

REPORT NO. TRC-91-N07

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

FORD MOTOR COMPANY
1992 FORD CLUB WAGON VAN
NHTSA NO. MN0202
TRC TEST NO. 920226

PREPARED BY:
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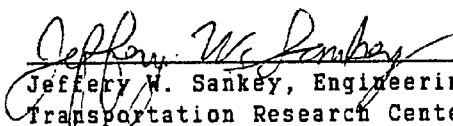


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FINAL REPORT

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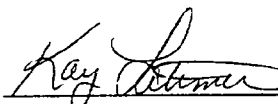
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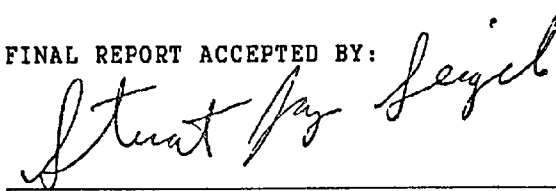
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16. Abstract A 35 mph frontal load cell barrier impact test was conducted on a 1992 Ford Club Wagon van, NHTSA No. MN0202, at the Transportation Research Center Inc. on February 26, 1992. This test was conducted to obtain new car assessment and research data indicant of FMVSS No. 208 performance. The barrier impact velocity was 35.2 mph. The vehicle's maximum crush was 20.0 inches. The ambient temperature was 68° F. The driver's head injury criteria (HIC) was 698. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.8 g. The driver's left and right femur maximum axial forces were 1528 pounds and 797 pounds, respectively. The passenger's head injury criteria (HIC) was 1004. The passenger's chest maximum resultant accceleration with three (3) milliseconds minimum duration was 51.8 g. The passenger's left and right femur maximum axial forces were 396 pounds and 408 pounds, respectively.					
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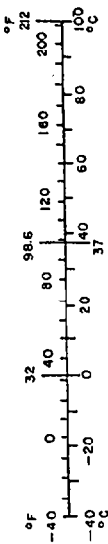
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons	0.9	tonnes	t
	(2000 lb)			
VOLUME				
tap	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	0.28	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. SO Catalog No. C13.10-286.

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SECTION 1.0

PURPOSE AND TEST PROCEDURE

PURPOSE

This 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 1992 Ford Club Wagon van, NHTSA No. MN0202, at an impact speed in excess of the current 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 seven (7) accelerometers to measure longitudinal axis accelerations and two (2) accelerometers to measure vertical 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 34.5 to 35.5 mph.

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 February 26, 1992.

The test vehicle, a 1992 Ford Club Wagon van, NHTSA No. MN0202, was equipped with a 4.9 liter inline engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 5785 pounds. The vehicle's impact speed was 35.2 mph. The vehicle sustained 20.0 inches of static crush during the impact.

The driver's head injury criteria (HIC) was 698. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.8 g. The driver's left and right femur maximum axial forces were 1528 pounds and 797 pounds, respectively.

The passenger's HIC was 1004. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.8 g. The passenger's left and right femur maximum axial forces were 396 pounds and 408 pounds, respectively.

DATA ACQUISITION EXPLANATIONS

The driver's seat belt extension potentiometer, SBED1, recorded a questionable spike at 76 milliseconds.

The right front passenger's seat belt extension potentiometer, SBED2, recorded a questionable spike at 23 milliseconds.

The vehicle rear center Z-axis accelerometer, RDKZG1, recorded a questionable spike at 12 milliseconds. The vehicle rear center Z-axis velocity and displacement calculations, RDKZV1, and RDKZD1, were affected by this spike.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: MN0202 TEST TYPE: Frontal Load Cell Barrier

TEST DATE: 02/26/92 TEST TIME: 1536 AMBIENT TEMP. (°F): 68

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1992/Ford/Club Wagon/van

VEHICLE TEST WEIGHT (LBS): 5785

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (MPH)**: PRIMARY = 35.2 SECONDARY = 35.2

MAXIMUM STATIC CRUSH (IN): 20.0

AVERAGE REBOUND (IN): 24.5

DUMMIES:	Driver #713	Passenger #826
TYPE:	Part 572 B	Part 572 B
LOCATION:	Left front	Right front
RESTRAINT:	Airbag and 3-point Unibelt	3-point Unibelt

NUMBER OF DATA CHANNELS: 69

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

*With respect to tow track centerline.

**Speed trap measurement ($\pm$.05 mph accuracy)

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Ford Motor Company

MAKE/MODEL: Ford/Club Wagon

VIN: 1FMEE11Y2NHA03973

BODY STYLE: Van

MODEL YEAR: 1992

NHTSA NO.: MN0202

COLOR: Blue

ENGINE DATA: TYPE: inline CYLINDERS: 6 DISPLACEMENT: 4.9 liter

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

DATE VEHICLE RECEIVED: 12/30/91

ODOMETER READING: 88.2

DEALER'S NAME AND ADDRESS: Dutro Ford, Lincoln-Mercury, Nissan, Inc.
131 South Fifth St.
Zanesville, OH 43702

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	Yes	AIR CONDITIONING	Front
RADIO	Yes	ANTI-SKID BRAKE	Rear
CLOCK	Yes	REAR WINDOW DEFROSTER	No
OTHER	3.08 ratio rear axle		
	Clearcoat paint		
	Auxillary heater		

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: Ford Motor Company

DATE OF MANUFACTURE: 09/91

VIN: 1FMEE11Y2NHA03973

GVWR: 6700 LBS

GAWR: FRONT: 3400 LBS., REAR: 3800 LBS.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Goodyear Wrangler HT P235/75R15

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 41 PSI
REAR: 41 PSI

SPARE TIRE (MFR., LINE, SIZE): Goodyear, Wrangler HT, P235/75R15

TYPE OF SEATS: FRONT: Bucket
REAR: Bench (2)

TYPE OF FRONT SEAT BACKS: Manually adjustable

MAXIMUM WIDTH: 79.0 INCHES

WHEELBASE: 138.0 INCHES

LOCATION OF LABEL STATING TIRE DATA:

The label was located on the driver's door.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P235/75R15 SL

RECOMMENDED COLD TIRE PRESSURE: FRONT: 41 PSI; REAR: 41 PSI

DESIGNATED SEATING CAPACITY: NA FRONT NA REAR NA TOTAL *

VEHICLE CAPACITY WEIGHT: NA LBS. *

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN INCHES):

DELIVERED ATTITUDE: LF 32.8; RF 33.0; LR 33.4; RR 33.6

PRE-TEST ATTITUDE: LF 32.8; RF 32.1; LR 32.2; RR 32.6

POST-TEST ATTITUDE: LF 30.5; RF 31.3; LR 32.8; RR 31.2

*The vehicle did not contain a label stating capacity data.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	1361 LBS.	RIGHT REAR	1168 LBS.
LEFT FRONT	1452 LBS.	LEFT REAR	1185 LBS.
TOTAL FRONT WEIGHT	2813 LBS.	(54.4% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	2353 LBS.	(45.6% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT 5166 LBS.			

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT*

UDW = UNLOADED DELIVERED WEIGHT (5166 LBS)

VCW = VEHICLE CAPACITY WEIGHT (NA LBS) *

DSC = DESIGNATED SEATING CAPACITY (NA) *

RCLW* = VCW - 150 (DSC) = 300 LBS

TARGET TEST WEIGHT = UDW + RCLW* + (NO. OF HYBRID II DUMMIES X 164 LBS/DUMMY)

TARGET TEST WEIGHT = 5166 + 300 + 328

TARGET TEST WEIGHT = 5794 LBS

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 291 LBS. OF CARGO WEIGHT:

RIGHT FRONT	1414 LBS.	RIGHT REAR	1380 LBS.
LEFT FRONT	1533 LBS.	LEFT REAR	1458 LBS.
TOTAL FRONT WEIGHT	2947 LBS.	(50.9% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	2838 LBS.	(49.1% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	5785 LBS.	(0.2% UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE CARGO AREA: 50 LBS.

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: None

CG = 67.7 INCHES 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 300 pounds, whichever is less.

TABLE 3 POST-IMPACT DATA

TEST NUMBER: 920226

NHTSA NO.: MNO202

TEST DATE: 02/26/92

TEST TIME: 1536

TEST TYPE: Frontal load cell barrier

IMPACT ANGLE: 0°

AMBIENT TEMPERATURE AT IMPACT AREA:

68° F

TEMPERATURE IN OCCUPANT COMPARTMENT:

73° F

IMPACT VELOCITY: PRIMARY = 35.2 MPH

SECONDARY = 35.2 MPH

(SPECIFIED RANGE = 34.5 TO 35.5 MPH)

DISTANCE FROM VEHICLE TO BARRIER: ENTERING VELOCITY TRAP = 26.0 IN.

EXITING VELOCITY TRAP = 2.0 IN.

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

OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 207.9; C 211.8; R 207.5

POST-TEST: L 192.2; C 191.8; R 192.0

TOTAL CRUSH: L 15.7; C 20.0; R 15.5

AVERAGE CRUSH: 17.1

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

DISTANCE FROM TEST VEHICLE TO BARRIER: L 22.5; C 24.8; R 26.1; AVG. 24.5

TABLE 4 FUEL SYSTEM DATA

MAKE/MODEL: Ford/Club Wagon

NHTSA NO.: MN0202

FUEL SYSTEM CAPACITY: 35.0 GALLONS (FROM OWNER'S MANUAL)

USABLE CAPACITY: 35.0 GALLONS (FURNISHED BY COTR)

TEST VOLUME RANGE: 32.2 GALLONS TO 32.9 GALLONS (92-94% OF USABLE)

ACTUAL TEST VOLUME: 32.5 GALLONS (WITH ENTIRE FUEL SYSTEM FILLED)

TEST FLUID TYPE: STODDARD SOLVENT

SPECIFIC GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

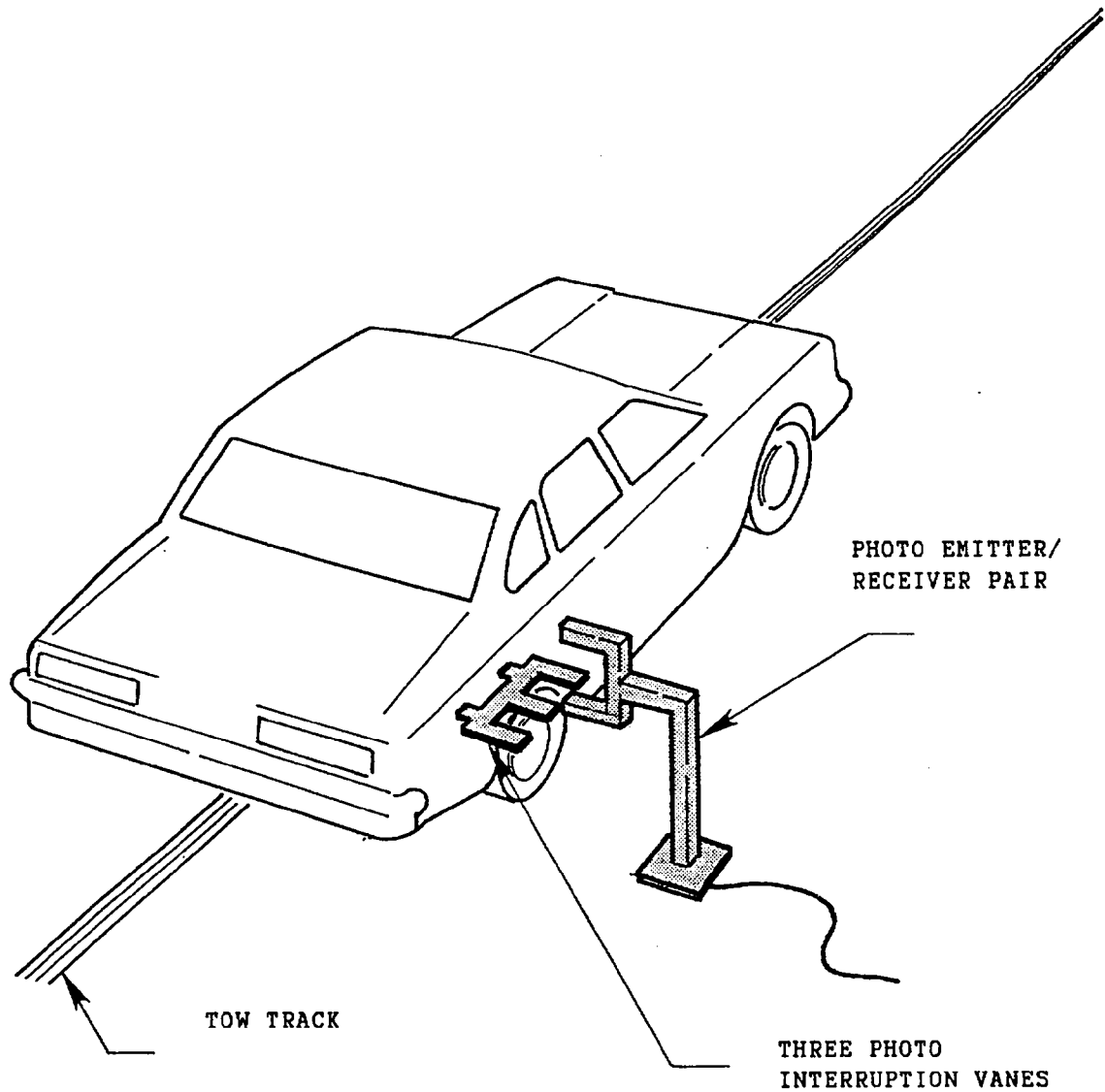
TEST FLUID COLOR: PURPLE

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

ELECTRIC FUEL PUMP: Yes FUEL INJECTION: Yes

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

FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM



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

The vanes have one foot spacing.

FIGURE 2 ACCIDENT INVESTIGATION DIVISION DATA
FOR 35 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Ford/Club Wagon/van

VEHICLE NHTSA NO.: MN0202; VIN: 1FMEE11Y2NHA03973

MODEL YEAR: 1992; BUILD DATE: 09/91; TEST DATE: 02/26/92

VEHICLE SIZE CATEGORY: Passenger van; TEST WEIGHT: 5785 LBS.

VEHICLE WHEELBASE: 138.0 INCHES

MAXIMUM WIDTH: 79.0 INCHES

FRONT OVERHANG: 31.5 INCHES

COLLISION DEFORMATION
CLASSIFICATION (CDC) CODE: 12FDEW3

CRUSH DEPTH
MEASUREMENTS:

C1 =	<u>15.7</u>	INCHES
C2 =	<u>17.7</u>	INCHES
C3 =	<u>20.0</u>	INCHES
C4 =	<u>19.8</u>	INCHES
C5 =	<u>18.0</u>	INCHES
C6 =	<u>15.5</u>	INCHES

MIDPOINT OF DAMAGE: D = VEHICLE CENTERLINE
(LONGITUDINAL)

LENGTH OF DAMAGED
REGION: L = 68.0 INCHES

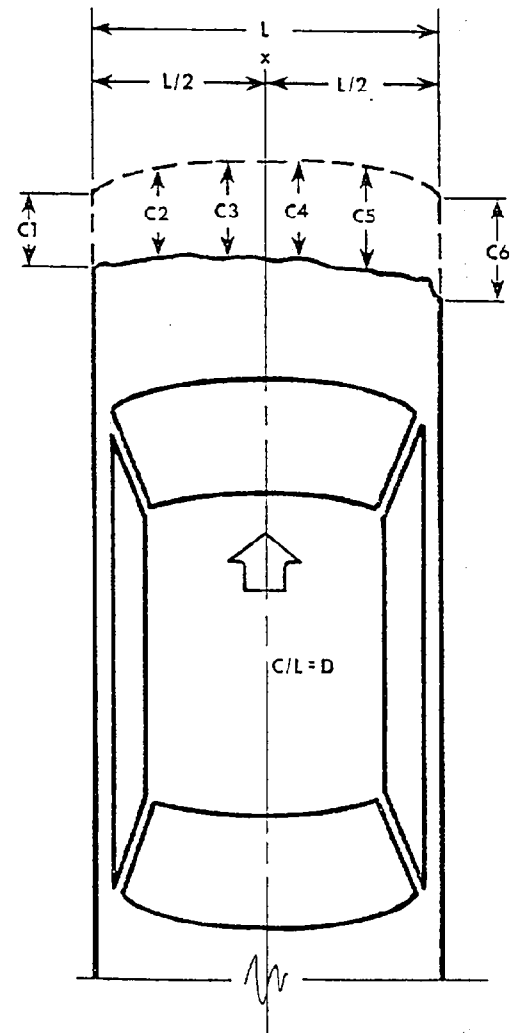
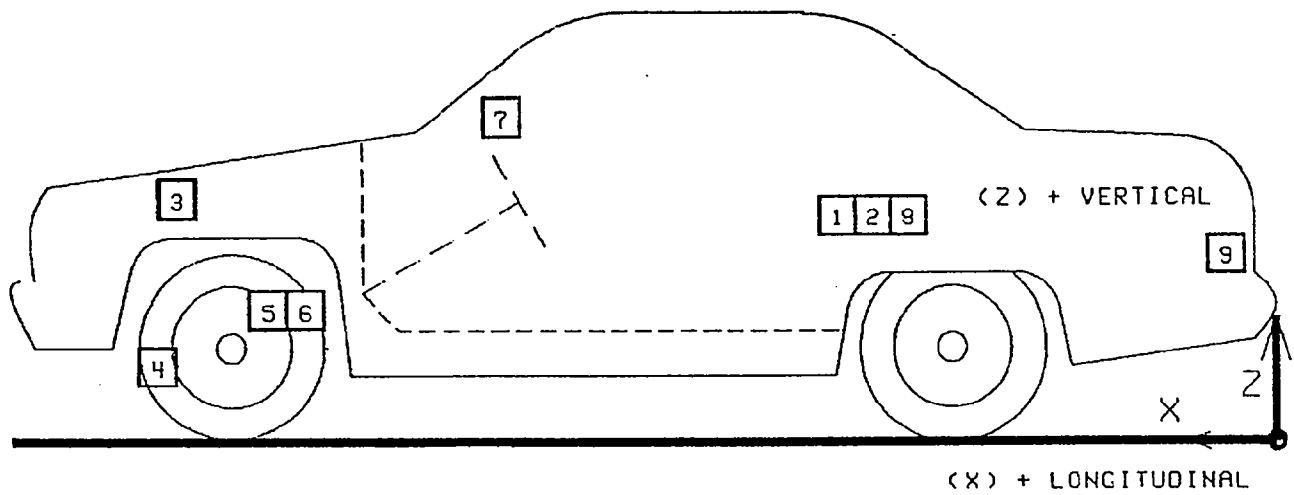
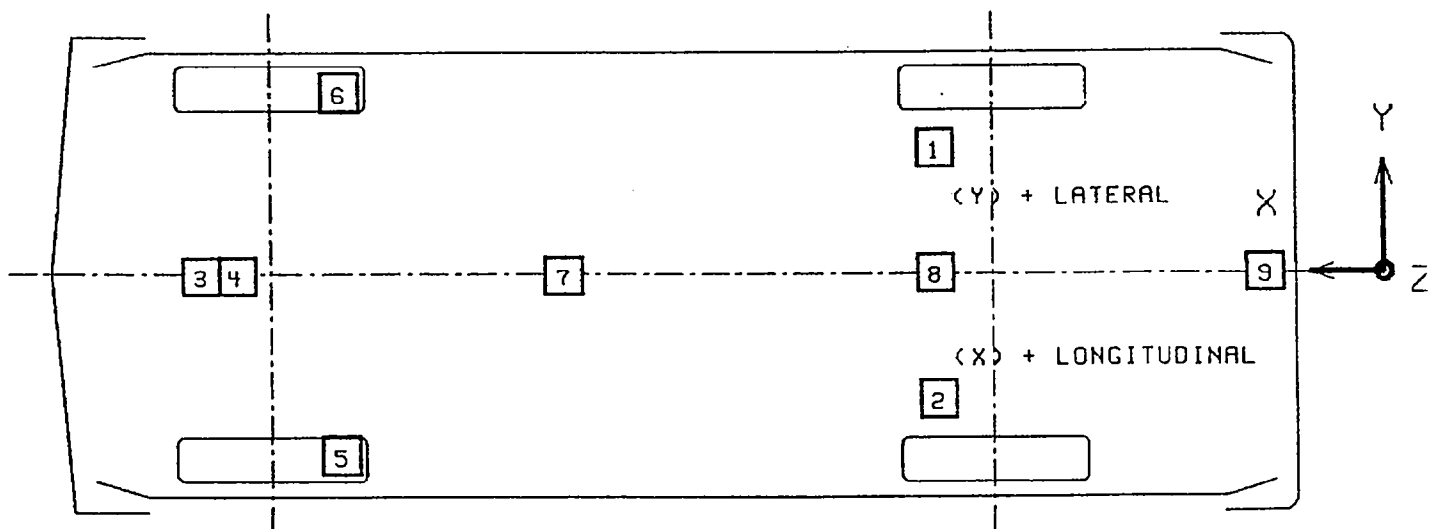


FIGURE 3
VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 5

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 920226

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX G	MSEC	MAX G	MSEC
1	LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	103.2	30.2	25.3	3.6	130.9	35.5	15.9
2	RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	104.0	-21.6	25.2	2.9	126.6	36.0	15.1
3	ENGINE TOP LONGITUDINAL	48.1	-2.0	36.9	6.1	47.4	88.6	33.9
4	ENGINE BOTTOM LONGITUDINAL	42.9	-2.0	10.4	19.0	56.6	89.4	35.0
5	RIGHT BRAKE CALIPER LONGITUDINAL	33.5	-29.2	13.8	38.2	44.6	83.6	37.4
6	LEFT BRAKE CALIPER LONGITUDINAL	33.5	29.2	13.6	28.1	45.6	83.4	15.6
7	INSTRUMENT PANEL CENTER LONGITUDINAL	40.4	-1.0	54.5	11.4	102.5	45.4	30.8
8	REAR SEAT CROSSMEMBER CENTER VERTICAL	103.0	0.0	25.2	15.7	38.1	18.5	17.1
9	VEHICLE REAR CENTER VERTICAL	207.7	0.0	22.0	---	--- Y	---	--- Y

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

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

Y See DATA ACQUISITION EXPLANATIONS

TABLE 6 POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #713	PASSENGER #826
HEAD	<u>Airbag</u>	<u>Chest & left leg</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>None</u>
REAR	<u>None</u>	<u>None</u>

GLAZING DAMAGE:

The entire windshield was cracked upon impact.

OTHER NOTABLE IMPACT EFFECTS:

Both front tires were flattened upon impact. The

hood came off the vehicle upon impact.

TABLE 7 FMVSS 208 DATA SUMMARY

VEH. YR./MAKE/MODEL/BODY STYLE: 1992/Ford/Club Wagon/vanVEH. NHTSA NO.: MN0202; TEST DATE: 02/26/92

	DRIVER DUMMY #713	PASSENGER DUMMY #826
<u>MAXIMUM ACCELERATIONS (G):</u>		
HEAD X-AXIS	-55.8	-46.3
HEAD Y-AXIS	21.6	15.7
HEAD Z-AXIS	-48.8	-72.2
HEAD RESULTANT	66.9	73.8
CHEST X-AXIS	-53.4	-52.0
CHEST Y-AXIS	6.0	25.0
CHEST Z-AXIS	-12.9	-20.4
CHEST RESULTANT*	51.8	51.8
CHEST RESULTANT TIME INTERVAL (SEC.)*	.003	.003

HEAD INJURY CRITERIA (HIC) VALUES:

HIC**	698	1004
HIC STARTING TIME (SEC.)	.055	.075
HIC ENDING TIME (SEC.)	.087	.111
AVG. HEAD RESULTANT ACCEL. DURING HIC TIME INTERVAL (G)	53.3	60.0

MAXIMUM CHEST DEFLECTIONS (IN):

CHEST X-AXIS	NA	NA
MAXIMUM CHEST DEFLECTION TIME (SEC.)	NA	NA

MAXIMUM COMPRESSIVE FEMUR FORCES (LBS):

LEFT FEMUR	1528	396
RIGHT FEMUR	797	408

MAXIMUM SEAT BELT FORCES (LBS):

LAP BELT	745	2378
SHOULDER BELT	1753	2254

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's head rotated rearward into the head restraint as the dummy rebounded into the seat back. The dummy came to rest seated 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 and contacted the dummy's chest and left leg as the dummy's torso was restrained by the three-point unbelt. The dummy's head rotated rearward into the head restraint as the dummy rebounded into the seat back. The dummy came to rest seated 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.	121.0	129.2
SHOULDER BELT LENGTH AS MEASURED ON PART 572 DUMMY.	39.8	38.2
LAP BELT LENGTH AS MEASURED ON PART 572 DUMMY.	28.4	27.2
<u>SHOULDER BELT SPOOL-OFF LENGTH:</u>		
AS DETERMINED BY FILM ANALYSIS	1.5	1.7
AS DETERMINED MECHANICALLY	0.9	1.4
AS DETERMINED ELECTRONICALLY	2.9	2.8
<u>BELT STRETCH LENGTH (IN/FT):</u>		
AS MEASURED MECHANICALLY	0.0	0.0
AS MEASURED ELECTRONICALLY	1.6 Y	0.8 Y
<u>RETRACTOR LOCK-UP TIME (MS):</u>		
AS DETERMINED BY SHOULDER BELT SPOOL-OFF	60	72

ALL MEASUREMENTS ARE IN INCHES UNLESS OTHERWISE NOTED.
Y See DATA ACQUISITION EXPLANATIONS

FIGURE 4
LOAD CELL BARRIER CONFIGURATION
FRONT VIEW

36 LOAD CELLS
 4 ROWS
 9 COLUMNS

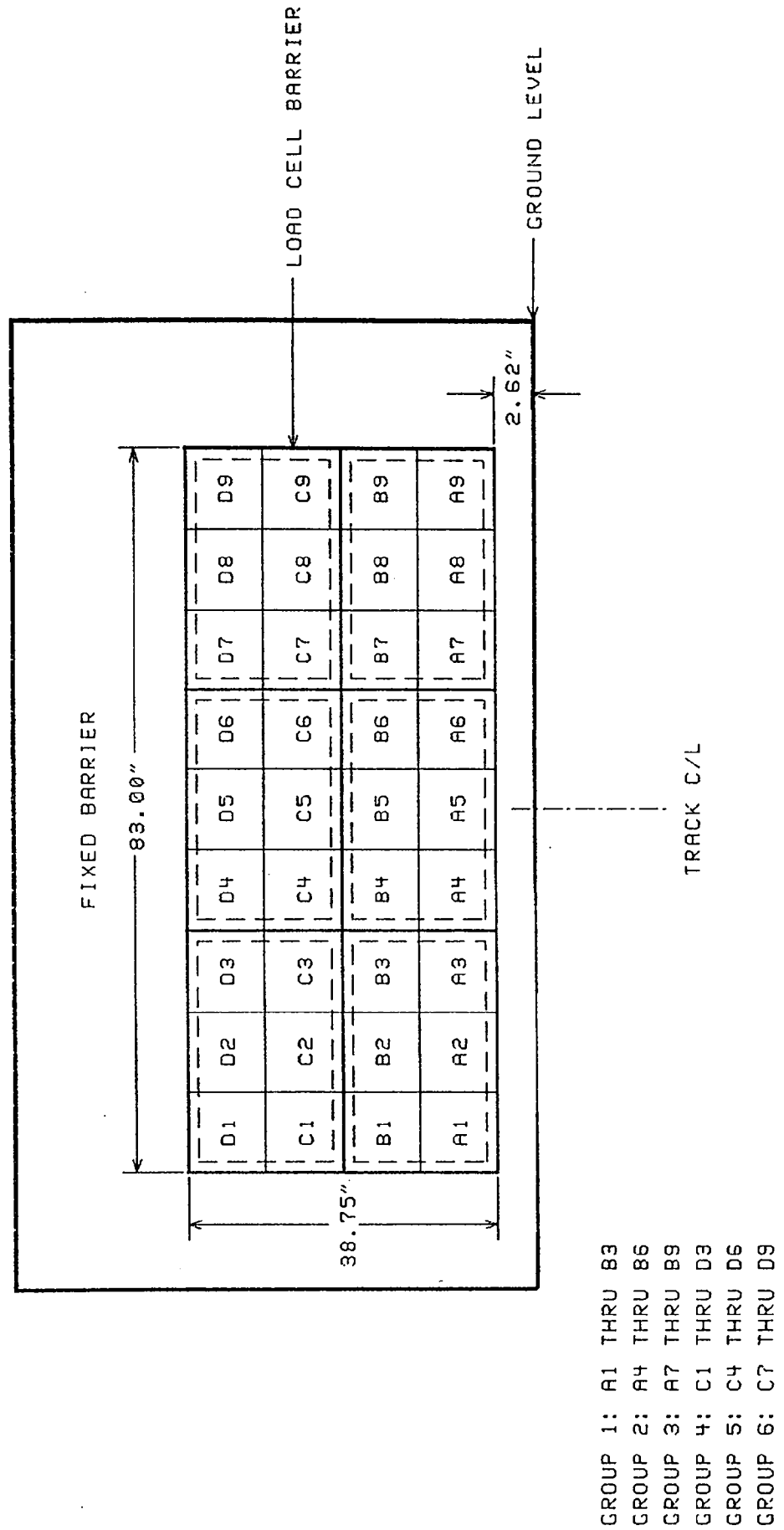


TABLE 9

LOAD CELL BARRIER DATA SUMMARY

TEST NUMBER 920226

LOCATION	POSITIVE DIRECTION		NEGATIVE DIRECTION	
	LB	MSEC	LB	MSEC
TOTAL GROUP 1	928	1.1	40596	36.1
TOTAL GROUP 2	416	313.0	12950	36.1
TOTAL GROUP 3	1031	0.8	46682	33.0
TOTAL GROUP 4	710	1.8	31313	32.1
TOTAL GROUP 5	321	145.6	60038	35.3
TOTAL GROUP 6	522	1.4	28502	35.8
TOTAL LOAD CELL FORCE	1468	1.4	215893	35.1

TENSION IS POSITIVE
COMPRESSION IS NEGATIVE

SECTION 3.0

OCCUPANT, CAMERA, & VEHICLE MEASUREMENTS

FIGURE 5 DUMMY AND SEAT POSITIONING DATA

TEST NO.: 920226; VEHICLE: 1992 Ford Club Wagon

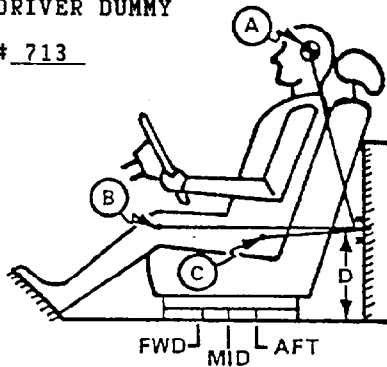
SEAT TYPE: BENCH ADJUSTER TYPE: X MANUAL FRONT SEAT BACK TYPE: NON-ADJUSTABLE

 X BUCKET POWER X ADJUSTABLE RECLINING

 SPLIT BENCH

DRIVER DUMMY

713

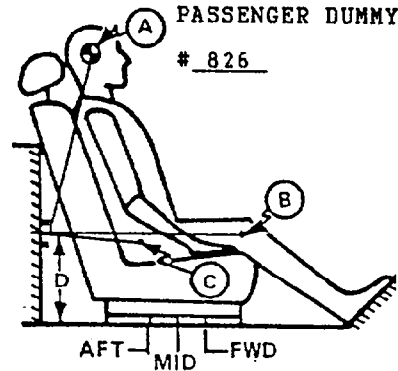


**MEASUREMENT
LOCATION**

- A - HEAD TARGET
- B - KNEE JOINT
- C - APPROXIMATE 'H' POINT
- D - SILL TO DOOR STRIKER REFERENCE POINT

PASSENGER DUMMY

826



A = 21.1 IN. -1 DEGREES

B = 23.6 IN. 98 DEGREES

C = 8.0 IN. 126 DEGREES

D = 27.6 IN.

A = 21.0 IN. -2 DEGREES

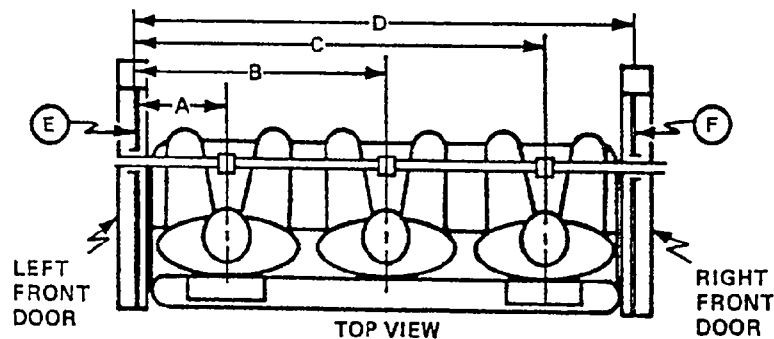
B = 21.5 IN. 95 DEGREES

C = 6.8 IN. 137 DEGREES

D = 27.6 IN.

SEAT TRACK REARWARD: 8 NOTCHES

SEAT TRACK REARWARD: 8 NOTCHES



A = LEFT DOOR TO DRIVER CENTERLINE 16.2 IN.

B = LEFT DOOR TO CENTER PASSENGER CENTERLINE NA IN.

C = LEFT DOOR TO RIGHT PASSENGER CENTERLINE 54.9 IN.

D = LEFT DOOR TO RIGHT DOOR 71.4 IN.

E, F = WINDOW GLASS HEIGHT (RIGHT AND LEFT MUST BE EQUAL) 14.0 IN.

ALL ANGLES ARE RELATIVE TO VERTICAL PLANE THROUGH DOOR STRIKER.

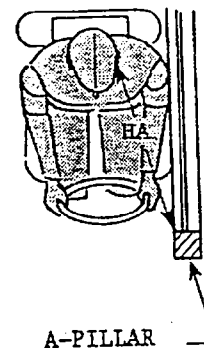
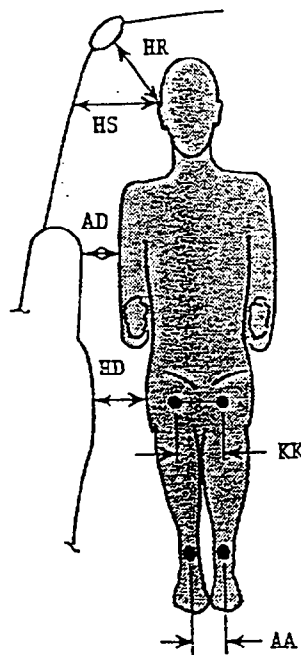
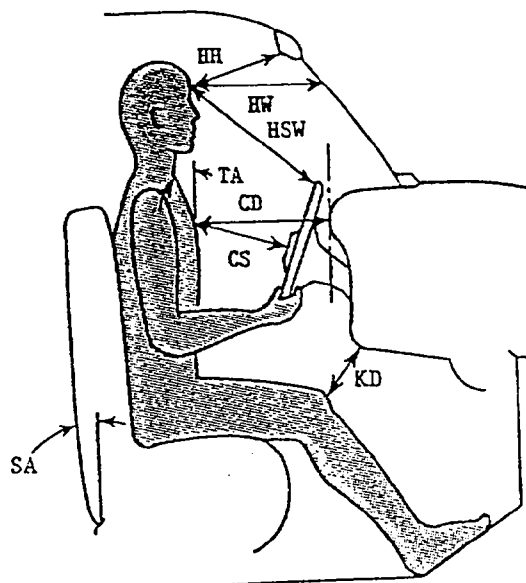
FIGURE 6 DUMMY IN-VEHICLE POSITIONING DATA

	DRIVER	PASSENGER
HH	19.7	22.9
HW	25.9	29.0
CD	22.3	27.0
CS	13.0	NA
KDL	4.2	9.9
KDR	4.1	10.5
TA	19°	25°
SA	16.5°	17°
HSW	18.8	NA

	DRIVER	PASSENGER
HR	10.6	10.8
HS	13.2	9.6
AD	7.9	5.2
HD	7.6	7.2
KK	10.5	7.1
AA	9.1	5.2
HA	27.1	31.0

KNEE OUTER BOLT HEAD TO OUTER
BOLT HEAD SPACING:

PASSENGER = 14.5
DRIVER = 11.8

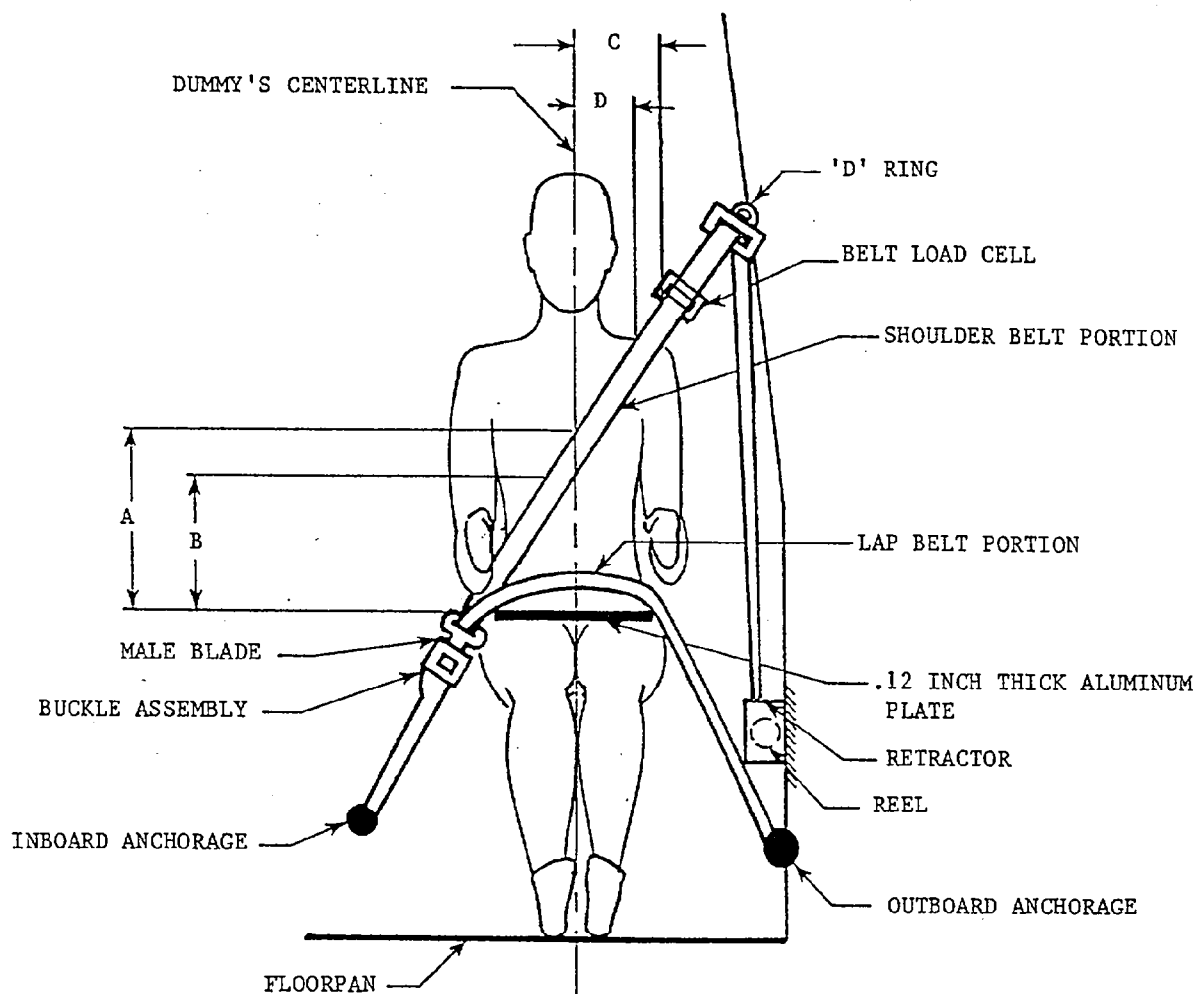


HH = HEAD TO WINDSHIELD HEADER
HW = HEAD TO WINDSHIELD
CD = CHEST TO DASH
CS = CHEST TO STEERING WHEEL
KD = KNEE TO DASH
TA = TORSO ANGLE
SA = SEAT BACK ANGLE
HSW = HEAD TO STEERING WHEEL

HR = HEAD C.G. TARGET TO SIDE ROOF HEADER
HS = HEAD C.G. TARGET TO SIDE WINDOW
AD = ARM TO DOOR
HD = HIP TO DOOR
KK = KNEE TO KNEE
AA = ANKLE TO ANKLE
HA = HEAD C.G. TARGET TO A-PILLAR

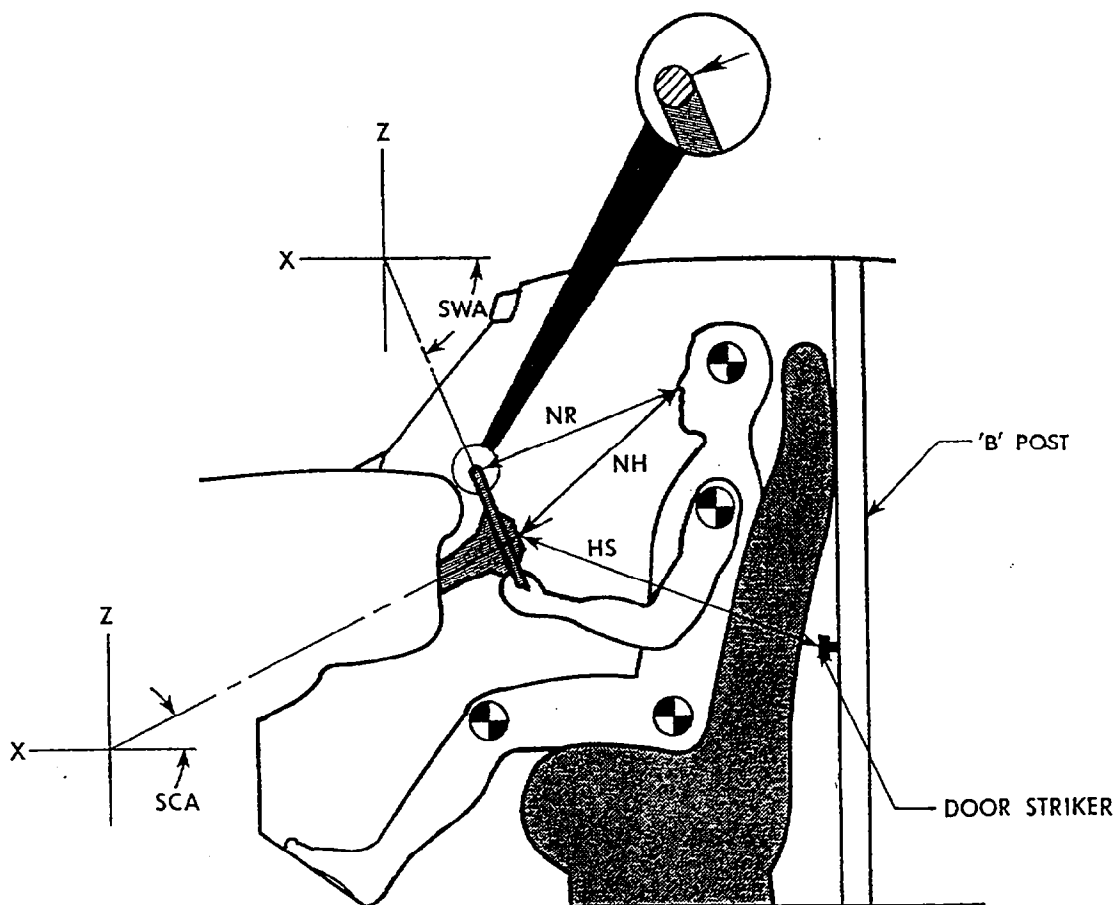
TORSO AND SEAT BACK ANGLES ARE RELATIVE TO VERTICAL.
ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 7 SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - TOP SURFACE OF ALUMINUM PLATE TO BELT UPPER EDGE	15.0	16.1
B - TOP SURFACE OF ALUMINUM PLATE TO BELT LOWER EDGE	11.2	12.2
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	6.0	4.0
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	3.5	1.8
LAP BELT TENSION (LBS)	4	4
SHOULDER BELT TENSION (LBS)	4	4
ALL DISTANCE MEASUREMENTS ARE IN INCHES.		

FIGURE 8 DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSEMBLY DATA



POSITION OF STEERING COLUMN TILTING AND TELESCOPING ADJUSTMENTS, IF ANY:
The steering column was not adjustable.

MEASUREMENTS

NR	- DISTANCE FROM TIP OF DUMMY'S NOSE TO TOP REAR SURFACE OF STEERING WHEEL RIM.	17.2
NH	- DISTANCE FROM TIP OF DUMMY'S NOSE TO CENTER OF STEERING COLUMN HUB.	18.4
HS	- DISTANCE FROM CENTER OF STEERING COLUMN HUB TO THE FORWARD SURFACE OF THE DOOR LOCK STRIKER PIN.	22.8
SCA	- ANGLE OF STEERING COLUMN RELATIVE TO THE HORIZONTAL X AXIS	25°
SWA	- ANGLE OF STEERING WHEEL RELATIVE TO THE HORIZONTAL X AXIS	65°

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 9
CAMERA POSITIONS

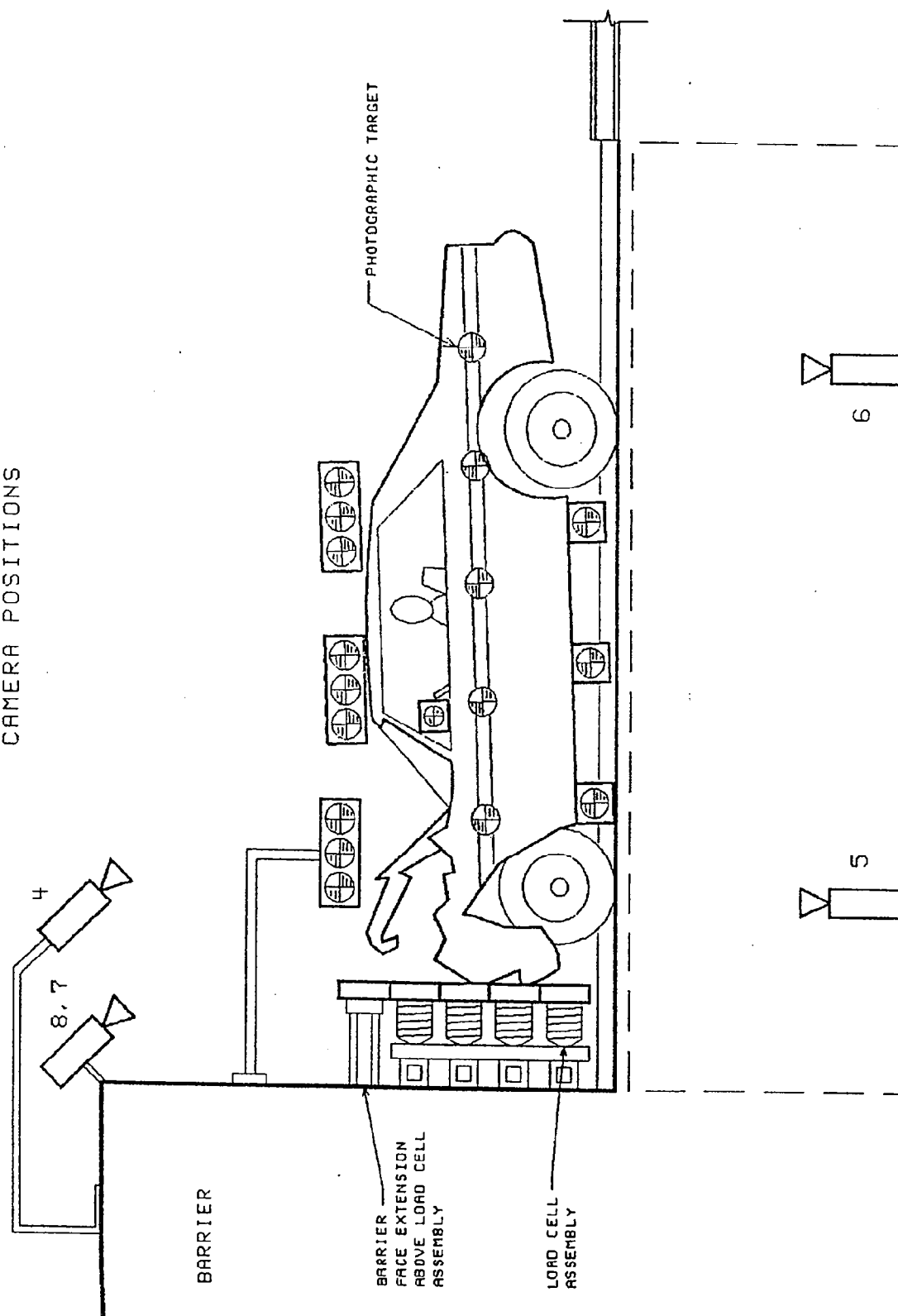


FIGURE 9

CAMERA POSITIONS, CONTINUED

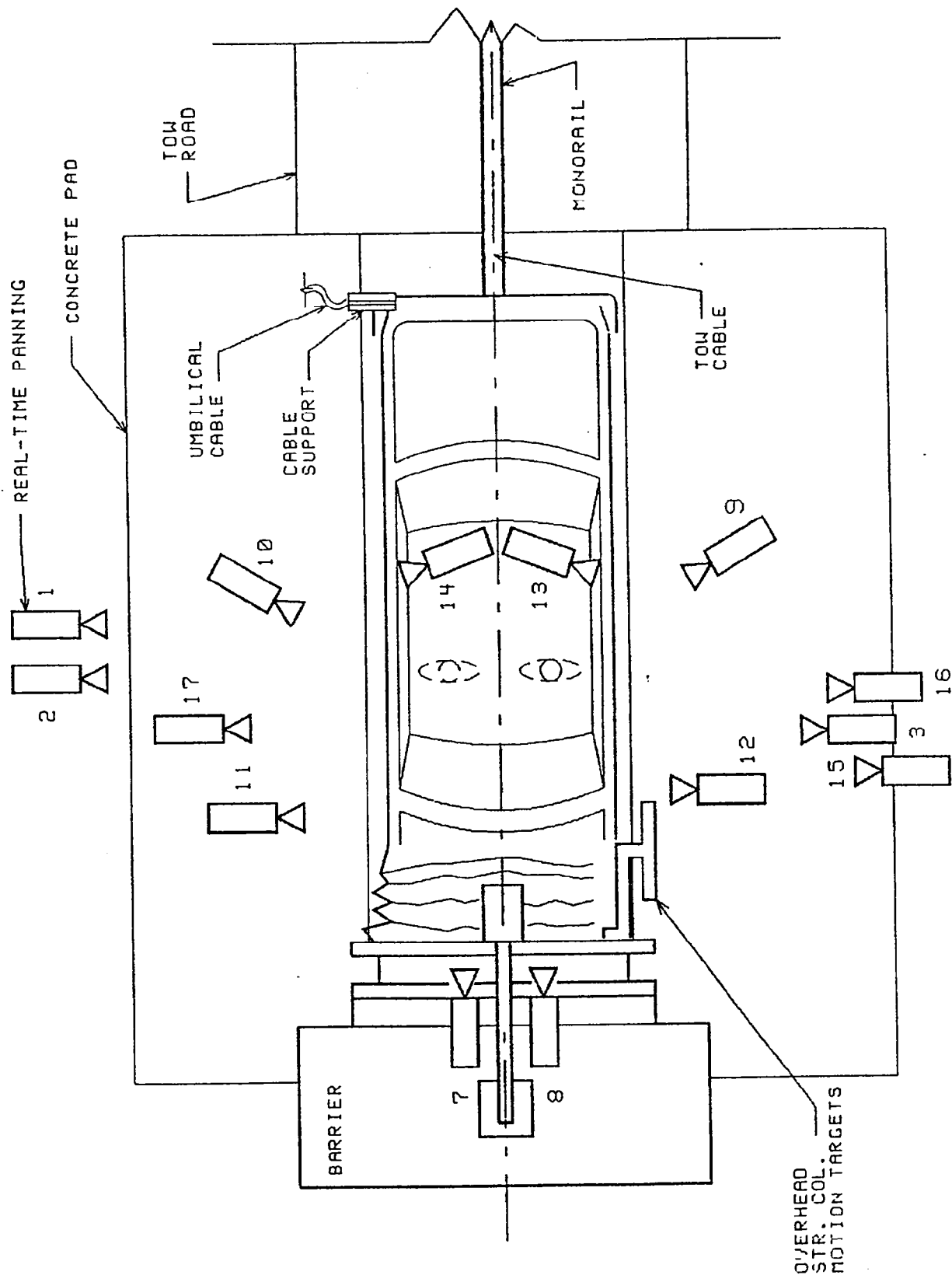


TABLE 10 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 920226		VEHICLE: 1992 Ford Club Wagon van					FILM PLANE			FILM
CAMERA NO.	VIEW	CAMERA POSITIONS (IN)*			ANGLE** (DEG)	TO HEAD		LENS (MM)	SPEED (FPS)	
		X	Y	Z		TARGET (IN)				
1	Real-time panning	-142.0	-504.0	61.0	NA	NA	NA	16	24	
2	Vehicle crush	-81.3	-266.4	37.1	-2	NA	NA	13	515	
3	Dummy kinematics	-41.5	295.0	44.0	-12	218.0	218.0	25	502	
4	Windshield damage	-36.4	0.0	98.0	-40	NA	NA	13	498	
5	Crush & fluid spillage	-50.5	0.0	-92.4	90	NA	NA	13	1002	
6	Fluid spillage	-99.3	0.0	-99.0	90	NA	NA	13	1000	
7	Passenger kinematics	-4.5	-13.8	85.0	-40	NA	NA	17	498	
8	Driver kinematics	-6.8	14.5	85.0	-41	NA	NA	17	498	
9	Driver kinematics	-180.0	73.0	102.0	-27	93.0	93.0	25	500	
10	Passenger kinematics	-184.0	-74.0	100.0	-26	68.0	68.0	25	500	
11	Windshield intrusion	-38.1	-306.1	44.0	0	NA	NA	50	500	
12	Windshield intrusion	-53.0	309.4	42.3	0	NA	NA	50	495	
13	Driver seatbelt movement	NA	NA	NA	NA	NA	NA	13	500	
14	Passenger seatbelt movement	NA	NA	NA	NA	NA	NA	13	500	
15	Column movement	-168.0	286.0	103.0	-14	NA	NA	25	505	
16	Column movement	-168.0	286.0	75.1	-9	NA	NA	25	500	
17	Passenger kinematics	-38.8	-210.8	45.3	7	233.0	233.0	25	472	

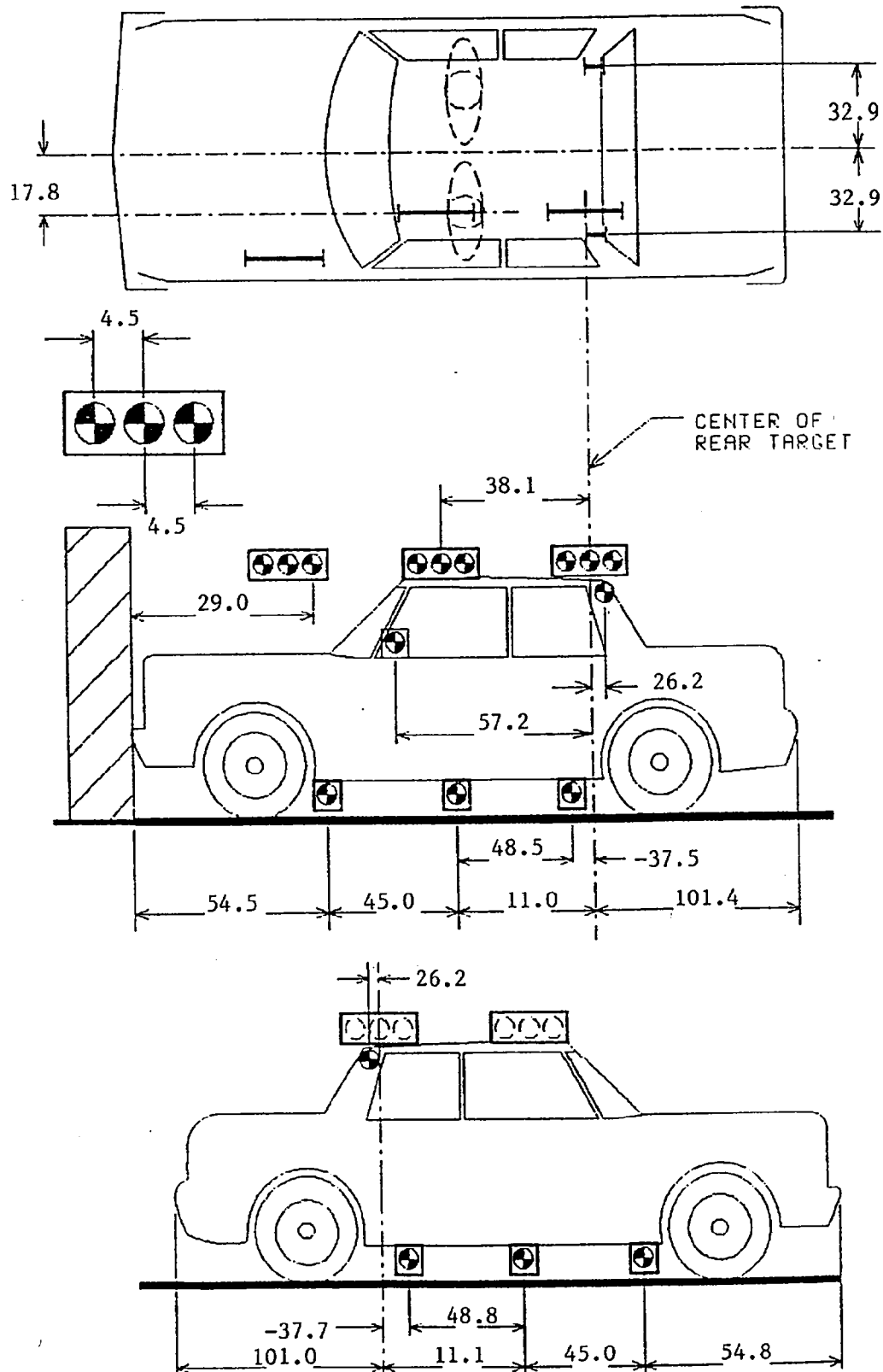
**X = Film plane forward of barrier face

+Y = Film plane to left of monorail centerline

+Z = Film plane above ground level

**Angle = Film plane angled upward from horizontal plane

FIGURE 10
VEHICLE TARGET LOCATIONS



ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 11

PRE-TEST AND POST-TEST MEASUREMENT POINTS

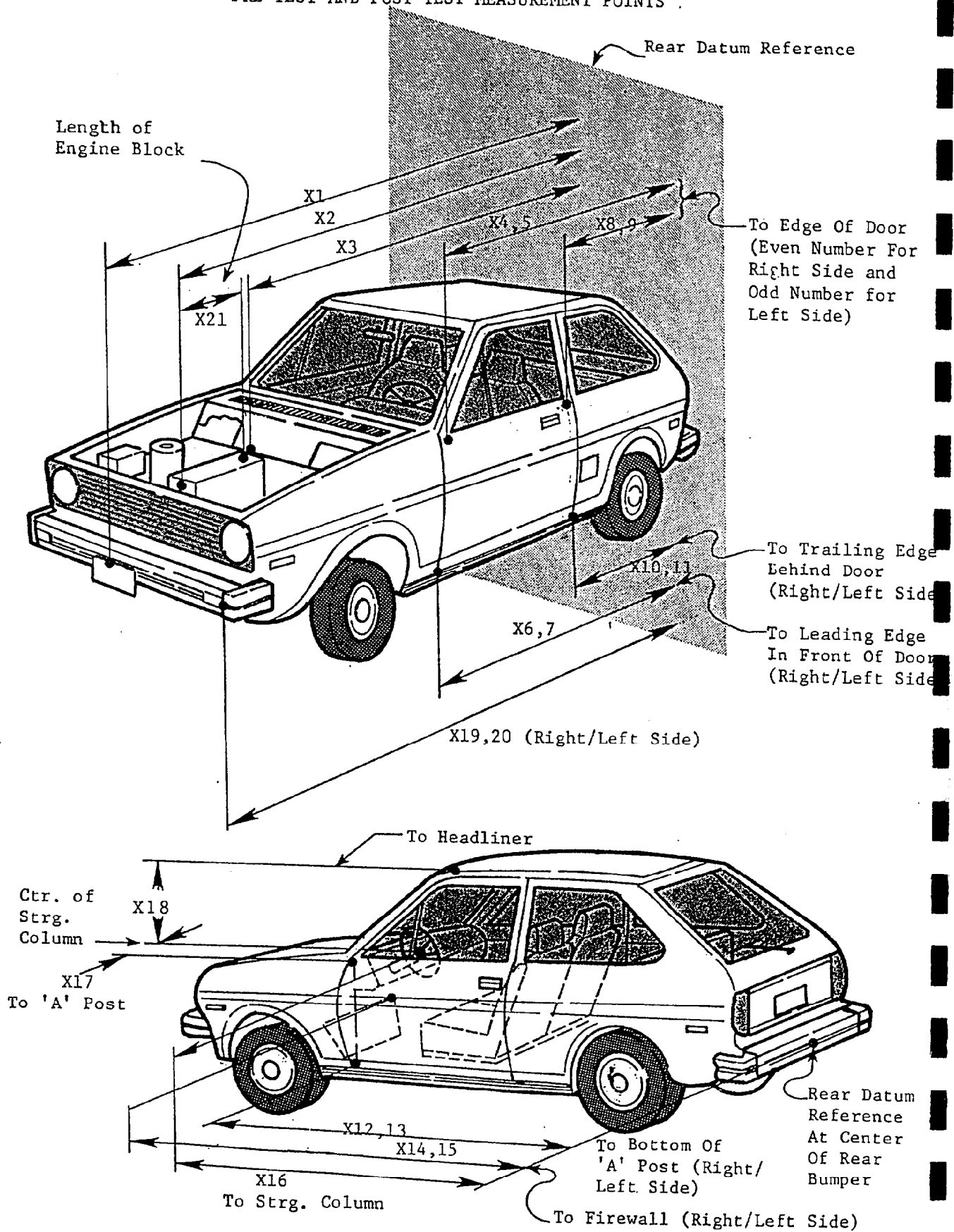


TABLE 11 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Ford/Club Wagon		TEST NUMBER: 920226	ALL MEASUREMENTS ARE IN INCHES		
NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.	
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	211.8	191.8	20.0	
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	188.4	181.4	7.0	
X3	REAR SURFACE OF VEHICLE TO FIREWALL	185.2	184.9	0.3	
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	167.6	167.4	0.2	
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	167.6	168.5	-0.9	
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	159.9	160.4	-0.5	
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	160.1	161.1	-1.0	
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	126.5	127.8	-1.3	
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	126.6	128.0	-1.4	
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	125.9	126.7	-0.8	
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	126.4	127.2	-0.8	
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	163.5	164.0	-0.5	
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	164.0	164.5	-0.5	
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	184.8	186.6	-1.8	
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	184.0	185.2	-1.2	
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	152.5	153.0	-0.5	
X17	CENTER OF STEERING COLUMN TO "A" POST	13.0	12.2	0.8	
X18	CENTER OF STEERING COLUMN TO HEADLINER	22.0	19.0	3.0	
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	207.5	192.0	15.5	
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	207.9	192.2	15.7	
X21	LENGTH OF ENGINE BLOCK	20.0	20.0	0.0	

