HS-806935 DOT48869

MVMA SIDE IMPACT TESTING

MDB-TO-CAR SIDE IMPACT TEST OF A 26° CRABBED MOVING DEFORMABLE BARRIER TO A 1985 FORD LTD AT 33.5 MPH

PREPARED BY:
TRANSPORTATION RESEARCH CENTER OF OHIO
ST. RT. 33 LOGAN COUNTY
EAST LIBERTY, OHIO 43319

TEST REPORT
TEST NO.: 850716
TEST DATE: JULY 16, 1985
TEST CONDITIONS: BASELINE STRUCTURE, DUMMY SEATED AGAINST PADDED DOOR PANEL

PREPARED FOR:
MGA RESEARCH CORPORATION
12790 MAIN ROAD
AKRON, NEW YORK 14001-0071

MVMA SIDE IMPACT TESTING

MDB-TO-CAR SIDE IMPACT TEST OF A 26° CRABBED MOVING DEFORMABLE BARRIER TO A 1985 FORD LTD AT 33.5 MPH

PREPARED BY:
TRANSPORTATION RESEARCH CENTER OF OHIO
ST. RT. 33 LOGAN COUNTY
EAST LIBERTY, OHIO 43319

TEST REPORT
TEST DATE: JULY 16, 1985

PREPARED FOR:
MGA RESEARCH CORPORATION
12790 MAIN ROAD
AKRON, NEW YORK 14001-0071

Prepared By: Barry L. Wade

B. L. Wade
Project Engineer
Transportation Research Center of Ohio

Approved By: John F. Shultis 5/7/85

J. F. Shultis
Manager, Impact Laboratory
Transportation Research Center of Ohio

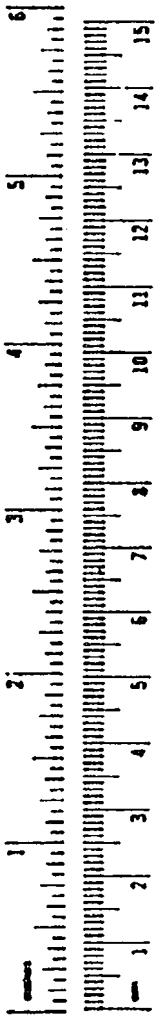
METRIC CONVERSION FACTORS

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



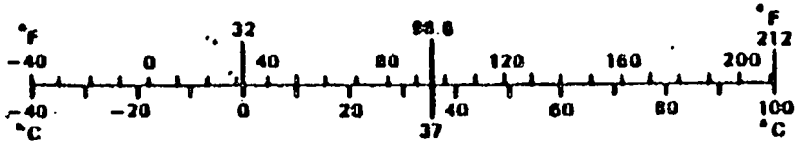


TABLE OF CONTENTS

	Page
1.0 PURPOSE AND INTRODUCTION	1-1
2.0 TEST PARAMETER DATA	2-1
3.0 CRASH TEST DATA	3-1
APPENDIX A DATA PLOT PRESENTATION	A-1
APPENDIX B DUMMY CERTIFICATION	B-1

SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to evaluate occupant responses to a padded door panel in a 90° side impact crash test.

INTRODUCTION

A stationary 1985 Ford LTD 4-door sedan was impacted on the right side by a Moving Deformable Barrier (MDB) on July 16, 1985. The test was to simulate an intersection collision with the striking vehicle travelling at 30 mph and the struck vehicle travelling at 15 mph. The orientation angle of the striking vehicle was 90° clockwise with respect to the longitudinal axis of the struck vehicle. The leading edge of contact 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 Ford LTD at 33.5 mph with the MDB's wheels crabbed counterclockwise to 26°. The actual test speed was 33.5 mph and the actual leading edge of contact was 39.0 inches forward of the midpoint of the Ford LTD's wheelbase.

The vehicle was a baseline model with no structural modification. The front passenger inner door panel was replaced with a padded hardboard panel. The padding was five inches thick at dummy torso height and six inches thick at the pelvis and leg height. A side impact dummy (SID) was seated in the right front passenger seat with its shoulder just touching the door padding.

Section 2 contains test parameter data. Section 3 contains crash test data. Appendix A contains Data Plots. Appendix B contains Dummy Certification Data.

SECTION 2.0

TEST PARAMETER DATA

This section includes the following information:

1. General Test Vehicle Information
2. Dummy Temperature Control and Positioning Data
3. High Speed Camera Information
4. Transducer Information

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Ford Motor Company

MAKE/MODEL: Ford LTD VIN: 1FABP39A3FG214519

BODY STYLE: 4-Door Sedan MODEL YEAR: 1985

NHTSA NO.: DNA COLOR: Midnight Blue

ENGINE DATA: TYPE: Inline CYLINDERS: 4 DISPLACEMENT 140 cu. in.

TRANSMISSION DATA: Automatic

DATE VEHICLE RECEIVED: 4/24/85 ODOMETER READING: 3

DEALER'S NAME AND ADDRESS: NA

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	No	AIR CONDITIONING	No
RADIO	No	ANTI-SKID BRAKE	No
CLOCK	No	REAR WINDOW DEFROSTER	No
OTHER			

REMARKS:

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

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

VEHICLE MANUFACTURED BY: Ford Motor Company

DATE OF MANUFACTURE: 4/85

GVWR: 4225 LBS.,

GAWR: FRONT 2103 LBS., REAR 2255 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 30 psi; REAR 30 psi

TIRES ON VEHICLE (MFGR. & LINE, SIZE): General Ameriway Radial P195/75R14

BIAS PLY, BELTED, OR RADIAL: Radial

PLY RATING: 3

IS SPARE TIRE "SPACE SAVER"? Yes

IS SPARE TIRE STANDARD EQUIPMENT? Yes

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

RIGHT FRONT	789	LBS.	RIGHT REAR	673	LBS.
LEFT FRONT	813	LBS.	LEFT REAR	666	LBS.
TOTAL FRONT WEIGHT	1602	LBS. (54.5 % OF TOTAL VEHICLE WEIGHT)			
TOTAL REAR WEIGHT	1339	LBS. (45.5 % OF TOTAL VEHICLE WEIGHT)			
TOTAL DELIVERED WEIGHT	2941	LBS.			

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 26 5/8	;LF 26 7/16	;RR 24 3/8	;LR 24 3/4
PRE-TEST ATTITUDE:	RF 26 1/2	;LF 26 13/16	;RR 22 7/8	;LR 23 3/4
POST-TEST ATTITUDE:	RF 26 1/4	;LF 26 1/2	;RR 24 1/2	;LR 24 7/8

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 90 LBS. CARGO:

RIGHT FRONT	830	LBS.	RIGHT REAR	821	LBS.
LEFT FRONT	770	LBS.	LEFT REAR	784	LBS.
TOTAL FRONT WEIGHT	1600	LBS. (49.9 % OF TOTAL VEHICLE WEIGHT)			
TOTAL REAR WEIGHT	1605	LBS. (50.1 % OF TOTAL VEHICLE WEIGHT)			
TOTAL TEST WEIGHT	3205	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 ACTUAL

TEST VOLUME: 14.8 GALLONS

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 16.0 GALLONS

DETAILS OF FUEL SYSTEM: Mechanical Fuel Pump

ELECTRIC FUEL PUMP: No FUEL INJECTION: No

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

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 30 psi; REAR 30 psi

RECOMMENDED TIRE SIZE: P195/75R14 LOAD RANGE X B, 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 100 LBS.

TOTAL 1000 LBS.

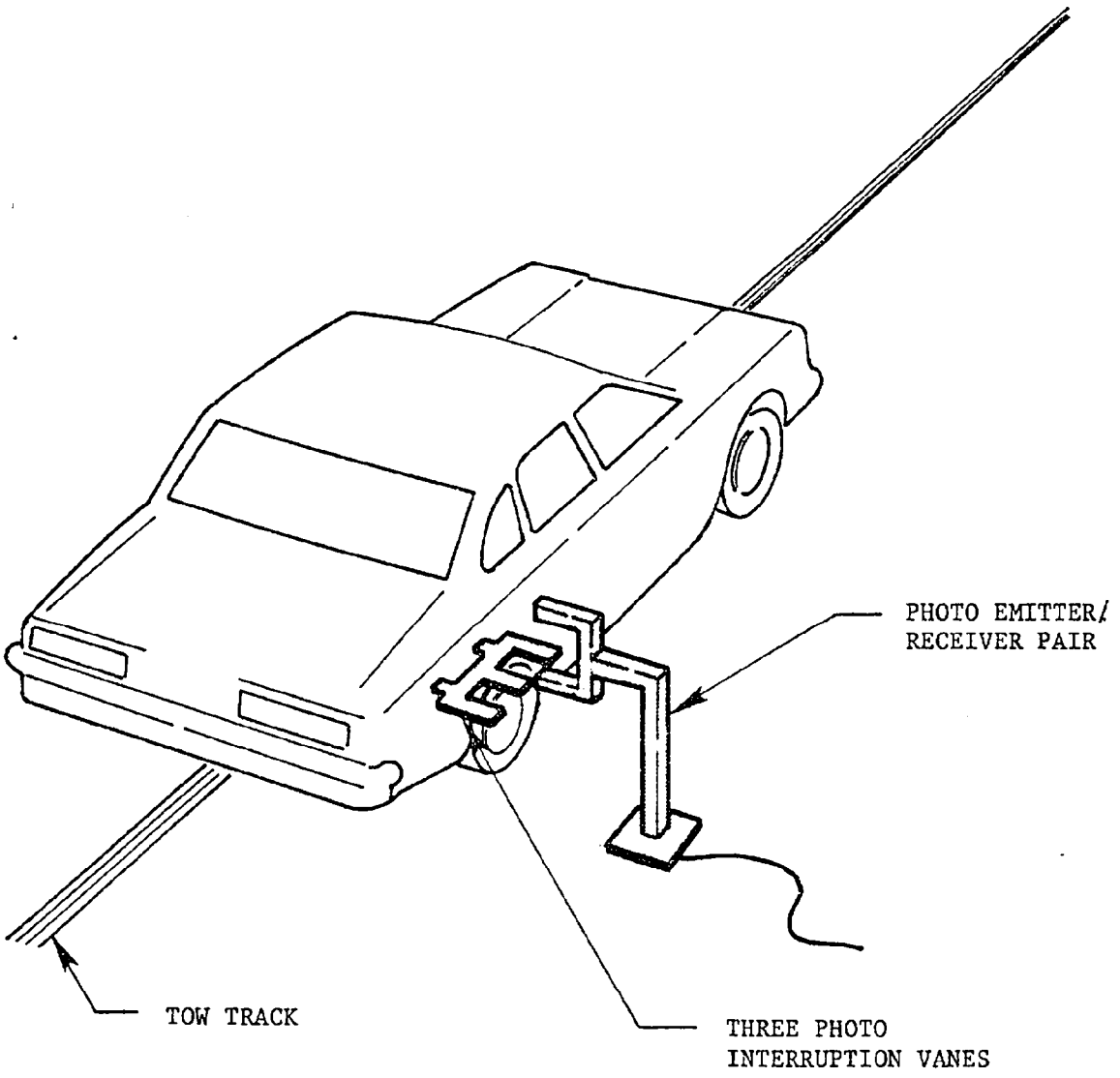
*WITH ENTIRE FUEL SYSTEM FILLED WITH FUEL TANK THROUGH CARBURETOR BOWL.

VEHICLE TEST WEIGHT CALCULATION

Test Weight = Unloaded Delivered Weight +
Number of Dummies X 174 lbs. +
Cargo Weight
= 2941 + 1 X 174 + 100 lbs.
= 3215 lbs.

To achieve test weight, the exhaust system, battery, air pump, alternator, air cleaner and power steering pump were removed and 14.8 gallons of Stoddard Solvent were added in the fuel tank. The weight of the test vehicle was measured by placing each wheel on a Force Plate manufactured by K.J. Law Engineers, Inc., Detroit, Michigan.

IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane clears emitter/receiver 24 inches before impact.

The vanes have one foot spacing.

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.

SIDE IMPACT DUMMY SEATING PROCEDURE

The following is an outline of the Side Impact Dummy Seating Procedure which is currently being developed.

1. The seat is placed in the midpoint of the fore to aft adjustment.

2. The H-point location of the NHTSA Side Impact Dummy (SID) is located by using the SAE three-dimensional H-point machine (SAE J826 APR80 - 50TH Percentile Male Configuration). The H-point machine is positioned in the right front outboard designated seating position such that the midsaggital plane is vertical and longitudinal. The H-point is located and documented using Sections 4 through 6 of SAE Standard J826 APR80.

3. The H-point machine is removed and the SID is positioned in the right front passenger seat such that its right shoulder is either five inches from or against the hardboard or padded inner door panel. The knees are initially set 11 1/2 inches apart, measured between the outer surfaces of the knee pivot bolt heads, if possible. The H-point is then positioned to within 1/2 inch of the coordinates of the H-point machine H-point location found in Step 2 by applying force in the appropriate direction to the dummy's lower torso. If the dummy's upper torso does not rest against the seatback, position the torso without moving the H-point so the upper torso does rest against the seatback. The dummy's feet are then positioned such that the heels rest on the floorpan and the feet are on the toeboard. If the dummy's feet will not reach the toeboard, the feet are positioned such that the feet are at right angles to the lower legs. If wheelhouse projections interfere with the above positioning of the feet, the heel is placed on the floorpan with the foot perpendicular to the lower leg by twisting the foot about the ankle.

4. Prior to the crash test the dummy's longitudinal and lateral head locations are rechecked. The dummy is then visually checked.

DUMMY IN-VEHICLE POSITION RECORDING SHEET

MFR./MAKE/MODEL: Ford LTD

FRONT SEAT TYPE: ___ BENCH
___ BUCKET
_X_ SPLIT BENCH

ADJUSTER TYPE: _X_ MANUAL
___ POWER

BUCKET SEAT BACK TYPE: _X_ FIXED
___ ADJUSTABLE

TECHNICIANS:
1. G. Watters
2. D. Carpenter
3. _____

POSITIONING DATE: 7/16/85

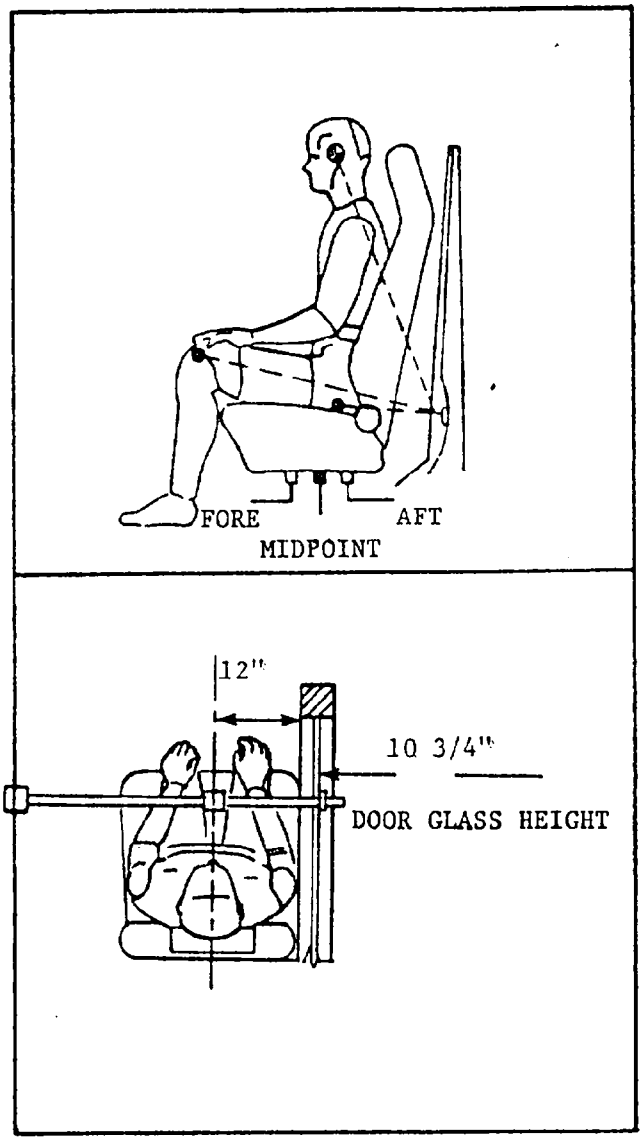
AMBIENT TEMP: 76 °F TIME: 10:00

FRONT PASSENGER DUMMY # 016

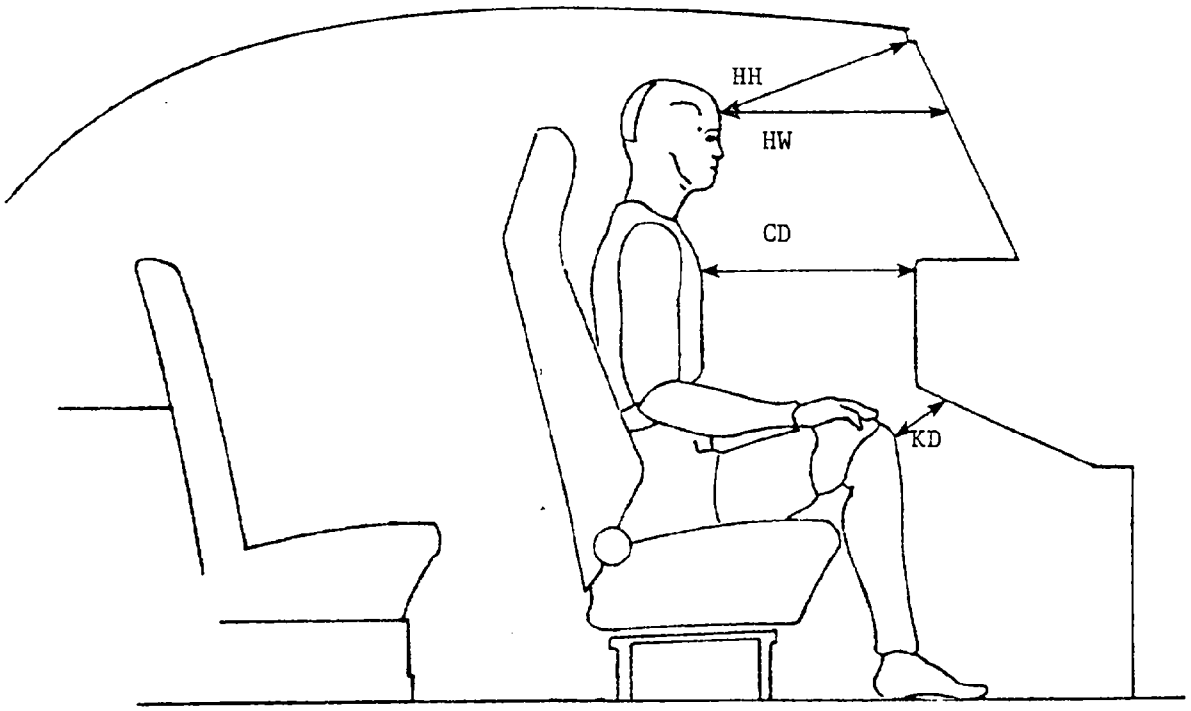
20 3/8 " HEAD
5° TARGET*

24 1/2 " KNEE
86° JOINT

APPROX.
11 3/16 " "H"
114° POINT



*All passenger dummy dimensions referenced to top of front door striker bolt and all angles referenced to vertical.

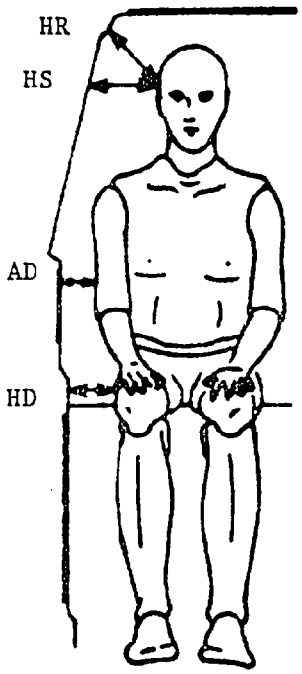


PASSENGER 016

HH	12 3/4
HW	18 13/16
CD	20 1/4
KDL	5 9/16
KDR	5 5/8

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSION



PASSENGER 016

HR	6 11/16
HS	9 1/4
AD	0
HD	0

ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS

LOCATIONS OF OFFBOARD HIGH SPEED CAMERAS

CAMERA NO.	X	Y	Z
1	-6'11 1/2"	-25'10 1/2"	+ 3'3"
2	-23'4 3/4"	+41'6 1/2"	+ 3'1"
5	0	0	+40'
6	+1'	0	+40'

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

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1		Beaulieu	18-86	24	Documentary
2	Right Panning	Kodak	16	24	Real Time
3	MDB Wide	Photosonic 1B	13	980	View Impact
4	Overhead Tight	Photosonic 1B	25	980	View Impact
5	Overhead Wide	Photosonic 1B	8	928	Vehicle Crush
6	Right	Photosonic 1B	25	1000	Vehicle Crush
7	Left	Photosonic 1B	13	1100	Vehicle Crush
8	Onboard Windshield	Photosonic 1B	8	995	Dummy Kinematics
9	Onboard Roof	Photosonic 1B	8	980	Dummy Kinematics
10	Onboard Door	Photosonic 1B	8	1000	Dummy Kinematics

TRANSDUCER INFORMATION

PARAMETER BEING MEASURED	LOCATION	TYPE OF TRANSDUCER	MFGR	MODEL NUMBER	SERIAL NUMBER
HEDXG2	HEAD CENTER OF GRAVITY	ACCEL.	ENDEVCO	2264	AY95
HEDYG2	HEAD CENTER OF GRAVITY	ACCEL.	ENDEVCO	2264	BA26
HEDZG2	HEAD CENTER OF GRAVITY	ACCEL.	ENDEVCO	2264	BA30
T01XG2	UPPER SPINE	ACCEL.	ENDEVCO	2264	AR93
T01YG2	UPPER SPINE	ACCEL.	ENDEVCO	2264	AN61
T01YGB	UPPER SPINE	ACCEL.	ENDEVCO	2264	AZ77
T01ZG2	UPPER SPINE	ACCEL.	ENDEVCO	2264	AN37
T12XG2	LOWER SPINE	ACCEL.	ENDEVCO	2264	AZ55
T12YG2	LOWER SPINE	ACCEL.	ENDEVCO	2264	BA64
T12YGB	LOWER SPINE	ACCEL.	ENDEVCO	2264	AZ74
T12ZG2	LOWER SPINE	ACCEL.	ENDEVCO	2264	AR86
RURYG2	RIGHT UPPER RIB	ACCEL.	ENDEVCO	2264	AR82
RURYGB	RIGHT UPPER RIB	ACCEL.	ENDEVCO	2264	AZ24
RLRYG2	RIGHT LOWER RIB	ACCEL.	ENDEVCO	2264	AN60
RLRYGB	RIGHT LOWER RIB	ACCEL.	ENDEVCO	2264	AY78
PEVXG2	PELVIS	ACCEL.	ENDEVCO	2264	AR78
PEVYG2	PELVIS	ACCEL.	ENDEVCO	2264	AN01
PEVZG2	PELVIS	ACCEL.	ENDEVCO	2264	AJ35
RRTYD2	RIGHT RIB TO SPINE DISPLACEMENT	LINEAR POT.	BOURNS	5184	4081-191
RFDYG1	RIGHT FRONT DOOR-POSITION 1	ACCEL.	ENDEVCO	2264	AT26
RFDYG2	RIGHT FRONT DOOR-POSITION 2	ACCEL.	ENDEVCO	2264	AS36
RFDYG3	RIGHT FRONT DOOR-POSITION 3	ACCEL.	ENDEVCO	2264	BC29
RFDYG4	RIGHT FRONT DOOR-POSITION 4	ACCEL.	ENDEVCO	7264	AN86
LFSXG	LEFT FRONT SILL	ACCEL.	B & H*	4-202-0001	18840
LFSYG	LEFT FRONT SILL	ACCEL.	B & H	4-202-0001	18236
LFSZG	LEFT FRONT SILL	ACCEL.	B & H	4-202-0001	18837
BCGXG	BARRIER CENTER OF GRAVITY	ACCEL.	B & H	4-202-0001	18851
BCGYG	BARRIER CENTER OF GRAVITY	ACCEL.	B & H	4-202-0001	18859
BCGZG	BARRIER CENTER OF GRAVITY	ACCEL.	B & H	4-202-0001	18836
BRCXG	BARRIER REAR CROSS MEMBER	ACCEL.	B & H	4-202-0001	19022
BRCYG	BARRIER REAR CROSS MEMBER	ACCEL.	B & H	4-202-0001	18237

*Bell & Howell

SECTION 3.0
CRASH TEST DATA

The following pages are included in this section:

1. Test conditions
2. Dummy accelerometer data summary
3. Dummy contact points and kinematic summary
4. Vehicle accelerometer locations and data summmary
5. Vehicle static crush table and profiles
6. Deformable moving barrier accelerometer locations and data summary
7. Test anomalies

TEST CONDITIONS

TEST NUMBER: 850716

DATE OF TEST: July 16, 1985 TIME OF TEST: 1:32

WIND VELOCITY: 3-6 mph 274° HUMIDITY: NA

AMBIENT TEMPERATURE AT IMPACT AREA: 74° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 76° F

DUMMY TEMPERATURE: 75° F

SUBJECT VEHICLE DATA

	ACTUAL	INTENDED
VEHICLE TEST WEIGHT (LBS.)	3182	3215
MDB TEST WEIGHT (LBS.)	2991	2992
MDB VELOCITY (MPH)*	33.5	33.5
IMPACT POINT (INCHES)**	39.0	37.0

DUMMIES

	DRIVER	MIDDLE PASSENGER	RT. FRONT PASSENGER	LEFT REAR PASSENGER	RT. REAR PASSENGER
TYPE:			SID		
SERIAL NO.:			016		
INSTRUMENTATION:					
HEAD ACCEL.:			3		
CHEST ACCEL.:			12		
FEMUR L.C.'S:			0		
OTHER:			3 Pelvis 1 Rib Disp.		

RESTRAINT SYSTEM: Dummy was unrestrained

* As measured over final one foot of travel.

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

SIDE IMPACT DUMMY DATA SUMMARY

	PASSENGER DUMMY			
	POSITIVE DIRECTION*		NEGATIVE DIRECTION**	
	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
HEAD ACCELERATION				
LONGITUDINAL	23.09	158.63	42.26	84.00
LATERAL	54.44	151.25	48.28	84.88
VERTICAL	107.77	151.00	35.58	158.25
RESULTANT		120.23 @ 151.13		
HIC	703.27 from 41.38 to 168.13			
DELTA V (MPH)		-25.5 @ 139.00		
CHEST ACCELERATION				
UPPER SPINE				
LONGITUDINAL	12.24	45.00	8.97	67.50
LATERAL (P)****	18.54	60.00	60.97	44.38
LATERAL (R)****	20.07	60.00	59.52	43.75
VERTICAL	8.62	33.13	13.77	58.13
RESULTANT (P)		62.23 @ 44.38		
RESULTANT (R)		60.75 @ 44.38		
DELTA V (MPH)***		-27.6 @ 59.38 (P)		
		-27.6 @ 59.00 (R)		
LOWER SPINE				
LONGITUDINAL	16.84	98.12	19.40	60.00
LATERAL (P)	20.84	98.12	72.20	37.50
LATERAL (R)	20.74	98.75	73.10	37.50
VERTICAL	6.50	78.75	14.60	58.13
RESULTANT (P)		73.16 @ 37.50		
RESULTANT (R)		74.04 @ 37.50		
DELTA V (MPH)		-31.9 @ 56.63 (P)		
		-32.8 @ 57.25 (R)		
RIGHT UPPER RIB				
LATERAL (P)	9.41	71.88	49.55	34.38
LATERAL (R)	12.08	68.75	54.37	34.38
DELTA V (MPH)		-25.7 @ 65.38 (P)		
		-25.8 @ 65.63 (R)		
RIGHT LOWER RIB				
LATERAL (P)	13.74	96.88	49.38	42.50
LATERAL (R)	15.29	97.50	52.16	35.00
DELTA V (MPH)		-27.8 @ 62.75 (P)		
		-27.9 @ 62.63 (R)		
PELVIS ACCELERATION				
LONGITUDINAL	14.97	72.63	26.09	37.88
LATERAL	23.63	80.13	61.55	35.25
VERTICAL	11.73	99.38	24.95	33.50
RESULTANT		62.53 @ 35.38		
DELTA V (MPH)		-28.6 @ 55.50		

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	PASSENGER DUMMY			
	POSITIVE DIRECTION*		NEGATIVE DIRECTION**	
	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)
RIB DEFLECTION †	---	---×	1.89	54.88

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

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

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

† Compression: Negative

× There were no positive values in the time interval of interest.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER DNA	PASSENGER 016
Head		Right Door Windowsill
Chest		Door padding
Abdomen		Door padding
Left Knee		Right knee
Right Knee		Door padding

DOOR OPENING:

	LEFT	RIGHT
Front	Normal	Tools required
Rear	Normal	Tools required

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	No	No
Rear	No	No

GLAZING DAMAGE: Right side windshield cracked

All right side door glass shattered

OTHER NOTABLE IMPACT EFFECTS:

DUMMY KINEMATIC SUMMARY

Upon impact, the dummy's right shoulder and right leg contacted the door padding. The dummy's head rotated to the right and down and struck the right front door window sill. The dummy then rebounded from the padded door panel and came to rest sitting upright on the right front passenger's seat.

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

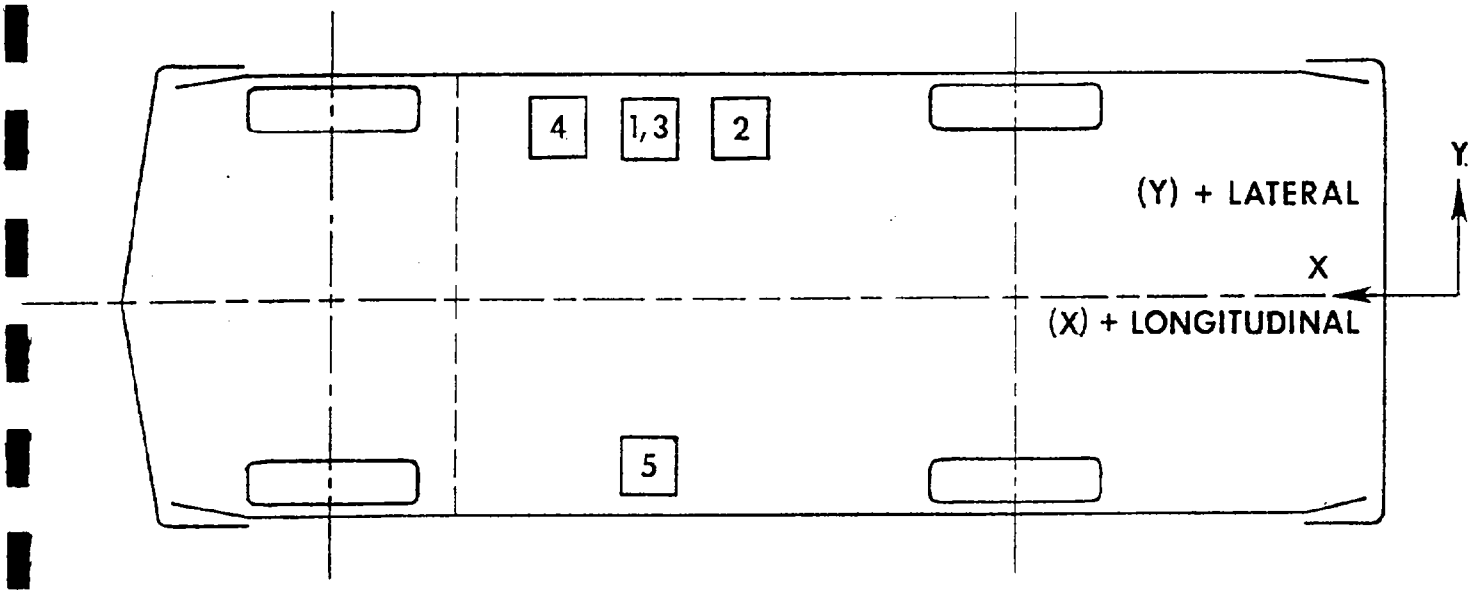
NO.	LOCATION	X*	Y*	Z*	POSITIVE** DIRECTION MAX (g)	POSITIVE** DIRECTION TIME (msec)	NEGATIVE*** DIRECTION MAX (g)	NEGATIVE*** DIRECTION TIME (msec)
1	RIGHT FRONT DOOR CENTERLINE (LATERAL)	113.1	28.5	23.5				
	ΔV = -19.0 mph @ 17.88 msec				38.43	22.75	116.15	15.38
2	MIDREAR OF RIGHT FRONT DOOR (LATERAL)	102.1	28.6	25.3				
	Δ V = -21.0 mph @ 32.63 msec				25.01	81.63	101.52	10.25
3	UPPER RIGHT FRONT DOOR CENTERLINE (LATERAL)	113.1	28.9	30.5				
	Δ V = -13.4 mph @ 26.75 msec				46.03	32.13	73.58	19.75
4	MIDFRONT OF RIGHT FRONT DOOR (LATERAL)	122.3	28.5	23.5				
	Δ V = -21.6 mph @ 14.88 msec				45.19	42.38	135.49	12.00
5	LEFT SILL AT FRONT SEAT (LONGITUDINAL)	119.8	-26.9	12.5				
					3.38	55.63	6.89	24.25
	(LATERAL) Δ V = -15.1 mph @ 136.88 msec				2.65	87.00	30.30	40.00
	(VERTICAL)				4.77	78.50	7.74	20.13
	(RESULTANT)					30.99 @ 39.88		

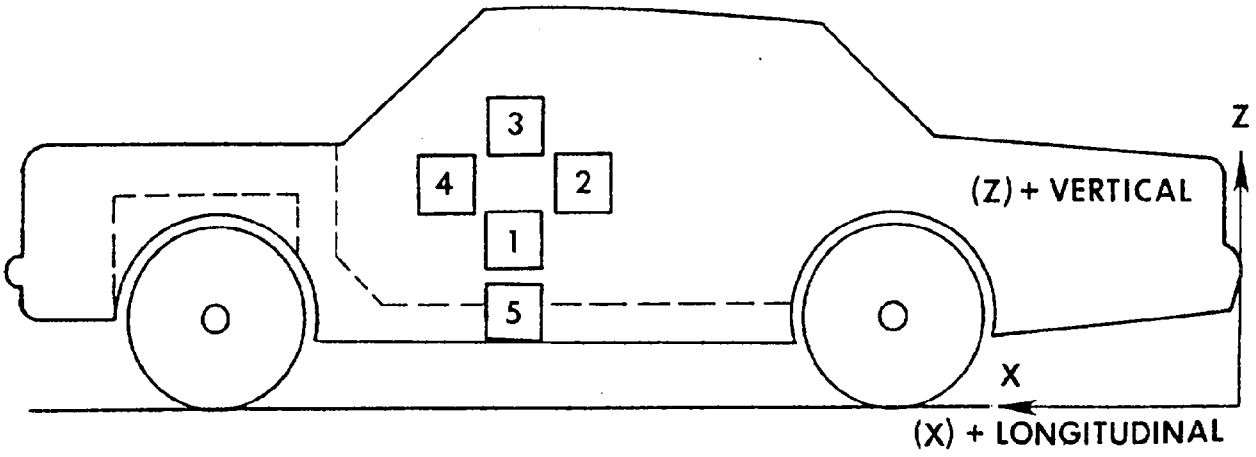
* Reference: X - Rear Bumper (+ Forward), Y - Vehicle Centerline (+ To Right), Z - Ground Level (+ Up)

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

All measurements of accelerometer locations in inches.

VEHICLE ACCELEROMETER PLACEMENT





VEHICLE EXTERIOR PROFILES AND STATIC CRUSH

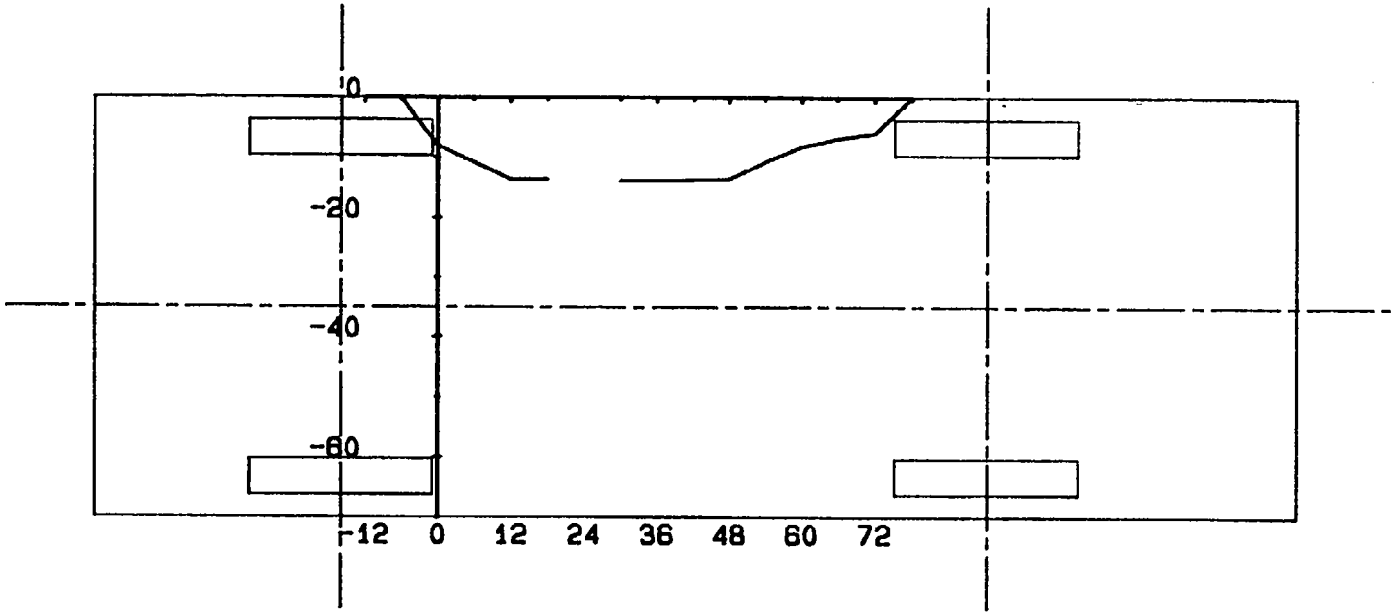
ZERO DISTANCE AT PROJECTED IMPACT POINT*

LOCATION	HEIGHT (in)	78	72	66	60	54	48	42	36	30	24	18	12	6	0	6
PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Axle Height	12.0	X	17.9	17.8	17.6	17.6	17.5	17.4	17.4	17.4	17.4	17.4	17.4	17.5	17.5	X
H-Point	22.8	13.0	13.2	13.6	13.5	13.5	13.5	13.6	13.6	13.7	13.2	13.9	14.0	14.1	14.0	X
Window Sill	36.8	16.0	16.1	16.1	16.1	16.1	16.0	16.1	16.1	16.2	16.2	16.4	16.4	16.5	16.8	17.0
Window Top	56.0	24.2	24.0	24.1	24.1	24.1	24.2	24.2	24.3	24.7	X	X	X	X	X	X
POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Axle Height	12.0	X	23.8	24.6	25.8	28.4	31.1	31.1	31.2	31.2	NA	31.0	30.9	28.3	25.5	X
H-Point	22.8	19.8	30.6	35.0	35.6	35.6	32.9	32.2	31.8	31.2	30.8	30.1	29.8	29.2	26.5	X
Window Sill	36.8	22.7	22.4	32.8	32.4	32.1	30.4	29.2	28.7	28.6	27.9	26.8	25.2	23.2	22.4	21.8
Window Top	56.0	28.6	28.8	29.0	29.4	29.8	30.1	30.4	30.3	30.8	X	X	X	X	X	X
STATIC CRUSH (IN)																
Axle Height	12.0	X	5.9	6.8	8.2	10.8	13.6	13.7	13.8	13.8	NA	13.6	13.5	10.8	8.0	X
H-Point	22.8	6.8	17.4	21.4	22.1	22.1	19.4	18.6	18.2	17.5	17.6	16.2	15.8	15.1	12.5	X
Window Sill	36.8	6.7	6.3	16.7	16.3	16.0	14.4	13.1	12.6	12.4	11.7	10.4	8.8	6.7	5.6	4.8
Window Top	56.0	4.4	4.8	4.9	5.3	5.7	5.9	6.2	6.0	6.1	X	X	X	X	X	X

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

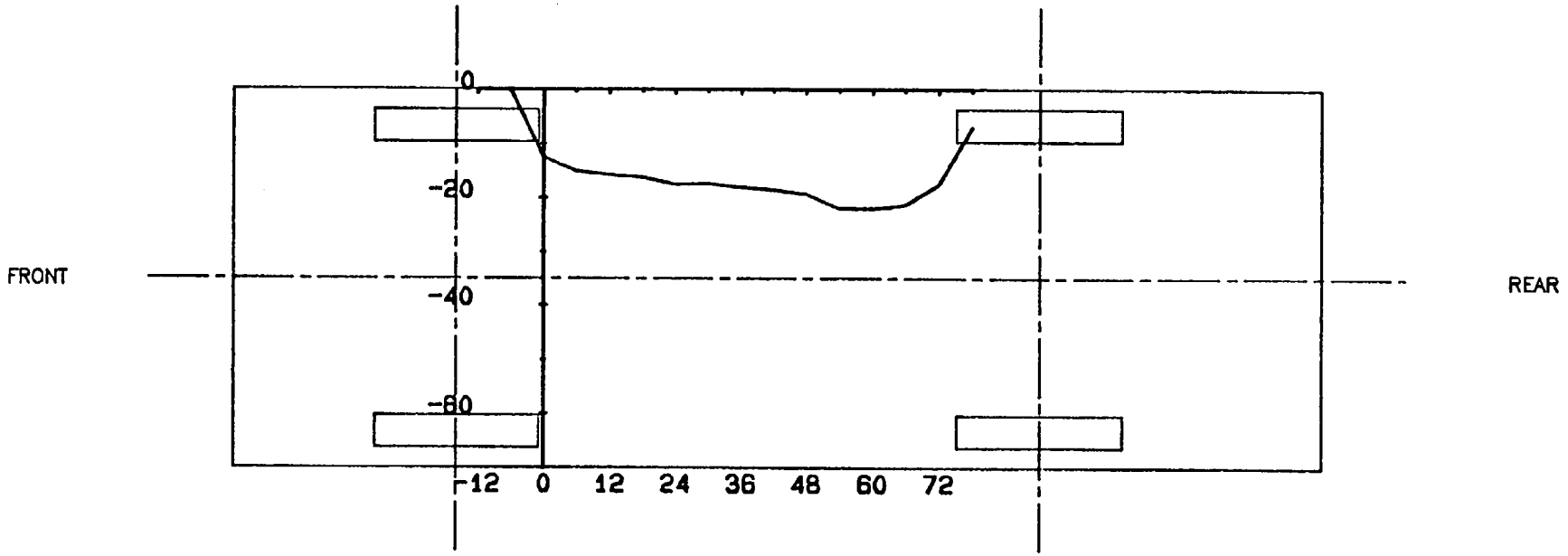
** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



