

REPORT NO. TRC-88-05

NEW CAR ASSESSMENT PROGRAM (NCAP)  
FRONTAL BARRIER IMPACT TEST

ISUZU MOTORS, LTD.  
1988 ISUZU SPACECAB LS  
PICKUP  
NHTSA NO. MJ5700  
TRC TEST NO. 880614

TRANSPORTATION RESEARCH CENTER OF OHIO  
U.S. RT. 33, LOGAN COUNTY  
EAST LIBERTY, OHIO 43319

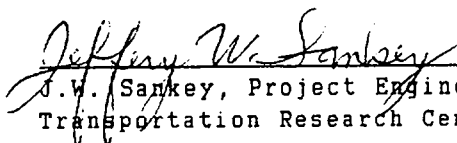


JUNE, 1988  
FINAL REPORT

PREPARED FOR:  
U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
OFFICE OF MARKET INCENTIVES  
400 SEVENTH STREET, S.W.  
ROOM NO. 5313 (NRM-20)  
WASHINGTON, DC 20590

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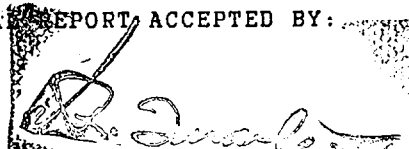
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JUL 28 1988  
Date \_\_\_\_\_

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                                      |                                                                                                                        |                                                                   |           |
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| 16. Abstract<br><br>A 35 mph frontal barrier impact test using a load cell barrier was conducted on a 1988 Isuzu Spacecab LS pickup at the Transportation Research Center of Ohio in East Liberty, Ohio on June 14, 1988.<br><br>The barrier impact velocity was 35.2 mph, and the ambient temperature at the barrier face at the time of impact was 95° F. The post-test maximum vehicle crush was 21.7 inches, and intrusion of the firewall into the compartment was 1.7 inches.<br><br>Driver HIC: 1873<br>Passenger HIC: 723 |  |                                                      |                                                                                                                        |                                                                   |           |
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# METRIC CONVERSION FACTORS

| Approximate Conversions to Metric Measures |                    |                            |                    |
|--------------------------------------------|--------------------|----------------------------|--------------------|
| Symbol                                     | When You Know      | Multiply by                | To Find            |
| LENGTH                                     |                    |                            |                    |
| in                                         | inches             | 2.5                        | centimeters        |
| ft                                         | feet               | 30                         | centimeters        |
| yd                                         | yards              | 0.9                        | meters             |
| mi                                         | miles              | 1.6                        | kilometers         |
| AREA                                       |                    |                            |                    |
| in <sup>2</sup>                            | square inches      | 6.5                        | square centimeters |
| ft <sup>2</sup>                            | square feet        | 0.09                       | square meters      |
| yd <sup>2</sup>                            | square yards       | 0.8                        | square meters      |
| mi <sup>2</sup>                            | square miles       | 2.6                        | square kilometers  |
| acres                                      | acres              | 0.4                        | hectares           |
| MASS (weight)                              |                    |                            |                    |
| oz                                         | ounces             | 28                         | grams              |
| lb                                         | pounds             | 0.45                       | kilograms          |
|                                            | short tons         | 0.9                        | metric ton         |
| (2000 lb)                                  |                    |                            |                    |
| VOLUME                                     |                    |                            |                    |
| tsp                                        | teaspoons          | 5                          | milliliters        |
| Tbsp                                       | tablespoons        | 15                         | milliliters        |
| in <sup>3</sup>                            | cubic inches       | 16                         | milliliters        |
| fl oz                                      | fluid ounces       | 30                         | milliliters        |
| c                                          | cups               | 0.24                       | liters             |
| pt                                         | pints              | 0.47                       | liters             |
| qt                                         | quarts             | 0.95                       | liters             |
| gal                                        | gallons            | 3.8                        | liters             |
| ft <sup>3</sup>                            | cubic feet         | 0.03                       | cubic meters       |
| yd <sup>3</sup>                            | cubic yards        | 0.76                       | cubic meters       |
| TEMPERATURE (exact)                        |                    |                            |                    |
| °F                                         | degrees Fahrenheit | 5/9 (after subtracting 32) | degrees Celsius    |

| Approximate Conversions from Metric Measures |                    |                   |                    |
|----------------------------------------------|--------------------|-------------------|--------------------|
| Symbol                                       | When You Know      | Multiply by       | To Find            |
| LENGTH                                       |                    |                   |                    |
| mm                                           | millimeters        | 0.04              | inches             |
| cm                                           | centimeters        | 0.4               | inches             |
| m                                            | meters             | 3.3               | feet               |
| m                                            | meters             | 1.1               | yards              |
| km                                           | kilometers         | 0.6               | miles              |
| AREA                                         |                    |                   |                    |
| cm <sup>2</sup>                              | square centimeters | 0.16              | square inches      |
| m <sup>2</sup>                               | square meters      | 1.2               | square yards       |
| km <sup>2</sup>                              | square kilometers  | 0.4               | square miles       |
| ha                                           | hectares           | 2.5               | acres              |
| (10 000 m <sup>2</sup> )                     |                    |                   |                    |
| MASS (weight)                                |                    |                   |                    |
| g                                            | grams              | 0.035             | ounces             |
| kg                                           | kilograms          | 2.2               | pounds             |
| t                                            | metric ton         | 1.1               | short tons         |
| (1000 kg)                                    |                    |                   |                    |
| VOLUME                                       |                    |                   |                    |
| ml                                           | milliliters        | 0.03              | fluid ounces       |
| ml                                           | milliliters        | 0.06              | cubic inches       |
| L                                            | liters             | 2.1               | pints              |
| L                                            | liters             | 1.06              | quarts             |
| L                                            | liters             | 0.26              | gallons            |
| m <sup>3</sup>                               | cubic meters       | 35                | cubic feet         |
| m <sup>3</sup>                               | cubic meters       | 1.3               | cubic yards        |
| TEMPERATURE (exact)                          |                    |                   |                    |
| °C                                           | degrees Celsius    | 9/5 (then add 32) | degrees Fahrenheit |

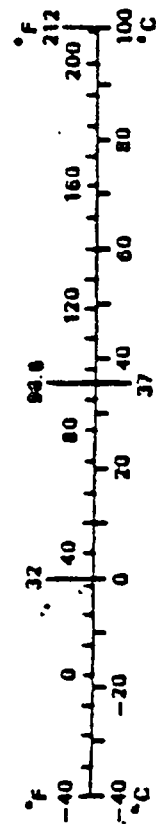


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## SECTION 1.0

### PURPOSE AND TEST SUMMARY

This 35 mph frontal barrier impact test is part of the Composite FY'87 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-87-R-02012. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data.

The 35 mph frontal barrier impact test was conducted in accordance with the Office of Market Incentives (OMI) Laboratory Indicant Test Procedure. Occupant performance data are provided herein.

## SECTION 2.0

### SUMMARY OF TEST NUMBER MJ5700

A load cell barrier consisting of 36 load cells was impacted by a 1988 Isuzu Spacecab LS pickup at a velocity of 35.2 mph. The test was performed at the Transportation Research Center of Ohio on June 14, 1988. Pre-test and post-test photographs of the vehicle and occupants are presented in Appendix A.

Two Part 572B, 50th percentile adult male Anthropomorphic Test Devices (ATDs) were placed in the driver and right-front passenger designated seating positions, according to dummy placement procedures specified in Laboratory Indicant Test Procedure dated September 1, 1986.

Both ATDs were instrumented with longitudinal, lateral, and vertical accelerometers in the head and chest and load cells in the left and right femurs. In addition, load cells were placed on the driver's and passenger's lap and shoulder belts to measure dummy upper torso and pelvic section loading. A summary of the dummy performance verification test data is presented in Appendix C.

The crash event was recorded by one real-time camera and 16 high-speed cameras. Camera locations and other pertinent camera information are found in Section 3.0 of this report.

The 67 channels of data were recorded on two 14-track tape drives. Appendix B contains the vehicle, load cell barrier and dummy response data plots.

TABLE 1

CRASH TEST SUMMARY

NHTSA NO.: MJ5700 PROJECT: New Car Assessment  
DATE: 6/14/88 TIME: 1527 TEMP: 95° F  
VEHICLE: 1988 Isuzu Spacecab LS  
TEST WEIGHT (LBS): 3747  
IMPACT ANGLE (DEG)\*: 0  
IMPACT VELOCITY (MPH\*\*): PRIMARY = 35.2 SECONDARY = 35.1  
MAXIMUM STATIC CRUSH (IN): 21.7  
VEHICLE REBOUND (IN): 19.6  
DUMMIES: Driver #826 Passenger #411  
TYPE: Part 572B Part 572B  
LOCATION: Left front Right front  
RESTRAINT: 3-point Unibelt 3-point Unibelt  
NUMBER OF DATA CHANNELS: 67  
NUMBER OF HIGH SPEED CAMREAS: 16 and 1 real-time camera

\*With respect to tow track centerline.  
\*\*Speed trap measurement ( $\pm$  .05 mph accuracy)

### GENERAL COMMENTS

The 1988 Isuzu Spacecab LS pickup was equipped with a 2.6 liter, 4-cylinder inline engine, 3-speed automatic transmission, and power brakes. The total test weight with two 50th percentile male dummies and instrumentation was 3747 pounds. The test vehicle impacted the frontal load cell barrier at a velocity of 35.2 mph.

The vehicle sustained 21.7 inches of static crush. Maximum load cell barrier force measured by the 36 load cells was lost (See Data Acquisition Explanations).

The driver's "Head Injury Criteria" was 1873; the maximum chest deceleration over 3 milliseconds was 59 g's. The right and left femur loads were 412 and 325 pounds, respectively.

The passenger's "Head Injury Criteria" was 723; the maximum chest deceleration over 3 milliseconds was 55 g's. The right and left femur loads were 172 and 397 pounds, respectively.

The belt-related data for each occupant are presented in Section 3.0 of this report.

#### DATA ACQUISITION EXPLANATIONS

Two barrier face load cell blocks were completely penetrated by tubes on the vehicle's front structure. These load cells, position B4 and B7, did not return to zero following the crash test event. This affected the group #5 force total, the group #6 force total, and the sum of load cell barrier forces.

TABLE 2  
TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Isuzu Motors, Limited

MAKE/MODEL: Isuzu Spacecab LS VIN: JAACL16E2J7207518

BODY STYLE: Pickup MODEL YEAR: 1988

NHTSA NO.: MJ5700 COLOR: Gray

ENGINE DATA: TYPE: Inline CYLINDERS: 4 DISPLACEMENT: 2.6 liters

TRANSMISSION DATA: 3 SPEED,     MANUAL, X AUTOMATIC,     FWD, X RWD,     4WD

DATE VEHICLE RECEIVED: 5/24/88 ODOMETER READING: 65.0

DEALER'S NAME AND ADDRESS: Isuzu North  
5885 Westerville, Rd.  
Westerville, OH 43081

ACCESSORIES:

|                |      |                            |     |
|----------------|------|----------------------------|-----|
| POWER STEERING | Yes  | AUTOMATIC TRANSMISSION     | Yes |
| POWER BRAKES   | Yes  | AUTOMATIC SPEED CONTROL    | No  |
| POWER SEATS    | No   | TILTING STEERING WHEEL     | Yes |
| POWER WINDOWS  | No   | TELESCOPING STEERING WHEEL | No  |
| TINTED GLASS   | Yes  | AIR CONDITIONING           | Yes |
| RADIO          | Yes  | ANTI-SKID BRAKE            | No  |
| CLOCK          | Yes  | REAR WINDOW DEFROSTER      | No  |
| 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

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

VEHICLE MANUFACTURED BY: Isuzu Motors, Limited

DATE OF MANUFACTURE: 2/88

GVWR: 4300 LBS

GAWR: FRONT 1900 LBS., REAR 2545 LBS.

TABLE 2 TEST VEHICLE INFORMATION, CONT'D.

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 29 psi; REAR 35 psi

RECOMMENDED TIRE SIZE: P205/75R14 LOAD RANGE X B C D

TIRES ON VEHICLE (MFR., LINE, SIZE): Uniroyal Tigerpaw P205/75R14

IS SPARE TIRE A "SPACE SAVER": Yes

IS SPARE TIRE STANDARD EQUIPMENT: Yes

VEHICLE CAPACITY: TYPES OF SEATS: FRONT: Bucket  
REAR: Jump seats

TYPE OF FRONT SEAT BACKS: Adjustable

NUMBER OF OCCUPANTS NA FRONT NA REAR NA TOTAL\*

CARGO LOAD 300 LBS. \* TOTAL NA LBS. \*

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

|                                  |           |                                 |          |
|----------------------------------|-----------|---------------------------------|----------|
| RIGHT FRONT                      | 913 lbs.  | RIGHT REAR                      | 682 lbs. |
| LEFT FRONT                       | 866 lbs.  | LEFT REAR                       | 667 lbs. |
| TOTAL FRONT WEIGHT               | 1779 lbs. | (56.9% OF TOTAL VEHICLE WEIGHT) |          |
| TOTAL REAR WEIGHT                | 1349 lbs. | (43.1% OF TOTAL VEHICLE WEIGHT) |          |
| TOTAL DELIVERED WEIGHT 3128 lbs. |           |                                 |          |

CALCULATION FOR TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (3128 LBS)

VCW = VEHICLE CAPACITY WEIGHT (NA LBS)\*

DSC = DESIGNATED SEATING CAPACITY (NA)

RCLW = VCW - 150 (DCS) = 300 LBS \*

TARGET TEST WEIGHT = UDW + RCLW + (2 DUMMIES X 164 LBS/DUMMY)

= 3128 + 300 + 328 LBS

TARGET TEST WEIGHT = 3756 LBS

\*A cargo load of 300 pounds was used per the NCAP Laboratory Procedure.

TABLE 2 TEST VEHICLE INFORMATION, CONT'D.

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

|                    |           |                                 |          |
|--------------------|-----------|---------------------------------|----------|
| RIGHT FRONT        | 972 lbs.  | RIGHT REAR                      | 883 lbs. |
| LEFT FRONT         | 961 lbs.  | LEFT REAR                       | 931 lbs. |
| TOTAL FRONT WEIGHT | 1933 lbs. | (51.6% OF TOTAL VEHICLE WEIGHT) |          |
| TOTAL REAR WEIGHT  | 1814 lbs. | (48.4% OF TOTAL VEHICLE WEIGHT) |          |
| TOTAL TEST WEIGHT  | 3747 lbs. | (0.2% UNDER TARGET WEIGHT)      |          |

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

COMPONENTS REMOVED TO MEET TARGET WEIGHT: None

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

|                     |    |      |     |      |     |      |     |      |
|---------------------|----|------|-----|------|-----|------|-----|------|
| DELIVERED ATTITUDE: | LF | 29.8 | ;RF | 31.1 | ;LR | 31.0 | ;RR | 31.4 |
| PRE-TEST ATTITUDE:  | LF | 29.0 | ;RF | 30.0 | ;LR | 29.4 | ;RR | 29.9 |
| POST-TEST ATTITUDE: | LF | 28.3 | ;RF | 27.3 | ;LR | 30.2 | ;RR | 29.1 |

WHEELBASE: 119.8 INCHES

CG = 58.0 INCHES REARWARD OF FRONT WHEEL CENTERLINE

TABLE 3 TEST CONDITIONS

TEST NUMBER: 880614

DATE OF TEST: 6/14/88

TIME OF TEST: 1527

TYPE OF TEST: Frontal Load Cell Barrier

IMPACT ANGLE: 0°

AMBIENT TEMPERATURE AT IMPACT AREA:

95° F

TEMPERATURE IN OCCUPANT COMPARTMENT:

75° F

IMPACT VELOCITY: PRIMARY = 35.2 MPH

SECONDARY = 35.1 MPH

(SPECIFIED RANGE = 34.5 TO 35.5 MPH)

VEHICLE REBOUND AND CRUSH (ALL DIMENSIONS IN INCHES):

|                                 |              |   |       |    |       |    |       |
|---------------------------------|--------------|---|-------|----|-------|----|-------|
| OVERALL LENGTH OF TEST VEHICLE: | PRE-TEST:    | L | 197.1 | ;C | 199.1 | ;R | 197.2 |
|                                 | POST-TEST:   | L | 175.9 | ;C | 177.9 | ;R | 176.2 |
|                                 | TOTAL CRUSH: | L | 21.2  | ;C | 21.2  | ;R | 21.0  |

FOR FRONTAL IMPACTS, DISTANCE FROM FRONT OF TEST VEHICLE TO BARRIER AFTER IMPACT: L: 19.4; C: 18.6; R: 20.9; AVG: 19.6

TABLE 4

VISIBLE DUMMY CONTACT POINTS:

|            | DRIVER #826                       | PASSENGER #411          |
|------------|-----------------------------------|-------------------------|
| Head       | <u>Steering wheel rim and hub</u> | <u>Chest</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>Easy</u> | <u>Easy</u> |
| Rear  | <u>NA</u>   | <u>NA</u>   |

SEAT MOVEMENT:

|       | SEAT BACK FAILURE | SEAT SHIFT  |
|-------|-------------------|-------------|
| Front | <u>None</u>       | <u>None</u> |
| Rear  | <u>NA</u>         | <u>NA</u>   |

GLAZING DAMAGE:

Windshield cracked upon impact.