APPENDIX A

PHOTOGRAPHS



FIGURE A-1. PRE-TEST FRONT VIEW

A-2

920226

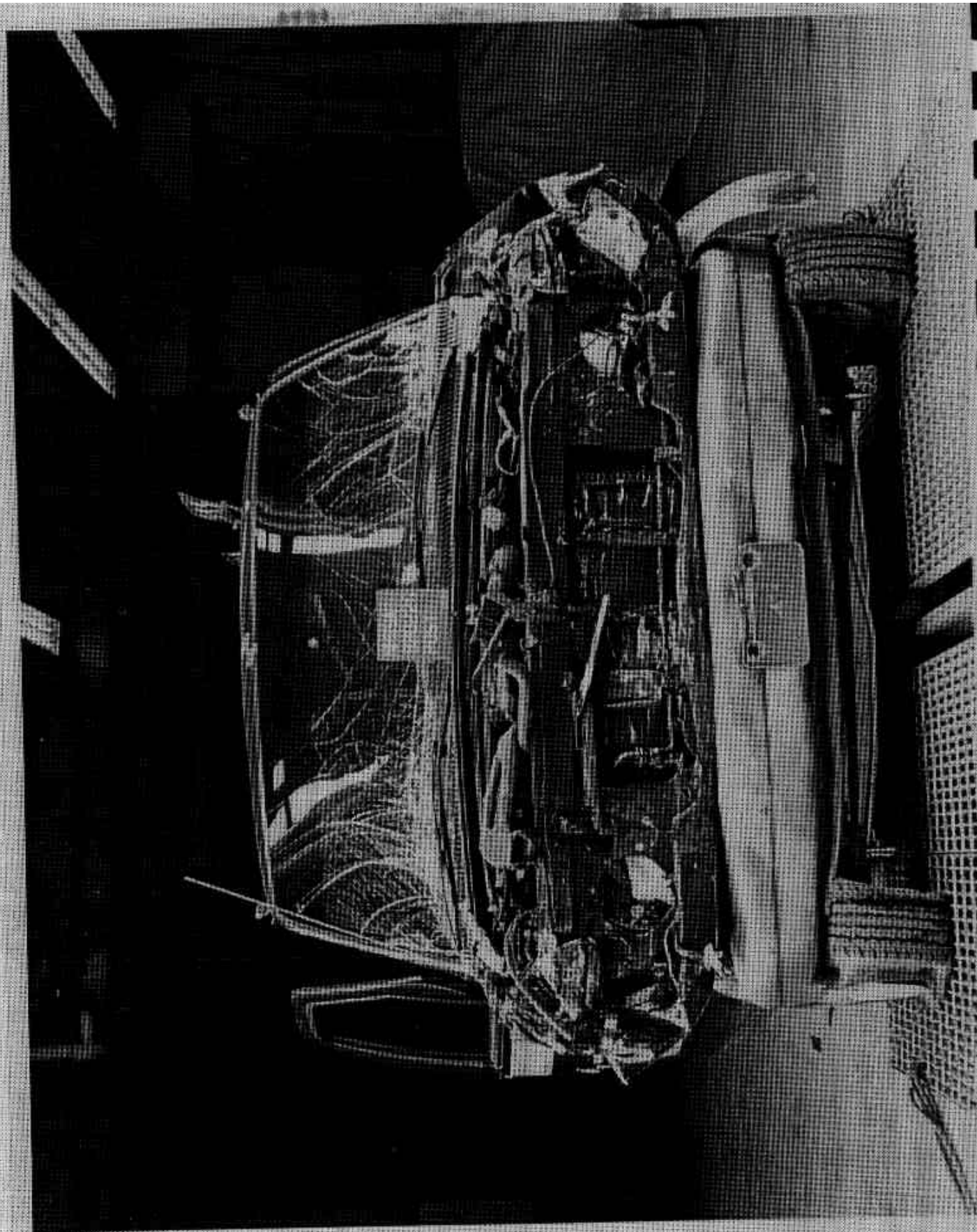


FIGURE A-2. POST-TEST FRONT VIEW

A-3

920226

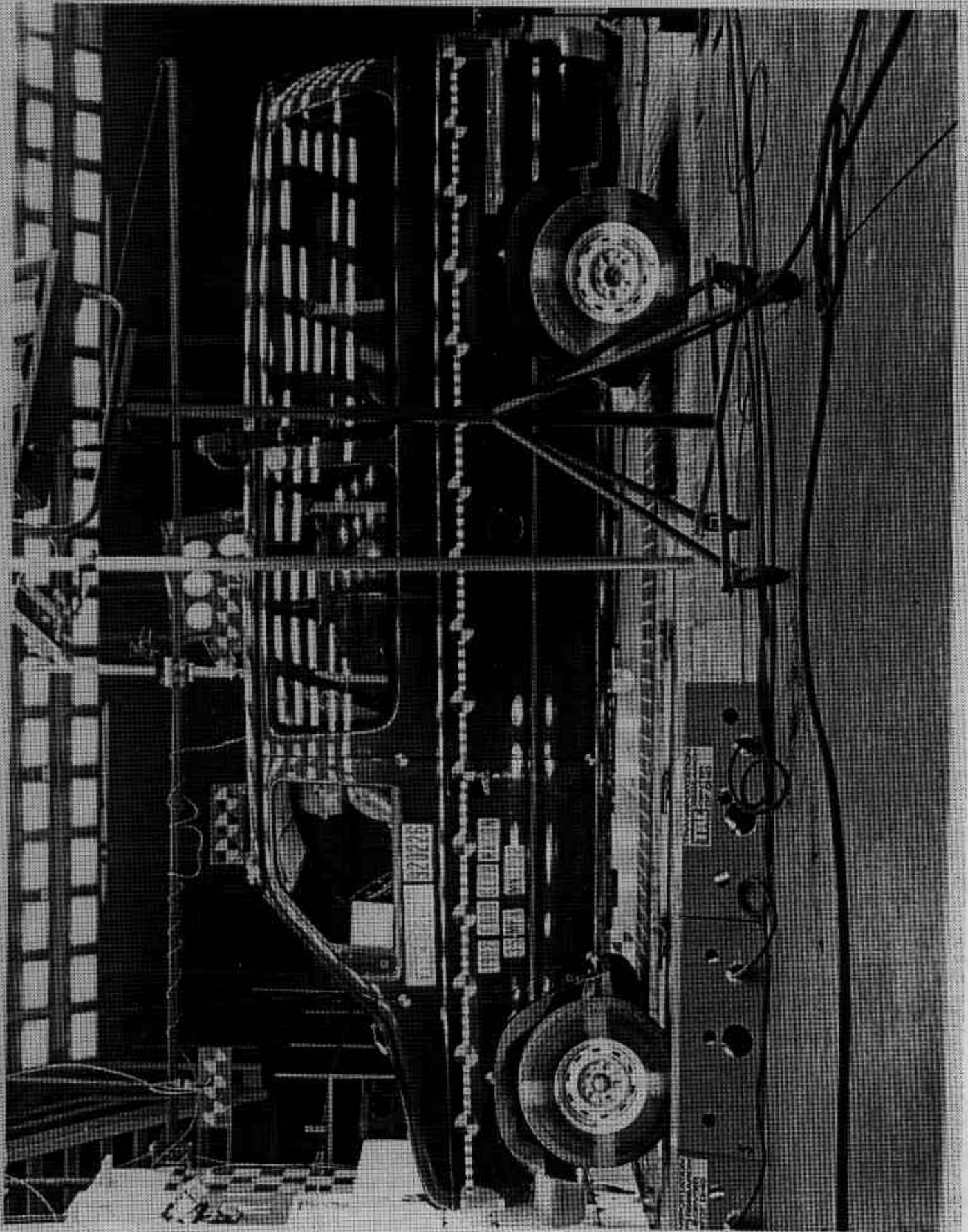


FIGURE A-3. PRE-TEST LEFT SIDE VIEW

A-4

920226

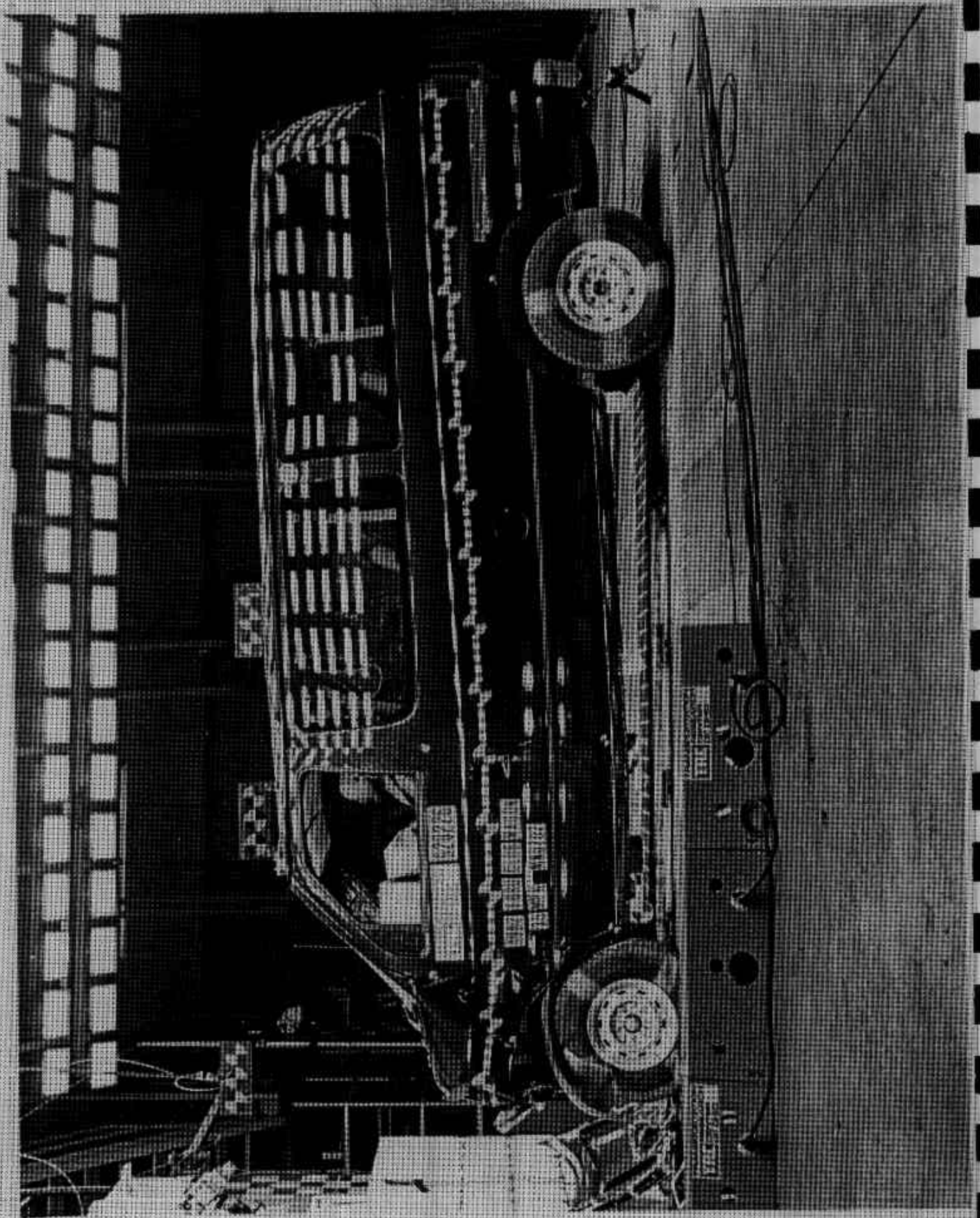


FIGURE A-4. POST-TEST LEFT SIDE VIEW
A-5

920226

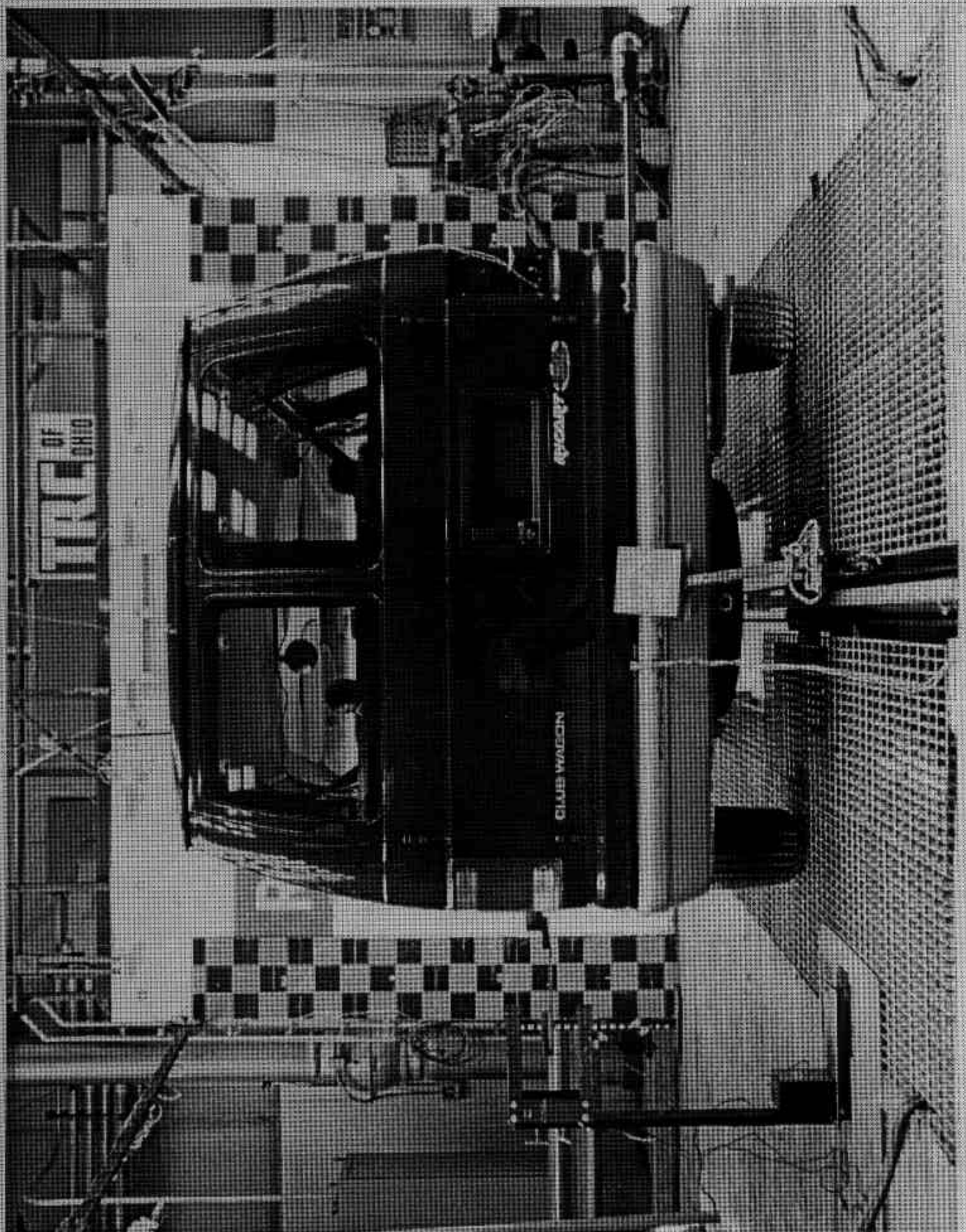


FIGURE A-5. PRE-TEST REAR VIEW

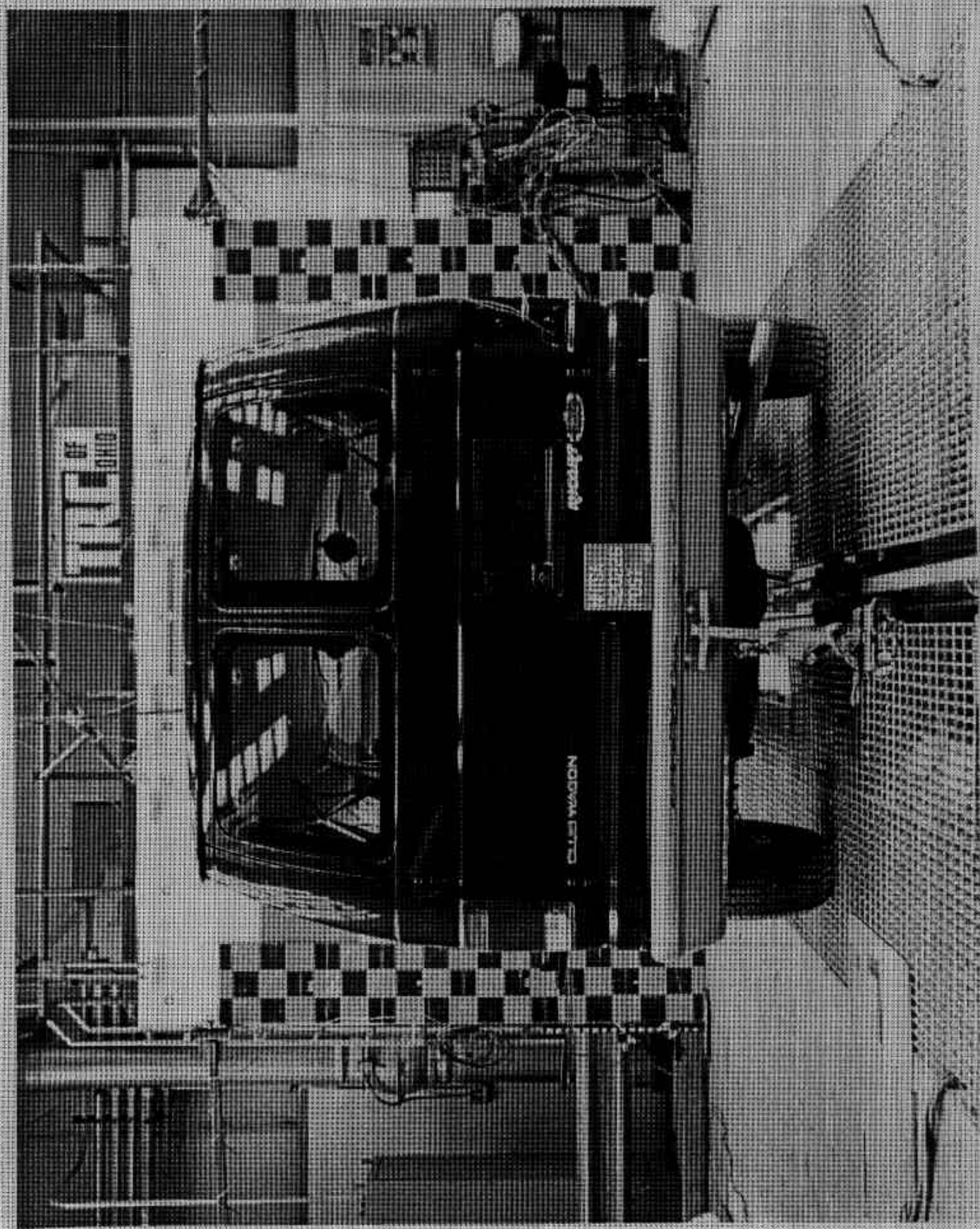


FIGURE A-6. POST-TEST REAR VIEW

A-7

920226

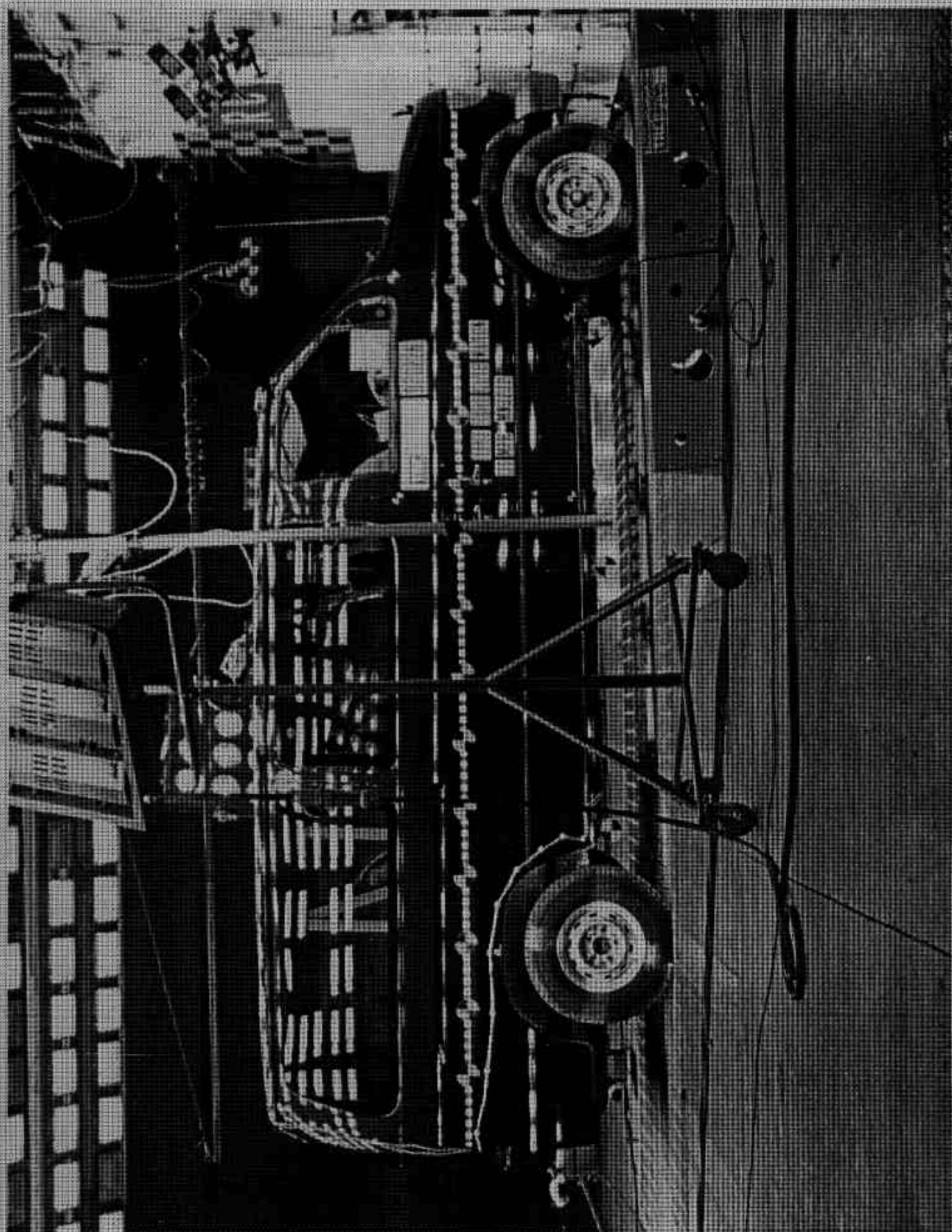


FIGURE A-7. PRE-TEST RIGHT SIDE VIEW

A-8

920226

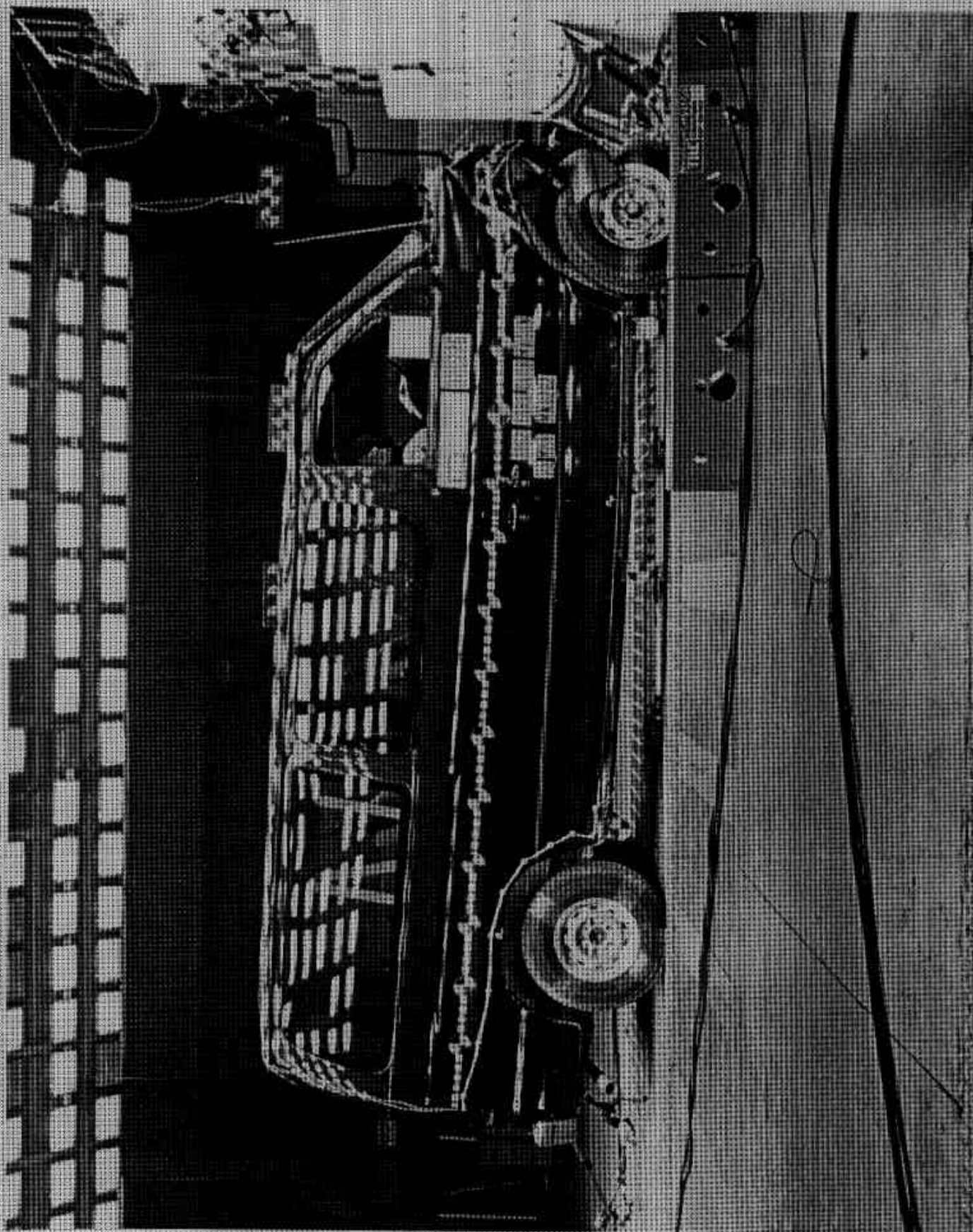


FIGURE A-8. POST-TEST RIGHT SIDE VIEW
A-9

920226



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

A-10

920226



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

A-11

920226

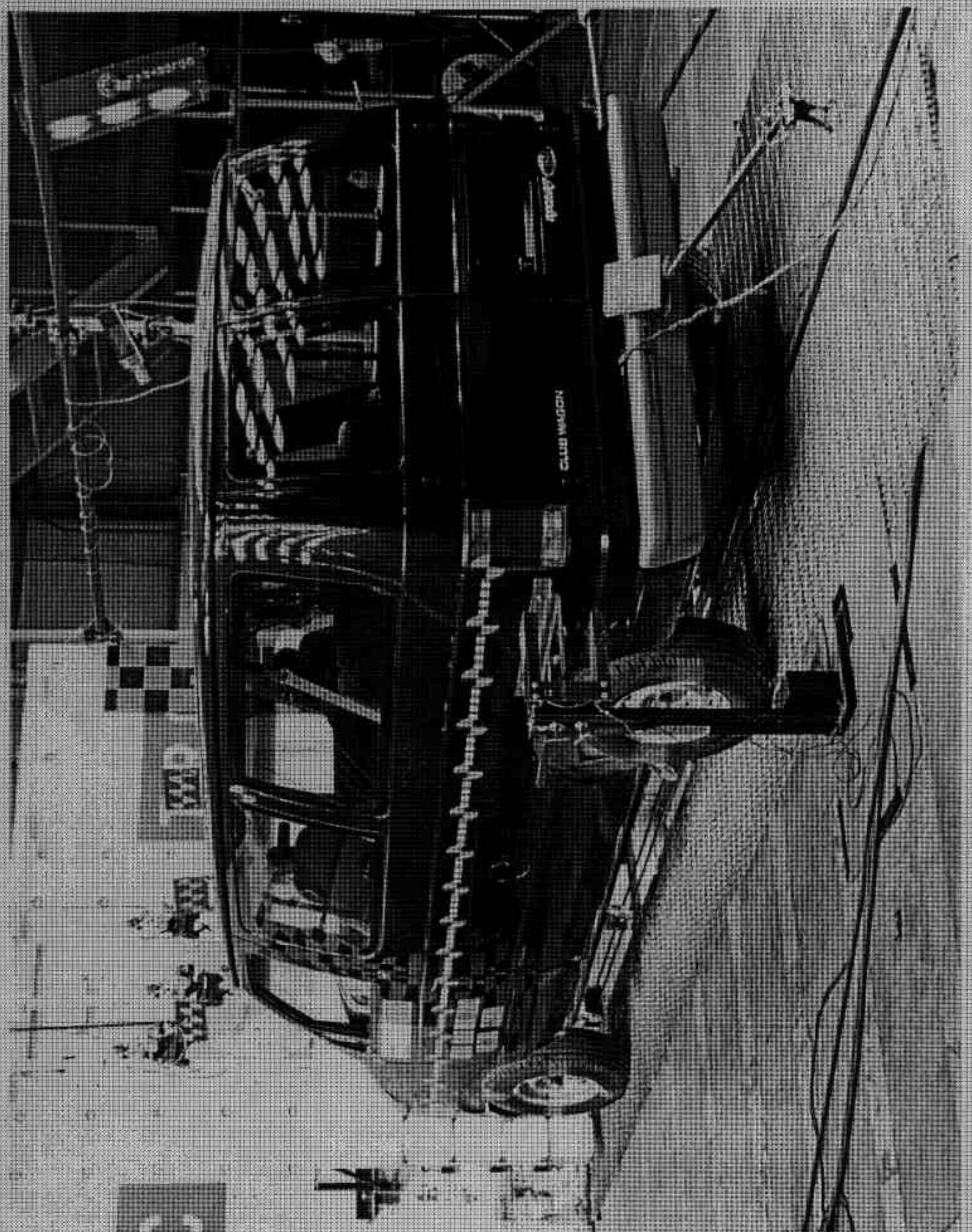


FIGURE A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW
A-12

920226

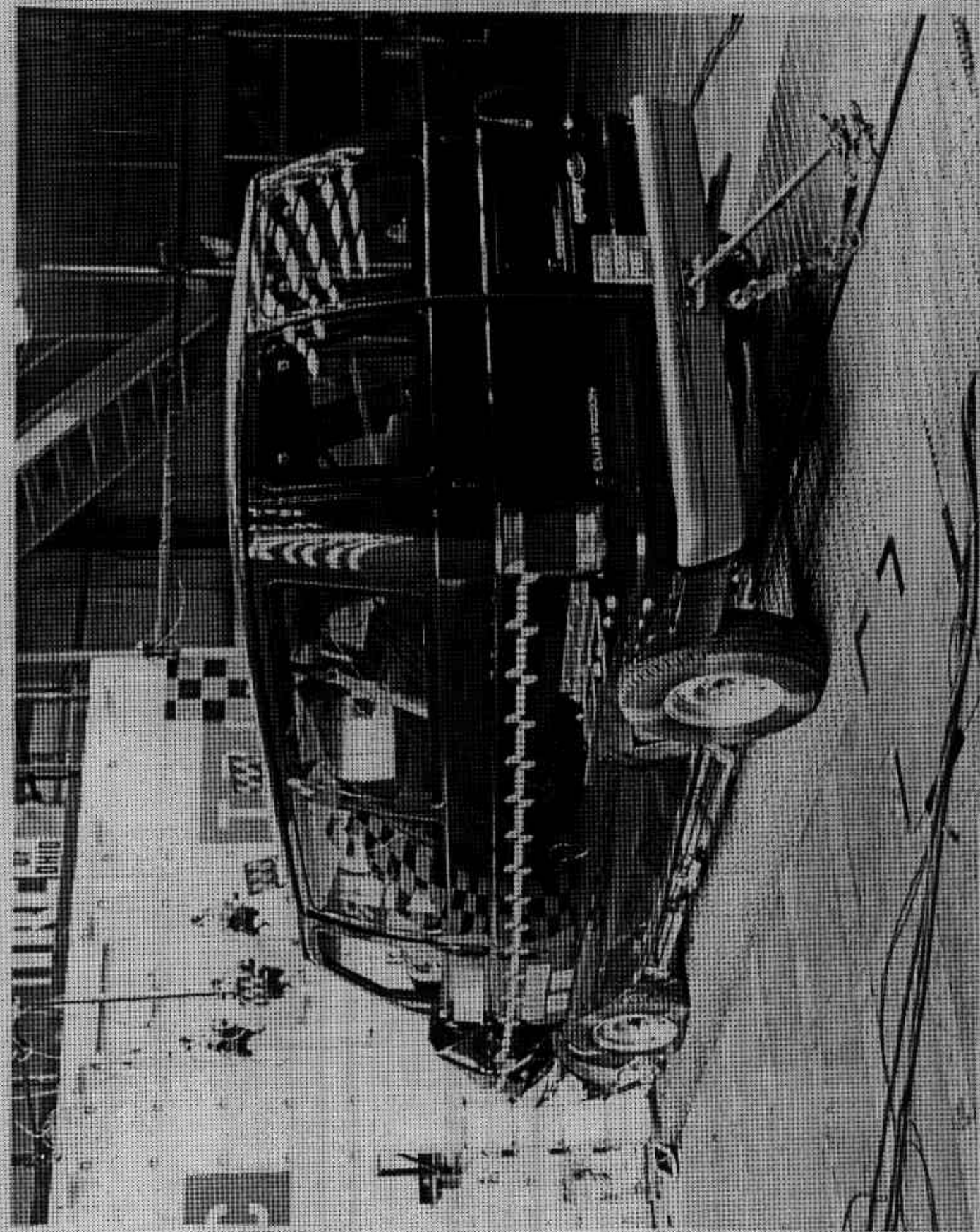


FIGURE A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW
A-13

920226

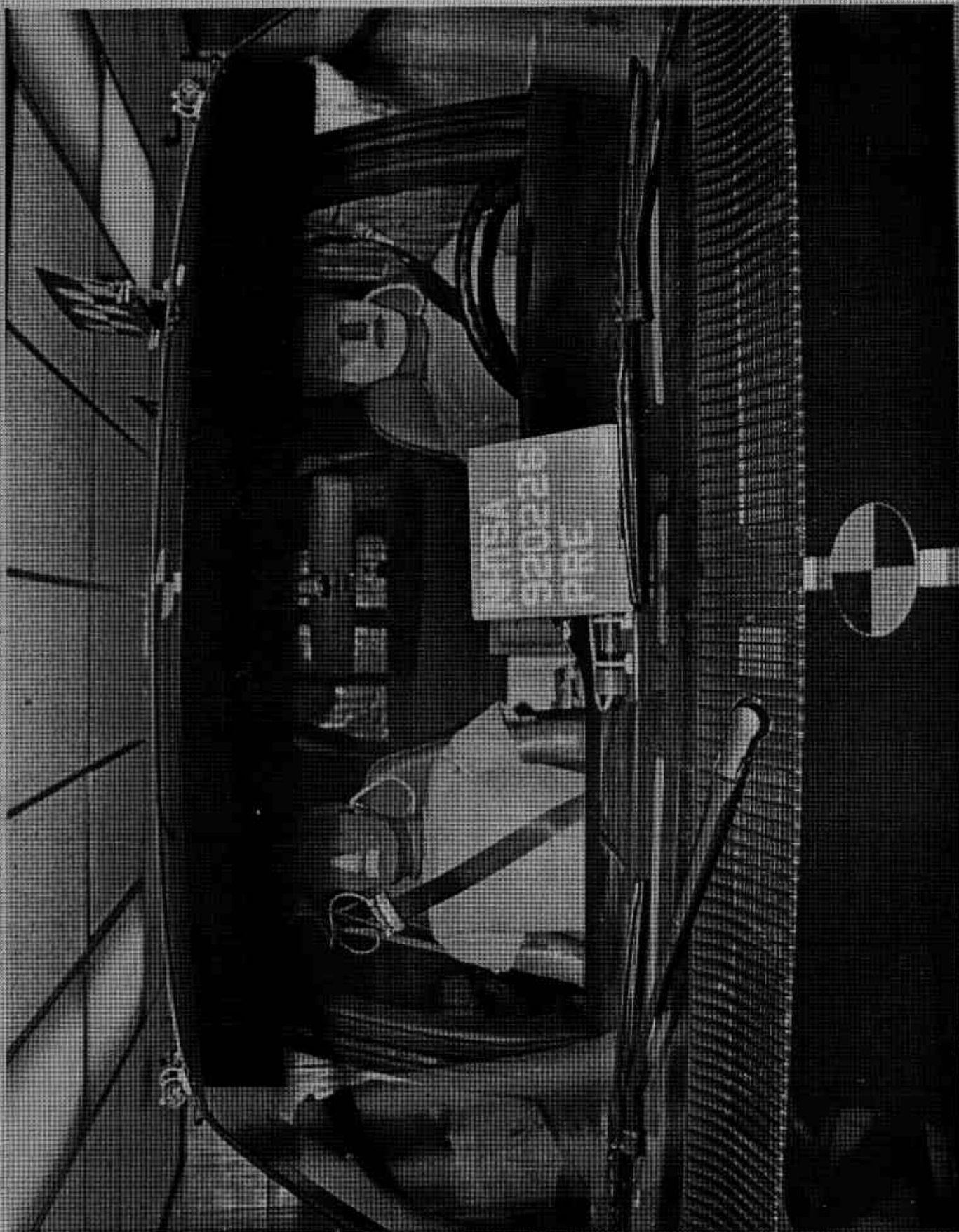


FIGURE A-13. PRE-TEST WINDSHIELD VIEW
A-14

920226

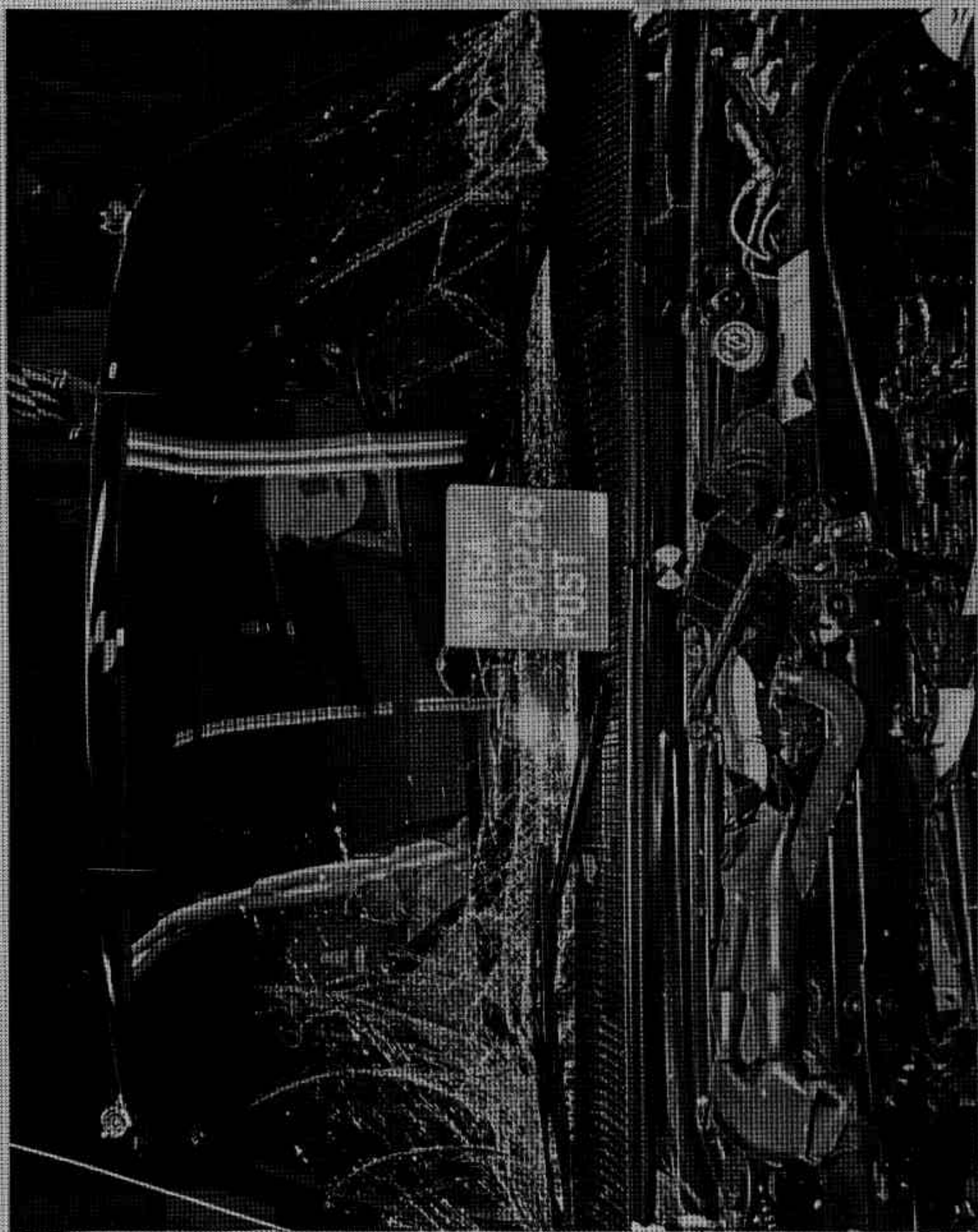


FIGURE A-14. POST-TEST WINDSHIELD VIEW
A-15

920226

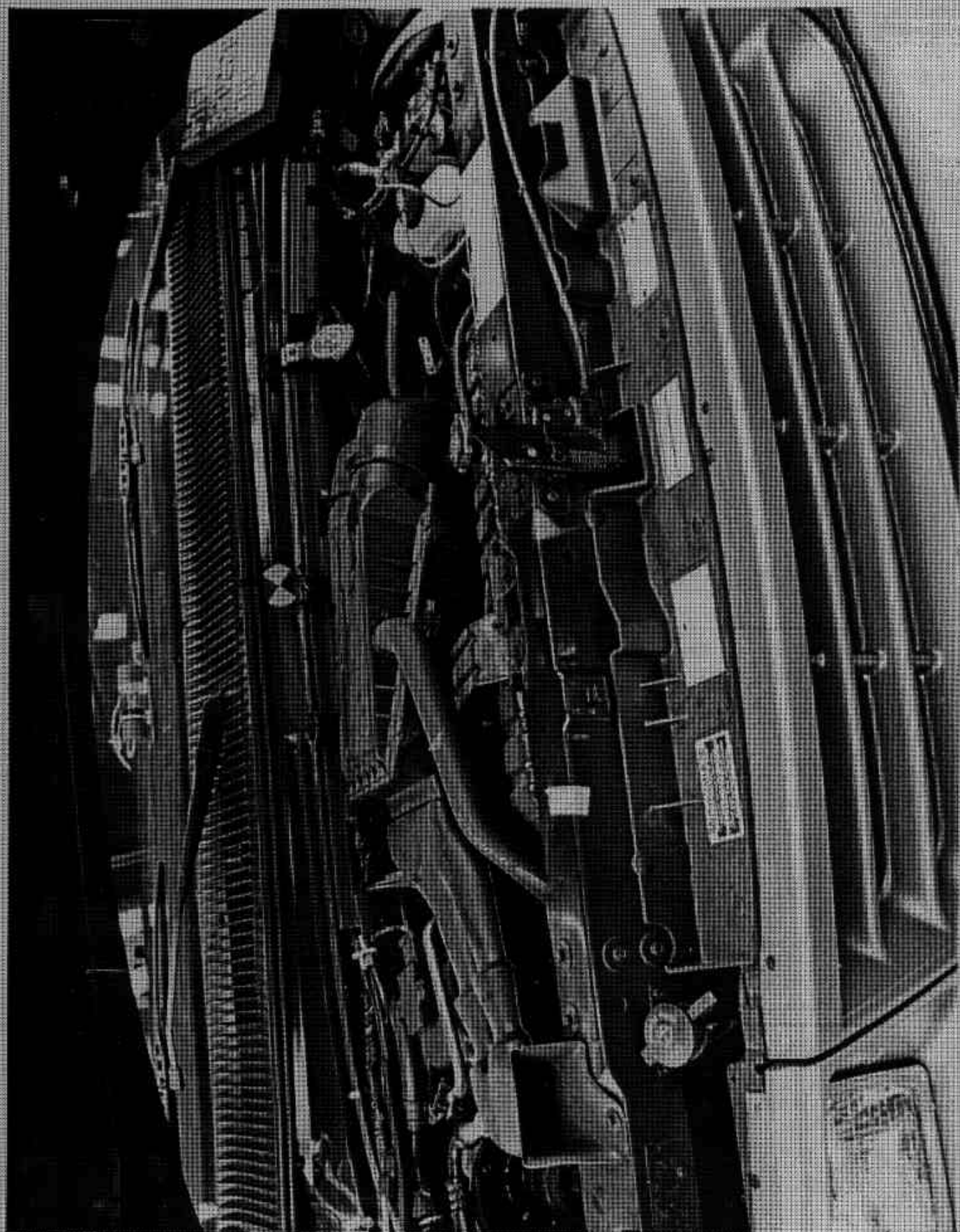


FIGURE A-15. PRE-TEST ENGINE COMPARTMENT VIEW

A-16

920226

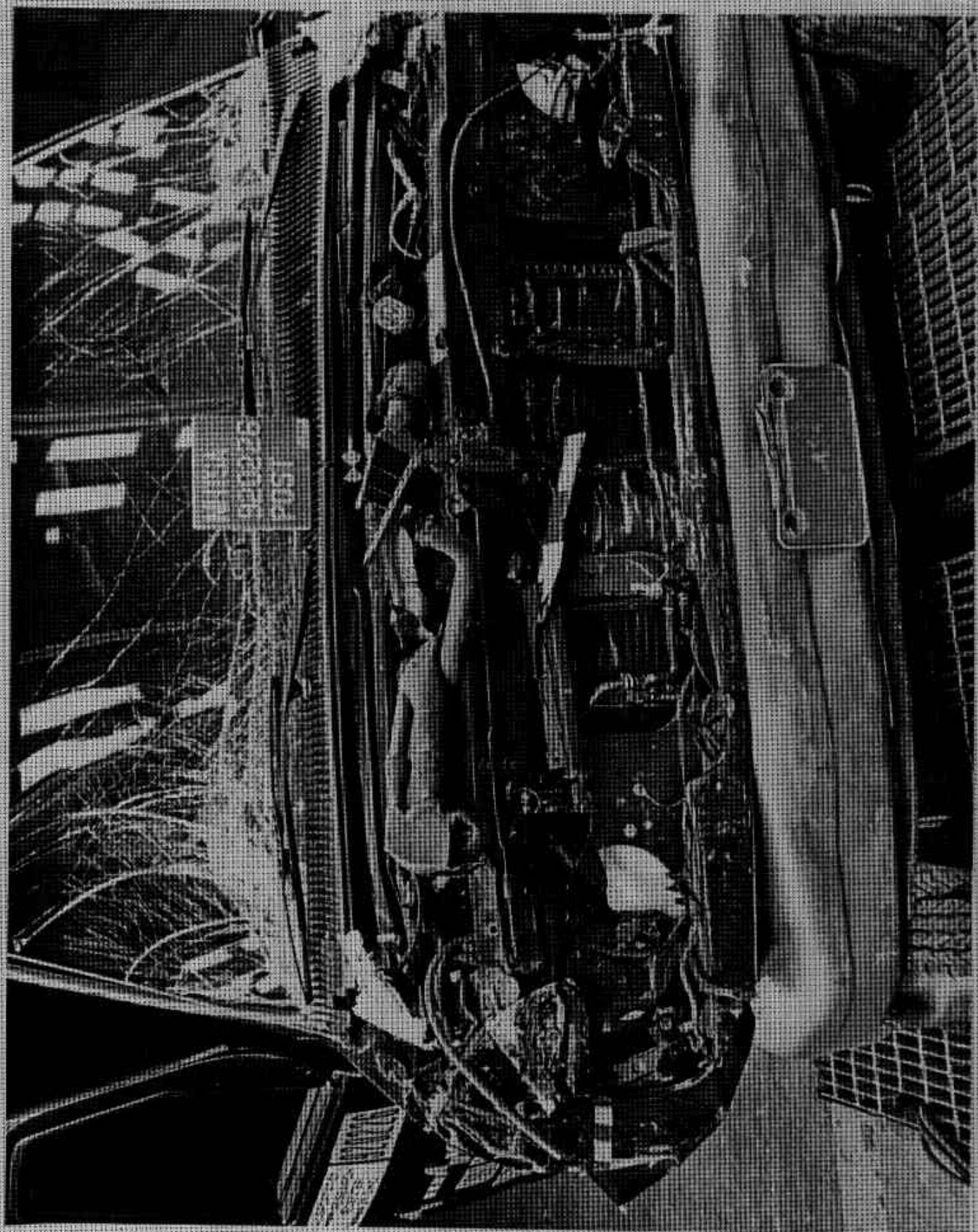


FIGURE A-16. POST-TEST ENGINE COMPARTMENT VIEW

A-17

920226

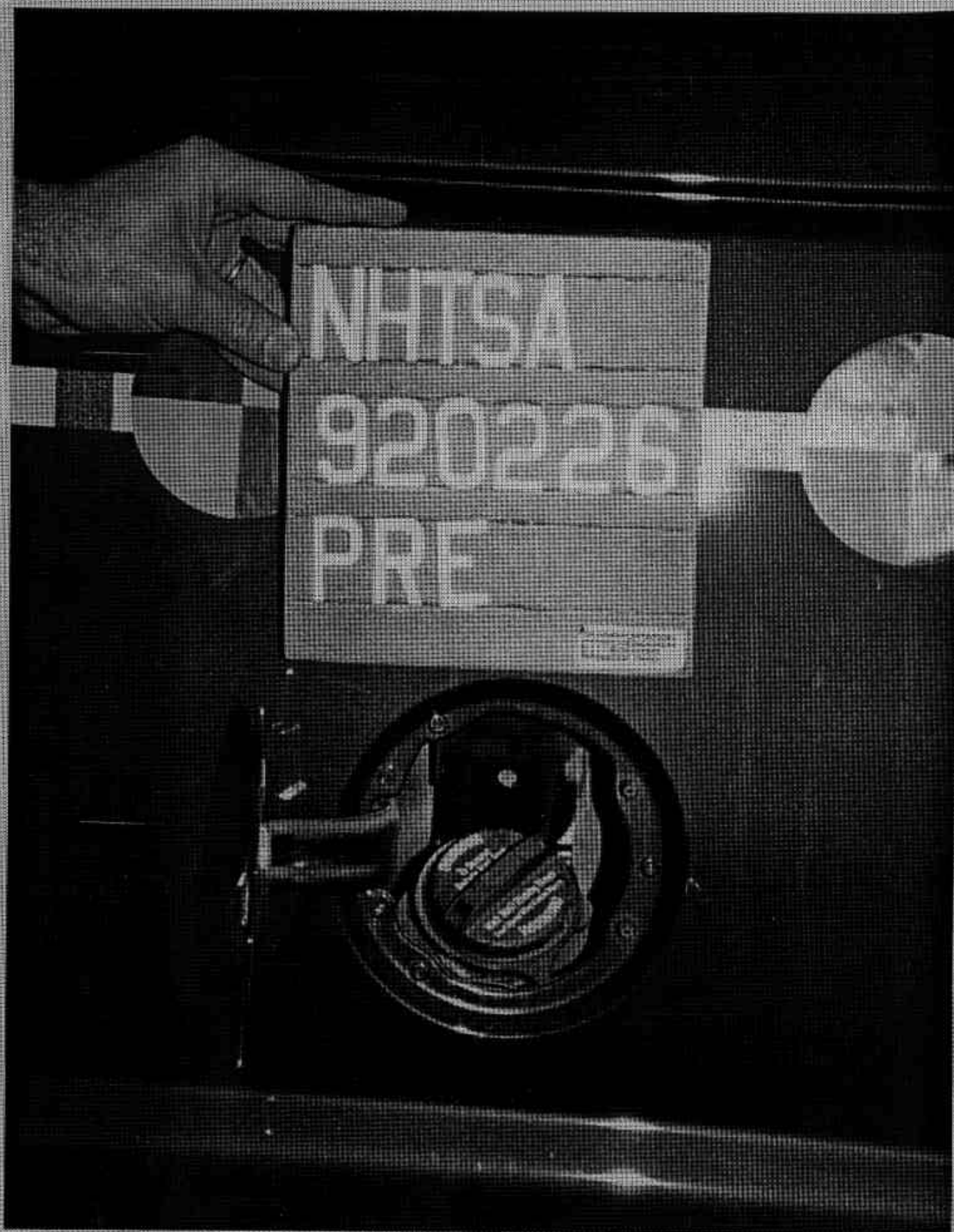


FIGURE A-17. PRE-TEST FUEL FILLER CAP VIEW
A-18

920226

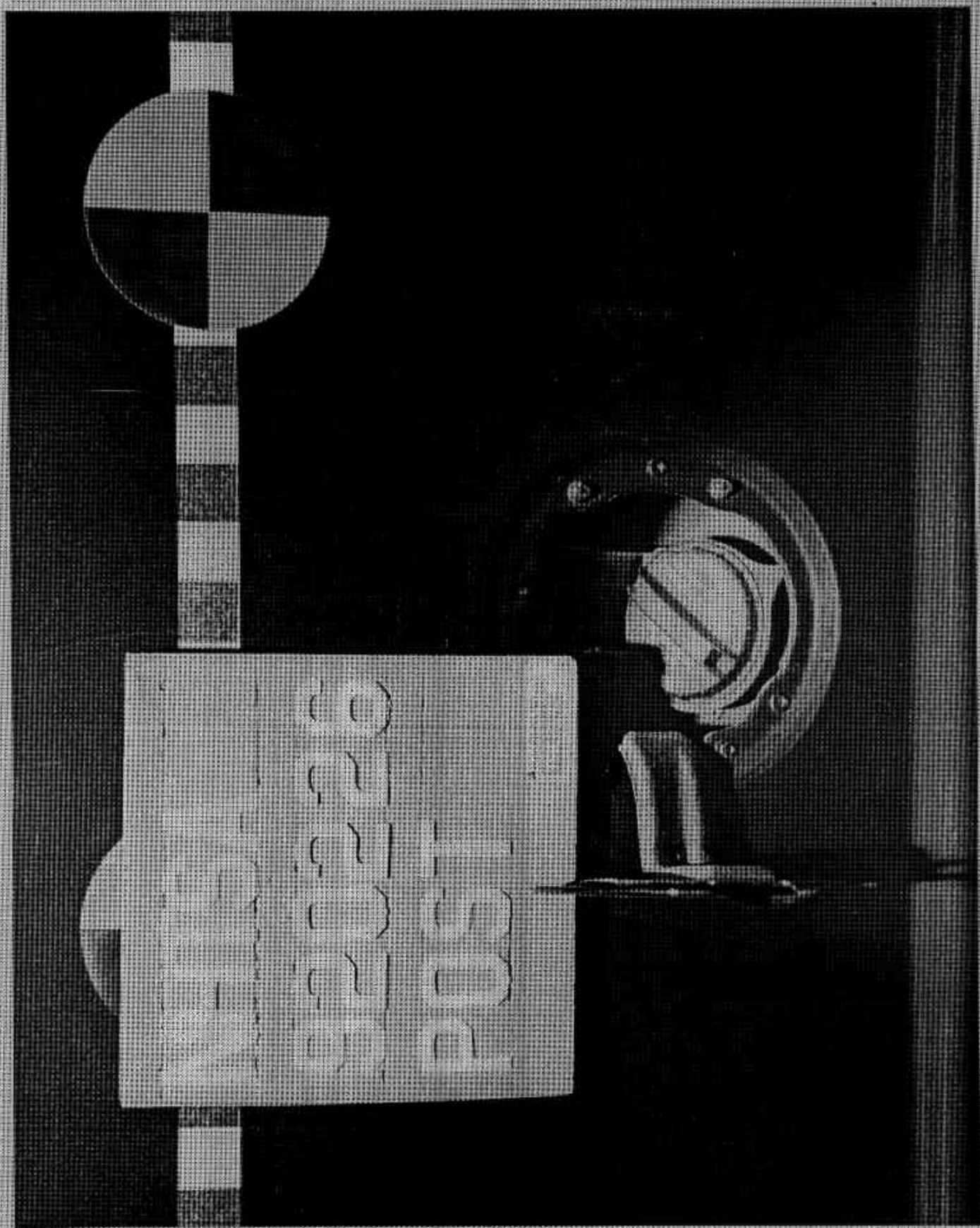


FIGURE A-18. POST-TEST FUEL FILLER CAP VIEW

A-19

920226

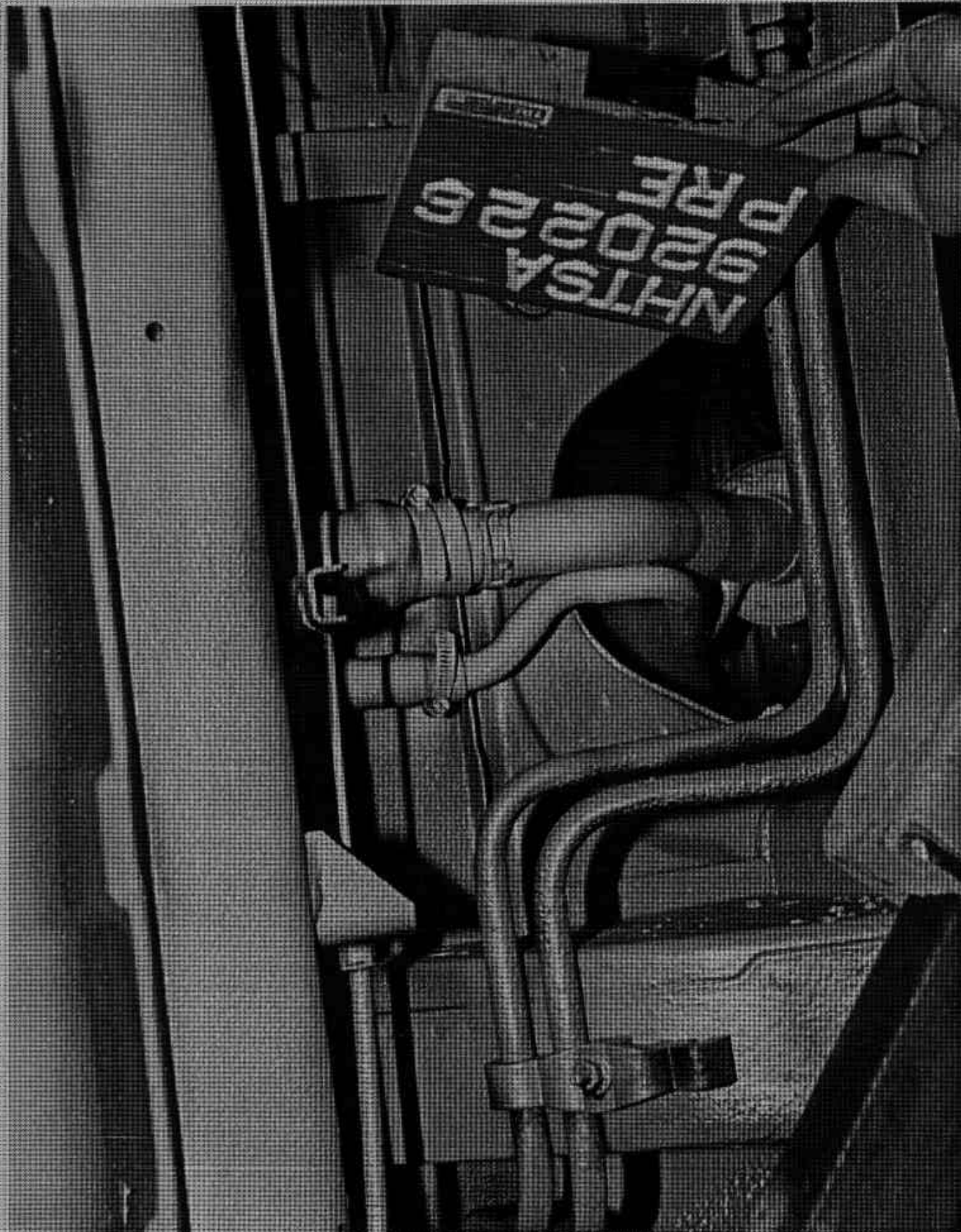


FIGURE A-19. PRE-TEST FUEL FILLER NECK VIEW

A-20

920226



FIGURE A-20. POST-TEST FUEL FILLER NECK VIEW

A-21

920226



FIGURE A-21. PRE-TEST FUEL TANK VIEW
A-22

920226



FIGURE A-22. POST-TEST FUEL TANK VIEW
A-23

920226

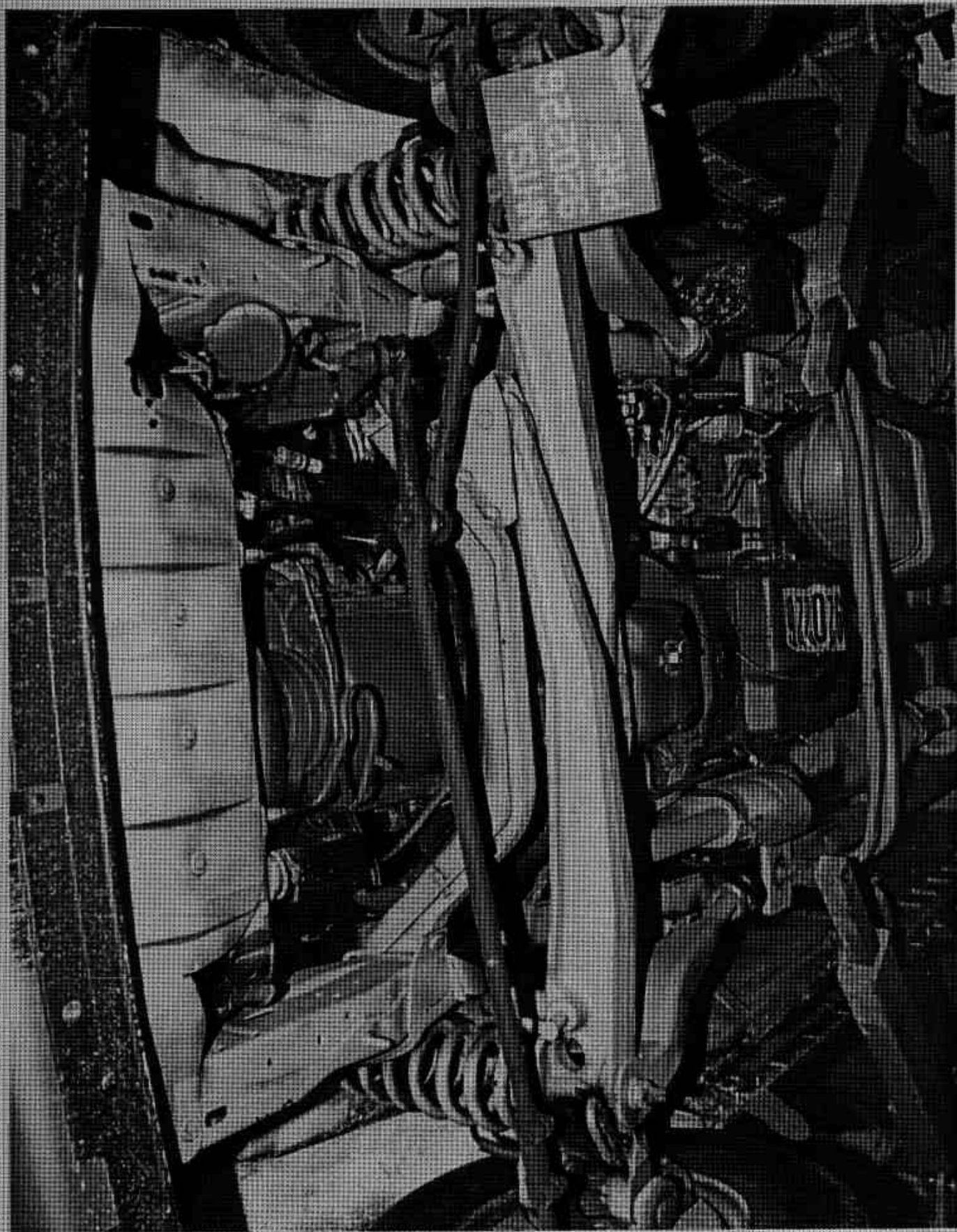


FIGURE A-23. PRE-TEST FRONT UNDERBODY VIEW

A-24

920226

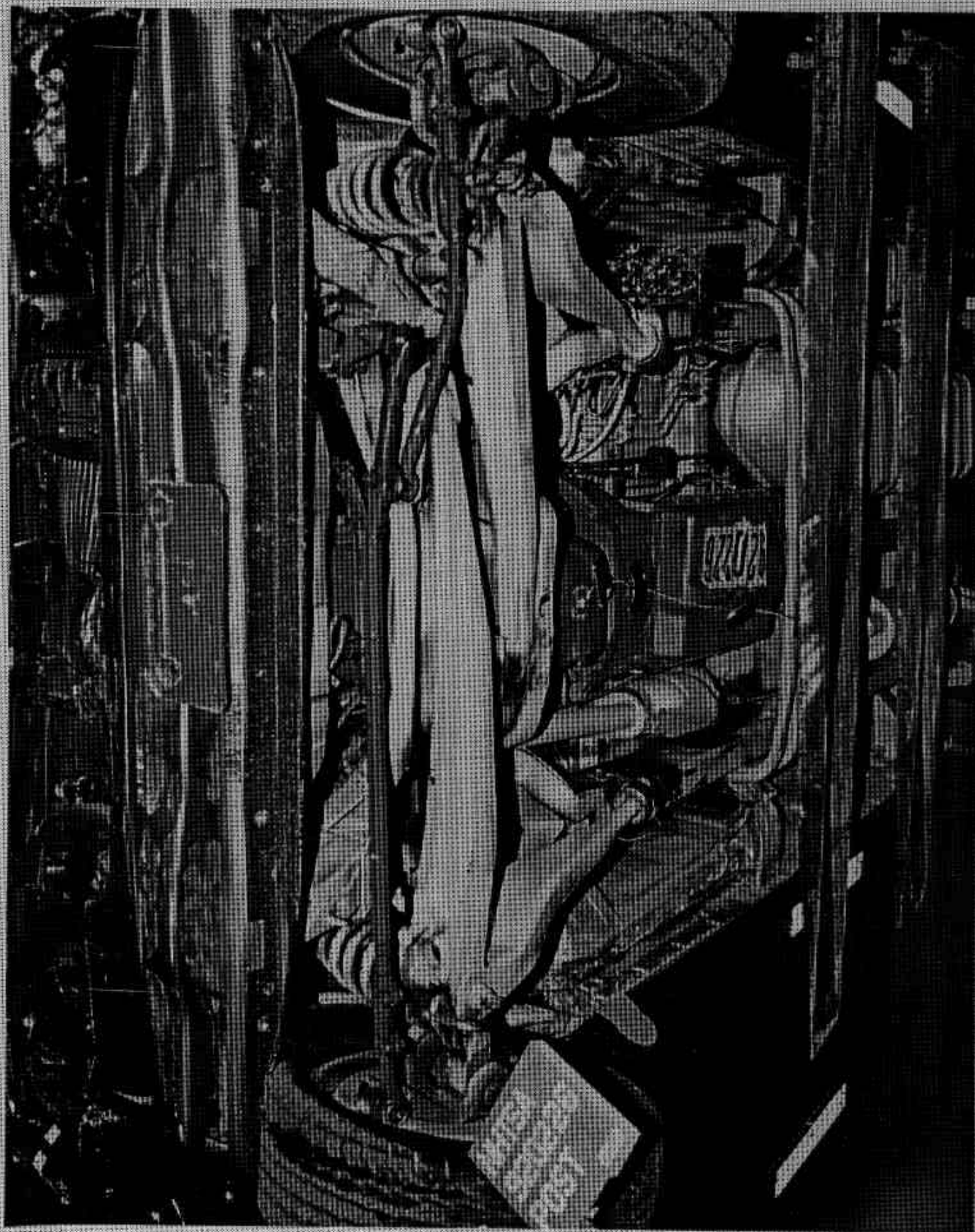


FIGURE A-24. POST-TEST FRONT UNDERBODY VIEW

A-25

920226



FIGURE A-25. PRE-TEST REAR UNDERBODY VIEW

A-26

920226

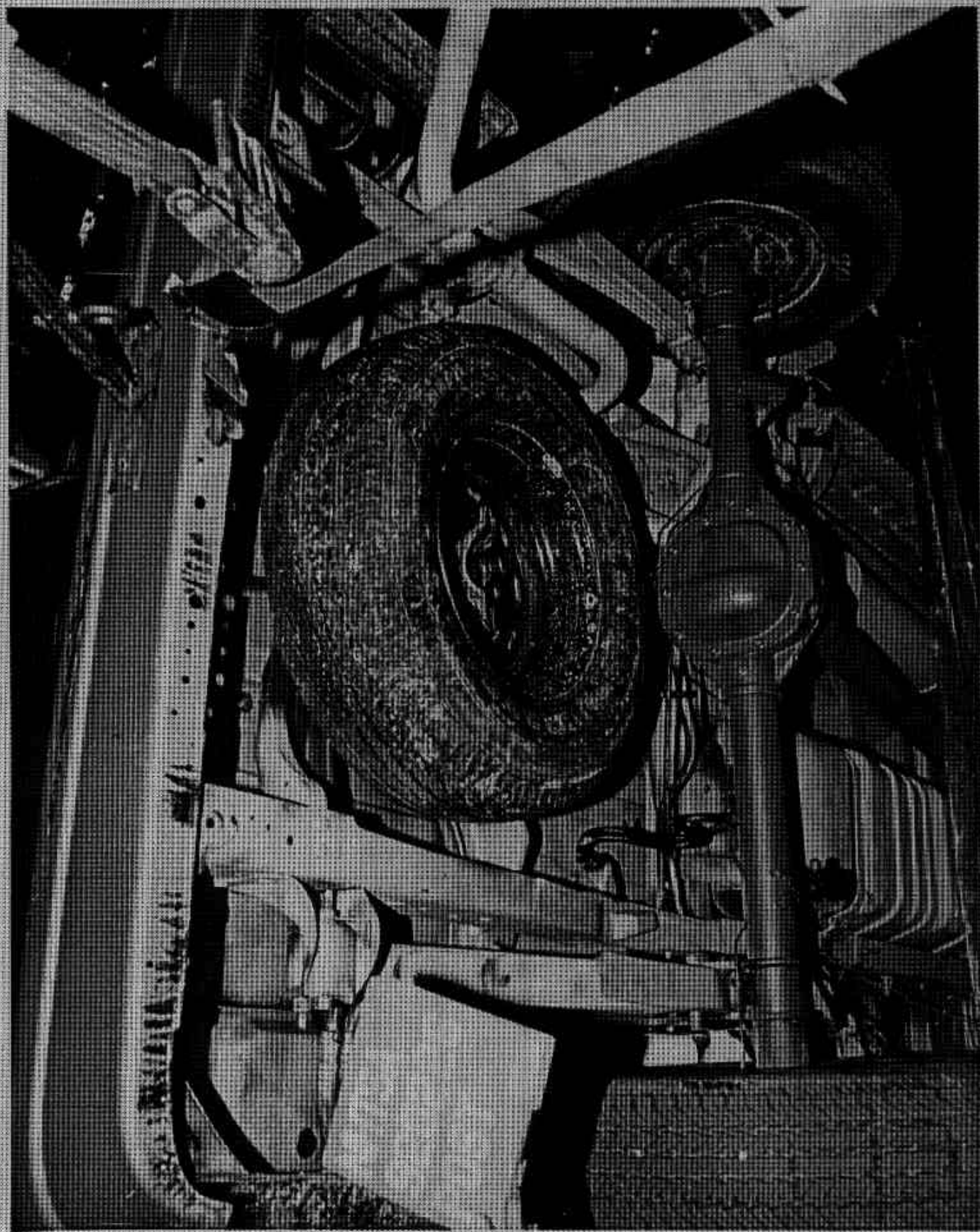


FIGURE A-26. POST-TEST REAR UNDERBODY VIEW

A-27

920226

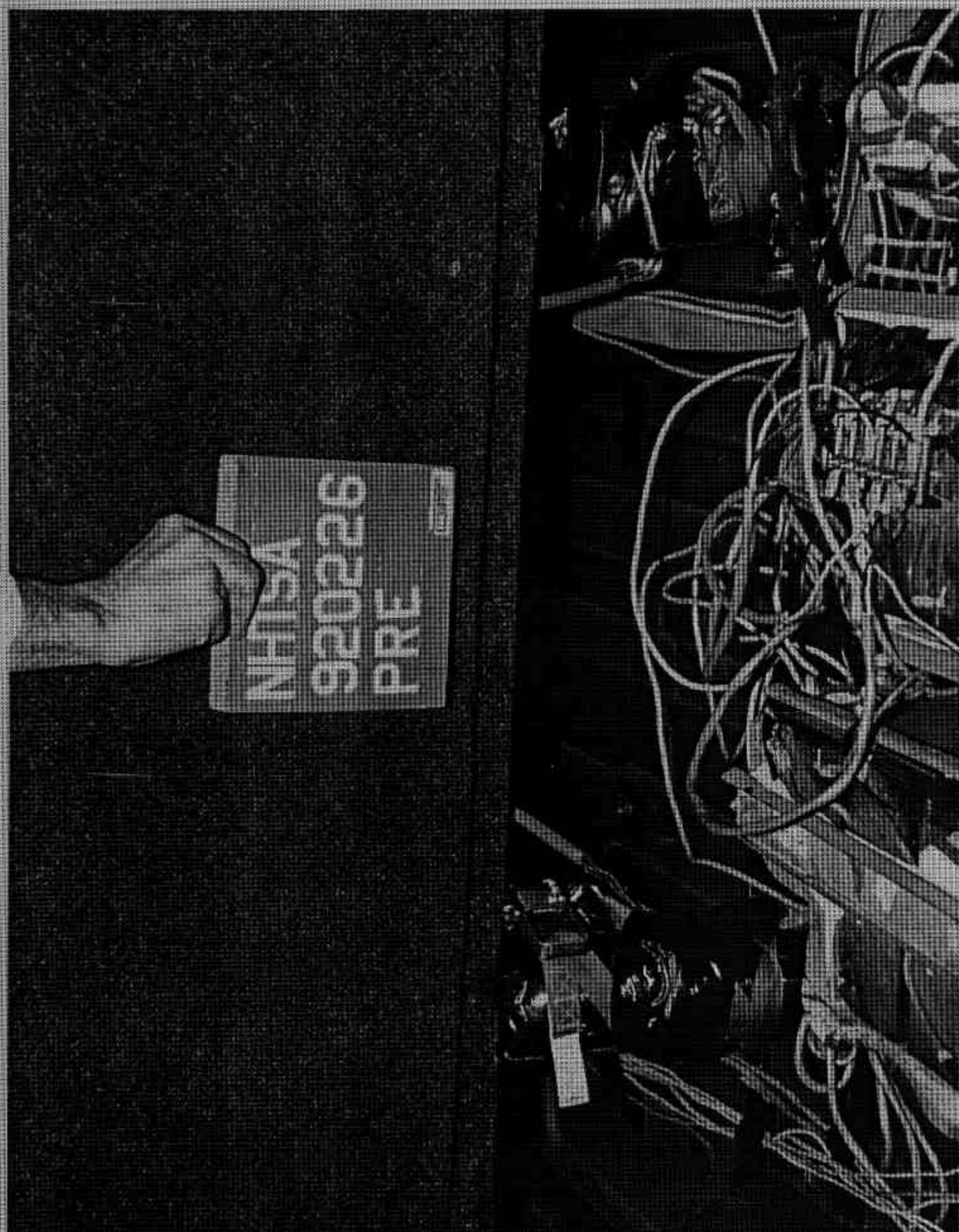


FIGURE A-27. PRE-TEST BALLAST LOCATION VIEW

A-28

920226

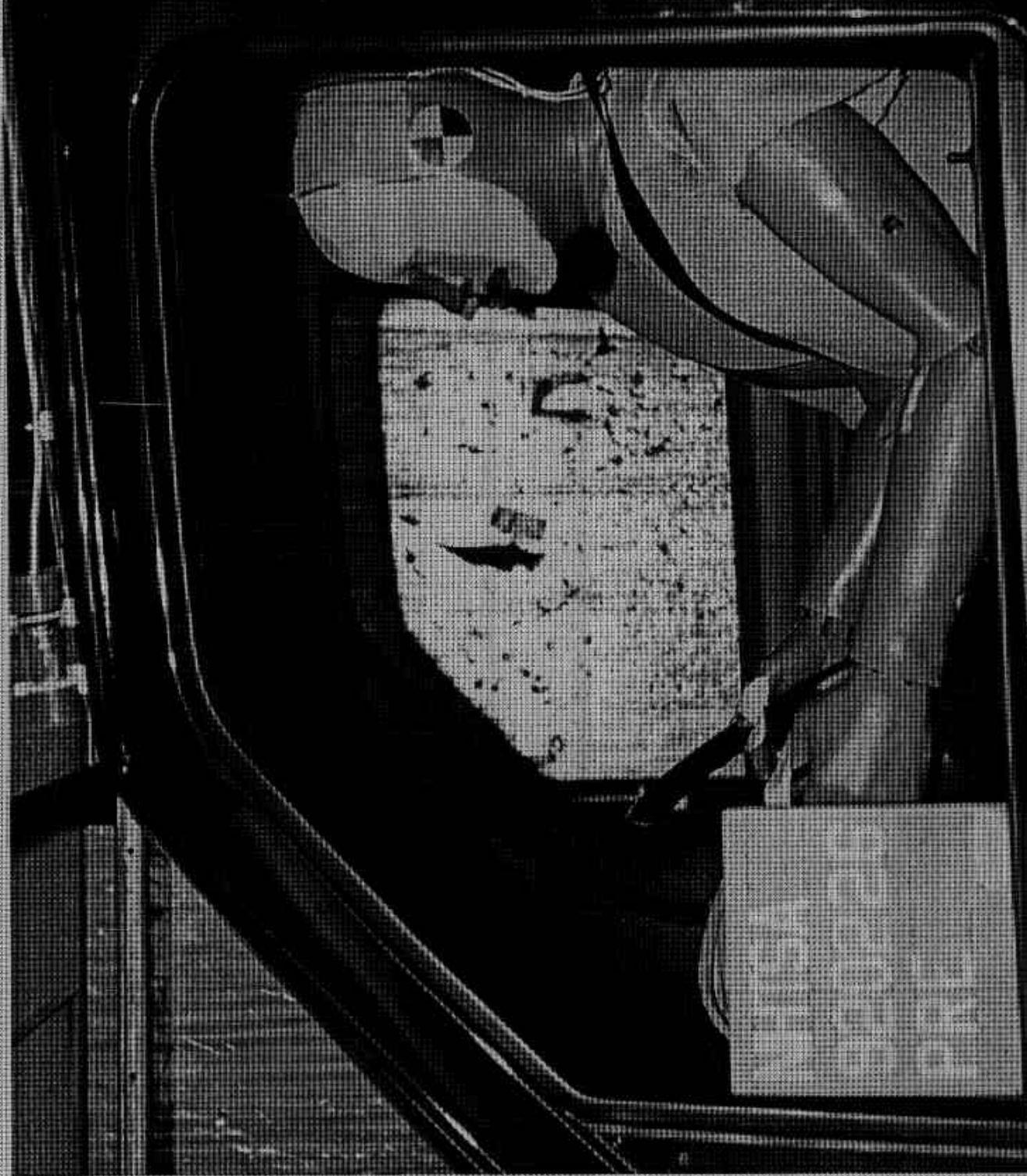


FIGURE A-28. PRE-TEST DRIVER DUMMY POSITION VIEW

A-29

920226

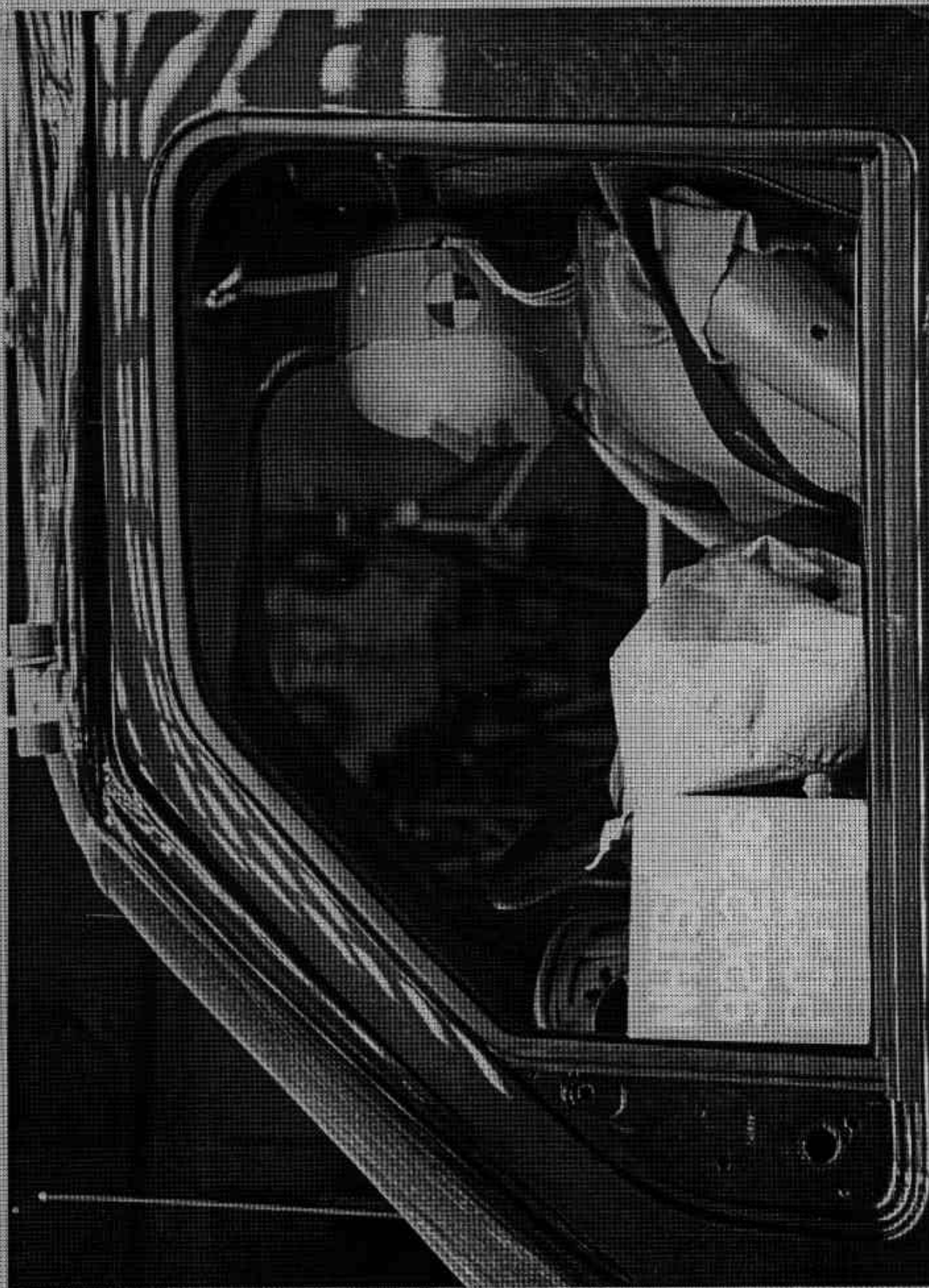


FIGURE A-29. POST-TEST DRIVER DUMMY POSITION VIEW



FIGURE A-30. PRE-TEST PASSENGER DUMMY POSITION VIEW

A-31

920226



FIGURE A-31. POST-TEST PASSENGER DUMMY POSITION VIEW

A-32

920226

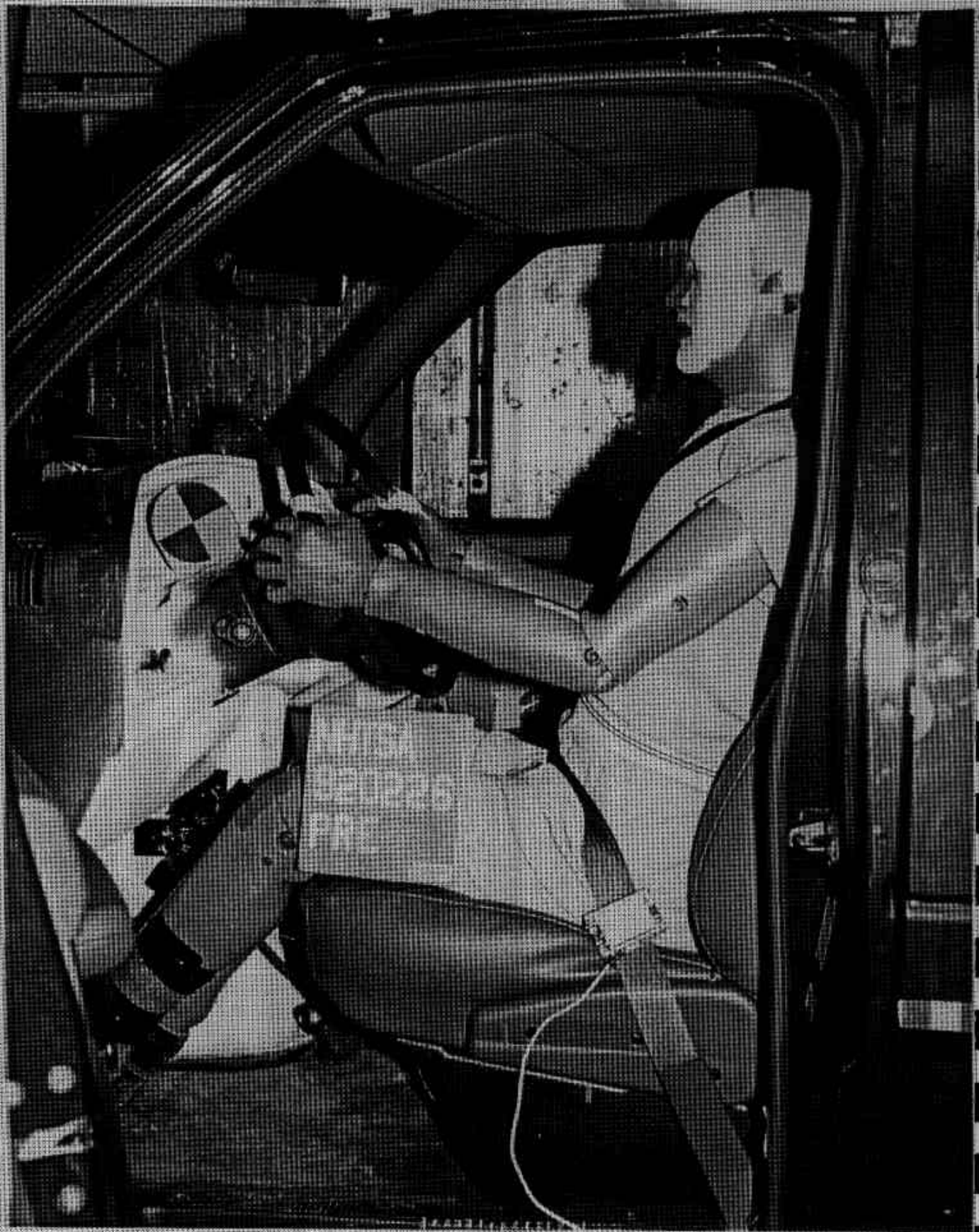


FIGURE A-32, PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

A-33

920226



FIGURE A-33. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

A-34

920226



FIGURE A-34. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

A-35

920226



FIGURE A-35. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

A-36

920226

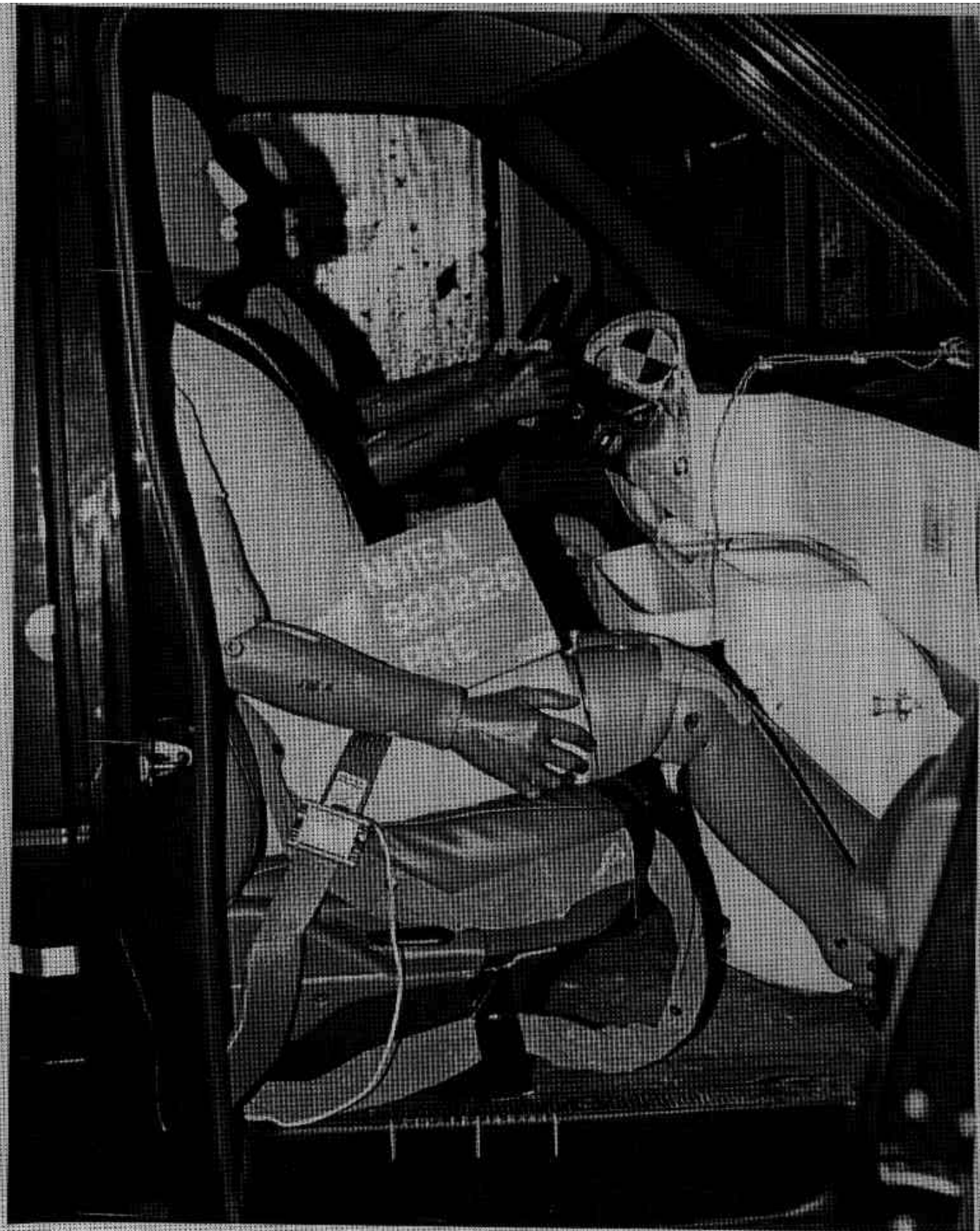


FIGURE A-36. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-37 920226



FIGURE A-37. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-38 920226



FIGURE A-38. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

A-39

920226



FIGURE A-39. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
A-40 920226

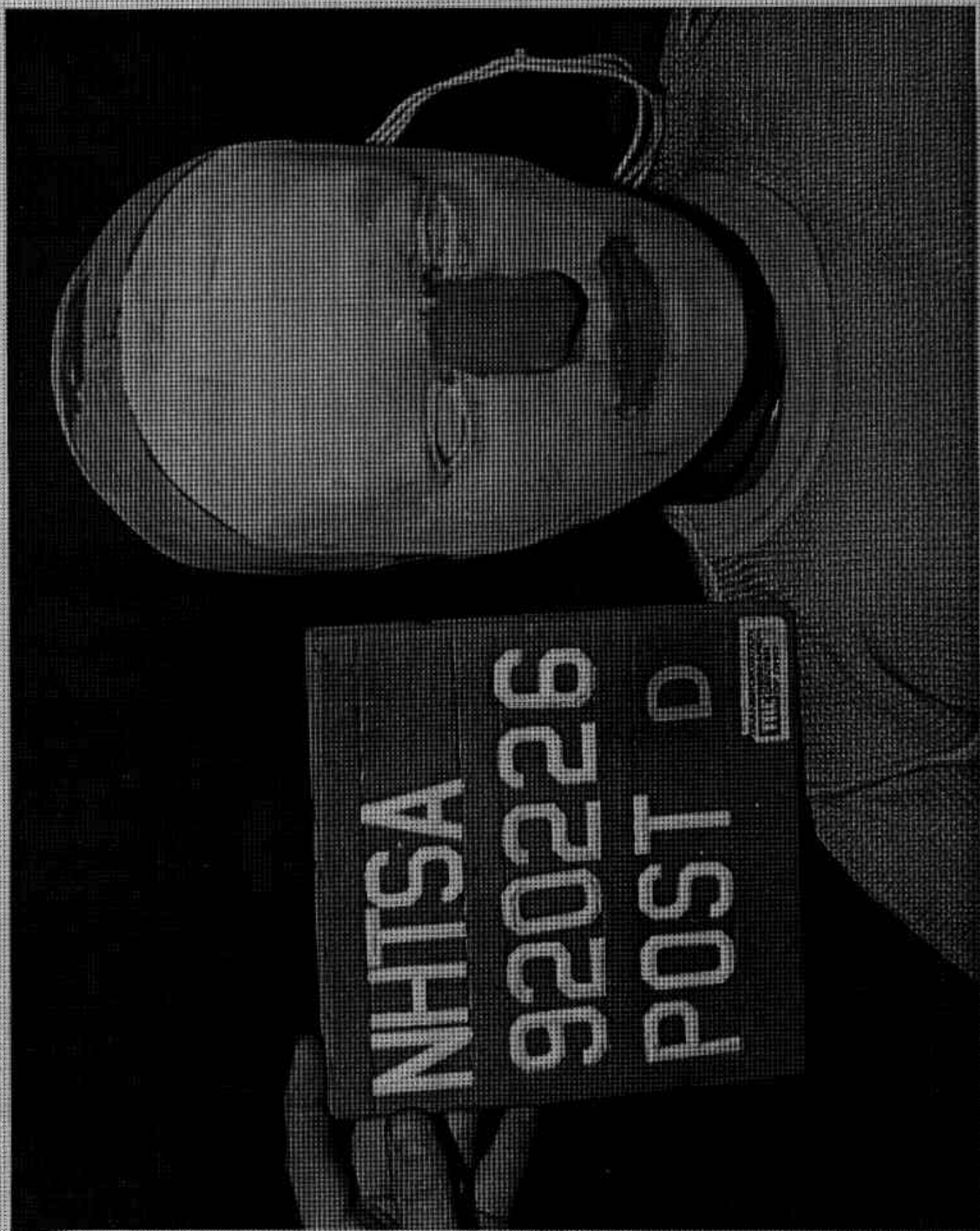


FIGURE A-40. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 1

A-41

920226

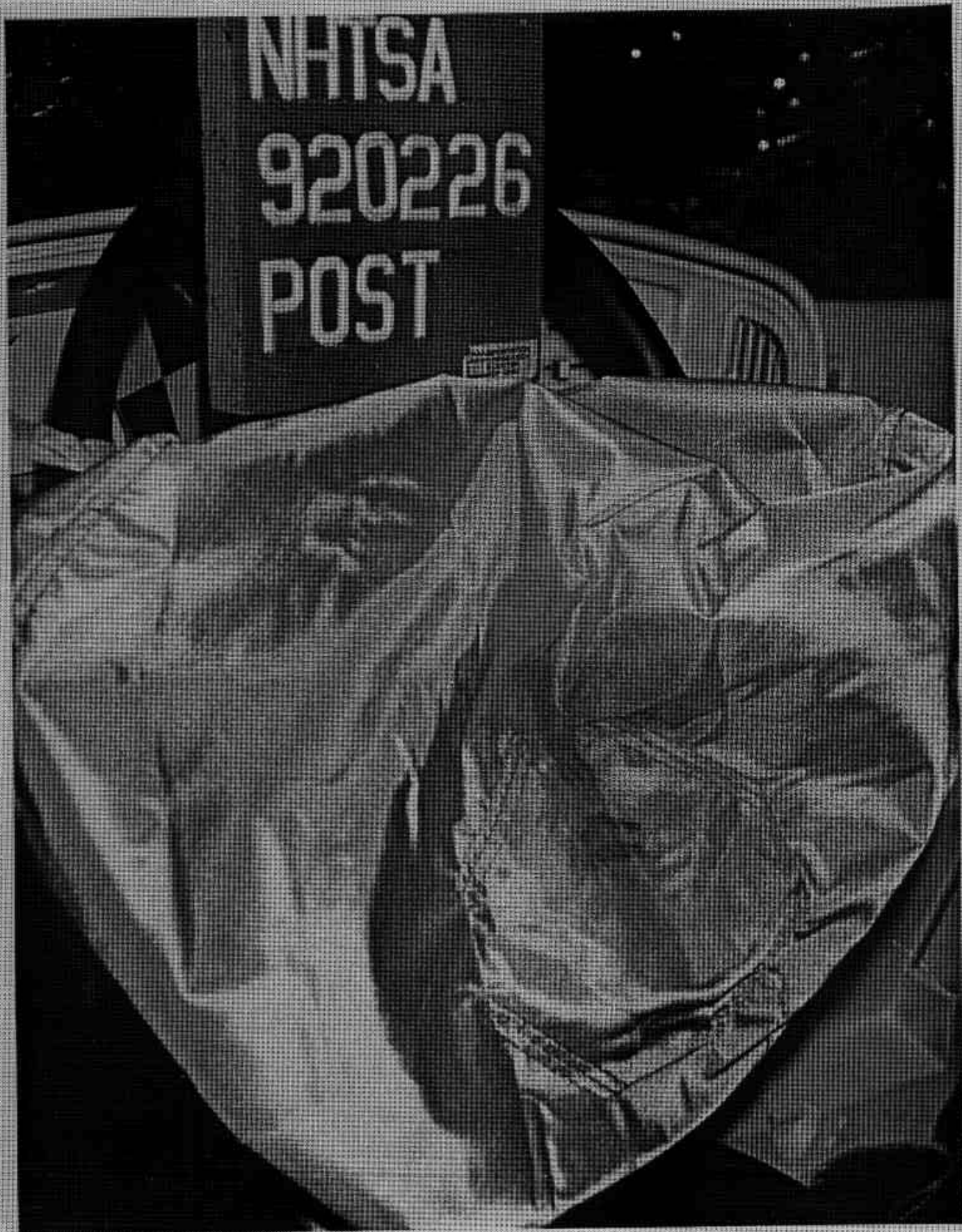


FIGURE A-41. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 2

A-42

920226



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

A-43

920226

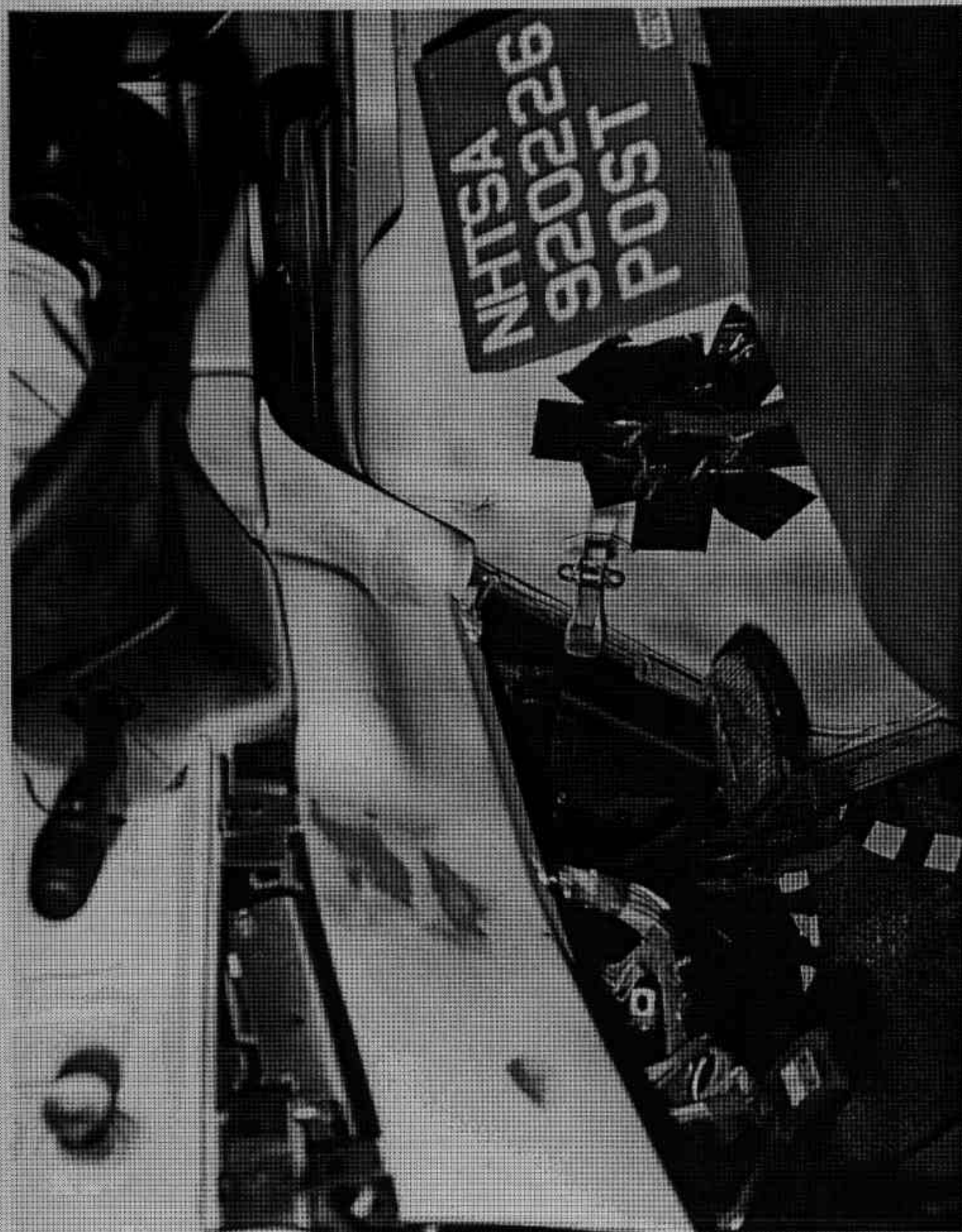


FIGURE A-43. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 2

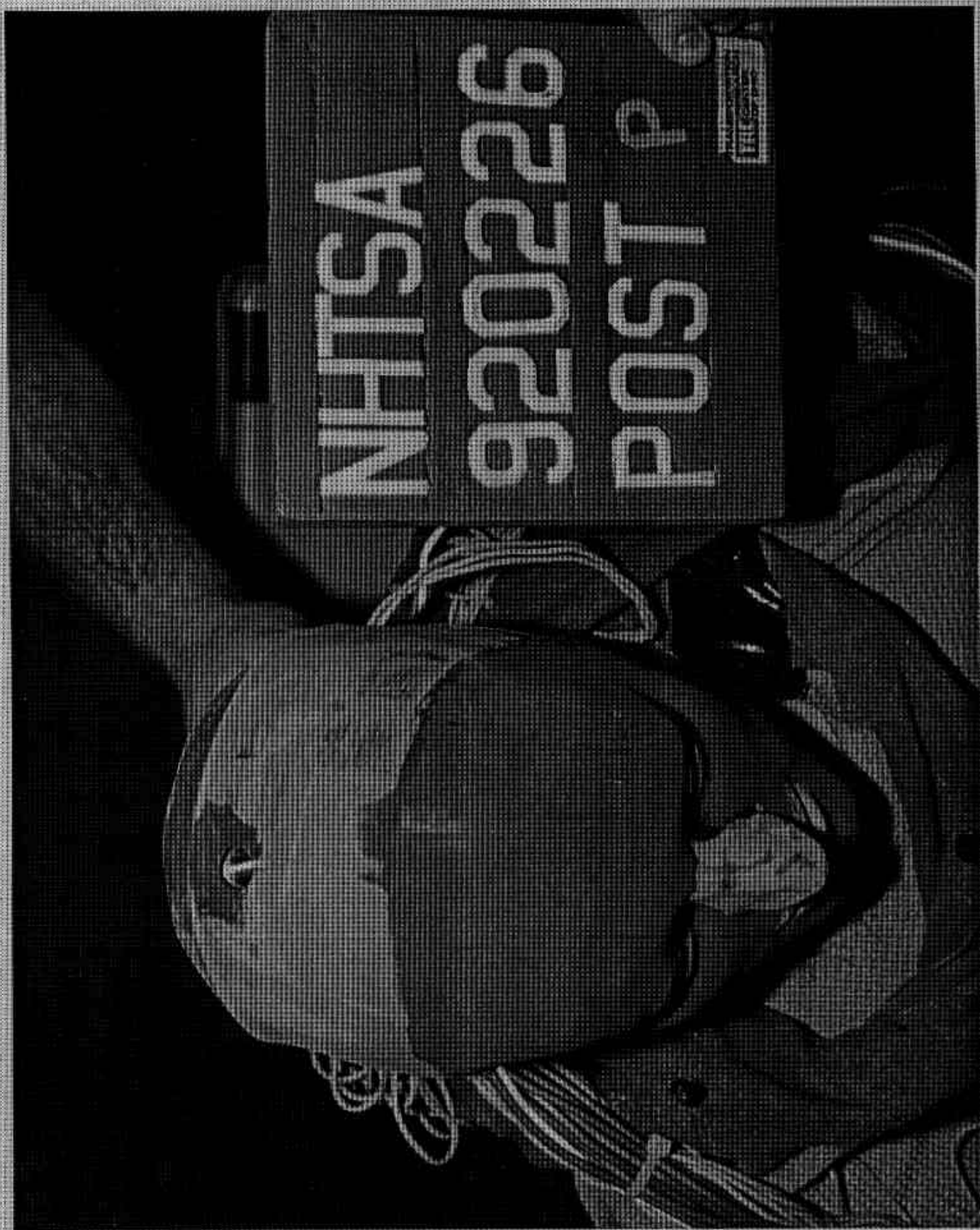


FIGURE A-44. POST-TEST PASSENGER DUMMY HEAD CONTACT VIEW

A-45

920226

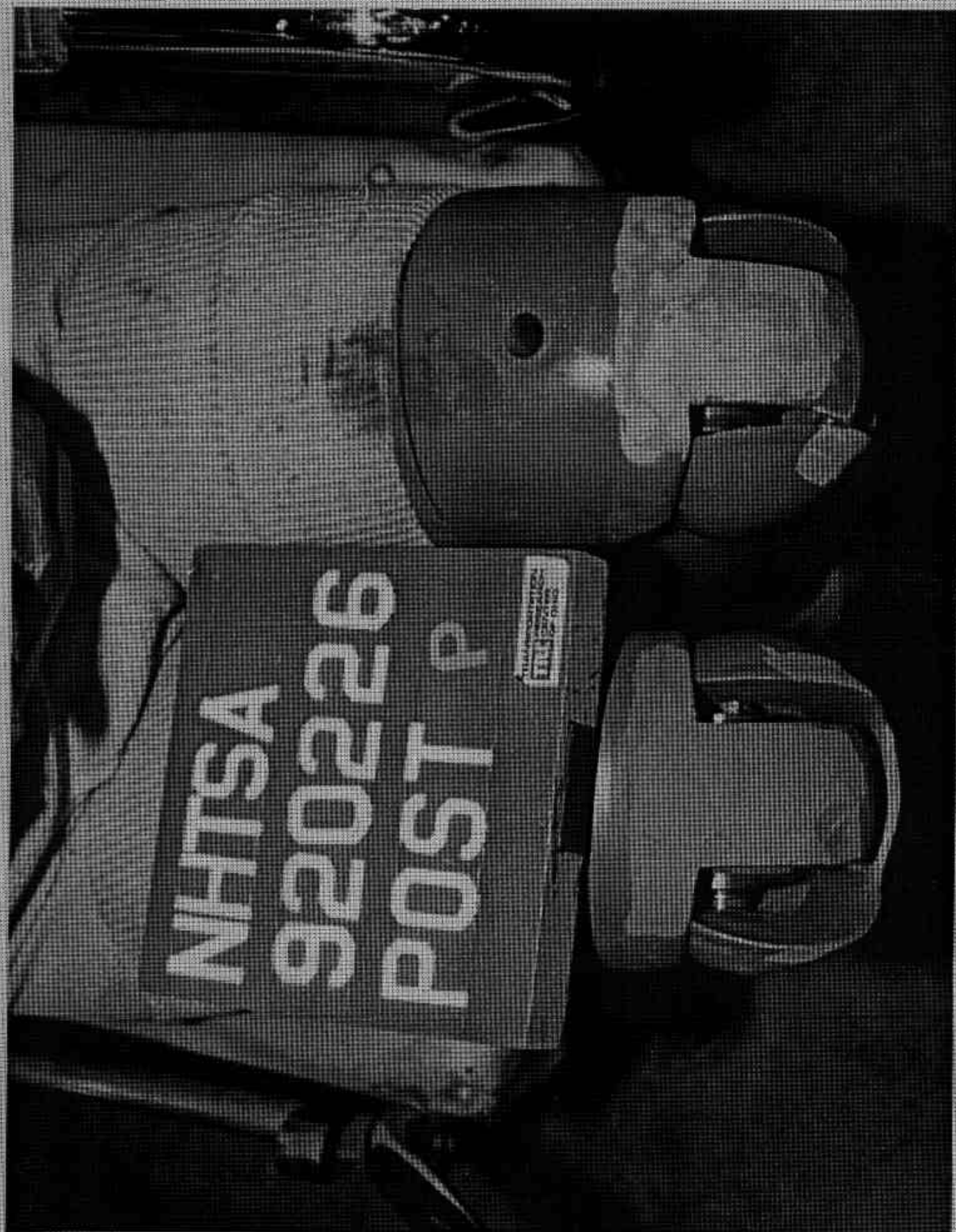


FIGURE A-45. POST-TEST PASSENGER DUMMY HEAD AND KNEE CONTACT VIEW



FIGURE A-46. POST-TEST PASSENGER DUMMY KNEE CONTACT VIEW

A-47

920226

MFD. BY FORD MOTOR CO. IN U.S.A.		DATE: 09/91
CUR: 6700LB/ 3039KG		REAR GAW: 3800LB
FRONT GAW: 3400LB		1723KG
WITH P235/75R15SL TIRES		15X6.0J RIMS
15X6.0J RIMS AT 41 PSI COLD		AT 41 PSI COLD
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE		
SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.		
VIN: 1FMEEL1Y2NHA03973 TYPE: MPV		
		
EXT. PAINT	COLORS	PK
130	E112	AJ
TYPE	TRANS	AXLE
130	E	18
TYPE	SPRINGS	H C
130	92	H C
F0154		T0422
VF20A-1525A10-00A		

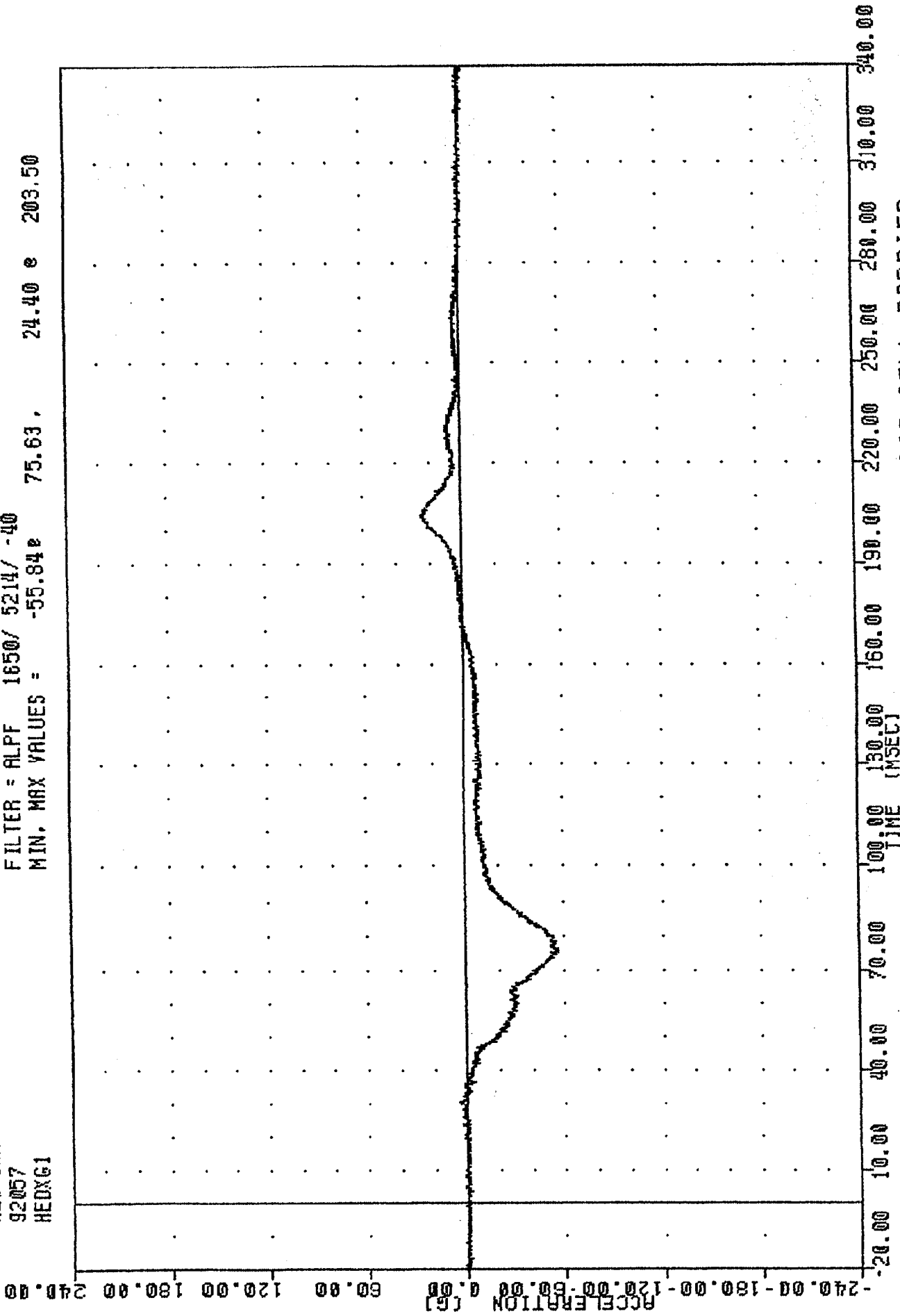
FIGURE A-47. PRE-TEST VEHICLE CERT. & RECOMMENDED TIRE PRES. LABEL
A-48 920226

APPENDIX B

DATA PLOTS

TRC 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 HEDXG1

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -55.84e 75.63, 24.40 e 203.50



NEW CAN TECHNOLOGIES CORPORATION

92057

HEDYG1

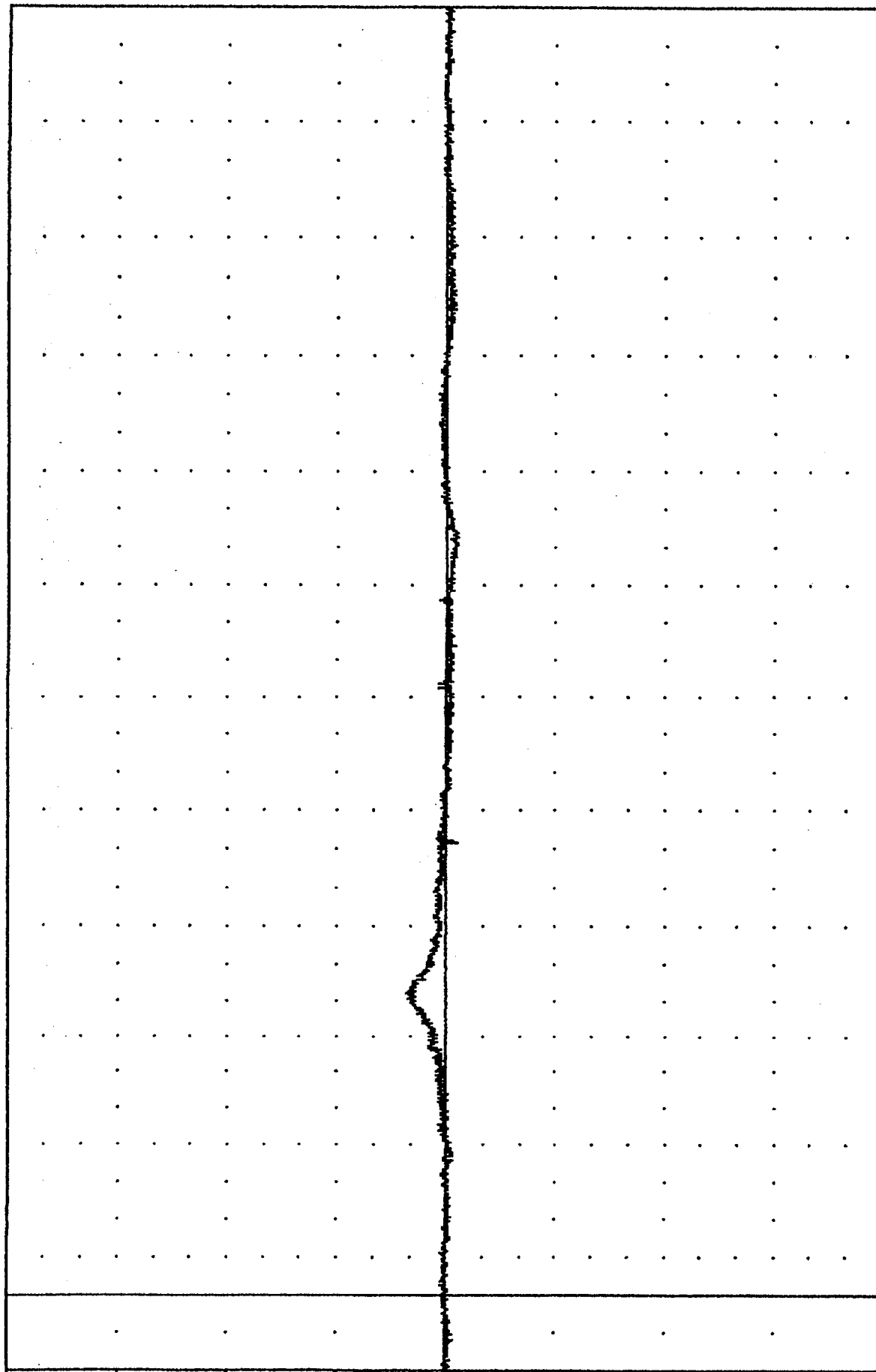
FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -6.50e

200.75,

21.61 e 82.13

ACCELERATION (G)

