

REPORT NO. TRC-92-N06

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

VOLKSWAGEN AG GERMANY
1993 VOLKSWAGEN EUROVAN
VAN

NHTSA NO. MP5800
TRC TEST NO. 930127

PREPARED BY:
TRANSPORTATION RESEARCH CENTER INC.
10820 STATE ROUTE 347
EAST LIBERTY, OHIO 43319



FEBRUARY 19, 1993

FINAL REPORT

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REPORT PREPARED BY:

Craig A. Markusic
Craig A. Markusic, Project Engineer
Transportation Research Center Inc.

Date 2/16/93

REPORT APPROVED BY:

C. Kay Latimer
C. Kay Latimer, Project Manager
Transportation Research Center Inc.

Date 2/17/93

FINAL REPORT ACCEPTED BY:

Stuart Jay Segel
Manager, New Car Assessment Program
NHTSA, Office of Market Incentives

Date _____

JUN 01 1993

Hans C. Chan
Contracting Officer's Technical Representative (COTR),
NHTSA, Office of Market Incentives

Date _____

JUN 01 1993

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16. Abstract A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1993 Volkswagen EuroVan van, NHTSA No. MP5800, at Transportation Research Center Inc. on January 27, 1993. This test was conducted to obtain new car assessment and research data indicant of FMVSS 208 performance. The barrier impact velocity was 56.2 kph. The vehicle's maximum static crush was 515 millimeters. The ambient temperature was 21°C. The driver's head injury criteria (HIC) was 1296. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 56.7 g. The driver's left and right femur maximum axial forces were 763 N and 358 N, respectively. The passenger's head injury criteria (HIC) was 663. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 56.0 g. The passenger's left and right femur maximum axial forces were 1495 N and 2101 N, respectively.			
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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	0.9	tonnes	t
VOLUME				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	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	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13.10.286.

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	tonnes (1000 kg)	1.1	short tons	
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
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	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

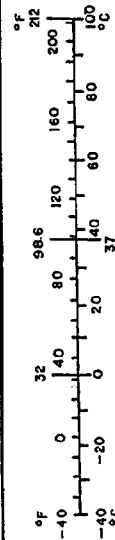


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SECTION 1.0

PURPOSE AND TEST PROCEDURE

PURPOSE

This 56 kph (35 mph) frontal barrier impact test is part of the New Car Assessment Program (NCAP) conducted for the National Highway Traffic Safety Administration's (NHTSA) Office of Market Incentives by Transportation Research Center Inc. (TRC) under Contract No. DTNH22-90-D-22121.

The purpose of this test was to obtain new car assessment and research data for vehicle crashworthiness and occupant restraint system performance for the subject vehicle, a 1993 Volkswagen EuroVan van, NHTSA No. MP5800, at an impact speed in excess of the current 48 kph (30 mph) FMVSS 208 requirements.

TEST PROCEDURE

This test was conducted in accordance with NHTSA's Laboratory Indicant Test Procedure, New Car Assessment Program, dated January 1, 1990. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection" performance.

The test vehicle was instrumented with nine (9) accelerometers to measure longitudinal axis accelerations. The driver's and passenger's restraint systems were instrumented with four (4) seat belt load cells to measure lap belt tension and shoulder belt tension, two (2) string potentiometers to measure shoulder belt displacement, and two (2) linear potentiometers to measure shoulder belt stretch. The vehicle impacted a frontal load cell barrier instrumented with thirty-six (36) barrier face load cells. The vehicle's specified impact velocity range was 55.5 to 57.1 kph.

The test vehicle contained two (2) Part 572B 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant Test Procedure.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations, and with left and right femur load cells to measure axial forces.

The sixty-nine (69) data channels were multiplexed and recorded on two (2) 14-track tape drives. The data was digitally sampled at 8000 samples per second and processed per section IP11 of the Laboratory Indicant Test Procedure.

The crash event was recorded by one (1) real-time panning motion picture camera and sixteen (16) high-speed motion picture cameras. The pre- and post-test conditions were recorded by one (1) real-time motion picture camera.

The vehicle, occupant, and load cell barrier data are presented in Section 2.0. The occupant, camera, and vehicle measurements are presented in Section 3.0. Appendix A contains the still photographic prints. Appendix B contains the dummy, vehicle, and load cell barrier data plots. Appendix C contains the dummy certification data. Appendix D contains miscellaneous test information. Appendix E contains the restraint system instructions from the owner's manual.

SECTION 2.0

FRONTAL BARRIER IMPACT TEST SUMMARY

TEST RESULTS SUMMARY

This frontal load cell barrier test was conducted at TRC on January 27, 1993.

The test vehicle, a 1993 Volkswagen EuroVan van, NHTSA No. MP5800, was equipped with a 2.5 liter transverse engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 2026 KG. The vehicle's impact speed was 56.2 kph. The vehicle sustained 515 mm of static crush during the impact.

The driver's head injury criteria (HIC) was 1296. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 56.7 g. The driver's left and right femur maximum axial forces were 763 N and 358 N, respectively.

The passenger's HIC was 663. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 56.0 g. The passenger's left and right femur maximum axial forces were 1495 N and 2101 N, respectively.

DATA ACQUISITION EXPLANATIONS

The right front passenger's chest Z-axis accelerometer recorded a questionable data spike at 24 milliseconds. This data spike affected the chest resultant acceleration calculation but did not affect the chest resultant acceleration with 3 milliseconds minimum duration calculation. The data acquisition circuit was checked immediately after the test and appeared normal. The cause of the data spike could not be identified.

The engine top X-axis acceleration, ENGXG1, exceeded the channel full scale value at 21 milliseconds.

The engine bottom X-axis accelerometer, ENGXG2, lost data at 57 milliseconds resulting from the vehicle's crush cutting the accelerometer cable on impact.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: MP5800 TEST TYPE: Frontal Load Cell Barrier

TEST DATE: 01/27/93 TEST TIME: 1425 AMBIENT TEMP.: 21° C

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1993/Volswagen/EuroVan/van

VEHICLE TEST WEIGHT (KG): 2026

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (KPH)**: PRIMARY = 56.2 SECONDARY = 56.2

MAXIMUM STATIC CRUSH (MM): 515

AVERAGE REBOUND (MM): 960

DUMMIES: Driver #713 Passenger #826

TYPE: Part 572 B Part 572 B

LOCATION: Left front Right front

RESTRAINT: 3-point unbelt 3-point unbelt

NUMBER OF DATA CHANNELS: 69

NUMBER OF CAMERAS: HIGH-SPEED 16 REAL-TIME 2

*With respect to tow track centerline.
**Speed trap measurement ($\pm$.08 kph accuracy)

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagen AG Germany

MAKE/MODEL: Volkswagen/EuroVan

VIN: WV2HC0700PH008015

BODY STYLE: Van

MODEL YEAR: 1993

NHTSA NO.: MP5800

COLOR: White

ENGINE DATA: TYPE: transverse CYLINDERS: 4⁵ DISPLACEMENT: 2.5 liter

TRANSMISSION DATA: 4 SPEED, MANUAL, X AUTOMATIC, X FWD, RWD, 4WD

DATE VEHICLE RECEIVED: 12/16/92

ODOMETER READING: 270.0

DEALER'S NAME AND ADDRESS: Karg Volkswagen
P. O. 1386
3950 Pearl Rd.
Medina, OH 44258

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	Yes	REAR WINDOW DEFROSTER	Yes
OTHER	None		

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

CERTIFICATION DATA FROM VEHICLE'S LABEL:

VEHICLE MANUFACTURED BY: Volkswagen AG Germany

DATE OF MANUFACTURE: 08/92

VIN: WV2HC0700PH008015

GVWR: 5578 LBS.

GAWR: FRONT: 2976 LBS., REAR: 2646 LBS.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Continental, Contact, 205/65R15

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 340 kPa
REAR: 340 kPa

SPARE TIRE (MFR., LINE, SIZE): Continental, Contact, 205/65R15

TYPE OF SEATS: FRONT: Bucket
ROW 2: Bench
ROW 3: Bench

TYPE OF FRONT SEAT BACKS: Manually-adjustable

MAXIMUM WIDTH: 1840 MM

WHEELBASE: 2920 MM

LOCATION OF LABEL STATING TIRE DATA:

The label was located on the driver's B-pillar.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: 205/65R15

RECOMMENDED COLD TIRE PRESSURE: FRONT: 300 kPa; REAR: 340 kPa

DESIGNATED SEATING CAPACITY: NA FRONT NA ROW 2 NA ROW 3
NA TOTAL

VEHICLE CAPACITY WEIGHT: NA KG

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN MILLIMETERS):

DELIVERED ATTITUDE: LF 726; RF 735; LR 730; RR 732

PRE-TEST ATTITUDE: LF 710; RF 718; LR 755; RR 733

POST-TEST ATTITUDE: LF 710; RF 713; LR 710; RR 690

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	553 KG	RIGHT REAR	318 KG
LEFT FRONT	558 KG	LEFT REAR	322 KG
TOTAL FRONT WEIGHT	1111 KG	(63.4% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	640 KG	(36.6% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	1751 KG		

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT*

UDW = UNLOADED DELIVERED WEIGHT (1751 KG)

VCW = VEHICLE CAPACITY WEIGHT (NA KG)

DSC = DESIGNATED SEATING CAPACITY (NA)

$RCLW* = VCW - 150 (DSC) = 136 \text{ KG}$

$TARGET \text{ TEST WEIGHT} = UDW + RCLW* + (NO. \text{ OF HYBRID II DUMMIES} \times 74 \text{ KG/DUMMY})$

$TARGET \text{ TEST WEIGHT} = 1751 + 136 + 148$

$TARGET \text{ TEST WEIGHT} = 2035 \text{ KG}$

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 127 KG OF CARGO WEIGHT:

RIGHT FRONT	610 KG	RIGHT REAR	417 KG
LEFT FRONT	607 KG	LEFT REAR	392 KG
TOTAL FRONT WEIGHT	1217 KG	(60.1% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	809 KG	(39.9% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2026 KG	(0.4 KG UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE: 73 KG

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: None

CG = 1166 MM REARWARD OF FRONT WHEEL CENTERLINE

*Cargo weight for multi-purpose passenger vehicles, trucks, and buses is the vehicle's rated cargo and luggage weight from the vehicle's label or 136 KG, whichever is less.

TABLE 3 POST-IMPACT DATA

TEST NUMBER: 930127 NHTSA NO.: MP5800
TEST DATE: 01/27/93 TEST TIME: 1425
TEST TYPE: Frontal load cell barrier IMPACT ANGLE: 0°
AMBIENT TEMPERATURE AT IMPACT AREA: 21° C
TEMPERATURE IN OCCUPANT COMPARTMENT: 20° C
IMPACT VELOCITY: PRIMARY = 56.2 KPH SECONDARY = 56.2 KPH

(SPECIFIED RANGE = 55.5 TO 57.1 KPH)

DISTANCE FROM VEHICLE TO BARRIER: ENTERING VELOCITY TRAP = 356 MM

EXITING VELOCITY TRAP = 51 MM

TEST VEHICLE STATIC CRUSH (ALL MEASUREMENTS ARE IN MILLIMETERS):

OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 4520; C 4752; R 4530

POST-TEST: L 4280; C 4265; R 4250

TOTAL CRUSH: L 240; C 487; R 280

AVERAGE CRUSH: 336

TEST VEHICLE REBOUND FROM FLAT BARRIER

(ALL MEASUREMENTS ARE IN MILLIMETERS):

DISTANCE FROM TEST VEHICLE TO BARRIER: L 897; C 960; R 1022; AVG. 960

TABLE 4 FUEL SYSTEM DATA

MAKE/MODEL: Volkswagen/EuroVan

NHTSA NO.: MP5800

FUEL SYSTEM CAPACITY: 80.0 LITERS (FROM OWNER'S MANUAL)

USABLE CAPACITY: 80.0 LITERS (FURNISHED BY COTR)

TEST VOLUME RANGE: 73.6 LITERS TO 75.2 LITERS (92-94% OF USABLE)

ACTUAL TEST VOLUME: 74.2 LITERS (WITH ENTIRE FUEL SYSTEM FILLED)

TEST FLUID TYPE: STODDARD SOLVENT

SPECIFIC GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

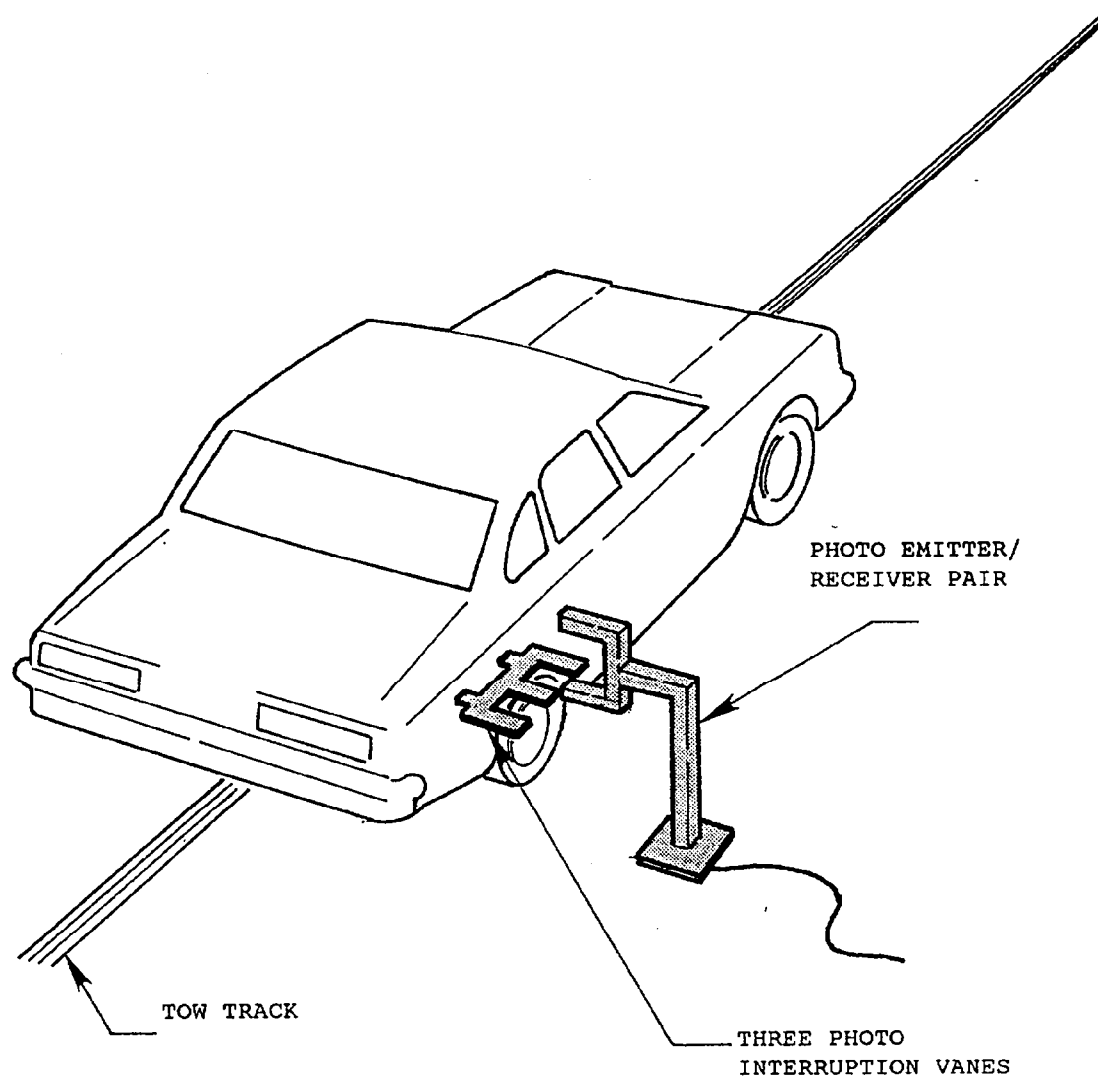
TEST FLUID COLOR: PURPLE

DETAILS OF FUEL SYSTEM: The fuel tank was located on the left side, in front of the rear axle. The fuel filler neck was located on the left side. The fuel lines ran along the left side to the front.

ELECTRIC FUEL PUMP: Yes FUEL INJECTION: Yes

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

FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane clears emitter/receiver 51 millimeters before impact.

The vanes have 305 millimeter spacing.

FIGURE 2 ACCIDENT INVESTIGATION DIVISION DATA
FOR 56 KPH (35 MPH) FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Volkswagen/EuroVan/van
 VEHICLE NHTSA NO.: MP5800; VIN: WV2HC0700PH008015
 MODEL YEAR: 1993; BUILD DATE: 08/92; TEST DATE: 01/27/92
 VEHICLE SIZE CATEGORY: Van; TEST WEIGHT: 2026 KG
 VEHICLE WHEELBASE: 2920 MM
 MAXIMUM WIDTH: 1840 MM
 FRONT OVERHANG: 950 MM

COLLISION DEFORMATION
 CLASSIFICATION (CDC) CODE: 12FDEW4

CRUSH DEPTH
 MEASUREMENTS:

C1 =	<u>240</u>	MM
C2 =	<u>495</u>	MM
C3 =	<u>515</u>	MM
C4 =	<u>495</u>	MM
C5 =	<u>465</u>	MM
C6 =	<u>280</u>	MM

VEHICLE CENTERLINE
 MIDPOINT OF DAMAGE: D = (LONGITUDINAL)

LENGTH OF DAMAGED
 REGION: L = 1790 MM

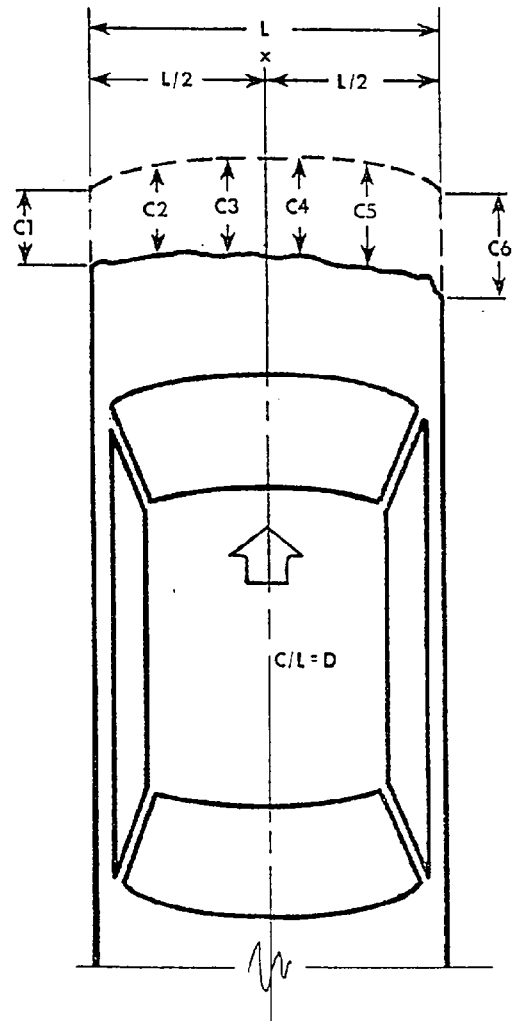
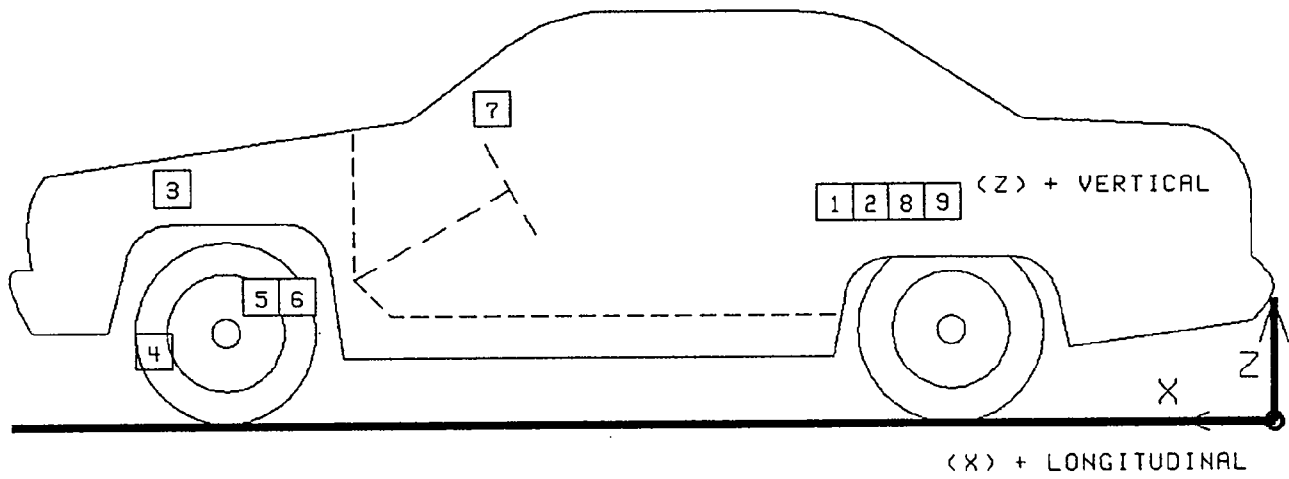
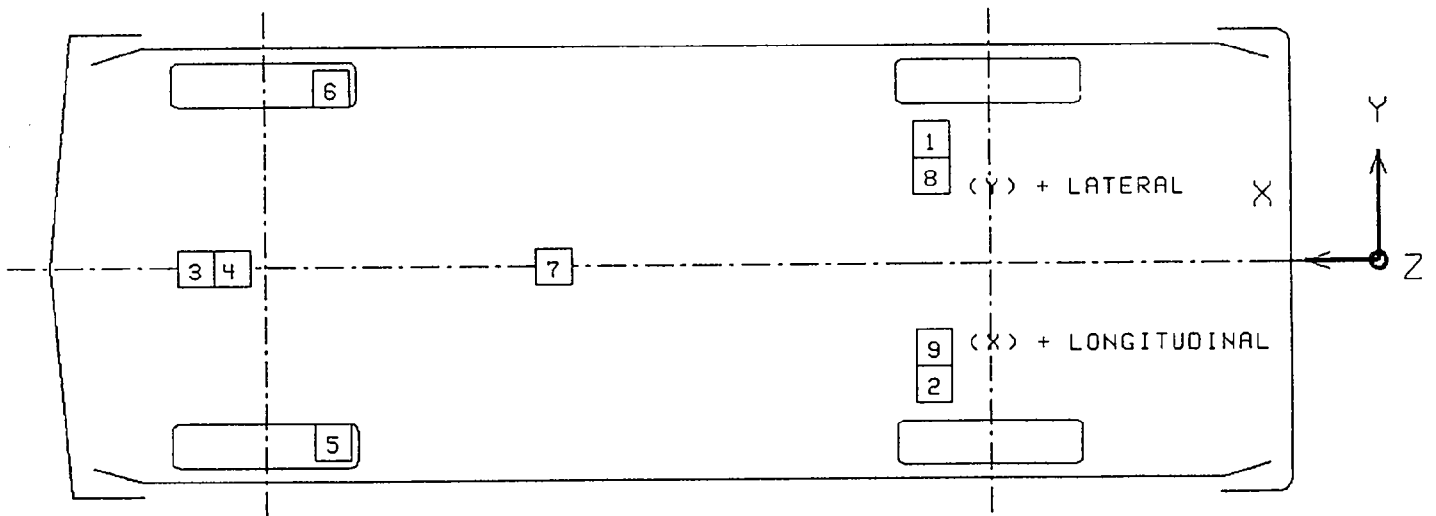


FIGURE 3

VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 5

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 930127

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX	G MSEC	MAX	G MSEC
1	LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	3012	615	475	2.0	89.1	36.7	30.0
2	RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	2922	-580	475	2.3	101.0	32.7	52.4
3	ENGINE TOP LONGITUDINAL	472	-95	900	50.1	54.3Y	404.7	21.4Y
4	ENGINE BOTTOM LONGITUDINAL	782	-180	204	---	---Y	60.3	45.5Y
5	RIGHT BRAKE CALIPER LONGITUDINAL	827	-668	319	12.6	60.8	99.3	41.8
6	LEFT BRAKE CALIPER LONGITUDINAL	827	668	321	27.3	71.0	69.0	54.6
7	INSTRUMENT PANEL CENTER LONGITUDINAL	1000	80	1310	52.4	54.9	63.2	45.6
8	LEFT REAR SEAT CROSSMEMBER REDUNDANT LONGITUDINAL	3012	615	475	2.9	88.6	35.8	29.9
9	RIGHT REAR SEAT CROSSMEMBER REDUNDANT LONGITUDINAL	2922	-580	475	3.0	100.5	33.1	52.5

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN MILLIMETERS. X-AXIS LOCATIONS ARE MEASURED REARWARD FROM THE FRONT BUMPER.

REFERENCE: X: + FORWARD ACCELERATION
Y: + LEFT FROM VEHICLE CENTERLINE
Z: + UP FROM GROUND LEVEL

Y See DATA ACQUISITION EXPLANATIONS

TABLE 6 POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #713	PASSENGER #826
HEAD	<u>Steering wheel hub</u>	<u>Chest, glove compartment door</u>
CHEST	<u>Steering wheel rim</u>	<u>None</u>
ABDOMEN	<u>None</u>	<u>None</u>
LEFT KNEE	<u>Instrument panel</u>	<u>Instrument panel</u>
RIGHT KNEE	<u>Instrument panel</u>	<u>Instrument panel</u>

DOOR OPENING:

	LEFT	RIGHT
FRONT	<u>Easy</u>	<u>Easy</u>
REAR	<u>NA</u>	<u>Easy</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
FRONT	<u>None</u>	<u>None</u>
REAR	<u>NA</u>	<u>NA</u>

GLAZING DAMAGE:

The entire windshield was cracked upon impact.

OTHER NOTABLE IMPACT EFFECTS:

The glove compartment door came off during the

impact.

TABLE 7 FMVSS 208 DATA SUMMARY

VEH. YR./MAKE/MODEL/BODY STYLE: 1993/Volkswagen/EuroVan/van

VEH. NHTSA NO.: MP5800; TEST DATE: 01/27/93

	DRIVER	PASSENGER
MAXIMUM ACCELERATIONS (G):	DUMMY #713	DUMMY #826
HEAD X-AXIS	-40.2	-22.7
HEAD Y-AXIS	78.3	-27.5
HEAD Z-AXIS	-86.7	-77.9
HEAD RESULTANT	118.3	79.8
CHEST X-AXIS	-55.7	-65.1
CHEST Y-AXIS	22.1	-31.4
CHEST Z-AXIS	-11.6	-18.6Y
CHEST RESULTANT*	56.7	56.0
CHEST RESULTANT TIME INTERVAL (SEC.)*	.003	.003

HEAD INJURY CRITERIA (HIC) VALUES:

HIC**	1296	663
HIC STARTING TIME (SEC.)	.068	.067
HIC ENDING TIME (SEC.)	.094	.103
AVG. HEAD RESULTANT ACCEL. DURING		
HIC TIME INTERVAL (G)	75.8	50.8

MAXIMUM COMPRESSIVE FEMUR FORCES (N):

LEFT FEMUR	763	1495
RIGHT FEMUR	358	2101

MAXIMUM SEAT BELT FORCES (N):

LAP BELT	8089	8038
SHOULDER BELT	9057	8639

NOTE: ALL VALUES LISTED MUST BE OCCURRING DURING PRIMARY IMPACT EVENT.
(HEAD ACCELERATIONS LISTED MUST BE DURING HIC TIME INTERVAL.)

*0.003 SEC. MINIMUM DURATION.

**THE MAXIMUM HIC TIME INTERVAL IS 36 MILLISECONDS.

Y See DATA ACQUISITION EXPLANATIONS

DUMMY KINEMATIC SUMMARY

DRIVER DUMMY

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and upper torso rotated slightly to the left as the dummy's chest impacted the lower steering wheel rim and the dummy's head rotated downward impacting the steering wheel hub. The driver dummy was restrained by the three-point unbelt. The dummy rebounded rearward and slightly to the right into the seat back. The driver dummy came to rest in the driver's seat leaning slightly to the right, restrained by the three-point unbelt.

RIGHT FRONT PASSENGER DUMMY

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and upper torso rotated downward and to the right. The dummy's head impacted the dummy's chest and the top edge of the glove compartment door. The right front passenger dummy was restrained by the three-point unbelt. The dummy, still rotated to the right, rebounded rearward and slightly to the right into the seat back. The dummy's head contacted the right side header. The right front passenger dummy came to rest in the right front passenger's seat, rotated slightly to the right, restrained by the three-point unbelt.

TABLE 8 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

	DRIVER	PASSENGER
<u>BELT LENGTH DATA:</u>		
BELT LENGTH FROM TRIM PANEL EXIT TO BOLT HOLE ANCHOR POINT FOR CONTINUOUS WEBBING SYSTEMS.	2626	2626
SHOULDER BELT LENGTH AS MEASURED ON PART 572 DUMMY.	940	952
LAP BELT LENGTH AS MEASURED ON PART 572 DUMMY.	894	952
<u>SHOULDER BELT SPOOL-OFF LENGTH:</u>		
AS DETERMINED BY FILM ANALYSIS	102	84
AS DETERMINED MECHANICALLY	NA*	79
AS DETERMINED ELECTRONICALLY	158	48
<u>BELT STRETCH LENGTH (MM/M):</u>		
AS MEASURED MECHANICALLY	7	NA**
AS MEASURED ELECTRONICALLY	44	42
<u>RETRACTOR LOCK-UP TIME (MS):</u>		
AS DETERMINED BY SHOULDER BELT SPOOL-OFF	60	54

ALL MEASUREMENTS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

*No mechanical indication of seat belt spoolout was available as a result of the spoolout indicator string coming out of the guide on impact.

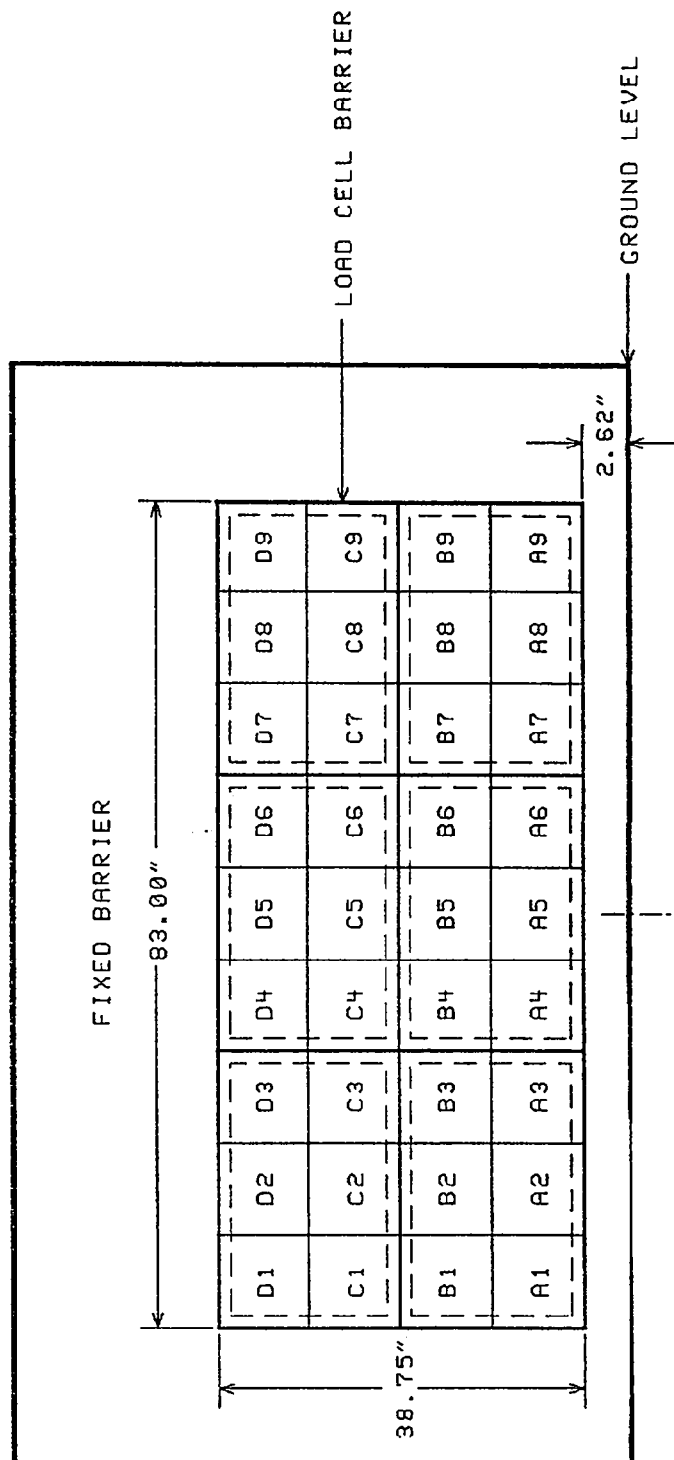
**The seat belt stretch indicator string did not give an accurate indication of belt stretch as a result of the shoulder belt twisting on impact.

FIGURE 4

LOAD CELL BARRIER CONFIGURATION

FRONT VIEW

36 LOAD CELLS
4 ROWS
9 COLUMNS



- GROUP 1: A1 THRU B3
- GROUP 2: A4 THRU B6
- GROUP 3: A7 THRU B9
- GROUP 4: C1 THRU D3
- GROUP 5: C4 THRU D6
- GROUP 6: C7 THRU D9

TABLE 9

LOAD CELL BARRIER DATA SUMMARY

TEST NUMBER 930127

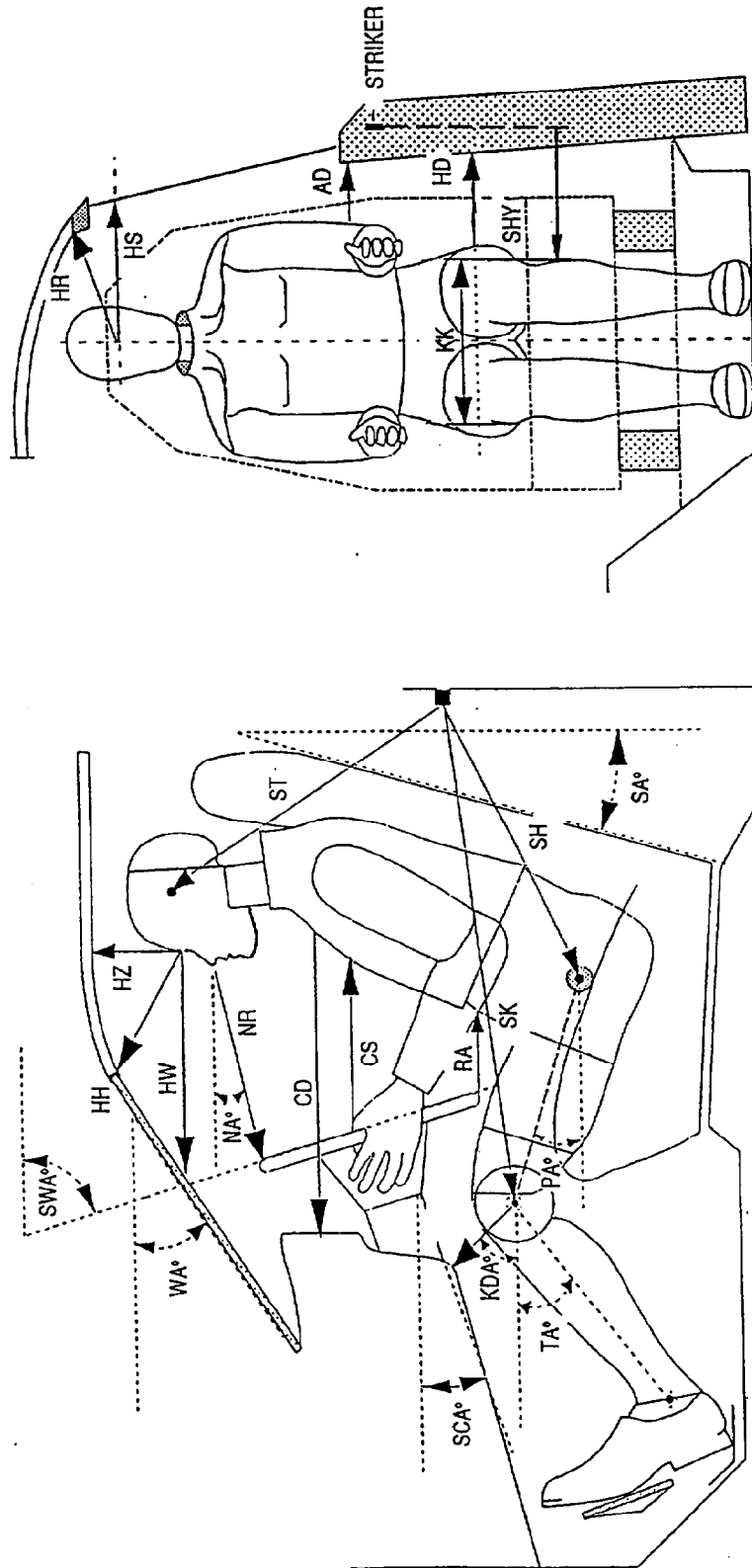
LOCATION	POSITIVE DIRECTION		NEGATIVE DIRECTION	
	KN	MSEC	KN	MSEC
TOTAL GROUP 1	2.6	1.4	115.1	19.3
TOTAL GROUP 2	2.3	153.5	133.4	4.6
TOTAL GROUP 3	2.9	1.3	172.0	19.3
TOTAL GROUP 4	1.6	153.3	97.3	42.6
TOTAL GROUP 5	1.6	153.3	143.1	36.0
TOTAL GROUP 6	1.8	153.4	240.5	33.8
TOTAL LOAD CELL FORCE	10.2	153.3	666.4	33.6
TENSION IS POSITIVE				
COMPRESSION IS NEGATIVE				

SECTION 3.0

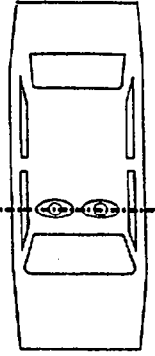
OCCUPANT, CAMERA, & VEHICLE MEASUREMENTS

FIGURE 5

DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS



VERTICAL TRANSVERSE PLANE



VERTICAL LONGITUDINAL PLANE

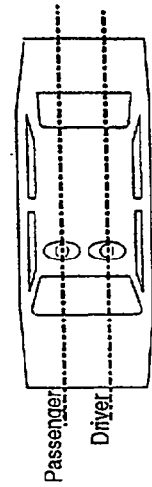
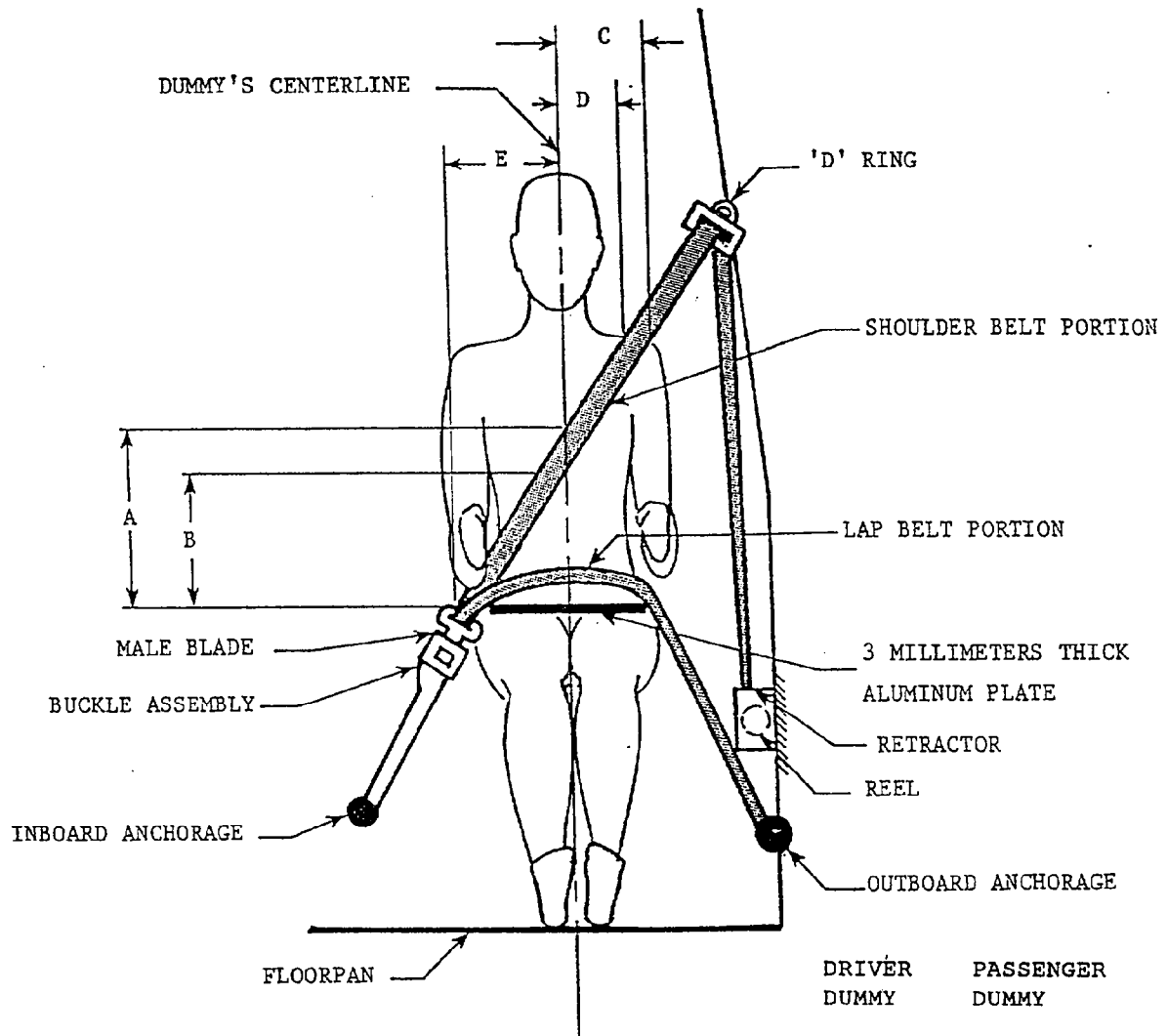


TABLE 10 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

DESIGNATION	TYPE OF MEASUREMENT	DRIVER (SERIAL #713)	PASSENGER (SERIAL #826)
WA°	WINDSHIELD ANGLE	40°	NA
SWA°	STEERING WHEEL ANGLE	45°	NA
SCA°	STEERING COLUMN ANGLE	45°	NA
SA°	SEAT BACK ANGLE	13°	13°
HZ	HEAD TO ROOF	167	174
HH	HEAD TO HEADER	485	527
HW	HEAD TO WINDSHIELD	611	654
HR	HEAD TO SIDE HEADER	275	270
NR	NOSE TO RIM	546	NA
NA	NOSE TO RIM ANGLE	20°	NA
CD	CHEST TO DASH	674	649
CS	STEERING WHEEL TO CHEST	344	NA
RA	RIM TO ABDOMEN	214	NA
KDL	LEFT KNEE TO DASH	150	112
KDR	RIGHT KNEE TO DASH	177	121
KDA	OUTBOARD KNEE TO DASH ANGLE	8°	24°
PA°	PELVIC ANGLE	4°	4°
TA°	TIBIAL ANGLE	45°	45°
KK	KNEE TO KNEE	345	250
ST	STRIKER TO HEAD	541	522
	STRIKER TO HEAD ANGLE	-80°	-77°
SK	STRIKER TO KNEE	634	651
	STRIKER TO KNEE ANGLE	11°	10°
SH	STRIKER TO H-POINT	252	280
	STRIKER TO H-POINT ANGLE	40°	30°
SHY	STRIKER TO H-POINT (Y DIR.)	240	230
HS	HEAD TO SIDE WINDOW	365	344
HD	H-POINT TO DOOR	175	465
AD	ARM TO DOOR	145	125

THE SEAT BACK ANGLE (SA°) IS MEASURED RELATIVE TO VERTICAL, ALL OTHER ANGLES ARE MEASURED RELATIVE TO HORIZONTAL.
ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 6 SEAT BELT POSITIONING DATA



ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 7 CAMERA POSITIONS

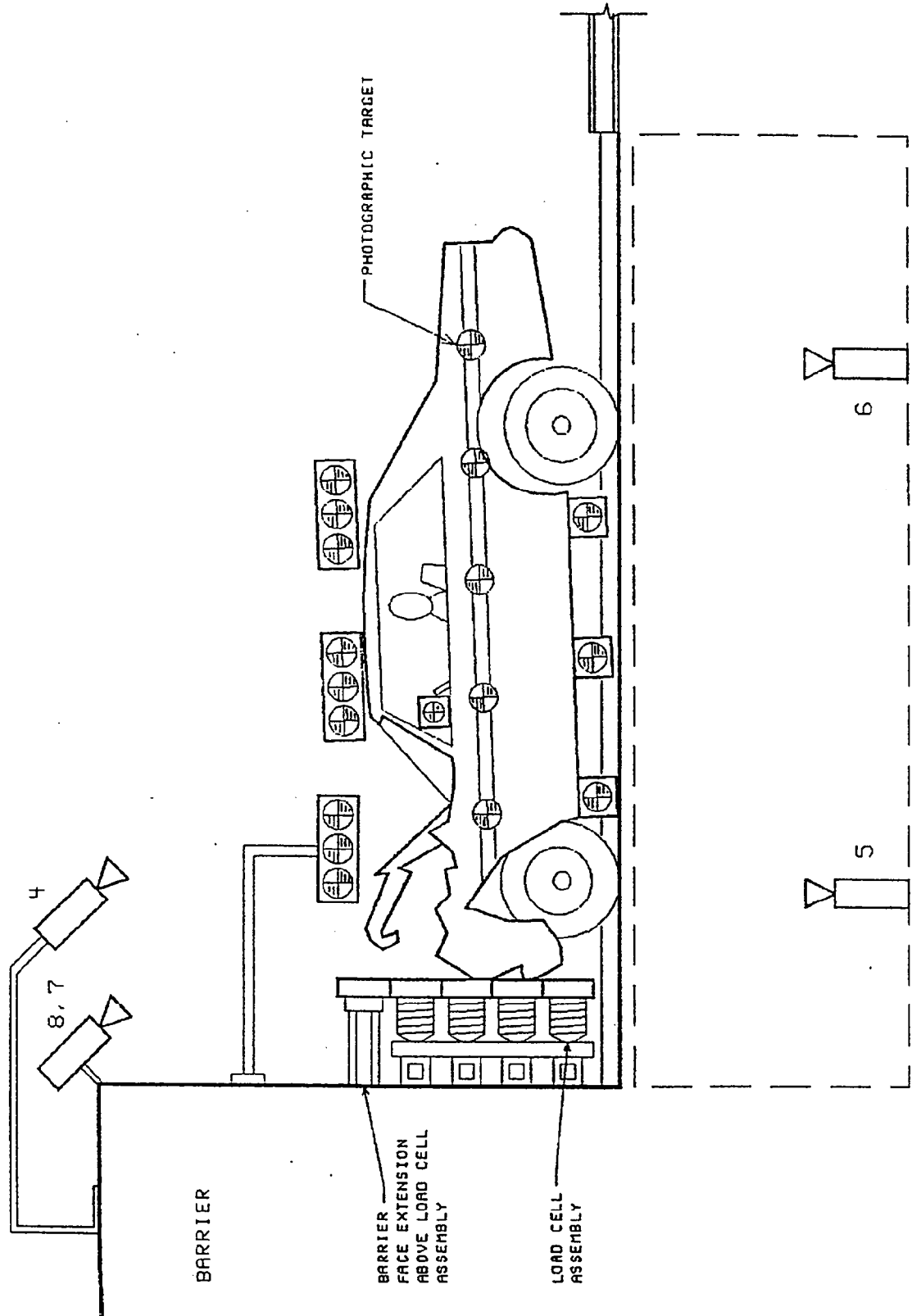


FIGURE 7 CAMERA POSITIONS, CONT'D.

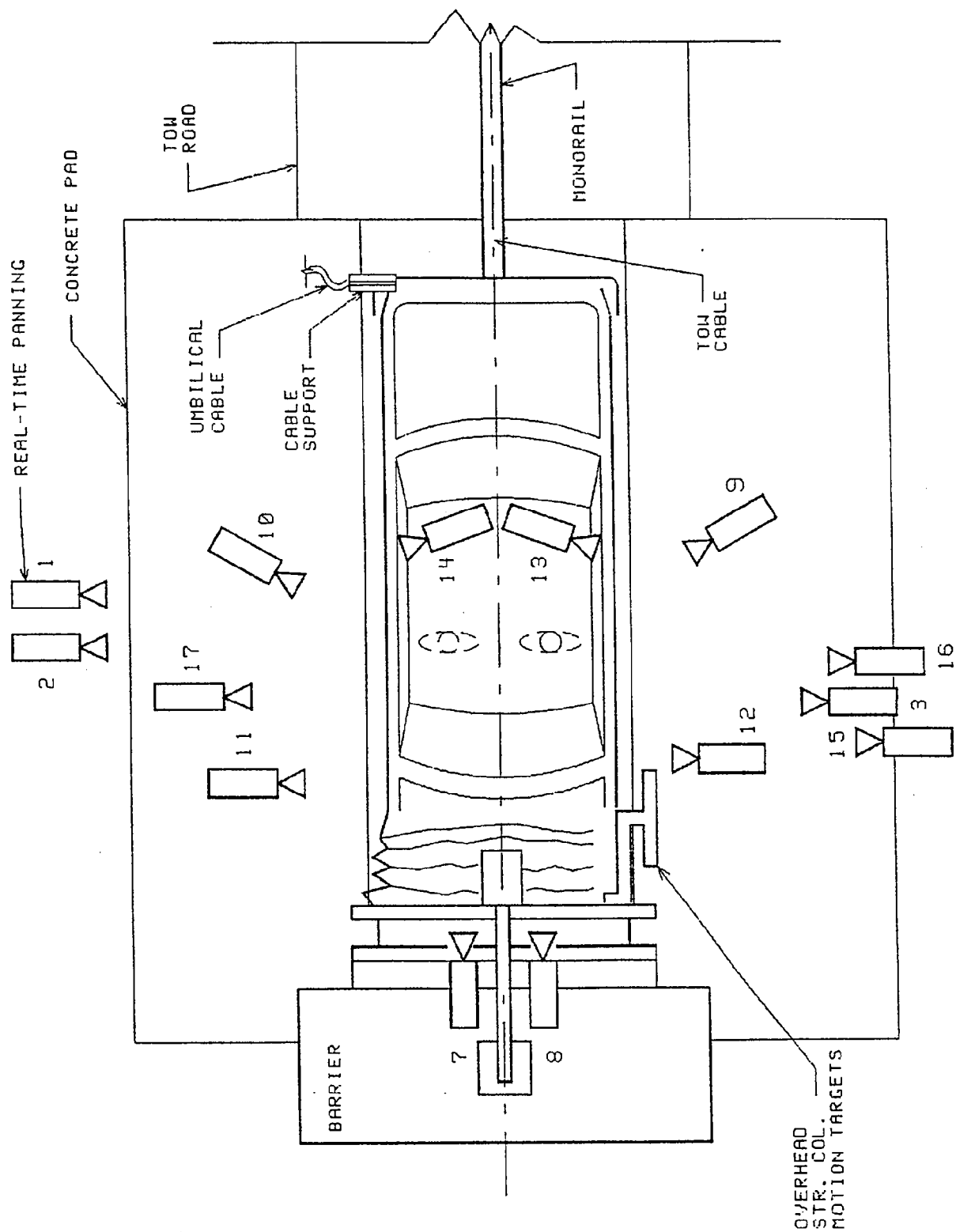


TABLE 11 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 930127		VEHICLE: 1993 Volkswagen EuroVan van		FILM PLANE		
CAMERA NO.	VIEW	CAMERA POSITIONS (MM)*			ANGLE** (DEG)	FILM SPEED (FPS)
		X	Y	Z		
1	Real-time panning	-3607	-12802	1549	NA	NA***
2	Vehicle crush	-2065	-6767	942	-2	490
3	Dummy kinematics	-1054	7493	1118	-12	1005
4	Windshield damage	-925	0	2489	-40	498
5	Crush & fluid spillage	-1283	0	-2347	90	995
6	Fluid spillage	-2522	0	-2515	90	1000
7	Passenger kinematics	-114	-351	2159	-40	508
8	Driver kinematics	-173	368	2159	-41	505
9	Driver kinematics	-4572	1854	2591	-27	498
10	Passenger kinematics	-4674	-1880	2540	-26	500
11	Windshield intrusion	-968	-7775	1118	0	500
12	Windshield intrusion	-1346	7859	1074	0	505
13	Driver seatbelt movement	NA	NA	NA	NA	500
14	Passenger seatbelt movement	NA	NA	NA	NA	500
15	Column movement	-4267	7264	2616	-14	500
16	Column movement	-4267	7264	1908	-9	508
17	Passenger kinematics	-986	-5354	1151	7	1008

**X = Film plane forward of barrier face

+Y = Film plane to left of monorail centerline

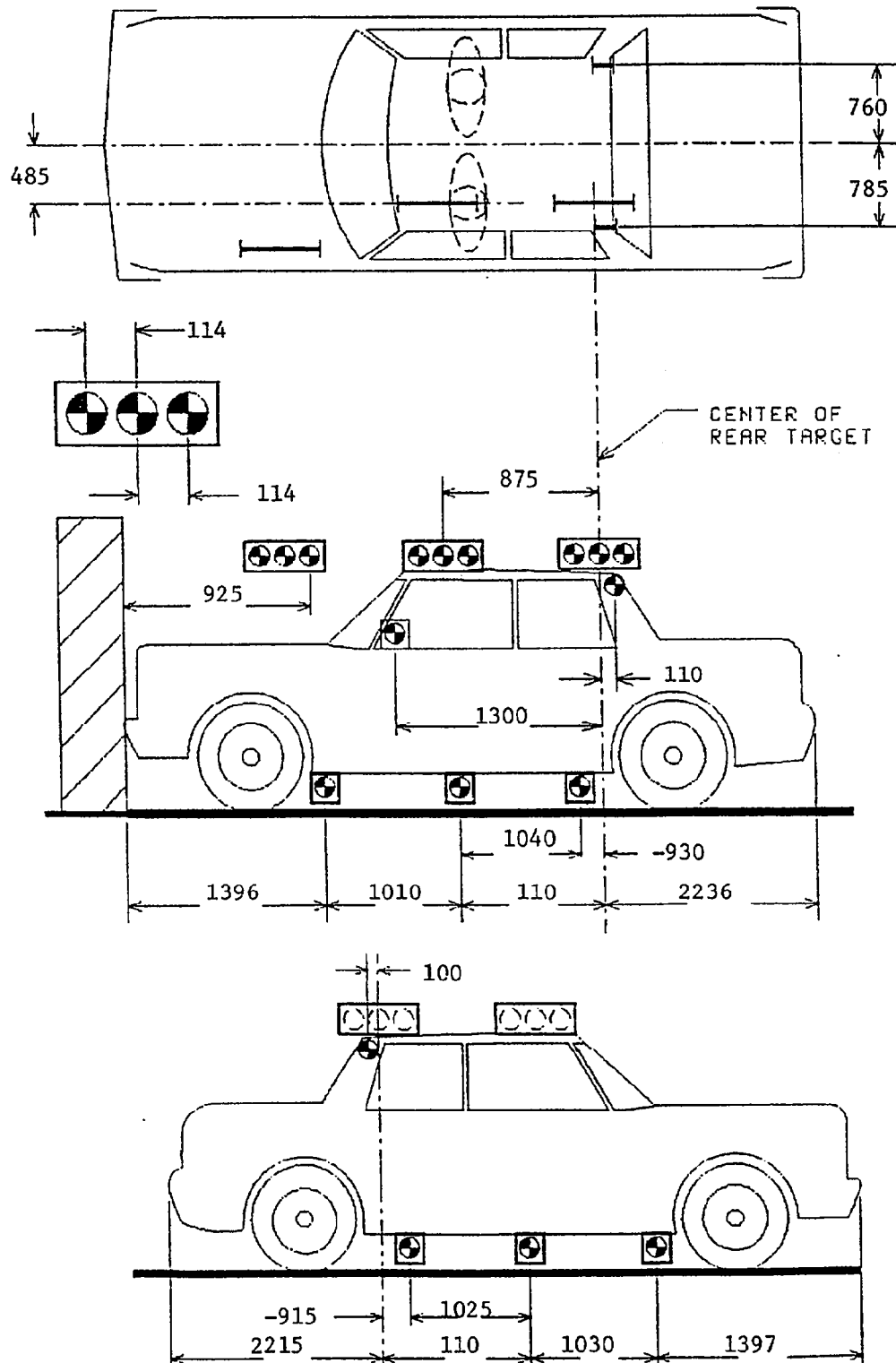
+Z = Film plane above ground level

***Angle = Film plane angled upward from horizontal plane

***No film due to camera malfunction.

FIGURE 8

VEHICLE TARGET LOCATIONS



ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 9

PRE-TEST AND POST-TEST MEASUREMENT POINTS

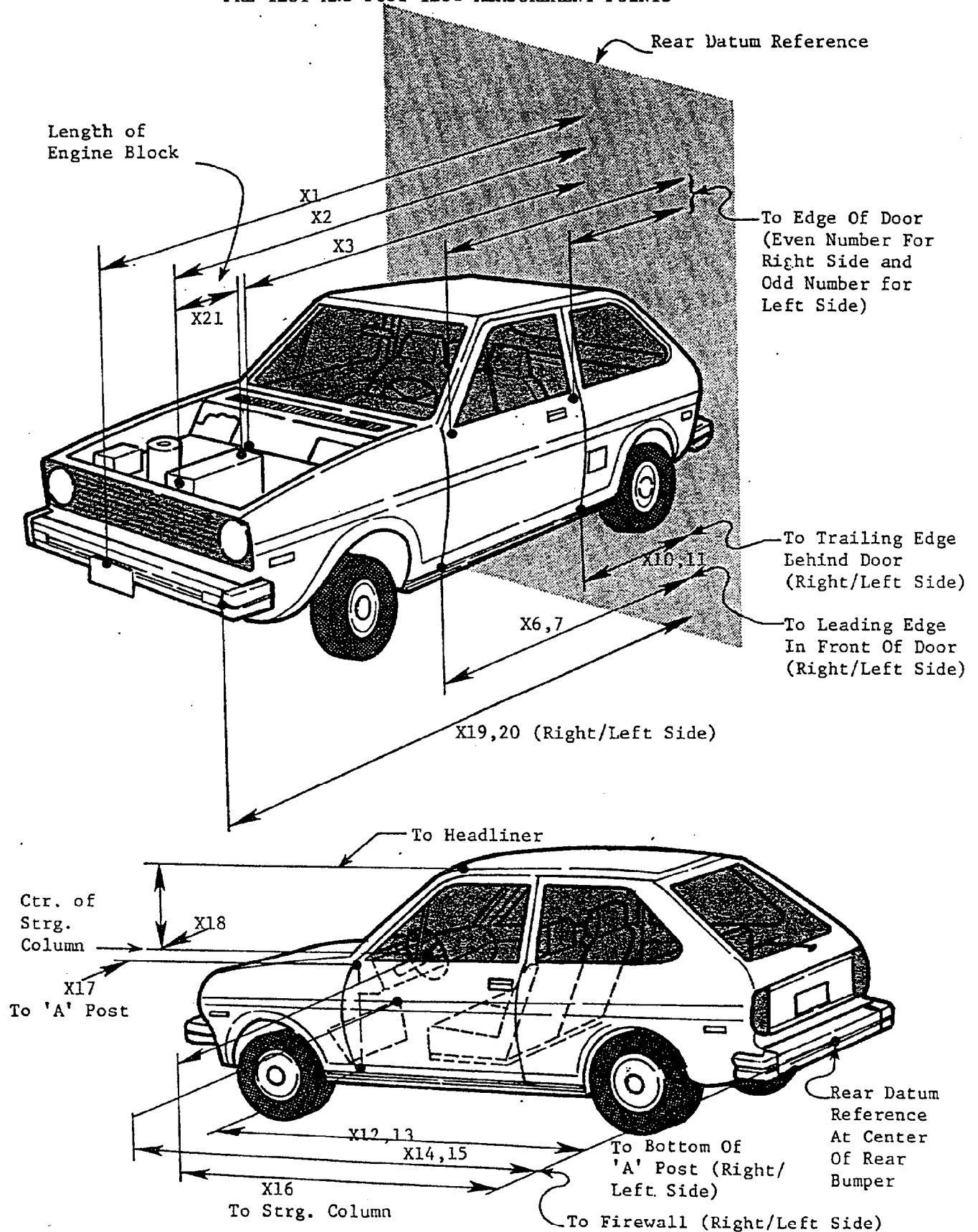


TABLE 12 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Volkswagen/EuroVan		TEST NUMBER: 930127		ALL MEASUREMENTS ARE IN MM		
NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.		
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	4752	4265	487		
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	4262	3985	277		
X3	REAR SURFACE OF VEHICLE TO FIREWALL	4047	3945	102		
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	3680	3663	17		
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	3672	3673	-1		
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	3365	3340	25		
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	3360	3365	-5		
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	2658	2645	13		
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	2648	2660	-12		
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	2715	2695	20		
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	2725	2716	9		
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	3639	3594	45		
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	3634	3619	15		
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	3910	3890	20		
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	3920	3920	0		
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	3345	3373	-28		
X17	CENTER OF STEERING COLUMN TO "A" POST	334	330	4		
X18	CENTER OF STEERING COLUMN TO HEADLINER	524	415	109		
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	4530	4250	280		
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	4520	4280	240		
X21	LENGTH OF ENGINE BLOCK	360	360	0		

APPENDIX A

PHOTOGRAPHS

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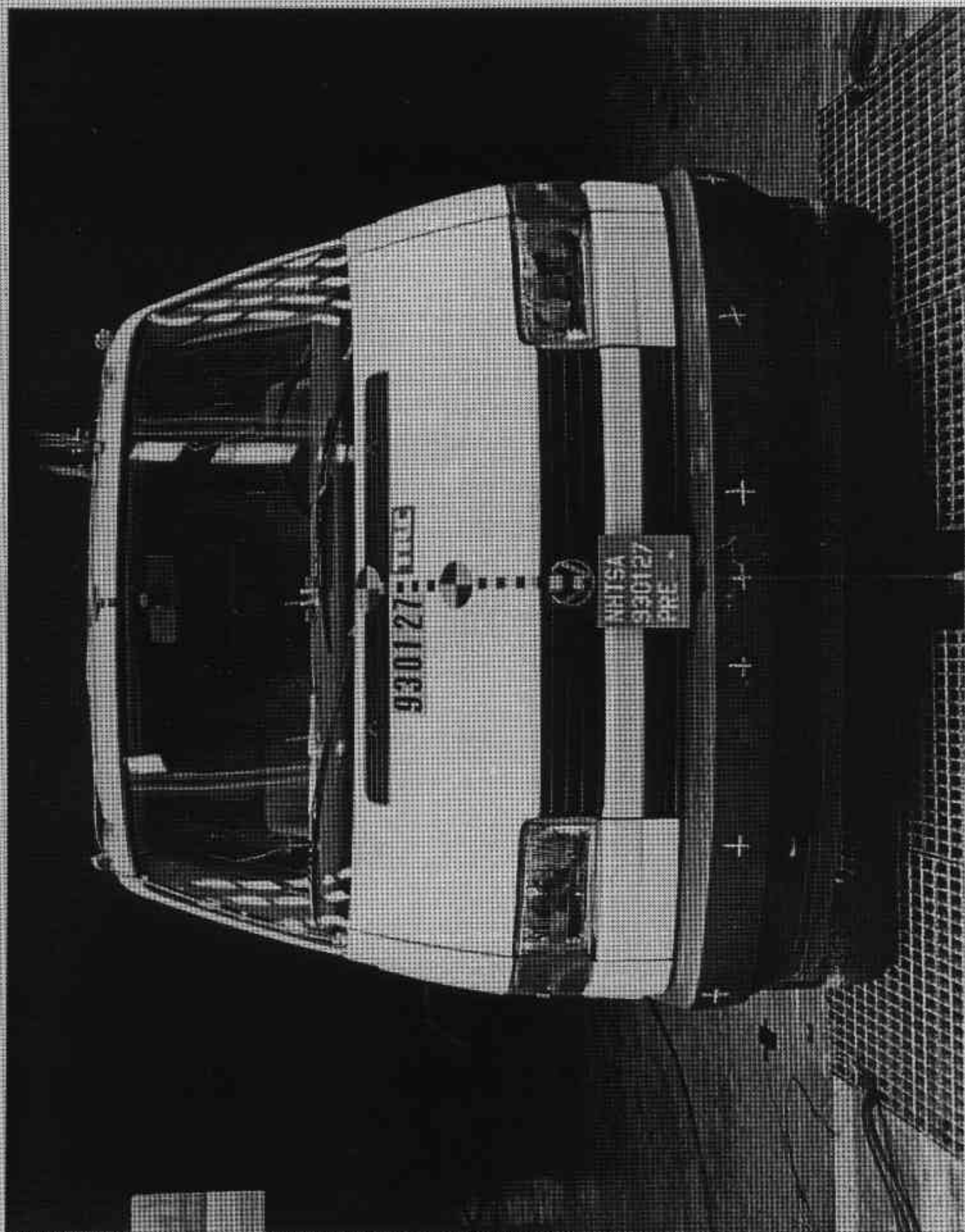


