

REPORT NO. TRC-90-N08

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

SUZUKI MOTOR COMPANY, LTD.

1991 SUZUKI SIDEKICK

5-DOOR UTILITY VEHICLE

NHTSA NO. MM0501

TRC TEST NO. 910401

PREPARED BY:

THE TRANSPORTATION RESEARCH CENTER OF OHIO

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EAST LIBERTY, OHIO 43319



APRIL 23, 1991

FINAL REPORT

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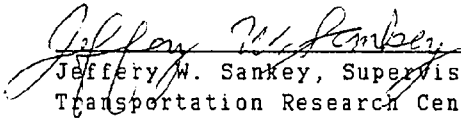
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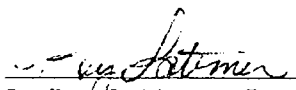
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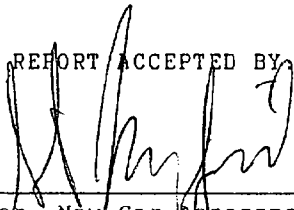
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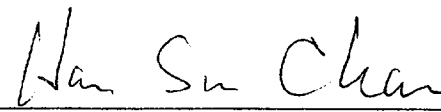
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16. Abstract A 35 mph frontal load cell barrier impact test was conducted on a 1991 Suzuki Sidekick 5-door utility vehicle, NHTSA No. MM0501, at the Transportation Research Center of Ohio on April 1, 1991. This test was conducted to obtain new car assessment and research data indicant of FMVSS No. 208 performance. The barrier impact velocity was 35.0 mph. The vehicle's maximum crush was 19.7 inches. The ambient temperature was 73° F. The driver's head injury criteria (HIC) was 1314. The driver's maximum chest deceleration over three (3) milliseconds was 74.2 g. The driver's chest displacement was 1.8 inches. The driver's maximum left and right femur forces were 562 pounds and 1283 pounds, respectively. The passenger's head injury criteria (HIC) was 2017. The passenger's maximum chest deceleration over three (3) milliseconds was 54.6 g. The passenger's chest displacement was 1.8 inches. The passenger's maximum left and right femur forces were 2285 pounds and 1252 pounds, respectively					
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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 of Ohio (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 1991 Suzuki Sidekick 5-door utility vehicle, NHTSA No. MM0501, 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 572 E 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. Each dummy's instrumentation also included a chest potentiometer to measure longitudinal displacement and a six-axis neck load cell to measure longitudinal, lateral and vertical forces and moments.

The eighty-three (83) 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 vehicle, occupant, and camera 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 April 1, 1991.

The test vehicle, a 1991 Suzuki Sidekick 5-door utility vehicle, NHTSA No. MM0501, was equipped with a 1.6 liter longitudinal engine, manual transmission, power steering, and power brakes. The vehicle's test weight was 3257 pounds. The vehicle's impact speed was 35.0 mph. The vehicle sustained 19.3 inches of static crush during the impact.

The driver's head injury criteria (HIC) was 1314. The driver's maximum chest resultant acceleration over three (3) milliseconds was 74.2 g. The driver's chest displacement was 1.8 inches. The driver's maximum left and right femur forces were 562 pounds and 1283 pounds, respectively.

The passenger's HIC was 2017. The passenger's maximum chest resultant acceleration over three (3) milliseconds was 54.6 g. The passenger's chest displacement was 1.8 inches. The passenger's maximum left and right femur forces were 2285 pounds and 1252 pounds, respectively.

No fluid spilled from the vehicle's fuel system following the crash test event.

DATA ACQUISITION EXPLANATIONS

The engine bottom X-axis accelerometer, ENGXG2, lost data after 29 milliseconds due to the vehicle's crush damaging the accelerometer case.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: MM0501 TEST TYPE: Frontal Load Cell Barrier

TEST DATE: 04/01/91 TEST TIME: 1513 AMBIENT TEMP. (°F): 73

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1991/Suzuki/Sidekick/5-door utility veh.

VEHICLE TEST WEIGHT (LBS): 3257

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (MPH)**: PRIMARY = 35.0 SECONDARY = 35.0

MAXIMUM STATIC CRUSH (IN): 19.7

AVERAGE REBOUND (IN): 14.3

DUMMIES: Driver #192 Passenger #142

TYPE: Part 572 E Part 572 E

LOCATION: Left front Right front

RESTRAINT: 3-point unbelt 3-point unbelt

NUMBER OF DATA CHANNELS: 83

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: Suzuki Motor Co., Ltd.

MAKE/MODEL: Suzuki/Sidekick

VIN: JS3TD01V1M4101804

BODY STYLE: 5-door utility vehicle

MODEL YEAR: 1991

NHTSA NO.: MM0501

COLOR: White

ENGINE DATA: TYPE: Longitudinal CYLINDERS: 4 DISPLACEMENT: 1.6 liter

TRANSMISSION DATA: 5 SPEED, X MANUAL, ___ AUTOMATIC, ___ FWD, ___ RWD, X 4WD

DATE VEHICLE RECEIVED: 01/24/91

ODOMETER READING: 122.0

DEALER'S NAME AND ADDRESS: Capitol Suzuki, Inc.
9301 W. Brown Deer Rd.
Milwaukee, WI 53224

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	No
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	No
RADIO	Yes	ANTI-SKID BRAKE	No
CLOCK	Yes	REAR WINDOW DEFROSTER	Yes
OTHER	None		

REMARKS:

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

CERTIFICATION DATA FROM VEHICLE'S LABEL:

VEHICLE MANUFACTURED BY: Suzuki Motor Co., Ltd.

DATE OF MANUFACTURE: 09/90

VIN: JS3TD01V1M4101804

GVWR: 3530 LBS

GAWR: FRONT: 1630 LBS., REAR: 2120 LBS.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Bridgestone/Desert Dueler P205/75R15

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 35 PSI
REAR: 35 PSI

SPARE TIRE (MFR., LINE, SIZE): P205/75R15

TYPE OF SEATS: FRONT: Bucket
REAR: Bench

TYPE OF FRONT SEAT BACKS: Manually adjustable

MAXIMUM WIDTH: 64.2 INCHES

WHEELBASE: 97.5 INCHES

LOCATION OF LABEL STATING TIRE & CAPACITY DATA:

The label was located on the lower portion of the left B-pillar.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P205/75R15

RECOMMENDED COLD TIRE PRESSURE: FRONT: 23 PSI; REAR: 23 PSI

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN INCHES):

DELIVERED ATTITUDE: LF 30.9; RF 30.6; LR 30.9; RR 30.6

PRE-TEST ATTITUDE: LF 30.5; RF 30.2; LR 29.1; RR 29.2

POST-TEST ATTITUDE: LF 31.6; RF 29.2; LR 29.2; RR 28.2

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	680 LBS.	RIGHT REAR	642 LBS.
LEFT FRONT	679 LBS.	LEFT REAR	642 LBS.
TOTAL FRONT WEIGHT	1359 LBS.	(51.4% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1284 LBS.	(48.6% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT 2643 LBS.			

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT*

UDW = UNLOADED DELIVERED WEIGHT (2643 LBS)

VCW = VEHICLE CAPACITY WEIGHT (NA*)

DSC = DESIGNATED SEATING CAPACITY (4)

RCLW = 300 LBS *

TARGET TEST WEIGHT = UDW + RCLW* + (NO. OF HYBRID III DUMMIES X 167 LBS/DUMMY)

TARGET TEST WEIGHT = 2643 + 300 + 334

TARGET TEST WEIGHT = 3277 LBS

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 280 LBS. OF CARGO WEIGHT:

RIGHT FRONT	734 LBS.	RIGHT REAR	886 LBS.
LEFT FRONT	741 LBS.	LEFT REAR	896 LBS.
TOTAL FRONT WEIGHT	1475 LBS.	(45.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1782 LBS.	(54.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	3257 LBS.	(0.6% UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE CARGO AREA: 0 LBS.

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: None

CG = 53.3 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: 910401 NHTSA NO.: MM0501
TEST DATE: 04/01/91 TEST TIME: 1513
TEST TYPE: Frontal load cell barrier IMPACT ANGLE: 0°
AMBIENT TEMPERATURE AT IMPACT AREA: 73° F
TEMPERATURE IN OCCUPANT COMPARTMENT: 70° F
IMPACT VELOCITY: PRIMARY = 35.0 MPH SECONDARY = 35.0 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 153.0; C 156.0; R 152.6

POST-TEST: L 134.4; C 137.9; R 134.5

TOTAL CRUSH: L 18.6; C 18.1; R 18.1

AVERAGE CRUSH: 18.3

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

DISTANCE FROM TEST VEHICLE TO BARRIER: L 14.4; C 13.4; R 15.2; AVG. 14.3

TABLE 4 FUEL SYSTEM DATA

MAKE/MODEL: Suzuki/Sidekick

NHTSA NO.: MM0501

FUEL SYSTEM CAPACITY: 14.5 GALLONS (FROM OWNER'S MANUAL)

USABLE CAPACITY: 14.5 GALLONS (FURNISHED BY COTR)

TEST VOLUME RANGE: 13.3 GALLONS TO 13.6 GALLONS (92-94% OF USABLE)

ACTUAL TEST VOLUME: 13.5 GALLONS (WITH ENTIRE FUEL SYSTEM FILLED)

TEST FLUID TYPE: STODDARD SOLVENT

SPECIFIC GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

TEST FLUID COLOR: PURPLE

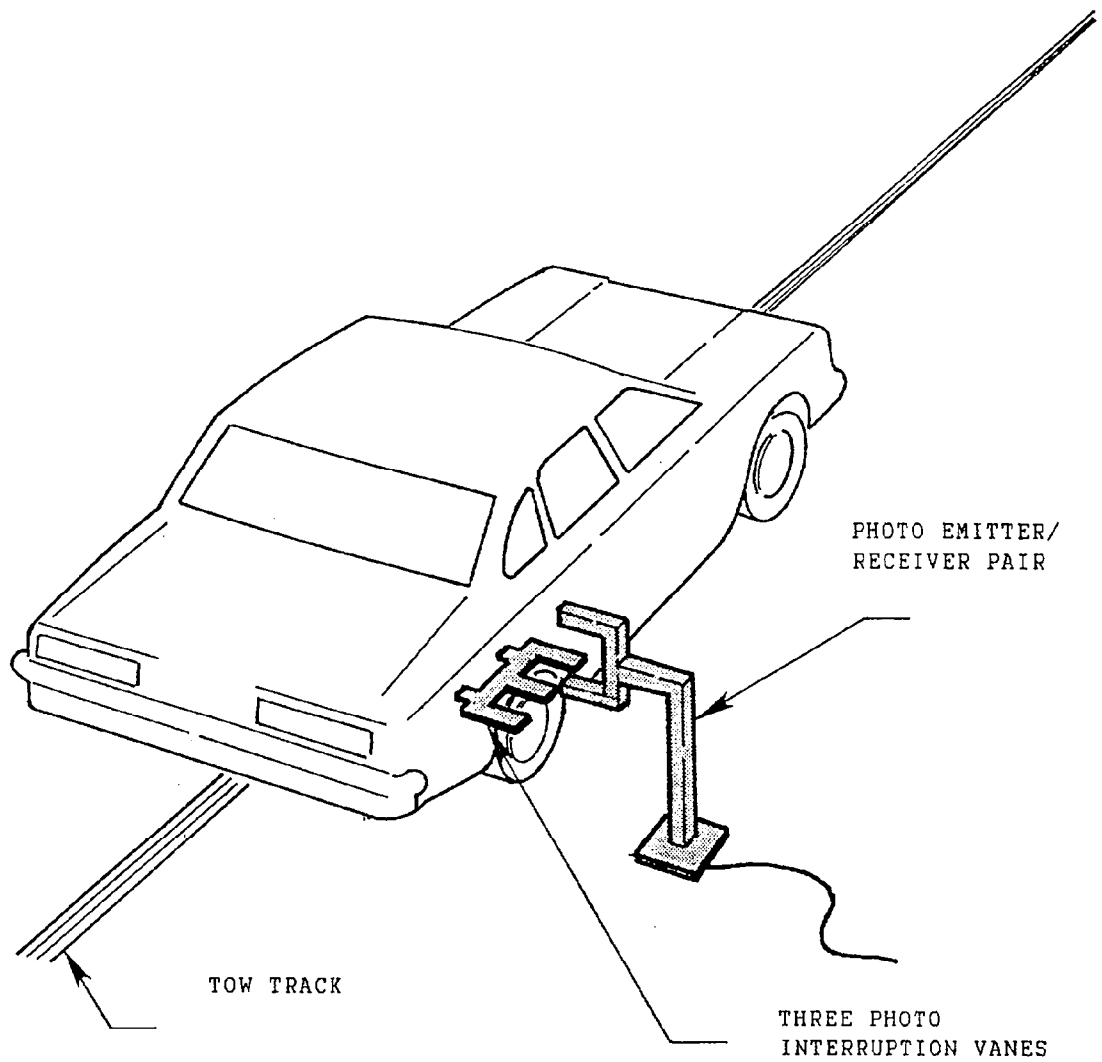
DETAILS OF FUEL SYSTEM: The fuel tank was located behind the rear axle.
The fuel filler neck was located on the right side. The fuel lines ran
along the right frame rail to the front.

ELECTRIC FUEL PUMP: Yes

FUEL INJECTION: Yes

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

FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane clears emitter/receiver 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: Suzuki/Sidekick/5-door utility vehicle

VEHICLE NHTSA NO.: MM0501; VIN: JS3TD01V1M4101804

MODEL YEAR: 1991; BUILD DATE: 09/90; TEST DATE: 04/01/91

VEHICLE SIZE CATEGORY: 4WD special purpose; TEST WEIGHT: 3257 LBS.

VEHICLE WHEELBASE: 97.5 INCHES

MAXIMUM WIDTH: 64.2 INCHES

FRONT OVERHANG: 27.1 INCHES

COLLISION DEFORMATION
 CLASSIFICATION (CDC) CODE: 12FDEW3

CRUSH DEPTH
 MEASUREMENTS:

C1 = 18.6 INCHES

C2 = 19.7 INCHES

C3 = 19.0 INCHES

C4 = 19.3 INCHES

C5 = 18.4 INCHES

C6 = 18.1 INCHES

MIDPOINT OF DAMAGE: D = VEHICLE CENTERLINE
(LONGITUDINAL)

LENGTH OF DAMAGED
 REGION: L = 57.8 INCHES

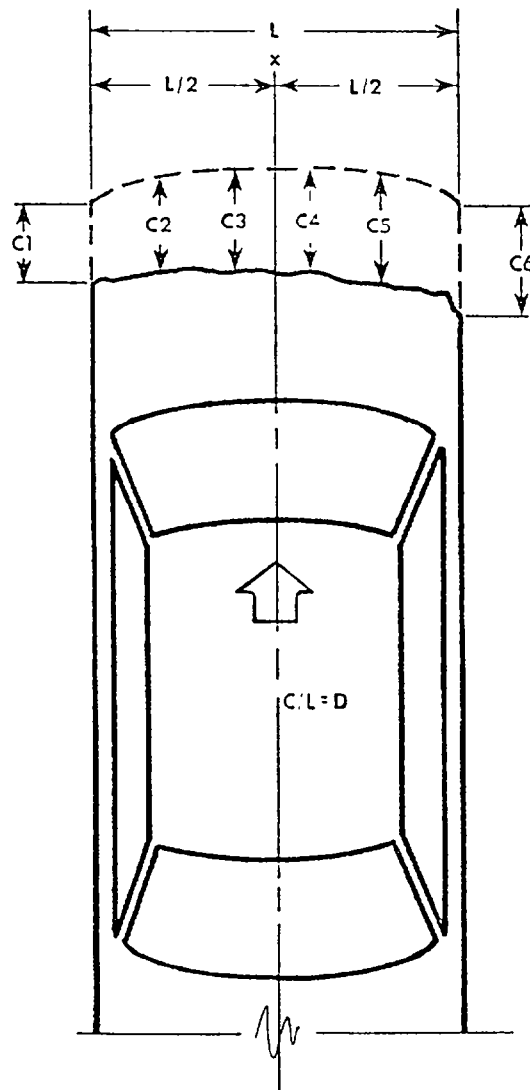
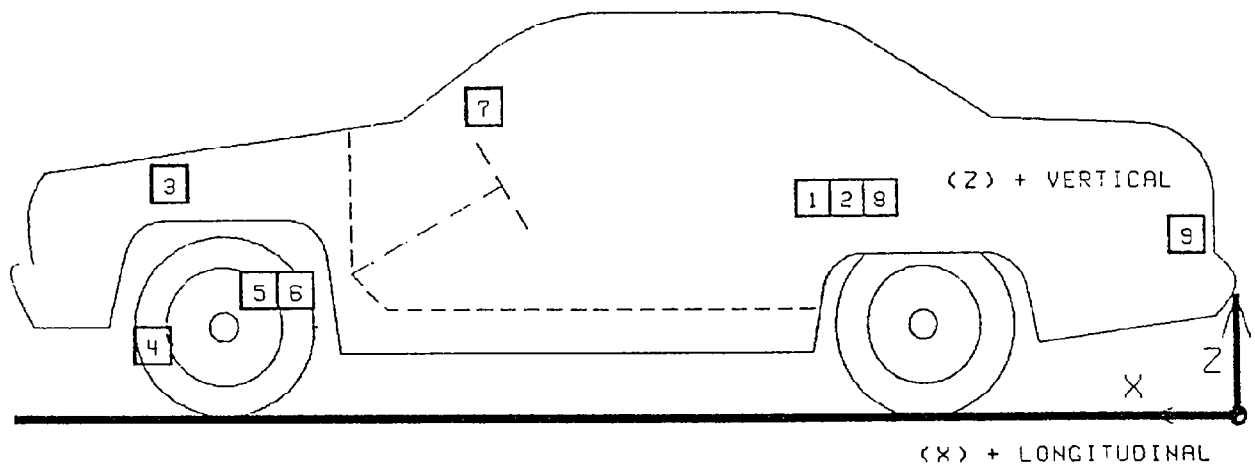
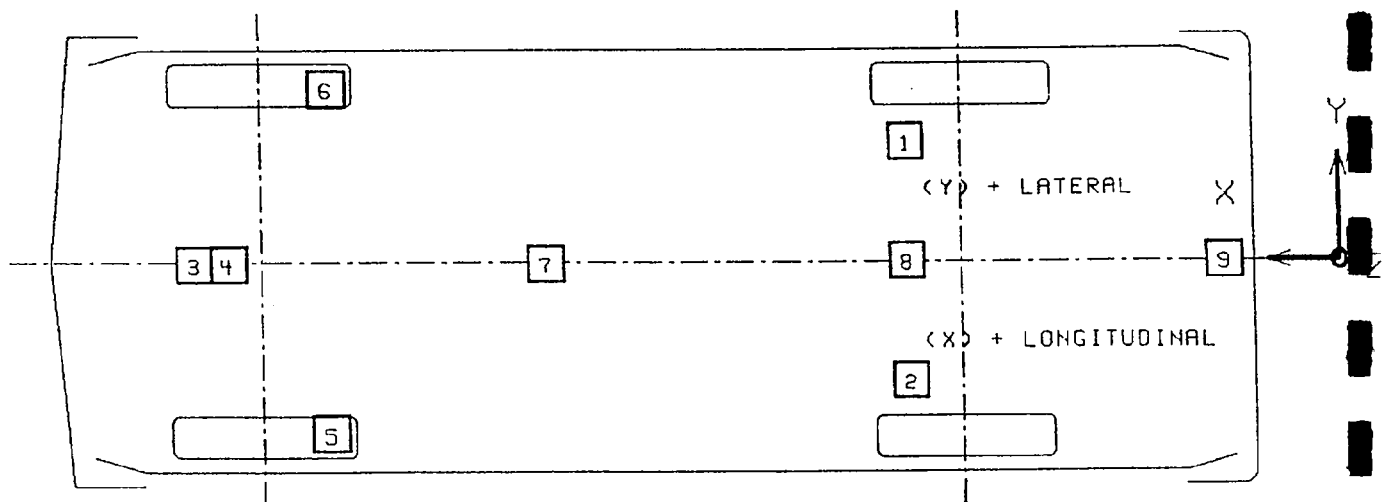


FIGURE 3
VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 5

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 910401

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX G MSEC		MAX G MSEC	
1	LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	108.4	19.0	23.4	2.5	140.3	37.2	44.0
2	RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	109.0	-18.6	24.0	2.2	119.8	40.4	42.6
3	ENGINE TOP LONGITUDINAL	26.0	-1.1	37.0	31.6	45.4	136.5	28.4
4	ENGINE BOTTOM LONGITUDINAL	22.2	0.0	14.8	--	-- Y	--	-- Y
5	RIGHT BRAKE CALIPER LONGITUDINAL	31.1	-24.3	15.4	22.1	48.5	117.5	20.8
6	LEFT BRAKE CALIPER LONGITUDINAL	30.5	24.3	15.2	37.1	41.0	126.7	21.5
7	INSTRUMENT PANEL CENTER LONGITUDINAL	48.5	0.5	44.1	22.8	67.4	60.9	37.1
8	REAR SEAT CROSSMEMBER CENTER VERTICAL	108.5	0.0	24.0	15.0	24.9	25.1	34.4
9	VEHICLE REAR CENTER VERTICAL	144.6	0.0	25.5	17.7	44.9	15.0	76.0

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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 #192	PASSENGER #142
HEAD	<u>Steering wheel hub</u>	<u>Instrument panel</u>
	<u>Lower</u>	
CHEST	<u>steering wheel rim</u>	<u>None</u>
ABDOMEN	<u>None</u>	<u>None</u>
LEFT KNEE	<u>Instrument panel</u>	<u>Instrument panel</u>
RIGHT KNEE	<u>Instrument panel</u>	<u>Instrument panel</u>

DOOR OPENING:

	LEFT	RIGHT
FRONT	<u>Torch & tools req'd</u>	<u>Tools required</u>
REAR	<u>Easy</u>	<u>Easy</u>

SEAT MOVEMENT:

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

GLAZING DAMAGE:

The entire windshield was cracked upon impact.

OTHER NOTABLE IMPACT EFFECTS:

None

TABLE 7 FMVSS 208 DATA SUMMARY

VEH. YR./MAKE/MODEL/BODY STYLE: 1991/Suzuki/Sidekick/5-door utility veh.VEH. NHTSA NO.: MM0501; TEST DATE: 04/01/91

	DRIVER DUMMY #192	PASSENGER DUMMY #142
<u>MAXIMUM ACCELERATIONS (G):</u>		
HEAD X-AXIS	-137.7	-157.0
HEAD Y-AXIS	-17.0	15.5
HEAD Z-AXIS	-92.3	-75.8
HEAD RESULTANT	139.4	167.9
CHEST X-AXIS	-82.1	-56.2
CHEST Y-AXIS	-11.3	6.5
CHEST Z-AXIS	-20.6	-21.8
CHEST RESULTANT*	74.2	54.6
CHEST RESULTANT TIME INTERVAL (SEC.)*	.003	.005

HEAD INJURY CRITERIA (HIC) VALUES:

HIC**	1314	2017
HIC STARTING TIME (SEC.)	.067	.069
HIC ENDING TIME (SEC.)	.091	.105
AVG. HEAD RESULTANT ACCEL. DURING HIC TIME INTERVAL (G)	78.8	79.2

MAXIMUM CHEST DEFLECTIONS (IN):

CHEST X-AXIS	-1.8	-1.8
MAXIMUM CHEST DEFLECTION TIME (SEC.)	.068	.072

MAXIMUM FEMUR COMPRESSIVE FORCES (LBS):

LEFT FEMUR	562	2285
RIGHT FEMUR	1283	1252

MAXIMUM SEAT BELT FORCES (LBS):

LAP BELT	1683	1996
SHOULDER BELT	1935	1730

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.

TABLE 8 HYBRID III NECK DATA SUMMARY

VEHICLE YR./MAKE/MODEL/BODY STYLE: 1991/Suzuki/Sidekick/5-door utility veh

VEHICLE NHTSA NO.: MM0501; TEST DATE: 04/01/91

<u>MAXIMUM VALUES:</u>	<u>DRIVER DUMMY #192</u>	<u>PASSENGER DUMMY #142</u>
NECK X-AXIS FORCE (LBS.)	229	337
NECK Y-AXIS FORCE (LBS.)	68	29
NECK Z-AXIS FORCE (LBS.)	1022	674
NECK MOMENT ABOUT X AXIS (IN.-LBS.)	221	-225
NECK MOMENT ABOUT Y AXIS (IN.-LBS.)	-466	435
NECK MOMENT ABOUT Z AXIS (IN.-LBS.)	93	86

NOTE: ALL VALUES LISTED MUST BE OCCURRING DURING PRIMARY IMPACT EVENT.

DUMMY KINEMATIC SUMMARY

DRIVER DUMMY

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The steering column rotated upward and the dummy's head rotated forward, impacting the steering wheel hub. The upper portion of the dummy's chest impacted the lower steering wheel rim 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 impacted the instrument panel 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.

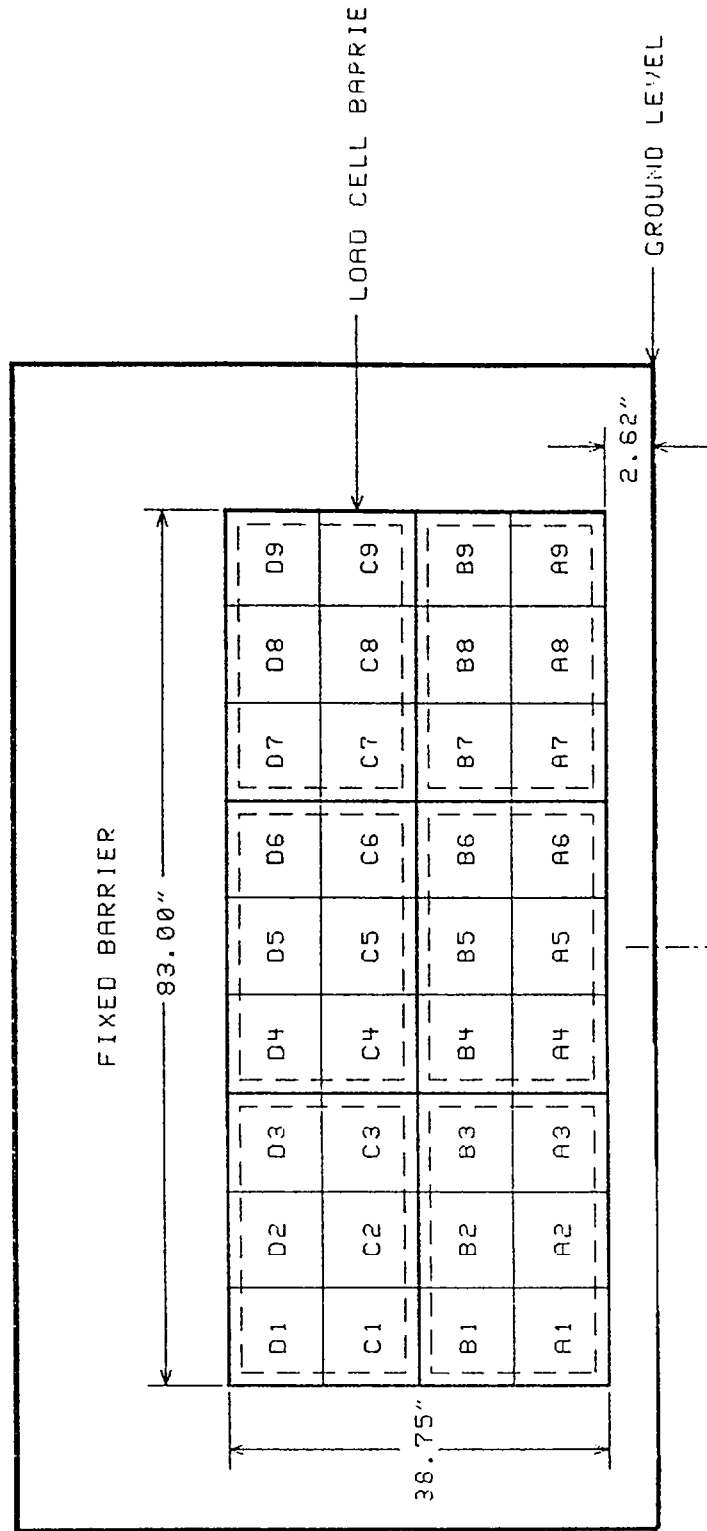
TABLE 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

	DRIVER	PASSENGER
<u>BELT LENGTH DATA:</u>		
BELT LENGTH FROM TRIM PANEL EXIT TO BOLT HOLE ANCHOR POINT FOR CONTINUOUS WEBBING SYSTEMS.	112.0	112.0
SHOULDER BELT LENGTH AS MEASURED ON PART 572 DUMMY.	42.3	42.9
LAP BELT LENGTH AS MEASURED ON PART 572 DUMMY.	33.0	34.1
<u>SHOULDER BELT SPOOL-OFF LENGTH:</u>		
AS DETERMINED BY FILM ANALYSIS	4.0	4.5
AS DETERMINED MECHANICALLY	4.2	4.7
AS DETERMINED ELECTRONICALLY	4.7	4.9
<u>BELT STRETCH LENGTH (IN/FT):</u>		
AS MEASURED MECHANICALLY	.00	.00
AS MEASURED ELECTRONICALLY	.68	1.05
<u>RETRACTOR LOCK-UP TIME (MS):</u>		
AS DETERMINED BY SHOULDER BELT SPOOL-OFF	78	72

ALL MEASUREMENTS ARE IN INCHES UNLESS OTHERWISE NOTED.

FIGURE 4
LOAD CELL BARRIER CONFIGURATION
FRONT VIEW

36 LOAD CELLS
4 ROWS
9 COLUMNS



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

TABLE 10

LOAD CELL BARRIER DATA SUMMARY

TEST NUMBER 910401

LOCATION	POSITIVE DIRECTION		NEGATIVE DIRECTION	
	LB	MSEC	LB	MSEC
TOTAL GROUP 1	384	217.6	14144	27.4
TOTAL GROUP 2	556	303.8	37707	27.5
TOTAL GROUP 3	230	1.6	27819	27.1
TOTAL GROUP 4	346	0.8	12316	26.4
TOTAL GROUP 5	316	217.6	39726	36.4
TOTAL GROUP 6	270	302.3	15521	35.4
TOTAL LOAD CELL FORCE	1437	218.0	131107	27.5
TENSION IS POSITIVE				
COMPRESSION IS NEGATIVE				

SECTION 3.0

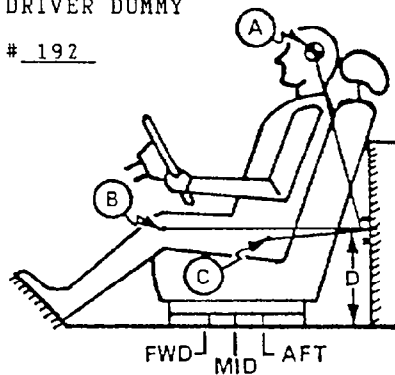
VEHICLE, OCCUPANT, AND CAMERA MEASUREMENTS

FIGURE 5 DUMMY AND SEAT POSITIONING DATA

TEST NO.: 910401; VEHICLE: Suzuki Sidekick
 SEAT TYPE: BENCH ADJUSTER TYPE: X MANUAL FRONT SEAT BACK TYPE: NON-ADJUSTABLE
 X BUCKET POWER X ADJUSTABLE RECLINING
 SPLIT BENCH

DRIVER DUMMY

192

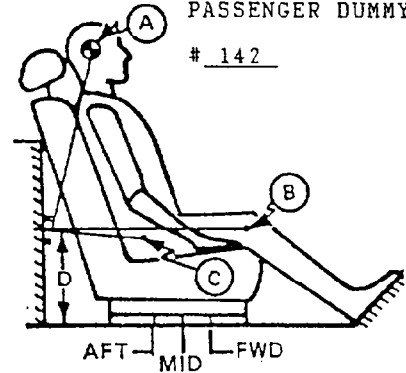


MEASUREMENT
LOCATION

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

PASSENGER DUMMY

142

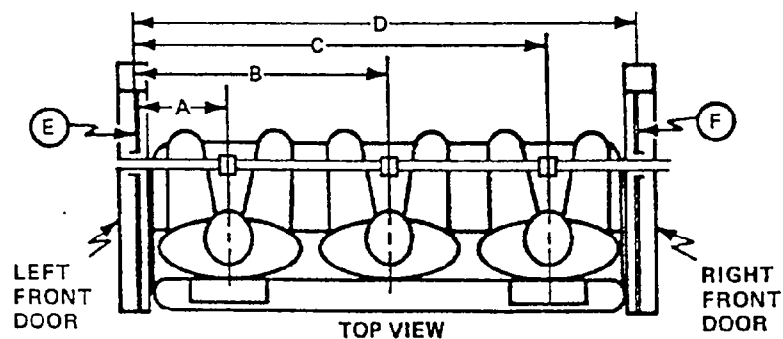


A = 23.7 IN. 3 DEGREES
 B = 21.3 IN. 84 DEGREES
 C = 5.7 IN. 99 DEGREES
 D = 14.4 IN.

A = 24.5 IN. 5 DEGREES
 B = 22.3 IN. 89 DEGREES
 C = 6.4 IN. 95 DEGREES
 D = 14.4 IN.

SEAT TRACK REARWARD: 7 NOTCHES

SEAT TRACK REARWARD: 7 NOTCHES



A = LEFT DOOR TO DRIVER CENTERLINE 10.9 IN.
 B = LEFT DOOR TO CENTER PASSENGER CENTERLINE NA IN.
 C = LEFT DOOR TO RIGHT PASSENGER CENTERLINE 39.6 IN.
 D = LEFT DOOR TO RIGHT DOOR 50.4 IN.
 E, F = WINDOW GLASS HEIGHT (RIGHT AND LEFT MUST BE EQUAL) 10.2 IN.

ALL ANGLES ARE RELATIVE TO VERTICAL PLANE THROUGH DOOR STRIKER.

FIGURE 6 DUMMY IN-VEHICLE POSITIONING DATA

	DRIVER	PASSENGER
HH	18.4	17.5
HW	23.0	22.8
CD	22.8	18.5
CS	13.6	NA
KDL	6.2	7.0
KDR	6.5	7.0
TA	20°	21°
SA	18°	18°
HSW	18.3	NA

	DRIVER	PASSENGER
HR	7.4	7.0
HS	8.1	8.0
AD	2.4	2.4
HD	4.4	4.0
KK	8.4	8.4
AA	10.5	7.6
HA	22.8	21.2

KNEE OUTER CLEVIS TO OUTER
CLEVIS SPACING:

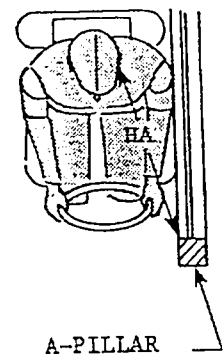
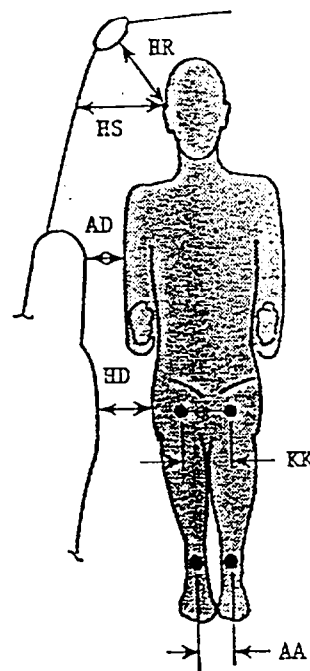
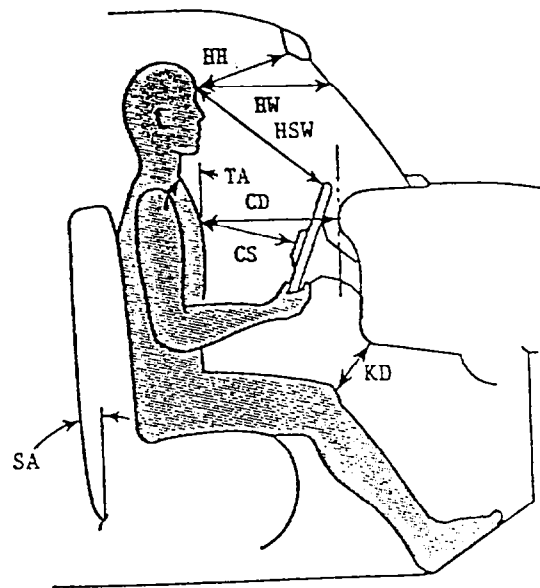
DRIVER = 10.6

PASSENGER = 10.6

PELVIS ANGLE:

DRIVER = 21°

PASSENGER = 20°

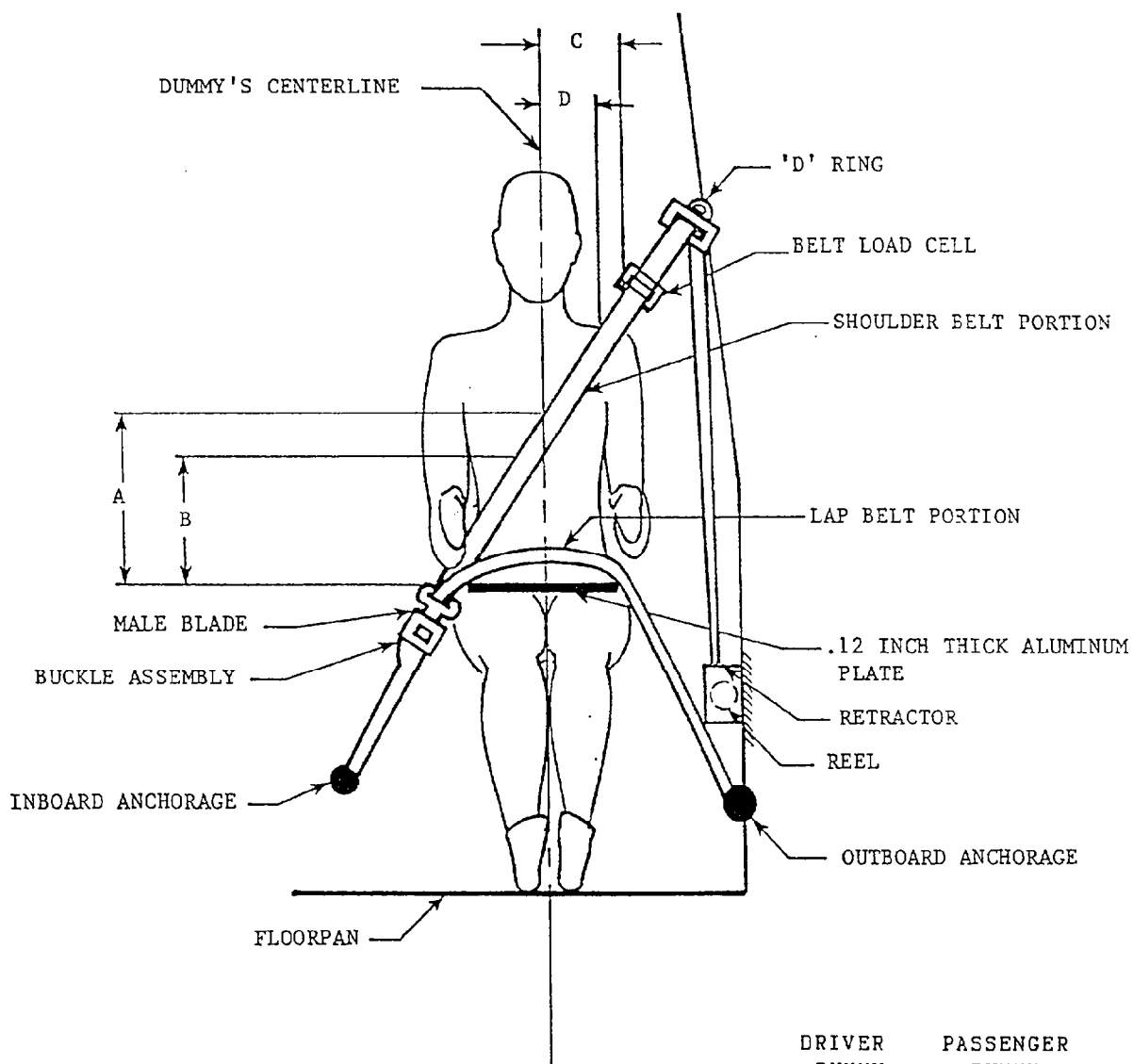


HH = HEAD TO WINDSHIELD HEADER
HW = HEAD TO WINDSHIELD
CD = CHEST TO DASH
CS = CHEST TO STEERING WHEEL
KD = KNEE TO DASH
TA = TORSO ANGLE
SA = SEAT BACK ANGLE
HSW = HEAD TO STEERING WHEEL

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.

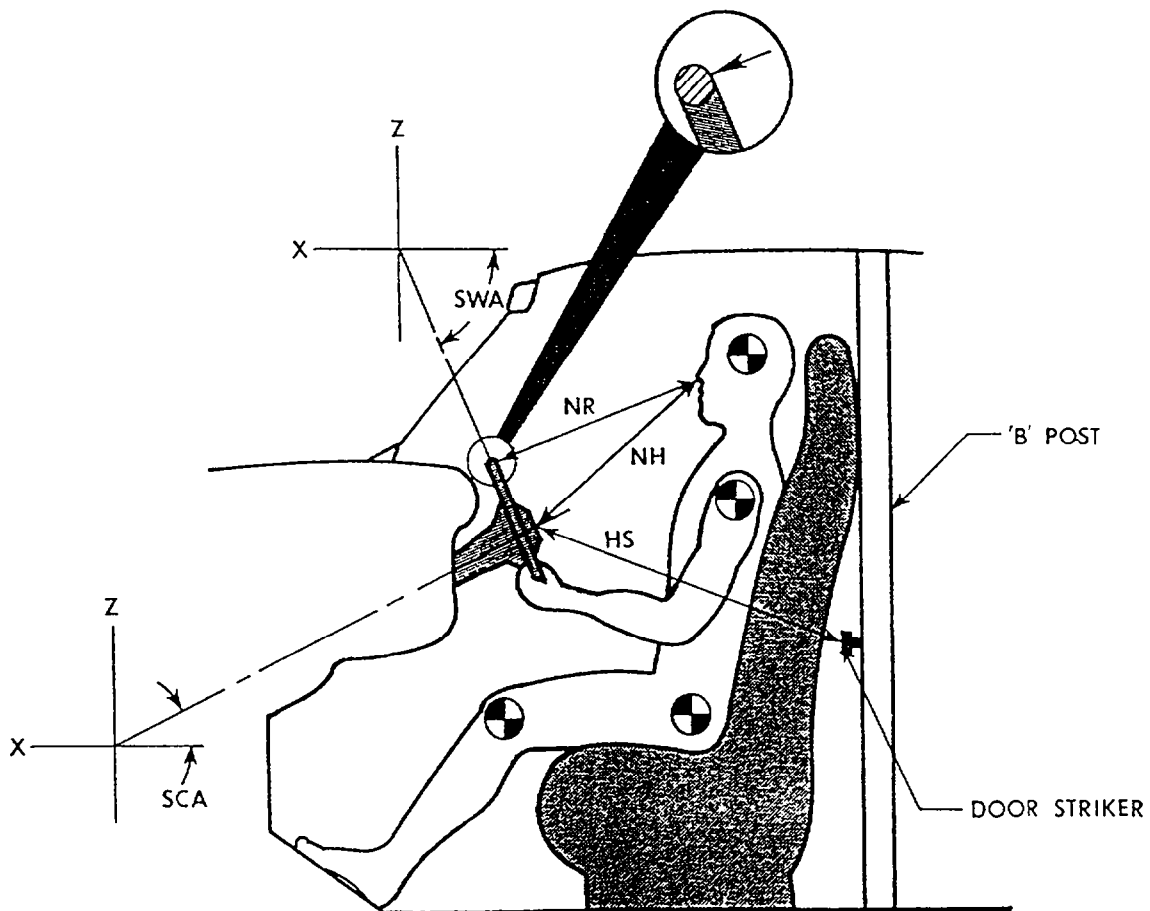
FIGURE 7 SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - TOP SURFACE OF ALUMINUM PLATE TO BELT UPPER EDGE	13.1	13.2
B - TOP SURFACE OF ALUMINUM PLATE TO BELT LOWER EDGE	9.5	9.8
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	5.1	4.9
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	2.8	2.5

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.	16.8
NH	- DISTANCE FROM TIP OF DUMMY'S NOSE TO CENTER OF STEERING COLUMN HUB.	16.0
HS	- DISTANCE FROM CENTER OF STEERING COLUMN HUB TO THE FORWARD SURFACE OF THE DOOR LOCK STRIKER PIN.	24.5
SCA	- ANGLE OF STEERING COLUMN RELATIVE TO THE HORIZONTAL X AXIS	33°
SWA	- ANGLE OF STEERING WHEEL RELATIVE TO THE HORIZONTAL X AXIS	57°

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 9
CAMERA POSITIONS

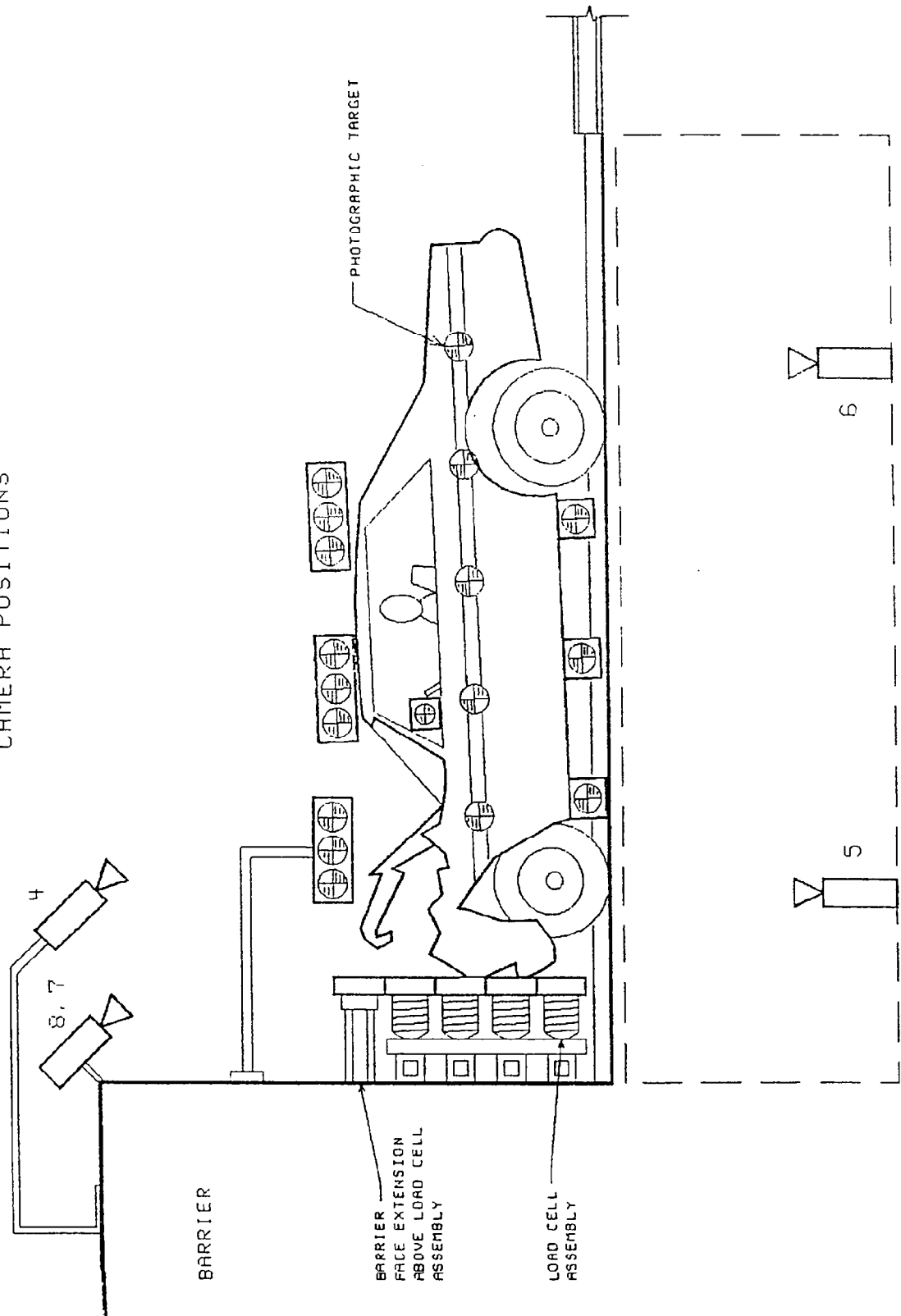


FIGURE 9
CAMERA POSITIONS, CONTINUED

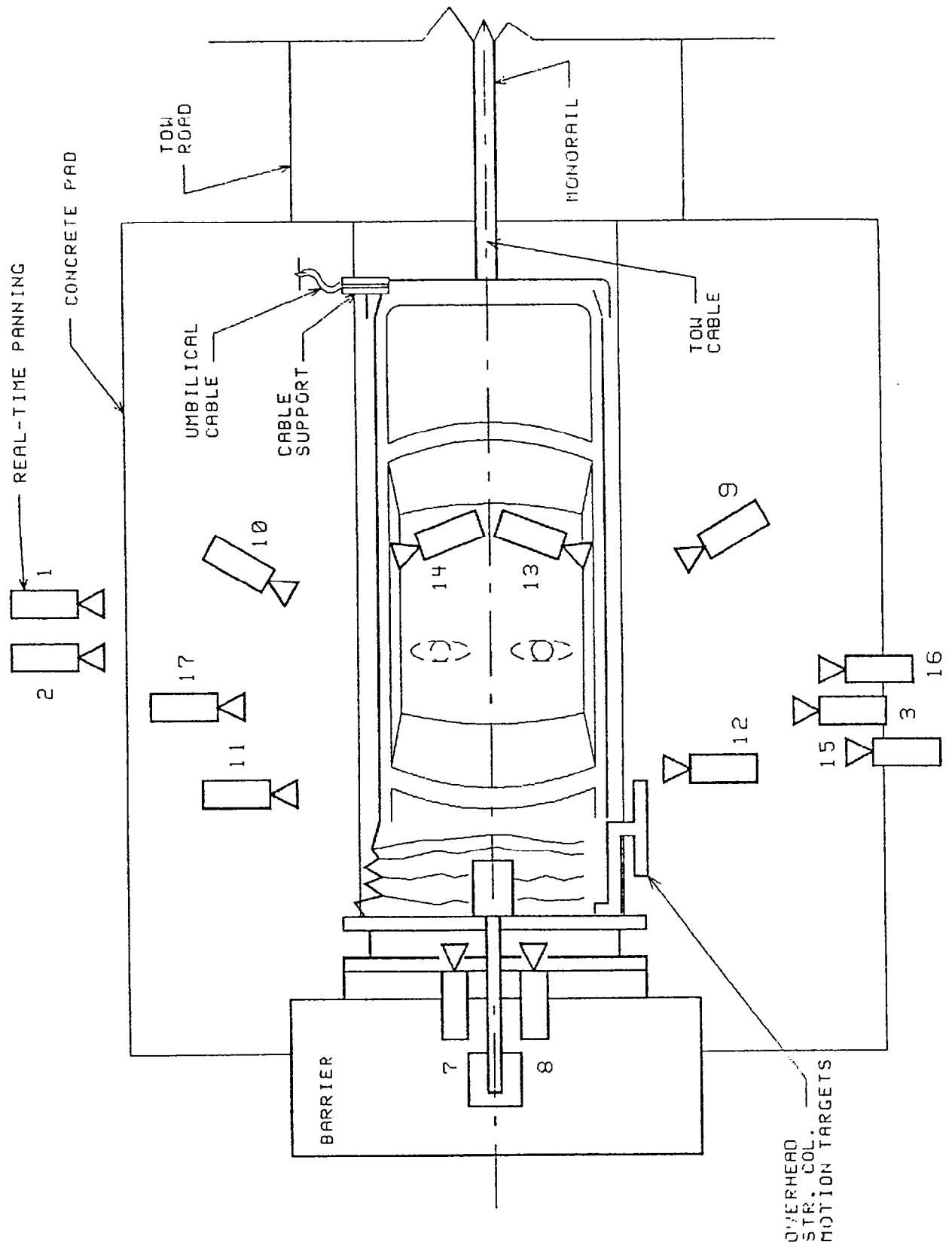


TABLE 11 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 910401		VEHICLE: Suzuki Sidekick 5-door utility vehicle						
CAMERA NO.	VIEW	CAMERA POSITIONS (IN)*			ANGLE** (DEG)	FILM PLANE		FILM SPEED (FPS)
		X	Y	Z		TO HEAD	TARGET (IN)	
1	Real-time panning	-142.0	-504.0	61.0	NA	NA	16	24
2	Right side	-81.3	-266.4	37.1	-2	NA	13	500
3	Left side	-41.5	295.0	44.0	-12	230.0	25	495
4	Overhead	-36.4	0.0	98.0	-40	NA	8.5	500
5	Pit - engine	-50.5	0.0	-92.4	90	NA	13	1000
6	Pit - fuel tank	-99.3	0.0	-99.0	90	NA	13	1000
7	Front - passenger	-4.5	-13.8	85.0	-40	NA	17	505
8	Front - driver	-6.8	14.5	85.0	-41	NA	17	502
9	Left side - driver	-180.0	73.0	102.0	-27	86.0	25	500
10	Right side - passenger	-184.0	-74.0	100.0	-26	70.0	25	500
11	Right side - A-pillar	-38.1	-306.1	44.0	0	NA	50	493
12	Left side - A-pillar	-53.0	309.4	42.3	0	NA	50	500
13	Onboard - left side	NA	NA	NA	NA	NA	13	500
14	Onboard - right side	NA	NA	NA	NA	NA	13	500
15	Left side - steering column	-87.0	286.0	103.0	-14	NA	25	502
16	Left side - steering column	-87.0	286.0	75.1	-9	NA	25	502
17	Right side - passenger	-38.8	-210.8	45.3	7	232.5	25	498

**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

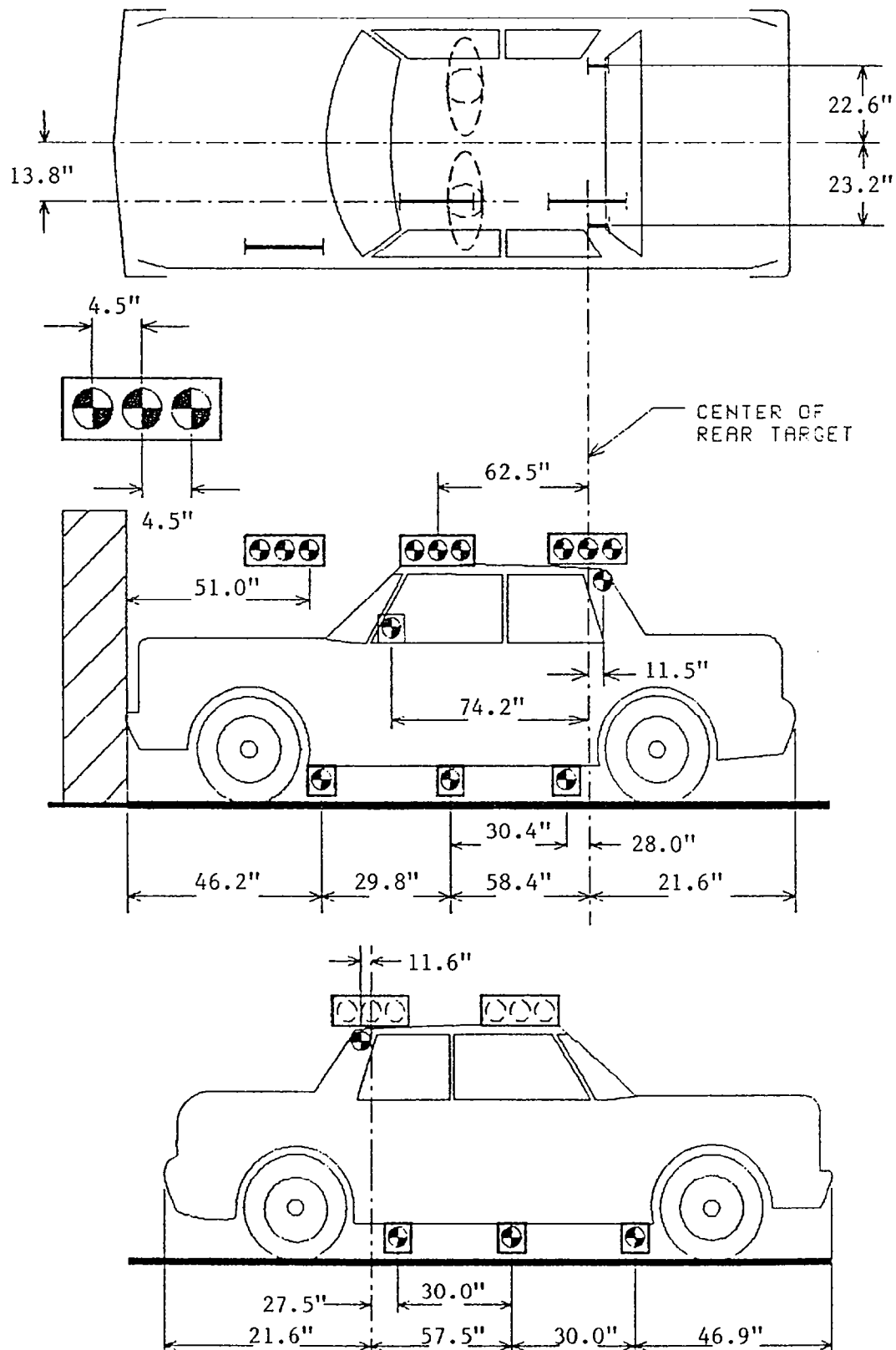


FIGURE 11

PRE-TEST AND POST-TEST MEASUREMENT POINTS

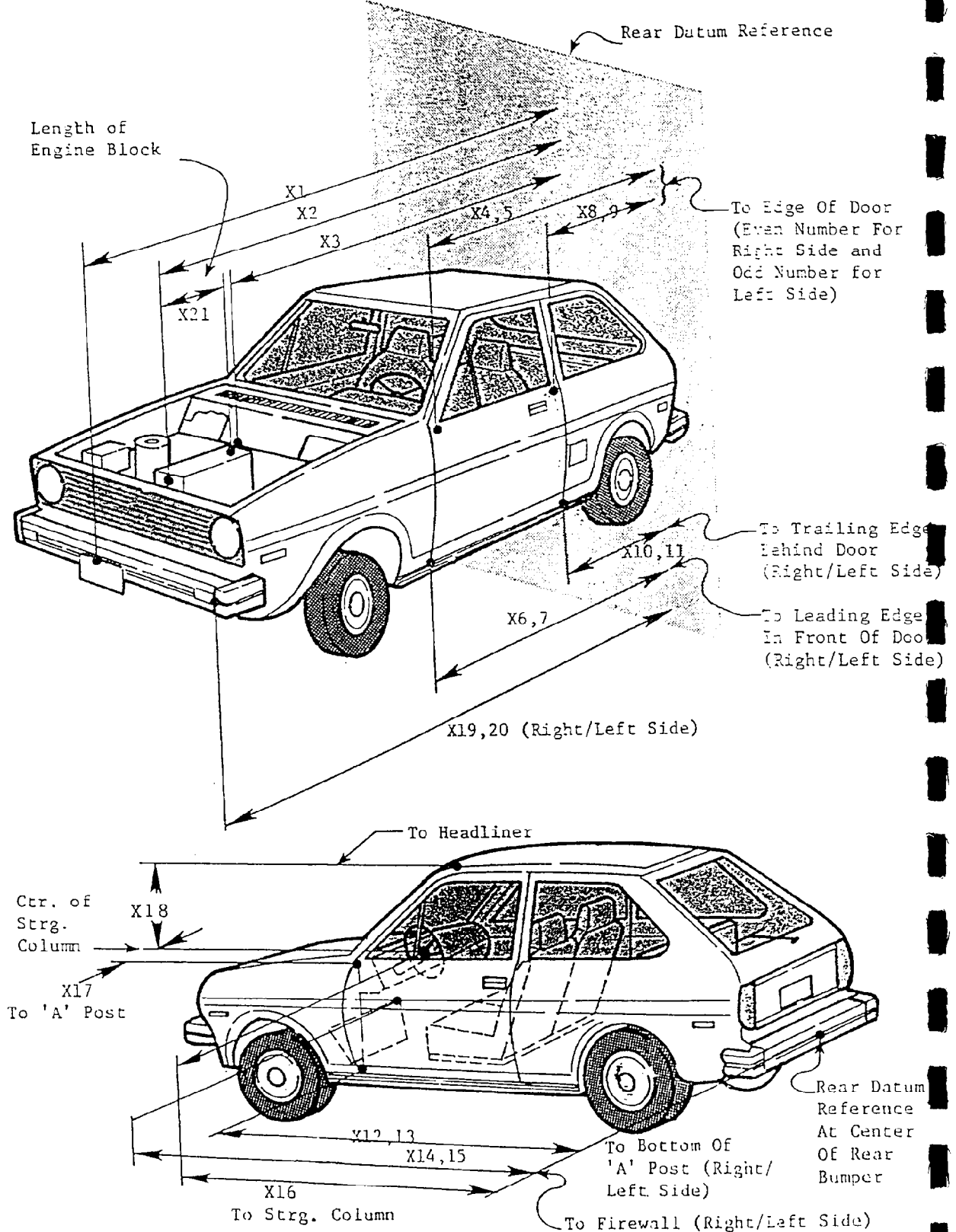


TABLE 12 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Suzuki/Sidekick		TEST NUMBER: 910401		ALL MEASUREMENTS ARE IN INCHES	
NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.	
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	156.0	137.9	18.1	
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	134.9	125.1	9.8	
X3	REAR SURFACE OF VEHICLE TO FIREWALL	114.8	111.9	2.9	
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	108.1	108.4	-0.3	
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	108.2	106.5	1.7	
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	107.2	106.9	0.3	
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	107.2	106.5	0.7	
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	67.6	68.0	-0.4	
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	67.8	68.0	-0.2	
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	67.6	67.6	0.0	
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	67.8	67.4	0.4	
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	107.0	105.6	1.4	
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	106.9	105.0	1.9	
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	117.1	115.3	1.8	
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	118.1	114.6	3.5	
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	91.6	90.1	1.5	
X17	CENTER OF STEERING COLUMN TO "A" POST	9.5	9.0	0.5	
X18	CENTER OF STEERING COLUMN TO HEADLINER	10.4	20.1	-9.7	
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	152.6	134.5	18.1	
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	153.0	134.4	18.6	
X21	LENGTH OF ENGINE BLOCK	15.0	15.0	0.0	