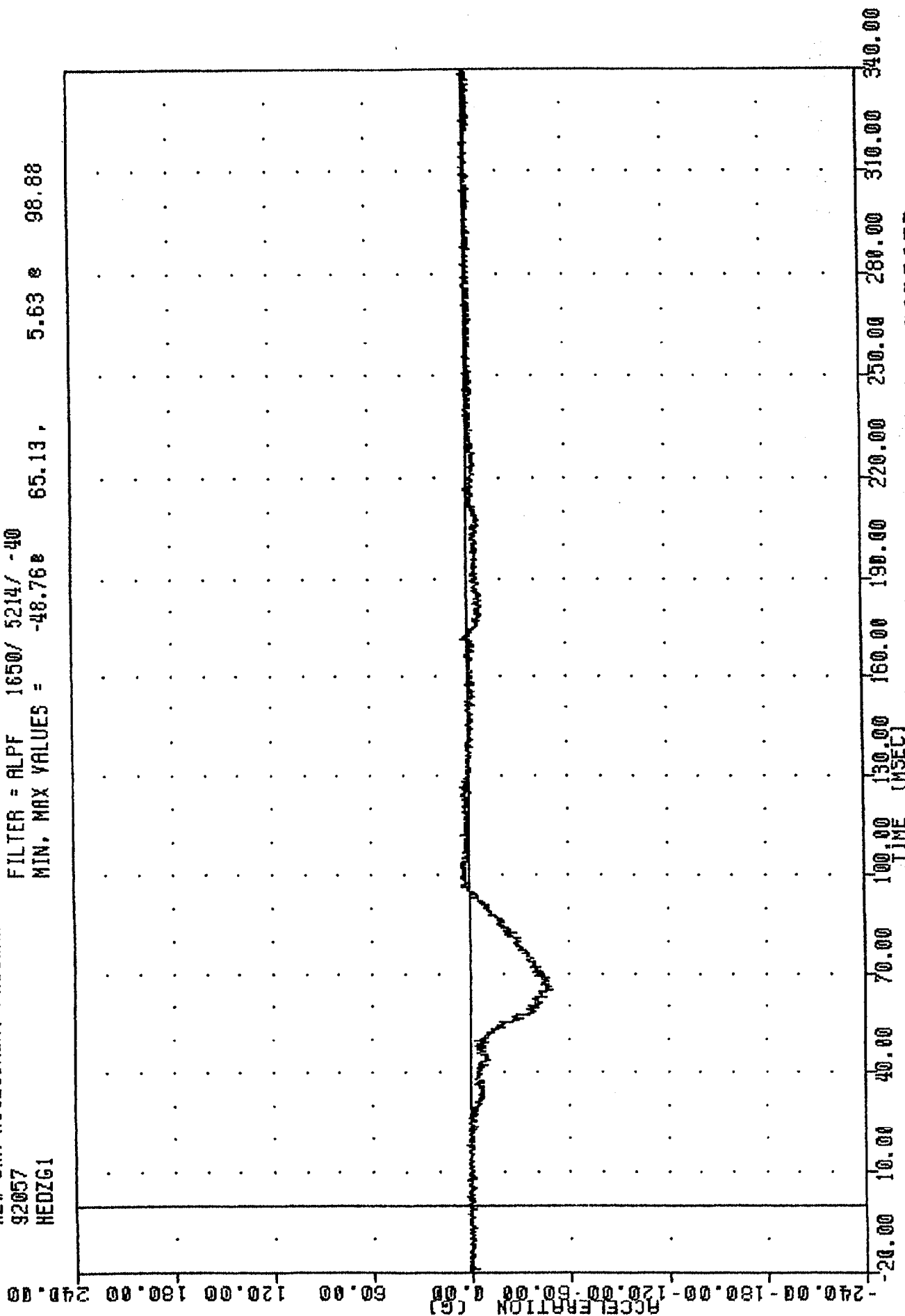


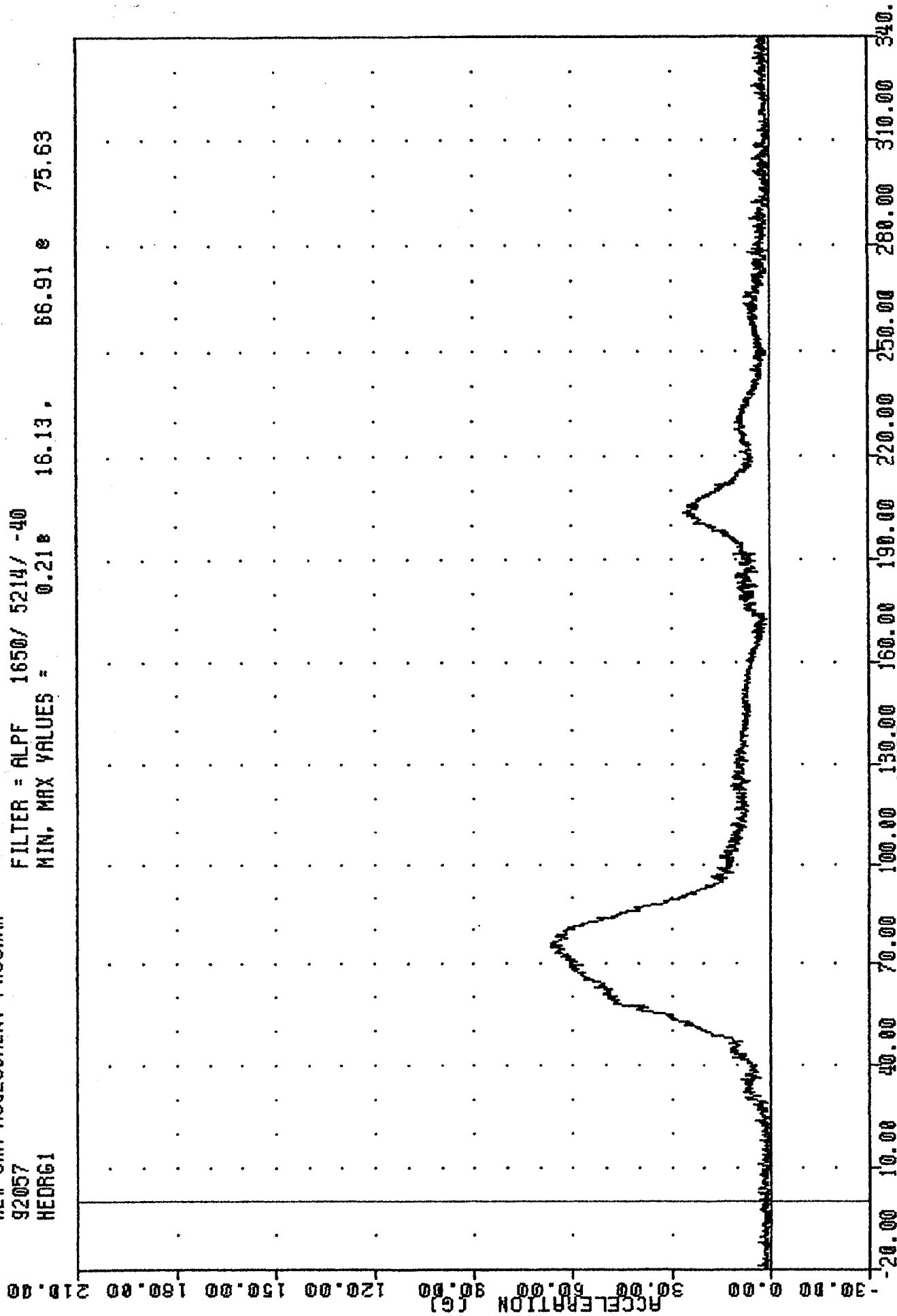
20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 HEDZG1

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -48.76 65.13 5.63 98.88

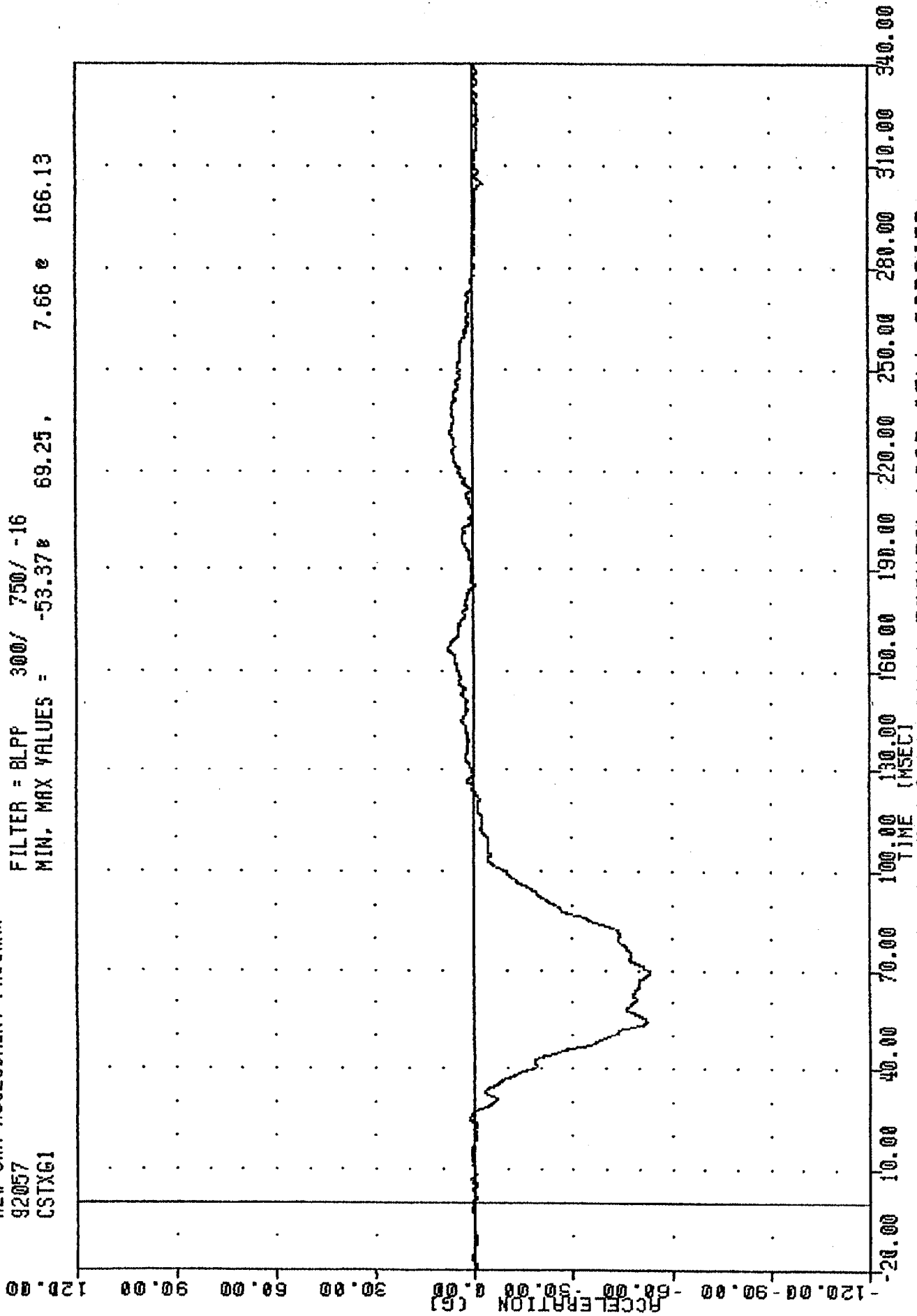




1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 CSTXG1

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -53.37% 69.25, 7.66 e 166.13

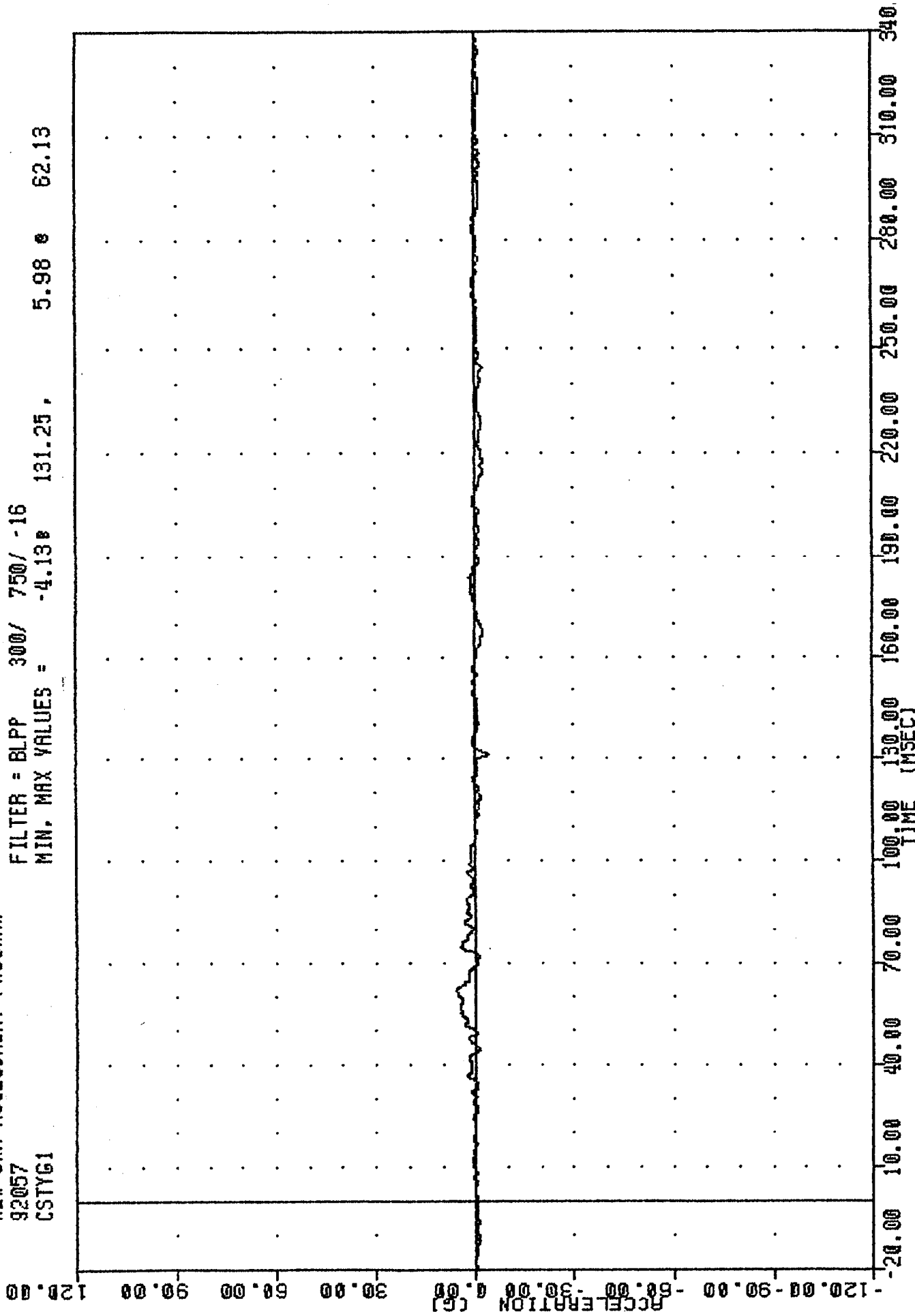


1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST X-AXIS ACCELERATION

NEW CAR ASSESSMENT PROGRAM

92057
CSTYG1

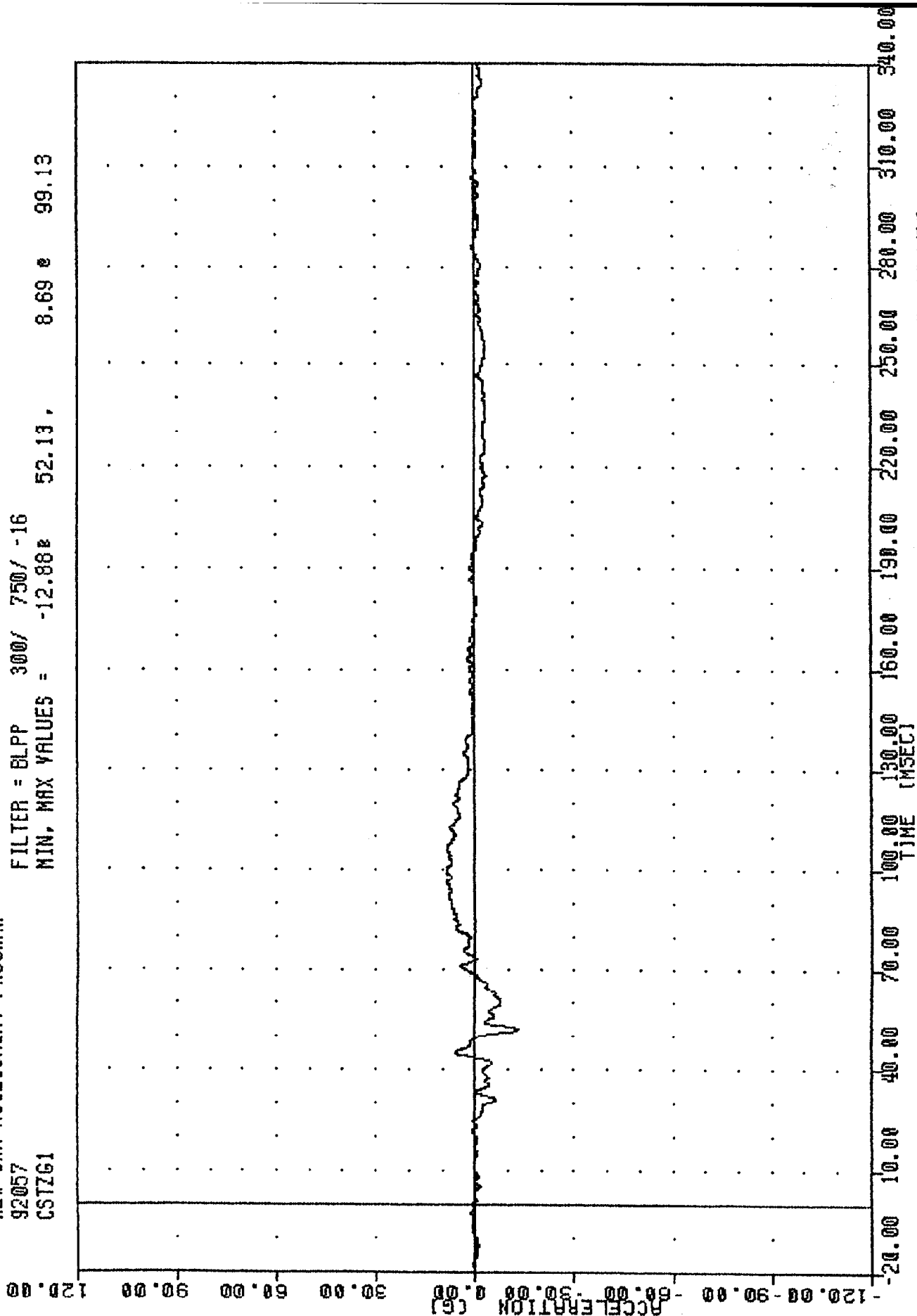
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -4.13 131.25, 5.98 62.13



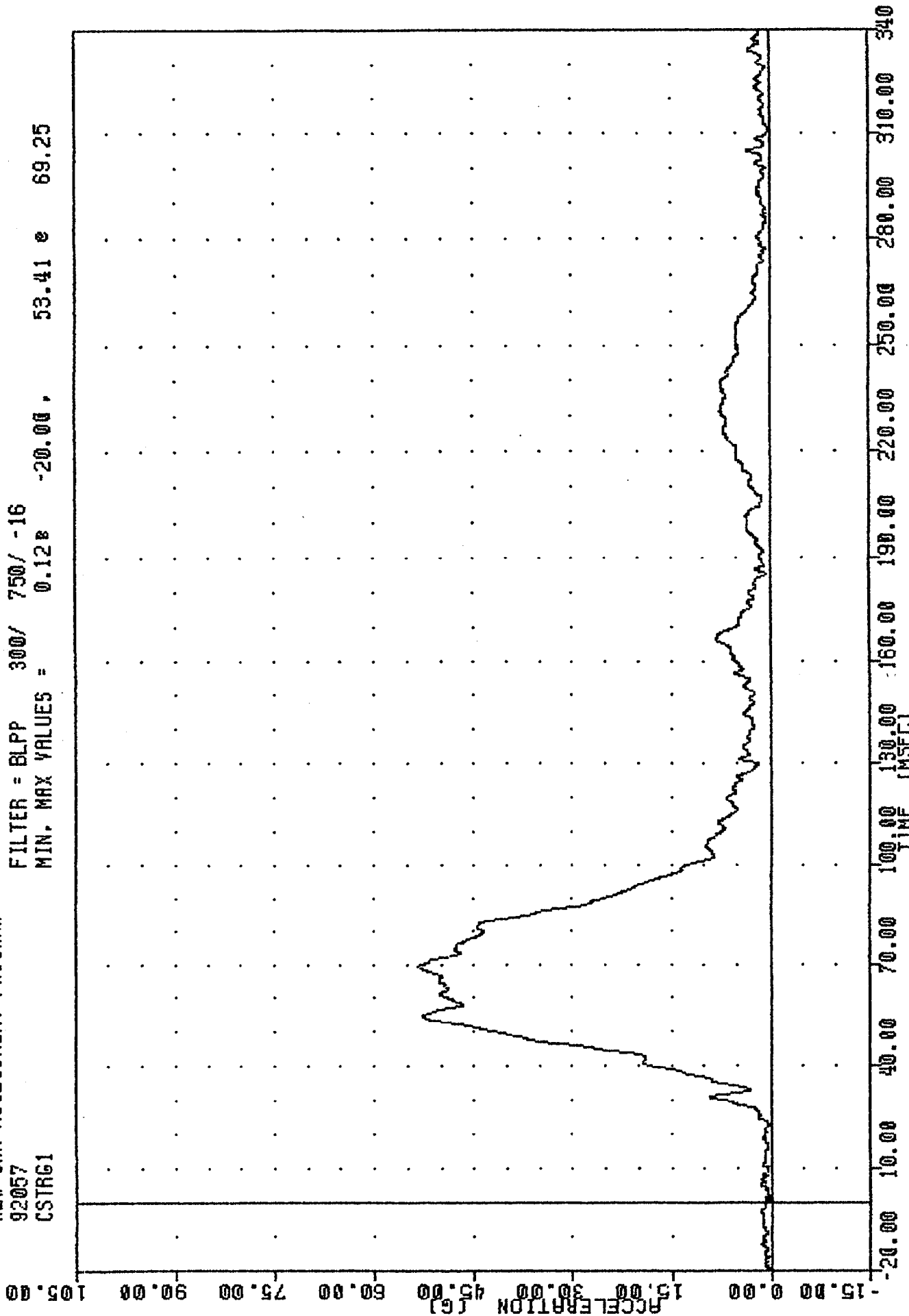
1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 CSTZG1

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -12.88 52.13, 8.69 99.13



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Z-AXIS ACCELERATION

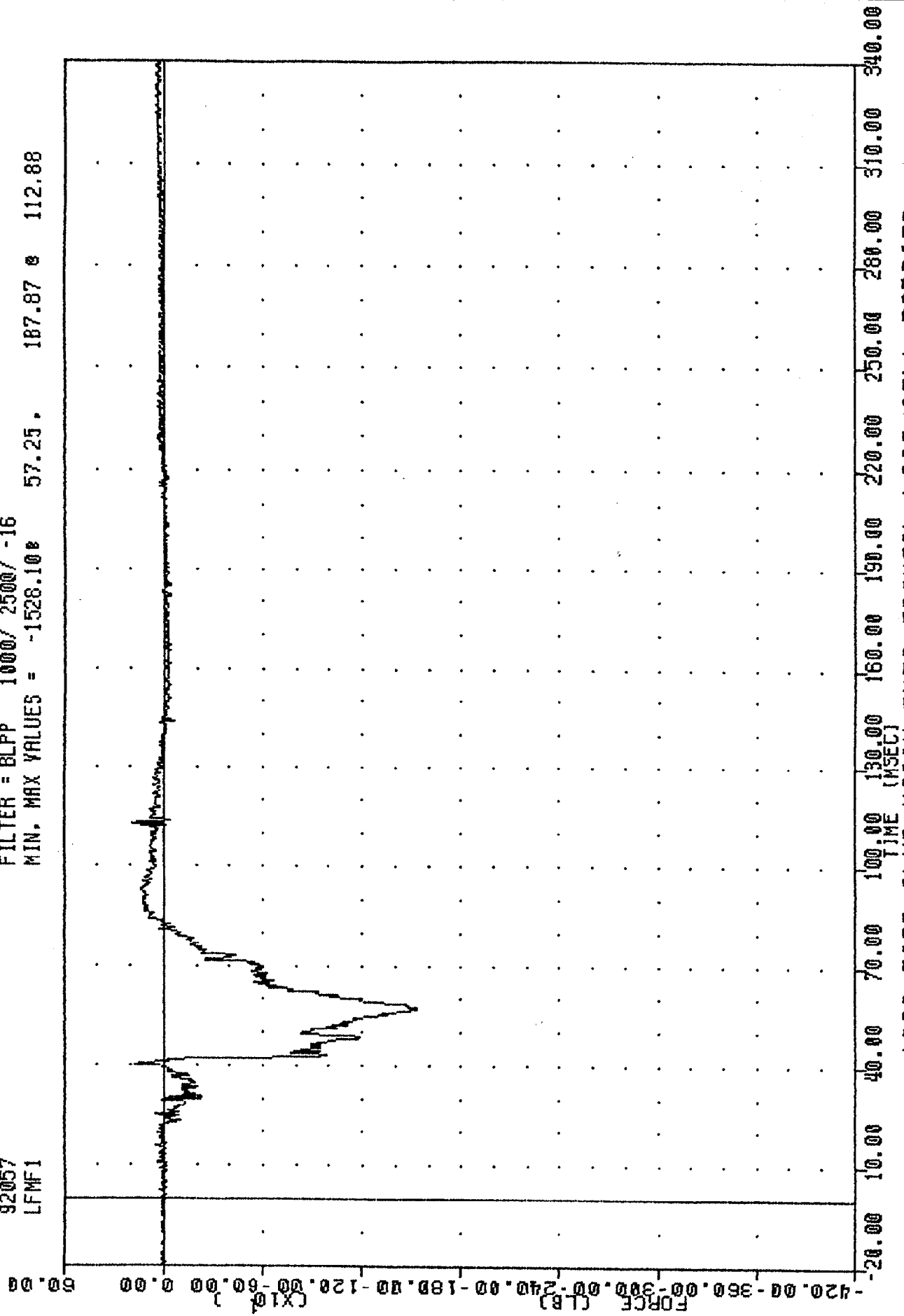


1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION

TRC
NEW CAR ASSESSMENT PROGRAM
92057
LFMF1

920226

FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -1528.100 57.25, 187.87 & 112.88



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FEMUR FORCE

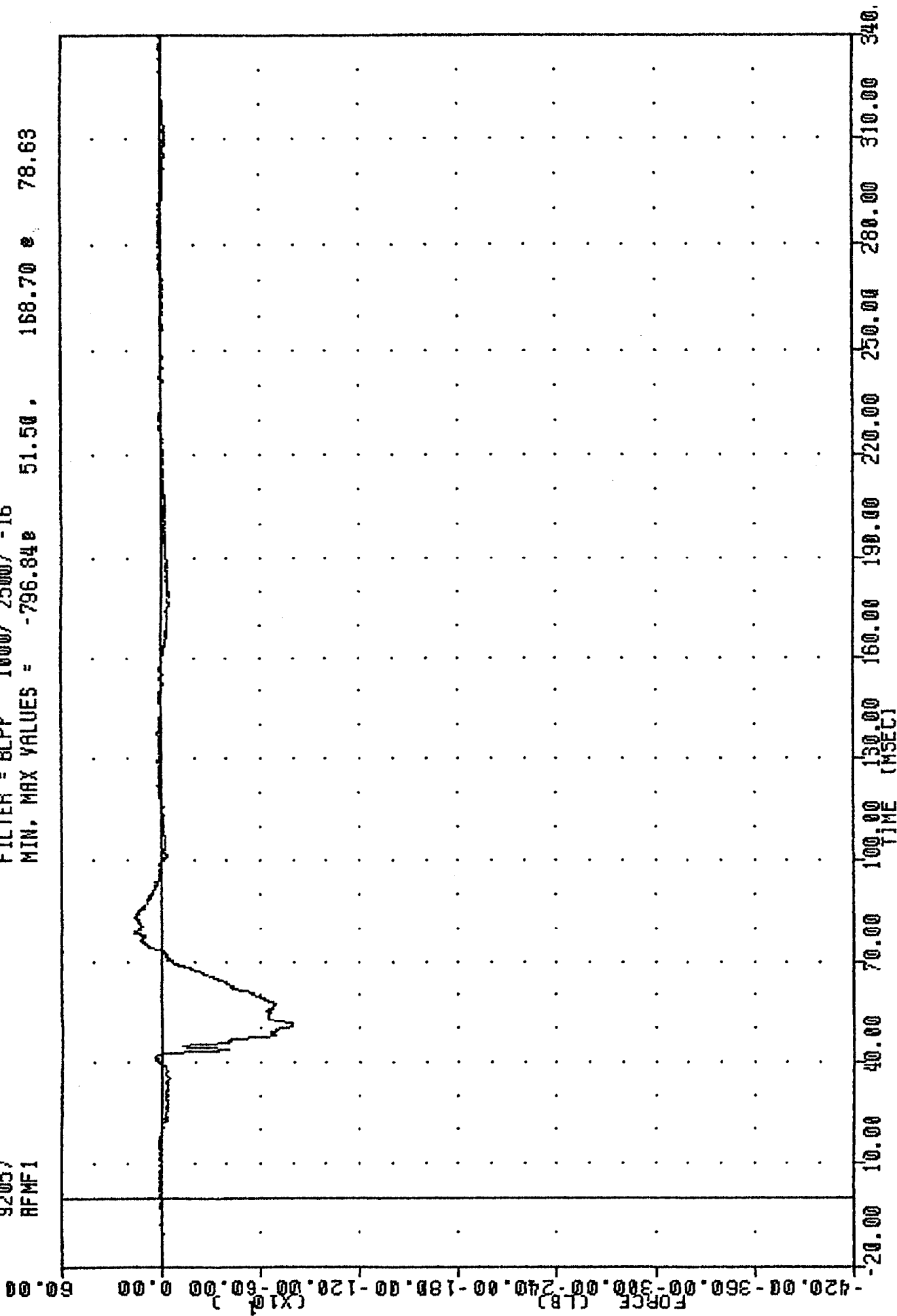
NEW CAR ASSESSMENT PROGRAM

92057

RFMF1

FILTER = BLPP 1000/ 2500/ -16

MIN. MAX VALUES = -796.84e 51.50. 168.70 e 78.63

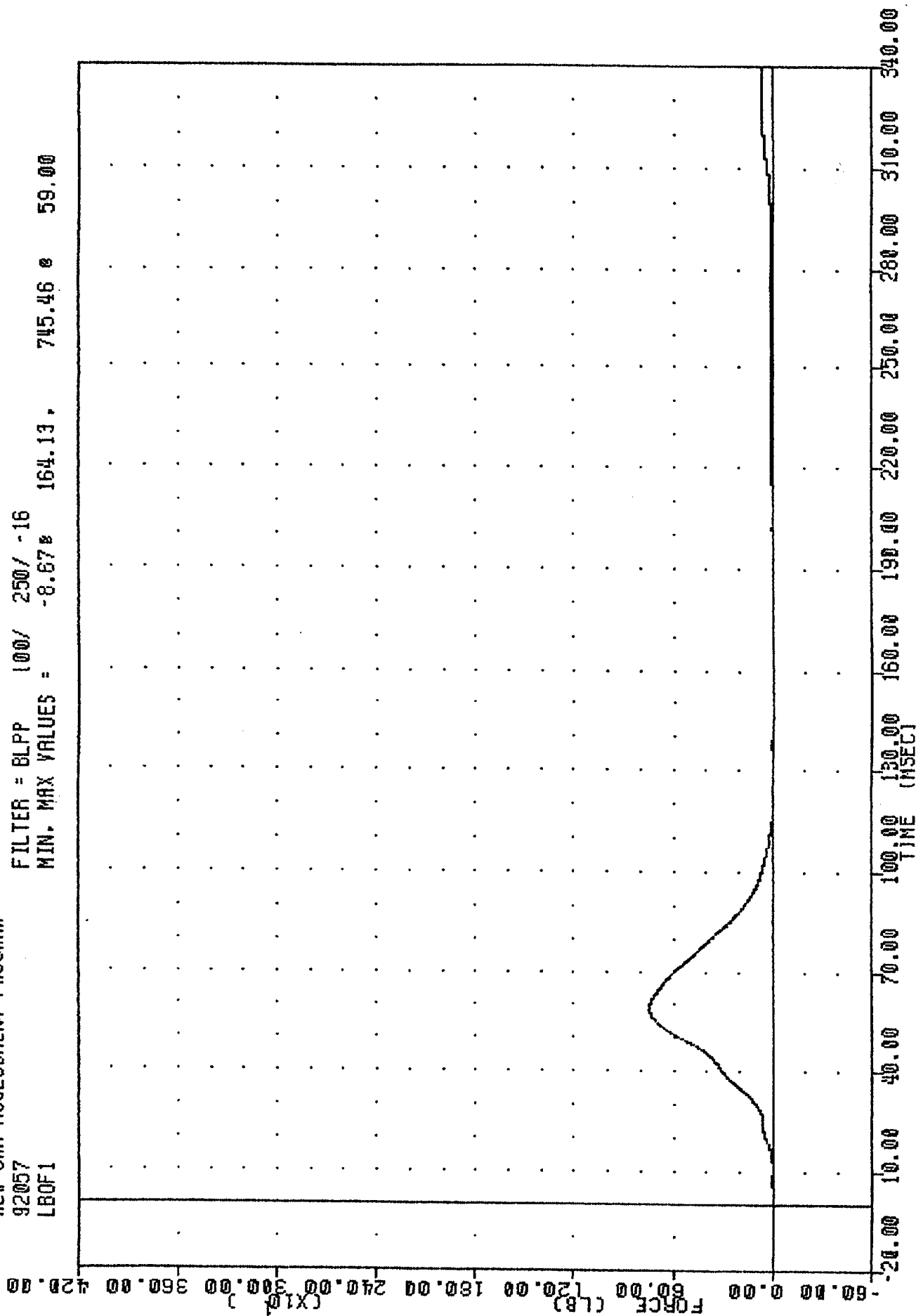


1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FEMUR FORCE

TRC
 NEW CAR ASSESSMENT PROGRAM
 92057
 LBOF1

, 920226

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -8.67% 164.13, 745.46 @ 59.00



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 DRIVER LAP BELT OUTBOARD FORCE

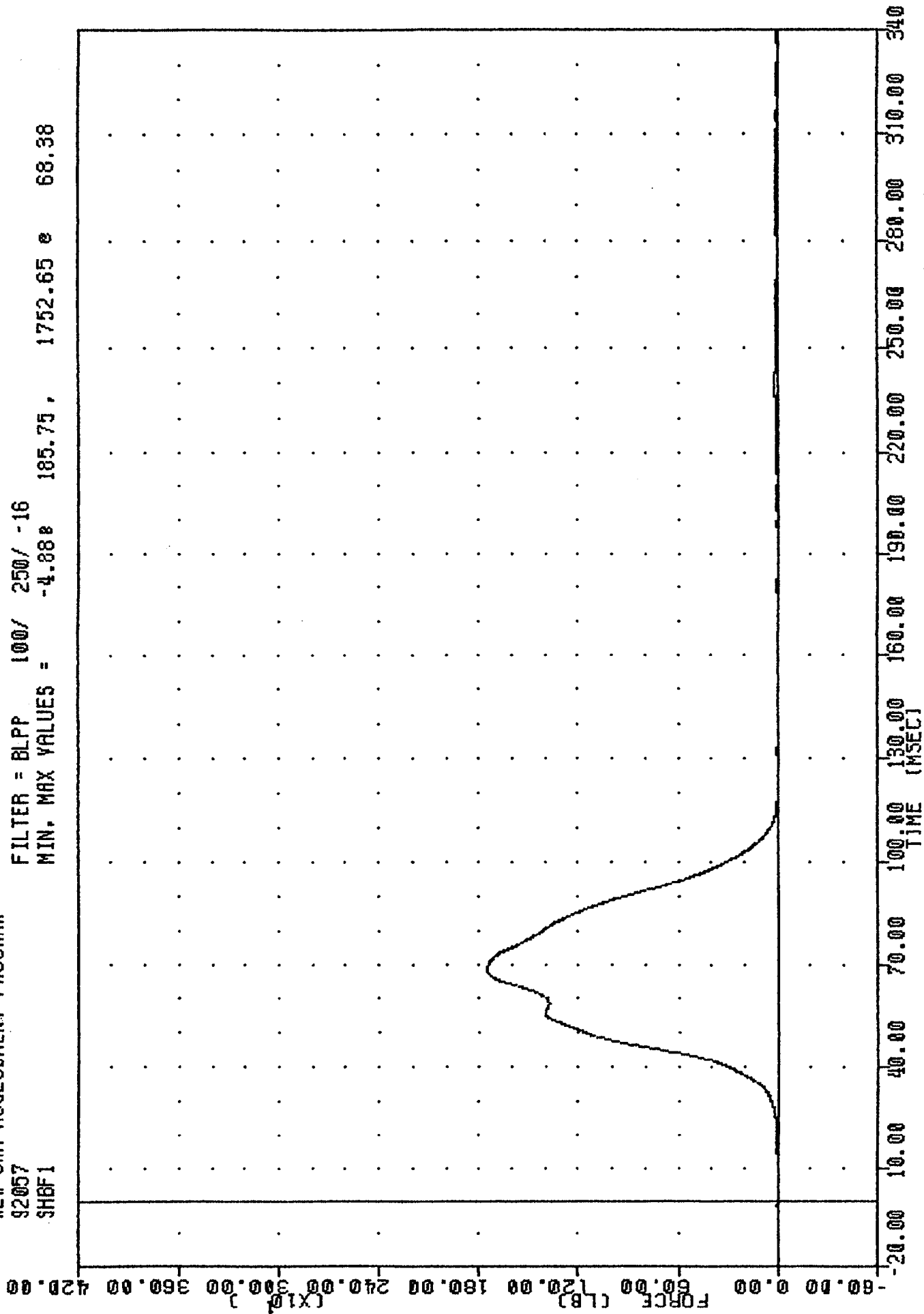
NEW CHH ASSESSMENT PROGRAM

92057

SHBF1

FILTER = BLPP 100/ 250/ -16

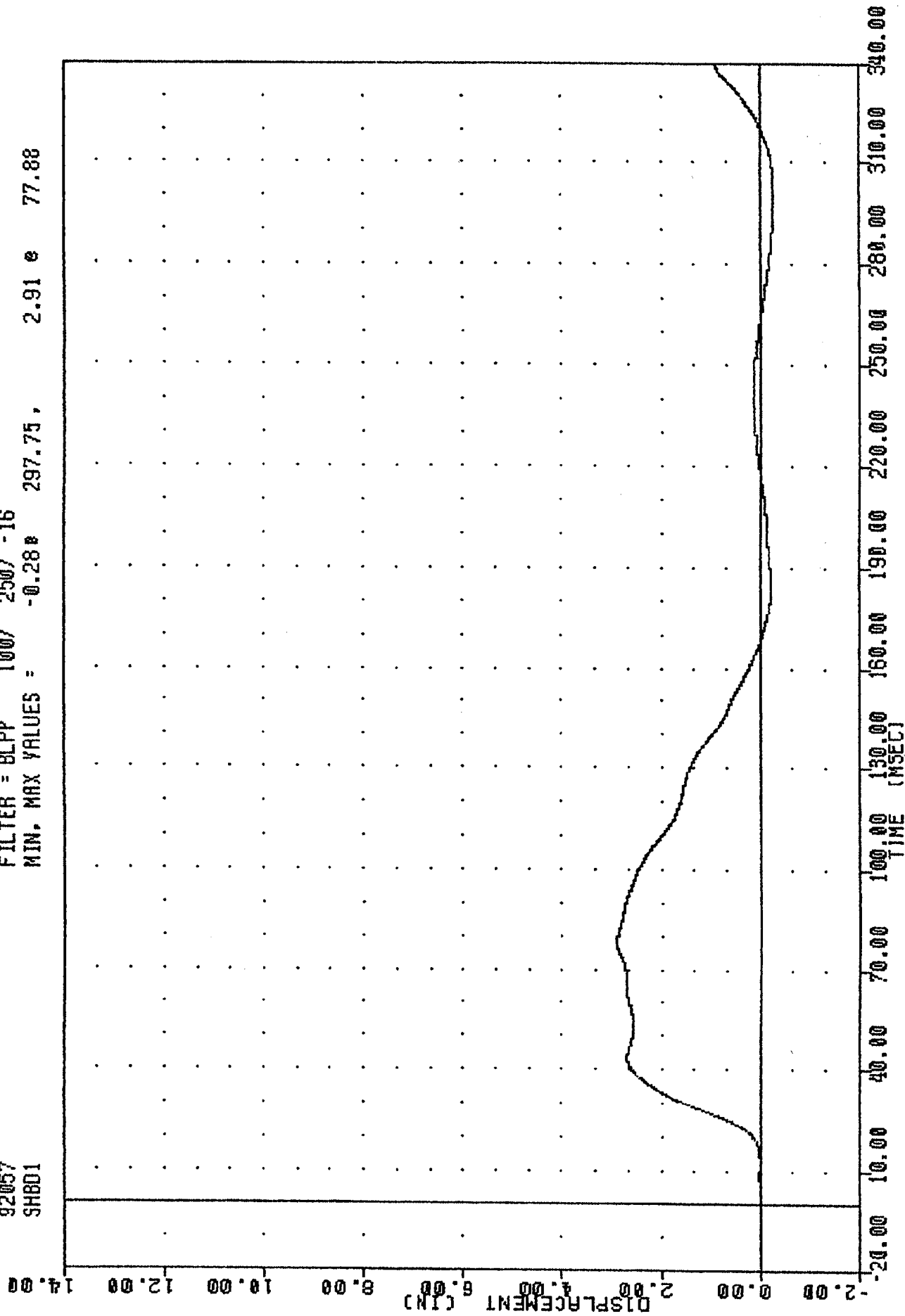
MIN. MAX VALUES = -4.88 185.75, 1752.65 68.38



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 SH801

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -0.28 297.75, 2.91 e 77.88



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT DISPLACEMENT

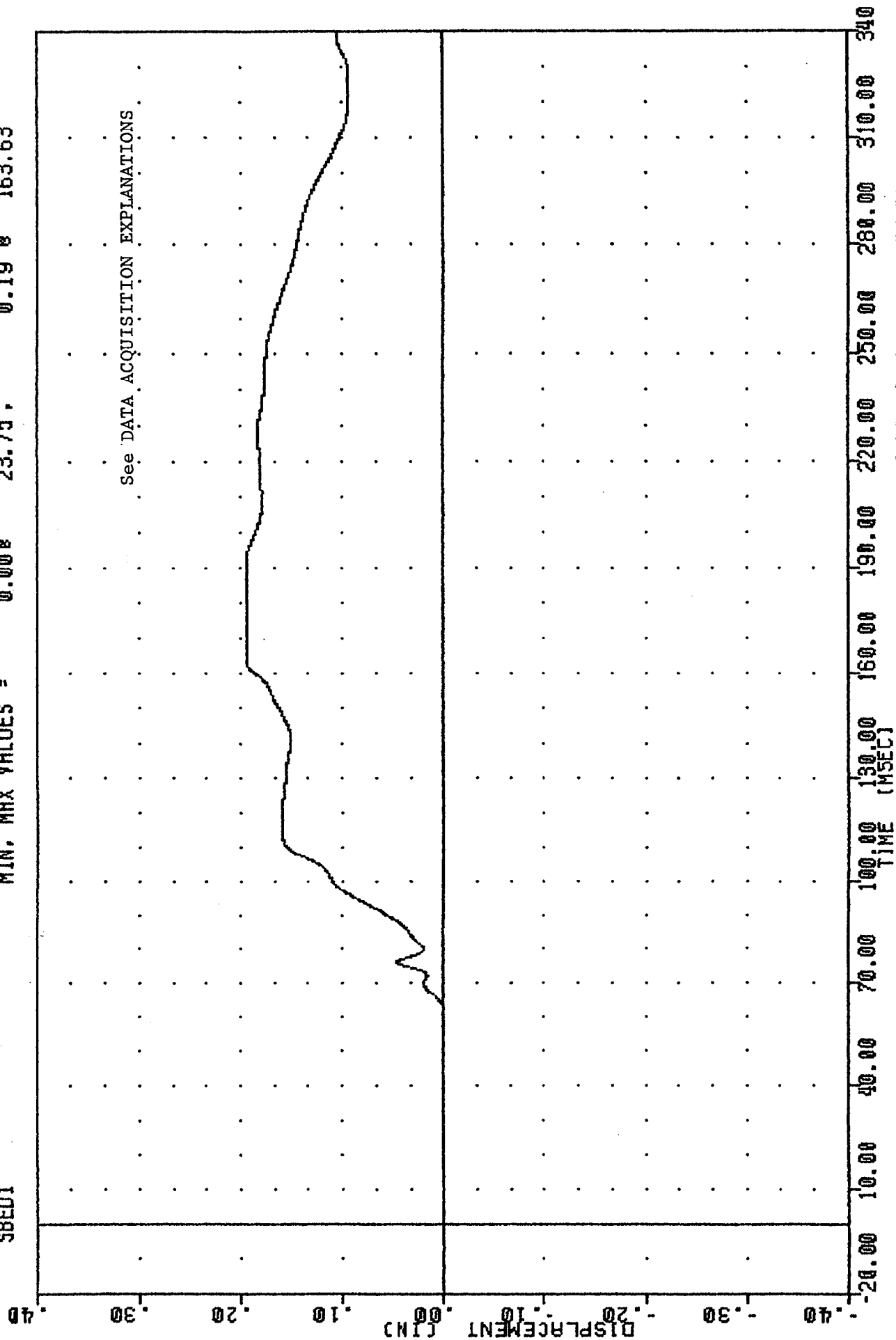
NEW CAR ASSESSMENT PROGRAM

92057

SBED1

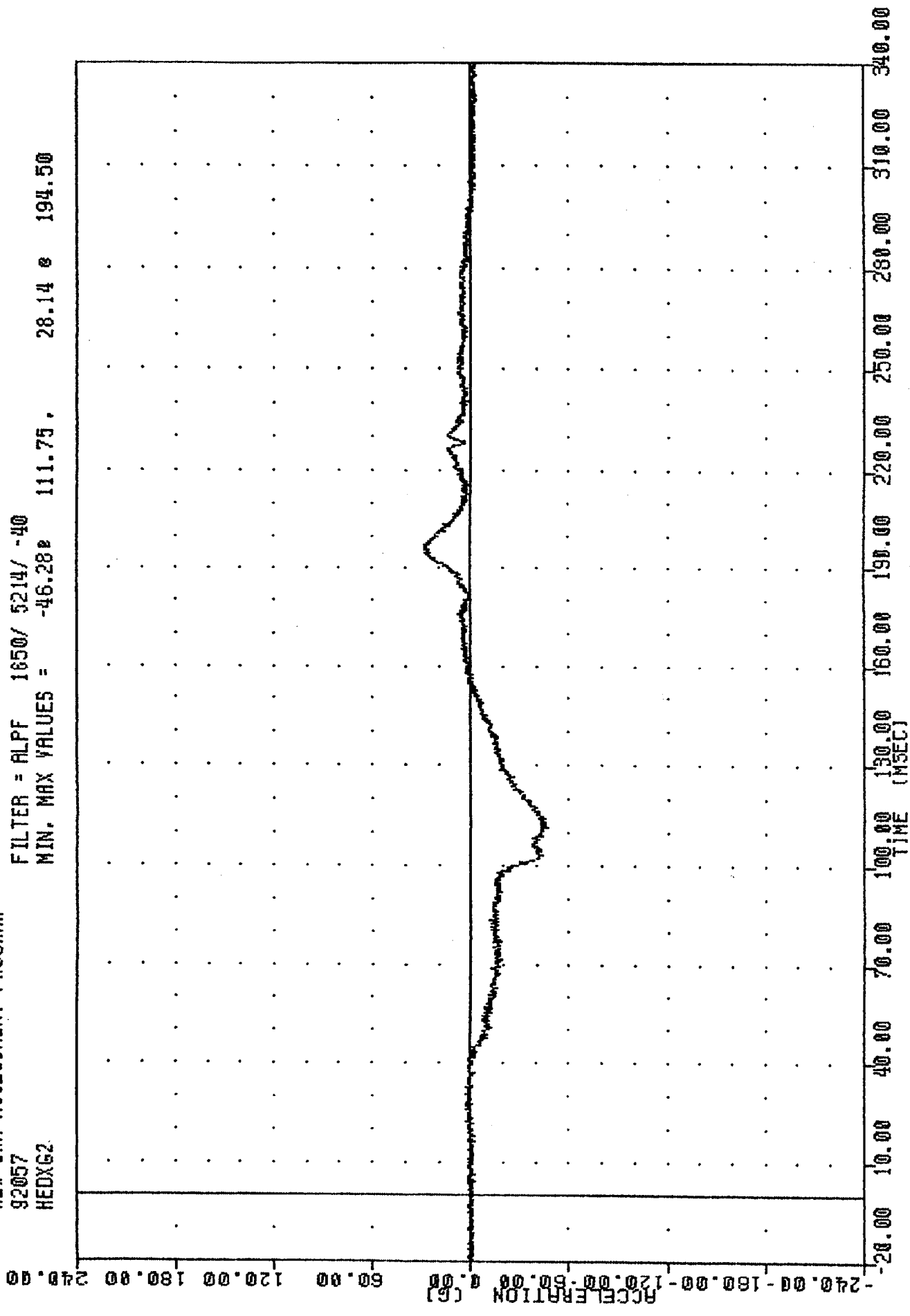
FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = 0.00 23.75, 0.19 163.63

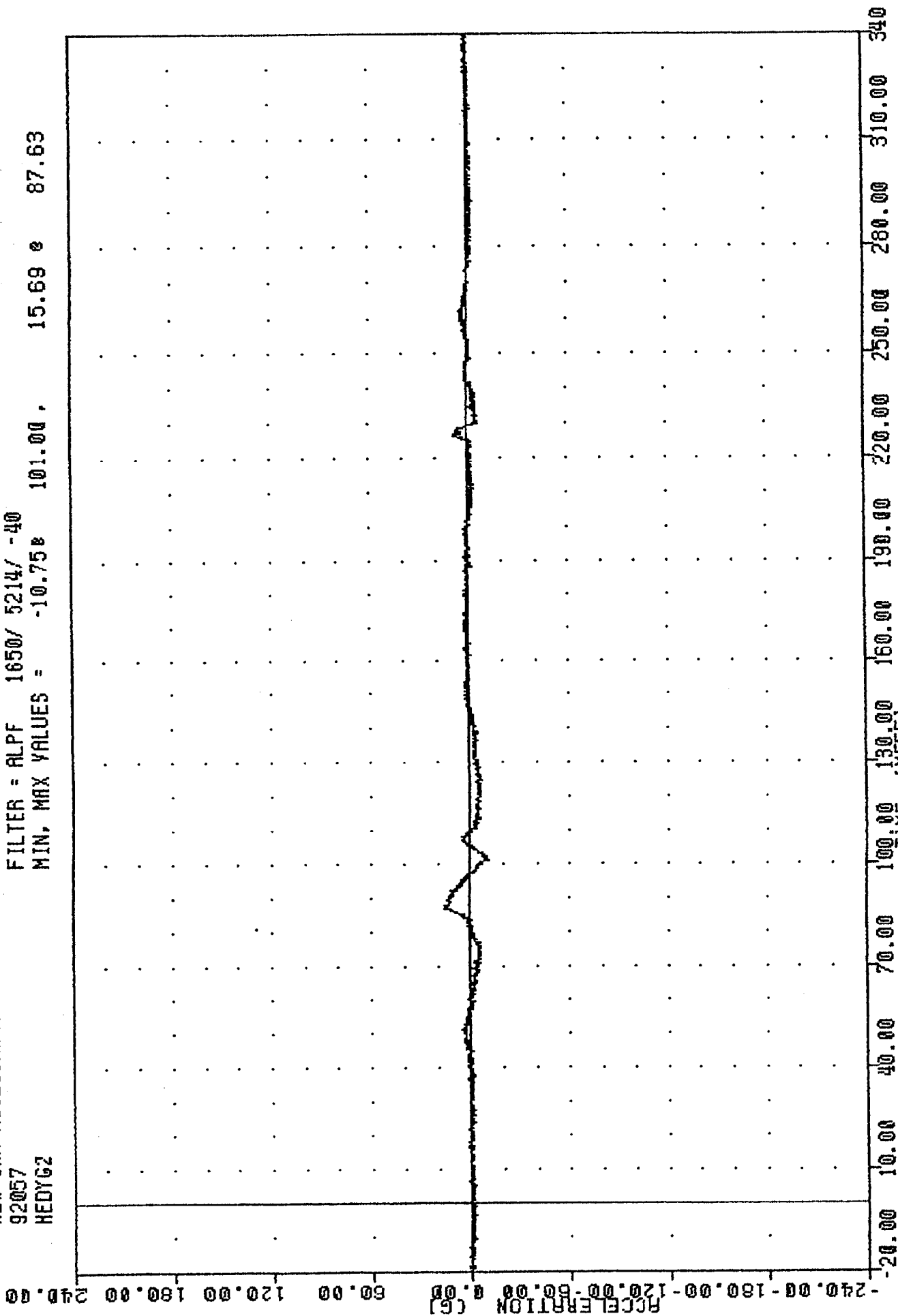


TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 HEDXG2

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -46.28e 111.75, 28.14 e 194.50



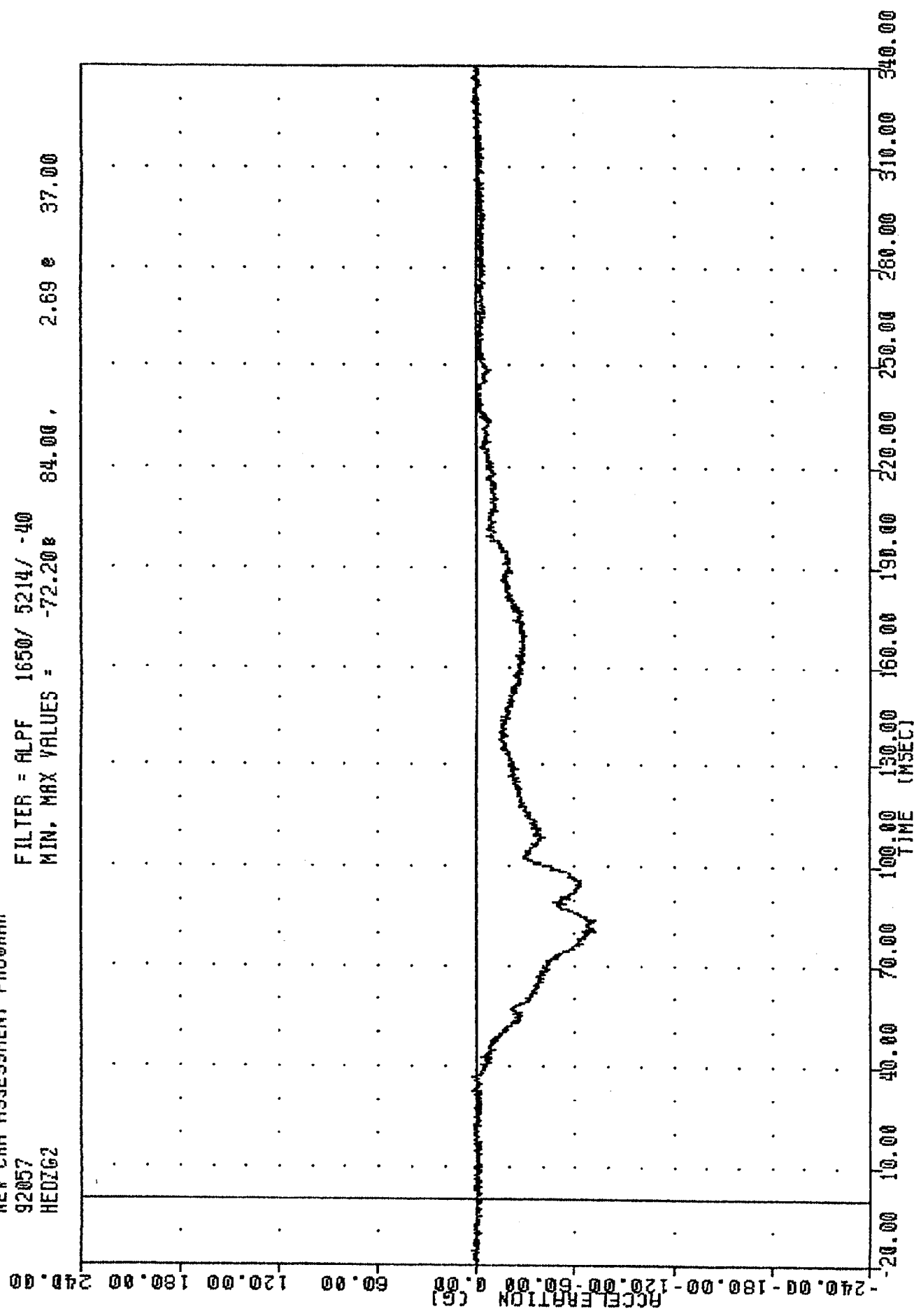
1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 PASSENGER HEAD X-AXIS ACCELERATION



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 HEDZG2

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -72.20e 84.00 , 2.69 e 37.00

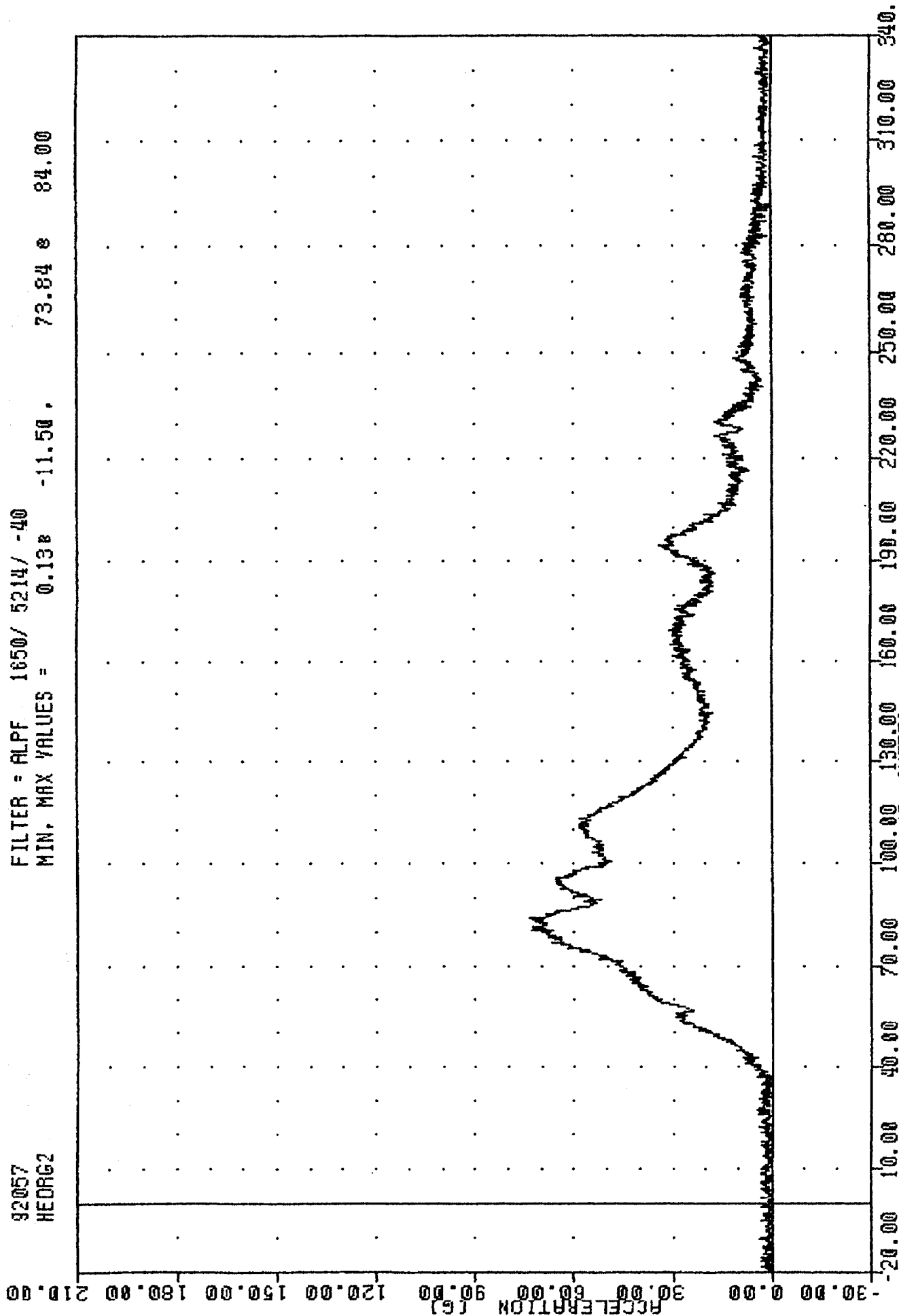


1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 PASSENGER HEAD Z-AXIS ACCELERATION

92057
HEORG2

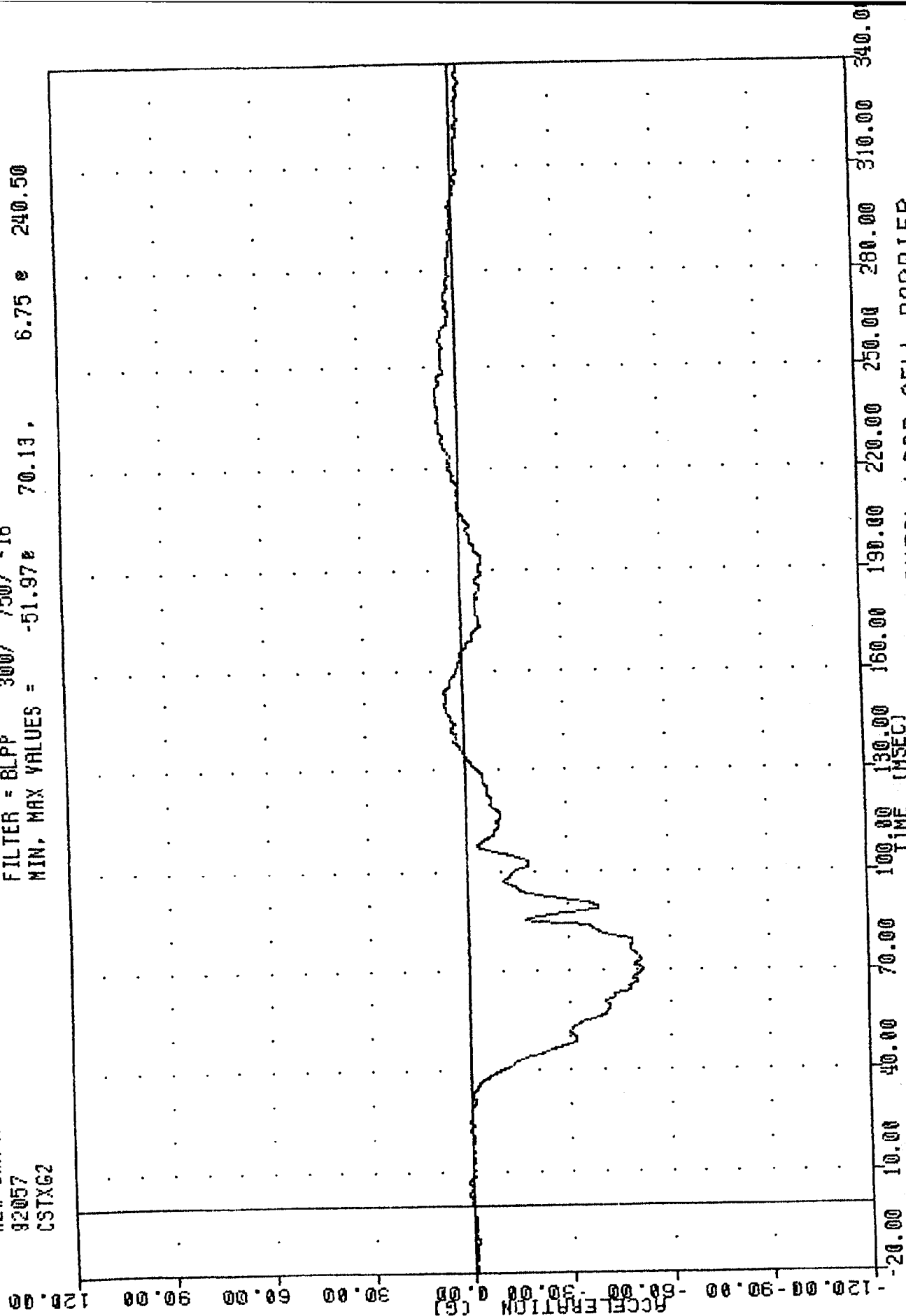
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.138 -11.50 ,

73.84 s 84.00



TRC . 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 CSTXG2

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -51.97 70.13, 6.75 e 240.50



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 PASSENGER CHEST X-AXIS ACCELERATION

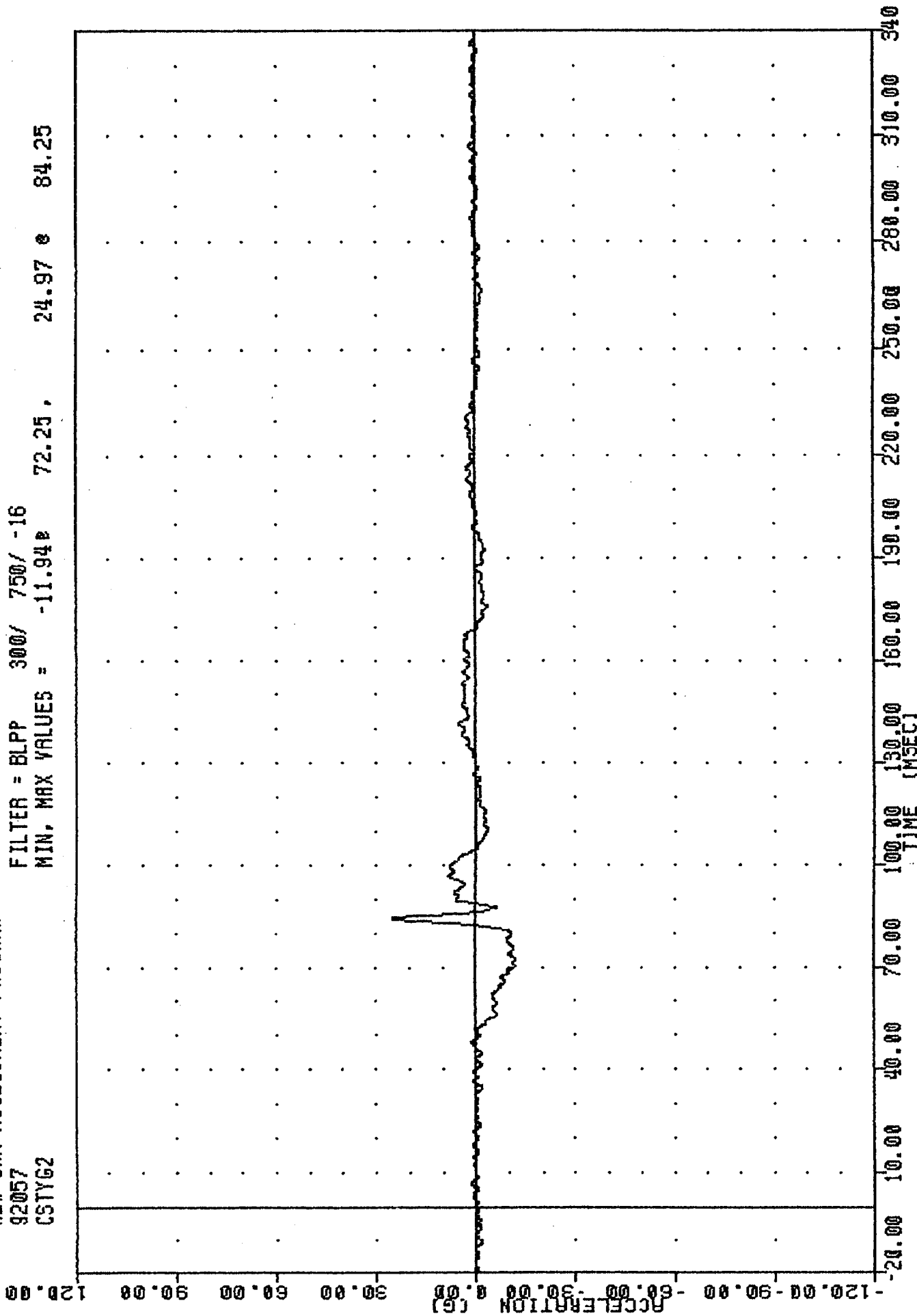
NEW CAR ASSESSMENT PROGRAM

92057

CSTYG2

FILTER = BLPP 300/ 750/ -16

MIN, MAX VALUES = -11.94e 72.25, 24.97 e 84.25

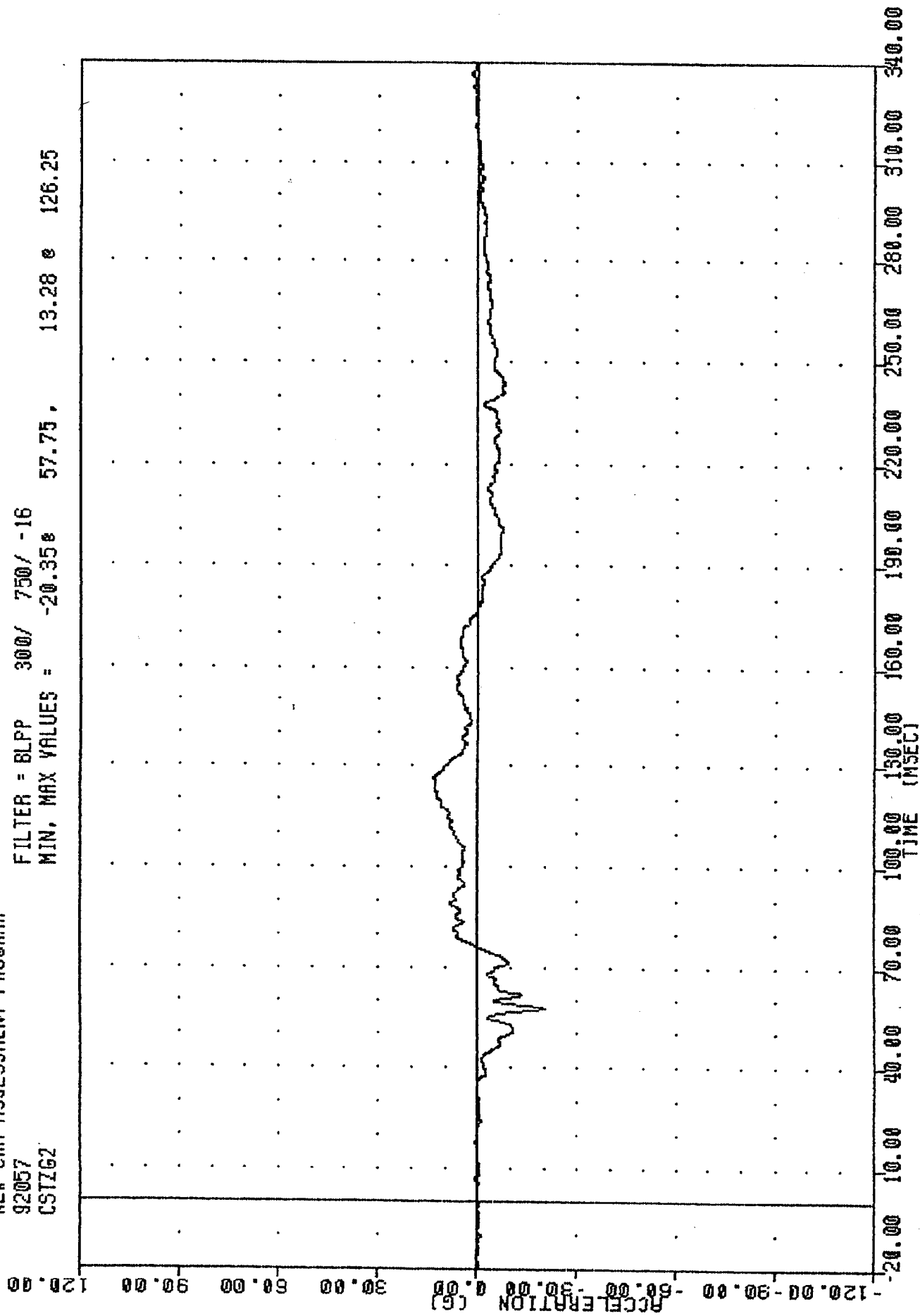


1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION

TRC
 NEW CAR ASSESSMENT PROGRAM
 92057
 CSTZG2

920226

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -20.35e 57.75, 13.28 e 126.25



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 PASSENGER CHEST Z-AXIS ACCELERATION

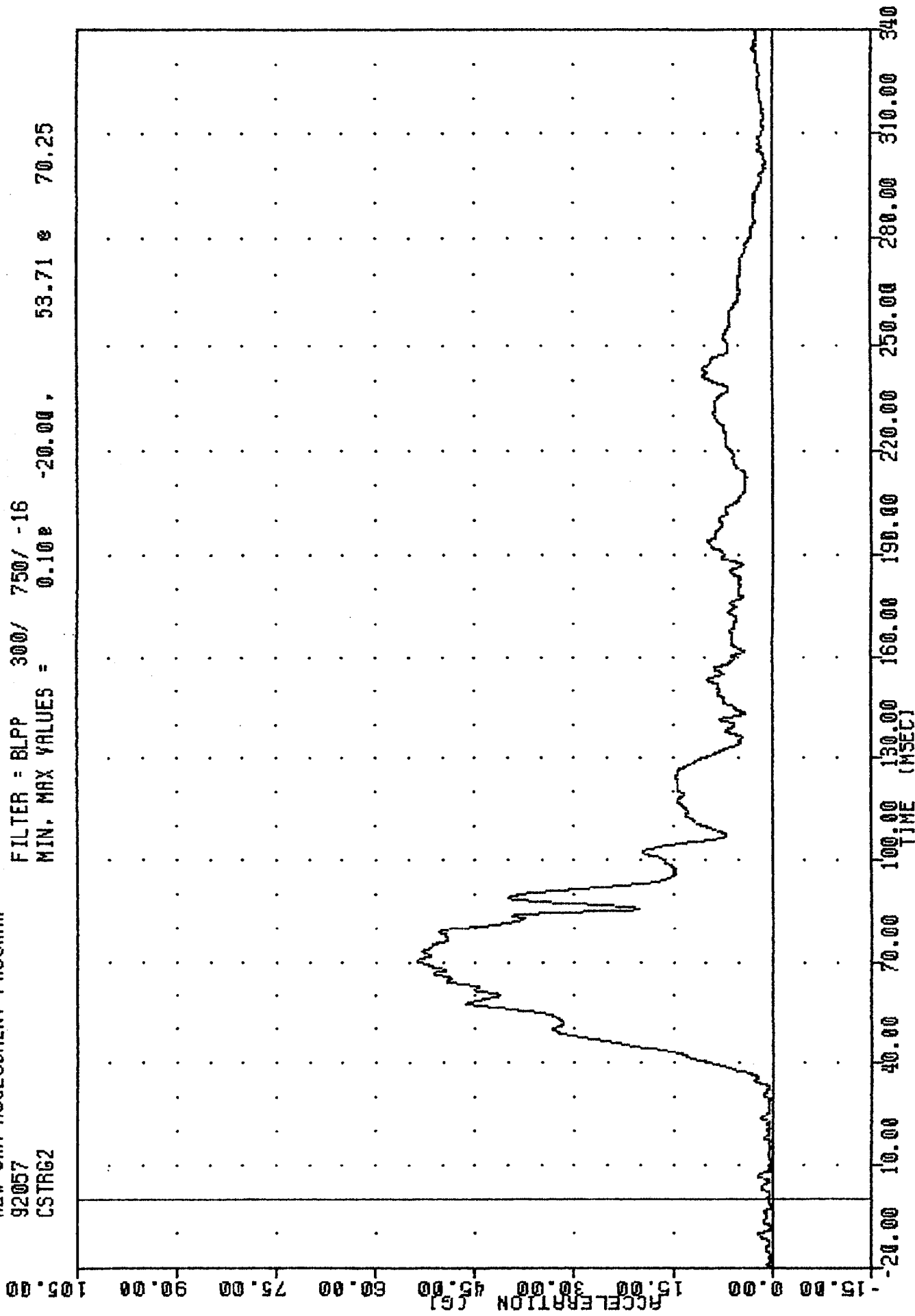
NEW CAR ASSESSMENT PROGRAM

92057

CSTRG2

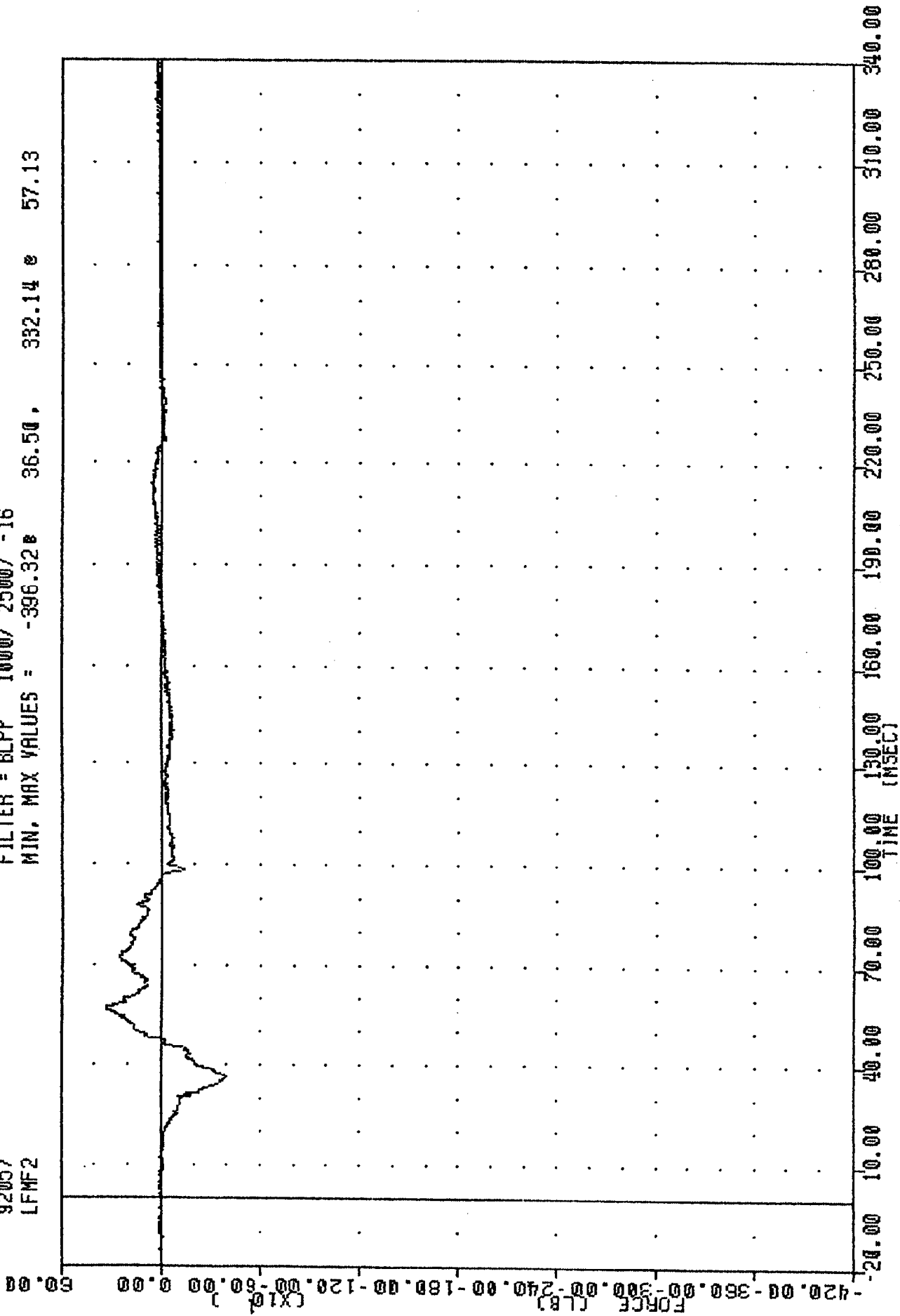
FILTER = BLPP 300/ 750/ -16

MIN. MAX VALUES = 0.10e -20.00 , 53.71 e 70.25



TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 LFMF2

FILTER = BLPP 1000/ 2500/ -16
 MIN. MAX VALUES = -396.32 332.14 36.50 57.13

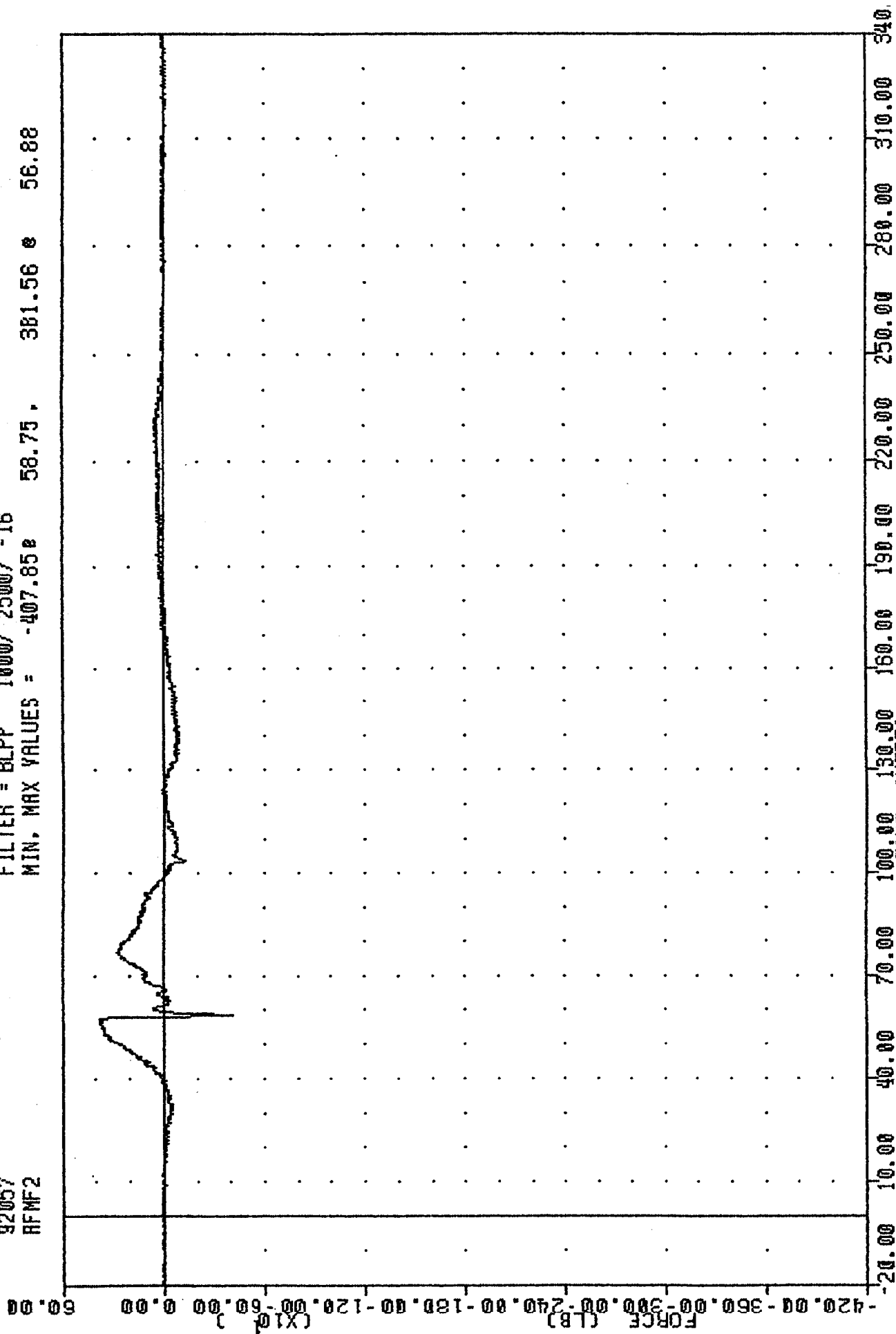


ALL UNIT MEASUREMENTS IN INCHES

92057
RFMF2

FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -407.85 58.75

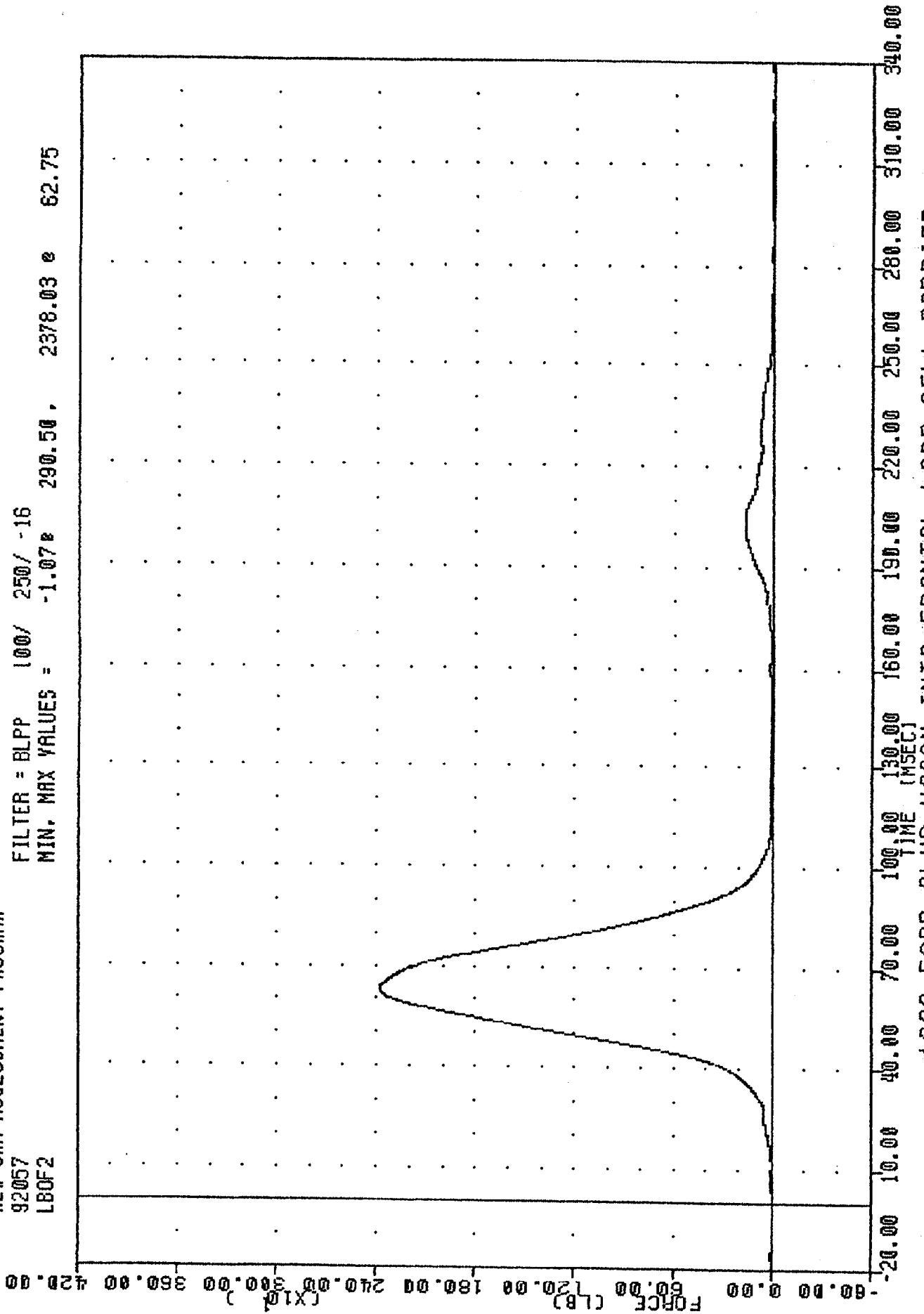
381.56 56.88



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FEMUR FORCE

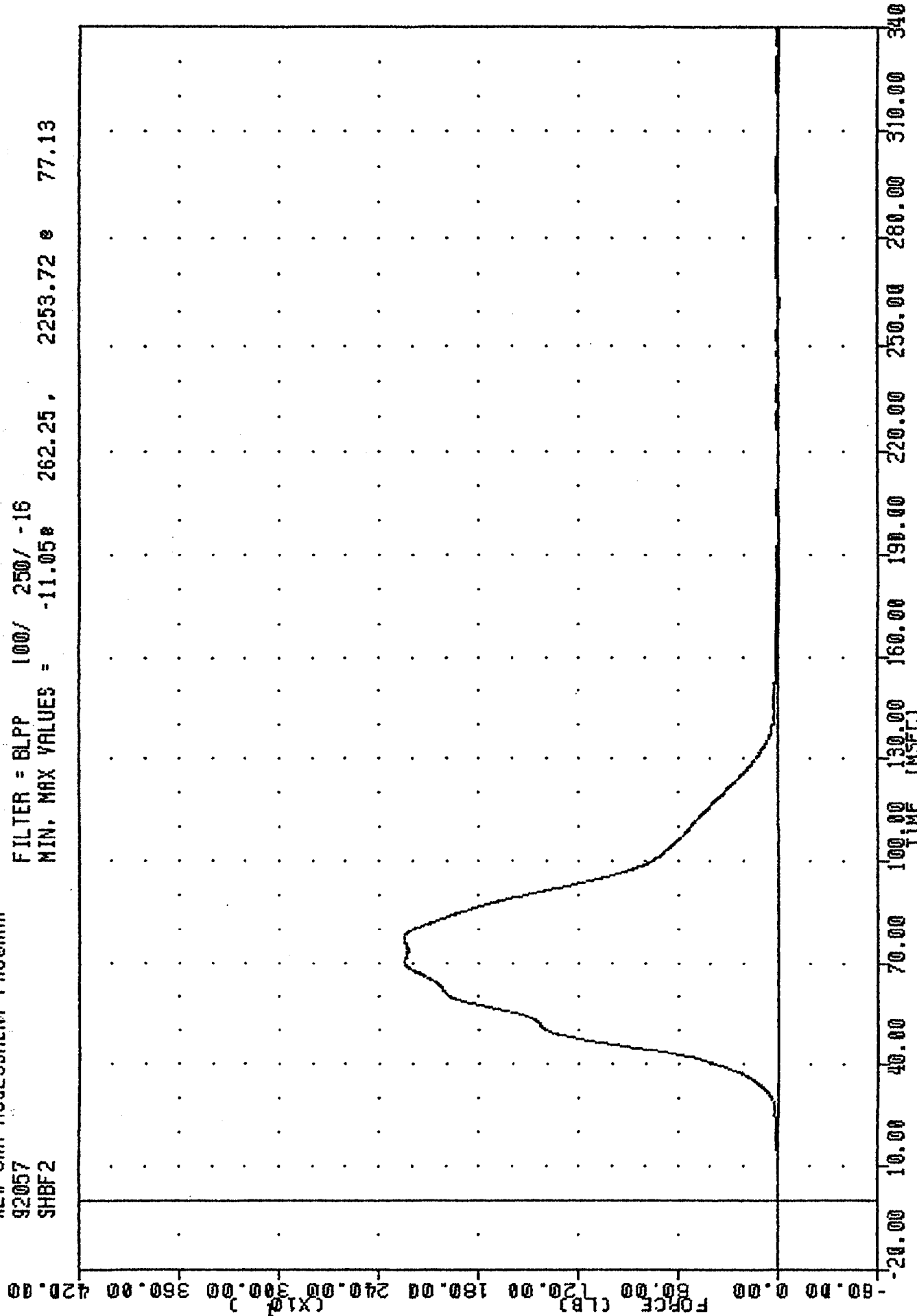
TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 LBOF2

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -1.07 290.50 , 2378.03 62.75