\_\_\_\_\_

\_\_\_\_\_

OTHER NOTABLE IMPACT EFFECTS:

None

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SECTION 3.0

OCCUPANT, VEHICLE AND LOAD CELL BARRIER INFORMATION

TABLE 5 DUMMY INJURY CRITERIA

MAXIMUM ACCELERATION ('G')

|           | <u>HEAD</u> |       |        |       | <u>CHEST</u> |       |      | R* |
|-----------|-------------|-------|--------|-------|--------------|-------|------|----|
|           | X           | Y     | Z      | R     | X            | Y     | Z    |    |
| DRIVER    | -174.0      | -24.2 | -146.4 | 220.6 | -62.6        | 23.3  | 21.6 | 59 |
| PASSENGER | -29.4       | -25.0 | -72.9  | 73.7  | -56.0        | -20.8 | 13.9 | 55 |

MAXIMUM FORCE-FEMUR LOAD (LBS)

|           | <u>RIGHT FEMUR</u> | <u>LEFT FEMUR</u> |
|-----------|--------------------|-------------------|
| DRIVER    | 412                | 325               |
| PASSENGER | 172                | 397               |

MAXIMUM FORCE-SEAT BELT LOADS (LBS)

|           | <u>SHOULDER STRAP</u>  | <u>LAP STRAP</u>       | <u>LAP STRAP</u>      |
|-----------|------------------------|------------------------|-----------------------|
|           | <u>UPPER BELT LOAD</u> | <u>RIGHT BELT LOAD</u> | <u>LEFT BELT LOAD</u> |
| DRIVER    | 1910                   | ---                    | 1169                  |
| PASSENGER | 1942                   | 1873                   | ---                   |

HEAD INJURY CRITERIA\*\*

|           | <u>HIC</u> | <u>TIME t<sub>1</sub></u><br><u>(MSEC)</u> | <u>TIME t<sub>2</sub></u><br><u>(MSEC)</u> |
|-----------|------------|--------------------------------------------|--------------------------------------------|
| DRIVER    | 1873       | 67.0                                       | 78.1                                       |
| PASSENGER | 723        | 64.8                                       | 100.8                                      |

\*Defined as exceeding 0.003 sec. duration

\*\*As defined in FMVSS No. 208

## DUMMY KINEMATIC SUMMARY

### DRIVER DUMMY

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

### RIGHT FRONT PASSENGER DUMMY

Upon impact the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated forward and contacted the dummy's chest as the chest was restrained by the three-point unbelt. The dummy's head rotated rearward as the dummy rebounded into the seatback. The dummy came to rest seated in the right front passenger's seat, leaning to the left, restrained by the three-point unbelt.

FIGURE 1 DUMMY POSITIONING DATA FOR 35 MPH FRONTAL BARRIER IMPACT TEST

PRE-IMPACT DATA:

Make/Model: Isuzu Spacecab LS  
 Body Style: Pickup Model Year: 1988  
 NHTSA No.: MJ5700 Color: Gray

DATA FROM CERTIFICATION LABEL:

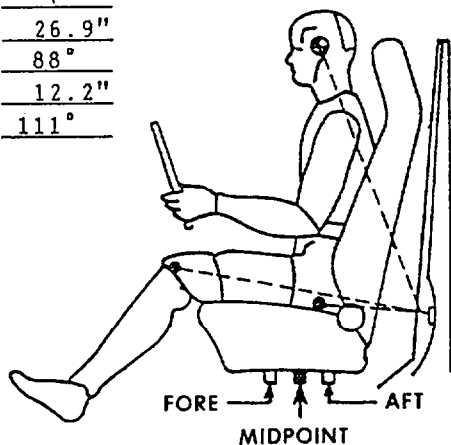
Vehicle Manufacturer: Isuzu Motors, Limited  
 Date of Manufacture: 2/88 VIN: JAACL16E2J7207518  
 GVWR: 4300 lb; GAWR: Front = 1900 lb; Rear = 2545 lb

POST-IMPACT DATA:

Date of Test: 6/14/88 Time: 1527 Temperature: 95 ° F  
 Required Impact Velocity Range: 34.5 to 35.5 mph  
 Impact Velocity: Primary = 35.2 mph Secondary = 35.1 mph  
 Seat Type: Bucket Adjuster Type: Manual  
 Bucket Seat Back Type: Manual adjustable  
 Technicians: B. Crabtree, S. Erickson, R. Branham

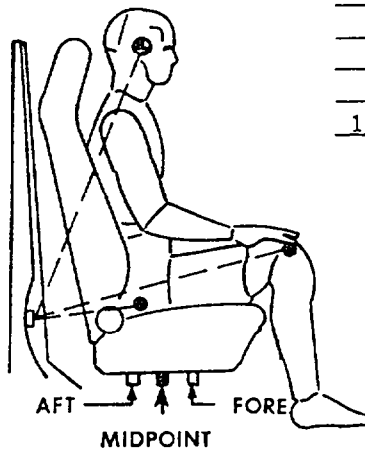
**DRIVER DUMMY #826**

Head 22.8"  
 Target 7°  
 Knee 26.9"  
 Joint 88°  
 Approx-imate 12.2"  
 "H" Point 111°



**PASSENGER DUMMY #411**

21.8" Head  
12° Target  
27.7" Knee  
87° Joint  
13.1" Approx-imate  
105° "H" Point



A = 54.4"  
 B = 41.6"  
 C = 27.2"  
 D = 12.5"  
 E = 12.8"

LATERAL BAR  
 ADJUSTABLE POINTER

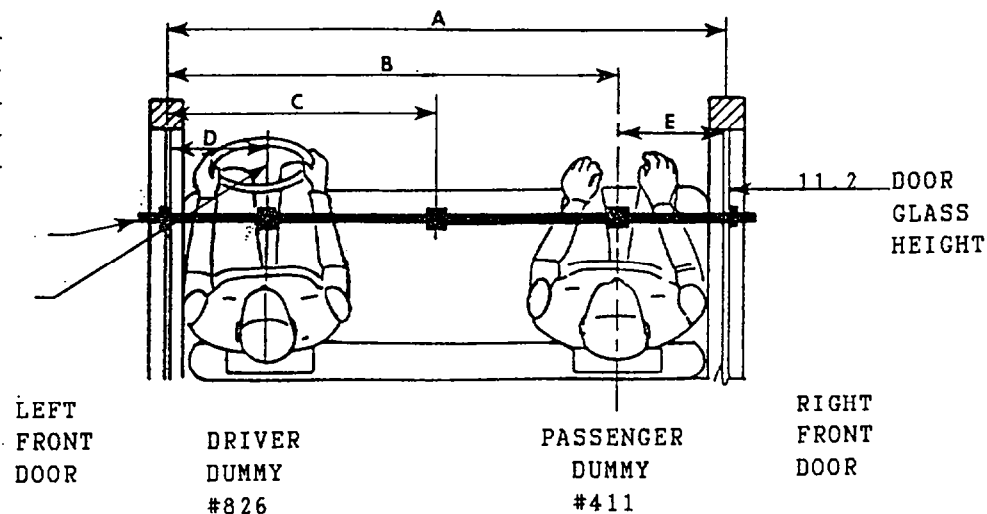
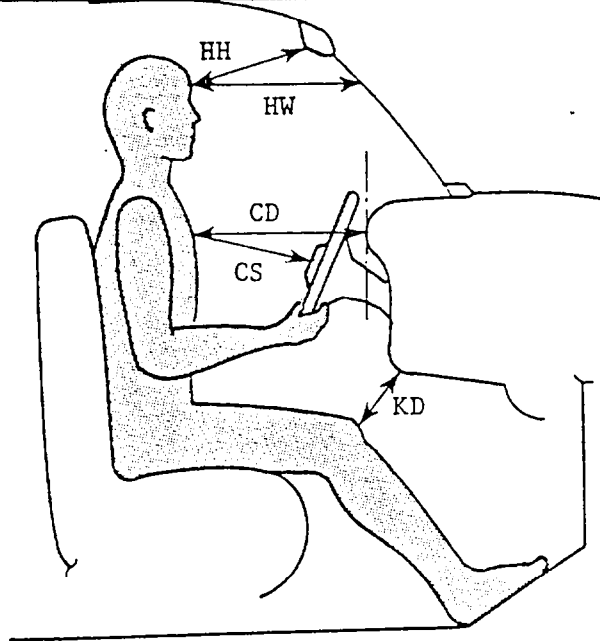


FIGURE 1, CONT'D DUMMY IN-VEHICLE POSITION RECORDING SHEET

|     | DRIVER | PASSENGER |
|-----|--------|-----------|
| HH  | 17.3   | 17.5      |
| HW  | 21.6   | 21.9      |
| CD  | 22.8   | 23.8      |
| CS  | 17.1   | NA        |
| KDL | 5.3    | 4.2       |
| KDR | 5.8    | 4.8       |
| TA  | 19°    | 24°       |
| SA  | 16°    | 16°       |
| HA  | 24.8   | 19.1      |

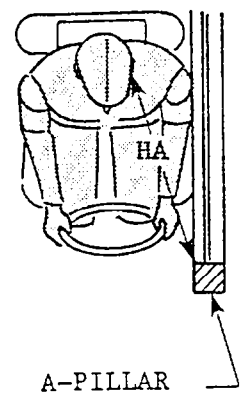
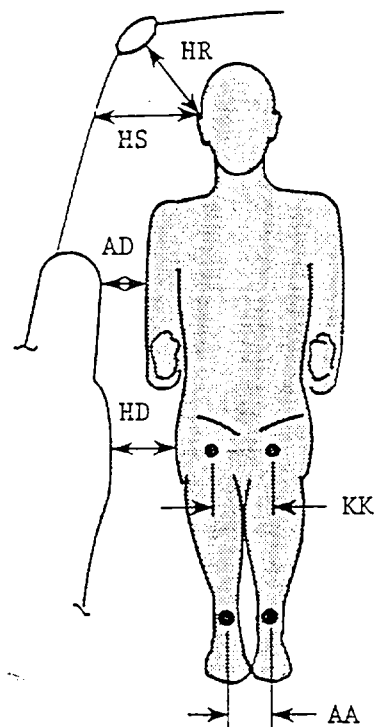


|    | DRIVER | PASSENGER |
|----|--------|-----------|
| HR | 8.1    | 8.3       |
| HS | 9.8    | 9.9       |
| AD | 4.0    | 4.1       |
| HD | 5.8    | 4.5       |
| KK | 10.0   | 8.0       |
| AA | 10.1   | 7.6       |

Knee outer bolt head to outer bolt head spacing:

Driver = 13.9

Passenger = 11.9

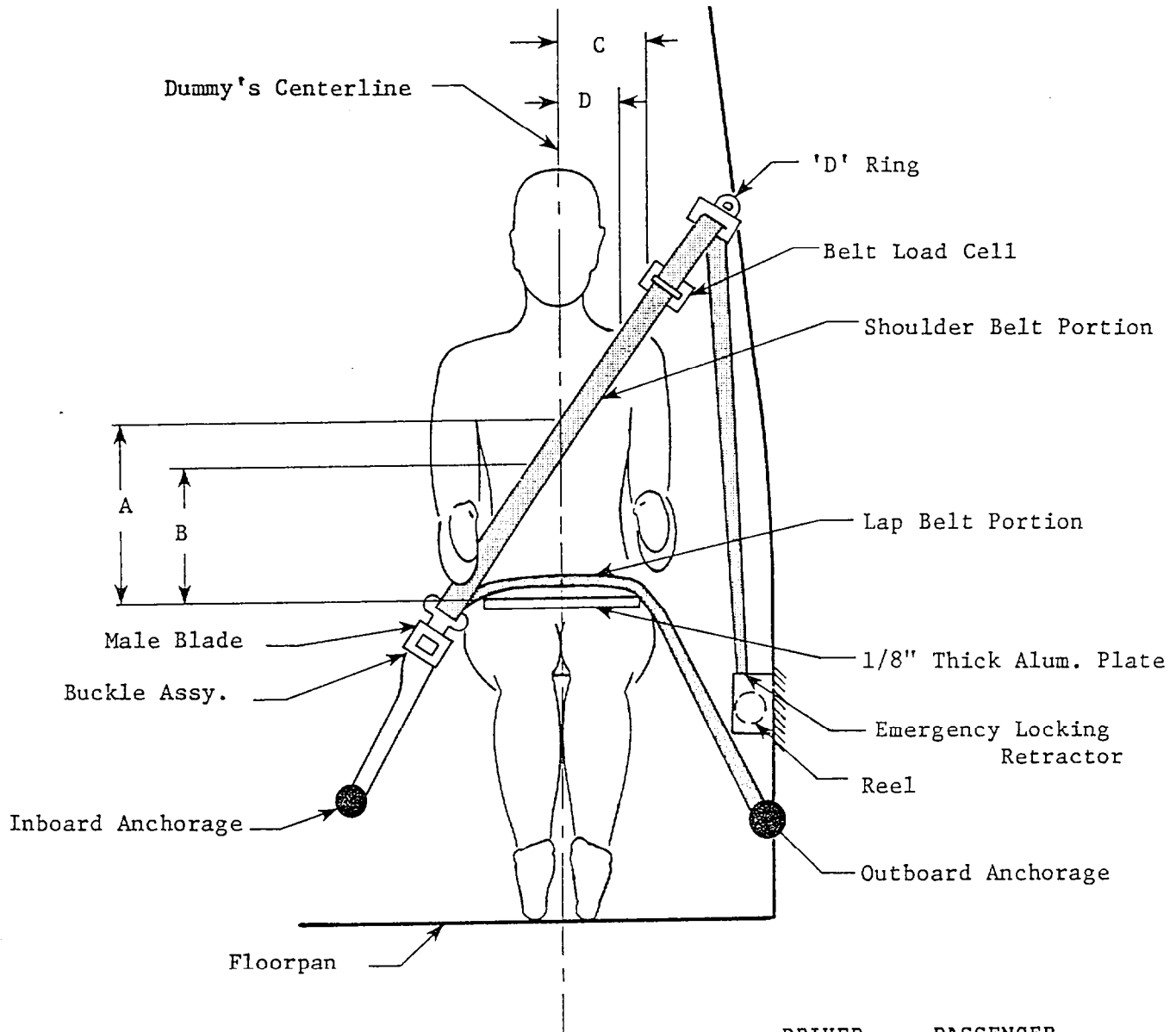


|                                |                          |
|--------------------------------|--------------------------|
| HH = Head to Windshield Header | HR = Head to Side Roof   |
| HW = Head to Windshield        | HS = Head to Side Window |
| CD = Chest to Dash             | AD = Arm to Door         |
| CS = Chest to Steering Wheel   | HD = Hip to Door         |
| KD = Knee to Dash              | KK = Knee to Knee        |
| TA = Torso Angle               | AA = Ankle to Ankle      |
| SA = Seat Back Angle           | HA = Head to A-Pillar    |

Torso and seat back angles are relative to vertical.

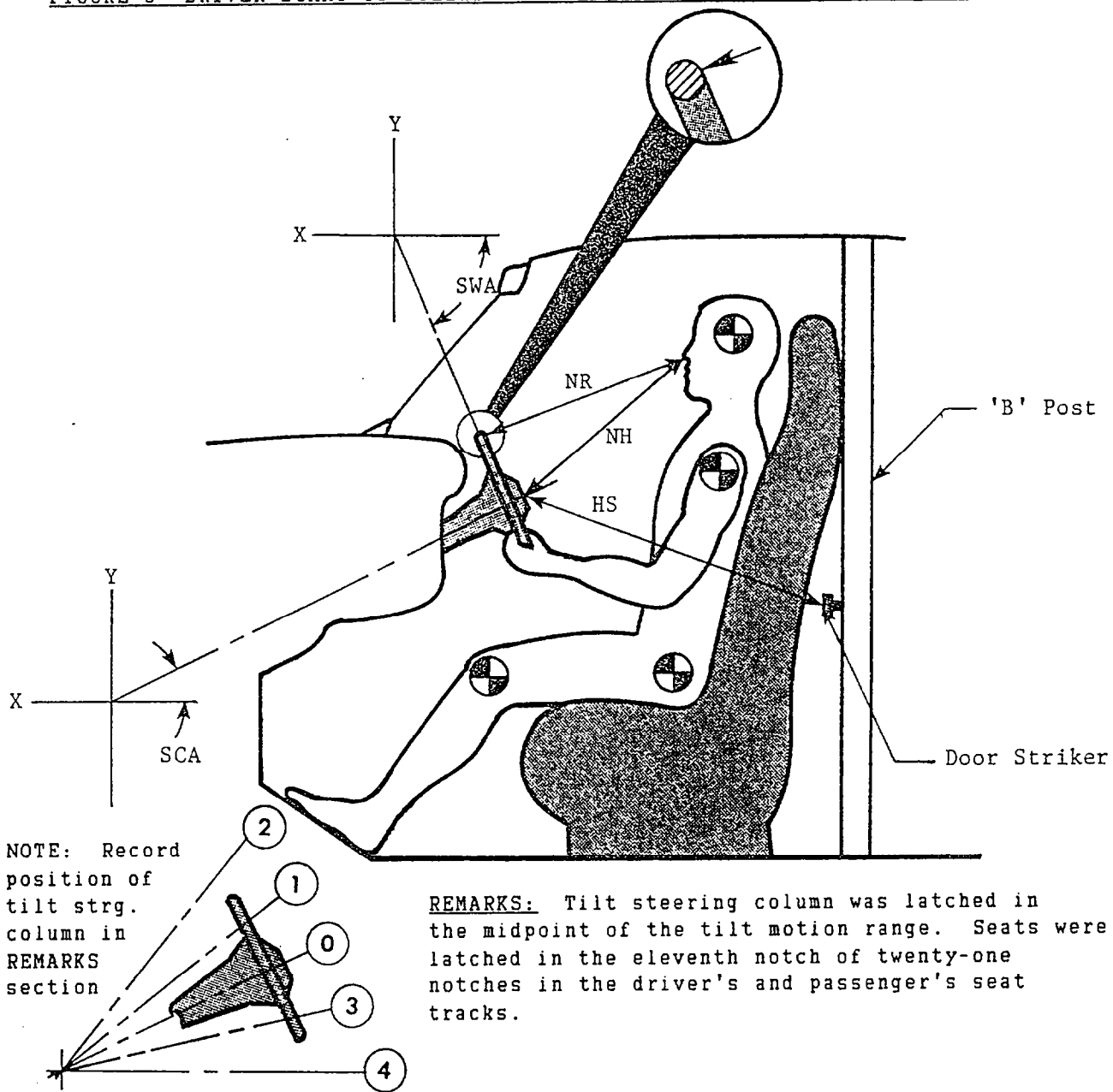
ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 2 SEAT BELT POSITIONING DATA



|                                                                    | DRIVER<br>DUMMY | PASSENGER<br>DUMMY |
|--------------------------------------------------------------------|-----------------|--------------------|
| A - Top surface of alum. plate to belt upper edge (in)             | 13.1            | 10.3               |
| B - Top surface of alum. plate to belt lower edge (in)             | 9.8             | 7.5                |
| C - Dummy centerline to outer edge of belt at chest flesh top (in) | 5.6             | 7.1                |
| D - Dummy centerline to inner edge of belt at chest flesh top (in) | 3.2             | 4.8                |
| LAP BELT TENSION (lbs)                                             | 4               | 4                  |
| SHOULDER BELT TENSION (lbs)                                        | 4               | 4                  |