Figure A-1. PRE-TEST FRONT VIEW

A-2

930127

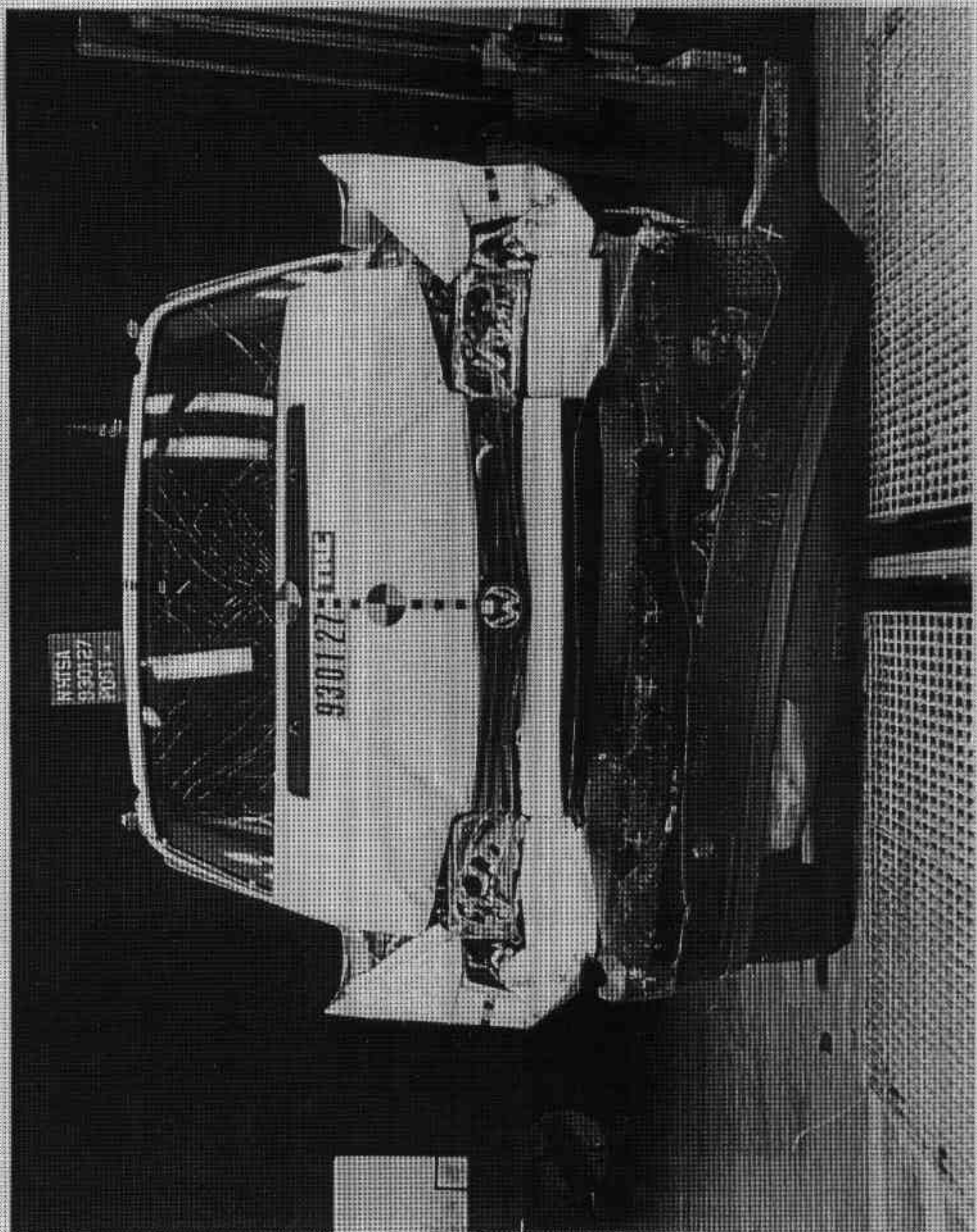


Figure A-2. POST-TEST FRONT VIEW
A-3

930127

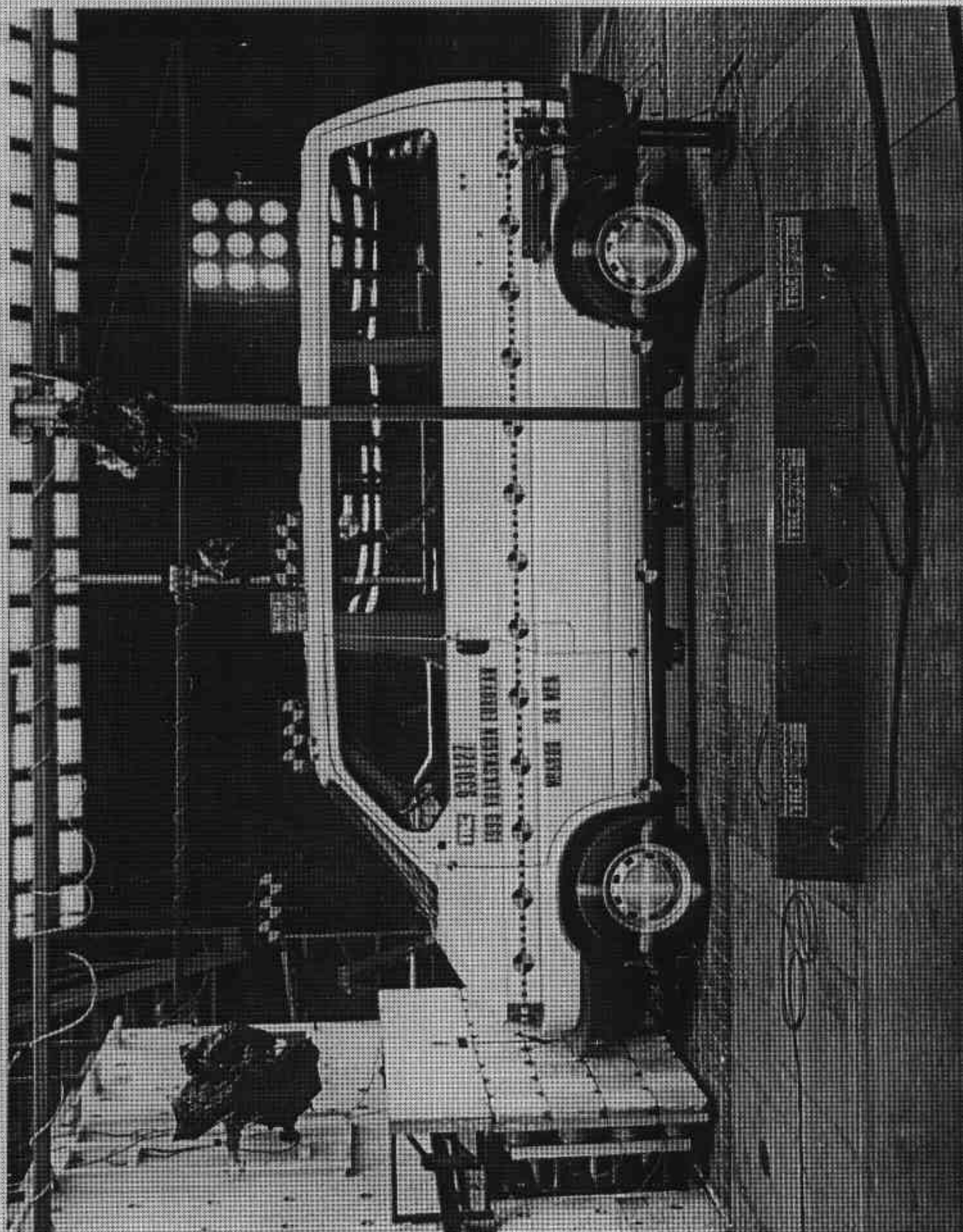


Figure A-3. PRE-TEST LEFT SIDE VIEW

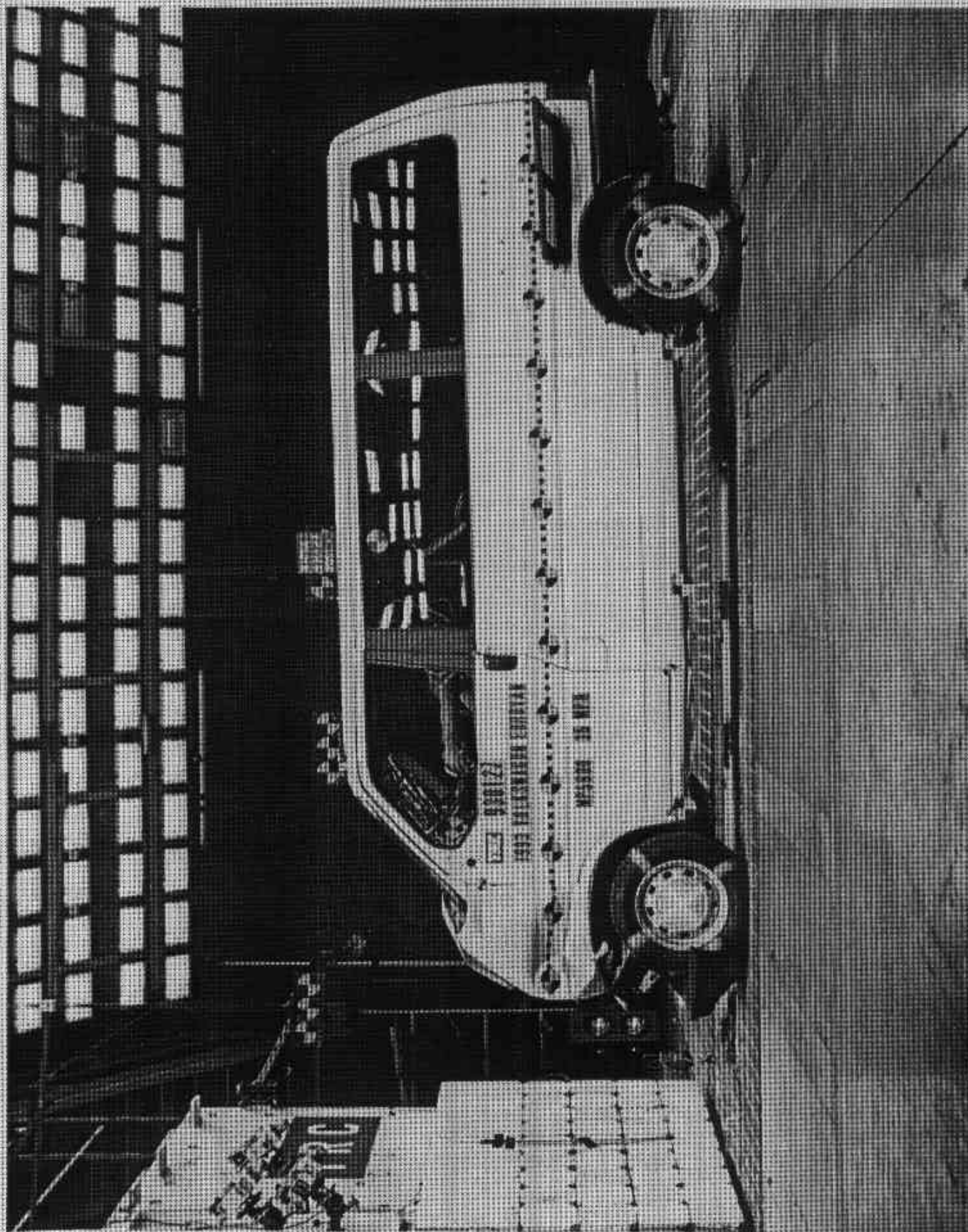


Figure A-4. POST-TEST LEFT SIDE VIEW
A-5

930127



Figure A-5. PRE-TEST REAR VIEW

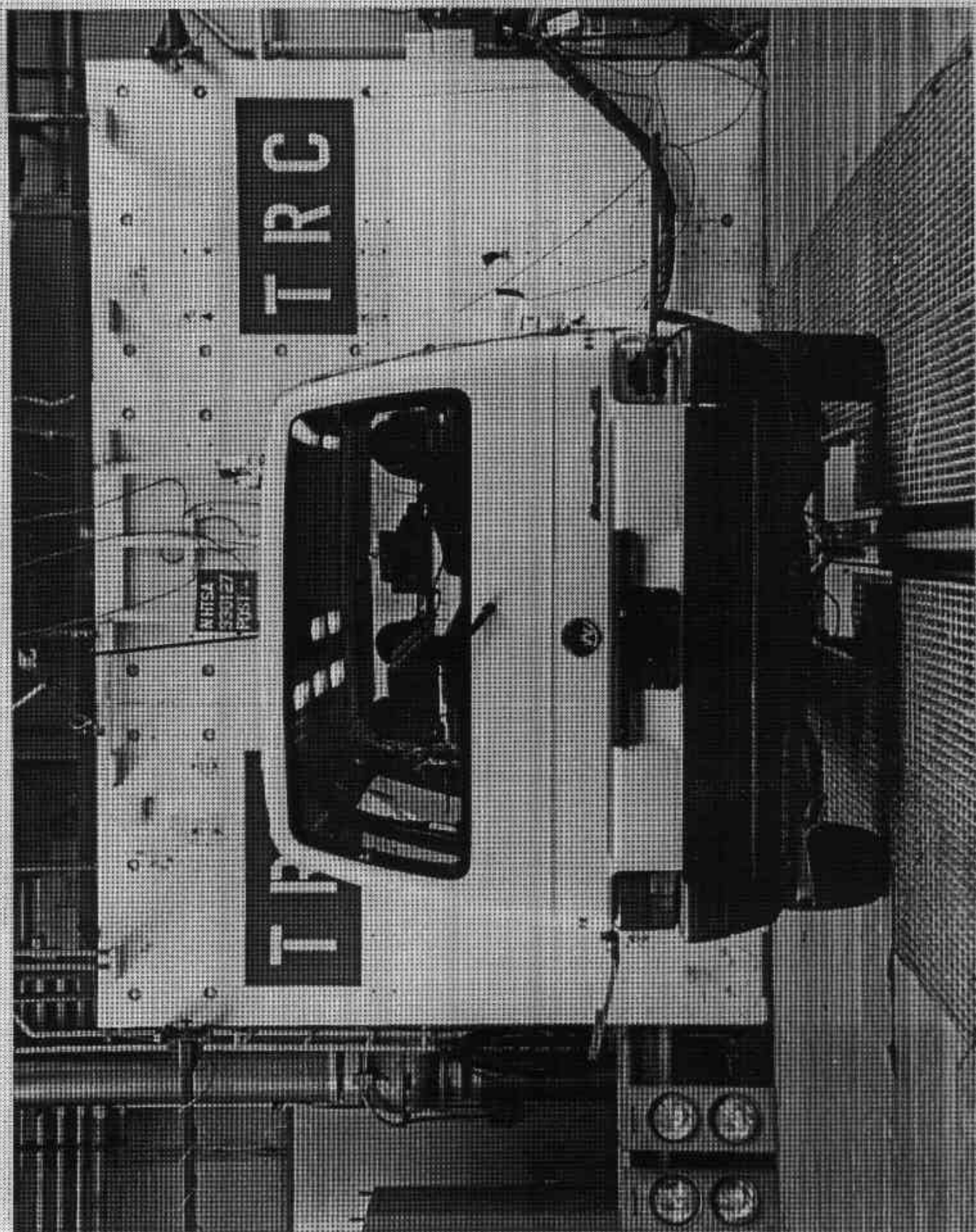


Figure A-6. POST-TEST REAR VIEW

A-7

930127

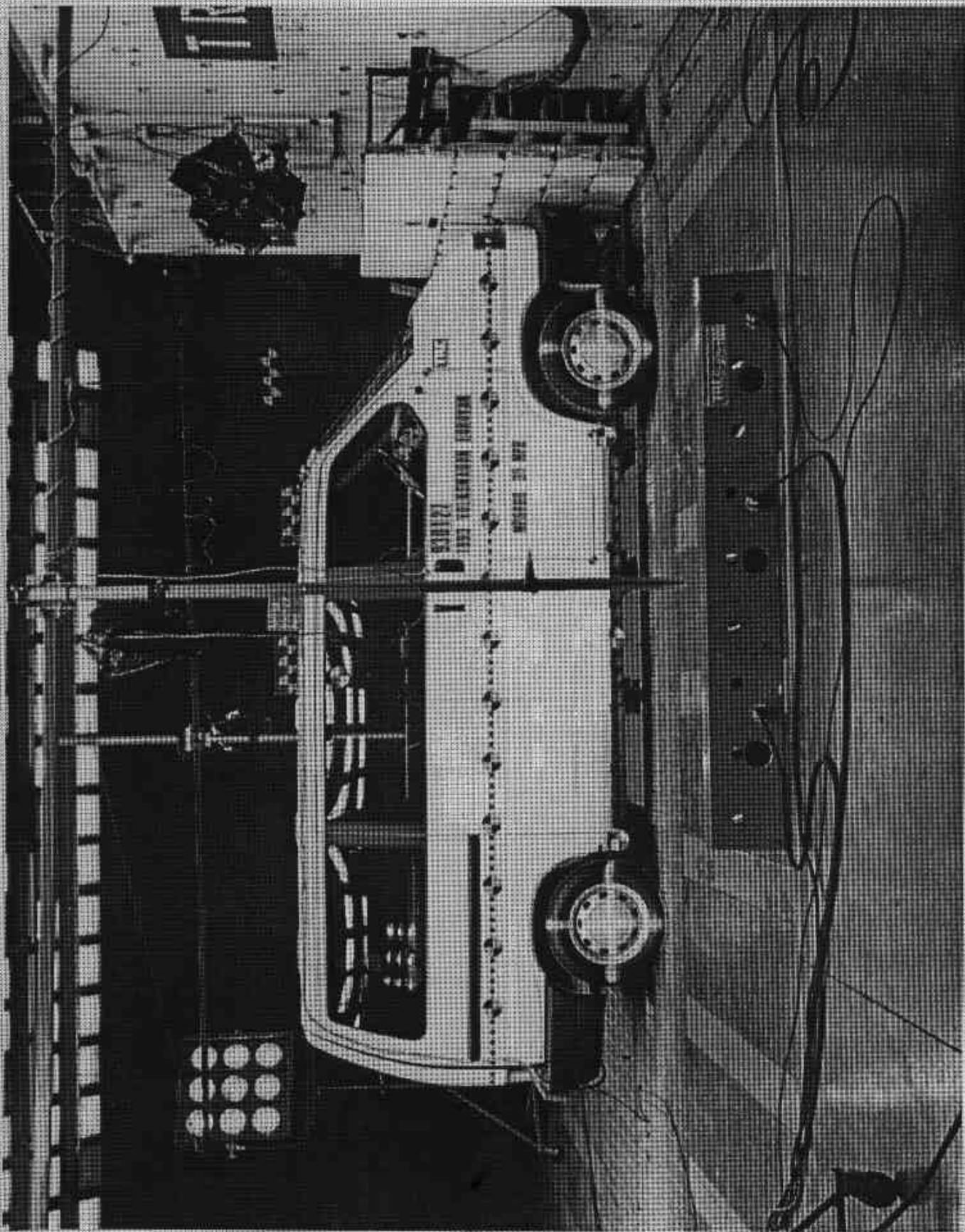


Figure A-7. PRE-TEST RIGHT SIDE VIEW

A-8

930127

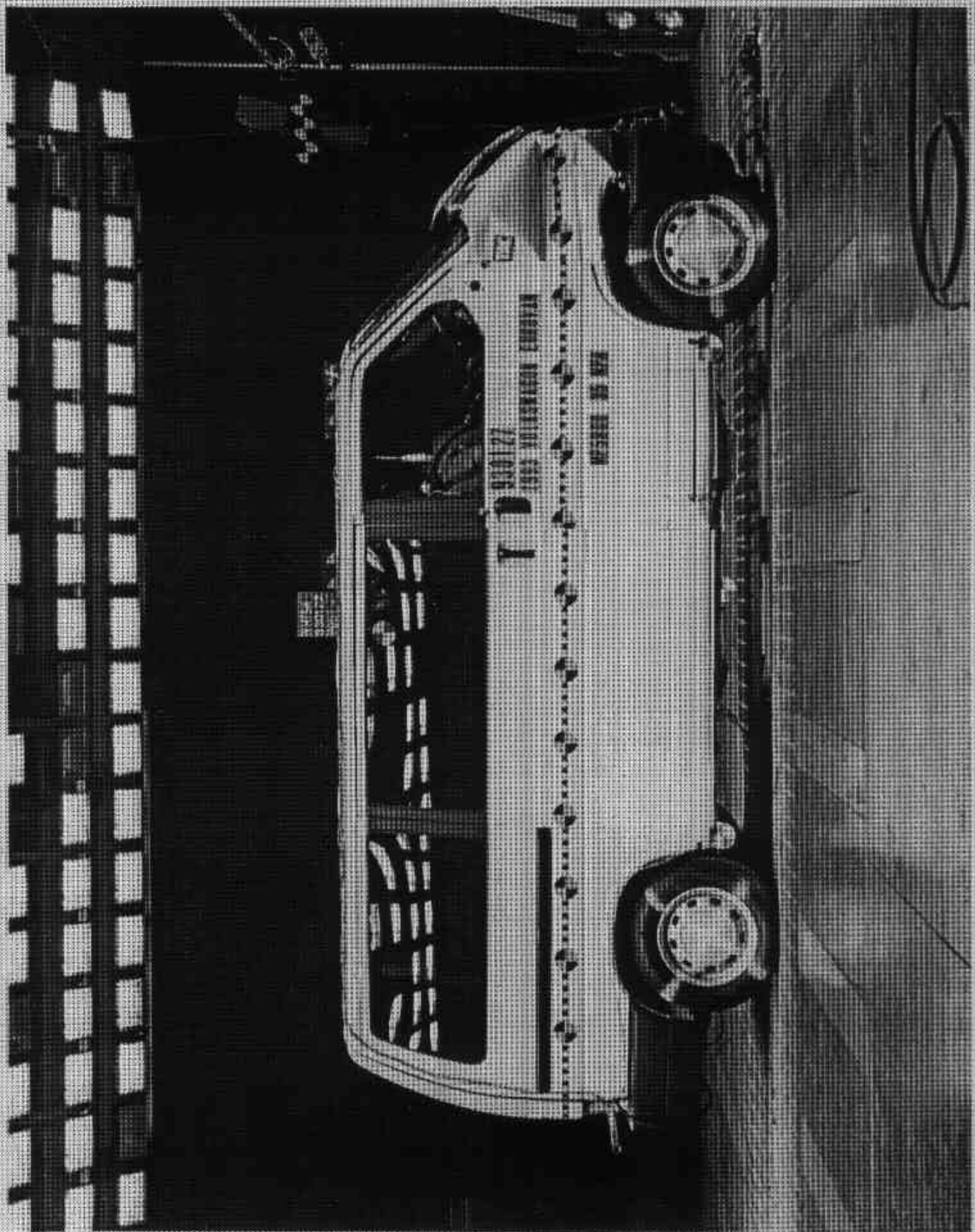


Figure A-8. POST-TEST RIGHT SIDE VIEW
A-9

930127

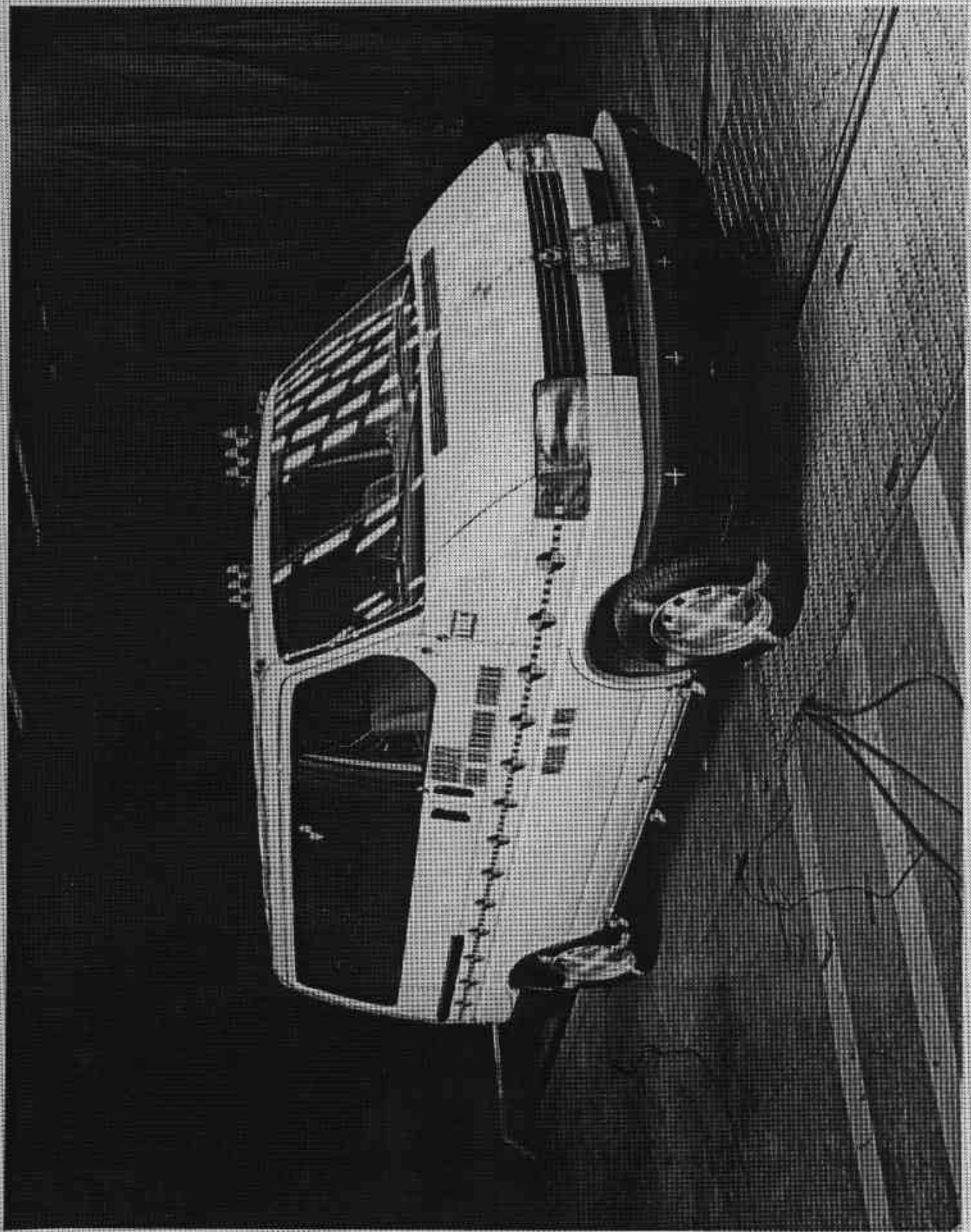


Figure A-9. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

930127

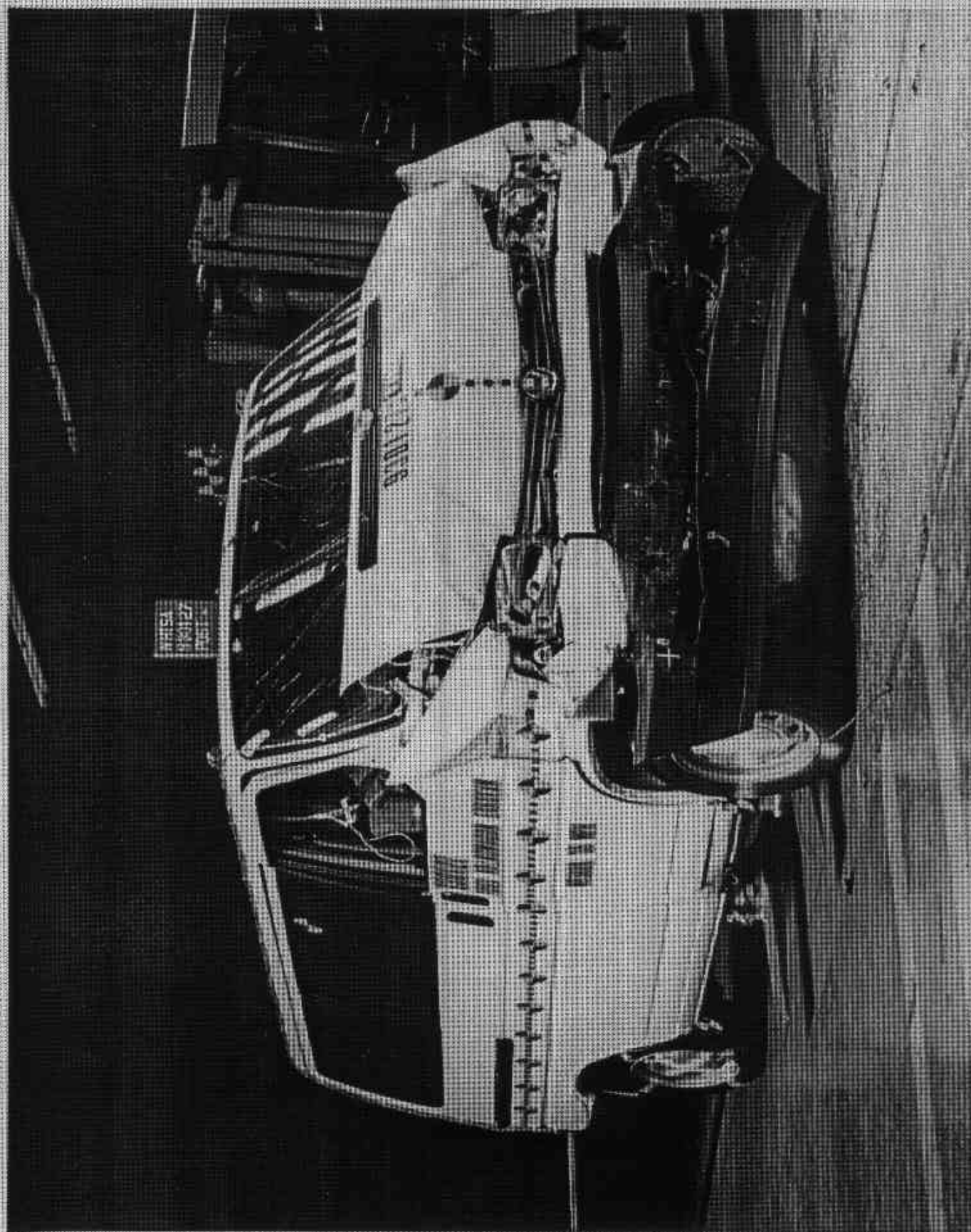


Figure A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-11

930127

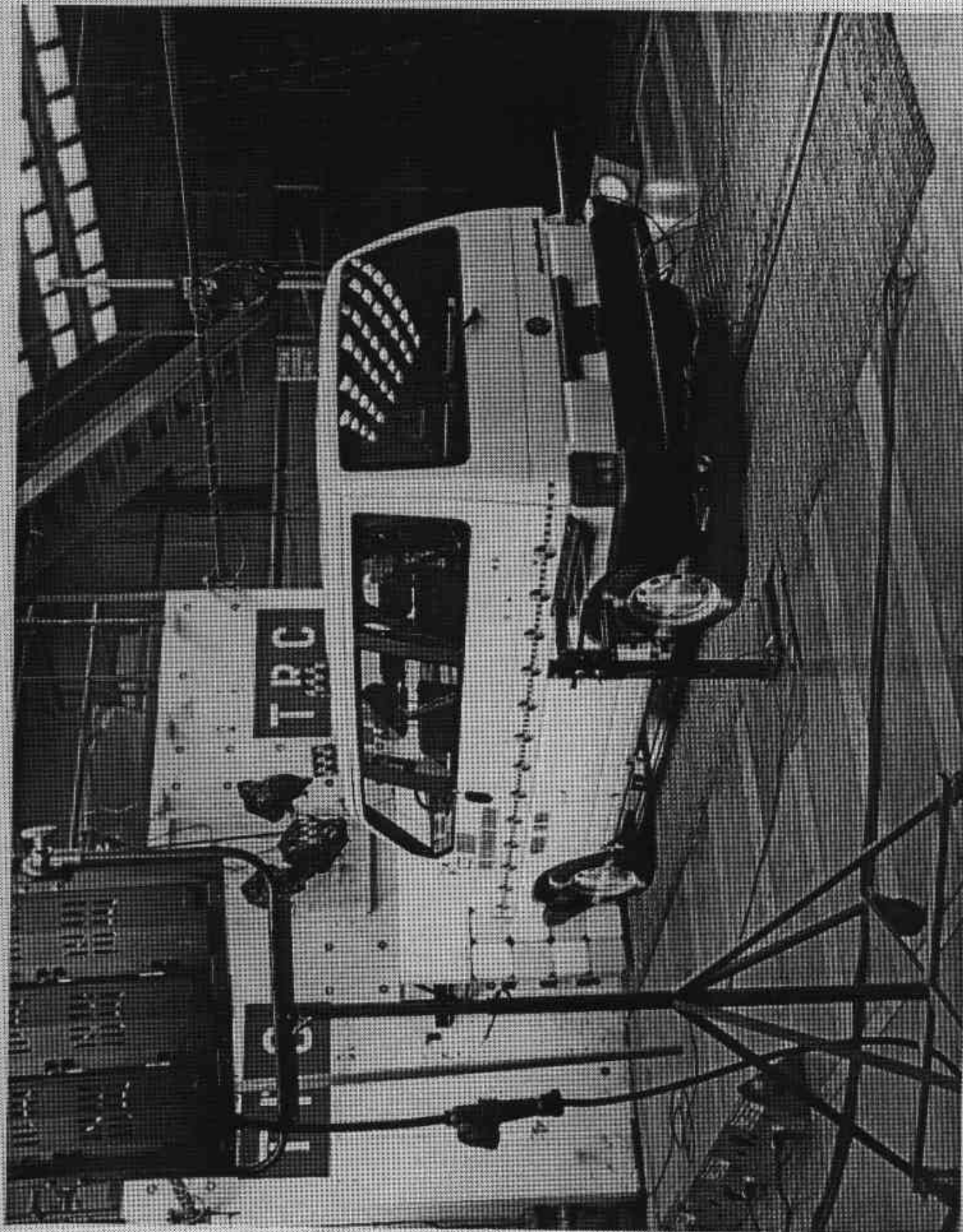


Figure A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-12

930127

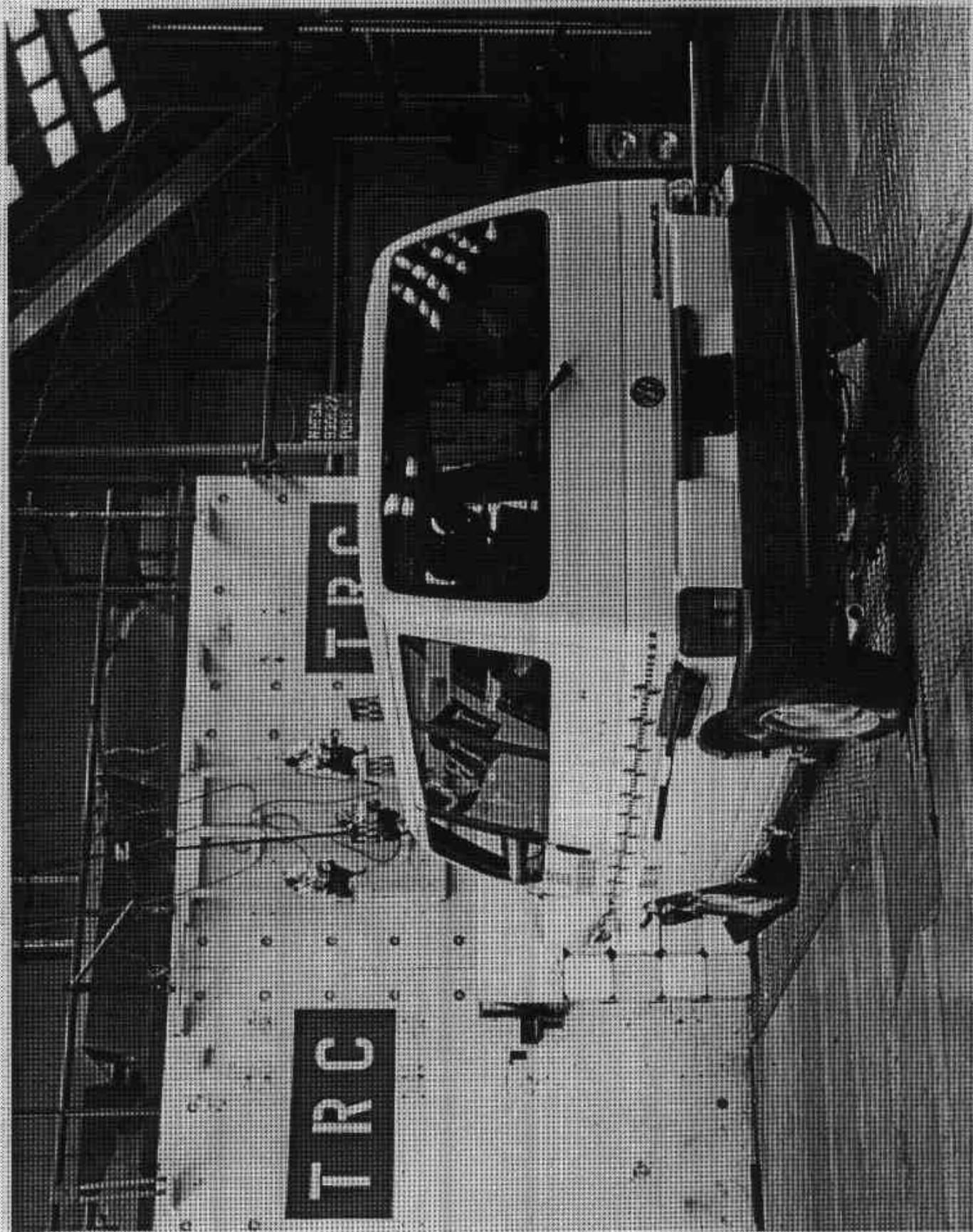


Figure A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

A-13

930127



Figure A-13. PRE-TEST WINDSHIELD VIEW

A-14

930127

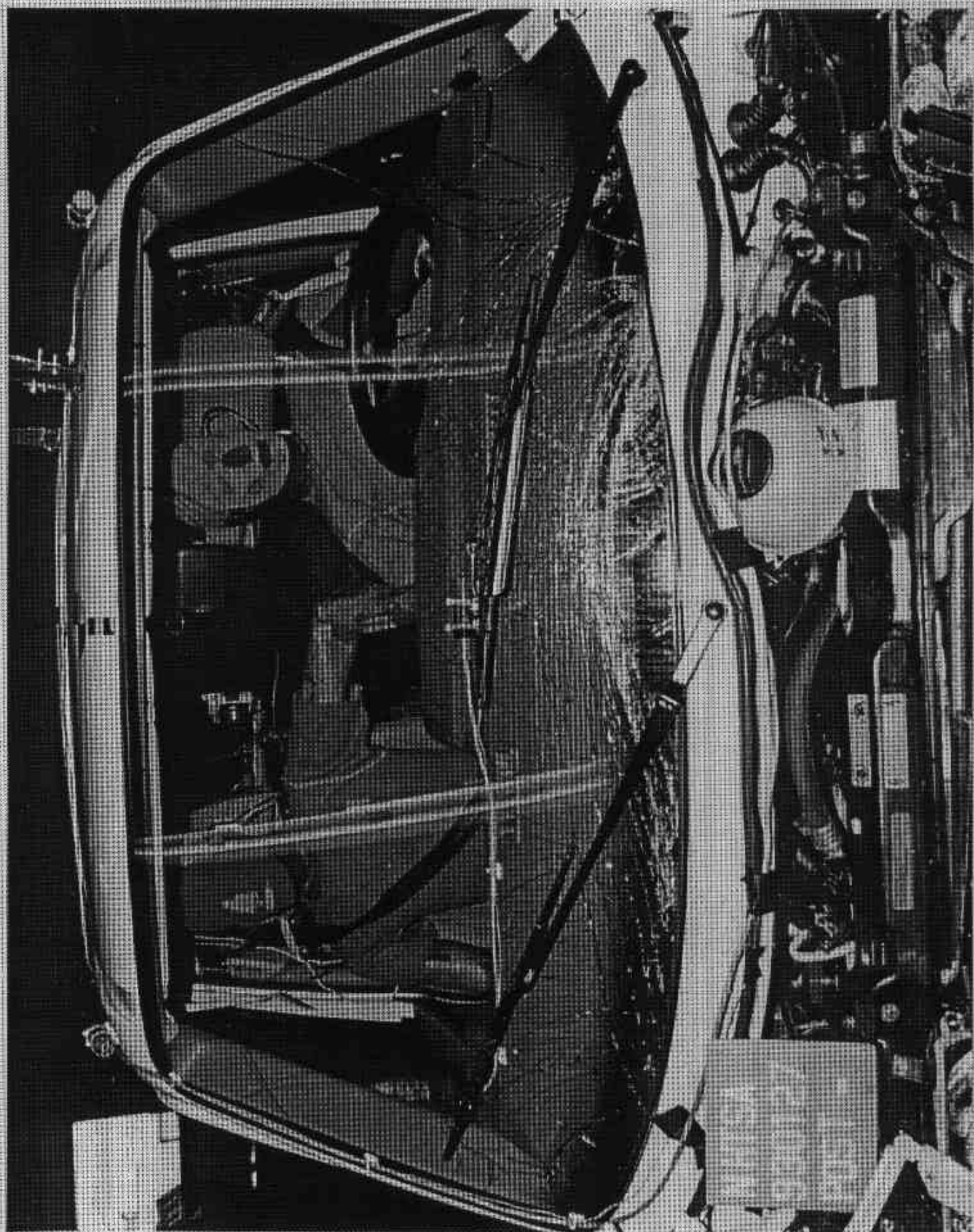


Figure A-14. POST-TEST WINDSHIELD VIEW
A-15

930127

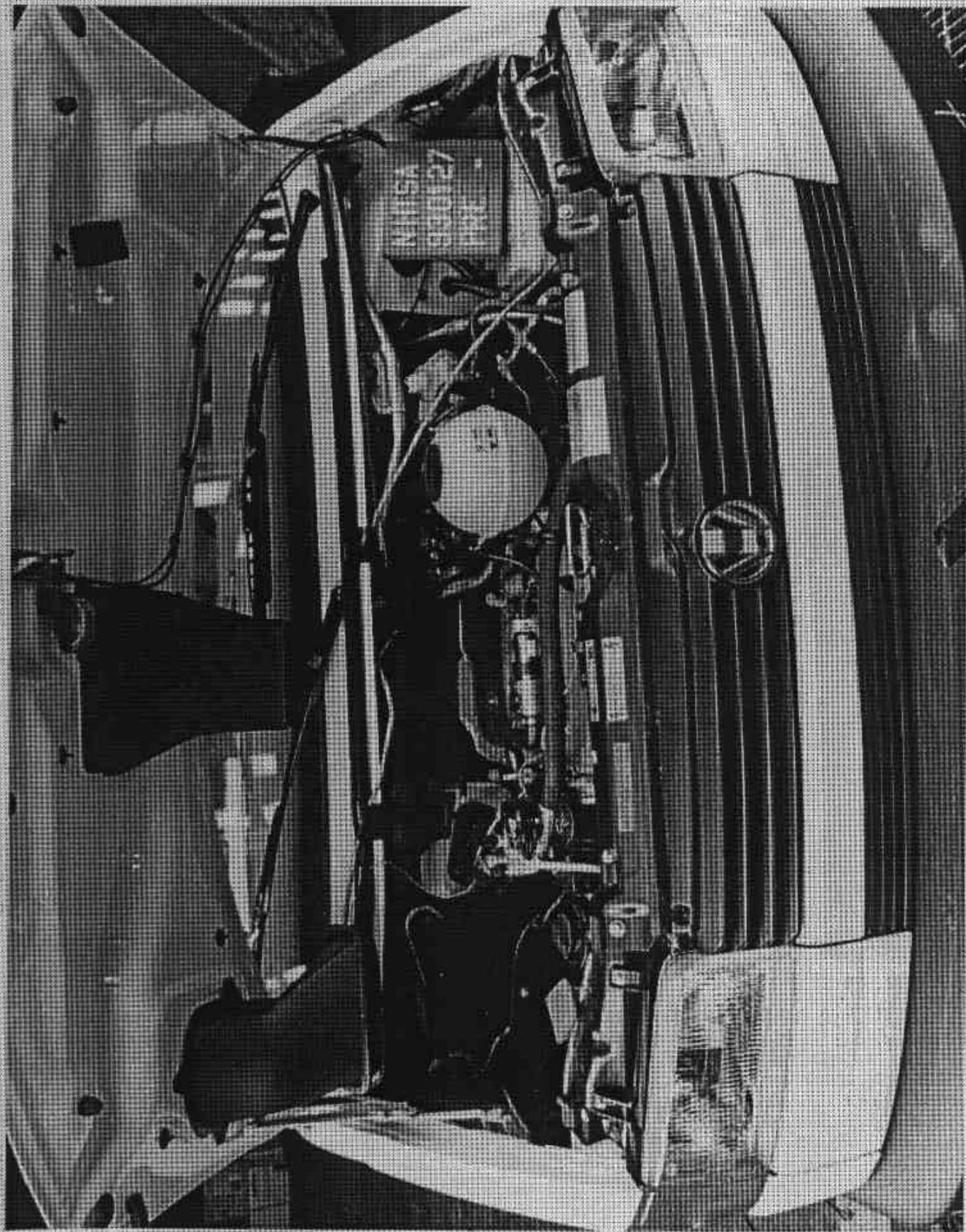


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

A-16

930127

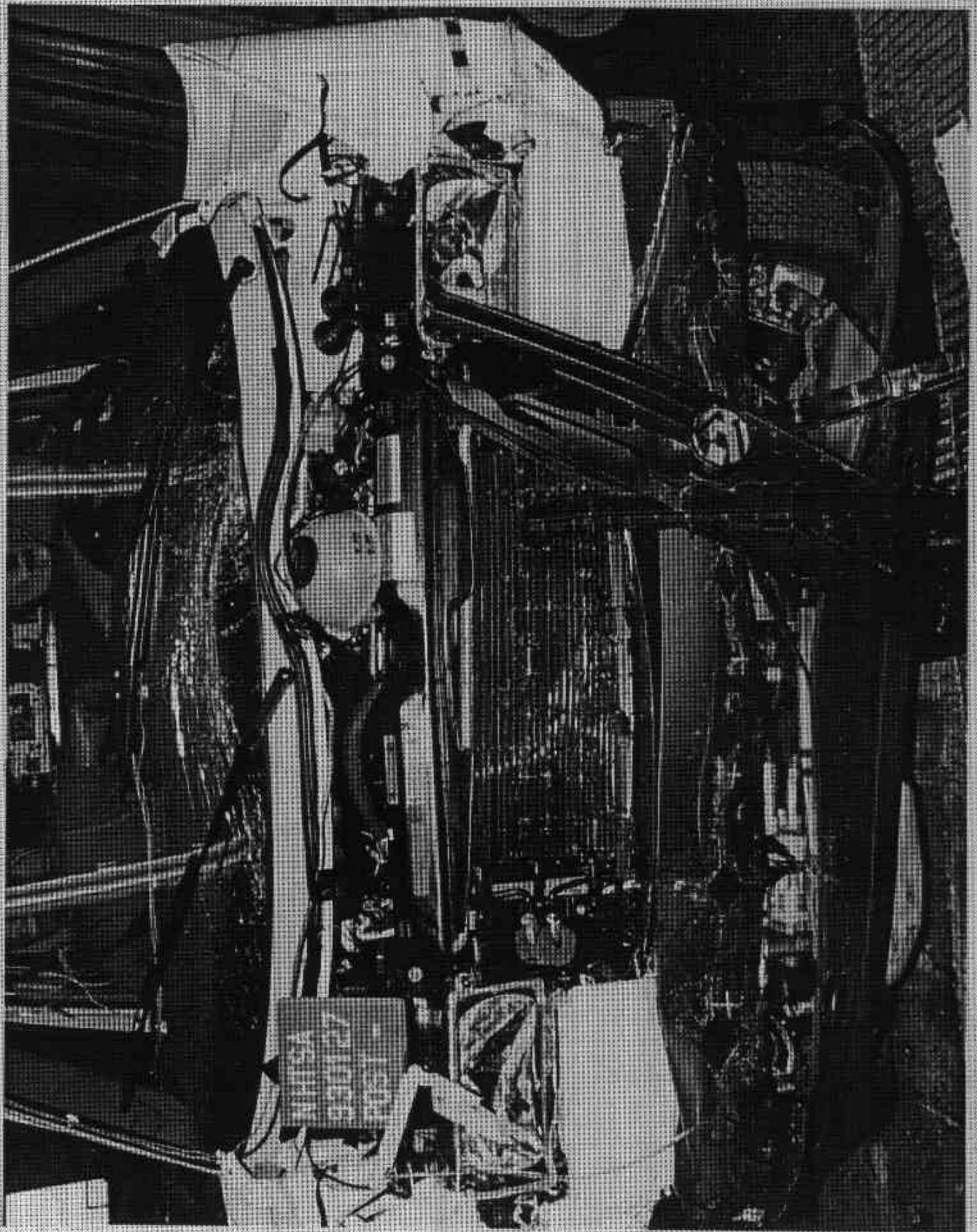


Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW

A-17

930127



Figure A-17. PRE-TEST FUEL FILLER CAP VIEW

A-18

930127

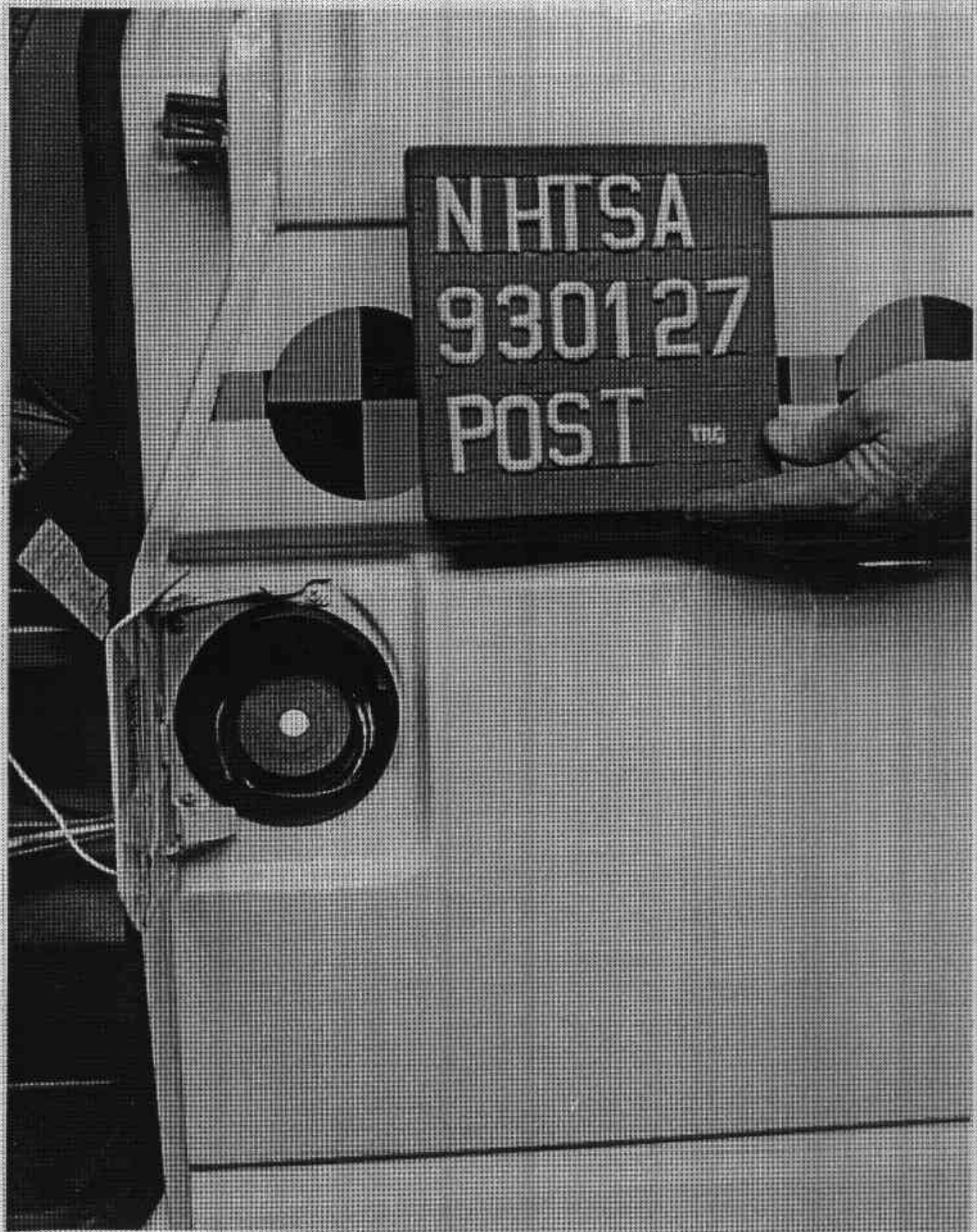


Figure A-18. POST-TEST FUEL FILLER CAP VIEW
A-19

930127



Figure A-19. PRE-TEST FUEL FILLER NECK VIEW

A-20

930127

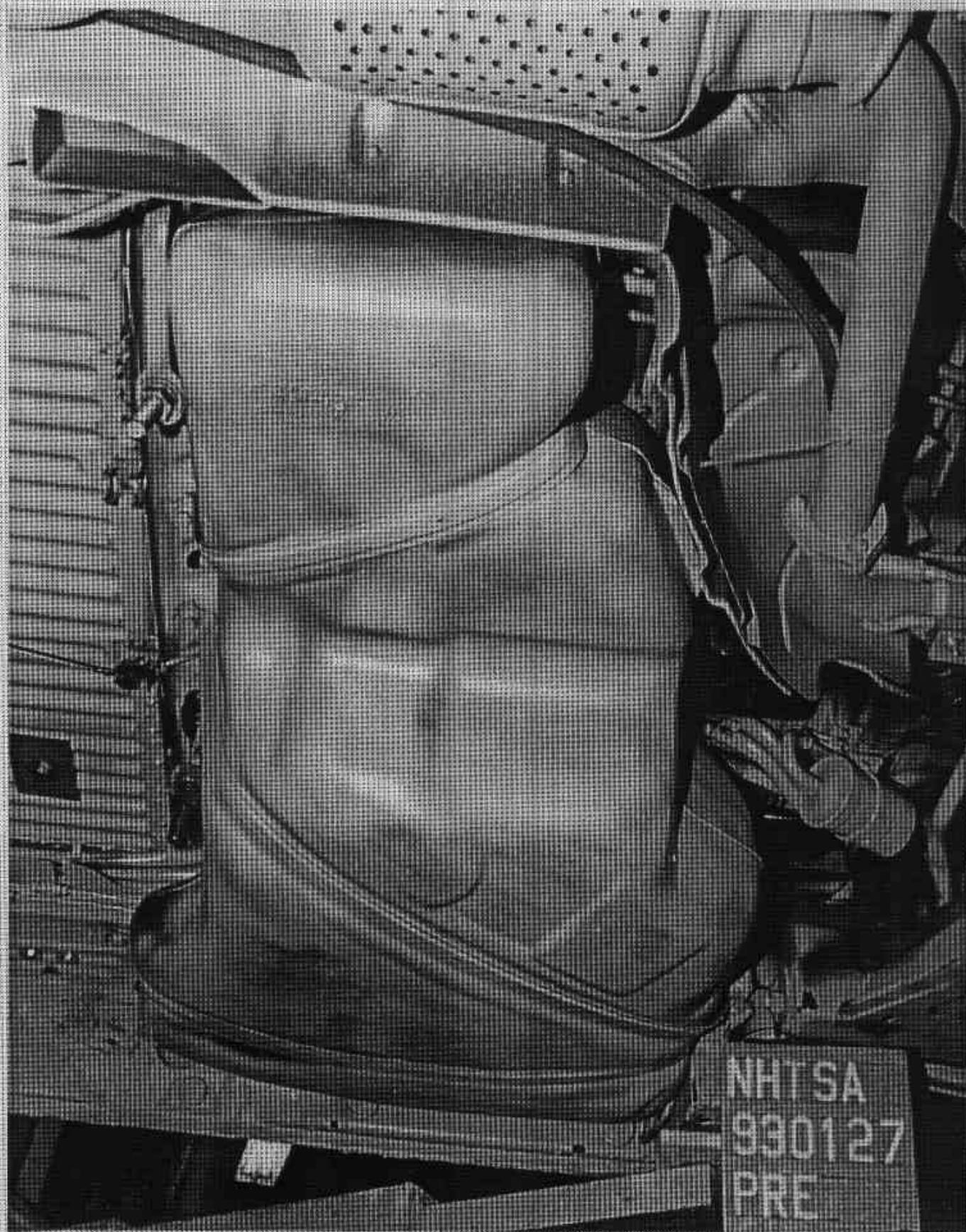


Figure A-20. PRE-TEST FUEL TANK VIEW
A-21

930127



Figure A-21. POST-TEST FUEL FILLER NECK & FUEL TANK VIEW

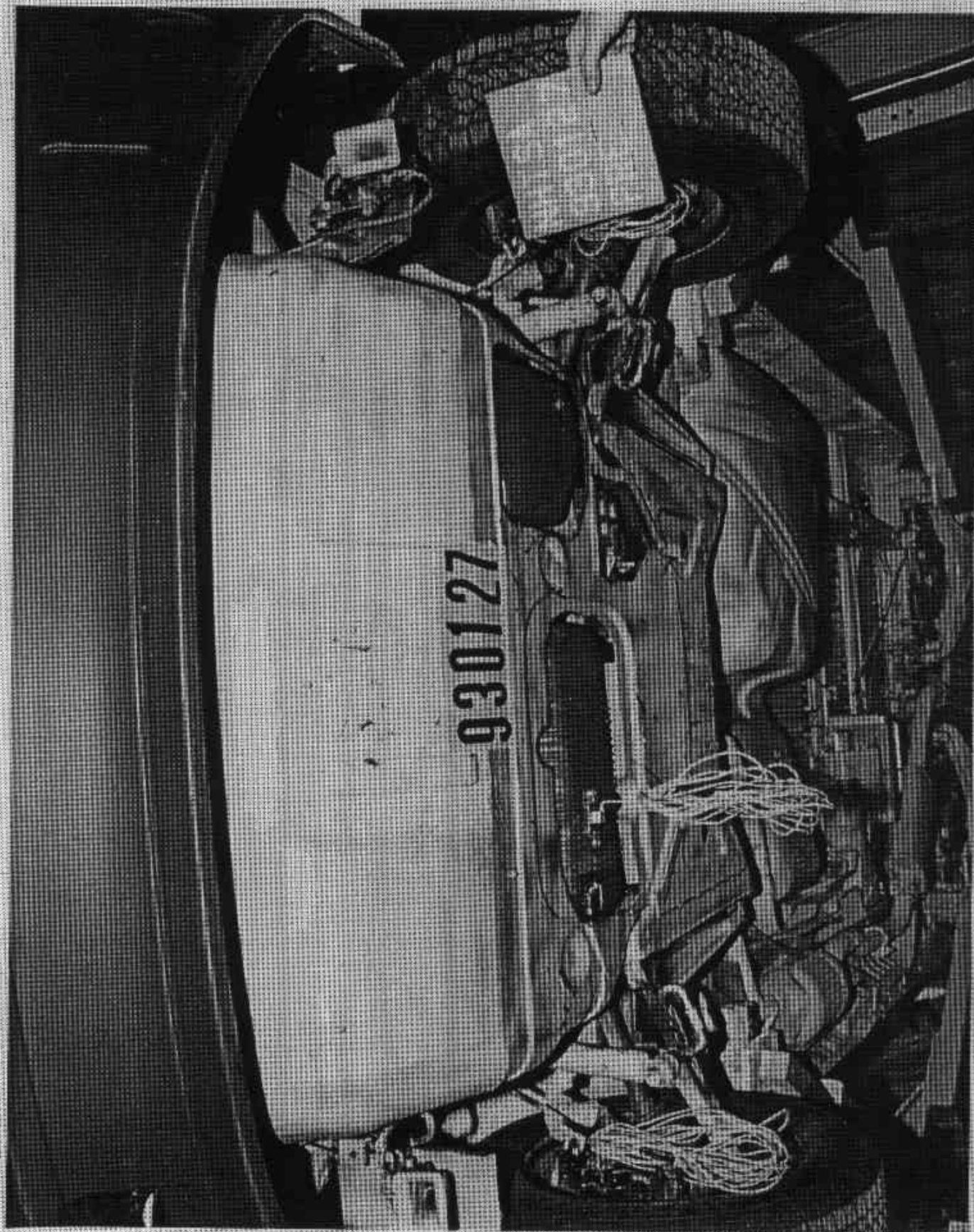


Figure A-22. PRE-TEST FRONT UNDERBODY VIEW

A-23

930127



Figure A-23. POST-TEST FRONT UNDERBODY VIEW

A-24

930127

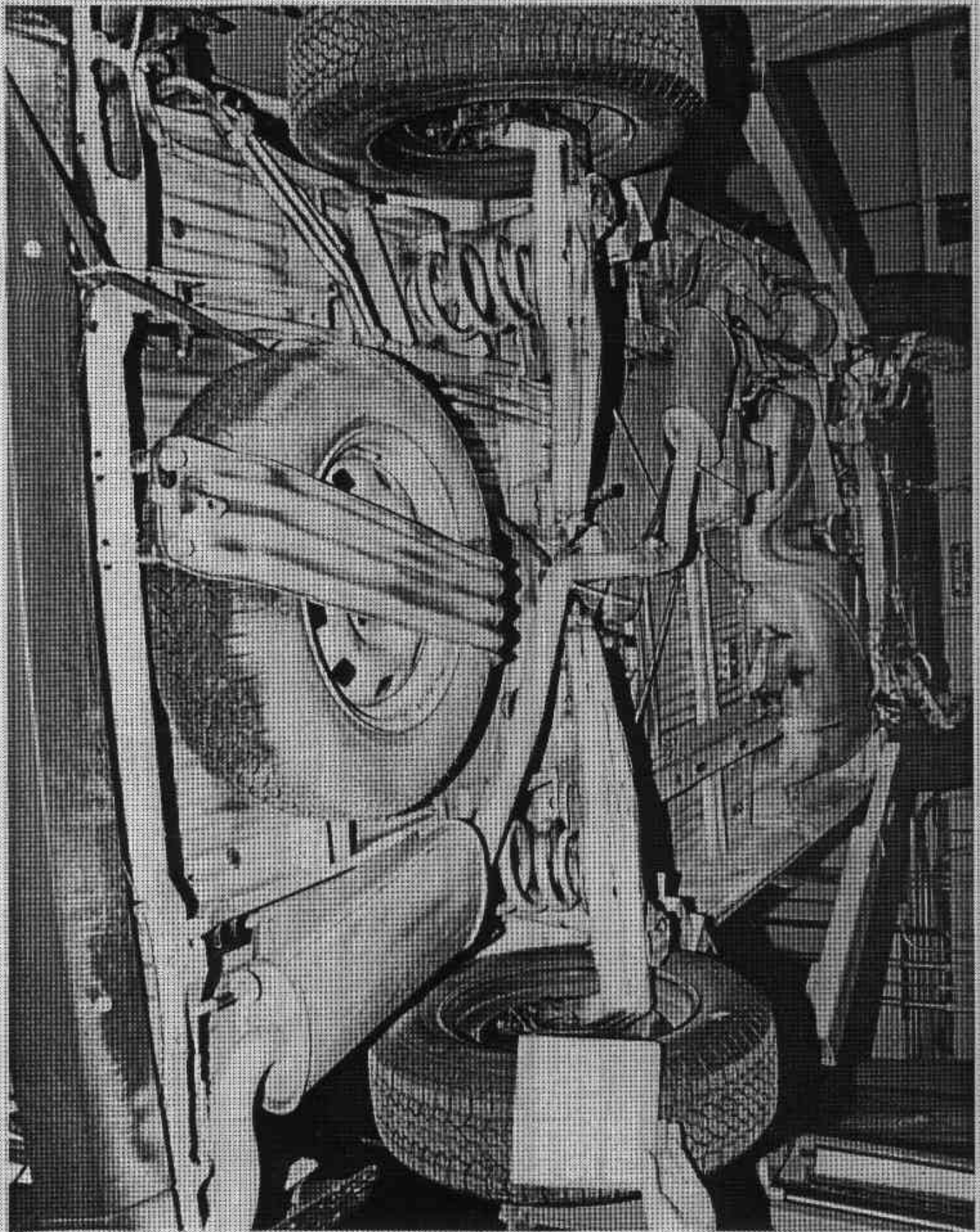


Figure A-24. PRE-TEST REAR UNDERBODY VIEW
A-25

930127

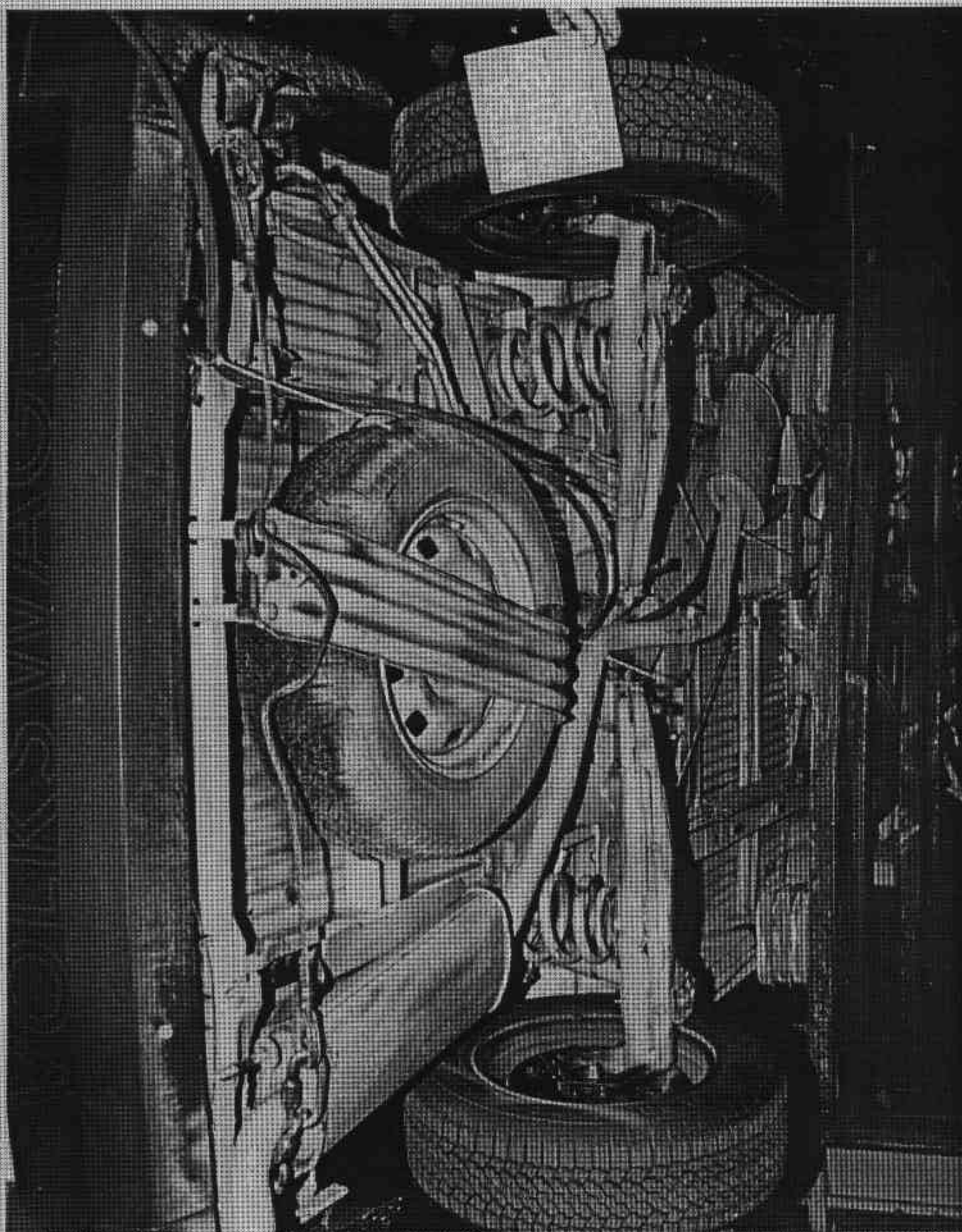


Figure A-25. POST-TEST REAR UNDERBODY VIEW

A-26

930127

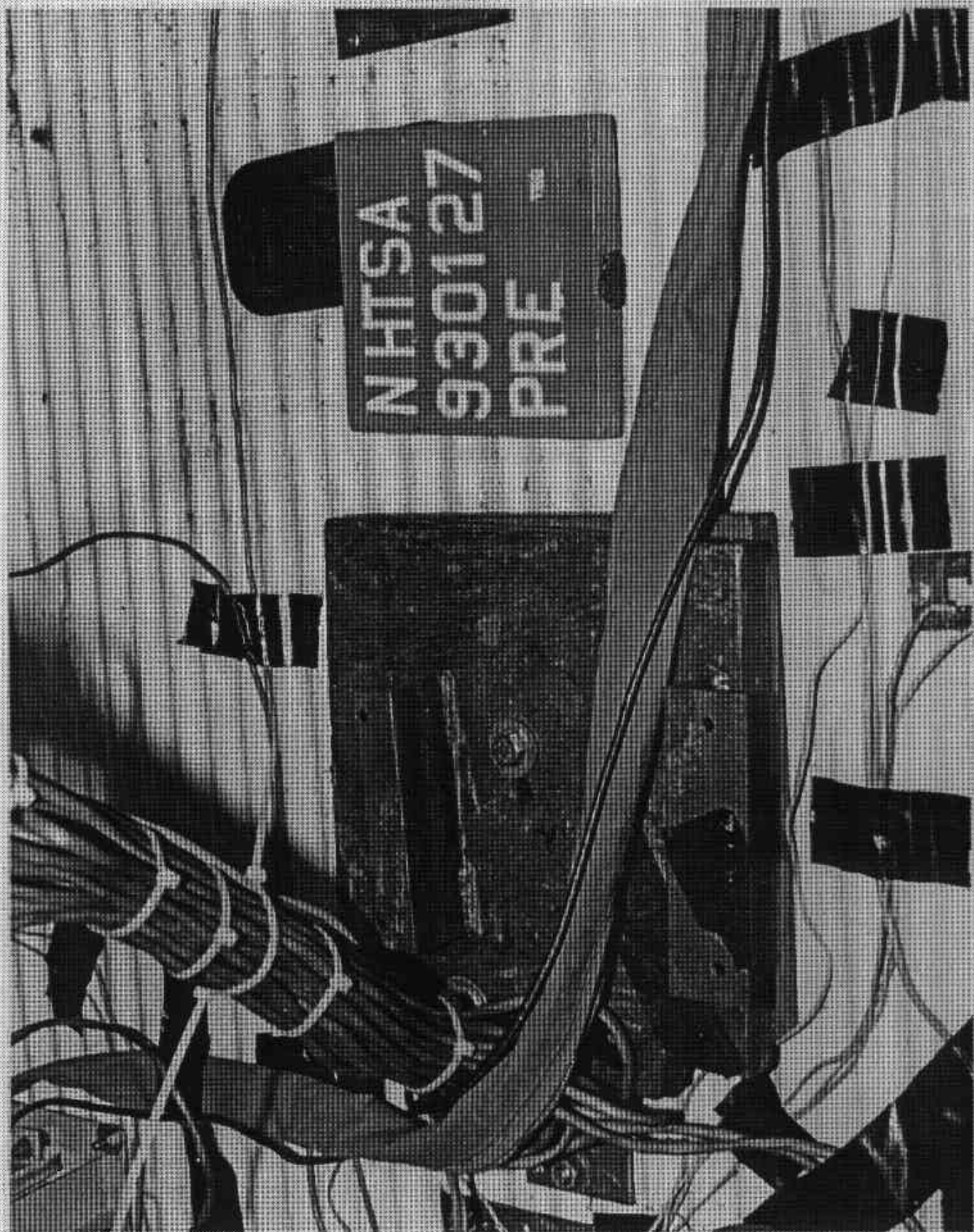
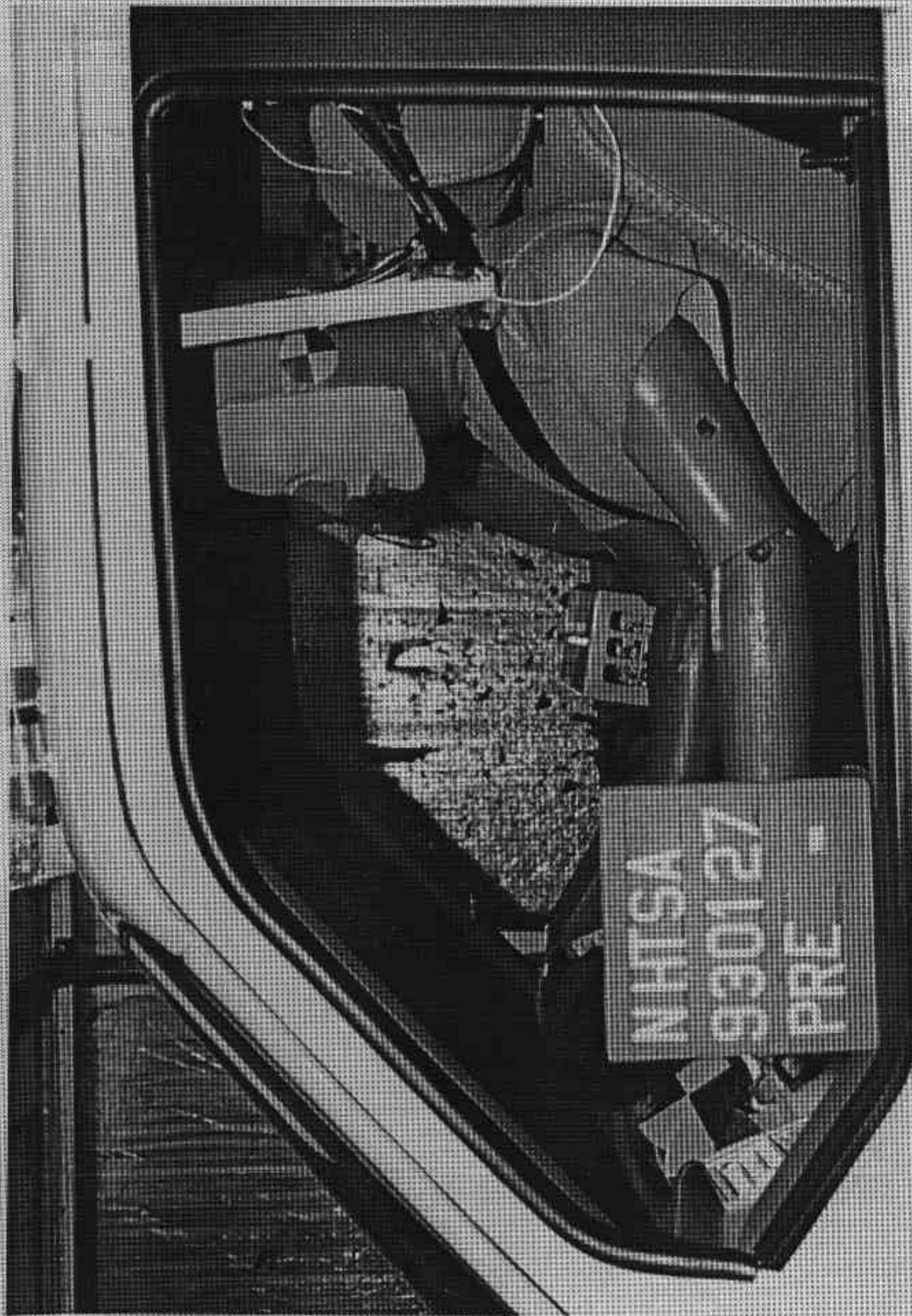


Figure A-26. PRE-TEST BALLAST LOCATION VIEW
A-27

930127



030127

Figure A-27. PRE-TEST DRIVER DUMMY POSITION VIEW



Figure A-28. POST-TEST DRIVER DUMMY POSITION VIEW
A-29

930127

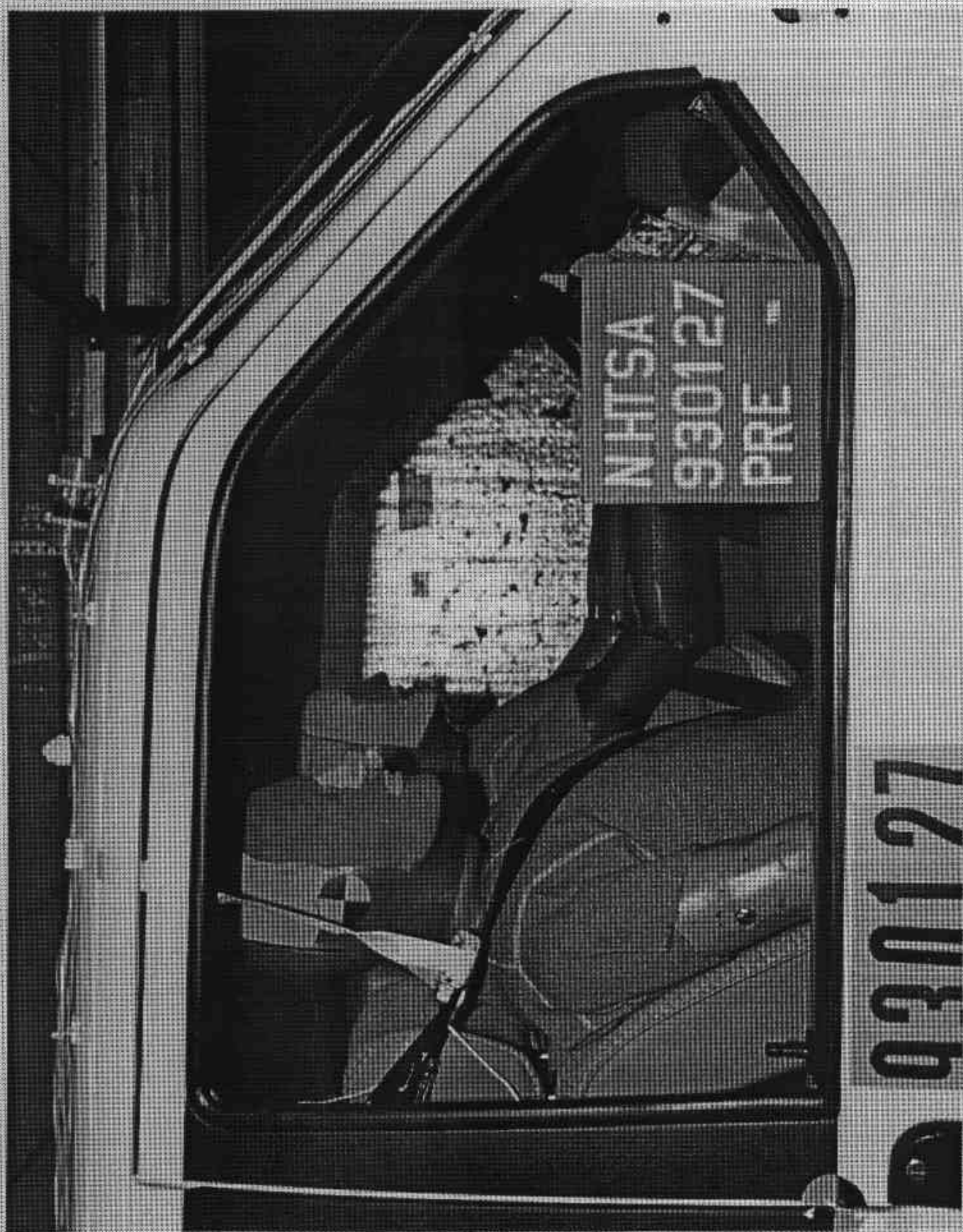


Figure A-29. PRE-TEST PASSENGER DUMMY POSITION VIEW



930127

1993 VOLKSWAGON EUROVAN

Figure A-30. POST-TEST PASSENGER DUMMY POSITION VIEW

A-31

930127

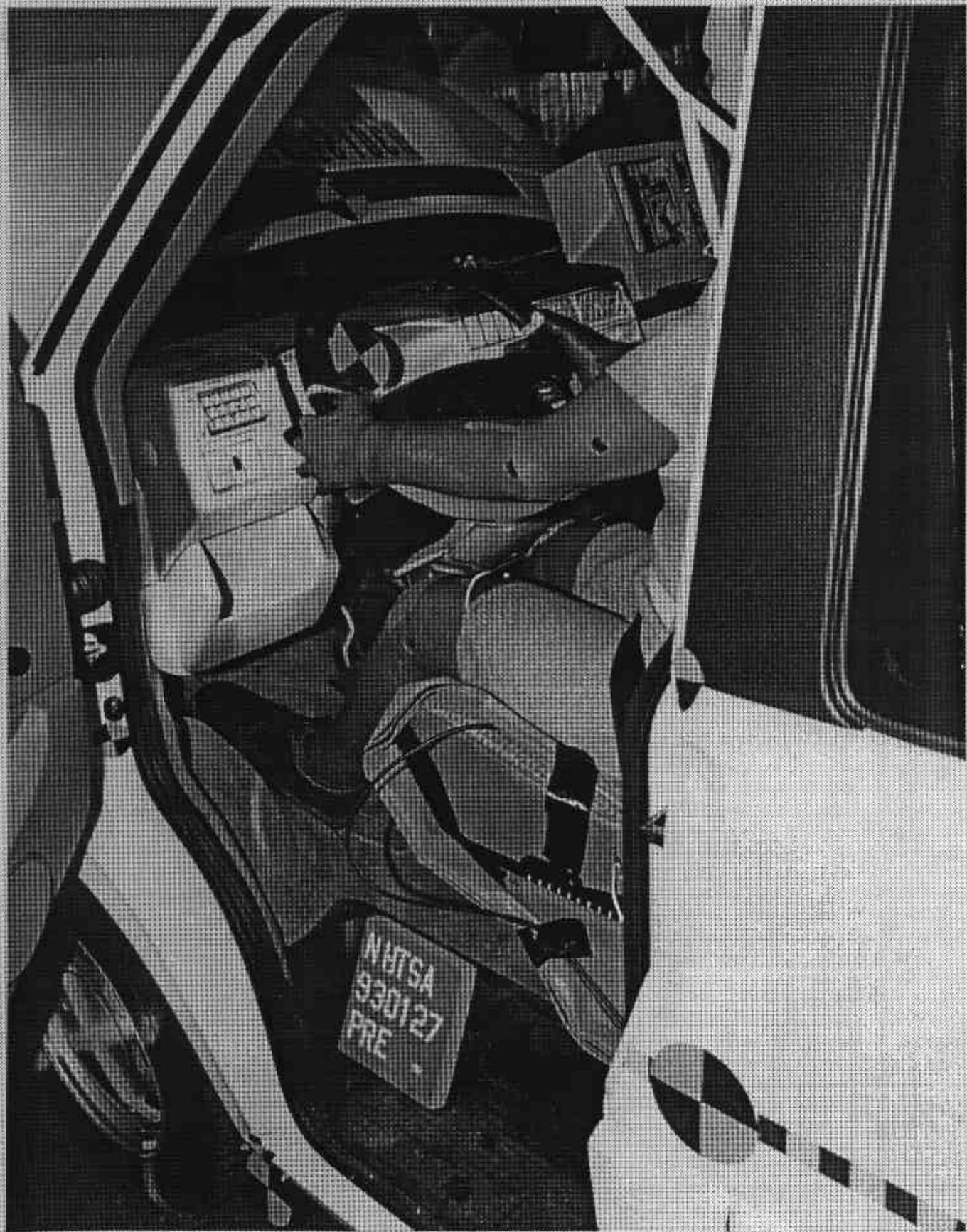


Figure A-31. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

A-32

930127



Figure A-32. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
A-33 930127



Figure A-33. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2



Figure A-34. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2
A-35 930127



Figure A-35. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW I

A-36

930127



Figure A-36. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-37 930127



Figure A-37. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

A-38

930127



Figure A-38. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
A-39 930127

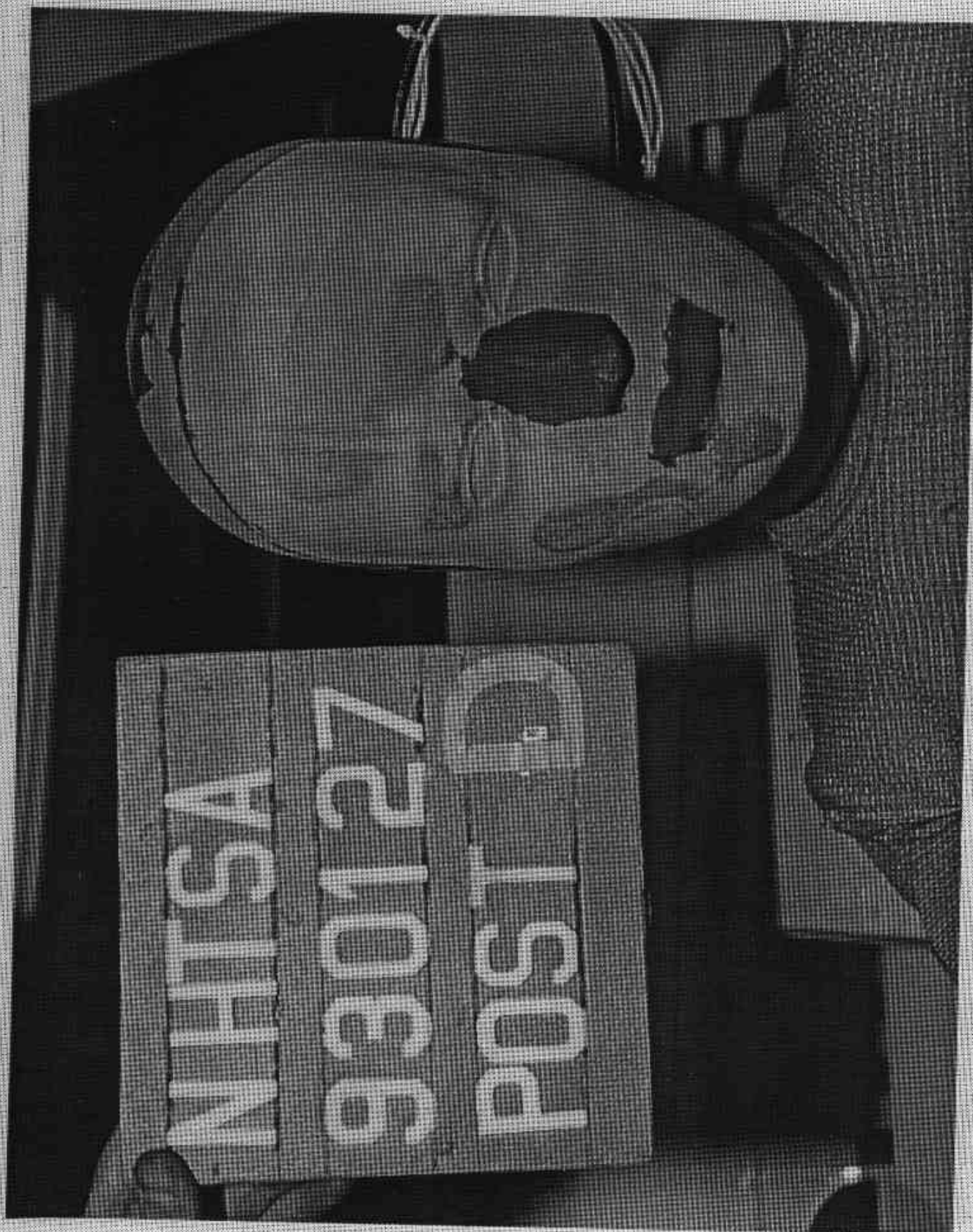


Figure A-39. POST-TEST DRIVER DUMMY HEAD CONTACT VIEW



Figure A-40. POST-TEST DRIVER DUMMY HEAD & CHEST CONTACT - VIEW 1

A-41

930127



Figure A-41. POST-TEST DRIVER DUMMY HEAD & CHEST CONTACT - VIEW 2
A-42 930127

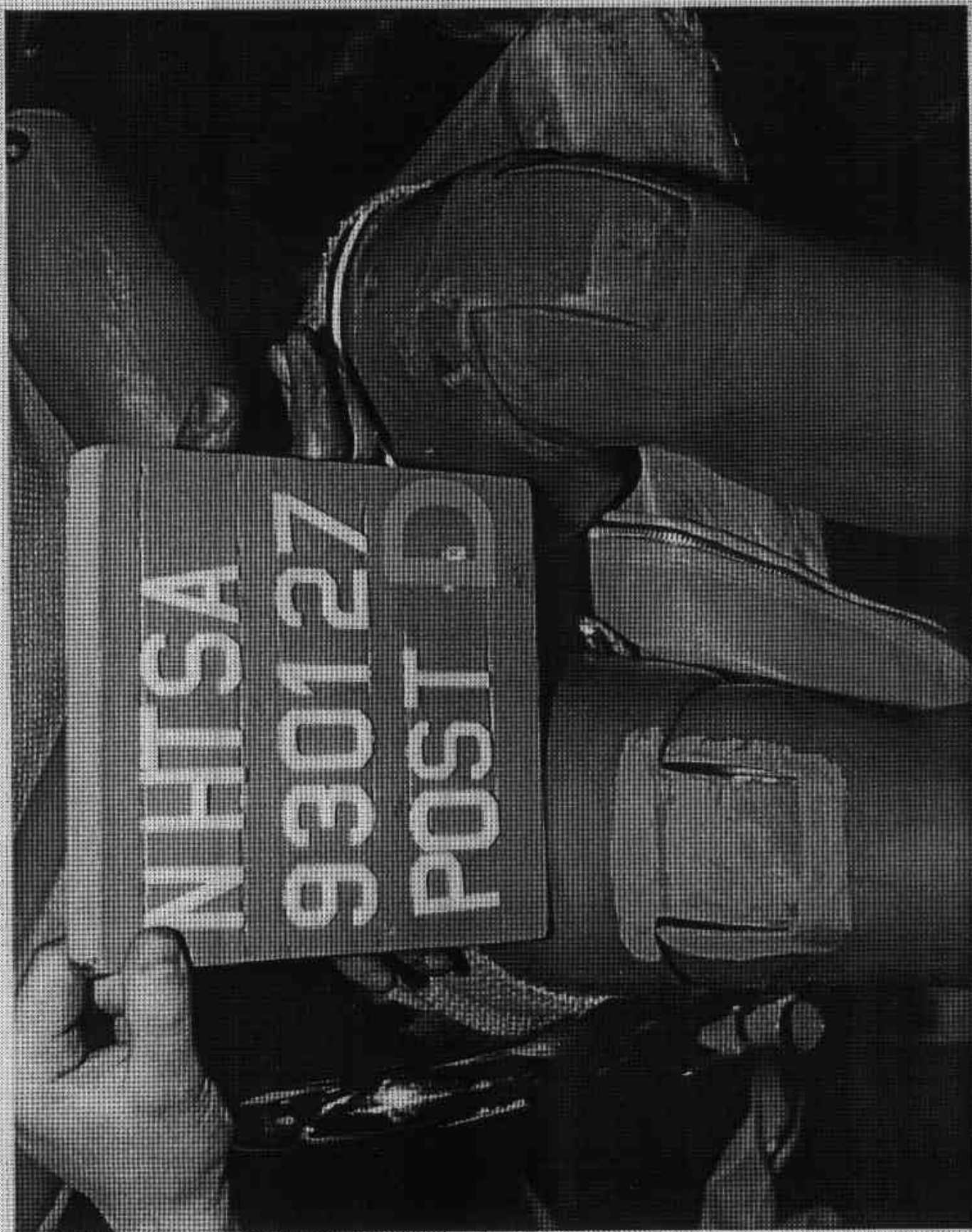


Figure A-42. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 1

A-43

930127

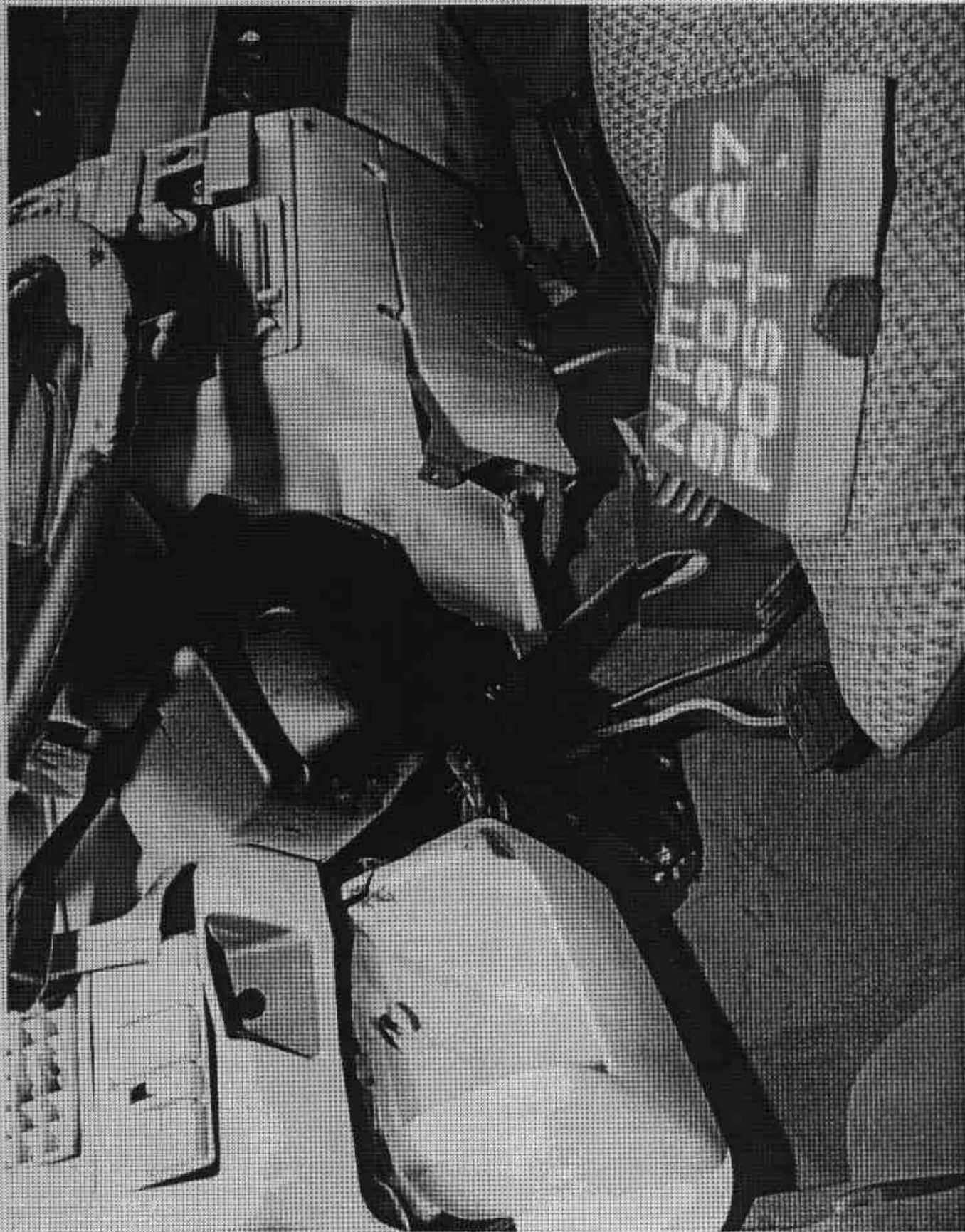


Figure A-43. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 2

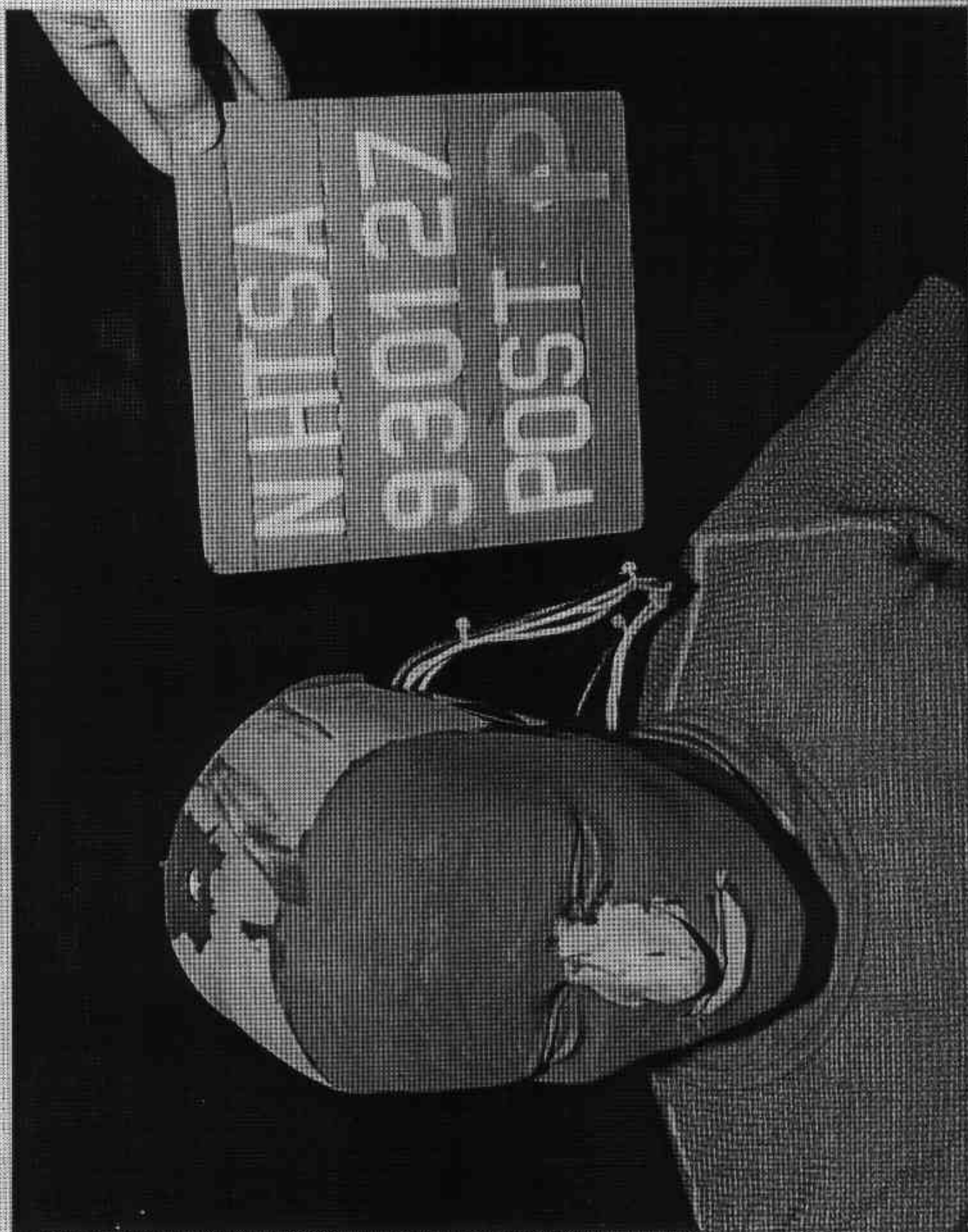


Figure A-44. POST-TEST PASSENGER DUMMY HEAD CONTACT VIEW

A-45

930127



Figure A-45. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1

A-46

930127



Figure A-46. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2
A-47 930127

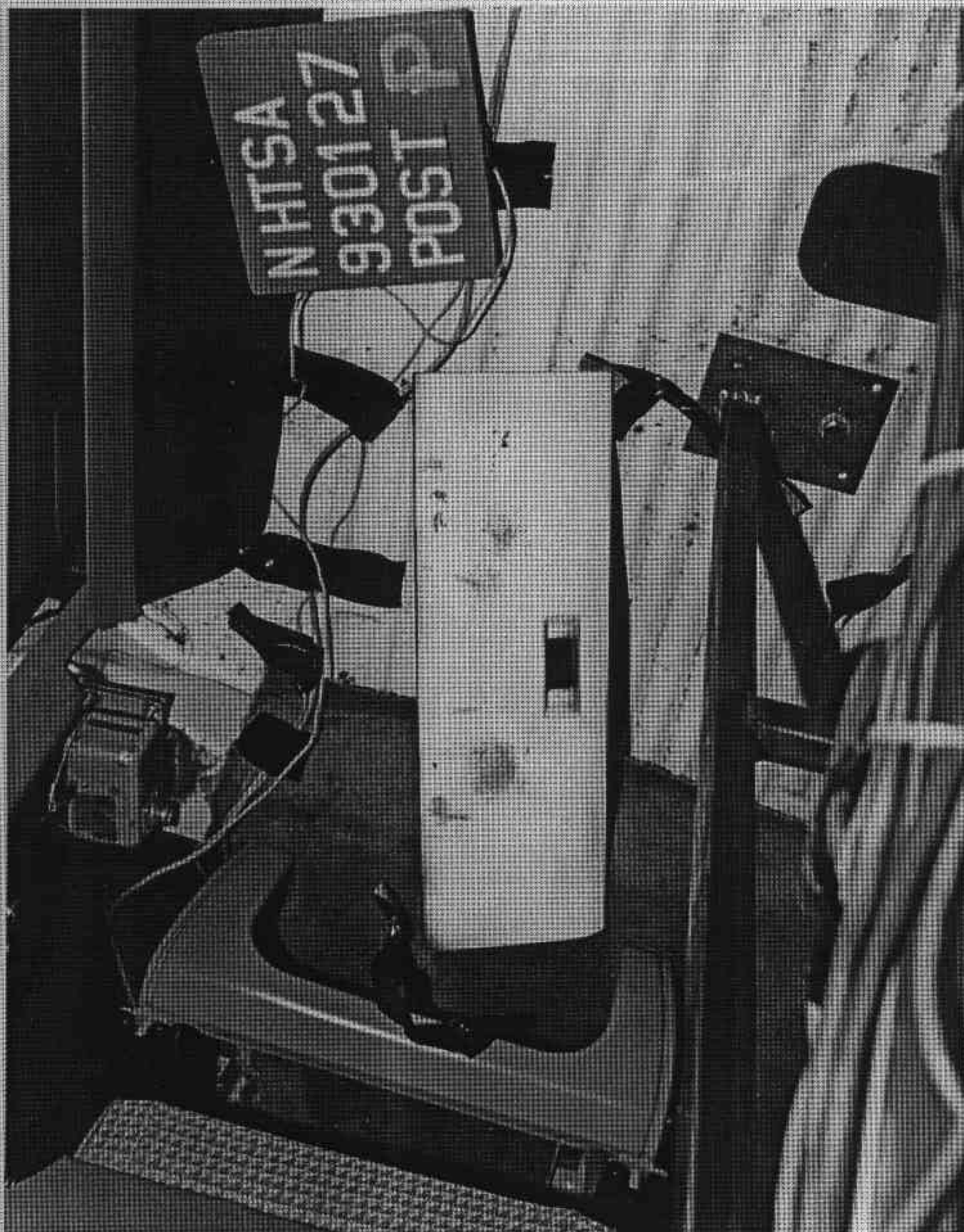


Figure A-47. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 3

A-48

930127

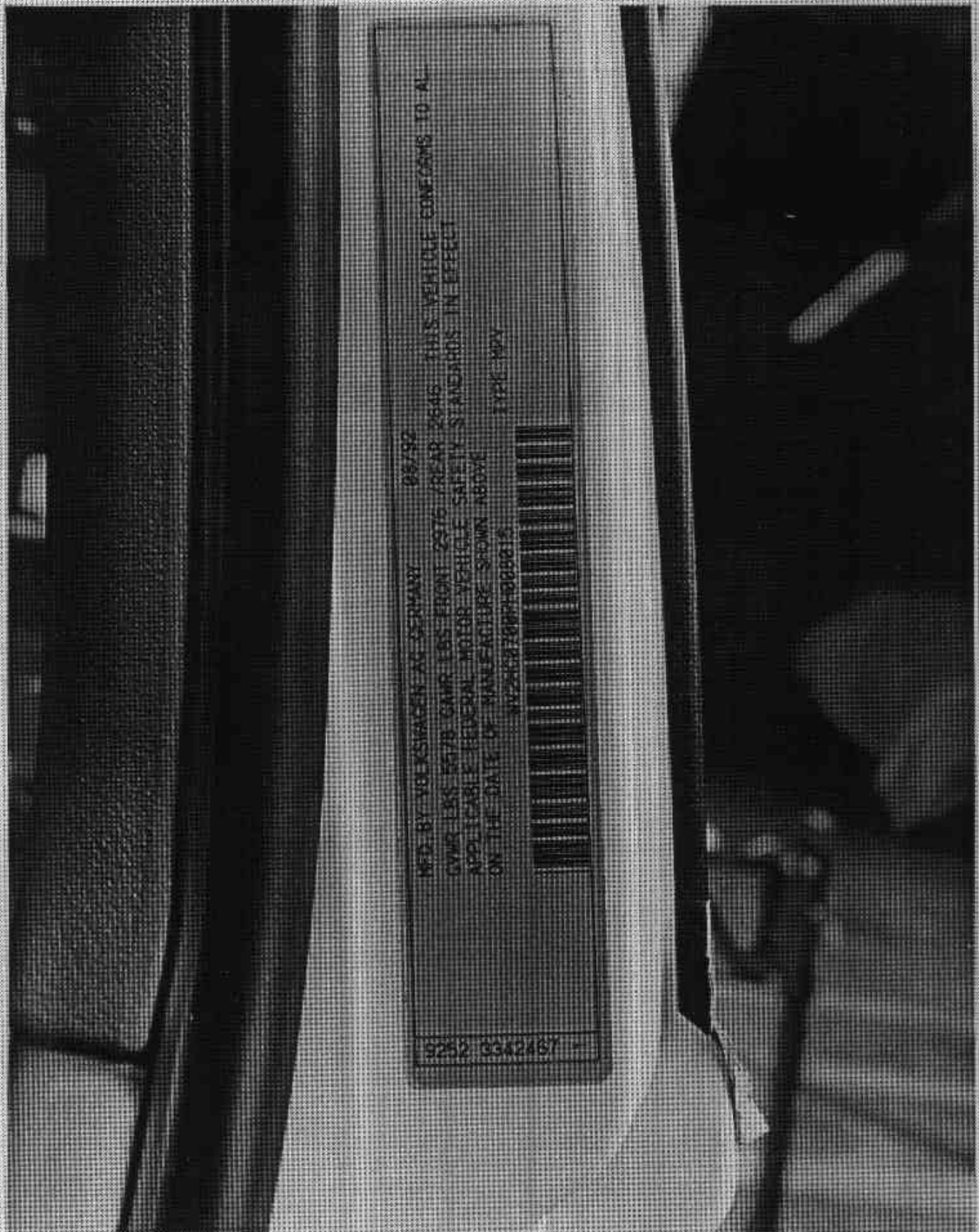


Figure A-48. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

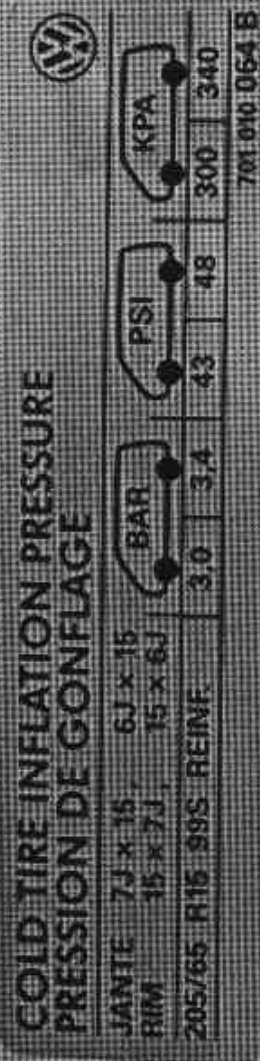


Fig. A-49. PRE-TEST VEHICLE RECOMMENDED TIRE PRESSURE LABEL VIEW

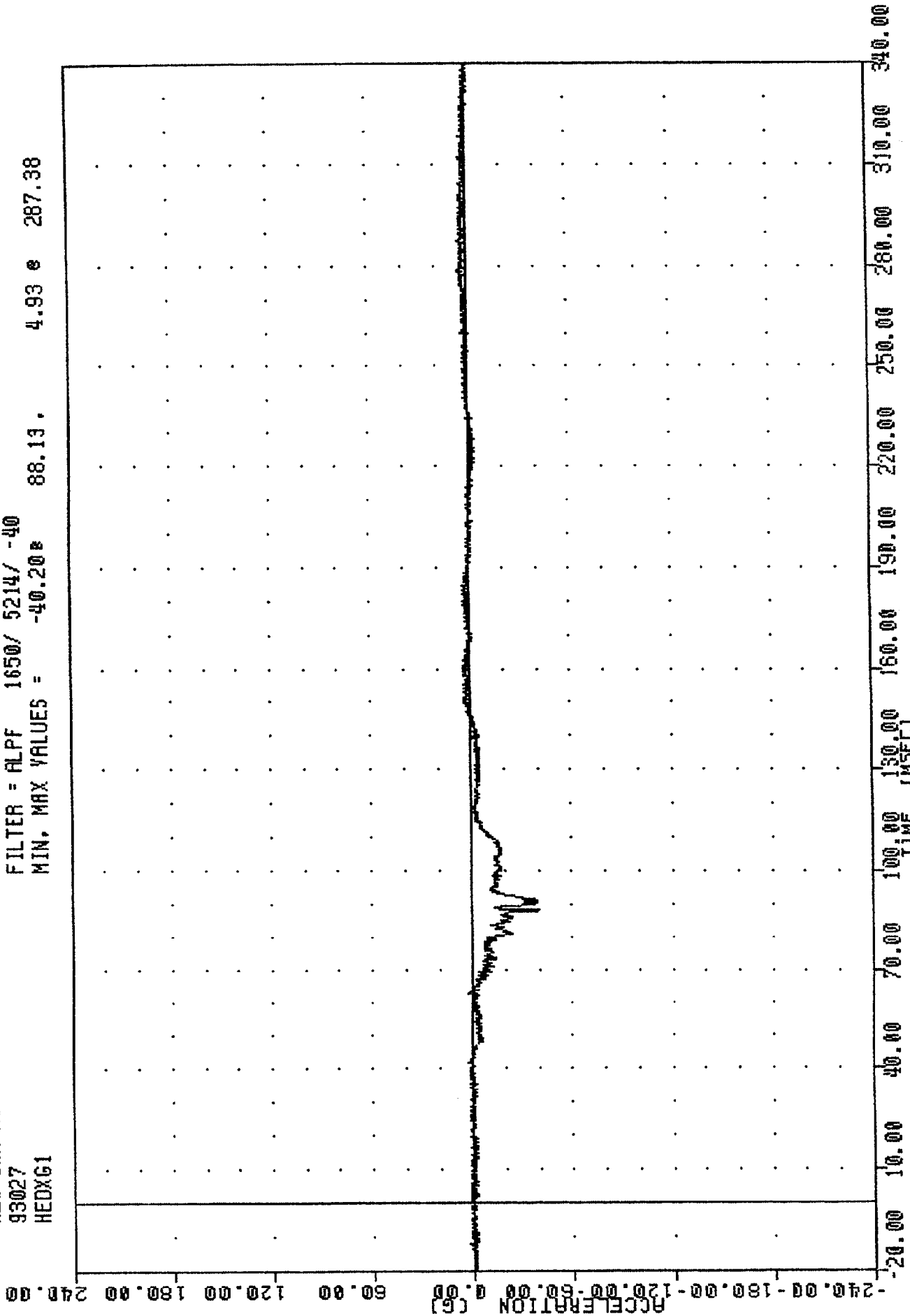
Intentionally Left Blank

APPENDIX B

DATA PLOTS

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 HEDXG1

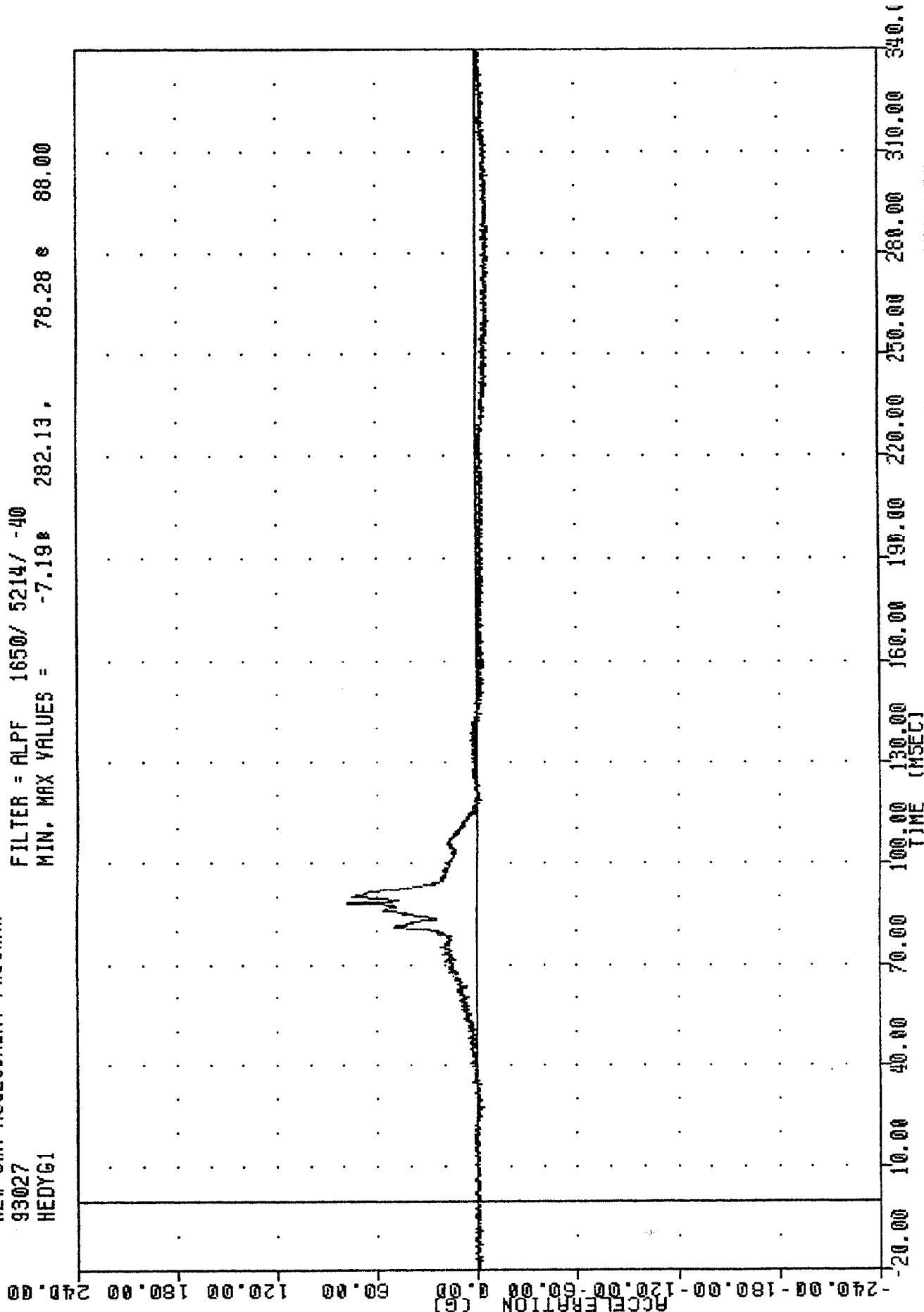
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -40.20 88.13 4.93 287.38



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD X-AXIS ACCELERATION

TRC
 NEW CAR ASSESSMENT PROGRAM
 93027
 HEDYG1

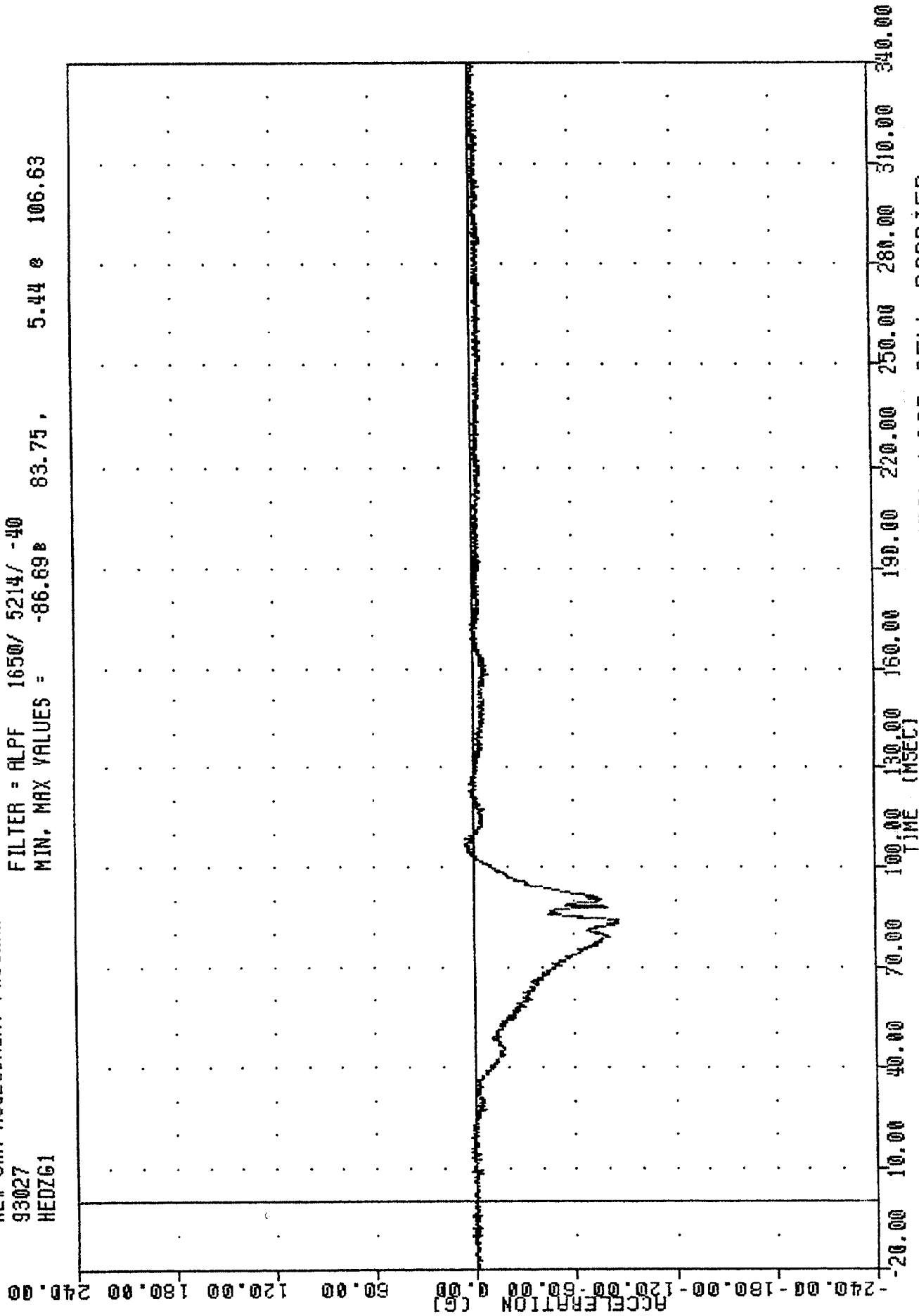
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -7.19 282.13 78.28 88.00



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD Y-AXIS ACCELERATION

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 HEDZG1

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -86.698 83.75, 5.44 e 106.63