92057
SHBF2

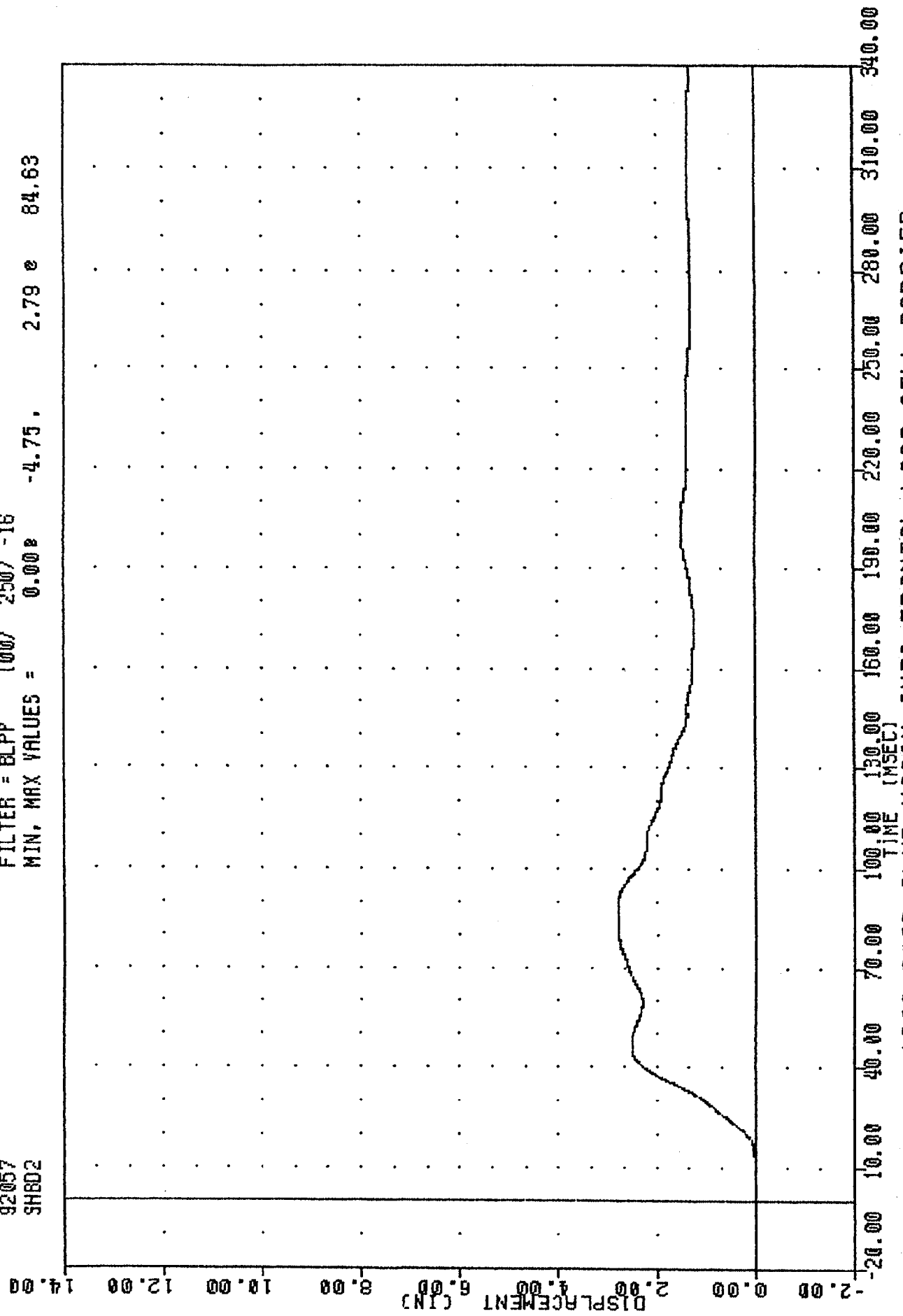
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -11.05 262.25 , 2253.72 77.13



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 SH802

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = 0.00 e -4.75 . 2.79 e 84.63



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 PASSENGER SHOULDER BELT DISPLACEMENT

NEW CAR ASSESSMENT PROGRAM

92057

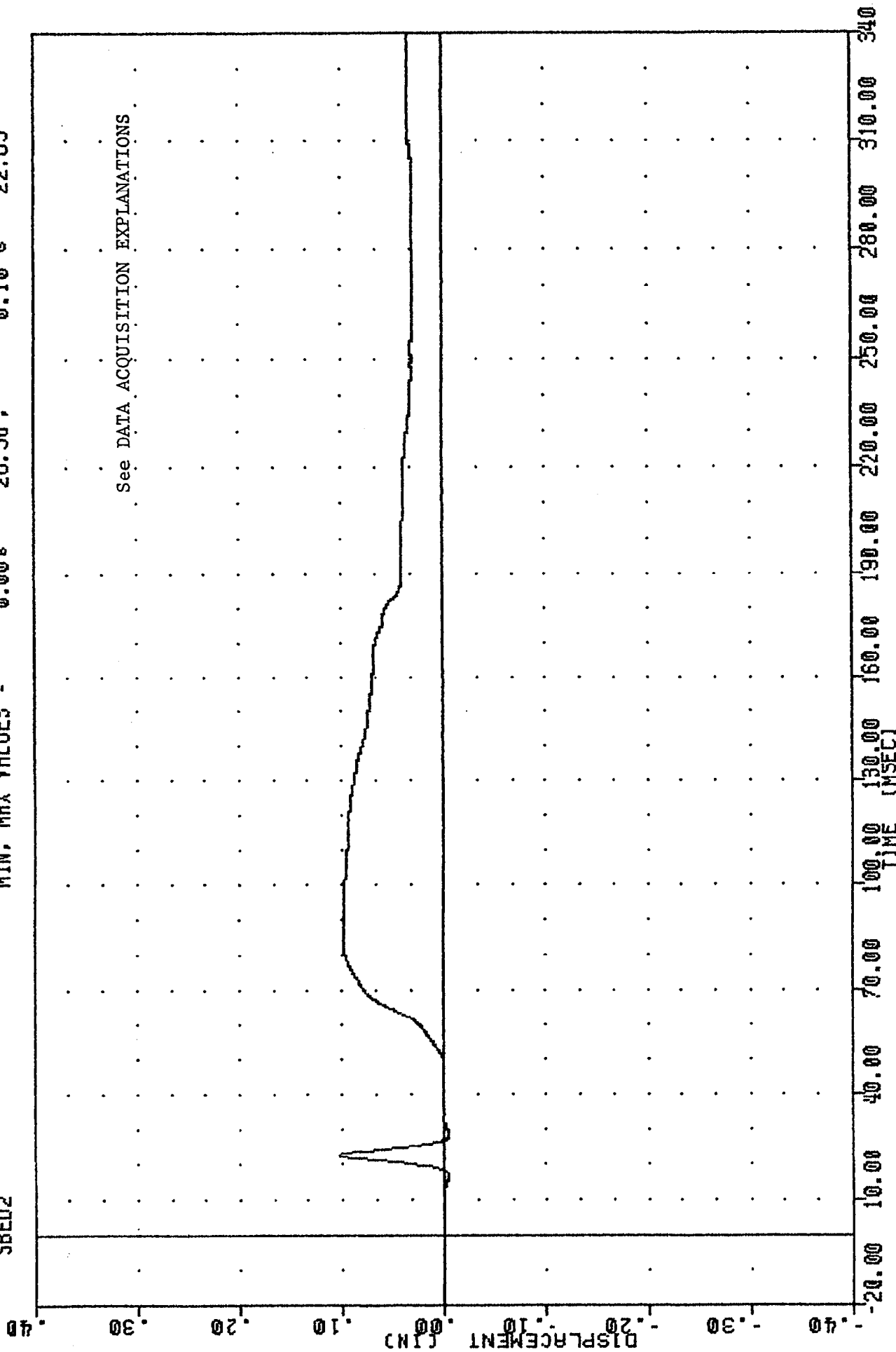
SBED2

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = 0.008

28.38 ,

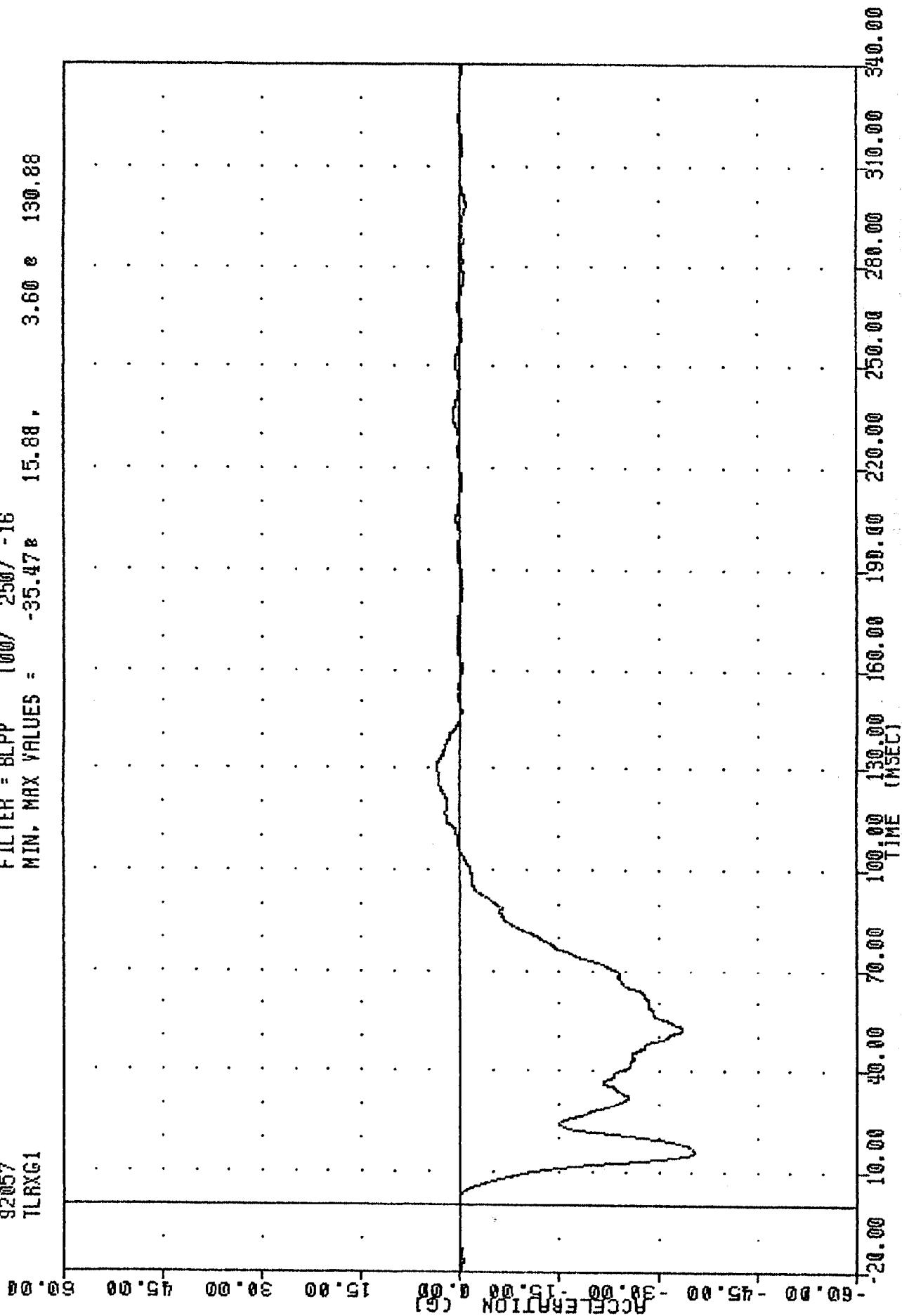
0.10 e 22.63



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 TLXG1

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -35.47 15.88 , 3.60 130.88



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS ACCELERATION

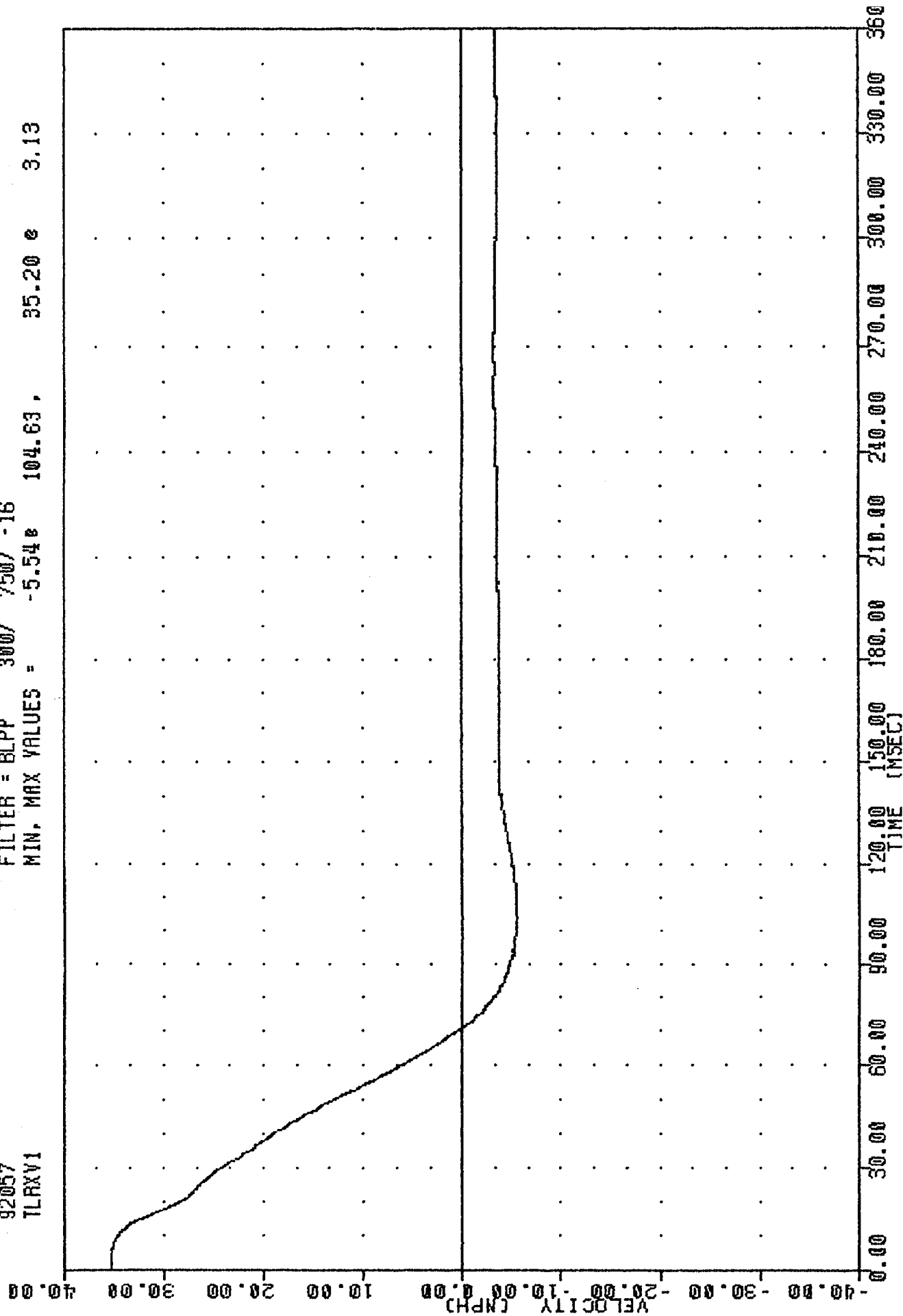
NEW CAR ASSESSMENT PROGRAM

92057

TLRXV1

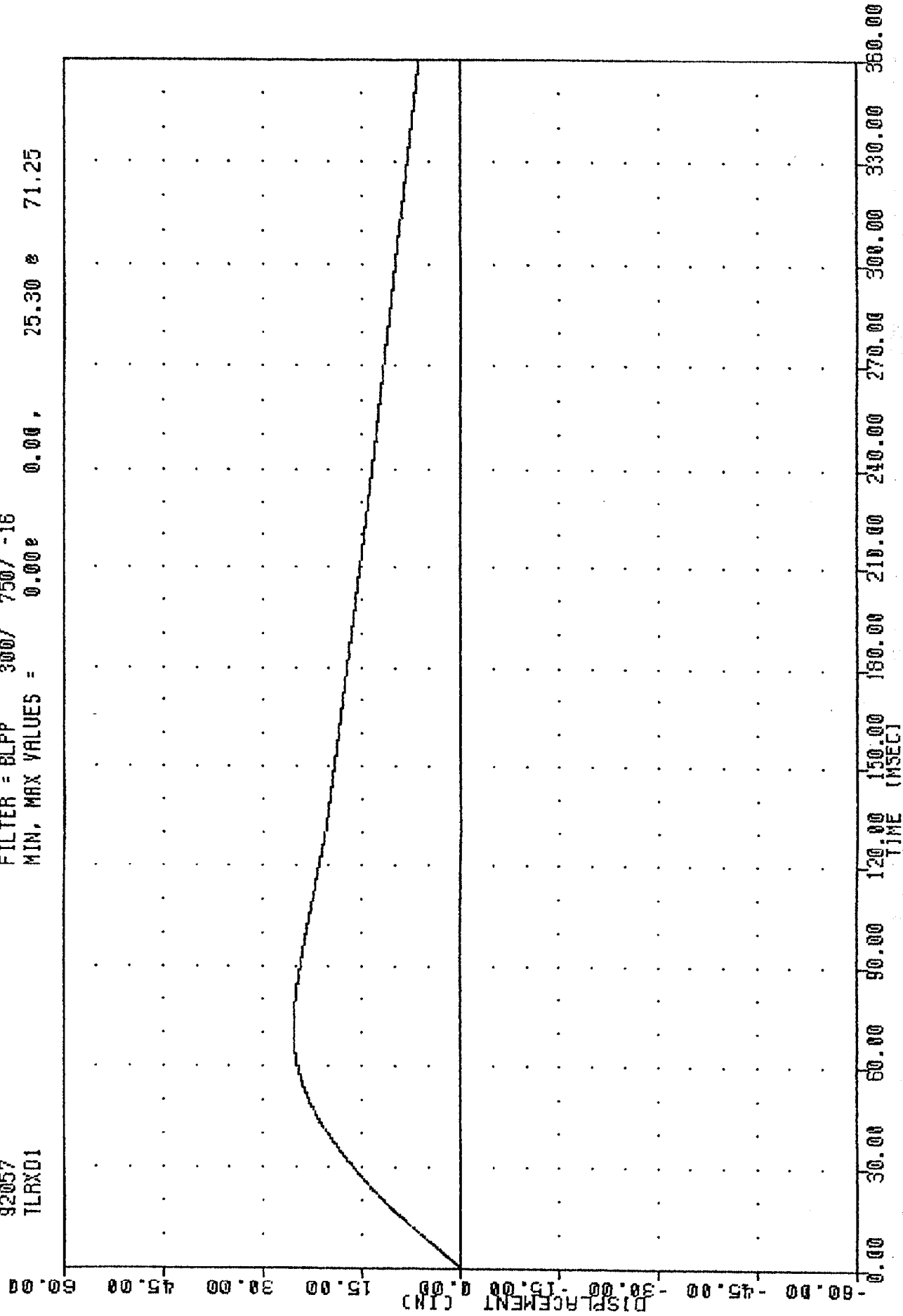
FILTER = BLPP 300/ 750/ -16

MIN. MAX VALUES = -5.54e 104.63, 35.20 e 3.13



TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 TLAX01

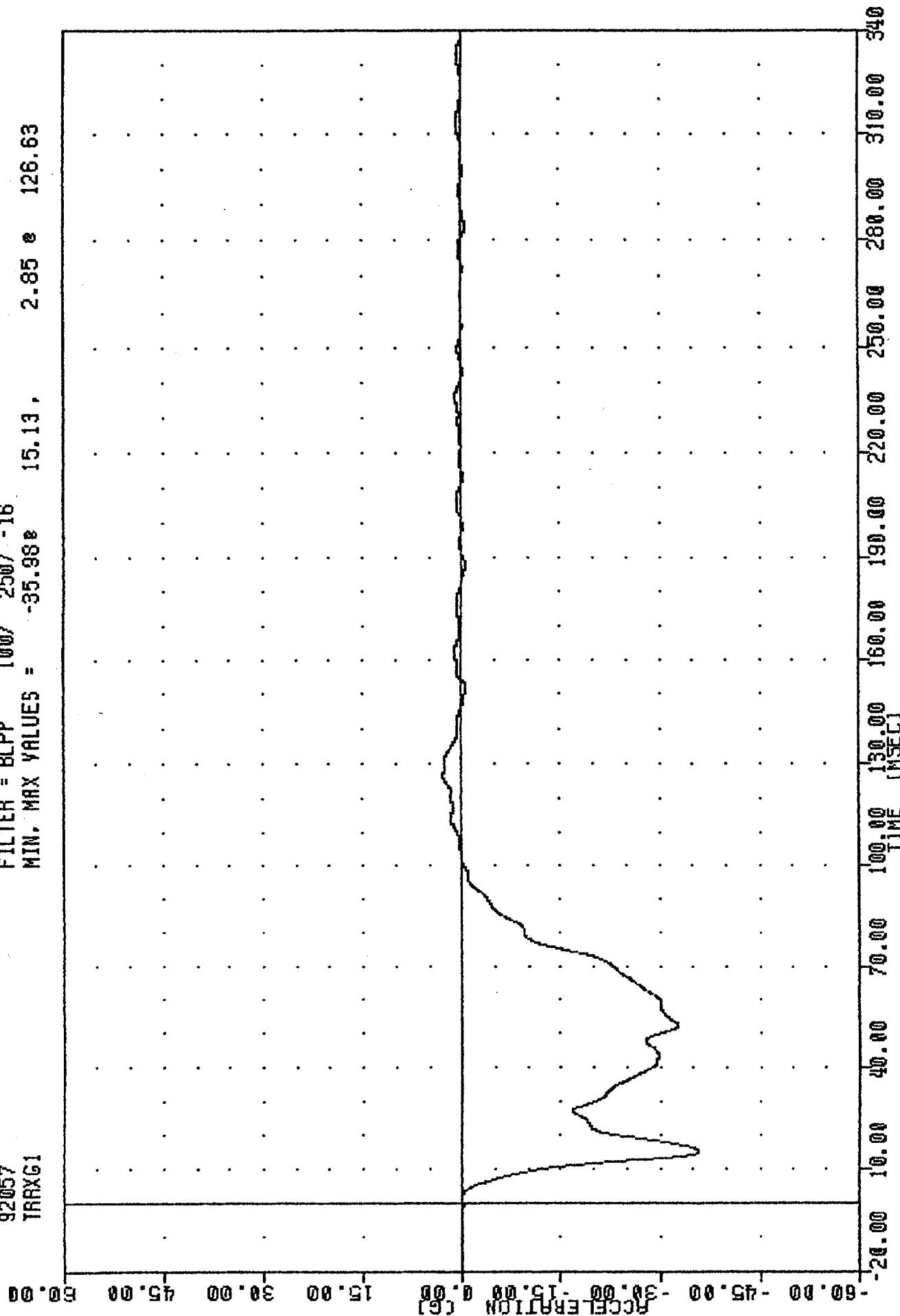
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = 0.00e 0.00, 25.30 e 71.25



NEW CAR ASSESSMENT PROGRAM

92057
TRXG1

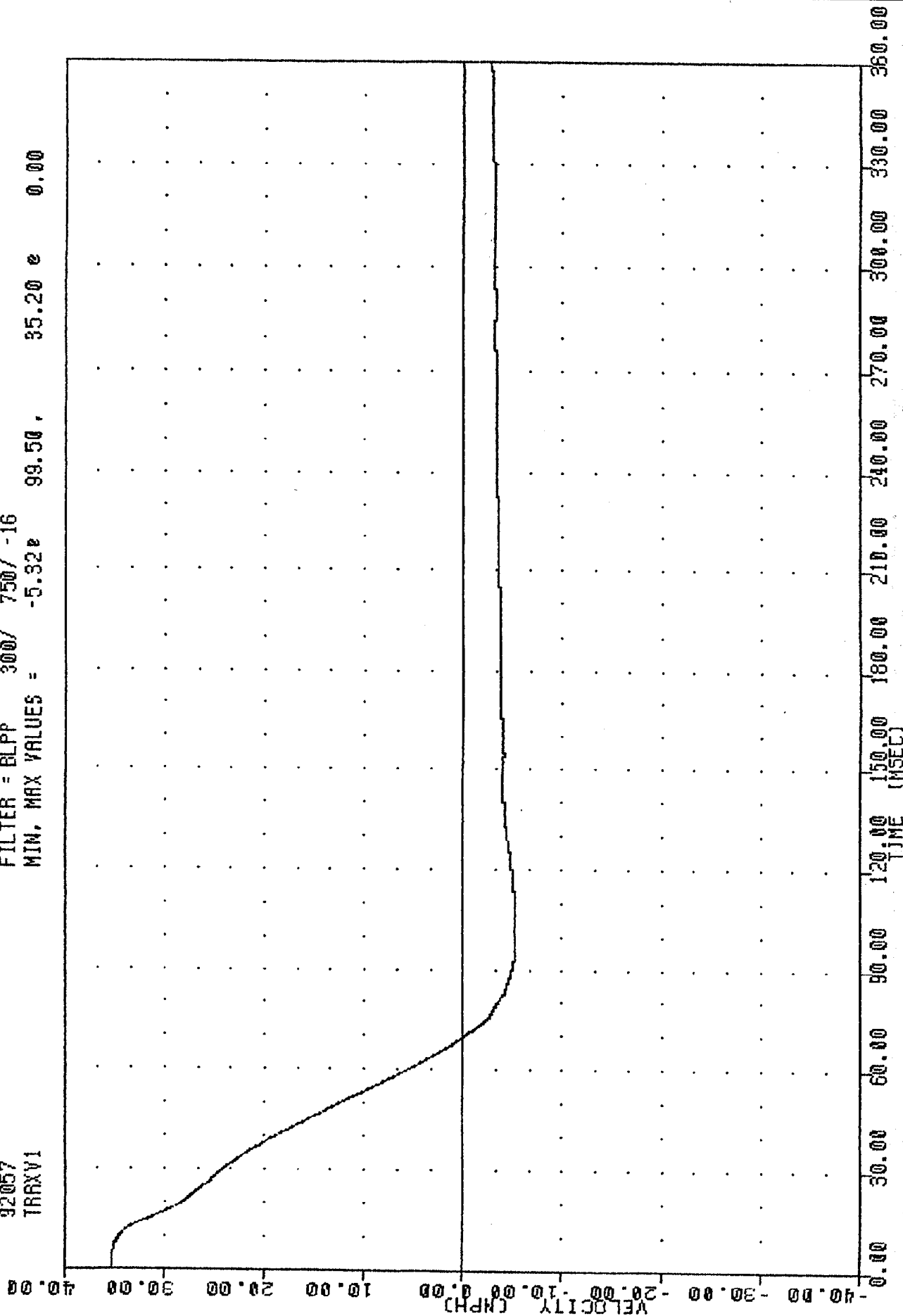
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -35.98 15.13 2.85 126.63



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 TRRXV1

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -5.32e 99.50 , 35.20 e 0.00



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS VELOCITY

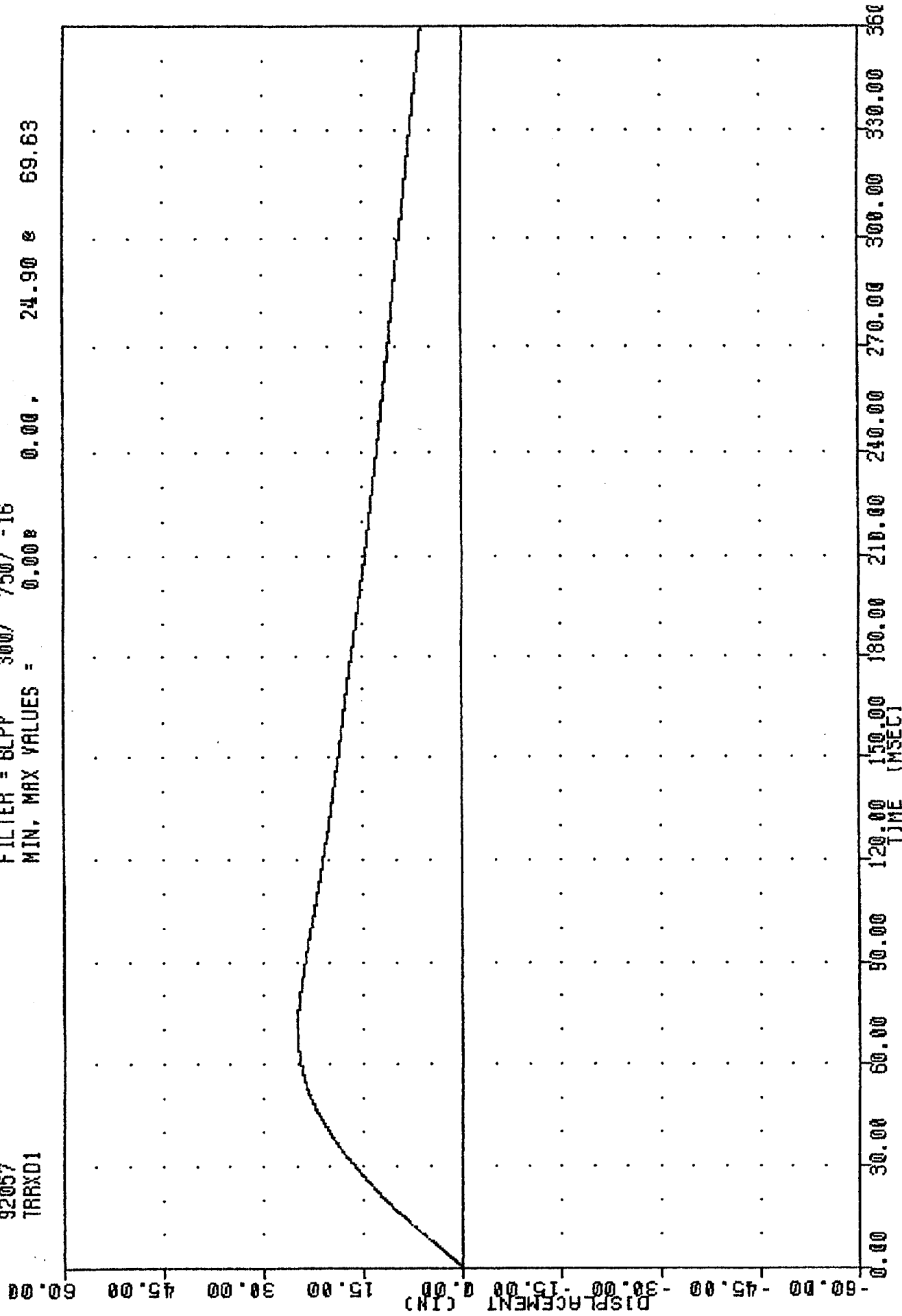
NEW CAR ASSESSMENT PROGRAM

92057

TRRXD1

FILTER = BLPP 300/ 750/ -16

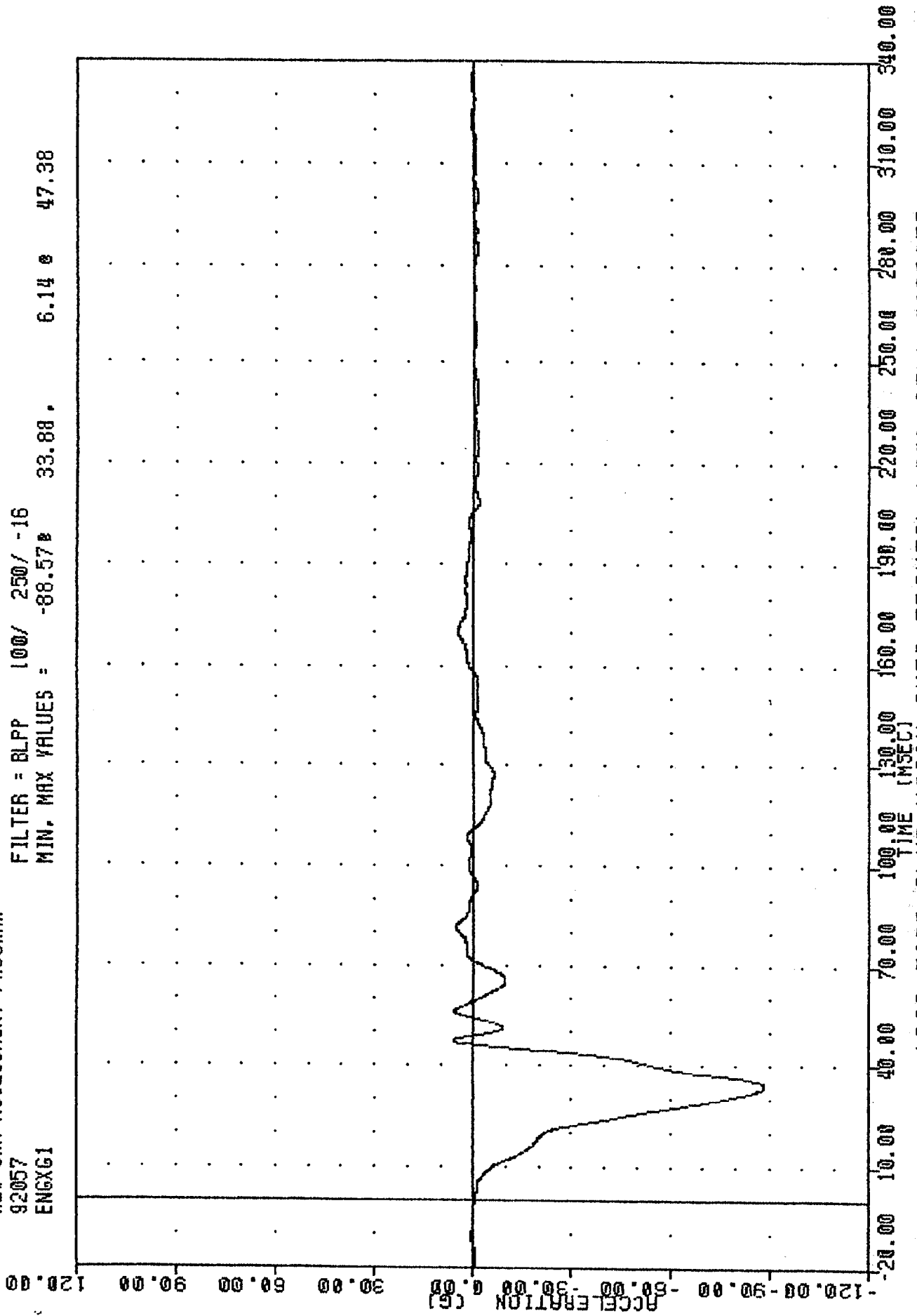
MIN. MAX VALUES = 0.00 24.90 69.63



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS DISPLACEMENT

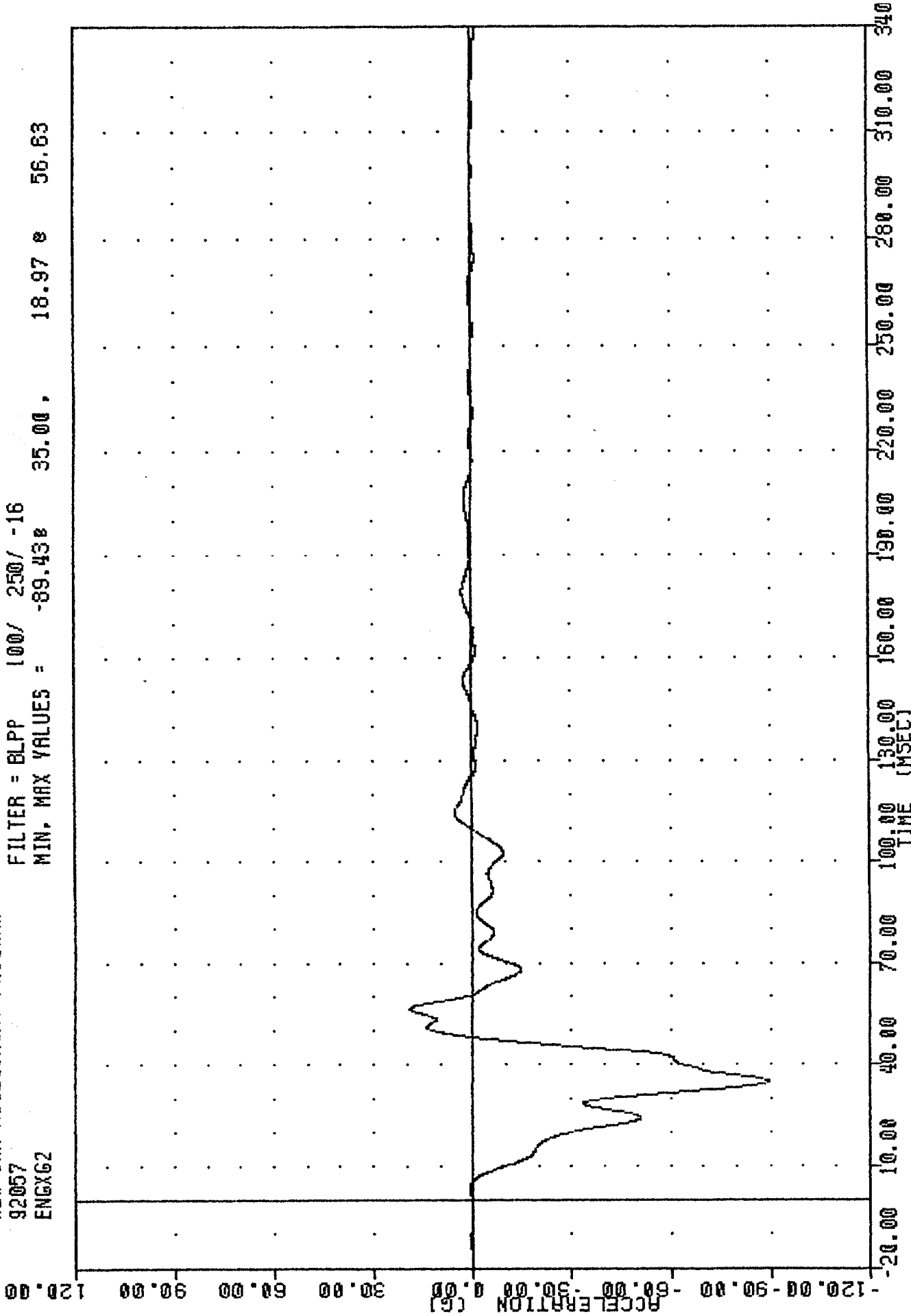
TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 ENGCG1

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -88.57% 33.88% 6.14% 47.38



NEW CAR ASSESSMENT PROGRAM
92057
ENGXG2

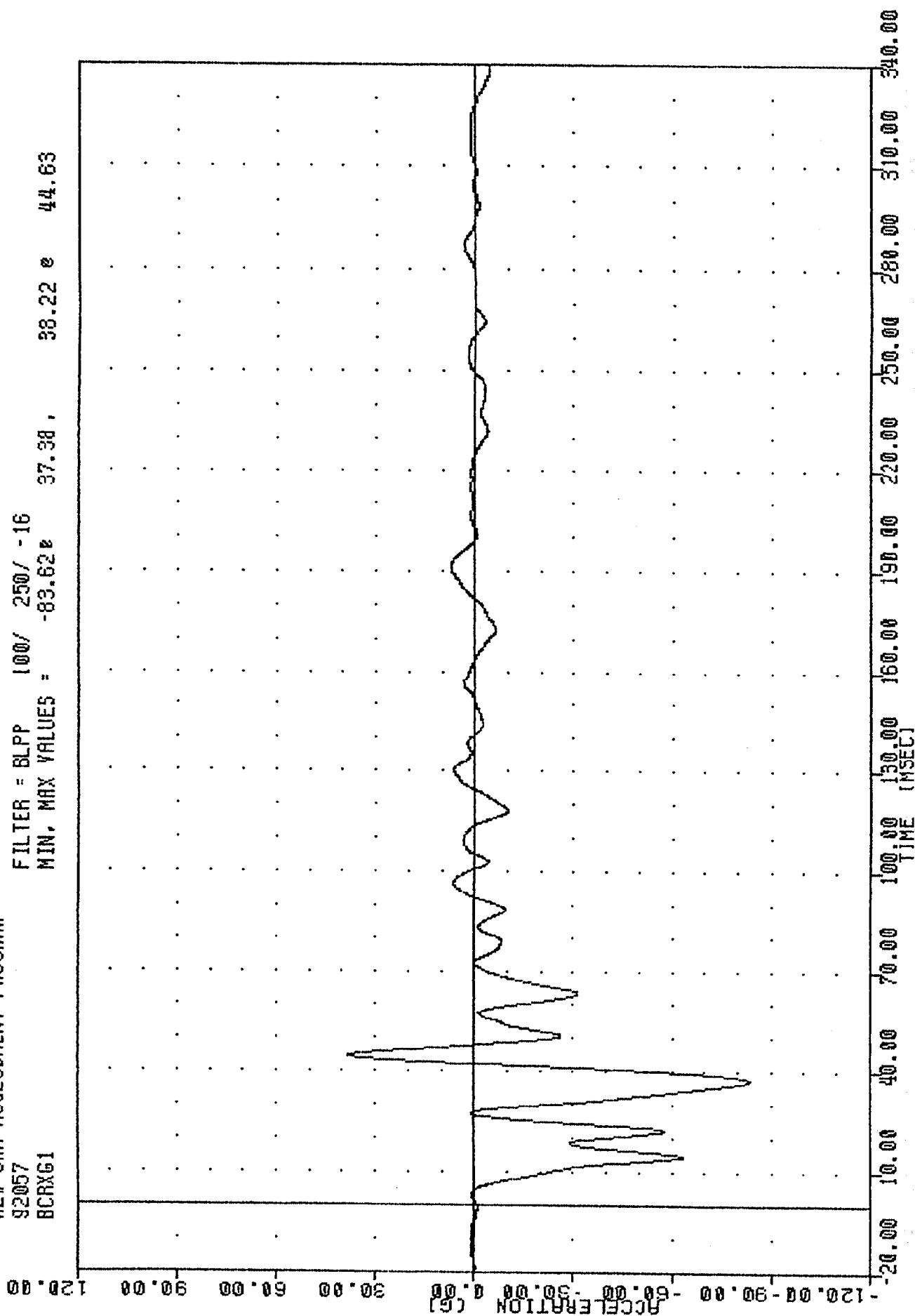
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -89.43e 35.00, 18.97 e 56.63



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 BCRXG1

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -83.62e 37.38 , 38.22 e 44.63



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 RIGHT BRAKE CALIPER Y-AXIS ACCELERATION

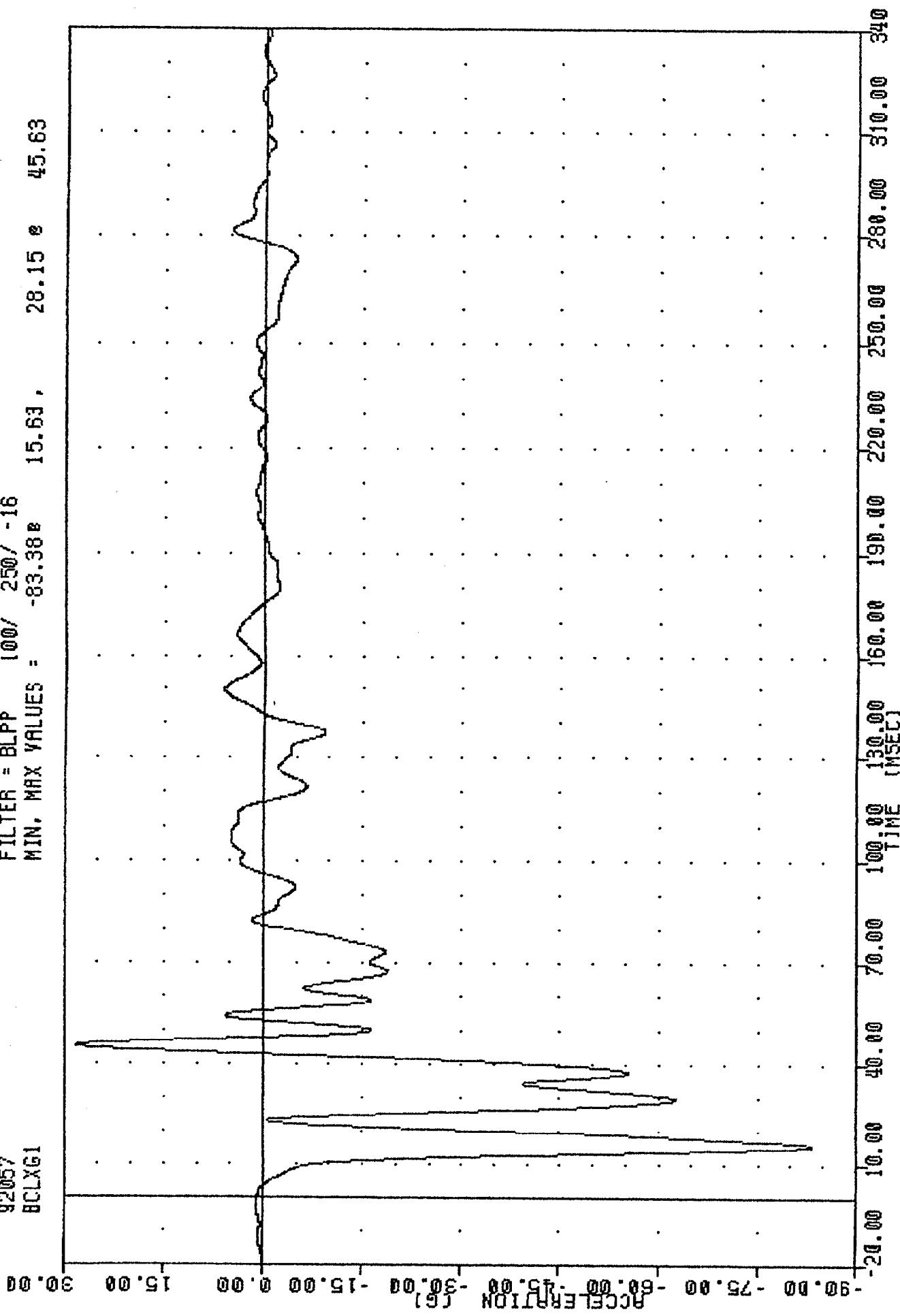
NEW CAR ASSESSMENT PROGRAM

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -83.38 15.63, 28.15 45.63

92057

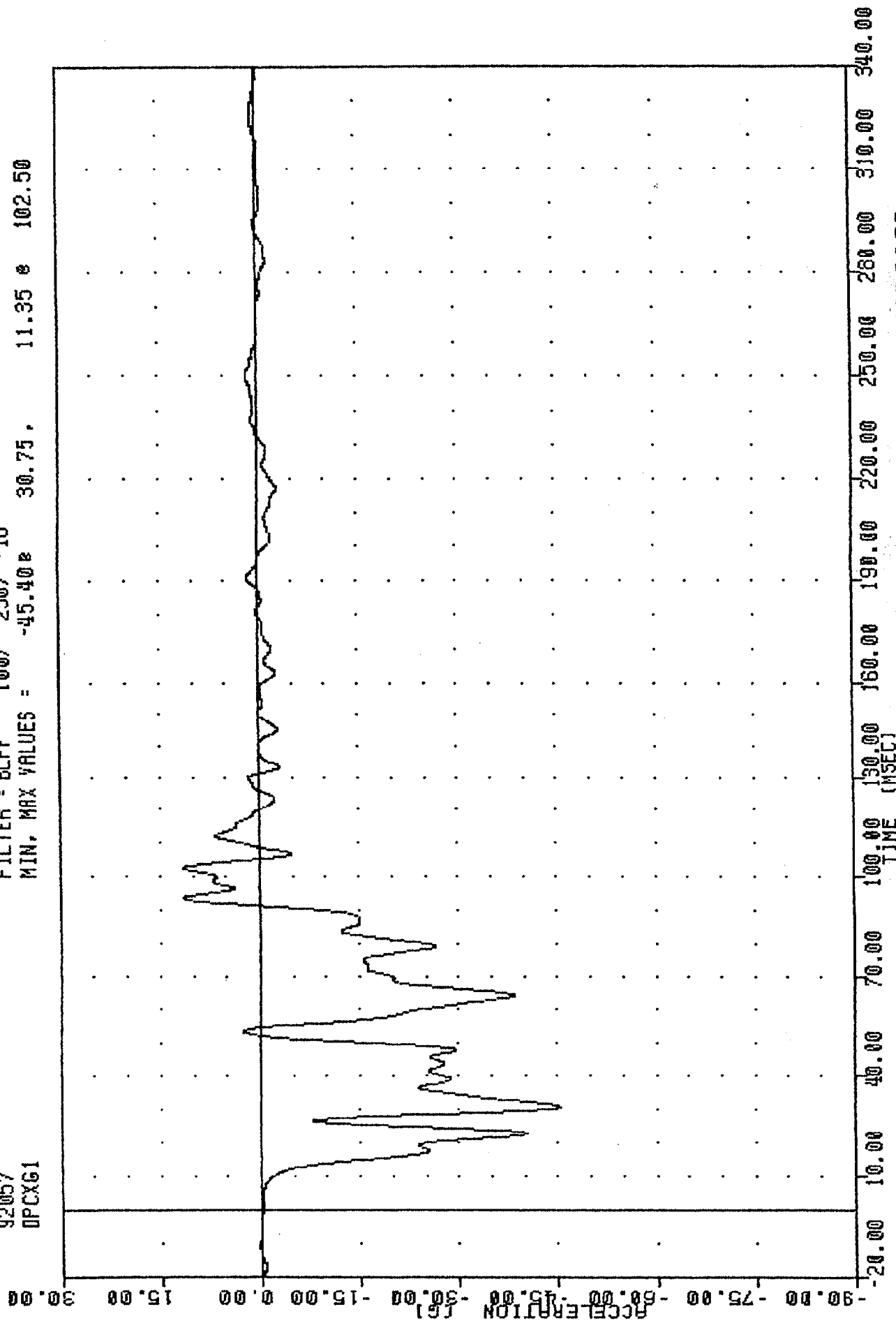
BCLXG1



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 OPCXG1

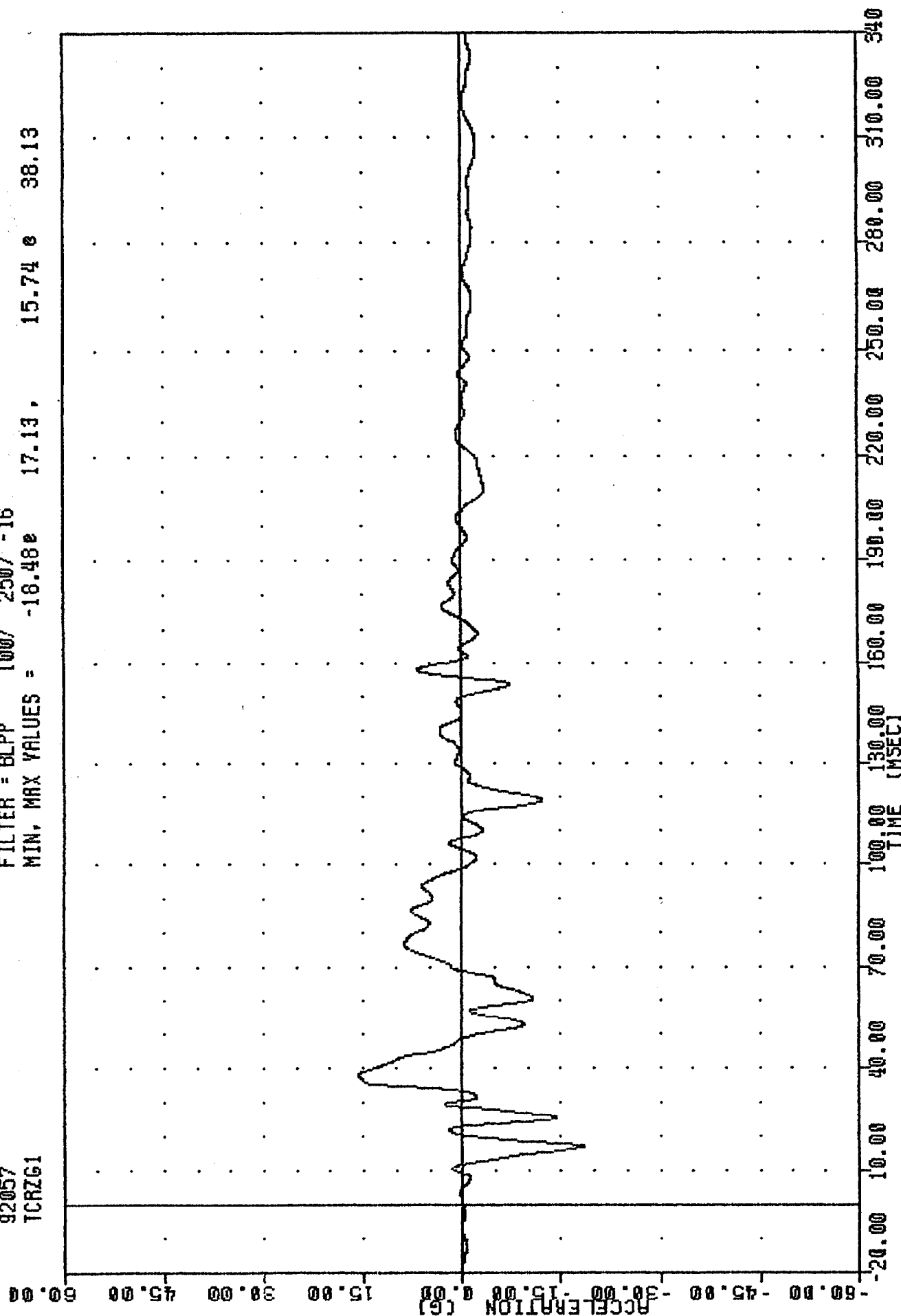
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -45.40 30.75, 11.35 102.50



NEW CAR ASSESSMENT PROGRAM

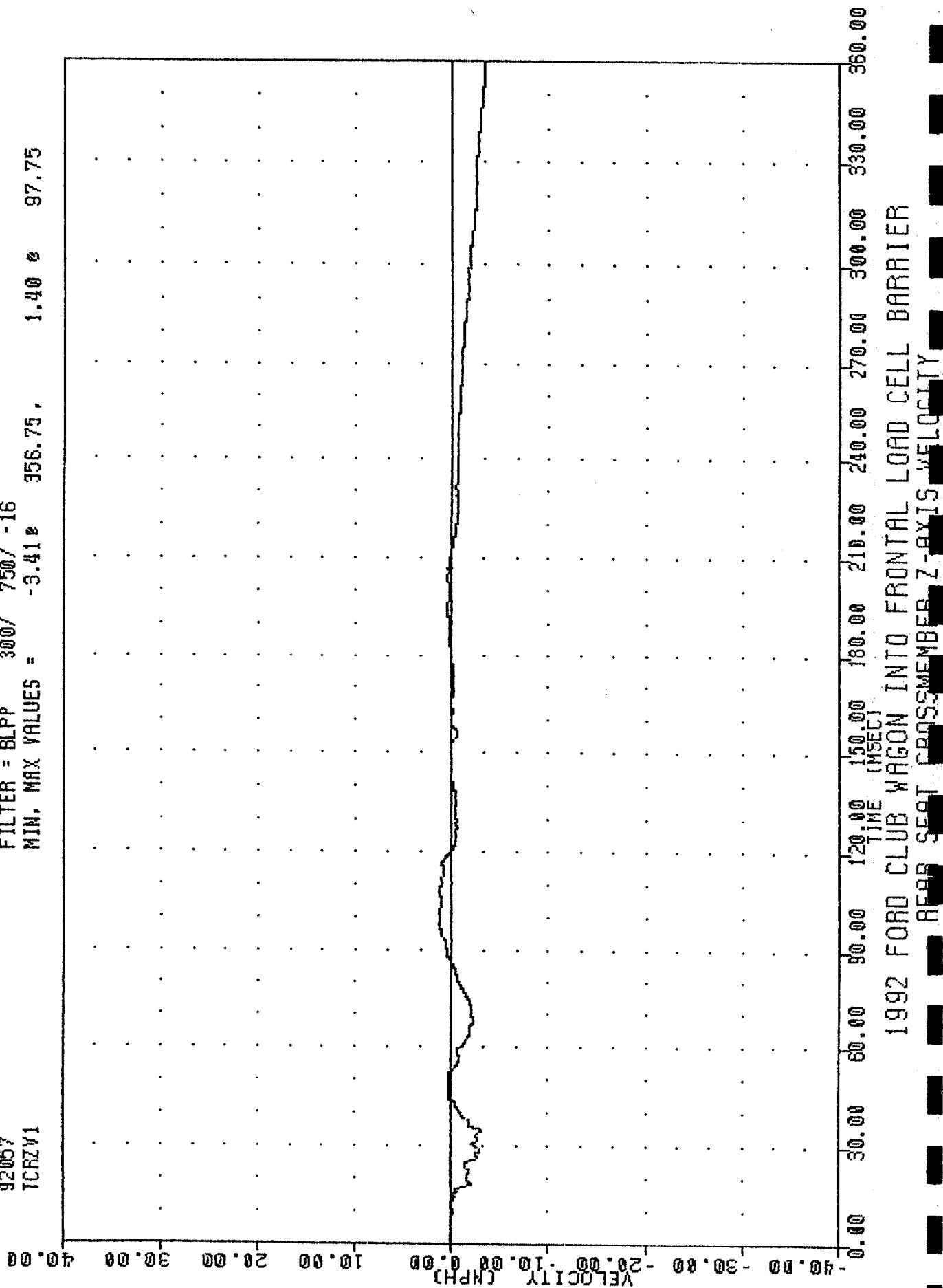
92057
TCRZG1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -18.48e 17.13, 15.74 e 38.13



TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 TCRZV1

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -3.41 356.75, 1.40 97.75



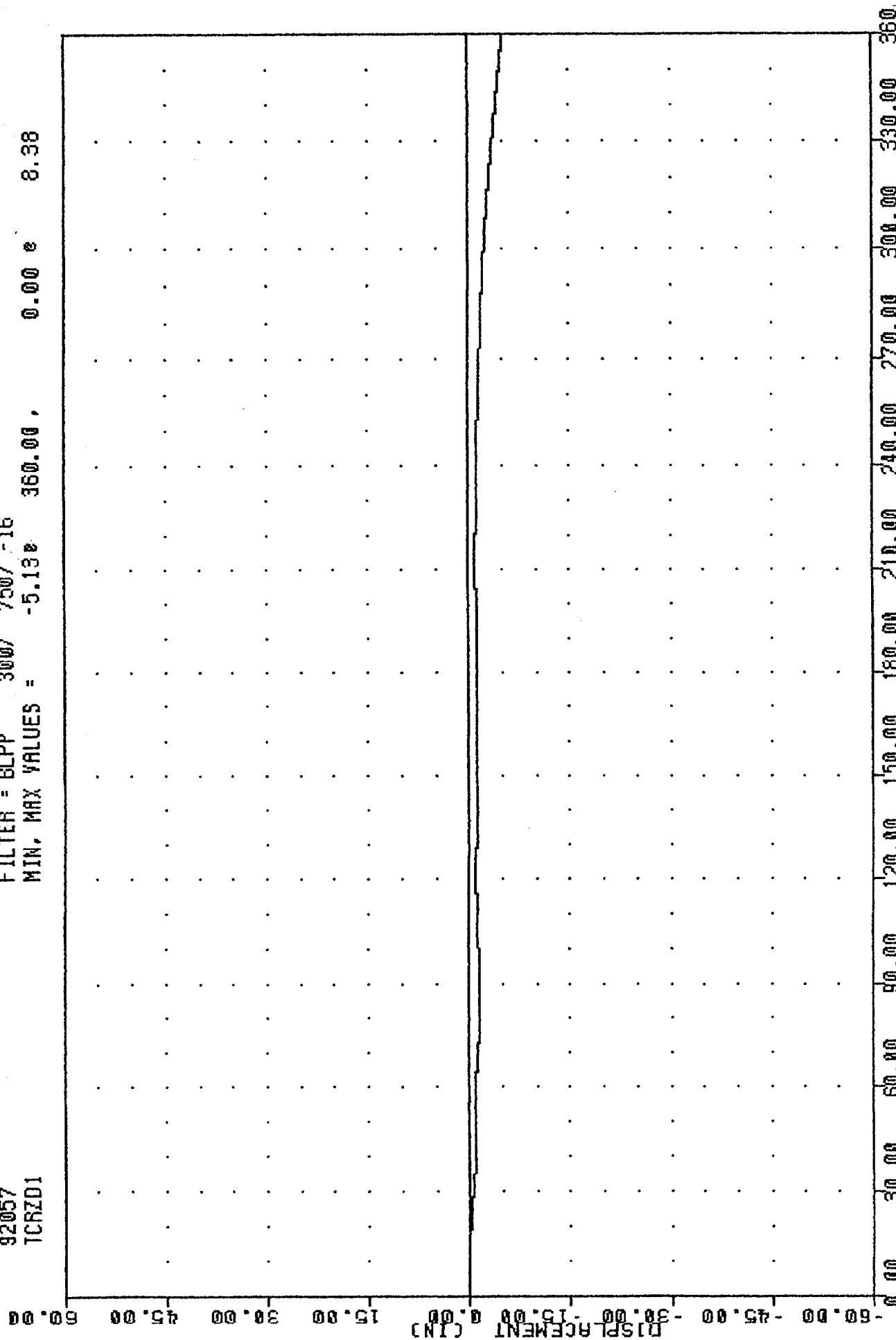
NEW CAR ASSESSMENT PROGRAM

92057

TCRZD1

FILTER = BLPP 300/ 750/ -16

MIN, MAX VALUES = -5.13 360.00, 0.00 8.38



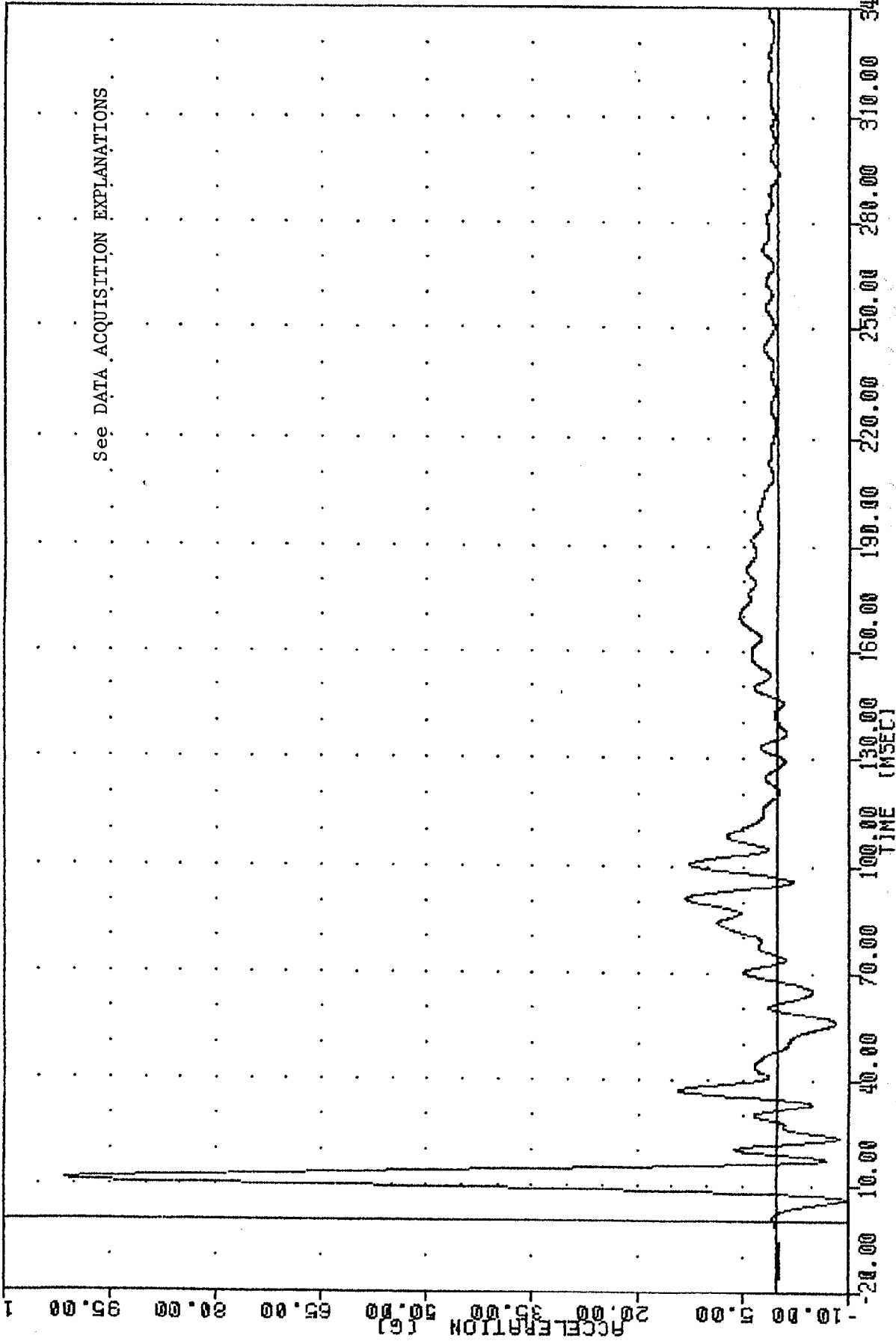
1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
REAR SEAT CROSSMEMBER Z-AXIS DISPLACEMENT

TRC
NEW CAR ASSESSMENT PROGRAM
92057
ADKZG1

920226

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -9.77 6.13 101.18 11.50

110.00



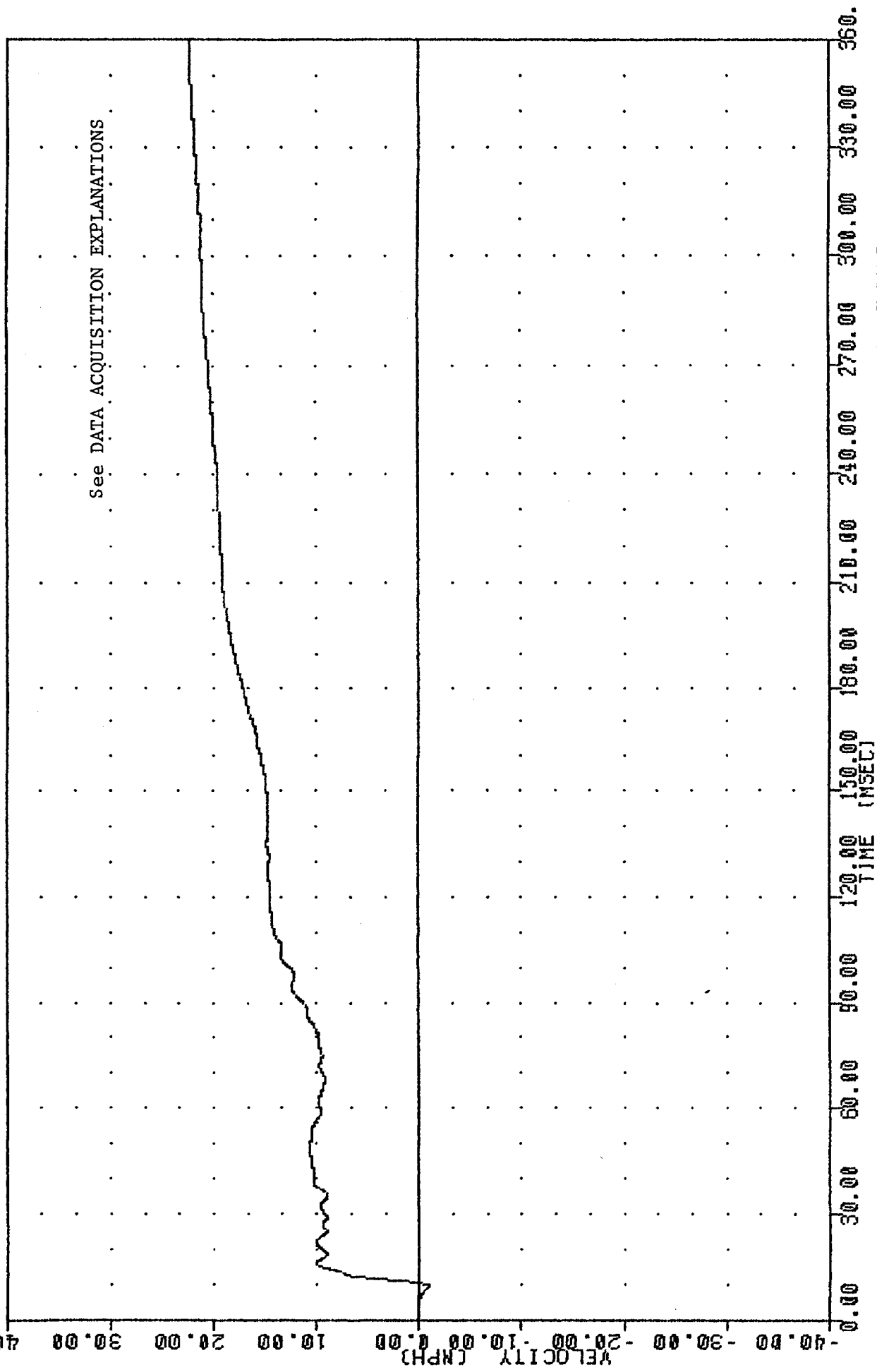
B-44

920226

1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
VEHICLE REAR CENTER Z-AXIS ACCELERATION

NEW CAR ASSESSMENT PROGRAM
 92057
 ADKZV1

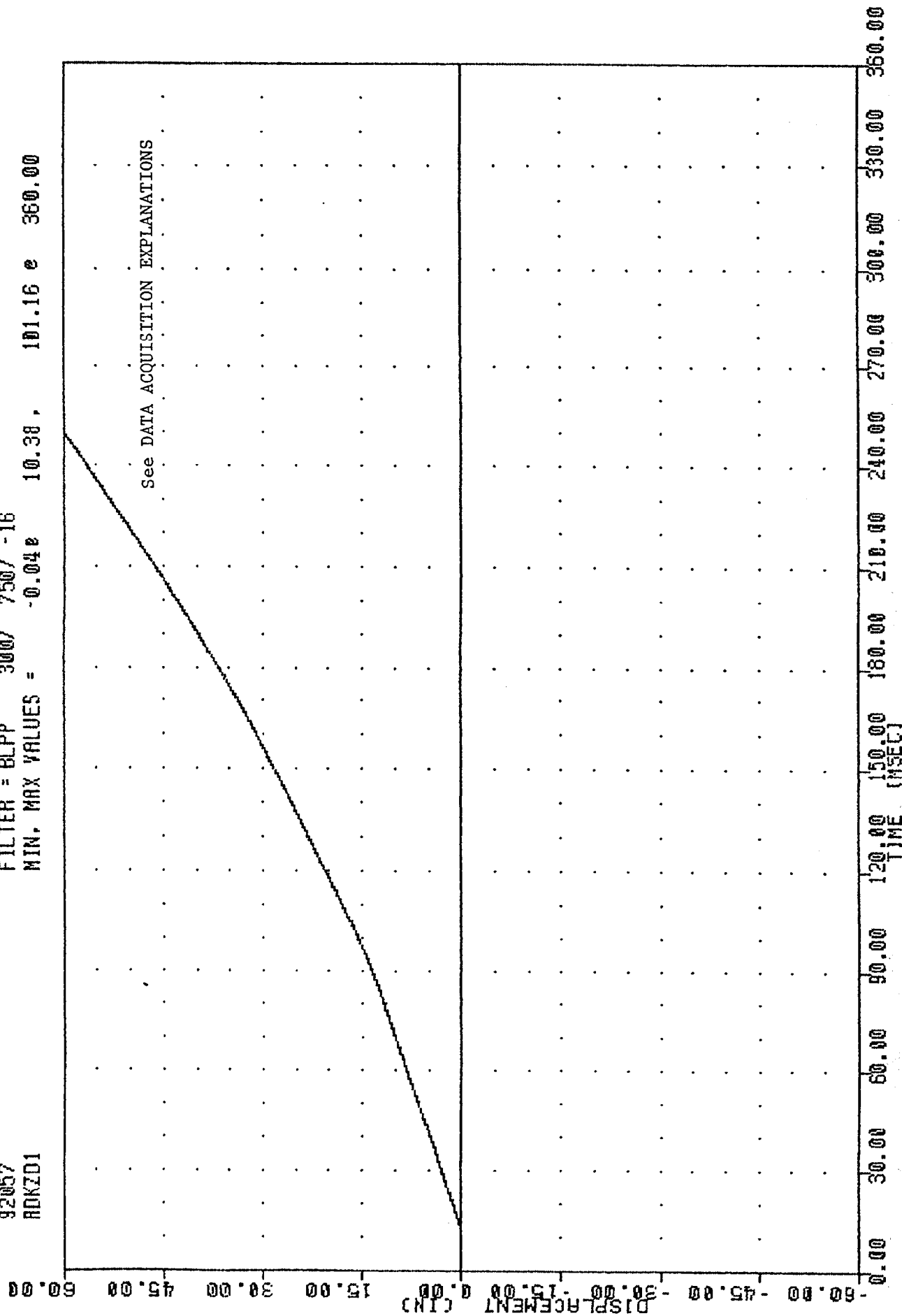
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -0.98 9.38, 22.33 e 360.00



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 VEHICLE REAR CENTER Z-AXIS VELOCITY

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 RDKZD1

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -0.04e 10.38 , 101.16 e 360.00



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 VEHICLE REAR CENTER Z-AXIS DISPLACEMENT

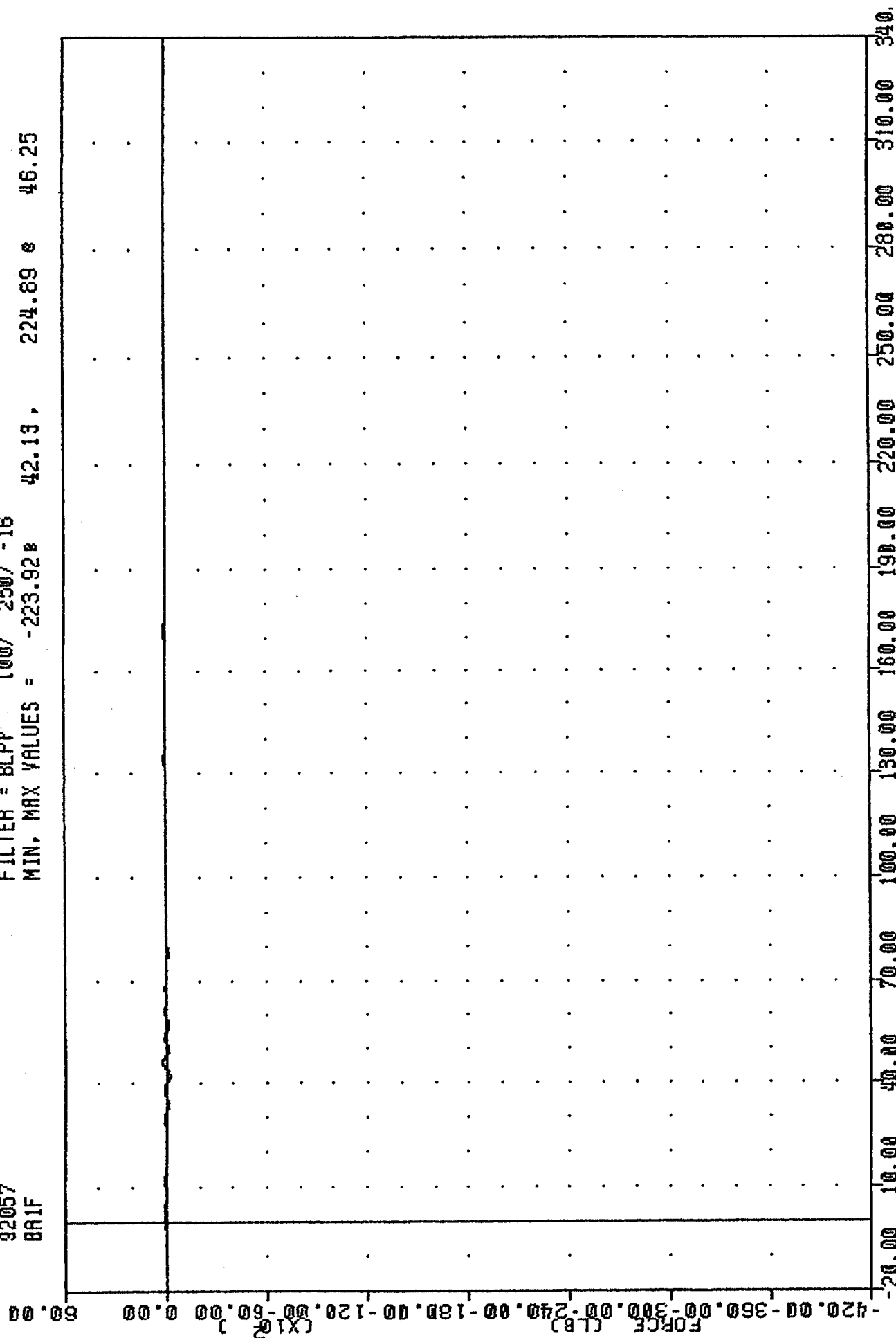
NEW CAR ASSESSMENT PROGRAM

92057

BA1F

FILTER = BLPP 100/ 250/ -16

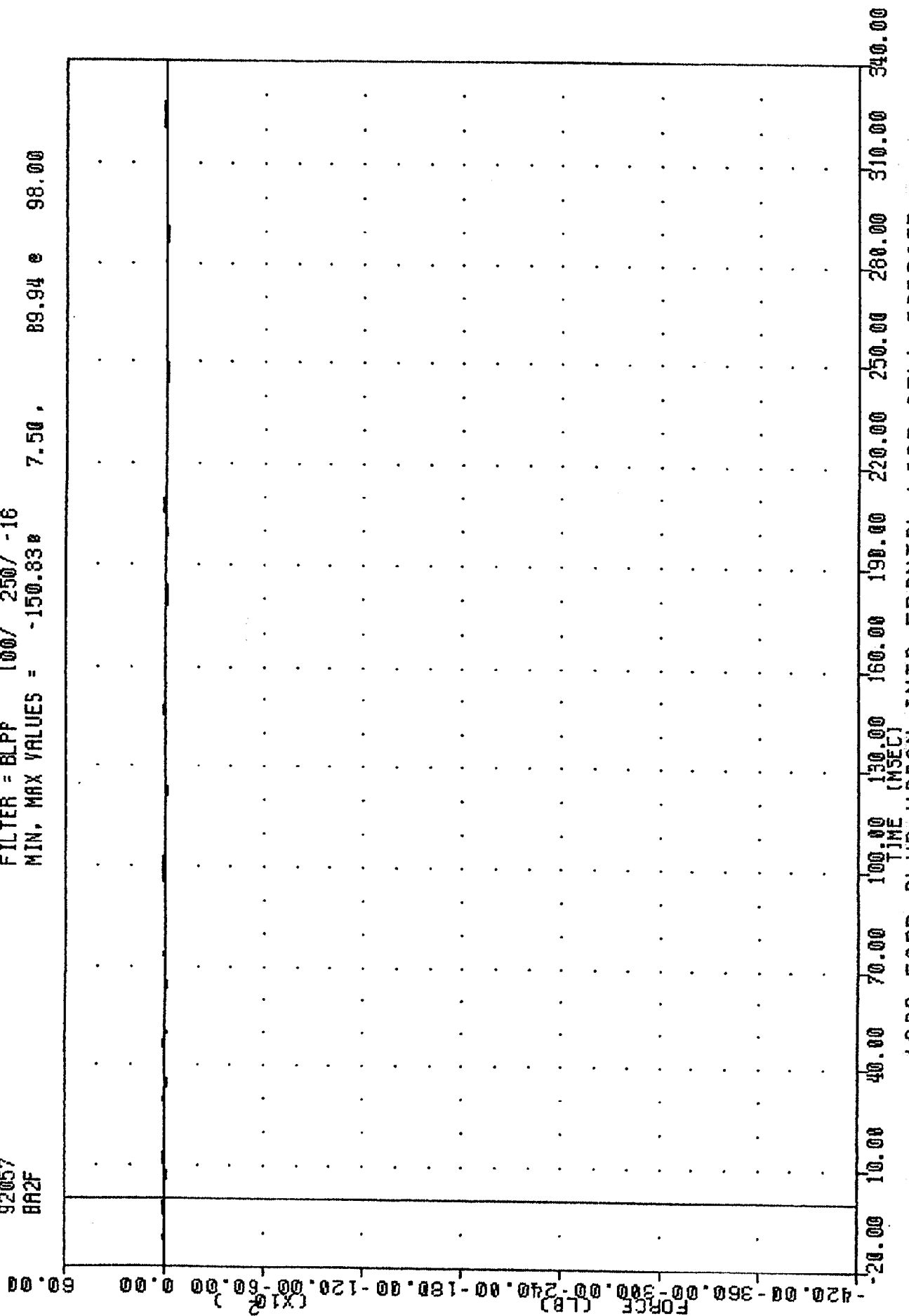
MIN, MAX VALUES = -223.92 42.13 , 224.89 46.25



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A1 FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 BR2F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -150.830 7.50 . 89.94 e 98.00



NEW CAR ASSESSMENT PROGRAM

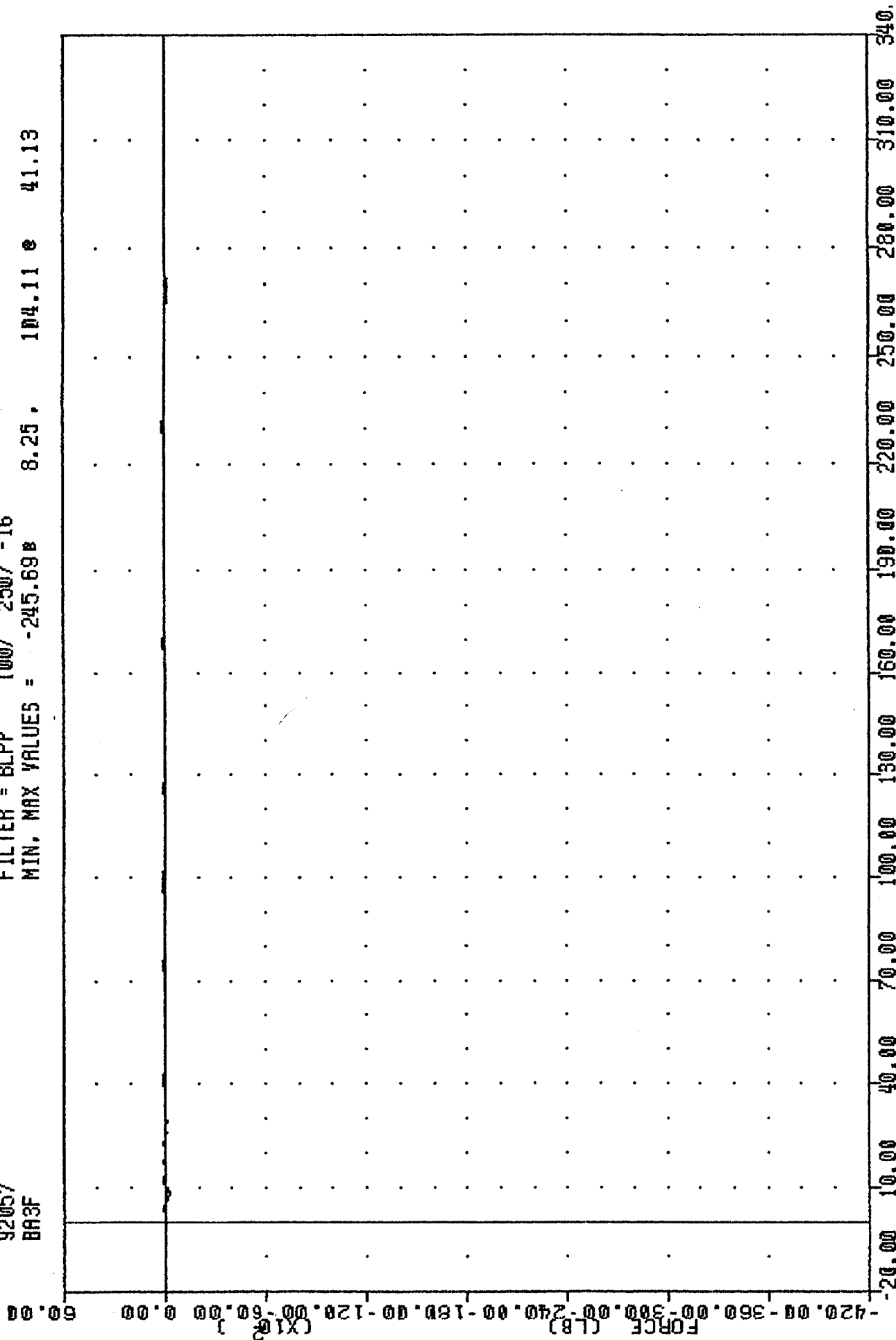
92057

BA3F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -245.69 8.25

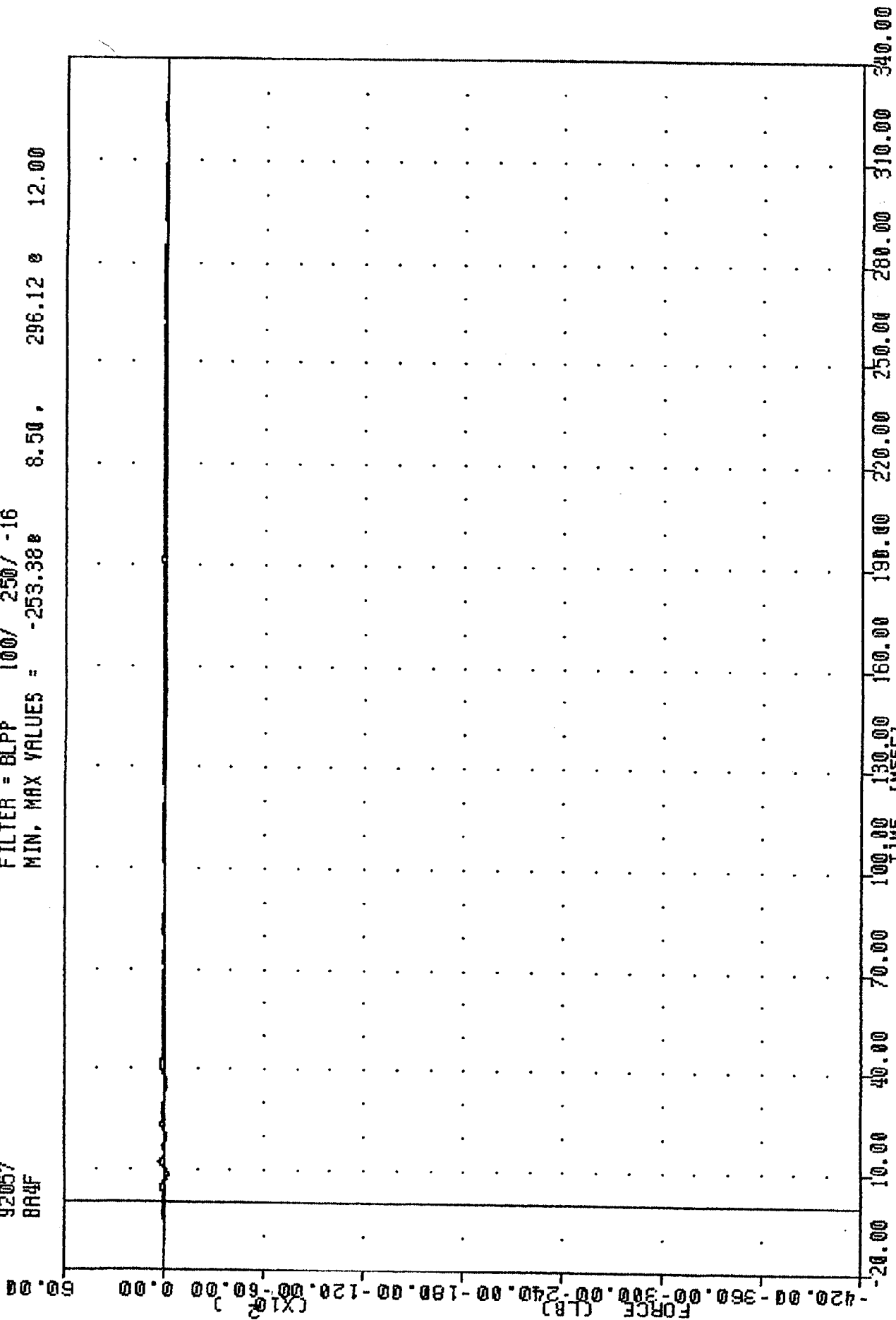
104.11 41.13



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A3 FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 BR4F

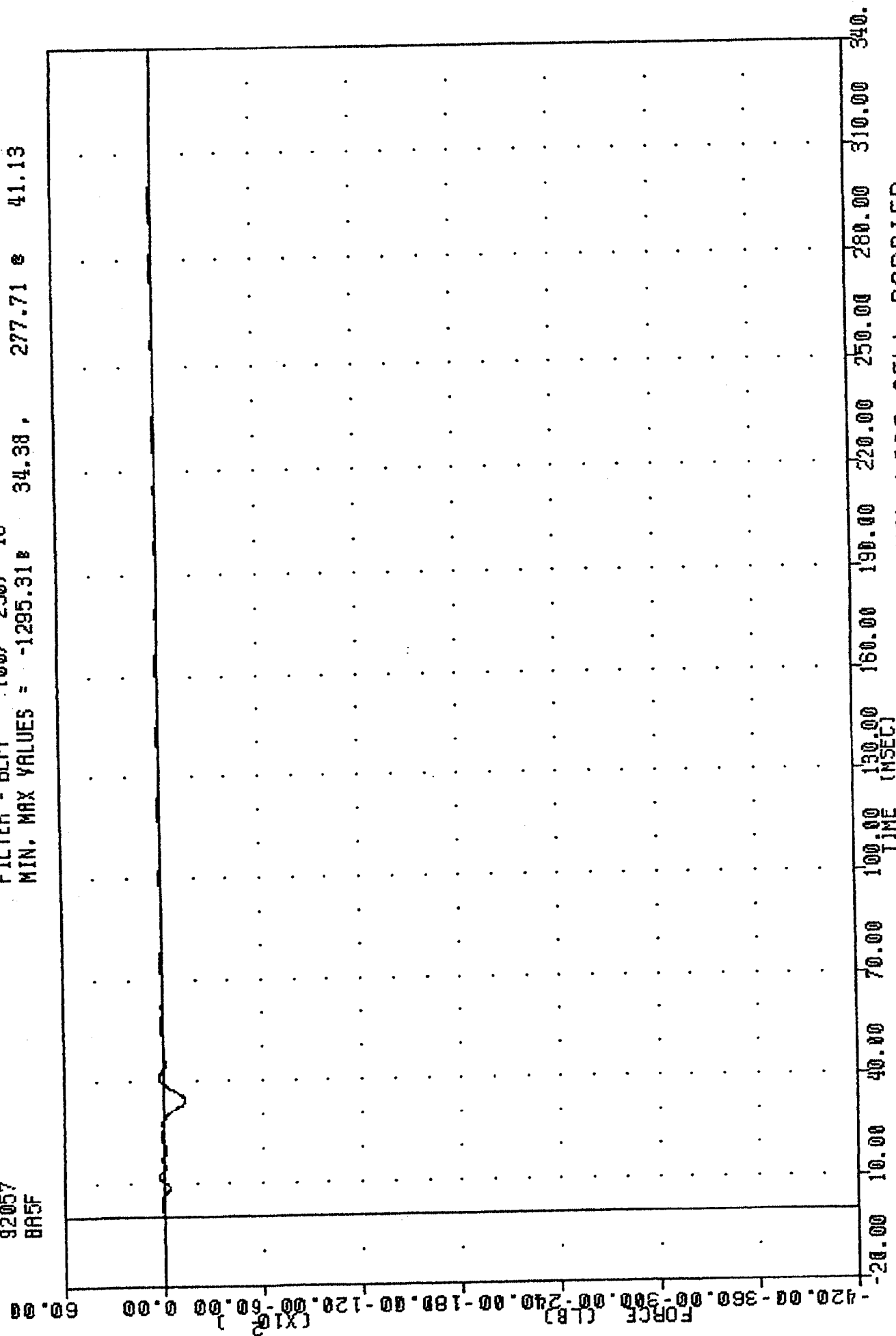
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -253.38 8.50 , 296.12 0 12.00