FIGURE 3 DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



MEASUREMENTS

|     |                                                                                                    |      |
|-----|----------------------------------------------------------------------------------------------------|------|
| NR  | - Distance from tip of dummy's nose to top rear surface of steering wheel rim.                     | 19.1 |
| NH  | - Distance from tip of dummy's nose to center of steering column hub.                              | 20.1 |
| HS  | - Distance from center of steering column hub to the forward surface of the door lock striker pin. | 27.2 |
| SCA | - Angle of steering column relative to the horizontal X axis                                       | 26°  |
| SWA | - Angle of steering wheel relative to the horizontal X axis                                        | 66°  |

FIGURE 4 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

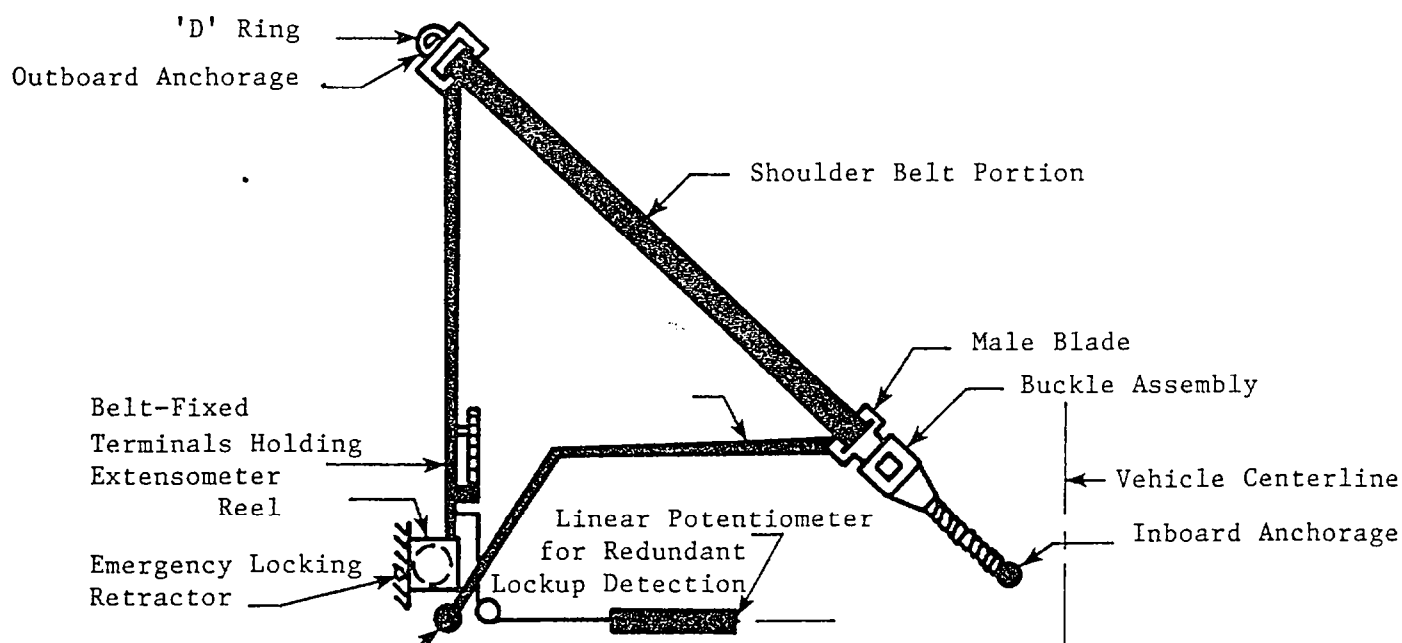
|                                                                                                 | DRIVER SIDE |           | PASSENGER SIDE |           |
|-------------------------------------------------------------------------------------------------|-------------|-----------|----------------|-----------|
|                                                                                                 | PRE-TEST    | POST-TEST | PRE-TEST       | POST-TEST |
| Total belt length from retractor reel to bolt hole anchor point for continuous webbing systems. | 110.6       | NA*       | 111.9          | NA*       |
| Retractor reel to 'D' ring as measured on Part 572 dummy.                                       | 16.8        | 17.0      | 17.2           | 16.6      |
| Shoulder belt length as measured on Part 572 dummy.                                             | 33.5        | 35.2      | 34.1           | 34.2      |
| Lap belt length as measured on Part 572 dummy.                                                  | 32.8        | 37.4      | 34.8           | 35.0      |
| Remainder of belt webbing left on retractor reel.                                               | 27.5        | NA*       | 25.8           | NA*       |

BELT SPOOL-OFF DATA:

|                                |     |     |     |     |
|--------------------------------|-----|-----|-----|-----|
| As determined by film analysis | DNA | 5.3 | DNA | 4.5 |
| As determined electronically   | DNA | 5.0 | DNA | 5.6 |

BELT STRAIN DATA:

|                                               |     |           |     |           |
|-----------------------------------------------|-----|-----------|-----|-----------|
| Measured between retractor reel and 'D' ring. | DNA | 0.5 in/ft | DNA | 0.7 in/ft |
|-----------------------------------------------|-----|-----------|-----|-----------|



\*Seatbelt retractors remained locked following the crash test event, preventing the belt length from being measured.

TABLE 6 TEST INFORMATION

PRE-IMPACT DATA

MAKE/MODEL: Isuzu/Spacecab LS

BODY STYLE: Pickup

MODEL YEAR: 1988

NHTSA NO.: MJ5700

COLOR: Gray

DATA FROM CERTIFICATION LABEL

VEHICLE MANUFACTURER: Isuzu Motors, Limited

DATE OF MANUFACTURE: 2/88

VIN: JAACL16E2J7207518

GVWR: 4300 LBS., GAWR: FRONT 1900 LBS., REAR 2545 LBS.

POST-IMPACT DATA

TYPE OF TEST: Frontal Load Cell Barrier Impact

DATE OF TEST: 6/14/88

TIME: 1527

TEMP: 95° F

REQUIRED IMPACT VELOCITY RANGE: 34.5 MPH TO 35.5 MPH

IMPACT VELOCITY: PRIMARY = 35.2 MPH, SECONDARY = 35.1 MPH

TEST WEIGHT = 3747 LBS., STATIC CRUSH MAX. = 21.7 IN., REBOUND = 19.6 IN.

FUEL SYSTEM DATA

TEST FLUID TYPE: PURPLE SOLVENT #2; SPEC. GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY\*: 19.3 GALLONS (FURNISHED BY COTR)

TEST VOLUME: 18.0 GALLONS (92-94% OF USEABLE)

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 19.8 GALLONS

DETAILS OF FUEL SYSTEM: Fuel tank is located on right side between axles.

Fuel filler is located on right side.

---

ELECTRIC FUEL PUMP: No

FUEL INJECTON: Yes

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

\*WITH ENTIRE FUEL SYSTEM FILLED.

FIGURE 5  
VEHICLE ACCELEROMETER LOCATIONS

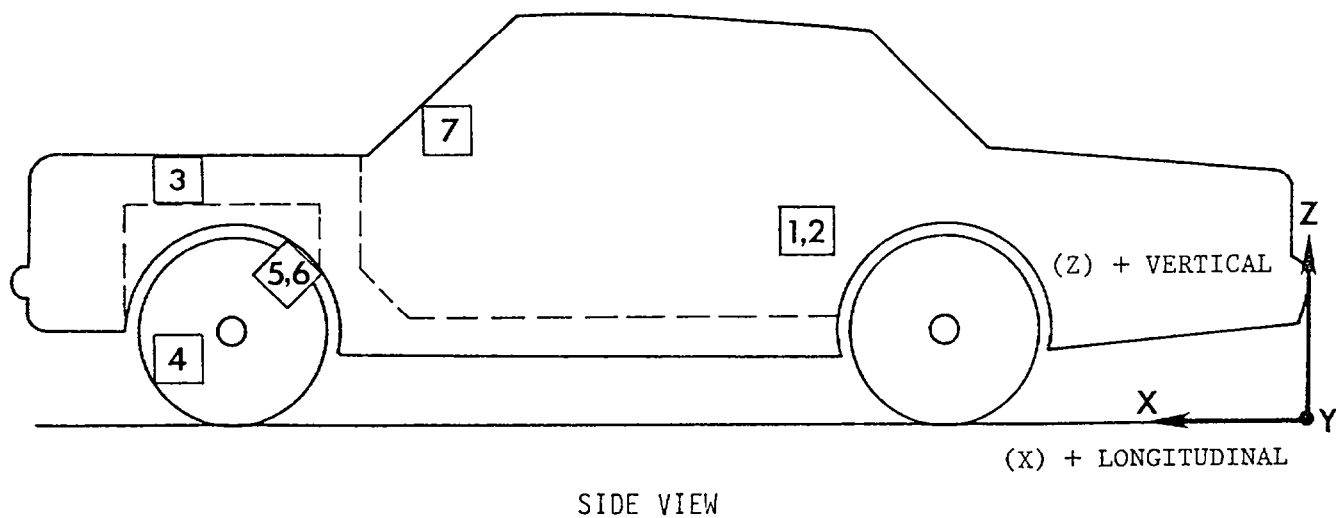
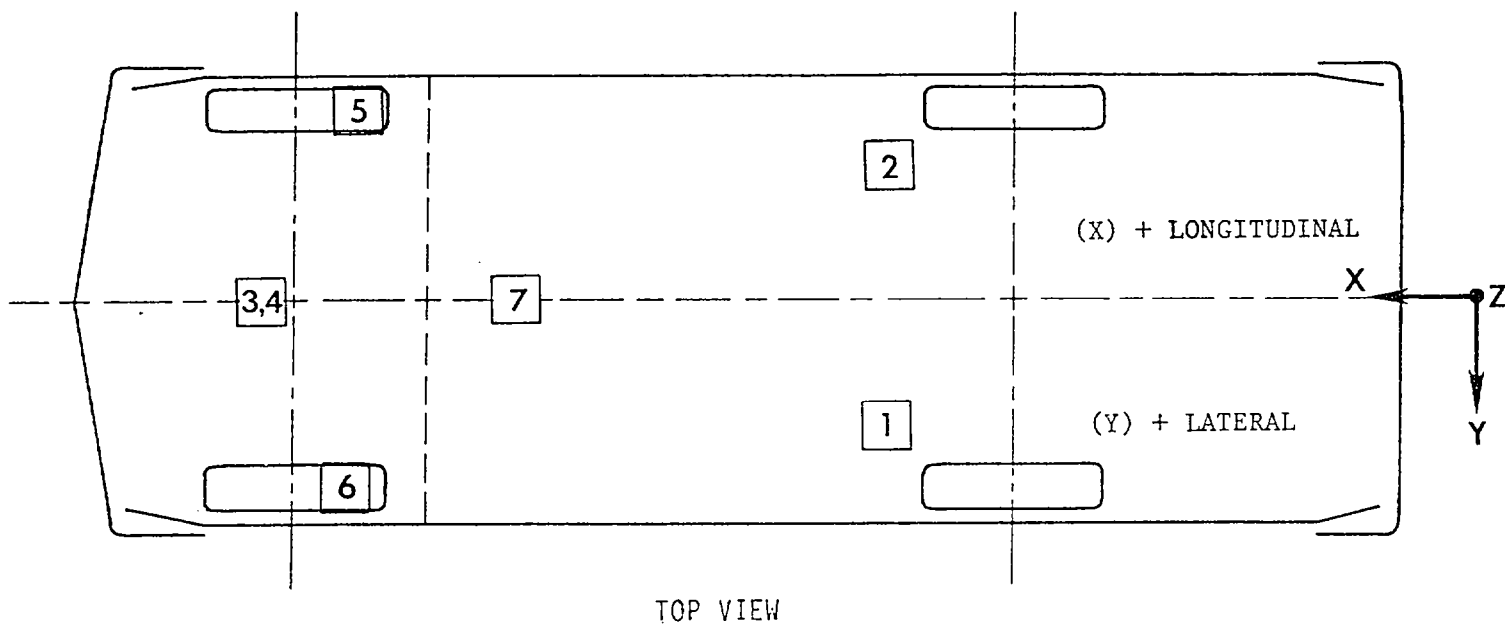


TABLE 7  
TEST NUMBER 880614

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

| No. | LOCATION                                            | X*    | Y*    | Z*   | POSITIVE<br>DIRECTION |       | NEGATIVE<br>DIRECTION |      |
|-----|-----------------------------------------------------|-------|-------|------|-----------------------|-------|-----------------------|------|
|     |                                                     |       |       |      | MAX G MSEC            |       | MAX G MSEC            |      |
| 1   | REAR SEAT X-MEMBER<br>AT LEFT SIDE<br>LONGITUDINAL  | 95.8  | 22.6  | 23.8 | 2.7                   | 146.5 | 74.7                  | 19.8 |
| 2   | REAR SEAT X-MEMBER<br>AT RIGHT SIDE<br>LONGITUDINAL | 95.6  | -22.6 | 24.2 | 3.7                   | 61.5  | 37.9                  | 41.3 |
| 3   | TOP OF ENGINE BLOCK<br>LONGITUDINAL                 | 175.9 | -1.1  | 32.4 | 42.3                  | 36.8  | 177.8                 | 27.2 |
| 4   | BOTTOM OF ENGINE BLOCK<br>LONGITUDINAL              | 165.0 | 1.4   | 6.7  | 27.3                  | 38.6  | 156.0                 | 30.4 |
| 5   | BRAKE CALIPER<br>AT RIGHT SIDE<br>LONGITUDINAL      | 166.9 | -24.0 | 12.2 | 67.5                  | 40.5  | 153.2                 | 17.1 |
| 6   | BRAKE CALIPER<br>AT LEFT SIDE<br>LONGITUDINAL       | 166.8 | 24.0  | 11.9 | 56.6                  | 37.5  | 156.1                 | 16.4 |
| 7   | DASH PANEL<br>LONGITUDINAL                          | 145.0 | 0.0   | 39.9 | 14.4                  | 53.8  | 80.9                  | 40.4 |

\* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: FORWARD FROM REAR BUMPER  
Y: LEFT FROM VEHICLE CENTERLINE  
Z: UP FROM GROUND LEVEL

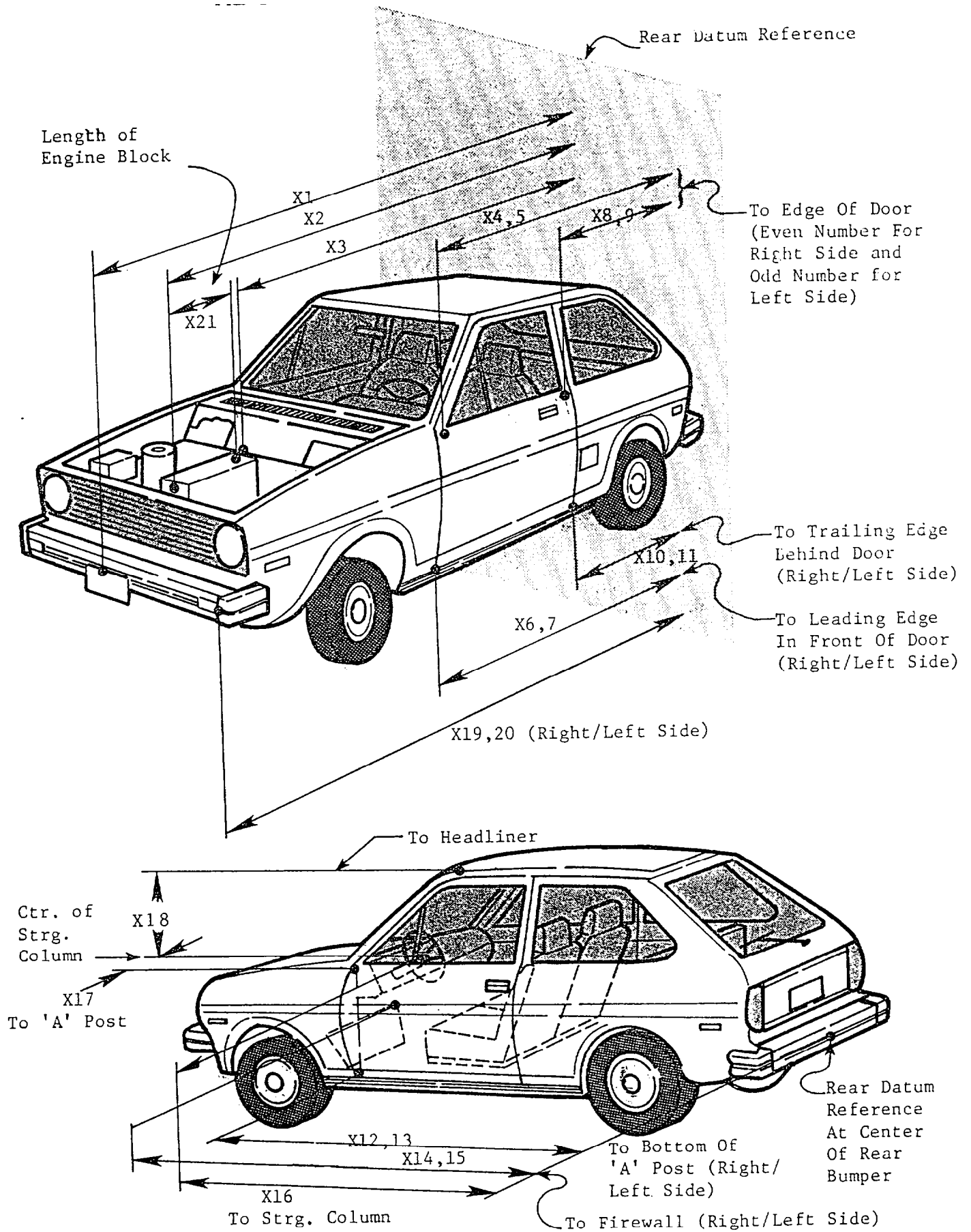


TABLE 8

## IMPACTED VEHICLE MEASUREMENTS

| VEHICLE MAKE/MODEL: Isuzu Spacecab LS      TEST NUMBER: 880614 |                                                              |  | DIMENSIONS IN INCHES |           |       |
|----------------------------------------------------------------|--------------------------------------------------------------|--|----------------------|-----------|-------|
| NO.                                                            | TYPE OF MEASUREMENT                                          |  | PRE-TEST             | POST-TEST | DIFF. |
| X1                                                             | TOTAL LENGTH OF VEHICLE AT CENTERLINE                        |  | 199.1                | 177.9     | 21.2  |
| X2                                                             | REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK             |  | 178.0                | 171.4     | 6.6   |
| X3                                                             | REAR SURFACE OF VEHICLE TO FIREWALL                          |  | 159.8                | 158.1     | 1.7   |
| X4                                                             | REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR  |  | 150.8                | 151.0     | -0.2  |
| X5                                                             | REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR   |  | 150.6                | 150.3     | 0.3   |
| X6                                                             | REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR  |  | 150.1                | 149.4     | 0.7   |
| X7                                                             | REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR   |  | 149.8                | 149.2     | 0.6   |
| X8                                                             | REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR |  | 105.2                | 105.8     | -0.6  |
| X9                                                             | REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR  |  | 105.2                | 105.1     | 0.1   |
| X10                                                            | REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR |  | 105.1                | 104.3     | 0.8   |
| X11                                                            | REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR  |  | 104.7                | 104.2     | 0.5   |
| X12                                                            | REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE  |  | 149.0                | 149.1     | -0.1  |
| X13                                                            | REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE   |  | 149.2                | 148.7     | 0.5   |
| X14                                                            | REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE             |  | 159.9                | 159.5     | 0.4   |
| X15                                                            | REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE              |  | 159.6                | 158.8     | 0.8   |
| X16                                                            | REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER             |  | 133.1                | 130.8     | 2.3   |
| X17                                                            | CENTER OF STEERING COLUMN TO "A" POST                        |  | 15.6                 | 14.9      | 0.7   |
| X18                                                            | CENTER OF STEERING COLUMN TO HEADLINING                      |  | 18.4                 | 13.7      | 4.7   |
| X19                                                            | REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER        |  | 197.2                | 176.2     | 21.0  |
| X20                                                            | REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER         |  | 197.1                | 175.9     | 21.2  |
| X21                                                            | LENGTH OF ENGINE BLOCK                                       |  | 16.5                 | 16.5      | 0.0   |