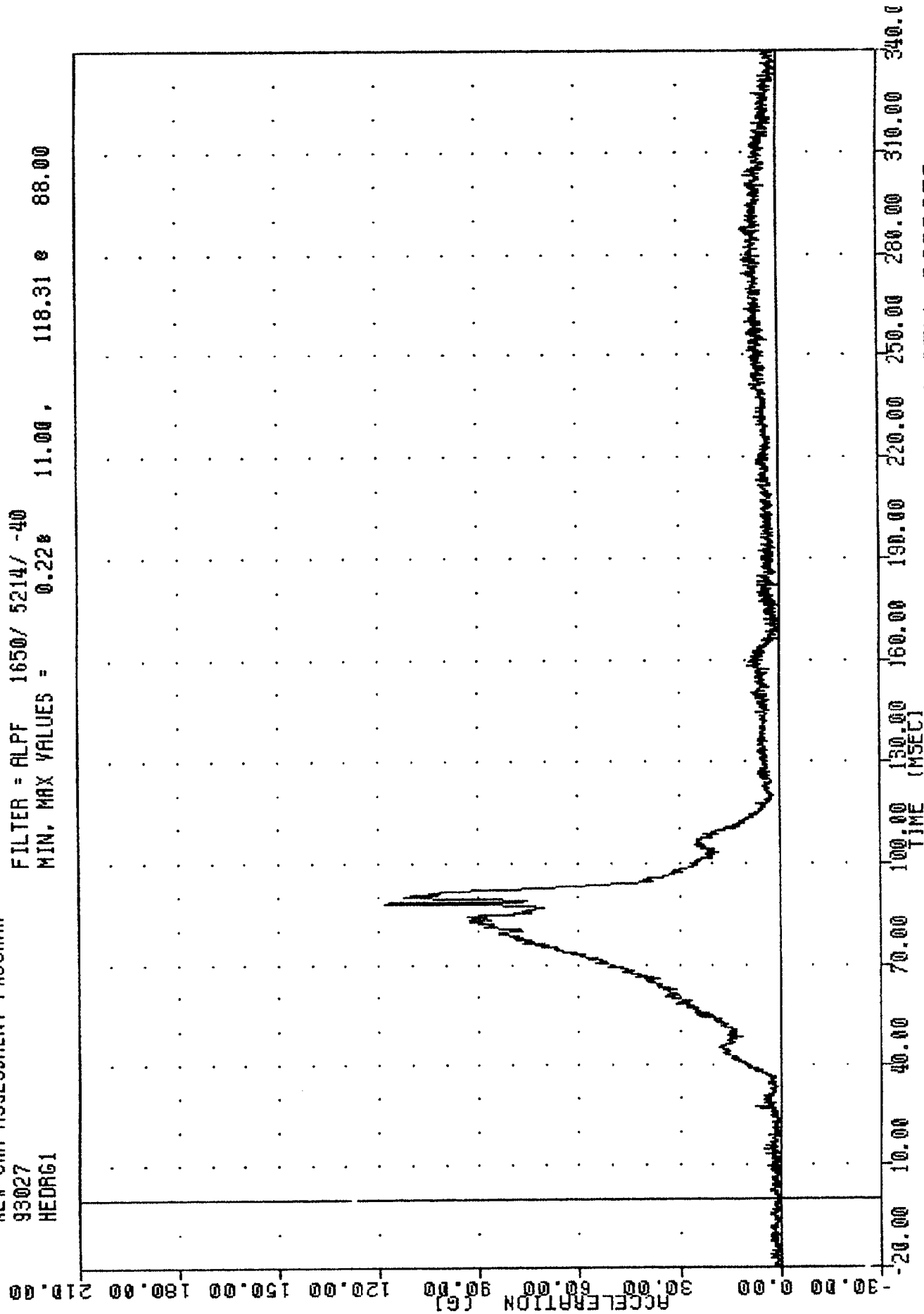


1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD AXIS ACCELERATION

TRC
 NEW CAR ASSESSMENT PROGRAM
 93027
 HEDRG1

, 930127

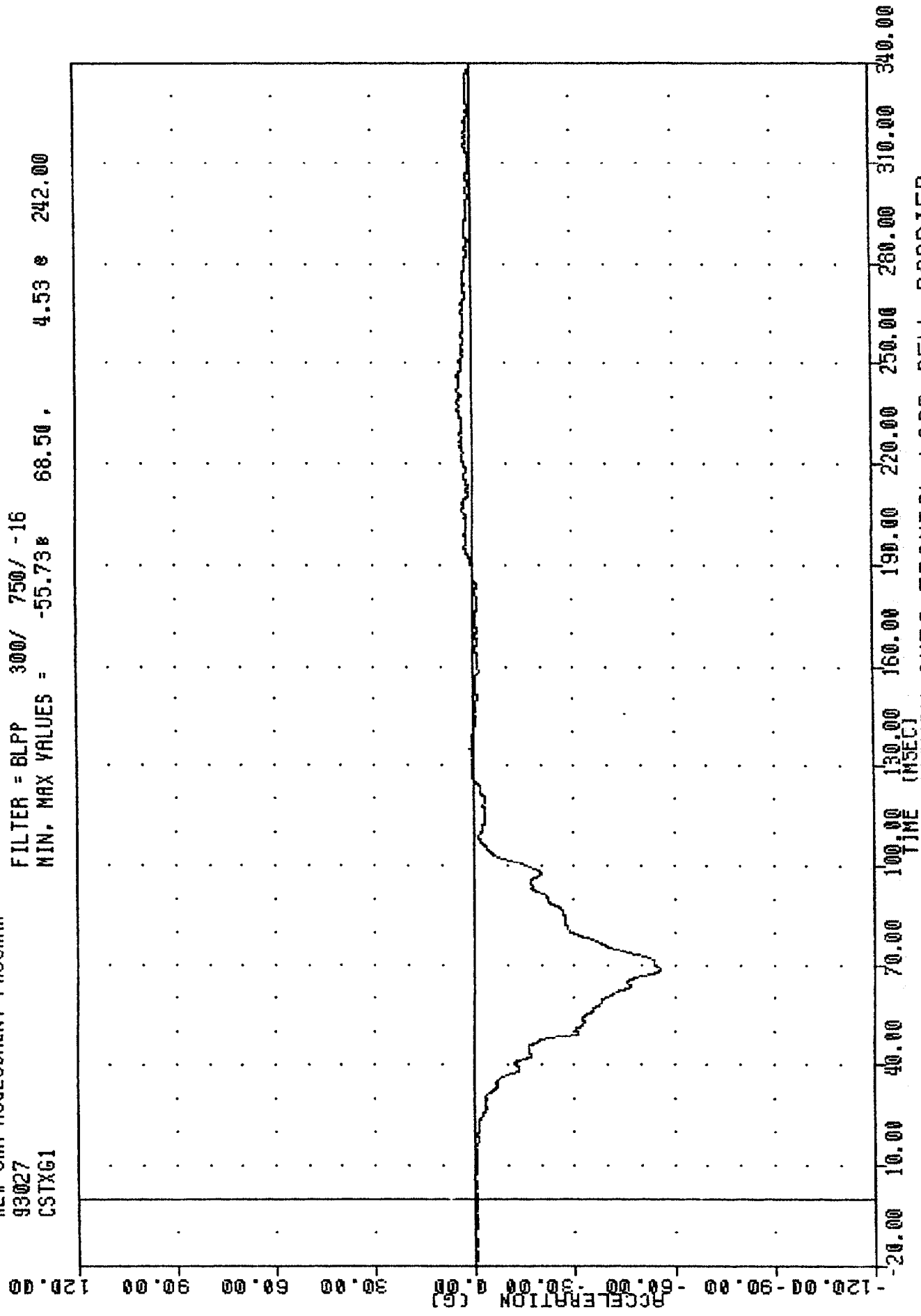
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 0.22% 11.00, 118.31 e 88.00



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD RESULTANT ACCELERATION

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 CSTXG1

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -55.73 68.50 4.53 242.00



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER

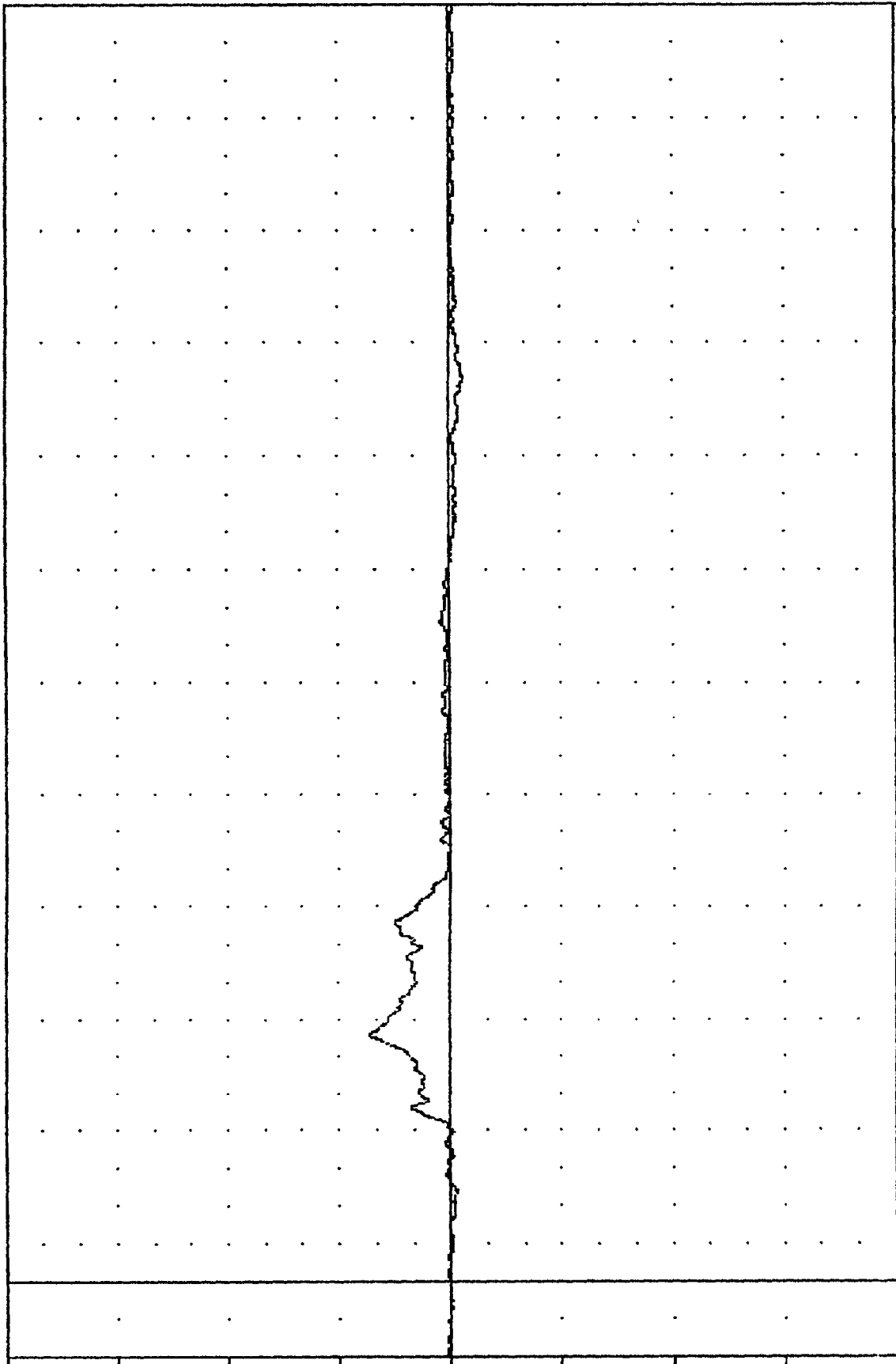
DRIVER SURVIVAL - ROPS PROTECTION

TRC
 NEW CAR ASSESSMENT PROGRAM
 93027
 CSTYG1

930127

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -3.638 240.50, 22.07 e 65.75

ACCELERATION (G)



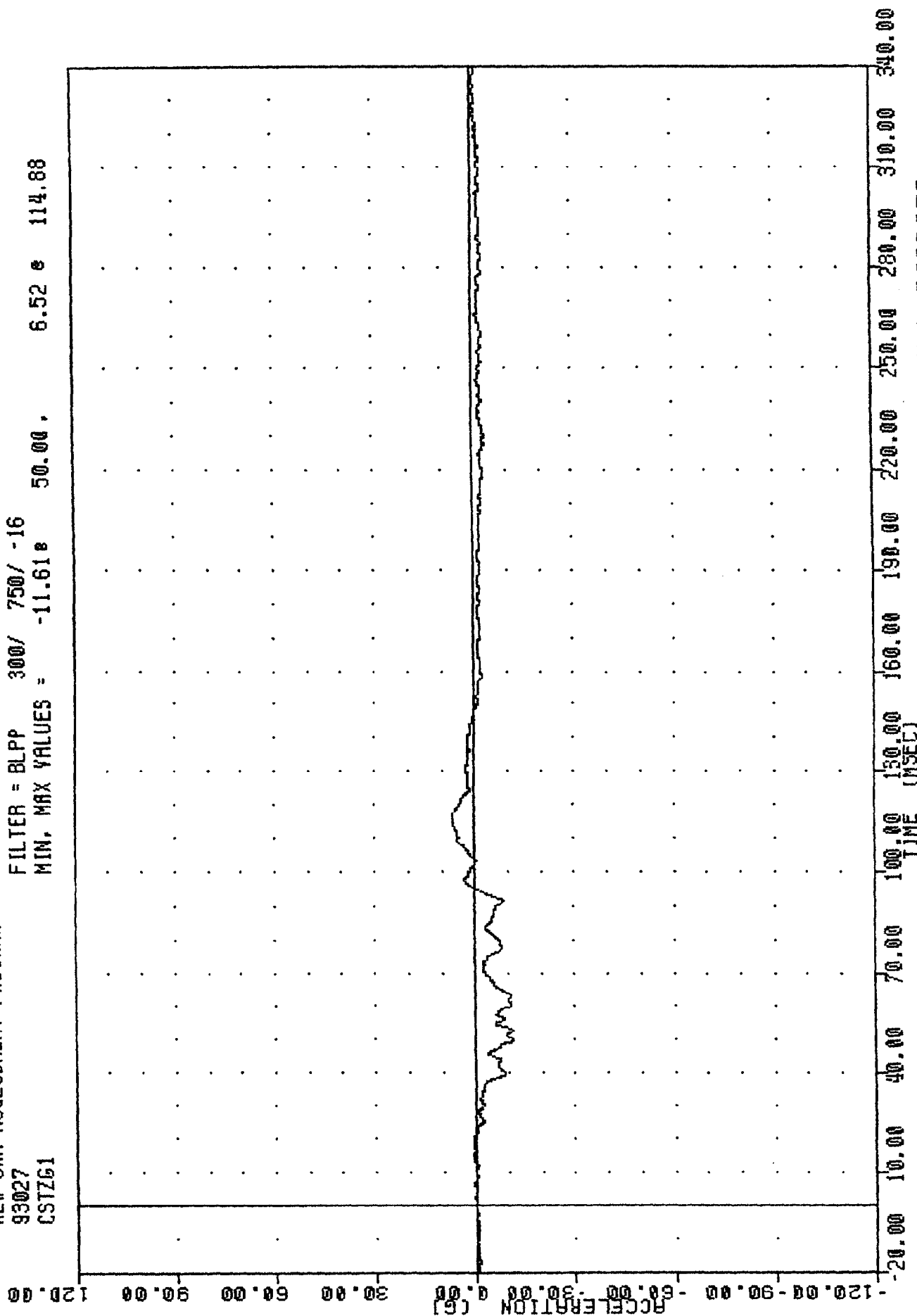
-120.00 -90.00 -60.00 -30.00 0.00 30.00 60.00 90.00 120.00

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

1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Y-AXIS ACCELERATION

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 CSTZG1

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -11.61e 50.00, 6.52 e 114.88



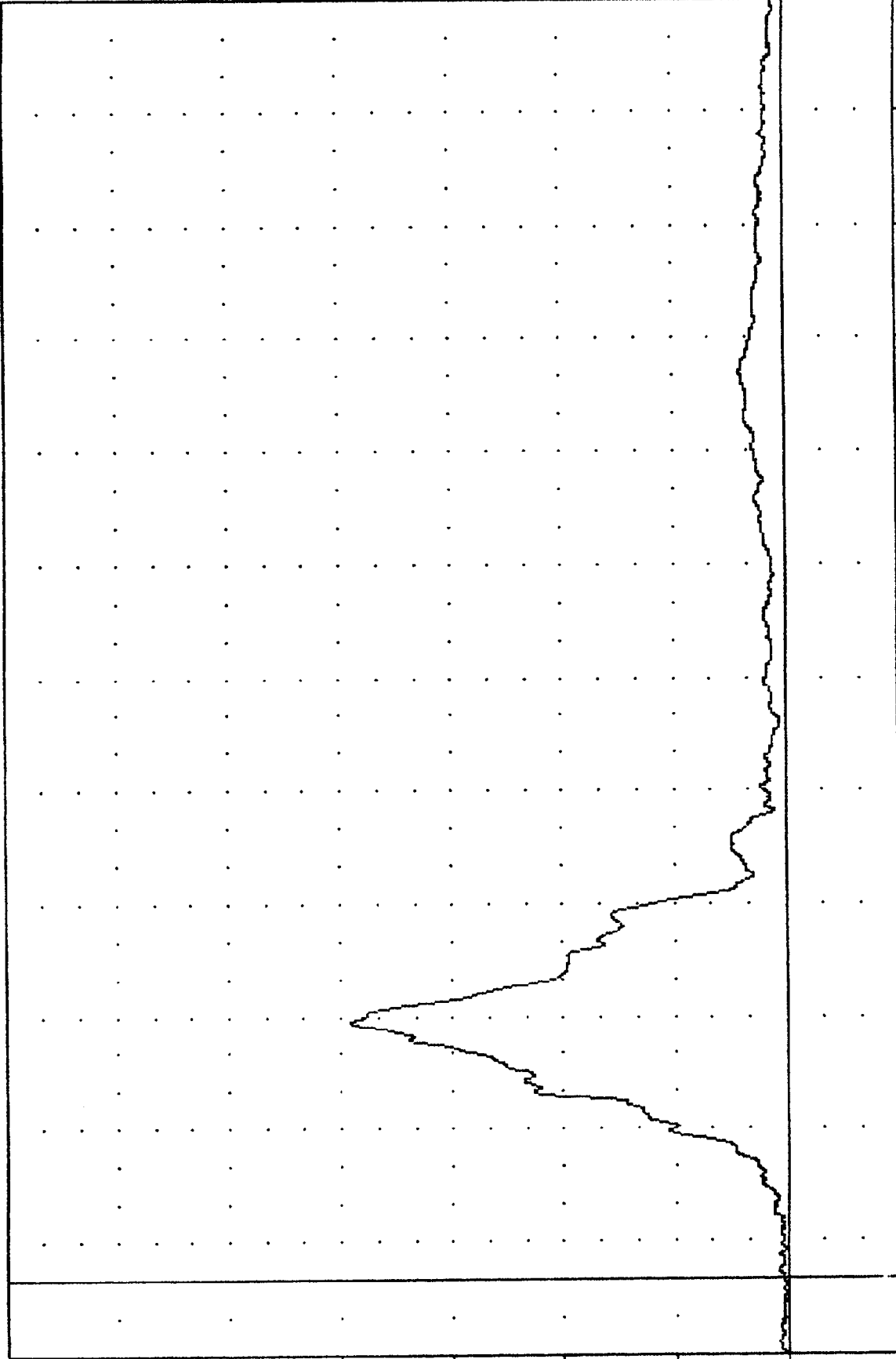
1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 PARTIAL CRASH TEST - AXIS ACCELERATION

TRC
 NEW CAR ASSESSMENT PROGRAM
 93027
 CSTRG1

, 930127

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = 0.08 58.70 68.38

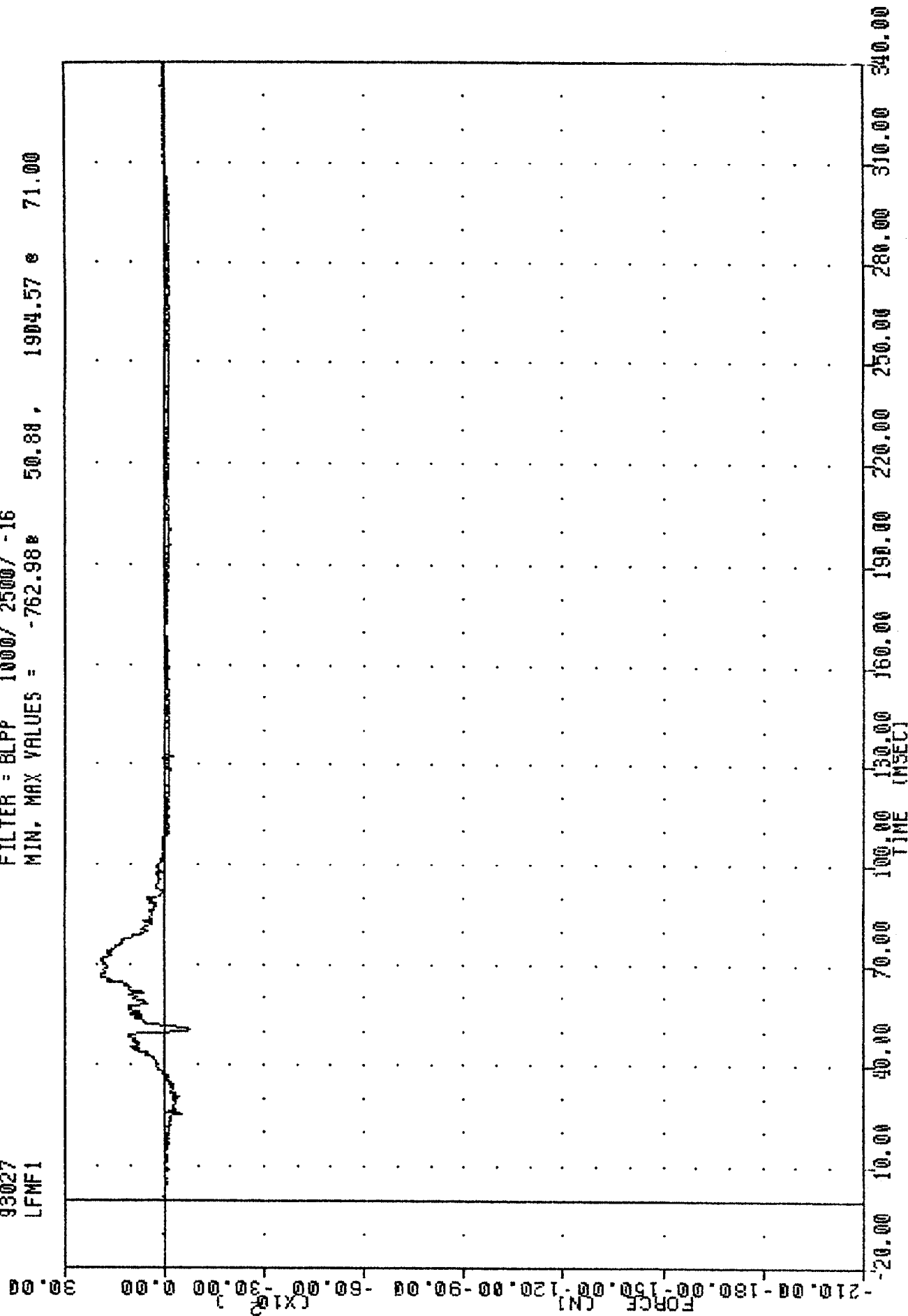
ACCELERATION (G)



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST RESULTANT ACCELERATION

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 LFMF1

FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = -762.98 50.88, 1904.57 71.00



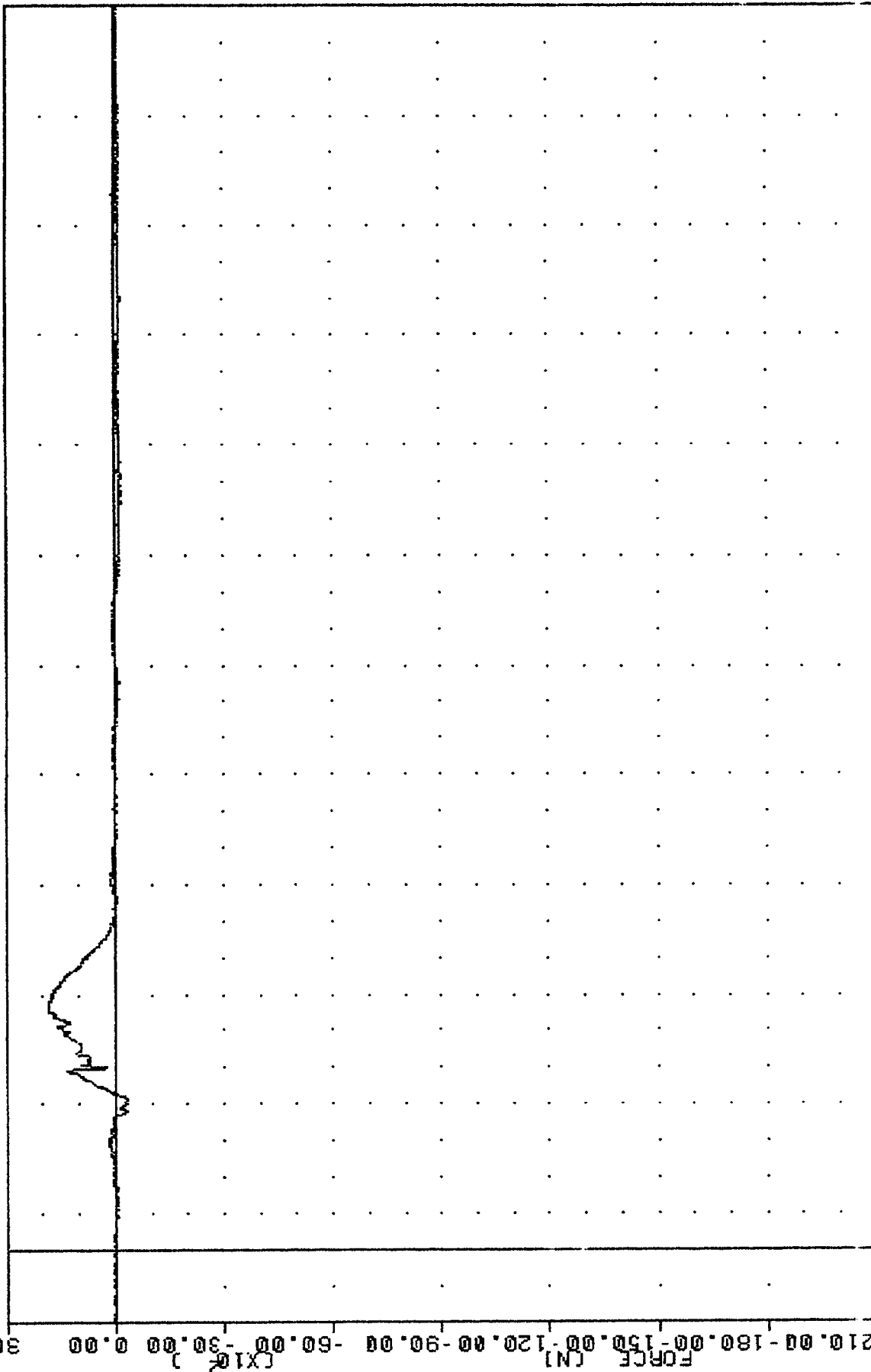
1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 DRIVEN LEFT CURB FORCE

TRC
NEW CAR ASSESSMENT PROGRAM
93027
RFMF1

, 930127

FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -357.93 41.38, 1857.65 66.25

30.00

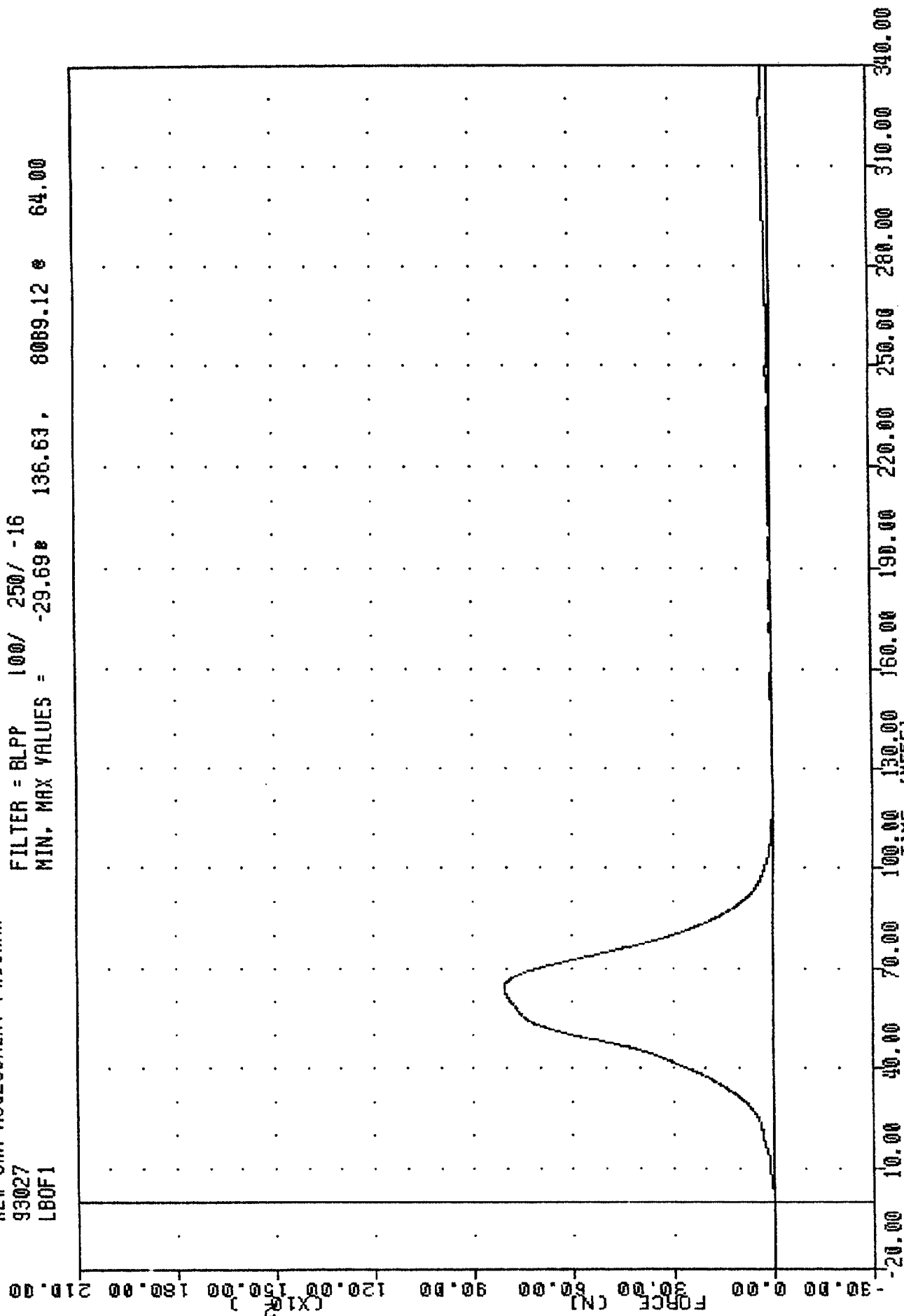


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FEMUR FORCE

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 LBOF1

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -29.69 136.63, 8089.12 64.00

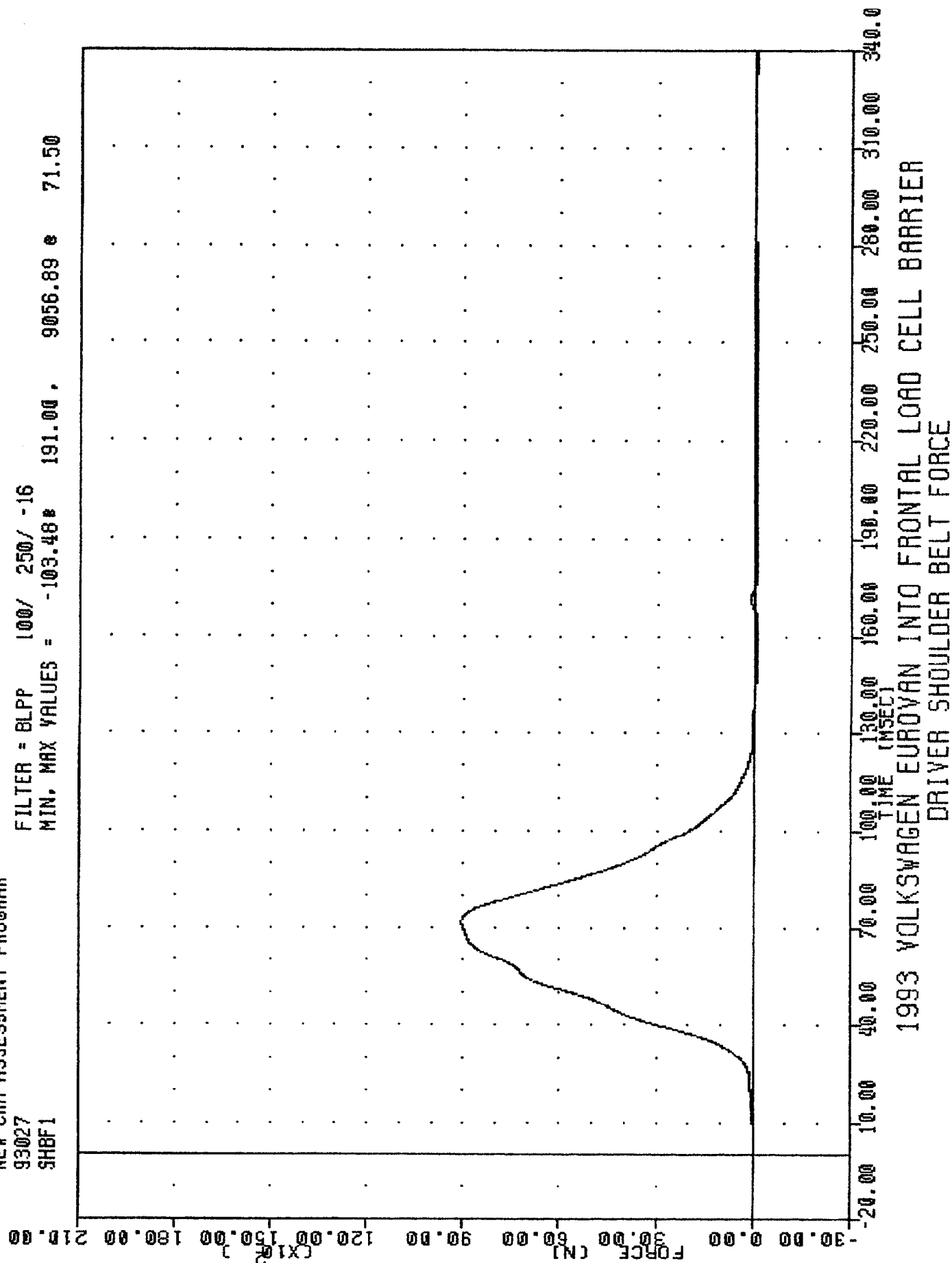


1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER

DRIVER HIP RESULT OUTWARD FORCE

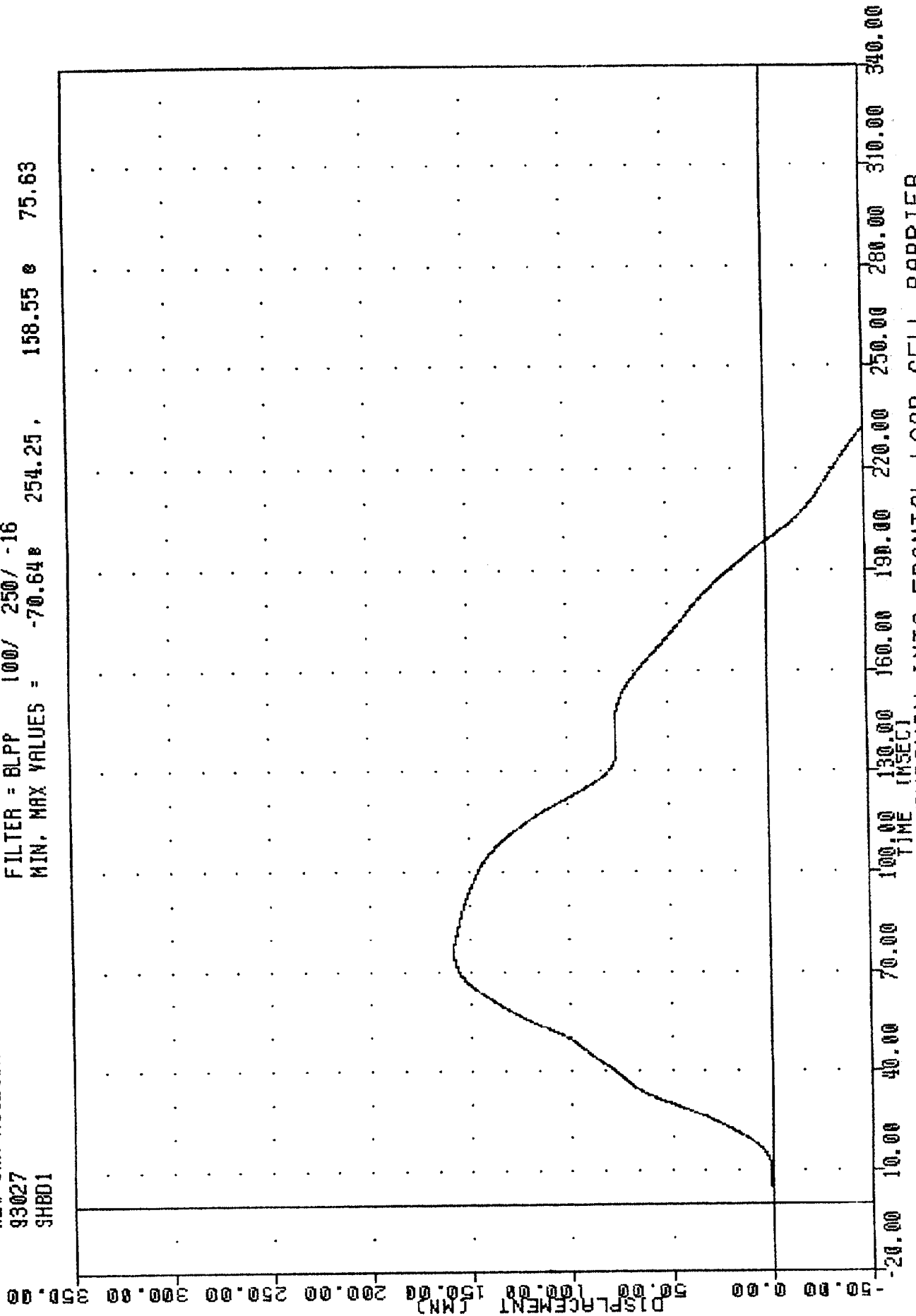
TRC
NEW CAR ASSESSMENT PROGRAM
93027
SHBF1

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -103.48 191.00, 9056.89 71.50



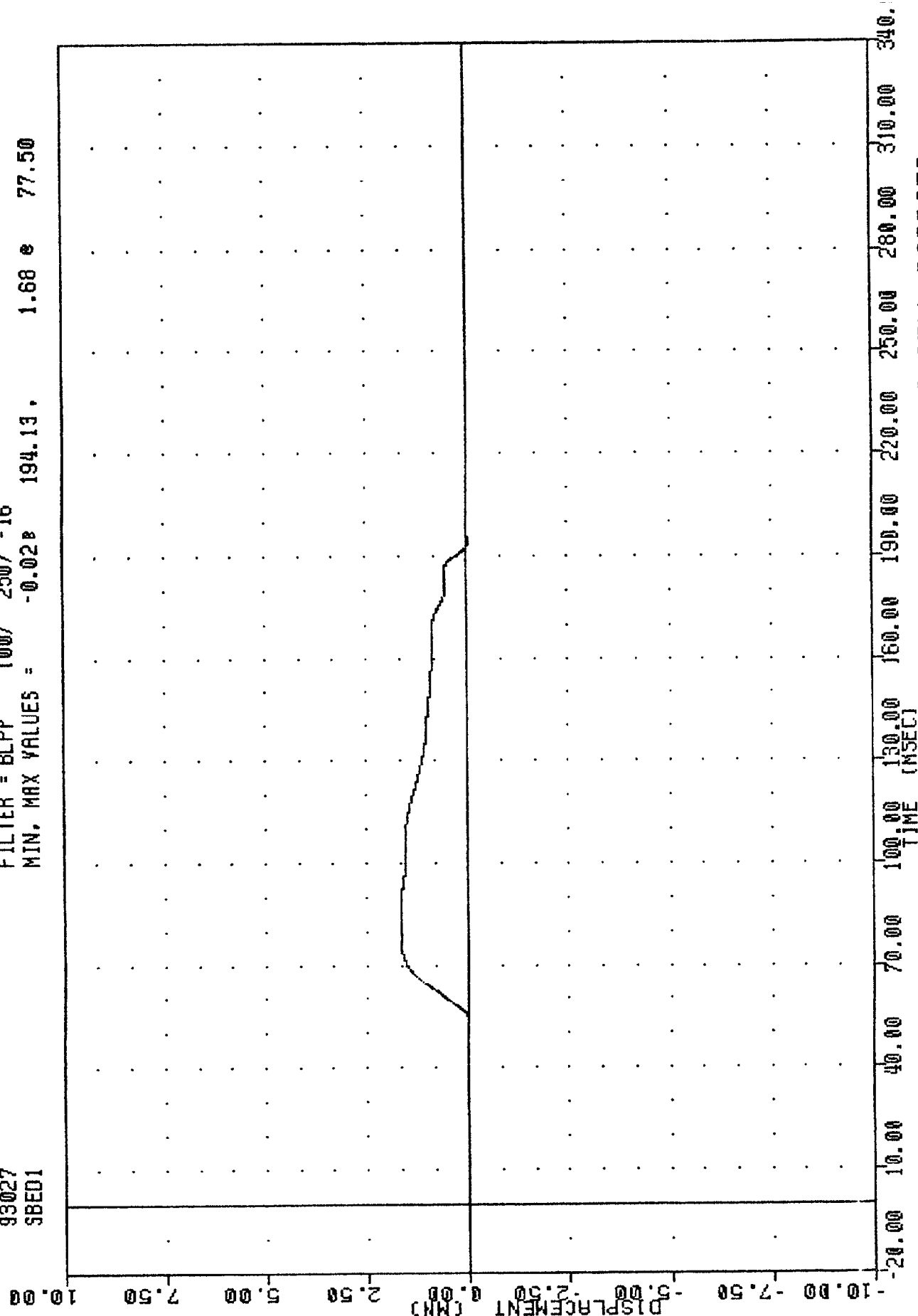
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 SHBD1

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -70.64 254.25 158.55 75.63



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 SBED1

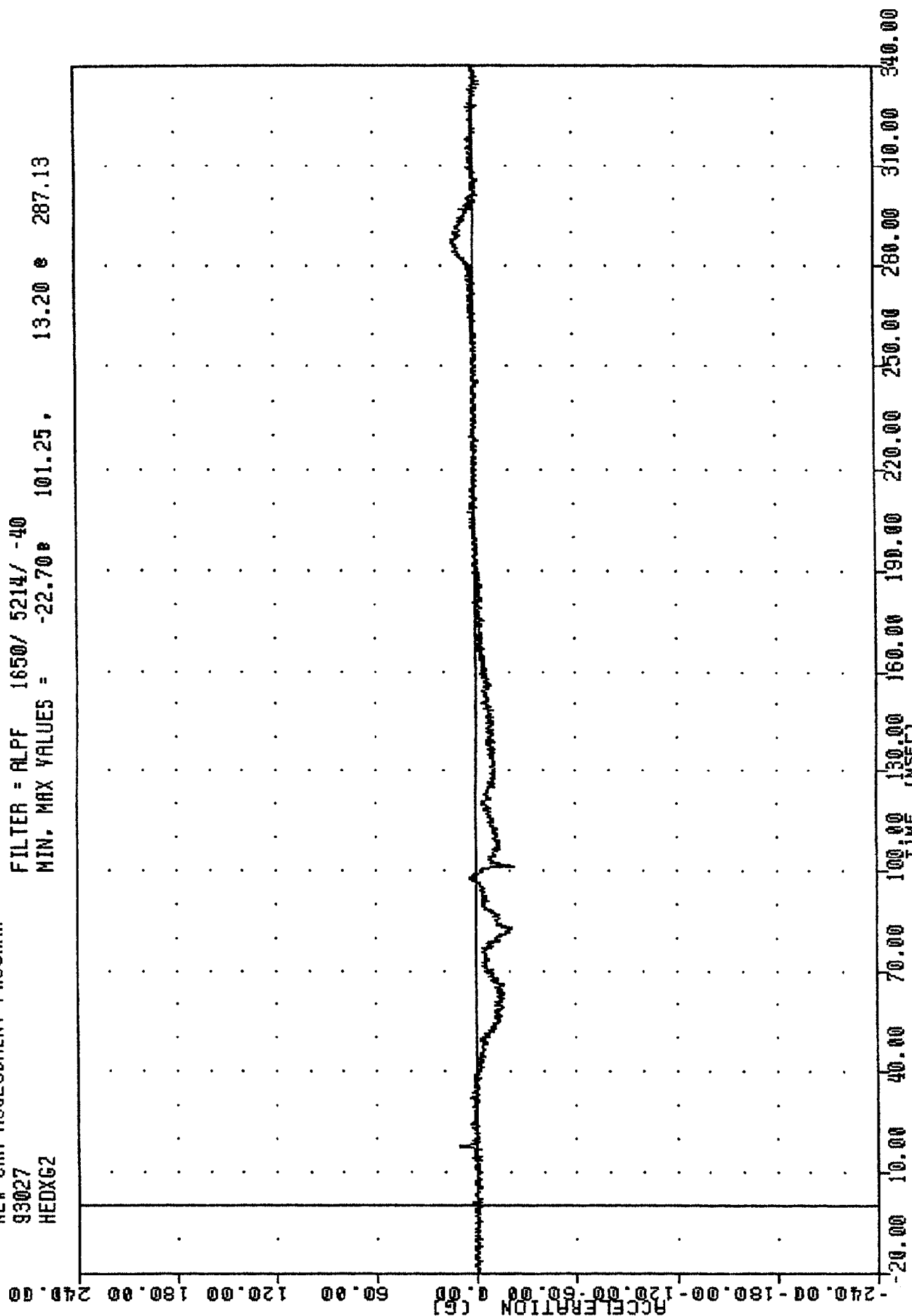
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -0.028 194.13 1.68 e 77.50



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 DRIVER SEAT BELT EXTENSION

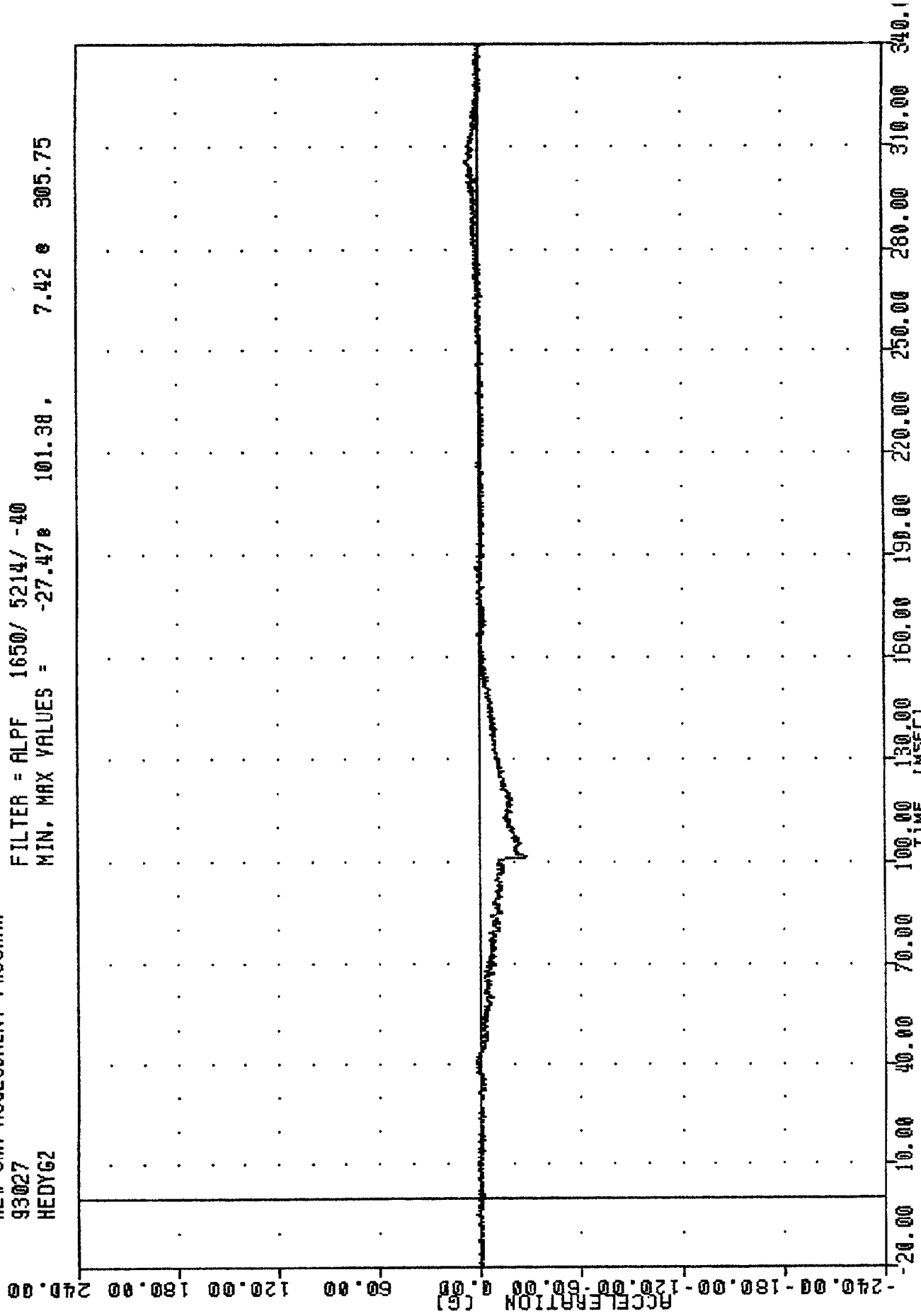
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 HEDXG2

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -22.70e 101.25. 13.20 e 287.13



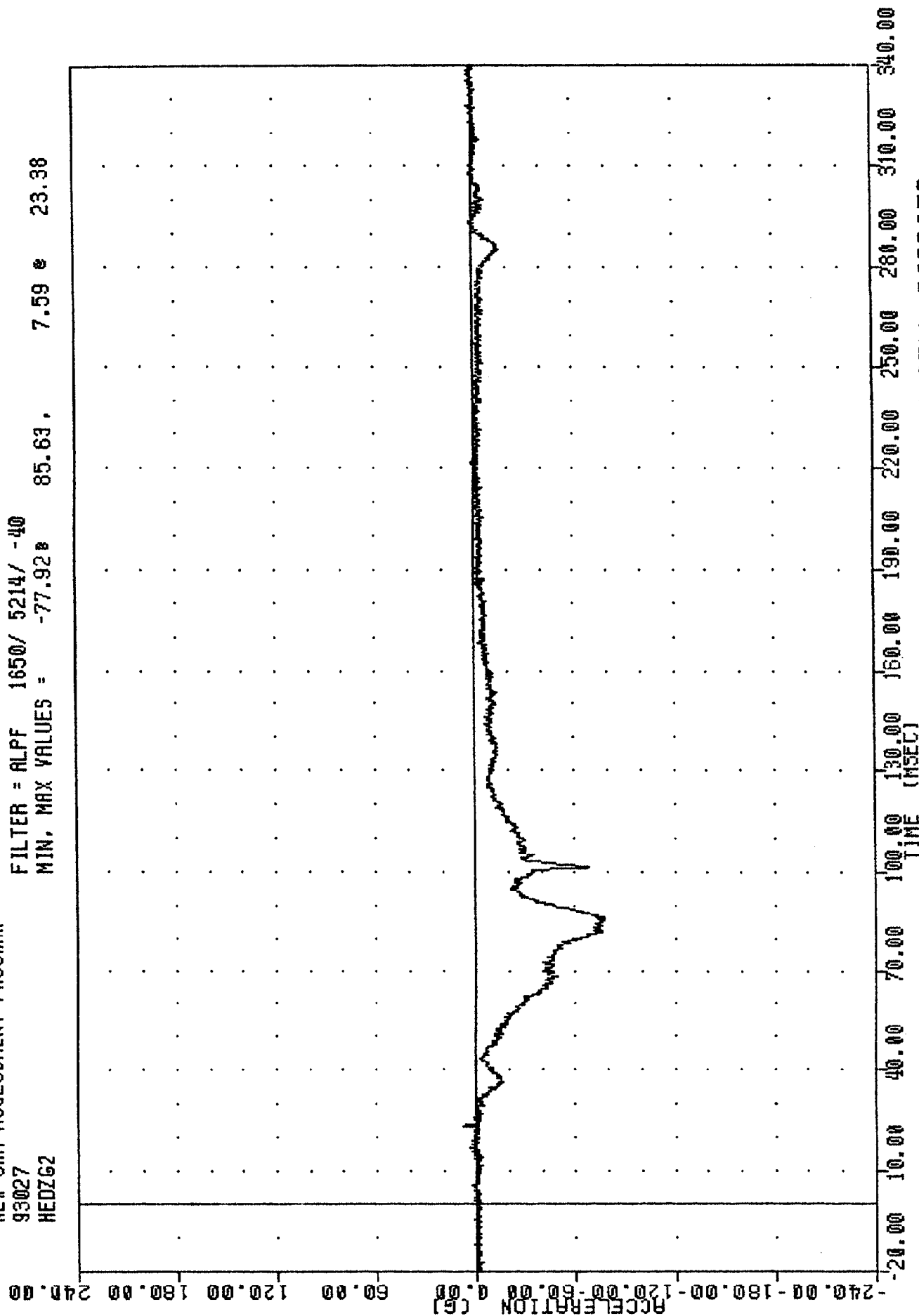
TRC
 NEW CAR ASSESSMENT PROGRAM
 93027
 HEDYG2

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -27.47e 101.38. 7.42 e 305.75



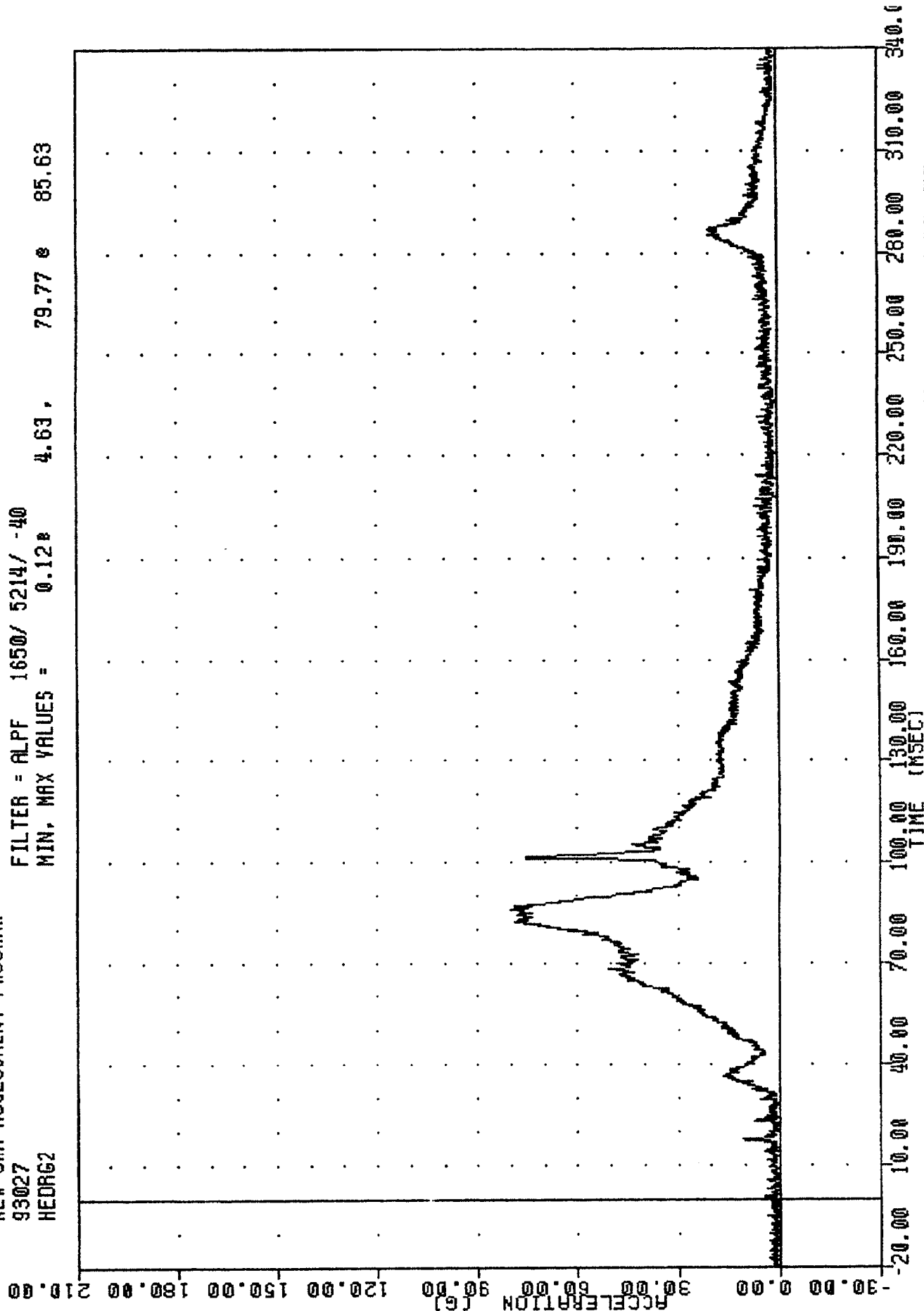
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 HEDZG2

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -77.92 85.63, 7.59 23.38



TRC
NEW CAR ASSESSMENT PROGRAM
93027
HEDRG2

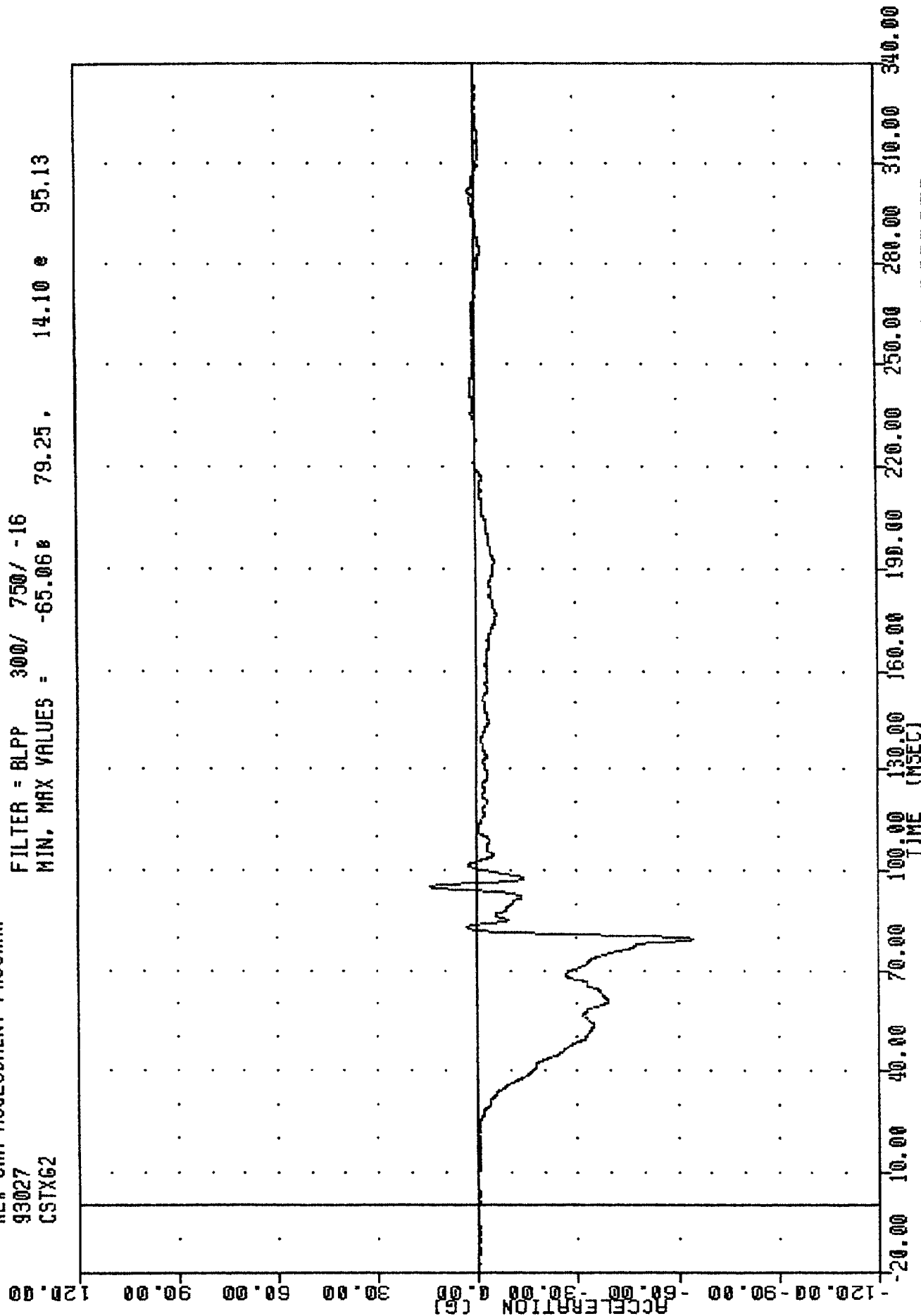
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.12g 4.63, 79.77 g 85.63



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 CSTX62

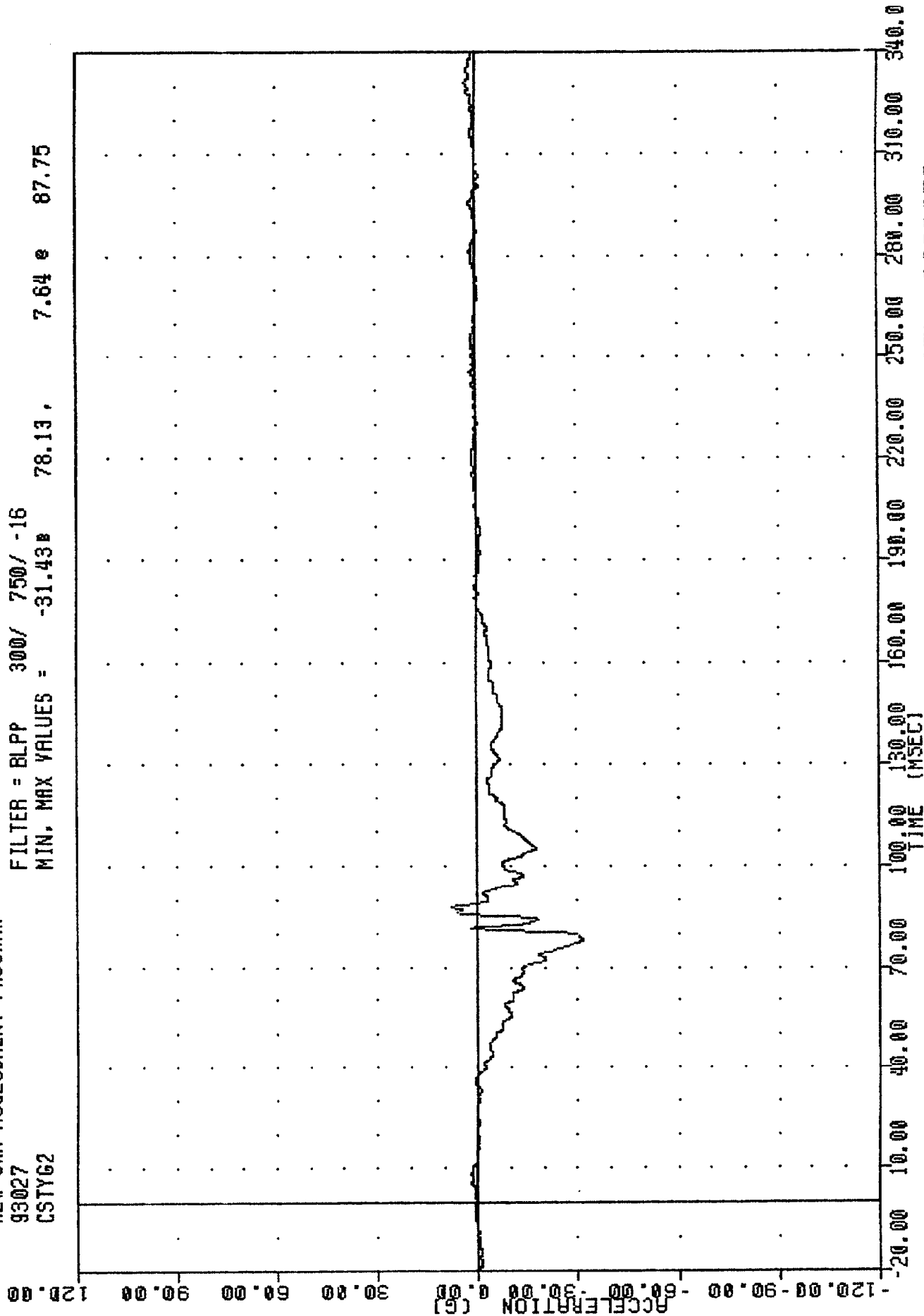
FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -65.06 79.25, 14.10 e 95.13



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 PASSENGER SHEET X-AXIS ACCELERATION

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 CSTYG2

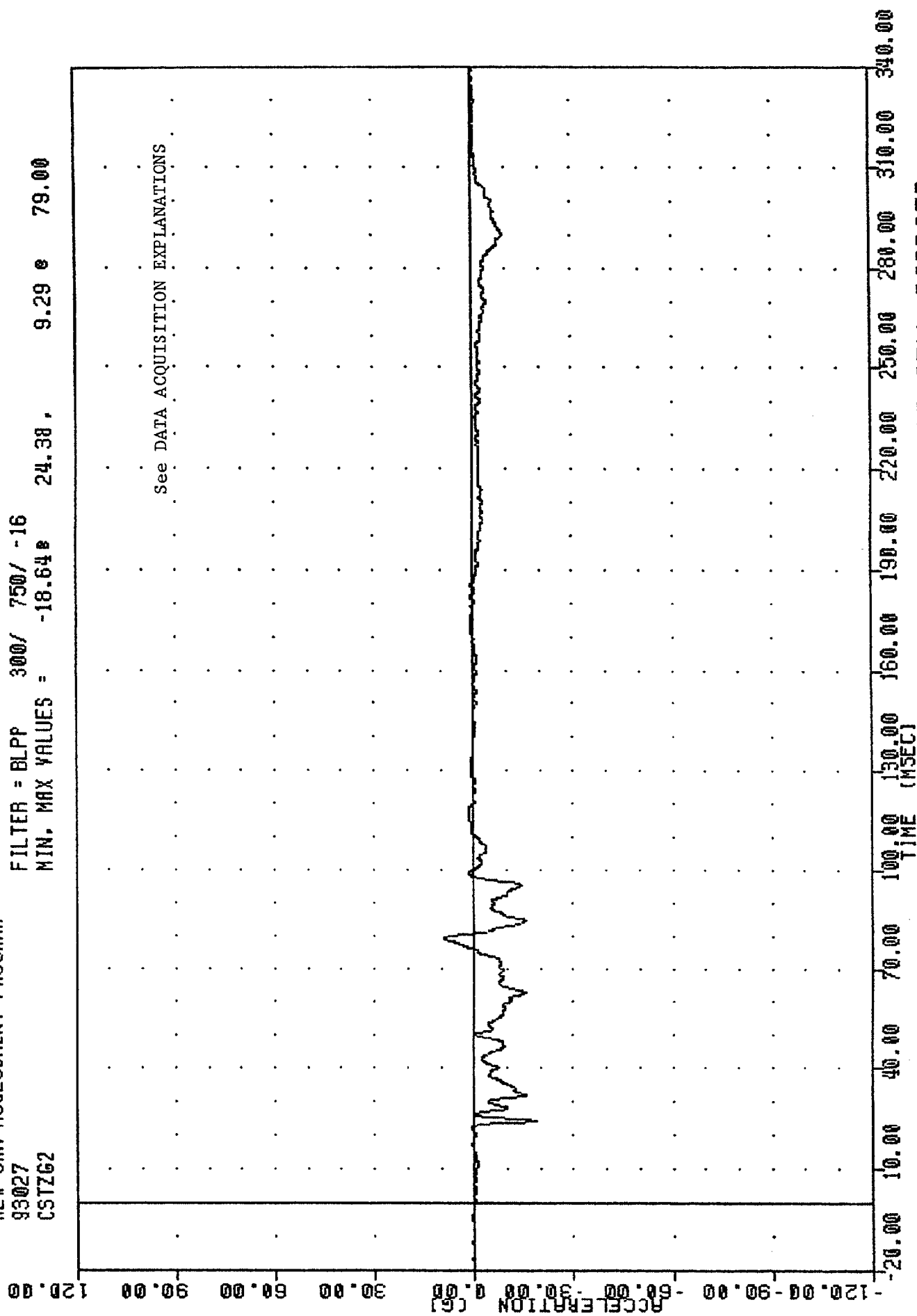
FILTER = BLPP 300/ 750/ -18
 MIN. MAX VALUES = -31.43 78.13, 7.64 87.75



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 PASSENGER CHEST Y-AXIS ACCELERATION

TRC , 930127
NEW CAR ASSESSMENT PROGRAM
93027
CSTZG2

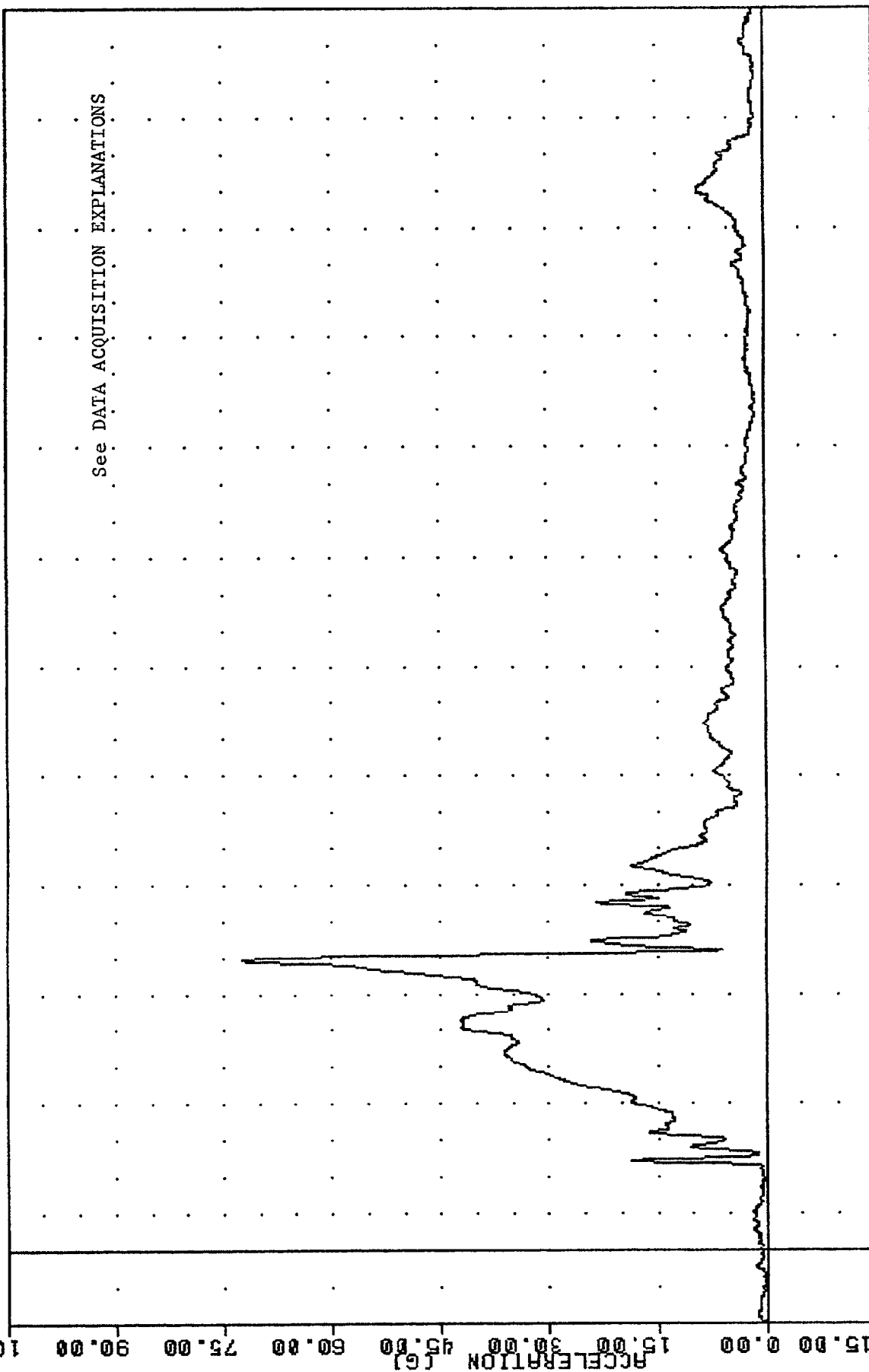
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -18.64e 24.38 , 9.29 e 79.00



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 CSTR62

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = 0.098 -20.00 , 72.37 e 79.25

105.00

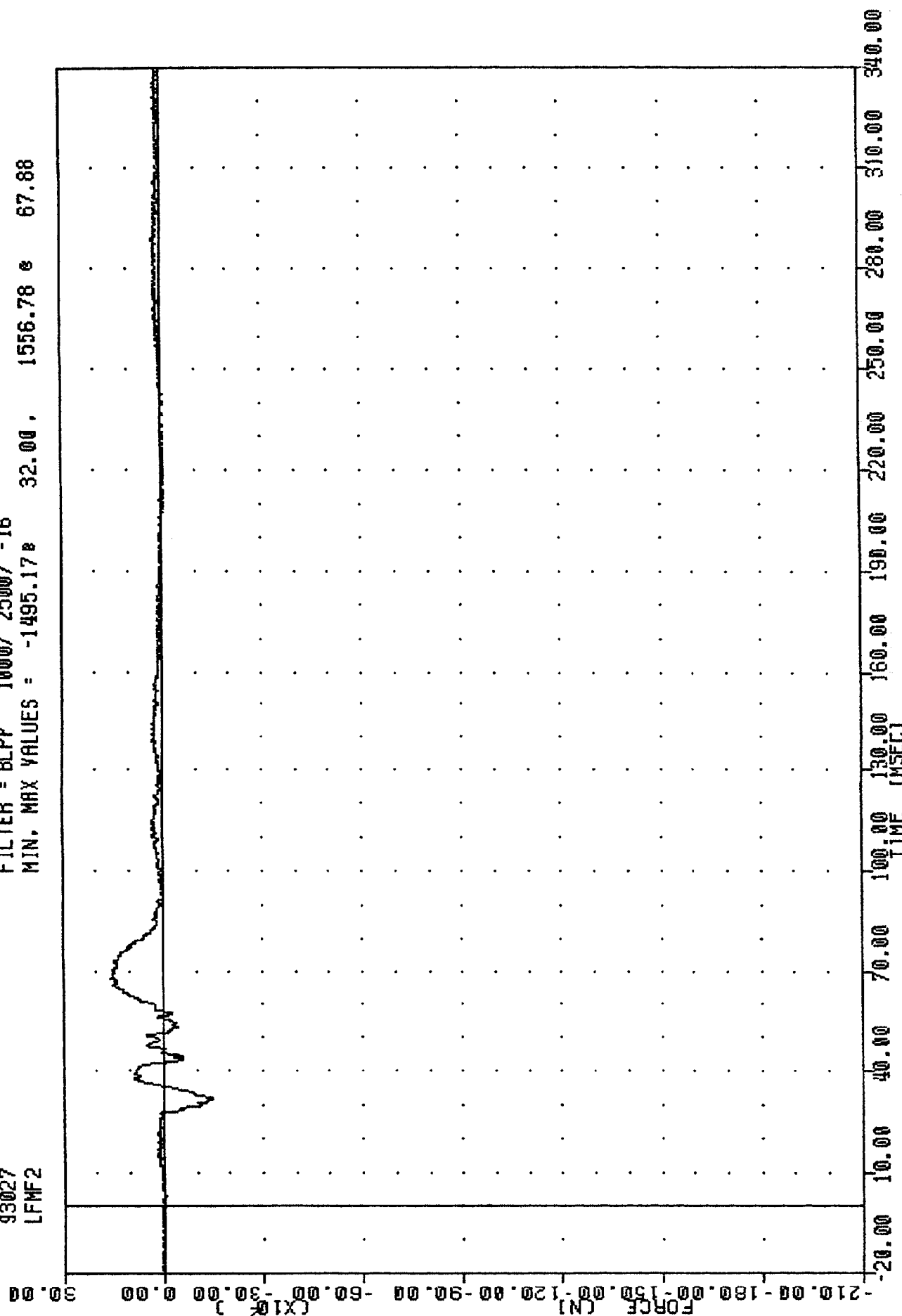


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 PASSENGER CHEST RESULTANT ACCELERATION

TAC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 LFMF2

FILTER = BLPP 1000/ 2500/ -16
 MIN. MAX VALUES = -1495.17 e 32.00 , 1556.78 e 67.88

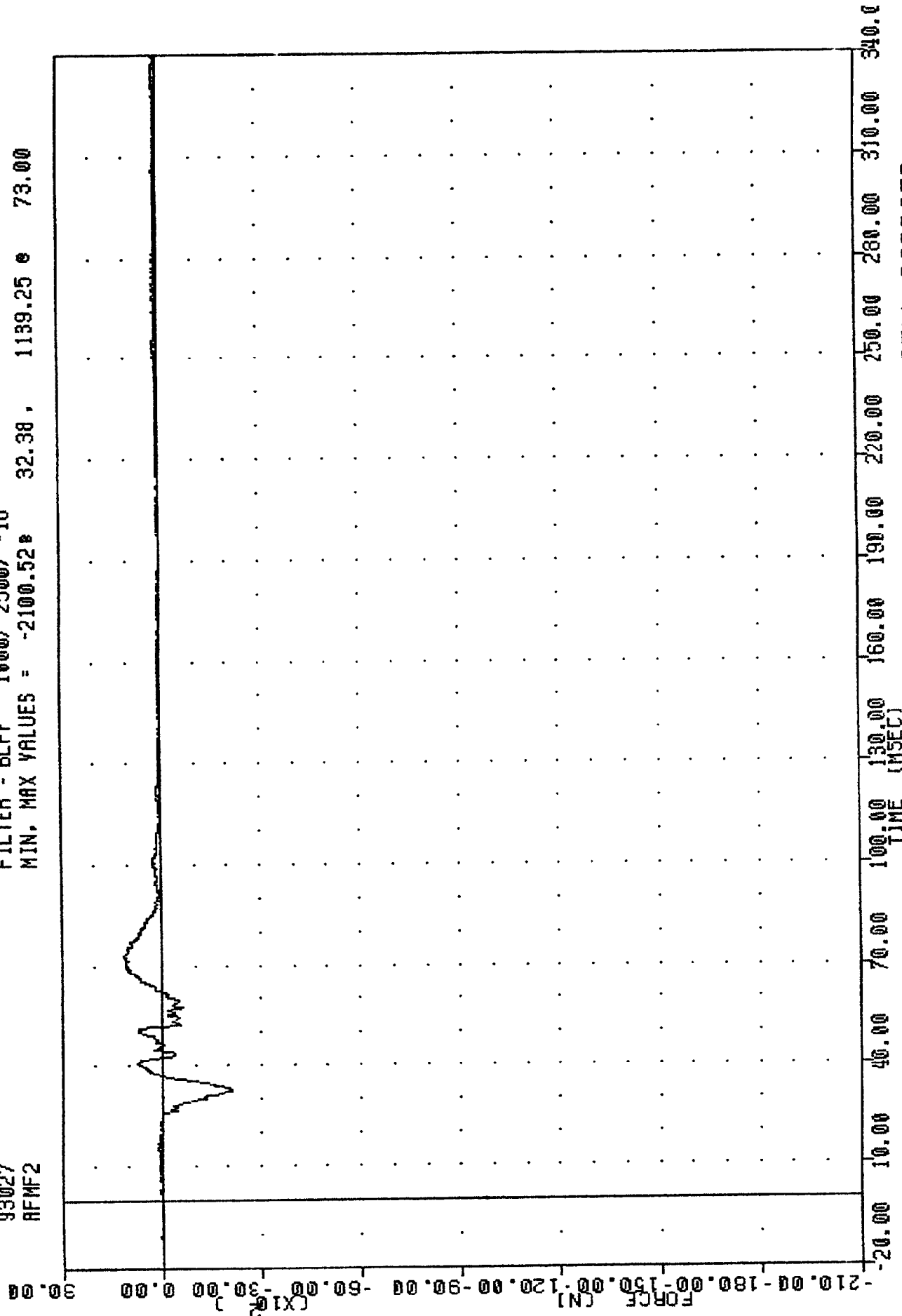


1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER

PASSENGER LEFT FEMUR FORCE

TRC . 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 AFMF2

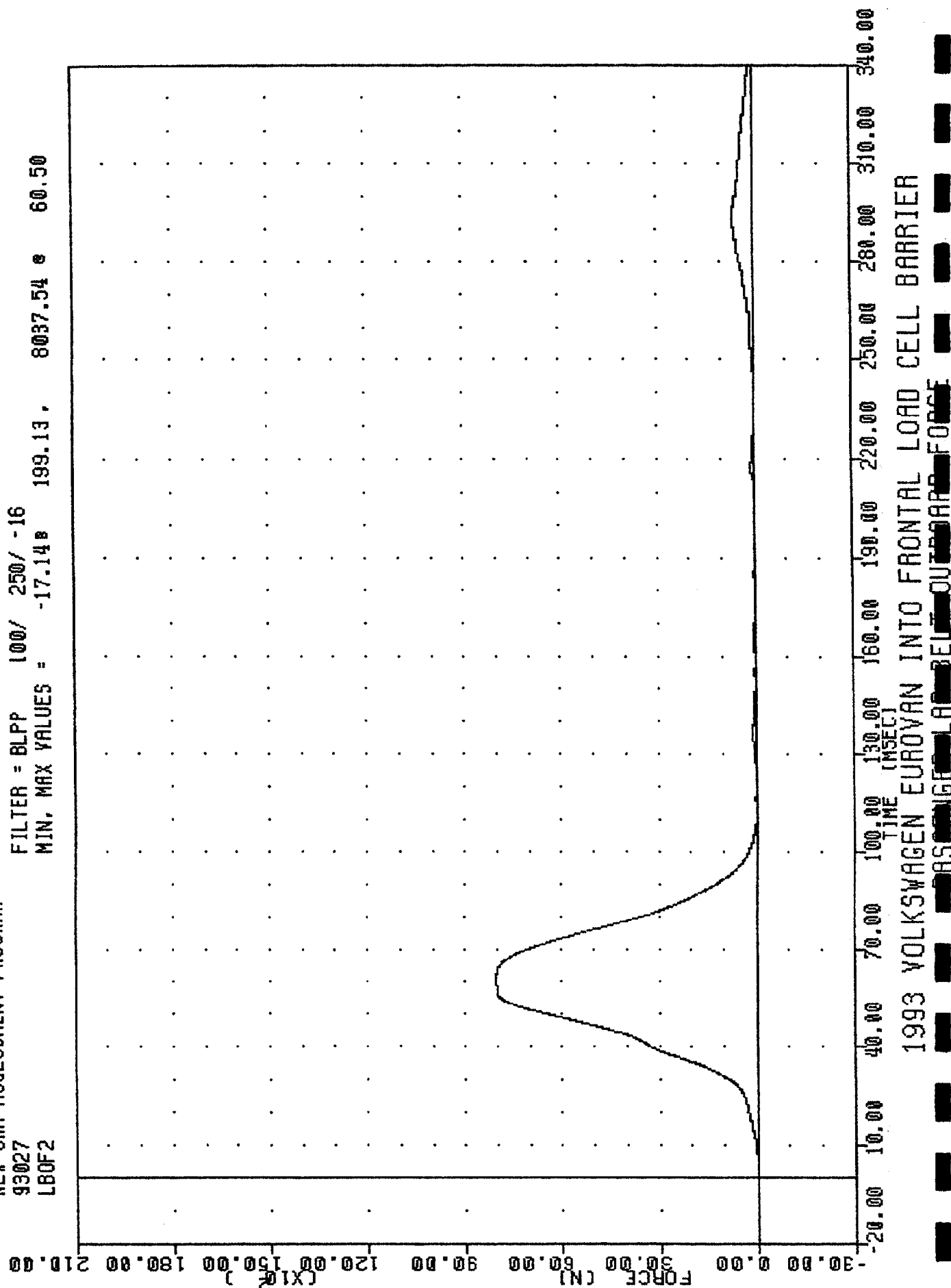
FILTER = BLPP 1000/ 2500/ -16
 MIN. MAX VALUES = -2100.52 32.38 1139.25 73.00



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 PASSENGER RIGHT FEMUR FORCE

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 LB0F2

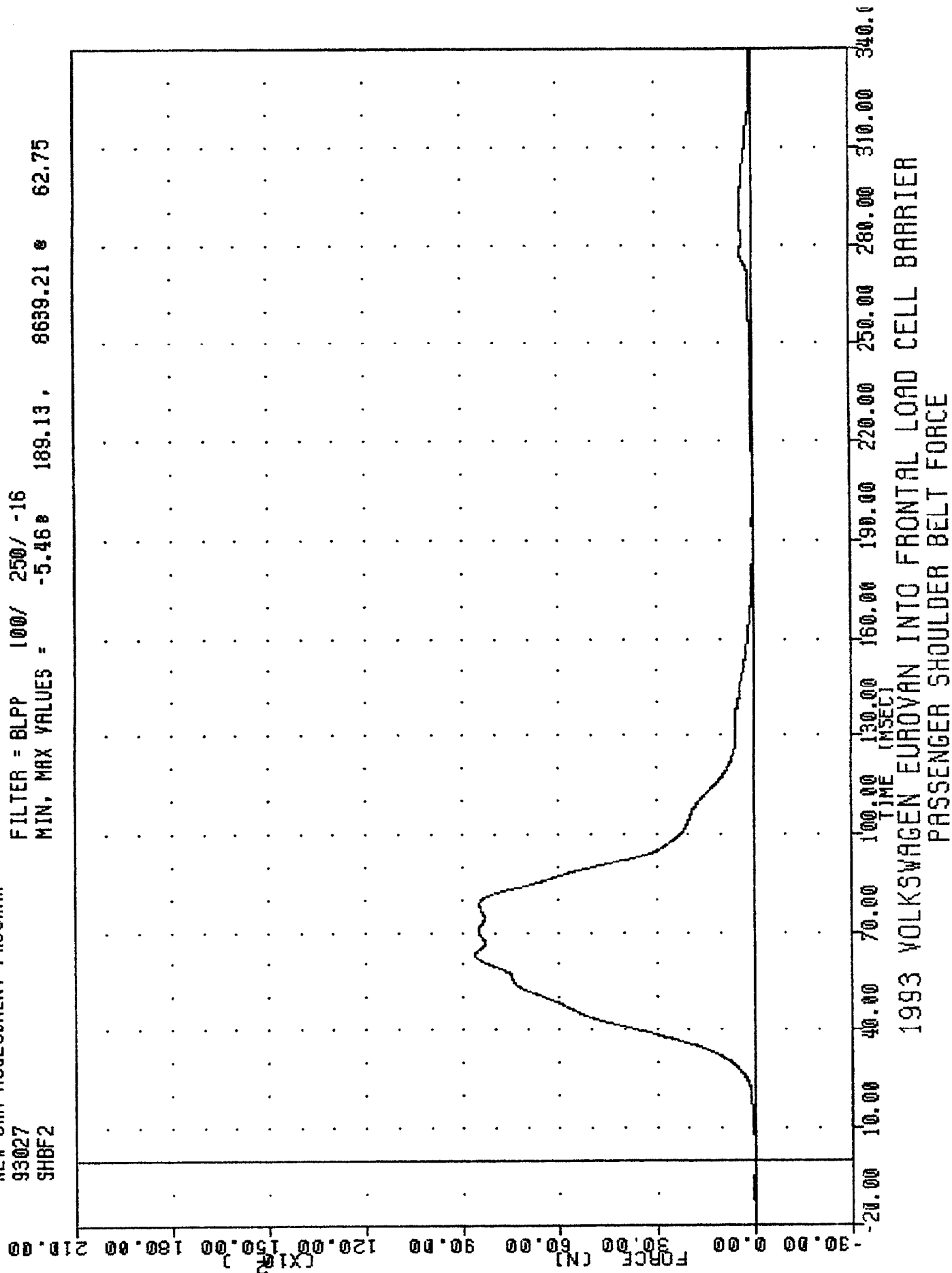
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -17.14 8037.54 60.50



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 BASELINE LAM BELT OUT APP FORCE

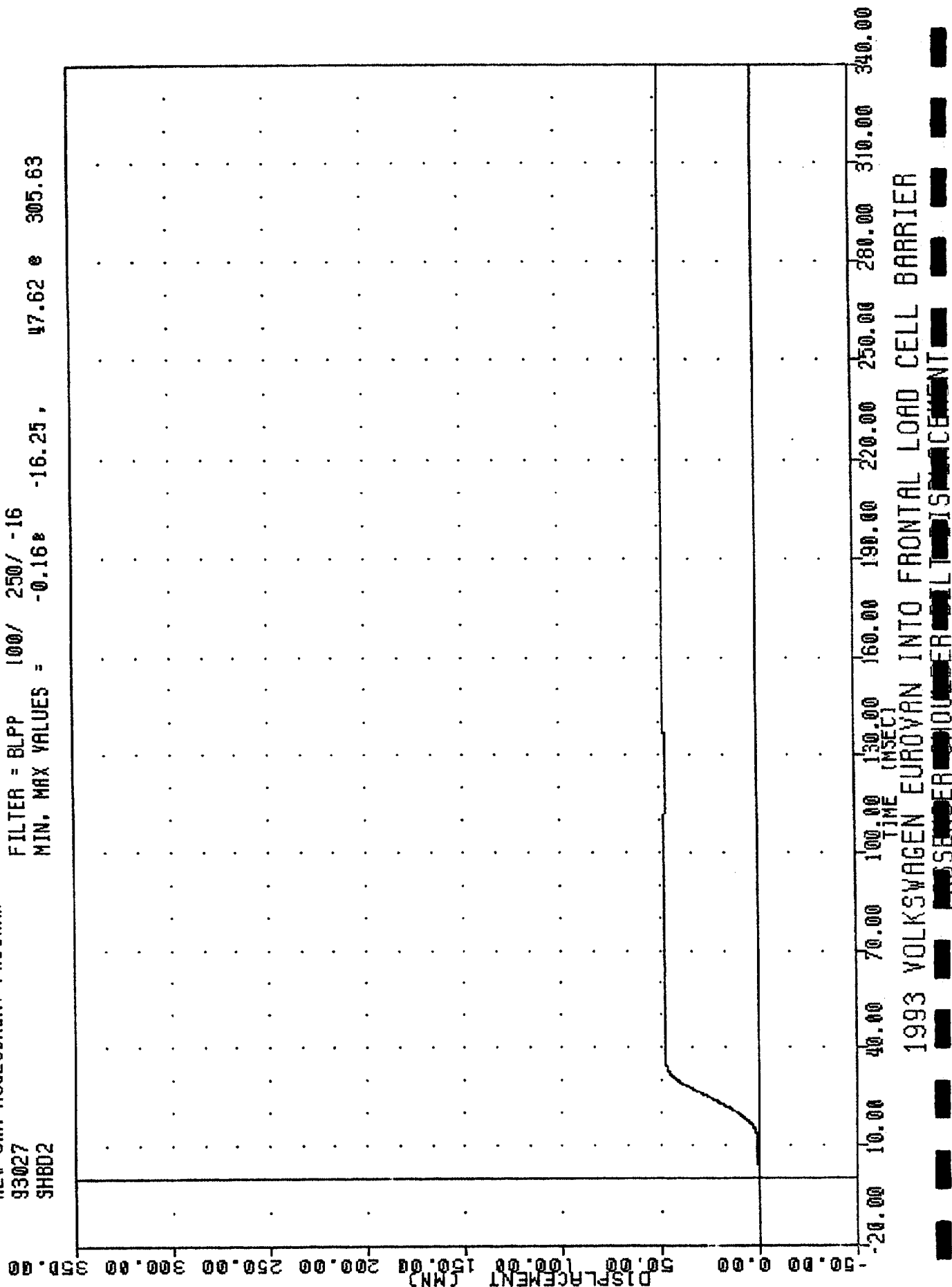
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 SHBF2

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -5.46 189.13, 8639.21 62.75



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 SH802

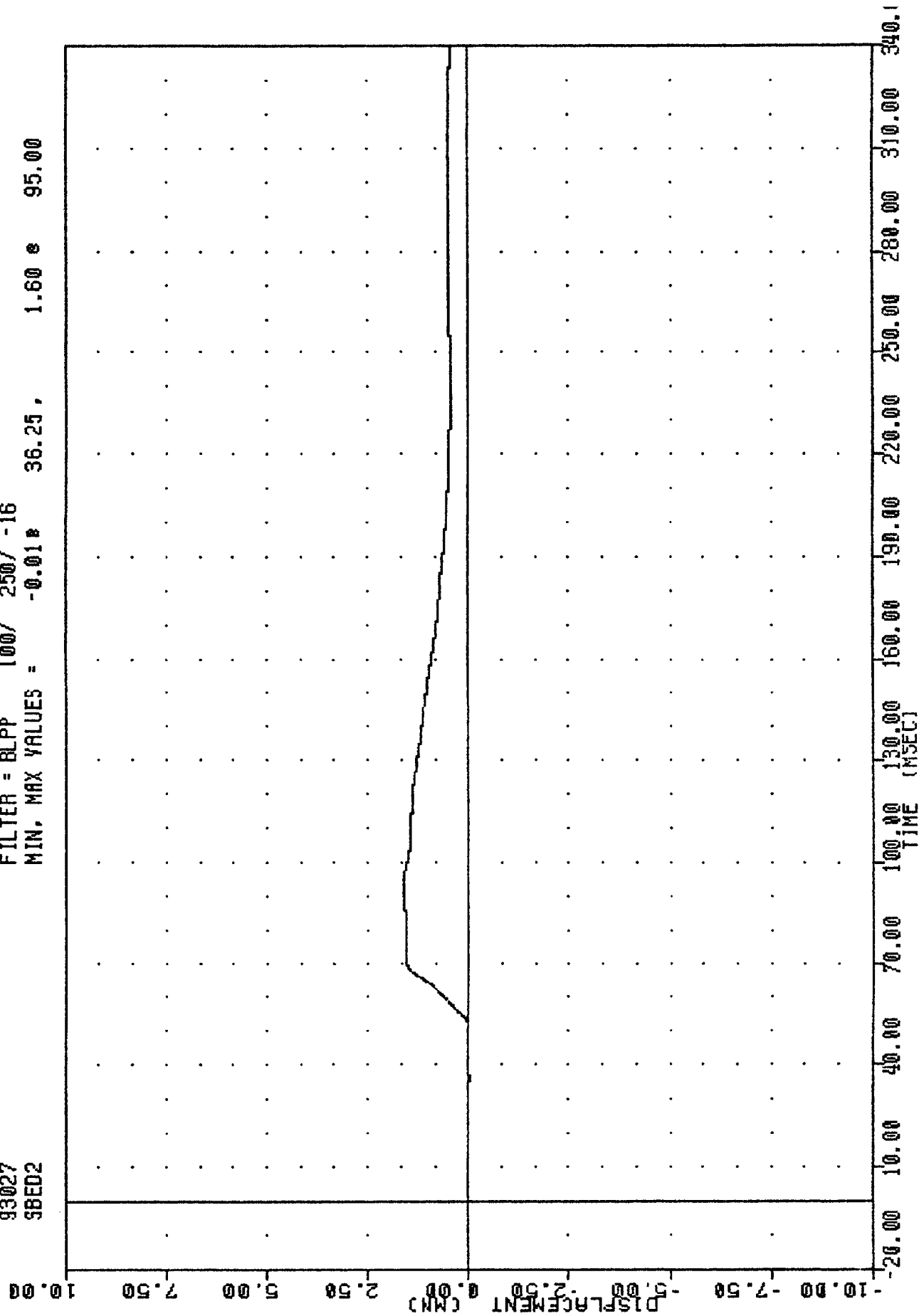
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -0.16 47.62 e 305.63