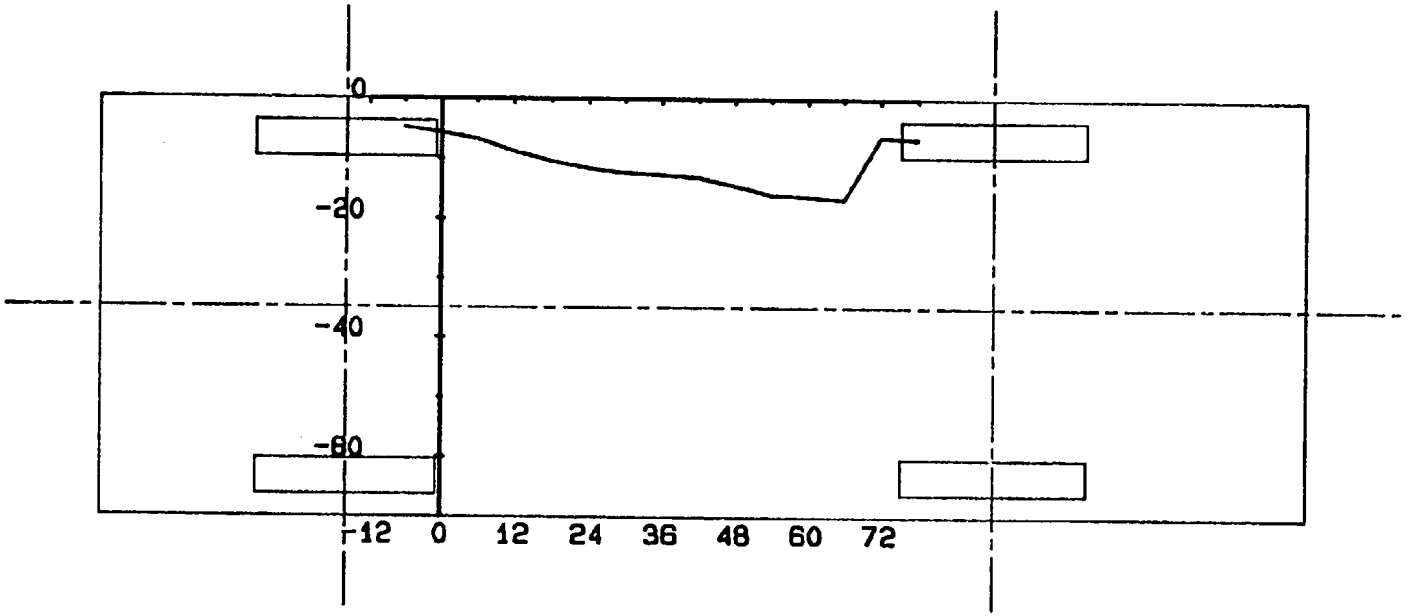
PROFILE LEVEL EQUALS AXLE HEIGHT WHICH IS 12.0 " ABOVE GROUND LEVEL
(0,0) EQUALS PROJECTED IMPACT POINT
SCALE FACTOR EQUALS 0.033

VEHICLE EXTERIOR STATIC CRUSH PROFILE



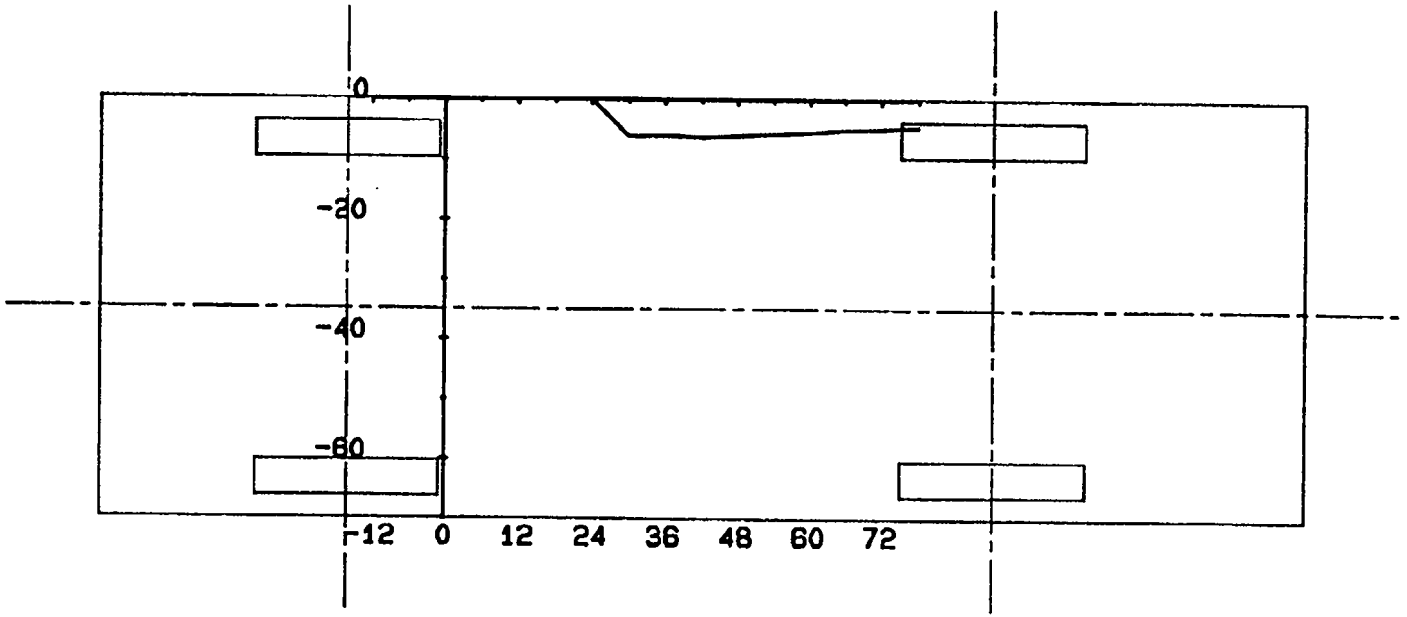
PROFILE LEVEL EQUALS H-POINT HEIGHT WHICH IS 22.8 " ABOVE GROUND LEVEL
(0,0) EQUALS PROJECTED IMPACT POINT
SCALE FACTOR EQUALS 0.033

VEHICLE EXTERIOR STATIC CRUSH PROFILE



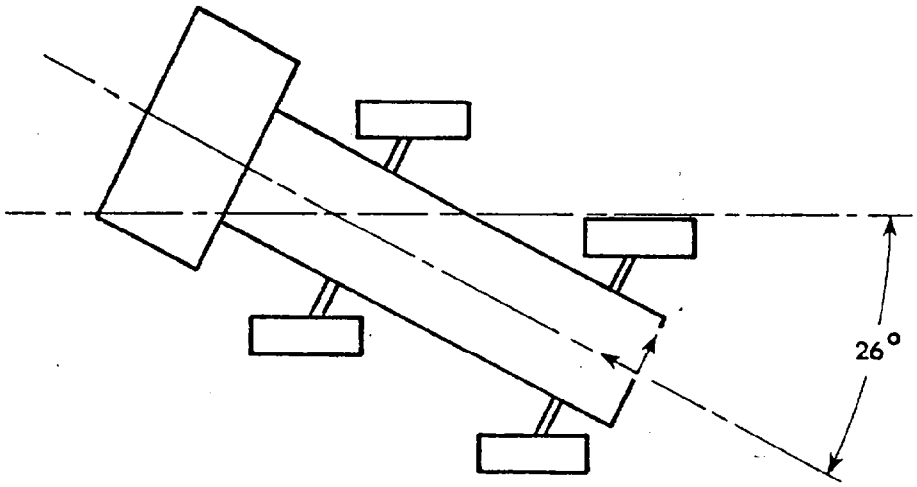
PROFILE LEVEL EQUALS WINDOW SILL HEIGHT WHICH IS 36.8 " ABOVE GROUND LEVEL
(0,0) EQUALS PROJECTED IMPACT POINT
SCALE FACTOR EQUALS 0.033

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT WHICH IS 56.0 " ABOVE GROUND LEVEL
(0,0) EQUALS PROJECTED IMPACT POINT
SCALE FACTOR EQUALS 0.033

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	73.0	0.9	11.9				
	(LONGITUDINAL) ΔV = -19.2 mph @ 140.13 msec				1.03	172.63	14.65	35.13
	(LATERAL) ΔV = 6.0 mph @ 140.13 msec				8.42	32.25	2.13	57.00
	(VERTICAL)				7.10	58.38	8.33	40.88
	(RESULTANT)					17.49 @ 32.75		
2	REAR FRAME MEMBER	18.5	-19.2	11.9				
	(LONGITUDINAL) ΔV = -14.2 mph @ 140.13 msec				---	--- [×]	10.50	26.25
	(LATERAL) ΔV = 0.0 mph @ 140.13 msec				5.00	114.63	5.49	23.25

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

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

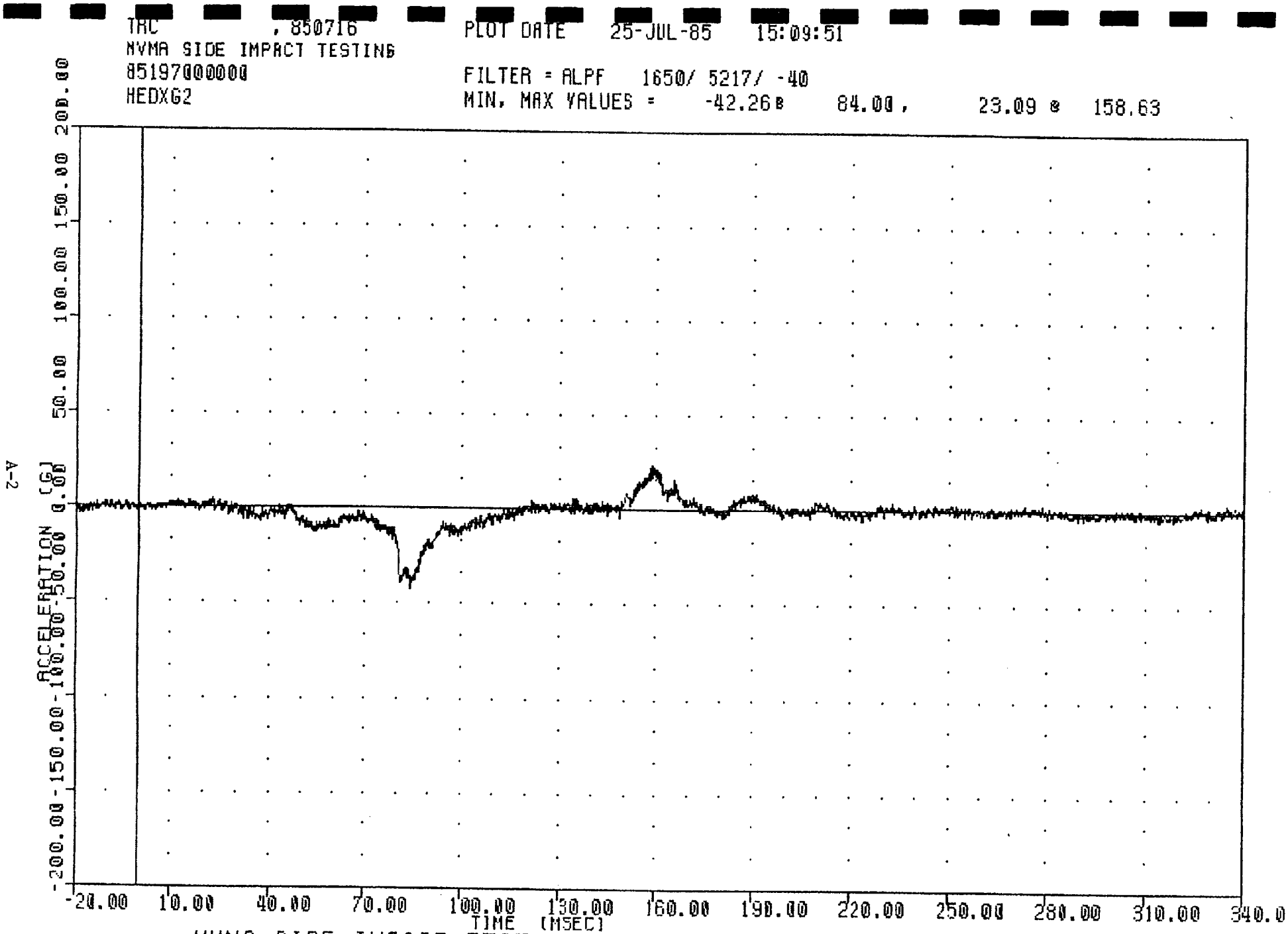
All measurements of accelerometer locations in inches.

[×] There were no positive values in the time interval of interest.

APPENDIX A

DATA PLOTS

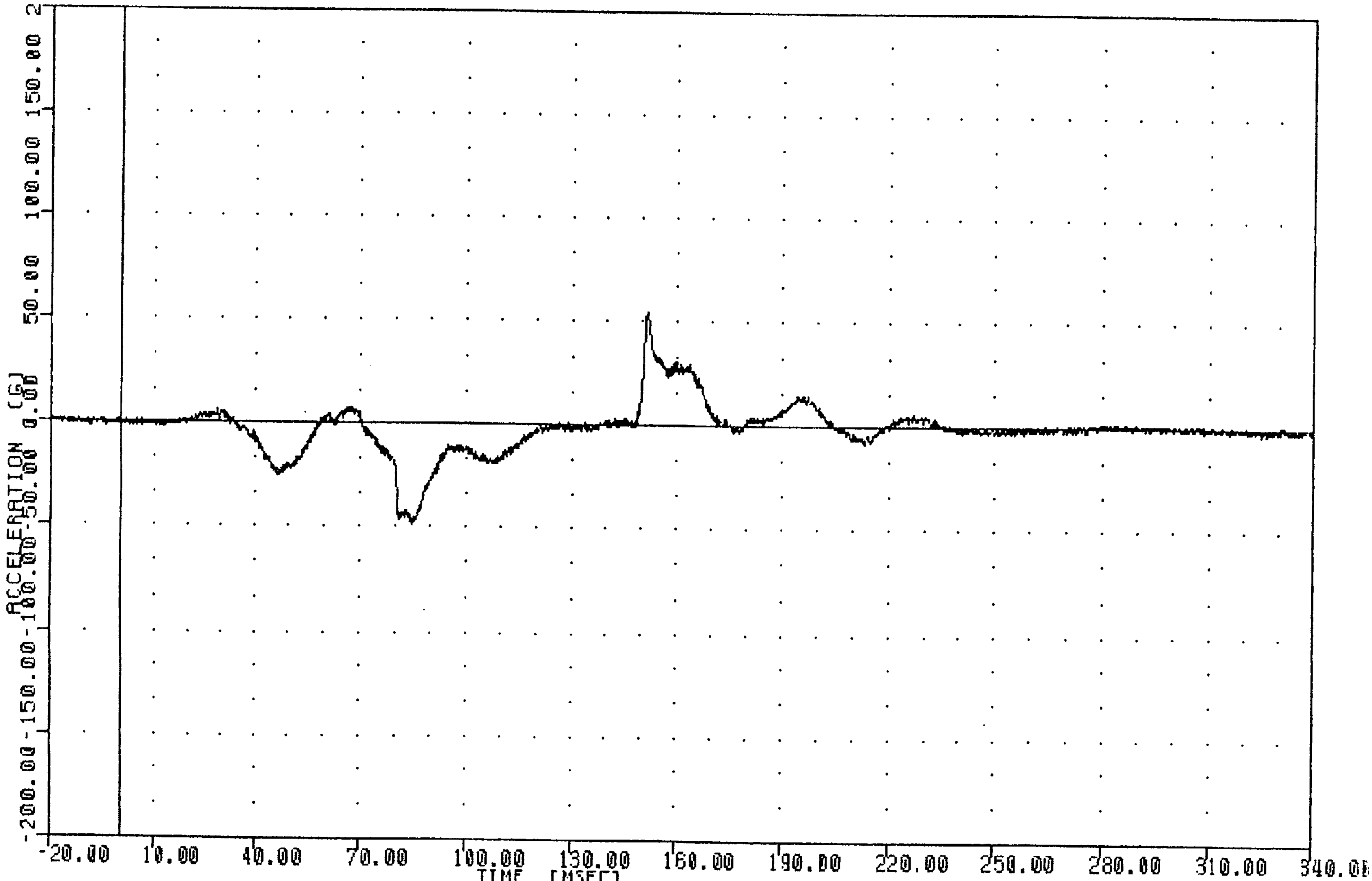
Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data were filtered according to SAE J211, except that dummy thorax data were filtered using the HSRI filter.



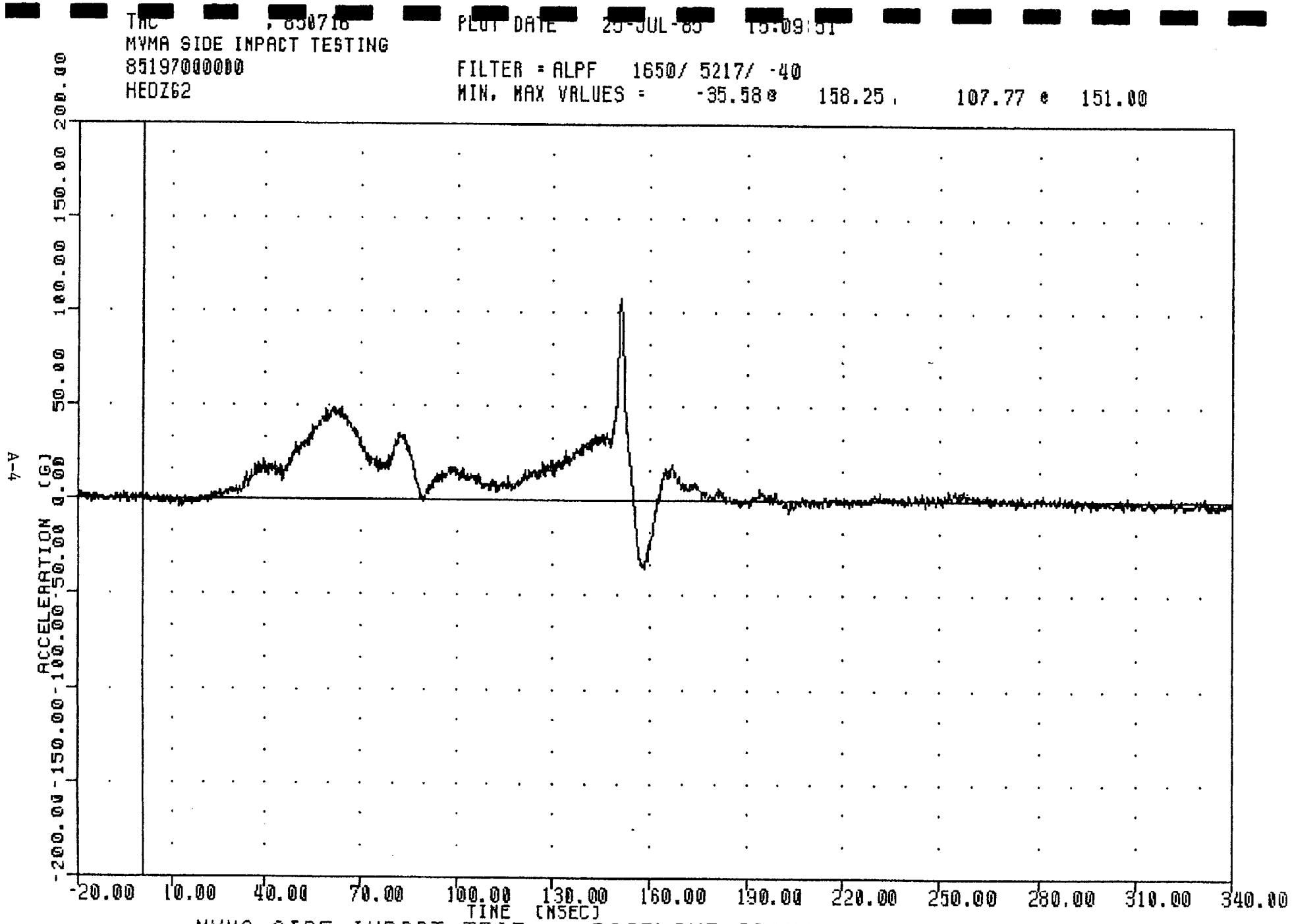
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER HEAD ACCELERATION X AXIS

TAG [illegible] PLOT DATE [illegible] 15:09:31
MVMA SIDE IMPACT TESTING
85197000000
HEDYG2

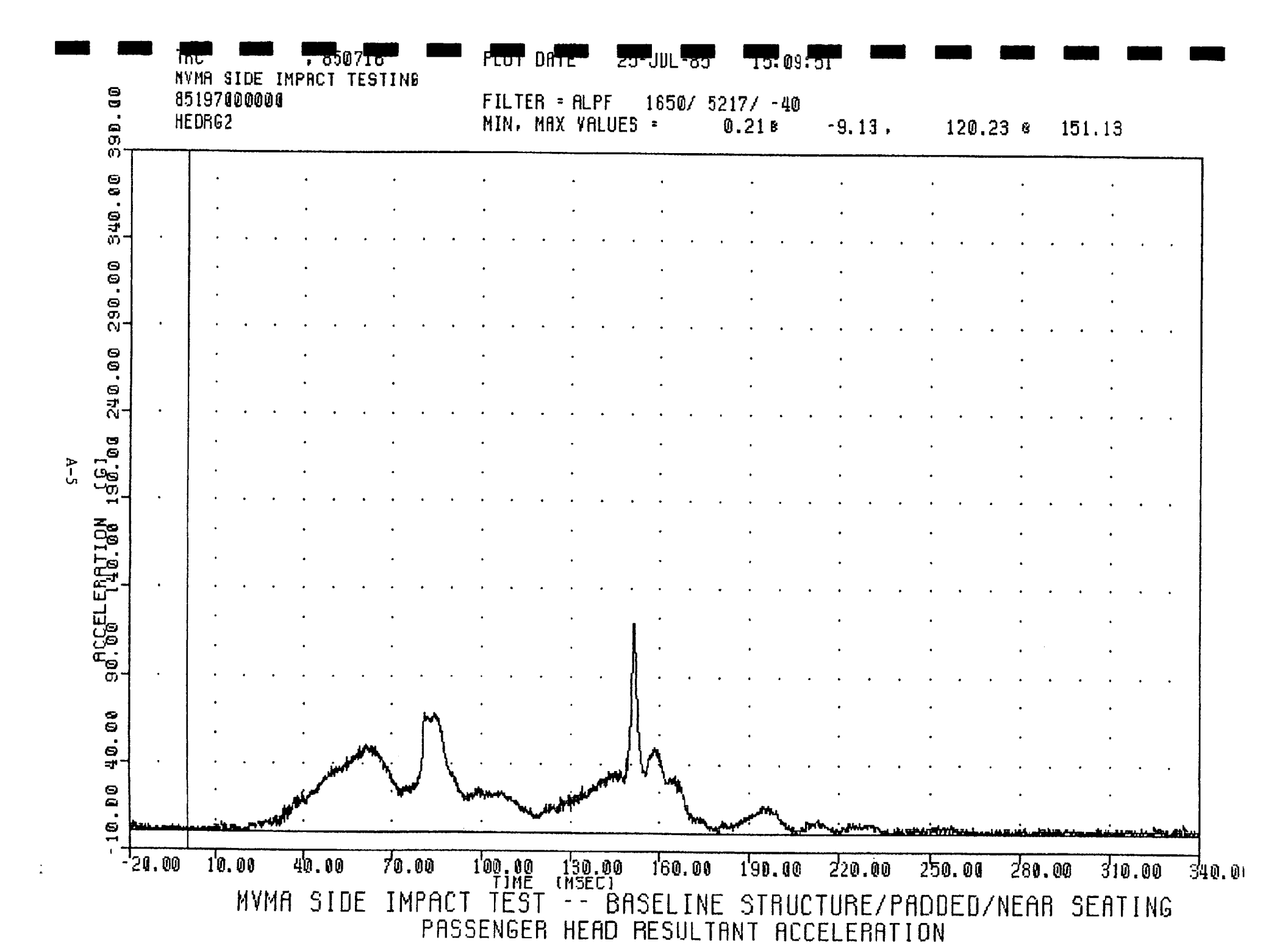
FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -48.28 @ 84.88 , 54.44 @ 151.25



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER HEAD ACCELERATION Y AXIS



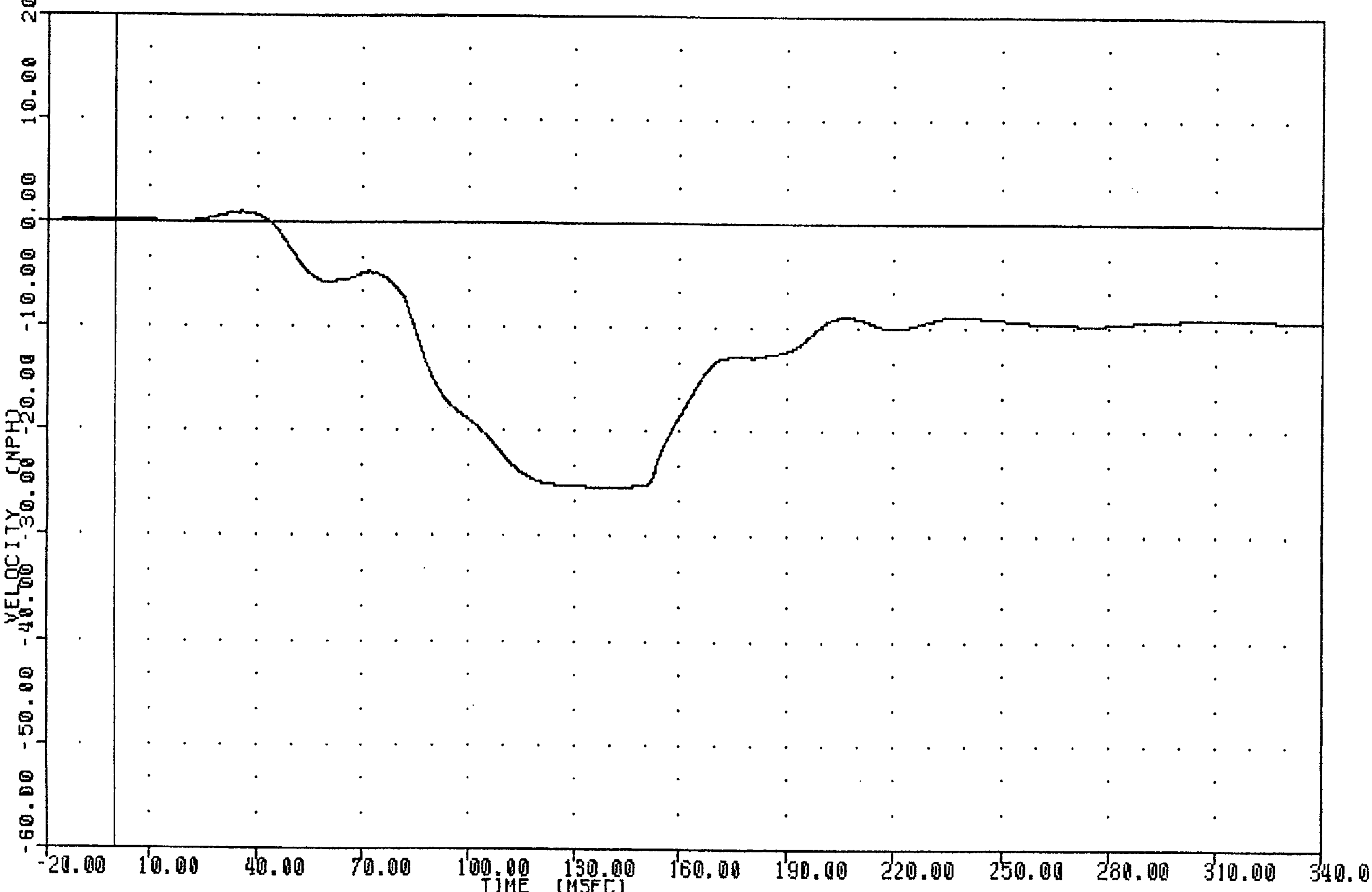
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER HEAD ACCELERATION Z AXIS



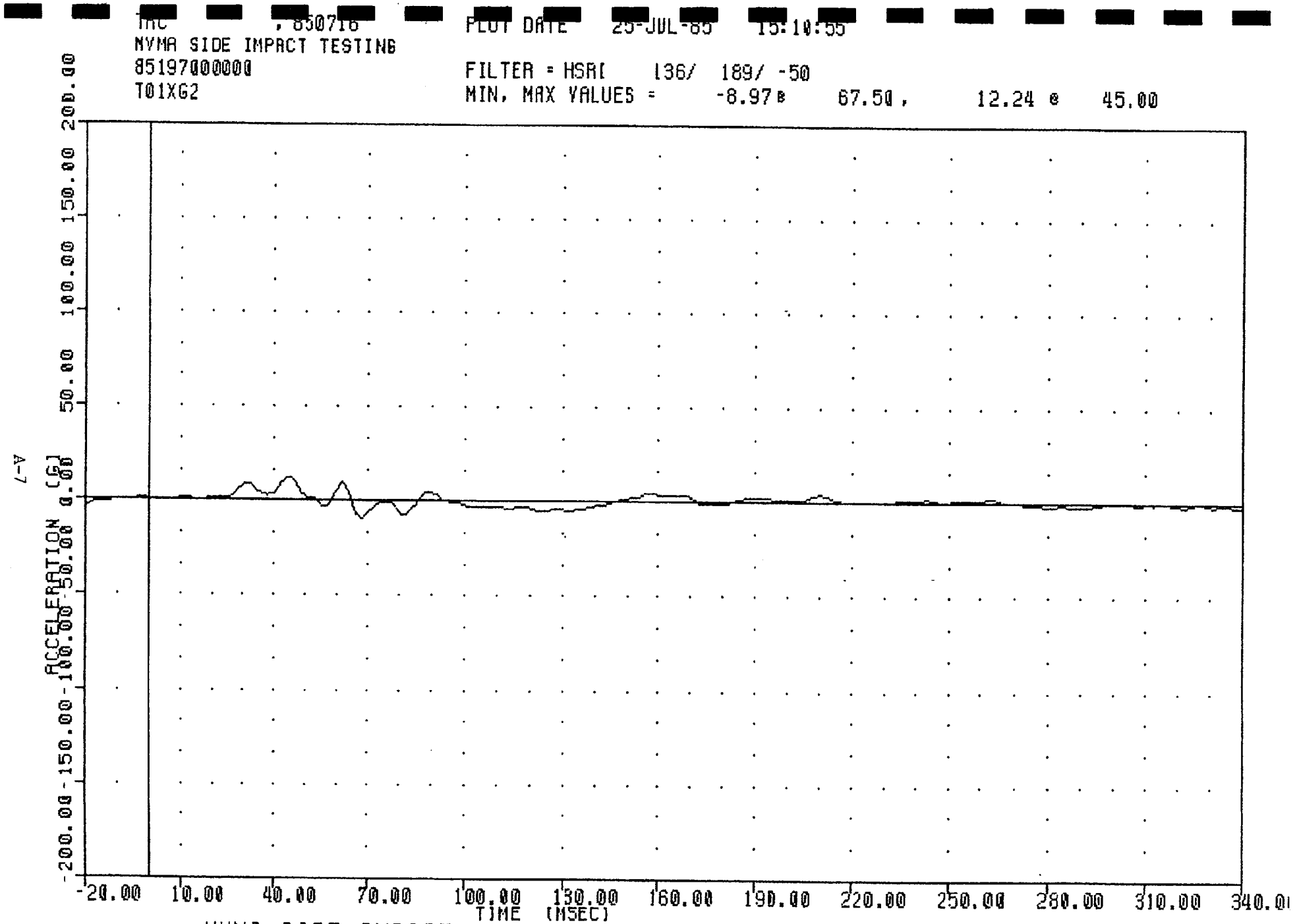
NVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER HEAD RESULTANT ACCELERATION

[redacted] [redacted] [redacted] DATE [redacted] JUL [redacted] [redacted].11:35
NVMA SIDE IMPACT TESTING
85197000000
HEDYV2

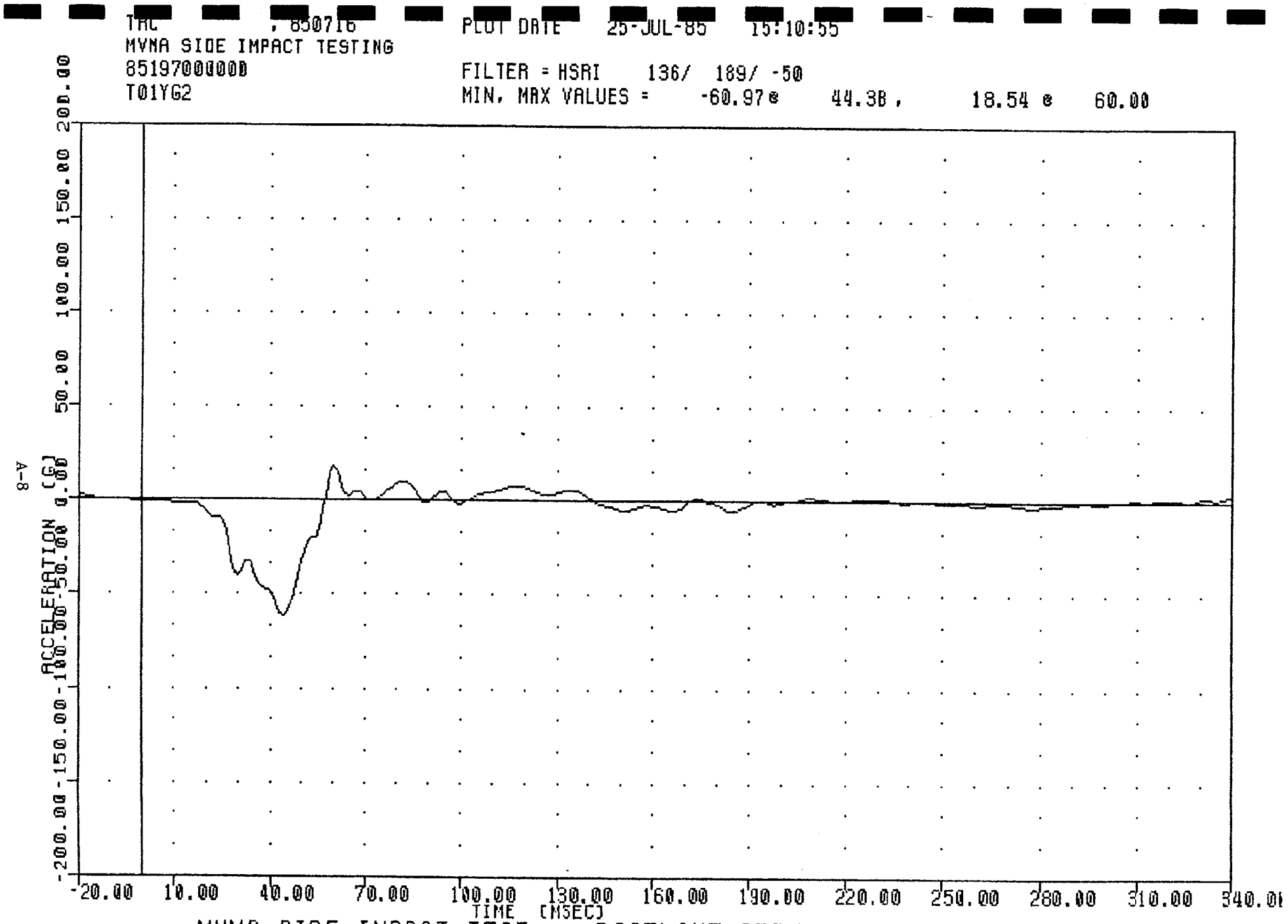
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -25.50 @ 139.00 , 0.95 @ 35.88



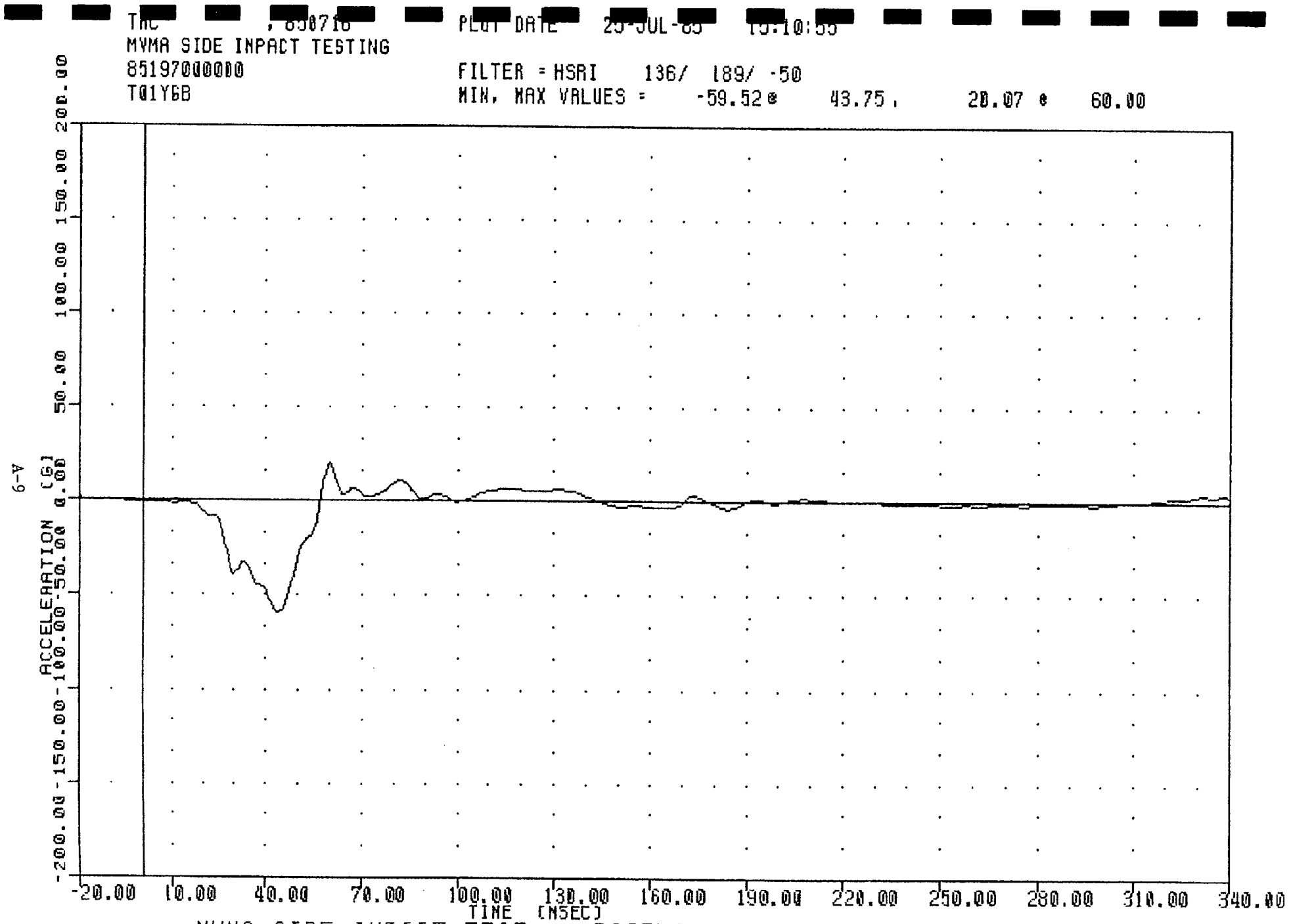
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
HEAD VELOCITY Y AXIS



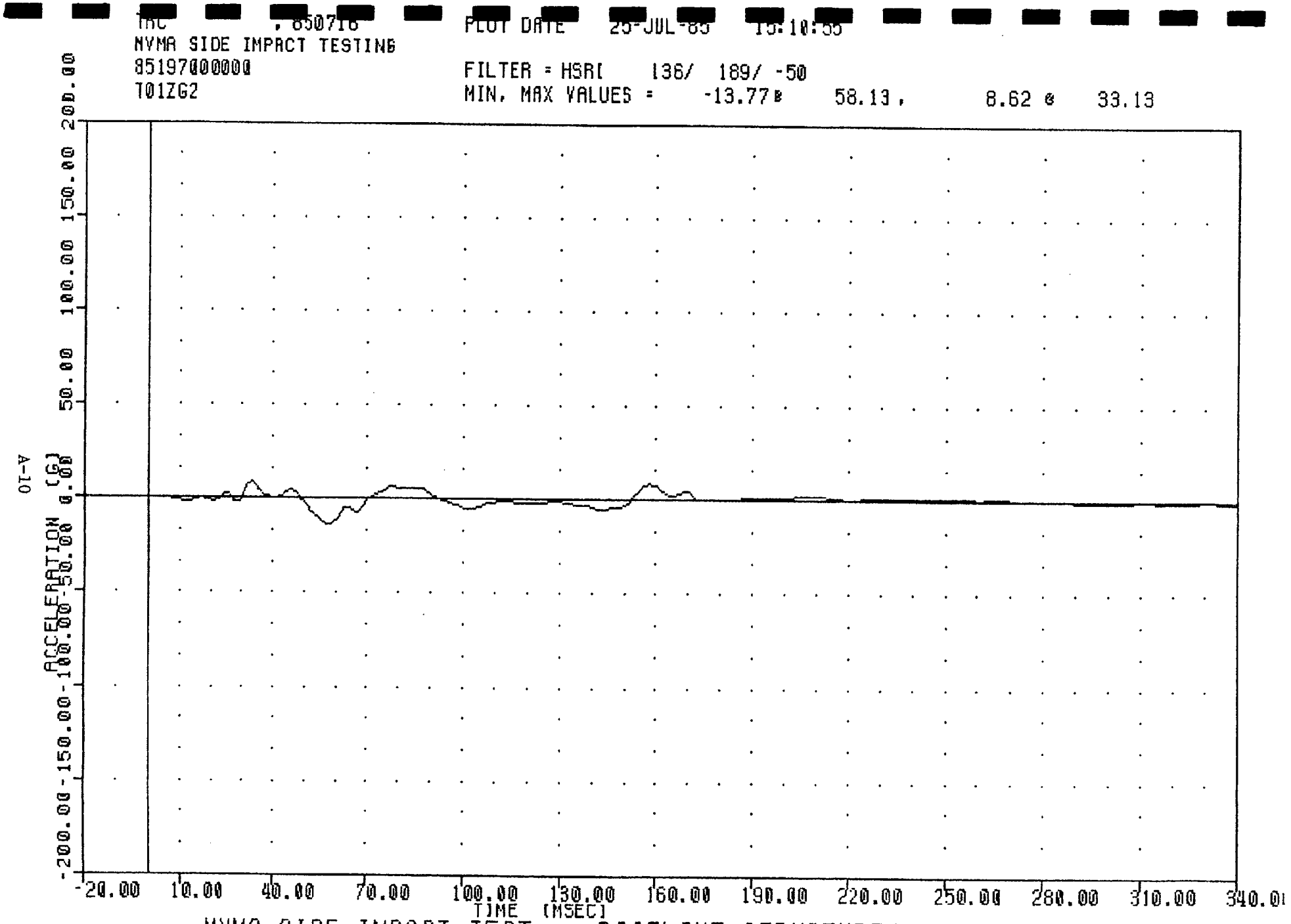
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER UPPER SPINE ACCELERATION X AXIS