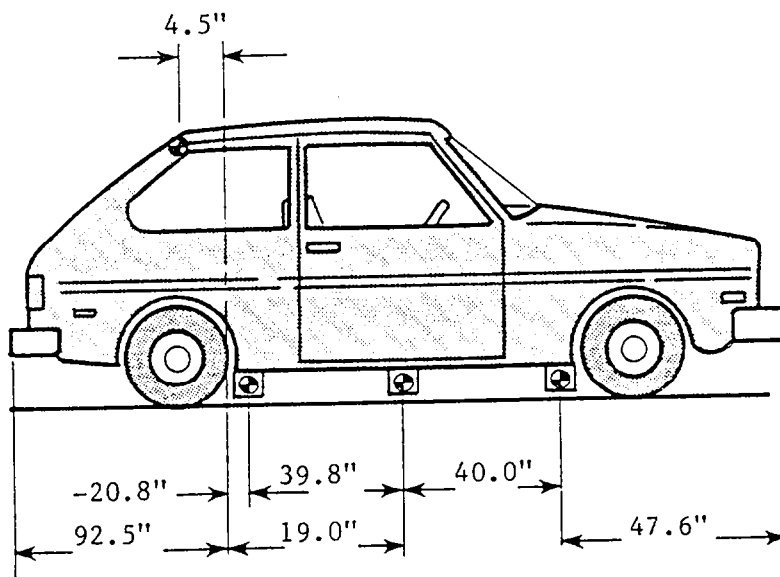
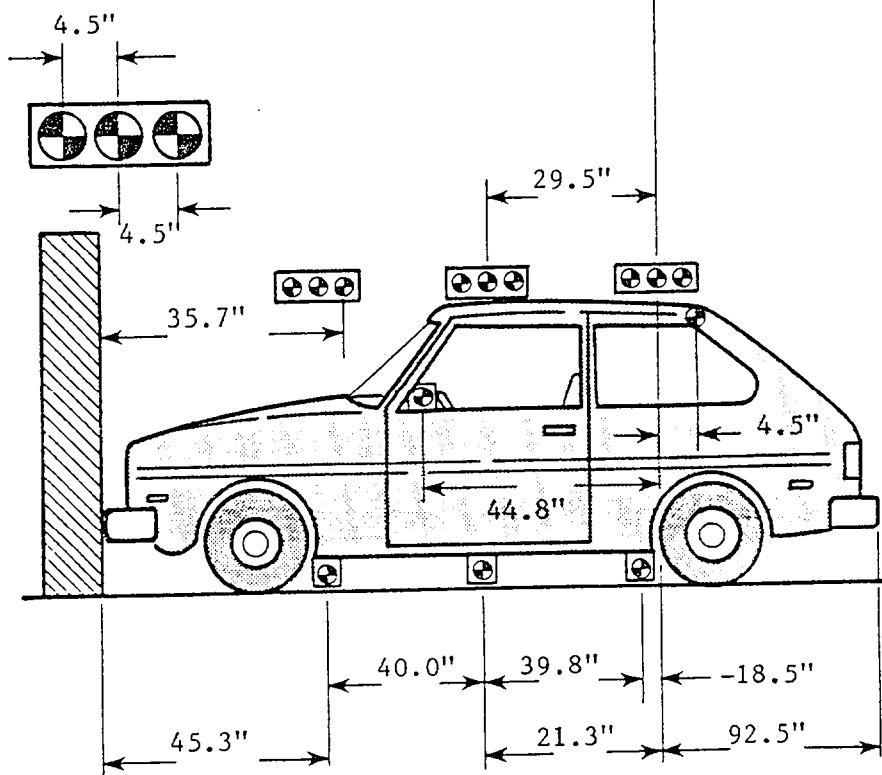
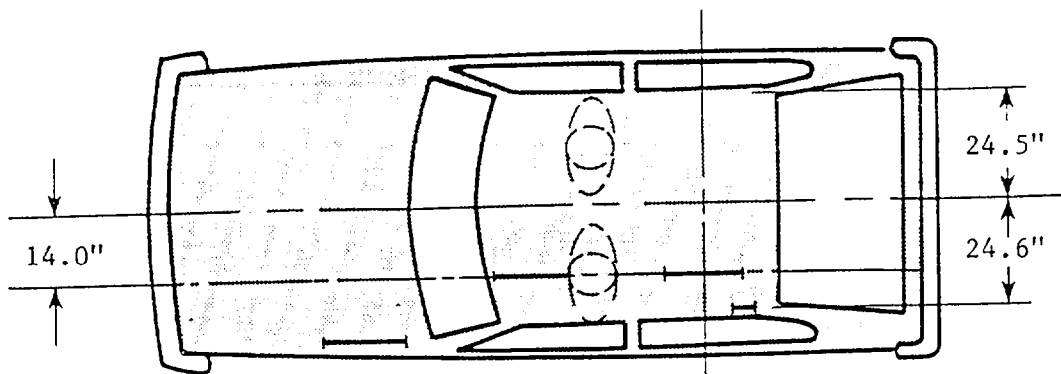


FIGURE 8 ACCIDENT INVESTIGATION DIVISION DATA  
FOR 35 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Isuzu/Spacecab LS/Pickup

VEH. NHTSA NO.: MJ5700; VIN: JAACL16E2J7207518

MODEL YEAR: 1988; BUILD DATE: 2/88; TEST DATE: 6/14/88

VEH. SIZE CATEGORY: Small pickup; TEST WEIGHT: 3747

VEH. WHEELBASE: 119.8

MAX. WIDTH: 66.2

FRONT OVERHANG: 28.8

COLLISION DEFORMATION  
 CLASSIFICATION (CDC) CODE: 12FDEW3

F (Frontal)  
 CRUSH DEPTH  
 DIMENSIONS:

C1 = 21.2 inches

C2 = 21.0 inches

C3 = 21.7 inches

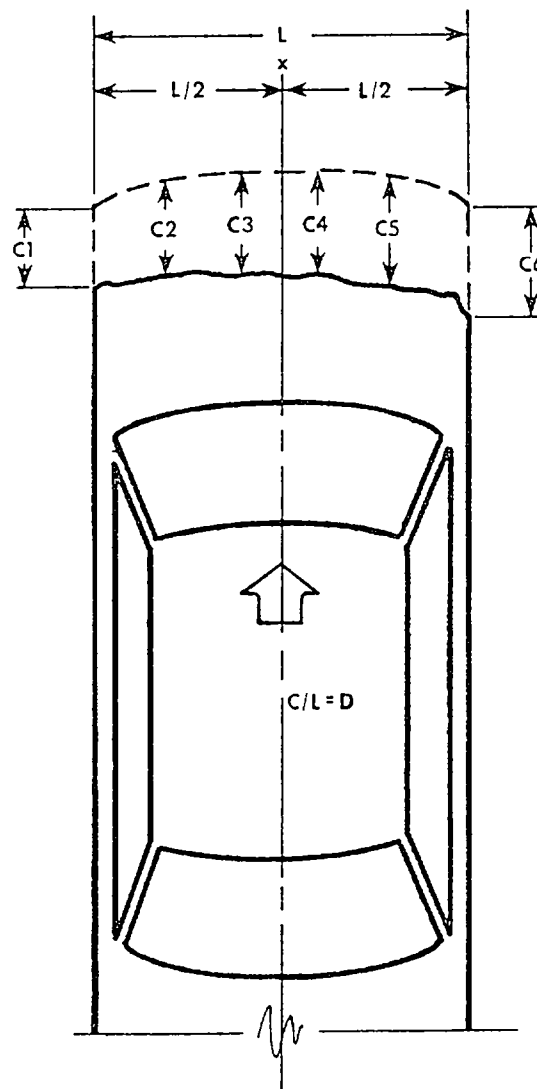
C4 = 21.5 inches

C5 = 21.0 inches

C6 = 21.0 inches

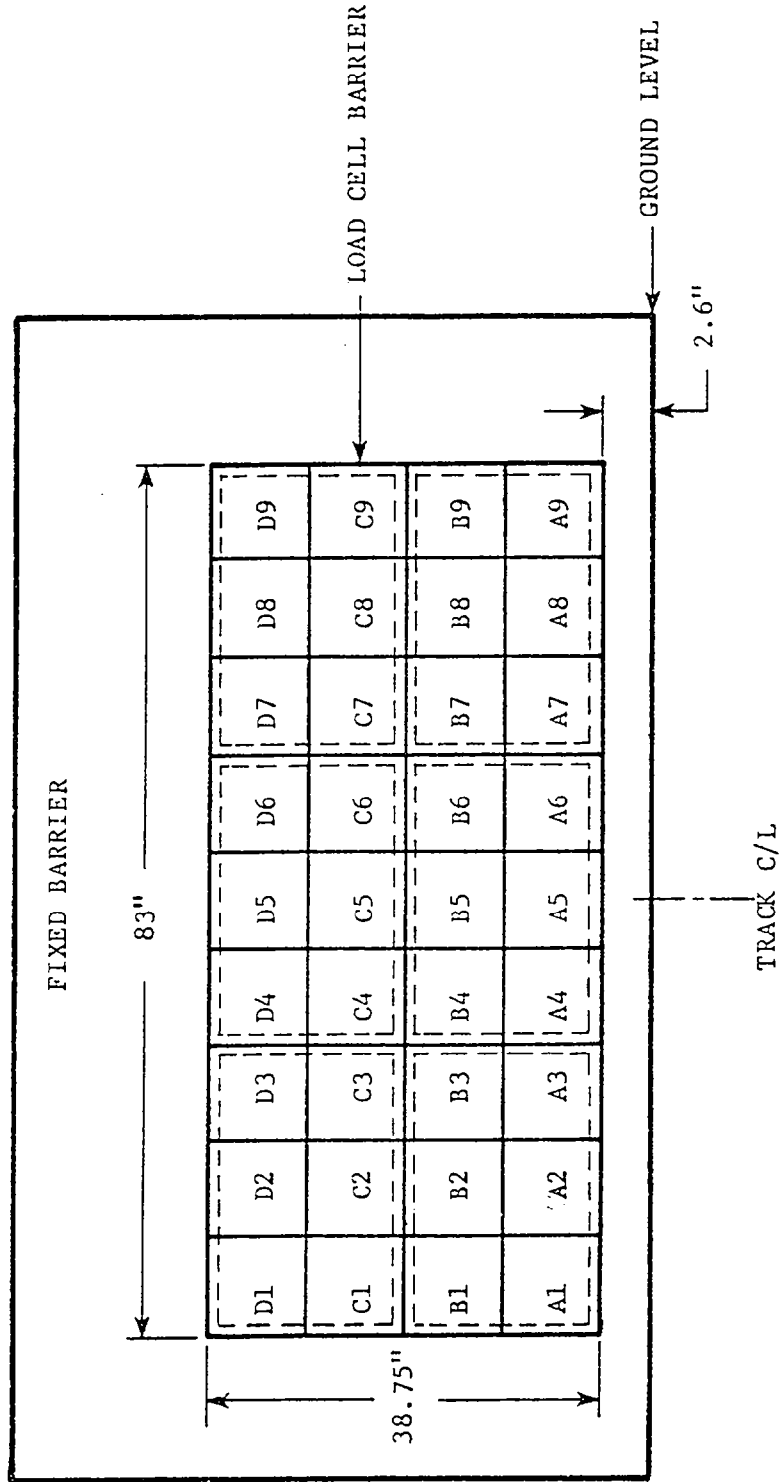
MIDPOINT OF DAMAGE: D = Vehicle Centerline  
(Longitudinal)

LENGTH OF DAMAGED  
 REGION: L = 58.2 inches



36 LOAD CELLS  
4 ROWS  
9 COLUMNS

FRONT VIEW



# BARRIER LOAD CELL CONFIGURATION

- GROUP 1: D1 thru C3
- GROUP 2: D4 thru C6
- GROUP 3: D7 thru C9
- GROUP 4: B1 thru A3
- GROUP 5: B4 thru A6
- GROUP 6: B7 thru A9

FIGURE 9

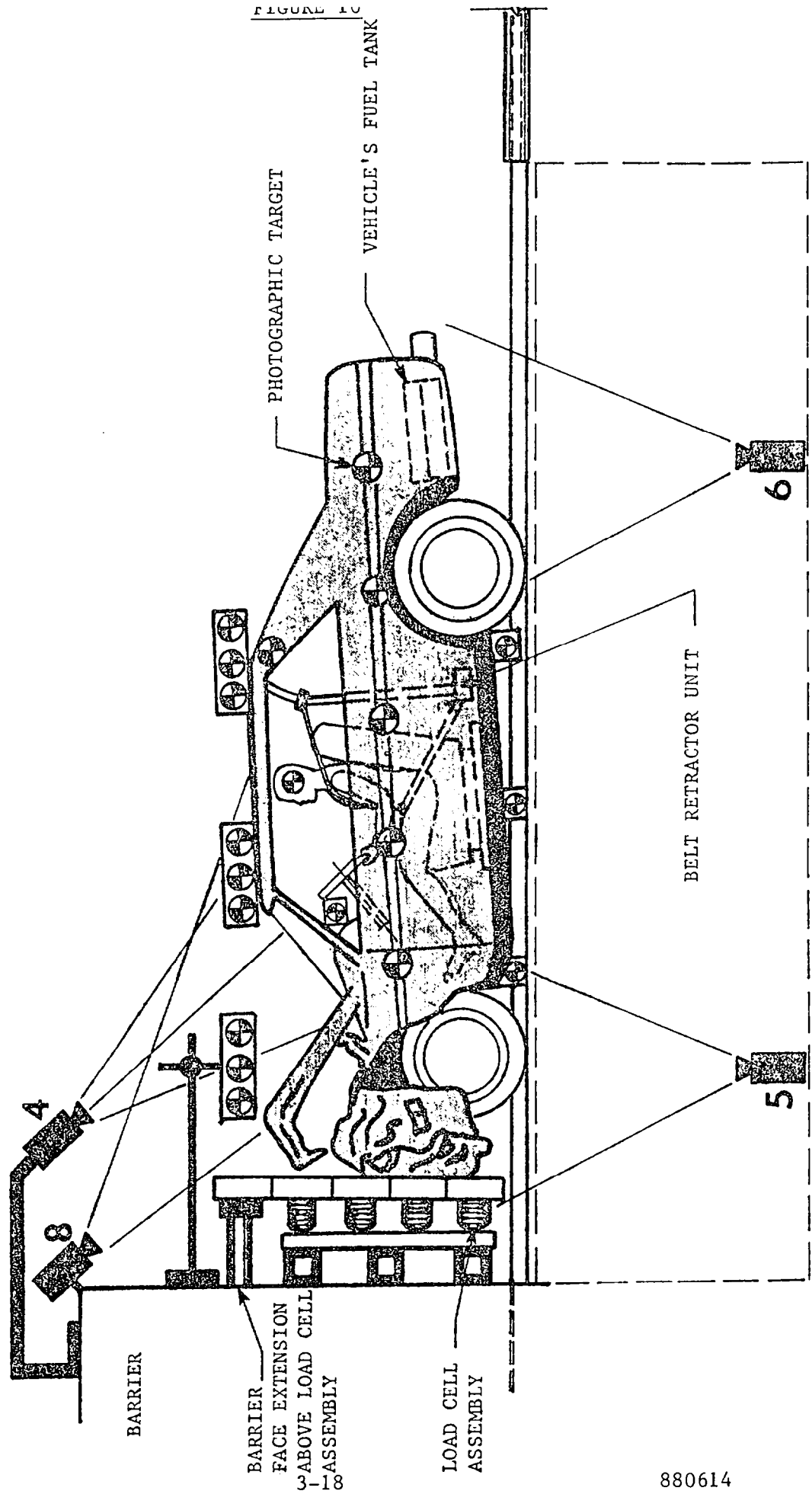
TABLE 9  
LOAD CELL BARRIER SUMMARY

| POSITION              | POSITIVE DIRECTON* |                | NEGATIVE DIRECTON* |                |
|-----------------------|--------------------|----------------|--------------------|----------------|
|                       | MAX<br>(lb)        | TIME<br>(msec) | MIN<br>(lb)        | TIME<br>(msec) |
| TOTAL GROUP 1         | 276.1              | 165.6          | 8148.6             | 20.9           |
| TOTAL GROUP 2         | 281.6              | 266.6          | 51486.3            | 30.5           |
| TOTAL GROUP 3         | 293.5              | 201.1          | 13059.0            | 21.8           |
| TOTAL GROUP 4         | 396.6              | 269.0          | 12615.0            | 11.6           |
| TOTAL GROUP 5         | ---                | --- Y          | ---                | --- Y          |
| TOTAL GROUP 6         | ---                | --- Y          | ---                | --- Y          |
| TOTAL LOAD CELL FORCE | ---                | --- Y          | ---                | --- Y          |