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 PASSENGER SIDE LOWER RAIL DISPLACEMENT

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 9BED2

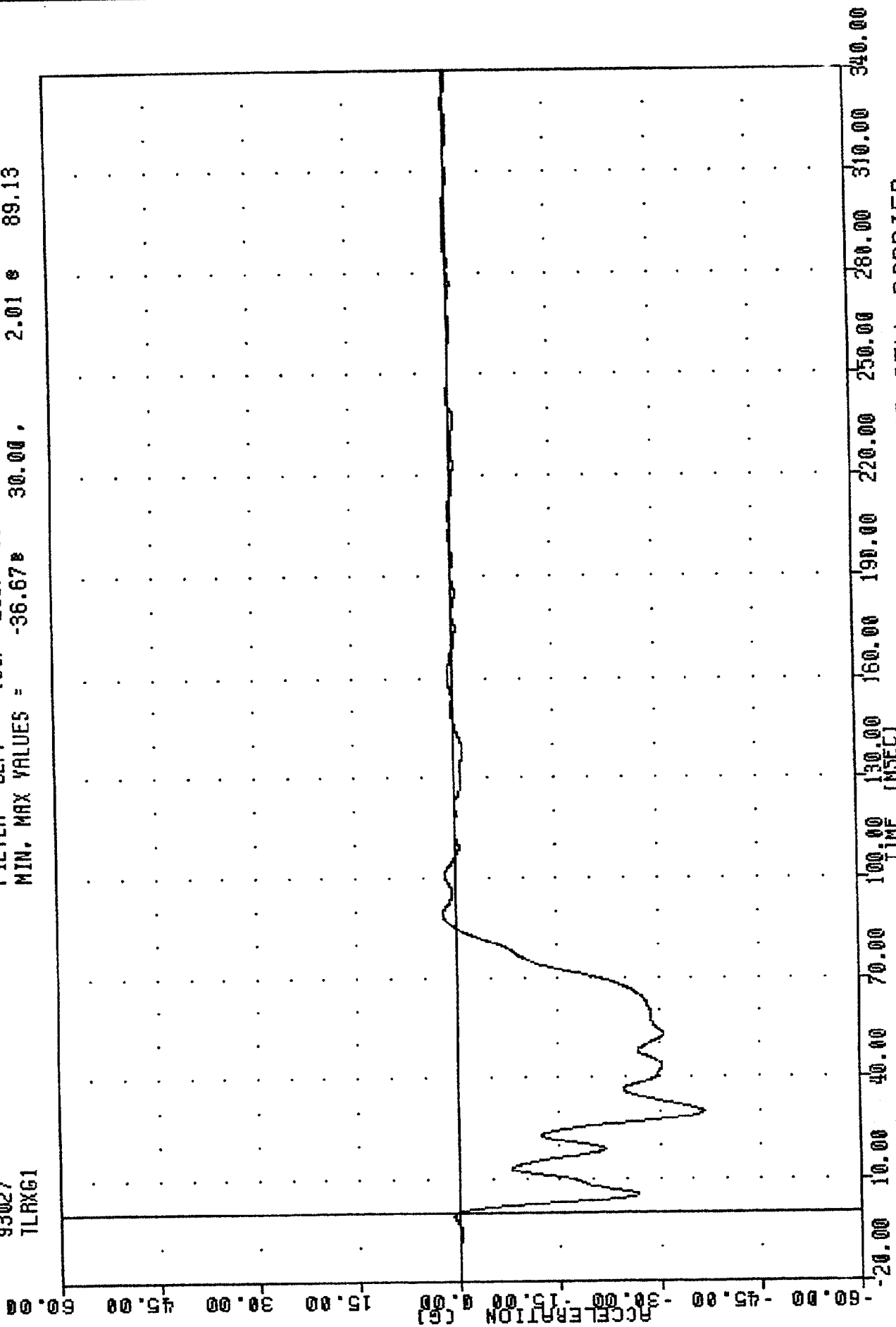
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -0.01 36.25 , 1.60 95.00



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 PASSENGER SEAT BELT EXTENSION

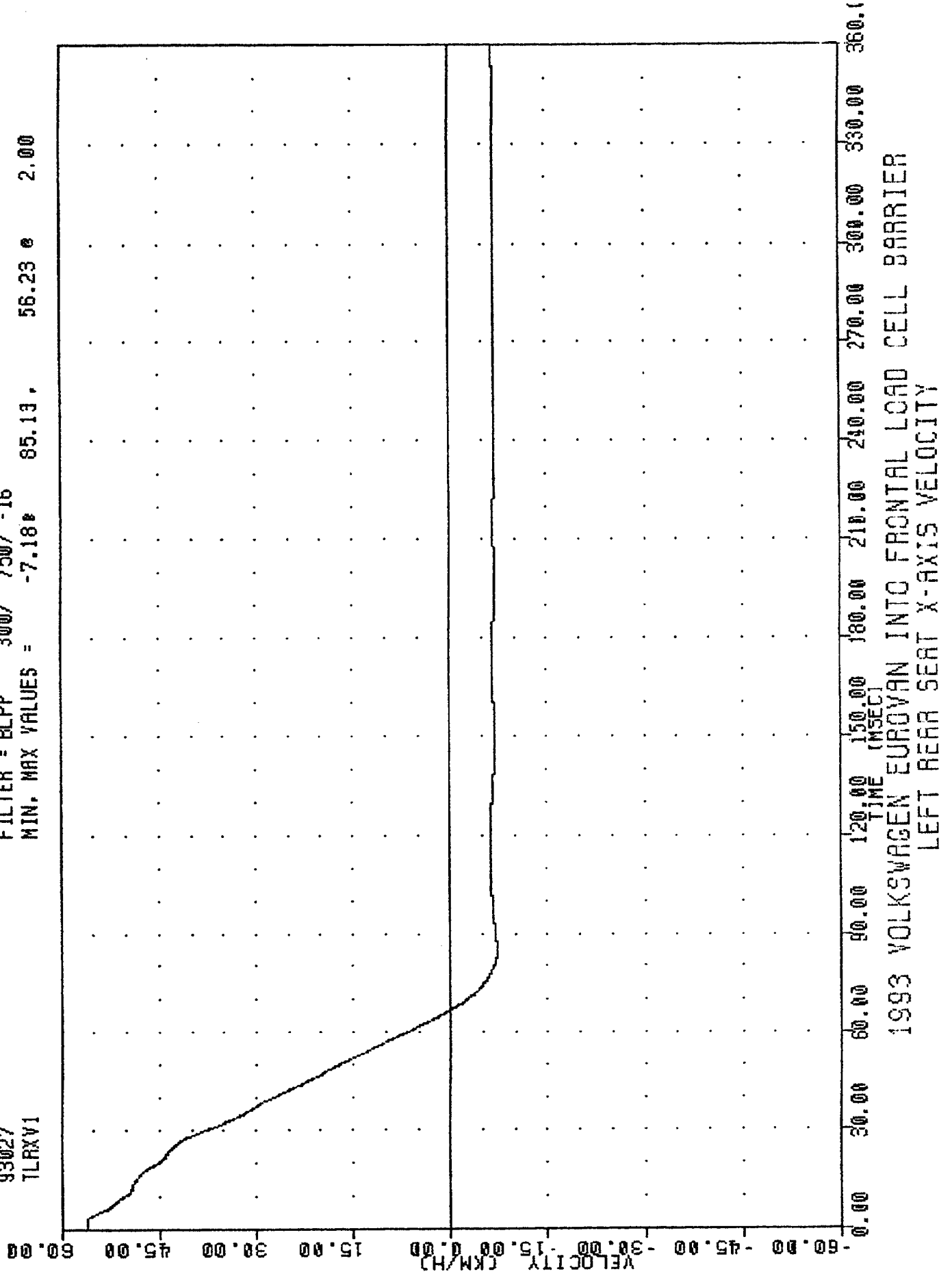
TRC 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 TLRXG1

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -36.67 30.00, 2.01 89.13



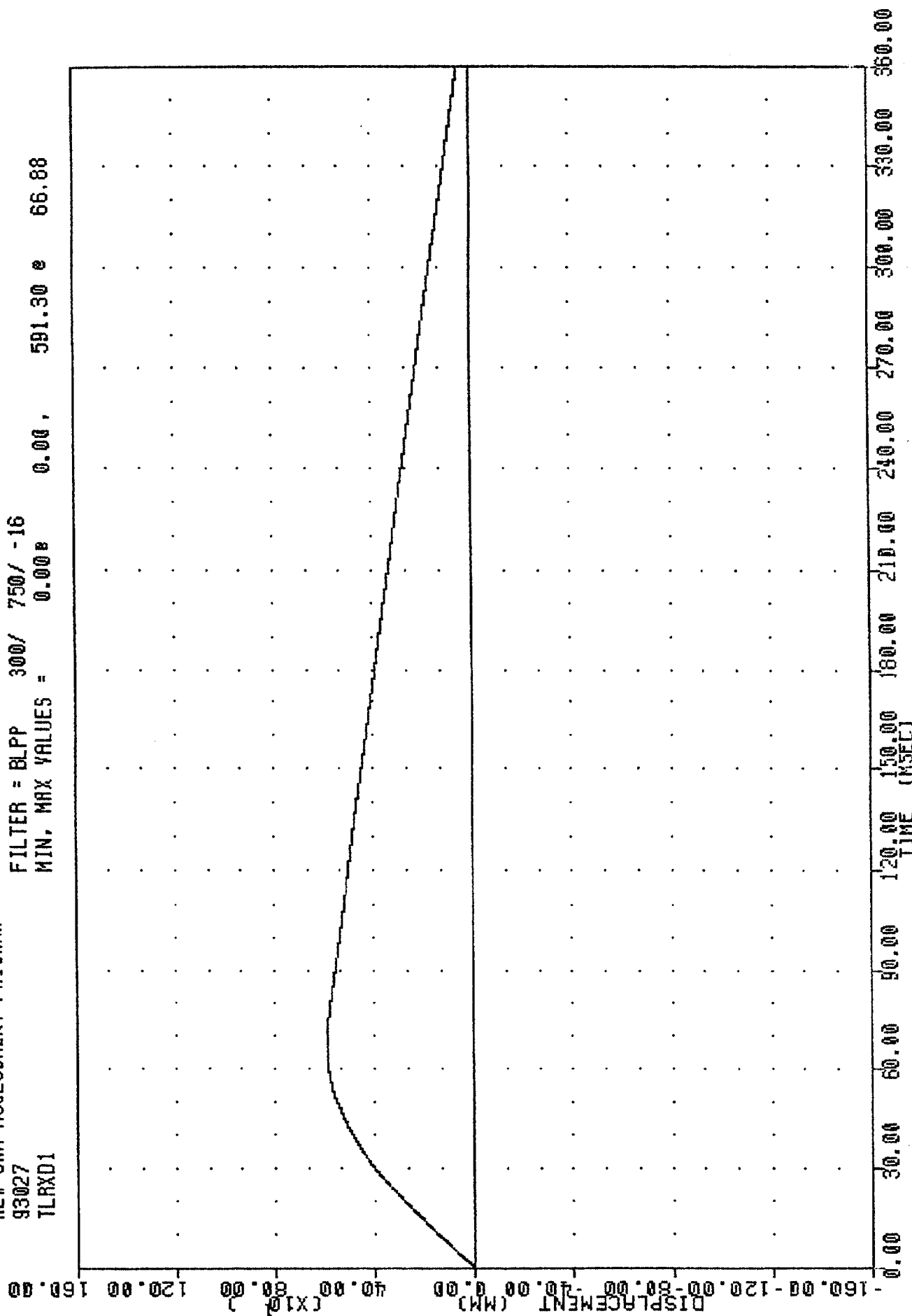
TRC
NEW CAR ASSESSMENT PROGRAM
93027
TLRXV1

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -7.18 85.13, 56.23 2.00



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 TLRXD1

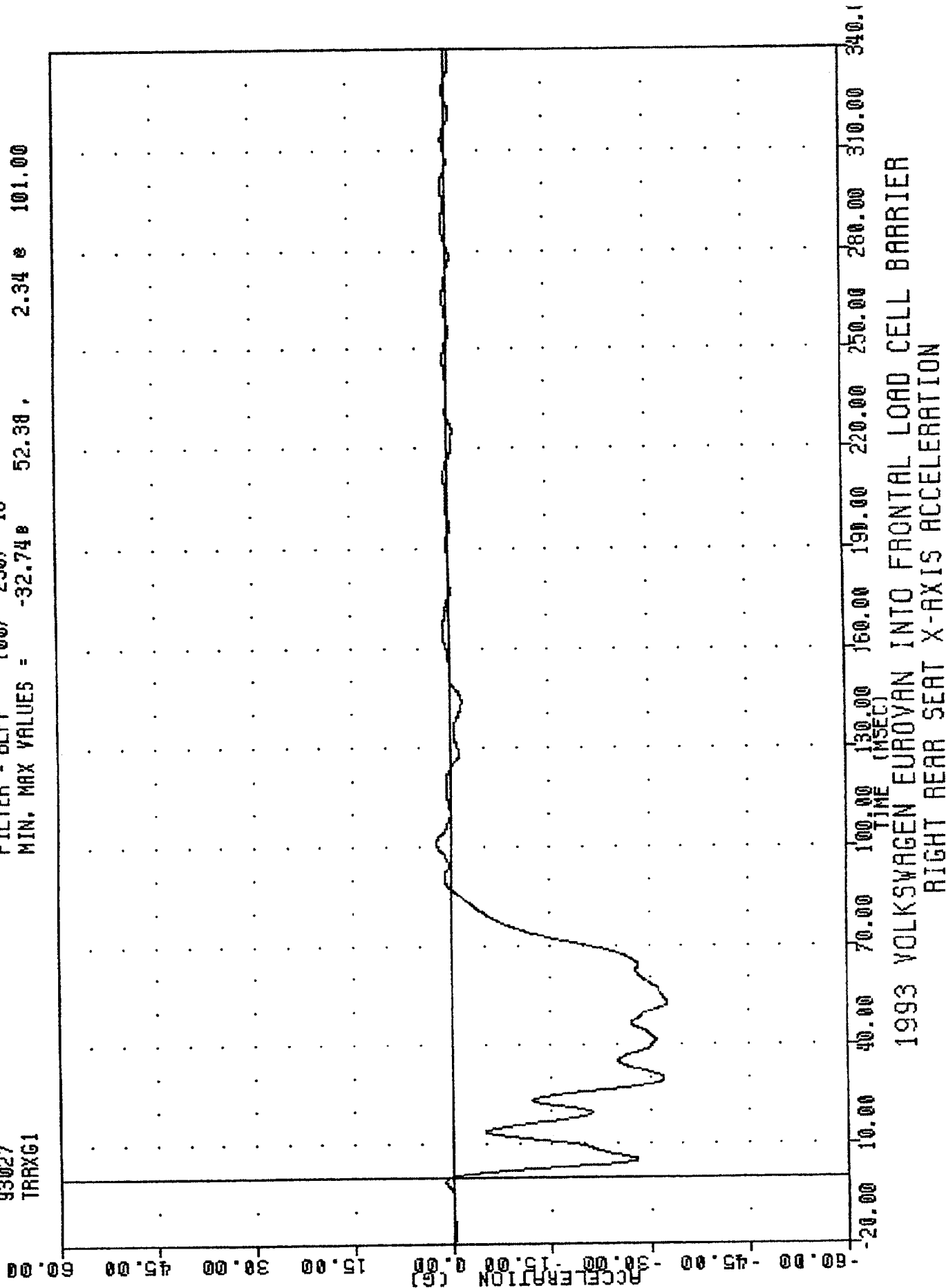
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = 0.00 591.30 e 66.88



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS DISPLACEMENT

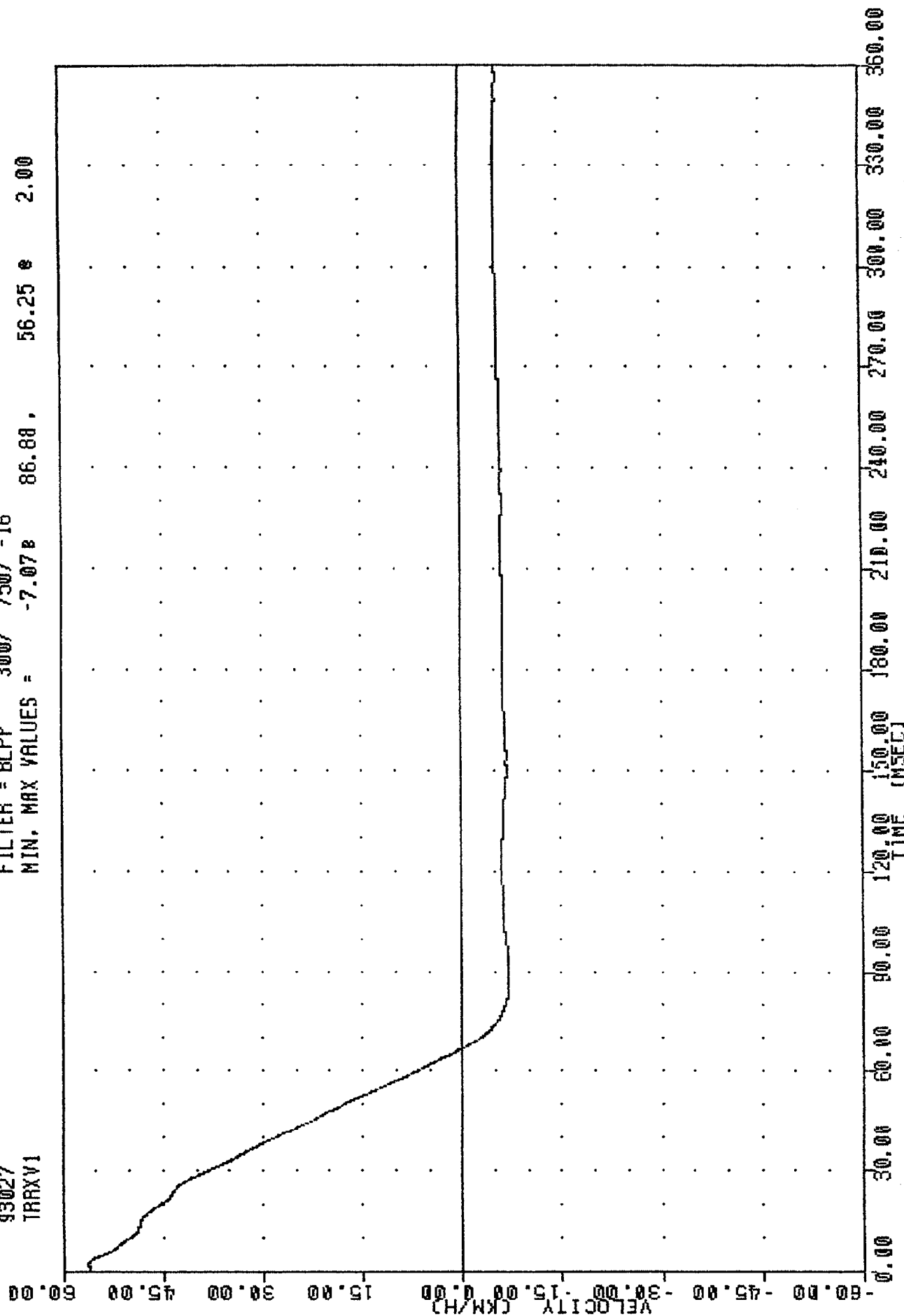
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 TRRXG1

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -32.74 52.38 , 2.34 101.00



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 TRRXV1

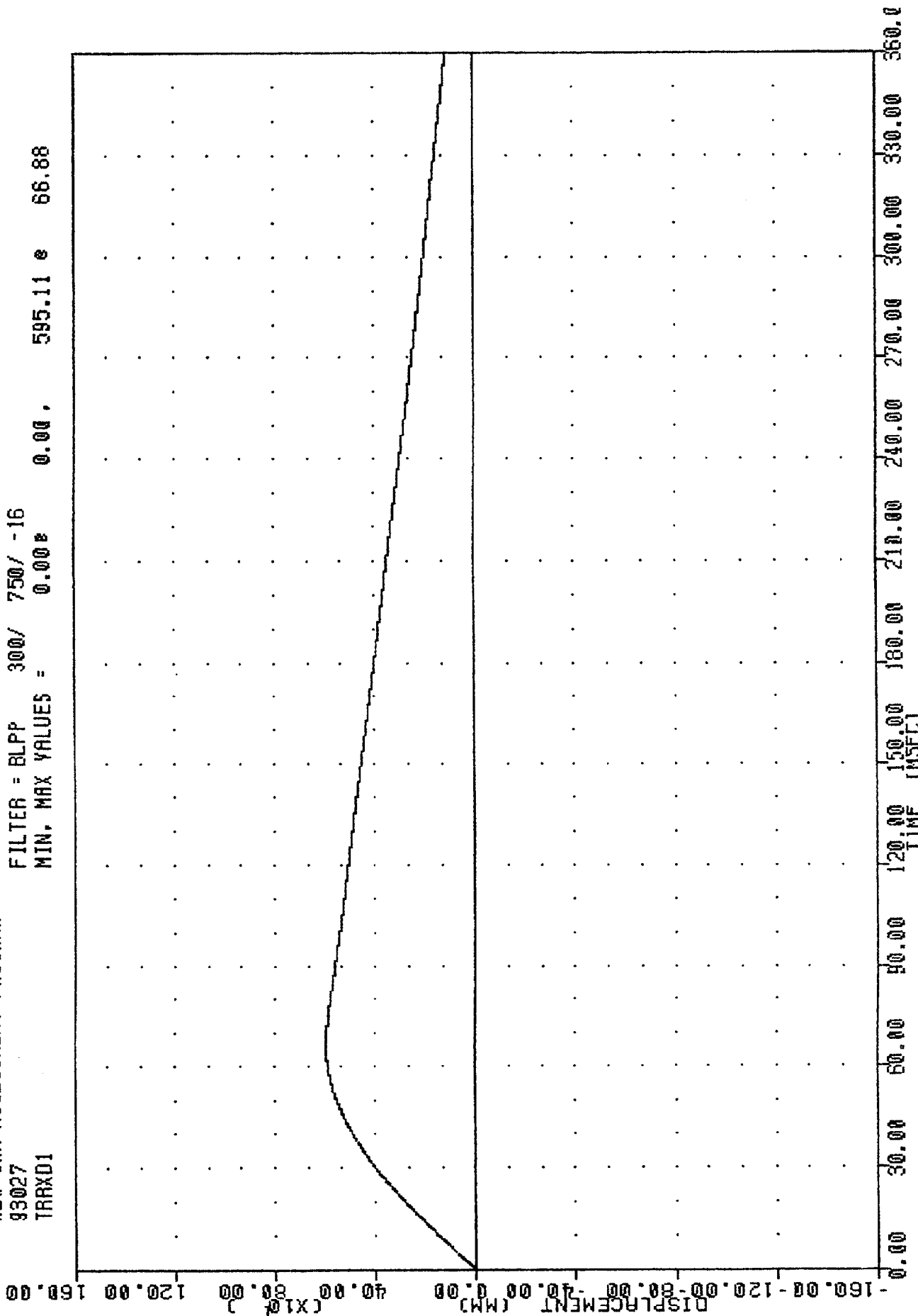
FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -7.07 86.88 56.25 2.00



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 RUCUT REAR SEAT Y-AXIS VELOCITY

TRC , 930127
NEW CAR ASSESSMENT PROGRAM
93027
TRXD1

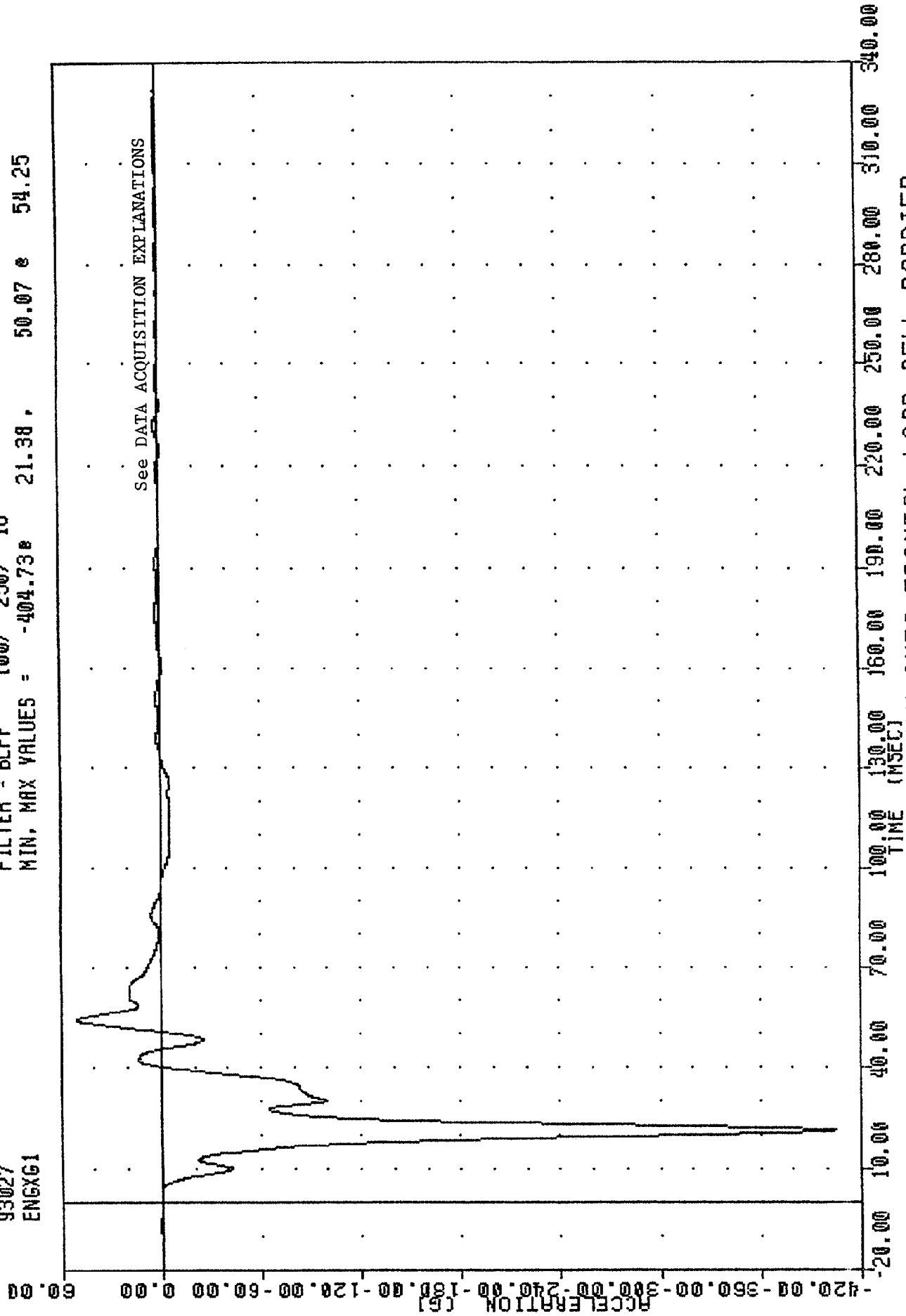
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = 0.00 0.00, 595.11 e 66.88



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS DISPLACEMENT

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 ENG61

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -404.73 50.07 e 54.25



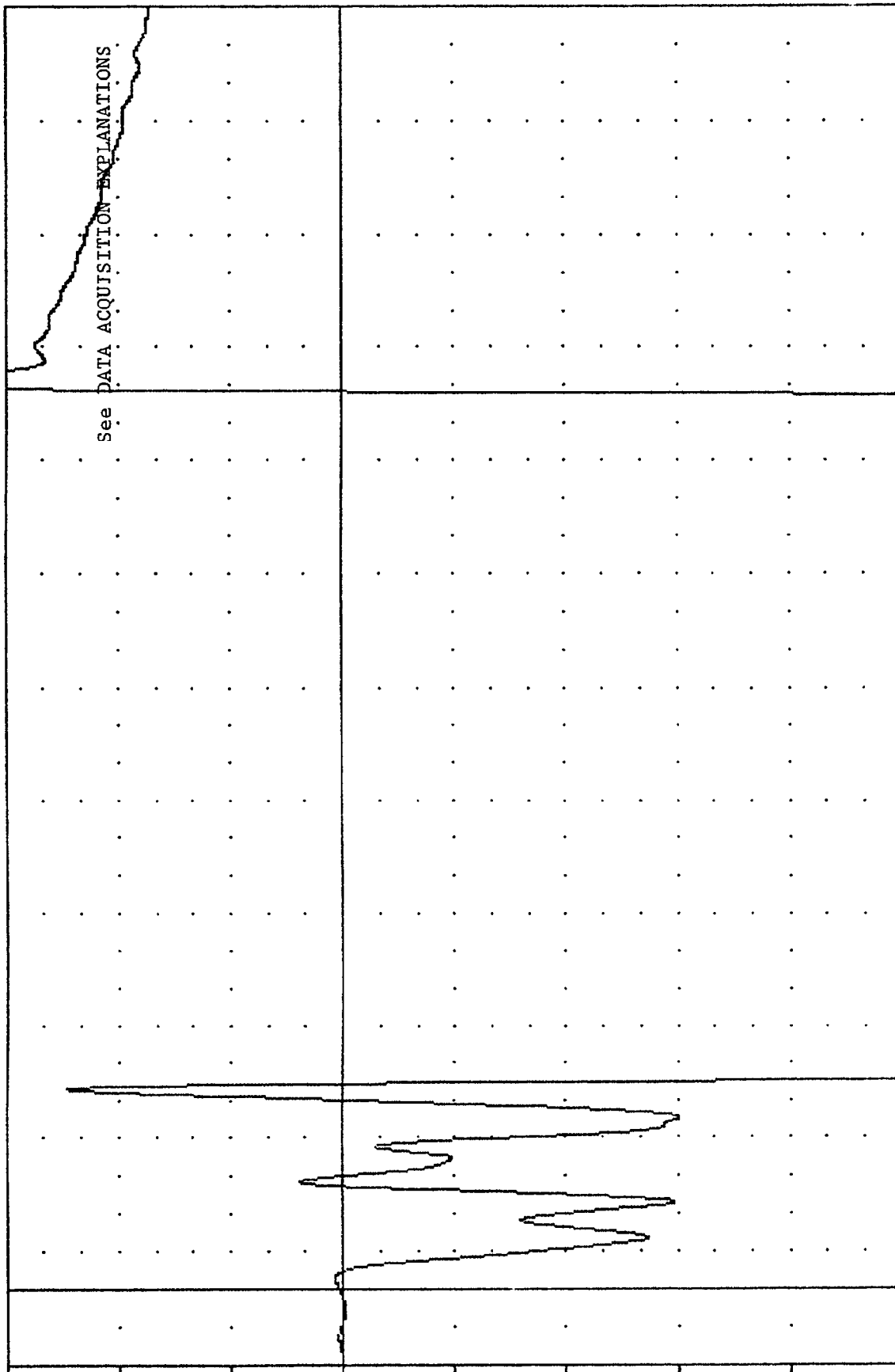
1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 ENGINE TOP X AXIS ACCELERATION

TRC
 NEW CAR ASSESSMENT PROGRAM
 93027
 ENGCG2

930127

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -1236.24 231.88, 102.53 e 240.38

ACCELERATION (G)



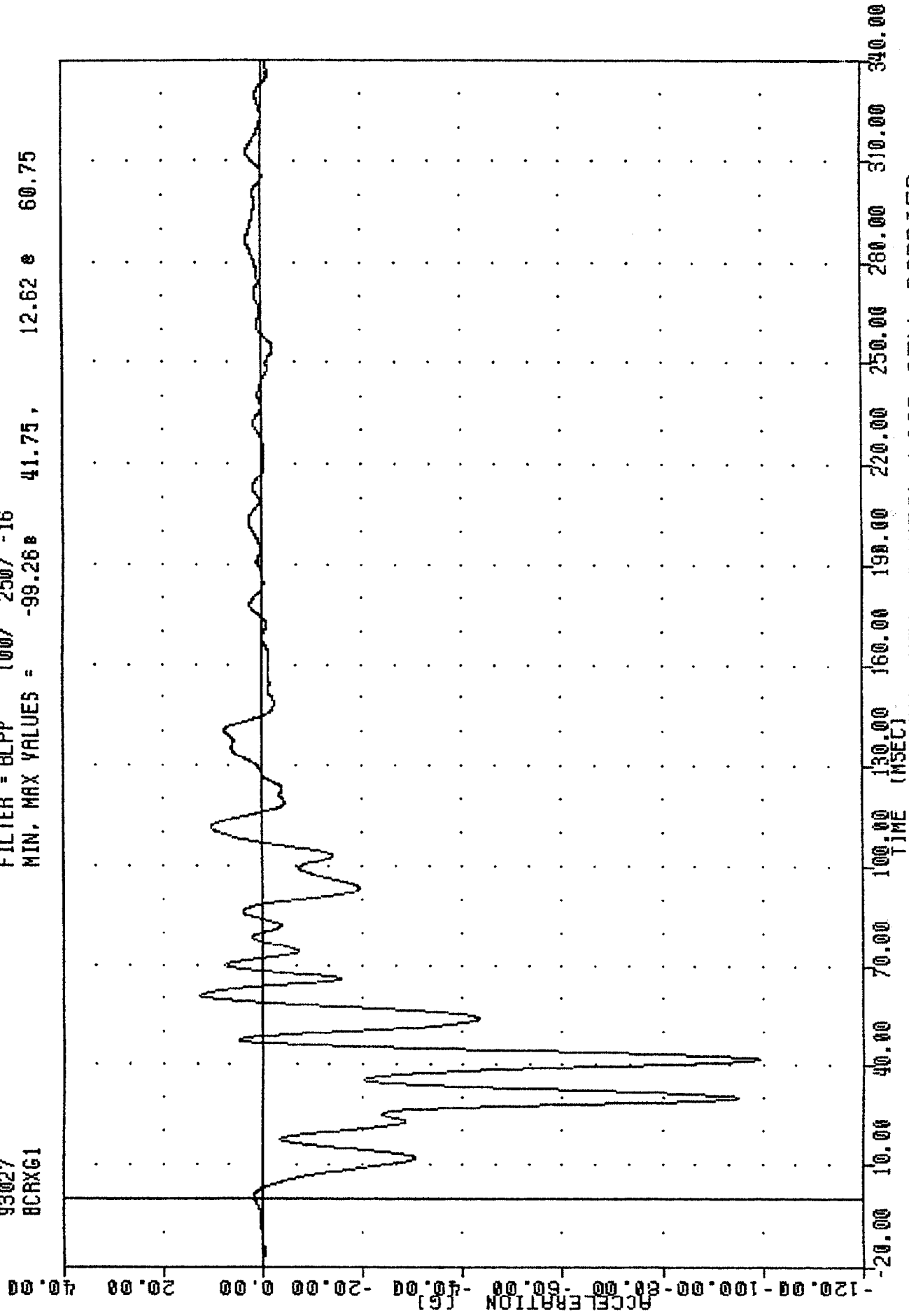
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 ENGINE BOTTOM X-AXIS ACCELERATION

TRC
NEW CAR ASSESSMENT PROGRAM
93027
BCRXG1

, 930127

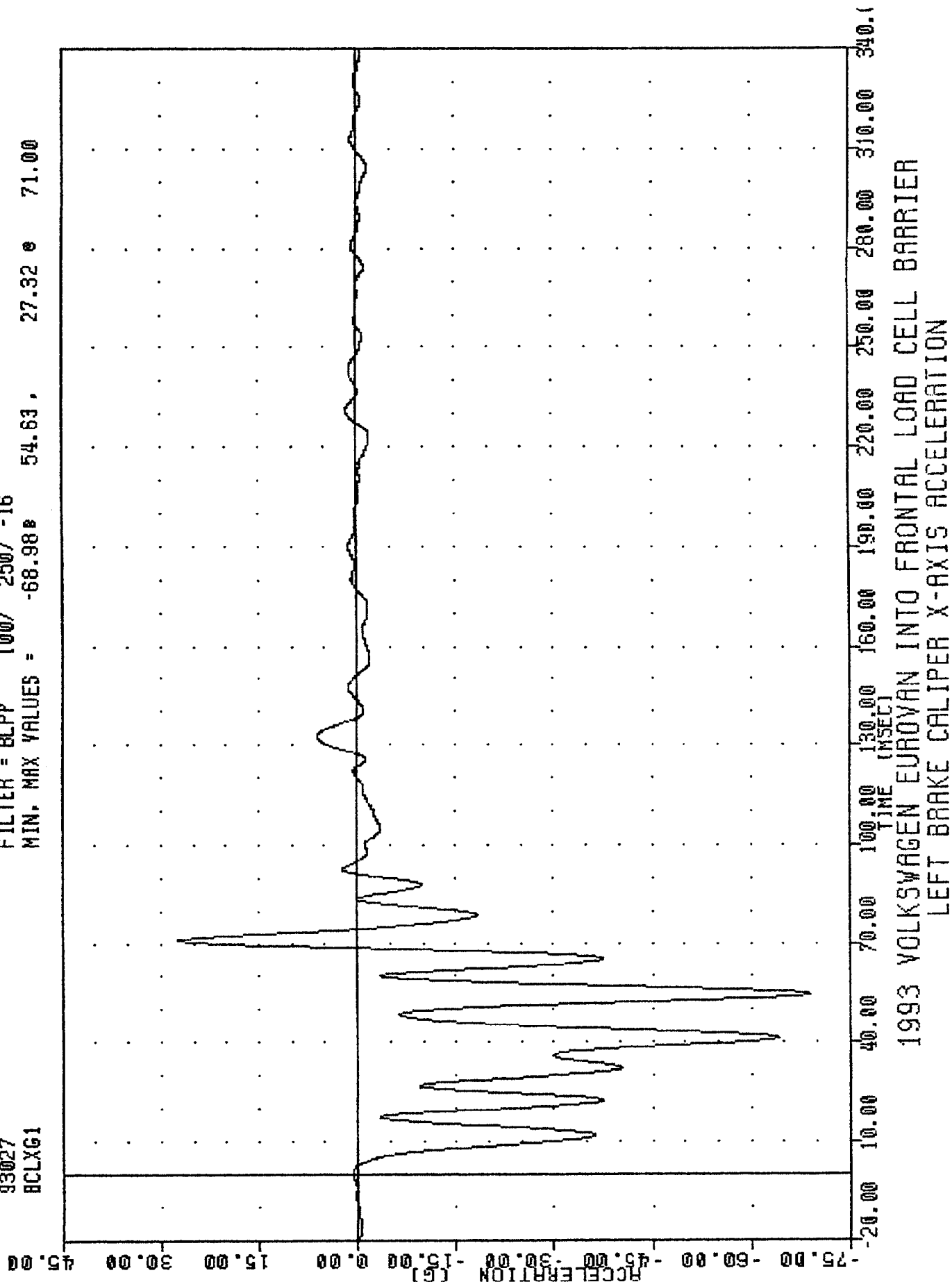
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -99.26 41.75, 12.62 60.75



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER Y-AXIS ACCELERATION

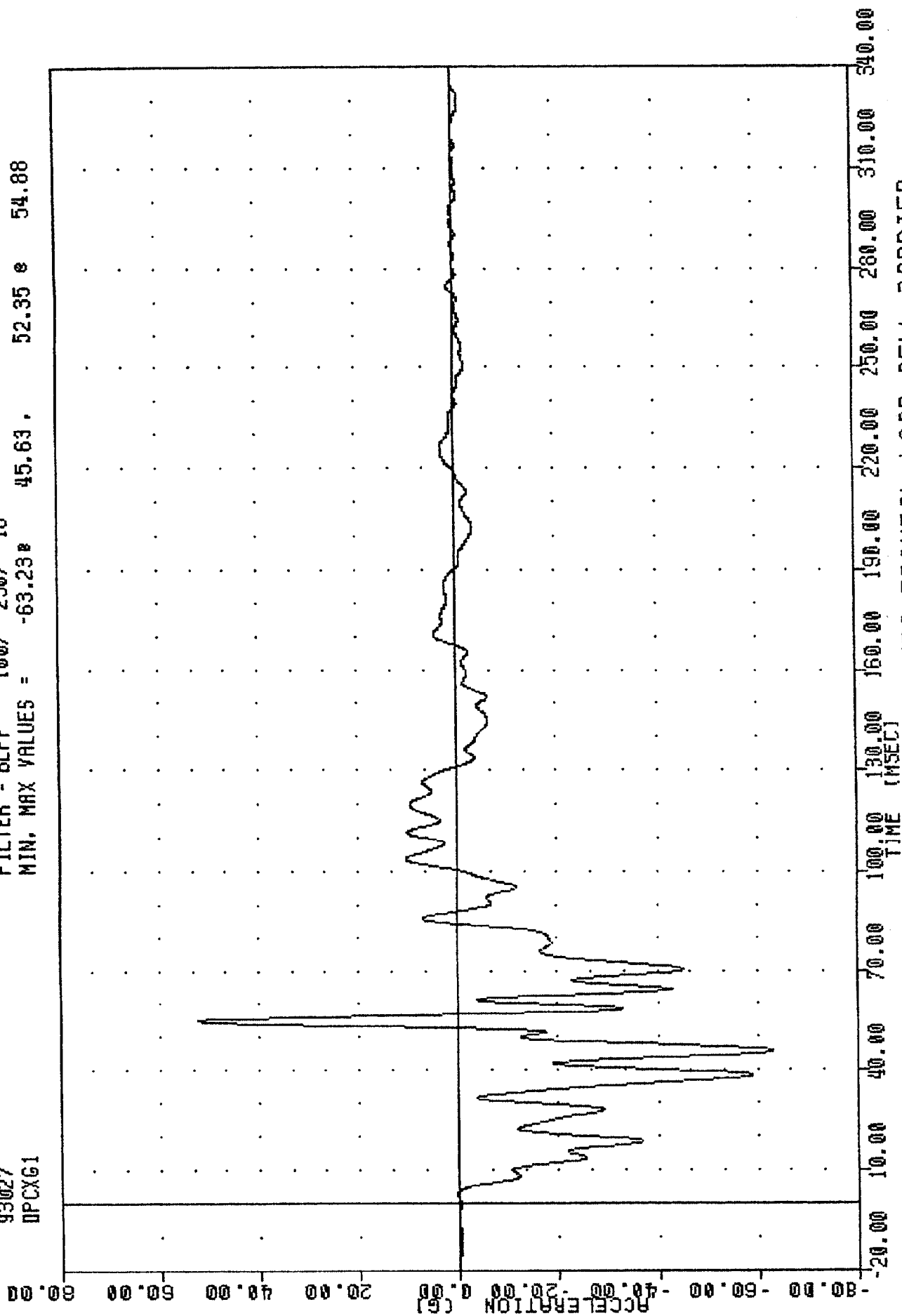
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BCLXG1

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -68.98 54.83, 27.32 71.00



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 OPCX61

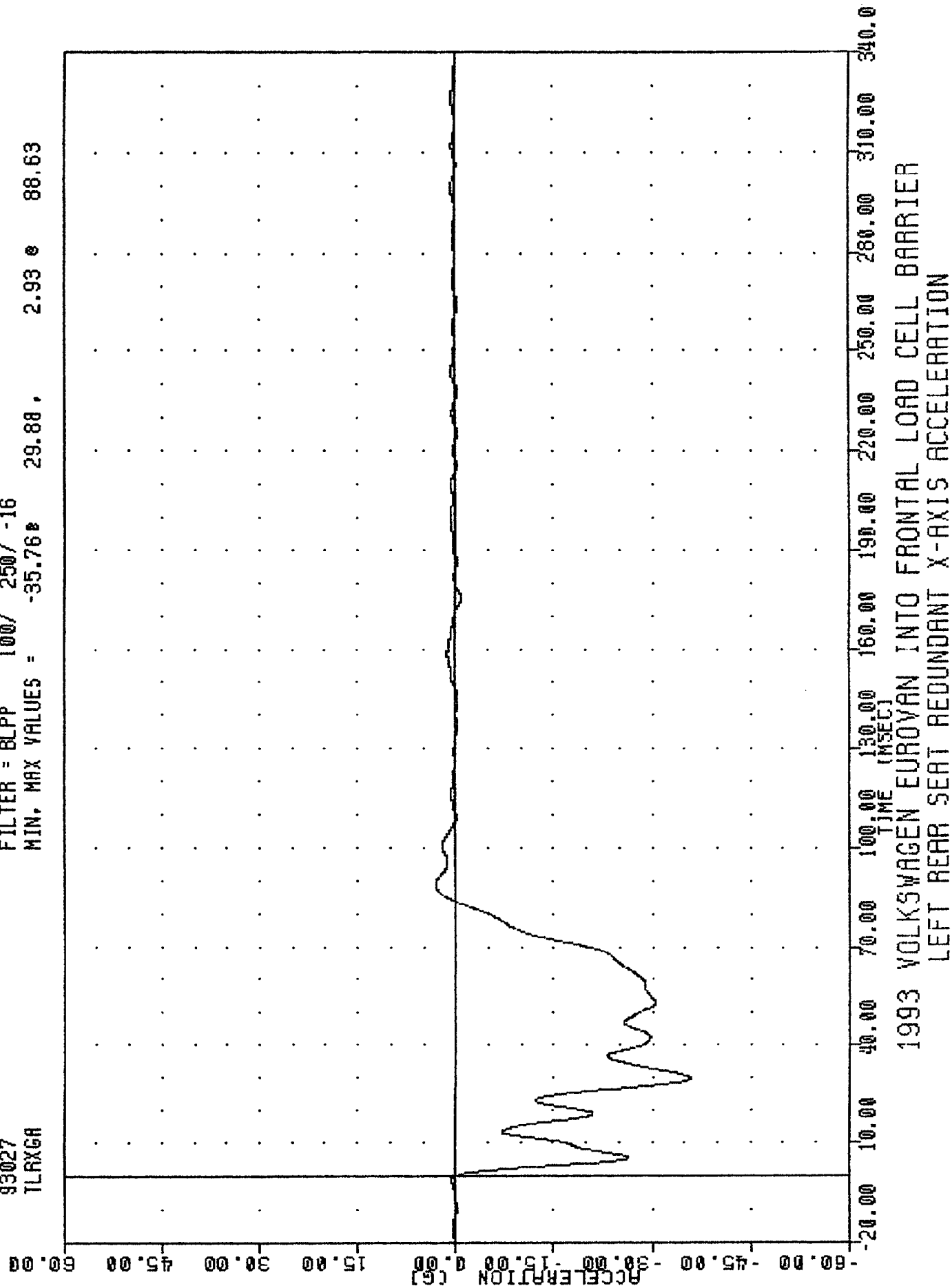
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -63.23 45.63 52.35 54.88



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 INSTRUMENT PANEL CENTER X-AXIS ACCELERATION

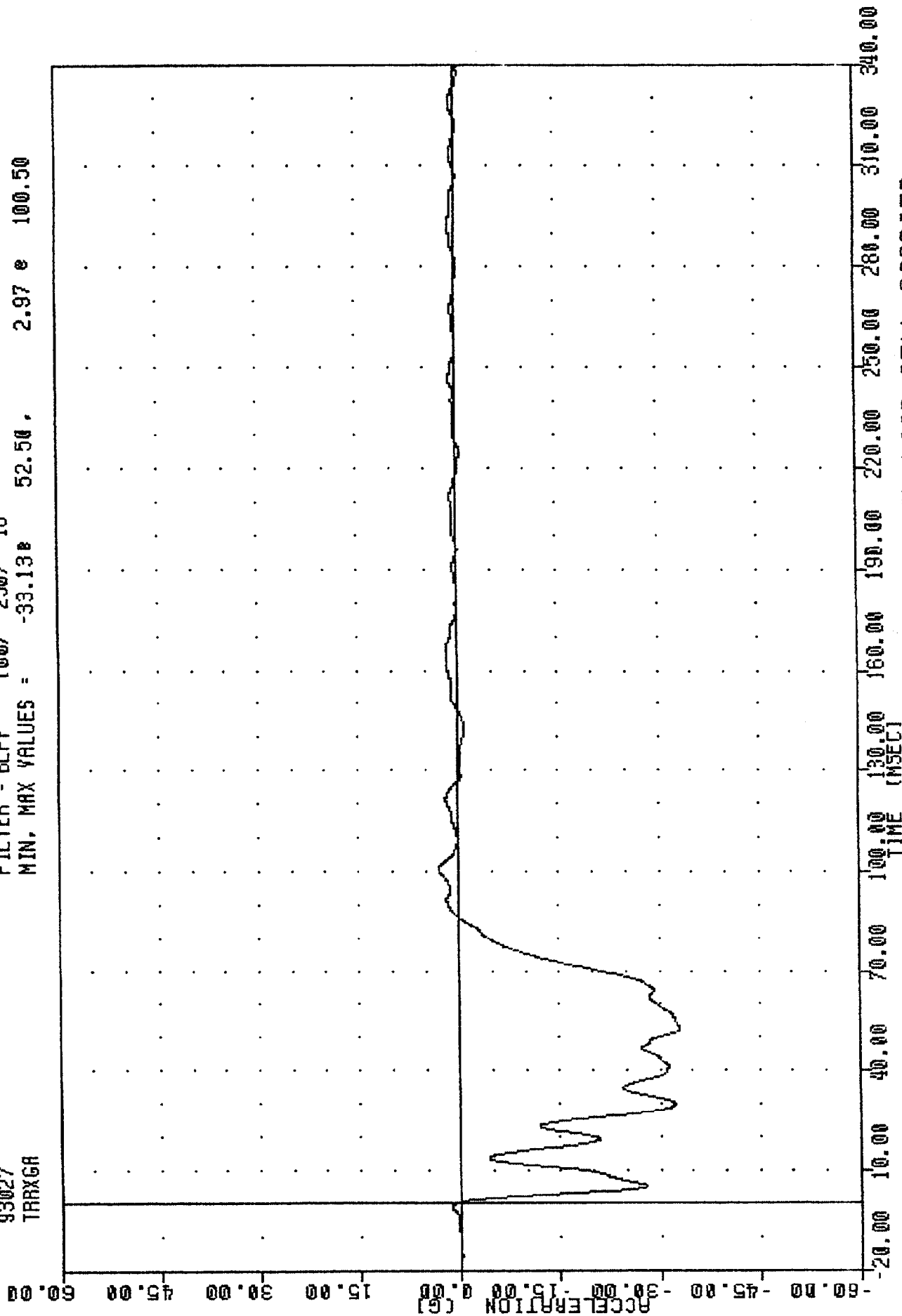
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 TLRXGA

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -35.76 29.88 , 2.93 88.63



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 TRXGR

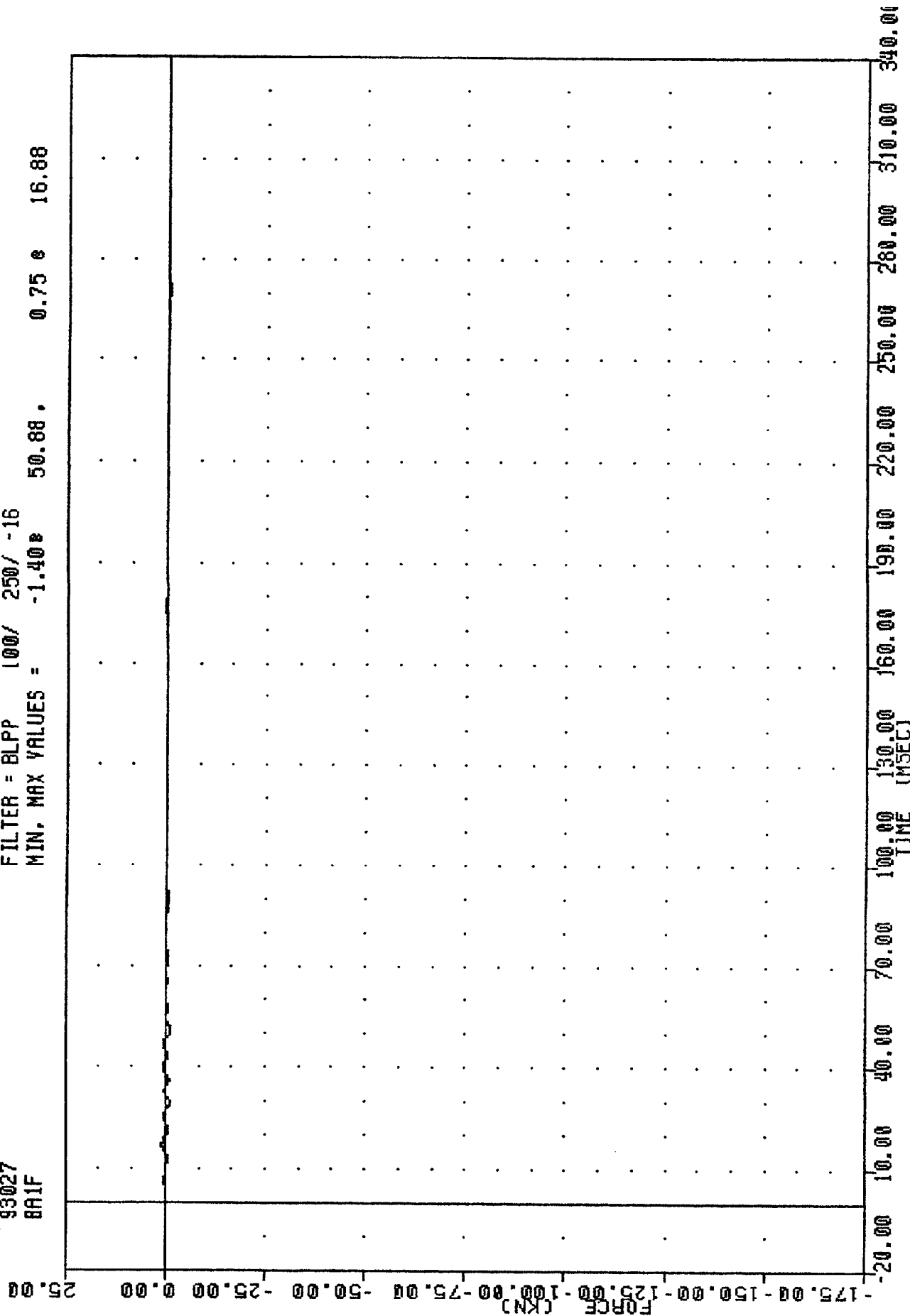
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -33.13 52.50 2.97 e 100.50



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BA1F

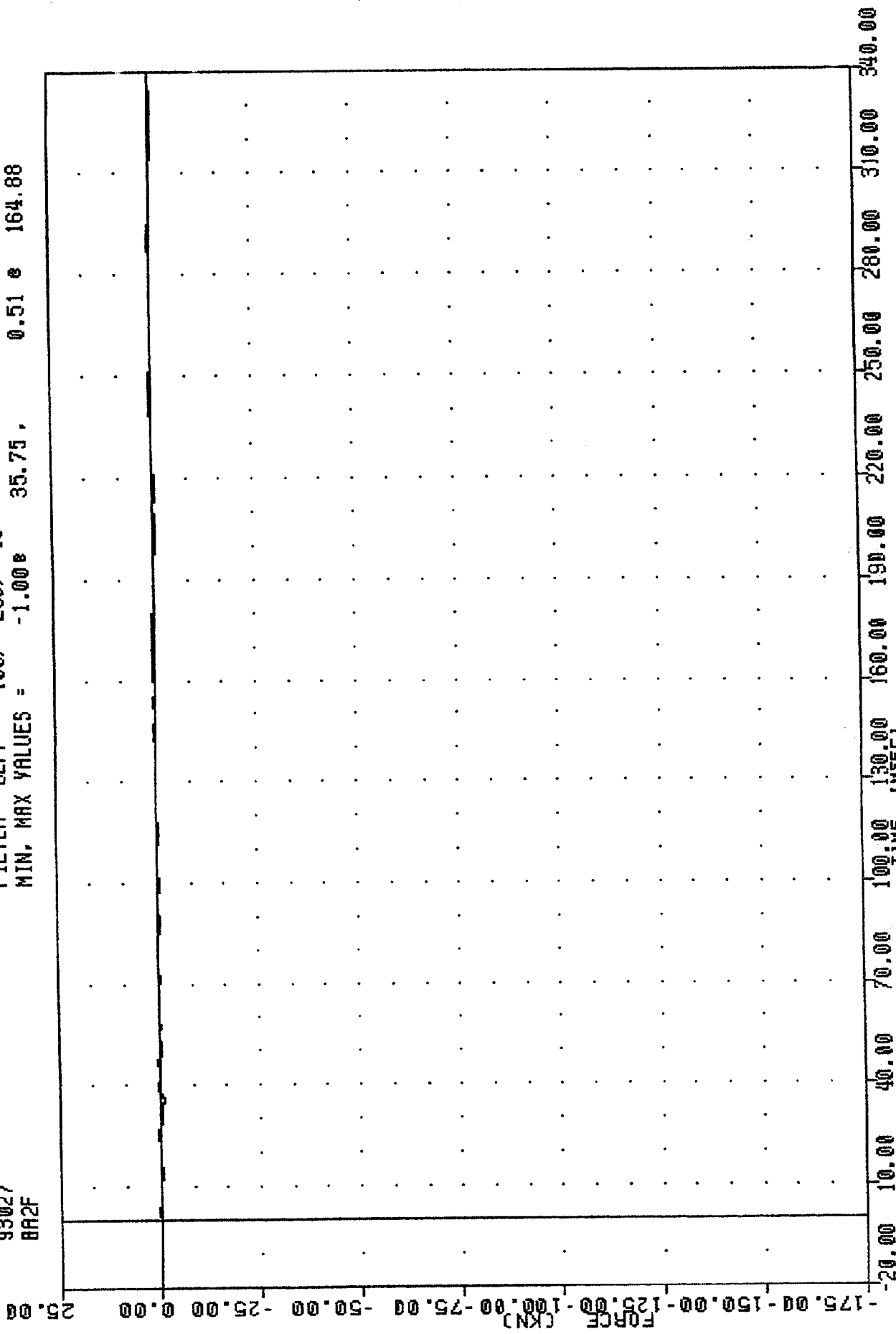
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -1.40e 50.88, 0.75 e 16.88



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A1 FORCE

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BR2F

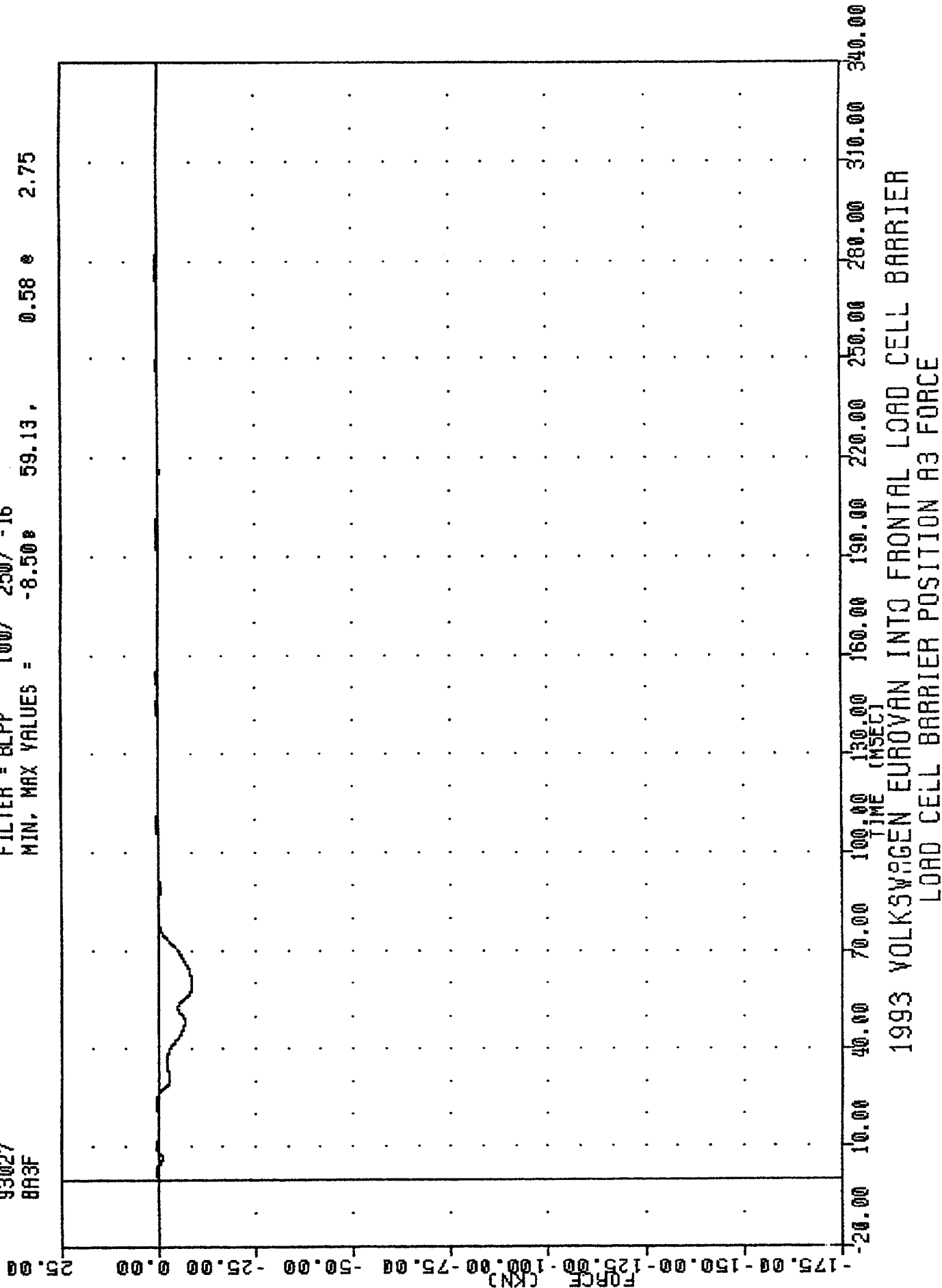
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -1.00 0.51 0 164.88



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 12 FORCE

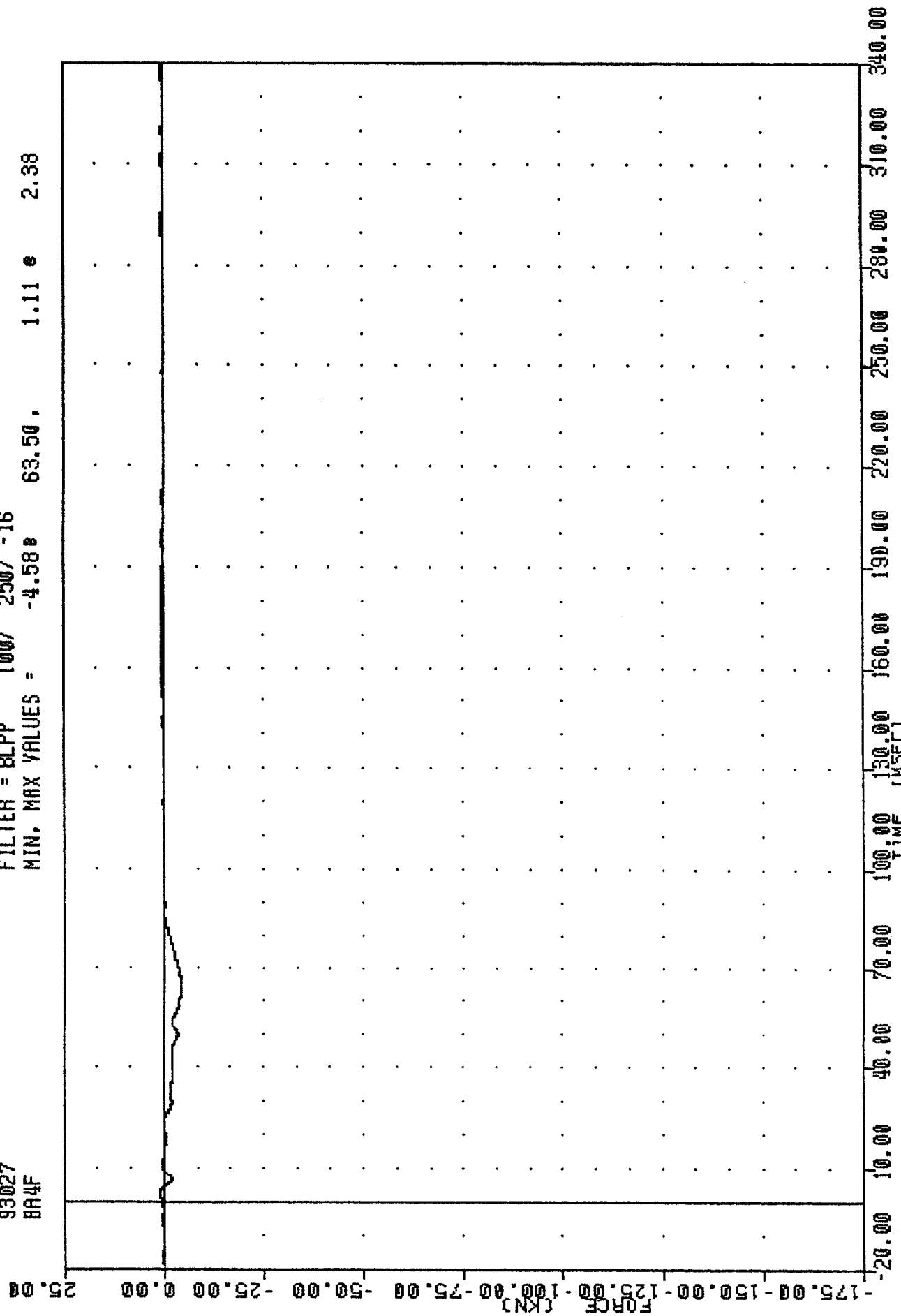
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 8A3F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -8.50 59.13, 0.58 2.75



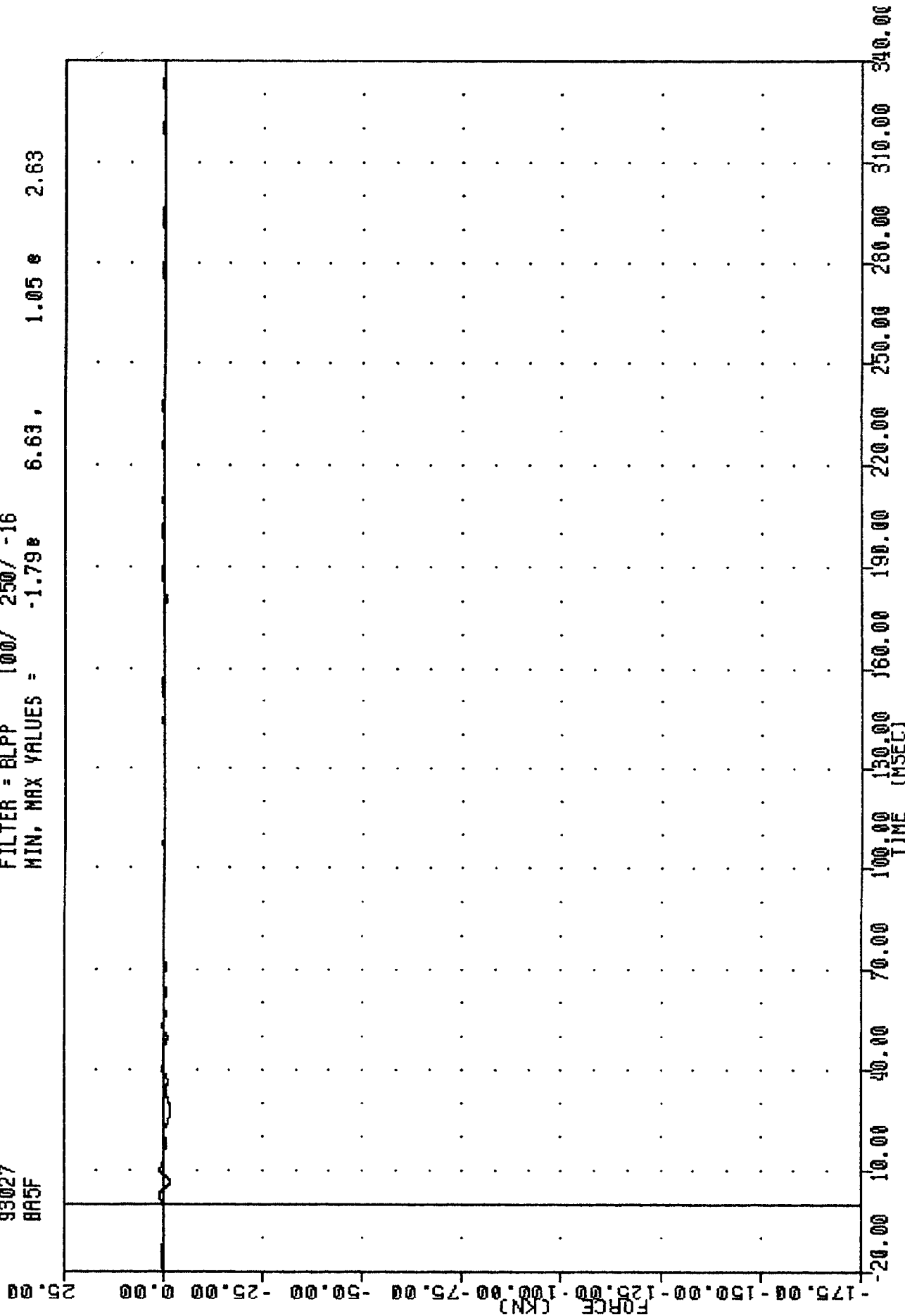
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BA4F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -4.58 63.50, 1.11 2.38



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BA5F

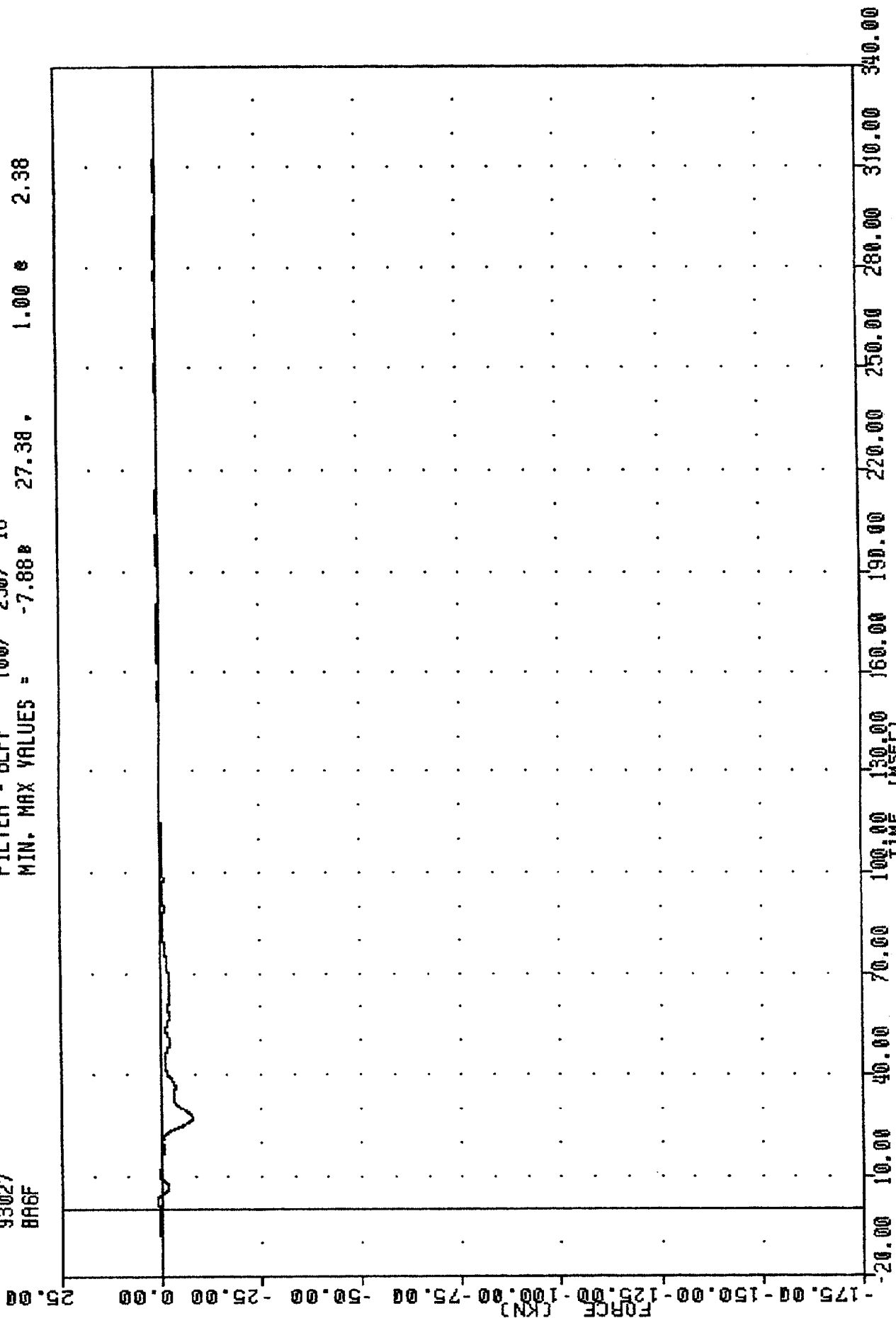
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -1.79e 6.63, 1.05 e 2.63



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A5 FORCE

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BAGF

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -7.88 27.38 1.00 2.38

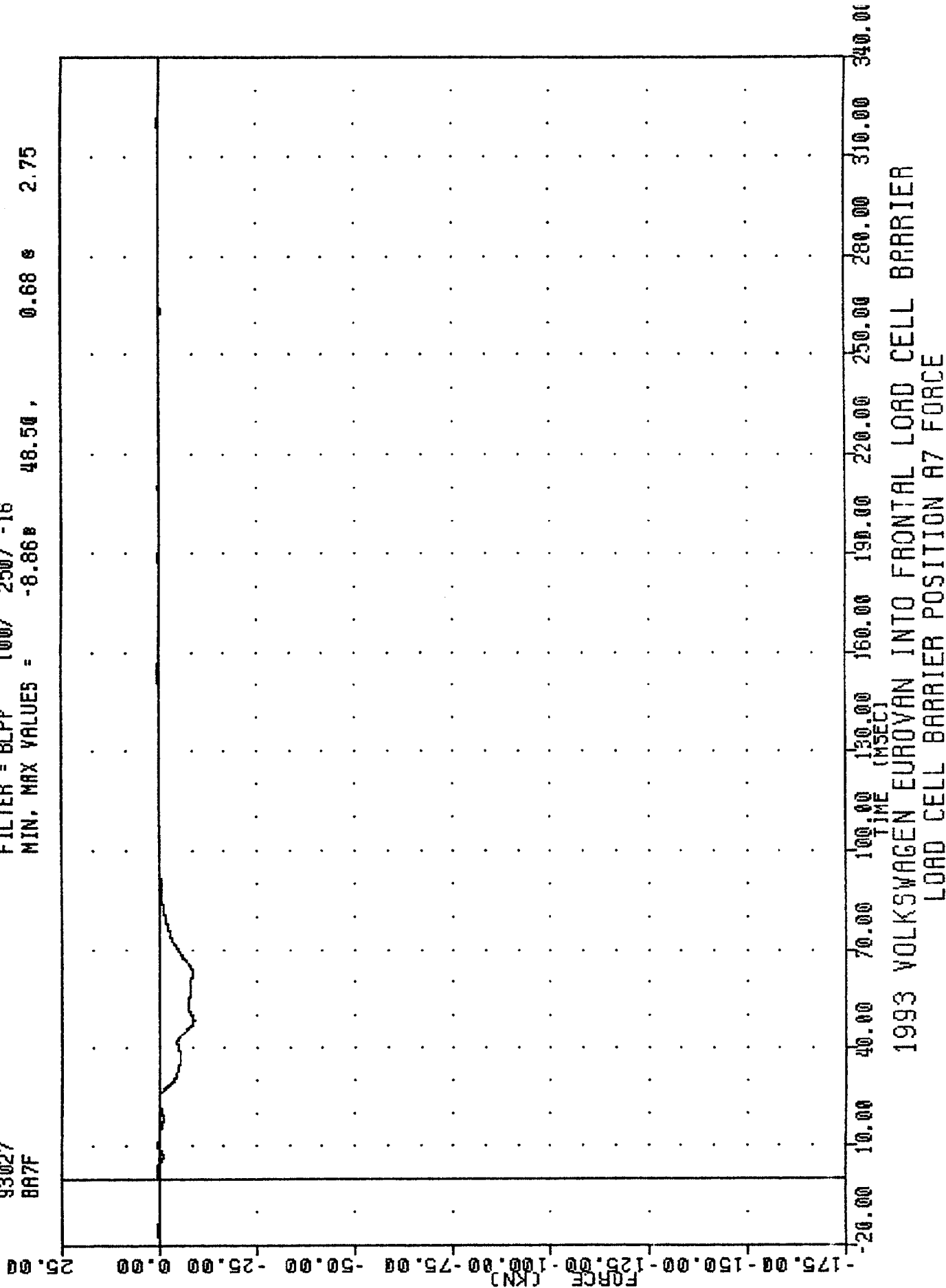


1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER

1000 CELL BARRIER POSITION FORCE

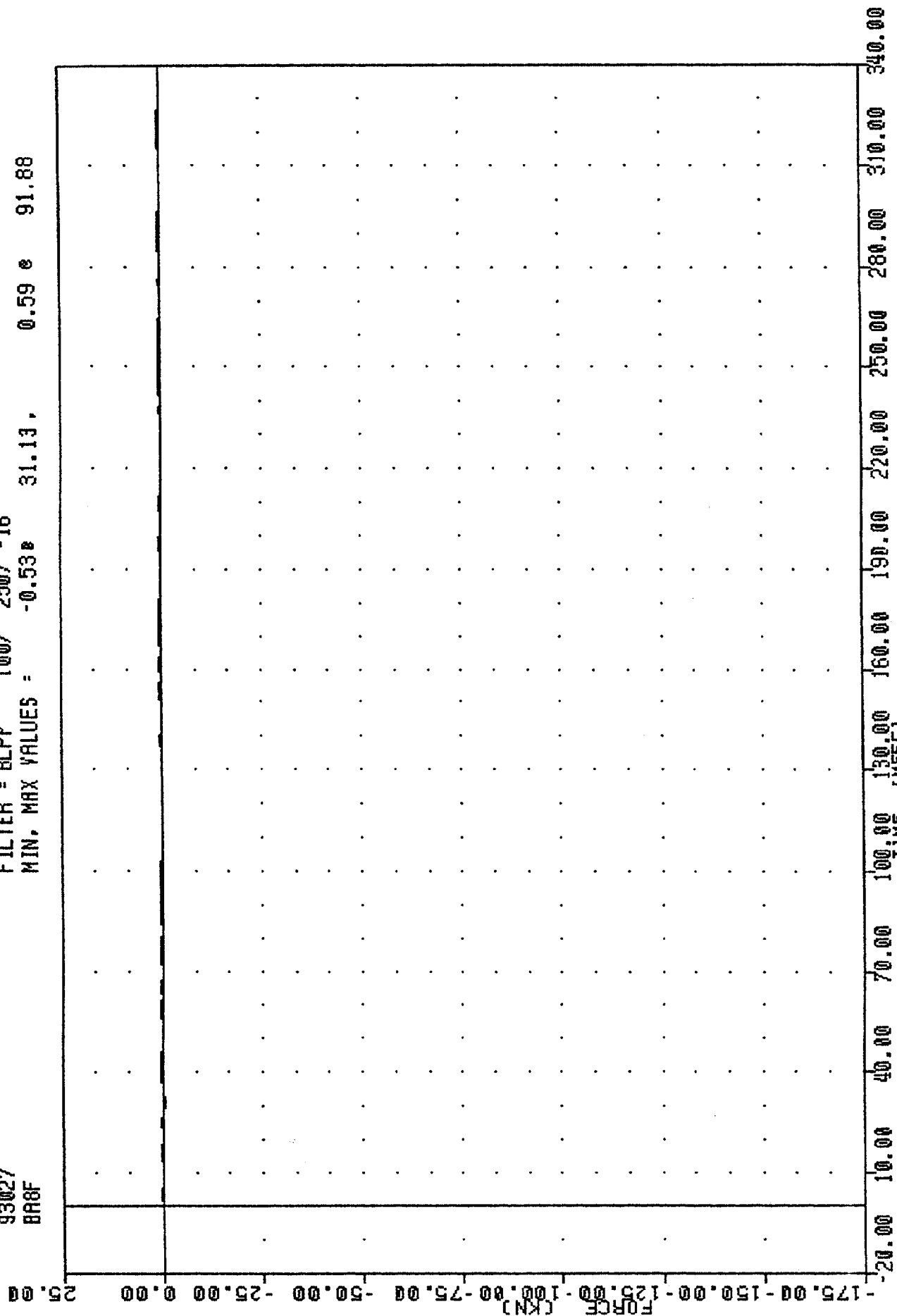
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BR7F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -8.86 48.50 , 0.68 2.75



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BR8F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -0.53 31.13 0.59 91.88

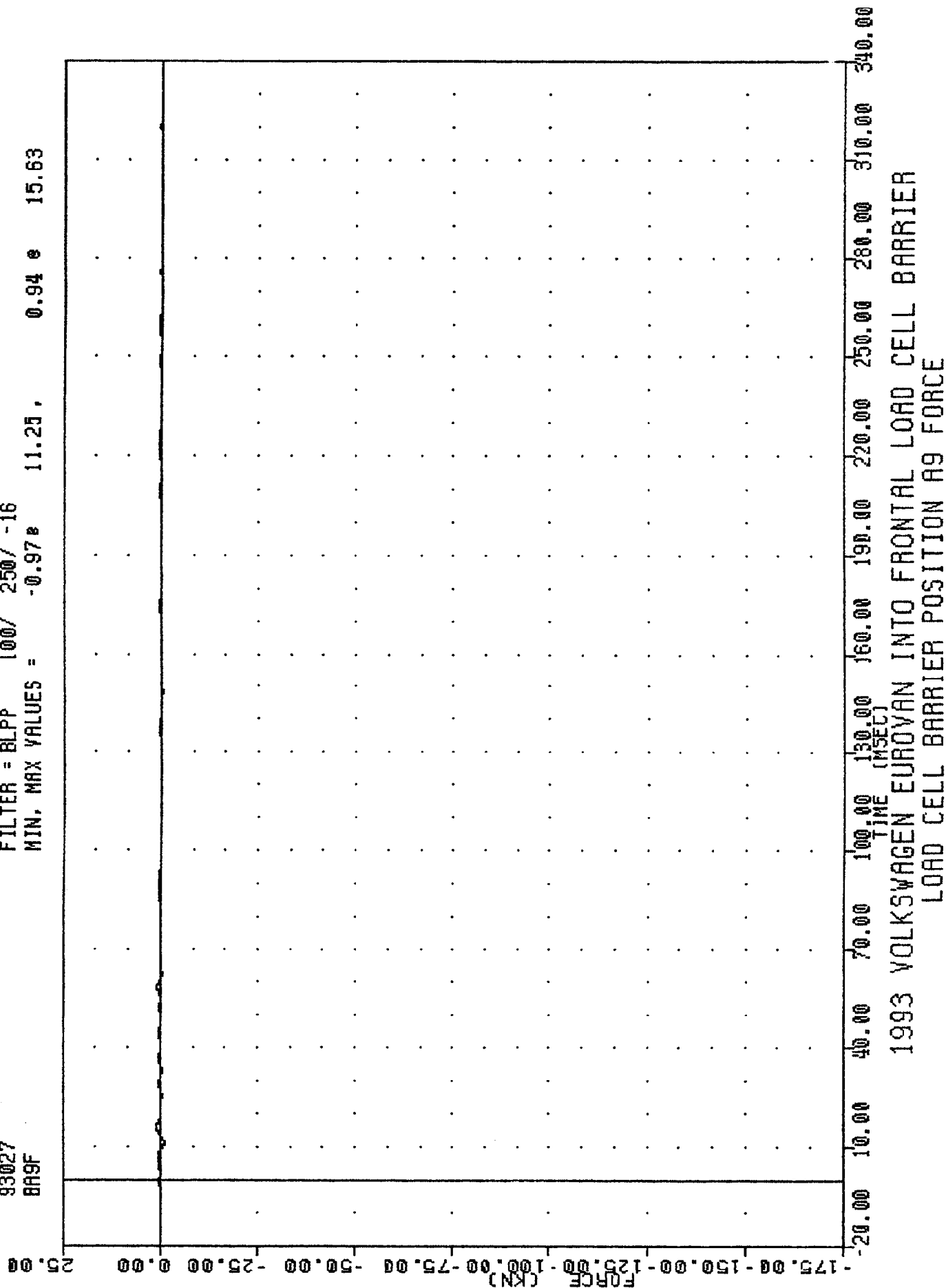


1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION FORCE

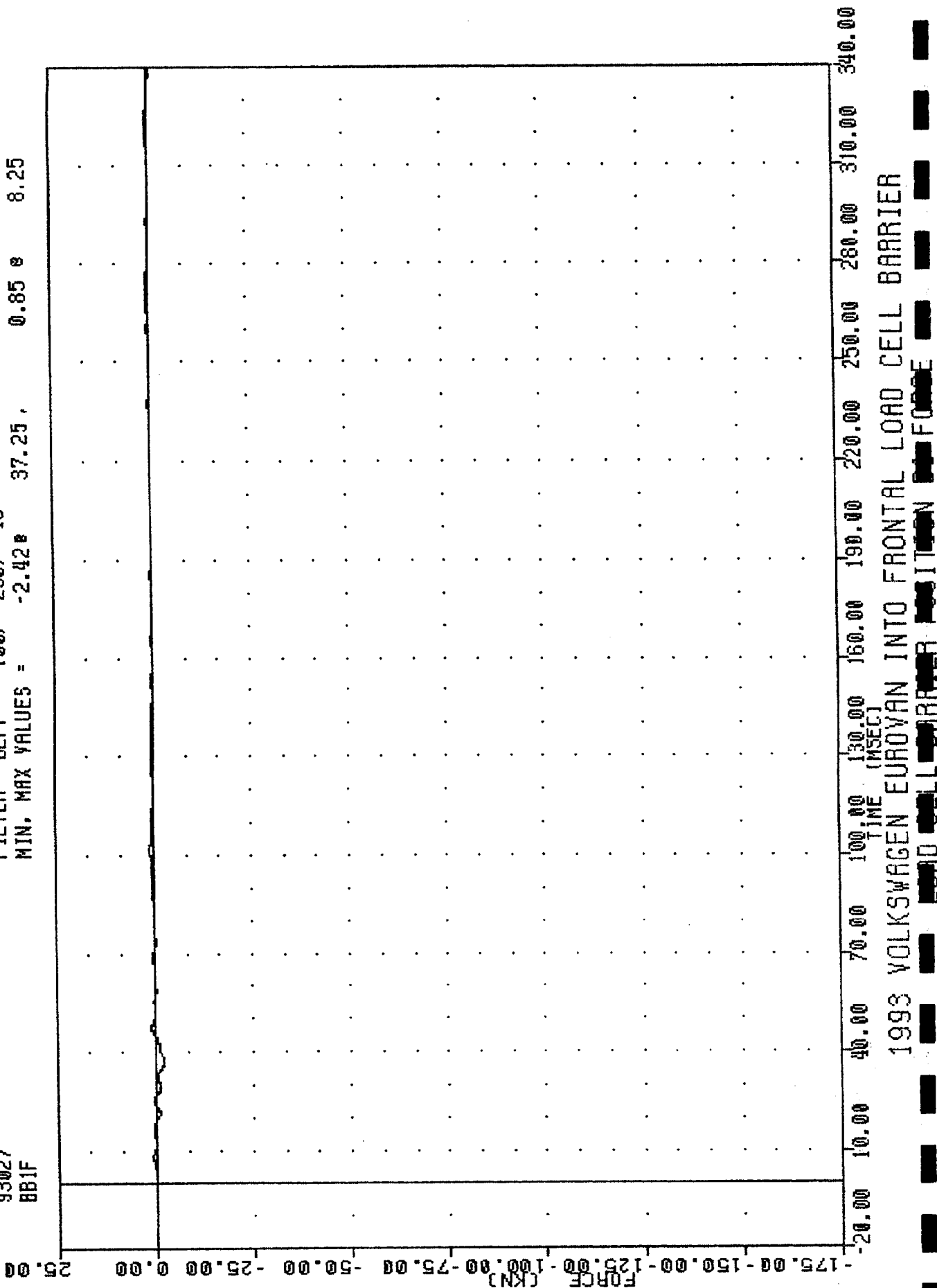
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BA9F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -0.97 11.25, 0.94 15.63



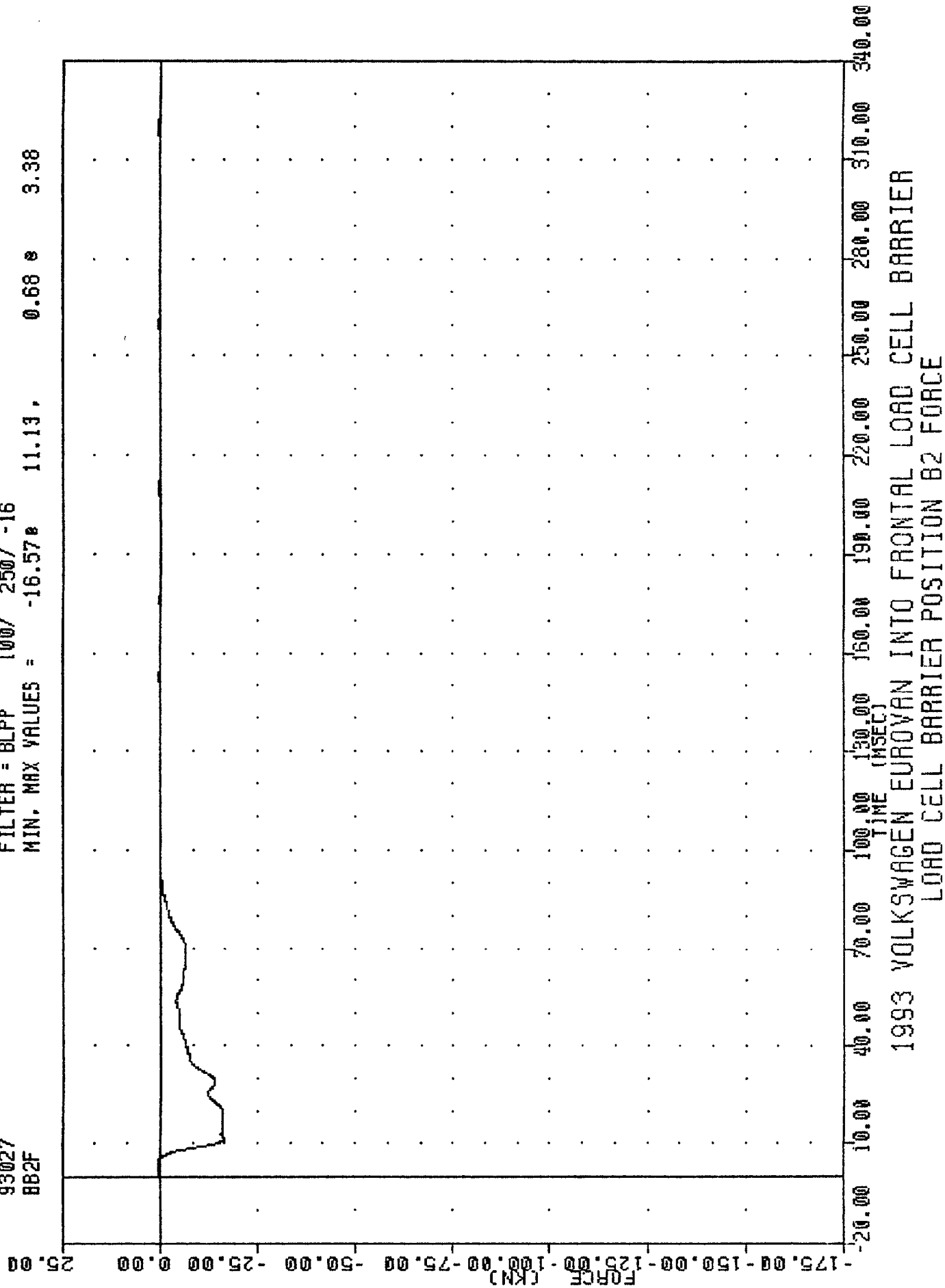
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BB1F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -2.42 0.85 8.25