APPENDIX A

PHOTOGRAPHS



Figure A-1. PRE-TEST FRONT VIEW



Figure A-2. POST-TEST FRONT VIEW

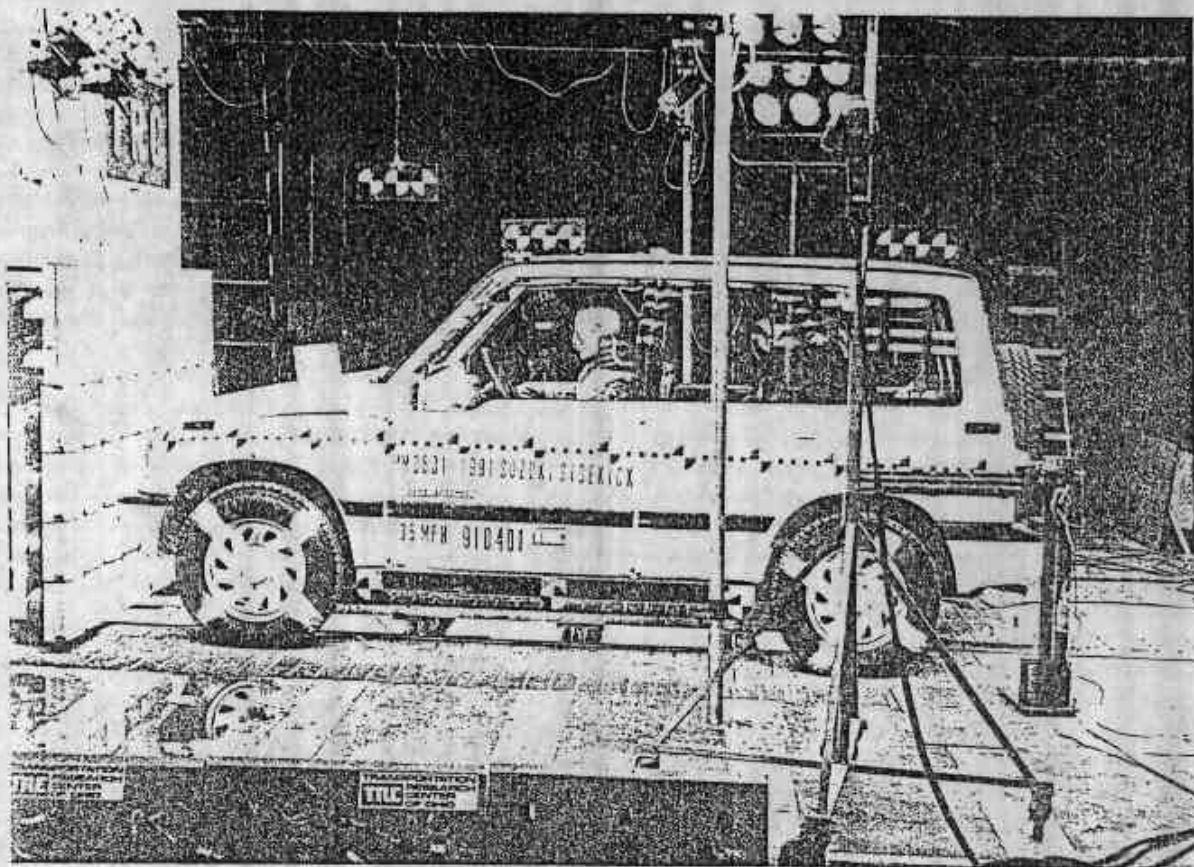


Figure A-3. PRE-TEST LEFT SIDE VIEW

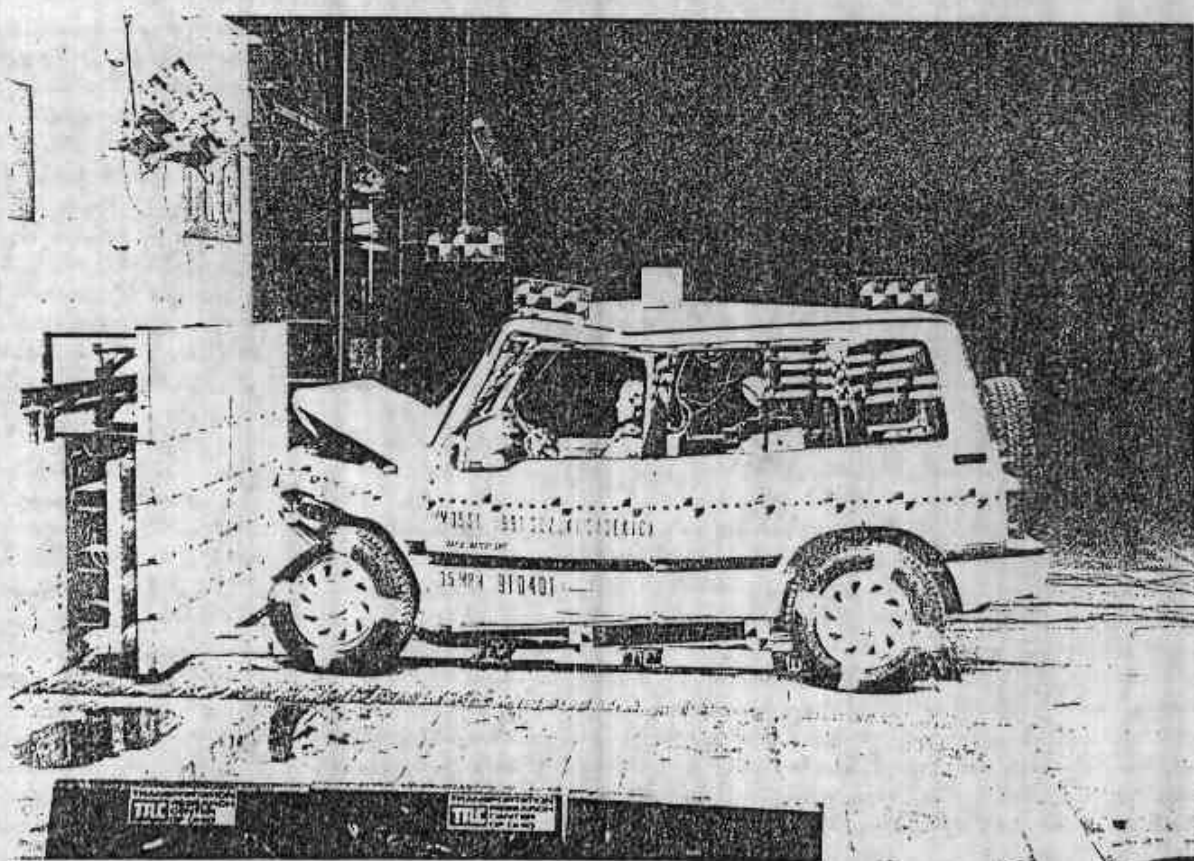


Figure A-4. POST-TEST LEFT SIDE VIEW

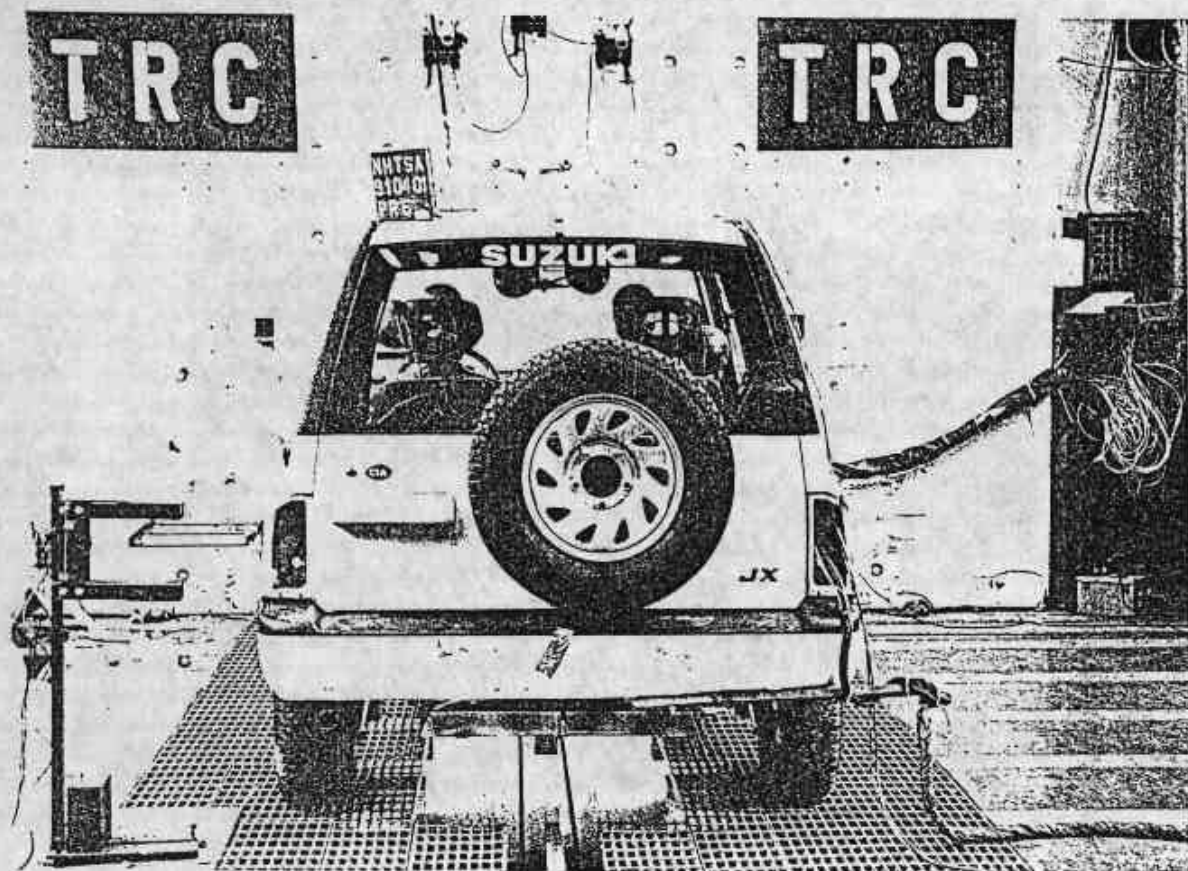


Figure A-5. PRE-TEST REAR VIEW

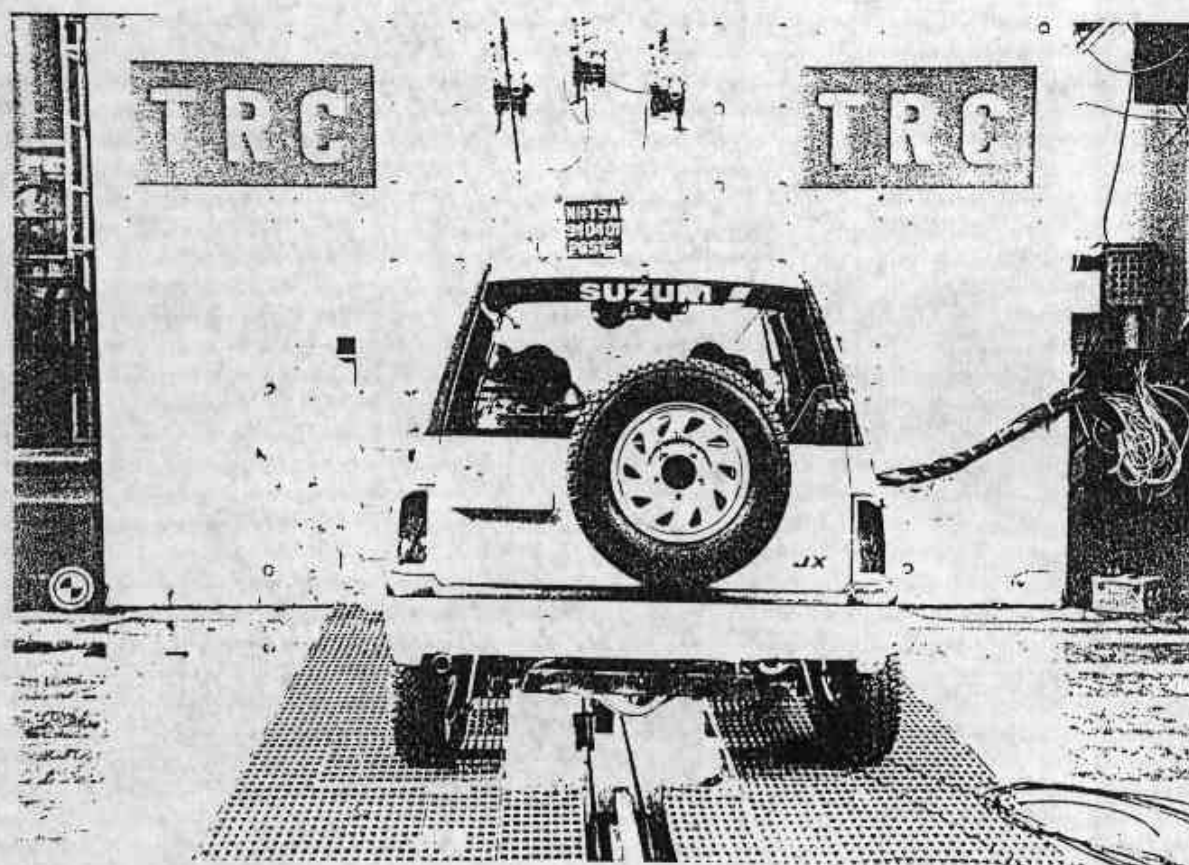


Figure A-6. POST-TEST REAR VIEW

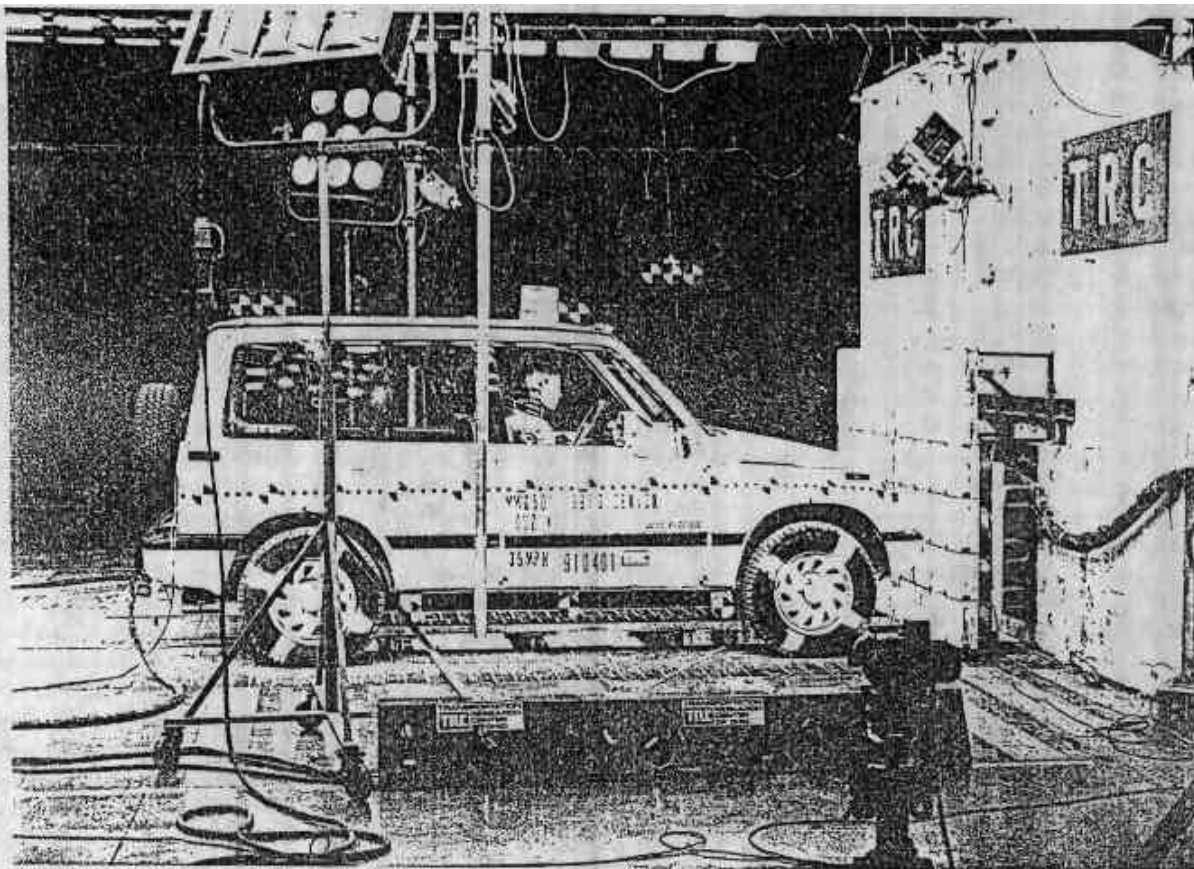


Figure A-7. PRE-TEST RIGHT SIDE VIEW



Figure A-8. POST-TEST RIGHT SIDE VIEW



Figure A-8. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



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

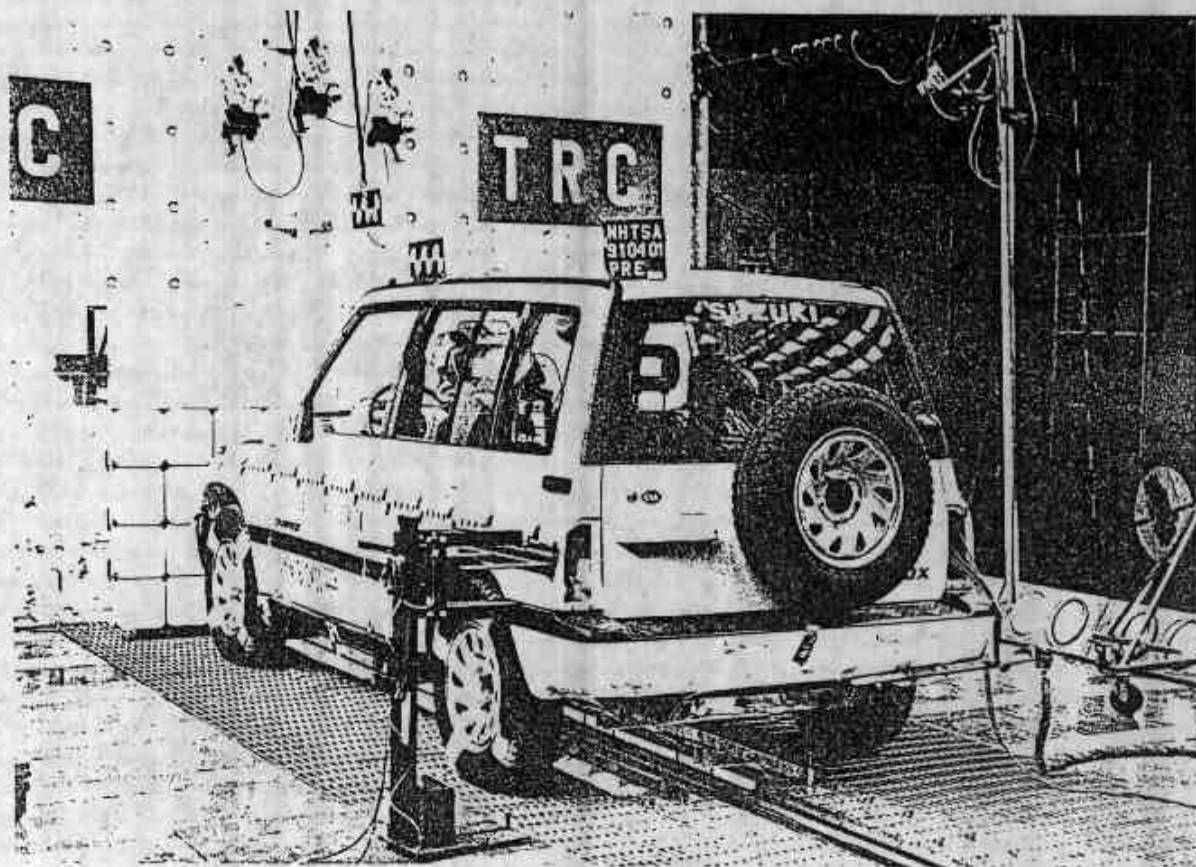


Figure A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW

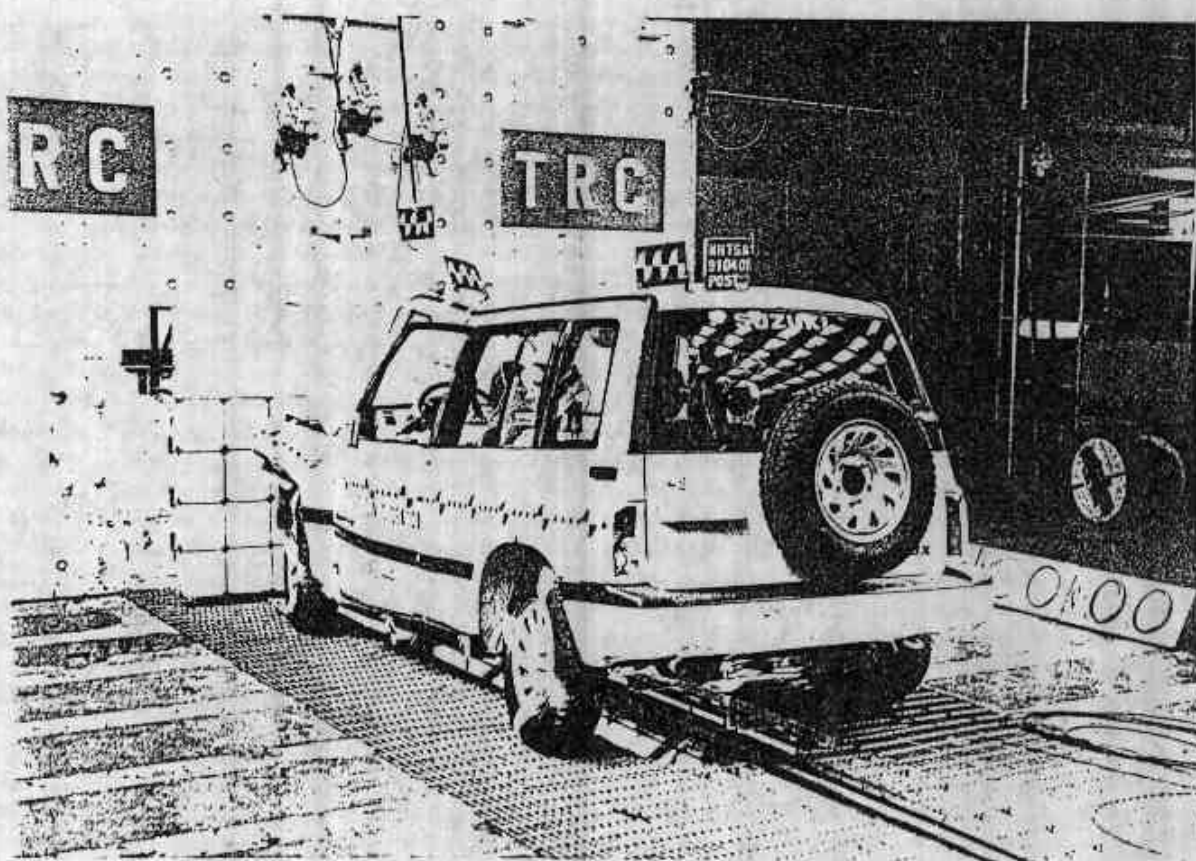


Figure A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

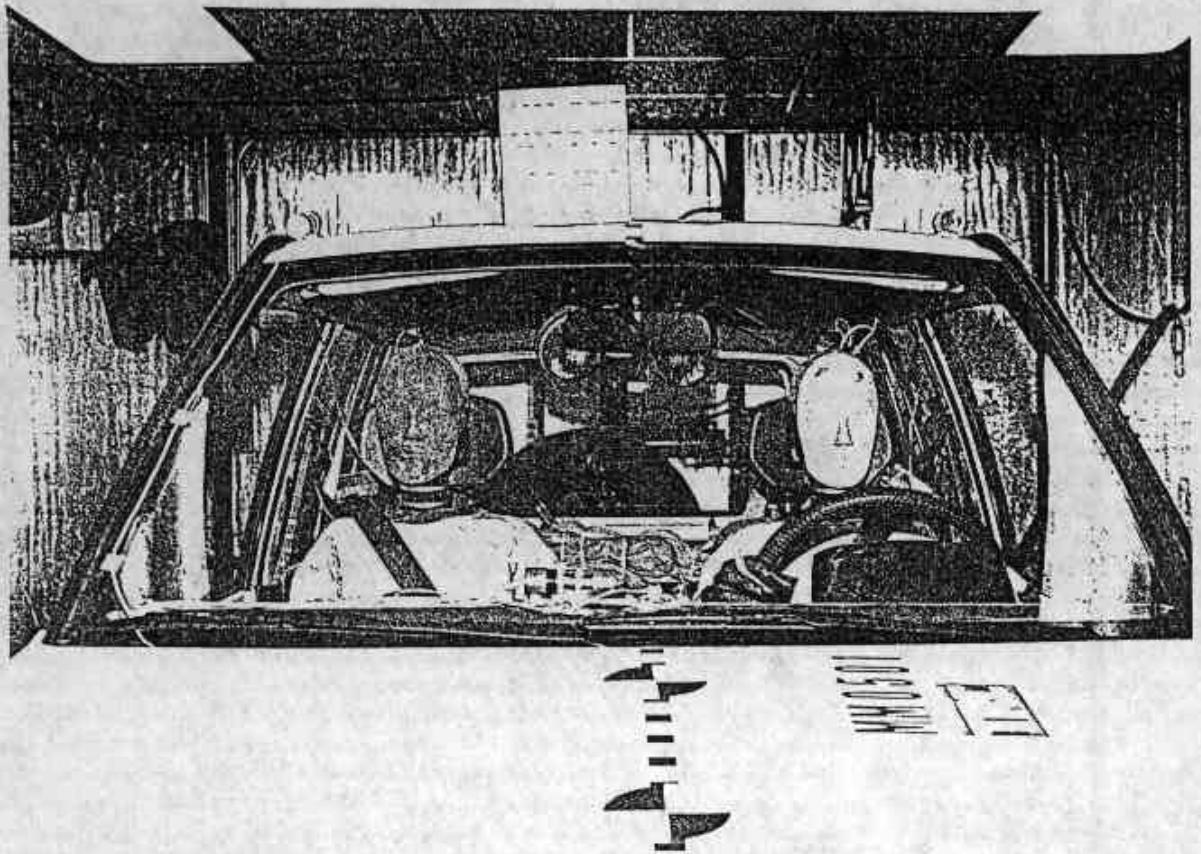


Figure A-13. PRE-TEST WINDSHIELD VIEW

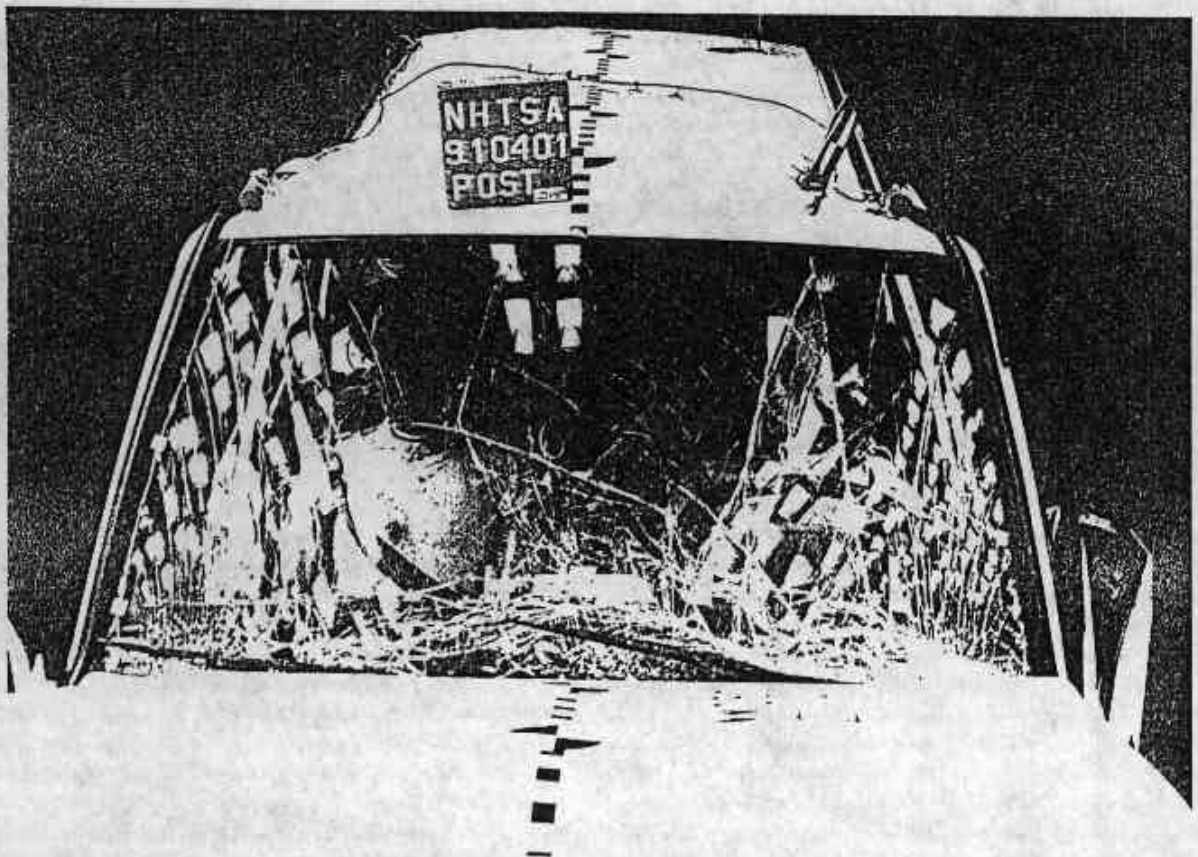


Figure A-14. POST-TEST WINDSHIELD VIEW

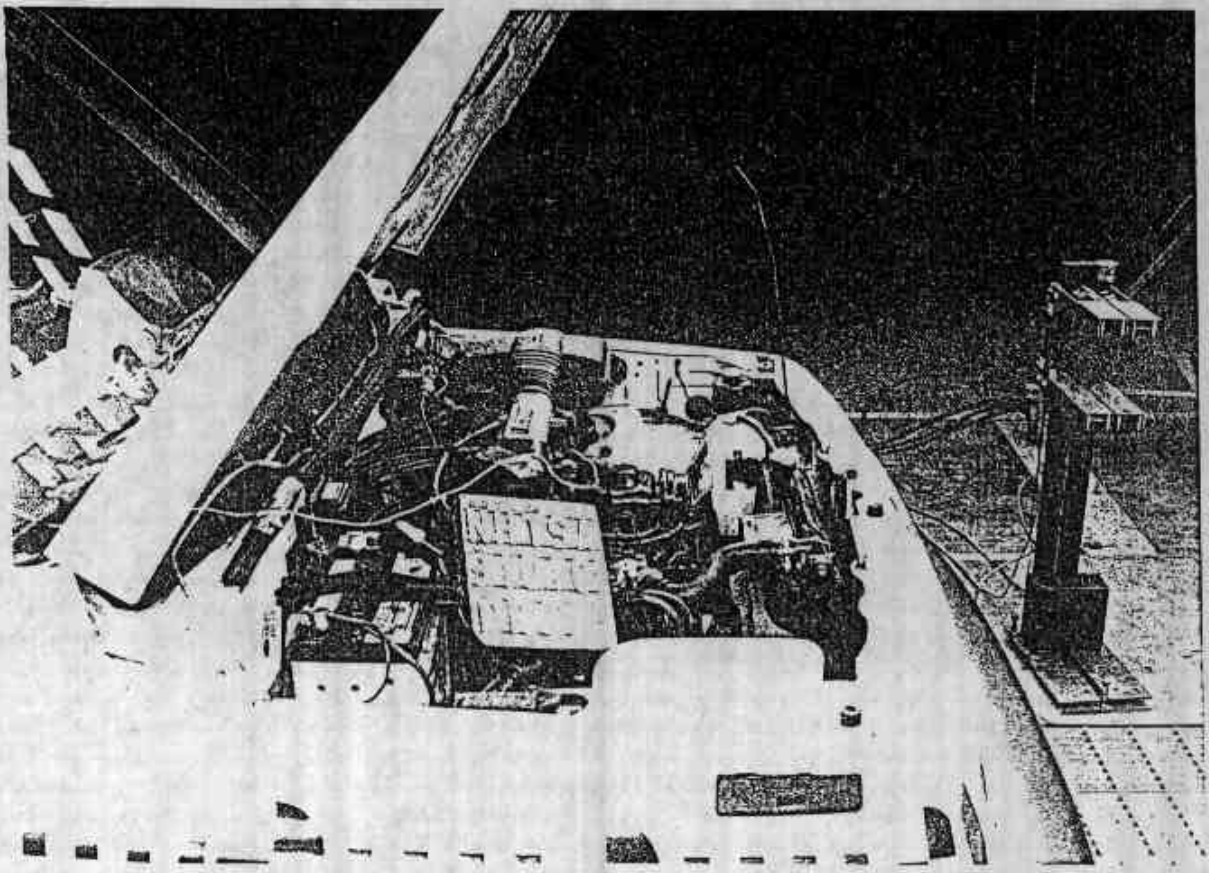


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

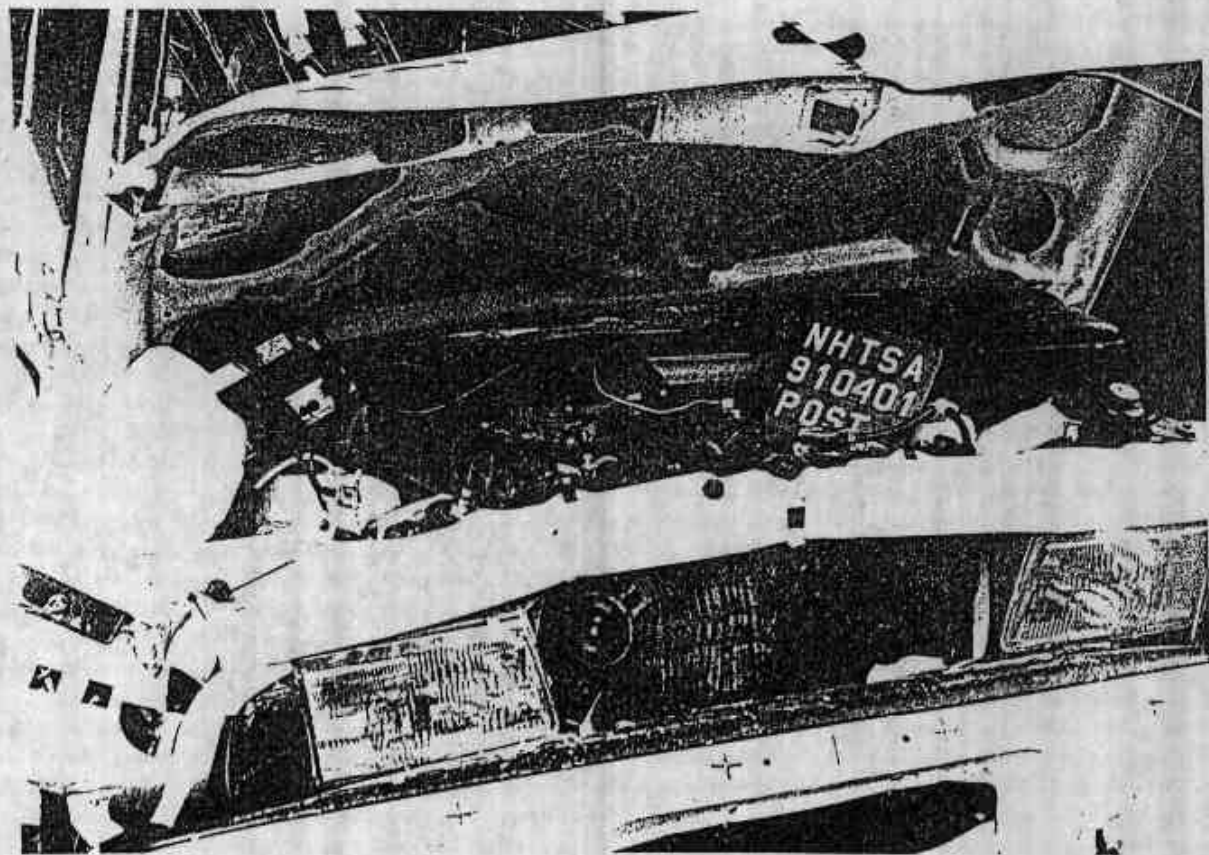


Figure A-16. POST TEST ENGINE COMPARTMENT VIEW

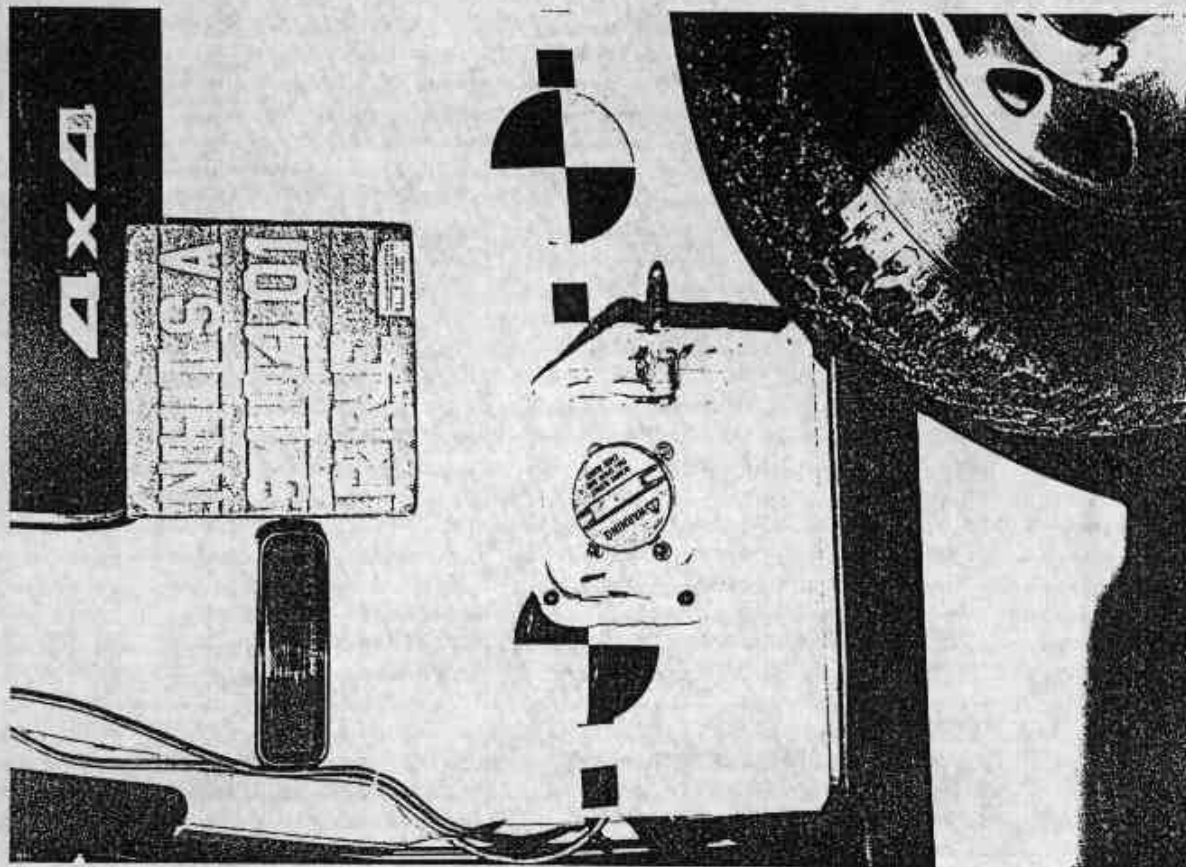


Figure A-17. PRE-TEST FUEL FILLER CAP VIEW

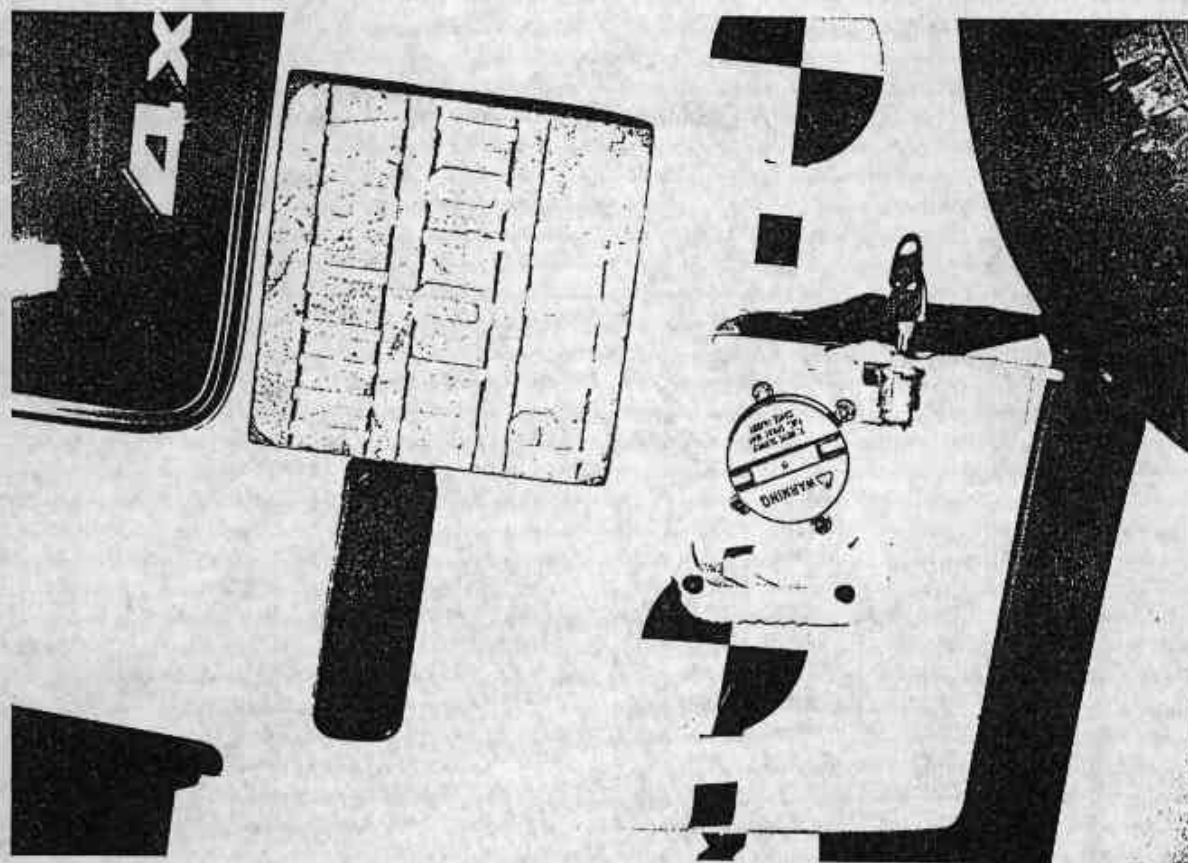


Figure A-18. POST-TEST FUEL FILLER CAP VIEW

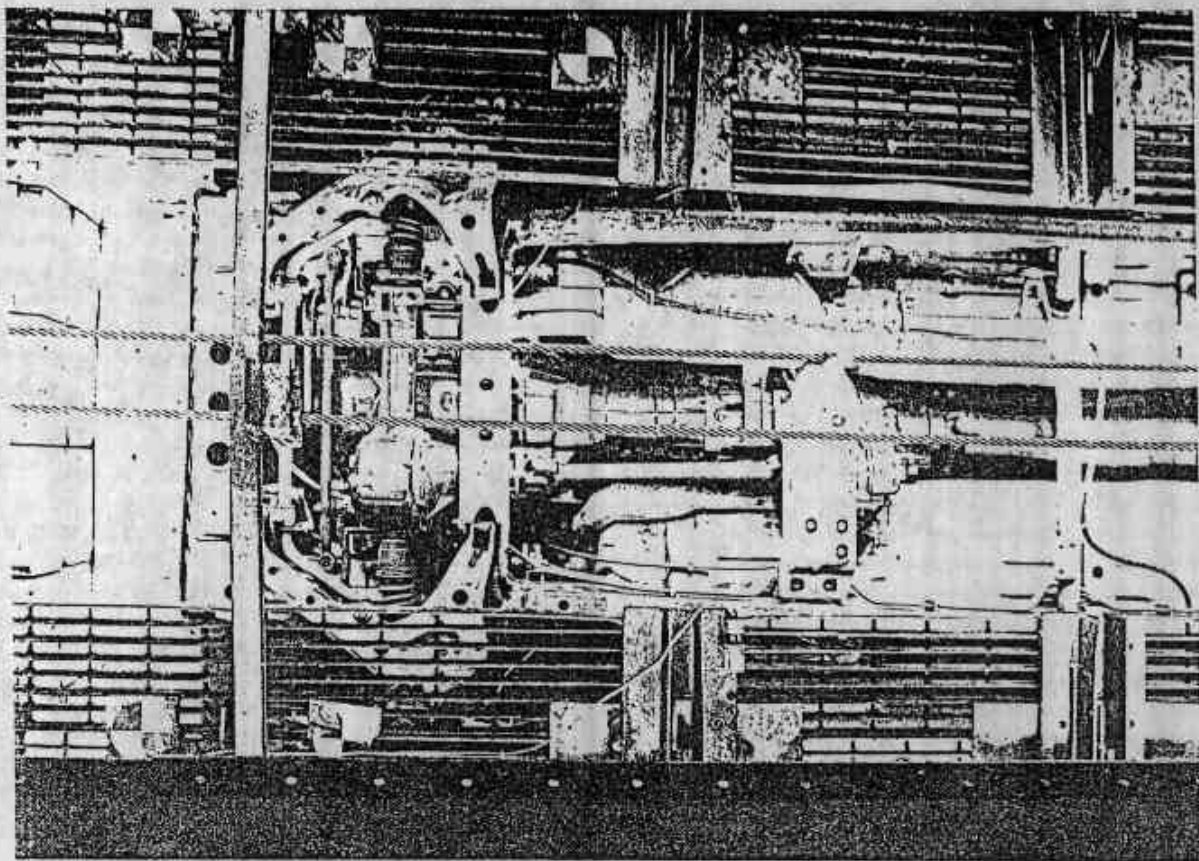


Figure A-19. PRE-TEST FRONT UNDERBODY VIEW

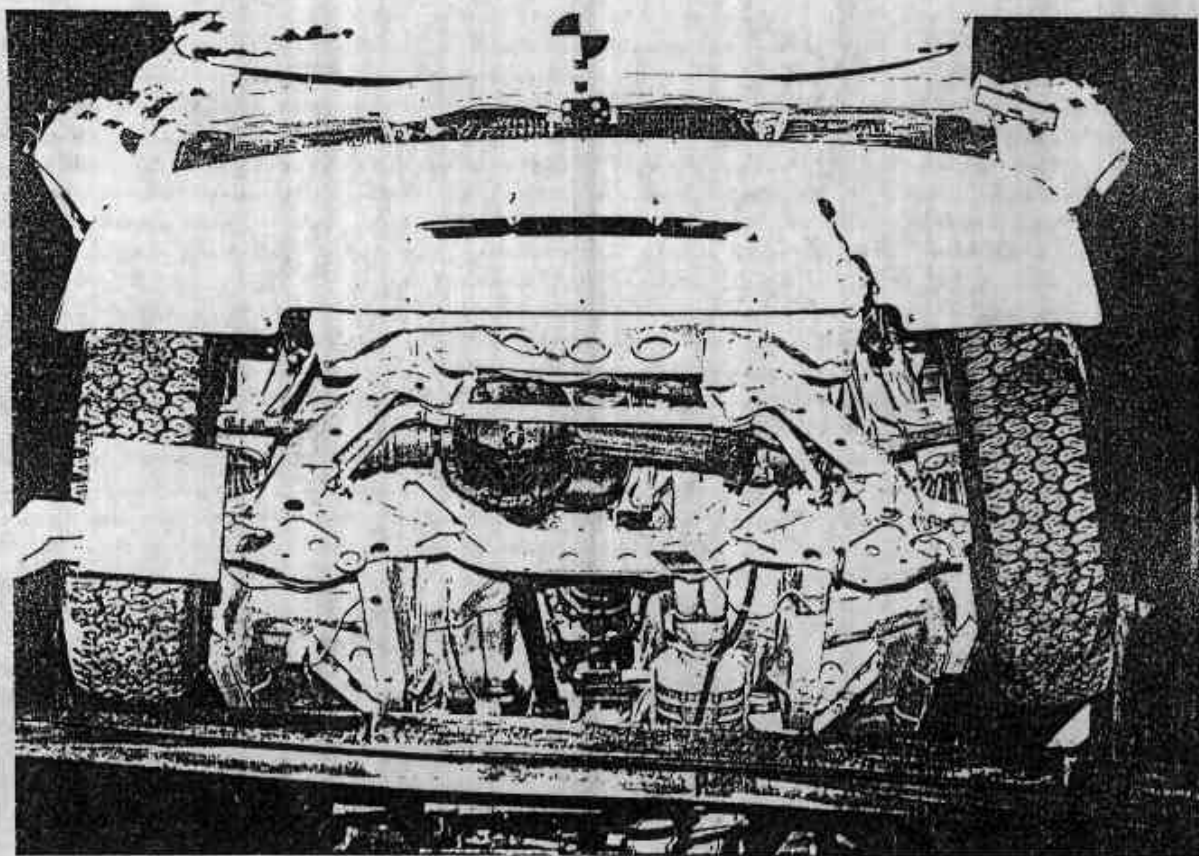


Figure A-20. PRE-TEST FRONT UNDERBODY VIEW
A-11

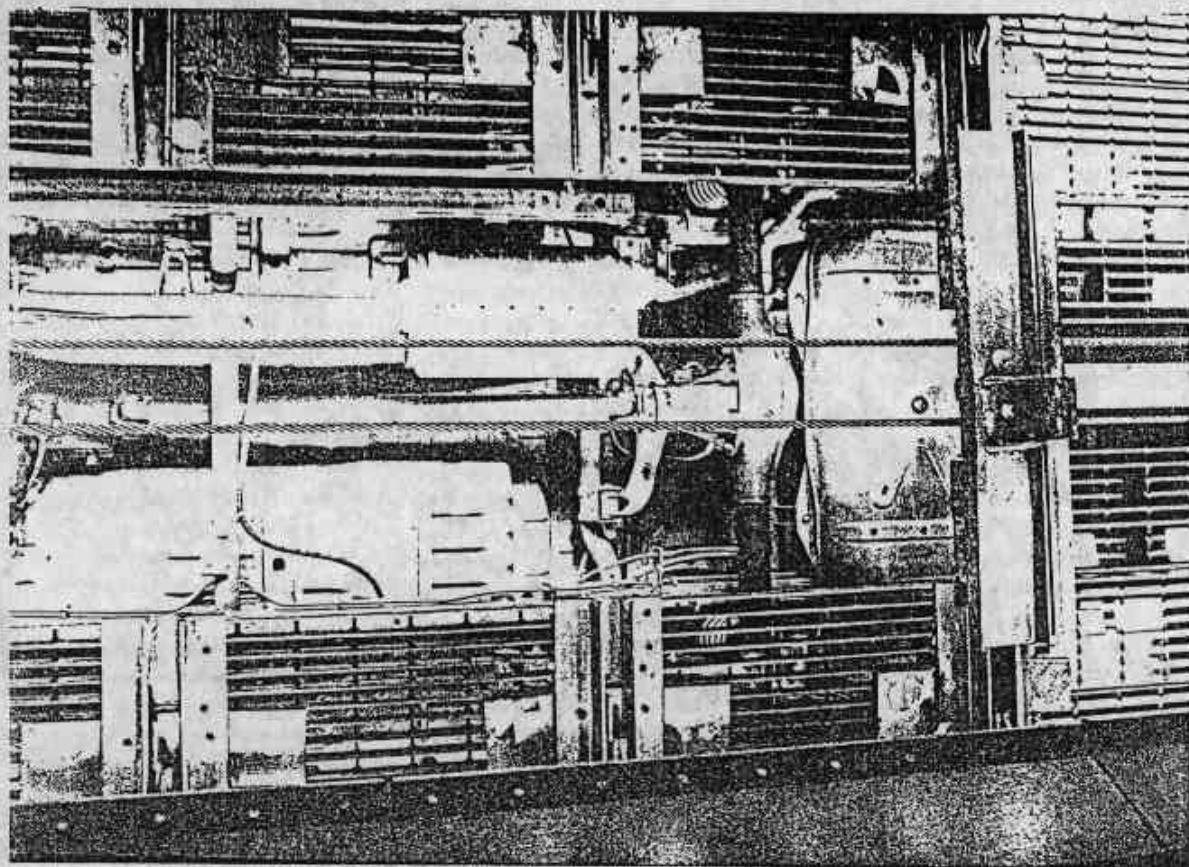


Figure A-21. PRE-TEST REAR UNDERBODY VIEW

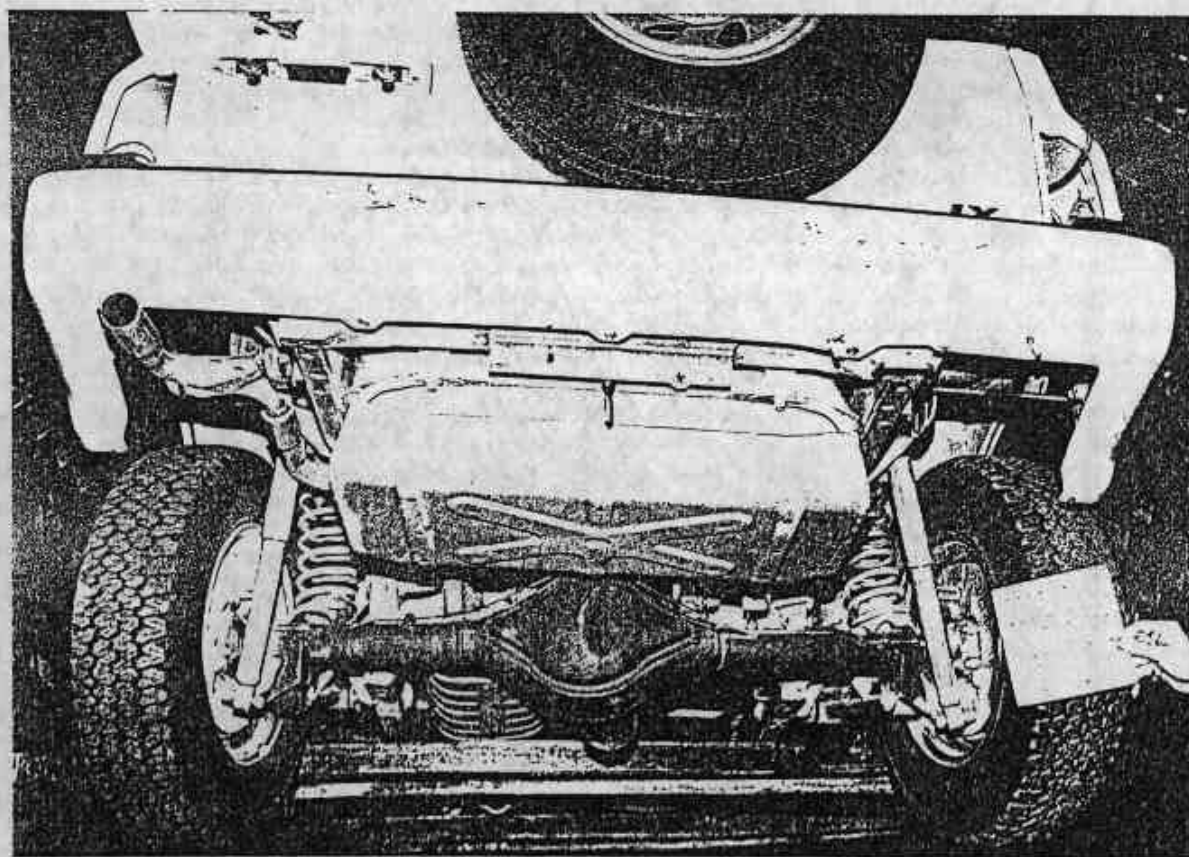


Figure A-22. POST TEST REAR UNDERBODY VIEW



Figure A-23. PRE-TEST DRIVER DUMMY POSITION VIEW

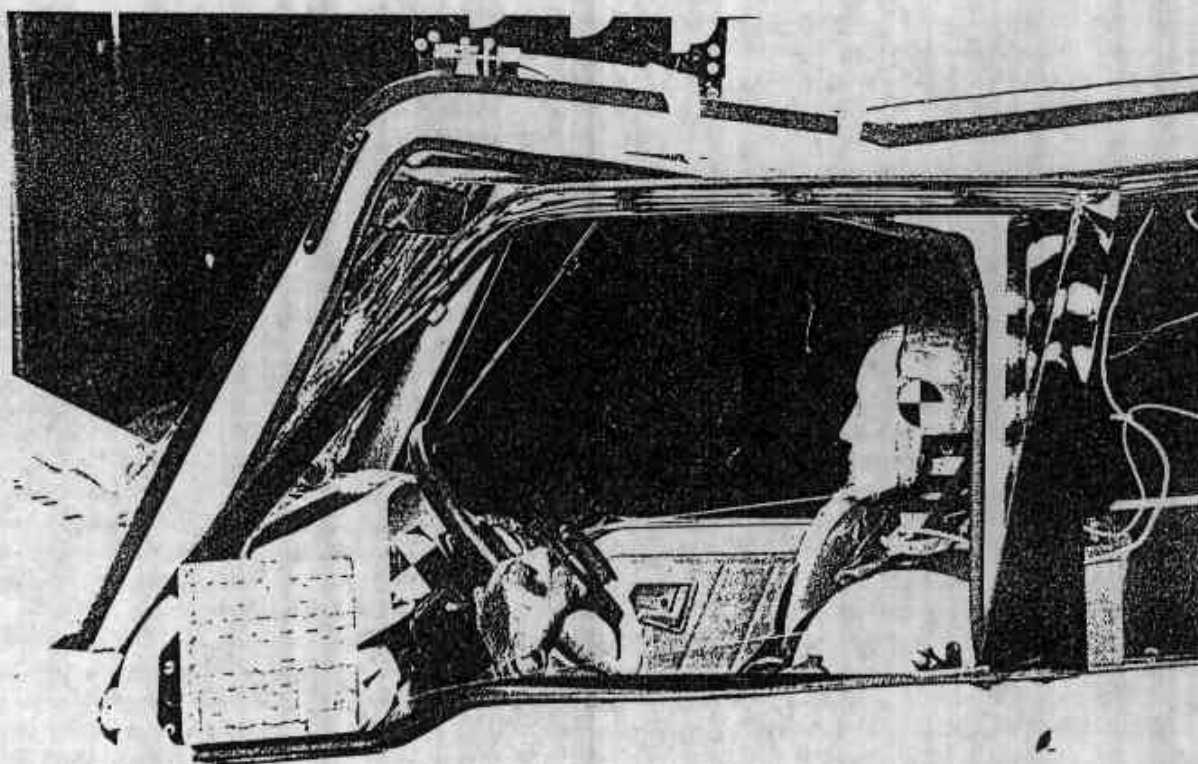


Figure A-24. POST-TEST DRIVER DUMMY POSITION VIEW



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



Figure A-26. POST-TEST PASSENGER DUMMY POSITION VIEW

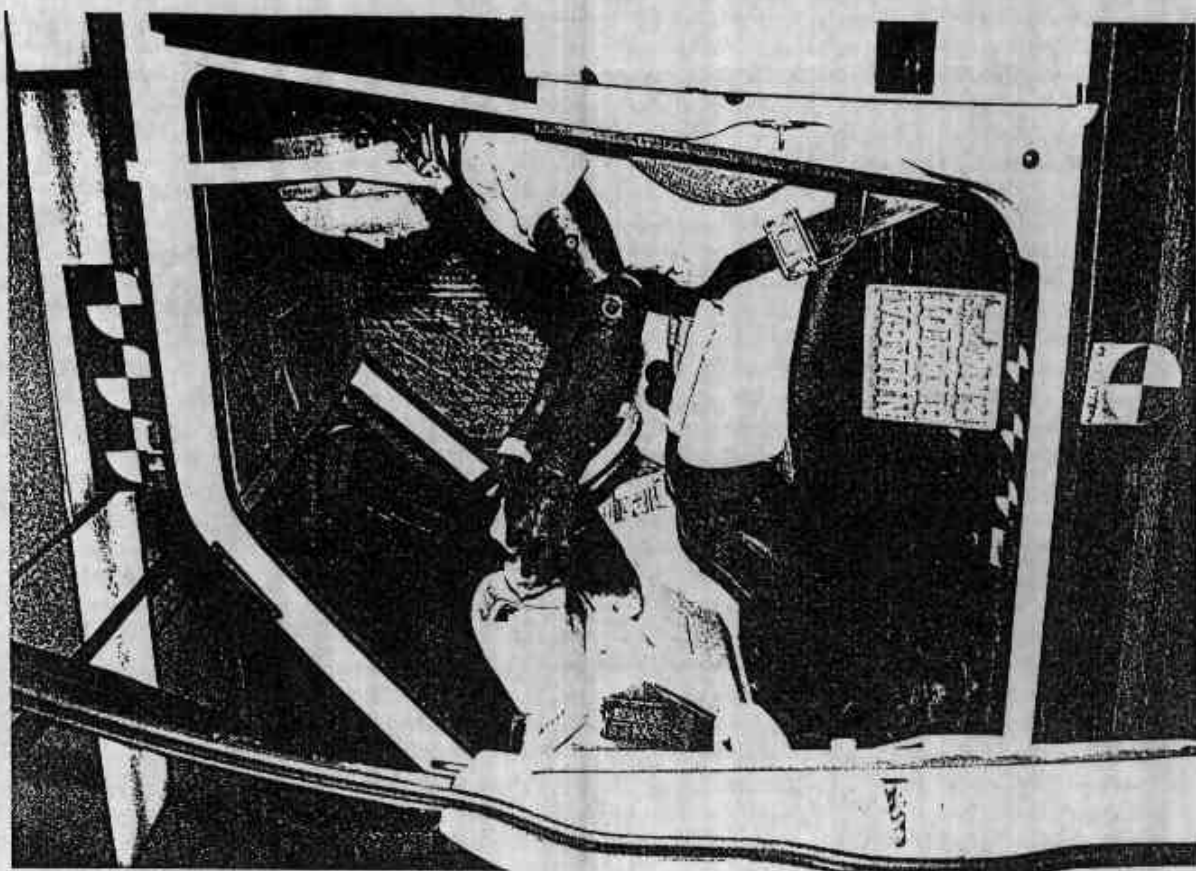


Figure A-27. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

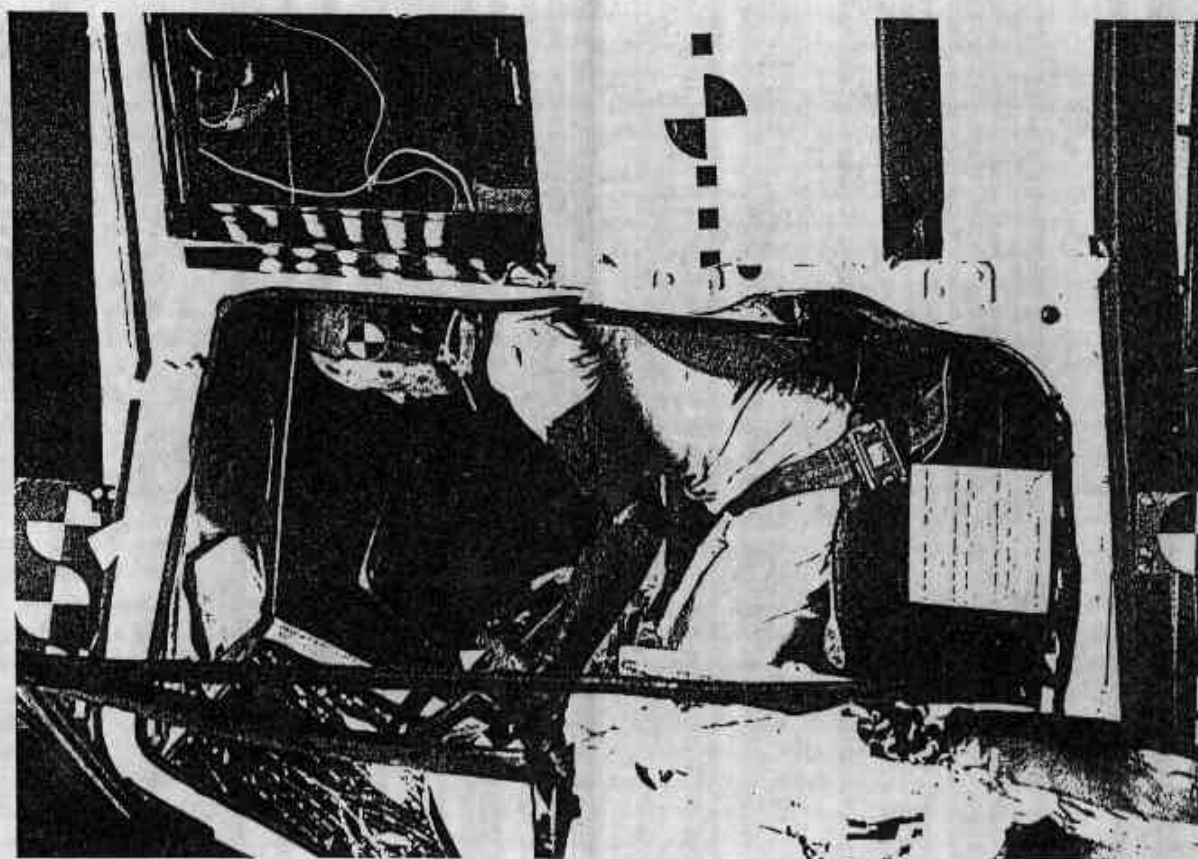


Figure A-28. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

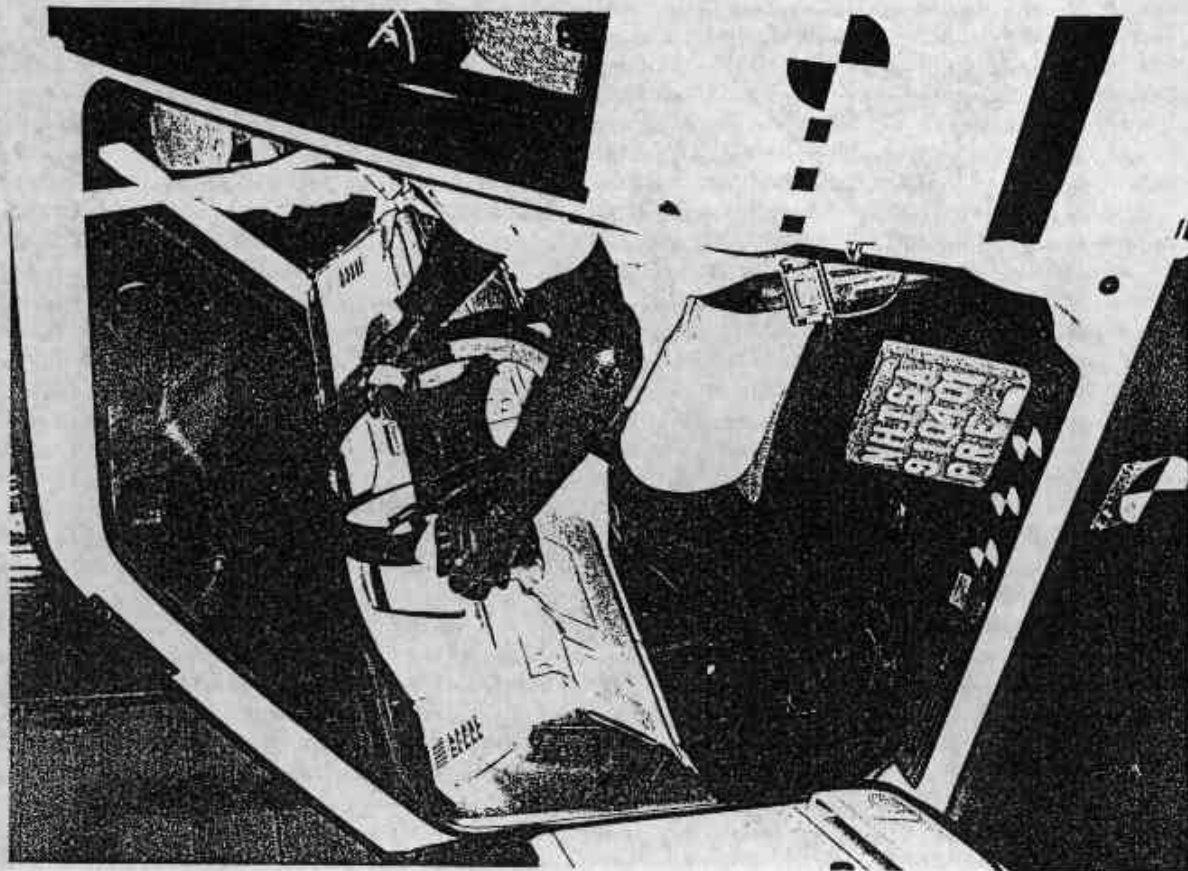


Figure A-29. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

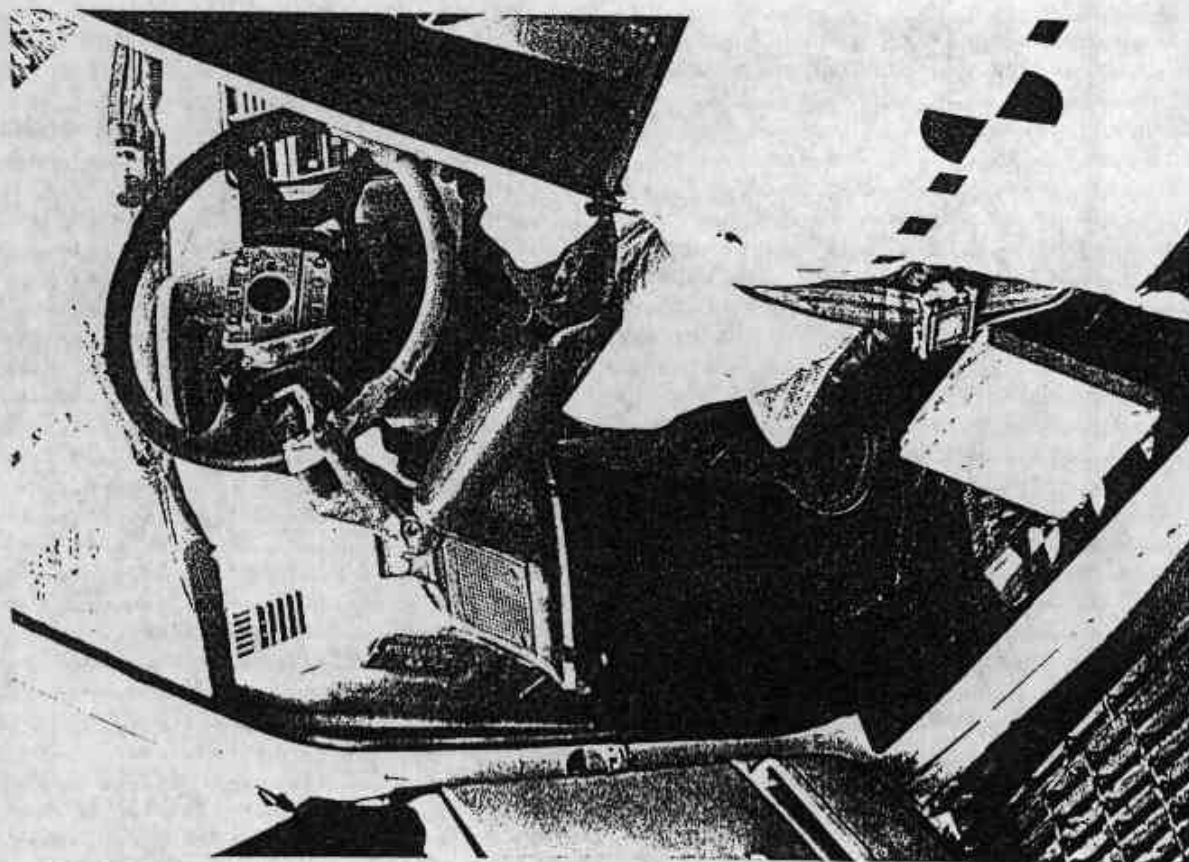


Figure A-30. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

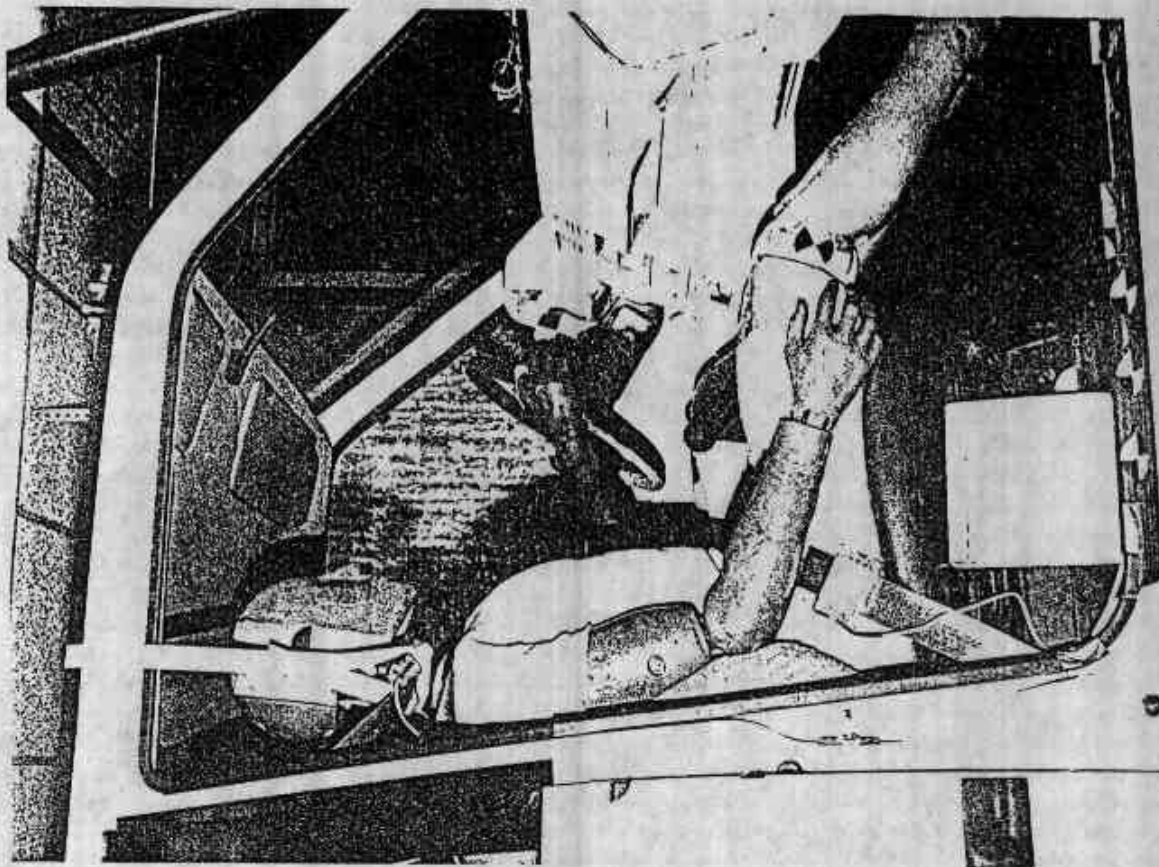


Figure A-31. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

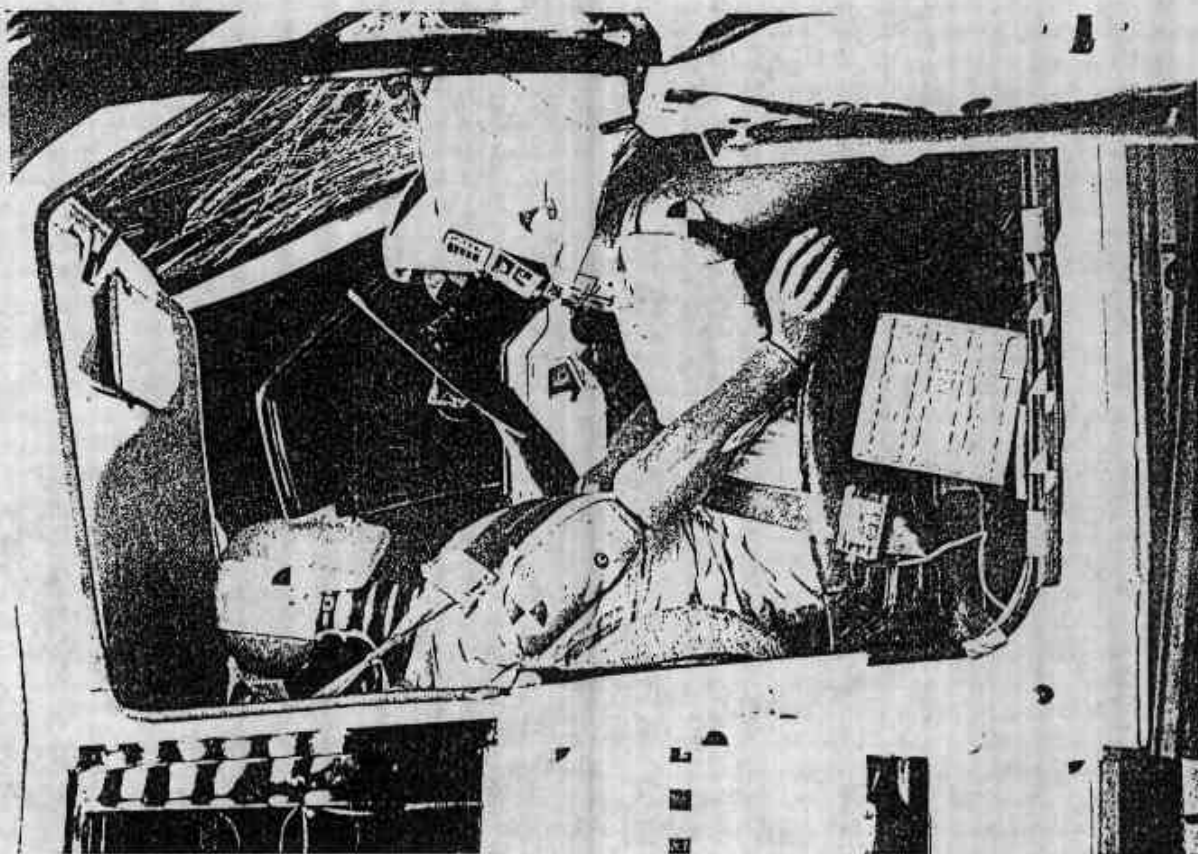


Figure A-32. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1



Figure A-23. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

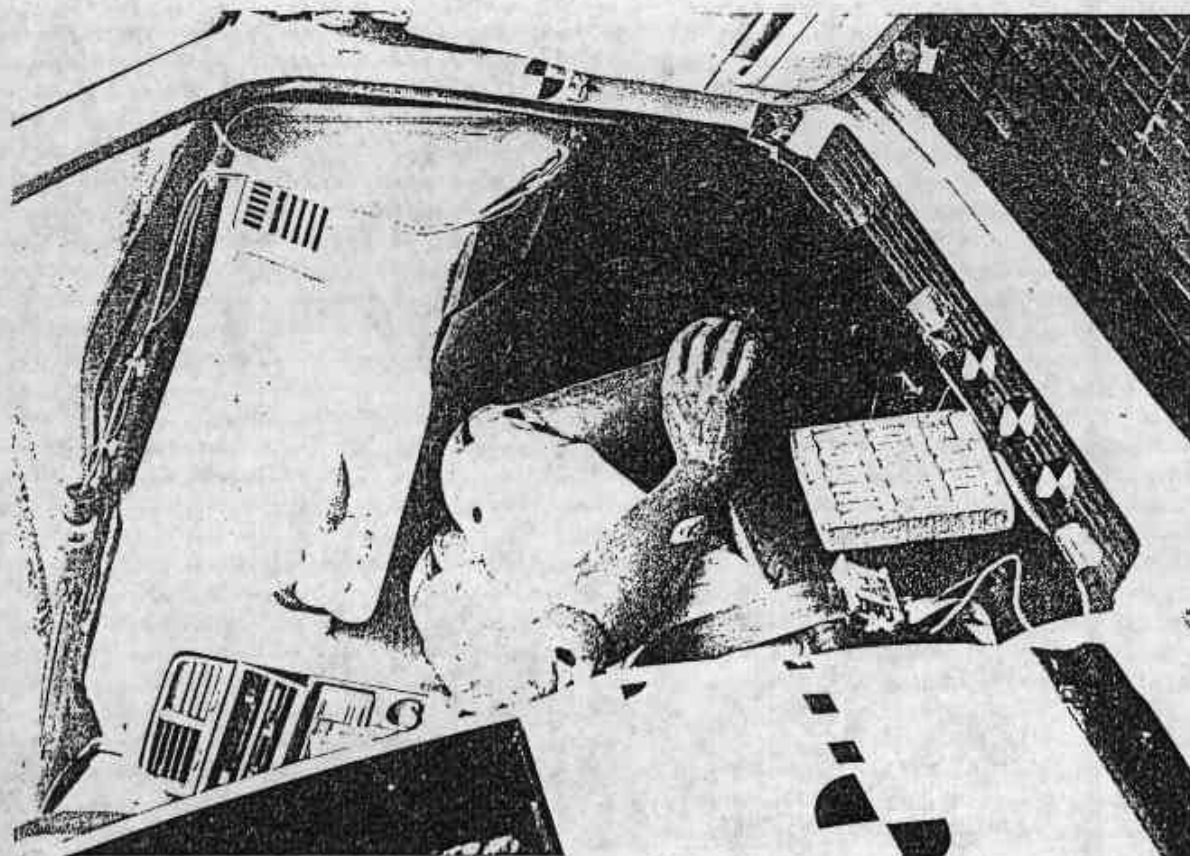


Figure A-24. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

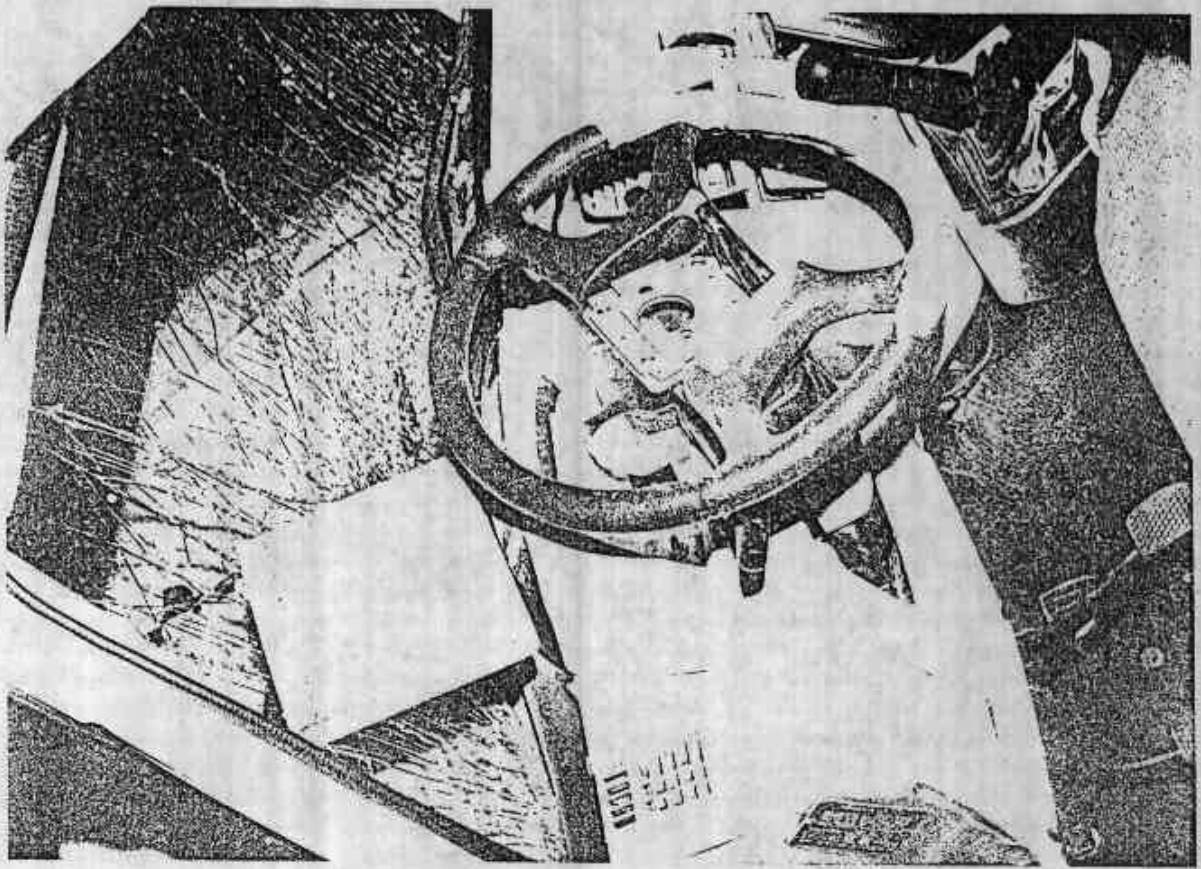


FIGURE A-35. POST-TEST DRIVER DUMMY HEAD CONTACT VIEW

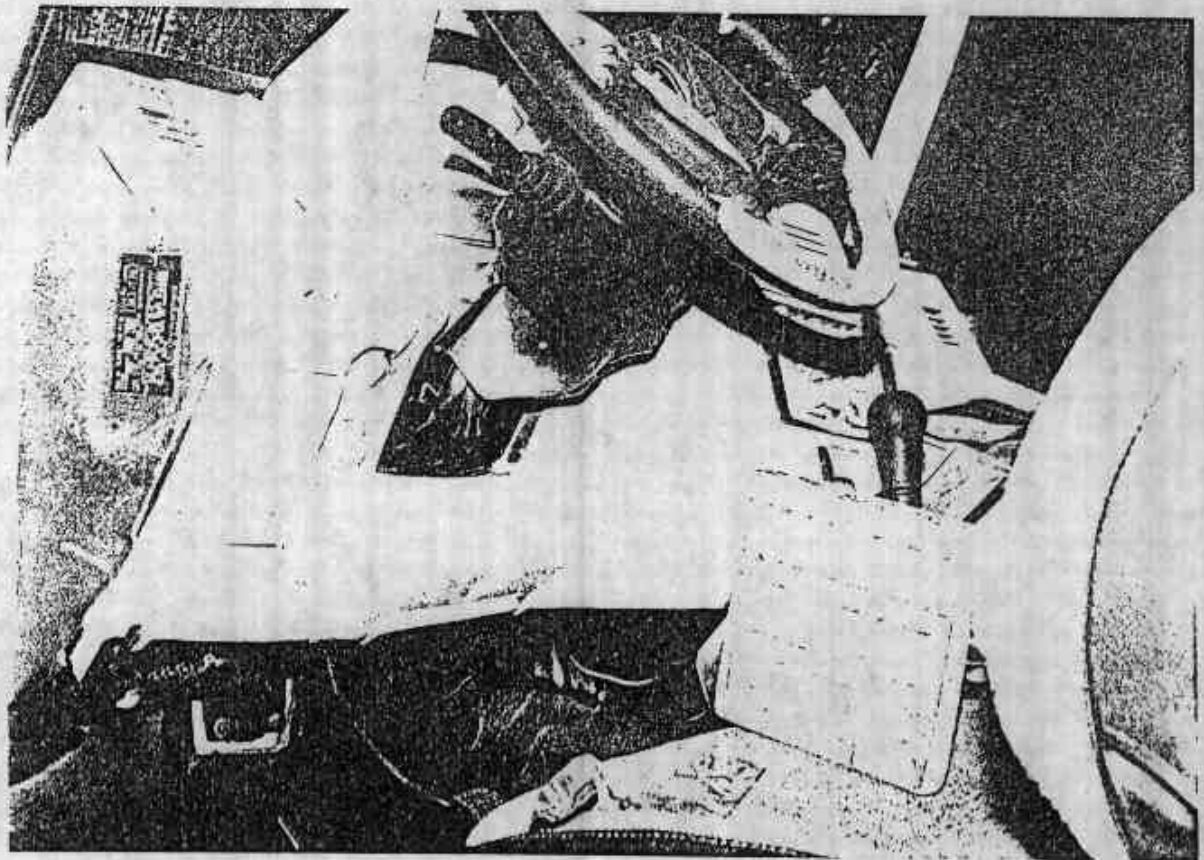


FIGURE A-36. POST-TEST DRIVER DUMMY HEAD CONTACT VIEW



Figure A-37. POST-TEST PASSENGER DUMMY HEAD AND KNEE CONTACT VIEW

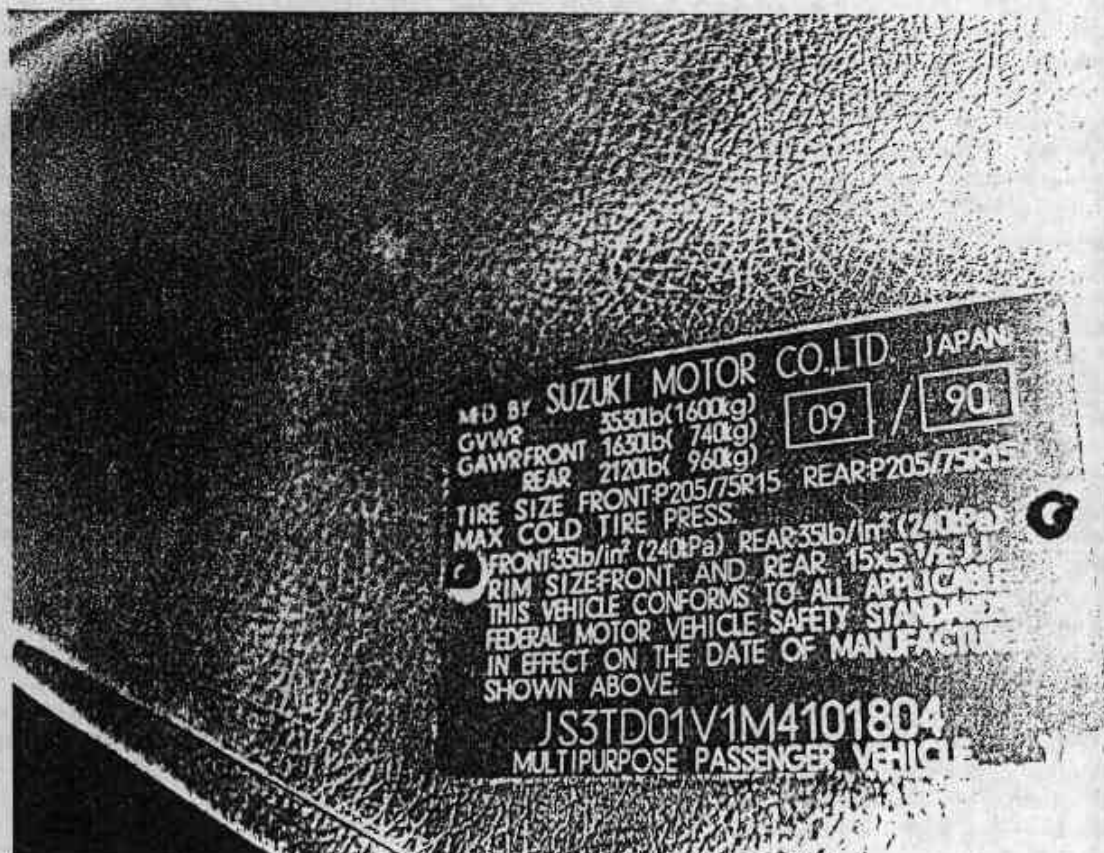


Figure A-38. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

TIRE PLACARD 56B00			
	GVWR	GAWR FRT	GAWR RR
LB/kg	3530/1600	1630/740	2120/960
TIRES		P205/75R15	P205/75R15
RIMS		15X5 1/2JJ	15X5 1/2JJ
INFLATION PRESSURE COLD PSI/kPa		23/160	23/160

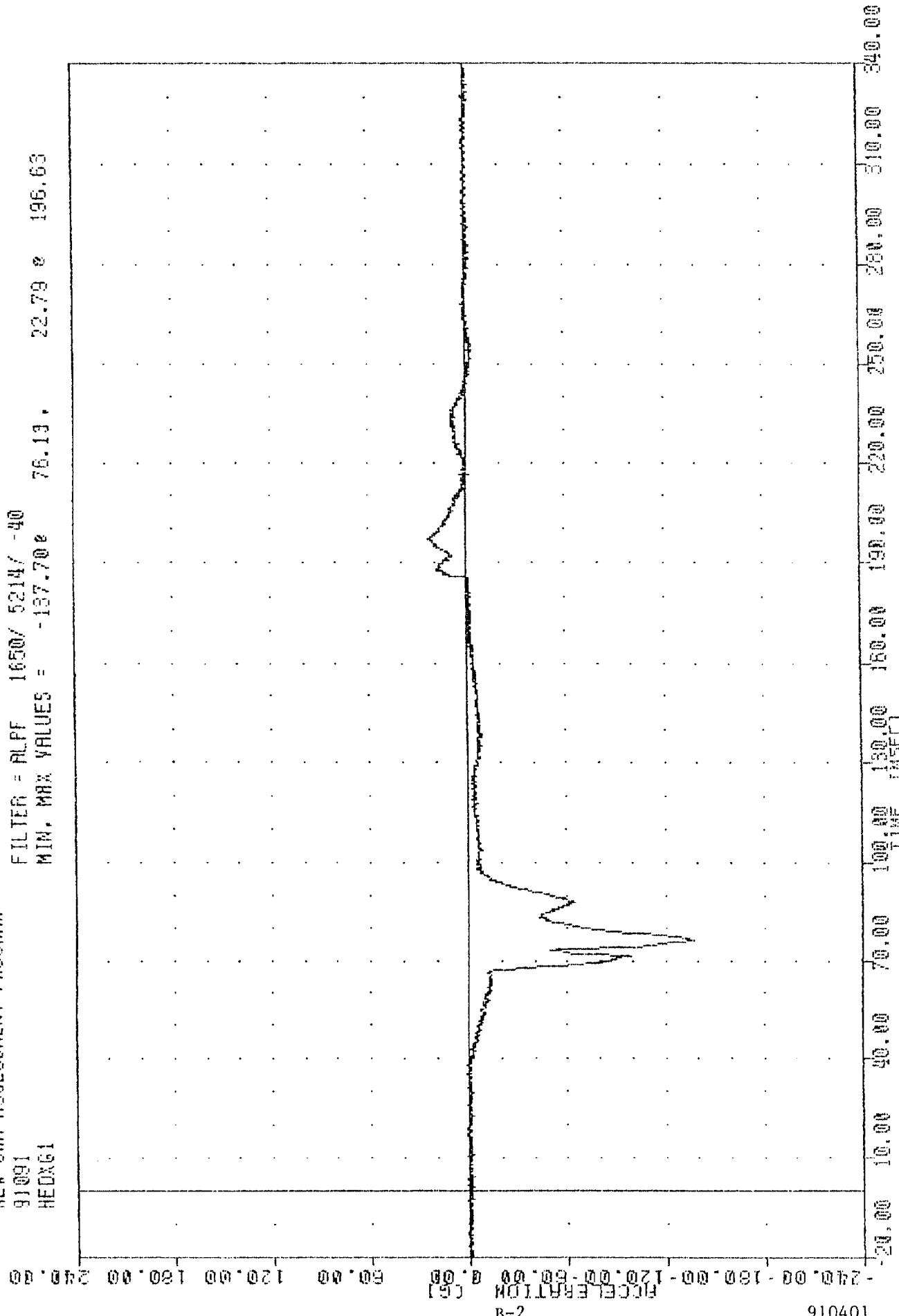
Figure A-39. PRE-TEST VEHICLE RECOMMENDED TIRE PRESSURE LABEL VIEW

APPENDIX B

DATA PLOTS

TRC , 910401
 NEW CRR ASSESSMENT PROGRAM
 91091
 HEDXG1

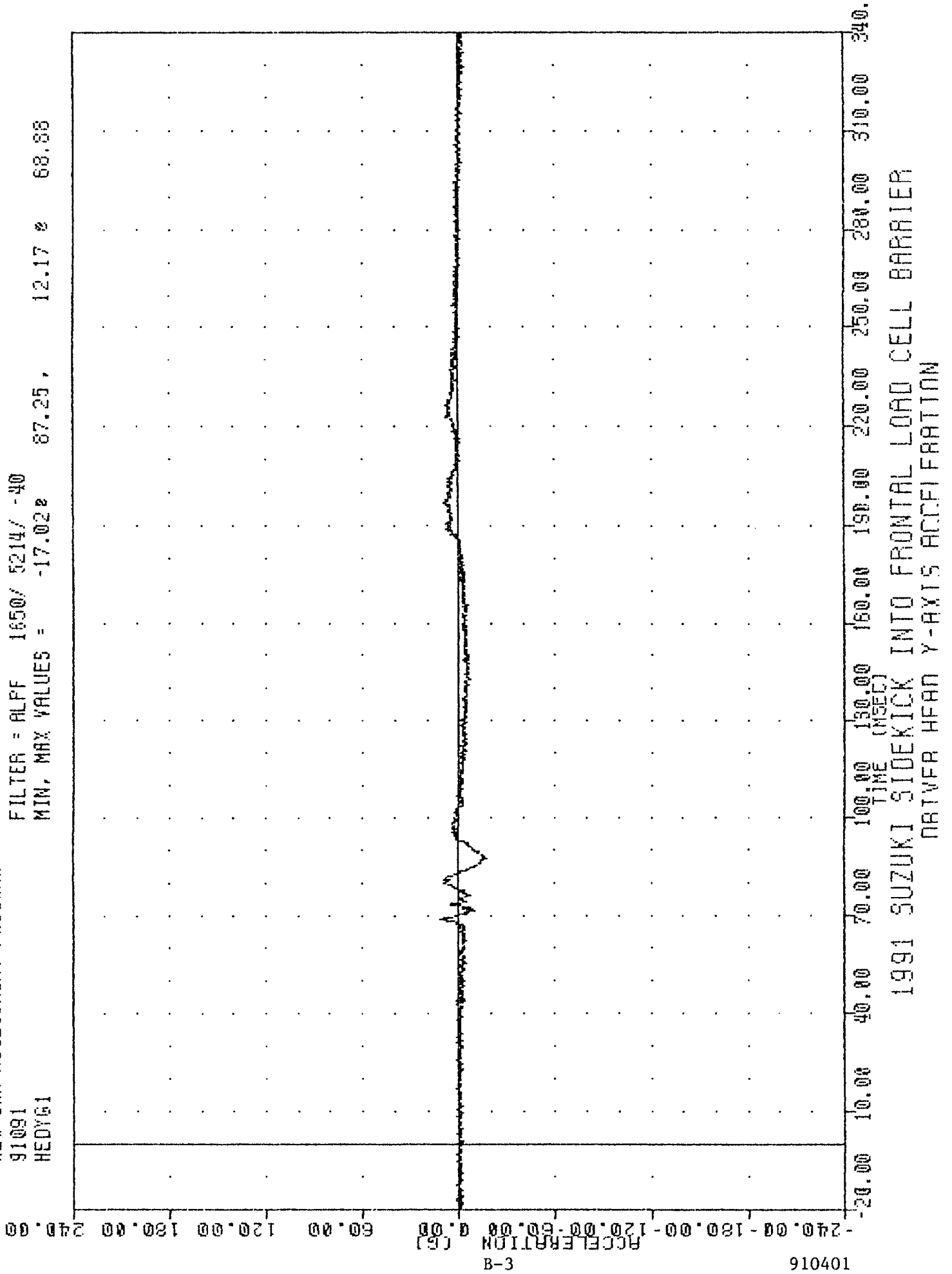
FILTER = ALPF 1050/ 5214/ -40
 MIN. MAX VALUES = -137.70e 76.13. 22.79 e 196.63



1991 SUZUKI SIDEKICK INFO FRONTAL LOAD CELL BARRIER

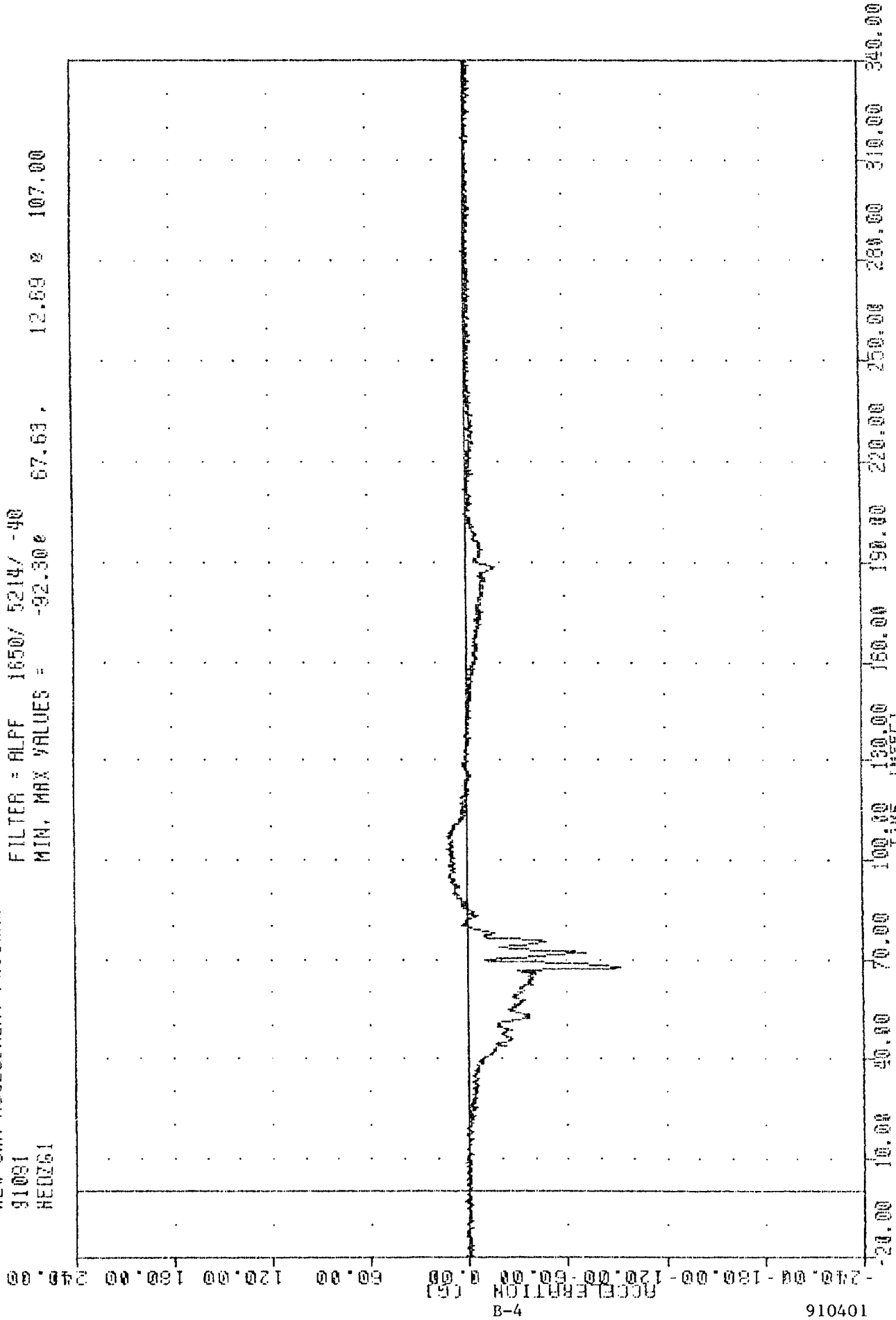
TRC . 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 HEDY61

FILTER = ALFF 1650/ 5214/ -40
 MIN, MAX VALUES = -17.028 87.25 , 12.17 8 68.88



TRC 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 REDZ61

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -92.300 67.63, 12.69 107.00



B-4

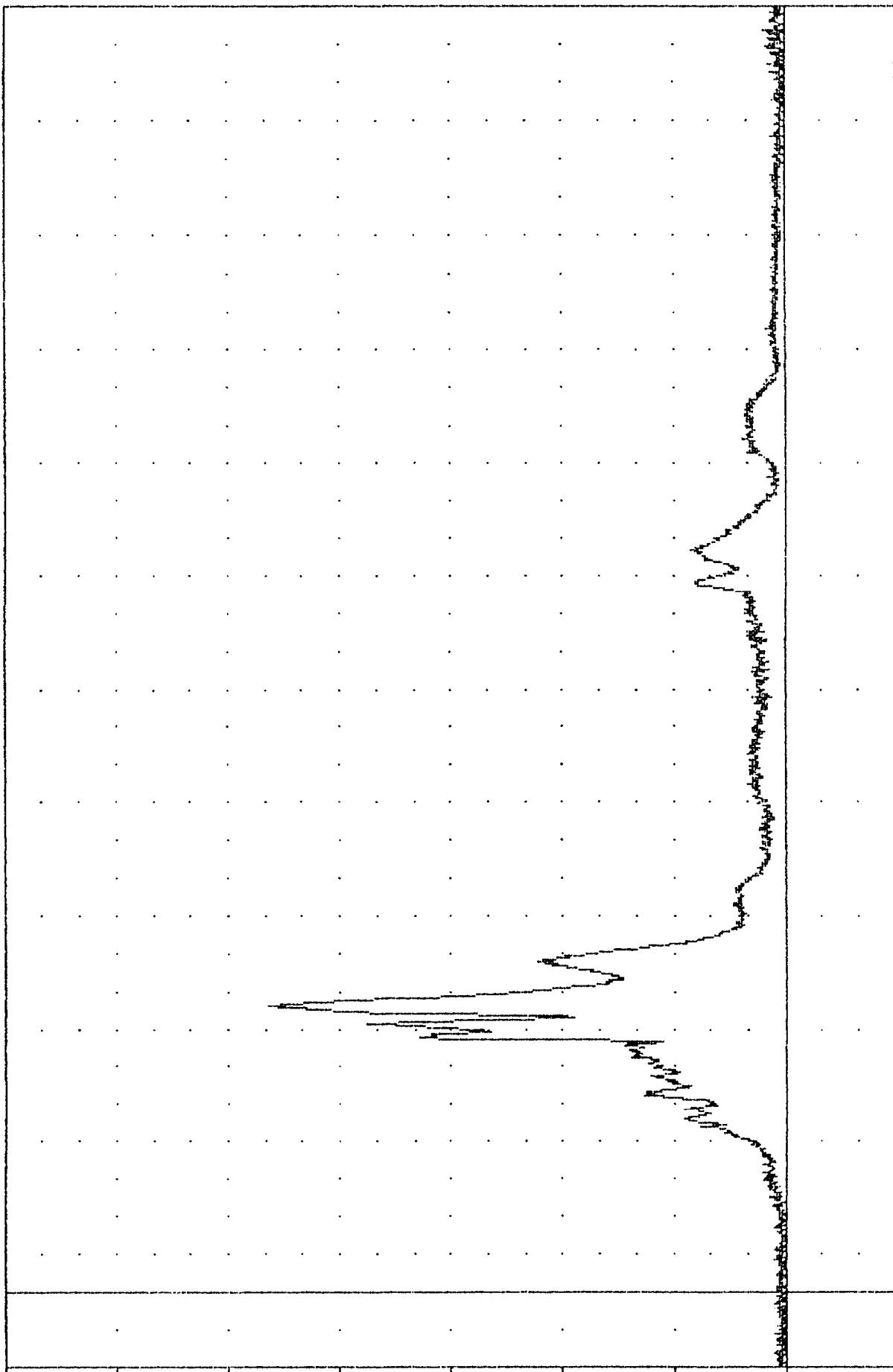
910401

1991 SUZUKI SIDEKICK INFO FRONTAL LOAD CELL BARRIER

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 HEDRG1

FILTER = ALPF 1850/ 5214/ -40
 MIN. MAX VALUES = 0.062 328.63 , 139.42 2 76.13

ACCELERATION (G)



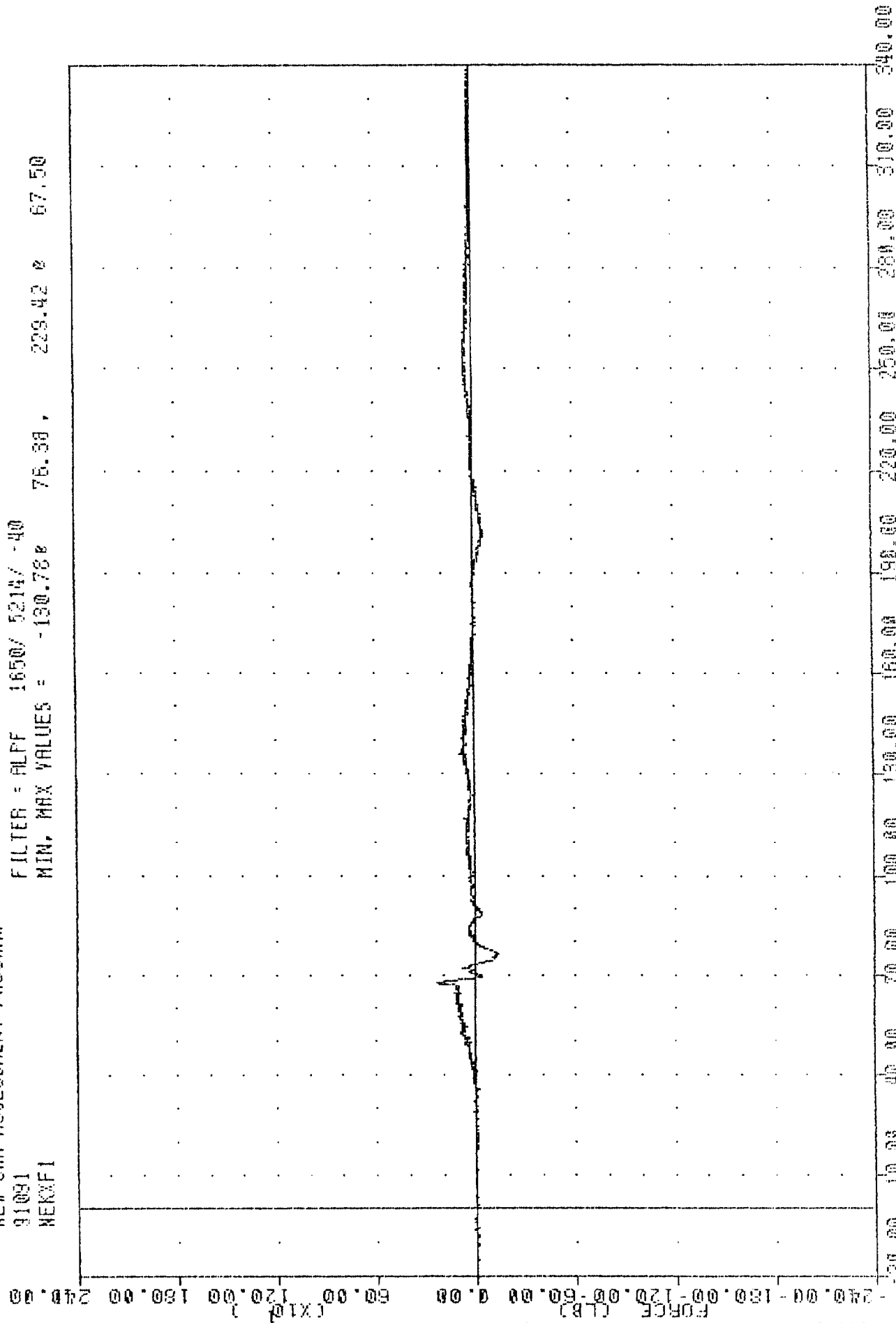
B-5

910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD RESULTANT ACCELERATION

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 NEWFI

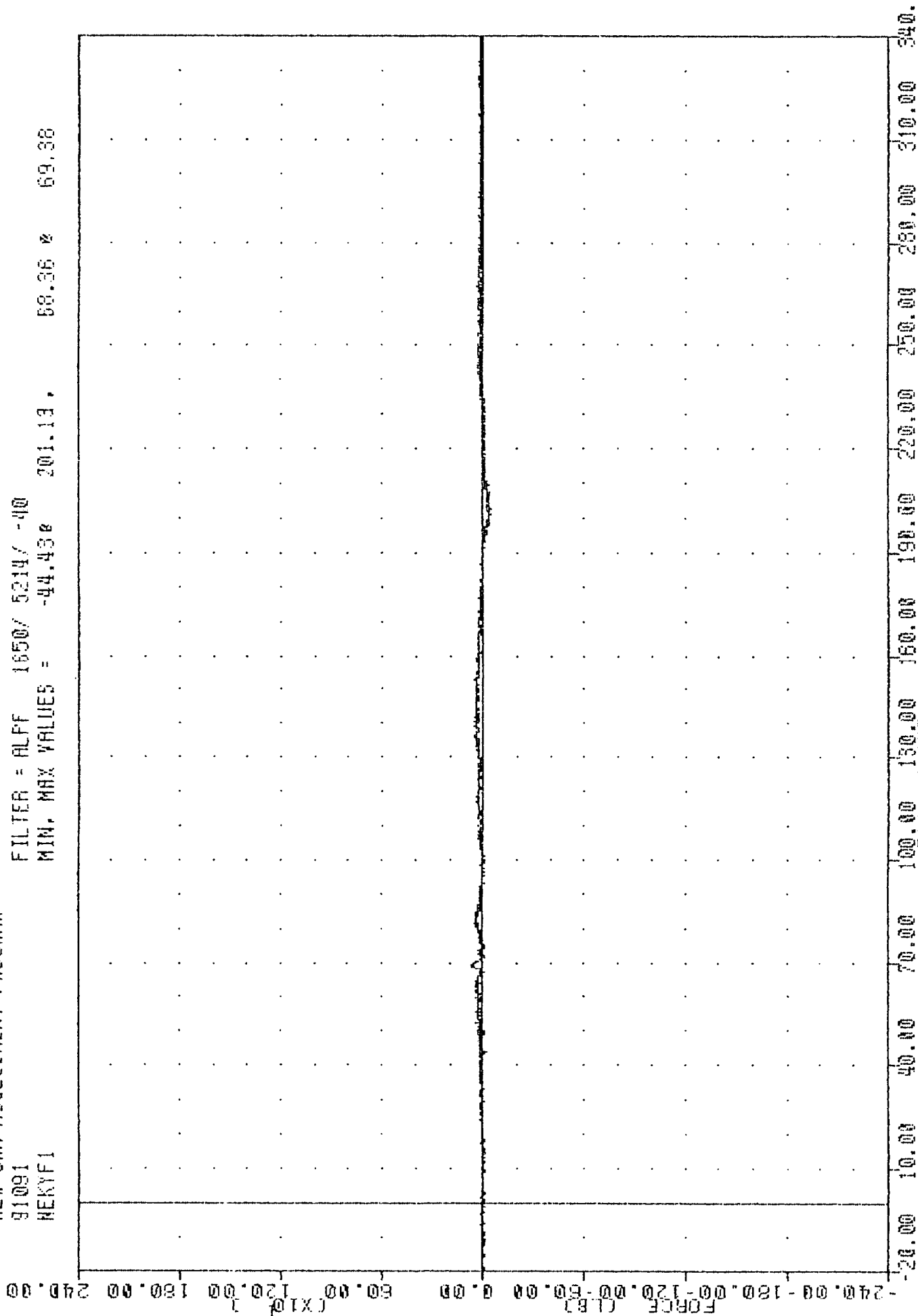
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -130.78 75.38 , 229.42 0 67.50



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 MEKVF1

FILTER = ALFF 1650/ 5214/ -40
 MIN. MAX VALUES = -44.436 201.13 58.36 69.38



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 NATVER NECK Y-AXIS SHEAR FORCE

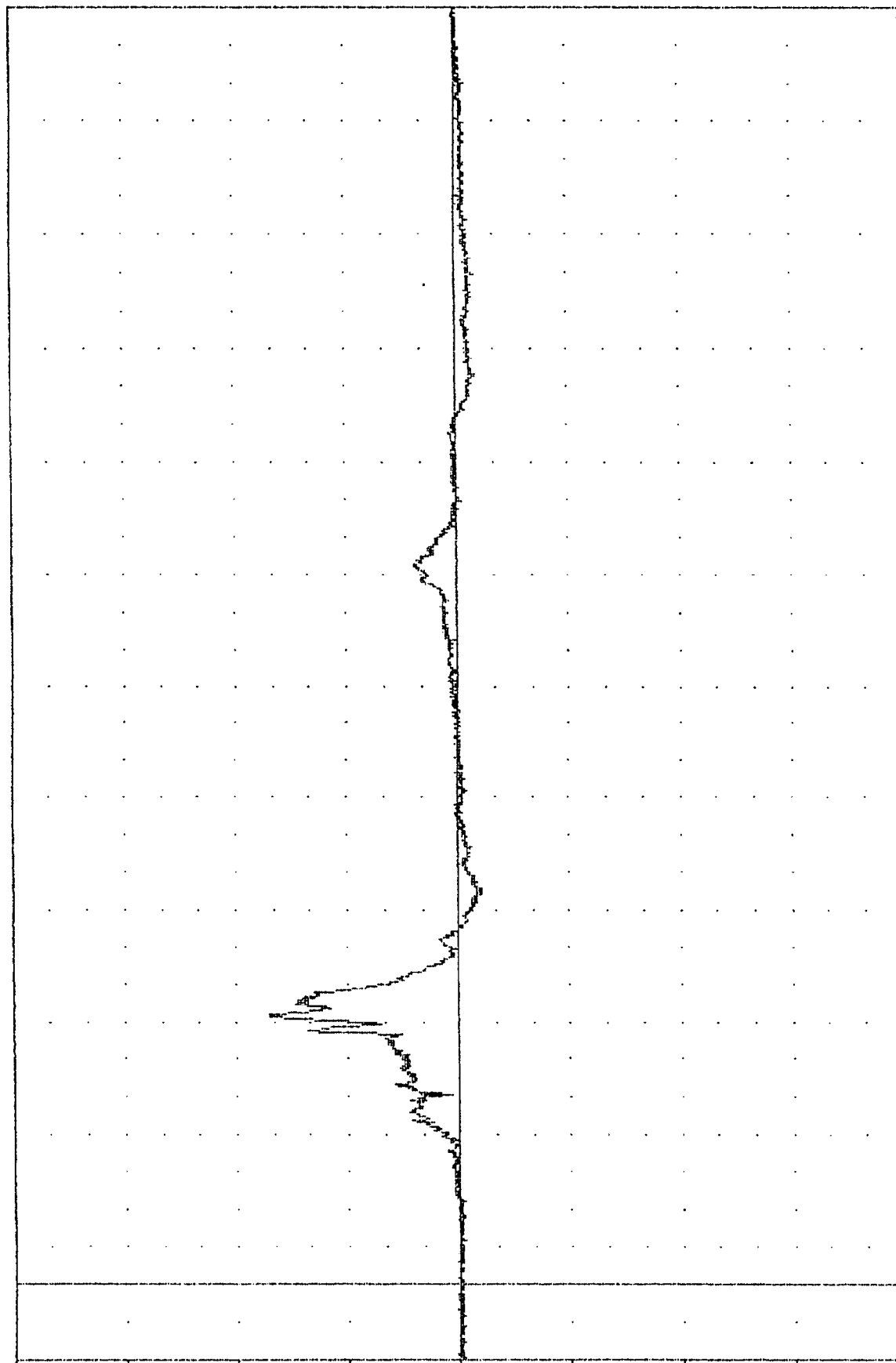
TRC 910401
NEW CAR ASSESSMENT PROGRAM

91091 FILTER = ALFF 1650/ 5214/ -40

MIN. MAX VALUES = -125.230 105.50 1022.35 71.50

HEKZF1

FORCE (LB)
(x10³)



B-8

910416

1991 SUZUKI SIDERICK INTO FRONTAL LOAD CELL BARRIER

TEST NO. 910401

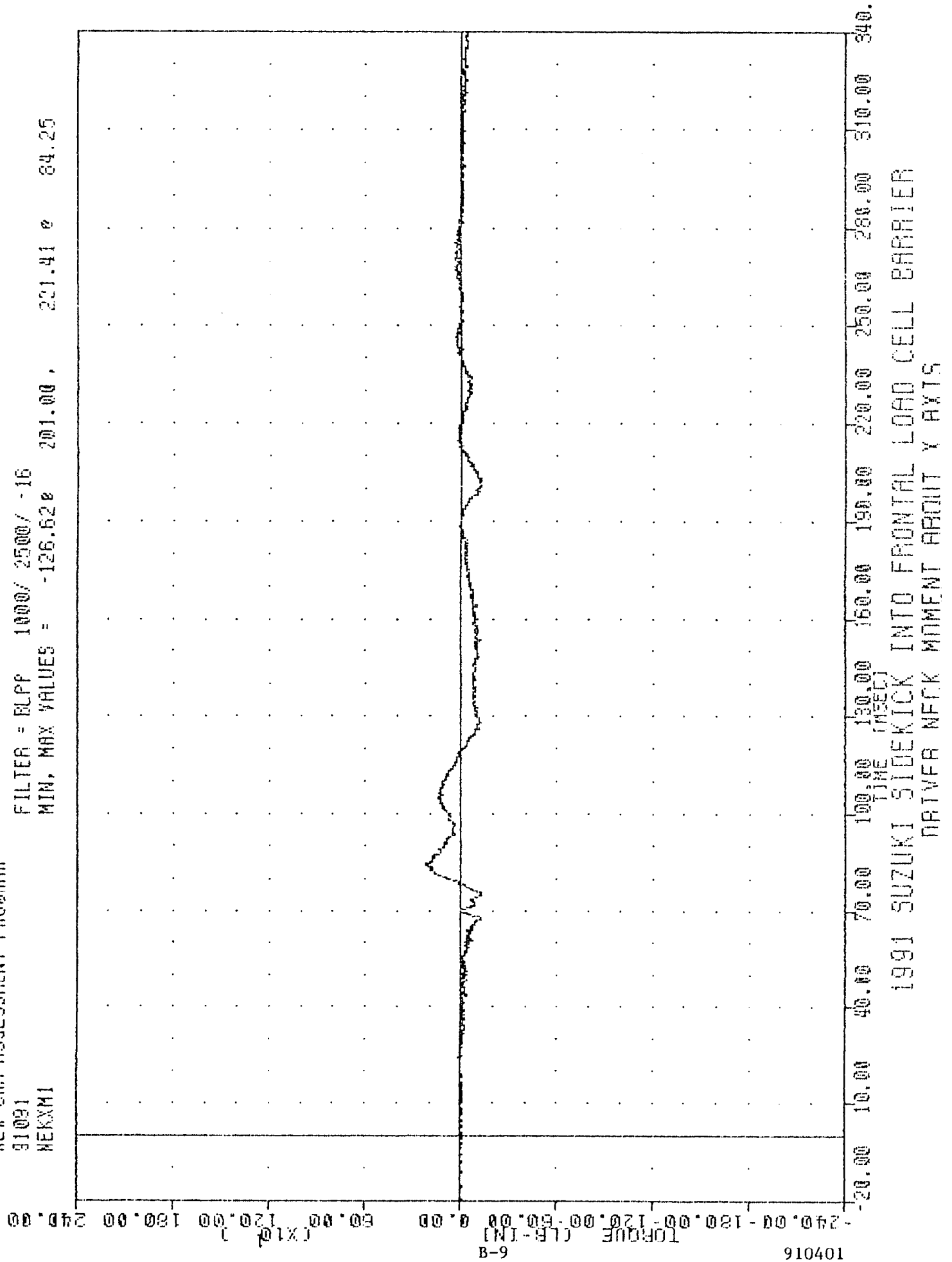
DATE 10/25/91

TIME 10:00

TESTER J. W. FORD

IRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 HEKXMI

FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = -126.620 201.00 , 231.41 0 84.25



TRC
NEW CAR ASSESSMENT PROGRAM

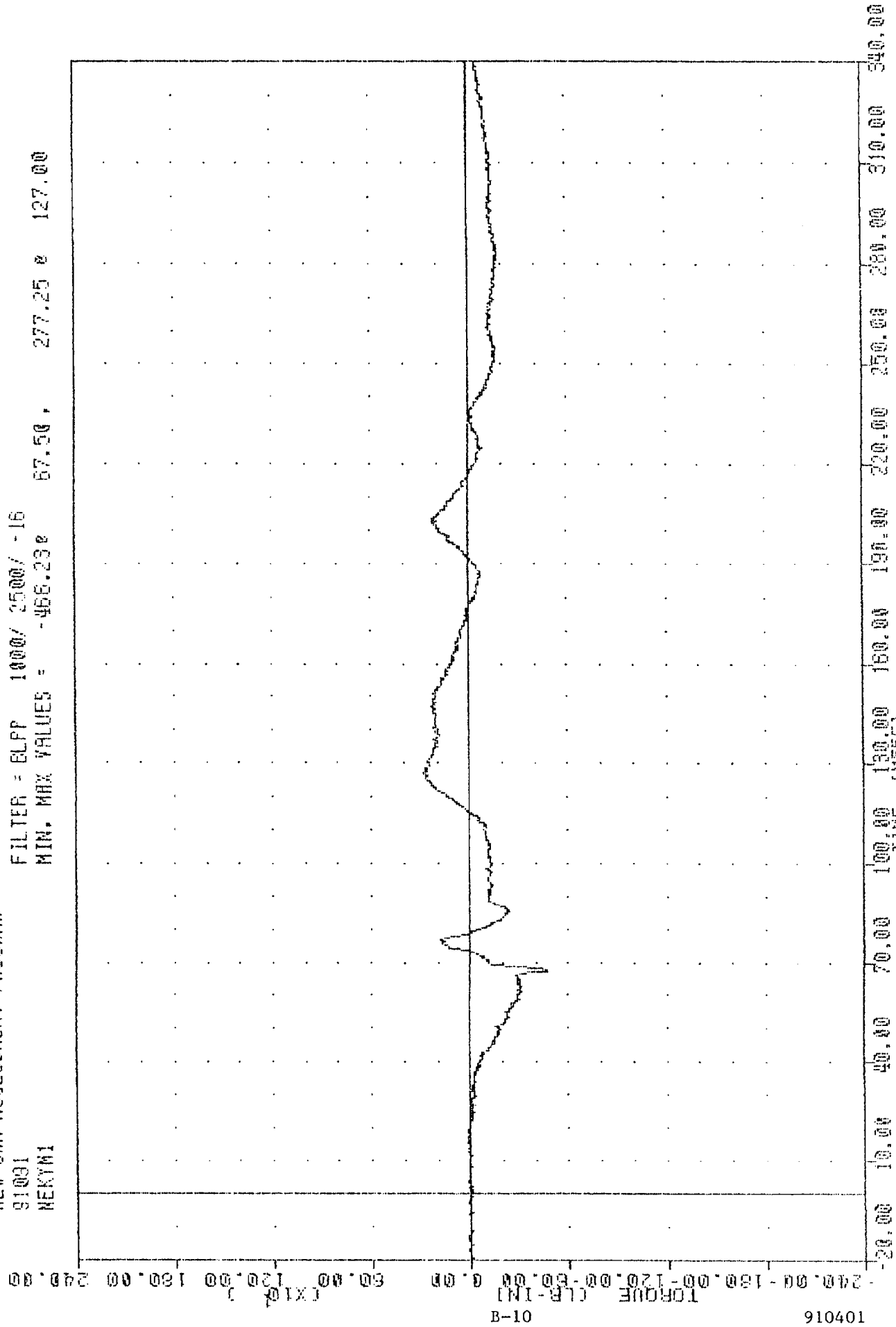
910401

FILTER = ELPP 1000/ 2500/ -16

91031

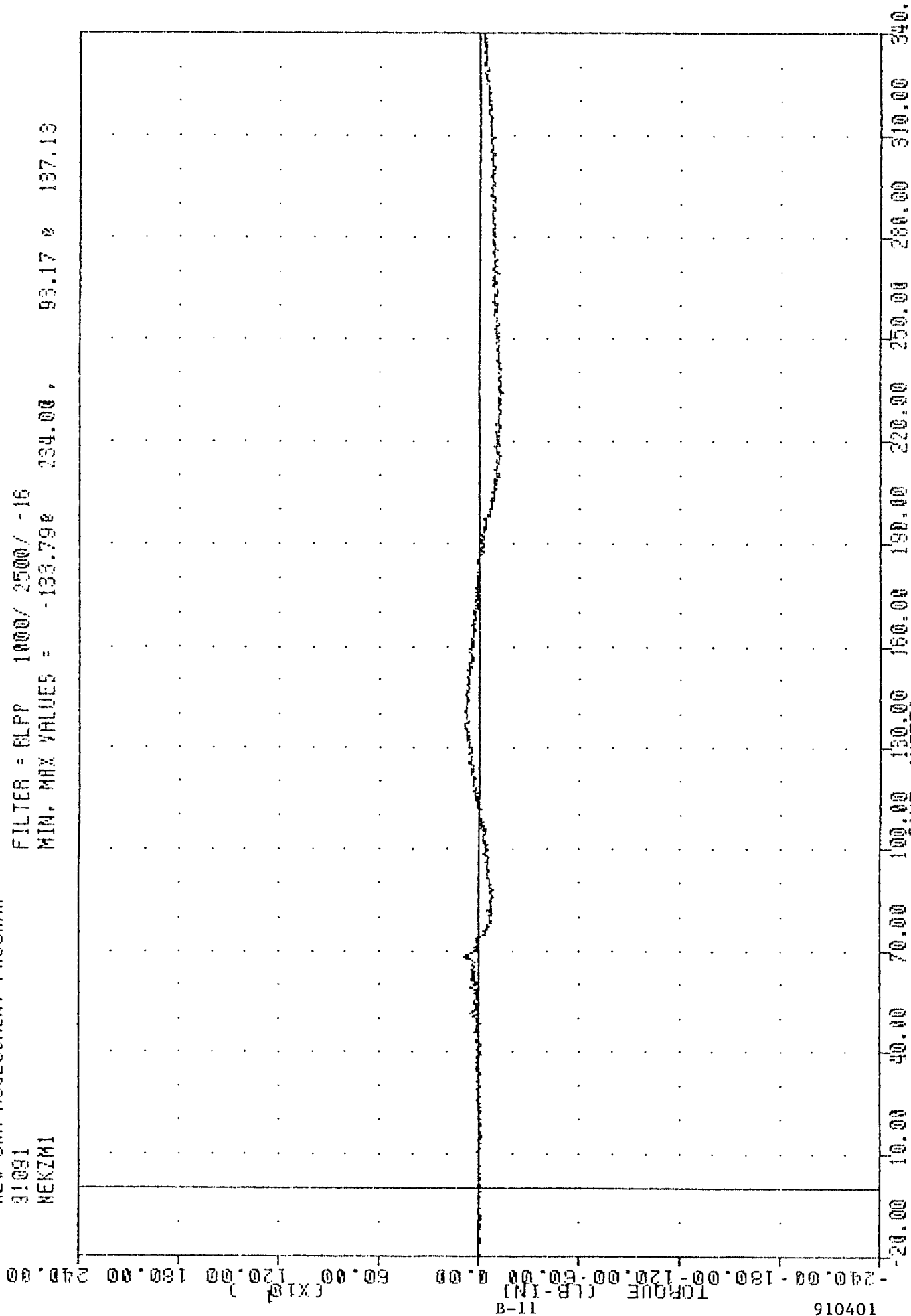
MIN. MAX VALUES = -466.23% 67.50 , 277.25 @ 127.00

NEKYN1



FILE , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 NEKZM1

FILTER = BLPP 1000/ 2500/ -16
 MIN. MAX VALUES = -133.790 234.00 , 93.17 137.13

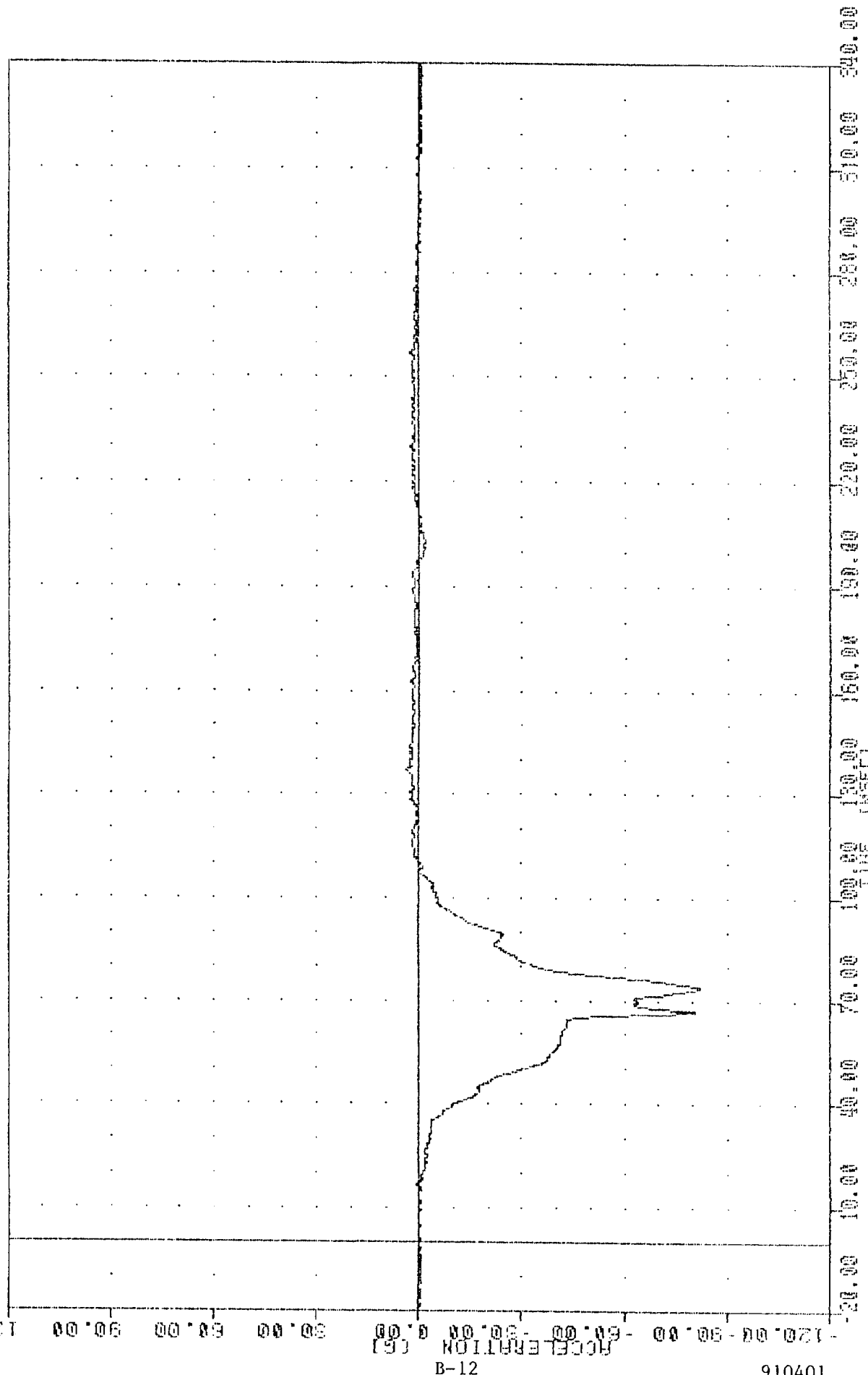


104016

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 DRIVE SHAFT MOMENT ABOUT 7 AXIS

TRC 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 C51X61

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -82.09% 73.63, 3.73 @ 136.88



B-12

910401

1991 SUZUKI SIDEWICK INTO FRONTAL LOAD CELL BARRIER

INC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 CSTY61

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -11.26 75.25 4.96 51.33

120.00

90.00

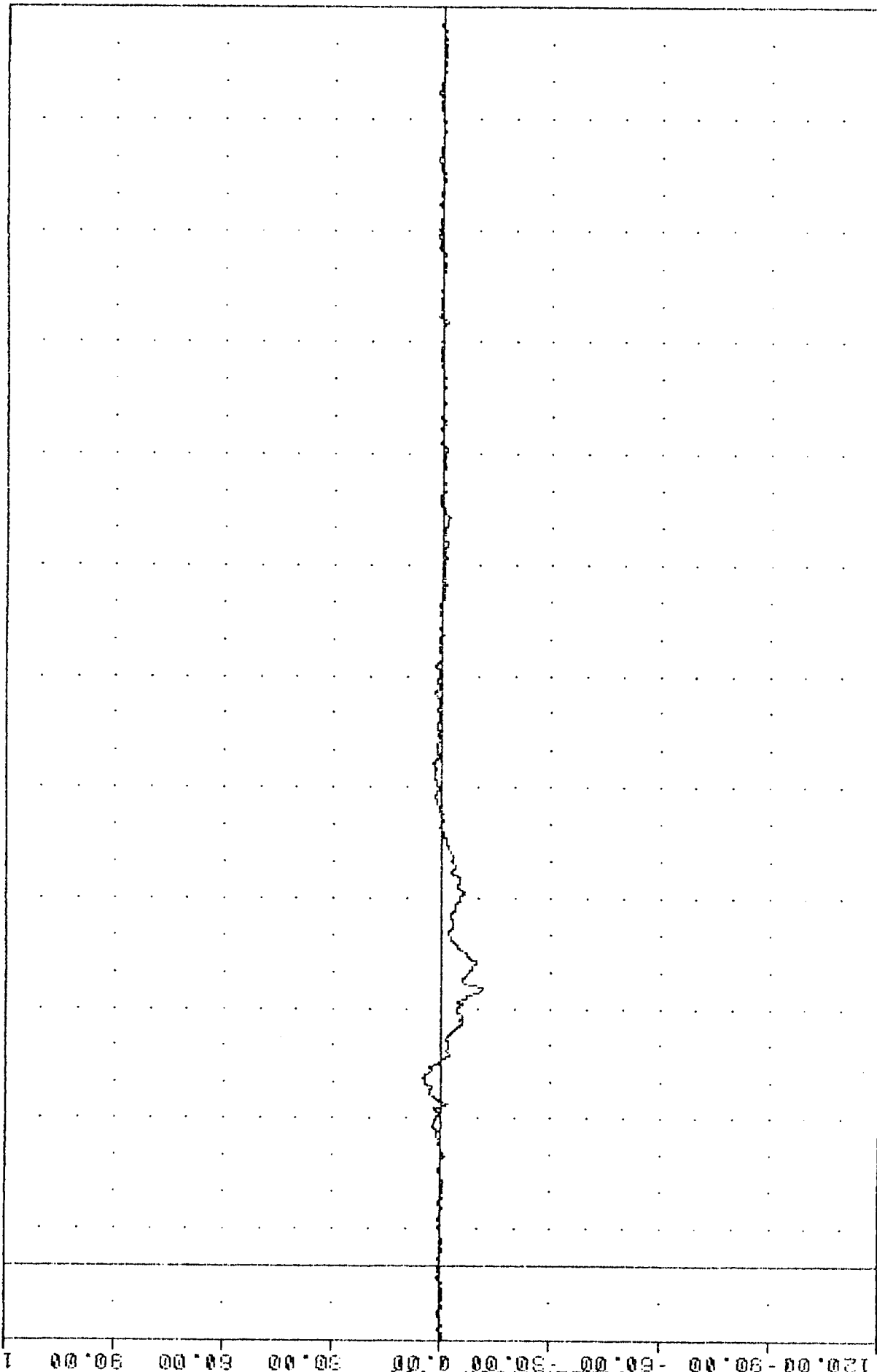
60.00

30.00

0.00

B-13

910401

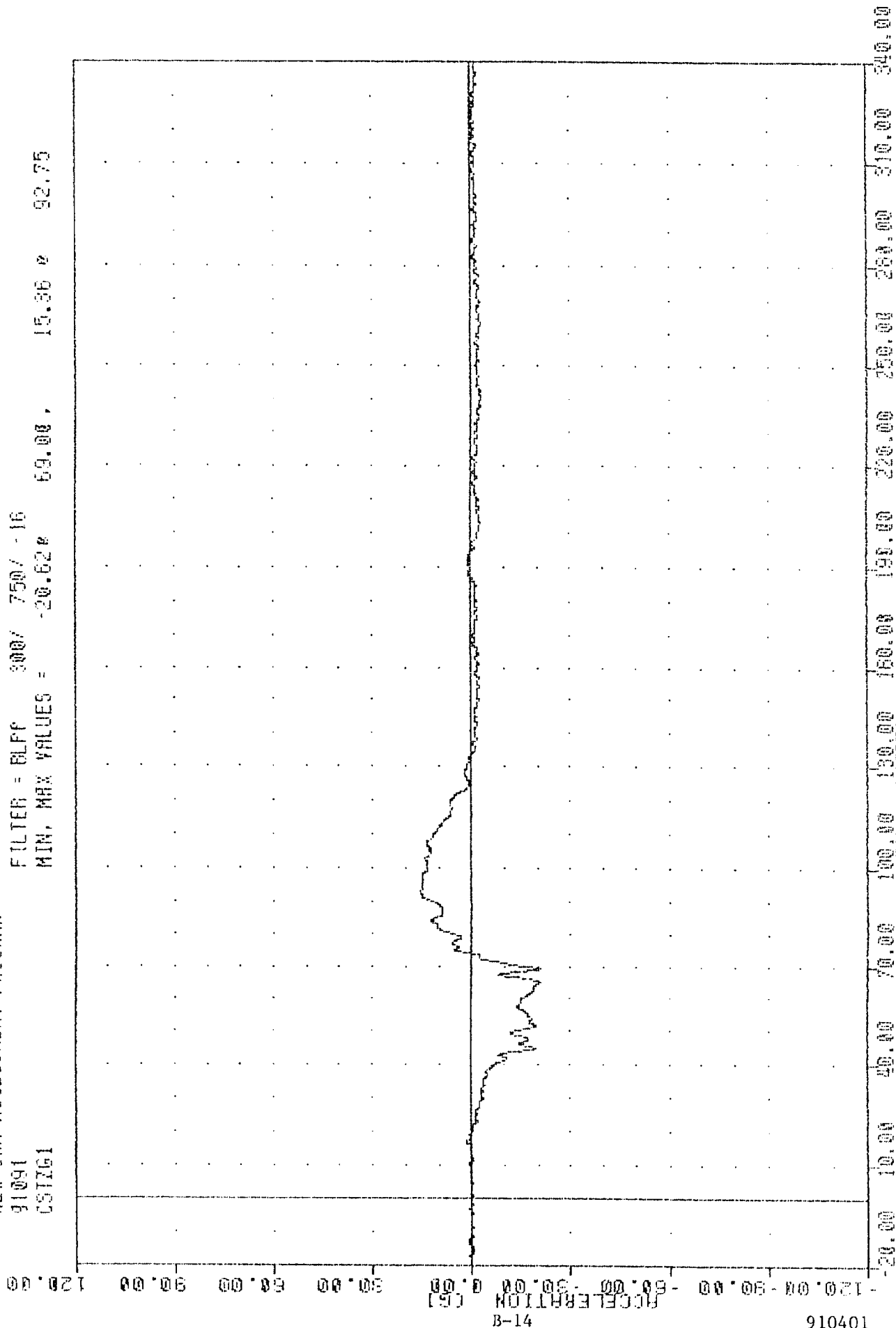


20.00 10.00 0.00 -10.00 -20.00 -30.00 -40.00 -50.00 -60.00 -70.00 -80.00 -90.00 -100.00 -110.00 -120.00

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER;
 DRIVER CHEST Y-AXIS ACCELERATION

19C , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 CS10G1

FILTER = BLFF 300/ 750/ -16
 MIN, MAX VALUES = -20.62# 69.00# 15.36# 92.75



INC . 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 CSTRG1

FILTER = BLPF 300/ 750/ -16
 MIN, MAX VALUES = 0.05e -20.00 , 82.45 e 73.63

105.00

90.00

75.00

60.00

45.00

ACCELERATION (G)

B-15

15.00

0.00

-15.00

-20.00

10.00

40.00

70.00

100.00

130.00

160.00

190.00

220.00

250.00

280.00

310.00

340.

