
-42.00
VELOCITY (MPH)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA V USING RPBXG

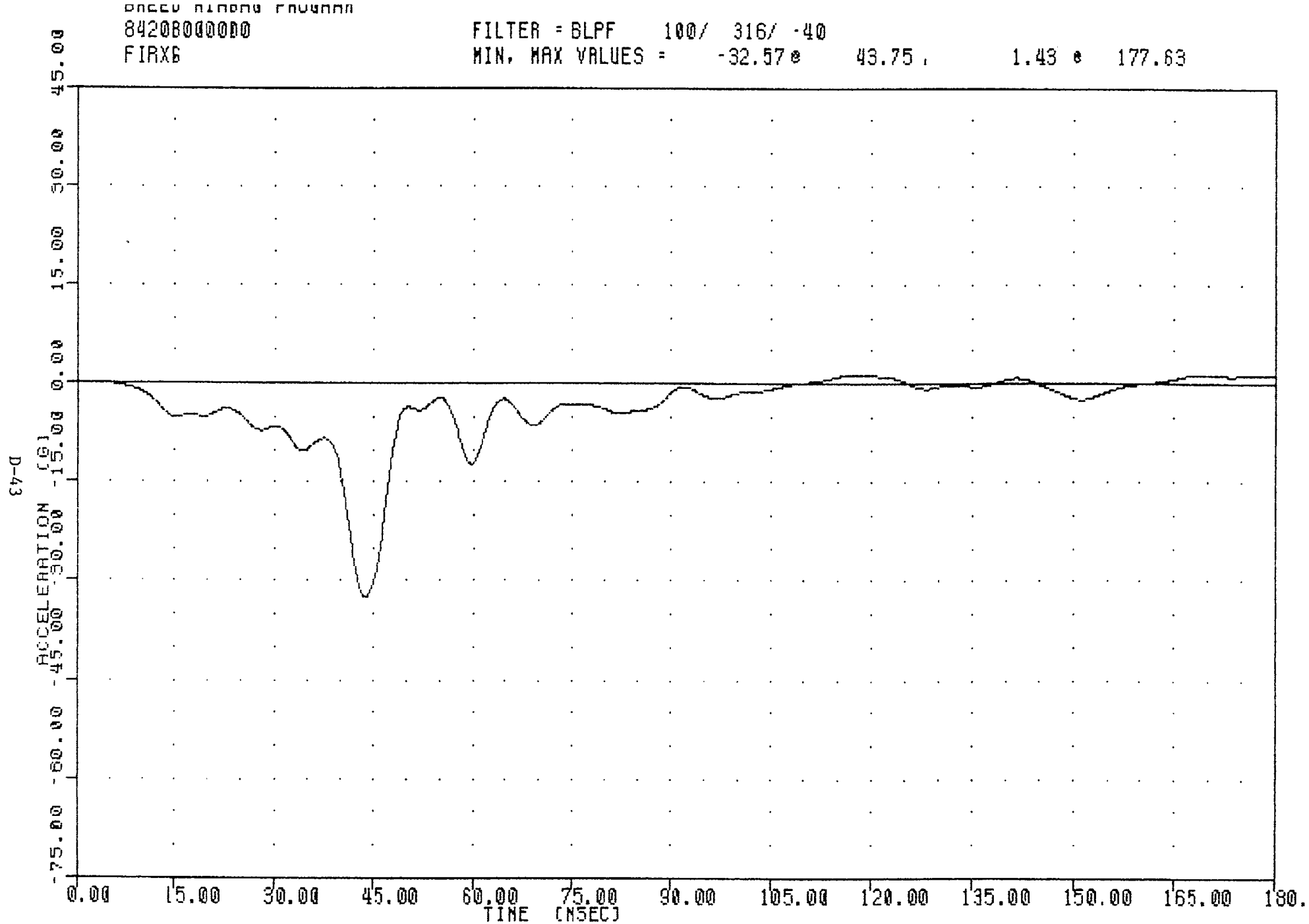

SPEED MIMBMS PROGRAM
84208000000
RPBXD
FILTER = BLPF 300/ 949/ -40
MIN, MRX VALUES = -22.84@ 180.00 , 0.00 @ 6.00
3.00
0.00
-3.00
-6.00
-9.00
-12.00
-15.00
-18.00
-21.00
DISPLACEMENT (IN)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180.
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA X USING RPBXV


842080000000
FWLXG
FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -18.55 @ 46.38 , 5.13 @ 116.00
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
-75.00
ACCELERATION (G)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
FIREWALL ACCELERATION X AXIS