92057
895F

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -1295.318

DATE	DESCRIPTION	AMOUNT	BALANCE
10/1/58	10/1/58	277.71	41.13
10/2/58	10/2/58	34.38	

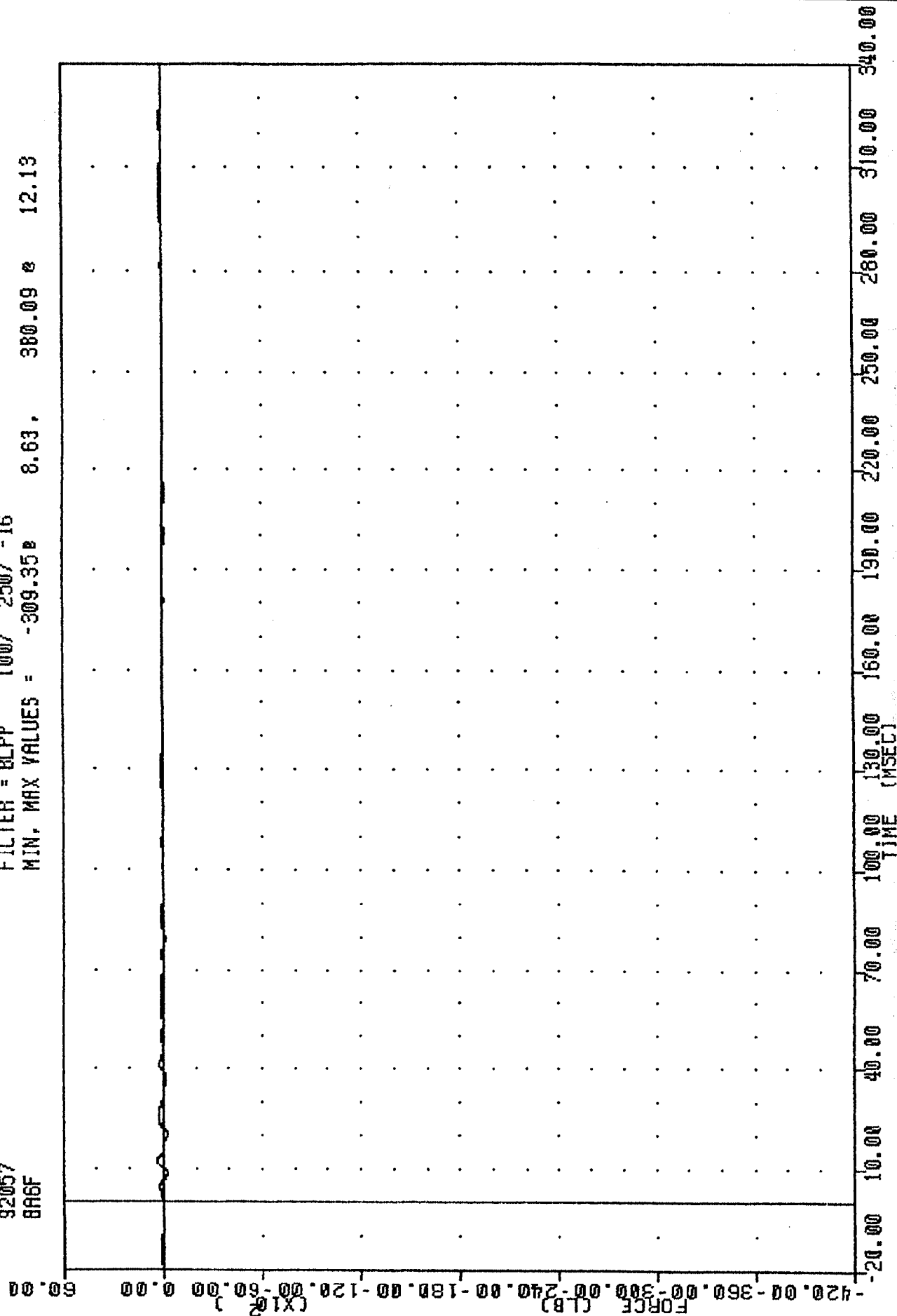


1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A5 FORCE

TRC , 920226
NEW CAR ASSESSMENT PROGRAM

92057 FILTER = BLPP 100/ 250/ -16

BASEF MIN, MAX VALUES = -309.35 8.63, 380.09 12.13

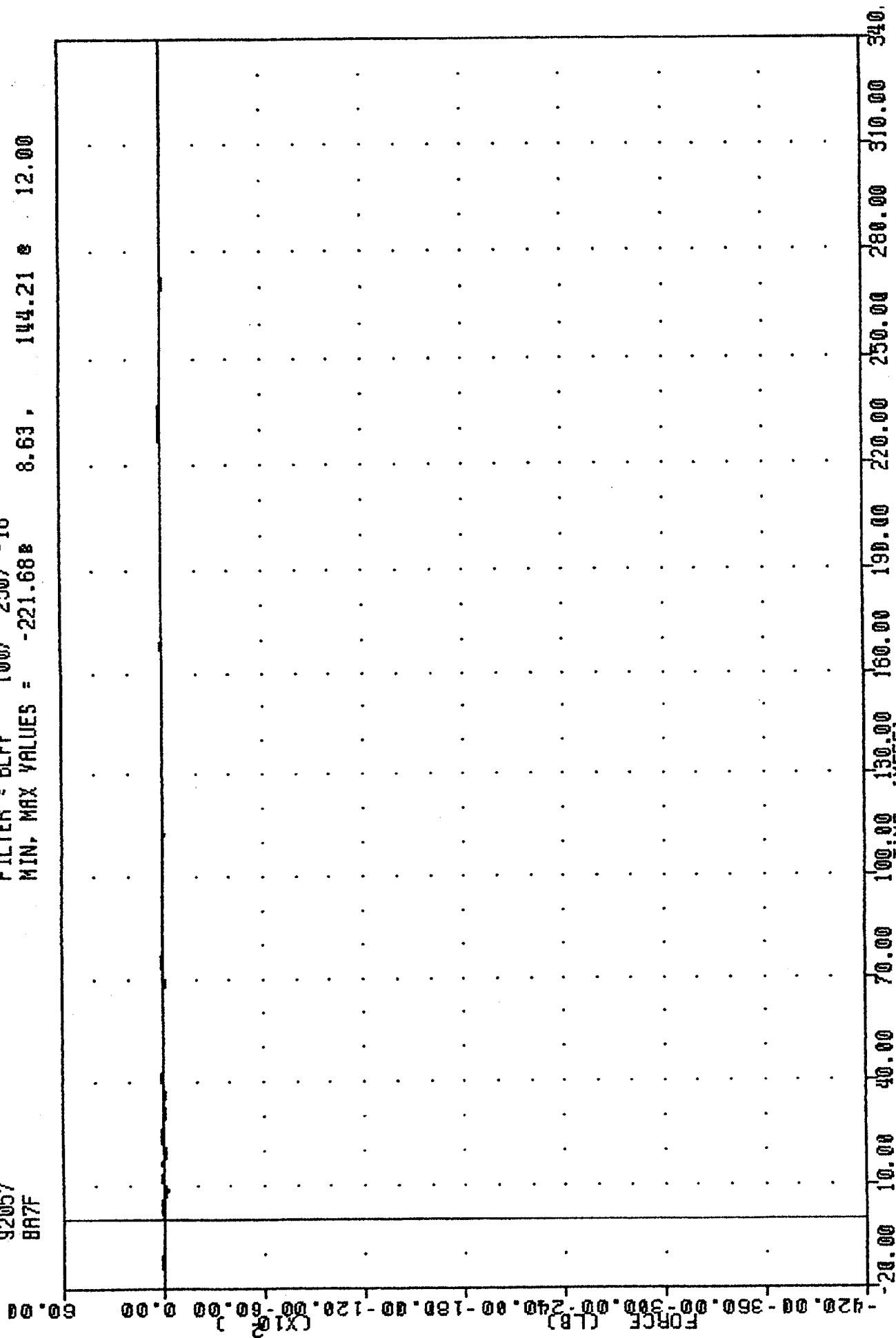


NEW CAR ASSESSMENT PROGRAM

92057
BA7F

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -221.68 8.63

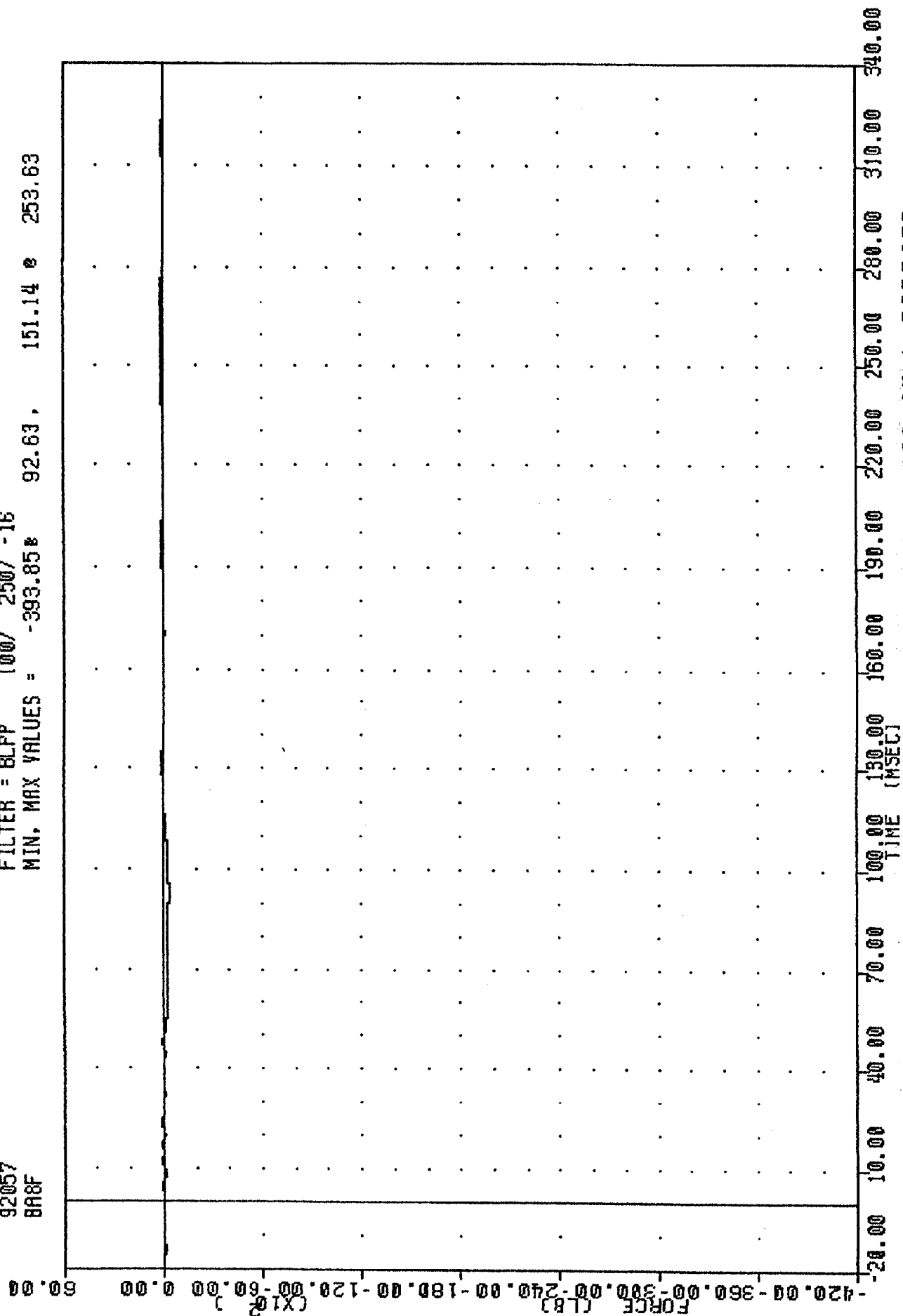
144.21 12.00



TRC
 NEW CAR ASSESSMENT PROGRAM
 92057
 BA8F

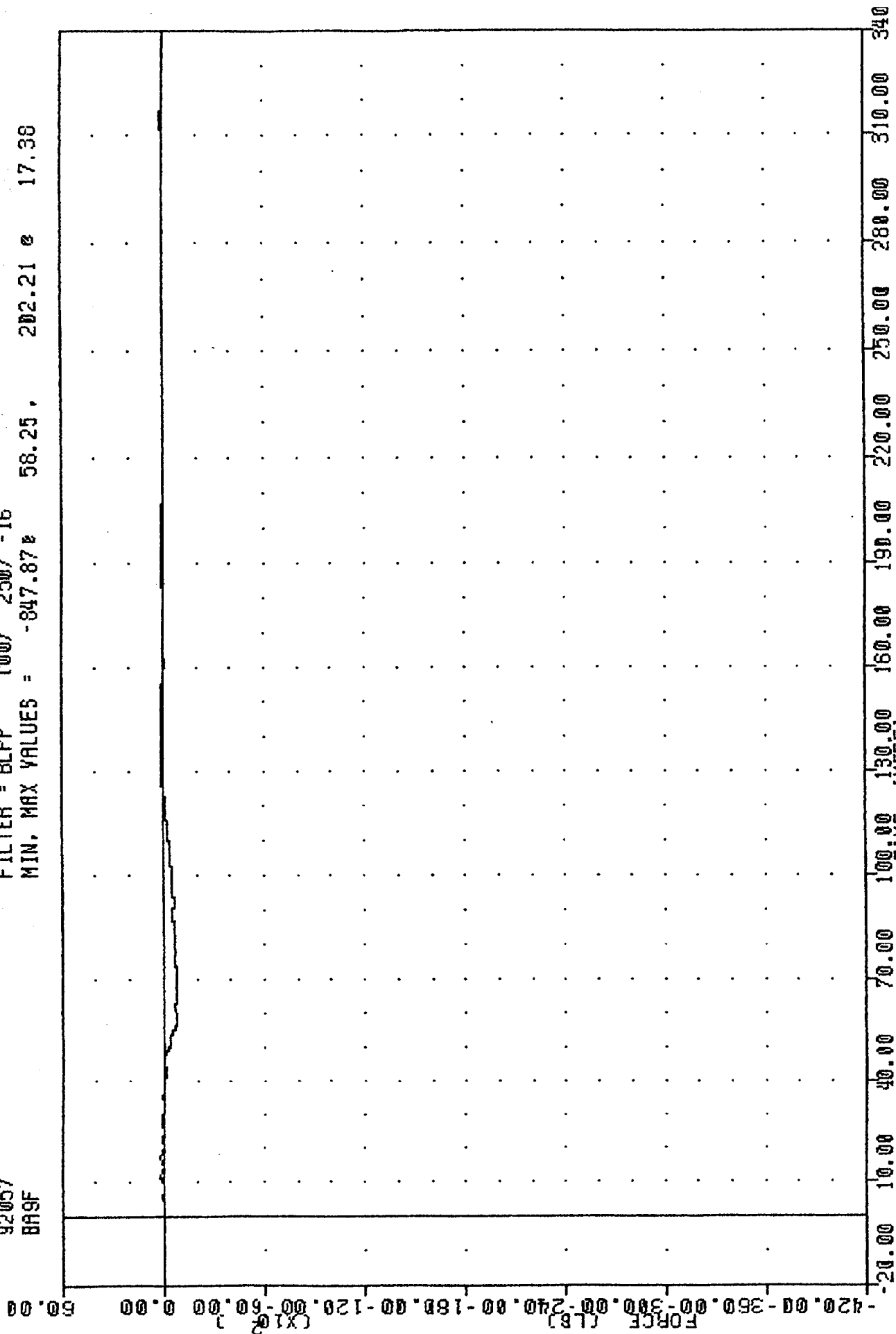
920226

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -393.85* 92.63, 151.14 * 253.63



NEW UNIT IDENTIFICATION NUMBER
 92057
 BAGF

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -847.87% 58.25% 202.21 @ 17.38



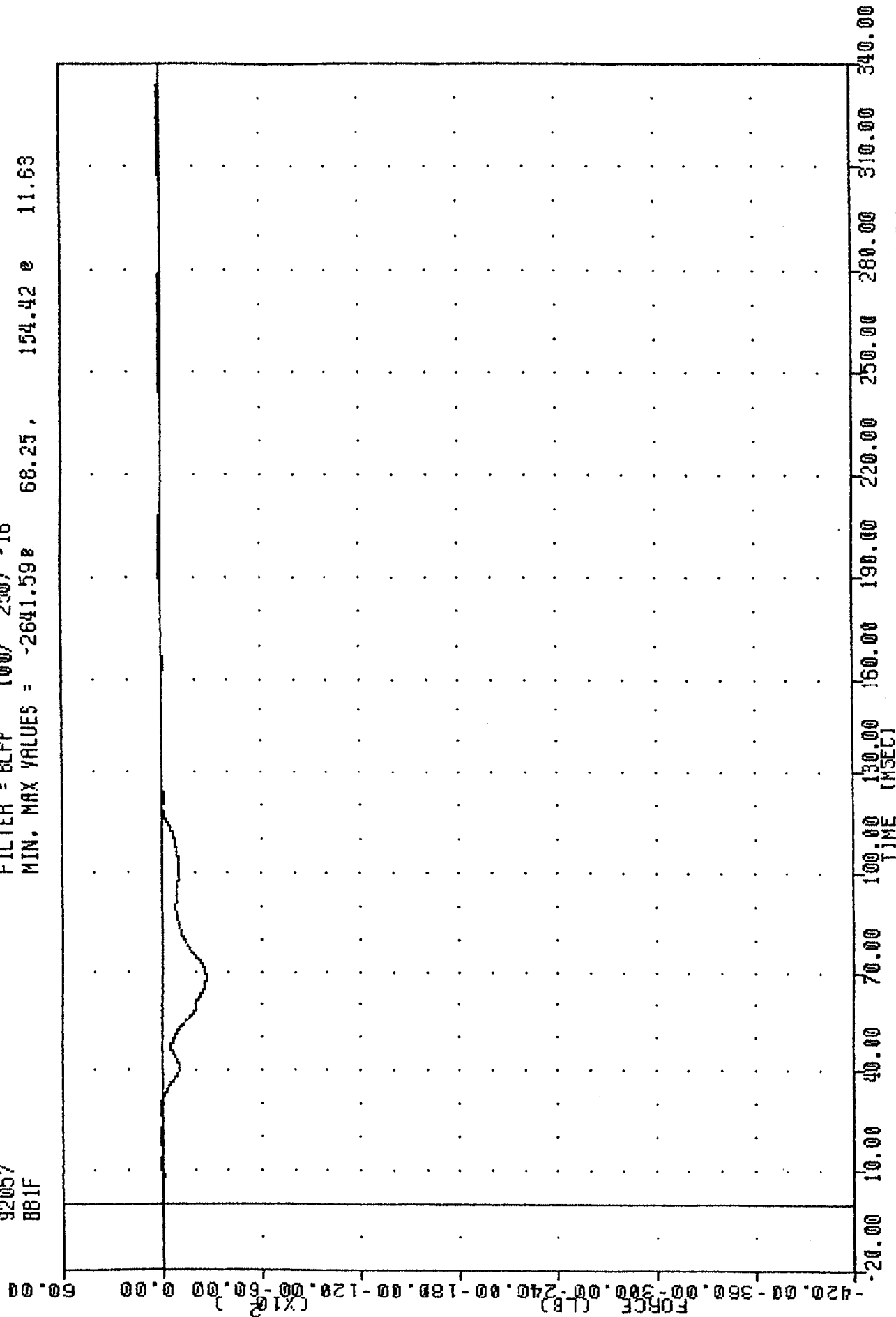
1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A9 FORCE

TRC
NEW CAR ASSESSMENT PROGRAM
92057
BR1F

920226

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -2641.598 68.25, 154.42 @ 11.63



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B1 FORCE

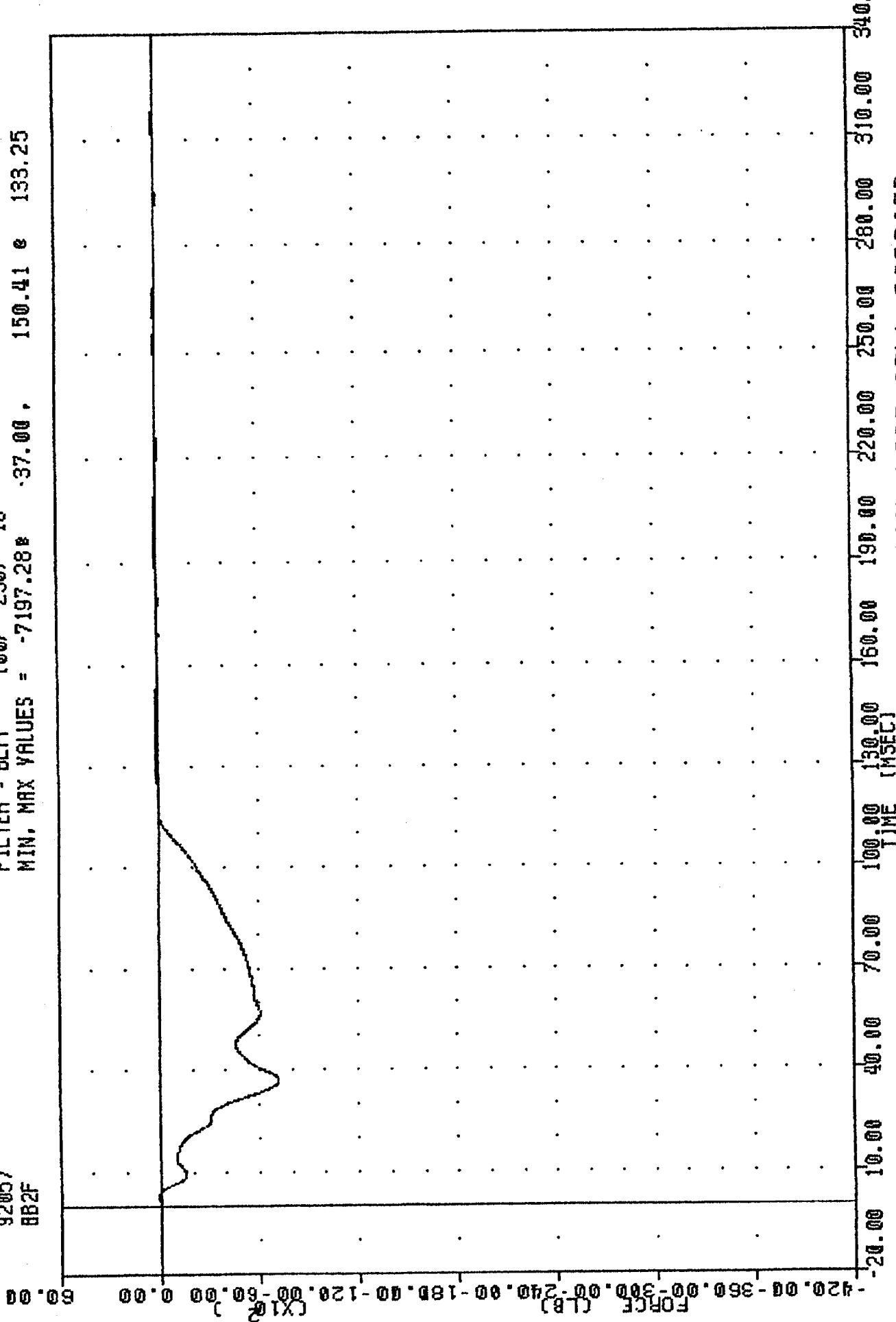
NEW CAR ASSESSMENT PROGRAM

92057

BB2F

FILTER = BLPP 100/ 250/ -16

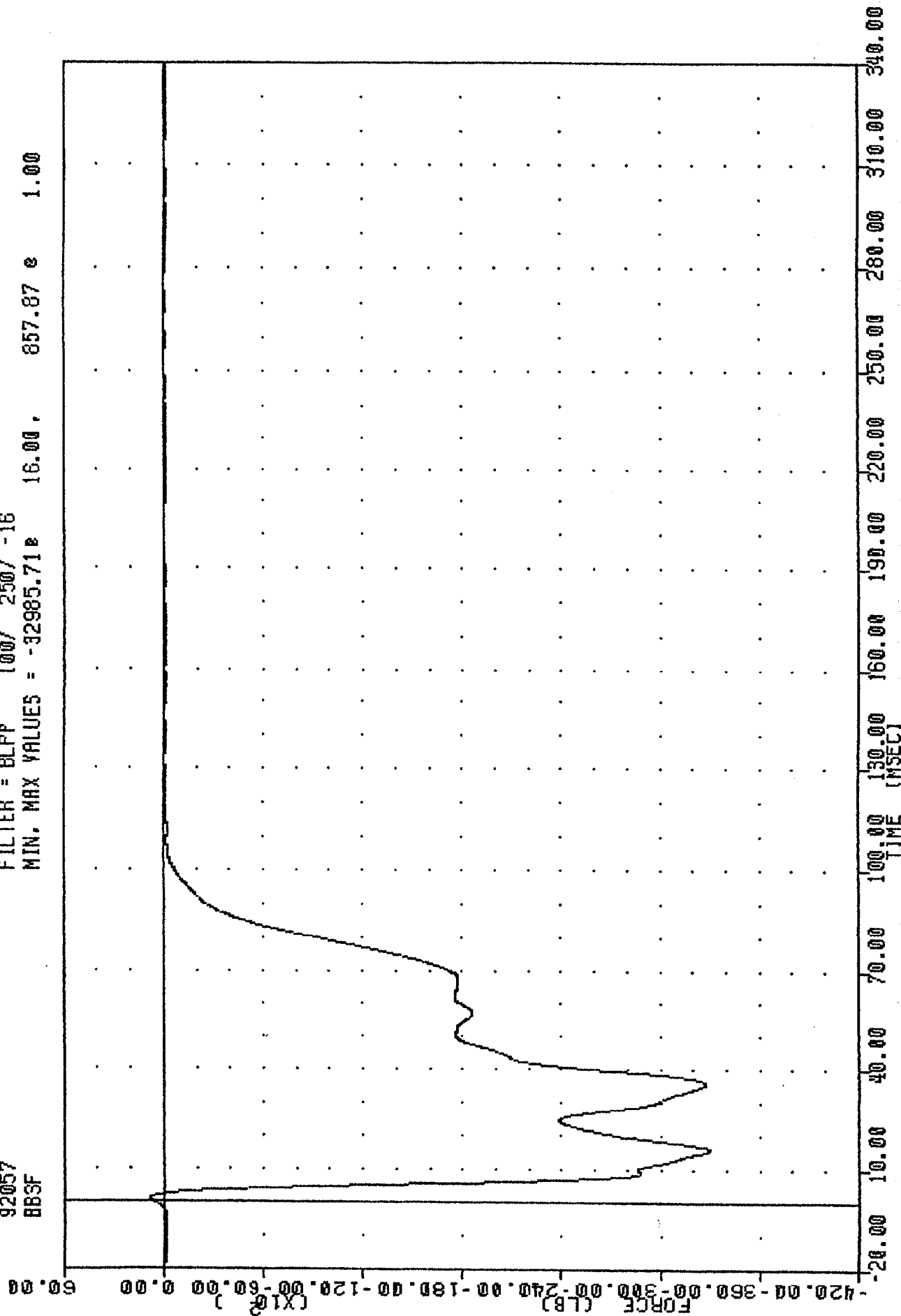
MIN, MAX VALUES = -7197.28 150.41 e 133.25



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B2 FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 BB3F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -32985.71 857.87 e 1.00



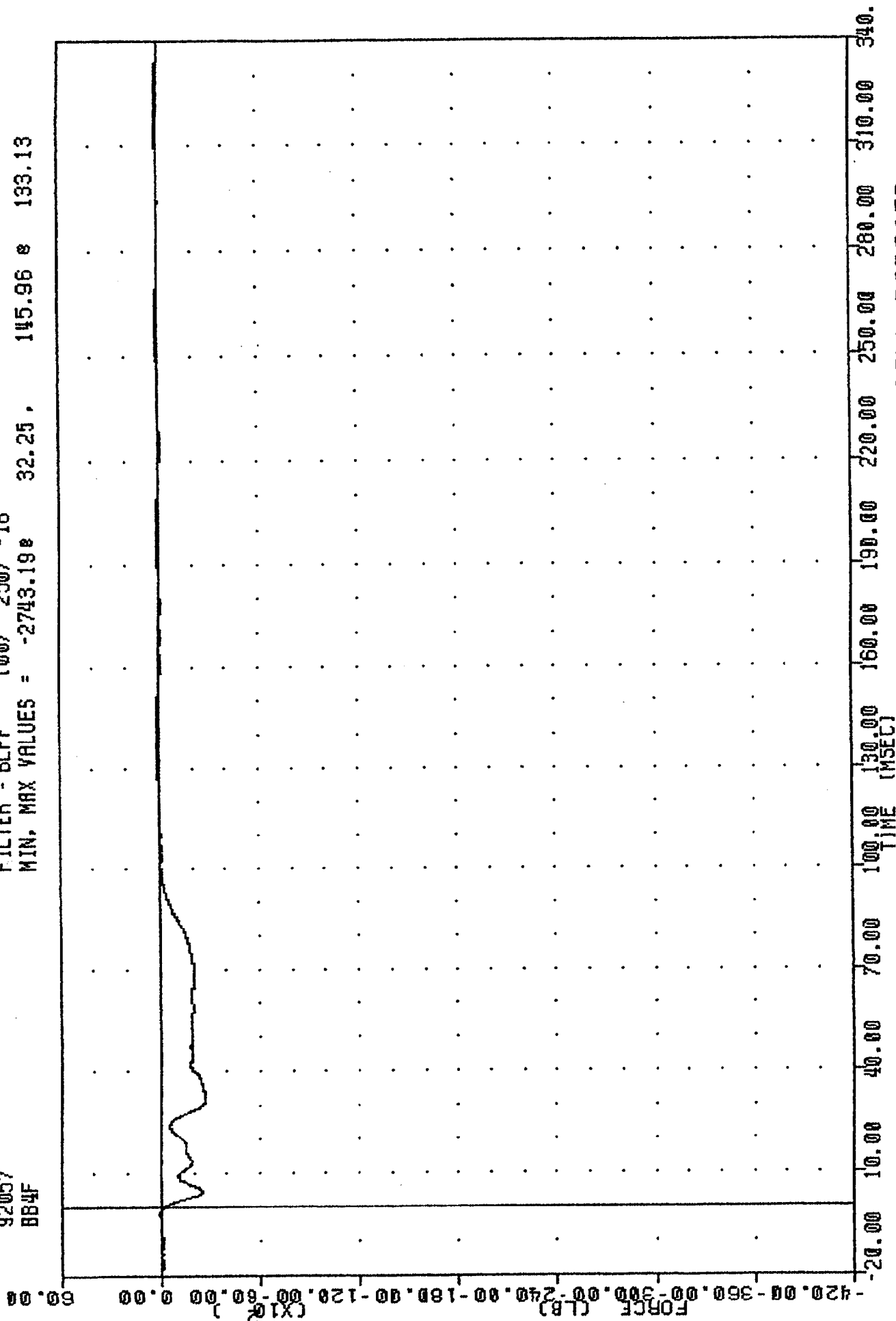
1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION BB3 FORCE

NEW CAR ASSESSMENT PROGRAM

92057
BB4F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -2743.19e 32.25. 145.96 e 133.13

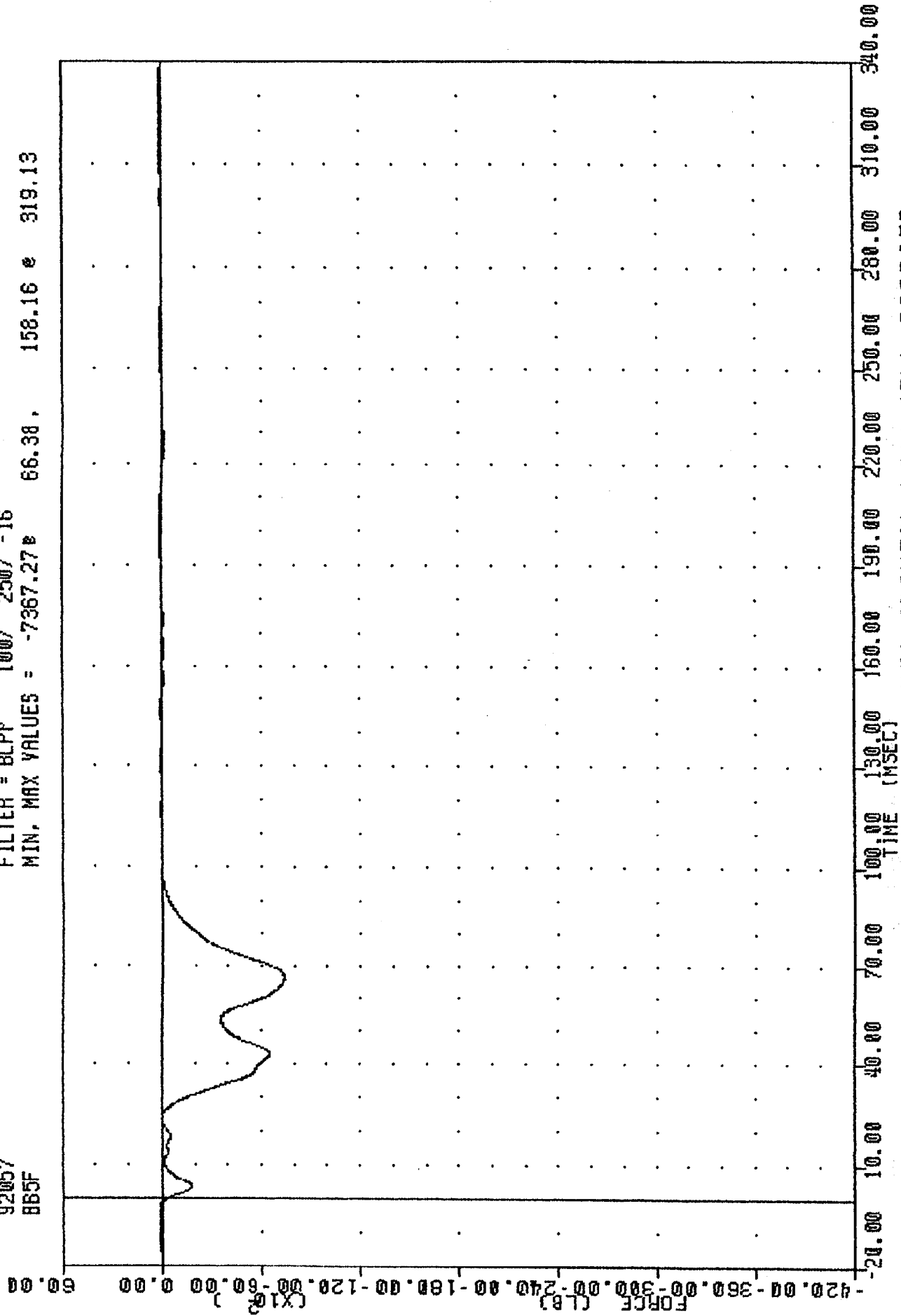


1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B4 FORCE

TRC , 920226
NEW CAR ASSESSMENT PROGRAM

92057
855F

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -7367.27 66.38 , 158.16 e 319.13



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B5 FORCE

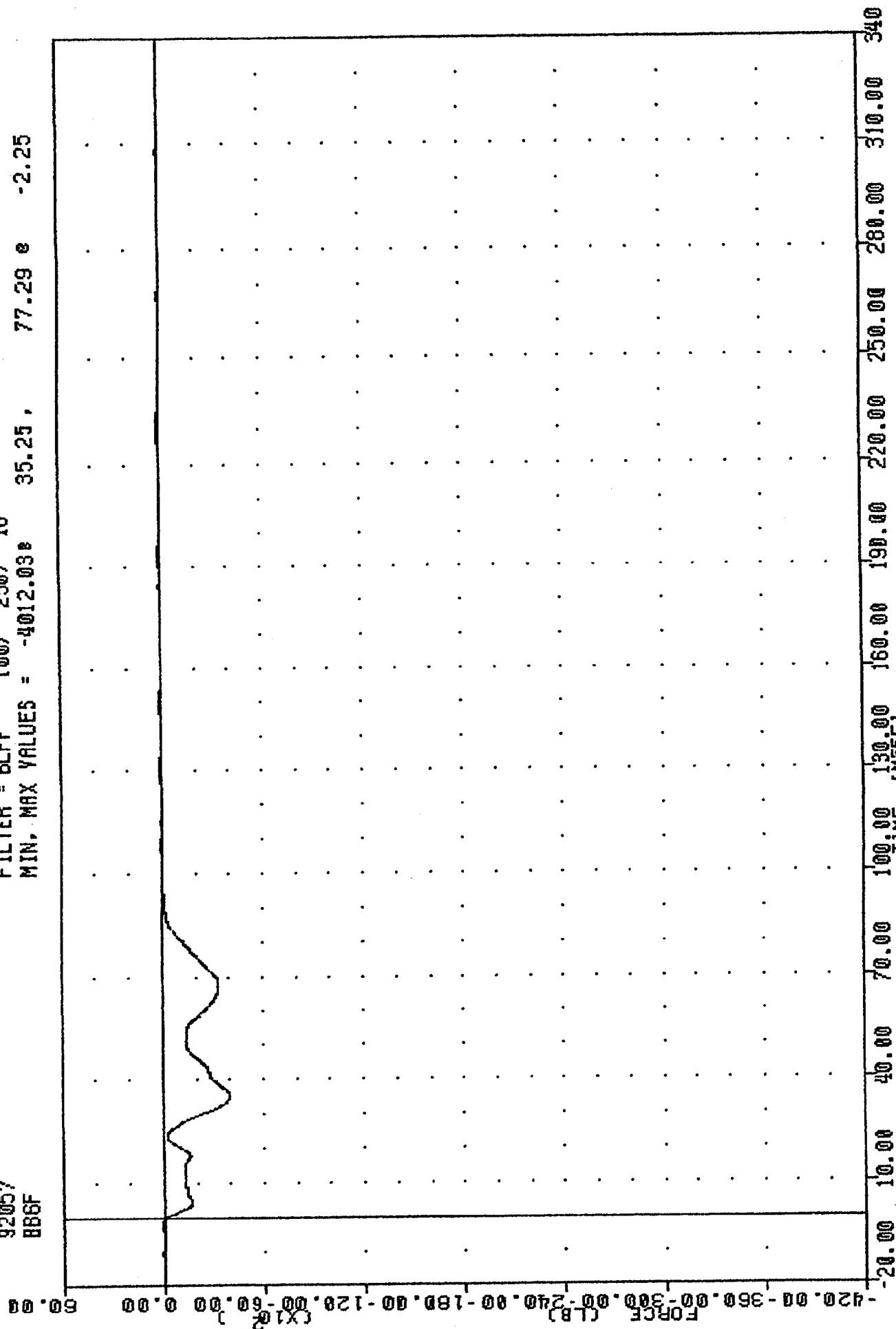
NEW CAR ASSESSMENT PROGRAM

92057

BB6F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -4012.03 35.25 , 77.29 e -2.25

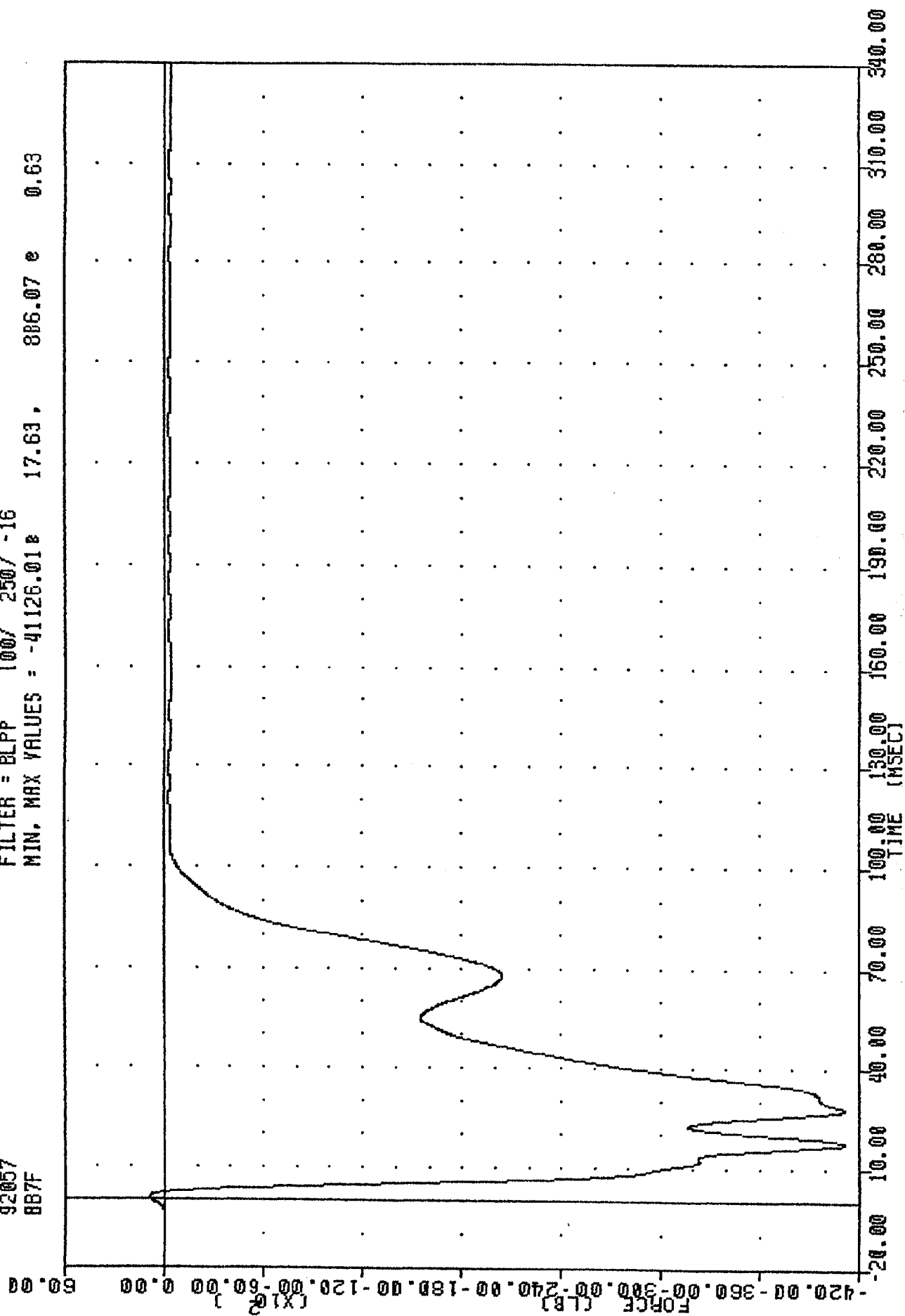


1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B6 FORCE

TRC
NEW CAR ASSESSMENT PROGRAM
92057
887F

, 920226

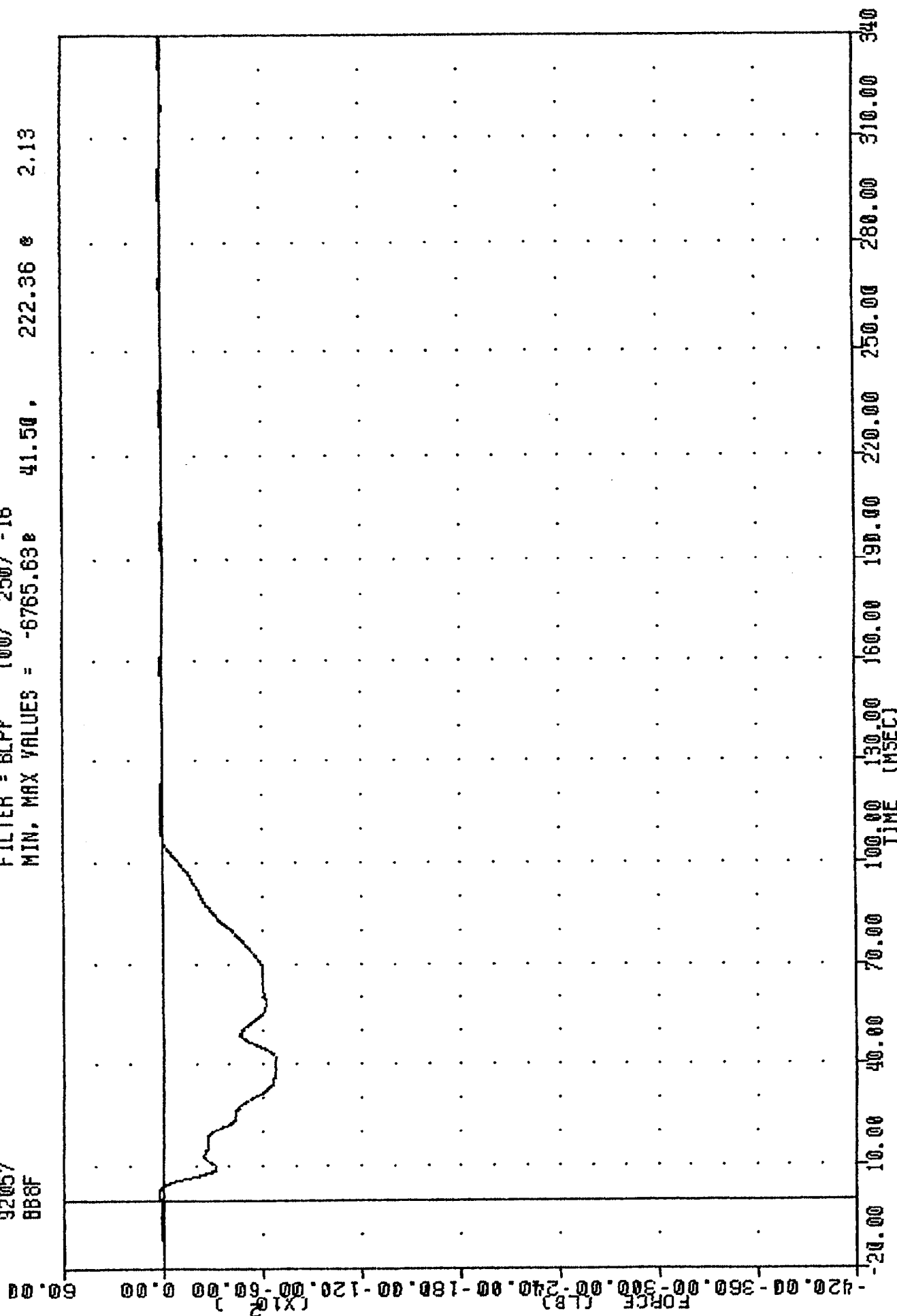
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -41126.018 17.63, 886.07 e 0.63



NEW CAR ASSESSMENT PROGRAM

92057
BB8F

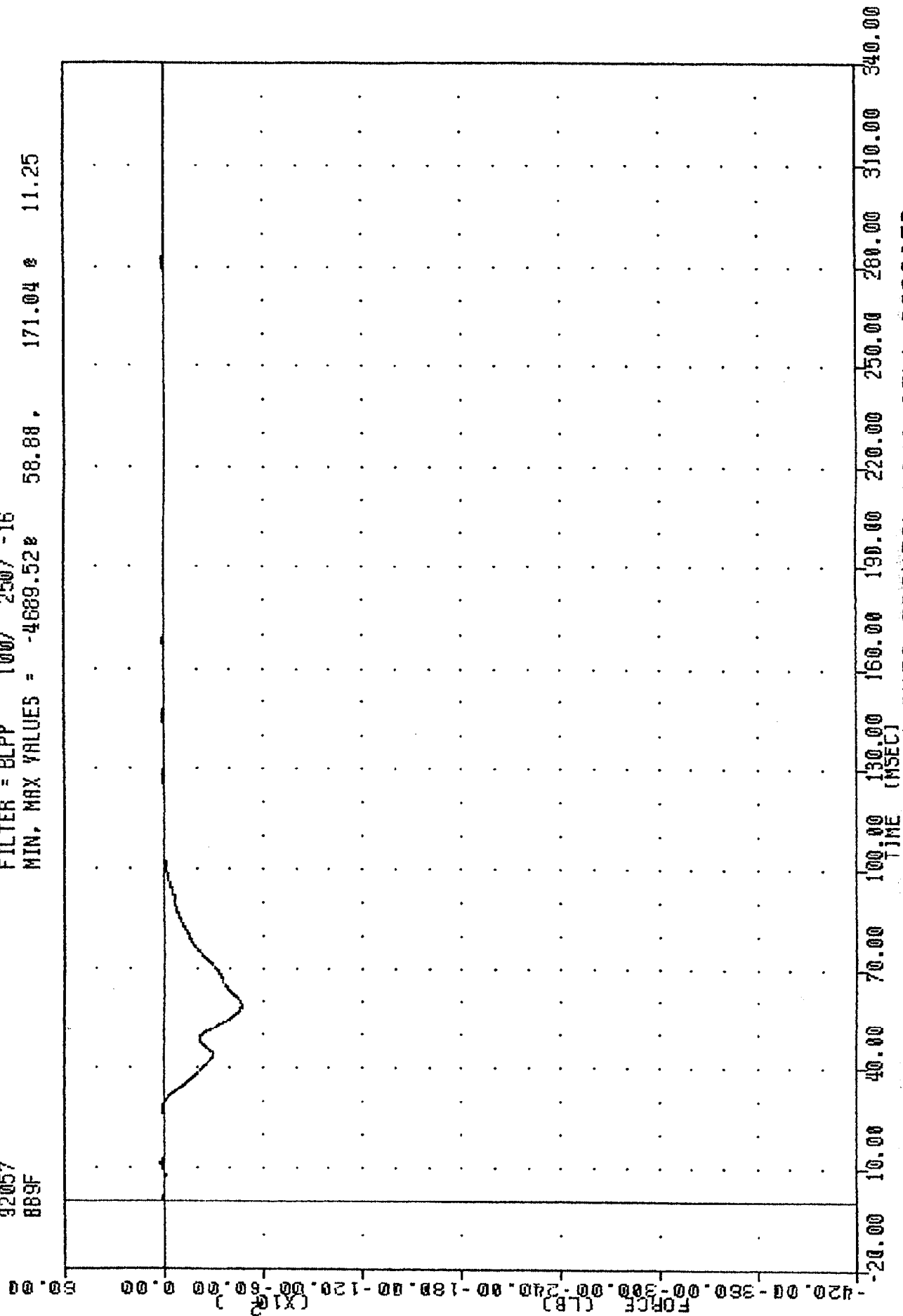
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -6765.63e 41.50. 222.36 e 2.13



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION BB FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 889F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -4689.52# 58.88, 171.04 # 11.25



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 89 FORCE

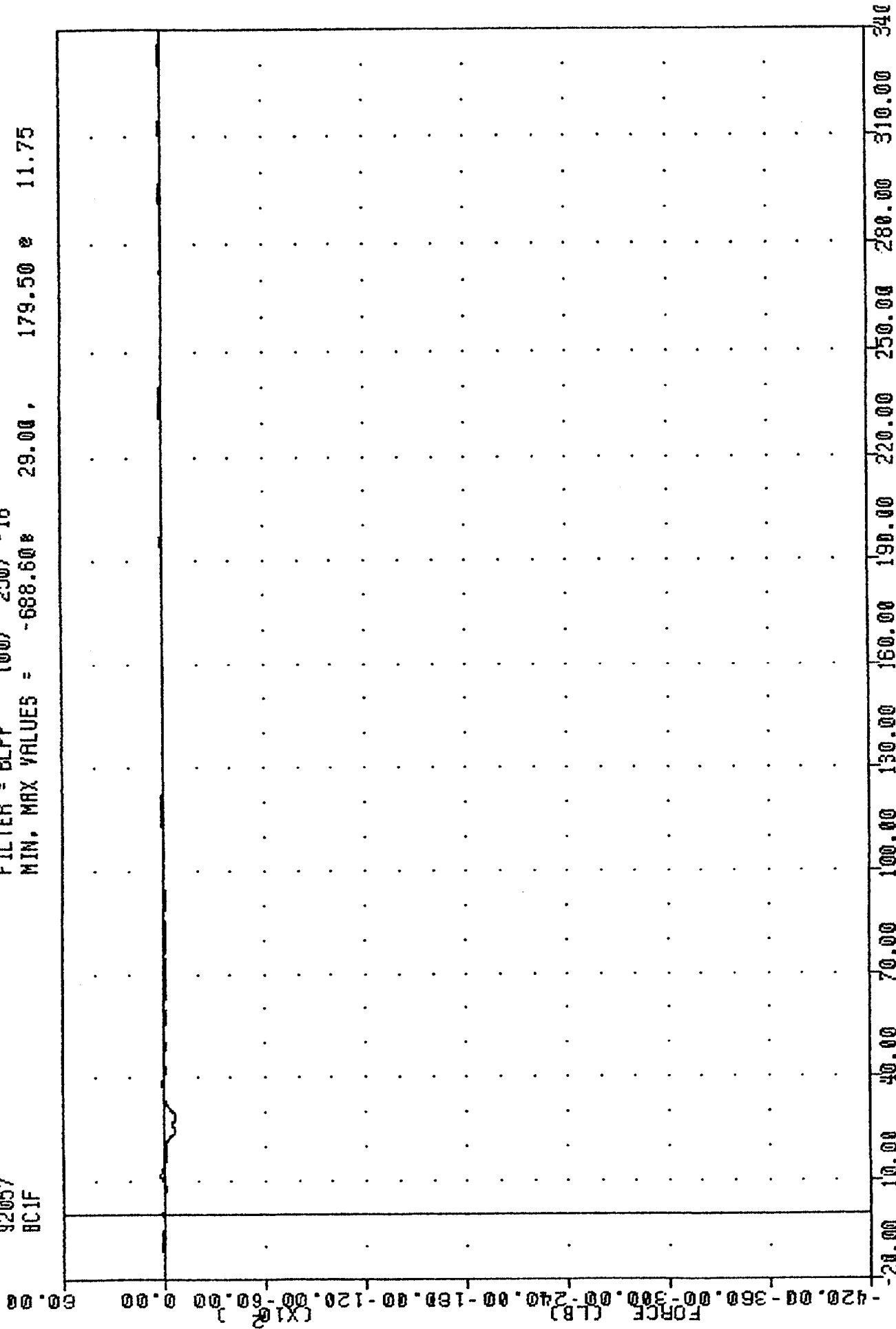
NEW CAR ASSESSMENT PROGRAM

92057

BC1F

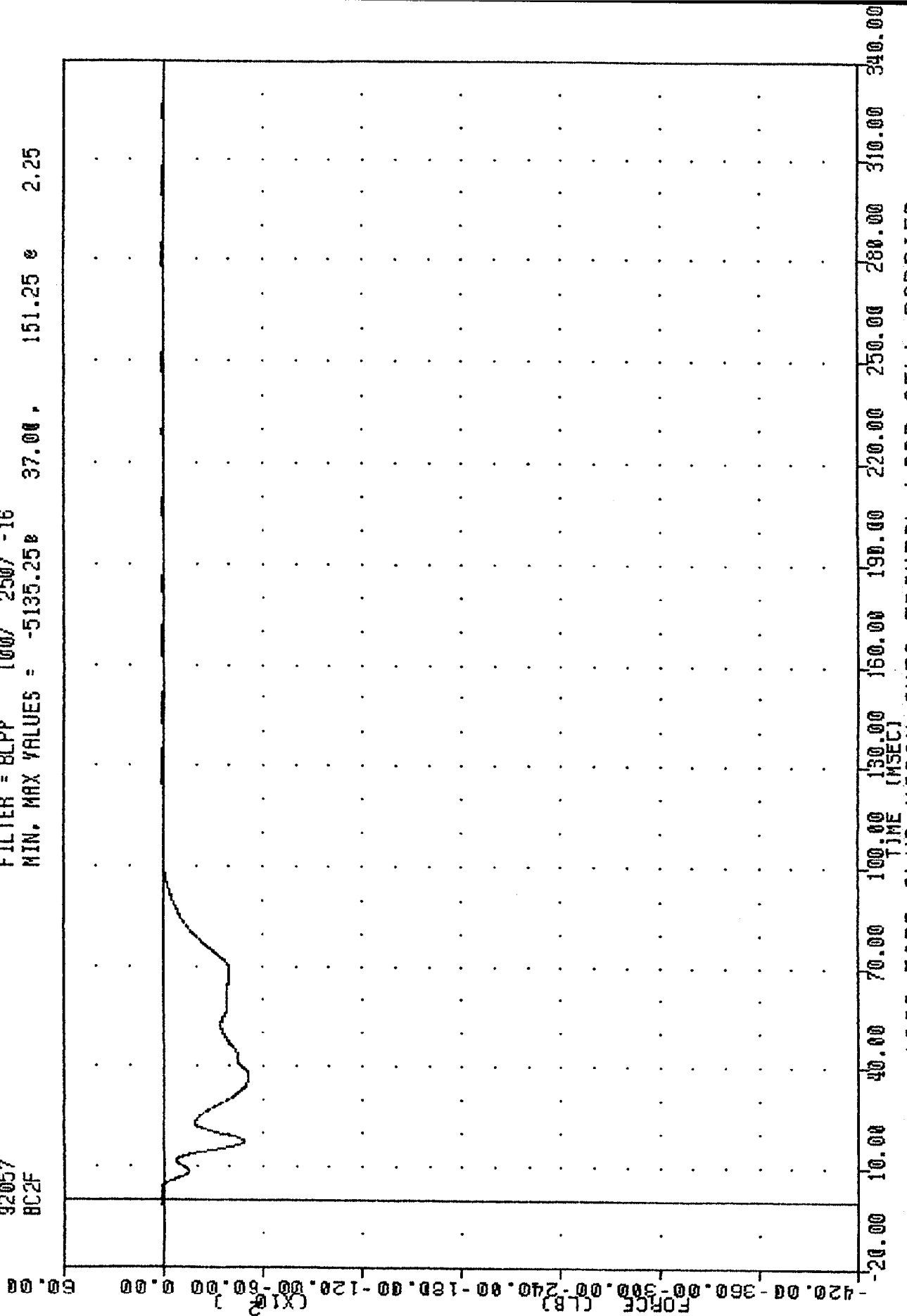
FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -688.60 29.00, 179.50 11.75



TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 BC2F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -5135.25 37.00 151.25 2.25



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C2 FORCE

NEW LHM ASSESSMENT PROGRAM

92057

BC3F

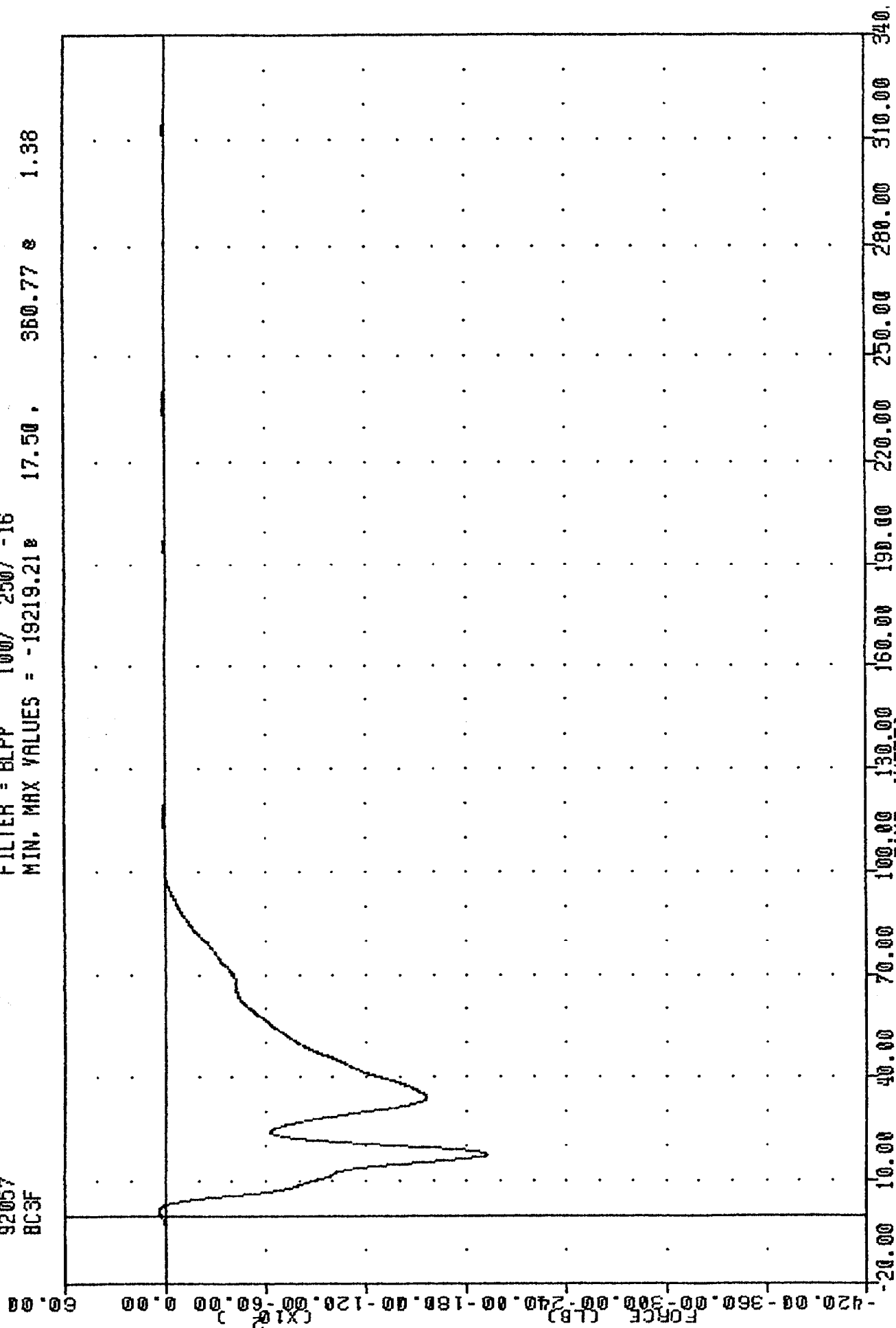
FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -19219.218

1.38

360.77

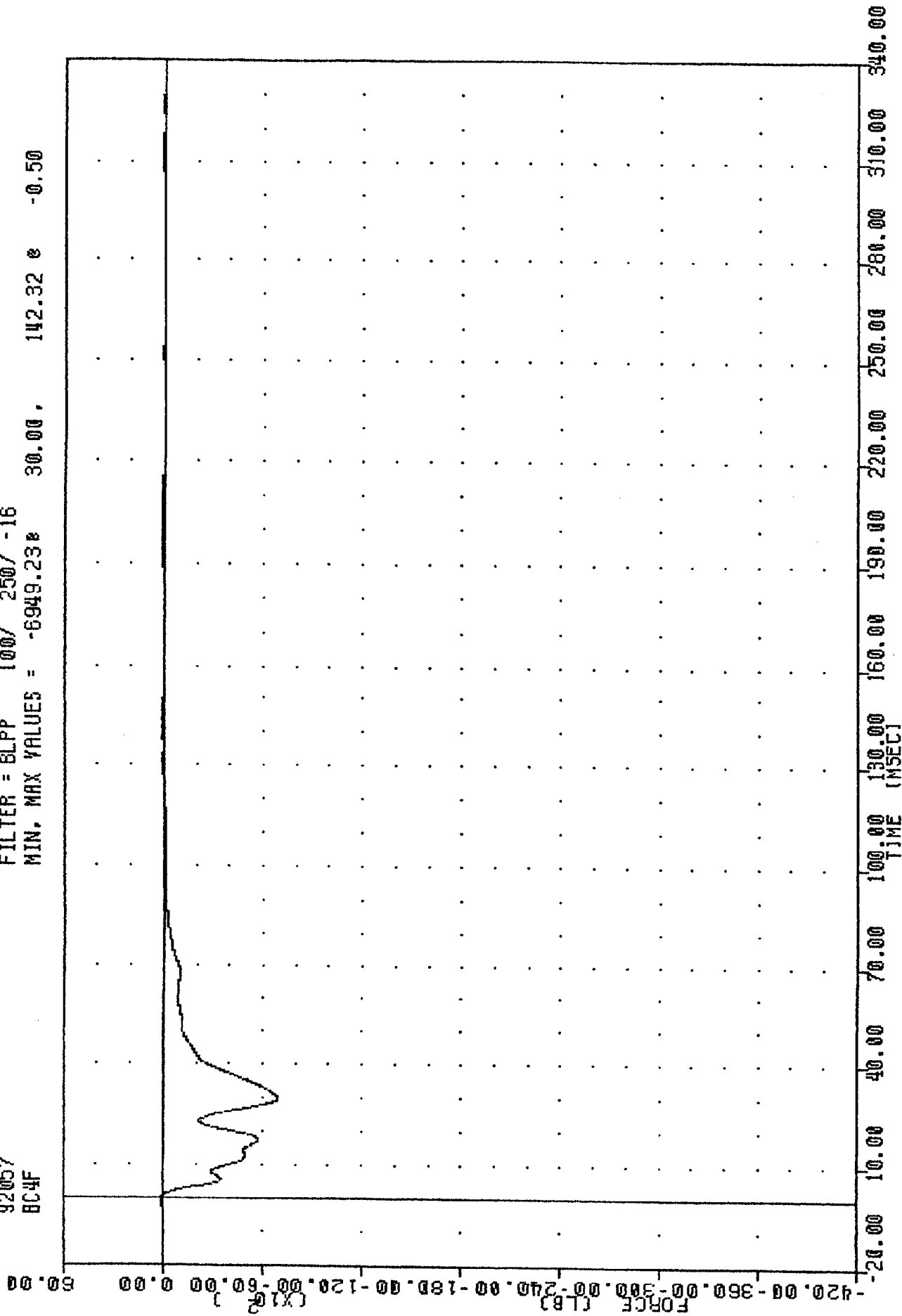
17.50



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C3 FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 BC4F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -6949.238 30.00, 142.32 e -0.50



NEW CAR ASSESSMENT PROGRAM

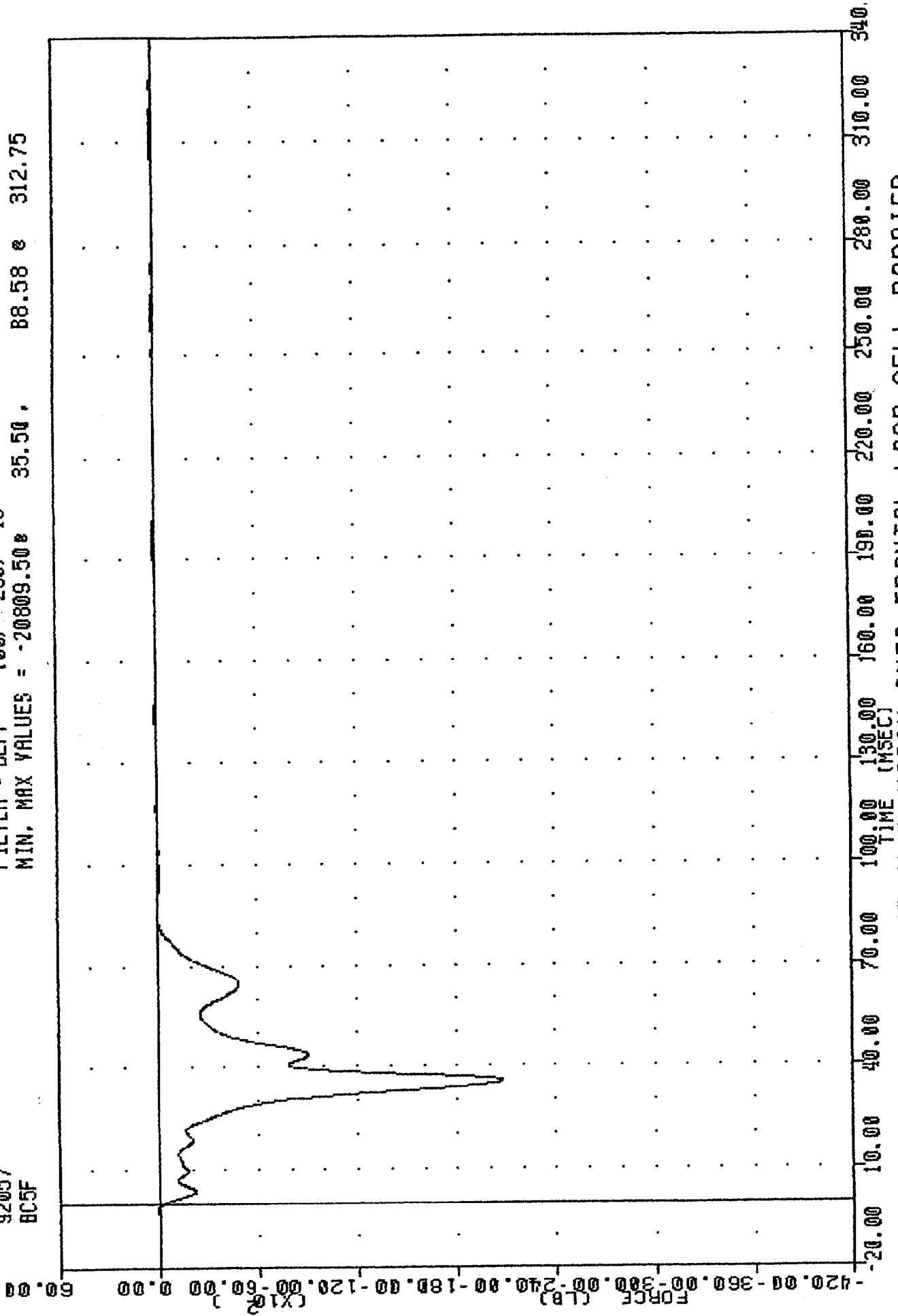
92057

BC5F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -20809.500 35.50 ,

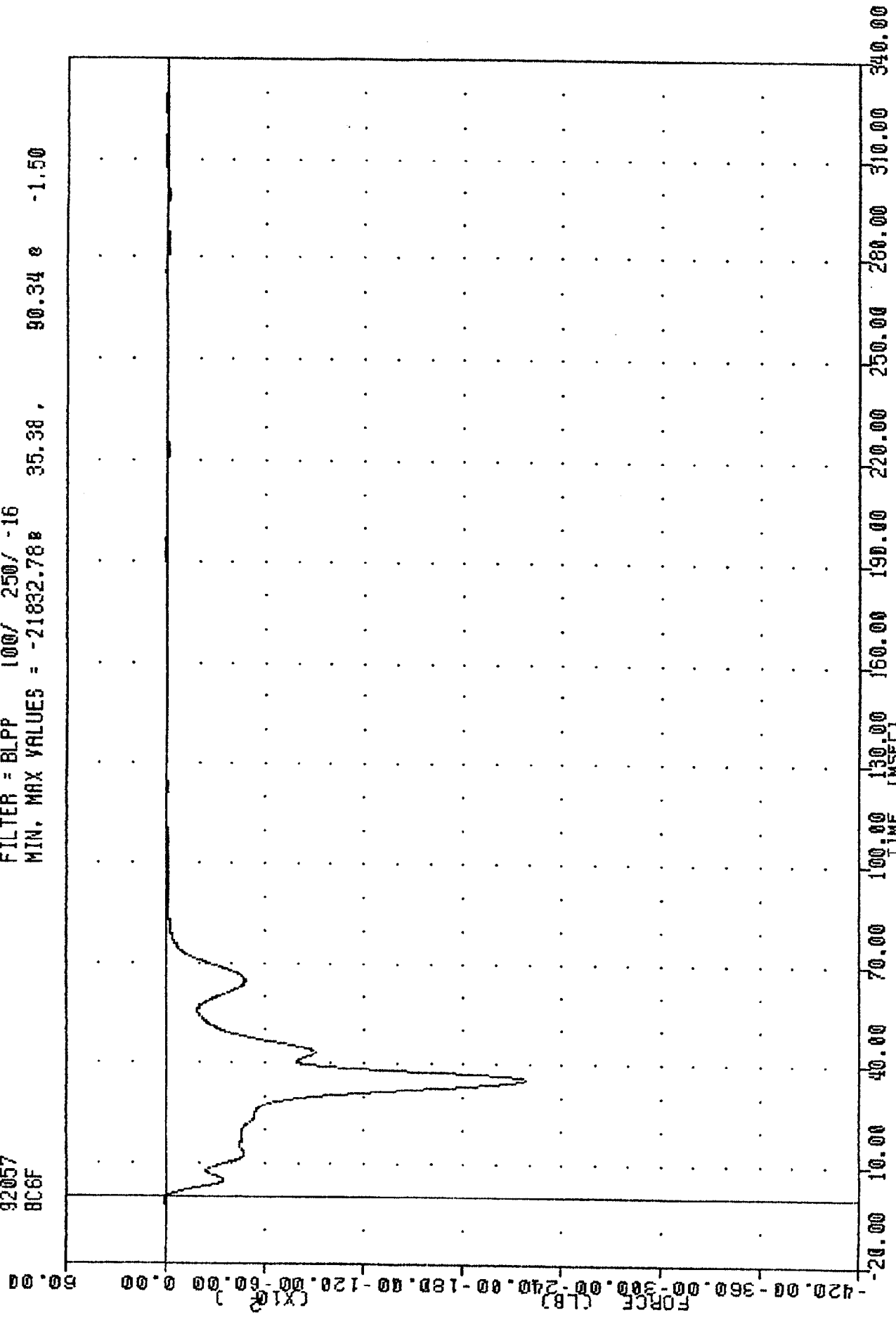
B8.58 @ 312.75



TRC
NEW CAR ASSESSMENT PROGRAM
92057
BC6F

920226

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -21832.78 35.38 90.34 e -1.50



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C6 FORCE

NEW CAR ASSESSMENT PROGRAM

92057

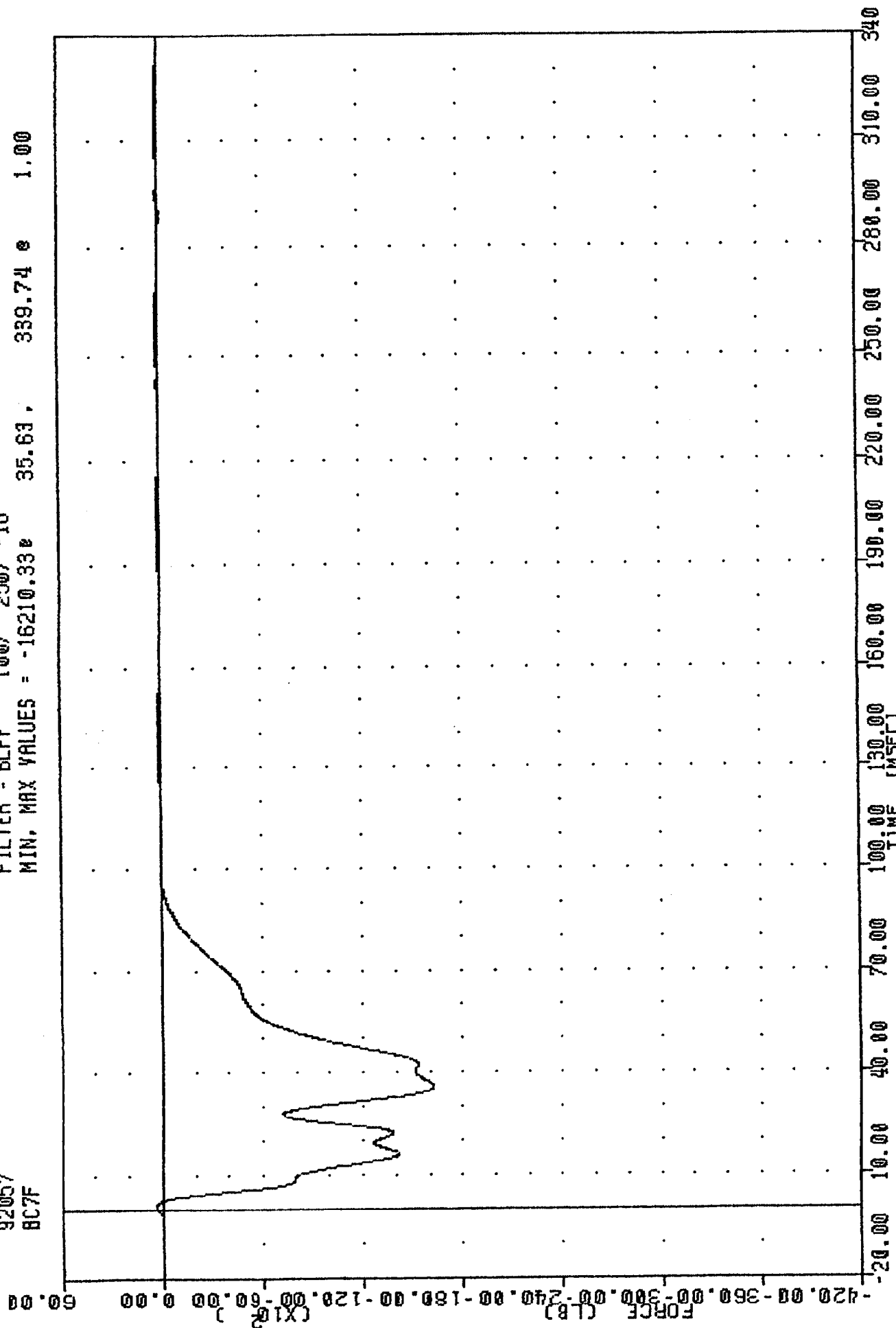
BC7F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -16210.33e

339.74 e

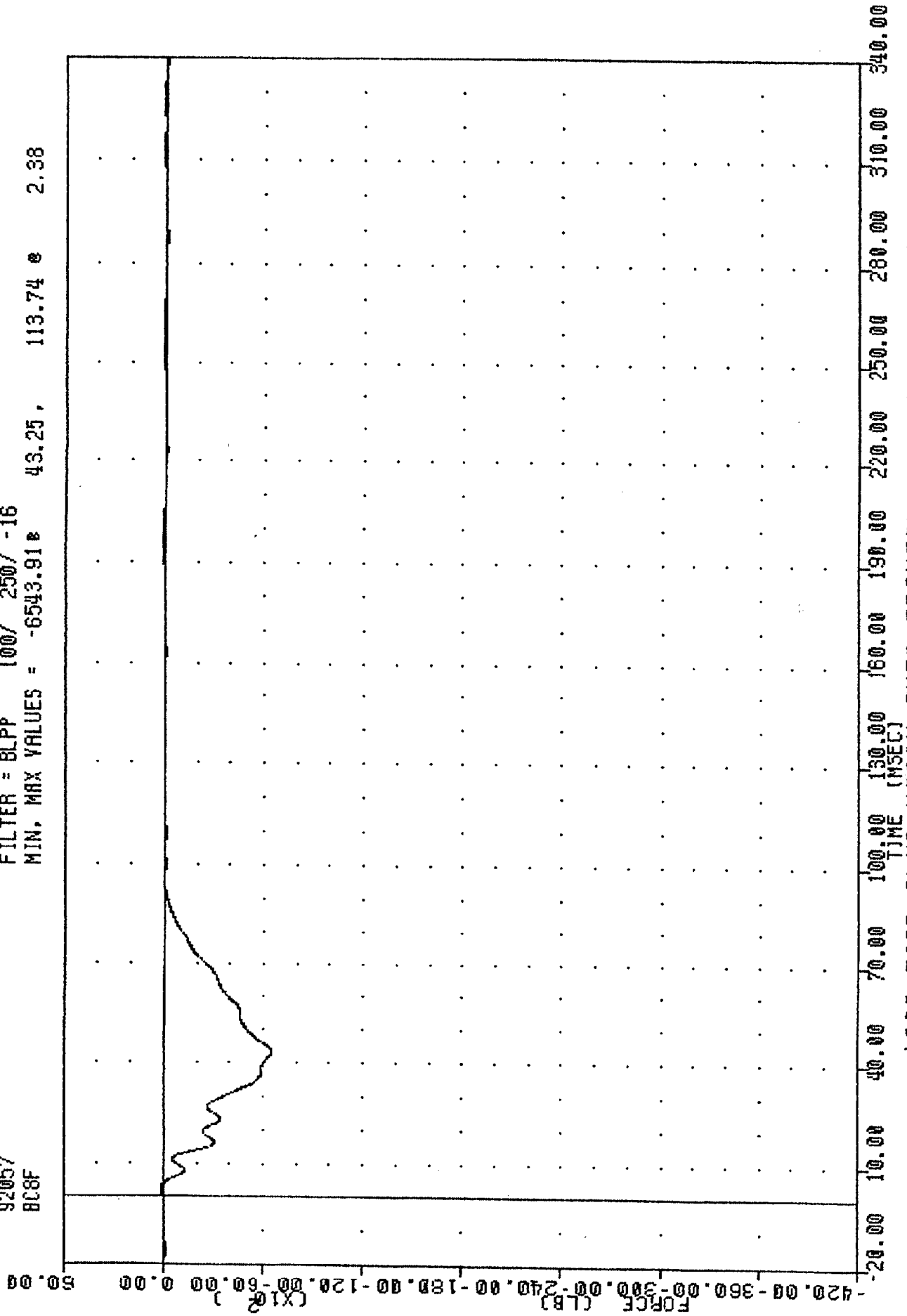
1.00

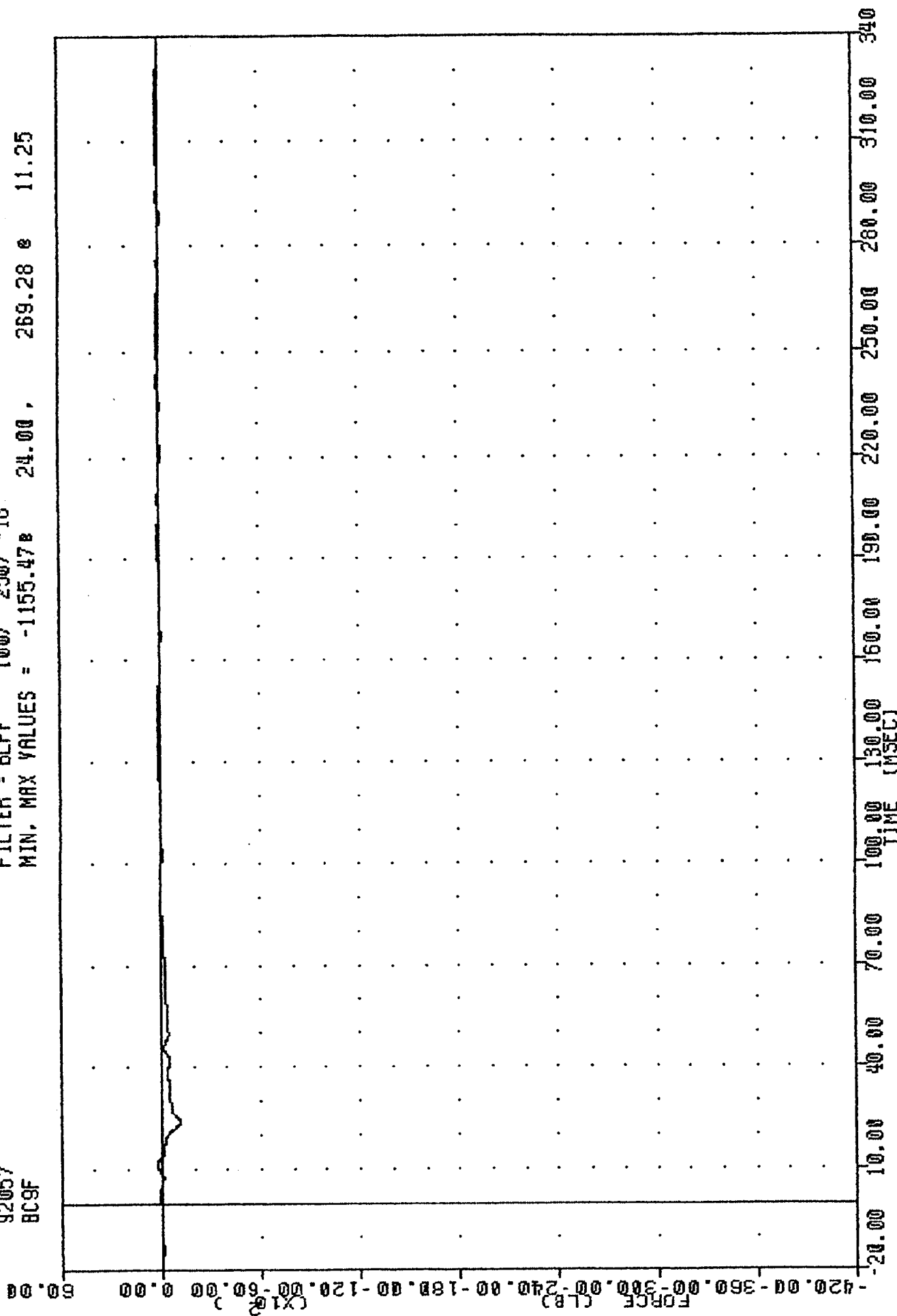


1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C7 FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 BC8F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -6543.91 43.25, 113.74 2.38

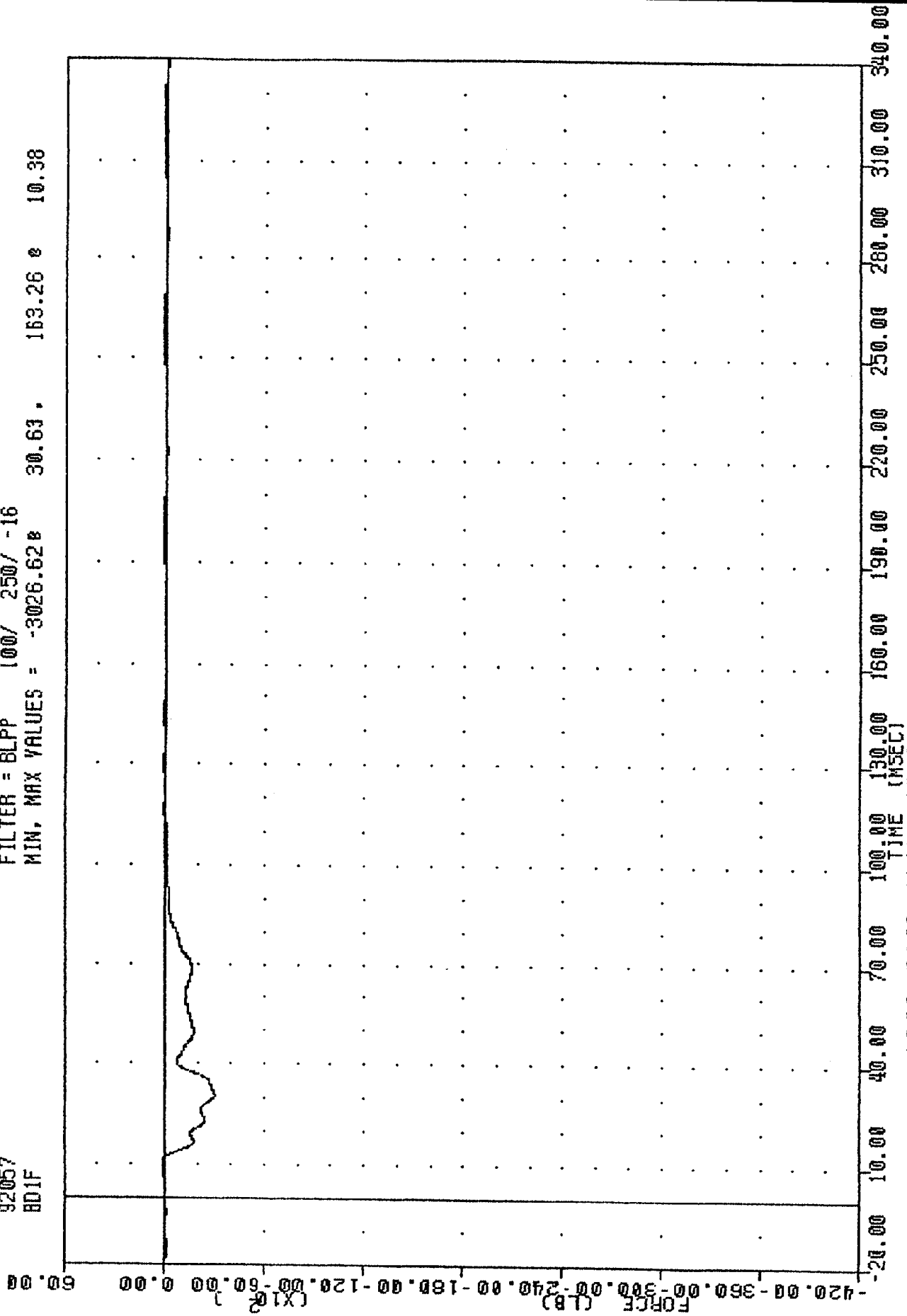




1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C9 FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 BD1F

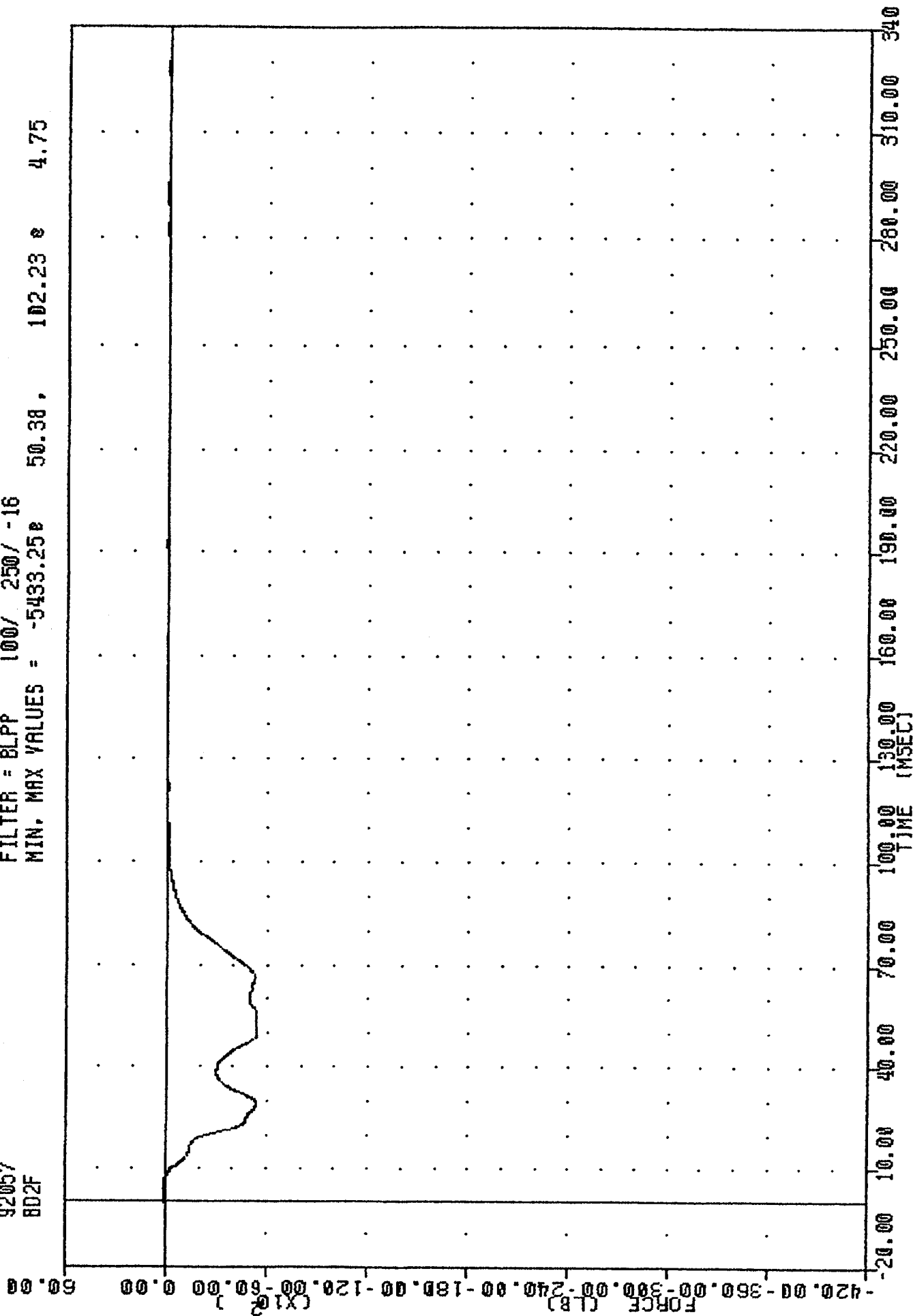
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -3026.628 30.63. 163.26 0 10.38



92057
BD2F

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -5433.25e 50.38.