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER UPPER SPINE ACCELERATION Y AXIS

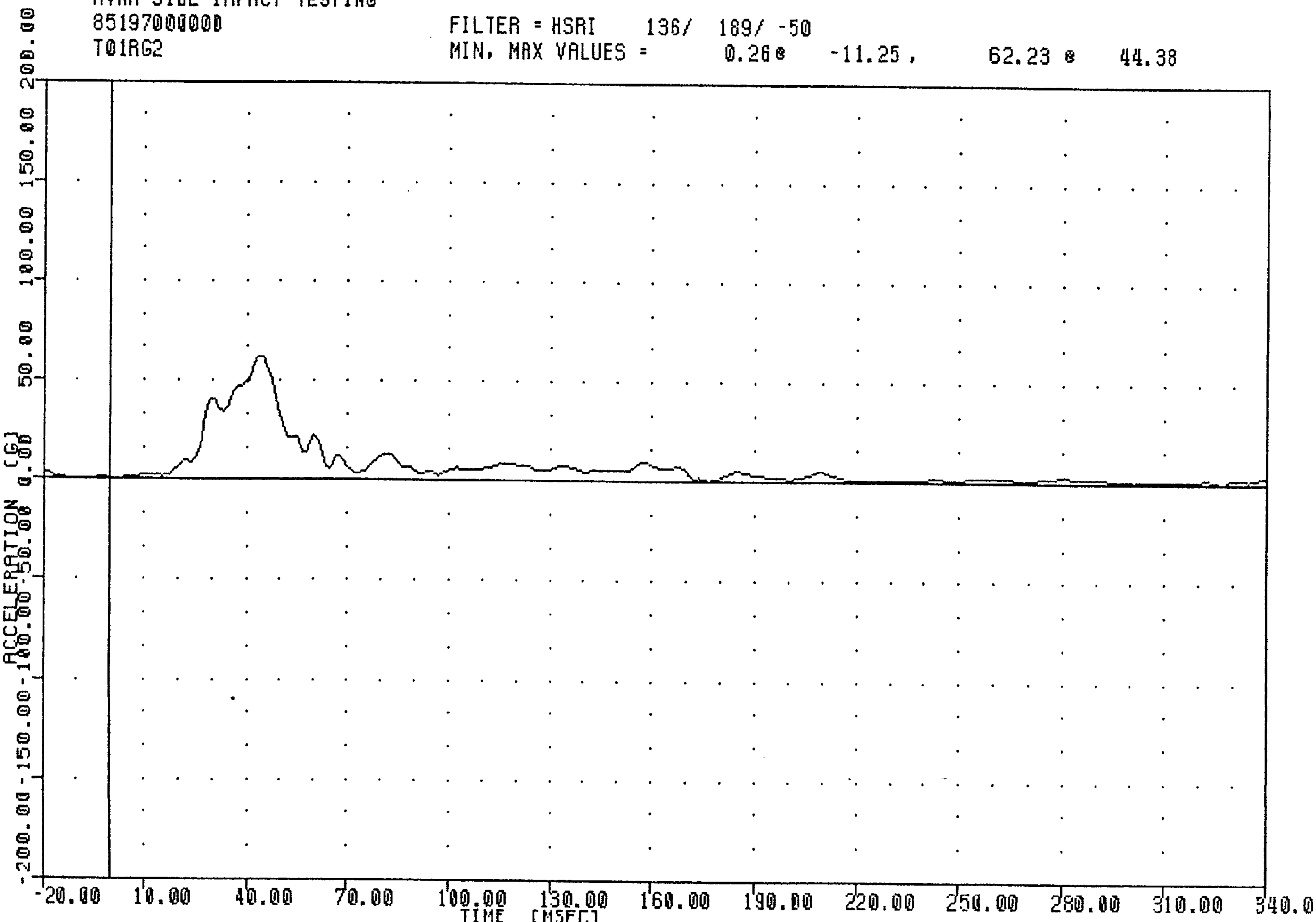


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER UPPER SPINE ACCELERATION -2 Y AXIS

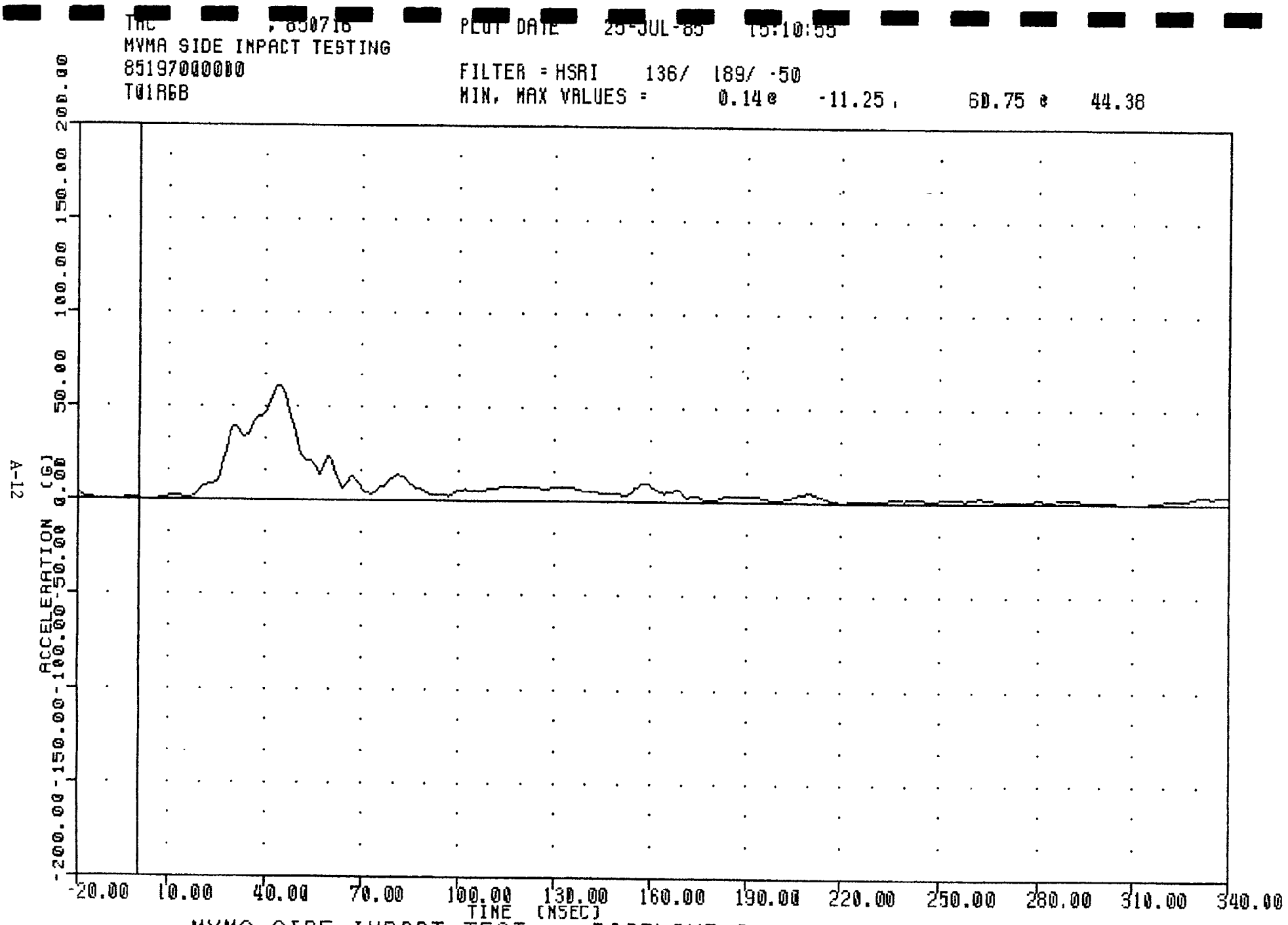


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER UPPER SPINE ACCELERATION Z AXIS

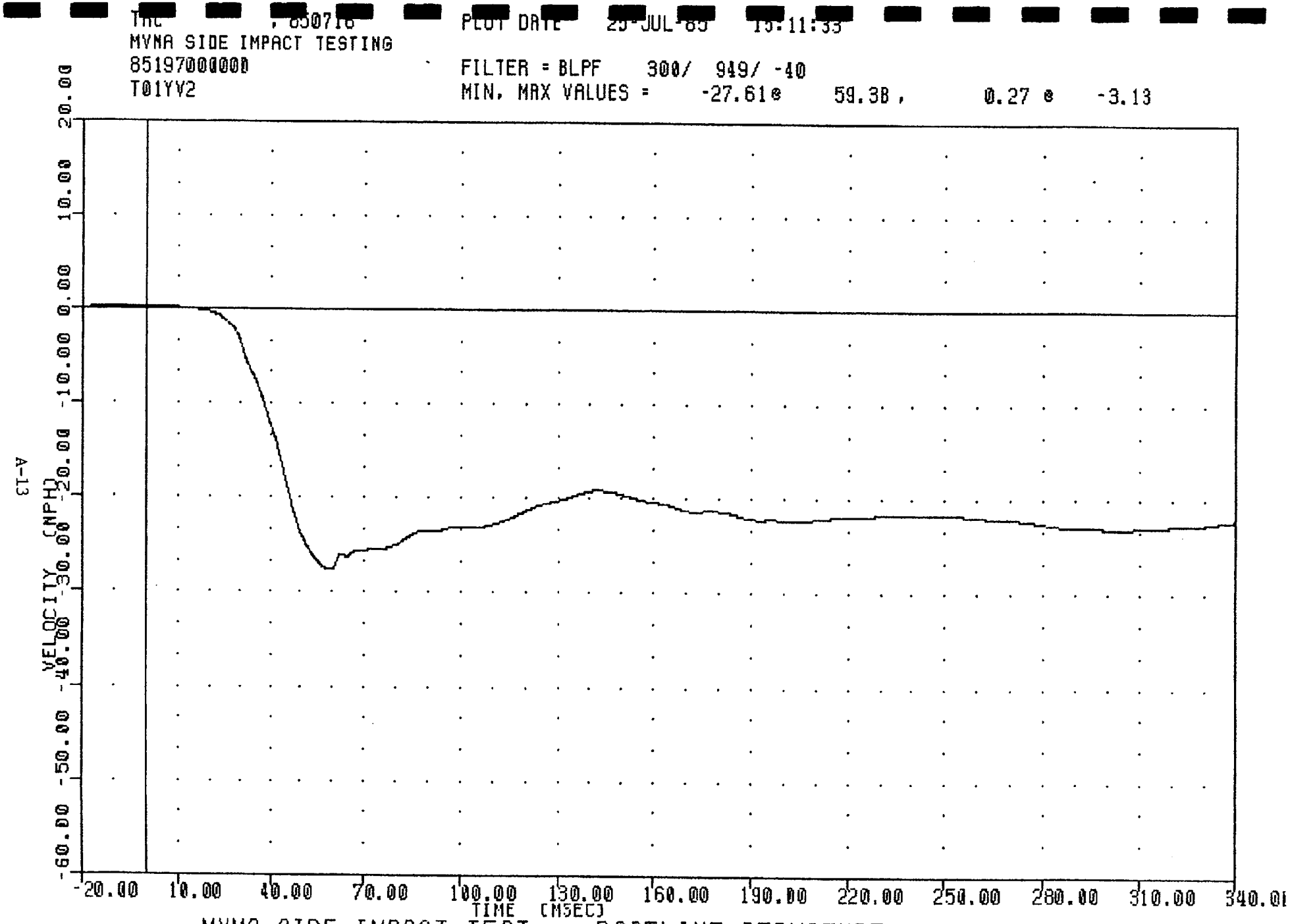
THC , 850710 PLOT DATE 25 JUL 85 15:10:55
MVMA SIDE IMPACT TESTING
85197000000 FILTER = HSRI 136/ 189/ -50
T01RG2 MIN, MAX VALUES = 0.26 @ -11.25 , 62.23 @ 44.38



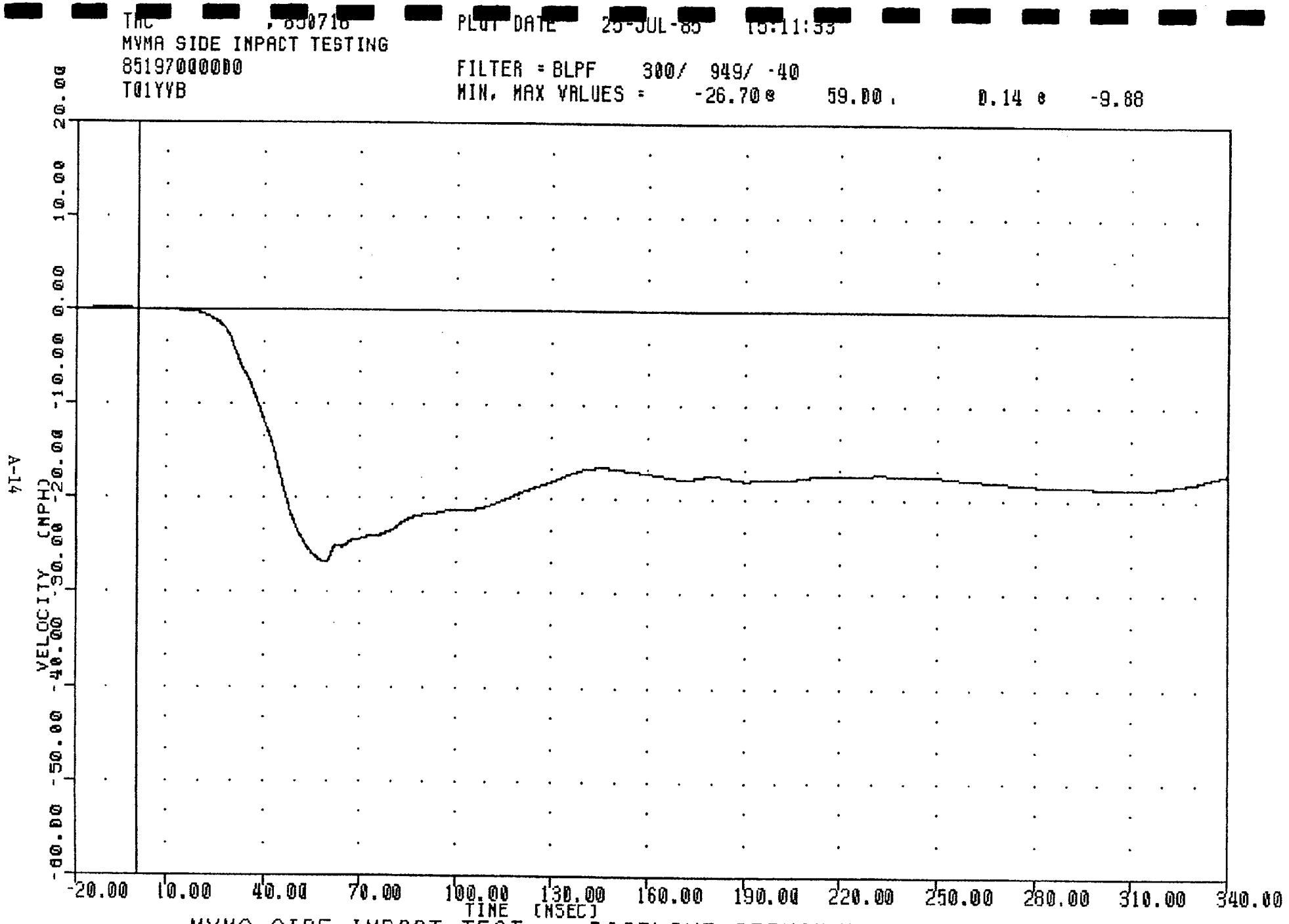
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER UPPER SPINE RESULTANT ACCELERATION



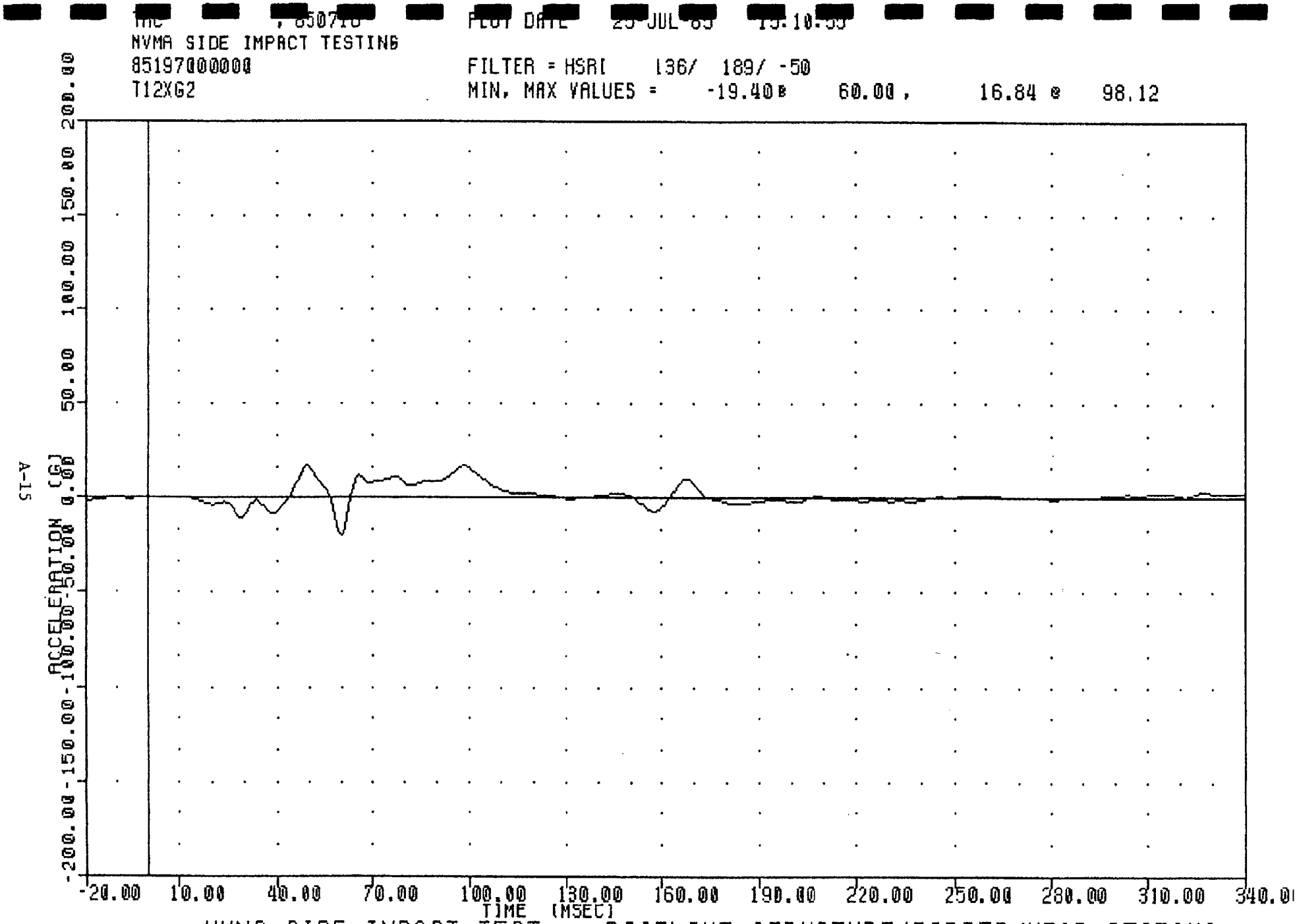
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER UPPER SPINE RESULTANT ACCELERATION -2



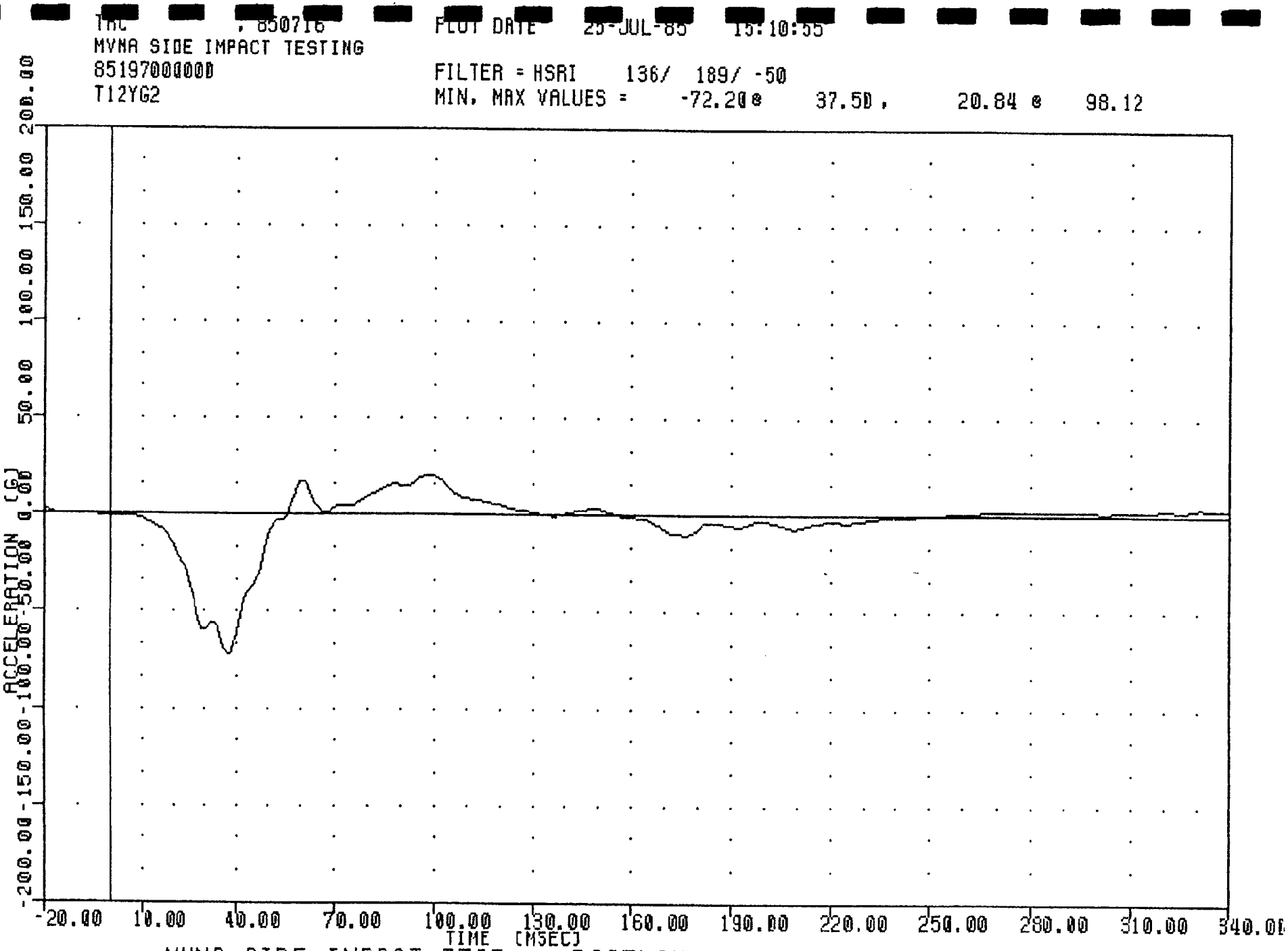
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
UPPER SPINE VELOCITY Y AXIS



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
UPPER SPINE VELOCITY -2 Y AXIS



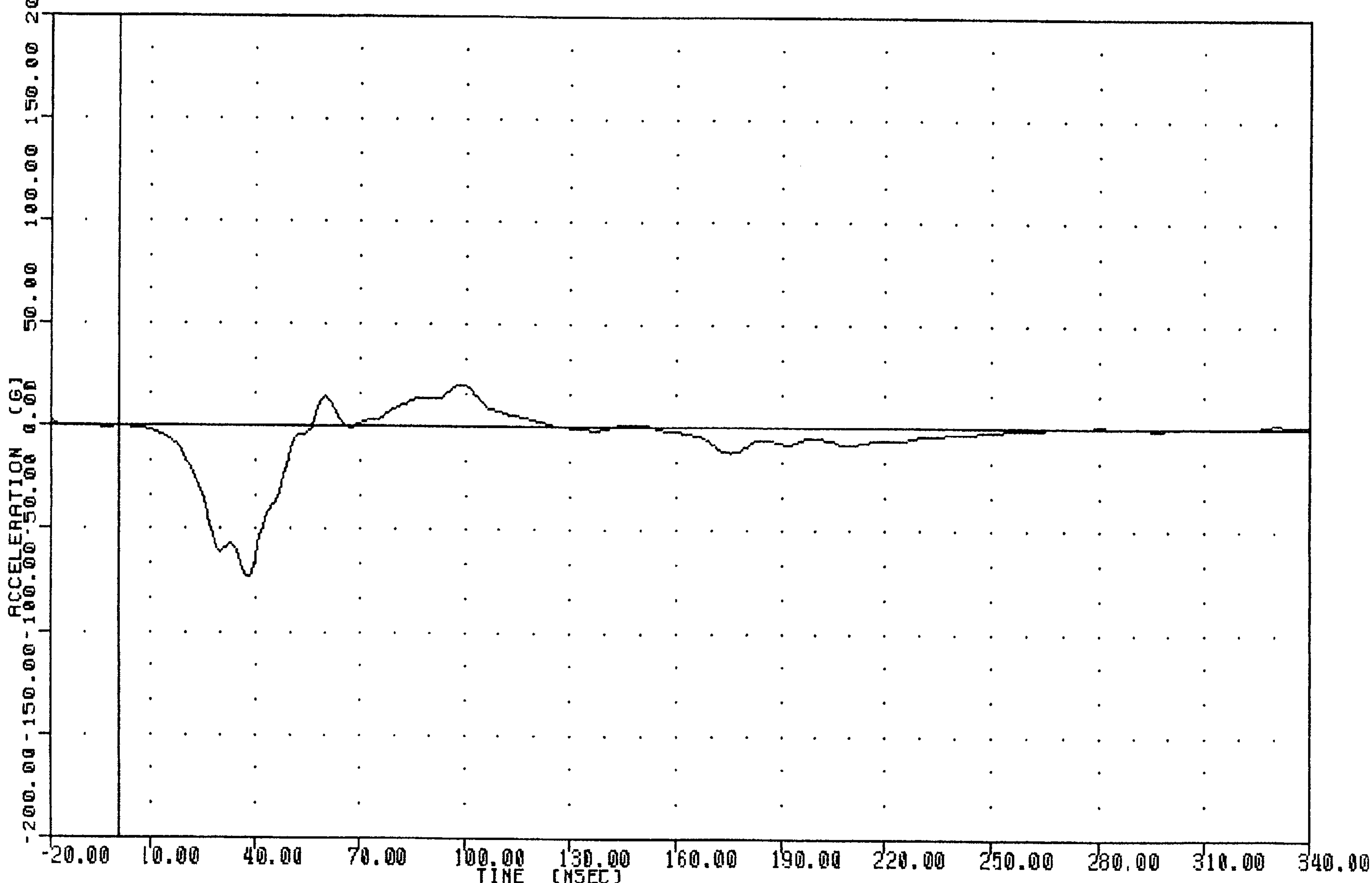
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER LOWER SPINE ACCELERATION X AXIS



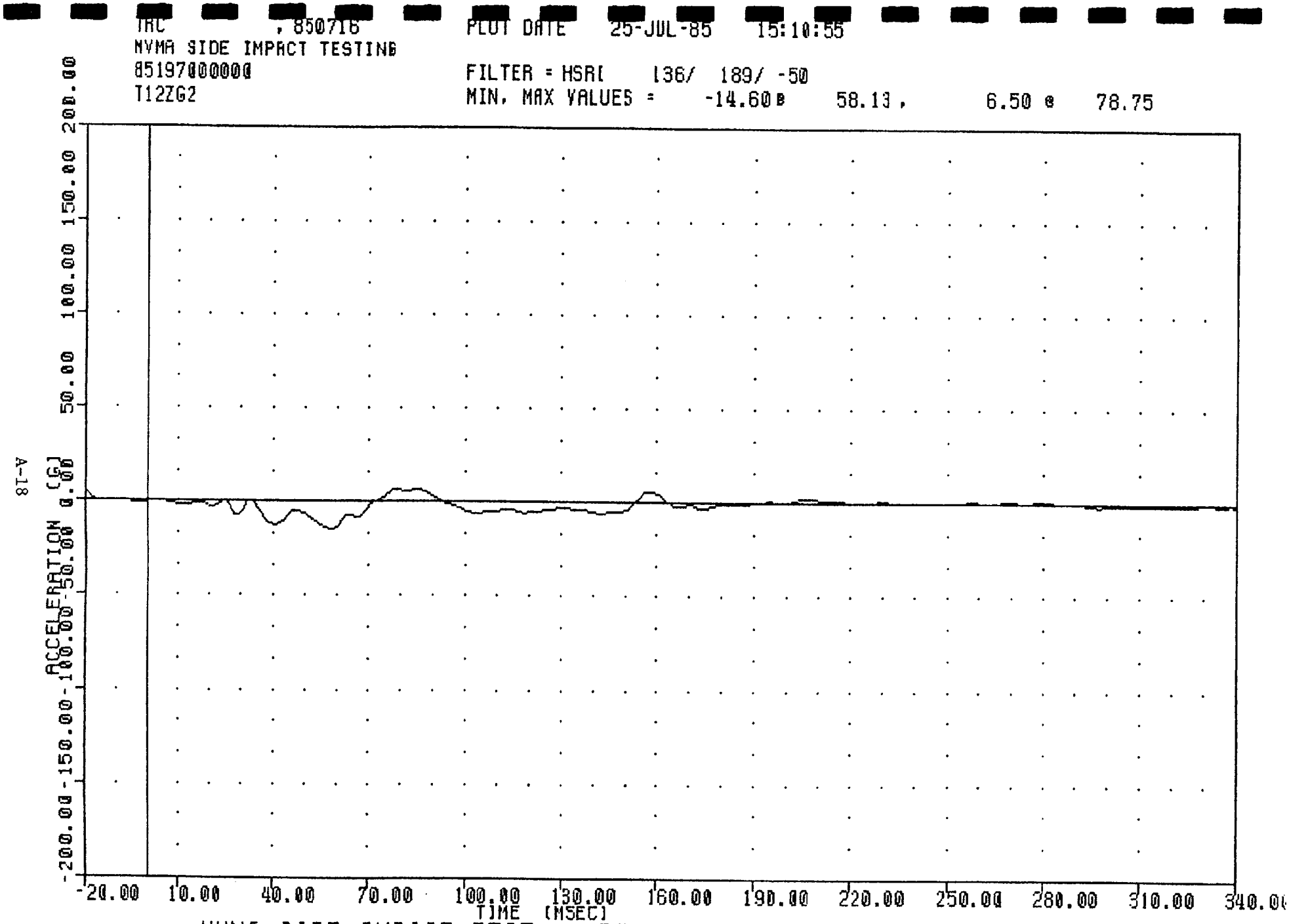
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER LOWER SPINE ACCELERATION Y AXIS

TRC , 850716 PLOT DATE 25-JUL-85 15:10:55
MVMA SIDE IMPACT TESTING
85197000000
T12Y6B

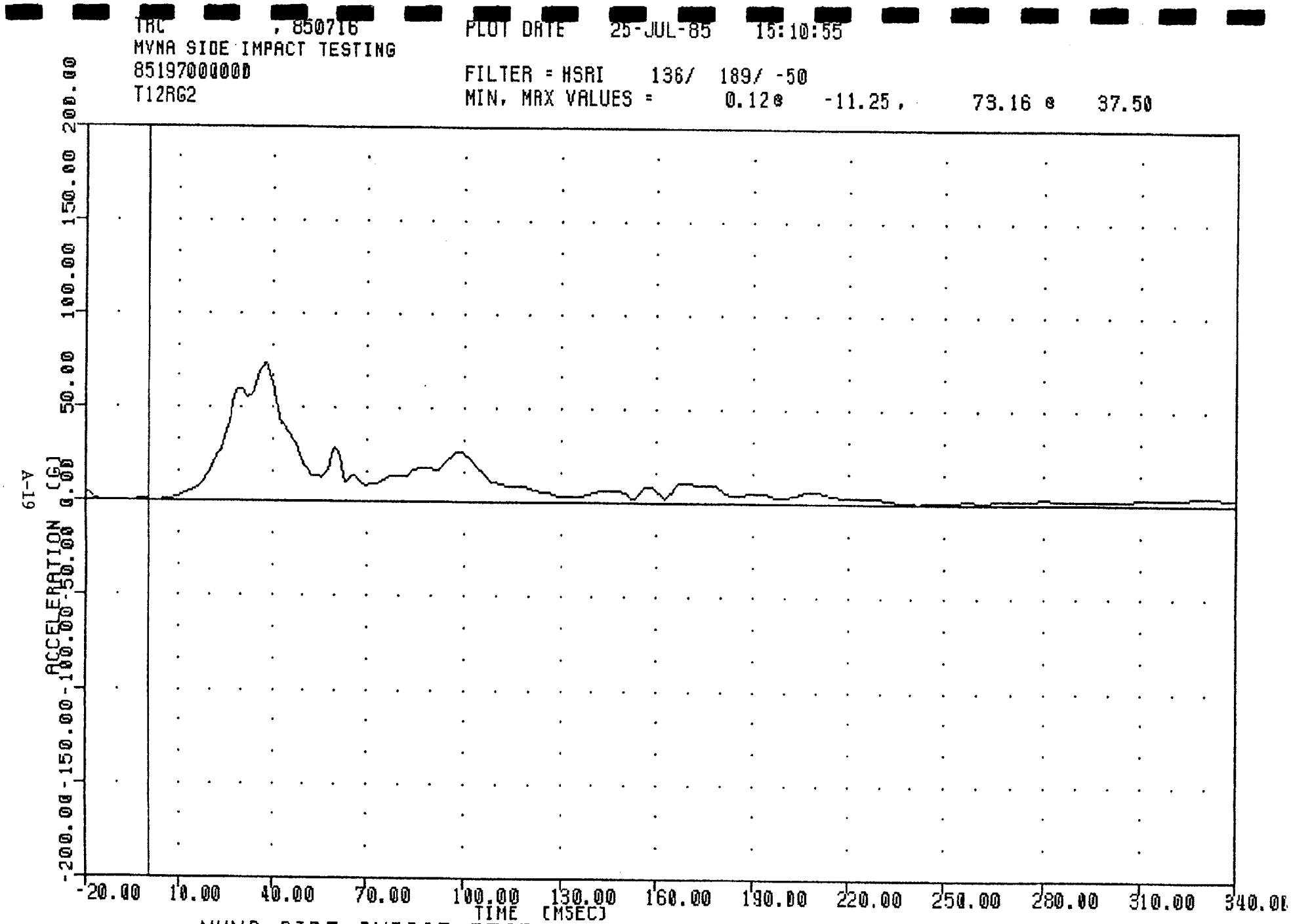
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -73.10 @ 37.50 , 20.74 @ 98.75



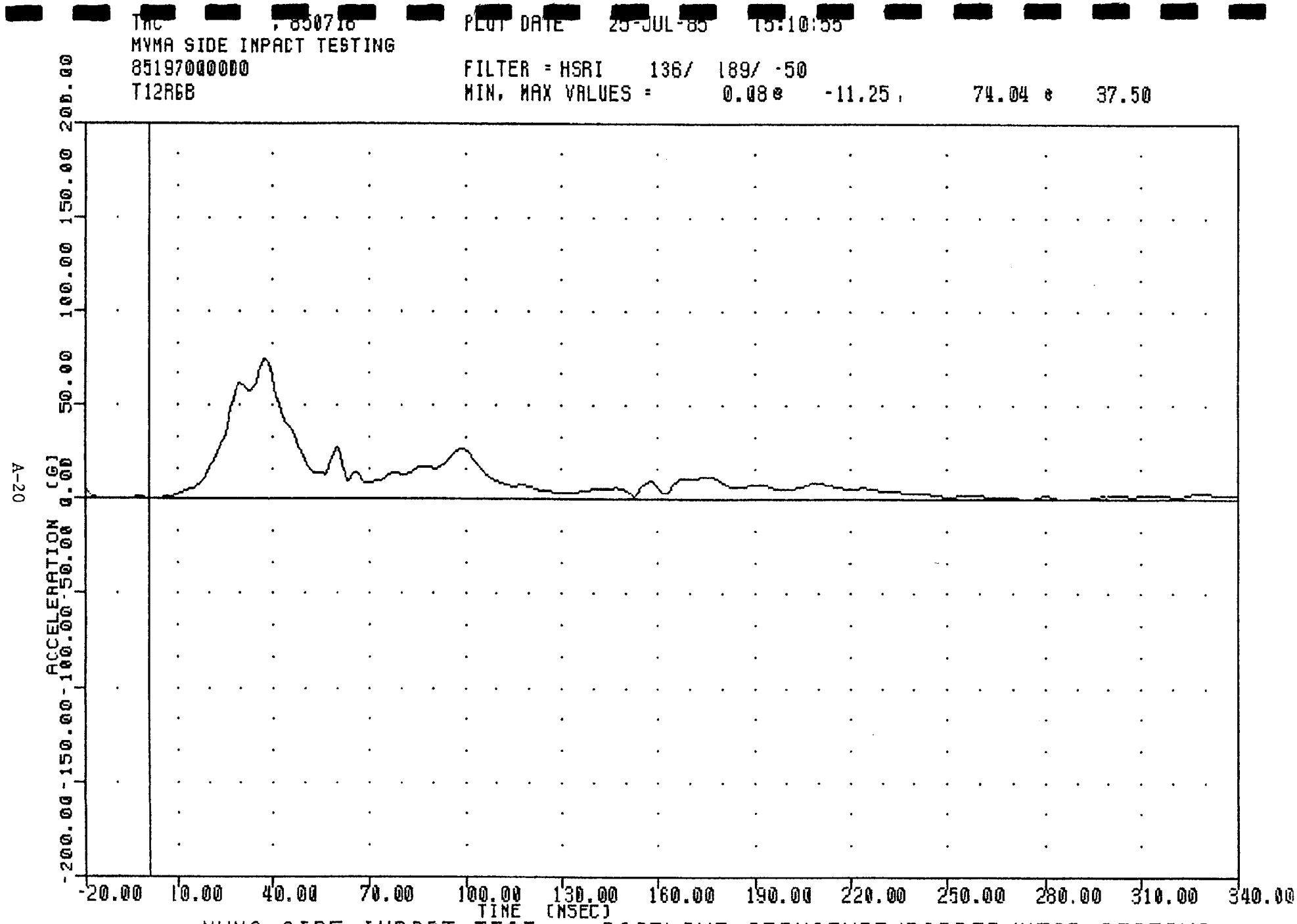
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER LOWER SPINE ACCELERATION -2 Y AXIS



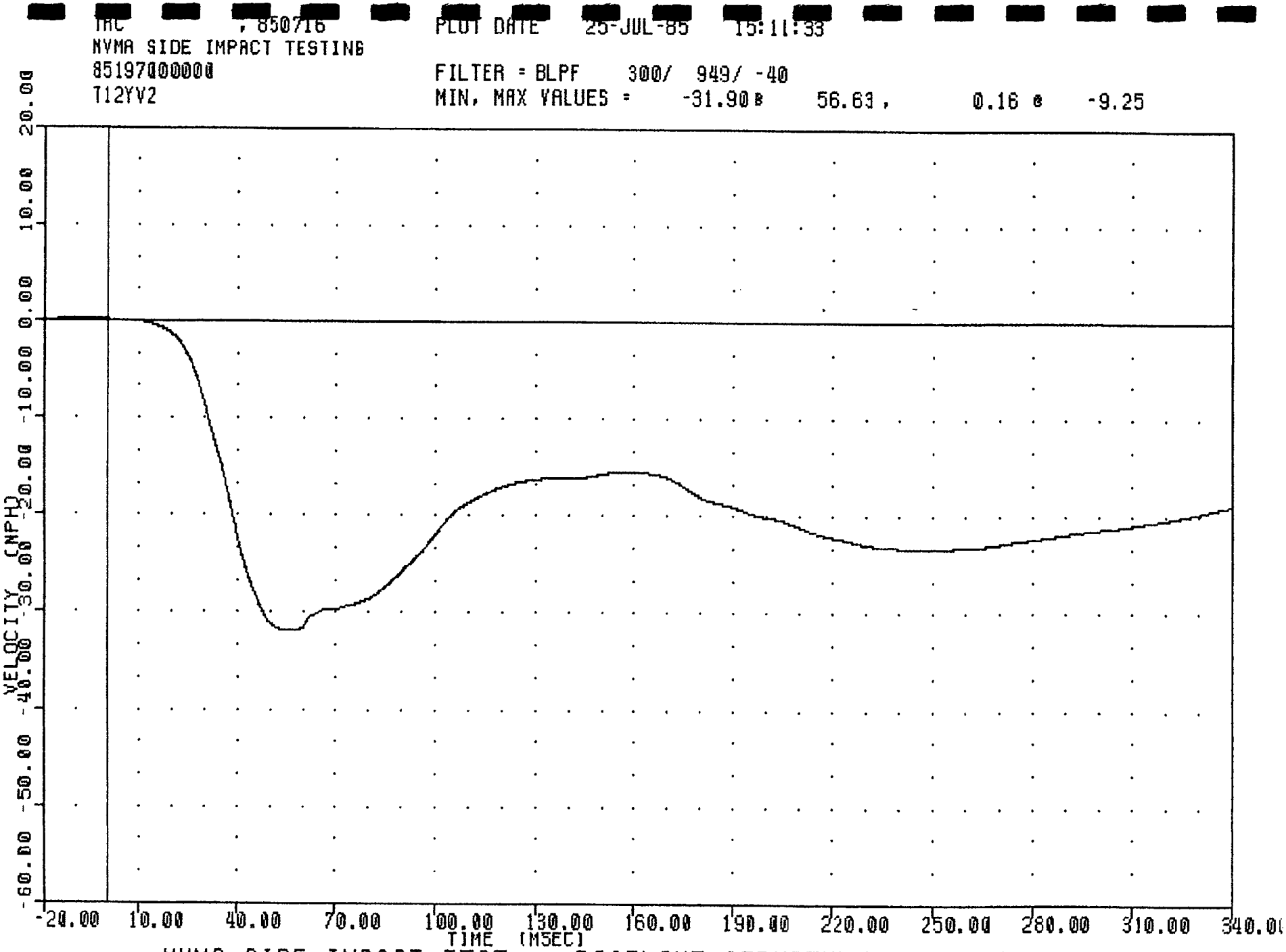
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER LOWER SPINE ACCELERATION Z AXIS