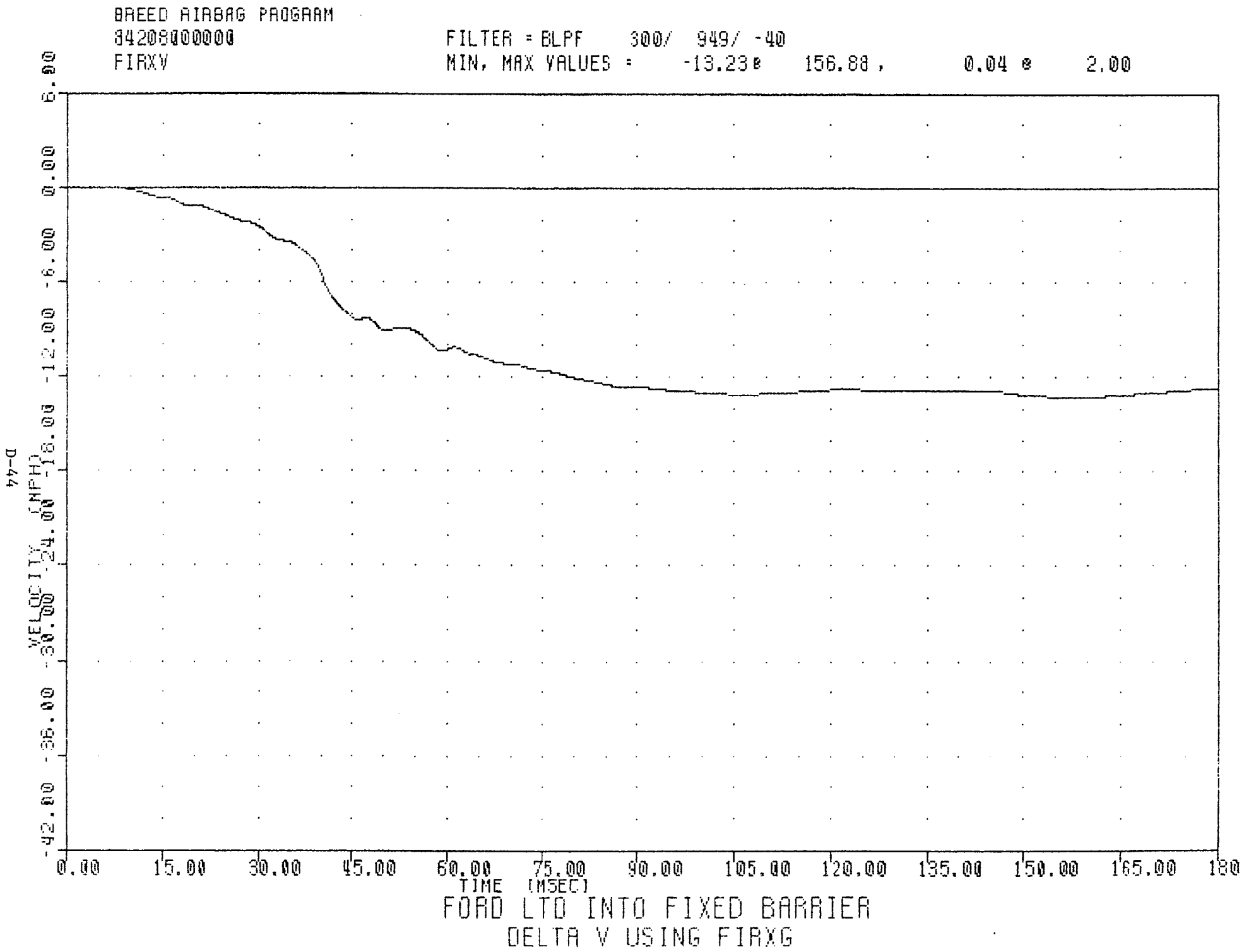
FORD LTD INTO FIXED BARRIER
DELTA V USING FWLXG