\*REFERENCE: TENSION IS POSITIVE  
COMPRESSION IS NEGATIVE

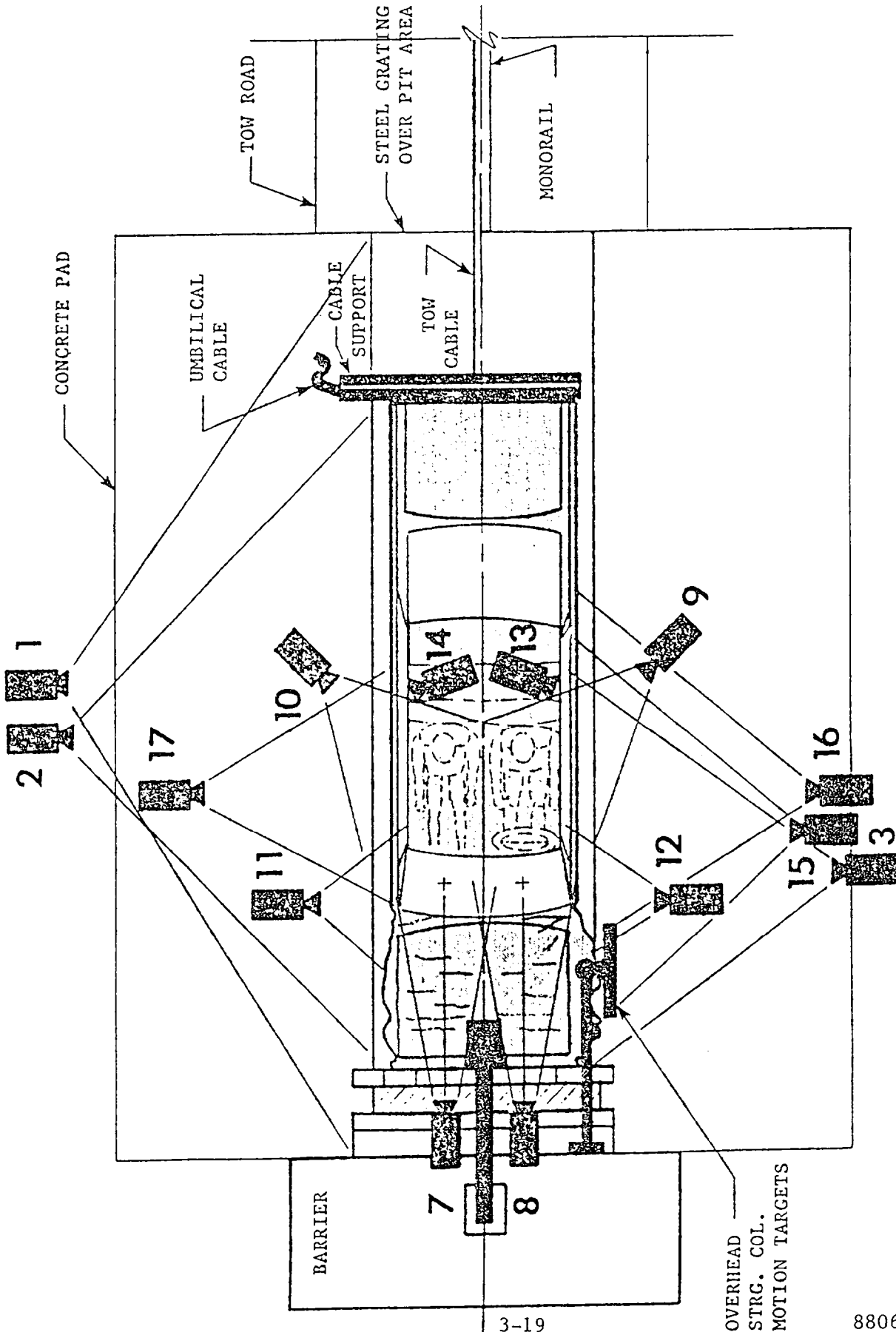
Y See DATA ACQUISITION EXPLANATIONS

# CAMERA POSITIONS



880614

FIGURE 10 CONT'D



CAMERA POSITIONS

TABLE 10  
HIGH SPEED CAMERA LOCATIONS

| TEST NO.: 880614 |                             | VEHICLE: Isuzu Spacecab LS |        |       |               |                | FILM PLANE |             |  |  |
|------------------|-----------------------------|----------------------------|--------|-------|---------------|----------------|------------|-------------|--|--|
| CAMERA NO.       | VIEW                        | CAMERA POSITIONS (IN)*     |        |       | ANGLE** (DEG) | TO HEAD TARGET | LENS (MM)  | SPEED (FPS) |  |  |
|                  |                             | X                          | Y      | Z     |               |                |            |             |  |  |
| 1                | Real time panning           | -142.0                     | 504.0  | 61.0  | NA            | NA             | 16         | 24          |  |  |
| 2                | Vehicle crush               | -81.3                      | 266.4  | 37.1  | -2            | NA             | 13         | 502         |  |  |
| 3                | Dummy kinematics            | -41.5                      | -295.0 | 44.0  | -12           | 294.0"         | 25         | 495         |  |  |
| 4                | Windshield damage           | -36.4                      | 0.0    | 98.0  | 40            | NA             | 13         | 495         |  |  |
| 5                | Crush & fluid spillage      | -50.5                      | 0.0    | -92.4 | 90            | NA             | 13         | 990         |  |  |
| 6                | Fluid spillage              | -99.3                      | 0.0    | -99.0 | 90            | NA             | 13         | 1000        |  |  |
| 7                | Passenger kinematics        | -4.5                       | 13.8   | 85.0  | 40            | NA             | 17         | 500         |  |  |
| 8                | Driver kinematics           | -6.8                       | -14.5  | 85.0  | 41            | NA             | 17         | 497         |  |  |
| 9                | Driver kinematics           | -180.0                     | -73.0  | 102.0 | -27           | 102.0"         | 25         | 502         |  |  |
| 10               | Passenger kinematics        | -184.0                     | 74.0   | 100.0 | -26           | 97.0"          | 25         | 497         |  |  |
| 11               | Windshield intrusion        | -38.1                      | 306.1  | 44.0  | 0             | NA             | 50         | 495         |  |  |
| 12               | Windshield intrusion        | -53.0                      | -309.4 | 42.3  | 0             | NA             | 50         | 495         |  |  |
| 13               | Driver seatbelt movement    | NA                         | NA     | NA    | NA            | NA             | 13         | 507         |  |  |
| 14               | Passenger seatbelt movement | NA                         | NA     | NA    | NA            | NA             | 13         | 495         |  |  |
| 15               | Column movement             | -85.0                      | -286.0 | 103.0 | -14           | NA             | 25         | 497         |  |  |
| 16               | Column movement             | -85.0                      | -286.0 | 75.1  | -9            | NA             | 25         | 502         |  |  |
| 17               | Passenger kinematics        | -38.8                      | 210.8  | 45.3  | 7             | 301.0"         | 25         | 502         |  |  |

\*X = Film plane to plane of barrier face

Y = Film plane to monorail centerline

Z = Film plane to ground

\*\*Referenced to horizontal plane

## APPENDIX A

### PHOTOGRAPHS

1. PRE-TEST FRONT VIEW
2. POST-TEST FRONT VIEW
3. PRE-TEST LEFT SIDE VIEW
4. POST-TEST LEFT SIDE VIEW
5. PRE-TEST RIGHT SIDE VIEW
6. POST-TEST RIGHT SIDE VIEW
7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW
8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
9. PRE-TEST LEFT REAR THREE-QUARTER VIEW
10. POST-TEST LEFT REAR THREE-QUARTER VIEW
11. PRE-TEST REAR VIEW
12. POST-TEST REAR VIEW
13. PRE-TEST WINDSHIELD VIEW
14. POST-TEST WINDSHIELD VIEW
15. PRE-TEST ENGINE COMPARTMENT VIEW
16. POST-TEST ENGINE COMPARTMENT VIEW
17. PRE-TEST FUEL FILLER CAP VIEW
18. POST-TEST FUEL FILLER CAP VIEW
19. PRE-TEST FUEL FILLER NECK VIEW
20. PRE-TEST FUEL TANK VIEW
21. PRE-TEST FRONT UNDERBODY VIEW
22. POST-TEST FRONT UNDERBODY VIEW
23. PRE-TEST REAR UNDERBODY VIEW
24. POST-TEST REAR UNDERBODY VIEW
25. PRE-TEST DRIVER DUMMY POSITION VIEW
26. POST-TEST DRIVER DUMMY POSITION VIEW
27. PRE-TEST PASSENGER DUMMY POSITION VIEW
28. POST-TEST PASSENGER DUMMY POSITION VIEW
29. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW 1 (DOOR OPEN)
30. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW 1 (DOOR OPEN)
31. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW 1 (DOOR OPEN)
32. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW 1 (DOOR OPEN)

APPENDIX A CONT'D

PHOTOGRAPHS

- 33. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW 2 (DOOR OPEN)
- 34. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW 2 (DOOR OPEN)
- 35. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW 2 (DOOR OPEN)
- 36. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW 2 (DOOR OPEN)
- 37. POST-TEST DRIVER DUMMY HEAD CONTACT VIEW
- 38. POST-TEST DRIVER DUMMY KNEE CONTACT VIEW
- 39. POST-TEST PASSENGER DUMMY KNEE CONTACT
- 40. POST-TEST LOAD CELL BARRIER DAMAGE - VIEW 1
- 41. POST-TEST LOAD CELL BARRIER DAMAGE - VIEW 2



