

REPORT NO. TRC-92-N05

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

TOYOTA MOTOR CORPORATION
1993 TOYOTA PREVIA VAN
VAN

NHTSA NO. MP5105
TRC TEST NO. 930106

PREPARED BY:
TRANSPORTATION RESEARCH CENTER INC.
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JANUARY 29, 1993

FINAL REPORT

PREPARED FOR:
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16. Abstract A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1993 Toyota Previa van, NHTSA No. MP5105, at the Transportation Research Center Inc. on January 6, 1993. This test was conducted to obtain new car assessment and research data indicant of FMVSS No. 208 performance. The barrier impact velocity was 56.5 kph. The vehicle's maximum crush was 389 millimeters. The ambient temperature was 22° C. The driver's head injury criteria (HIC) was 711. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 58.0 g. The driver's left and right femur maximum axial forces were 2895 N and 2218 N, respectively. The passenger's head injury criteria (HIC) was 983. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 55.6 g. The passenger's left and right femur maximum axial forces were 3672 N and 2897 N, respectively.			
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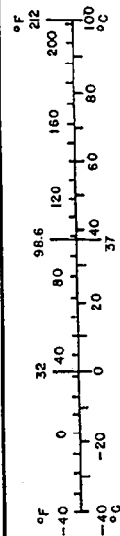
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	*2.5	centimeters	cm
ft	feet	30	meters	m
yd	yards	0.9	kilometers	km
mi	miles	1.6		
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
	(2000 lb)			
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

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



* 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. C13.10286.

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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 the 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 Toyota Previa van, NHTSA No. MP5105, 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 6, 1993.

The test vehicle, a 1993 Toyota Previa van, NHTSA No. MP5105, was equipped with a 2.4 liter inline engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 1902 KG. The vehicle's impact speed was 56.5 kph. The vehicle sustained 389 mm of static crush during the impact.

The driver's head injury criteria (HIC) was 711. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 58.0 g. The driver's left and right femur maximum axial forces were 2895 N and 2218 N, respectively.

The passenger's HIC was 983. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 55.6 g. The passenger's left and right femur maximum axial forces were 3672 N and 2897 N, respectively.

DATA ACQUISITION EXPLANATIONS

The right front passenger's shoulder belt displacement data, SHBD2, was invalid after 60 milliseconds due to motion of the vehicle's B-pillar trim panel pulling the potentiometer string, causing the potentiometer to record additional apparent displacement.

The right front passenger's seat belt extension data, SBED2, was lost due to the shoulder belt motion breaking the potentiometer data cable.

The instrument panel center X-axis accelerometer, DPCXG1, recorded questionable data spikes from 125 to 155 milliseconds.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: MP5105 TEST TYPE: Frontal Load Cell Barrier

TEST DATE: 01/06/93 TEST TIME: 1502 AMBIENT TEMP.: 22° C

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1993/Toyota/Previa/van

VEHICLE TEST WEIGHT (KG): 1902

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (KPH)**: PRIMARY = 56.5 SECONDARY = 56.5

MAXIMUM STATIC CRUSH (MM): 389

AVERAGE REBOUND (MM): 991

DUMMIES: Driver #826 Passenger #713

TYPE: Part 572 B Part 572 B

LOCATION: Left front Right front

RESTRAINT: Driver's airbag 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: Toyota Motor Corporation

MAKE/MODEL: Toyota/Previa

VIN: JT3AC11R6P1065698

BODY STYLE: Van

MODEL YEAR: 1993

NHTSA NO.: MP5105

COLOR: Silverleaf metallic

ENGINE DATA: TYPE: inline CYLINDERS: 4 DISPLACEMENT: 2.4 liter

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

DATE VEHICLE RECEIVED: 11/24/92

ODOMETER READING: 52.0

DEALER'S NAME AND ADDRESS: Toyota West, Inc.
1500 Auto Mall Drive
Columbus, OH 43228

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	Yes
POWER SEATS	No	TILTING STEERING WHEEL	Yes
POWER WINDOWS	Yes	TELESCOPING STEERING WHEEL	No
TINTED GLASS	Yes	AIR CONDITIONING	Yes
RADIO	Yes	ANTI-SKID BRAKE	No
CLOCK	Yes	REAR WINDOW DEFROSTER	Yes
OTHER	Front variable & rear intermittent wipers		
	Cassette		
	Dual outside power mirrors		
	Full-size spare		

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: Toyota Motor Corporation

DATE OF MANUFACTURE: 09/92 VIN: JT3AC11R6P1065698

GVWR: 2409 KG

GAWR: FRONT: 1245 KG, REAR: 1245 KG

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Toyo, A02, P205/75R14

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 300 kPa
REAR: 300 kPa

SPARE TIRE (MFR., LINE, SIZE): Toyo, A02, P205/75R14

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

TYPE OF FRONT SEAT BACKS: Manually-adjustable

MAXIMUM WIDTH: 1854 MM

WHEELBASE: 2860 MM

LOCATION OF LABEL STATING TIRE DATA:

The label was located in the glove box.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P205/75R14 P215/65R15 95H

RECOMMENDED COLD TIRE PRESSURE: FRONT: 240 kPa; REAR: 240 kPa

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

VEHICLE CAPACITY WEIGHT: 1190 KG

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN MILLIMETERS):

DELIVERED ATTITUDE: LF 711; RF 730; LR 742; RR 753

PRE-TEST ATTITUDE: LF 708; RF 708; LR 709; RR 710

POST-TEST ATTITUDE: LF 739; RF 764; LR 720; RR 708

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	445 KG	RIGHT REAR	387 KG
LEFT FRONT	458 KG	LEFT REAR	403 KG
TOTAL FRONT WEIGHT	903 KG	(53.4% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	790 KG	(46.6% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT 1693 KG			

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT*

UDW = UNLOADED DELIVERED WEIGHT (1693 KG)

VCW = VEHICLE CAPACITY WEIGHT (540 KG)

DSC = DESIGNATED SEATING CAPACITY (7)

$RCLW* = VCW - 68 (DSC) = 540 - 68 (7) = 64 \text{ KG}$

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

TARGET TEST WEIGHT = $1693 + 64 + 148$

TARGET TEST WEIGHT = 1905 KG

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 61 KG OF CARGO WEIGHT:

RIGHT FRONT	501 KG	RIGHT REAR	451 KG
LEFT FRONT	491 KG	LEFT REAR	459 KG
TOTAL FRONT WEIGHT	992 KG	(52.2% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	910 KG	(47.8% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	1902 KG	(0.2 KG UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE: 0 KG

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: Rear bumper, interior trim panels

CG = 1368 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: 930106 NHTSA NO.: MP5105
TEST DATE: 01/06/93 TEST TIME: 1502
TEST TYPE: Frontal load cell barrier IMPACT ANGLE: 0°
AMBIENT TEMPERATURE AT IMPACT AREA: 22° C
TEMPERATURE IN OCCUPANT COMPARTMENT: 21° C
IMPACT VELOCITY: PRIMARY = 56.5 KPH SECONDARY = 56.5 KPH

(SPECIFIED RANGE = 34.5 TO 35.5 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 4610; C 4753; R 4603

POST-TEST: L 4313; C 4368; R 4313

TOTAL CRUSH: L 297; C 385; R 290

AVERAGE CRUSH: 324

TEST VEHICLE REBOUND FROM FLAT BARRIER
(ALL MEASUREMENTS ARE IN MILLIMETERS):

DISTANCE FROM TEST VEHICLE TO BARRIER: L 990; C 980; R 1004; AVG. 991

TABLE 4 FUEL SYSTEM DATA

MAKE/MODEL: Toyota/Previa
NHTSA NO.: MP5105
FUEL SYSTEM CAPACITY: 75.0 LITERS (FROM OWNER'S MANUAL)
USABLE CAPACITY: 74.9 LITERS (FURNISHED BY COTR)
TEST VOLUME RANGE: 68.9 LITERS TO 70.4 LITERS (92-94% OF USABLE)
ACTUAL TEST VOLUME: 69.6 LITERS (WITH ENTIRE FUEL SYSTEM FILLED)
TEST FLUID TYPE: STODDARD SOLVENT
SPECIFIC GRAVITY: 0.764
KINEMATIC VISCOSITY: 0.99 CENTISTOKES
TEST FLUID COLOR: PURPLE

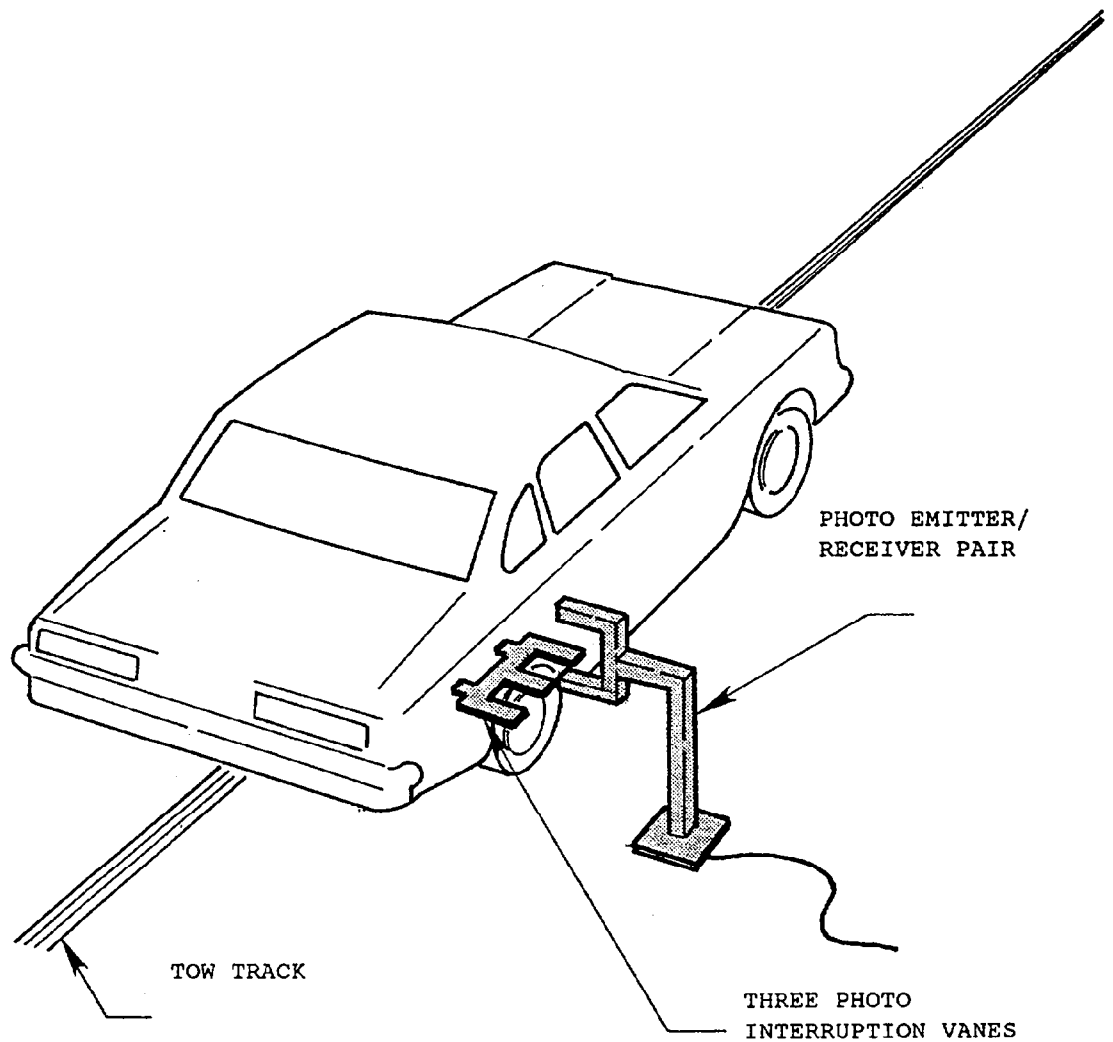
DETAILS OF FUEL SYSTEM: The fuel tank was located on the left side, in front of the rear axle. The fuel filler neck was located on the left side and entered the rear of the fuel tank. The fuel lines ran along the left frame rail to the front.

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: Toyota/Previa/van

VEHICLE NHTSA NO.: MP5105; VIN: JT3AC11R6P1065698

MODEL YEAR: 1993; BUILD DATE: 09/92; TEST DATE: 01/06/92

VEHICLE SIZE CATEGORY: Van; TEST WEIGHT: 1902 KG

VEHICLE WHEELBASE: 2860 MM

MAXIMUM WIDTH: 1854 MM

FRONT OVERHANG: 838 MM

COLLISION DEFORMATION
CLASSIFICATION (CDC) CODE: 12FDEW4

CRUSH DEPTH
MEASUREMENTS:

C1 =	<u>297</u>	MM
C2 =	<u>355</u>	MM
C3 =	<u>378</u>	MM
C4 =	<u>389</u>	MM
C5 =	<u>333</u>	MM
C6 =	<u>290</u>	MM

MIDPOINT OF DAMAGE: D = VEHICLE CENTERLINE
(LONGITUDINAL)

LENGTH OF DAMAGED
REGION: L = 1525 MM

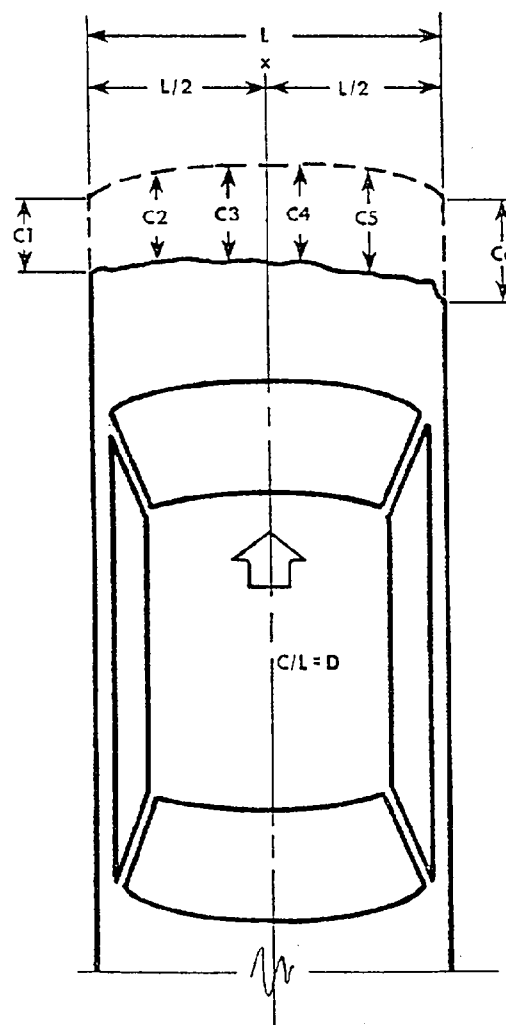
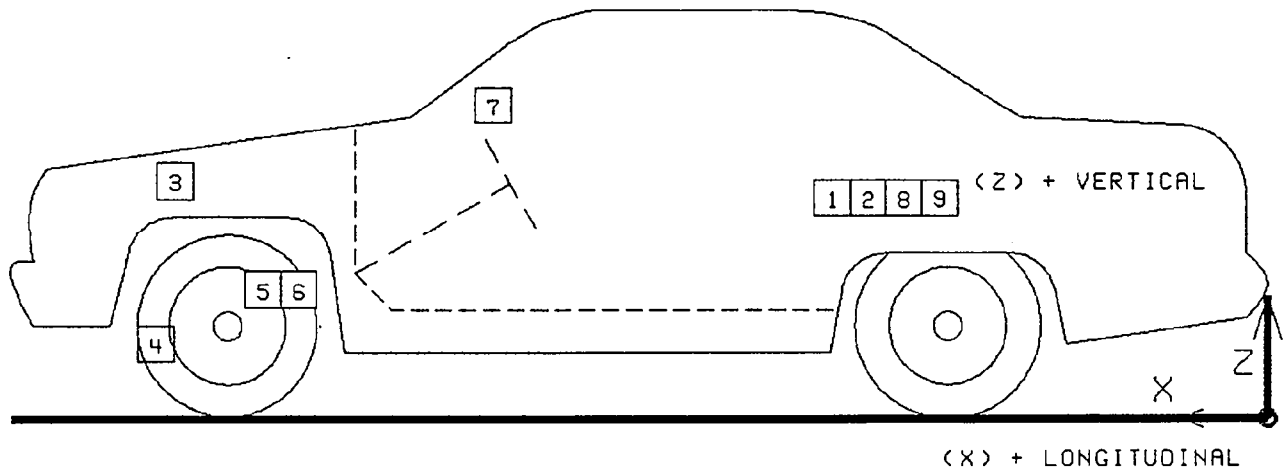
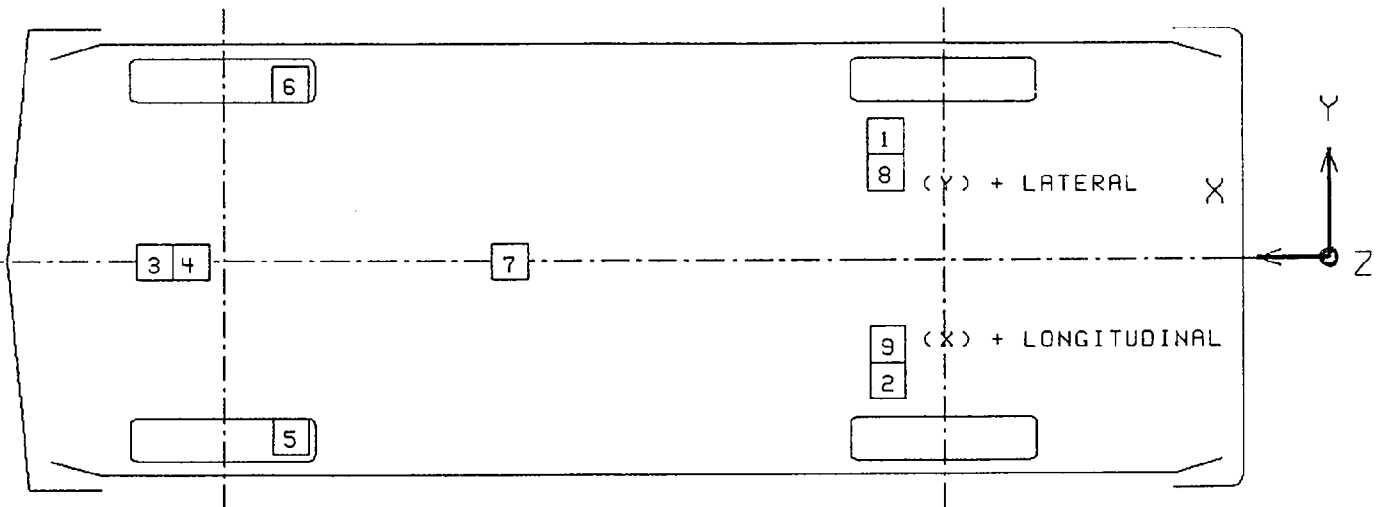


FIGURE 3

VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 5

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 930106

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX	G MSEC	MAX	G MSEC
1	LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	3273	682	527	8.2	13.8	51.5	9.4
2	RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	3283	-682	527	10.8	13.5	53.0	9.3
3	ENGINE TOP LONGITUDINAL	1846	200	553	4.2	140.5	64.3	28.1
4	ENGINE BOTTOM LONGITUDINAL	1748	-260	208	4.4	131.3	48.0	28.3
5	RIGHT BRAKE CALIPER LONGITUDINAL	948	-684	322	18.4	69.9	53.9	35.6
6	LEFT BRAKE CALIPER LONGITUDINAL	963	684	340	15.9	69.5	59.3	50.3
7	INSTRUMENT PANEL CENTER LONGITUDINAL	1018	-16	1233	26.5	68.9 ^Y	69.7	42.1
8	LEFT REAR SEAT CROSSMEMBER REDUNDANT LONGITUDINAL	3273	682	527	7.7	13.8	51.3	9.4
9	RIGHT REAR SEAT CROSSMEMBER REDUNDANT LONGITUDINAL	3283	-682	527	10.6	13.5	53.7	9.3

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN MILLIMETERS.

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

^YSee DATA ACQUISITION EXPLANATIONS

TABLE 6 POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #826	PASSENGER #713
HEAD	<u>Airbag</u>	<u>Chest and right thigh</u>
CHEST	<u>Airbag</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>Right track of driver's seat shifted forward</u>
REAR	<u>None</u>	<u>None</u>

GLAZING DAMAGE:

The entire windshield was cracked upon impact.

OTHER NOTABLE IMPACT EFFECTS:

None

TABLE 7 FMVSS 208 DATA SUMMARY

VEH. YR./MAKE/MODEL/BODY STYLE: 1993/Toyota/Previa/van

VEH. NHTSA NO.: MP5105; TEST DATE: 01/06/93

	DRIVER	PASSENGER
<u>MAXIMUM ACCELERATIONS (G):</u>	<u>DUMMY #826</u>	<u>DUMMY #713</u>
HEAD X-AXIS	-62.8	-49.7
HEAD Y-AXIS	19.5	-27.2
HEAD Z-AXIS	-37.6	-69.4
HEAD RESULTANT	67.8	73.8
CHEST X-AXIS	-58.2	-57.6
CHEST Y-AXIS	24.7	-20.3
CHEST Z-AXIS	18.5	19.4
CHEST RESULTANT*	58.0	55.6
CHEST RESULTANT TIME INTERVAL (SEC.)*	.003	.003

HEAD INJURY CRITERIA (HIC) VALUES:

HIC**	711	983
HIC STARTING TIME (SEC.)	.044	.059
HIC ENDING TIME (SEC.)	.080	.095
AVG. HEAD RESULTANT ACCEL. DURING HIC TIME INTERVAL (G)	52.3	59.6

MAXIMUM COMPRESSIVE FEMUR FORCES (N):

LEFT FEMUR	2895	3672
RIGHT FEMUR	2218	2897

MAXIMUM SEAT BELT FORCES (N):

LAP BELT	9467	7864
SHOULDER BELT	8846	10274

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.

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 chest were restrained by the driver's airbag as the dummy's torso was restrained by the three-point unbelt. The dummy rebounded into the seat back. The driver dummy came to rest in the driver's seat 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 rotated forward impacting the dummy's chest and the dummy's right thigh. The dummy's torso was restrained by the three-point unbelt. The dummy's head rotated rearward as the dummy rebounded into the seat back. The right front passenger dummy came to rest in the right front passenger's seat, 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.	2515	2721
SHOULDER BELT LENGTH AS MEASURED ON PART 572 DUMMY.	915	895
LAP BELT LENGTH AS MEASURED ON PART 572 DUMMY.	910	892
<u>SHOULDER BELT SPOOL-OFF LENGTH:</u>		
AS DETERMINED BY FILM ANALYSIS	46	64
AS DETERMINED MECHANICALLY	62	NA*
AS DETERMINED ELECTRONICALLY	69	103*
<u>BELT STRETCH LENGTH (MM/M):</u>		
AS MEASURED MECHANICALLY	0	0
AS MEASURED ELECTRONICALLY	0	NAY
<u>RETRACTOR LOCK-UP TIME (MS):</u>		
AS DETERMINED BY SHOULDER BELT SPOOL-OFF	70	60

ALL MEASUREMENTS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

*The right B-pillar trim panel, which the strings were anchored to, rotated rearward and pulled the strings from their original positions.

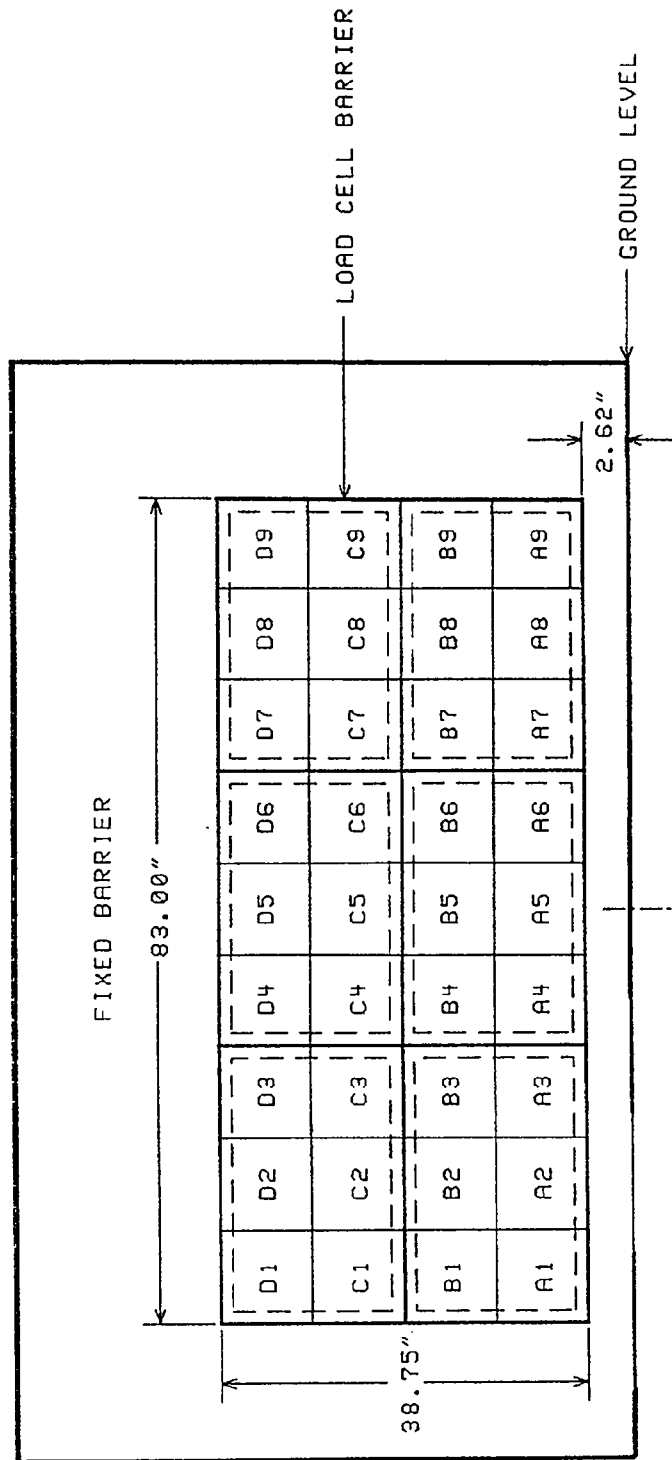
YSee DATA ACQUISITION EXPLANATIONS

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 930106

LOCATION	POSITIVE DIRECTION		NEGATIVE DIRECTION	
	KN	MSEC	KN	MSEC
TOTAL GROUP 1	3.3	2.1	211.7	54.8
TOTAL GROUP 2	1.4	115.8	92.4	36.4
TOTAL GROUP 3	3.9	2.0	230.9	54.0
TOTAL GROUP 4	1.5	173.0	64.5	48.6
TOTAL GROUP 5	1.7	4.3	80.5	38.9
TOTAL GROUP 6	1.3	241.1	61.5	46.8
TOTAL LOAD CELL FORCE	6.4	115.8	695.8	52.8

TENSION IS POSITIVE
COMPRESSION IS NEGATIVE

SECTION 3.0

OCCUPANT, CAMERA, & VEHICLE MEASUREMENTS

FIGURE 5

DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS

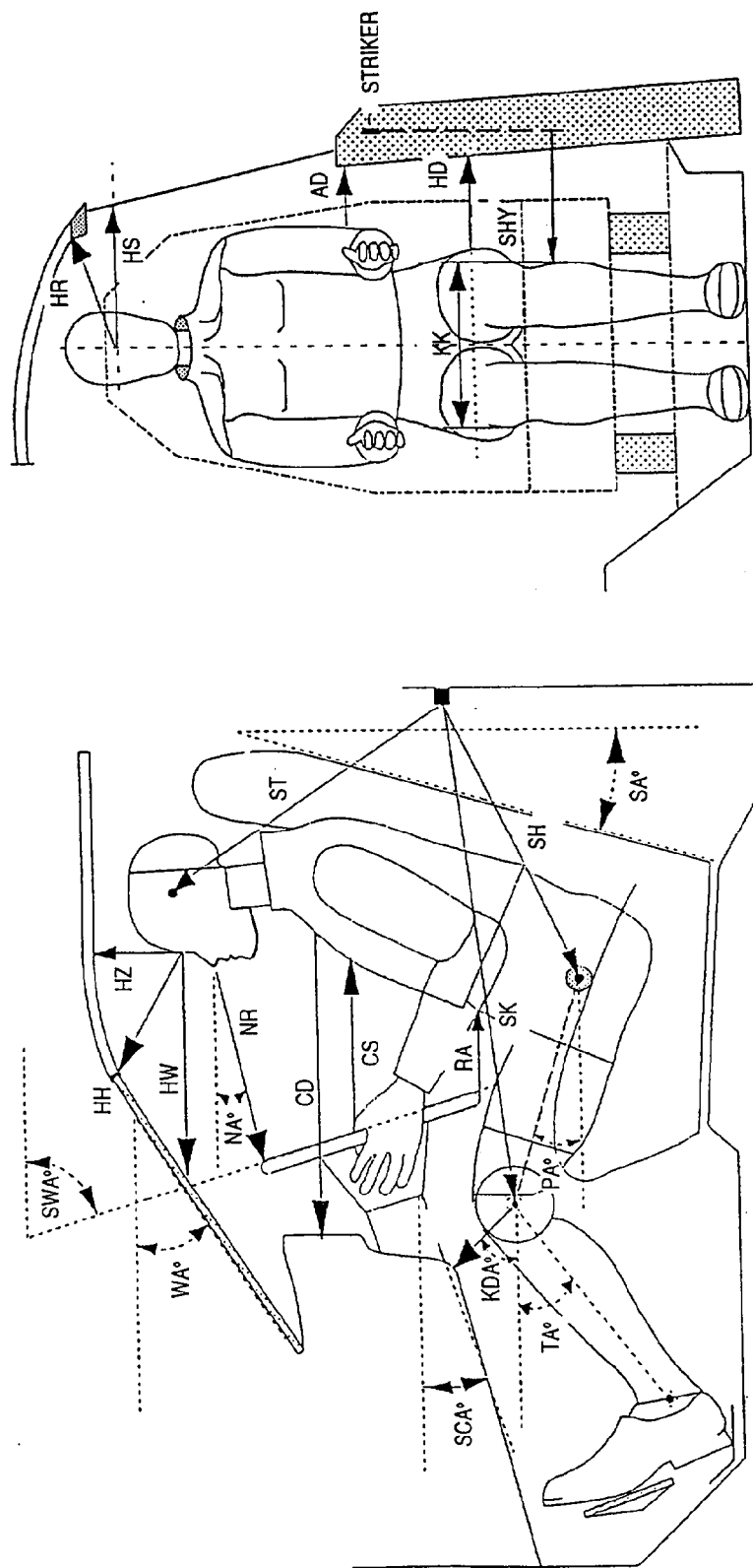


TABLE 10 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

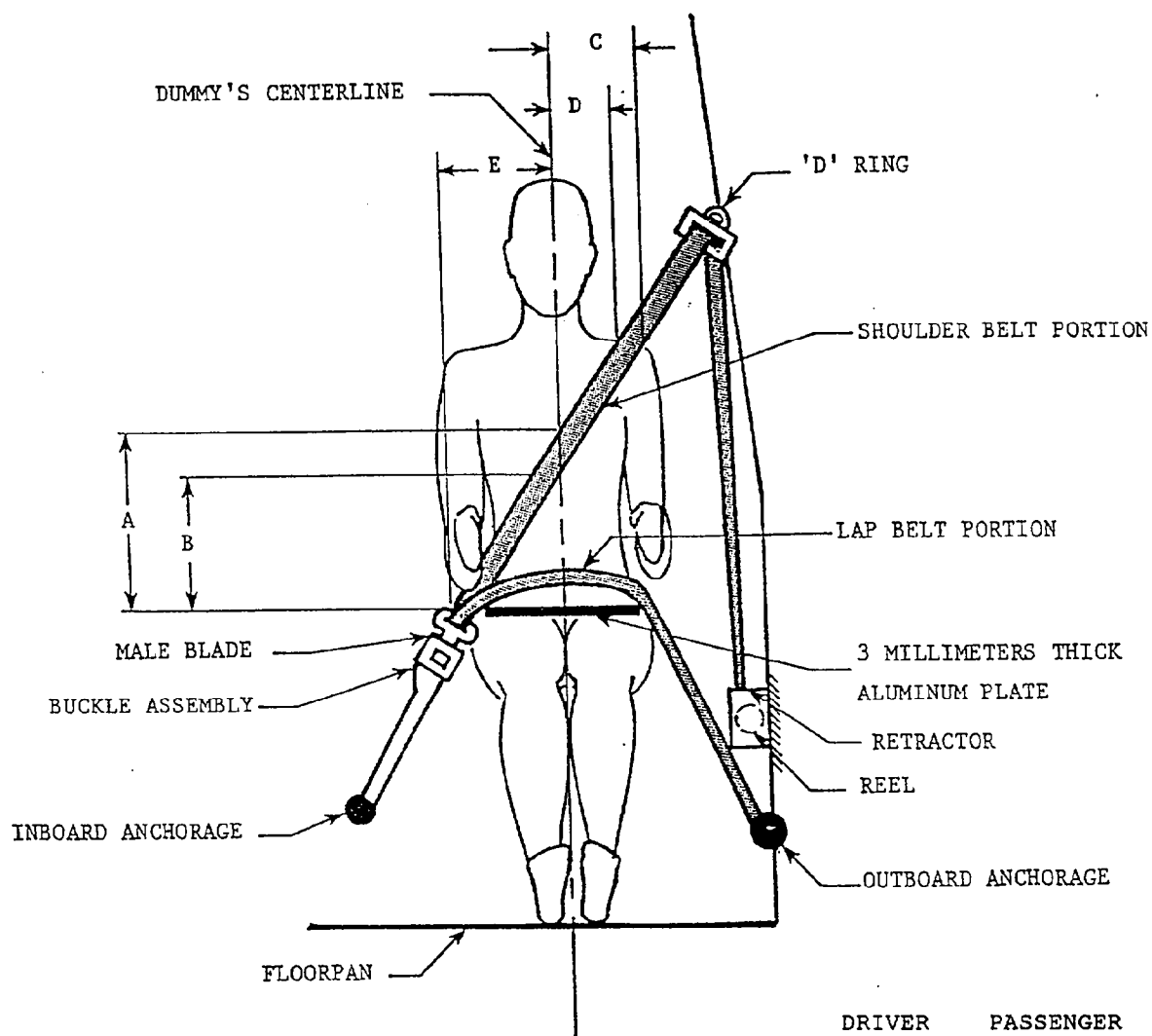
DESIGNATION	TYPE OF MEASUREMENT	DRIVER (SERIAL #826)	PASSENGER (SERIAL #713)
WA°	WINDSHIELD ANGLE	30°	NA
SWA°	STEERING WHEEL ANGLE	60°	NA
SCA°	STEERING COLUMN ANGLE	30°	NA
SA°	SEAT BACK ANGLE	8°	6°
HZ	HEAD TO ROOF	158	151
HH	HEAD TO HEADER	395	403
HW	HEAD TO WINDSHIELD	514	570
HR	HEAD TO SIDE HEADER	273	203
NR	NOSE TO RIM	421	NA
NA	NOSE TO RIM ANGLE	24°	NA
CD	CHEST TO DASH	695	662
CS	STEERING WHEEL TO CHEST	324	NA
RA	RIM TO ABDOMEN	192	NA
KDL	LEFT KNEE TO DASH	208	203
KDR	RIGHT KNEE TO DASH	219	225
KDA	OUTBOARD KNEE TO DASH ANGLE	18°	21°
PA°	PELVIC ANGLE	11°	6°
TA°	TIBIAL ANGLE	38°	35°
KK	KNEE TO KNEE	163	296
ST*	STRIKER TO HEAD	629	620
	STRIKER TO HEAD ANGLE	-65°	-65°
SK*	STRIKER TO KNEE	770	775
	STRIKER TO KNEE ANGLE	3°	4°
SH*	STRIKER TO H-POINT	385	406
	STRIKER TO H-POINT ANGLE	18°	19°
SHY	STRIKER TO H-POINT (Y DIR.)	275	225
HS	HEAD TO SIDE WINDOW	342	275
HD	H-POINT TO DOOR	178	120
AD	ARM TO DOOR	129	100

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

*A negative angle indicates the measurement point was located above the striker.

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 6 SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - TOP SURFACE OF ALUMINUM PLATE TO BELT UPPER EDGE	333	385
B - TOP SURFACE OF ALUMINUM PLATE TO BELT LOWER EDGE	240	285
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	155	131
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	90	70
LAPBELT TENSION (N)	4	4
SHOULDER BELT TENSION (N)	4	4
ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.		

FIGURE 7 CAMERA POSITIONS

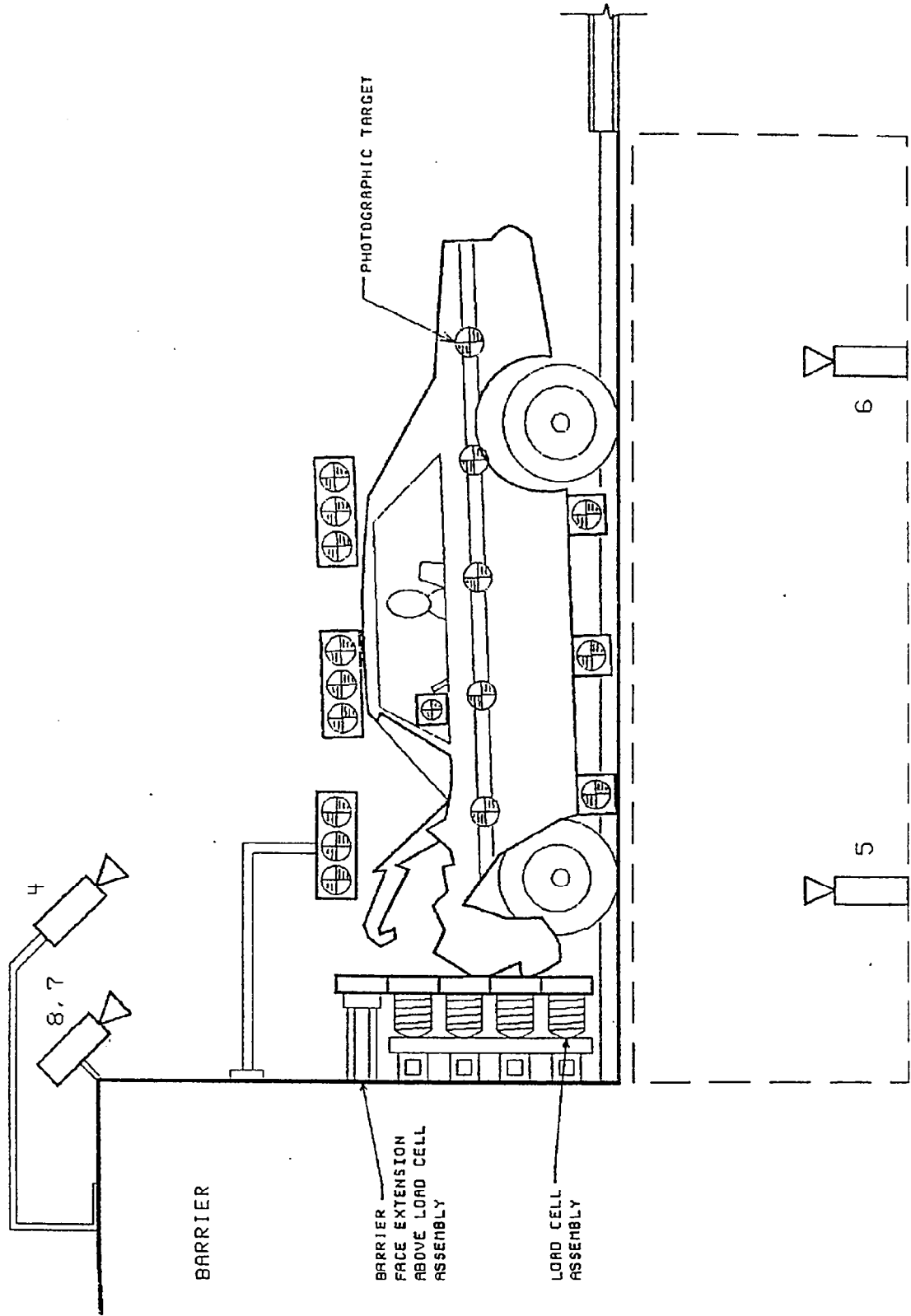


FIGURE 7 CAMERA POSITIONS, CONT'D.

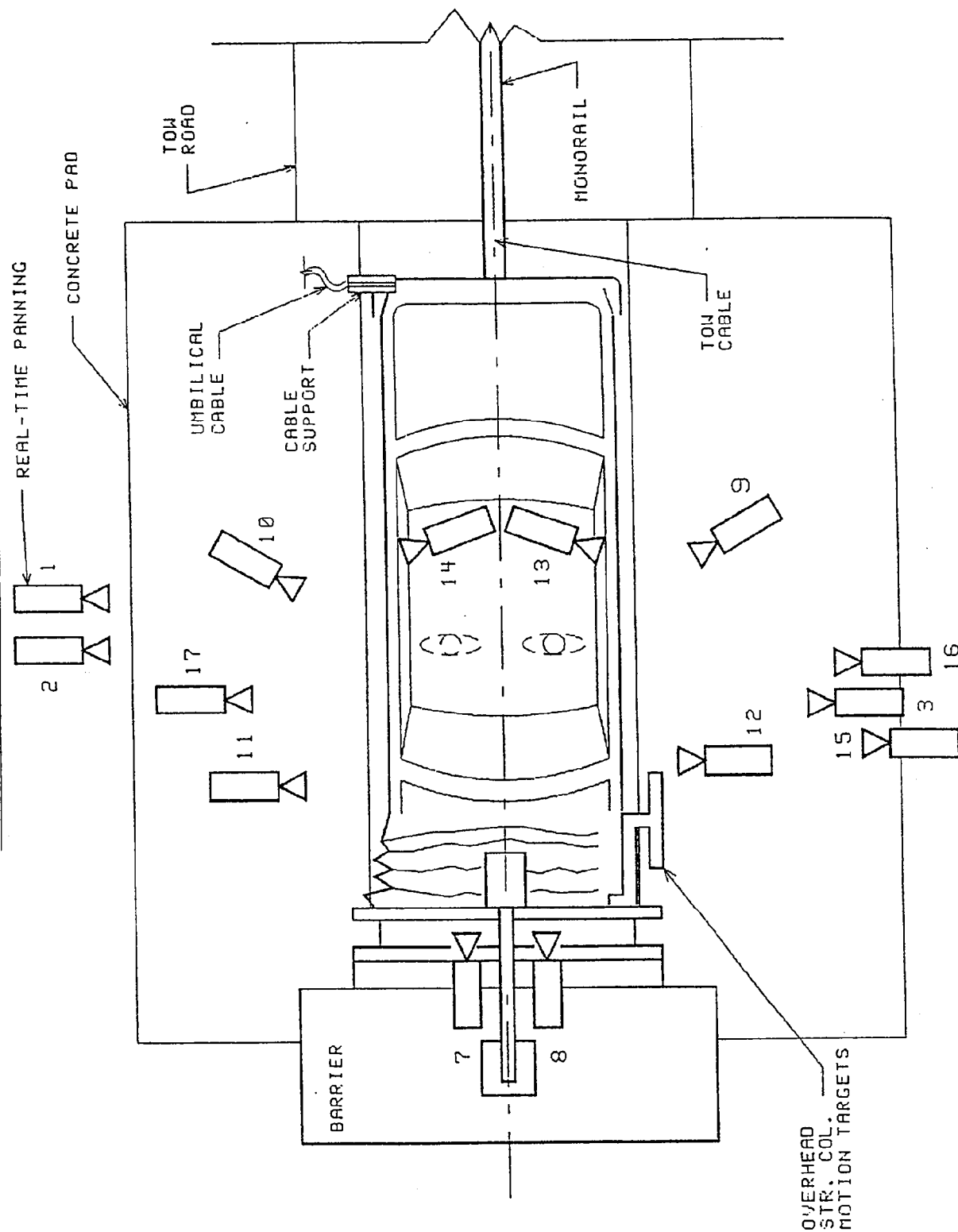


TABLE 11 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 930106		VEHICLE: 1993 Toyota Previa van					FILM PLANE			FILM SPEED (FPS)
CAMERA NO.	VIEW	CAMERA POSITIONS (MM)*			ANGLE** (DEG)	TO HEAD TARGET (MM)				
		X	Y	Z						
1	Real-time panning	-3607	-12802	1549	NA	NA	NA	16	24	
2	Vehicle crush	-2065	-6767	942	-2	-2	NA	13	495	
3	Dummy kinematics	-1054	7493	1118	-12	-12	6096	25	1018	
4	Windshield damage	-925	0	2489	-40	-40	NA	13	498	
5	Crush & fluid spillage	-1283	0	-2347	90	90	NA	13	1015	
6	Fluid spillage	-2522	0	-2515	90	90	NA	13	1000	
7	Passenger kinematics	-114	-351	2159	-40	-40	NA	17	465	
8	Driver kinematics	-173	368	2159	-41	-41	NA	17	500	
9	Driver kinematics	-4572	1854	2591	-27	-27	2311	25	500	
10	Passenger kinematics	-4674	-1880	2540	-26	-26	2133	25	495	
11	Windshield intrusion	-968	-7775	1118	0	0	NA	50	500	
12	Windshield intrusion	-1346	7859	1074	0	0	NA	50	505	
13	Driver seatbelt movement	NA	NA	NA	NA	NA	NA	13	505	
14	Passenger seatbelt movement	NA	NA	NA	NA	NA	NA	13	498	
15	Column movement	-3048	7264	2616	-14	-14	NA	25	505	
16	Column movement	-3048	7264	1908	-9	-9	NA	25	498	
17	Passenger kinematics	-986	-5354	1151	7	7	5105	25	1015	

**X = Film plane forward of barrier face

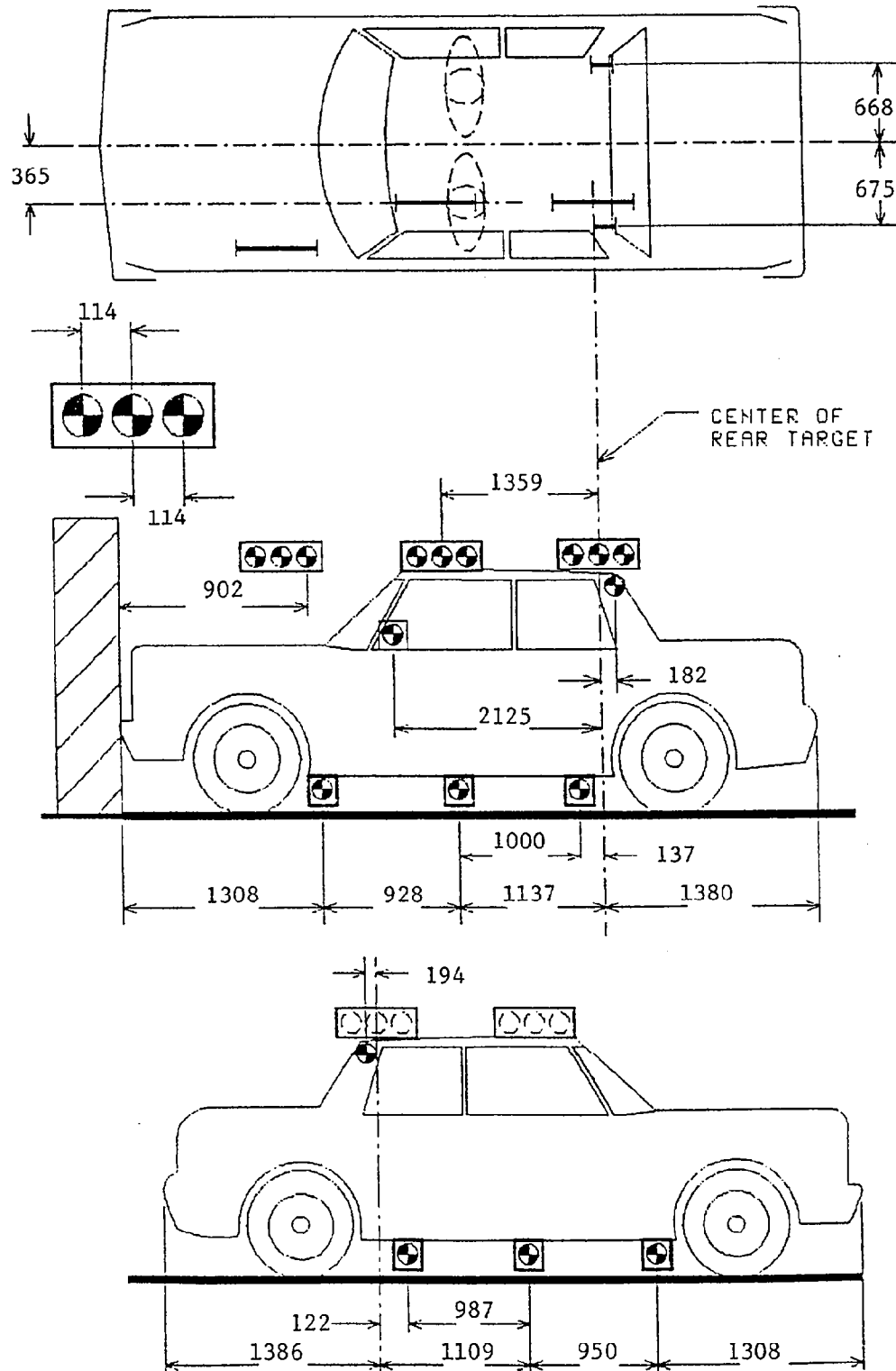
+Y = Film plane to left of monorail centerline

+Z = Film plane above ground level

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

FIGURE 8

VEHICLE TARGET LOCATIONS



ALL MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 9

PRE-TEST AND POST-TEST MEASUREMENT POINTS

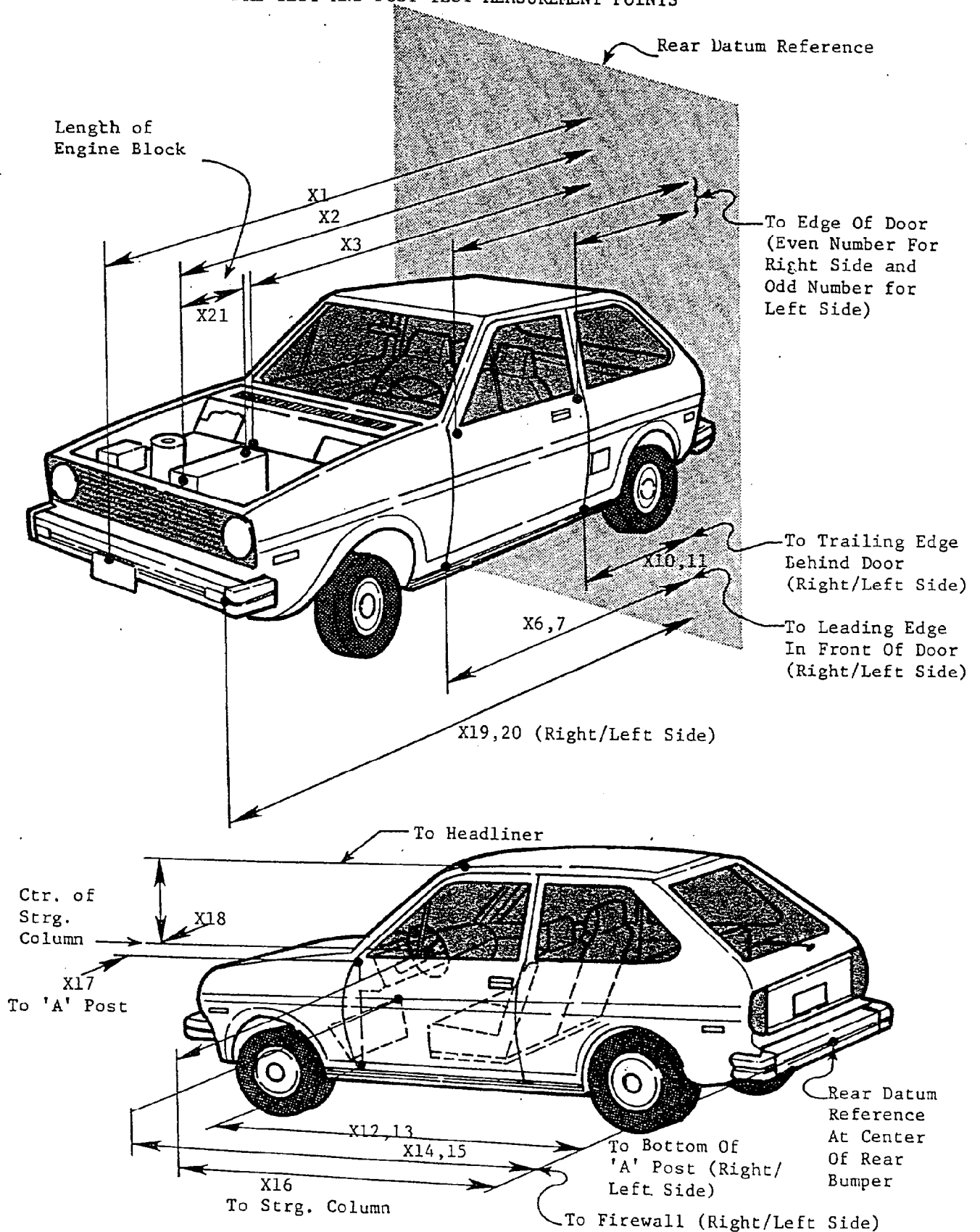


TABLE 12 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Toyota/Previa		TEST NUMBER: 930106		ALL MEASUREMENTS ARE IN MM		
TYPE OF MEASUREMENT		PRE-TEST	POST-TEST	DIFF.		
NO.						
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	4753	4368	385		
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	3330	3473	-143		
X3	REAR SURFACE OF VEHICLE TO FIREWALL	3968	3963	5		
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	3551	3598	-47		
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	3548	3498	50		
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	3480	3523	-43		
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	3485	3531	-46		
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	2495	2543	-48		
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	2488	2543	-55		
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	2485	2533	-48		
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	2485	2535	-50		
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	3554	3594	-40		
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	3564	3602	-38		
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	4008	4002	6		
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	3920	3933	-13		
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	3280	3346	-66		
X17	CENTER OF STEERING COLUMN TO "A" POST	330	302	28		
X18	CENTER OF STEERING COLUMN TO HEADLINER	450	360	90		
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	4603	4313	290		
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	4610	4313	297		
X21	LENGTH OF ENGINE BLOCK	215	215	0		

APPENDIX A

PHOTOGRAPHS

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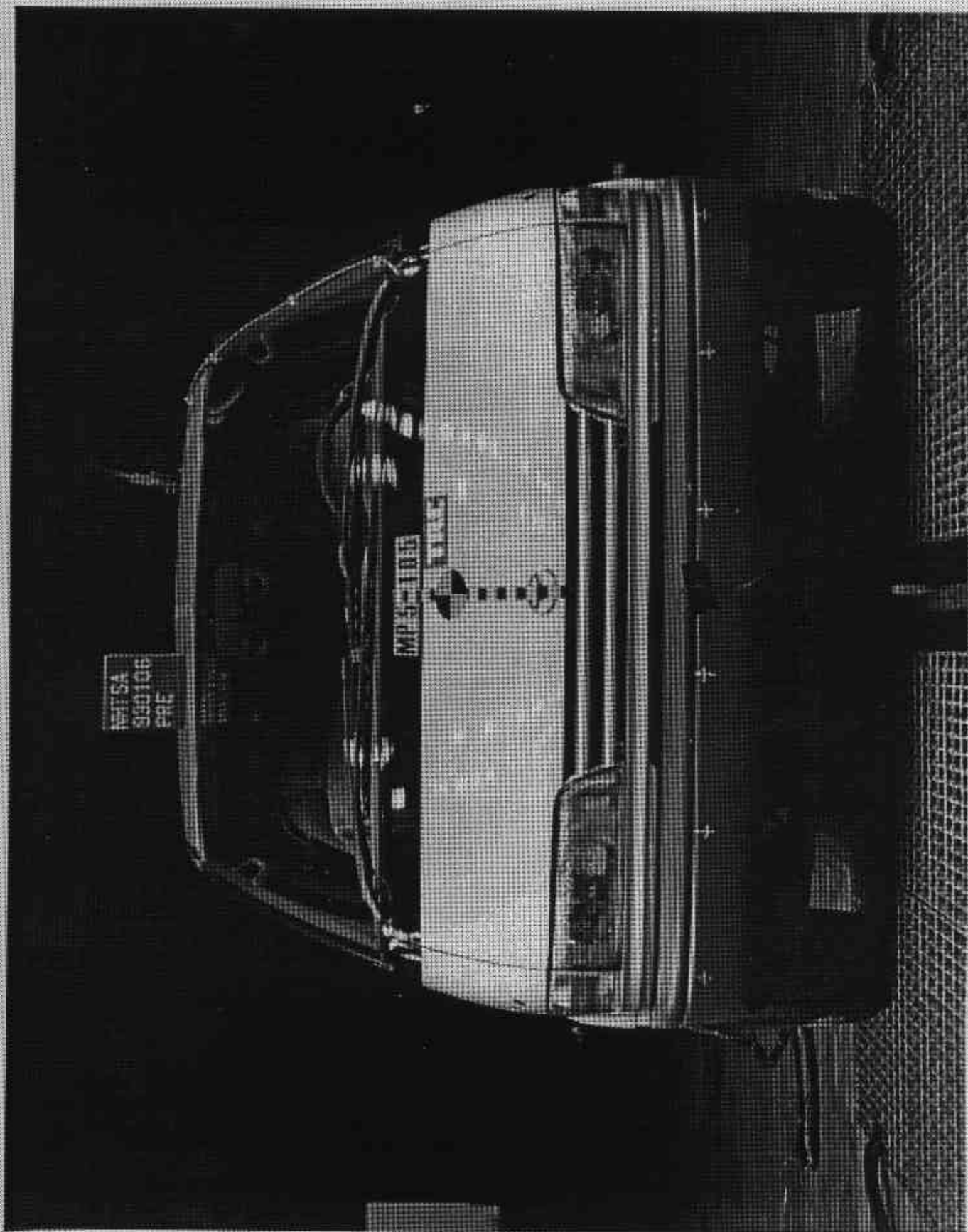