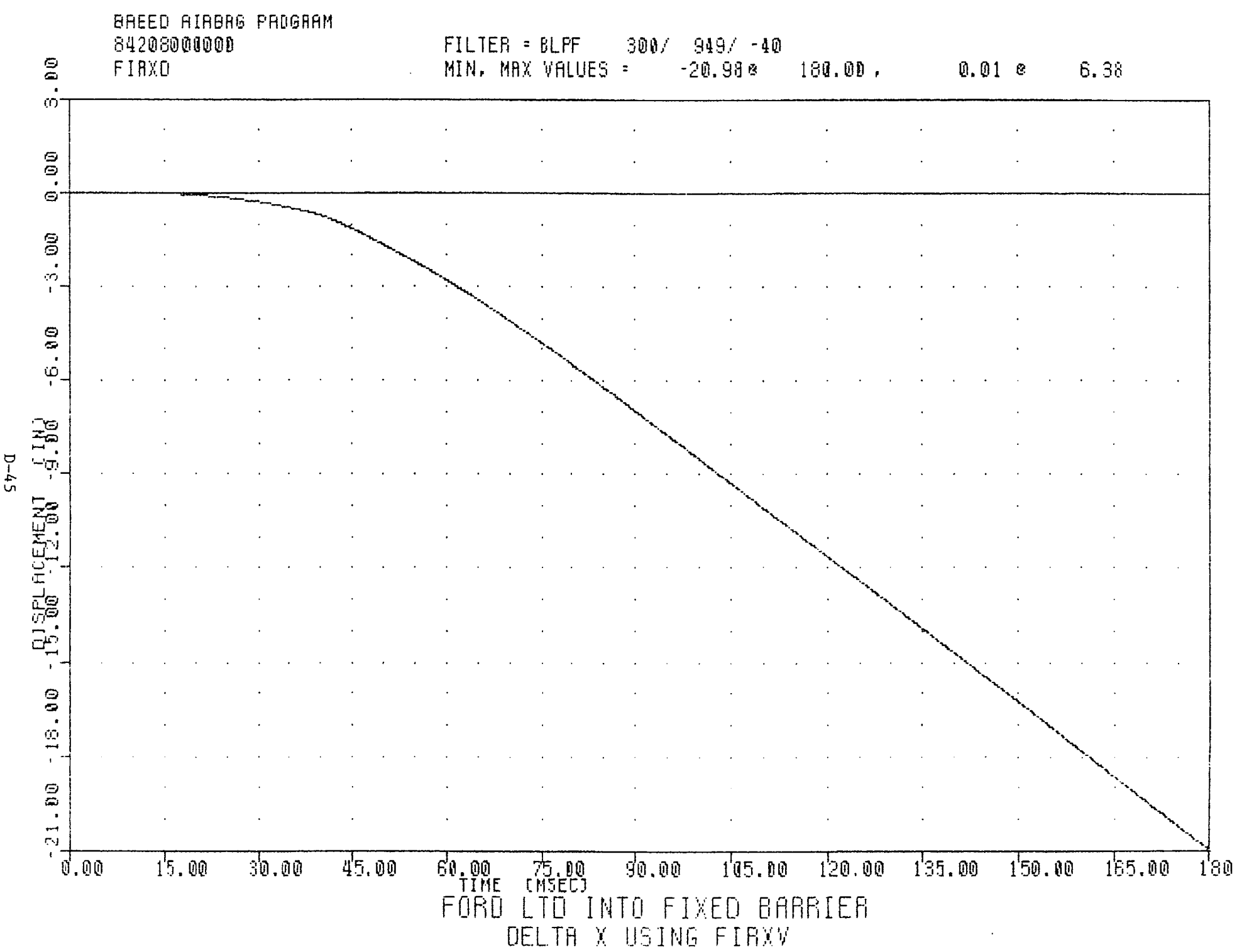

SHEED AIRBAG PROGRAM
84208000000
FWLXD
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -22.39 @ 180.00 , 0.00 @ 10.63
3.00
0.00
-3.00
-6.00
-9.00
-12.00
-15.00
-18.00
-21.00
DISPLACEMENT (IN)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180.
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA X USING FWLXV