TIME (SECS)

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST RESULTANT ACCELERATION

910401

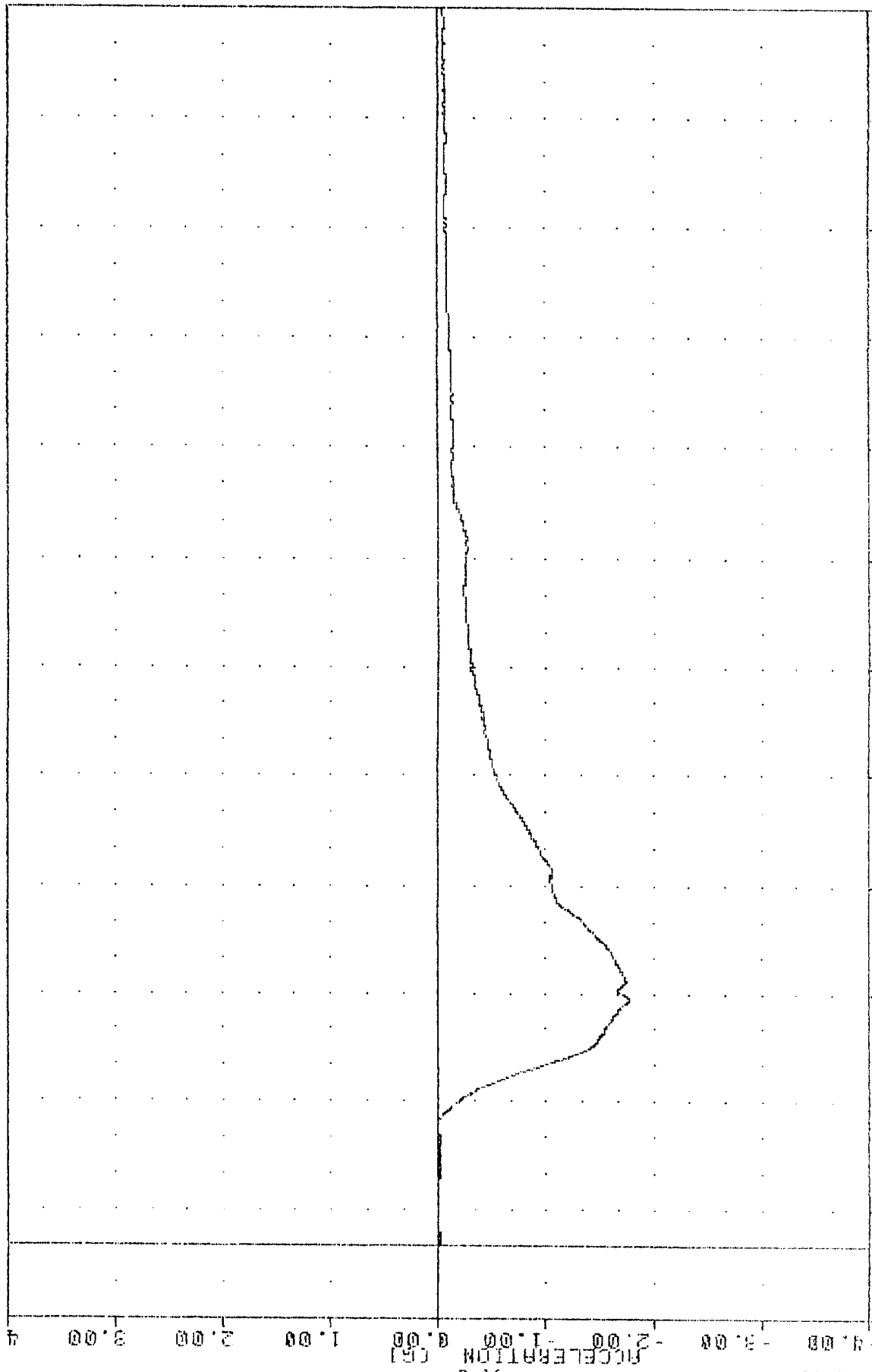
TRC , 910401
NEW CAR ASSESSMENT PROGRAM

91091 FILTER = BLPP 300/ 750/ -16

CSTXD1 MIN. MAX VALUES = -1.76 68.25 0.01 13.88

910401

4.00



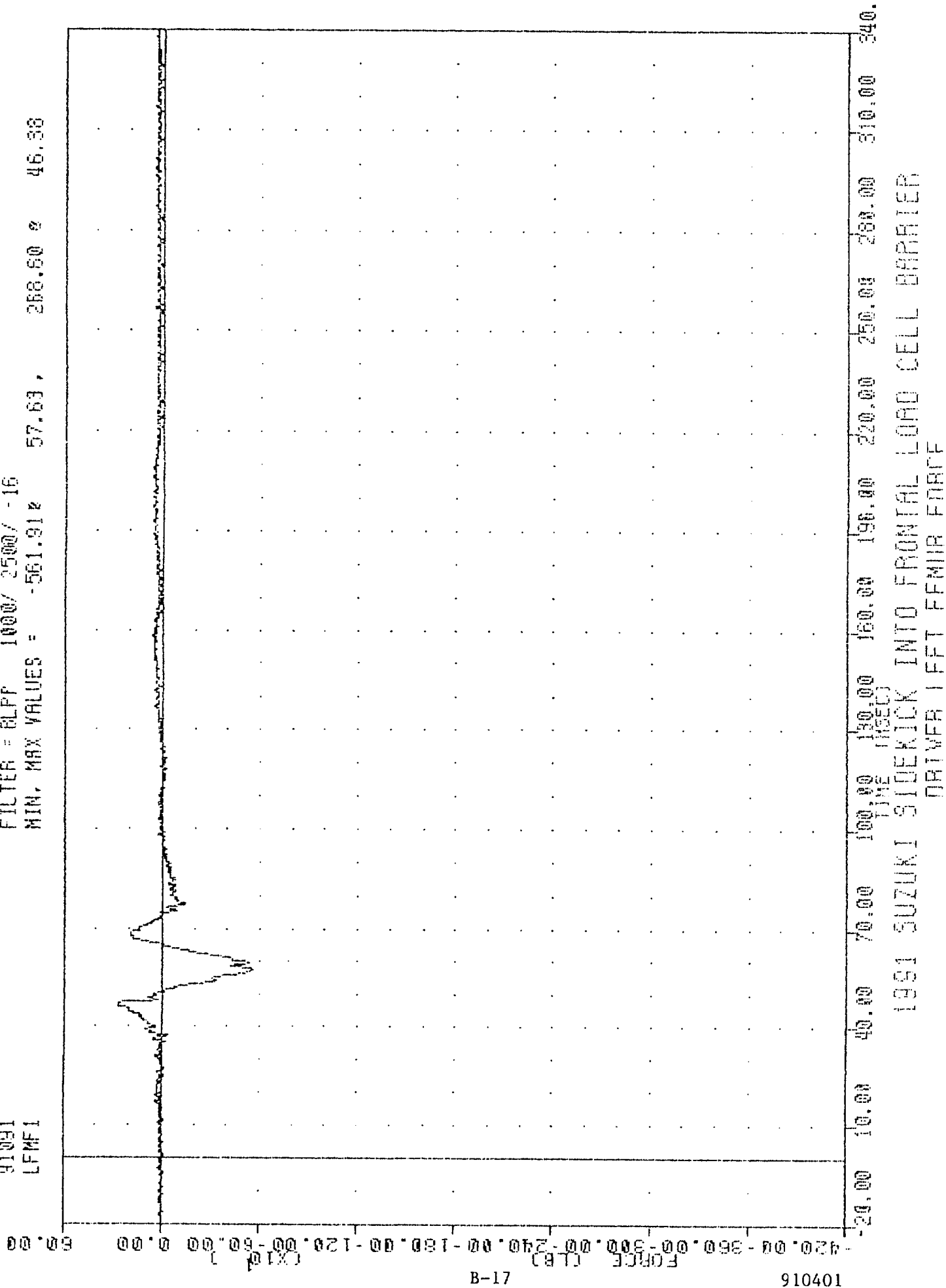
910401

-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

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST DISPLACEMENT

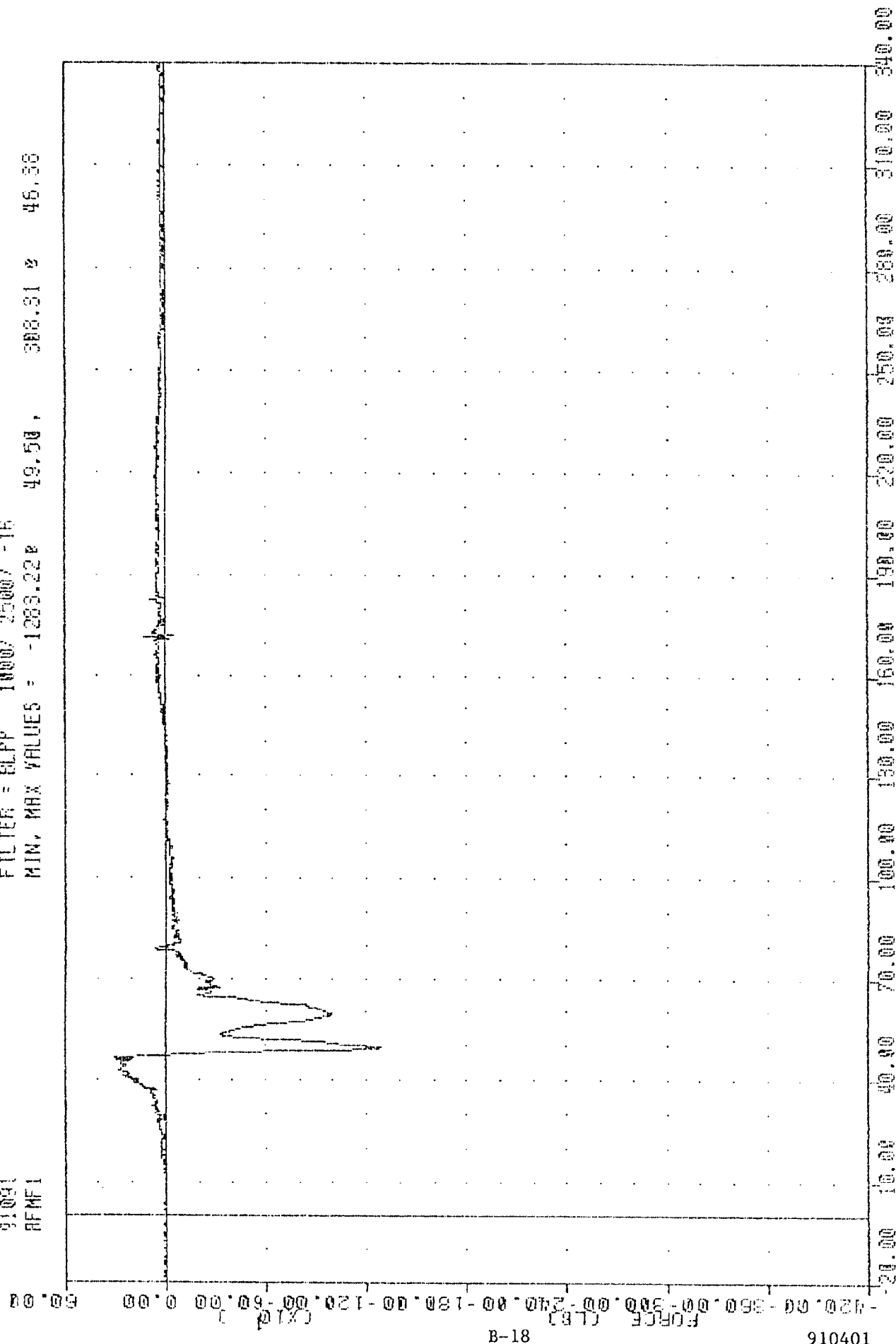
INC 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 LFMFI

FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = -561.91% 57.63, 268.60 % 46.38



TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 RFMF1

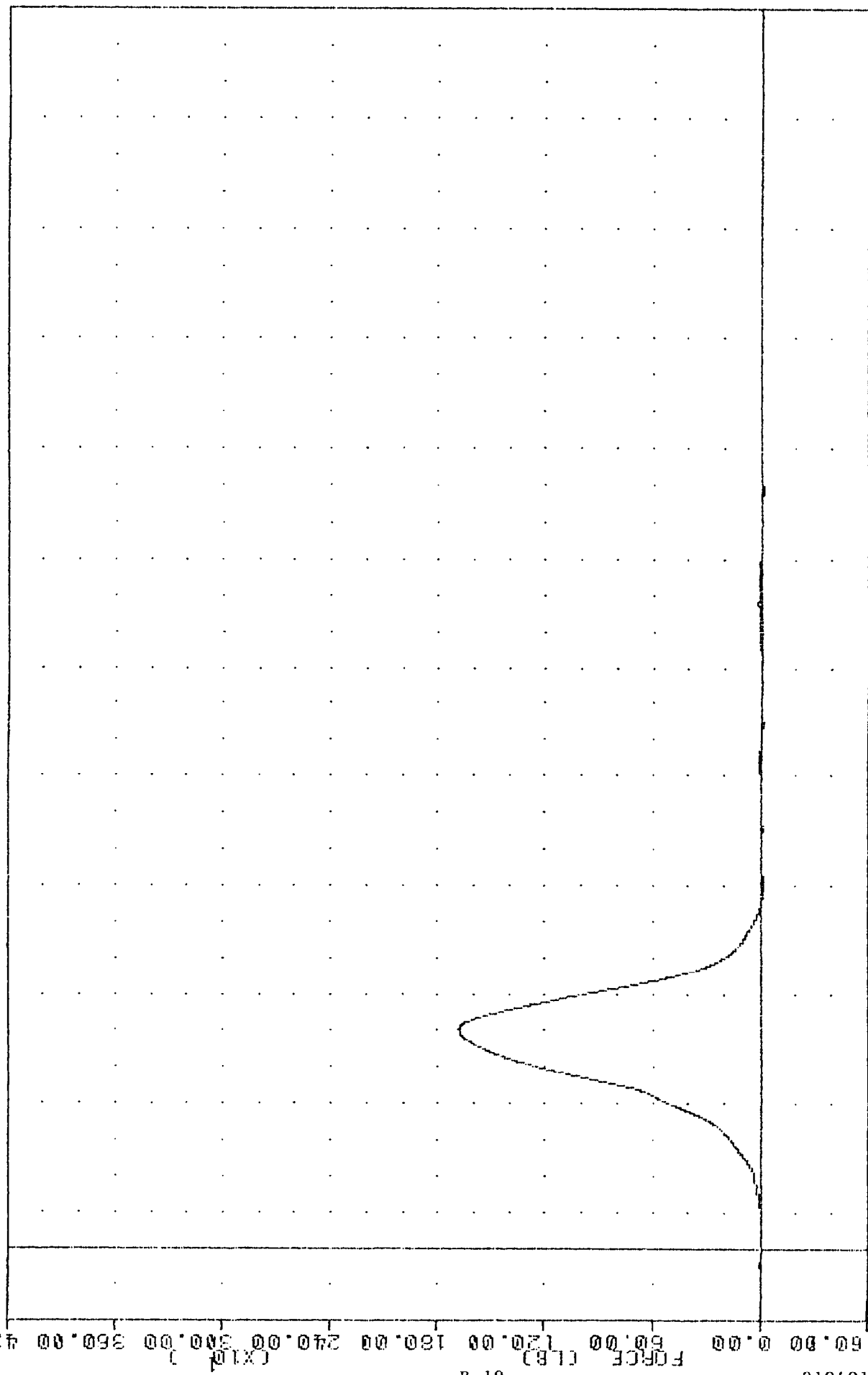
FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = -1283.22 49.50, 388.31 45.38



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 DECEMBER 1991

INL 910401
 REV CAR ASSESSMENT PROGRAM
 91091
 LBDF1

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -13.61e 98.63, 1662.58 e 60.13



910401
 1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 DRIVER LAP BELT OUTBOARD FORCE

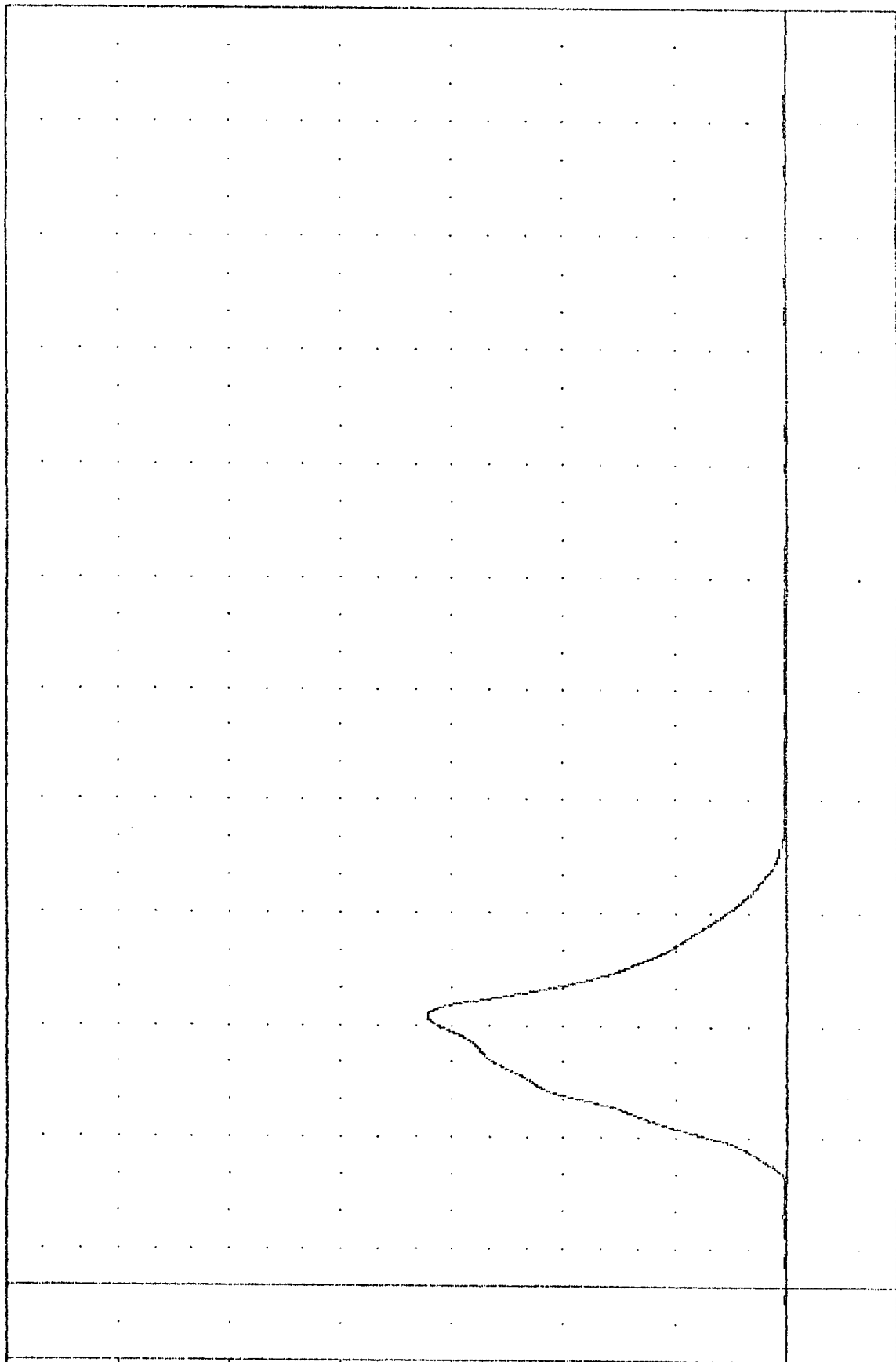
TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 SHBFI

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -3.22e -9.88, 1935.27 e 72.38

FORCE (LBS)
 (X10³)

B-20

910401

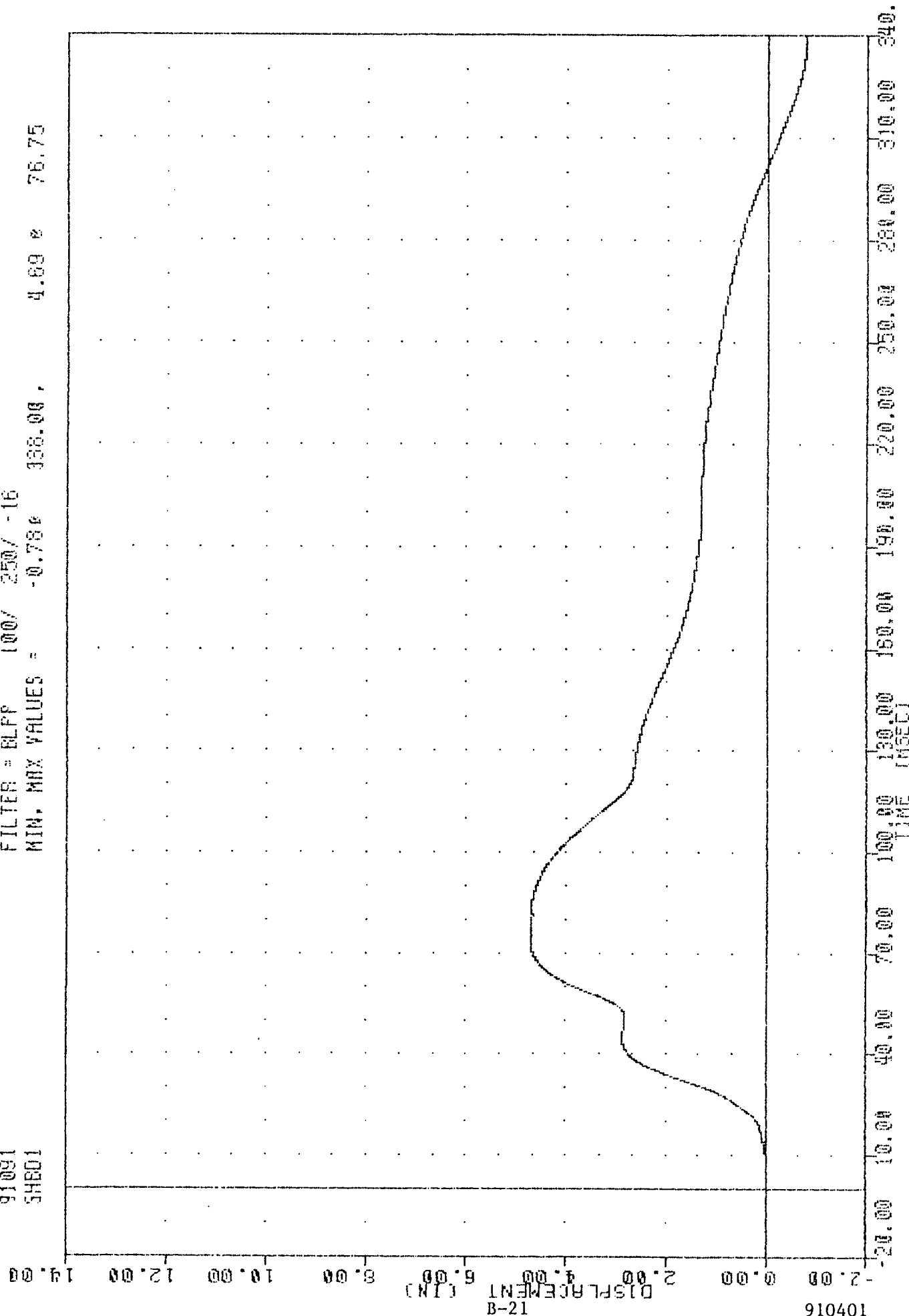


1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 TIME (ms)

DRIVER SURVIVAL

NEW CAR ASSESSMENT PROGRAM
 91091
 SHE01

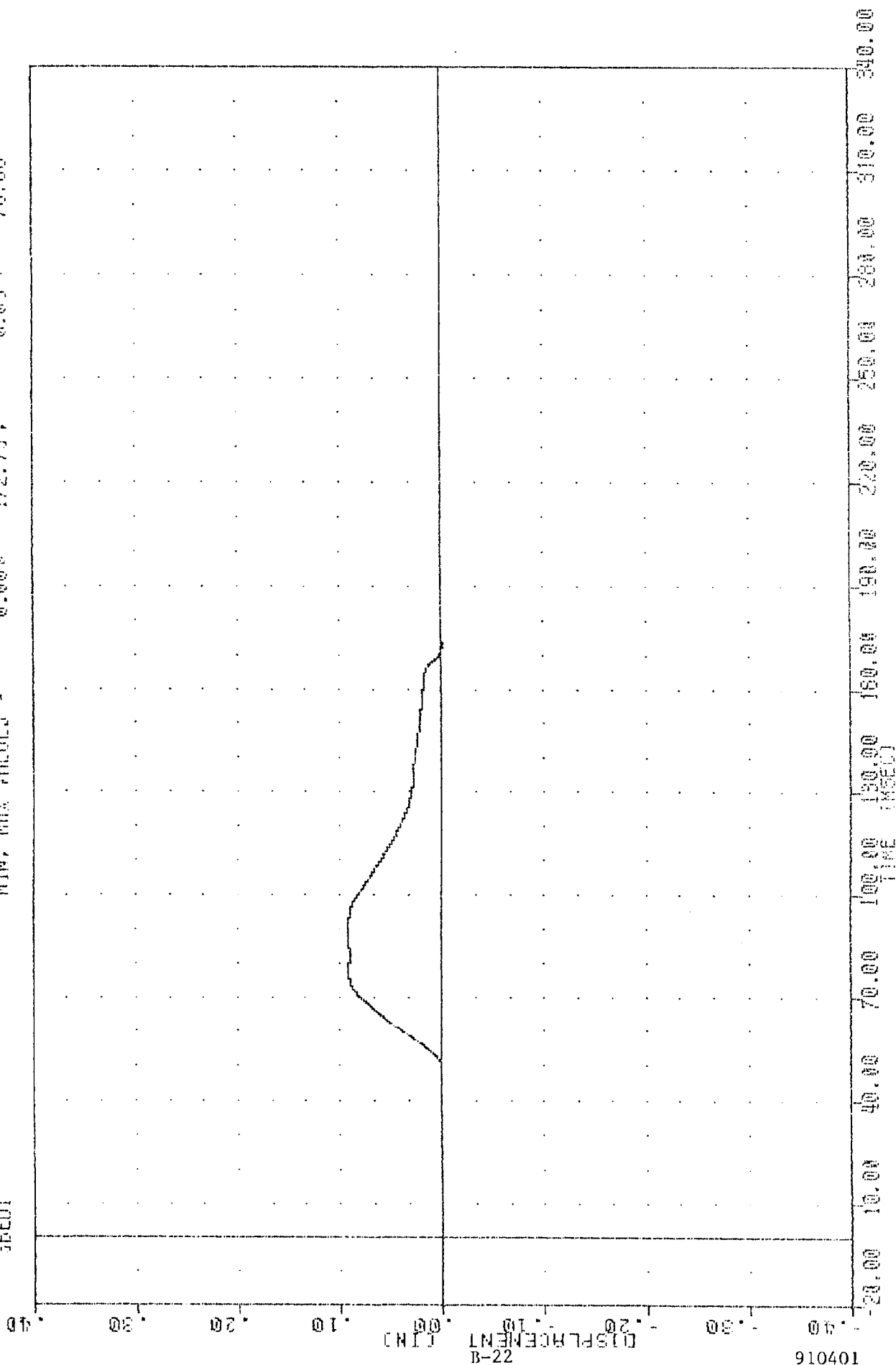
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -0.786 338.00, 4.69 76.75



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT DISPLACEMENT

TRC , 910401
 NEW CRR ASSESSMENT PROGRAM
 91091
 SBED1

FILTER = 5LPP 100/ 250/ -15
 MIN, MAX VALUES = 0.00% 172.75, 0.09 76.82



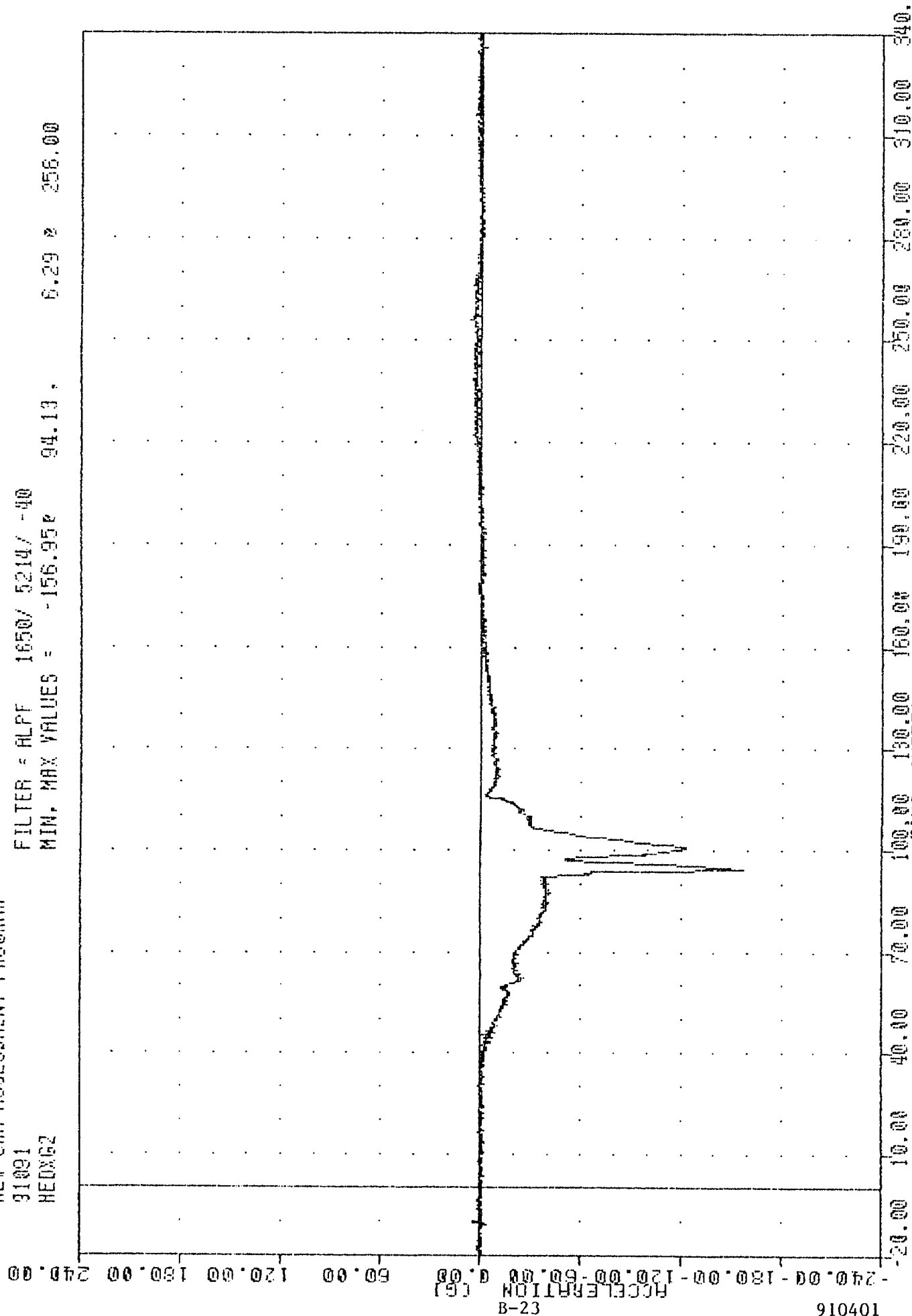
910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

DRIVER SEAT BELT EXTENSION

IRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 HEDX62

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -156.950 94.13 6.29 2 256.00

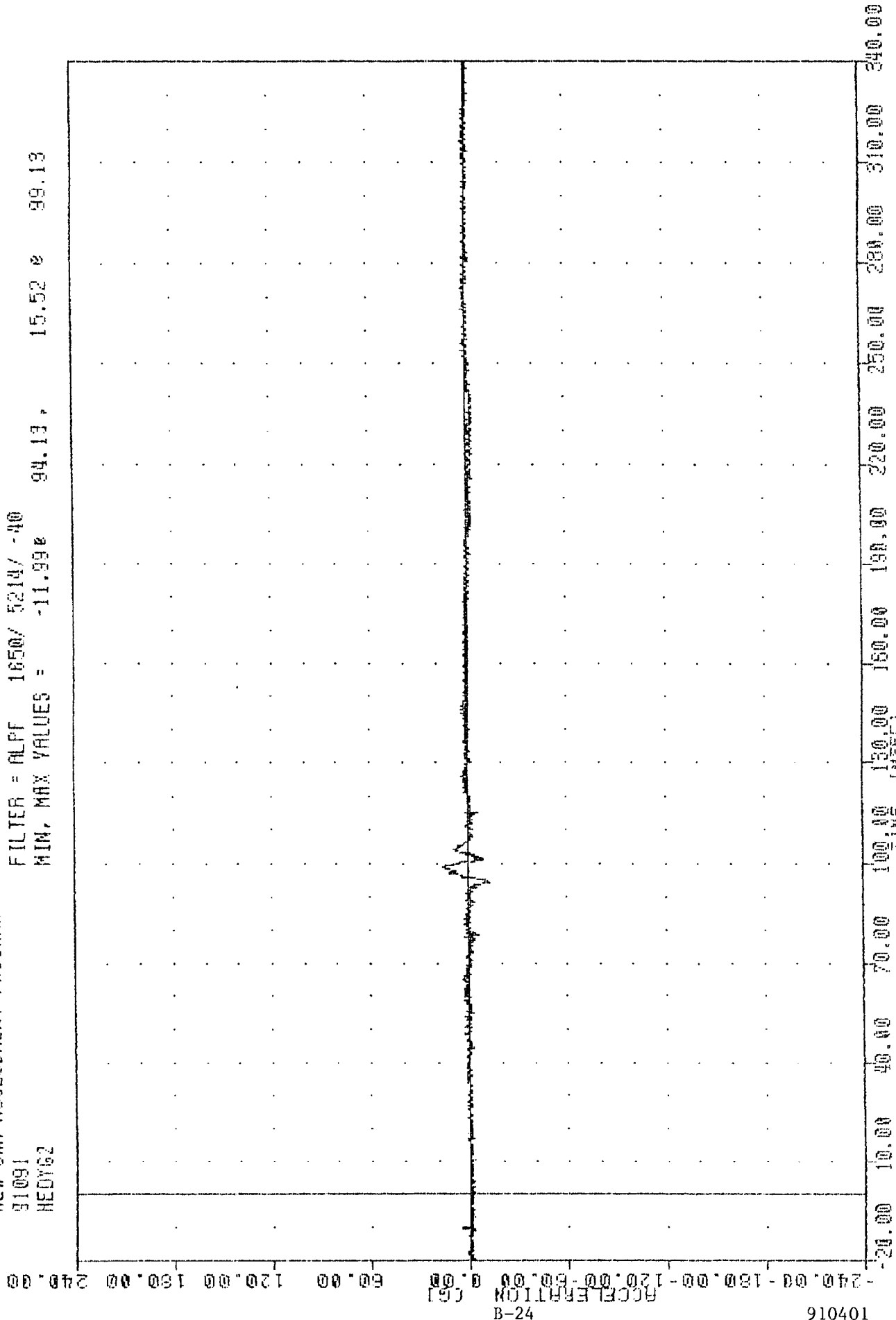


910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 PASSENGER HEAD X-AXIS ACCELERATION

TRC
 NEW CAR ASSESSMENT PROGRAM
 91091
 HEDY62

FILTER = ALPF 1850/ 5214/ -40
 MIN, MAX VALUES = -11.99e 94.13, 15.52 e 99.13



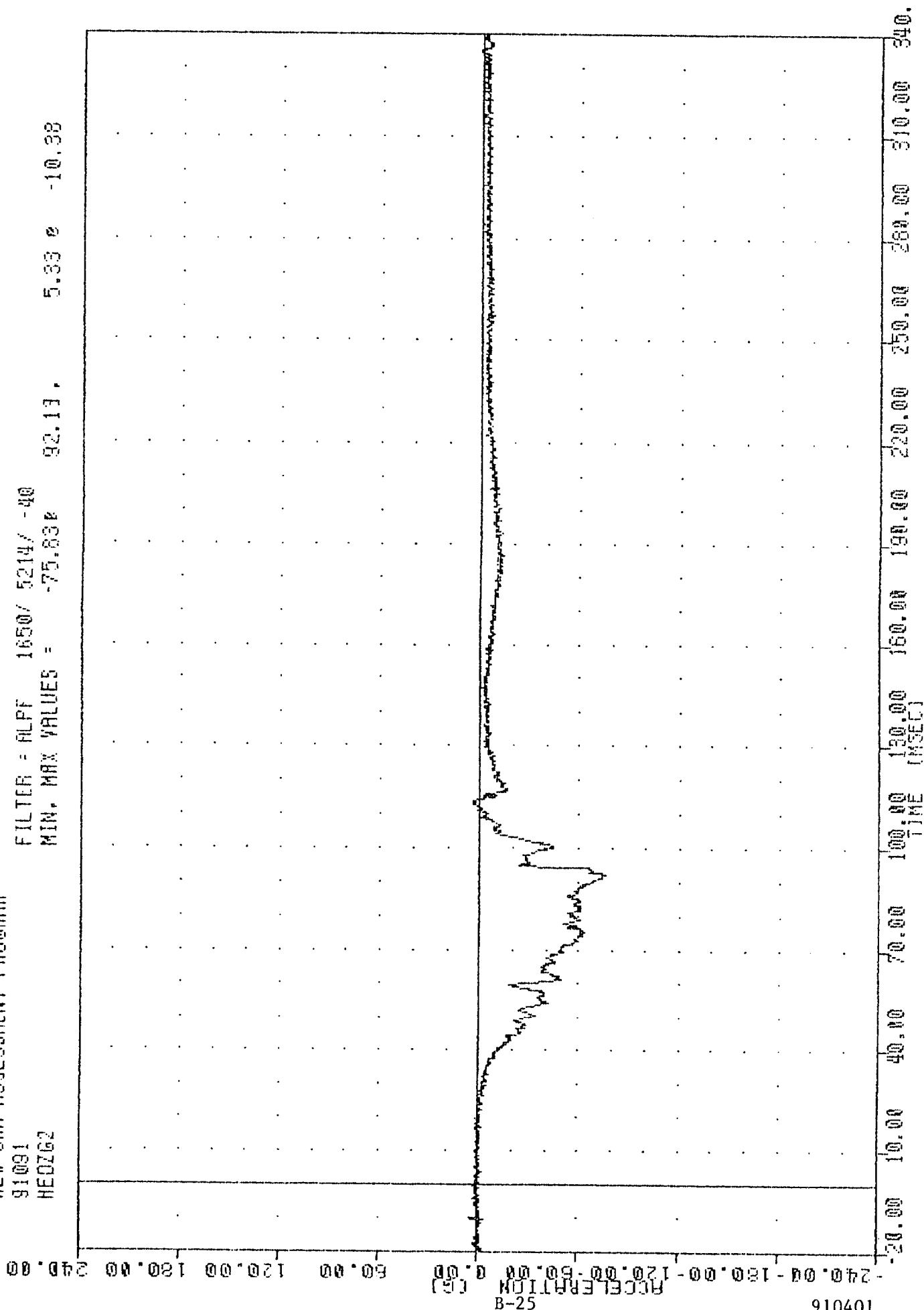
B-24

910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

INC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 HE0262

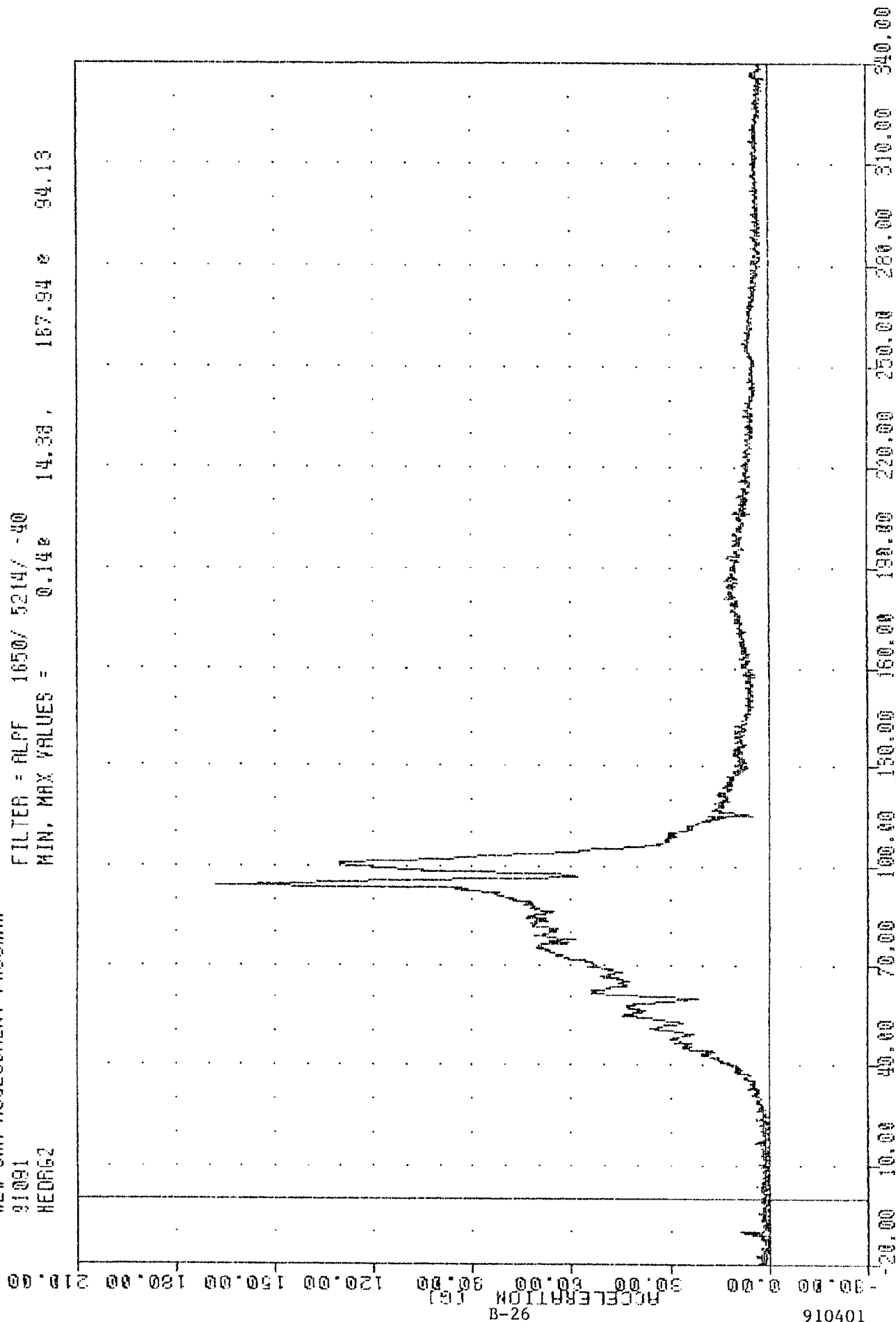
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -75.83% 92.13, 5.33 0 -10.38



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 PASSENGER HEAD Z-AXIS ACCELERATION

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 HEDR62

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 0.14e 14.38, 167.94 e 94.13

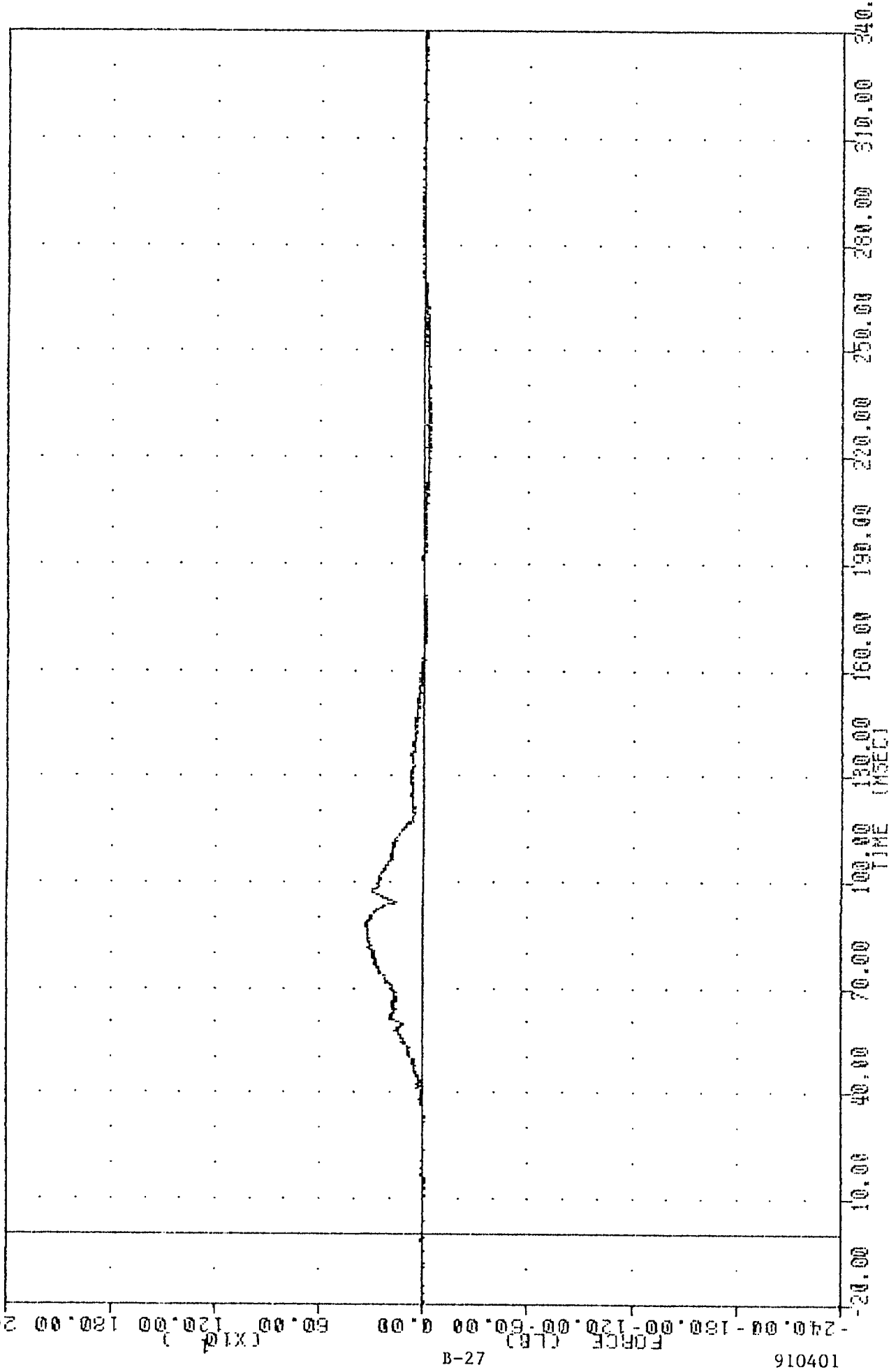


B-26

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 PASSENGER HANS RESULTANT DEFORMATION

INL
 NEW CAR ASSESSMENT PROGRAM
 91091
 HEKXF2

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -34.00 337.02 87.25



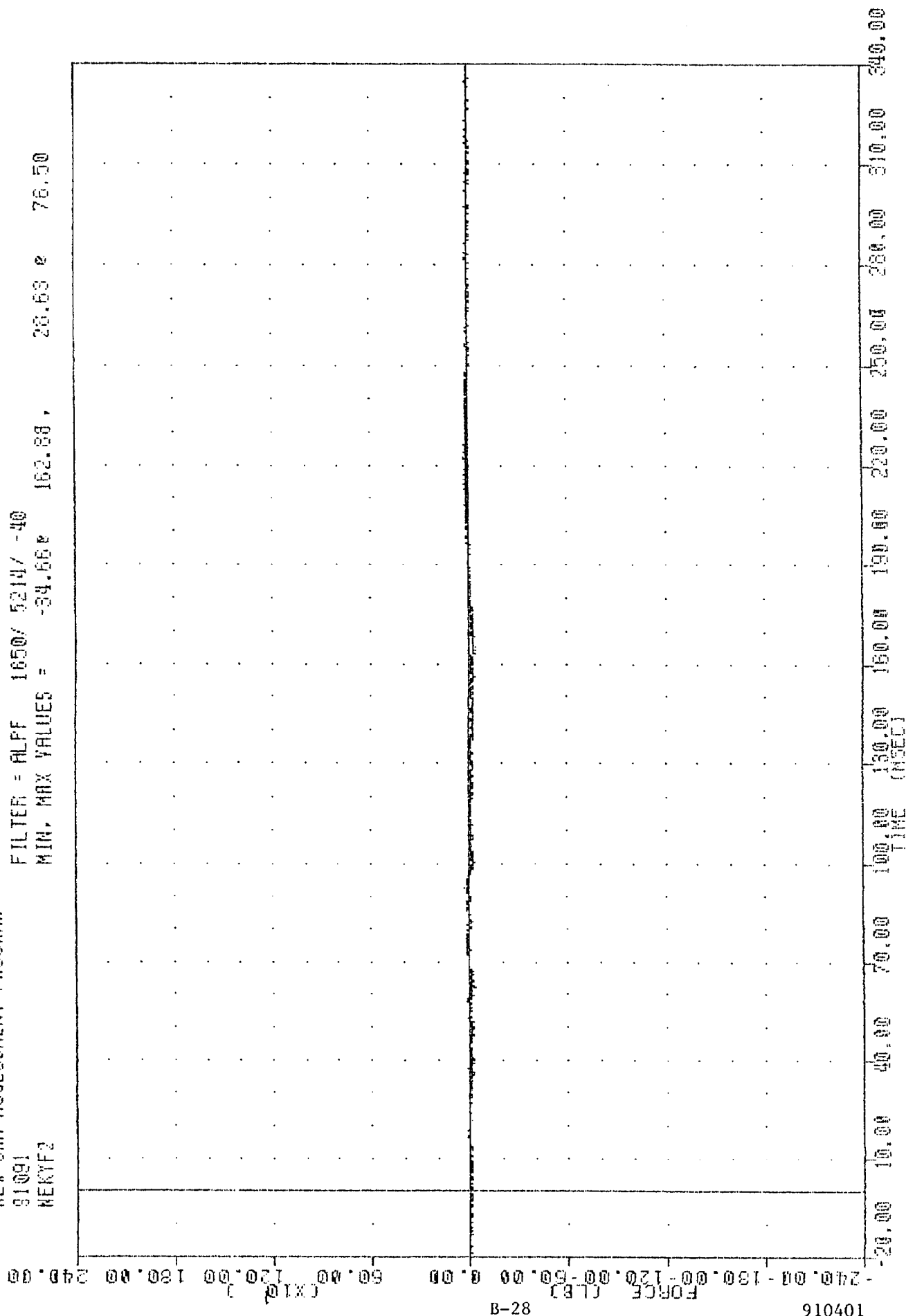
1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 PASSENGER NECK X-AXIS SHEAR FORCE

THE NEW CAR ASSESSMENT PROGRAM
31091 NEWYF3

```

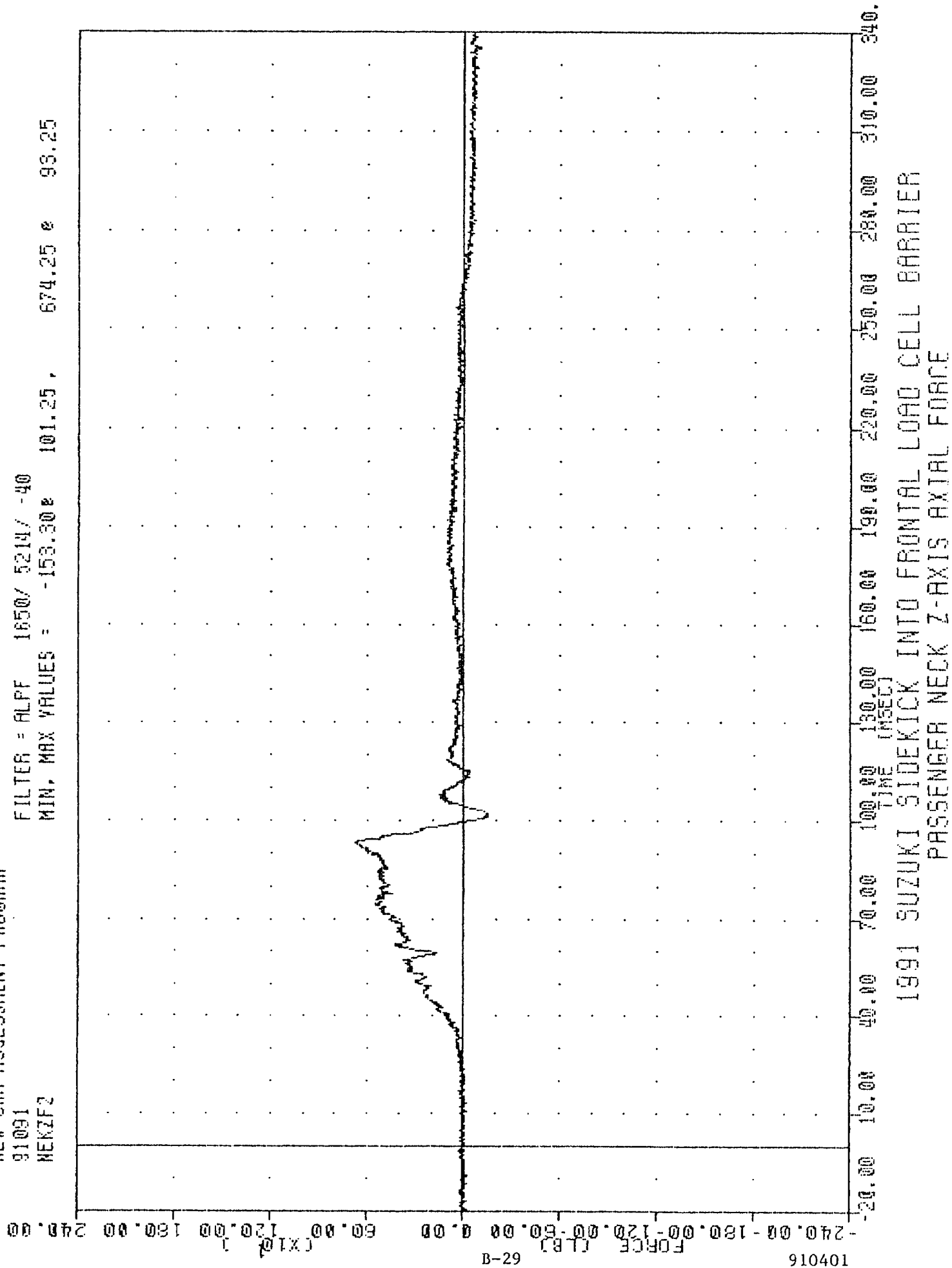
FILTER = ALFF 1650/ 5214/ -40
MIN, MAX VALUES = -34.66 162.88, 28.63 76.50

```



INC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 NEKZF2

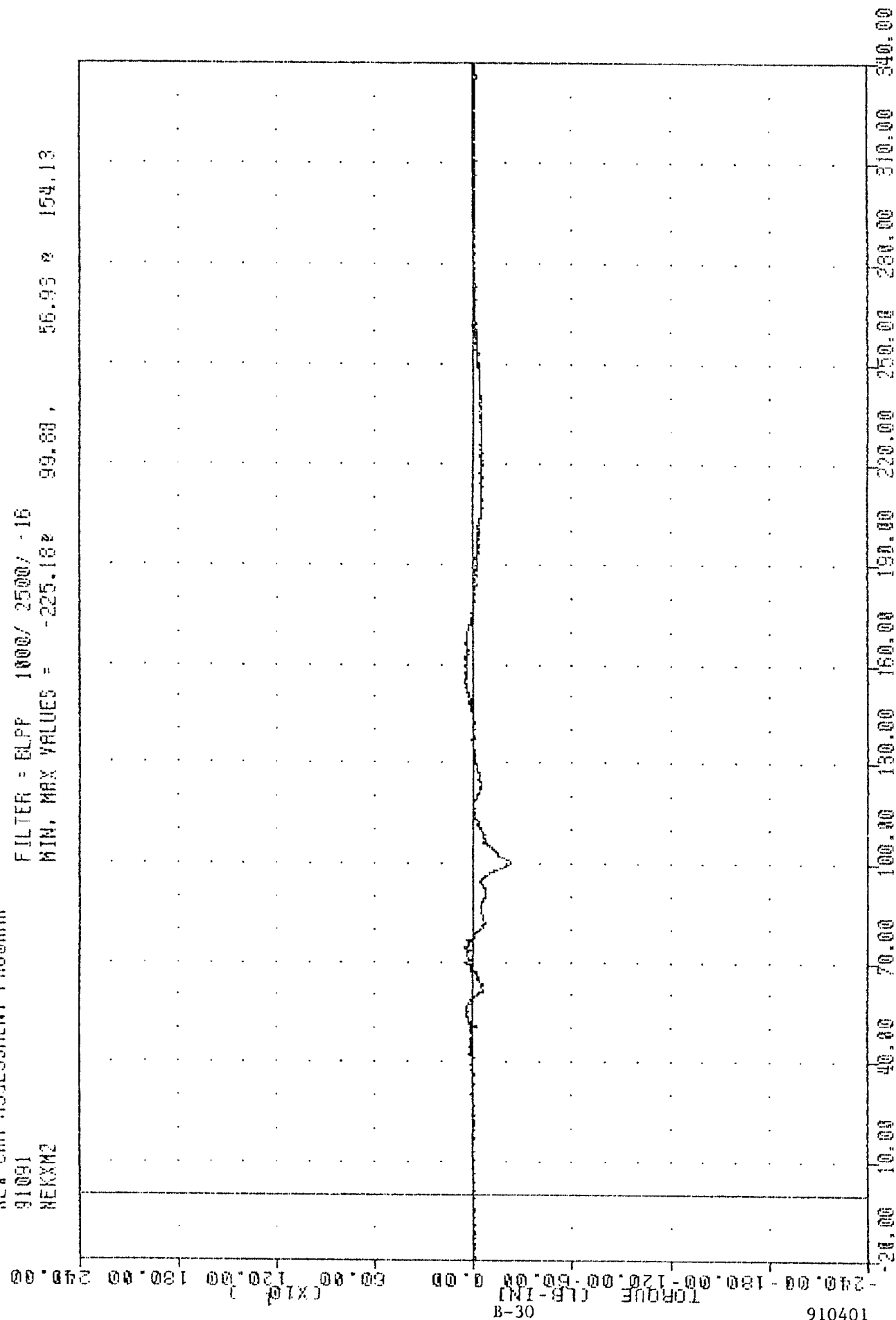
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -153.30 101.25 , 674.25 93.25



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 PASSENGER NECK Z-AXIS AXIAL FORCE

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 HEKYM2

FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = -225.18% 99.60 , 56.93 % 154.13

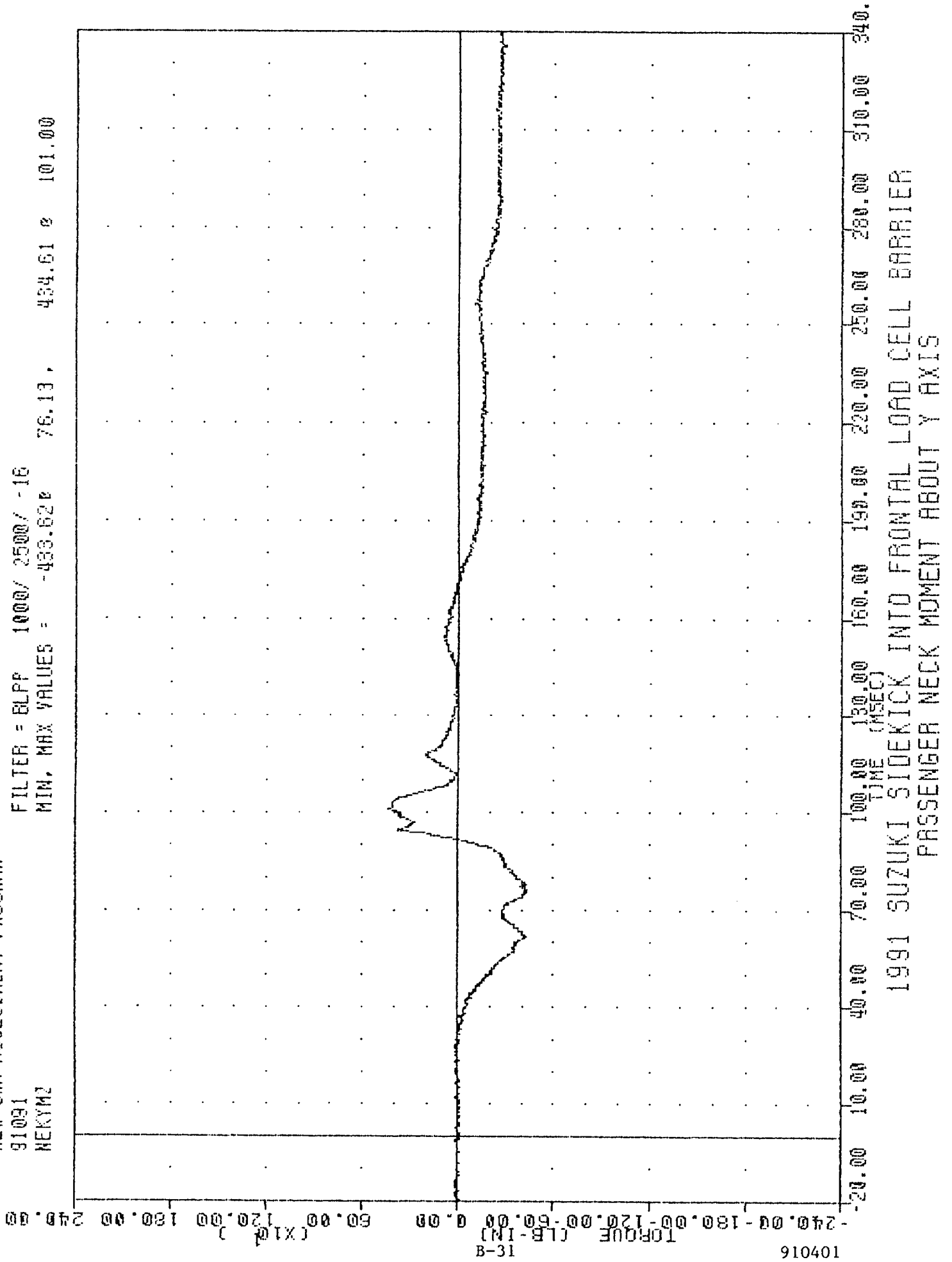


1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

POSSIBLE RACK MOUNT ABOUT 100.00

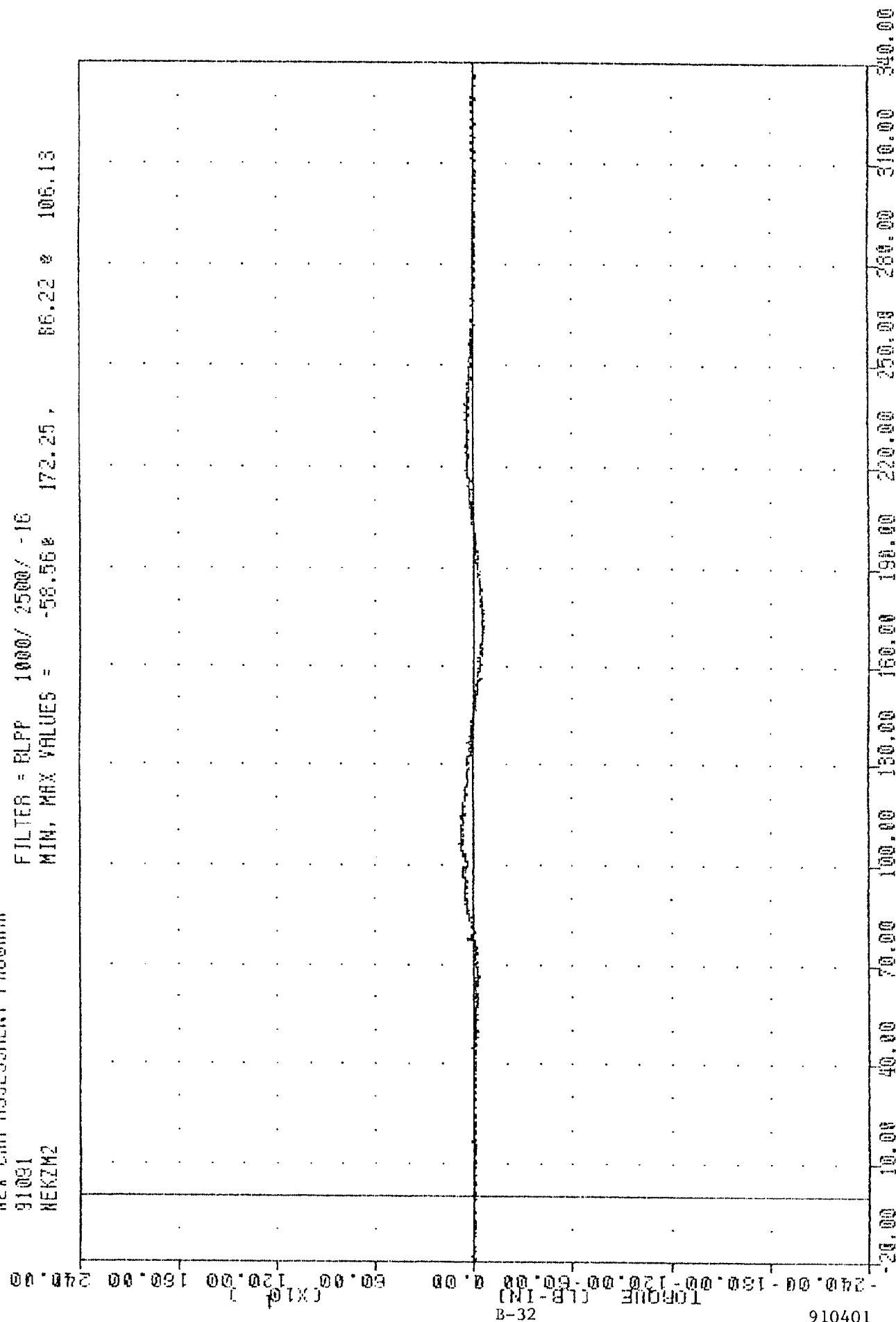
910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 HEKYM2

FILTER = BLPP 1000/ 2500/ -16
 MIN. MAX VALUES = -433.620 76.13, 434.61 0 101.00



TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 HEK2M2

FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = -58.56 172.25 86.22 106.13

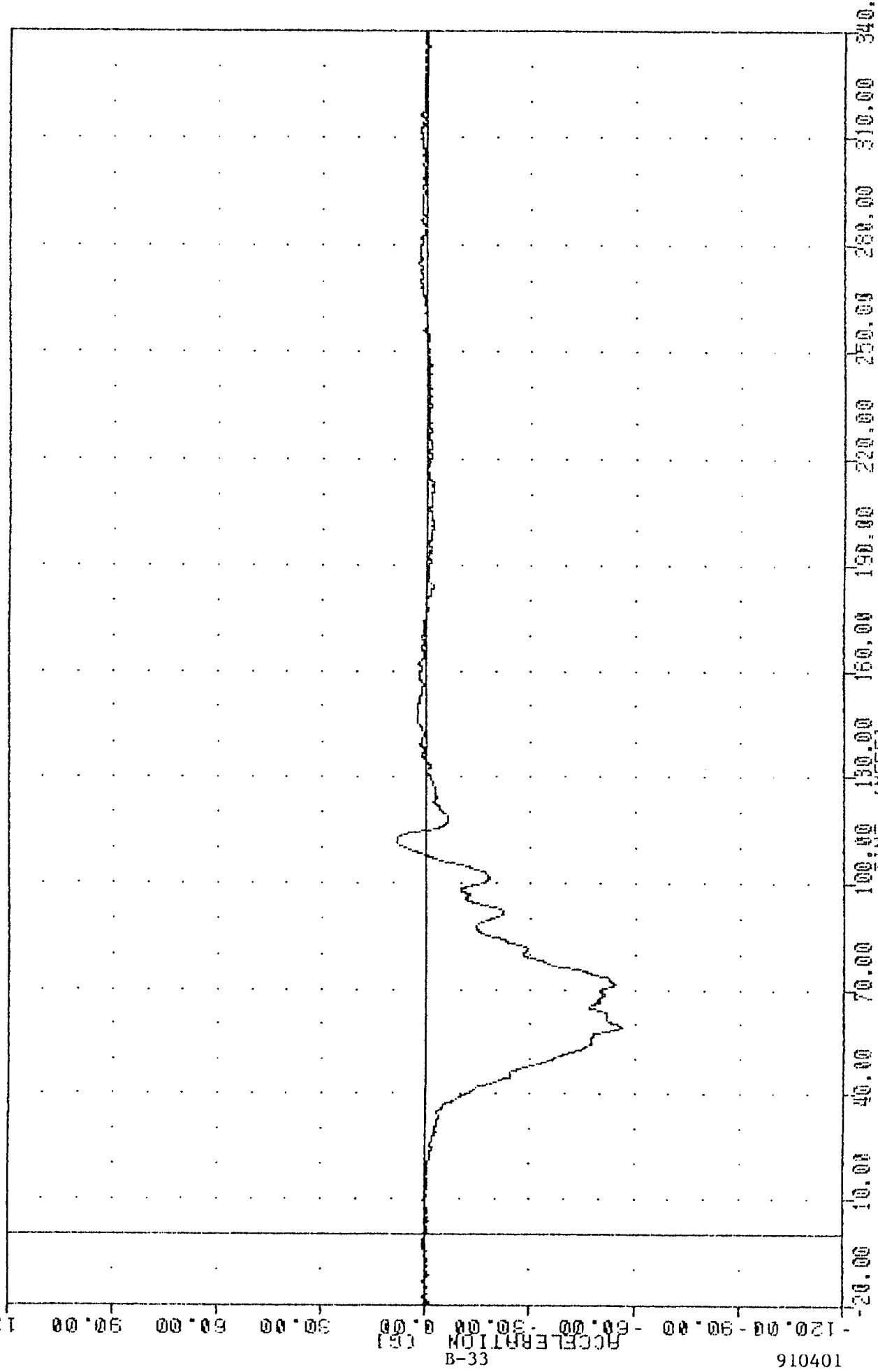


1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

REMARKS: R [REDACTED] T [REDACTED] AV [REDACTED]

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 CSTX62

FILTER = BLFP 300/ 750/ -16
 MIN, MAX VALUES = -56.20e 59.38 , 0.69 e 112.25

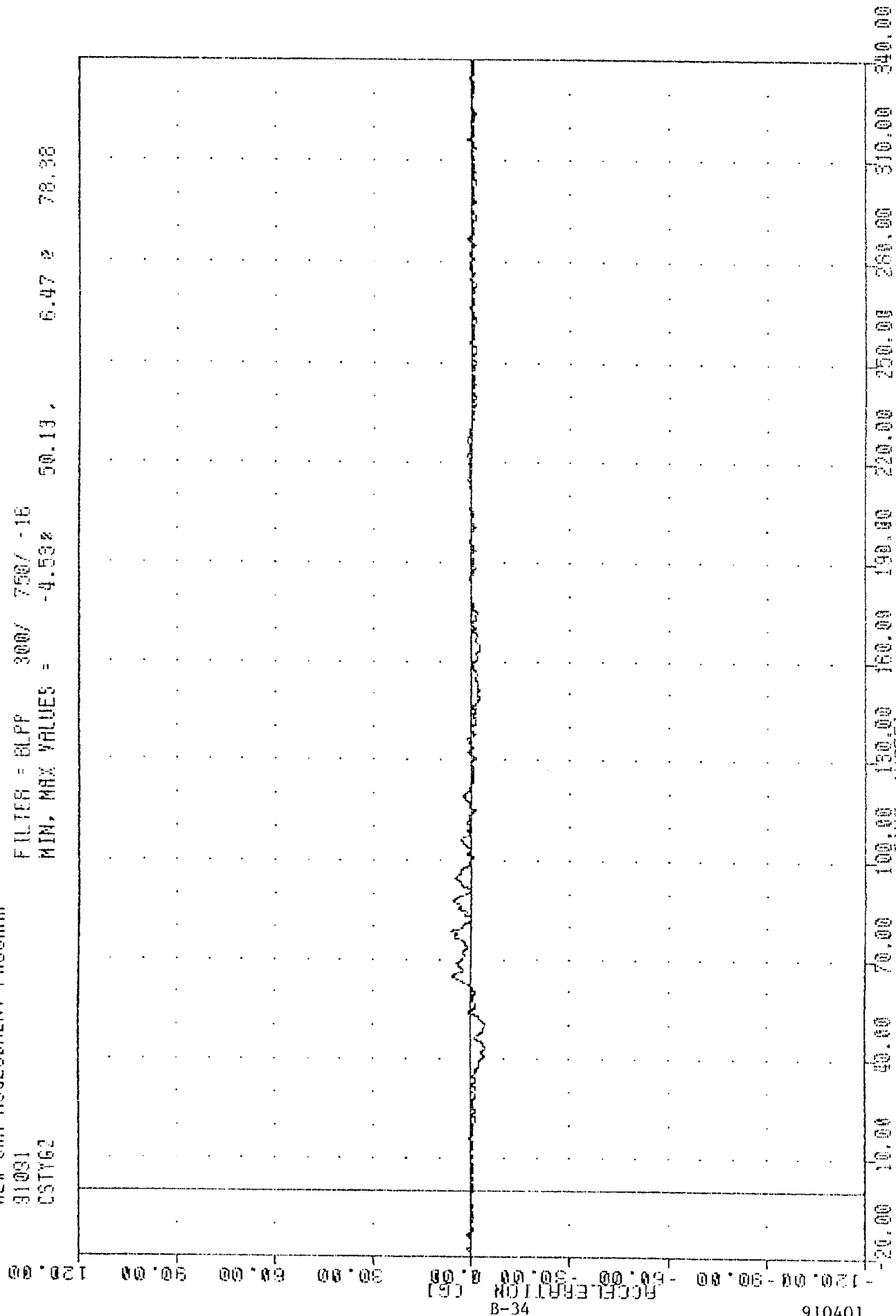


1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 PASSENGER CHEST X-AXIS ACCELERATION

TRC 910401
NEW CAR ASSESSMENT PROGRAM

91031
CSTY62
FILTER = BLPP 300/ 750/ -16

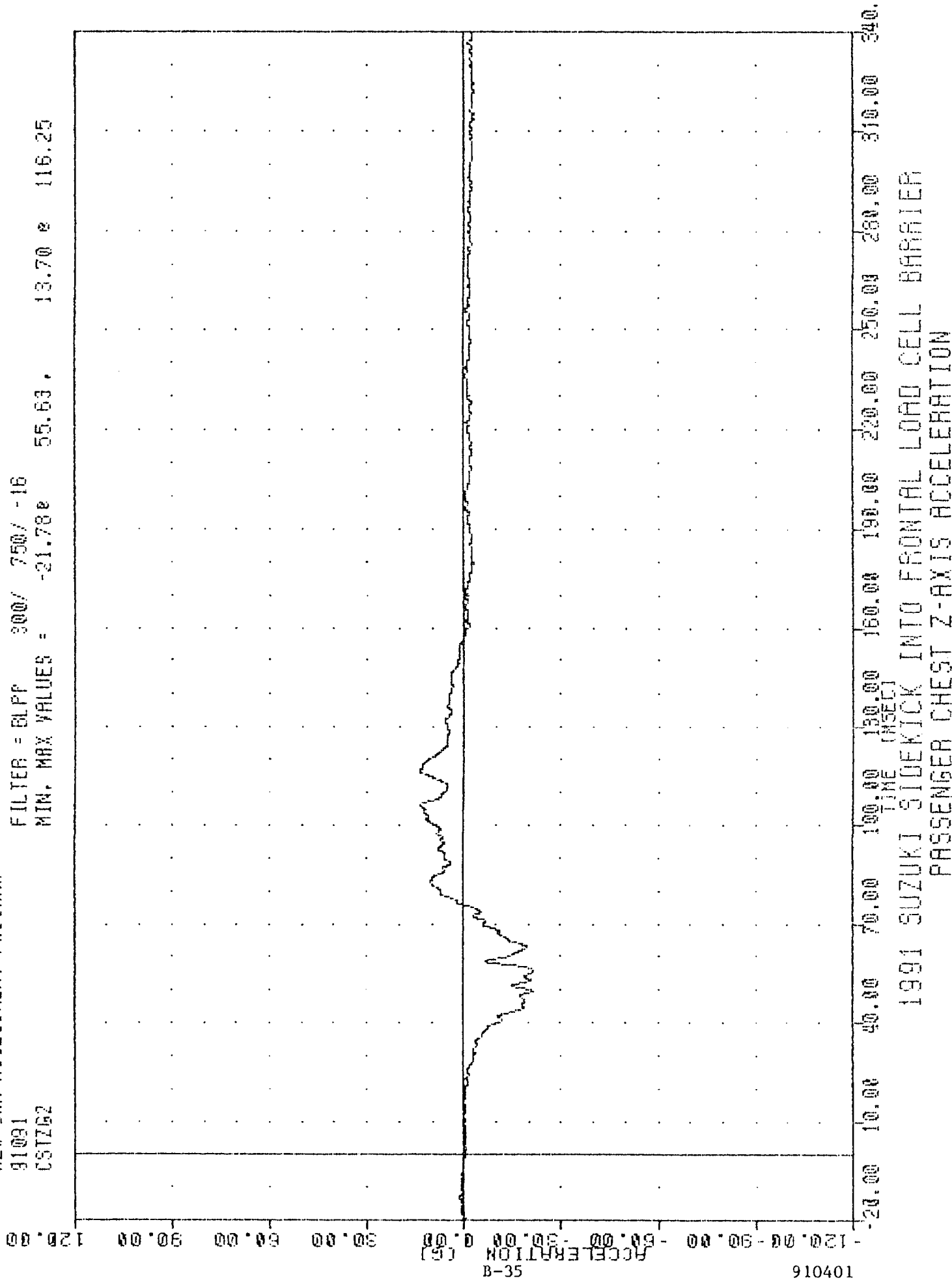
MIN. MAX VALUES = -4.53% 50.13, 6.47 @ 78.98



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
PRESENTED QUESTIONS AND ANSWERS

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 CSTZ62

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -21.78e 55.63, 13.70 e 116.25

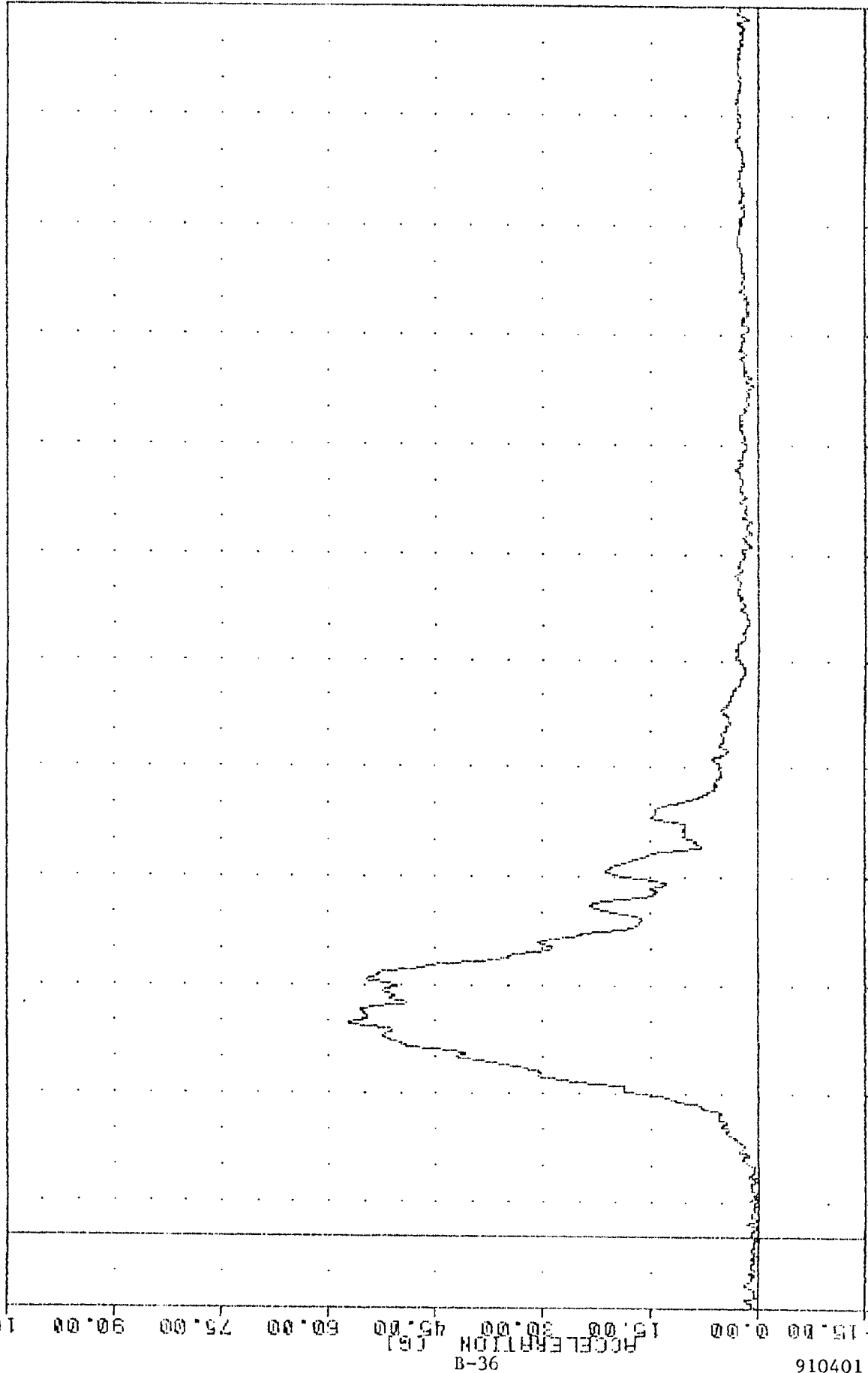


IRC
 NEW CAR ASSESSMENT PROGRAM
 91031
 CSTR62

• 910401

FILTER = 6LPP 300/ 750/ -16
 MIN. MAX VALUES = 0.04e 4.88, 57.19 e 59.50

105.00



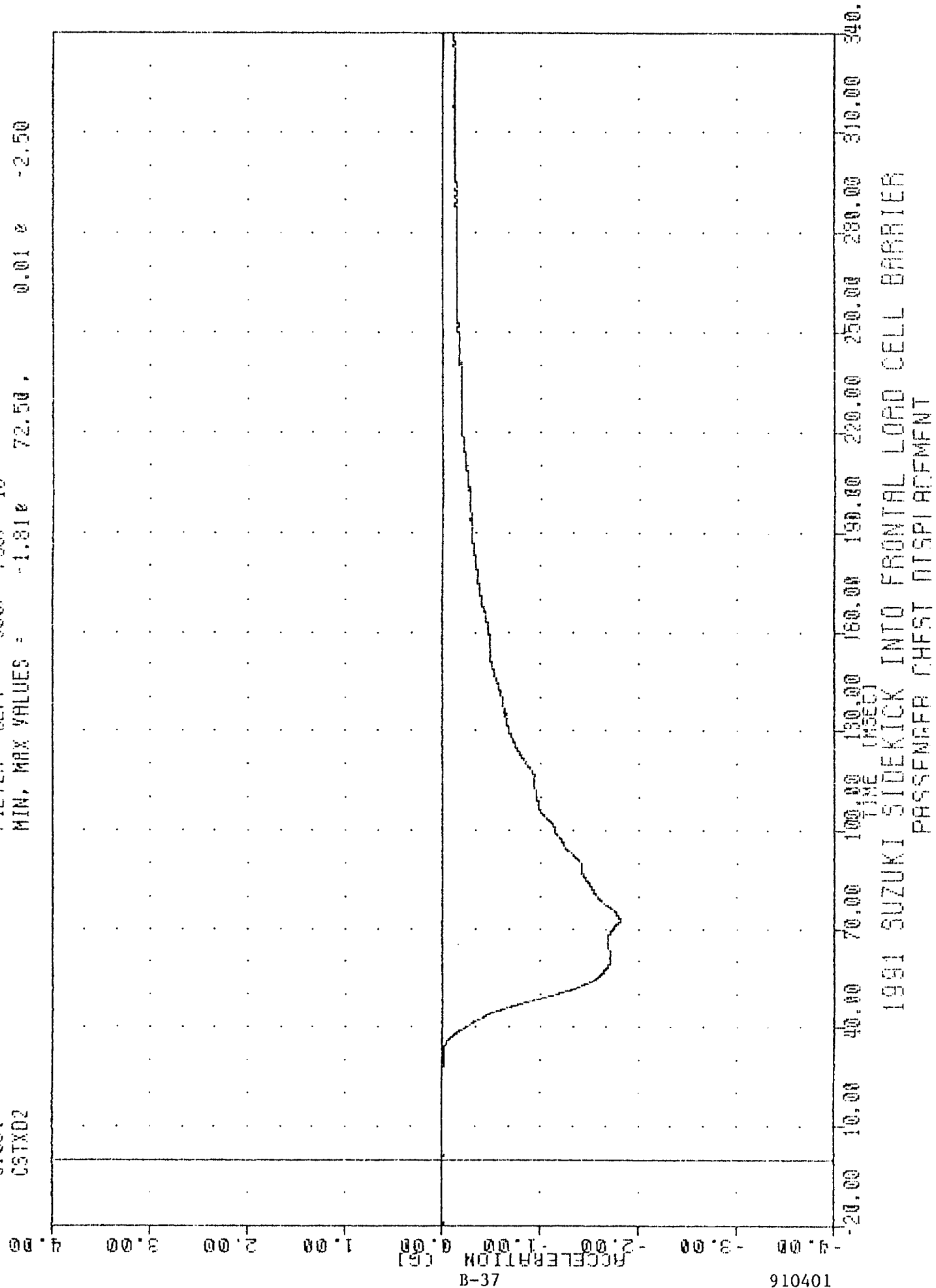
B-36

9104016

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 FRONT CRASH TEST EQUIPMENT CRASH IN

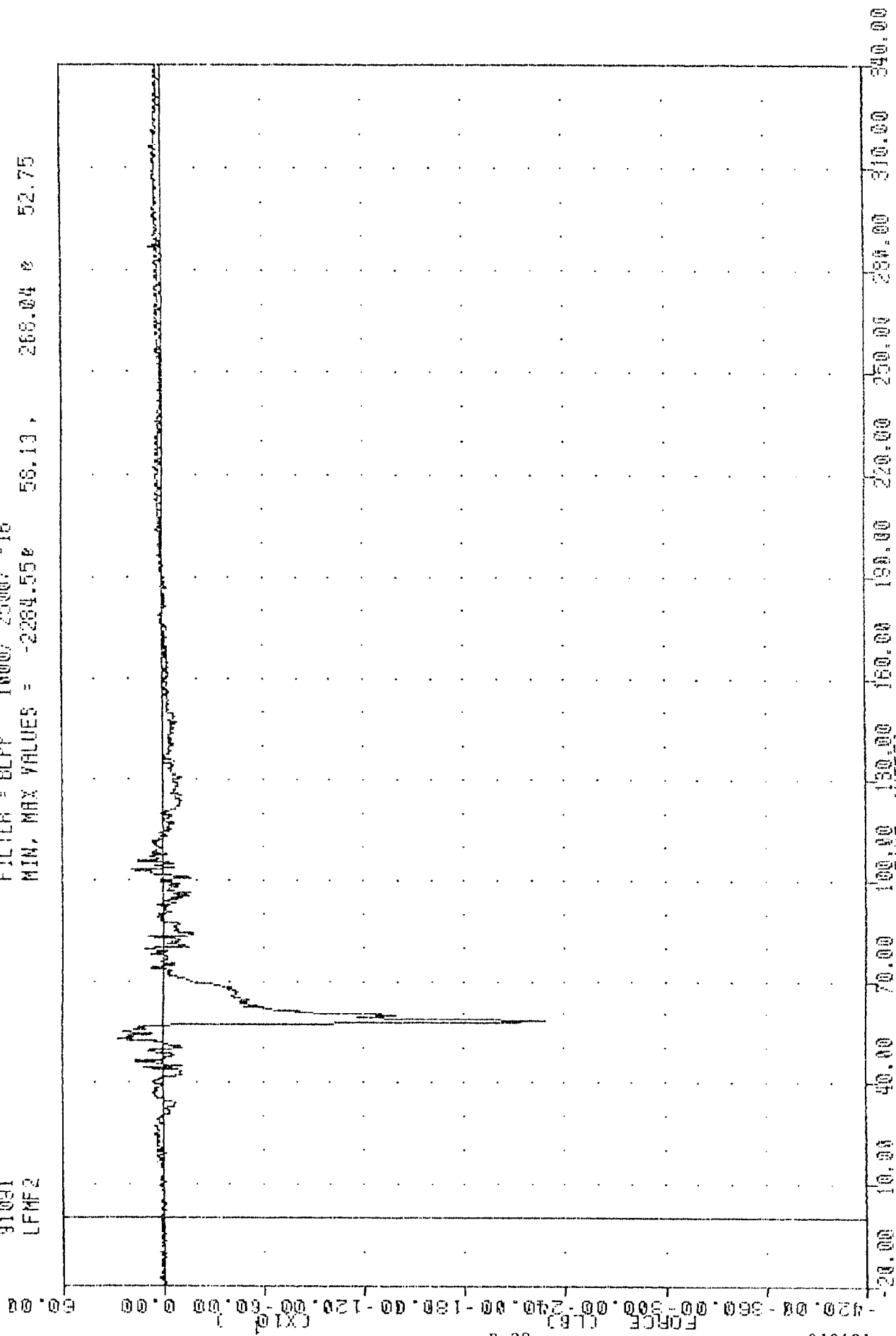
INC , 910401
 NEW CRA ASSESSMENT PROGRAM
 91091
 CSTXD2