Figure A-1. PRE-TEST FRONT VIEW

A-2

930106

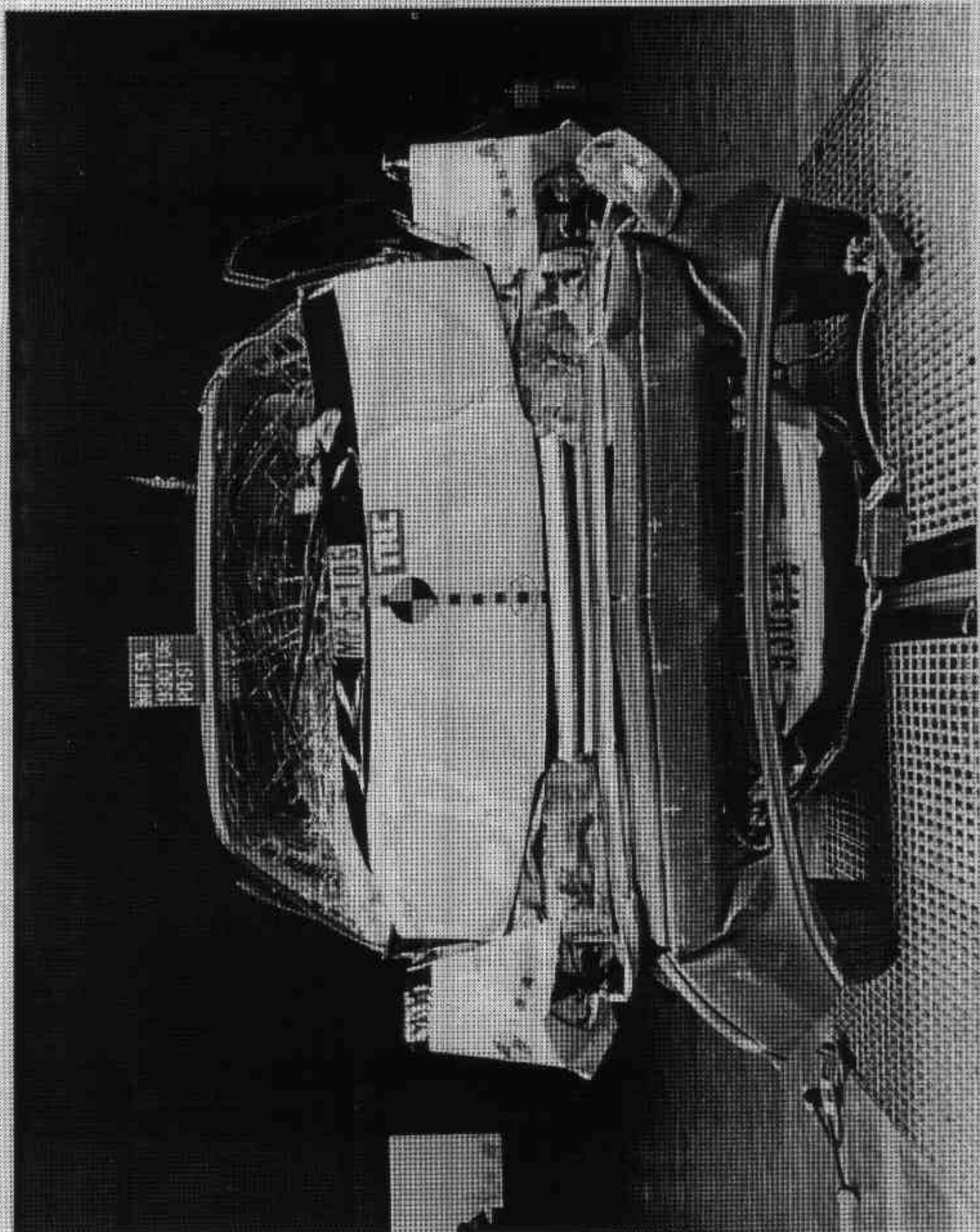


Figure A-2. POST-TEST FRONT VIEW

A-3

930106

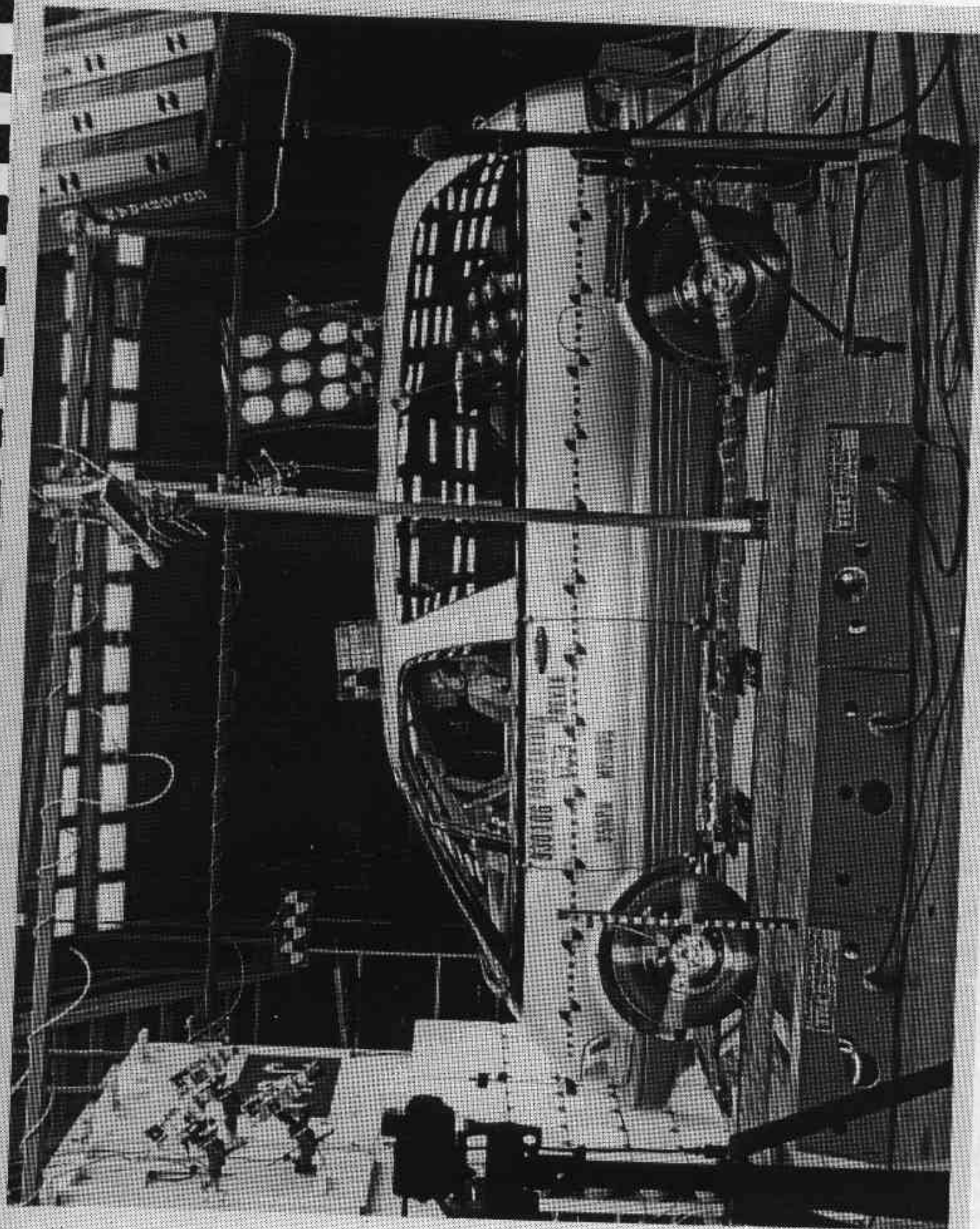


Figure A-3. PRE-TEST LEFT SIDE VIEW

A-4

930106

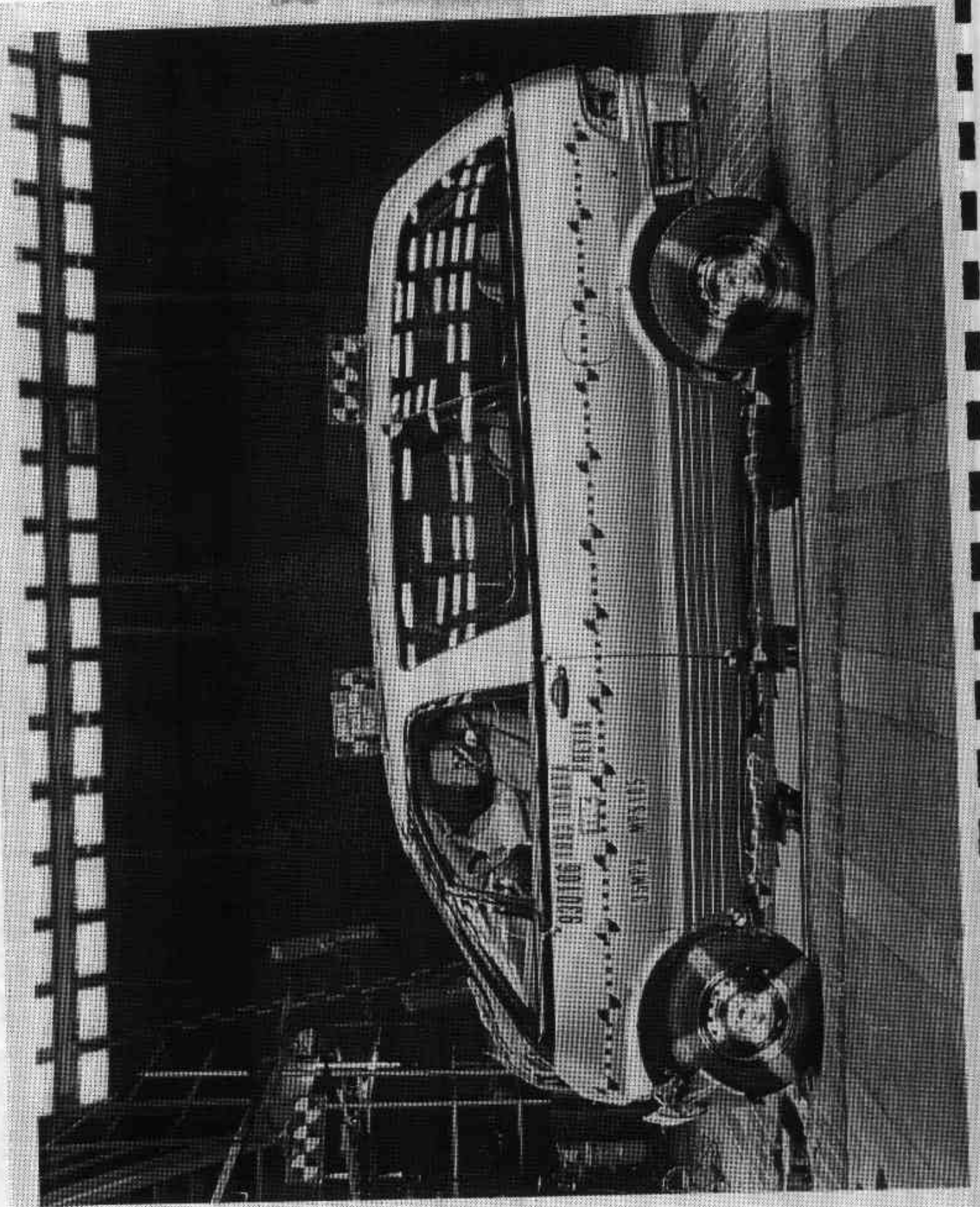


Figure A-4. POST-TEST LEFT SIDE VIEW
A-5

930106

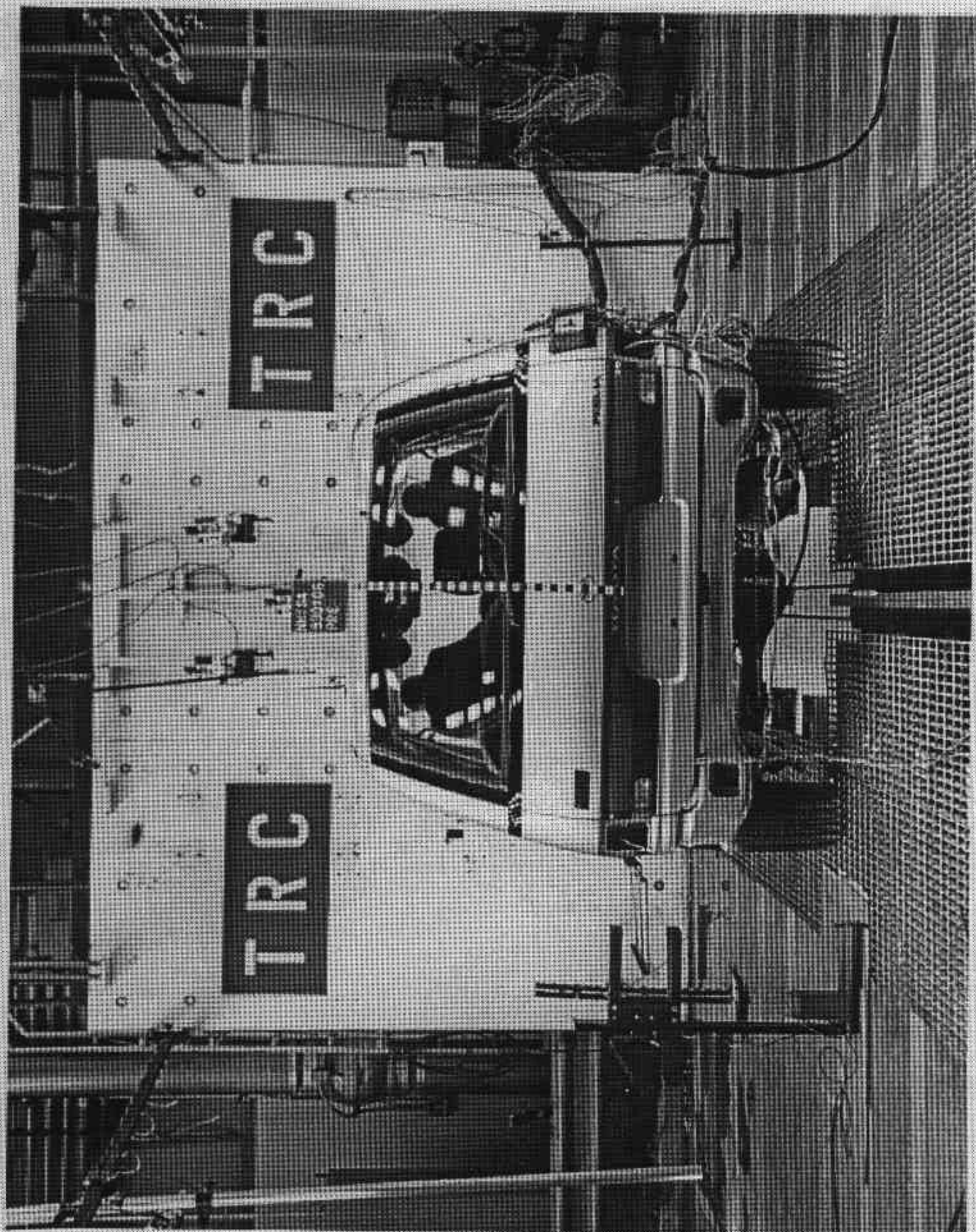


Figure A-5. PRE-TEST REAR VIEW

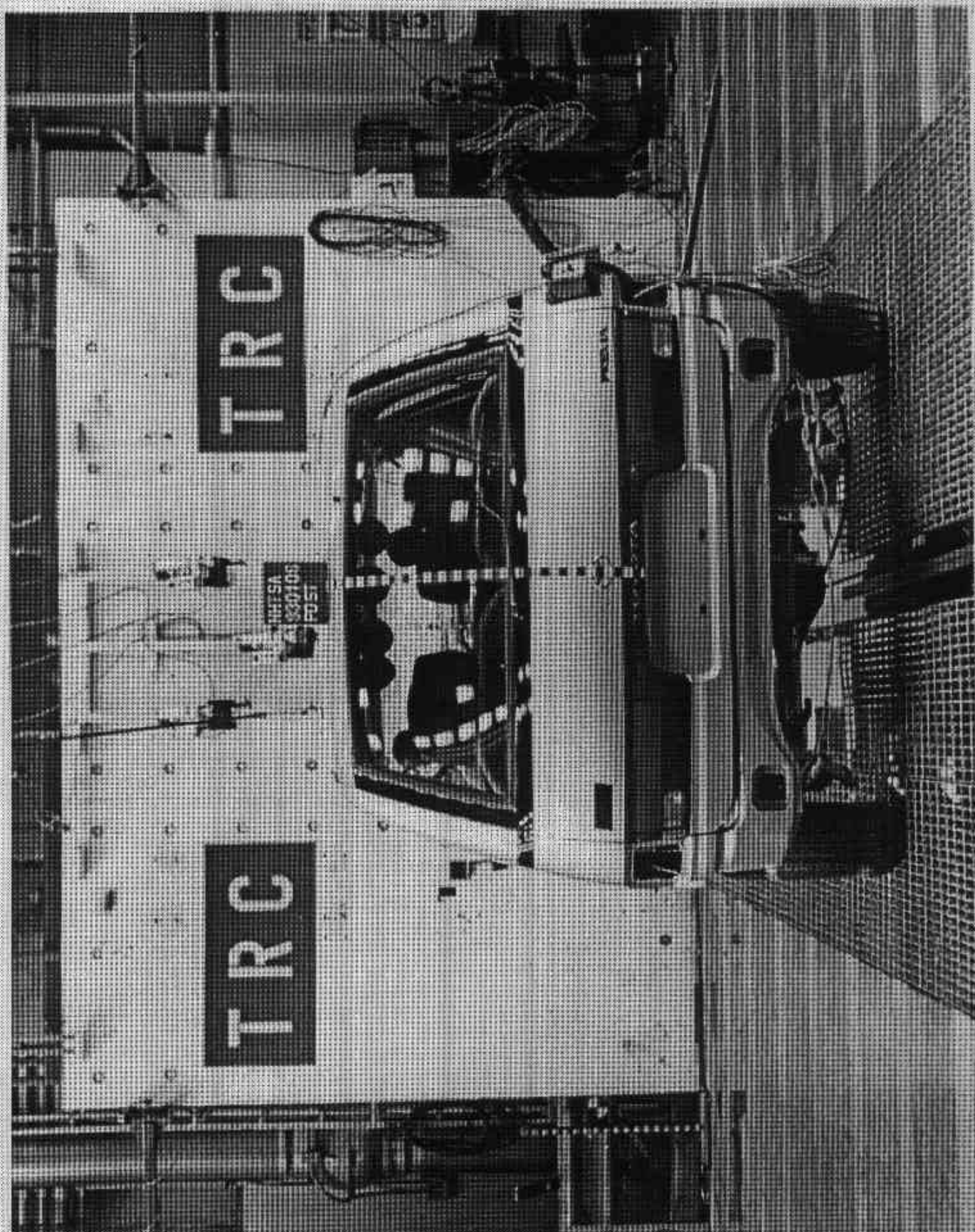


Figure A-6. POST-TEST REAR VIEW

A-7

930106

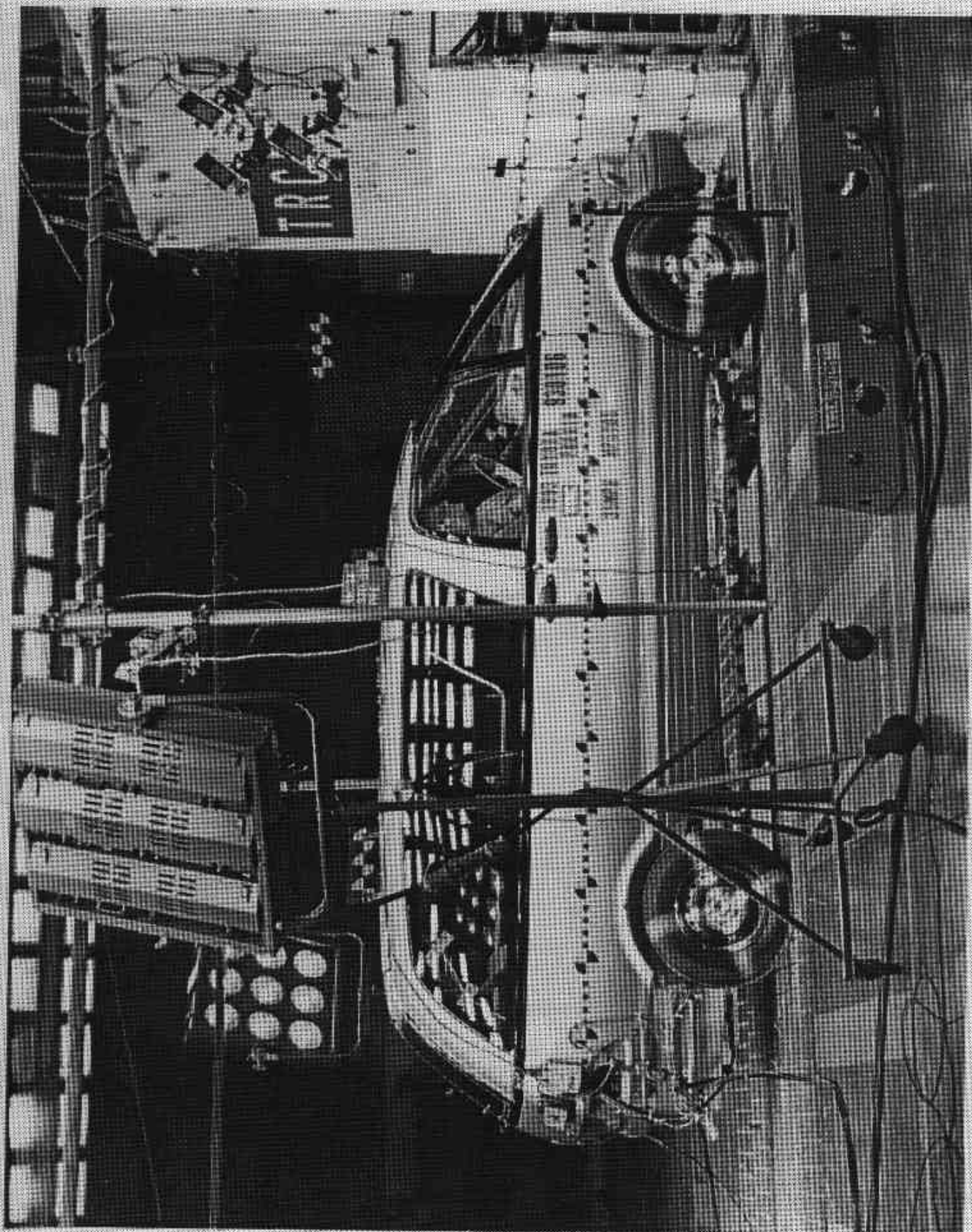


Figure A-7. PRE-TEST RIGHT SIDE VIEW

A-8

930106

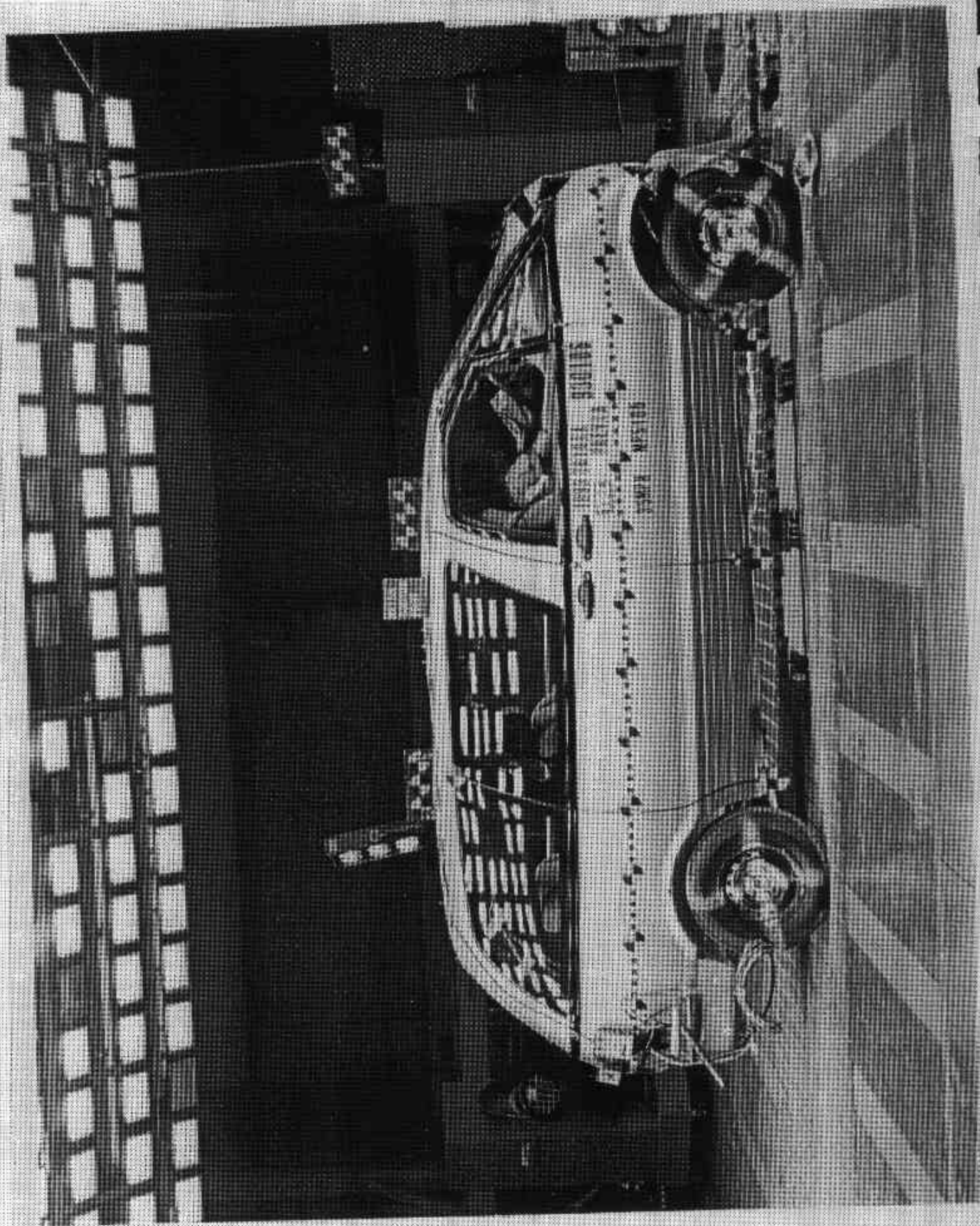


Figure A-8. POST-TEST RIGHT SIDE VIEW
A-9

930106

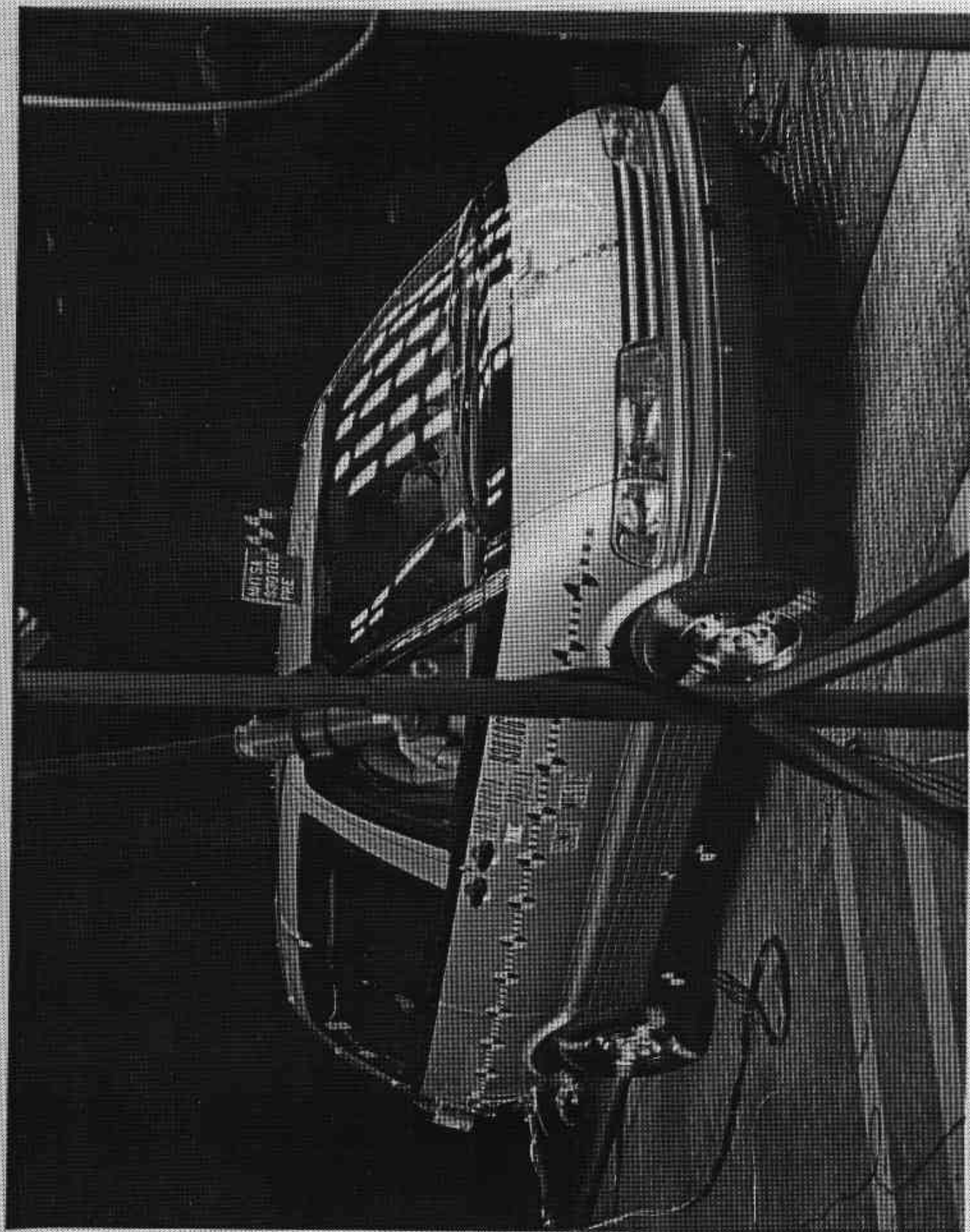


Figure A-9. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

930106

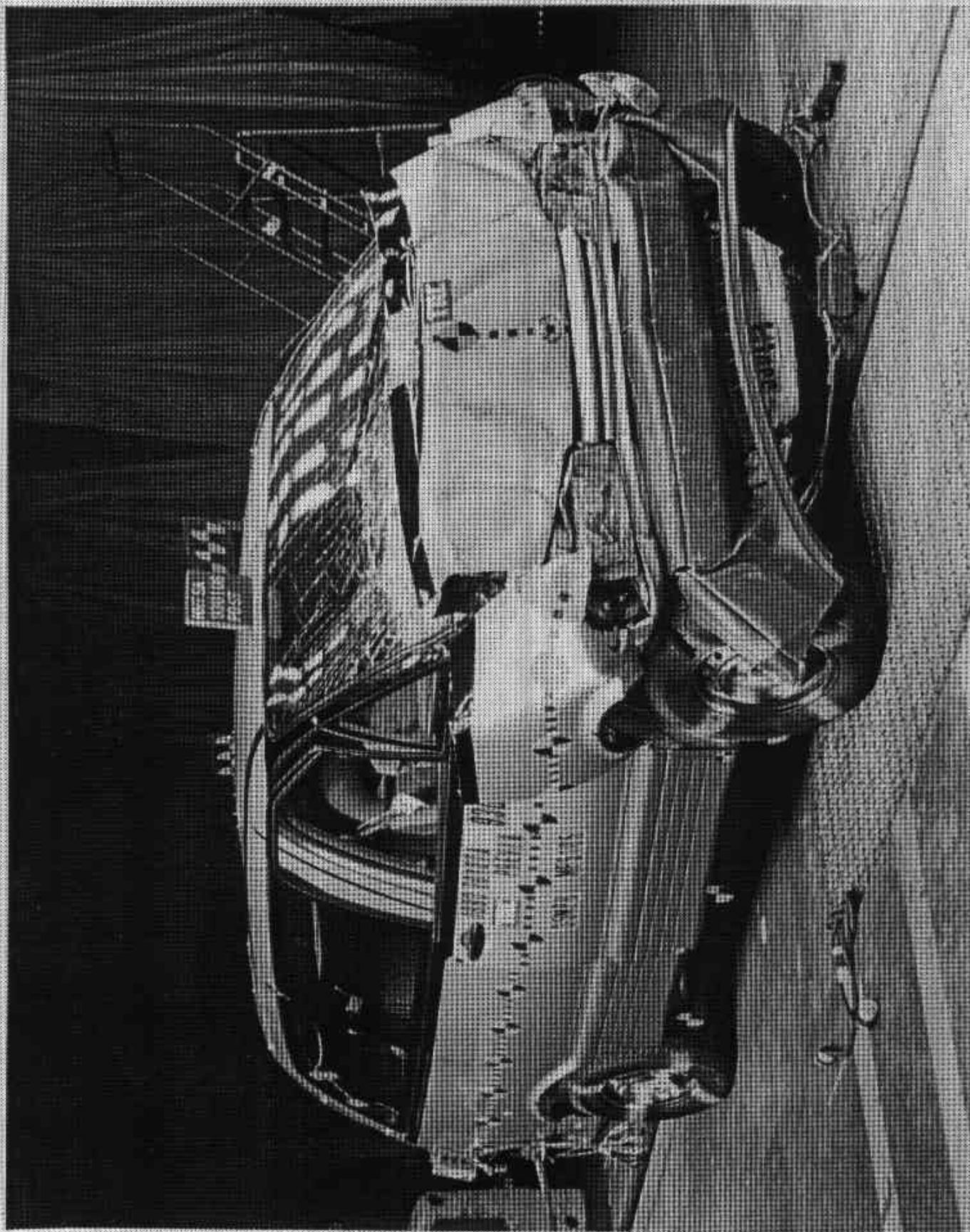


Figure A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-11

930106

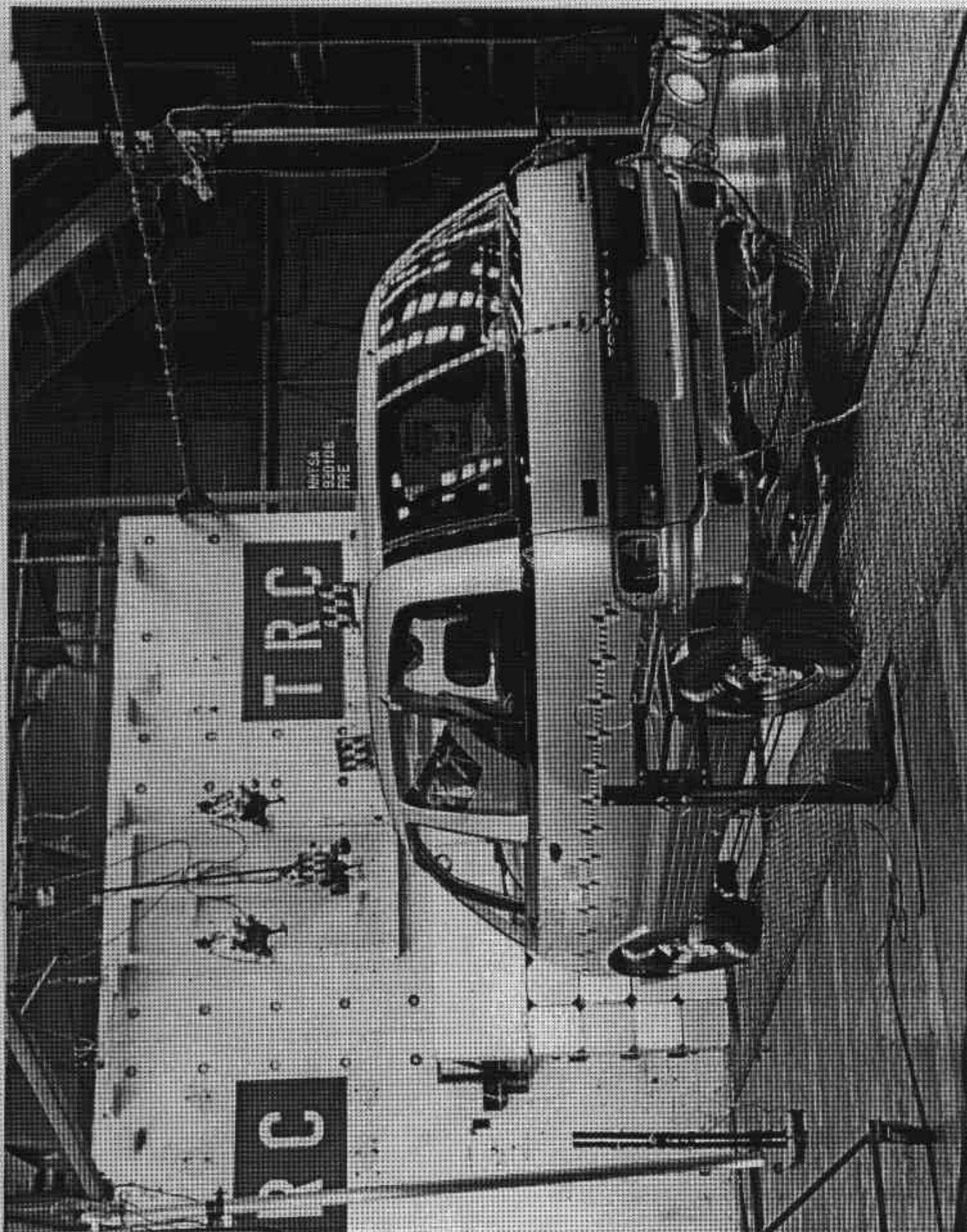


Figure A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-12

930106

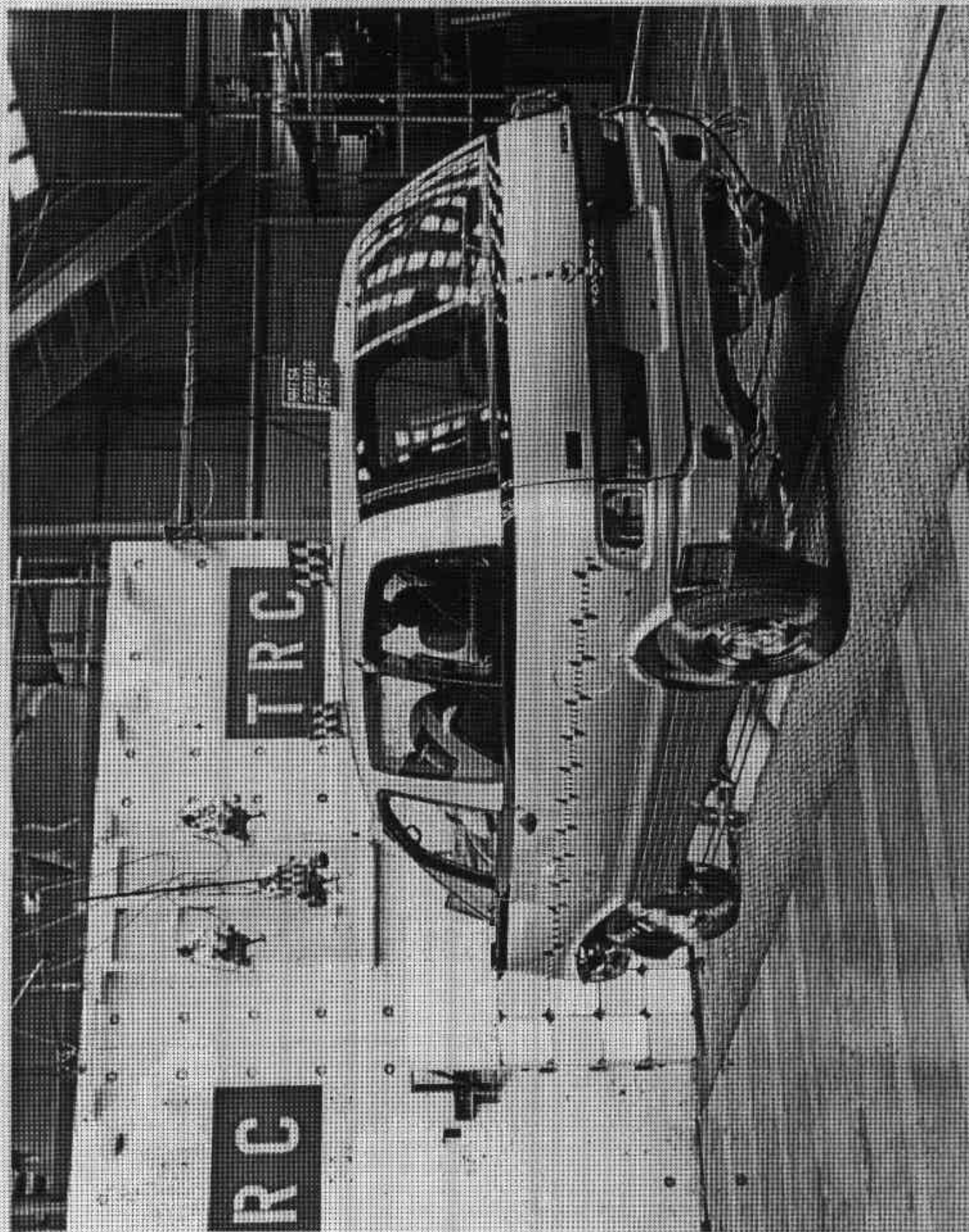


Figure A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

A-13

930106

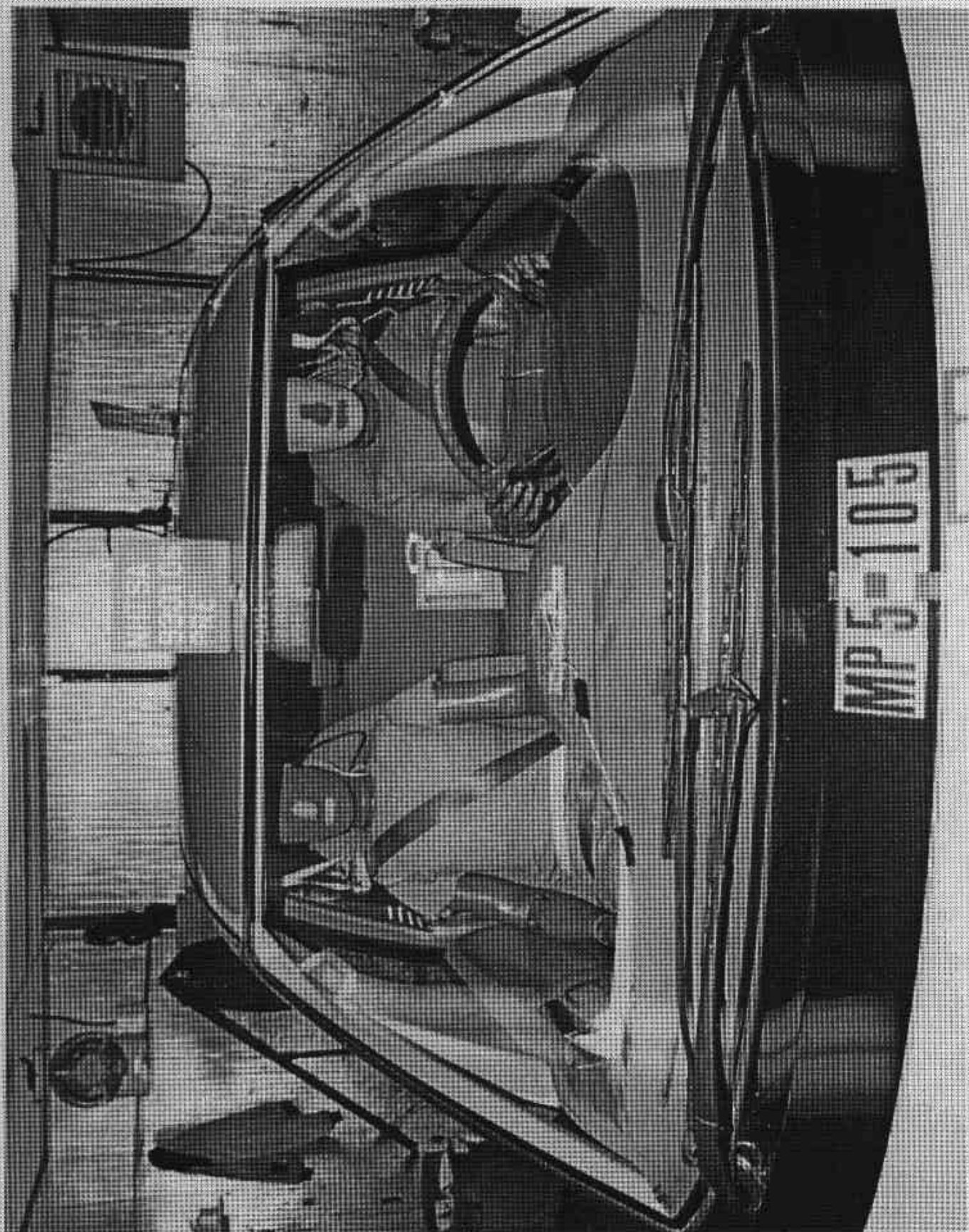


Figure A-13. PRE-TEST WINDSHIELD VIEW
A-14

930106

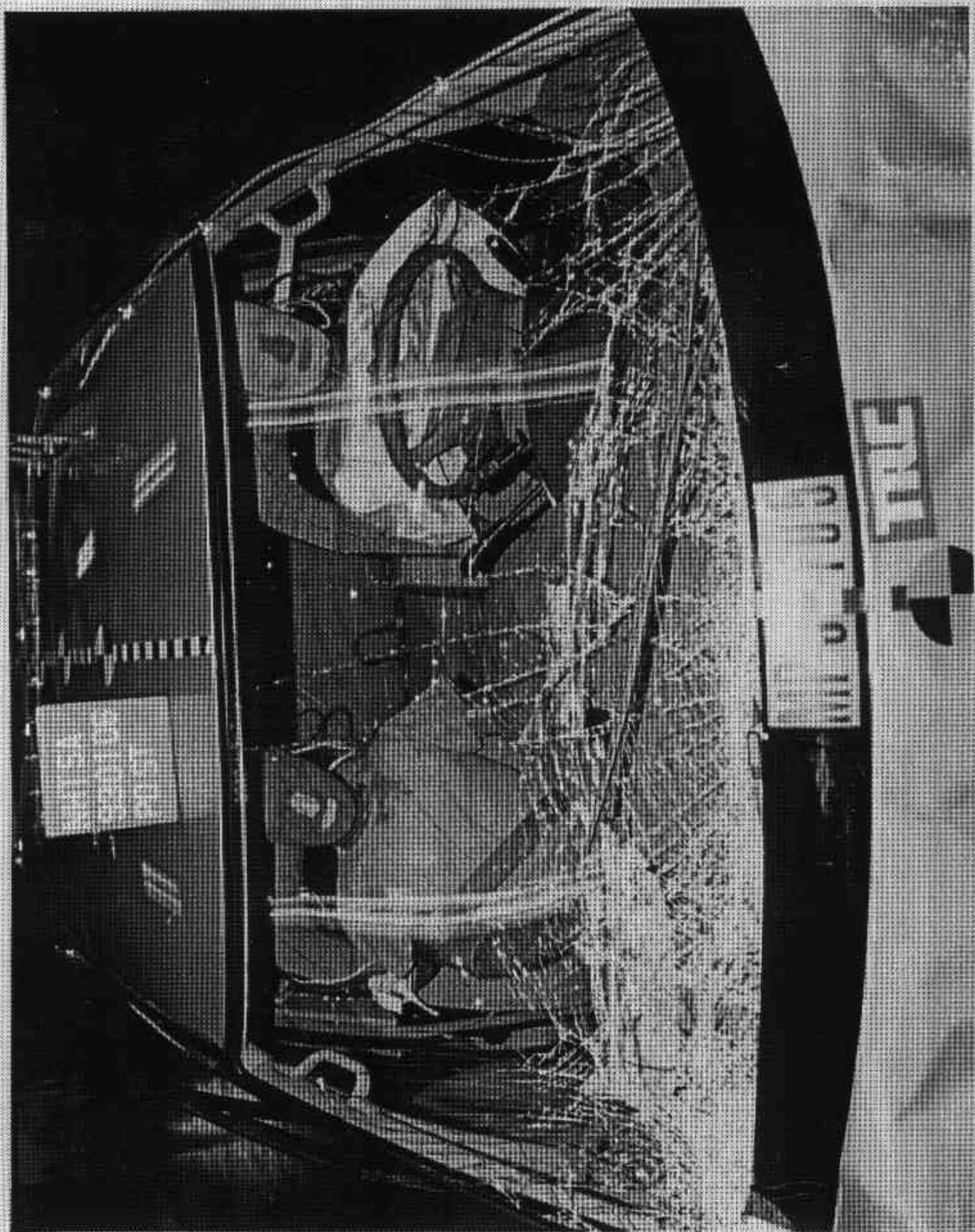


Figure A-14. POST-TEST WINDSHIELD VIEW
A-15

930106

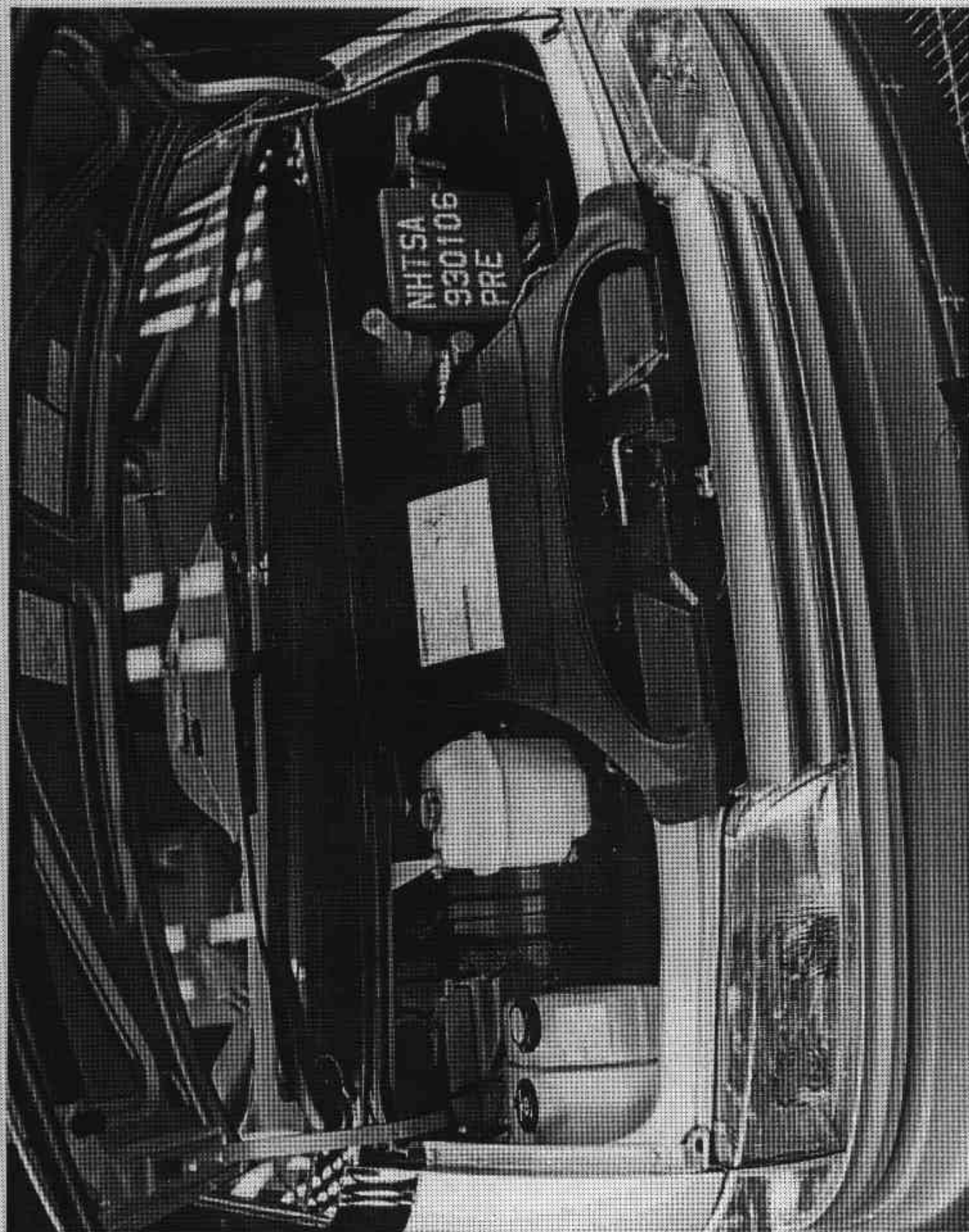


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

A-16

930106

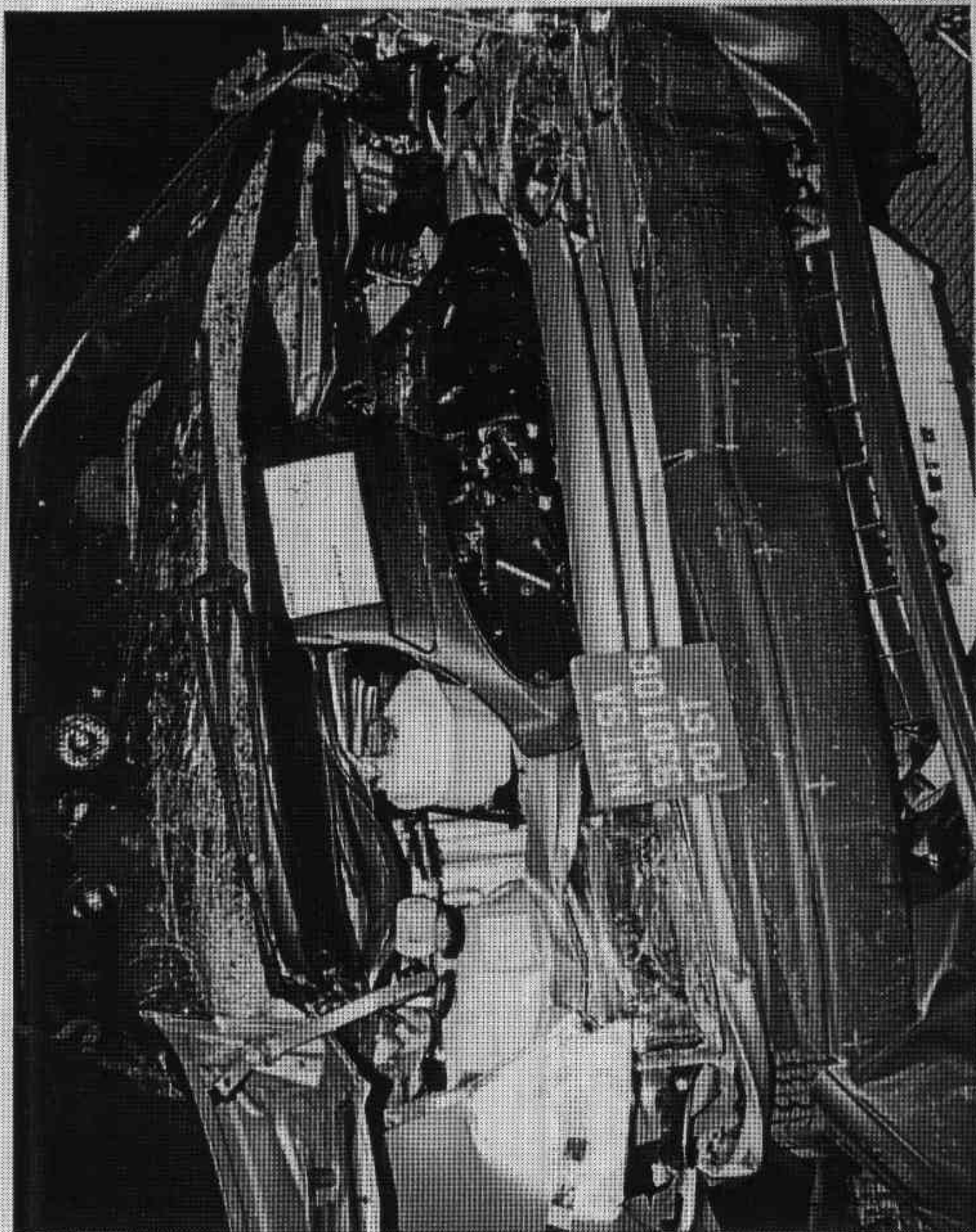


Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW
A-17

930106

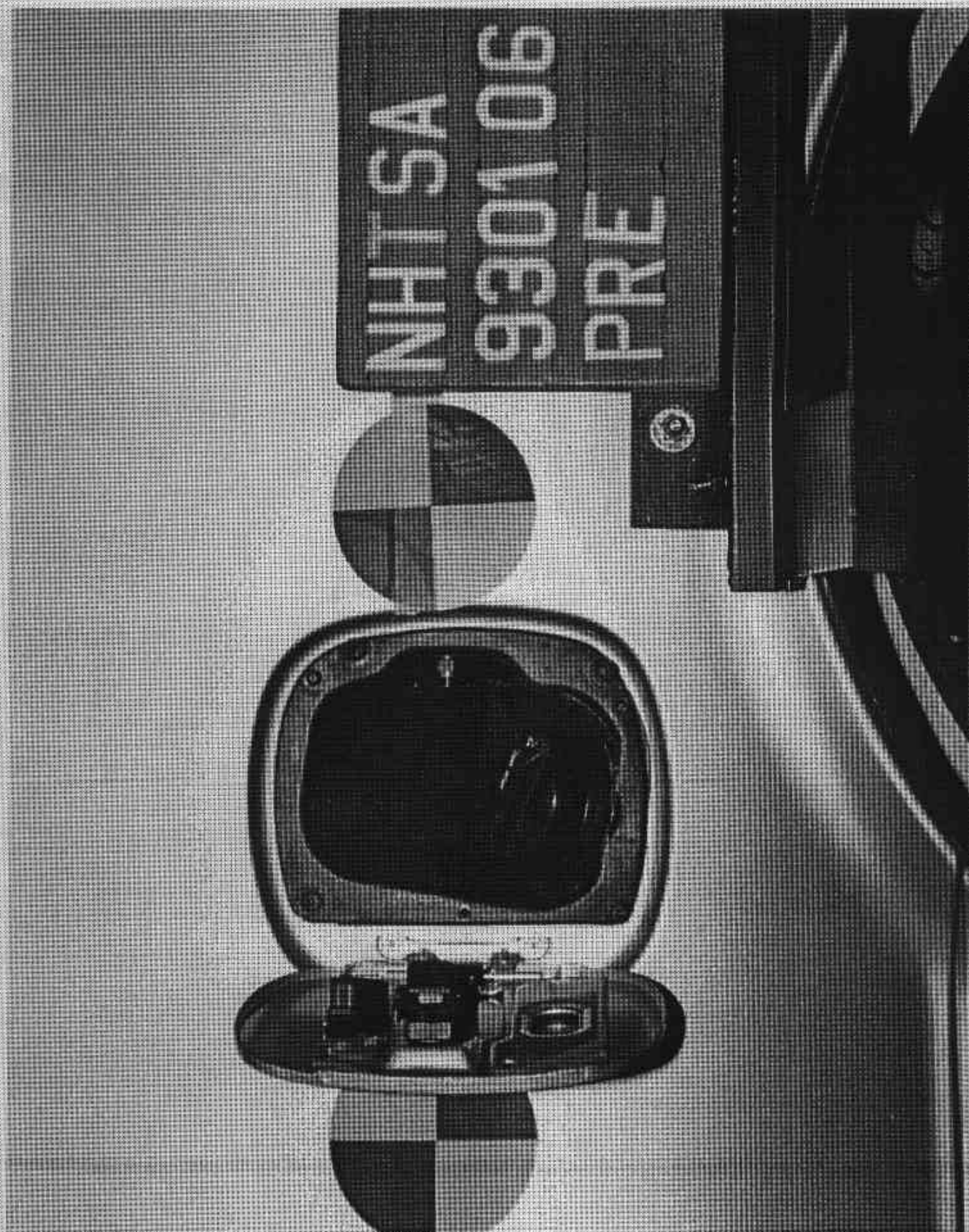


Figure A-17. PRE-TEST FUEL FILLER CAP VIEW



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

A-19

930106



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



Figure A-20. POST-TEST FUEL FILLER NECK & FUEL TANK VIEW

A-21

930106

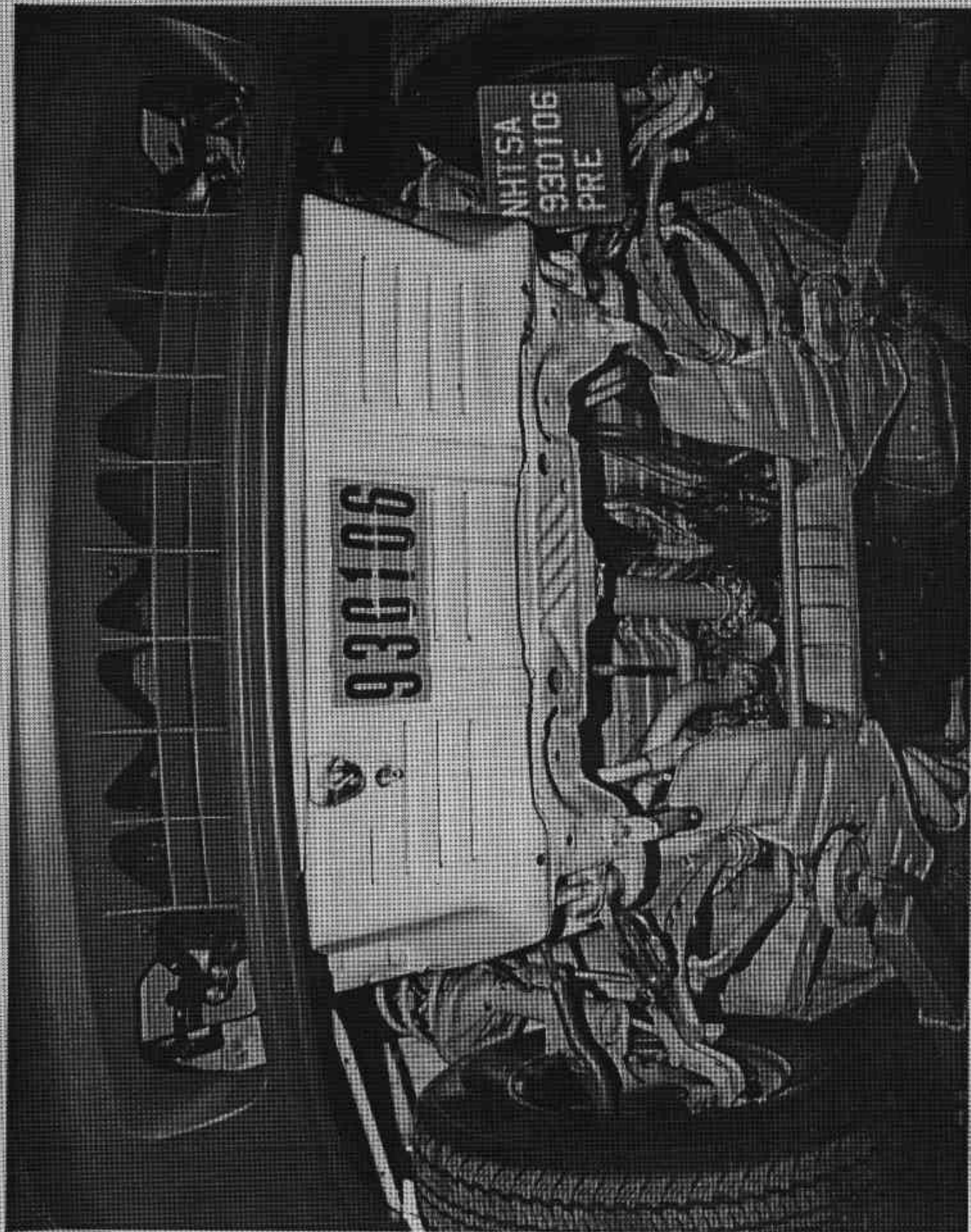


Figure A-21. PRE-TEST FRONT UNDERBODY VIEW

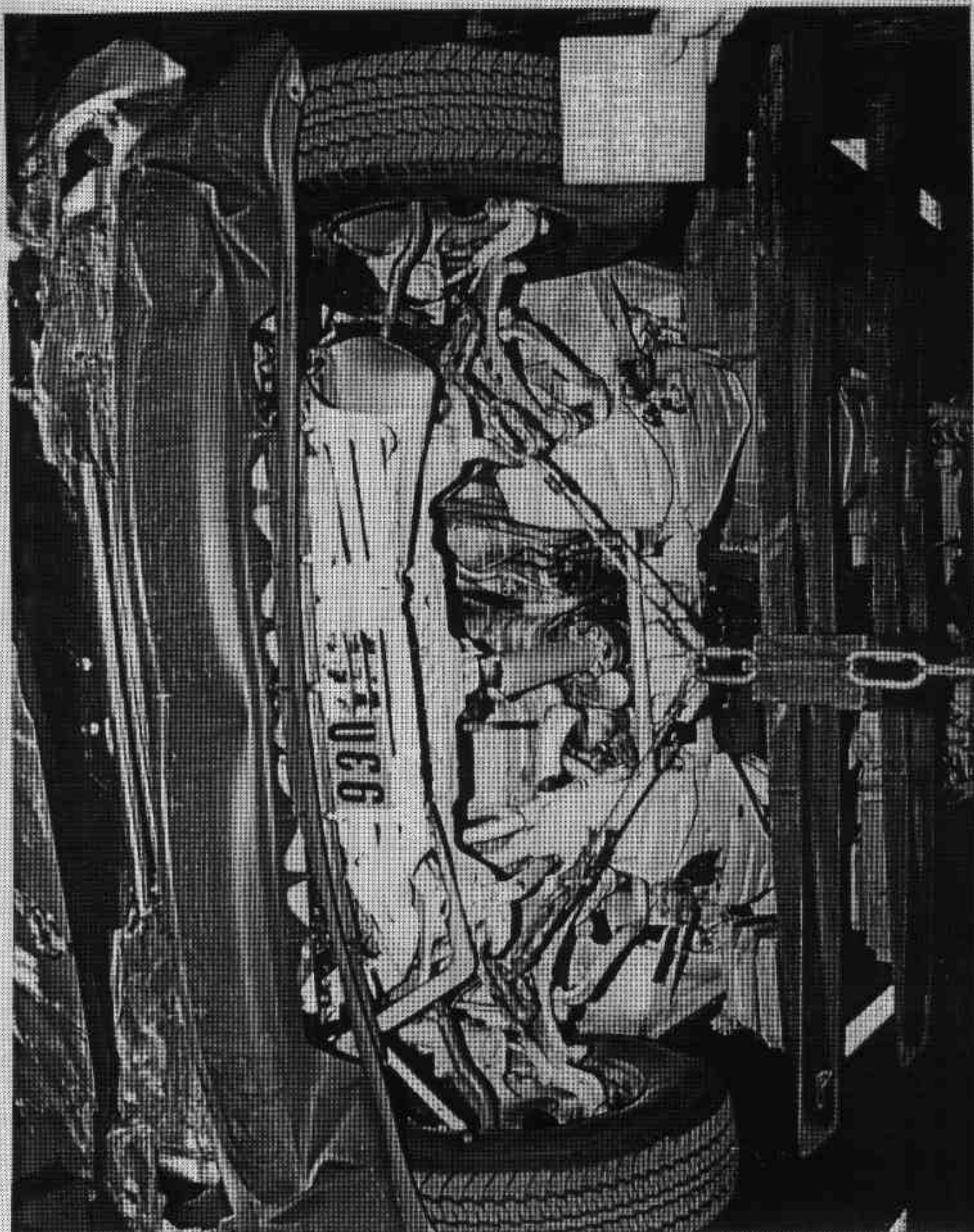


Figure A-22. POST-TEST FRONT UNDERBODY VIEW

A-23

930106

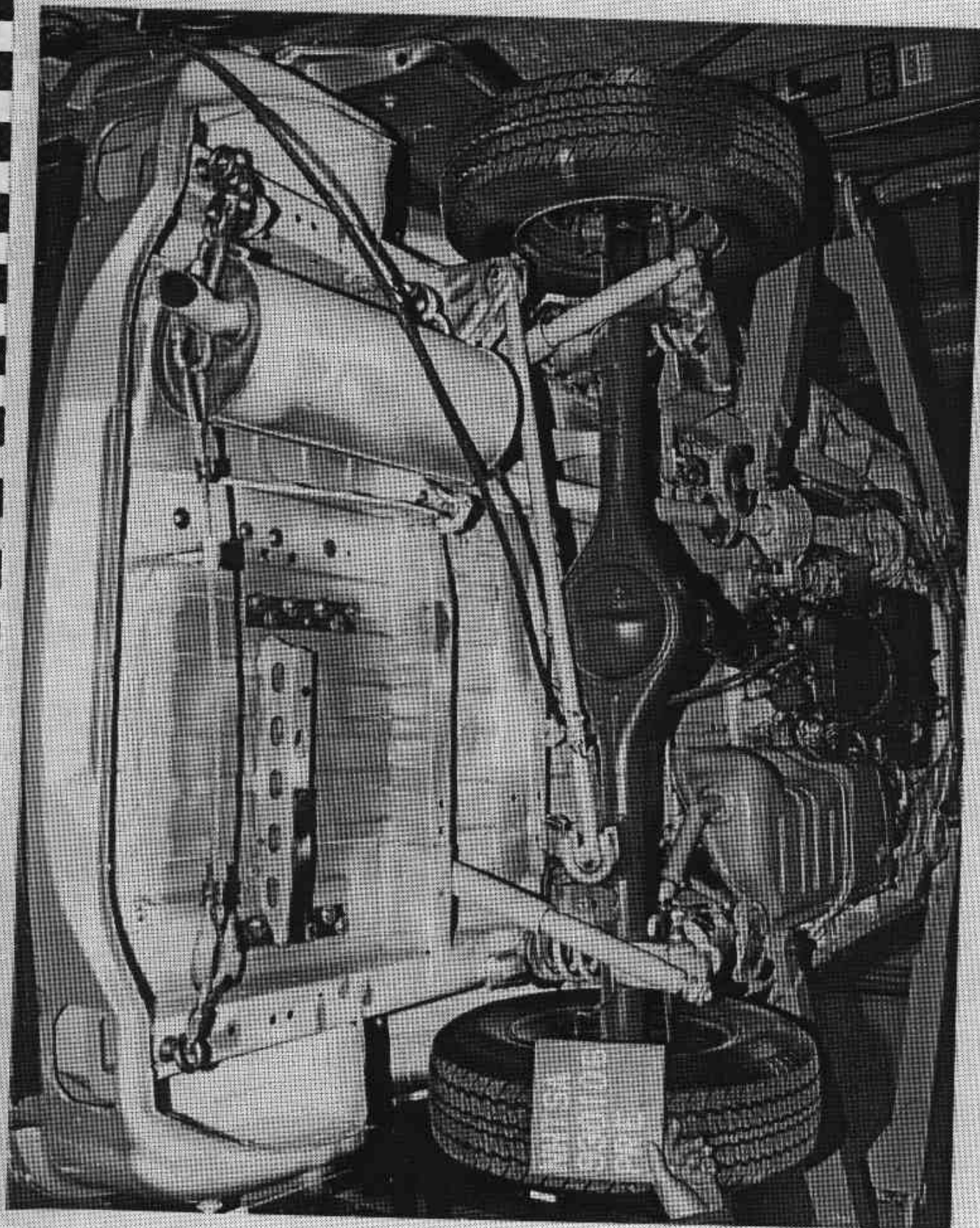


Figure A-23. PRE-TEST REAR UNDERBODY VIEW
A-24

930106

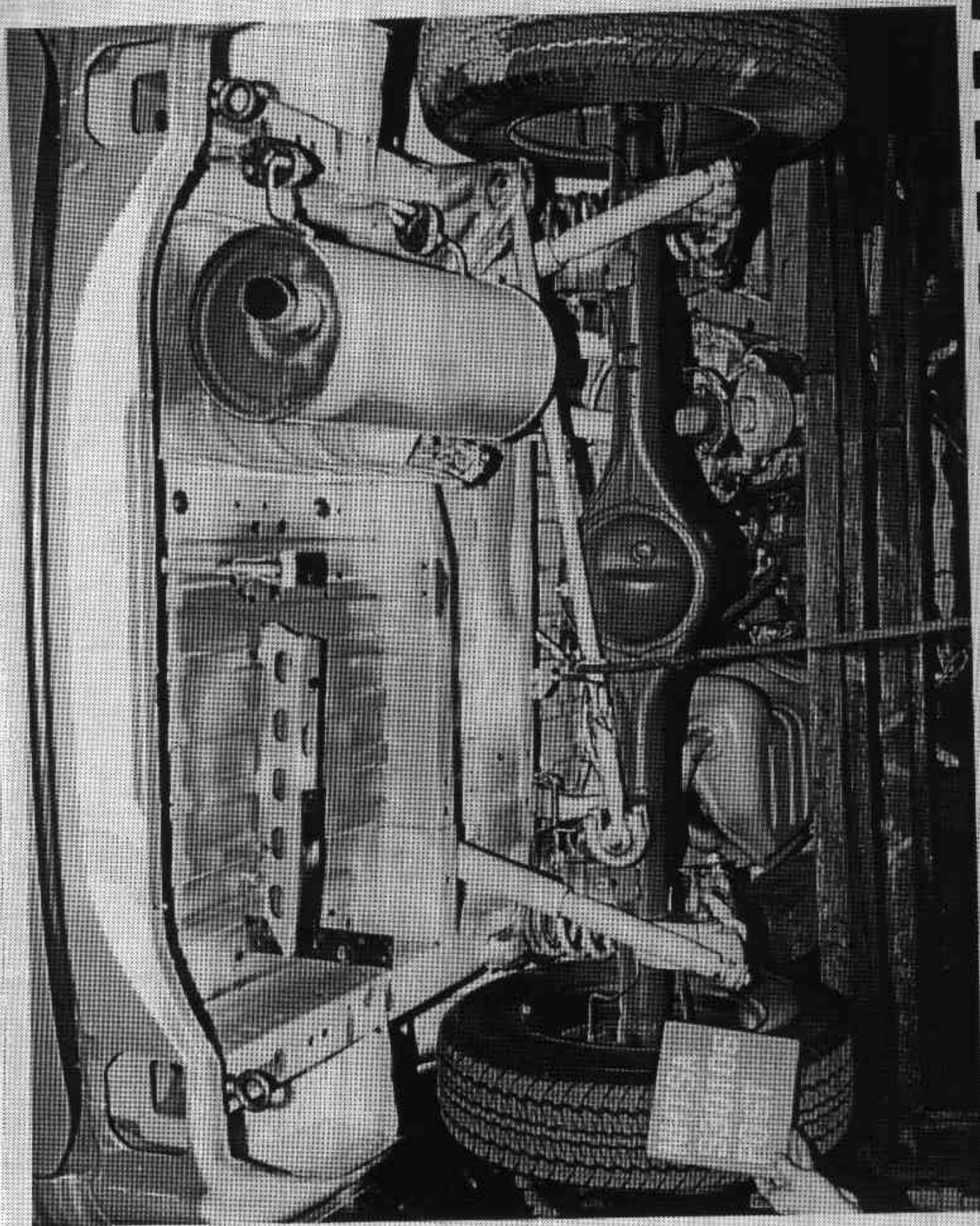


Figure A-24. POST-TEST REAR UNDERBODY VIEW
A-25

930106

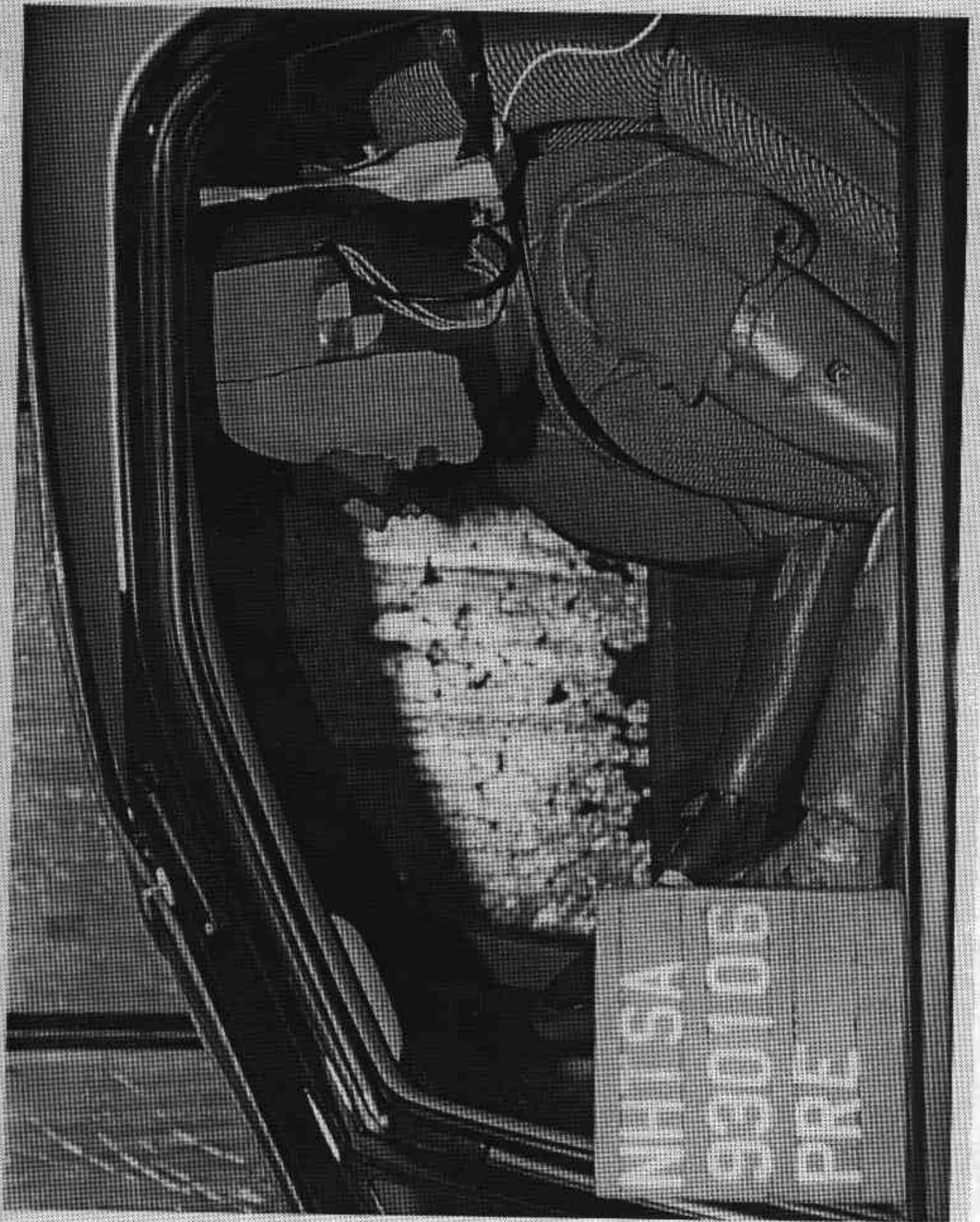


Figure A-25. PRE-TEST DRIVER DUMMY POSITION VIEW

A-26

930106

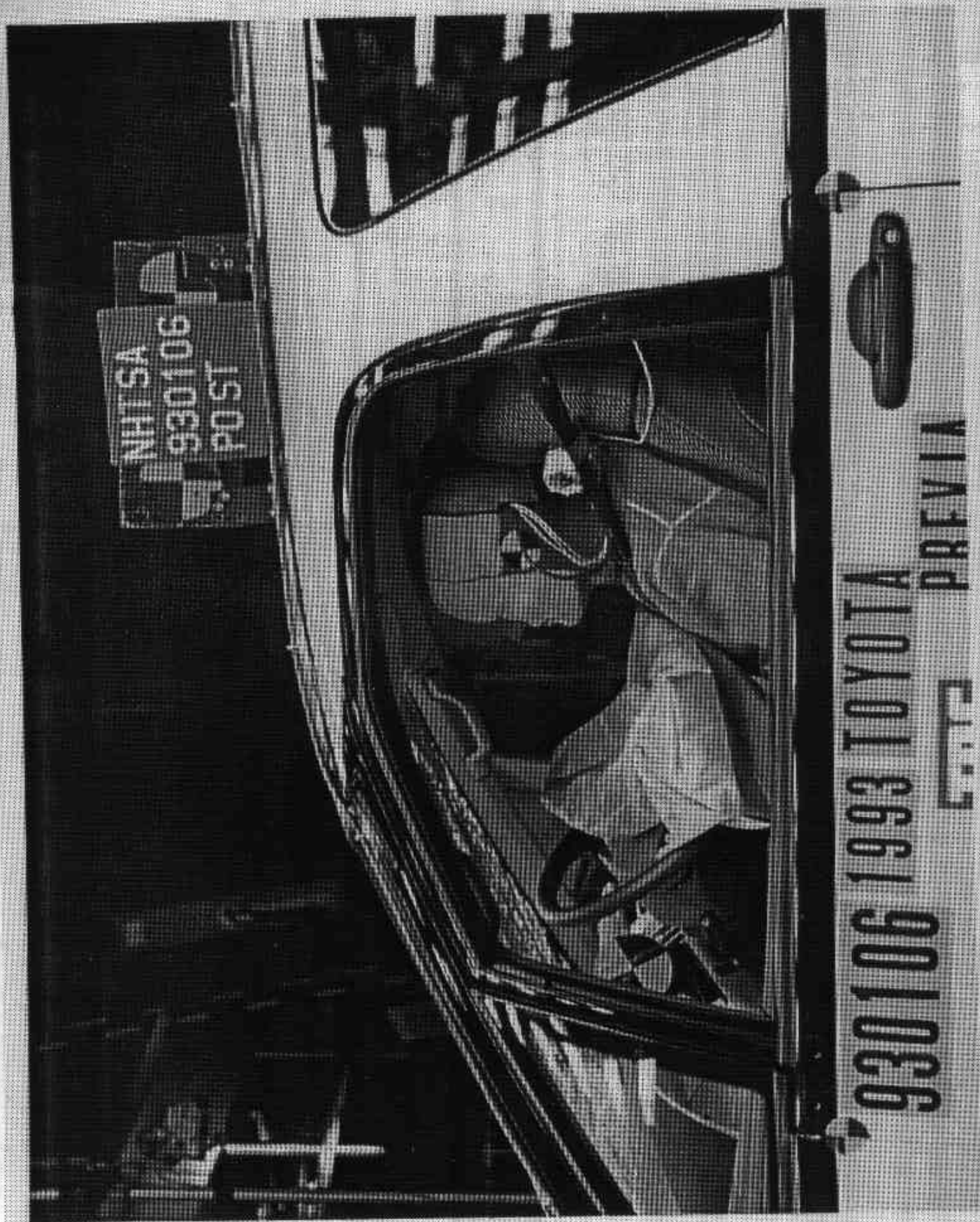


Figure A-26. POST-TEST DRIVER DUMMY POSITION VIEW
A-27

930106



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

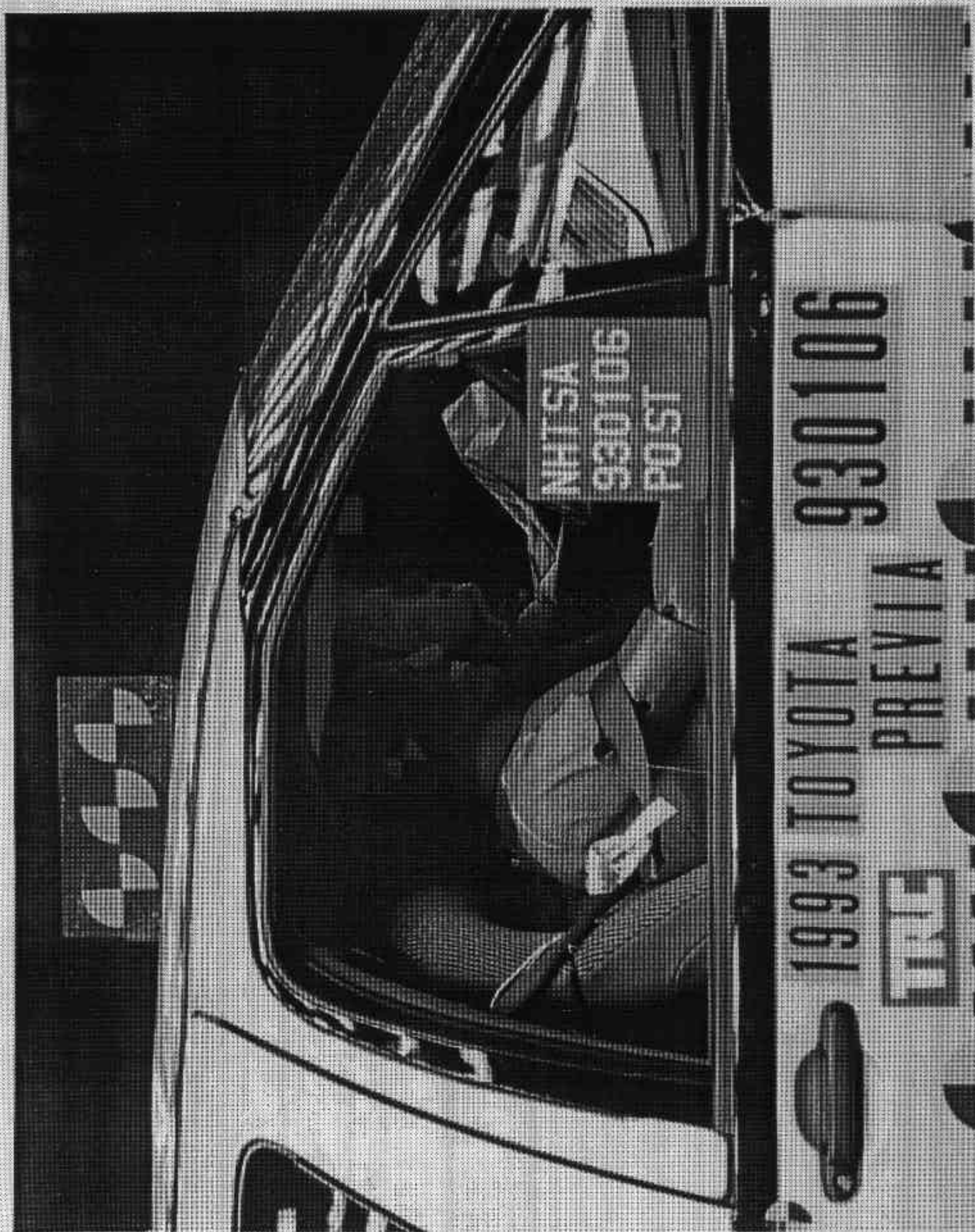


Figure A-28. POST-TEST PASSENGER DUMMY POSITION VIEW



Figure A-29. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
A-30 930106



Figure A-30. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
A-31 930106



Figure A-31. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

A-32

930106



Figure A-32. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2
A-33 930106



Figure A-33. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

A-34

930106



Figure A-34. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-35 930106



Figure A-35. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

A-36

930106



Figure A-36. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

A-37

930106

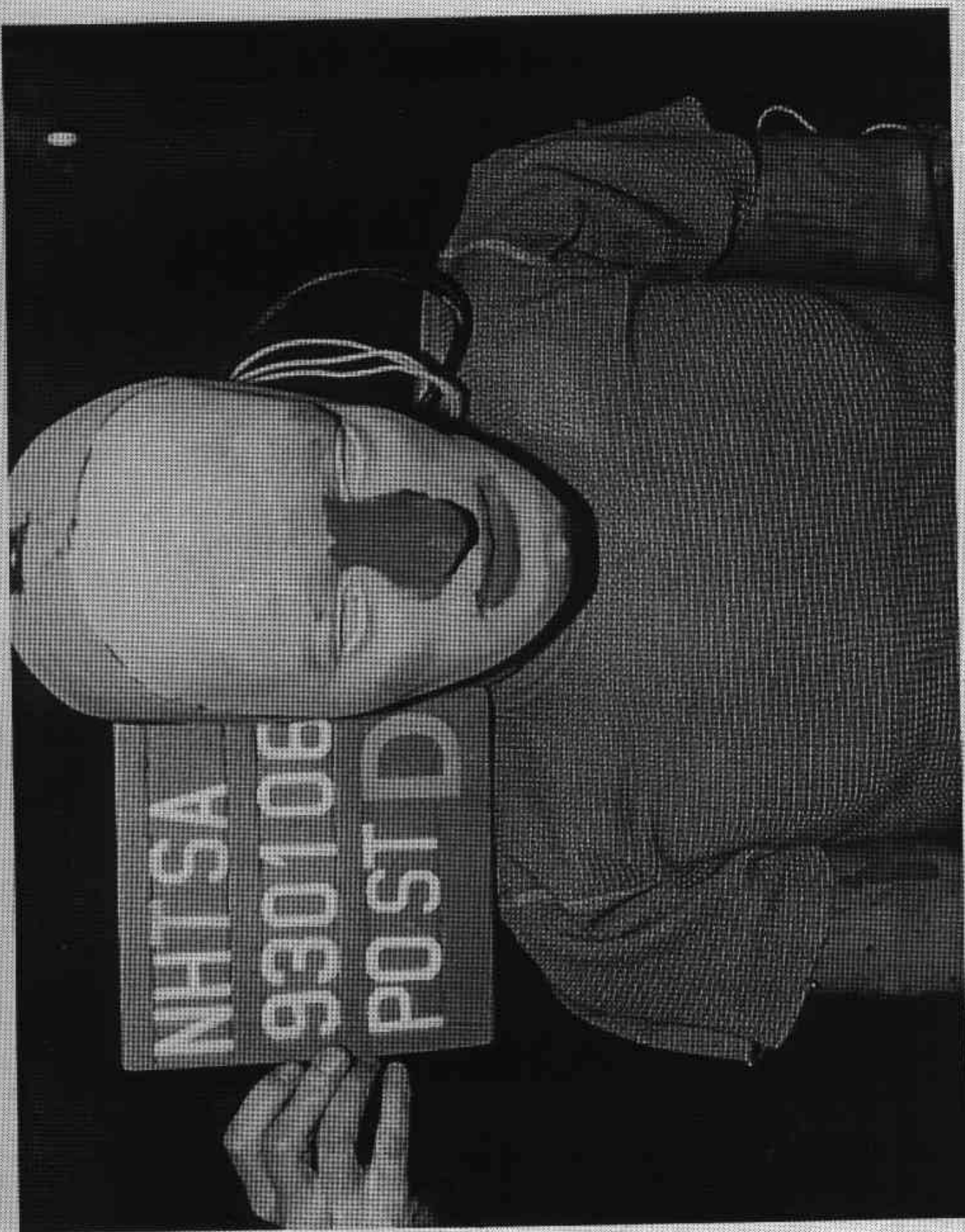


Figure A-37. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 1



Figure A-38. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 2

A-39

930106



Figure A-39. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 1

A-40

930106

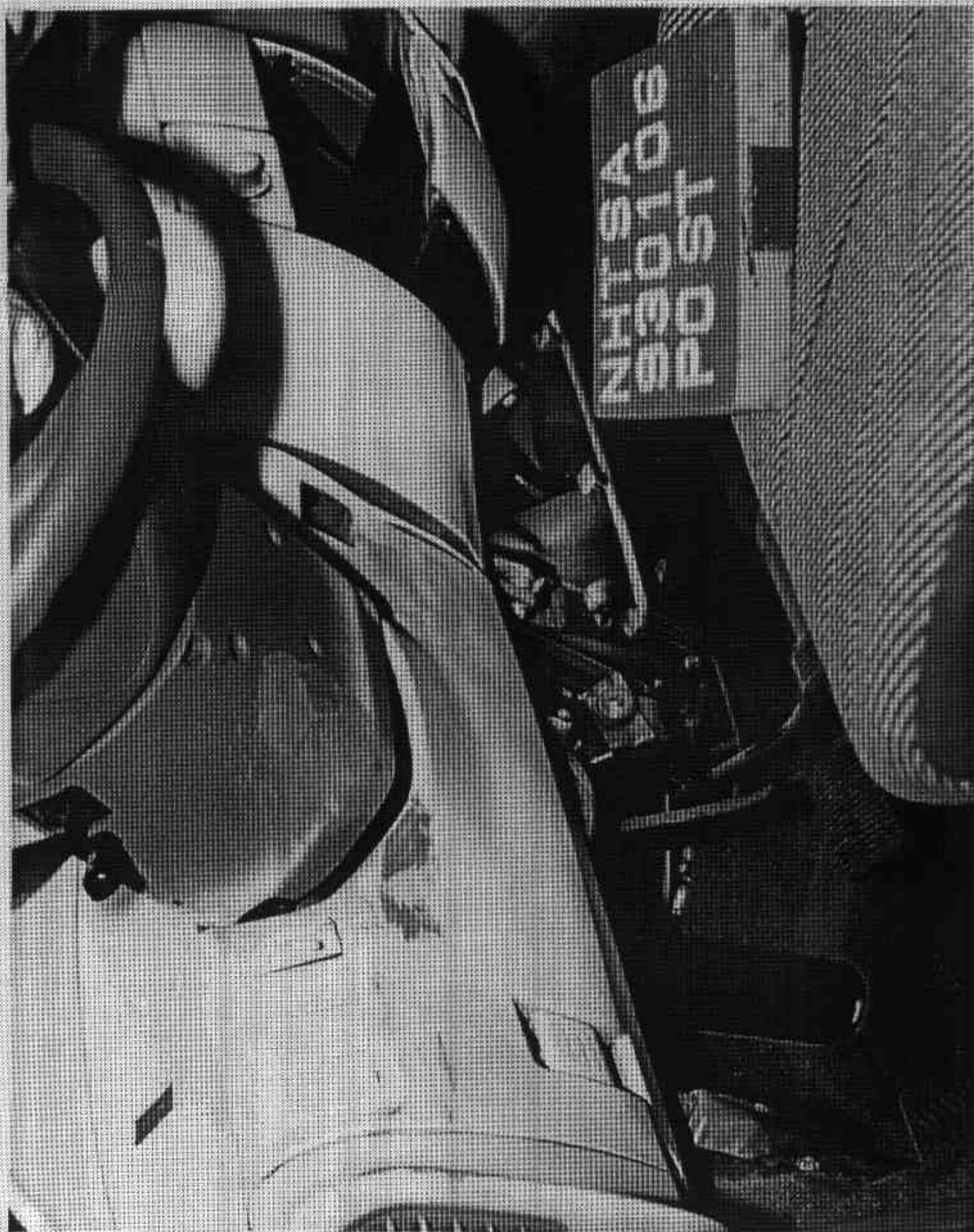


Figure A-40. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 2

A-41

930106

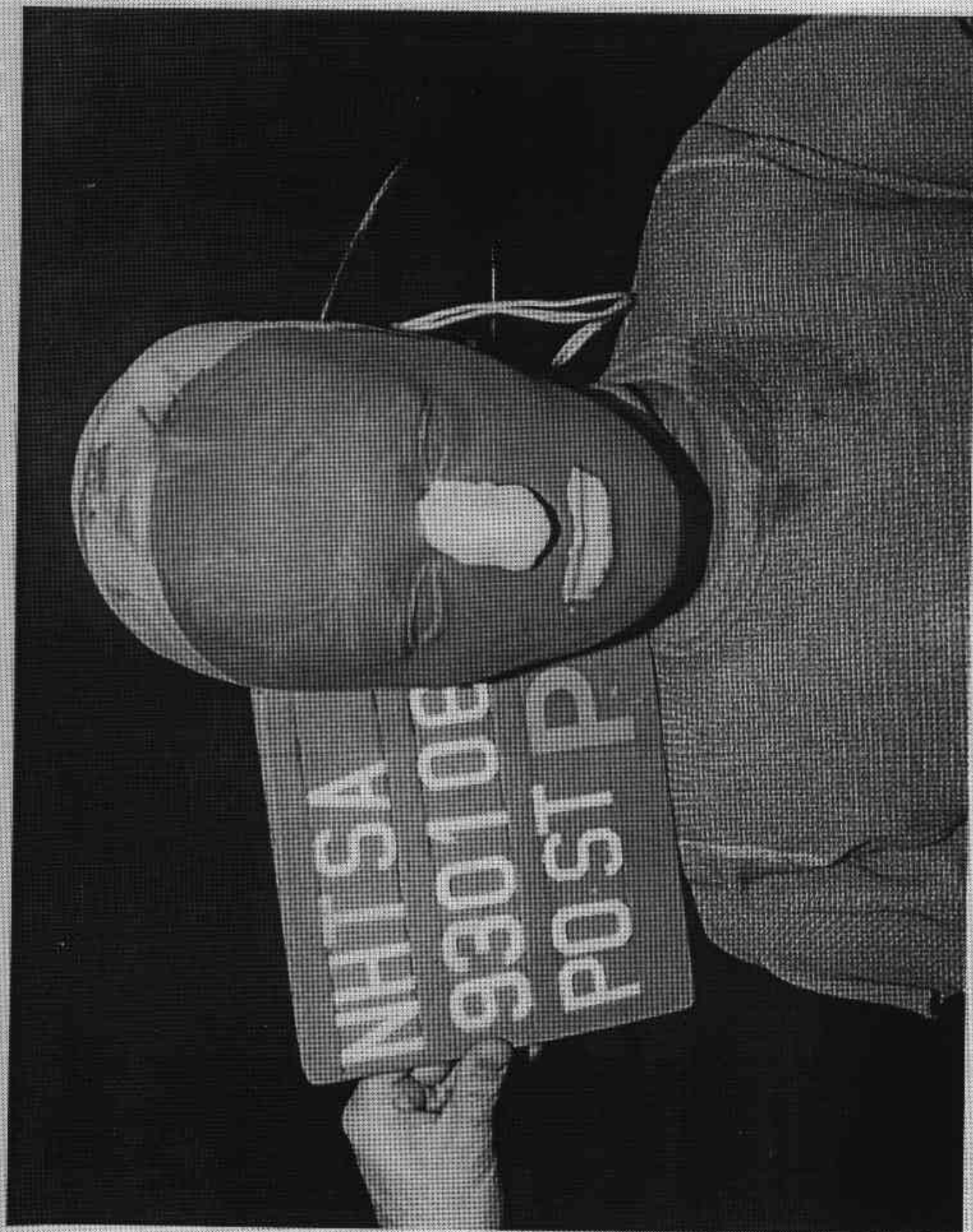


Figure A-41. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW I
A-42 930106



Figure A-42. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW 2
A-43 930106

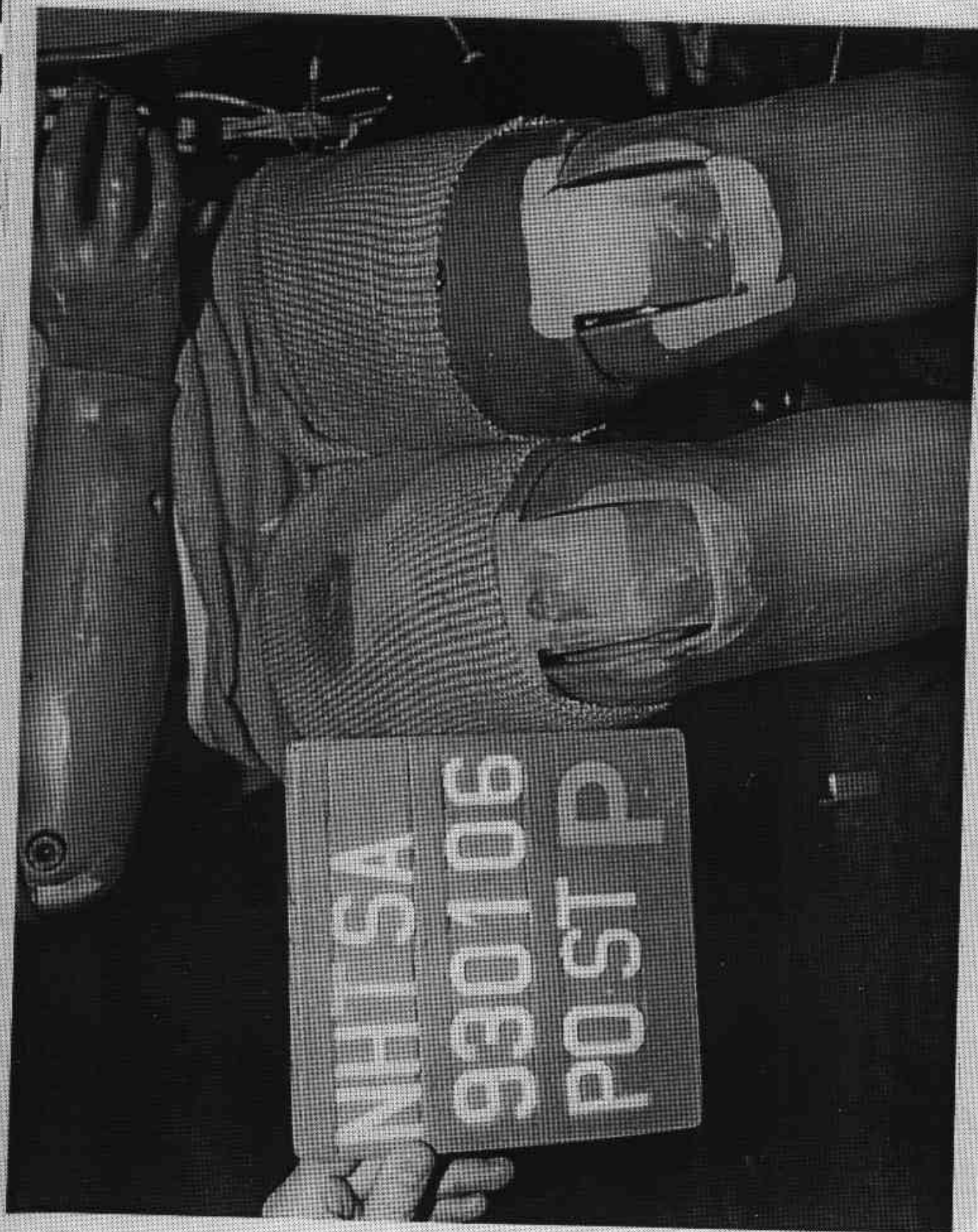


Figure A-43. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1

A-44

930106

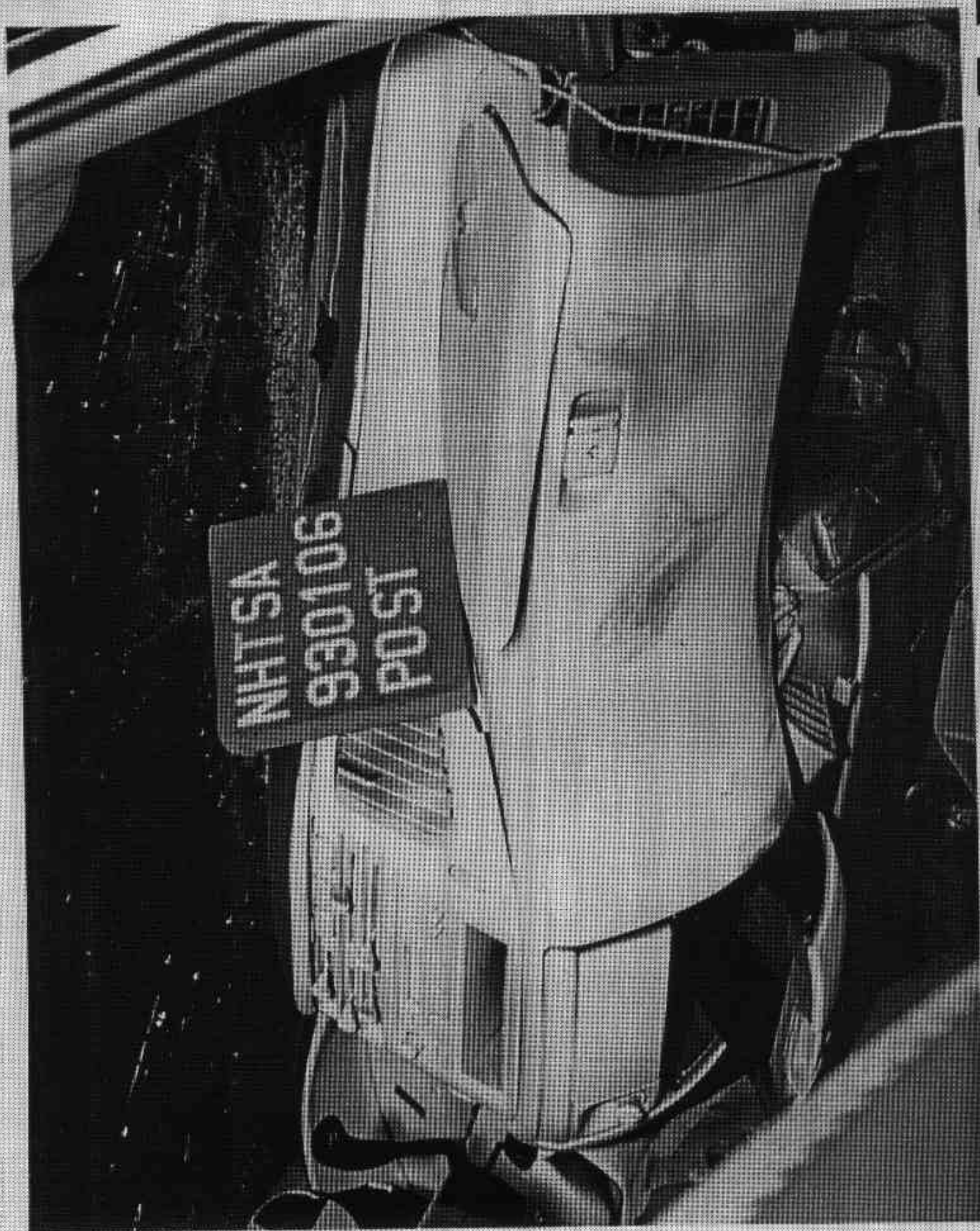


Figure A-44. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2

A-45

930106

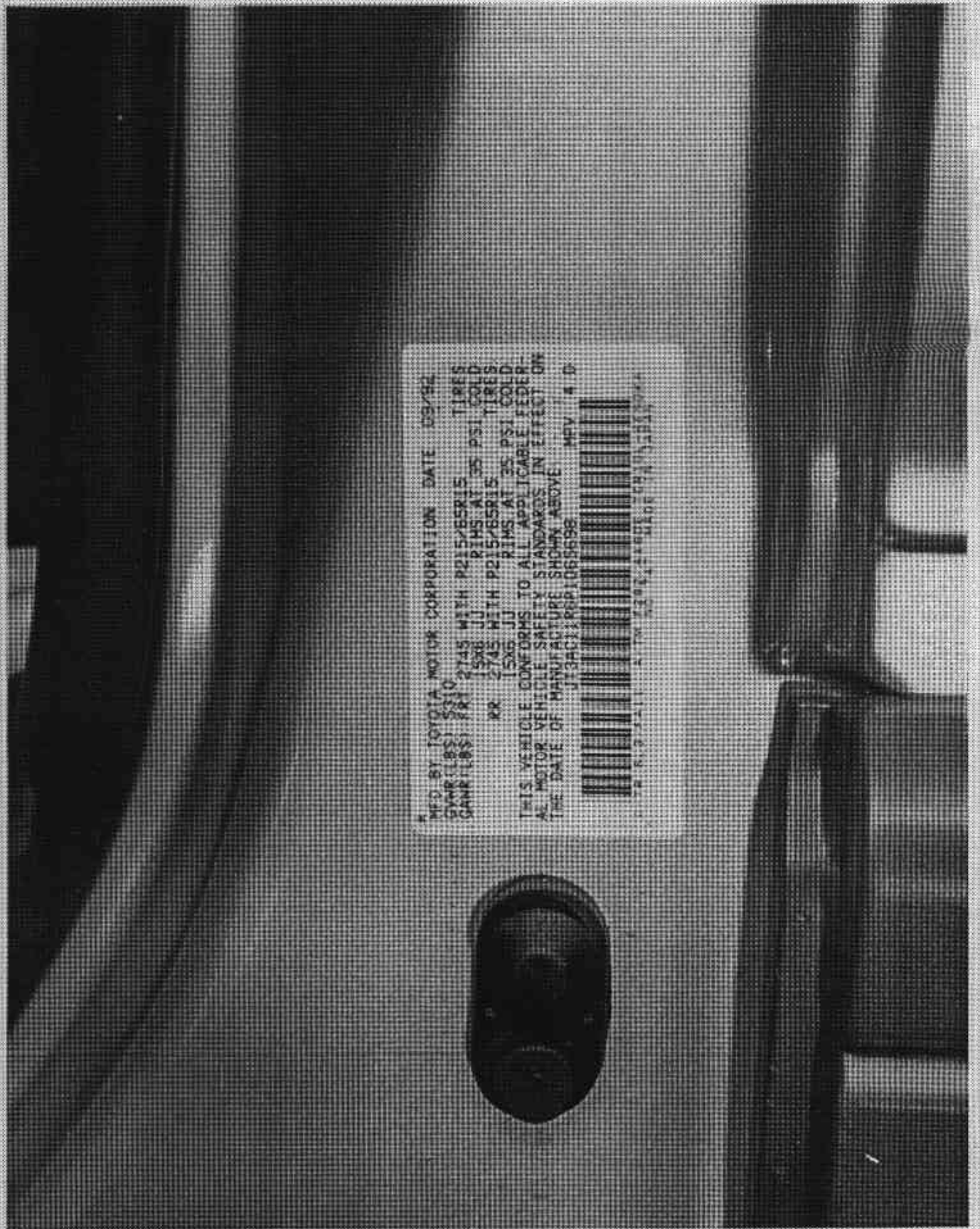


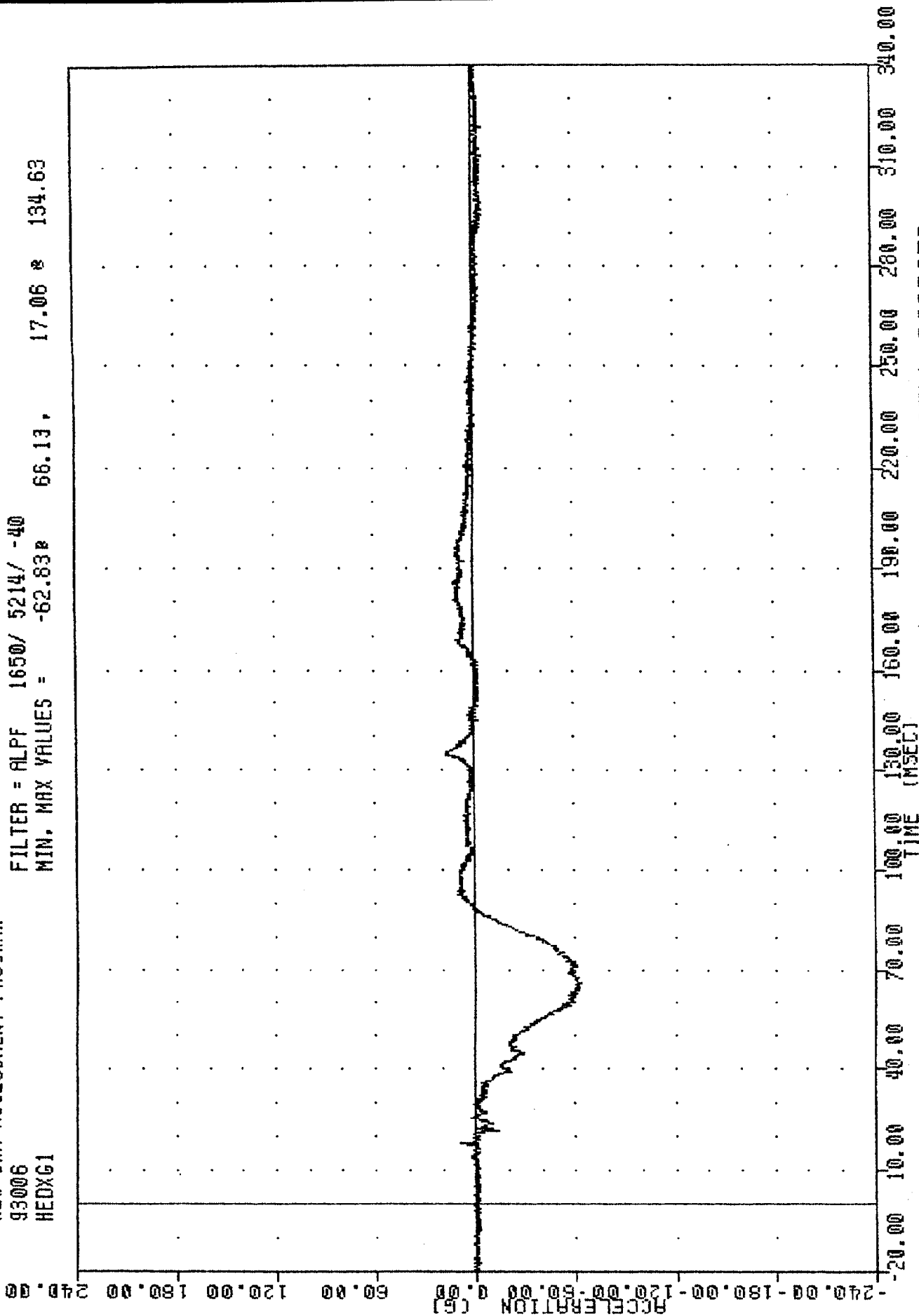
Figure A-45. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

APPENDIX B

DATA PLOTS

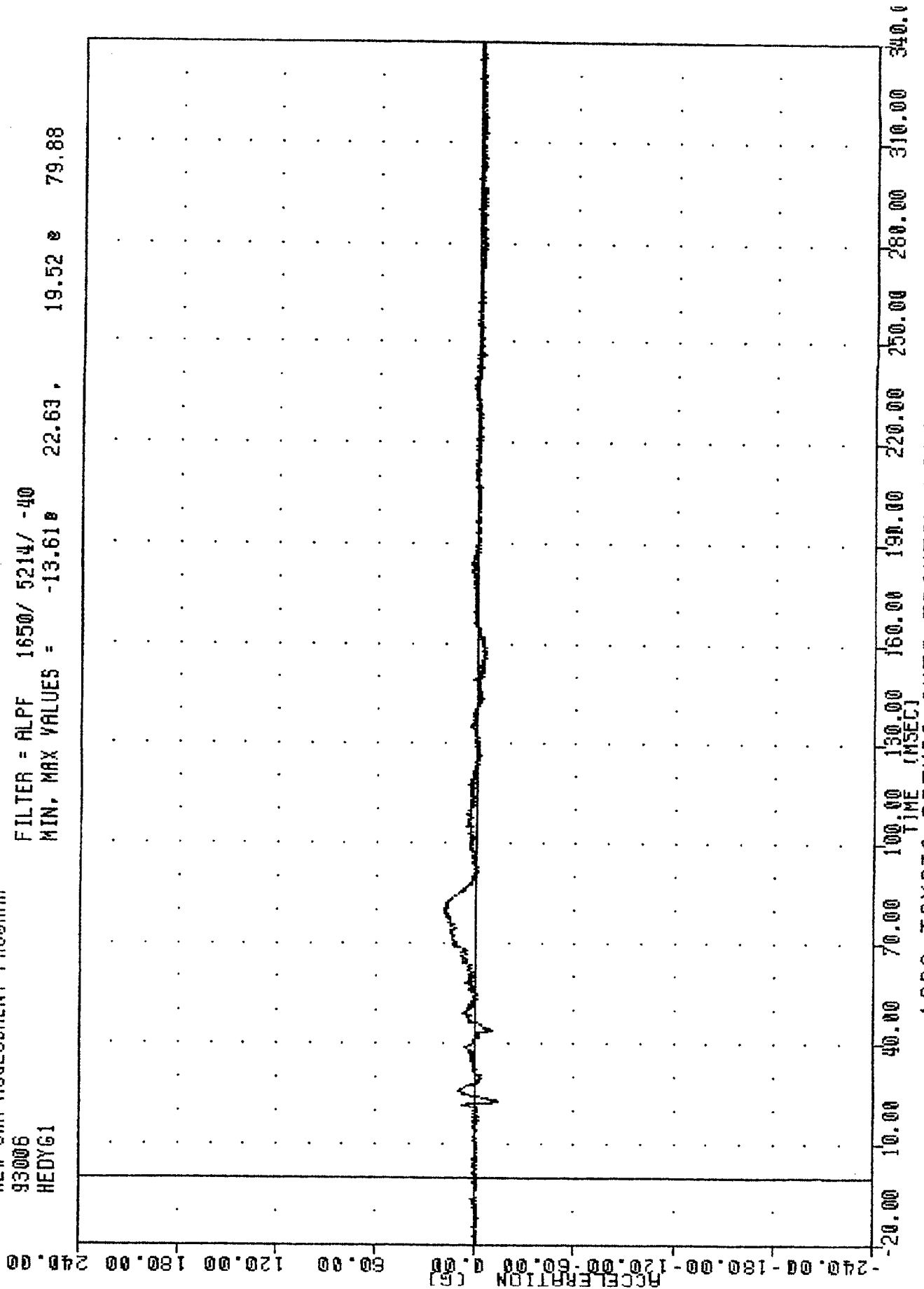
TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 HEDXG1

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -62.838 66.13 , 17.06 134.63



TRC
NEW CAR ASSESSMENT PROGRAM
93006
HEDYG1

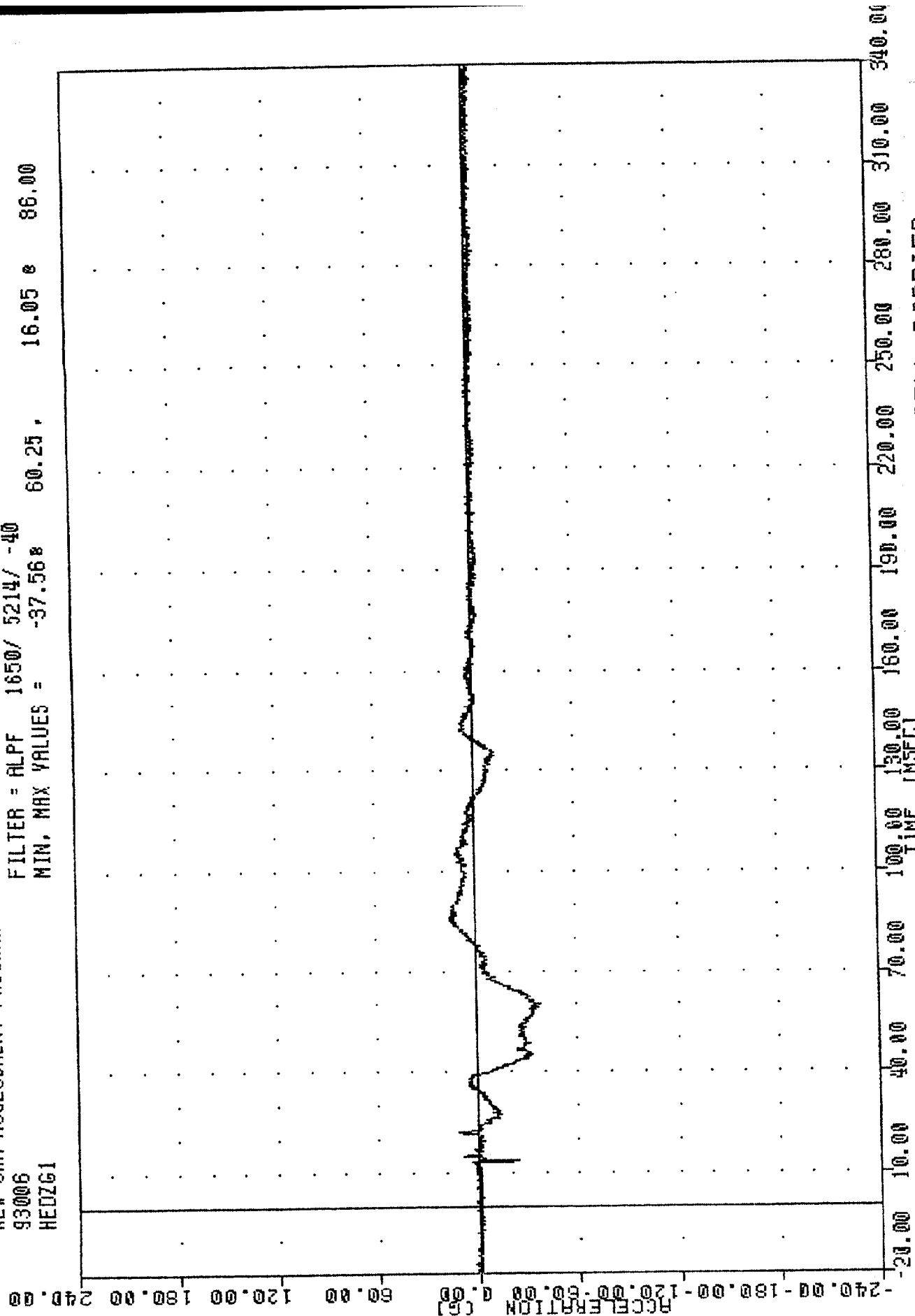
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -13.618 22.63, 19.52 79.88



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 HEDZG1

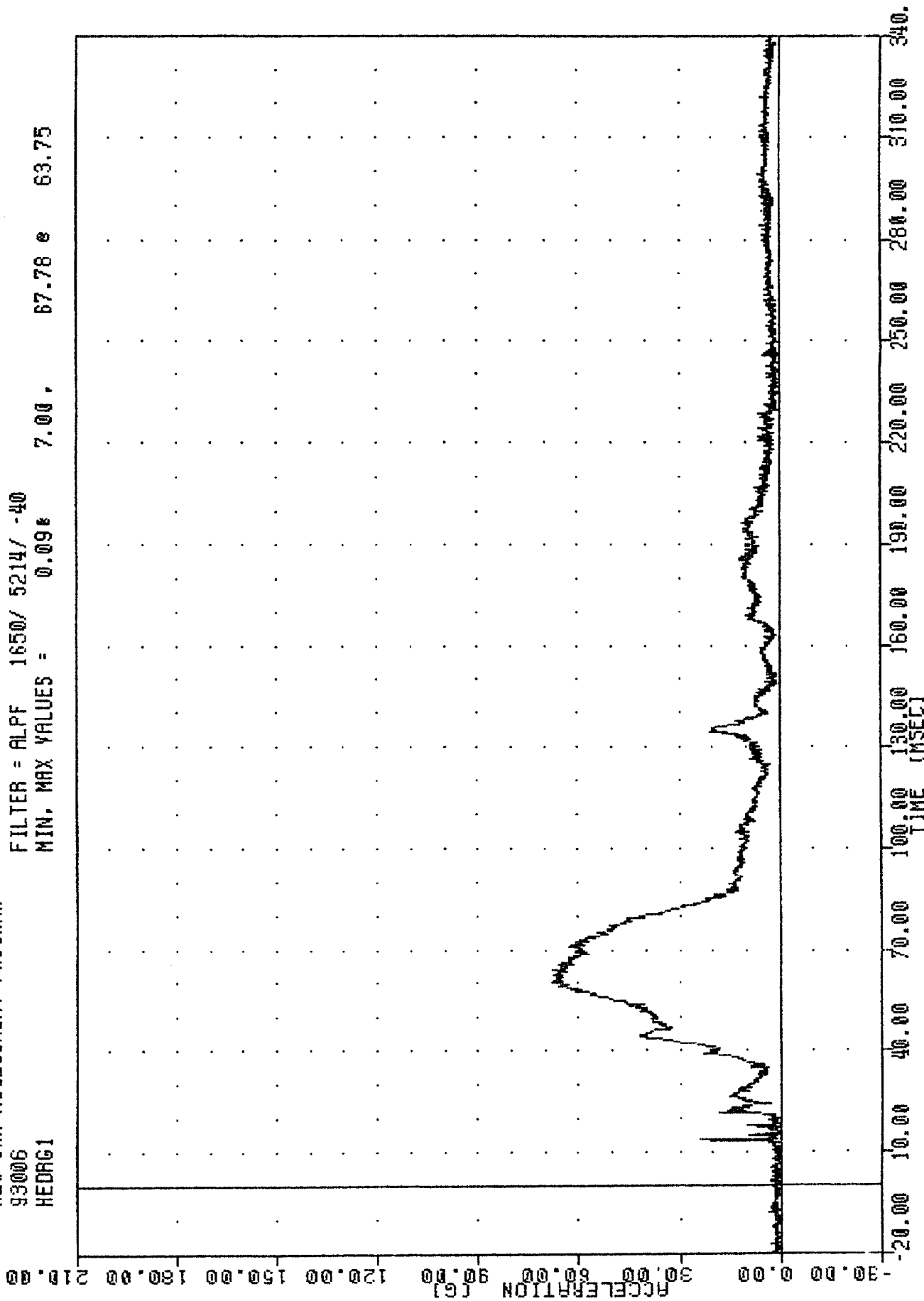
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -37.56 60.25 16.05 86.00