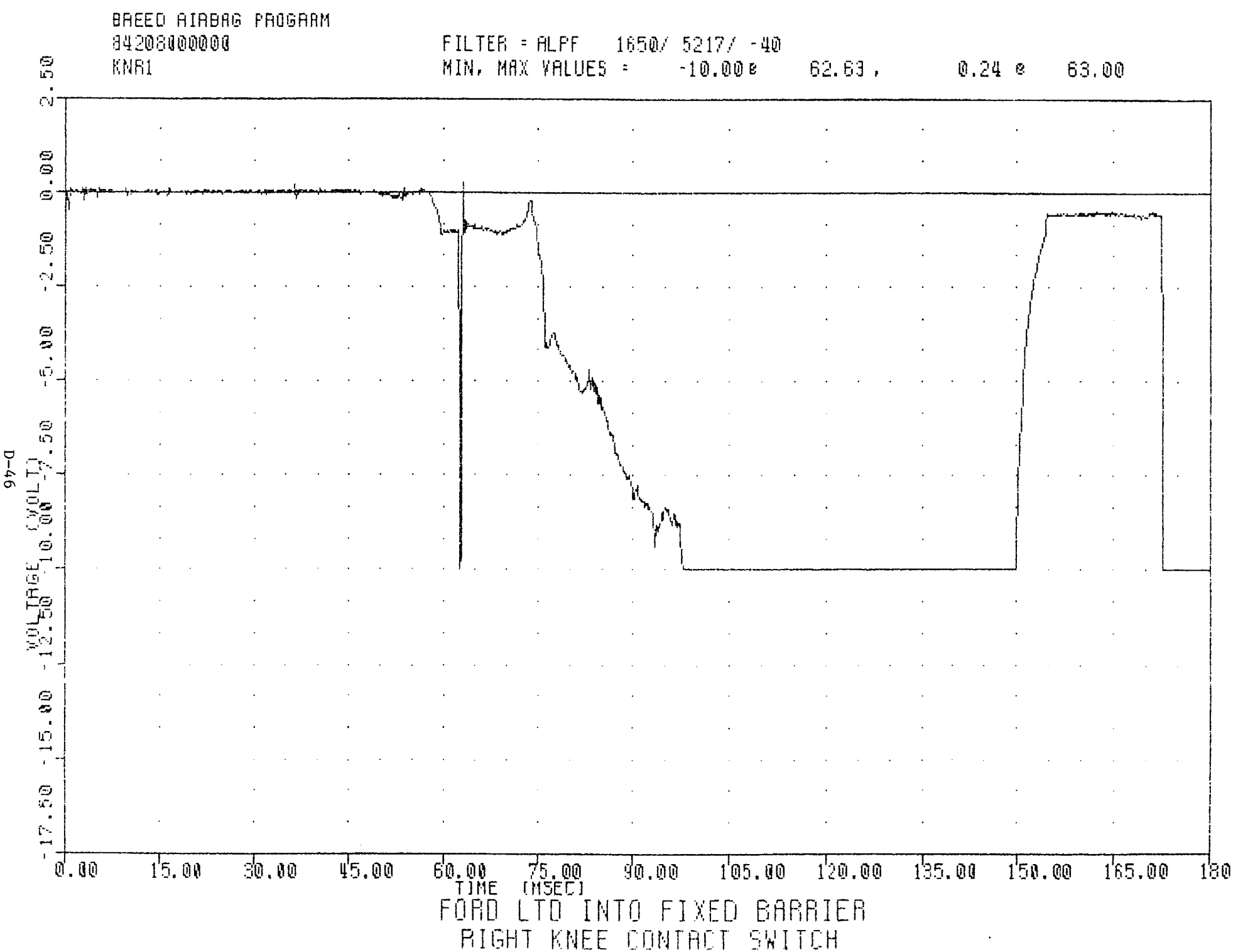


FORD LTD INTO FIXED BARRIER

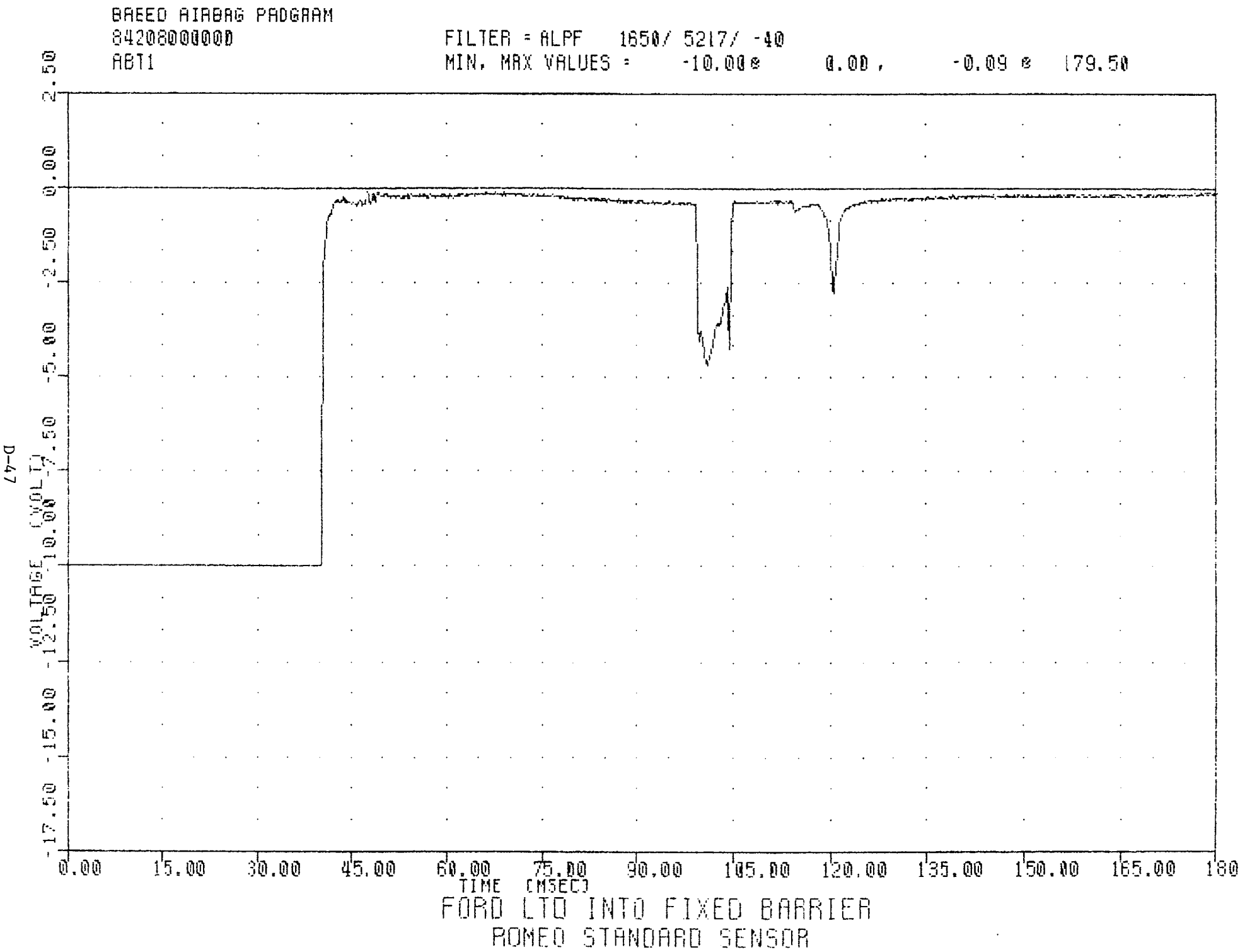
RIGHT FENDER WELL INNER ACCELERATION X AXIS