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -1.810 72.50 , 0.01 0 -2.50



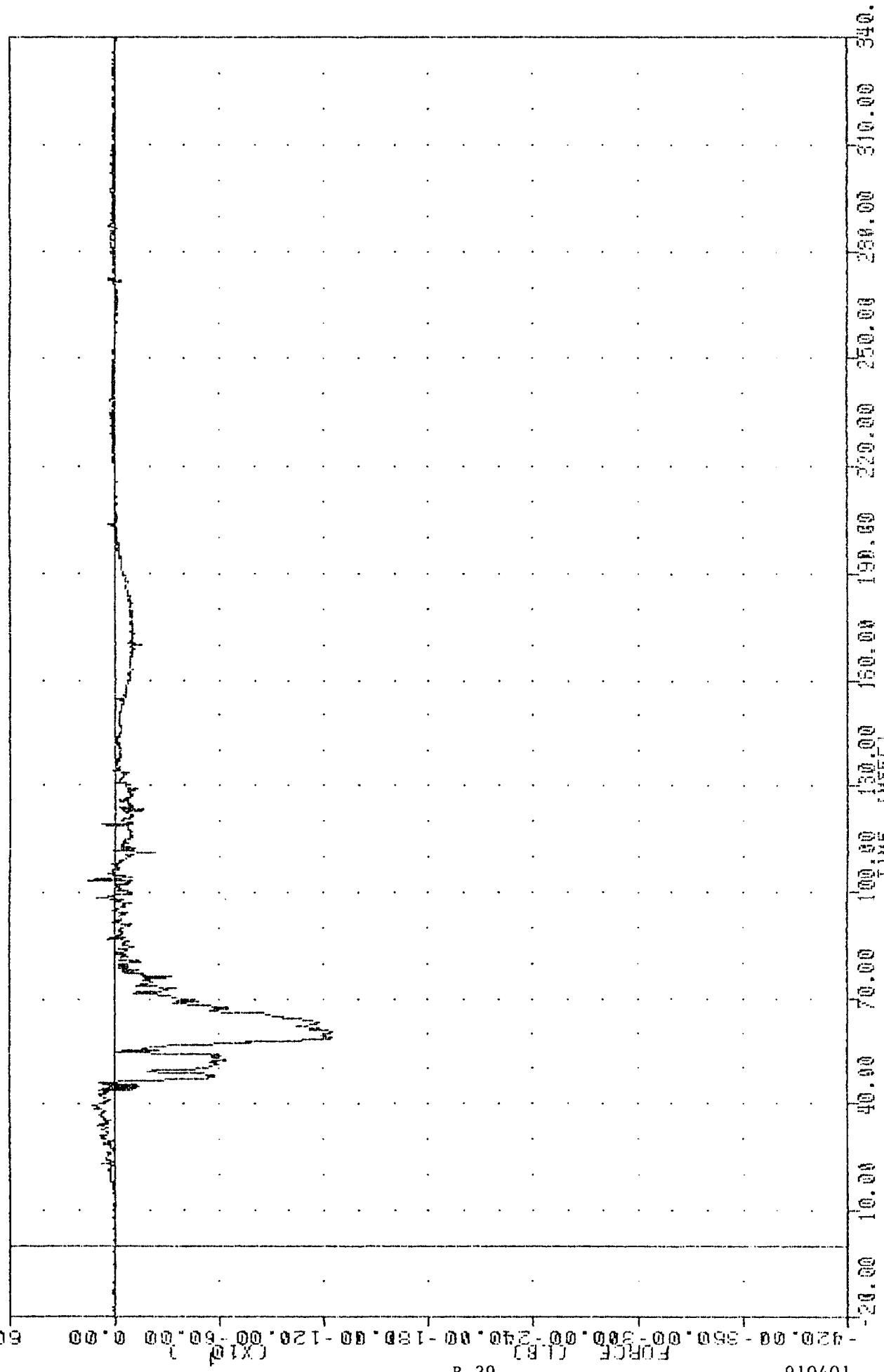
TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 LFME2

FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = -2284.55 58.13 , 268.04 52.75



NEW CAR ASSESSMENT PROGRAM
 91091
 AFMF2

FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = -1252.000 59.00, 148.35 103.38



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 PASSENGER RIGHT FEMUR FORCE

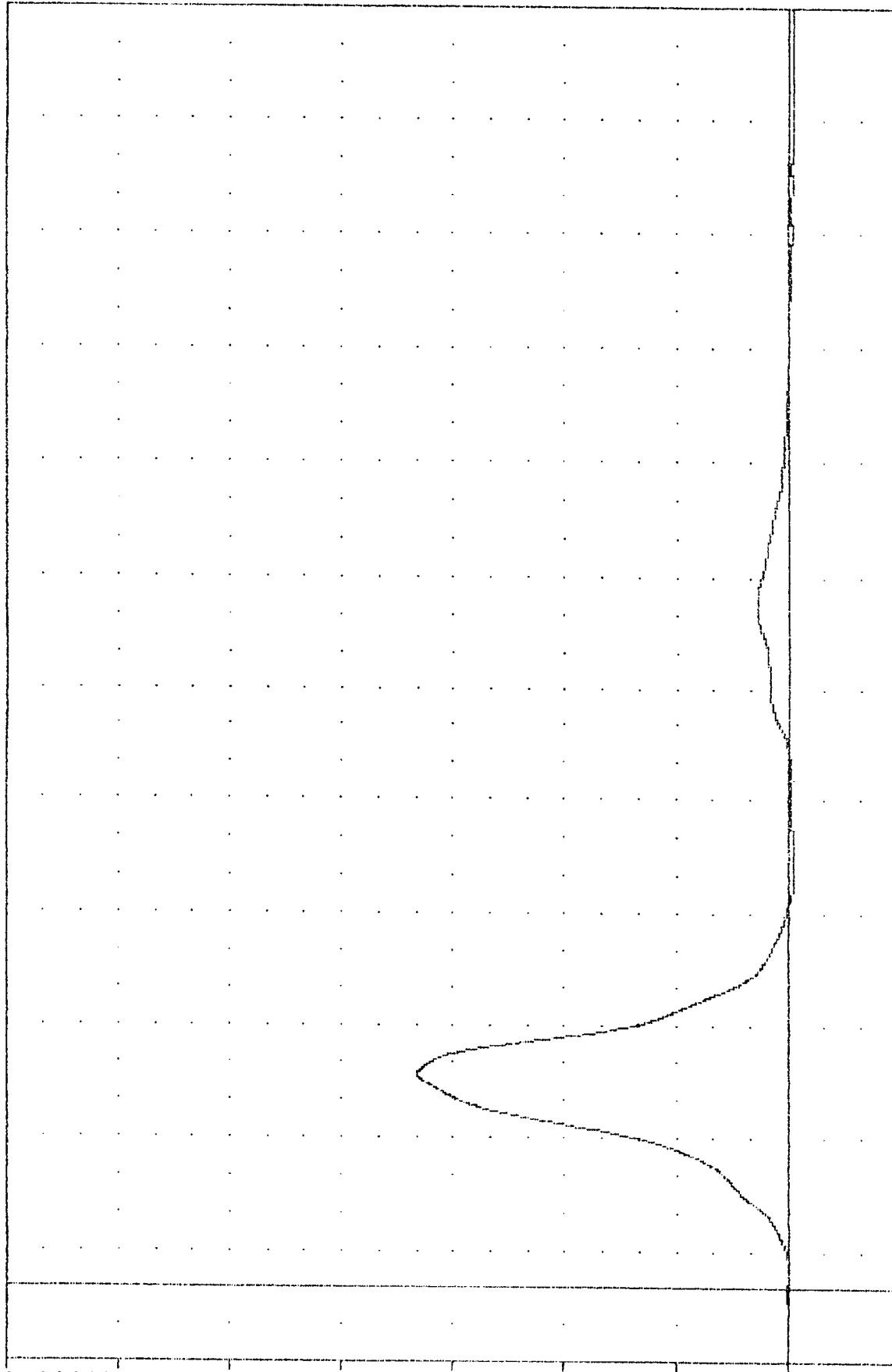
TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 LB0F2

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -35.25 114.38 , 1996.43 2 57.00

FORCE (LBS)
 420.00
 360.00
 300.00
 240.00
 180.00
 120.00
 60.00
 0.00
 -60.00
 -120.00
 -180.00
 -240.00
 -300.00
 -360.00
 -420.00

B-40

910401

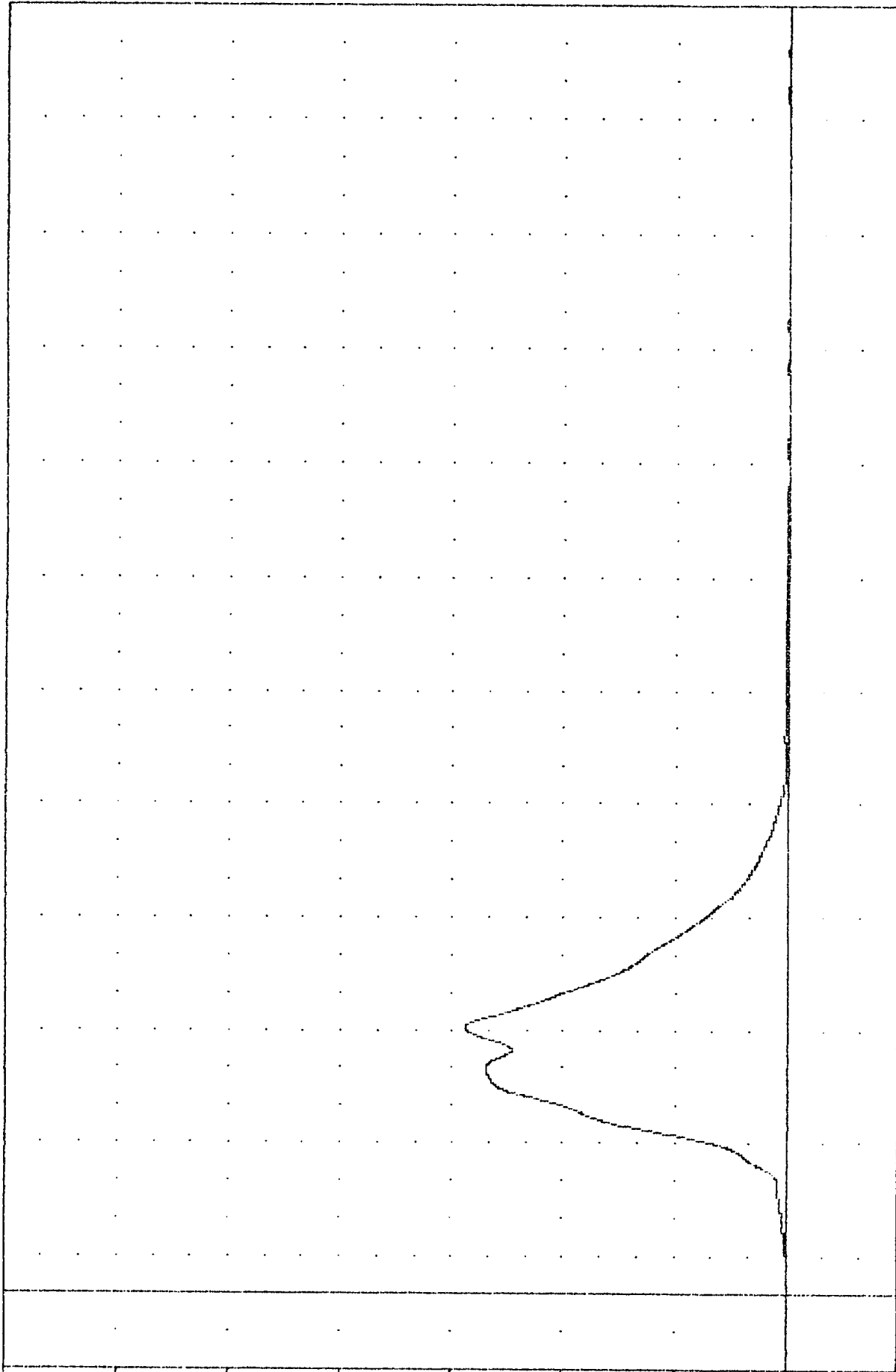


1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 PASSENGER LPP BELT OUTBOARD FORCE

NEW CAR ASSESSMENT PROGRAM
 91031
 SHBF2

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -3.85e 273.50 , 1730.32 e 70.50

14-B
 FORCE (LB)
 420.00
 360.00
 300.00
 240.00
 180.00
 120.00
 60.00
 0.00

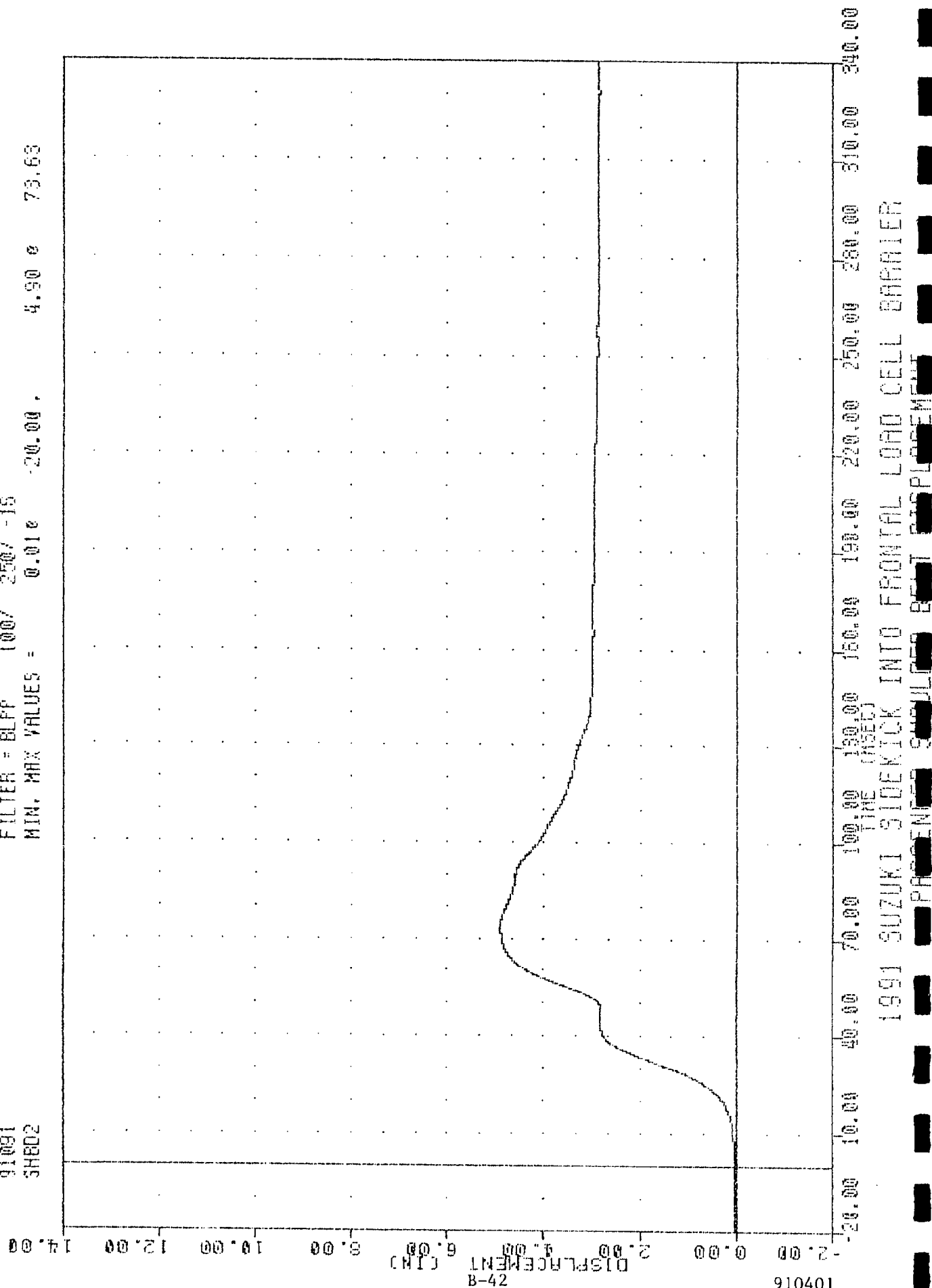


910401

-20.00 10.00 40.00 70.00 100.00 130.00 150.00 180.00 220.00 250.00 280.00 310.00 340.
 TIME (msec)
 1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 PASSENGER SHOULDER BELT FORCE

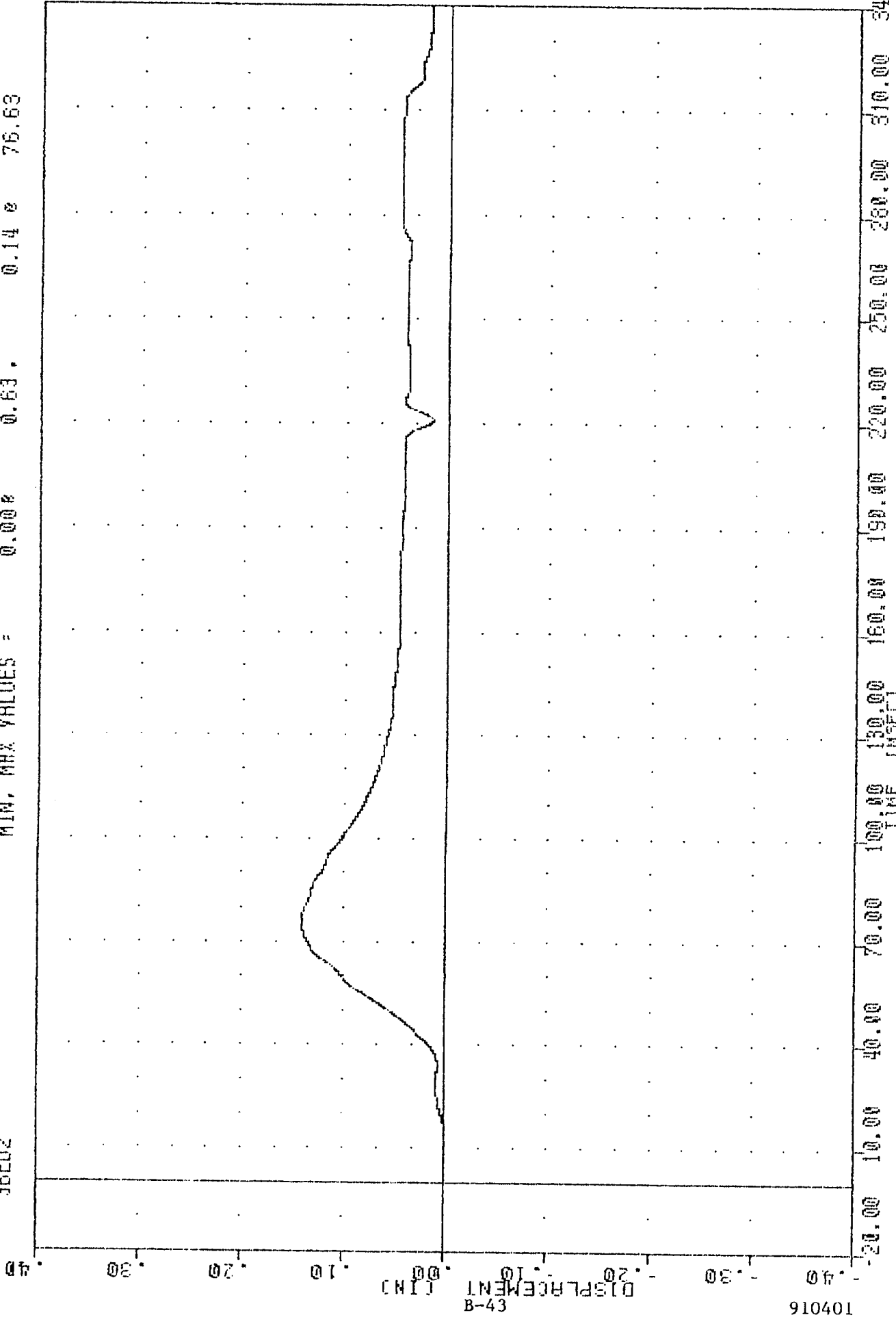
TRC 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 SHED2

FILTER = BLFF 100/ 250/ -15
 MIN. MAX VALUES = 0.010 -20.00 4.90 0 73.63



NEW CAR ASSESSMENT PROGRAM
91091
SBED2

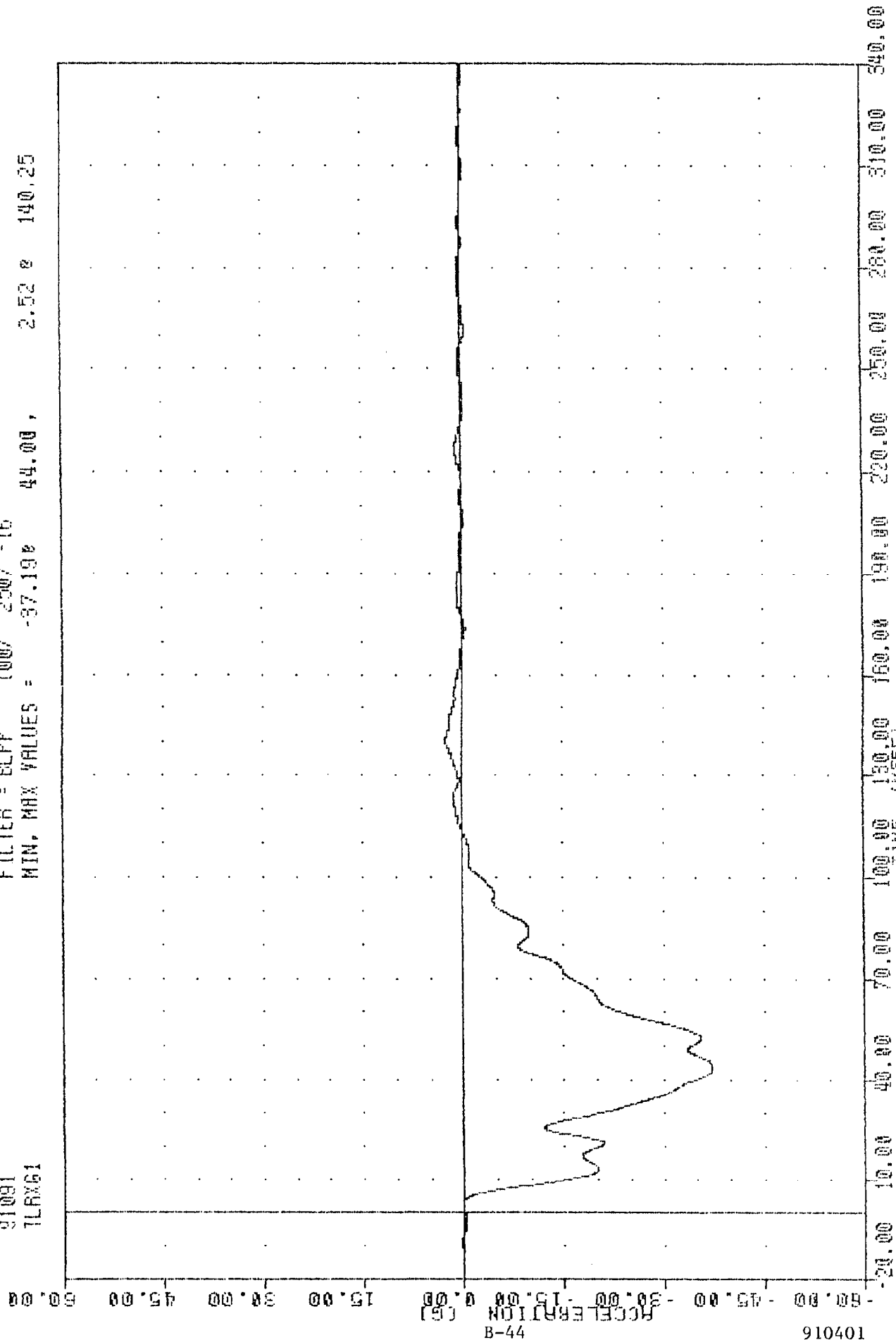
FILTER = BLPP 100/ 250/ -15
MIN, MAX VALUES = 0.00% 0.63. 0.14 e 76.63



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 TLXG1

FILTER = ELPP 100/ 250/ -16
 MIN. MAX VALUES = -37.19% 44.00 , 2.52 % 140.25



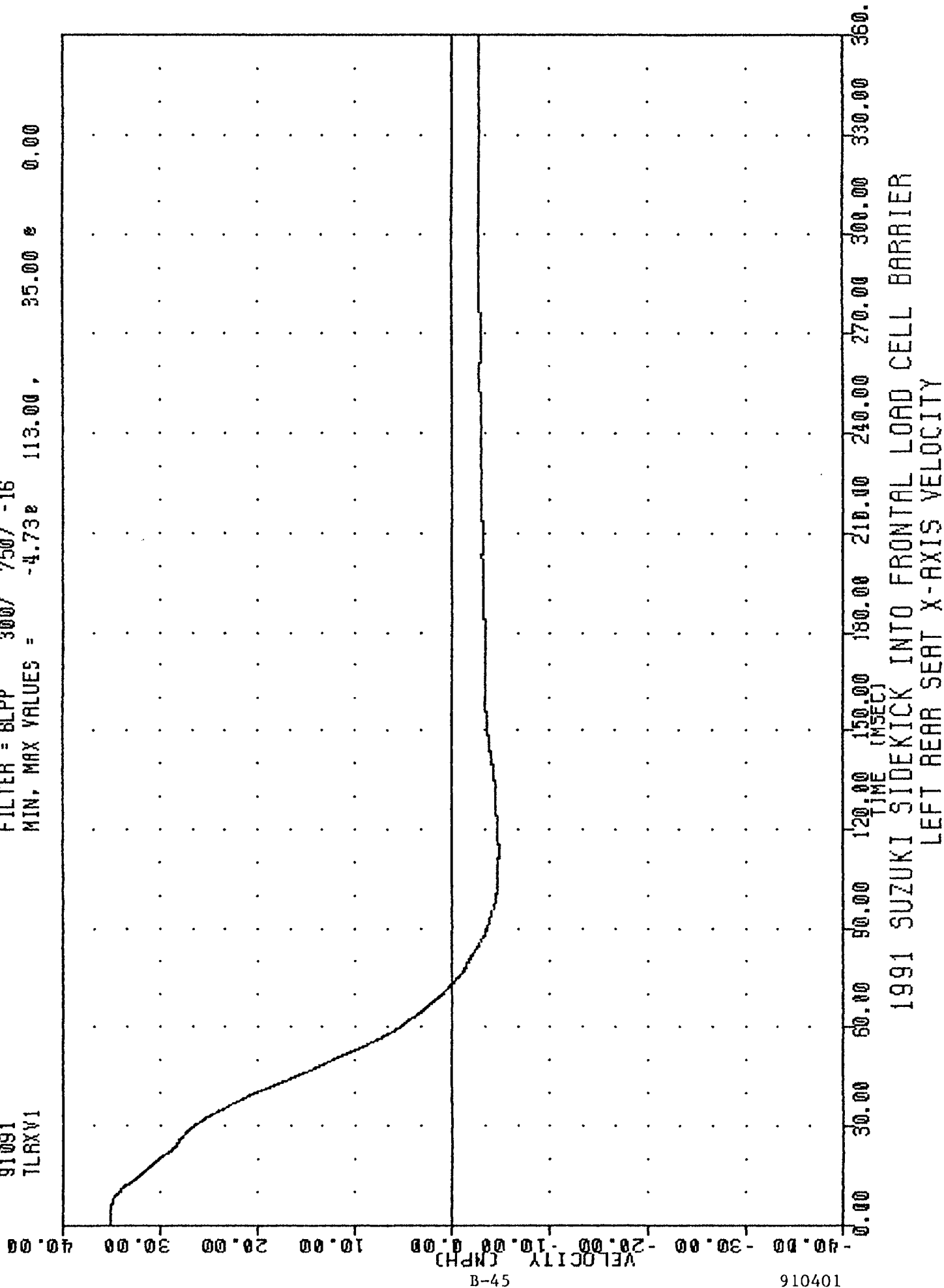
B-44

910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

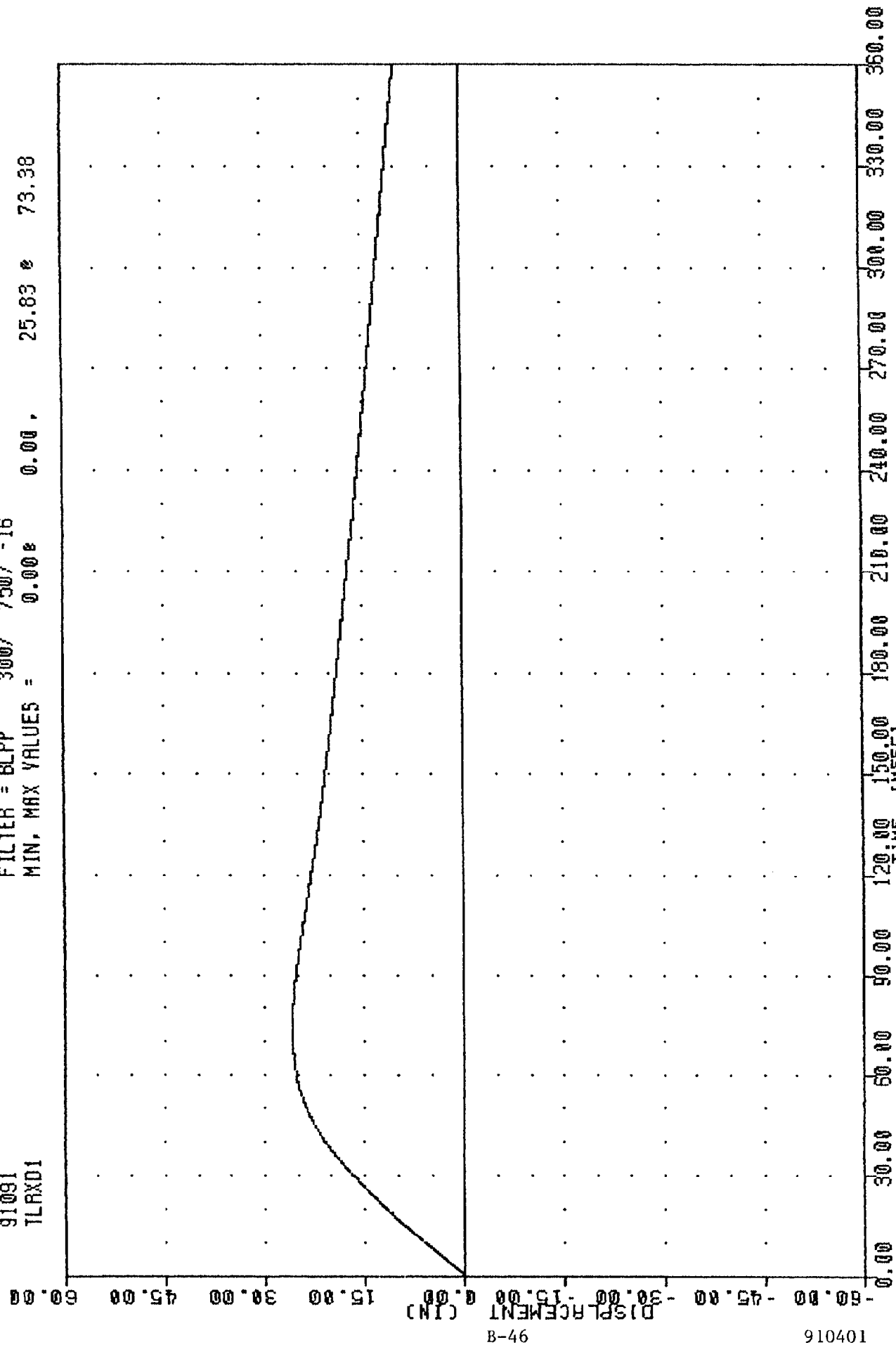
TRC , 910401
NEW CAR ASSESSMENT PROGRAM
91091
TLXYV1

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -4.73e 113.00 , 35.00 e 0.00



TRC 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 TLRXD1

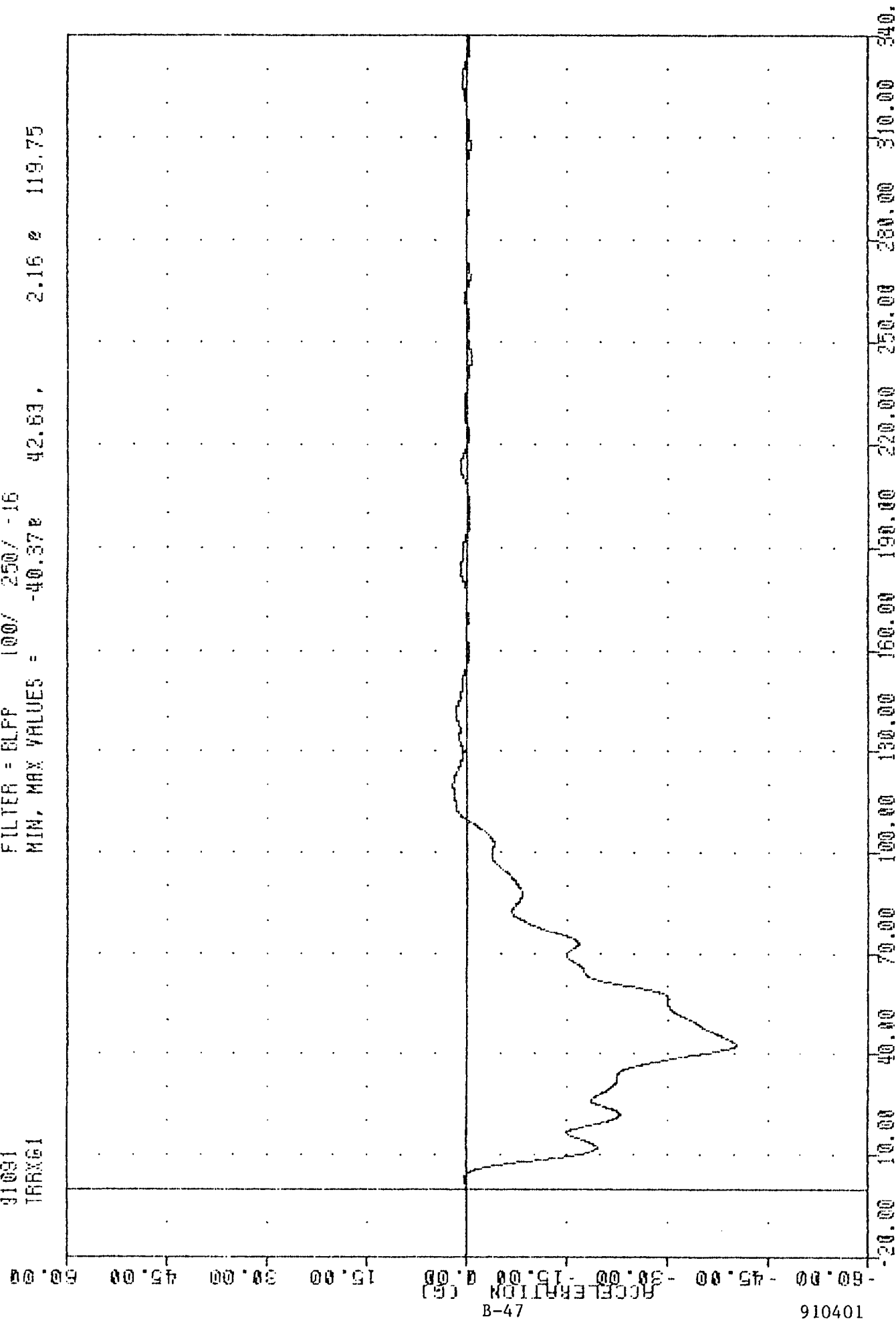
FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = 0.00% 0.00% 25.83% 73.38



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 100T BARRIER AT MAX DISPLACEMENT

TRC 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 TRX01

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -40.37 42.63, 2.16 119.75



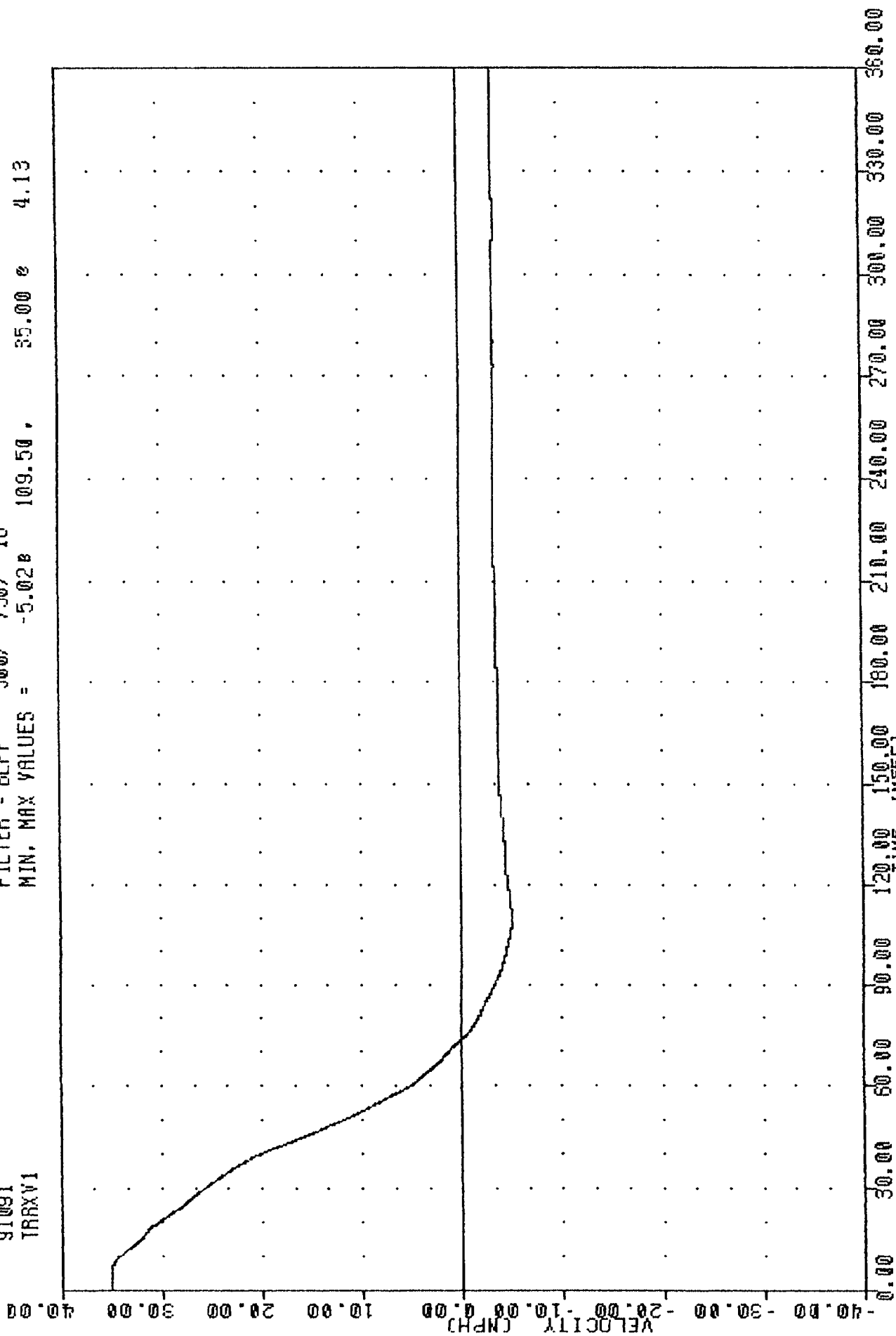
B-47

910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS ACCELERATION

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 TRRXV1

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -5.020 109.50 , 35.00 4.13



B-48

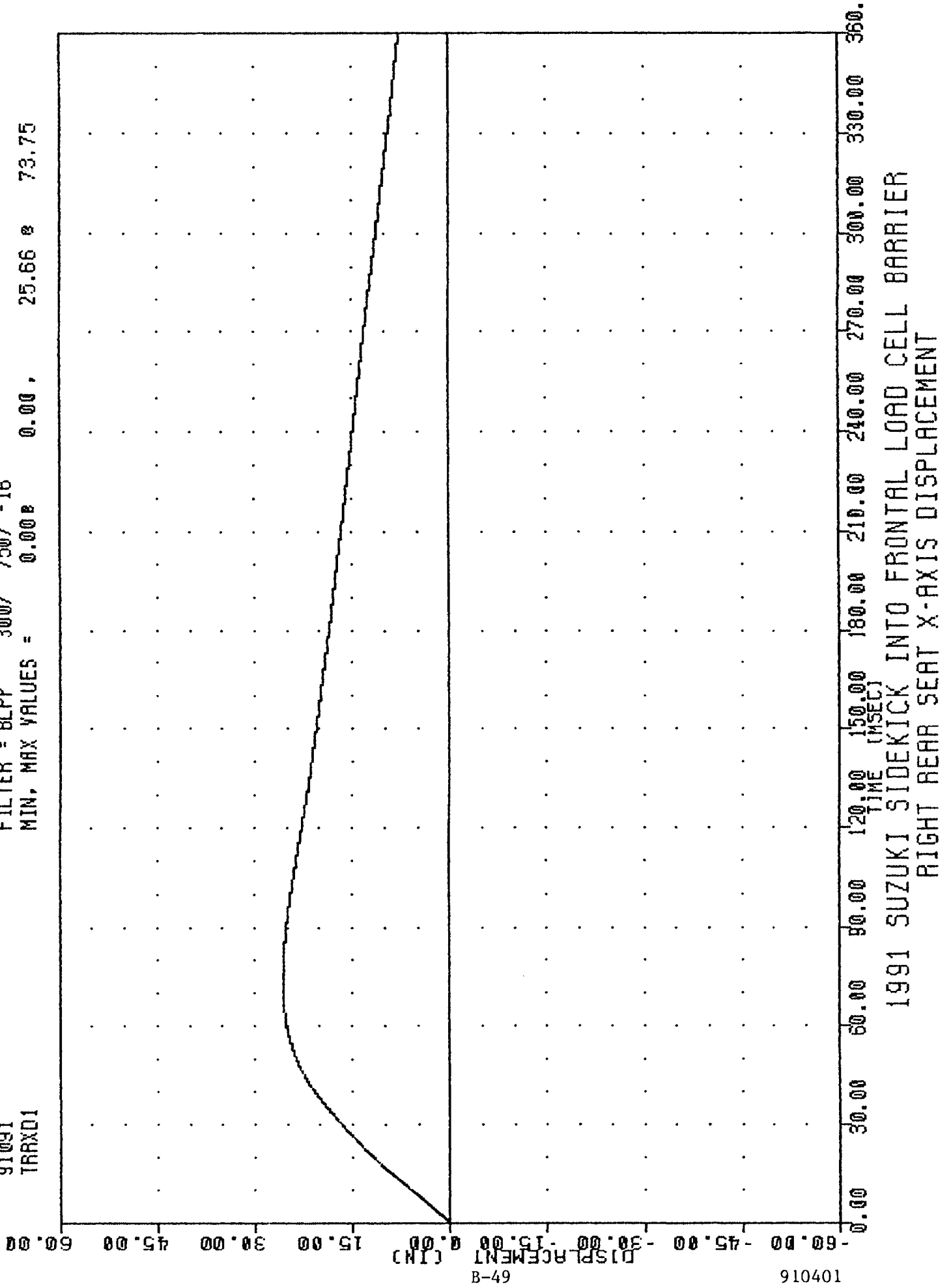
910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

WCH RFRM SFM X 19.00 VELOCITY

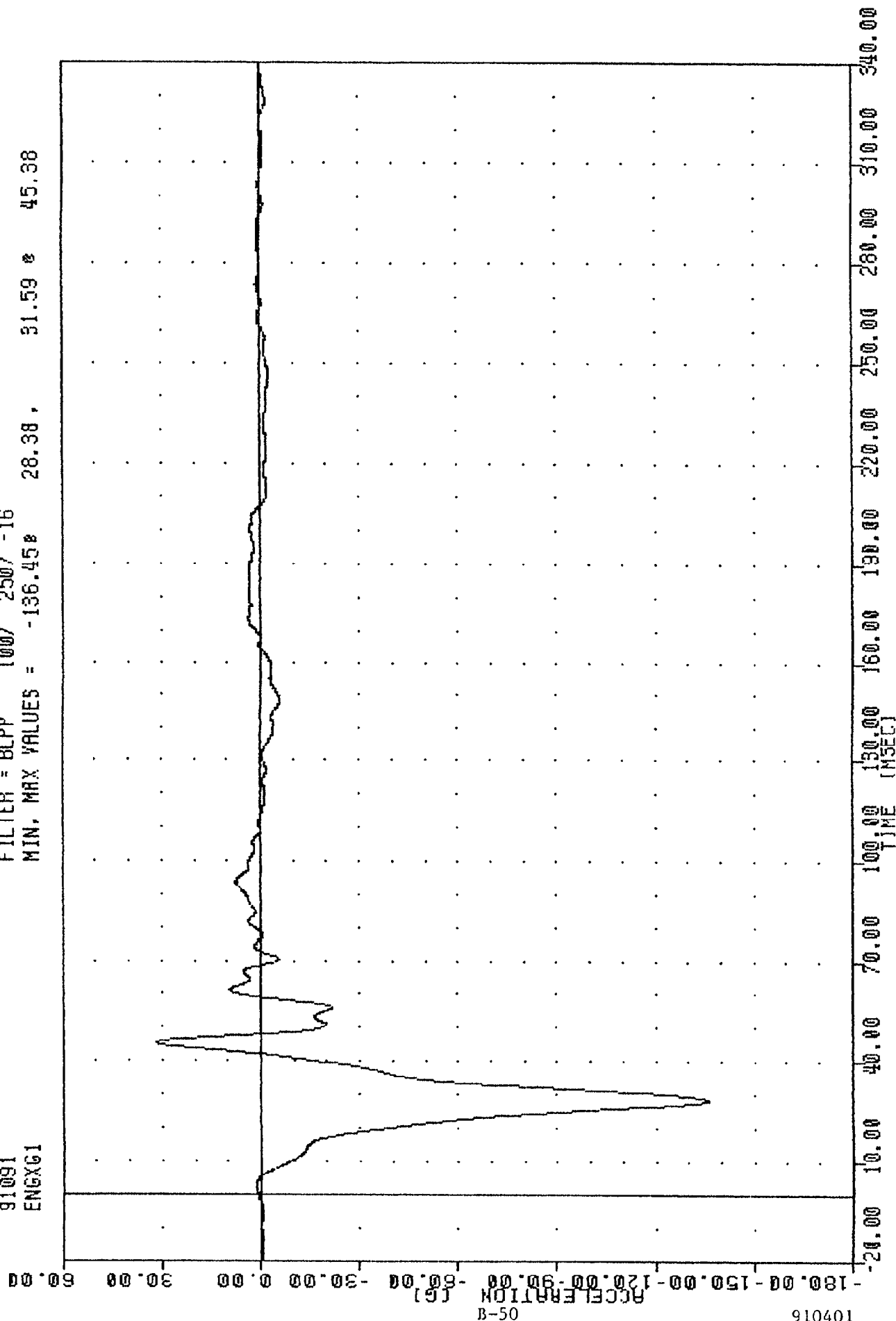
TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 TRXD1

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = 0.000 0.00 , 25.66 73.75



TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 ENGXC1

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -136.458 28.38 , 31.59 45.38



TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 ENGCG2

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -176.90 25.63 1242.44 33.50

50.00

45.00

40.00

35.00

30.00

25.00

20.00

15.00

10.00

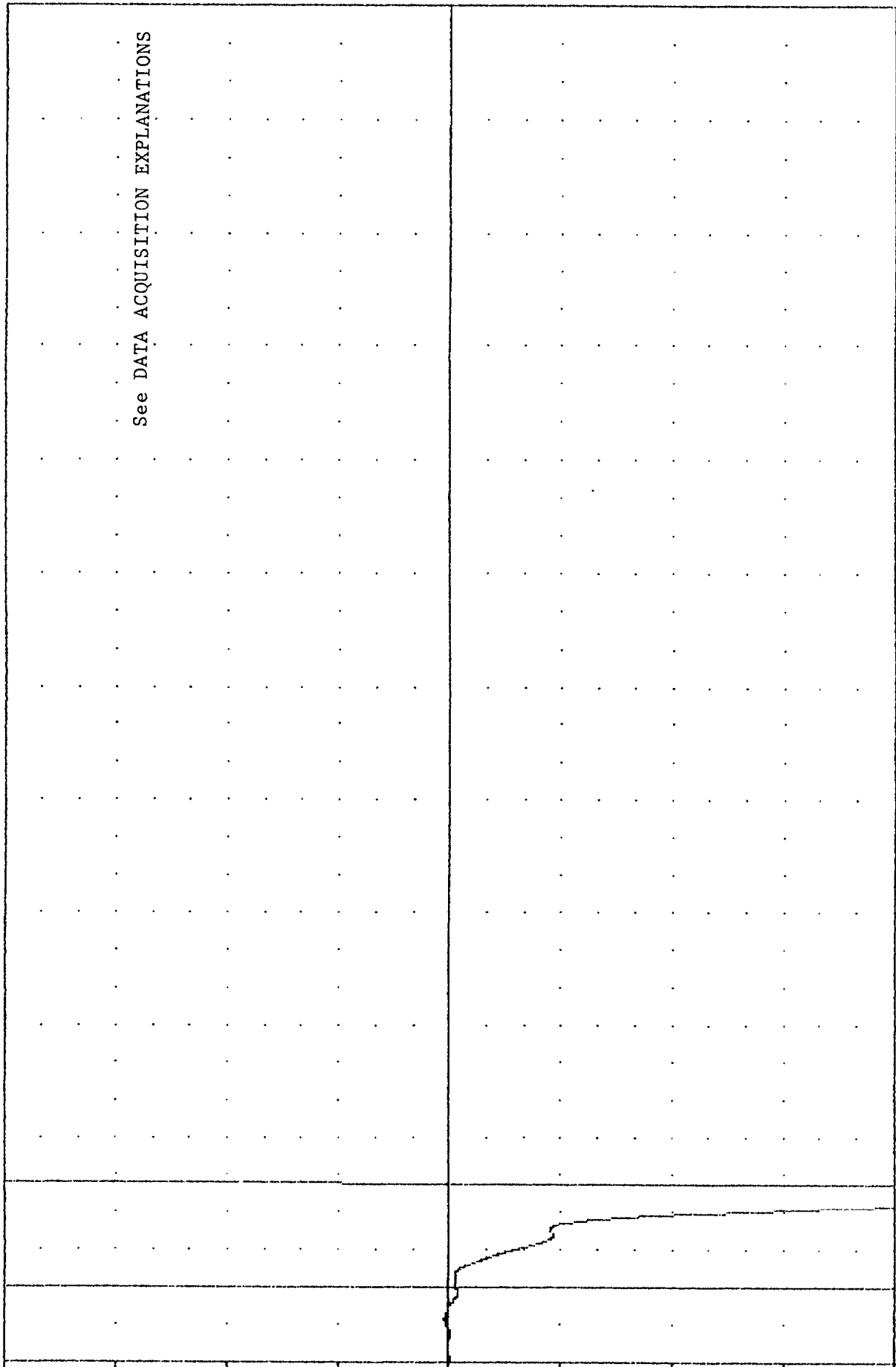
5.00

0.00

ACCELERATION (G)

B-51

910401



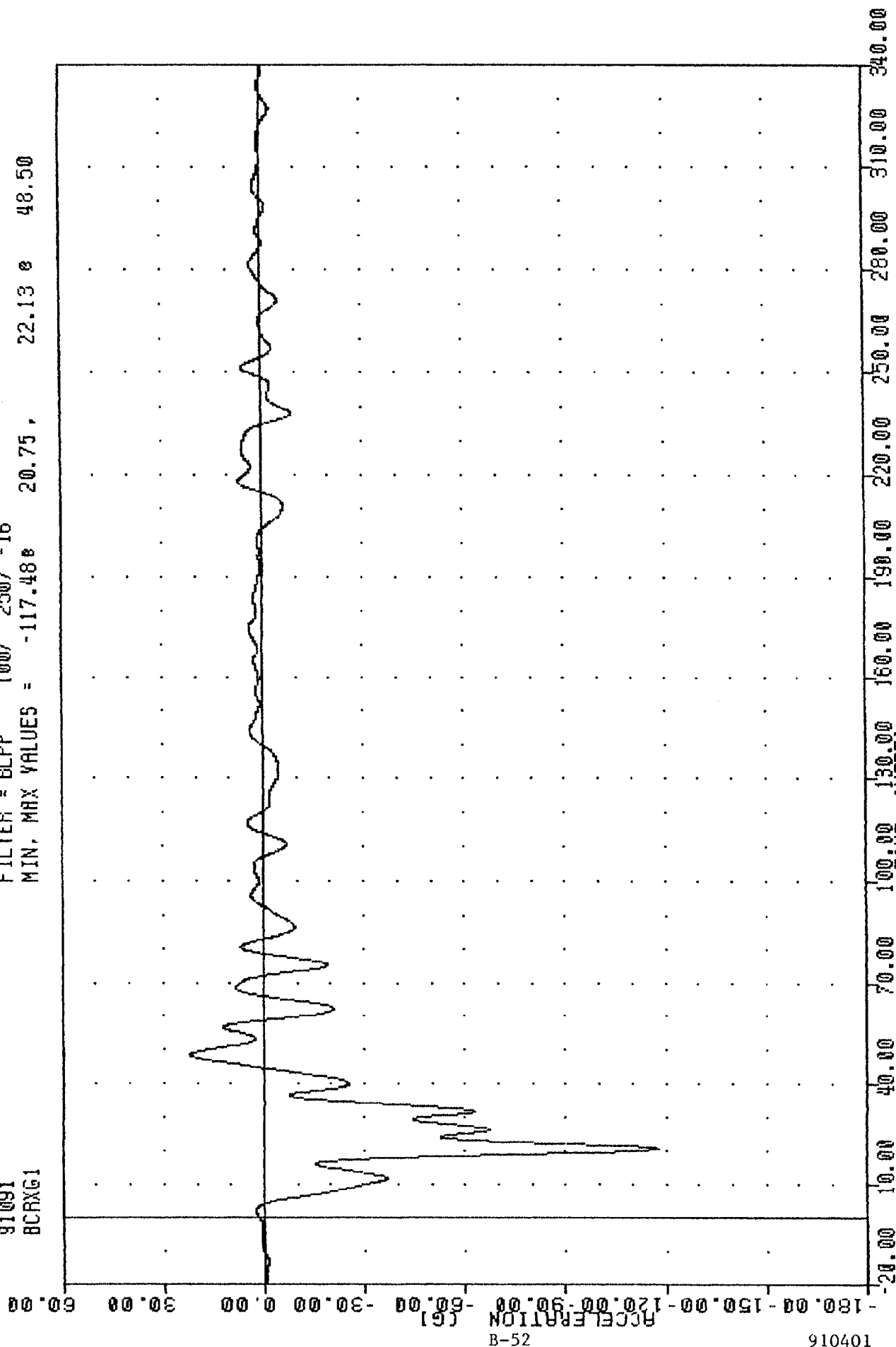
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (msec)

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 ENGINE BOTTOM Y-AXIS ACCELERATION

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 BCRXG1

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -117.48 20.75 , 22.13 48.50



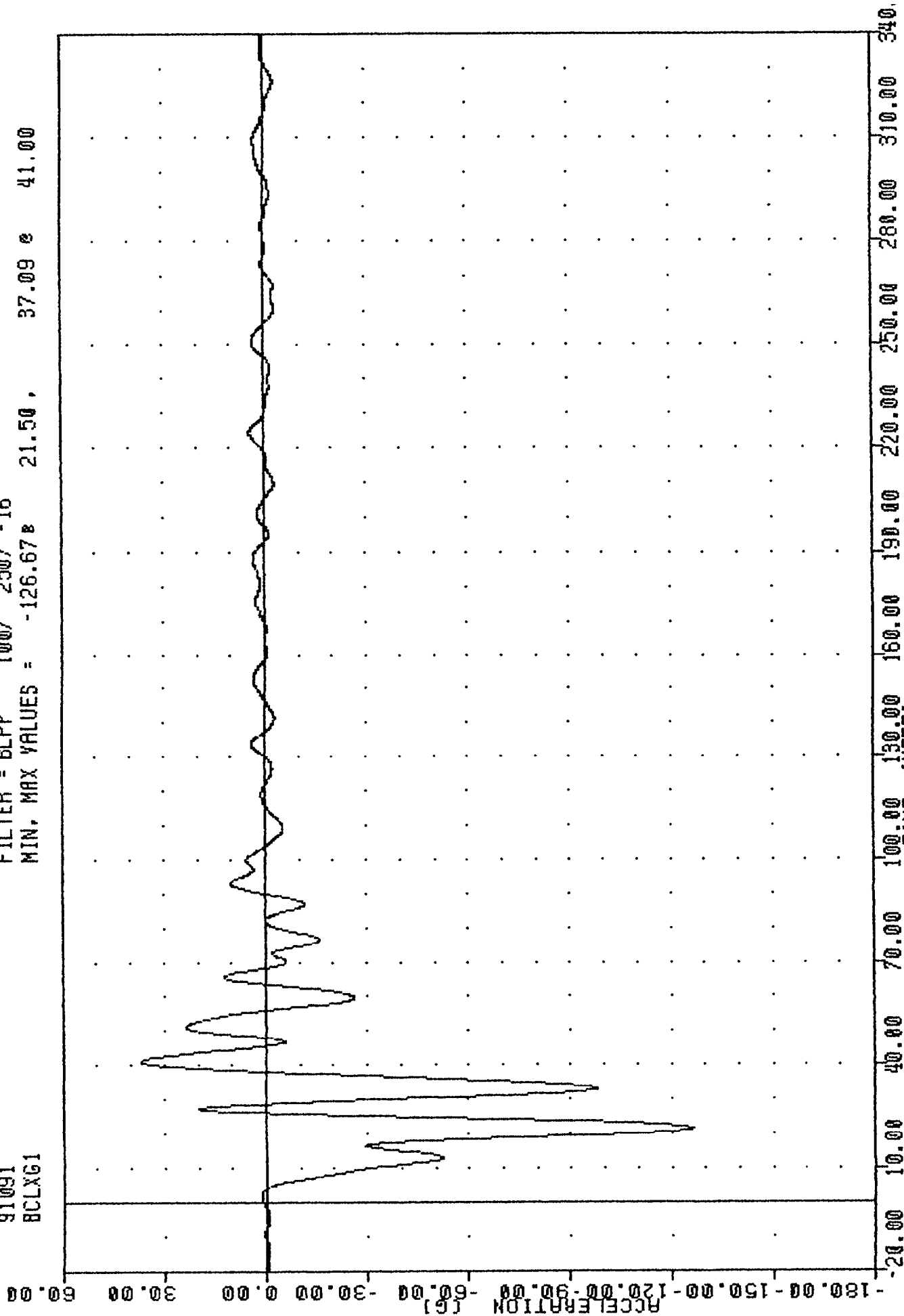
B-52

910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 X-1000 ACCIDENT

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 BCLXG1

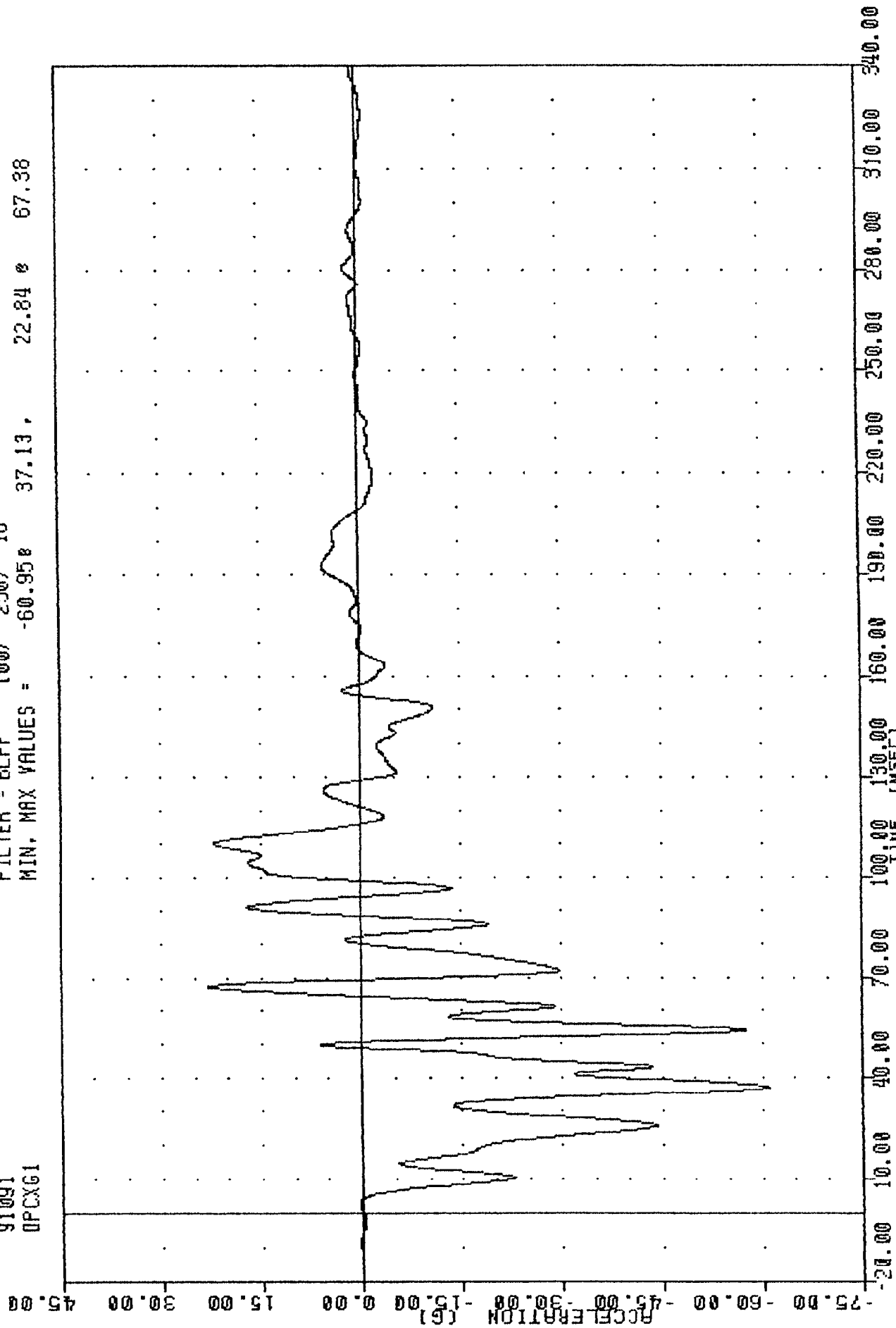
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -126.67 21.50, 37.09 41.00



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 LEFT BRAKE CALIPER X-AXIS ACCELERATION

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 OPCXG1

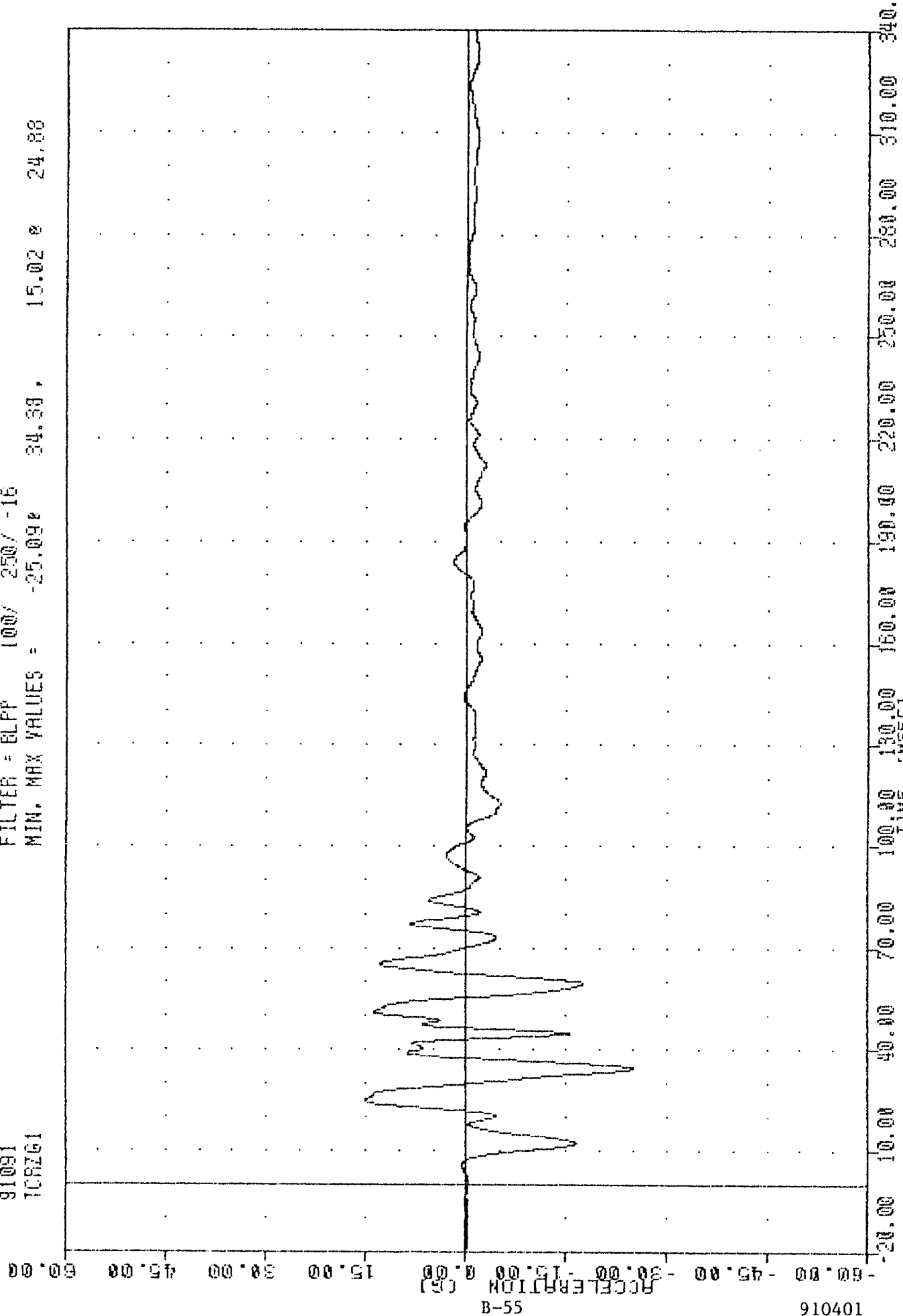
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -60.950 37.13, 22.84 67.38



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 TESTED BY FRANK DANIEL FRANK DANIEL
 ANALYSIS BY FRANK DANIEL FRANK DANIEL

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 TCRZG1

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -25.09% 34.38 , 15.02 % 24.88



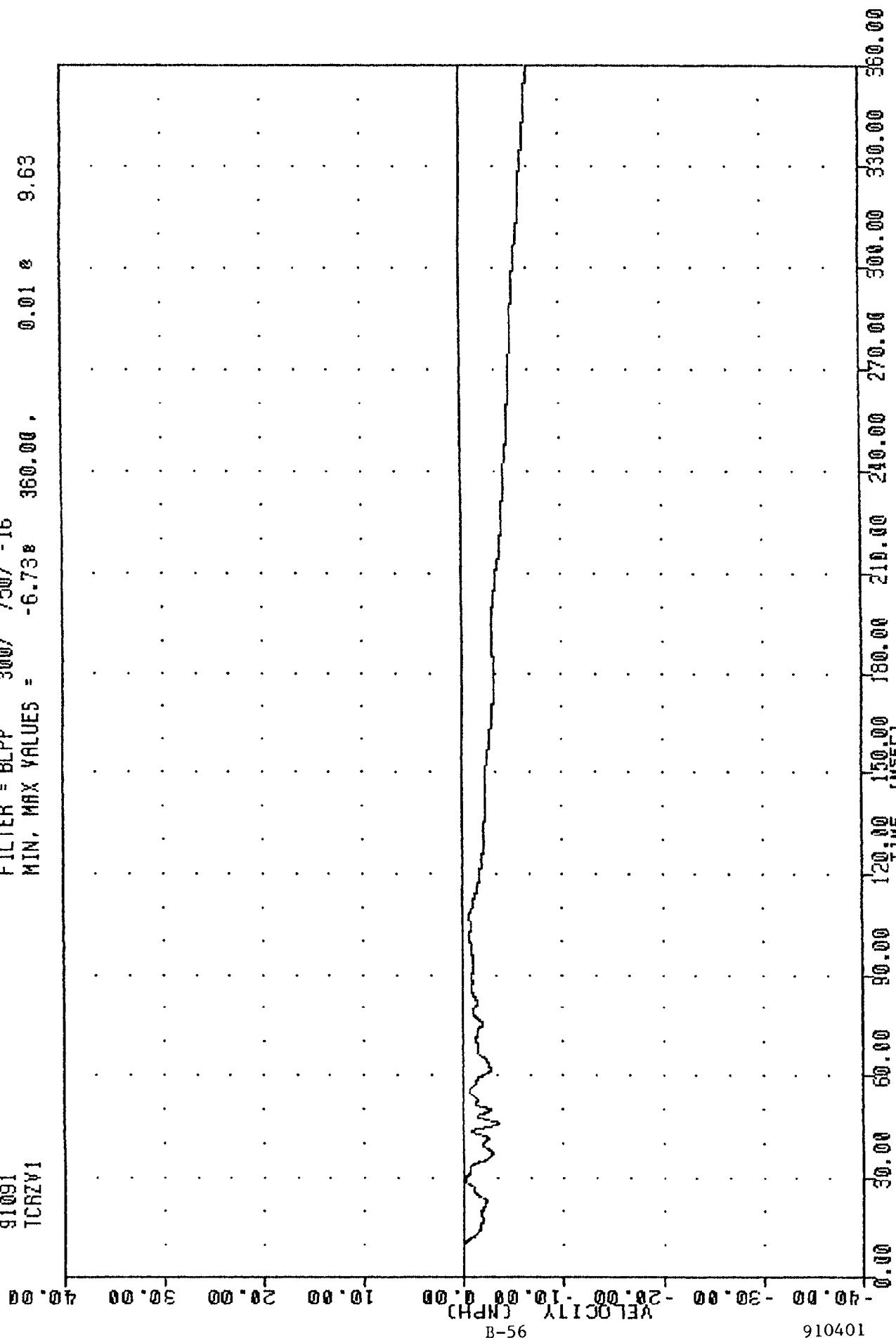
B-55

910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 REAR SEAT CROSSMEMBER 7-AXIS ACCELERATION

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 TCRZV1

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -6.73% 360.00 , 0.01 % 9.63



B-56

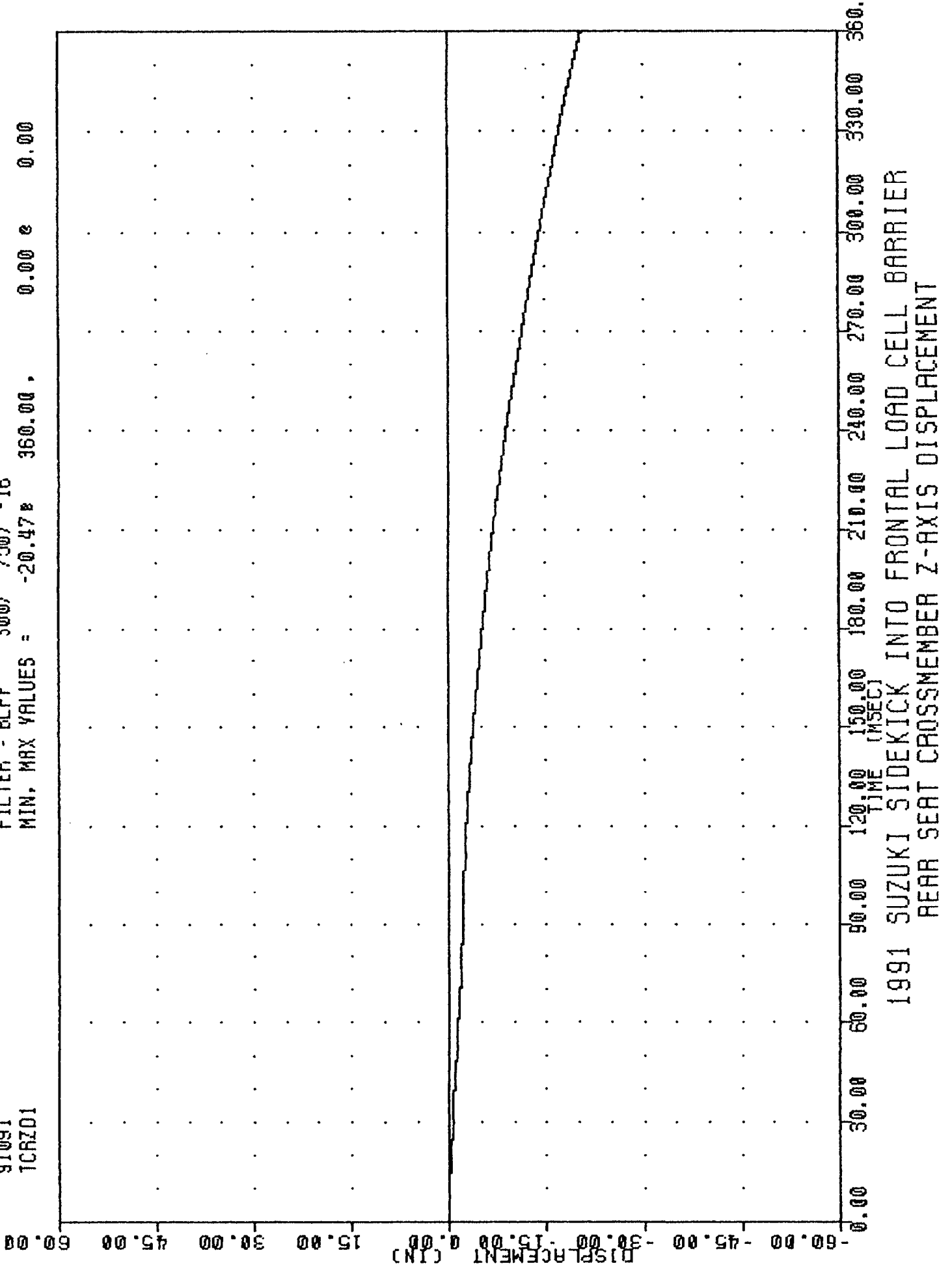
910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

REAR SEAT CROSSMEMBER - PASS 6 VELOCITY

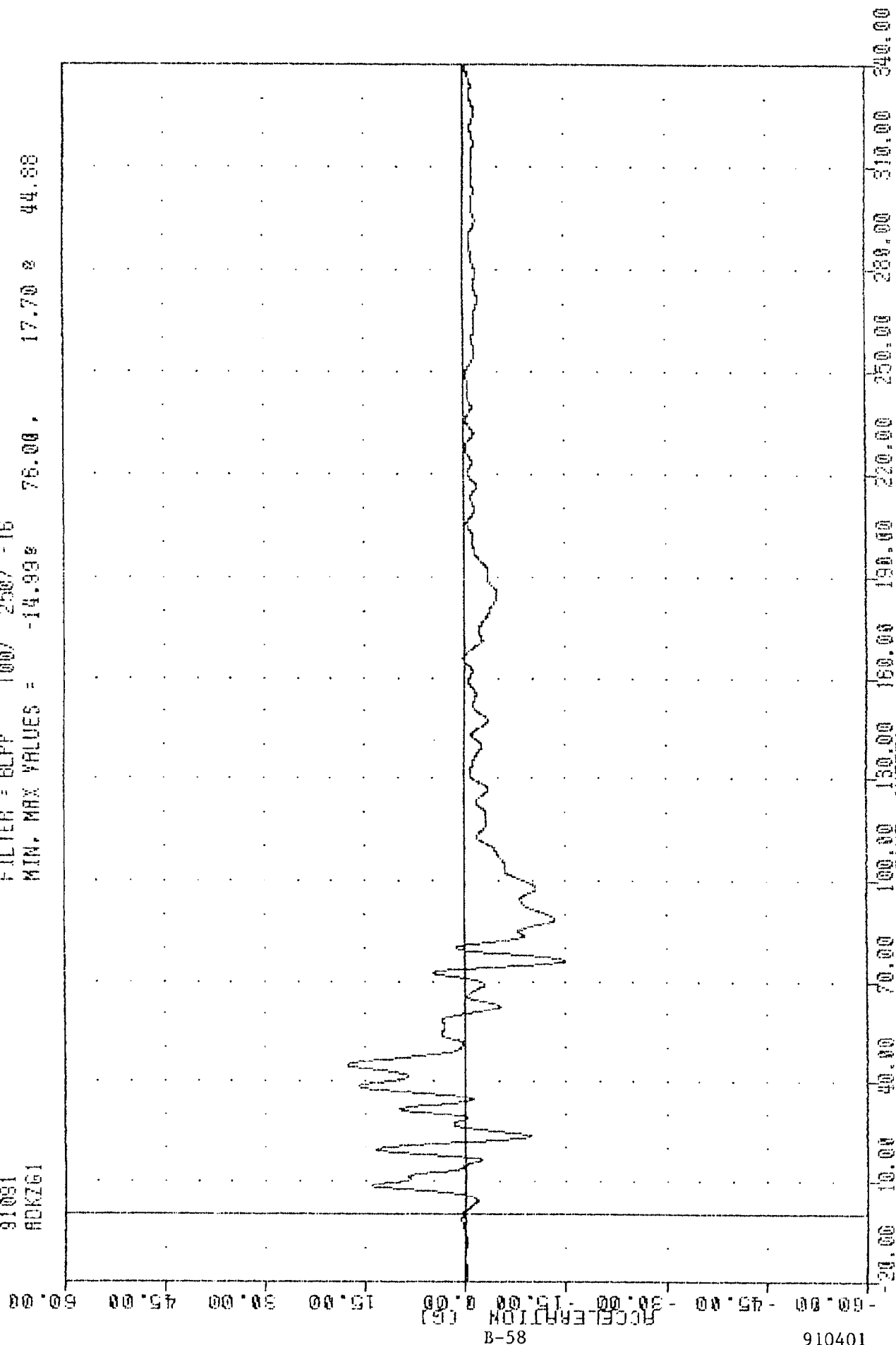
IKL , 910401
NEW CAR ASSESSMENT PROGRAM
91091
TCRZD1

FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -20.47 360.00 0.00 0.00



TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 ROKZG1

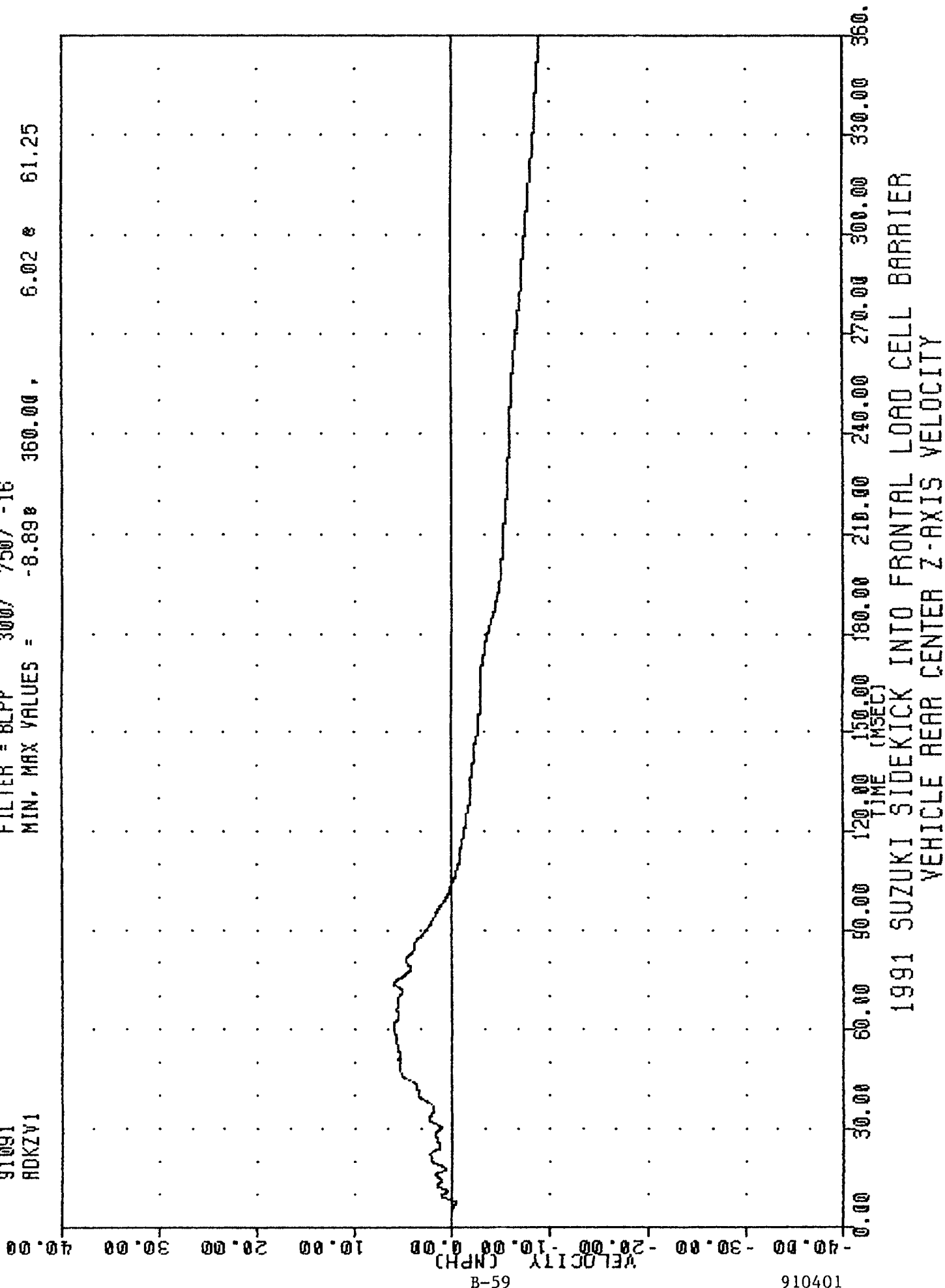
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -14.99% 76.00 , 17.70 % 44.88



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 FH F BAR NT Z TAC T P

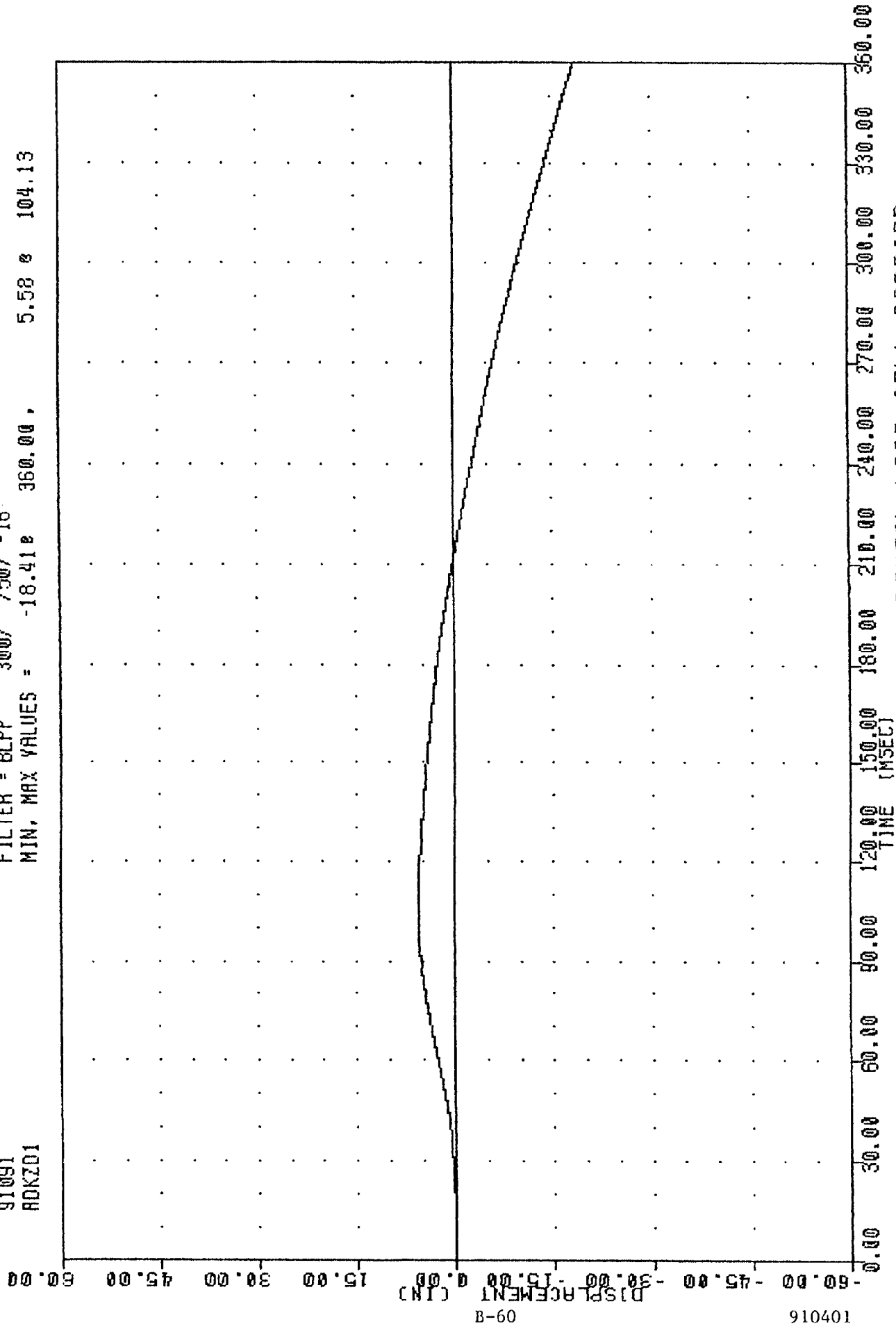
INC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 RDKZV1

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -8.898 360.00 , 6.02 61.25



TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 ADKZD1

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -18.41e 360.00, 5.58 e 104.13



B-60

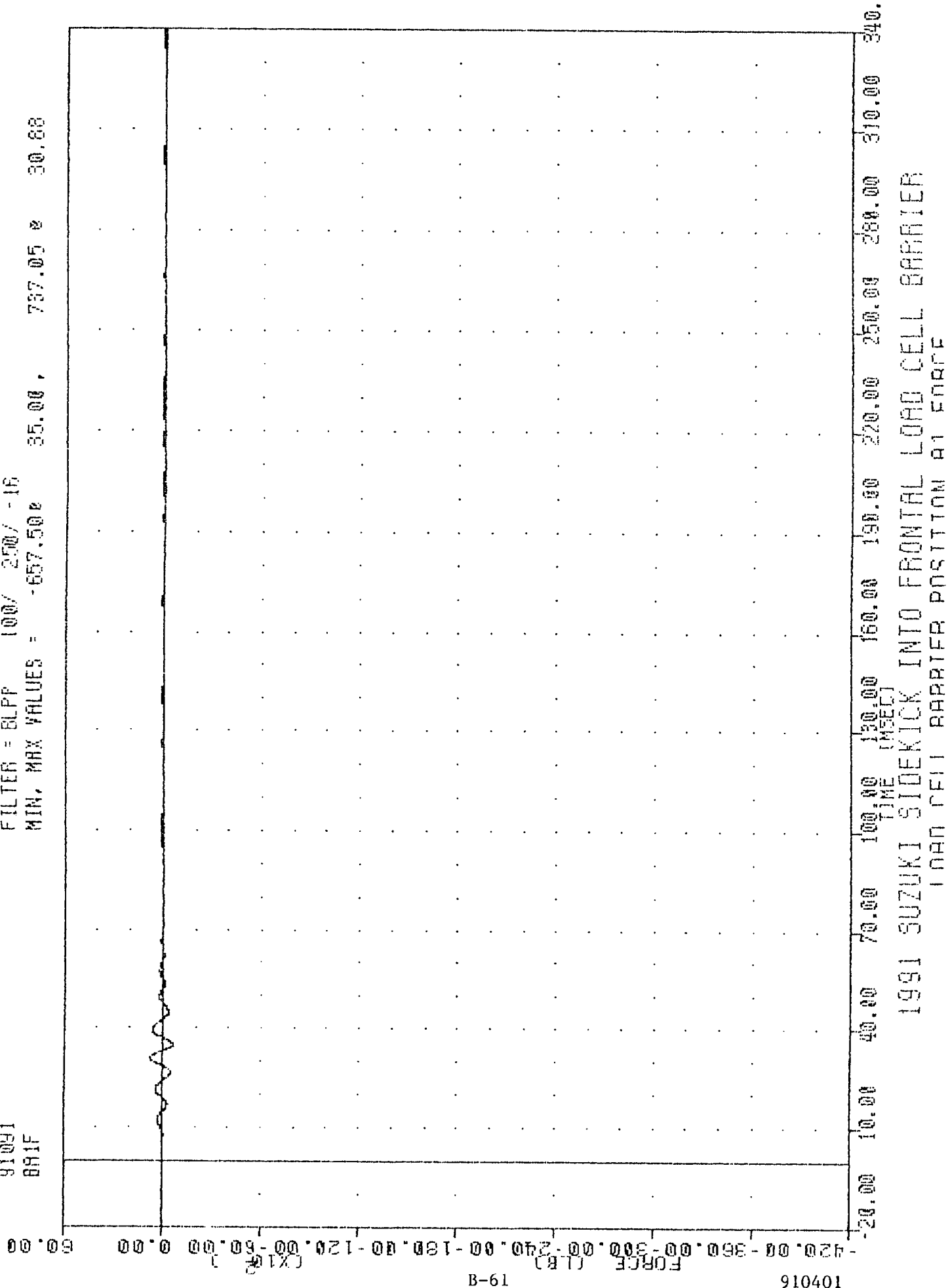
910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 VEHICLE REAR CENTER Z AXIS DISPLACEMENT

TRC
 NEW CAR ASSESSMENT PROGRAM
 91091
 891F

, 910401

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -657.500 35.00, 737.05 30.88



TRC .910401
NEW CAR ASSESSMENT PROGRAM

91091
BR2F

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -440.318 35.13, 185.38 0 13.25

50.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

B-62

910401

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

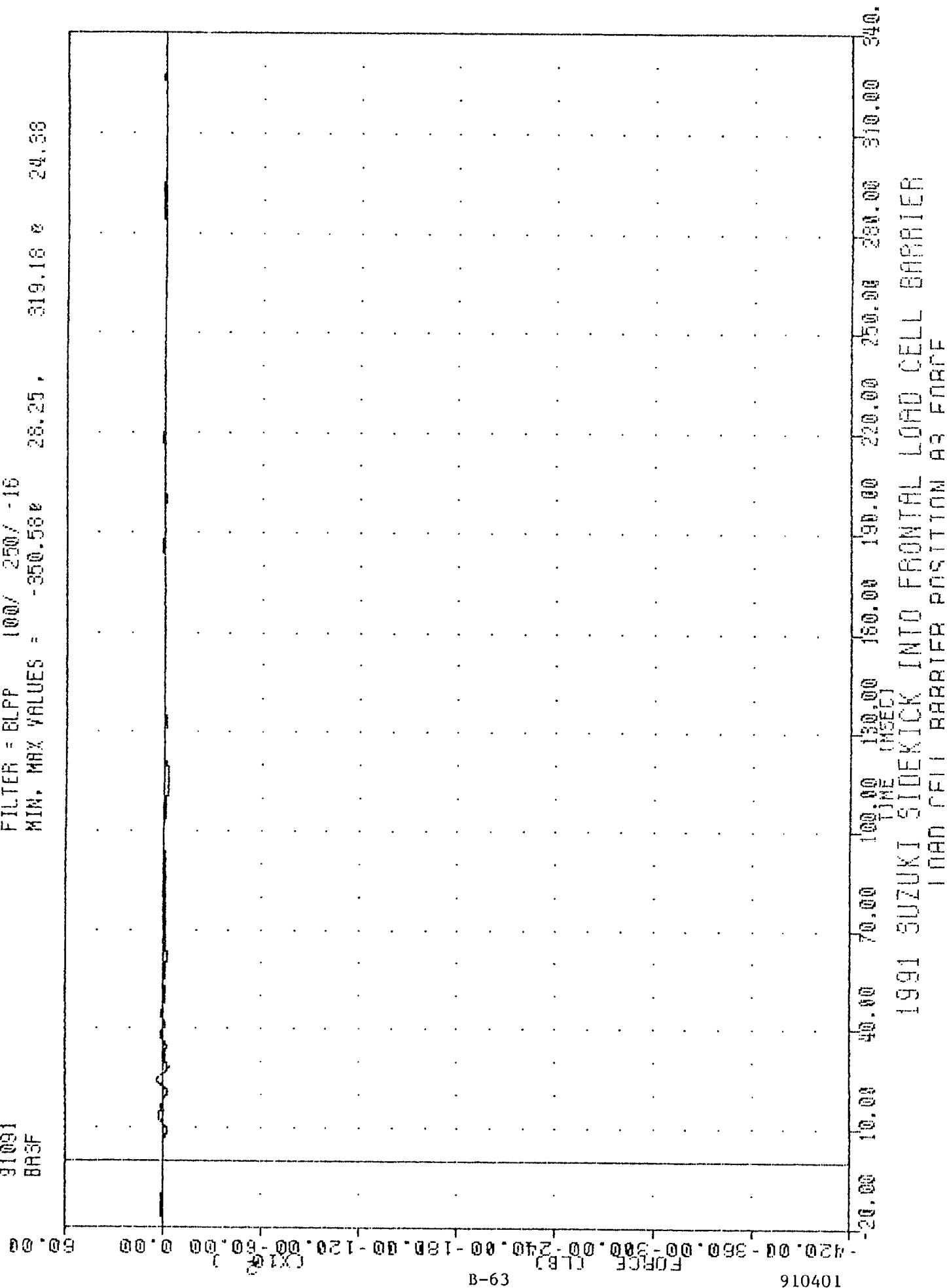
TIME USED

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

LONG CELL BARRIER POSITION AREA

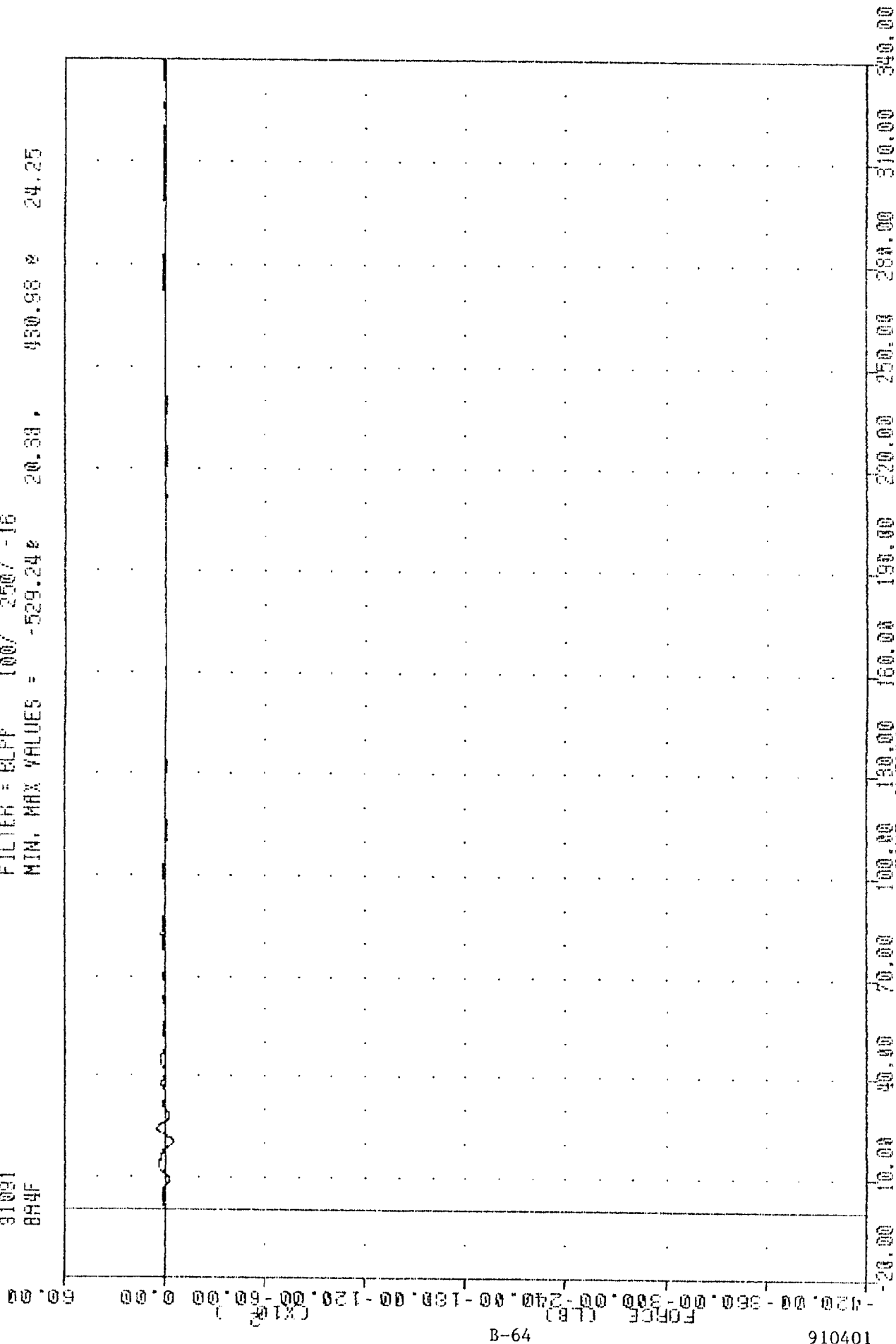
TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 BR3F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -350.58 28.25, 319.18 24.38



TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 894F

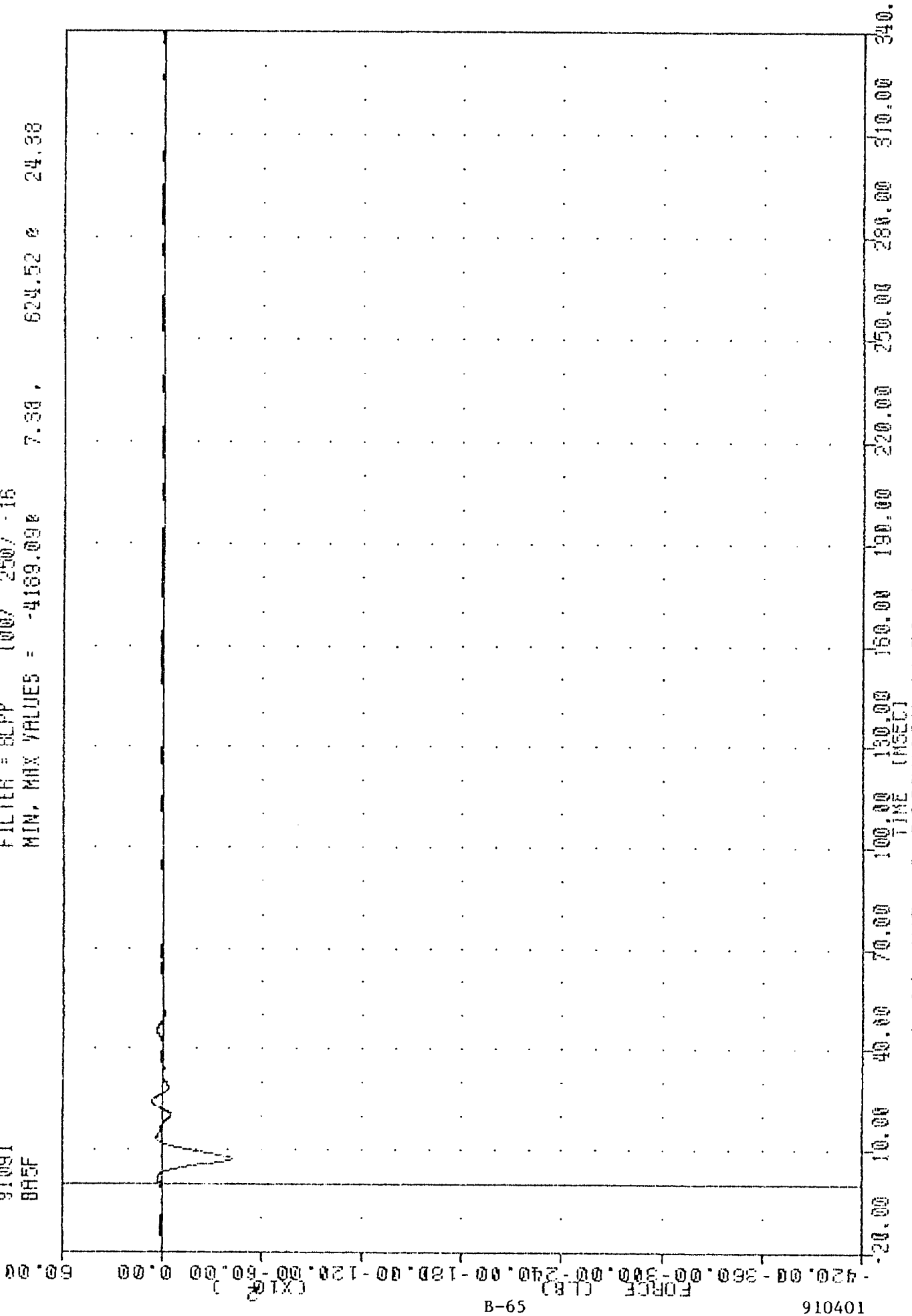
FILTER = BLPP 100% 250V -16
 MIN. MAX VALUES = -529.24 20.33 430.98 24.25