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD 3-AXIS ACCELERATION

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 HEDRG1

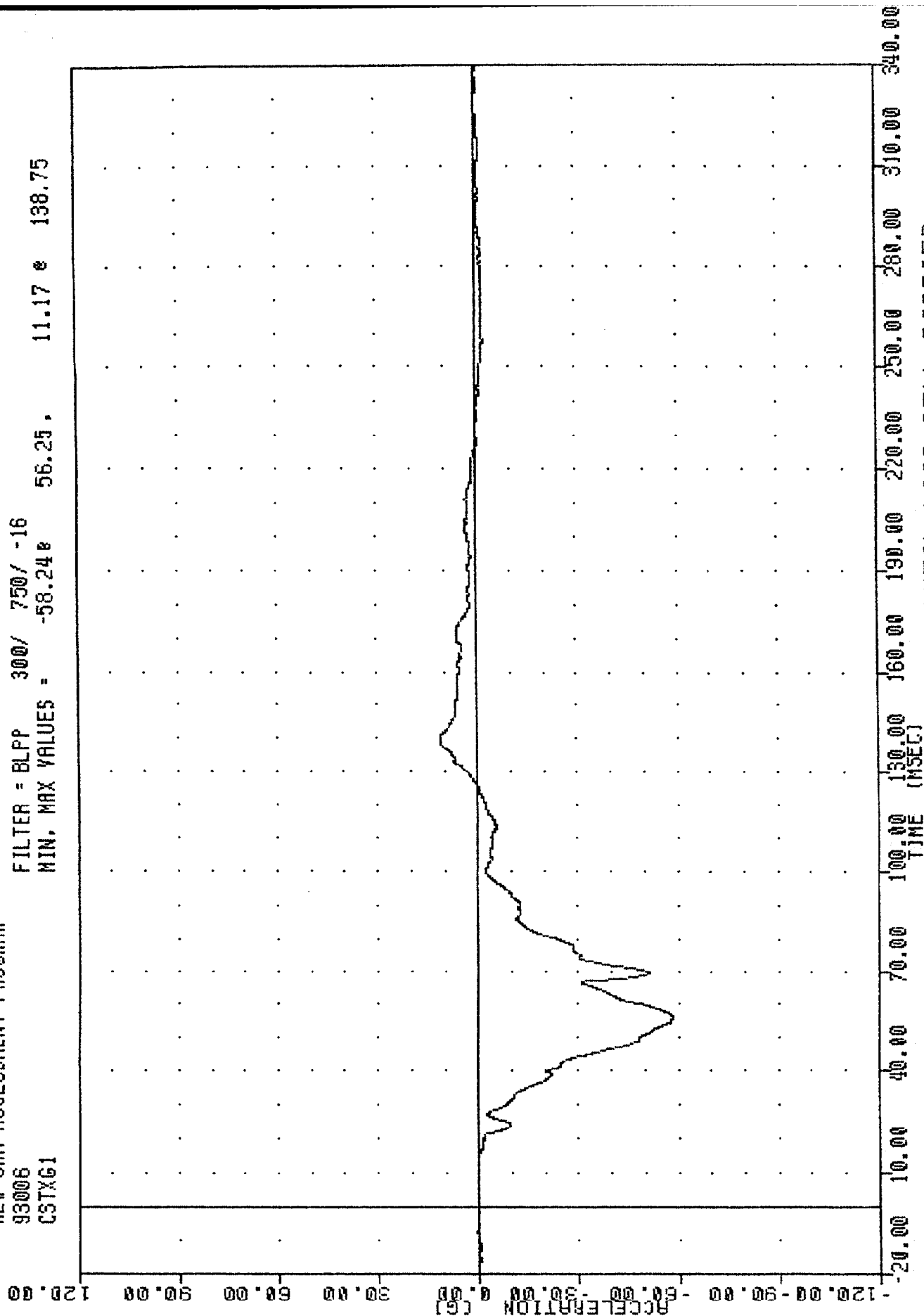
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 0.09% 7.00, 67.78 % 63.75



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD RESULTANT ACCELERATION

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 CSTXG1

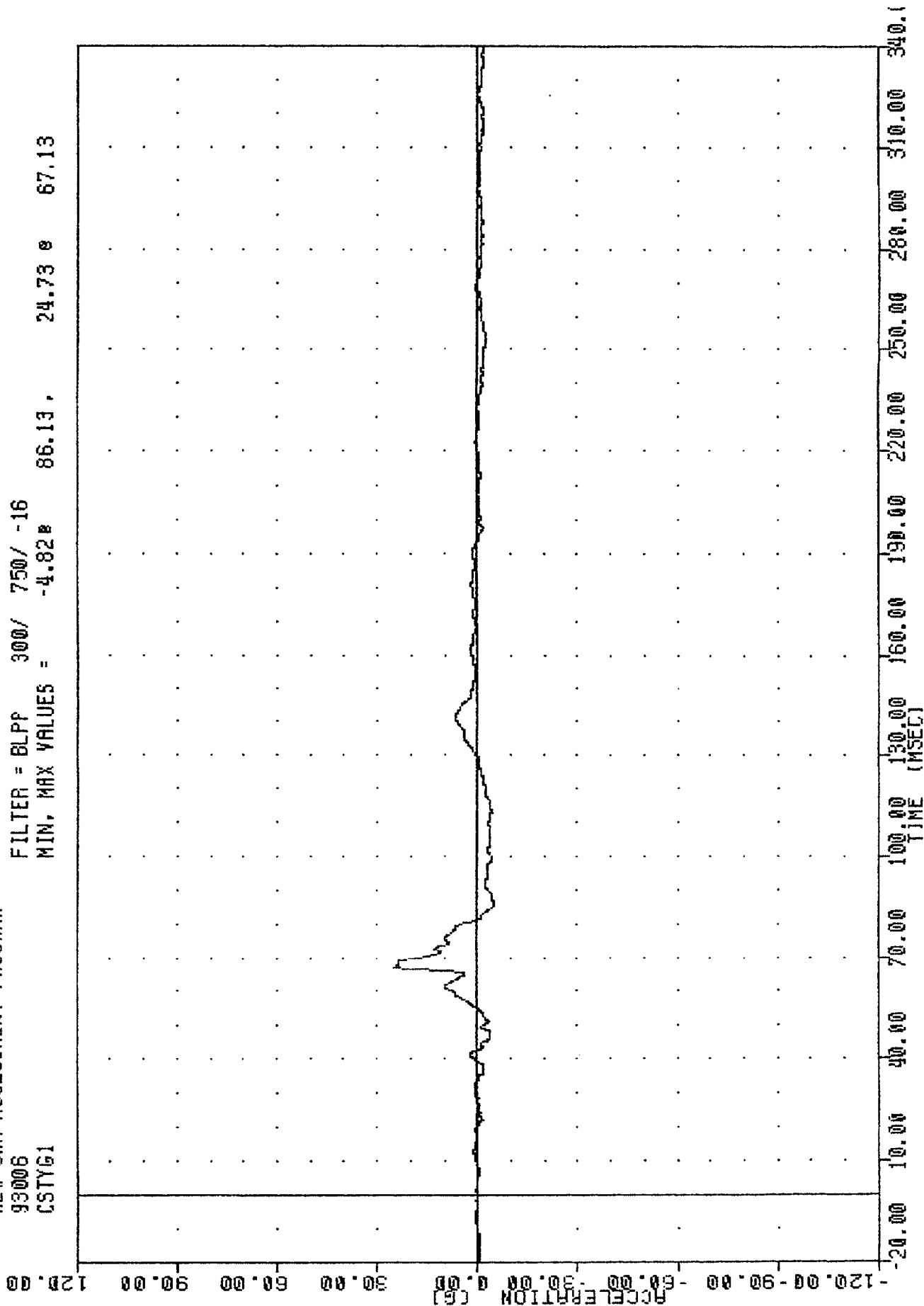
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -58.24 56.25 11.17 138.75



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER SEAT X-AXIS ACCELERATION

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 CSTYG1

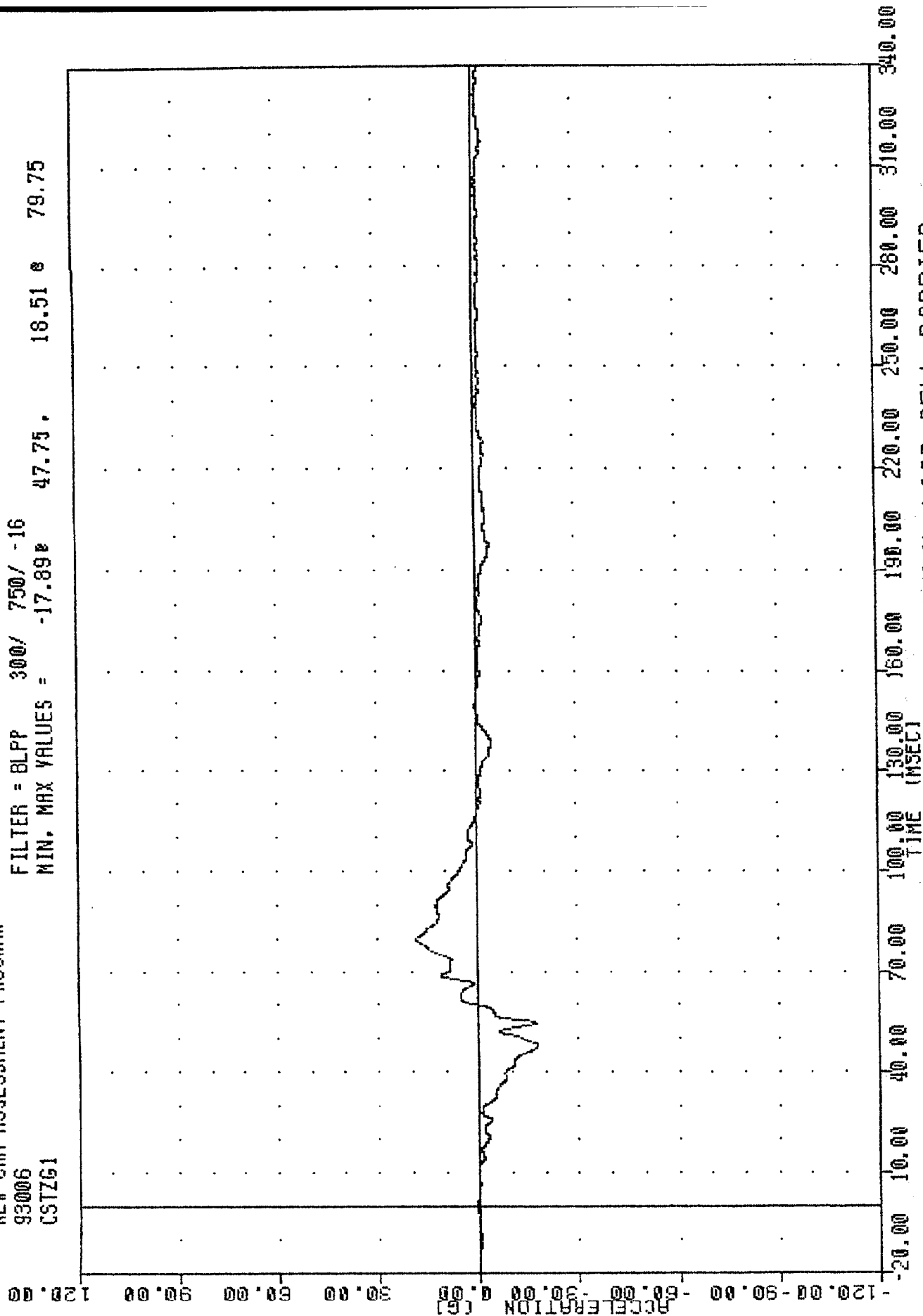
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -4.82 86.13, 24.73 67.13



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Y-AXIS ACCELERATION

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 930006
 CSTZG1

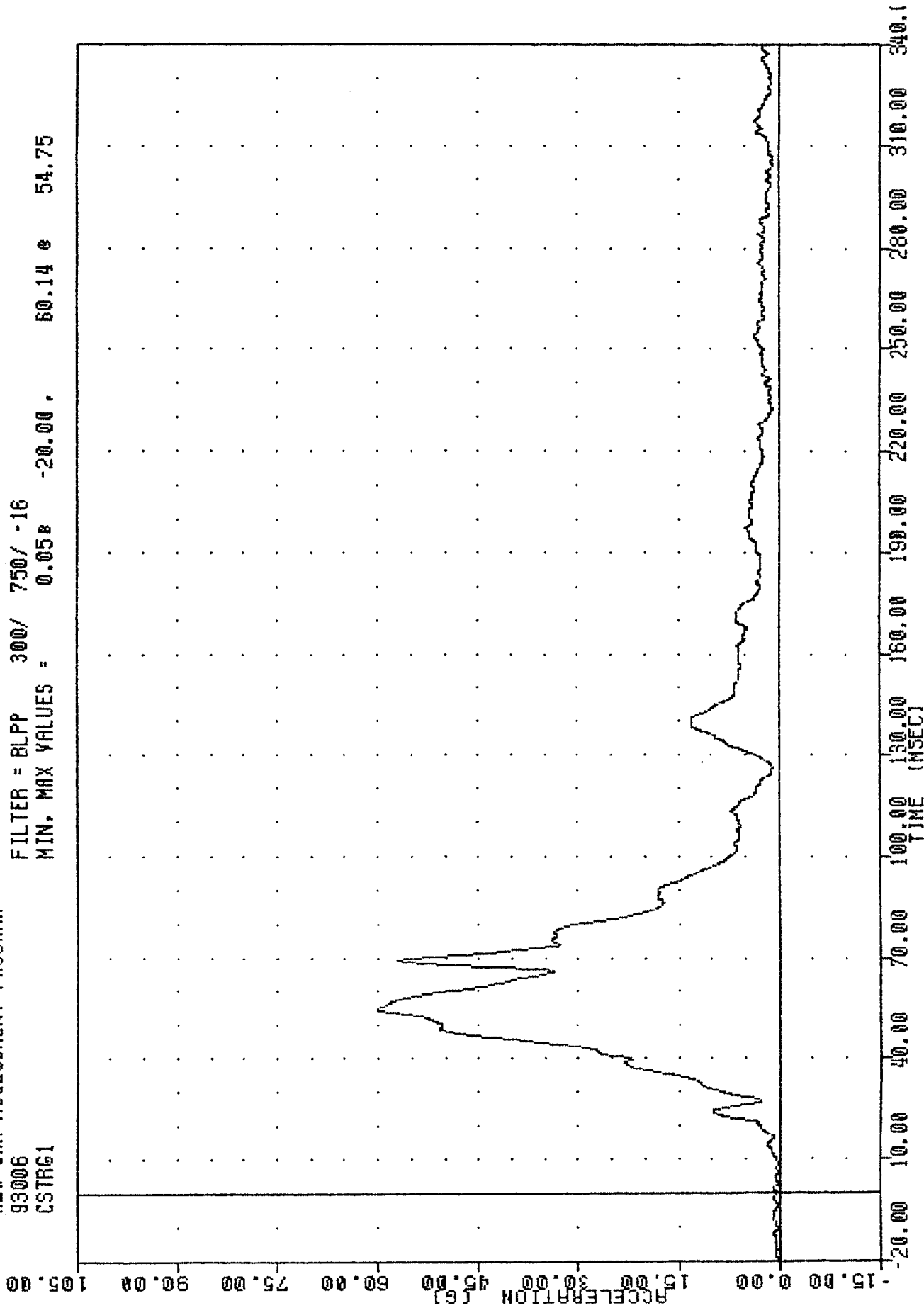
FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -17.89% 47.75. 18.51 @ 79.75



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Z-AXIS ACCELERATION

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 CSTRG1

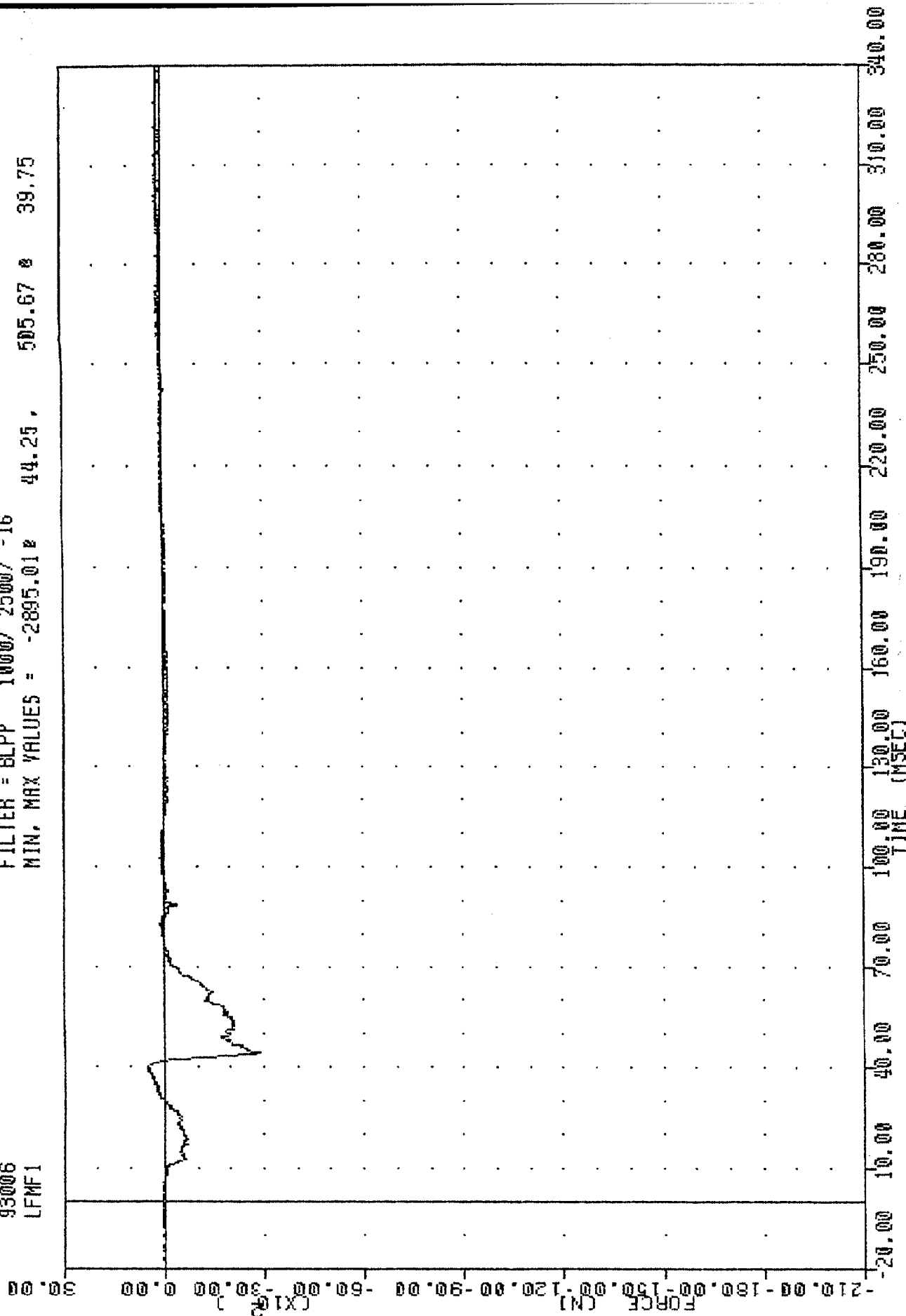
FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = 0.058 -20.00, 60.14 54.75



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST RESULTANT ACCELERATION

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 LFMF1

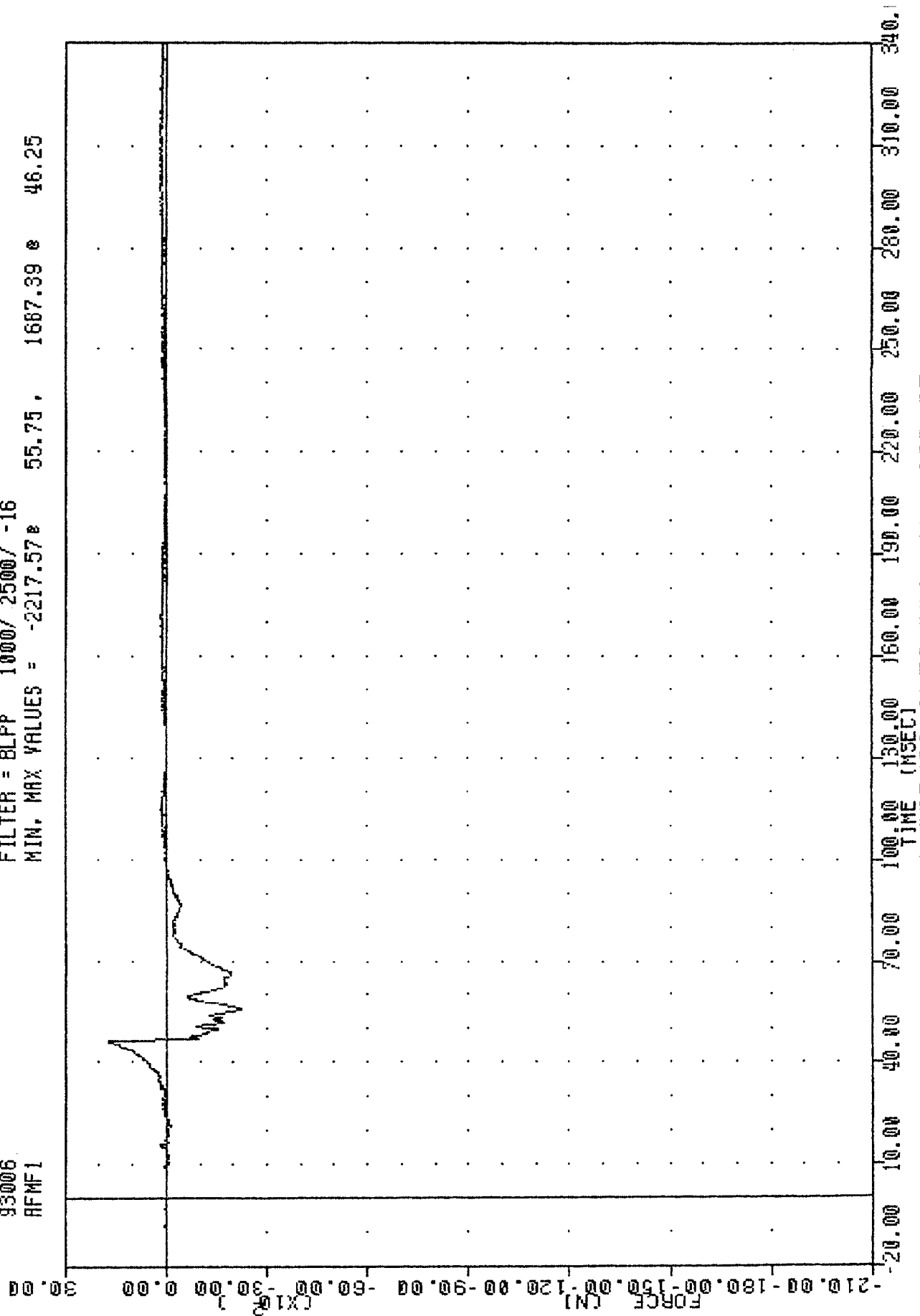
FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = -2895.01 44.25, 505.67 39.75



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER LEFT REAR FORCE

TRC
 93006
 NEW CAR ASSESSMENT PROGRAM
 AFMF1

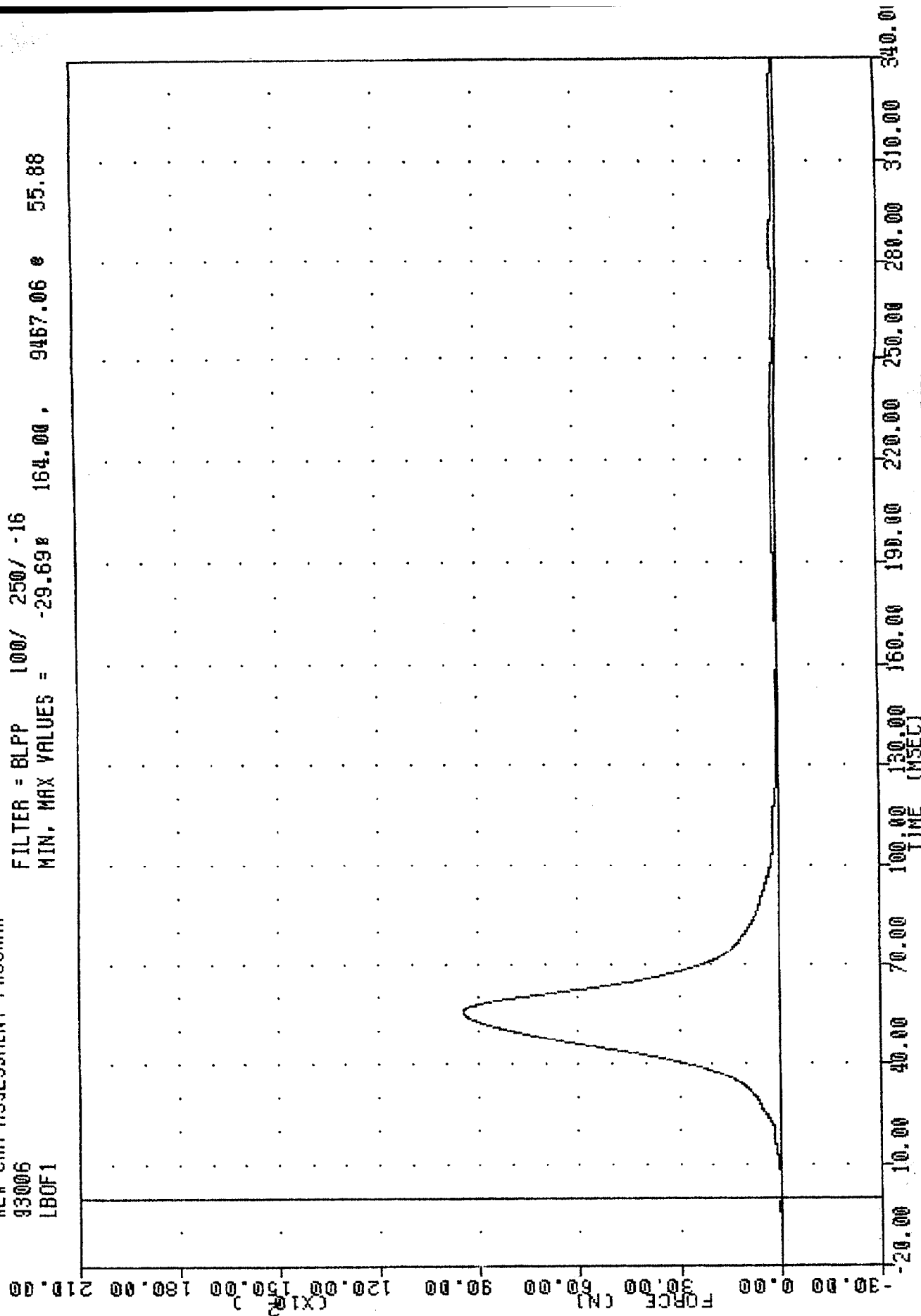
FILTER = BLPP 1000/ 2500/ -16
 MIN. MAX VALUES = -2217.57e 55.75, 1687.39 e 46.25



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER RIGHT FEMUR FORCE

TRC . 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 LBOF1

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -29.698 164.00 9467.06 e 55.88



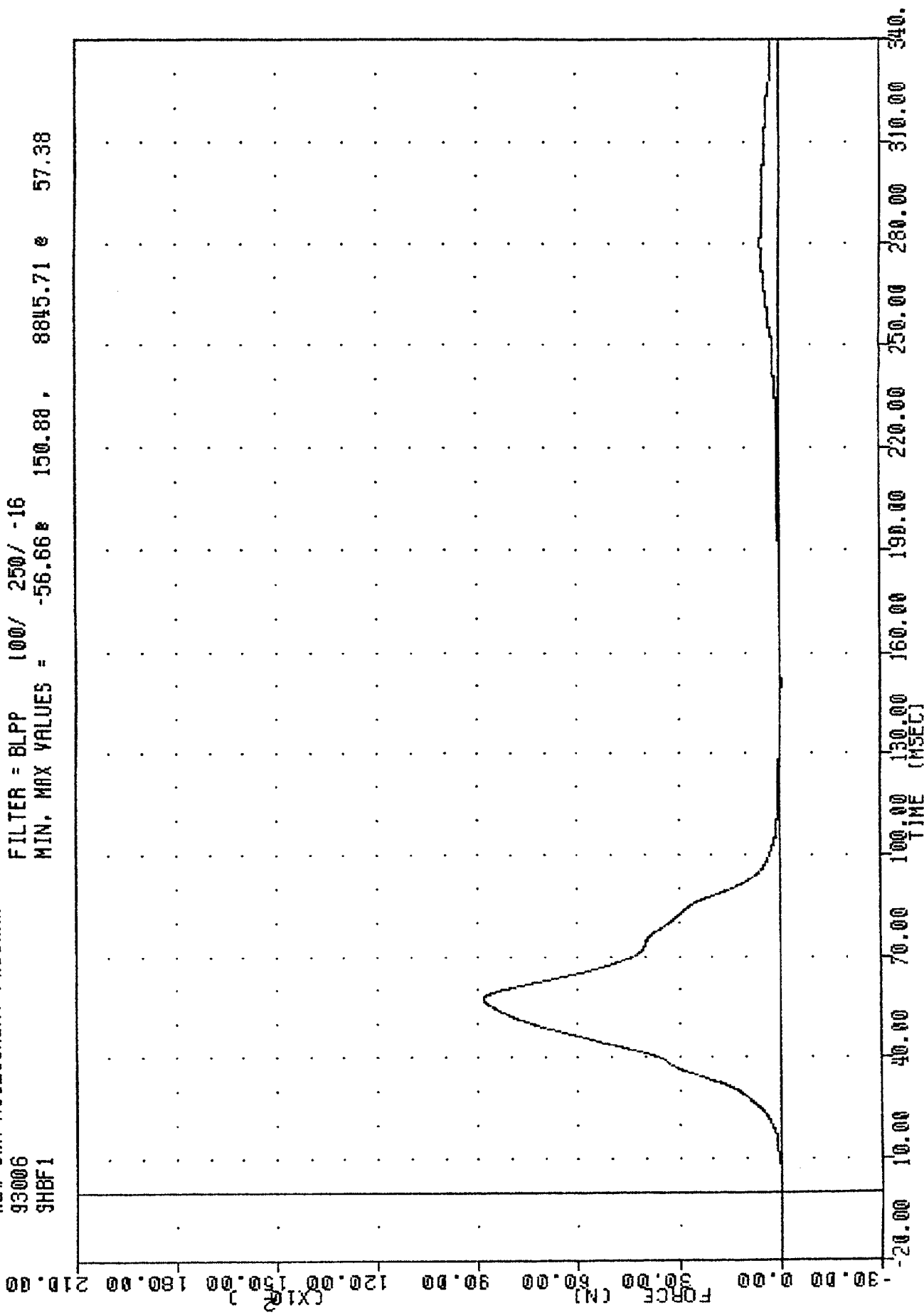
1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

OVERLAP BELT OUTWARD FORCE

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 SHBF1

, 930106

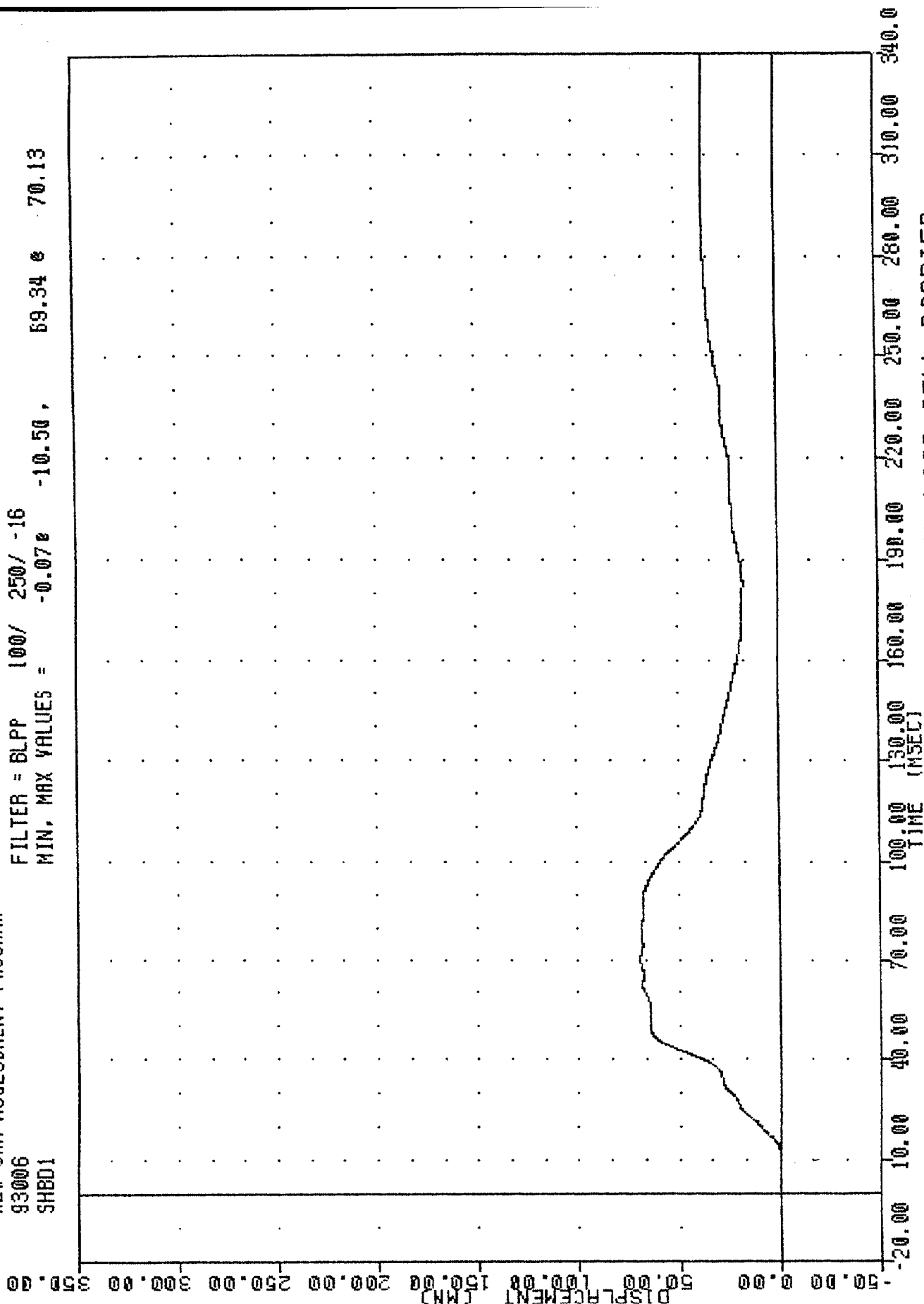
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -56.66 150.88 8845.71 e 57.38



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 SHBD1

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -0.07e -10.50, 59.34 e 70.13

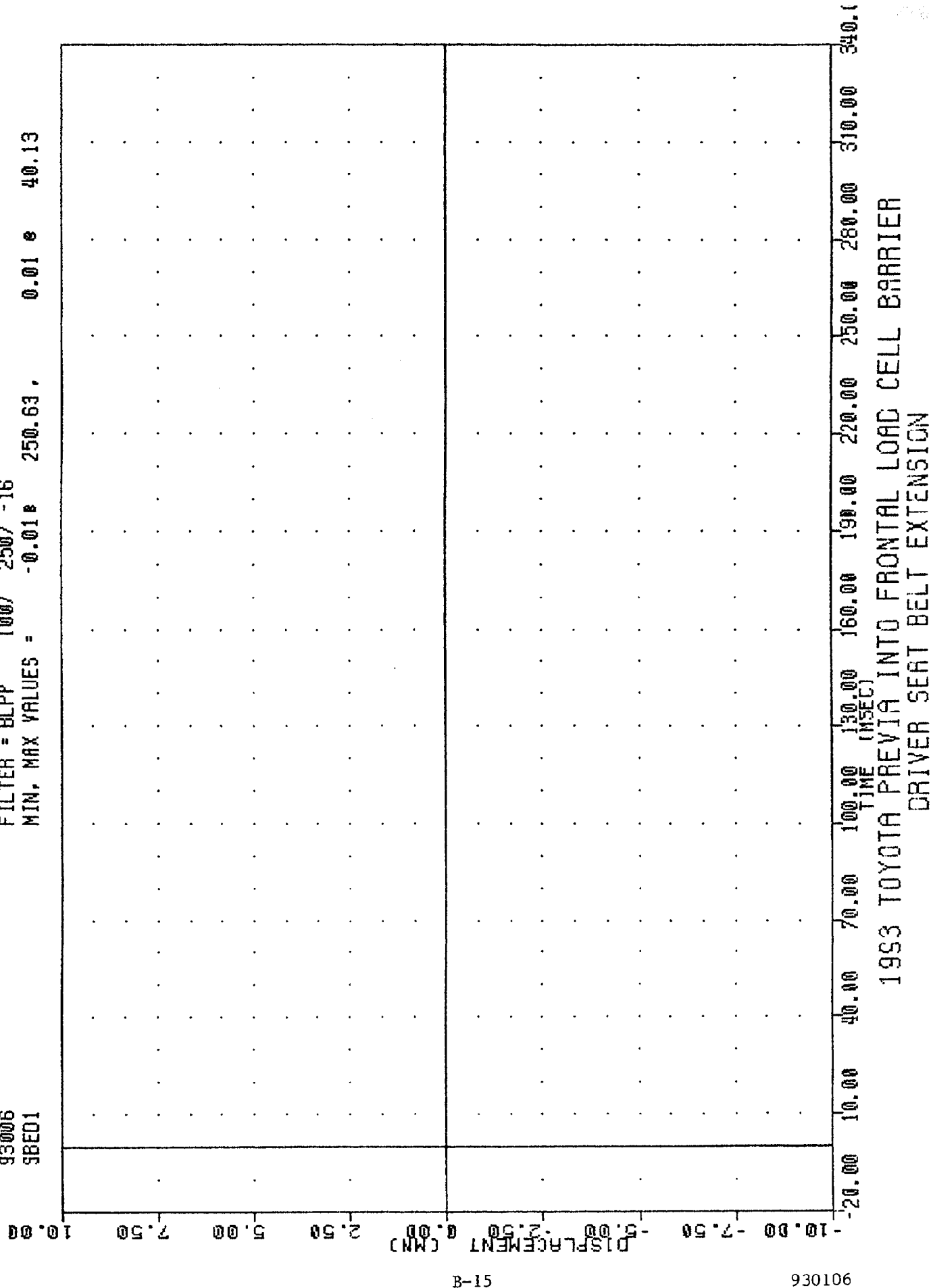


1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

DRIVER OCCUPANT BELT DISPLACEMENT

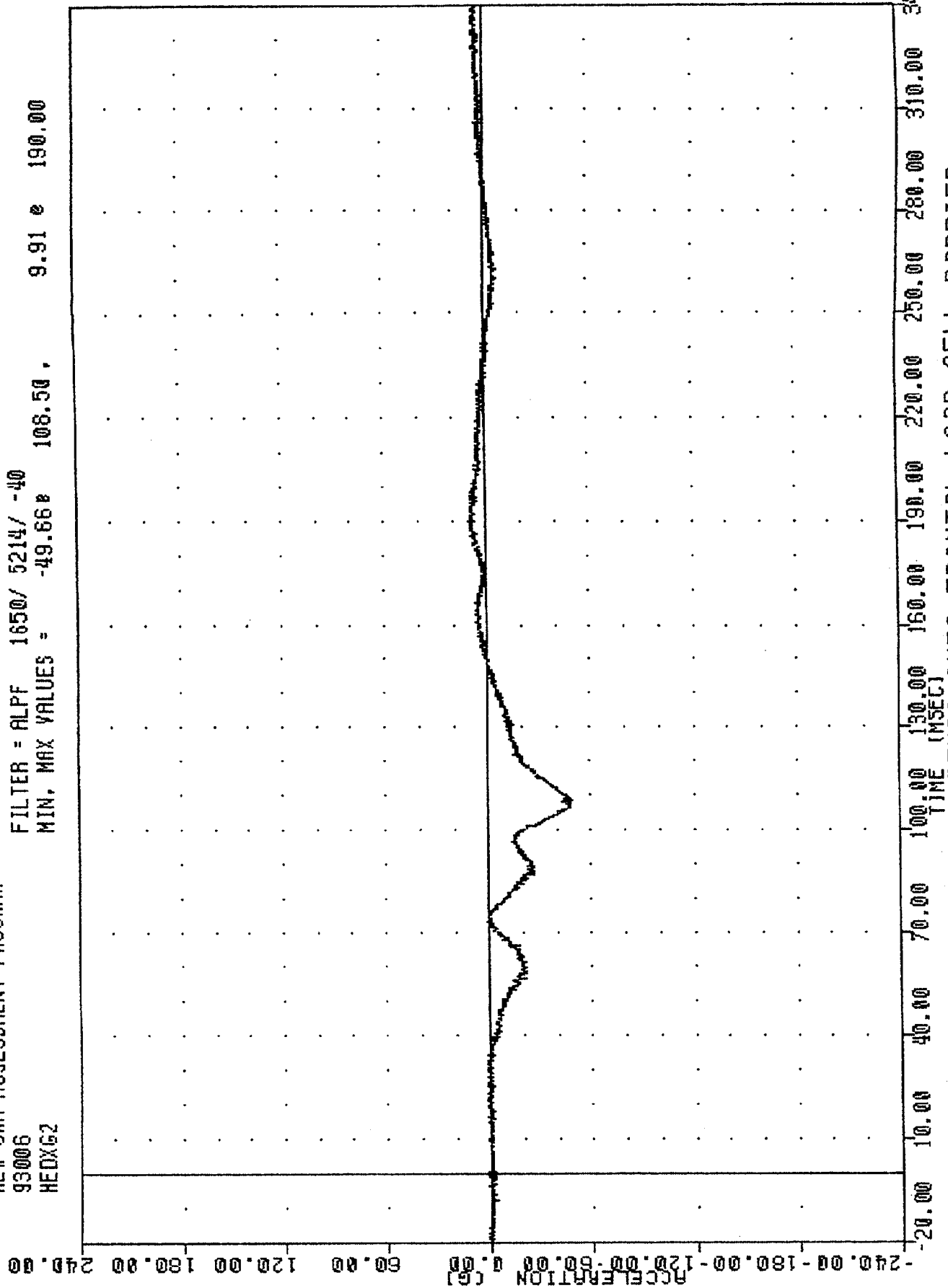
TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 9BED1

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -0.01e 250.63, 0.01 e 40.13



TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 HEDX62

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -49.66 108.50 , 9.91 e 190.00

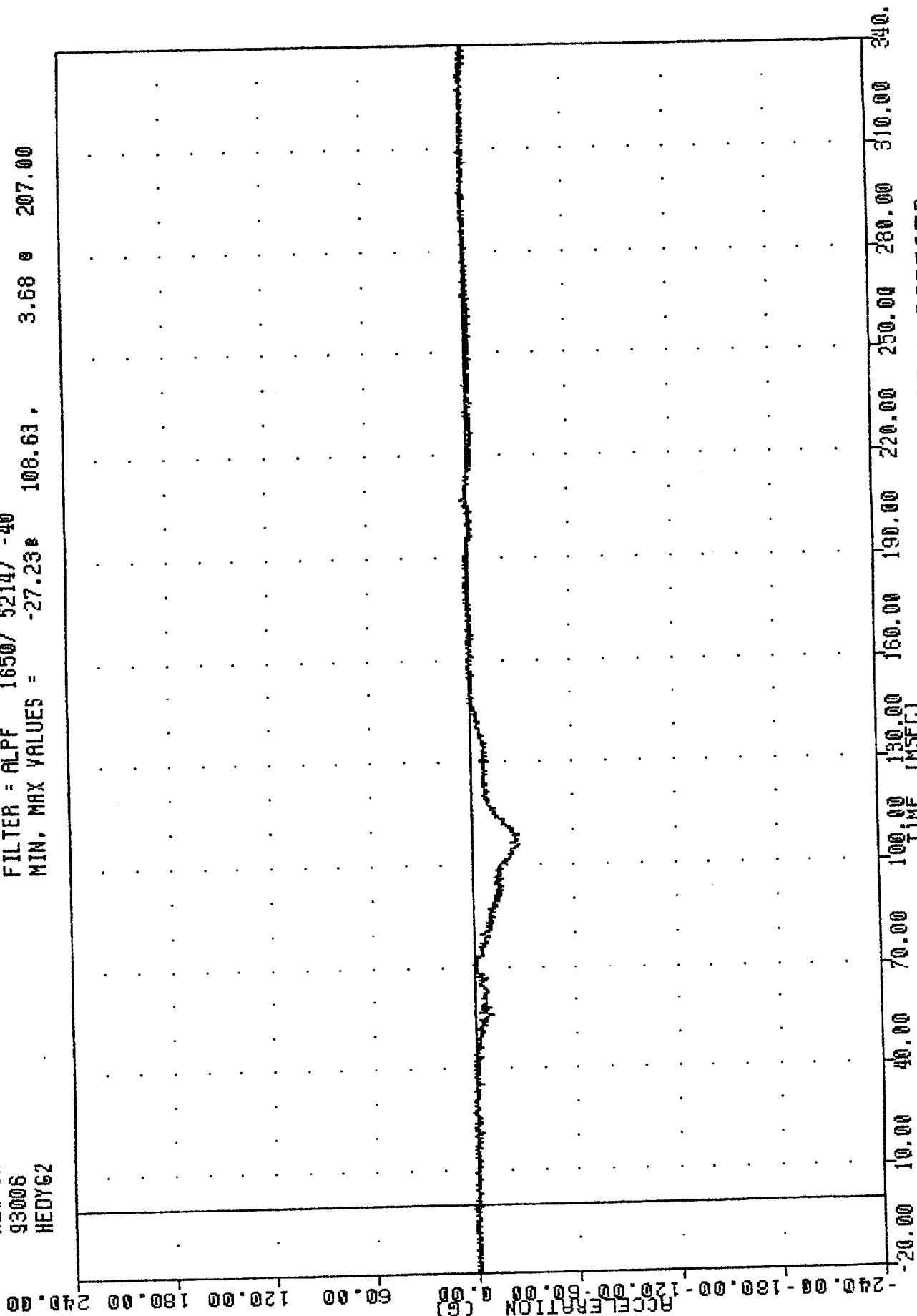


1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 PASSENGER HEAD X-AXIS ACCELERATION

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 HEDYG2

, 930106

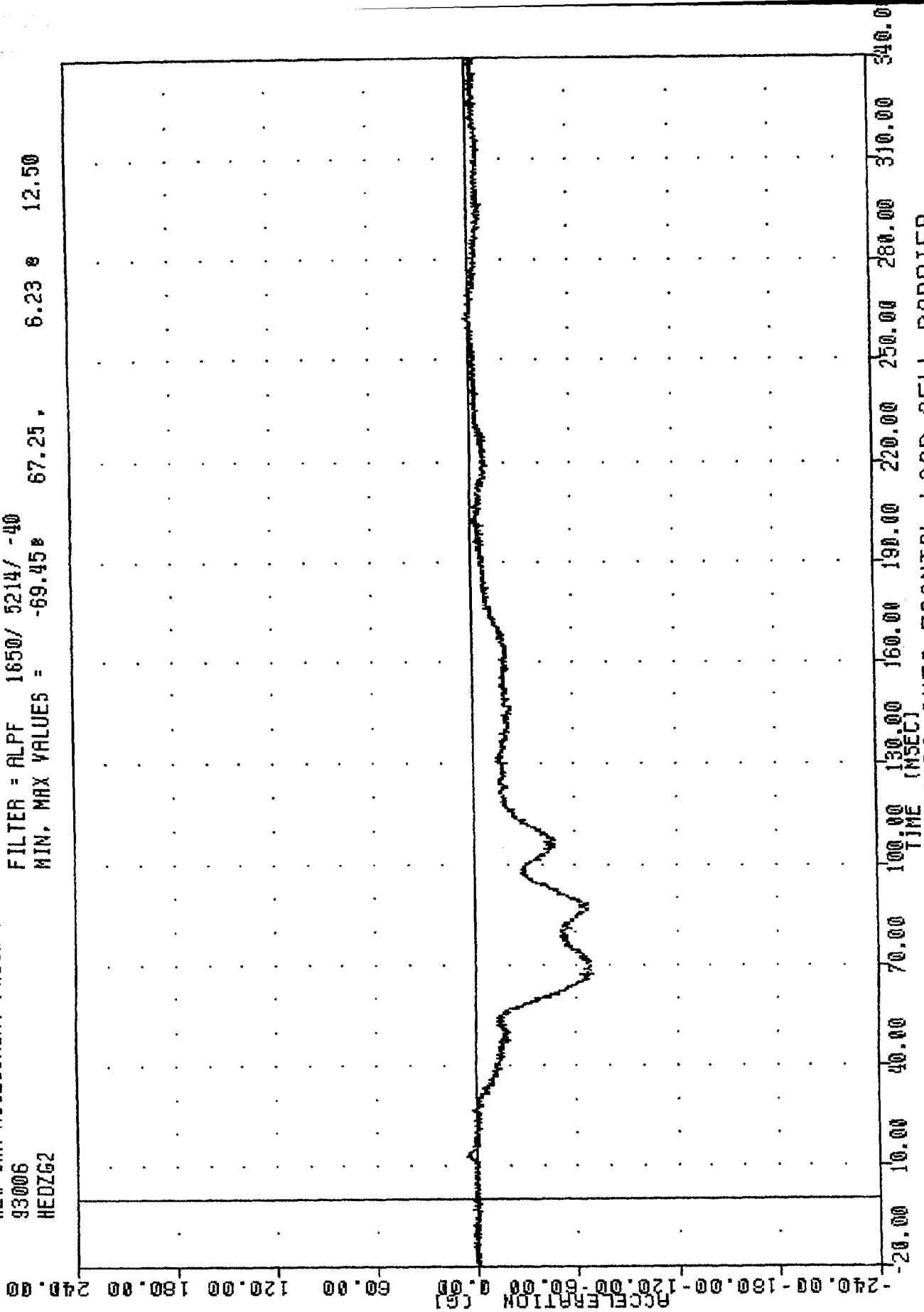
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -27.23 108.63, 3.68 207.00



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 PASSENGER HEAD Y-AXIS ACCELERATION

TRC 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 HEDZG2

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -69.45 67.25 6.23 12.50



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 DECELERATION HEAD Z-AXIS ACCELERATION

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 HEDRG2

, 930106

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 0.19 6.75, 73.82 87.88

ACCELERATION (G)

210.00

180.00

150.00

120.00

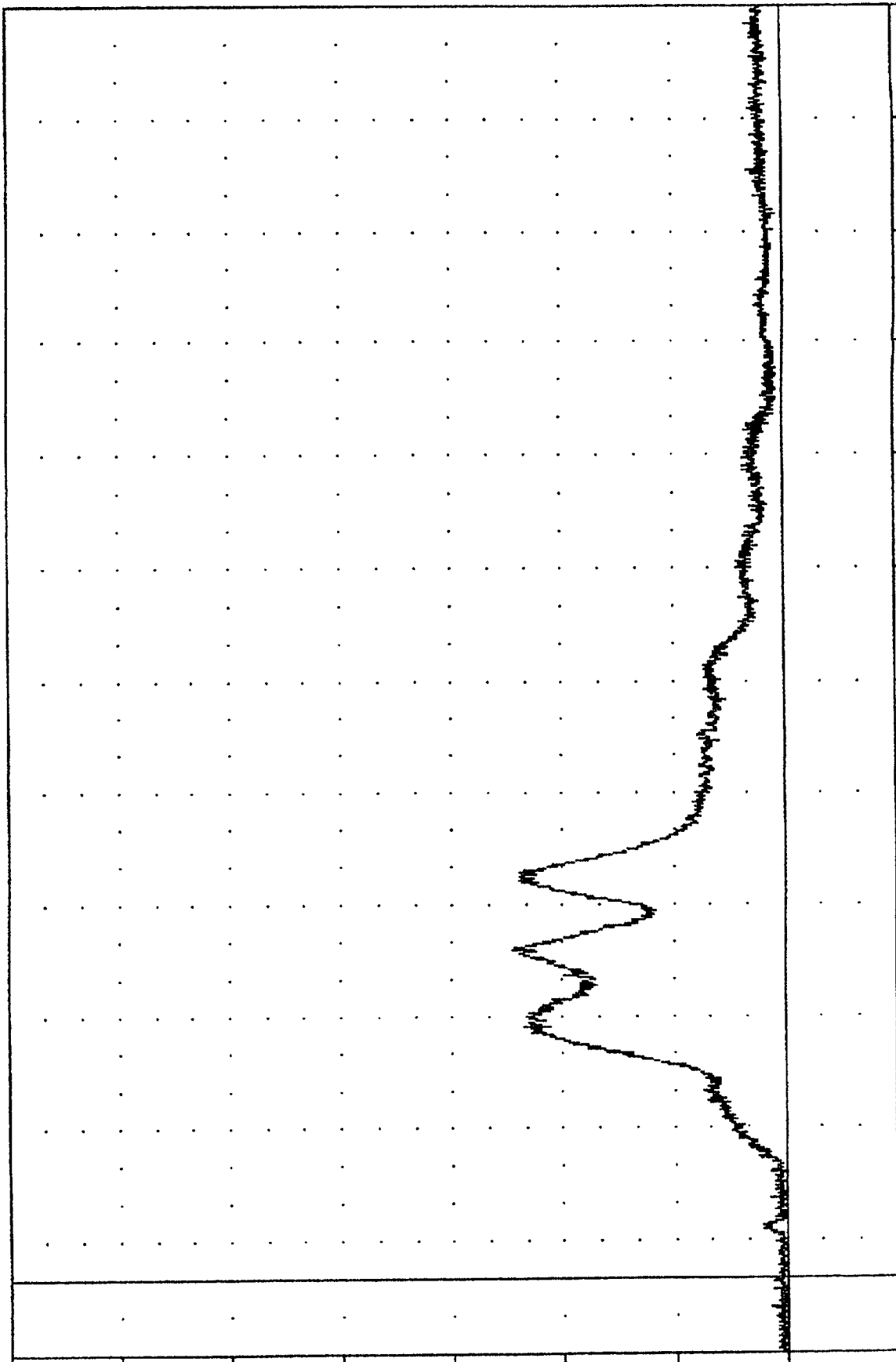
90.00

60.00

30.00

0.00

-30.00



TIME (MSEC)

340.00

310.00

280.00

250.00

220.00

190.00

160.00

130.00

100.00

70.00

40.00

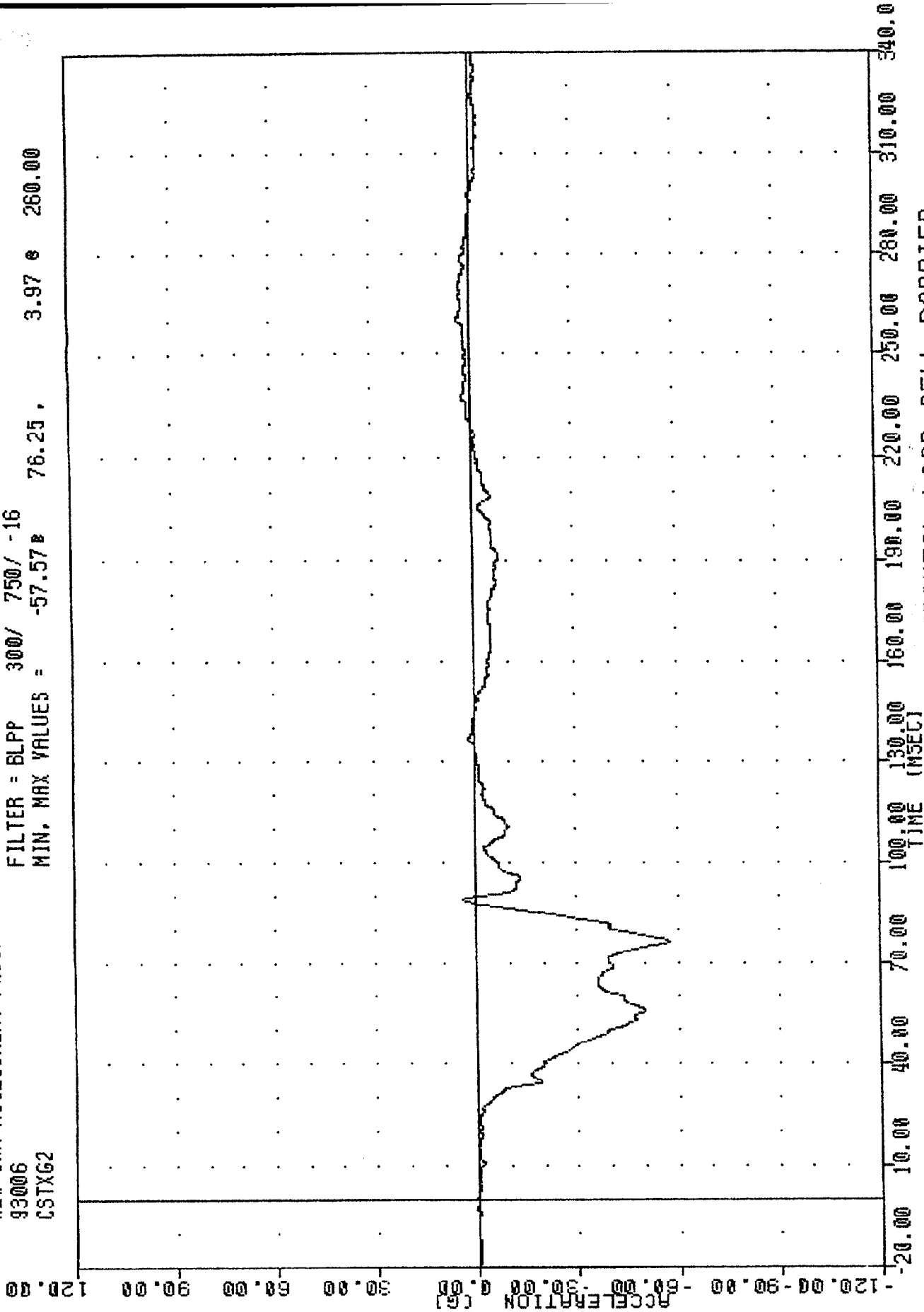
10.00

-20.00

1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 PASSENGER HEAD RESULTANT ACCELERATION

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 930006
 CSTXG2

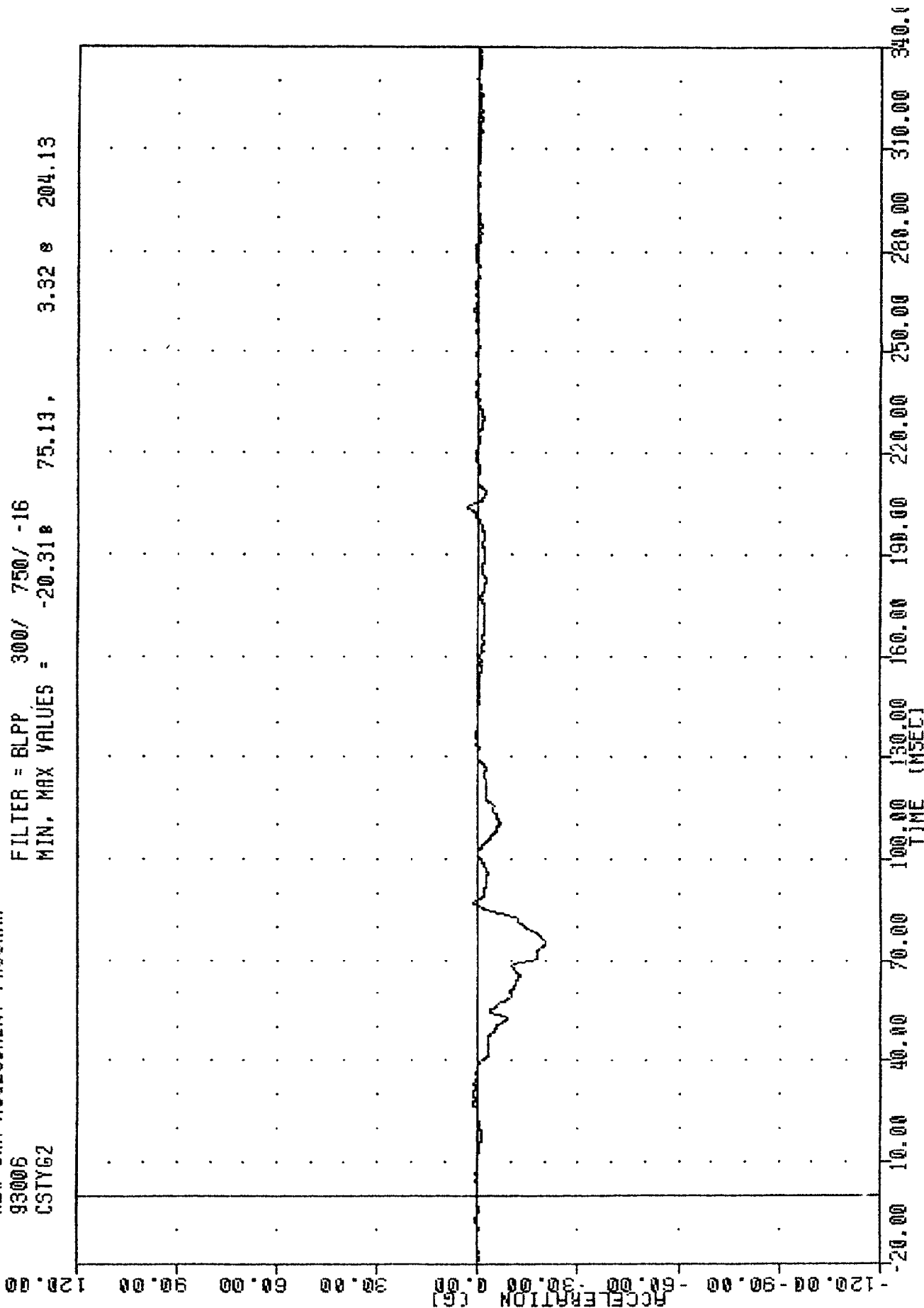
FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -57.57 76.25 3.97 260.00



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 PASSENGER CHEST Y-AXIS ACCELERATION

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 CSTY62

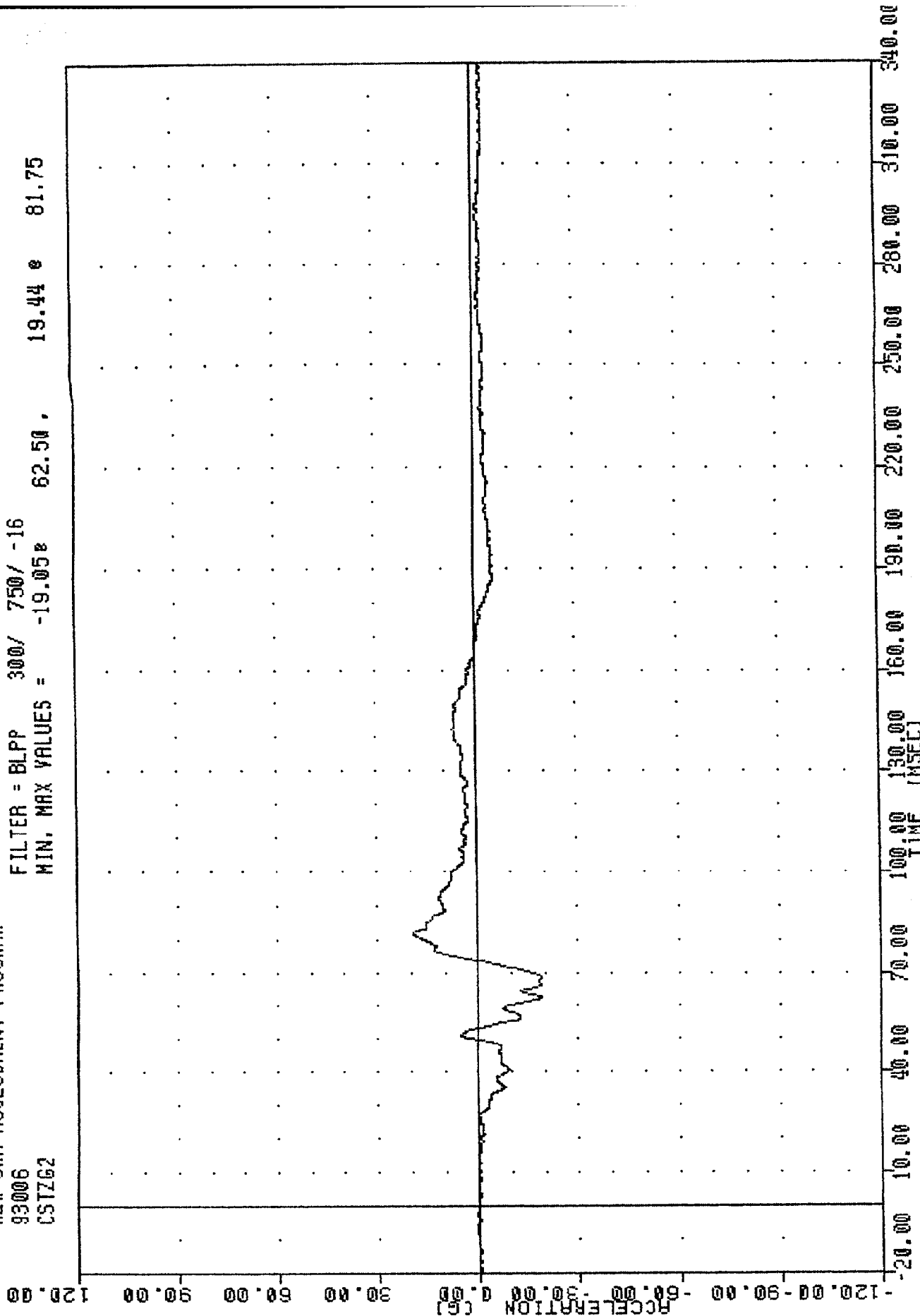
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -20.31 75.13, 3.32 204.13



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 PASSENGER CHEST Y-AXIS ACCELERATION

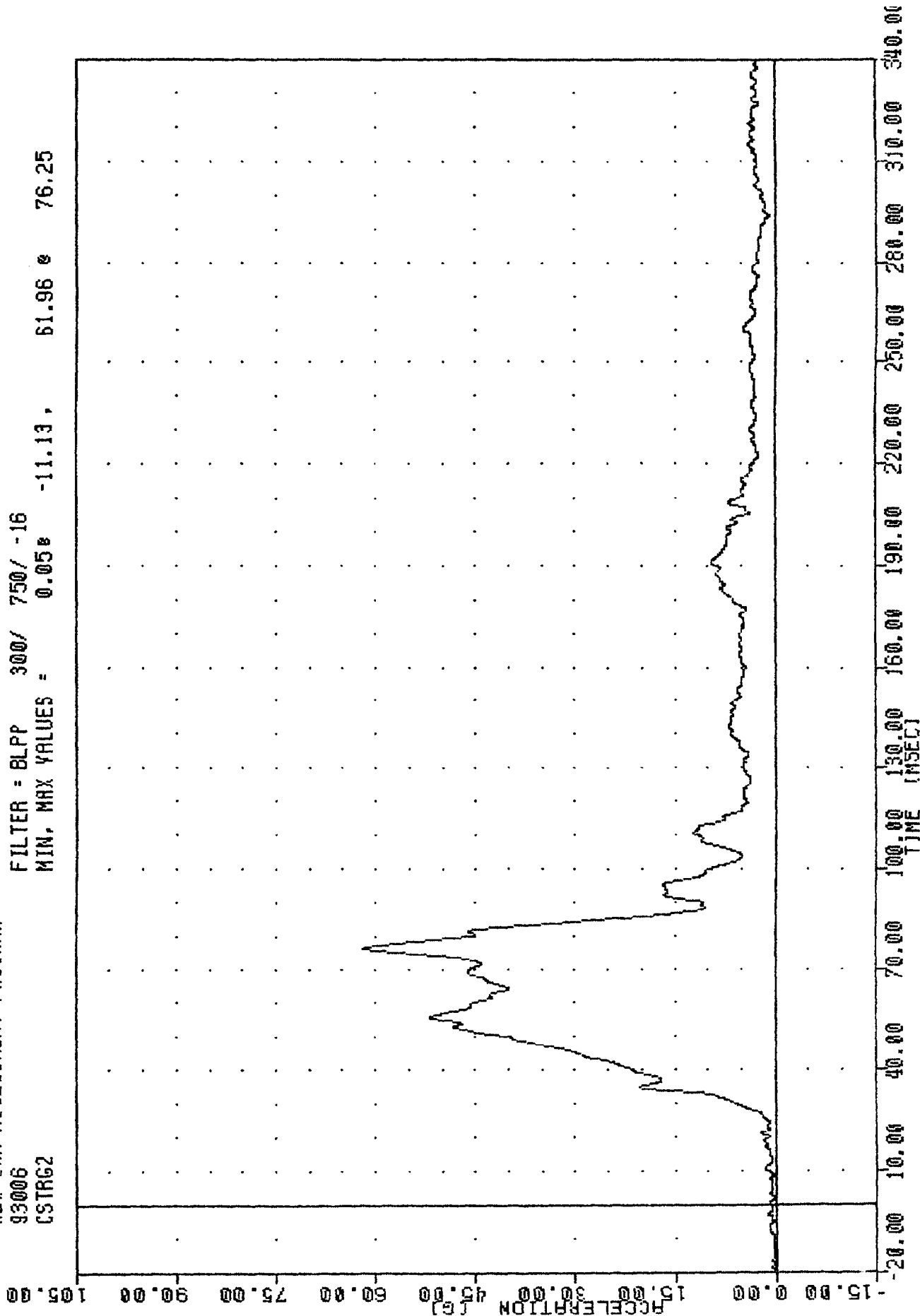
TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 CSTZG2

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -19.05e 62.50 , 19.44 e 81.75



TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 CSTRG2

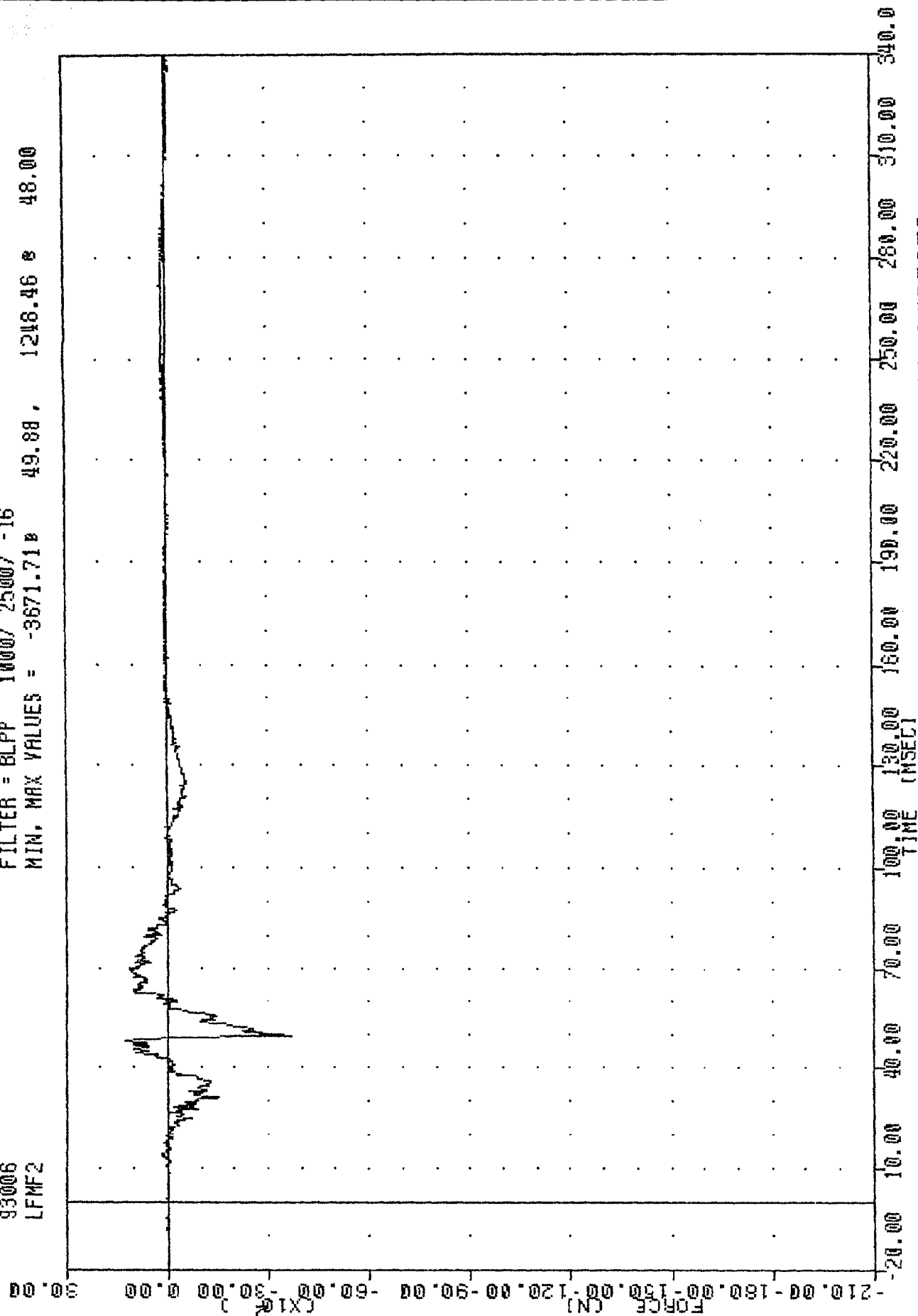
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = 0.058 -11.13, 61.96 76.25



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 PASSENGER CHEST RESULTANT ACCELERATION

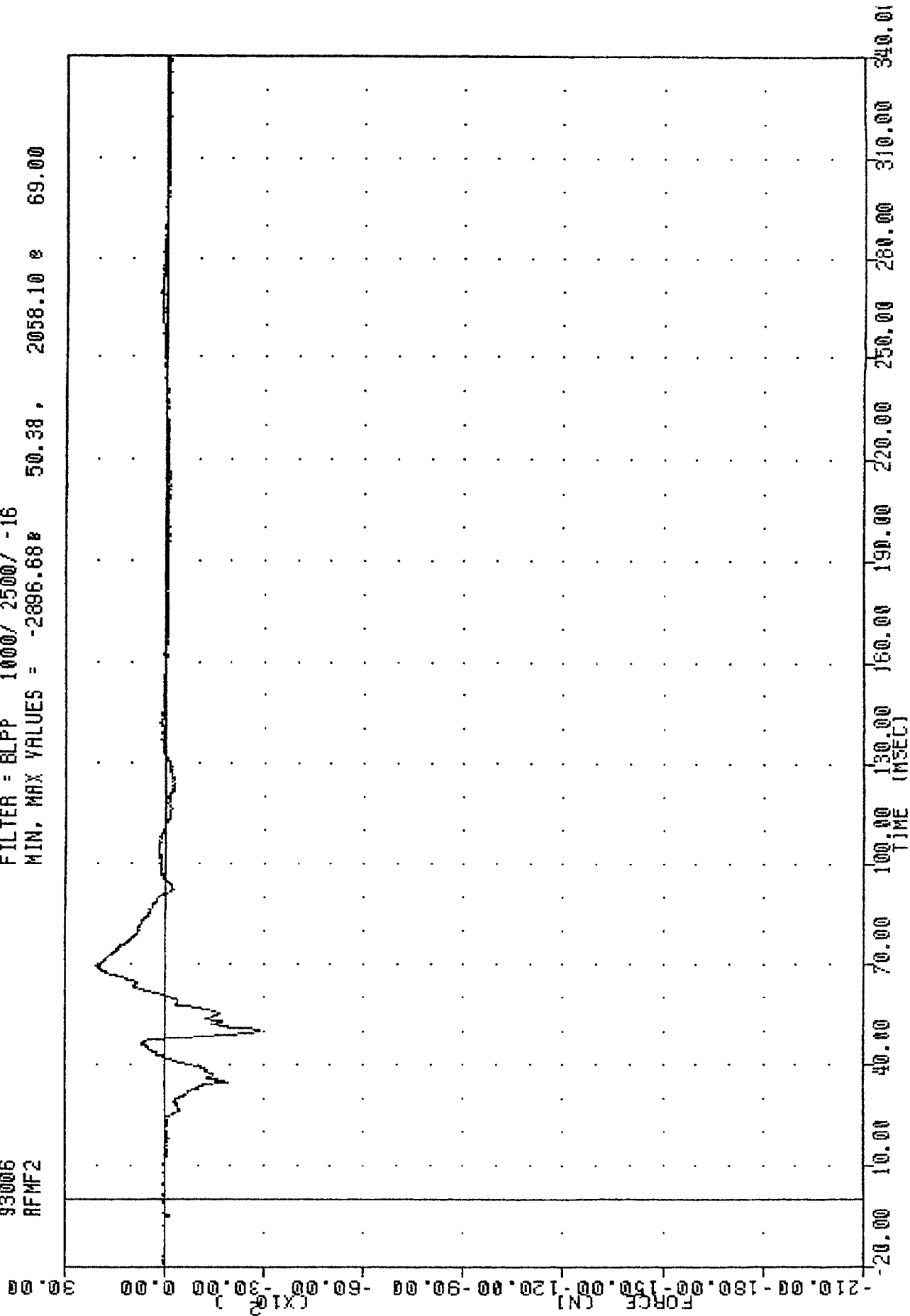
TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 LFMF2

FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = -3671.71 49.88, 1248.46 48.00



TRC
 93006
 NEW CAR ASSESSMENT PROGRAM
 93006
 RFMF2

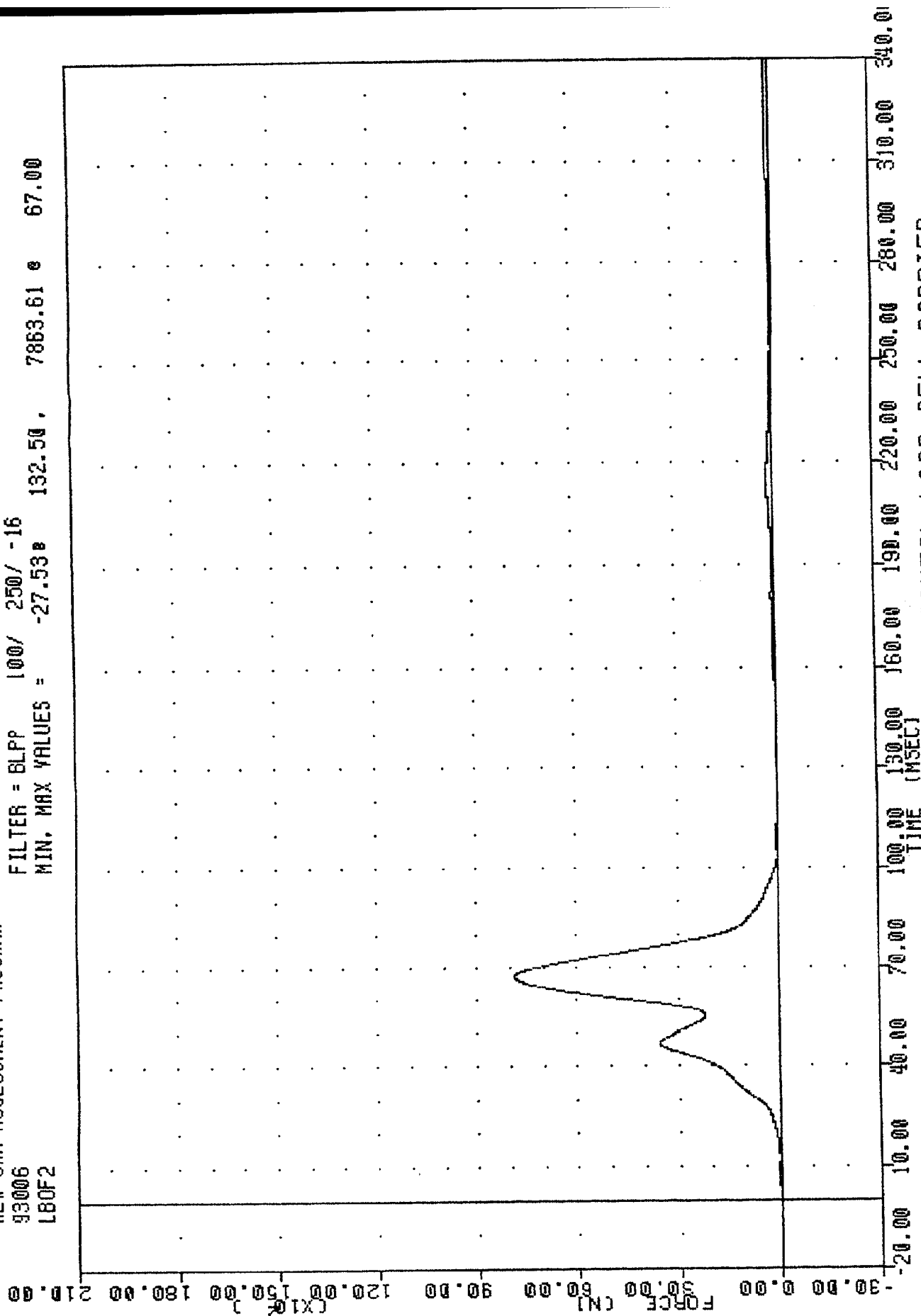
FILTER = BLPP 1000/ 2500/ -16
 MIN. MAX VALUES = -2896.68 50.38, 2058.10 e 69.00



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 PASSENGER RIGHT FEMUR FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 LB0F2

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -27.53 7863.61 67.00

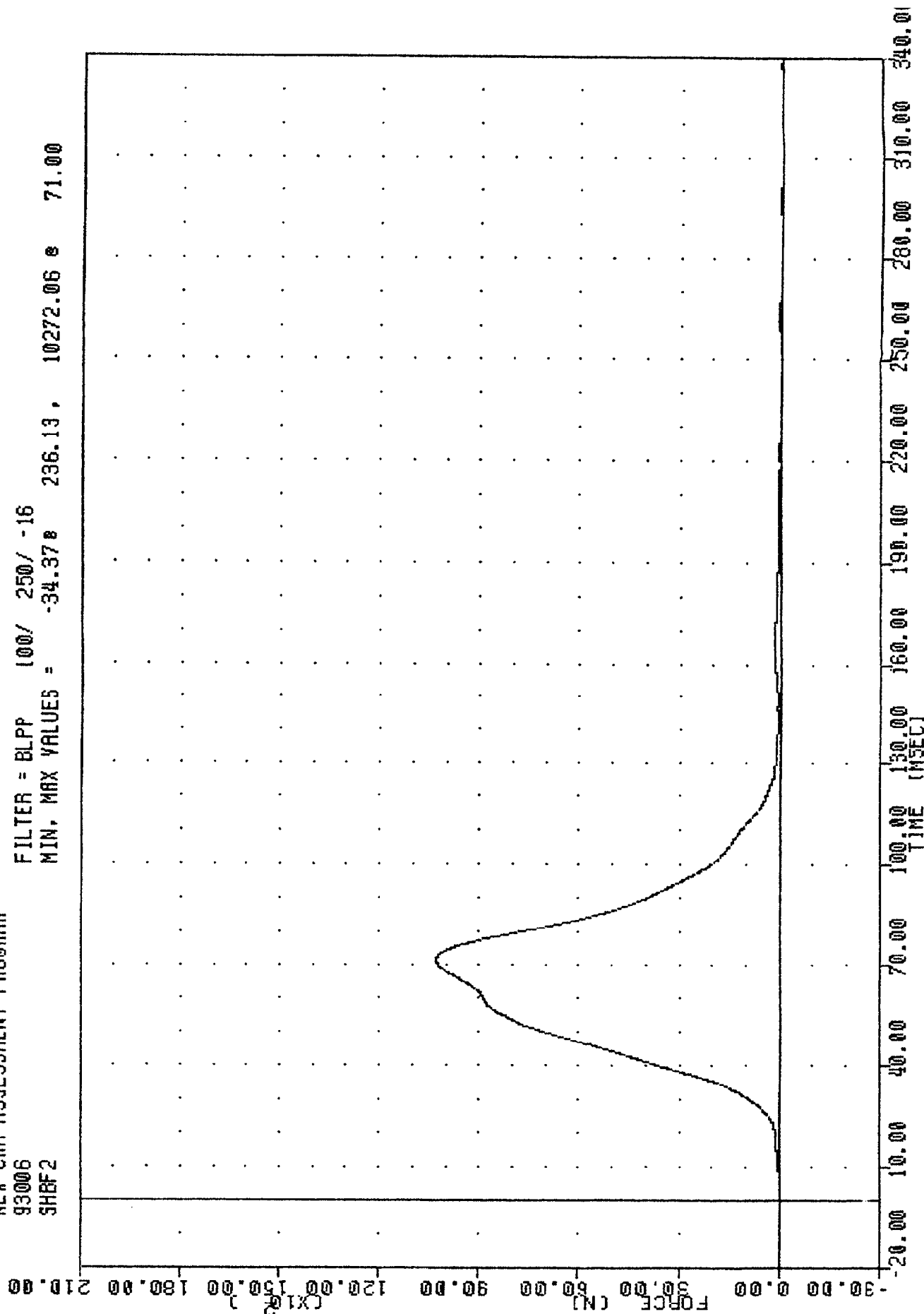


1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

PREVIOUS LOAD BEHavior OUTBOARD FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 SHBF2

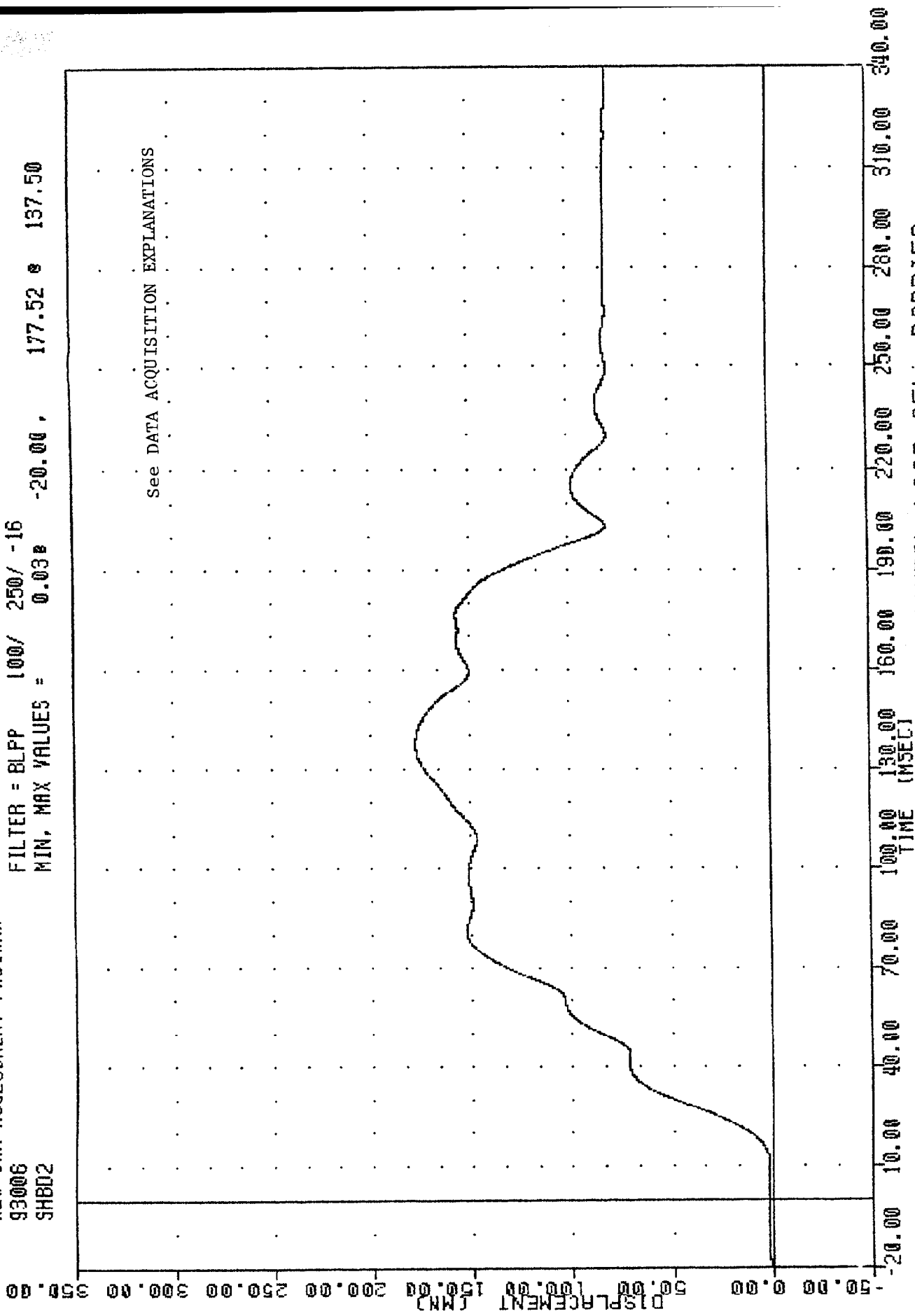
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -34.378 236.13, 10272.06 & 71.00



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 PASSENGER SHOULDER BELT FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 930006
 SHBD2

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = 0.032 -20.00 , 177.52 e 137.50



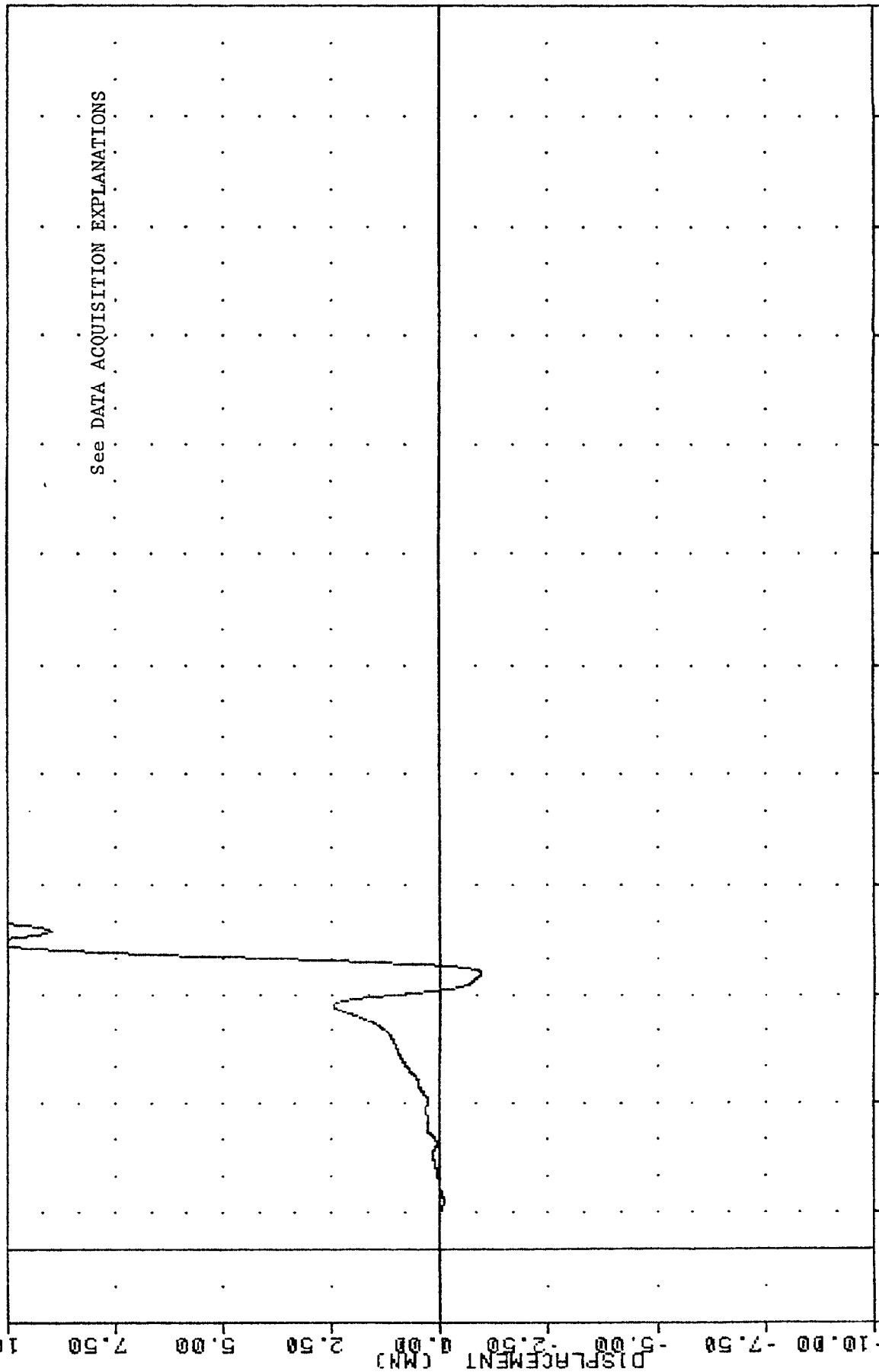
1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 PASSENGER SIDE SEAT DISPLACEMENT