Figure A-1. PRE-TEST FRONT VIEW



Figure A-2. POST-TEST FRONT VIEW

A-3

880614

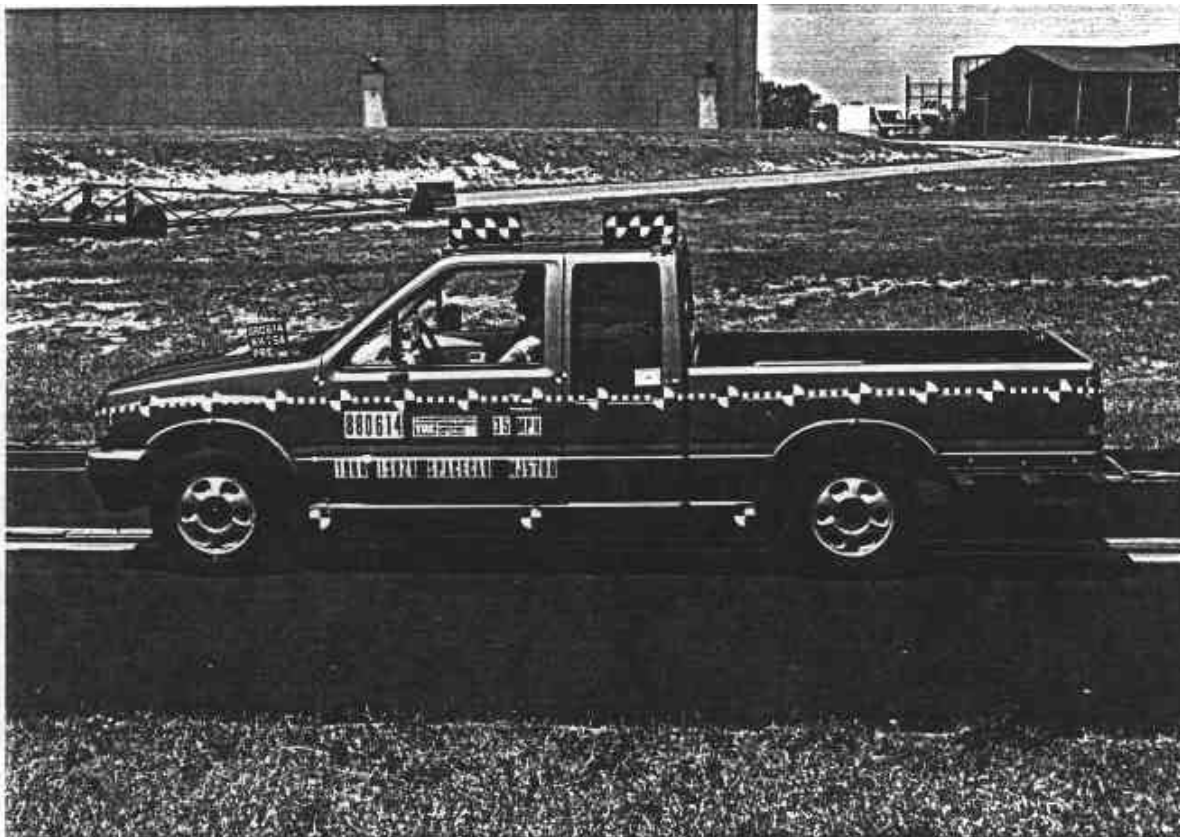


Figure A-3. PRE-TEST LEFT SIDE VIEW

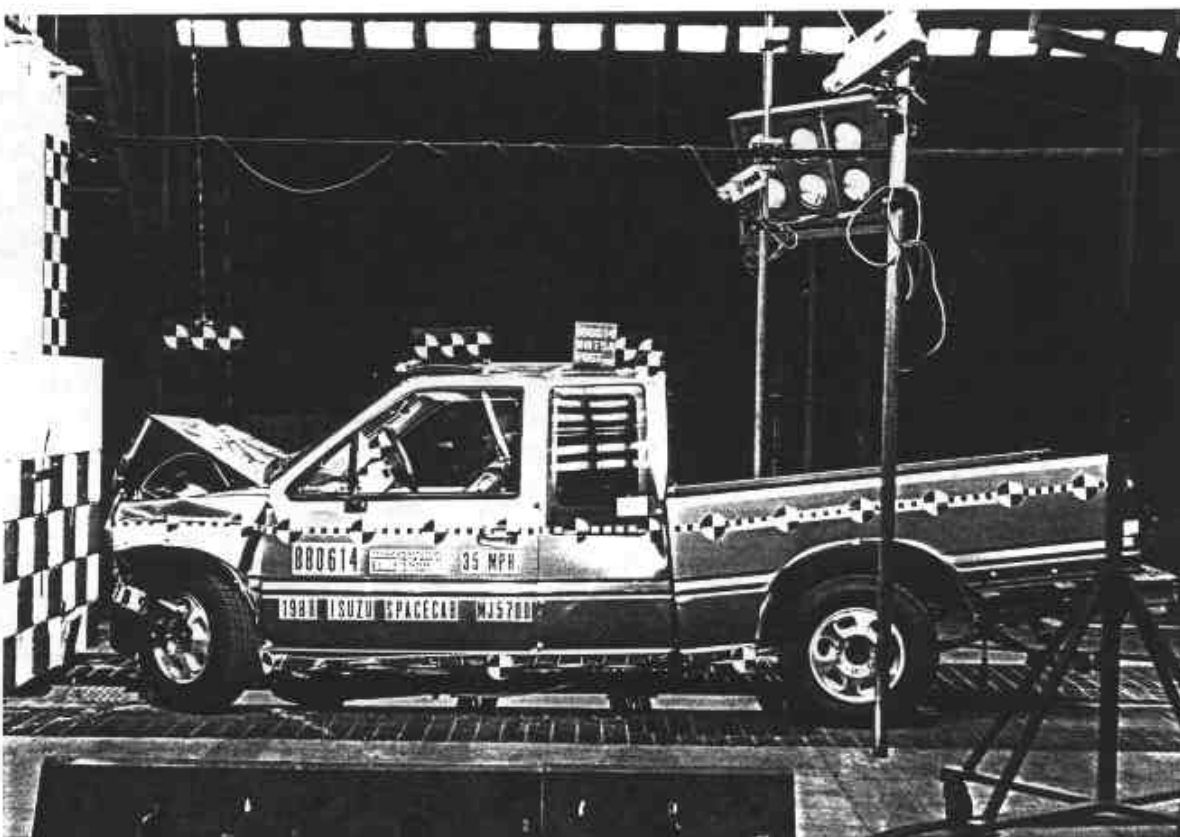


Figure A-4. POST-TEST LEFT SIDE VIEW

A-4

880614

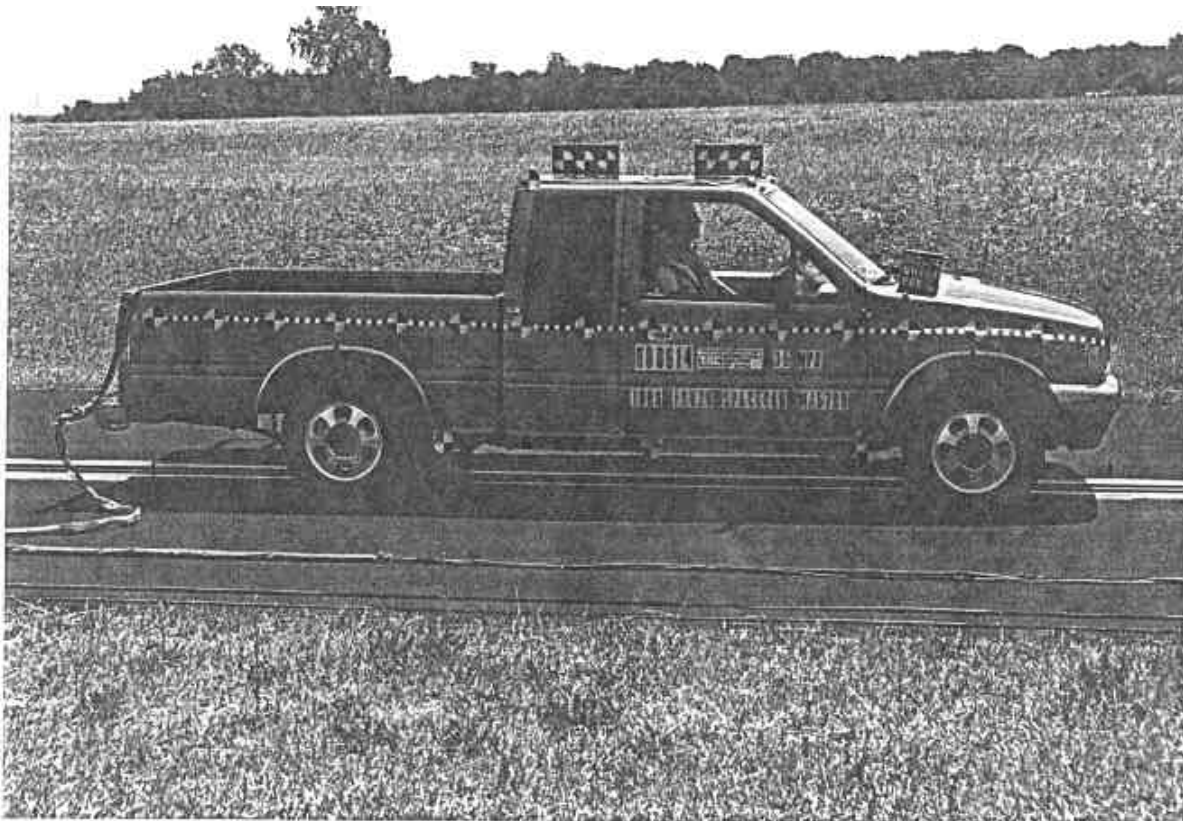


Figure A-5. PRE-TEST RIGHT SIDE VIEW

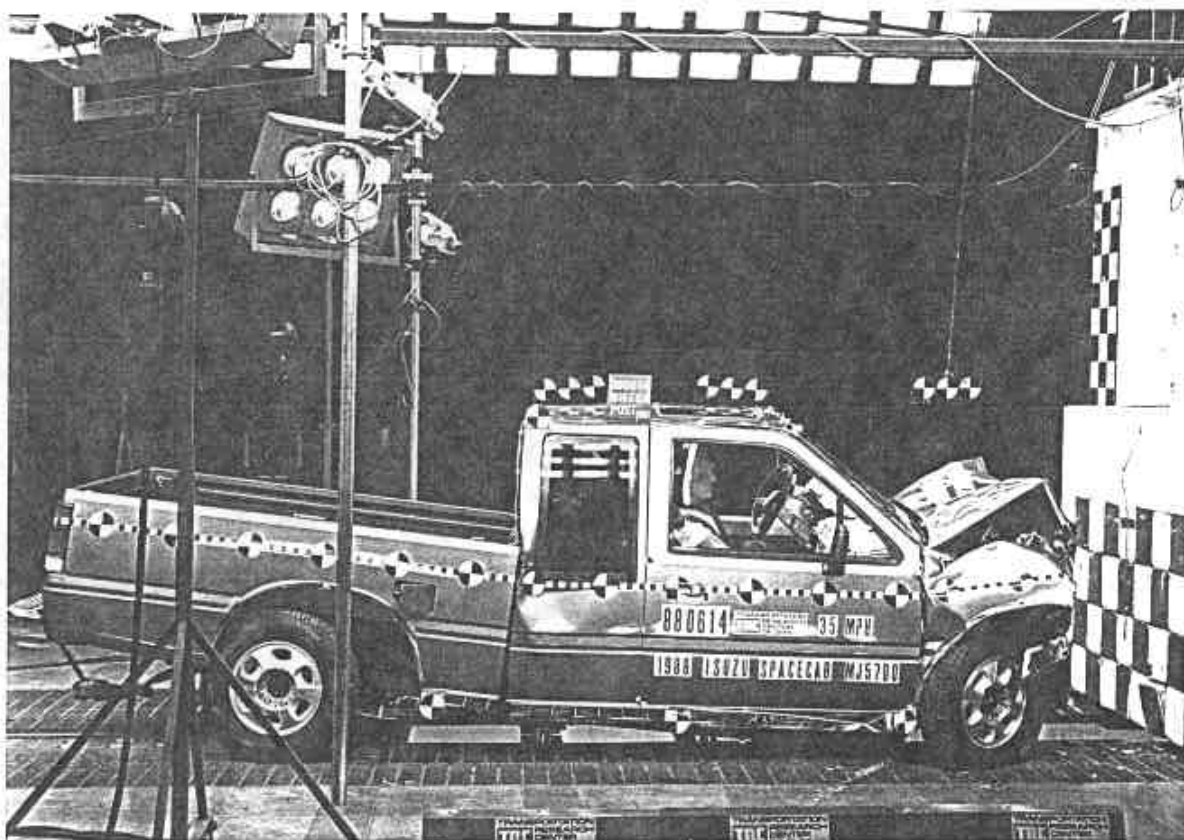


Figure A-6. POST-TEST RIGHT SIDE VIEW  
A-5

880614



Figure A-7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

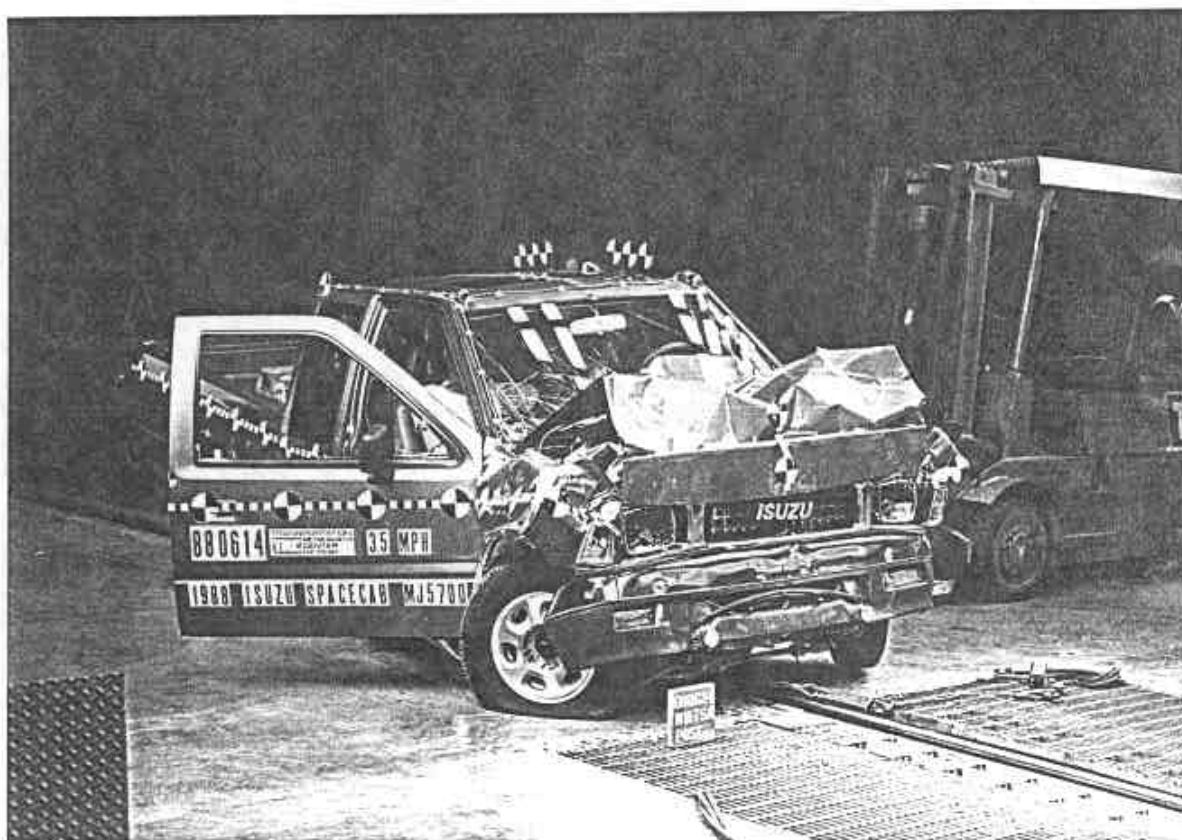


Figure A-8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-6

880614



Figure A-9. PRE-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-10. POST-TEST LEFT REAR THREE-QUARTER VIEW  
A-7