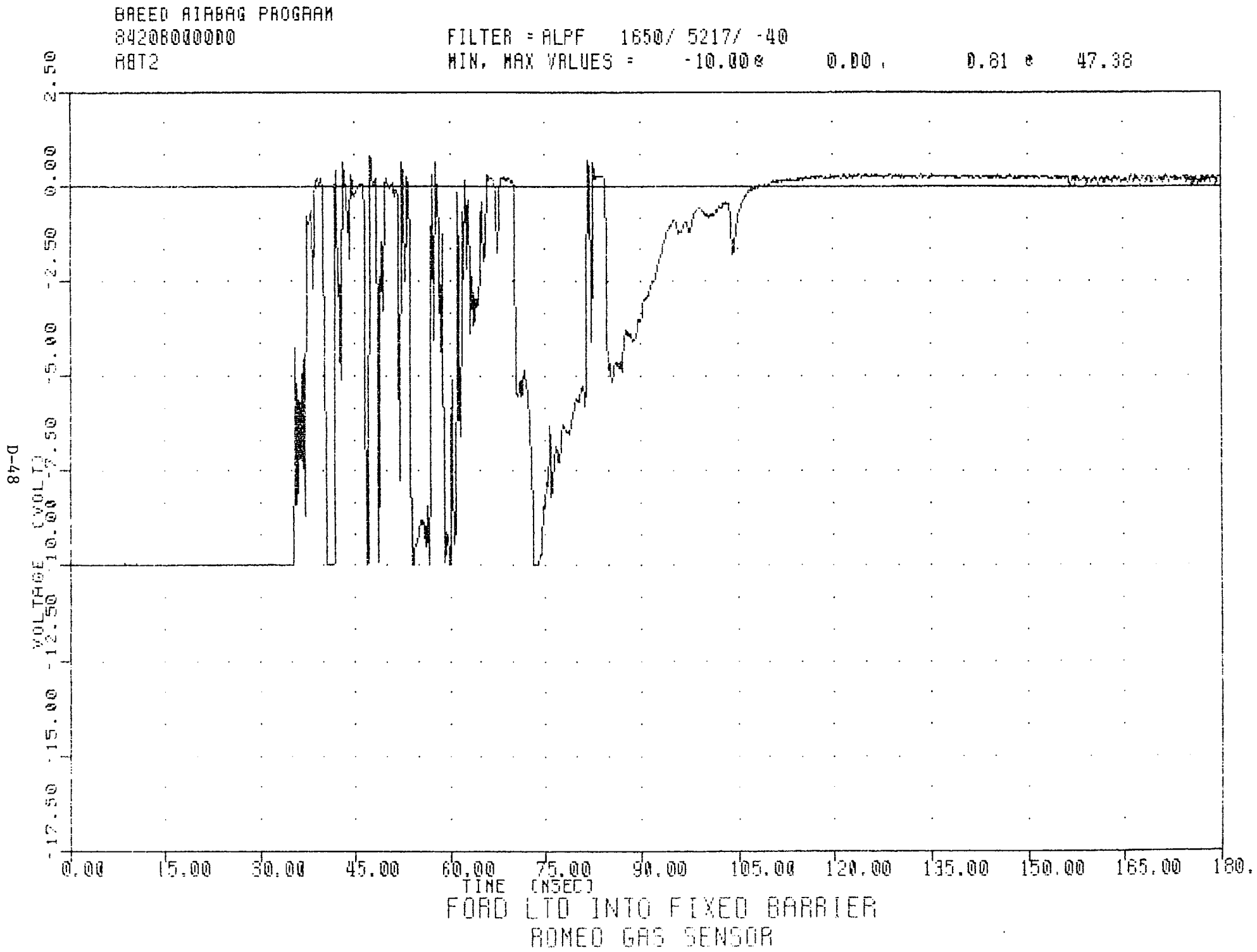

BREED AIRBAG PROGRAM
84208000000
FIRXV
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -13.23 @ 156.88 , 0.04 @ 2.00
6.00
0.00
-6.00
-12.00
-18.00
-24.00
-30.00
-36.00
-42.00
VELOCITY (MPH)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA V USING FIRXG