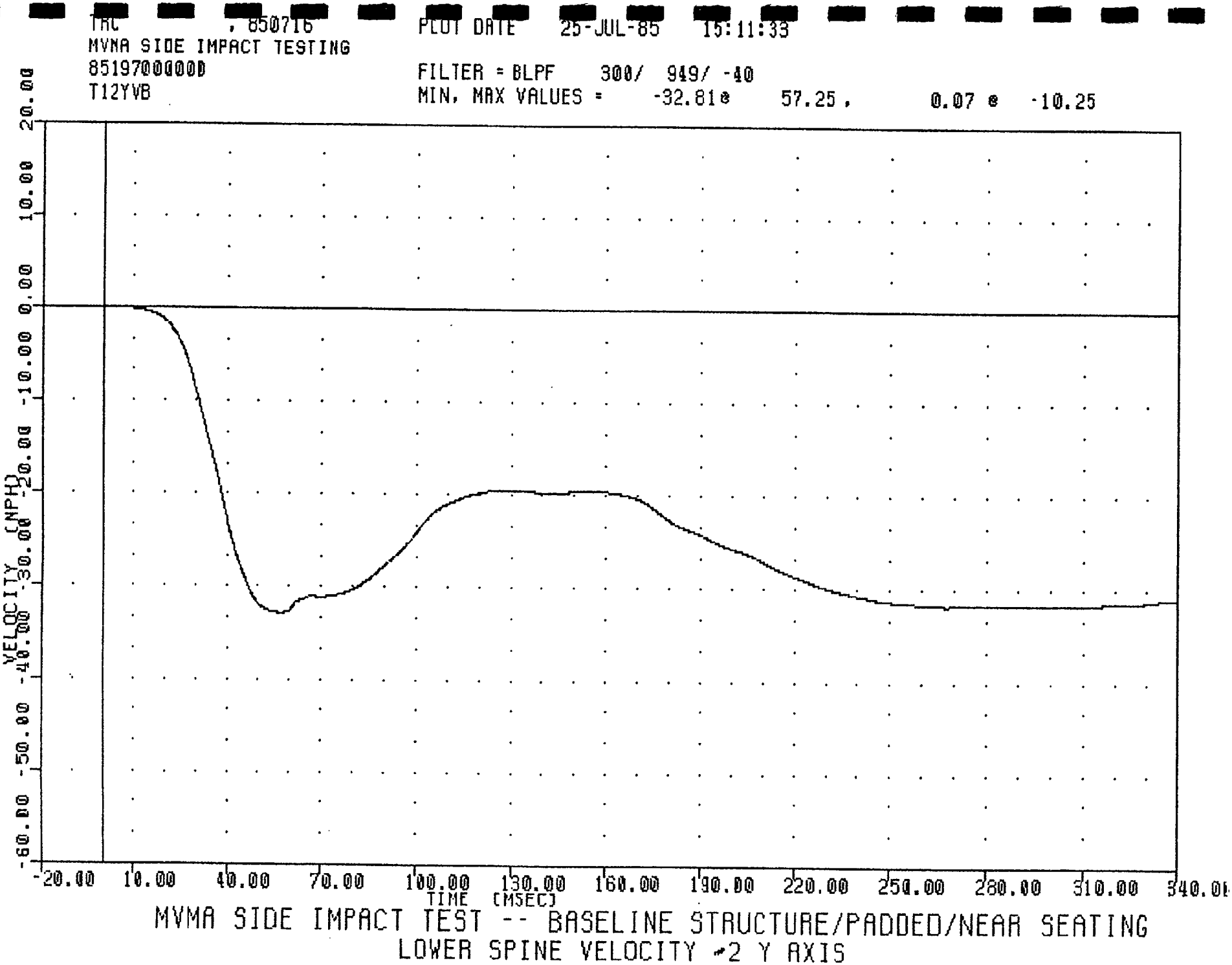
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER LOWER SPINE RESULTANT ACCELERATION



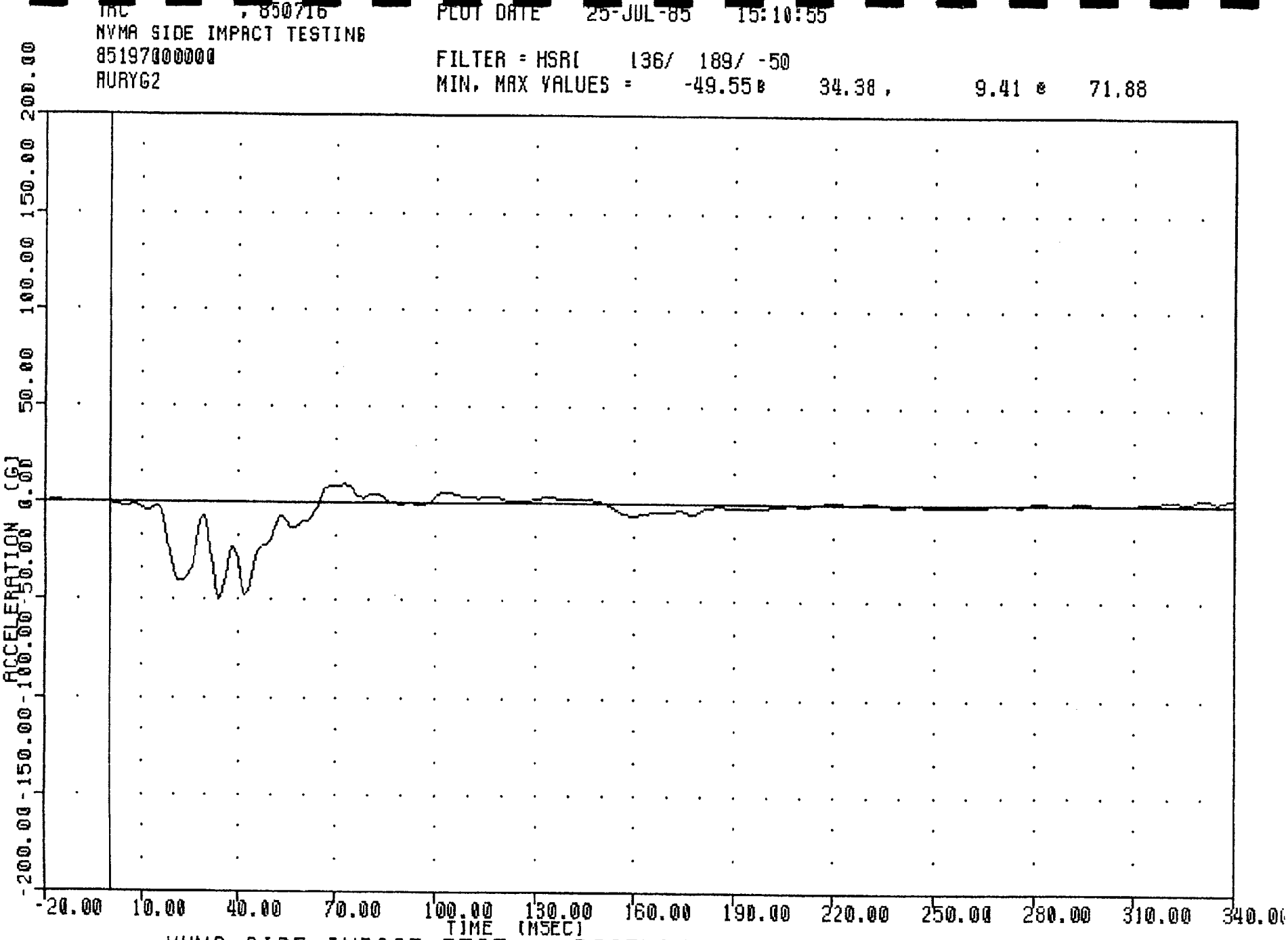
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER LOWER SPINE RESULTANT ACCELERATION #2



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
LOWER SPINE VELOCITY Y AXIS

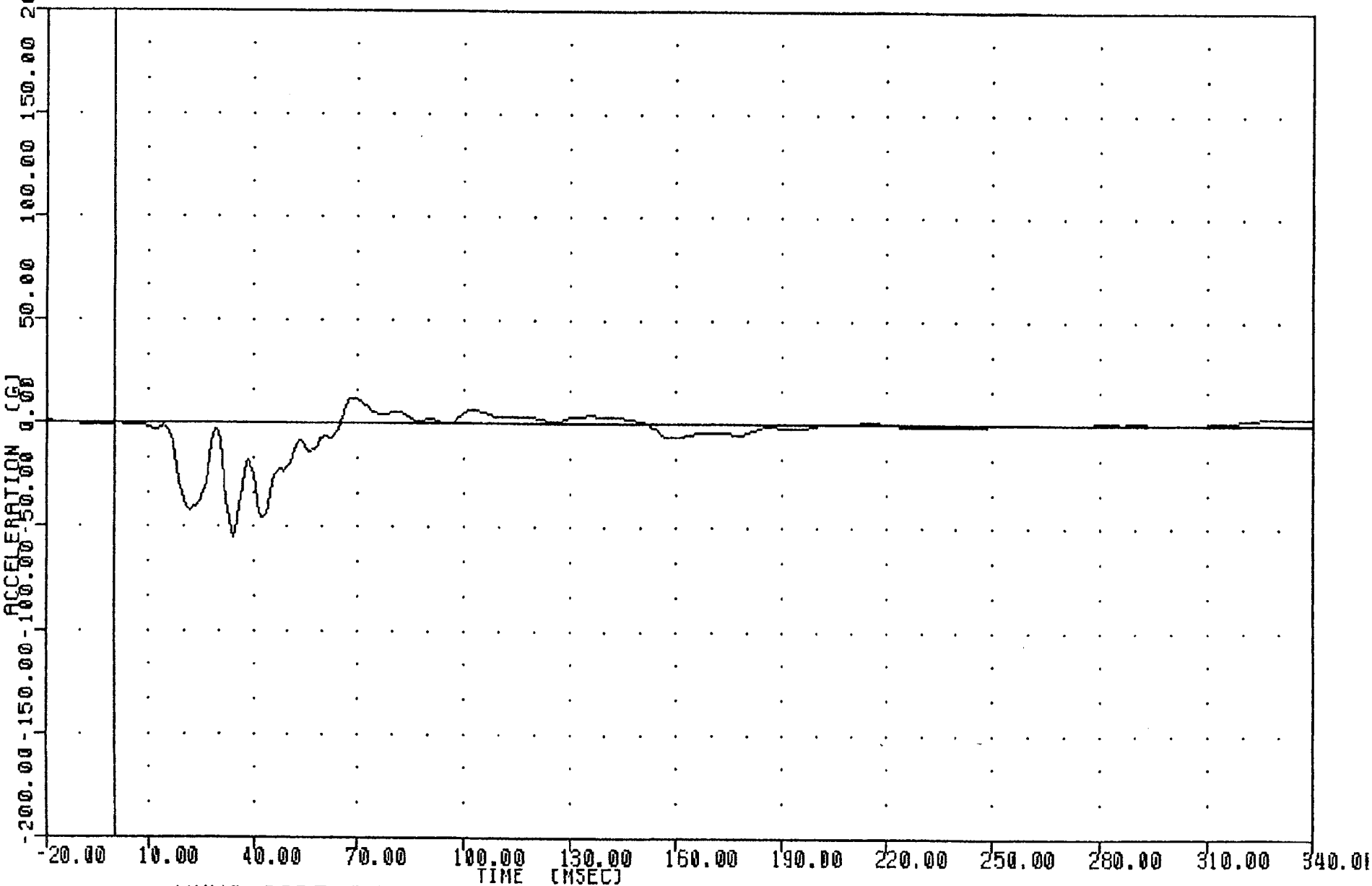


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
LOWER SPINE VELOCITY -2 Y AXIS



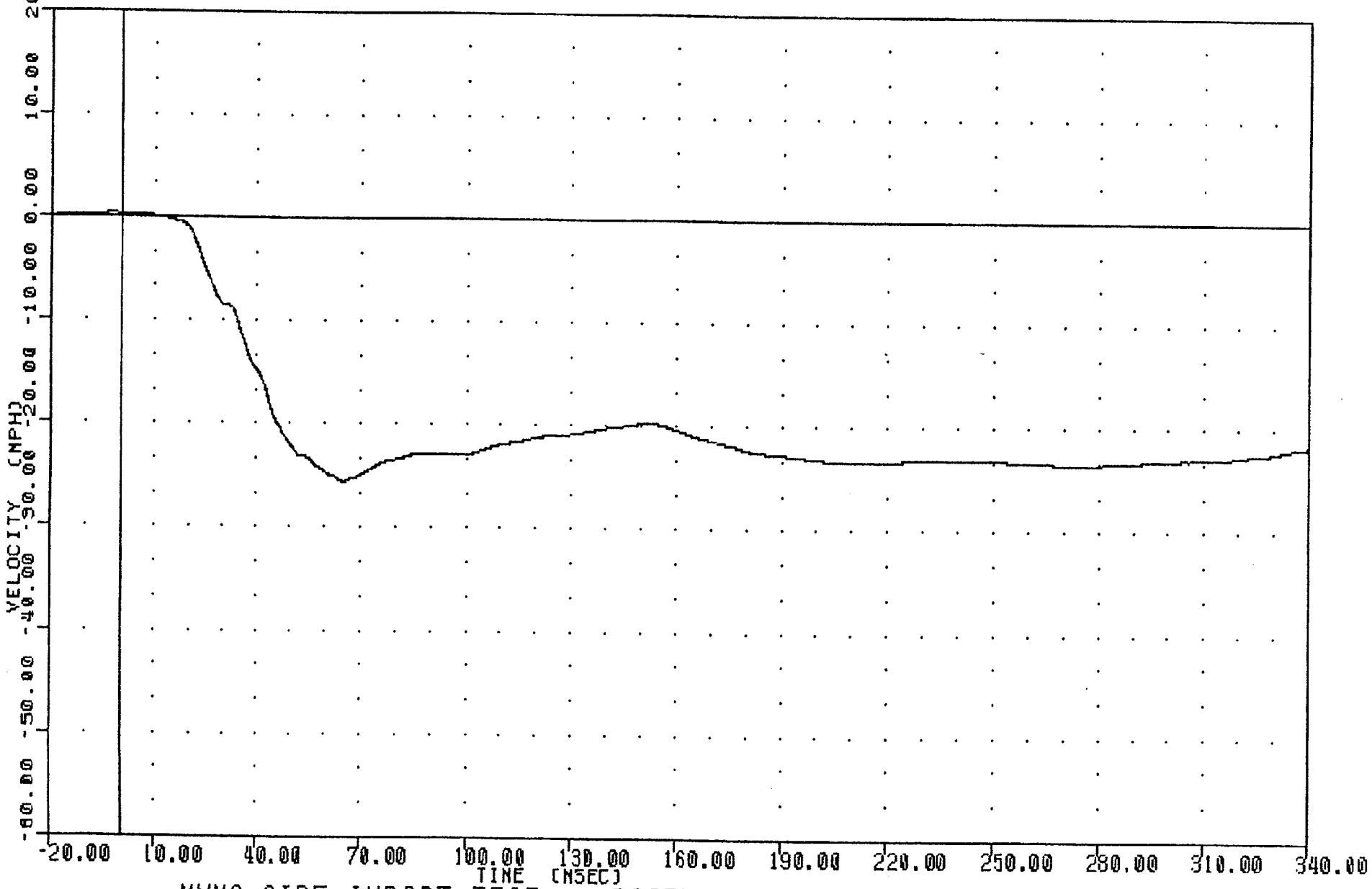
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER RIGHT UPPER RIB ACCELERATION Y AXIS

TRC , 850716 PLOT DATE 25-JUL-85 15:10:55
MVMA SIDE IMPACT TESTING
85197000000
RURYGB
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -54.37 @ 34.38 , 12.08 @ 68.75



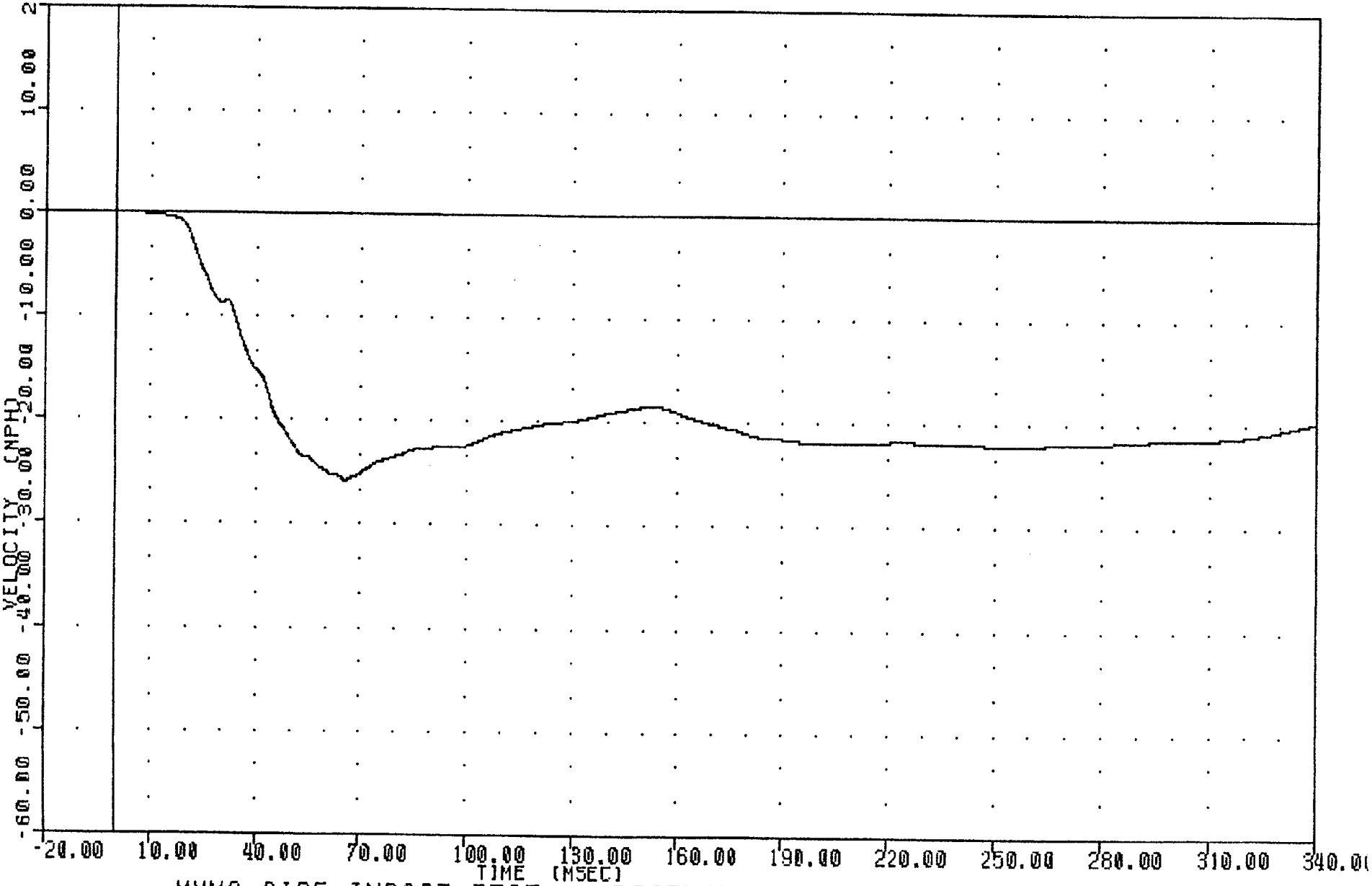
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER RIGHT UPPER RIB ACCELERATION -2 Y AXIS

[redacted] , 850716 PLOT DATE 25-JUL-85 15:11:33
MVMA SIDE IMPACT TESTING
85197000000
RURYV2
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -25.66 @ 65.38 , 0.32 @ -2.88

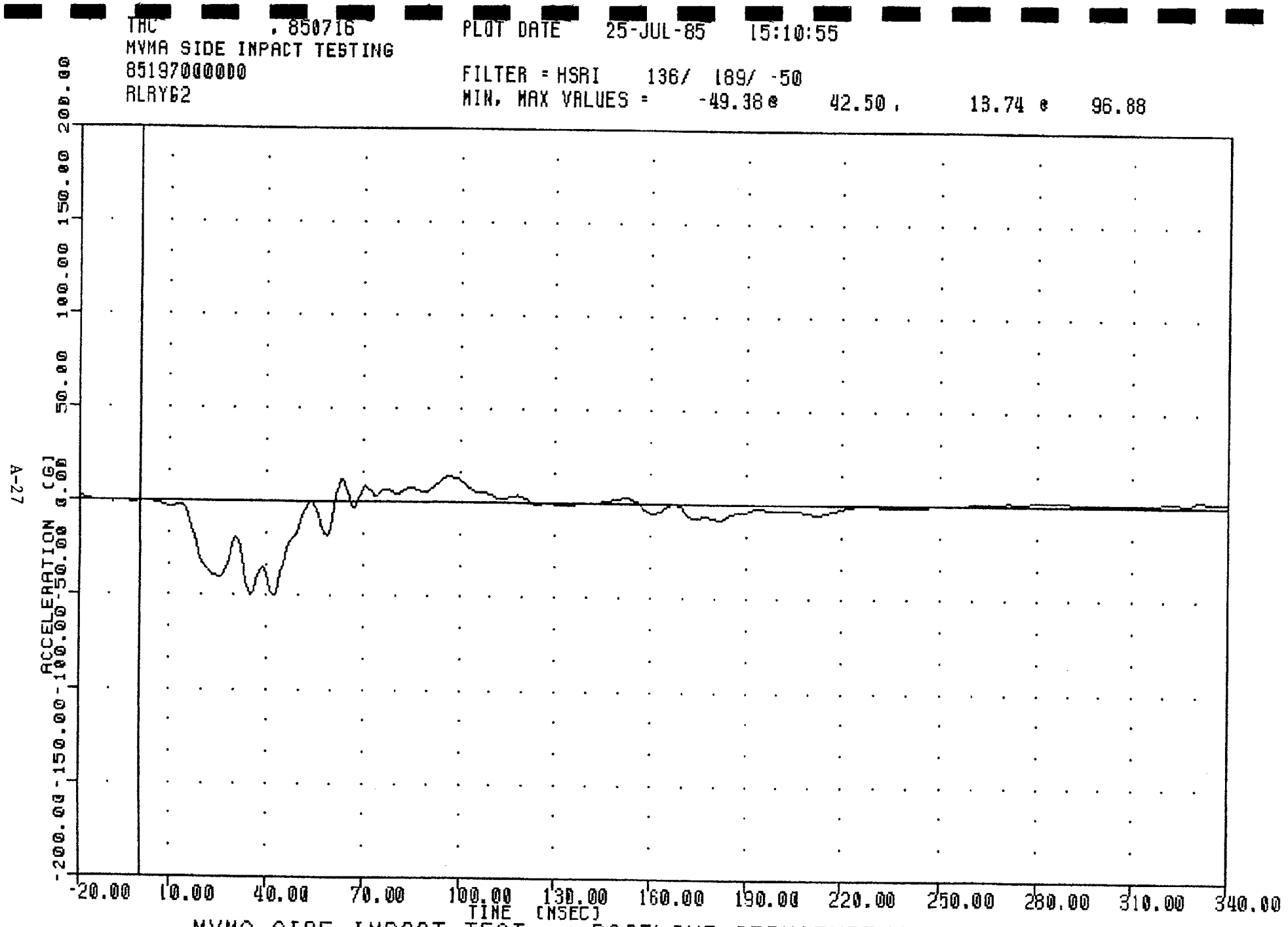


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
RIGHT UPPER RIB VELOCITY Y AXIS

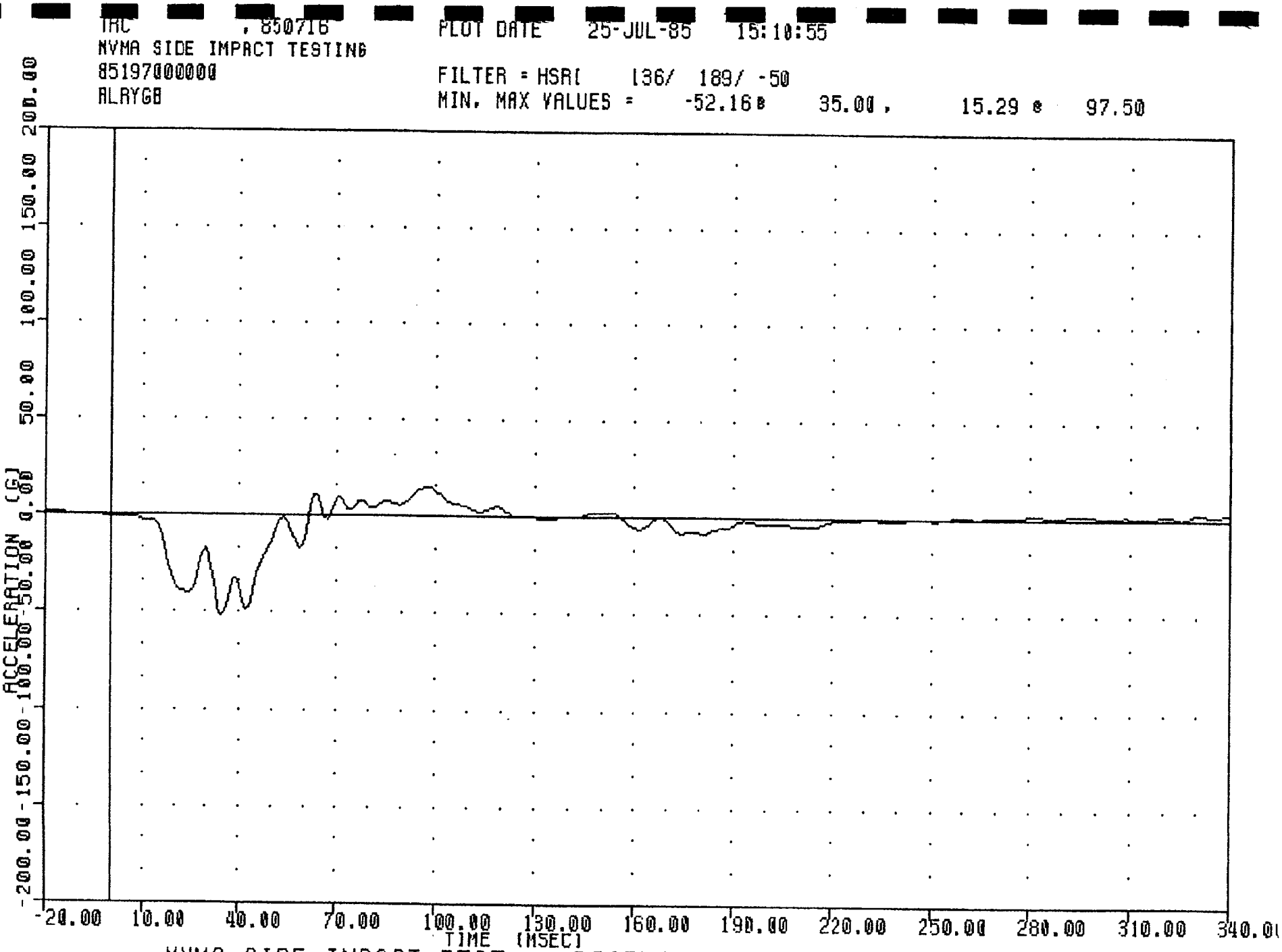
TRC , 850716 PLOT DATE 25-JUL-85 15:11:33
NVMA SIDE IMPACT TESTING
851970000000
RURYVB
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -25.84 @ 65.63 , 0.05 @ -10.50



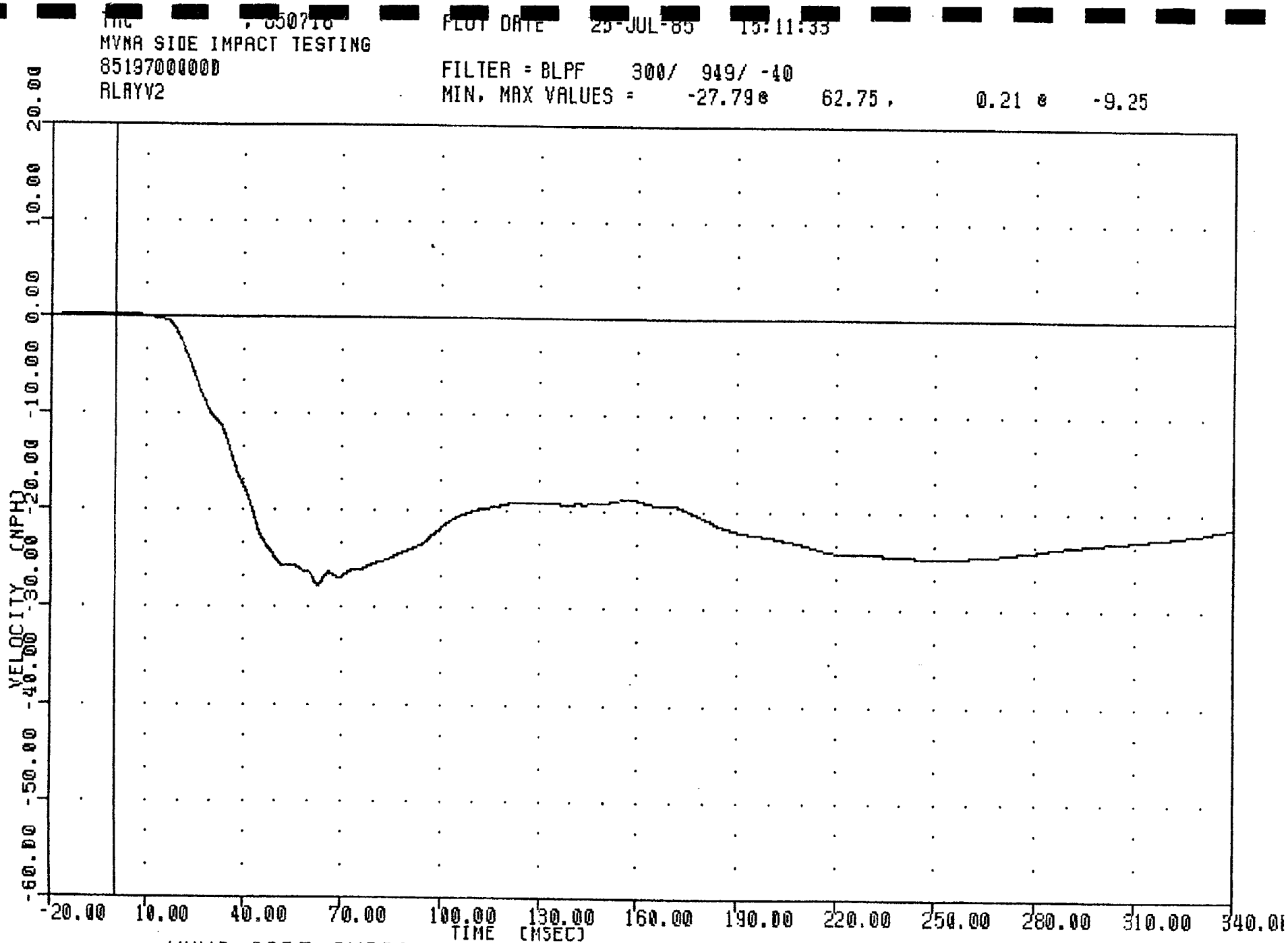
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
RIGHT UPPER RIB VELOCITY -2 Y AXIS



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER RIGHT LOWER RIB ACCELERATION Y AXIS



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER RIGHT LOWER RIB ACCELERATION -2 Y AXIS

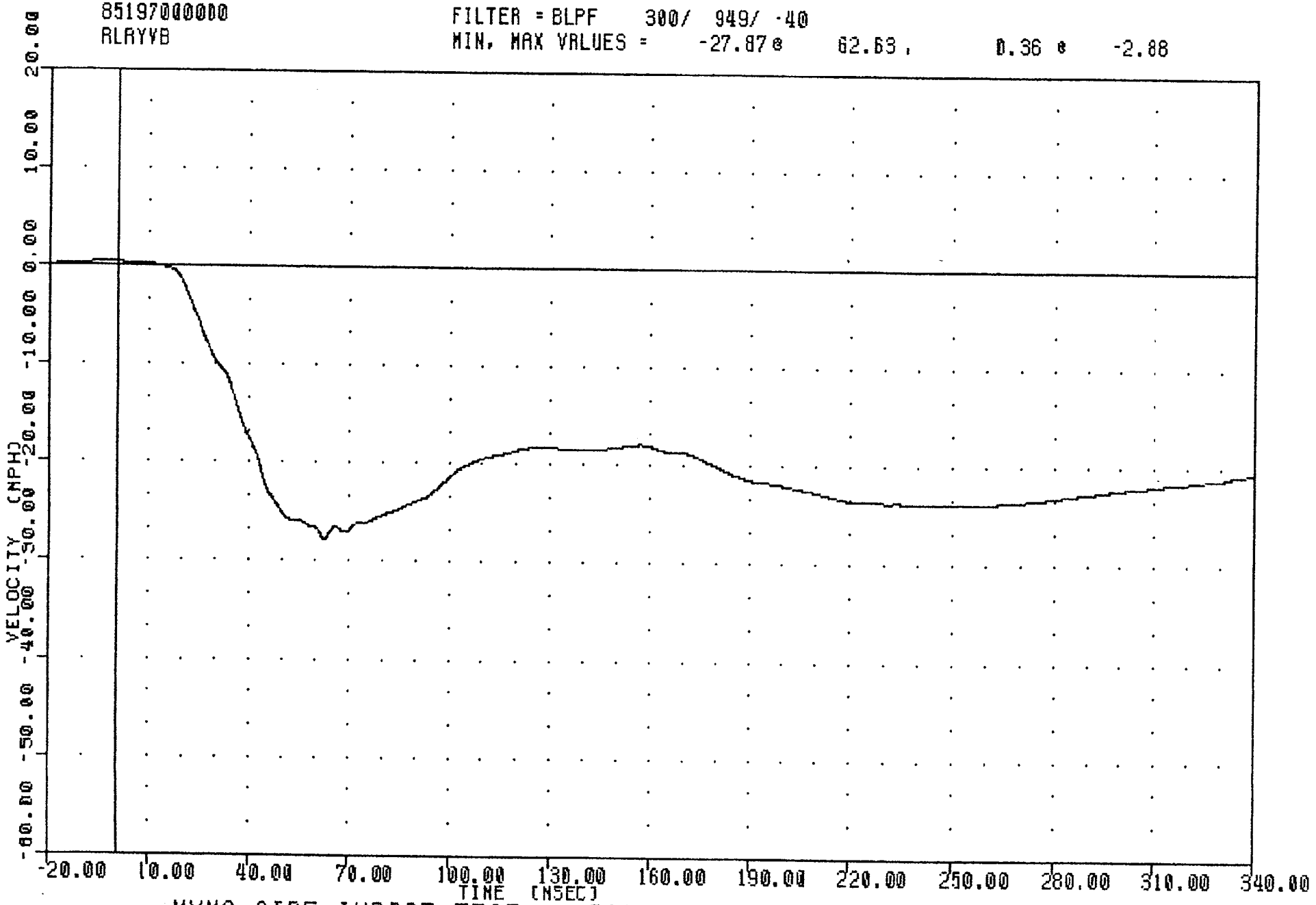


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
RIGHT LOWER RIB VELOCITY

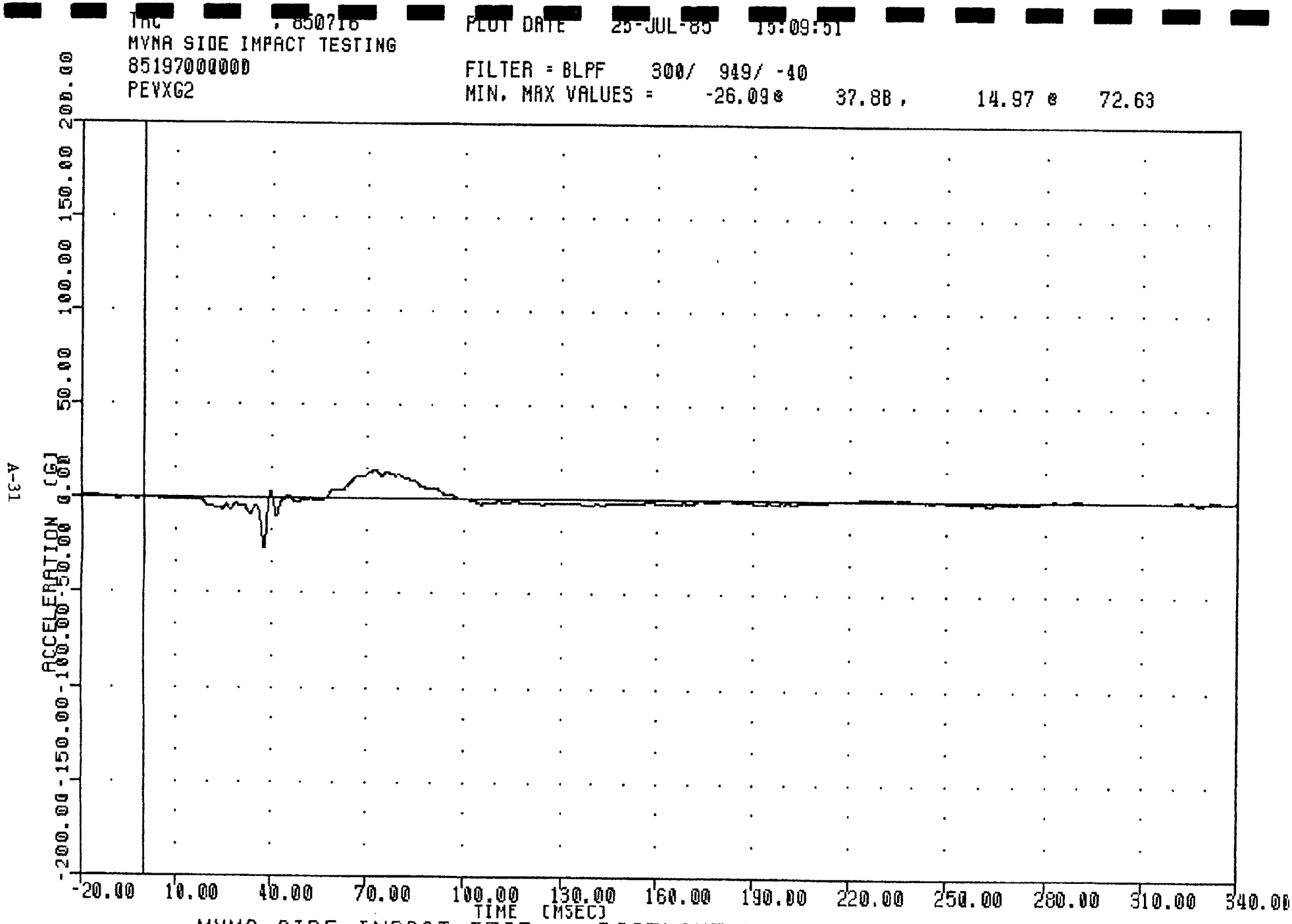
[redacted] PLOT DATE [redacted] 25 JUL 03 [redacted] 13:11:33

MVMA SIDE IMPACT TESTING
85197000000
RLRYVB

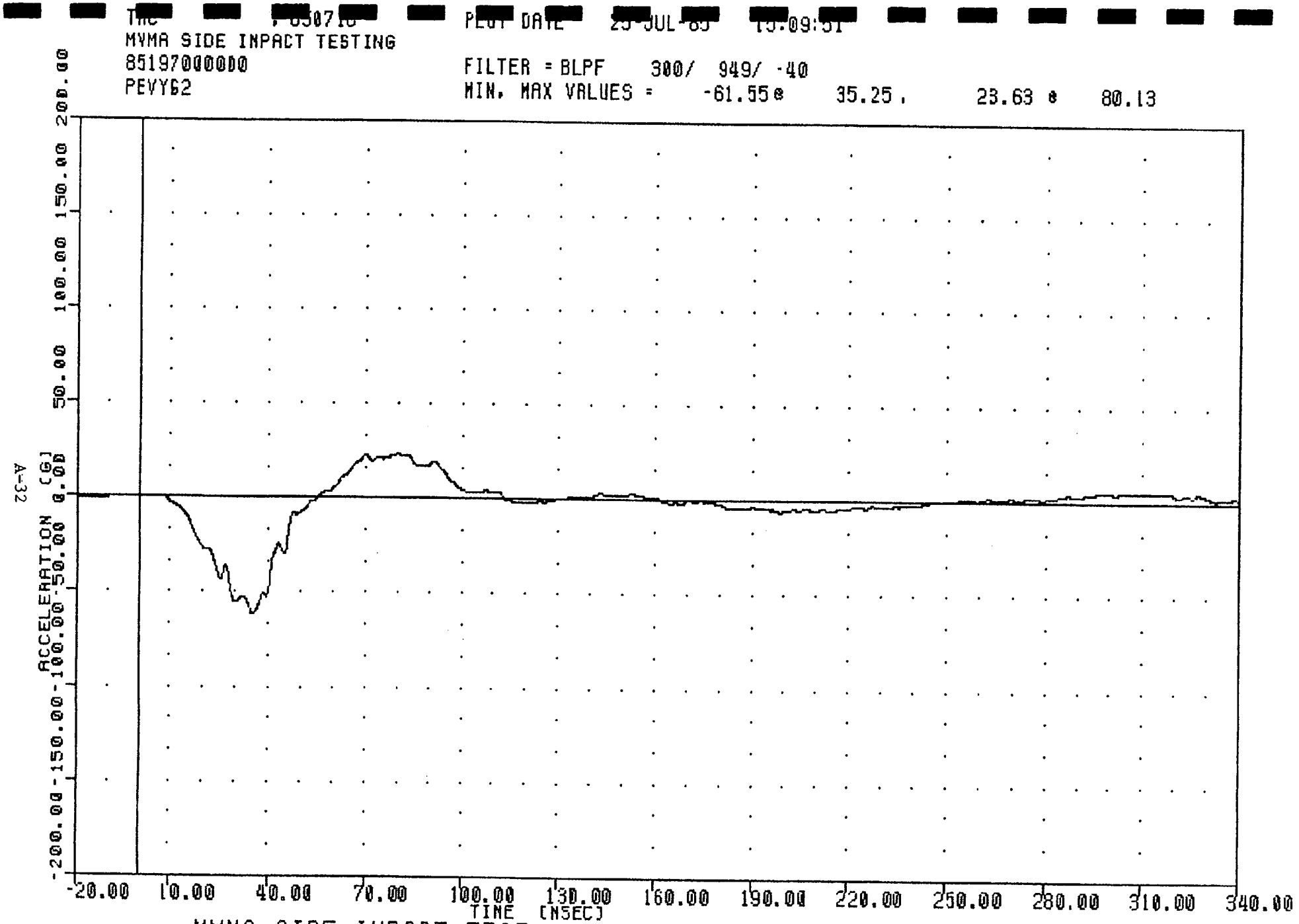
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -27.87 @ 62.63 , 0.36 @ -2.88