880614



Figure A-11. PRE-TEST REAR VIEW

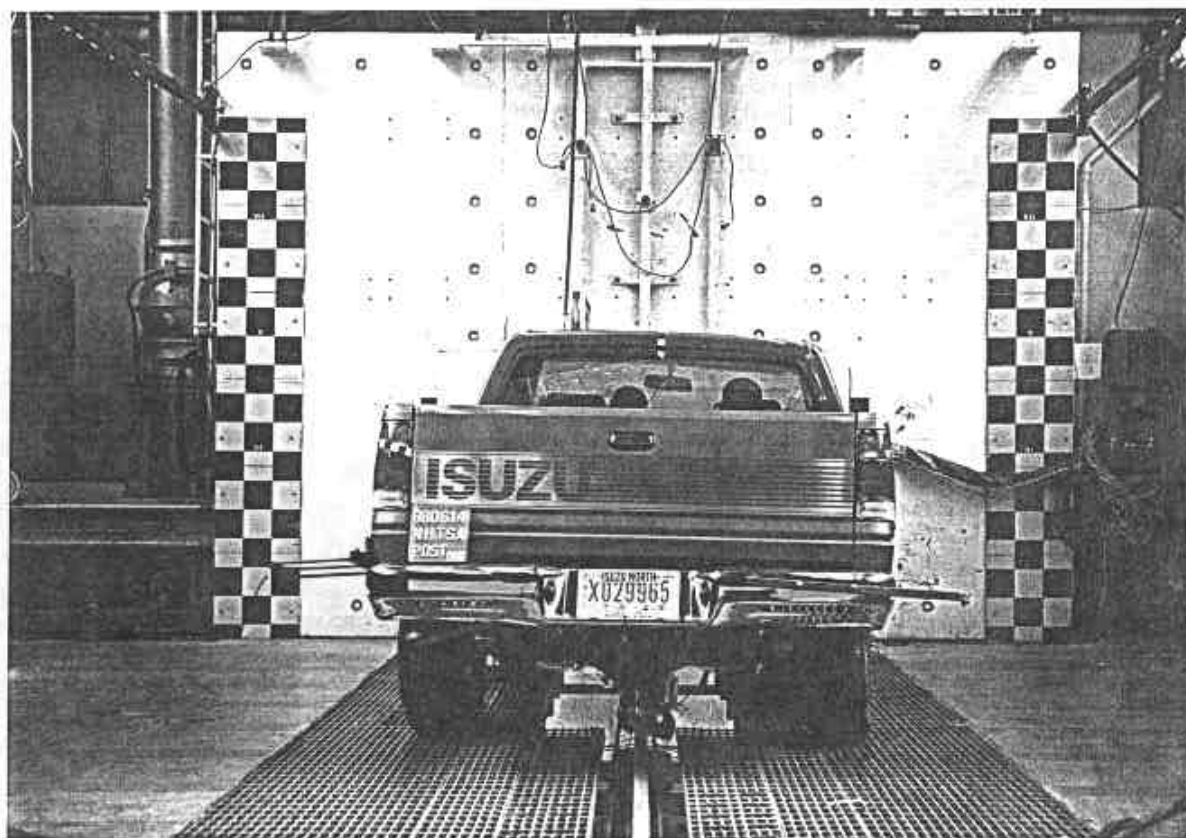


Figure A-12. POST-TEST REAR VIEW  
A-8

880614



Figure A-13. PRE-TEST WINDSHIELD VIEW

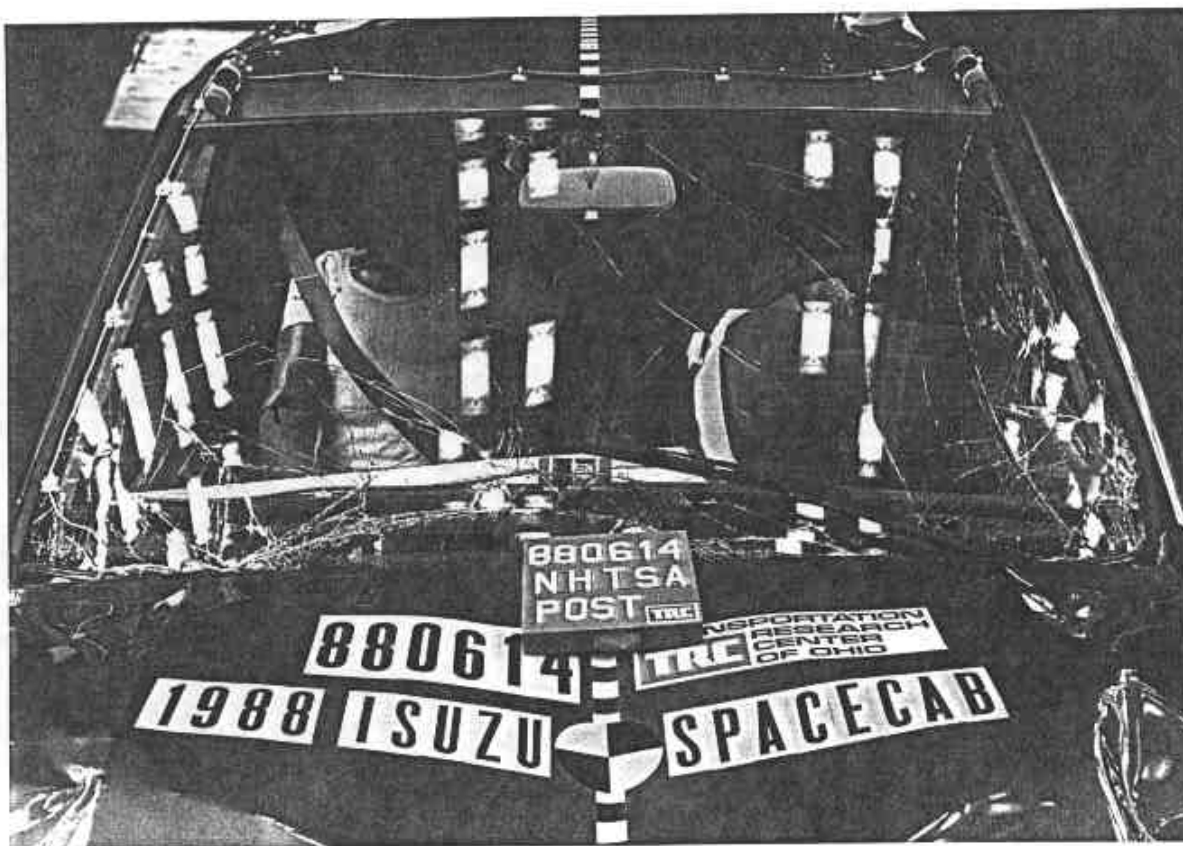


Figure A-14. POST-TEST WINDSHIELD VIEW  
A-9

880614

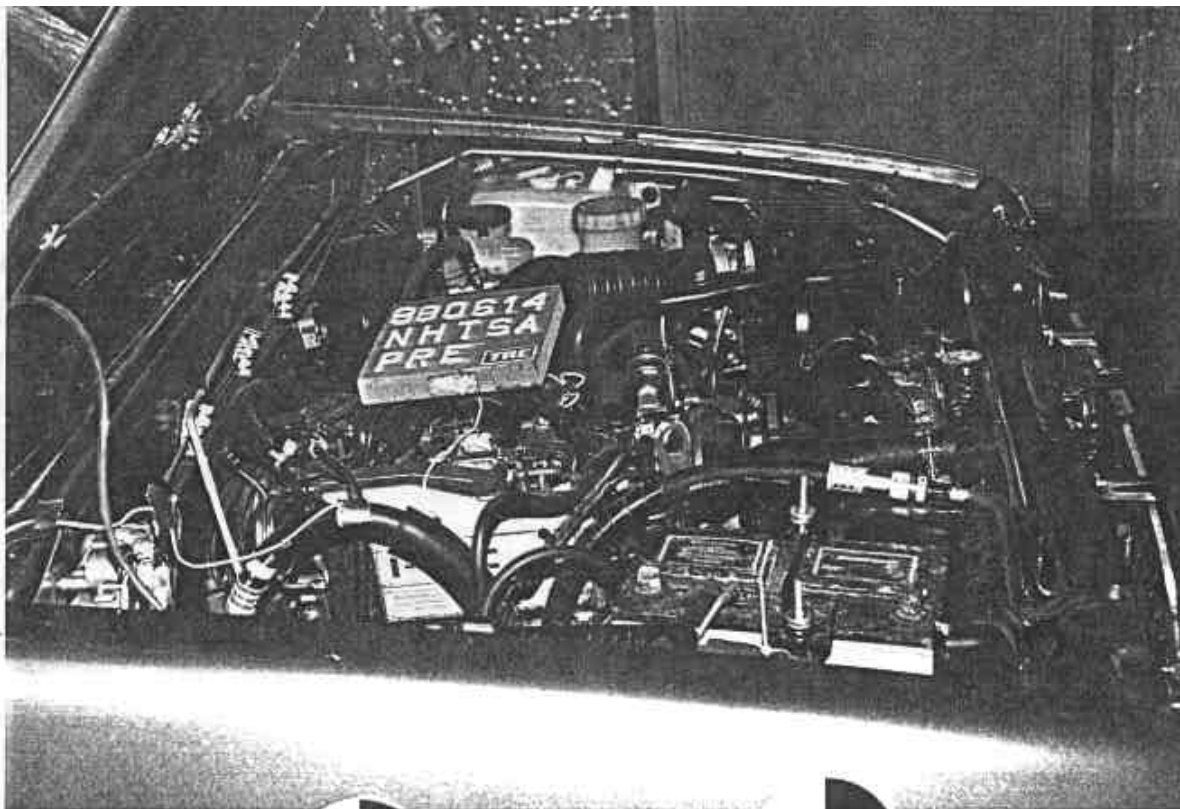


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

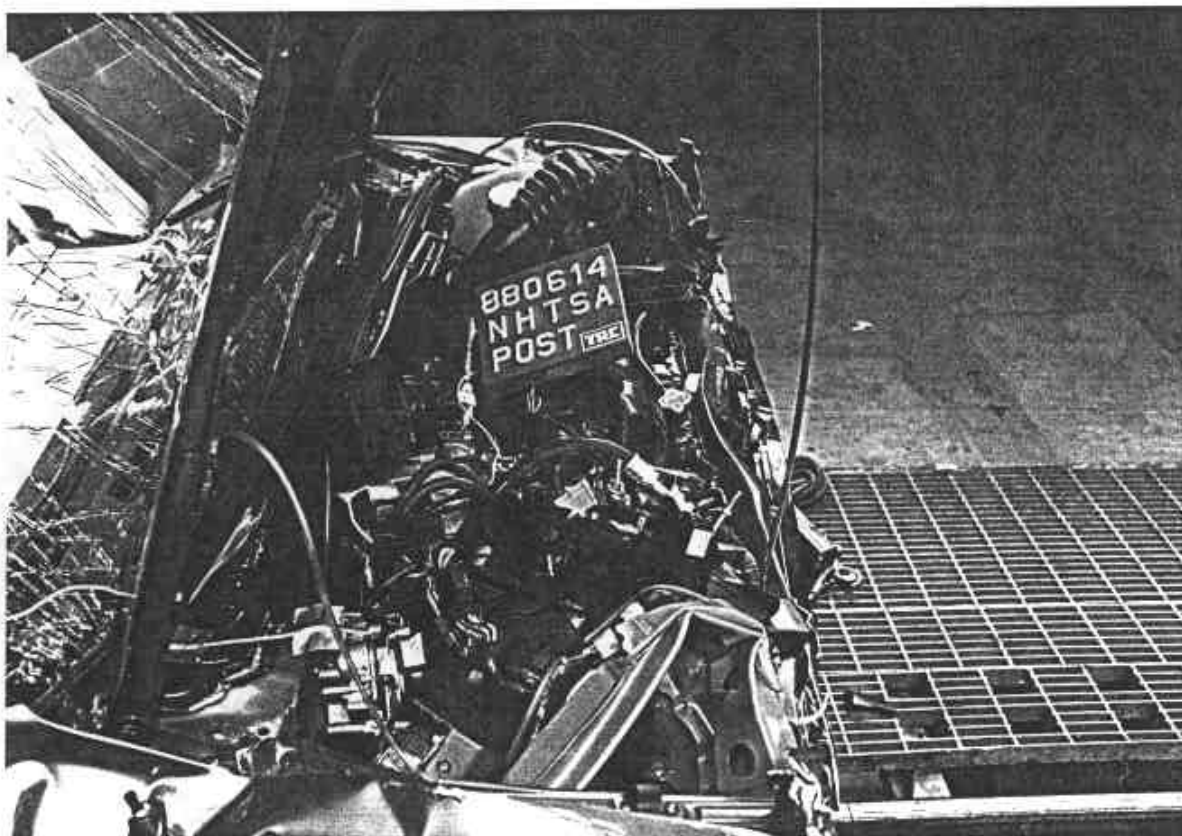


Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW



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



Figure A-18. POST-TEST FUEL FILLER CAP VIEW  
A-11

880614

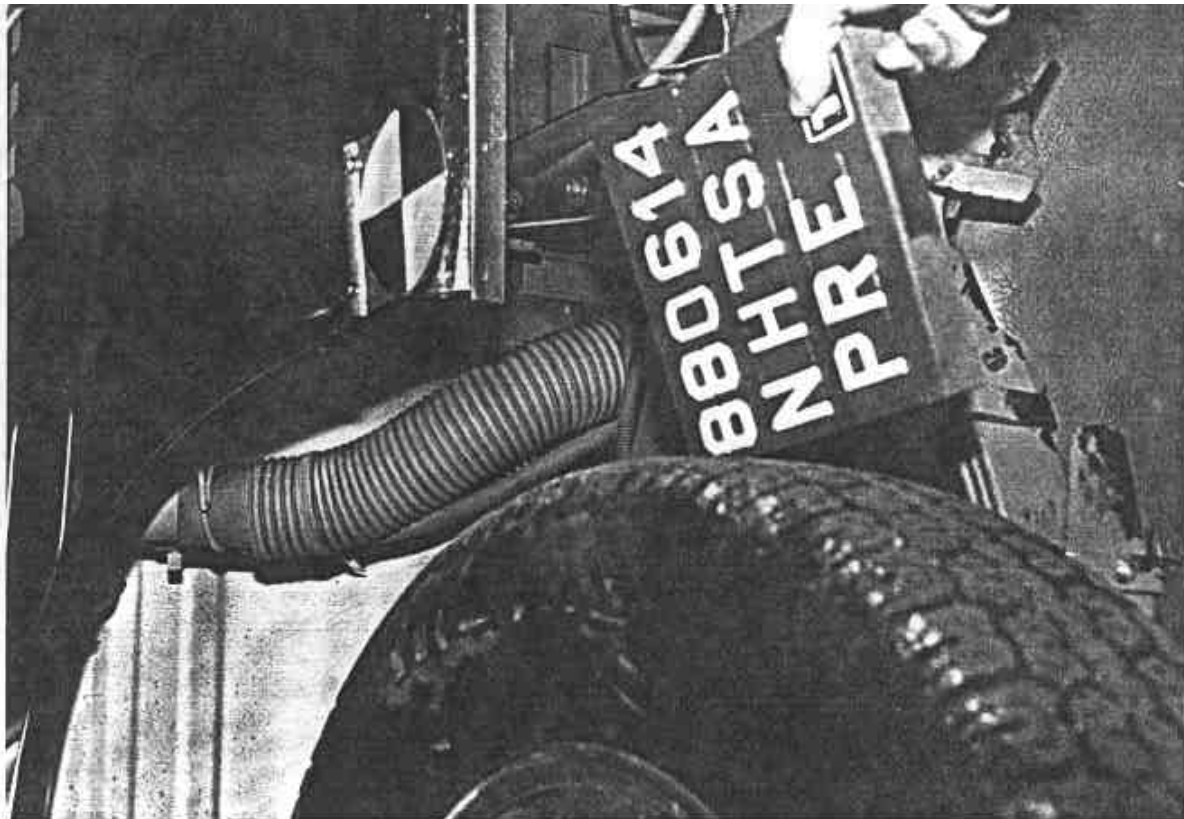


Figure A-19. PRE-TEST FUEL FILLER NECK VIEW

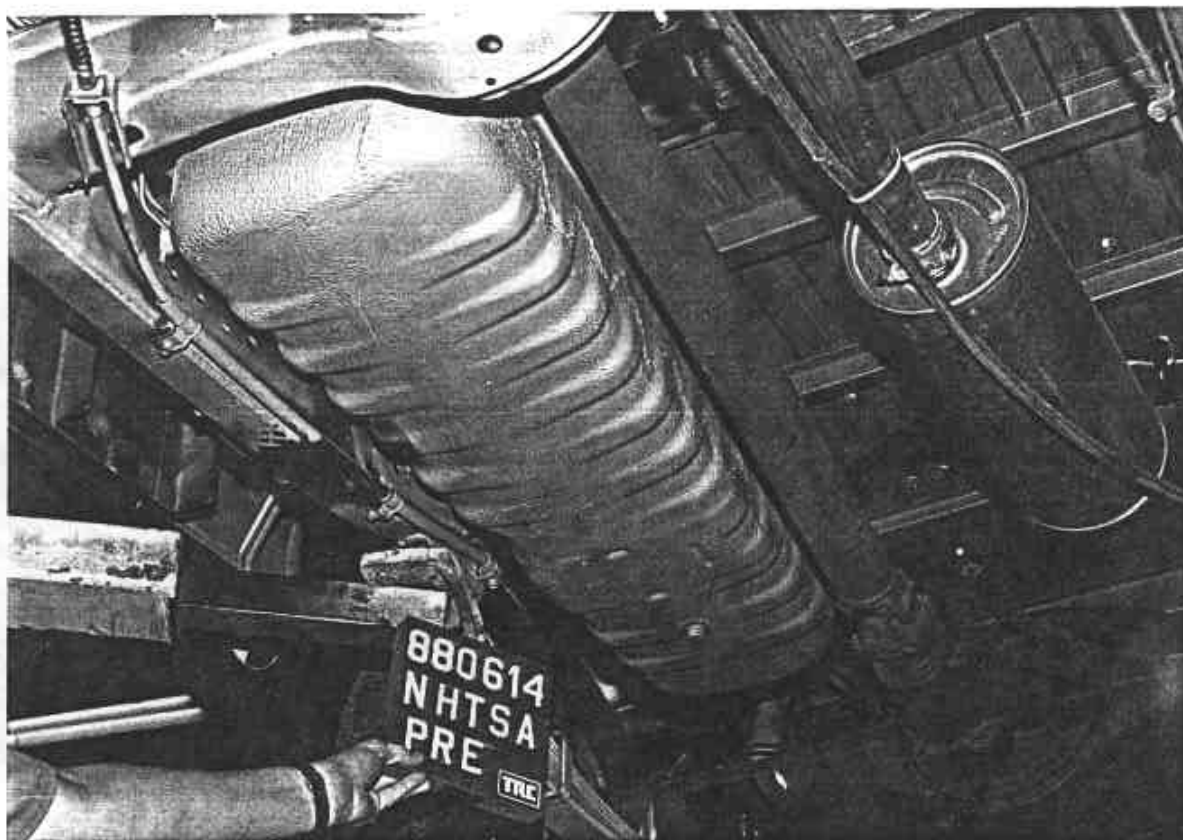


Figure A-20. PRE-TEST FUEL TANK VIEW  
A-12

880614

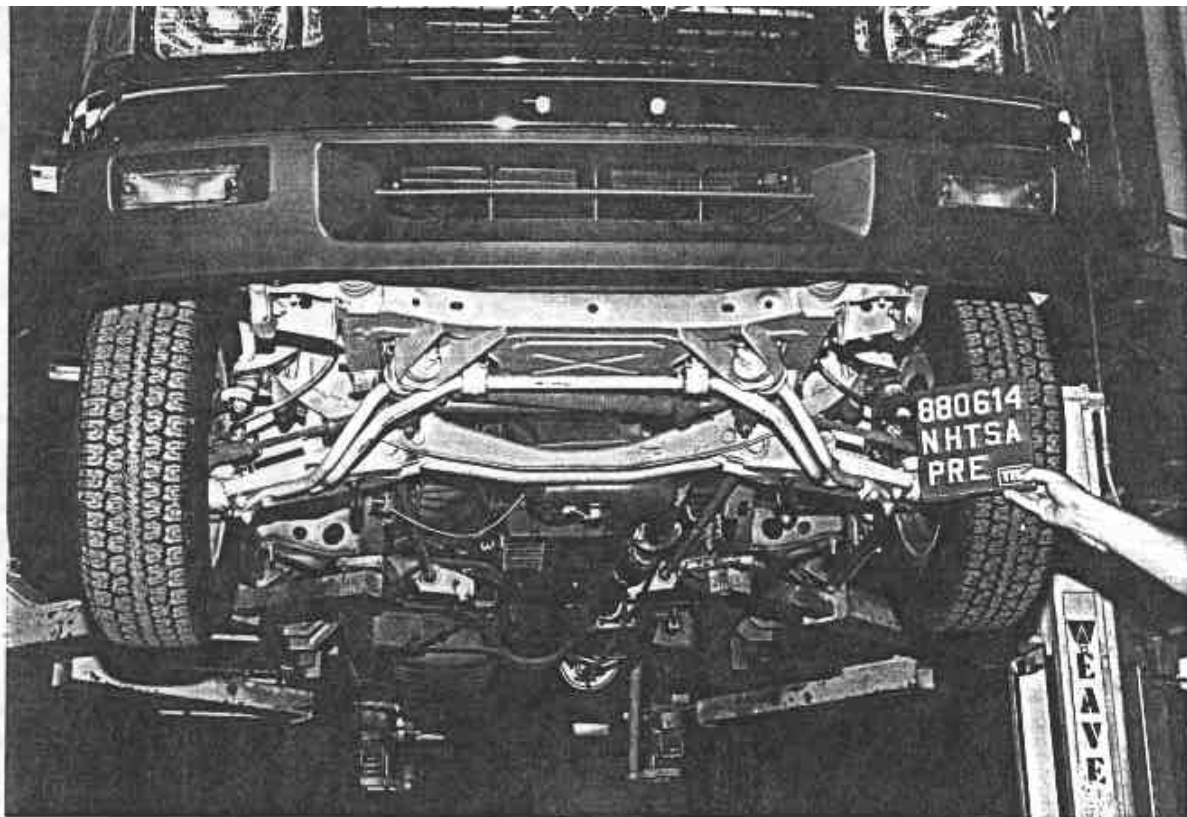


Figure A-21. PRE-TEST FRONT UNDERBODY VIEW

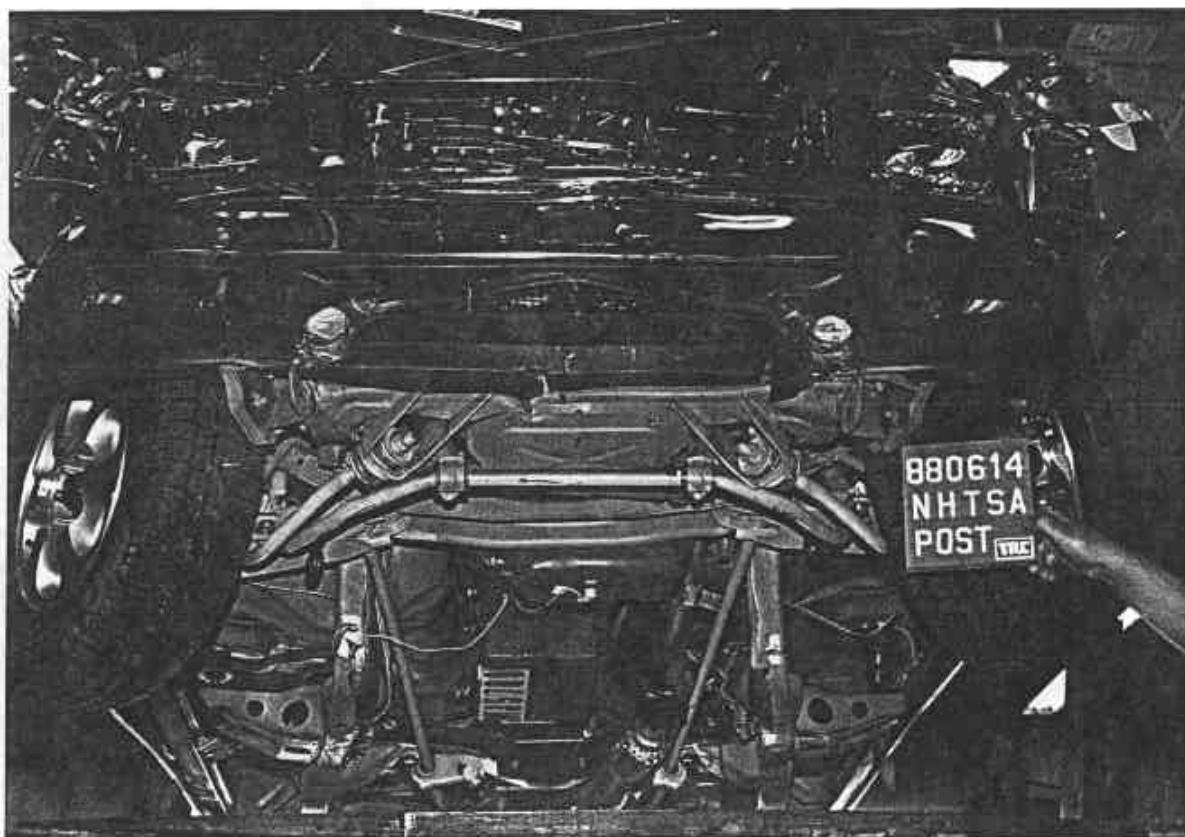


Figure A-22. POST-TEST FRONT UNDERBODY VIEW

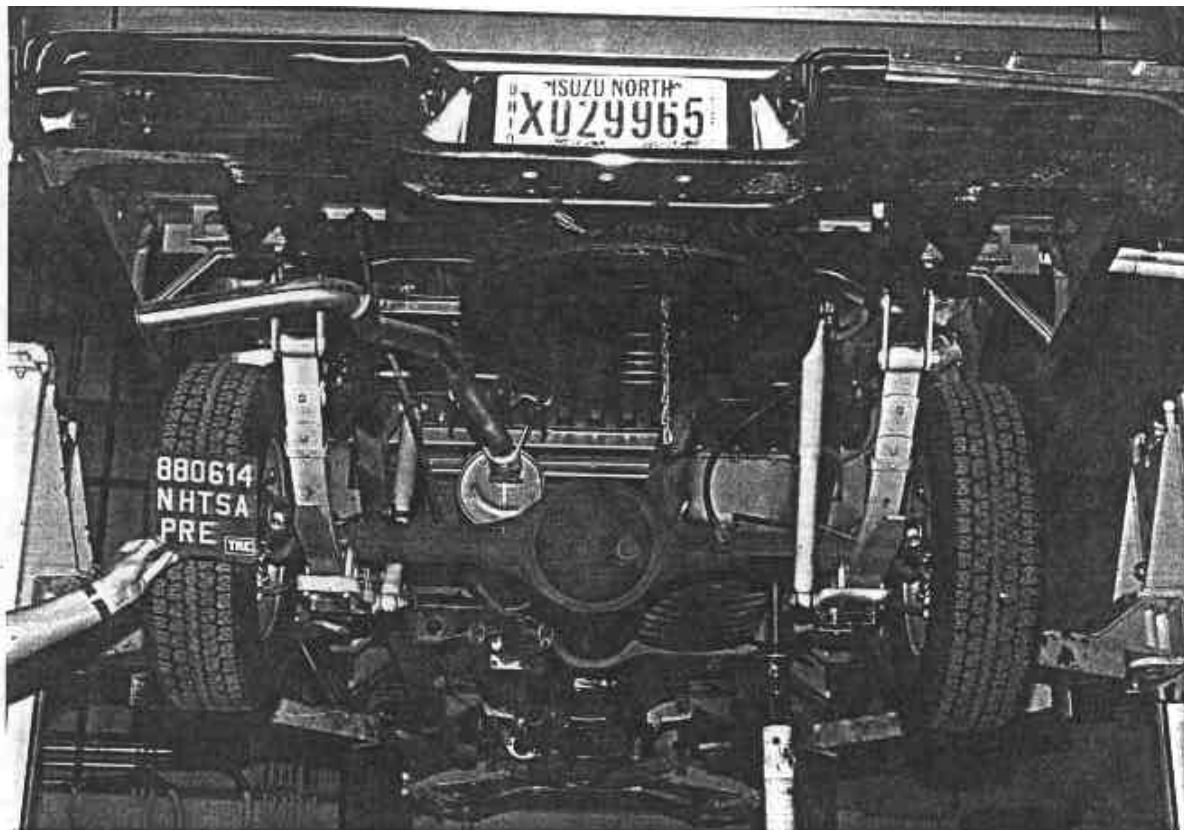


Figure A-23. PRE-TEST REAR UNDERBODY VIEW

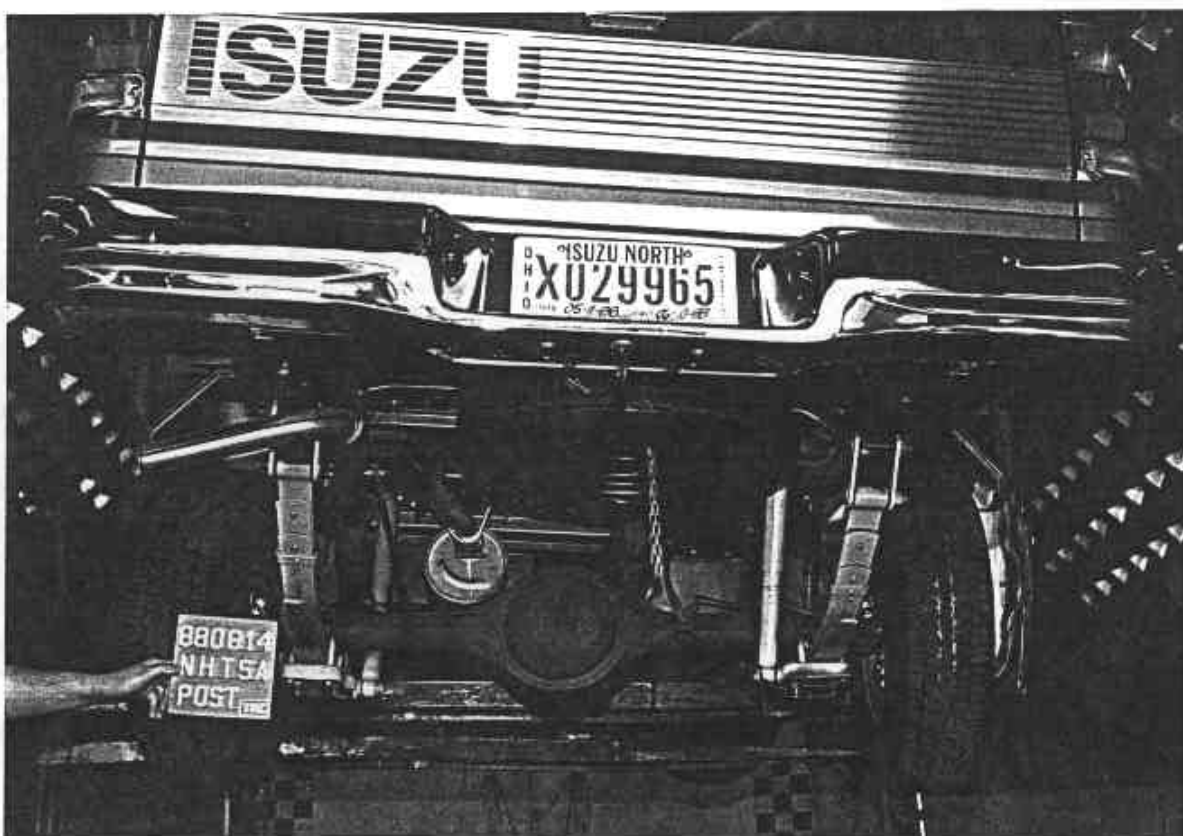


Figure A-24. POST-TEST REAR UNDERBODY VIEW  
A-14

880614



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

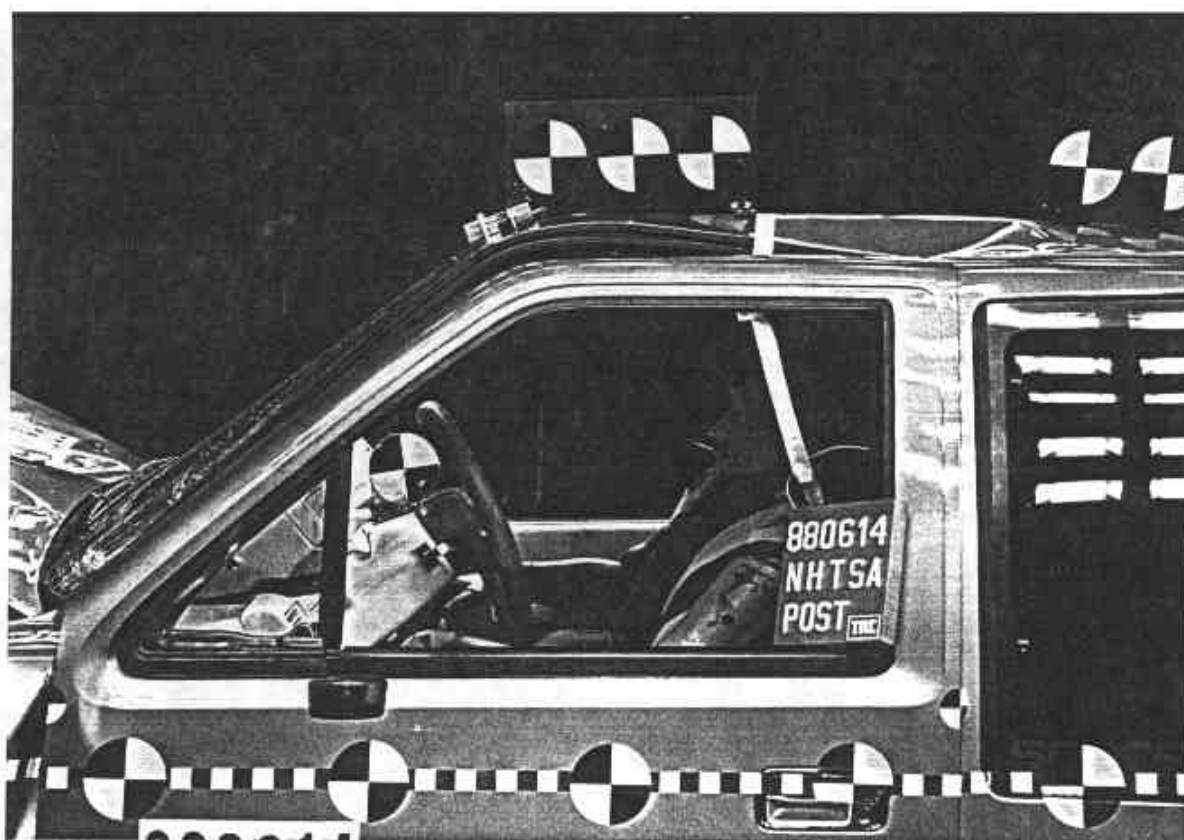