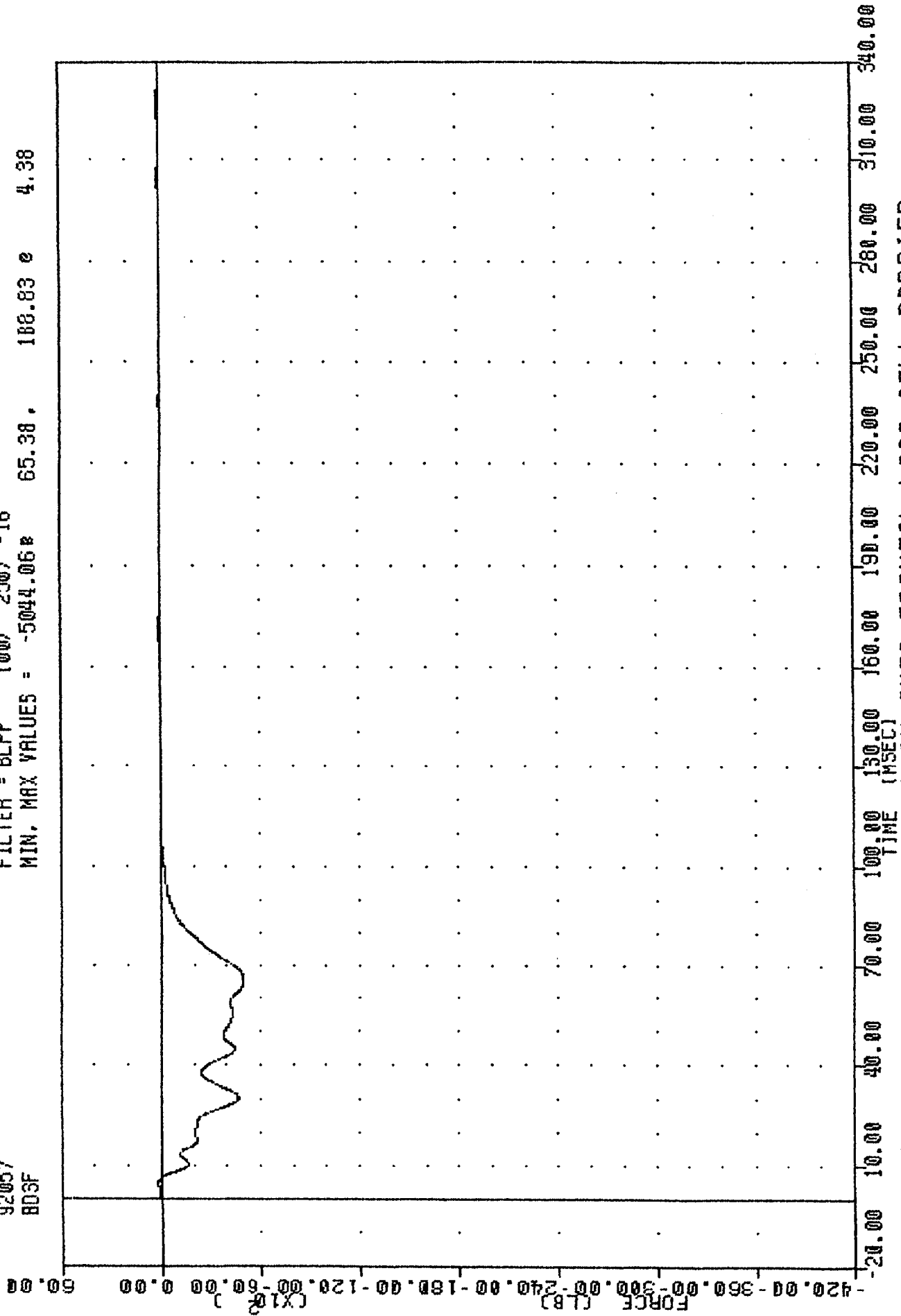
102.23 e 4.75



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D2 FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 BD3F

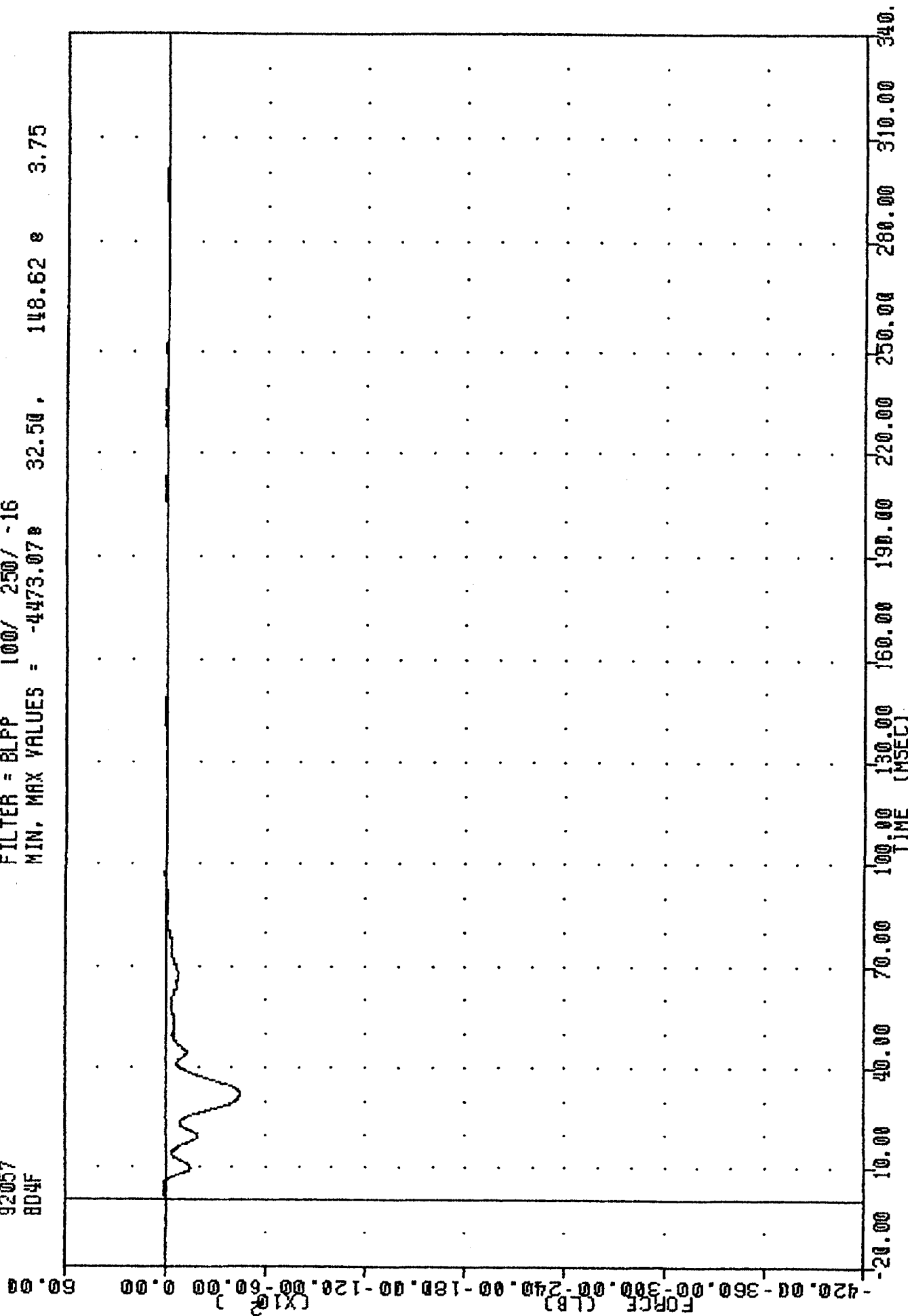
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -5044.06 65.38 , 188.83 4.38



92057
804F

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -4473.07 32.50

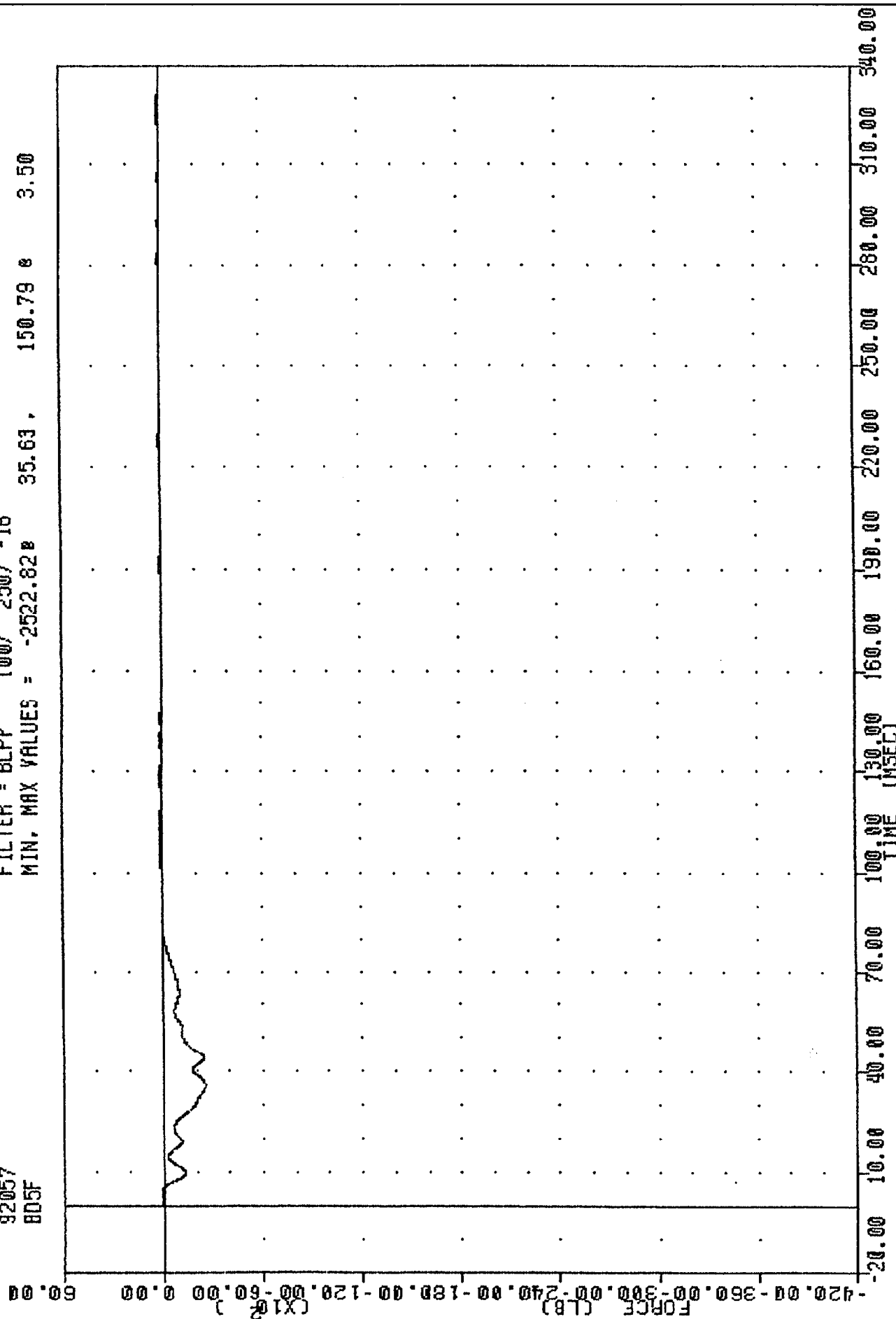
148.62 3.75



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 04 FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 BD5F

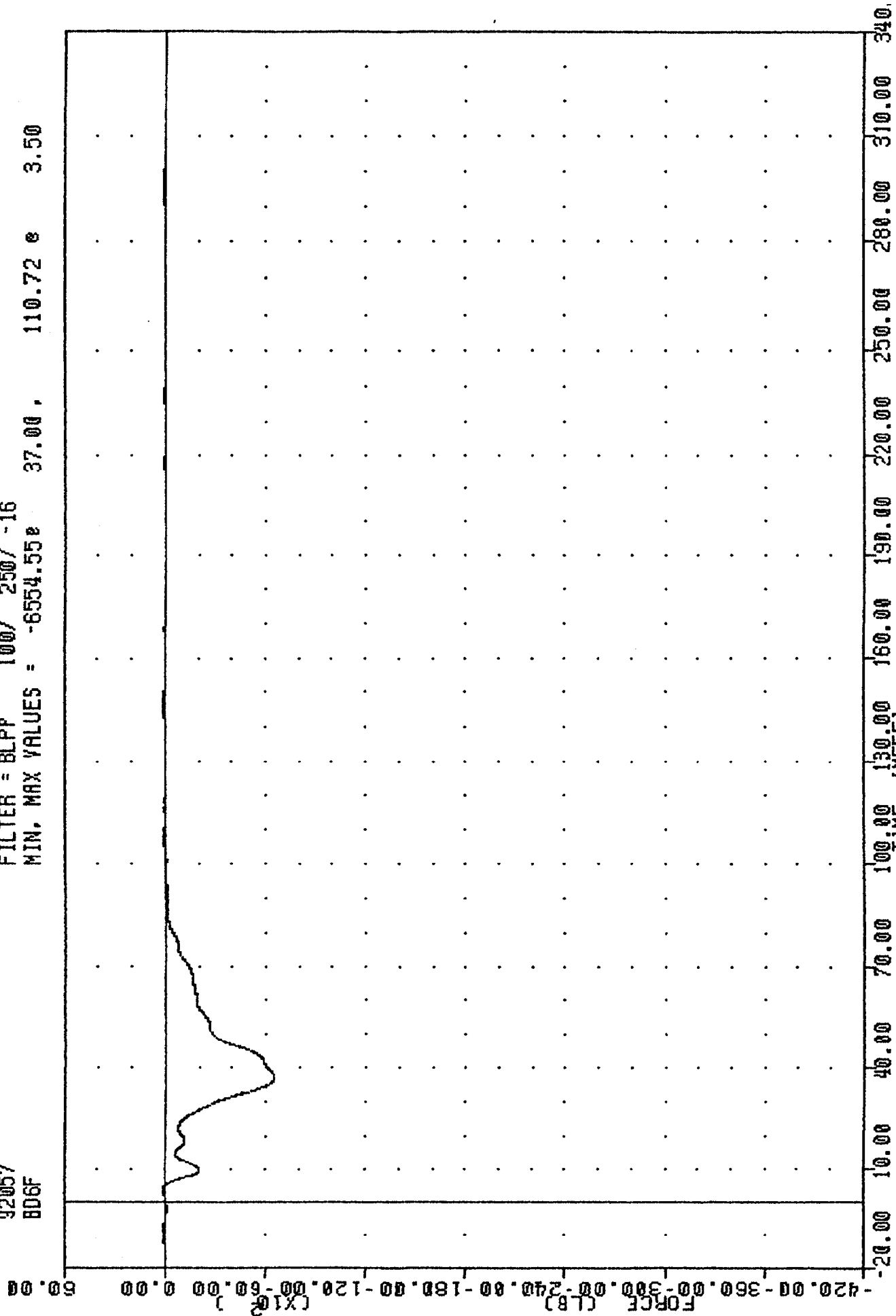
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -2522.82 35.63 , 150.79 3.50



92057
806F

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -6554.55e 37.00,

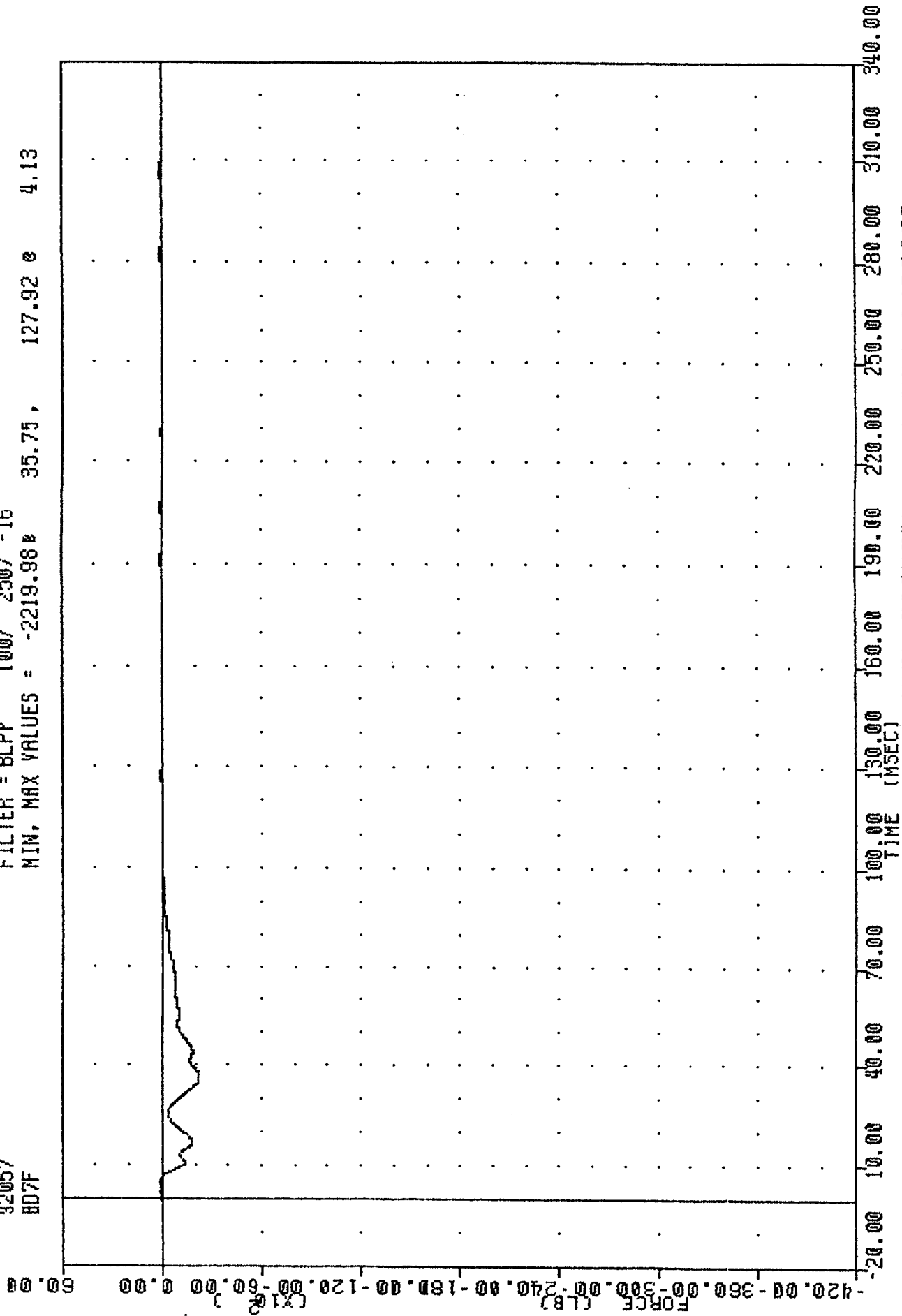
110.72 e 3.50



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 06 FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 BD7F

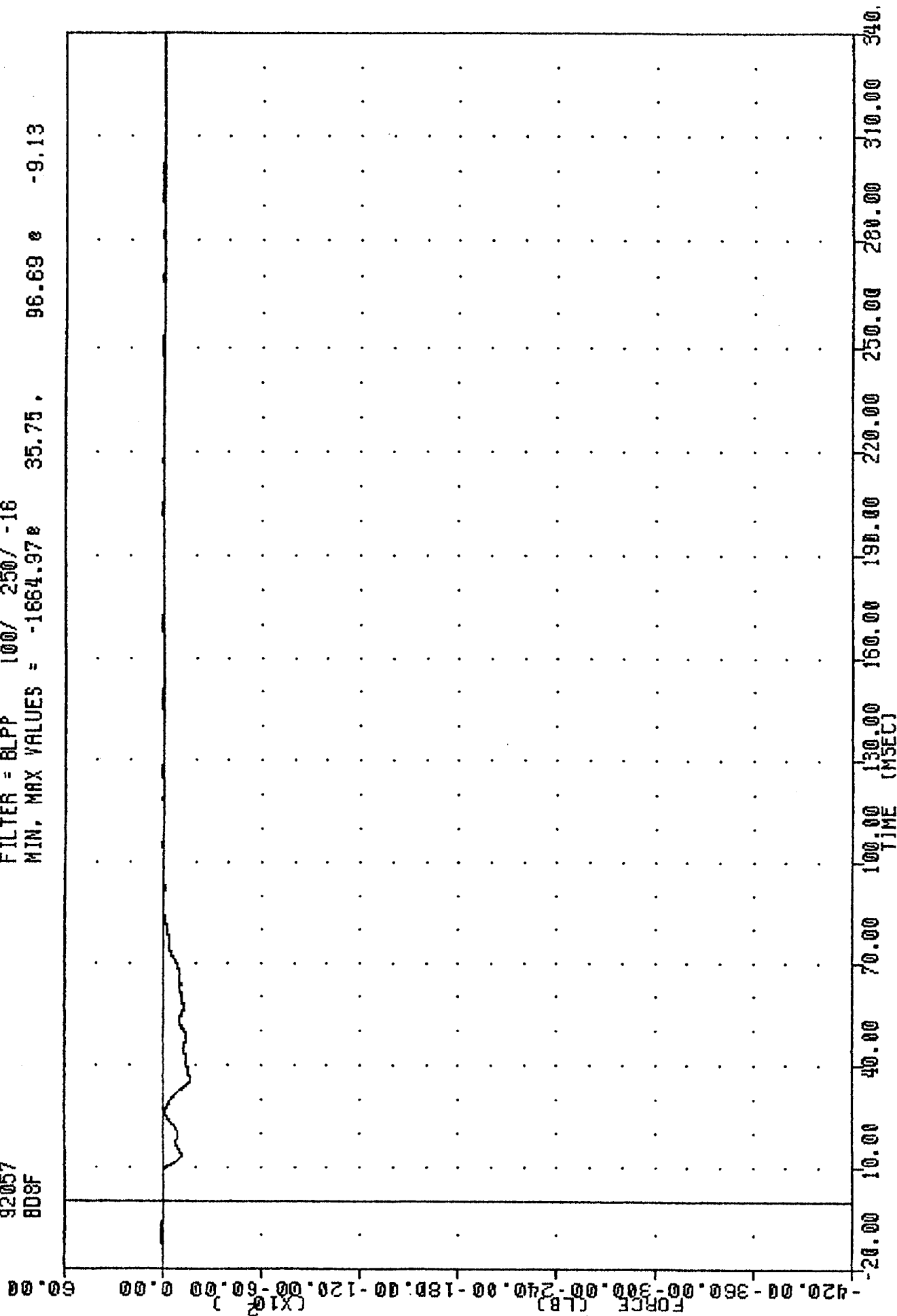
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -2219.98 35.75, 127.92 4.13



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D7 FORCE

92057
808F

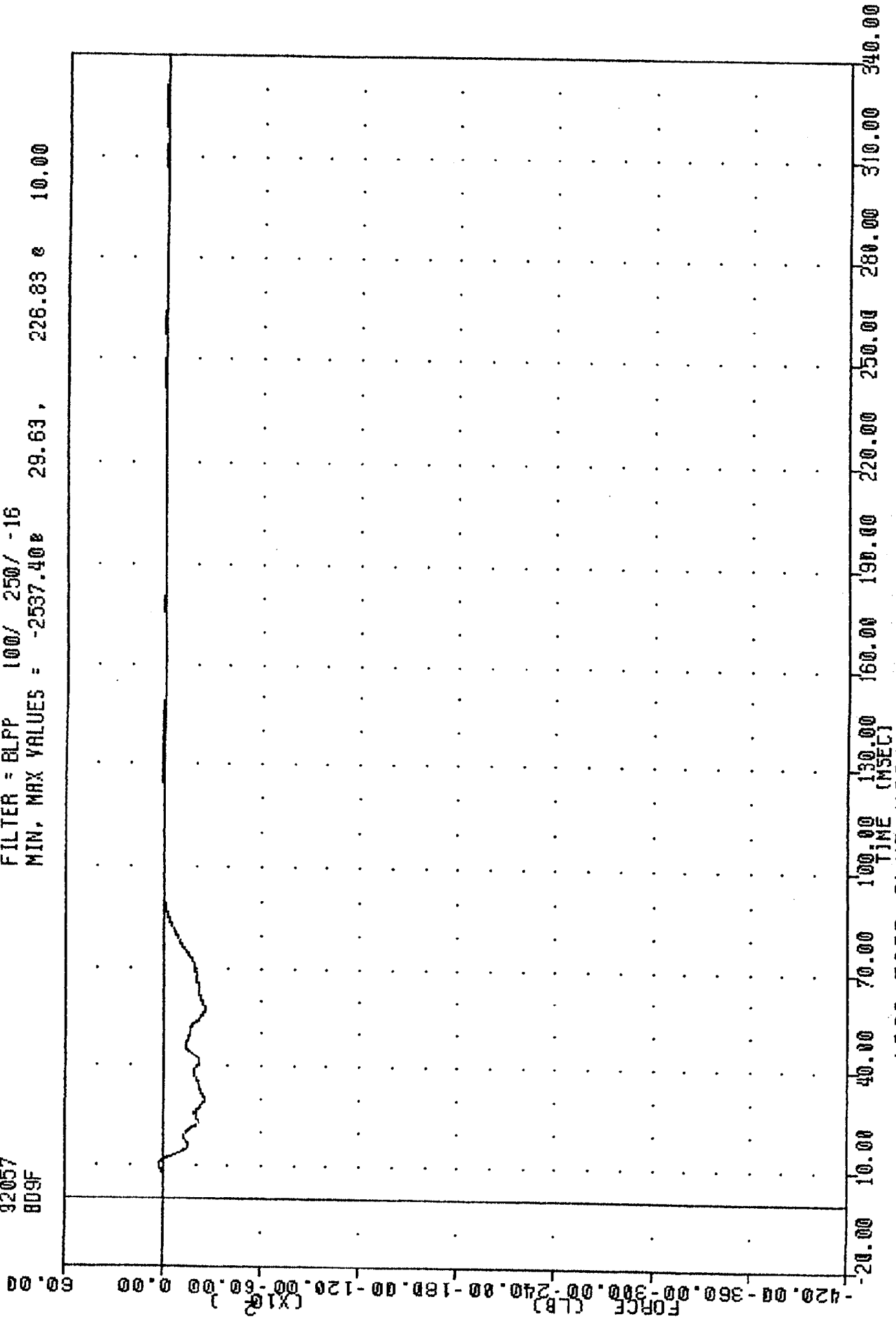
FILTER = BLPP 100/ 250/ -18
MIN, MAX VALUES = -1664.97 35.75 , 96.69 e -9.13



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 809F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -2537.40 29.63 , 226.83 10.00



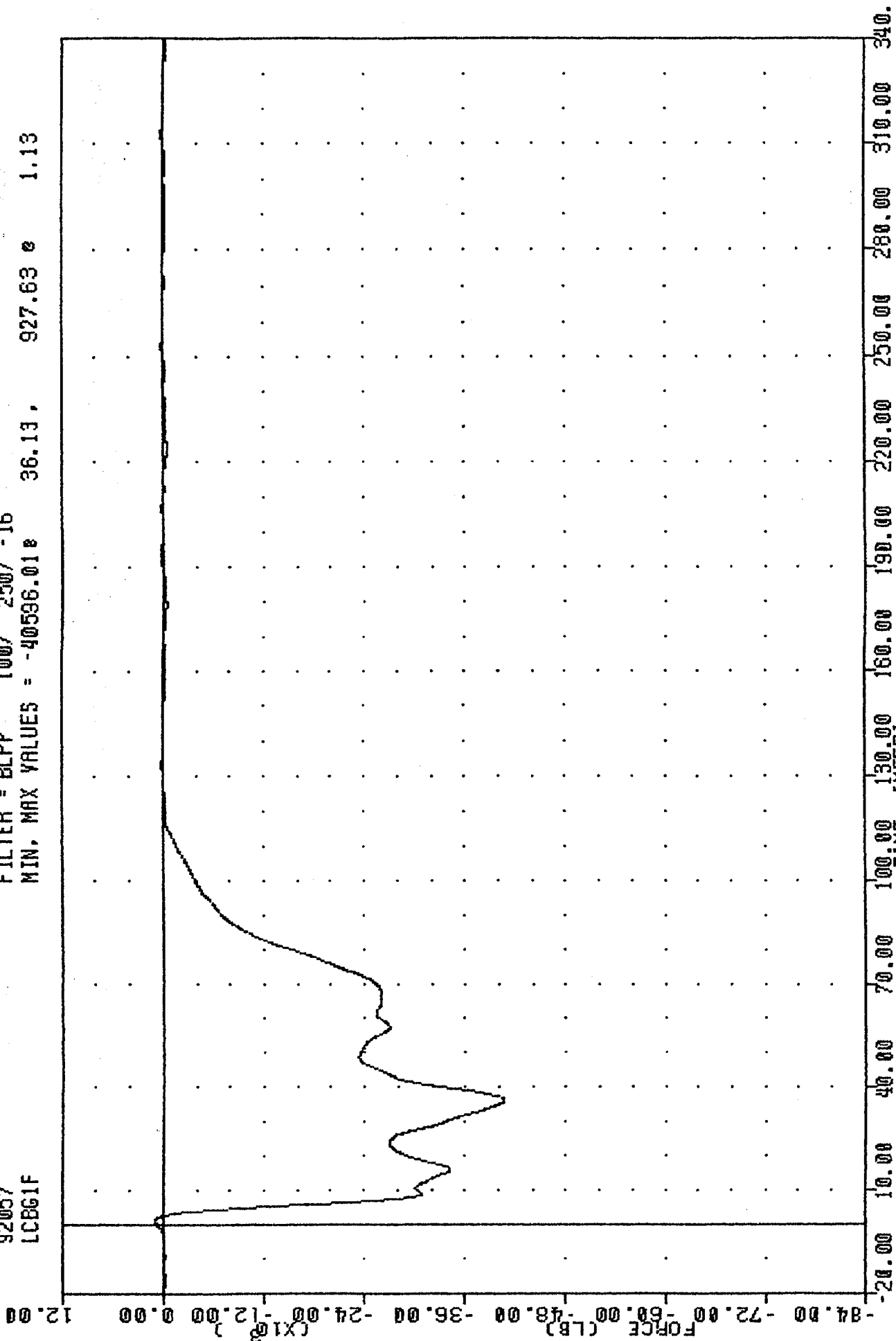
92057

LCB61F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -40596.018 36.13

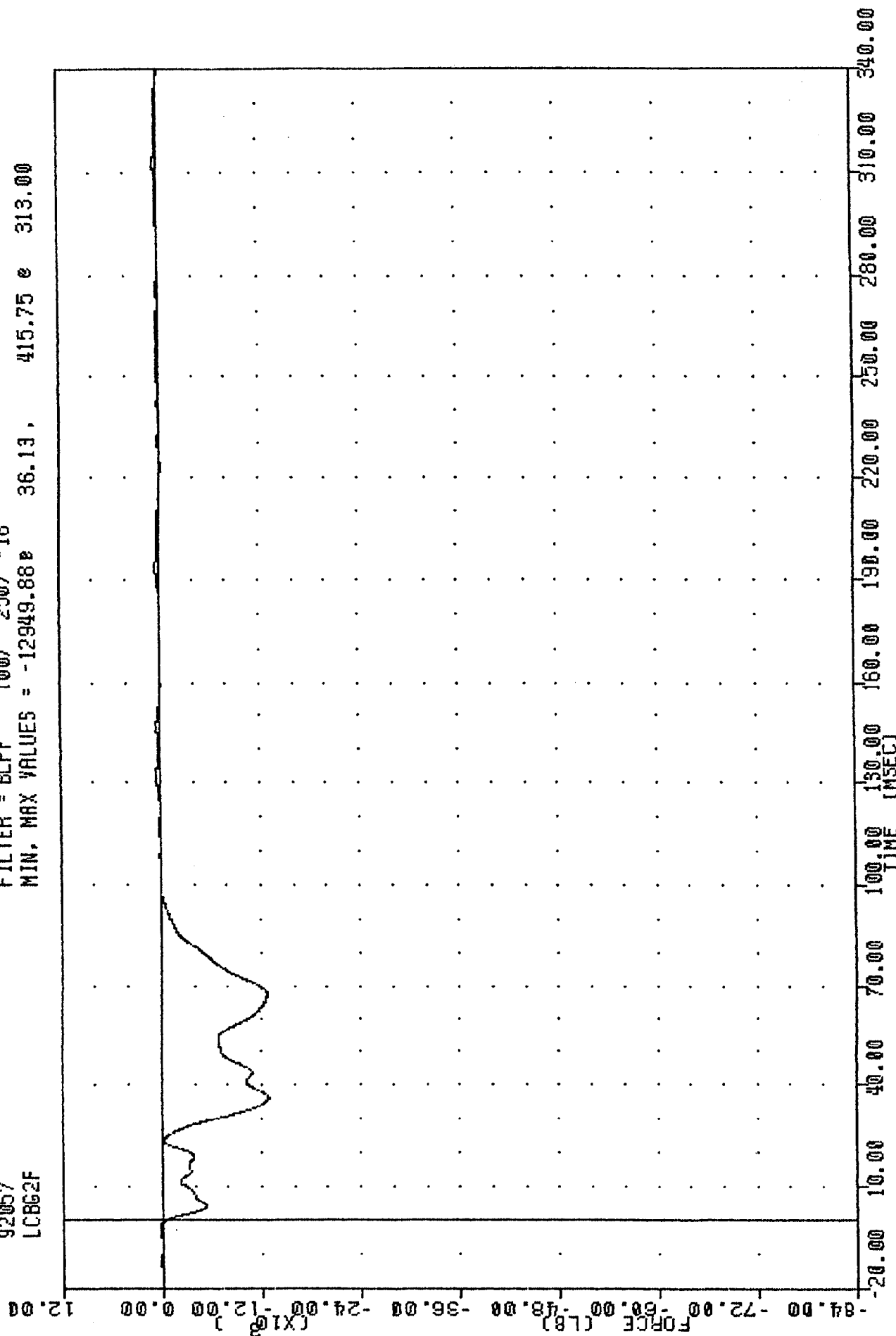
927.63 1.13



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 1 FORCE TOTAL

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 LCBG2F

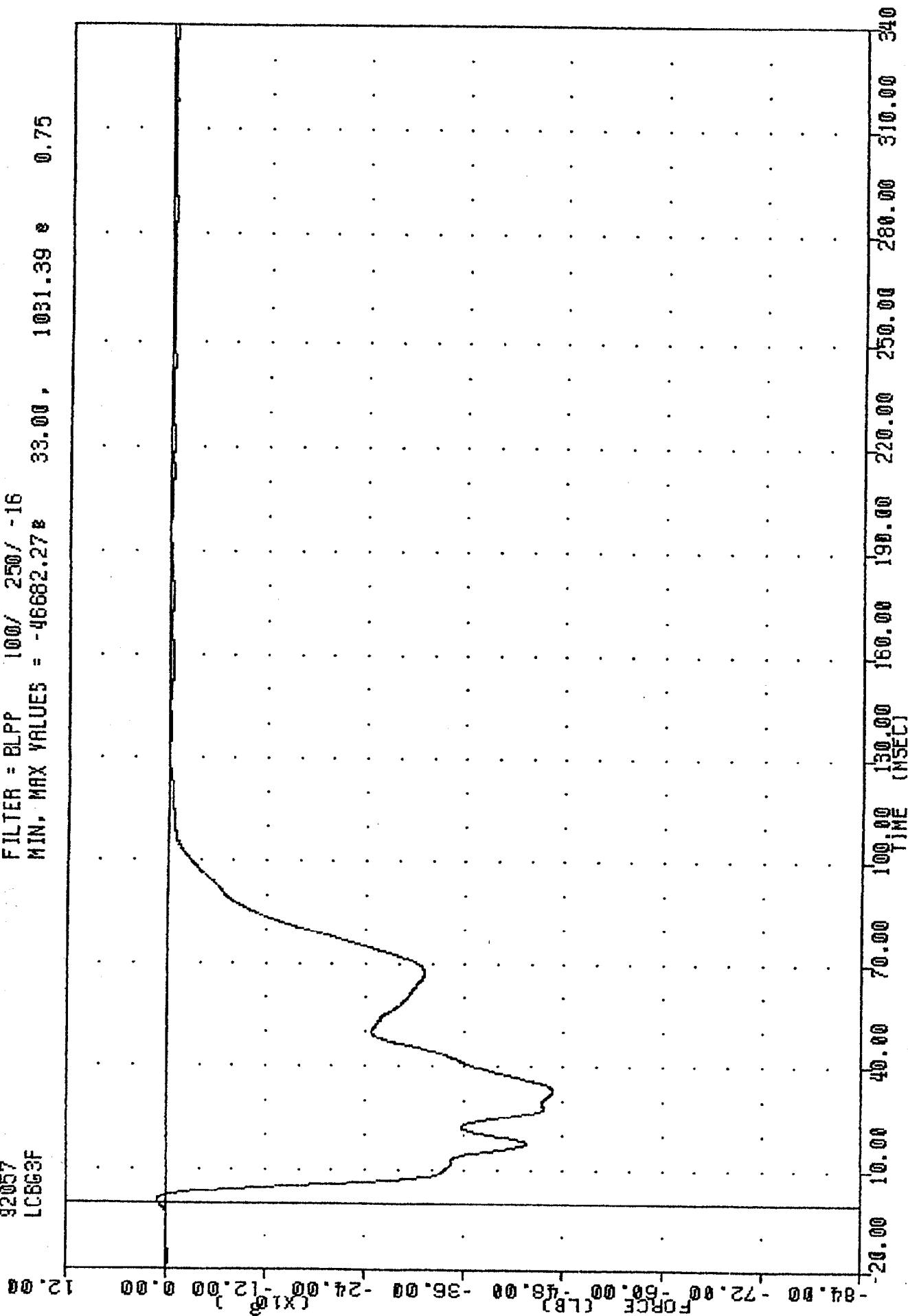
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -12949.888 36.13, 415.75 @ 313.00



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP - 2 FORCE TOTAL

92057
LC663F

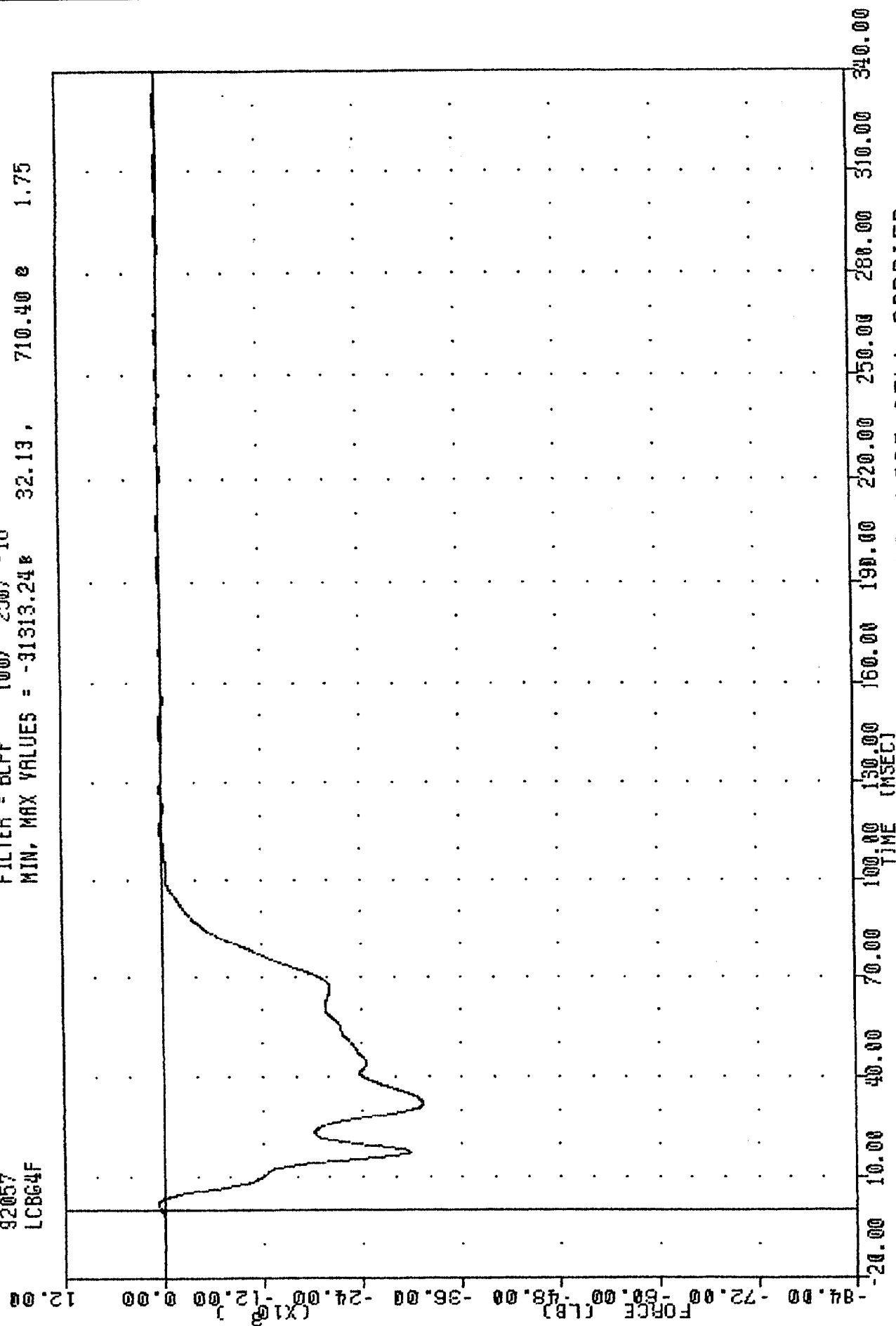
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -46682.27 33.00 , 1031.39 0.75



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 3 FORCE TOTAL

TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 LCBG4F

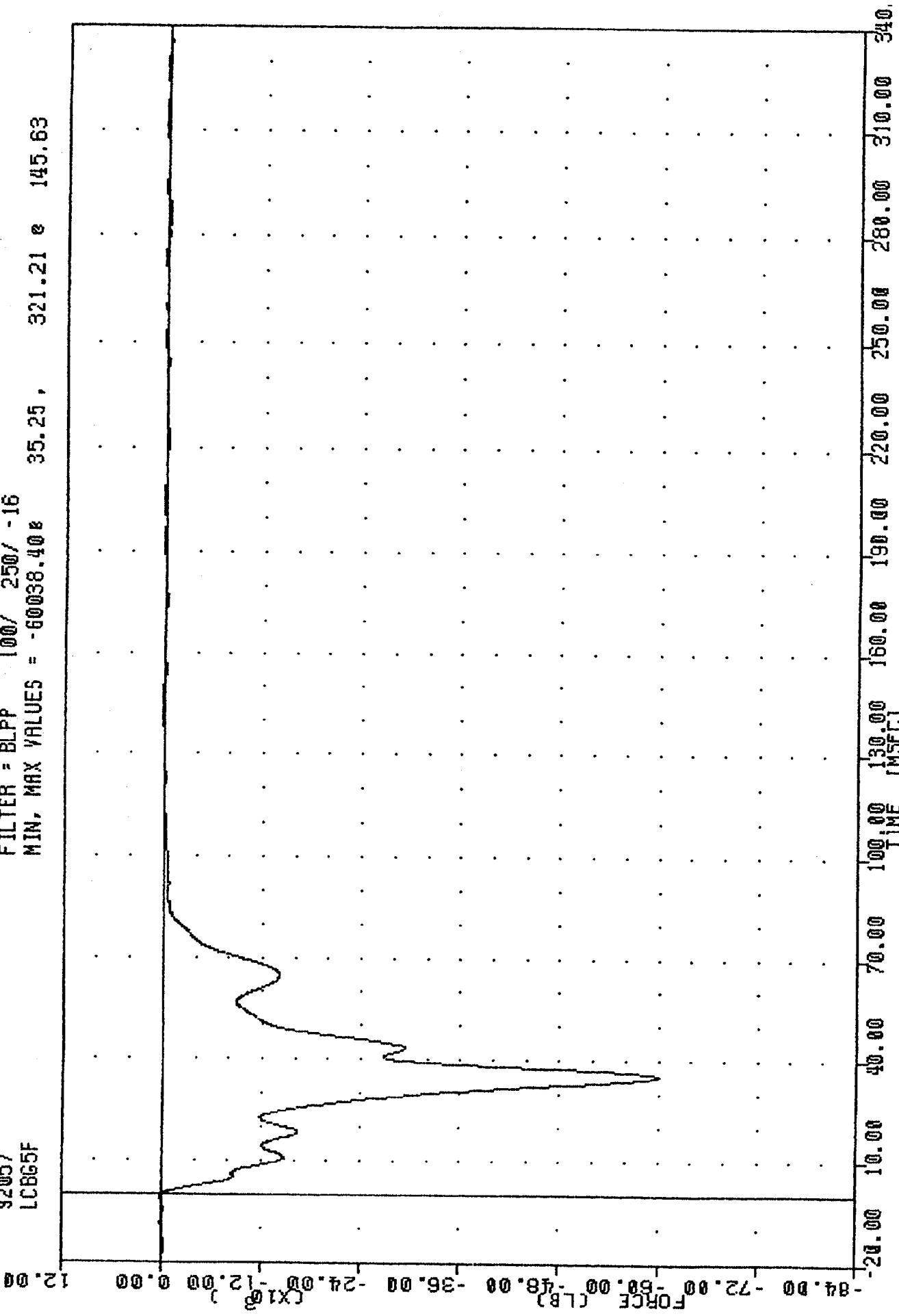
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -31313.24 32.13, 710.40 1.75



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP - 4 FORCE TOTAL

92057 LCBG5F

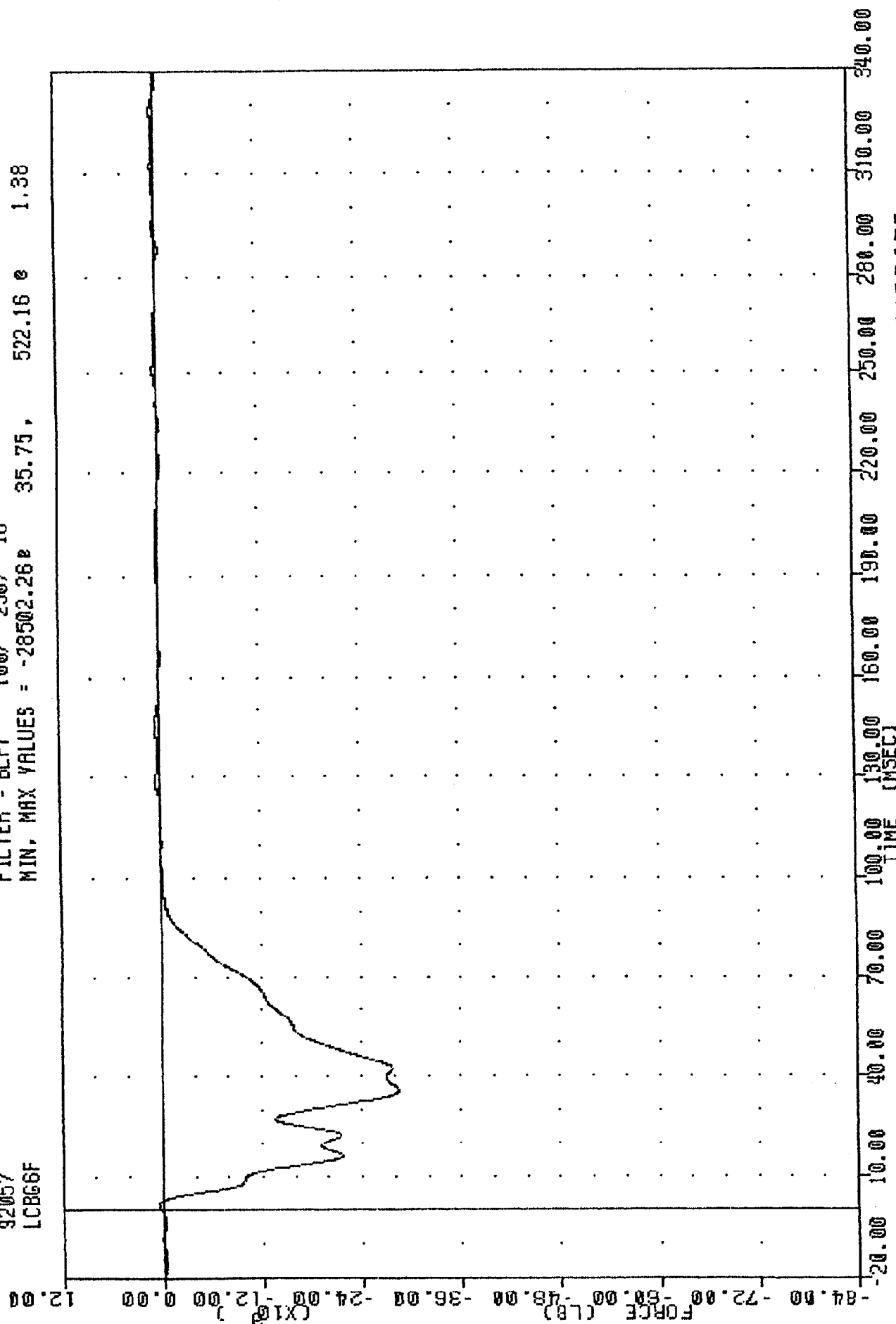
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -60038.40 35.25, 321.21 145.63



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 5 FORCE TOTAL

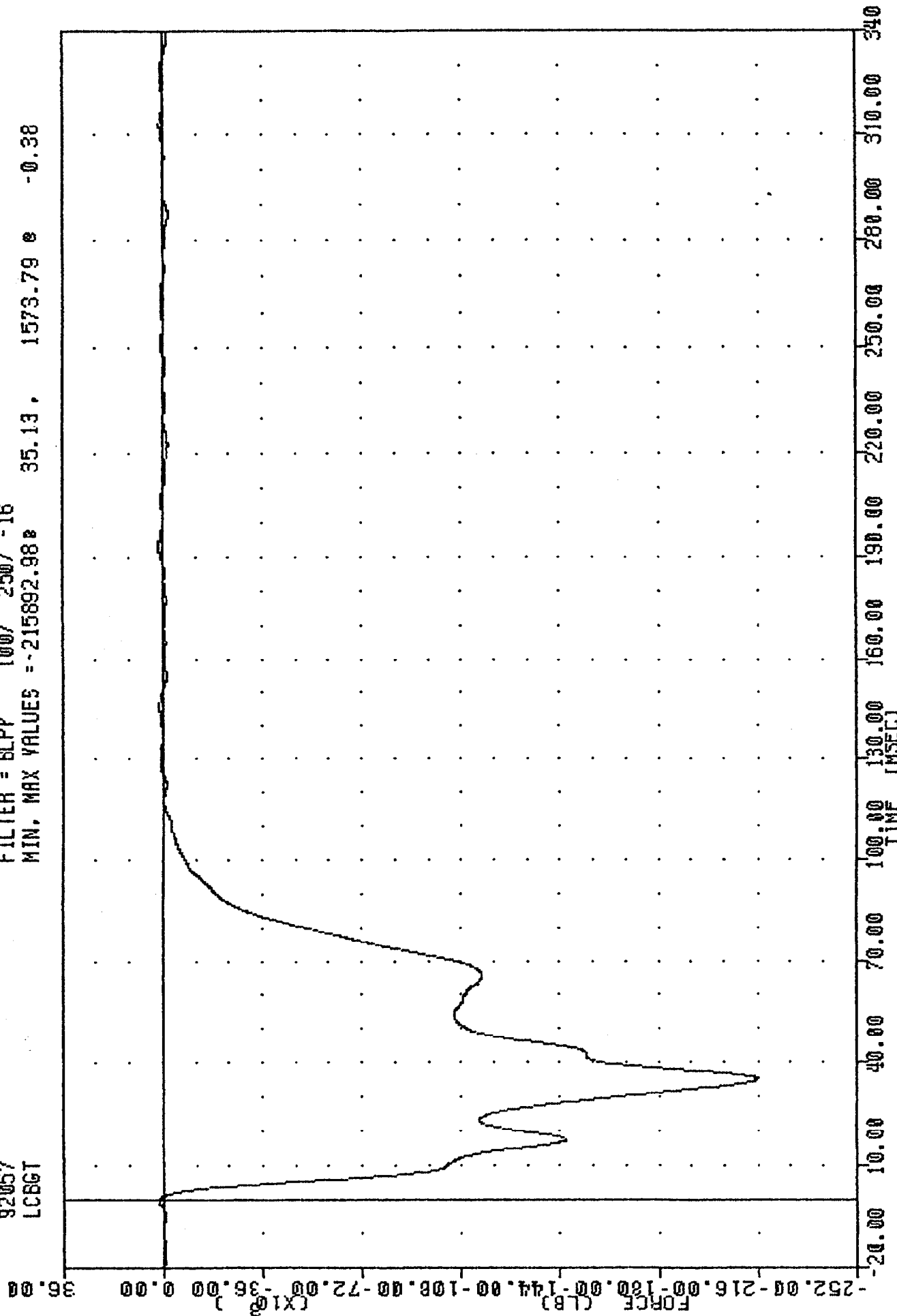
TRC , 920226
 NEW CAR ASSESSMENT PROGRAM
 92057
 LCBG6F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -28502.26 e 35.75 , 522.16 e 1.38



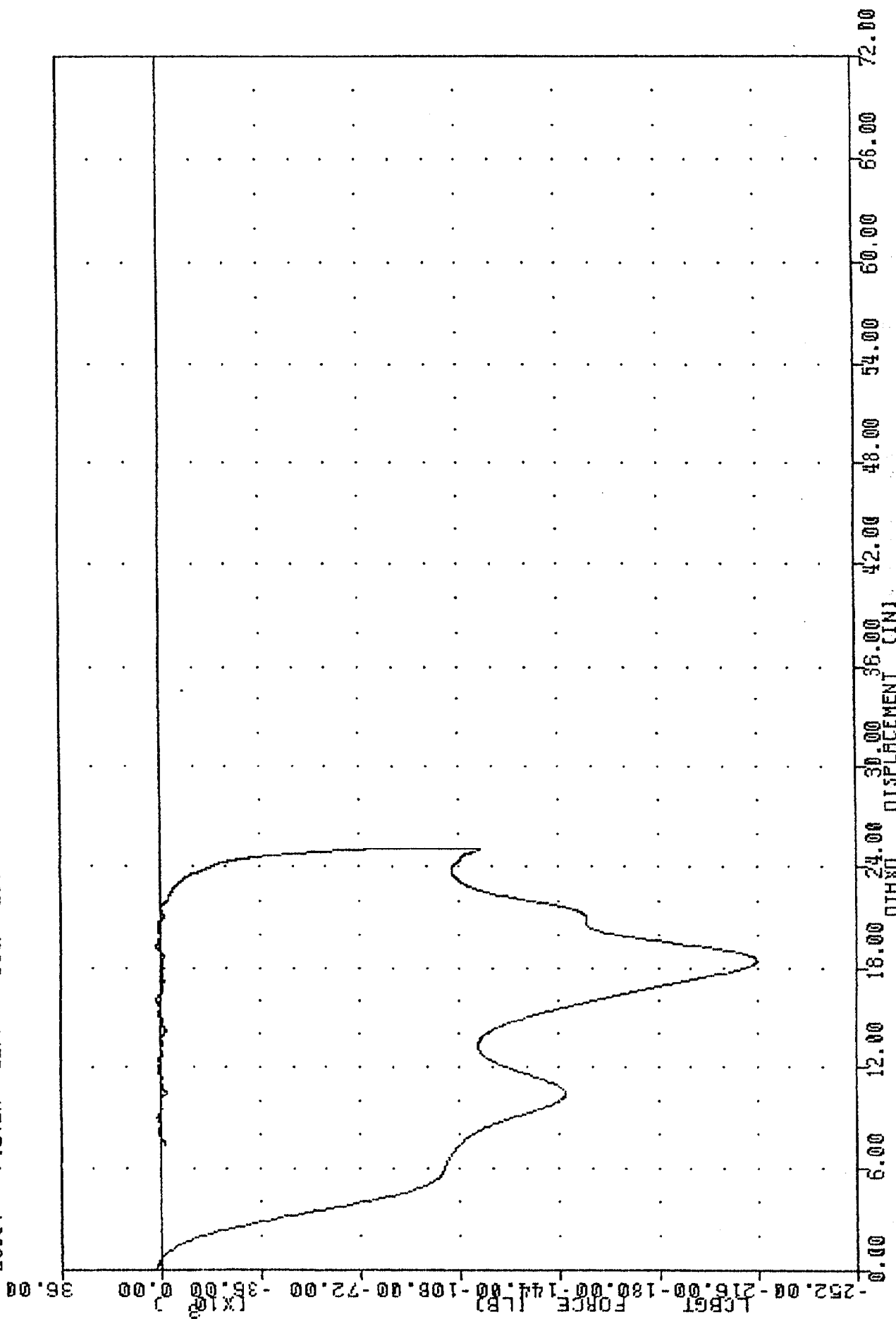
92057
LCBGT

FILTER = 8LPP 100/ 250/ -16
MIN, MAX VALUES = -215892.98 35.13, 1573.79 -0.38



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE

TRC 920226 NEW CAR ASSESSMENT PROGRAM 92057 70.38
 OTHXD FILTER = BLPP 300/ 750/ -16 MIN. MAX = 0.00 0.00
 LC8GT FILTER = BLPP 100/ 250/ -16 MIN. MAX = -215892.98 35.13



1992 FORD CLUB WAGON INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE VS VEHICLE X-AXIS DISPLACEMENT

APPENDIX C

DUMMY CERTIFICATION DATA

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PRE-TEST CERTIFICATION DATA

DRIVER DUMMY S/N: 713

TRANSPORTATION RESEARCH CENTER OF OHIO

EXTERNAL DIMENSIONS

PART 572

09-JAN-92

TEMPERATURE 70 F
TRC ED71302

RELATIVE HUMIDITY 49 %
572B SN713 EXT. DIMENSION CAL02

DESCRIPTION	SPECIFICATION	TEST RESULTS
SN 713 HUMANOID		
Sitting Height	35.6 - 35.8 IN	35.6 IN
Shoulder Pivot Height	21.8 - 22.4 IN	22.1 IN
Hip Pivot Height	3.9 IN	3.9 IN
Hip Pivot From Backline	4.8 IN	4.8 IN
Knee Pivot From Backline	20.1 - 20.7 IN	20.5 IN
Rear of Head From Backline	1.7 IN	1.7 IN
Chest Depth	9.1 - 9.6 IN	9.4 IN
Shoulder Width	17.8 - 18.4 IN	17.9 IN
Chest Circumference Over Nipples	36.8 - 40.0 IN	37.6 IN
Waist Circumference at Min. Girth	31.4 - 32.6 IN	32.5 IN
Hip Width	14.0 - 15.4 IN	14.6 IN
Knee Pivot From Floor	19.3 - 19.9 IN	19.6 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

PART 572

09-Jan-92

TEMPERATURE 70 F
TRC HD71302

RELATIVE HUMIDITY 49 %
572B SN 713 HEAD DROP CAL 02

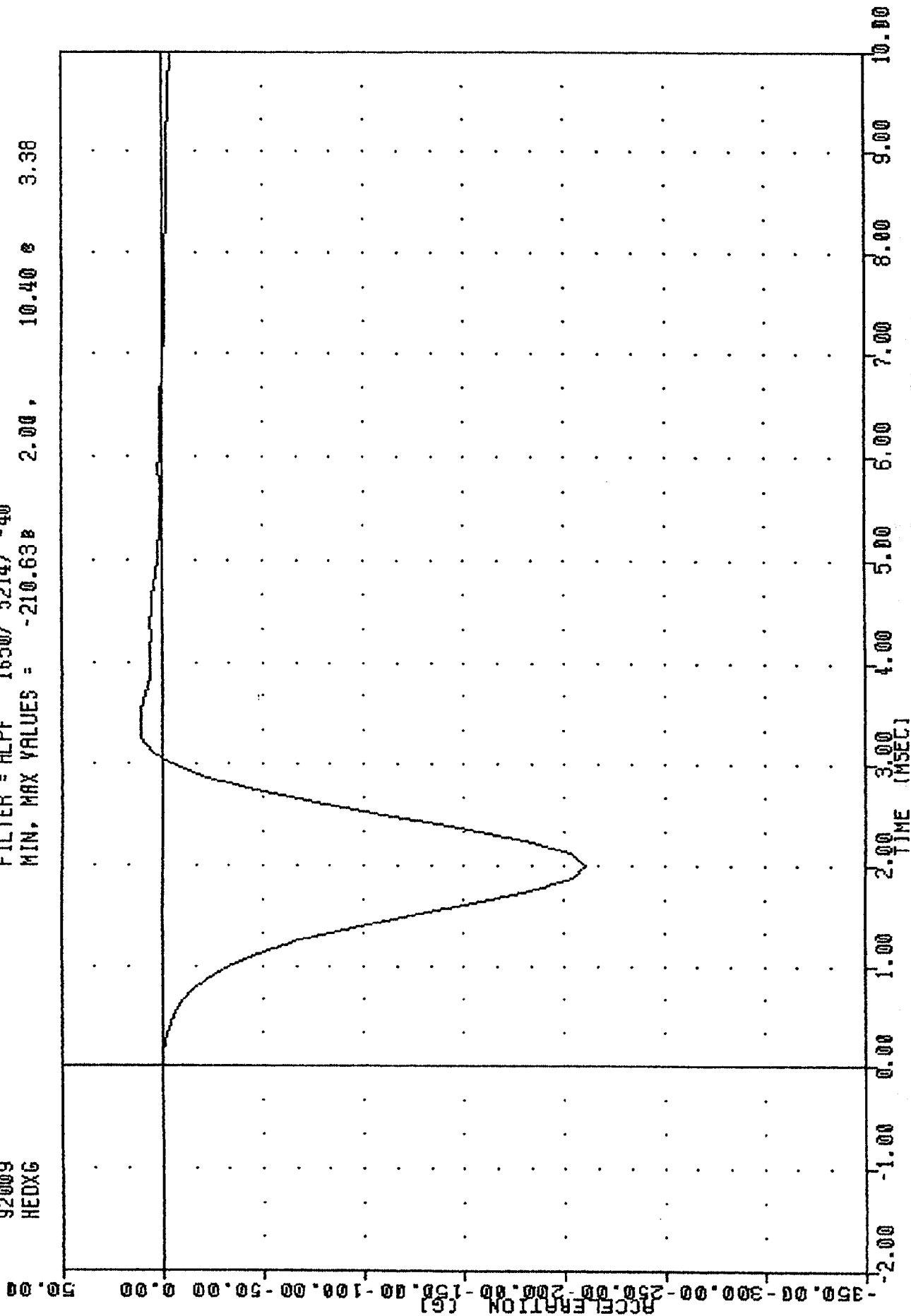
TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	251.45 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MSEC	1.27 MSEC
PEAK LATERAL ACCELERATION	10 G MAX	6.74 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middleton

TRC
572B SN 713 HEAD DROP CAL 02
92009
HEDXG

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -210.63 2.00, 10.40 3.38



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

572B SN 713 HEAD DROP CAL 02

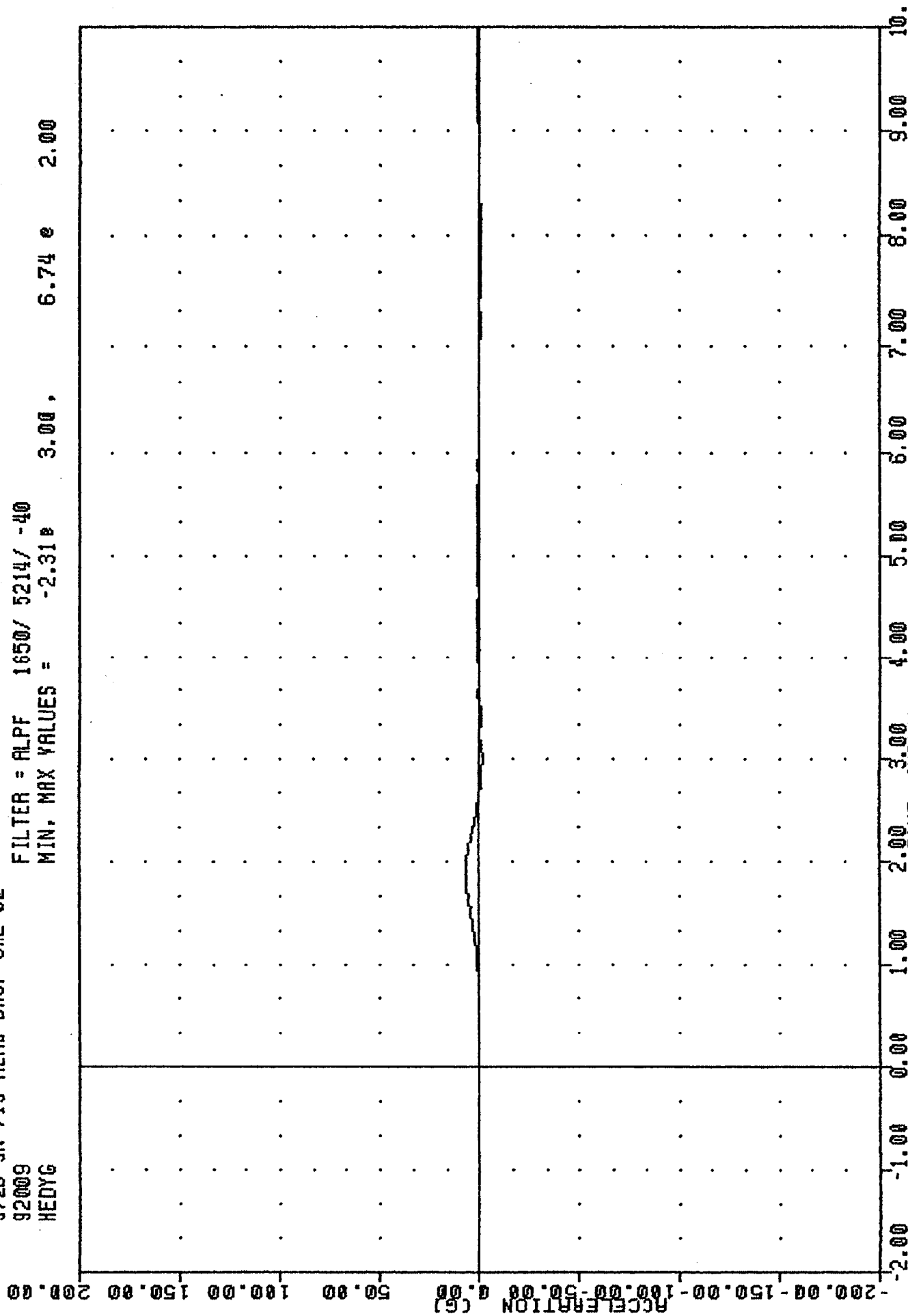
92009

HEDYG

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = -2.31 3.00 .

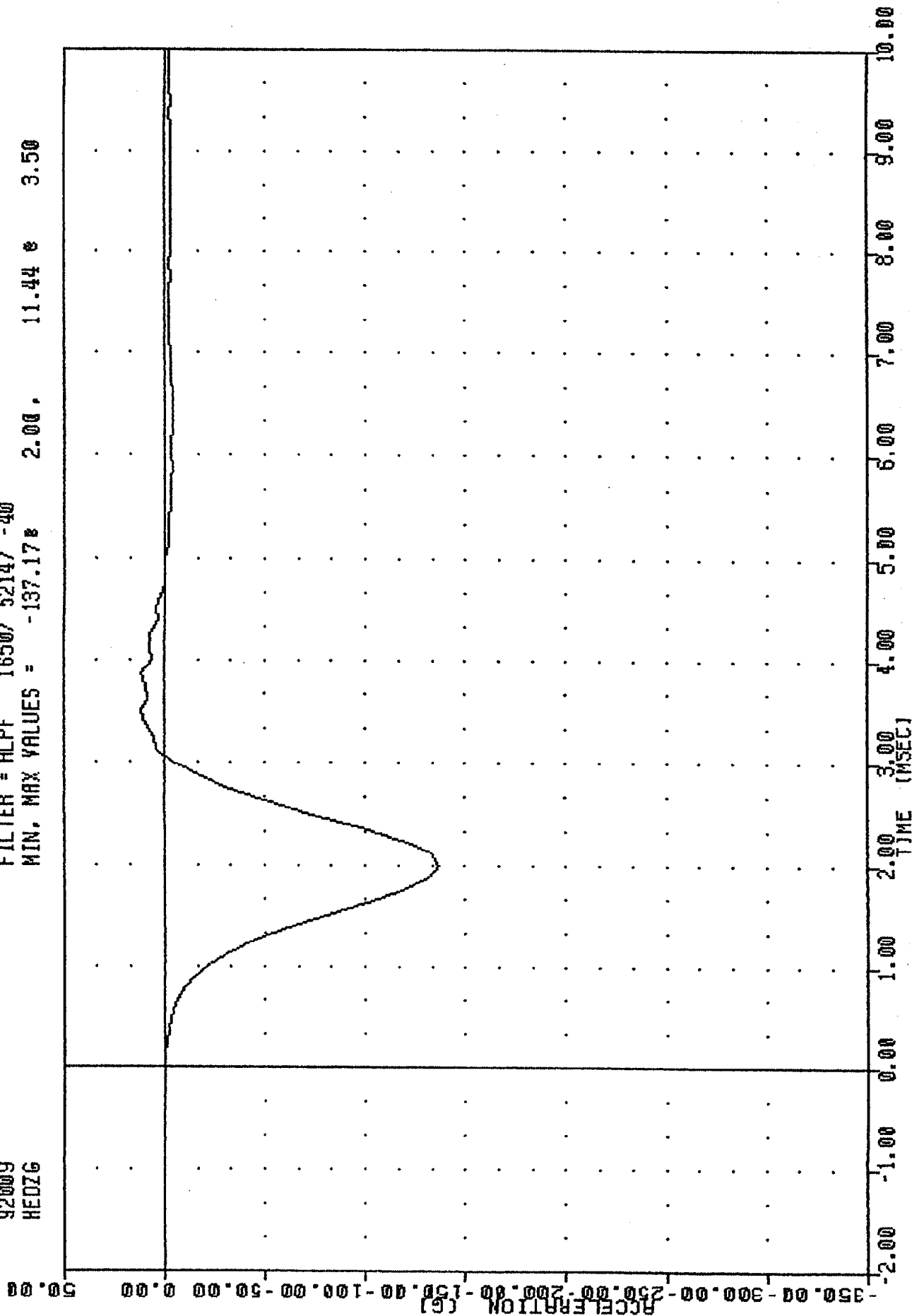
6.74 e 2.00



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

TRC , HD71302
 572B SN 713 HEAD DROP CAL 02
 92009
 HDZG

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -137.17 2.00 11.44 3.50



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

5728 SN 713 HEAD DROP CAL 02

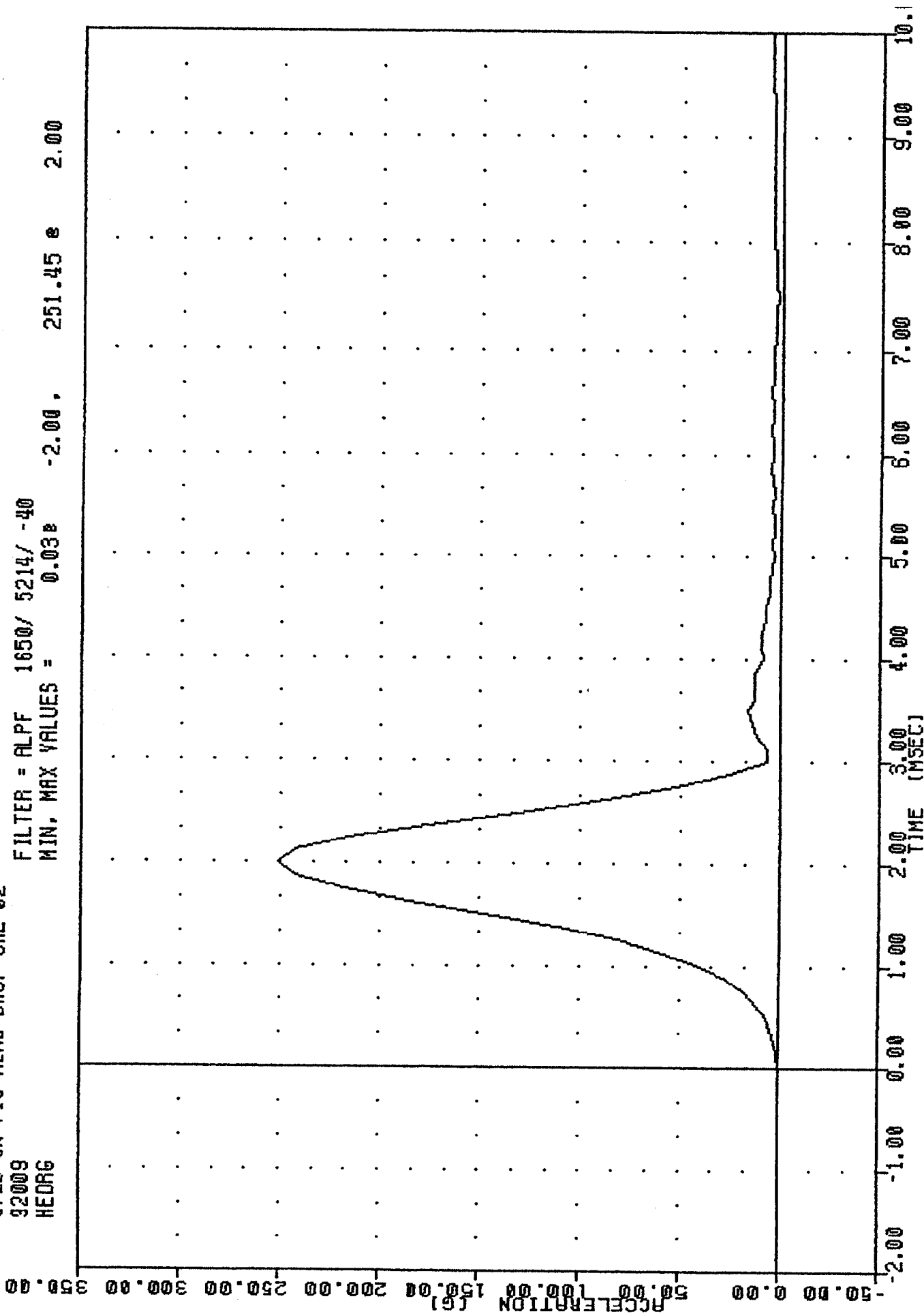
32009

HEAD

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = 0.03e

-2.00, 251.45 e 2.00



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

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572

10-Jan-92

TEMPERATURE 70 F
TRC HN71302

RELATIVE HUMIDITY 34 %
572B SN 713 HEAD/NECK CAL 02

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Pendulum velocity	121.5 to 25.5 ft/sec	23.76 ft/sec
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 msec max	2.42 msec
T2 - T3: 20 - 20 G	25 - 30 msec	26.32 msec
T3 - T4: 20 - 5 G	10 msec max	6.17 msec
Avg. G level T2 - T3	20 - 24 G	23.59 G
Maximum Rotation Angle	63 - 73 deg	68.42 deg
Peak Head Resultant Accel	26 G max	22.56 G

Test Parameter	Specification	Test Results
Rotation Angle	Time	Chordal Disp.
(degrees)	(msec)	(in)
0	-2.0 - +2.0	-0.5 - +0.5
30	25.6 - 34.4	2.1 - 3.1
60	40.3 - 51.7	4.3 - 5.3
max	53.2 - 66.8	5.0 - 6.0
60	67.0 - 83.0	4.3 - 5.3
30	85.4 - 104.6	2.1 - 3.1
0	101.0 - 123.0	-0.5 - +0.5

SND: 5.95 in

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Ch. Middleton

3/29 3N /13 HEAD/NECK LNL W2

92010

PENXG

FILTER = BLPF 100/ 317/ -40

MIN, MAX VALUES = -4.28e 220.00, 26.63 e 8.50

35.00

30.00

25.00

20.00

15.00

10.00

5.00

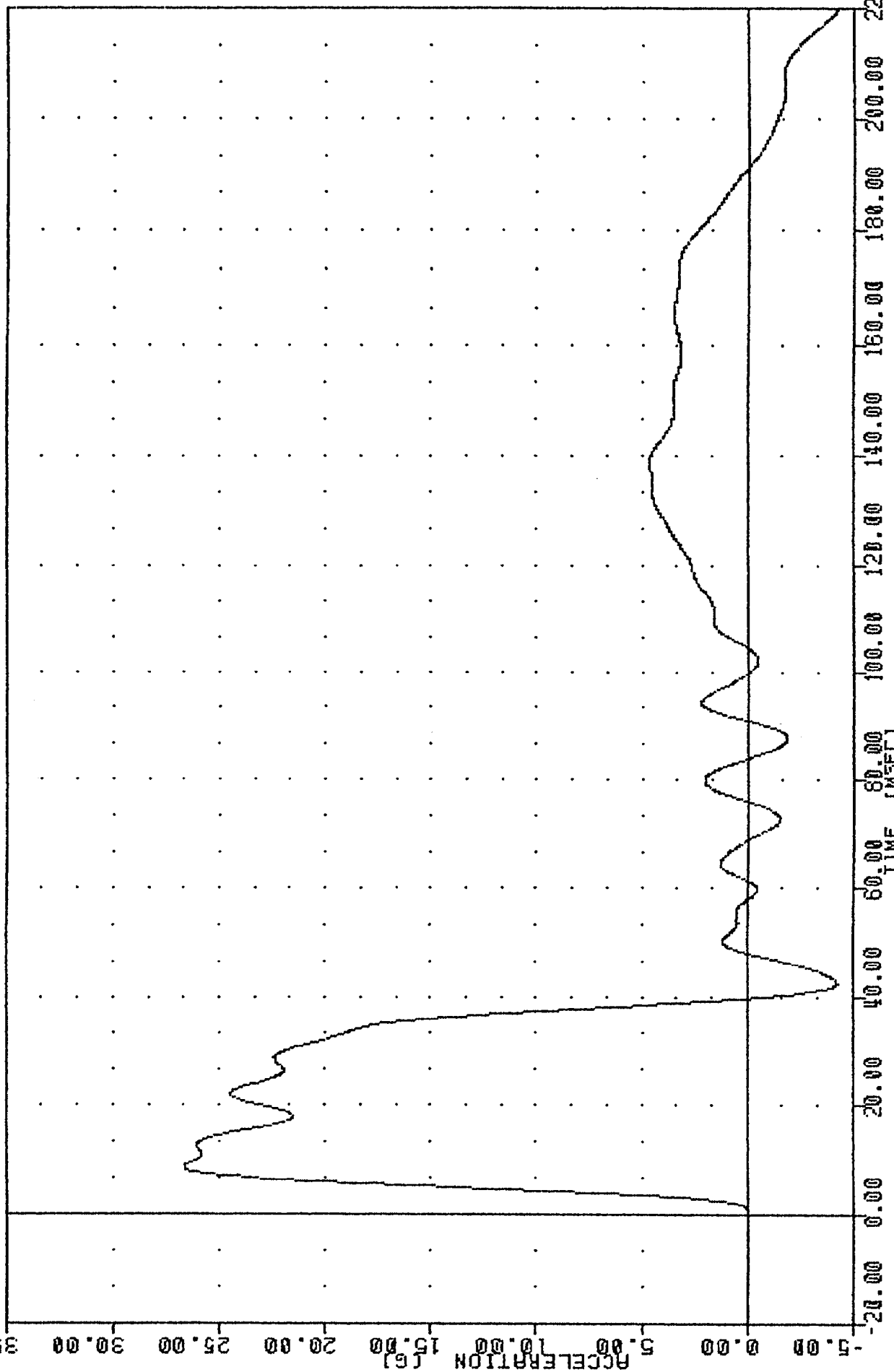
0.00

-5.00

ACCELERATION (G)

C-10

920226

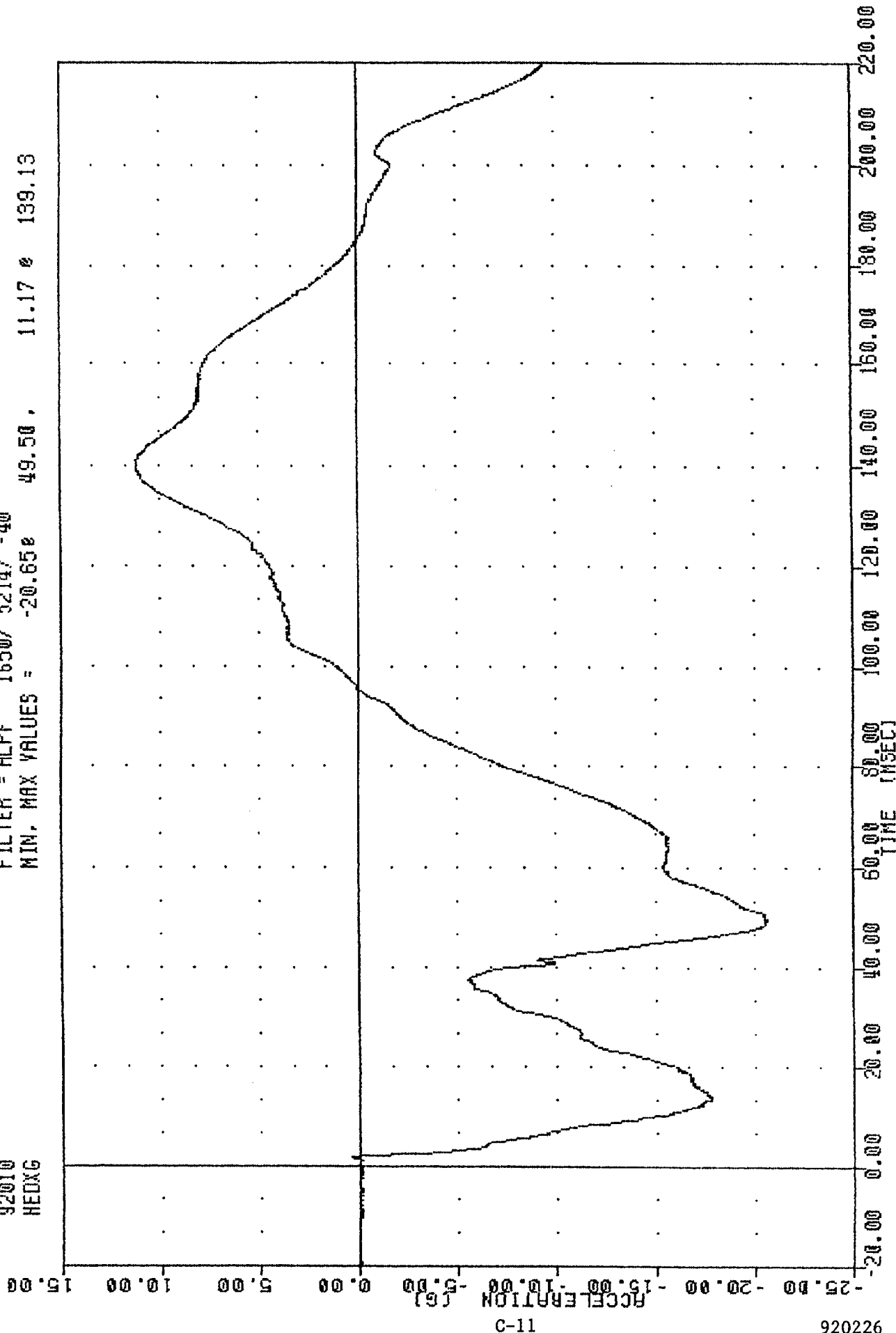


PART 572-B HYBRID II HEAD/NECK CALIBRATION
PENDULUM DECELERATION

TRC
572B SN 713 HEAD/NECK CAL 02
92010
HEDXG

, HN71302

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -20.65e 49.50, 11.17 e 139.13



572B SN 713 HEAD/NECK CHL W2

92010

HEDYG

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -1.38g 40.13 , 0.34 g 124.75

20.00

15.00

10.00

5.00

0.00

-5.00

-10.00

-15.00

-20.00

ACCELERATION (G)

C-12

920226

-20.00 0.00 20.00 40.00 60.00 80.00 100.00 120.00 140.00 160.00 180.00 200.00 220.00

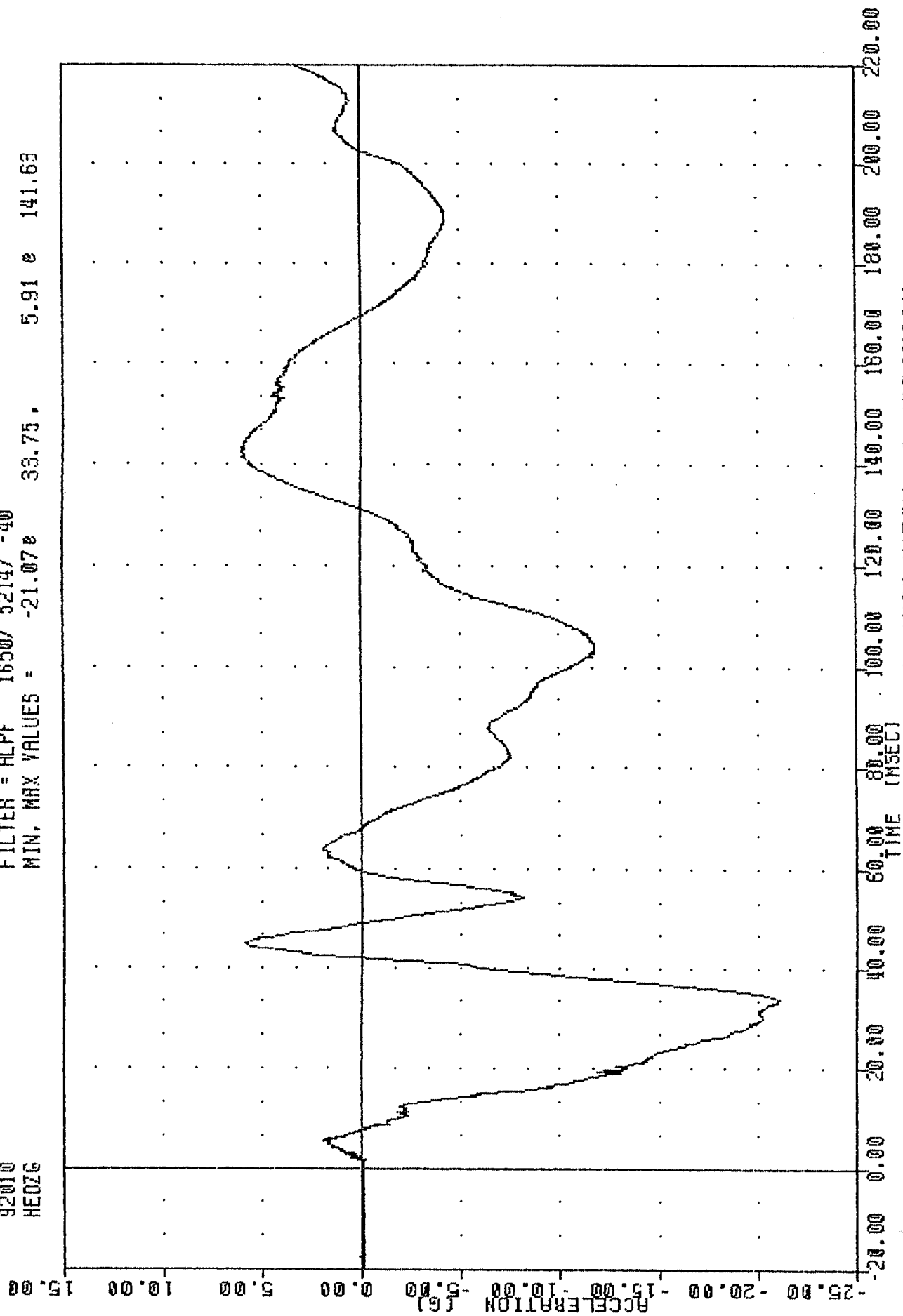
TIME (MSEC)

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

TRC
572B SN 713 HEAD/NECK CAL 02
92010
HEADZG

HN71302

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -21.07e 33.75, 5.91 e 141.63



C-13

920226

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

5/28 SN /13 HEAD/NECK LHL W2

92010

HEADG

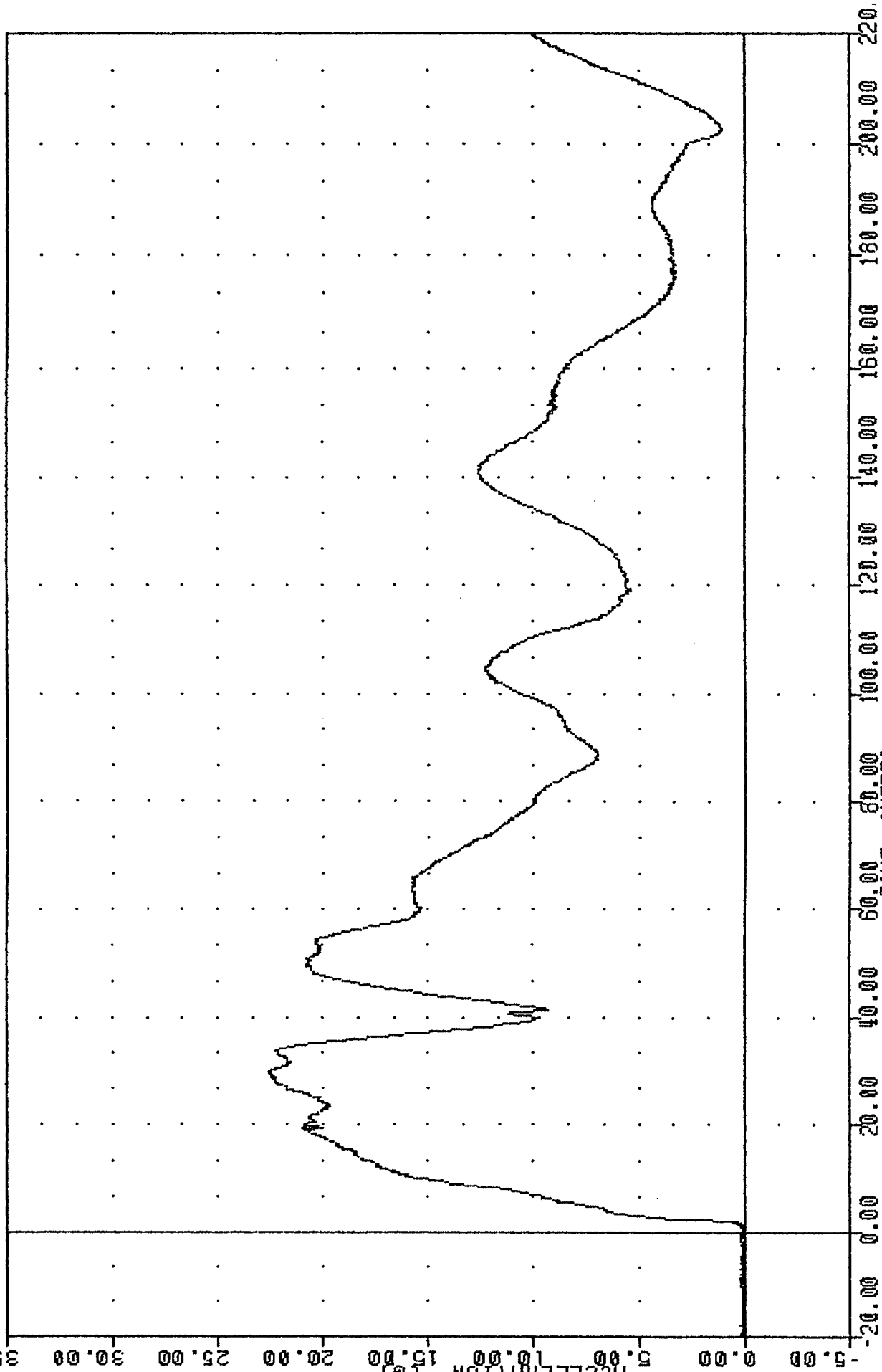
FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = 0.020 -19.88, 22.56 0 29.88

ACCELERATION (G)

C-14

920226

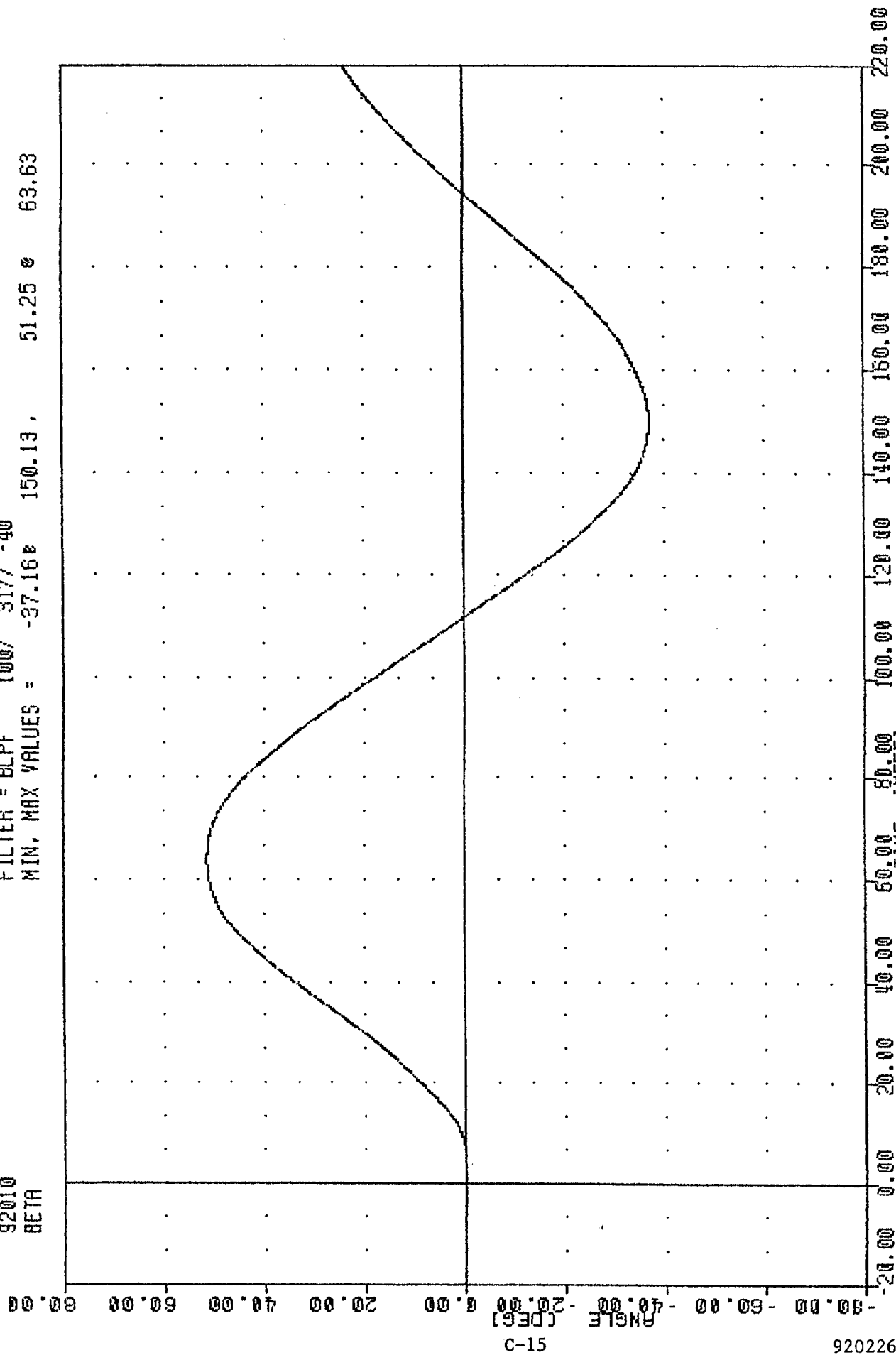


PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD RESULTANT ACCELERATION

TRC
5728 SN 713 HEAD/NECK CAL 02
92010
BETA

, HN71302

FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -37.16 150.13, 51.25 63.63



920226

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

3/20 3N 113 HEAD/NECK LNL W2

92010

THETA

FILTER = BLPF 100/ 317/ -40

MIN, MAX VALUES = -12.610 154.88, 17.18 0 65.00

80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
-60.00
-80.00

ANGLE (DEG)

C-16

-20.00 0.00 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
ROTATION ABOUT THE HEAD C.G.