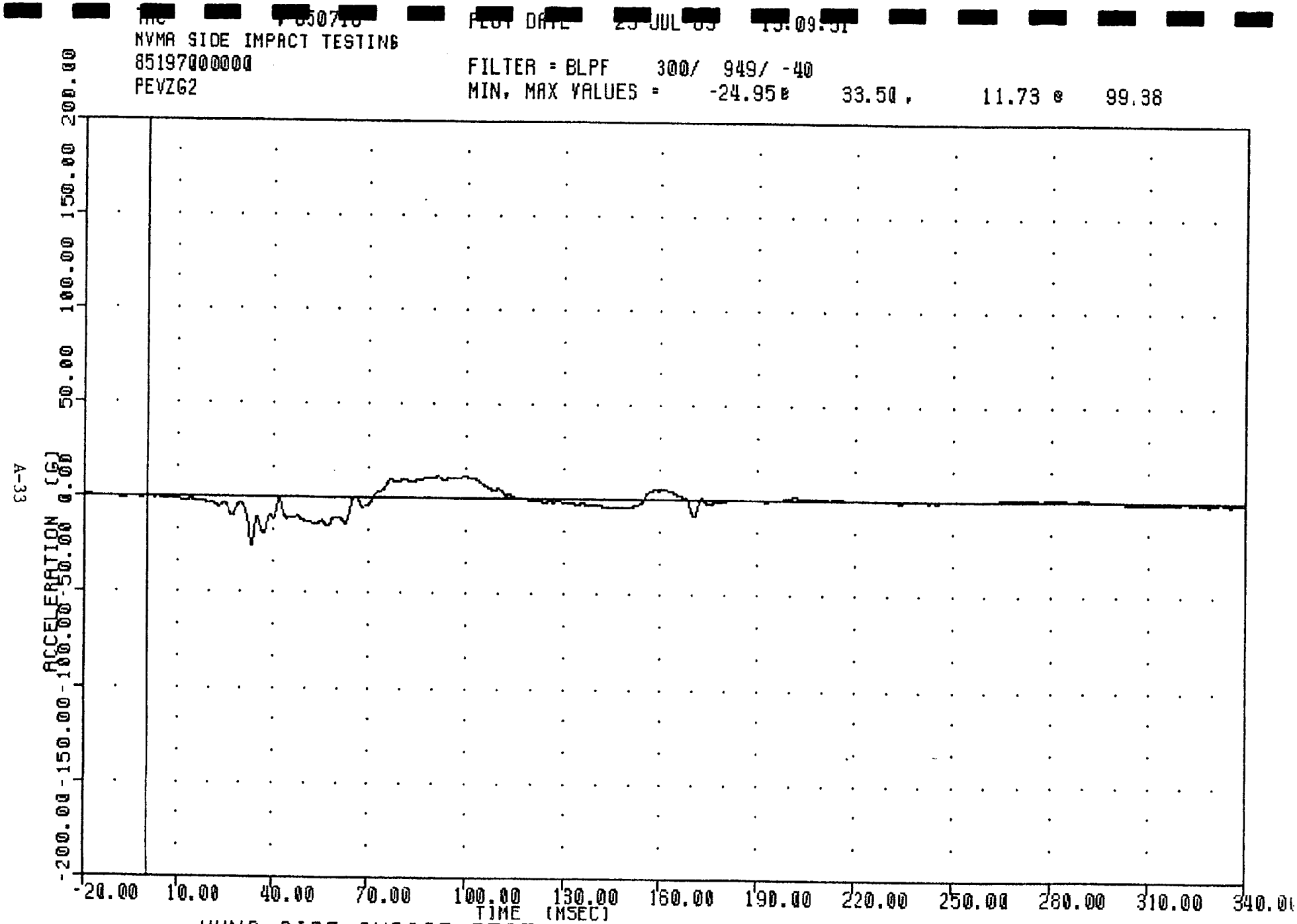
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
RIGHT LOWER RIB VELOCITY #2 Y AXIS



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER PELVIS ACCELERATION X AXIS



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER PELVIS ACCELERATION Y AXIS

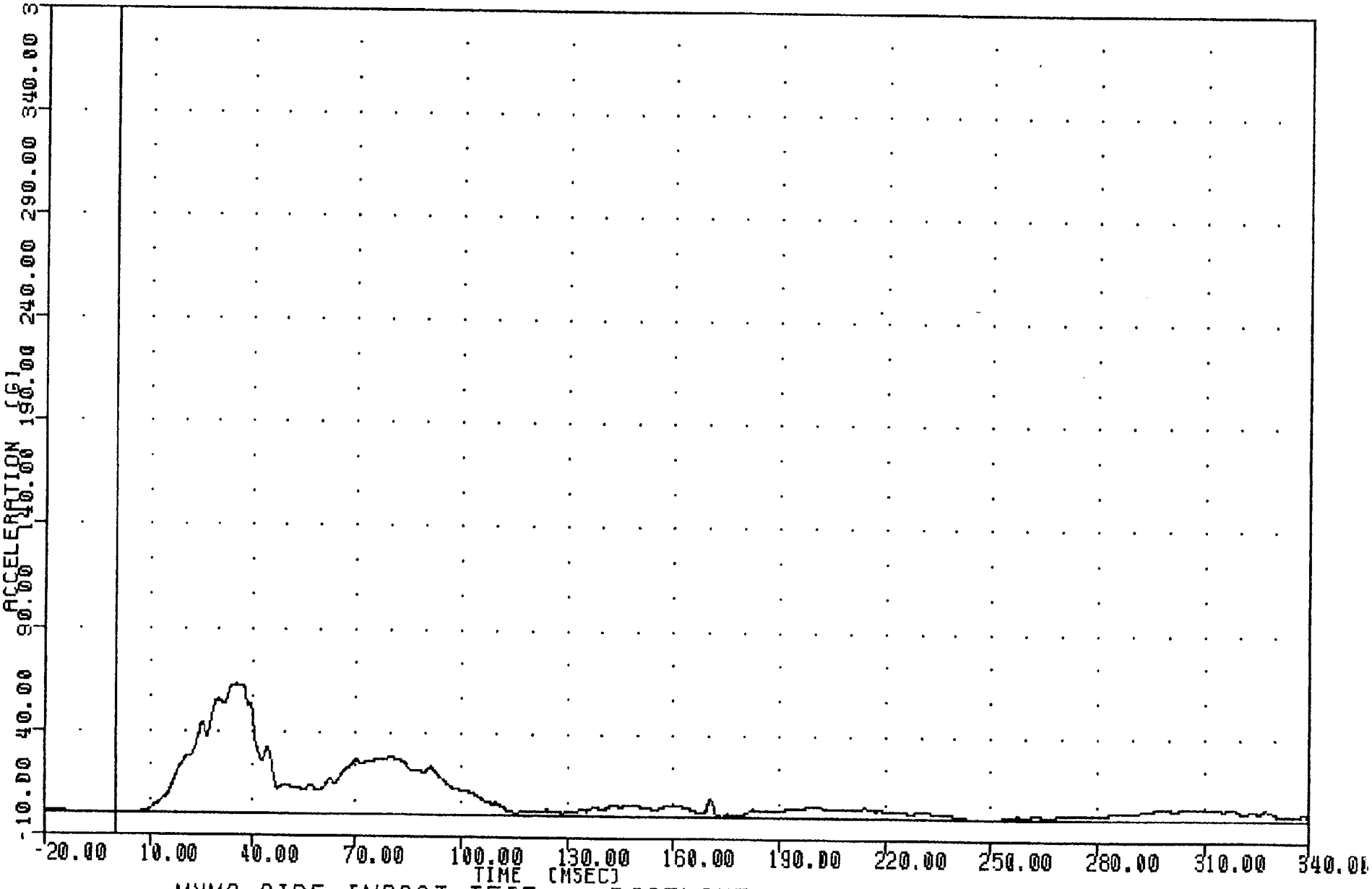


NVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER PELVIS ACCELERATION Z AXIS

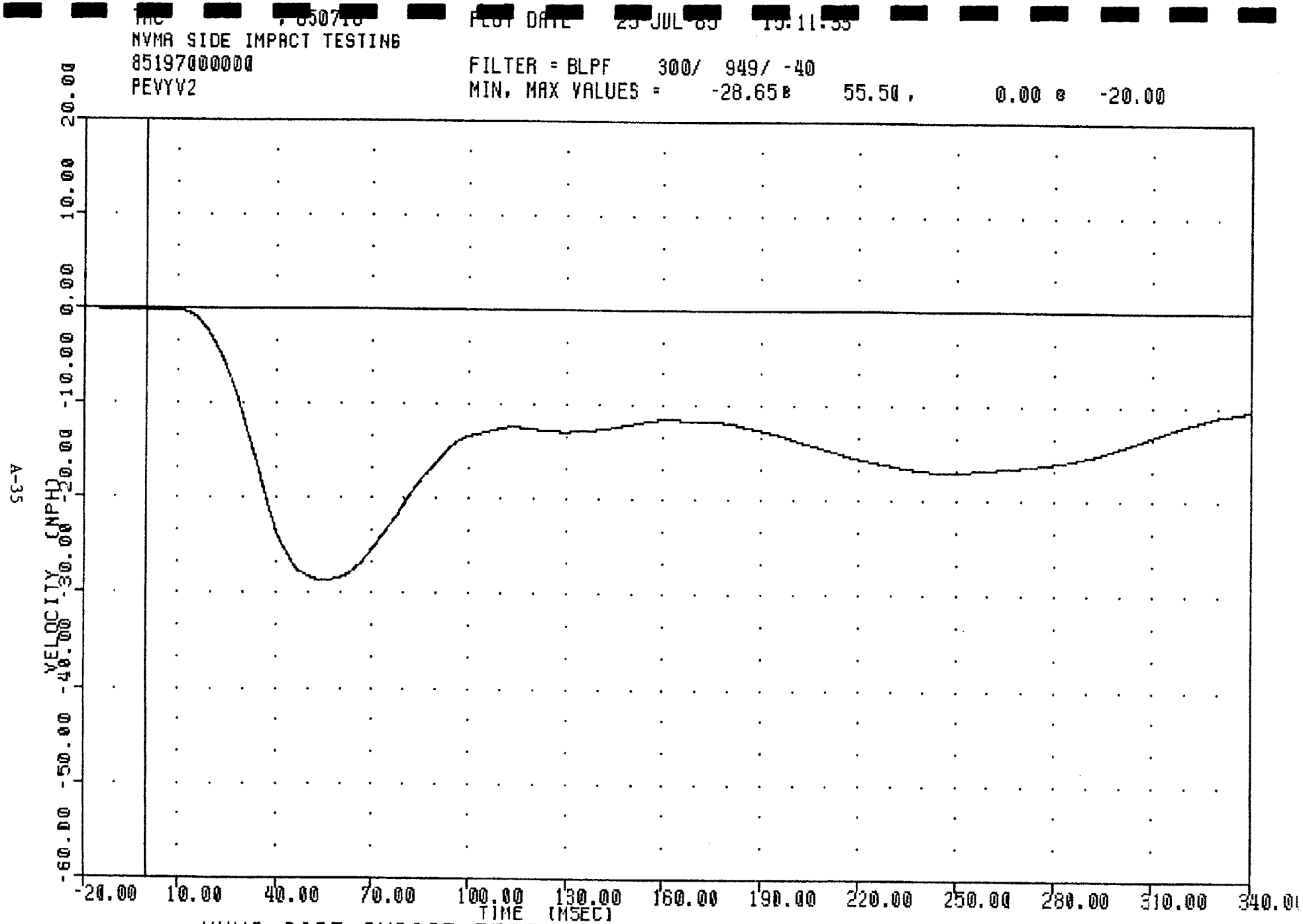
[redacted] PEST DATE [redacted] 25 JUL 85 15:09:51

MVMA SIDE IMPACT TESTING
85197000000
PEVRG2

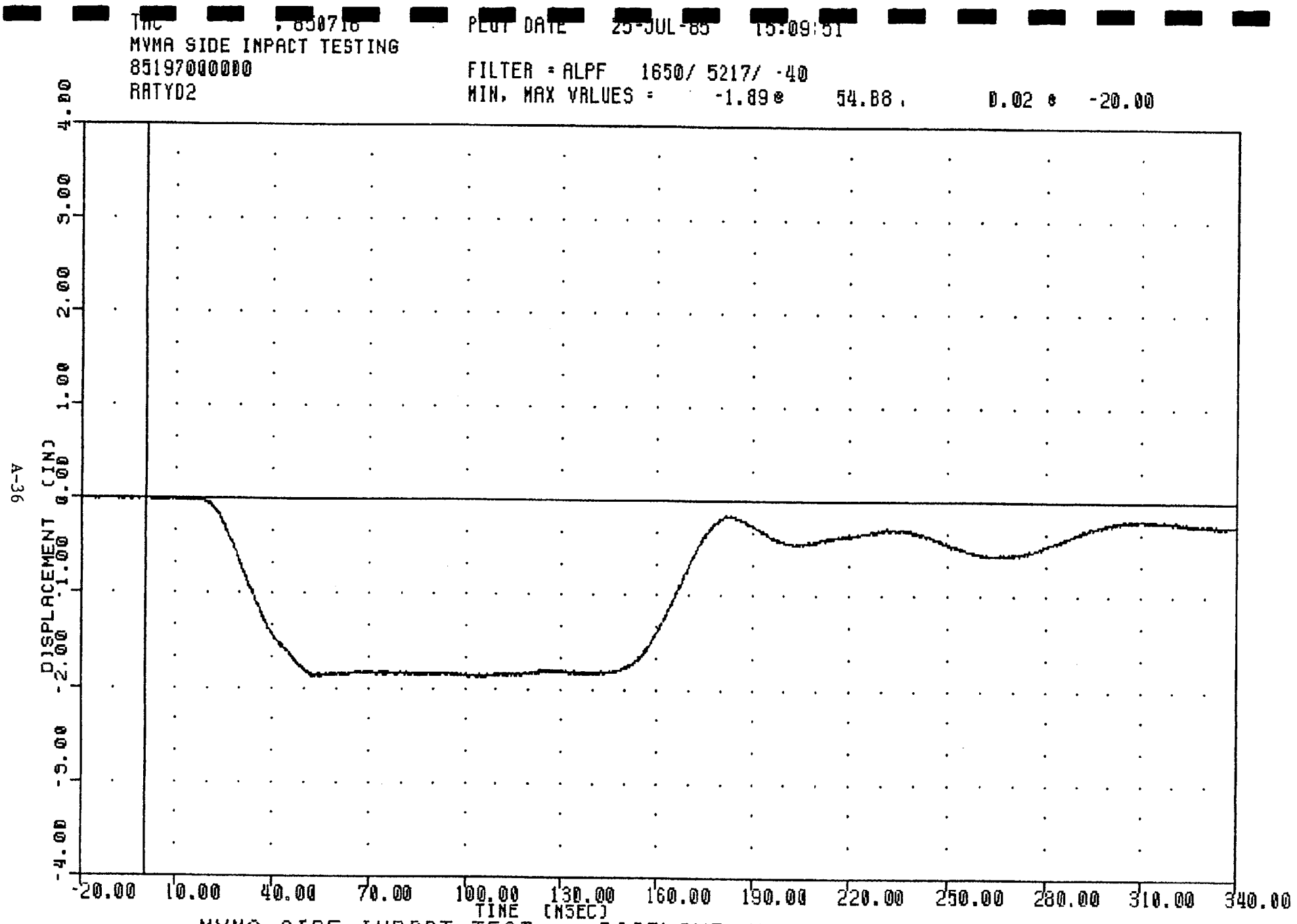
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.07 @ 246.50 , 62.53 @ 35.38



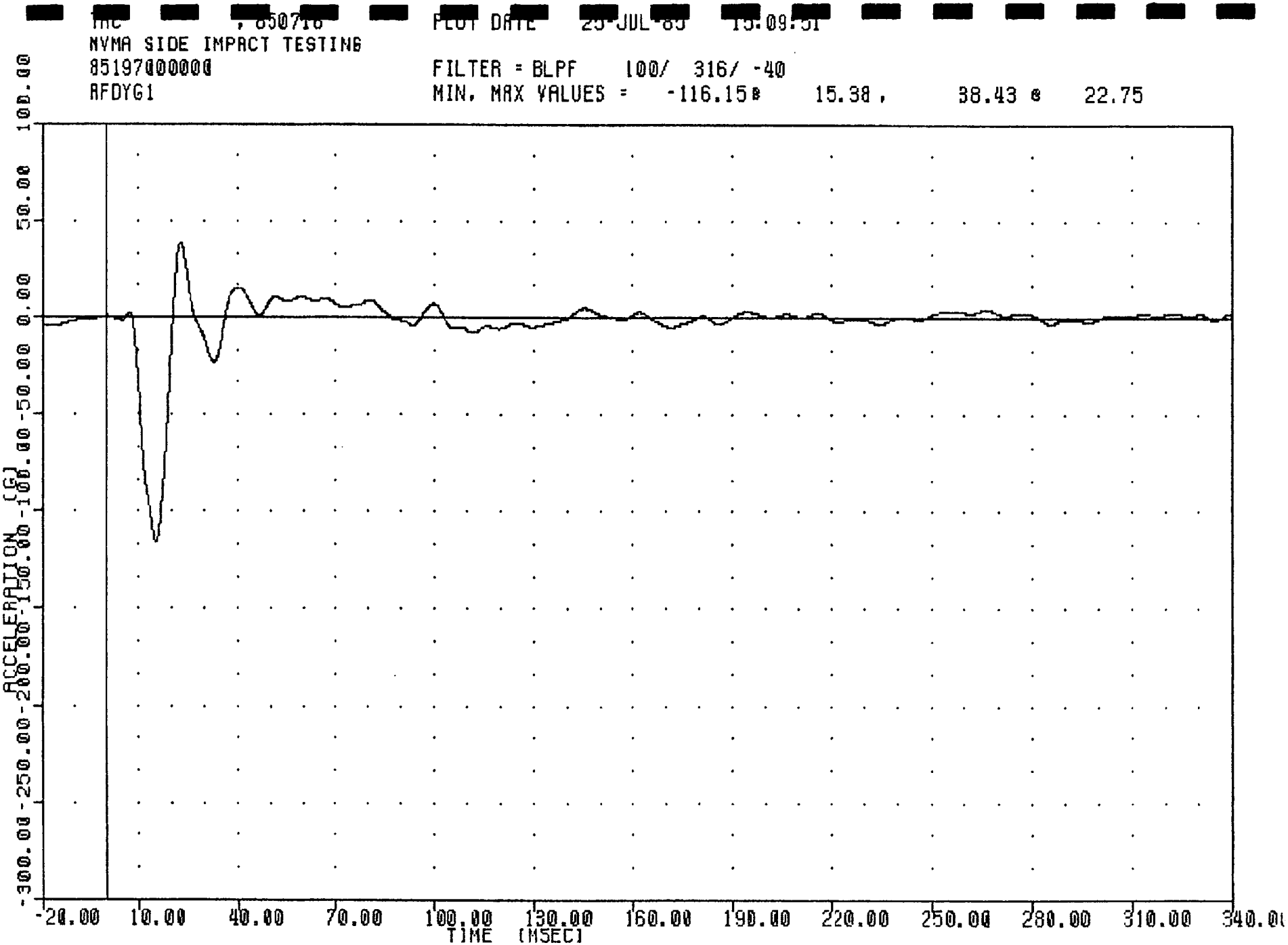
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER PELVIS RESULTANT ACCELERATION



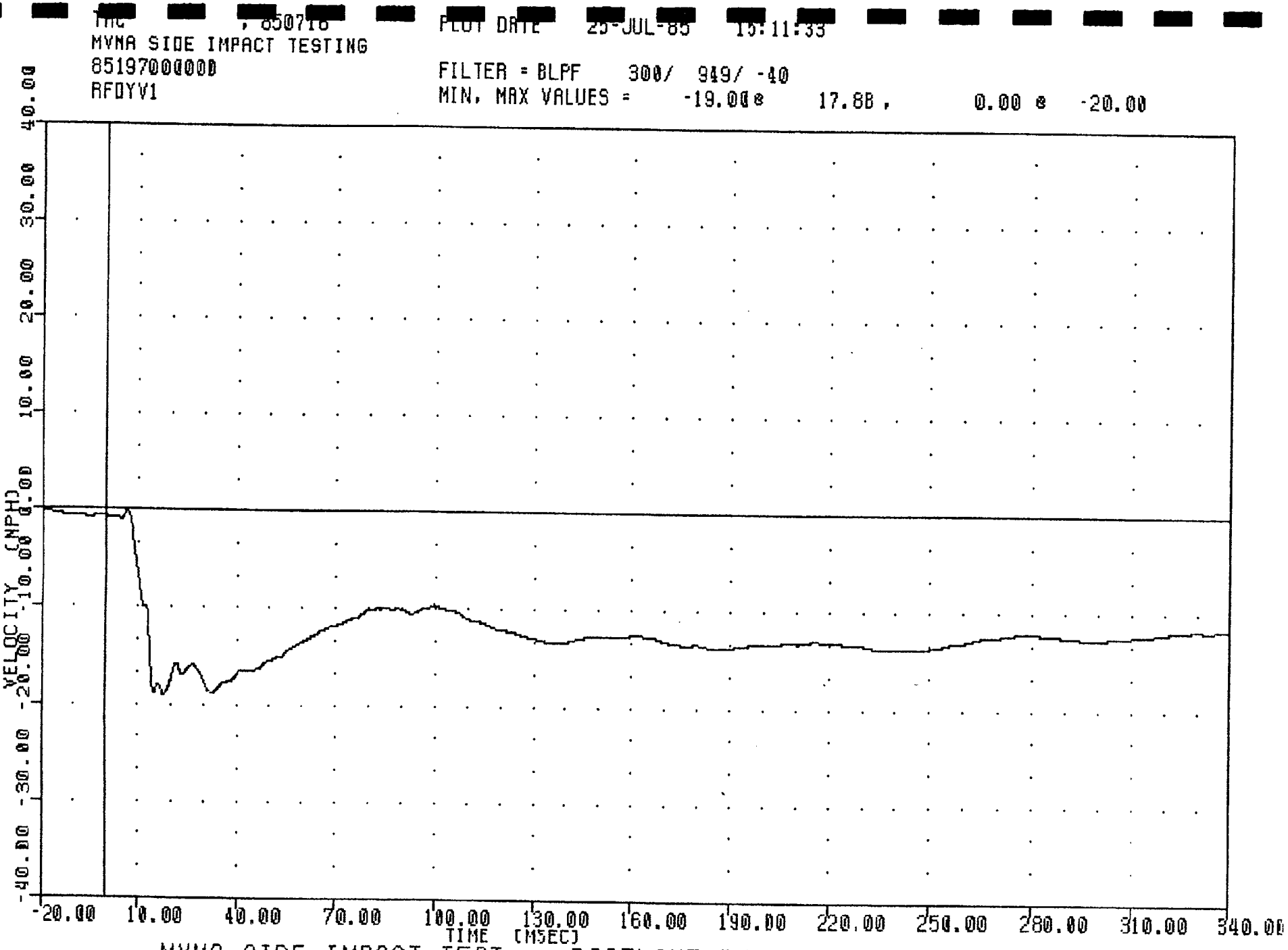
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PELVIS VELOCITY Y AXIS



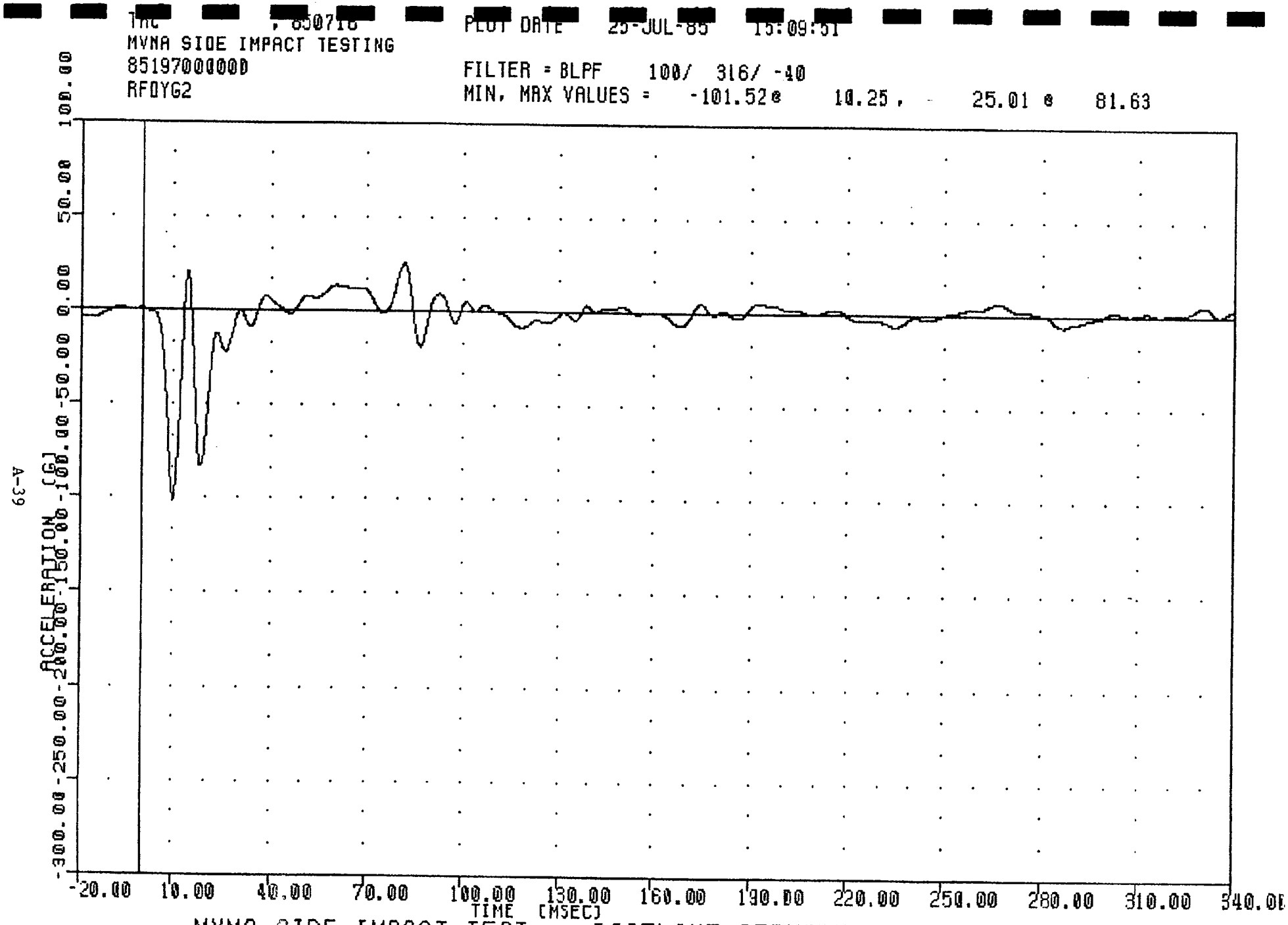
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
PASSENGER RIGHT RIB TO SPINE DISPLACEMENT INCHES



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
VEHICLE RIGHT FRONT DOOR (POSITION 1) ACCELERATION Y AXIS



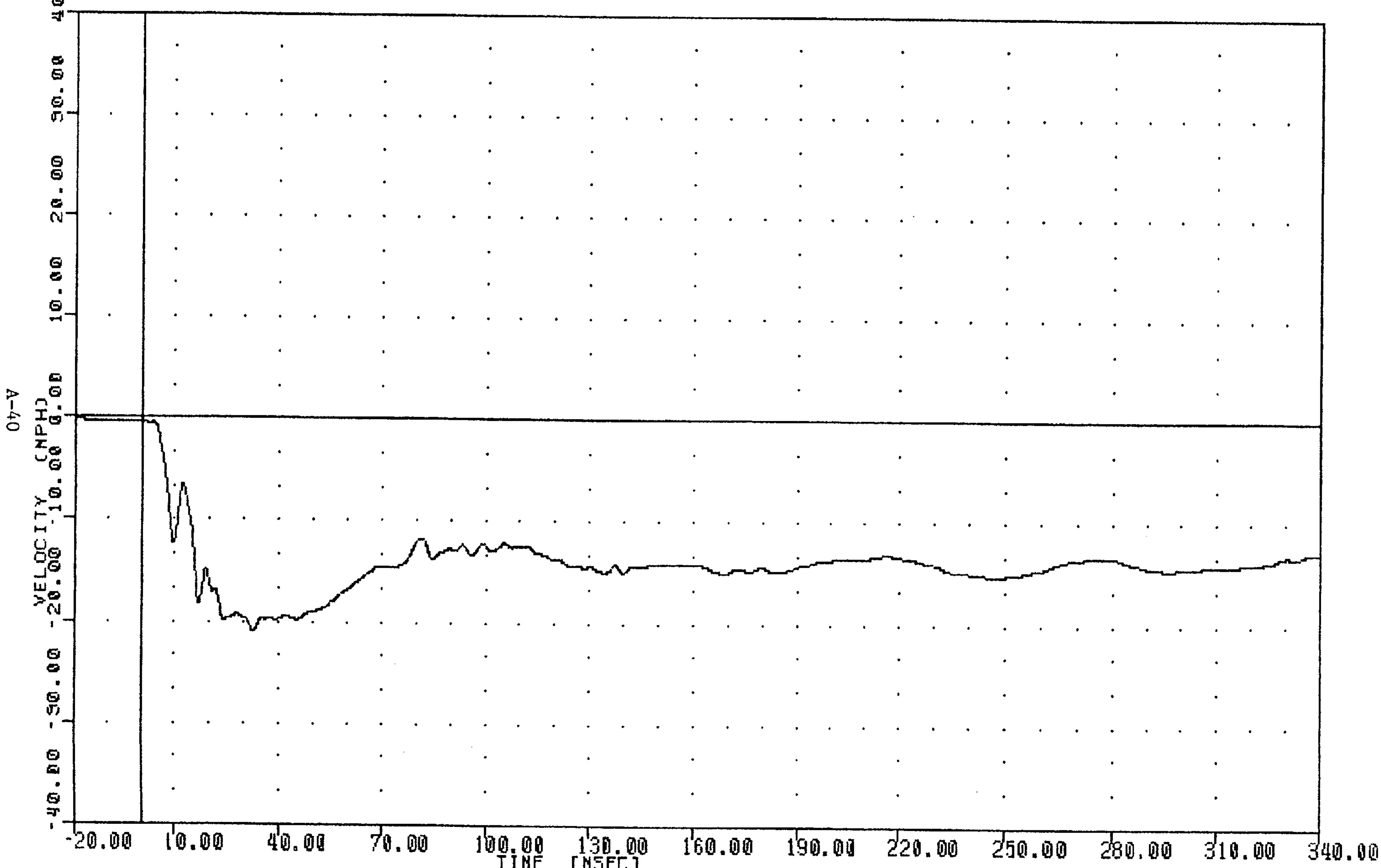
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
RIGHT FRONT DOOR (POSITION 1) VELOCITY Y AXIS



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
VEHICLE RIGHT FRONT DOOR (POSITION 2) ACCELERATION Y AXIS

TH[redacted] , [redacted] PL[redacted] DA[redacted] 2[redacted] JUL [redacted] [redacted]:11:5[redacted]
MVMA SIDE IMPACT TESTING
85197000000
RFDYV2

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -20.97 @ 32.63 , 0.00 @ -20.00

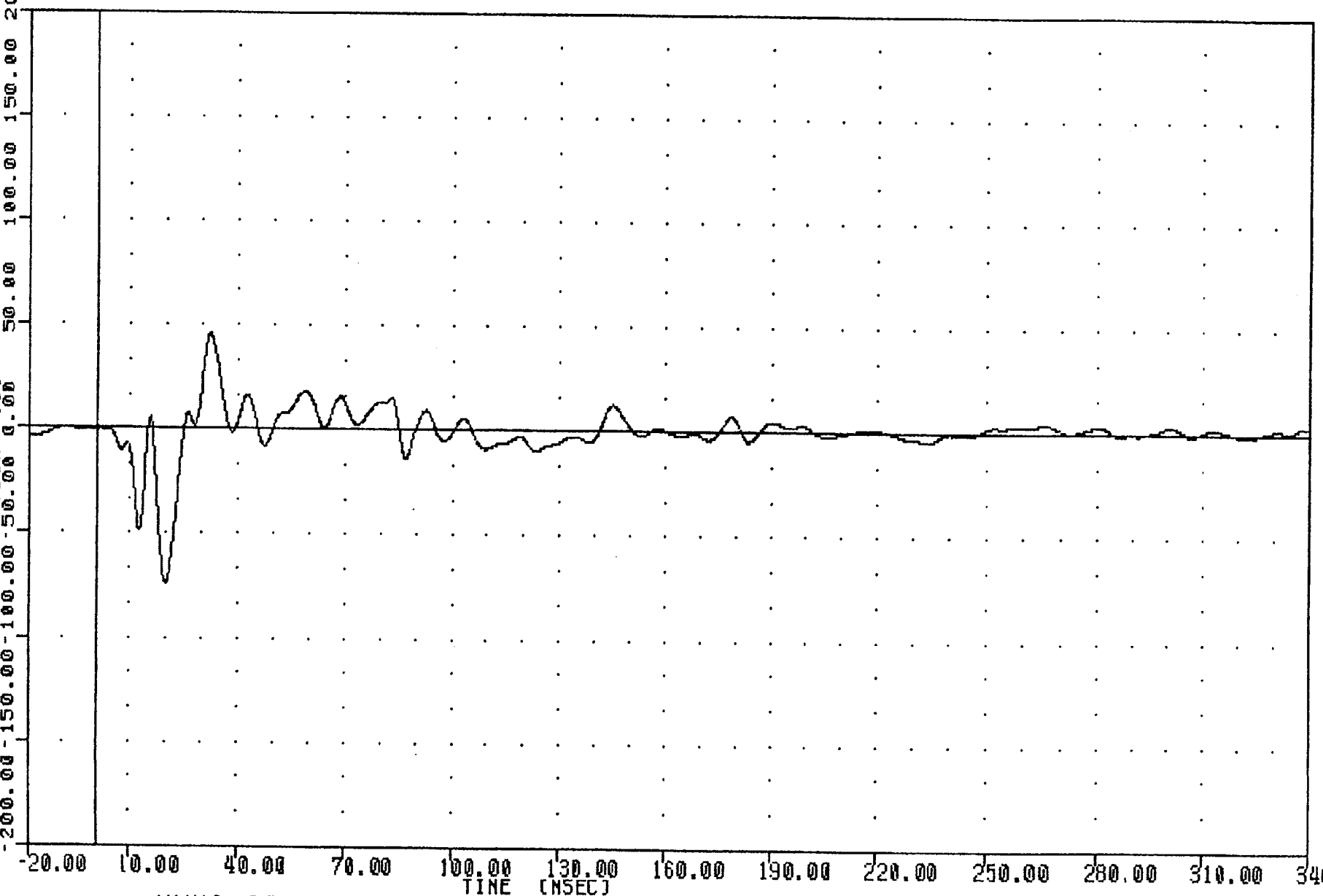


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
RIGHT FRONT DOOR (POSITION 2) VELOCITY Y AXIS

[redacted] PLOT DATE [redacted] 15:09:51

MVMA SIDE INPACT TESTING
8519700000D0
RFDY63

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -73.58 @ 19.75 , 46.03 @ 32.13

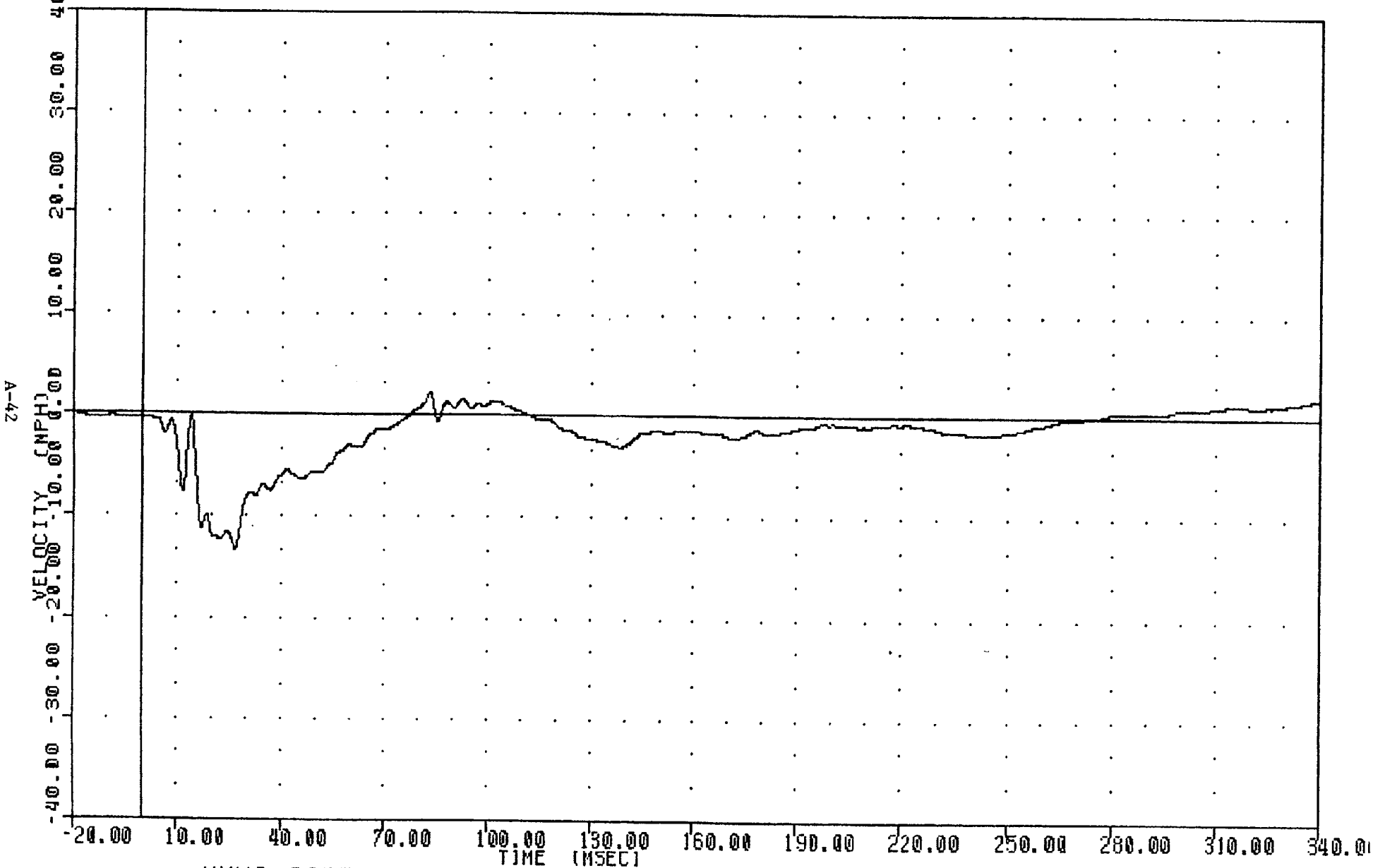


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
VEHICLE RIGHT FRONT DOOR (POSITION 3) ACCELERATION Y AXIS

[redacted] DA[redacted] JUL [redacted]

NVMA SIDE IMPACT TESTING
851970[redacted]
RFDYV3

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -13.40 @ 26.75 , 2.19 @ 83.13

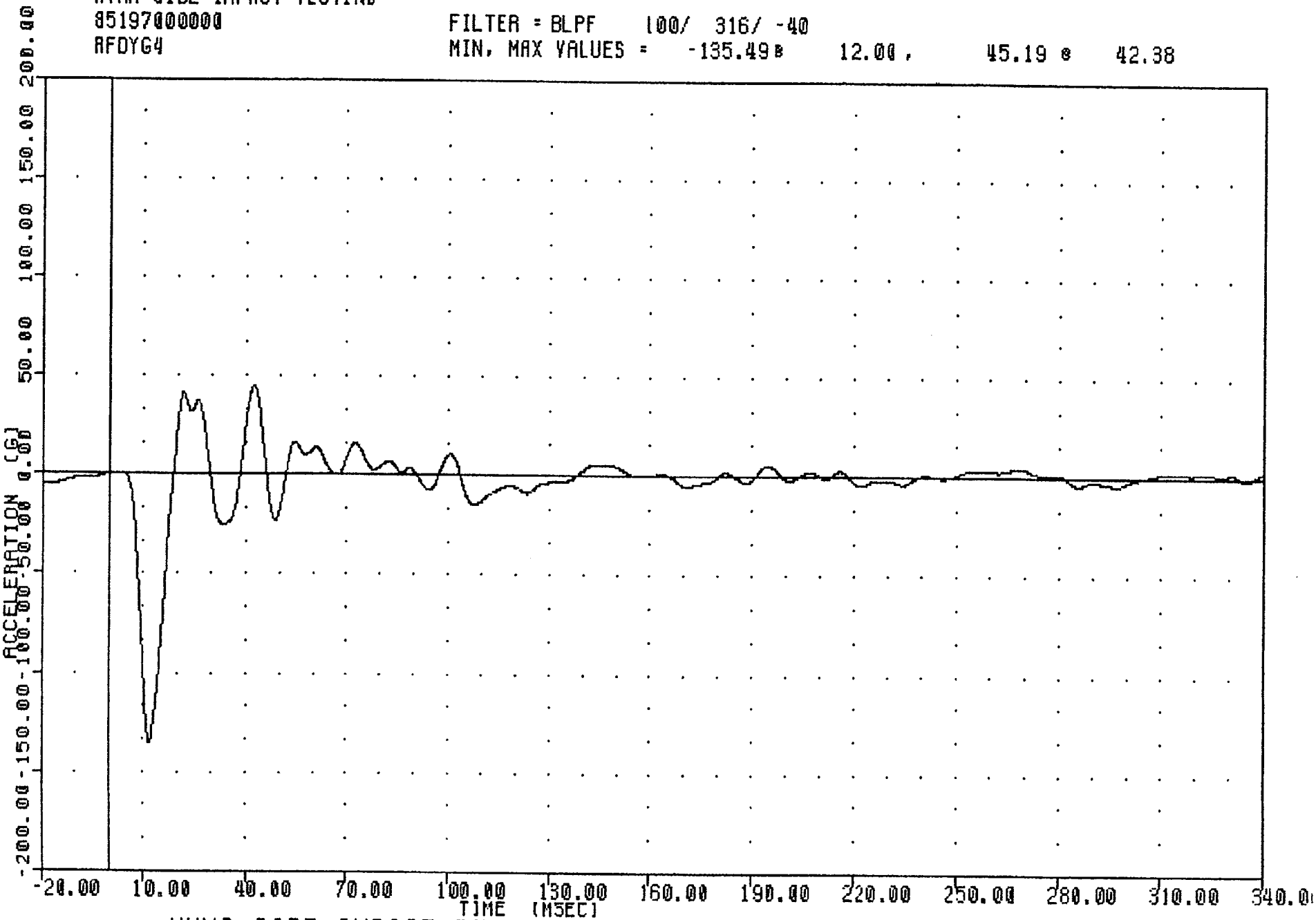


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
RIGHT FRONT DOOR (POSITION 3) VELOCITY Y AXIS

[redacted]

NVMA SIDE IMPACT TESTING
85197000000
RFDYG4

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -135.49 @ 12.00 , 45.19 @ 42.38