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION AT OFF

INL , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 085F

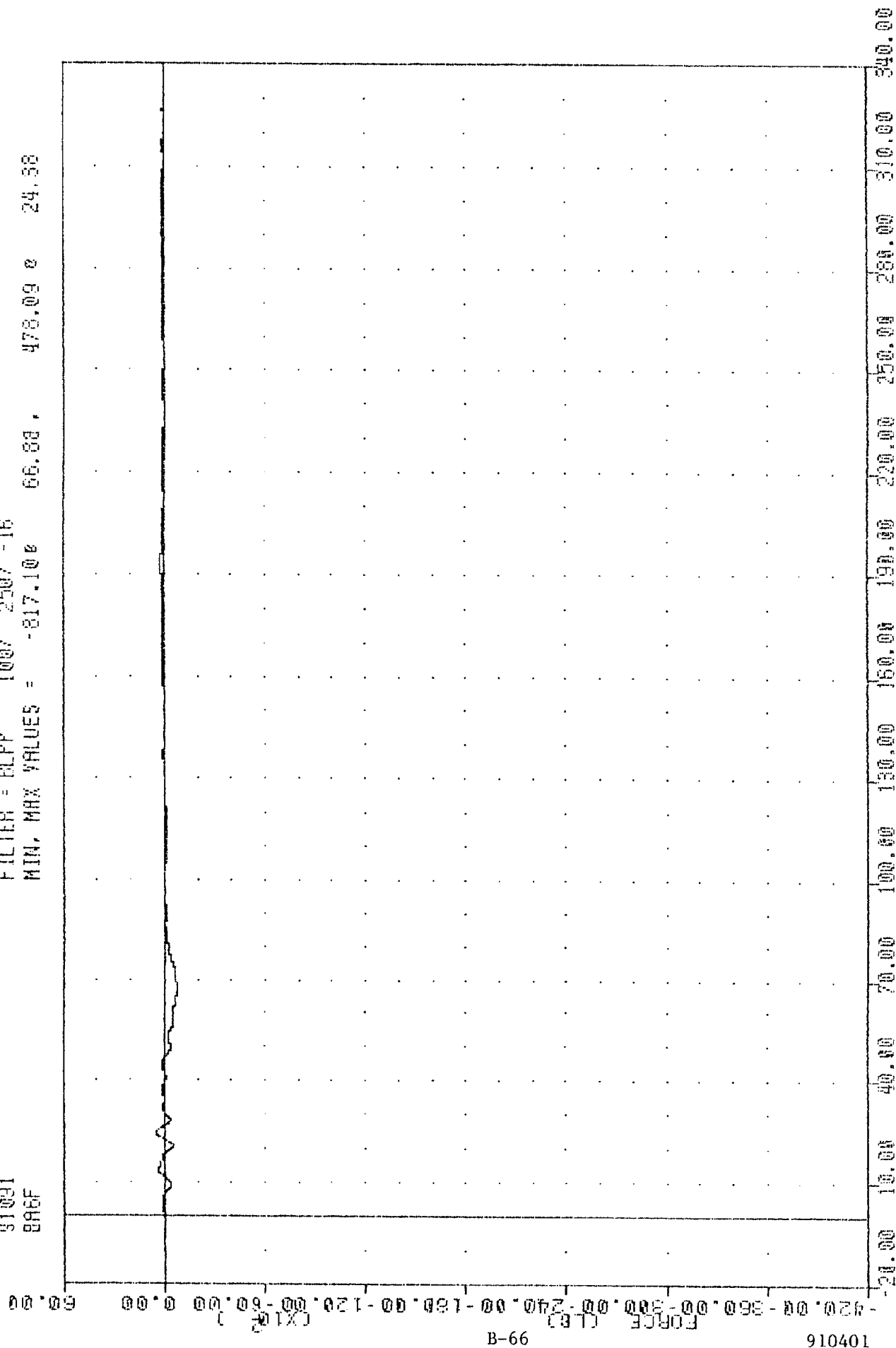
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -4169.098 7.38 624.52 24.38



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A5 FORCE

IAC . 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 896F

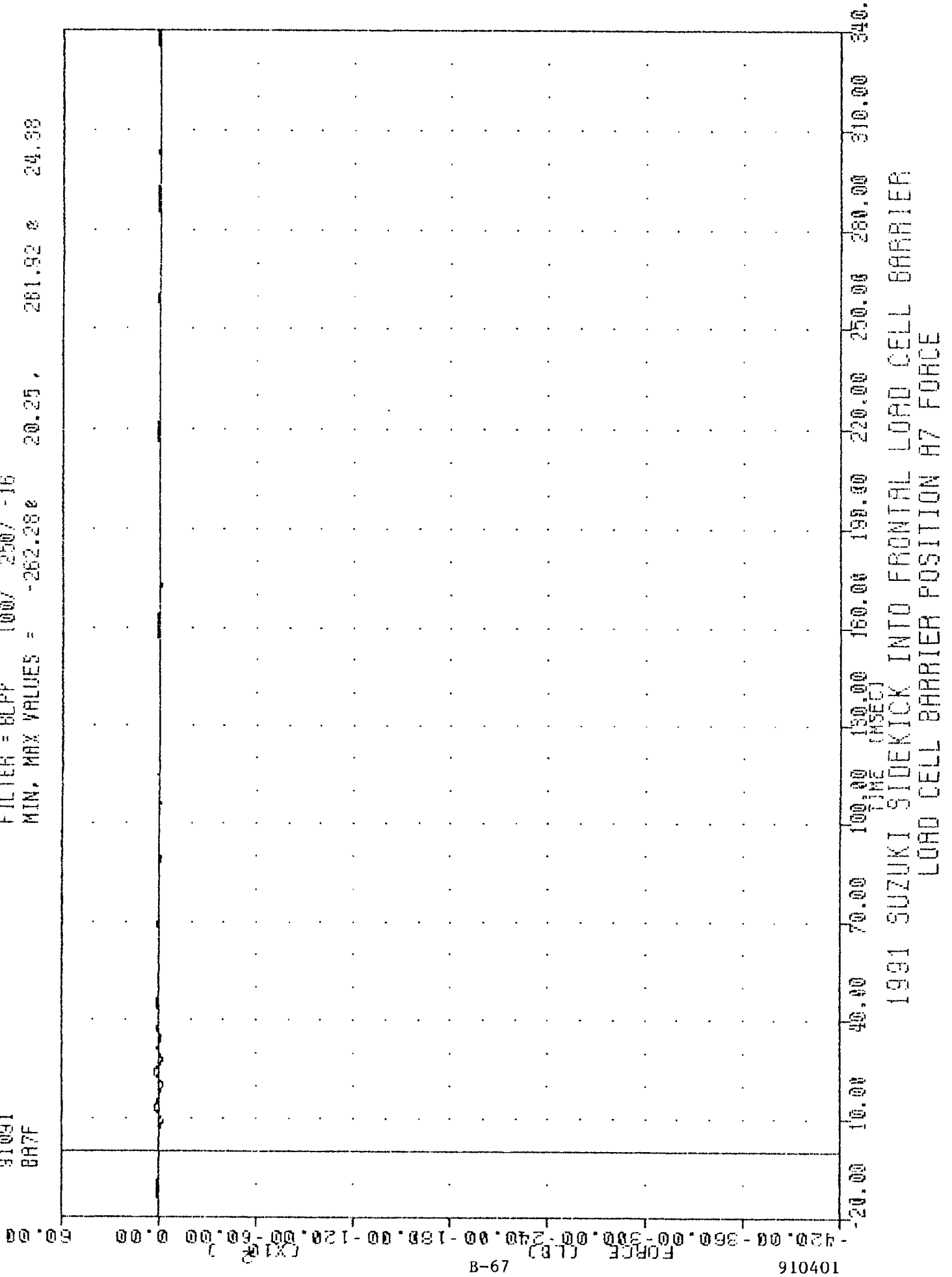
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -817.100 66.88, 478.09 0 24.38



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

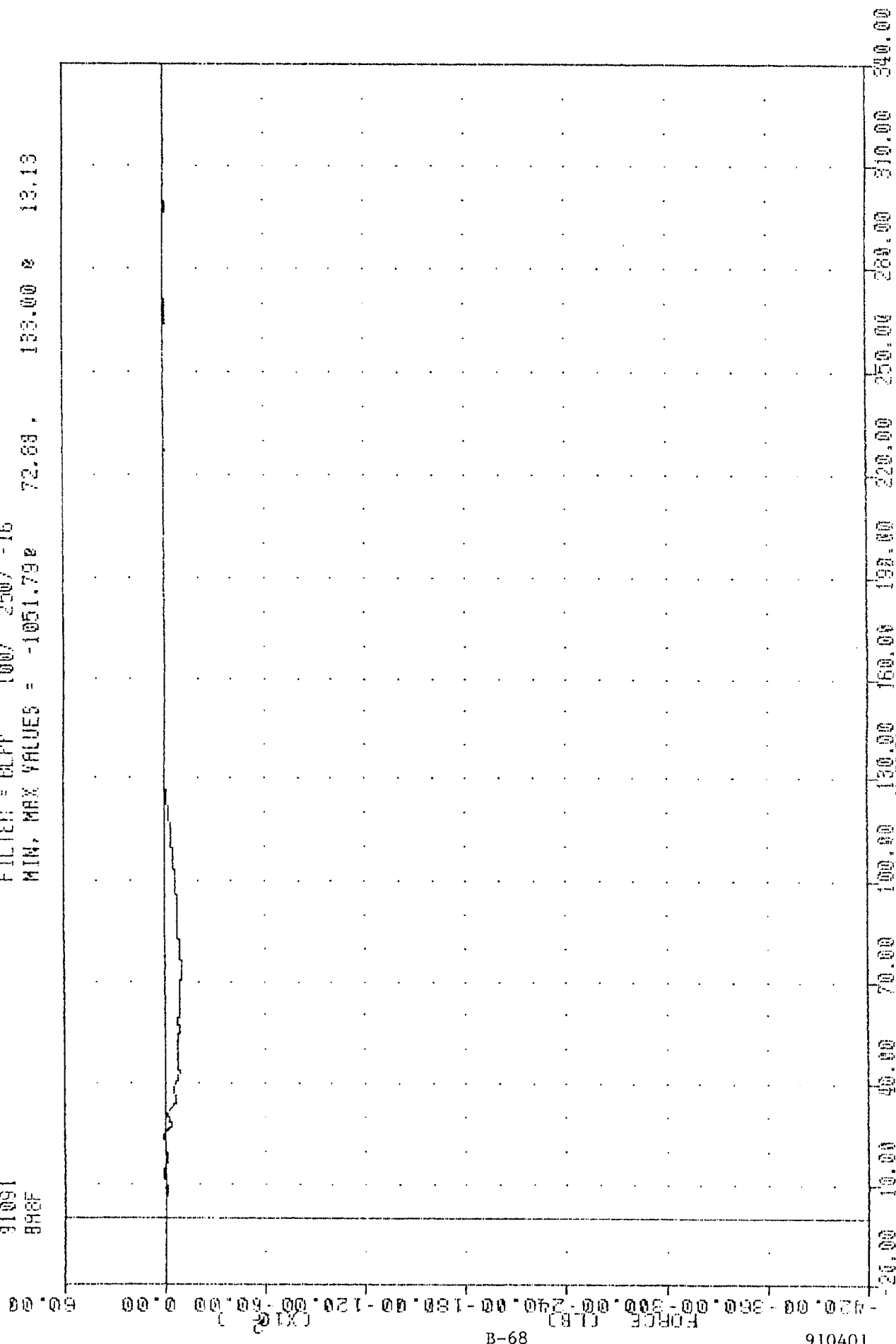
TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 BR7F

FILTER = 8LPP 100/ 250/ -16
 MIN, MAX VALUES = -262.280 20.25, 261.92 24.99



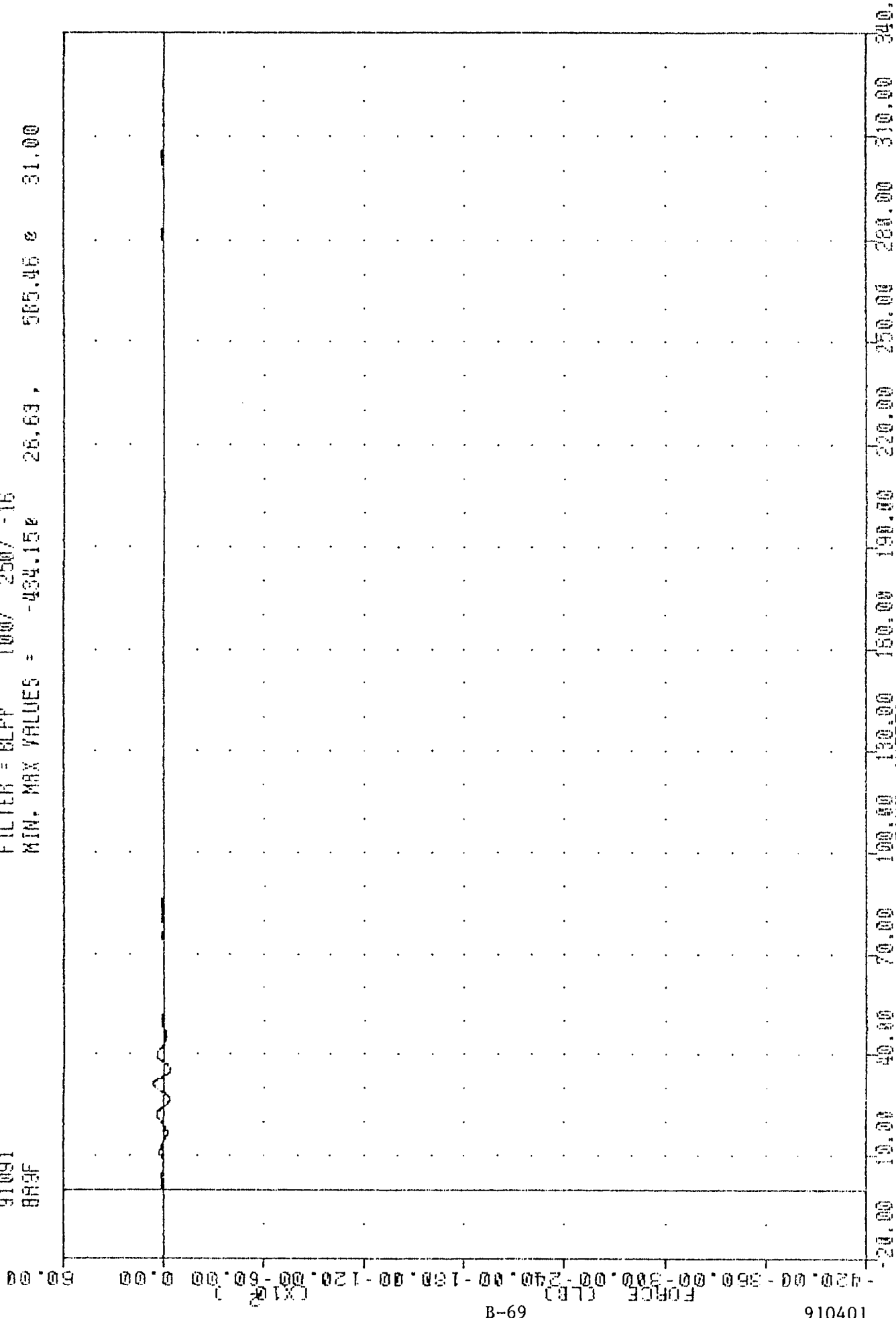
TRC . 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 882F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -1051.79 72.68 153.00 13.13



THC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 BR9F

FILTER = BLFF 100/ 250/ -16
 MIN. MAX VALUES = -434.150 26.63 , 505.46 0 31.00

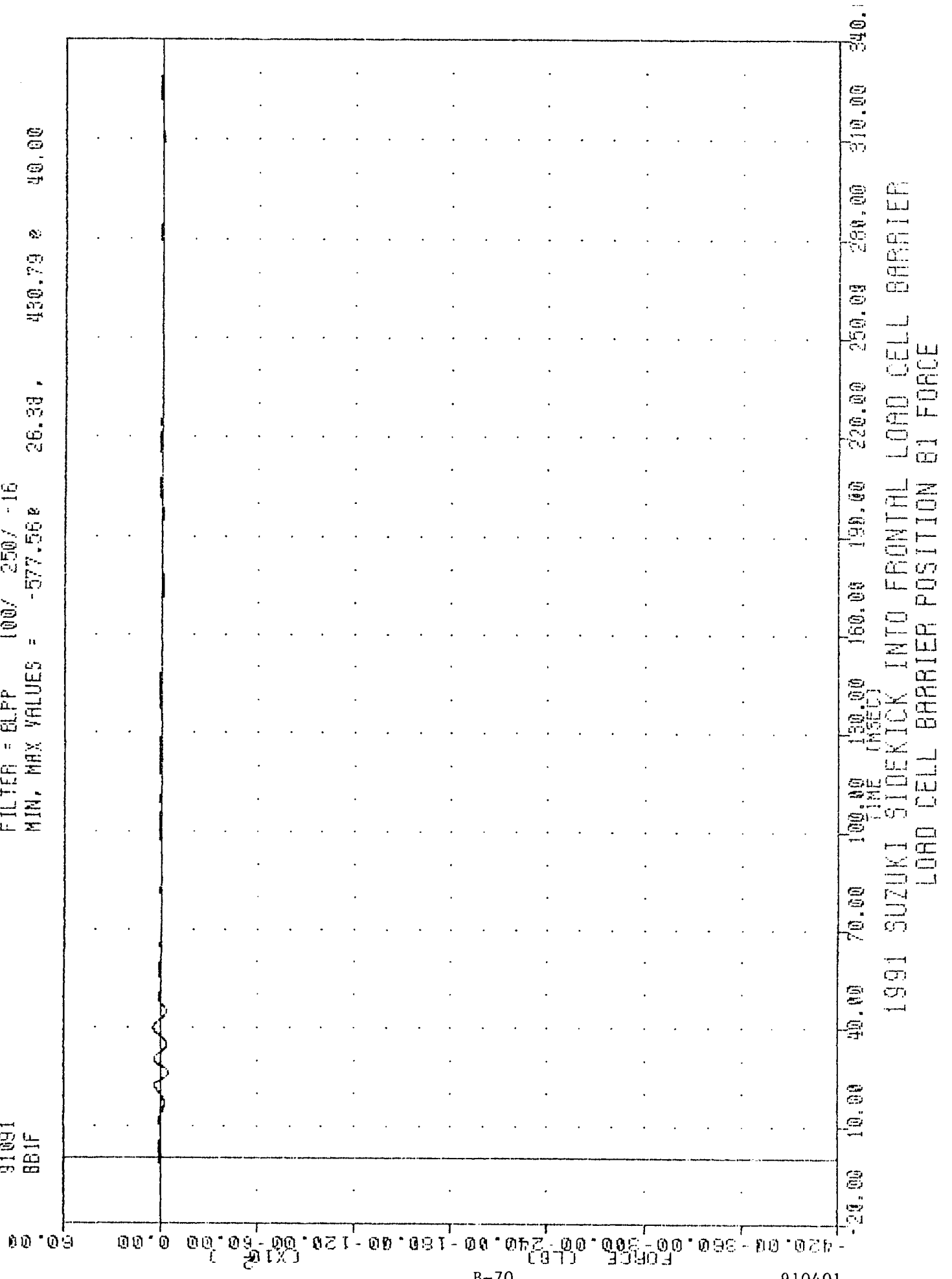


1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 1000 CFI BARRIER POSITION AS FORCE



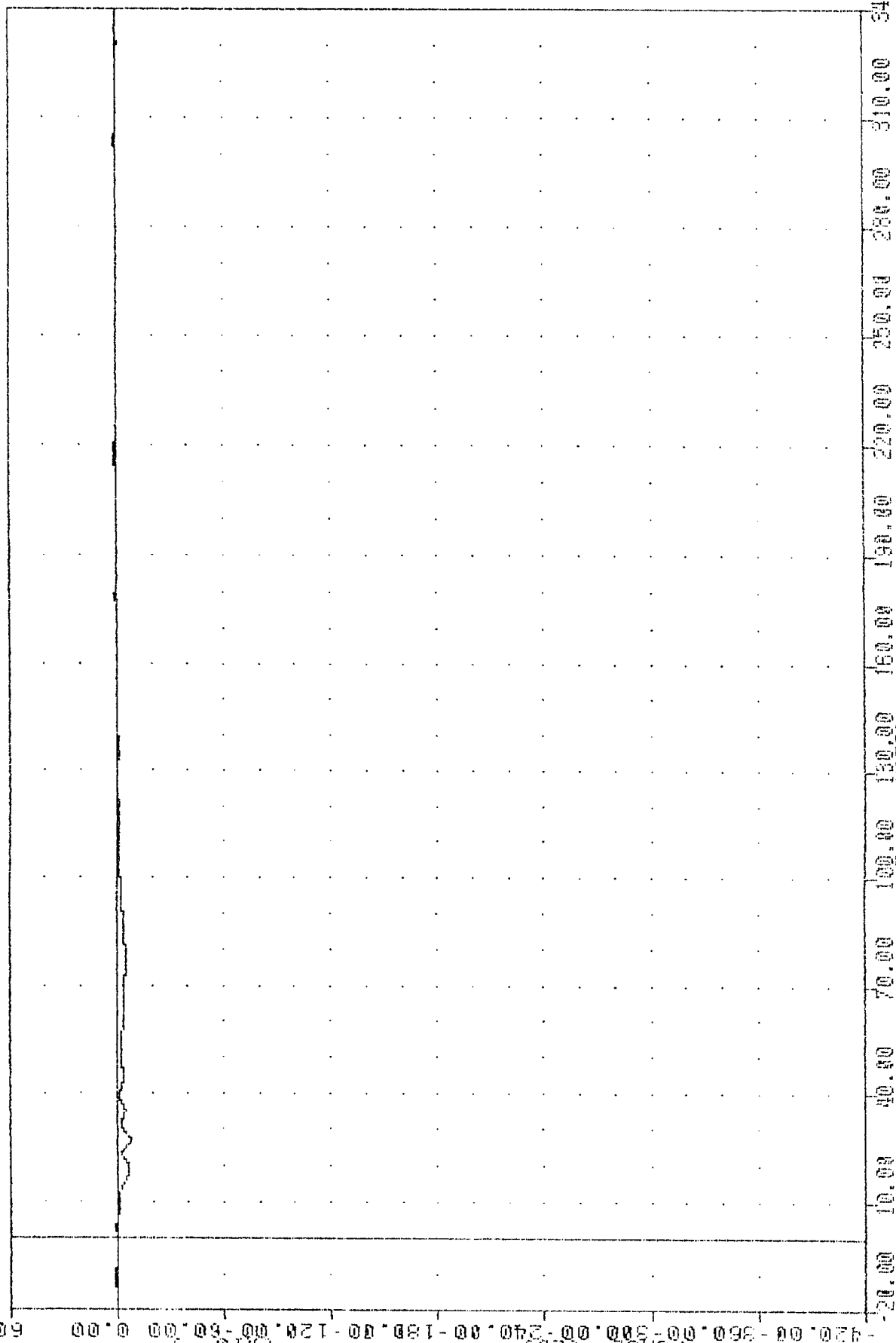
100
 NEW CAR ASSESSMENT PROGRAM
 91091
 881F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -577.56 26.38, 430.79 40.00



TRC
NEW CAR ASSESSMENT PROGRAM
91091
882F

FILTER = ELPP 100/ 250/ -16
MIN, MAX VALUES = -772.16 75.12 217.00

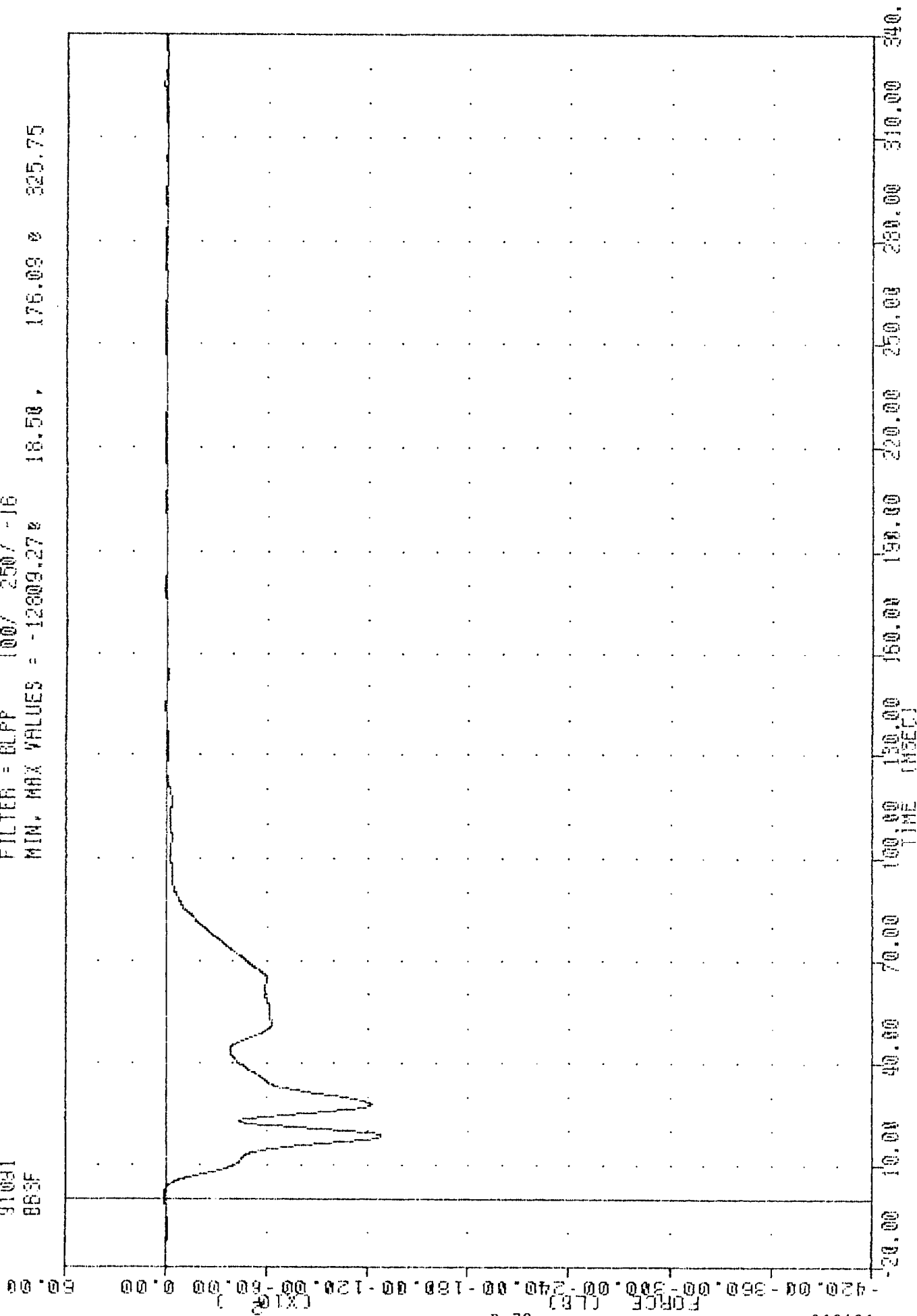


1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

ADAPTED FROM R-1000

IRL
 NEW CAR ASSESSMENT PROGRAM
 910401
 883F

FILTER = BLFP 100/ 250/ -16
 MIN. MAX VALUES = -12809.27 18.50 176.09 325.75



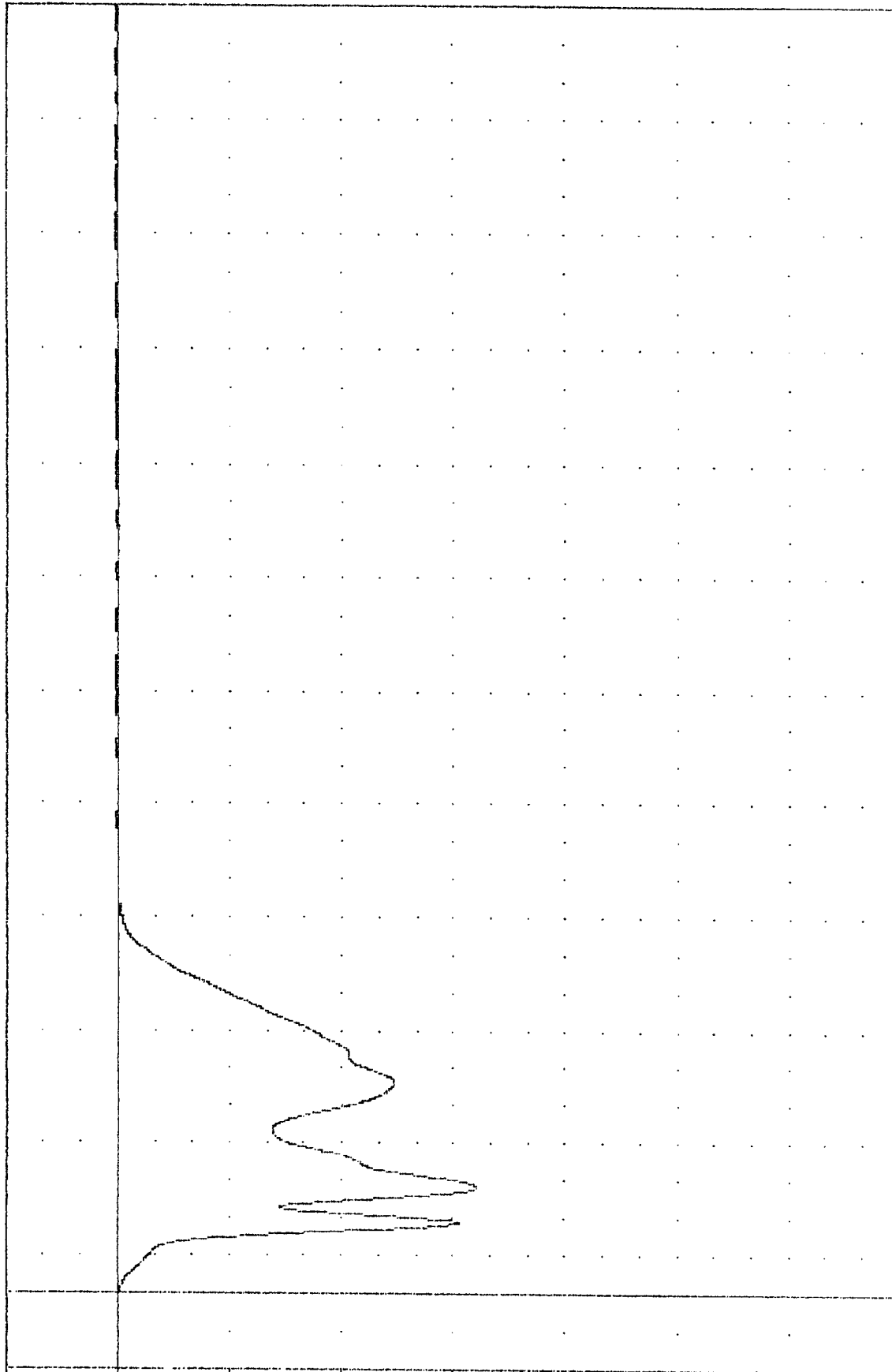
1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 83 FORCE

TRC 910401
 NEW CAR ASSESSMENT PROGRAM

91001 FILTER = BLPP 100/ 250/ -16

984F MIN, MAX VALUES = -19296.632 28.25, 160.52 0 304.00

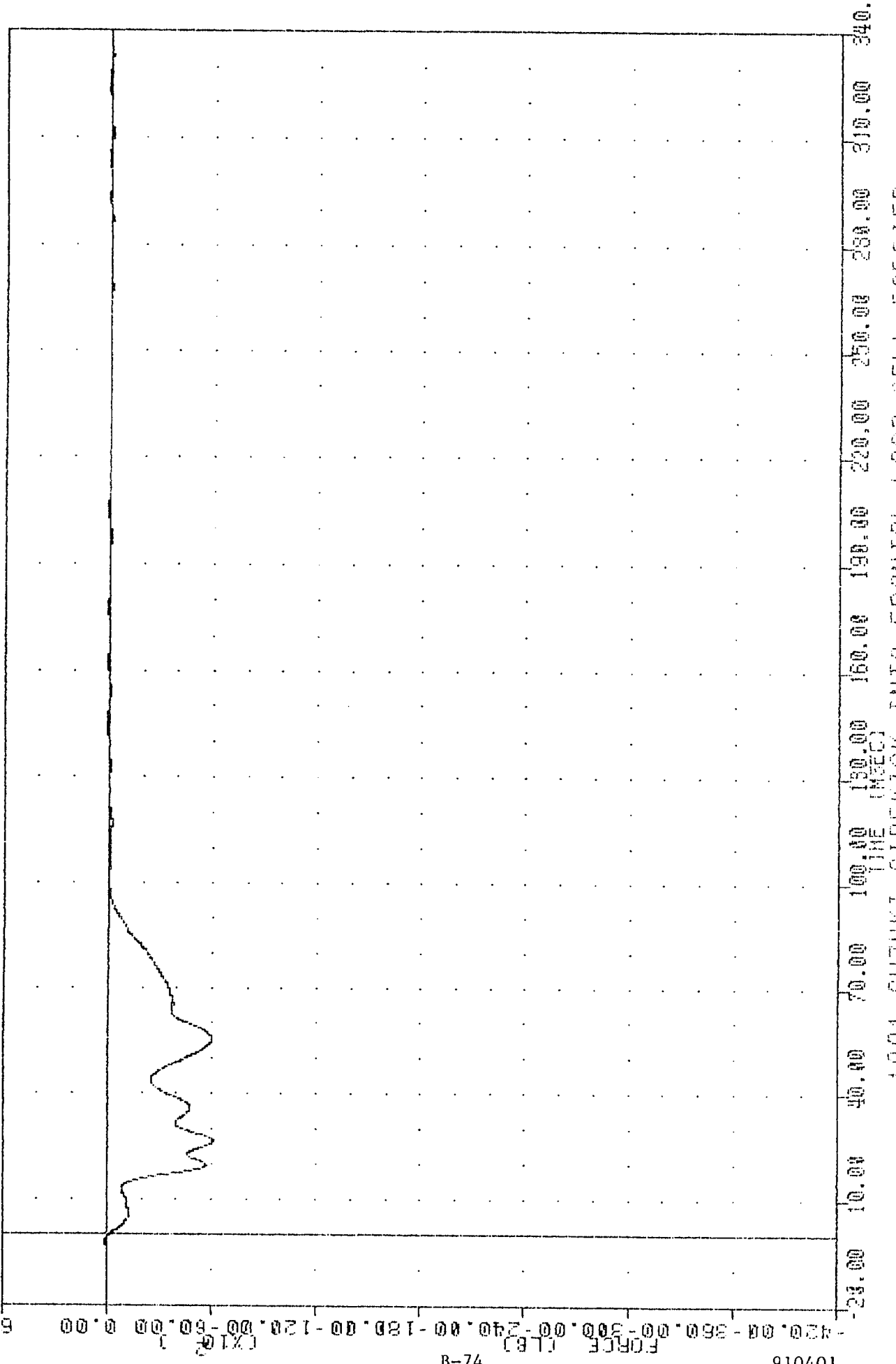
50.00
 0.00
 -50.00
 -100.00
 -150.00
 -200.00
 -250.00
 -300.00
 -350.00
 -400.00
 -450.00



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

INC
 NEW CAR ASSESSMENT PROGRAM
 91091
 885F

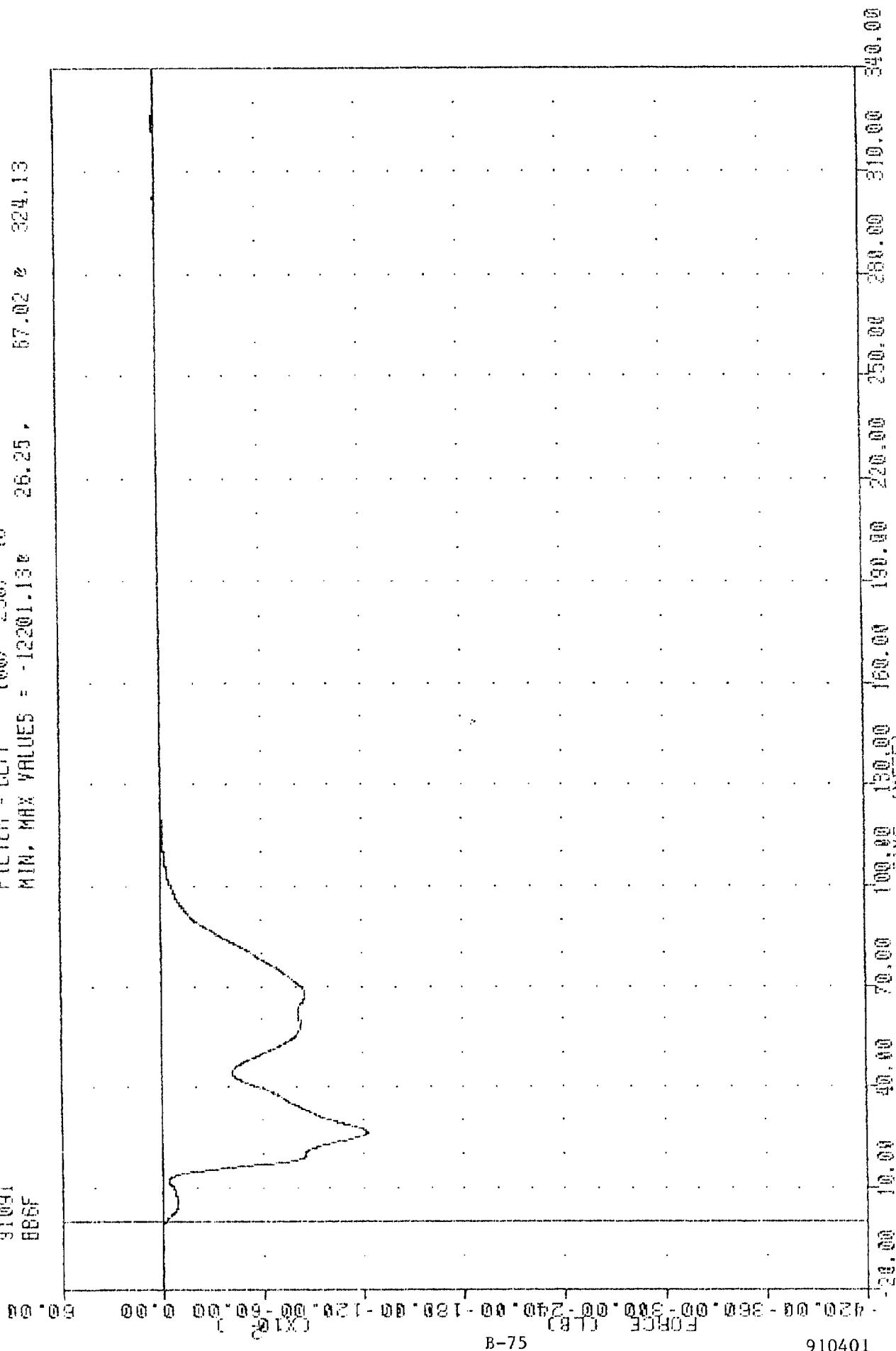
FILTER = 6LFF 100/ 250/ -15
 MIN. MAX VALUES = -6126.36 26.63 130.60 326.00



1991 SUZUKI SIDERICK INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION AS FORCE

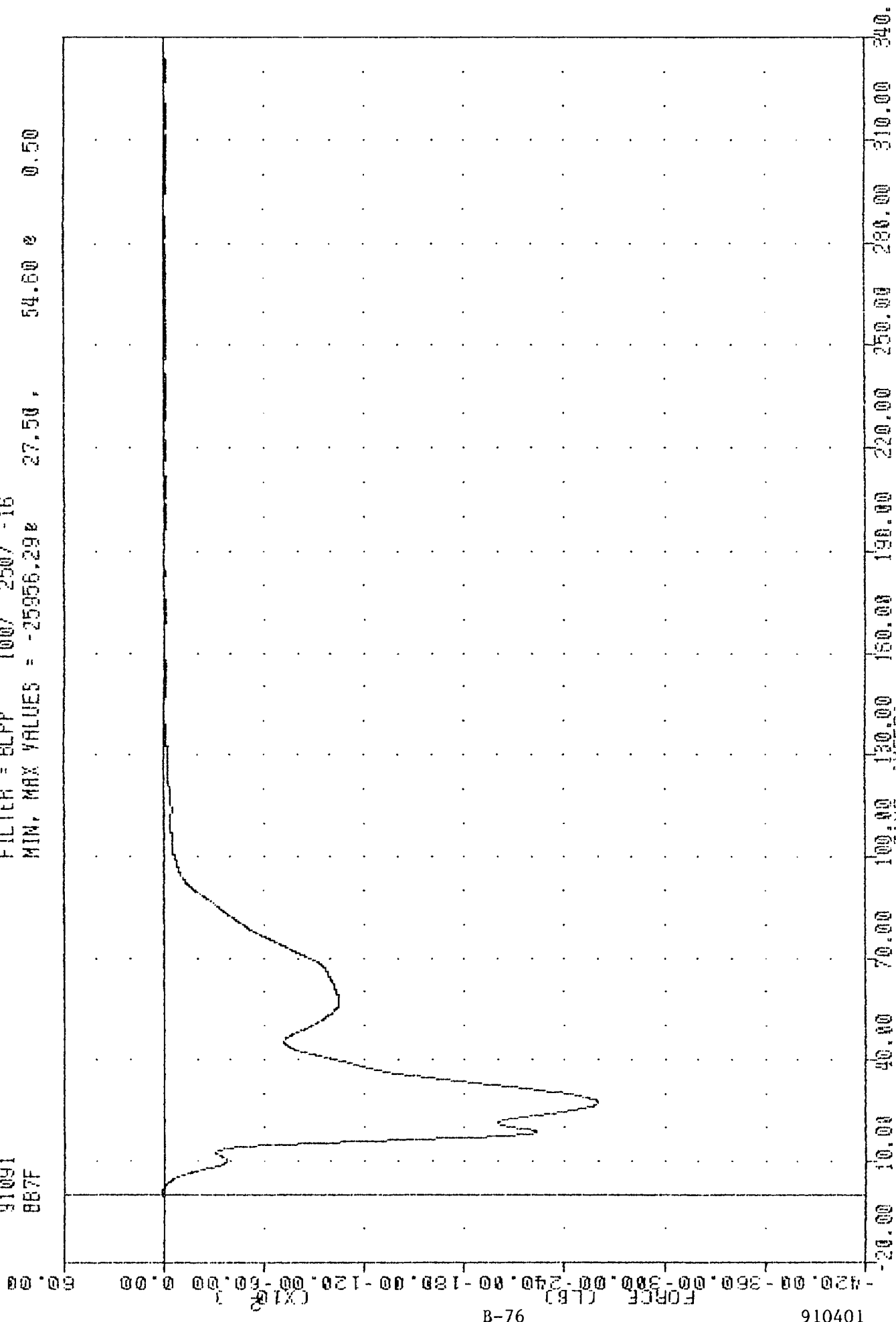
TRC 910401
 NEW CAR ASSESSMENT PROGRAM
 91031
 886F

FILTER = ELFF 100/ 250/ -16
 MIN. MAX VALUES = -12201.13 26.25 67.02 324.13



TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 BB7F

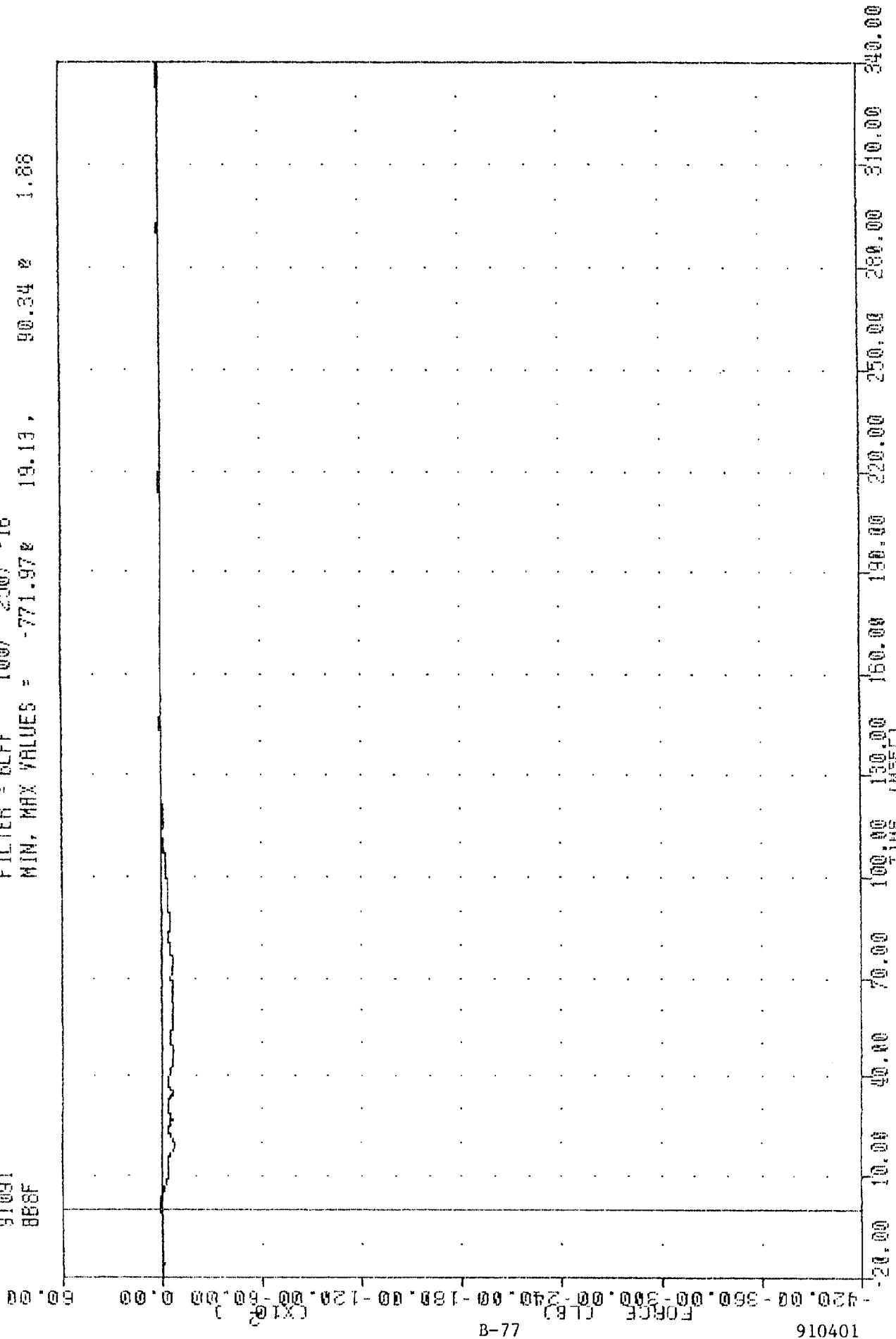
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -25956.290 27.50 , 54.60 0 0.50



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 1000 CELL BARRIER POSITION AT FORCE

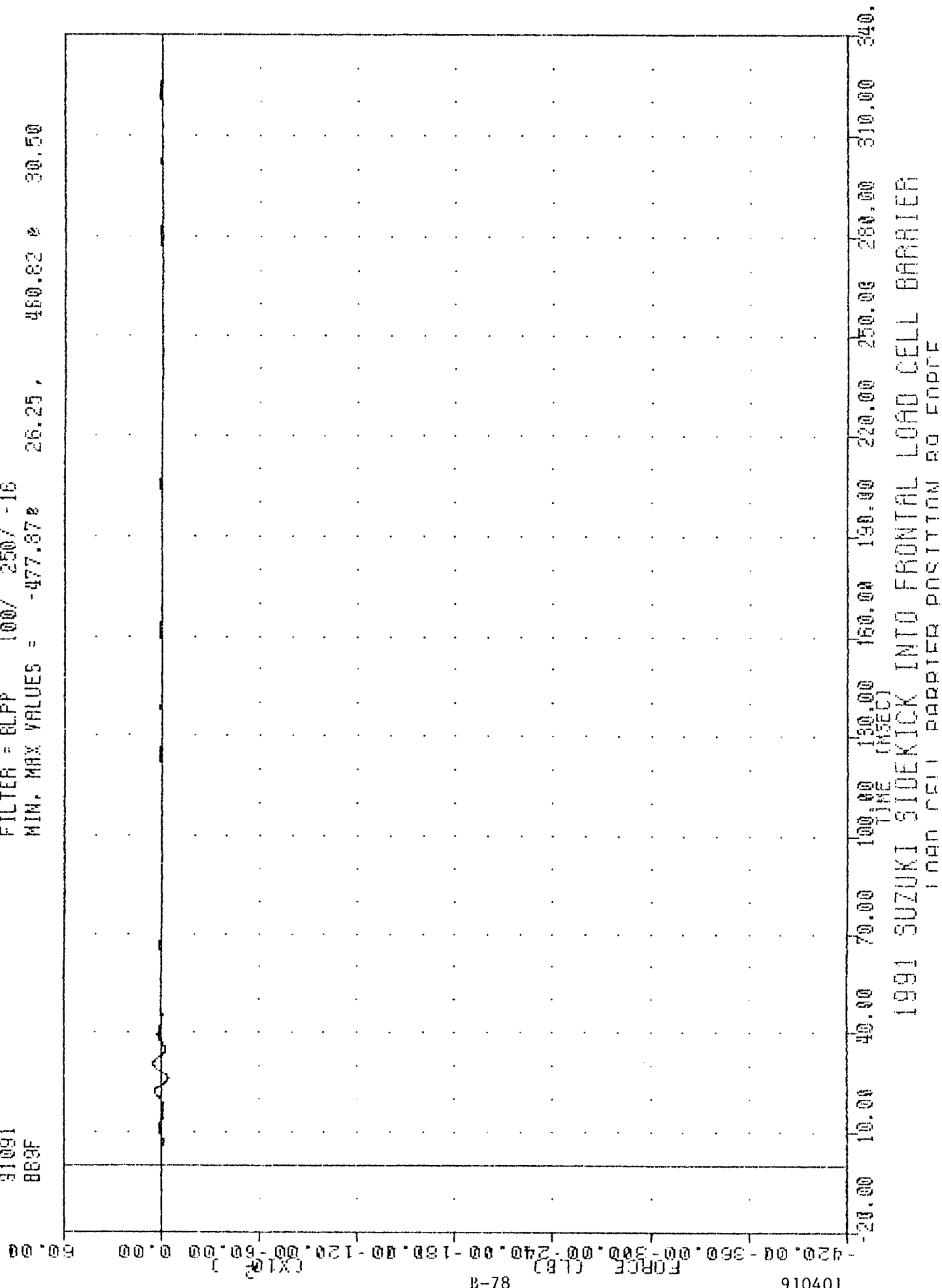
TRC . 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 888F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -771.97 19.13, 90.34 2 1.88



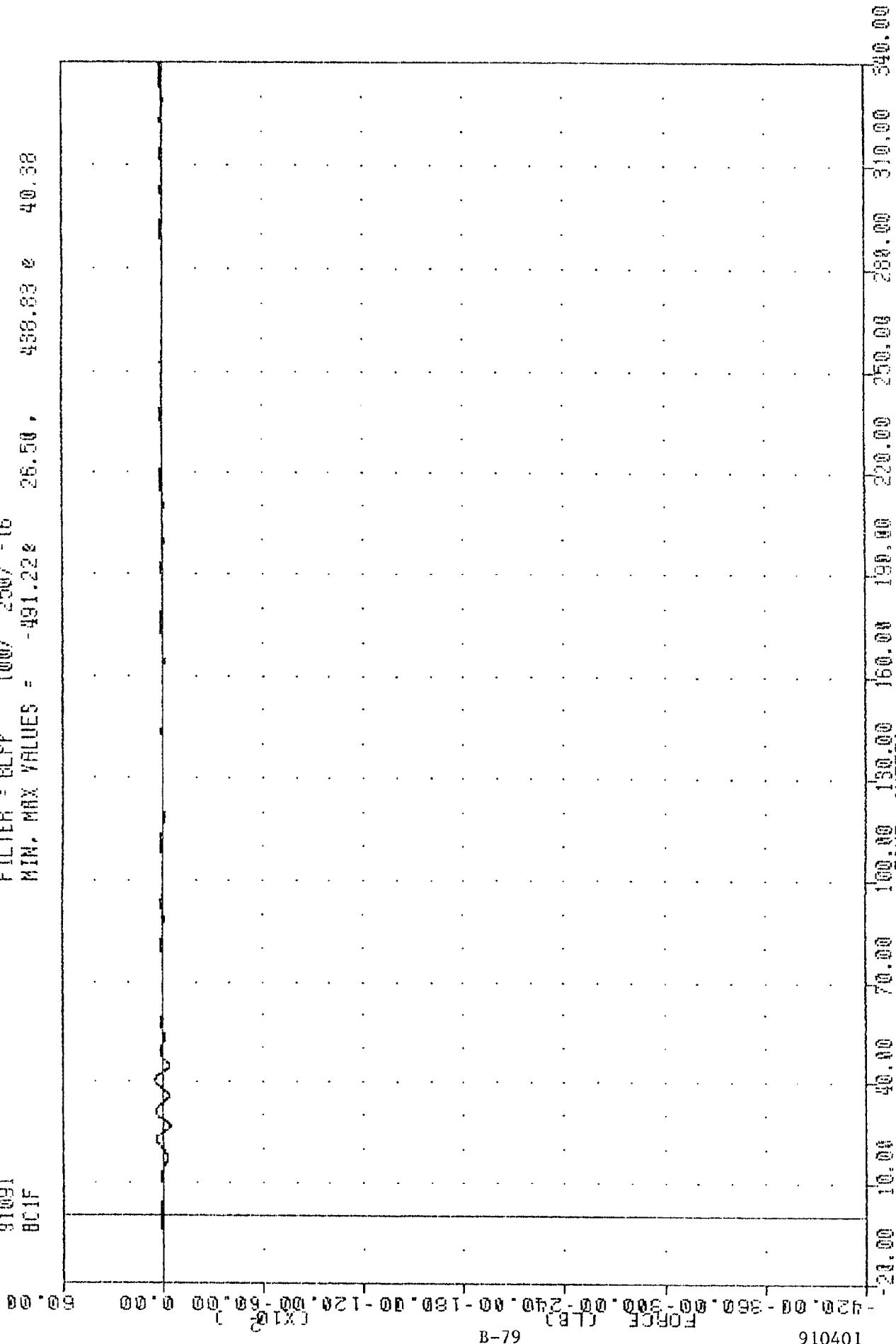
TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 31091
 889F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -477.87 26.25 , 460.82 30.50



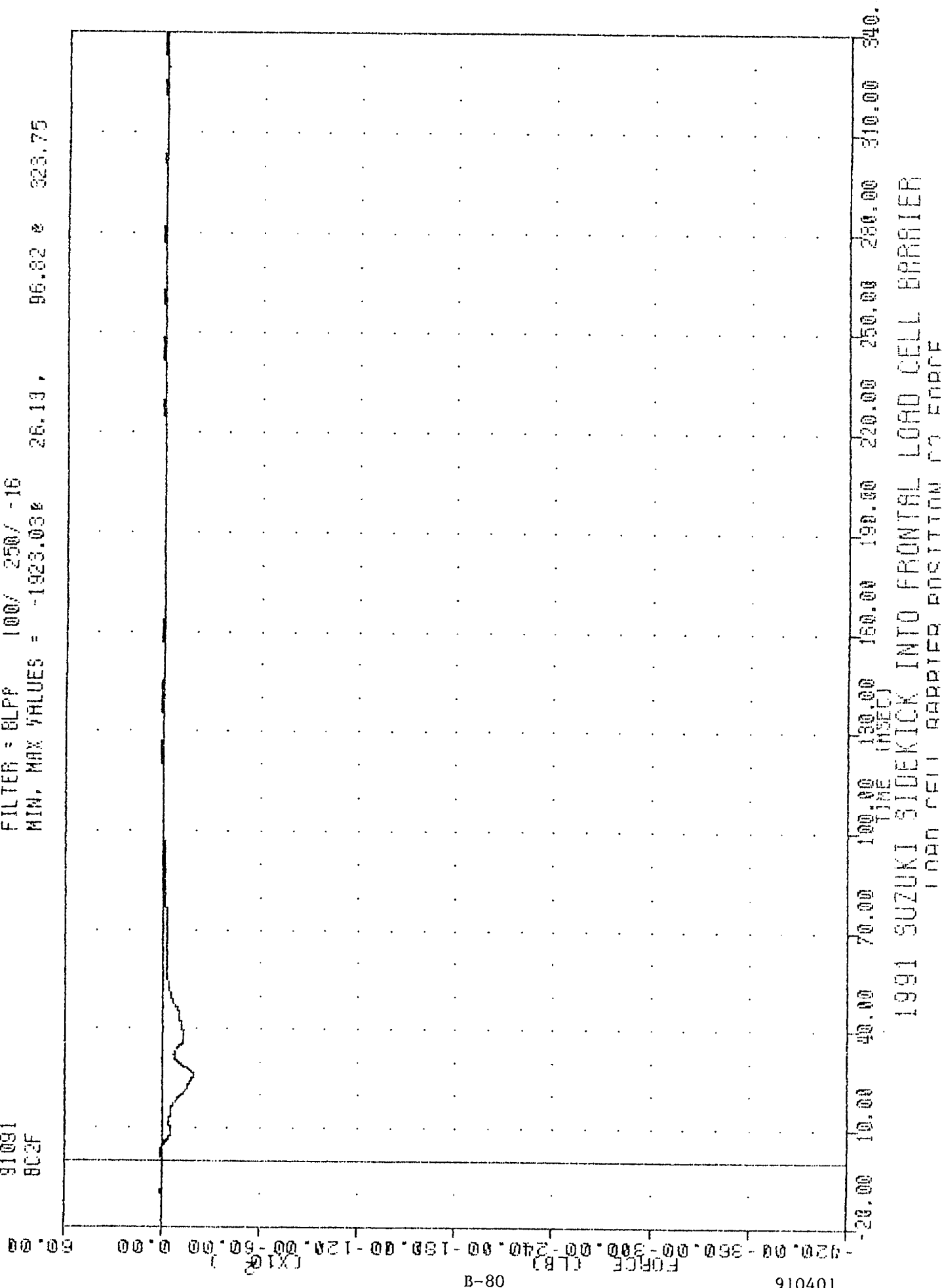
TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 BC1F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -491.22 26.50 , 438.83 40.38



TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 802F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -1923.03 26.13, 96.82 323.75

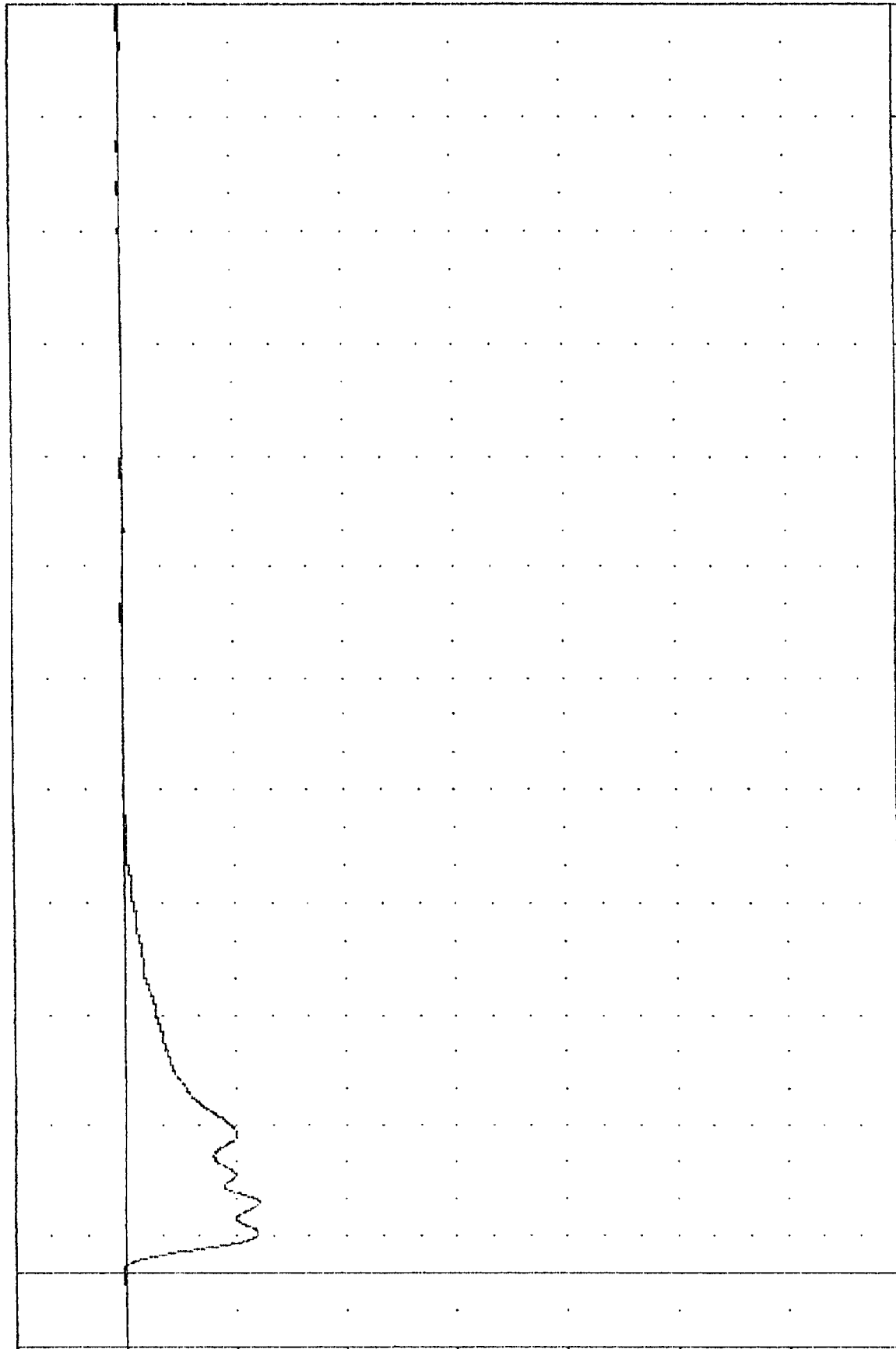


1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 IN CAR CELL BARRIER POSITION P3 END OF

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 BC3F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -7249.598 19.13 , 139.54 8 0.13

FORCE (LB)
 (x10²)



B-81

910401

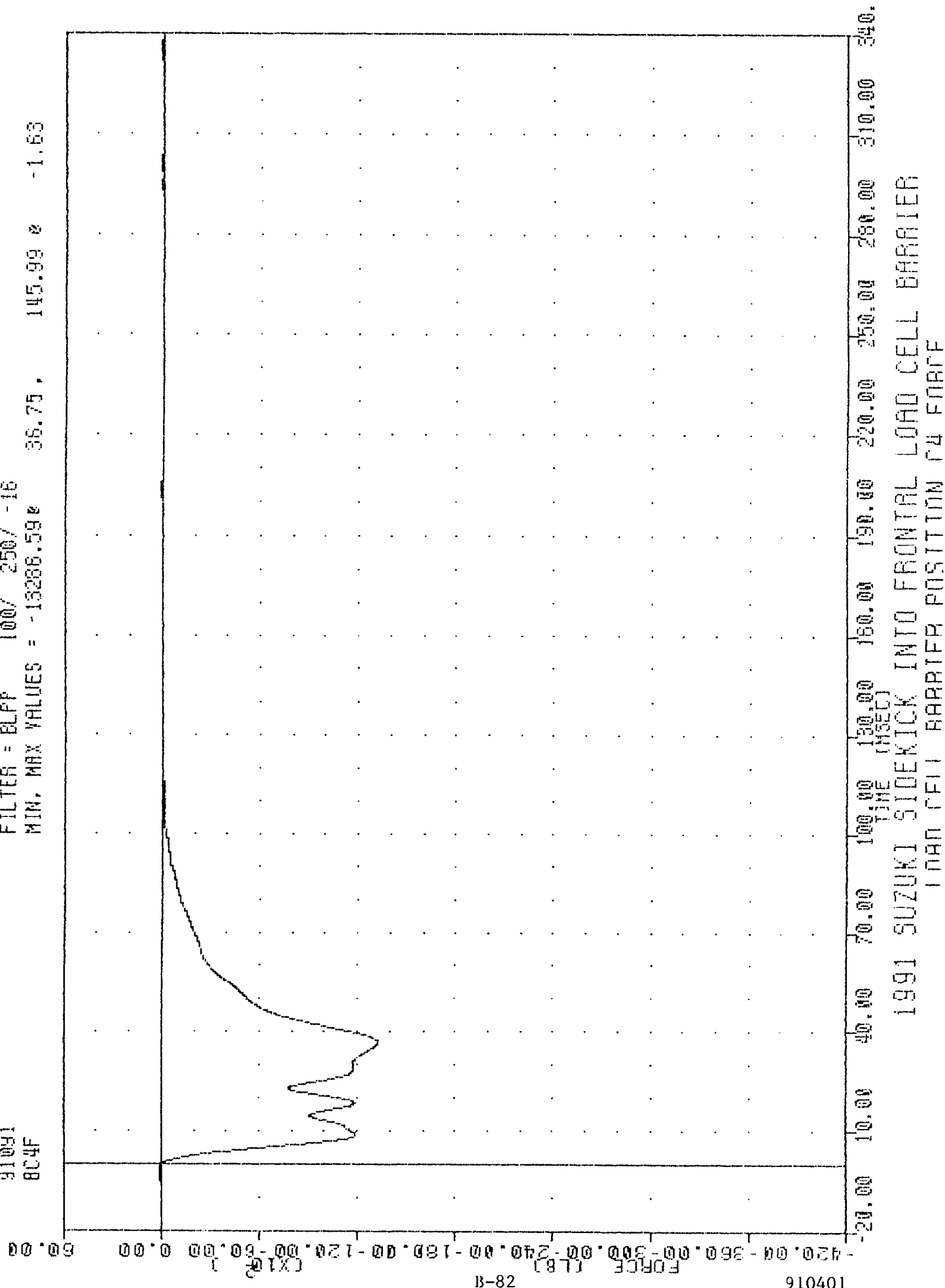
20.00 10.00 0.00 100.00 130.00 150.00 180.00 200.00 220.00 250.00 280.00 310.00 340.00

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

TIME (msec) BARRIER POSITION (INCHES)

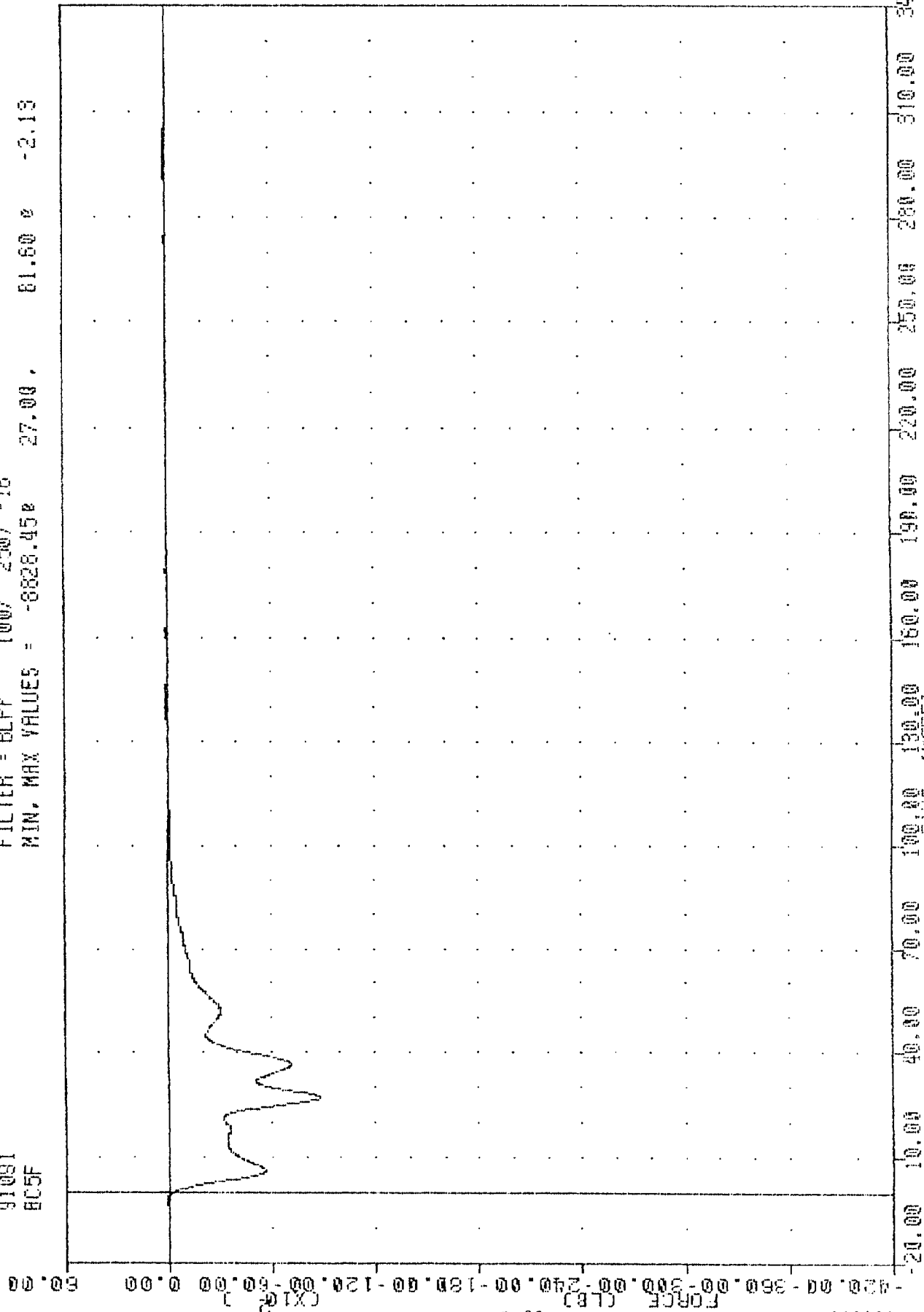
TRC , 310401
 NEW CAR ASSESSMENT PROGRAM
 31091
 804F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -13286.59 36.75 , 145.99 2 -1.63



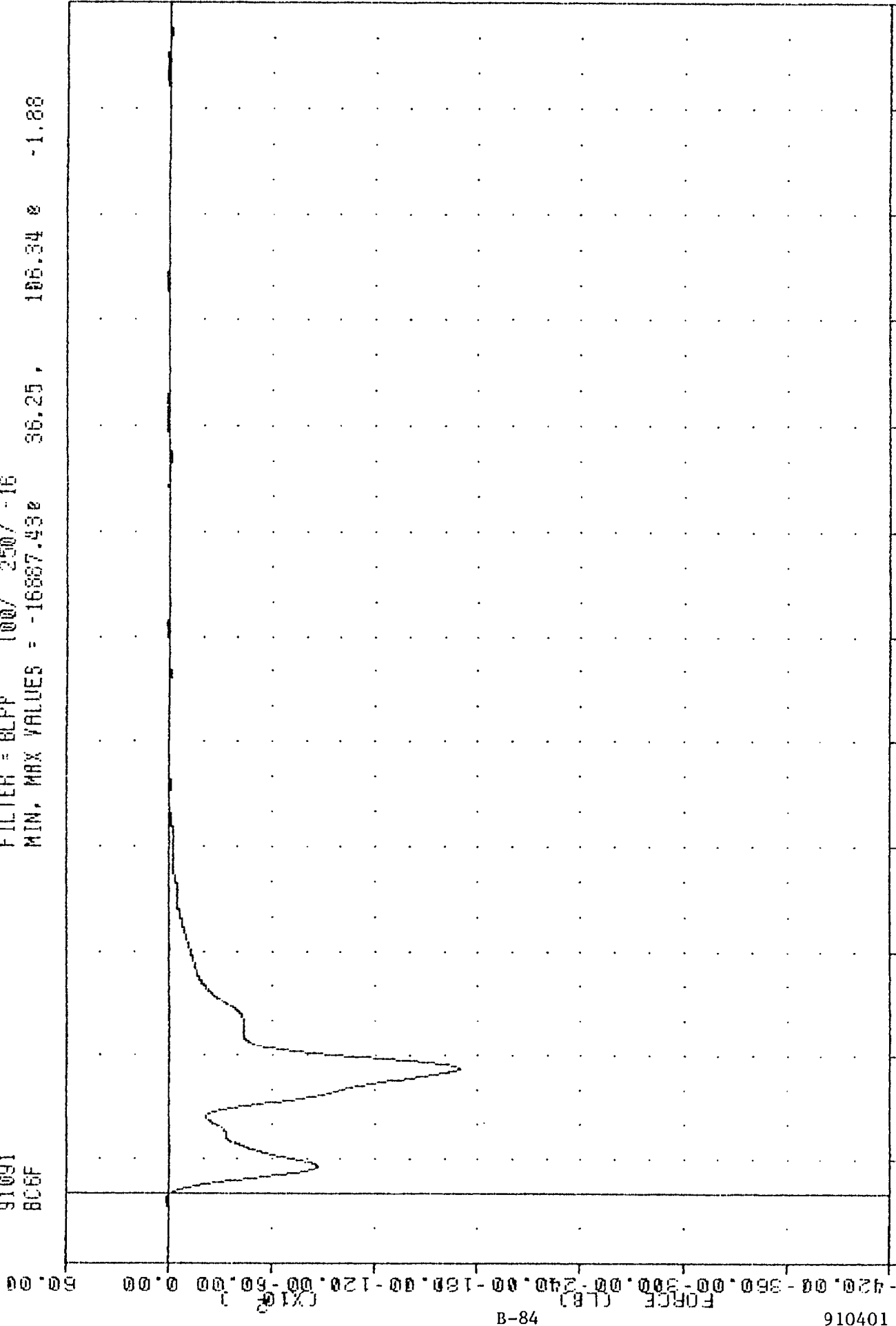
TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91081
 EC5F

FILTER = BLFF 100/ 250/ -16
 MIN. MAX VALUES = -8828.45e 27.00 , 81.60 e -2.13



150 , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 BC6F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -16887.43e 36.25 , 186.34 e -1.88



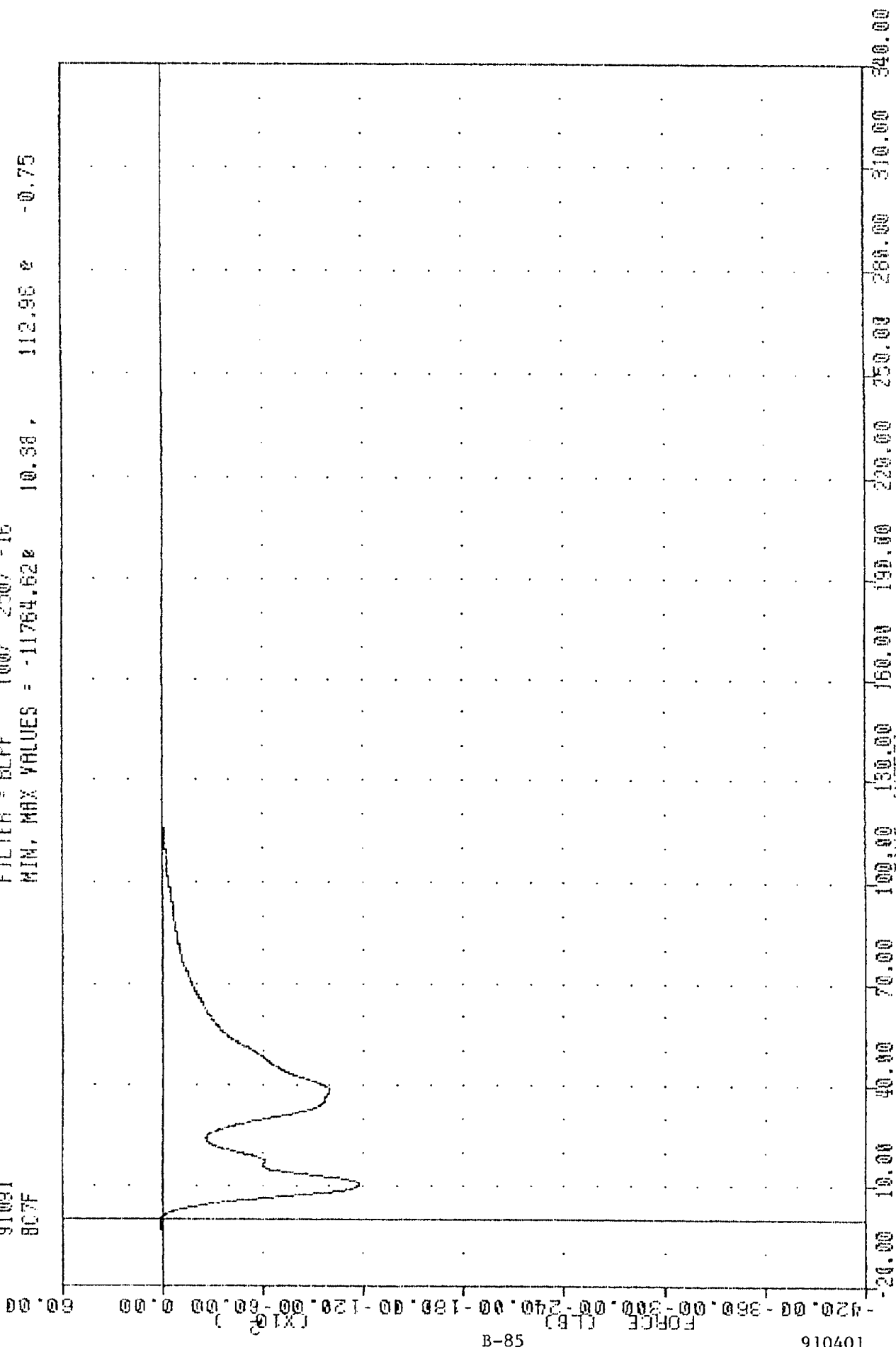
B-84

910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 INAD CELL BARRIER POSITION CR FORCE

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 BC7F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -11764.62 10.38 , 112.95 e -0.75



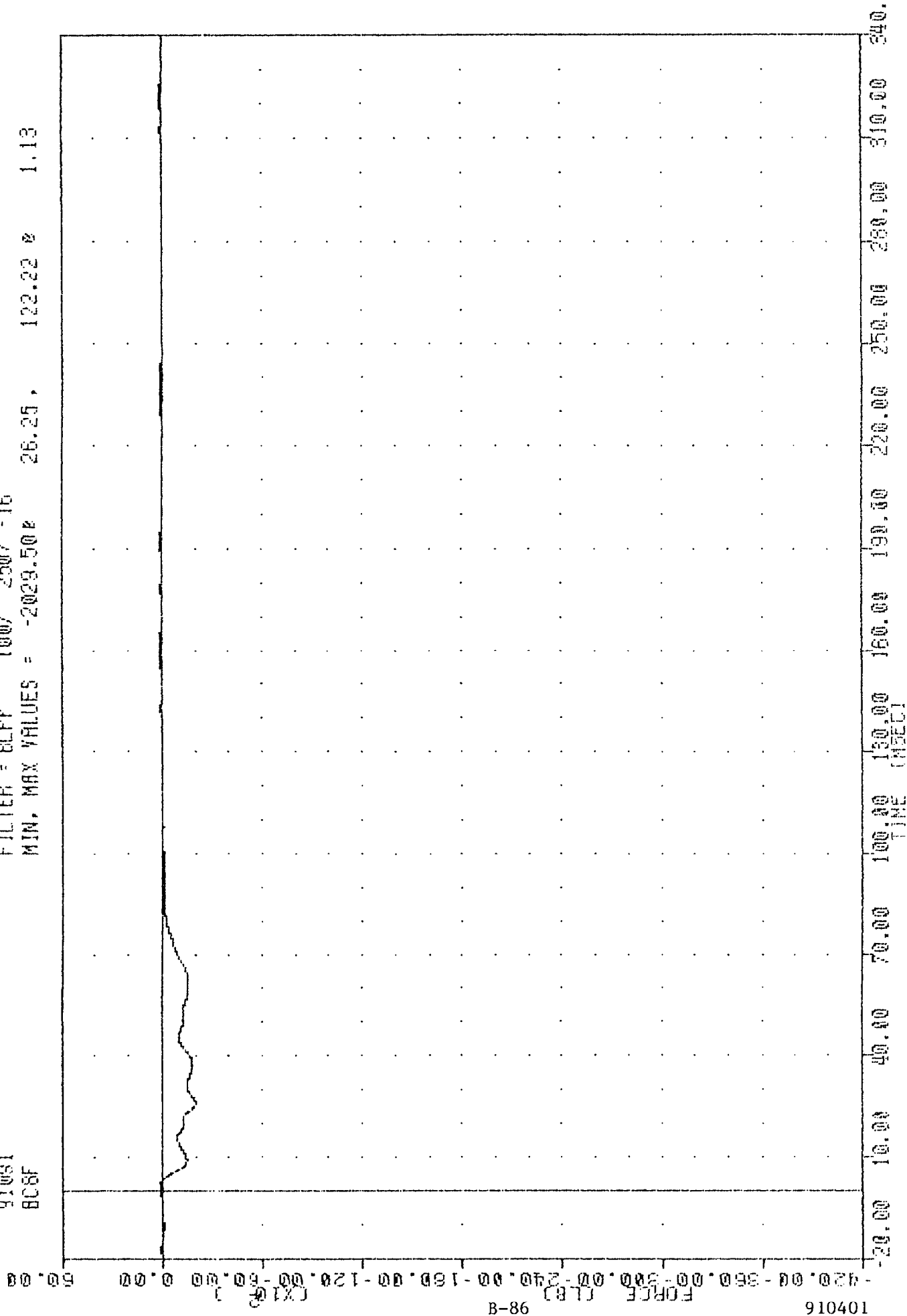
B-85

910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 BARRIER POSITION FORCE

TRC 910401
 NEW CAR ASSESSMENT PROGRAM
 91081
 BC8F

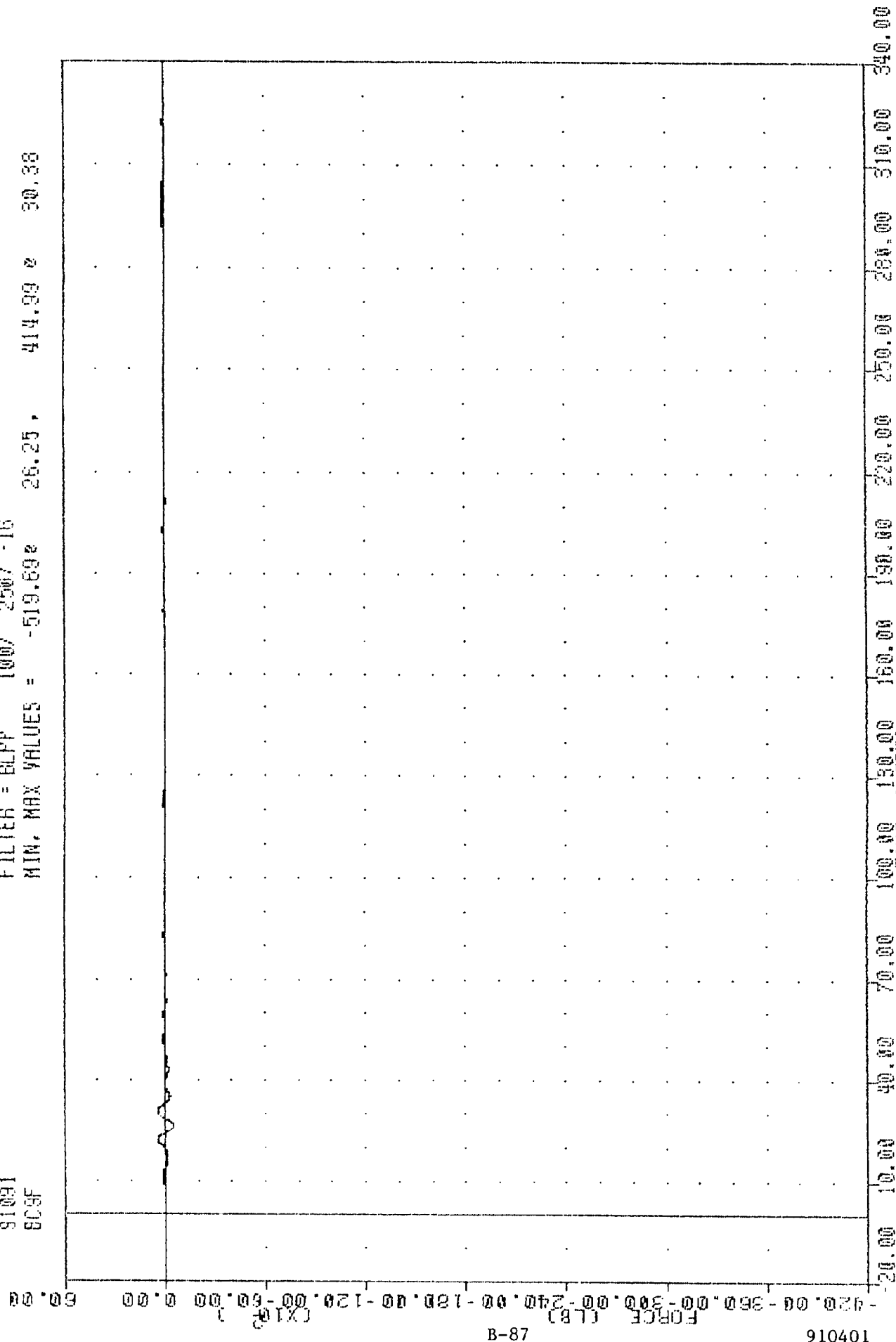
FILTER = BLFP 100/ 250/ -16
 MIN. MAX VALUES = -2029.50# 26.25, 122.22 # 1.13



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C8 FORCE

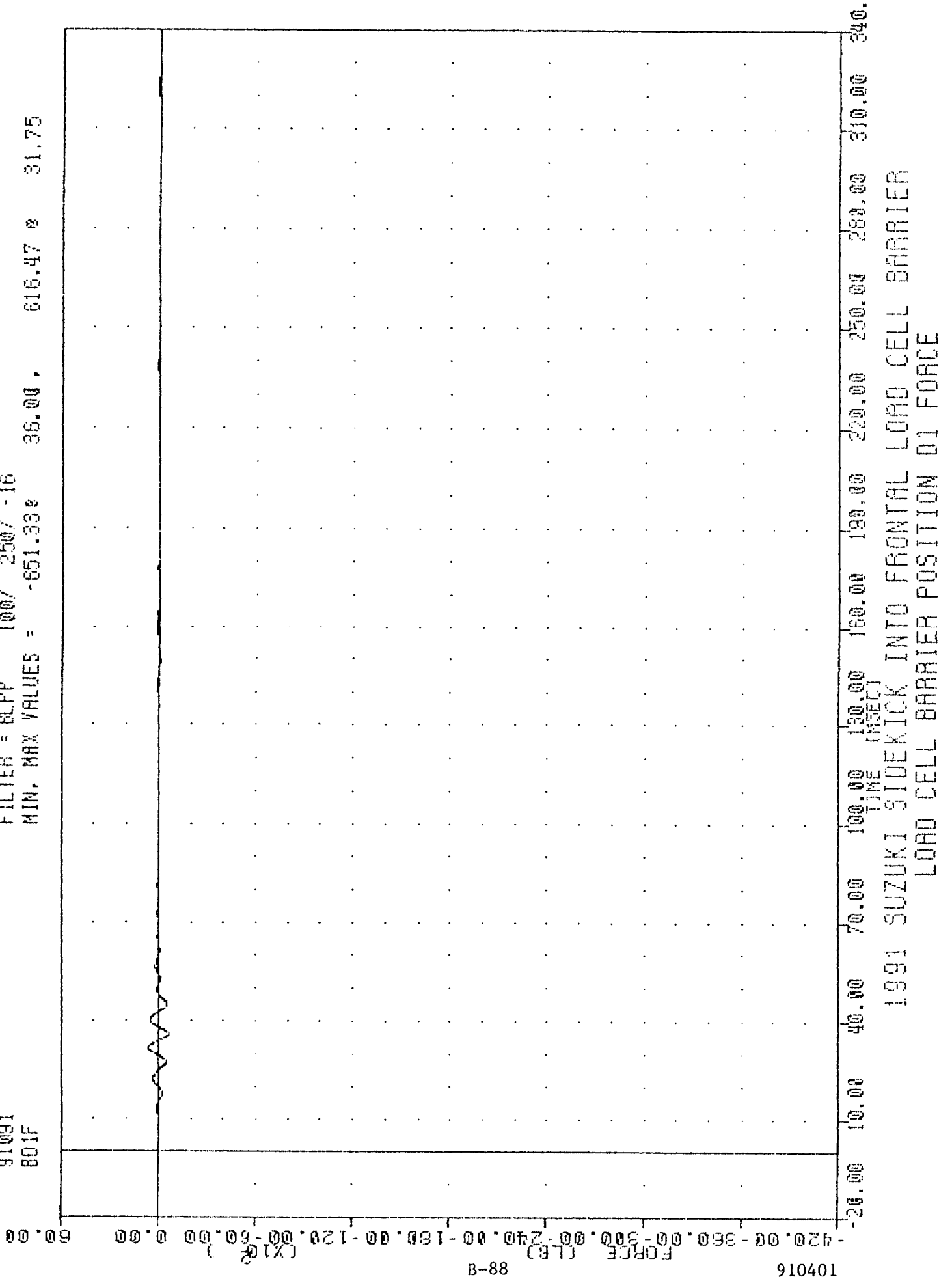
TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 809F

FILTER = BLFF 100/ 250/ -16
 MIN, MAX VALUES = -519.69 26.25 , 414.99 30.38



TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 801F

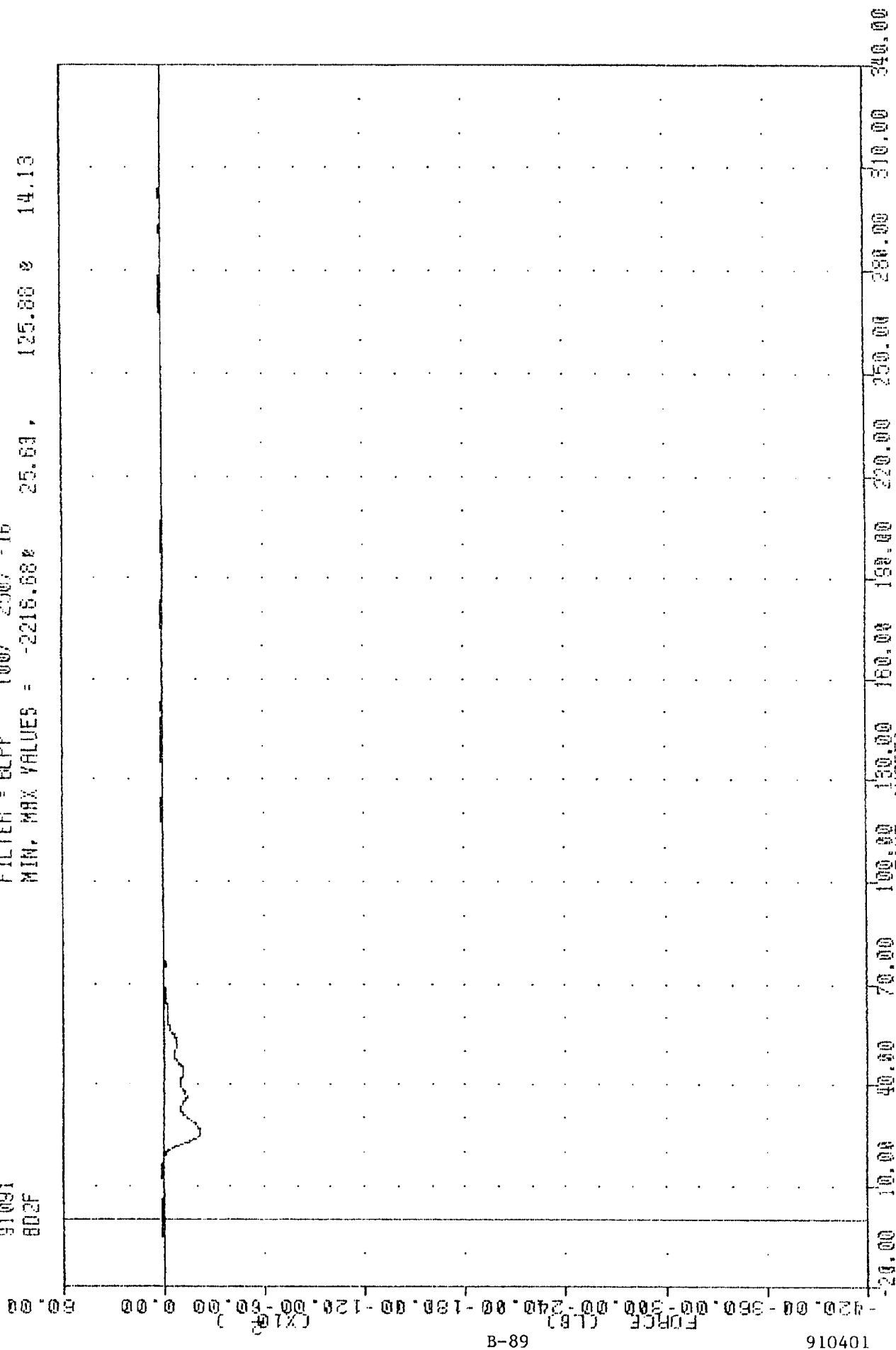
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -651.33 36.00 , 616.47 31.75



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 01 FORCE

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 BD2F

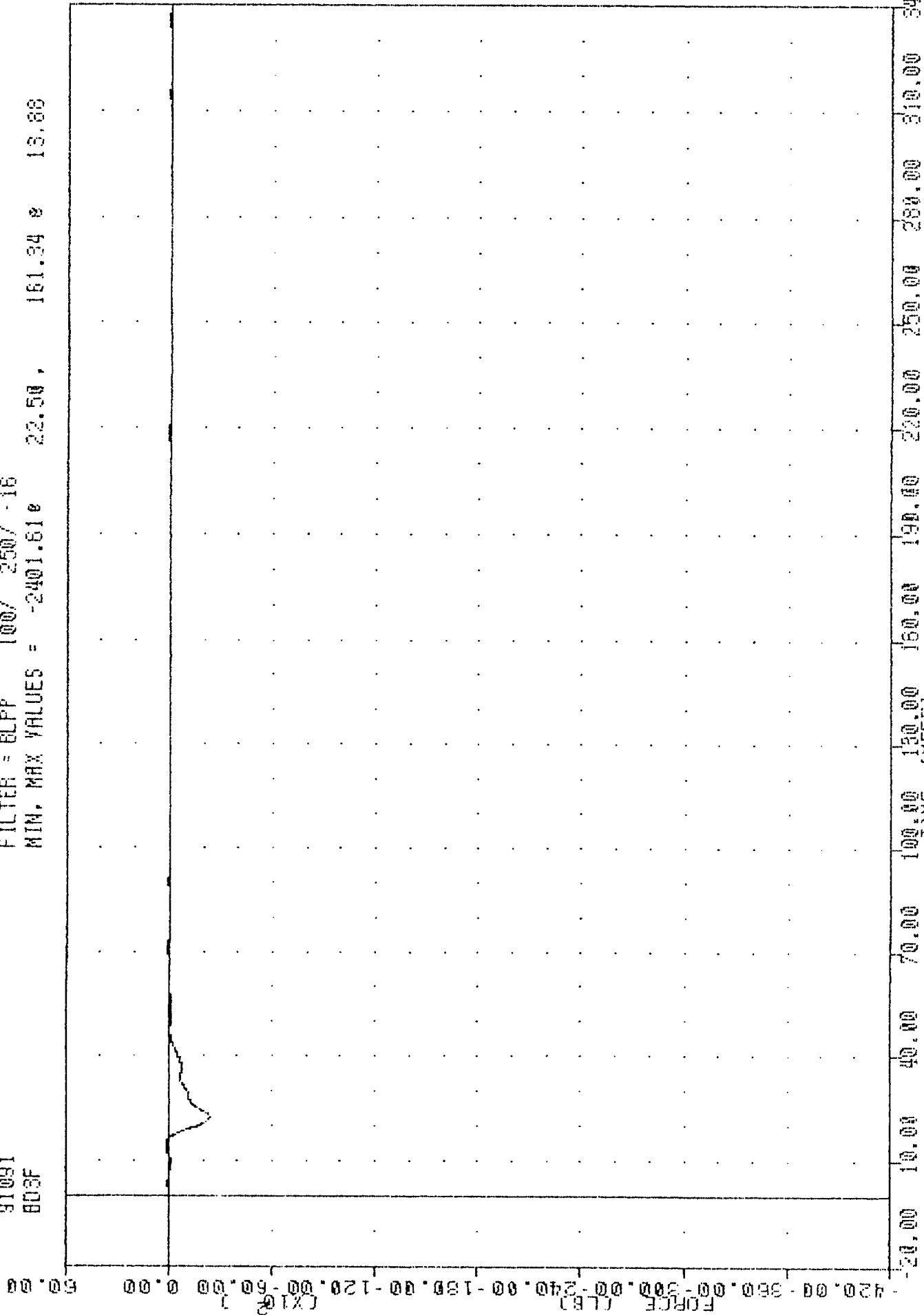
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -2218.68 25.63 125.80 14.13