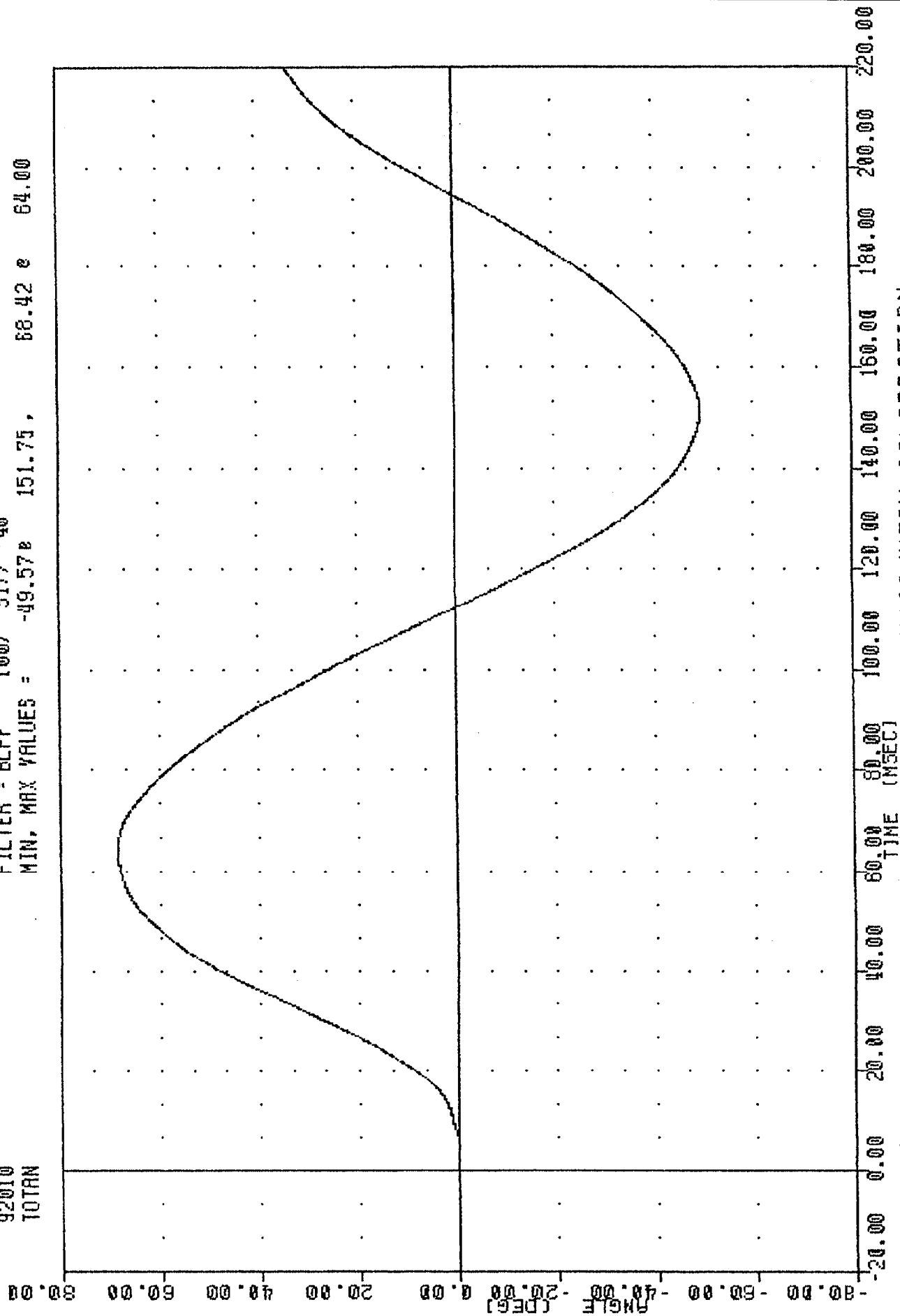
920226

TRC
 572B SN 713 HEAD/NECK CAL 02
 92010
 TOTAL

, HW71302

FILTER = BLPF 100/ 317/ -40

MIN. MAX VALUES = -49.57e 151.75, 58.42 e 64.00



PART 572-B HYBRID II HEAD/NECK CALIBRATION
 TOTAL ROTATION

0728 SN 713 HEAD/NECK LML W2

92010

NEKZD

FILTER = BLPF 100/ 317/ -40

MIN, MAX VALUES = -0.58 0.63 60.88

152.13

0.63

60.88

1.00

.75

.50

.25

0.00

DISPLACEMENT (IN)

81-C

920226

-20.00 0.00 20.00 40.00 60.00 80.00 100.00 120.00 140.00 160.00 180.00 200.00 220.00

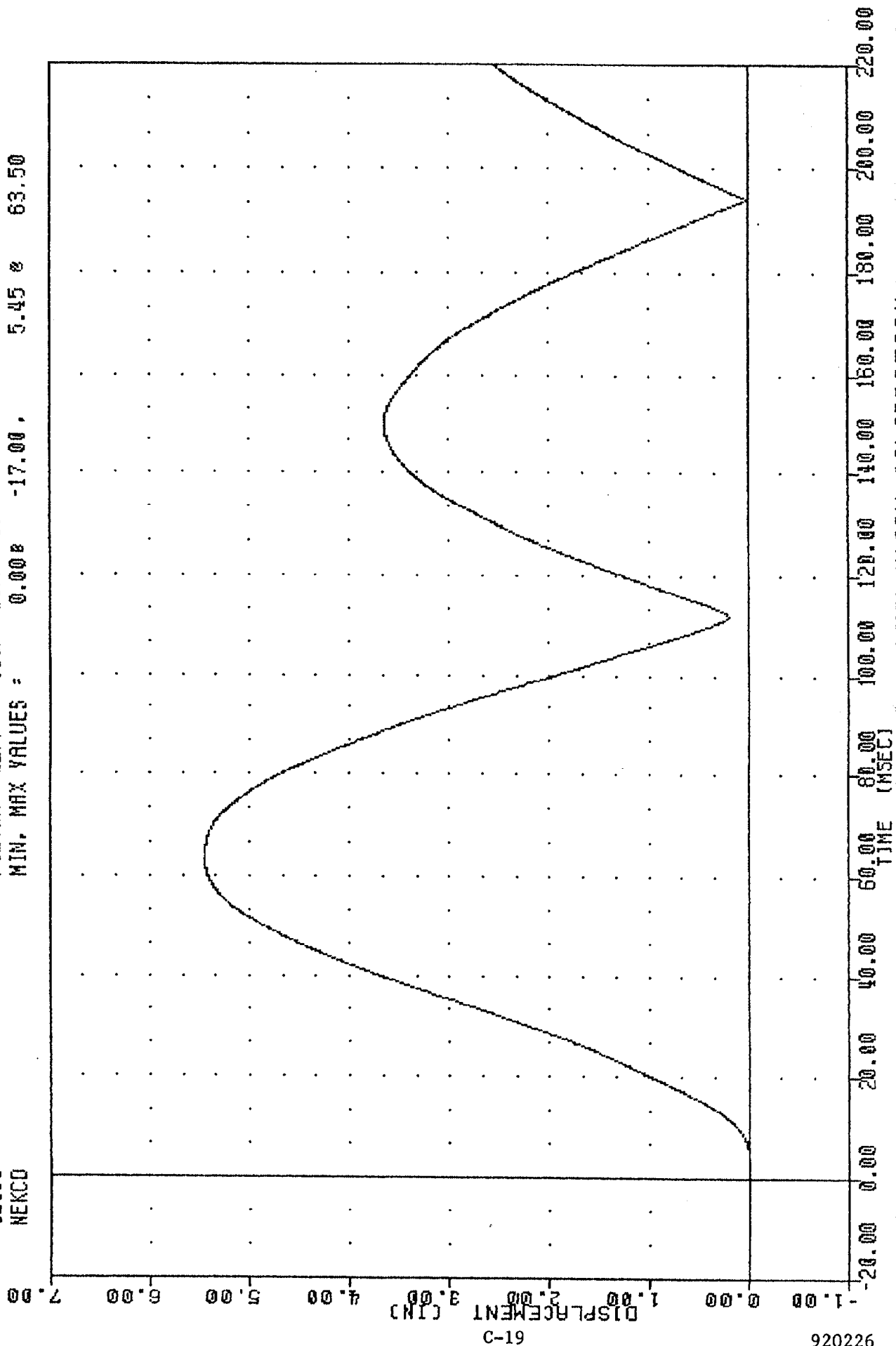
TIME (MSEC)

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

TRC
 5729 SN 713 HEAD/NECK CAL 02
 92010
 NEKCO

HN71302

FILTER = 8LPF 100/ 317/ -40
 MIN. MAX VALUES = 0.000 -17.00, 5.45 @ 63.50



C-19

920226

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

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

10-Jan-92

TEMPERATURE 70 F
TRC TH71302RELATIVE HUMIDITY 40 %
572B SN 713 H.S.THORAX CAL 02

	HIGH SPEED TEST	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
=====		
PENDULUM VELOCITY	21.78-22.22 FT/SEC	21.92 FT/SEC

PEAK DEFLECTION	1.7 IN max.	1.55 IN

PEAK RESISTIVE FORCE	2,250. LB max.	2075. LB

INTERNAL HYSTERESIS	50% - 70%	64.9%

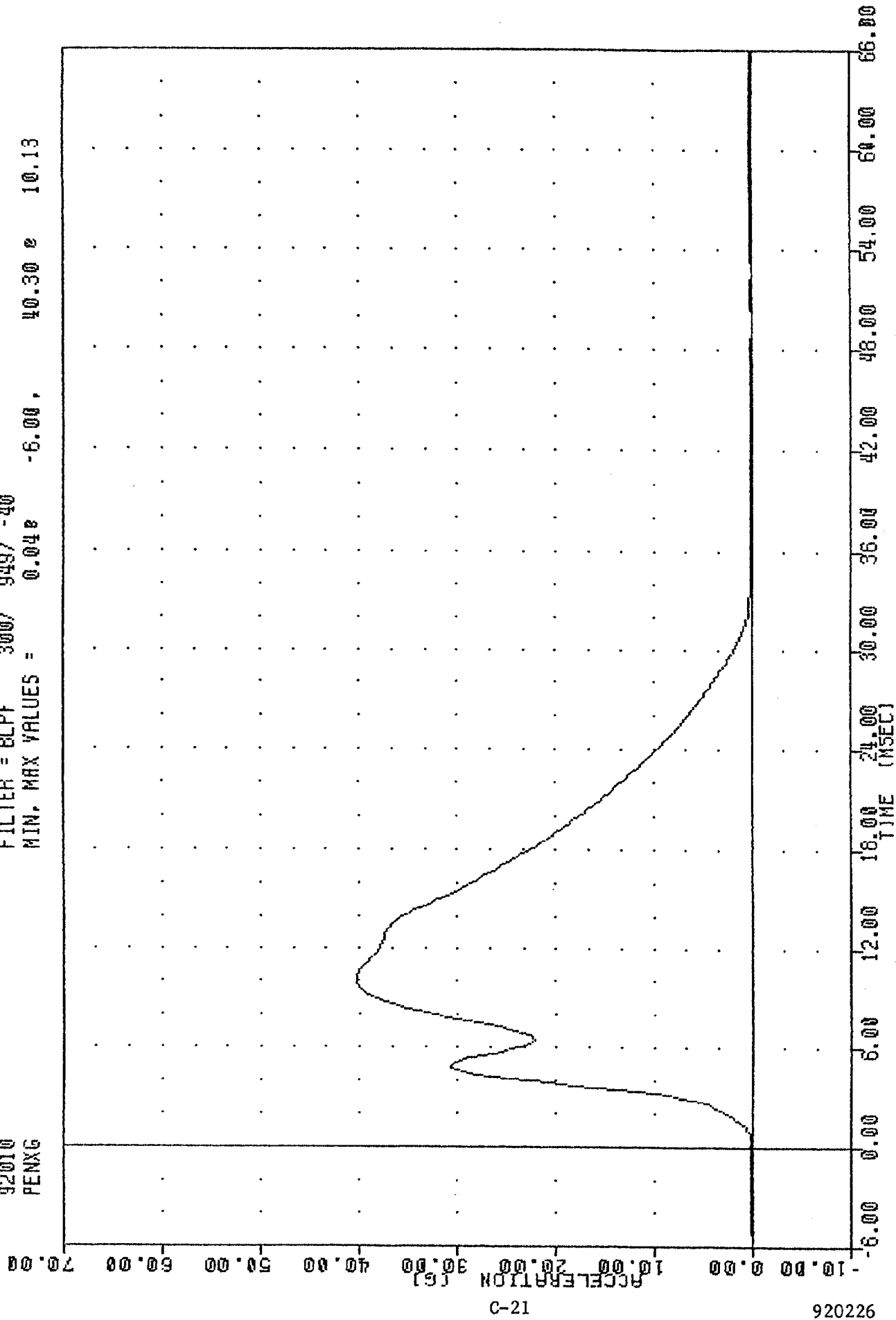
SCD: 2.20 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Char. Middleton

TRC
572B SN 713 H.S. THORAX CAL 02
92010
PENXG

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.048 -6.00 40.30 e 10.13



C-21

920226

PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
PENDULUM DECELERATION

572B SN 713 H.S. THORAX CAL 02

92010

PENXF

FILTER = 8LPF 300/ 949/ -40

MIN, MAX VALUES = 1.81e -6.00, 2075.41 e 10.13

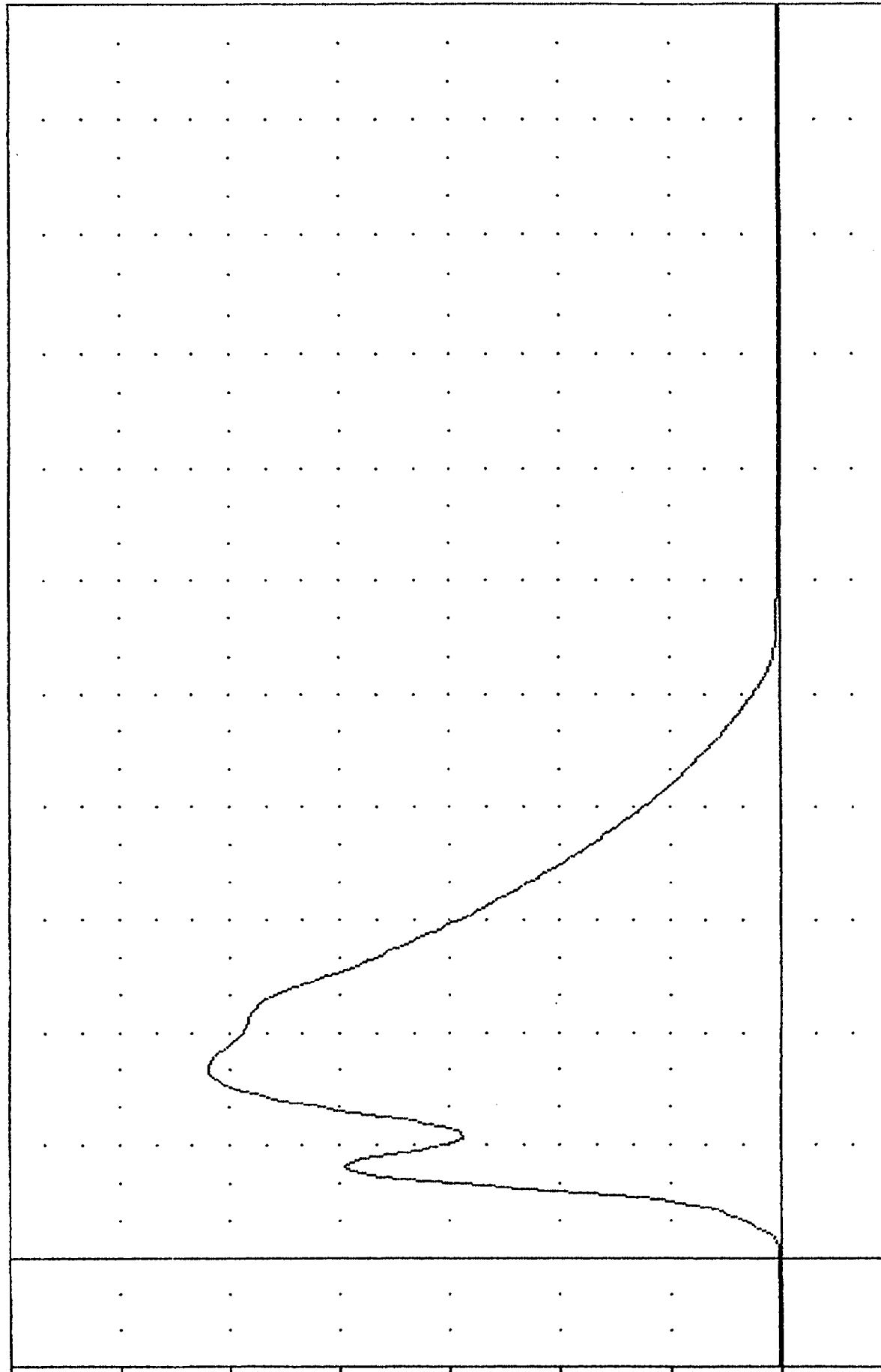
280.00
240.00
200.00
160.00
120.00
80.00
40.00
0.00
-40.00

(X10⁴)

FORCE (LB)

C-22

920226



PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
PENDULUM FORCE

TRC , TH71302

572B SN 713 H.S. THORAX CAL 02

92010

CSTXD

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = 0.00e

-1.38 , 1.55 e 12.88

2.10

1.80

1.50

1.20

.90

.60

.30

.00

-.30

-.60

0.00

6.00

12.00

18.00

24.00

30.00

36.00

42.00

48.00

54.00

60.00

66.00

72.00

DISPLACEMENT (IN)

TIME (MSEC)

PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC

STERNUM DISPLACEMENT

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

10-Jan-92

TEMPERATURE 70 F
TRC TL71302RELATIVE HUMIDITY 40 %
572B SN 713 L.S.THORAX CAL 02

LOW SPEED TEST		
TEST PARAMETER	SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	13.86-14.14 FT/SEC	13.97 FT/SEC
PEAK DEFLECTION	1.1 IN max.	0.96 IN
PEAK RESISTIVE FORCE	1,450. LB max.	1348. LB
INTERNAL HYSTERESIS	50% - 70%	64.3%

SCD: 2.20 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middle

572B SN 713 L.S. THORAX CAL 02

92010

PENXG

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.052 46.00 , 26.17 e 10.75

70.00

60.00

50.00

40.00

30.00

20.00

10.00

0.00

-10.00

-20.00

-30.00

-40.00

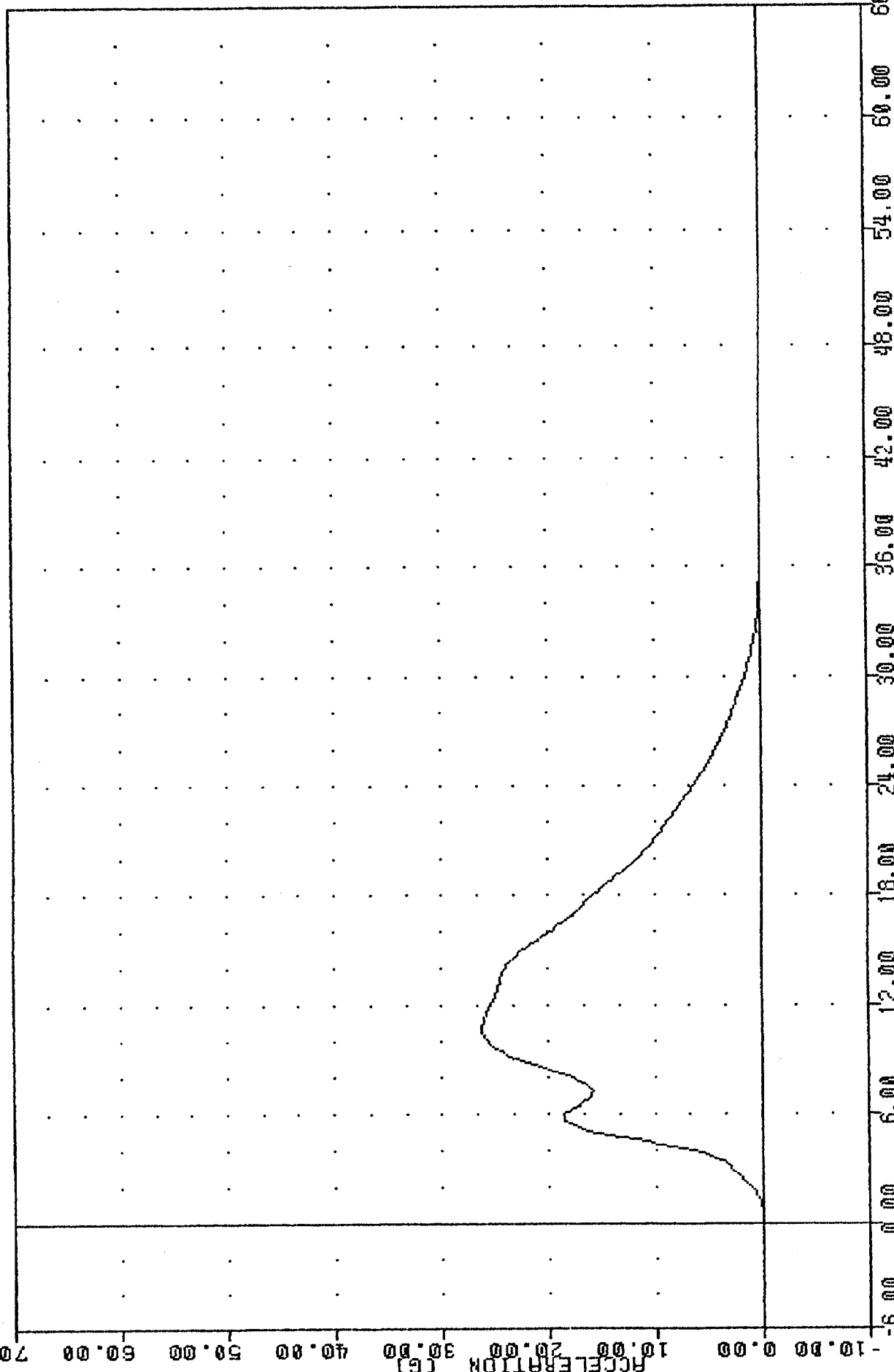
-50.00

-60.00

-70.00

C-26

920226



PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
PENDULUM DECELERATION

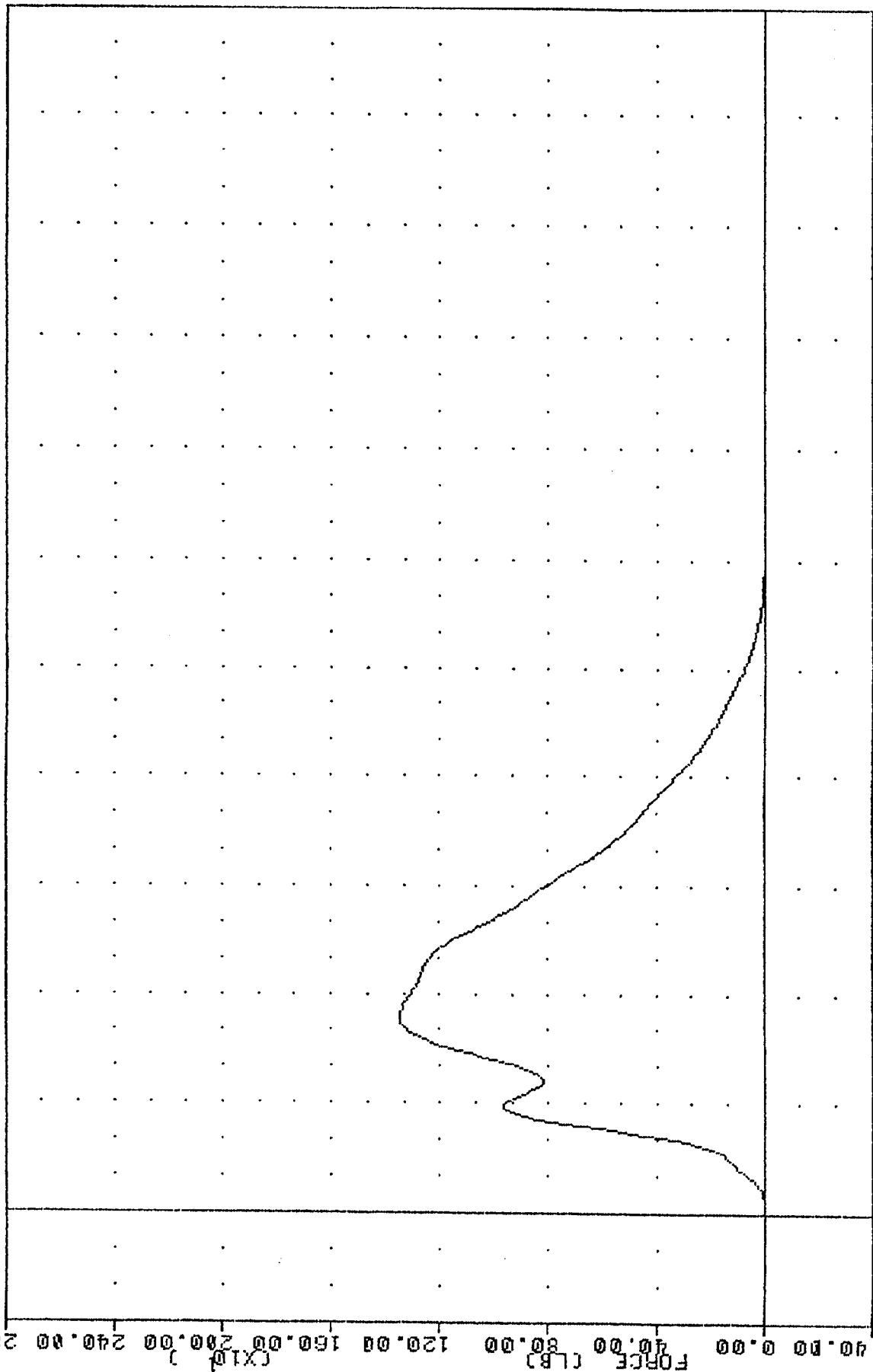
TRC
572B SN 713 L-S. THORAX CAL 02
92010
PENXF

TL71302

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -2.65e 46.00, 1347.53 e 10.75

FORCE (LB)
-40.00 0.00 40.00 80.00 120.00 160.00 200.00 240.00 280.00



-6.00 0.00 6.00 12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00 60.00 66.00

PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC

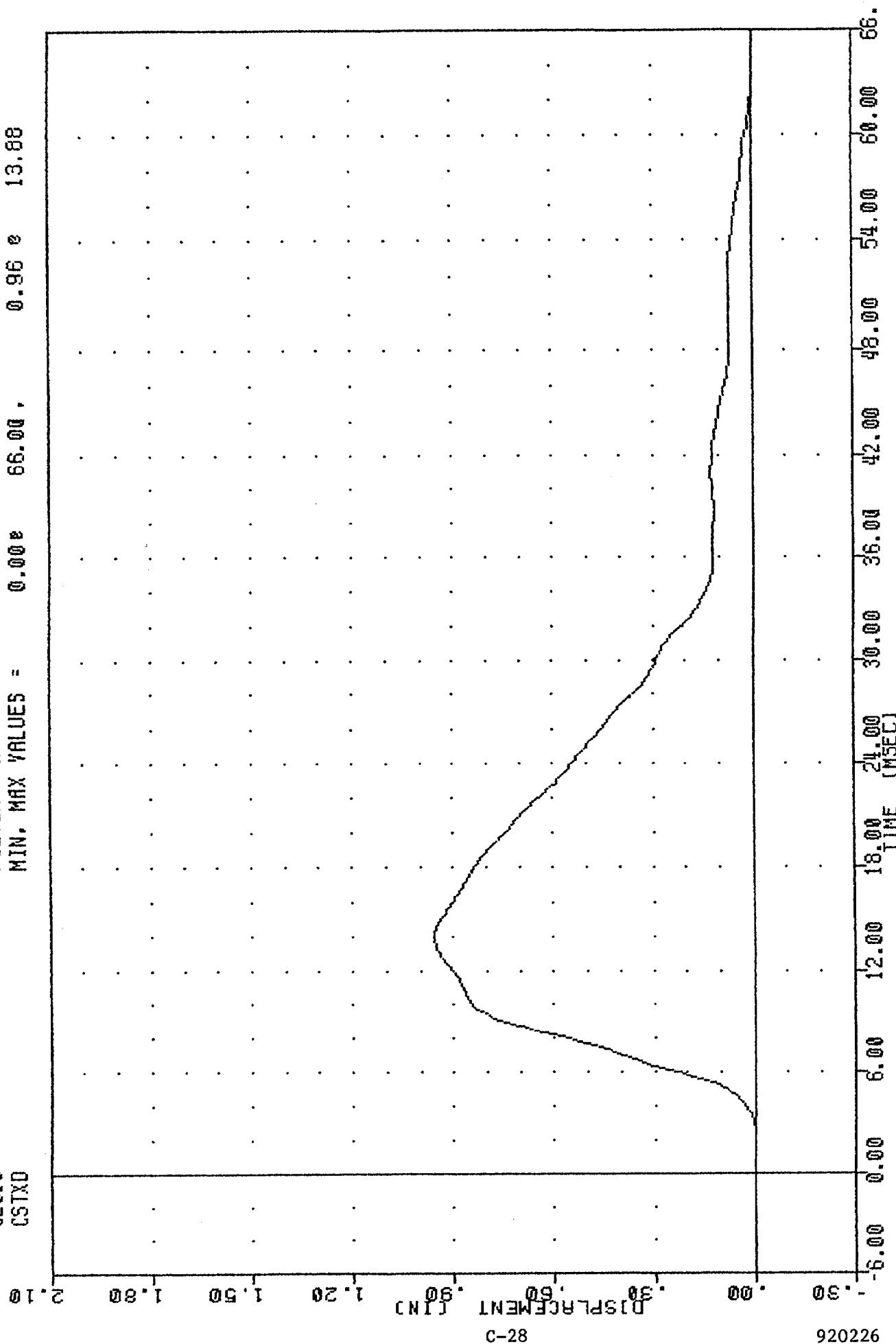
PENDULUM FORCE

U.S. 15

FILTER = BLPF 300/1676 307-40

MIN. MAX VALUES = 0.008 66.00

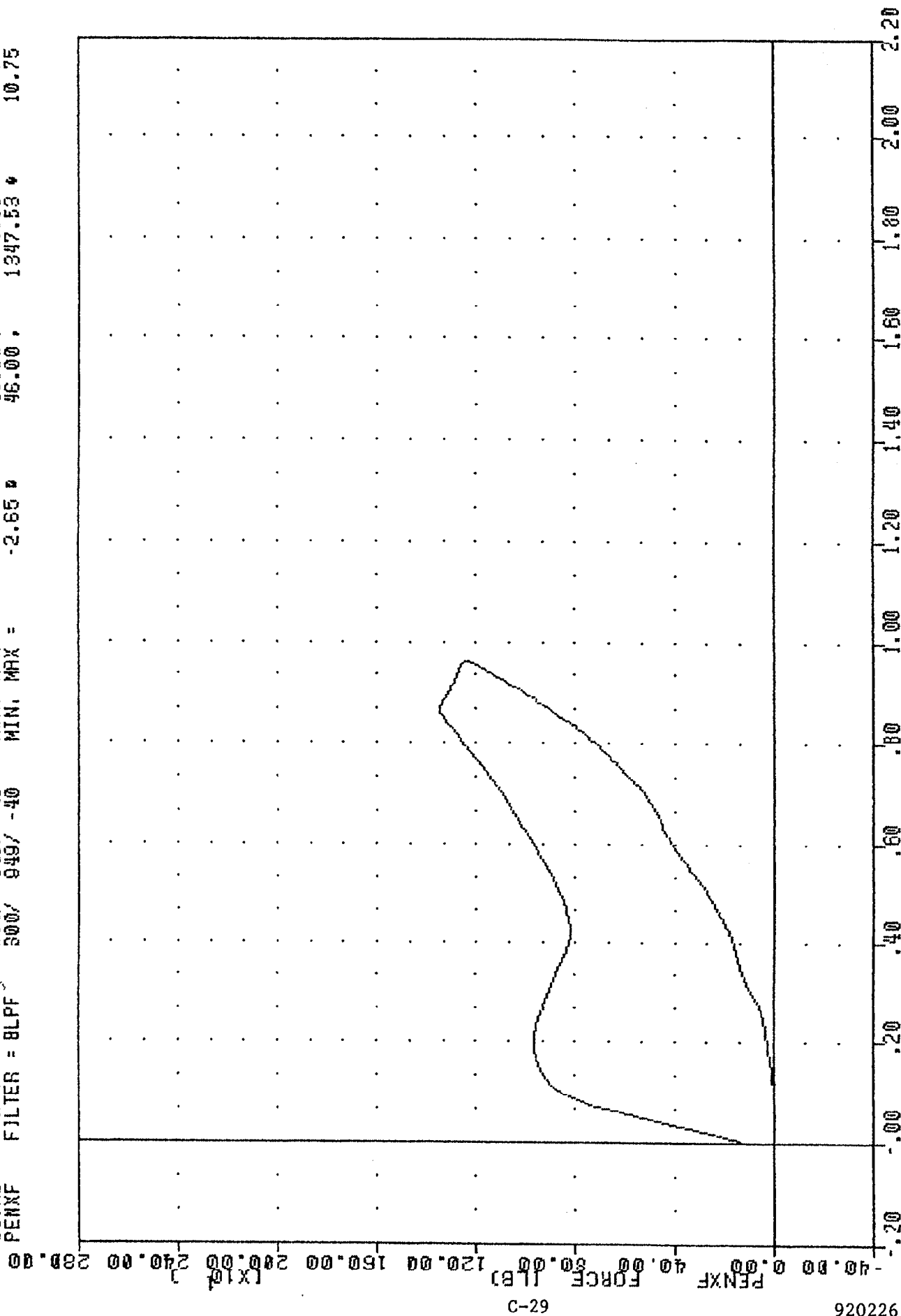
0.95 2 13.88



PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
FILE (INSEC)
STERNUM DISPLACEMENT

TRC TL71302 5728 SN 713 L.S. THORAX CAL 02 92010
 CSIXD FILTER = BLPF 500/ 949/ -40 MIN. MAX = 0.00 0
 PENXF FILTER = BLPF 500/ 949/ -40 MIN. MAX = -2.65 0

66.00 1347.53 0.95 13.88
 46.00 10.75



PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
 CHEST DISPLACEMENT VS PENDULUM FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMEN COMPRESSION TEST

PART 572

10-Jan-92

TEMPERATURE 70 F
TRC AB71302

RELATIVE HUMIDITY 34 %
572B SN 713 ABDOM COMPR CAL 02

TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0.00 IN	10.00 LBS	10.00 LBS
0.50 IN	23.00 - 36.00 LBS	28.04 LBS
0.75 IN	36.00 - 50.00 LBS	39.89 LBS
1.00 IN	50.00 - 63.00 LBS	54.49 LBS
1.30 IN	73.00 - 88.00 LBS	76.45 LBS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

TRC
ABXD
ABXF

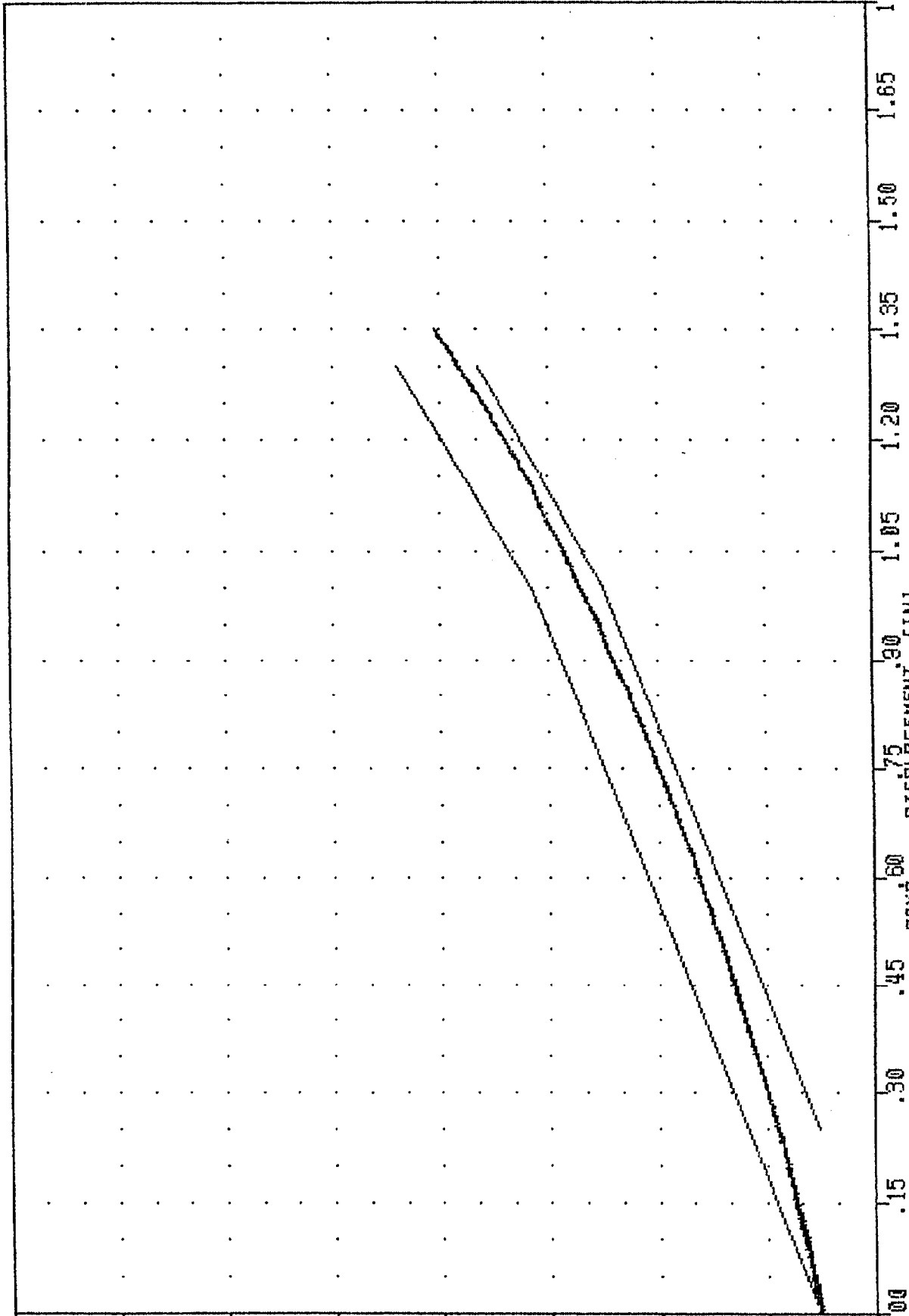
AB71302
FILTER = ALPF
FILTER = ALPF

572B SN 713 ABDOM COMP CAL 02 92010
1550/ 5214/ -40 MIN. MAX =
1550/ 5214/ -40 MIN. MAX =

0.000
0.000
0.000

1.35
80.99
80.99

920226
C-31
ABXF
FORCE (LB)
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00



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

TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572

10-JAN-92

TEMPERATURE 70 F
TRC LF71302RELATIVE HUMIDITY 34 %
572B SN713 LUMBAR FLEX CAL02

DEFLECTION	SPECIFICATION	TEST RESULTS
0 DEG	0 LB	0.00 LB
20 DEG	22.00 - 34.00 LB	29.00 LB
30 DEG	34.00 - 46.00 LB	39.00 LB
40 DEG	46.00 - 58.00 LB	52.00 LB
NET RETURN ANGLE	< 12 DEG	2.23 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

10-Jan-92

TEMPERATURE 70 F
LEFT KNEE
TRC LK71302

RELATIVE HUMIDITY 40 %

572B SN 713 L.KNEE IMP CAL 02

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.97 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LB	2301.67 LB
DURATION ABOVE 1000 LB	>=1.7 MSEC	1.78 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

9/25 SN 713 L.KNEE INF LHL W2

92010

LFMF

FILTER = BLFF 1000/ 3162/ -40

MIN, MAX VALUES = -0.800

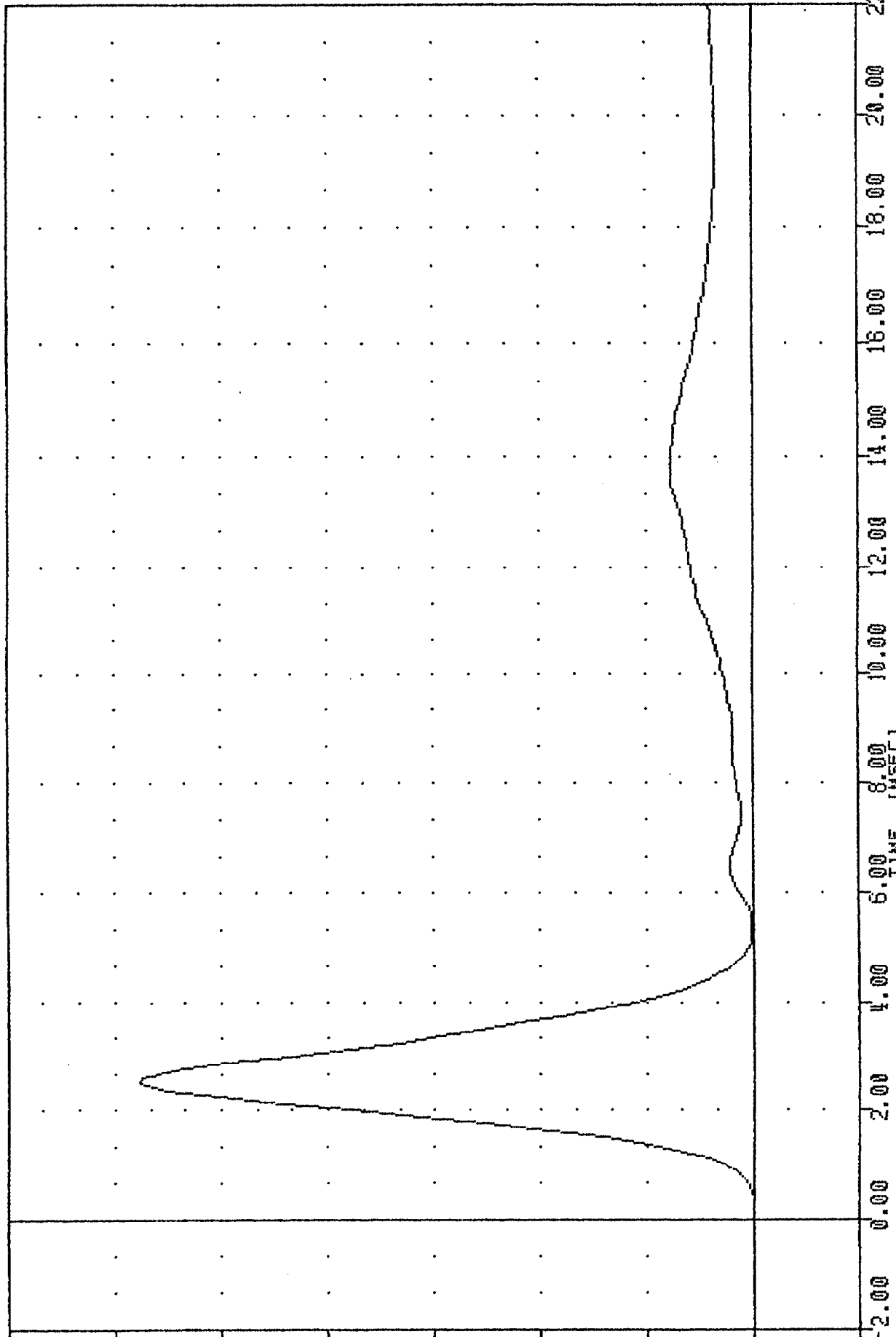
-0.63, 2301.67 0 2.50

FORCE (LB)
280.00
240.00
200.00
160.00
120.00
80.00
40.00
0.00
-40.00

(x10³)

C-34

920226



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

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

10-Jan-92

TEMPERATURE 70 F
RIGHT KNEE
TRC RK71302

RELATIVE HUMIDITY 40 %
572B SN 713 R.KNEE IMP CAL 02

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.97 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LB	2129.01 LB
DURATION ABOVE 1000 LB	>=1.7 MSEC	1.98 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middleton

572B SN 713 R.KNEE/IMP CAL 02

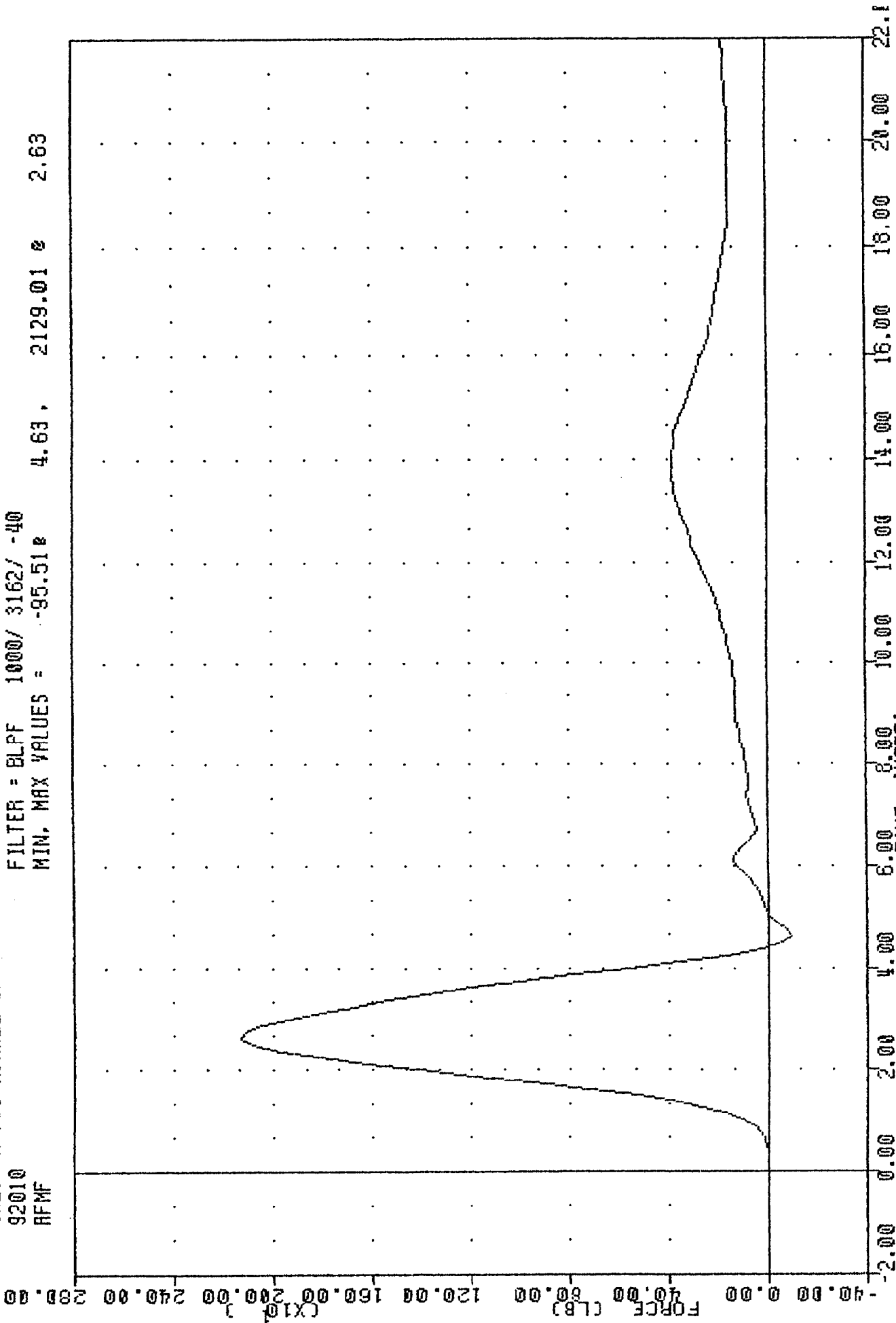
92010

RFMF

FILTER = BLPF 1000/ 3162/ -40

MIN. MAX VALUES = -95.51 4.63

2.63



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

PRE-TEST CERTIFICATION DATA

PASSENGER DUMMY S/N: 826

TRANSPORTATION RESEARCH CENTER OF OHIO

EXTERNAL DIMENSIONS

PART 572

09-JAN-92

TEMPERATURE 70 F
TRC ED82628RELATIVE HUMIDITY 49 %
572B SN826 EXT.DIMENSION CAL28

DESCRIPTION	SPECIFICATION	TEST RESULTS
SN 826 HUMANOID		
Sitting Height	35.6 - 35.8 IN	35.8 IN
Shoulder Pivot Height	21.8 - 22.4 IN	22.4 IN
Hip Pivot Height	3.9 IN	3.9 IN
Hip Pivot From Backline	4.8 IN	4.8 IN
Knee Pivot From Backline	20.1 - 20.7 IN	20.4 IN
Rear of Head From Backline	1.7 IN	1.7 IN
Chest Depth	9.1 - 9.6 IN	9.4 IN
Shoulder Width	17.8 - 18.4 IN	18.0 IN
Chest Circumference Over Nipples	36.8 - 40.0 IN	37.6 IN
Waist Circumference at Min. Girth	31.4 - 32.6 IN	32.5 IN
Hip Width	14.0 - 15.4 IN	14.7 IN
Knee Pivot From Floor	19.3 - 19.9 IN	19.3 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Chae Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

PART 572

09-Jan-92

TEMPERATURE 70 F
TRC HD82628RELATIVE HUMIDITY 49 %
572B SN 826 HEAD DROP CAL 28

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	218.43 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MSEC	1.25 MSEC
PEAK LATERAL ACCELERATION	10 G MAX	1.53 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middleton

92003 HEDXG

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -176.428 2.13, 12.11 8 4.13

50.00

0.00

-50.00

-100.00

-150.00

-200.00

-250.00

-300.00

-350.00

ACCELERATION (G)

C-40

920226

10.00 9.00 8.00 7.00 6.00 5.00 4.00 3.00 2.00 1.00 0.00 -1.00 -2.00

TIME (MSEC)

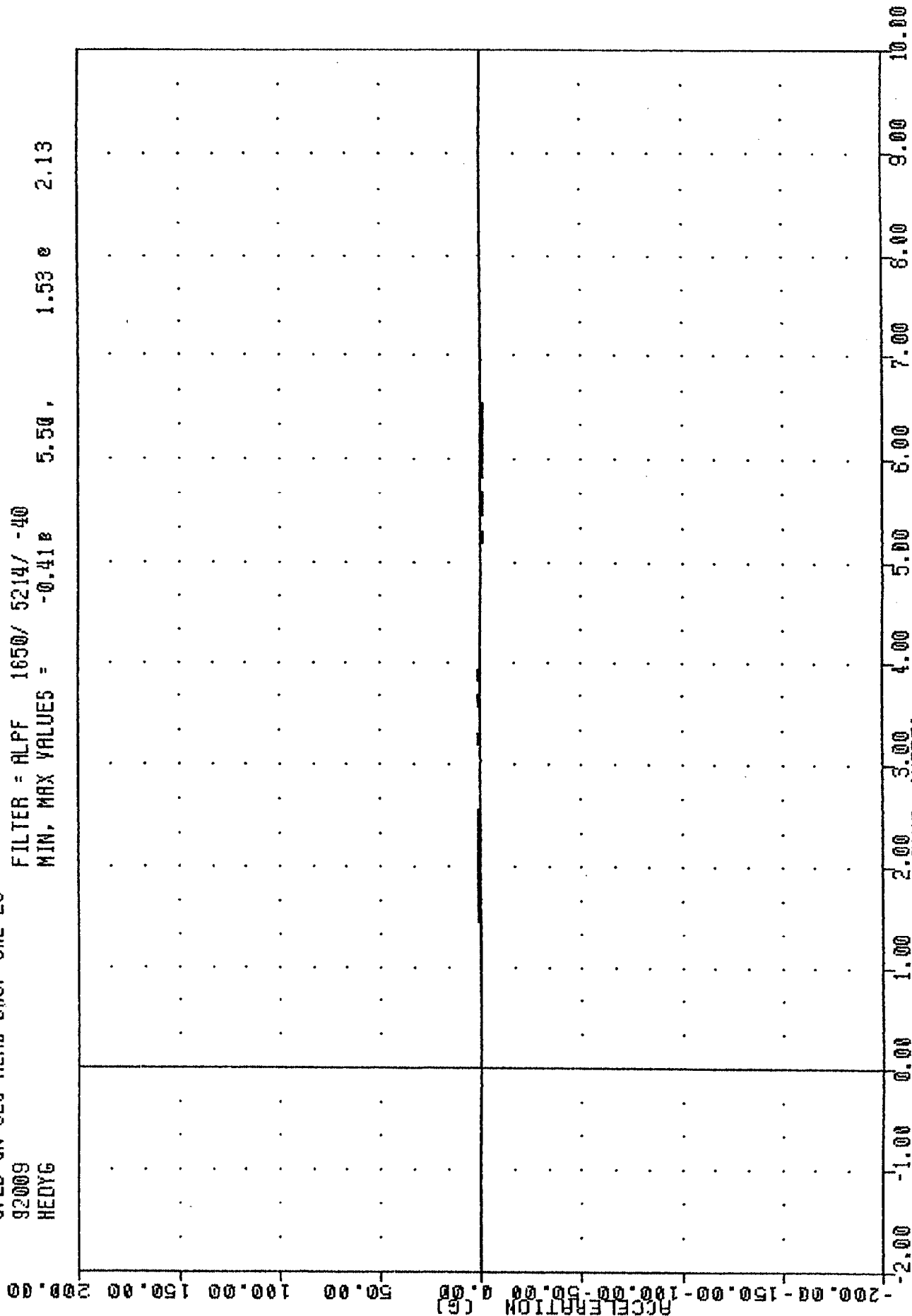
PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION X AXIS

TRC
572B SN 026 HEAD DROP CAL 20
92009
HEDYG

, H082628

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -0.418

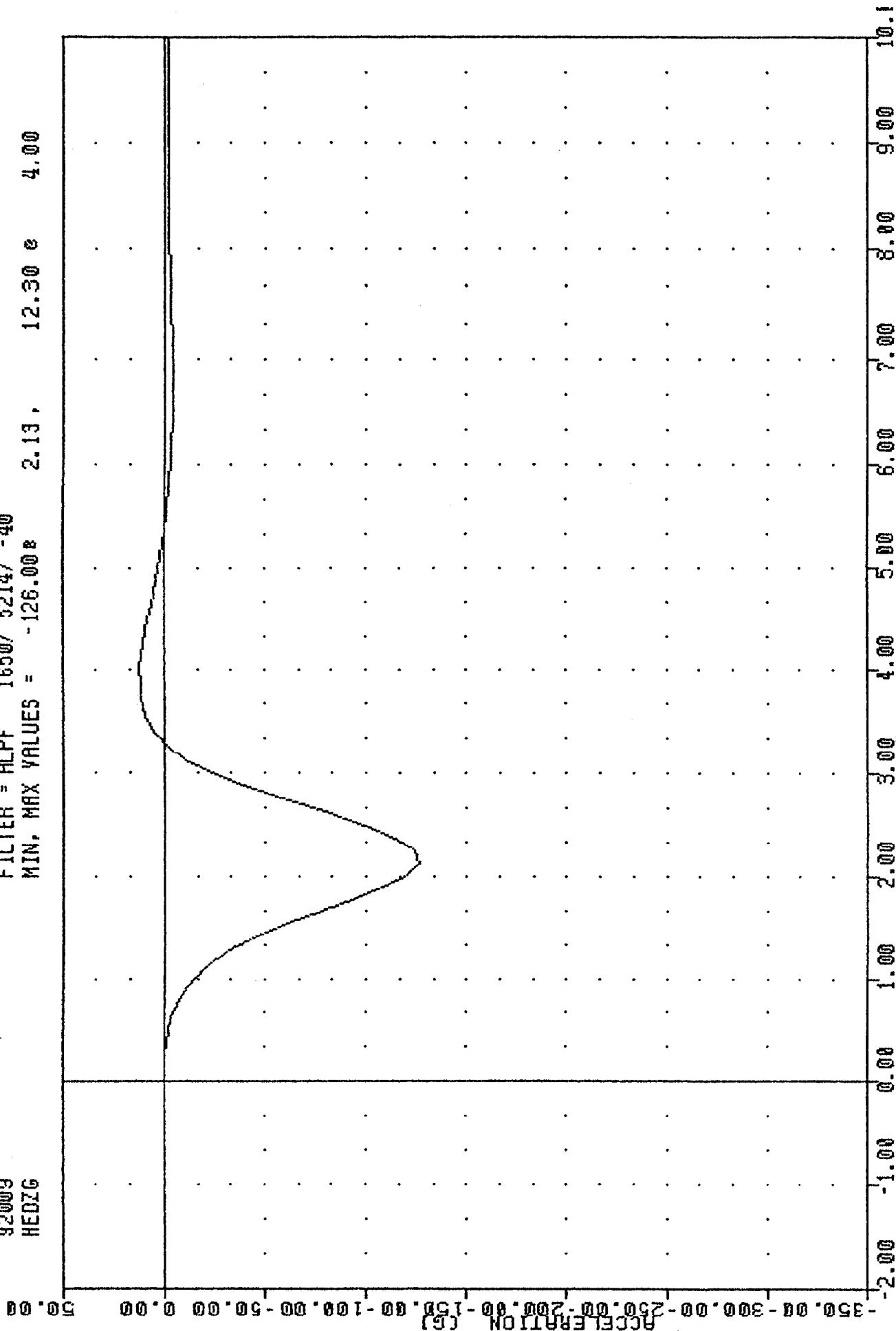
5.50 , 1.53 e 2.13



92009
HEDZG

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -126.00 8

2.13, 12.30 e 4.00

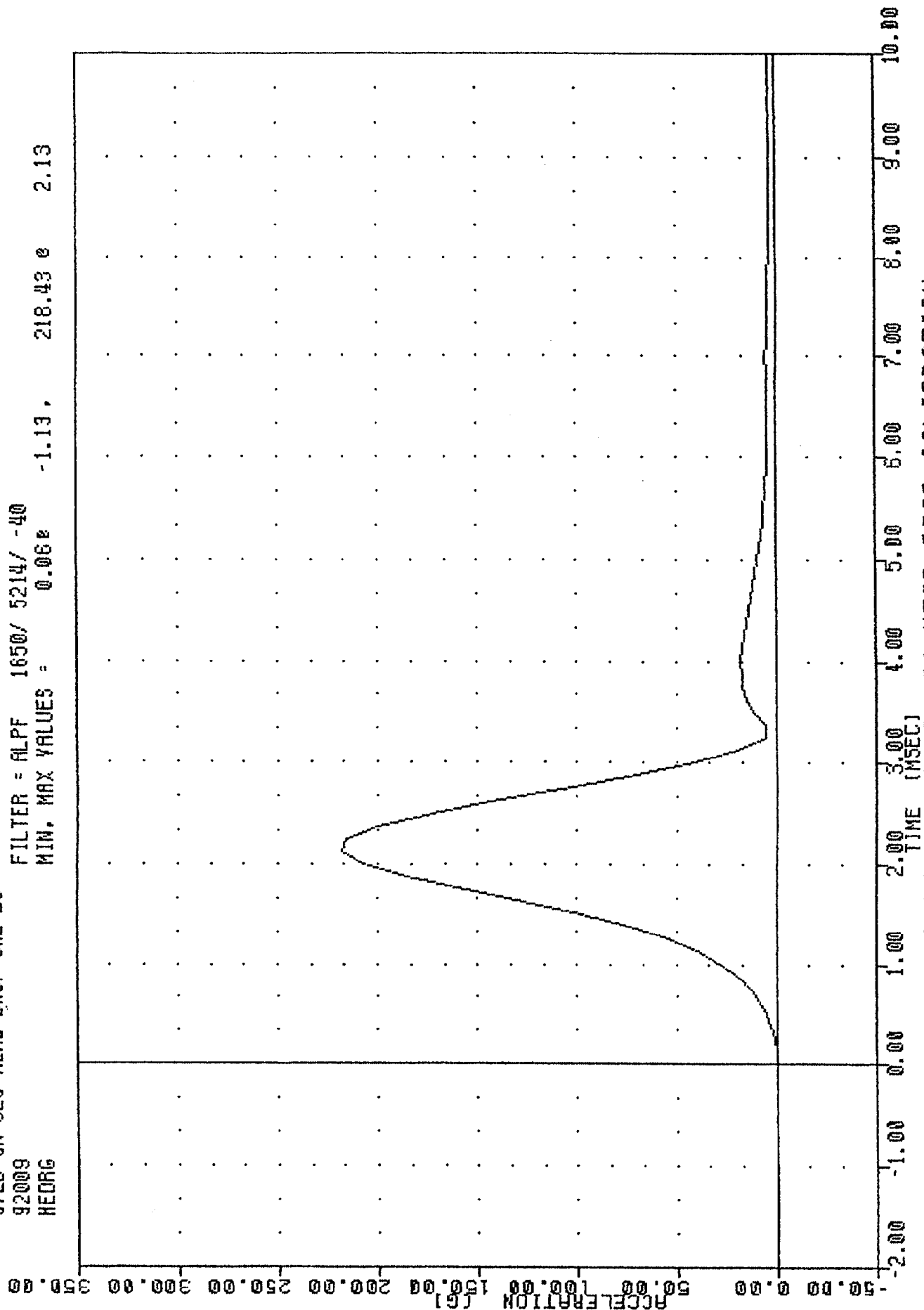


PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION Z AXIS

TRC
572B SN 826 HEAD DROP CAL 20
92009
HEADRG

, HD82628

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.06e -1.13, 218.43 e 2.13



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

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572

10-Jan-92

TEMPERATURE 70 F
TRC HN82628

RELATIVE HUMIDITY 34 %
572B SN 826 HEAD/NECK CAL 28

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Pendulum velocity	121.5 to 25.5 ft/sec	23.53 ft/sec
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 msec max	2.81 msec
T2 - T3: 20 - 20 G	25 - 30 msec	25.57 msec
T3 - T4: 20 - 5 G	10 msec max	8.24 msec
Avg. G level T2 - T3	20 - 24 G	22.24 G
Maximum Rotation Angle	63 - 73 deg	66.15 deg
Peak Head Resultant Accel	26 G max	21.81 G

Test Parameter	Specification	Test Results
Rotation Angle	Time Chordal Disp.	Time Chordal Disp.
(degrees)	(msec) (in)	(msec) (in)
0	-2.0 - +2.0 -0.5 - +0.5	1.50 0.00
30	25.6 - 34.4 2.1 - 3.1	32.68 2.40
60	40.3 - 51.7 4.3 - 5.3	49.97 4.54
max	53.2 - 66.8 5.0 - 6.0	62.38 5.12
60	67.0 - 83.0 4.3 - 5.3	74.99 4.70
30	85.4 - 104.6 2.1 - 3.1	95.18 2.26
0	101.0 - 123.0 -0.5 - +0.5	109.84 0.15

SND: 5.95 in

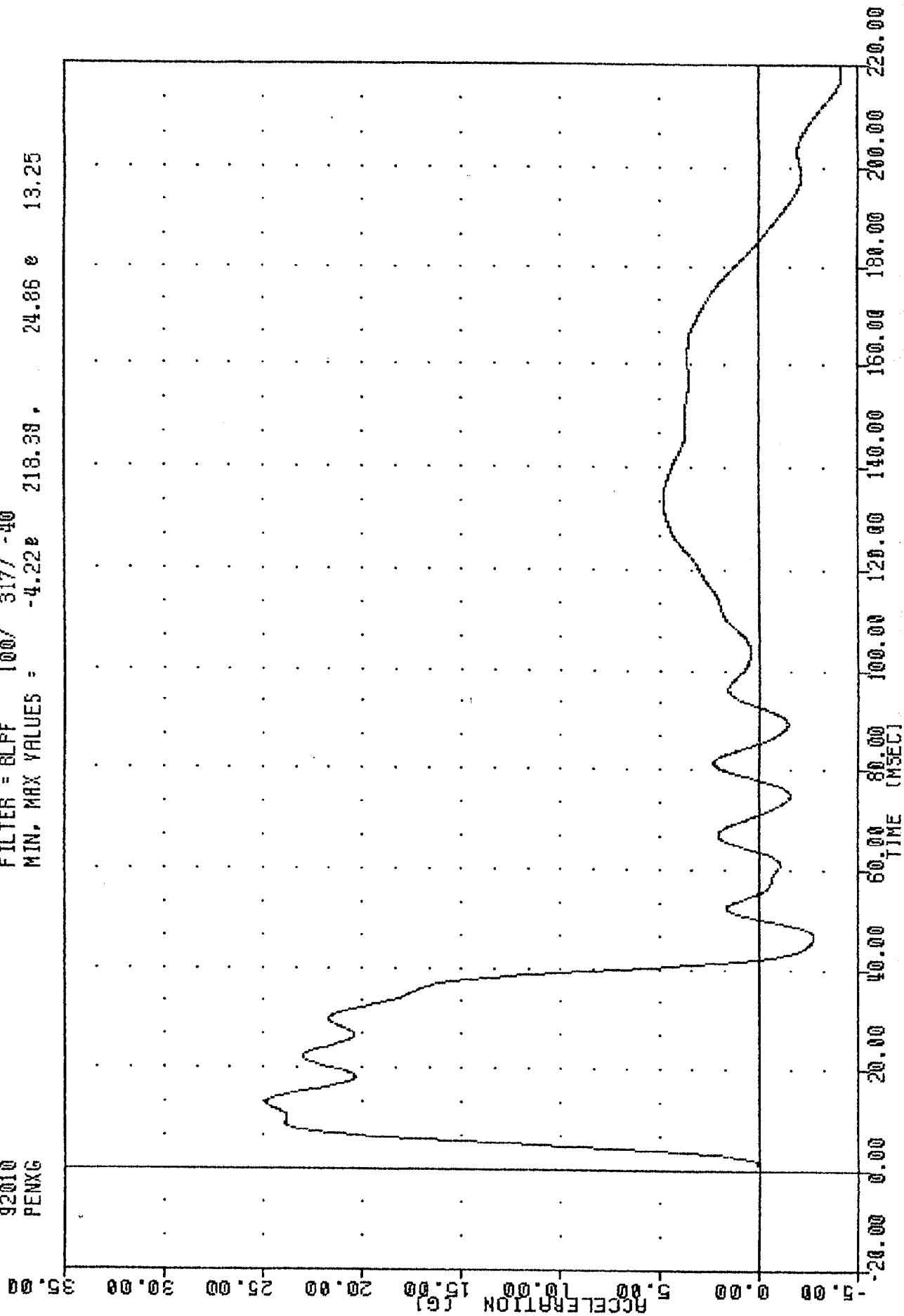
DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Chas. Middleton*

TRC
5728 SN 826 HEAD/NECK CARL 28
92010
PENXG

, HN82628

FILTER = BLPF 100/ 317/ -40
MIN. MAX VALUES = -4.22e 213.38 . 24.86 e 13.25



C-45

920226

PART 572-B HYBRID II HEAD/NECK CALIBRATION
PENDULUM DECELERATION

9/28 3N 826 HEAD/NECK CAL 20

92010

HEAD

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -19.19 50.00,

11.47 136.25

15.00

10.00

5.00

0.00

-5.00

-10.00

-15.00

-20.00

-25.00

ACCELERATION (G)

C-46

920226

20.00 0.00 20.00 40.00 60.00 80.00 100.00 120.00 140.00 160.00 180.00 200.00 220

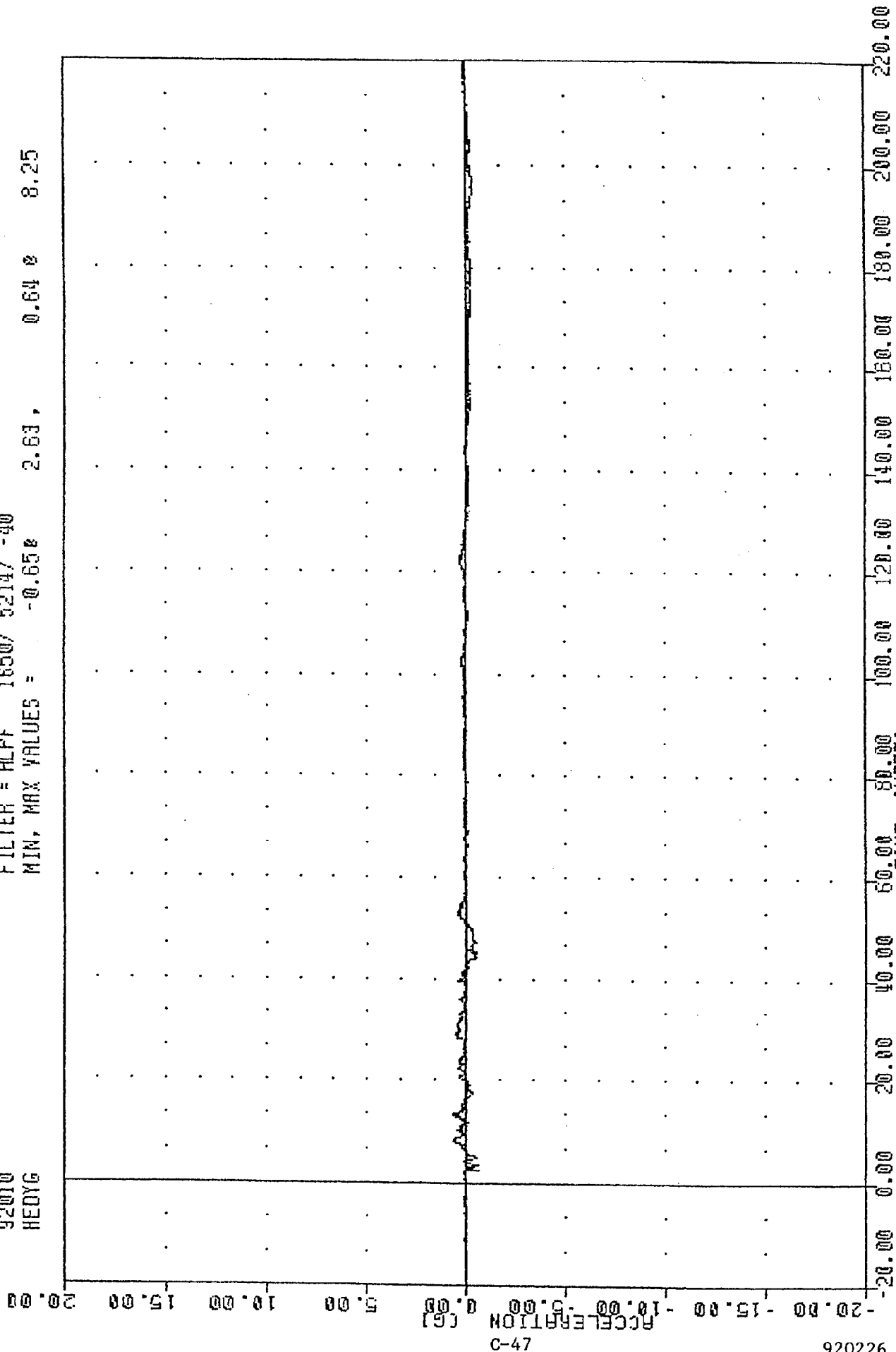
TIME (MSEC)

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

TRC
5728 SN 826 HEAD/NECK CRL 28
92010
HEADG

, HHS2628

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -0.658 2.63, 0.64 8 8.25



920226

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

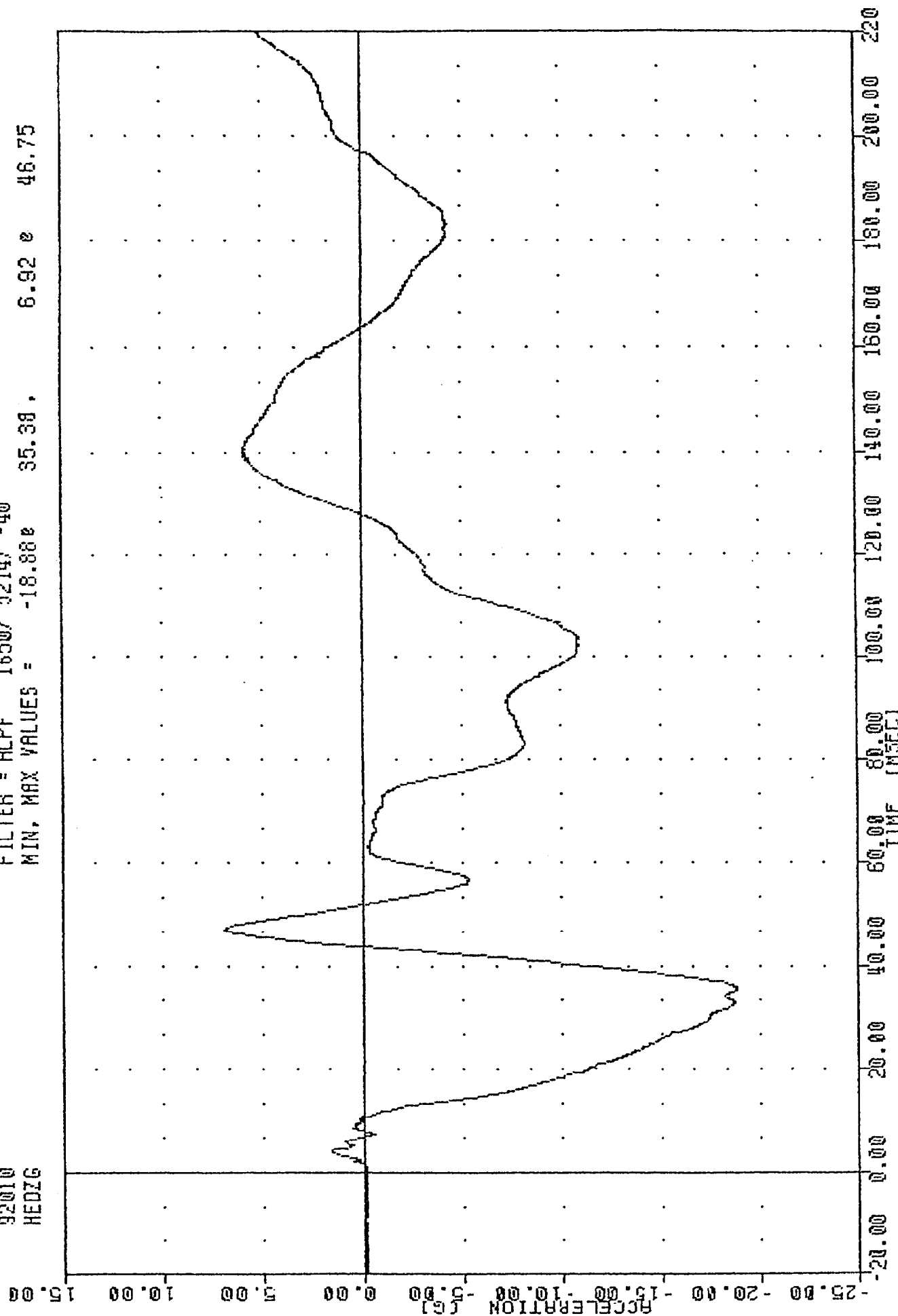
572B SN 026 HEAD/NECK CRL 20

92010

HEDIG

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -18.880 35.30 , 6.92 0 46.75

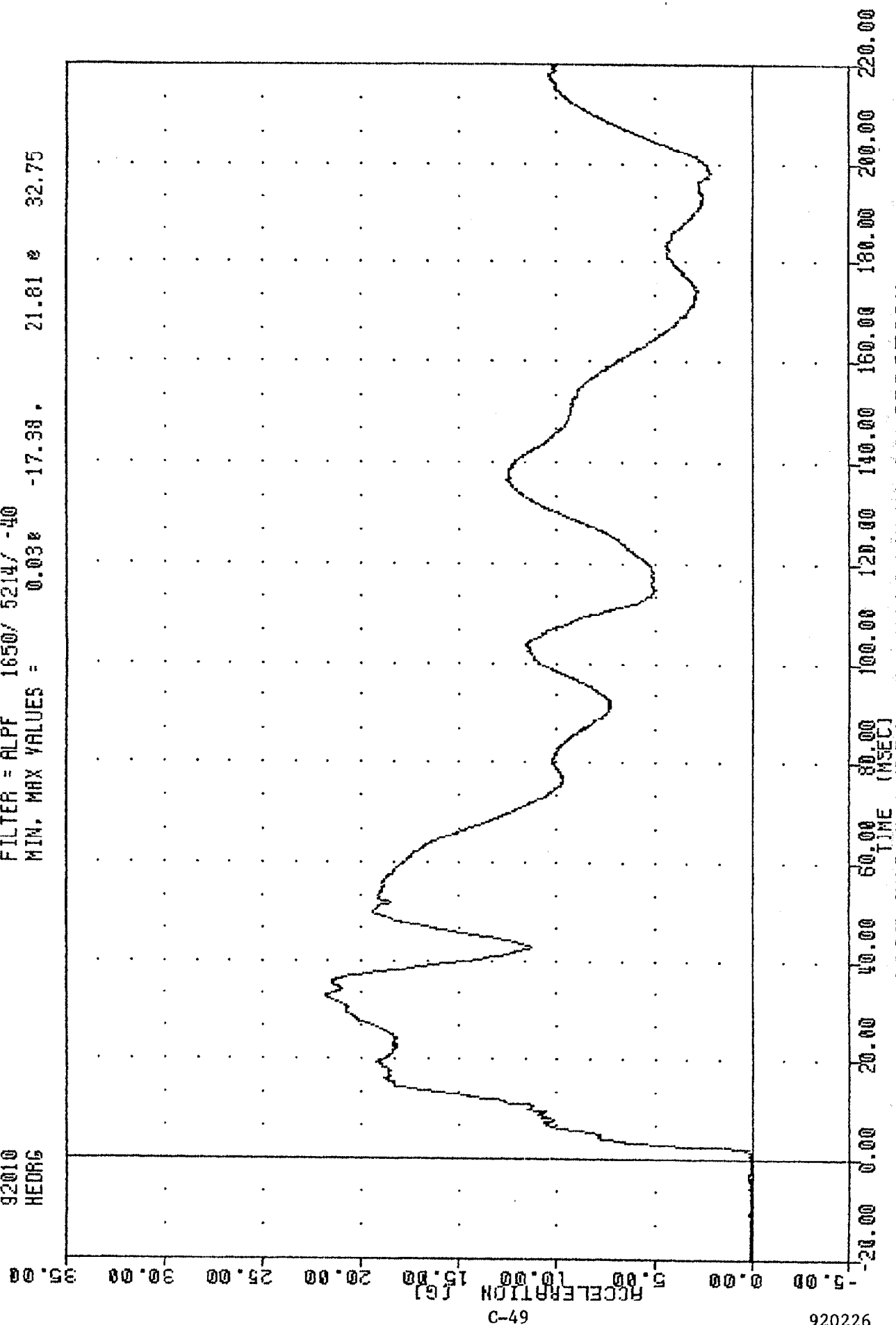


PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION Z AXIS

TRC
5728 SN 828 HEAD/NECK CAL 28
92010
HEADG

, HN82628

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.03% 21.81% 32.75
-17.38.



C-49

920226

5728 SN 826 HEAD/NECK CAL 28

92010

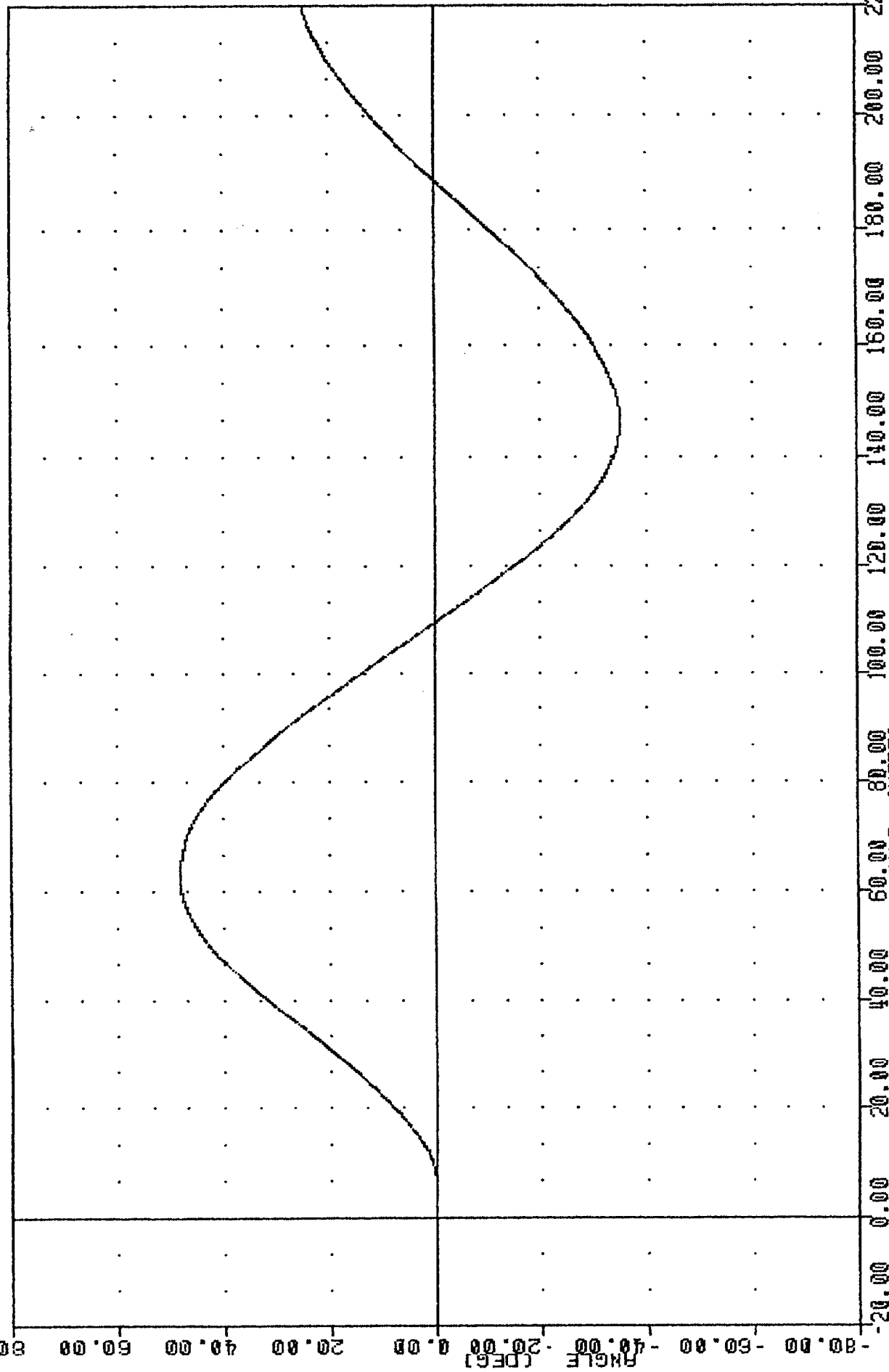
BETA

FILTER = BLPF 100/ 317/ -40

MIN. MAX VALUES = -35.14 146.50 48.19 62.38

80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
-60.00
-80.00

C-50



920226

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

TRC
572B SN 826 HEAD/NECK CAL 28
92010
THETA

HN82628

FILTER = BLPF 100/ 317/ -40

MIN. MAX VALUES = -11.79e 150.00, 17.98 e 57.25

80.00

60.00

40.00

20.00

0.00

C-51

ANGLE (DEG)

-80.00

-60.00

-40.00

-20.00

0.00

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

ROTATION ABOUT THE HEAD C.G.