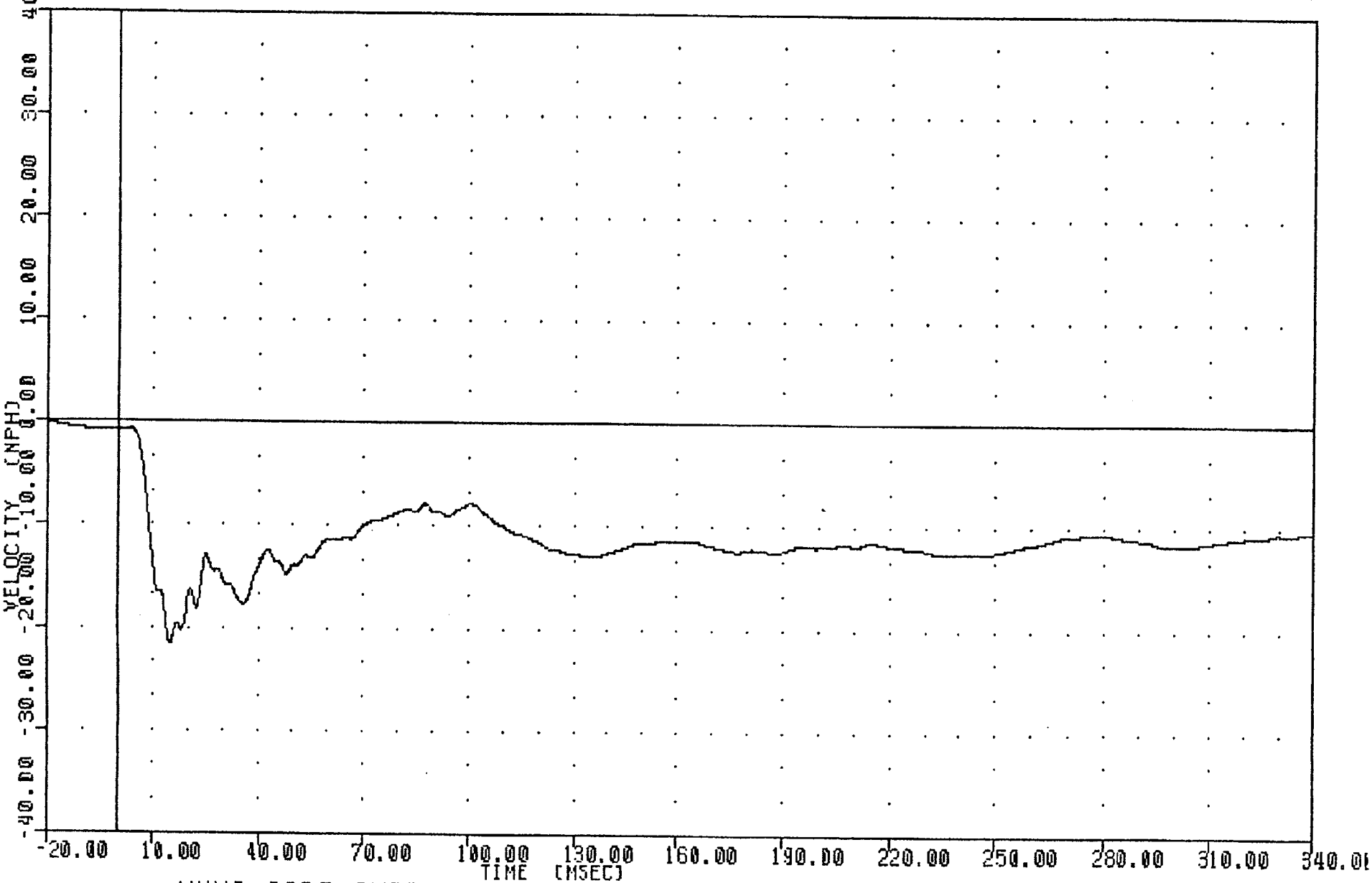


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
VEHICLE RIGHT FRONT DOOR (POSITION 4) ACCELERATION Y AXIS

[redacted] DA[redacted] [redacted]JUL[redacted] [redacted]11[redacted]

MVMA SIDE IMPACT TESTING
85197000000
RFDYV4

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -21.60@ 14.8B, 0.00 @ -20.00

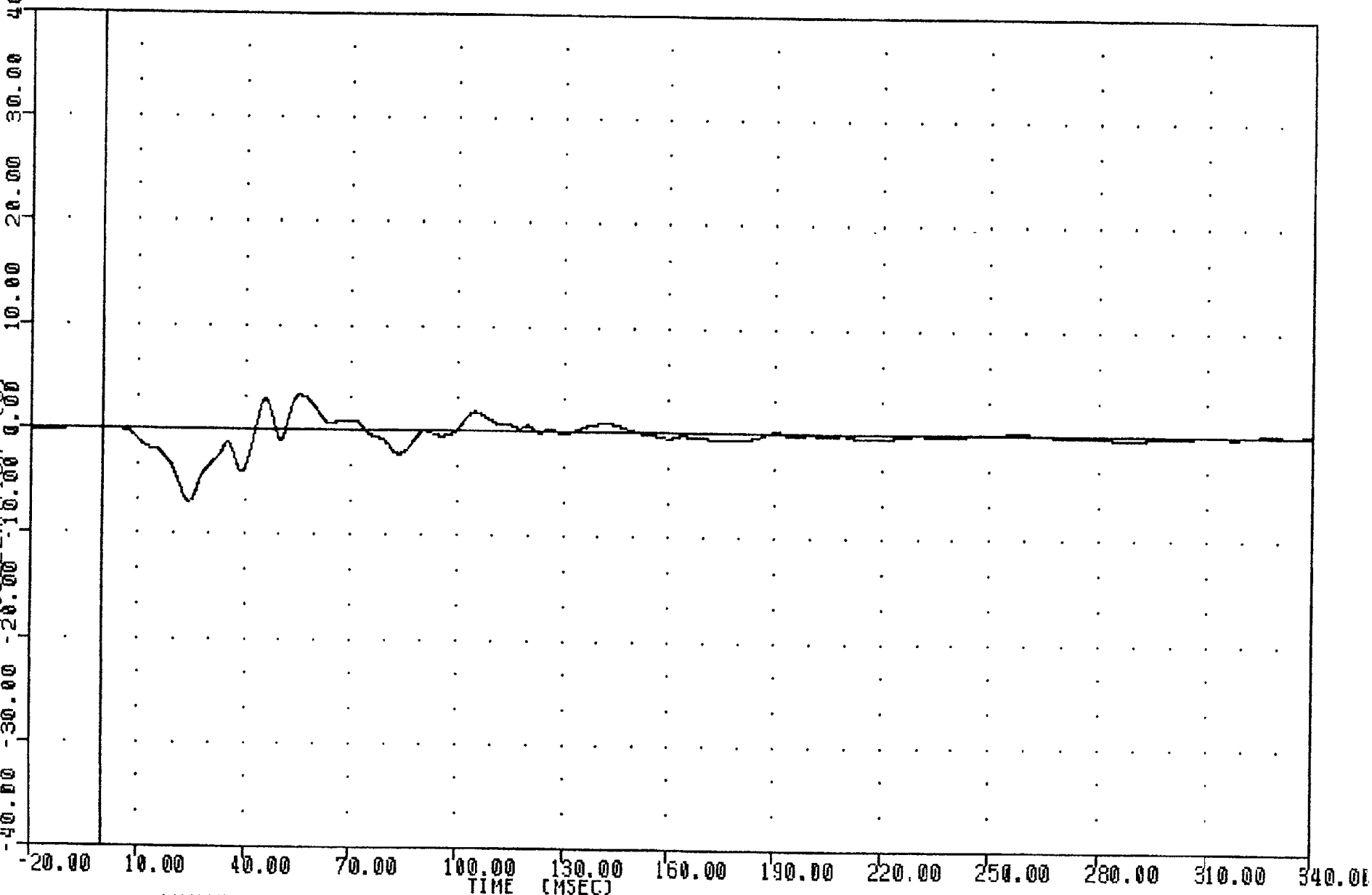


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
RIGHT FRONT DOOR (POSITION 4) VELOCITY Y AXIS

[redacted]

MVMA SIDE IMPACT TESTING
8519700Q000
LFSXG

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -6.89 @ 24.25 , 3.38 @ 55.63

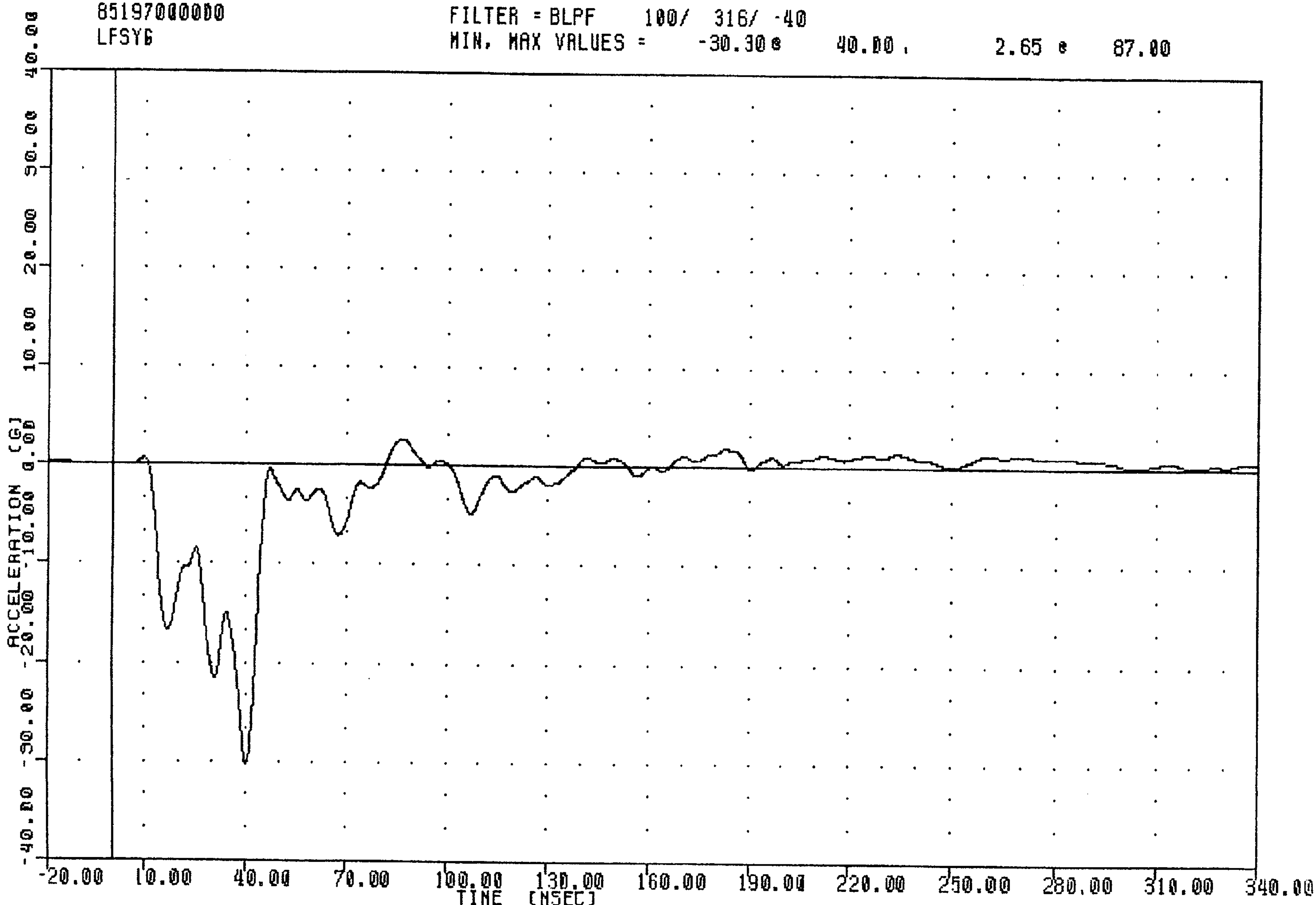


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
VEHICLE LEFT FRONT SILL ACCELERATION X AXIS

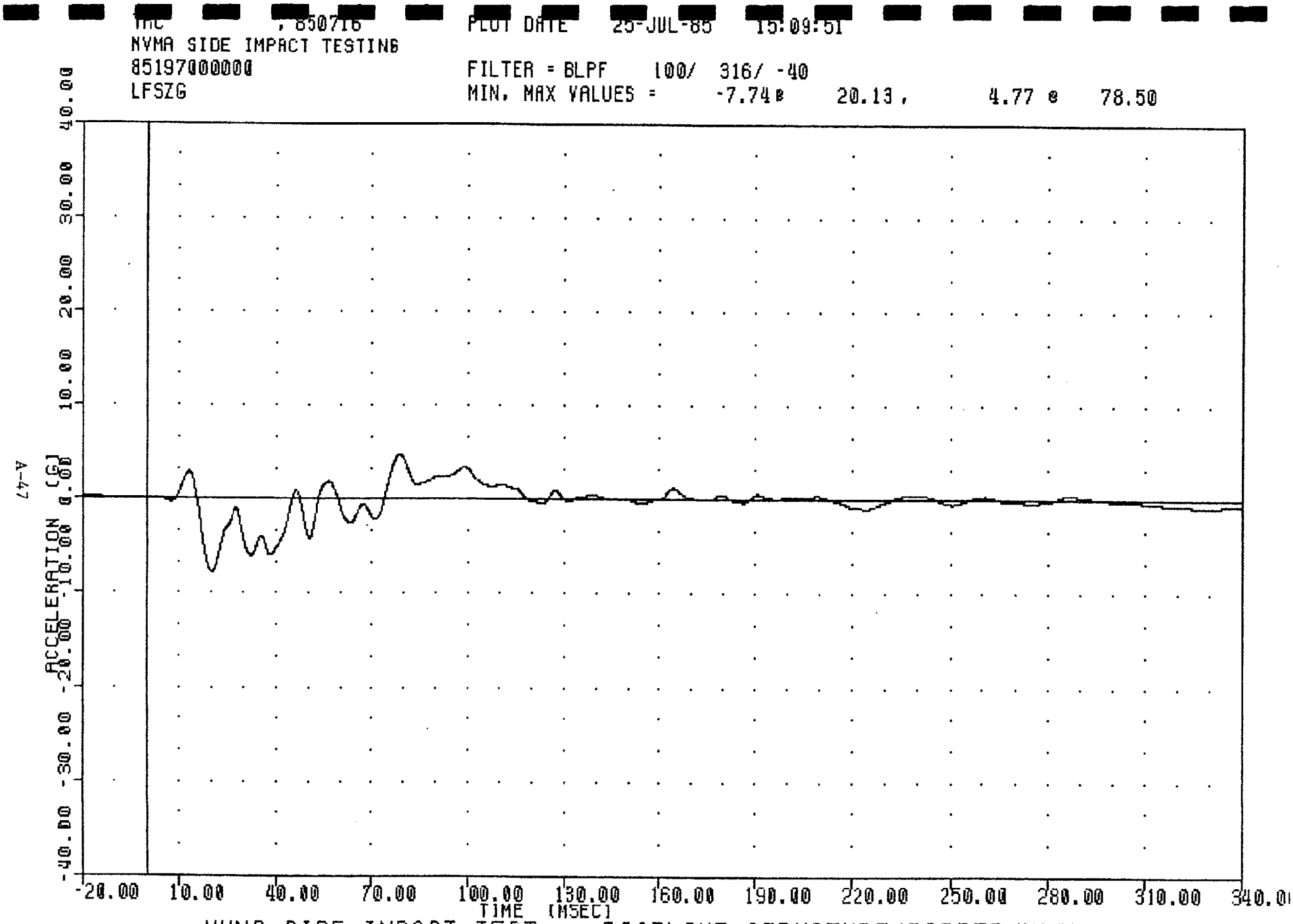
[redacted] T[redacted] [redacted]507[redacted] [redacted] P[redacted] DA[redacted] [redacted]JUL[redacted] [redacted]09:[redacted]

MVMA SIDE IMPACT TESTING
8519700000D0
LFSYG

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -30.30 @ 40.00 , 2.65 @ 87.00



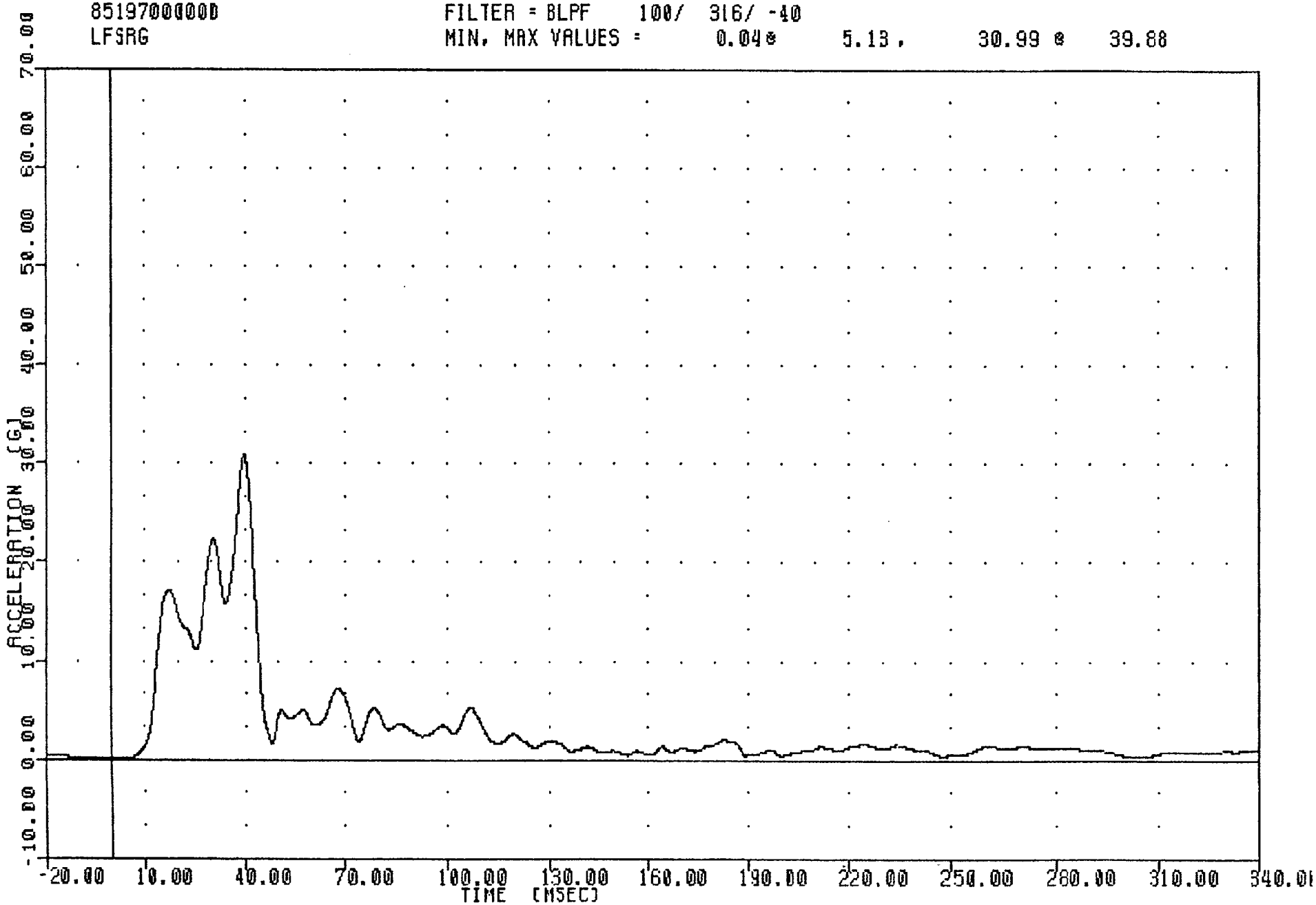
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
VEHICLE LEFT FRONT SILL ACCELERATION Z AXIS

[redacted]

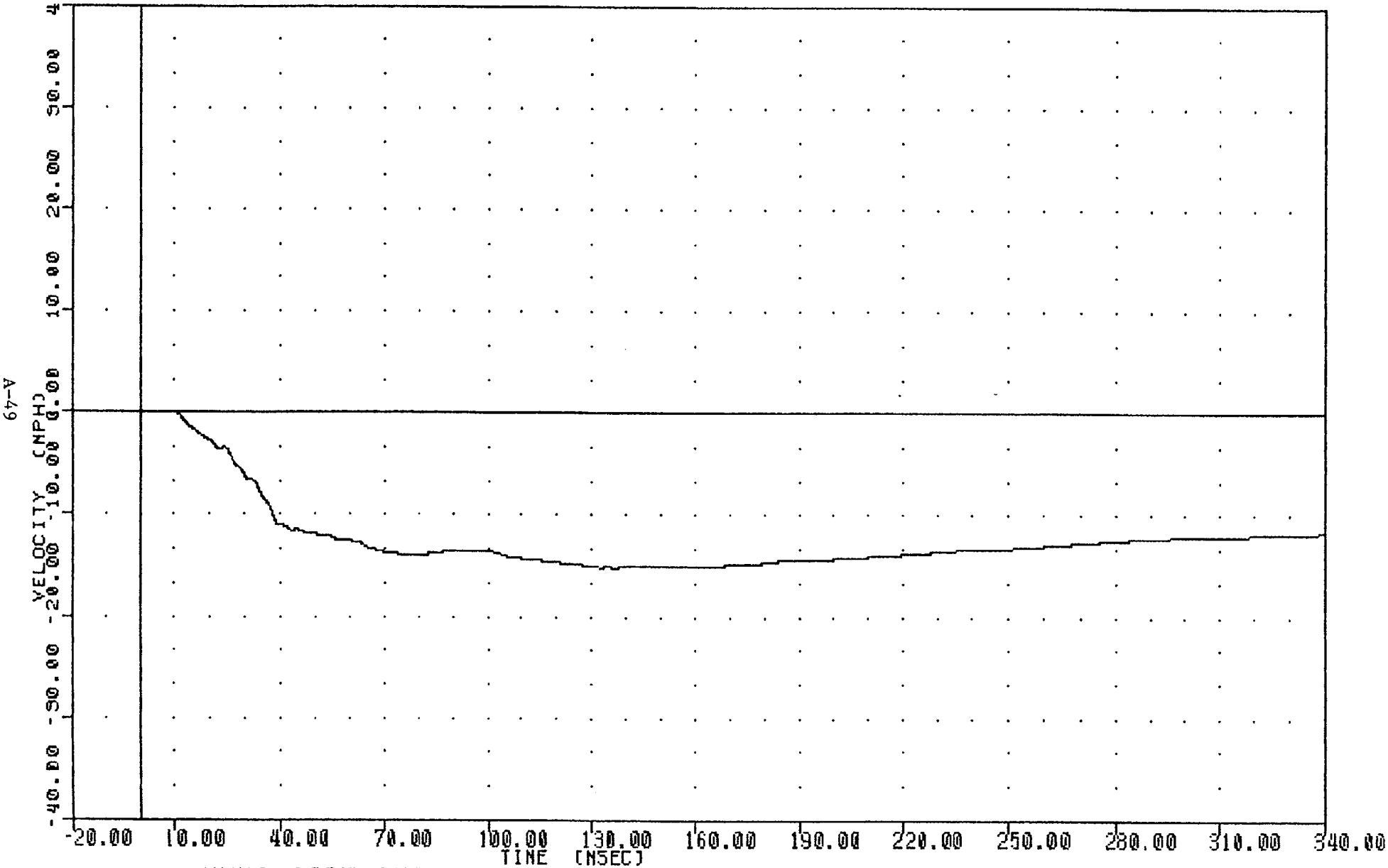
TRC , 850716 PLOT DATE 25-JUL-85 15:09:51
MVMA SIDE IMPACT TESTING
8519700@@@D FILTER = BLPF 100/ 316/ -40
LFSRG MIN, MAX VALUES = 0.04@ 5.13 , 30.99 @ 39.88



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
VEHICLE LEFT FRONT SILL RESULTANT

[redacted]

THC , 850716 PLOT DATE 25-JUL-85 15:11:33
MVMA SIDE IMPACT TESTING
85197000000
LFSYV
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -15.13 @ 136.88 , 0.11 @ 9.25



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
LEFT FRONT SILL VELOCITY Y AXIS

[redacted] PLOT DATE 25-JUL-85 15:09:51

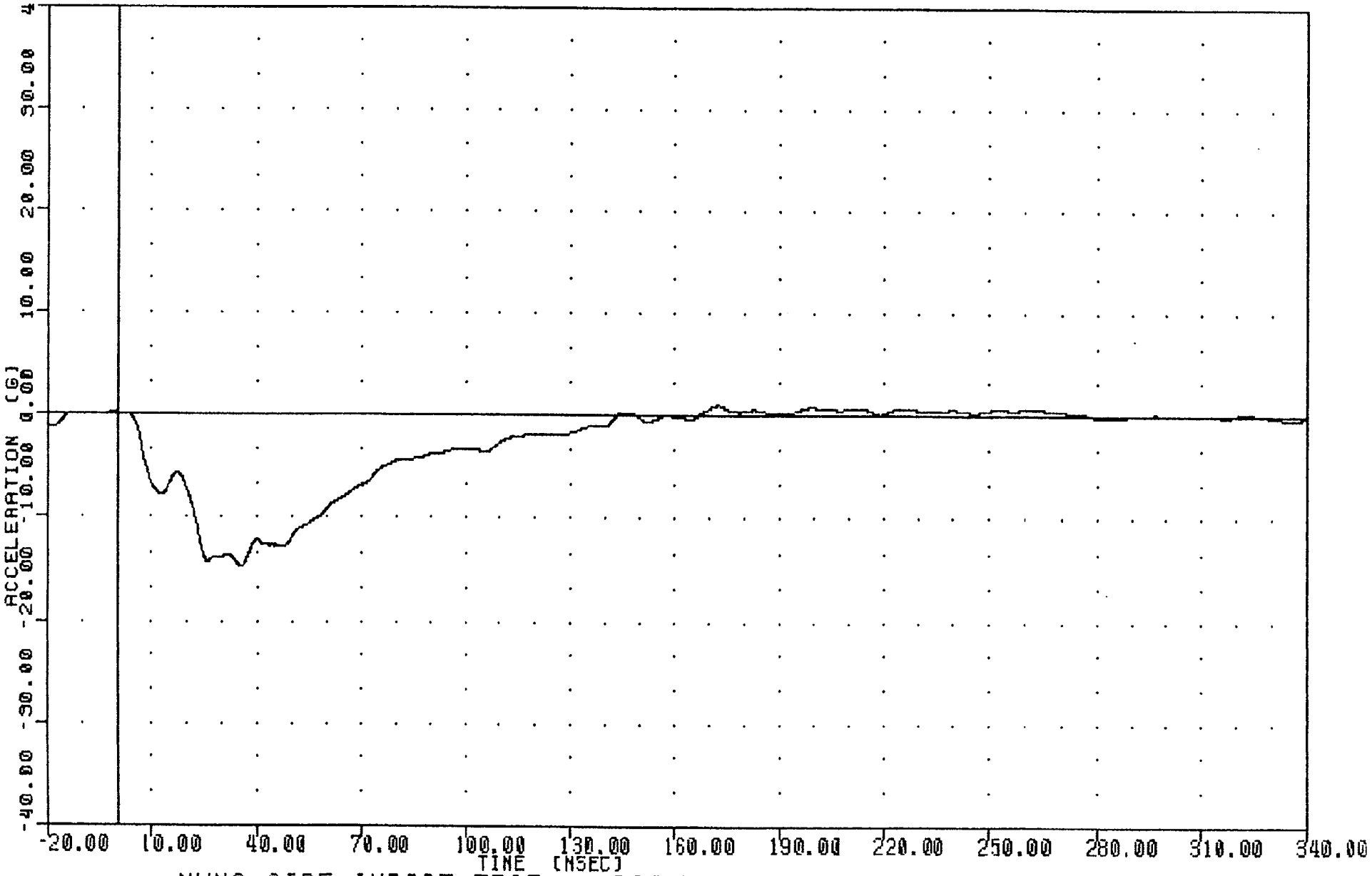
MVMA SIDE IMPACT TESTING

85197000000

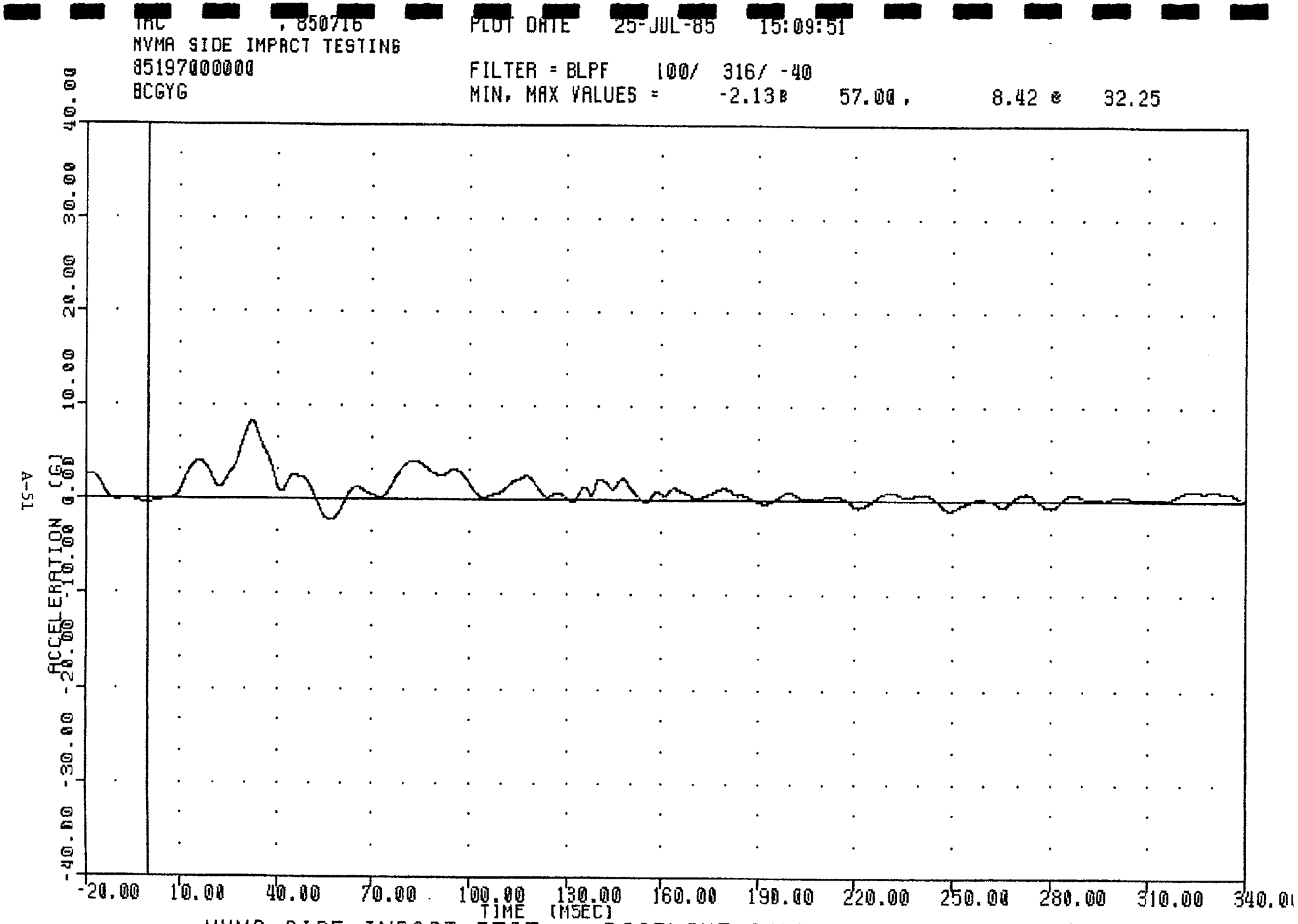
BCGXG

FILTER = BLPF 100/ 316/ -40

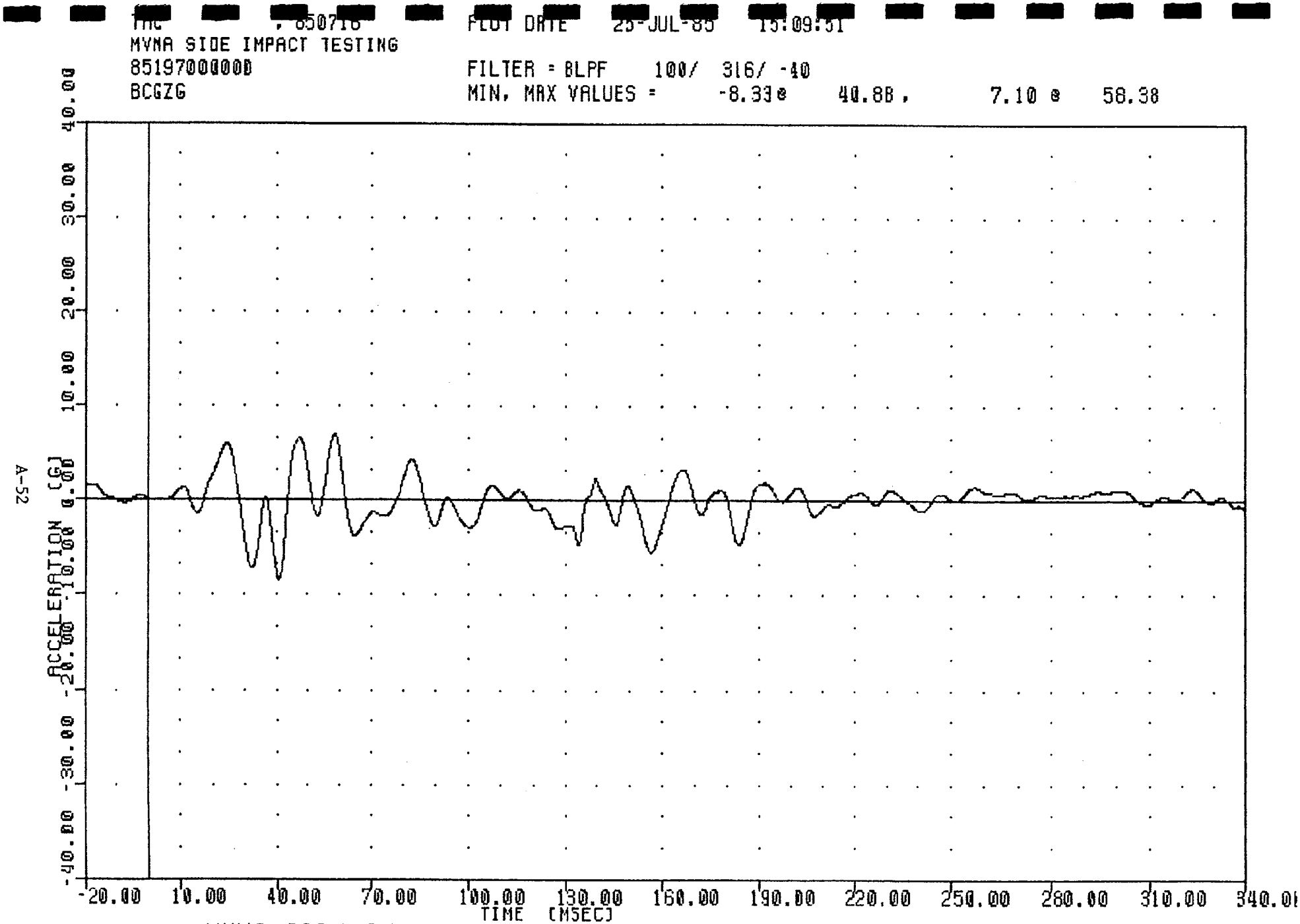
MIN, MAX VALUES = -14.65 @ 35.13 , 1.03 @ 172.63



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
BARRIER CENTER OF GRAVITY X AXIS



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
BARRIER CENTER OF GRAVITY Y AXIS

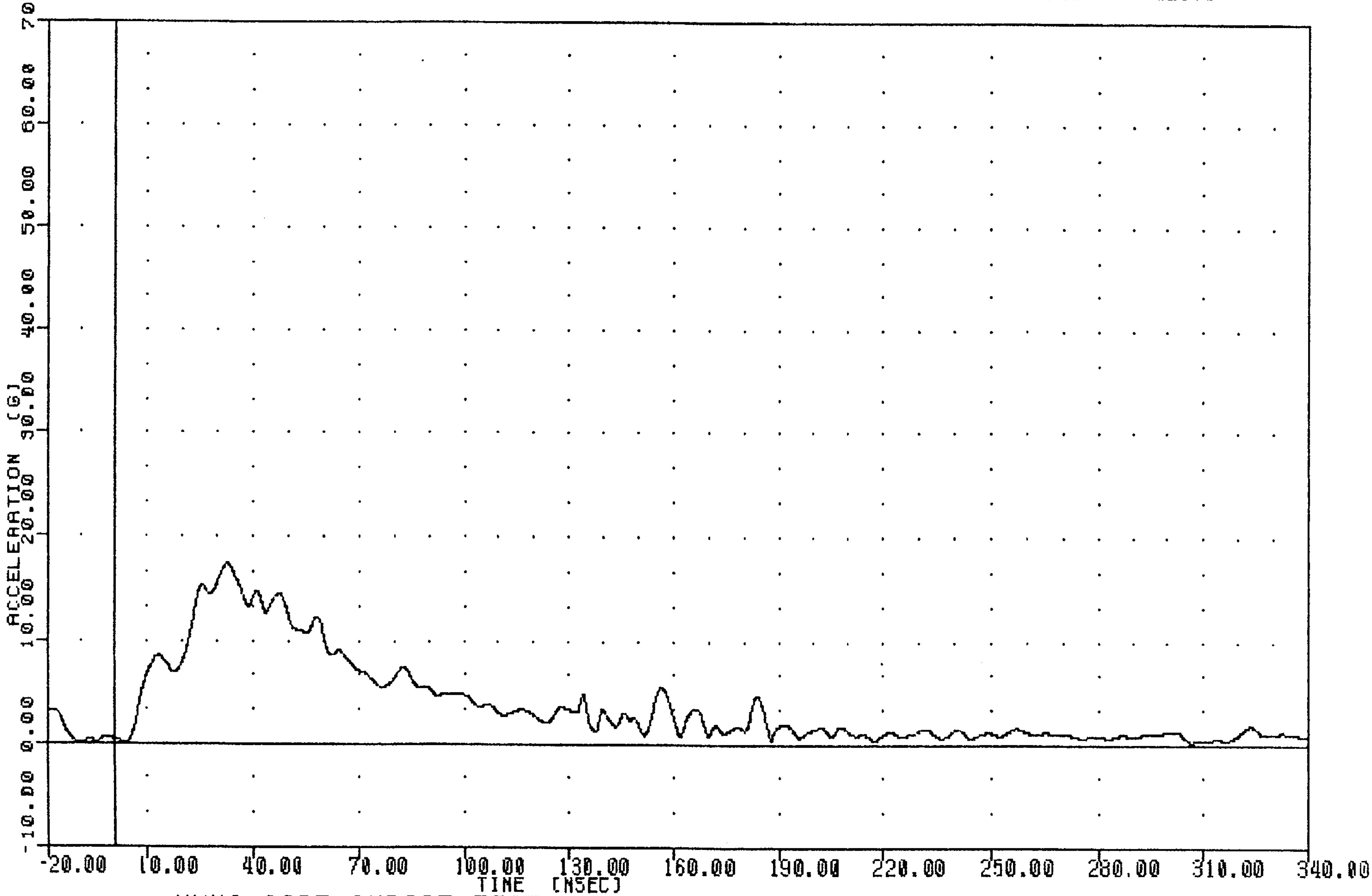


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
BARRIER CENTER OF GRAVITY Z AXIS

[redacted] MVMA SIDE IMPACT TESTING
85197000000
BCGRG

P[redacted] DATE [redacted] JUL [redacted] [redacted]09:51 [redacted]

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = 0.09 @ -5.00 , 17.49 @ 32.75