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BB2F

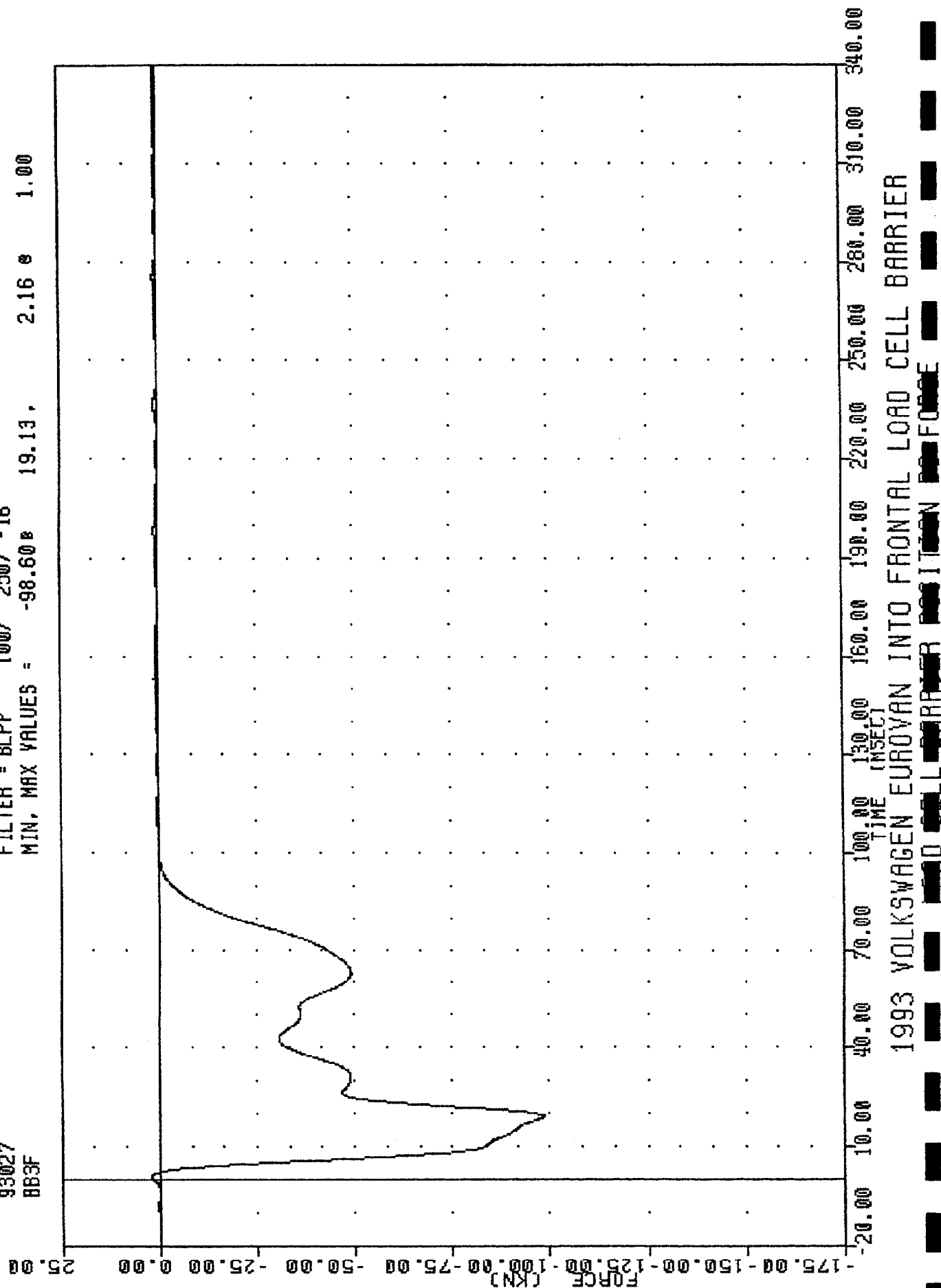
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -16.57e 11.13, 0.68 e 3.38



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B2 FORCE

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BB3F

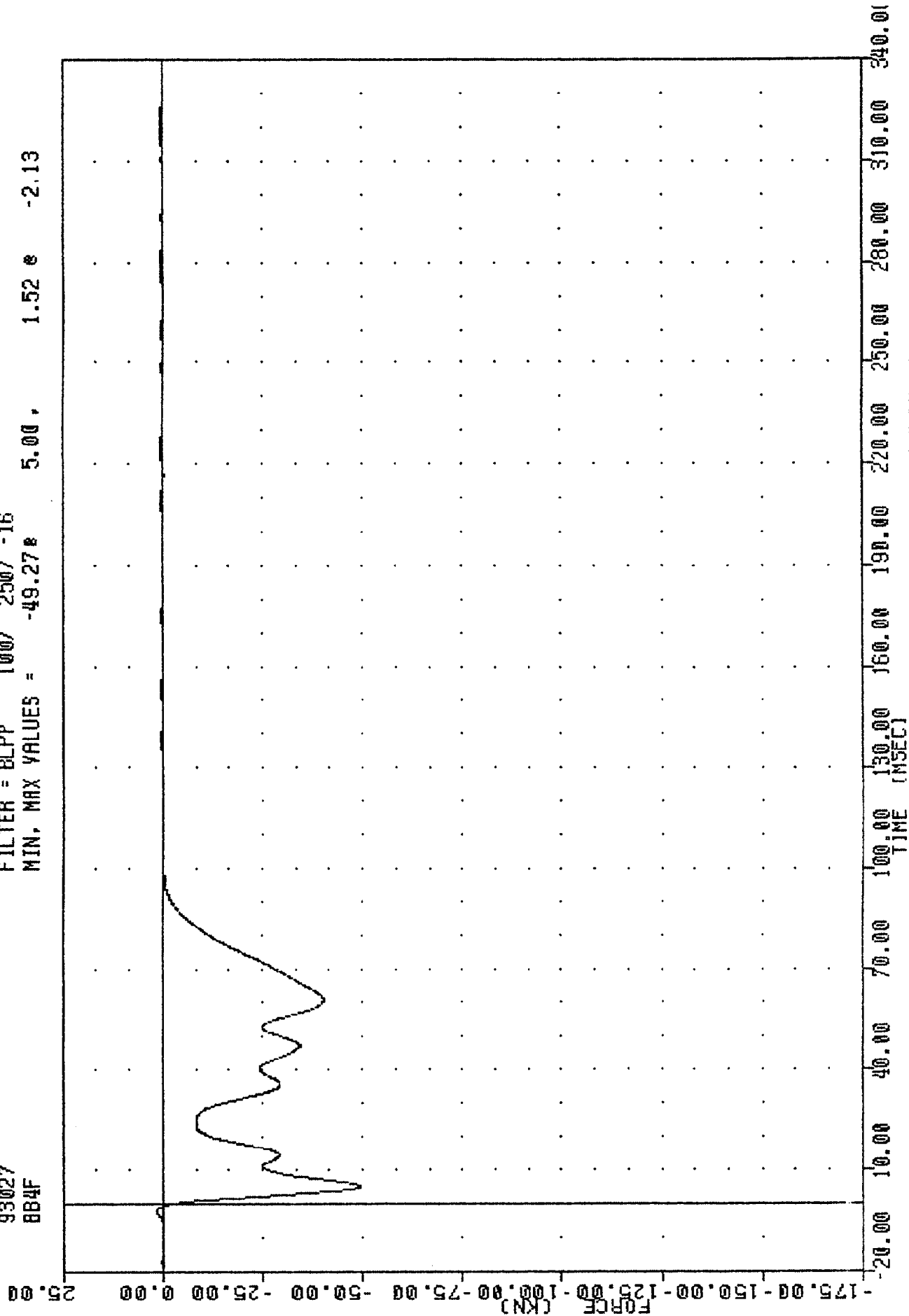
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -98.60 19.13, 2.16 1.00



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 POSITION FORCE

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BB4F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -49.27e 5.00 , 1.52 e -2.13

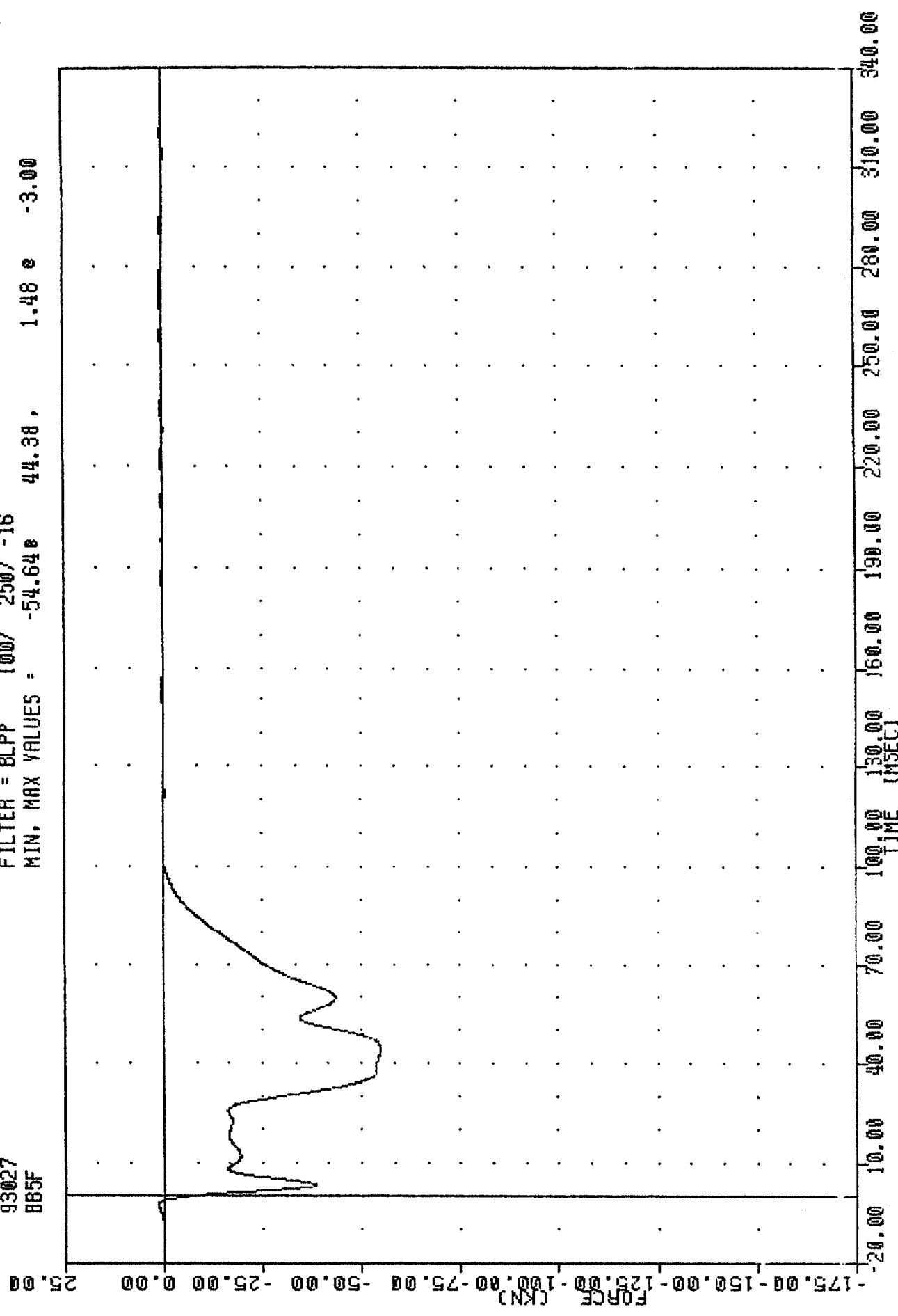


1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B4 FORCE

TRC
 NEW CAR ASSESSMENT PROGRAM
 93027
 885F

, 930127

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -54.64 44.38 , 1.48 e -3.00

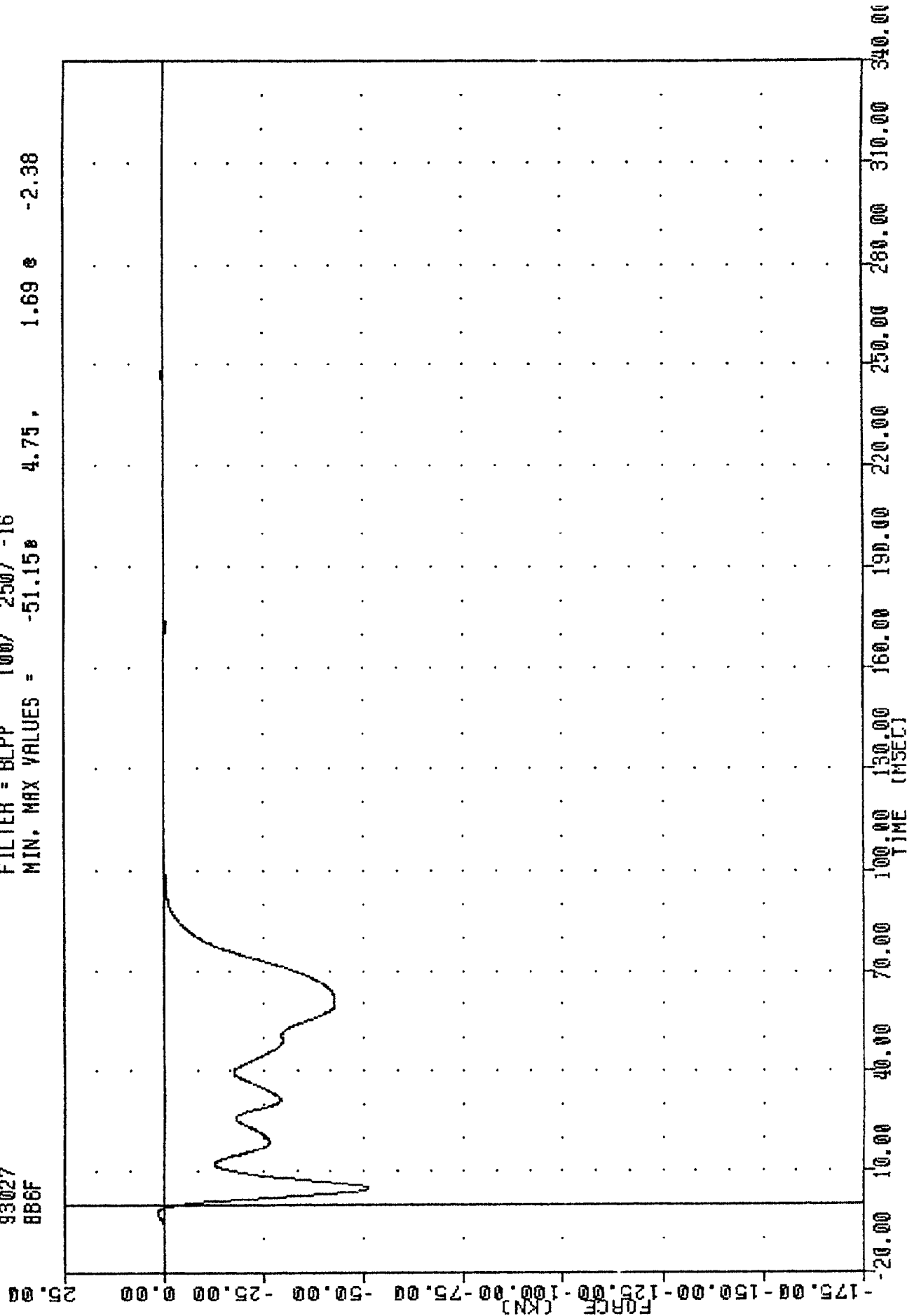


1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER

FRONT BARRIER POSITION FORCE

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BB6F

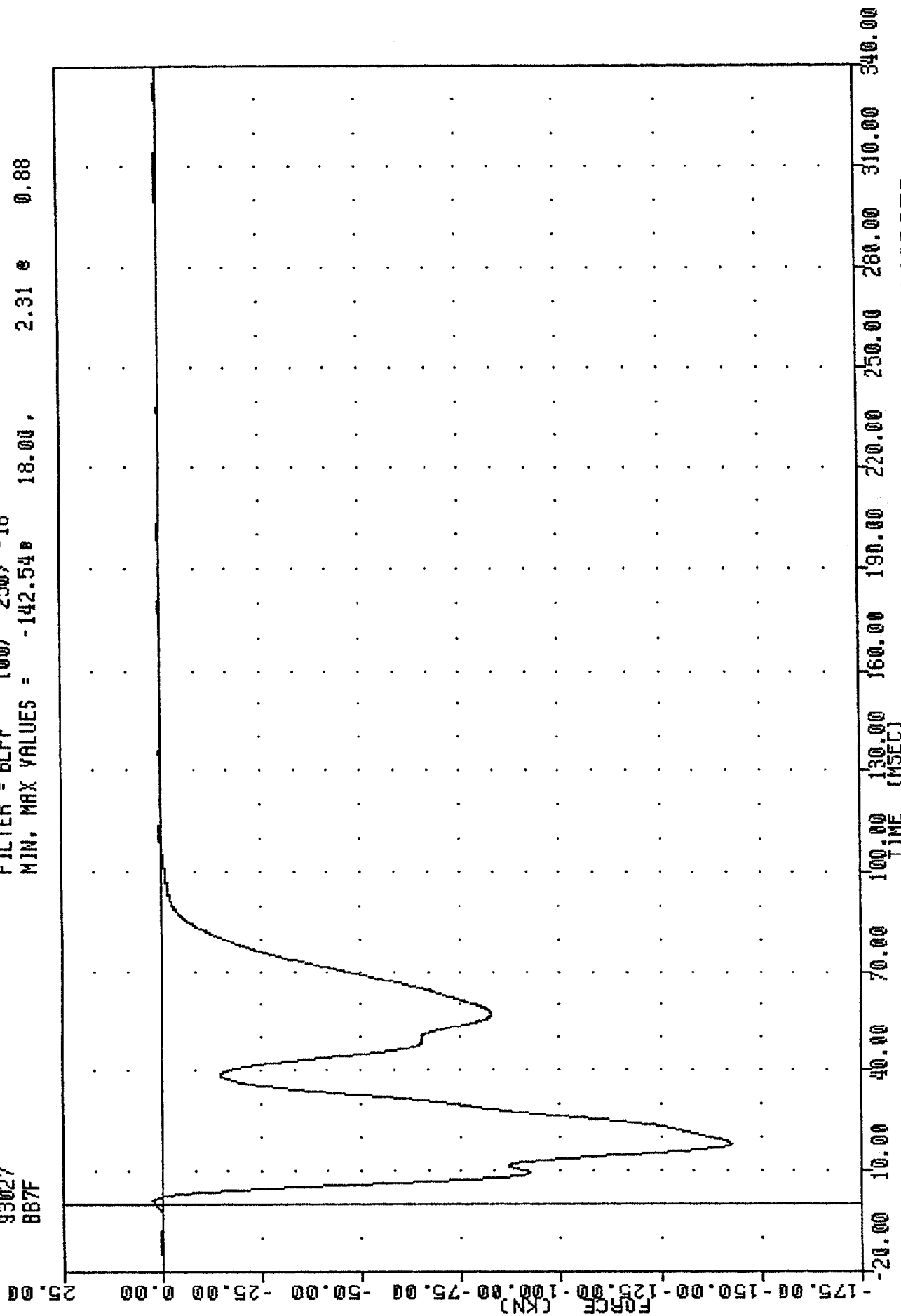
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -51.15 4.75 , 1.69 e -2.38



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 66 FORCE

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BB7F

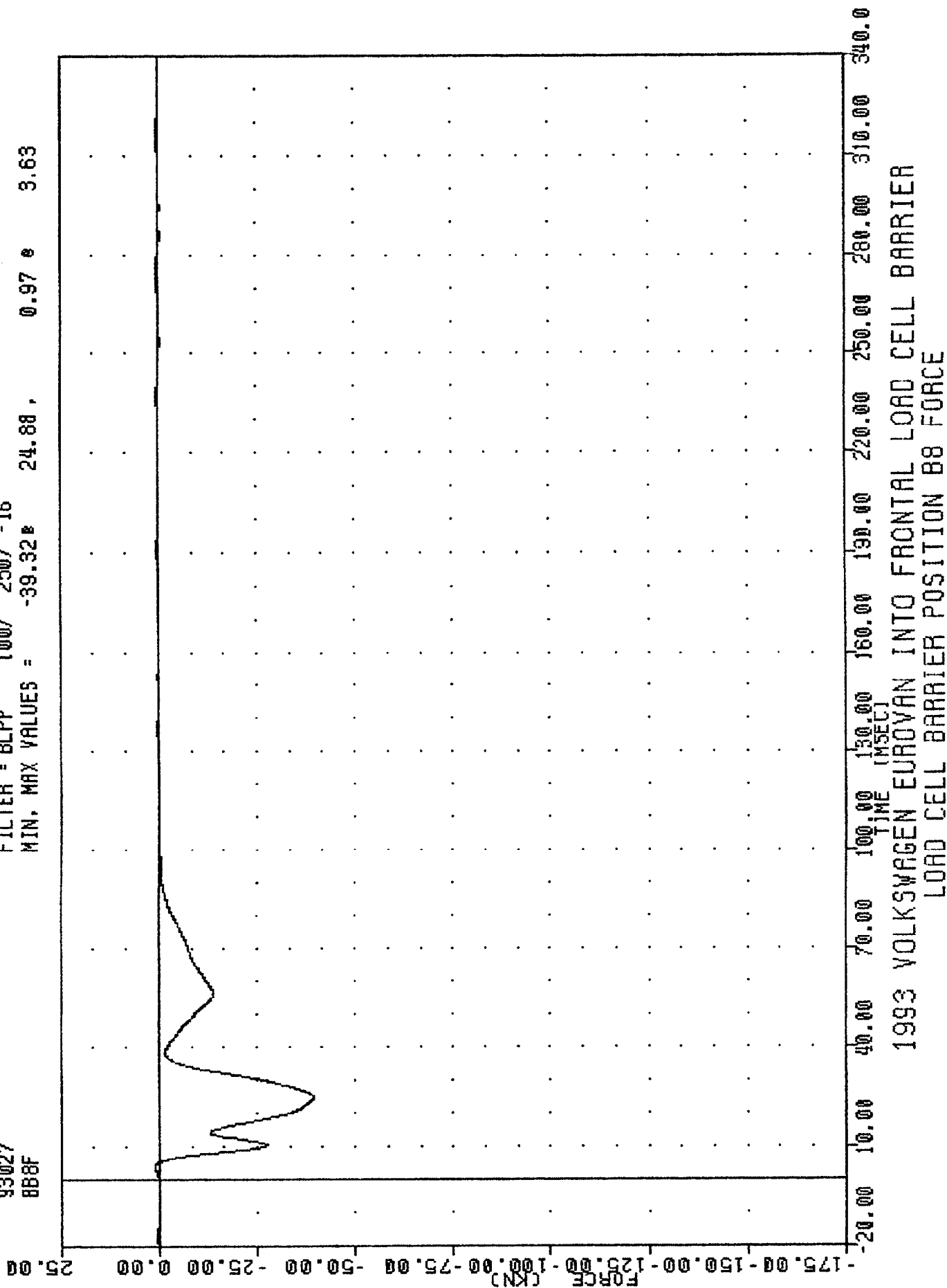
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -142.54 18.00, 2.31 0.88



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER POSITION BY FORCE

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BB8F

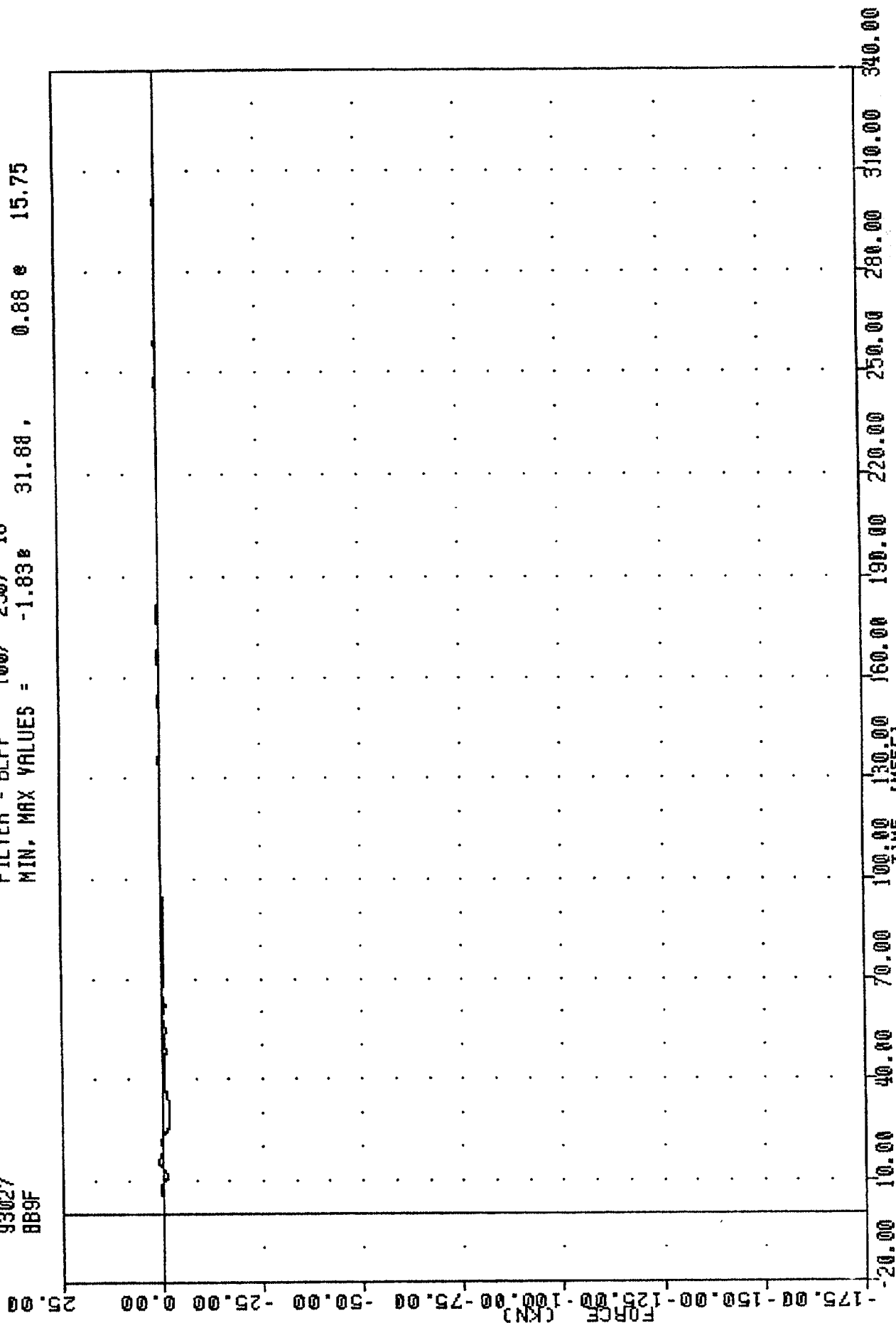
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -39.32 24.88 , 0.97 e 3.63



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B8 FORCE

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BB9F

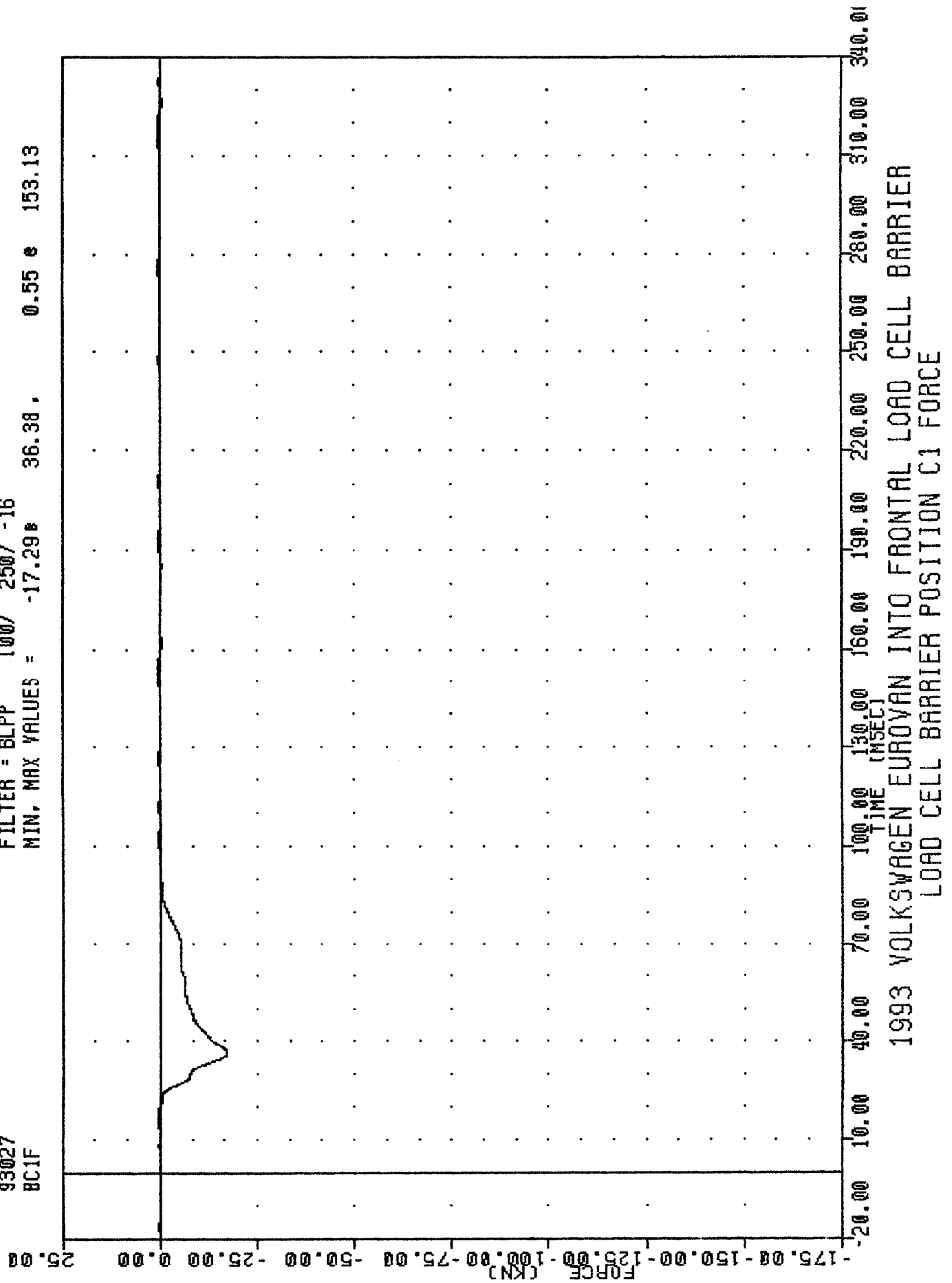
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -1.83 31.88 , 0.88 e 15.75



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION VS FORCE

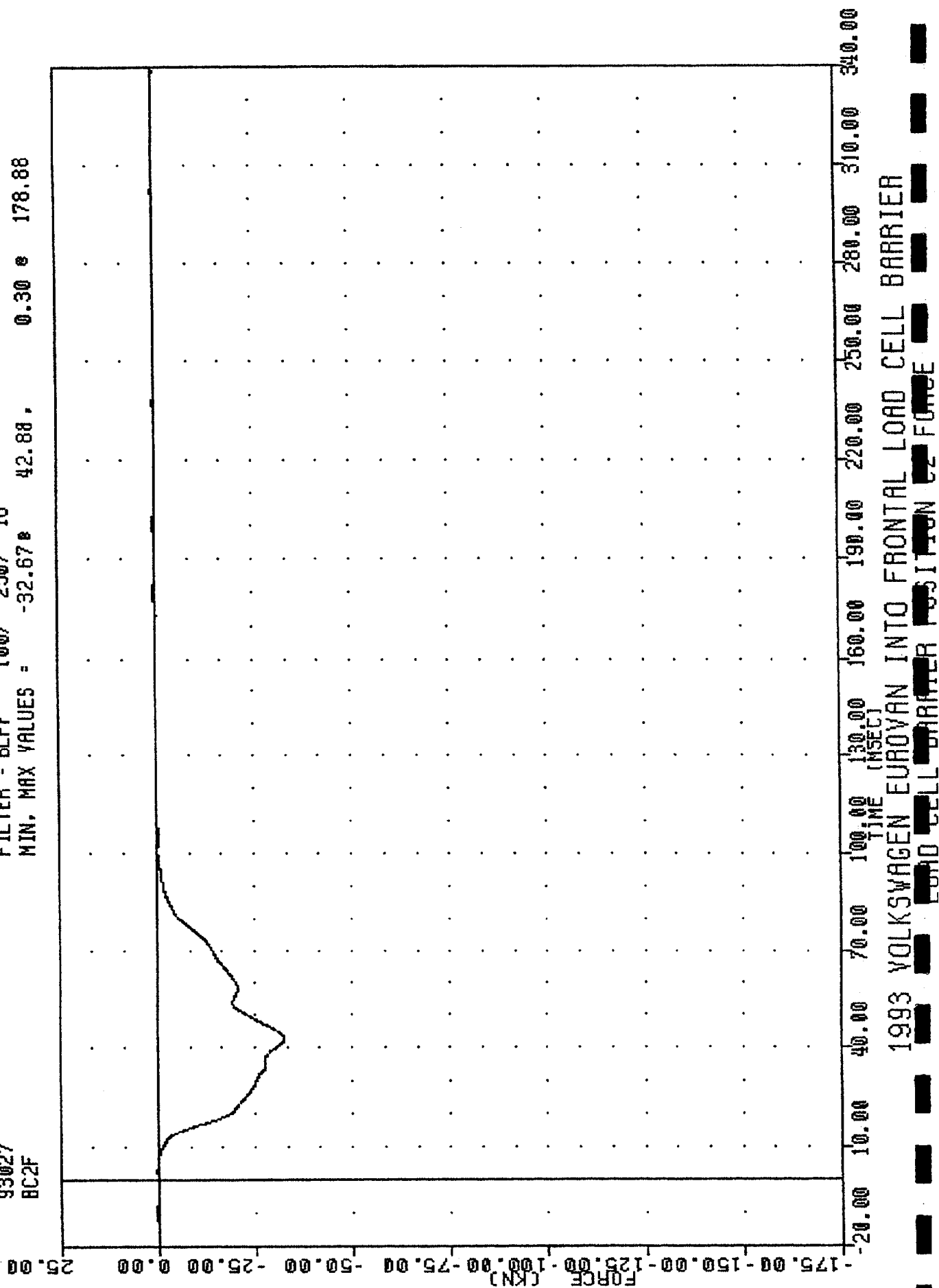
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BC1F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -17.29 36.38 , 0.55 153.13



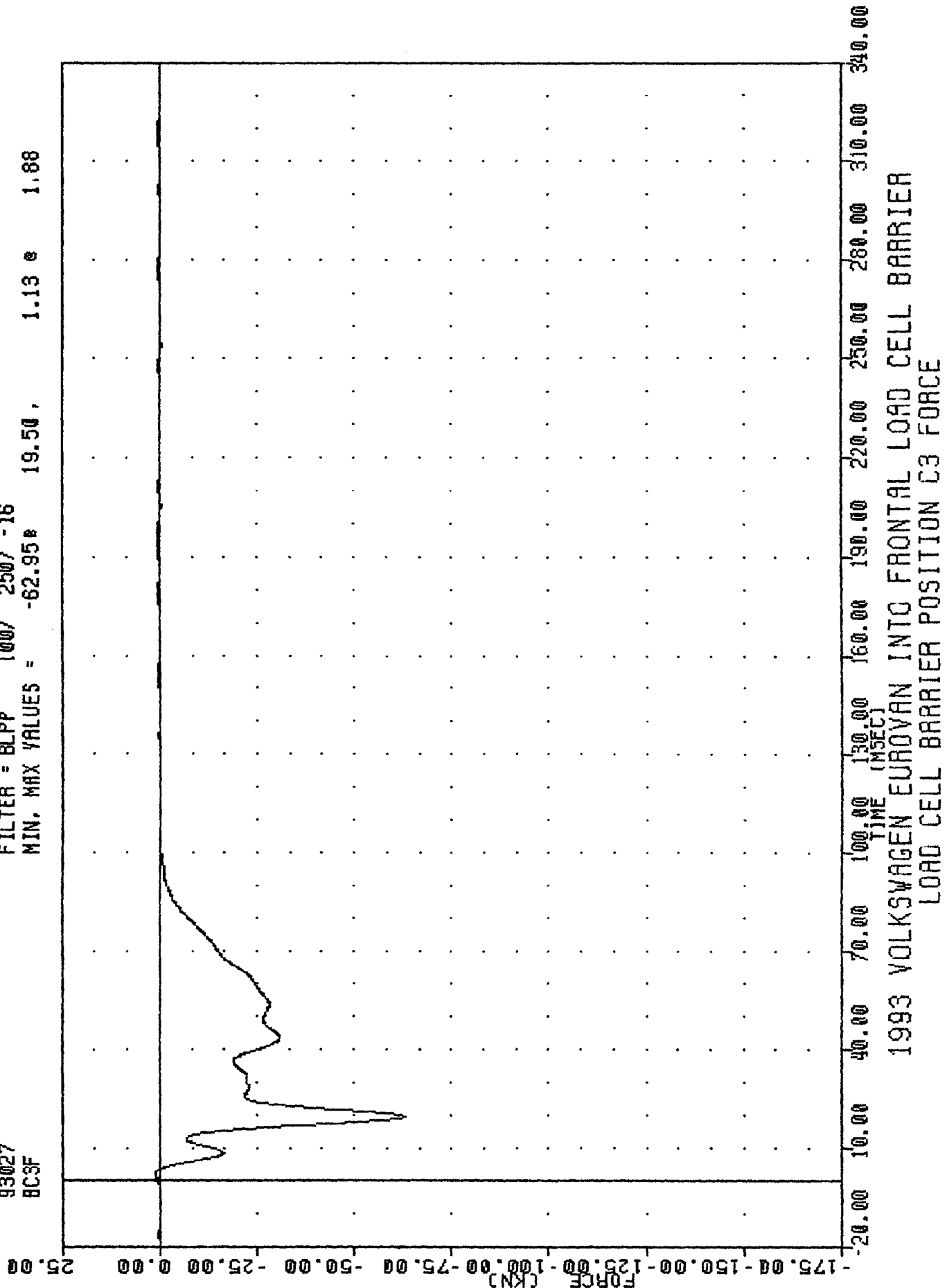
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BC2F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -32.67 42.88, 0.30 178.88



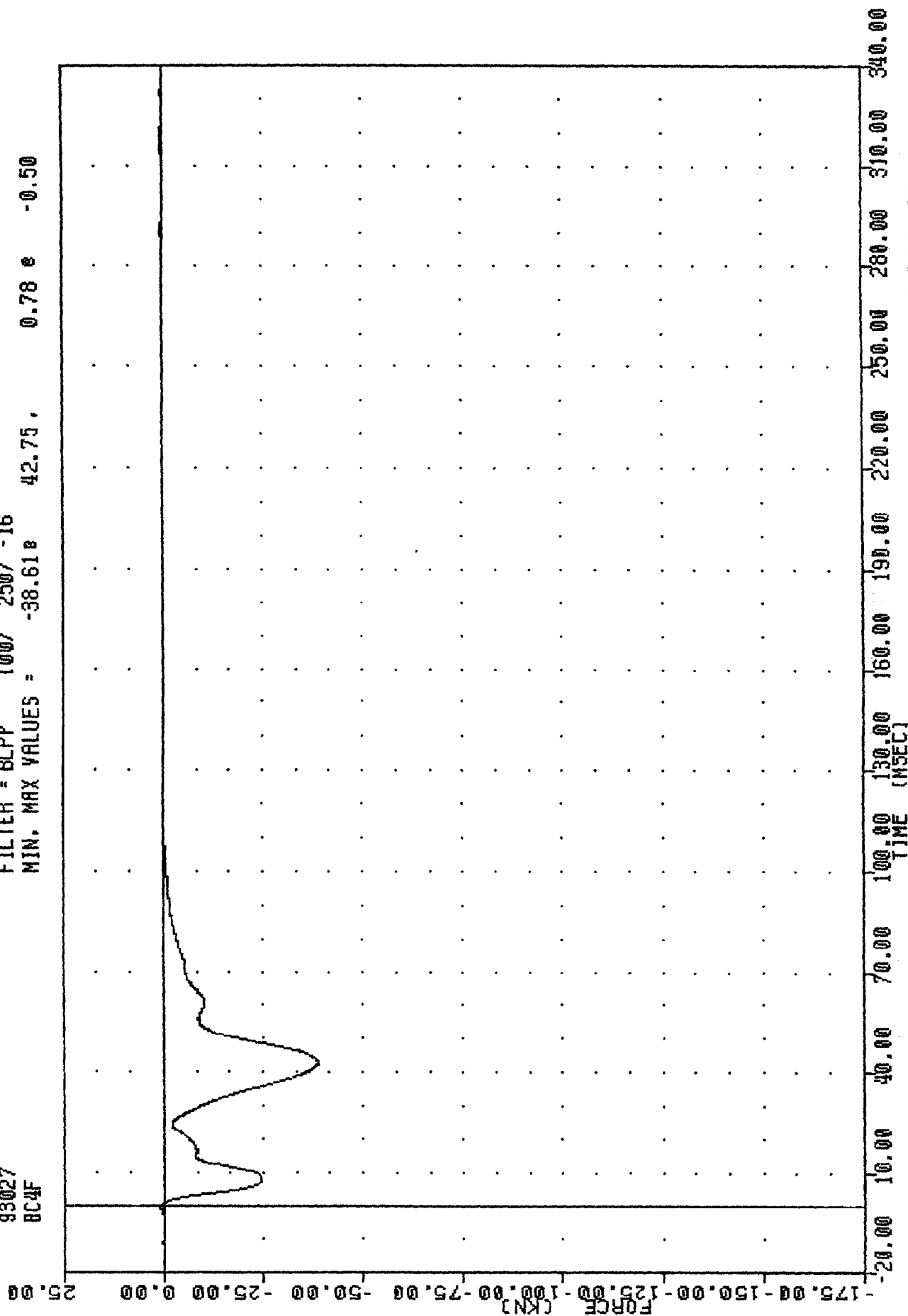
TRC . 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BC3F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -62.95* 19.50 , 1.13 * 1.88



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BC4F

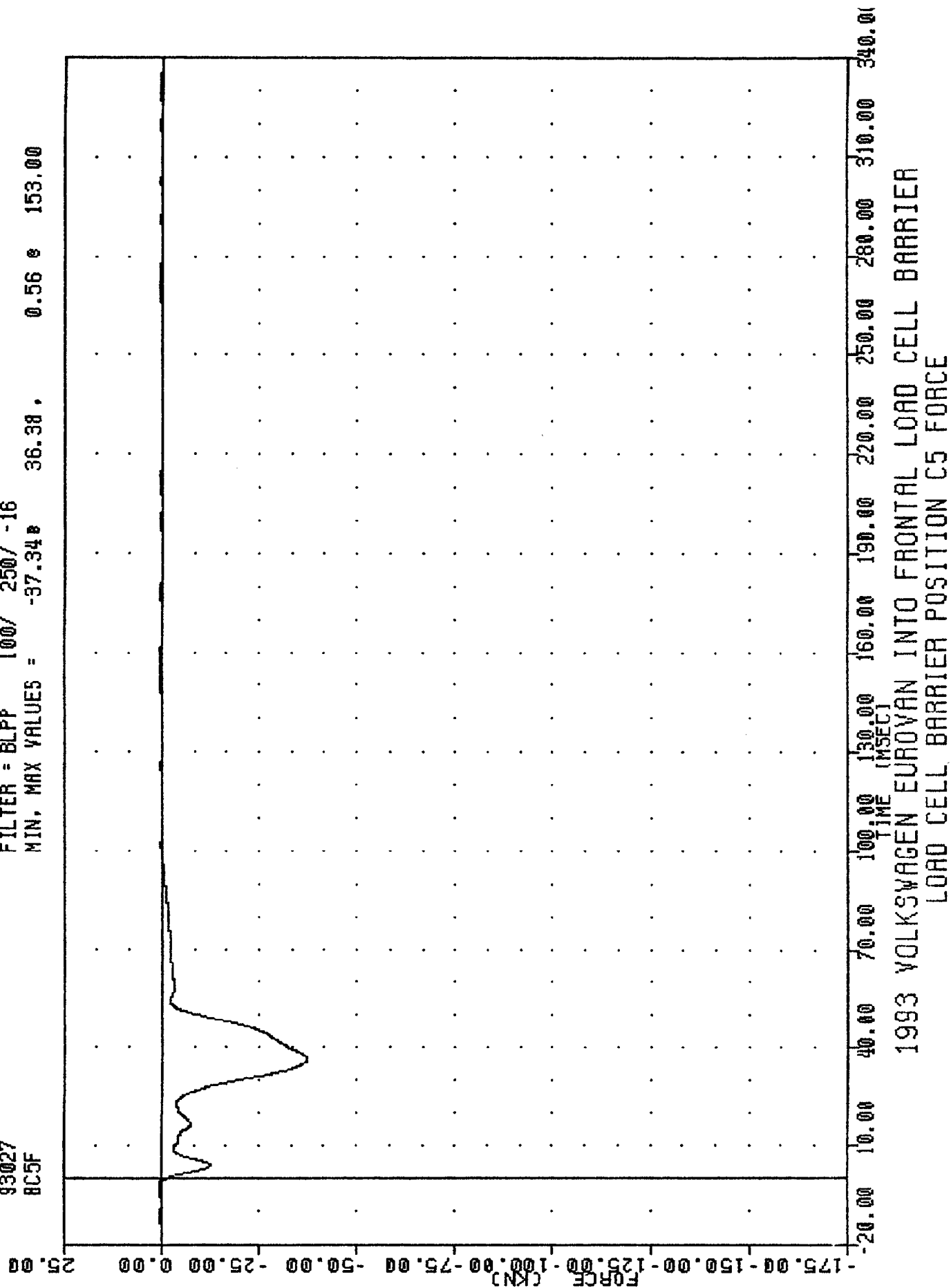
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -38.61 e 42.75 , 0.78 e -0.50



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 BARRIER POSITION FORCE

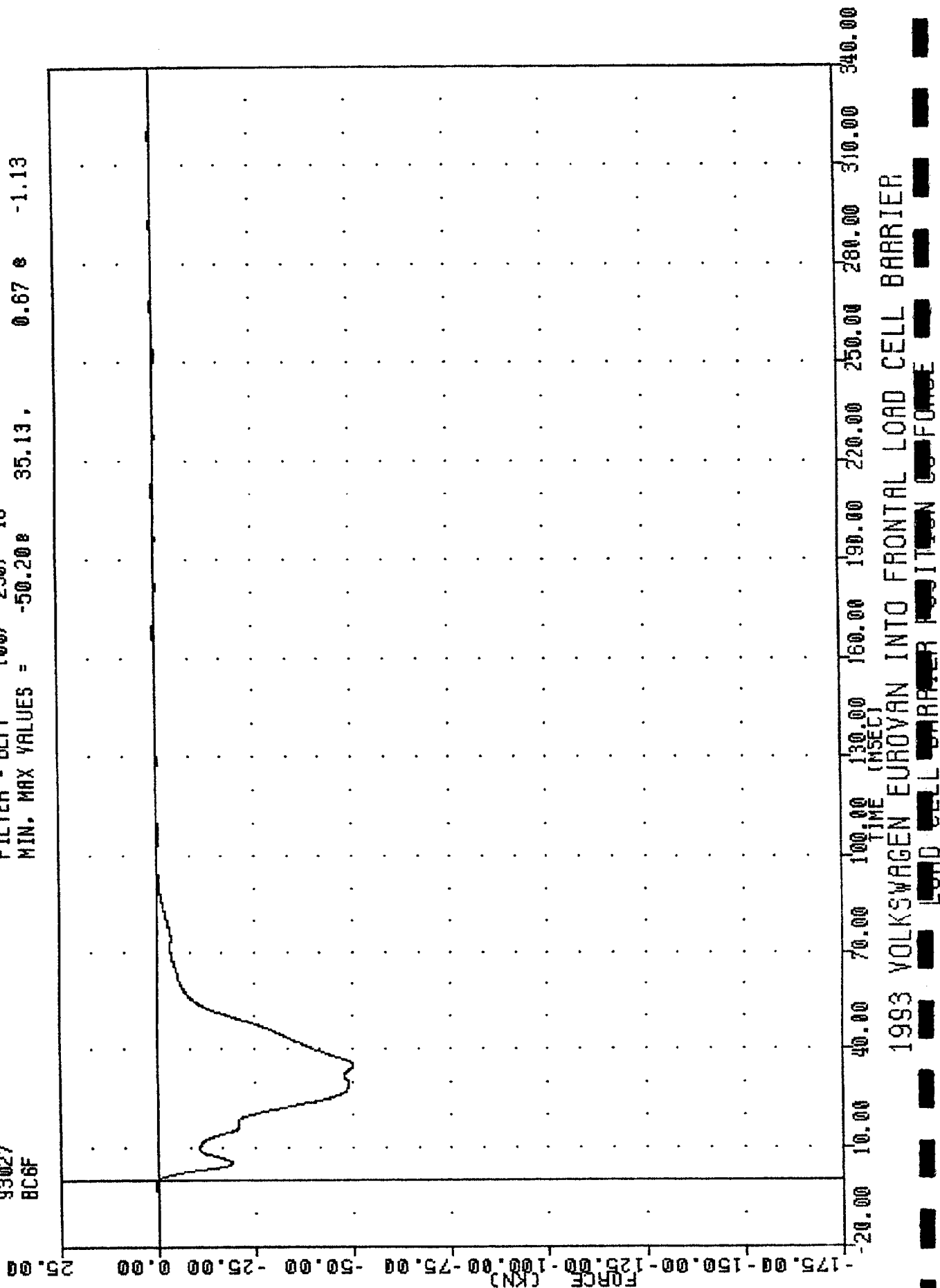
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BC5F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -37.34 36.38 , 0.56 153.00



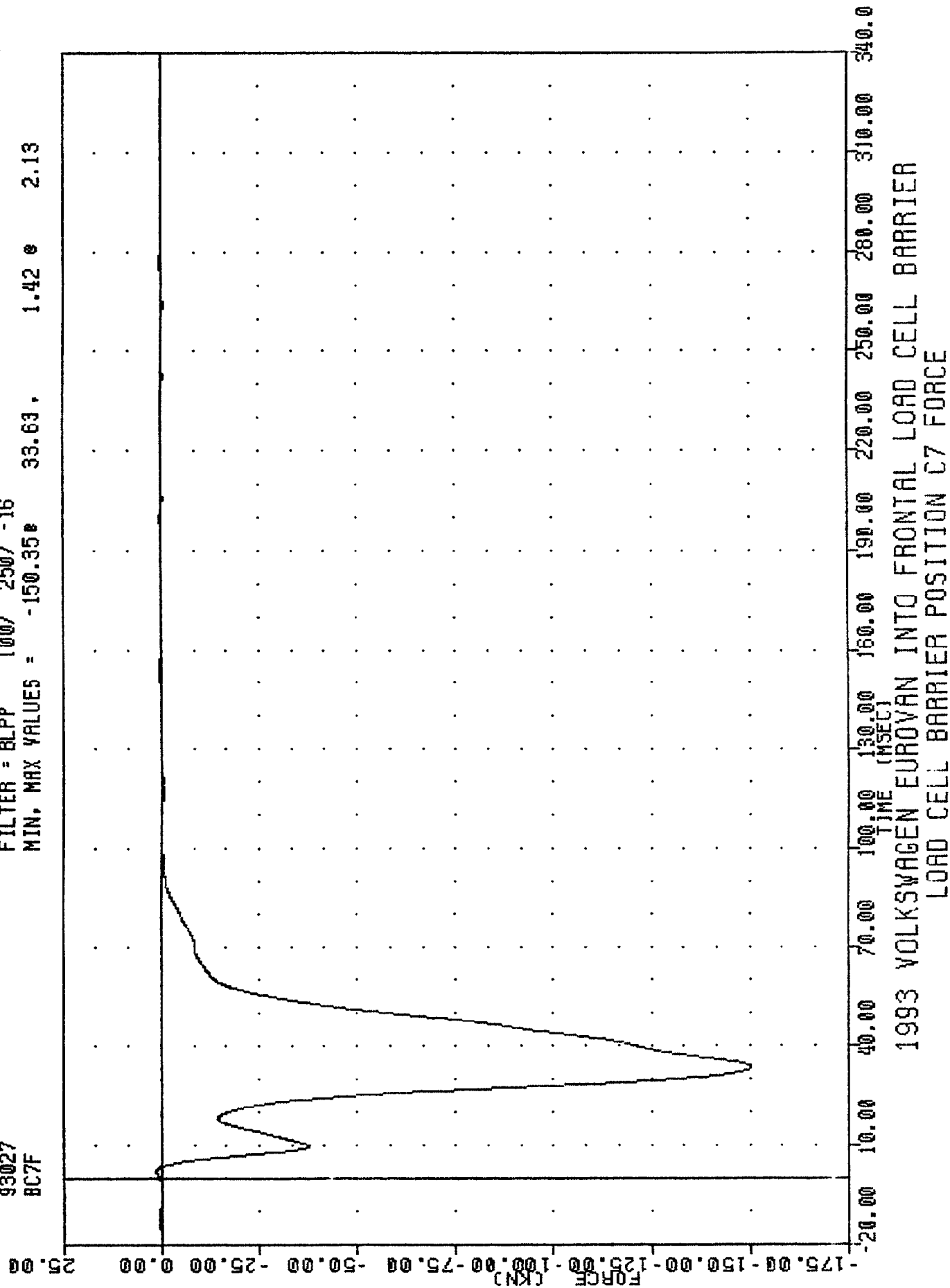
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BC6F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -50.200 35.13, 0.67 e -1.13



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BC7F

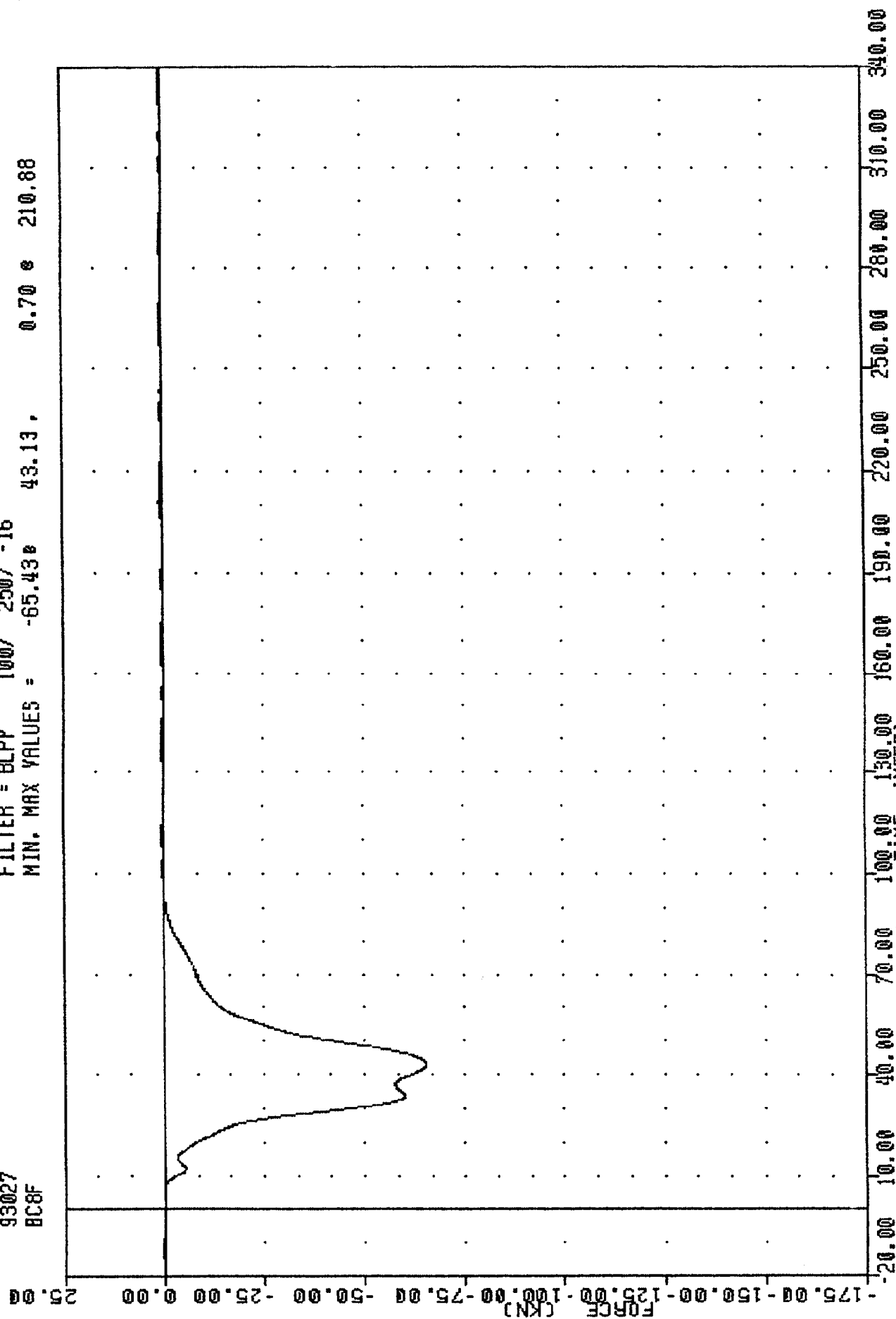
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -150.35 33.63 , 1.42 2.13



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM

93027
 BC8F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -65.43 43.13, 0.70 210.88

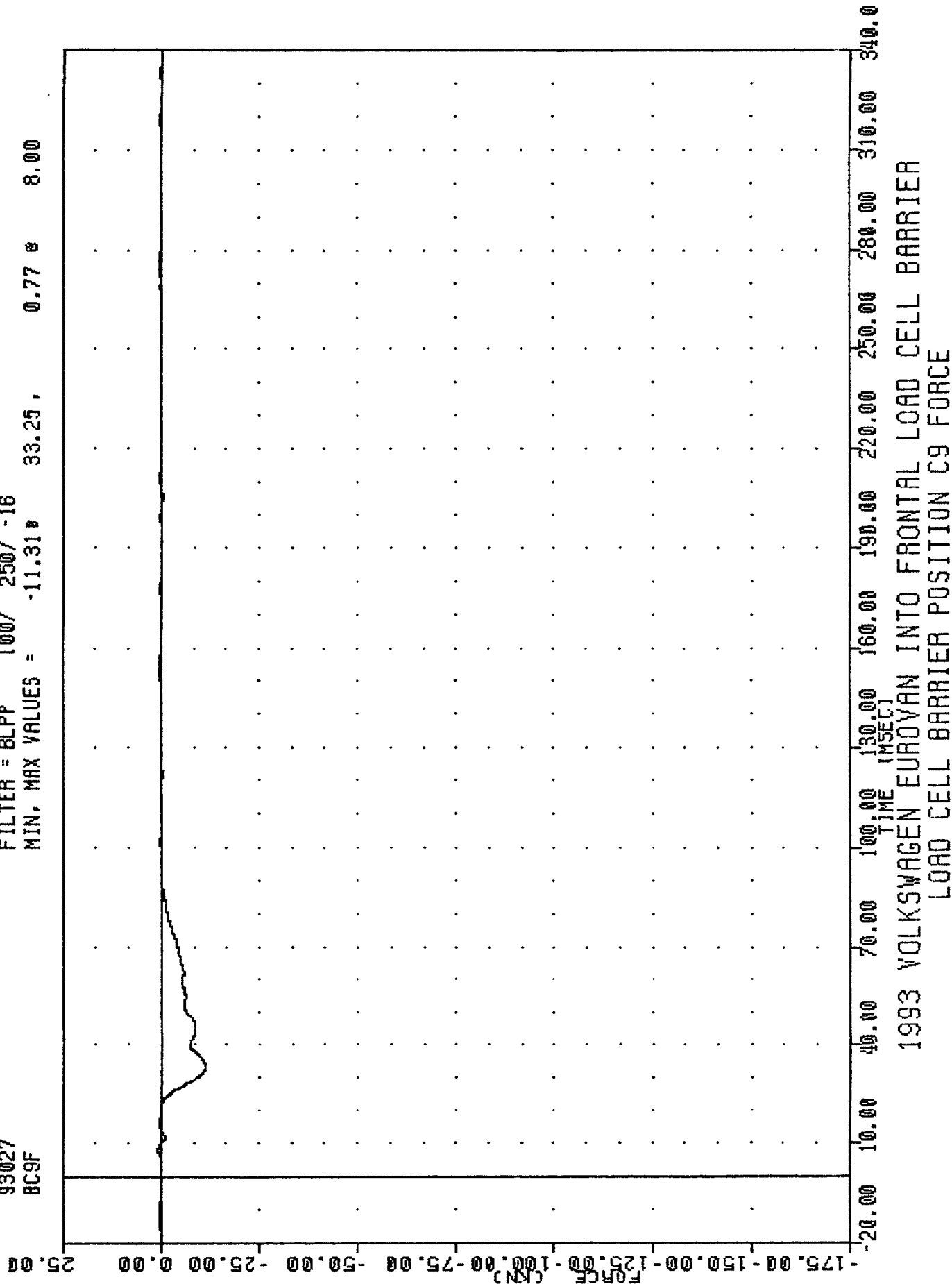


1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION FORCE

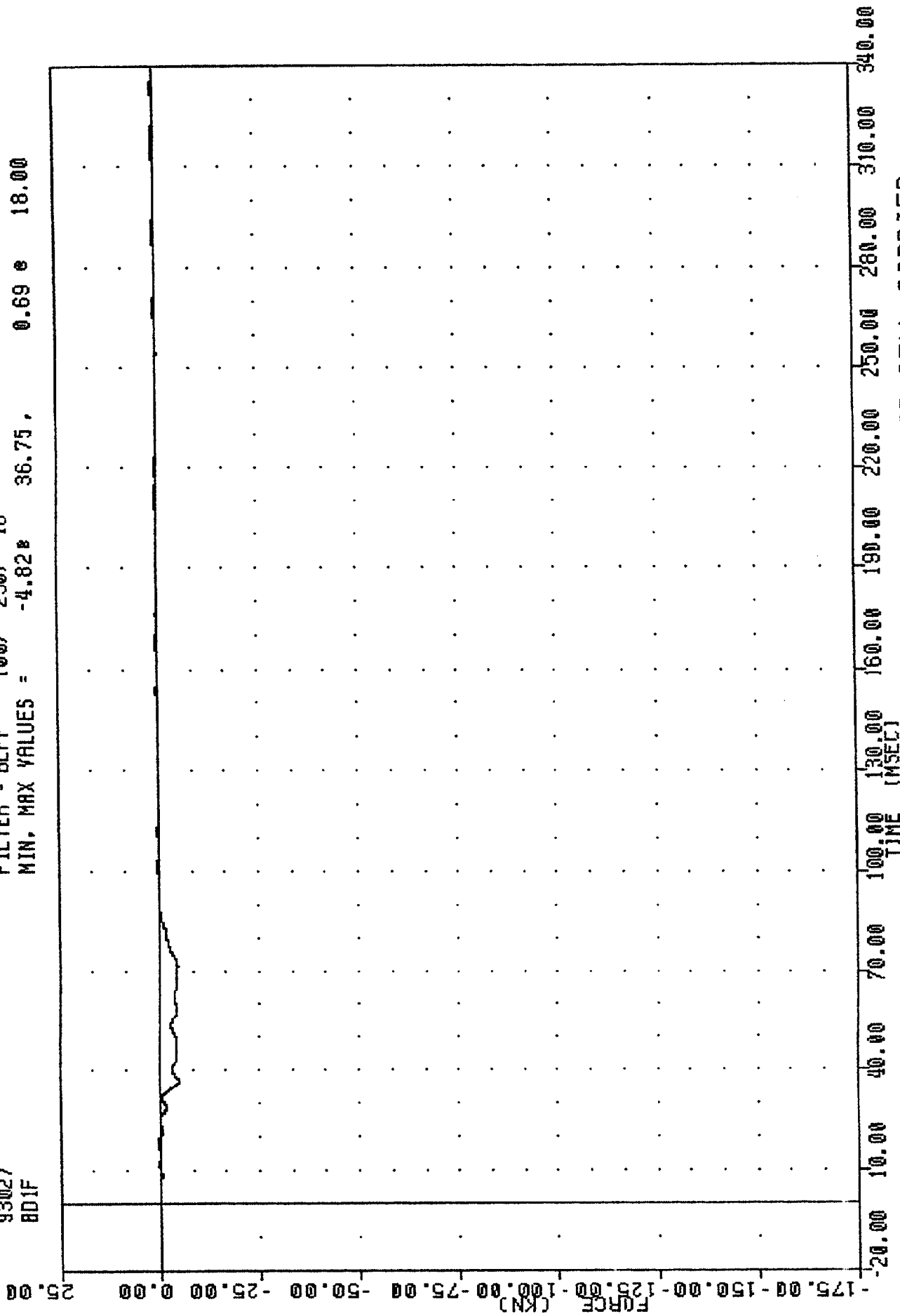
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BC9F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -11.31 33.25, 0.77 8.00



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BDIF

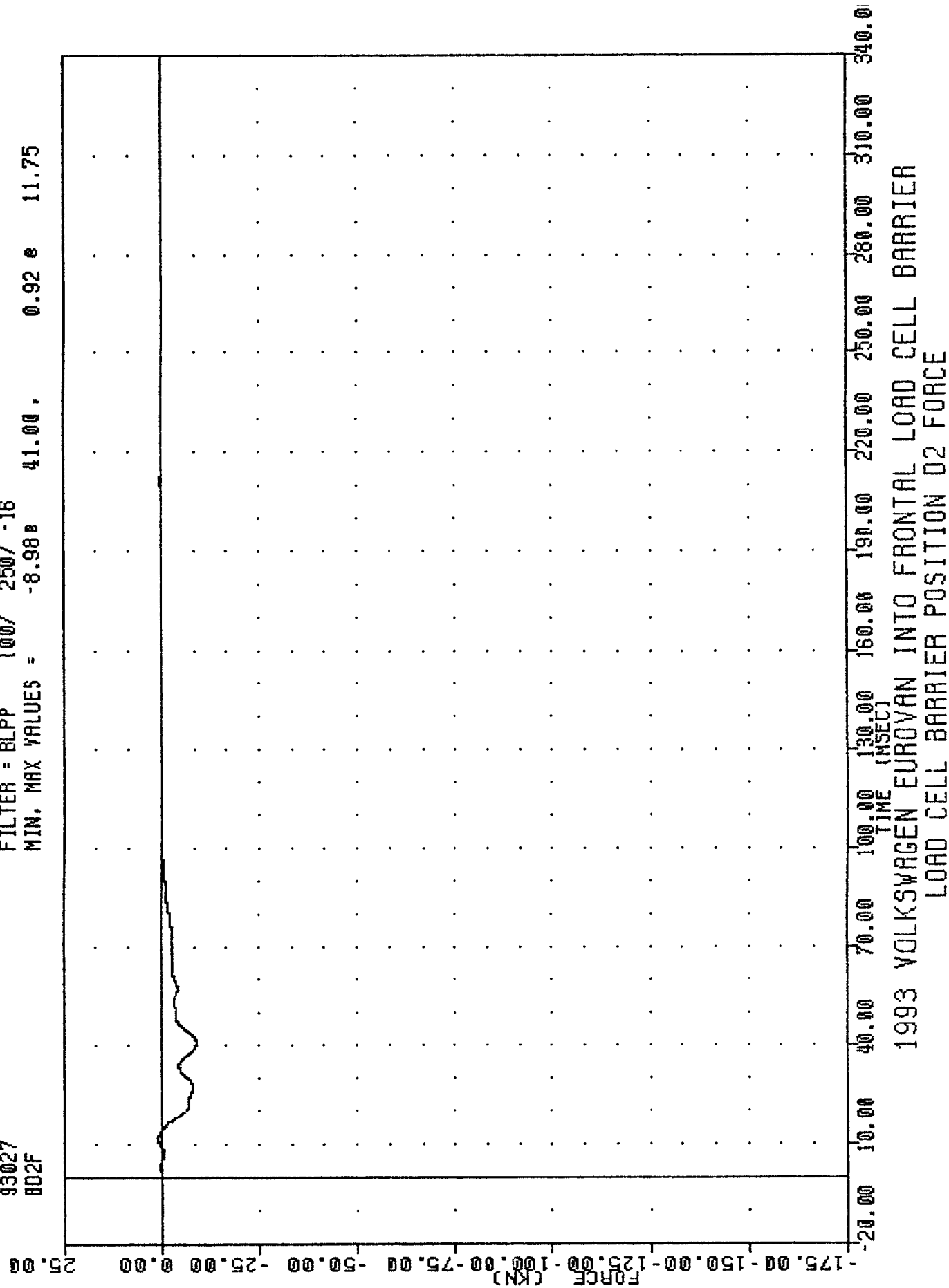
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -4.82# 36.75, 0.69 # 18.00



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION DISFORGE

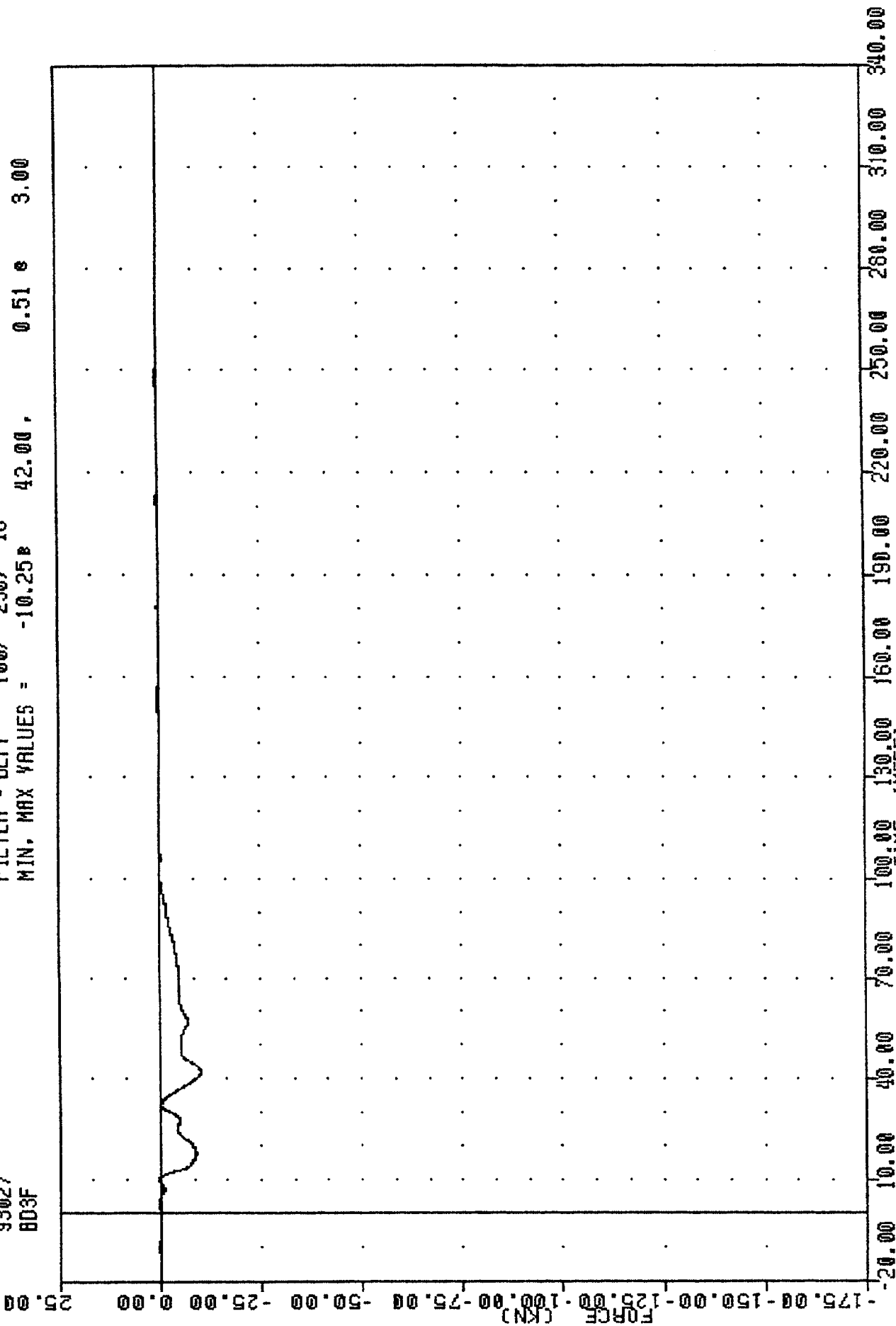
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BD2F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -8.98 41.00 , 0.92 e 11.75



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BD3F

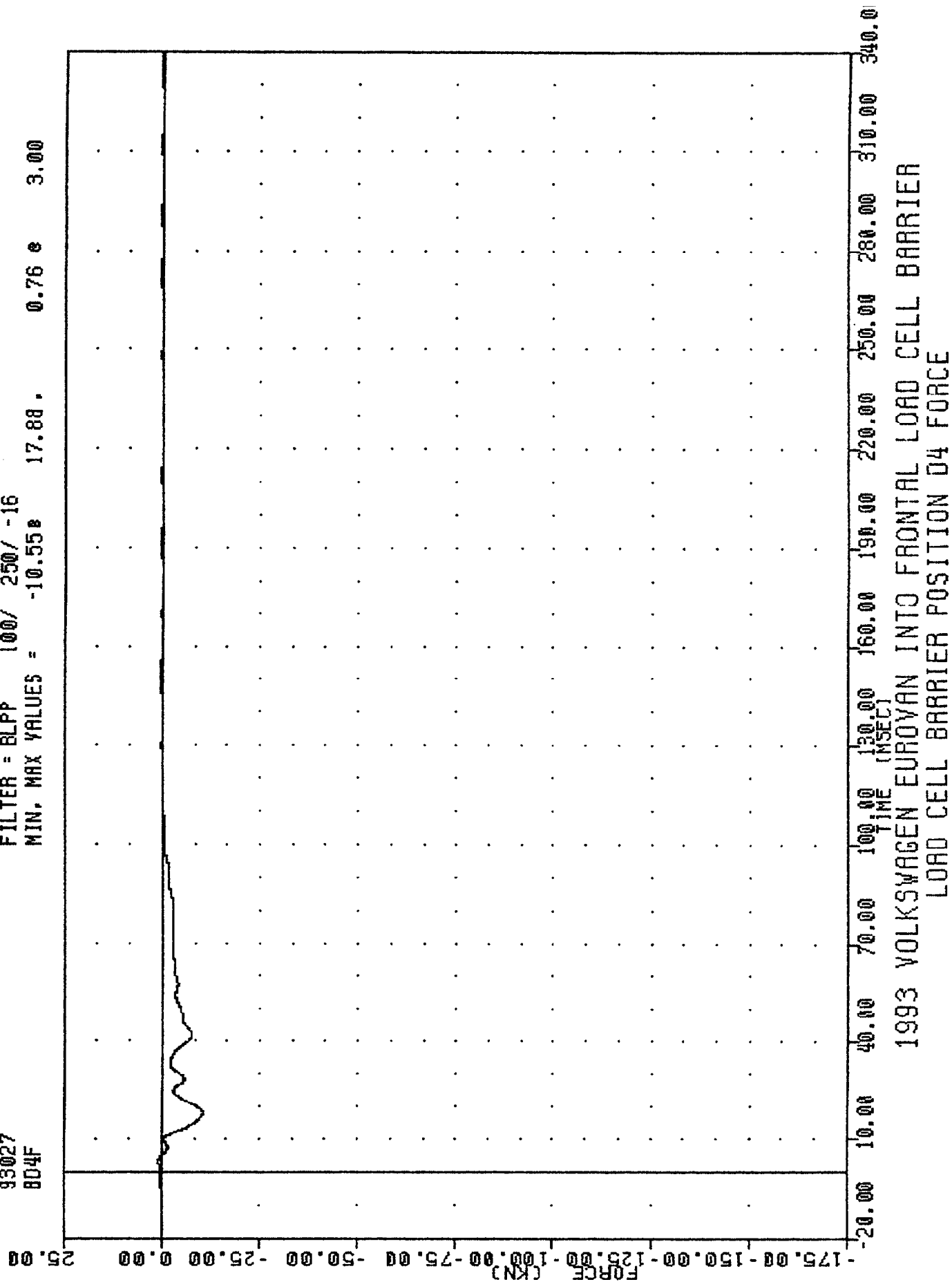
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -10.25 42.00, 0.51 3.00



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 00 FORCE

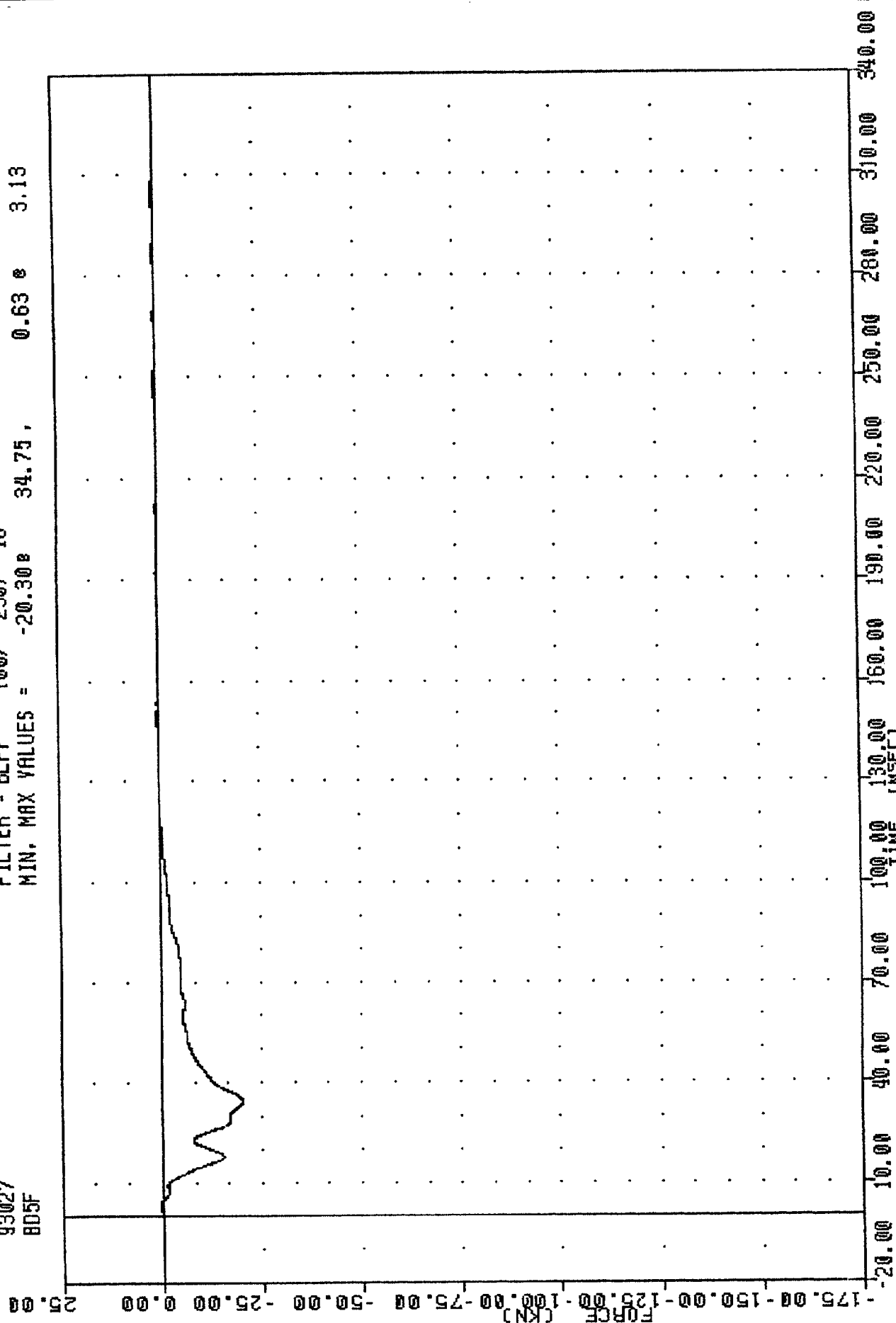
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 804F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -10.558 17.88 . 0.76 e 3.00



TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BD5F

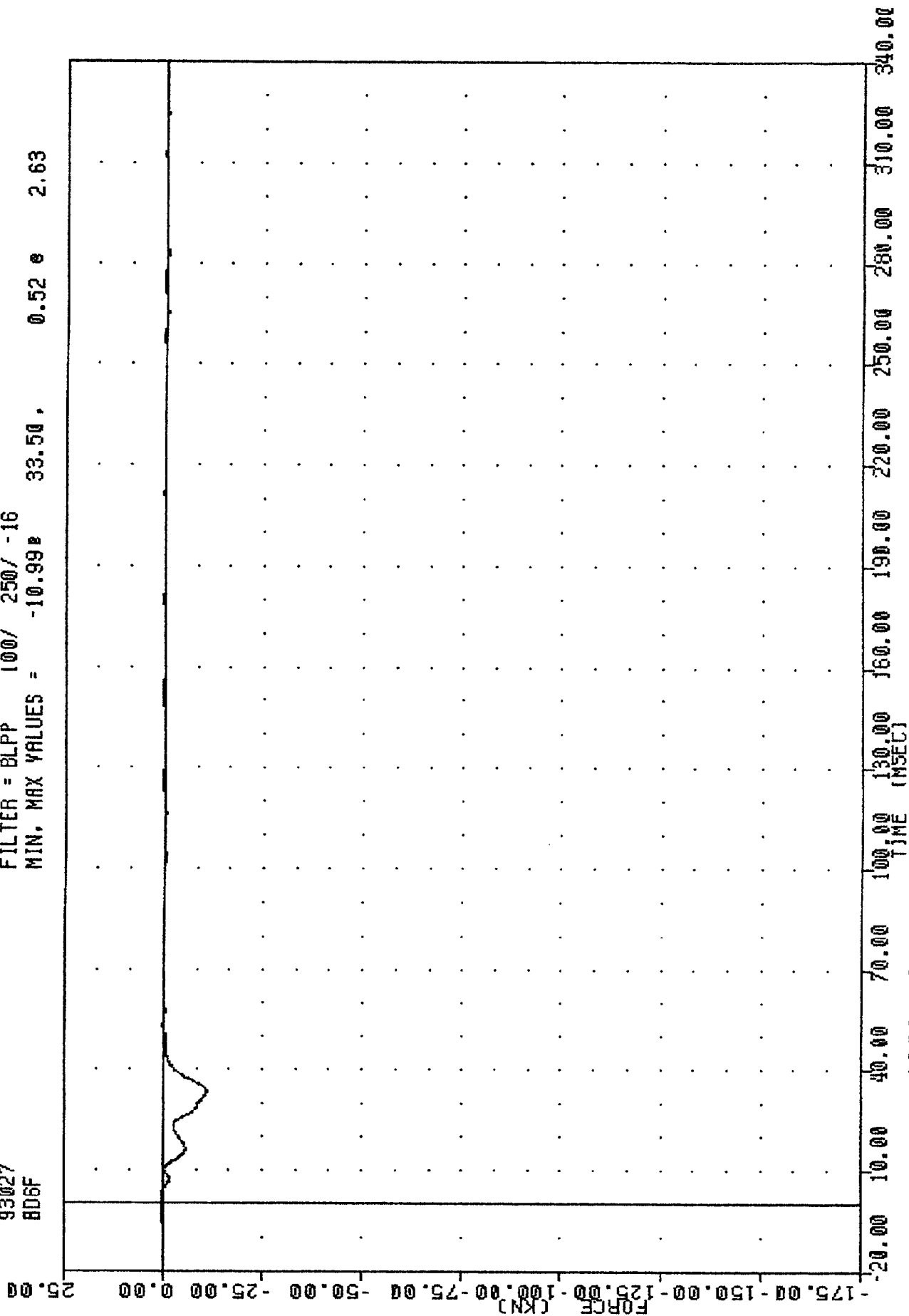
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -20.300 34.75 , 0.63 3.13



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION DOWNSIDE FORCE

TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BD6F

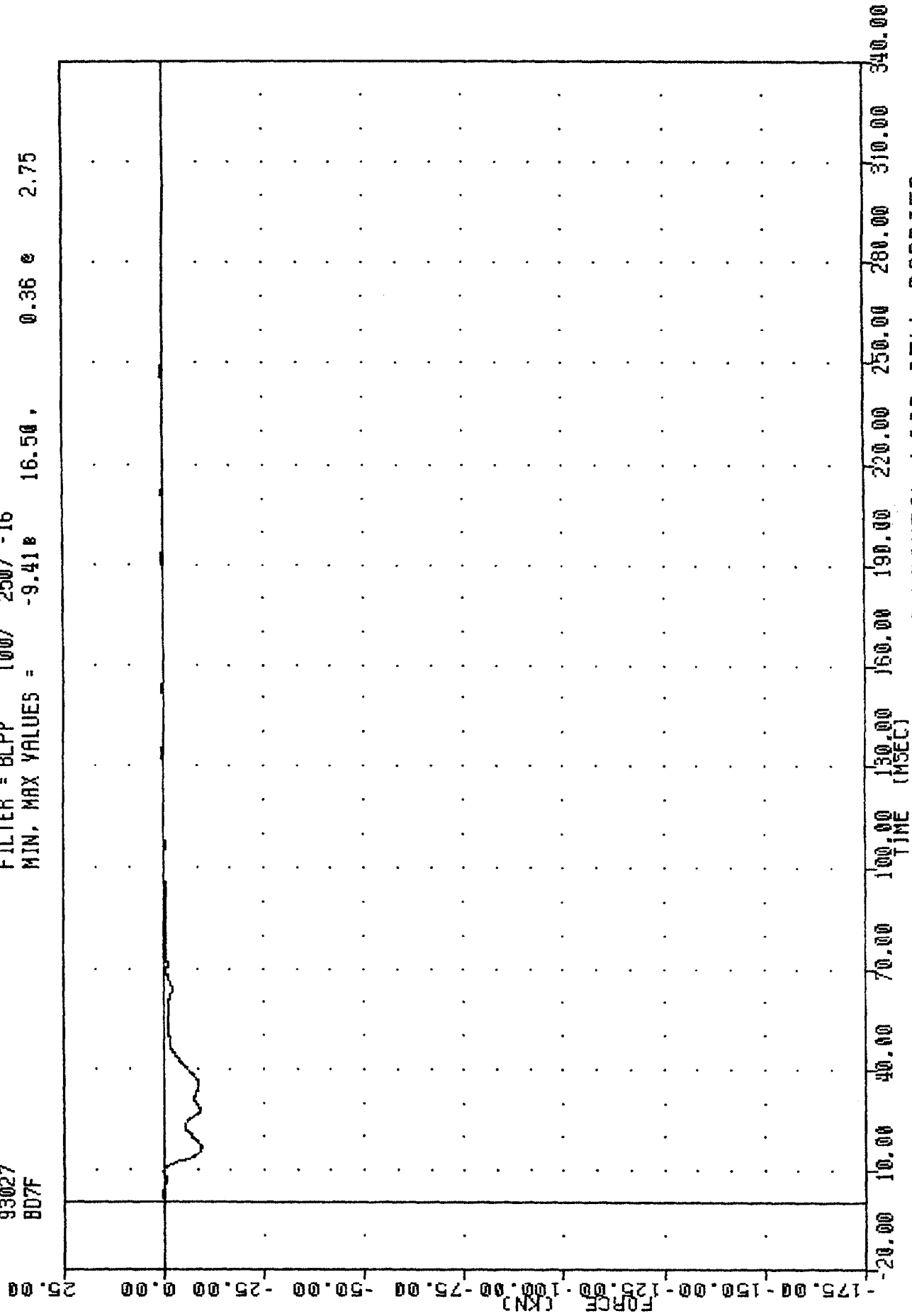
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -10.99 33.50 , 0.52 2.63



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D6 FORCE

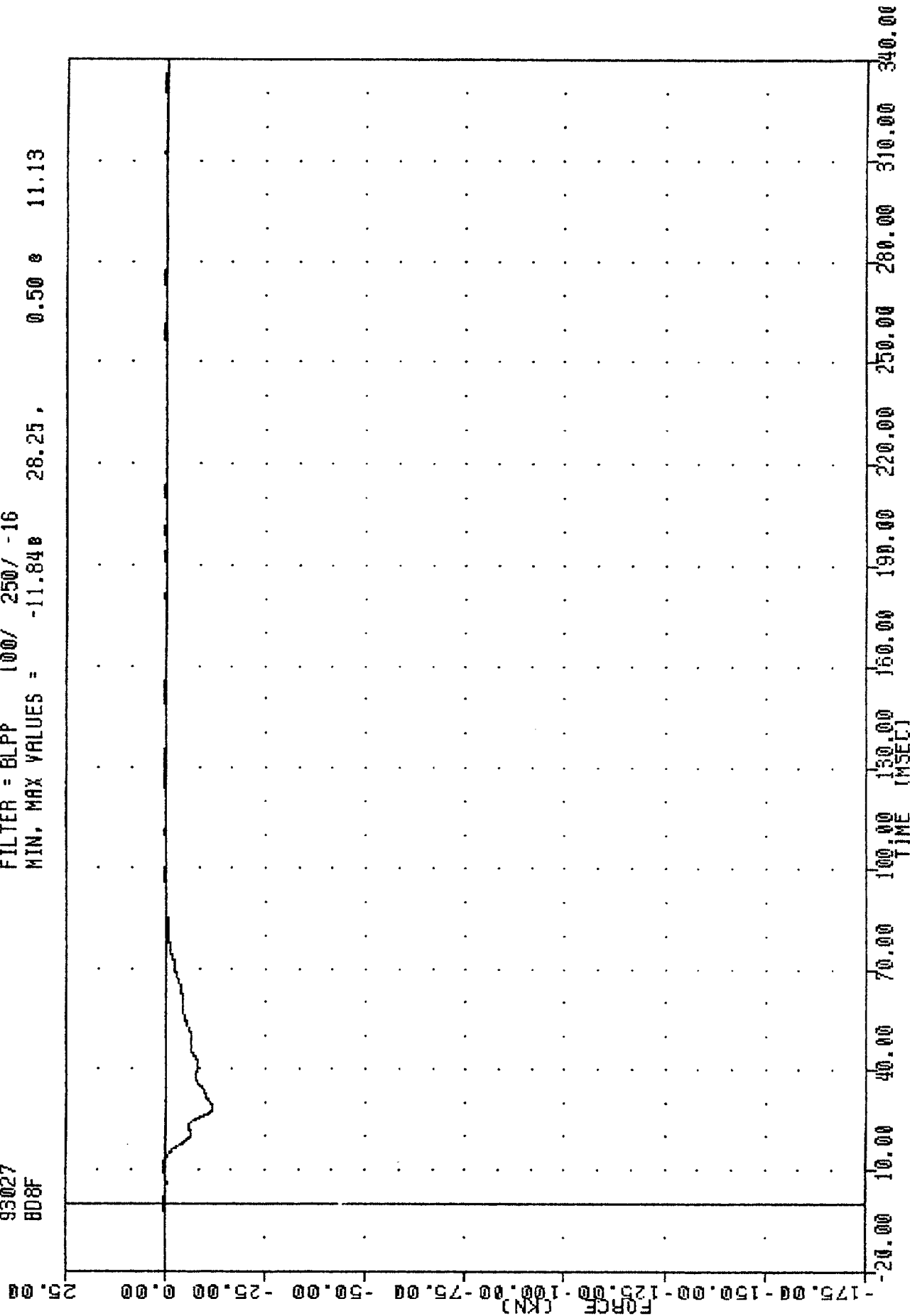
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BD7F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -9.41 16.50 0.36 2.75