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 SBED2

930106

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -0.96 75.75 11.89 93.75

10.00

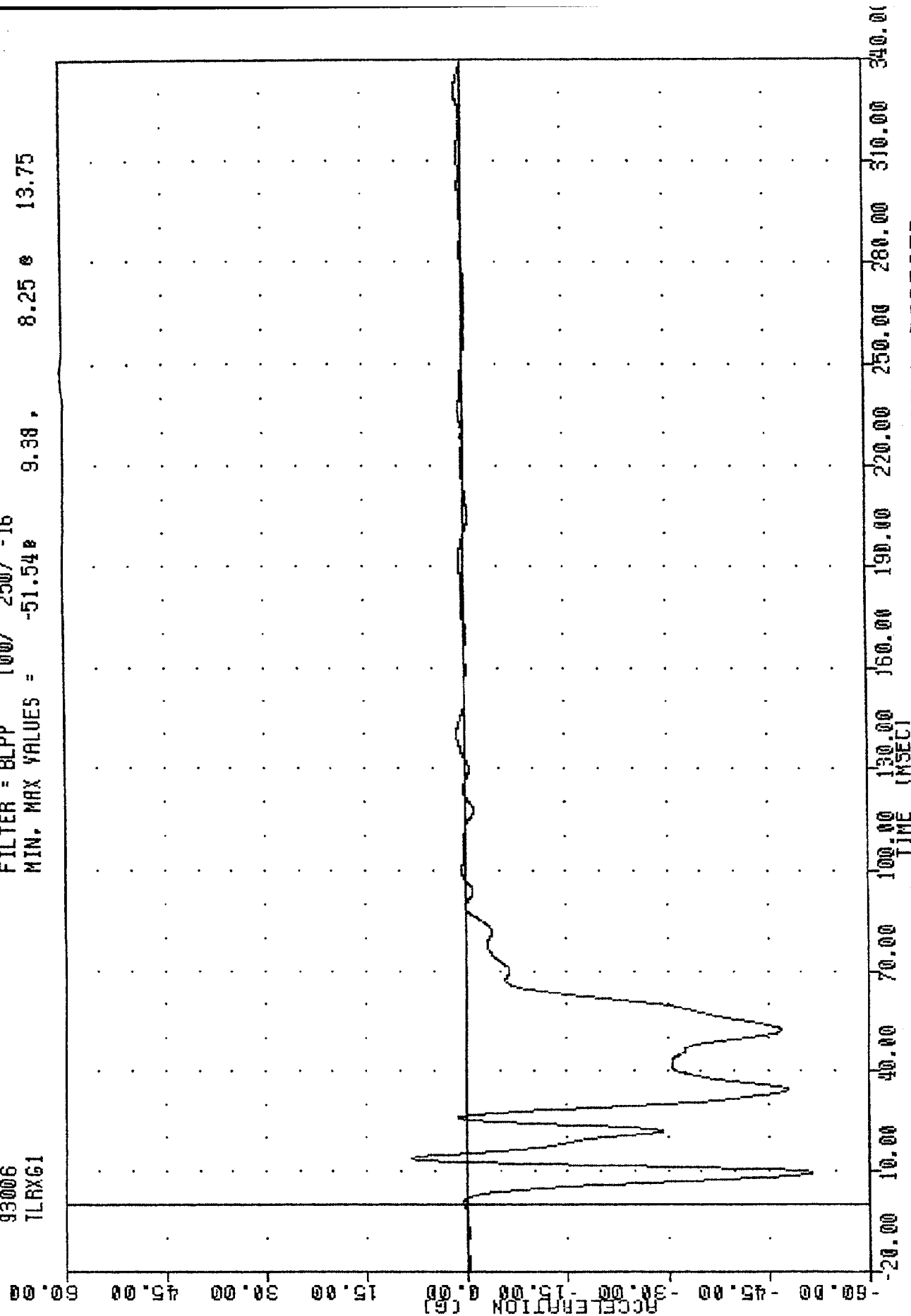


-20.00 10.00 0.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 PASSENGER SEAT BELT EXTENSION

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 TLRX61

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -51.54 9.38 8.25 13.75



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

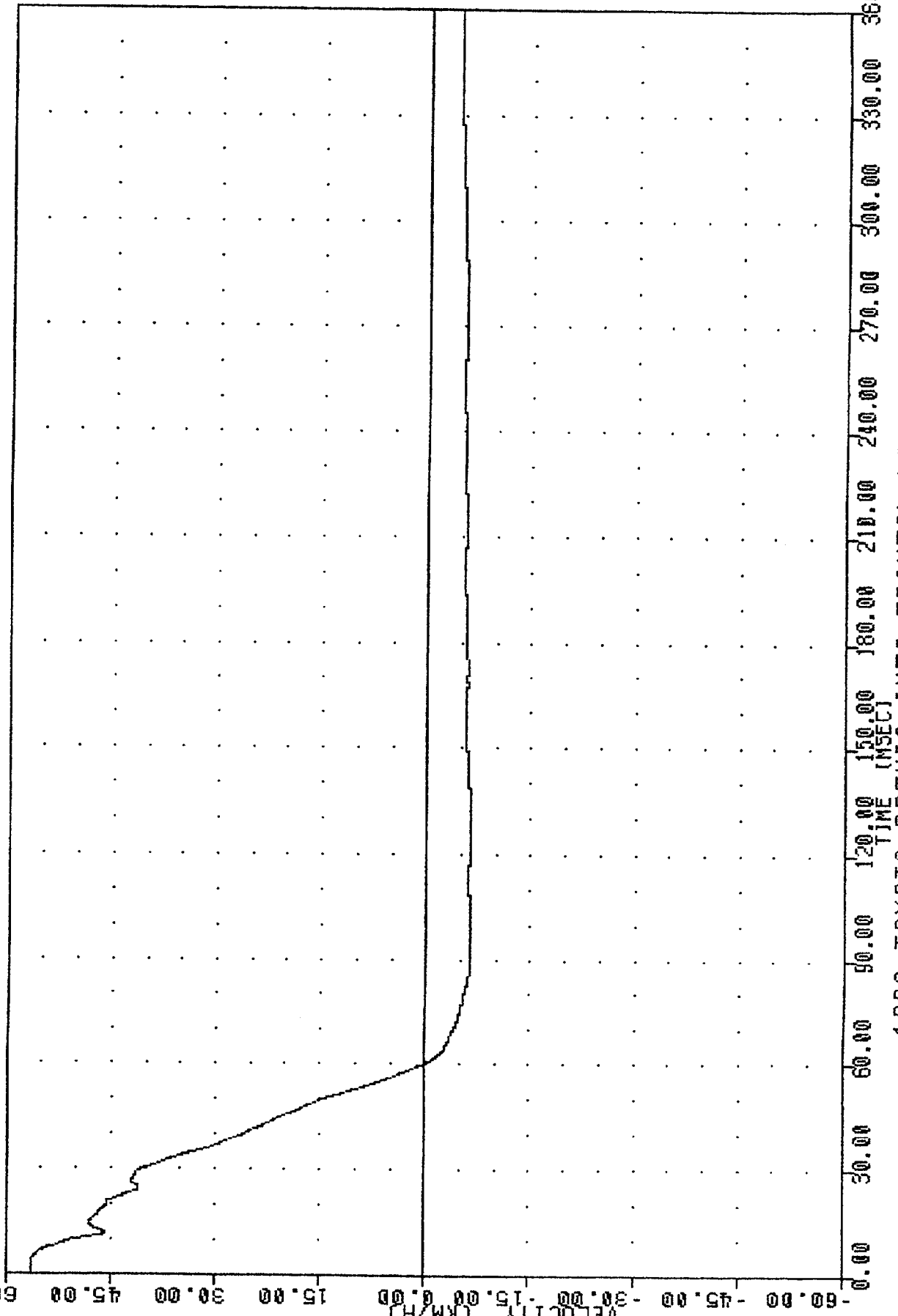
LEAKAGE SEVERITY X-KI CONVERSION

TRC
NEW CAR ASSESSMENT PROGRAM
93006
TLRXV1

, 930106

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -6.33 96.88, 56.50 0.00

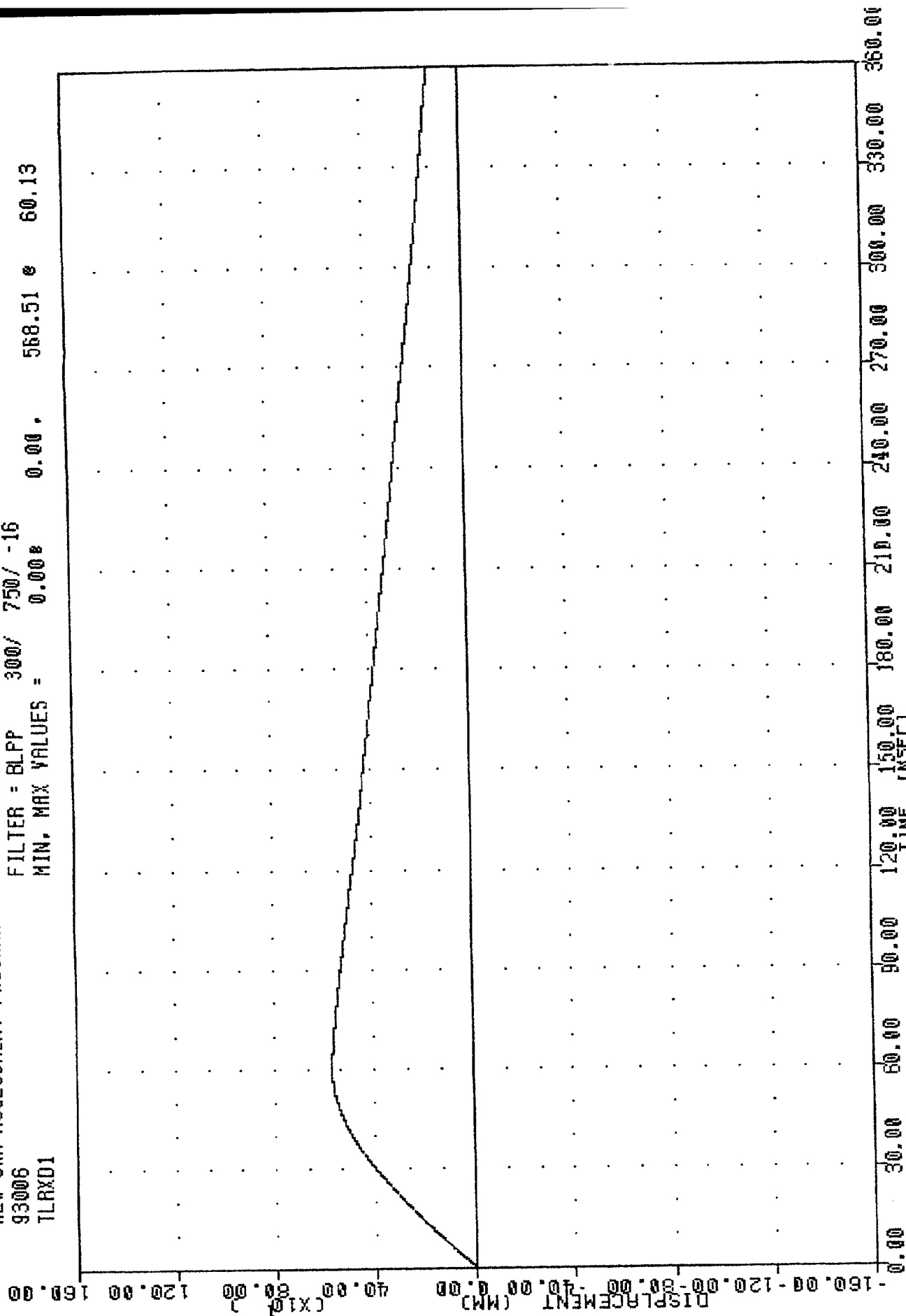
VELOCITY (KM/H)



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS VELOCITY

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 TLRXD1

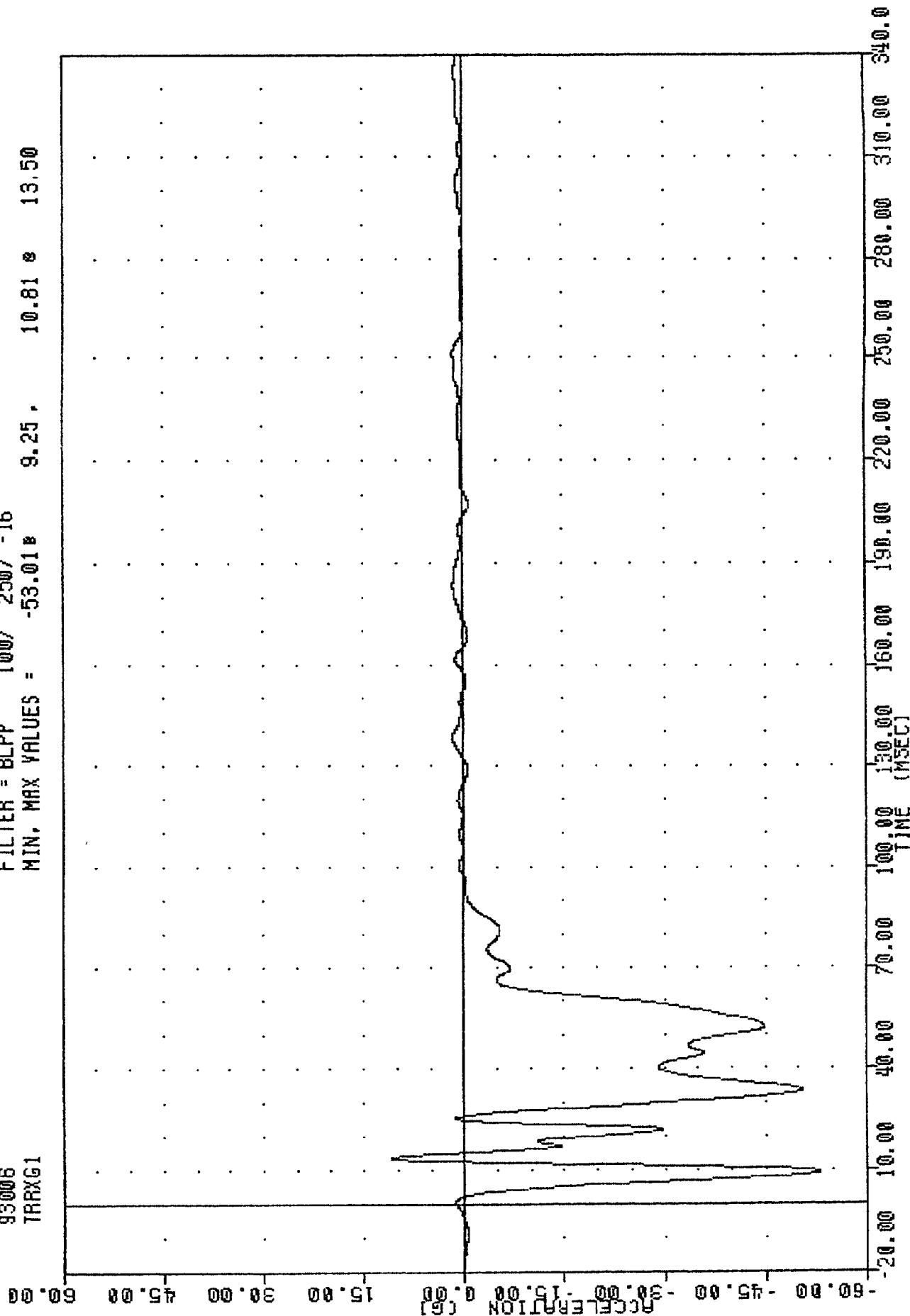
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = 0.00e 568.51 e 60.13



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS DISPLACEMENT

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 TRRXG1

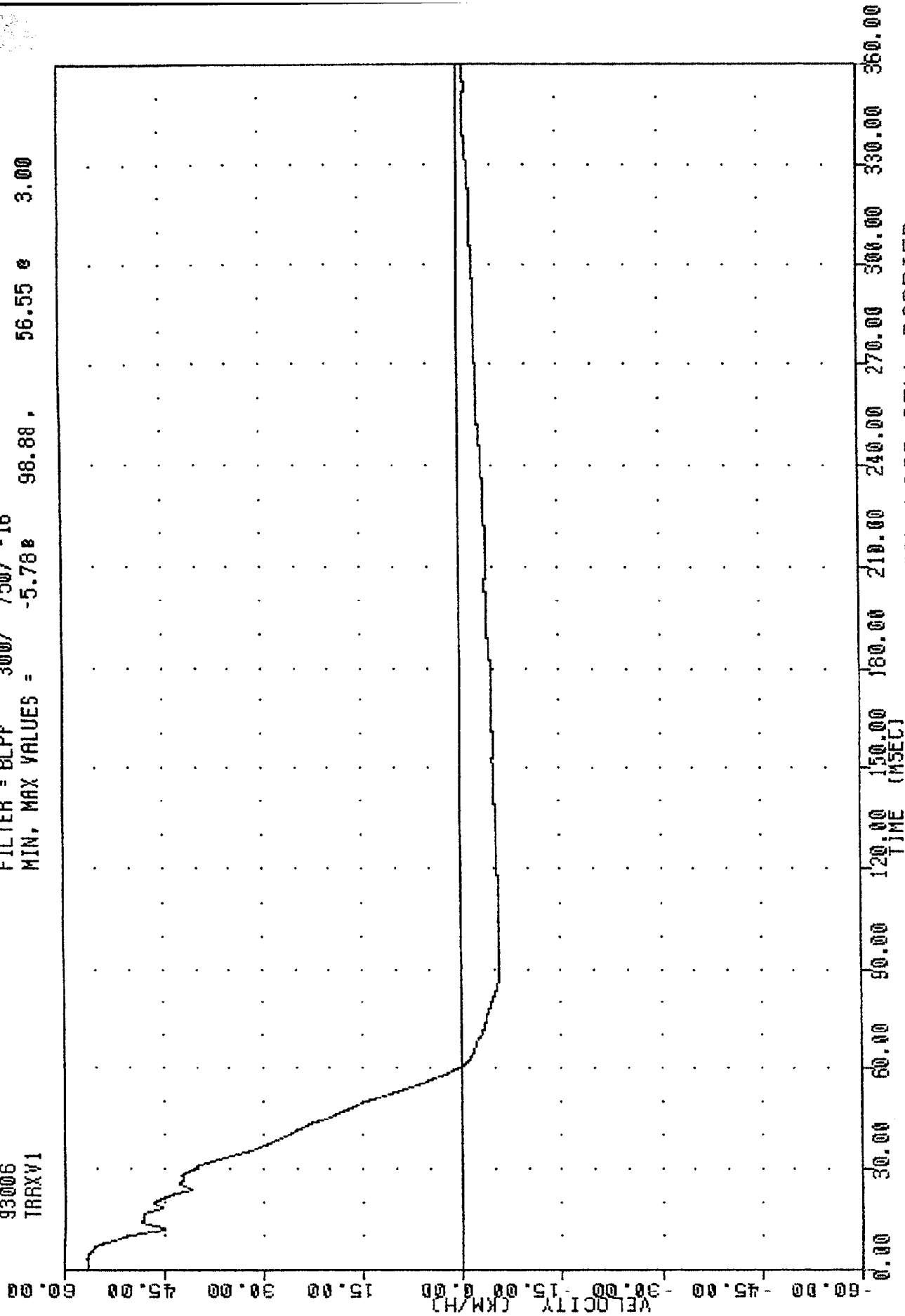
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -53.01 9.25 10.81 13.50



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS ACCELERATION

TRC 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 TRAXV1

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -5.78 56.55 3.00



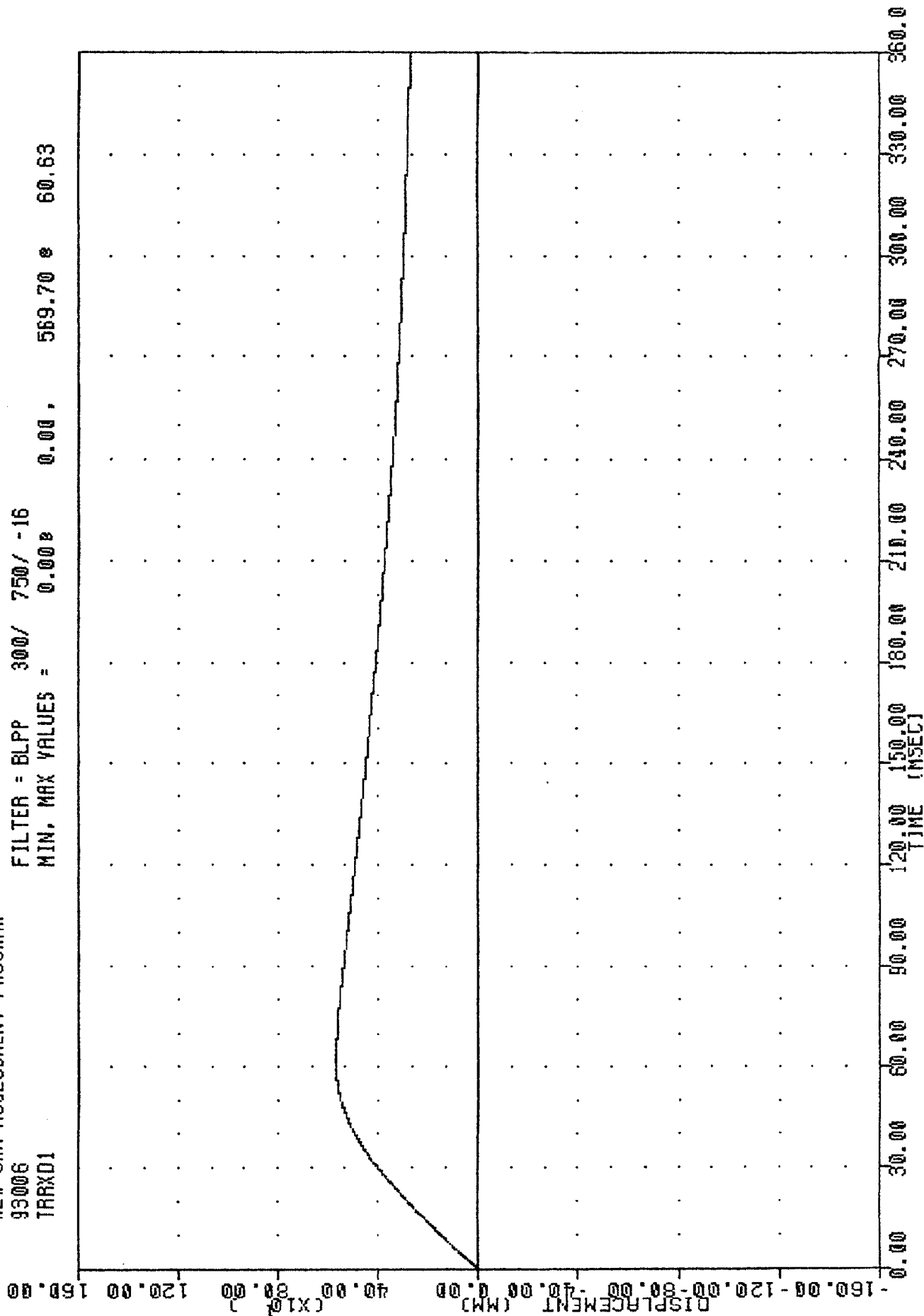
1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

RIGHT REAR SEAT X-AXIS VELOCITY

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 TRXD1

930106

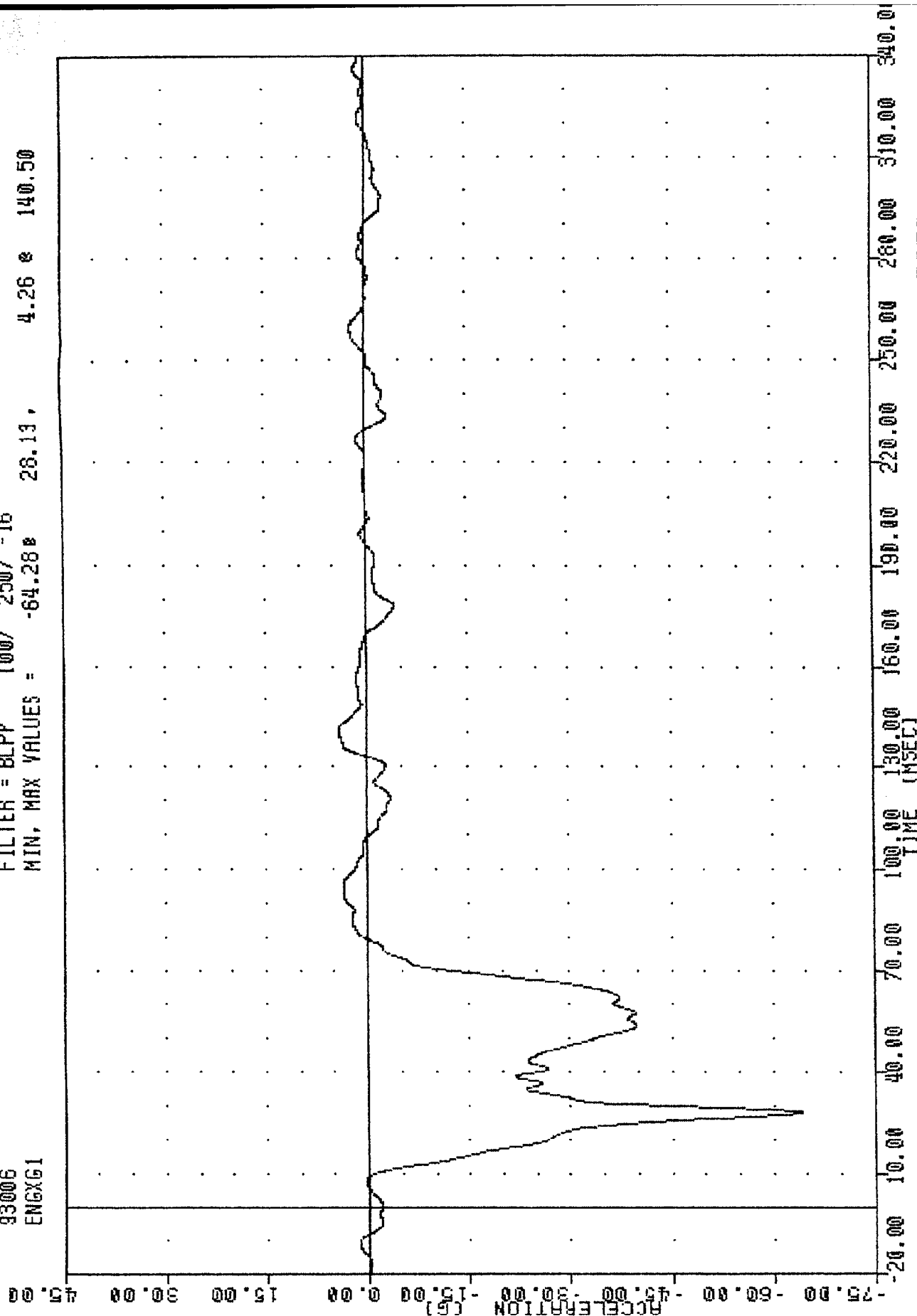
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = 0.00 569.70 60.63



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS DISPLACEMENT

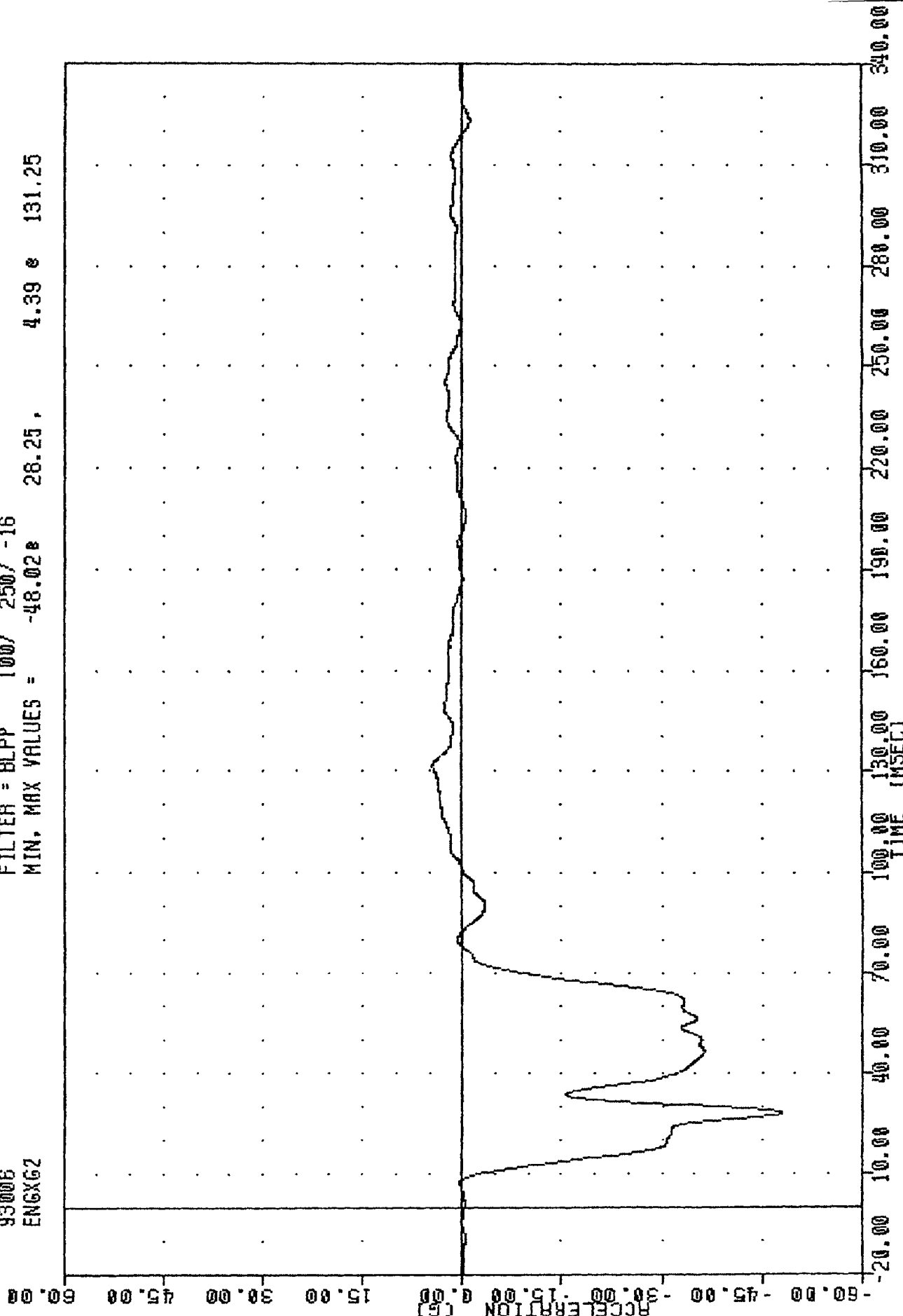
TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 ENG61

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -64.28 28.13, 4.26 140.50



TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 ENG62

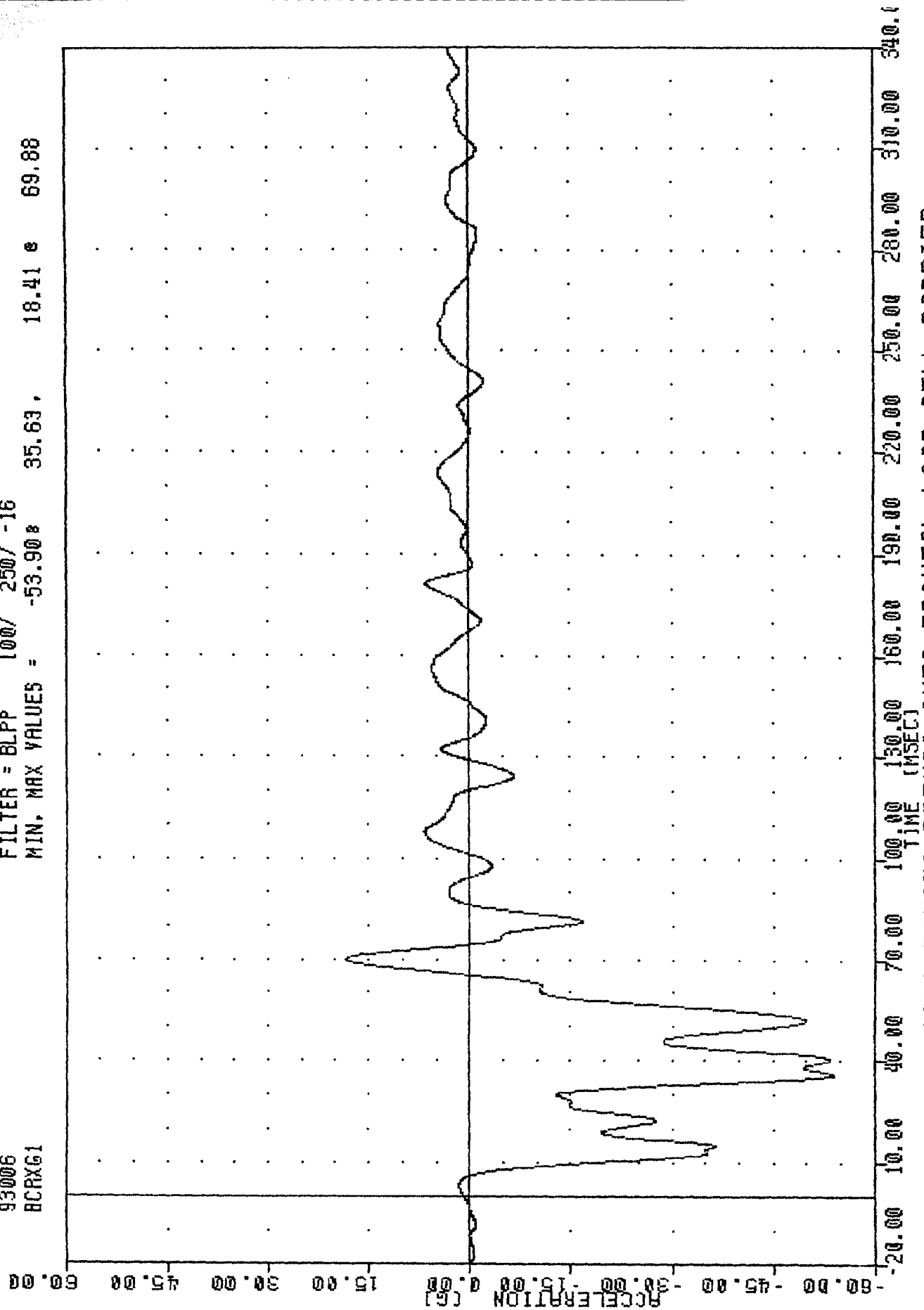
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -48.02 28.25 4.39 131.25



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 ENGINE BOTTOM X-AXIS ACCELERATION

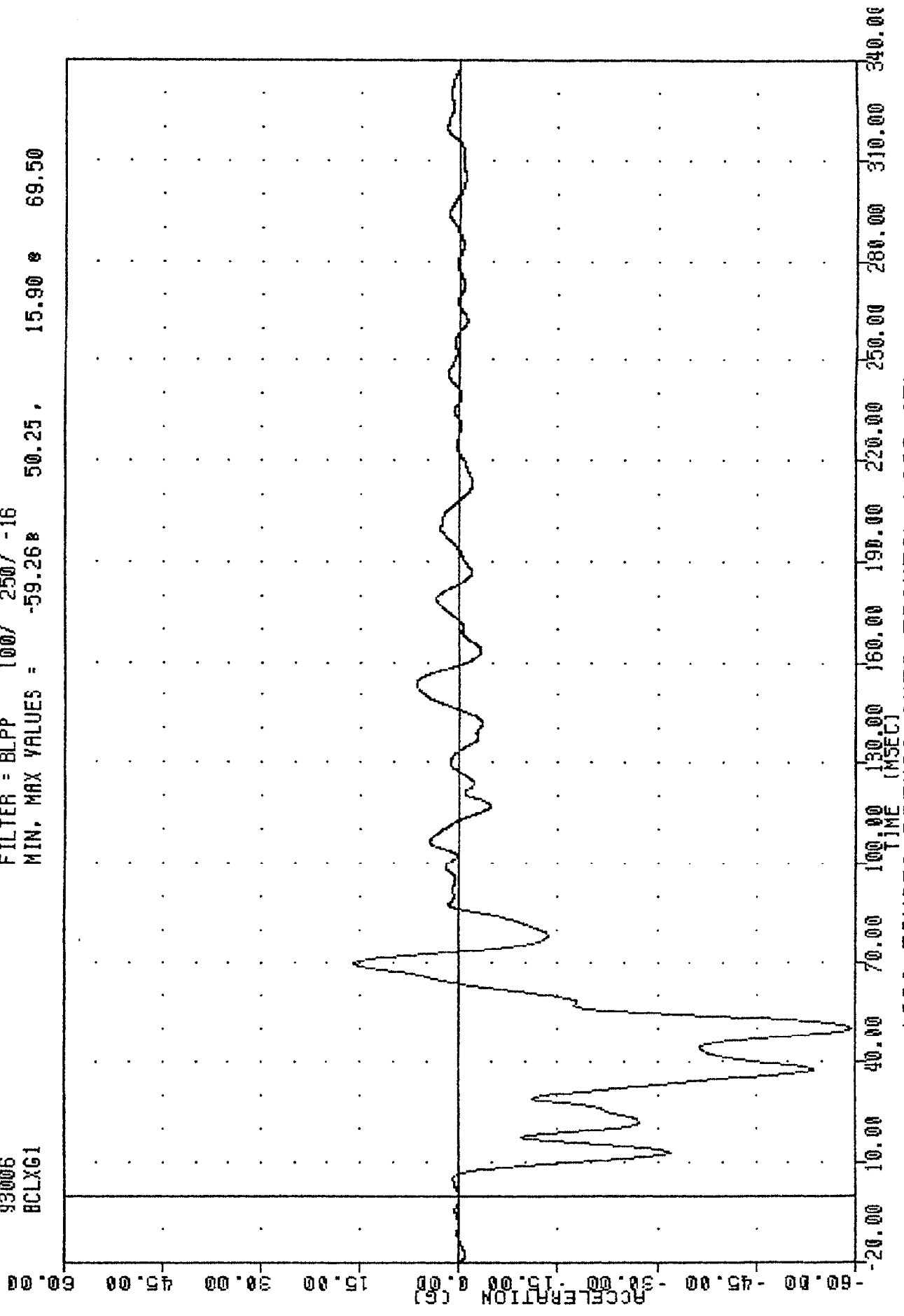
TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BCRXG1

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -53.90 35.63, 18.41 e 69.88



TRC
NEW CAR ASSESSMENT PROGRAM
93006
BCLXG1

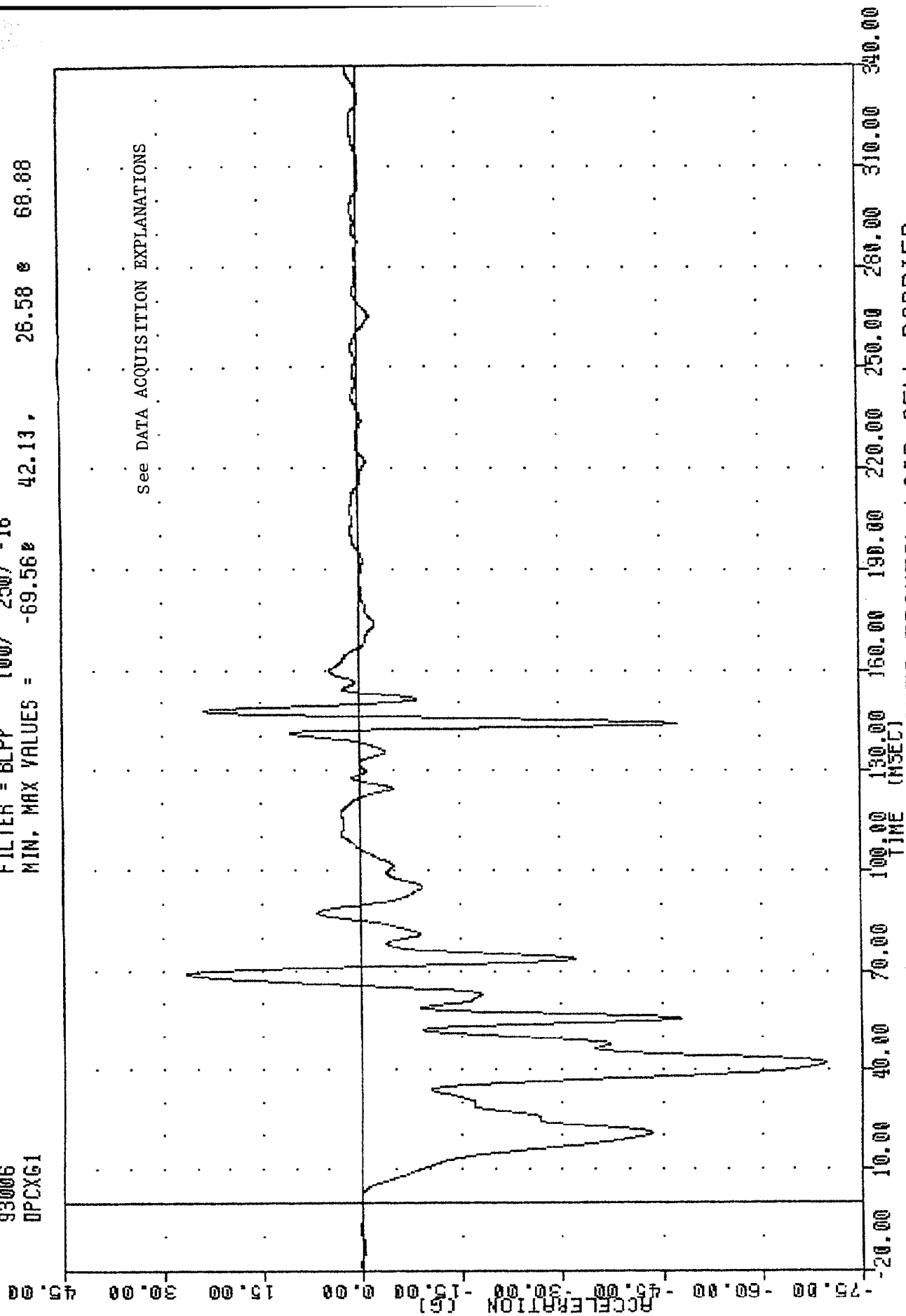
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -59.26 50.25 15.90 69.50



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 DPCXG1

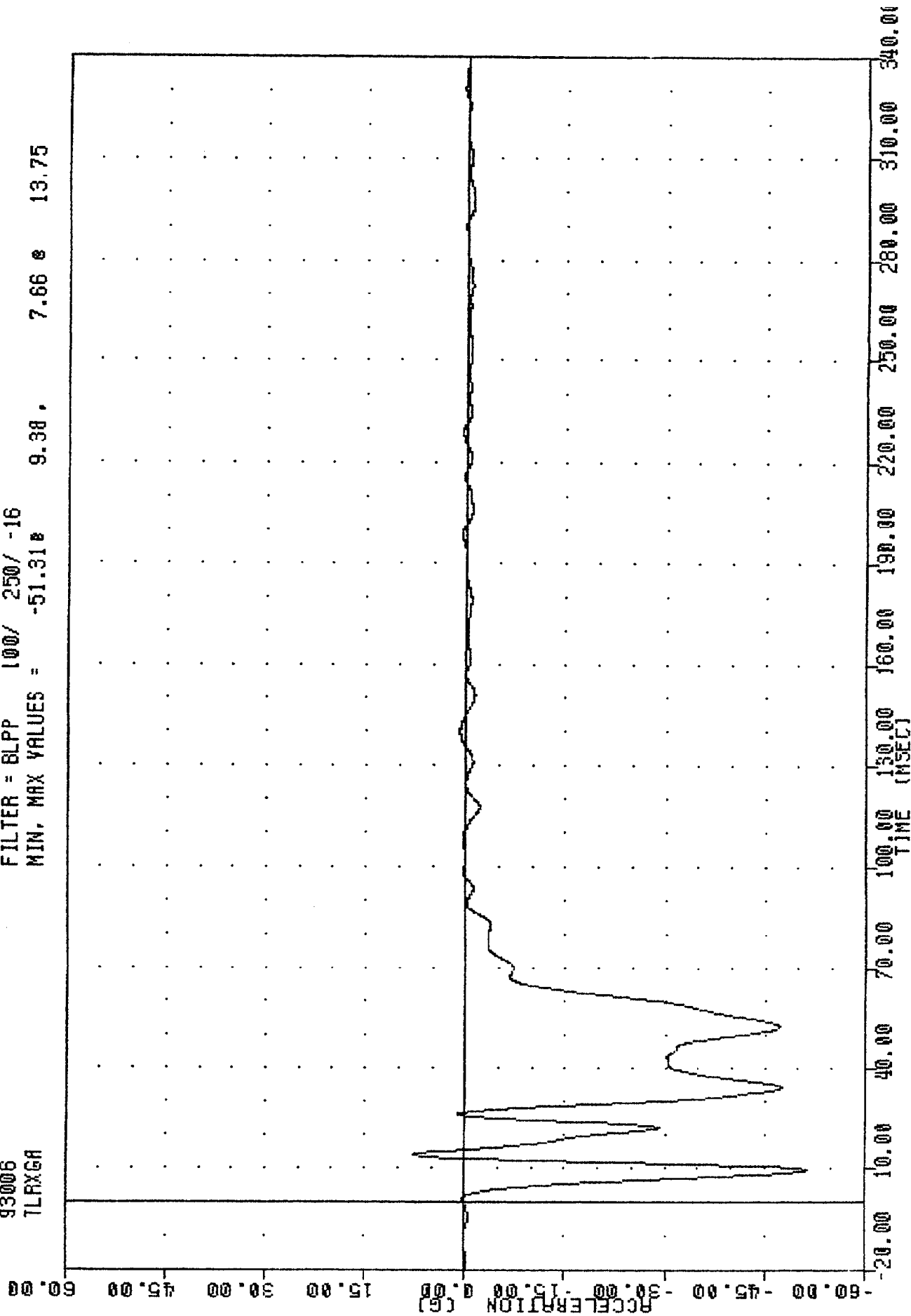
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -69.56% 42.13, 26.58 % 68.88



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 INSTRUMENT PANEL CENTER X-AXIS ACCELERATION

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 TLRXGA

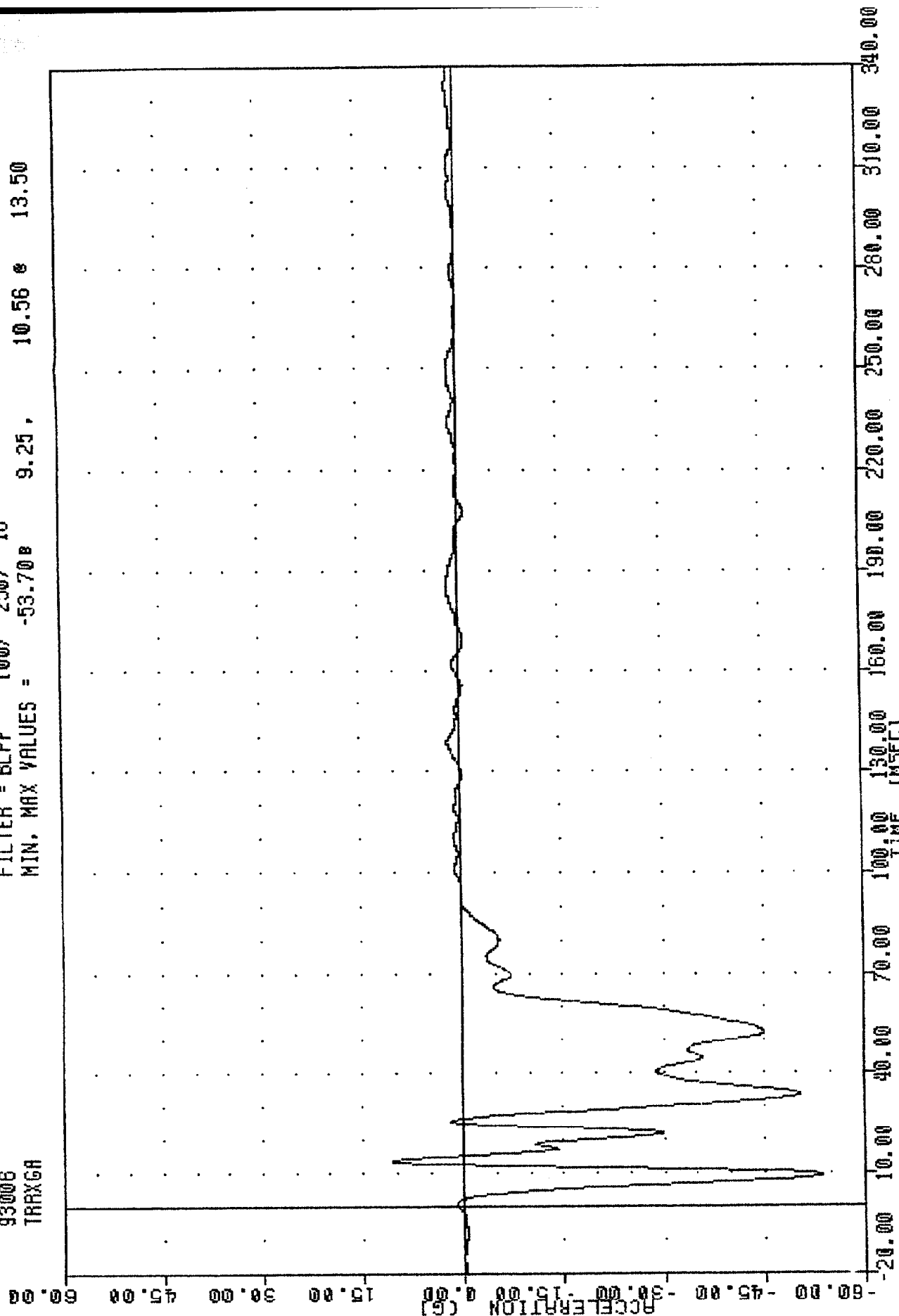
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -51.31e 9.38e 7.66e 13.75



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 TRXGA

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -53.70 9.25, 10.56 13.50



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

MINIMUM RESULT SEEN AT 10.00 msec MAXIMUM RESULT SEEN AT 50.00 msec

TRC
NEW CAR ASSESSMENT PROGRAM

930106

93006

BA1F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -1.75 18.25 1.66 22.13

25.00

0.00

-25.00

-50.00

-75.00

-100.00

-125.00

-150.00

-175.00

FORCE (KN)

-20.00

10.00

40.00

70.00

100.00

130.00

160.00

190.00

220.00

250.00

280.00

310.00

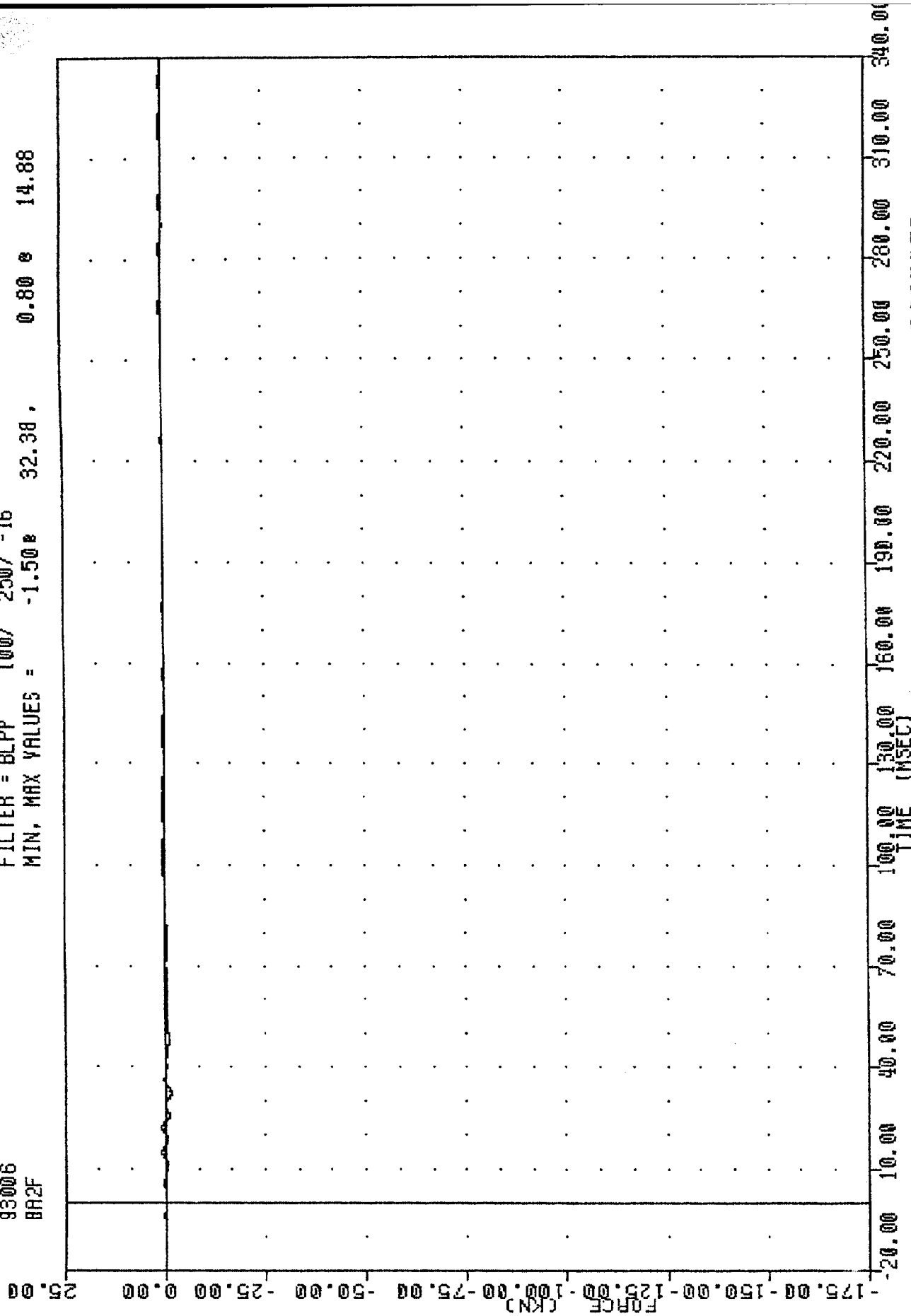
340.00

TIME (MSEC)

1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A1 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BR2F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -1.50 32.38 , 0.80 14.88

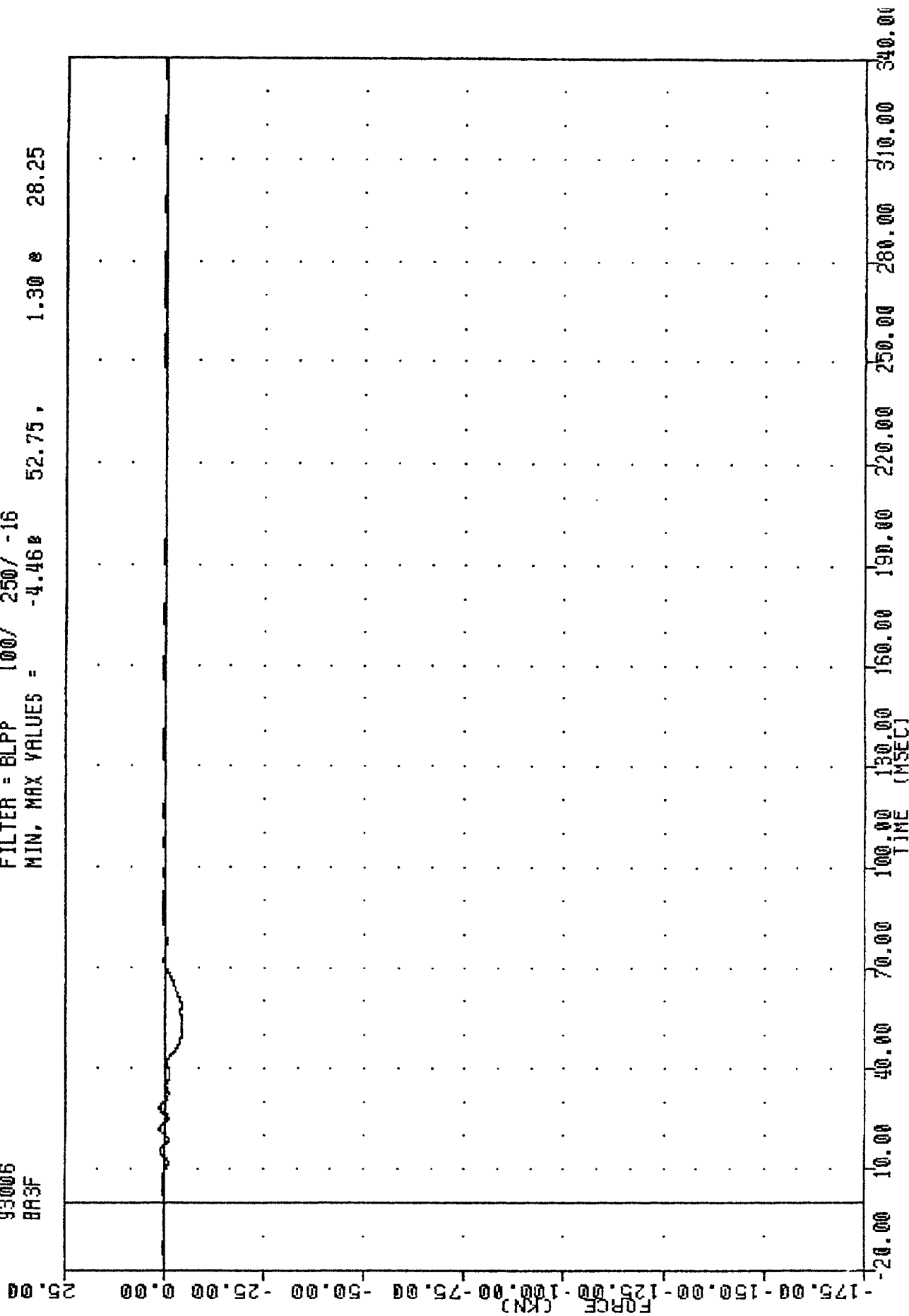


1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

TOP CELL BARRIER POSITION 92 FORCE

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 BR3F

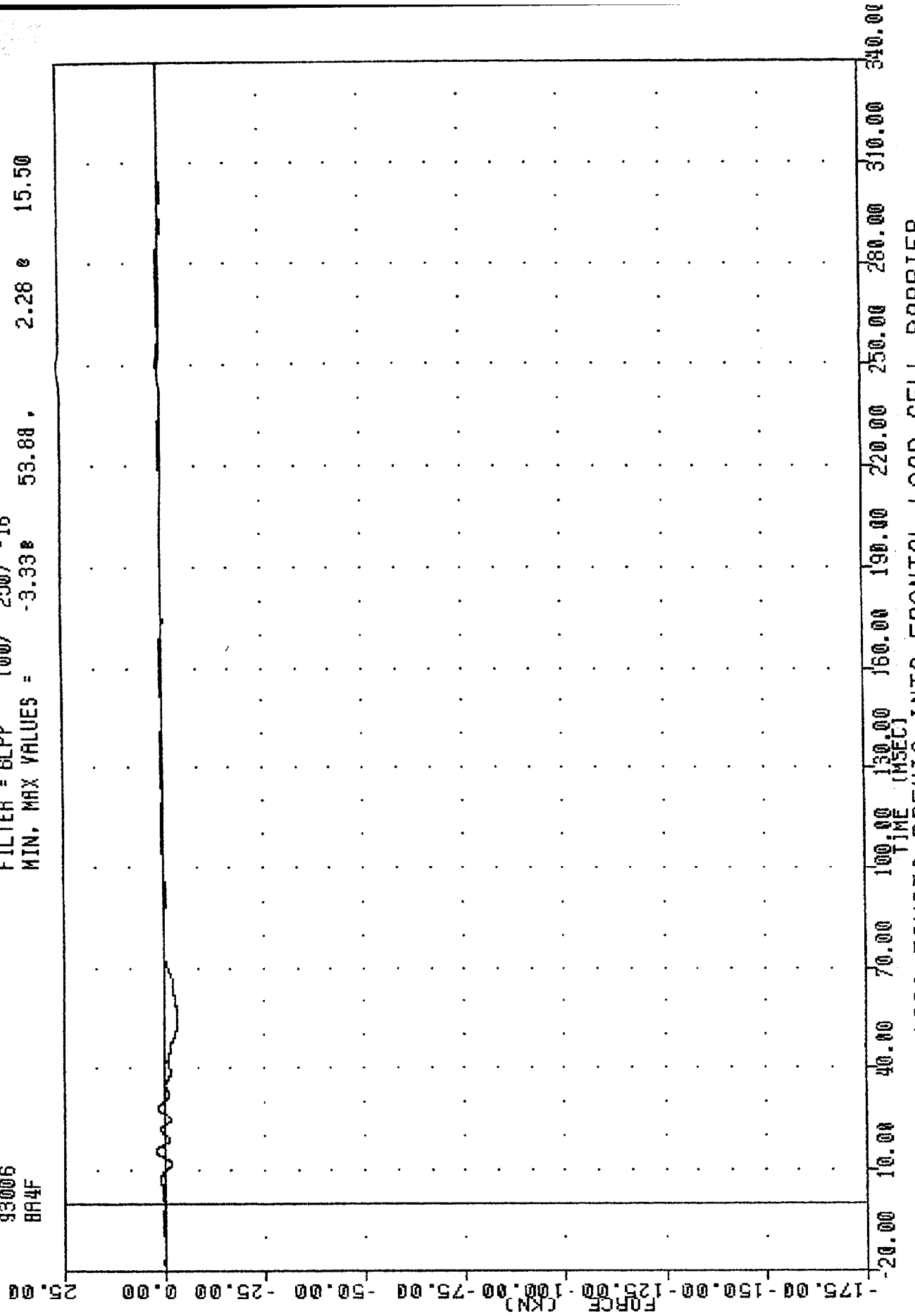
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -4.46 52.75 1.30 28.25



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A3 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BRA4F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -3.33% 53.88 , 2.28 % 15.50

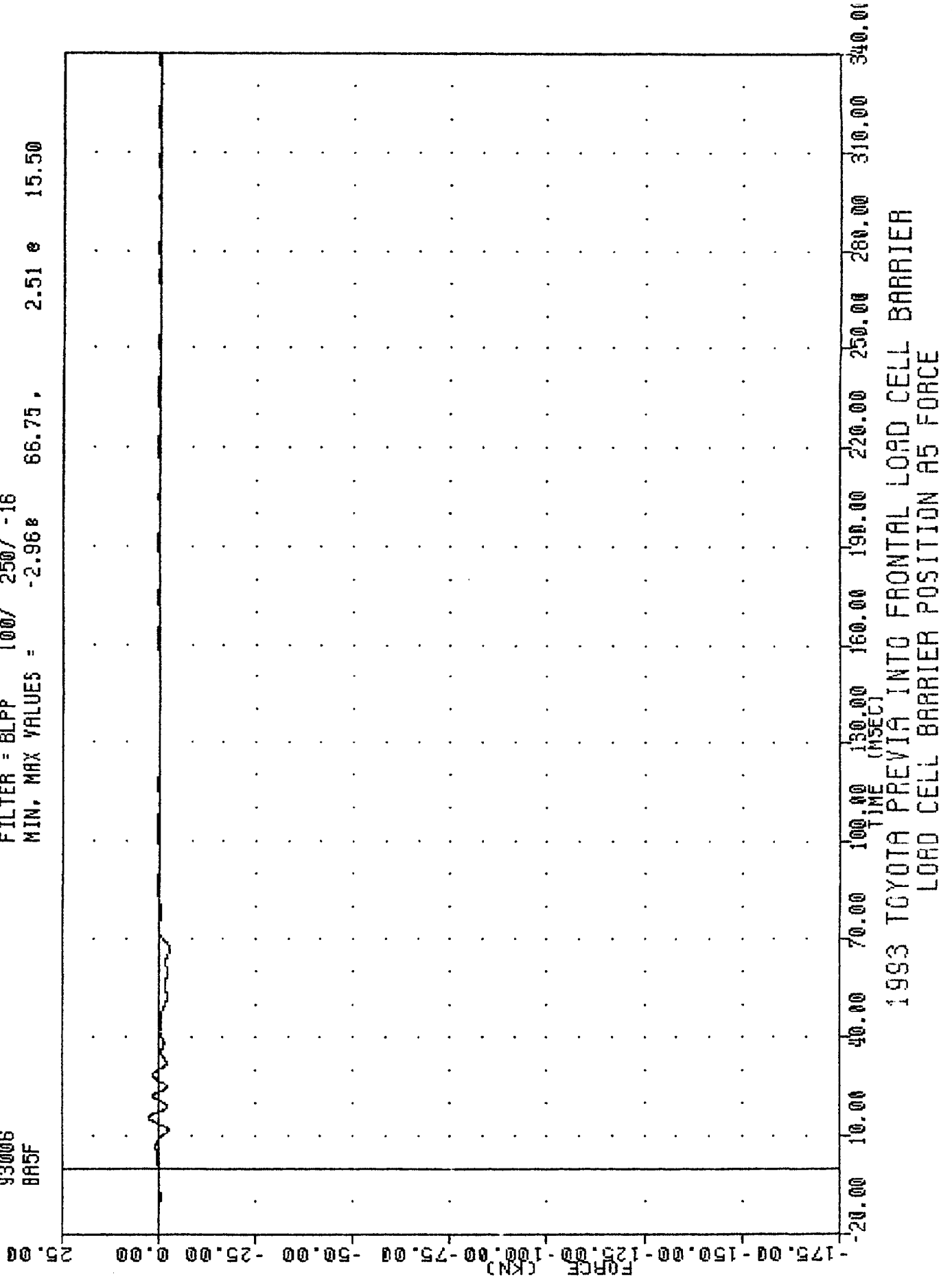


1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

BARREL POSITION 24 FORCE

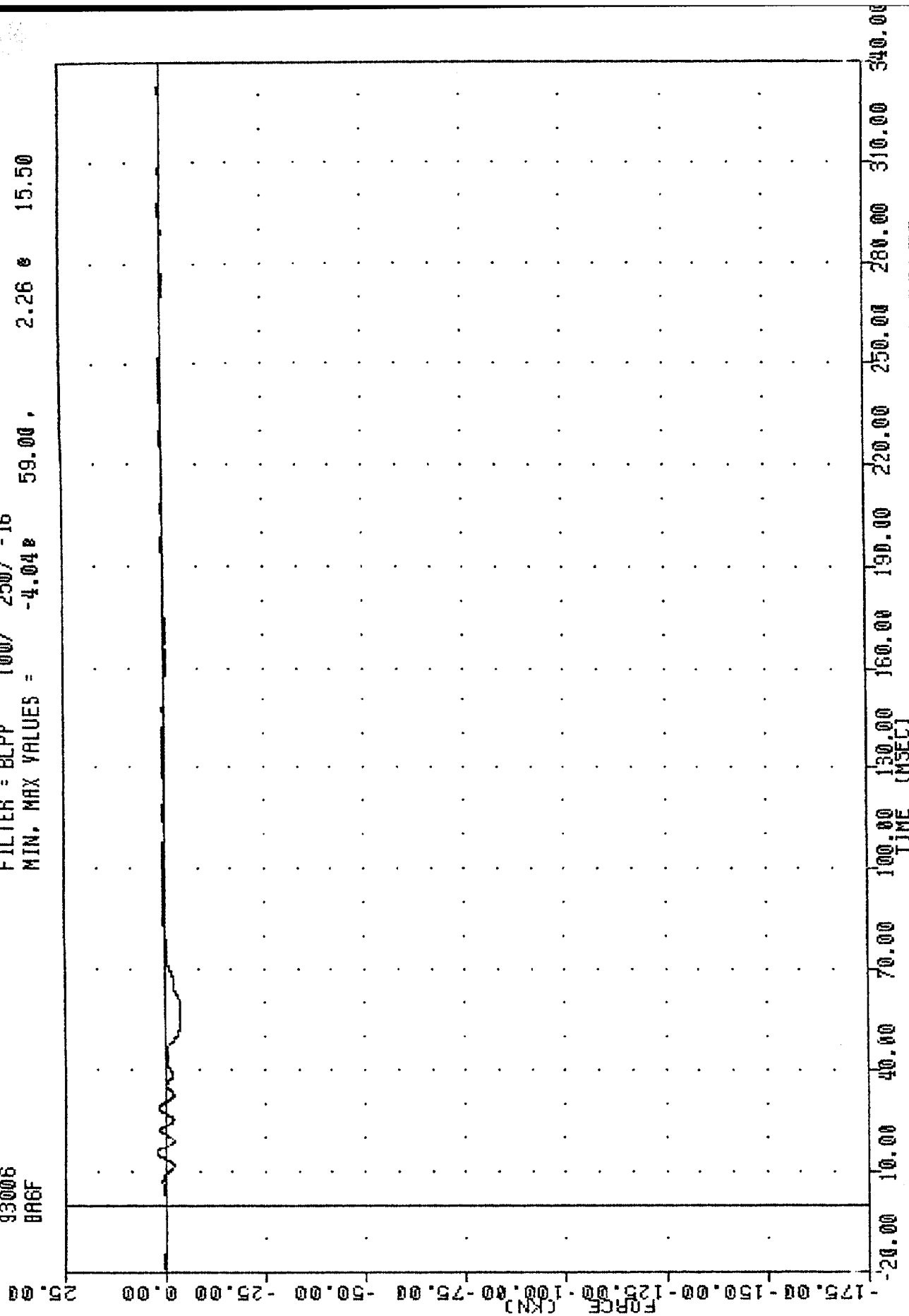
TRC
 93006
 NEW CAR ASSESSMENT PROGRAM
 93006
 BR5F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -2.96e 66.75, 2.51 e 15.50



TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 B86F

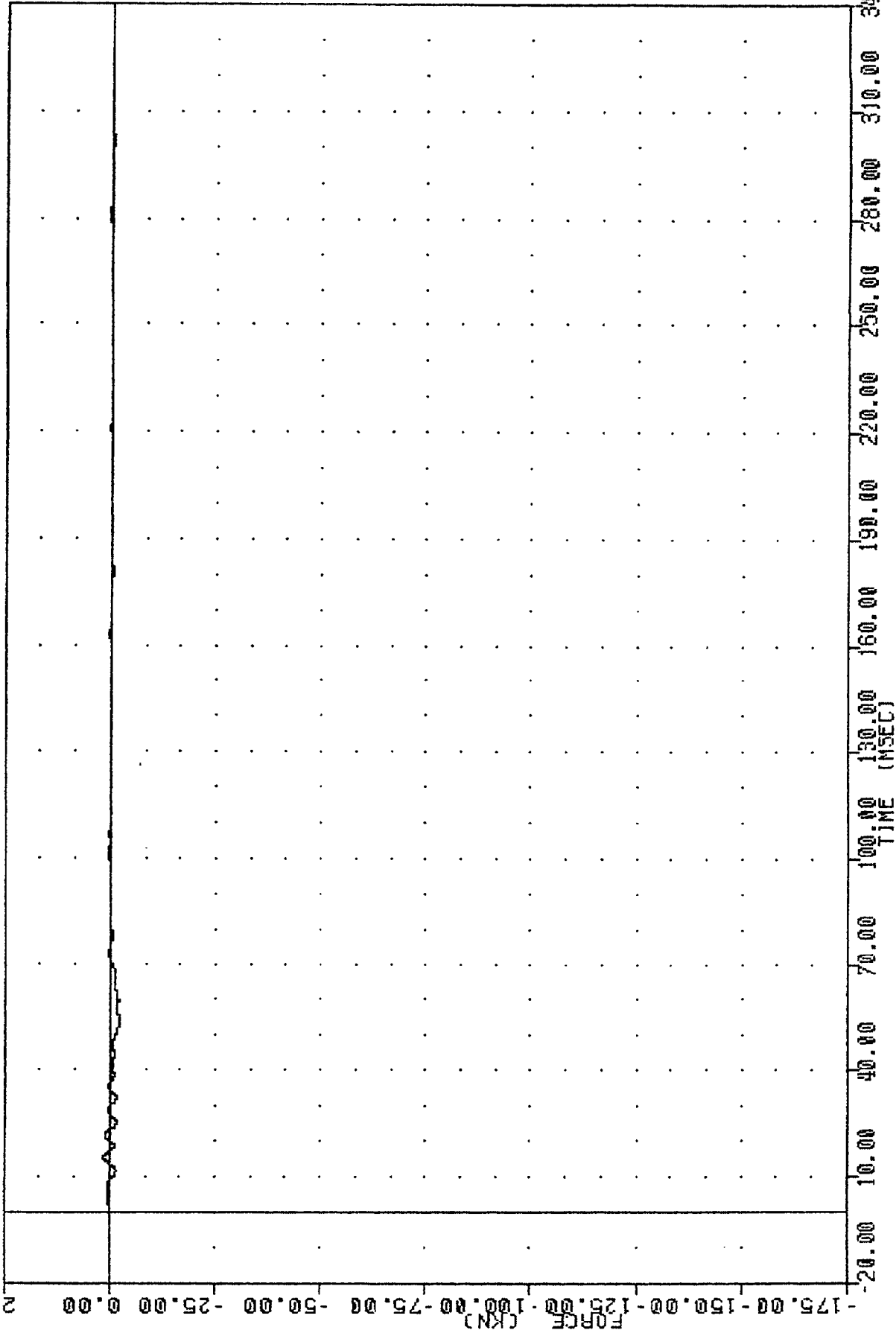
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -4.04e 59.00 , 2.26 e 15.50



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION AS FORCE

TRC
NEW CAR ASSESSMENT PROGRAM
93006
BA7F

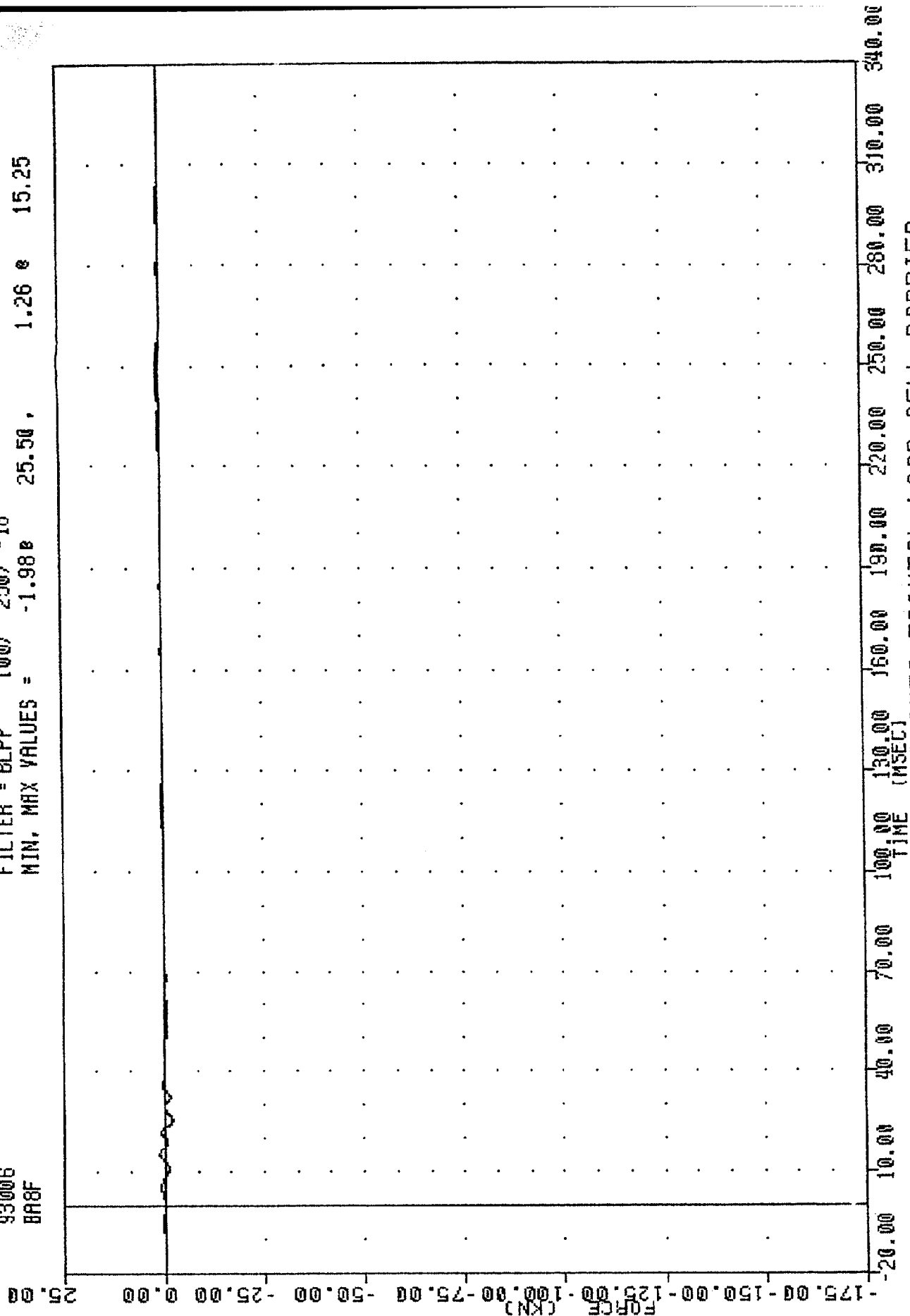
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -2.15 53.63, 1.30 15.38



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A7 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BA8F

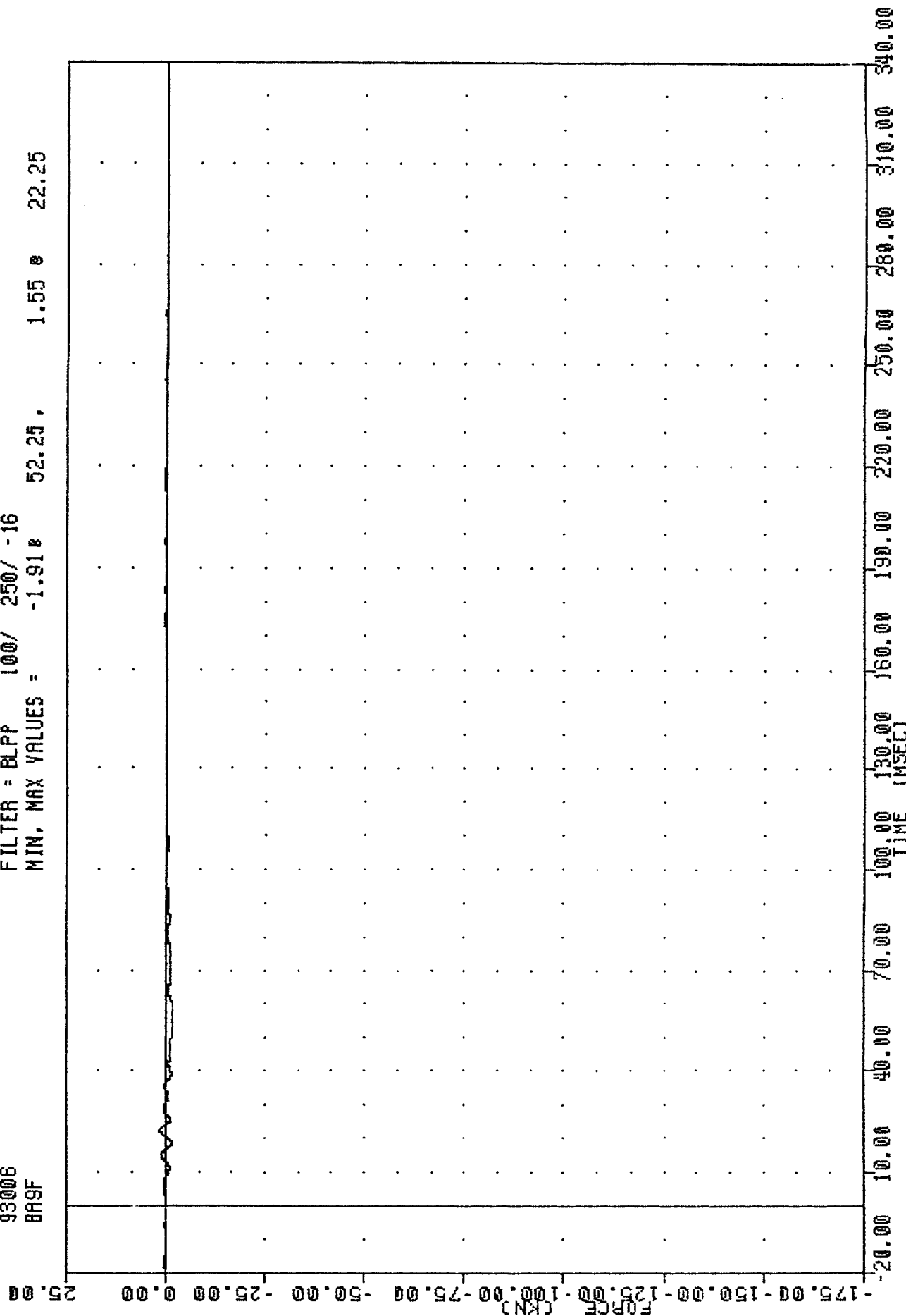
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -1.98e 25.50 , 1.26 e 15.25



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 88 FORCE

TRC
 NEW CAR ASSESSMENT PROGRAM
 930006
 BASF

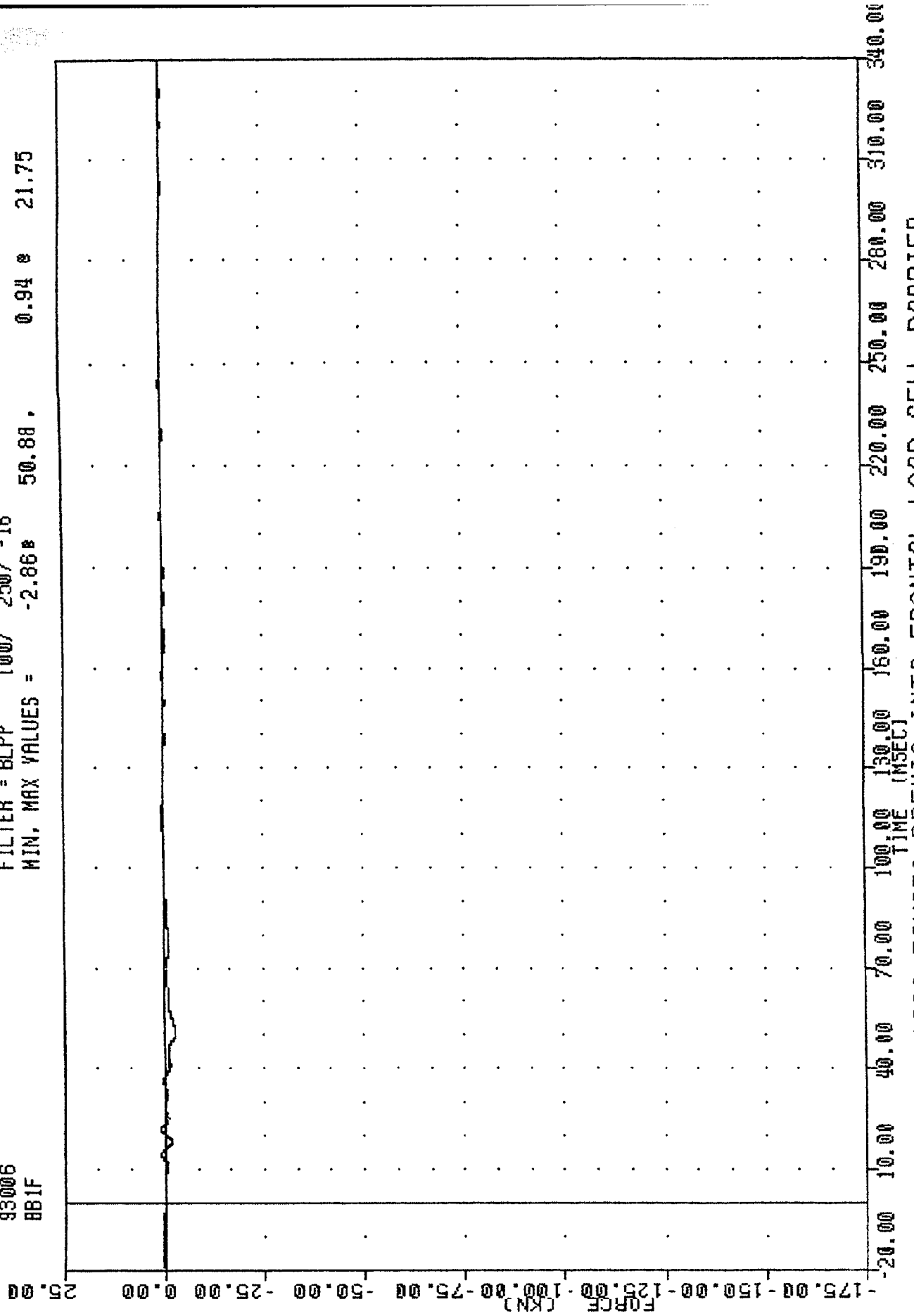
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -1.918 52.25, 1.55 22.25



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A9 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BBIF

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = 50.88 , 0.94 @ 21.75

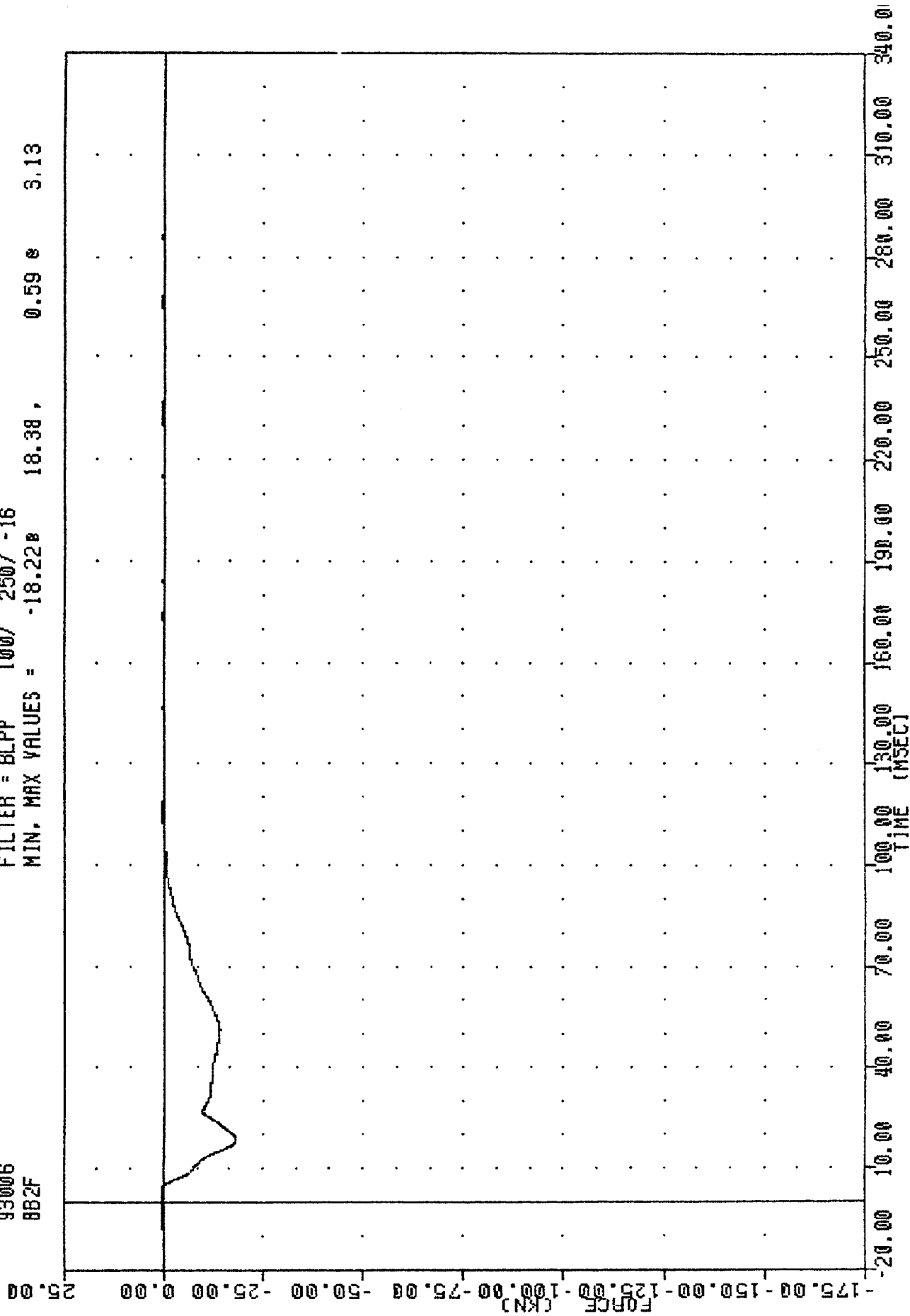


1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION 01 FORCE

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 BB2F

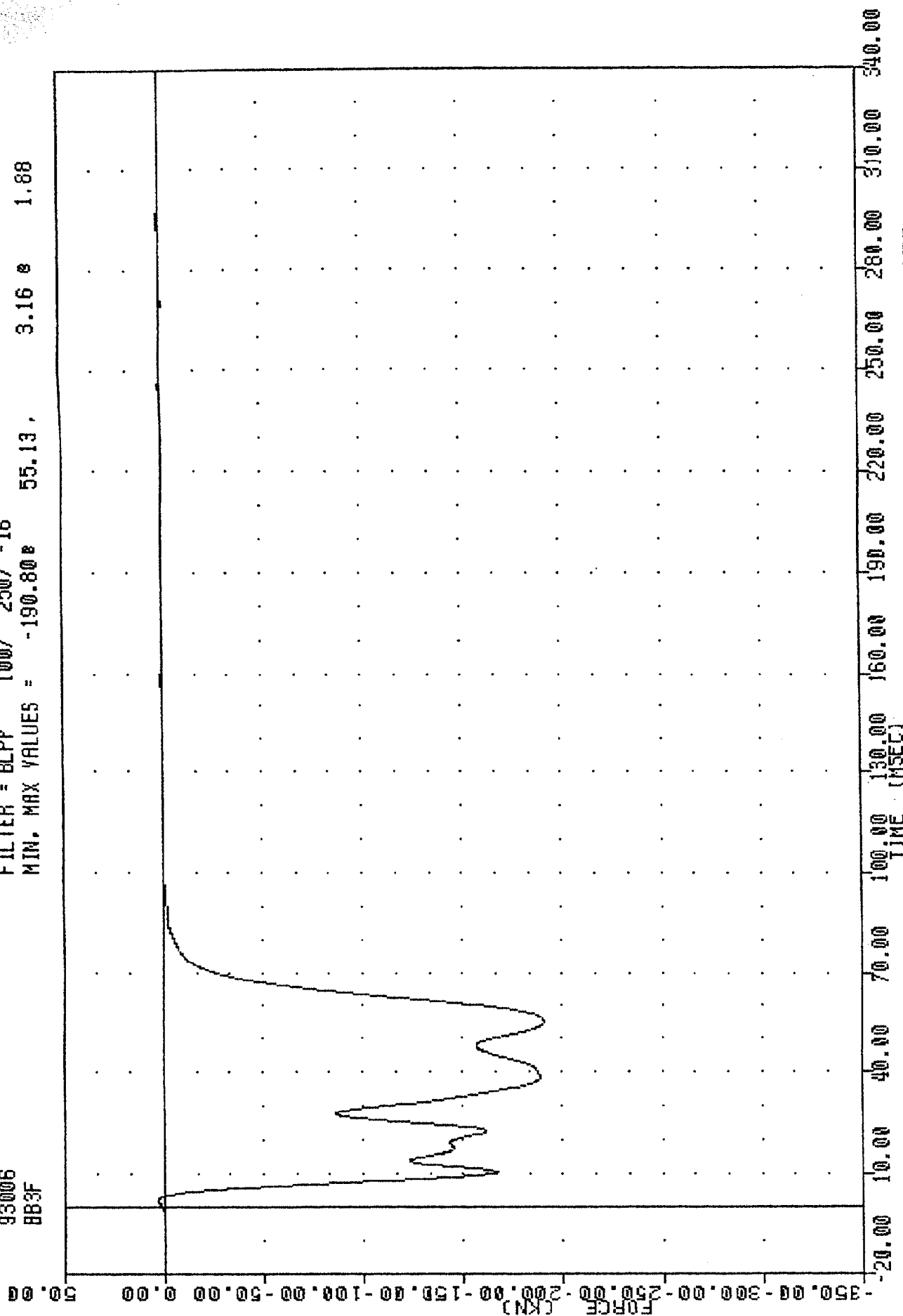
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -18.22 18.38, 0.59 3.13