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

[redacted] PLOT DATE 25 JUL 85 15:11:33

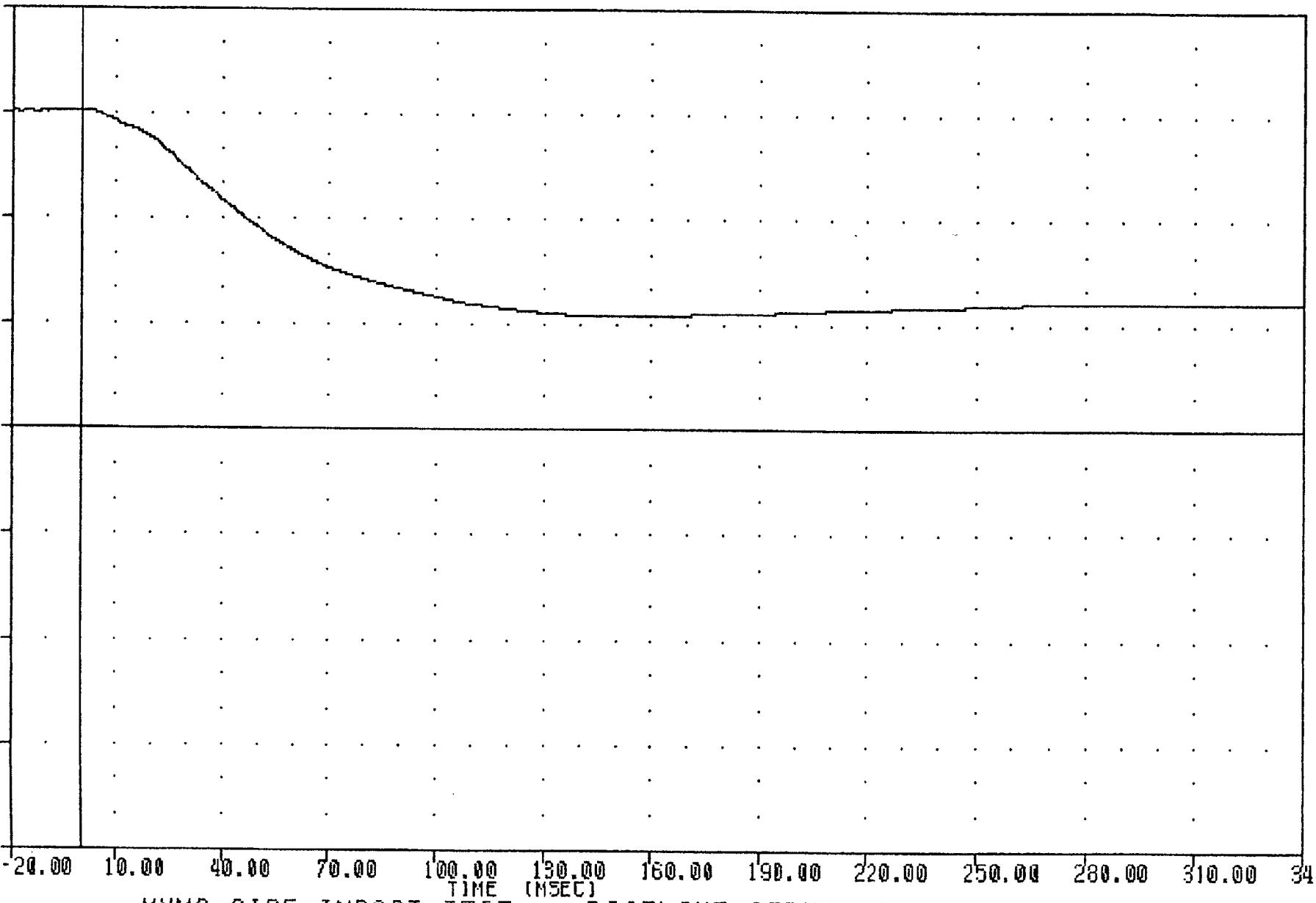
NVMA SIDE IMPACT TESTING

851970000000

BCGXV

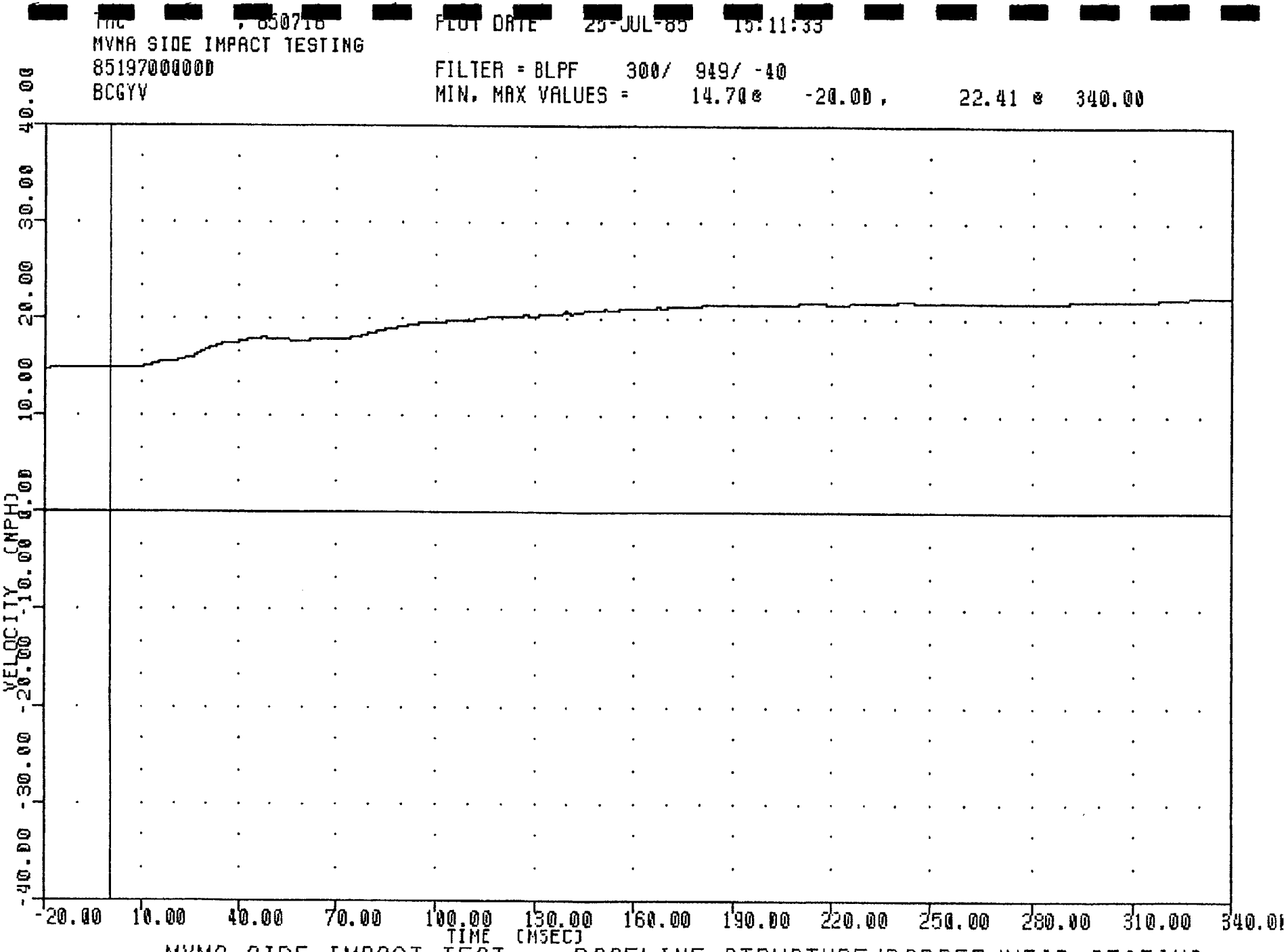
FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 10.83 @ 163.88 , 30.11 @ -2.13



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING

BARRIER CENTER OF GRAVITY VELOCITY X AXIS

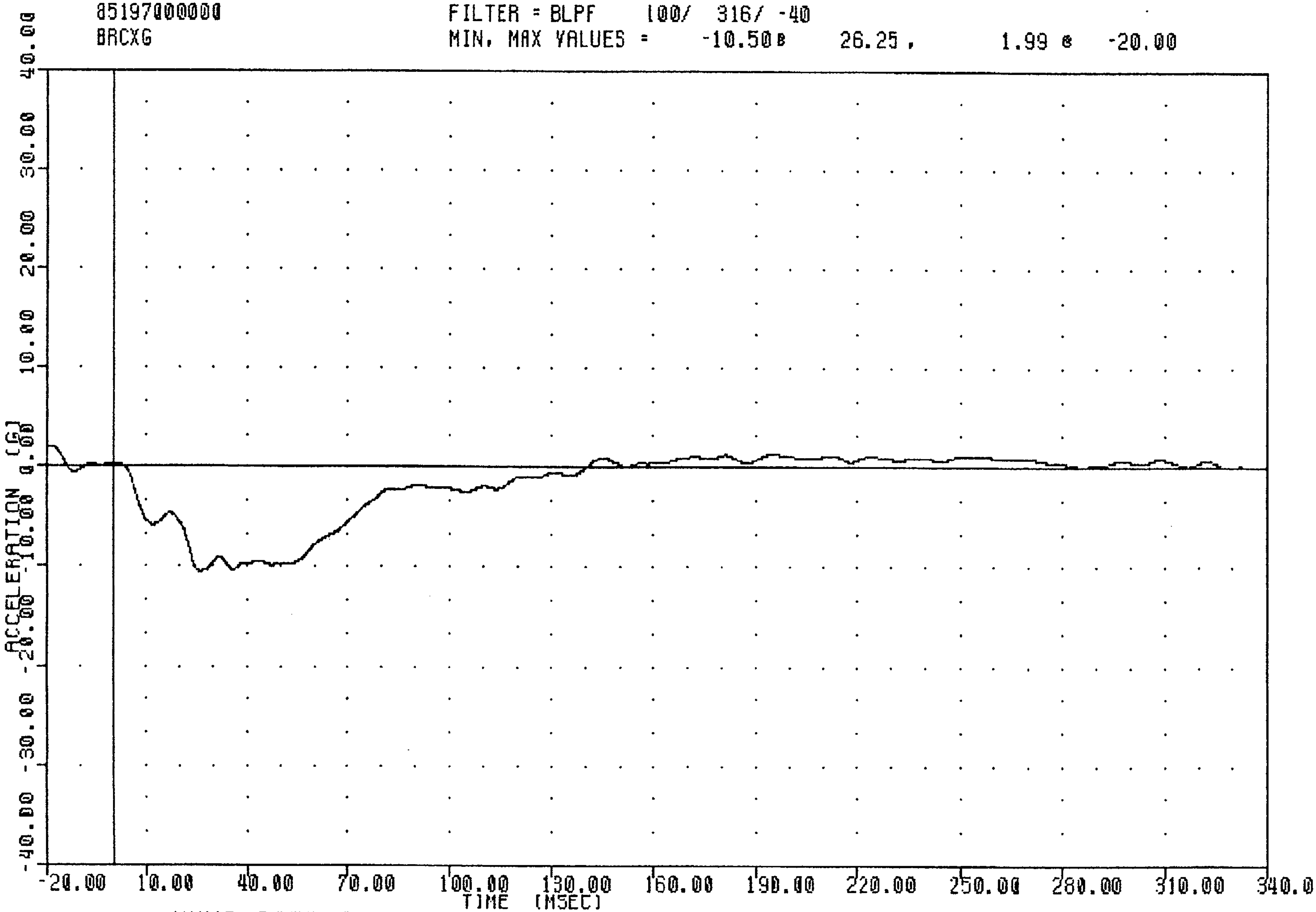


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
BARRIER CENTER OF GRAVITY VELOCITY Y AXIS

DATE JUL 09.31

NVMA SIDE IMPACT TESTING
85197000000
BRCXG

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -10.50 @ 26.25 , 1.99 @ -20.00



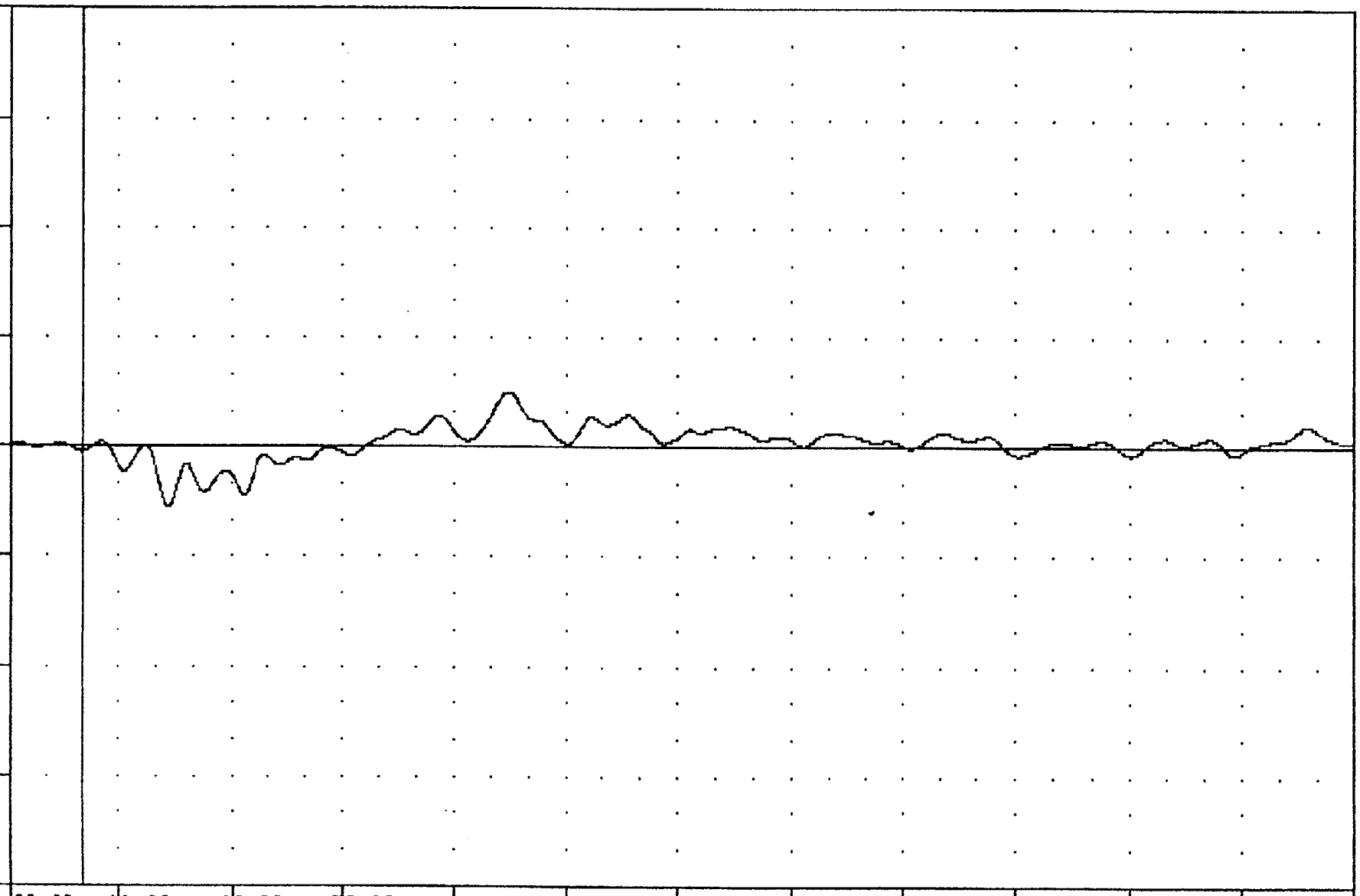
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
BARRIER REAR CROSSMEMBER ACCELERATION X AXIS

[redacted] PLOT DATE= 25-JUL-03 15:09:51

MVMA SIDE IMPACT TESTING

8519700[redacted]0D FILTER = BLPF 100/ 316/ -40

BRCYG MIN, MAX VALUES = -5.49 @ 23.25 , 5.00 @ 114.63



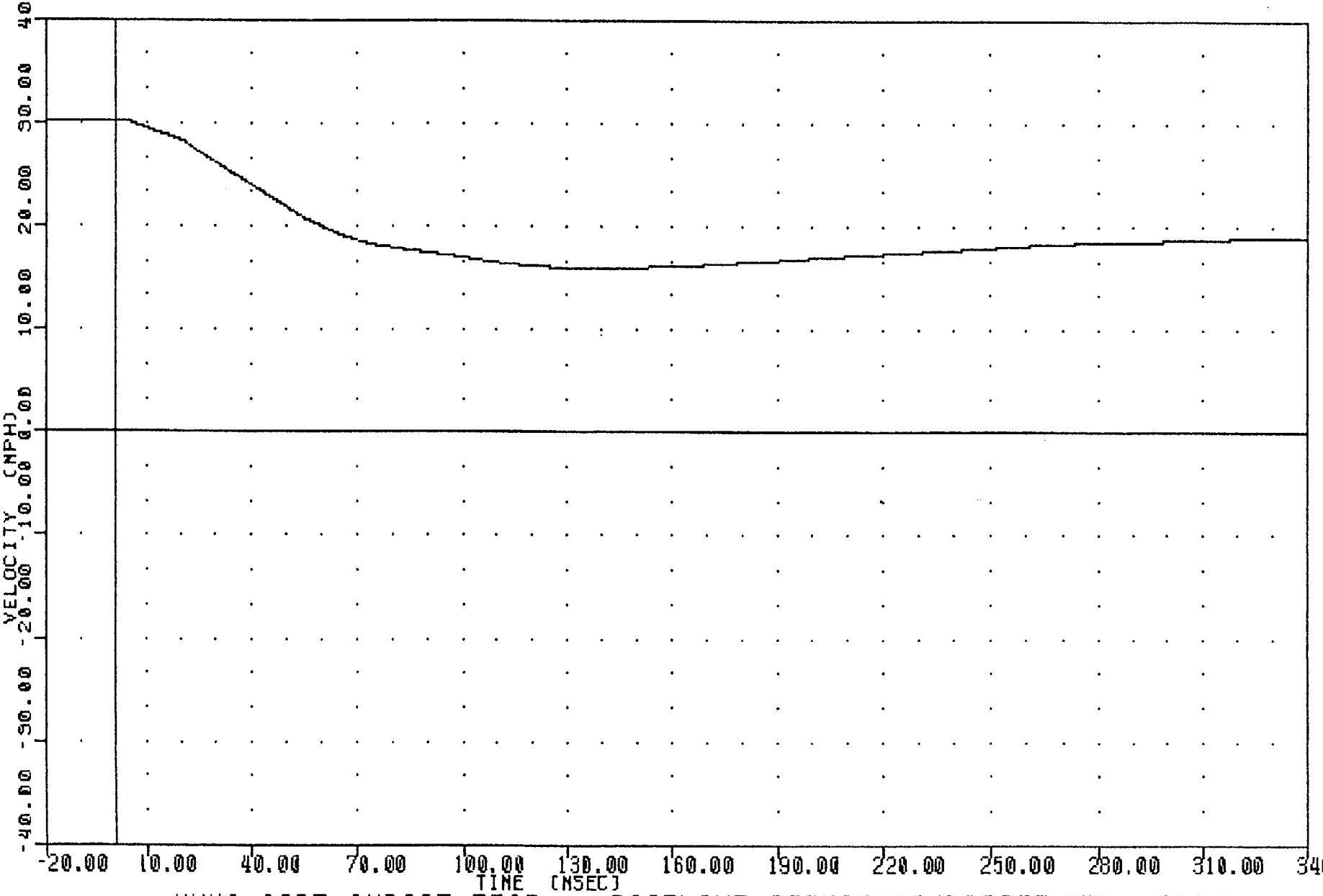
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING

BARRIER REAR CROSSMEMBER ACCELERATION Y AXIS

[redacted] T[redacted] [redacted] [redacted]07[redacted] [redacted] P[redacted] DA[redacted] [redacted]UL-[redacted] [redacted]11:[redacted]

MVMA SIDE IMPACT TESTING
85197000000
BRCXV

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 15.87 @ 137.13 , 30.18 @ -17.75

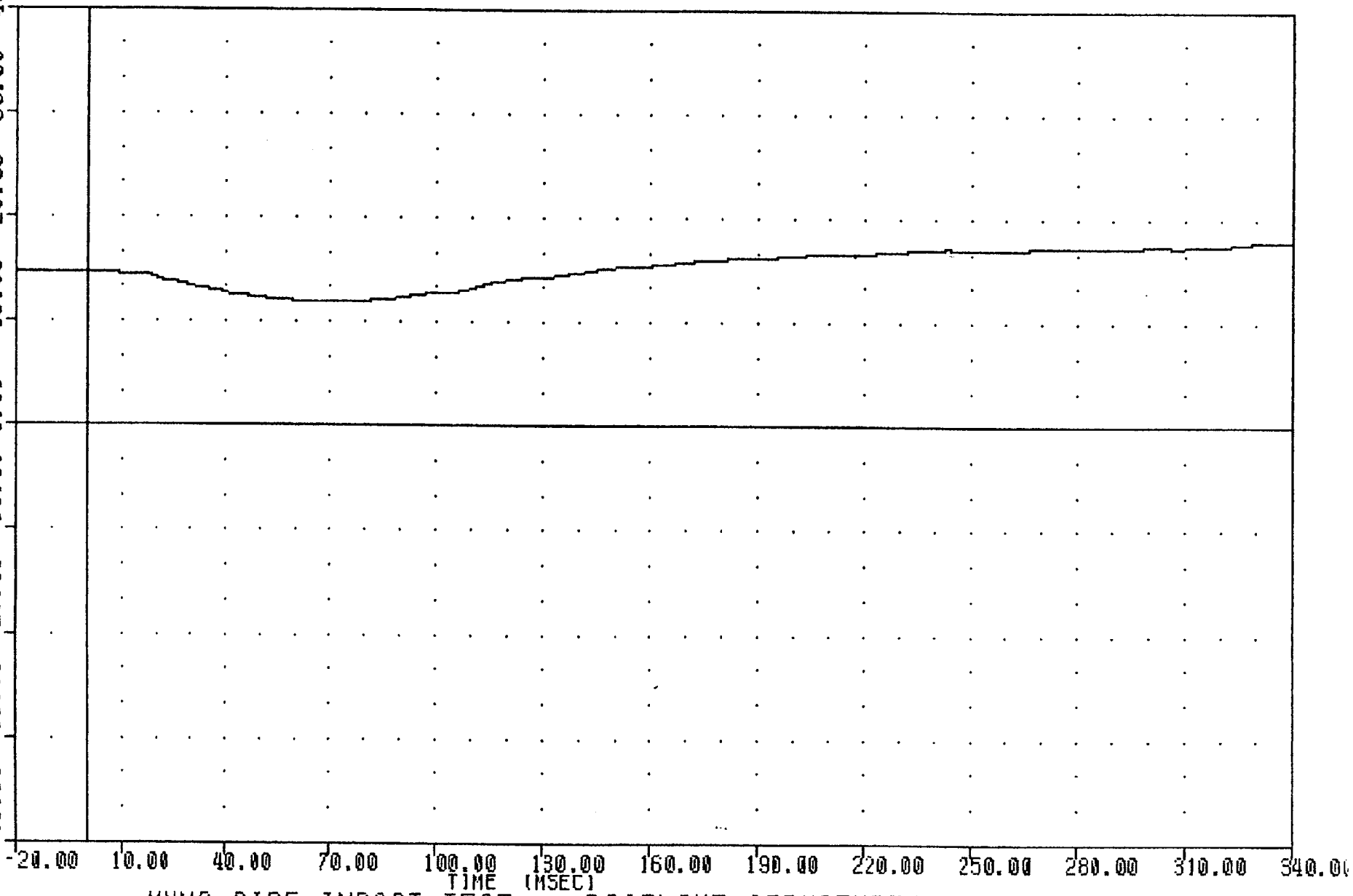


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
BARRIER REAR CROSSMEMBER VELOCITY X AXIS

[redacted] DATE [redacted] JUL [redacted]

NVMA SIDE IMPACT TESTING
85197000000
BRCYV

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 11.92 @ 72.38 , 17.92 @ 340.00



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/PADDED/NEAR SEATING
BARRIER REAR CROSSMEMEBER VELOCITY Y AXIS

APPENDIX B

DUMMY CERTIFICATION

SIDE IMPACT DUMMY CALIBRATION

Side Impact Dummy
Damage Checklist

Dummy S/N 016

OK	Damaged	
X		Outer skin on entire dummy (gashes, rips, etc.)
X		Head - Gashes, rips, general appearance, etc.
X		Neck - broken or cracks in rubber
X		Spine - broken or cracks in rubber
X		Ribs - check all ribs for damage (bent or broken), damping material separation.
X		Rib Attach Leather - breaks in leather at ribs
X		Bourns Pot. - bent shaft - electrical discontinuity
X		Accelerometer Leads - torn cables
X		Accelerometer Mountings (Head, Thorax, Pelvis) - check for secure mounting
X		Retrofit Kit (Calspan) - check for bent brackets, sagging rib cage
X		Thorax support wire and springs - check for damage
X		Overall smooth stroking of thorax left to right (no interference)
X		Other

If upon visual examination, damage is apparent in any of these areas, a VRTC representative is to be consulted for a decision on repair or replacement of parts.

Repair or Replacement Approved By:

Signature _____ Date _____

Comments on repair or replacement of parts:

Visual OK

TRC Personnel
Checked By:

Signature Gregg Wilks Date 27 Jun 85

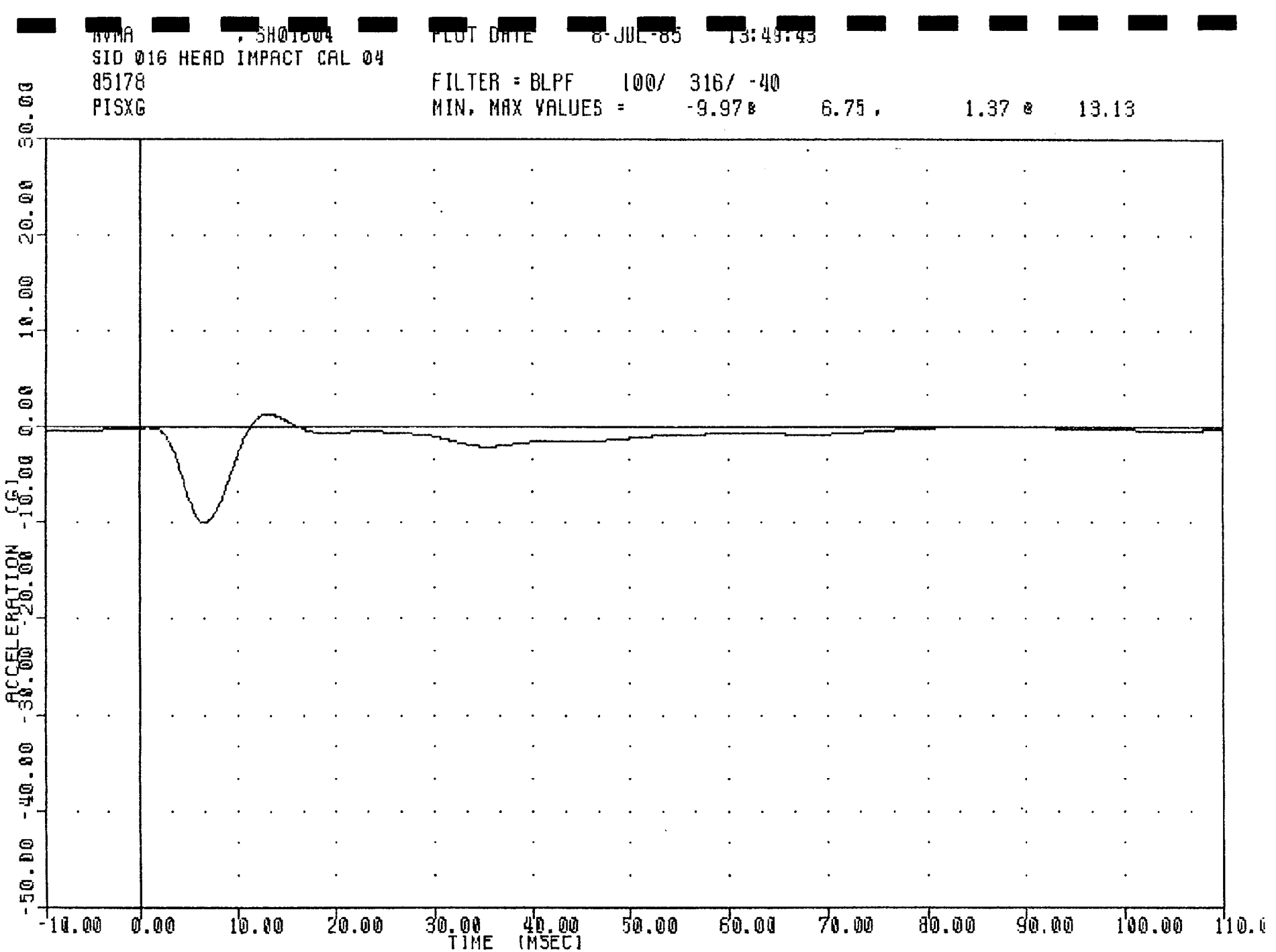
VRTC Personnel
Checked and Approved for Testing By:

Signature _____ Date _____

SIDE IMPACT DUMMY CALIBRATION
DUMMY SERIAL NUMBER 016
CALIBRATION 04

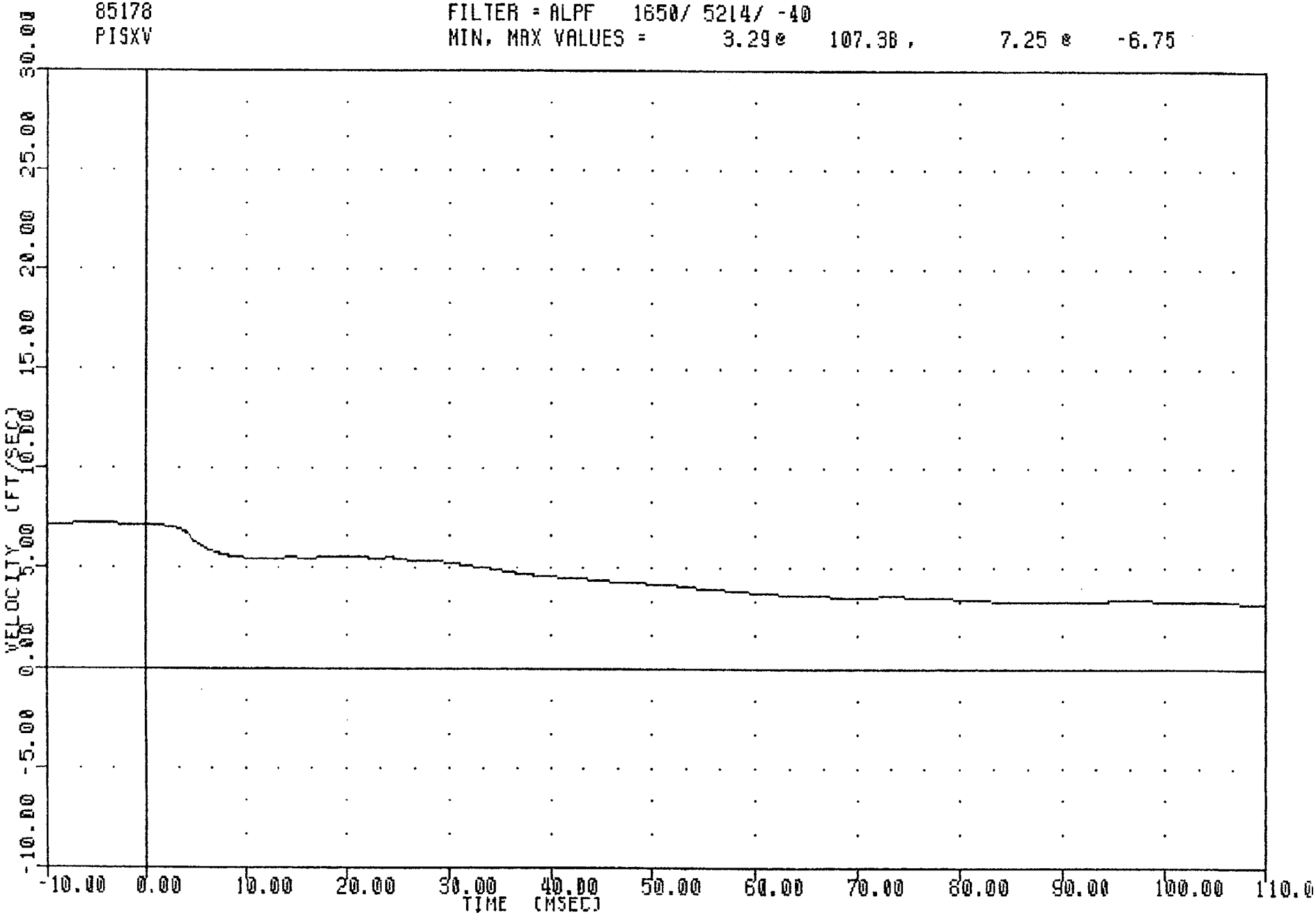
TEST/ DATE	CHANNEL	FILTER CLASS	PEAK ACCELERATION (g) SPECIFICATION*	TEST RESULT
HEAD 6/27/85	HEAD Y-AXIS	1000	150-175	171.36
THORAX 6/28/85	UPPER SPINE Y-AXIS			
	PRIMARY	180	16-24.6	21.64
	REDUNDANT	180	16-24.6	21.39
	LOWER SPINE Y-AXIS			
	PRIMARY	180	17.6-26.4	18.90
	REDUNDANT	180	17.6-26.4	19.06
	RIGHT UPPER RIB Y-AXIS			
	PRIMARY	180	36-50	39.75
	REDUNDANT	180	36-50	40.52
	RIGHT LOWER RIB Y-AXIS			
	PRIMARY	180	36-50	40.67
	REDUNDANT	180	36-50	41.45
PELVIS 6/27/85	PELVIS Y-AXIS	180	50-65	46.75

*Side impact test specifications currently in use by VRTC-NHTSA.

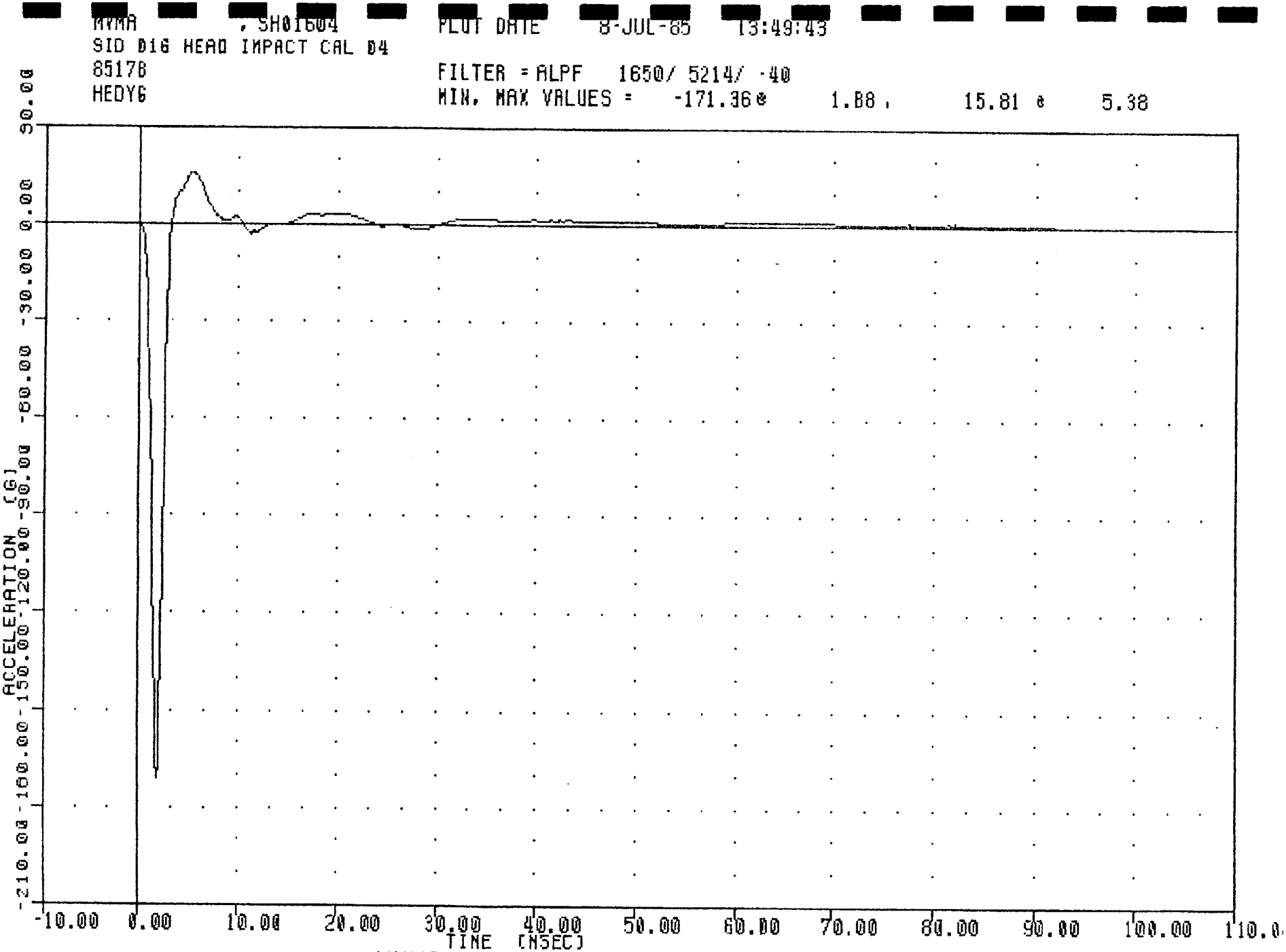


MVMA SIDE IMPACT DUMMY CALIBRATION
PISTON ACCELERATION

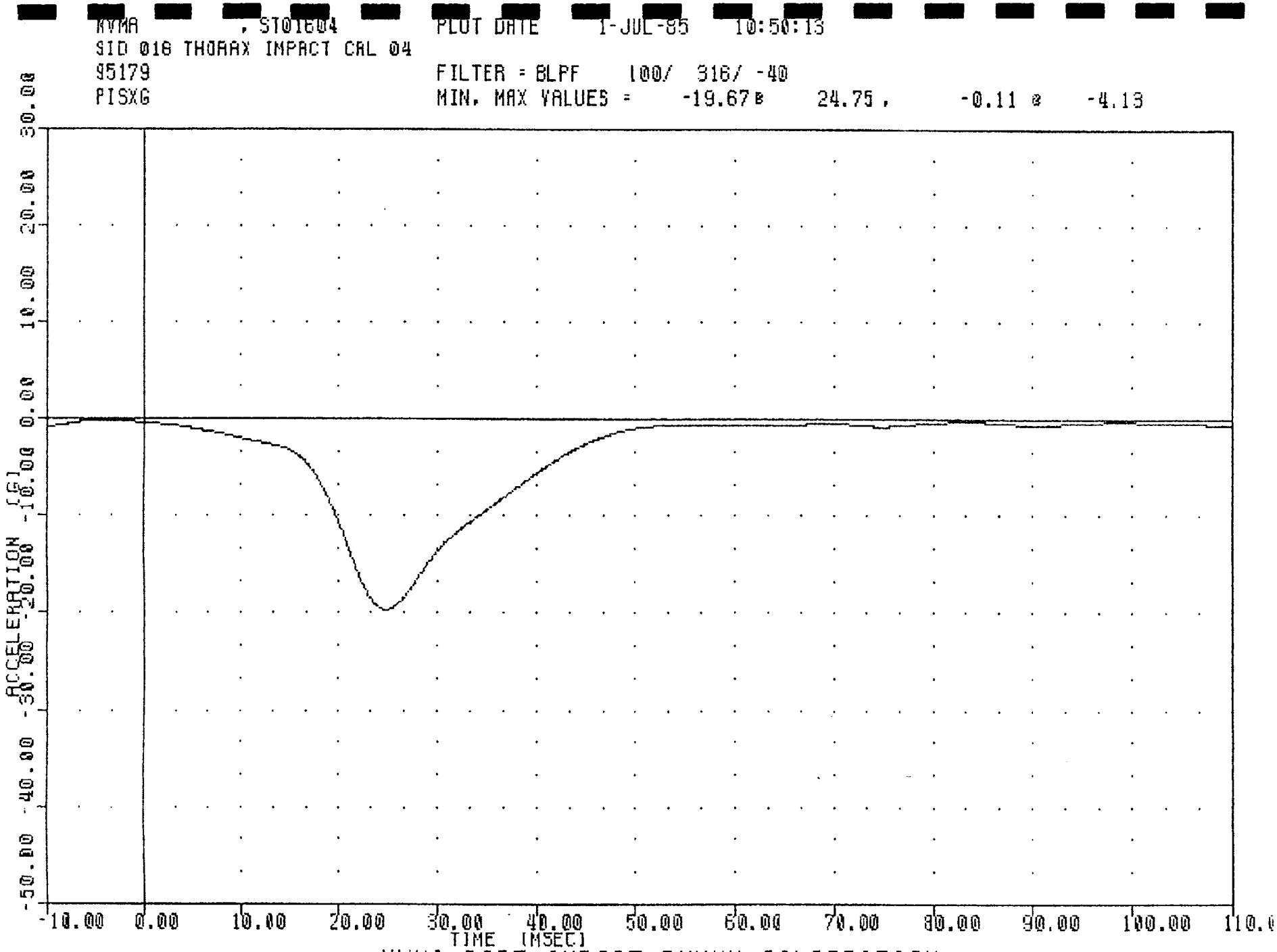
MVMA , SH@1604 PLOT DATE 6-JUL-85 13:49:43
SID 016 HEAD IMPACT CAL 04
85178
PISXV
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 3.29 @ 107.38 , 7.25 @ -6.75