TRC
NEW CAR ASSESSMENT PROGRAM
93027
BD8F

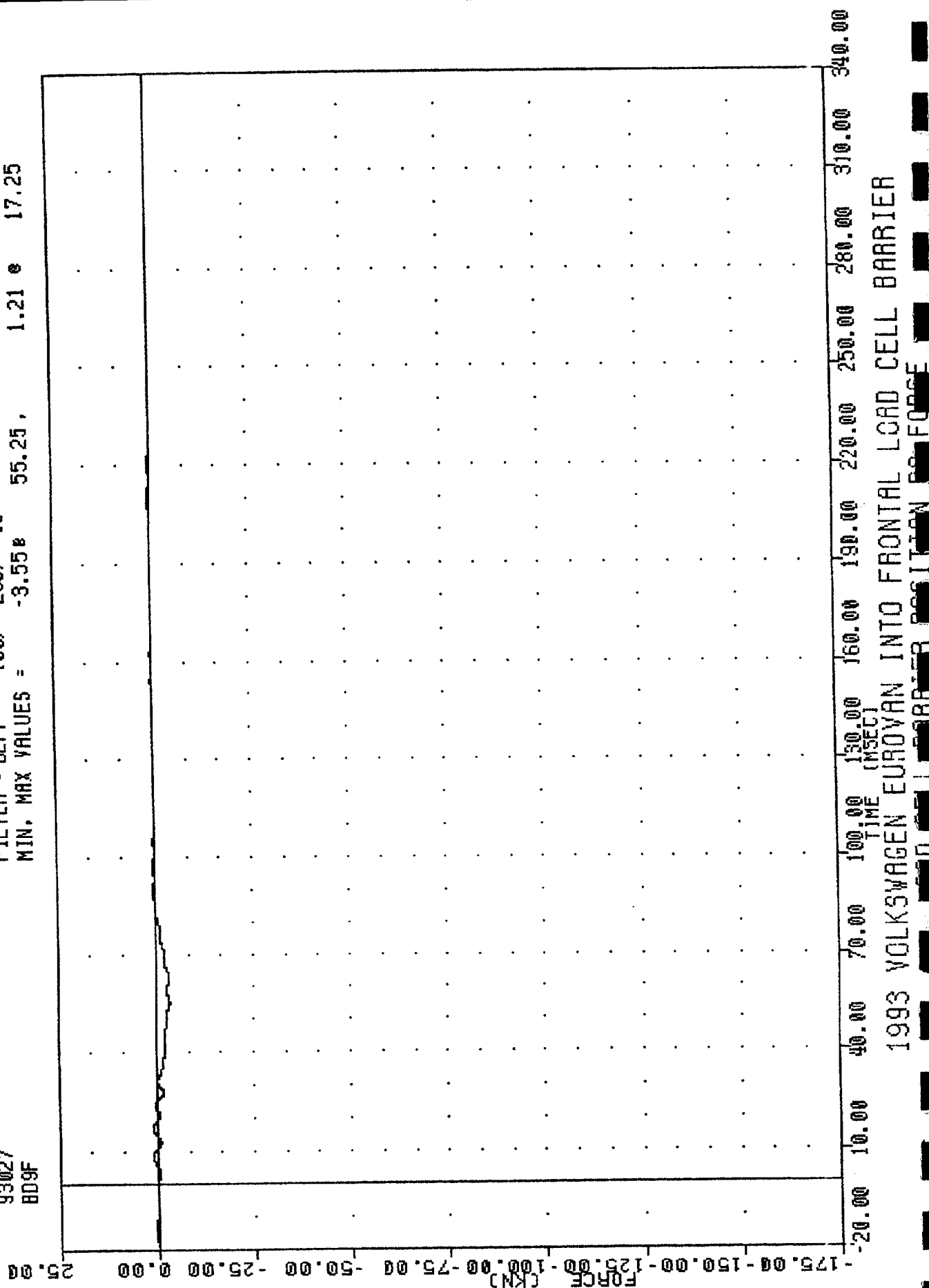
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -11.84 28.25, 0.50 e 11.13



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE

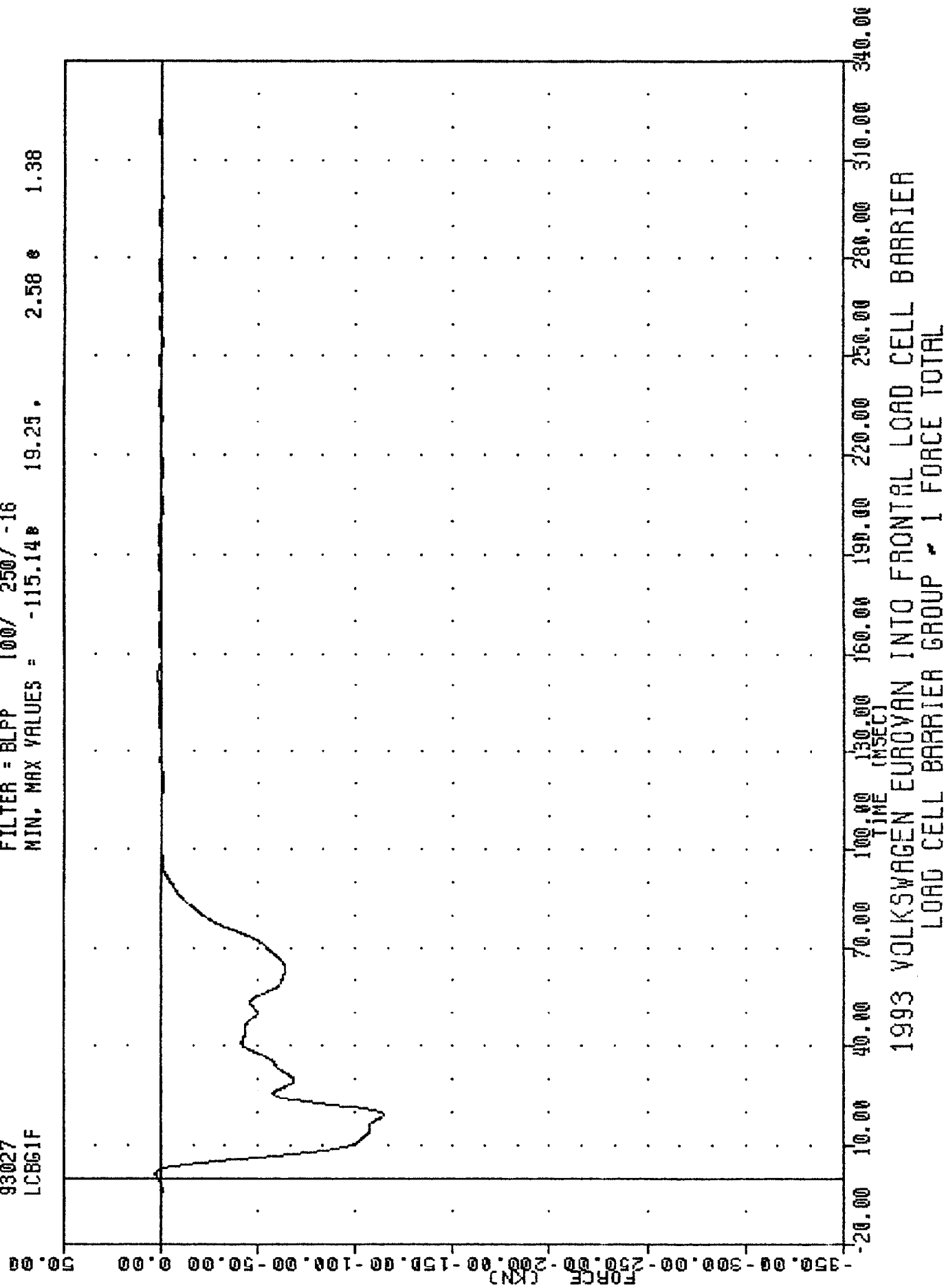
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 BD9F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = 55.25, 1.21 e 17.25



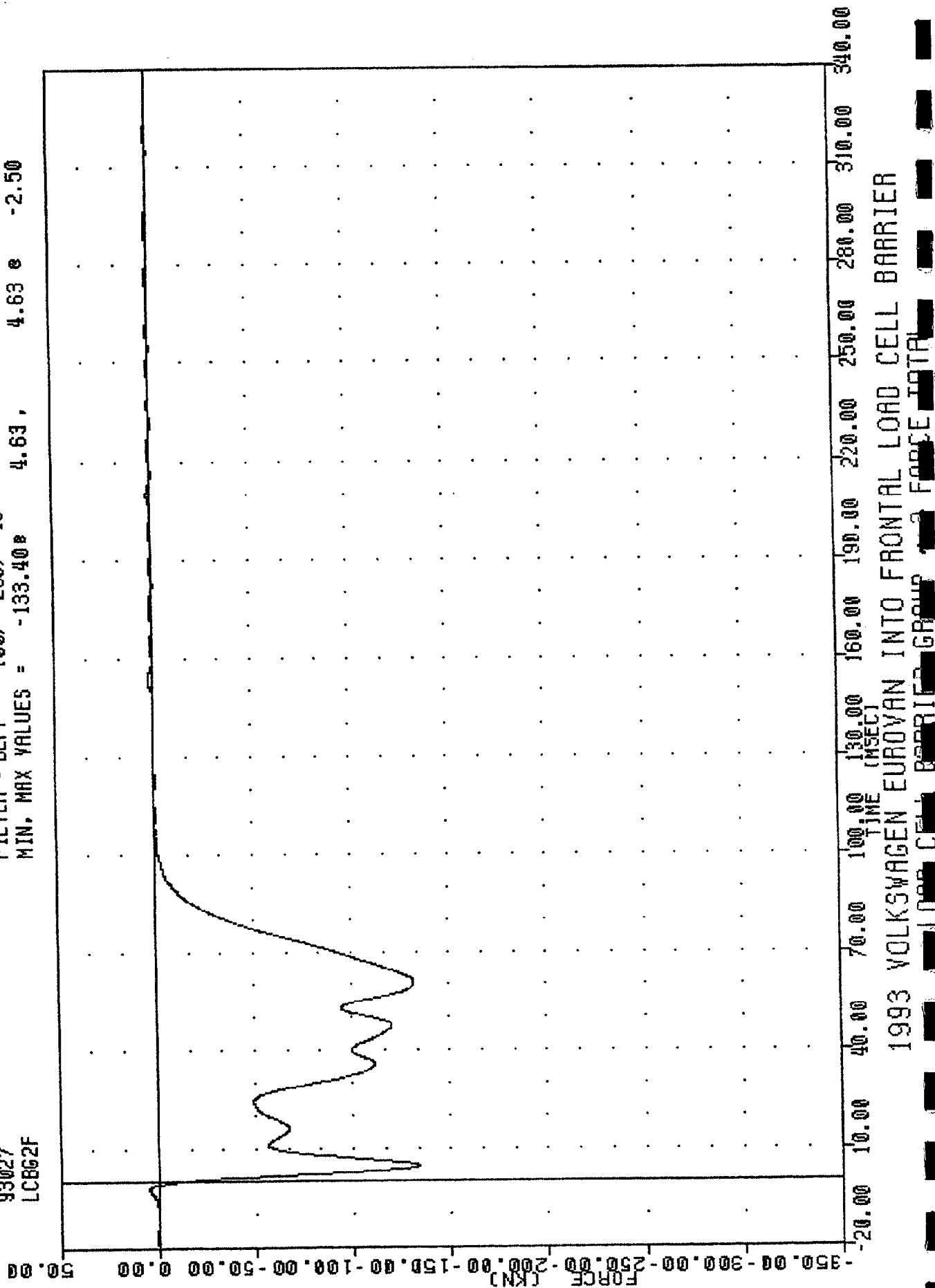
TRC
 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 LCBG1F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -115.14 19.25, 2.58 1.38



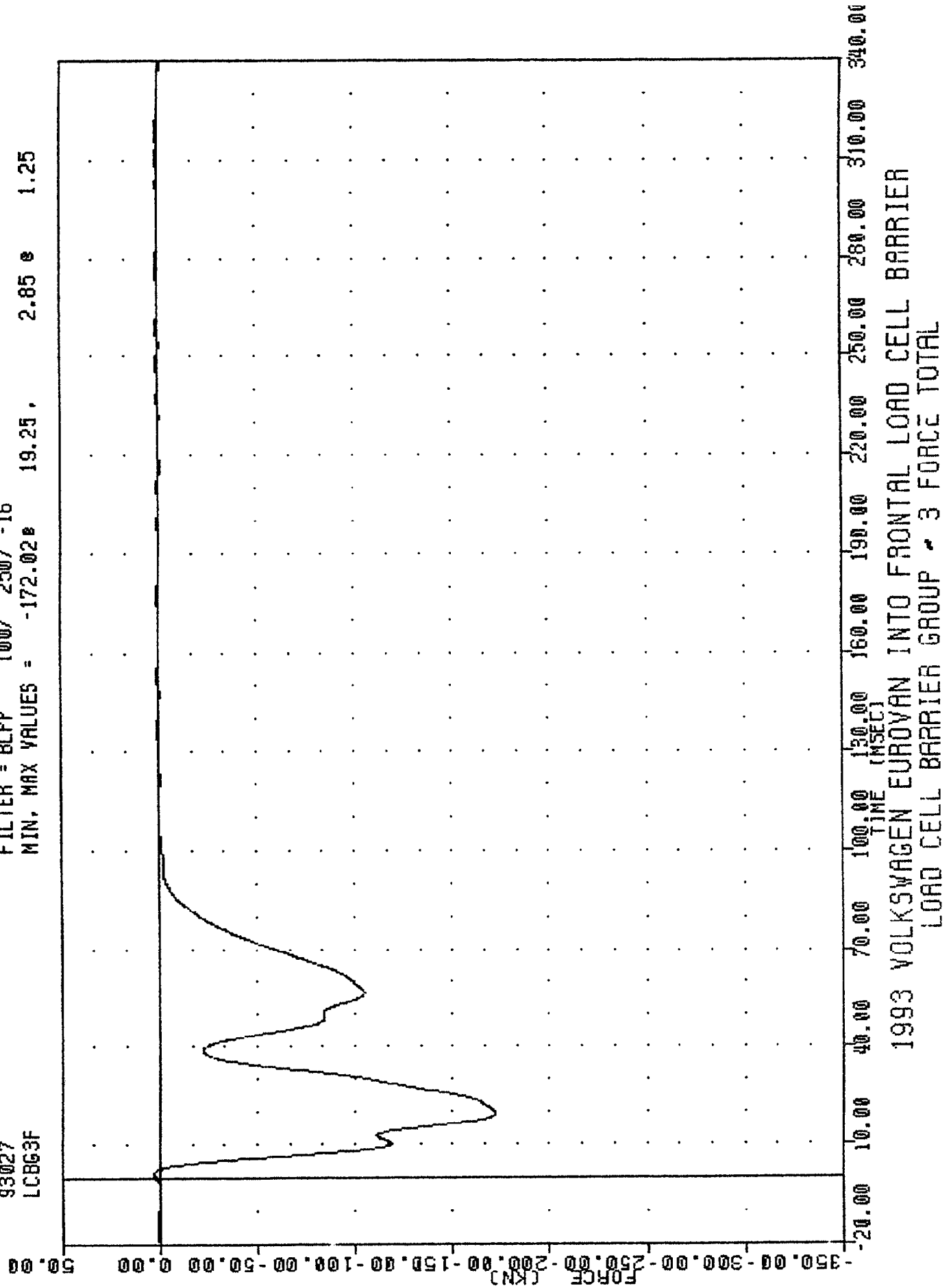
TRC 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 LCBG2F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -133.40 4.63 , 4.63 e -2.50



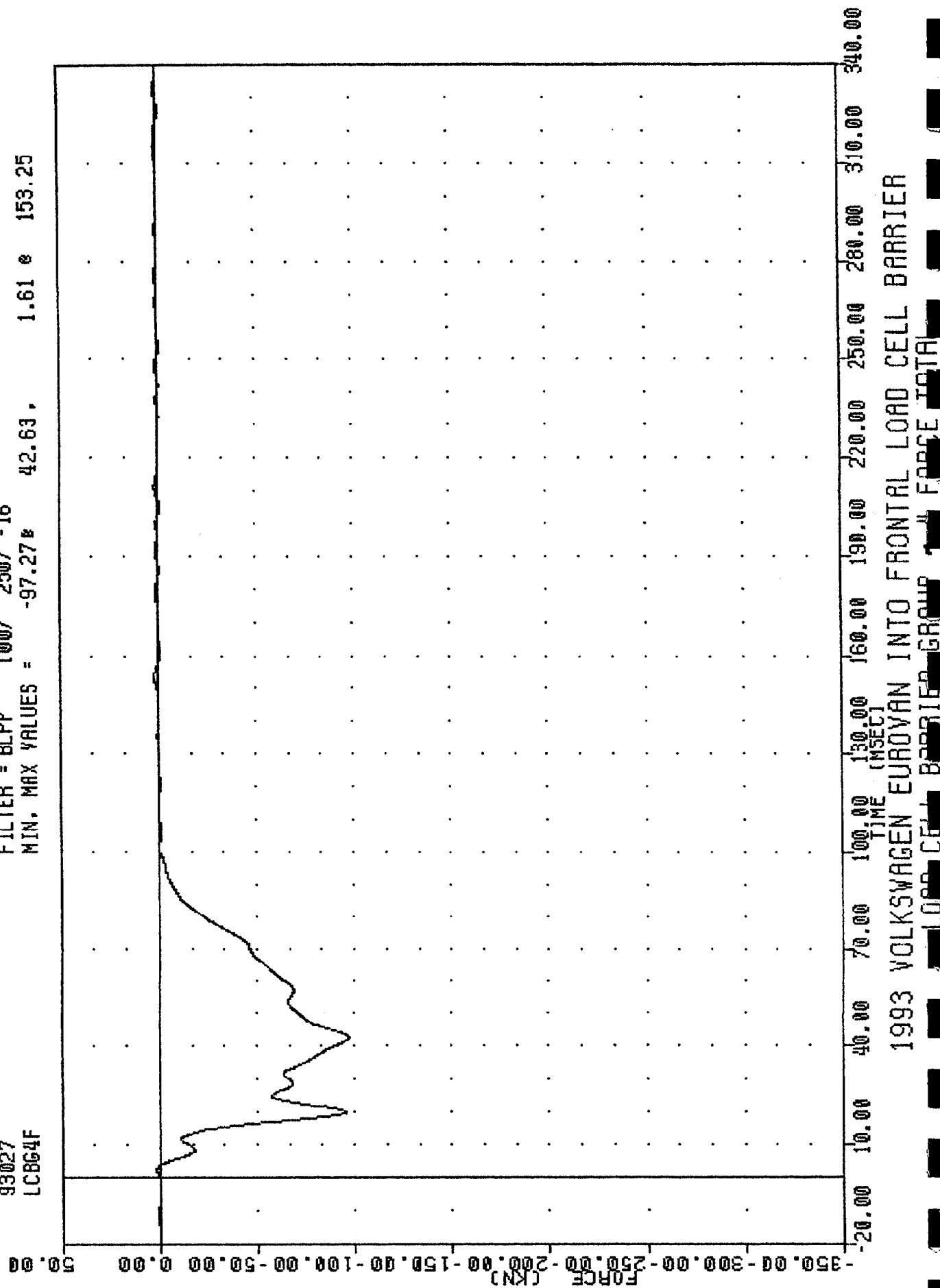
TRC
NEW CAR ASSESSMENT PROGRAM
93027
LCB63F

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -172.028 19.25, 2.85 1.25



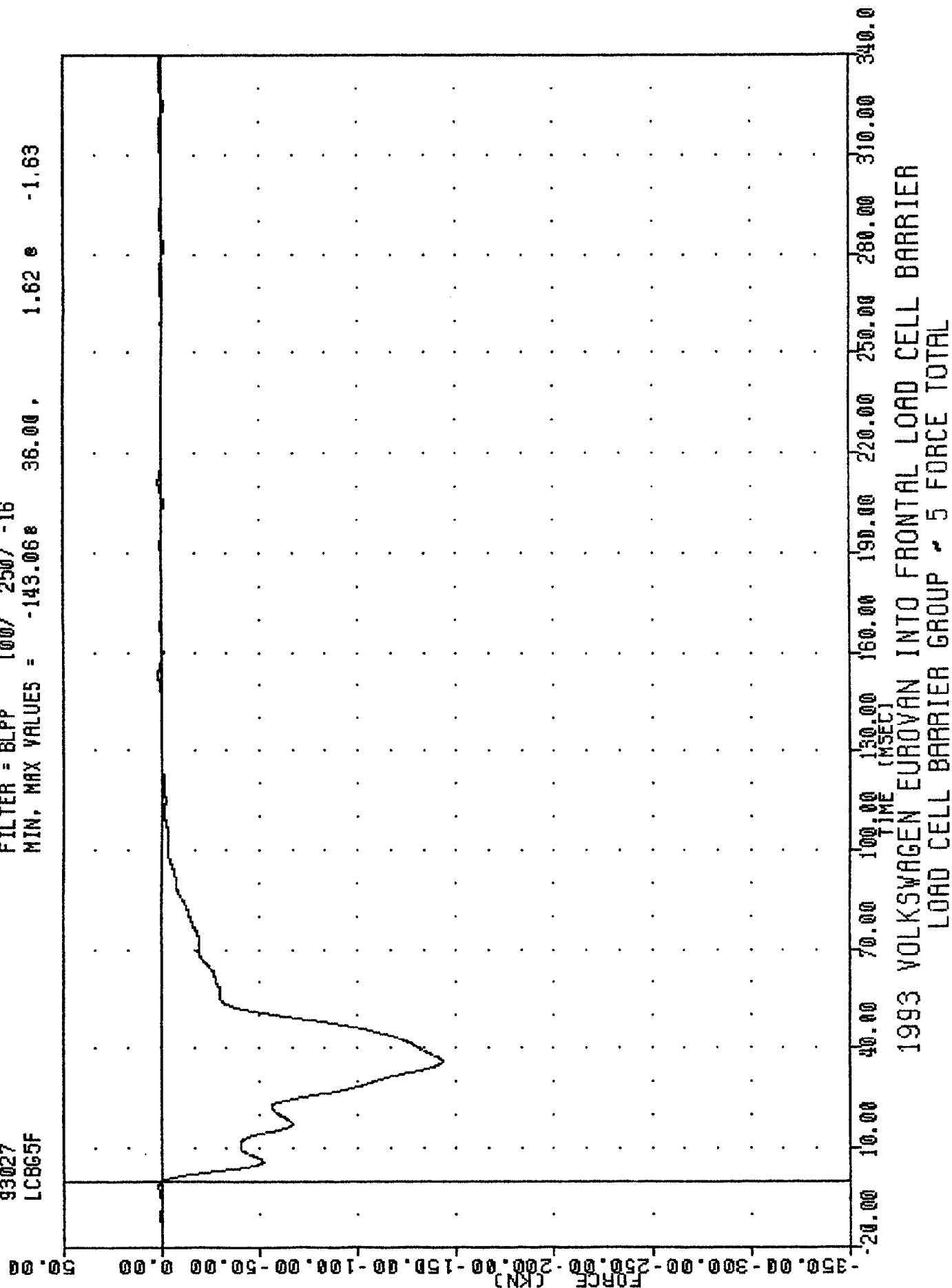
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 LCBG4F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -97.27 42.63 1.61 e 153.25



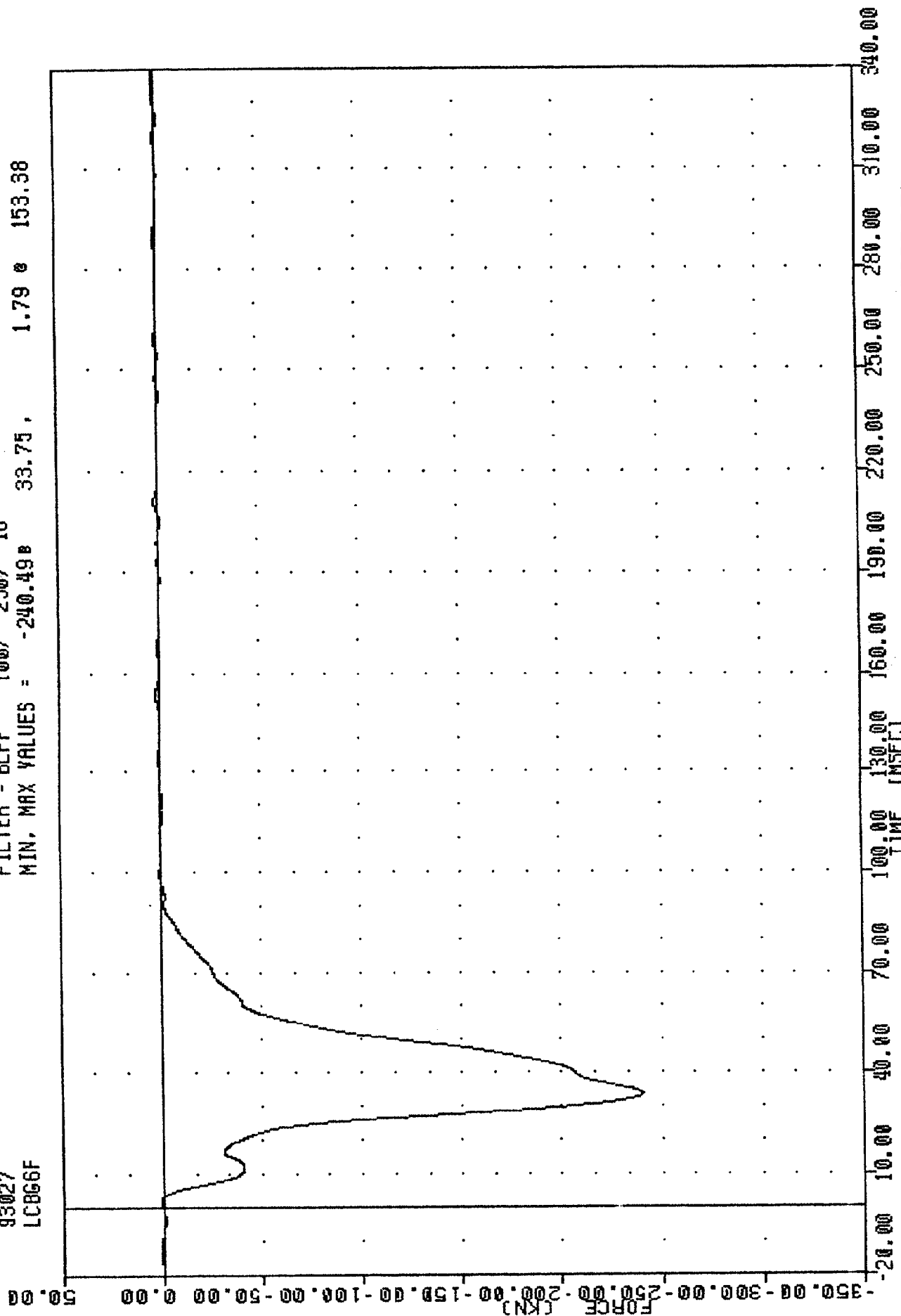
TRC
NEW CAR ASSESSMENT PROGRAM
93027
LC865F

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -143.068 36.00, 1.62 e -1.63



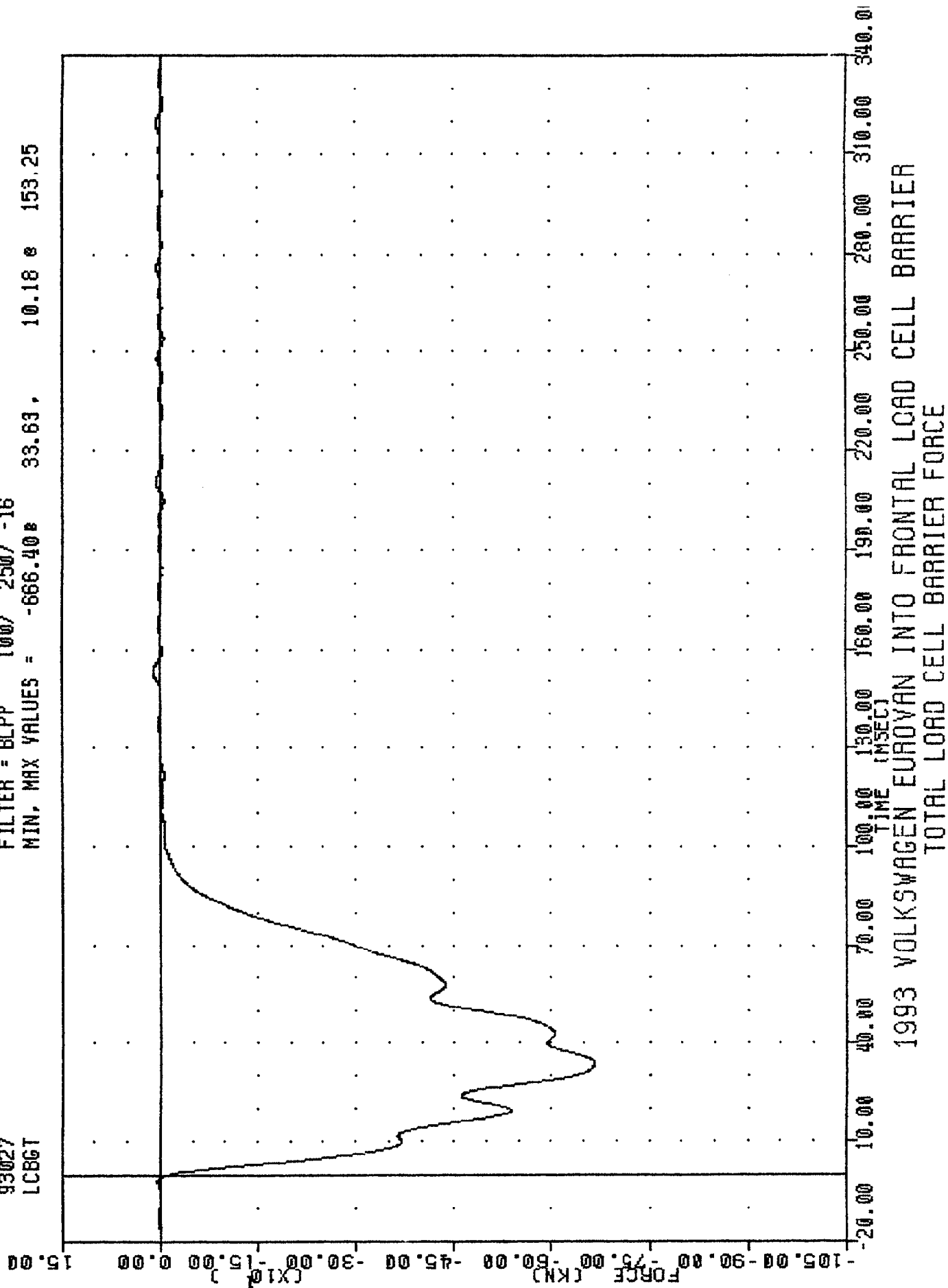
TRC , 930127
 NEW CAR ASSESSMENT PROGRAM
 93027
 LCBG6F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -240.498 33.75, 1.79 e 153.38

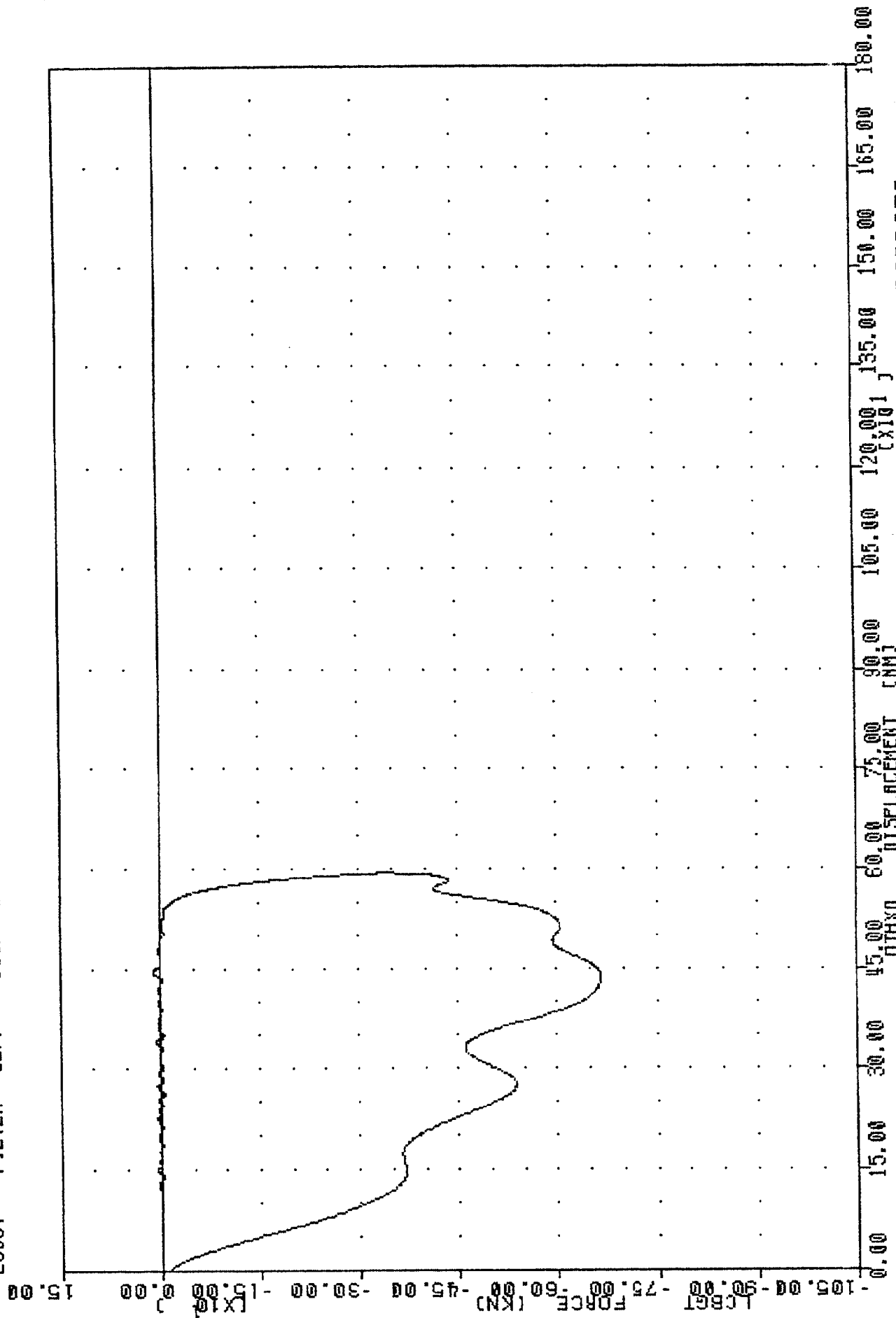


TRC
NEW CAR ASSESSMENT PROGRAM
93027
LCBGT

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -666.40 33.63, 10.18 153.25



TRC 930127 NEY CAR ASSESSMENT PROGRAM 93027 593.21 * 66.88
 OTHXD FILTER = BLPP 300/ 750/ -16 MIN. MAX = 0.00 * 153.25
 LC8GT FILTER = BLPP 100/ 250/ -16 MIN. MAX = -666.40 * 33.63 *



1993 VOLKSWAGEN EUROVAN INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT

APPENDIX C

DUMMY CERTIFICATION DATA

PRE-TEST CERTIFICATION DATA

DRIVER DUMMY S/N: 713

TRANSPORTATION RESEARCH CENTER INC.

EXTERNAL DIMENSIONS

PART 572B

12-JAN-93

TRC ED71306
SN HUMANOID 713

572B SN713 EXT. DIMENSION CAL06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
SITTING HEIGHT	904 - 909 MM	904. MM
SHOULDER PIVOT HEIGHT	553 - 569 MM	561. MM
HIP PIVOT HEIGHT	99 MM	REFERENCE
HIP PIVOT FROM BACKLINE	122 MM	REFERENCE
KNEE PIVOT FROM BACKLINE	511 - 526 MM	521. MM
REAR OF HEAD FROM BACKLINE	43 MM	REFERENCE
CHEST DEPTH	231 - 244 MM	239. MM
SHOULDER WIDTH	452 - 467 MM	455. MM
CHEST CIRCUMFERENCE OVER NIPPLES	935 - 1016 MM	958. MM
WAIST CIRCUMFERENCE AT MIN. GIRTH	798 - 828 MM	818. MM
HIP WIDTH	356 - 391 MM	378. MM
KNEE PIVOT FROM FLOOR	490 - 506 MM	498. MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Ford

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

PART 572B

12-JAN-93

TRC

HD71306

572B SN 713 HEAD DROP CAL 06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
PEAK RESULTANT ACCELERATION	210 - 260 G	231.97 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MS	1.27 MS
PEAK LATERAL ACCELERATION	10 G MAX	-1.88 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

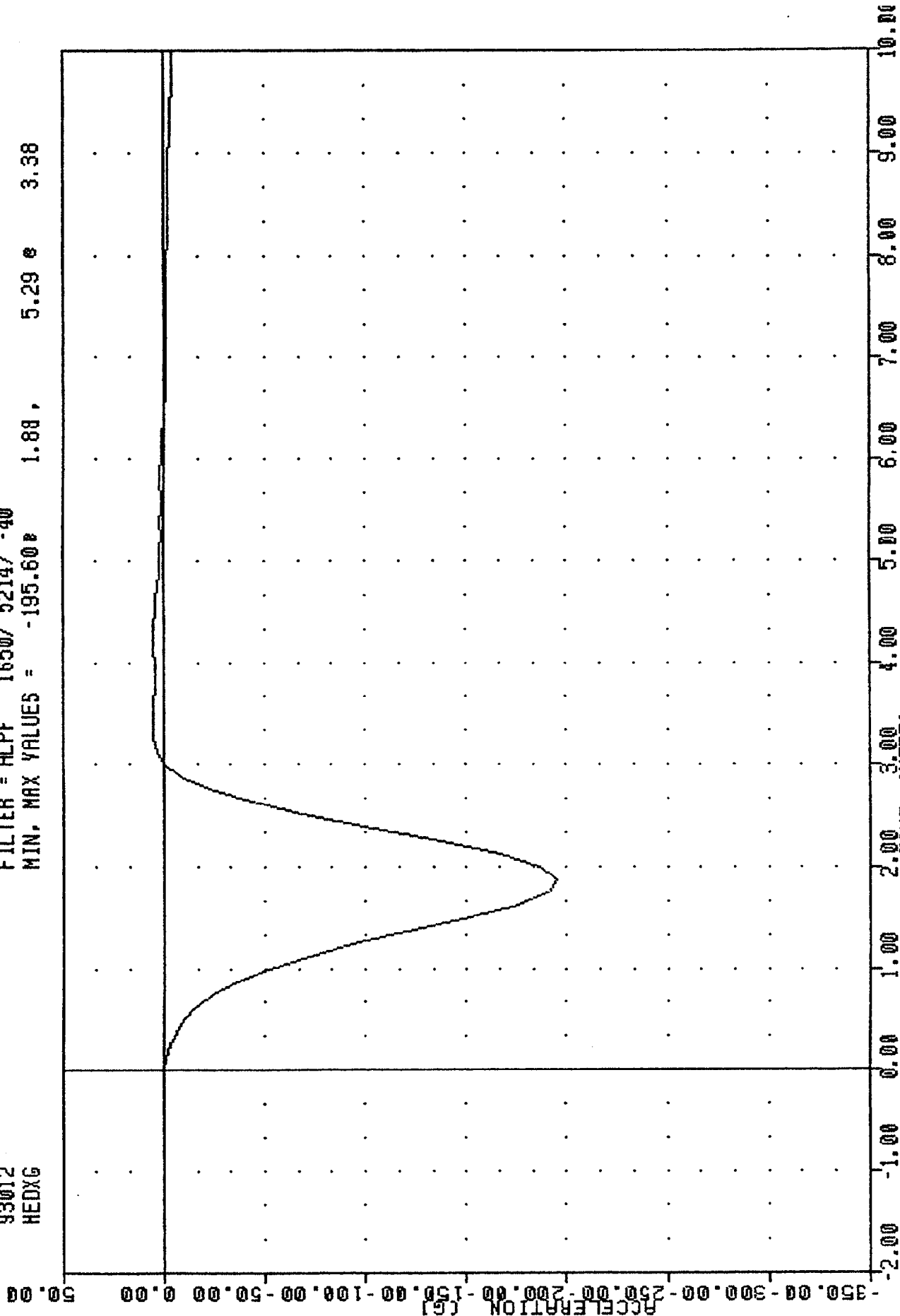
DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Lita Fount

TRC , HD71306
 572B SN 713 HEAD DROP CAL 06
 93012
 HEDXG

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -195.60e 1.88 , 5.29 e 3.38

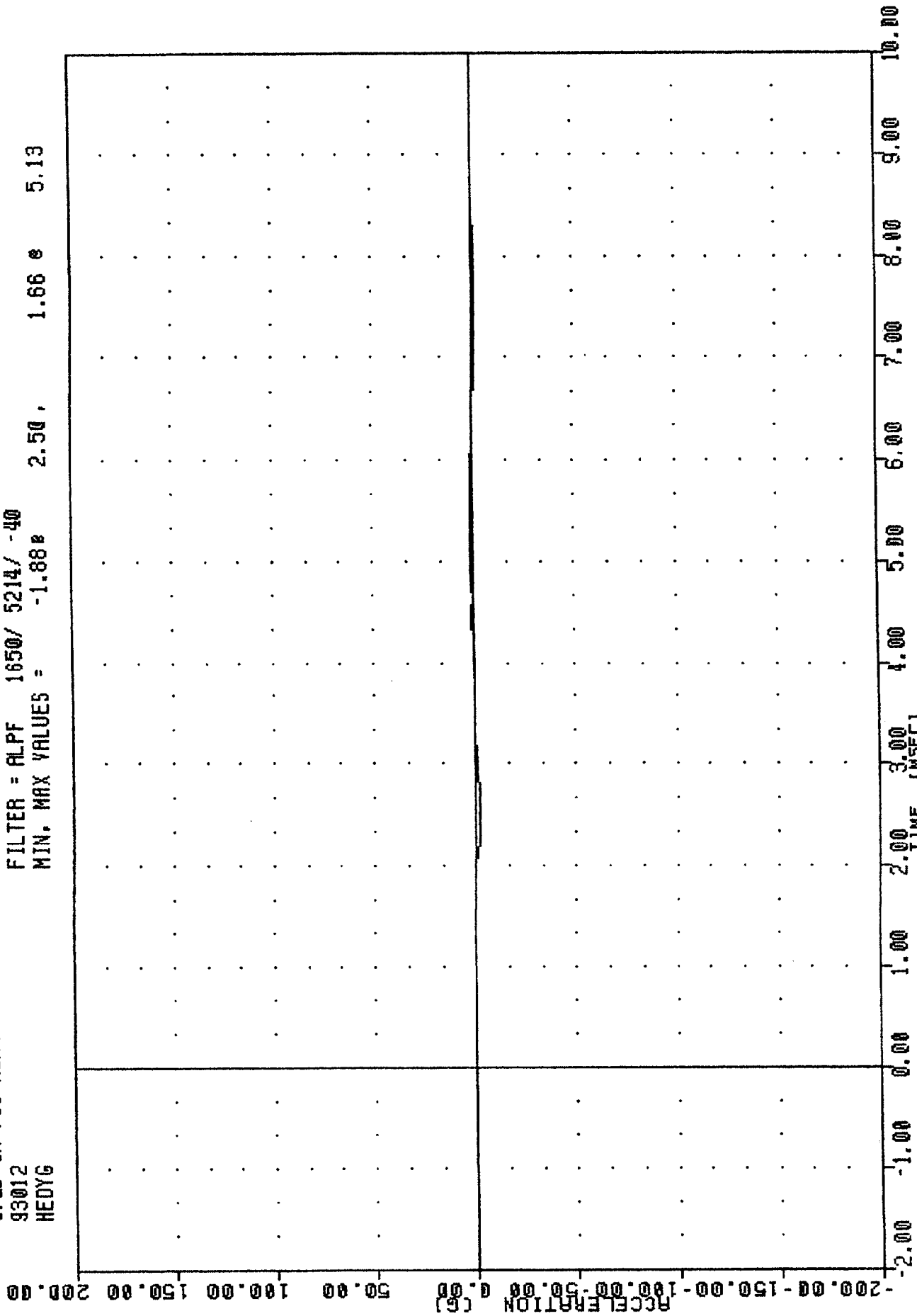


PART 572-B HYBRID II HEAD DROP CALIBRATION

TRC
5728 SN 713 HEAD DROP CAL 06
93012
HEDYG

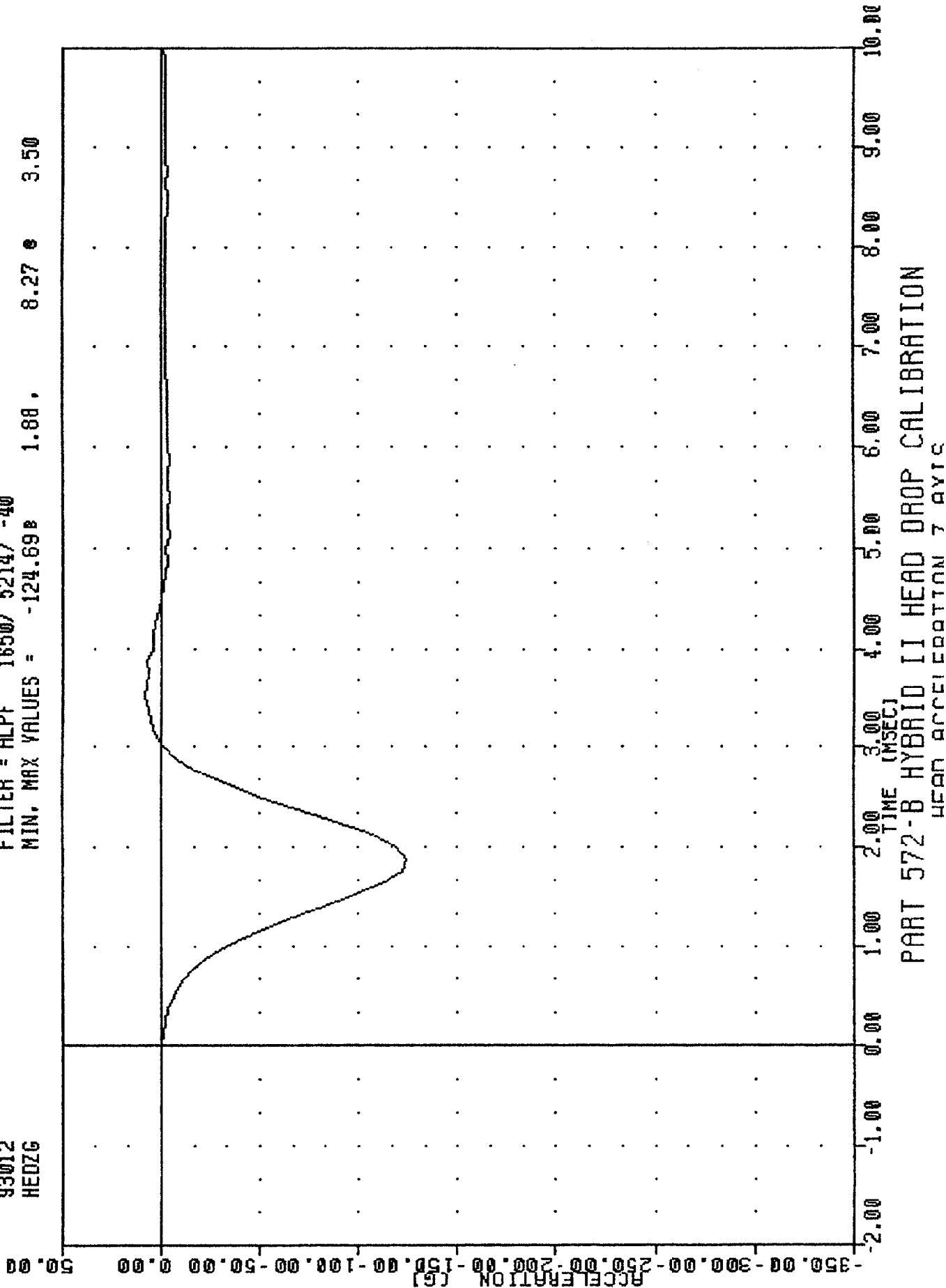
HD71306

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -1.88 2.50 1.66 5.13



TRC , HD71306
 572B SN 713 HEAD DROP CAL 06
 93012
 HEDZG

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -124.69B 1.88 , 8.27 e 3.50

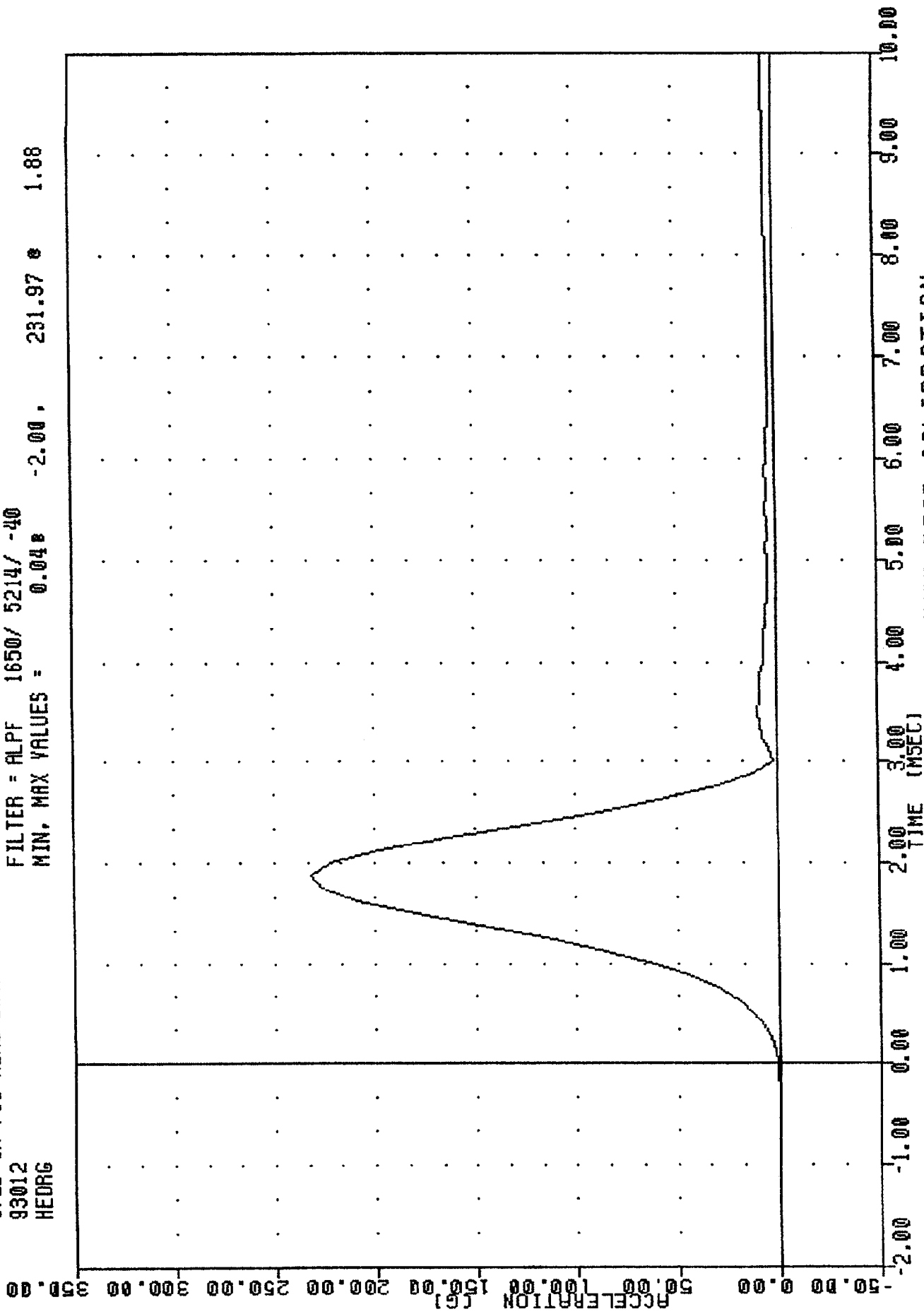


PART 572-B HYBRID II HEAD DROP CALIBRATION
 HEAD ACCELERATION 7 AXIS

TRC
5728 SN 713 HEAD DROP CRL 06
93012
HEADRG

, HD71306

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.048 -2.00 . 231.97 1.88



TRANSPORTATION RESEARCH CENTER INC.

NECK PENDULUM TEST

PART 572B

12-JAN-93

TRC

HN71306

572B SN 713 HEAD/NECK CAL 06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
PENDULUM VELOCITY	6.55 TO 7.77 M/SEC	7.31 M/SEC
PENDULUM DECELERATION:		
T1 - T2 TIME (5 - 20 G)	3 MS MAX	2.44 MS
T2 - T3 TIME (20 - 20 G)	25 - 30 MS	28.24 MS
T3 - T4 TIME (20 - 5 G)	10 MS MAX	3.73 MS
AVG. G LEVEL T2 - T3	20 - 24 G	23.72 G
MAXIMUM ROTATION ANGLE	63 - 73 DEG	67.56 DEG
PEAK HEAD RESULTANT ACCEL	26 G MAX	23.31 G

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ROTATION ANGLE (DEGREES)	TIME (MS)	CHORDAL DISP. (MM)
0	-2.0 - +2.0	-12.7 - +12.7
30	25.6 - 34.4	53.3 - 78.7
60	40.3 - 51.7	109.2 - 134.6
MAX	53.2 - 66.8	127.0 - 152.4
60	67.0 - 83.0	109.2 - 134.6
30	85.4 - 104.6	53.3 - 78.7
0	101.0 - 123.0	-12.7 - +12.7

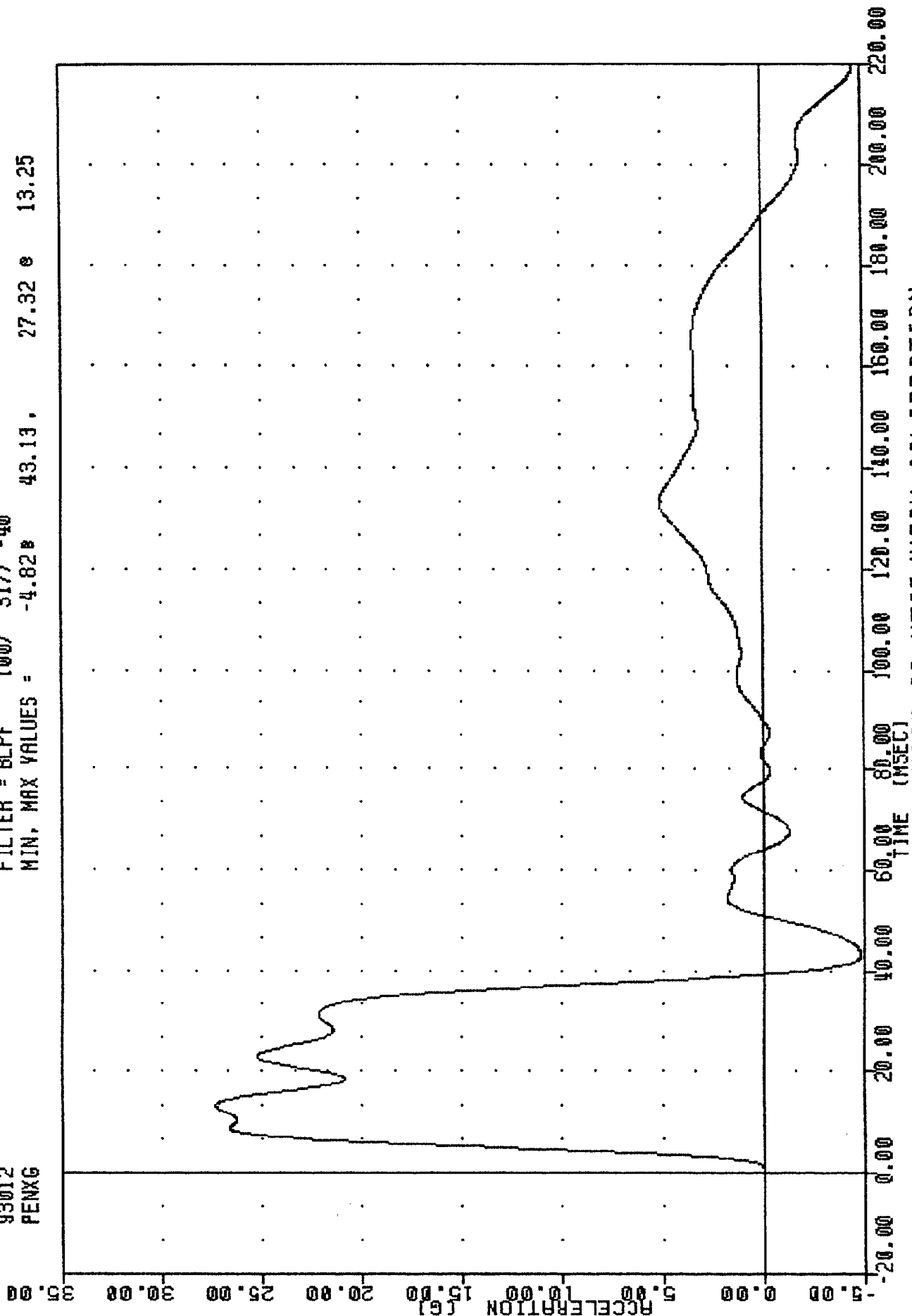
SND: 151.13 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Pete Fort*

TRC , HN71306
 572B SN 713 HEAD/NECK CAL 06
 93012
 PENXG

FILTER = BLPF 100/ 317/ -40
 MIN, MAX VALUES = -4.82 27.32 43.13 13.25

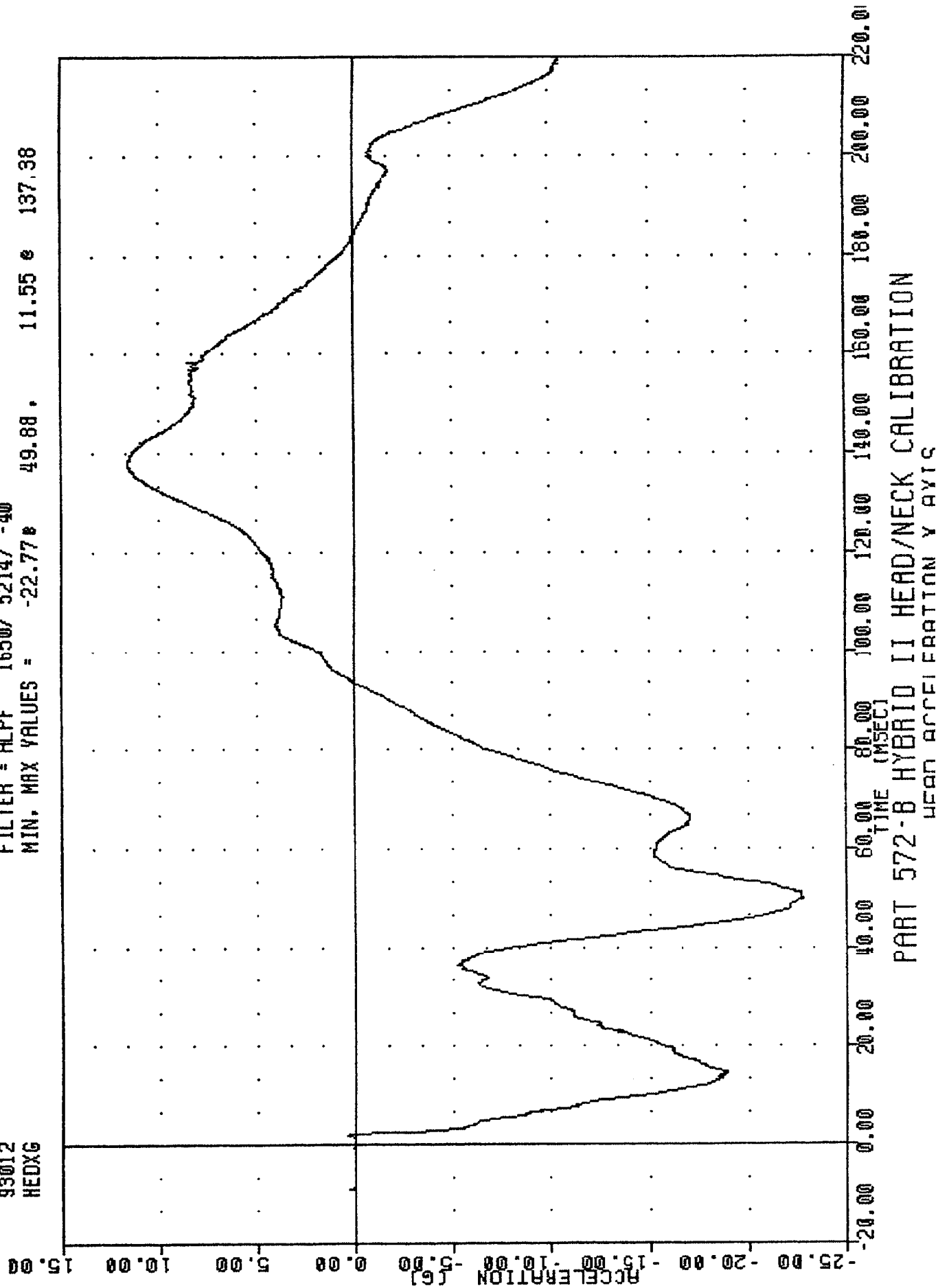


TRC
572B SN 713 HEAD/NECK CAL 06
93012
HEDXG

, HN71306

FILTER = ALPF 1650/ 5214/ -40

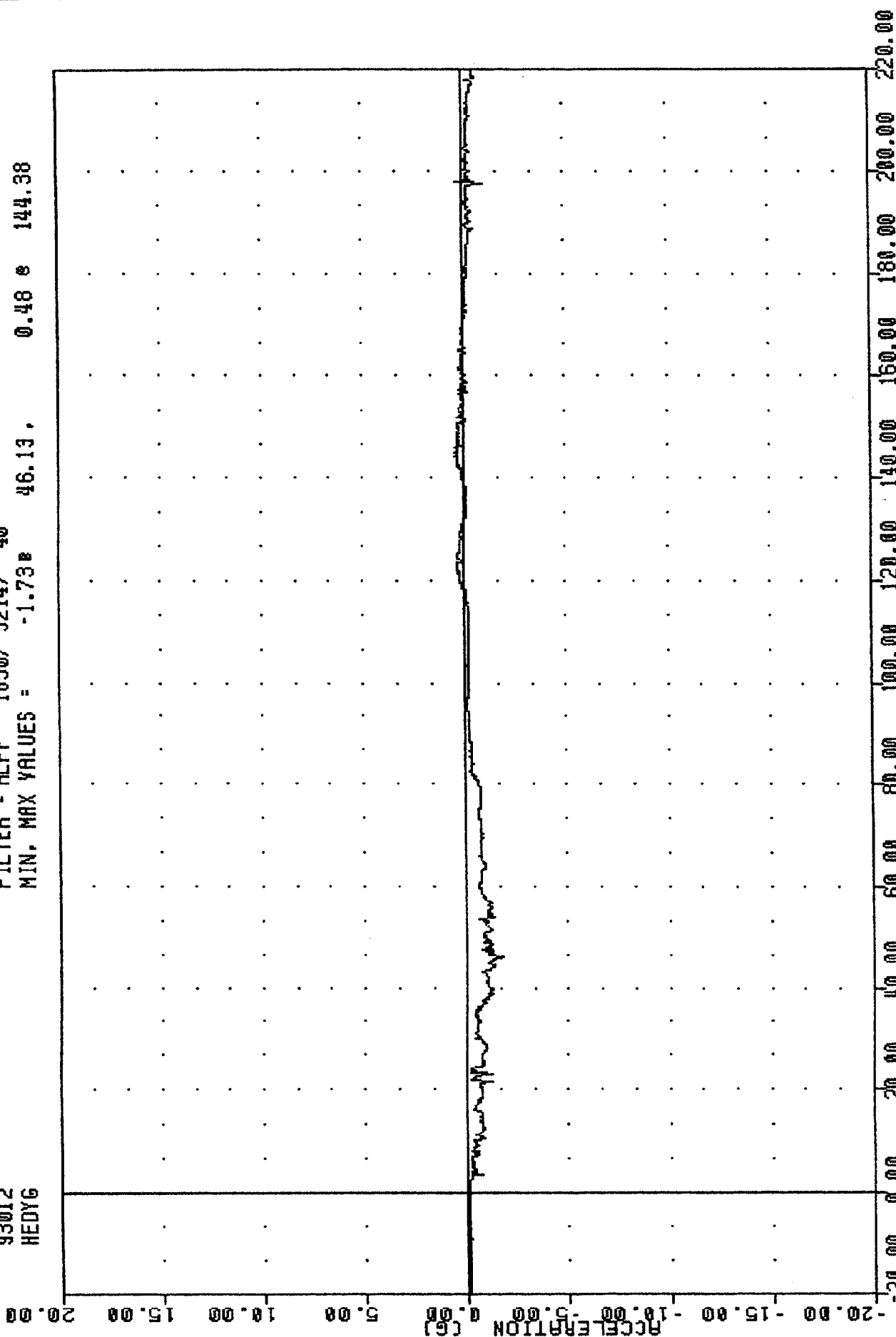
MIN, MAX VALUES = -22.77 49.88, 11.55 137.38



PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION Y AXIS

TRC , HN71306
 572B SN 713 HEAD/NECK CAL 06
 93012
 HEDYG

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -1.73 46.13, 0.48 144.38

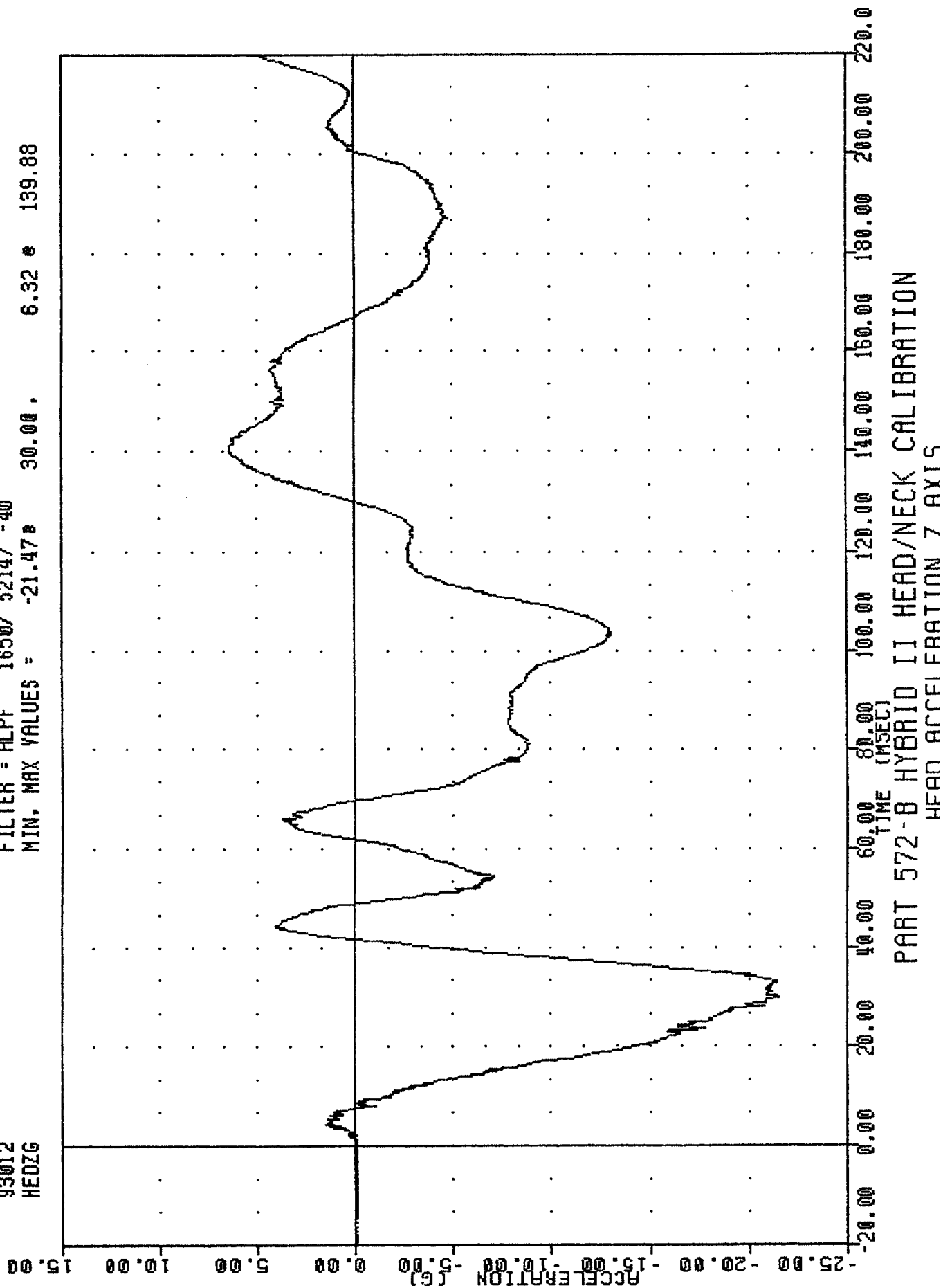


TRC
572B SN 713 HEAD/NECK CAL 06
93012
HEADZG

HN71306

FILTER = ALPF 1650/ 5214/ -40

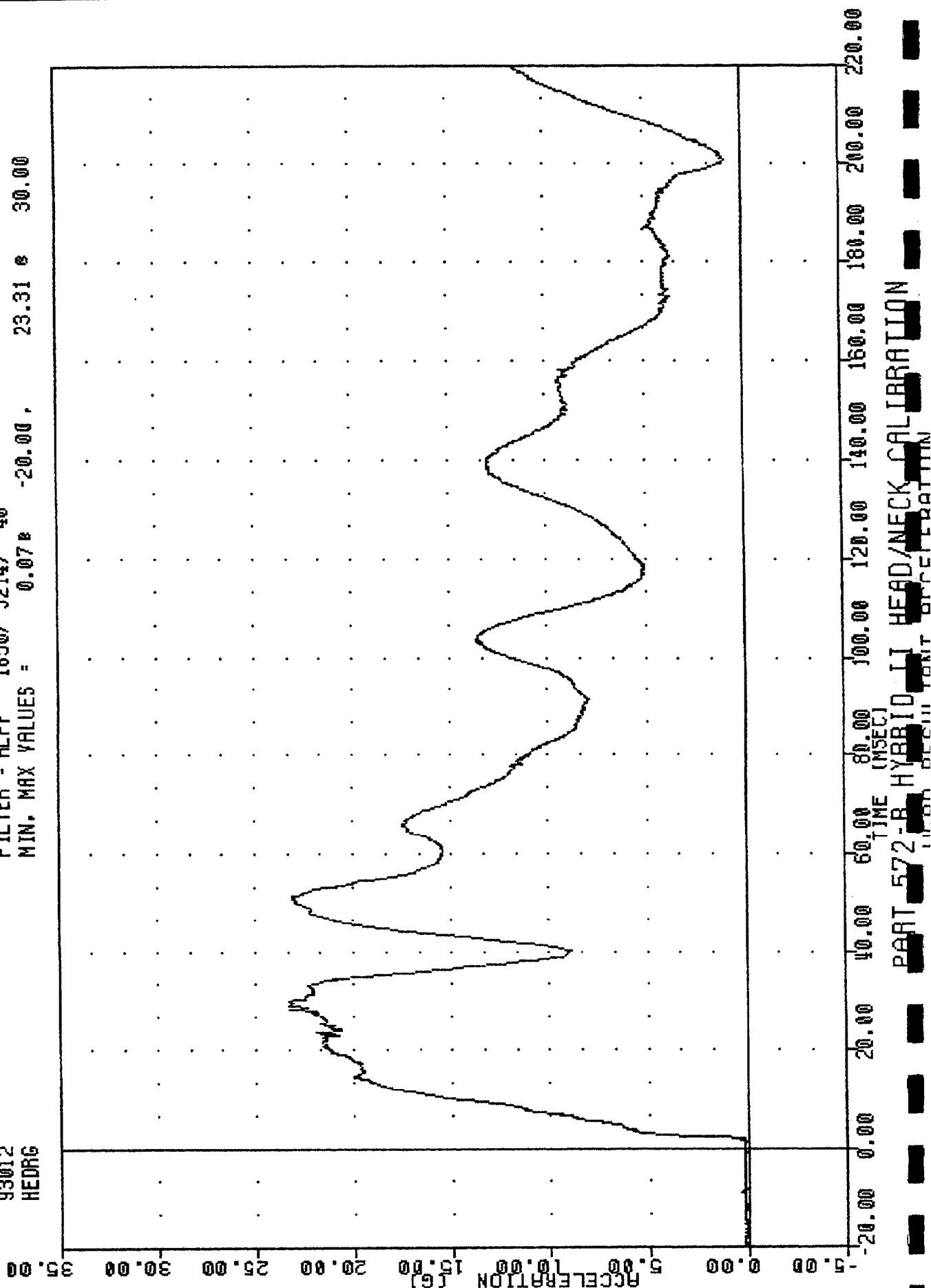
MIN. MAX VALUES = -21.47 30.00, 6.32 139.88



PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION 7 AXIS

TRC , HN71306
 5728 SN 713 HEAD/NECK CAL 06
 93012
 HEDRG

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 0.07 23.31 30.00
 -20.00 ,

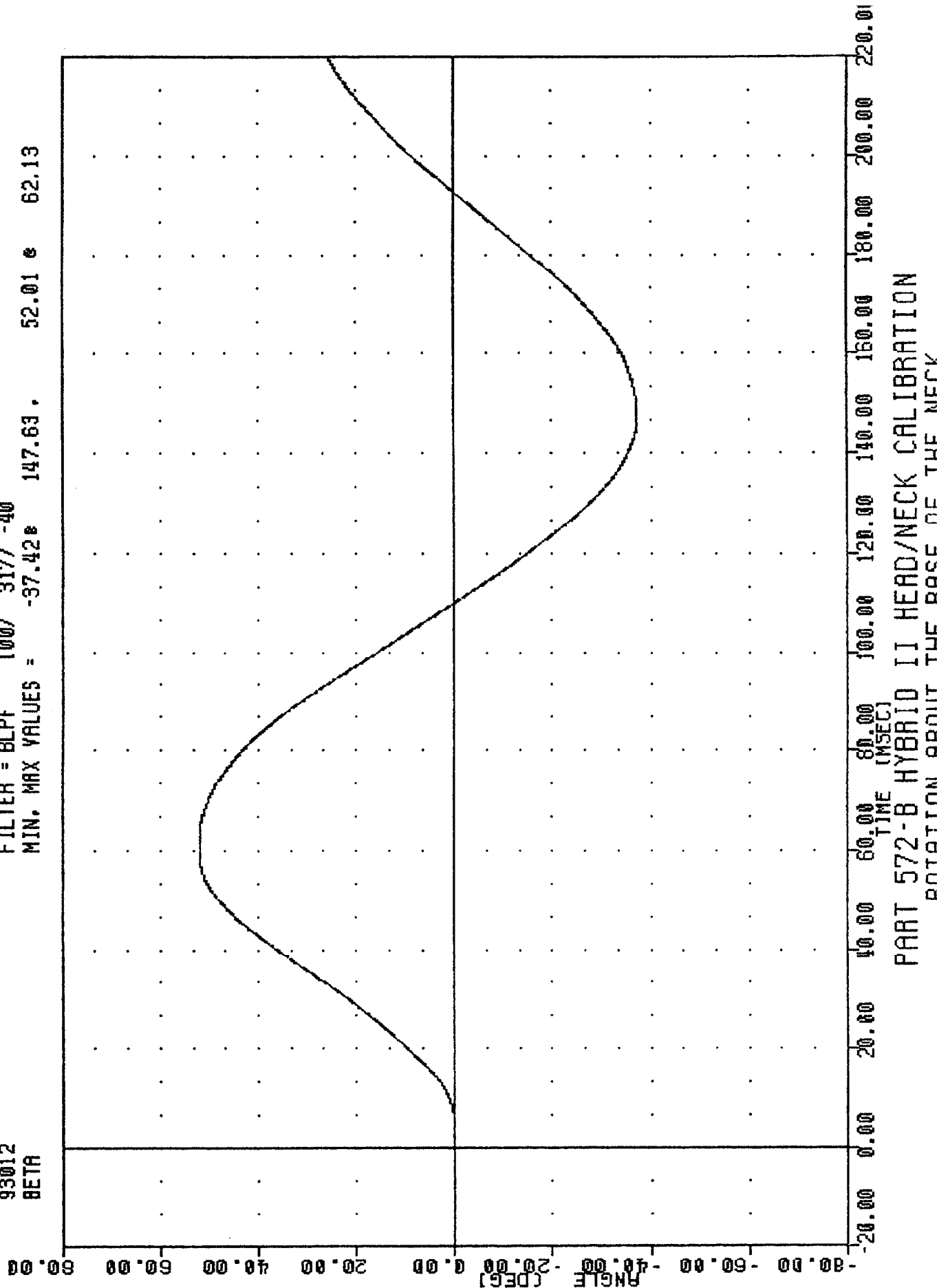


TRC
572B SN 713 HEAD/NECK CAL 06
93012
BETA

, HW71306

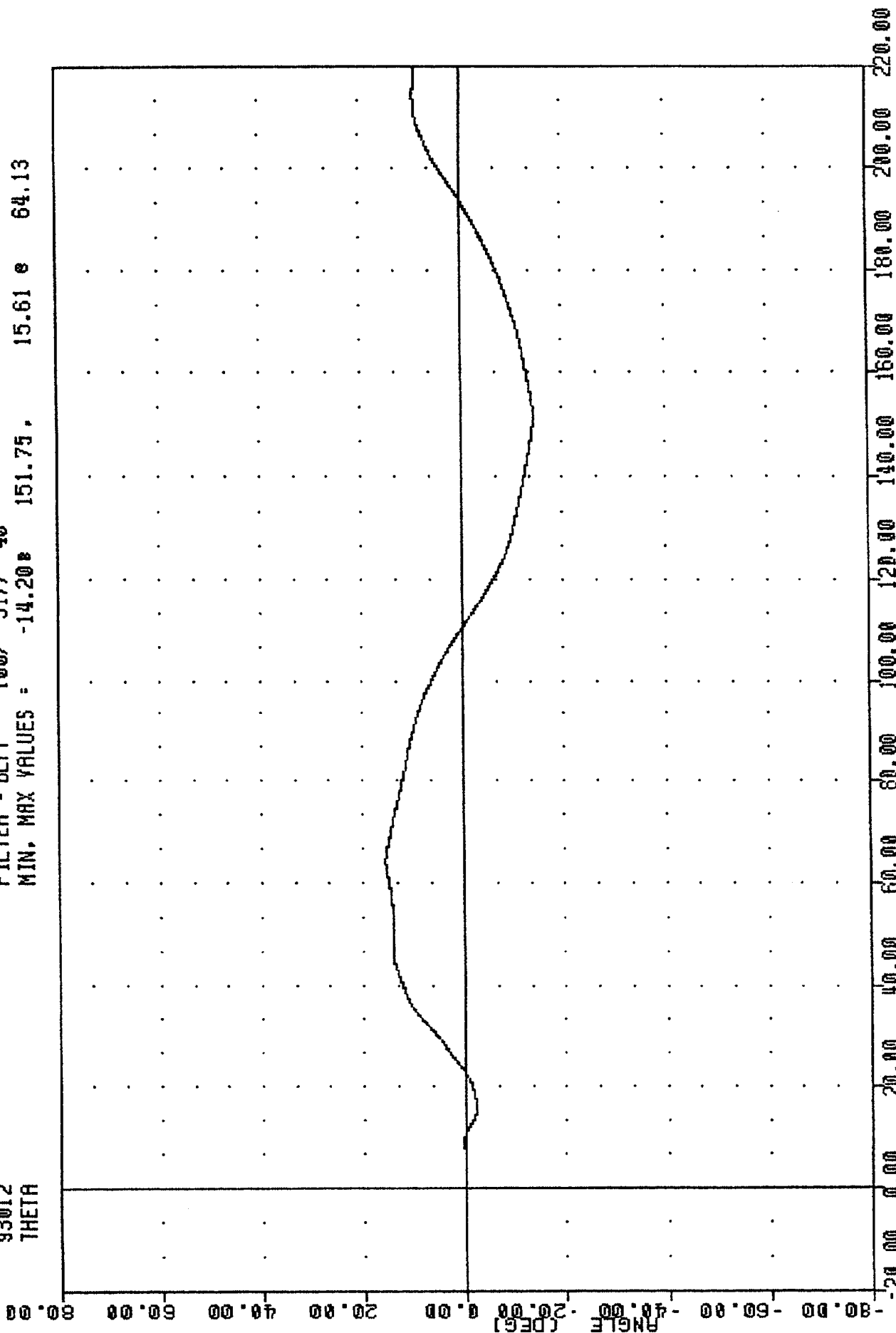
FILTER = BLPF 100/ 317/ -40

MIN. MAX VALUES = -37.42° 147.63, 52.01 & 62.13



TRC
572B SN 713 HEAD/NECK CAL 06
93012
THETA

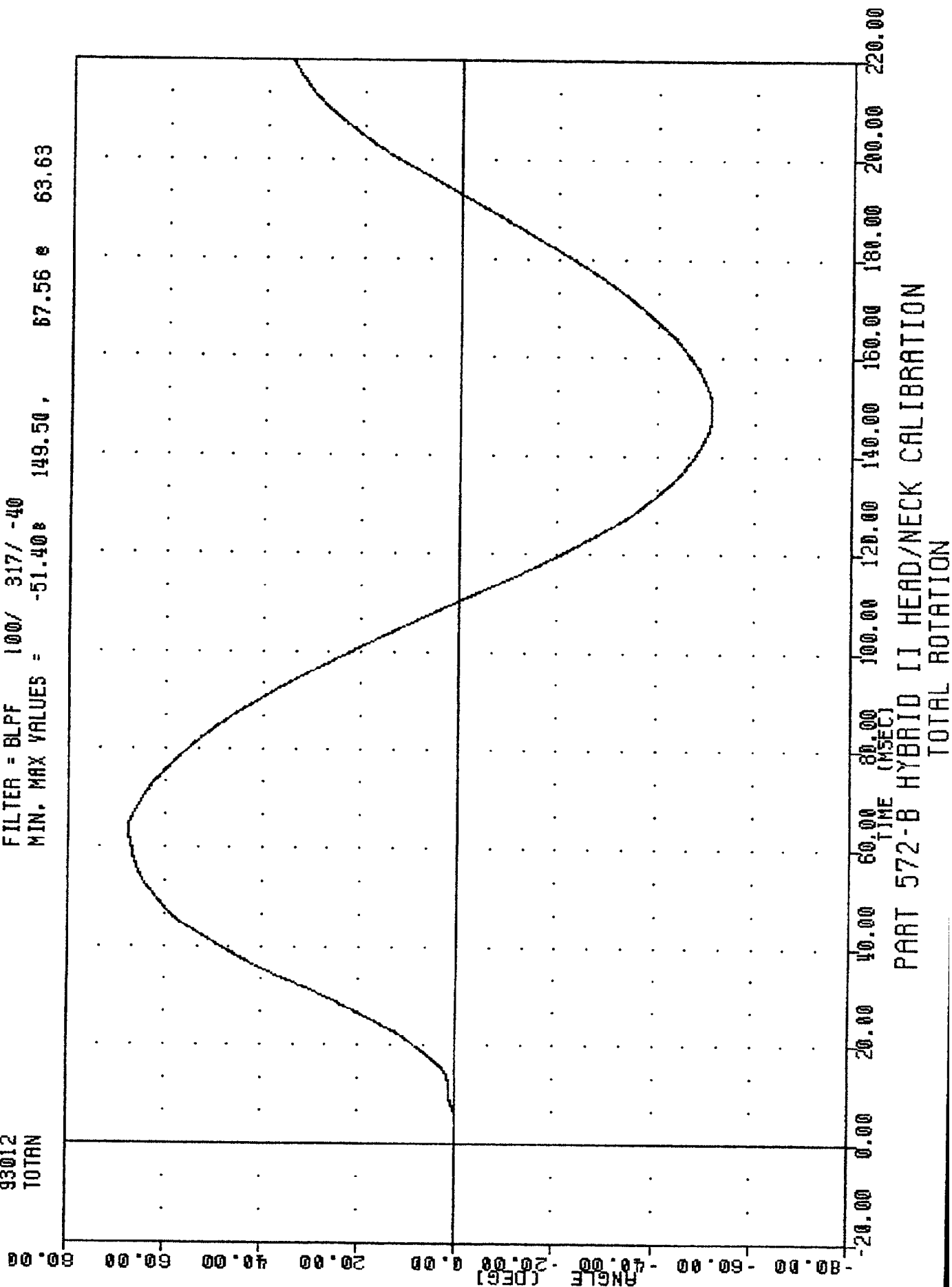
FILTER = BLPF 100/ 317/ -40
MIN. MAX VALUES = -14.20° 151.75° 15.61° 64.13



PART 572-B HYBRID II HEAD/NECK CALIBRATION
ROTATION ABOUT THE HEAD

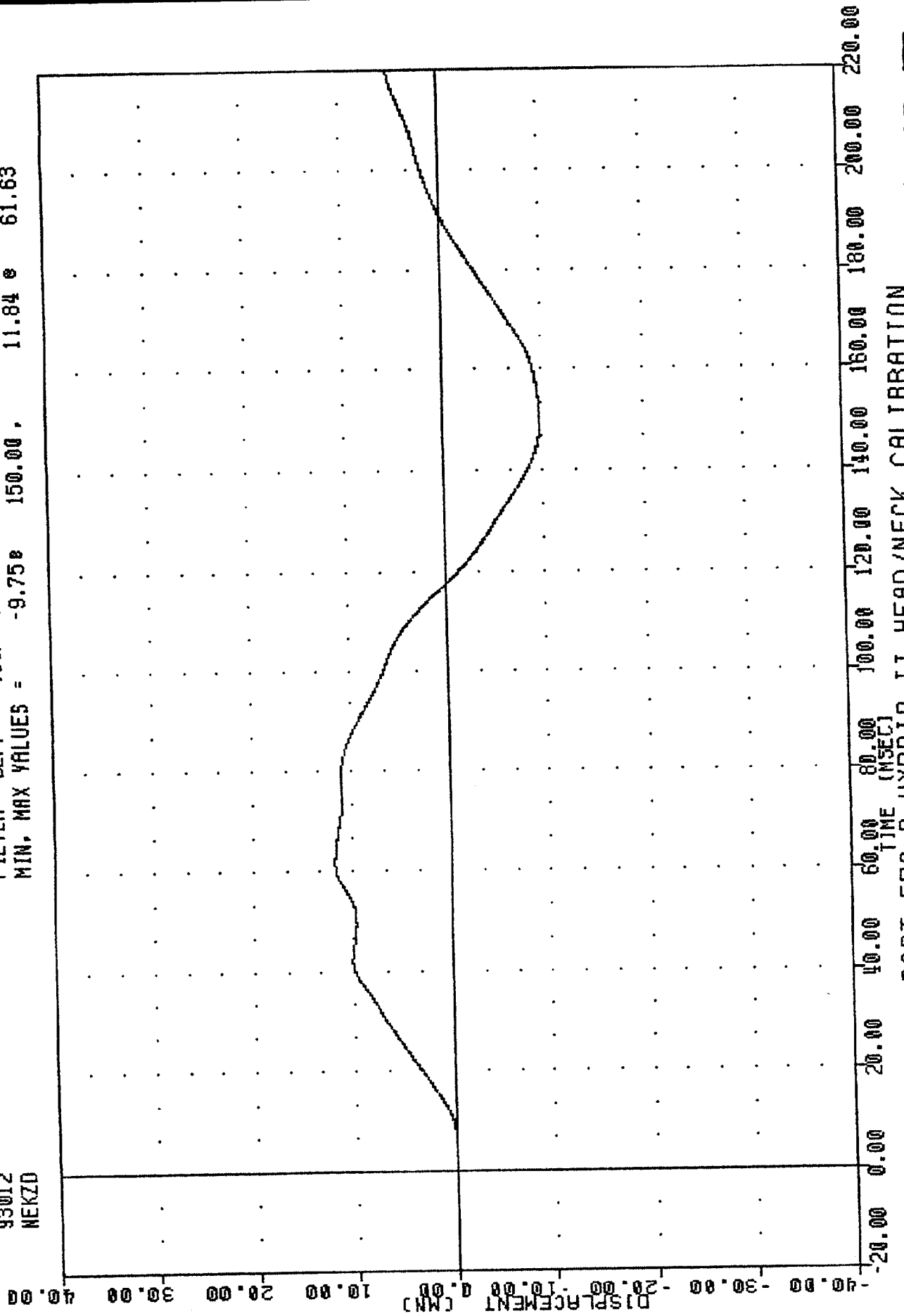
TRC
 572B SN 713 HEAD/NECK CARL 08
 93012
 TOTAN

FILTER = BLPF 100/ 317/ -40
 MIN. MAX VALUES = -51.40 149.50 , 67.56 63.63



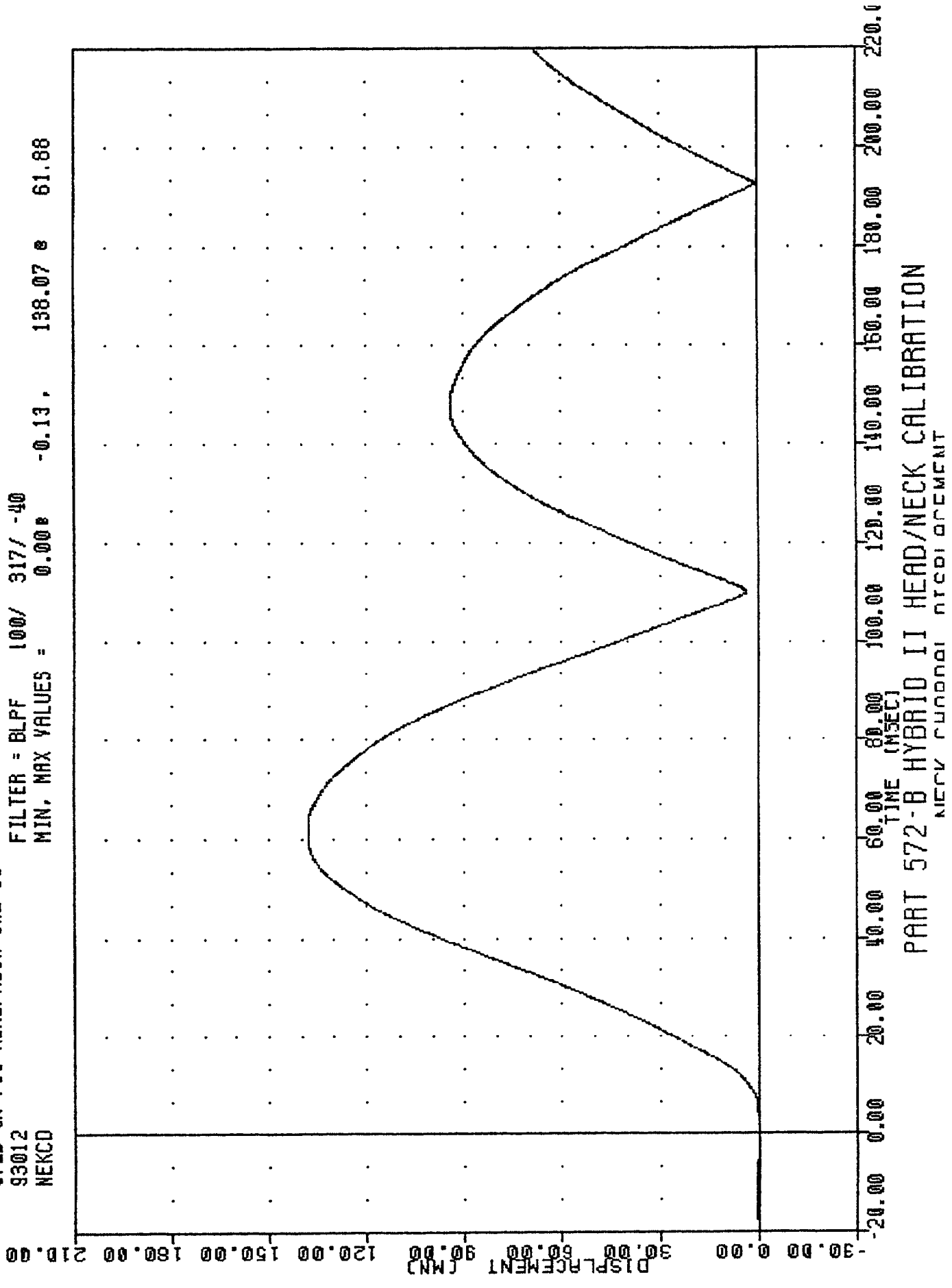
TRC
572B SN 713 HEAD/NECK CAL 06
93012
NEKZO

FILTER = BLPF 100/ 317/ -40
MIN. MAX VALUES = -9.75e 150.00 . 11.84 e 61.63



TRC
 572B SN 713 HEAD/NECK CAL 06
 93012
 NEKCD

FILTER = BLPF 100/ 317/ -40
 MIN, MAX VALUES = 0.00E -0.13, 138.07 e 61.88



PART 572-B HYBRID II HEAD/NECK CALIBRATION
 NECK CUNDONI MICROELEMENT

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B

13-JAN-93

TRC

TL71306

572B SN 713 L.S.THORAX CAL 06

=====		
	LOW SPEED TEST	
TEST PARAMETER	SPECIFICATION	TEST RESULTS
=====		
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
PENDULUM VELOCITY	4.22 - 4.31 M/SEC	4.28 M/SEC
PEAK STERNUM DEFLECTION	28 MM MAX.	24.42 MM
PEAK RESISTIVE FORCE	6450. N MAX.	5757. N
INTERNAL HYSTERESIS	50 - 70 %	63.0 %
=====		