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B2 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BB3F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -190.80e 55.13 , 3.16 e 1.88



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B3 FORCE

TRC
NEW CAR ASSESSMENT PROGRAM

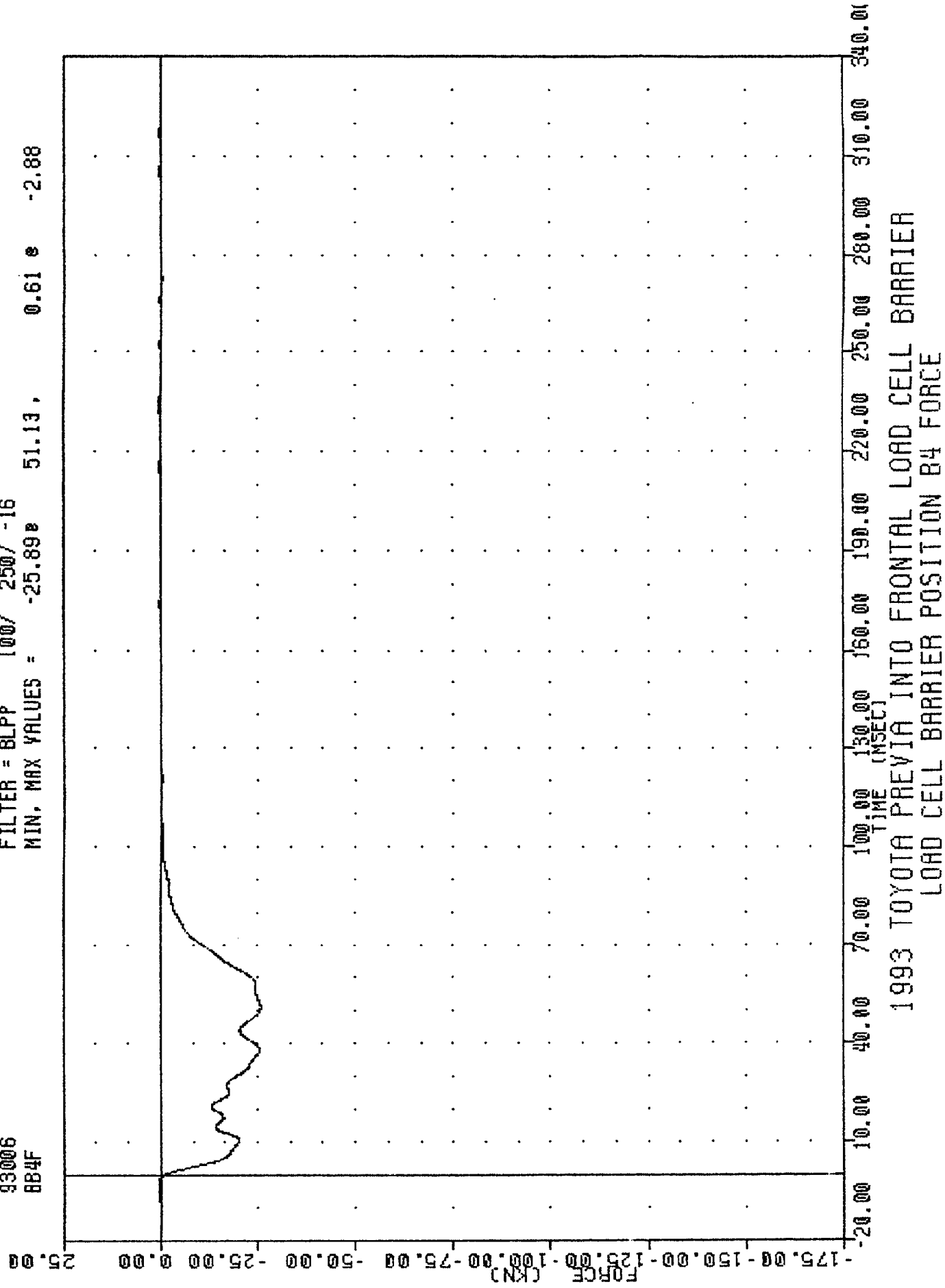
930106

93006

BB4F

FILTER = BLPP 100/ 250/ -16

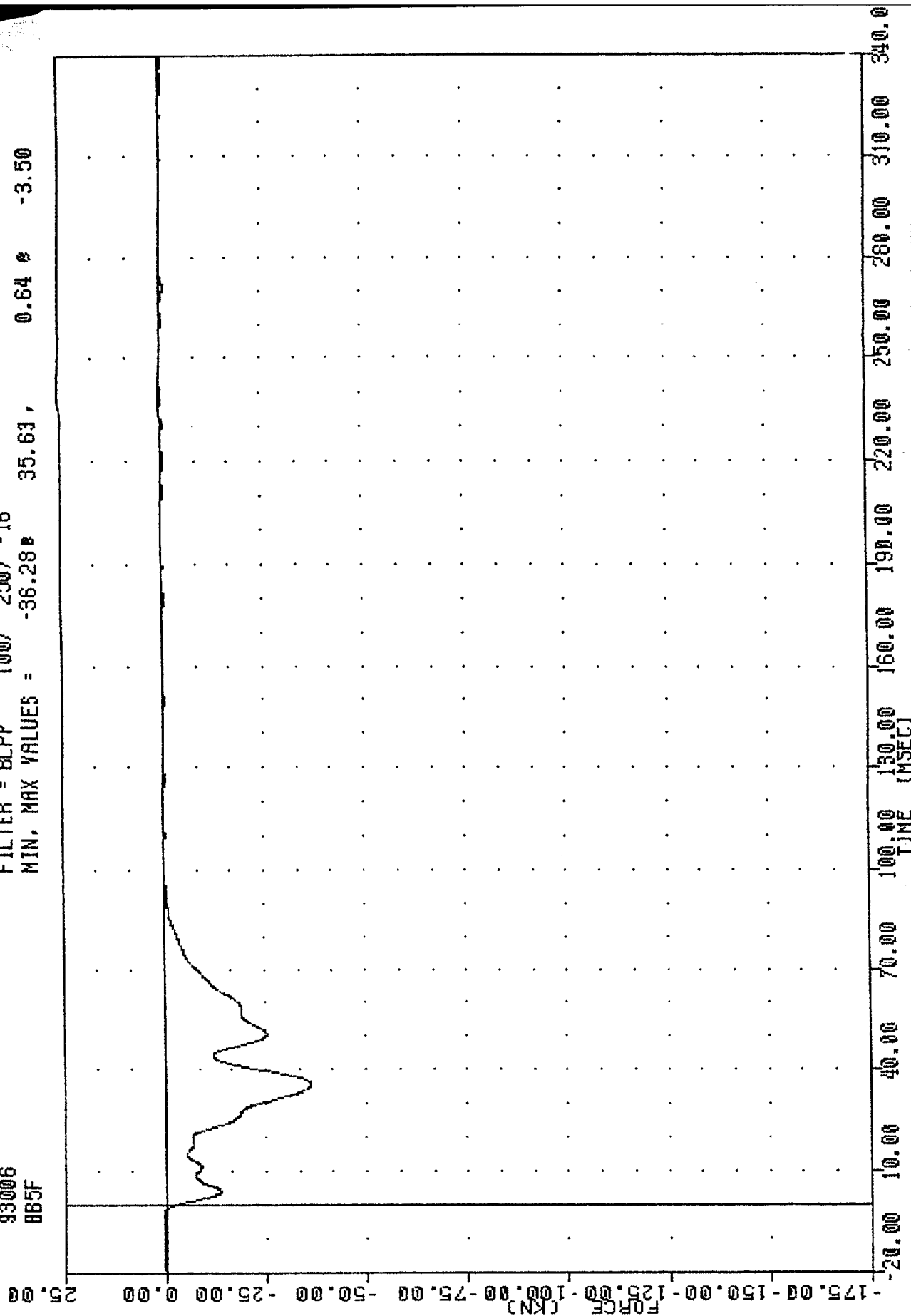
MIN, MAX VALUES = -25.89e 51.13, 0.61 e -2.88



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B4 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BB5F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -36.28 35.63 0.64 -3.50

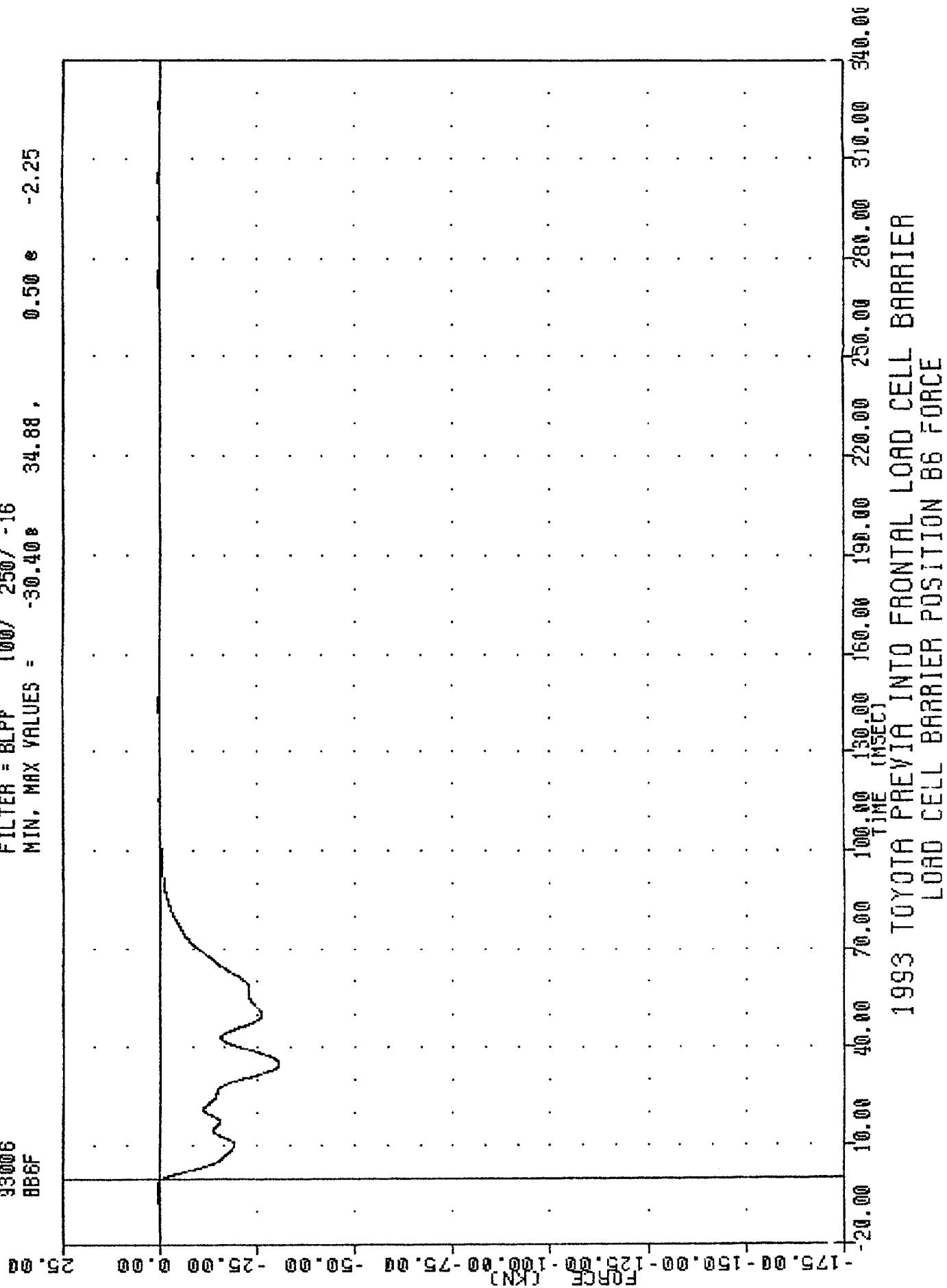


1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 35 FORCE

TRC
NEW CAR ASSESSMENT PROGRAM
93006
886F

, 930106

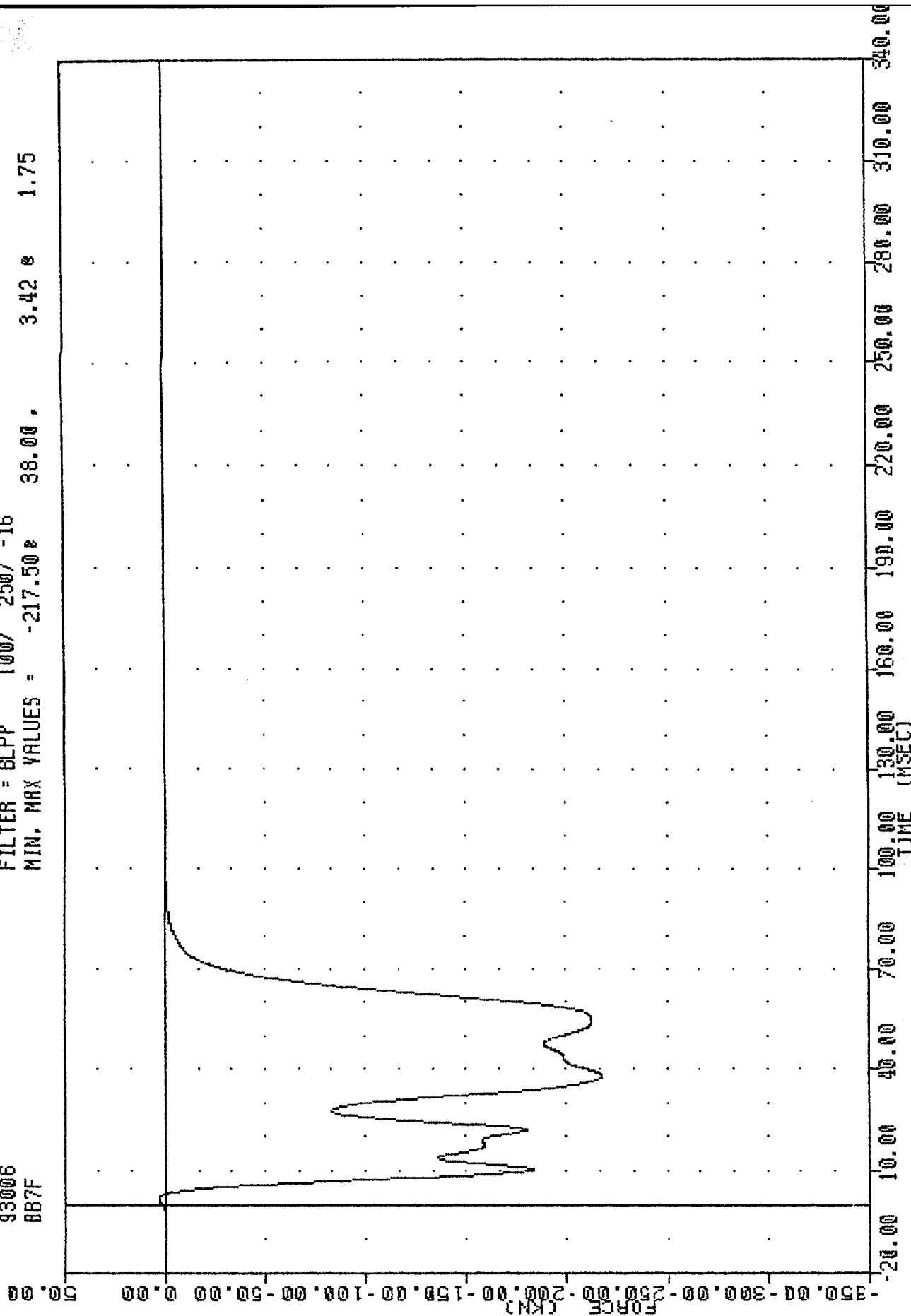
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -30.40* 34.88, 0.50 * -2.25



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 86 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BB7F

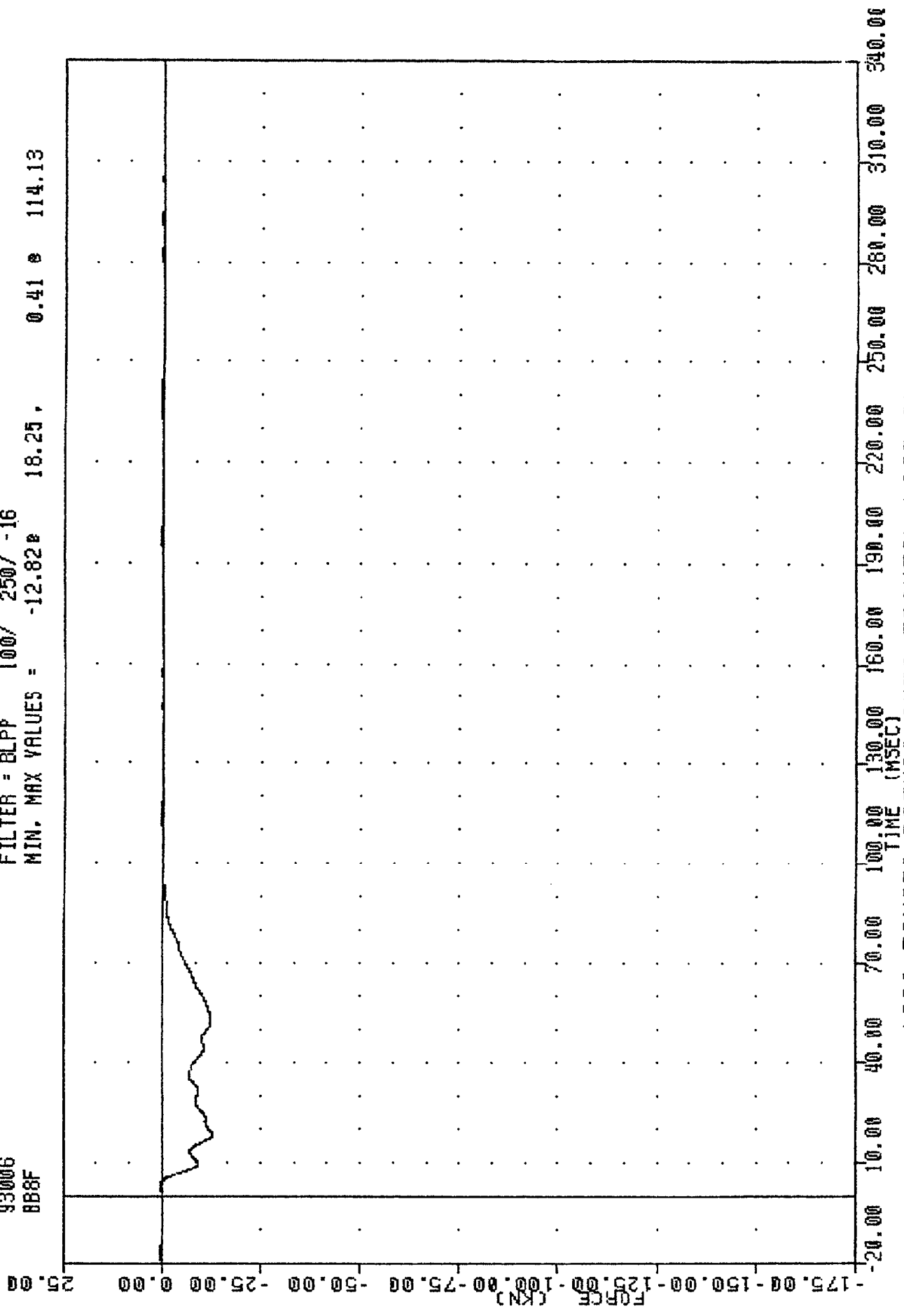
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -217.50e 38.00 , 3.42 e 1.75



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B7 FORCE

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 BB8F

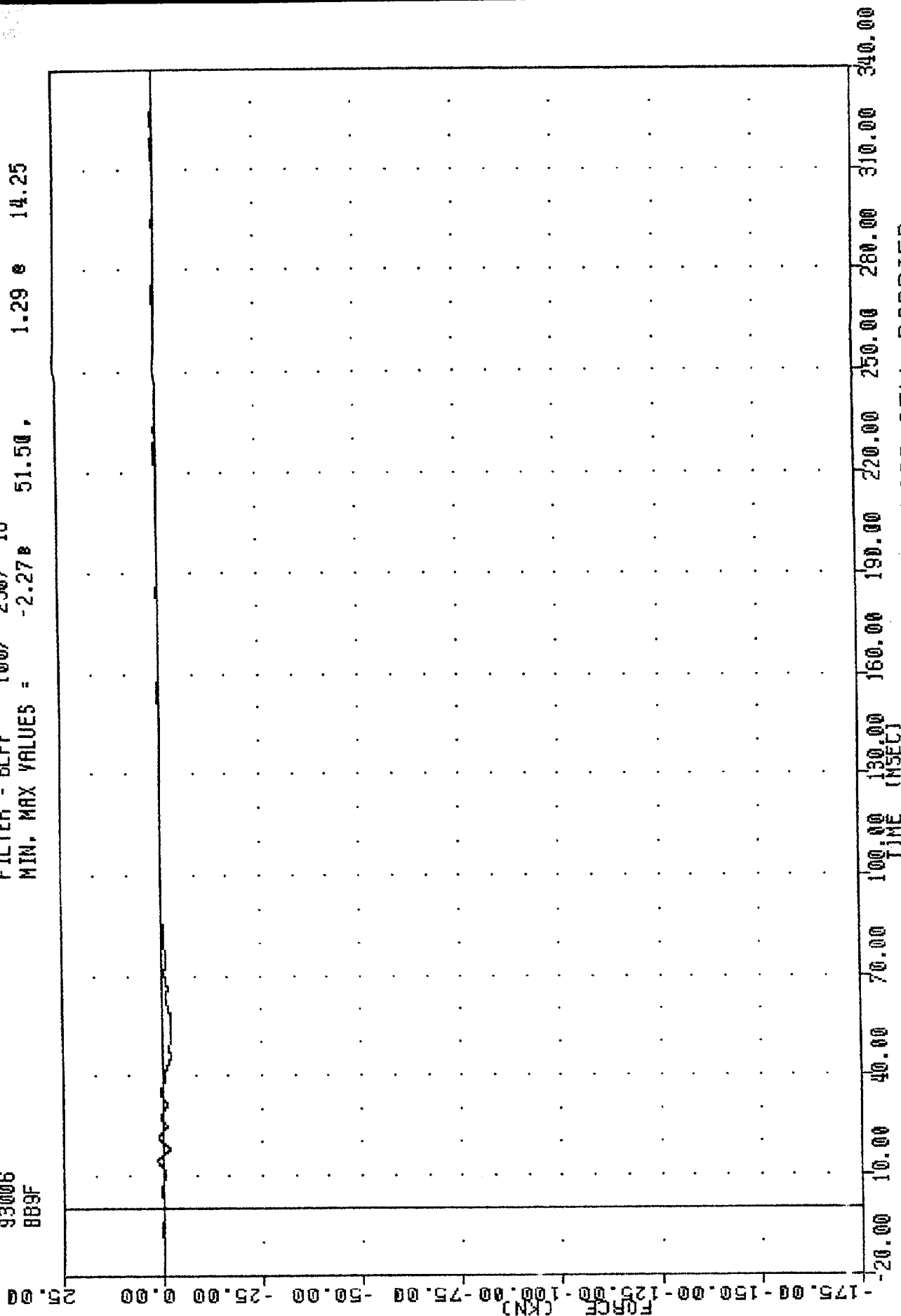
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -12.82 18.25 0.41 114.13



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 88 FORCE

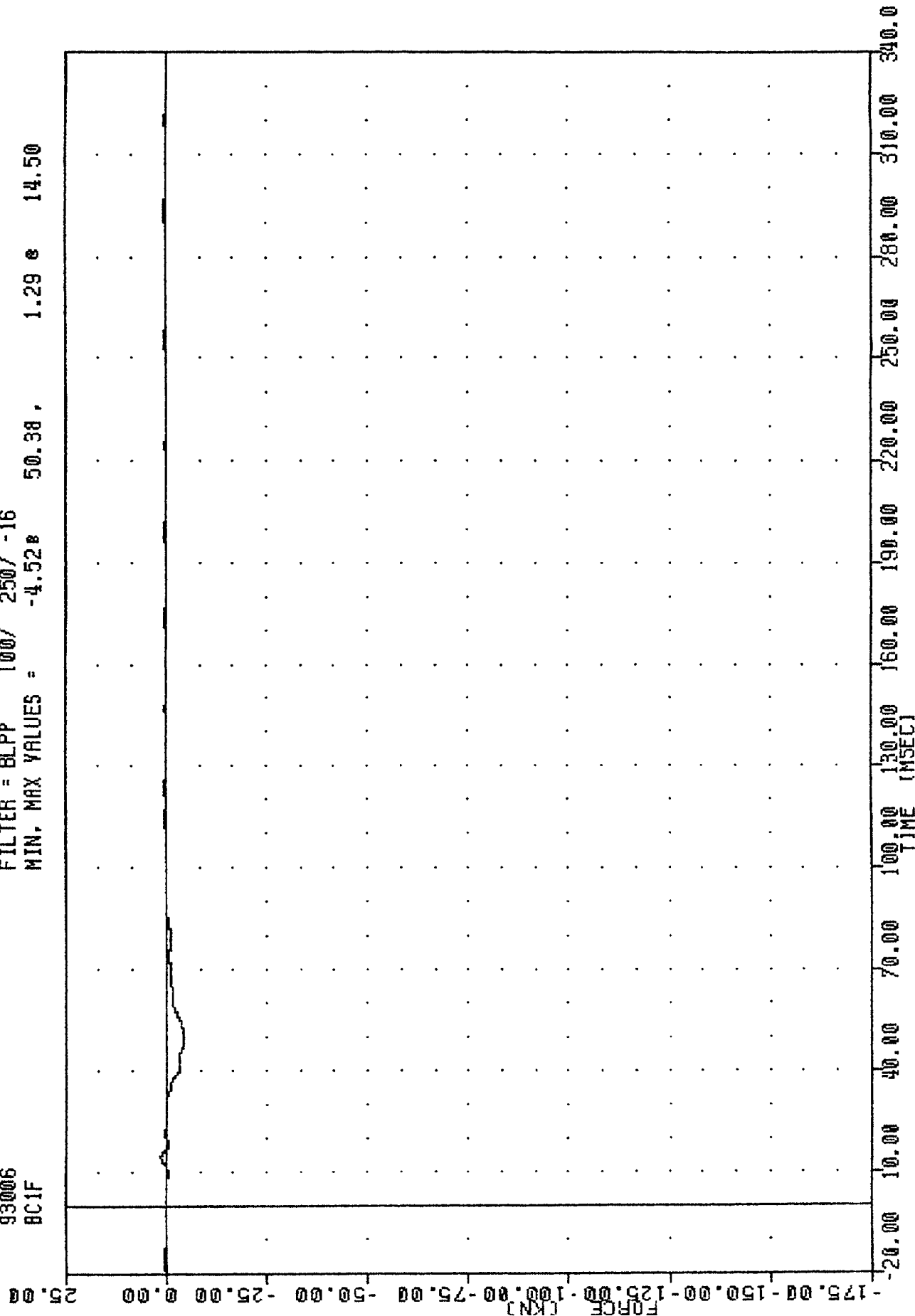
TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BB9F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -2.27 51.50 1.29 14.25



TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BC1F

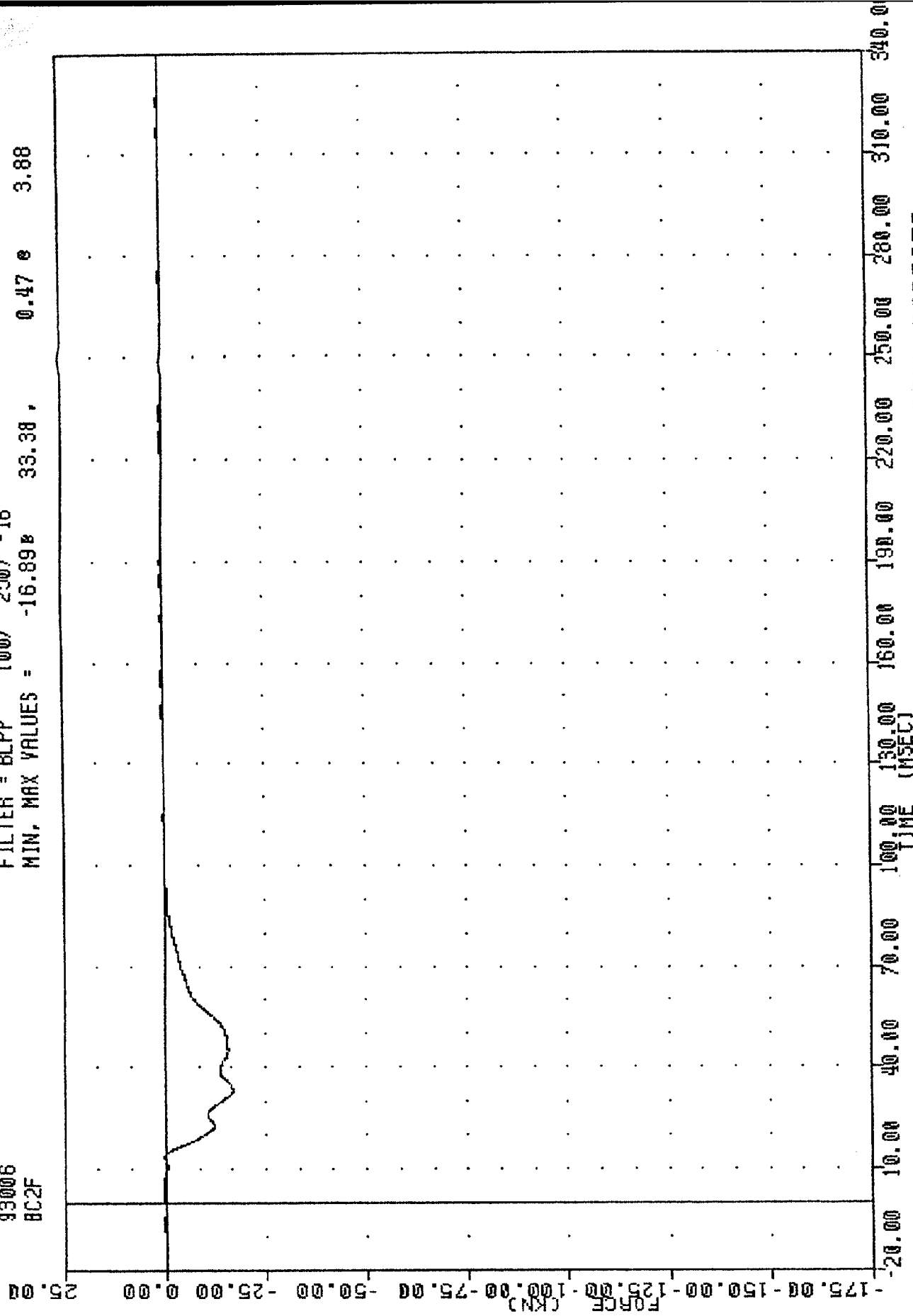
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -4.52 50.38, 1.29 14.50



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C1 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 930006
 BC2F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -16.89 33.38 , 0.47 e 3.88



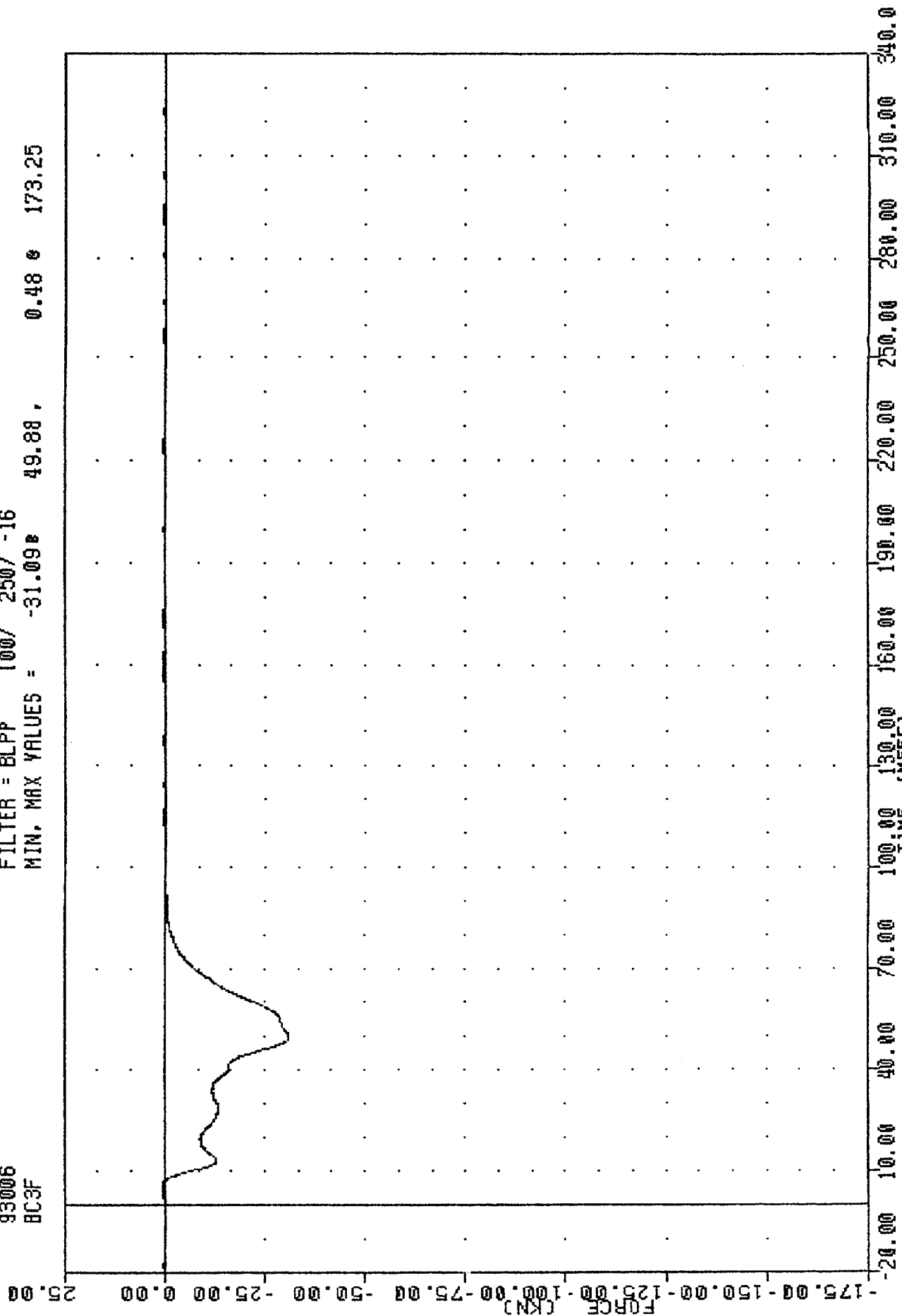
1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

1000 CELL BARRIER POSITION 2 FORCE

TRC
NEW CAR ASSESSMENT PROGRAM
93006
BC3F

, 930106

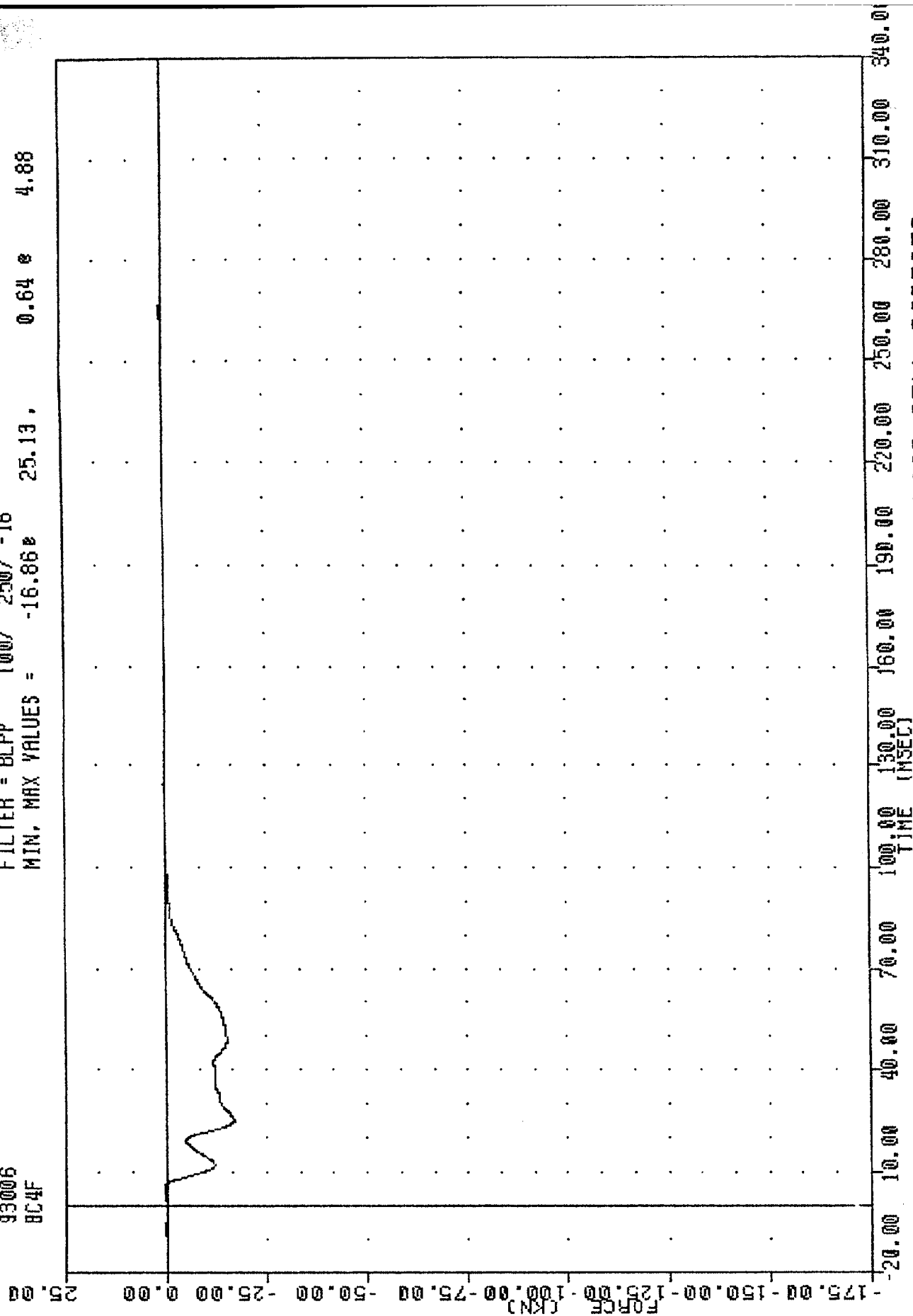
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -31.09 49.88, 0.48 173.25



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C3 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BC4F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -16.86 0.64 4.88



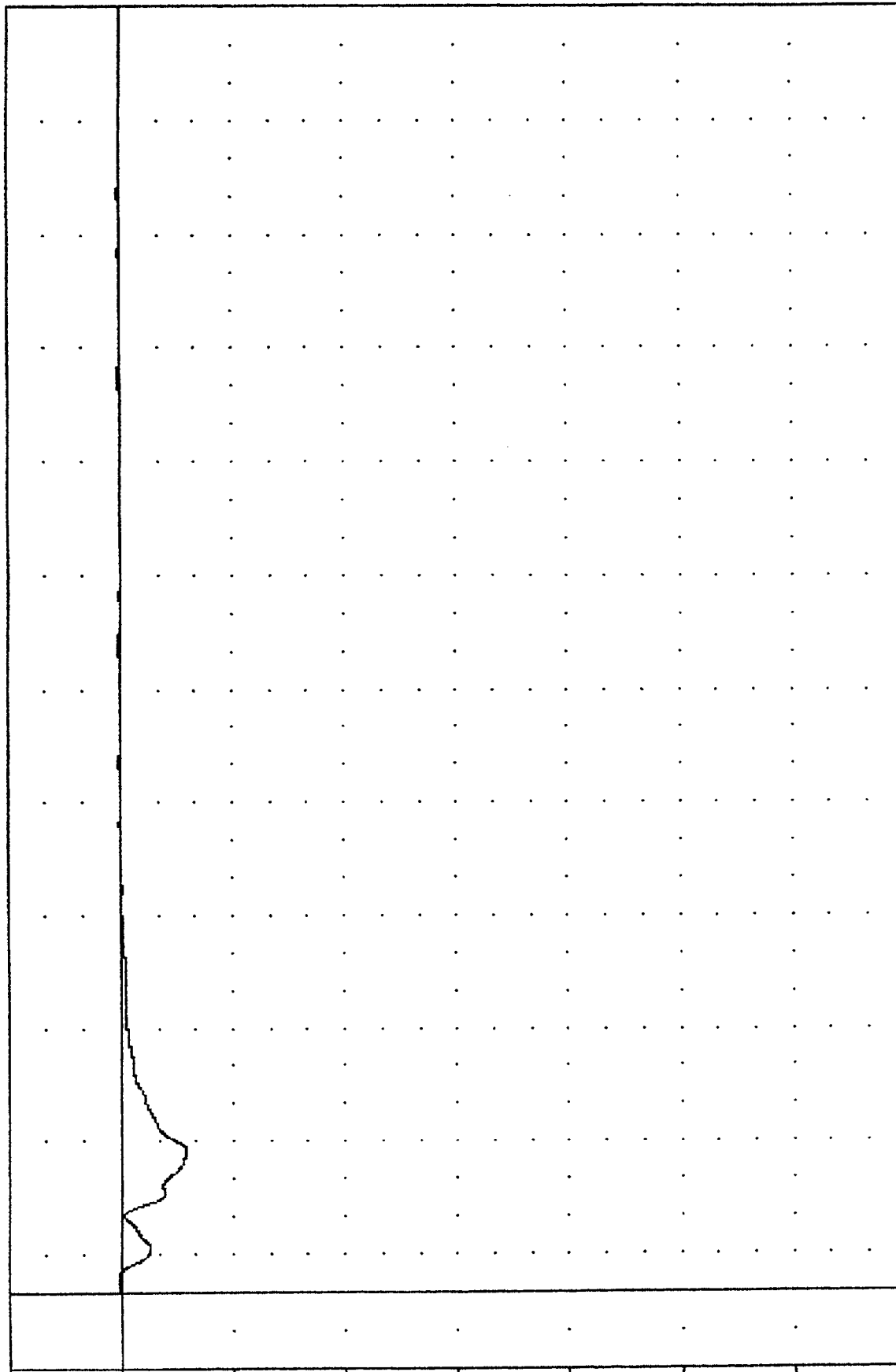
1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION 4 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 930006
 BC5F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -14.59 37.00 , 0.47 e 3.50

25.00
 0.00
 -25.00
 -50.00
 -75.00
 -100.00
 -125.00
 -150.00
 -175.00

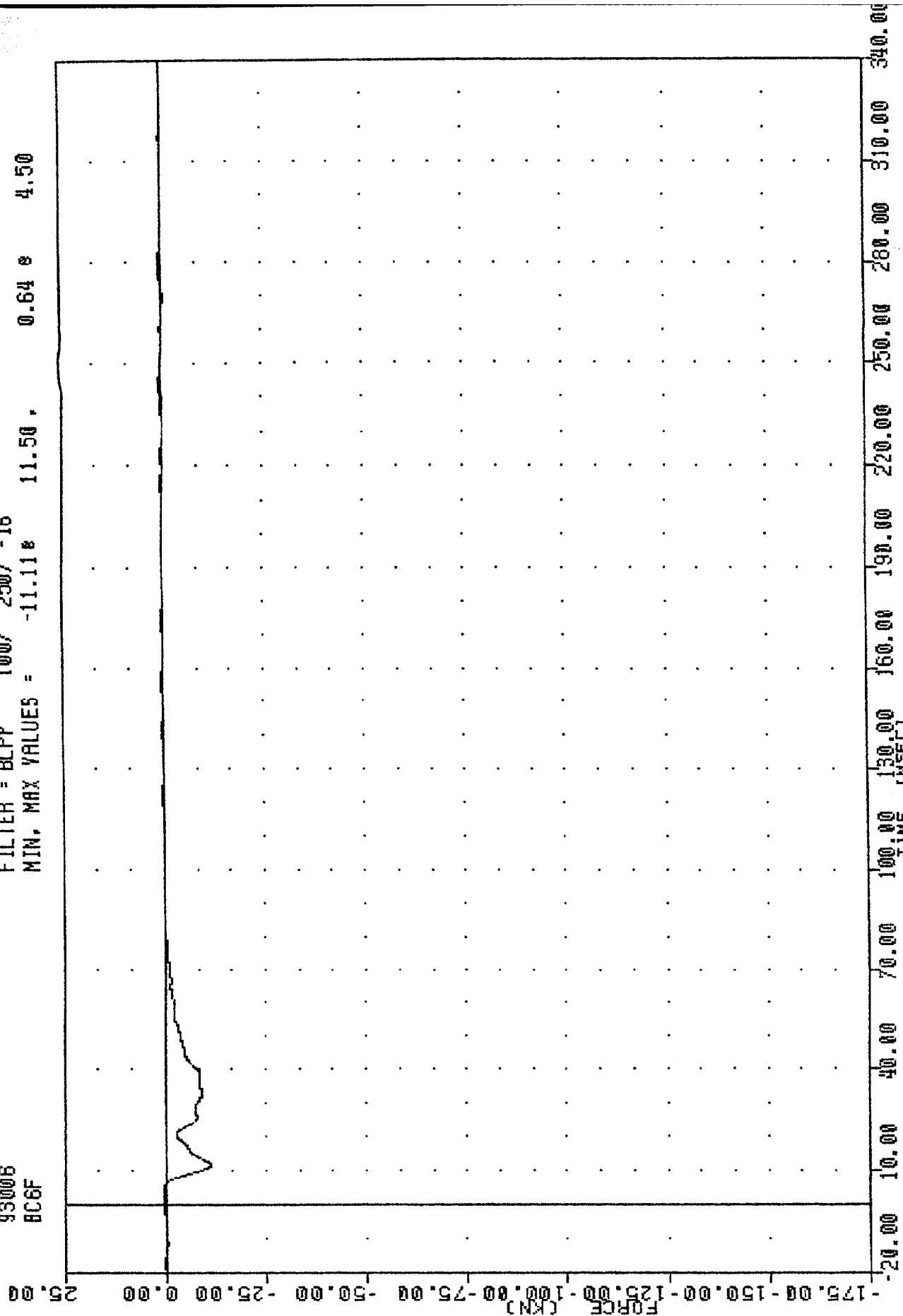


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C5 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BC6F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -11.11 11.50 0.64 8 4.50



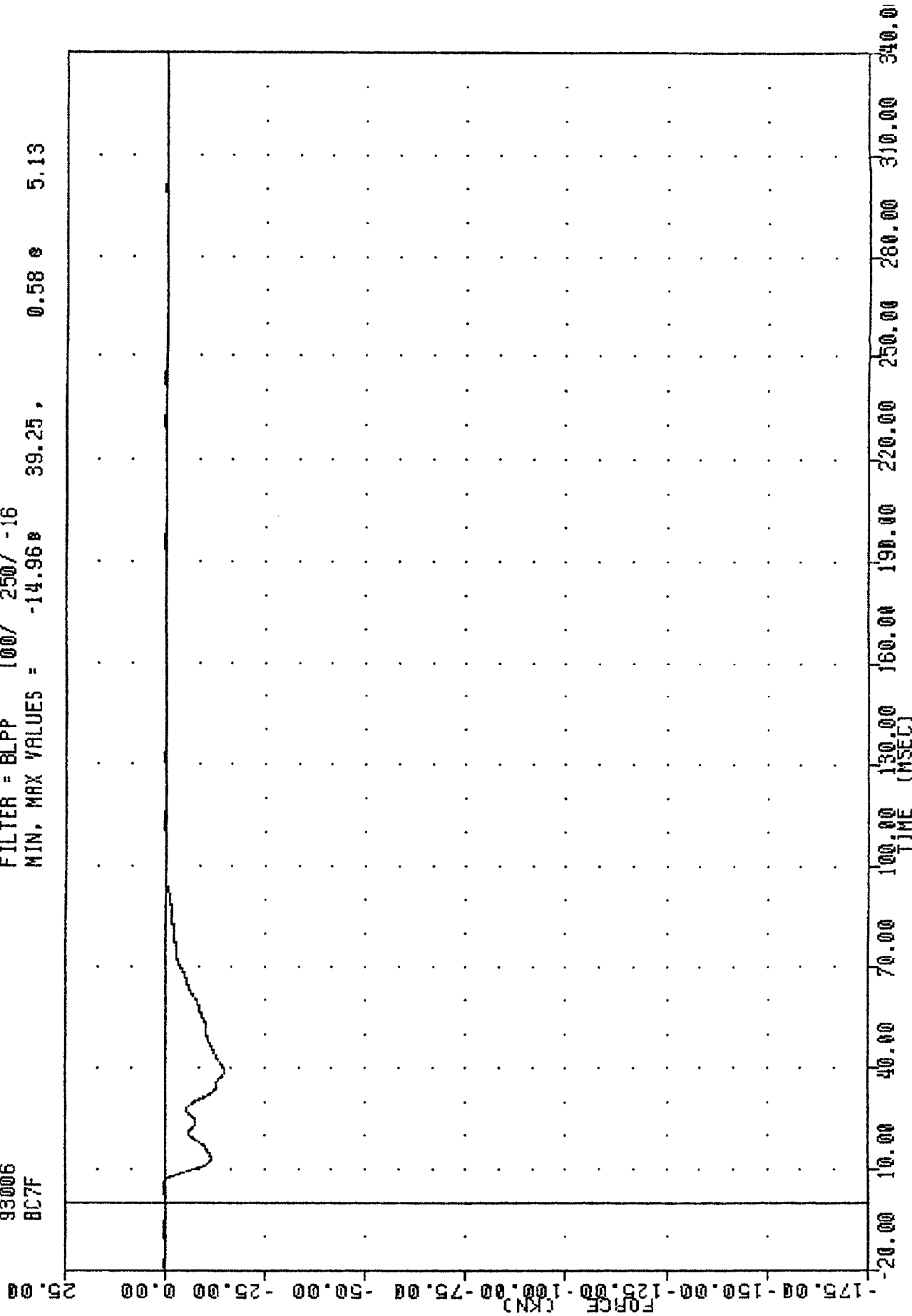
1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

20A CELL BARRIER POSITION 06 FORCE

TRC
NEW CAR ASSESSMENT PROGRAM
93006
BC7F

, 930106

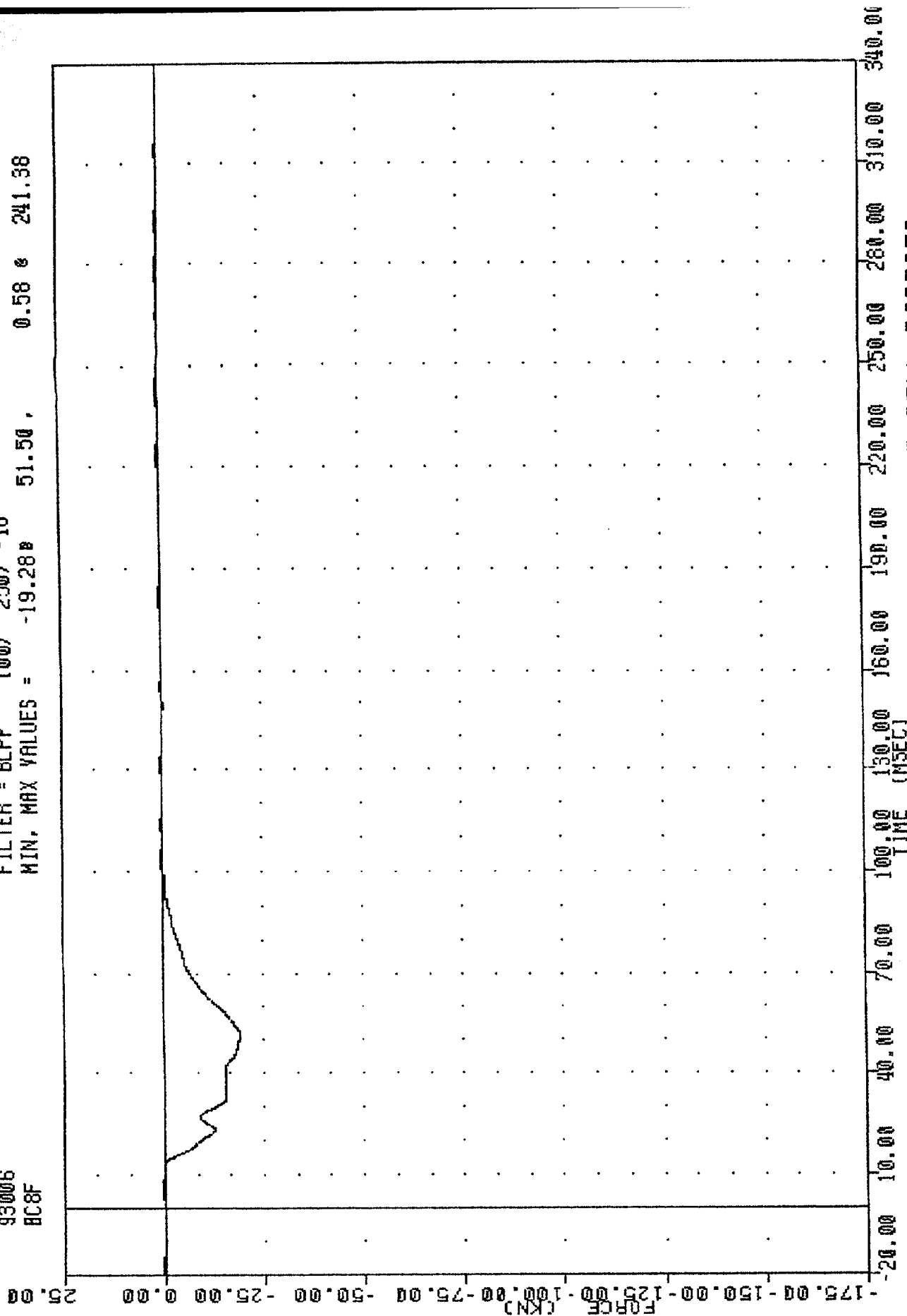
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -14.96 39.25, 0.58 5.13



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C7 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BC8F

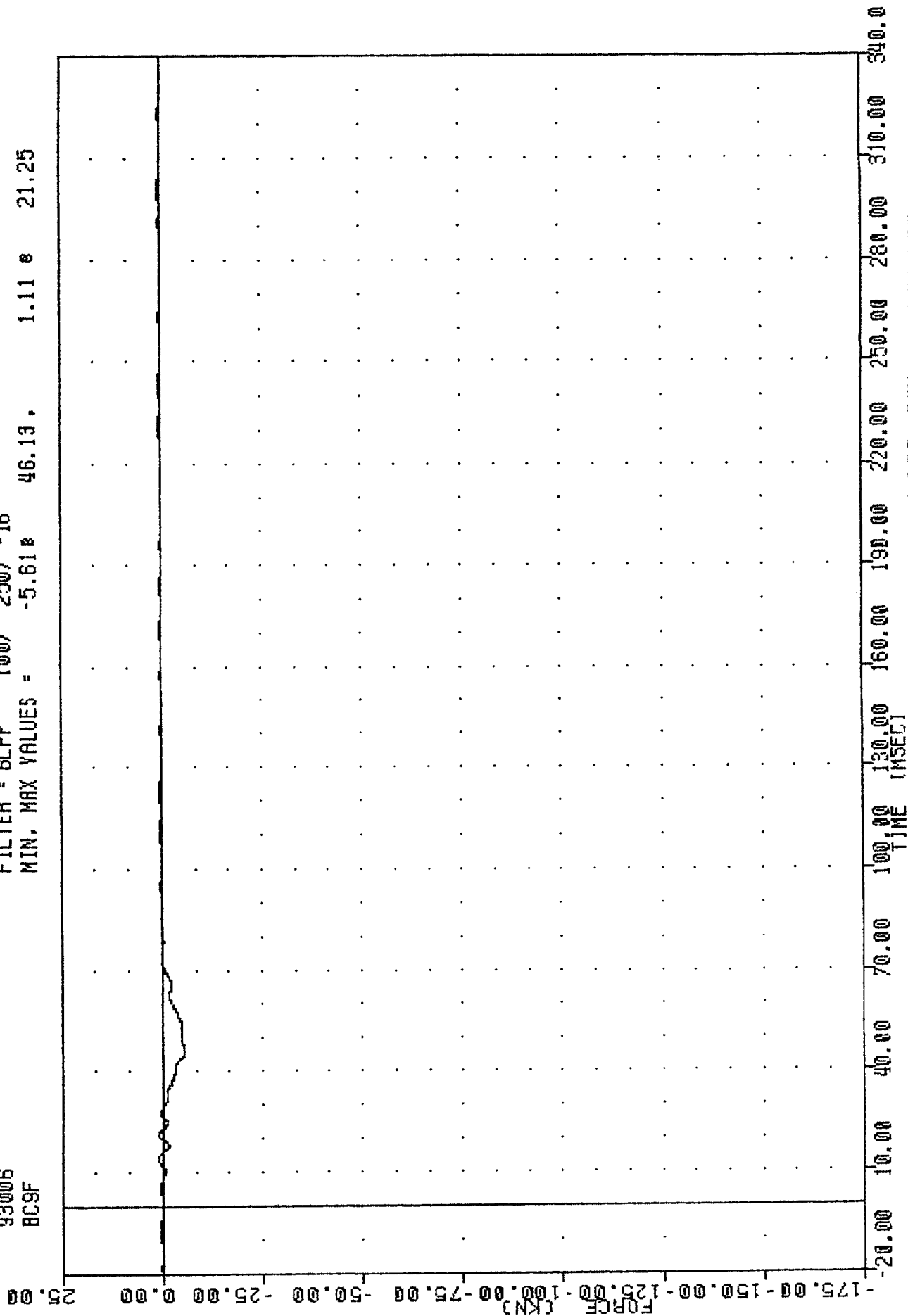
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -19.28 51.50 , 0.58 241.38



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 ORANGE COUNTY BARRIER POSITION 08 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BC9F

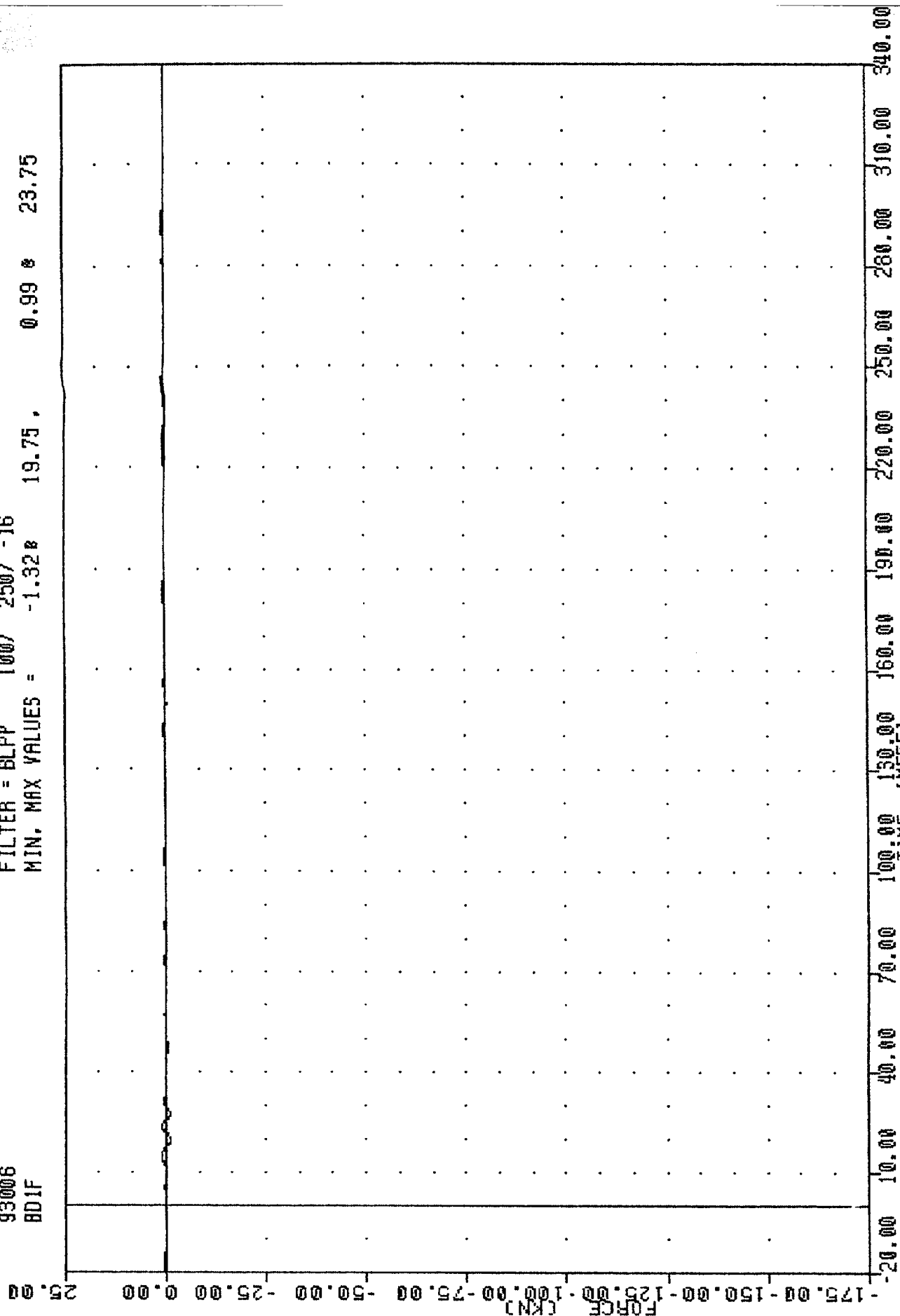
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -5.61B 46.13. 1.11 e 21.25



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C9 FORCE

TRC .930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BD1F

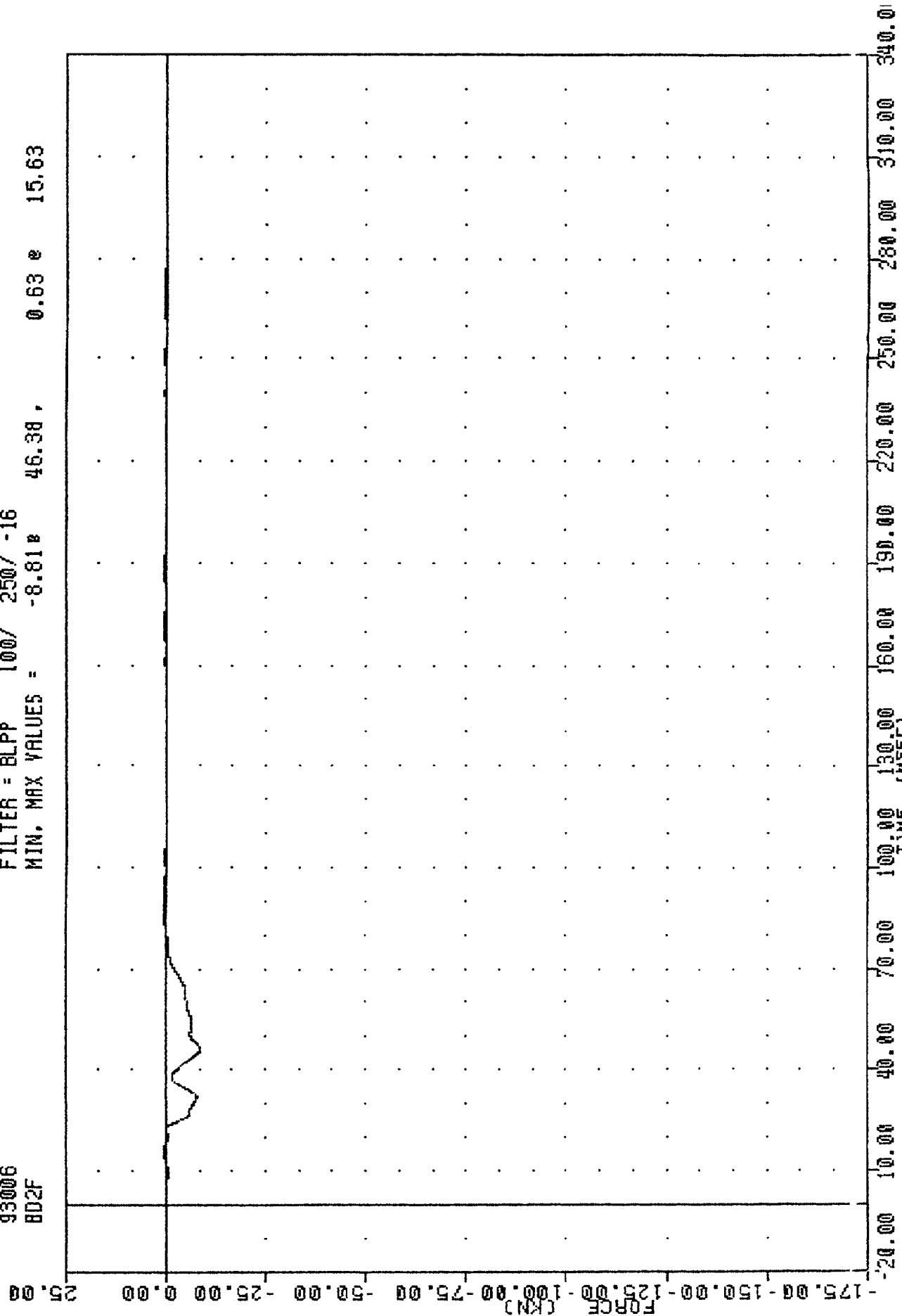
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -1.32 0.99 23.75



TRC
 93006
 NEW CAR ASSESSMENT PROGRAM
 BD2F

, 930106

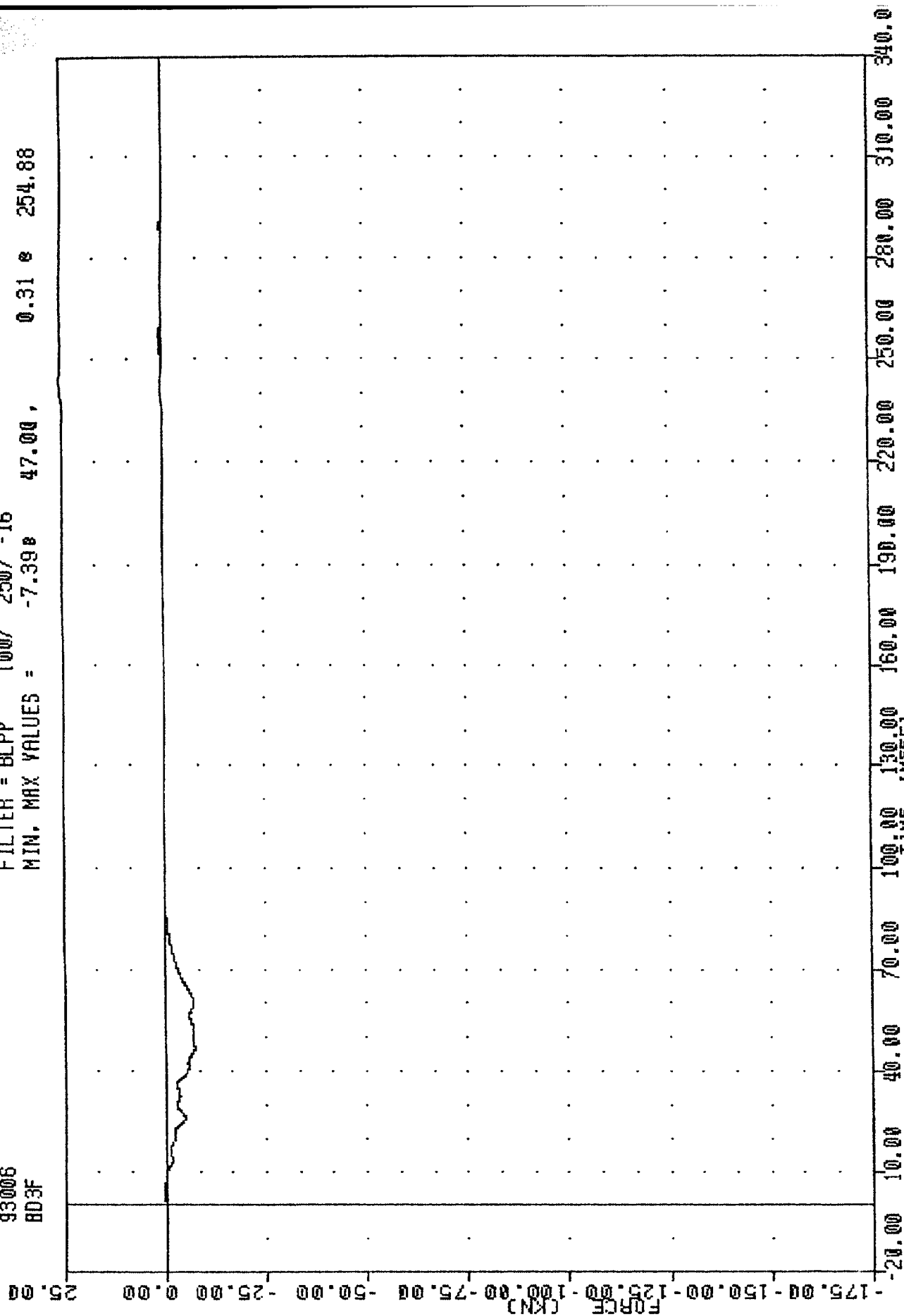
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -8.81 46.38 0.63 15.63



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 02 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BD3F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -7.39 47.00, 0.31 254.88



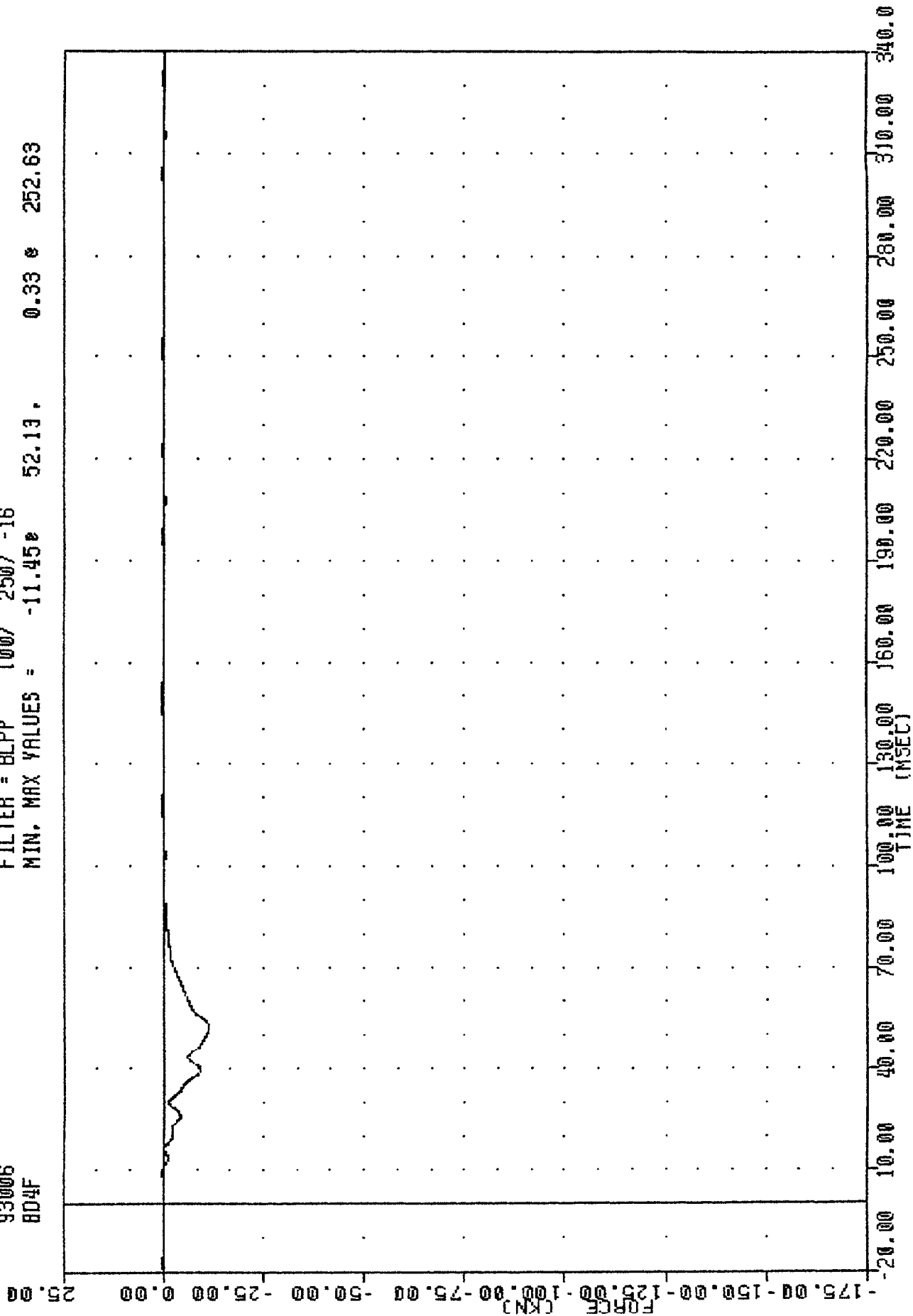
1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

LONG CELL BARRIER POSITION 33

TRC
 93006
 NEW CAR ASSESSMENT PROGRAM
 BD4F

, 930106

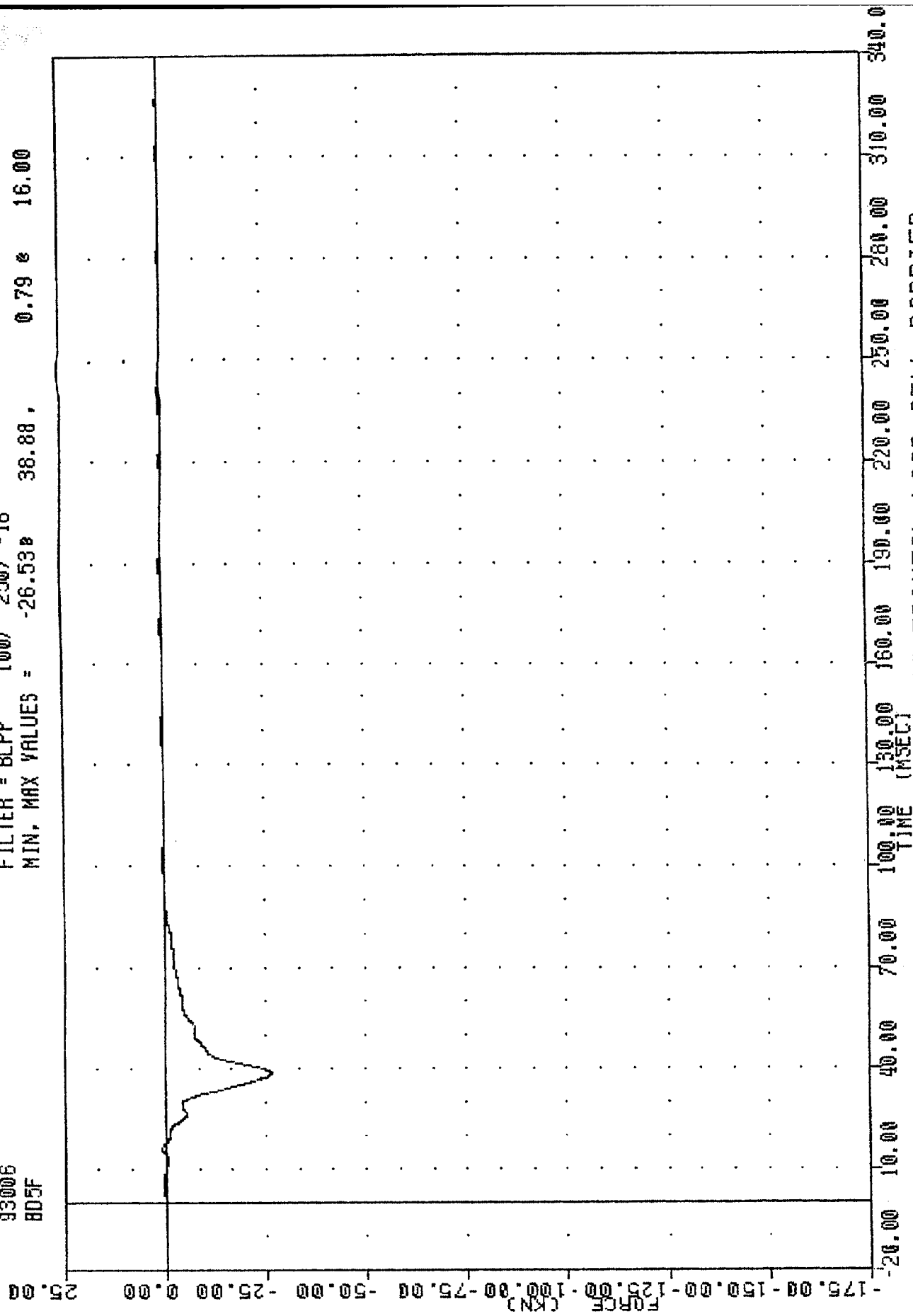
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -11.450 52.13 0.33 252.63



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 04 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BD5F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -26.53 38.88 , 0.79 16.00



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

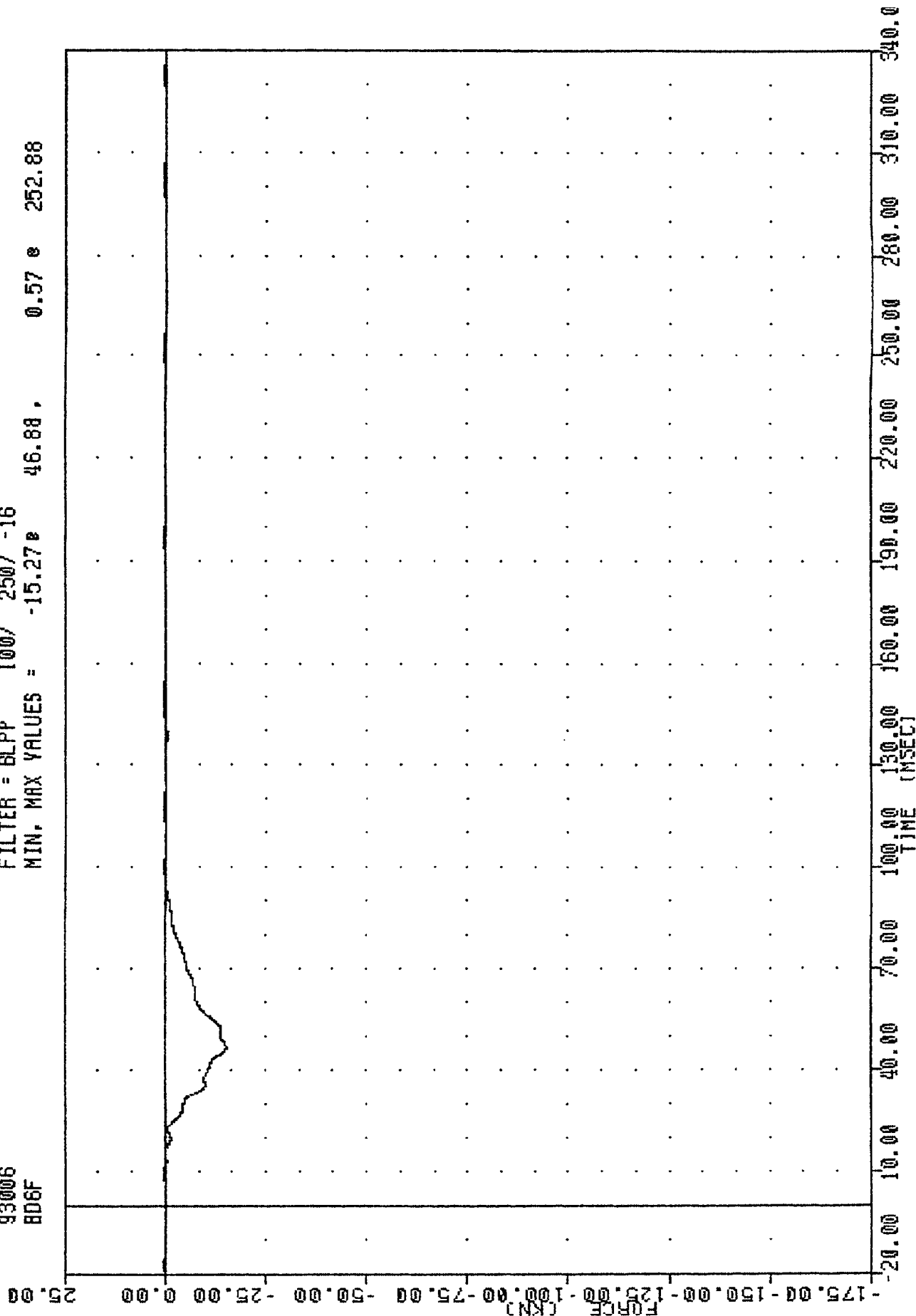
LONG CELL BARRIER POSITION 05 FORCE

TRC
NEW CAR ASSESSMENT PROGRAM
93006
BD6F

, 930106

FILTER = BLPP 100/ 250/ -16

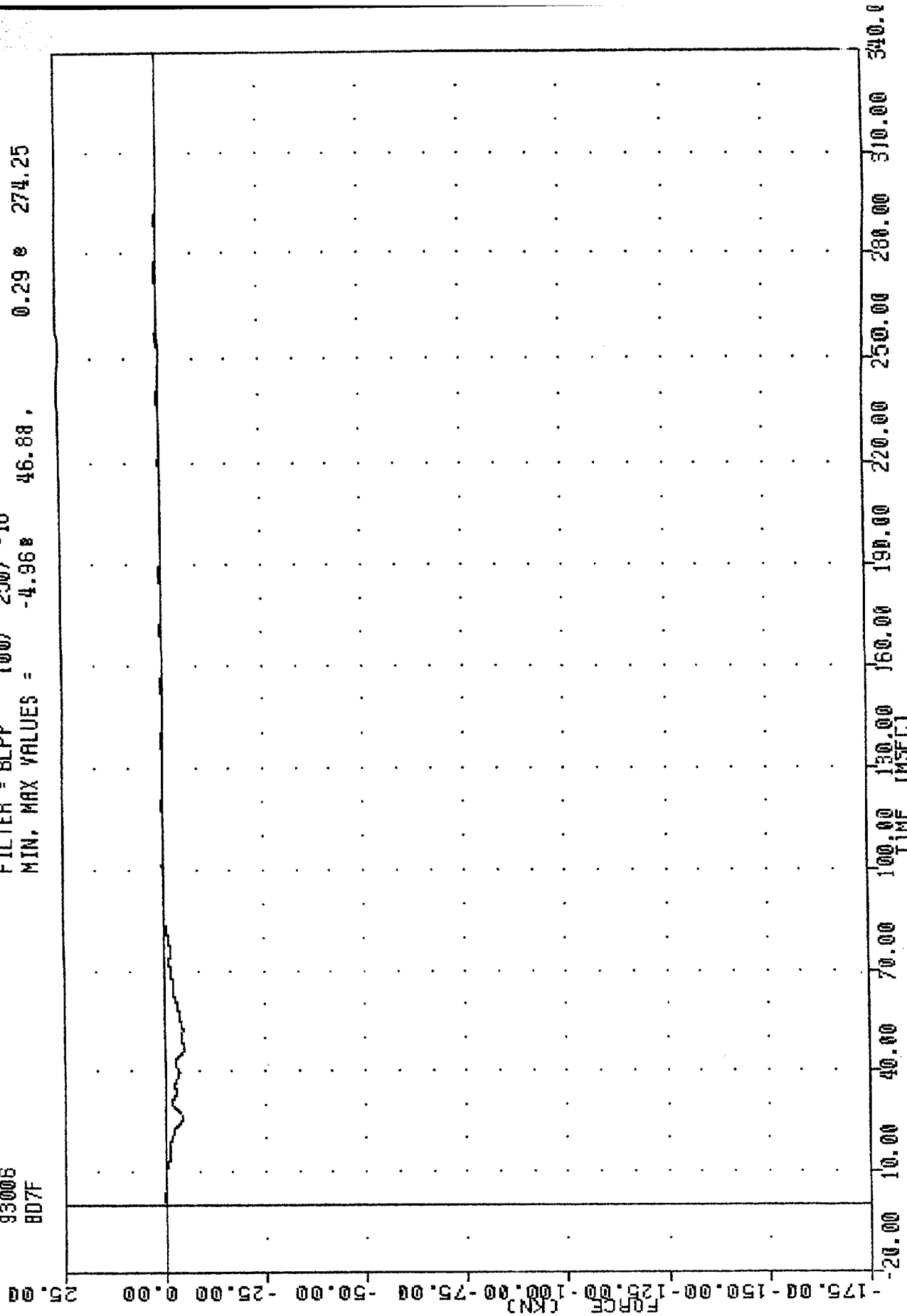
MIN, MAX VALUES = -15.27e 46.88, 0.57 e 252.88



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D6 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BD7F

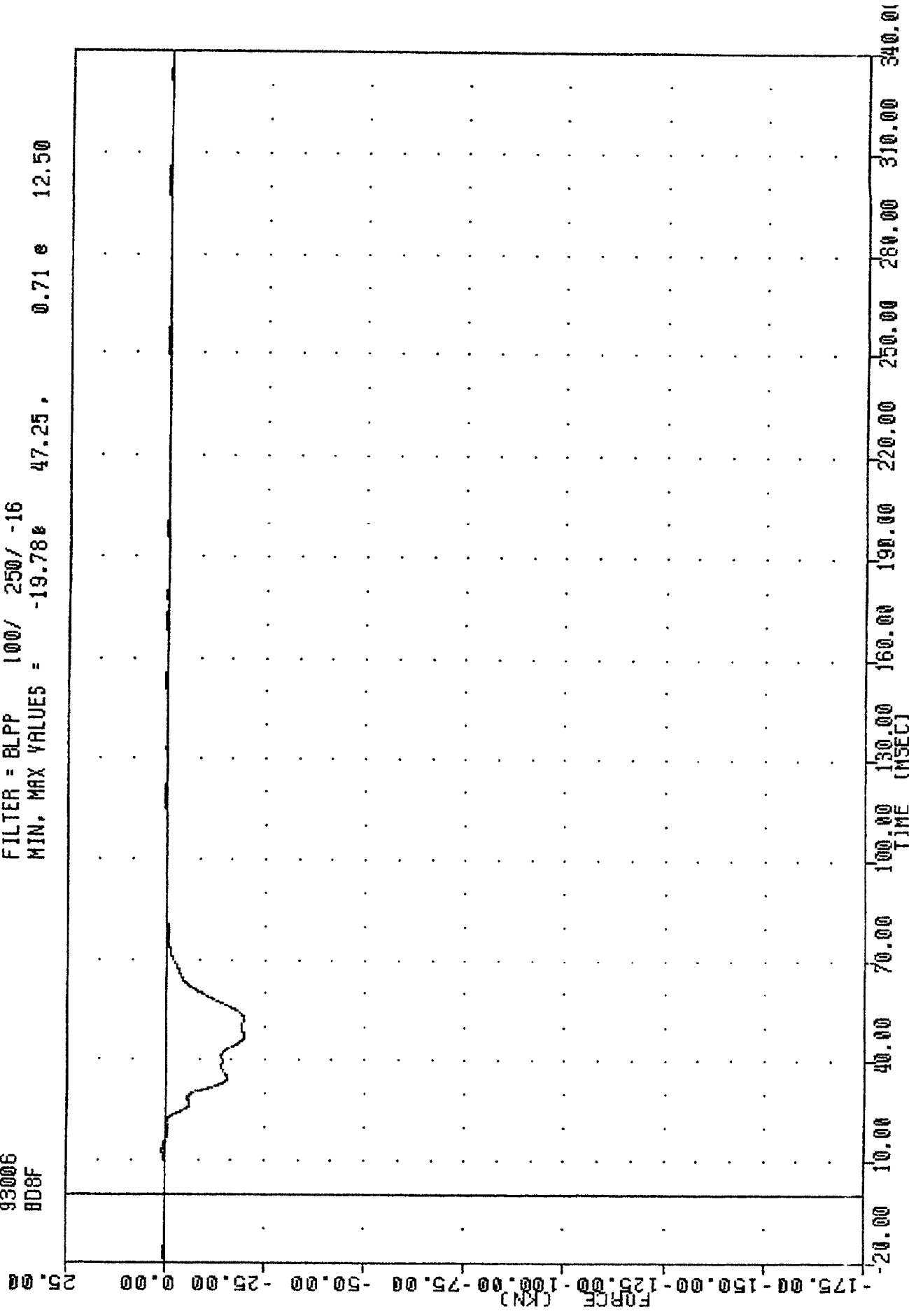
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -4.96 46.88, 0.29 274.25



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 BARRIER POSITION 07

TRC
NEW CAR ASSESSMENT PROGRAM
93006
BD8F

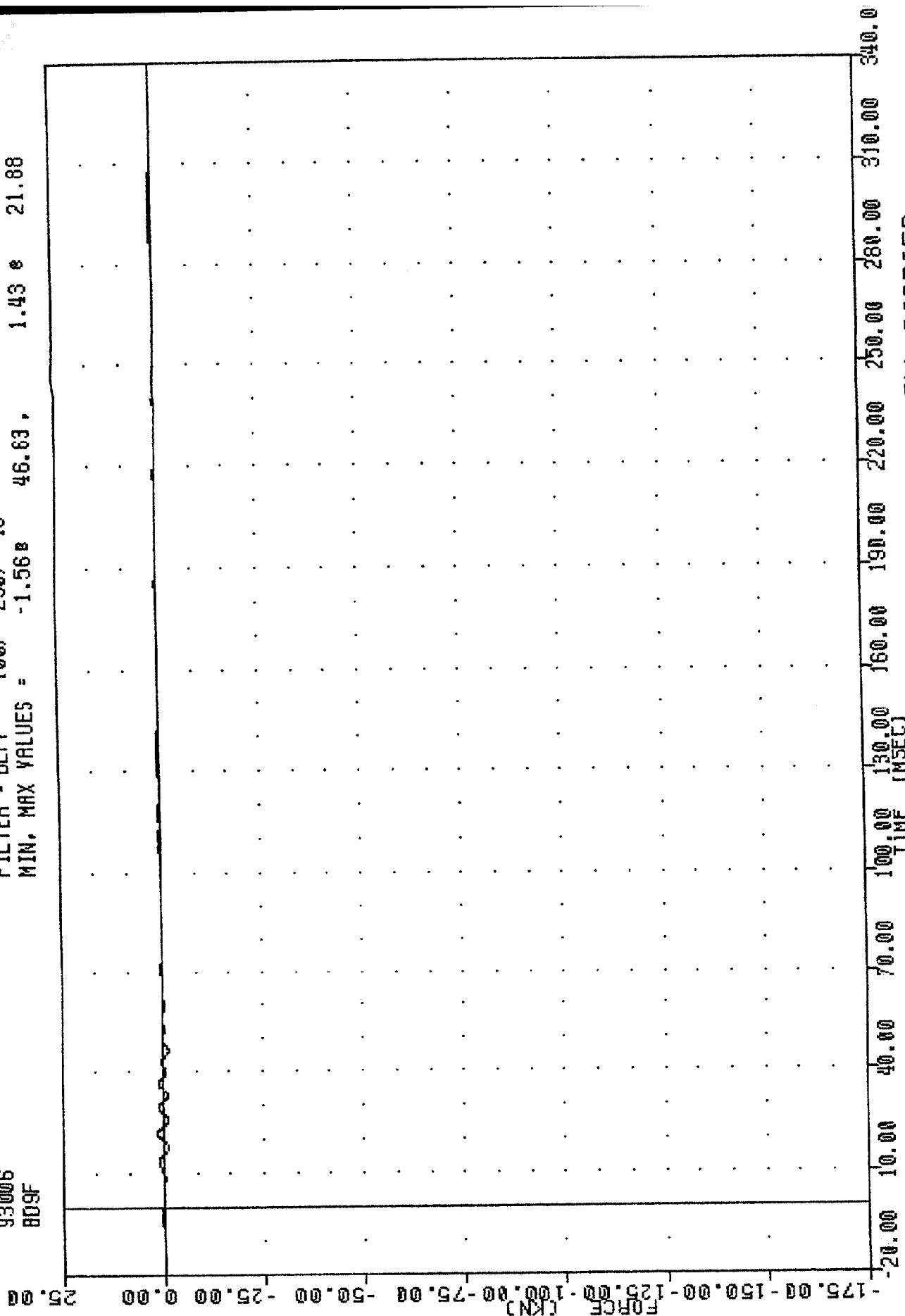
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -19.78 47.25, 0.71 e 12.50