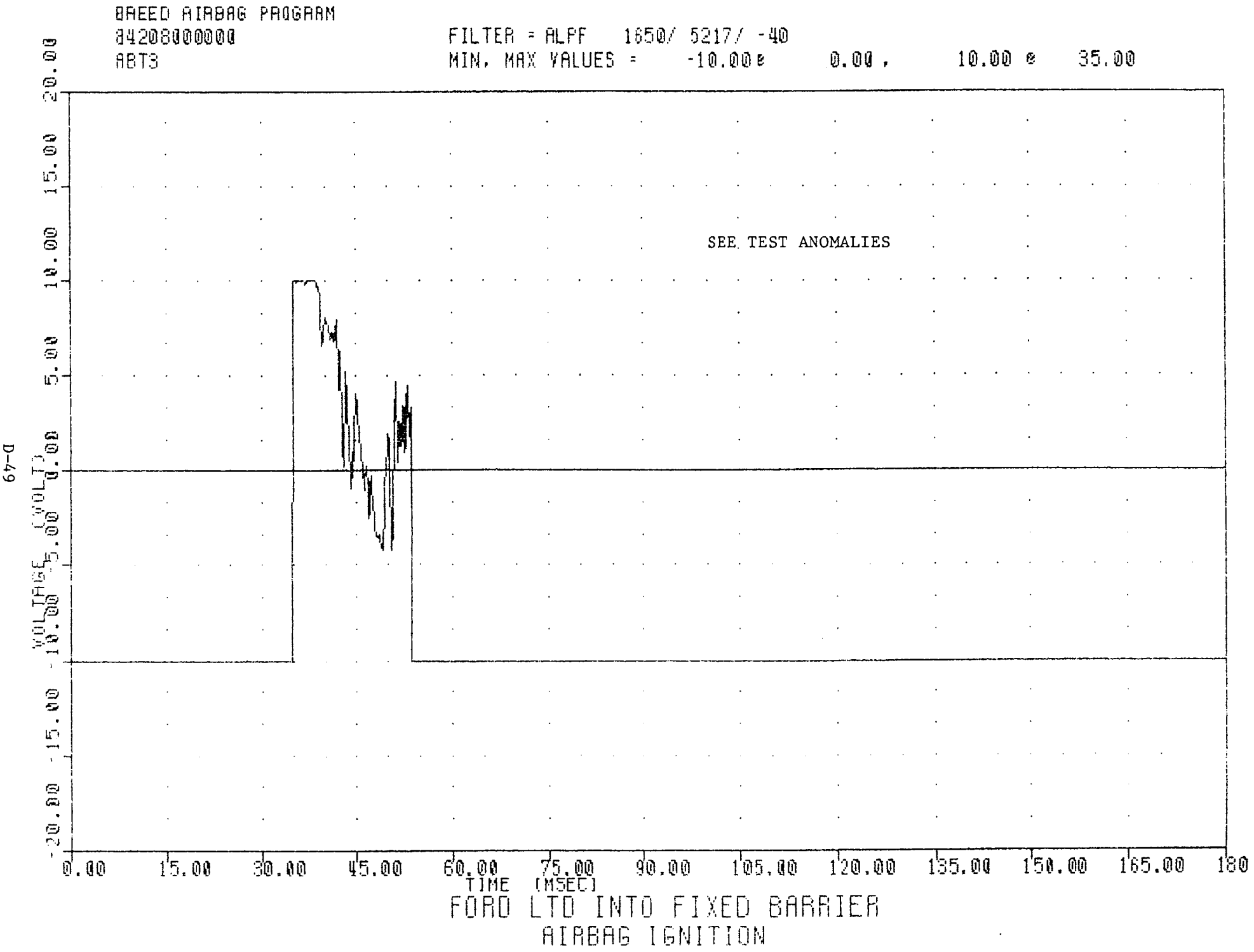

BREED AIRBAG PROGRAM
84208000000
FIRXD
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -20.98 @ 180.00 , 0.01 @ 6.38
3.00
0.00
-3.00
-6.00
-9.00
-12.00
-15.00
-18.00
-21.00
DISPLACEMENT (IN)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
DELTA X USING FIRXV