920226

572B SN 826 HEAD/NECK CAL 28

92010

TOTAN

FILTER = BLPF 100/ 317/ -40

MIN. MAX VALUES = -46.80 147.50 , 66.15 62.38

80.00

60.00

40.00

20.00

0.00

-20.00

-40.00

-60.00

-80.00

ANGLE (DEG)

-20.00

-40.00

-60.00

-80.00

-100.00

-120.00

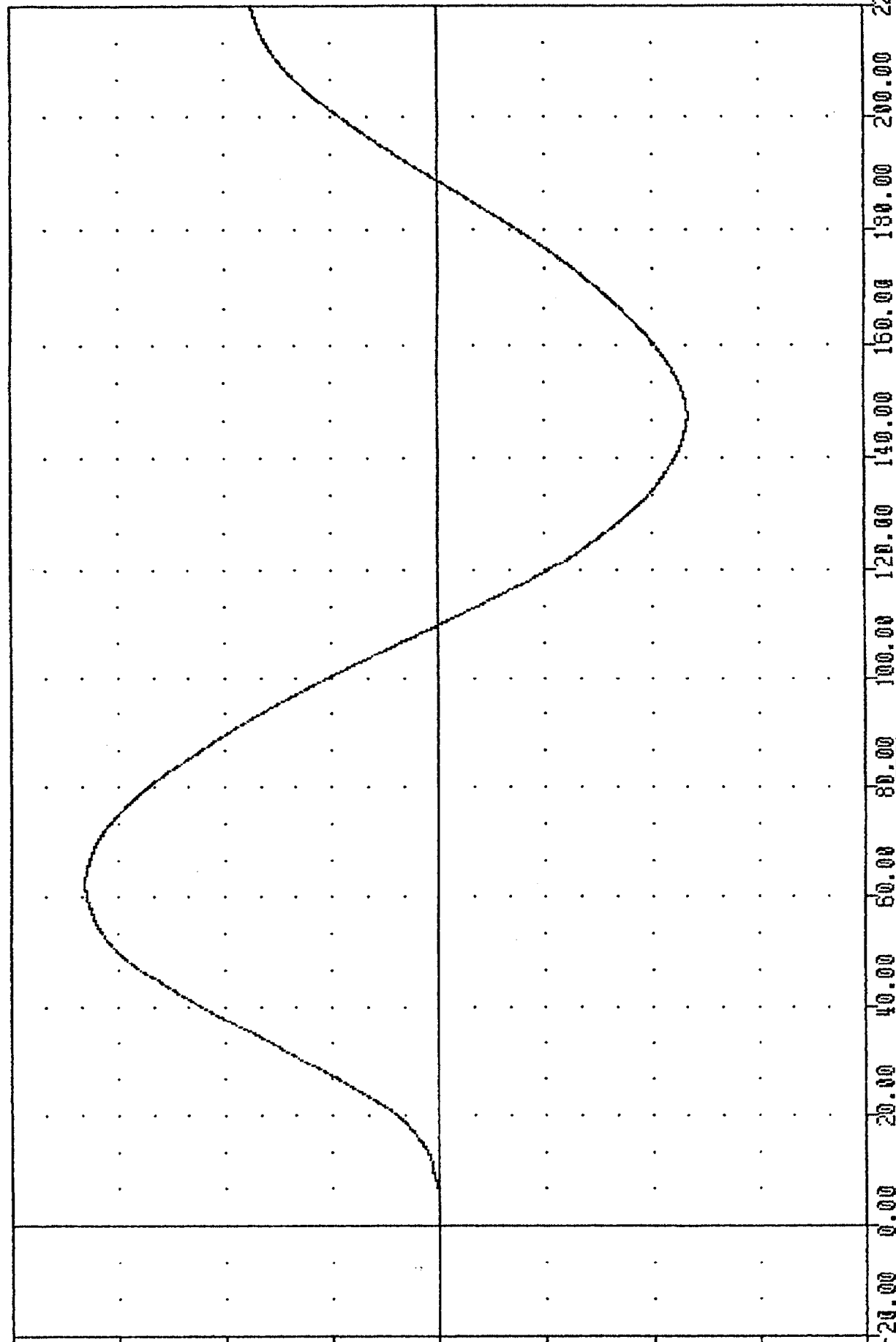
-140.00

-160.00

-180.00

C-52

920226

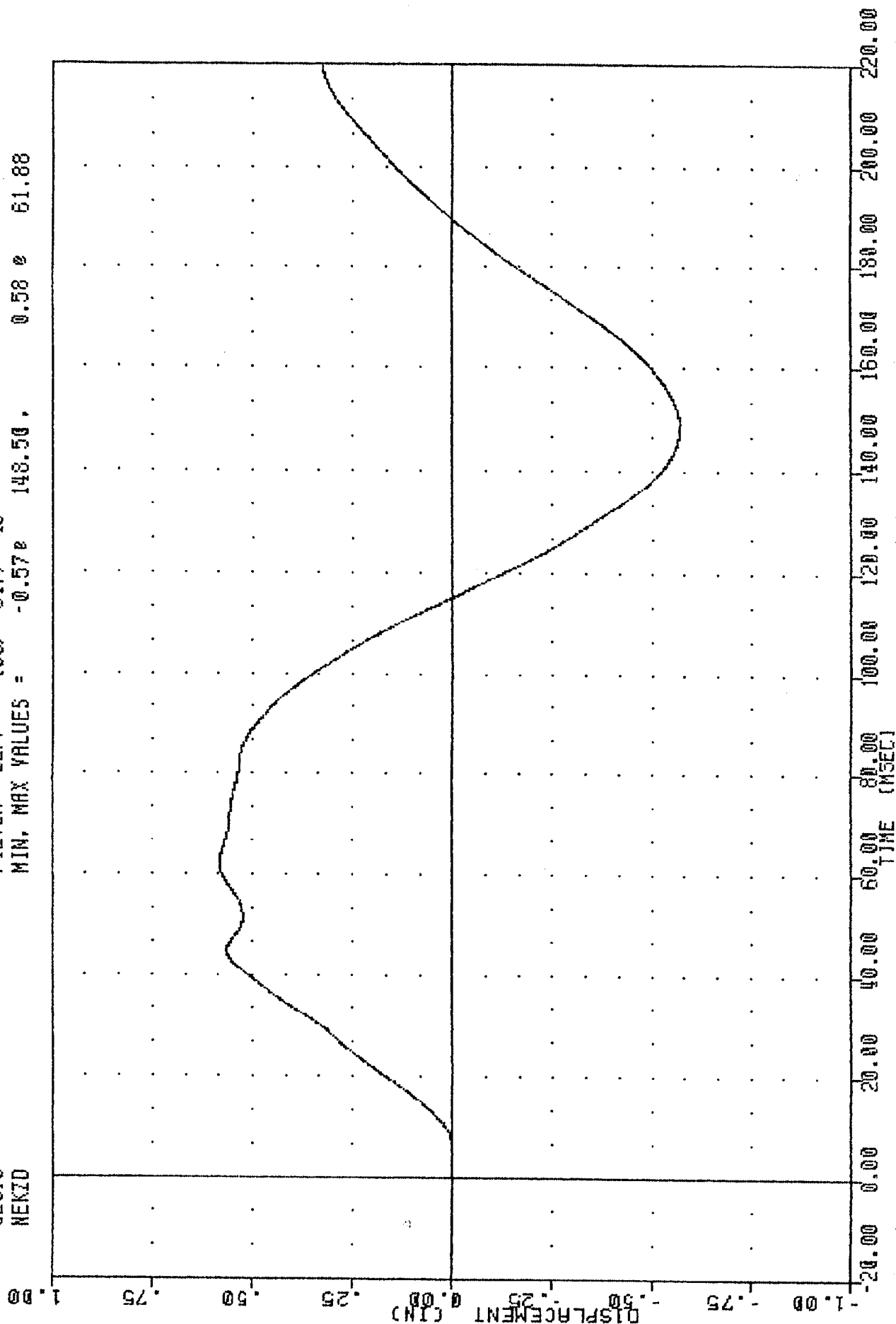


PART 572-B HYBRID II HEAD/NECK CALIBRATION
TOTAL ROTATION

TRC
5728 SN 826 HEAD/NECK CRL 28
92010
NEKZD

, HN82628

FILTER = BLPF 100/ 317/ -40
MIN. MAX VALUES = -0.57e 148.50 , 0.58 e 61.88



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

572B SN 026 HEAD/NECK CAL 28

92010

NEKCD

FILTER = BLPF 100/ 317/ -40

MIN. MAX VALUES = 0.00e -20.00 , 5.12 e 62.38

7.00

6.00

5.00

4.00

3.00

2.00

1.00

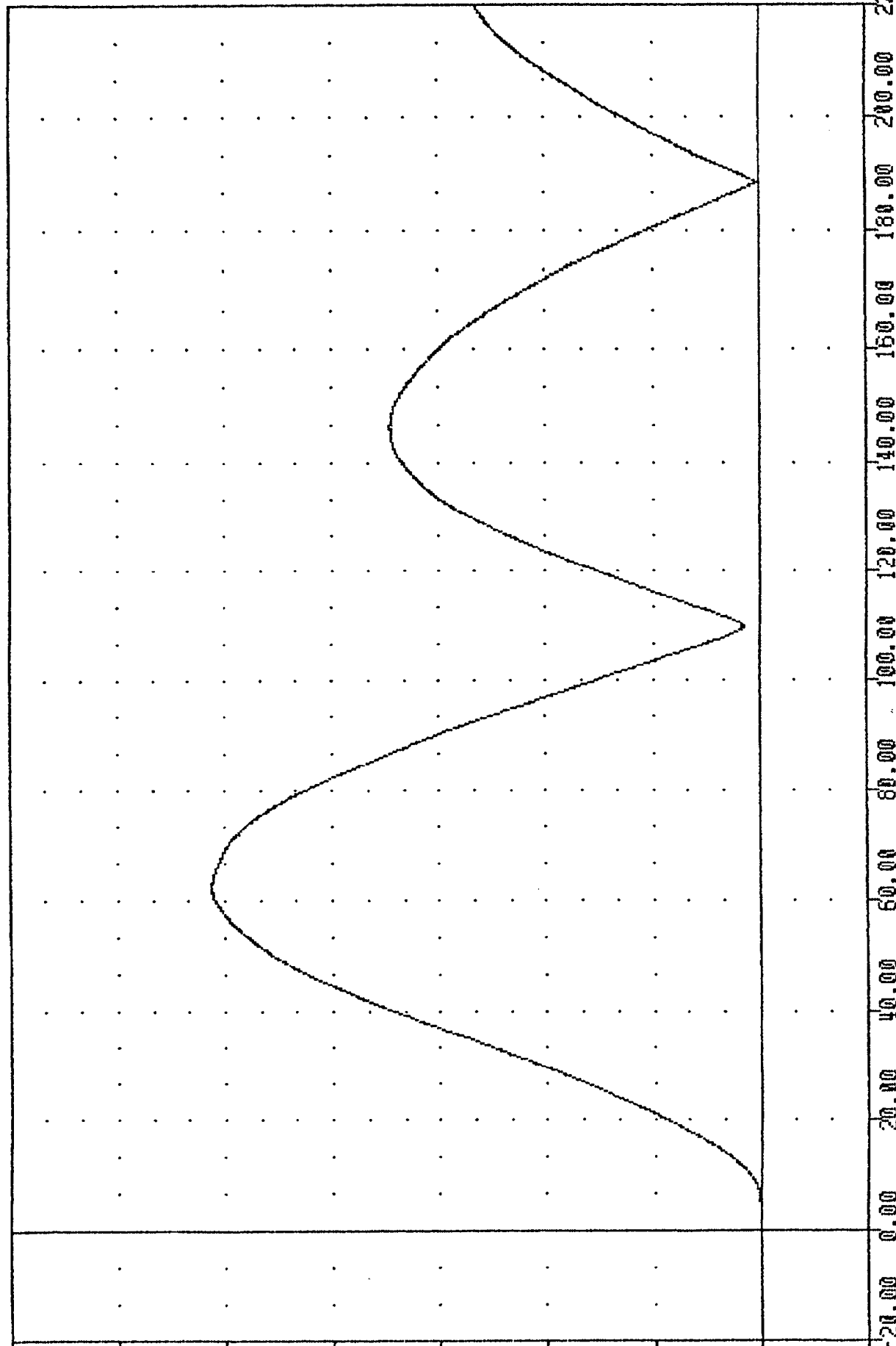
0.00

-1.00

-2.00

C-54

920226



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

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

10-Jan-92

TEMPERATURE 70 F
TRC TH82628

RELATIVE HUMIDITY 34 %
572B SN 826 H.S.THORAX CAL 28

TEST PARAMETER	HIGH SPEED TEST	
	SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	21.78-22.22 FT/SEC	21.92 FT/SEC
PEAK DEFLECTION	1.7 IN max.	1.39 IN
PEAK RESISTIVE FORCE	2,250. LB max.	2045. LB
INTERNAL HYSTERESIS	50% - 70%	68.1%

SCD: 2.15 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chris Middel

572B SN 026 H.S. THORAX CAL 2B

92010

PENXG

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 0.06e

-5.63,

39.70 e

11.88

70.00

60.00

50.00

40.00

30.00

20.00

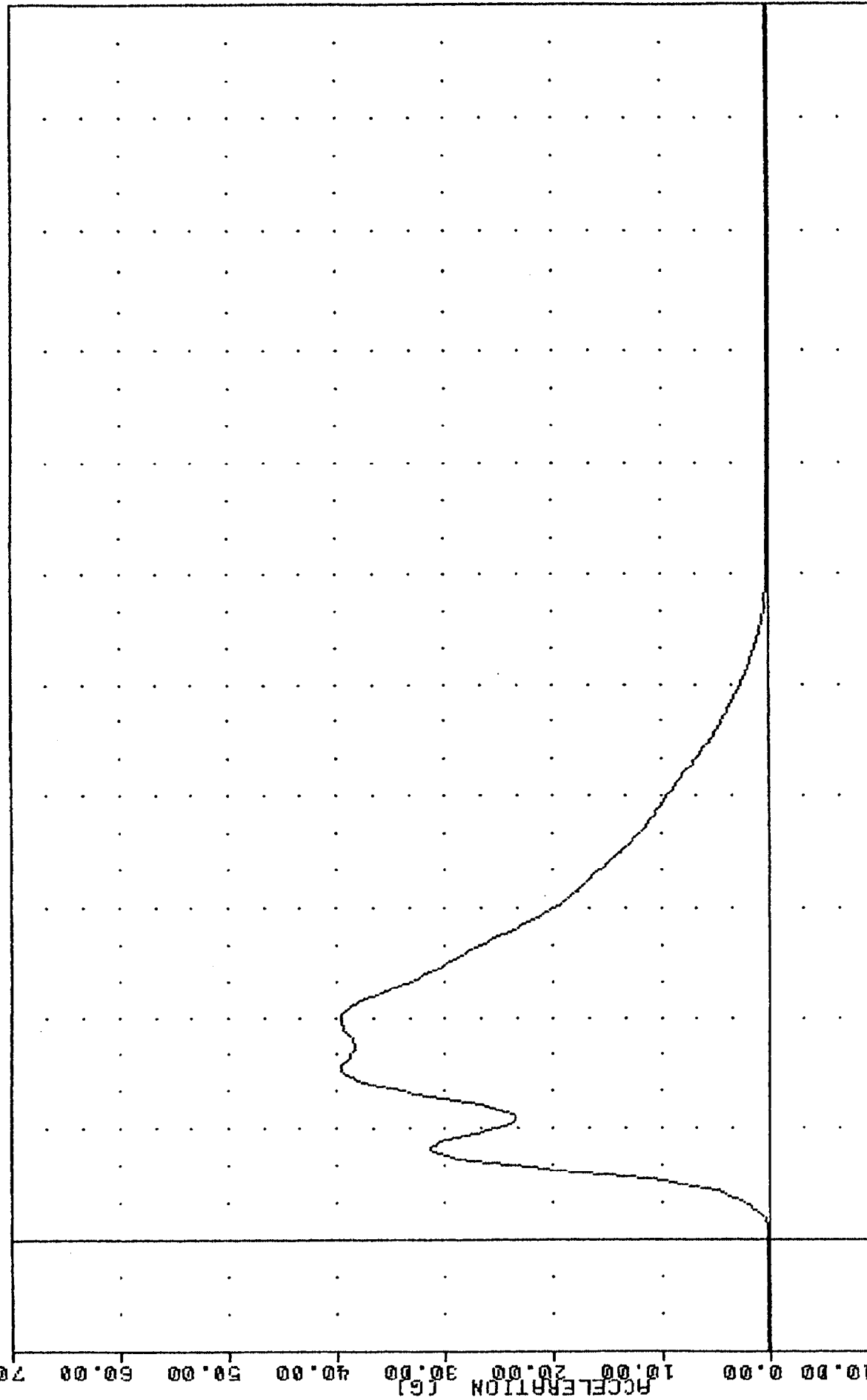
10.00

0.00

-10.00

C-56

920226



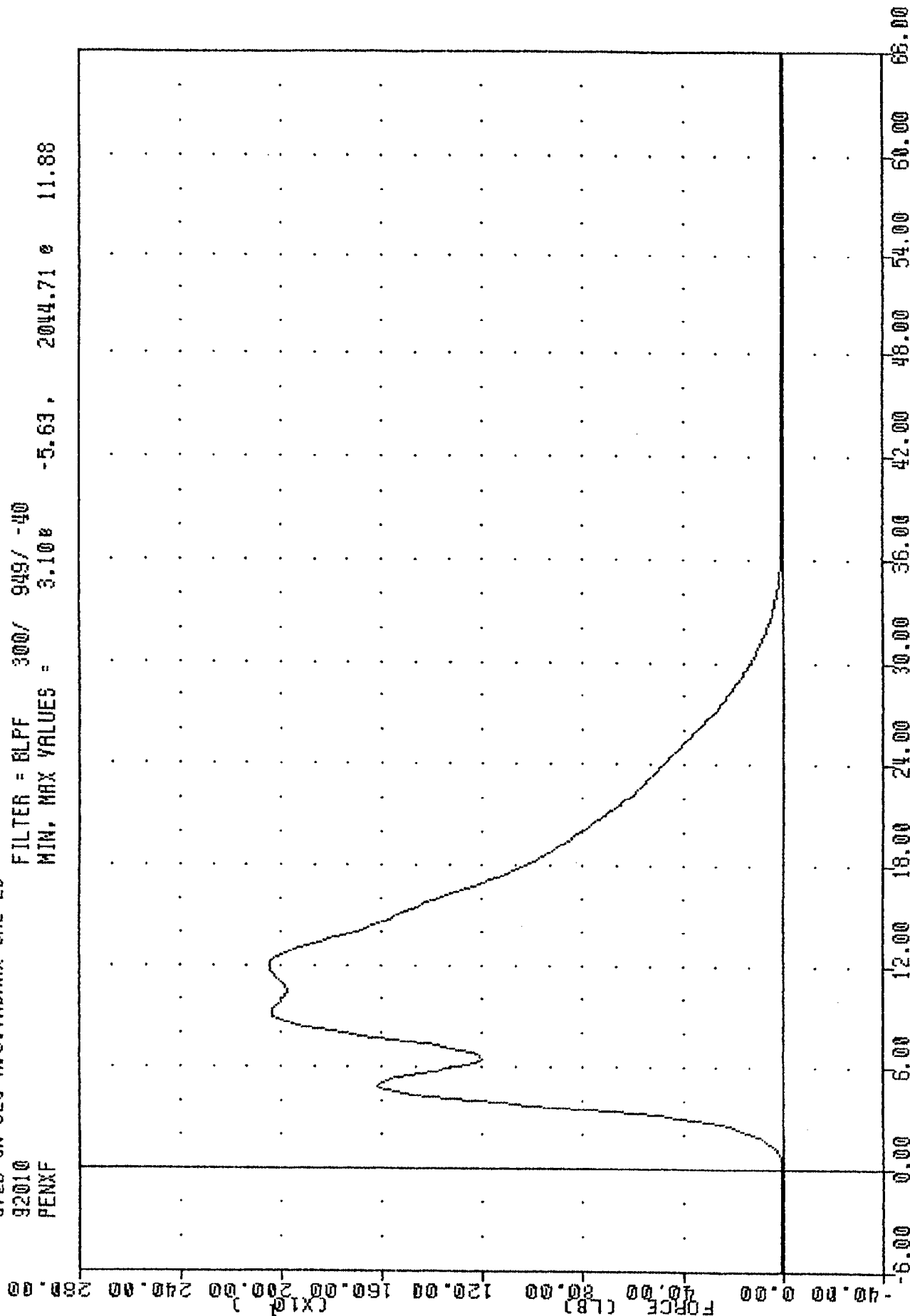
-6.00 0.00 6.00 12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00 60.00 66.00

TIME (MSEC)

PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
PENDULUM DECELERATION

TRC
 572B SN 026 H.S. THORAX CAL 2B
 92010
 PENXF

FILTER = BLPF 300/ -40
 MIN. MAX VALUES = 3.10e -5.63, 2044.71 e 11.88



PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
 PENDULUM FORCE

5728 SN 826 H.S. THORAX CHL 28

92010

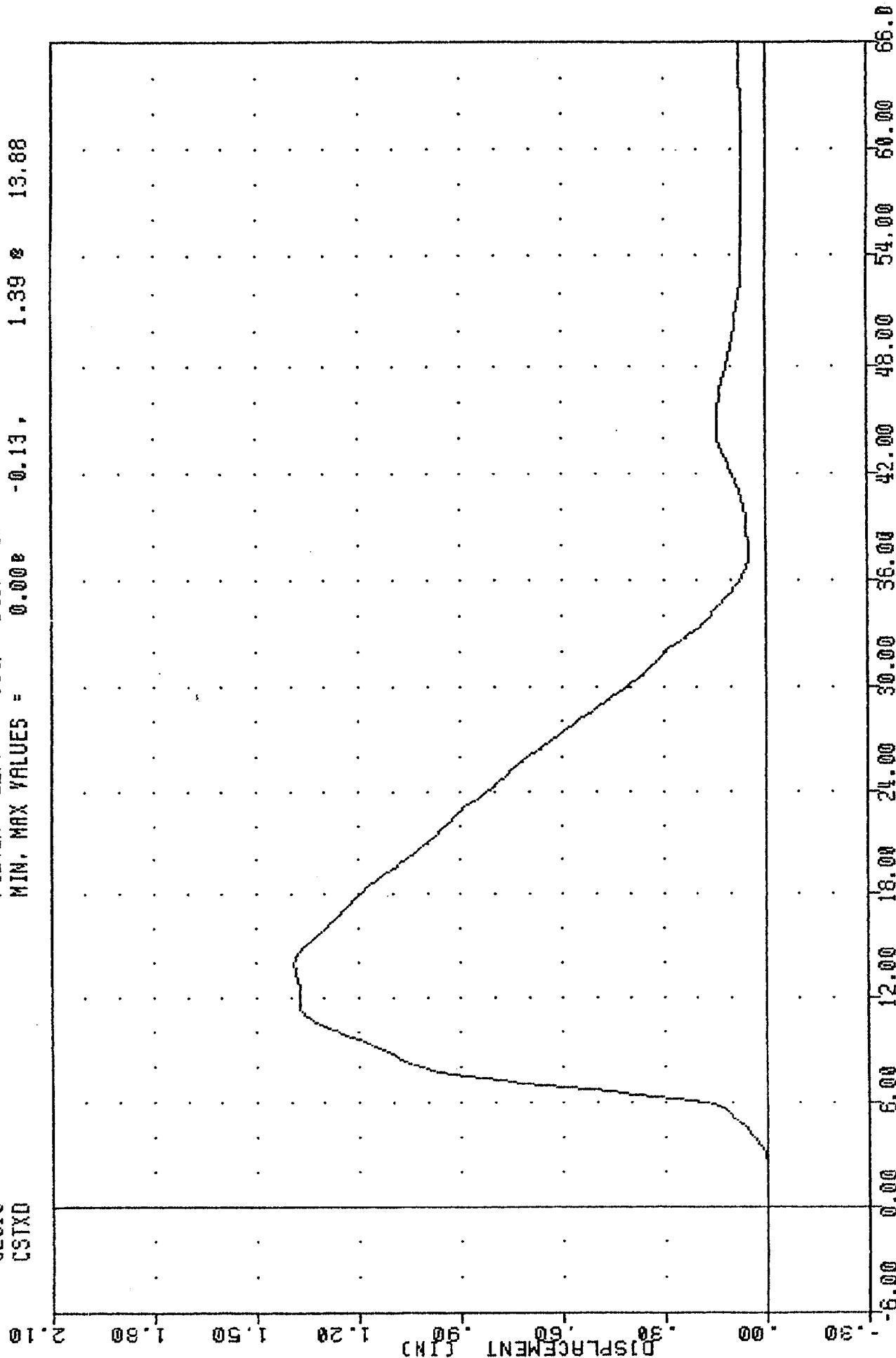
CSTXD

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = 0.00e

-0.13,

1.39 e 13.88



PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
STERNUM DISPLACEMENT

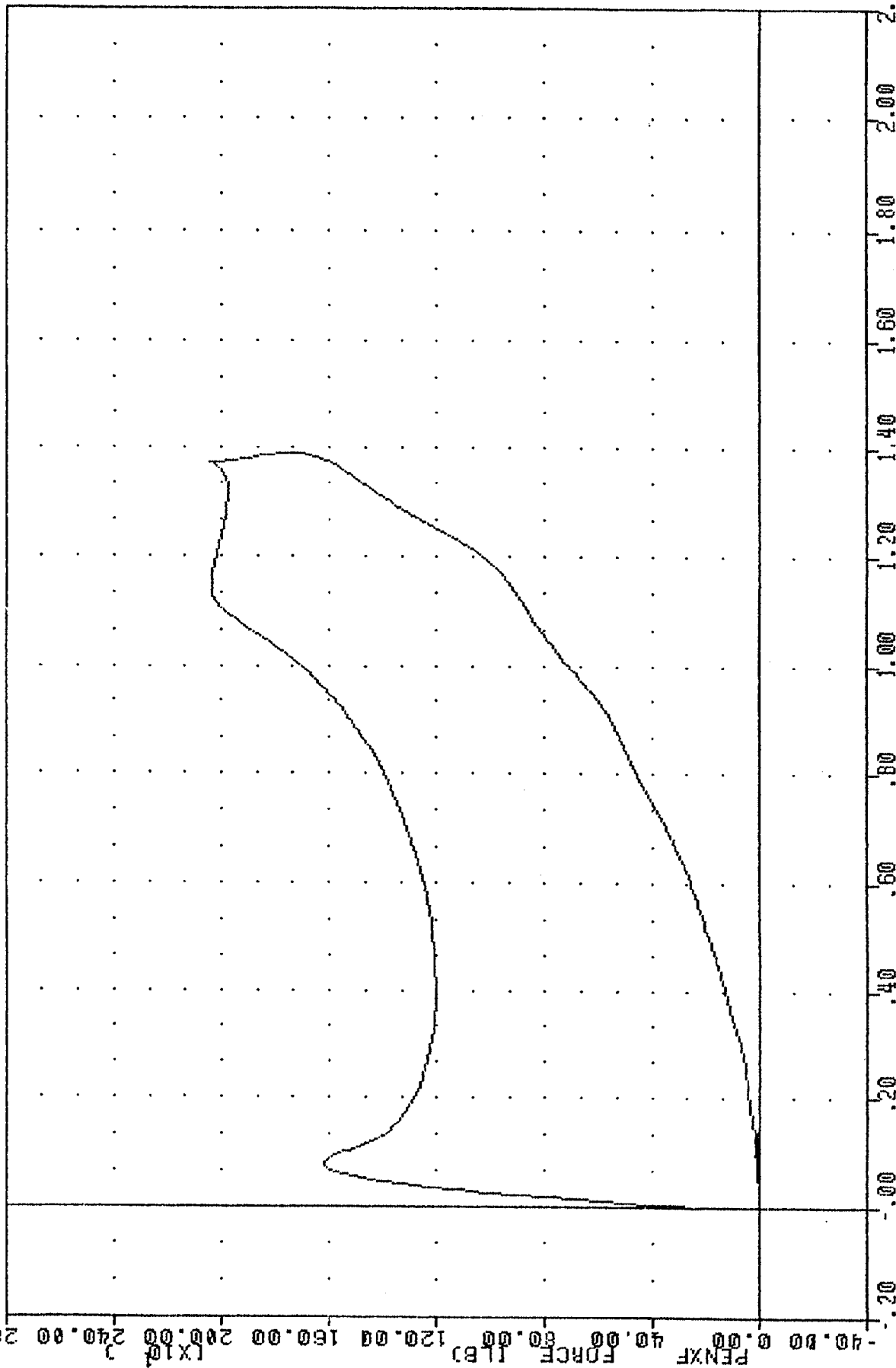
TRC
CSTXD
PENXF

572B SN 826 H. S. THORAX CAL 28
300/ 949/ -40 MIN. MAX =
300/ 949/ -40 MIN. MAX =

92010
0.00 e
3.10 e

-0.13
-5.83
1.39 e
2044.71 e
13.88
11.88

40.00
0.00
-40.00
200.00
240.00
280.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
240.00
260.00
280.00
300.00
320.00
340.00
360.00
380.00
400.00
420.00
440.00
460.00
480.00
500.00
520.00
540.00
560.00
580.00
600.00
620.00
640.00
660.00
680.00
700.00
720.00
740.00
760.00
780.00
800.00
820.00
840.00
860.00
880.00
900.00
920.00
940.00
960.00
980.00
1000.00



PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
CHEST DISPLACEMENT VS PENDULUM FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

10-Jan-92

TEMPERATURE 70 F
TRC TL82628

RELATIVE HUMIDITY 34 %
572B SN 826 L. S. THORAX CAL 28

TEST PARAMETER	LOW SPEED TEST	
	SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	13.86-14.14 FT/SEC	13.97 FT/SEC
PEAK DEFLECTION	1.1 IN max.	0.94 IN
PEAK RESISTIVE FORCE	1,450. LB max.	1368. LB
INTERNAL HYSTERESIS	50% - 70%	68.1%

SCD: 2.15 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Chas Middleton

TRC
572B SN 826 L.S.THORAX CAL 28
92010
PENXG

TL82628

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.01e 44.75, 26.56 e 10.38

70.00

60.00

50.00

40.00

30.00

20.00

10.00

0.00

-10.00

-20.00

-30.00

-40.00

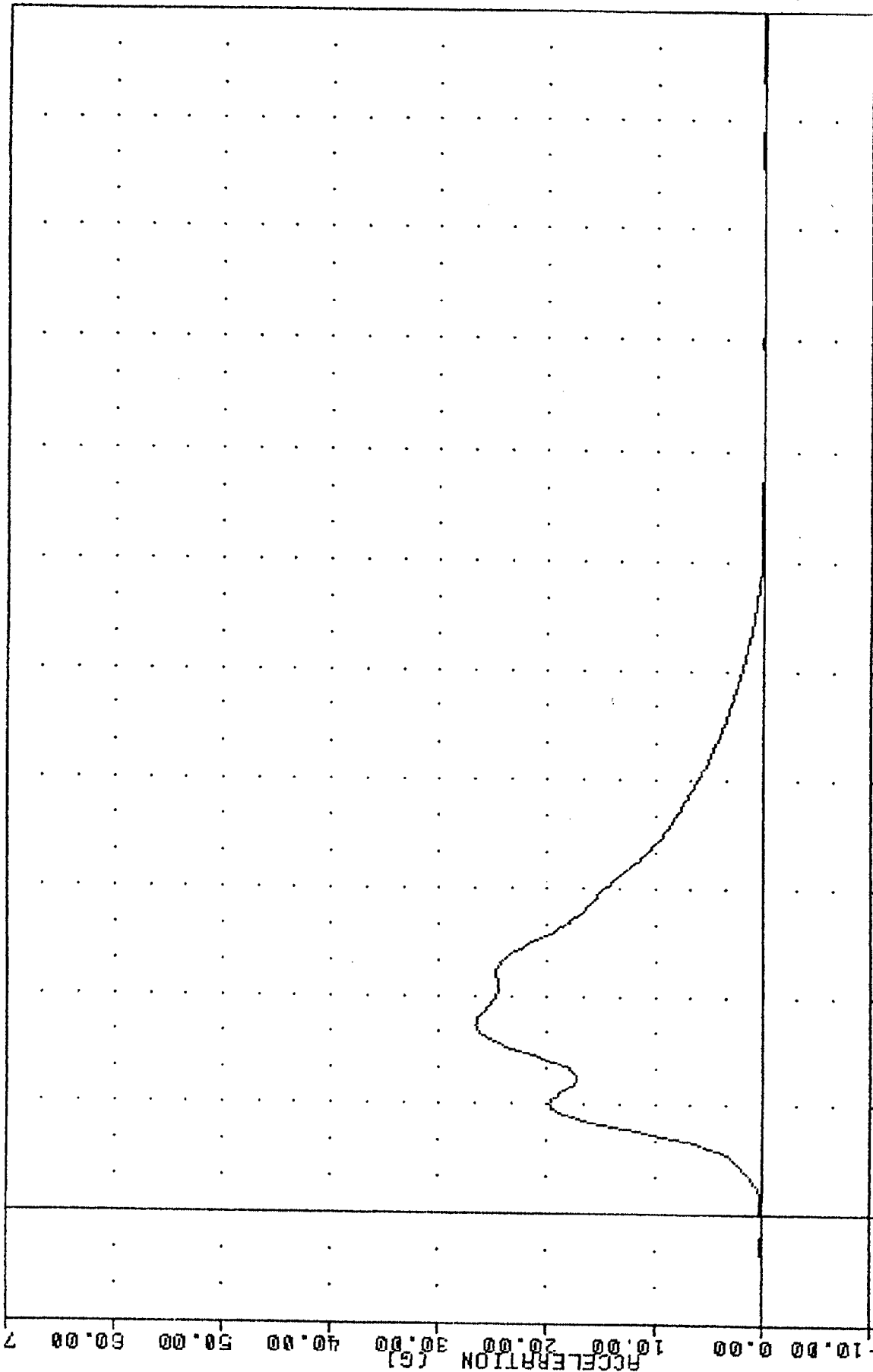
-50.00

-60.00

-70.00

19-C

920226



PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
PENDULUM DECELERATION

572B SN 026 L.S. THORAX CAL 2B

92010

PENXF

FILTER = BLPF 300/ -40

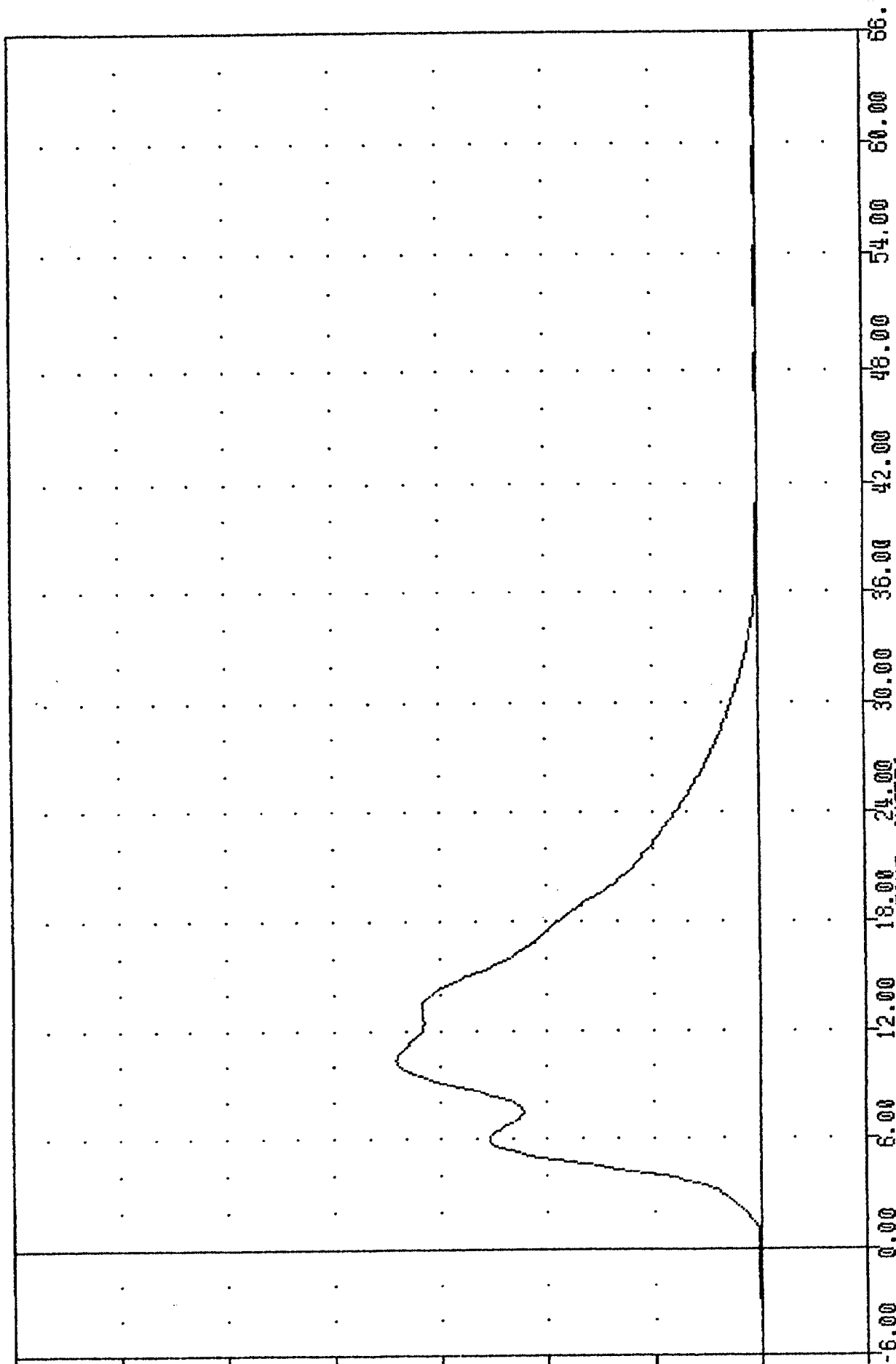
MIN. MAX VALUES = 0.288

44.75, 1367.91 @ 10.38

FORCE (LB) (X10³)

C-62

920226



PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
PENDULUM FORCE

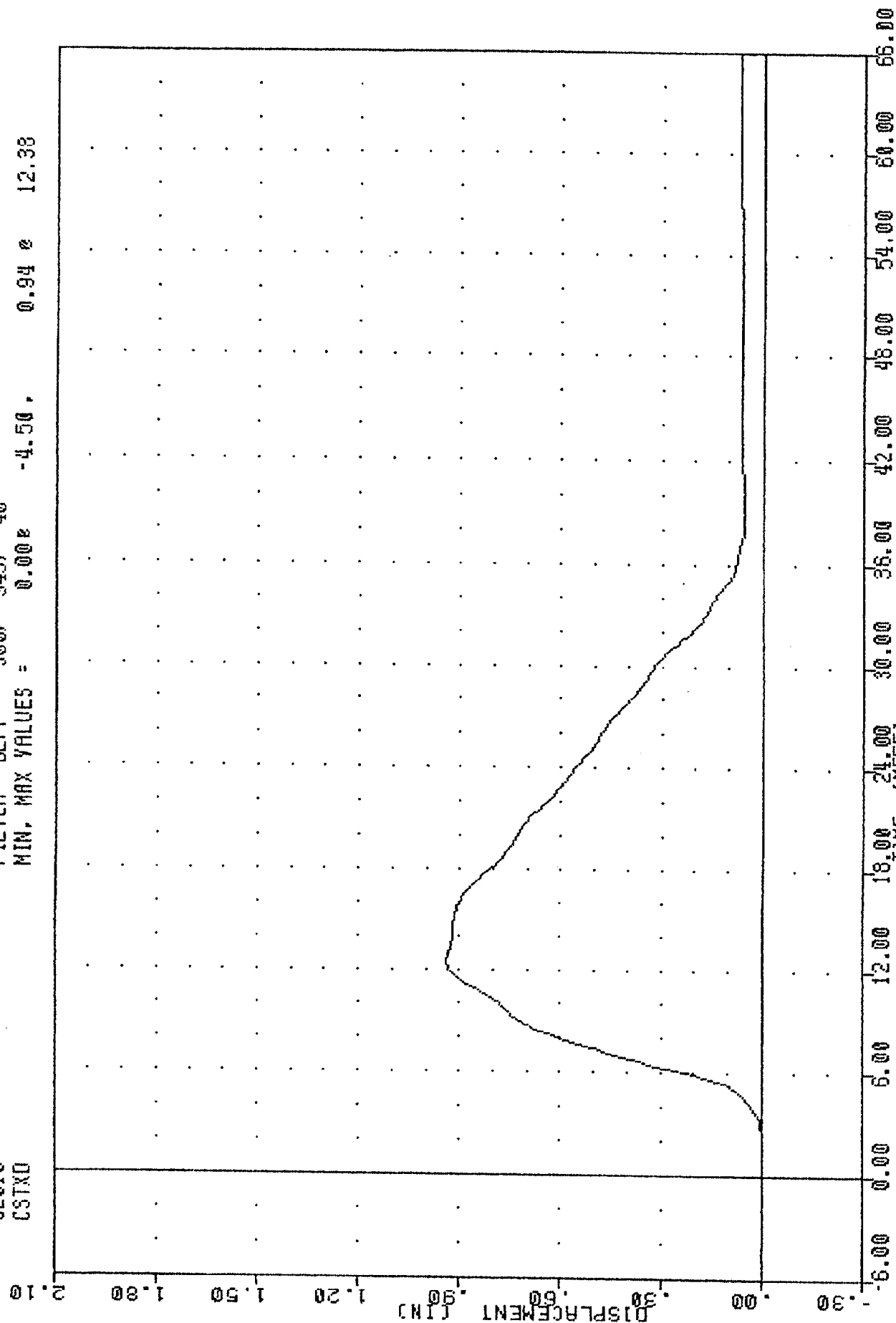
TRC
572B SN 826 L.S.THORAX CAL 28
92010
CSTXD

, TL82628

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 0.00e

-4.50, 0.94 e 12.38

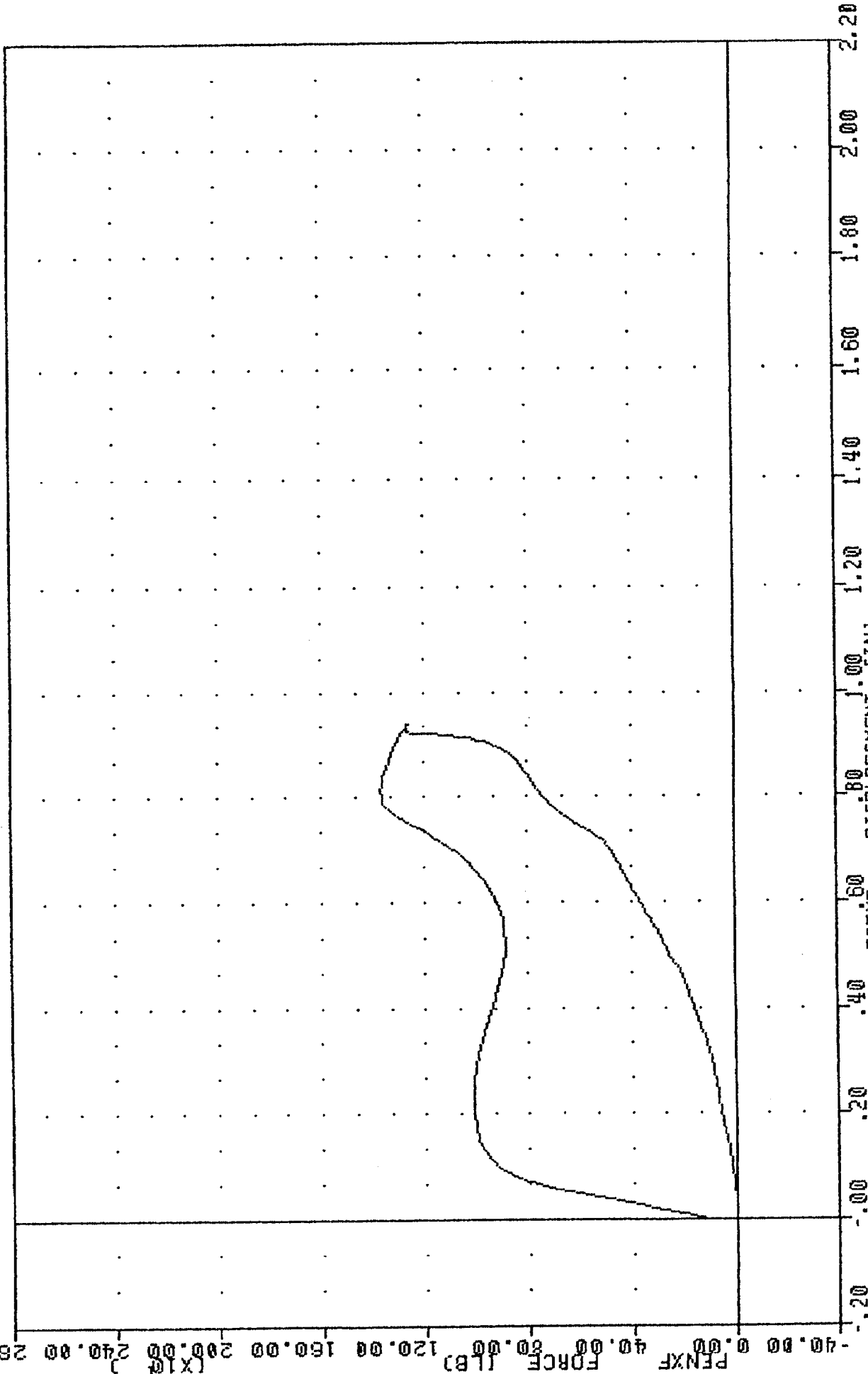


C-63

920226

PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
STERNUM DISPLACEMENT

L21AD FILTER = 0LFF 3000/ 940/ -40 MIN, MAX = 0.28 44.75 1367.01 10.98
 PENXF FILTER = 8LFF 3000/ 940/ -40 MIN, MAX = 0.28 44.75 1367.01 10.98



PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
 CHEST DISPLACEMENT VS PENDULUM FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMEN COMPRESSION TEST

PART 572

09-Jan-92

TEMPERATURE 70 F
TRC AB82628

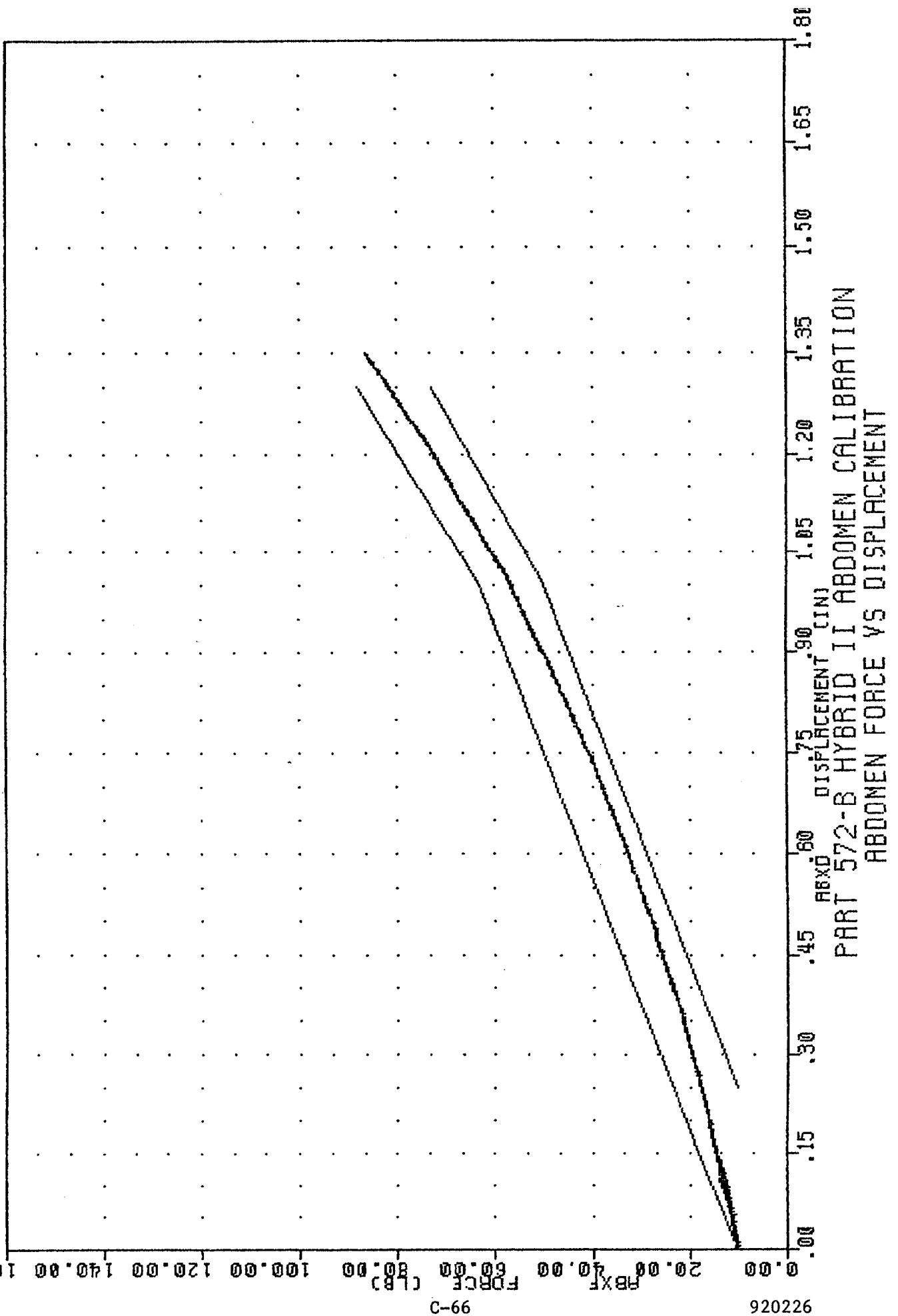
RELATIVE HUMIDITY 49 %
572B SN 826 ABDOM COMPR CAL 28

TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0.00 IN	10.00 LBS	10.00 LBS
0.50 IN	23.00 - 36.00 LBS	27.58 LBS
0.75 IN	36.00 - 50.00 LBS	40.69 LBS
1.00 IN	50.00 - 63.00 LBS	56.52 LBS
1.30 IN	73.00 - 88.00 LBS	81.43 LBS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middleton

HBXU FILIER = HLPF 1650/ 5214/ -40 MIN. MAX = 0.0000 1.32 * 00.43
 ABXF FILTER = HLPF 1650/ 5214/ -40 MIN. MAX = 0.01 86.85 * 1.35



TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572

10-JAN-92

TEMPERATURE 70 F
TRC LF82629

RELATIVE HUMIDITY 49 %
572B SN826 LUMBAR FLEX CAL28

DEFLECTION	SPECIFICATION	TEST RESULTS
0 DEG	0 LB	0.00 LB
20 DEG	22.00 - 34.00 LB	28.00 LB
30 DEG	34.00 - 46.00 LB	39.00 LB
40 DEG	46.00 - 58.00 LB	53.00 LB
NET RETURN ANGLE	< 12 DEG	0.00 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

11-Jan-92

TEMPERATURE 69 F
LEFT KNEE
TRC LK82628

RELATIVE HUMIDITY 38 %
572B SN 826 L.KNEE IMP CAL 28

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.93 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LB	2034.74 LB
DURATION ABOVE 1000 LB	≥ 1.7 MSEC	2.06 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

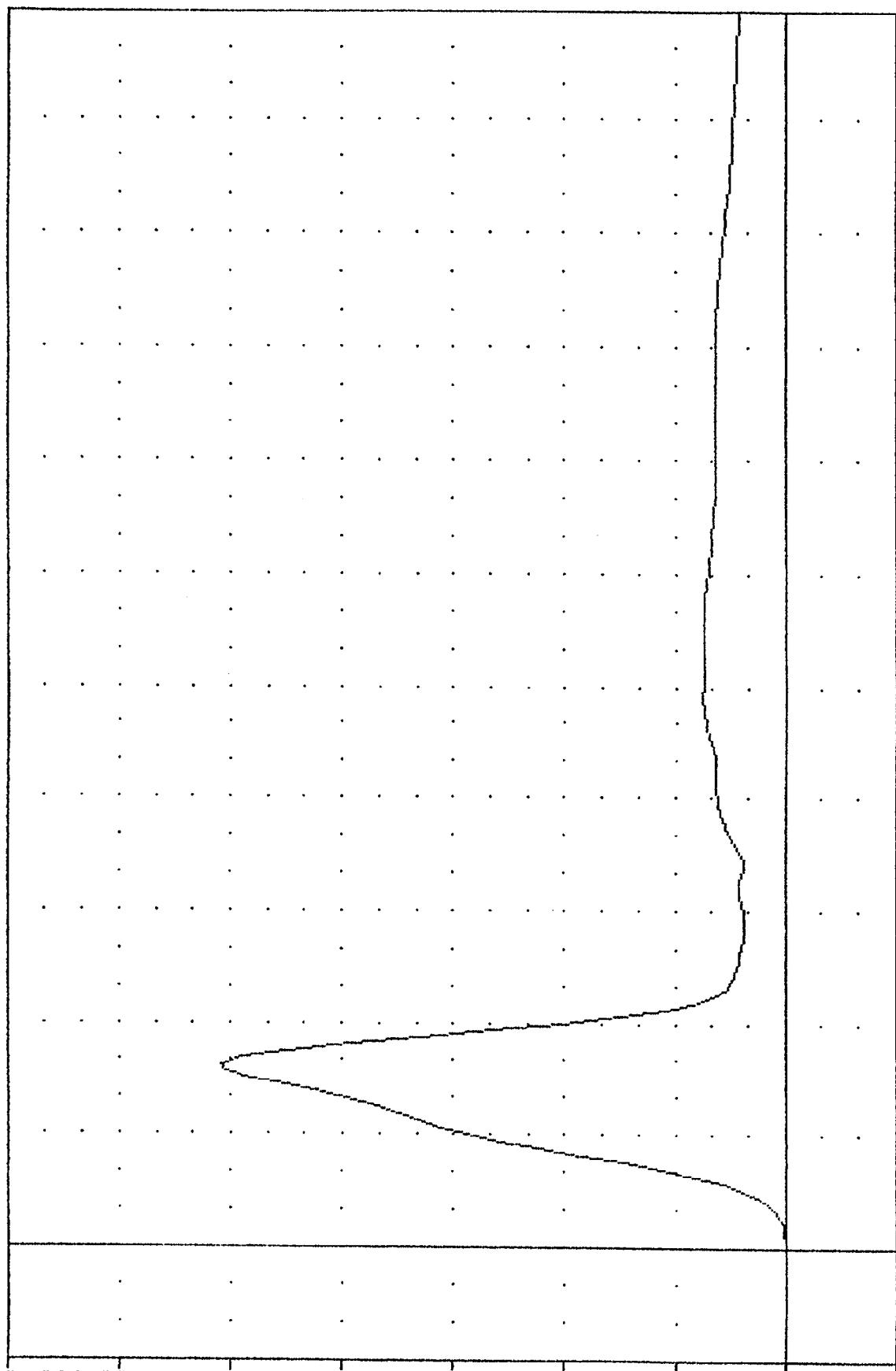
Chas Middleton

TRC
5720 SN 026 L.KNEE INP CAL 20
92011
LFMF

LK82628

FILTER = BLPF 1000/ 3162/ -40
MIN. MAX VALUES = -0.628 -1.88 2034.74 3.25

FORCE (LB)
-40.00 0.00 40.00 80.00 120.00 160.00 200.00 240.00 280.00
(X10³)



-2.00 0.00 2.00 4.00 6.00 8.00 10.00 12.00 14.00 16.00 18.00 20.00 22.00
TIME (MSEC)

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

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

10-Jan-92

TEMPERATURE 70 F
RIGHT KNEE
TRC RK82628

RELATIVE HUMIDITY 40 %
572B SN 826 R.KNEE IMP CAL 28

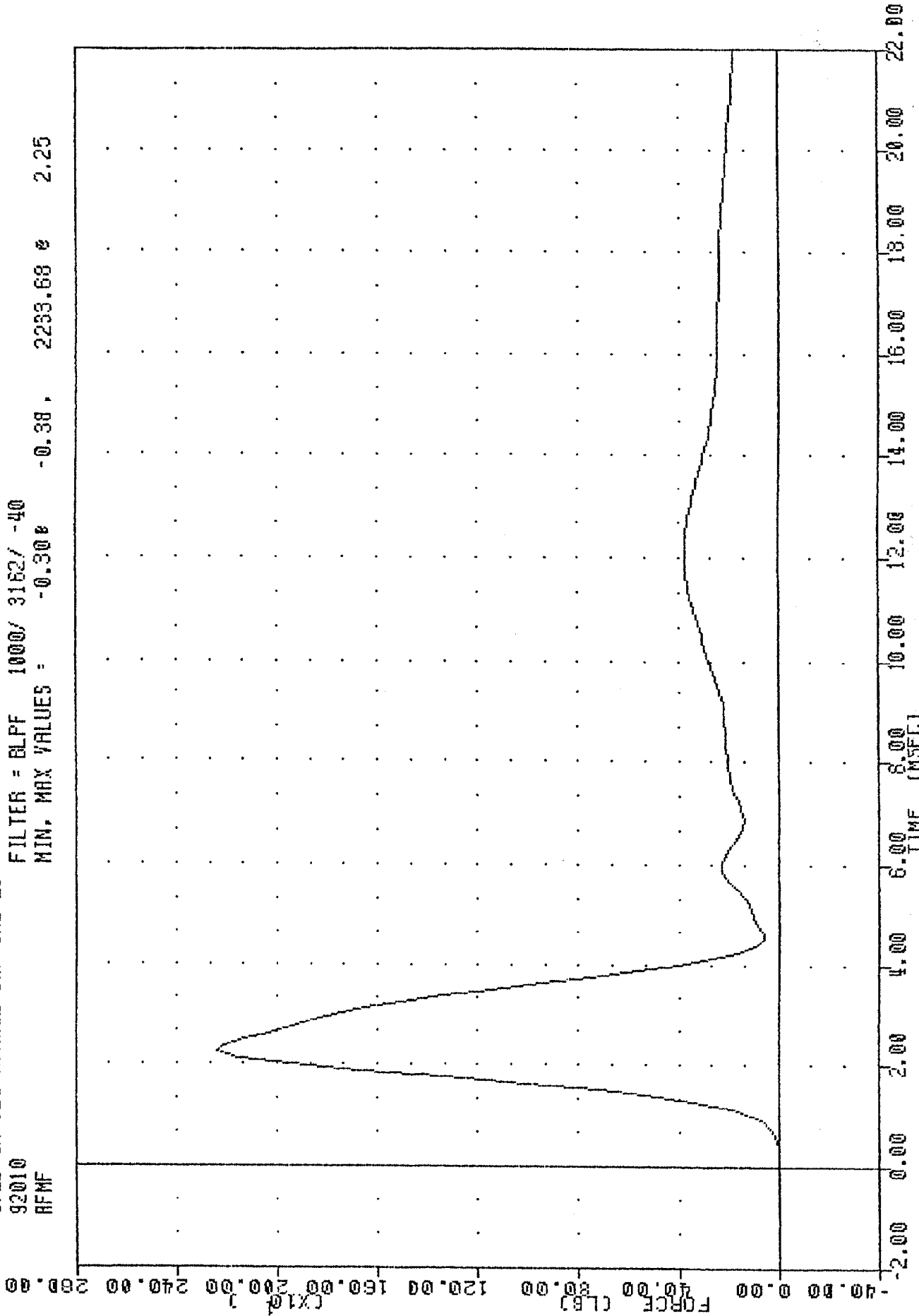
TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.97 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LB	2233.68 LB
DURATION ABOVE 1000 LB	>=1.7 MSEC	1.97 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

TRC
5728 SN 826 R.KNEE INP DAL 28
92010
AFMF

FILTER = BLPF 1000/ 3162/ -40
MIN. MAX VALUES = -0.30 2233.68 2.25



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

APPENDIX D

MISCELLANEOUS TEST INFORMATION

DUMMY INSTRUMENT CALIBRATIONS

DRIVER DUMMY #713

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCEL.	CW96H	7264	ENDEVCO	01/08/92	07/08/92
Y-AXIS ACCEL.	DN99JC	7264	ENDEVCO	01/08/92	07/08/92
Z-AXIS ACCEL.	CR78H	7264	ENDEVCO	01/08/92	07/08/92
CHEST X-AXIS ACCEL.	CC71H	7264	ENDEVCO	01/08/92	07/08/92
Y-AXIS ACCEL.	CY32H	7264	ENDEVCO	01/08/92	07/08/92
Z-AXIS ACCEL.	CG13H	7264	ENDEVCO	01/08/92	07/08/92
LEFT FEMUR FORCE LOAD CELL	901	2430	GSE	01/09/92	07/09/92
RIGHT FEMUR FORCE LOAD CELL	902	2430	GSE	01/09/92	07/09/92
*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	571	3419	LEBOW	09/12/91	03/12/92
SHOULDER BELT FORCE LOAD CELL	616	3419	LEBOW	09/12/91	03/12/92
SHOULDER BELT SPOOL-OUT POTENTIOMETER	A12899	PT-101-40A	CELESCO	11/27/91	05/27/92
SHOULDER BELT STRETCH POTENTIOMETER	2087	2051414101	BOURNES	11/27/91	05/27/92

*HYBRID III USE ONLY.

DUMMY INSTRUMENT CALIBRATIONS

PASSENGER DUMMY #826

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCEL.	CL95H	7264	ENDEVCO	01/08/92	07/08/92
Y-AXIS ACCEL.	DW12J	7264	ENDEVCO	01/08/92	07/08/92
Z-AXIS ACCEL.	CC11H	7264	ENDEVCO	01/08/92	07/08/92
CHEST X-AXIS ACCEL.	DB74H	7264	ENDEVCO	01/08/92	07/08/92
Y-AXIS ACCEL.	CY31H	7264	ENDEVCO	01/08/92	07/08/92
Z-AXIS ACCEL.	CH67H	7264	ENDEVCO	01/08/92	07/08/92
LEFT FEMUR FORCE LOAD CELL	880	2430	GSE	01/09/92	07/09/92
RIGHT FEMUR FORCE LOAD CELL	898	2430	GSE	01/09/92	07/09/92
*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	236	3419	LEBOW	10/19/91	04/19/92
SHOULDER BELT FORCE LOAD CELL	615	3419	LEBOW	09/12/91	03/12/92
SHOULDER BELT SPOOL-OUT POTENTIOMETER	0586135	PT-101-40A	CELESCO	11/27/91	05/27/92
SHOULDER BELT STRETCH POTENTIOMETER	NA	2051414101	BOURNES	11/27/91	05/27/92

*HYBRID III USE ONLY.

VEHICLE AND CALIBRATION LABORATORY INSTRUMENT CALIBRATIONS

VEHICLE ACCELEROMETERS					CALIBRATION DATE	
	SERIAL NO.	MODEL NO.	MFR.	LAST	DUE	
LEFT SEAT REAR CROSSMEMBER X-AXIS	CW11H	7264	ENDEVCO	12/16/91	06/16/92	
RIGHT REAR SEAT CROSSMEMBER X-AXIS	CT68H	7264	ENDEVCO	09/18/91	03/18/92	
ENGINE TOP X-AXIS	CH24H	7264	ENDEVCO	12/02/91	06/02/92	
ENGINE BOTTOM X-AXIS	BW77H	7264	ENDEVCO	11/27/91	05/27/92	
RIGHT BRAKE CALIPER X-AXIS	CG67H	7264	ENDEVCO	12/16/91	06/16/92	
LEFT BRAKE CALIPER X-AXIS	CJ39H	7264	ENDEVCO	12/17/91	06/17/92	
INSTRUMENT PANEL CENTER X-AXIS	CC43H	7264	ENDEVCO	09/05/91	03/05/92	
REAR SEAT CROSSMEMBER CENTER Z-AXIS	CK56H	7264	ENDEVCO	09/05/91	03/05/92	
VEHICLE REAR CENTER Z-AXIS	DK59J	7264	ENDEVCO	09/04/91	03/04/92	

CALIBRATION LABORATORY INSTRUMENTS					CALIBRATION DATE	
	SERIAL NO.	MODEL NO.	MFR.	LAST	DUE	
NECK BENDING PENDULUM ACCEL.	CC59	7232	ENDEVCO	10/08/91	04/08/92	
NECK BENDING ROTARY POTENTIOMETER	NA	35435-1-102	BOURNES	MFR. SPECIFICATION		
NECK BENDING LINEAR POTENTIOMETER	NA	5184-2051846003	BOURNES	10/08/91	04/08/92	
THORAX/HYBRID II FEMUR PEND. ACCEL.	CC64	7232	ENDEVCO	10/08/91	04/08/92	
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	10/08/91	04/08/92	
ABDOMEN COMPRESSION FORCE GAUGE	1261	3167	LEBOW	10/08/91	04/08/92	
HYBRID III FEMUR PEND. ACCEL.	CG83	7232	ENDEVCO	10/08/91	04/08/92	

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: ENLONGATION
+KNEE SLIDER DISPLACEMENT: DISTANCE BETWEEN FEMUR AND
TIBIA INCREASED (IN RELATION
TO A SEATED DUMMY)

LOAD CELLS:

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

NECK LOAD CELLS:

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

TIBIA LOAD CELLS:

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

FREQUENCY RESPONSE CLASSES

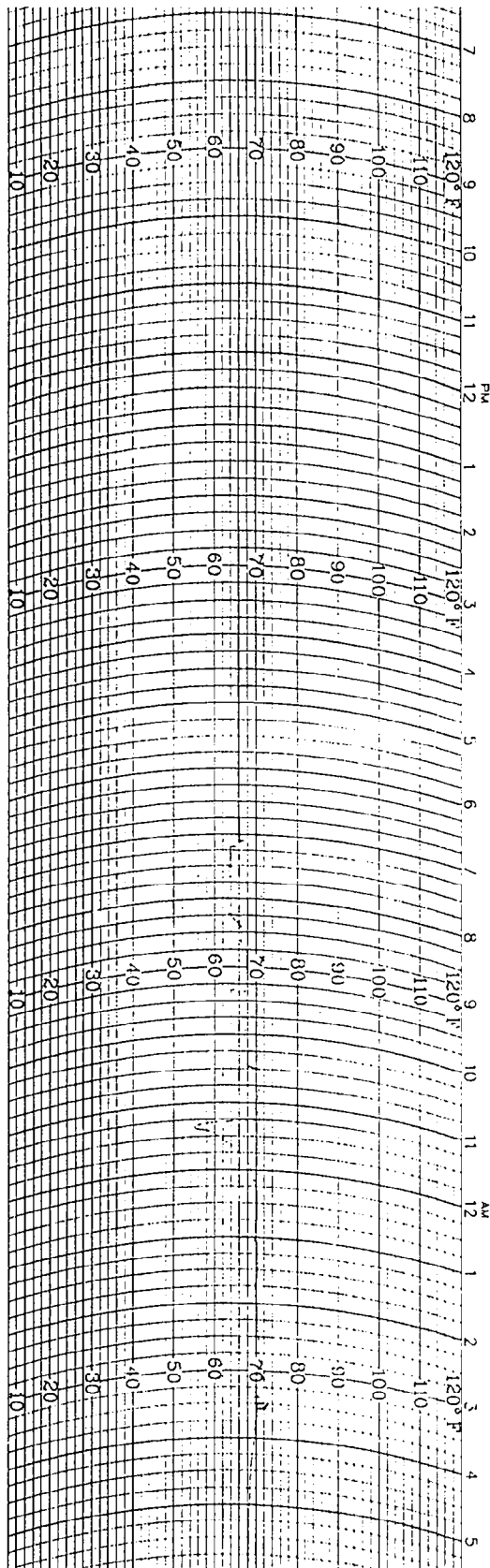
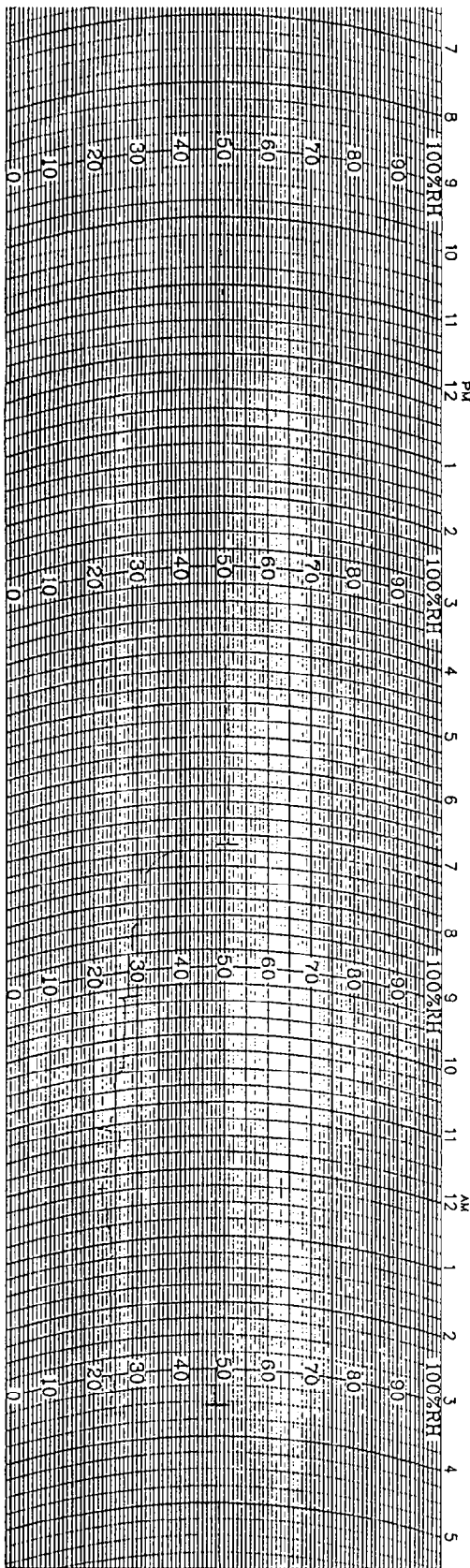
SAE J211 OCT88

TYPICAL TEST MEASUREMENTS

CHANNEL CLASS

Vehicle Structural Accelerations for use in:

Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180
Barrier Face Forces	60
Belt Restraint System Loads	60
Anthropomorphic Test Device	
Head accelerations (linear and angular)	1000
Neck	
Forces	1000
Moments	600
Thorax	
Spine accelerations	180
Rib accelerations	1000
Sternum accelerations	1000
Deflections	180
Lumbar	
Forces	1000
Moments	1000
Pelvis	
Accelerations	1000
Forces	1000
Moments	1000
Femur/Knee/Tibia/Ankle	
Forces	600
Moments	600
Displacements	180
Sled Accelerations	60
Steering Column Loads	600
Headform Accelerations	1000



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C311-D-HF
ECH 2717
6-9-87

STATION CLUB WAGON DATE ON 2/25/92 DATE OFF 2/26/92

APPENDIX E

RESTRAINT SYSTEM INSTRUCTIONS FROM OWNER'S MANUAL

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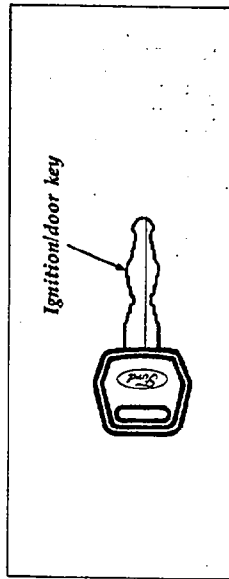
Safety Restraints

Using Safety Restraints Properly

Safety Belts

The use of safety belts help to restrain you and your passengers in case of a collision. In most states, the law requires their use. We strongly recommend that you use them every time you travel in your vehicle.

Safety belts provide best restraint when:



The key for your vehicle

- ☐ the seat back is upright
- ☐ the occupant is sitting upright (not slouched)
- ☐ the lap belt is snug and low on the hips
- ☐ the shoulder belt is snug against the chest
- ☐ the knees are straight forward

For your safety, your vehicle has different types of safety belts:

- ☐ Combination lap and shoulder belts - for people who sit next to the side windows in either front or rear seats
- ☐ Lap belts without retractors

See the following sections for directions on how to properly use these safety belts. Also see *Safety Restraints for Children* in this chapter for special instructions about using safety belts for children.

Warning:

Make sure that you and your passengers, including pregnant women, wear safety belts. Be sure that lap belts fit snugly and as low as possible around the hips. If safety belts are not used properly, the risk of you or your passengers being injured in a collision greatly increases.

Warning:

Always drive and ride with your seatback upright and the lap belt snug and low across the hips to reduce the risk of serious injury to the abdomen or neck that could be caused by sliding under the safety belts in a collision.

Do not allow any people to ride in the cargo area of your vehicle. People who are not riding in seats with their safety belts fastened are much more likely to be injured in a collision.

Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

Children should always ride with the seatback in the fully upright position. When the seatback is not fully upright, there is a greater risk that the child will slide under the safety belt and be seriously injured in a collision.

Never use a single belt for more than one person or across more than one seating position. This greatly increases the risk that one or both of the people will be injured in a collision. Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue that are designed to be used as a pair.

Warning: Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around the neck over the inside shoulder. Failure to follow these precautions could increase the risk and/or severity of injury in an accident.

Warning: Be sure to lock all doors before you drive away. This will lessen your risk of being thrown from the vehicle in a collision.

Combination Lap and Shoulder Belts

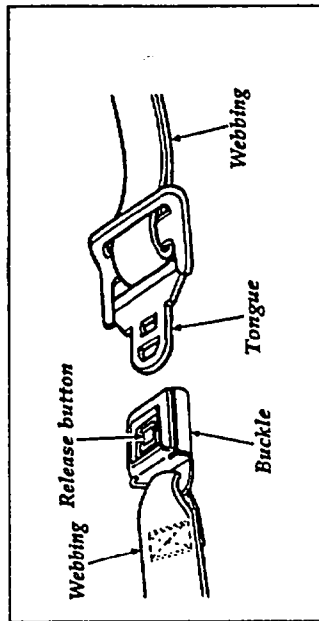
While your vehicle is in motion, the combination lap and shoulder belt adjusts to your movement. However, if you brake hard, corner hard or if your vehicle receives an impact of 5 mph (8 km/h) or more, the lap and shoulder belt locks and prevents you from moving. The front seat belt systems can also be made to lock by jerking on the belt.

After you get into your vehicle, close the door and lock it. Then adjust the seat to the position that suits you best.

To fasten the belt, pull the lap-shoulder belt from the retractor so that the shoulder portion of the belt crosses your shoulder and chest. Insert the belt tongue into the proper buckle until you hear a snap and feel it latch.

Warning: Use the shoulder belt only on the shoulder that is closest to the side of the vehicle. Never wear the belt under your arm. Never swing it around your neck over the inside shoulder. If you do not use the shoulder belt properly, the chances of your being injured in a collision greatly increase.

To tighten the lap portion of the belt, pull up on the shoulder belt until it fits you snugly. The belt should rest as low on your hips as possible.



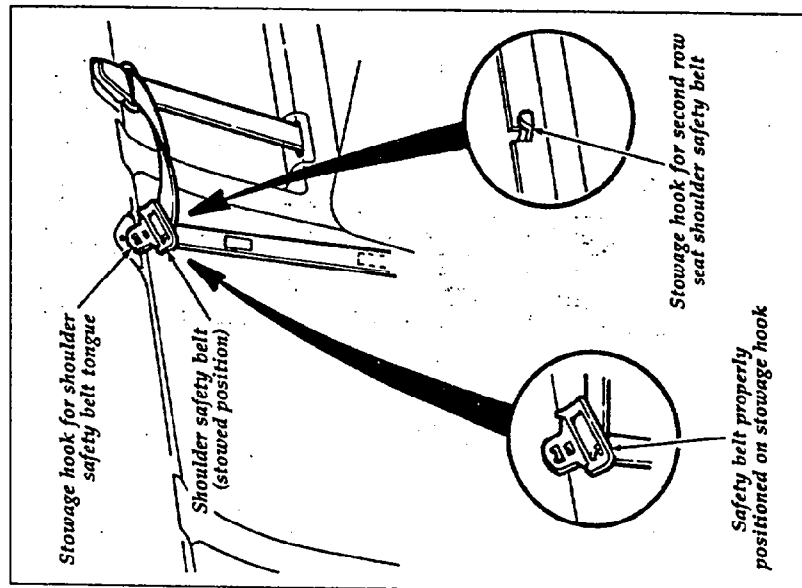
Unfastening the outboard lap/shoulder belts

All Three Passenger Bench Seat or Captain's Chair

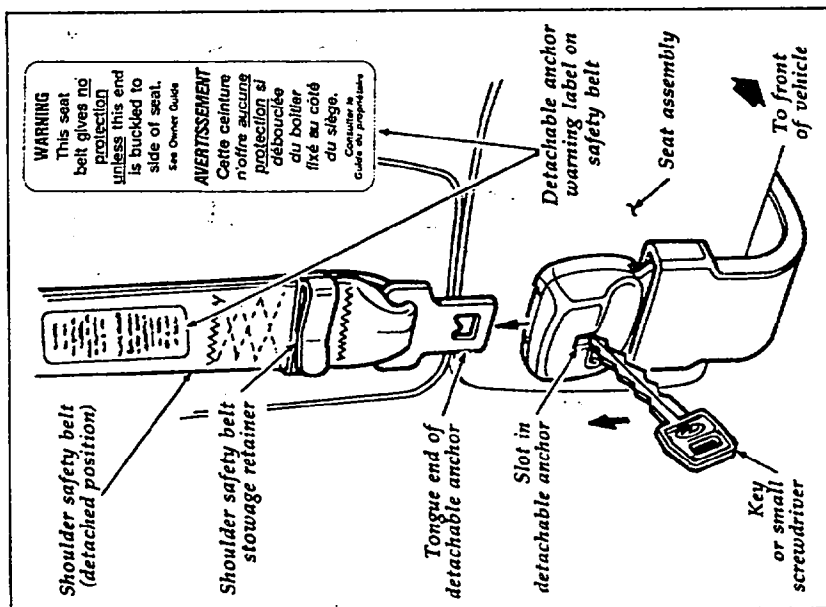
In addition to anchorages in the floor and roof structures, some rear safety belts have a detachable anchor mounted to the outboard side of the rear seat. This should remain attached, except when removing the rear seats.

The second row passenger side outboard seating position uses a hook above the sliding/cargo door to stow the shoulder safety belt when it is not being used.

NOTE: When the belt is stowed using the hook, **DO NOT** use the hanging belt as an assist when entering the vehicle.

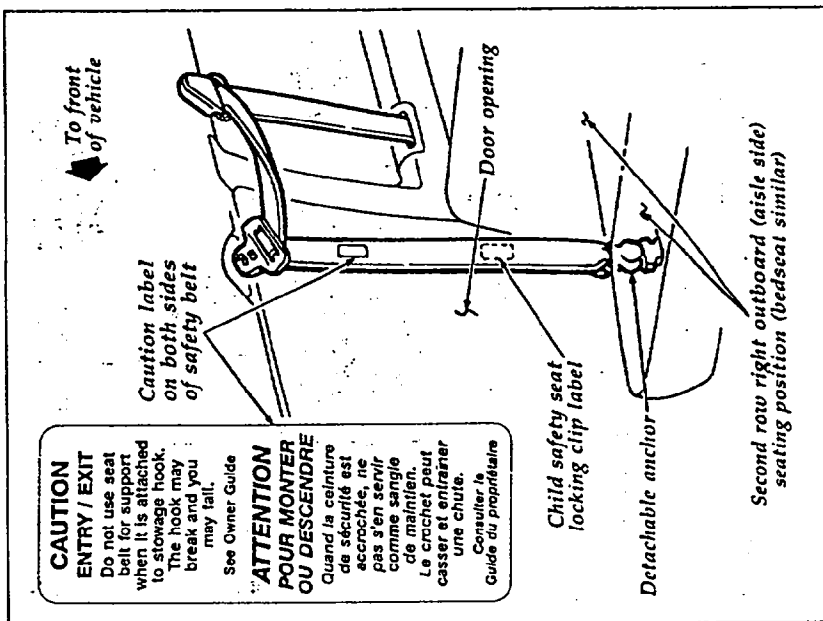


Proper stowage of shoulder safety belt



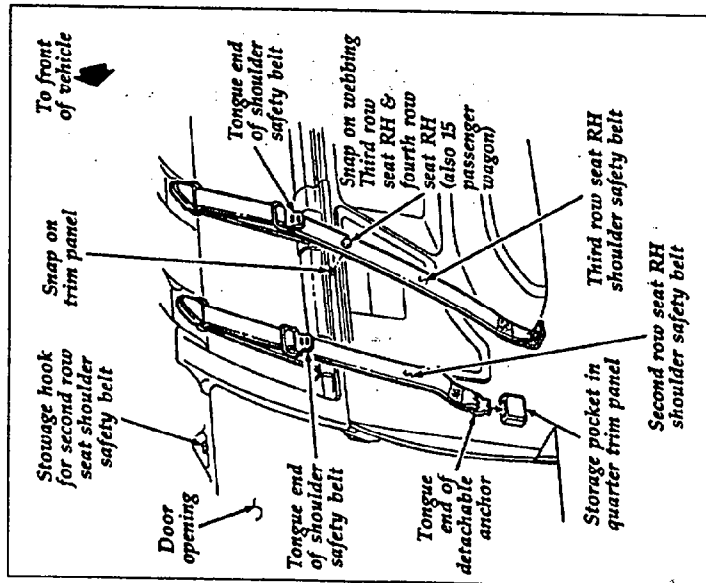
Location of the detachable anchor warning label on safety belt

In order to remove the rear seat, the safety belt must be disengaged from the seat. To disengage the safety belt from the seat, insert a key or small screwdriver into the slot provided on the detachable anchor. Then lift upward. See previous illustration.

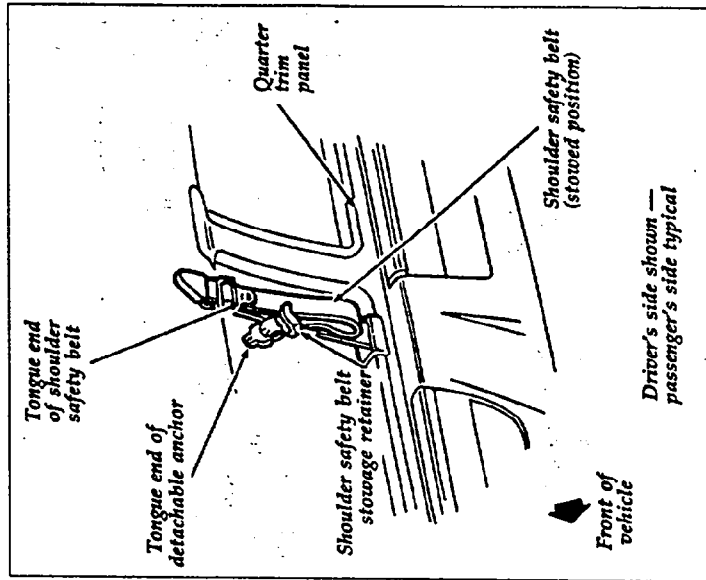


Location of the detachable anchor caution label on safety belt

Whenever a rear seat has been removed, the tongue end of the detachable anchor must be correctly stowed. See the following illustration.



Rear seat shoulder safety belt — stowage (with seat removed)



Rear seat shoulder safety belt — stowage (with seat removed)

Warning:

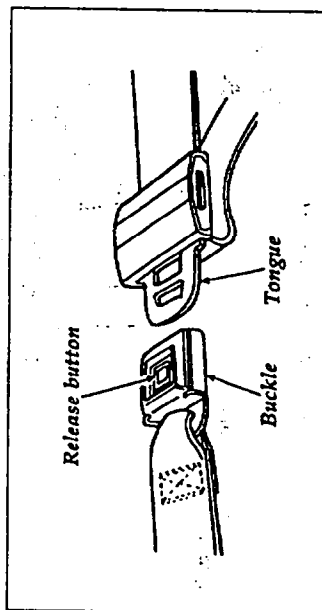
When reinstalling a rear seat in the vehicle, install the seat in its original location. Improper installation of the seat will prevent correct use of the shoulder safety belt and could increase the risk and/or severity of injury in an accident.

After installing the rear seat, make sure that the safety belt is not twisted before you insert it into the detachable anchor. Then insert the detachable anchor tongue into the detachable

anchor until you hear a "snap" and feel the latch engage.

Lap Belts Without Retractors

On the center seat of the three-passenger bench seat, and both inboard seats of the four-passenger bench seat, you will find a lap belt without a retractor. Shorten and fasten these belts when you are not using them. To make each belt longer, tip the tongue at a right angle to the belt and pull the belt over your lap until the tongue reaches the buckle.



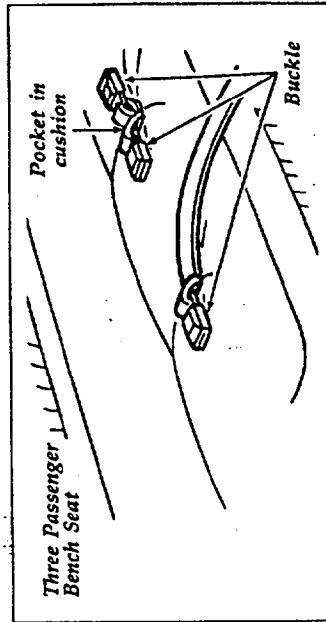
Fastening and unfastening rear occupant safety belts

To fasten the belt, pull the belt across your hips and insert the tongue into the correct buckle on your seat until you hear a snap and feel it lock. Make sure the buckle is securely fastened.

Adjust the belt so that it fits snugly and as low as possible around the hips:

- ☐ If you need to lengthen the belt, unfasten it and repeat the procedure above.
- ☐ If you need to shorten the belt, pull on the loose end of the webbing.

Safety belt bed/Seat pocket



Location of the safety belt bed/seat pocket

To Unfasten the Safety Belts with Retractors:

1. Push the release button on the buckle. This allows the tongue to unlatch from the buckle.
2. While the belt retracts, guide the tongue to its original position. If you do not guide the tongue, it may strike you or part of the vehicle.

To Untwist or Unjam a Safety Belt (Retractor):

If you should jam the lap belt retractor by allowing the belt to retract when it is twisted, you can free the webbing with this procedure:

1. Pull on the belt with both hands to tighten it on the retractor spool.
2. Feed the belt back into the retractor until it is completely retracted. Repeat previous step if necessary.
3. Pull the belt out of its holder as far as it will go and untwist the belt or remove the object that is jamming the belt. Let the belt retract.

4. Then, pull the belt out and let it retract several times to make sure that the belt works properly.

For Twisted Rear Outboard Combination Lap and Shoulder Safety Belts

Disengage the detachable anchor tongue from the detachable anchor, remove the twist and re-install the detachable anchor tongue end into the detachable anchor until you hear a snap and feel the latch engage.

Safety Belt Extension Assembly

For some people, the safety belt may be too short even when it is fully extended. You can add about eight inches (20 cm) to the belt length with a safety belt extension assembly (611C22). Safety belt extensions are available from your dealer.

Warning: To ensure that the safety belt extension assembly will hold in the event of a collision, only safety belt extensions manufactured by the same supplier as the safety belt should be used. Manufacturer identification is located at the end of the webbing on a label.

Safety Belt Maintenance

Check your safety belt system periodically to make sure that it works properly and isn't damaged. If the webbing shows any wear, nicks or cuts, have it examined by a qualified technician to determine if replacement is necessary. Always have your safety belt system checked after a collision.

For information on cleaning the webbing of seat belt assemblies, see "Cleaning the Safety Belts" in the Index.

Warning: All safety belt assemblies including retractors and attaching hardware should be inspected after any collision. Ford recommends that all safety belt assemblies used during a collision be replaced unless the collision was minor and a qualified technician finds that the belts do not show damage and continue to operate properly. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

Air Bag Supplemental Restraint System (SRS)

Driver Air Bag

Econoline E-150 and E-250 vehicles equipped with a driver side supplemental air bag can be identified by the letters "SRS" located in the center of the steering wheel.

The air bag is a Supplemental Restraint System (SRS). It is designed to be used in addition to the safety belt to help protect against head and chest injuries in certain moderate to severe frontal collisions.

Warning: Safety belts must be worn by all vehicle occupants to help reduce the risk of injury in an accident.

The Importance of Wearing Safety Belts

There are four very important reasons to use safety belts even with an air bag system. Use your safety belts to:

- ☒ help keep you in the proper position when the air bag inflates

- ☐ reduce the risk of harm in rollover, side, or rear impact accidents, since an air bag is not designed to inflate in such situations
- ☐ reduce the risk of harm in frontal collisions that are not severe enough to activate the air bag
- ☐ reduce the risk of being thrown from your vehicle

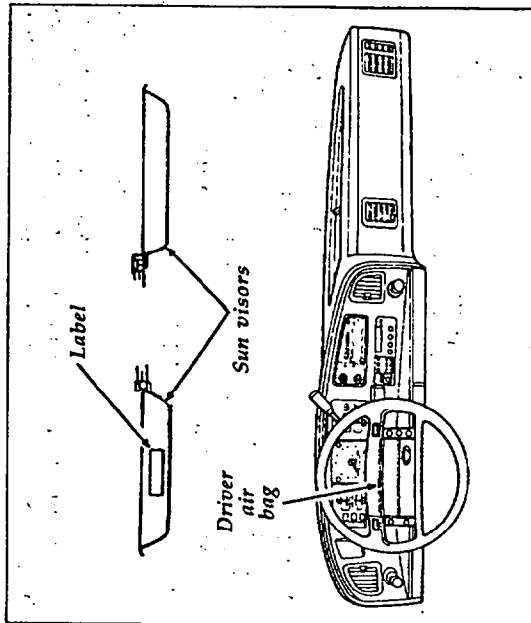
The Importance of Proper Seated Position

In an accident, the air bag must inflate extremely fast to help provide additional protection for you. In order to do this, the air bag must inflate with considerable force. If you are not seated in a normal riding position with your back against the seat back, the air bag may not protect you properly and could possibly hurt you as it inflates.

Warning: Do not put objects in front of the air bag system storage area that might restrict inflation or that might increase personal injury.

How the Air Bag Supplemental Restraint System Operates

The air bag supplemental restraint system has two main parts. One part is the air bag system with the driver air bag and inflator located in the center of the steering wheel. The second part is the electrical system, which has impact sensors, a diagnostic module, and backup power supply. The diagnostic module monitors its own internal circuits and the supplemental air bag electrical system readiness, including the crash sensors, the system wiring, the air bag system readiness light, air bag power, and the supplemental air bag ignitor.



The location of the air bag and warning labels

The air bag system uses a readiness light and a tone to indicate the condition of the system. The readiness light is in the instrument cluster.

When you turn the ignition key to ON, this light will illuminate for approximately six (6) seconds and then turn off. This indicates that the system is operating normally. **NOTE:** Regularly scheduled maintenance of the air bag system is not required.

Warning: A problem with the system is indicated by one or more of the following:

- ☐ the readiness light will either flash or stay lit,
- ☐ or it will not light,
- ☐ or groups of five beeps will be heard.

If any of these things happen, have the air bag system serviced at your Ford or Lincoln-Mercury dealer immediately.

Tone Generator

The air bag readiness light indicates the air bag system condition. However, a series of five sets of five beeps will be heard only if the readiness light doesn't work and there is a problem with the air bag system. This also means that the Air Bag Supplemental Restraint System (SRS) is in need of service. The tone pattern will repeat (five sets of five beeps) periodically until the problem and light are repaired. Unless serviced, the Air Bag Supplemental Restraint System may not function properly in the event of an accident.

Warning: Do not attempt to service, repair, or modify the Air Bag Supplemental Restraint System; tampering could cause activation of the system and increase the risk of personal injury. For servicing of the Air Bag Supplemental Restraint System, see your Ford or Lincoln-Mercury dealer.

The air bag system is designed to stay out of sight until it is activated. The air bag system is designed to operate in frontal and front-angled collisions more severe than hitting a parked car of similar size and weight head-on at about 28 mph (45 km/h). Because the system senses severe crashes rather than vehicle speed, some frontal collisions at speeds above 28 mph (45 km/h) will not inflate the air bag.

The following four steps show how the air bag system works:

1. Sensors in the vehicle detect a severe frontal impact. When two sensors close at the same time, electricity flows to the inflator and ignites the chemicals.
2. The chemical then rapidly burns in the metal container. The rapid burning produces nitrogen gas and small amounts of dust. The nitrogen gas and dust are cooled and filtered during inflation of the air bag.
3. The inflating air bag splits open the trim cover. The air bag then rapidly unfolds and inflates in front of the occupant.

NOTE: STEPS 1-3 TAKE PLACE IN A FRACTION OF A SECOND.

4. After inflation, the gas empties through holes in the air bag. The air bag deflates at once.

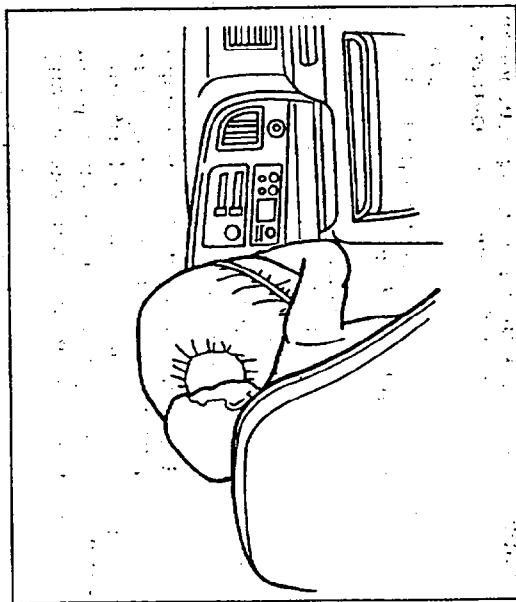
The surface of the air bag(s) and the vehicle interior may be dusted with a powdery residue. The powder is corn starch or talcum powder, which is used to lubricate the air bag as it inflates, and sodium compounds such as sodium carbonates (e.g., baking soda), and possibly a very small amount of sodium hydroxide that may be irritating to the skin and eyes, but is not toxic.

Right after air bag inflation, you may notice smoke (from the powder and dust) and smell the burnt chemicals. This is normal.

NOTE: Several air bag system components get hot after inflation. Do not try to touch them after inflation.

Air bags may not inflate in certain frontal collisions, even though the vehicle may be badly damaged. The fact that your air bag did not inflate in such a collision does not mean that

something is wrong with the air bag system. Rather, it means the crash forces were not severe enough to need an air bag.



The driver side supplemental air bag inflated

Warning:

The air bag will inflate only once. The system is designed to function on a one-time-only basis. If the air bag is inflated, THE AIR BAG WILL NOT FUNCTION AGAIN AND MUST BE REPLACED IMMEDIATELY. If the air bag is not replaced, the unrepaired area will increase the risk of injury in a collision.

Disposal of Air Bag Equipped Vehicles

For disposal of air bags or air bag equipped vehicles, see your local Ford or Lincoln-Mercury dealer, or refer to the procedures in the 1992 Ford Shop Manual. Information on how to order a shop manual is available at an authorized Ford or Lincoln-Mercury Dealer. You can also order a shop manual using the order form in the back of your Owner's Guide.

Service and Information Labels

Service and information labels are attached to the sun visor(s), and the radiator support in the engine compartment.

This vehicle has a DRIVER AIR BAG Supplemental Restraint System (SRS). The SRS supplements the driver's seat belt by inflating in moderate or severe frontal collisions. It is not designed to inflate in side or rear crashes, rollovers, or minor frontal collisions, so ALWAYS WEAR YOUR SEAT BELT.

"AIR BAG" lamp normally lights briefly when ignition key is turned on. NO SRS MAINTENANCE IS NEEDED unless:

- "AIR BAG" lamp flashes or stays lit.
- "AIR BAG" lamp does not light when key is turned on.
- Groups of five beeps are heard.

SEE OWNER GUIDE FOR MORE AIR BAG INFORMATION.

The label located on the back of the driver's sun visor

WARNING
 DO NOT TAMPER WITH OR DISCONNECT THE AIR BAG SYSTEM WIRING. You could inflate the bag(s) or make it inoperative which may result in injury. See Shop Manual.

AVERTISSEMENT
 NE PAS MANIPULER NI DÉBRANCHER LE CÂBLAGE ÉLECTRIQUE DU DISPOSITIF D'UN COUSSIN DE SÉCURITÉ. Cela pourrait gonfler le coussin de sécurité ou le mettre hors service et entraîner des blessures. Voir le manuel de réparation.

FOOB-5400014-AA

Label on radiator support in the engine compartment

Safety Restraints for Children

In most states, you are required by law to use safety restraints for children. If small children ride in your vehicle — this generally includes children who are four years old or younger and who weigh 40 pounds (18 kg) or less — you must put them in safety seats that are made specially for children. Safety belts alone do not provide maximum protection for these children. Check your local and state laws for specific requirements.

Warning: Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

Warning: Never let children or adults ride in the cargo area of your vehicle. Make sure that all passengers sit where they can be properly restrained. If they are not restrained, the risk of their being injured in a collision greatly increases.