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 BD9F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = 46.63, 1.43 e 21.88

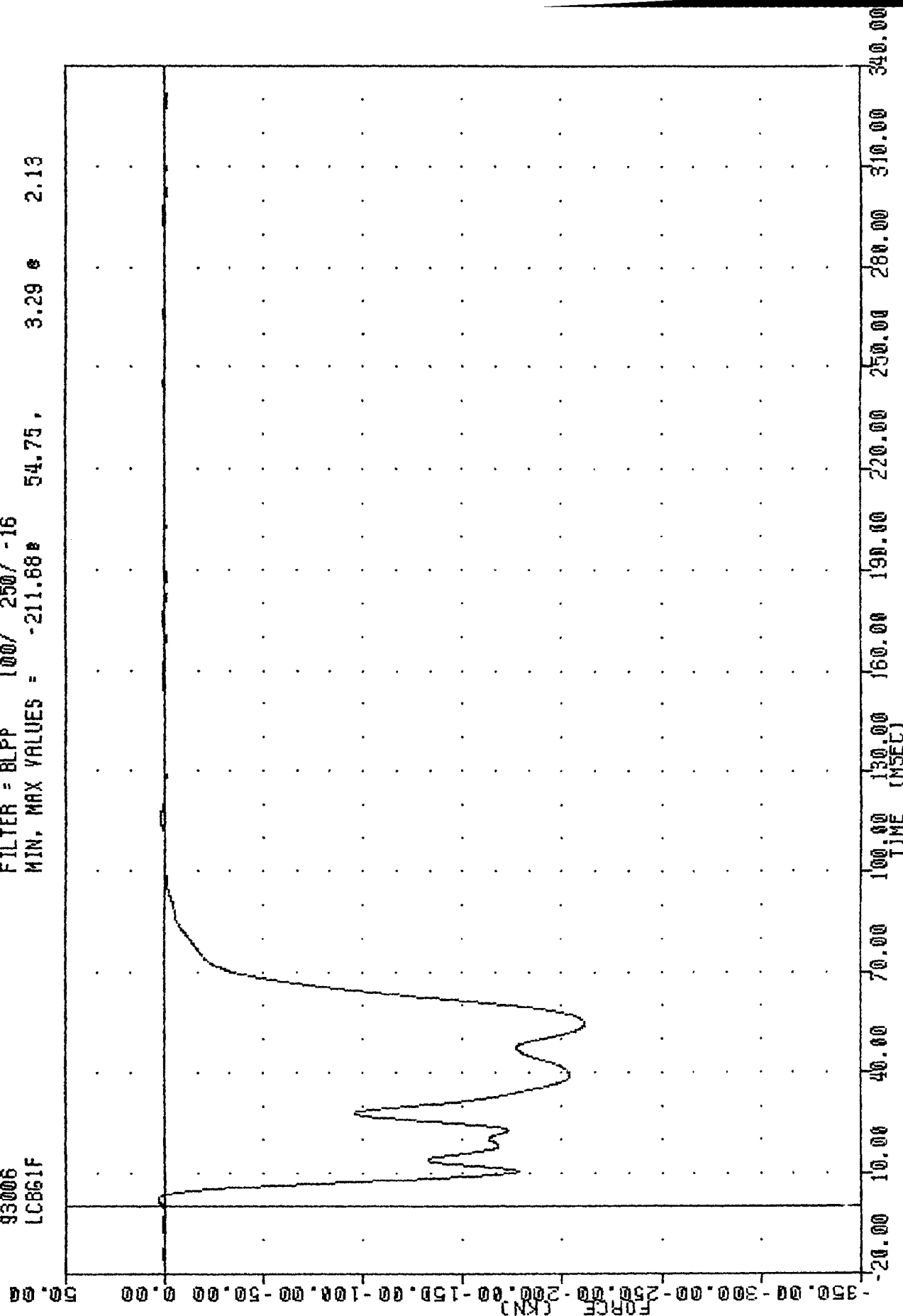


1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

NAME: CF BARRIER POSITION: 930106

INL 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 LCBG1F

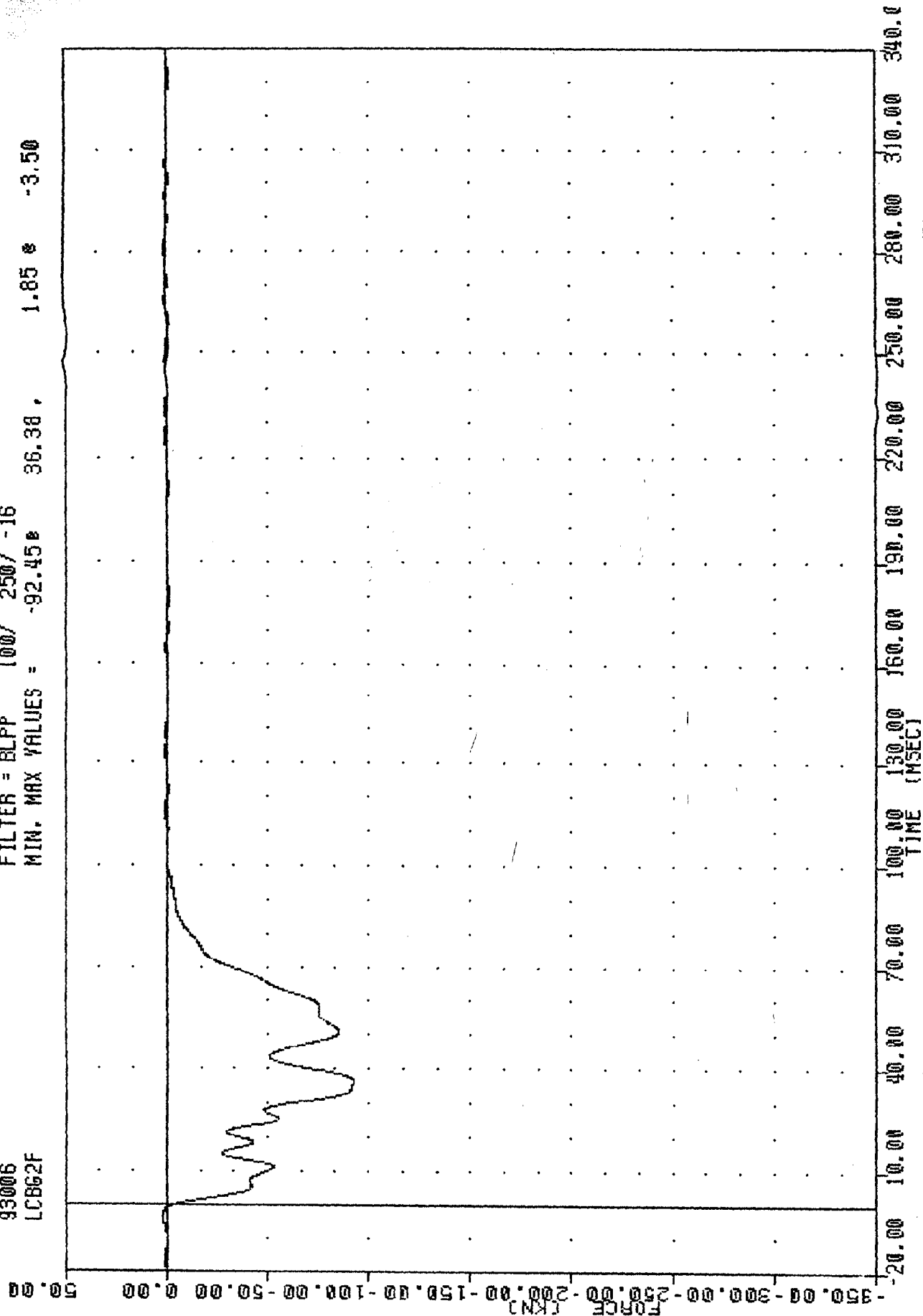
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -211.68 54.75, 3.29 2.13



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP - 1 FORCE TOTAL

TRC 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 LCBG2F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -92.45 36.38 1.85 -3.50

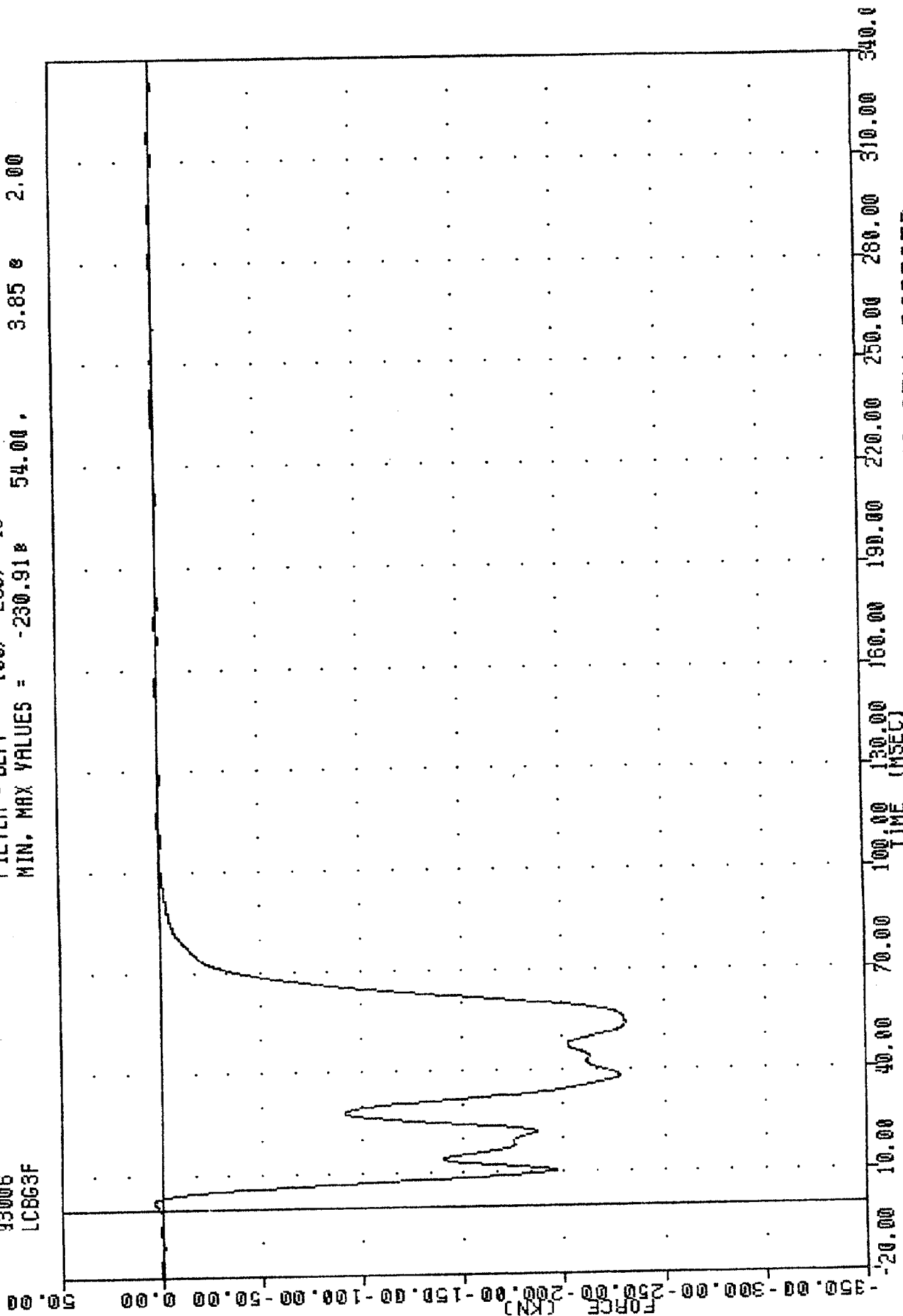


1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 TEST SET UP: BARRIER 25000 LBS TOTAL

TRC
 NEW CAR ASSESSMENT PROGRAM
 93006
 LCBG3F

930106

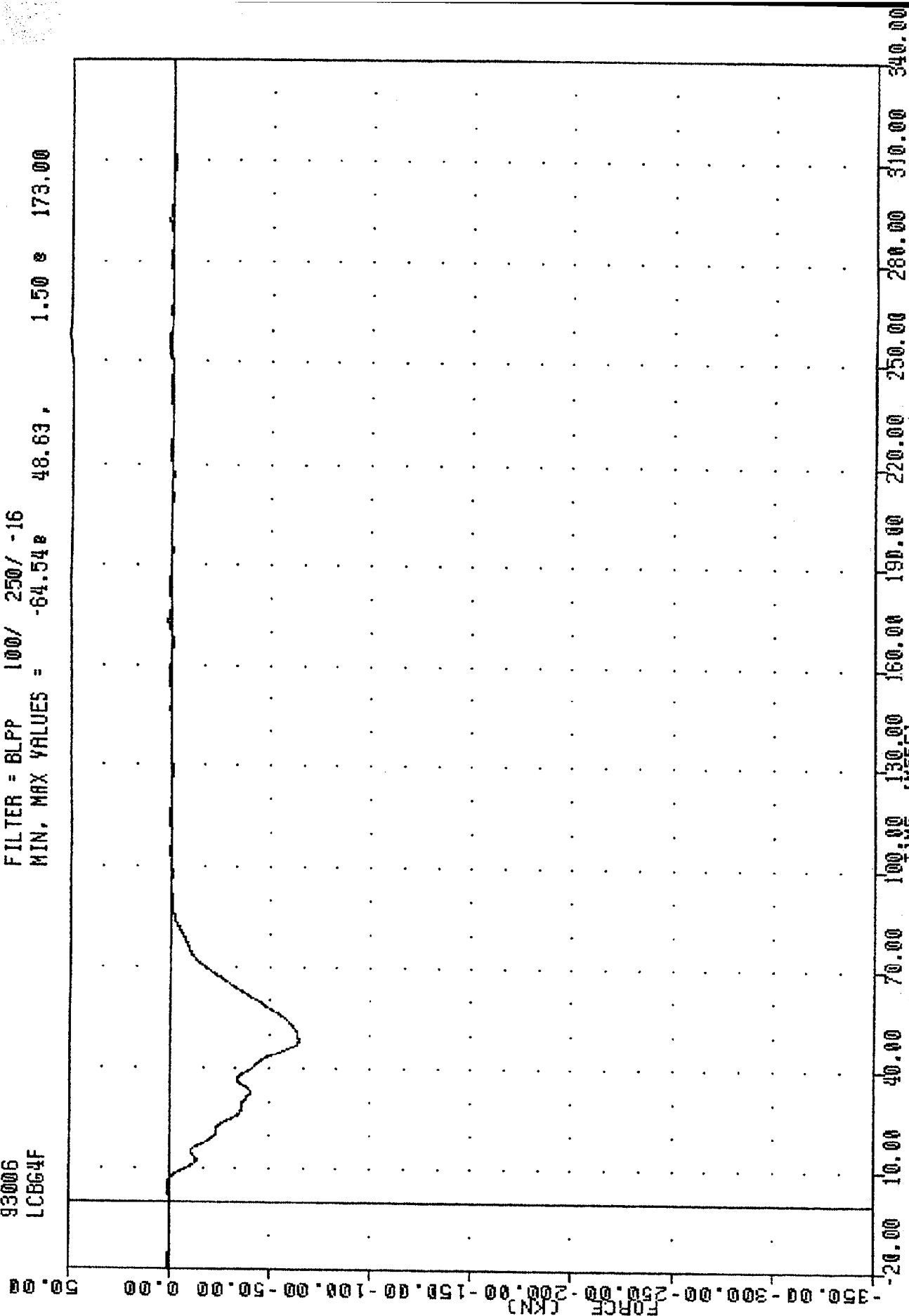
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -230.91 54.00 3.85 2.00



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP - 3 FORCE TOTAL

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 LCBG4F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -64.54 48.63, 1.50 173.00



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER GROUP 4 FORCE TOTAL

TRC
NEW CAR ASSESSMENT PROGRAM

930106

93006

LCB65F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -80.48 38.88 , 1.71 e 4.25

50.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

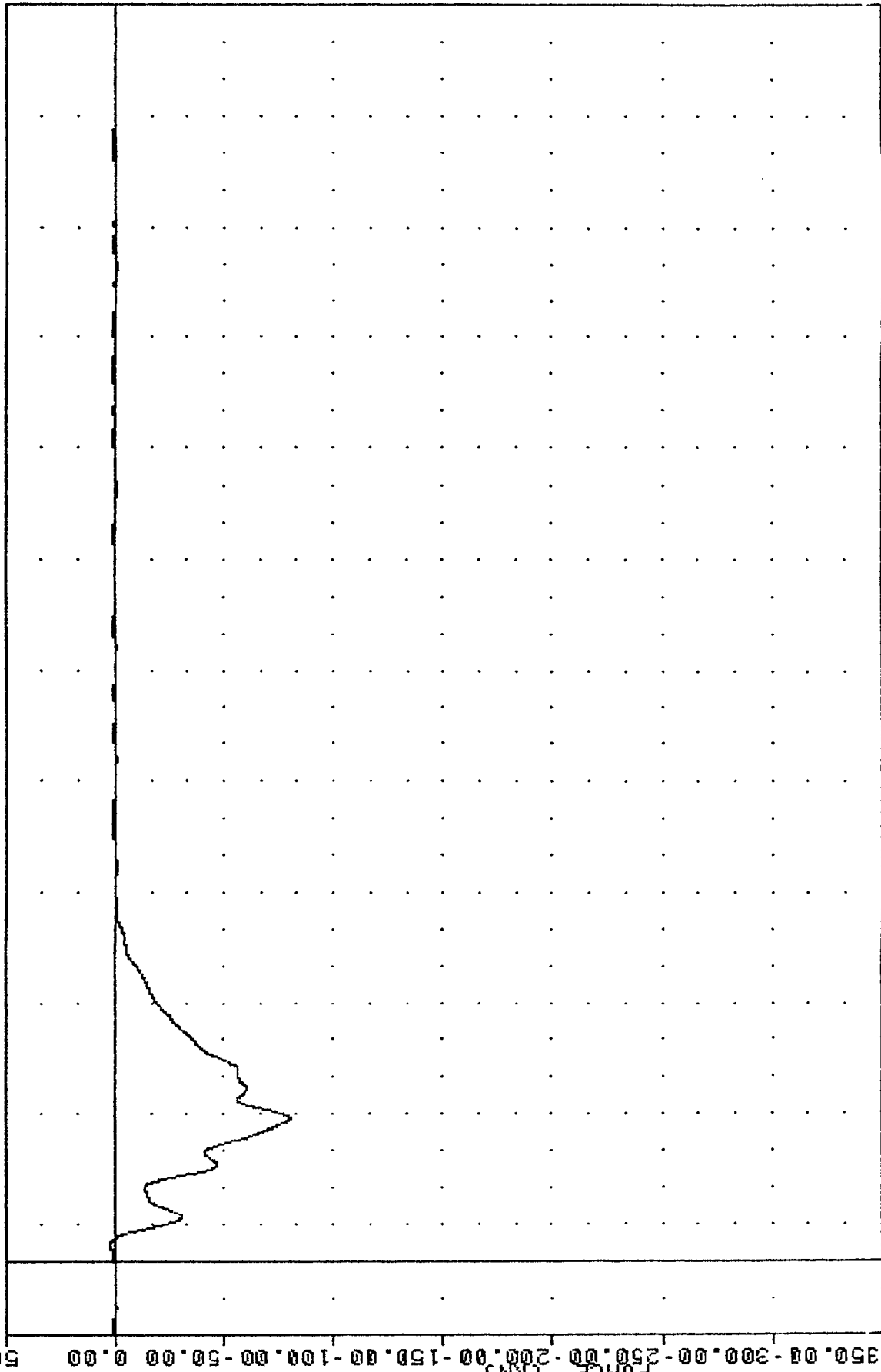
0.00

0.00

0.00

0.00

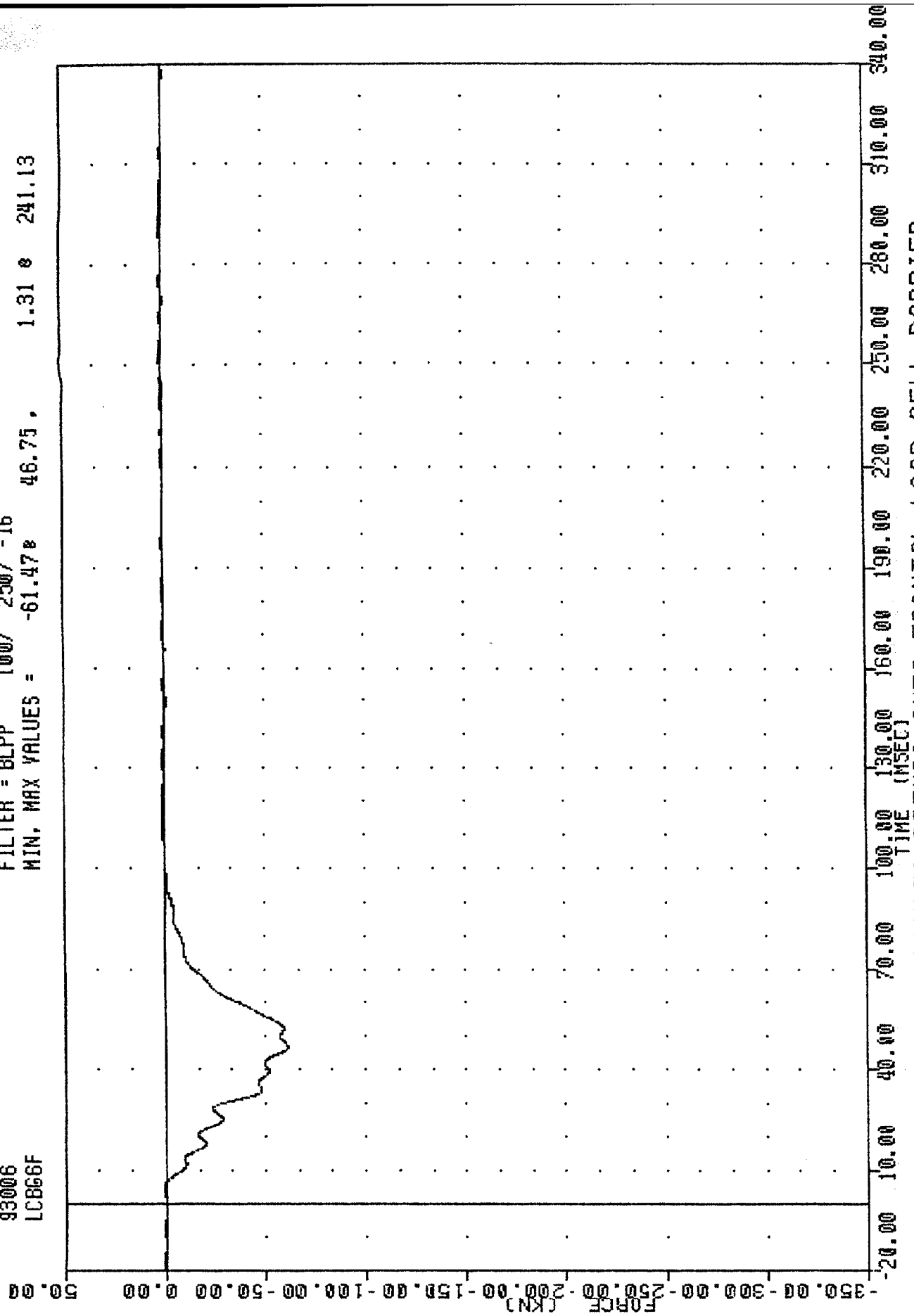
0.00



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 5 FORCE TOTAL

TRC , 930106
 NEW CAR ASSESSMENT PROGRAM
 93006
 LC866F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -61.47* 46.75, 1.31 * 241.13

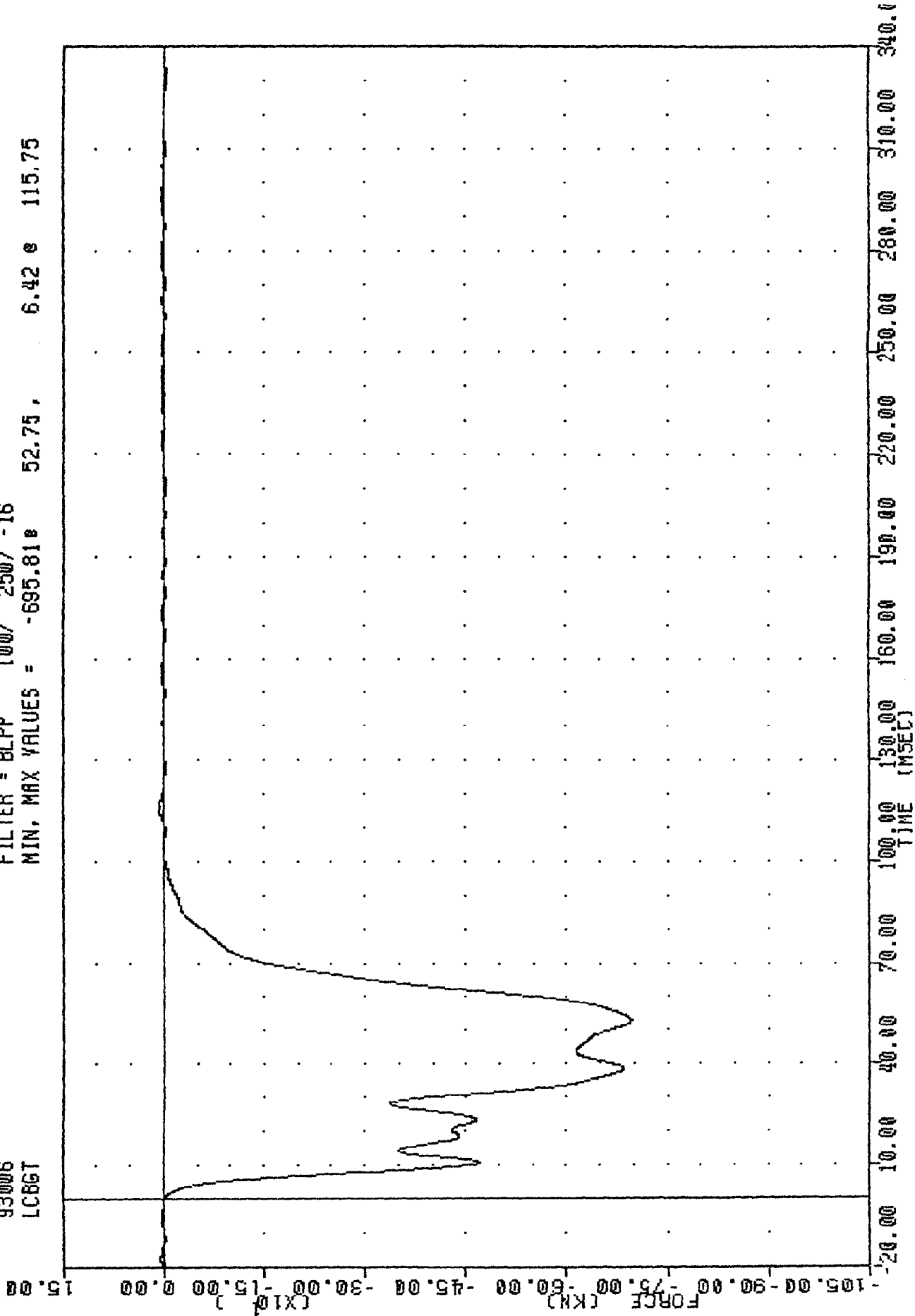


1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER GROUP 6 FORCE TOTAL

NEW CAR ASSESSMENT PROGRAM
 930006
 LCBGT

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -695.81 52.75, 6.42 115.75



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE

TRC
 OTHXD
 LC8GT

930106
 FILTER = BLPP
 FILTER = BLPP

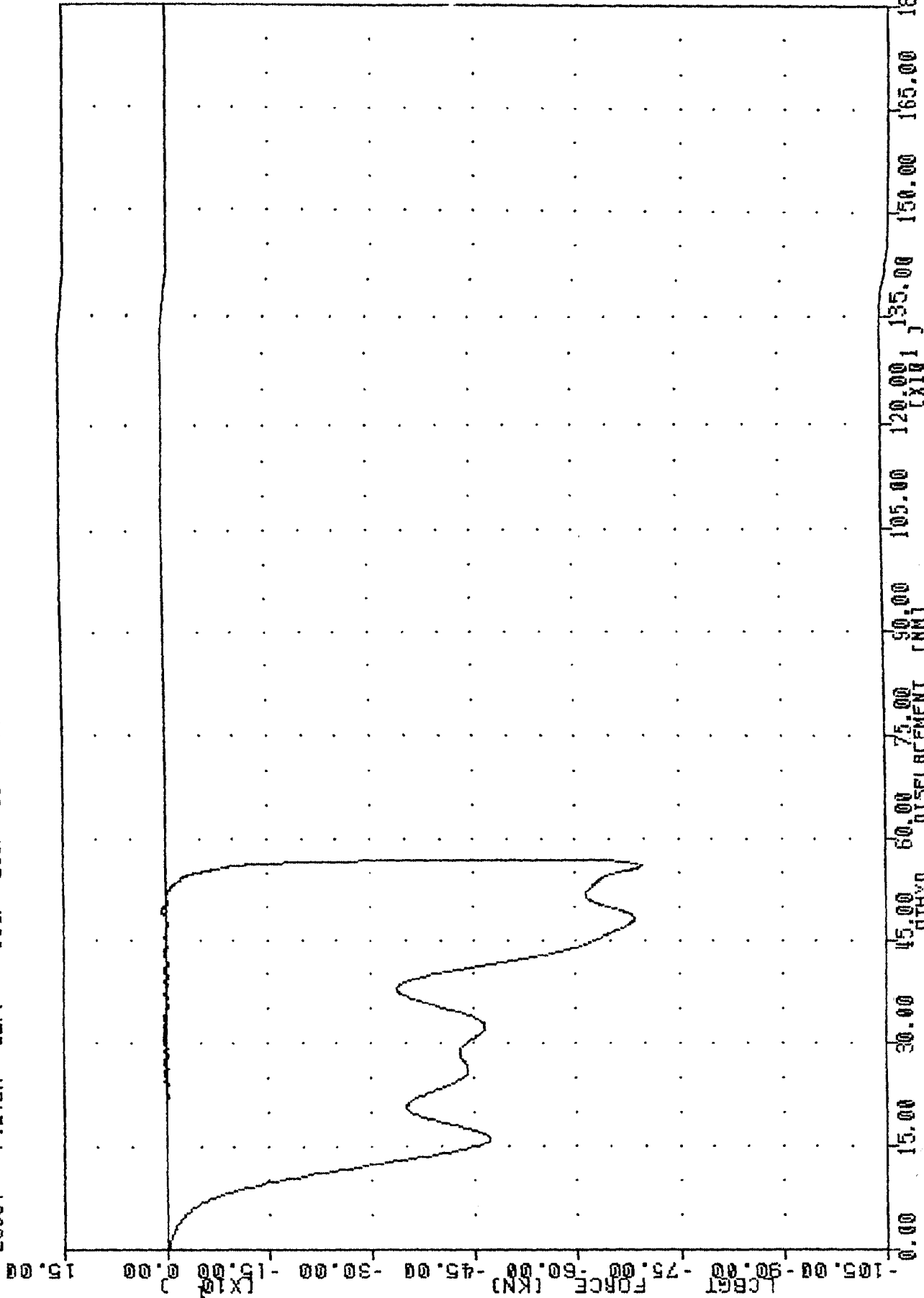
NEW CAR ASSESSMENT PROGRAM
 300/ 750/ -16 MIN, MAX =
 100/ 250/ -16 MIN, MAX =

93005
 0.00 B
 -695.81 B

0.00
 52.75

569.10
 6.42

60.38
 115.75



1993 TOYOTA PREVIA INTO FRONTAL LOAD CELL BARRIER

APPENDIX C

DUMMY CERTIFICATION DATA

PRE-TEST CERTIFICATION DATA

DRIVER DUMMY S/N: 826

TRANSPORTATION RESEARCH CENTER OF OHIO

EXTERNAL DIMENSIONS

PART 572

29-JUL-92

TEMPERATURE 21 C
TRC EDB2631RELATIVE HUMIDITY 56 %
572B SN826 EXT. DIMENSION CAL31

DESCRIPTION	SPECIFICATION	TEST RESULTS
SN 826		
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 Fount

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

PART 572

27-JUL-92

TEMPERATURE 21 C
TRC HD82631

RELATIVE HUMIDITY 56 %
572B SN 826 HEAD DROP CAL 31

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	218.52 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MSEC	1.23 MSEC
PEAK LATERAL ACCELERATION	10 G MAX	-7.81 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

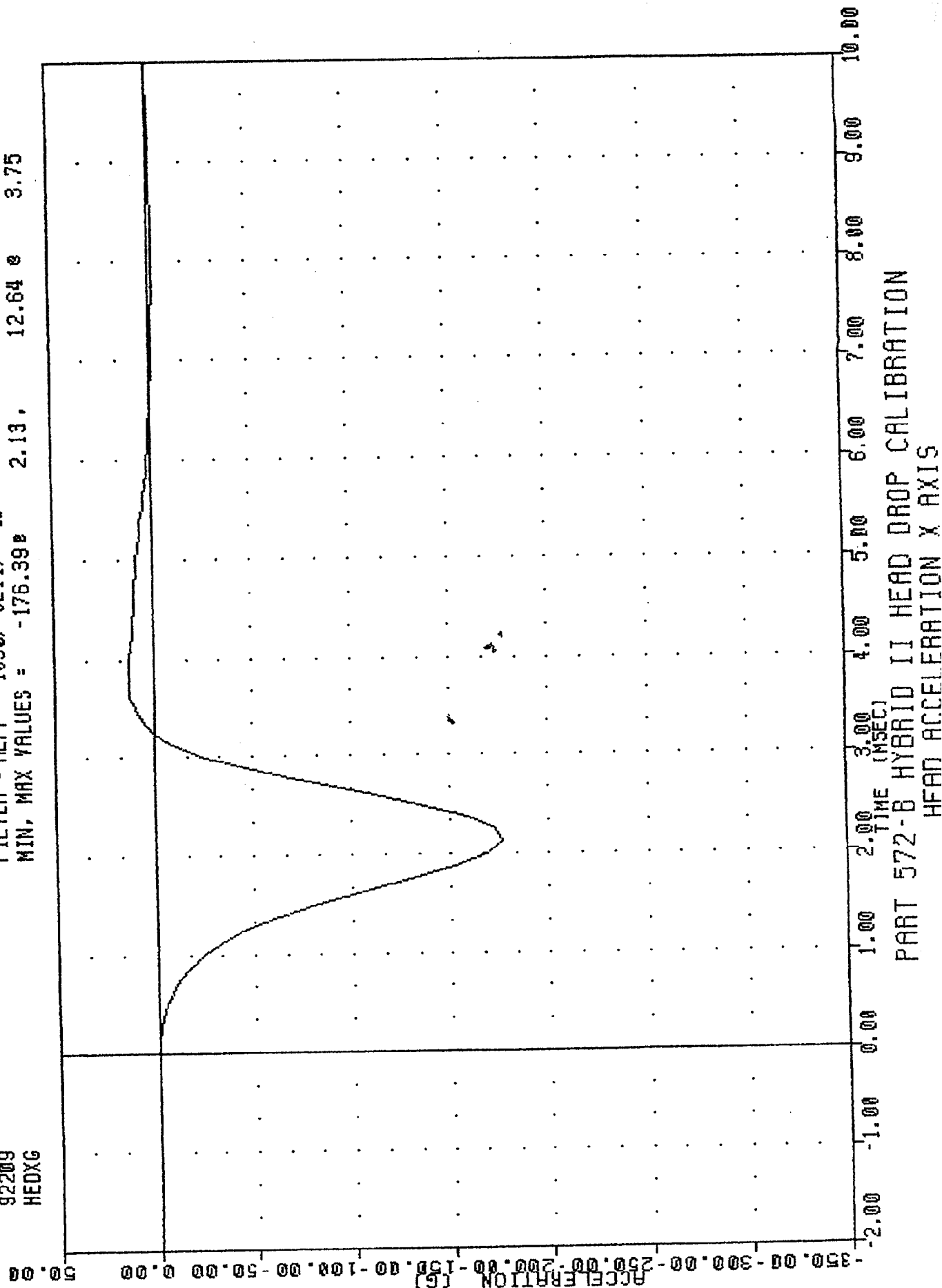
DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete. Font

TAC
572B SN 826 HEAD DROP CAL 31
92209
HEDXG

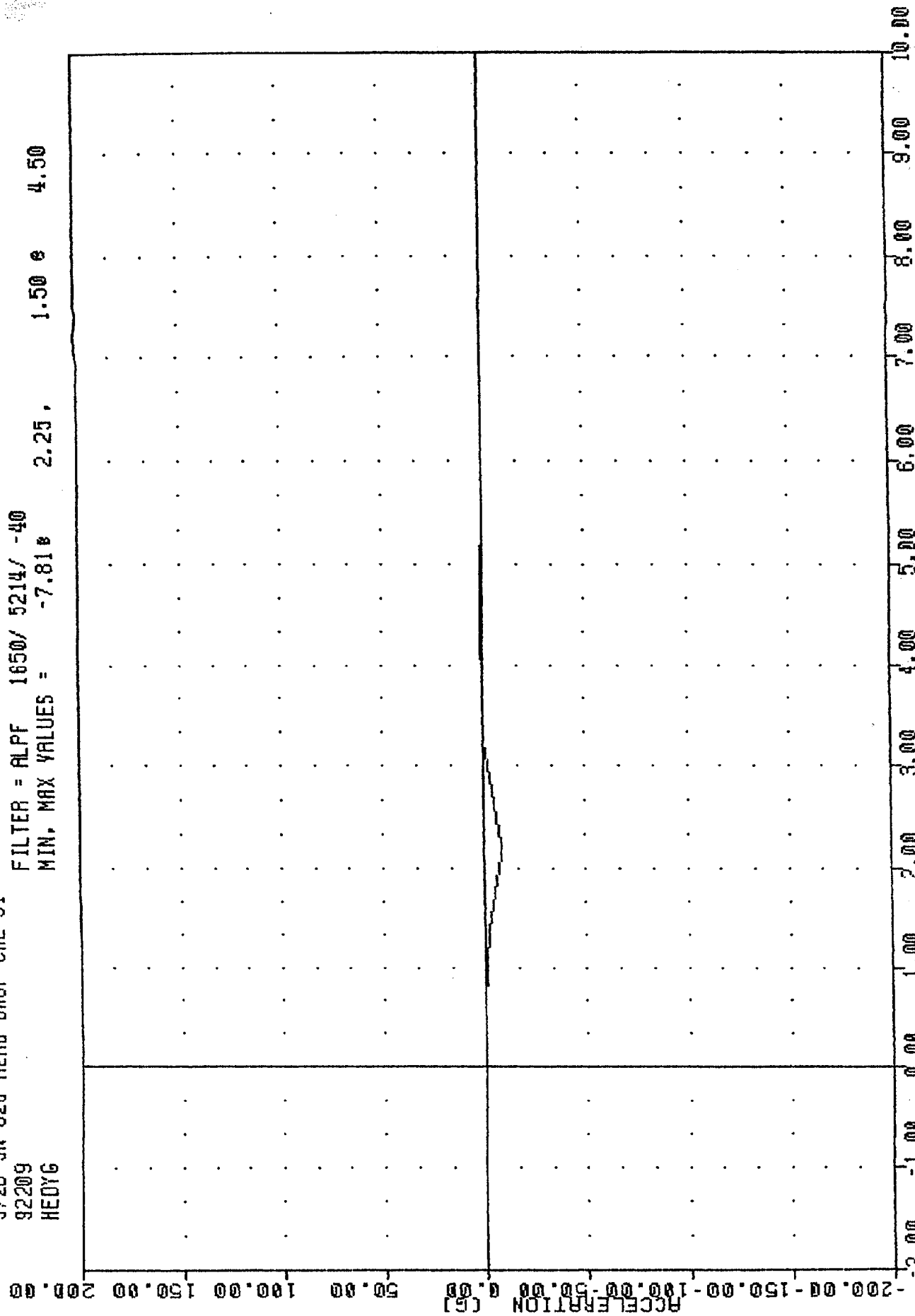
, H082631

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -176.390 2.13, 12.64 e 3.75



TRC
572B SN 826 HEAD DROP CAL 31
92209
HEDYG

FILTER = ALPF 1850/ 5214/ -40
MIN. MAX VALUES = -7.81% 1.50% 4.50



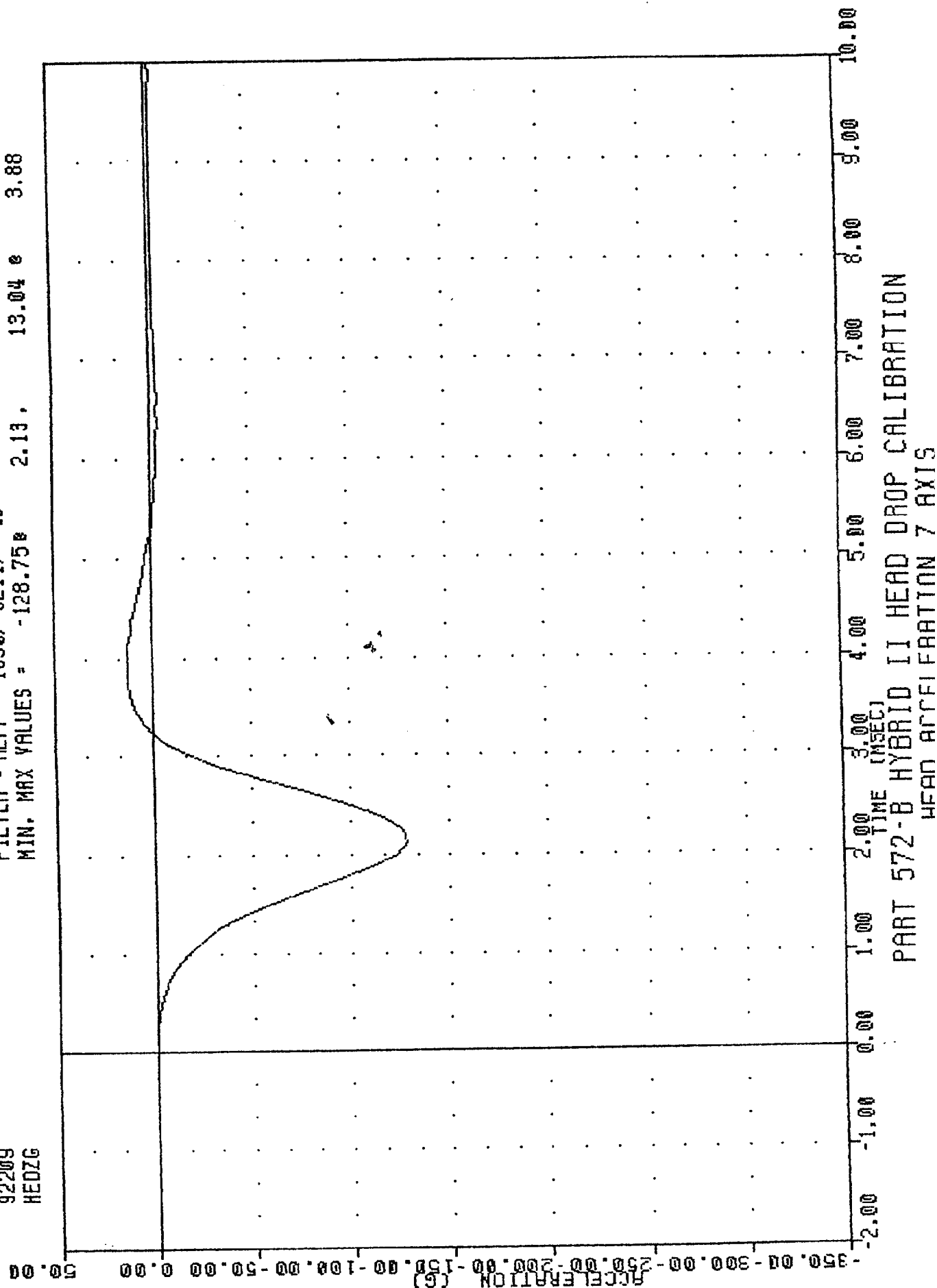
C-6

930106

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

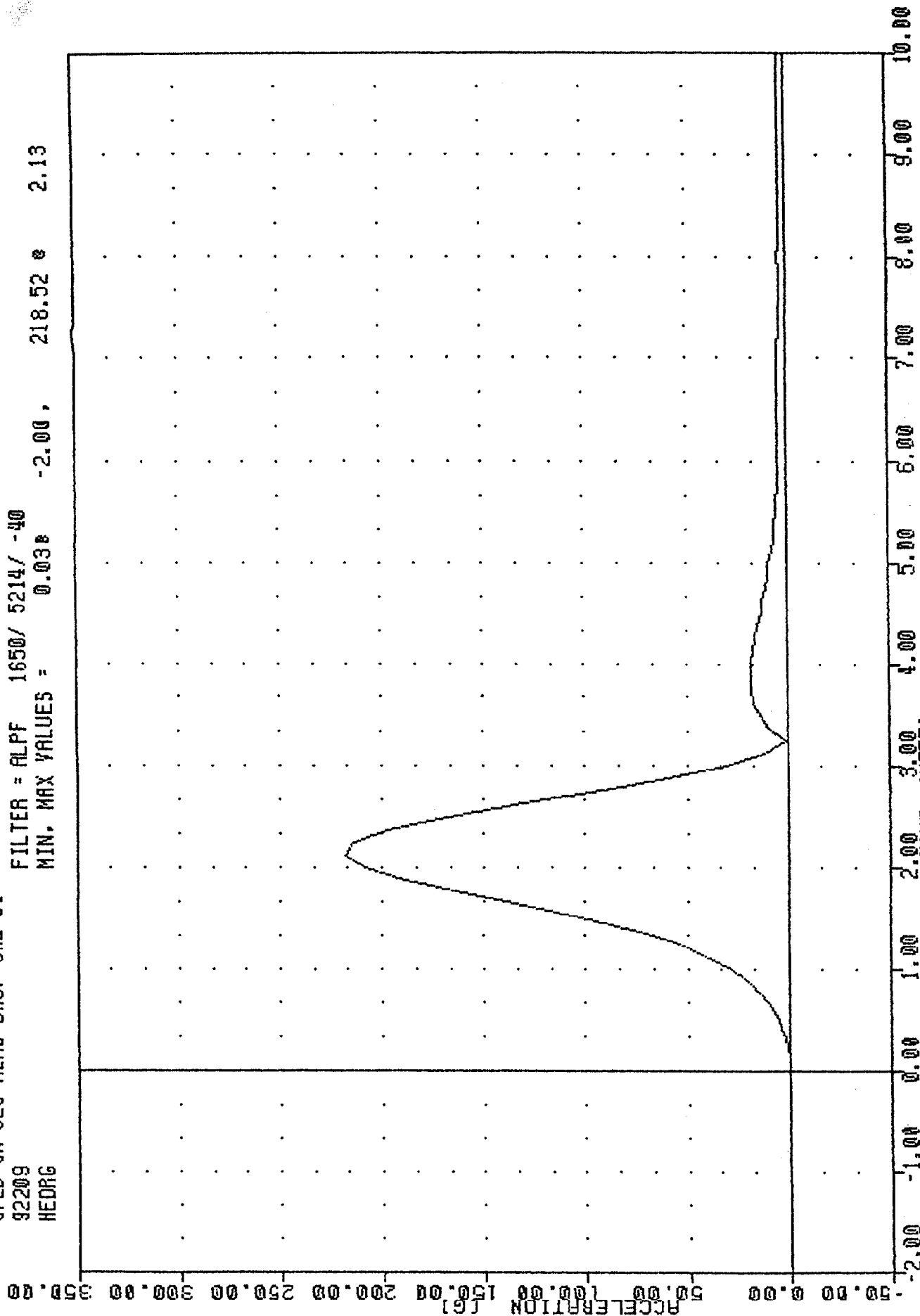
TRC
572B SN 026 HEAD DROP CRL 31
92209
HEADZG

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -128.750 2.13 13.04 3.88



TRC
572B SN 826 HEAD DROP CAL 31
92209
HEADRG

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.038 -2.00, 218.52 @ 2.13



PART 572-B HYBRID II HEAD DROP CALIBRATION

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572

27-Jul-92

TEMPERATURE 21 C
TRC HN82631

RELATIVE HUMIDITY 56 %
572B SN 826 HEAD/NECK CAL 31

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Pendulum velocity	6.55 to 7.77 m/sec	7.24 m/sec
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 msec max	2.33 msec
T2 - T3: 20 - 20 G	25 - 30 msec	26.73 msec
T3 - T4: 20 - 5 G	10 msec max	5.05 msec
Avg. G level T2 - T3	20 - 24 G	23.99 G
Maximum Rotation Angle	63 - 73 deg	66.23 deg
Peak Head Resultant Accel	26 G max	24.11 G

Test Parameter	Specification		Test Results	
Rotation Angle (degrees)	Time (msec)	Chordal Disp. (mm)	Time (msec)	Chordal Disp. (mm)
0	-2.0 - +2.0	-12.7 - +12.7	1.25	0.11
30	25.6 - 34.4	53.3 - 78.7	30.68	61.04
60	40.3 - 51.7	109.2 - 134.6	46.62	115.66
max	53.2 - 66.8	127.0 - 152.4	60.88	130.86
60	67.0 - 83.0	109.2 - 134.6	72.53	117.35
30	85.4 - 104.6	53.3 - 78.7	92.42	56.04
0	101.0 - 123.0	-12.7 - +12.7	106.66	2.63

SND: 151.13 mm

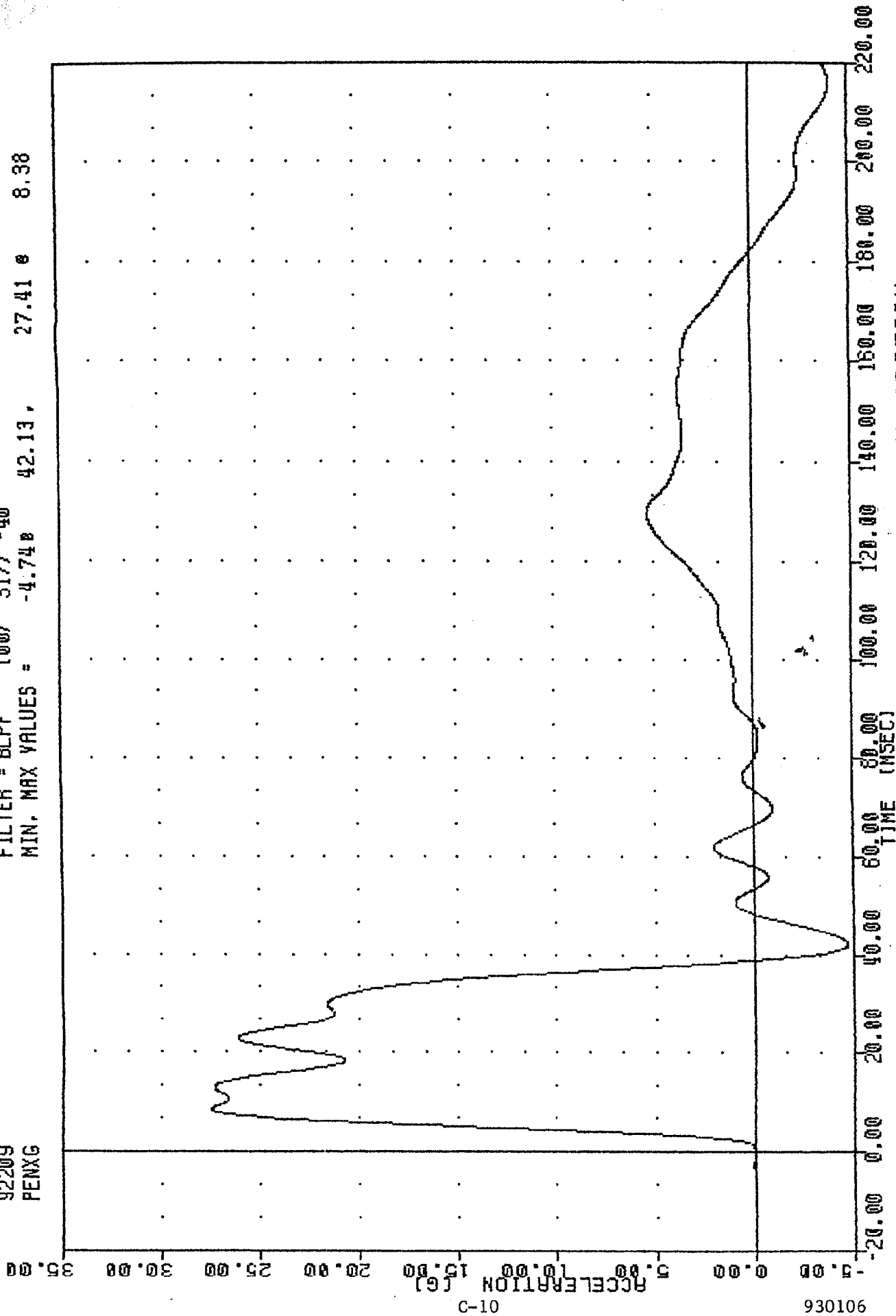
DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Euto Fort

TRC
572B SN 926 HEAD/NECK CAL 31
92209
PENXG

FILTER = BLPF 100/ 317/ -40
MIN. MAX VALUES = -4.74 42.13 27.41 8.38



C-10

930106

PART 572-B HYBRID II HEAD/NECK CALIBRATION

FORM INFORMATION

TAC
 572B SN 026 HEAD/NECK CAL 31
 92209
 HEDXC

, HM82631

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = -19.73e 50.00, 11.23 s 129.88

15.00

10.00

5.00

0.00

-5.00

-10.00

-15.00

-20.00

-25.00

ACCELERATION (G)

11-C

930106

20.00

40.00

60.00

80.00

100.00

120.00

140.00

160.00

180.00

200.00

220.00

TIME (MSEC)

PART 572-B HYBRID II HEAD/NECK CALIBRATION

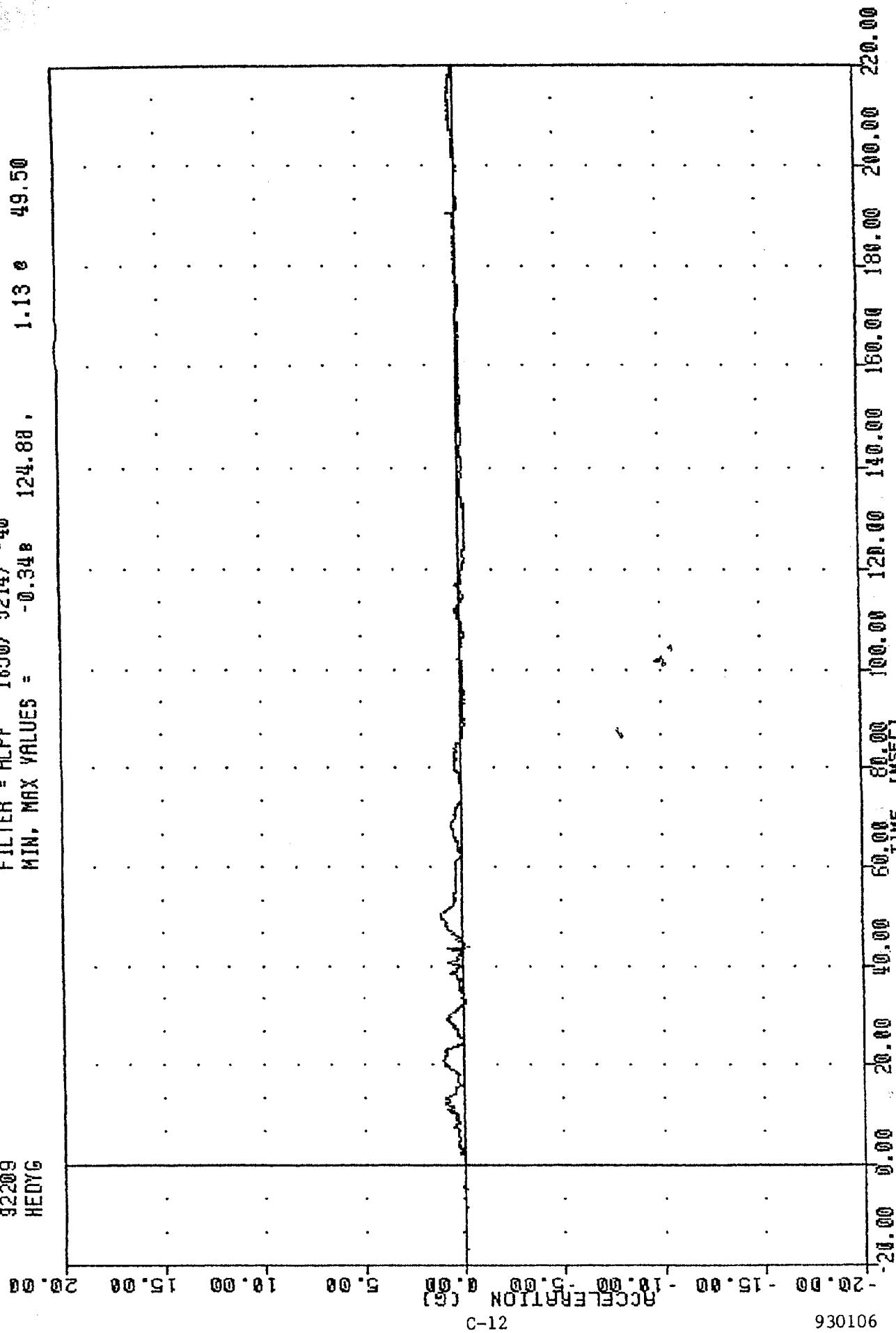
HEAD ACCELERATION X AXIS

11-C

930106

TRC
5728 SN 826 HEAD/NECK CAL 31
92209
HEDYG

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -0.348 124.88 1.13 0 49.50

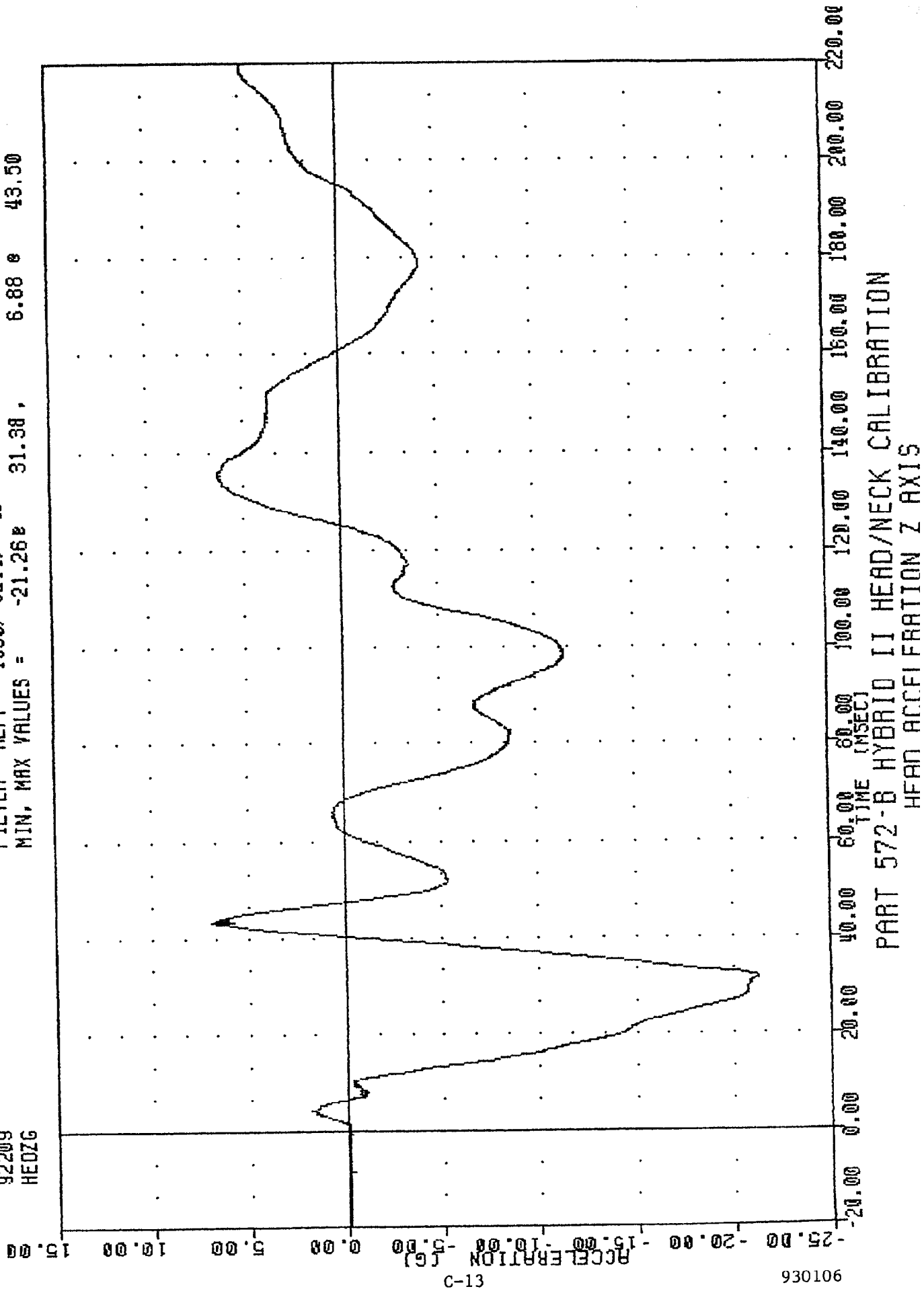


PART 572-B HYBRID II HEAD/NECK CALIBRATION
ACCELERATION AXIS

TRC
572B SN 026 HEAD/NECK CAL 01
92209
HEDZG

HN82631

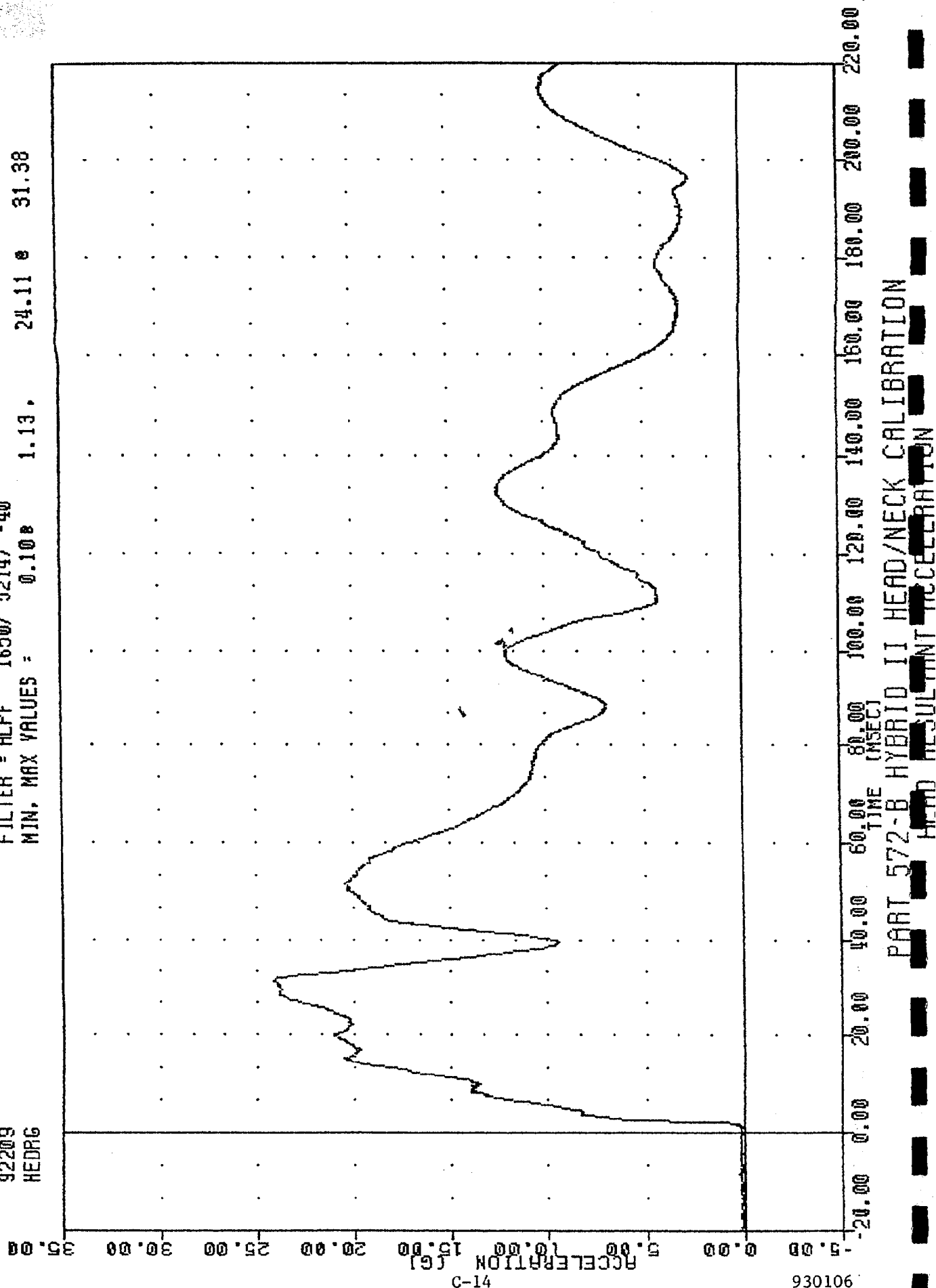
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -21.26V 31.38, 6.88 @ 43.50



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

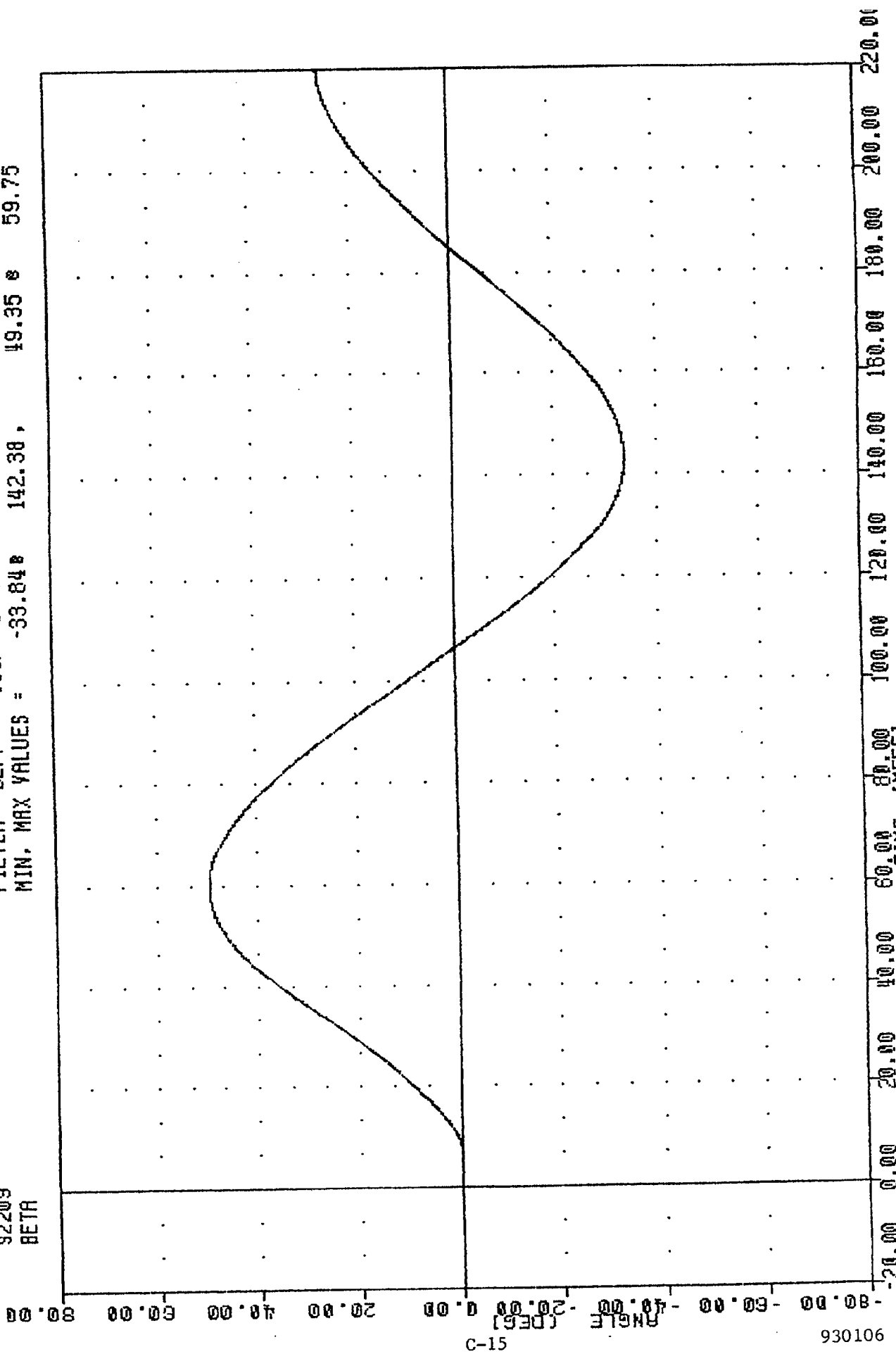
TRC
572B SN 926 HEAD/NECK CAL 31
92209
HEDRG

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.108 1.13, 24.11 e 31.38



TRC
5728 SN 826 HEAD/NECK CAL 31
92209
BETA

FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -33.84 142.38, 49.35 59.75



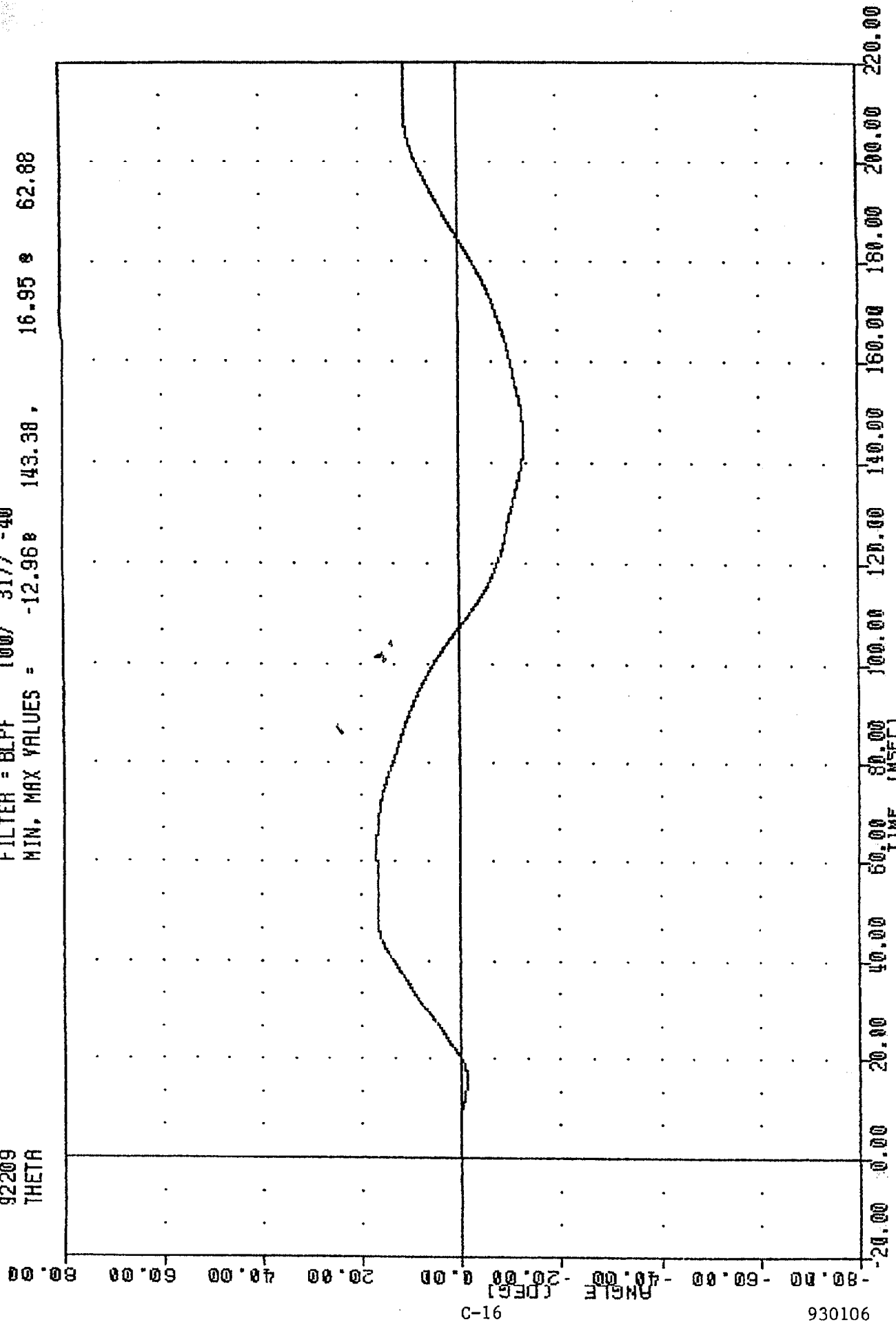
C-15

930106

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

TRC
5728 SN 826 HEAD/NECK CAL 31
92209
THETA

FILTER = BLPF 100/ 317/ -40
MIN. MAX VALUES = -12.96 143.38 16.95 62.88



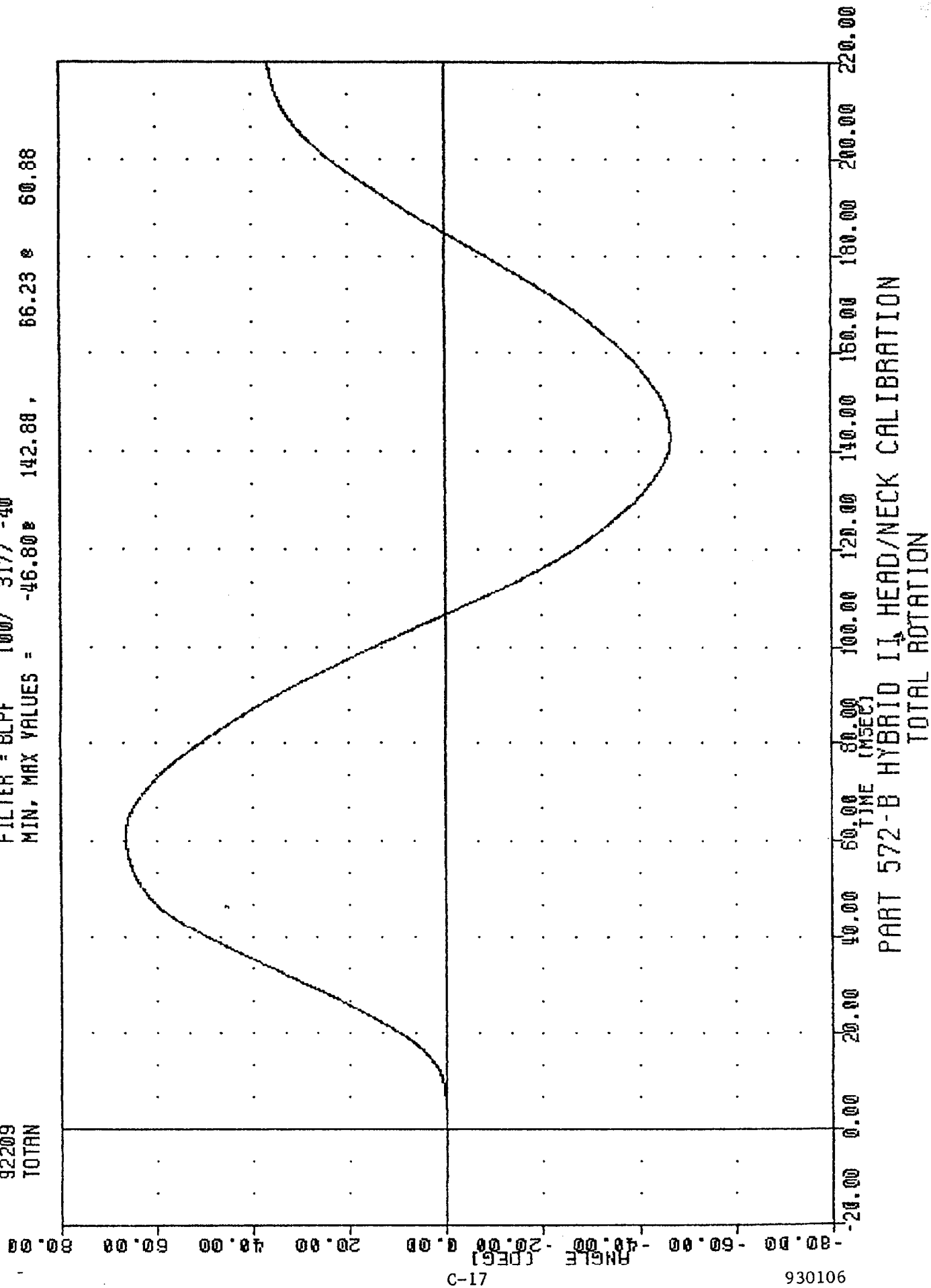
C-16

930106

PART 572-B HYBRID II HEAD/NECK CALIBRATION
ATTENTION ABOUT THE HEAD C.G.