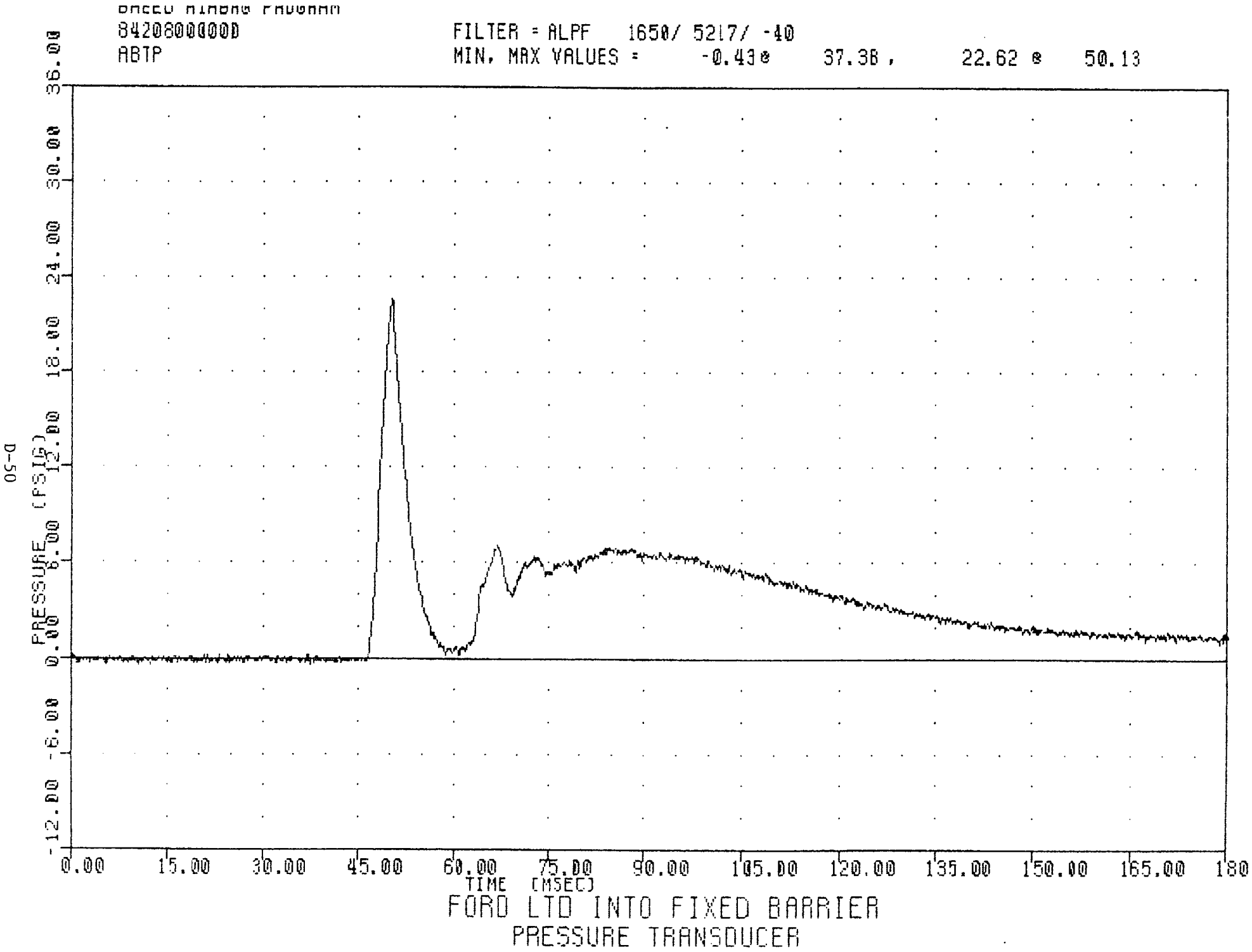


FORD LTD INTO FIXED BARRIER
RIGHT KNEE CONTACT SWITCH

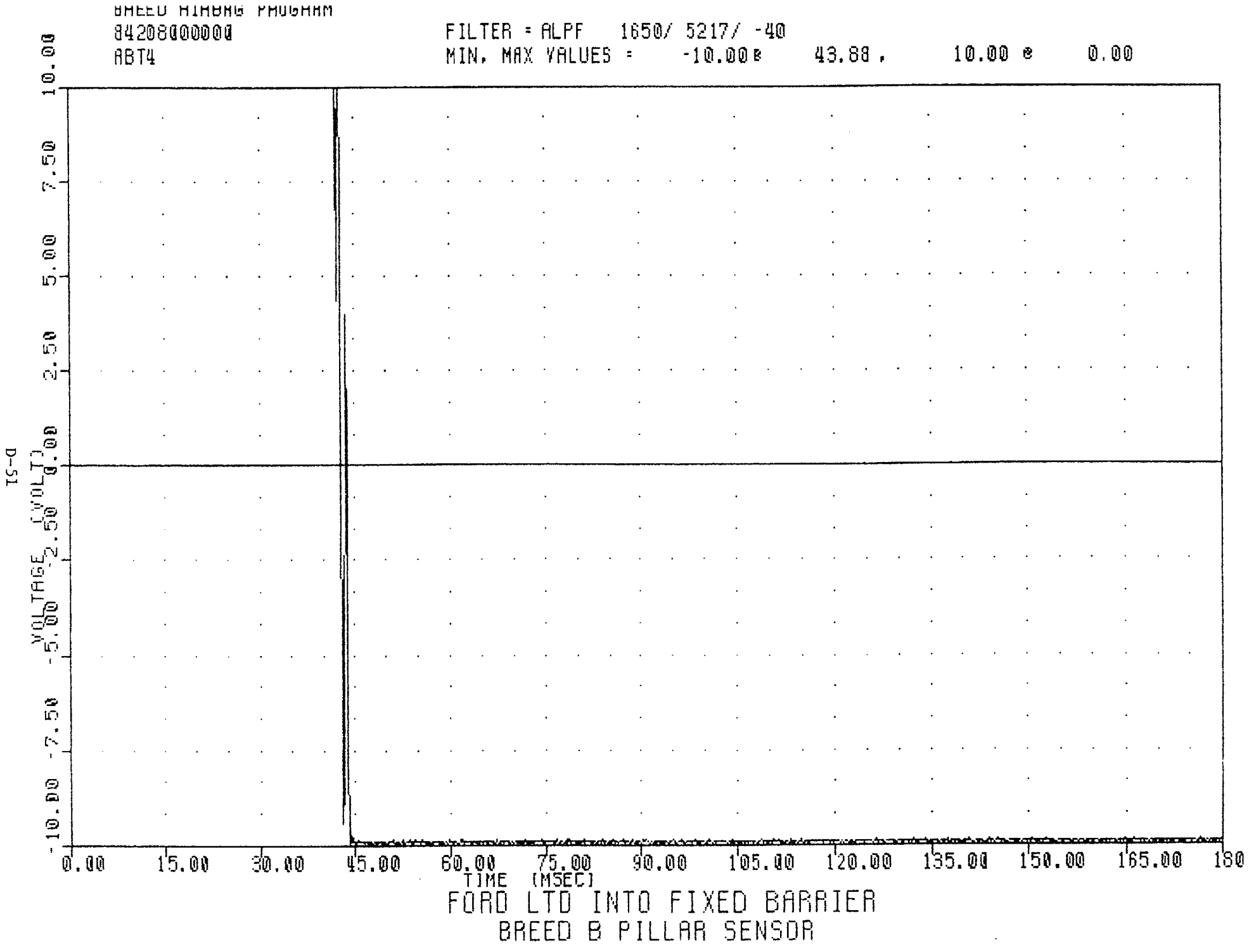

BAEED AIABAG PADGRAM
842080000000
ABT1
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -10.00@ 0.00 , -0.09 @ 179.50
2.50
0.00
-2.50
-5.00
-7.50
-10.00
-12.50
-15.00
-17.50
VOLTAGE (VOLT)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
ROMEO STANDARD SENSOR


BREED AIRBAG PROGRAM
8420800000D
RBT2
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -10.00@ 0.00, 0.81 @ 47.38
2.50
0.00
-2.50
-5.00
-7.50
-10.00
-12.50
-15.00
-17.50
VOLTAGE (VOLTS)
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180.
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
RONEO GAS SENSOR


BREED AIRBAG PROGRAM
84208000000
ABT3
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -10.00 @ 0.00 , 10.00 @ 35.00
SEE TEST ANOMALIES
VOLTAGE (VOLTS)
20.00
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
180
TIME (MSEC)
FORD LTD INTO FIXED BARRIER
AIRBAG IGNITION



FORD LTD INTO FIXED BARRIER
PRESSURE TRANSDUCER



FORD LTD INTO FIXED BARRIER

BREED B PILLAR SENSOR