SCD1 54.61 MM

DUMMY MEETS SPECIFICATIONS

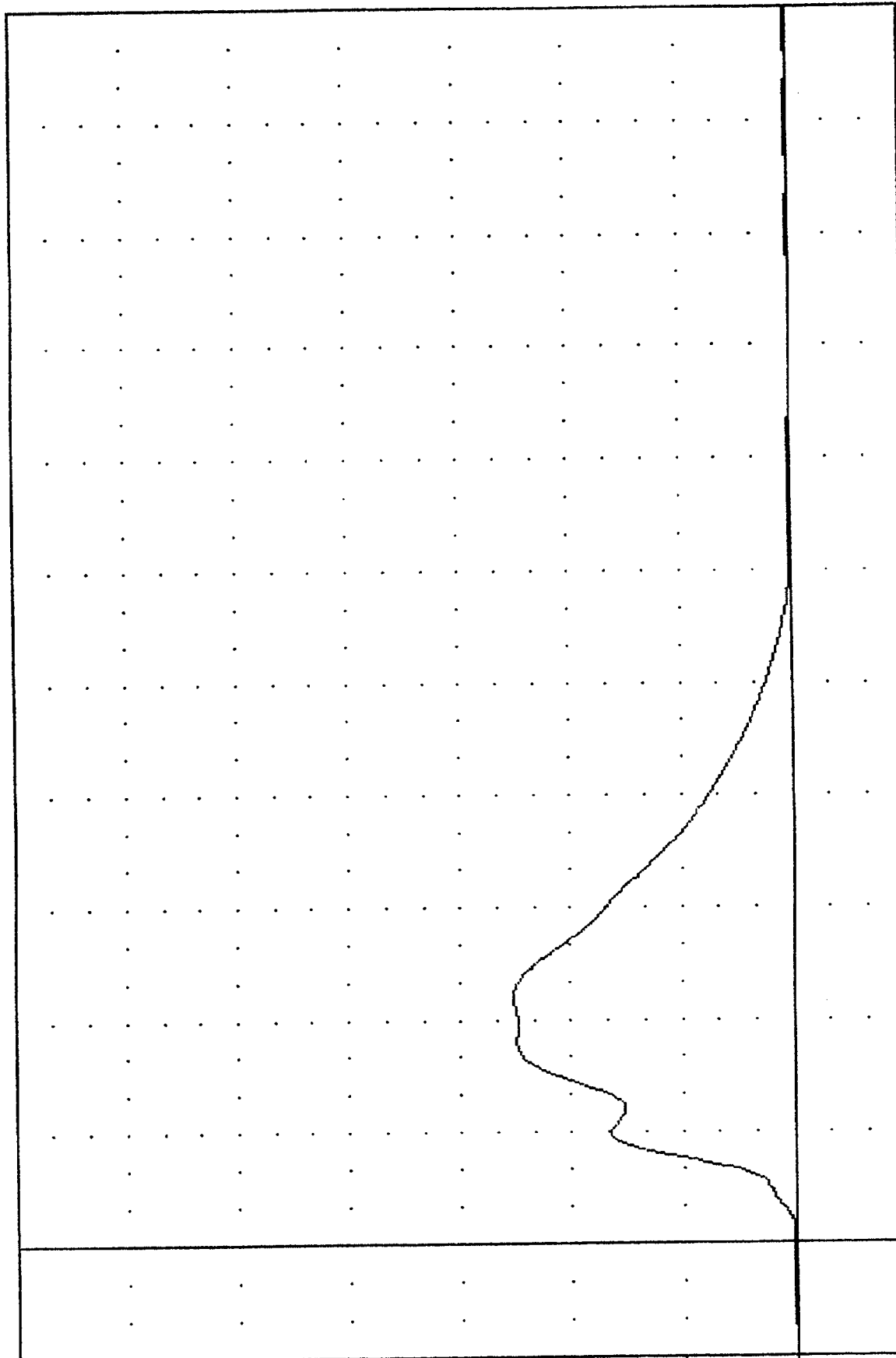
TECHNICIAN *File*

TRC
572B SN 713 L.S.THORAX CAL 06
93013
PENXG

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.028 46.75, 25.13 13.25

ACCELERATION (G)

-10.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00



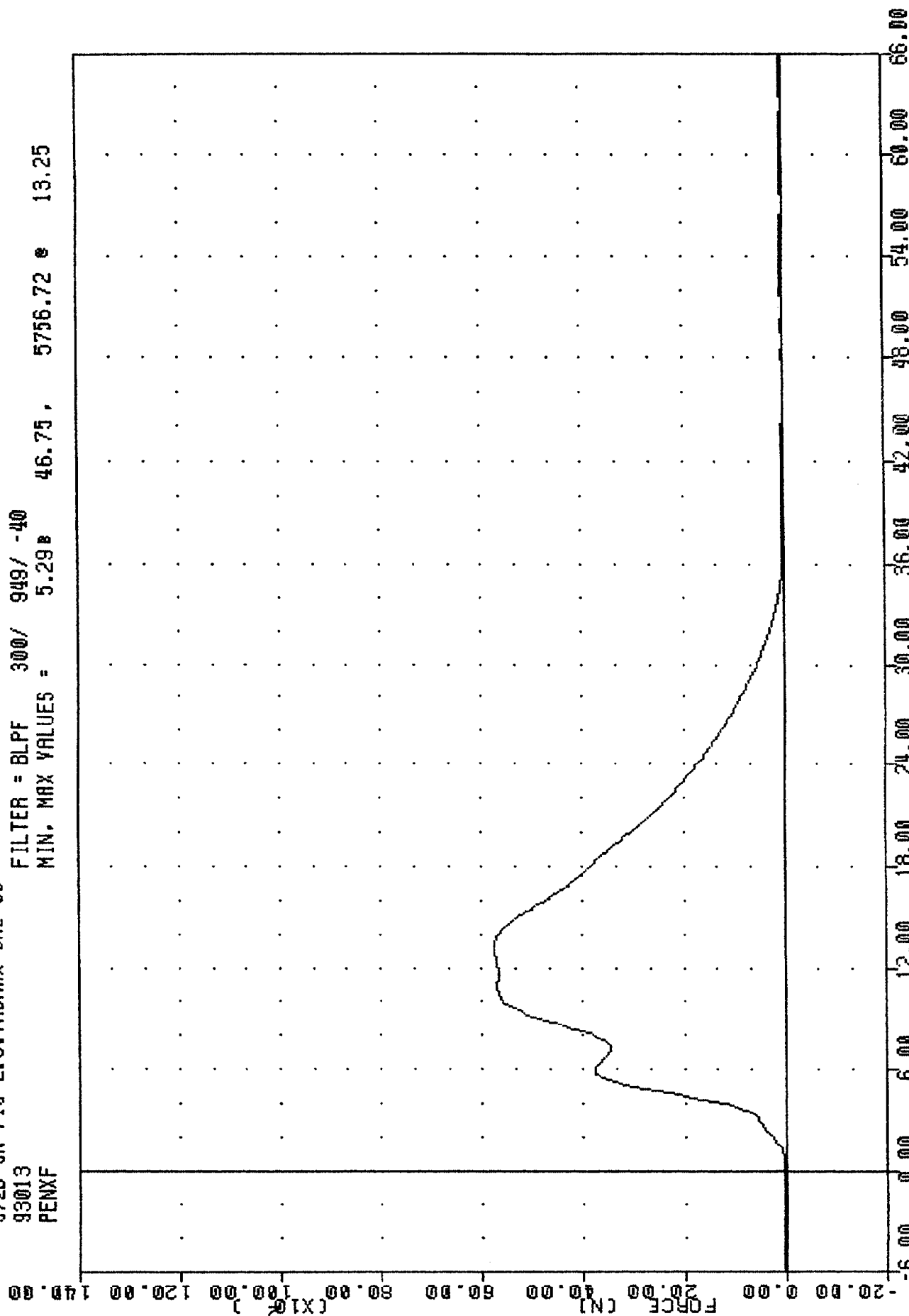
930127

C-21

PART 572-B HYBRID II THORAX CALIBRATION 4.3 M/SEC
DEFINITION RECEIVED BOTTOM

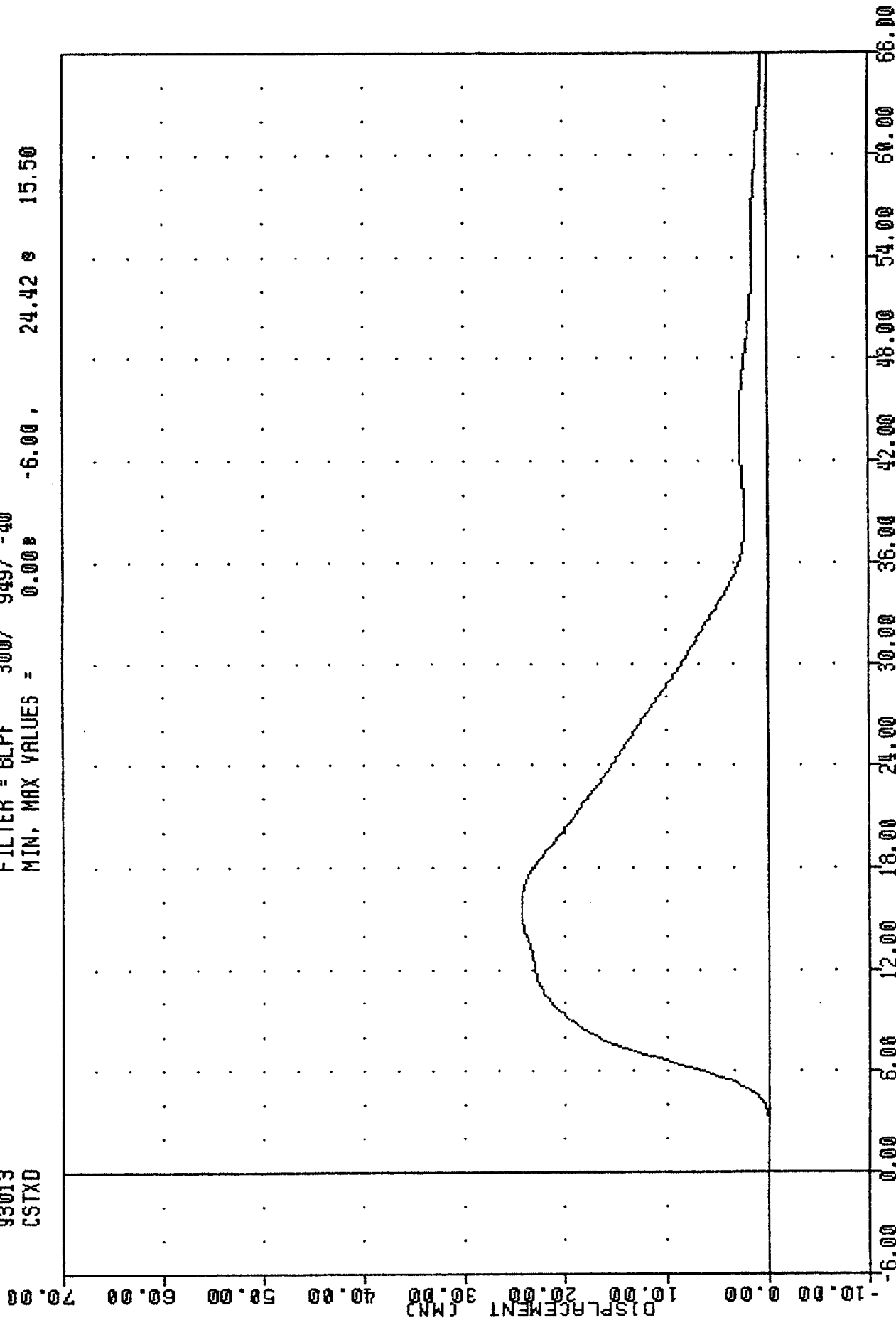
TRC , TL71306
 5720 SN 713 L.S.THORAX CAL 06
 93013
 PENXF

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 5.29 46.75, 5756.72 13.25



TRC , TL71306
 572B SN 713 L.S.THORAX CAL 06
 93013
 CSTXD

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 0.00 24.42 15.50
 -6.00 ,



PART 572-B HYBRID II THORAX CALIBRATION 4.3 M/SEC
 STERNUM DISPLACEMENT

TRC
 CSTXD
 PENXF

IL71306
 FILTER = 8LFF
 FILTER = 8LFF

572B SN 713 L.S. THORAX CAL 06
 300/ 949/ -40 MIN. MAX =
 300/ 949/ -40 MIN. MAX =

93013
 0.00 8
 5.29 8

-6.00,
 46.75,

24.42 8
 5756.72 8

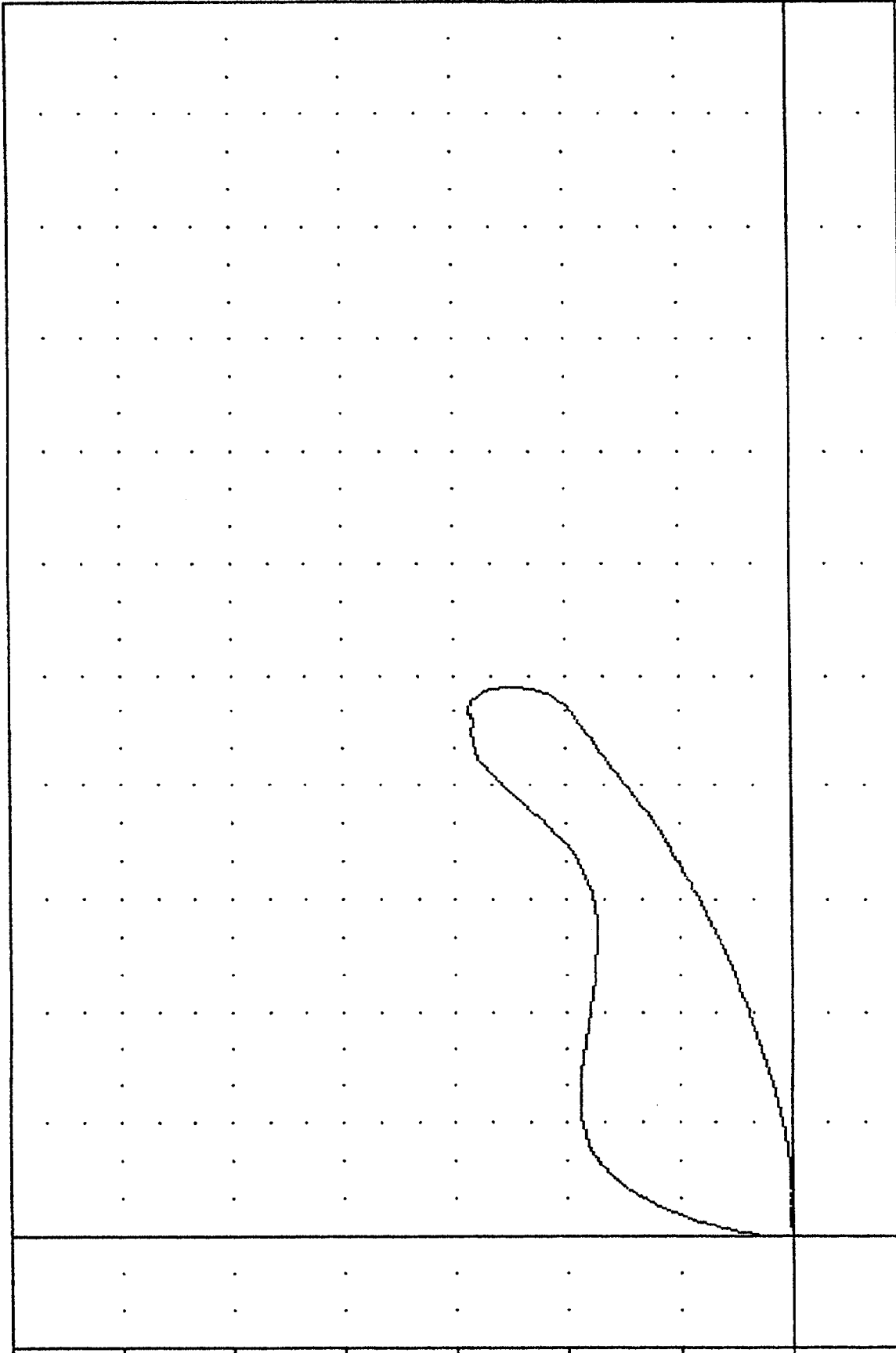
15.50
 13.25

-20.00 0.00 20.00 40.00 60.00 80.00 100.00 120.00 140.00

(X10²)

FORCE (N)

PENXF



-5.00 0.00 5.00 10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00 50.00 55.00

CSTXD
 DISPLACEMENT (MM)

PART 572-B HYBRID II THORAX CALIBRATION 4.3 M/SEC
 IMPACT DISPLACEMENT VS PENETRATION CURVE

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B

13-JAN-93

TRC

TH71306

572B SN 713 H.S.THORAX CAL 06

	HIGH SPEED TEST	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
=====		
TEMPERATURE	18.9 - 25.5 C	20.0 C

RELATIVE HUMIDITY	10 - 70 %	43 %

PENDULUM VELOCITY	6.64 - 6.77 M/SEC	6.68 M/SEC

PEAK STERNUM DEFLECTION	43 MM MAX.	39.03 MM

PEAK RESISTIVE FORCE	10009. N MAX.	9072. N

INTERNAL HYSTERESIS	50 - 70 %	62.3 %

SCD: 54.61 MM

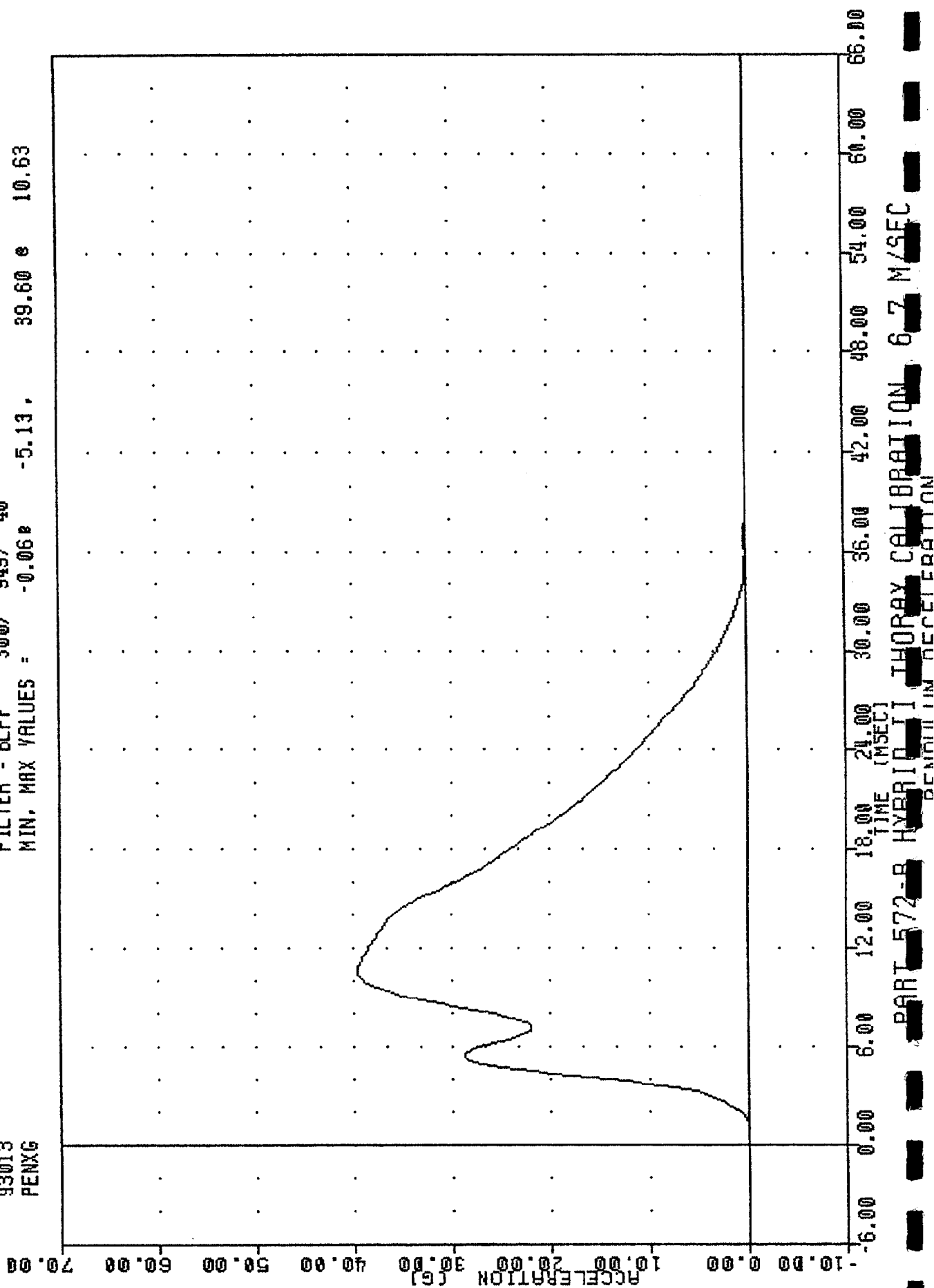
DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Pete Fount

TRC , TH71306
 572B SN 713 H.S.THRAX CAL 06
 93013
 PENXG

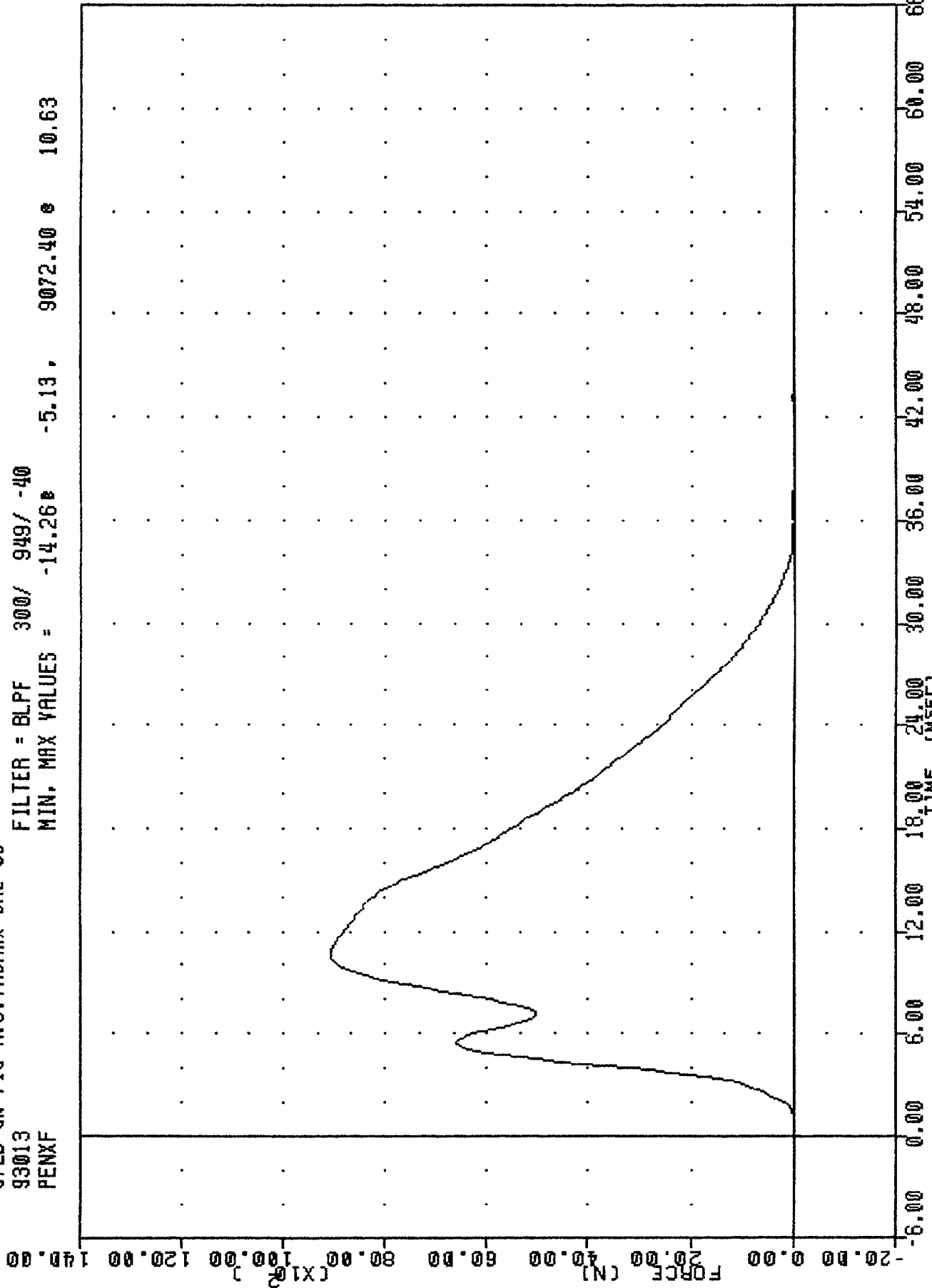
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.06 39.60 10.63



PART 572-B HYBRID I THORAX CALIBRATION 6.7 M/SEC
 BENJAMIN REGENERATION

TRC , TH71306
 572B SN 713 H.S. THORAX CAL 06
 93013
 PENXF

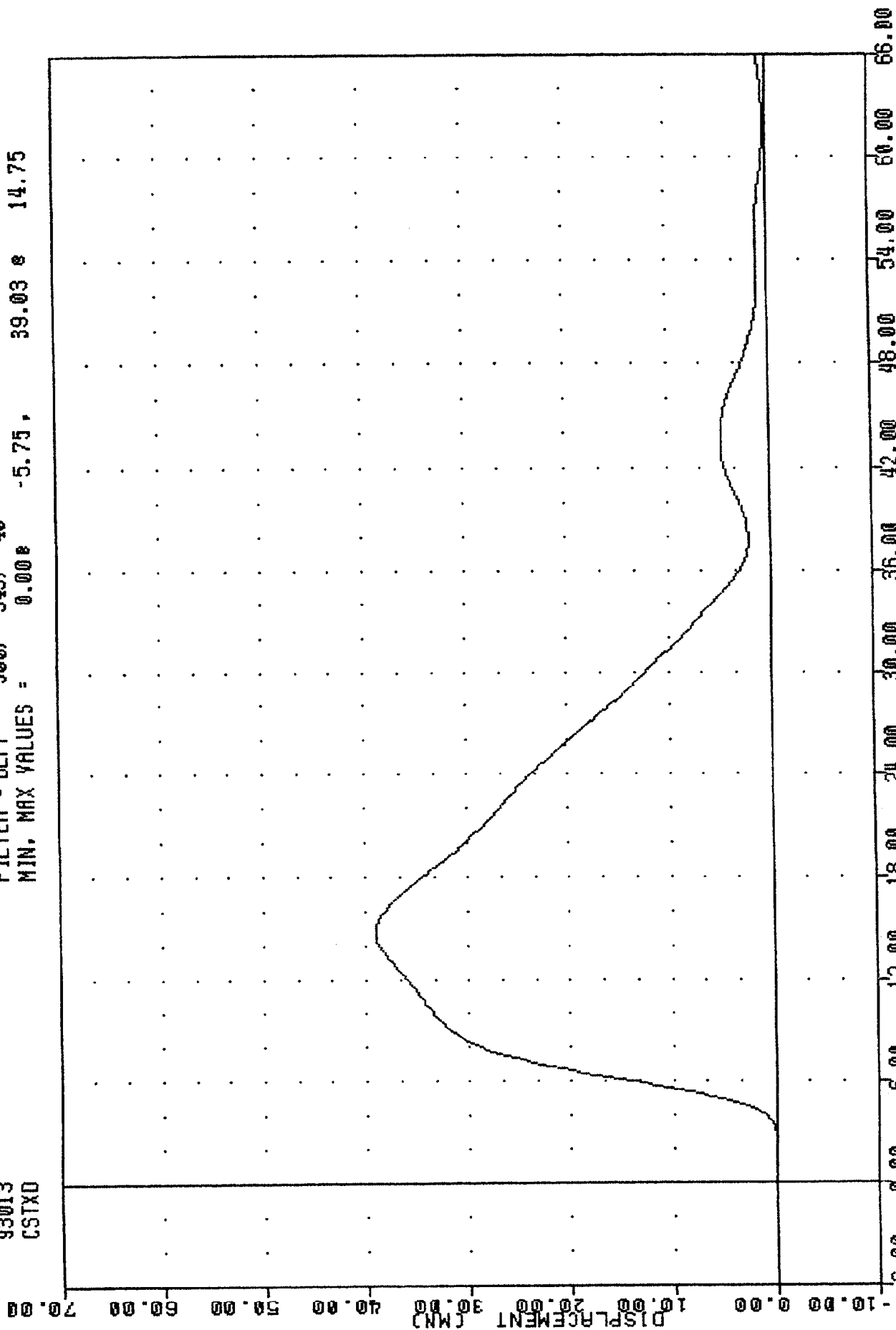
FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -14.26e -5.13 , 9072.40 e 10.63



PART 572-B HYBRID II THORAX CALIBRATION 6.7 M/SEC

TRC , TH71306
 5728 SN 713 H.S.THORAX CAL 06
 93013
 CSTXD

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 0.00e -5.75, 39.03 e 14.75



TRC
 CSTXD
 PENXF

TH71306
 FILTER = BLPF
 FILTER = BLPF

572B SN 713 H. S. THORAX CAL 06
 300/ 949/ -40 MIN. MAX =
 300/ 949/ -40 MIN. MAX =

93013
 0.00
 -14.26

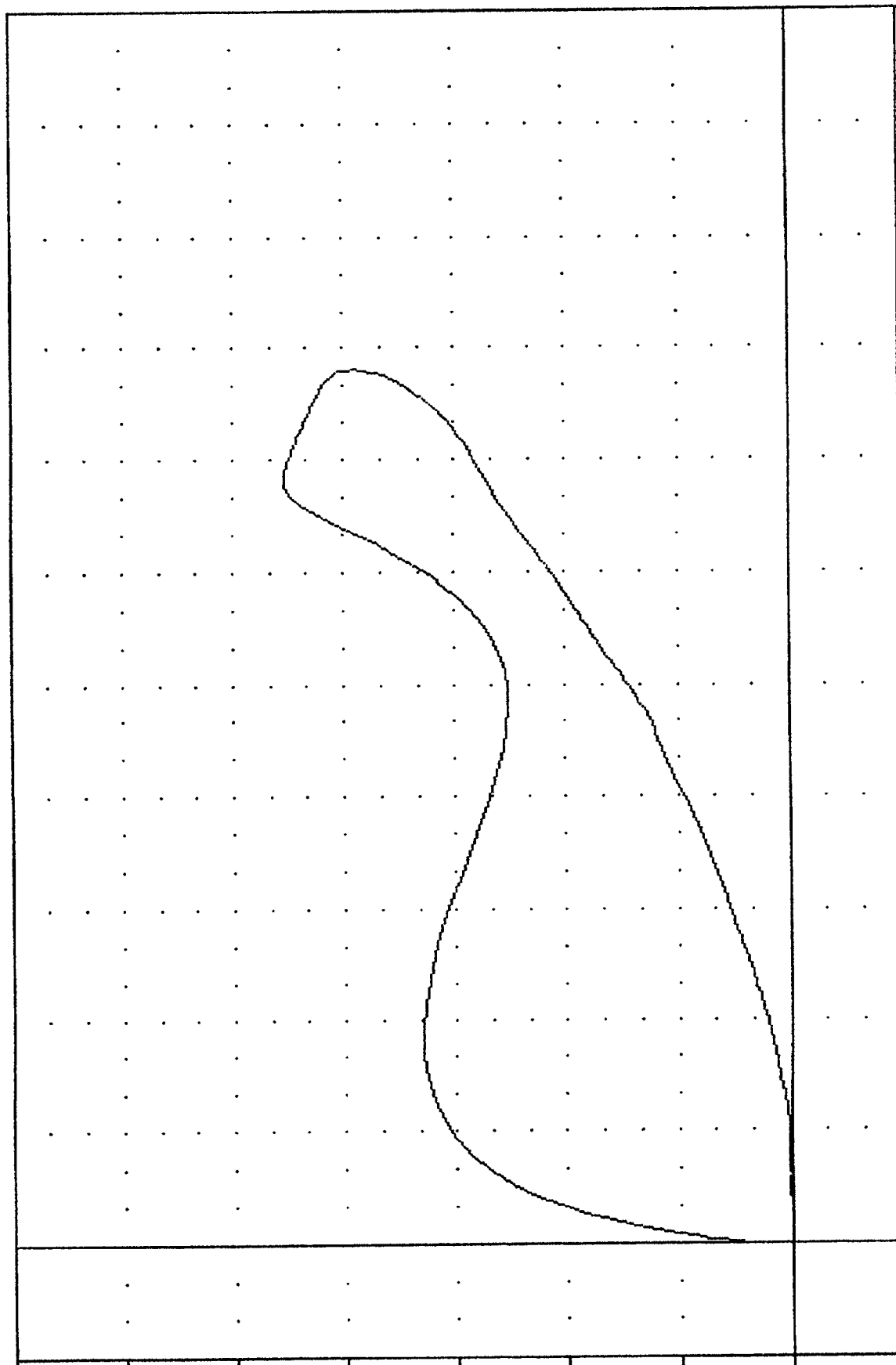
-5.75
 -5.13

39.03
 9072.40

14.75
 10.53

140.00
 120.00
 100.00
 80.00
 60.00
 40.00
 20.00
 0.00
 -20.00

(X10³)
 FORCE (N)
 PENXF



930127

C-29

PART 572-B HYBRID II THORAX CALIBRATION 6.7 M/SEC
 CURET DISPLACEMENT VS PENNINUM FORCE

TRANSPORTATION RESEARCH CENTER INC.

ABDOMEN COMPRESSION TEST

PART 572B

12-JAN-93

TRC

AB71306

572B SN 713 ABDOM COMP CAL 06

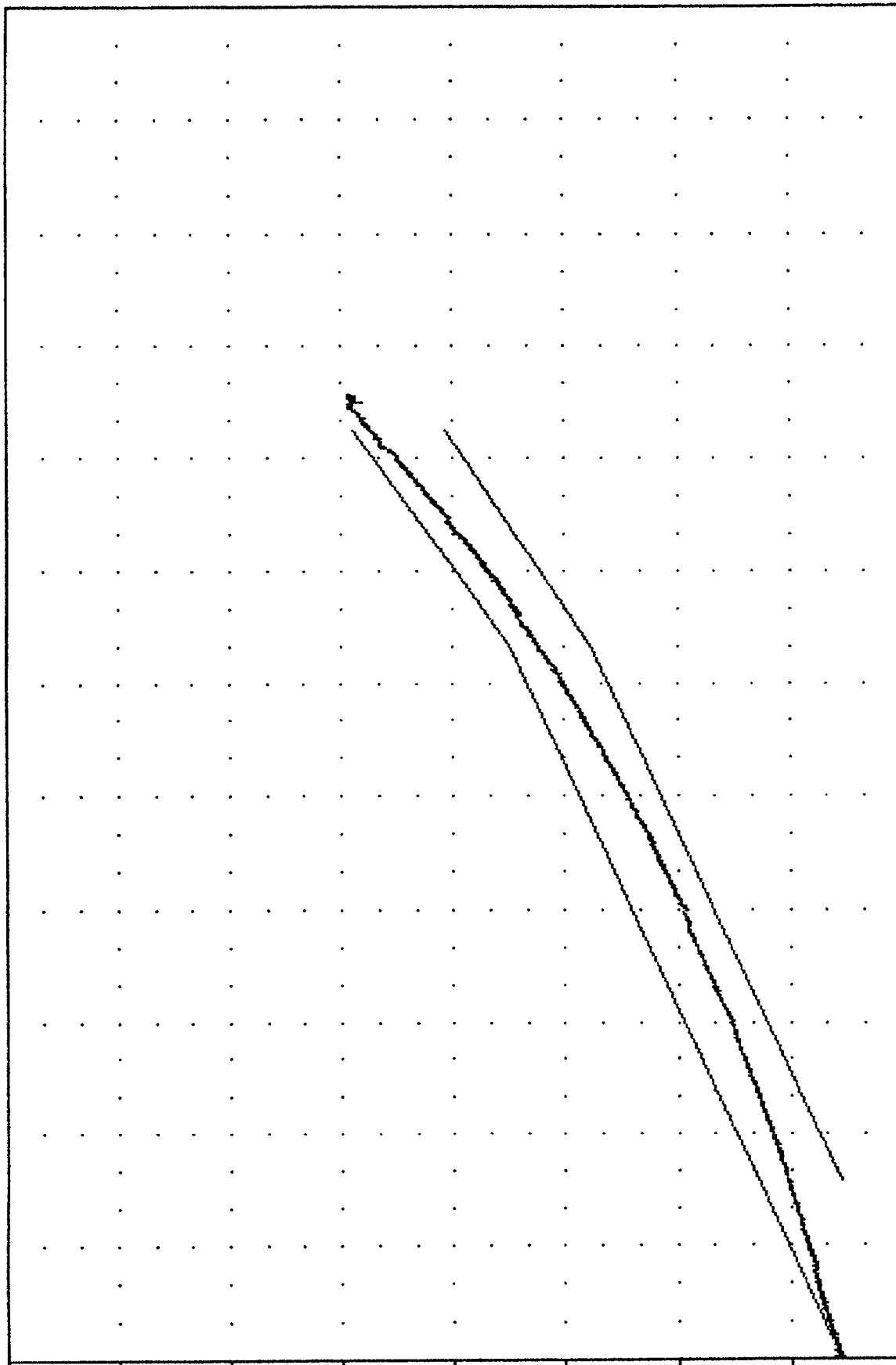
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
FORCE AT 0.00 MM DISP.	44.48 N	44.48 N
FORCE AT 12.7 MM DISP.	102.30 - 160.13 N	129.26 N
FORCE AT 19.1 MM DISP.	160.13 - 222.40 N	185.63 N
FORCE AT 25.4 MM DISP.	222.40 - 280.22 N	260.28 N
FORCE AT 33.0 MM DISP.	324.70 - 391.42 N	379.16 N

DUMMY MEETS SPECIFICATIONS

TECHNICIAN *File Font*

TRC
 ABXD
 ABXF
 572B SN 713 ABDOM COMP CAL 06 93012
 1650/ 5214/ -40 MIN. MAX =
 1650/ 5214/ -40 MIN. MAX =
 34.29 * 395.21
 395.39 * 34.14
 0.00 *
 0.07 *

0.00 4.00 8.00 12.00 16.00 20.00 24.00 28.00 32.00 36.00 40.00 44.00 48.00
 ABXD DISPLACEMENT (MM)
 0.00 80.00 160.00 240.00 320.00 400.00 480.00 560.00 640.00
 ABXF FORCE (N)



PART 572-B HYBRID II ABDOMEN CALIBRATION
 ABDOMEN FORCE VS DISPLACEMENT

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

PART 572B

12-JAN-93

TRC

LF71306

572B SN713 LUMBAR FLEX CAL06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
FORCE AT 0 DEG FLEXION	-26.69 - +26.69 N	0.00 N
FORCE AT 20 DEG FLEXION	97.86 - 151.24 N	137.89 N
FORCE AT 30 DEG FLEXION	151.24 - 204.62 N	160.13 N
FORCE AT 40 DEG FLEXION	204.62 - 258.00 N	213.50 N
NET RETURN ANGLE	< 12 DEG	6.52 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Ford

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

PART 572B

21-JAN-93

TRC

RK71306

572B SN 713 R. KNEE IMP CAL 06

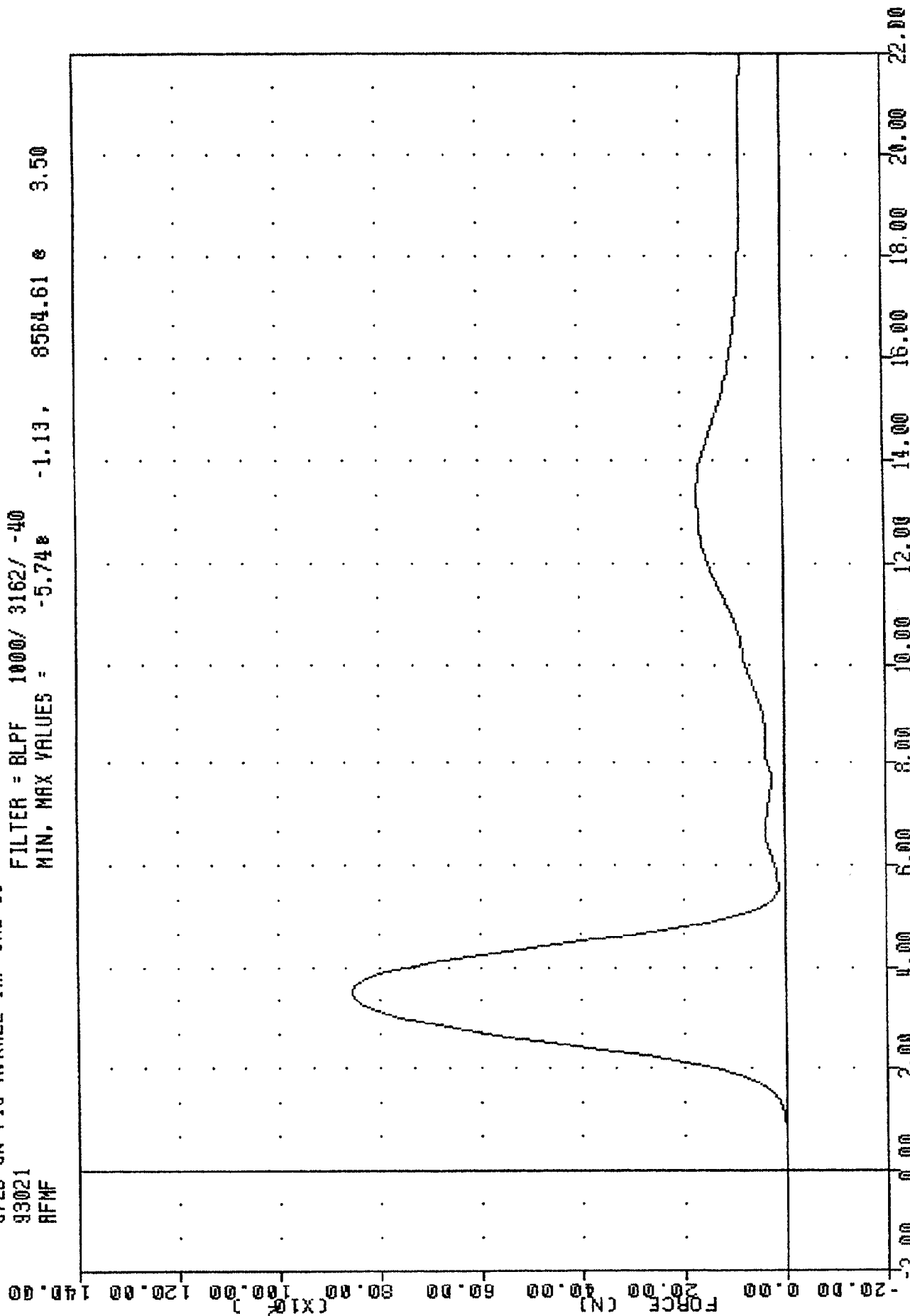
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	22.0 C
RELATIVE HUMIDITY	10 - 70 %	52 %
PENDULUM VELOCITY	2.06 - 2.15 M/SEC	2.12 M/SEC
PEAK KNEE IMPACT FORCE	8229 - 11121 N	8564.61 N
DURATION ABOVE 4448 N	≥ 1.7 MS	1.96 MS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Font

TRC , RK71306
 572B SN 713 R.KNEE INP CAL 0B
 93021
 RFMF

FILTER = BLPF 1000/ 3162/ -40
 MIN. MAX VALUES = -5.74e -1.13, 8564.61 e 3.50



TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

PART 572B

21-JAN-93

TRC

LK71306

572B SN 713 L. KNEE IMP CAL 06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	22.0 C
RELATIVE HUMIDITY	10 - 70 %	52 %
PENDULUM VELOCITY	2.06 - 2.15 M/SEC	2.12 M/SEC
PEAK KNEE IMPACT FORCE	8229 - 11121 N	8611.08 N
DURATION ABOVE 4448 N	≥ 1.7 MS	1.86 MS

DUMMY MEETS SPECIFICATIONS

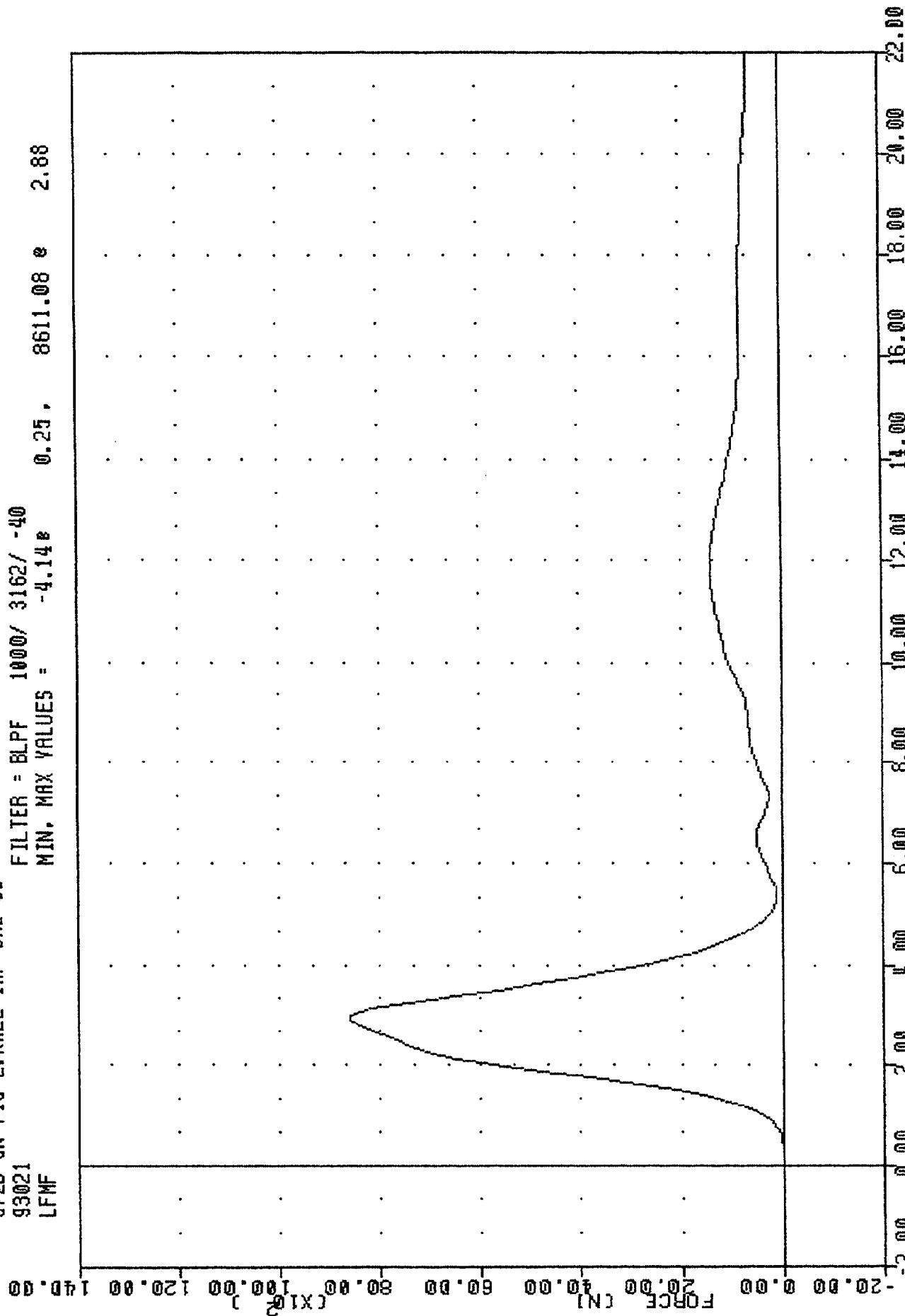
TECHNICIAN

Pete Font

TRC , LK71306
 572B SN 713 L.KNEE INP CAL 06
 93021
 LFMF

FILTER = BLPF 1000/ 3162/ -40
 MIN, MAX VALUES = -4.14e

0.25, 8611.08 e 2.88



PART 572-B HYBRID II LEFT KNEE CALIBRATION
 LEFT FEMUR FORCE

PRE-TEST CERTIFICATION DATA

PASSENGER DUMMY S/N: 826

TRANSPORTATION RESEARCH CENTER INC.

EXTERNAL DIMENSIONS

PART 572B

12-JAN-93

TRC ED82632
SN HUMANOID 826

572B SN826 EXT. DIMENSION CAL32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
SITTING HEIGHT	904 - 909 MM	904. MM
SHOULDER PIVOT HEIGHT	553 - 569 MM	564. MM
HIP PIVOT HEIGHT	99 MM	REFERENCE
HIP PIVOT FROM BACKLINE	122 MM	REFERENCE
KNEE PIVOT FROM BACKLINE	511 - 526 MM	518. MM
REAR OF HEAD FROM BACKLINE	43 MM	REFERENCE
CHEST DEPTH	231 - 244 MM	239. MM
SHOULDER WIDTH	452 - 467 MM	455. MM
CHEST CIRCUMFERENCE OVER NIPPLES	935 - 1016 MM	958. MM
WAIST CIRCUMFERENCE AT MIN. GIRTH	798 - 828 MM	826. MM
HIP WIDTH	356 - 391 MM	376. MM
KNEE PIVOT FROM FLOOR	490 - 506 MM	495. MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Pete Fort*

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

PART 572B

12-JAN-93

TRC

HDB2632

572B SN 826 HEAD DROP CAL 32

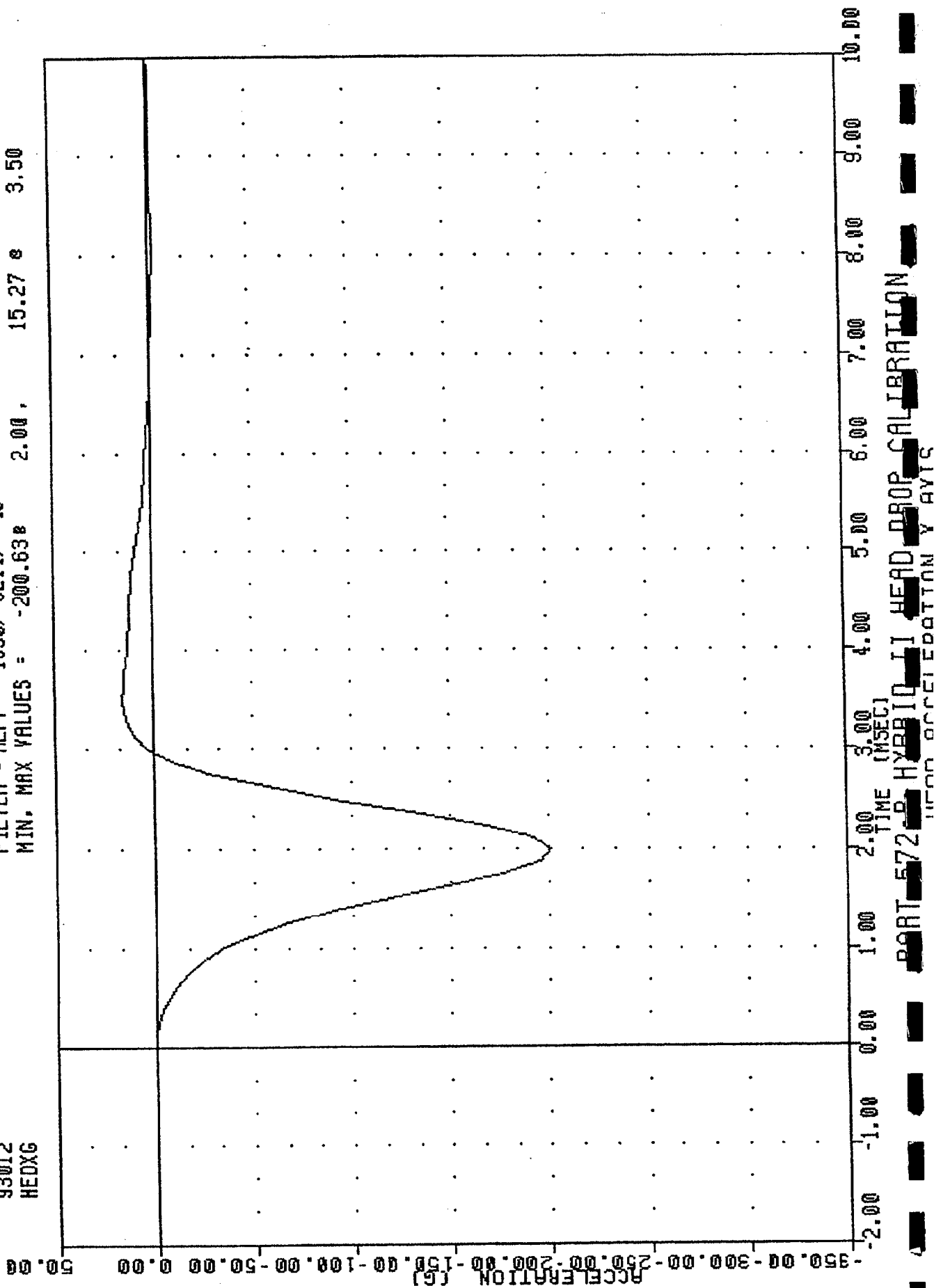
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
PEAK RESULTANT ACCELERATION	210 - 260 G	247.87 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MS	1.21 MS
PEAK LATERAL ACCELERATION	10 G MAX	-6.34 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Pete Font*

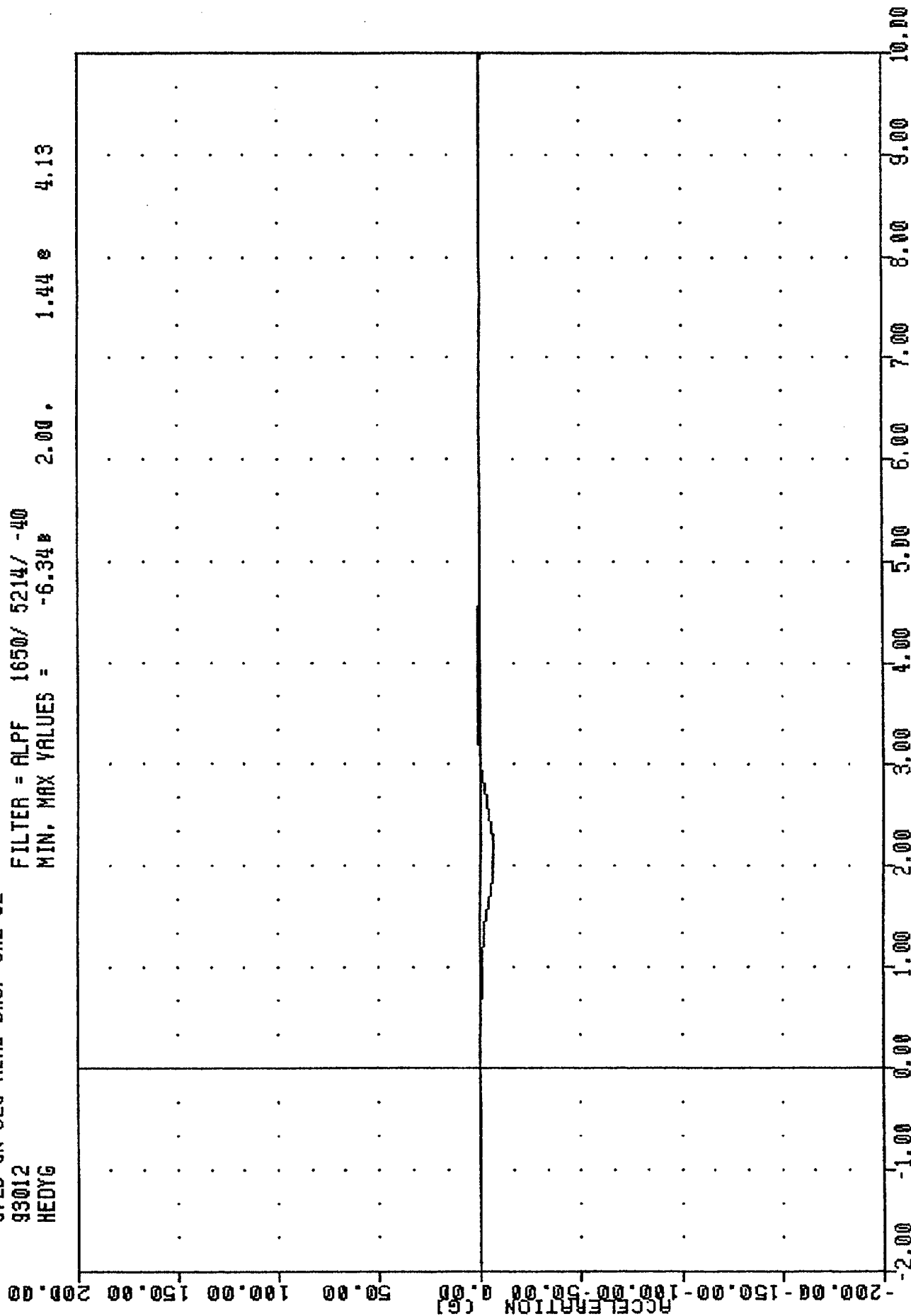
TRC , HD82632
 572B SN 826 HEAD DROP CAL 32
 93012
 HEDXG

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -200.63 2.00 , 15.27 3.50



TRC
572B SN 026 HEAD DROP CAL 32
93012
HEDYG

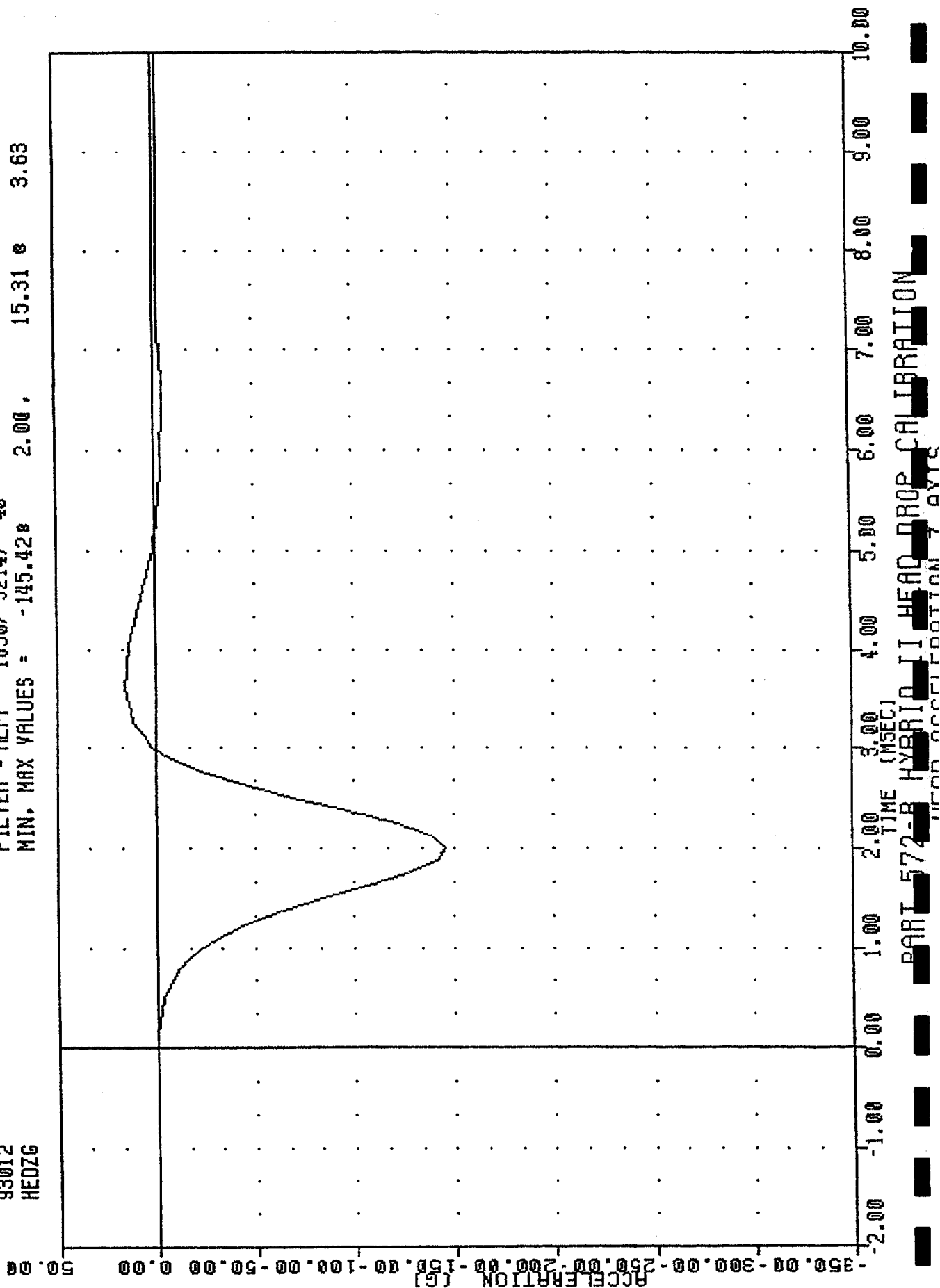
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -6.34 2.00 1.44 4.13



PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION Y AXIS

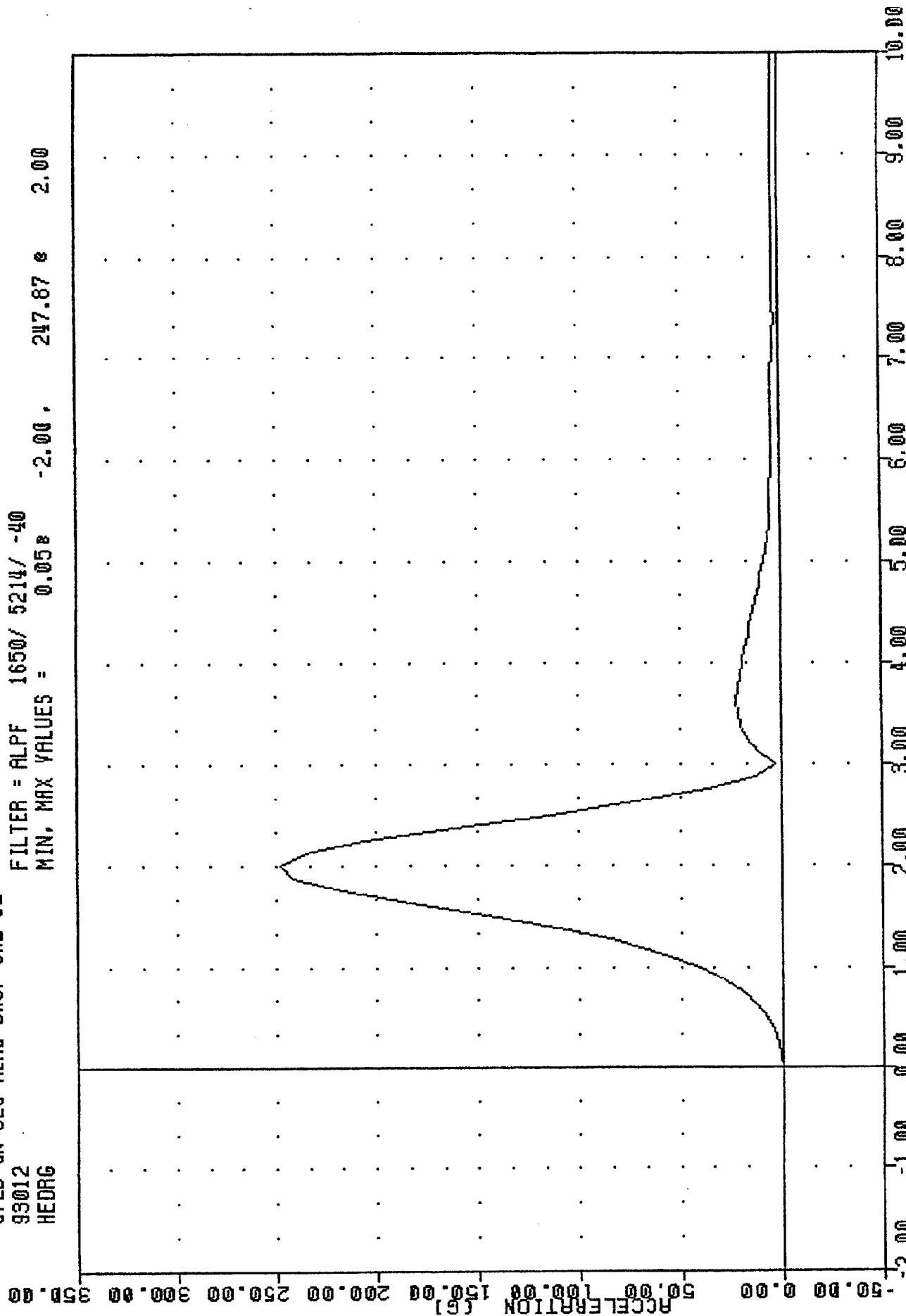
TRC , H082632
 5728 SN 026 HEAD DROP CAL 32
 93012
 HEDZG

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -145.42 2.00 15.31 3.63



TRC
572B SN 828 HEAD DROP CAL 32
93012
HEDRG

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.058 -2.00, 247.87 e 2.00



PART 572-B HYBRID II HEAD DROP CALIBRATION

TRANSPORTATION RESEARCH CENTER INC.

NECK PENDULUM TEST

PART 572B

12-JAN-93

TRC

HNB2632

572B SN 826 HEAD/NECK CAL 32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
PENDULUM VELOCITY	6.55 TO 7.77 M/SEC	7.31 M/SEC
PENDULUM DECELERATION:		
T1 - T2 TIME (5 - 20 G)	3 MS MAX	2.43 MS
T2 - T3 TIME (20 - 20 G)	25 - 30 MS	27.25 MS
T3 - T4 TIME (20 - 5 G)	10 MS MAX	5.42 MS
AVG. G LEVEL T2 - T3	20 - 24 G	23.23 G
MAXIMUM ROTATION ANGLE	63 - 73 DEG	65.78 DEG
PEAK HEAD RESULTANT ACCEL	26 G MAX	23.98 G

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ROTATION ANGLE	TIME	CHORDAL DISP.
(DEGREES)	(MS)	(MM)
0	-2.0 - +2.0	-12.7 - +12.7
30	25.6 - 34.4	53.3 - 78.7
60	40.3 - 51.7	109.2 - 134.6
MAX	53.2 - 66.8	127.0 - 152.4
60	67.0 - 83.0	109.2 - 134.6
30	85.4 - 104.6	53.3 - 78.7
0	101.0 - 123.0	-12.7 - +12.7

SND: 151.13 MM

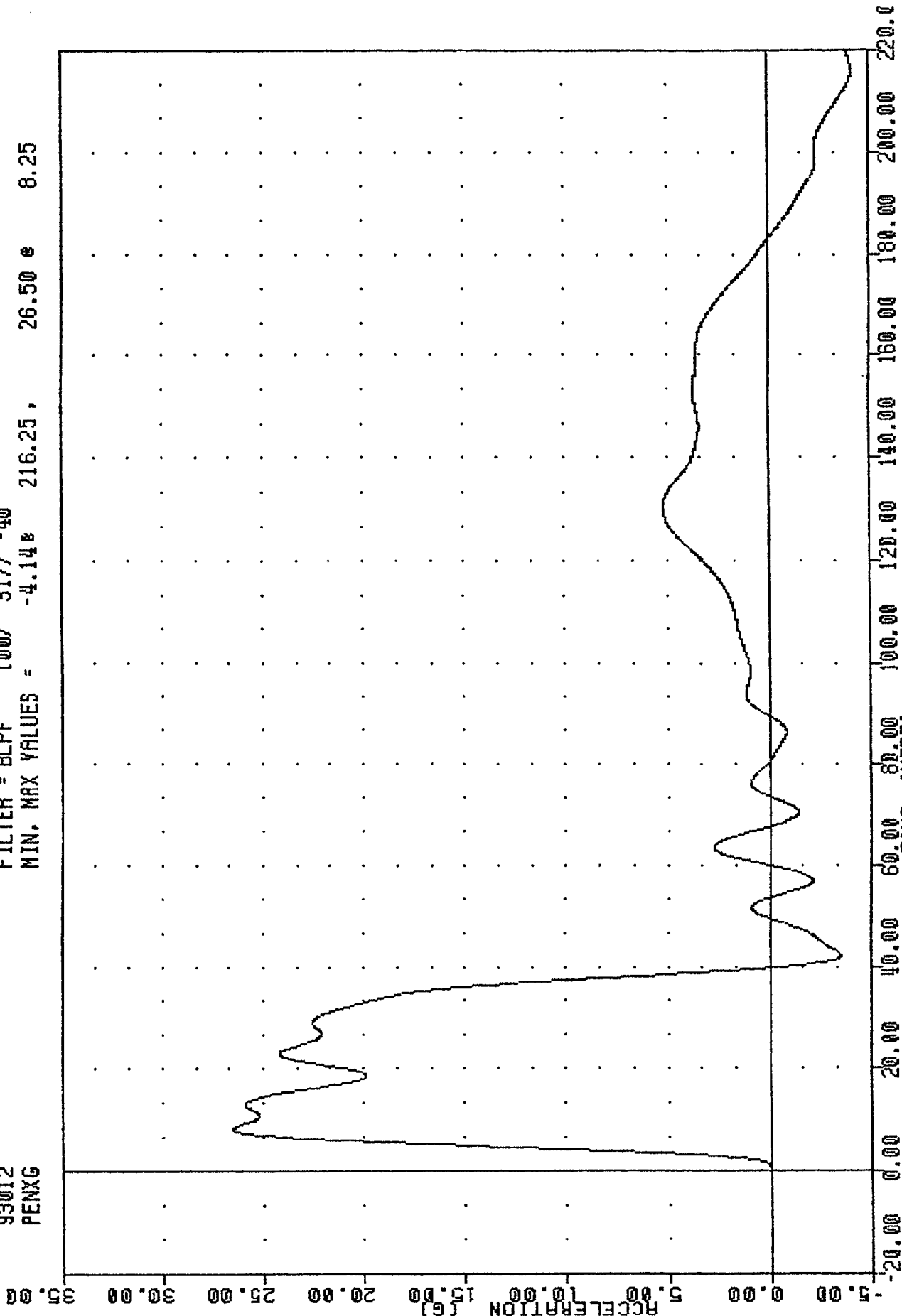
DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Pete Font

TRC , HM82632
 572B SN 826 HEAD/NECK CAL 32
 93012
 PENXG

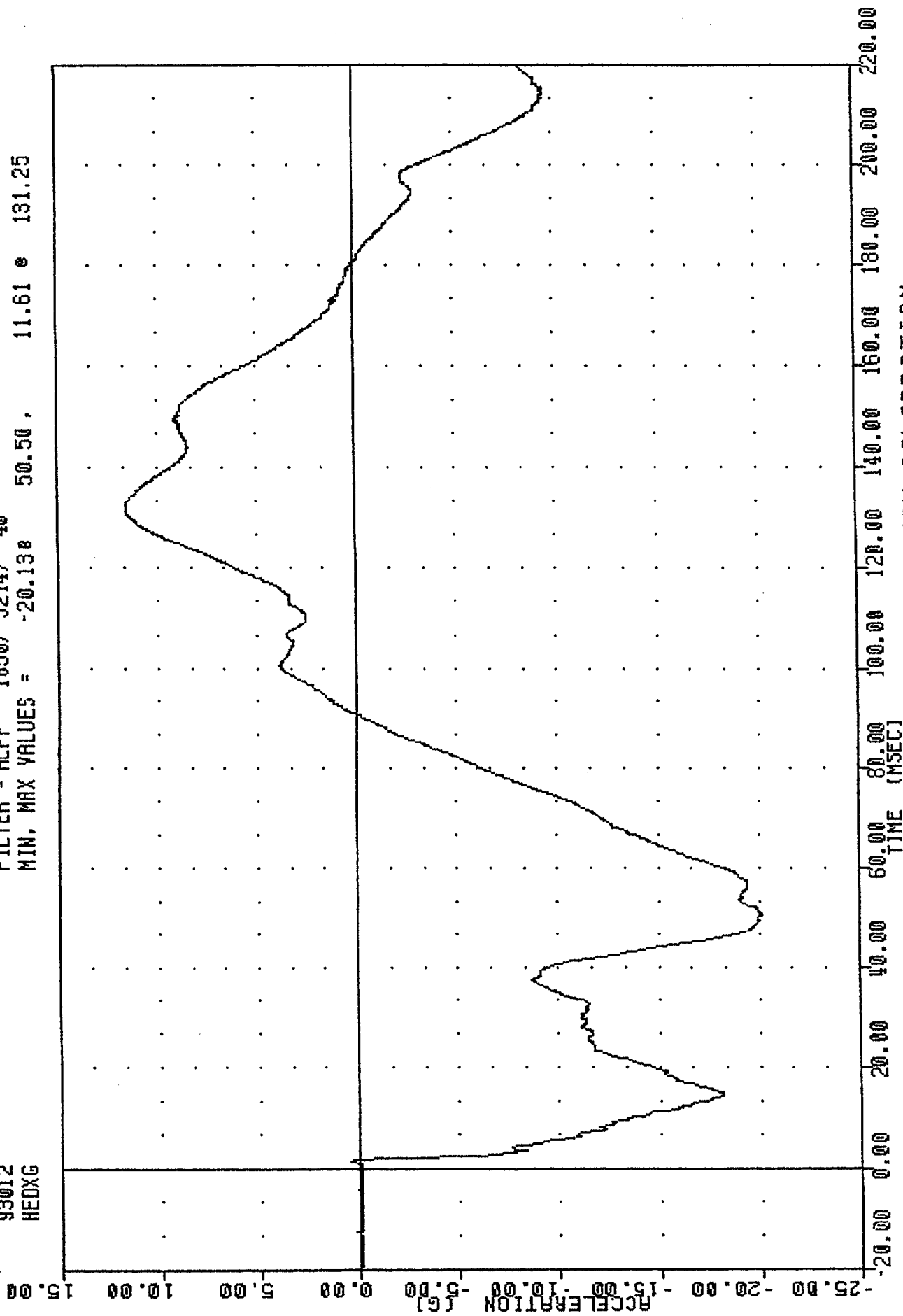
FILTER = BLPF 100/ 317/ -40
 MIN. MAX VALUES = -4.14 216.25 26.50 8.25



PART 572-B HYBRID II HEAD/NECK CALIBRATION
 PENXG IN REVISION

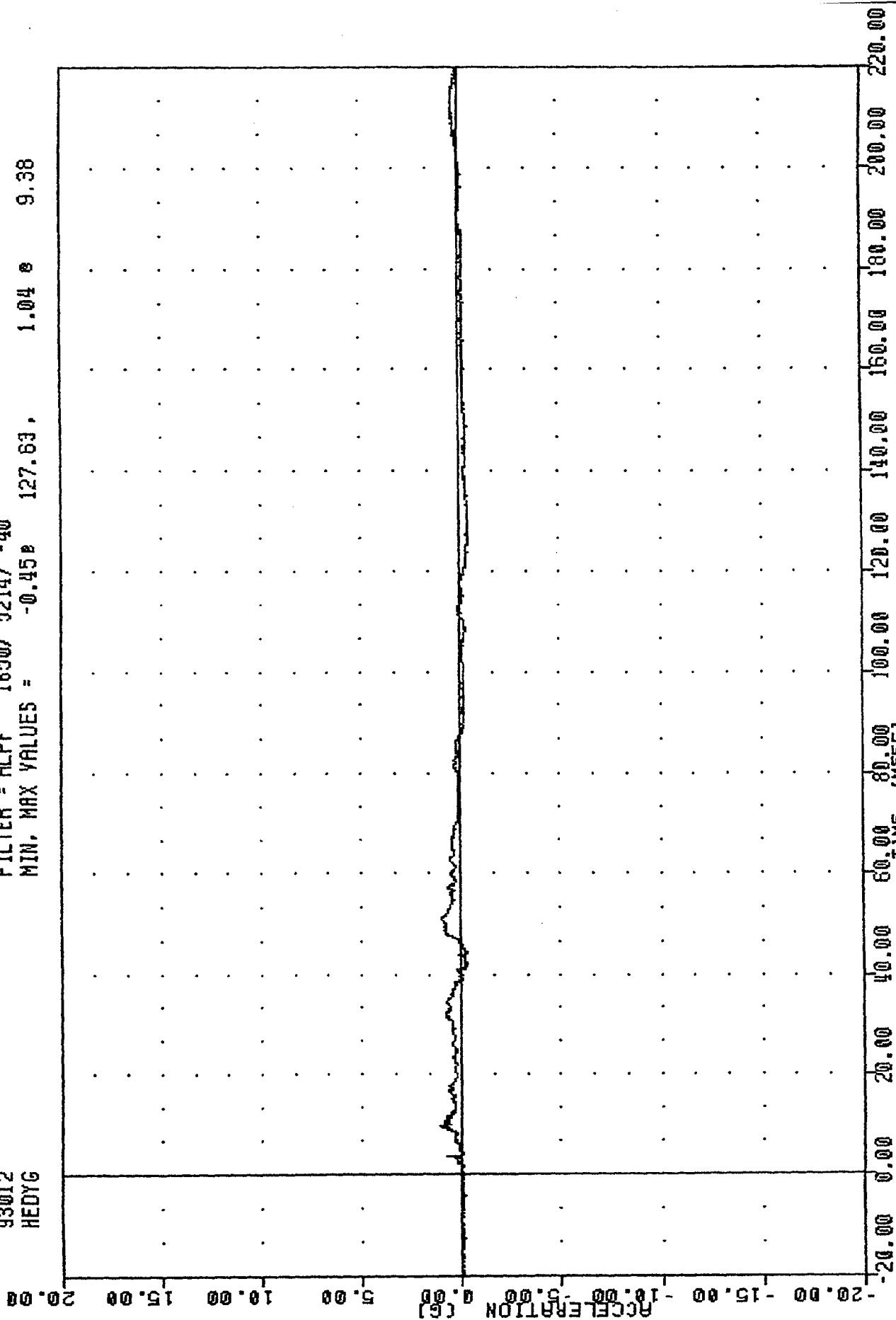
TRC , HM82632
 572B SN 026 HEAD/NECK CAL 32
 93012
 HEDXG

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -20.138 50.50 , 11.61 e 131.25



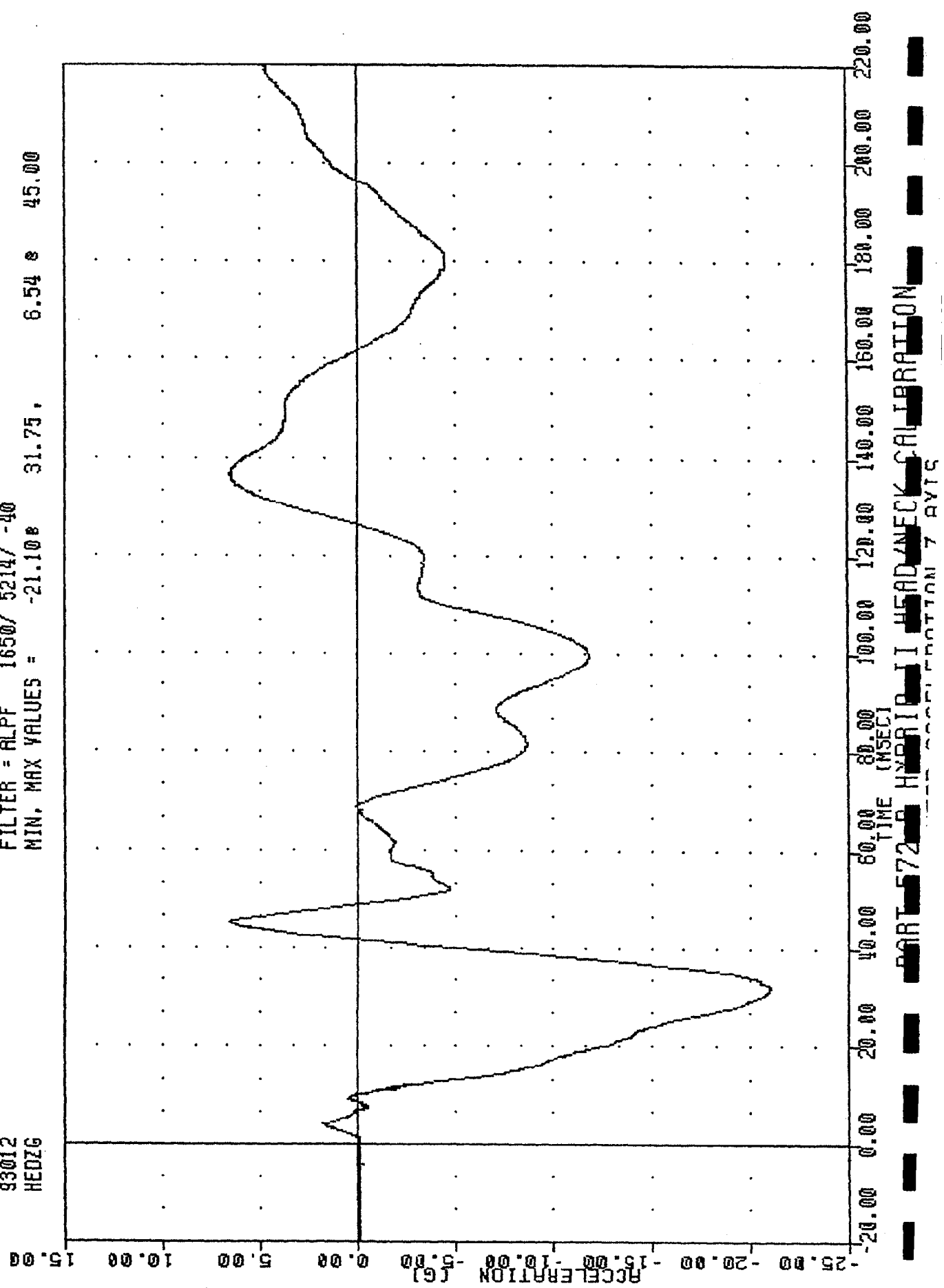
TRC
572B SN 026 HEAD/NECK CAL 32
93012
HEDYG

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -0.458 127.63, 1.04 9.38



TRC
572B SN 026 HEAD/NECK CAL 32
93012
HEDIG

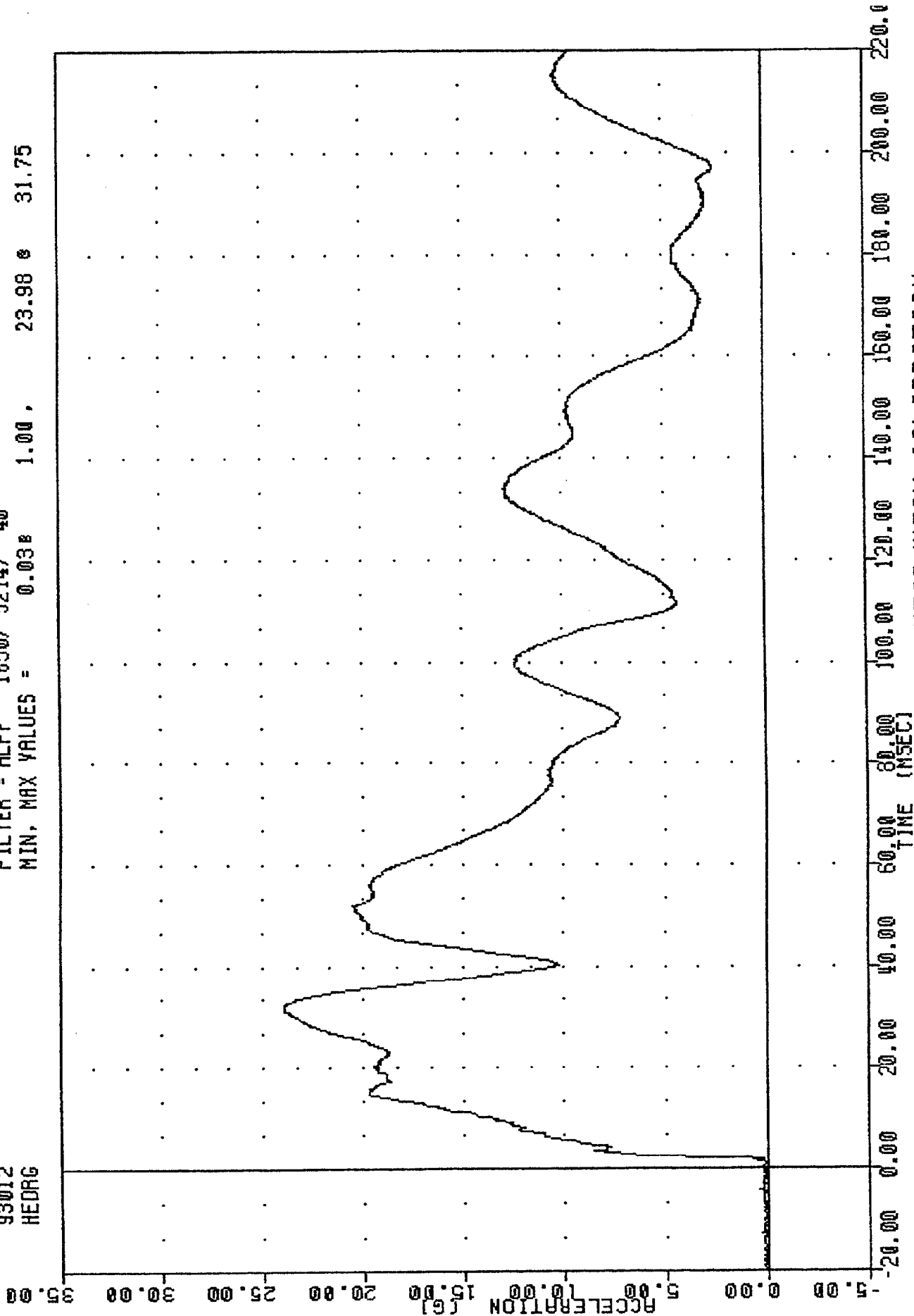
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -21.10 31.75, 6.54 s 45.00



PART 572B HEAD/NECK CALIBRATION
SECTION 7 BYTS

TRC , HW82632
 572B SN 826 HEAD/NECK CAL 32
 93012
 HEDRG

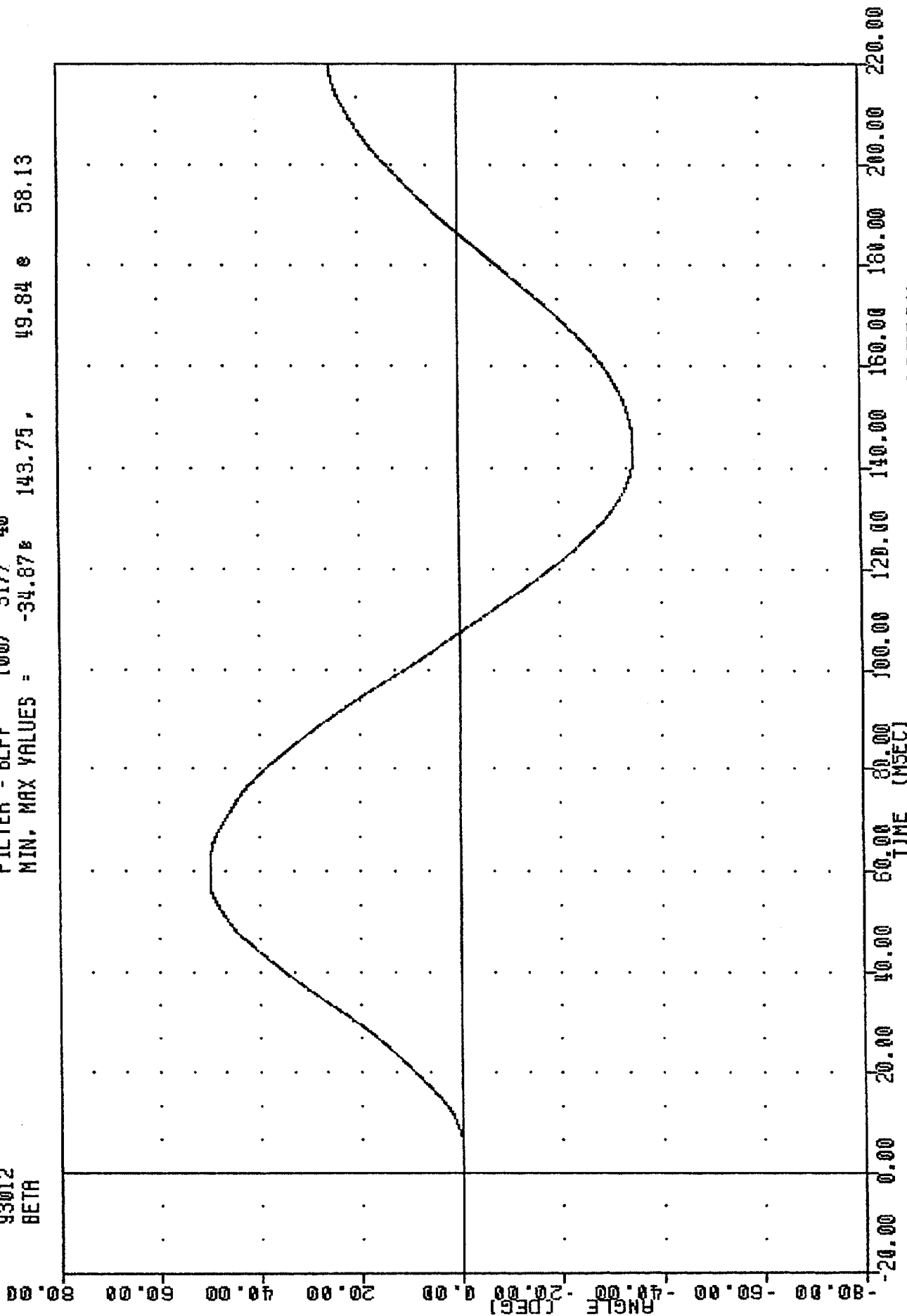
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 0.038 1.00, 23.98 31.75



PART 572-B HYBRID II HEAD/NECK CALIBRATION

TRC
572B SN 026 HEAD/NECK CAL 32
93012
BETA

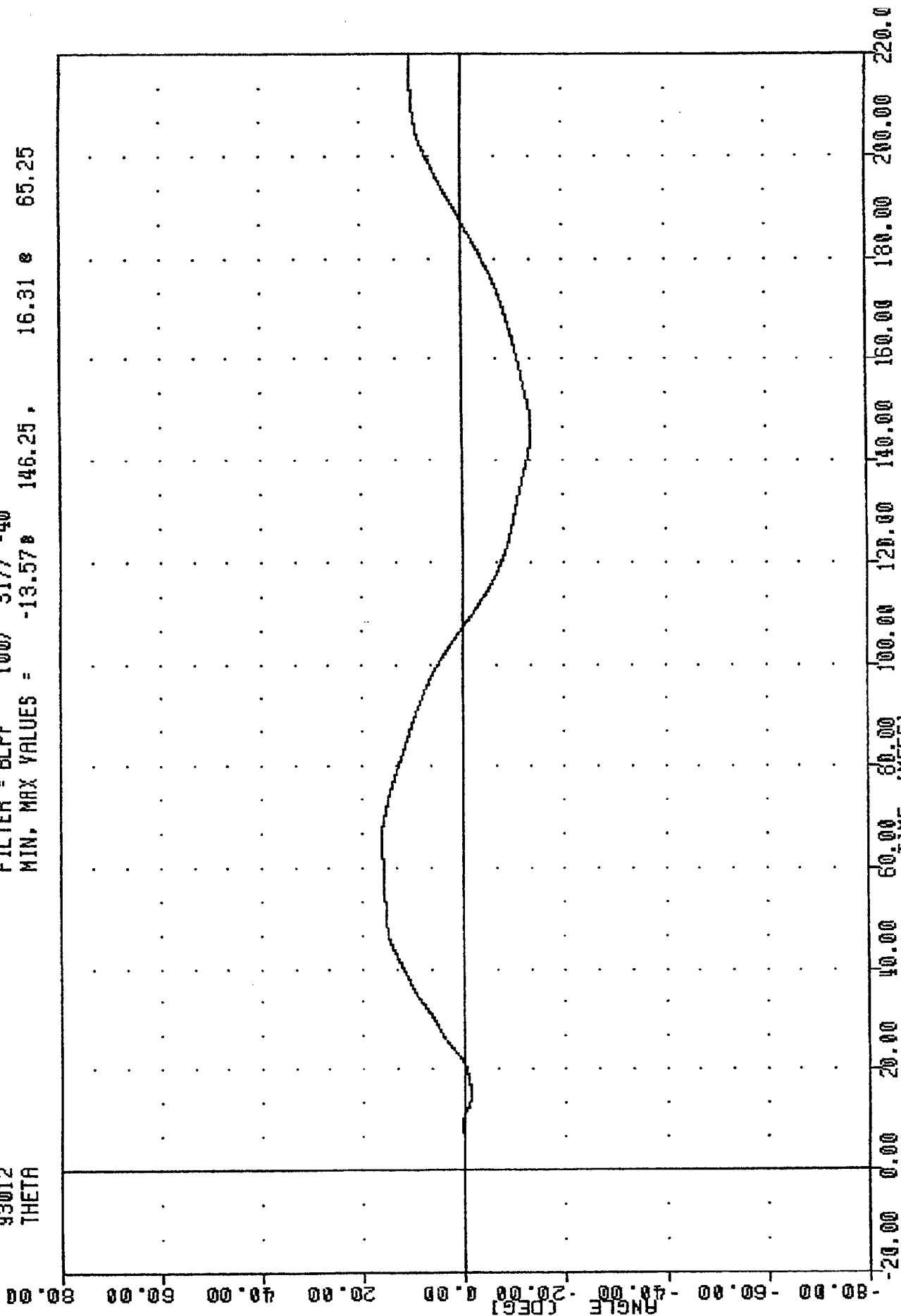
FILTER = BLPF 100/ 317/ -40
MIN. MAX VALUES = -34.87° 143.75° 49.84° 58.13