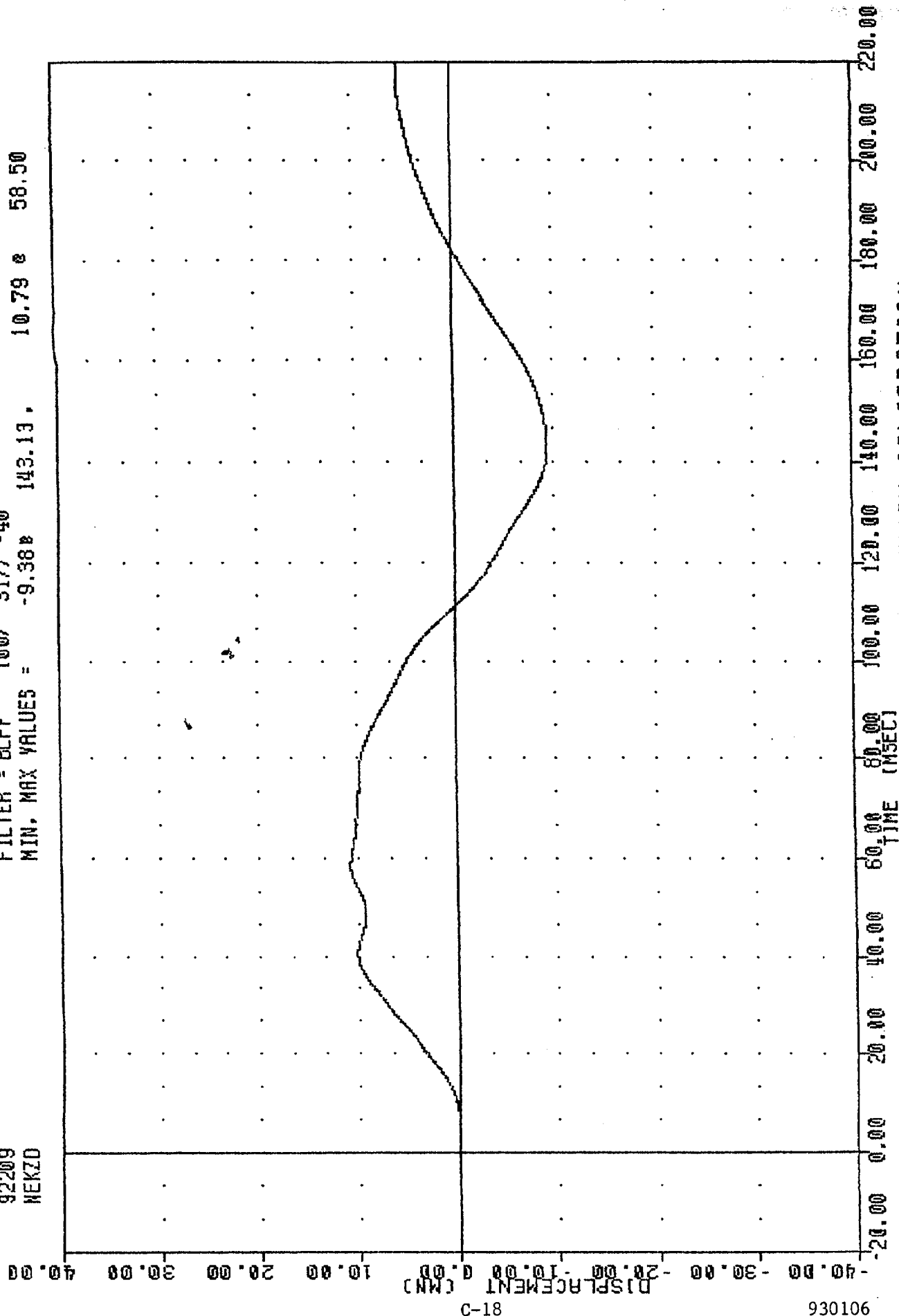
TRC
 572B SN 826 HEAD/NECK CAL 31
 92209
 TOTAL

FILTER = BLPF 100/ 317/ -40
 MIN, MAX VALUES = -46.80e 142.88, 86.23 e 60.88



TRC , HW82631
 572B SN 826 HEAD/NECK CAL 31
 92209
 NEKZO

FILTER = BLPF 100/ 317/ -40
 MIN, MAX VALUES = -9.38 143.13 10.79 e 58.50



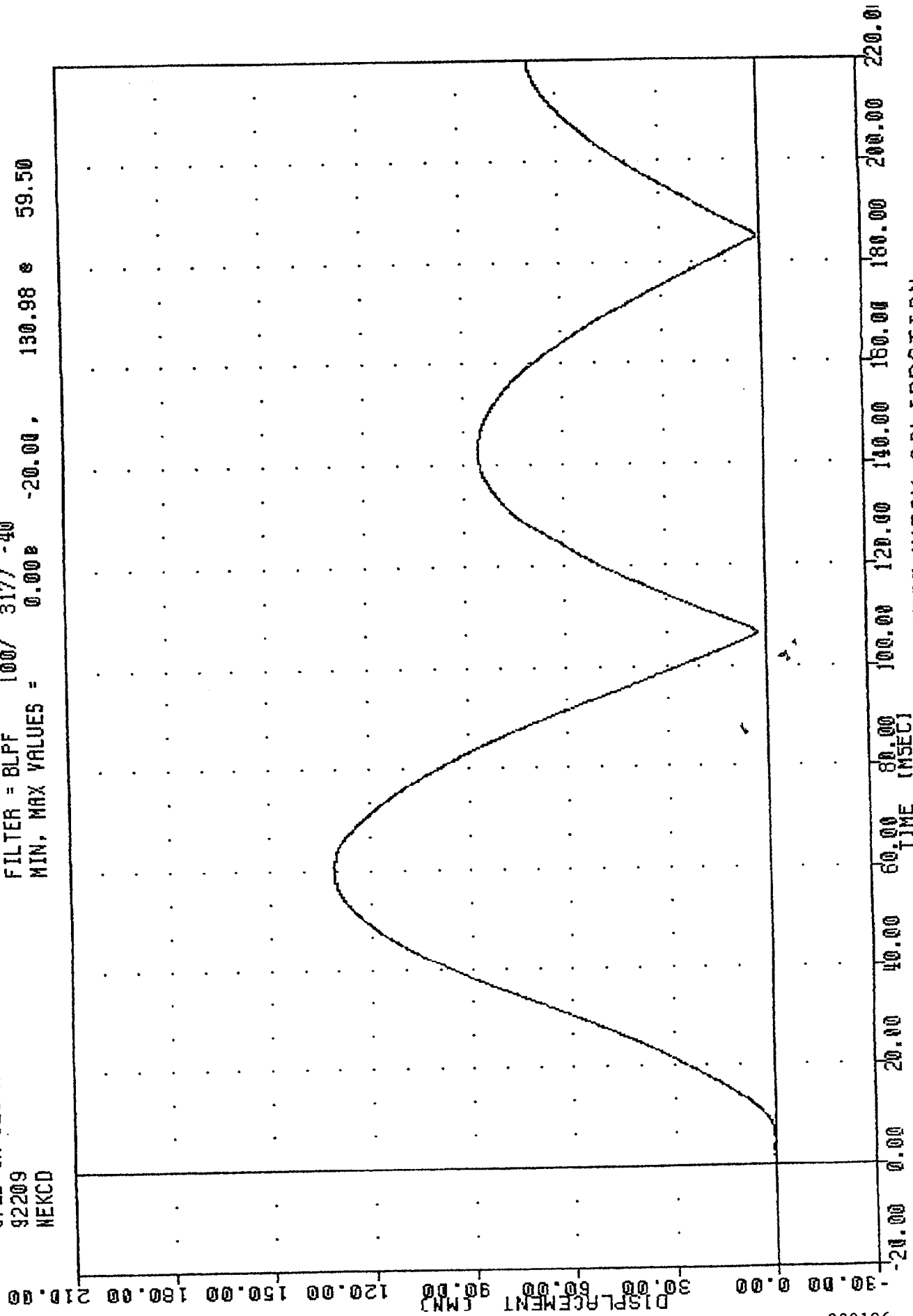
PART 572-B HYBRID II HEAD/NECK CALIBRATION

NECK DISPLACEMENT (MN)

TIME (MSEC)

TRC
 5728 SN 826 HEAD/NECK CAL 31
 92209
 NEKCD

FILTER = BLPF 100/ 317/ -40
 MIN, MAX VALUES = 0.00e -20.00, 130.98 e 59.50



TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

28-Jul-92

TEMPERATURE 21 C
TRC TL82631

RELATIVE HUMIDITY 56 %
572B SN 826 L. S. THORAX CAL 31

TEST PARAMETER	LOW SPEED TEST	
	SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	4.22-4.31 M/SEC	4.28 M/SEC
PEAK DEFLECTION	28 MM max.	23.87 MM
PEAK RESISTIVE FORCE	6,450. N max.	5931. N
INTERNAL HYSTERESIS	50% - 70%	66.8%

SCD: 54.61 MM

DUMMY MEETS SPECIFICATIONS

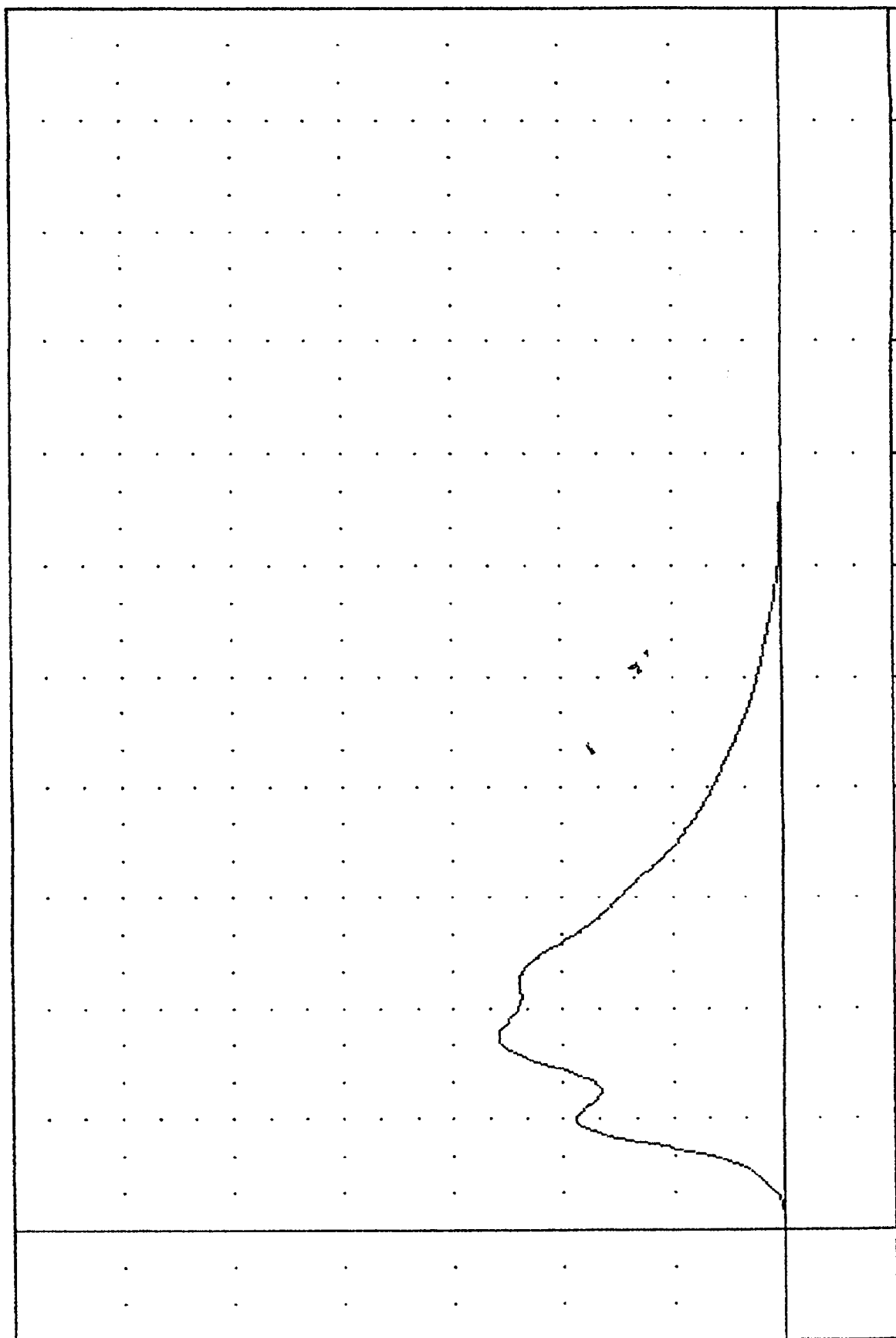
TECHNICIAN Lito Font

TRC
572B SN 026 L.S. THORAX CAL 31

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.03 55.88 25.89 10.38

92210
PENXG

ACCELERATION (G)



C-21

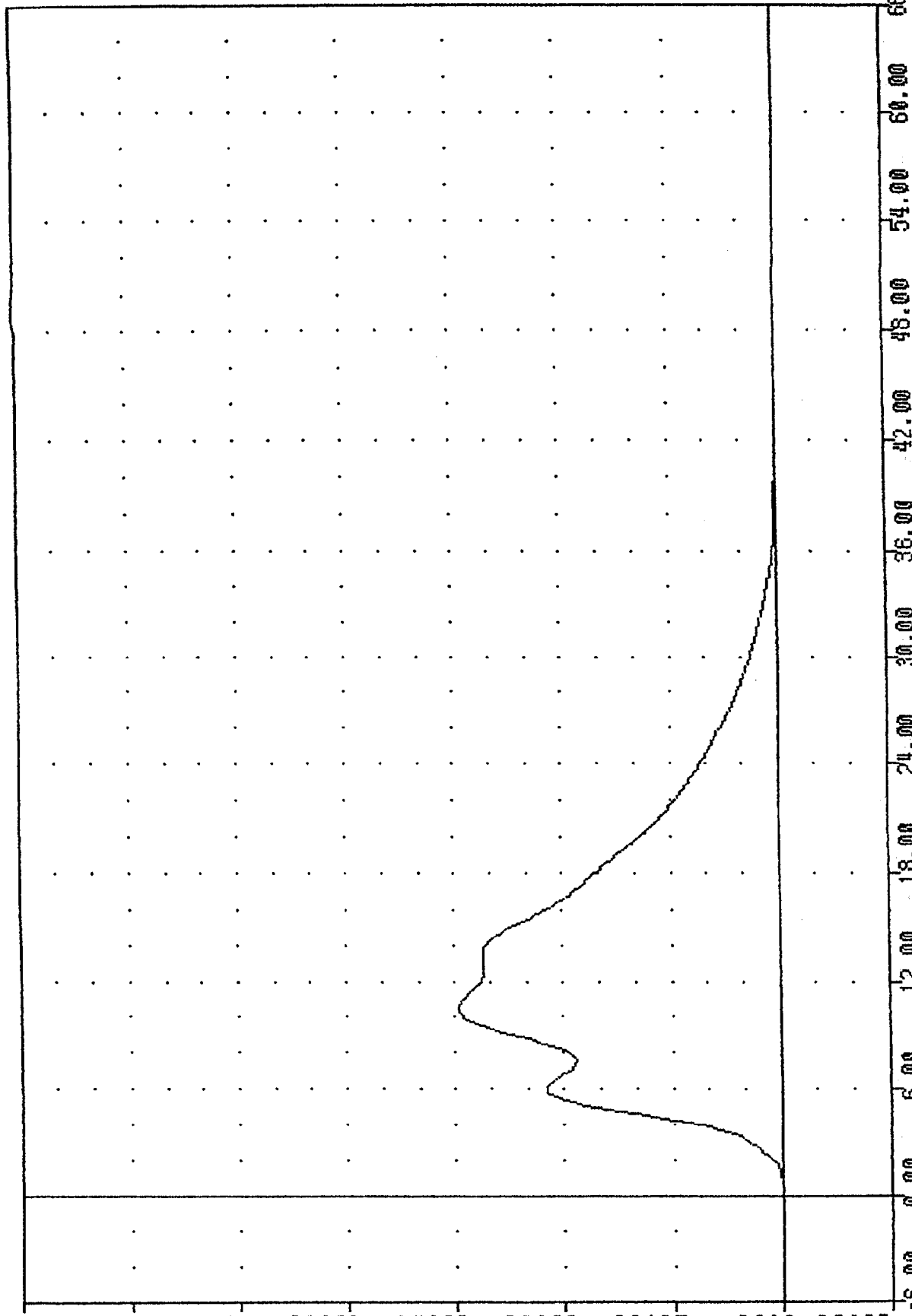
930106

PART 572-B HYBRID II THORAX CALIBRATION 4.3 M/SEC
PENDULUM DECELERATION

TRC
5728 SN 828 L.S.THORAX CAL 31
92210
PENXF

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -6.07e 55.88, 5931.11 e 10.38

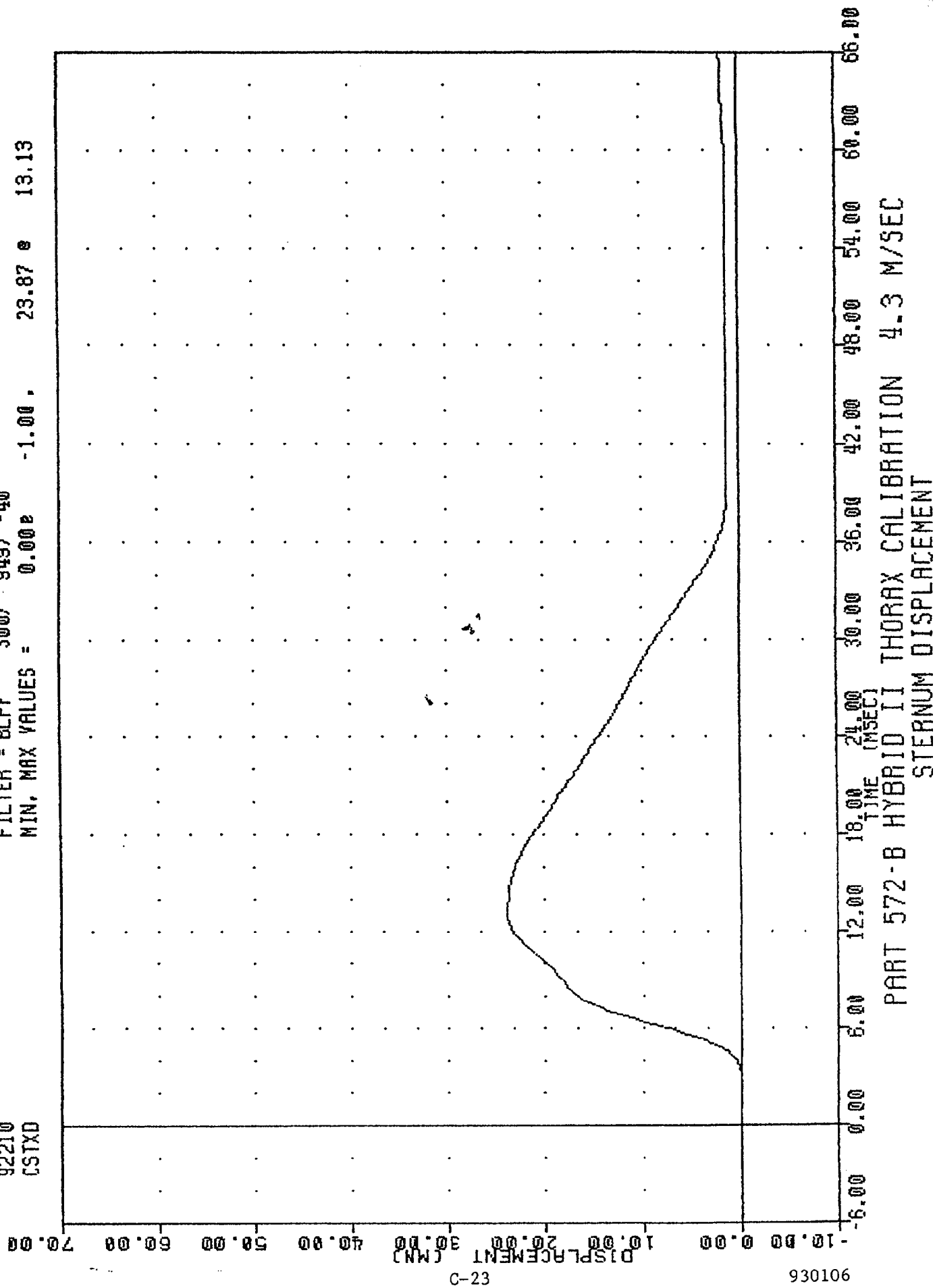
FORCE (N) (X10²)



PART 572-B HYBRID II THORAX CALIBRATION 4.3 M/SEC
PENDULUM FORCE

1RC
572B SN 926 L.S.THORAX CAL 31
92210
CSTXD

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.00e -1.00. 23.87 e 13.13



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

TRC
 CSIXD
 PENXF

TL82631
 FILTER = BLPF
 FILTER = BLPF

572B SN 826 L.S. THORAX CAL 31
 300/ 949/ -40 MIN. MAX =
 300/ 949/ -40 MIN. MAX =

92210
 0.00
 -6.07

-1.00
 55.88

23.87
 5931.11

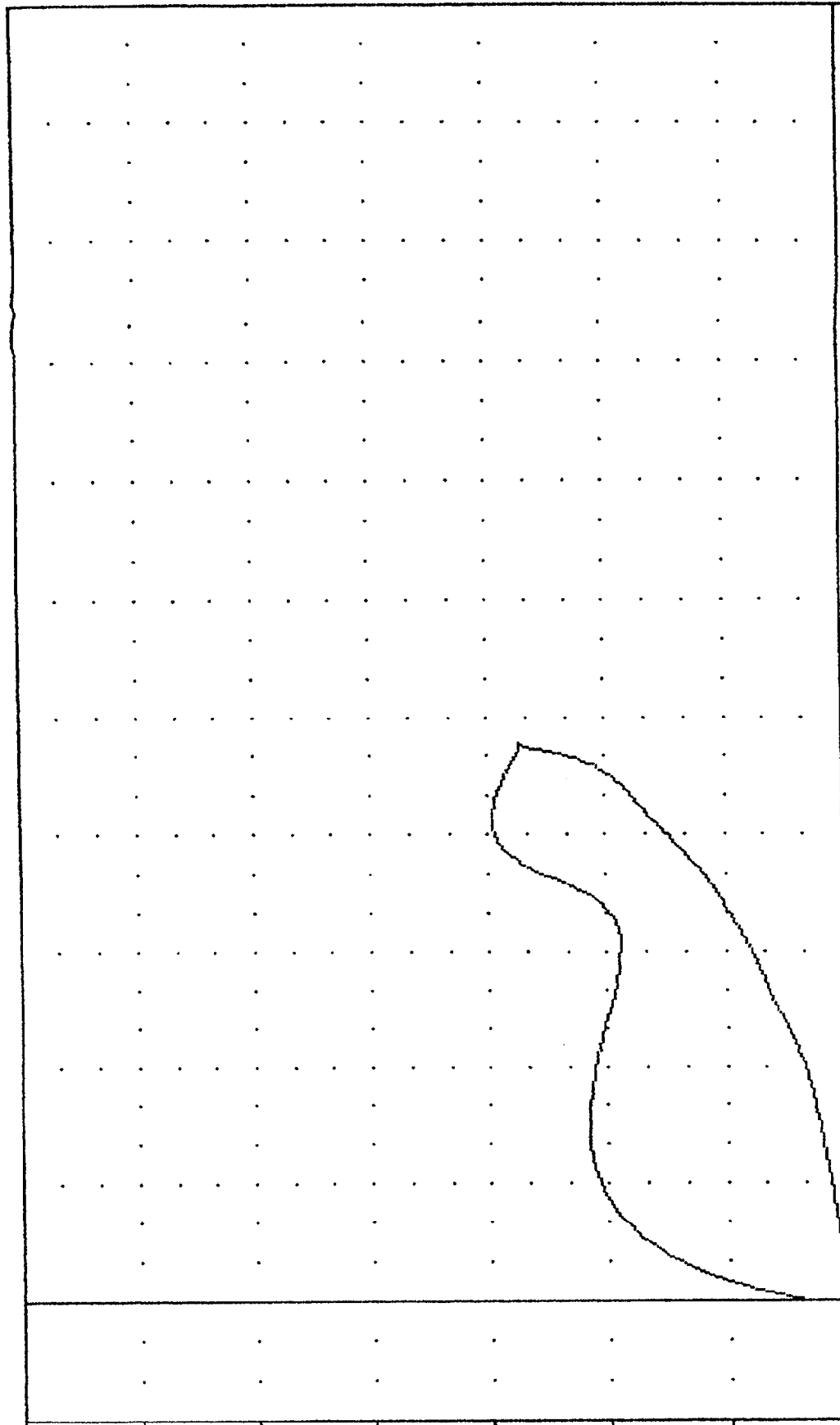
13.13
 10.38

-20.00
 -10.00
 0.00
 10.00
 20.00
 30.00
 40.00
 50.00
 60.00
 70.00
 80.00
 90.00
 100.00
 110.00
 120.00
 130.00
 140.00

(X10)

FORCE (N)

C-24



930106

-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

CSIXD DISPLACEMENT (MM)

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

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

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

28-JUL-92

TEMPERATURE 21 C
TRC TH82631RELATIVE HUMIDITY 56 %
572B SN 826 H. S. THORAX CAL 31

TEST PARAMETER	HIGH SPEED TEST	
	SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	6.64-6.77 M/SEC	6.68 M/SEC
PEAK DEFLECTION	43 MM max.	36.52 MM
PEAK RESISTIVE FORCE	10,009. N max.	9217. N
INTERNAL HYSTERESIS	50% - 70%	67.5%

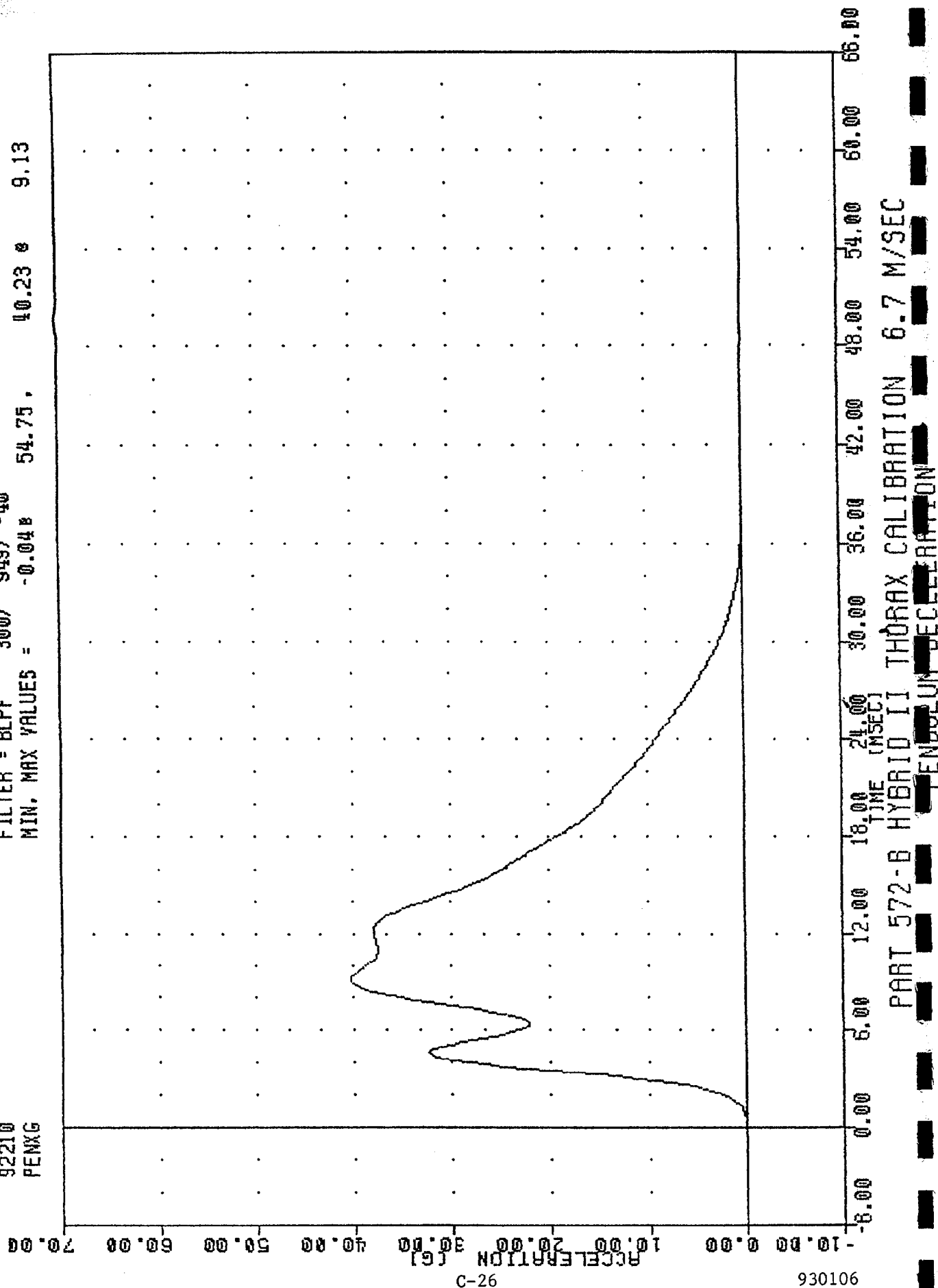
SCD: 54.61 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Faint

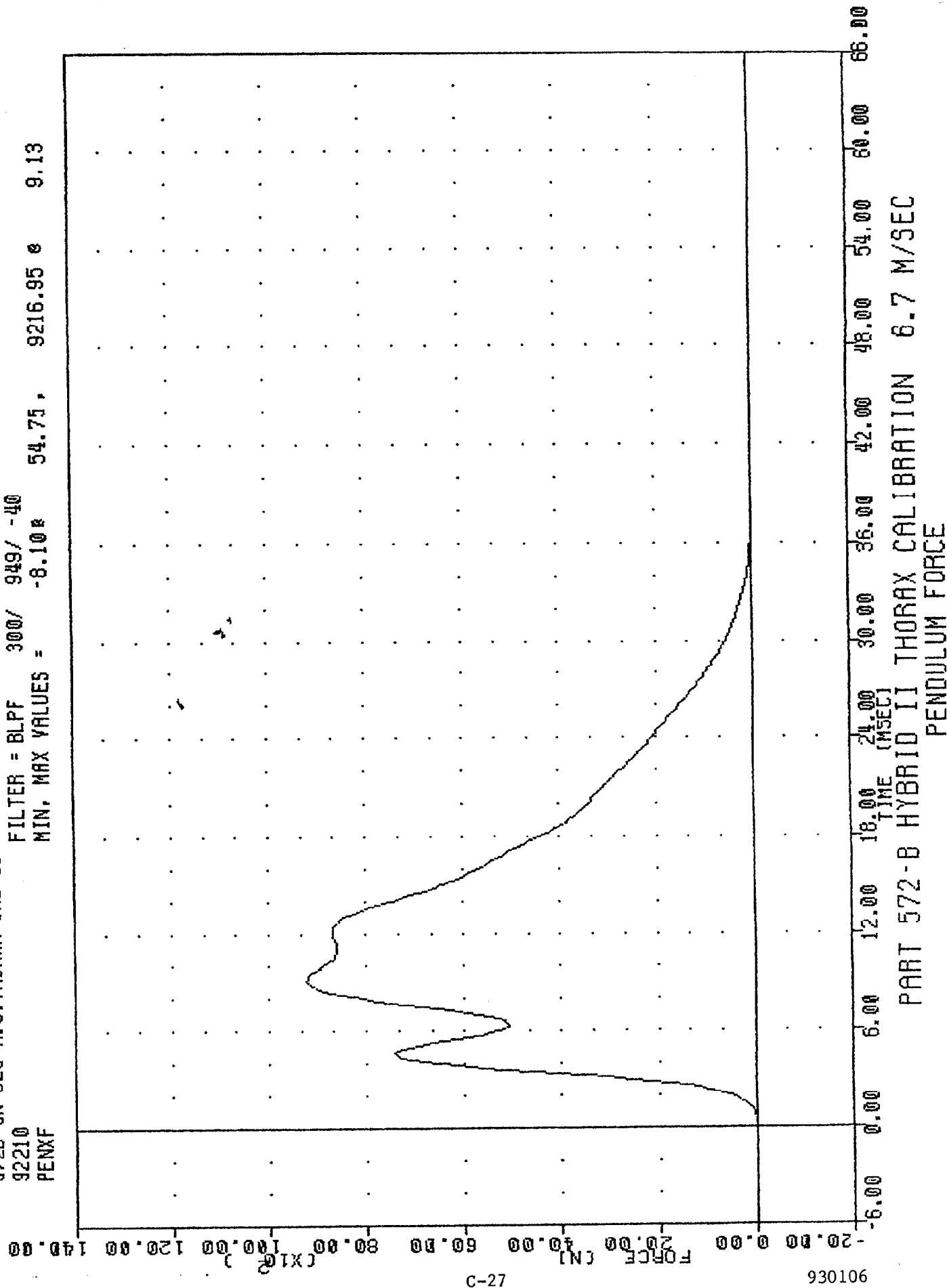
TRC
5728 SN 826 H.S.THORAX CAL 31
92210
PENXG

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -0.048 54.75, 40.23 9.13



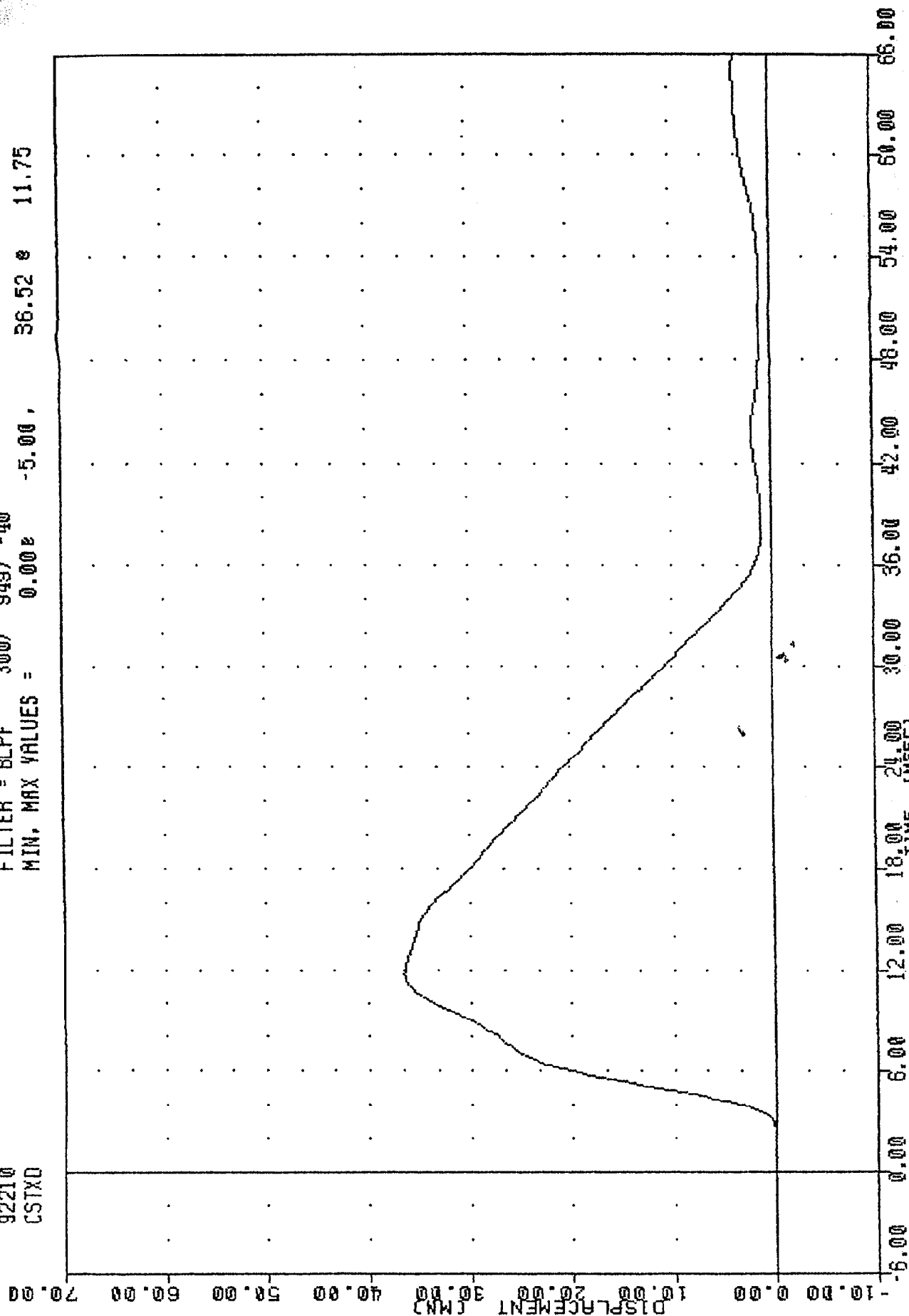
TRC
 572B SN 826 H.S. THORAX CAL 31
 92210
 PENXF

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -8.10 54.75, 9216.95 9.13



TRC
572B SN 626 H.S.THORAX CAL 31
92210
CSTD

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.00e -5.00 , 36.52 e 11.75



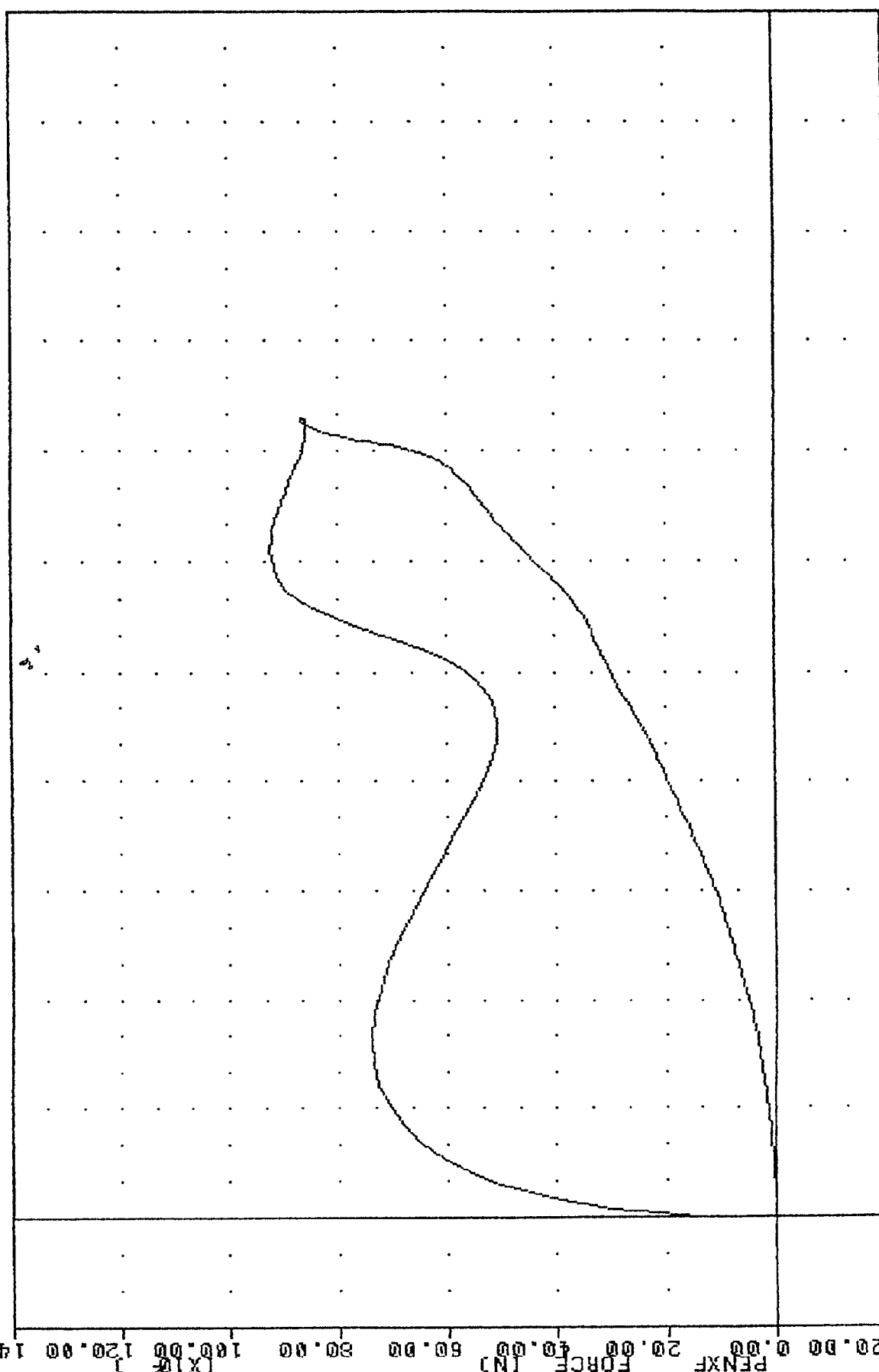
PART 572-B HYBRID II THORAX CALIBRATION 6.7 M/SEC
STEMUM DISPLACEMENT

TBC
 CSTXD
 PENXF
 TH82631
 FILTER = BLPF
 FILTER = BLPF
 572B SN 826 H. S. THORAX CAL 31 92210
 300/ 949/ -40 MIN, MAX = 0.00 B
 300/ 949/ -40 MIN, MAX = -8.10 B
 -5.00
 54.75
 36.52
 9216.85
 11.75
 9.13

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

C-29

930106



-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 (CM)

PART 572-B HYBRID II THORAX CALIBRATION 6.7 M/SEC
 CHEST DISPLACEMENT VS PENDULUM FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMEN COMPRESSION TEST

PART 572

28-Jul-92

TEMPERATURE 21 C
TRC AB82631

RELATIVE HUMIDITY 56 %
572B SN 826 ABDOM COMPR CAL 31

TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0.0 MM	44.48 N	44.48 N
12.7 MM	102.30 - 160.13 N	133.18 N
19.1 MM	160.13 - 222.40 N	190.64 N
25.4 MM	222.40 - 280.22 N	255.74 N
33.0 MM	324.70 - 391.42 N	363.79 N

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Smith

TRC
ABXD
ABXF

AB82631
FILTER = ALPF
FILTER = ALPF

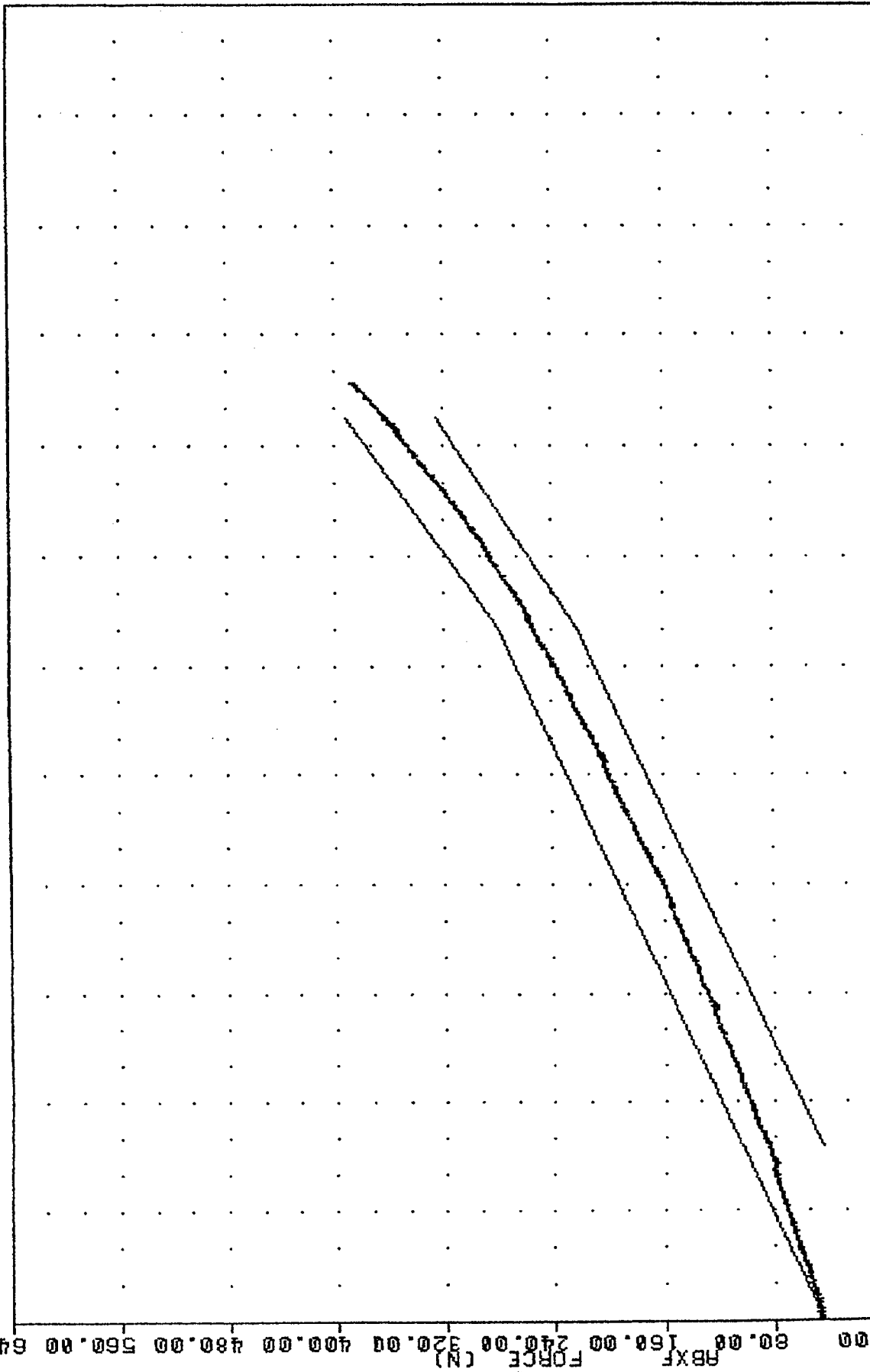
5728 SN 826 ABDOM COMP CAL 31
1650/ 5214/ -40 MIN, MAX =
1650/ 5214/ -40 MIN, MAX =

92210
-0.01 g
43.45 g

0.00;
0.10;

34.29 g
387.46 g
386.51
34.26

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



C-31

930106

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

TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572

27-JUL-92

TEMPERATURE 21 C
TRC LF82631

RELATIVE HUMIDITY 56 %
572B SNB26 LUMBAR FLEX CAL31

DEFLECTION	SPECIFICATION	TEST RESULTS
0 DEG	0 N	0.00 N
20 DEG	97.86 - 151.24 N	111.20 N
30 DEG	151.24 - 204.62 N	164.58 N
40 DEG	204.62 - 258.00 N	222.40 N
NET RETURN ANGLE	< 12 DEG	1.80 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Peto Fort

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

24-Dec-92

TEMPERATURE 21 C
RIGHT KNEE
TRC RK82631A

RELATIVE HUMIDITY 38 %
572B SN 826 R. KNEE IMP CAL 31

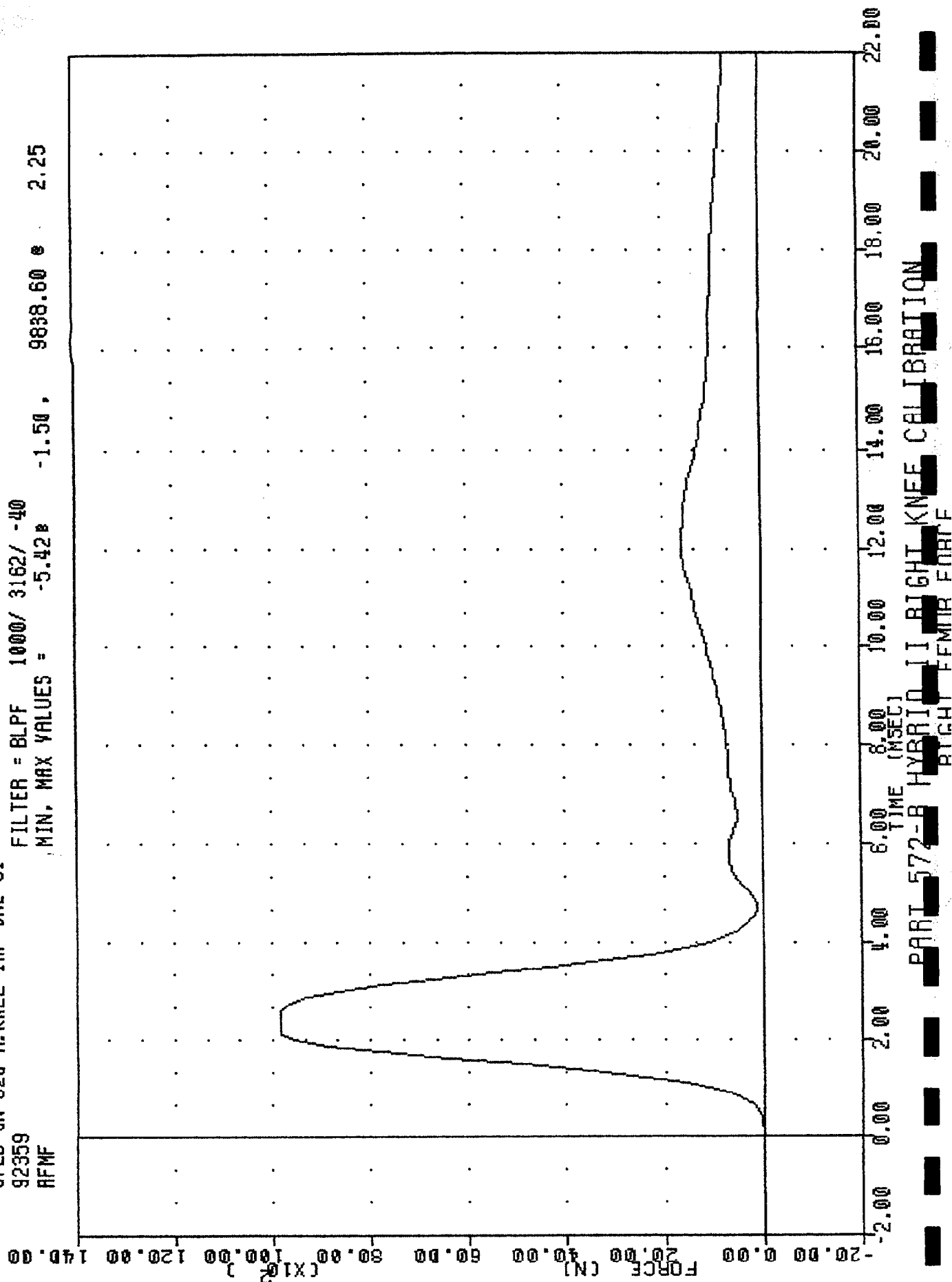
TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	2.06 - 2.15 M/SEC	2.13 M/SEC
PEAK KNEE IMPACT FORCE	8229 - 11121 N	9838.60 N
DURATION ABOVE 4448 N	≥ 1.7 MSEC	2.03 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Fount

TRC
5728 SN 826 R.KNEE INP CAL 31
92359
RFMF

FILTER = BLPF 1000/ 3162/ -40
MIN, MAX VALUES = -5.428 -1.50 9838.60 2.25



TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

24-Dec-92

TEMPERATURE 21 C
LEFT KNEE
TRC LK82631A

RELATIVE HUMIDITY 38 %
572B SN 826 L. KNEE IMP CAL 31

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	2.06 - 2.15 M/SEC	2.13 M/SEC
PEAK KNEE IMPACT FORCE	8229 - 11121 N	8898.68 N
DURATION ABOVE 4448 N	>=1.7 MSEC	2.07 MSEC

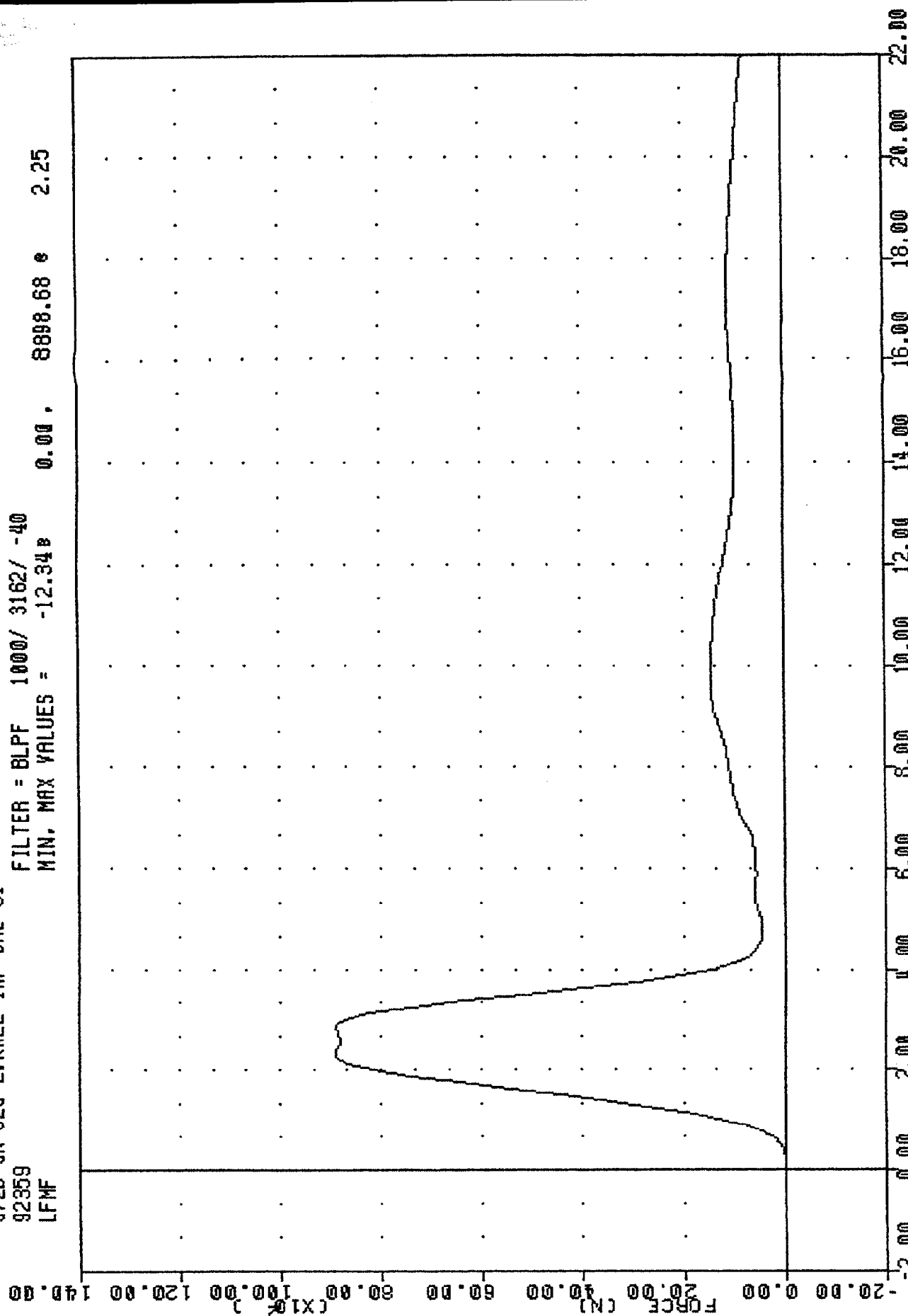
DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Font

TRC , LK82631A
 5728 SN 026 L.KNEE INP DAL 31
 92359
 LFMF

FILTER = BLPF 1000/ 3162/ -40
 MIN, MAX VALUES = -12.34 8

0.00 , 8898.68 8 2.25



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

PRE-TEST CERTIFICATION DATA

PASSENGER DUMMY S/N: 713

TRANSPORTATION RESEARCH CENTER OF OHIO

EXTERNAL DIMENSIONS

PART 572

29-JUL-92

TEMPERATURE 21 C
TRC ED71305

RELATIVE HUMIDITY 56 %
572B SN713 EXT. DIMENSION CAL05

DESCRIPTION	SPECIFICATION	TEST RESULTS
SN 713 HUMANOID		
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 OF OHIO

HEAD DROP TEST

PART 572

11-Dec-92

TEMPERATURE 21 C
TRC HD71305A

RELATIVE HUMIDITY 56 %
572B SN 713 HEAD DROP CAL 05

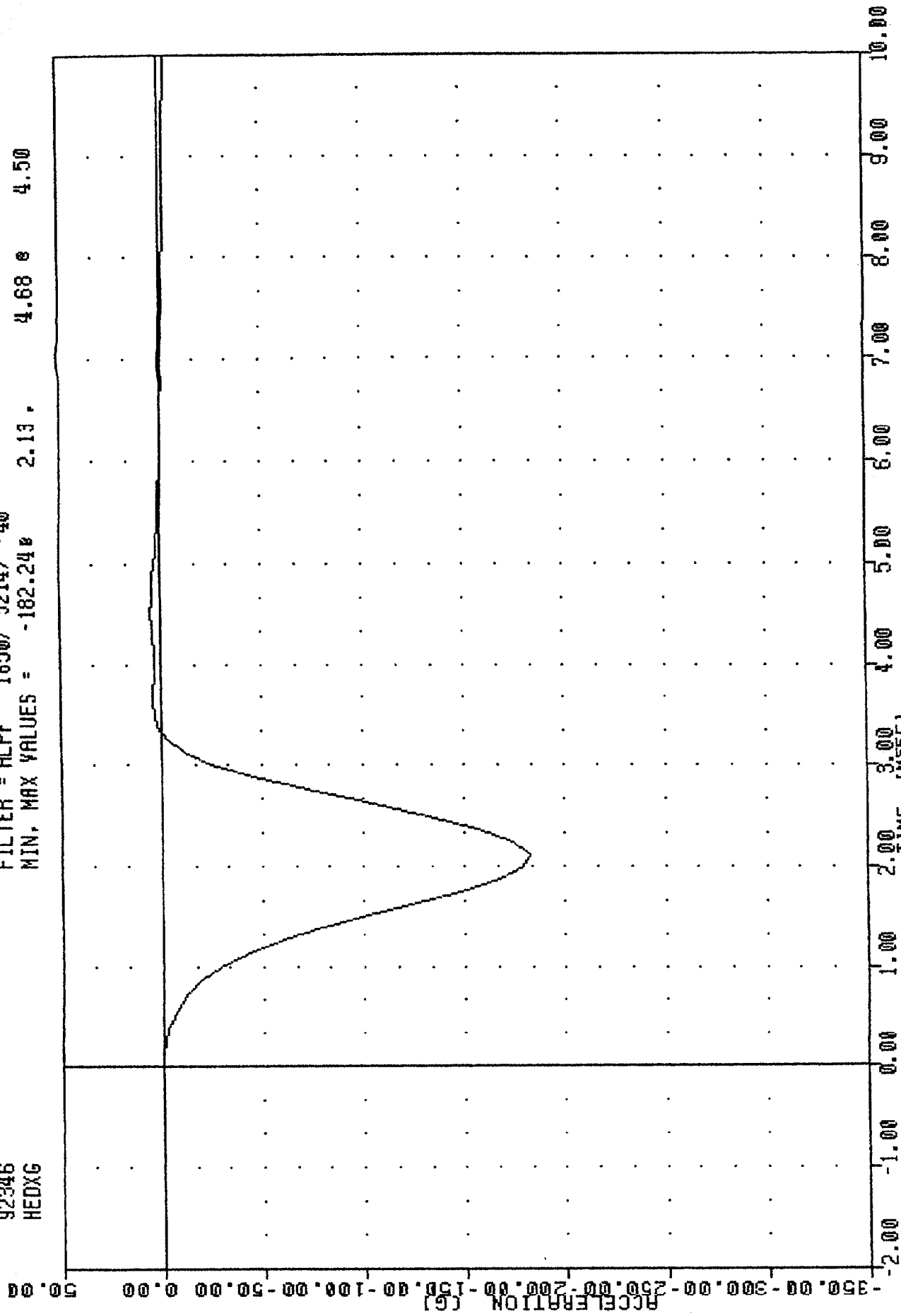
TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	215.93 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MSEC	1.29 MSEC
PEAK LATERAL ACCELERATION	10 G MAX	-2.99 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Leta Fong

TRC , HD71305A
 572B SN 713 HEAD DROP CAL 05
 92346
 HEDXG

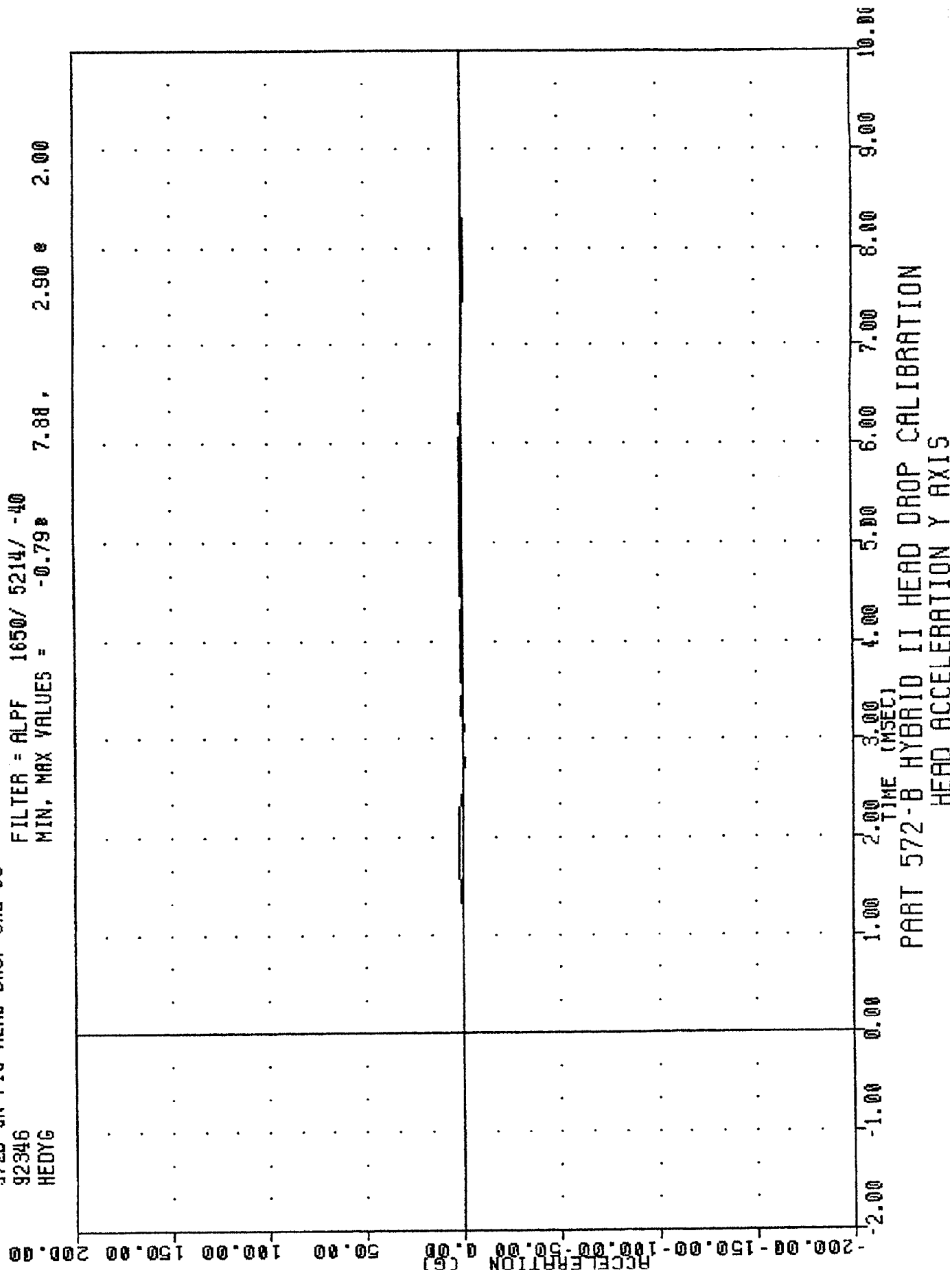
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -182.248 2.13 . 4.68 e 4.50



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

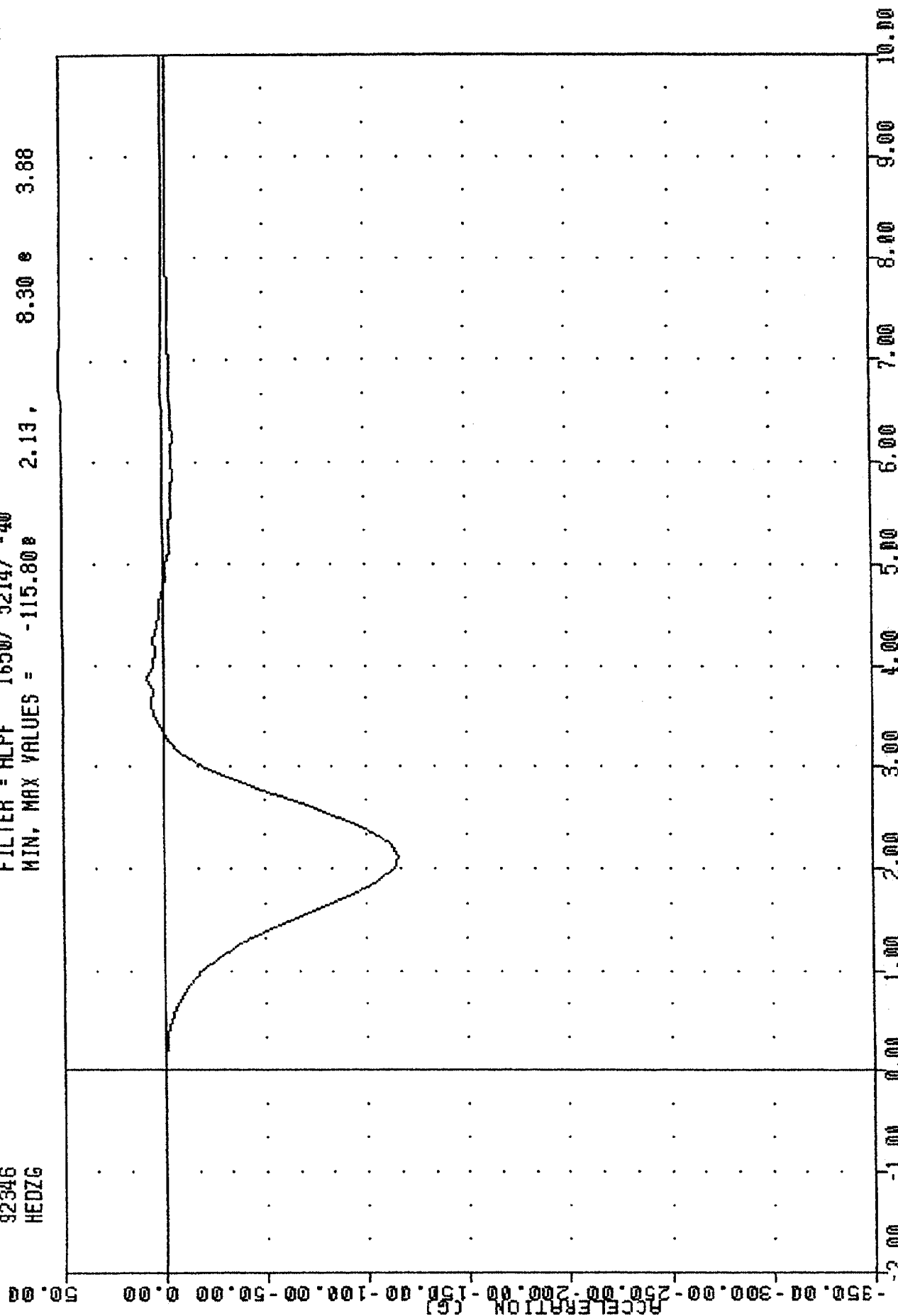
TRC
 572B SN 713 HEAD DROP CAL 05
 92346
 HEDYG

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -0.79 7.88 , 2.90 2.00



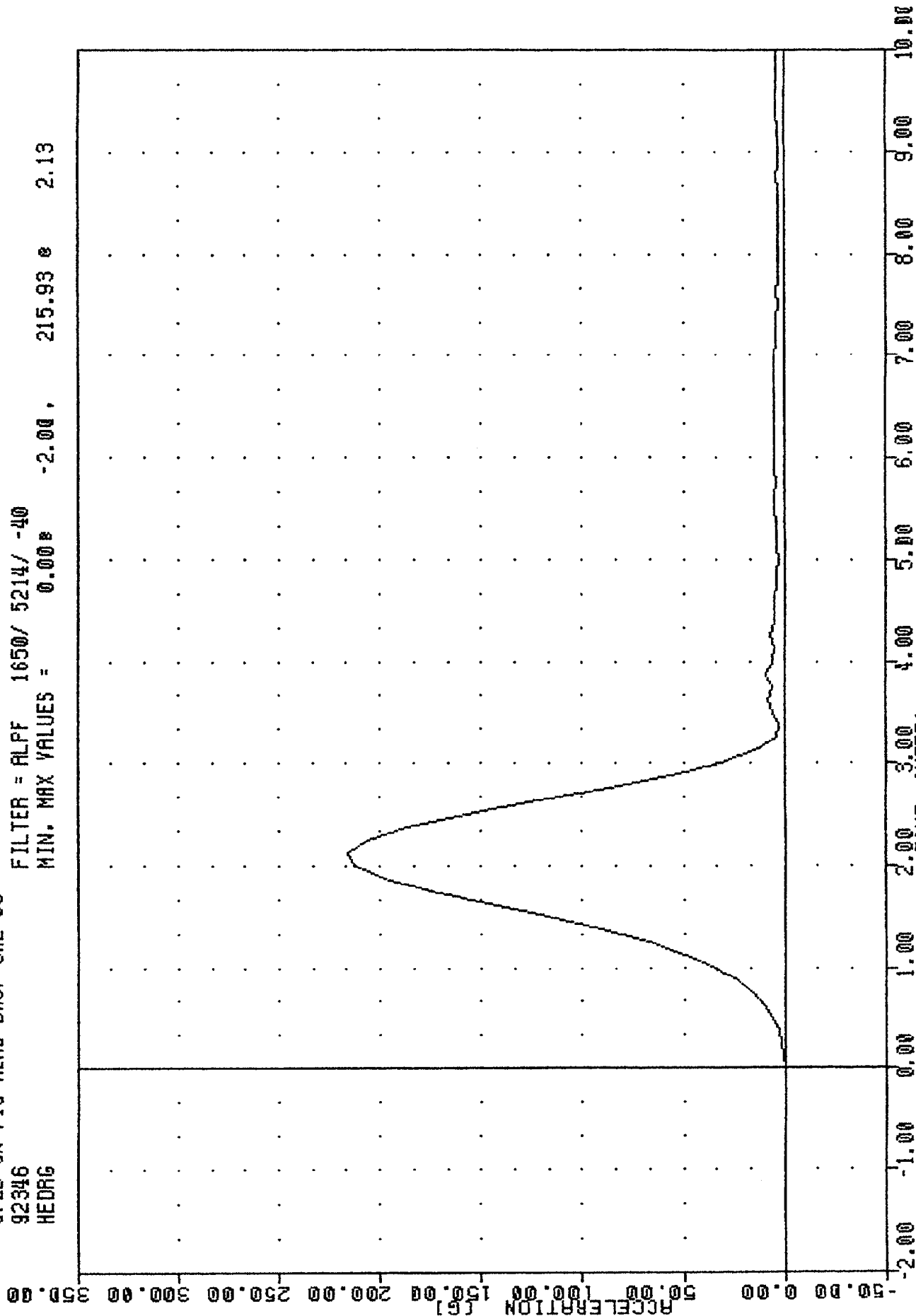
TRC
5728 SN 713 HEAD DROP CAL 05
92346
HEDZG

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -115.80 2.13, 8.30 e 3.88



TRC
572B SN 713 HEAD DROP CAL 05
92346
HEDRG

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.00 215.93 2.13
-2.00



PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD RESONANT ACCELERATION

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572

11-Dec-92

TEMPERATURE 21 C
TRC HN71305A

RELATIVE HUMIDITY 54 %
572B SN 713 HEAD/NECK CAL 05

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Pendulum velocity	6.55 to 7.77 m/sec	7.24 m/sec
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 msec max	2.58 msec
T2 - T3: 20 - 20 G	25 - 30 msec	27.96 msec
T3 - T4: 20 - 5 G	10 msec max	3.92 msec
Avg. G level T2 - T3	20 - 24 G	23.62 G
Maximum Rotation Angle	63 - 73 deg	66.78 deg
Peak Head Resultant Accel	26 G max	24.34 G

Test Parameter	Specification		Test Results	
Rotation Angle (degrees)	Time (msec)	Chordal Disp. (mm)	Time (msec)	Chordal Disp. (mm)
0	-2.0 - +2.0	-12.7 - +12.7	1.50	0.00
30	25.6 - 34.4	53.3 - 78.7	31.45	62.57
60	40.3 - 51.7	109.2 - 134.6	48.07	121.66
max	53.2 - 66.8	127.0 - 152.4	64.00	137.85
60	67.0 - 83.0	109.2 - 134.6	75.09	124.98
30	85.4 - 104.6	53.3 - 78.7	95.68	58.80
0	101.0 - 123.0	-12.7 - +12.7	110.06	4.70

SND: 151.13 mm

DUMMY MEETS SPECIFICATIONS

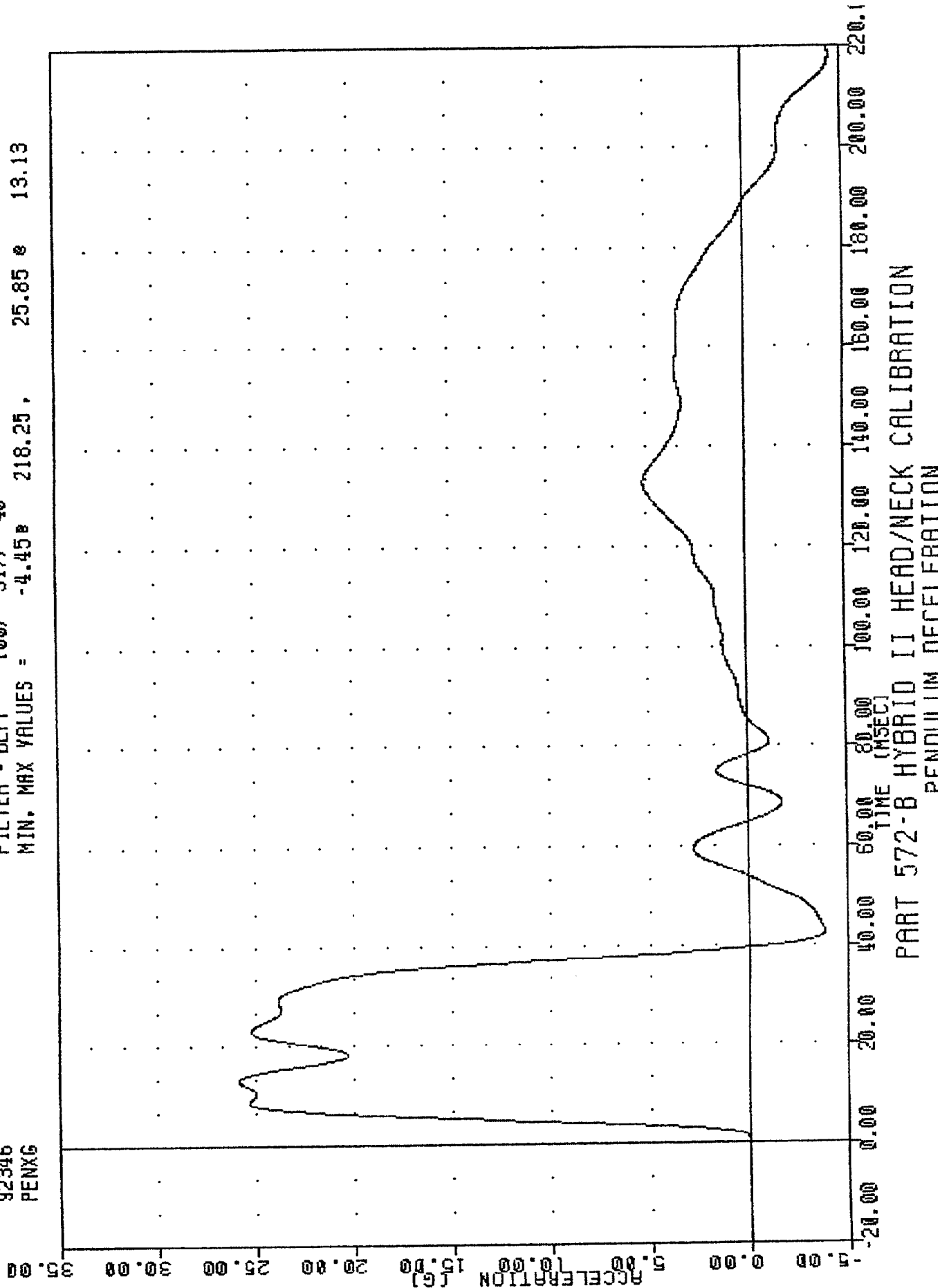
TECHNICIAN

Pete Font

TRC
 572B SN 713 HEAD/NECK CAL 05
 92346
 PENXG

HN71305A

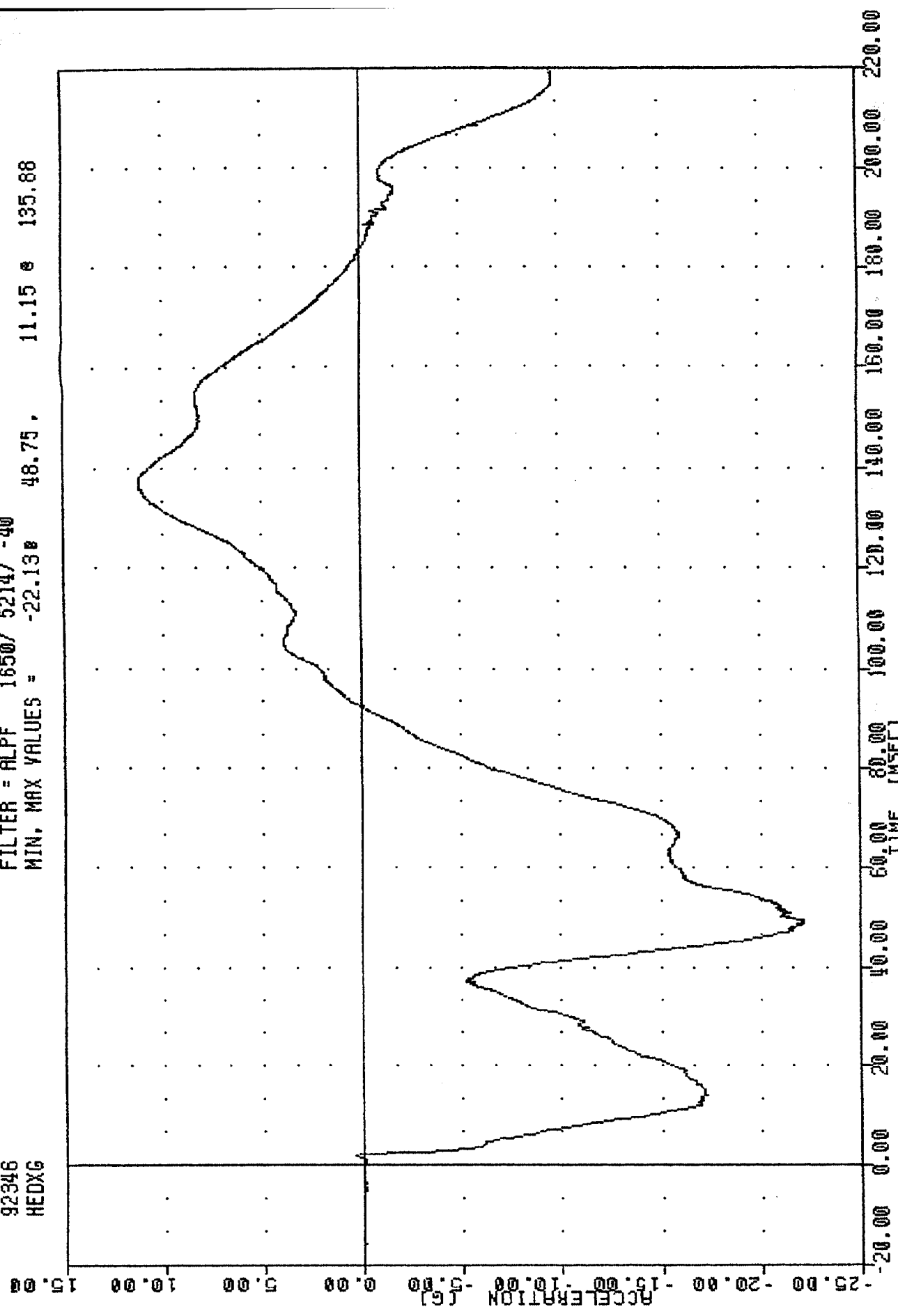
FILTER = BLPF 100/ 317/ -40
 MIN. MAX VALUES = -4.45 218.25 25.85 13.13



TRC
 572B SN 713 HEAD/NECK CAL 05
 92346
 HEDXG

• HK71305A

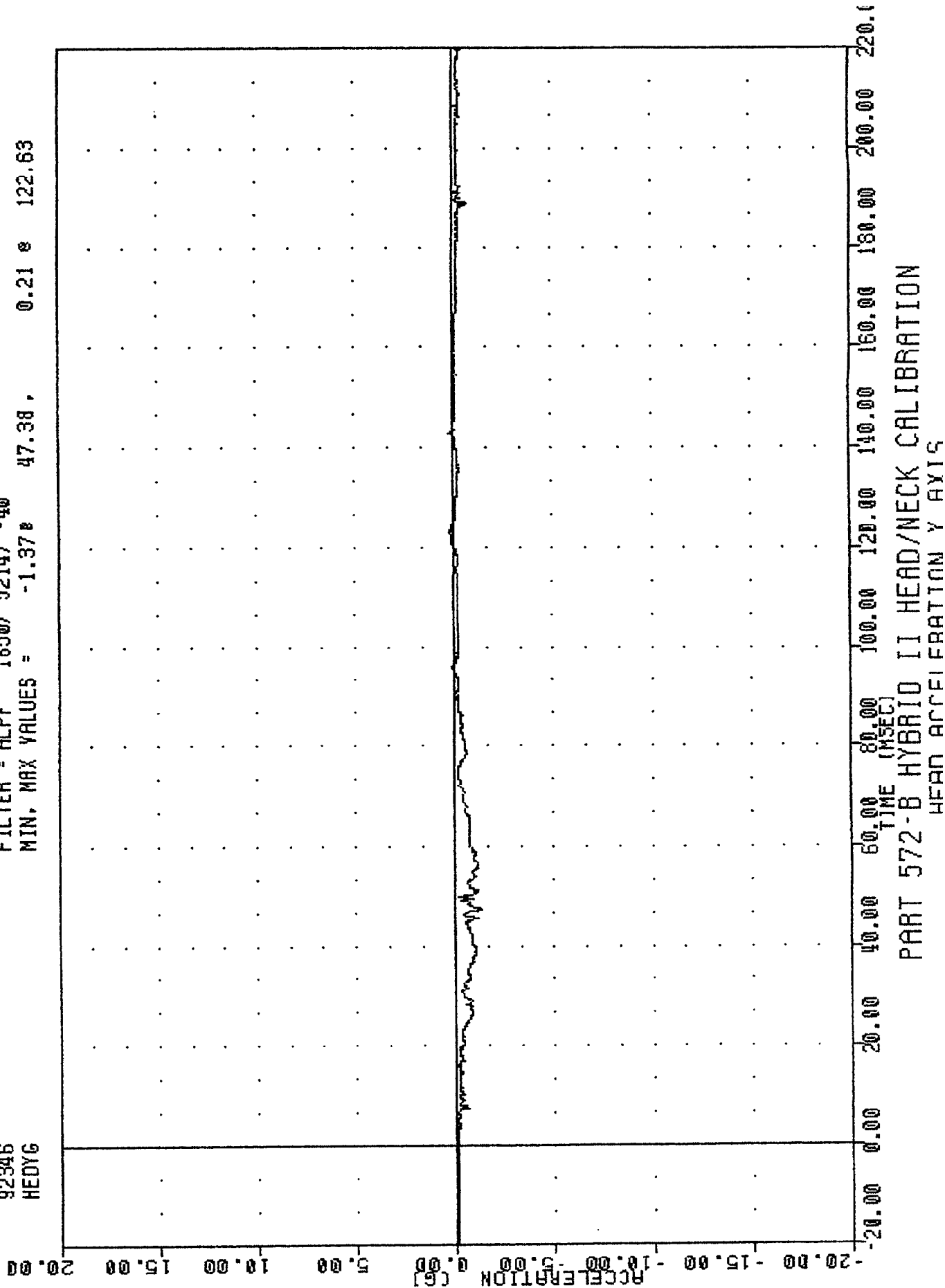
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -22.13 48.75, 11.15 135.88



PART 572-B HYBRID II HEAD/NECK CALIBRATION
 HEAD ACCELERATION 1 AXIS

TRC
5728 SN 713 HEAD/NECK CRL 05
92346
HEDYG

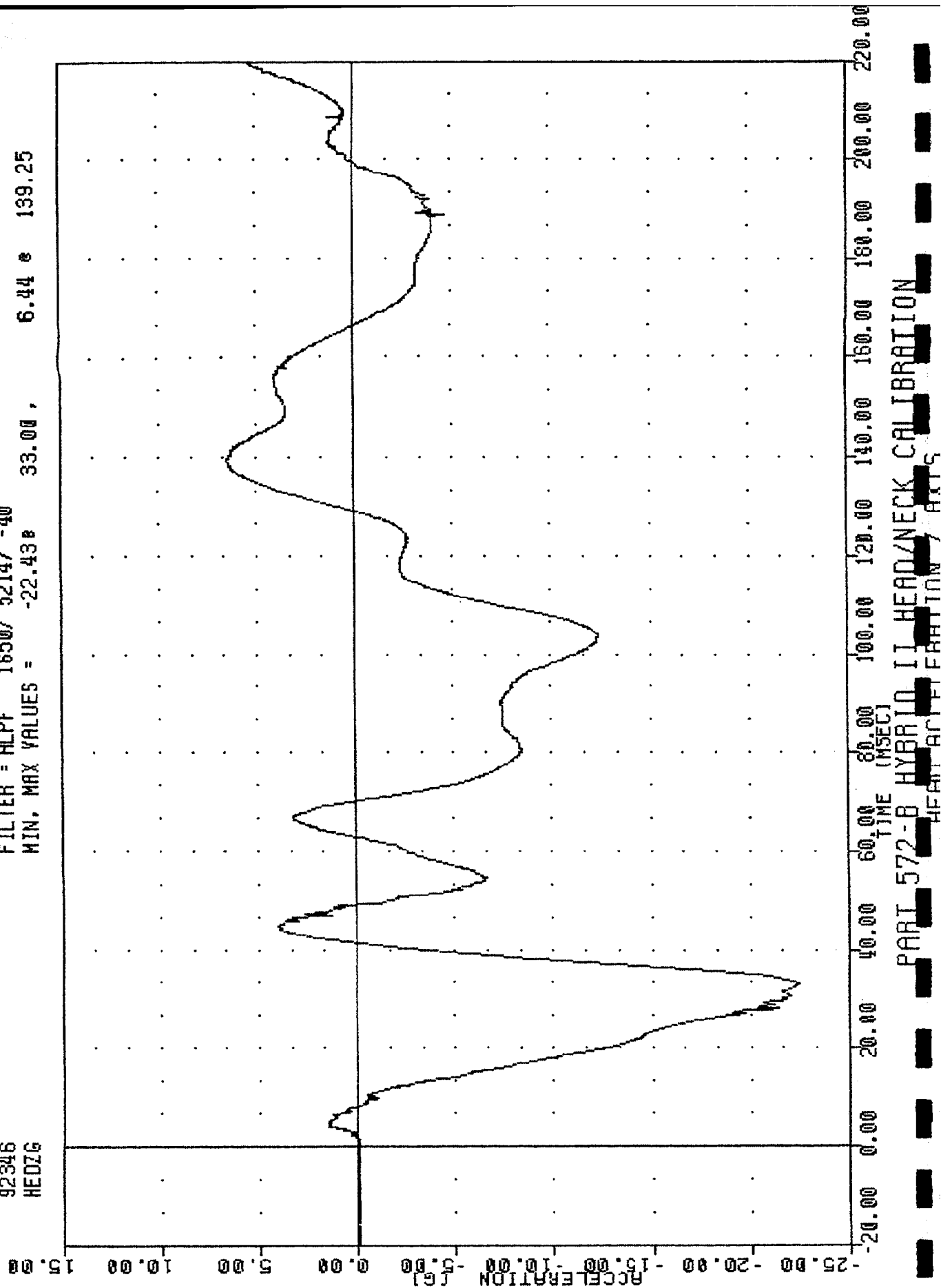
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -1.37e 47.38, 0.21 e 122.63



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

TRC
5728 SN 713 HEAD/NECK CAL 05
92346
HEDZG

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -22.438 33.00 , 6.44 e 139.25

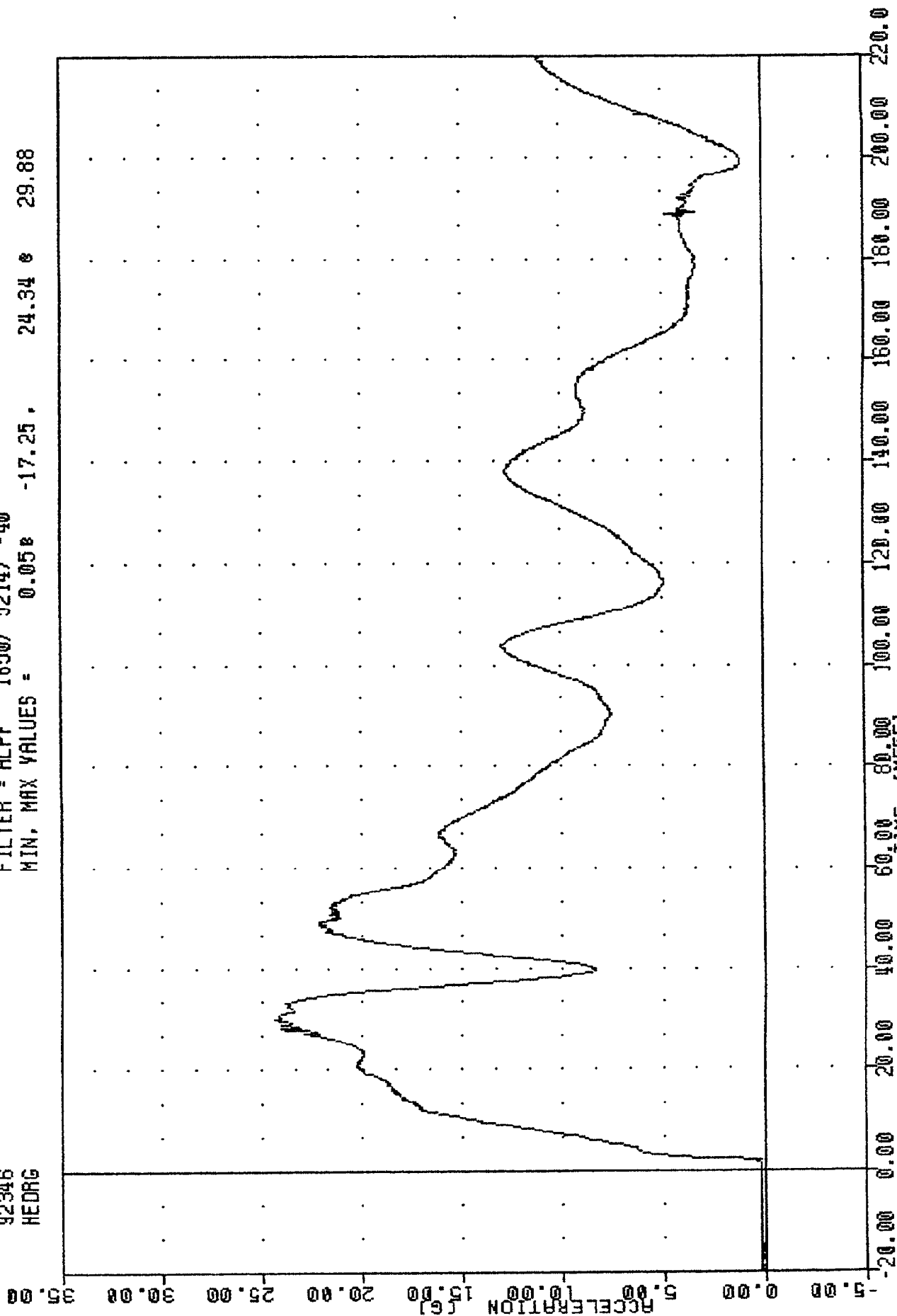


TRC
 572B SN 713 HEAD/NECK CRL 05
 92346
 HEDRG

HN71305A

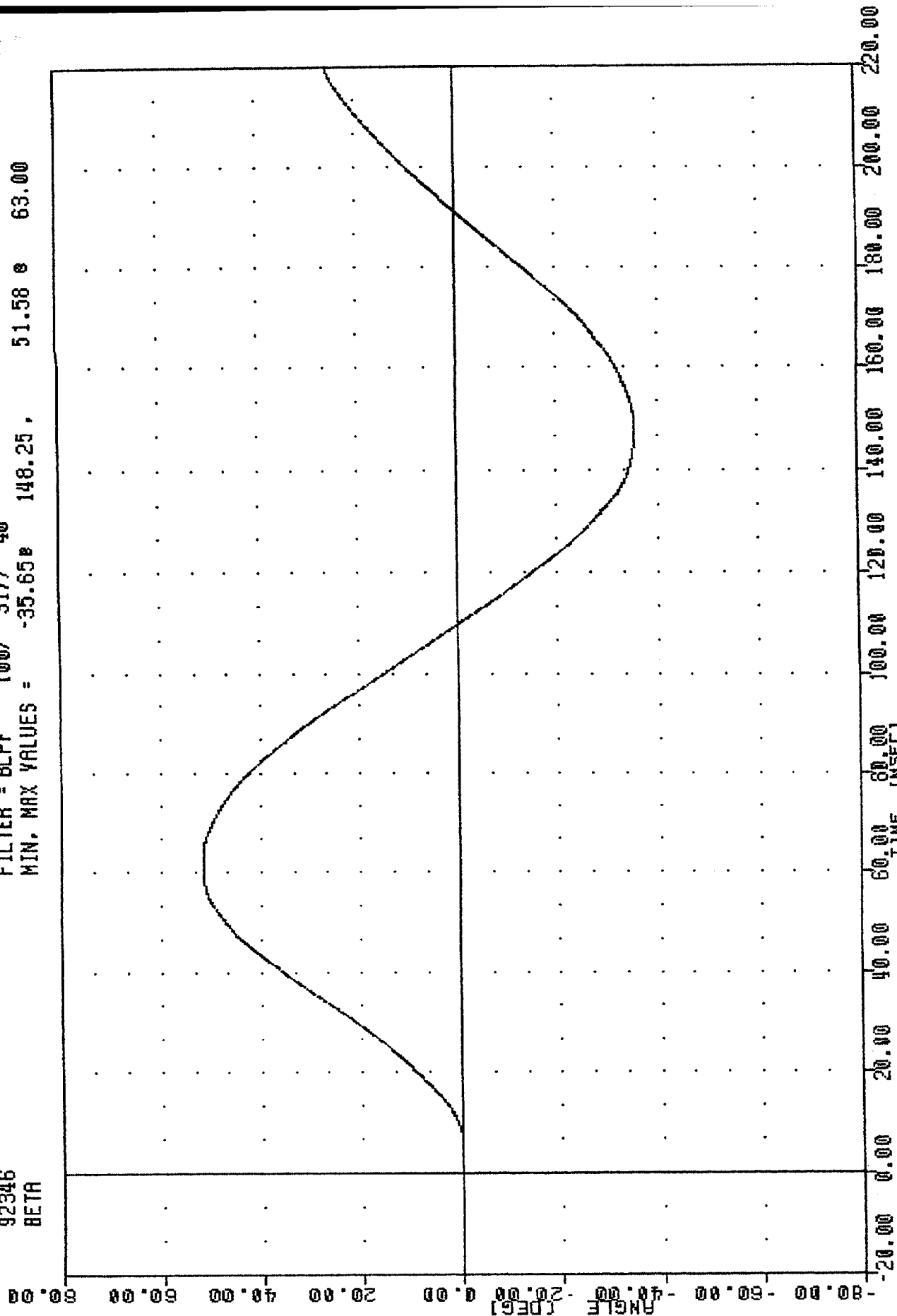
FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = 0.058 -17.25 24.34 29.88



TRC
 572B SN 713 HEAD/NECK CAL 05
 92346
 BETA

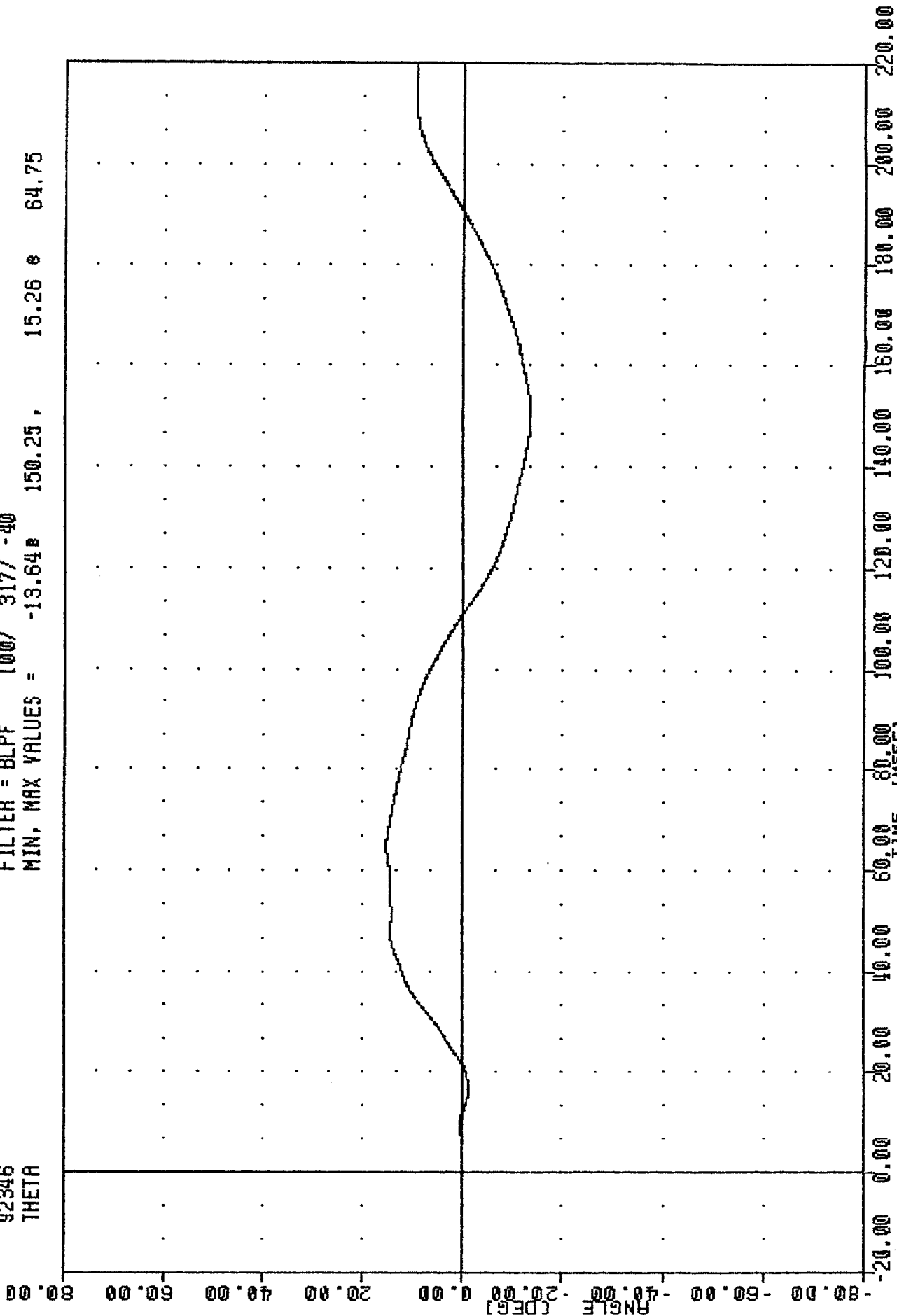
FILTER = BLPF 100/ 317/ -40
 MIN, MAX VALUES = -35.65 148.25, 51.58 63.00



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

TRC
572B SN 713 HEAD/NECK CAL 05
92346
THETA

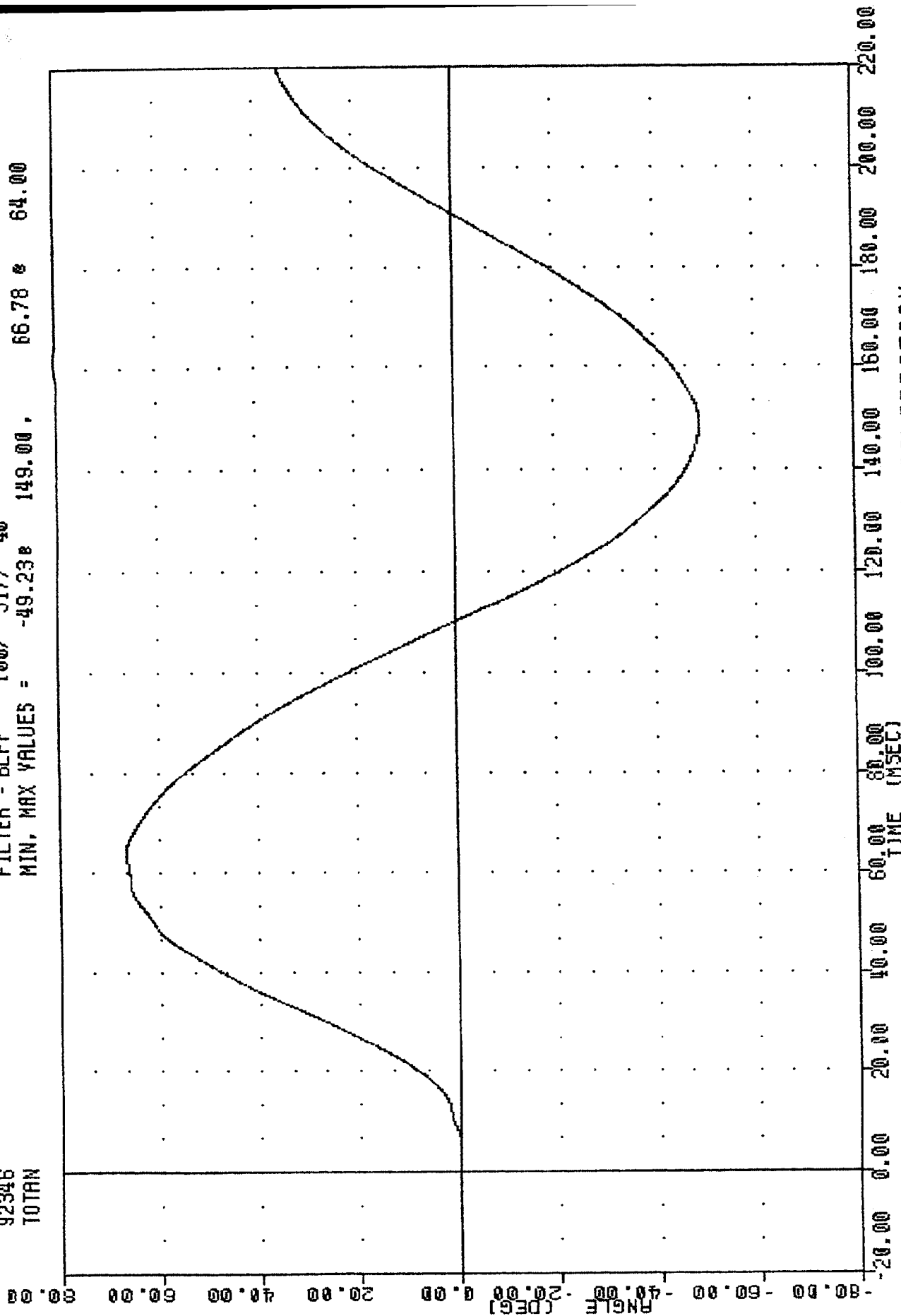
FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -13.64 150.25, 15.26 64.75