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 803F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -2401.61e 22.50 , 161.34 e 13.88



B-90

910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D3 FORCE

TRC , 910401
NEW CAR ASSESSMENT PROGRAM

91091

804F

FILTER = BLPP 100/ 250/ -18

MIN, MAX VALUES = -1615.310 20.00 ,

72.96 0 70.13

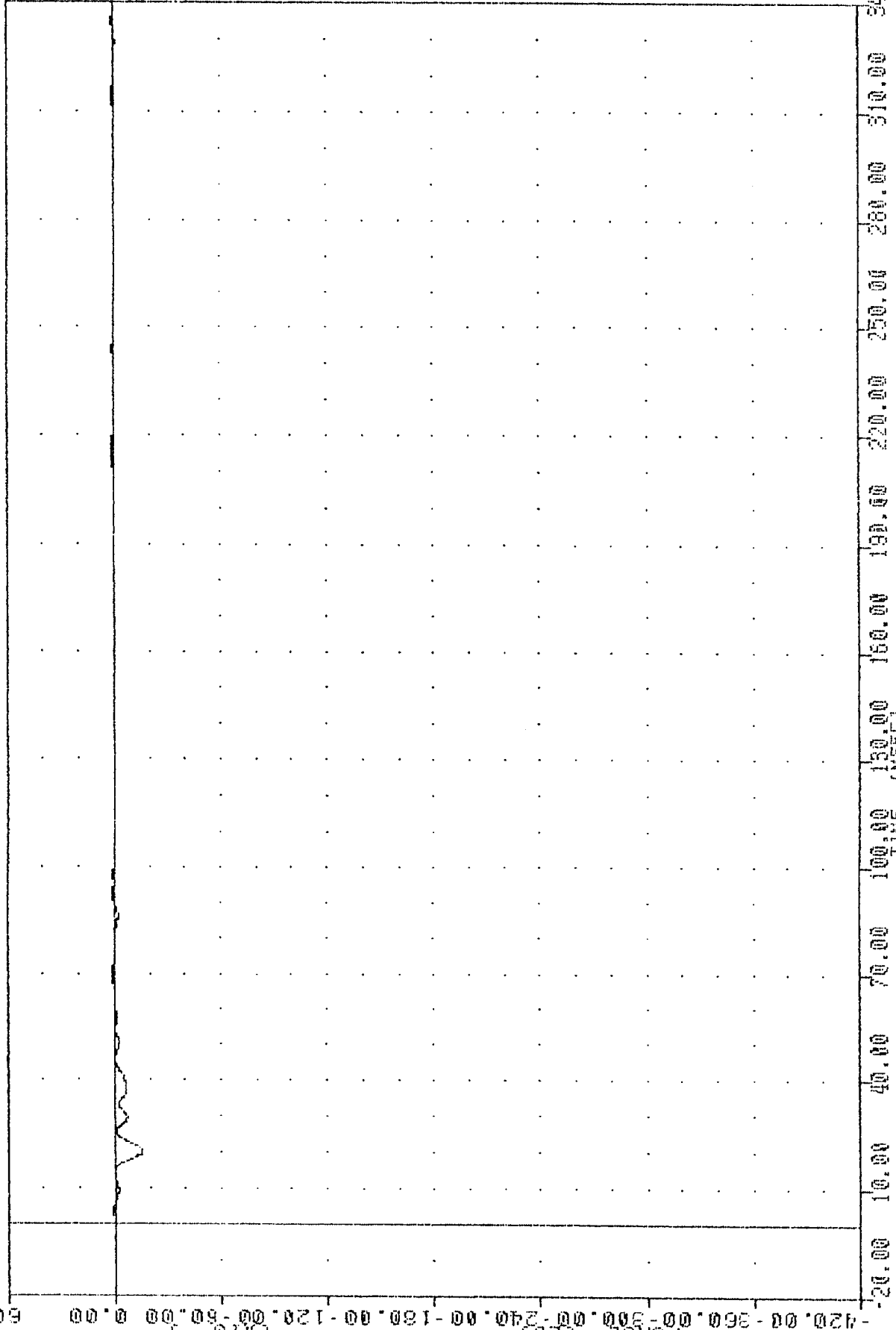
50.00

0.00

(X10³)

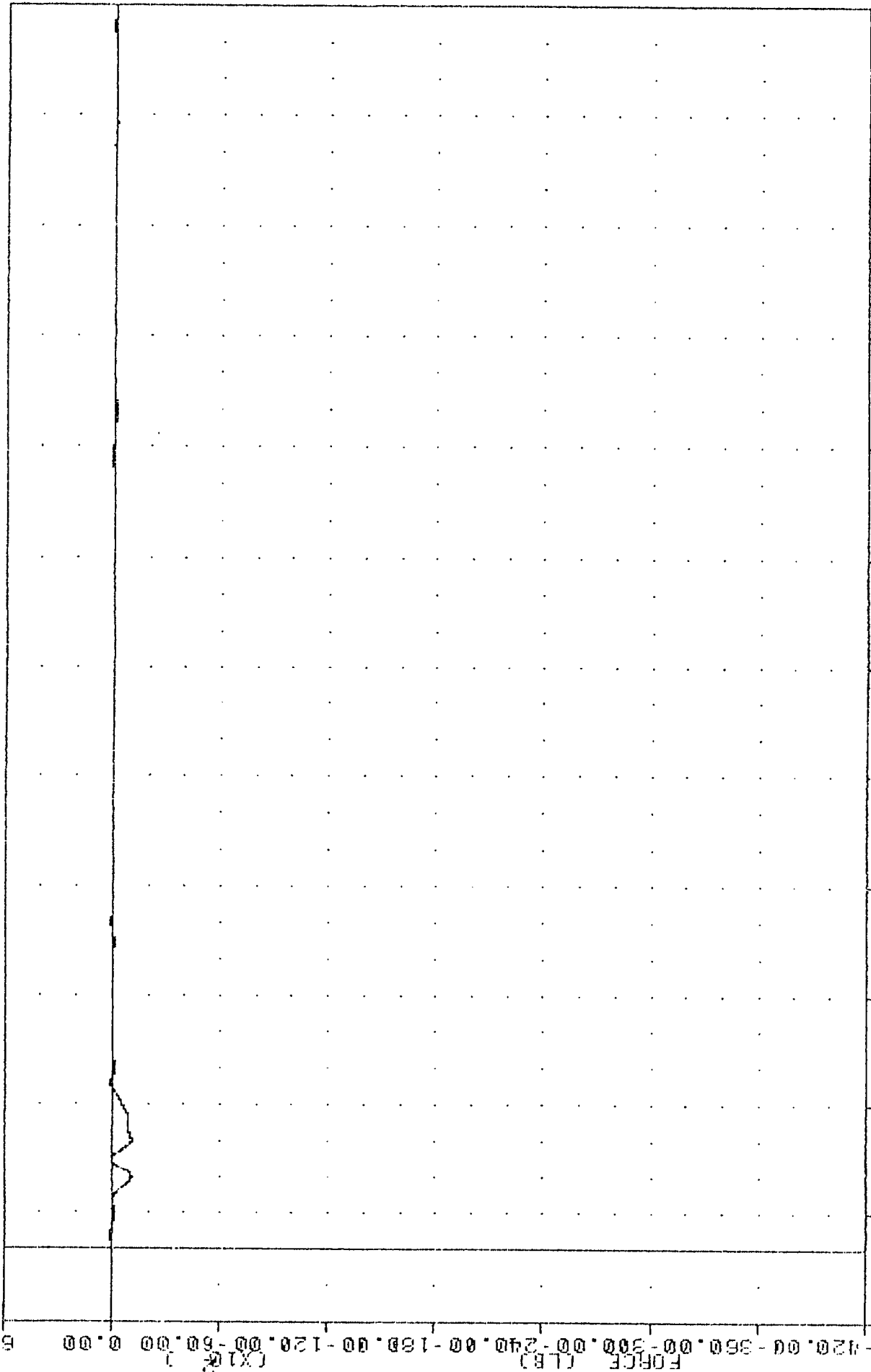
B-91

910401



100
 NEW CAR ASSESSMENT PROGRAM
 91091
 805F

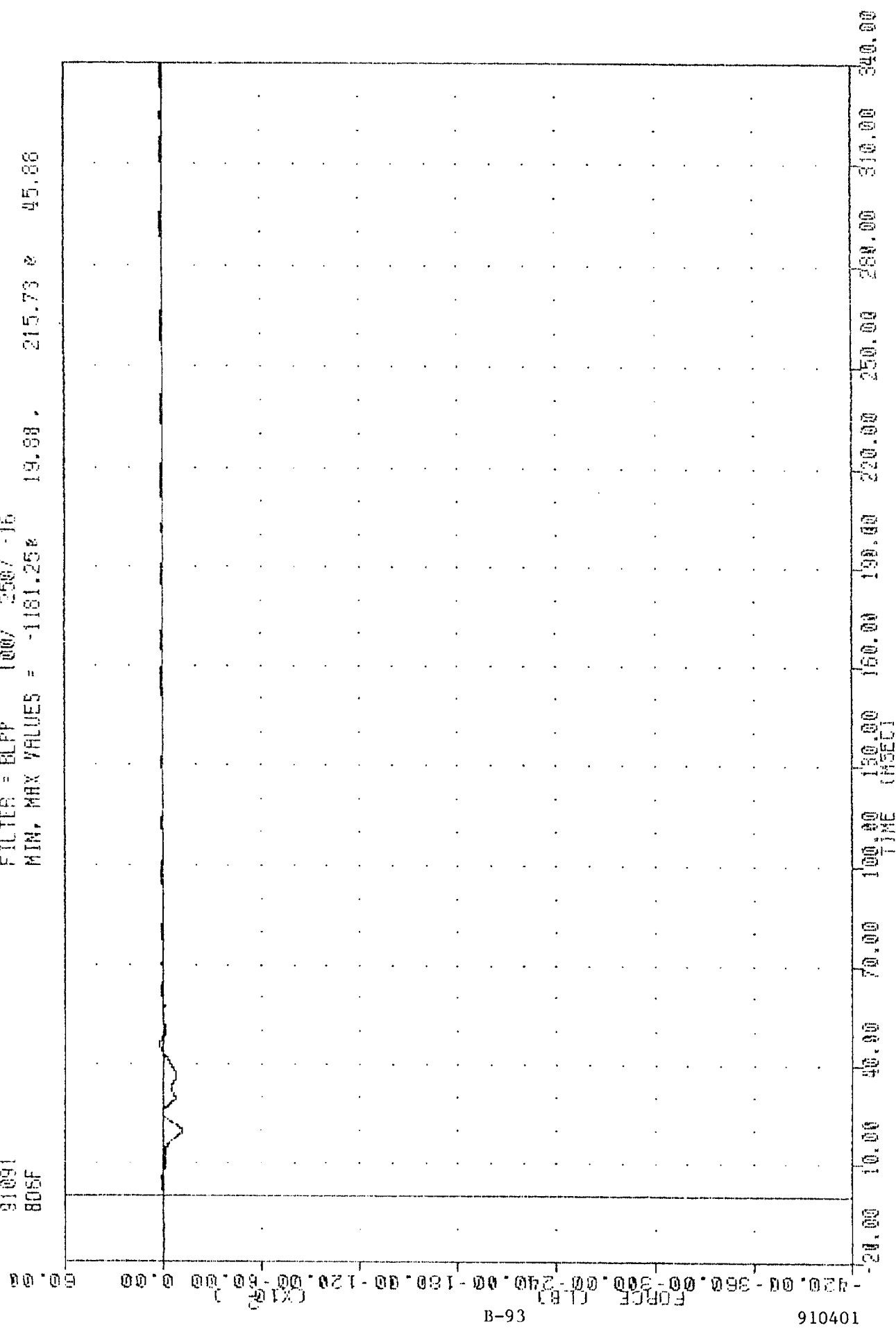
FILTER = 8LFF 100/ 250/ -15
 MIN, MAX VALUES = -1128.16e 30.13, 71.76 e 217.63



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 05 FORCE

TAC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 80SF

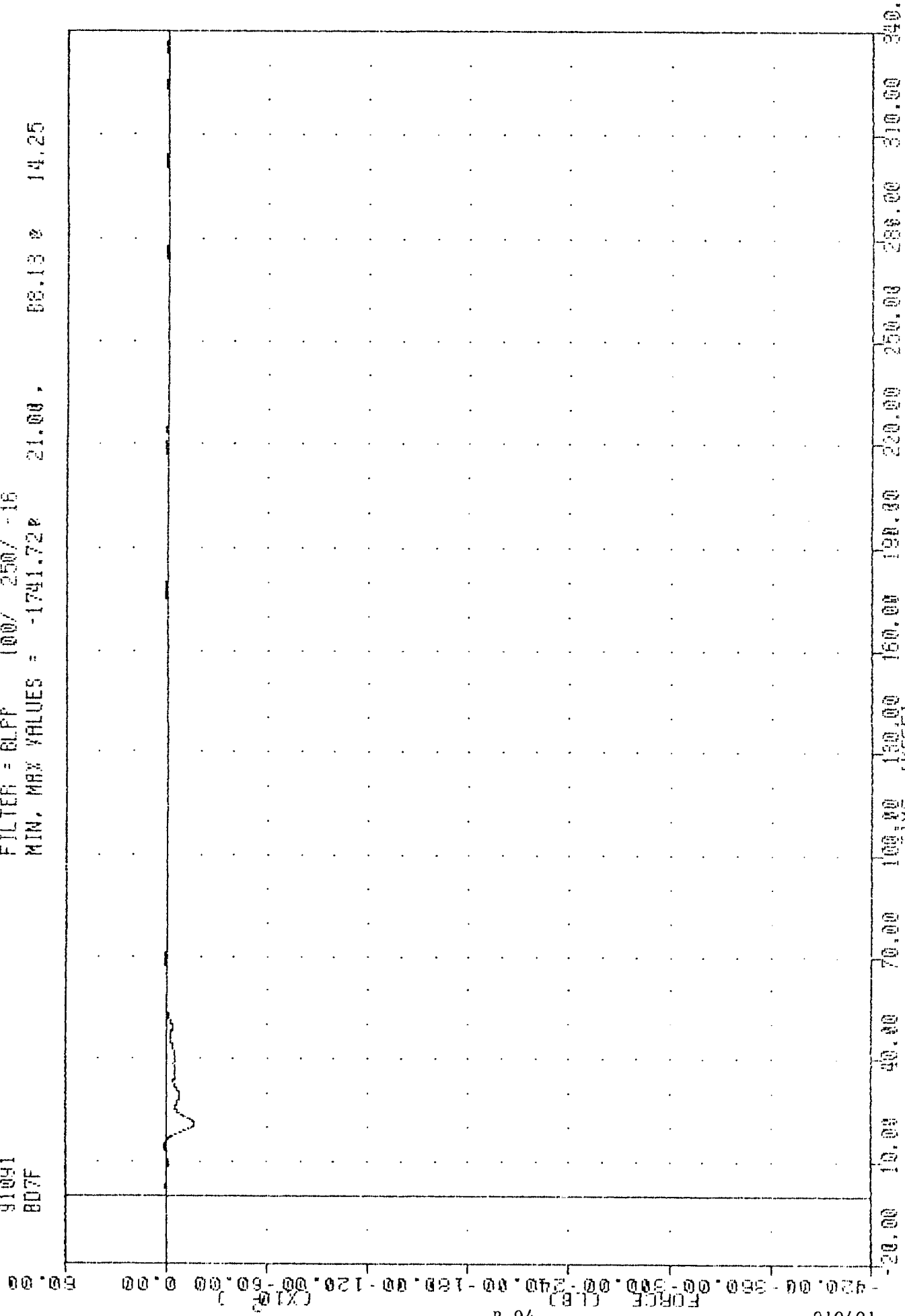
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -1181.25% 19.98 , 215.73 % 45.88



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 BARRIER POSITION INSIDE FORCE

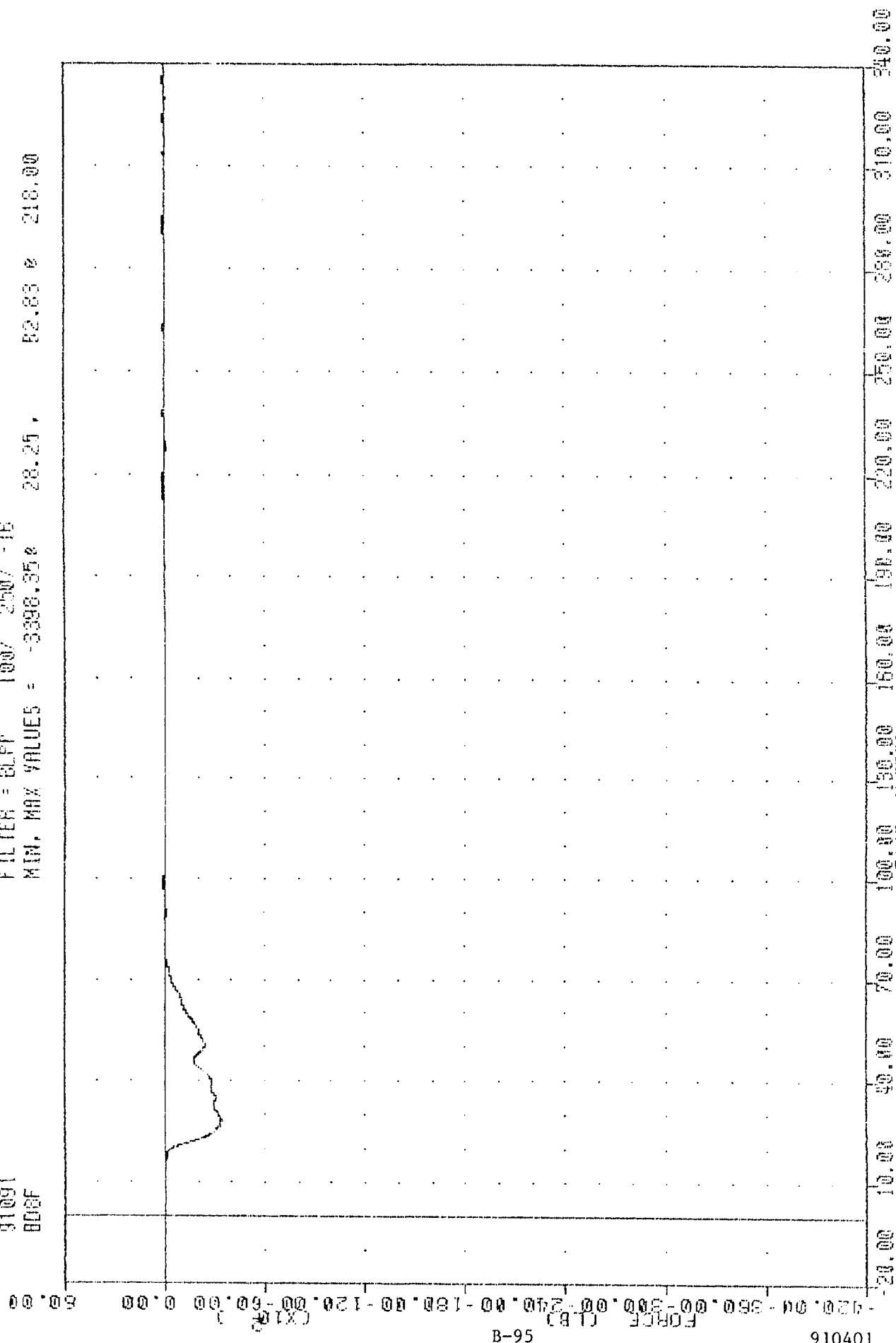
NEW CAR ASSESSMENT PROGRAM
 91091
 807F

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -1741.72 21.00, 88.13 14.25



TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 BDRF

FILTER = BLFF 100/ 250/ -16
 MIN. MAX VALUES = -3396.358 28.25 , 82.83 @ 218.00

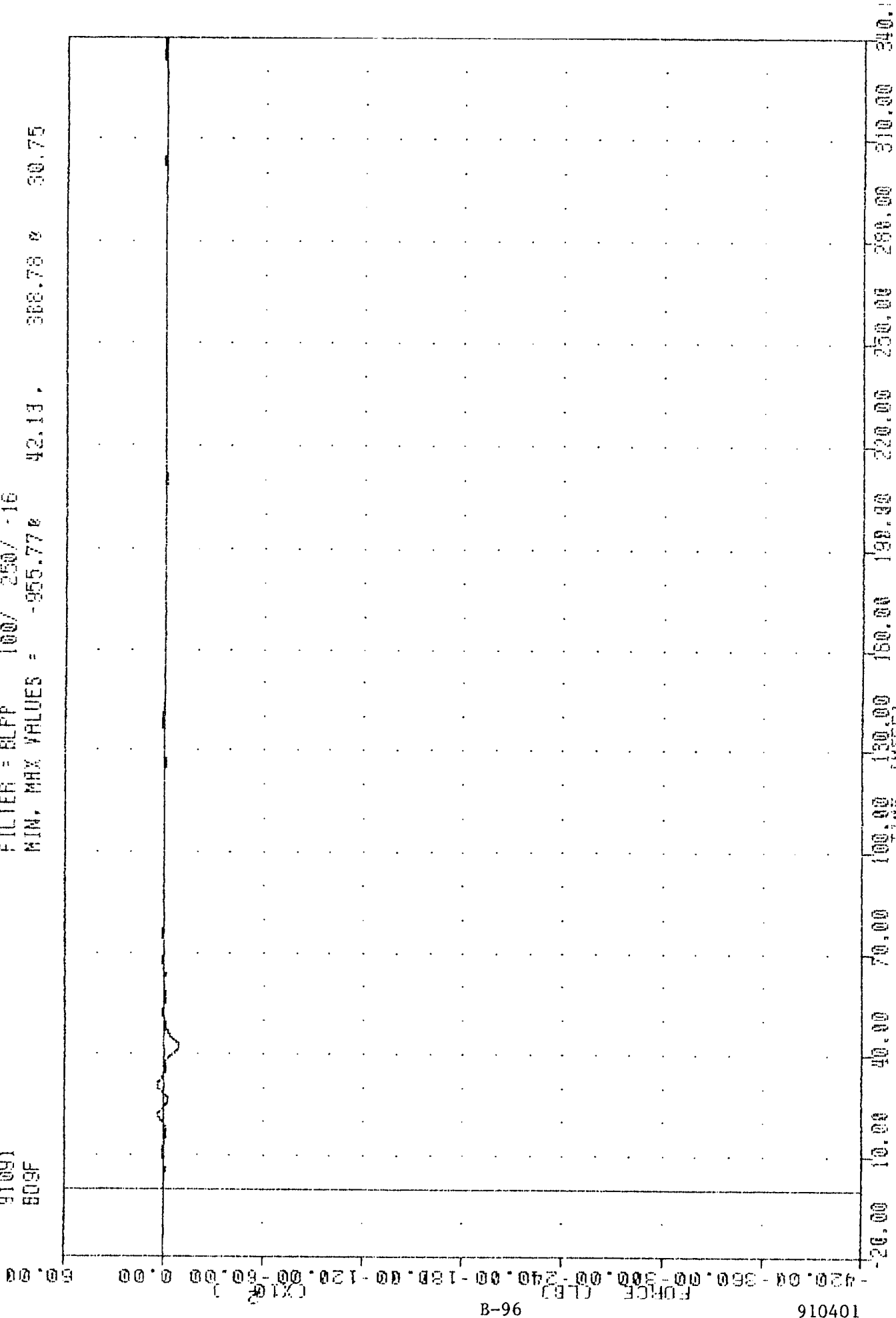


1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER

LOSS OF CONTROL POSITION OF BARRIER

TRC
NEW CAR ASSESSMENT PROGRAM
91091
809F

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -955.77 42.13 388.78 30.75



TRC
NEW CAR ASSESSMENT PROGRAM

91091

LCB61F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -14143.828

27.38 , 383.94 @ 217.63

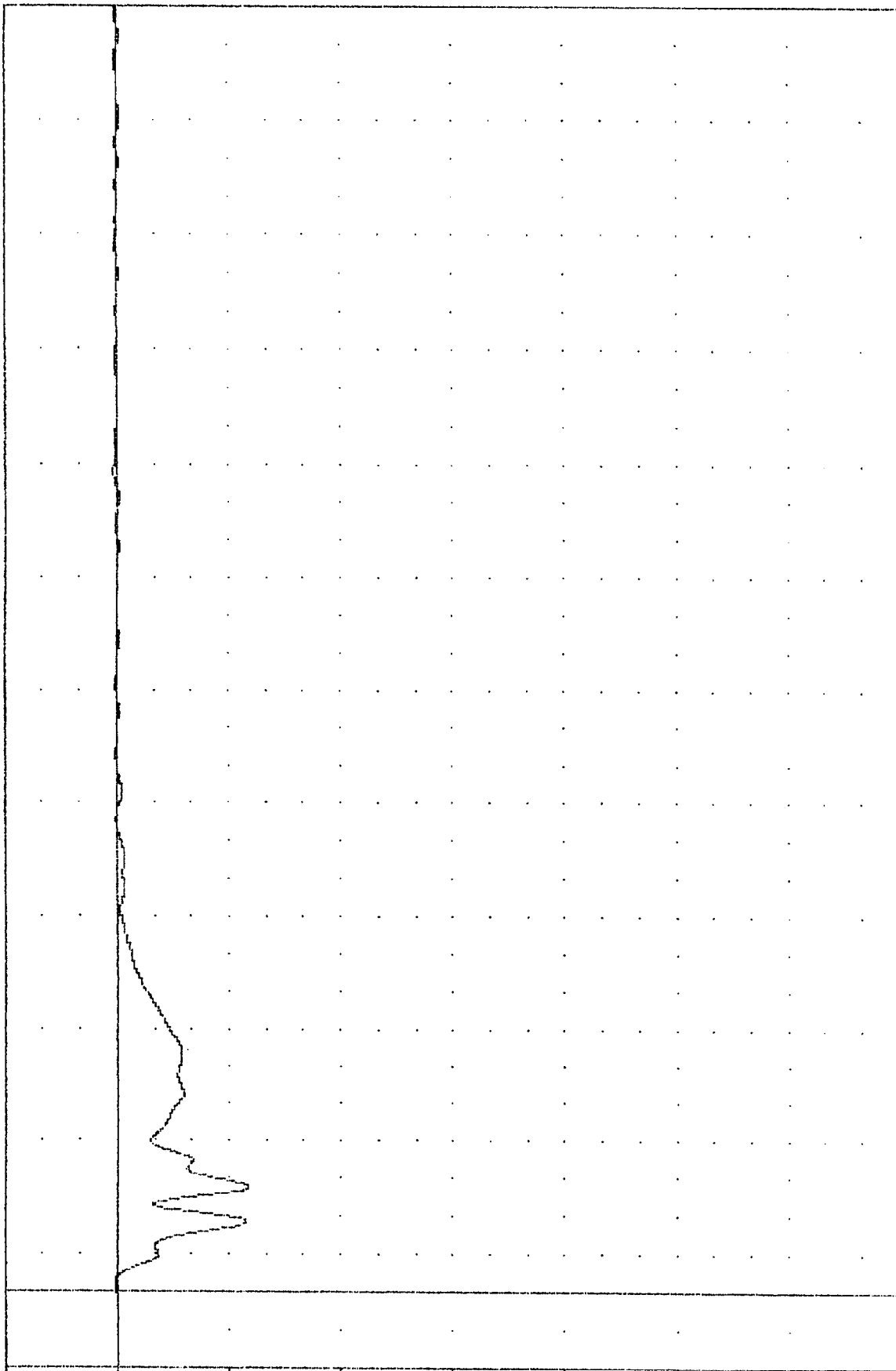
12.00

0.00

(X10³)

B-97

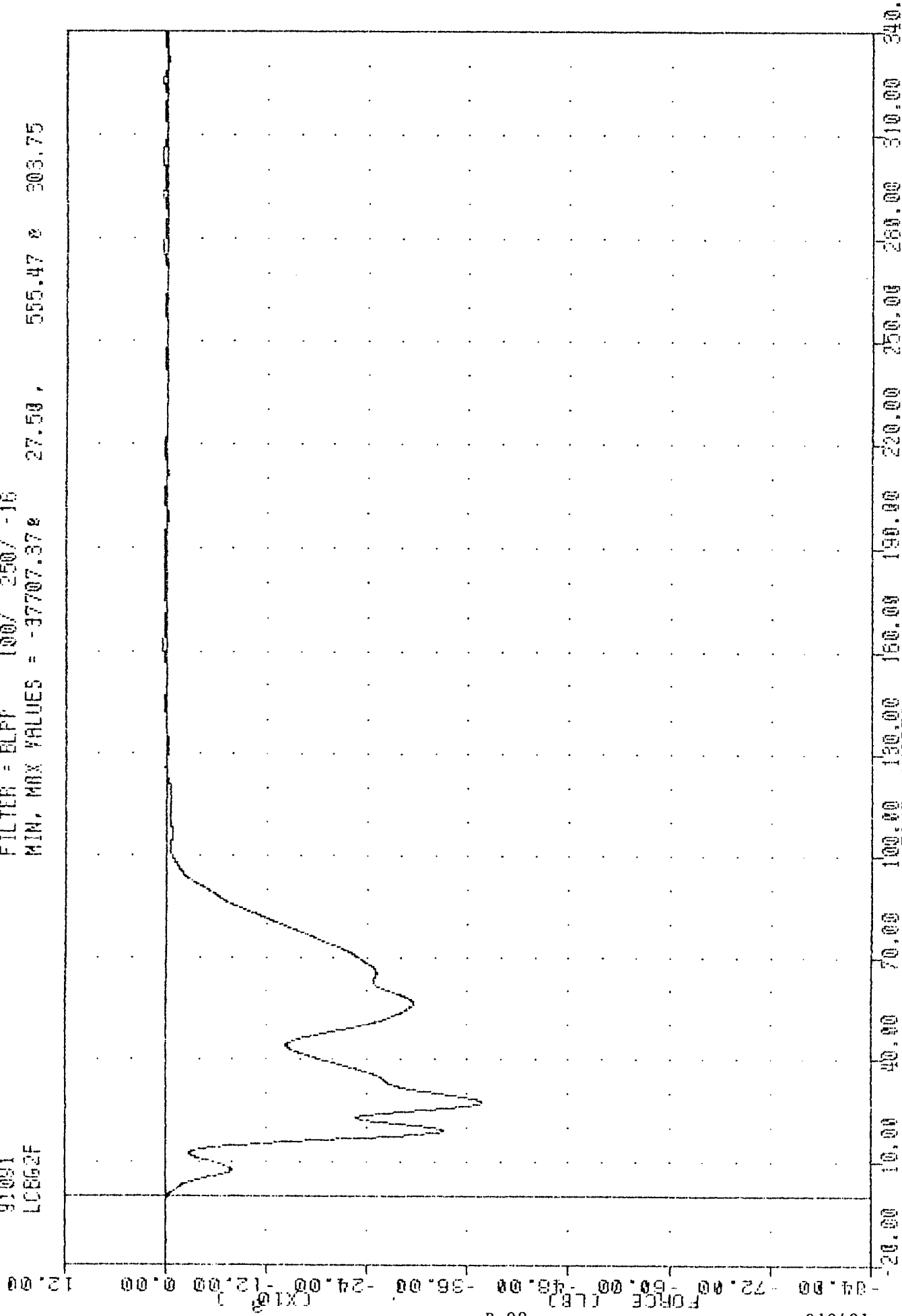
910401



1991 SUZUKI SIDERICK INTO FRONTAL LOAD CELL BARRIER

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 LC862F

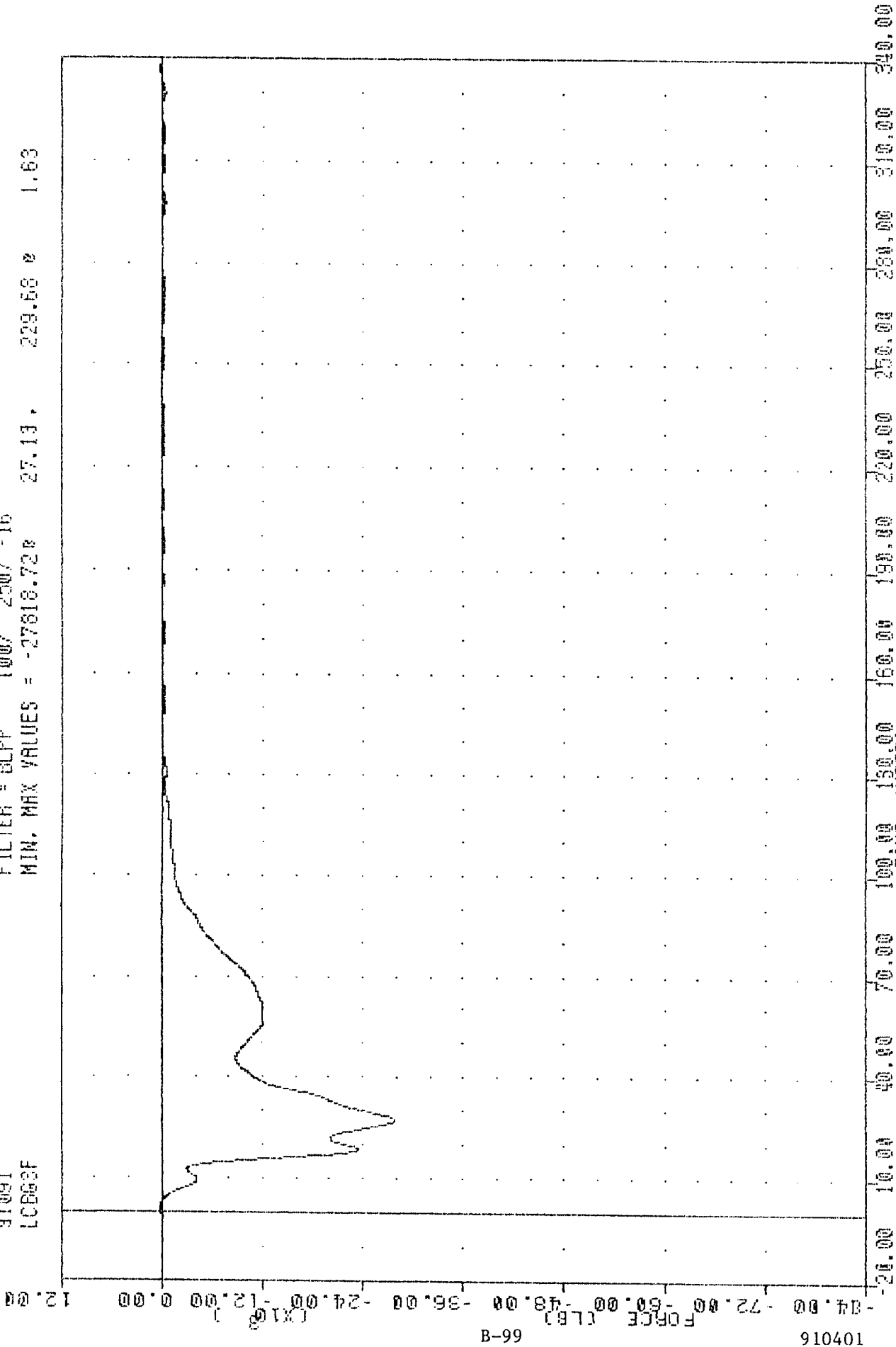
FILTER = BLPF 100/ 250/ -16
 MIN. MAX VALUES = -37707.37 555.47 303.75



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP - 2 FORCE TOTAL

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 LCD99F

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -27618.728 27.13 229.68 1.63



B-99

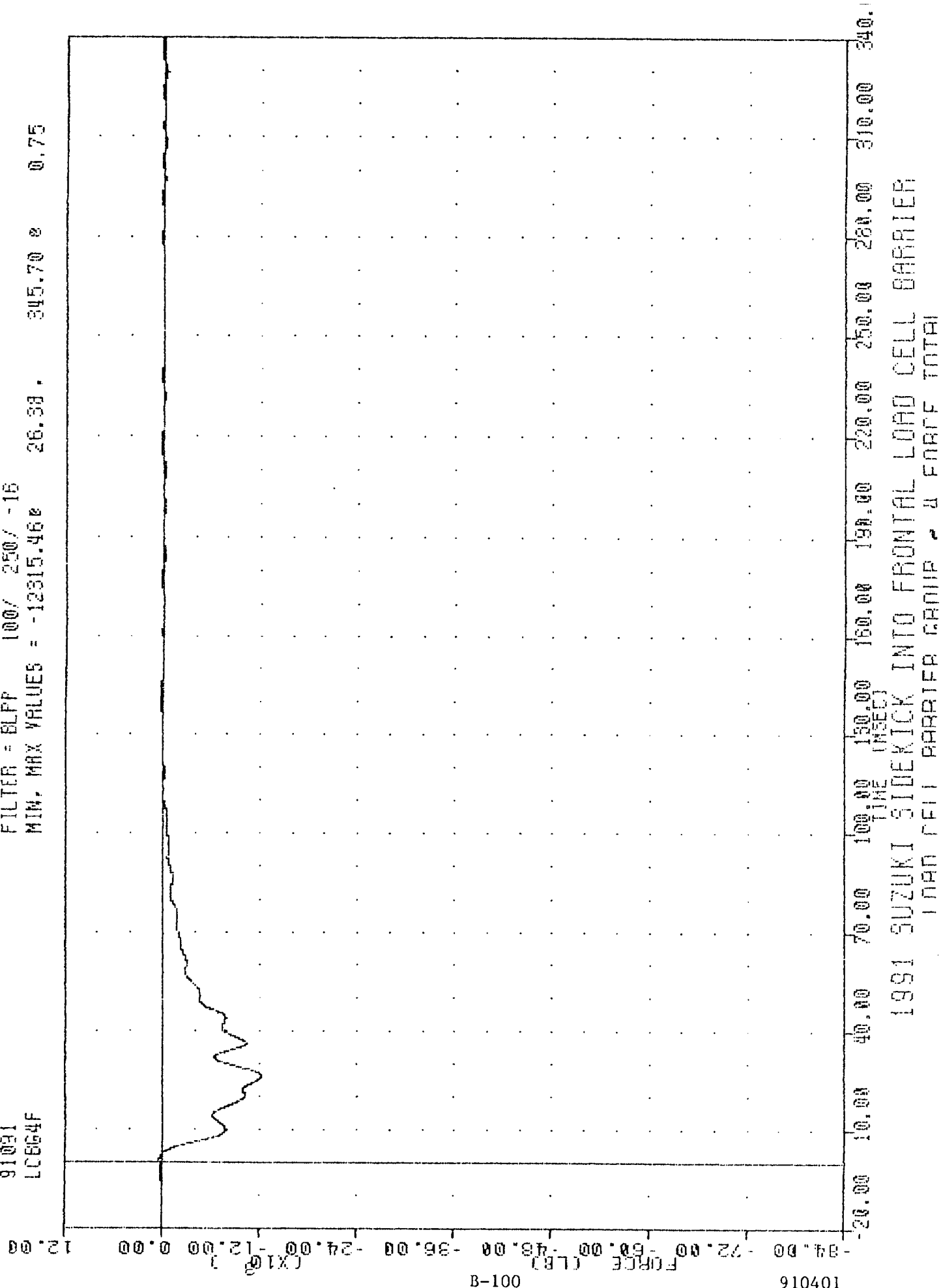
910401

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 LEAD CELL BARRIER GROUP TOTAL FORCE

TRC
NEW CAR ASSESSMENT PROGRAM
91091
LC664F

910401

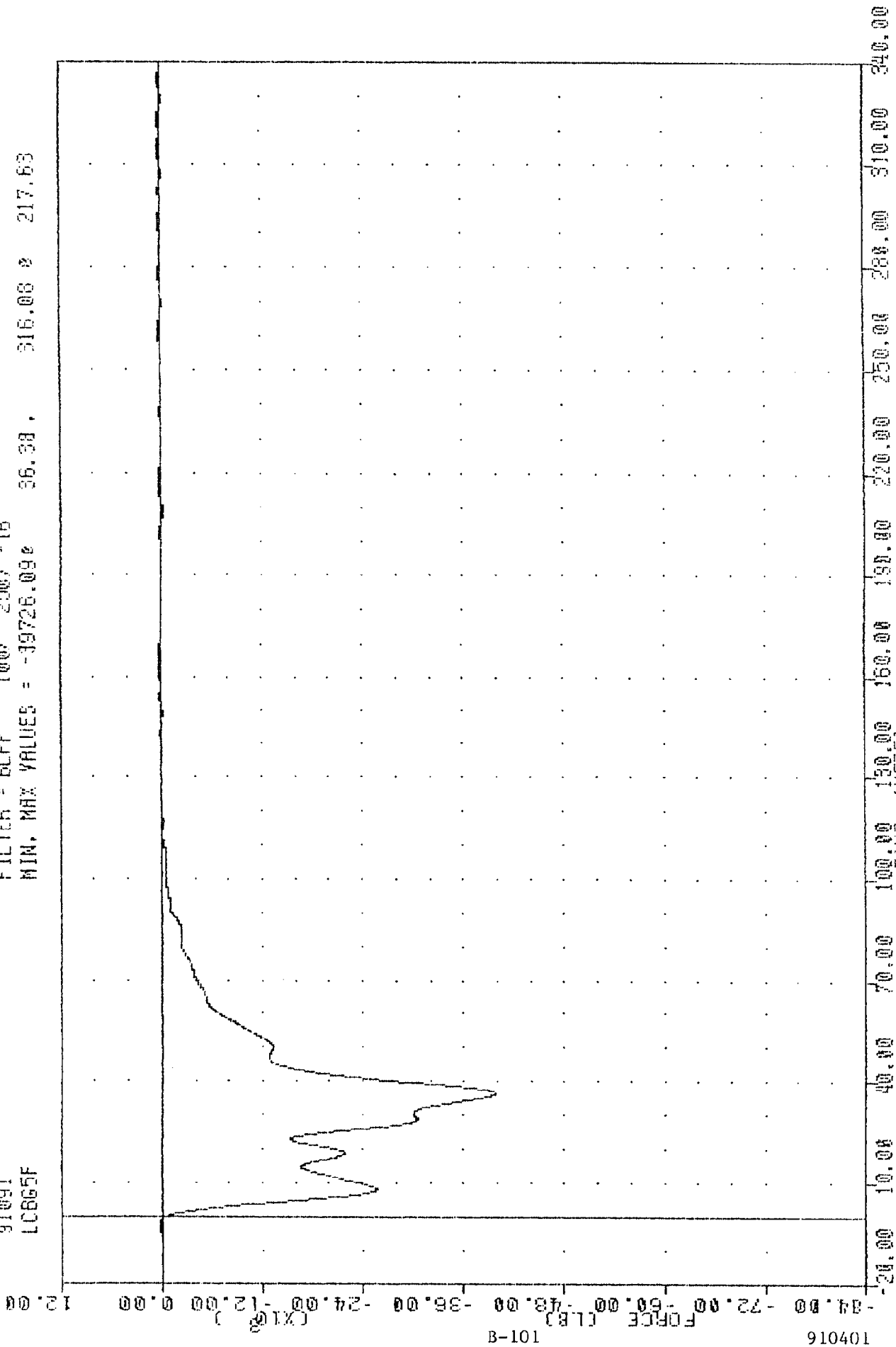
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -12315.460 26.38 345.70 0 0.75



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
INAD CELL BARRIER CRASH - A FORCE TOTAL

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM
 91091
 LCBG5F

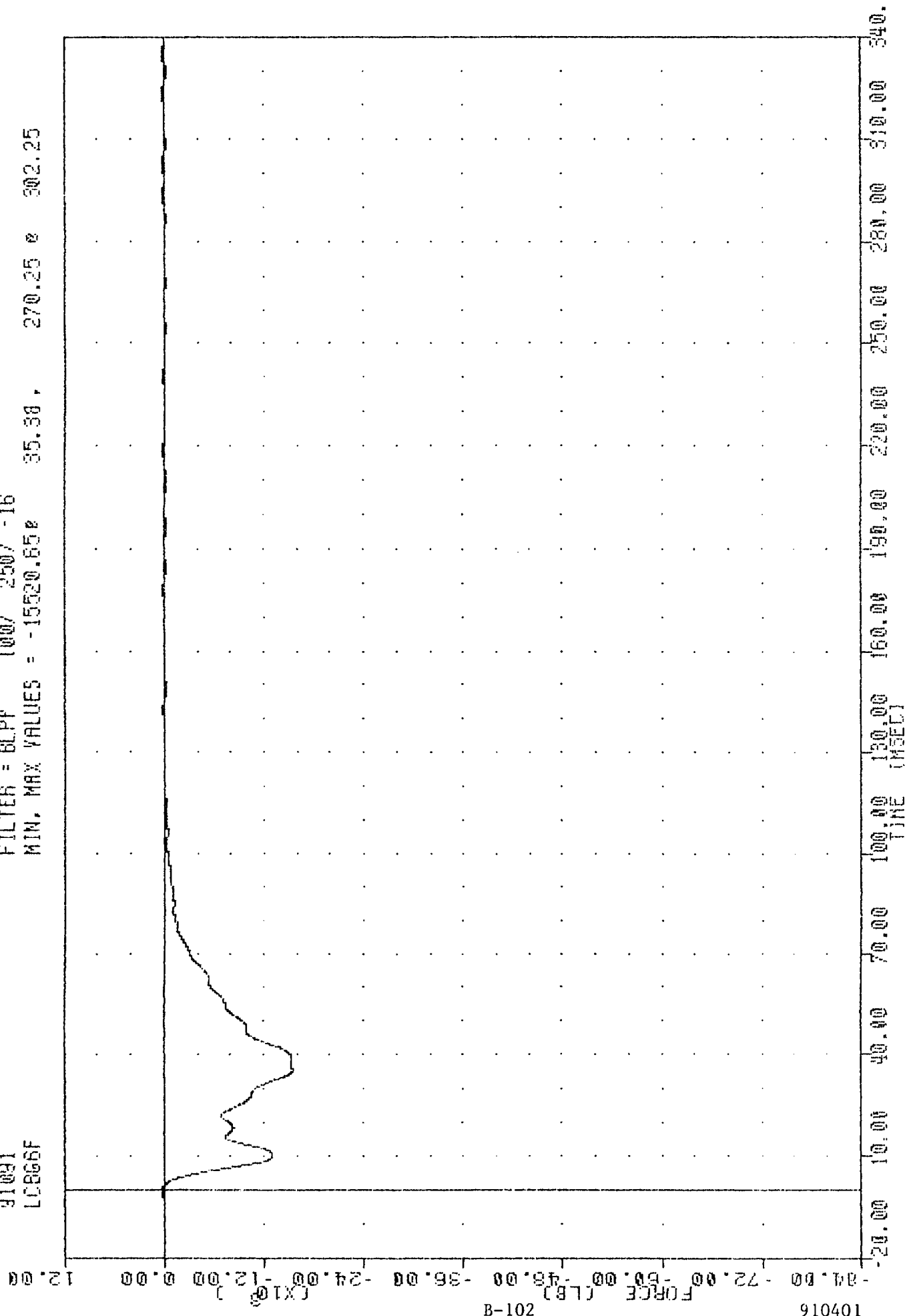
FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -39726.090 36.38 316.08 217.63



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER BROKE - J-FORCE TOTAL

INC , 910401
 NEW CAR ASSESSMENT PROGRAM
 31091
 LCB06F

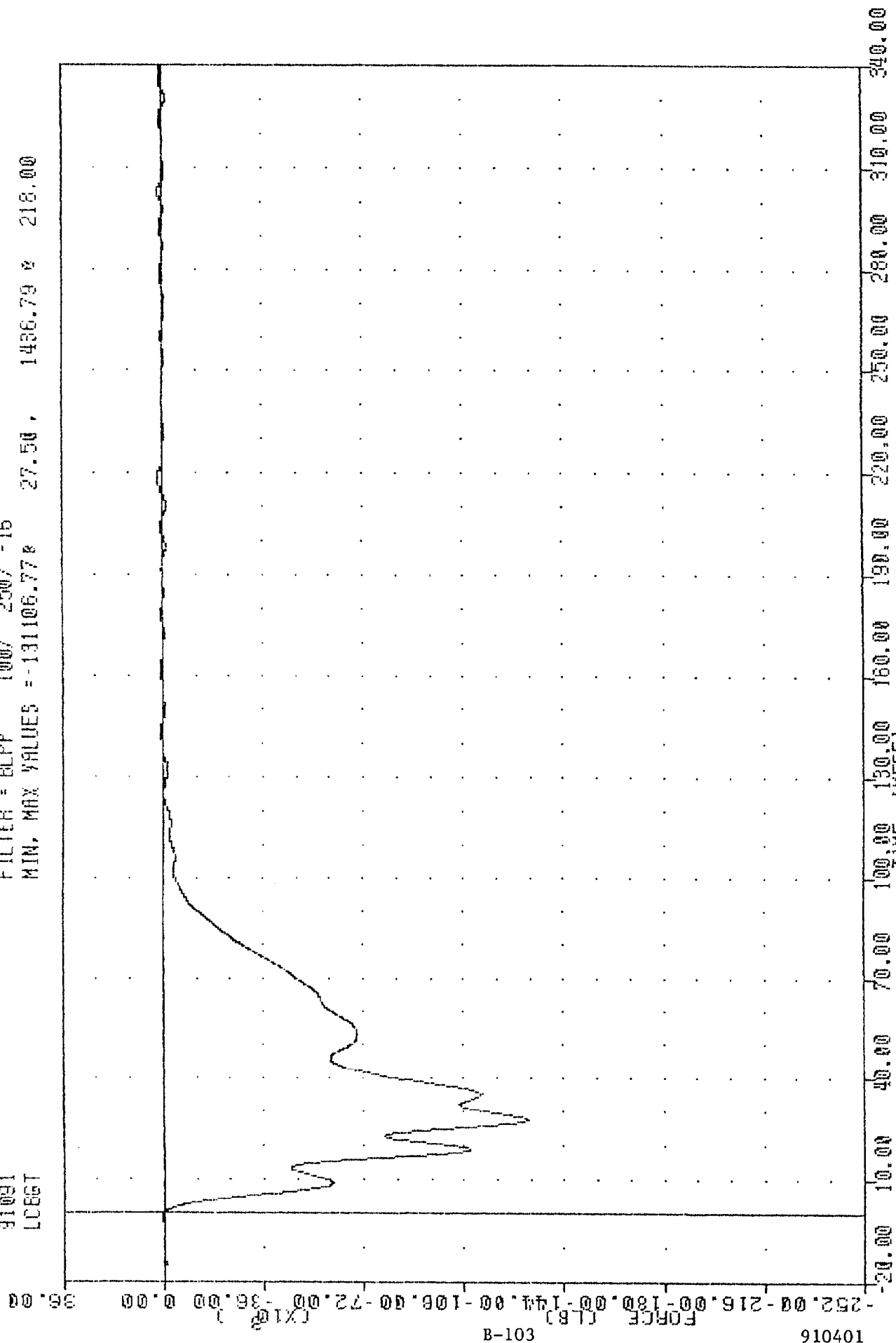
FILTER = BLPF 100/ 250/ -16
 MIN. MAX VALUES = -15520.650 35.30 , 270.25 0 302.25



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 1 RAD CFI BARRIER GROUP - 6 FORCE TOTAL

TRC , 910401
 NEW CAR ASSESSMENT PROGRAM

91091
 LCEGT
 FILTER = BLPP 100/ 250/ -15
 MIN, MAX VALUES = -131106.778 27.50 , 1436.79 218.00

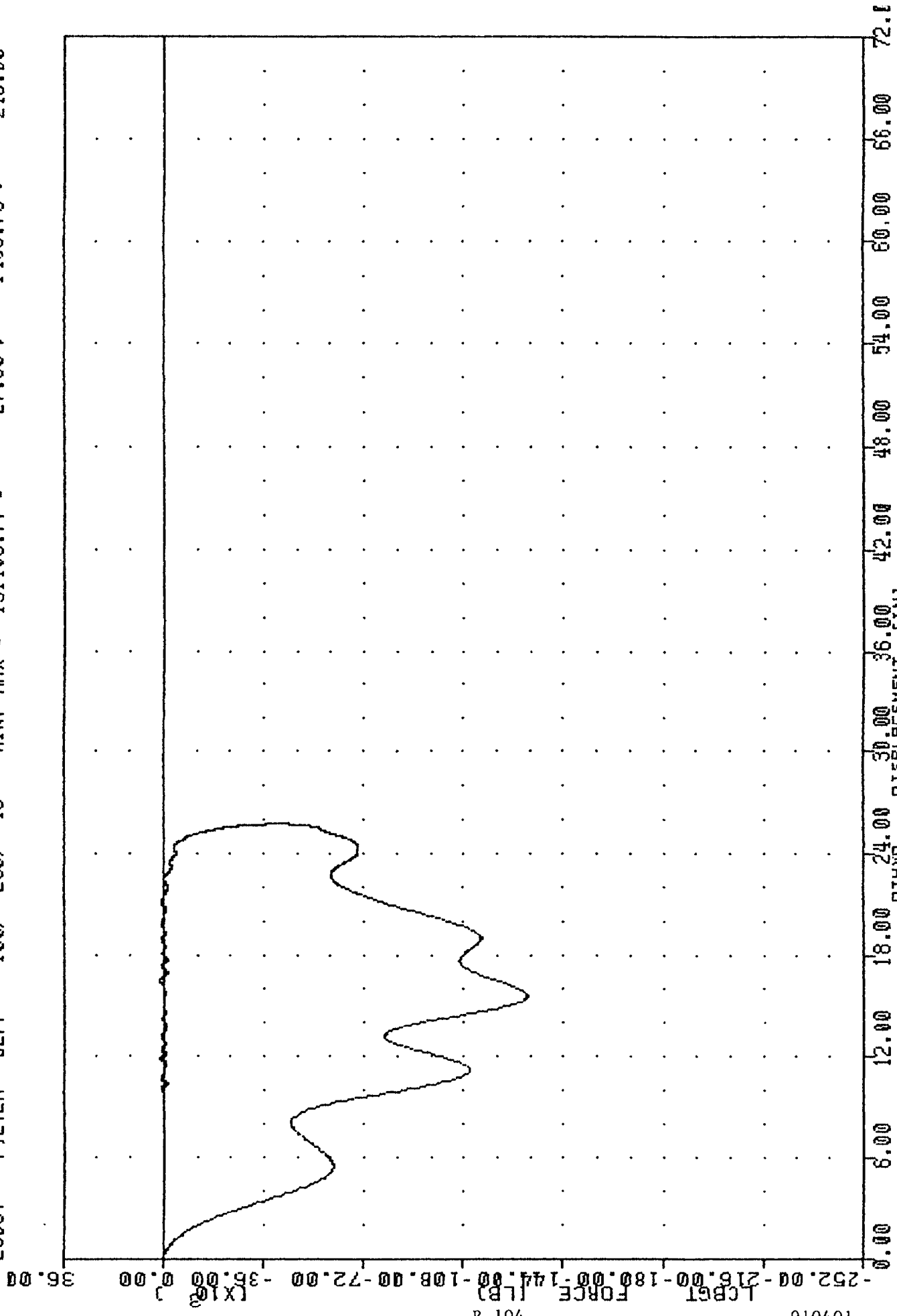


B-103

9104016

1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 TOTAL 1000 CELL BARRIER FORCE

TRC 910401 NEV CAR ASSESSMENT PROGRAM 91091
 OTHXD 300/ 750/ -16 MIN, MAX = 0.00 25.75 73.53
 LCBGT 100/ 250/ -16 MIN, MAX = -131106.77 0.00 218.00



1991 SUZUKI SIDEKICK INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE VS VEHICLE X AXIS DISPLACEMENT

APPENDIX C

DUMMY CERTIFICATION DATA

PRE-TEST CERTIFICATION DATA

DRIVER DUMMY S/N: 192

TRANSPORTATION RESEARCH CENTER OF OHIO
HYBRID III EXTERNAL DIMENSIONS
192 HUMANOID

26-MAR-91

NHTSA

19203ED1

572E SN192 EXT. DIMENSION CAL03

TEST PARAMETER	(DIMEN.)	SPECIFICATION	TEST RESULTS
TEMPERATURE			72.0 DEG. F
RELATIVE HUMIDITY			45.0 %
LOCATION FOR CHEST CIRCUMFERENCE (AA)		16.9-17.1 IN	17.0 IN
LOCATION FOR WAIST CIRCUMFERENCE (BB)		8.9- 9.1 IN	9.0 IN
CHEST CIRCUMFERENCE (Y)		38.2-39.4 IN	38.5 IN
WAIST CIRCUMFERENCE (Z)		32.9-34.1 IN	33.5 IN
CHEST DEPTH (O)		8.4- 9.0 IN	8.6 IN
H-POINT HEIGHT (C)		3.3- 3.5 IN	3.4 IN
H-POINT FROM SEATBACK (D)		5.3- 5.5 IN	5.4 IN
SKULL CAP TO BACKLINE (H)		1.6- 1.8 IN	1.7 IN
TOTAL SITTING HEIGHT (A)		34.6-35.0 IN	34.8 IN
THIGH CLEARANCE (F)		5.5- 6.1 IN	5.8 IN
BUTTOCK KNEE LENGTH (K)		22.8-23.8 IN	23.7 IN
BUTTOCK POPLITEAL LENGTH (N)		17.8-18.8 IN	18.6 IN
POPLITEAL HEIGHT (L)		16.9-17.9 IN	17.7 IN
KNEE PIVOT HEIGHT (M)		19.1-19.7 IN	19.4 IN
FOOT LENGTH (P)		9.9-10.5 IN	10.2 IN
FOOT BREADTH (W)		3.6- 4.2 IN	4.0 IN
SHOULDER PIVOT FROM BACKLINE (E)		3.3- 3.7 IN	3.6 IN
SHOULDER BREADTH (V)		16.6-17.2 IN	16.8 IN
SHOULDER PIVOT HEIGHT (B)		19.9-20.5 IN	20.1 IN
ELBOW REST HEIGHT (J)		7.5- 8.3 IN	8.1 IN
SHOULDER-ELBOW LENGTH (I)		13.0-13.6 IN	13.4 IN
BACK OF ELBOW TO WRIST PIVOT (G)		11.4-12.0 IN	11.6 IN

TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

HYBRID III

26-Mar-91

NHTSA

192C3HD1

572E SN192 HEAD DROP CAL 03

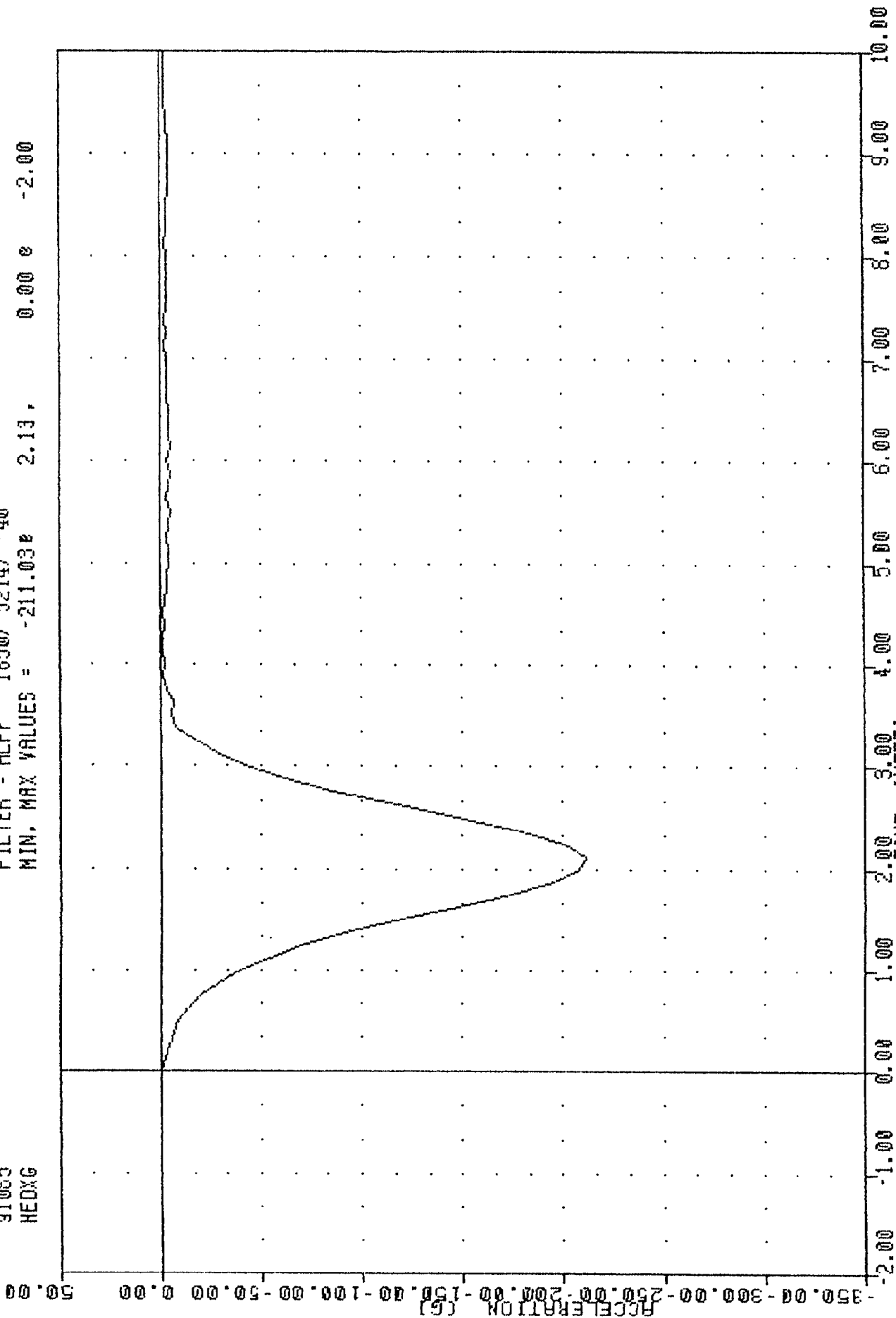
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	72.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	45.00 %
PEAK RESULTANT ACCELERATION	225 - 275 G	245.56 G
PEAK LATERAL ACCELERATION	15 G MAX	-2.81 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

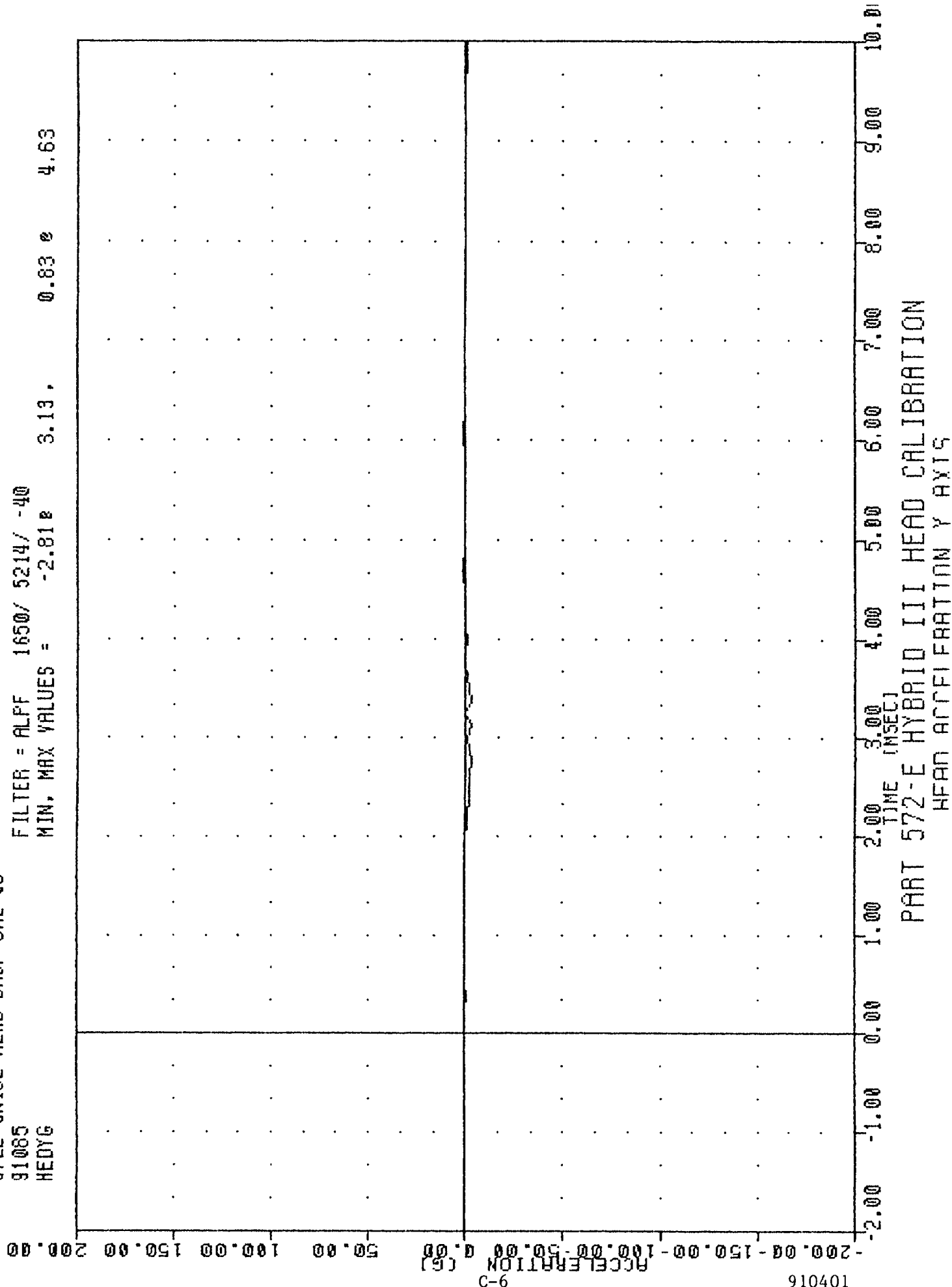
KHTSA , 192C3HD1
 572E SN192 HEAD DROP CAL 03
 91085
 HEDXC

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -211.03e 2.13, 0.00 e -2.00



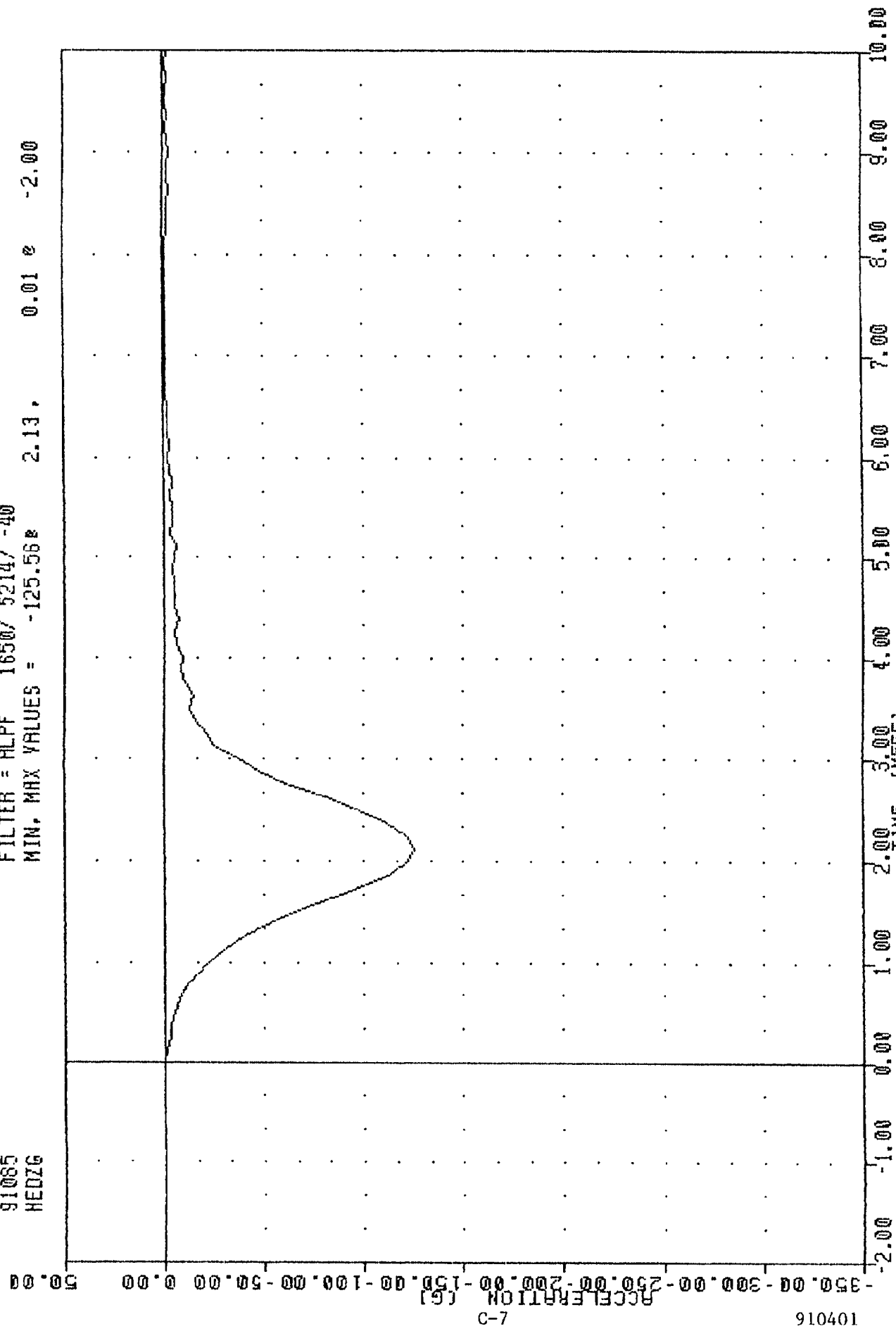
WHTSA , 192C3HD1
 572E SN192 HEAD DROP CAL 03
 91085
 HEDYG

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -2.81e 3.13, 0.83 e 4.63



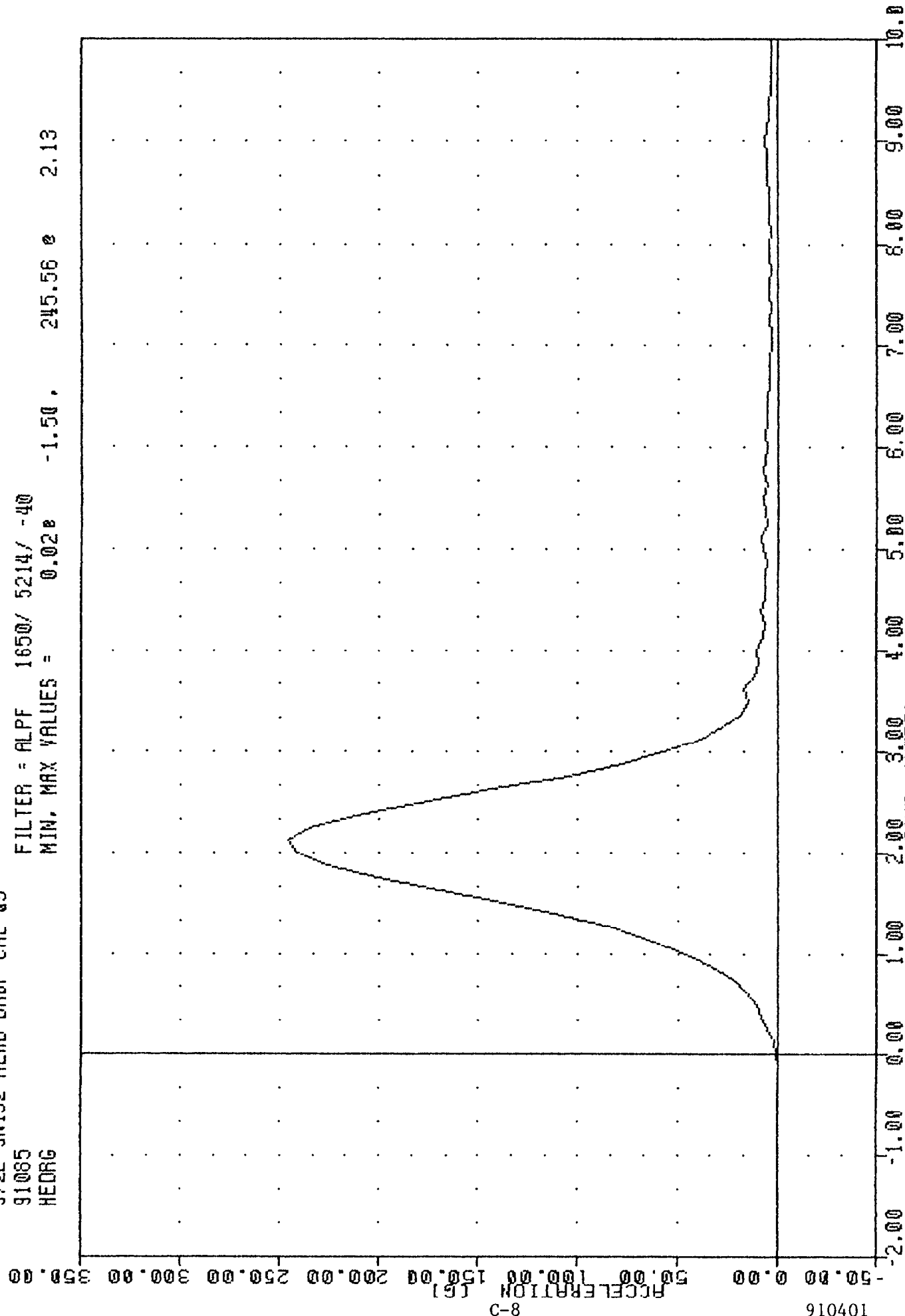
NHTSA
572E SN192 HEAD DROP CAL 03
91085
HEDIG

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -125.56 2.13, 0.01 0 -2.00



NHT3A , 192C3HD1
 572E SN192 HEAD DROP CAL 03
 91085
 HEDRG

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 0.02e -1.50, 245.56 e 2.13



PART 572-E HYBRID III HEAD CALIBRATION
 HEAD RESONANT ACCELERATION

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK FLEXION TEST

HYBRID III

26-Mar-91

6 AXIS NECK TRANSDUCER
NHTSA 192C3NF1

S72E SN192 NECK FLEXION CAL03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	72.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	46.00 %
IMPACT VELOCITY	22.6-23.4 FT/SEC	22.86 FT/SEC
PENDULUM	10 MS 22.50 - 27.50 G	26.33 G
DECELERATION	20 MS 17.60 - 22.60 G	20.42 G
	30 MS 12.50 - 18.50 G	15.09 G
MAX PENDULUM G ABOVE 30 MS	29 G MAX	15.01 G
DECELERATION-TIME CURVE		
DECAY TIME TO 5 G	34 - 42 MS	36.25 MS
D PLANE	MAX 64 - 78 DEG.	73.80 DEG.
ROTATION	TIME 57 - 64 MS	59.13 MS
MOMENT ABOUT OCCIPITAL	MAX 65 - 80 FT.LBS	70.93 FT.LBS
CONDYLE	TIME 47 - 58 MS	51.00 MS
ROTATION ANGLE-TIME CURVE		
DECAY TIME TO ZERO	113 - 128 MS	115.25 MS
POSITIVE MOMENT-TIME CURVE		
DECAY TIME TO ZERO	97 - 107 MS	98.25 MS

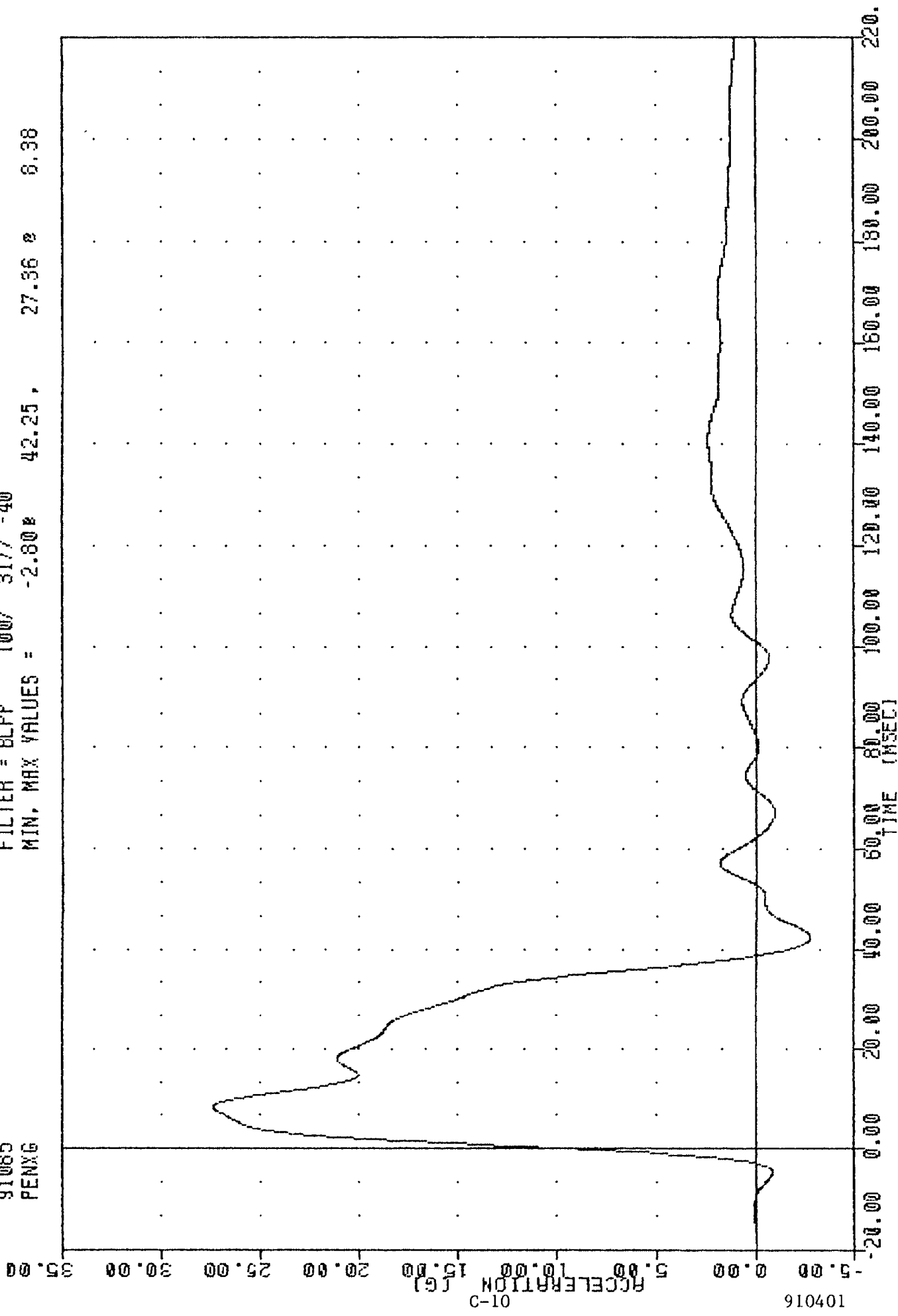
TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middel

WHTSA , 192C3NF1
572E SN192 NECK FLEXION CAL03
91085
PENXG

FILTER = BLPP 100/ 317/ -40
MIN. MAX VALUES = -2.80e 42.25 , 27.36 e 8.38

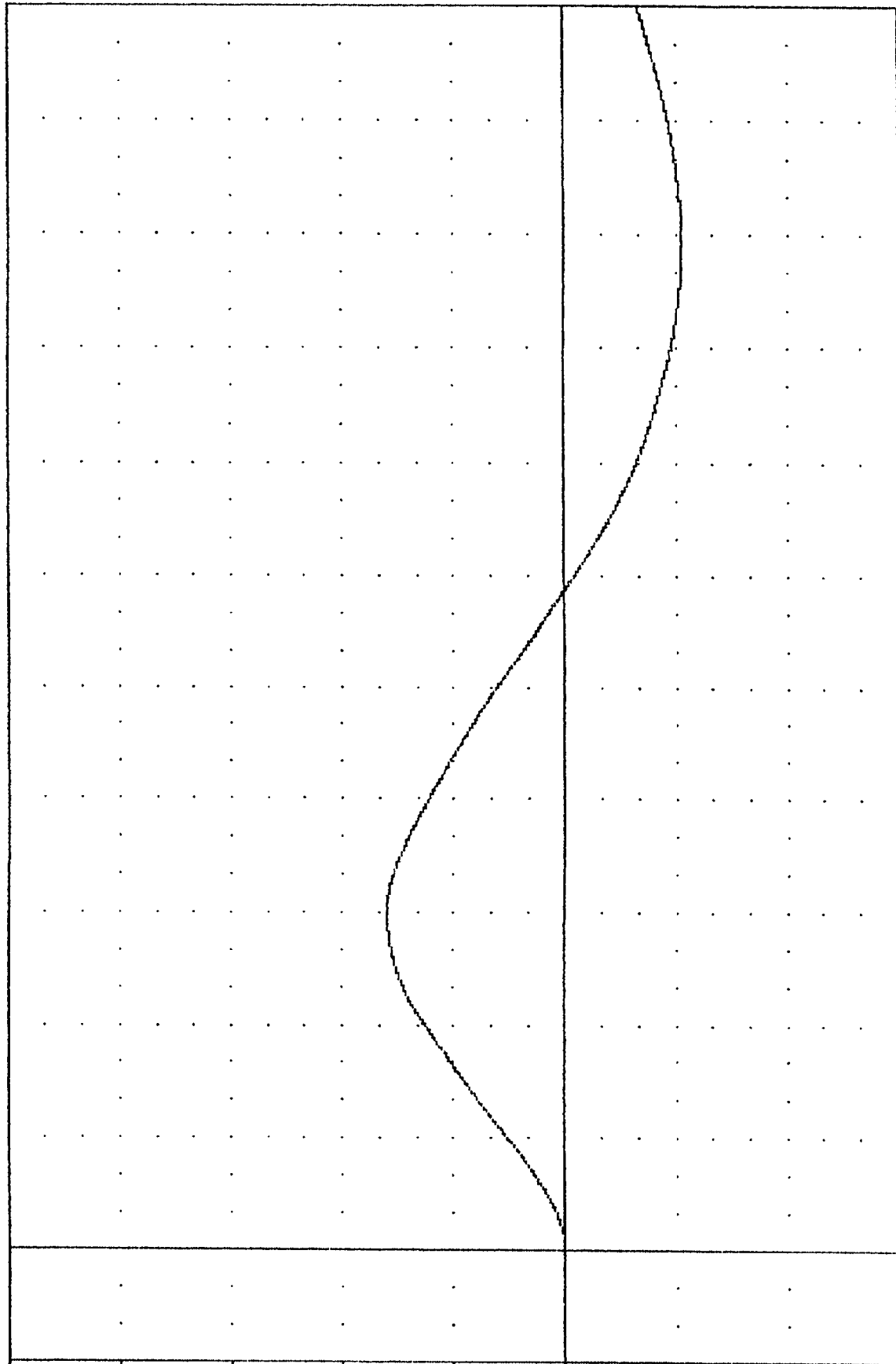


PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENXG MIN DEFFERATION

NHTSA , 192C3NF1
 572E SN192 NECK FLEXION CAL03
 91085
 BETA

FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -20.98% 182.00, 31.97 % 60.00

100.00
 80.00
 60.00
 40.00
 20.00
 0.00
 -20.00
 -40.00
 -60.00
 -80.00
 -100.00



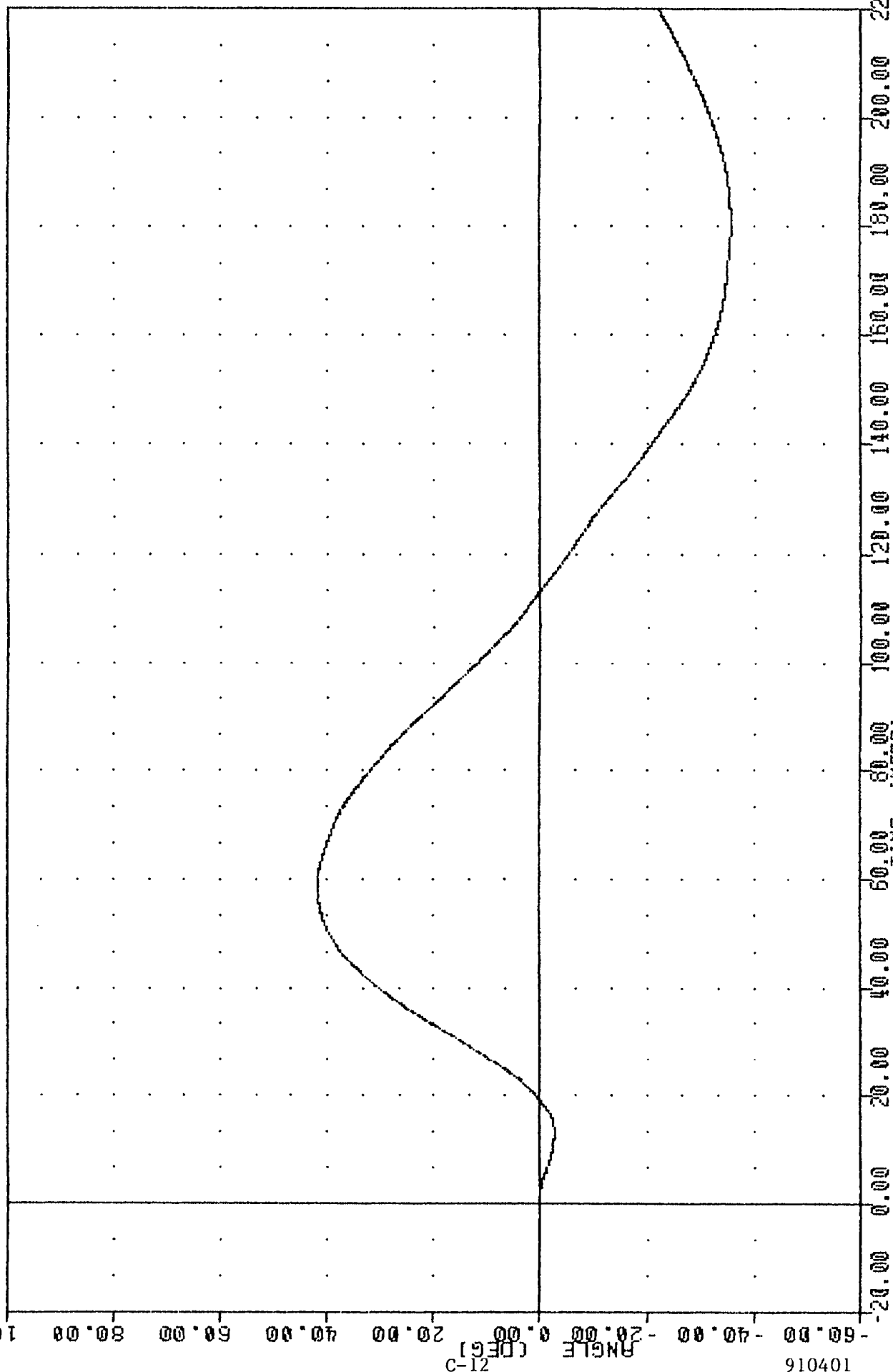
910401

C-11

PART 572-E HYBRID III NECK FLEXION CALIBRATION

NHTSA , 192C3MF1
 572E SN192 NECK FLEXION CAL03
 91085
 THETA

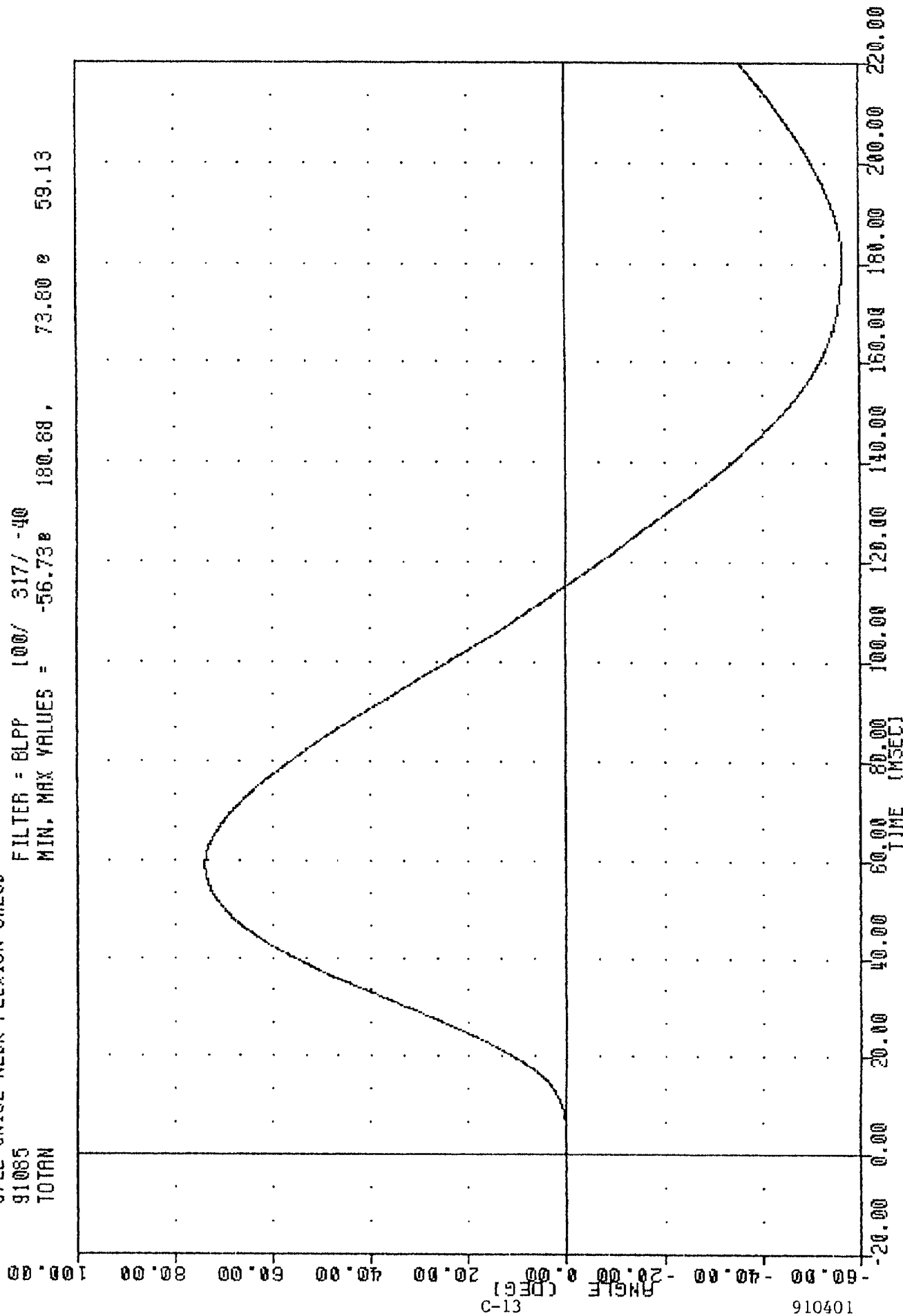
FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -35.75e 180.63, 41.85 e 58.75



PART 572-E HYBRID III NECK FLEXION CALIBRATION
 ROTATION ABOUT OCCIPITAL CONDYLE

NHTSA , 192C3NF1
 572E SN192 NECK FLEXION CAL03
 91085
 TOTAL

FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -56.73e 180.88 , 73.80 e 59.13

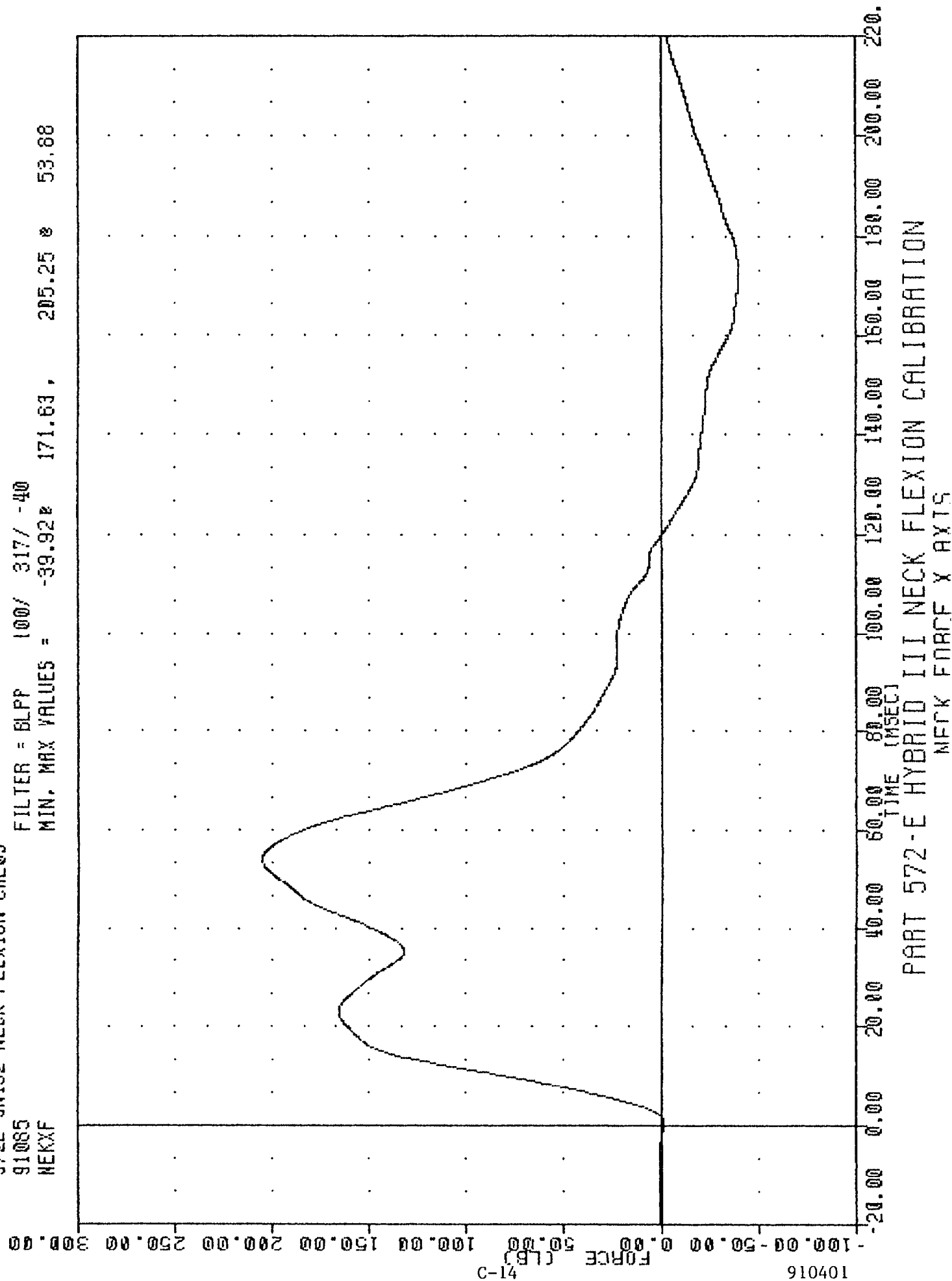


PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL

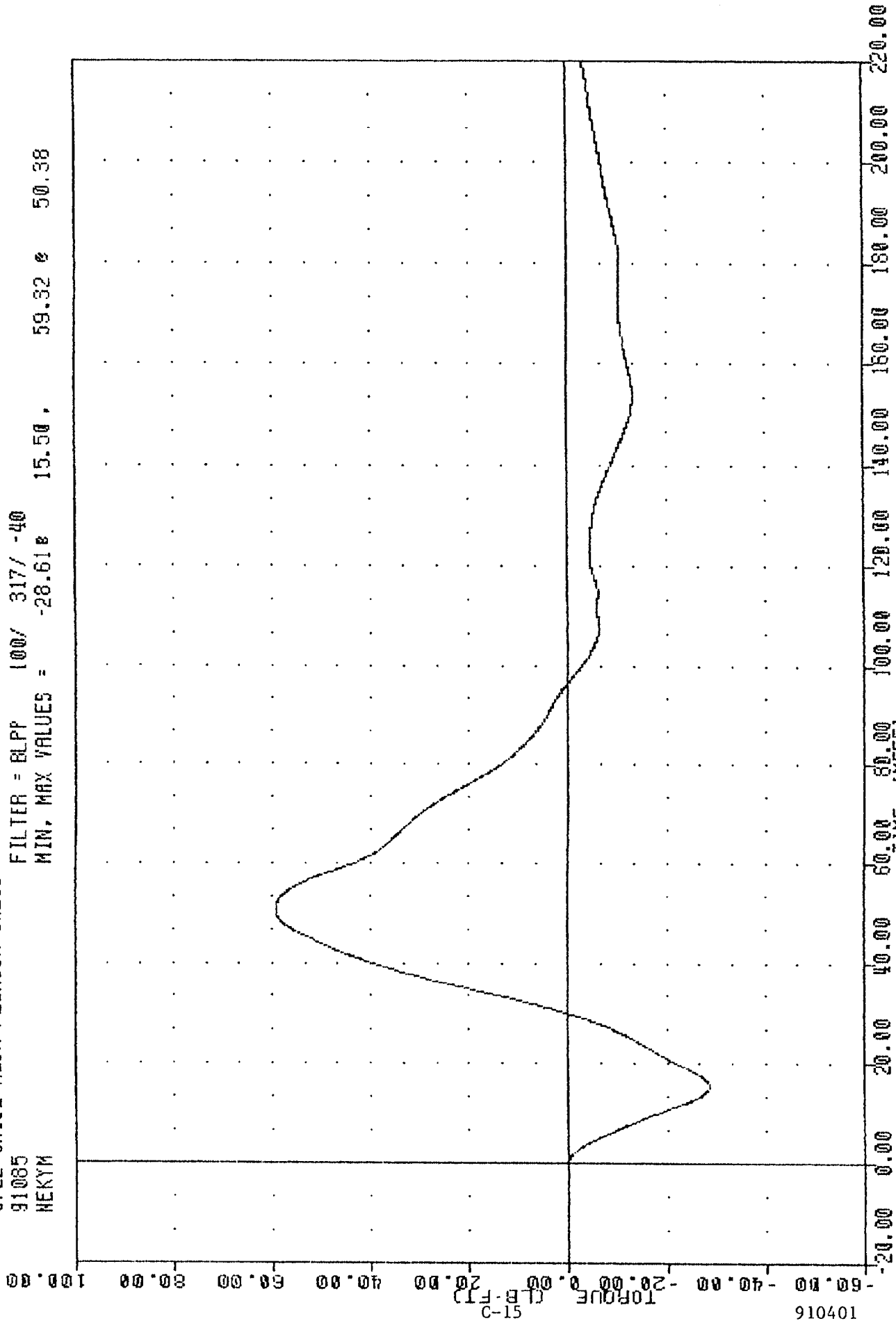
WHTSA , 192C3NF1
572E SN192 NECK FLEXION CAL03
91085
NEKXF