TRC
572B SN 826 HEAD/NECK CAL 92
93012
THETA

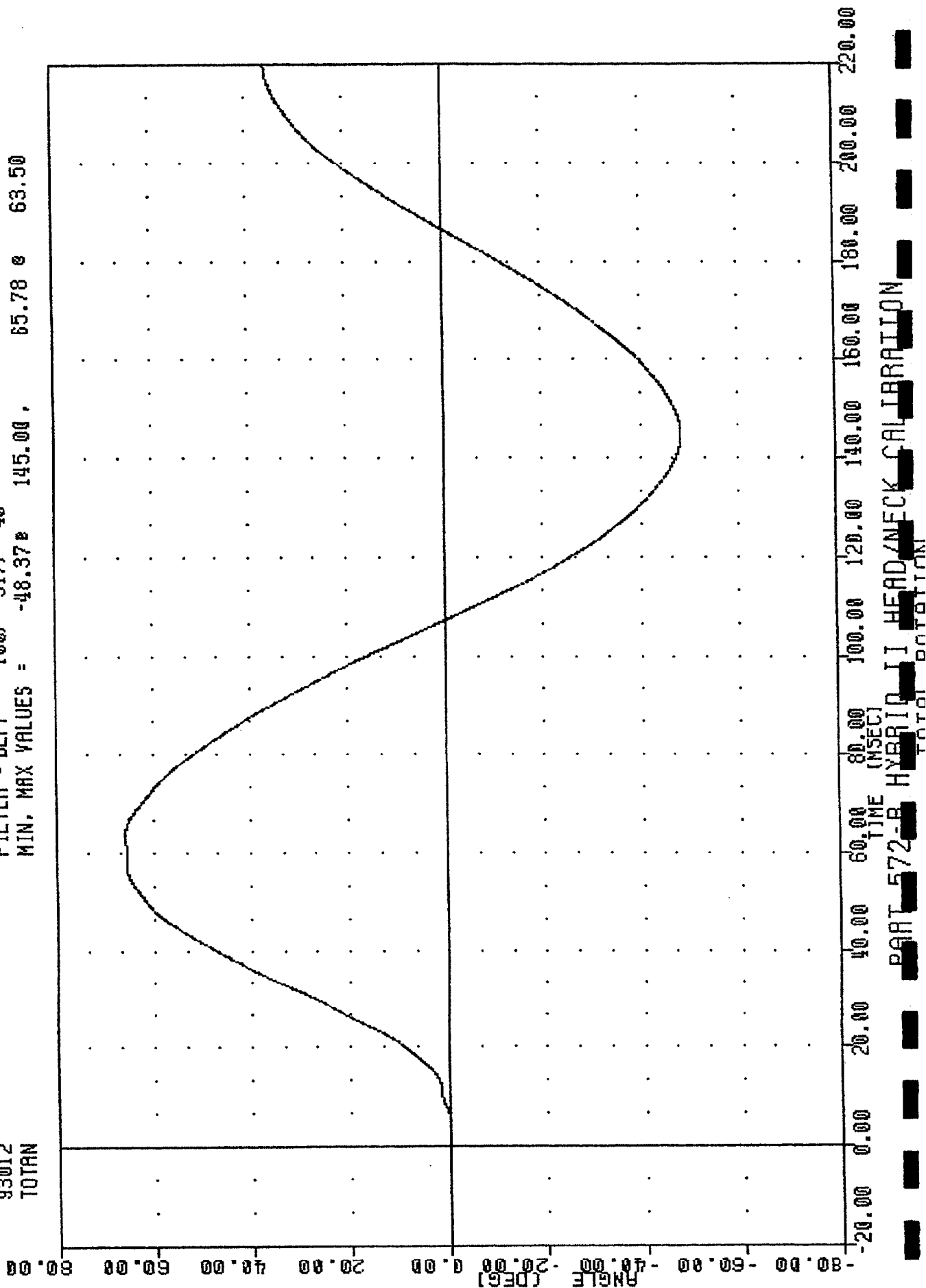
, HM82632

FILTER = BLPF 100/ 317/ -40
MIN. MAX VALUES = -13.57 146.25 16.31 e 65.25



TRC , HN82632
 572B SN 826 HEAD/NECK CAL 32
 93012
 TOTAL

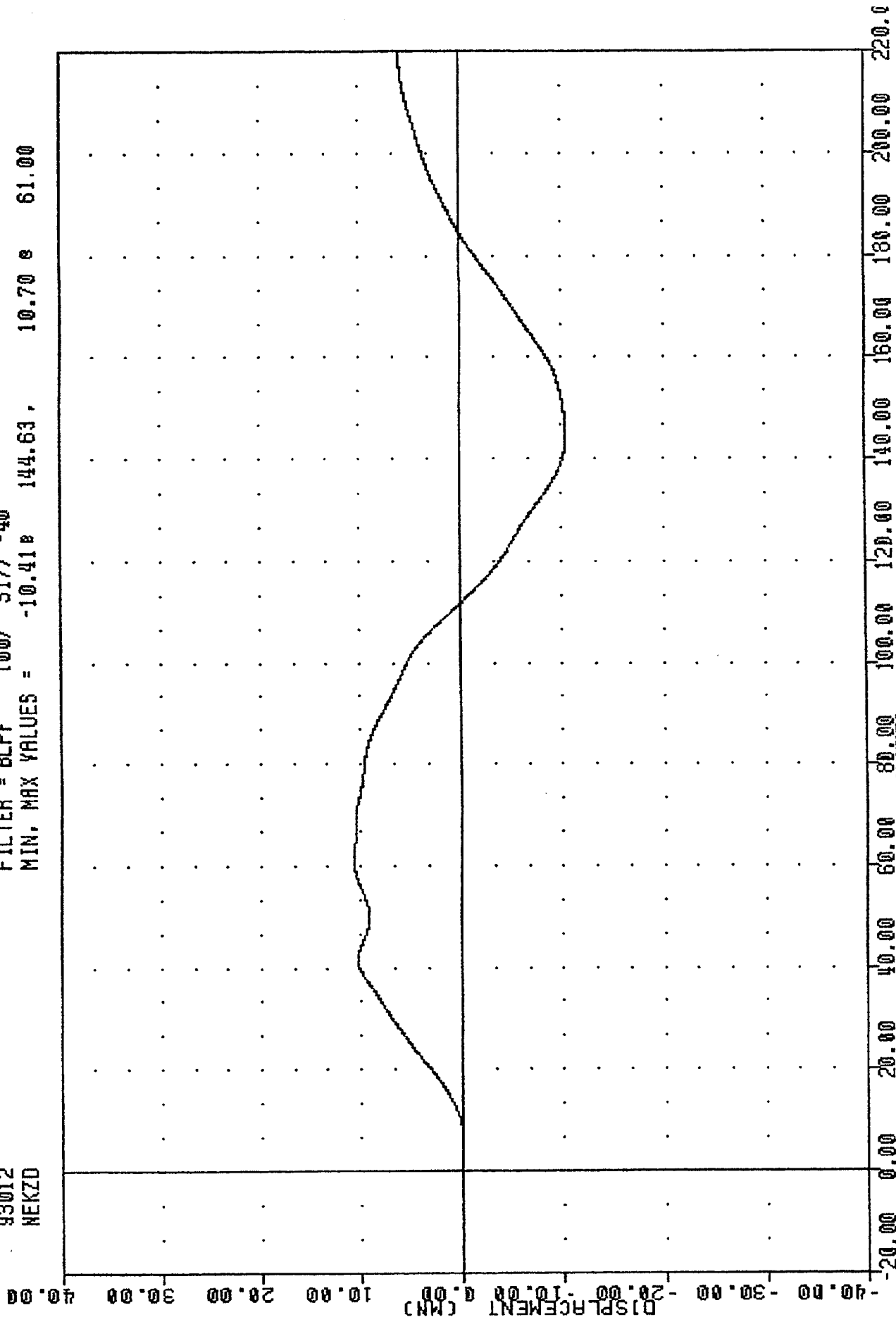
FILTER = BLPF 100/ 317/ -40
 MIN, MAX VALUES = -48.37 145.00 , 65.78 63.50



TRC
5728 SN 826 HEAD/NECK CAL 32
93012
NEKZD

HW82632

FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -10.41e 144.63, 10.70 e 61.00



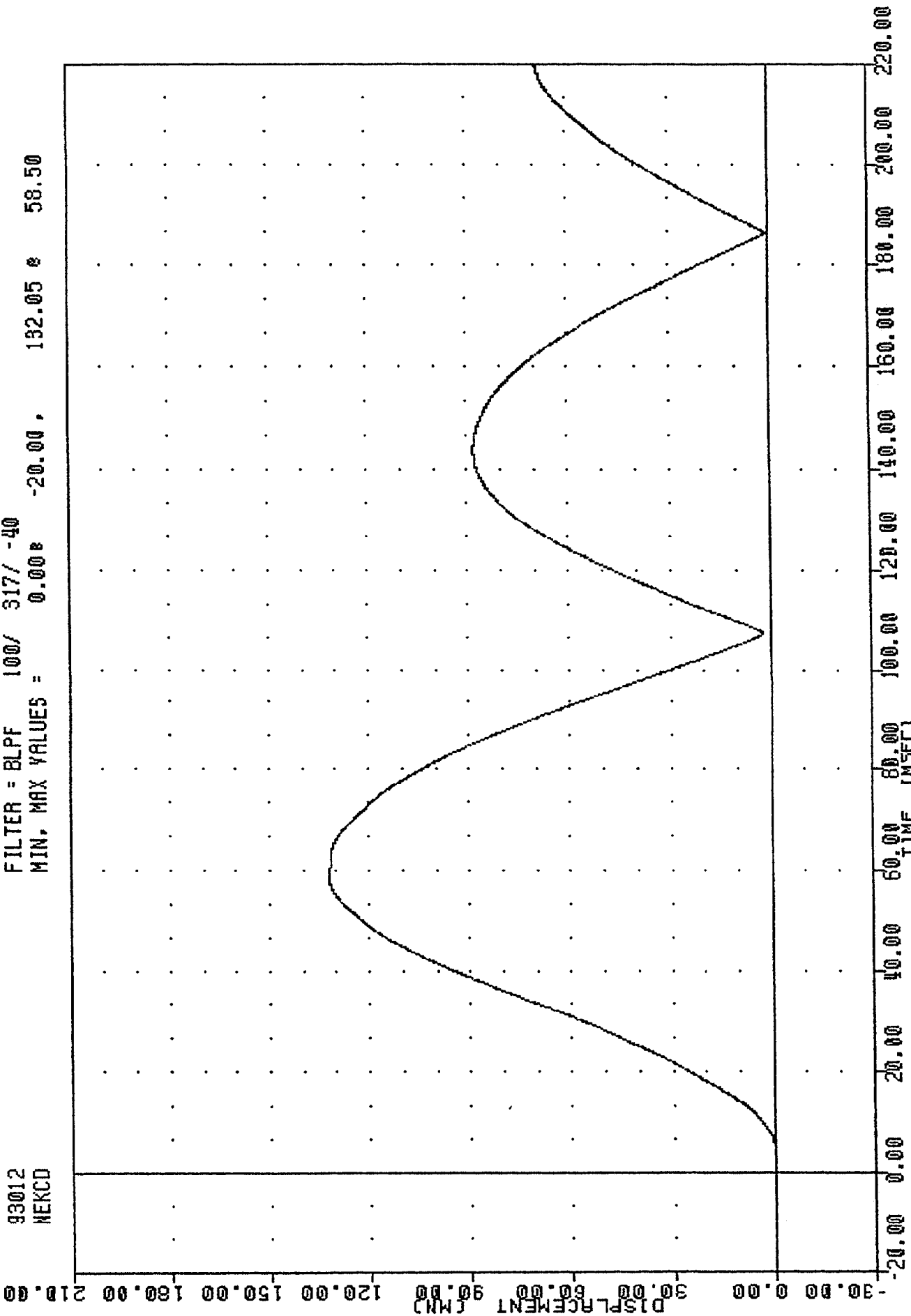
C-53

930127

PART 572-B HYBRID II HEAD/NECK CALIBRATION

TRC , HN82632
 572B SN 026 HEAD/NECK CRL 32
 93012
 HEKCD

FILTER = BLPF 100/ 317/ -40
 MIN, MAX VALUES = 0.008 -20.00, 132.05 58.50



PART 572-B HYBRID II HEAD/NECK CALIBRATION

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B

13-JAN-93

TRC

TL82632

572B SN 826 L.S.THORAX CAL 32

TEST PARAMETER	LOW SPEED TEST	
	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
PENDULUM VELOCITY	4.22 - 4.31 M/SEC	4.28 M/SEC
PEAK STERNUM DEFLECTION	28 MM MAX.	23.80 MM
PEAK RESISTIVE FORCE	6450. N MAX.	5778. N
INTERNAL HYSTERESIS	50 - 70 %	69.9 %

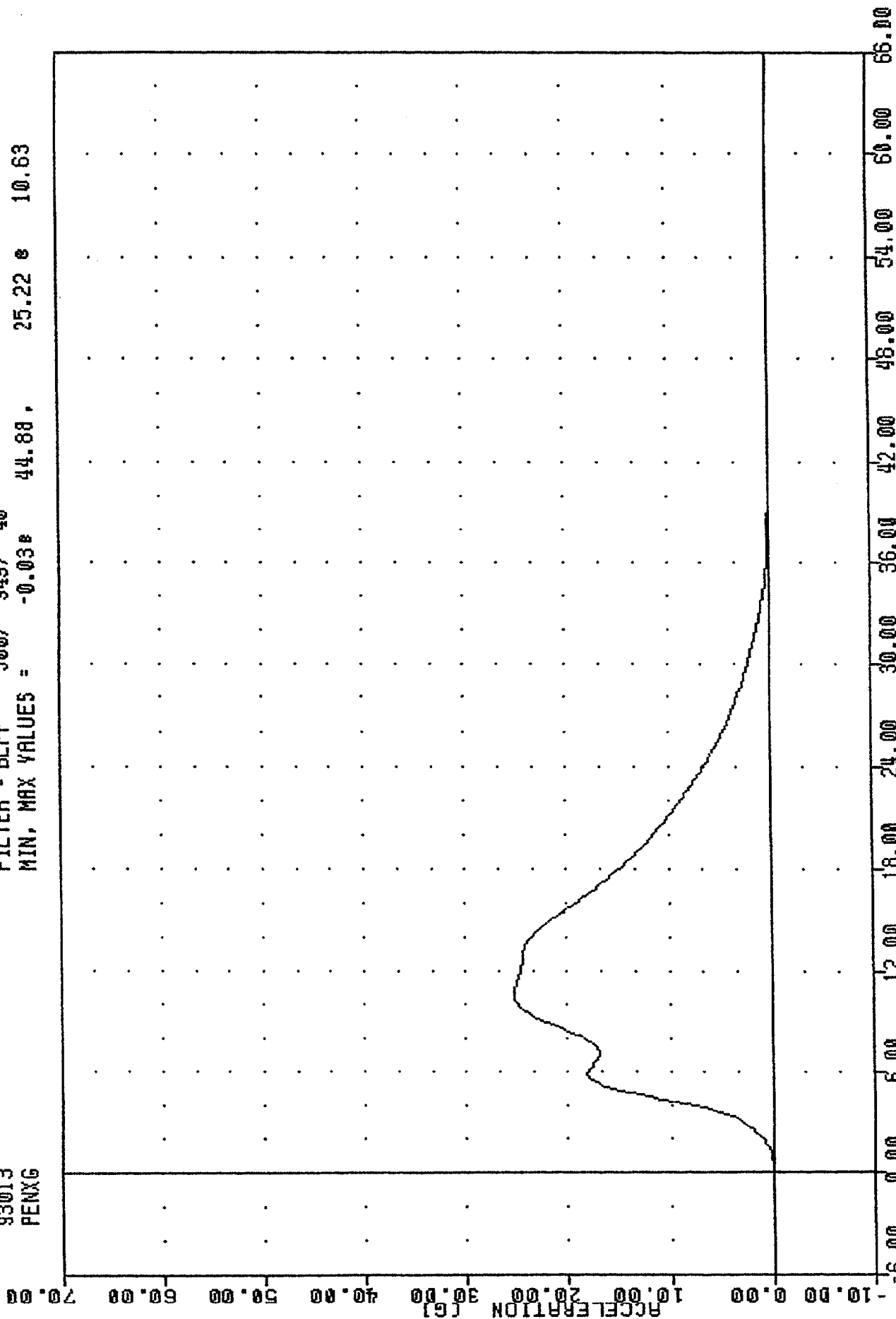
SCD: 53.34 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Fort

TRC
572B SN 026 L.S.THORAX CAL 32
93013
PENXG

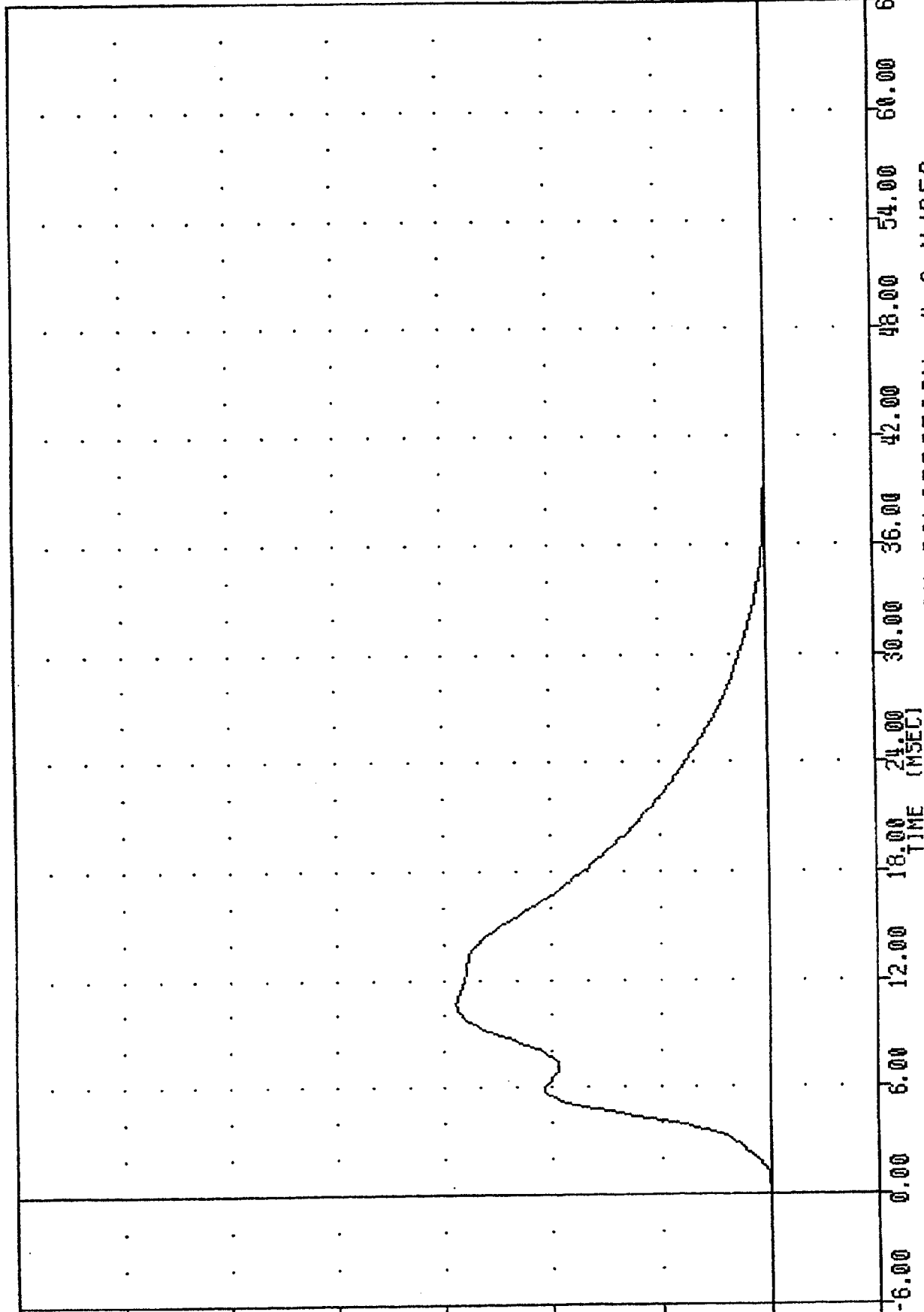
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.038 44.88, 25.22 10.63



TRC , TL82632
 5728 SN 826 L.S.THORAX CAL 32
 93013
 PENXF

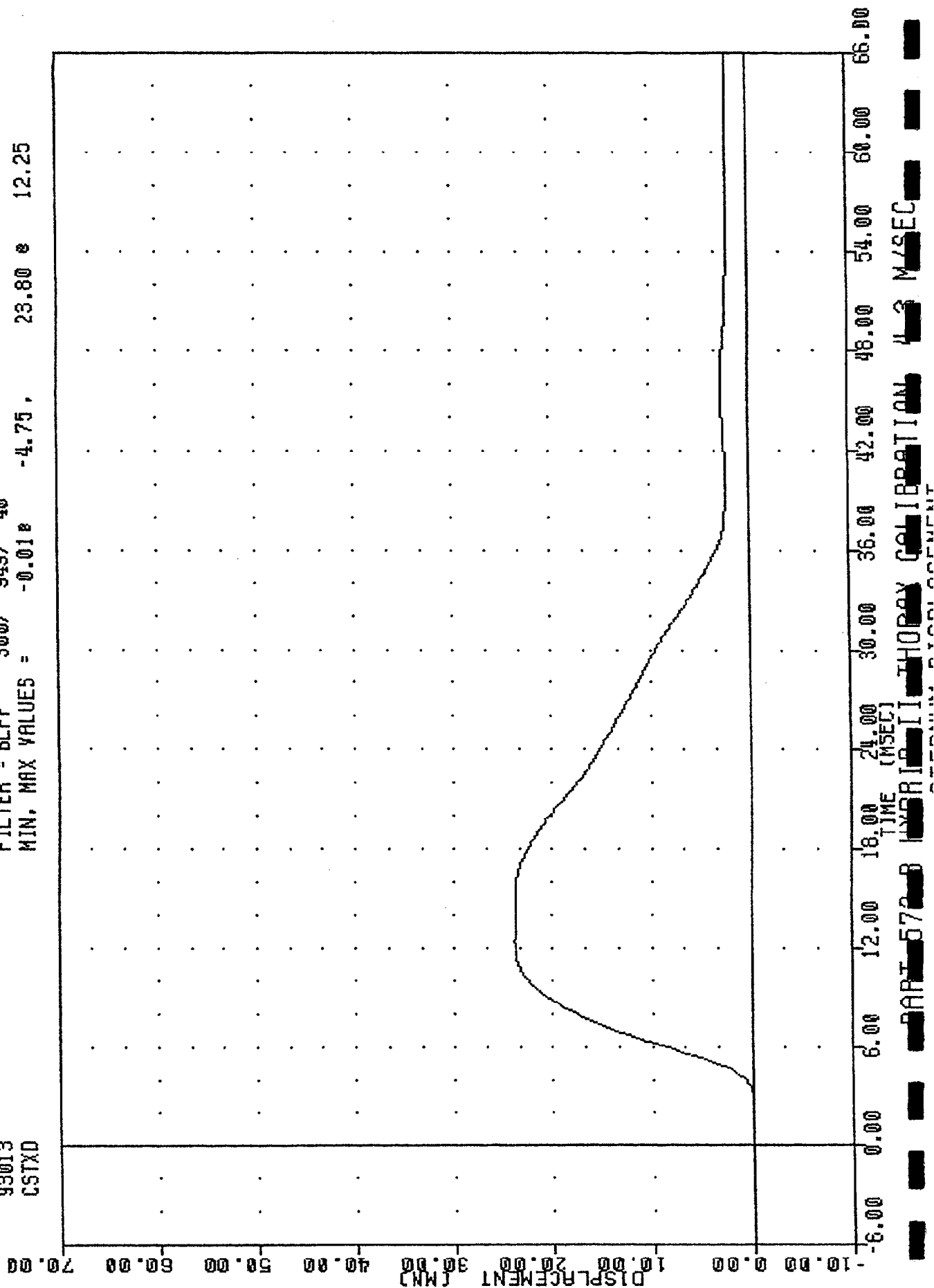
FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 44.89, 5778.20 e 10.63

FORCE (N) (X10²)



TRC , TL82632
 5720 SN 026 L.S.THORAX CAL 32
 93013
 CSTXD

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -0.018 -4.75, 23.80 12.25



TRC
 CSTXD
 PENXF

TL82632
 FILTER = BLPF
 FILTER = BLPF

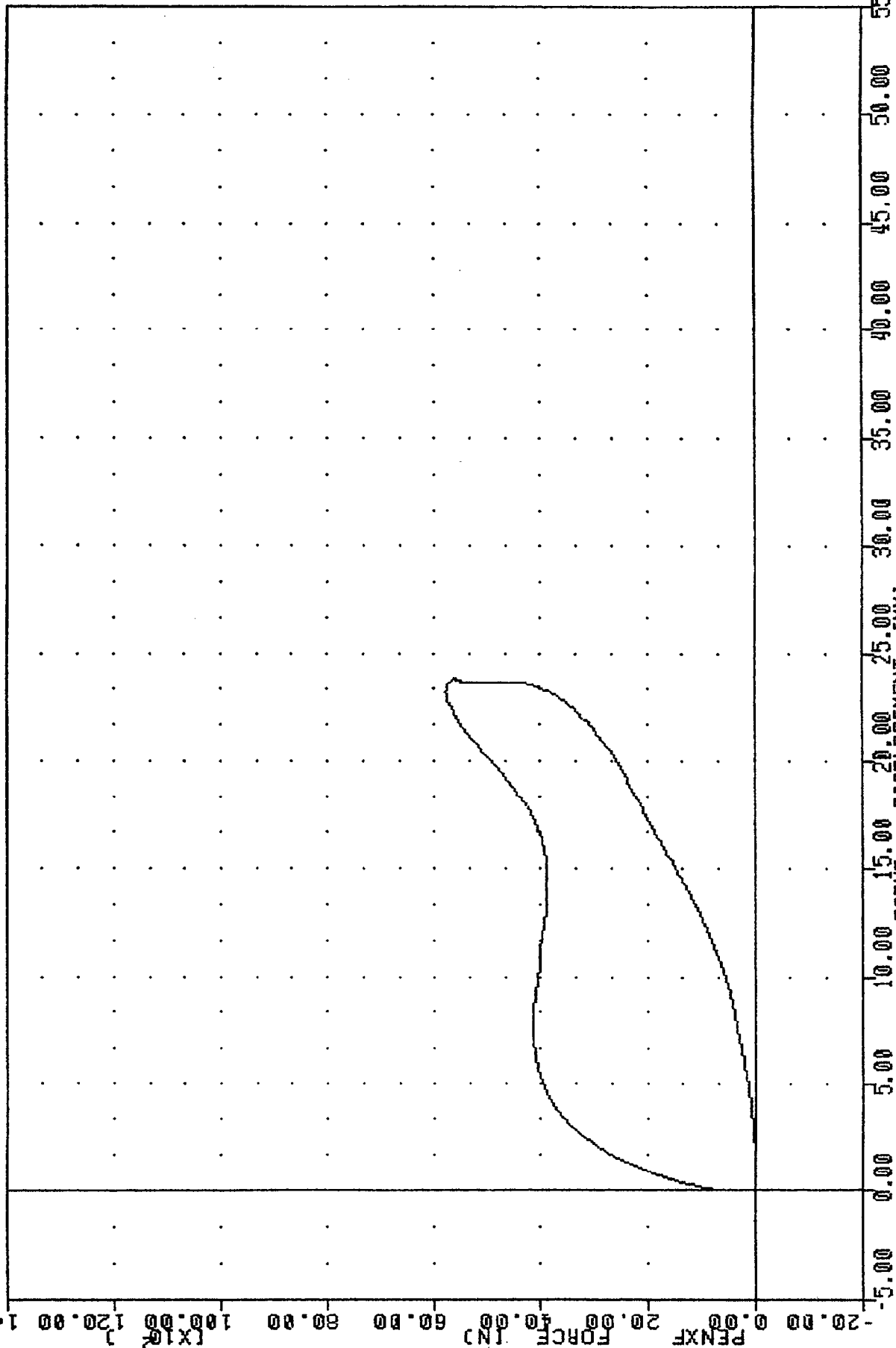
572B SN 826 L.S. THORAX CAL 32
 300/ 949/ -40 MIN. MAX =
 300/ 949/ -40 MIN. MAX =

93013
 -0.01 e
 -6.20 e

-4.75 ,
 44.88 ,

23.80 e
 5778.20 e

12.25
 10.53



TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B

13-JAN-93

TRC

TH82632

572B SN 826 H.S. THORAX CAL 32

HIGH SPEED TEST		
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
PENDULUM VELOCITY	6.64 - 6.77 M/SEC	6.68 M/SEC
PEAK STERNUM DEFLECTION	43 MM MAX.	35.99 MM
PEAK RESISTIVE FORCE	10009. N MAX.	9129. N
INTERNAL HYSTERESIS	50 - 70 %	69.0 %

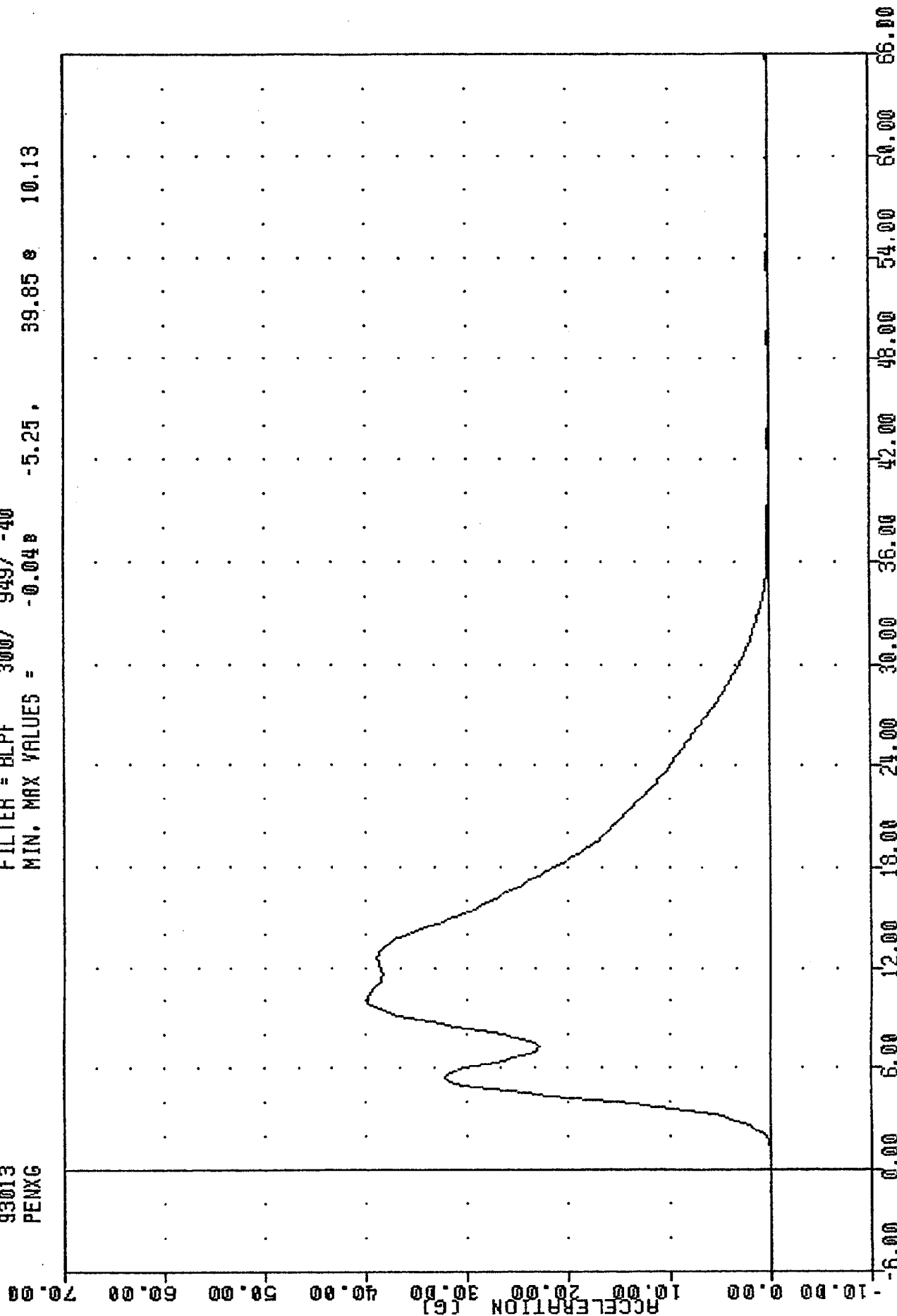
SCD: 53.34 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Pete Font*

TRC
572B SN 828 H.S.THORAX CAL 32
93013
PENXG

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.048 -5.25, 39.85 10.13



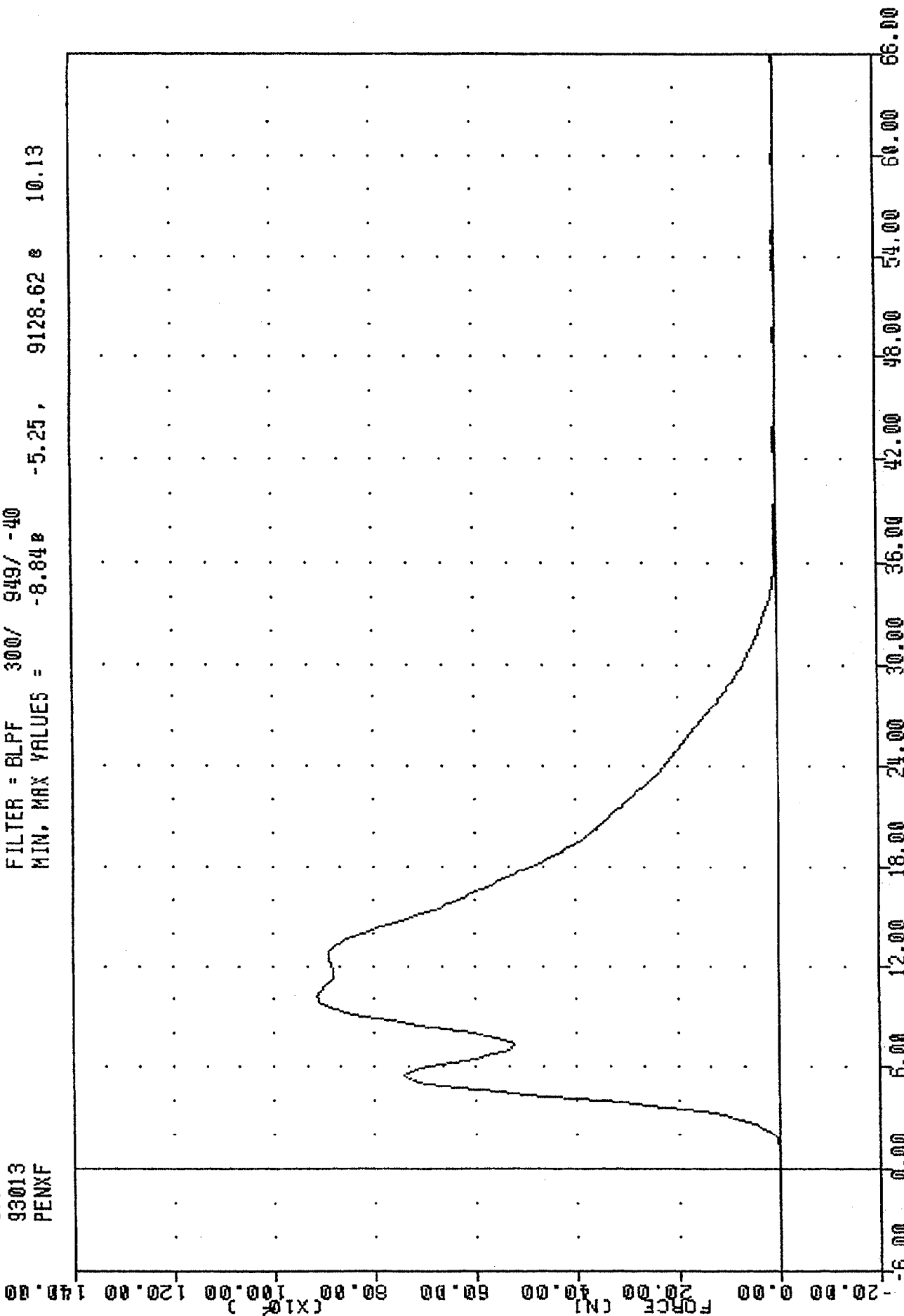
C-61

930127

PART 572-B HYBRID II THORAX CALIBRATION 6.7 M/SEC
DYNAMIC CALIBRATION

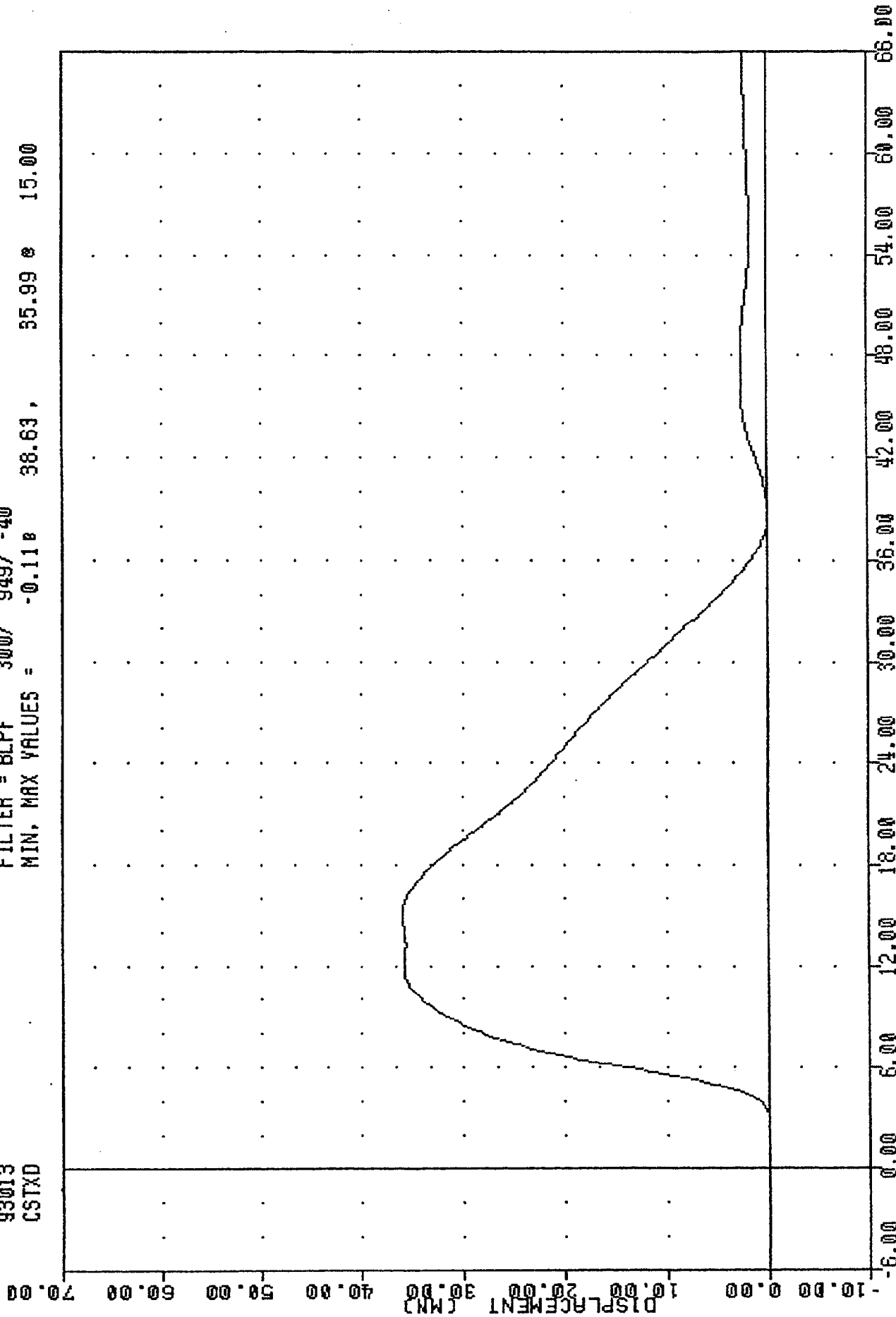
TRC , TH82632
 572B SN 026 H.S.THORAX CAL 32
 93013
 PENXF

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -8.848 -5.25, 9128.62 10.13



TRC , TH82632
 572B SN 826 H.S.THORAX CAL 32
 93013
 CSTXD

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.118 38.63, 35.99 @ 15.00



PART 572-B HYBRID II THORAX CALIBRATION 6.7 M/SEC
 CTEDNIM RTCDI OCMENT

TRC
CSTXD
PENXF

572B SM 826 H. S. THORAX CAL 32 93013
300/ 949/ -40 MIN. MAX = -0.11 B
300/ 949/ -40 MIN. MAX = -8.84 B

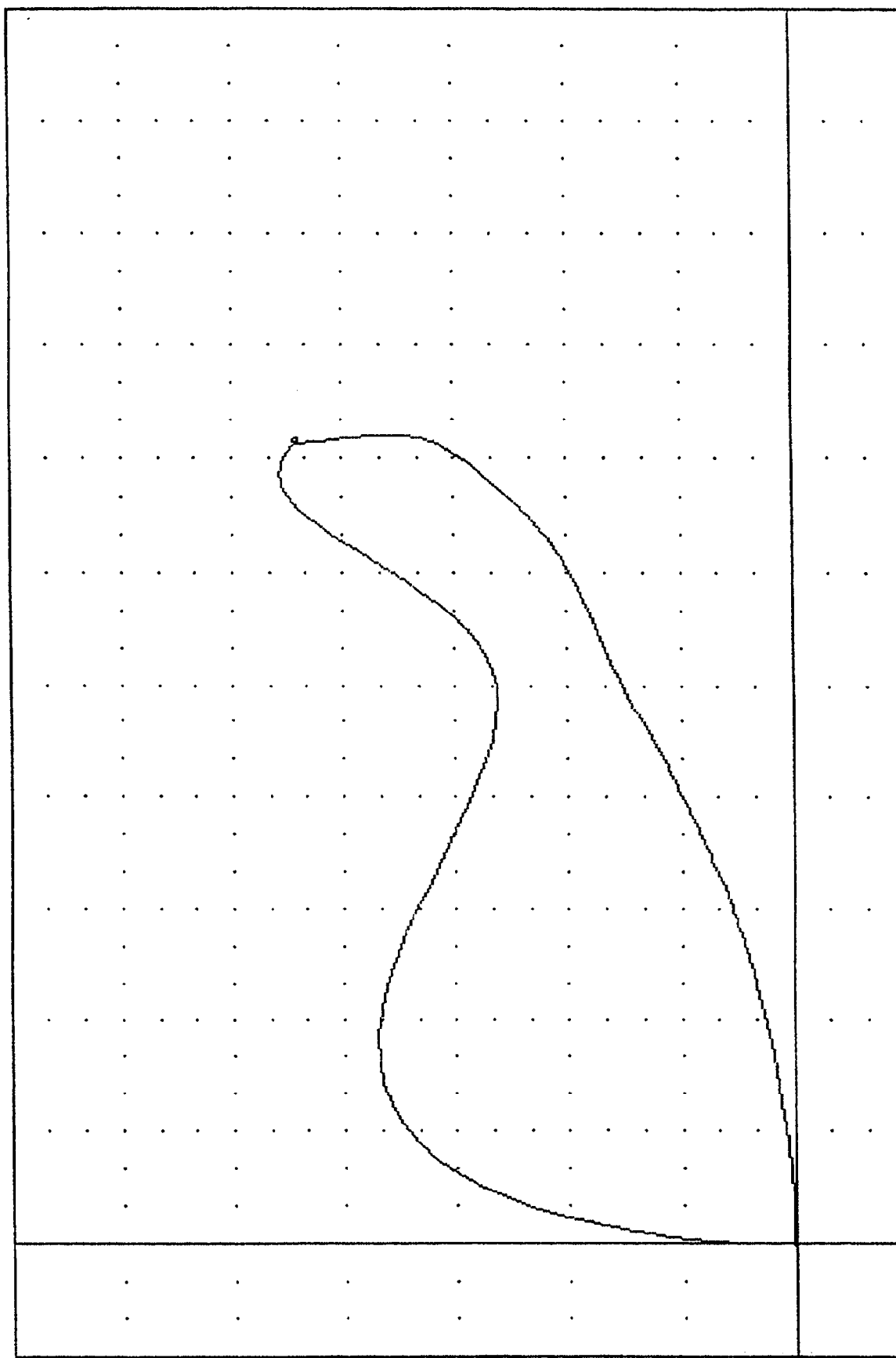
38.63
-5.25

35.99
0128.62

15.00
10.13

(X10³)
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
-60.00
-80.00
-100.00
-120.00
-140.00

FORCE (N)



-5.00 0.00 5.00 10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00 50.00 55.00

DISPLACEMENT (MM)

TRANSPORTATION RESEARCH CENTER INC.

ABDOMEN COMPRESSION TEST

PART 572B

12-JAN-93

TRC

AB82632

572B SN 826 ABDOM COMPR CAL 32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
FORCE AT 0.00 MM DISP.	44.48 N	44.48 N
FORCE AT 12.7 MM DISP.	102.30 - 160.13 N	125.23 N
FORCE AT 19.1 MM DISP.	160.13 - 222.40 N	180.31 N
FORCE AT 25.4 MM DISP.	222.40 - 280.22 N	247.53 N
FORCE AT 33.0 MM DISP.	324.70 - 391.42 N	347.42 N

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Fort

TAC
ABXD
ABXF

AB82632
FILTER = ALPF
FILTER = ALPF

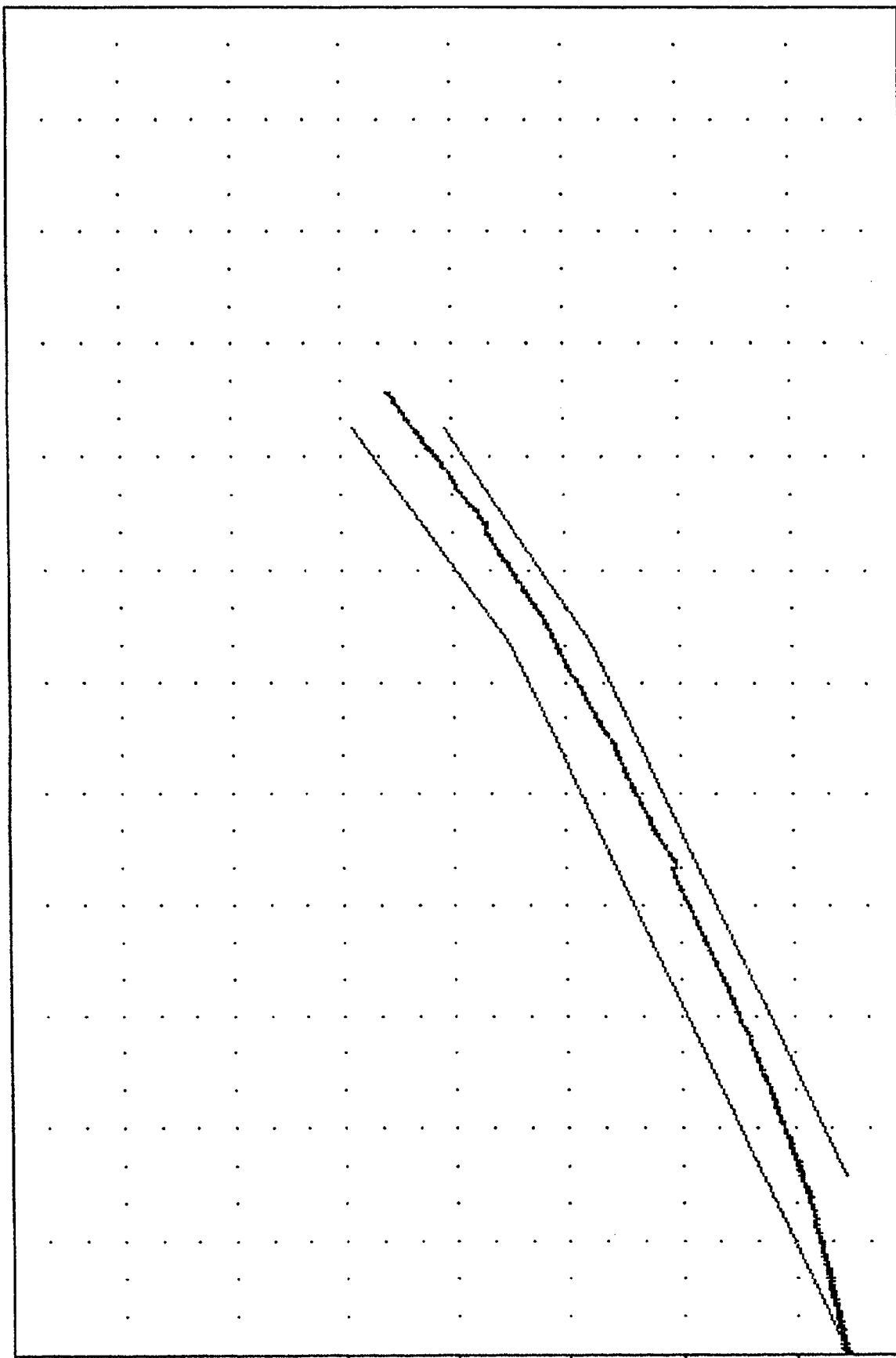
572B SN 826 ABDOM COMP CAL 32
1650/ 5214/ -40 MIN, MAX =
1650/ 5214/ -40 MIN, MAX =

93012
-0.01
42.32

0.00
0.04
34.30
368.15
367.21
34.29

0.00 4.00 8.00 12.00 16.00 20.00 24.00 28.00 32.00 36.00 40.00 44.00 48.00

0.00 80.00 160.00 240.00 320.00 400.00 480.00 560.00 640.00



TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

PART 572B

12-JAN-93

TRC

LF82632

572B SN826 LUMBAR FLEX CAL32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	43 %
FORCE AT 0 DEG FLEXION	-26.69 - +26.69 N	0.00 N
FORCE AT 20 DEG FLEXION	97.86 - 151.24 N	106.75 N
FORCE AT 30 DEG FLEXION	151.24 - 204.62 N	160.13 N
FORCE AT 40 DEG FLEXION	204.62 - 258.00 N	213.50 N
NET RETURN ANGLE	< 12 DEG	4.35 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Fount

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

PART 572B

21-JAN-93

TRC

RKB2632

572B SN B26 R.KNEE IMP CAL 32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	22.0 C
RELATIVE HUMIDITY	10 - 70 %	52 %
PENDULUM VELOCITY	2.06 - 2.15 M/SEC	2.12 M/SEC
PEAK KNEE IMPACT FORCE	8229 - 11121 N	9153.59 N
DURATION ABOVE 4448 N	≥ 1.7 MS	2.00 MS

DUMMY MEETS SPECIFICATIONS

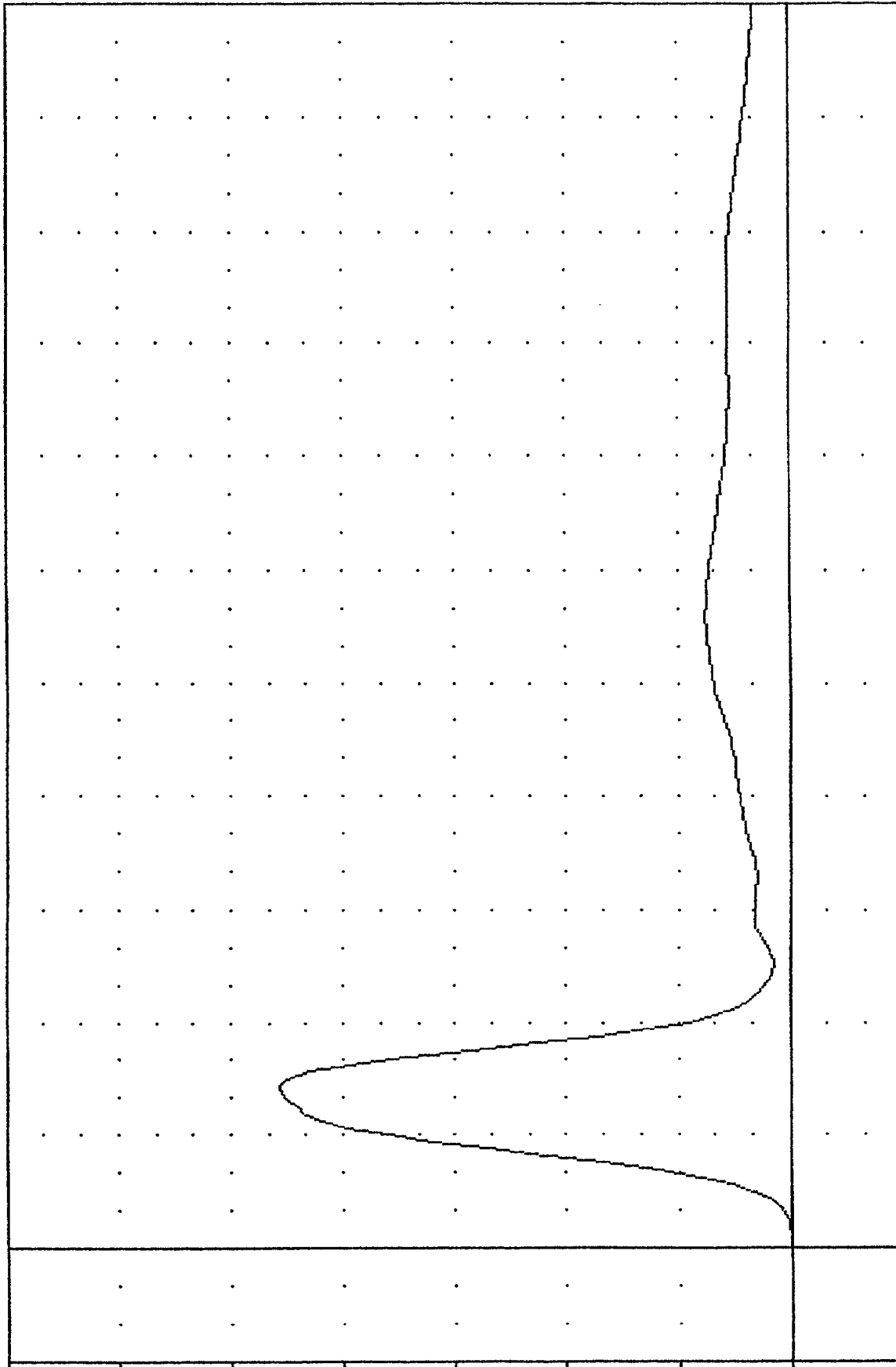
TECHNICIAN

Chas Middleton

TRC , RK82632
 5728 SN 826 R.KNEE INP CAL 32
 93021
 RFMF

FILTER = BLPF 1000/ 3162/ -40
 MIN, MAX VALUES = -1.288 -2.00, 9153.59 2.88

FORCE (N) (X10²)



TIME (MSEC)

PART 572-B HYBRID II RIGHT KNEE CALIBRATION
 STOUT FFMID FORCE

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

PART 572B

21-JAN-93

TRC

LK82632

572B SN 826 L. KNEE IMP CAL 32

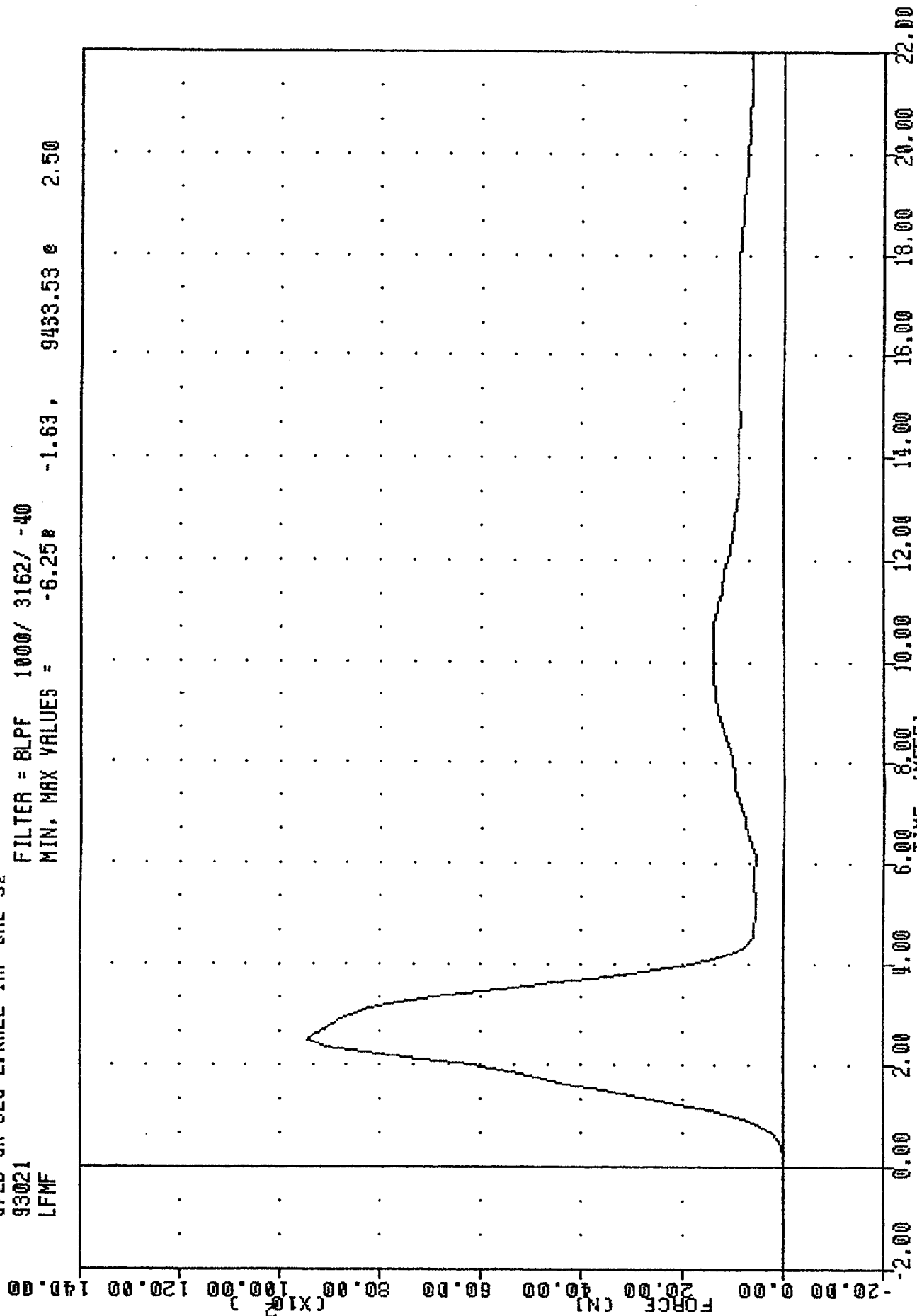
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	22.0 C
RELATIVE HUMIDITY	10 - 70 %	52 %
PENDULUM VELOCITY	2.06 - 2.15 M/SEC	2.13 M/SEC
PEAK KNEE IMPACT FORCE	8229 - 11121 N	9433.53 N
DURATION ABOVE 4448 N	>=1.7 MS	1.97 MS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chris. Middleton

TRC , LK82632
 572B SN 826 L.KNEE INP CAL 32
 93021
 LFMF

FILTER = BLPF 1000/ 3162/ -40
 MIN, MAX VALUES = -6.25e -1.63, 9433.53 e 2.50



PART 572-B HYBRID II LEFT KNEE CALIBRATION
 LEFT FEMUR FORCE

APPENDIX D

MISCELLANEOUS TEST INFORMATION

DUMMY INSTRUMENT CALIBRATIONS

DRIVER DUMMY #713

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCEL.	CW96H	7264	ENDEVCO	01/11/93	07/11/93
Y-AXIS ACCEL.	DK71J	7264	ENDEVCO	01/11/93	07/11/93
Z-AXIS ACCEL.	CR78H	7264	ENDEVCO	01/11/93	07/11/93
CHEST X-AXIS ACCEL.	CC71H	7264	ENDEVCO	01/11/93	07/11/93
Y-AXIS ACCEL.	CY32H	7264	ENDEVCO	01/11/93	07/11/93
Z-AXIS ACCEL.	CG13H	7264	ENDEVCO	01/11/93	07/11/93
LEFT FEMUR FORCE LOAD CELL	901	2430	GSE	01/11/93	07/11/93
RIGHT FEMUR FORCE LOAD CELL	902	2430	GSE	01/11/93	07/11/93
*NECK X-AXIS FORCE LOAD CELL	NA				
Y-AXIS FORCE LOAD CELL	NA				
Z-AXIS FORCE LOAD CELL	NA				
*NECK MOMENT ABOUT X-AXIS LOAD CELL	NA				
MOMENT ABOUT Y-AXIS LOAD CELL	NA				
MOMENT ABOUT Z-AXIS LOAD CELL	NA				
*CHEST DEFLECTION POTENTIOMETER	NA				
LAP BELT FORCE LOAD CELL	616	3419	LEBOW	10/06/92	04/06/93
SHOULDER BELT FORCE LOAD CELL	615	3419	LEBOW	10/06/92	04/06/93
SHOULDER BELT SPOOL-OUT POTENTIOMETER	A12889	PT-101-40A	CELESCO	10/28/92	04/28/93
SHOULDER BELT STRETCH POTENTIOMETER	2690	2051414101	BOURNES	10/28/92	04/28/93

*HYBRID III USE ONLY.

DUMMY INSTRUMENT CALIBRATIONS

PASSENGER DUMMY #826

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCEL.	CL95H	7264	ENDEVCO	01/11/93	07/11/93
Y-AXIS ACCEL.	DW12JC	7264	ENDEVCO	01/11/93	07/11/93
Z-AXIS ACCEL.	CC11H	7264	ENDEVCO	01/11/93	07/11/93
CHEST X-AXIS ACCEL.	DB74H	7264	ENDEVCO	01/11/93	07/11/93
Y-AXIS ACCEL.	CY31H	7264	ENDEVCO	01/11/93	07/11/93
Z-AXIS ACCEL.	CH67H	7264	ENDEVCO	01/11/93	07/11/93
LEFT FEMUR FORCE LOAD CELL	880	2430	GSE	01/11/93	07/11/93
RIGHT FEMUR FORCE LOAD CELL	898	2430	GSE	01/11/93	07/11/93
*NECK X-AXIS FORCE LOAD CELL	NA				
Y-AXIS FORCE LOAD CELL	NA				
X-AXIS FORCE LOAD CELL	NA				
*NECK MOMENT ABOUT X-AXIS LOAD CELL	NA				
MOMENT ABOUT Y-AXIS LOAD CELL	NA				
MOMENT ABOUT Z-AXIS LOAD CELL	NA				
*CHEST DEFLECTION POTENTIOMETER	NA				
LAP BELT FORCE LOAD CELL	127	3419	LEBOW	10/06/92	04/06/93
SHOULDER BELT FORCE LOAD CELL	571	3419	LEBOW	10/06/92	04/06/93
SHOULDER BELT SPOOL-OUT POTENTIOMETER	0586136	PT-101-40A	CELESCO	10/28/92	04/28/93
SHOULDER BELT STRETCH POTENTIOMETER	1291	2051414101	BOURNES	10/28/92	04/28/93

*HYBRID III USE ONLY.

VEHICLE AND CALIBRATION LABORATORY INSTRUMENT CALIBRATIONS

VEHICLE ACCELEROMETERS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
LEFT REAR SEAT CROSSMEMBER X-AXIS	CK87H	7264	ENDEVCO	11/20/92	05/20/93
LEFT REAR SEAT CROSSMEMBER X-AXIS REDUN	CN83H	7264	ENDEVCO	11/20/92	05/20/93
RIGHT REAR SEAT CROSSMEMBER X-AXIS	BY03H	7264	ENDEVCO	11/20/92	05/20/93
RIGHT REAR SEAT CROSSMEMBER X-AXIS REDUN	CL83H	7264	ENDEVCO	08/21/92	02/21/93
ENGINE TOP X-AXIS	CE72H	7264	ENDEVCO	11/20/92	05/20/93
ENGINE BOTTOM X-AXIS	BY74H	7264	ENDEVCO	11/20/92	05/20/93
RIGHT BRAKE CALIPER X-AXIS	DA06H	7264	ENDEVCO	11/20/92	05/20/93
LEFT BRAKE CALIPER X-AXIS	CL60H	7264	ENDEVCO	11/20/92	05/20/93
INSTRUMENT PANEL CENTER X-AXIS	BW77J	7264	ENDEVCO	11/23/92	05/23/93

CALIBRATION LABORATORY INSTRUMENTS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
NECK BENDING PENDULUM ACCEL.	CC44	7232	ENDEVCO	10/06/92	04/06/93
NECK BENDING ROTARY POTENTIOMETER	NA	35435-1-102	BOURNES	MFR. SPECIFICATION	
NECK BENDING LINEAR POTENTIOMETER	NA	5184-2051846003	BOURNES	10/06/92	04/06/93
THORAX/HYBRID II FEMUR PEND. ACCEL.	CC64	7232	ENDEVCO	10/06/92	04/06/93
LUMBAR FLEXION FORCE GAUGE	NA	DPPH-50	CHATILLON	05/03/89	REPAIRED
LUMBAR FLEXION ROTATION GAUGE	CP17-0601-1	7020	HUMPHREY	MFR. SPECIFICATION	
ABDOMEN COMPRESSION DISPL. GAUGE	4075-172	80294-2051941504	BOURNES	10/06/92	04/06/93
ABDOMEN COMPRESSION FORCE GAUGE	1261	3167	LEBOW	10/06/92	04/06/93
HYBRID III FEMUR PEND. ACCEL.	CG83	7232	ENDEVCO	10/06/92	04/06/93

SIGN CONVENTION
NHTSA DATA TAPE REFERENCE GUIDE

ACCELEROMETERS:

+X: FORWARD
+Y: LEFTWARD
+Z: UPWARD

POTENTIOMETERS:

+CHEST LONGITUDINAL DEFLECTION: OUTWARD
+CHEST LATERAL DEFLECTION: LEFTWARD
+SEAT BELT DISPLACEMENT: OUTWARD
+SEAT BELT EXTENSION: ELONGATION
+KNEE SLIDER DISPLACEMENT: DISTANCE BETWEEN FEMUR
AND TIBIA INCREASED
(IN RELATION TO A
SEATED DUMMY)

LOAD CELLS:

+FEMUR FORCE: TENSION
+SEAT BELT FORCE: TENSION
+BARRIER FORCE: TENSION

NECK LOAD CELLS:

+X FORCE: HEAD PUSHED FORWARD
+Y FORCE: HEAD PUSHED LEFTWARD
+Z FORCE: HEAD PULLED UPWARD (TENSION ON NECK)
+X MOMENT: RIGHT EAR ROTATING TOWARD RIGHT SHOULDER
+Y MOMENT: CHIN ROTATING TOWARD CHEST
+Z MOMENT: CHIN ROTATING TOWARD LEFT SHOULDER

TIBIA LOAD CELLS:

+X FORCE: TENSION
+Y FORCE: TENSION
+Z FORCE: TENSION
+X MOMENT: BOTTOM OF TIBIA MOVING LEFTWARD
+Y MOMENT: BOTTOM OF TIBIA MOVING REARWARD

FREQUENCY RESPONSE CLASSES

SAE J211 OCT88

TYPICAL TEST MEASUREMENTS

CHANNEL CLASS

Vehicle Structural Accelerations for use in:

Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180

Barrier Face Forces 60

Belt Restraint System Loads 60

Anthropomorphic Test Device

Head accelerations (linear and angular) 1000

Neck

Forces 1000

Moments 600

Thorax

Spine accelerations 180

Rib accelerations 1000

Sternum accelerations 1000

Deflections 180

Lumbar

Forces 1000

Moments 1000

Pelvis

Accelerations 1000

Forces 1000

Moments 1000

Femur/Knee/Tibia/Ankle

Forces 600

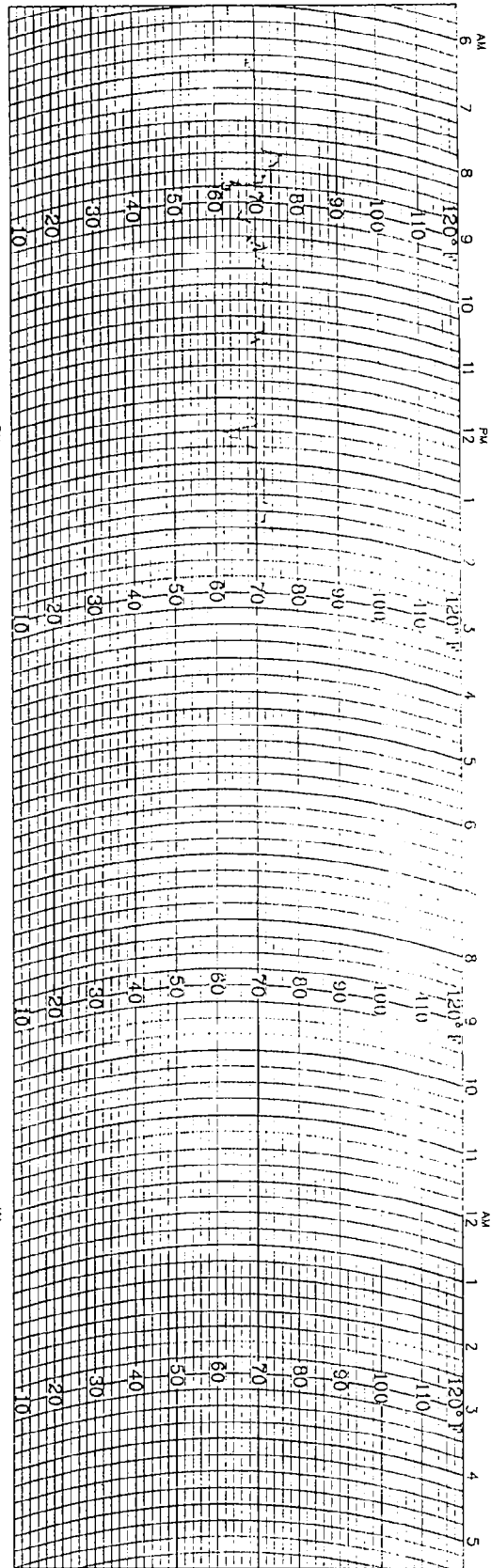
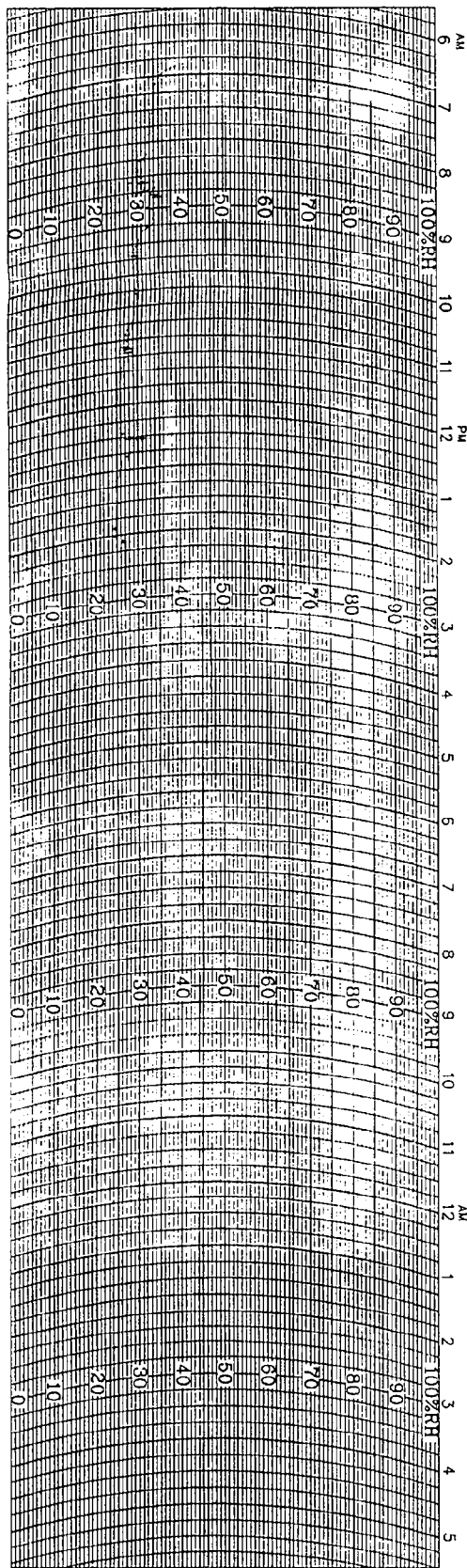
Moments 600

Displacements 180

Sled Accelerations 60

Steering Column Loads 600

Headform Accelerations 1000



Weather Measure
WEATHERtronics
 Division of QUALMETRICS, Inc.

P.O. BOX 41039
 SACRAMENTO, CA 95841
 PHONE: (916) 923-0055

HYGROTHERMOGRAPH
1 DAY

CHART NO. M699123
 C311-0-HF
 ECN 2717
 6-9-87

STATION _____ DATE ON _____ DATE OFF _____

APPENDIX E

RESTRAINT SYSTEM INSTRUCTIONS FROM OWNER'S MANUAL

CONTROLS AND EQUIPMENT

SAFETY BELTS

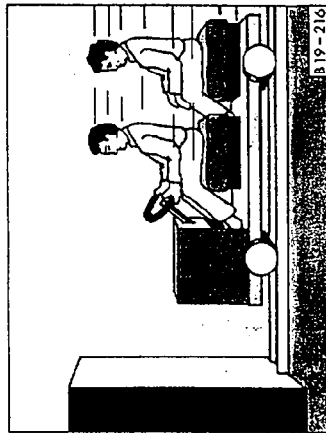


Always wear your safety belts!

WARNING
Safety belts have been shown to be the single most effective means available for reducing the potential for serious injury and death in automobile accidents. Therefore, for your own protection as well as that of your passengers, always properly wear safety belts when the vehicle is in motion.
Pregnant women injured or physically impaired persons should also use safety belts. Like all vehicle occupants, they are more likely to be seriously injured if they do not wear safety belts. The best way to protect the fetus is to protect the mother.

Why safety belts work and how to wear them properly is explained in this chapter. Read all the information given and always observe the following instructions and warnings pertaining to the use of the safety belts installed in your vehicle.

For information on child safety see page 25.



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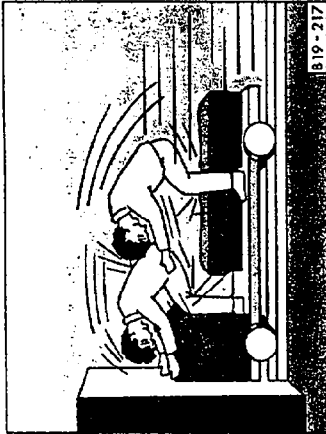
Why safety belts work

Safety belts can't work unless they are worn and worn properly.

The illustration above shows the passengers on a "vehicle" which is headed for a brick wall. They are not using safety belts.

The physical principles involved are simple. Both the vehicle and the passengers possess energy which varies with vehicle speed and body weight. Engineers call this energy "kinetic energy."

The higher the speed of the vehicle and the greater the passenger's weight, the more kinetic energy there is and the more energy which must be "absorbed" in an accident.



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Vehicle speed is, however, the most significant factor. If the speed doubles from 15 to 30 mph (25 to 50 km/h), for example, the kinetic energy increases 4 times!

Because these passengers are not using safety belts, their kinetic energy remains unchanged. They will keep moving at the same speed the vehicle was moving just before the crash, until something gets in the way, here, the wall.

CONTROLS AND EQUIPMENT



The same physical principles apply to people sitting in a passenger car which is involved in a frontal collision.

Even when driving at city speeds of 20 to 30 mph (30-50 km/h), the forces acting on the body can reach one ton (2000 lb/1000 kg) or more. At greater speeds these forces are even higher.

People who do not use safety belts are also not attached to their car. In a frontal collision they will also continue to move forward at the speed their car was travelling just before the impact.



Unable to resist the tremendous forces arising at impact, they will slam violently into the steering wheel, dashboard, windshield or whatever else is in the way. Their impact with the vehicle interior takes place with all of the kinetic energy they had just before their car crashed. Those who do not use safety belts can also be thrown out of their car where even more severe or fatal injuries can occur.

Nobody is strong enough to overcome the forces of an accident by holding tight or bracing themselves against the dashboard. Safety belts can help to reduce the risk of injury caused by uncontrolled impact with the vehicle and the possibility of ejection.



Passengers sitting in the rear seats who do not use safety belts not only endanger themselves but also front seat passengers. In a frontal collision they will also move forward where they can hit and injure the driver or front seat passenger.

Safety belts protect

Safety belts used properly can make a big difference. Safety belts help to keep passengers in their seats, reduce energy levels applied to the body in an accident gradually and help prevent the uncontrolled movement which can cause serious injuries.

CONTROLS AND EQUIPMENT



Although these examples are based on a frontal collision, safety belts can also substantially reduce the risk of injury in other types of accidents. So, regardless of whether you are on a long trip or just going to the corner store, always buckle up and make sure others do too.

The following pages provide important instructions which will enable you to use safety belts properly. Be sure to read and follow the instructions carefully and heed all warnings.

Safety belts attach passengers to the car and give them the benefit of being slowed down more gently or "softly" through the give in the safety belts, crumple zones and other safety features engineered into today's cars. By reducing the kinetic energy over a longer period of time, the forces on the body become more "tolerable" and less likely to produce injury.

In addition, safety belts reduce the danger of being thrown out of the car.



Belt warning system

Your vehicle has a warning light to remind you to wear your safety belt.

If you do not put on your safety belt after switching on the ignition, the warning light in the instrument cluster will come on along with a warning tone for approximately 6 seconds. **Fasten your safety belt now and make sure that your passengers also properly put on their safety belts.**

CONTROLS AND EQUIPMENT

How to wear safety belts properly

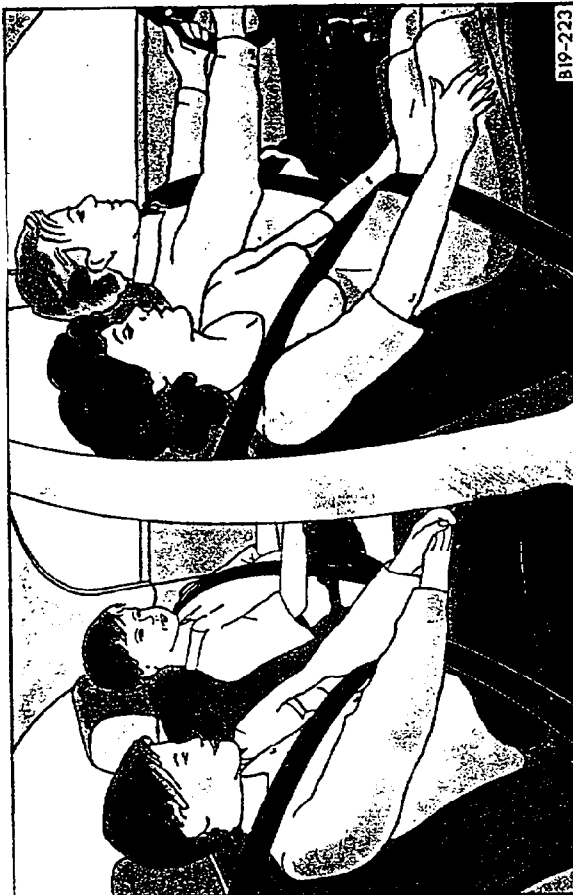
On the previous pages, you have seen how safety belts offer protection in accidents. Accident statistics show that passengers' properly wearing safety belts have a lower risk of being injured and a much better chance of surviving an accident. For this reason, wearing a safety belt is legally required in most countries and in much of the United States.

WARNING

Always fasten your safety belts before driving off. Always make sure your passengers are properly restrained — even those sitting in the rear.

Safety belts can only work when used properly. Always observe the following precautions:

- Never wear belts twisted
- Never strap in more than one person, including small children, with each belt. It is especially dangerous to place a safety belt over a child sitting on your lap.



■ Never wear safety belts in any other way than illustrated and described in this chapter. For instance, do not wear shoulder part of belt under your arm or otherwise out of position. This would increase the risk of serious injury in case of an accident.

- Never place your feet on the instrument panel or on the seat. Always keep both feet on the floor in front of the seat.
- Never wear belts over rigid or breakable objects in or on your clothing, such as eye glasses, pens, keys, etc., as these may cause injury.

CONTROLS AND EQUIPMENT

WARNING continued

- Several layers of heavy clothing may interfere with proper positioning of belts and reduce the overall effectiveness of the system.
- Never allow safety belts to become damaged by being caught in door or seat hardware. Always keep belt buckles free of any obstruction that may prevent secure locking.
- Never use comfort clips or devices which create slack in the shoulder belt portion and can increase the risk of injury in an accident. However, such clips may be required in the proper use of some child restraint systems.
- Inspect your belts periodically. If belts show damage to webbing, bindings, buckles or retractors, they must be replaced.
- The belts must be kept clean as otherwise the retractors may not work properly (see also "Vehicle Care" page 100).

- Safety belts that have been worn and loaded in an accident must be replaced by an authorized Volkswagen dealer.
- Never modify, disassemble, or attempt to repair the safety belts in your vehicle.

Each seating position in your EuroVan has been provided with a safety belt, which must be used for your safety whenever the vehicle is in motion.

Lap-shoulder belt

The front seats and outside seating positions of the rear seat are equipped with a three-point safety belt.

This combination lap-shoulder belt has a locking retractor. The system adjusts automatically to your size and movements as long as the pull on the belt is slow.

Hard braking or a collision locks the belt. The belt will also lock when you drive up or down a steep hill or in a sharp curve.



Fastening the safety belt

- Before fastening the safety belt, first adjust your seat — see page 30.

WARNING

Safety belts only offer optimum protection when the seat backs are upright and belts are properly positioned on the body. Improperly positioned safety belts can cause serious personal injury in an accident.

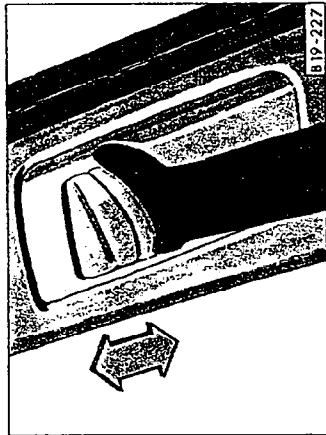
- To fasten, grasp belt tongue and pull belt in continuous slow motion across your chest and lap.

CONTROLS AND EQUIPMENT



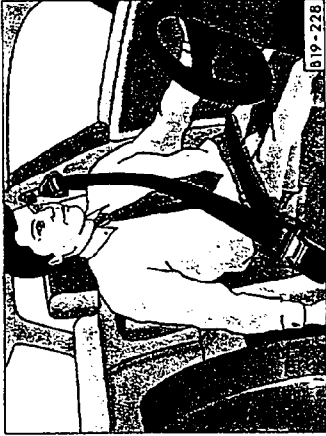
■ Insert belt tongue into buckle on in-board side of seat. Push down until it is securely locked with an audible click. Pull belt to check.

WARNING
Always make certain that the safety belt tongue is inserted into the safety belt buckle associated with the corresponding seat. Attaching the safety belt to the buckle for another seat could reduce safety belt effectiveness and cause injury.



Safety belt height adjusters on the front seats can be used to adjust the height of the shoulder portion of the safety belt.

- Press the handle slowly up or down so that the shoulder portion of the safety belt is positioned nearly midway on the shoulder.
- Pull on the shoulder belt to check whether the belt anchor is securely locked in place.
- The shoulder belt must be positioned over the shoulder — it must never rest



against the neck and must fit against your body. See illustration. The lap belt must be worn low and tight across the pelvis. Pull belt tight if necessary.

WARNING
■ Always position safety belts properly over the body for maximum levels of safety. Improperly positioned safety belts can cause serious personal injury in case of an accident.
■ Safety belts worn too loose will allow too much forward movement of your body in a crash. This will increase the risk of personal injury.

CONTROLS AND EQUIPMENT



WARNING
Pregnant women should, especially, make sure to wear the lap portion of the safety belt as low as possible across the pelvis so that there is no pressure on the abdomen.



Unfastening the safety belt

- Push the orange release button on the buckle. The belt tongue will spring out of the buckle.
- Allow belt to wind up on retractor as you guide belt tongue to its stowed position.



Lap belt

The rear center seating position is equipped with a lap belt.

Lap belt without a retractor

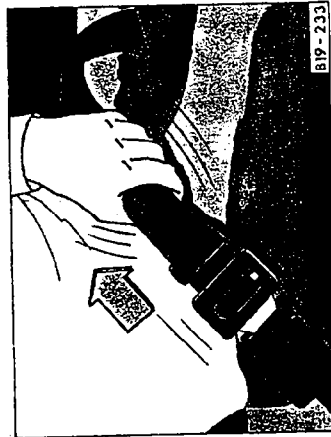
- Pull the belt over the pelvis and insert the tongue into the buckle.

CONTROLS AND EQUIPMENT

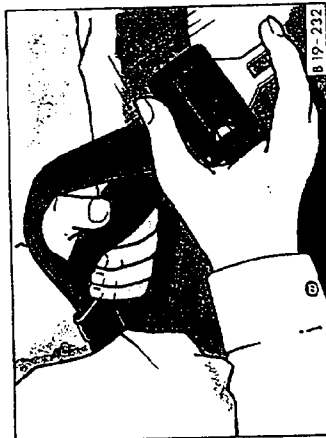
- To unfasten belt, push in the orange release button on buckle.

Note

For safety reasons, keep the belt on top of the seat and fastened together when it is not being used.



- To tighten belt, buckle up and pull at loose end of the belt.



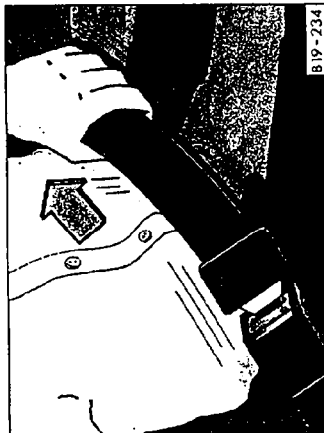
- If the belt length is too short, you can lengthen the belt.

Hold belt tongue at a right angle to the belt and loop out the required portion.

For easy operation, press cap and tongue of buckle together.

WARNING
To reduce the risk of injury in an accident, position the lap belt tight and as low as possible across the pelvis. Pregnant women should especially make sure to wear the lap portion of the safety belt as low as possible across the pelvis so that there is no pressure on the abdomen.

CONTROLS AND EQUIPMENT



Lap belt with retractor*

■ To fasten lap belt, grasp belt tongue and slowly and evenly pull across the pelvis. Insert belt tongue into the respective buckle and push down until it is securely locked with an audible click. Pull belt to check.

Note

If the belt locks up while pulling it out of the retractor, let the belt rewind **completely** and then pull it out again.

Then, make sure the belt is positioned low and tightly across the pelvis. If necessary, pull the belt toward the retractor and let it roll up.

WARNING
To reduce the risk of injury in an accident, position the lap belt tight and as low as possible across the pelvis. Pregnant women should, especially, make sure to wear the lap portion of the safety belt as low as possible across the pelvis so that there is no pressure on the abdomen.

■ To unfasten belt, push in the orange release button on buckle and let the belt roll up.

CONTROLS AND EQUIPMENT

CHILD SAFETY

The physical principles illustrated on pages 14-16 also apply to children. In contrast to adults and teenagers, their muscles and bones are not fully developed. In many respects children have a greater risk of serious injury in accidents than adults.

Because children's bodies are not fully developed, they require restraint systems which are especially designed for their size, weight and body structure. Many countries and all States of the United States have laws which require the use of approved child restraint systems for infants and small children.

Child restraints, like adult safety belts, must be used properly to be effective. Used improperly, child restraints can also increase the risk of serious injury in an accident.

WARNING
All vehicle occupants and especially children should be restrained when ever riding in a vehicle. An unrestrained child could be injured by striking the interior, or by being ejected from the vehicle during a sudden maneuver or impact. Do not allow children to stand or kneel on the seat. A child restraint system can help protect a child in a vehicle.
Accident statistics have shown that children are generally safer in the rear seat area than in the front seating position.
A suitable child restraint properly installed and used at one of the rear seating positions provides the highest degree of protection for infants and small children in most accident situations.
Children who are less than 12 years old should normally sit in the rear.
All children must use, depending on age and body size, either a child restraint system or the existing safety belts.



Your child may travel on the front passenger's seat only if you have a child restraint system which is specifically designed and approved by the child restraint system manufacturer for use in the front together with the restraint system installed at that position.

CONTROLS AND EQUIPMENT



In a frontal accident at a speed of 20--35 mph (30--56 km/h) the forces acting on a 13 lb (6 kg) infant would be more than twenty times the weight of the child. This means that the weight of the child would suddenly be more than 260 lbs (120 kg). Only an appropriate child restraint system properly used can reduce the risk of serious injury under these conditions.

WARNING
 Infants and older children must never ride in a vehicle sitting on the lap of an adult. Holding a child in your arms is never a substitute for a child restraint system.



Forces acting on a child in an accident make it impossible to hold a child in the arms. The child would hit the dash, board, windshield or other parts of the vehicle interior and could receive serious injury. The adult's body could also move forward, particularly if the adult is not using safety belts, and cause additional injury to the child.

Infants up to approximately 9 months old (22 lbs/10 kg) receive the best protection in special infant carriers and child seats designed for their age group. Many experts believe that infants and small children should only ride in special child restraints in which the child's back faces in driving direction.



Children up to 7 years old (55 lbs/25 kg) are best protected in child safety seats designed for their age and weight. Experts say that the skeletal structure, particularly the pelvis, of these children is not fully developed and that they should not use lap belts.

CONTROLS AND EQUIPMENT



Children of average size of about 7 years and older may use available three point combination lap and shoulder belts usually together with appropriate booster seats meeting all applicable safety standards. Booster seats raise the seating position of the child and reposition both the lap and shoulder portions of the safety belt so that they pass across the child's body in the right places.

The routing of the belt over the child's body is extremely important for the child's protection whether or not a booster seat is used.

Always make sure that the shoulder portion of the three point belt is positioned midway over the shoulder. The shoulder portion must never rest against or across

the neck and it may never contact or remain in front of the face, chin or throat. The lap belt portion of the three point belt as well as any lap belt alone must always pass as low as possible across the pelvis, never over the abdomen.

Children of average size of about 7 years of age and older may use available lap belts in exceptional circumstances if the proper use of three point belts alone is not possible. Always remember that children do not have the pronounced pelvic structure required for the proper function of lap belts and that the child's safety absolutely requires that the lap belt be fastened snugly and as low as possible around the pelvis. The lap belt must never pass over the stomach or abdomen.

Younger children should only use a lap belt in very exceptional situations and only if no child restraint system for the child's size and weight or safer alternative means of transportation of the child is available. The use of a lap belt in these exceptional situations is better than permitting the child to remain totally unrestrained. A lap belt cannot provide the same level of protection as a proper child restraint. The use of a lap belt for younger children may violate State law.

WARNING

- An improperly worn safety belt will not provide optimum protection in an accident and may cause serious personal injury. Always make sure that children and other vehicle occupants properly wear available restraint systems. Carefully follow the instructions provided by the manufacturers of child restraints.
- When purchasing a child restraint, select one which fits your child and your vehicle.
- Commercially available child seats are required to comply with U.S. Federal Motor Vehicle Safety Standard (FMVSS) 213. (or in Canada CMVSS 213). These standards include installation requirements which utilize a lap belt or the lap portion of a combination lap-shoulder belt such as that installed in your vehicle.

CONTROLS AND EQUIPMENT

WARNING continued
Should these safety belts be too short, a special lap/belt adapter is available from your authorized Volkswagen dealer.

■ Only use child restraint systems which fully contact the flat portion of the seat cushion. The child seat must not tip or lean to either side. We do not recommend the use of child seats which rest on legs or tube-like frames because they do not provide adequate contact with the seat.

Improperly or inadequately installed child restraint systems can increase the risk of injury to children in accidents; therefore always carefully read and follow all instructions on installation and use that come with the system.



Child restraint anchorages for the rear seats (Canada models)

If your child restraint seat or seats are equipped with a tether strap you will want to use one or more of the three anchor points provided on the filler panel behind the rear seat.

Child restraint anchorages (USA models)

Similar to Canadian models, your vehicle can be fitted with three anchorage points on the filler panel for use of child restraints having a tether strap.

Ask your authorized Volkswagen dealer for installation of one or more anchor points and the required hardware for the attachment of the tether.



The restraint anchorage points are shown in the illustration (see arrows).

WARNING
■ Child restraint anchorages are designed to withstand only those loads imposed by correctly fitted child restraints. Under no circumstances are they to be used for adult seatbelts or harnesses.
■ Do not mount two child restraint seats on one anchor point.