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

TRC , HW71305A
 572B SN 713 HEAD/NECK CAL 05
 92346
 TOTAN

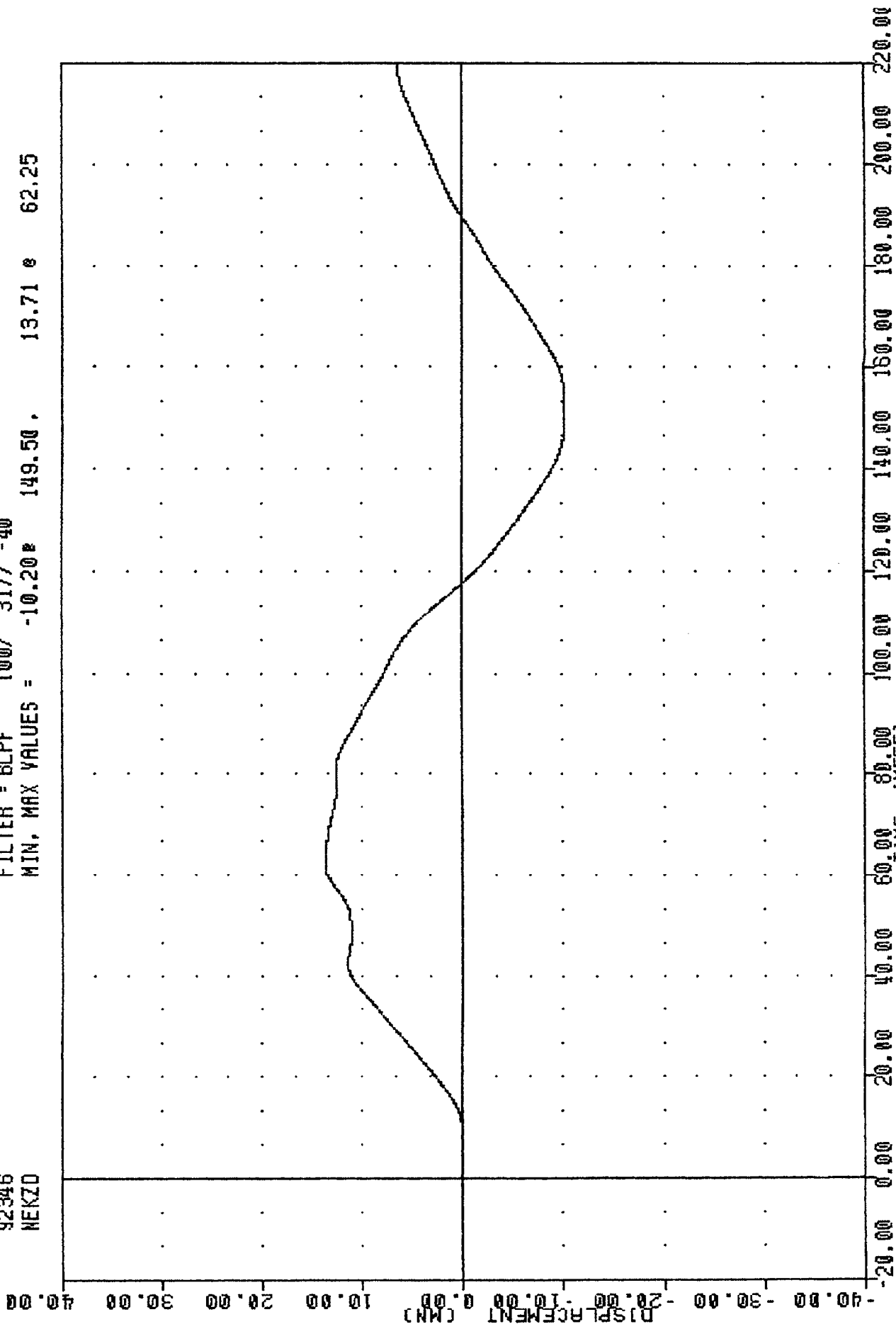
FILTER = BLPF 100/ 317/ -40
 MIN, MAX VALUES = -49.23e 149.00 , 66.78 e 64.00



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

TRC
572B SN 713 HEAD/NECK CAL 05
92346
NEKZD

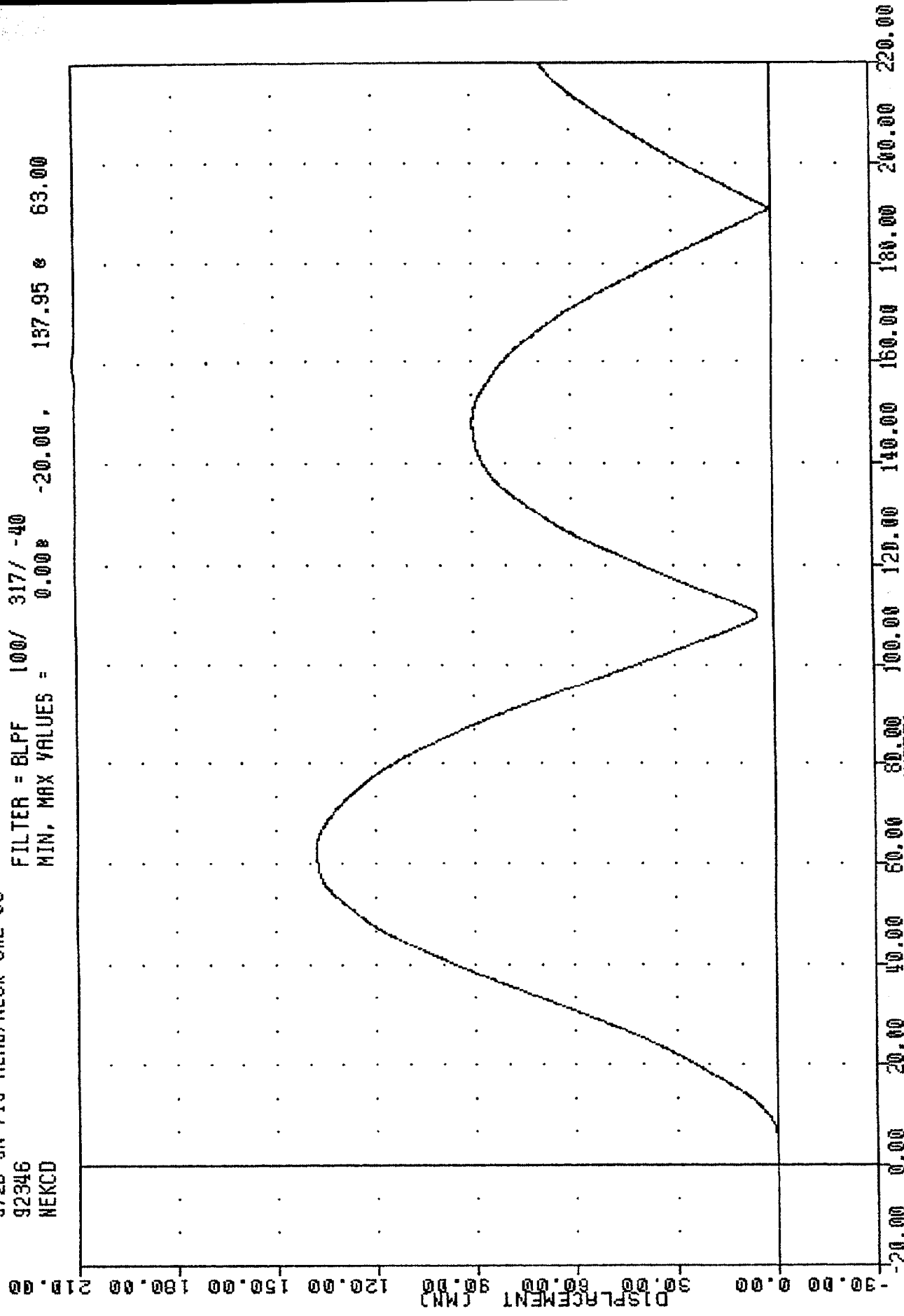
FILTER = BLPF 100/ 317/ -40
MIN. MAX VALUES = -10.20 149.50 13.71 62.25



PART 572-B HYBRID II HEAD/NECK CALIBRATION
NECK DISPLACEMENT Z AXIS

TRC
 572B SN 713 HEAD/NECK CAL 05
 92346
 NEKCD

FILTER = BLPF 100/ 317/ -40
 MIN, MAX VALUES = 0.00e -20.00, 137.95 e 63.00



PART 572-B HYBRID II HEAD/NECK CALIBRATION
 NECK INITIAL DISPLACEMENT

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

28-JUL-92

TEMPERATURE 21 C
TRC TL71305

RELATIVE HUMIDITY 56 %
572B SN 713 L. S. THORAX CAL 05

TEST PARAMETER	LOW SPEED TEST	TEST RESULTS
	SPECIFICATION	
PENDULUM VELOCITY	4.22-4.31 M/SEC	4.28 M/SEC
PEAK DEFLECTION	28 MM max.	23.68 MM
PEAK RESISTIVE FORCE	6,450. N max.	6038. N
INTERNAL HYSTERESIS	50% - 70%	64.1%

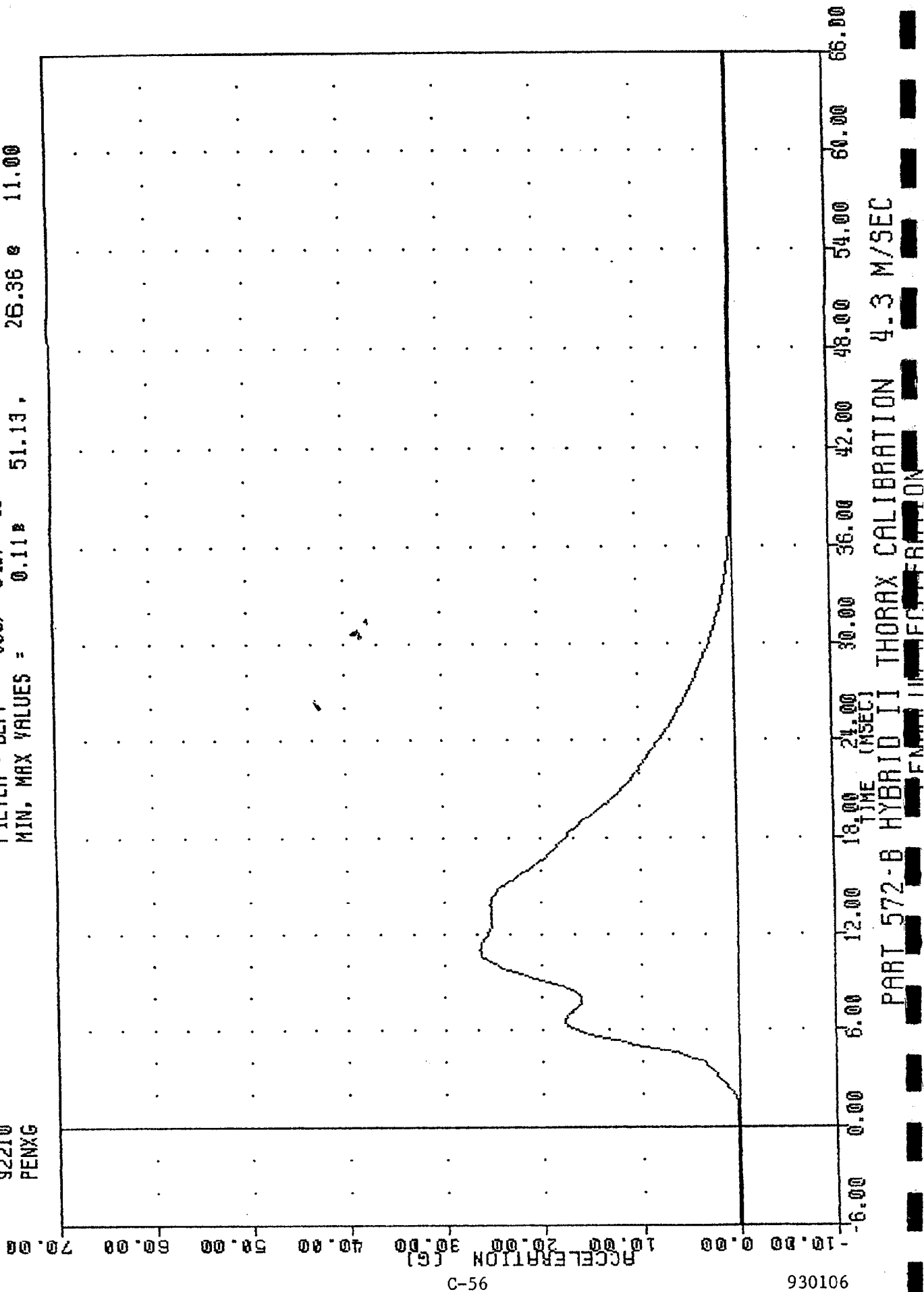
SCD: 54.61 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pto Font

TRC TL71305
 572B SN 713 L.S.THORAX CAL 05
 92210
 PENXG

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 0.11 26.36 11.00



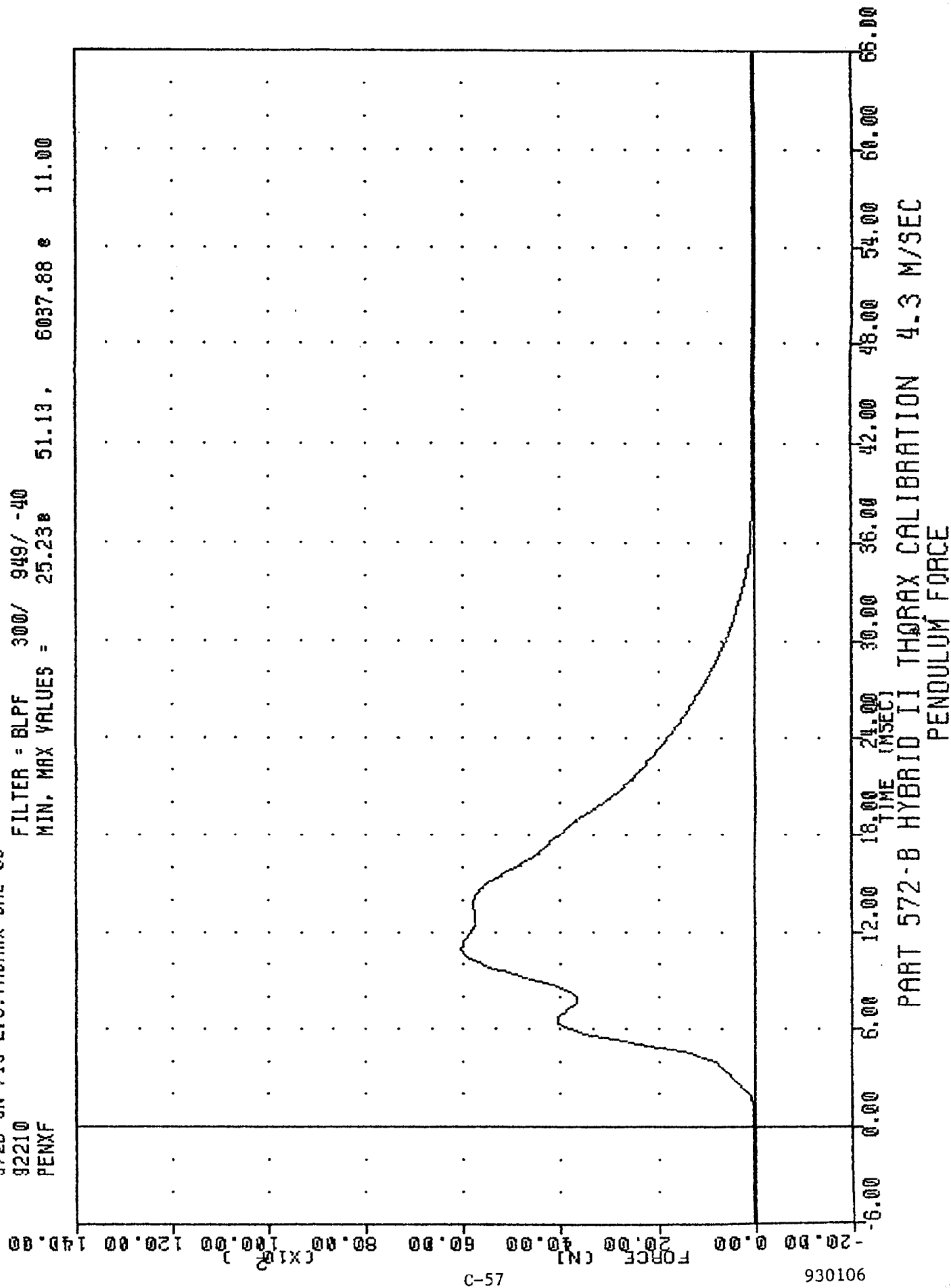
C-56

930106

PART 572-B HYBRID II THORAX CALIBRATION 4.3 M/SEC
 MIN, MAX VALUES = 0.11 26.36 11.00

TRC
572B SN 713 L.S.THORAX CAL 05
92210
PENXF

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 25.238 51.13, 6037.88 e 11.00



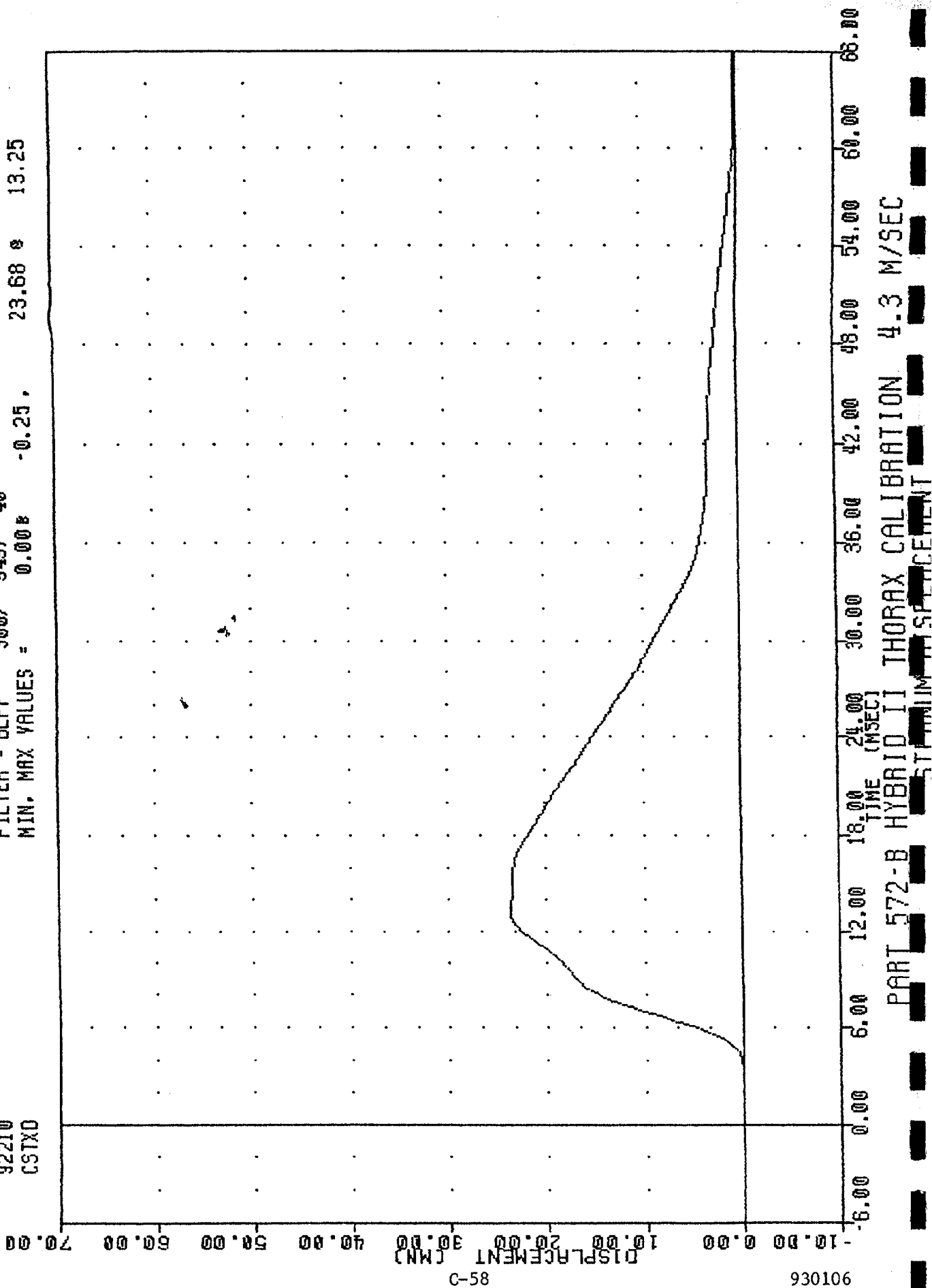
C-57

930106

PART 572-B HYBRID II THORAX CALIBRATION 4.3 M/SEC
PENDULUM FORCE

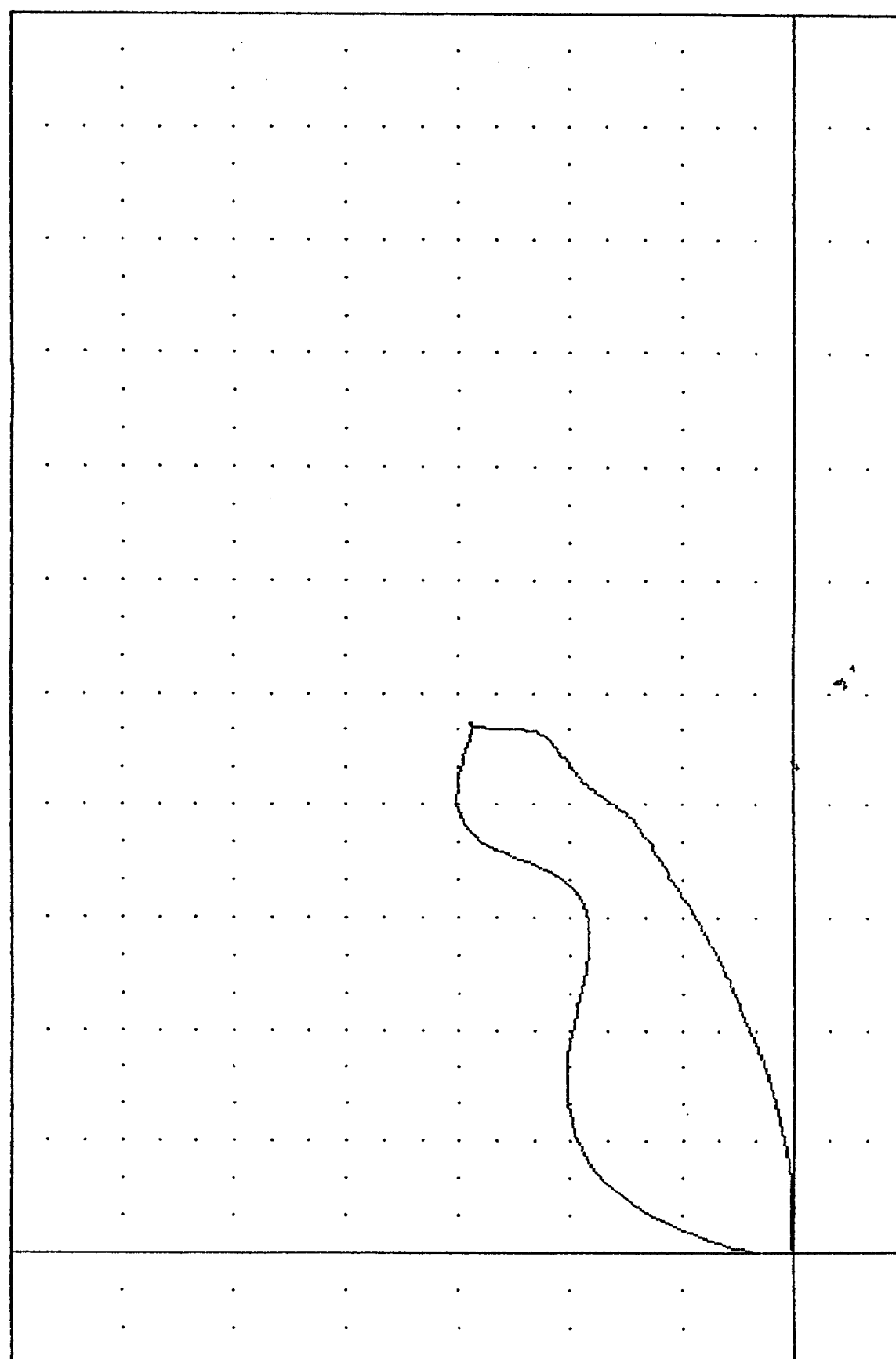
TRC
572B SN 713 L.S. THORAX CAL 05
92210
CSTXD

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.00% -0.25, 23.68% 13.25



TRC
 CSTXD
 PENXF
 IL71305
 FILTER = BLPF
 FILTER = BLPF
 5728 SN 713 L.S. THORAX CAL 05
 300/ 949/ -40
 300/ 949/ -40
 MIN, MAX =
 MIN, MAX =
 92210
 -0.25,
 51.13,
 23.68 e
 6037.88 e
 13.25
 11.00

930106
 C-59
 FORCE (N)
 PENXF
 140.00
 120.00
 100.00
 80.00
 60.00
 40.00
 20.00
 0.00
 -20.00



-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
 CHEST DISPLACEMENT VS PENDULUM FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

28-Jul-92

TEMPERATURE 21 C
TRC TH71305

RELATIVE HUMIDITY 56 %
572B SN 713 H. S. THORAX CAL 05

TEST PARAMETER	HIGH SPEED TEST	
	SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	6.64-6.77 M/SEC	6.73 M/SEC
PEAK DEFLECTION	43 MM max.	37.68 MM
PEAK RESISTIVE FORCE	10,009. N max.	9268. N
INTERNAL HYSTERESIS	50% - 70%	66.4%

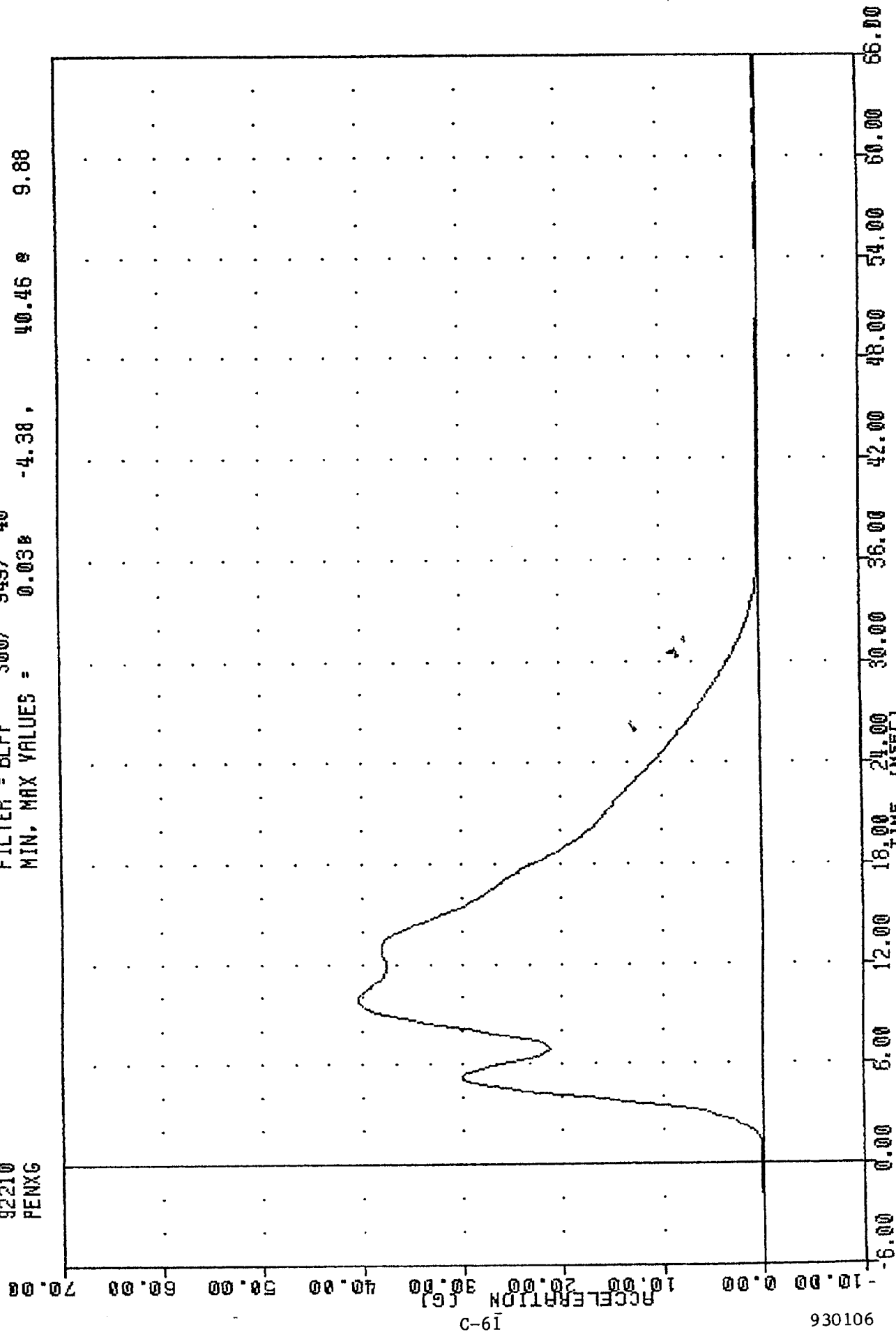
SCD: 54.61 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Fawcett

TRC
572B SN 713 H.S. THORAX CAL 05
92210
PENXG

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.038 -4.38 40.46 9.88



930106

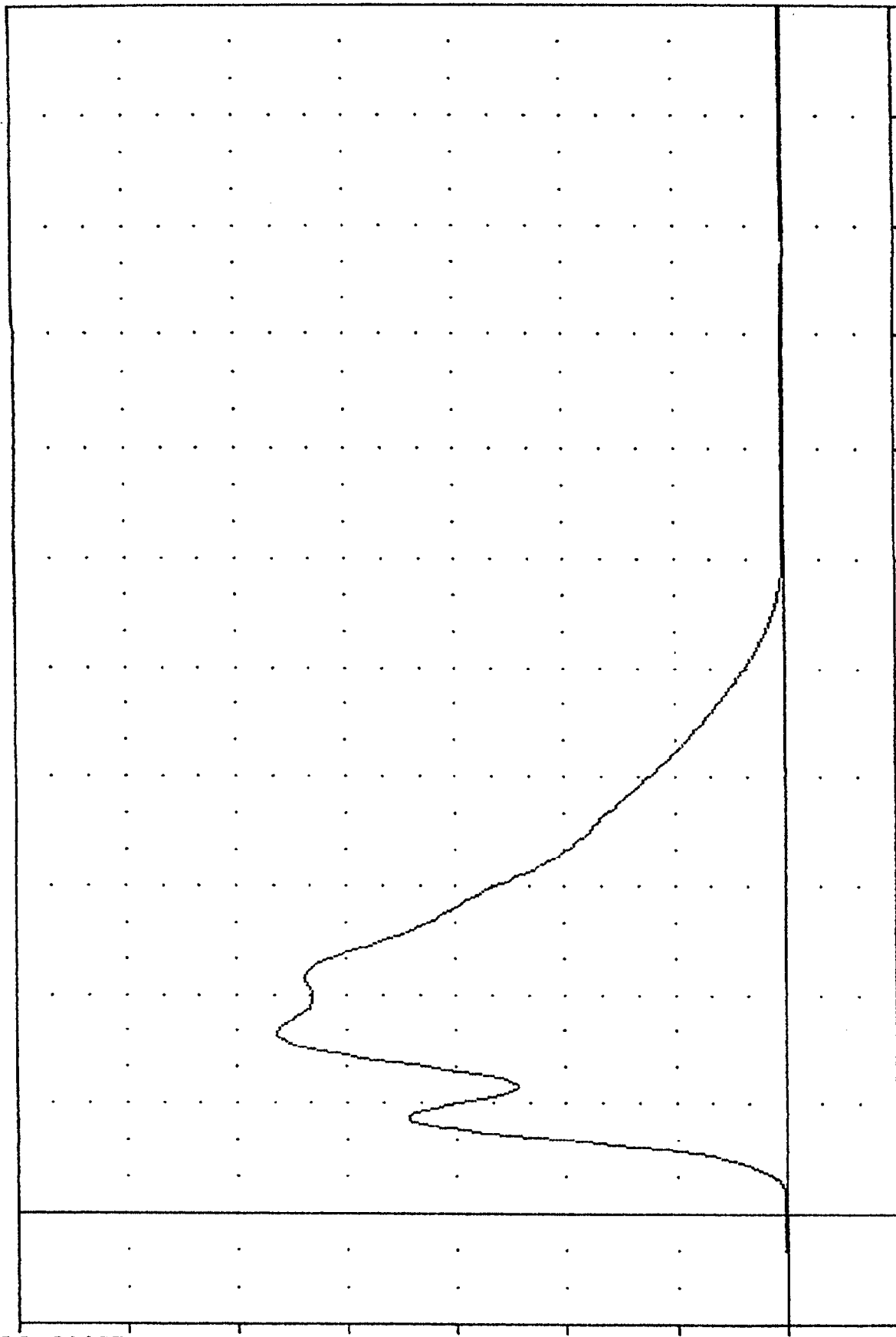
PART 572-B HYBRID II THORAX CALIBRATION 6.7 M/SEC
PENDULUM DECELERATION

TRC
 572B SN 713 H.S.THORAX CAL 05
 92210
 PENXF

TH71305

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -4.38 , 9268.35 e 9.88

FORCE (N) (X10²)



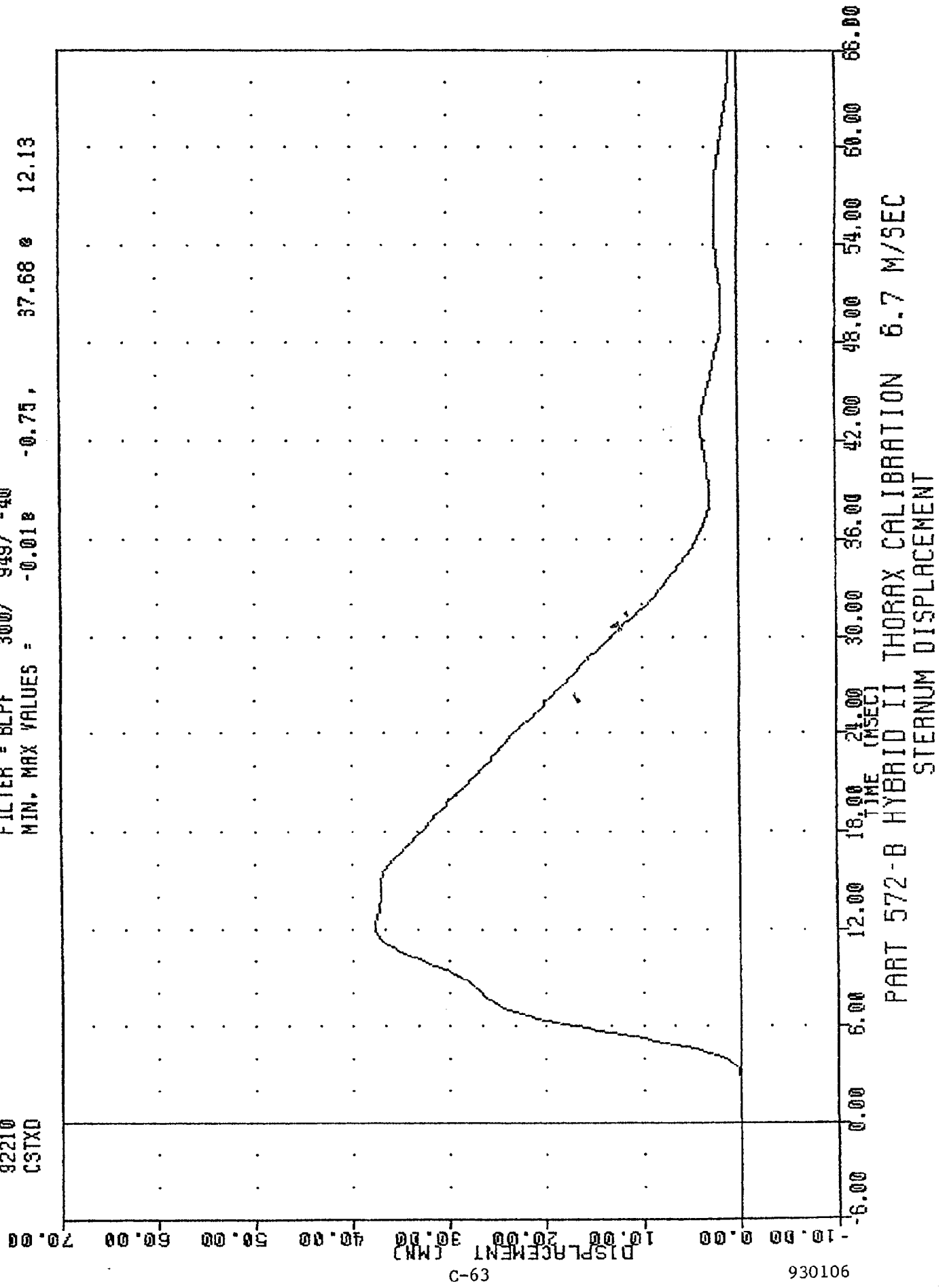
930106

C-62

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

TRC
 572B SN 713 H.S.THORAX CAL 05
 92210
 C3TXD

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.018 -0.75, 37.68 e 12.13



TAC
 CSTXD
 PENXF

,TH71305
 FILTER = BLPF
 FILTER = BLPF

572B SN 713 H. S. THORAX CAL 05
 300/ 949/ -40 MIN. MAX =
 300/ 949/ -40 MIN. MAX =

92210
 -0.01
 5.75

-0.75
 -4.38

37.68
 9268.35

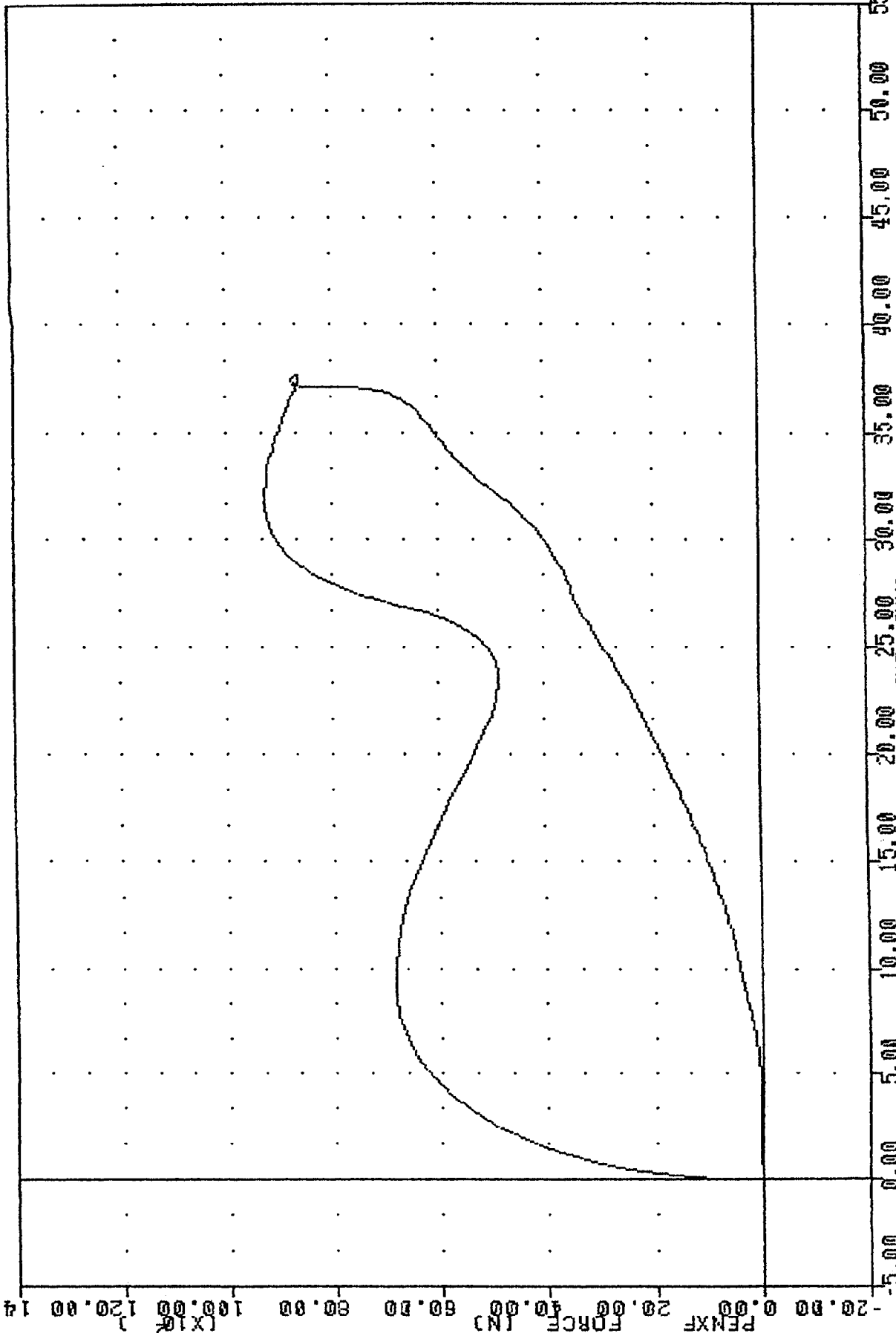
12.13
 9.88

140.00
 120.00
 100.00
 80.00
 60.00
 40.00
 20.00
 0.00
 -20.00

(X10²)
 FORCE (N)
 PENXF

C-64

930106



PART 572-B HYBRID II THORAX CALIBRATION 6.7 M/SEC
 CHEST DISPLACEMENT vs PENETRATION FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMEN COMPRESSION TEST

PART 572

27-Jul-92

TEMPERATURE 21 C
TRC AB71305

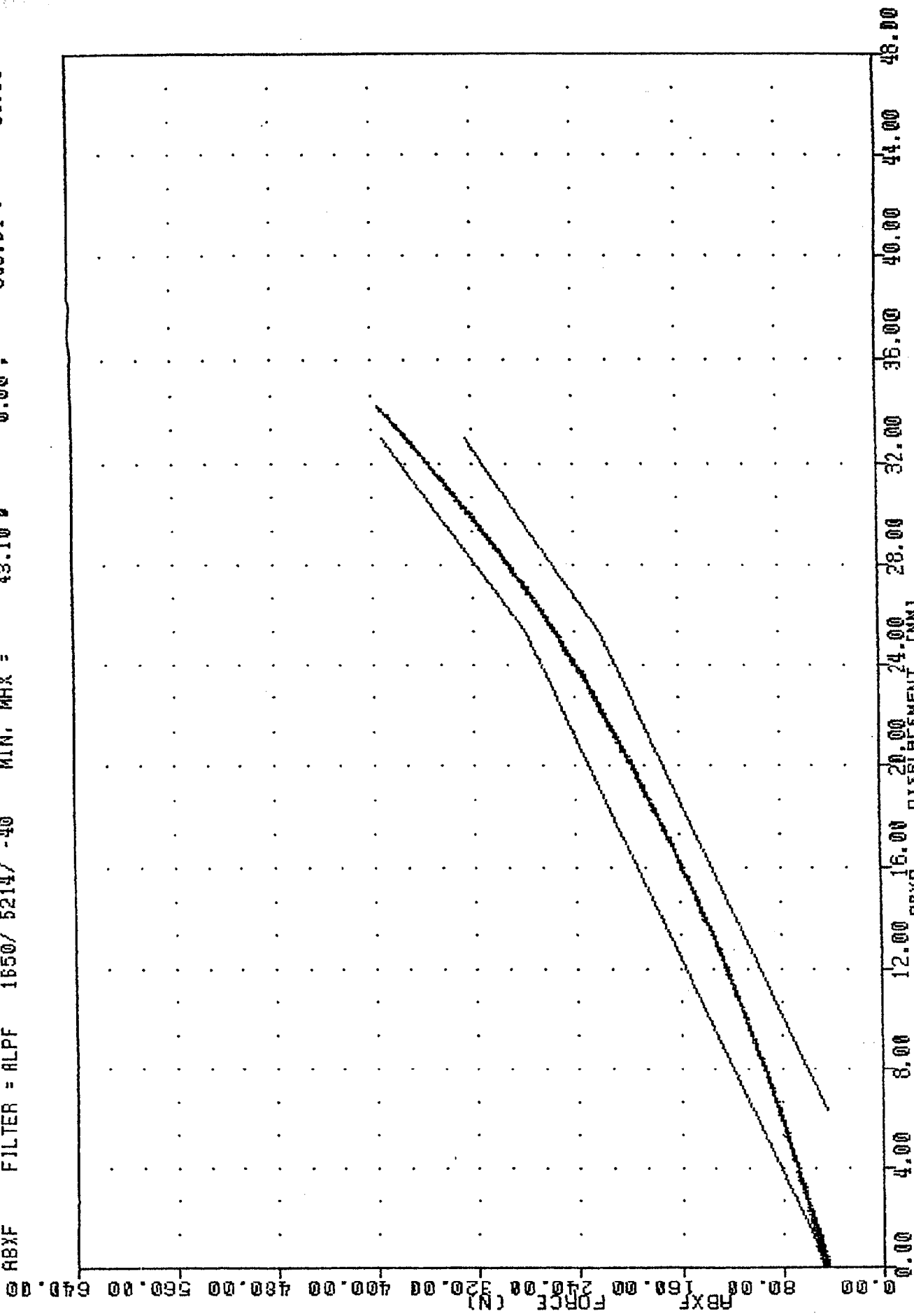
RELATIVE HUMIDITY 56 %
572B SN 713 ABDOM COMPR CAL 05

TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0.0 MM	44.48 N	44.48 N
12.7 MM	102.30 - 160.13 N	129.04 N
19.1 MM	160.13 - 222.40 N	187.29 N
25.4 MM	222.40 - 280.22 N	255.66 N
33.0 MM	324.70 - 391.42 N	372.73 N

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Rito Fout

TAC
 ABXD
 ABXF
 572B SN 713 ABDOOM COMP CAL 05 92209
 1650/ 5214/ -40 MIN. MAX = 0.00 34.30 395.84
 1650/ 5214/ -40 MIN. MAX = 43.10 395.84 34.30



C-66

930106

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

TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572

27-JUL-92

TEMPERATURE 21 C
TRC LF71305

RELATIVE HUMIDITY 56 %
572B SN713 LUMBAR FLEX CAL05

DEFLECTION	SPECIFICATION	TEST RESULTS
0 DEG	0 N	0.00 N
20 DEG	97.86 - 151.24 N	115.65 N
30 DEG	151.24 - 204.62 N	173.47 N
40 DEG	204.62 - 258.00 N	217.95 N
NET RETURN ANGLE	< 12 DEG	10.50 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Faint

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

24-Dec-92

TEMPERATURE 21 C
RIGHT KNEE
TRC RK71305A

RELATIVE HUMIDITY 36 %
572B SN 713 R. KNEE IMP CAL 05

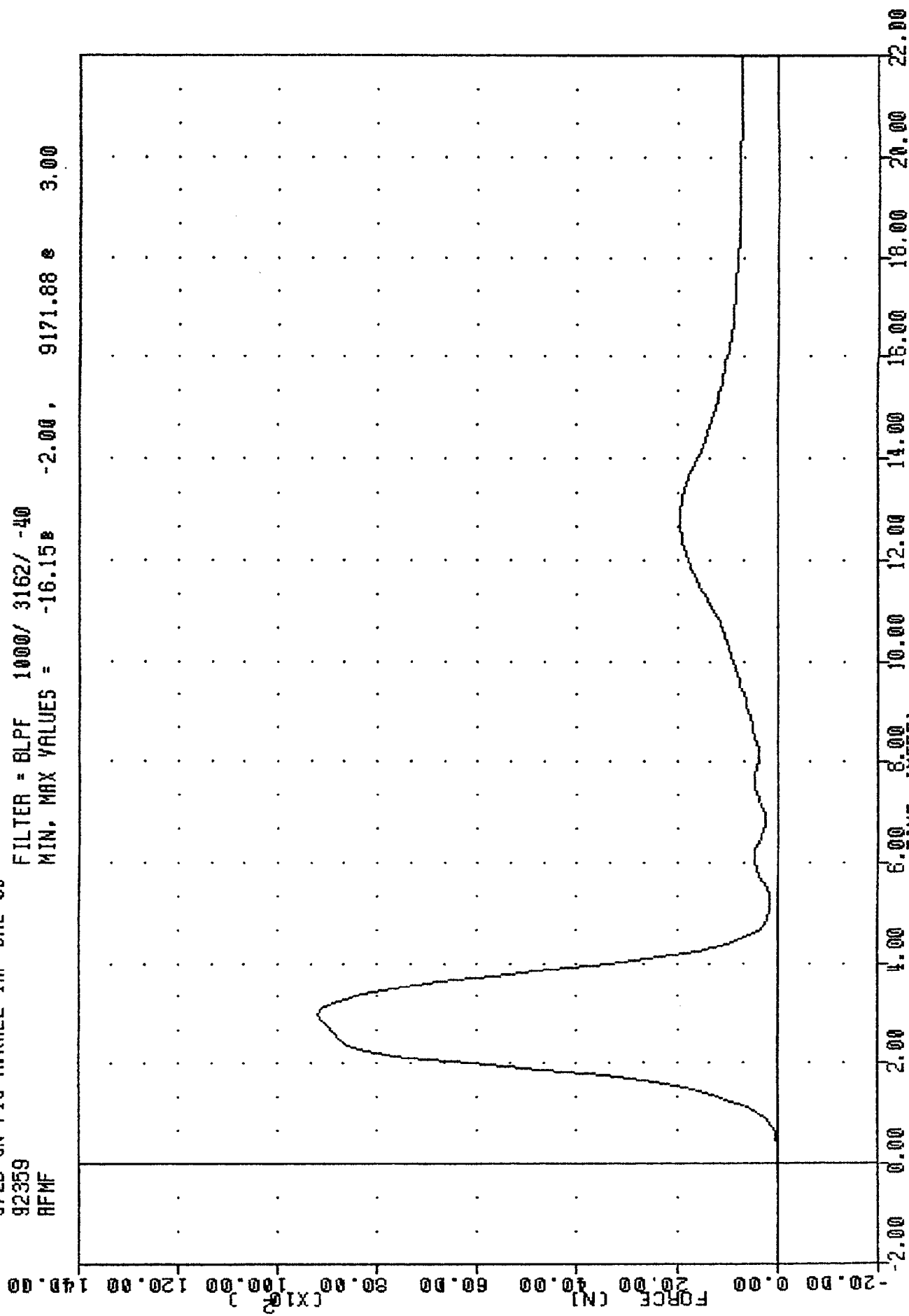
TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	2.06 - 2.15 M/SEC	2.12 M/SEC
PEAK KNEE IMPACT FORCE	8229 - 11121 N	9171.88 N
DURATION ABOVE 4448 N	≥ 1.7 MSEC	2.03 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Jant

TRC , RK71305A
 572B SN 713 R.KNEE INP CAL 05
 92359
 AFMF

FILTER = BLPF 1000/ 3162/ -40
 MIN. MAX VALUES = -16.15 9171.88 e 3.00



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

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

24-Dec-92

TEMPERATURE 21 C
LEFT KNEE
TRC LK71305A

RELATIVE HUMIDITY 36 %
572B SN 713 L.KNEE IMP CAL 05

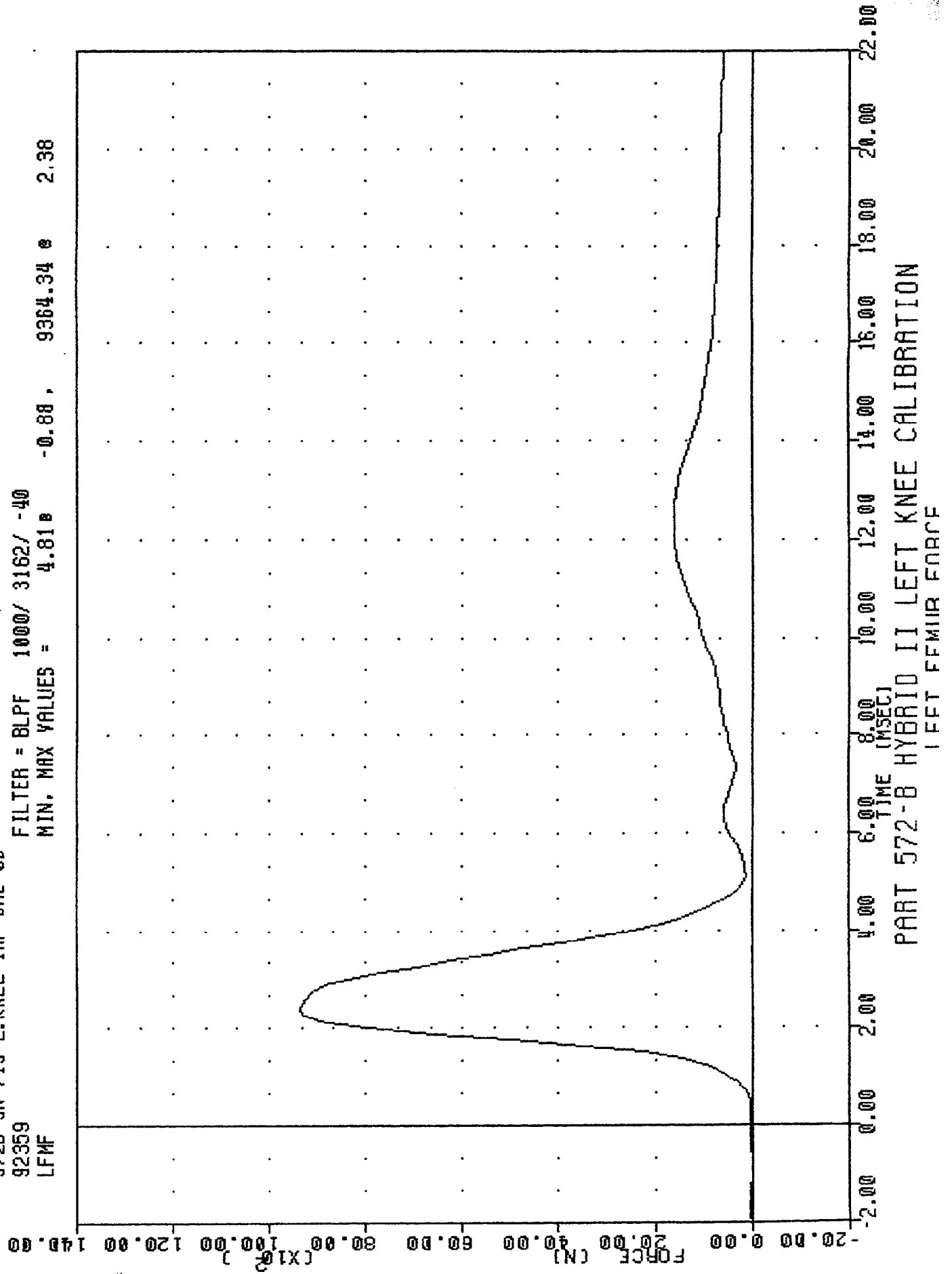
TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	2.06 - 2.15 M/SEC	2.13 M/SEC
PEAK KNEE IMPACT FORCE	8229 - 11121 N	9364.34 N
DURATION ABOVE 4448 N	>=1.7 MSEC	1.96 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Fant

TRC , LK71305A
 572B SN 713 L.KNEE INP CAL 05
 92359
 LFMF

FILTER = BLPF 1000/ 3162/ -40
 MIN. MAX VALUES = 4.81 -0.88, 9364.34 2.38



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

APPENDIX D

MISCELLANEOUS TEST INFORMATION

DUMMY INSTRUMENT CALIBRATIONS

DRIVER DUMMY #826

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCEL.	CL95H	7264	ENDEVCO	07/20/92	01/20/93
Y-AXIS ACCEL.	DW12JC	7264	ENDEVCO	07/20/92	01/20/93
Z-AXIS ACCEL.	CC11H	7264	ENDEVCO	07/20/92	01/20/93
CHEST X-AXIS ACCEL.	DB74H	7264	ENDEVCO	07/20/92	01/20/93
Y-AXIS ACCEL.	CY31H	7264	ENDEVCO	07/20/92	01/20/93
Z-AXIS ACCEL.	CH67H	7264	ENDEVCO	07/20/92	01/20/93
LEFT FEMUR FORCE LOAD CELL	880	2430	GSE	07/24/92	01/24/93
RIGHT FEMUR FORCE LOAD CELL	898	2430	GSE	07/24/92	01/24/93
*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	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	07/30/92	01/30/93
SHOULDER BELT STRETCH POTENTIOMETER	2690	2051414101	BOURNES	07/30/92	01/30/93

*HYBRID III USE ONLY.

DUMMY INSTRUMENT CALIBRATIONS

PASSENGER DUMMY #713

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCEL.	CW96H	7264	ENDEVCO	07/21/92	01/21/93
Y-AXIS ACCEL.	DK71J	7264	ENDEVCO	09/23/92	03/23/93
Z-AXIS ACCEL.	CR78H	7264	ENDEVCO	07/20/92	01/20/93
CHEST X-AXIS ACCEL.	CC71H	7264	ENDEVCO	07/21/92	01/21/93
Y-AXIS ACCEL.	CY32H	7264	ENDEVCO	07/21/92	01/21/93
Z-AXIS ACCEL.	CG13H	7264	ENDEVCO	07/21/92	01/21/93
LEFT FEMUR FORCE LOAD CELL	901	2430	GSE	07/24/92	01/24/93
RIGHT FEMUR FORCE LOAD CELL	902	2430	GSE	07/24/92	01/24/93
*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	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	07/30/92	01/30/93
SHOULDER BELT STRETCH POTENTIOMETER	1291	2051414101	BOURNES	07/30/92	01/30/93

*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	BY03H	7264	ENDEVCO	11/20/92	05/20/93
RIGHT REAR SEAT CROSSMEMBER X-AXIS	CP37H	7264	ENDEVCO	07/14/92	01/14/93
RIGHT REAR SEAT CROSSMEMBER X-AXIS REDUN	CJ37H	7264	ENDEVCO	07/22/92	01/22/93
ENGINE TOP X-AXIS	CW79H	7264	ENDEVCO	07/14/92	01/14/93
ENGINE BOTTOM X-AXIS	CH12H	7264	ENDEVCO	11/23/92	05/23/93
RIGHT BRAKE CALIPER X-AXIS	DG40J	7264	ENDEVCO	07/14/92	01/14/93
LEFT BRAKE CALIPER X-AXIS	CE72H	7264	ENDEVCO	11/23/92	05/23/93
INSTRUMENT PANEL CENTER X-AXIS	CK01H	7264	ENDEVCO	07/23/92	01/23/93

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

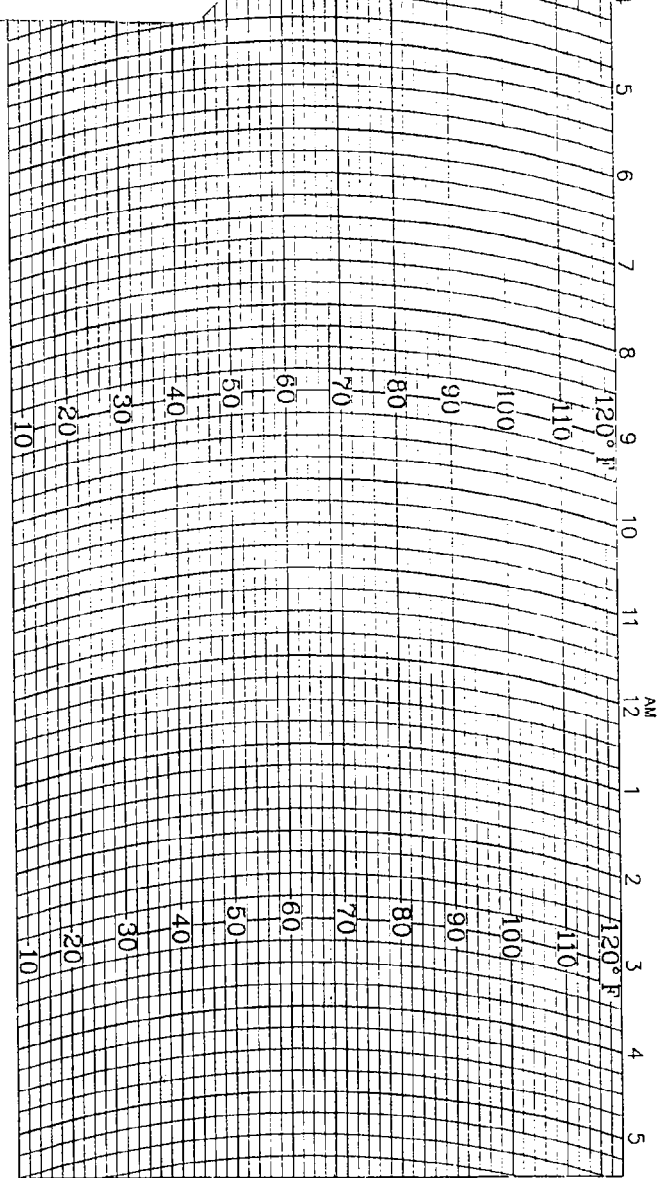
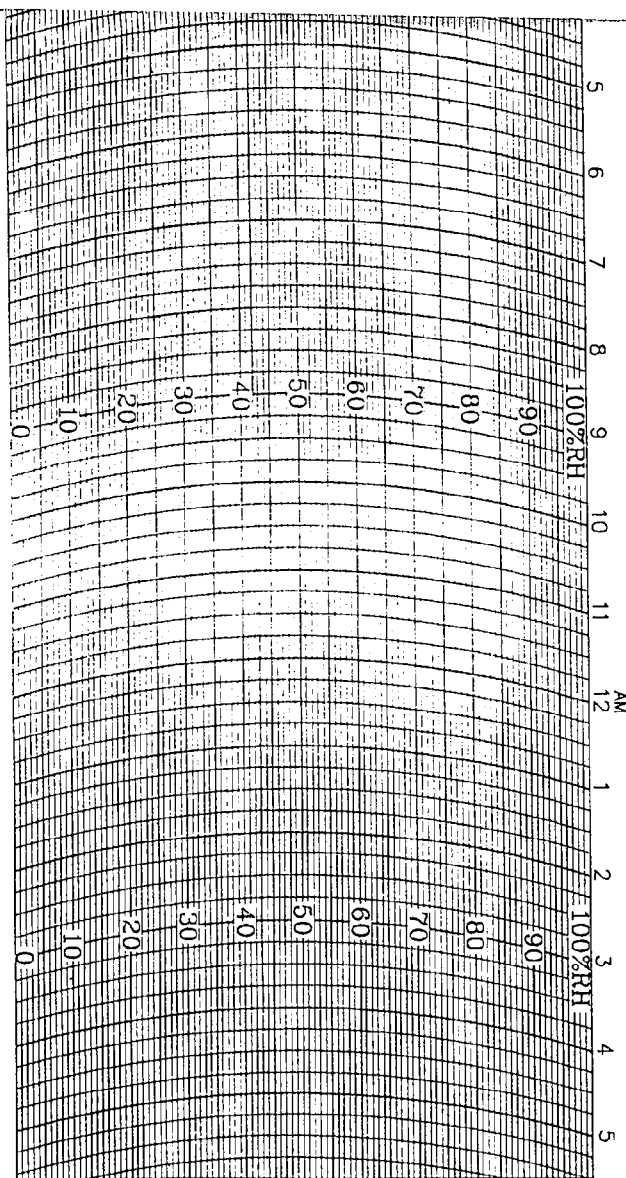
TIBIA LOAD CELLS:

+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

<u>TYPICAL TEST MEASUREMENTS</u>	<u>CHANNEL CLASS</u>
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



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HYGROTHERMOGRAPH
 1 DAY

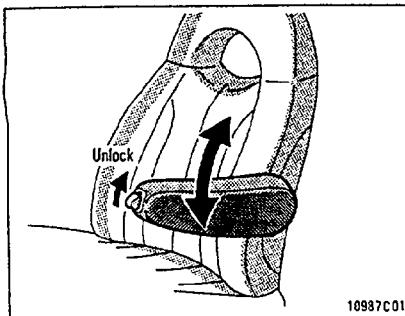
CHART NO. M699123
 C311-D-HF
 ECN 2717
 6-9-87

STATION _____ DATE ON _____ DATE OFF _____

APPENDIX E

RESTRAINT SYSTEM INSTRUCTIONS FROM OWNER'S MANUAL

Front armrests



To adjust the armrest angle, simply raise the armrest, or lower it while pulling up the knob. Then release the knob at the desired angle.

Seat belts— —Seat belt precautions

Toyota recommends that the driver and passengers in the vehicle be properly restrained at all times with the seat belts provided. Failure to do so could increase the chance of injury and/or the severity of injury in accidents.

Baby or small child. Use a child restraint system which fits your vehicle. See "Child restraint" for details.

Child. If a child is too big for a child restraint system, the child should sit in the seat and must be restrained with the seat belt. According to accident statistics, the child is safer when properly restrained in the rear seat than in the front seat. Do not allow the child to stand up or kneel on the seat. If the shoulder belt falls across the child's neck or face, use the 2-point type seat belt.

Pregnant woman. Toyota recommends the use of a seat belt. Ask your doctor for specific recommendations. The lap belt should be worn securely and as low as possible over the hips and not on the waist.

Injured person. Toyota recommends the use of a seat belt. Depending on the injury, however, first check with your doctor.

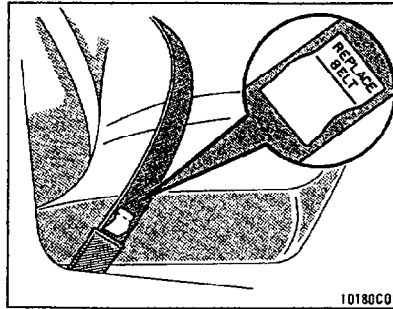
CAUTION:

Persons should ride in their seats properly wearing their seat belts whenever the vehicle is moving. Otherwise, they are much more likely to suffer serious bodily injury in the event of sudden braking or a collision.

When using the seat belts, observe the following:

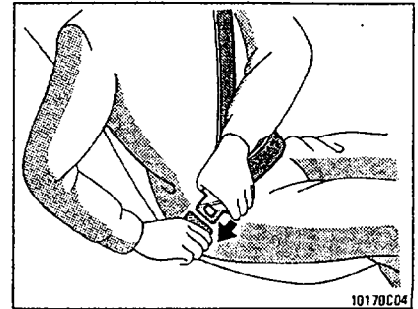
- Use the belt for only one person at a time. Do not use a single belt for two or more people—even children.
- After inserting the tab, make sure that the connection is secure and the belt is not twisted.
- Avoid reclining the seatbacks too much. The seat belts provide maximum protection when the seatbacks are in the upright position. (See the seat adjustment instructions.)
- Be careful not to damage the belt webbing or hardware, and take care that they do not get caught or pinched in the seat or doors.
- Inspect the belt system periodically. Check for cuts, frays, and loose parts. Damaged parts should be replaced. Do not disassemble or modify the system.

- Keep the belts clean and dry. If they need cleaning, use a mild soap solution or lukewarm water. Never use bleach, dye, or abrasive cleaners—they may severely weaken the belts.
- Replace the belt assembly if it has been used in a severe impact. The entire assembly should be replaced even if damage is not obvious.



- Replace the belt if the warning label under the sleeve can be seen. The warning label, "REPLACE BELT", will appear if the belt receives a severe impact or other force.

—3-point type



Adjust the seat as needed and *sit up straight and well back in the seat*. To fasten your belt, pull it out of the retractor and insert the tab into the buckle.

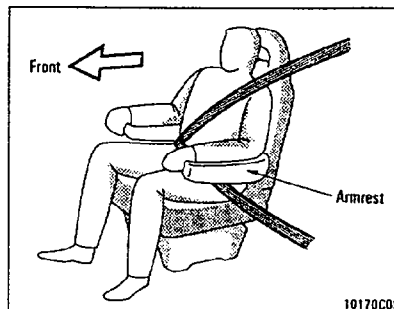
You will hear a click when the tab locks into the buckle.

The seat belt length automatically adjusts to your size and the seat position.

The retractor will lock the belt during a sudden stop or on impact. It also may lock if you lean forward too quickly. A slow, easy motion will allow the belt to extend, and you can move around freely.

If the seat belt cannot be pulled out of the retractor, firmly pull the belt and release it. You will then be able to smoothly pull the belt out of the retractor.

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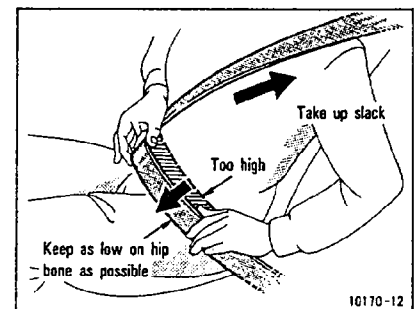


This passengers' seat belts are dual mode locking type: they cannot be extended further once you pull them out fully and allow them to retract a little. This feature is used to hold the child restraint system securely. (For details, see "Child restraint" in this Chapter.) To free the belt, allow it to retract fully.

BELTS FOR SWIVEL TYPE SECOND SEAT (FACING FRONT)

For the swivel type second seat, use 3-point type seat belt when it is facing front.

The shoulder portion of the lap/shoulder belt must pass over the outside armrest and the lap portion must be routed under the outside armrest.



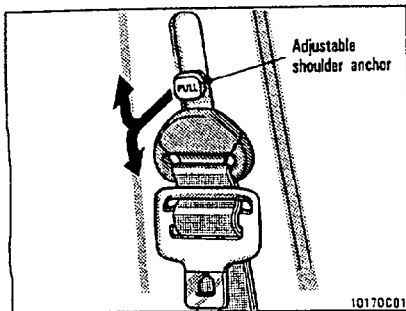
Adjust the position of the lap and shoulder belts.

Position the lap belt as low as possible on your hips—not on your waist, then adjust it to a snug fit by pulling the shoulder portion upward through the latch plate.

CAUTION:

- Both high-positioned lap belts and loose-fitting shoulder belts could increase the chance of injury due to sliding under the lap belt during an accident.
- For your safety, do not place the shoulder belt under your arm.

29



Seat belts with an adjustable shoulder anchor—

Adjust the shoulder anchor position to your size.

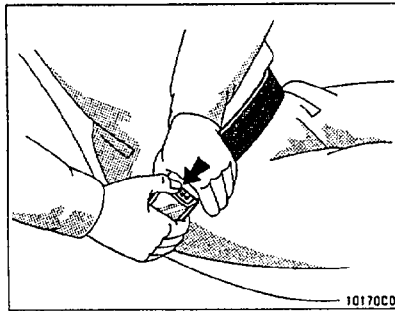
To adjust the anchor position, pull the knob out and slide it up or down. Release the knob and make sure the anchor is locked in position.

CAUTION:

Always be sure that the belt is positioned across your shoulder, as close to your neck as possible; not on your upper arm or neck. Failure to do so could reduce the amount of protection in an accident and increase the chance of injury.

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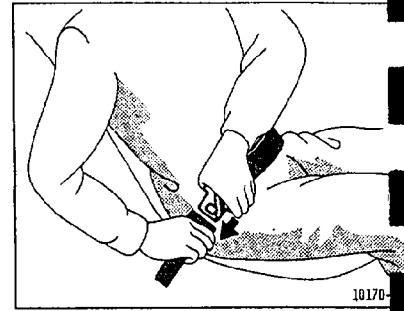
30



To release the belt, press the buckle-release button and allow the belt to retract.

If the belt does not retract smoothly, pull it out and check for kinks or twists. Then make sure that it remains untwisted as it retracts.

—2-point emergency locking retractor type

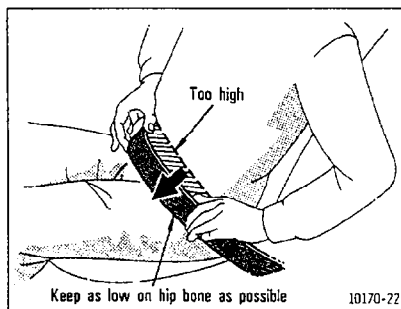


Sit up straight and well back in the seat. To fasten your belt, pull it out of the retractor and insert the tab into the buckle.

You will hear a click when the tab locks in the buckle.

The seat belt length automatically adjusts to your size.

The retractor will lock the belt during a sudden stop or on impact.



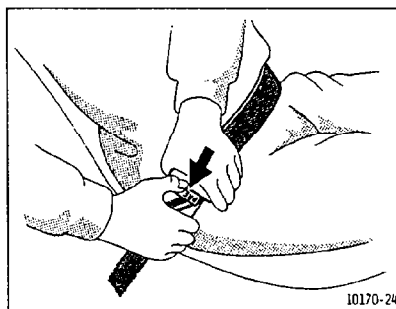
Adjust the position of the belt.

Position the lap belt as low as possible on your hips—not on your waist, then adjust it to a snug fit by pulling it firmly across your lap toward the retractor, so it can take up slack.

CAUTION:

High-positioned lap belts could increase the chance of injury due to sliding under the lap belt during an accident.

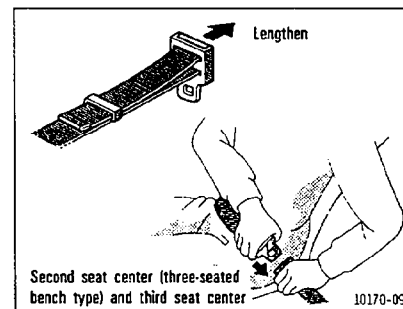
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To release the belt, press the buckle-release button and allow the belt to retract.

If the belt does not smoothly retract, pull it out and check for kinks or twists. Then make sure that it remains untwisted as it retracts.

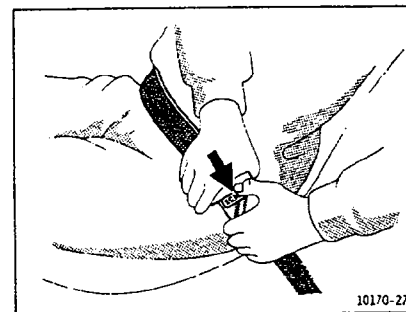
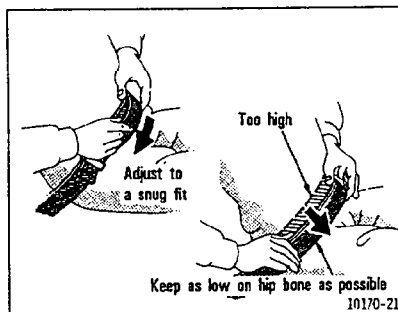
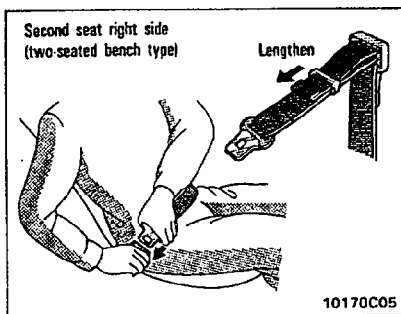
—2-point non-retractor type



Sit well back in the seat and straight up. To fasten your belt, insert the tab into the buckle.

You will hear a click when the tab locks into the buckle.

If the belt is not long enough for you, hold the tab at a right angle to the belt and pull on the tab.



Remove excess length of the belt and adjust the belt position.

To shorten the belt, pull the free end of the belt.

Position the lap belt as low as possible on your hips—not on your waist, then adjust it to a snug fit.

CAUTION:

High-positioned lap belts could increase the chance of injury due to sliding under the lap belt during an accident.

To release the belt, press the buckle-release button.

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—Seat belt extender

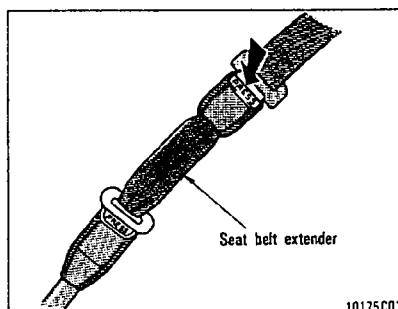
If your seat belt cannot be fastened securely because it is not long enough, a personalized seat belt extender is available from your Toyota dealer free of charge.

Please contact your local Toyota dealer so that the dealer can order the proper required length for the extender. Bring the heaviest coat you expect to wear for proper measurement and selection of length. Additional ordering information is available at your Toyota dealer.

CAUTION:

When using the seat belt extender, observe the following. Failure to follow these instructions could result in less effectiveness of the seat belt restraint system in case of vehicle accident, increasing the chance of personal injury.

- o Never use the seat belt extender if you can fasten the seat belt without it.
- o Remember that the extender provided for you may not be safe when used on a different vehicle, or for another person and at different seating position than specified.



To connect the extender to the seat belt, insert the tab into the seat belt buckle so that the buckle-release buttons of the extender and the seat belt are located on the same side as shown.

You will hear a click when the tab locks into the buckle.

When releasing the seat belt, press on the buckle-release button on the extender, not on the seat belt. This helps prevent damage to the vehicle interior and extender itself.

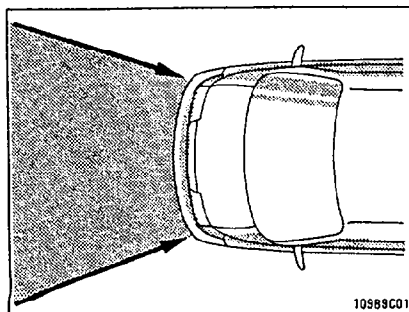
When not in use, remove the extender and store in the vehicle for future use.

CAUTION:

After inserting the tab, make sure that the connection is secure and the seat belt extender is not twisted.

33

SRS airbag



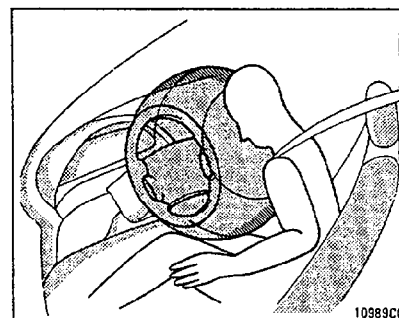
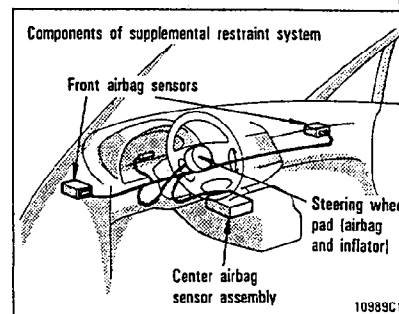
The SRS (Supplemental Restraint System) airbag is designed to be activated in response to a severe frontal impact within the shaded area as shown in the illustration, and to provide the driver with further protection in addition to the protection provided by the driver's seat belt.

The SRS airbag system is not designed to protect the driver from an impact from the side or rear, or if the vehicle overturns.

For instructions and precautions concerning the seat belt system, see "Seat belt".

CAUTION:

The SRS airbag system is designed only as a supplement to the driver's seat belt system. To obtain maximum protection in an accident, the driver and all passengers in the vehicle should always wear his/her seat belts when driving.



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The center airbag sensor assembly consists of a safing sensor and center airbag sensor. In the event of a severe frontal impact, a front airbag sensor and safing sensor, or center airbag sensor and safing sensor detect the shock, the center airbag sensor assembly triggers the inflator, and the inflator fills the bag to restrain the driver's forward motion.

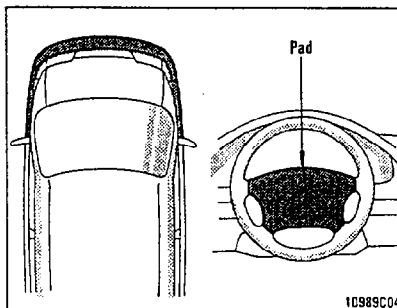
When the SRS airbag inflates, an operating noise will be heard and a small amount of smoke-like gas will be released. This gas is harmless and does not indicate that a fire is occurring.

CAUTION:

Do not modify or remove any component or wiring, such as the steering wheel, column cover, center airbag sensor assembly or front airbag sensors. Doing any of these may cause sudden SRS airbag inflation or disable the system, which could result in personal injury.

NOTICE:

Do not perform any of the following changes without prior approval from Toyota dealers. Repairs or service of this kind can interfere with proper operation of the SRS airbag system in some cases.



- Installation of electronic items such as a mobile two-way radio, cassette tape player or Compact Disc player.
- Modifications to the suspension system.
- Repairs made on or near the front fenders, front console, steering column or steering wheel.

In the following cases, contact your Toyota dealer as soon as possible:

- The SRS airbag system malfunctions. This SRS airbag system has a service reminder indicator to indicate operating problems. See "Service reminder indicators and warning buzzers" in Chapter 1-5.

- The SRS airbag has been inflated.
- The front part of the vehicle (shown in the illustration) was involved in an accident which was not of the extent to cause the SRS airbag to inflate.
- The pad section of the steering wheel (shown in the illustration) is scratched, cracked, or otherwise damaged.

Child restraint—

—Child restraint precautions

Toyota strongly urges the use of a child restraint systems for children small enough for the child restraint system.

The laws of all fifty states in the U.S.A. and Canada now require the use of a child restraint system.

CAUTION:

For effective protection in automobile accidents and sudden stops, children must not be transported unrestrained. Holding a child in your arms is not a substitute for a child restraint system. In an accident, a child held in a person's arms can be crushed between the vehicle's interior and an unrestrained person.

.....

—Child restraint system

A child restraint system for a small child or baby must be restrained on the seat with either the lap belt or the lap portion of the lap/shoulder belt.

The child restraint system should conform to the size of the child and properly fit the vehicle seat. For a higher degree of safety, the child restraint system should be installed in the rear seat. According to accident statistics, children are safer when properly restrained in the rear seat than in the front seat.

When installing a child restraint system, refer to the instructions provided by the manufacturer of the system and follow the directions listed under the following illustrations.

Your vehicle is provided with anchors for securing the top strap of a child restraint system. The anchor nuts are welded beneath the sheet metal to permit installation of an anchor bracket for a child restraint system.

To install an anchor bracket, use an 8 mm X 30 mm X 1.25 mm coarse thread metric bolt and two spacers (second seat—15 mm [0.6 in.] and 5 mm [0.2 in.], and third seat—15 mm [0.6 in.] and 10 mm [0.4 in.]). Note that the bolts accompanying many child restraint systems are not metric. You can damage the anchor nuts on your vehicle if you force bolts with different thread into the anchor nuts.

For instructions about how to install the anchor bracket, see "(c) TOP STRAP ANCHORS AND LOCATIONS".

If any of the necessary parts do not come with your child restraint system, you can purchase them from your Toyota dealer. Details are as follows:

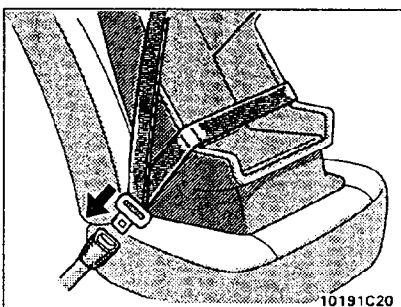
- * CRS installation kit (Part No. 04731-22012)
Kit contains bolt, 3 types of spacers and locking clip.
- * Bolt (Part No. 91511-60830)
- * Locking clip (Part No. 73119-22010)

CAUTION:

After installation, make sure the child restraint system is secure in place. If the child restraint system is not restrained securely, it may cause injury to the child in case of vehicle accident and sudden stops.

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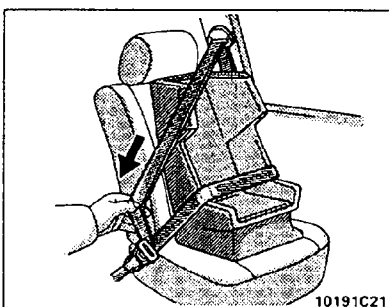
When not using the child restraint system, keep it secured with the seat belt or remove it and place it somewhere other than in the vehicle to prevent injury to passengers in event of a sudden stop or accident.



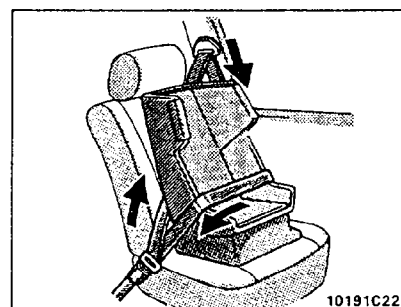
(A) INSTALLATION WITH A 3-POINT TYPE SEAT BELT

Forward-facing child restraint system—

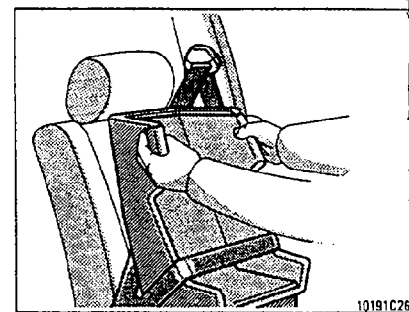
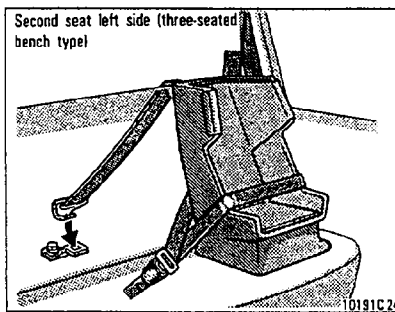
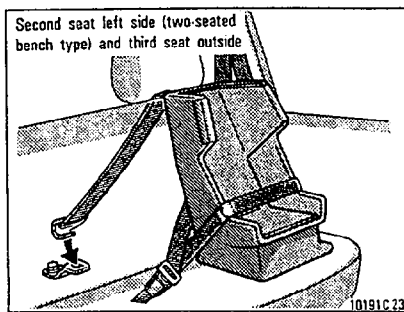
1. Fasten the lap and shoulder belt over the child restraint system in accordance with the instruction provided with the child restraint system. Keep the lap portion of the belt tight.



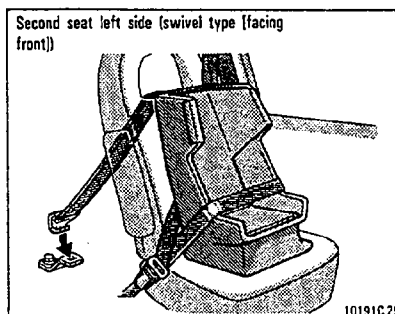
2. Pull the shoulder belt fully out.



3. To hold the child restraint system securely, let the shoulder belt retract as far as it will go while firmly pushing down the child restraint system.

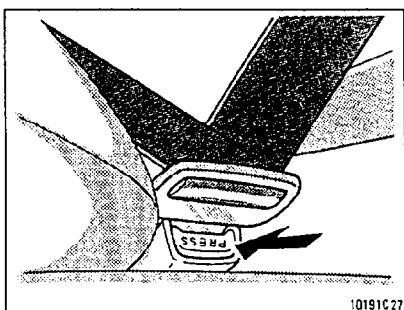


4. For second seat left side (two-seat bench type, three-seat bench type and swivel type [facing front]) and third seat outside: If your child restraint system requires the use of a top strap, latch the hook onto the anchor bracket and tighten the top strap.

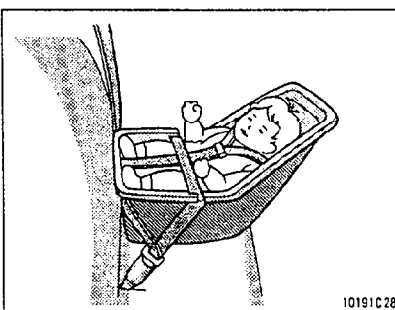


5. Make sure the seat belt is securely locked and that the child restraint system is secure by pushing and pulling it in different directions.

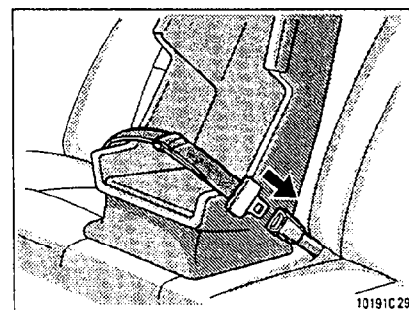
38



6. To remove the child restraint system, press the buckle-release button and allow the belt to retract. Unlatch the top strap.

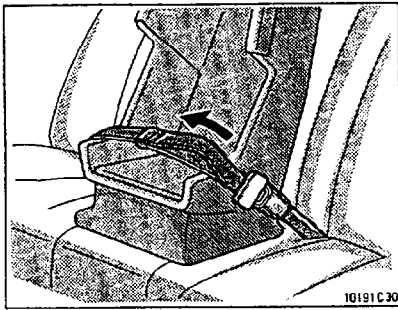


Rear-facing child restraint system—
When installing a rear-facing child restraint system, follow the same procedure to install a forward-facing child restraint system.

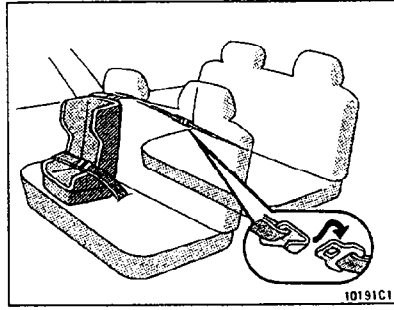


(B) INSTALLATION WITH A 2-POINT TYPE SEAT BELT

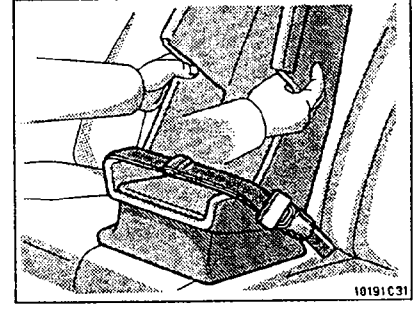
Forward-facing child restraint system—
1. Fasten the lap belt over the child restraint system in accordance with the instruction provided with the child restraint system.



2. To hold the child restraint system securely, tighten the belt by pulling its free end while firmly pushing down the child restraint system.

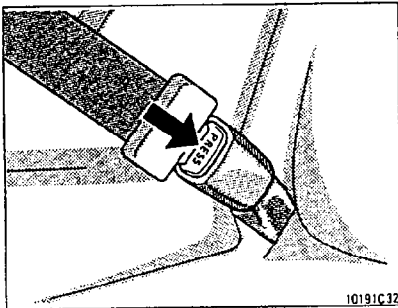


3. Second seat right side (two-seated bench type) only: If your child restraint system requires the use of a top strap, latch the hook onto the tab of the third center seat belt and tighten the top strap.

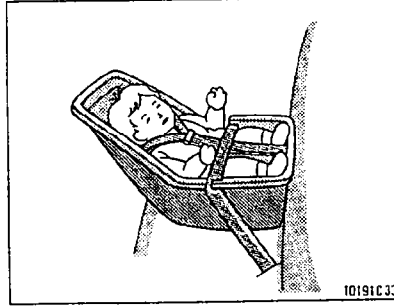


4. Make sure the seat belt is securely locked and that the child restraint system is secure by pushing and pulling it in different direction.

40

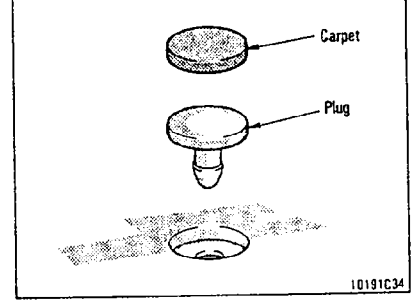


5. To remove the child restraint system, press the buckle-release button and unlatch the top strap.



Rear-facing child restraint system—

When installing a rear-facing child restraint system, follow the same procedure to install a forward-facing child restraint system.



(C) TOP STRAP ANCHORS AND LOCATIONS

All models —On the floor behind the seat

a. Using the illustration as a guide, cut out the carpet on the floor behind the seat. The anchor holes are plugged.

b. Remove the anchor plug you wish to use and insert spacer (15 mm [0.6 in.]) for the second seat, or spacer (15 mm [0.6 in.]) for the third seat. Tighten down the anchor bracket for your child restraint system with a bolt.