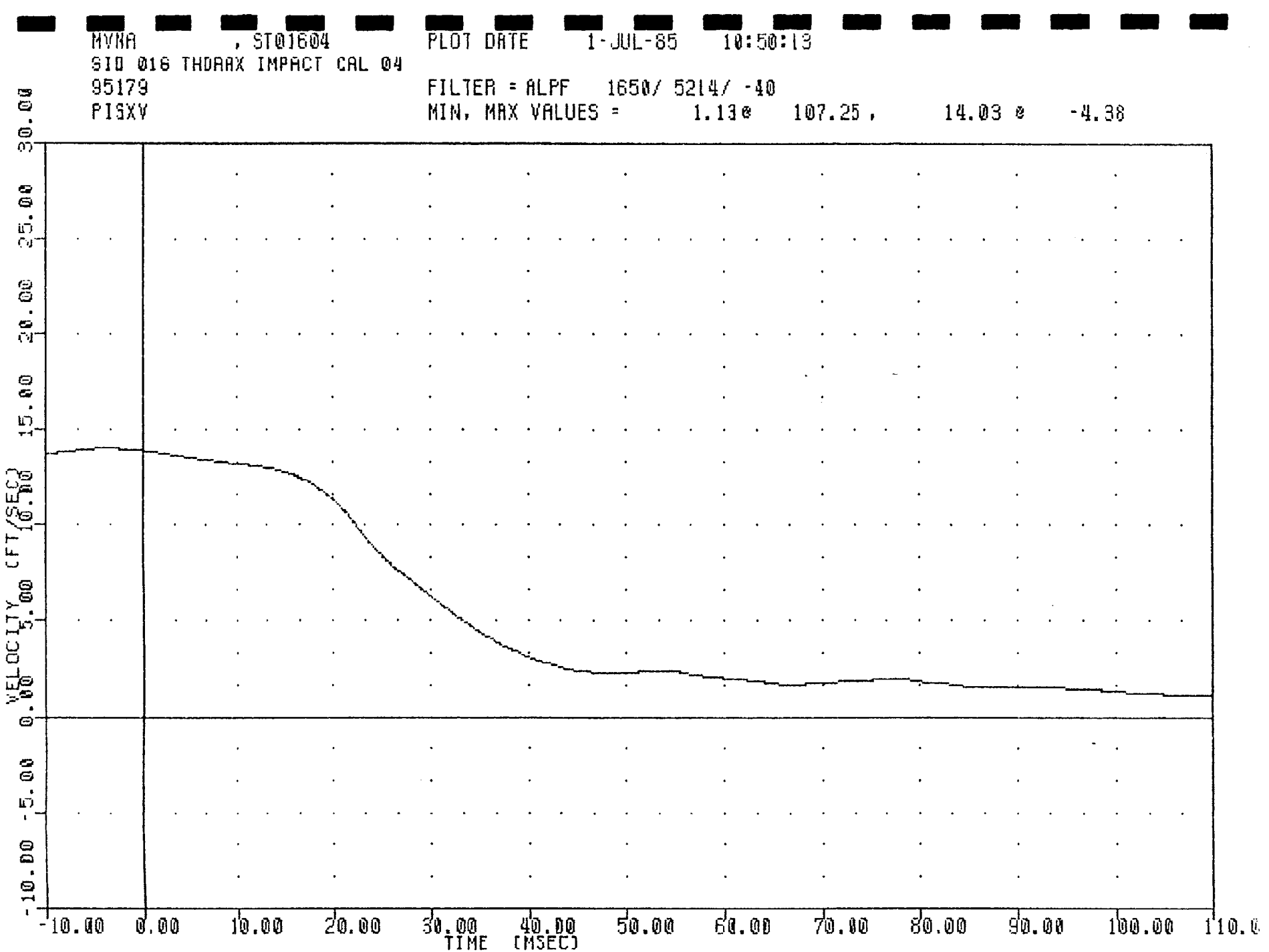
MVMA SIDE IMPACT DUMMY CALIBRATION
PISTON VELOCITY



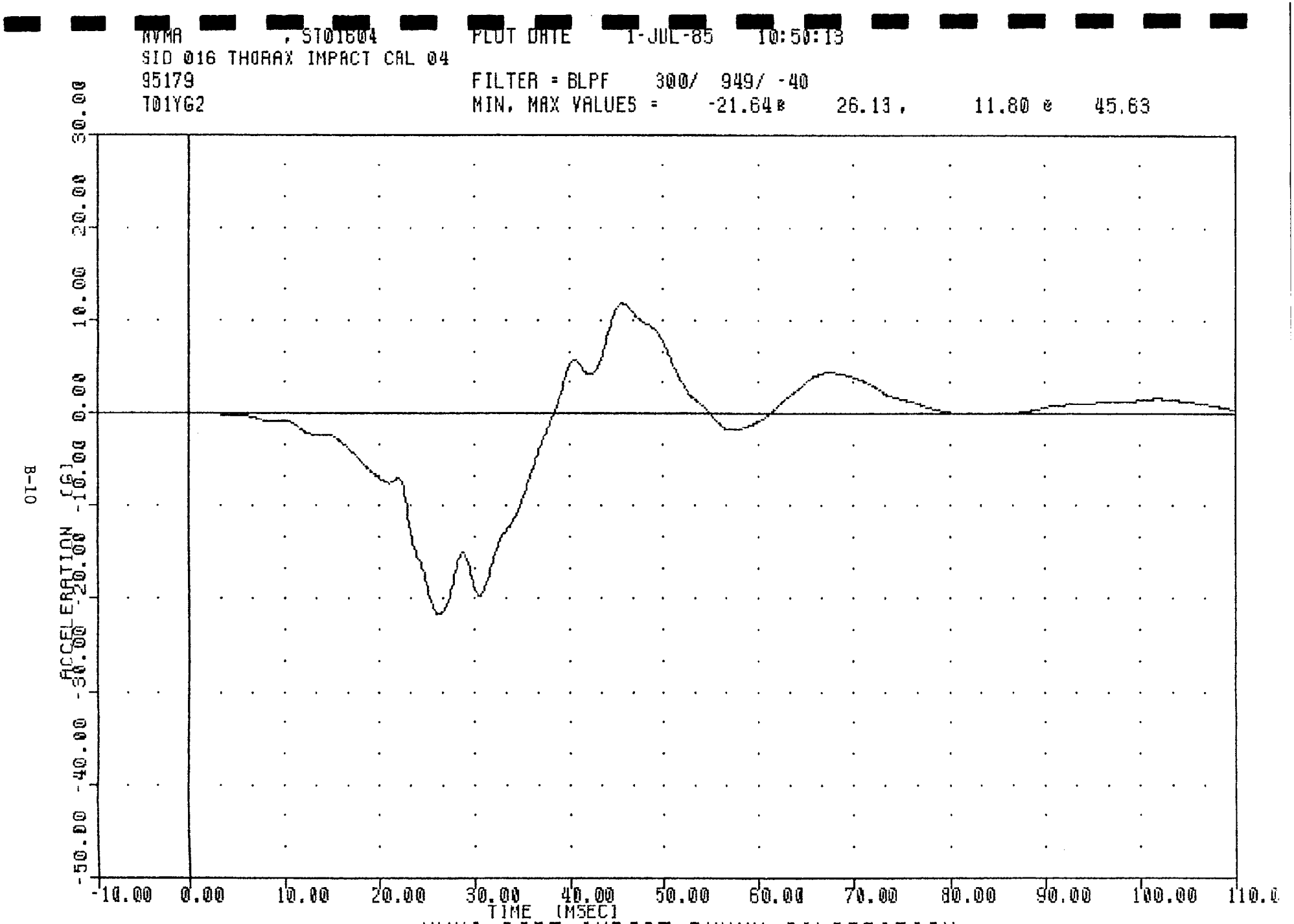
MVMA SIDE IMPACT DUMMY CALIBRATION
HEAD ACCELERATION Y AXIS



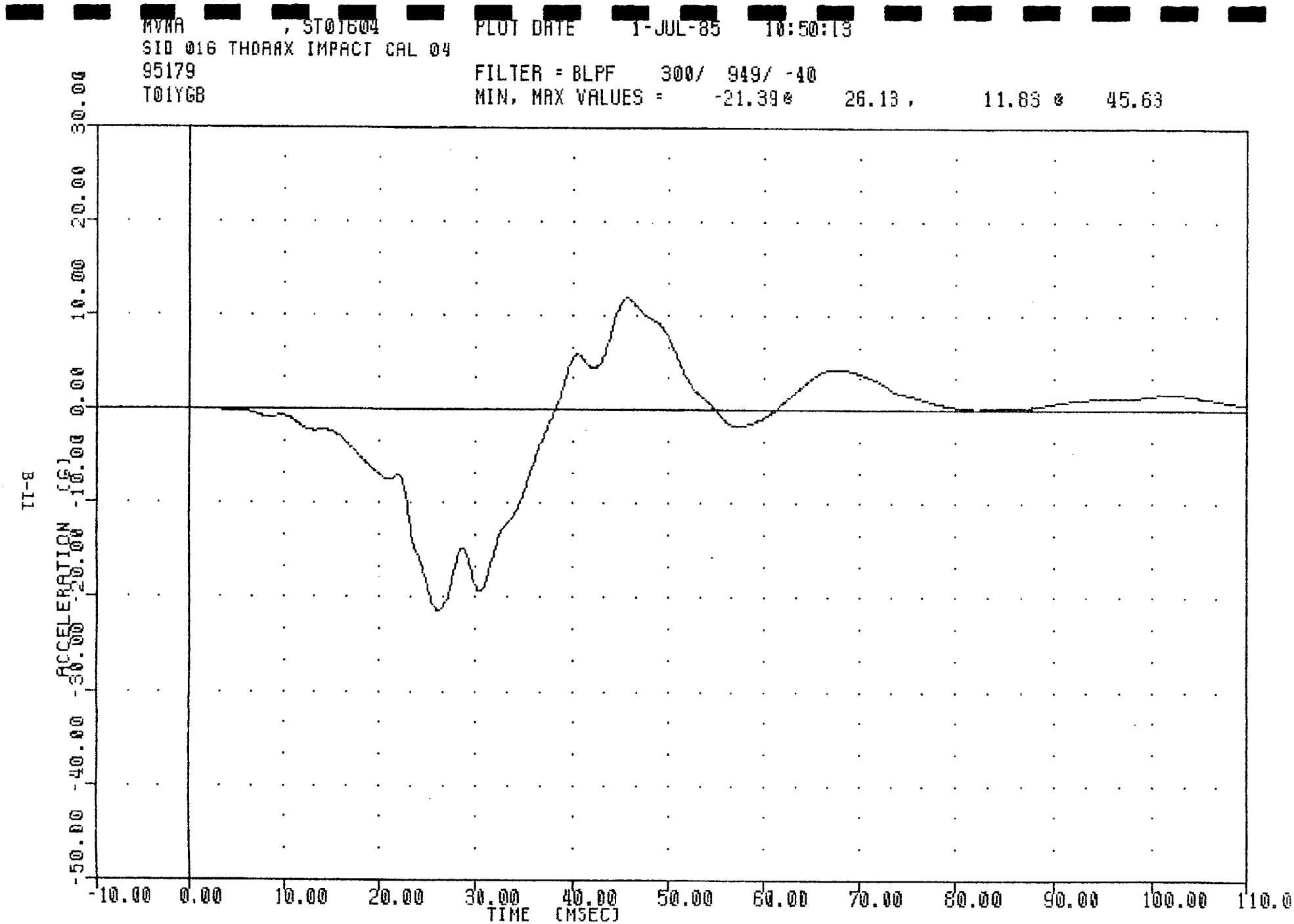
MVMA SIDE IMPACT DUMMY CALIBRATION
PISTON ACCELERATION



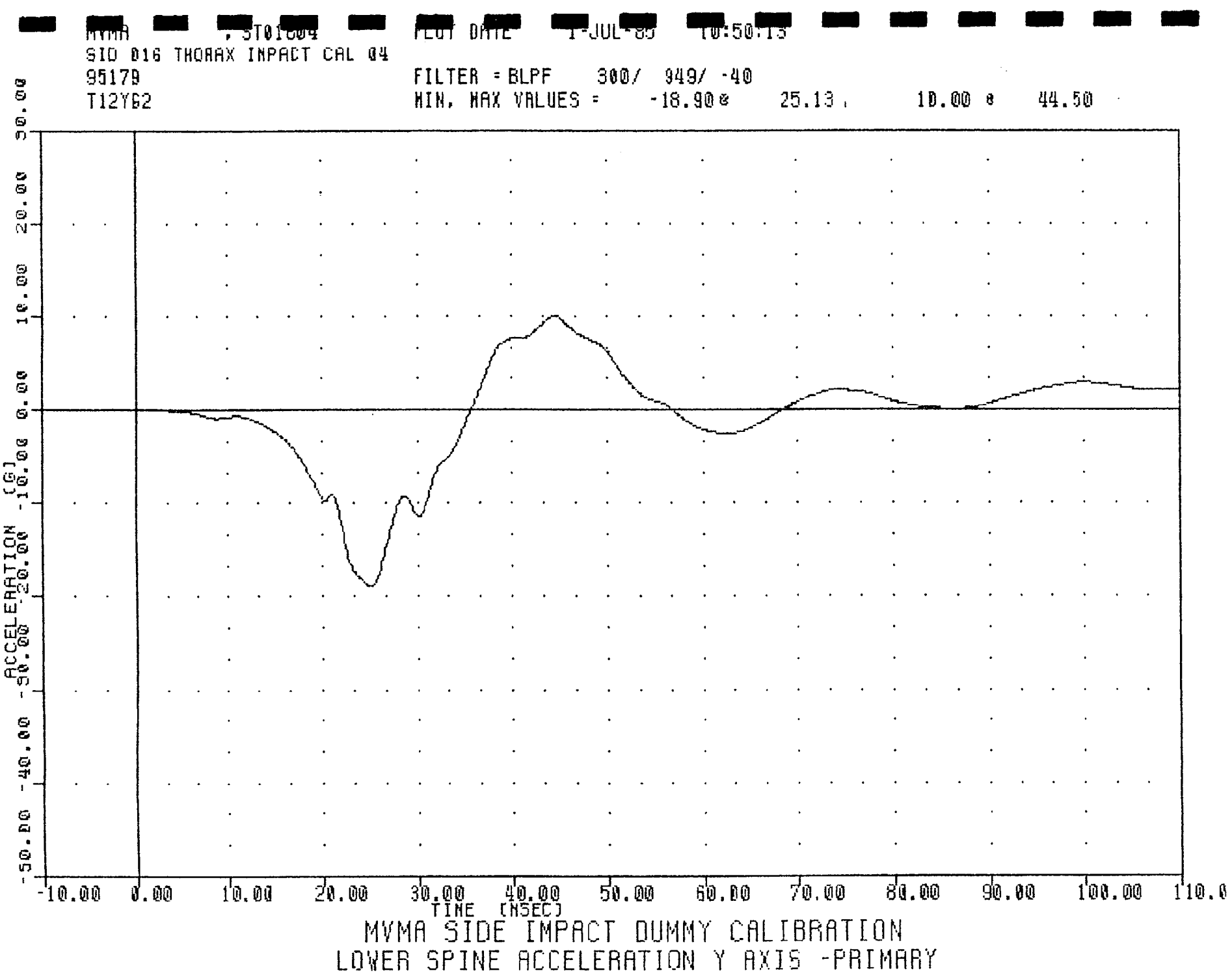
MVMA SIDE IMPACT DUMMY CALIBRATION
PISTON VELOCITY



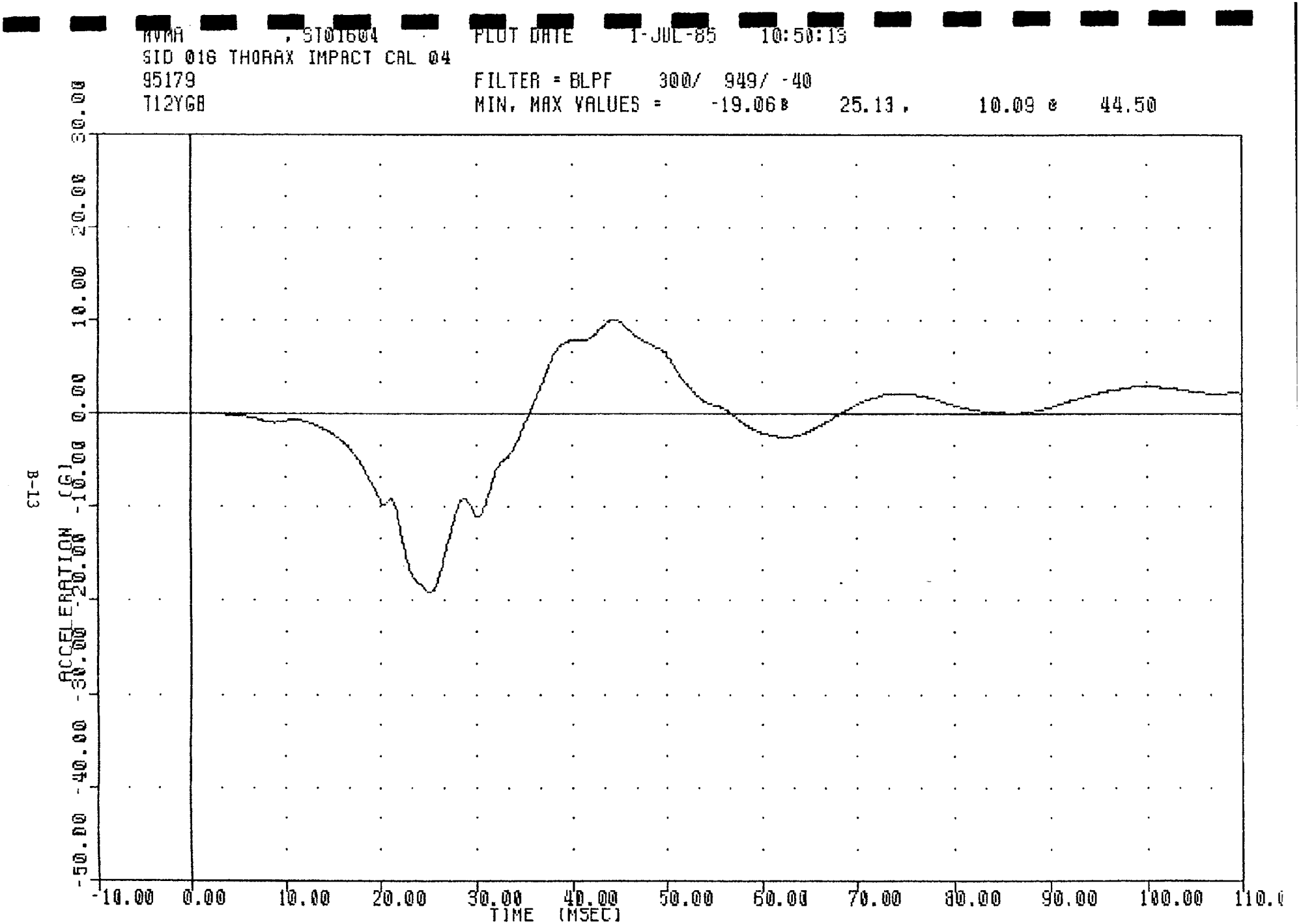
NVMA SIDE IMPACT DUMMY CALIBRATION
UPPER SPINE ACCELERATION Y AXIS -PRIMARY



MVMA SIDE IMPACT DUMMY CALIBRATION
UPPER SPINE ACCELERATION Y AXIS -REDUNDANT

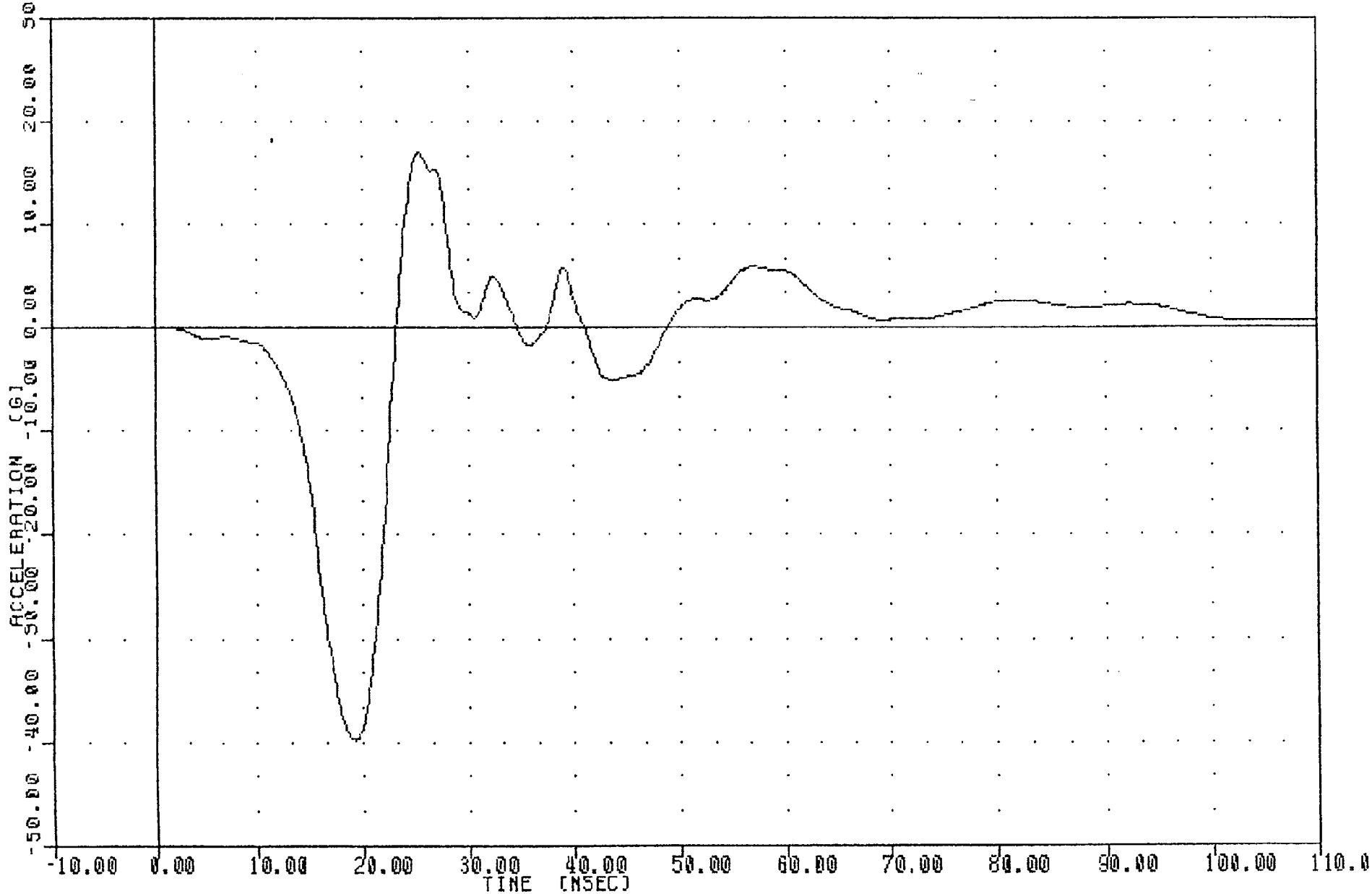


MVMA SIDE IMPACT DUMMY CALIBRATION
LOWER SPINE ACCELERATION Y AXIS -PRIMARY

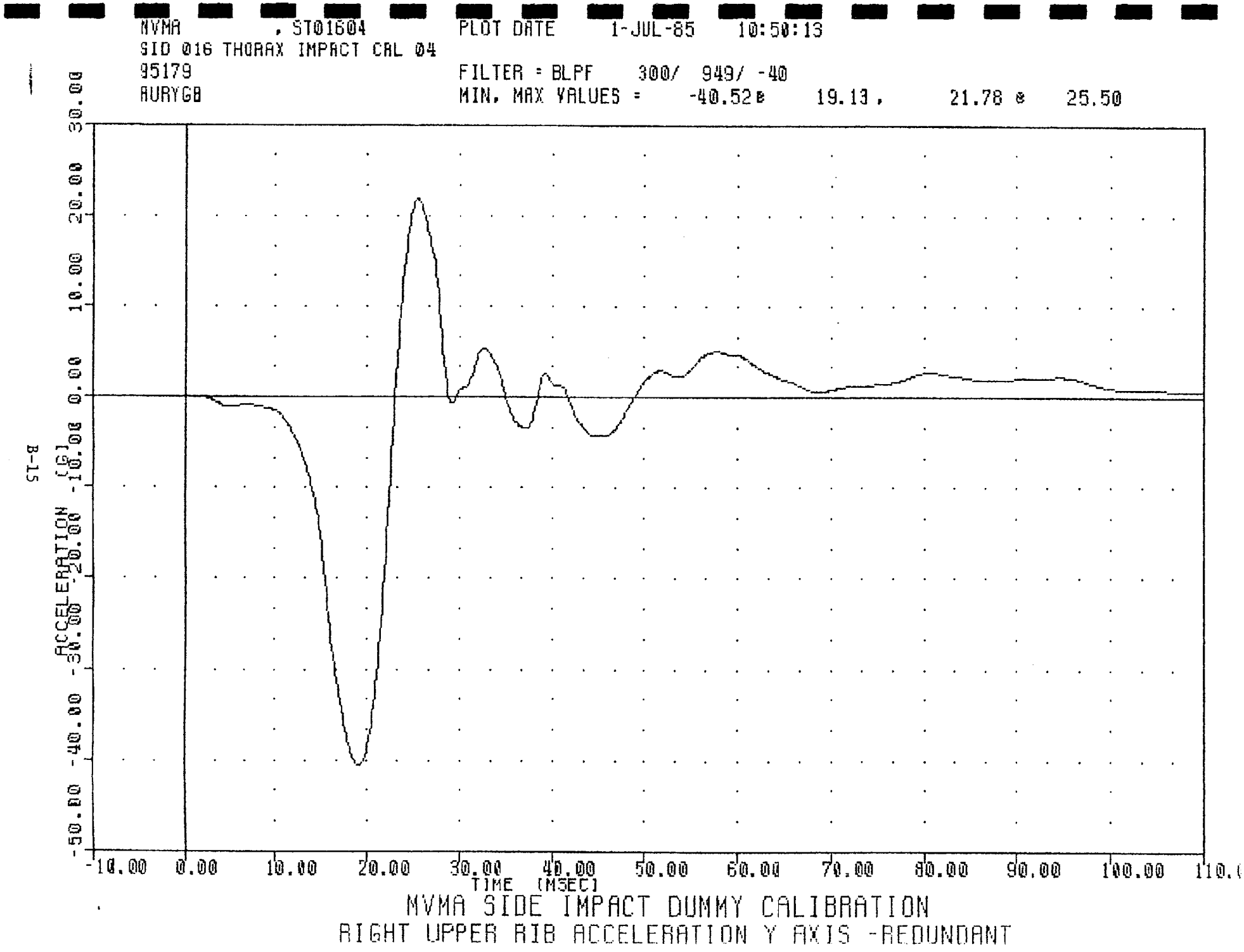


MVMA SIDE IMPACT DUMMY CALIBRATION
LOWER SPINE ACCELERATION Y AXIS -REDUNDANT

MVMA , ST01604 PLOT DATE 1-JUL-85 10:50:13
SID D16 THORAX INPACT CAL 04
95179 FILTER = BLPF 300/ 949/ -40
RURY62 MIN, MAX VALUES = -39.75 @ 19.38 , 16.97 @ 25.38

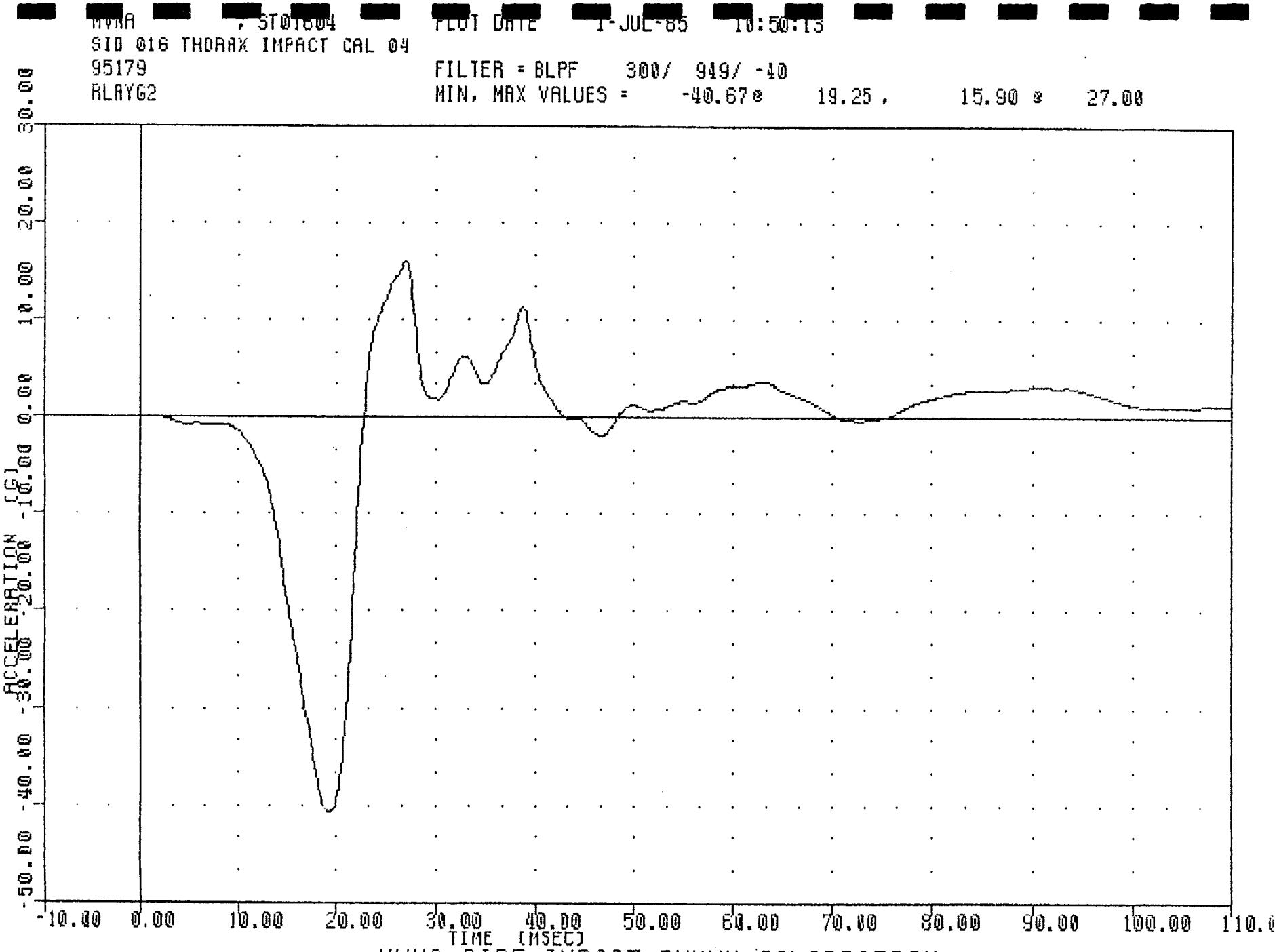


MVMA SIDE IMPACT DUMMY CALIBRATION
RIGHT UPPER RIB ACCELERATION Y AXIS -PRIMARY

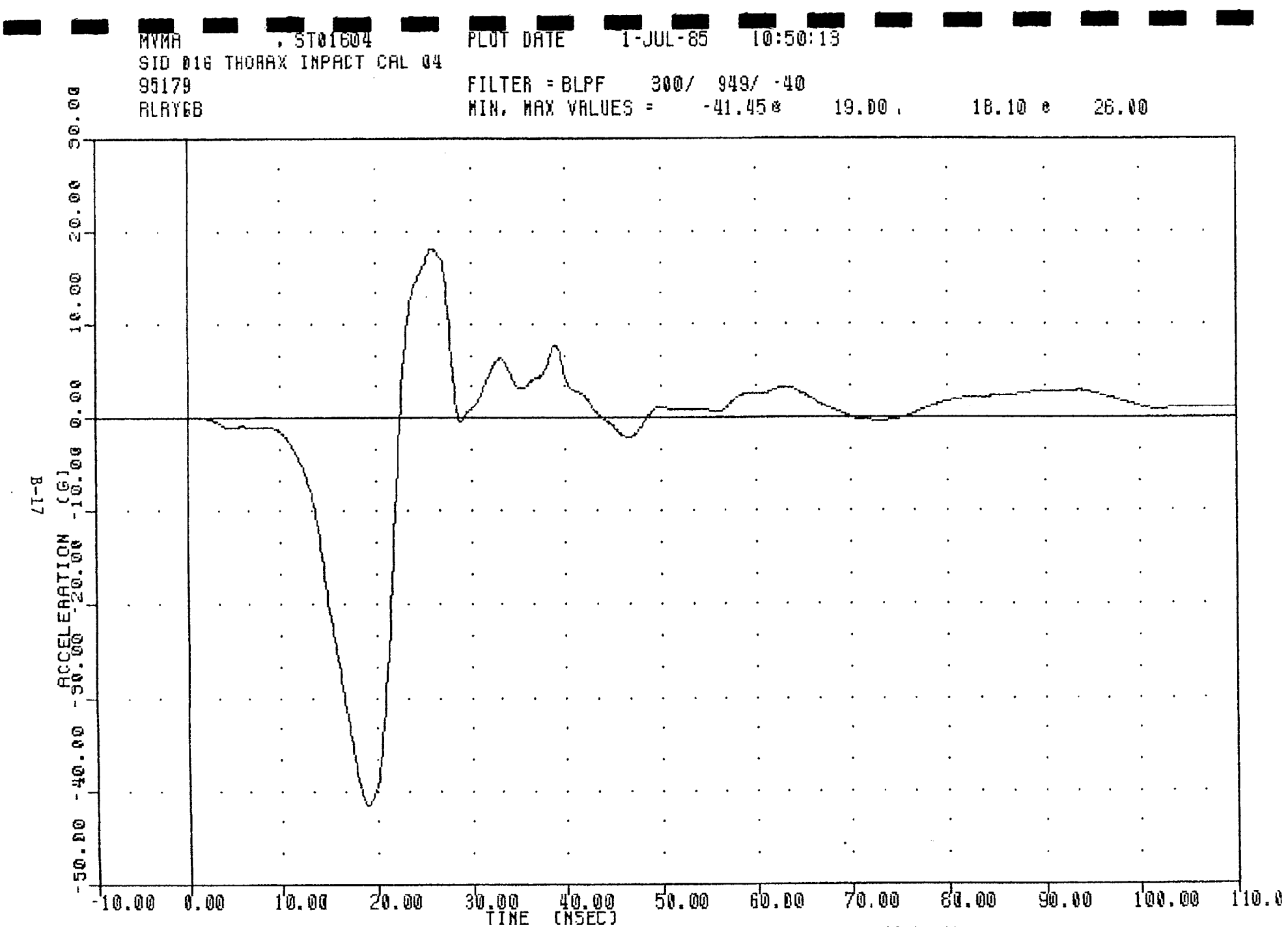


NVMA SIDE IMPACT DUMMY CALIBRATION

RIGHT UPPER RIB ACCELERATION Y AXIS -REDUNDANT

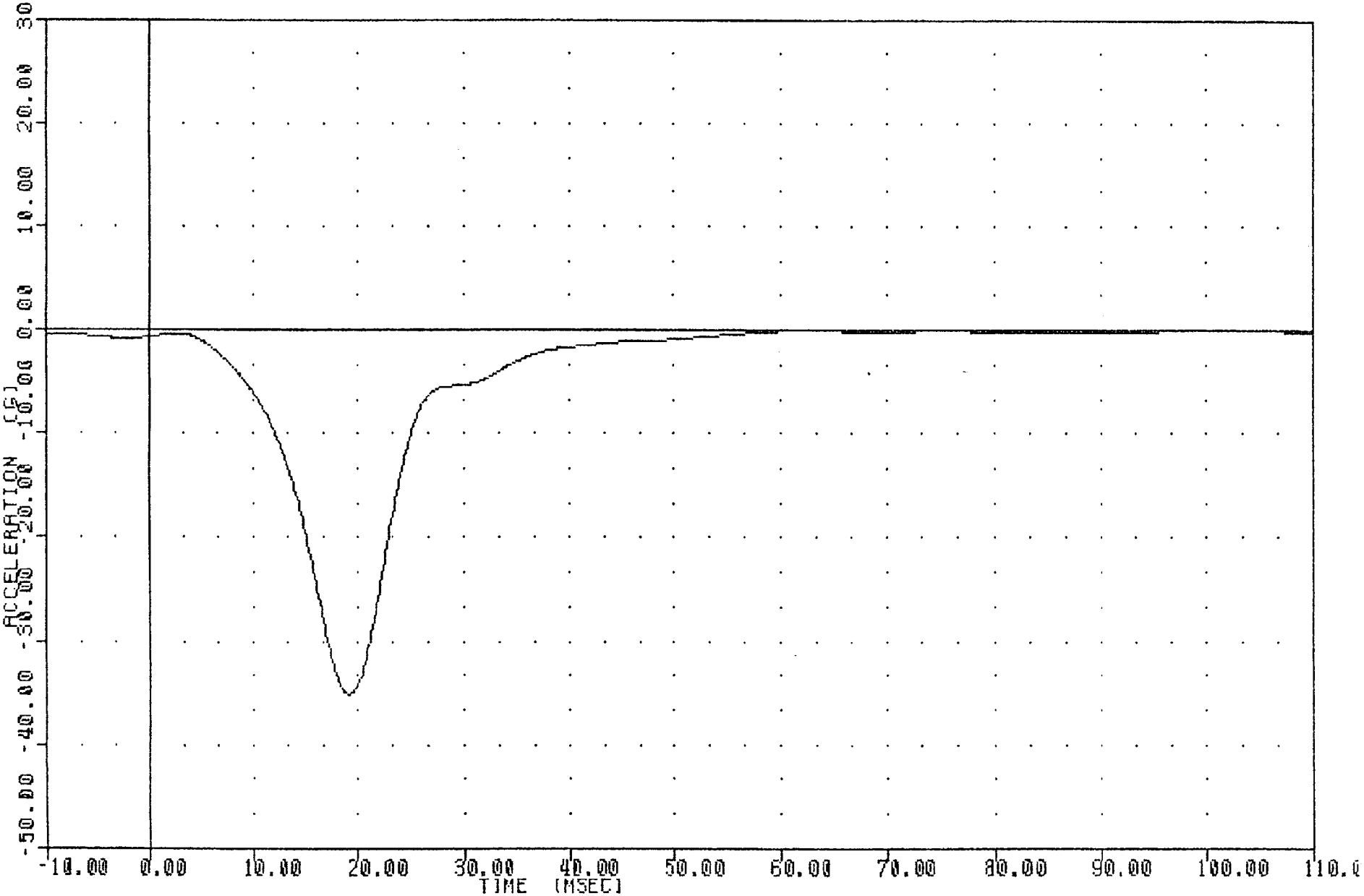


MVMA SIDE IMPACT DUMMY CALIBRATION
RIGHT LOWER RIB ACCELERATION Y AXIS -PRIMARY



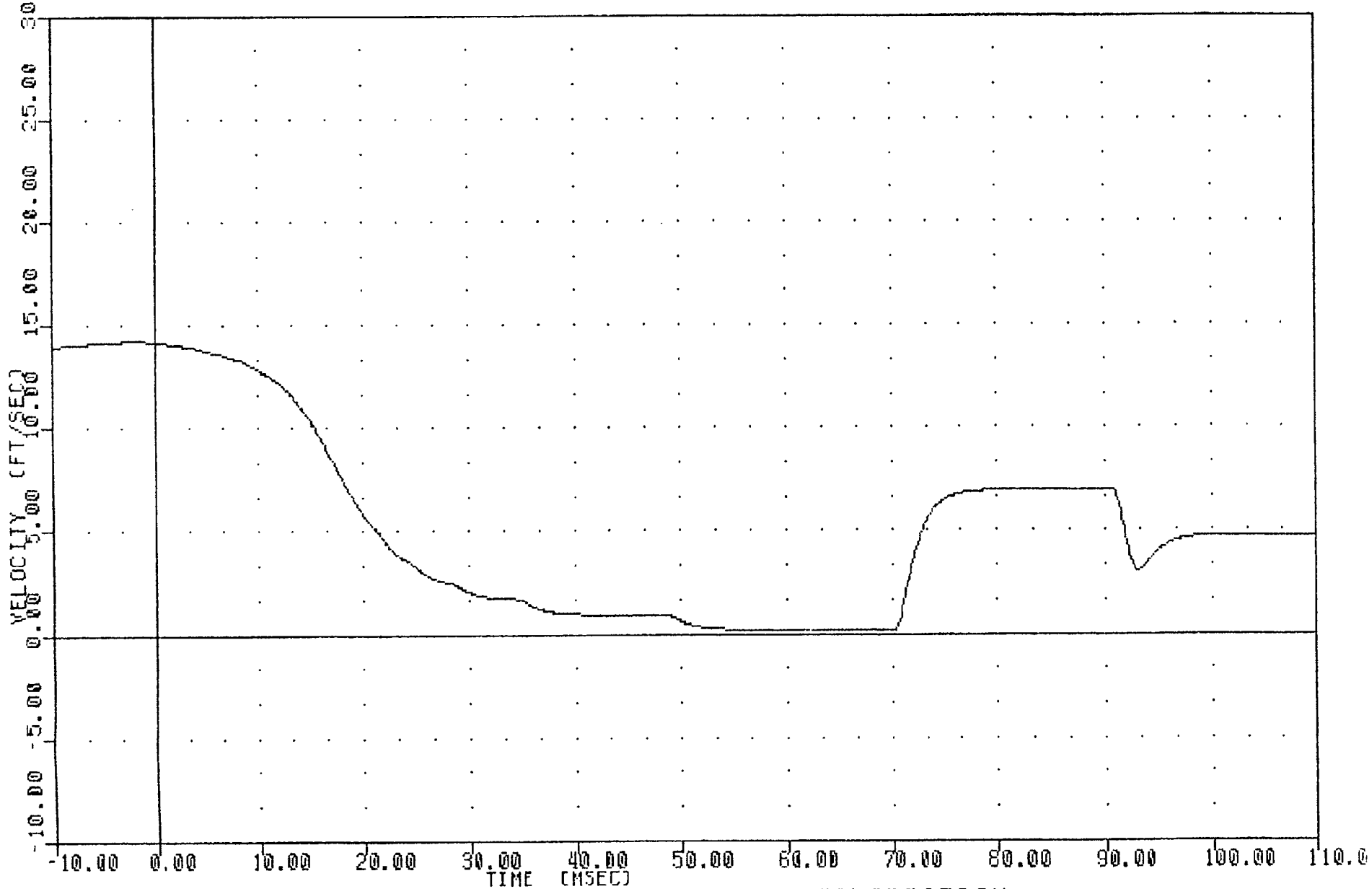
MVMA SIDE IMPACT DUMNY CALIBRATION
RIGHT LOWER RIB ACCELERATION Y AXIS -REDUNDANT

NVMA , SP01604 PLOT DATE 1-JUL-85 10:49:04
SID 016 PELVIC IMPACT CAL 04
85178 FILTER = BLPF 100/ 316/ -40
PISXG MIN, MAX VALUES = -35.16 @ 19.13 , 0.00 @ 98.63

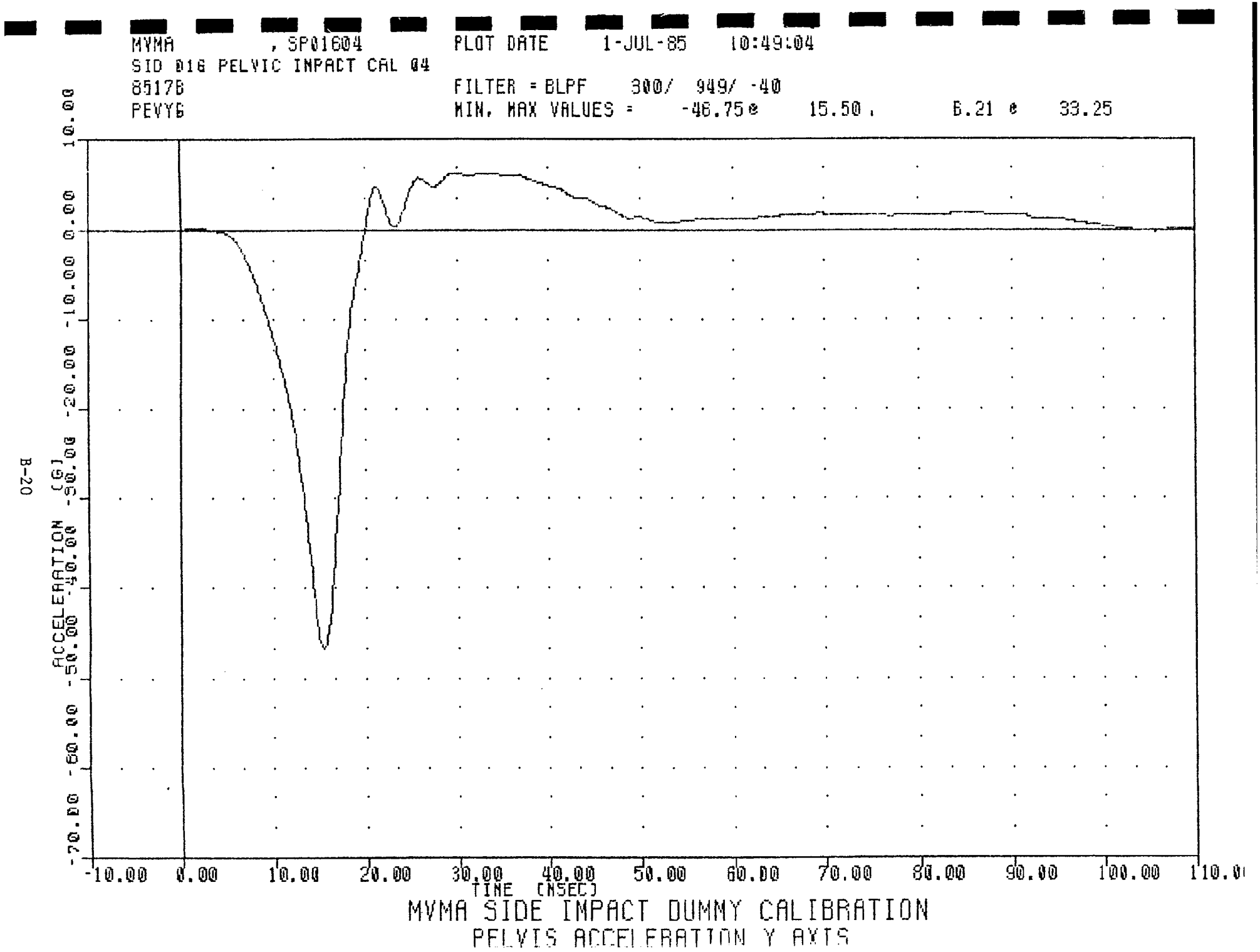


NVMA SIDE IMPACT DUMMY CALIBRATION
PISTON ACCELERATION

MVMA , SP01604 PLOT DATE 1-JUL-85 10:49:04
SID 016 PELVIC IMPACT CAL 04
85178 FILTER = RLPF 1650/ 5214/ -40
PISXV MIN, MAX VALUES = 0.14@ 70.13, 14.24 @ -2.13



MVMA SIDE IMPACT DUMMY CALIBRATION
PISTON VELOCITY


MVMA , SP01604
PLOT DATE 1-JUL-85 10:49:04
SID 016 PELVIC INPACT CAL 04
8517B
PEVY6
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -46.75 @ 15.50 , 6.21 @ 33.25
ACCELERATION (G)
10.00
0.00
-10.00
-20.00
-30.00
-40.00
-50.00
-60.00
-70.00
-10.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00
110.00
TIME (MSEC)
MVMA SIDE IMPACT DUMMY CALIBRATION
PELVIS ACCELERATION Y AXIS