FILTER = BLPP 100/ 317/ -40
MIN. MAX VALUES = -39.92 171.63, 205.25 53.68



NHT3A , 192C3NF1
 572E SN192 NECK FLEXION CAL03
 91085
 NEKYM

FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -28.61 15.50, 59.32 50.38

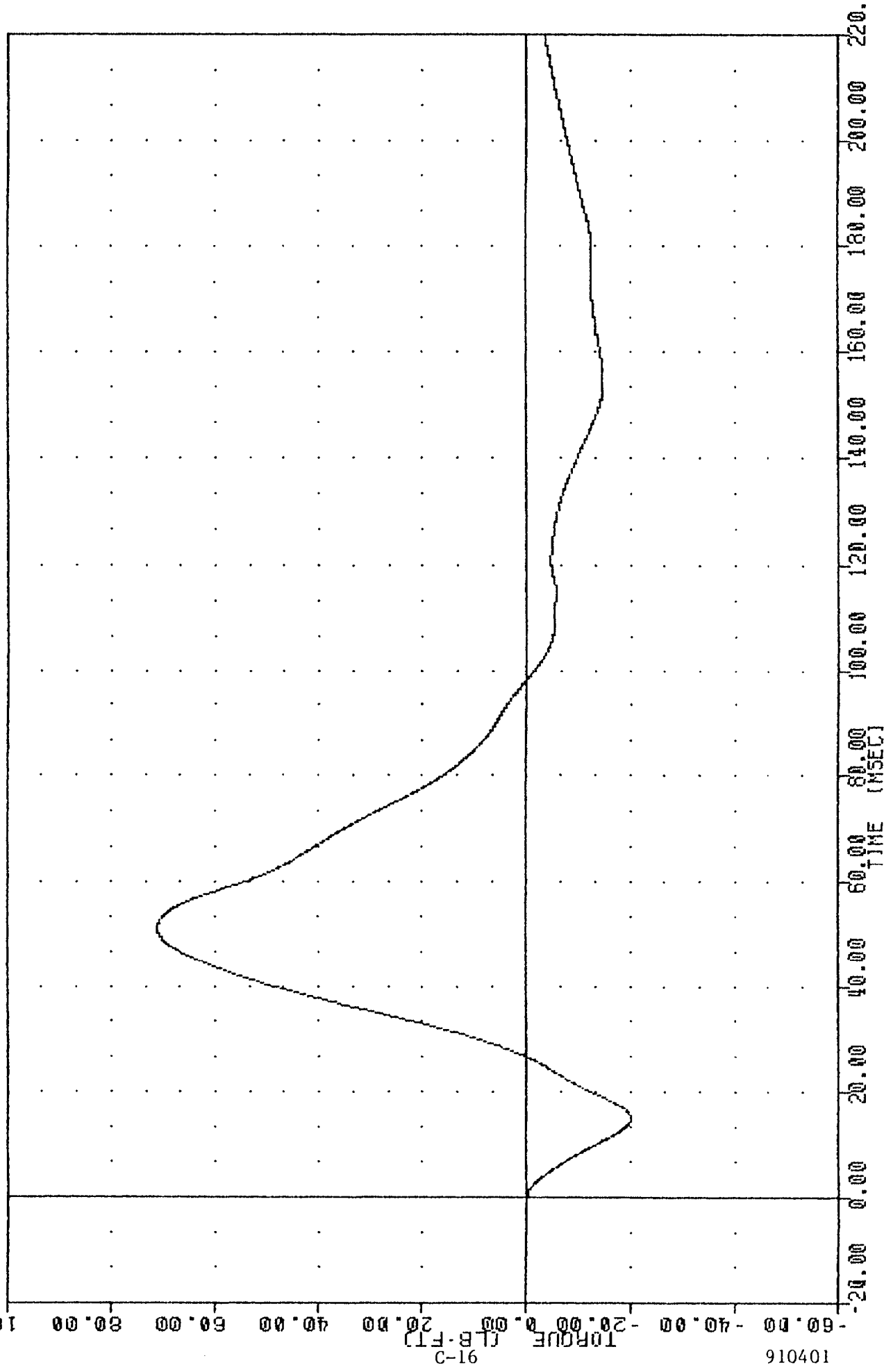


910401

PART 572-E HYBRID III NECK FLEXION CALIBRATION

WHTSA , 182C3NF1
572E SN192 NECK FLEXION CAL03
91085
WEKOM

FILTER = BLFF 100/ 317/ -40
MIN. MAX VALUES = -20.15e 15.00 , 70.93 e 51.00



PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK EXTENSION TEST

HYBRID III

26-Mar-91

6 AXIS NECK TRANSDUCER
NHTSA 192C3NE1

572E SN192 NECK EXT. CAL03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	72.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	46.00 %
IMPACT VELOCITY	19.50-20.30 FT/SEC	19.51 FT/SEC
PENDULUM	10 MS 17.20 - 21.20 G	17.76 G
DECELERATION	20 MS 14.00 - 19.00 G	14.97 G
	30 MS 11.00 - 16.00 G	12.84 G
MAX PENDULUM G ABOVE 30 MS	22 G MAX	12.78 G
DECELERATION-TIME CURVE		
DECAY TIME TO 5 G	38 - 46 MS	43.00 MS
D PLANE	MAX 81 - 106 DEG.	103.78 DEG.
ROTATION	TIME 72 - 82 MS	80.25 MS
MOMENT ABOUT OCCIPITAL	MIN -59.0/-39.0 FT.LBS	-50.27 FT.LBS
CONDYLE	TIME 65 - 79 MS	76.63 MS
ROTATION ANGLE-TIME CURVE		
DECAY TIME TO ZERO	147 - 174 MS	165.75 MS
NEGATIVE MOMENT-TIME CURVE		
DECAY TIME TO ZERO	120 - 148 MS	147.75 MS

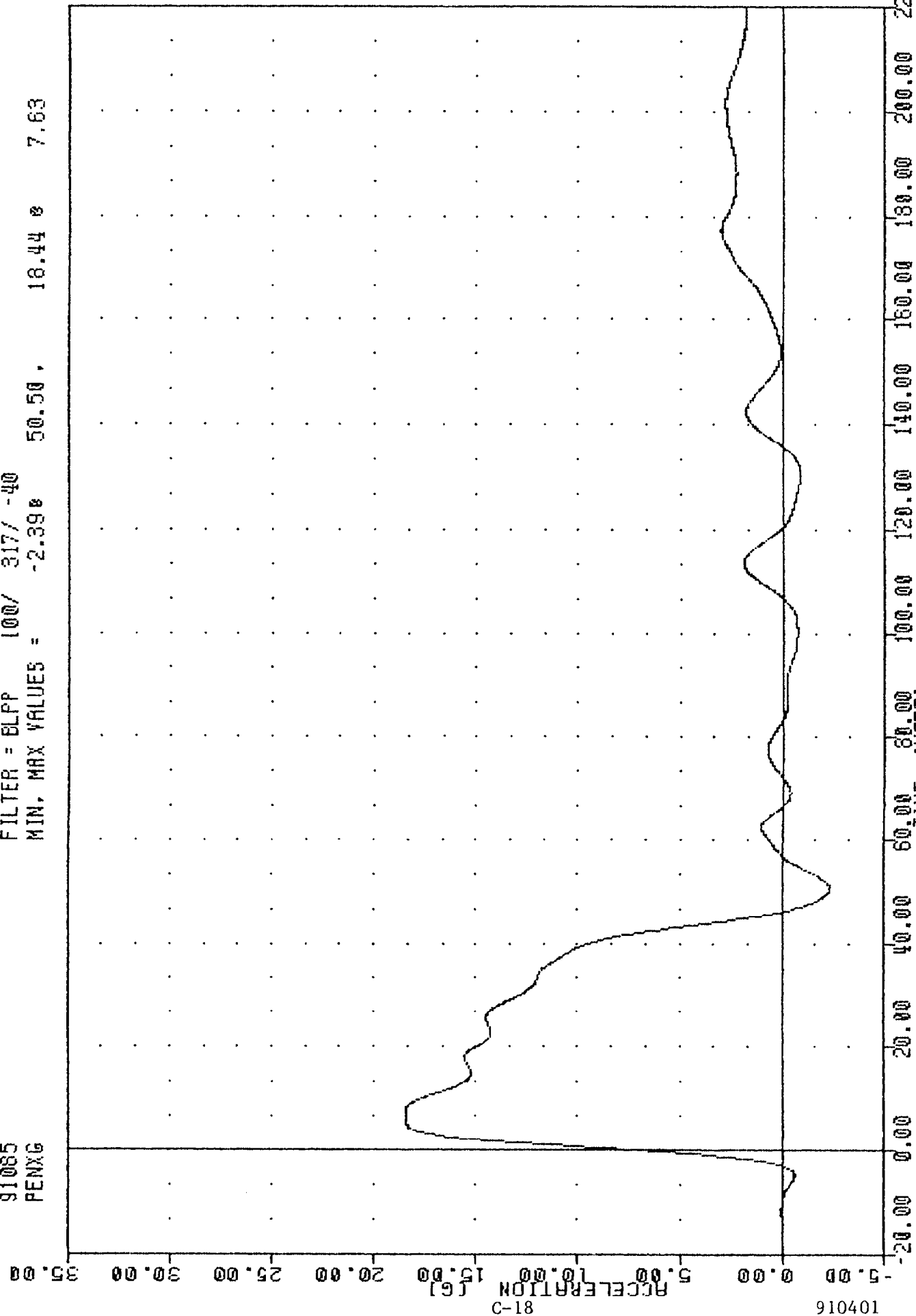
TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middleton

NHTSA , 192C3NE1
 572E SN192 NECK EXT. CAL03
 91085
 PENXG

FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -2.39g 50.50 , 18.44 g 7.63

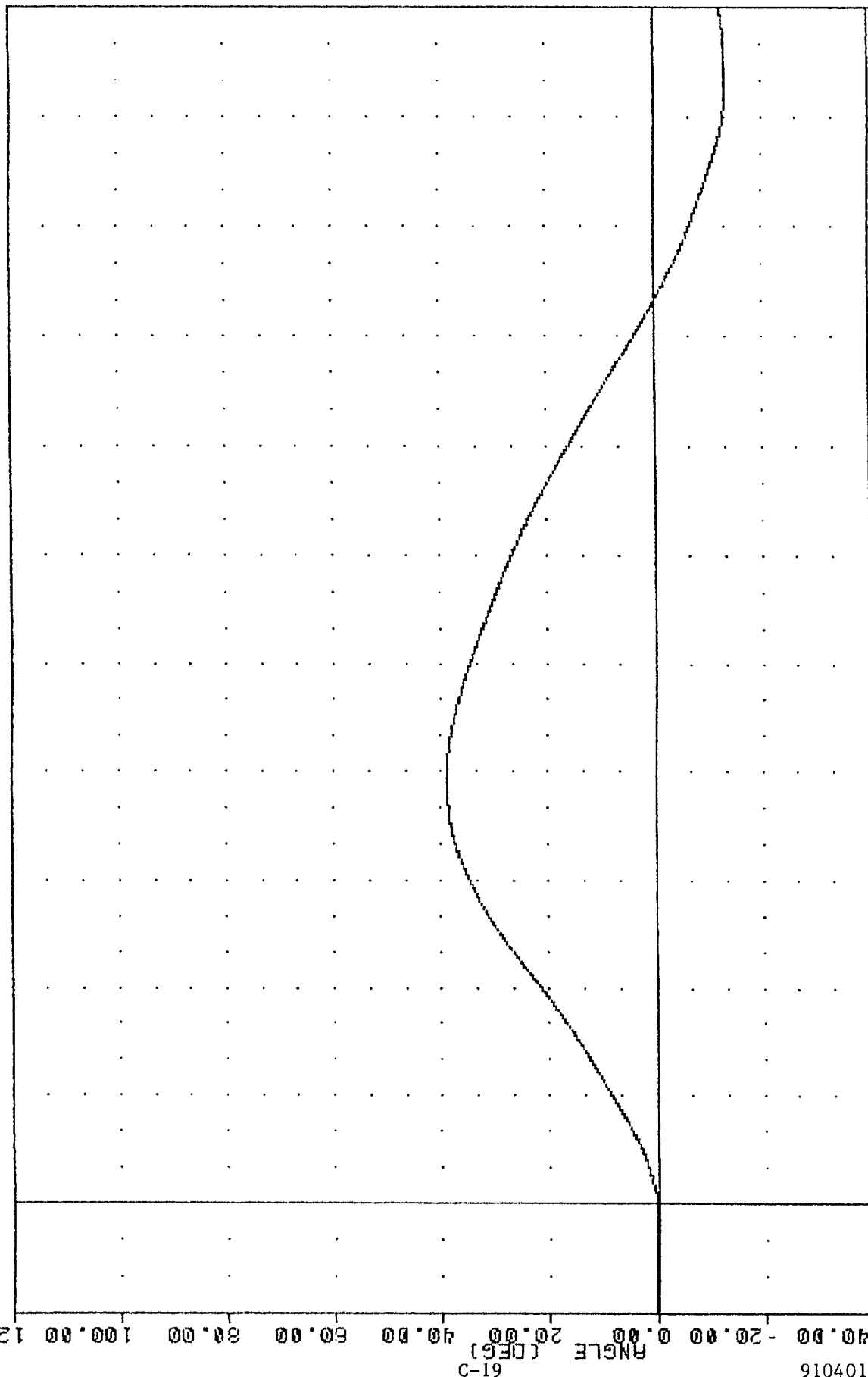


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 PENDULUM DECELERATION

NHTSR , 192C3ME1
 572E 3N192 NECK EXT. CAL03
 91085
 BETA

FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -13.40 206.88 38.78 78.88

120.00



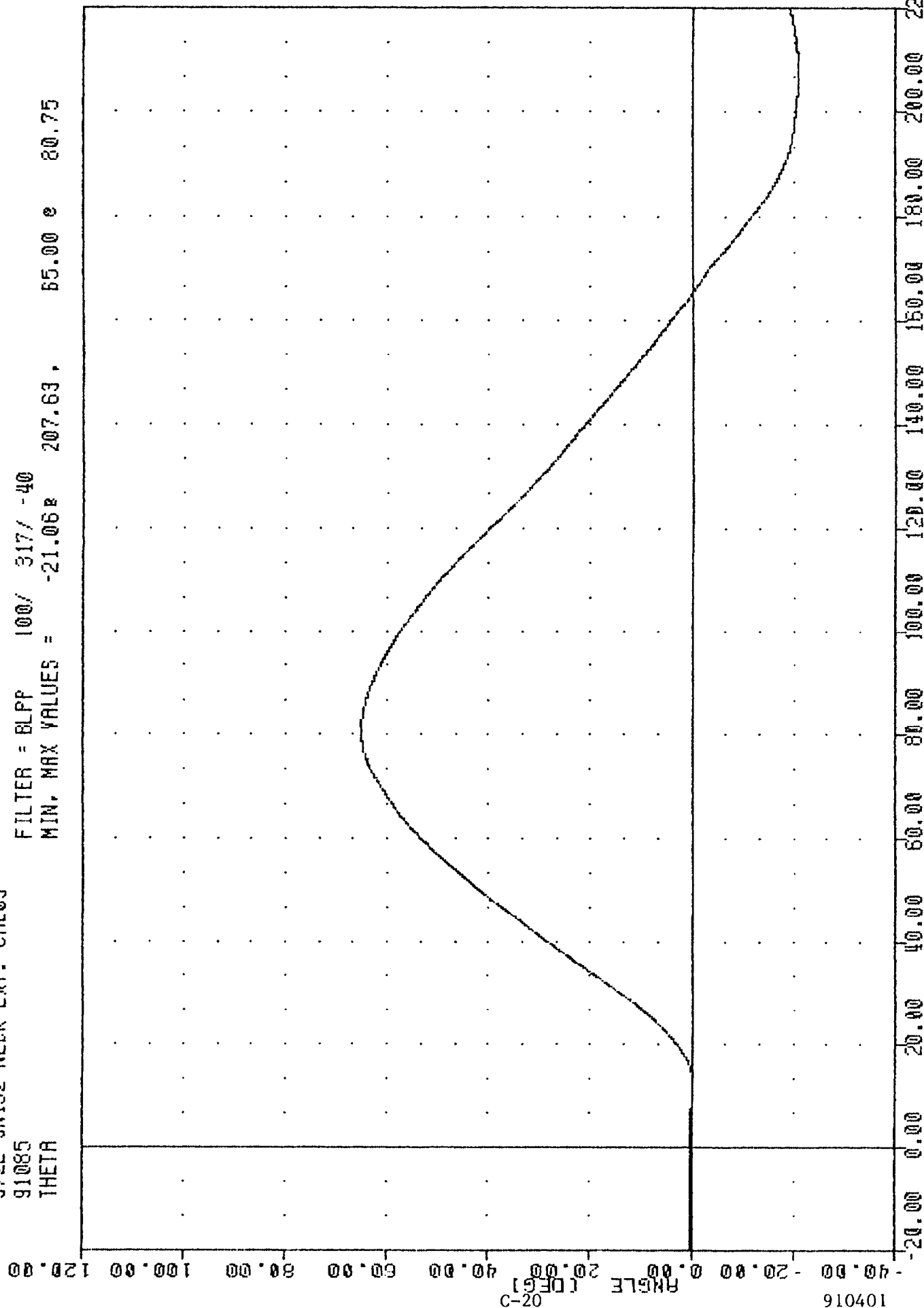
910401

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

CONTINUATION OF PART 572-E NECK

NHTSA , 192C3ME1
 572E SM192 NECK EXT. CAL03
 91085
 THETA

FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -21.06 207.63 , 55.00 80.75



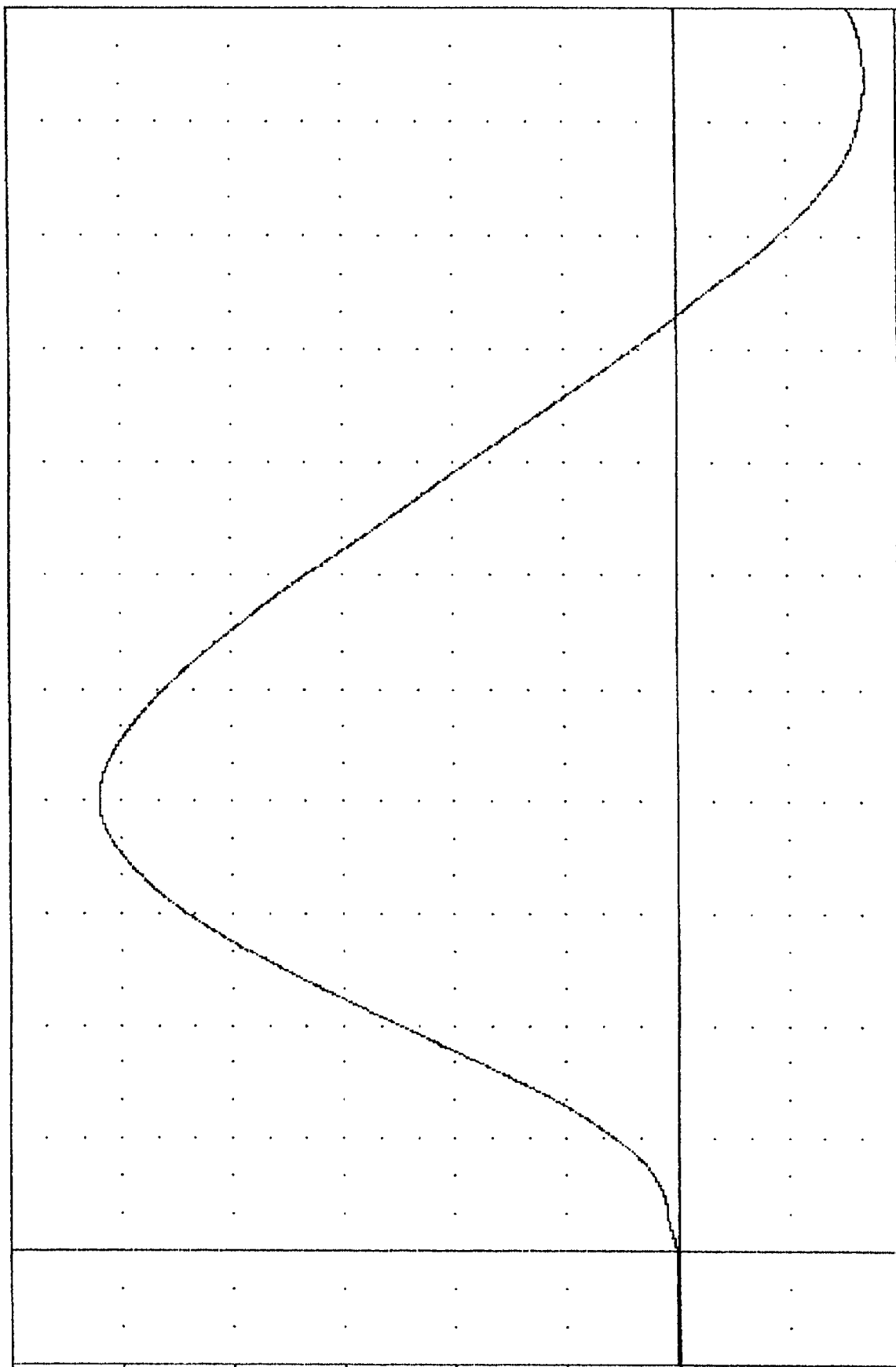
910401

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 ANNOTATION ABOUT OCCIPITAL CONDYLE

WHTSA , 192C3NE1
 572E SN192 NECK EXT. CAL03
 91085
 TOTAN

FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -34.47e 207.50, 103.78 e 80.25

12-3
 9104016
 ANGLE (DEG)



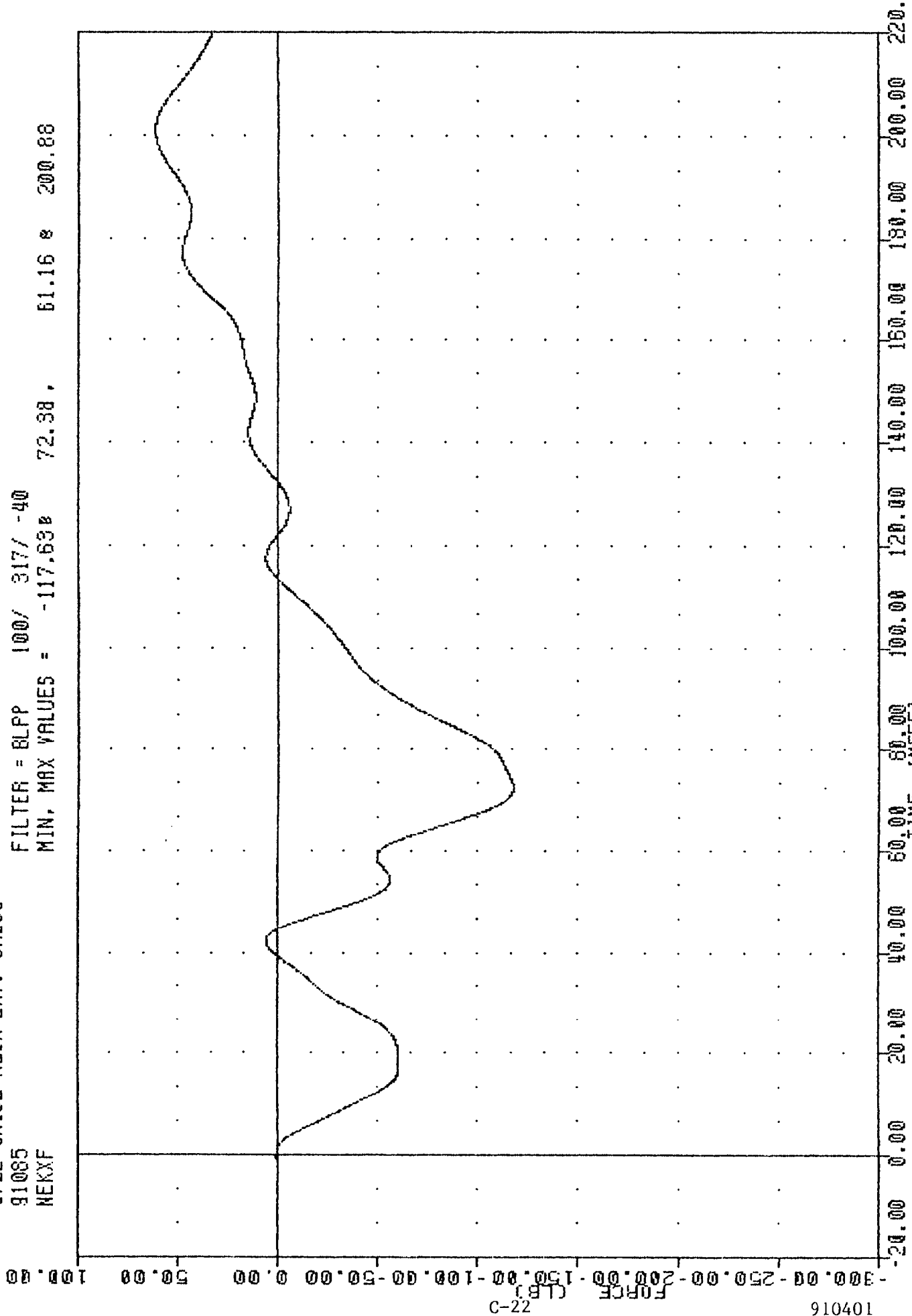
-20.00 0.00 20.00 40.00 60.00 80.00 100.00 120.00 140.00 160.00 180.00 200.00 220.00

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL

NHTSR , 192C3NE1
572E SN192 NECK EXT. CAL03
91085
NEKXF

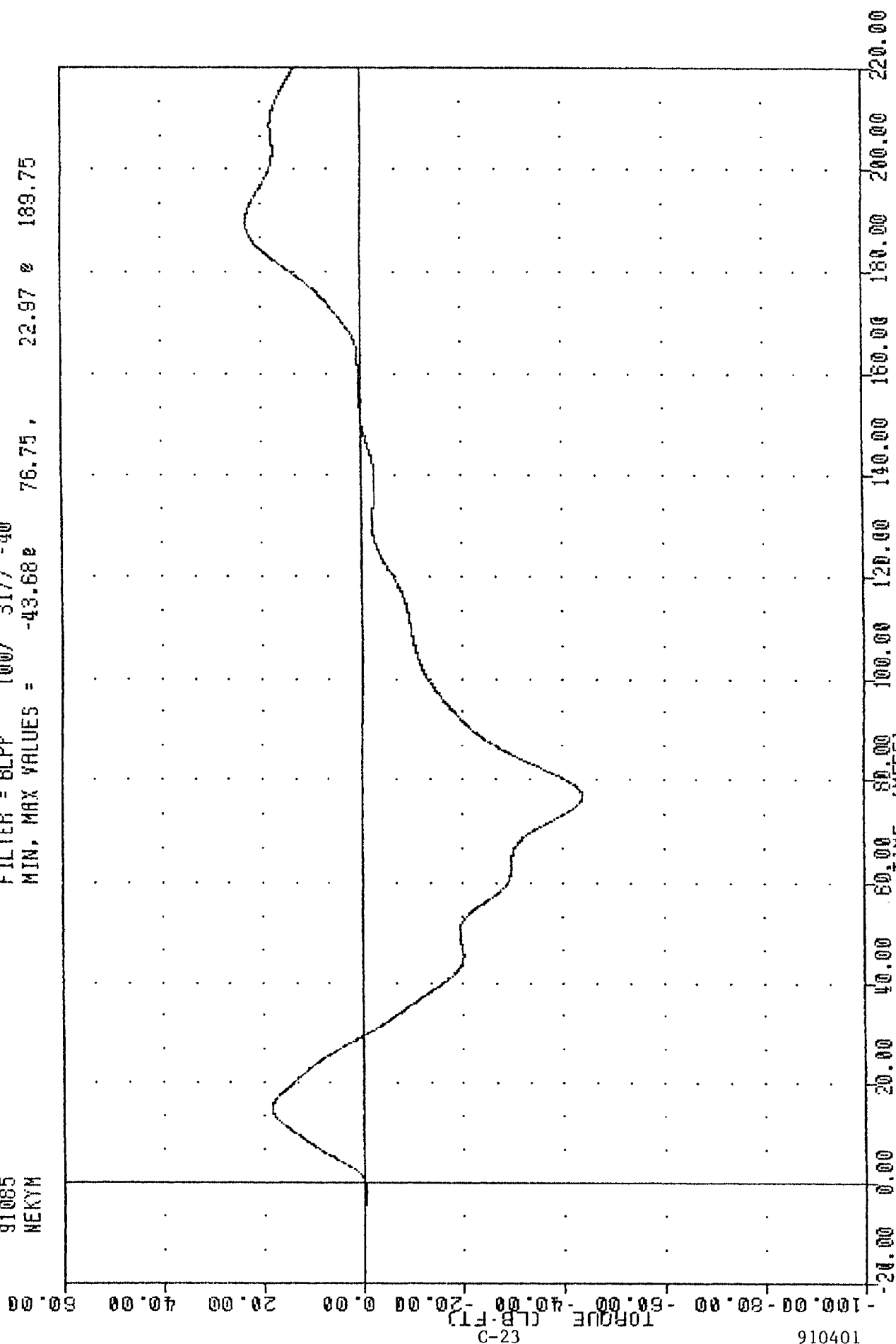
FILTER = BLPP 100/ 317/ -40
MIN, MAX VALUES = -117.638 72.38 , 61.16 8 200.88



PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS

NHTSA , 192C3NE1
 572E 3N192 NECK EXT. CAL03
 91085
 NEKYM

FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -43.68e 76.75 , 22.97 e 189.75



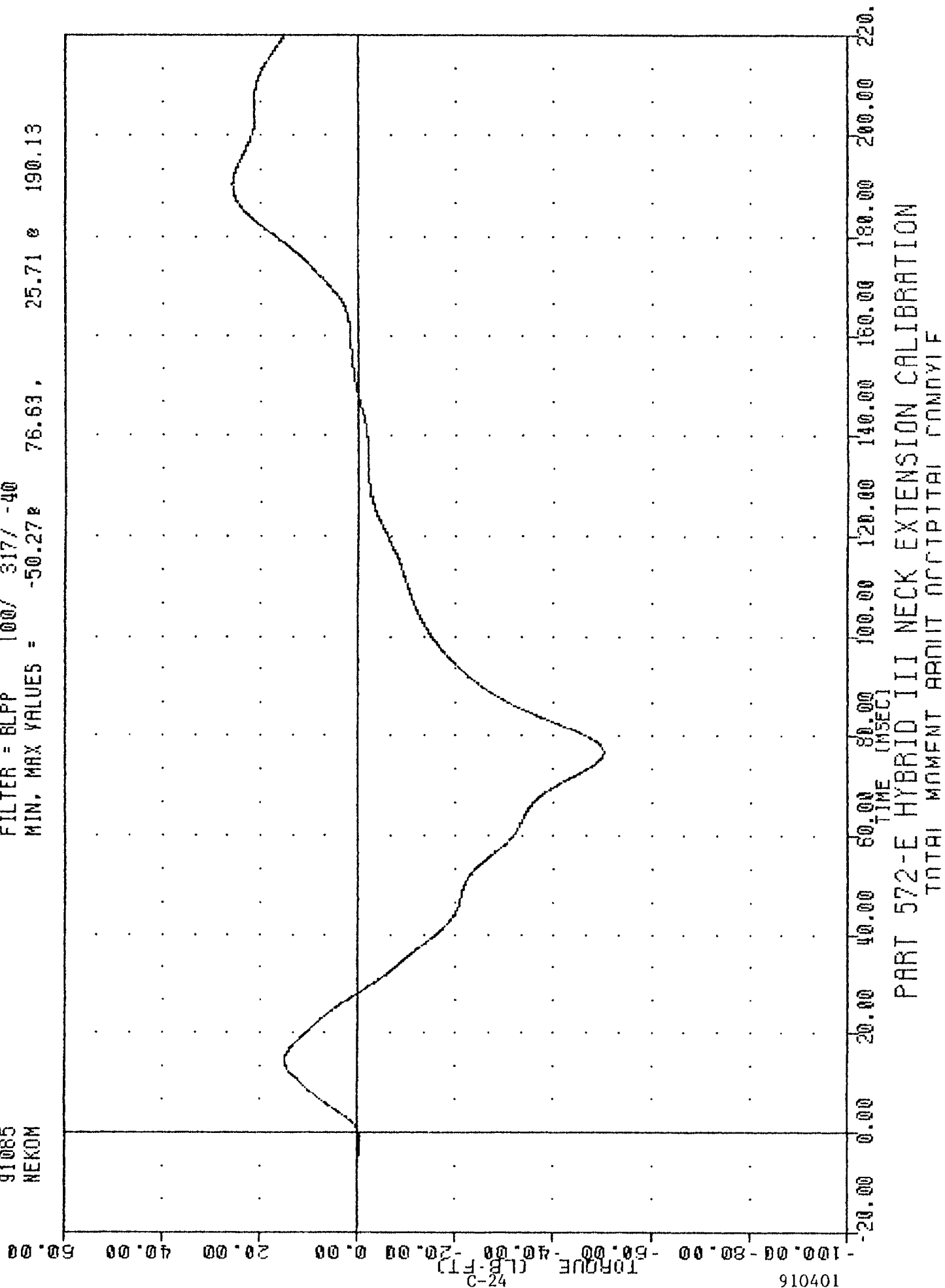
910401

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK EXTENSION CALIBRATION

KHTSA , 192C3NE1
 572E SN192 NECK EXT. CAL03
 91085
 NEKOM

FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -50.27 76.63 , 25.71 190.13



PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 TOTAL MOMENT ARMUT OCCUPANT CONDYLE

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

HYBRID III

26-Mar-91

NHTSA

192C3TH1

572E SN192 H.S. THORAX CAL03

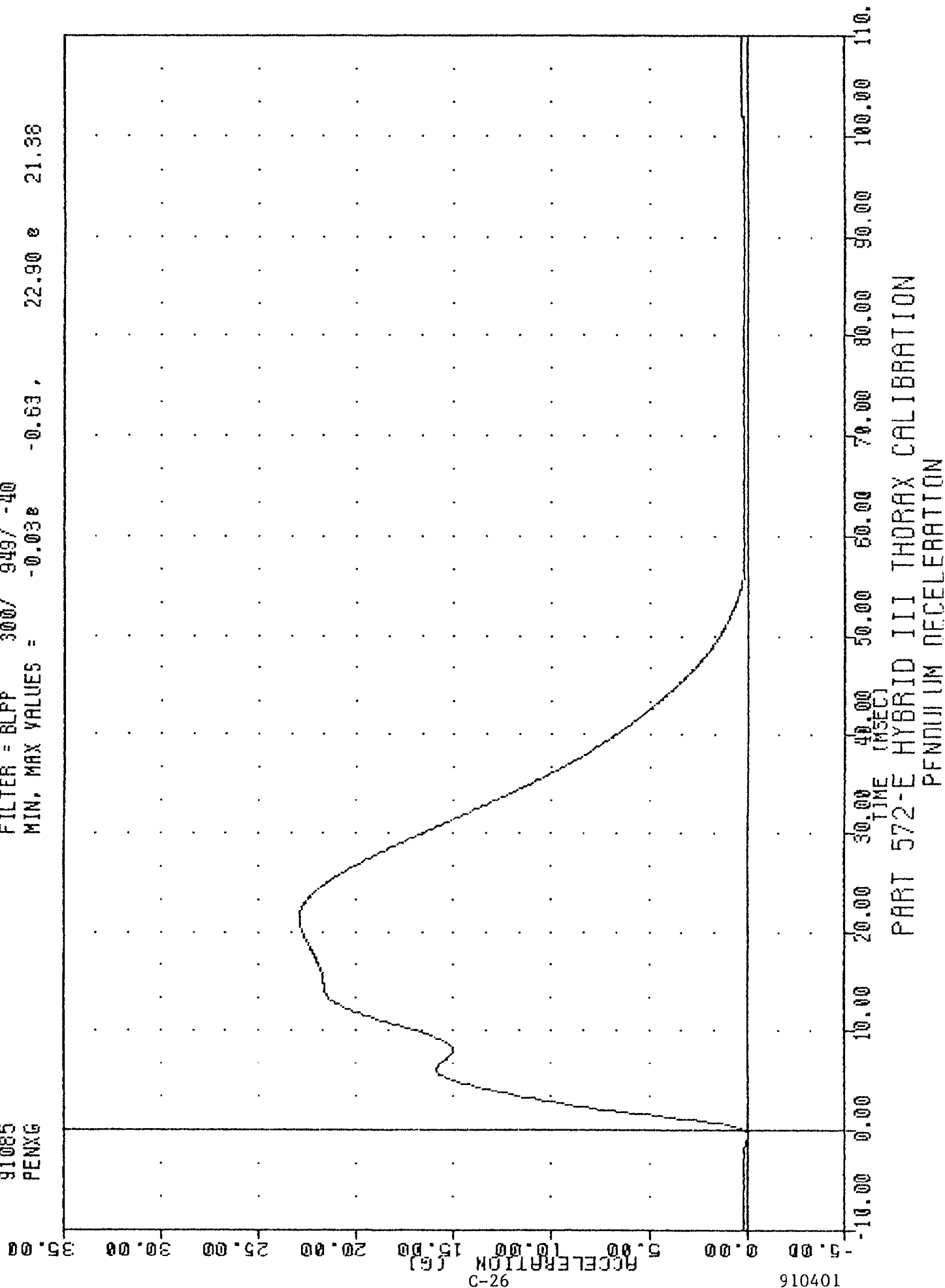
	HIGH SPEED TEST	
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	72.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	49.00 %
PENDULUM VELOCITY	21.6-22.4 FT/SEC	21.92 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 IN	2.65 IN
MAXIMUM RESISTIVE FORCE	1160 - 1325 LBS	1179.4 LBS
INTERNAL HYSTERESIS	69% - 85%	73.1%

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middel

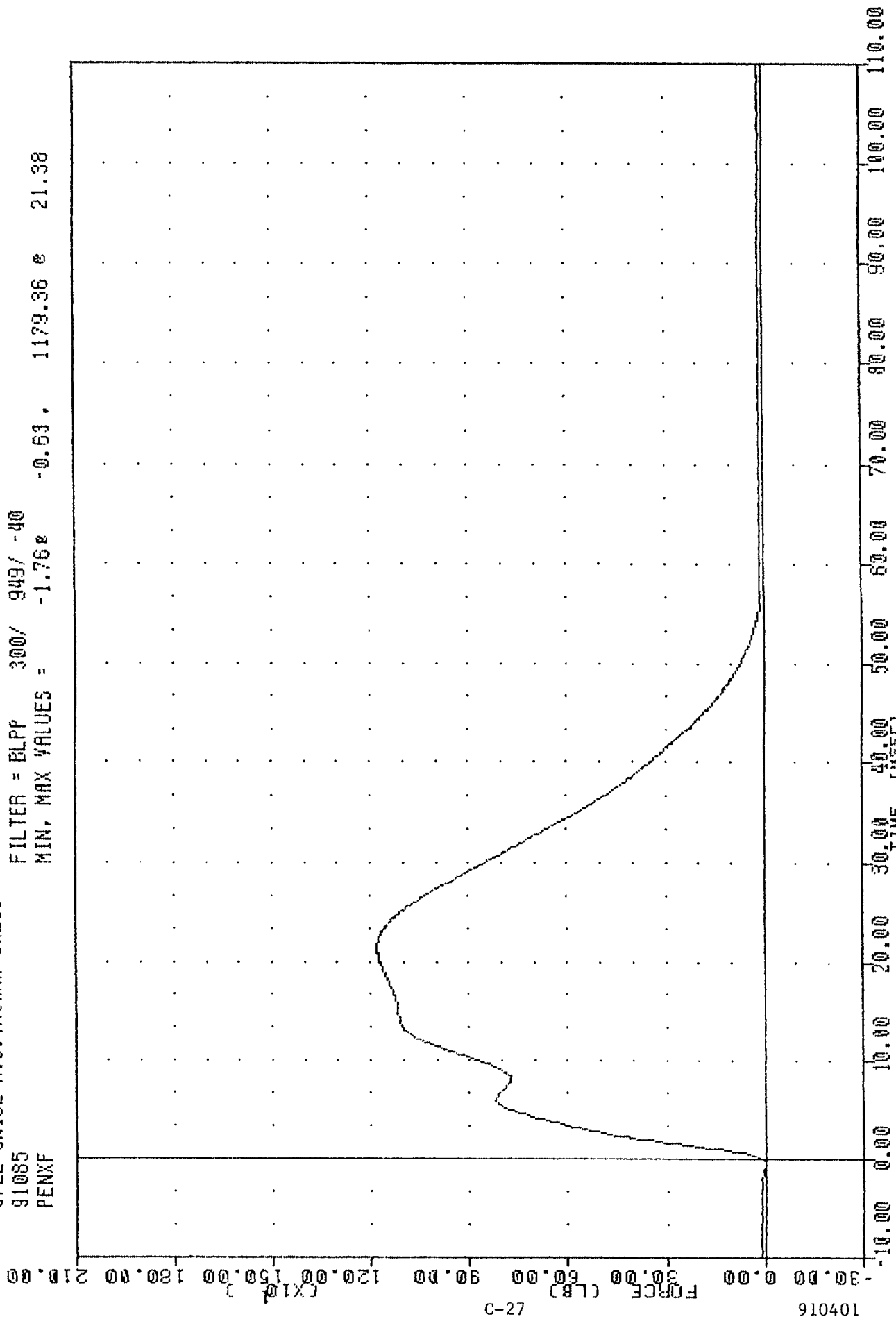
NHT3A , 182C3TH1
 572E SN192 H.S. THORAX CAL03
 91085
 PENXG

FILTER = BLPP 300/ 949/ -40
 MIN, MAX VALUES = -0.03e -0.63, 22.90 e 21.38



NHTSR , 192C3TH1
 572E SN192 H.S.THORAX CRL03
 91085
 PENXF

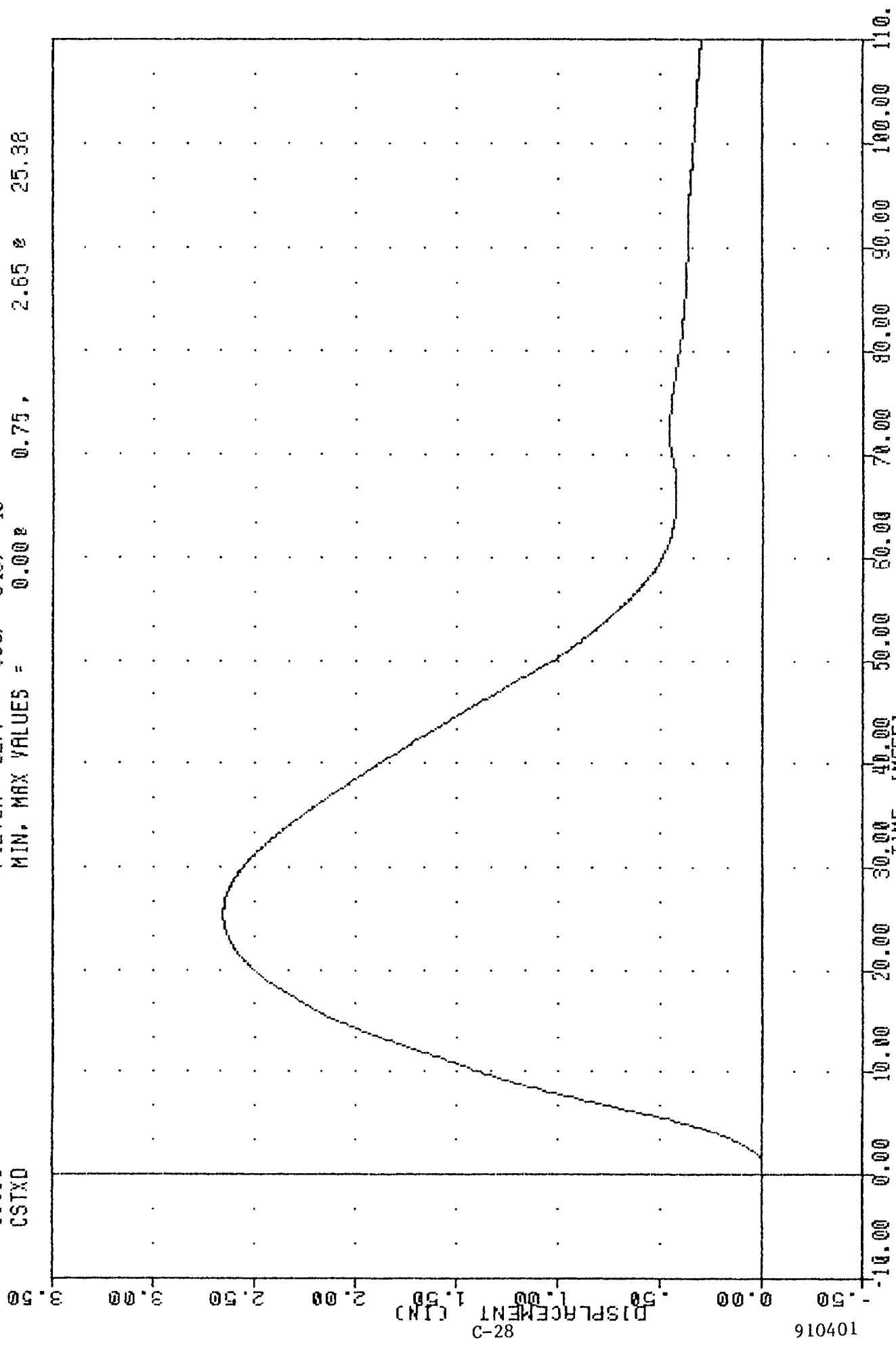
FILTER = BLPP 300/ 949/ -40
 MIN. MAX VALUES = -1.76e 1179.36 e 21.38
 -0.63.



PART 572-E HYBRID III THORAX CALIBRATION

NHTSA , 192C3TH1
 572E SN192 H.S.THORAX CAL03
 91085
 CSTXD

FILTER = BLPP 300/ 943/ -40
 MIN. MAX VALUES = 0.000 0.75 , 2.65 25.38



PART 572-E HYBRID III THORAX CALIBRATION
 STERNUM DISPLACEMENT



NR13H
CSTXD
PENXF

1192031H1
FILTER = BLPP
FILTER = BLPP

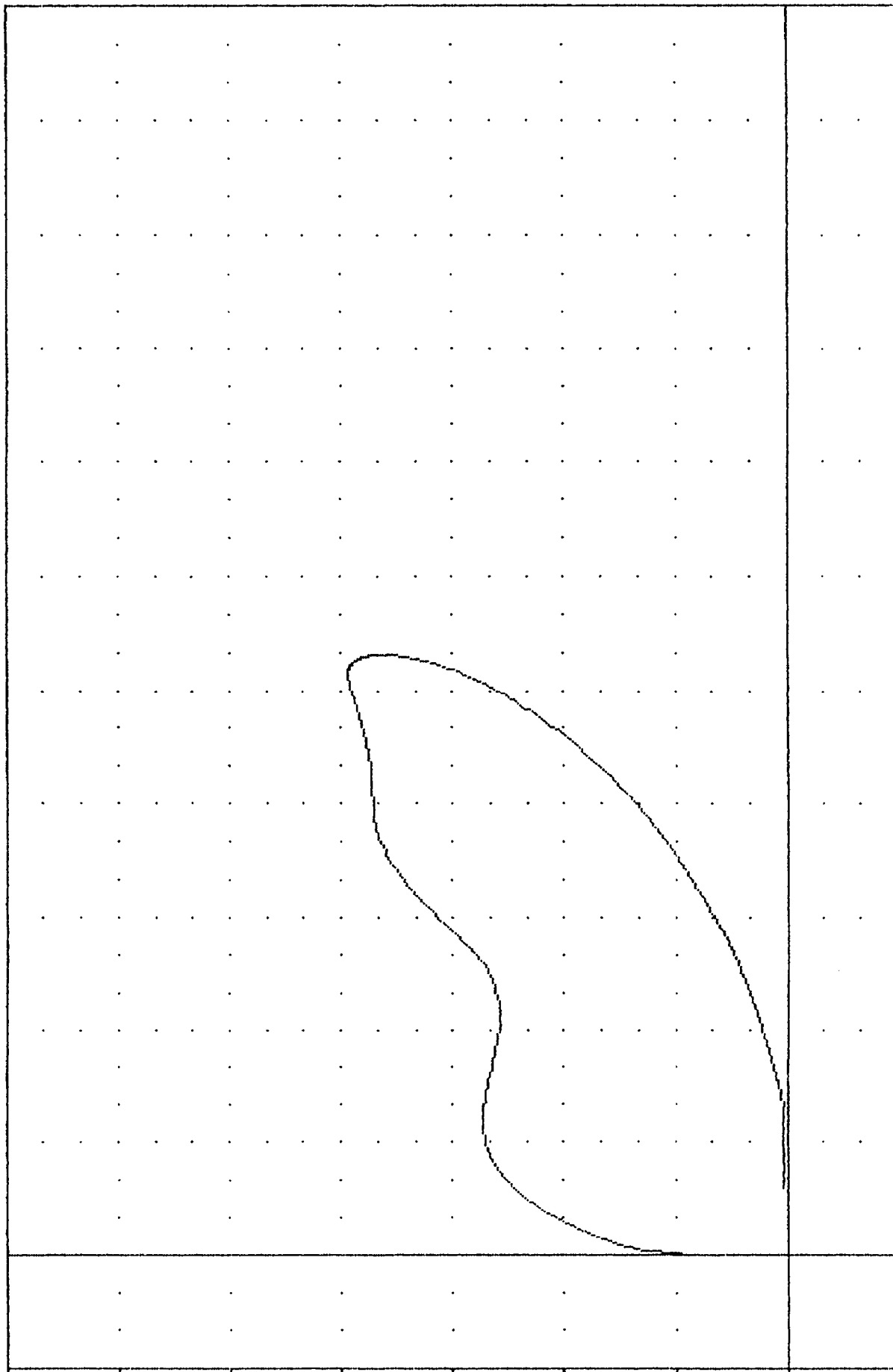
5/2E 5N192 H-3.1HURAX
300/ 949/ -40 MIN, MAX =
300/ 949/ -40 MIN, MAX =

91085
0.00
-1.76

0.75
-0.63
2.65
1179.36

25.38
21.38

910401
C-29
X10⁴
210.00
180.00
150.00
120.00
90.00
60.00
30.00
0.00
-30.00



PART 572-E HYBRID III THORAX CALIBRATION
CHEST DISPLACEMENT VS PENDULUM FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

26-Mar-91

LEFT KNEE

NHTSA

192C3LK1

870E SN192 L.KNEE 1118 CAL 03

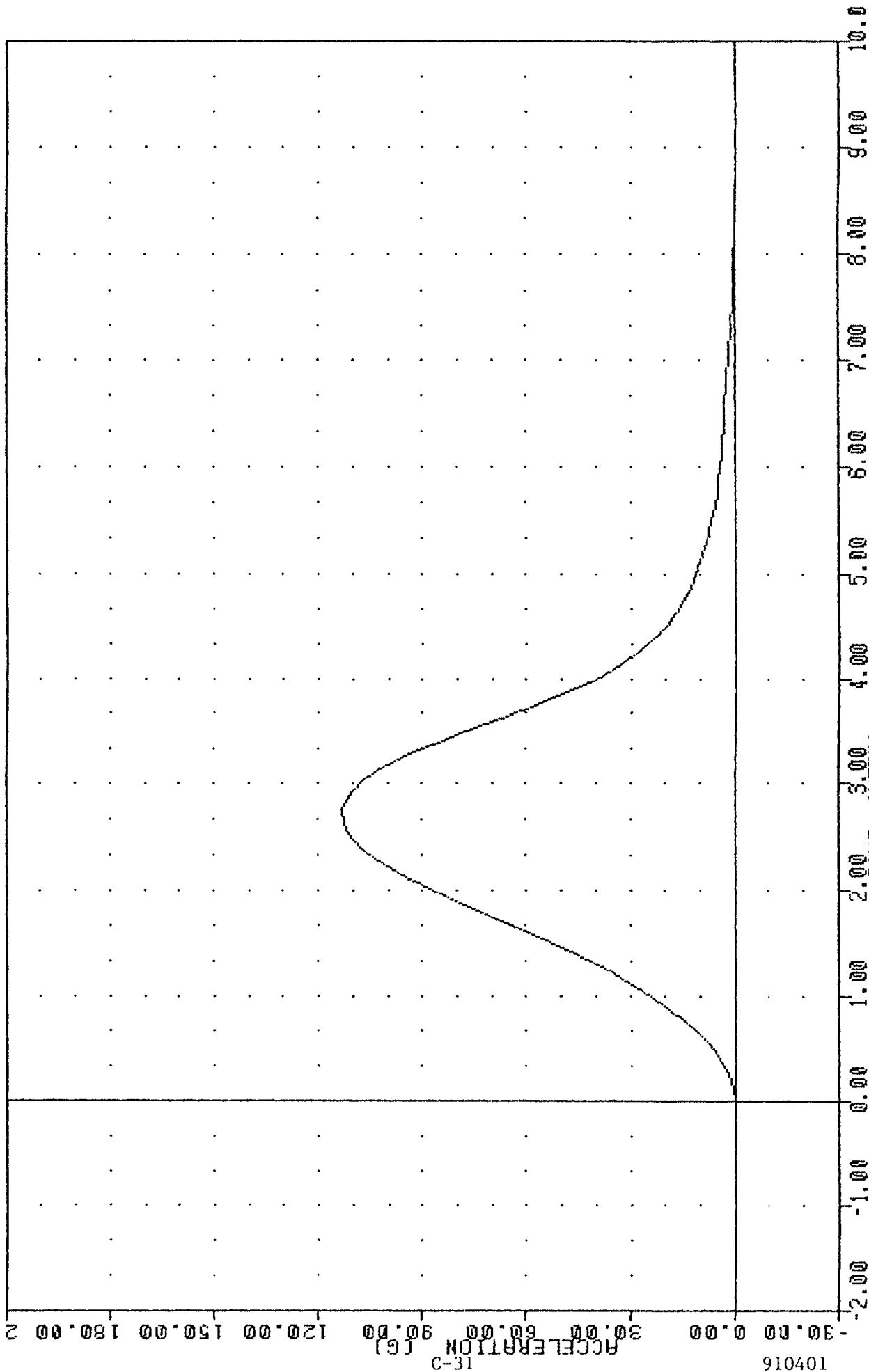
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	72.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	45.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.94 FT/SEC
PEAK KNEE IMPACT FORCE	1060 - 1300 LBS	1240.84 LBS
PROBE WEIGHT	11.0 LBS	

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

WHTSA , 192C3LK1
 572E SN192 L.KNEE 11LB CAL 03
 91085
 PENXG

FILTER = BLPP 1000/ 3162/ -40
 MIN. MAX VALUES = -0.258 -0.13, 112.80 2.75

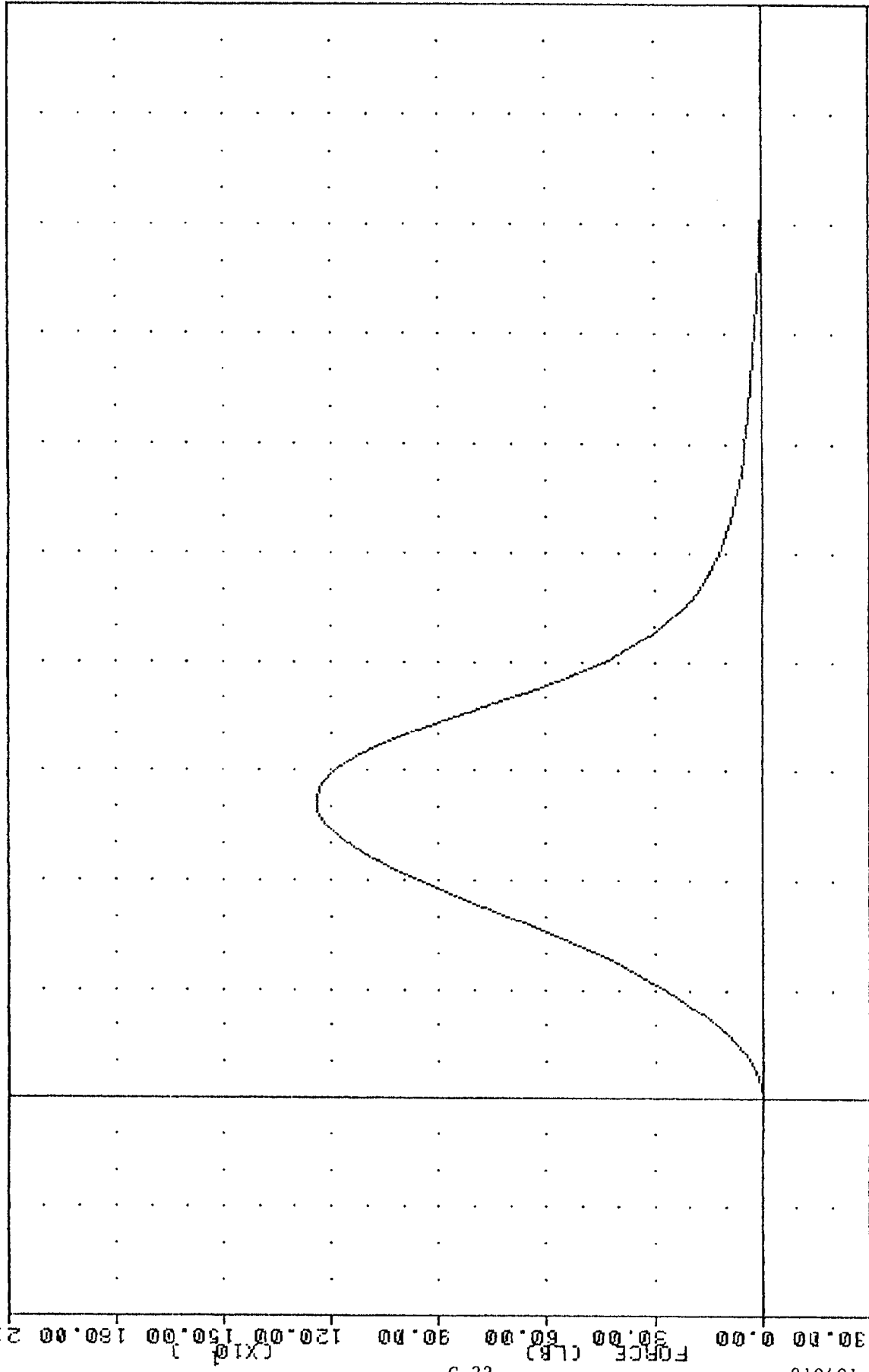


PART 572-E HYBRID III LEFT KNEE CALIBRATION
 PENNIIIIM NFFCFRATTON (111R PFNN.1)

NHTSA , 192C3LK1
 572E SN192 L.KNEE 11LB CAL 03
 91085
 PENXF

FILTER = BLPP 1000/ 3162/ -40
 MIN. MAX VALUES = -2.73E -0.13 , 1240.84 e 2.75

9104016
 C-32
 104016



PART 572-E HYBRID III LEFT KNEE CALIBRATION

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

26-Mar-91

RIGHT KNEE
NHTSA 192C3RK1

572E 3W192 R,KNEE 11LS CAL 03

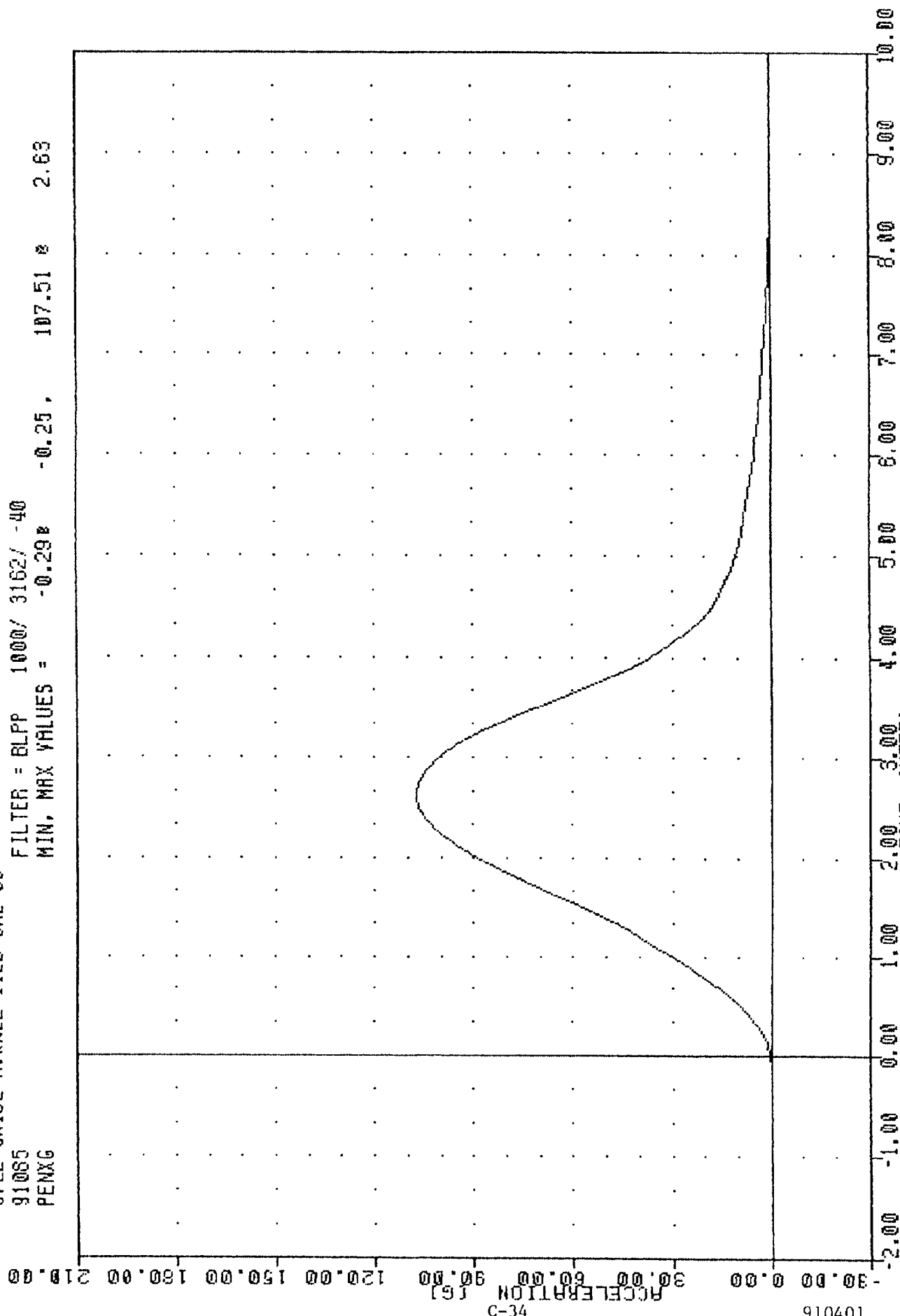
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	72.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	45.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.94 FT/SEC
PEAK KNEE IMPACT FORCE	1060 - 1300 LBS	1182.63 LBS
PROBE WEIGHT	11.0 LBS	

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

NHTSA , 192C3RK1
 572E SN192 R.KNEE 11LB CAL 03
 91085
 PENXG

FILTER = BLPP 1000/ 3162/ -40
 MIN. MAX VALUES = -0.29 107.51 2.63



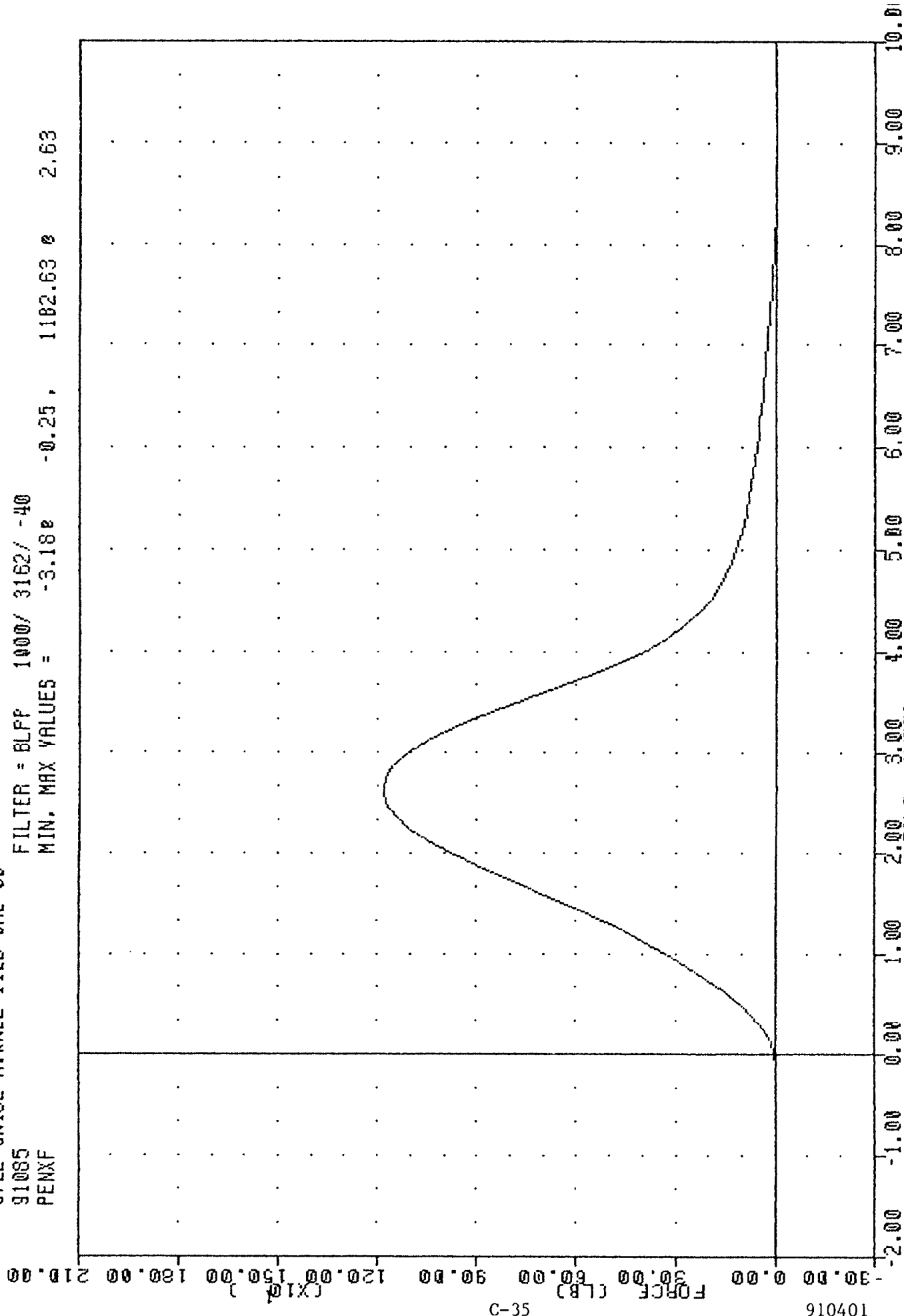
C-34

910401

PART 572-E HYBRID III RIGHT KNEE CALIBRATION

NHTSA , 192C3RK1
 572E SN192 R.KNEE 11LB CAL 03
 91085
 PENXF

FILTER = BLFF 1000/ 3162/ -40
 MIN. MAX VALUES = -3.18e -0.25, 1182.63 0 2.63



910401

C-35

PART 572-E HYBRID III RIGHT KNEE CALIBRATION
 PENNIIUM FORCE (11 IR PENN)

PRE-TEST CERTIFICATION DATA

PASSENGER DUMMY S/N: 142

26-MAR-91

NHTSA 142C4ED1 572E SN142 EXT. DIMENSION CAL04

TEST PARAMETER	(DIMEN.)	SPECIFICATION	TEST RESULTS
TEMPERATURE			72.0 DEG. F
RELATIVE HUMIDITY			45.0 %
LOCATION FOR CHEST CIRCUMFERENCE (AA)		16.9-17.1 IN	17.0 IN
LOCATION FOR WAIST CIRCUMFERENCE (BB)		8.9- 9.1 IN	9.0 IN
CHEST CIRCUMFERENCE (Y)		38.2-39.4 IN	38.8 IN
WAIST CIRCUMFERENCE (Z)		32.9-34.1 IN	33.2 IN
CHEST DEPTH (D)		8.4- 9.0 IN	8.7 IN
H-POINT HEIGHT (C)		3.3- 3.5 IN	3.4 IN
H-POINT FROM SEATBACK (D)		5.3- 5.5 IN	5.4 IN
SKULL CAP TO BACKLINE (H)		1.6- 1.8 IN	1.7 IN
TOTAL SITTING HEIGHT (A)		34.6-35.0 IN	34.8 IN
THIGH CLEARANCE (F)		5.5- 6.1 IN	5.7 IN
BUTTOCK KNEE LENGTH (K)		22.8-23.8 IN	23.5 IN
BUTTOCK POPLITEAL LENGTH (N)		17.8-18.8 IN	18.7 IN
POPLITEAL HEIGHT (L)		16.9-17.9 IN	17.8 IN
KNEE PIVOT HEIGHT (M)		19.1-19.7 IN	19.3 IN
FOOT LENGTH (P)		9.9-10.5 IN	10.1 IN
FOOT BREADTH (W)		3.6- 4.2 IN	3.8 IN
SHOULDER PIVOT FROM BACKLINE (E)		3.3- 3.7 IN	3.5 IN
SHOULDER BREADTH (V)		16.6-17.2 IN	16.8 IN
SHOULDER PIVOT HEIGHT (B)		19.9-20.5 IN	20.1 IN
ELBOW REST HEIGHT (J)		7.5- 8.3 IN	8.2 IN
SHOULDER-ELBOW LENGTH (I)		13.0-13.6 IN	13.6 IN
BACK OF ELBOW TO WRIST PIVOT (G)		11.4-12.0 IN	11.5 IN

TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

HYBRID III

26-Mar-91

NHTSA

142C4HD1

572E SN142 HEAD DROP CAL 04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	72.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	48.00 %
PEAK RESULTANT ACCELERATION	225 - 275 G	244.12 G
PEAK LATERAL ACCELERATION	15 G MAX	-3.80 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

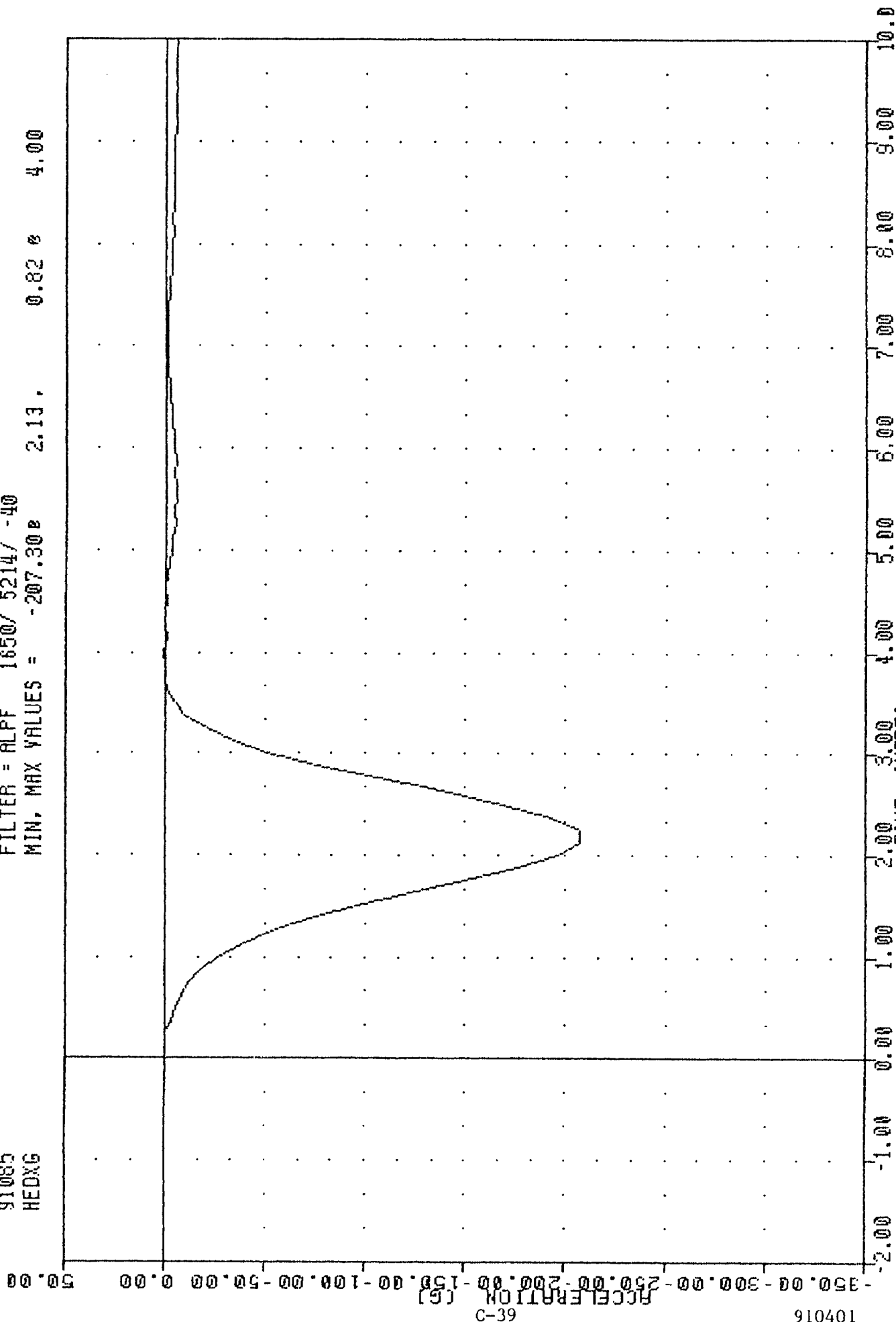
TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middleton

NHTSA , 142C4H01
 572E SN142 HEAD DROP CAL 04
 91085
 HEDXG

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -207.30e 2.13, 0.82 e 4.00

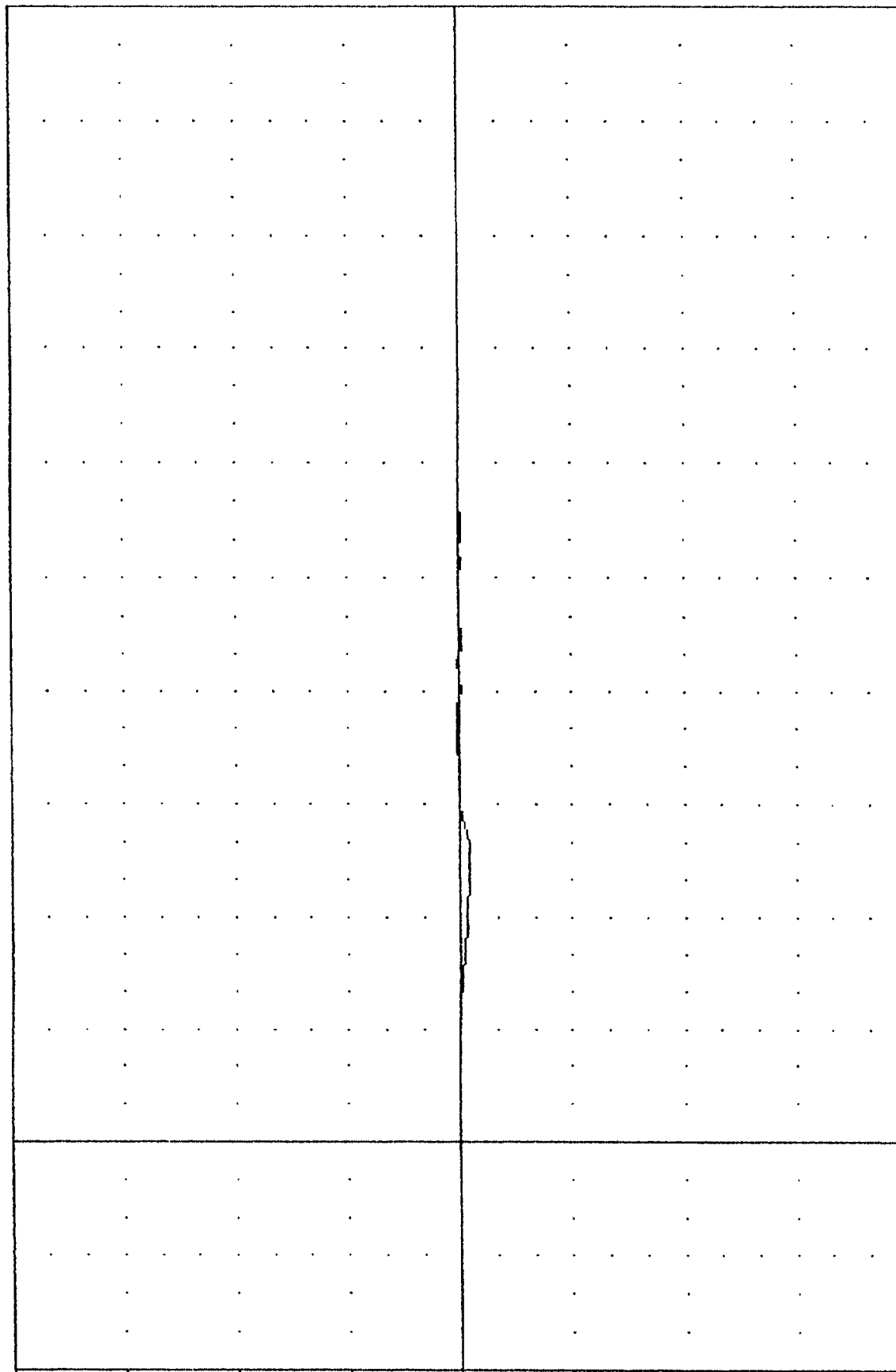


PART 572-E HYBRID III HEAD CALIBRATION
 HEAD ACCELERATION Y AXIS

NHTSR , J42C4HD1
 572E SN142 HEAD DROP CAL 04
 91085
 HEDYG

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -3.60e 2.63, 1.48 e 3.75

ACCELERATION (G)
 -200.00 -150.00 -100.00 -50.00 0.00 50.00 100.00 150.00 200.00



-2.00 -1.00 0.00 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00
 TIME (MSEC)

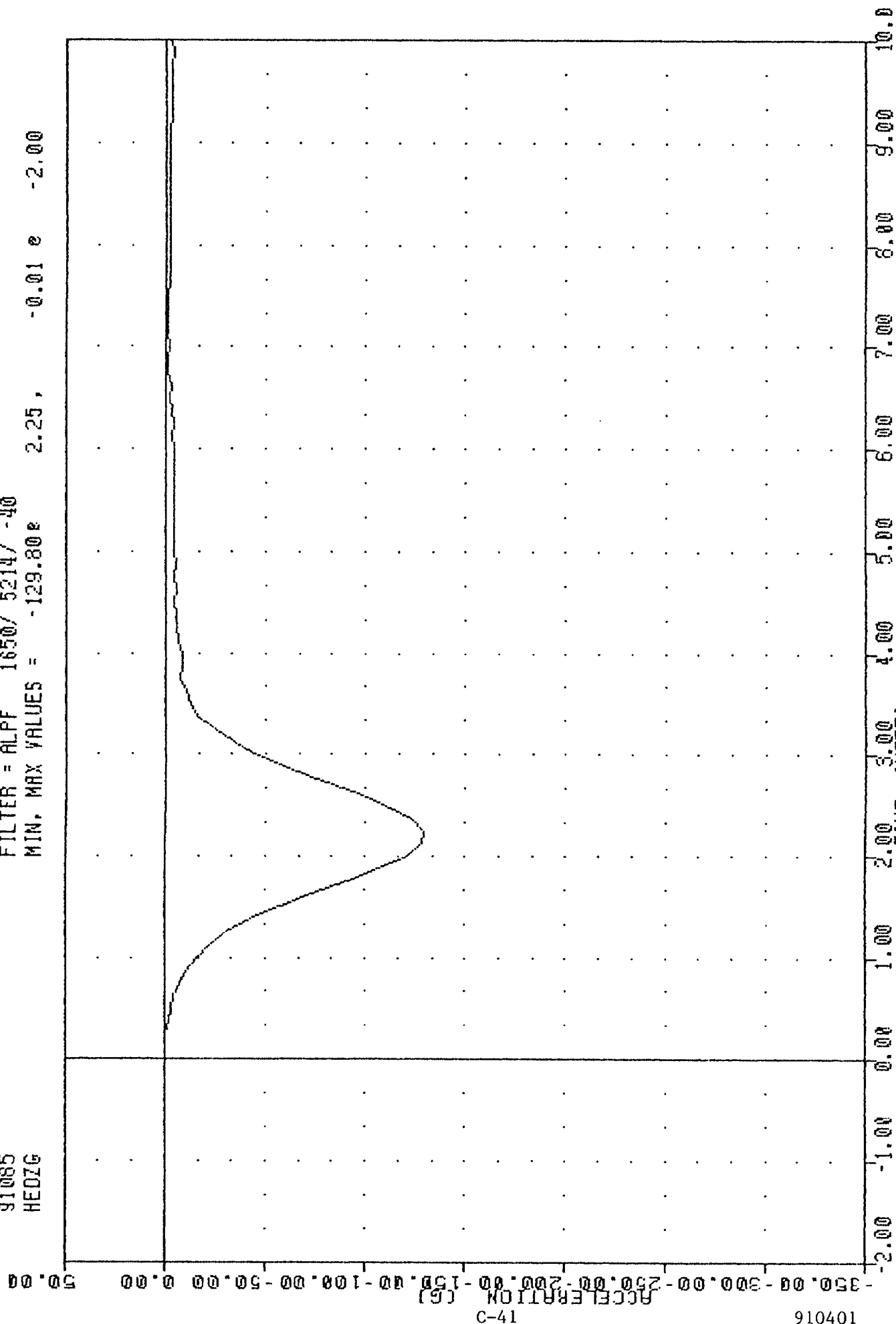
910401

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PART 572-E HYBRID III HEAD CALIBRATION

NHTSA , 142C4HD1
 572E 3N142 HEAD DRDP CAL 04
 91085
 HEADZG

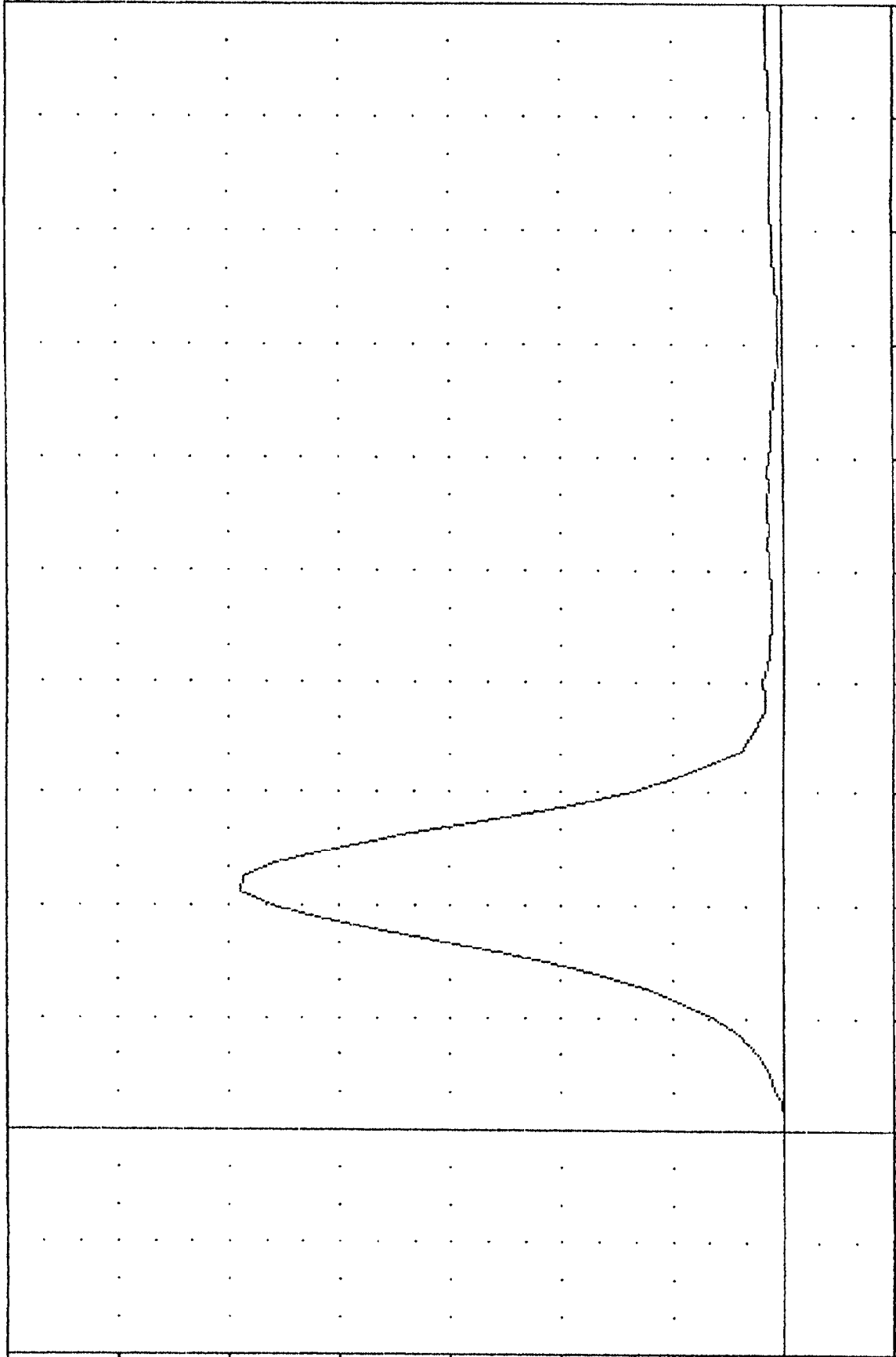
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -129.80e 2.25, -0.01 e -2.00



NHTSR , 142C4HD1
 572E SN142 HEAD DROP CAL 04
 91085
 HEDRG

FILTER = ALFF 1650/ 5214/ -40
 MIN. MAX VALUES = 0.020 -2.00 , 244.12 0 2.13

ACCELERATION (G)
 -50.00 0.00 50.00 100.00 150.00 200.00 250.00 300.00 350.00



910401

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PART 572-E HYBRID III HEAD CALIBRATION

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK FLEXION TEST

HYBRID III

26-Mar-91

6 AXIS NECK TRANSDUCER
NHTSA 142C4NF1

572E SN142 NECK FLEXION CAL 04

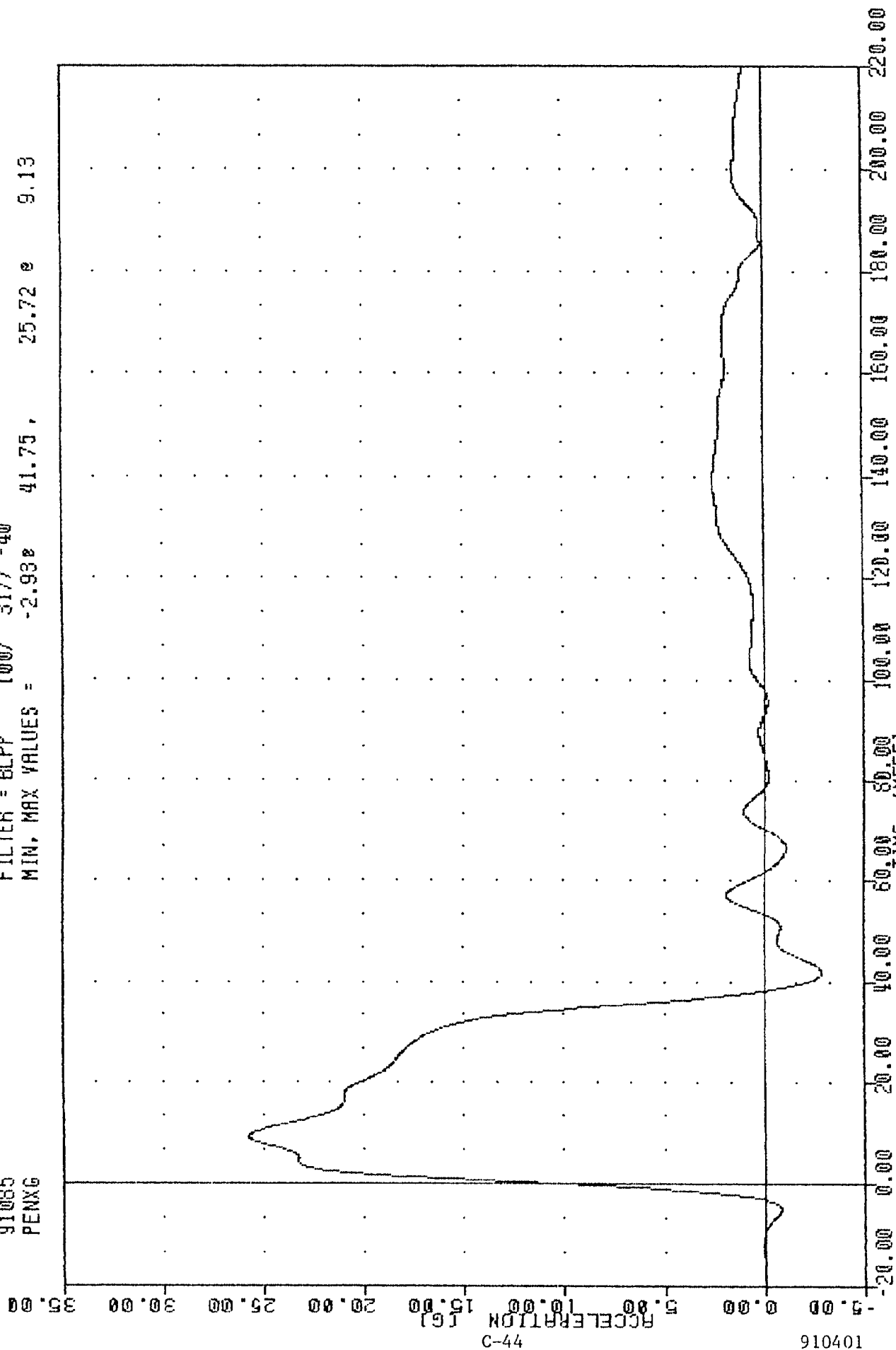
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	72.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	49.00 %
IMPACT VELOCITY	22.6-23.4 FT/SEC	23.08 FT/SEC
PENDULUM	10 MS 22.50 - 27.50 G	25.48 G
DECELERATION	20 MS 17.60 - 22.60 G	20.26 G
	30 MS 12.50 - 18.50 G	16.58 G
MAX PENDULUM G ABOVE 30 MS	29 G MAX	16.51 G
DECELERATION-TIME CURVE		
DECAY TIME TO 5 G	34 - 42 MS	36.00 MS
D PLANE	MAX 64 - 78 DEG.	74.68 DEG.
ROTATION	TIME 57 - 64 MS	58.38 MS
MOMENT ABOUT OCCIPITAL	MAX 65 - 80 FT.LBS	70.63 FT.LBS
CONDYLE	TIME 47 - 58 MS	49.13 MS
ROTATION ANGLE-TIME CURVE		
DECAY TIME TO ZERO	113 - 128 MS	114.50 MS
POSITIVE MOMENT-TIME CURVE		
DECAY TIME TO ZERO	97 - 107 MS	101.00 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

NHTSR , 142C4NF1
 572E 9N142 NECK FLEXION CAL04
 91085
 PENXG

FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -2.93e 41.75, 25.72 e 9.13



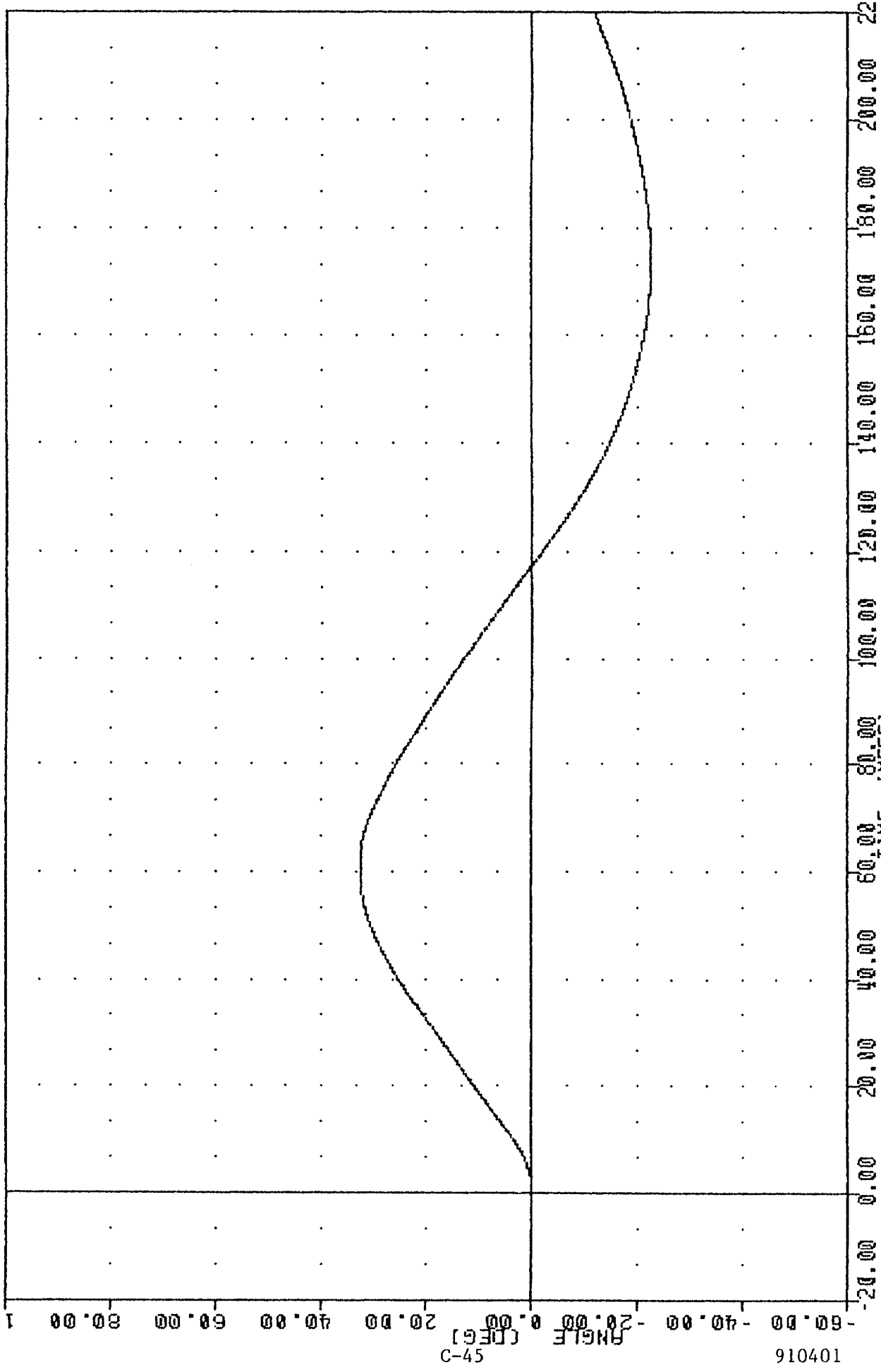
C-44

910401

PART 572-E HYBRID III NECK FLEXION CALIBRATION

NHTSA , 142C4NF1
 572E SN142 NECK FLEXION CAL04
 91085
 BETA

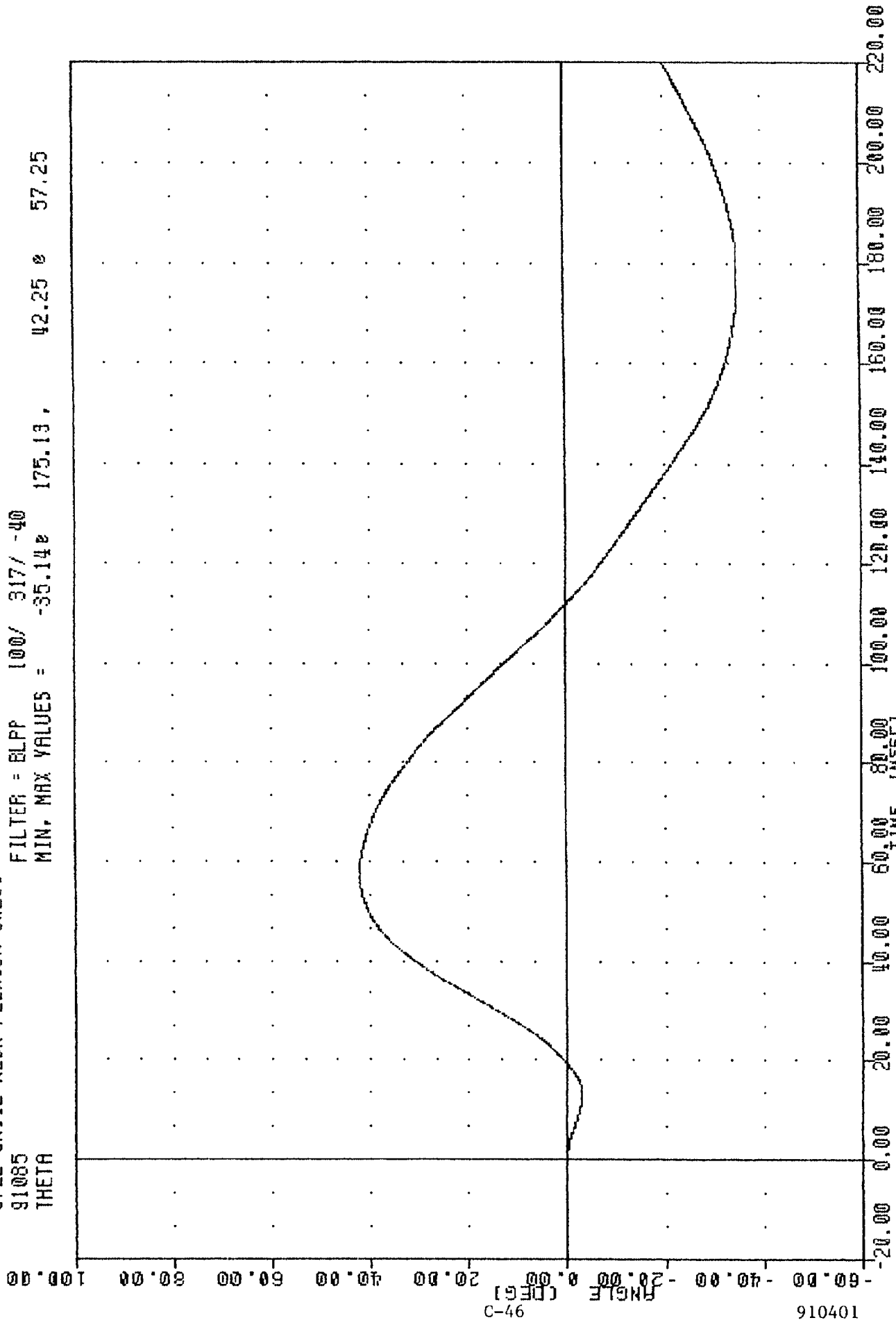
FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -22.88 174.00 32.59 61.75



PART 572-E HYBRID III NECK FLEXION CALIBRATION
 ROTATION ABOUT BASE OF NECK

NHTSA , 142C4NF1
 572E SN142 NECK FLEXION CAL04
 91085
 THETA

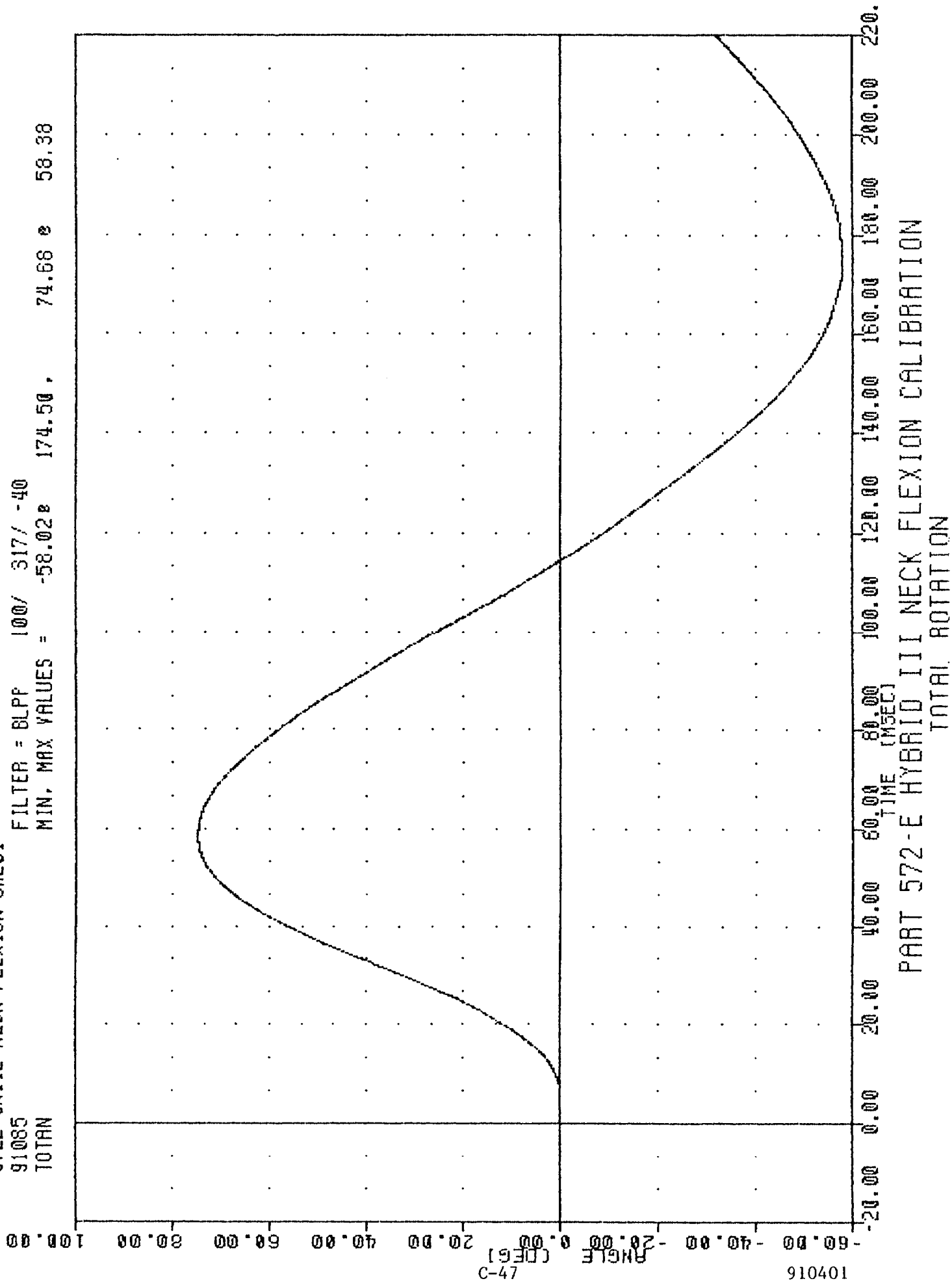
FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -35.14e 175.13, 42.25 e 57.25



PART 572-E HYBRID III NECK FLEXION CALIBRATION

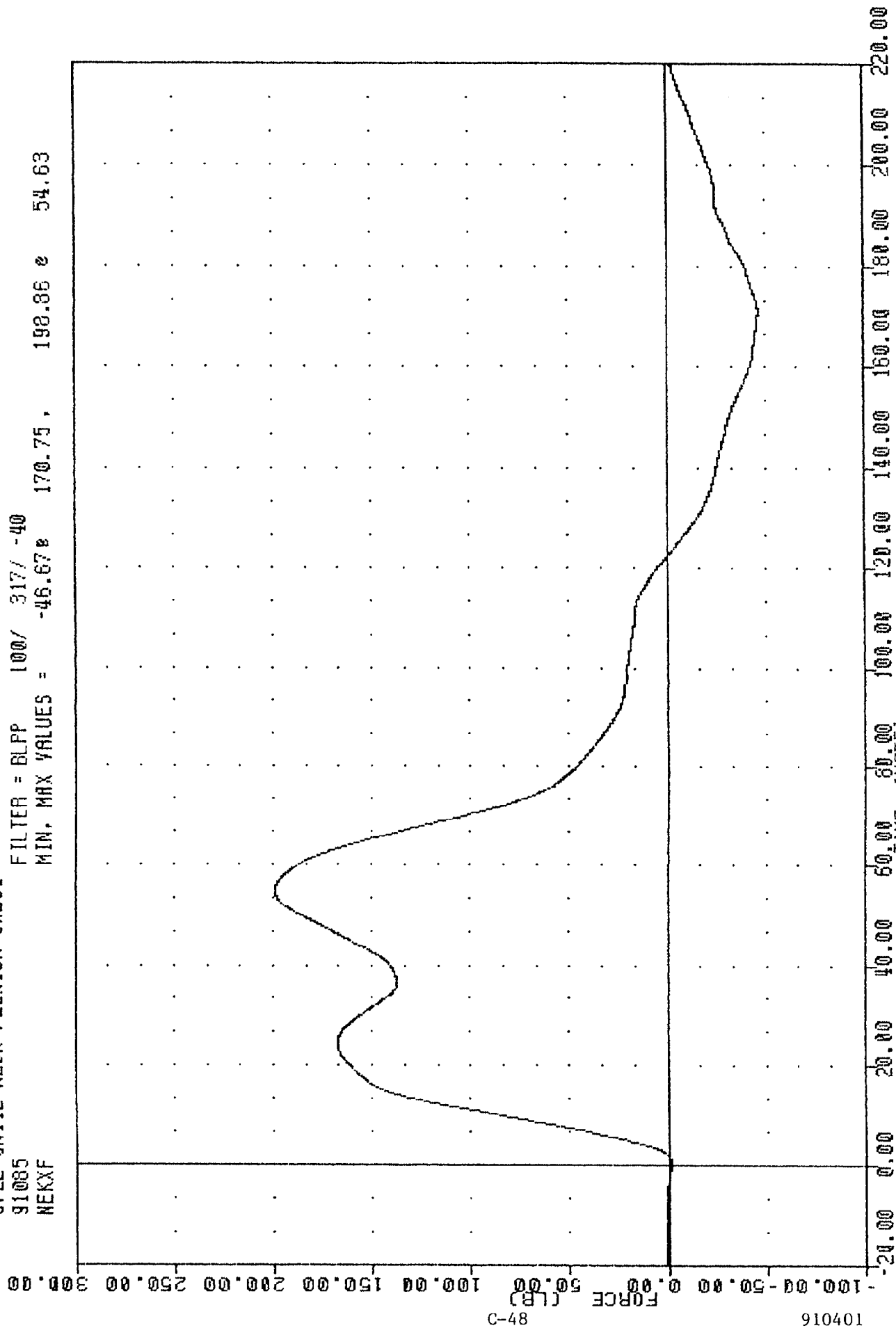
NHTSA , 142C4NF1
572E SN142 NECK FLEXION CAL04
91085
TOTAL

FILTER = BLPP 100/ 317/ -40
MIN, MAX VALUES = -58.02° 174.50 , 74.68 ° 58.38



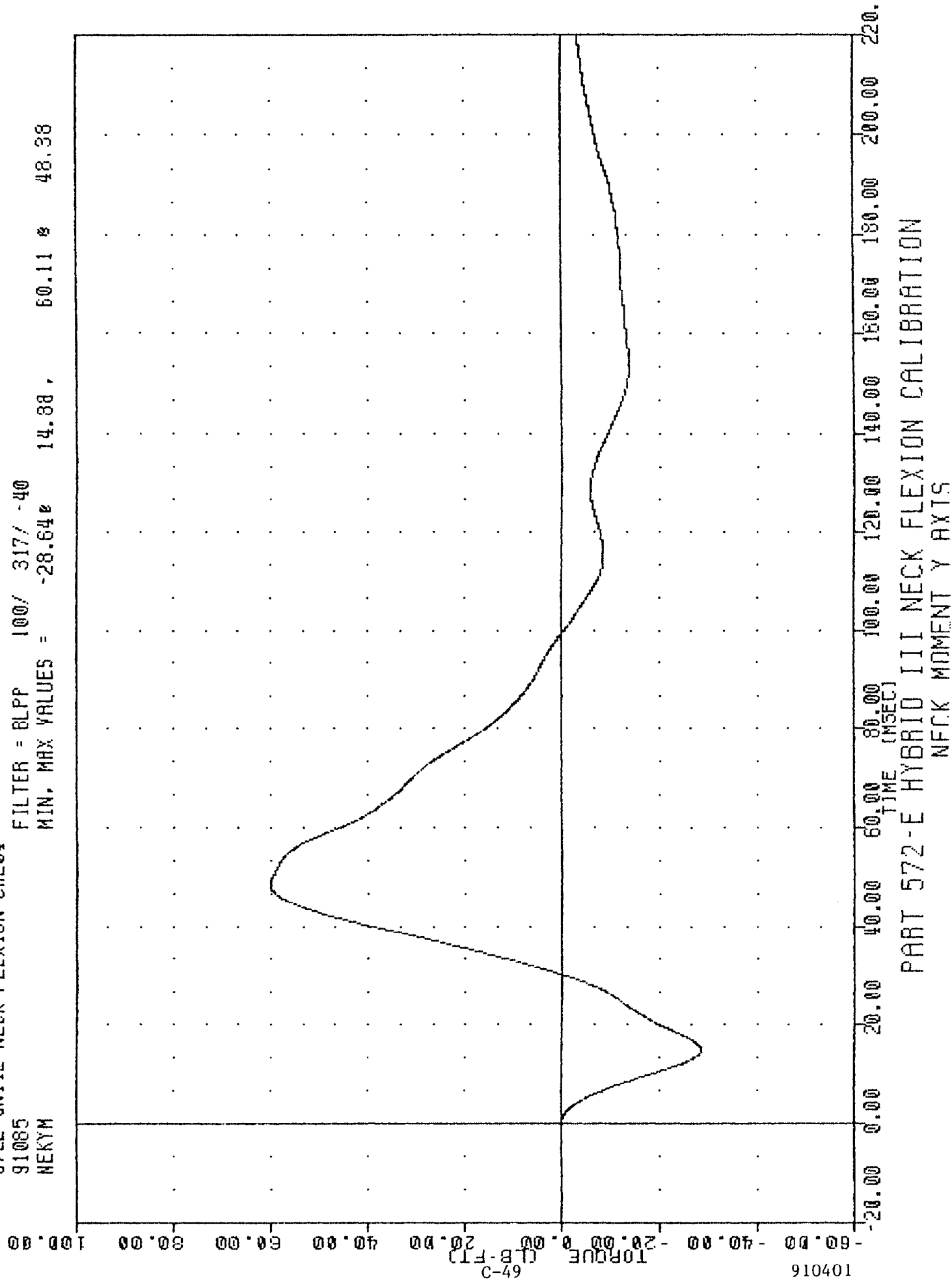
NHTSA , 142C4NF1
 572E SN142 NECK FLEXION CAL04
 91085
 NEKXF

FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -46.67 e 170.75 , 190.86 e 54.63



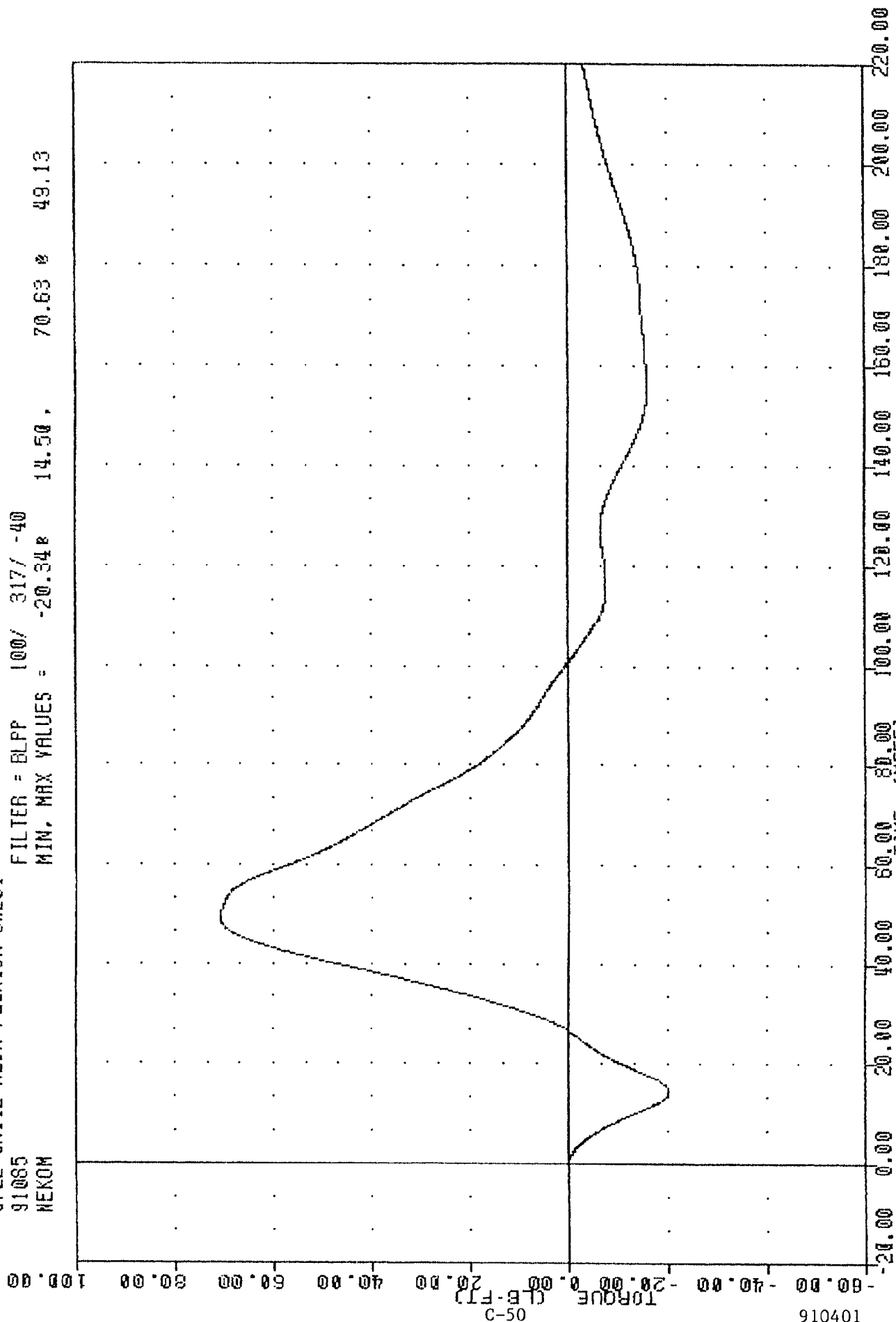
NHTSA , 142C4NF1
 572E SN142 NECK FLEXION CAL04
 91085
 NEKYM

FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -28.64e 14.38, 60.11 e 48.38



NHTSA , 14204NF1
 572E SN142 NECK FLEXION CAL04
 91085
 NEKOM

FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -20.34 14.50 70.63 49.13



TRANSPORTATION RESEARCH CENTER OF OHIO

NECK EXTENSION TEST

HYBRID III

26-Mar-91

6 AXIS NECK TRANSDUCER
NHTSA 142C4NE1

572E SN142 NECK EXT. CAL04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	72.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	49.00 %
IMPACT VELOCITY	19.50-20.30 FT/SEC	19.51 FT/SEC
PENDULUM	10 MS 17.20 - 21.20 G	17.97 G
DECELERATION	20 MS 14.00 - 19.00 G	15.83 G
	30 MS 11.00 - 16.00 G	13.41 G
MAX PENDULUM G ABOVE 30 MS	22 G MAX	13.32 G
DECELERATION-TIME CURVE		
DECAY TIME TO 5 G	38 - 46 MS	41.25 MS
D PLANE	MAX 81 - 106 DEG.	100.53 DEG.
ROTATION	TIME 72 - 82 MS	76.63 MS
MOMENT ABOUT OCCIPITAL	MIN -59.0/-39.0 FT.LBS	-54.28 FT.LBS
CONDYLE	TIME 65 - 79 MS	74.00 MS
ROTATION ANGLE-TIME CURVE		
DECAY TIME TO ZERO	147 - 174 MS	155.88 MS
NEGATIVE MOMENT-TIME CURVE		
DECAY TIME TO ZERO	120 - 148 MS	144.13 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN *Chas. Middleton*

NHTSR , 142C4ME1
 572E SN142 NECK EXT. CAL04
 91085
 PENXG

FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -3.07e 49.38 , 18.59 e 7.88

35.00

30.00

25.00

20.00

15.00

10.00

5.00

0.00

-5.00

-10.00

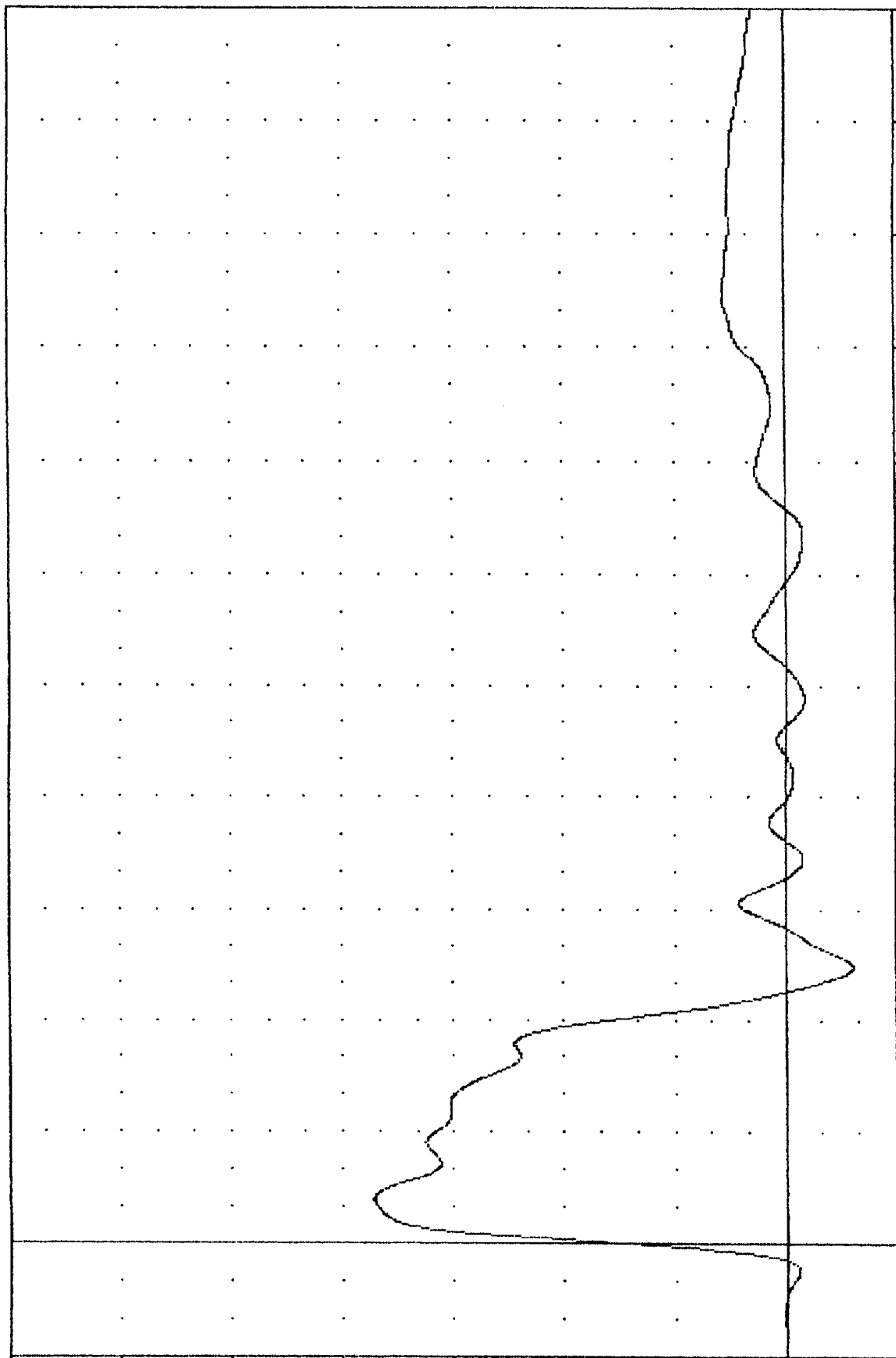
-15.00

-20.00

-25.00

-30.00

-35.00



910401

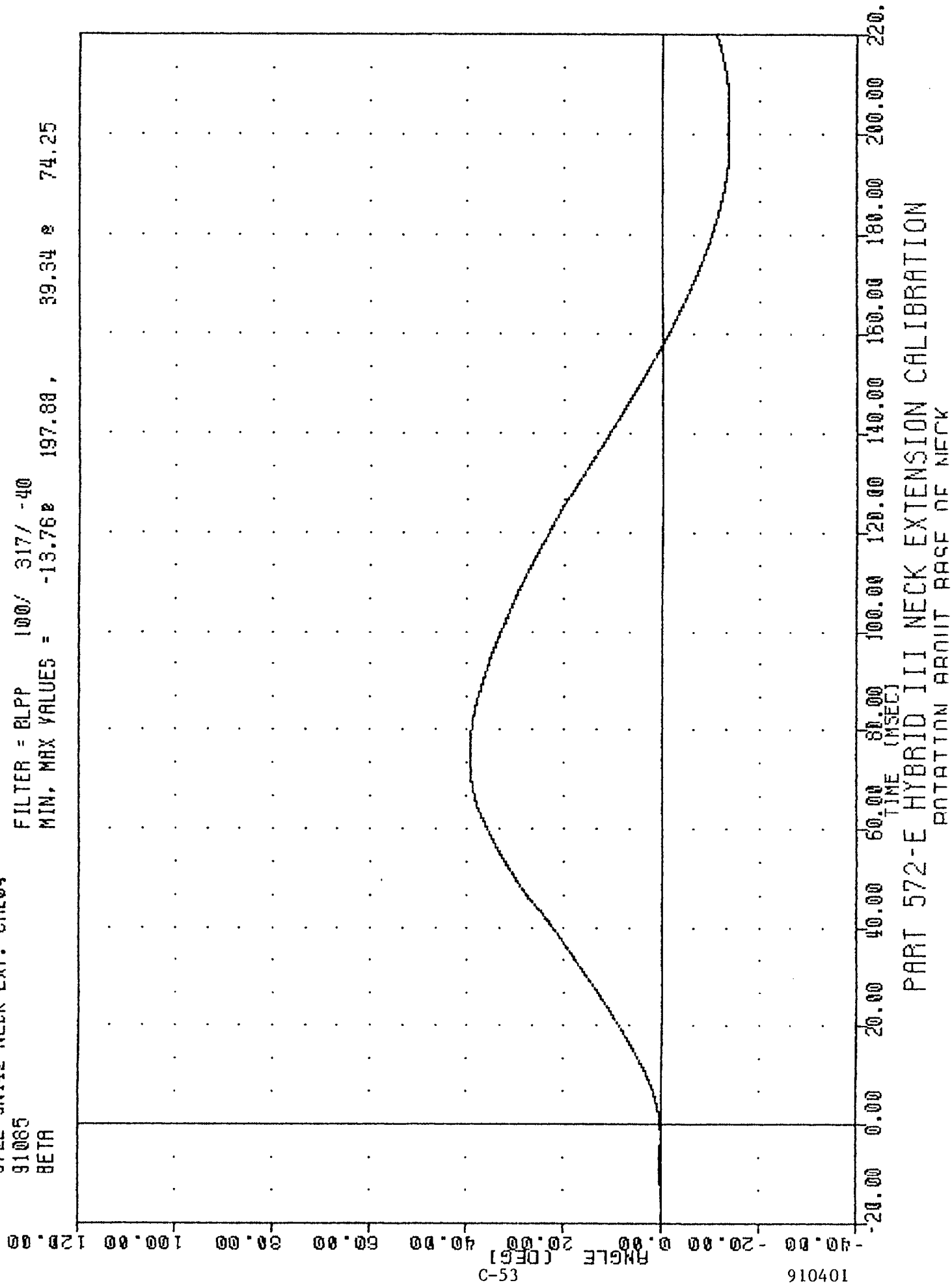
C-52

-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

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

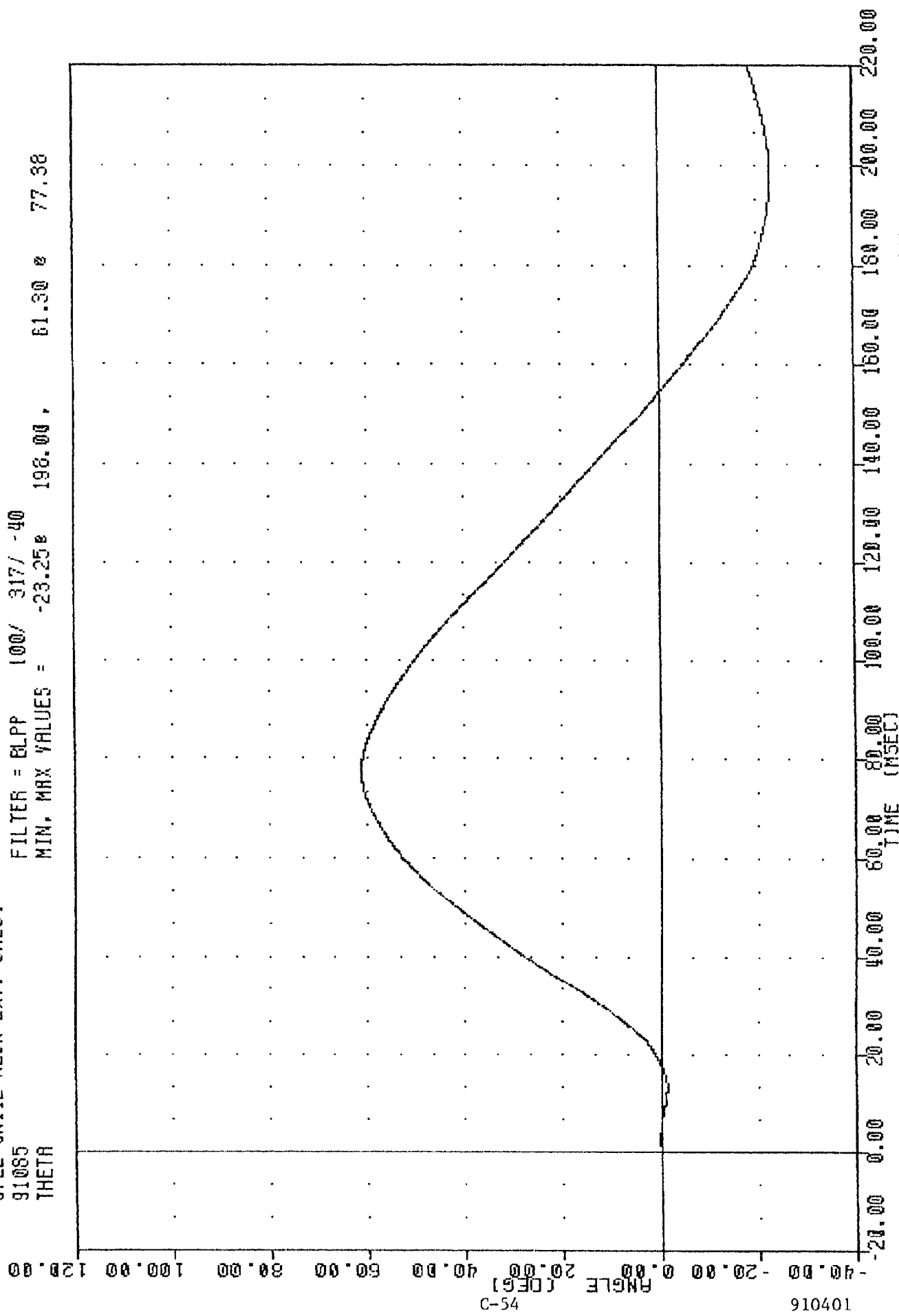
NHTSR , 142C4NE1
 572E SN142 NECK EXT. CAL04
 91085
 BETA

FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -13.760 197.80 , 39.34 74.25



NHTSR , 142C4NE1
 572E SN142 NECK EXT. CAL04
 91085
 THETA

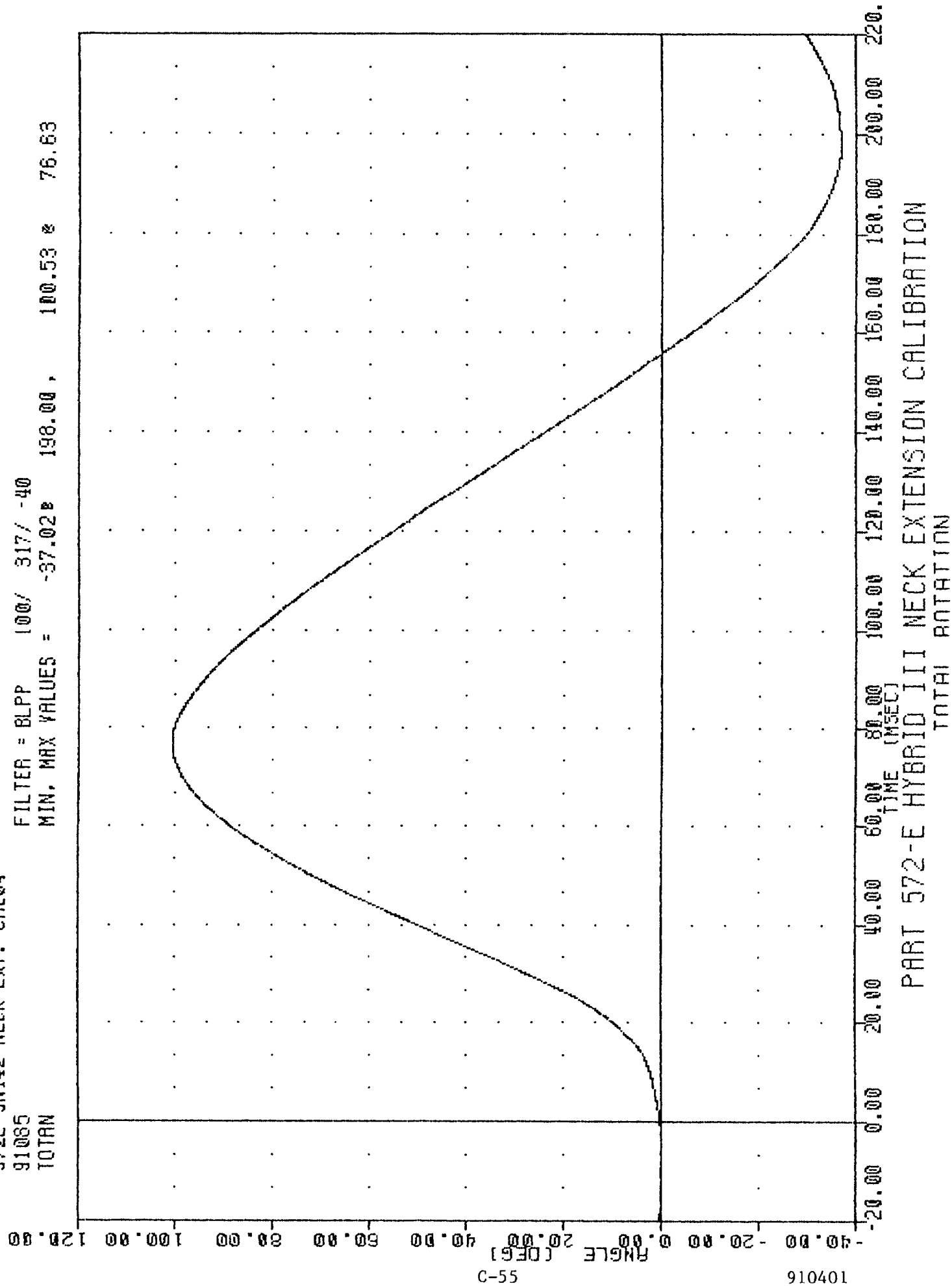
FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -23.25e 198.00 , 61.30 e 77.38



PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NHTSR , 142C4NE1
 572E SN142 NECK EXT. CAL04
 91085
 TOTAN

FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -37.02 198.00 , 100.53 76.63



WHTSA , 14204NE1
 572E SN142 NECK EXT. CAL04
 91085
 NEKXF

FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -140.62 72.25 , 56.45 193.50

100.00

50.00

0.00

-50.00

-100.00

-150.00

-200.00

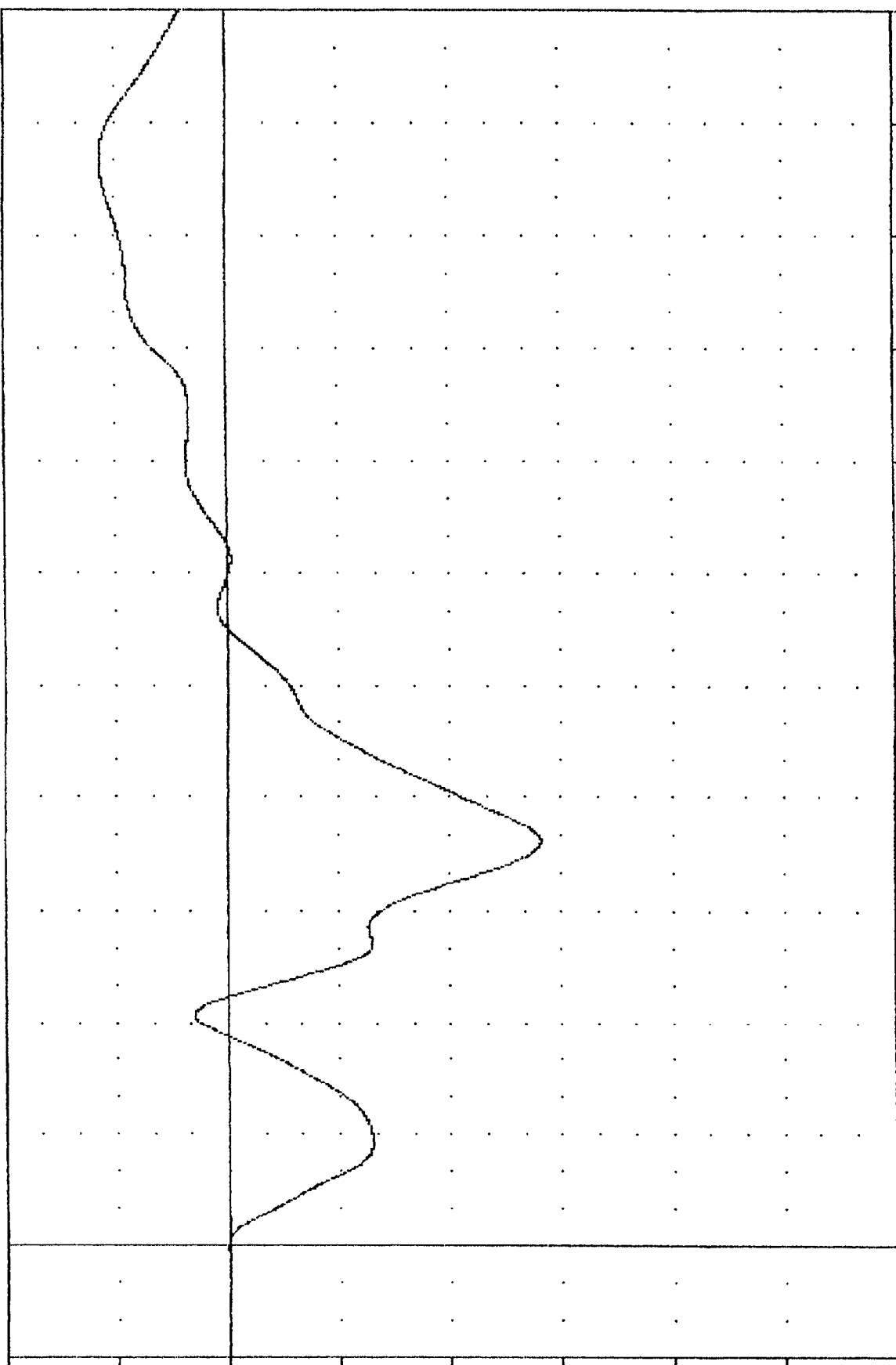
-250.00

-300.00

FORCE (LB)

C-56

910401

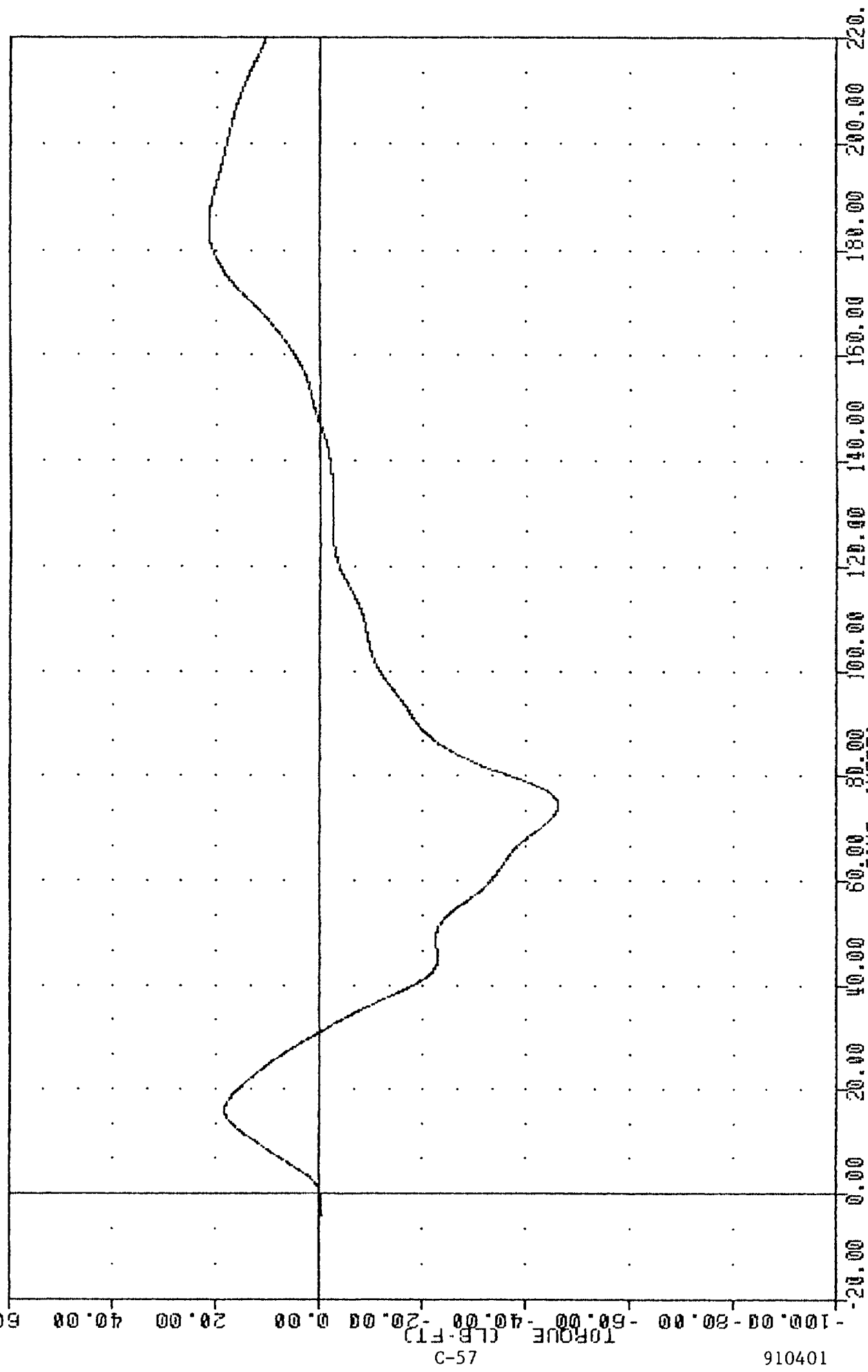


-20.00 0.00 20.00 40.00 60.00 80.00 100.00 120.00 140.00 160.00 180.00 200.00 220.00
 TIME (MSEC)

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NHTSA , 142C4NE1
 572E SN142 NECK EXT. CAL04
 91085
 NEKYM

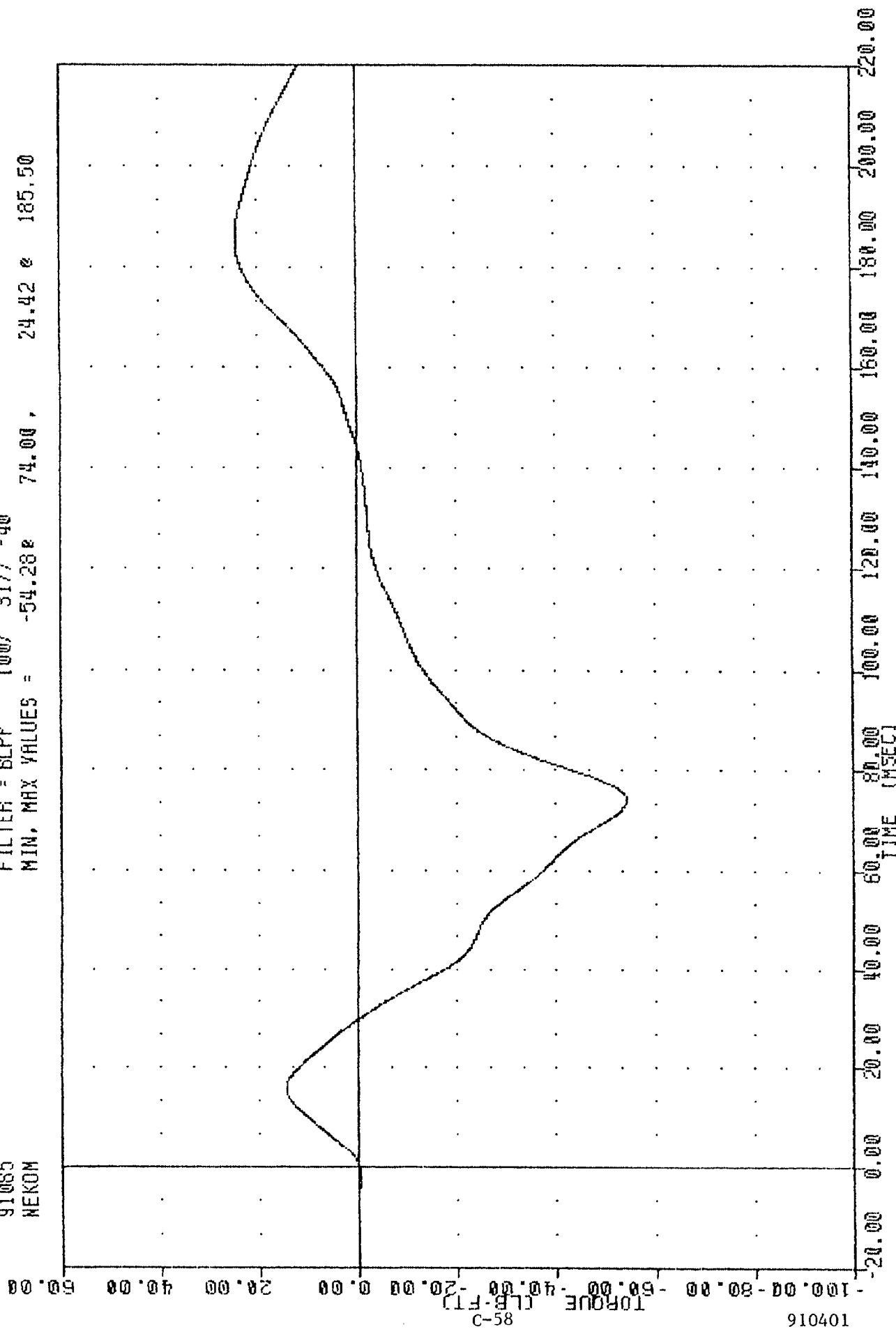
FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -46.28 74.38 , 21.39 184.50



PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 NECK MOMENT Y AXIS

WHTSA , 14204ME1
 572E SN142 NECK EXT. CAL04
 91085
 WEKOM

FILTER = BLPF 100/ 317/ -40
 MIN. MAX VALUES = -54.28e 74.00 , 24.42 e 185.50



910401

C-58

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

HYBRID III

26-Mar-91

NHTSA

142C4TH1

572E SN142 H. S. THORAX CAL04

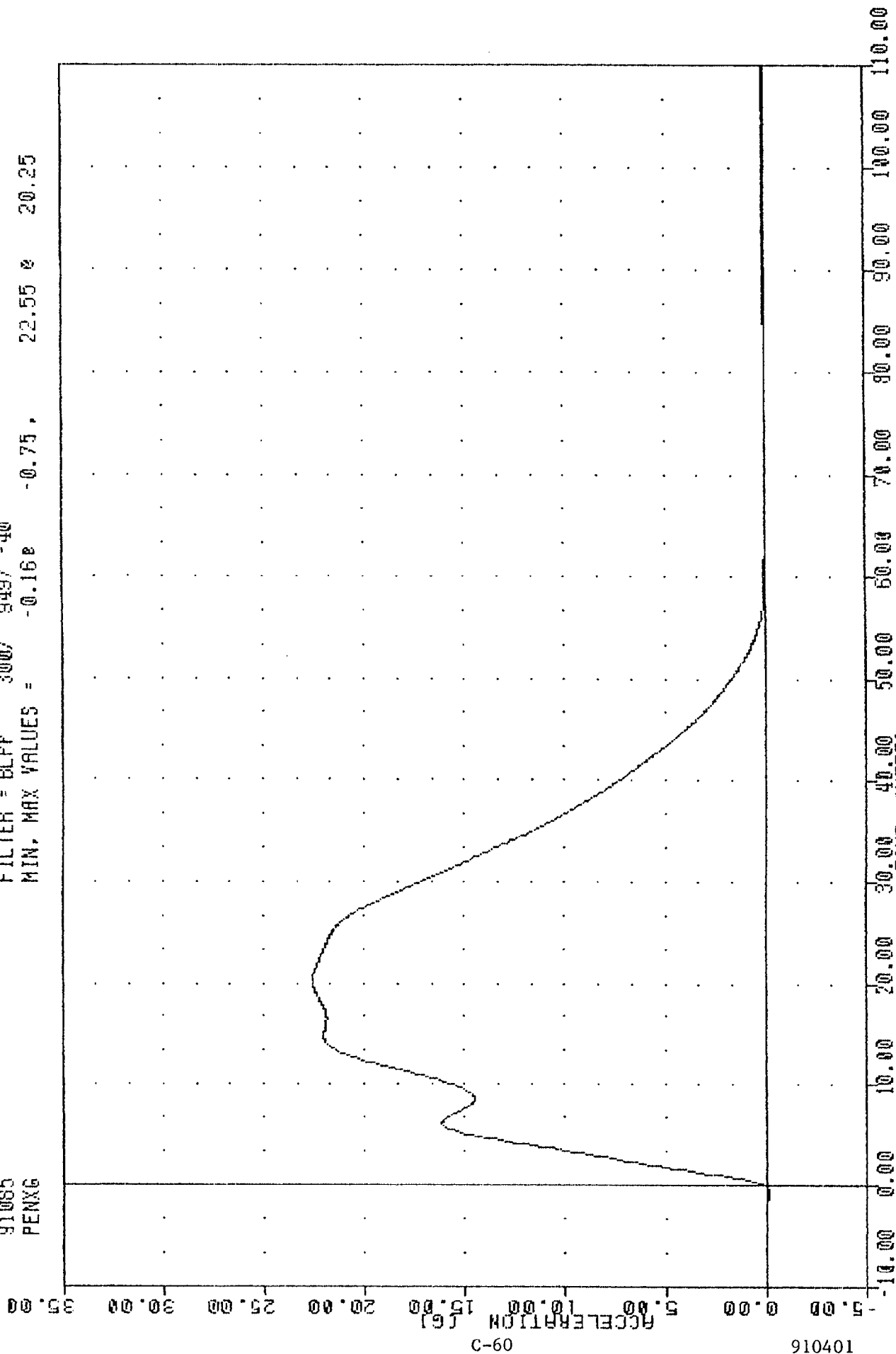
TEST PARAMETER	HIGH SPEED TEST	
	SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	72.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	49.00 %
PENDULUM VELOCITY	21.6-22.4 FT/SEC	21.92 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 IN	2.77 IN
MAXIMUM RESISTIVE FORCE	1160 - 1325 LBS	1161.2 LBS
INTERNAL HYSTERESIS	69% - 85%	72.7%

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas Middleton

KHTSR 142C4TH1
 572E SN142 H.S. THORAX CAL04
 91085
 PENXG

FILTER = BLPP 300/ 949/ -40
 MIN, MAX VALUES = -0.16e 22.55 e 20.25
 -0.75 .



104016

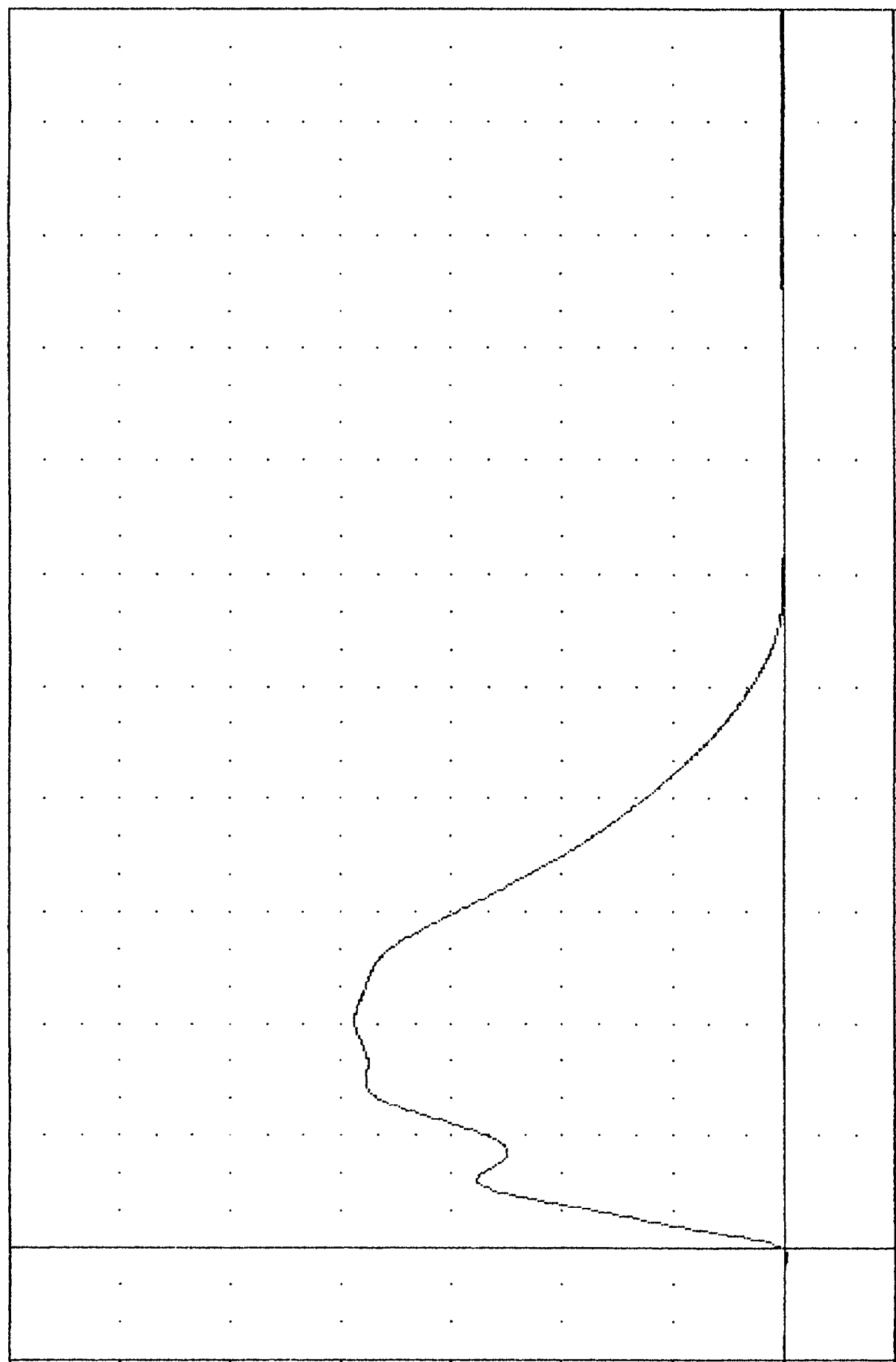
09-C

PART 572-E HYBRID III THORAX CALIBRATION

HHTSR , 142C4TH1
 572E SN142 H.S.THORAX CAL04
 91085
 PENXF

FILTER = BLPP 300/ 949/ -40
 MIN. MAX VALUES = -8.34e -0.75 , 1161.20 e 20.25

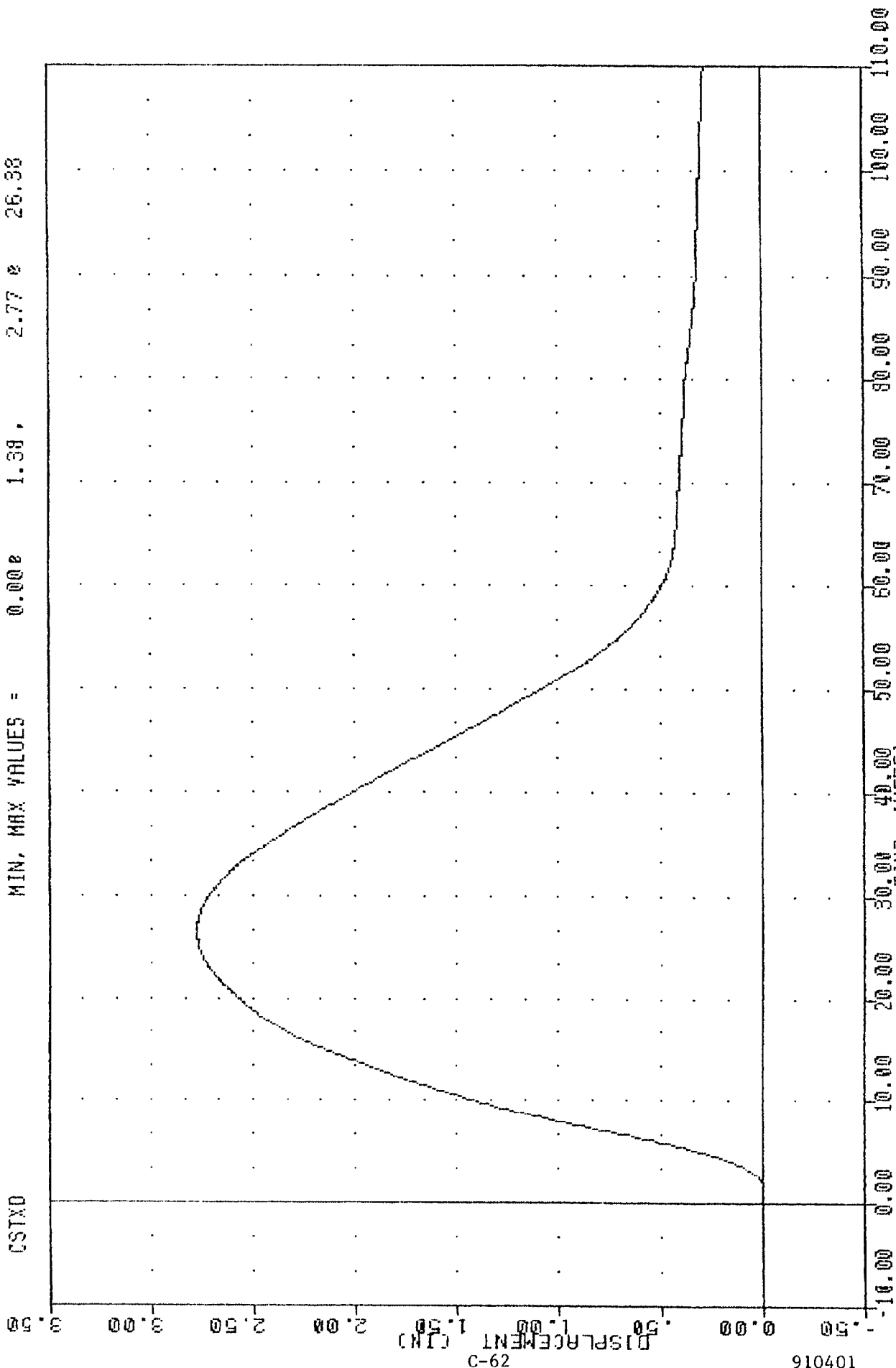
910401
 19-61
 FORCE (LB)
 (X10³)
 210.00
 180.00
 150.00
 120.00
 90.00
 60.00
 30.00
 0.00



-10.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00
 TIME (msec)
 PART 572-E HYBRID III THORAX CALIBRATION
 PENNIM FORCE

NHTSR : 142C4TH1
 572E SN142 H.S.THORAX CAL04
 91085
 CSTXD

FILTER = BLPP 300/ 949/ -40
 MIN, MAX VALUES = 0.00e 1.38 , 2.77 e 26.38

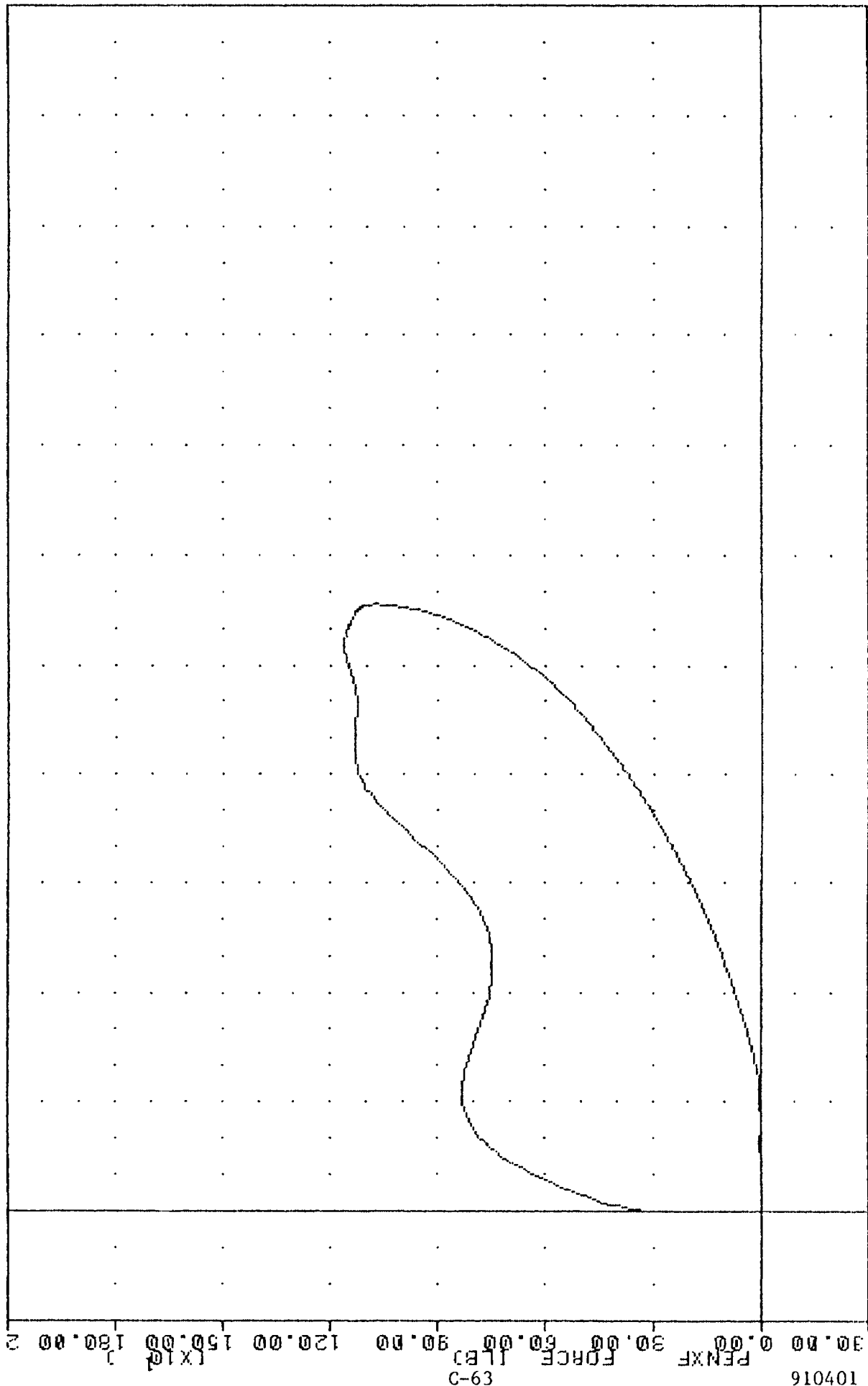


910401

C-62

PART 572-E HYBRID III THORAX CALIBRATION

NHISA
 CSTXD
 PENXF
 14204THL
 FILTER = BLPP
 FILTER = BLPP
 572E 3N142 H.S. THORAX CAL04
 300/ 949/ -40 MIN. MAX =
 300/ 949/ -40 MIN. MAX =
 91085
 0.00
 -8.34
 1.38
 -0.75
 2.77
 1161.20
 26.38
 20.25



104016

19-3

PART 572-E HYBRID III THORAX CALIBRATION
 CHEST PIECE ALIGNMENT VS PENNIIIM FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

26-Mar-91

LEFT KNEE

NHTSA

142C4LK1

572E SN142 L.KNEE 11LB CAL 04

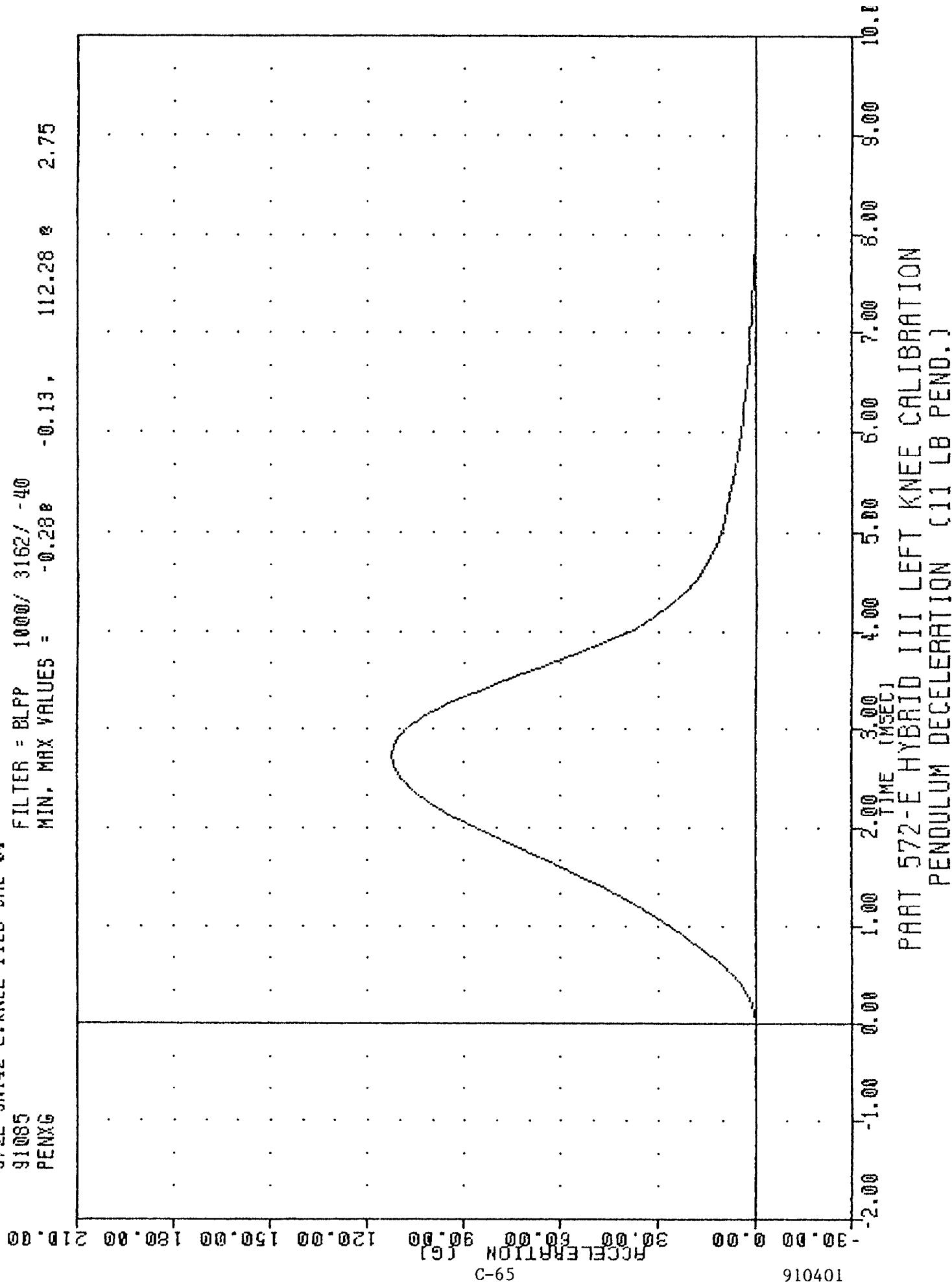
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	72.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	45.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.96 FT/SEC
PEAK KNEE IMPACT FORCE	1060 - 1300 LBS	1235.07 LBS
PROBE WEIGHT	11.0 LBS	

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas Middleton

NHTSA , 142C4LK1
 572E SNI42 L.KNEE 11LB CAL 04
 91085
 PENXG

FILTER = BLPP 1000/ 3162/ -40
 MIN, MAX VALUES = -0.288 -0.13 , 112.28 2.75

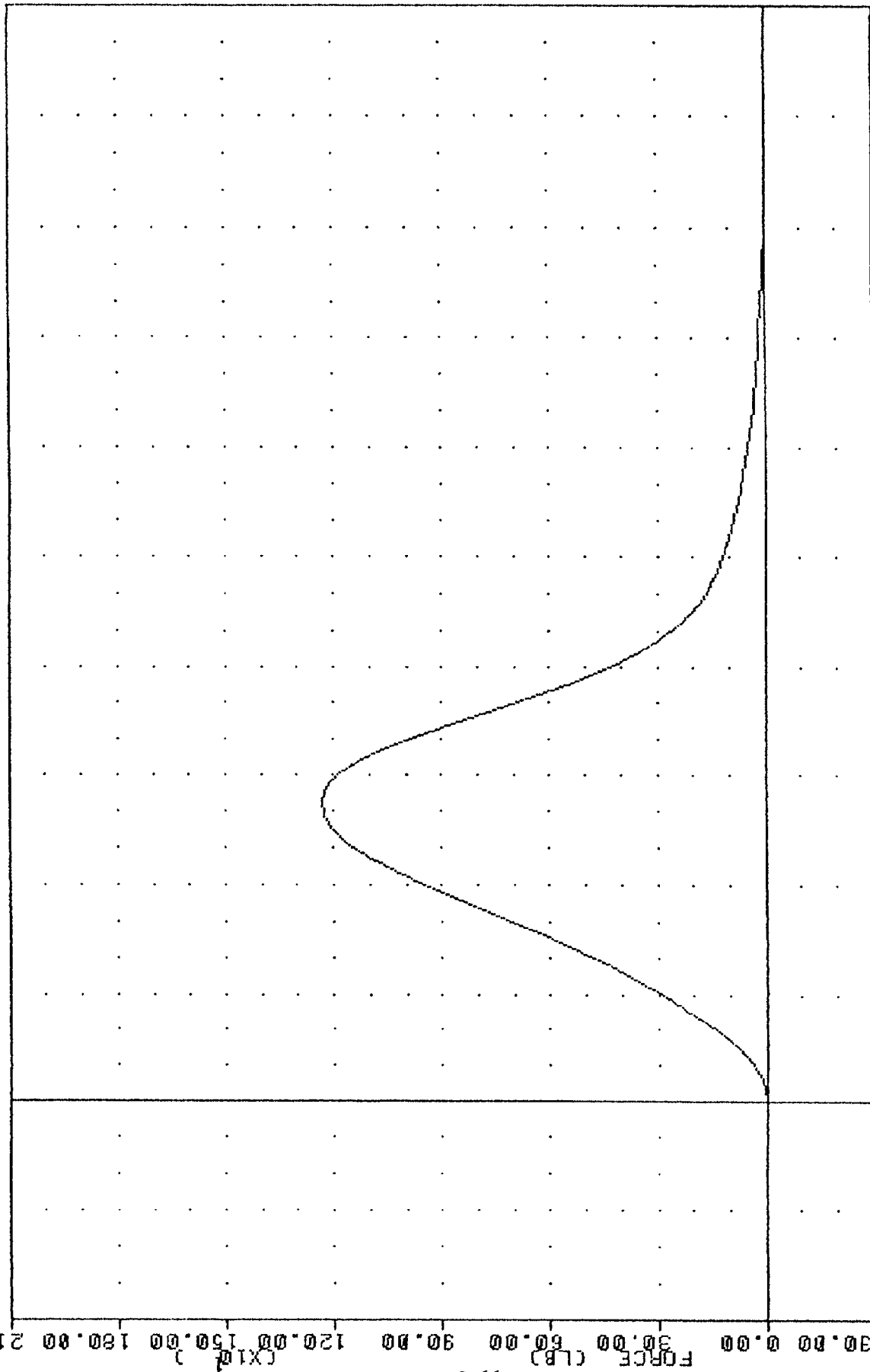


NHTSA , 142C4LK1
 572E SN142 L.KNEE 11LB DAL 04
 91085
 PENXF

FILTER = BLPP 1000/ 3162/ -40
 MIN, MAX VALUES = -3.098 -0.13, 1255.07 e 2.75

910401

C-66



PART 572-E HYBRID III LEFT KNEE CALIBRATION

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

26-Mar-91

RIGHT
NHTSAKNEE
142C4RK1

573E SN142 R-KNEE 11LB CAL. 04

TEST PARAMETER	SPECIFICATION	TEST RESULT
TEMPERATURE	66 - 78 DEG. F	72.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	45.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.93 FT/SEC
PEAK KNEE IMPACT FORCE	1060 - 1300 LBS	1242.23 LBS
PROBE WEIGHT	11.0 LBS	

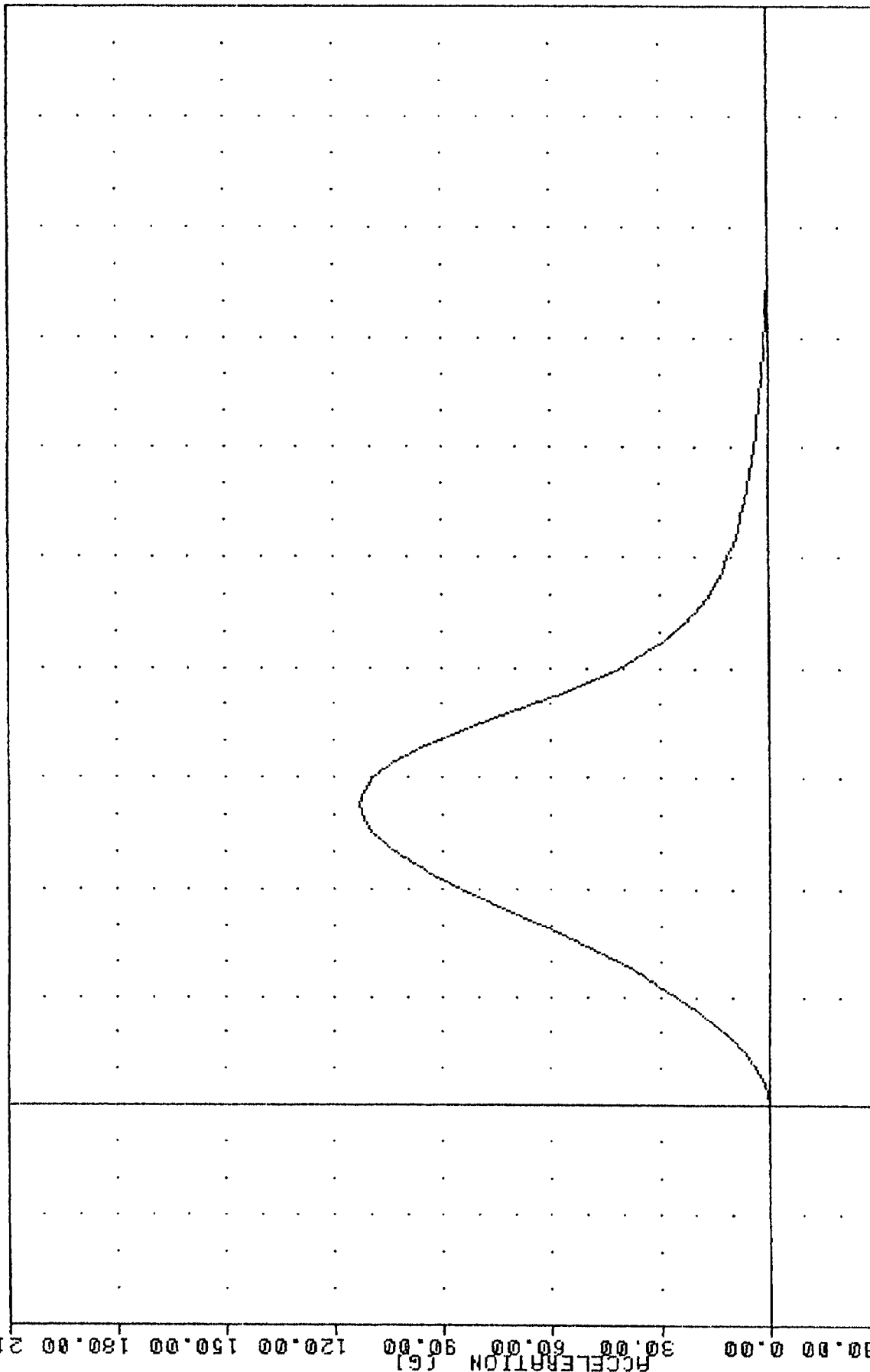
TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

NHTSA , 142C4RK1
 572E SN142 R.KNEE 11LB CAL 04
 91085
 PENXG

FILTER = BLPP 1000/ 3162/ -40
 MIN, MAX VALUES = -0.41e 8.38 , 112.93 e 2.75

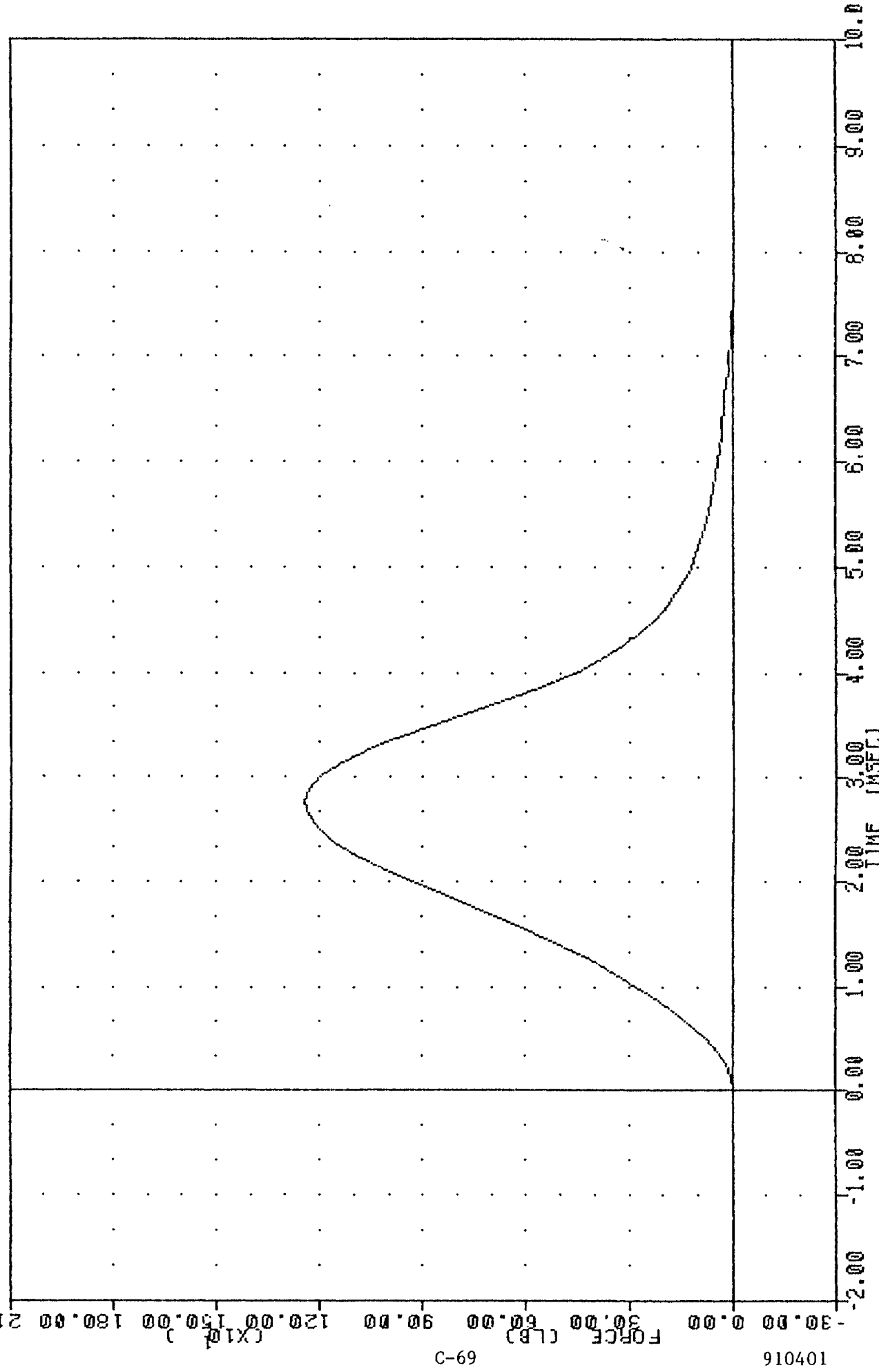
210.00



PART 572-E HYBRID III RIGHT KNEE CALIBRATION

NHTSA , 142C4RK1
 572E SN142 R.KNEE 11LB CAL 04
 91085
 PENXF

FILTER = BLPP 1000/ 3162/ -40
 MIN, MAX VALUES = -4.46 8.38 , 1242.23 2.75



PART 572-E HYBRID III RIGHT KNEE CALIBRATION
 PENNIIIM FORCE (11 LB PEND.)

APPENDIX D

MISCELLANEOUS TEST INFORMATION

DUMMY INSTRUMENT CALIBRATIONS

DRIVER DUMMY #192

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCEL.	CC71H	7264	ENDEVCO	11/07/90	05/07/91
Y-AXIS ACCEL.	DA84H	7264	ENDEVCO	11/07/90	05/07/91
Z-AXIS ACCEL.	CL98H	7264	ENDEVCO	11/07/90	05/07/91
CHEST X-AXIS ACCEL.	CW96H	7264	ENDEVCO	11/05/90	05/05/91
Y-AXIS ACCEL.	CM28H	7264	ENDEVCO	11/05/90	05/05/91
Z-AXIS ACCEL.	CG13H	7264	ENDEVCO	11/07/90	05/07/91
LEFT FEMUR FORCE LOAD CELL	903	2430	GSE	11/06/90	05/06/91
RIGHT FEMUR FORCE LOAD CELL	923	2430	GSE	11/06/90	05/06/91
*NECK X-AXIS FORCE LOAD CELL	0280	1716	DENTON	11/07/90	05/07/91
Y-AXIS FORCE LOAD CELL	0280	1716	DENTON	11/07/90	05/07/91
Z-AXIS FORCE LOAD CELL	0280	1716	DENTON	11/07/90	05/07/91
*NECK MOMENT ABOUT X-AXIS LOAD CELL	0280	1716	DENTON	11/27/90	05/27/91
MOMENT ABOUT Y-AXIS LOAD CELL	0280	1716	DENTON	11/27/90	05/27/91
MOMENT ABOUT Z-AXIS LOAD CELL	0280	1716	DENTON	11/27/90	05/27/91
*CHEST DEFLECTION POTENTIOMETER	87313-96	81422A	VERNITECH	12/03/90	06/03/91
LAP BELT FORCE LOAD CELL	236	3419	LEBOW	01/10/91	07/10/91
SHOULDER BELT FORCE LOAD CELL	610	3419	LEBOW	11/28/90	05/28/91
SHOULDER BELT SPOOL-OUT POTENTIOMETER	A12899	PT-101-40A	CELESCO	04/01/91	10/01/91
SHOULDER BELT STRETCH POTENTIOMETER	2087	2051414101	BOURNES	04/01/91	10/01/91

DUMMY INSTRUMENT CALIBRATIONS

PASSENGER DUMMY #142

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCEL.	DC59J	7264	ENDEVCO	11/05/90	05/05/91
Y-AXIS ACCEL.	CW42H	7264	ENDEVCO	11/05/90	05/05/91
Z-AXIS ACCEL.	CT44H	7264	ENDEVCO	11/05/90	05/05/91
CHEST X-AXIS ACCEL.	CR63H	7264	ENDEVCO	11/07/90	05/07/91
Y-AXIS ACCEL.	CK65H	7264	ENDEVCO	11/07/90	05/07/91
Z-AXIS ACCEL.	CK16H	7264	ENDEVCO	11/07/90	05/07/91
LEFT FEMUR FORCE LOAD CELL	1007	2430	GSE	02/15/91	08/15/91
RIGHT FEMUR FORCE LOAD CELL	1006	2430	GSE	02/15/91	08/15/91
*NECK X-AXIS FORCE LOAD CELL	0106	1716	DENTON	11/28/90	05/28/91
Y-AXIS FORCE LOAD CELL	0106	1716	DENTON	11/28/90	05/28/91
X-AXIS FORCE LOAD CELL	0106	1716	DENTON	11/28/90	05/28/91
*NECK MOMENT ABOUT X-AXIS LOAD CELL	0106	1716	DENTON	11/28/90	05/28/91
MOMENT ABOUT Y-AXIS LOAD CELL	0106	1716	DENTON	11/28/90	05/28/91
MOMENT ABOUT Z-AXIS LOAD CELL	0106	1716	DENTON	11/28/90	05/28/91
*CHEST DEFLECTION POTENTIOMETER	903208	81422A	VERNITECH	12/03/90	06/03/91
LAP BELT FORCE LOAD CELL	613	3419	LEBOW	01/11/91	07/11/91
SHOULDER BELT FORCE LOAD CELL	606	3419	LEBOW	01/11/91	07/11/91
SHOULDER BELT SPOOL-OUT POTENTIOMETER	0586135	PT-101-40A	CELESCO	04/01/91	10/01/91
SHOULDER BELT STRETCH POTENTIOMETER	5089	2051414101	BOURNES	04/01/91	10/01/91

VEHICLE AND CALIBRATION LABORATORY INSTRUMENT CALIBRATIONS

VEHICLE ACCELEROMETERS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
LEFT SEAT REAR CROSSMEMBER X-AXIS	CH46H	7264	ENDEVCO	11/13/90	05/13/91
RIGHT REAR SEAT CROSSMEMBER X-AXIS	CJ39H	7264	ENDEVCO	11/07/90	05/07/91
ENGINE TOP X-AXIS	CJ30H	7264	ENDEVCO	01/17/91	07/17/91
ENGINE BOTTOM X-AXIS	CY23H	7264	ENDEVCO	10/24/90	04/24/91
RIGHT BRAKE CALIPER X-AXIS	CH18H	7264	ENDEVCO	03/20/91	09/20/91
LEFT BRAKE CALIPER X-AXIS	CH97H	7264	ENDEVCO	10/12/90	04/12/91
INSTRUMENT PANEL CENTER X-AXIS	CH81H	7264	ENDEVCO	10/24/90	04/24/91
REAR SEAT CROSSMEMBER CENTER Z-AXIS	CK09H	7264	ENDEVCO	12/21/90	06/21/91
VEHICLE REAR CENTER Z-AXIS	CR66H	7264	ENDEVCO	11/13/90	05/13/91

CALIBRATION LABORATORY INSTRUMENTS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
NECK BENDING PENDULUM ACCEL.	CC59	7232	ENDEVCO	10/09/90	04/09/91
NECK BENDING ROTARY POTENTIOMETER	NA	35435-1-102	BOURNES	MFR. SPECIFICATION	
NECK BENDING LINEAR POTENTIOMETER	NA	5184-2051846003	BOURNES	10/10/90	04/16/91
FEMUR/CHEST/THORAX PENDULUM ACCEL.	CC64	7232	ENDEVCO	10/16/90	04/16/91
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	10/01/90	04/01/91
ABDOMEN COMPRESSION FORCE GAUGE	1261	3167	LEBOW	10/17/90	04/17/91

SIGN CONVENTION
NHTSA DATA TAPE REFERENCE GUIDE

ACCELEROMETERS:

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

POTENTIOMETERS:

+CHEST LONGITUDINAL DISPLACEMENT: OUTWARD
+CHEST LATERAL DISPLACEMENT: 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

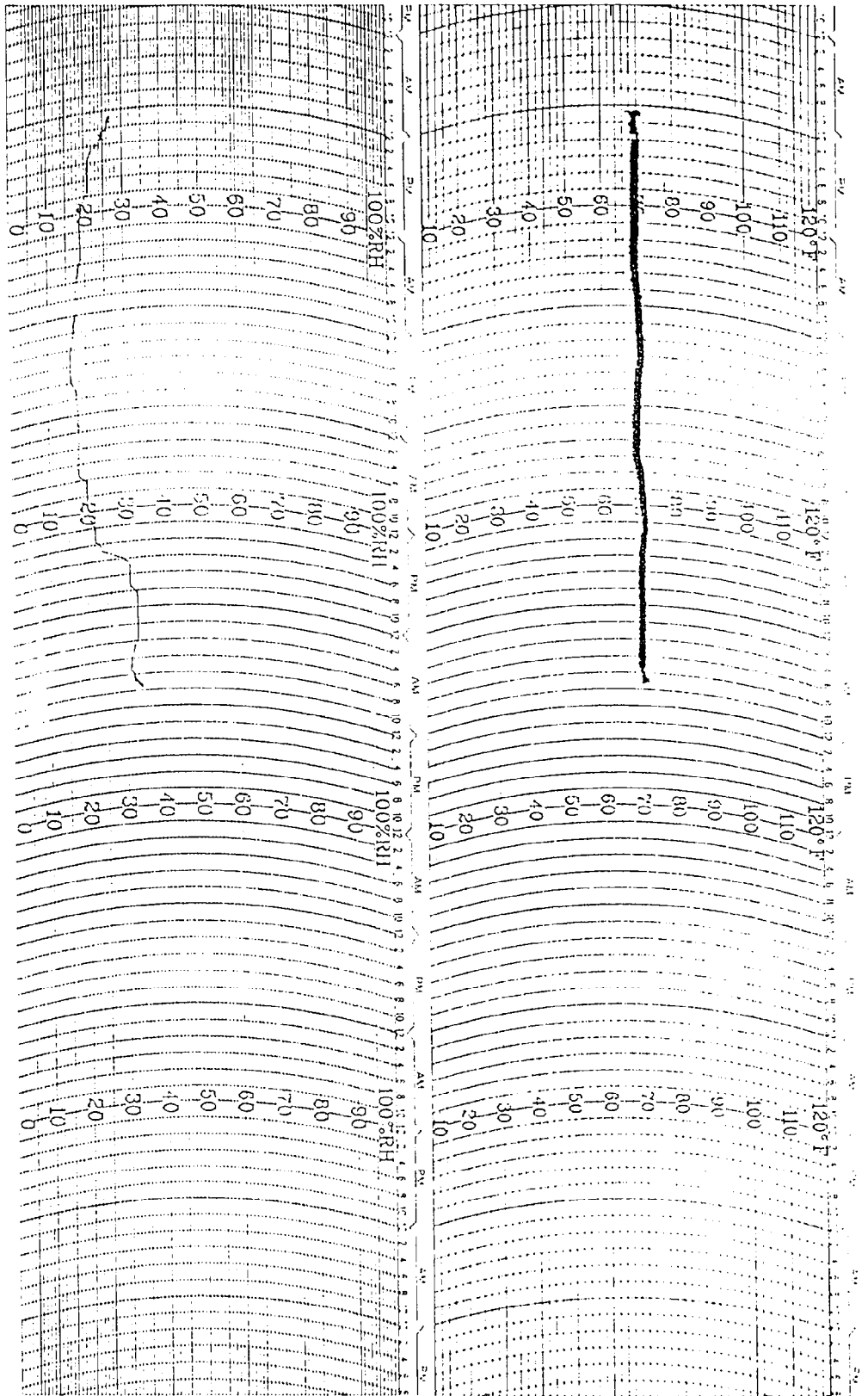
TIBIA LOAD CELLS:

+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

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



Weather Bureau
WEATHER BUREAU
DIVISION OF SYNOPTICS

100-100-100-100
100-100-100-100
100-100-100-100

100-100-100-100
100-100-100-100
100-100-100-100

100-100-100-100
100-100-100-100
100-100-100-100

100-100-100-100 100-100-100-100 100-100-100-100

APPENDIX E

RESTRAINT SYSTEM INSTRUCTIONS FROM OWNER'S MANUAL

⚠ WARNING

- * Never drive the vehicle with the head restraints removed.
- * Do not attempt to adjust the head restraint while driving.

(For front seat in the 2-door model)

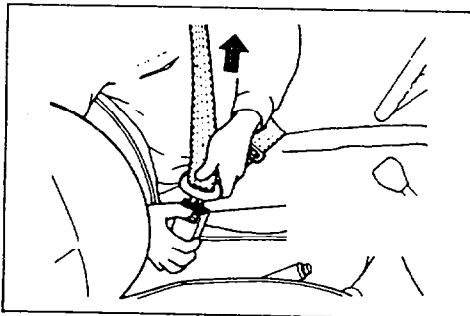
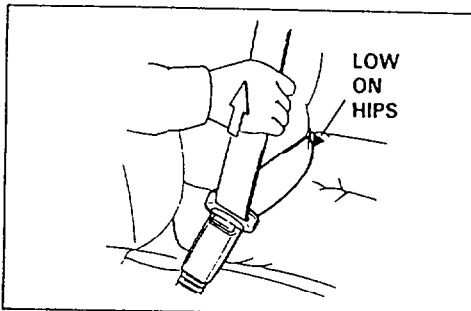
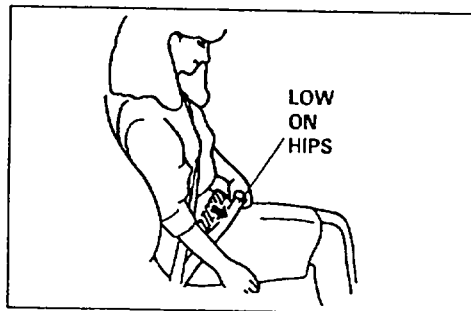
Pull upward on the restraint to raise it to the first position. To raise it higher (or to lower), pull upward on the restraint (or push it down) while pushing in the release.

(For front seat in the 4-door model)

To raise the head restraint, pull upward on the restraint until it clicks. To lower the restraint, push down on the restraint while holding in the lock lever. If a head restraint must be removed (for cleaning, replacement, etc.), push in the release and pull the head restraint all the way out.

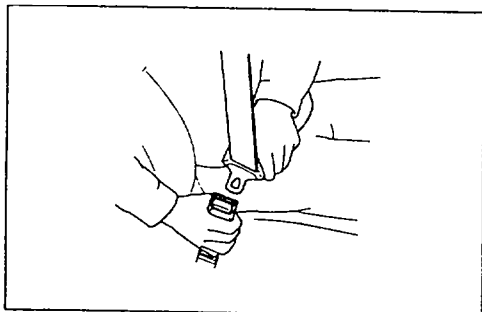
(For split rear seat in the 4-door model)

The head restraints do not have different height positions; they should remain fully inserted. If a head restraint must be removed (for cleaning, replacement, etc.), push in the release and pull the head restraint all the way out. To reinstall, fully insert the head restraint while pushing in the release.



SEAT BELTS AND CHILD RESTRAINT SYSTEMS

Front and Rear Lap-Shoulder Belts



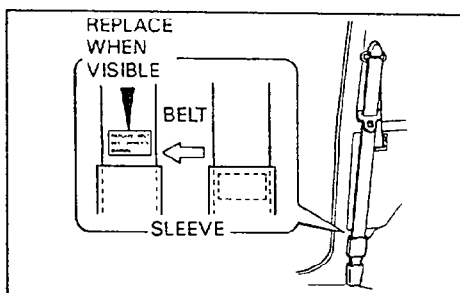
Pull the buckle tongue attached to the seat belt across your body and press it into the buckle catch until you hear a "click". The buckle catch is located at the inboard side of the seat. To reduce the risk of sliding under the belt during a collision, position the lap portion of the belt across your lap as low on your hips as possible and adjust it to a snug fit by pulling the shoulder portion of the belt upward through the latch plate.

The length of the diagonal shoulder strap adjusts itself to allow freedom of movement. The seat belt has an emergency locking retractor (ELR), which is designed to lock the seat belt only during a sudden stop or impact. To unfasten the belt, press the release button on the buckle catch.

NOTE:

The front passenger's seat belt and the rear seat belts have emergency locking retractors (ELRs) that can be temporarily converted to function as automatic locking retractors (ALRs). The ALR mode should be used if you need to secure a child restraint system in the seat. Refer to the CHILD RESTRAINT section for details.

Seat Belt Inspection



Periodically inspect the seat belts to make sure they work properly and are not damaged. Check the webbing, buckles, latch plates, retractors, anchorages, and guide loops. Replace any seat belts which do not work properly or are damaged.

The front passenger's seat lap-shoulder belt has a small loop of webbing lightly stitched into the belt under the plastic sleeve, as shown in the illustration. Periodically inspect the belt to see if the loop has been pulled out (making the "REPLACE BELT" label visible). If the "REPLACE BELT" label is visible, you must replace the belt to help restore optimum restraint system effectiveness.

▲ WARNING

Be sure to inspect all seat belt assemblies after any collision. Any seat belt assembly which was in use during a collision (other than a very minor one) should be replaced, even if damage to the assembly is not obvious. Any seat belt assembly which was not in use during a collision should be replaced if it does not function properly or is damaged in any way.

Child Restraint Systems

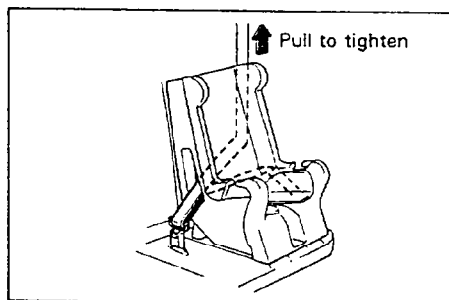
Suzuki highly recommends that you use a child restraint system to restrain infants and small children. Many different types of child restraint systems are available; make sure that the restraint system you select meets Federal Motor Vehicle Safety Standards.

All child restraint systems are designed to be secured in vehicle seats by lap belts or the lap portion of lap-shoulder belts. Whenever possible, Suzuki recommends that child restraint systems be installed on the rear seat. According to accident statistics, children are safer when properly restrained in rear seating positions than in front seating positions.

▲ WARNING

Children could be endangered in a crash if their child restraints are not properly secured in the vehicle. When installing a child restraint system, be sure to follow the instructions below.

Installation



Install your child restraint system according to the instructions provided by the child restraint system manufacturer. After making sure that the seat belt is securely latched:

- 1) Pull all of the remaining webbing out of the retractor. You will hear a click, which means that the emergency locking retractor (ELR) has converted to function as an automatic locking retractor (ALR).
- 2) Allow the extra webbing to retract, and pull the webbing toward the retractor to take up any slack. Make sure that the lap portion of the belt is tight around the child restraint system and the shoulder

portion of the belt is positioned so that it can not interfere with the child's head or neck.

- 3) Make sure that the retractor has converted to the ALR mode by trying to pull webbing out of the retractor. If the retractor is in the ALR mode, the belt will be locked.

⚠ WARNING

If the retractor is not in the ALR mode, the child restraint system can move or tip over when your vehicle turns or stops abruptly.

- 4) Try moving the child restraint system in all directions, to make sure it is securely installed. If you need to tighten the belt, pull more webbing toward the retractor.

When you unbuckle the seat belt and allow it to retract to a certain length, the retractor will automatically revert back to the normal ELR mode.

Do not attempt to use a child restraint that requires a top strap in the rear seat of this vehicle. There is no appropriate place to attach a top strap anchor behind the rear seat.

⚠ WARNING

- * Never allow persons to ride in the cargo area of a vehicle. In the event of an accident, there is a much greater risk of injury for persons who are not riding in a seat with their seat belt securely fastened.
- * Seat belts should always be adjusted so the lap portion of the belt is worn low across the pelvis, not across the waist. Shoulder straps should be worn on the outside shoulder only, and never under the arm. Seat belts should never be worn with the straps twisted and should be adjusted as tightly as is comfortable to provide the protection for which they have been designed. A slack belt will provide less protection than one which is snug.
- * Make sure that each seat belt

buckle is inserted into the proper buckle catch. It is possible to cross the buckles in the rear seat.

- * Do not wear your seat belt over hard or breakable objects in your pockets or on your clothing. If an accident occurs, objects such as glasses, pens, etc. under the seat belt can cause injury.
- * Never use the same seat belt on more than one occupant and never attach a seat belt over an infant or child being held on an occupant's lap. Such seat belt use could cause serious injury in the event of an accident.
- * Pregnant women should use seat belts, although specific recommendations about restraint use should be made by the woman's physician.
- * Periodically inspect seat belt assemblies for excessive wear and damage. Seat belts should be replaced if webbing becomes frayed, contaminated, or damaged in any way. It is essential to replace the entire seat belt assembly after it has been worn in a severe impact, even if damage to the assembly is not obvious.
- * Infants and small children should never be transported unless they are properly restrained. Restraint systems for infants and small children can be purchased commercially and should be used. Make sure that the system you purchase meets Federal Motor Vehicle Safety Standards. Read and follow all the directions provided by the manufacturer.
- * Avoid contamination of seat belt webbing by polishes, oils, chemicals, and particularly battery acid. Cleaning may safely be carried out using mild soap and water.
- * For children, if the shoulder belt irritates the neck or face, move the child closer to the center of the vehicle.
- * Seatbacks should always be in a fairly upright position when the vehicle is being used, or seat belt

effectiveness may be reduced.
Seat belts are designed to offer
maximum protection when seat-
backs are in the fully upright
position.

2-10

14