Figure A-26. POST-TEST DRIVER DUMMY POSITION VIEW  
A-15

880614



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



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



Figure A-29. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW 1 (DOOR OPEN)

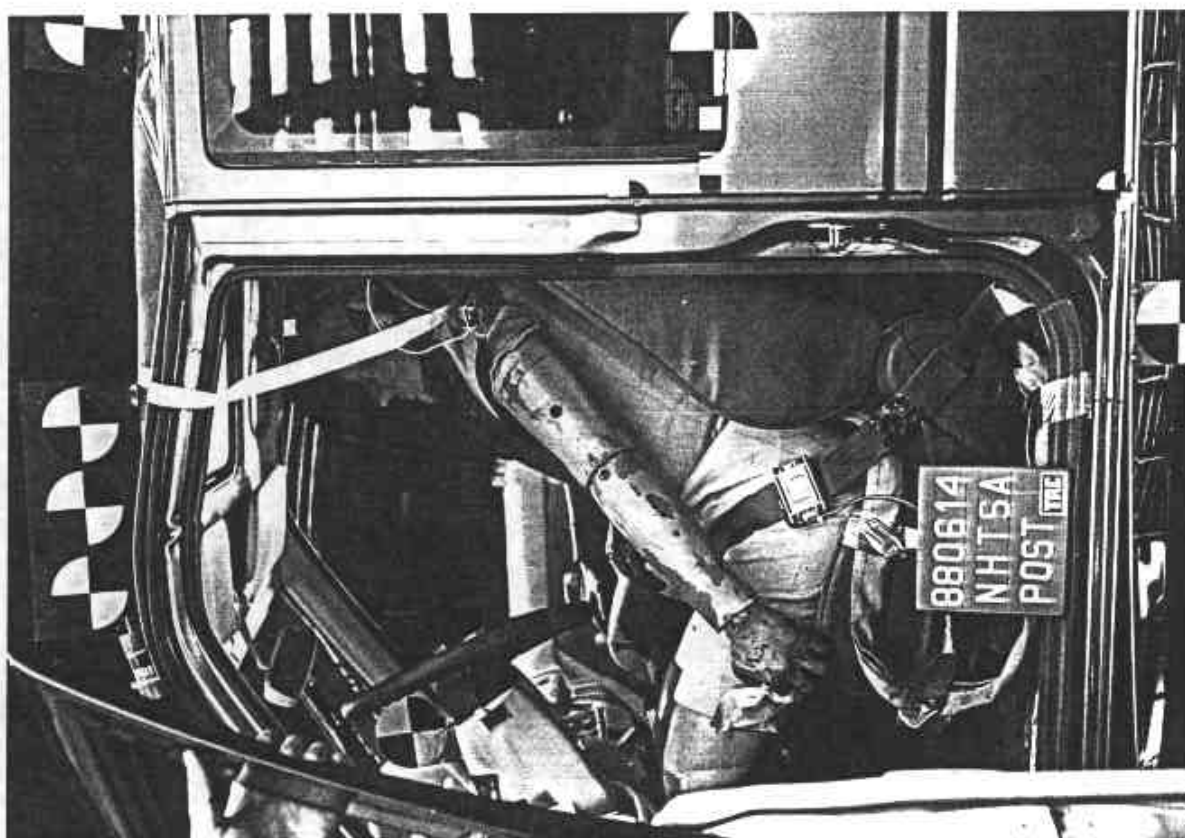


Figure A-30. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW 1 (DOOR OPEN)



Figure A-31. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW 1 (DOOR OPEN)

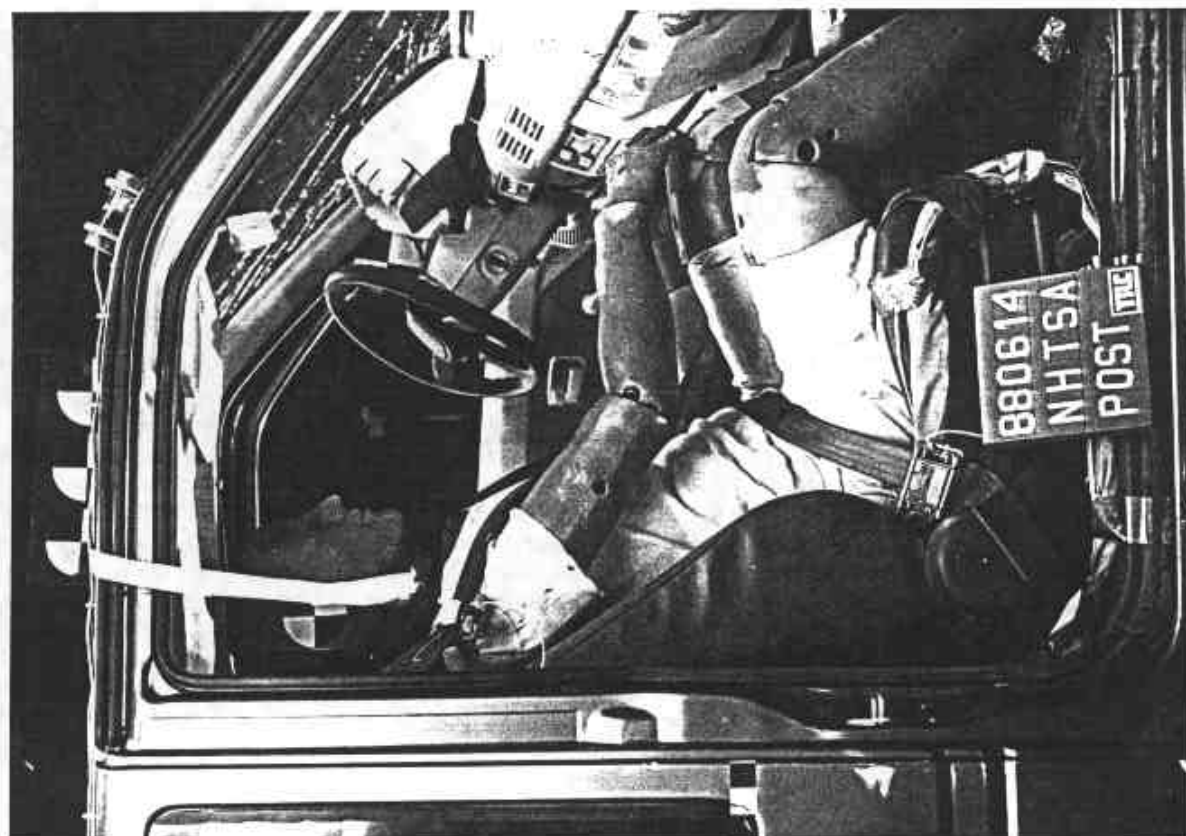


Figure A-32. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW 1 (DOOR OPEN)

A-18

880614



Figure A-33. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW 2 (DOOR OPEN)



Figure A-34. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW 2 (DOOR OPEN)



Figure A-35. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW 2 (DOOR OPEN)



Figure A-36. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW 2 (DOOR OPEN)

A-20

880614



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



Figure A-38. POST-TEST DRIVER DUMMY KNEE CONTACT VIEW



Figure A-39. POST-TEST PASSENGER DUMMY KNEE CONTACT



Figure A-40. POST-TEST LOAD CELL BARRIER DAMAGE - VIEW 1

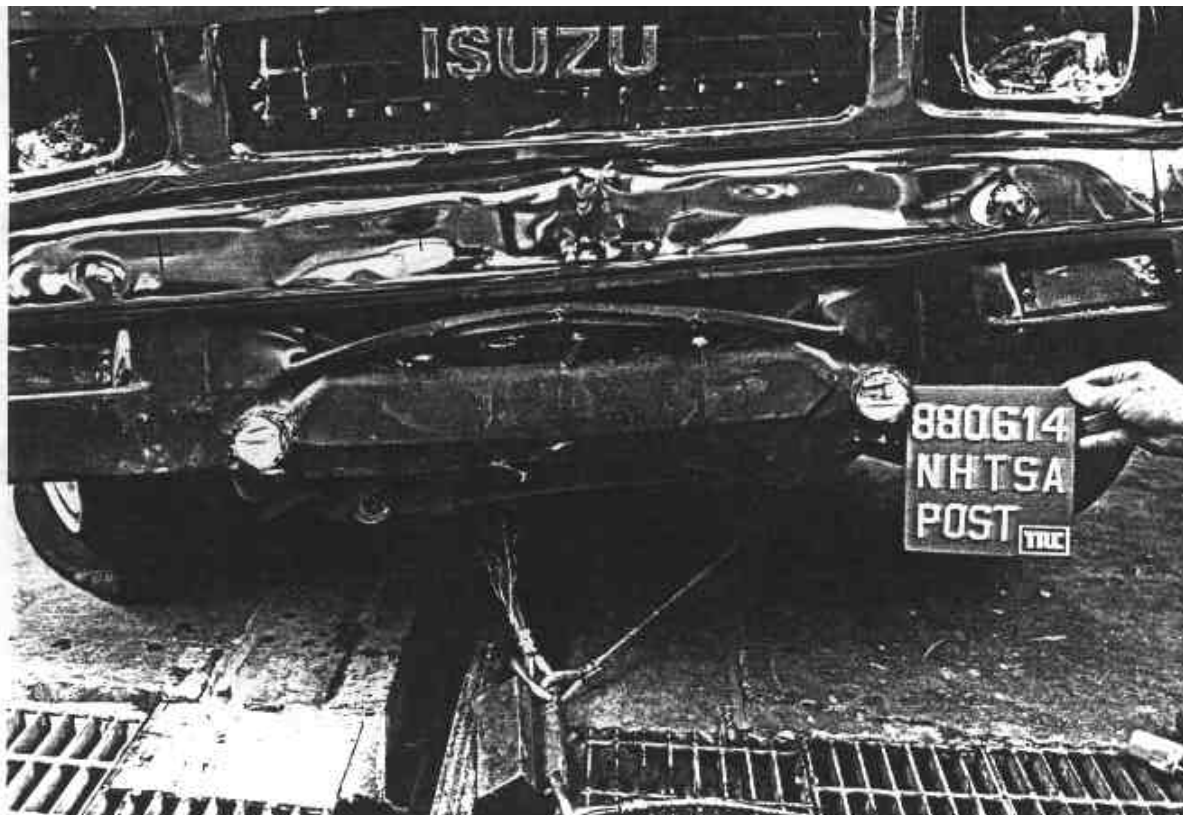


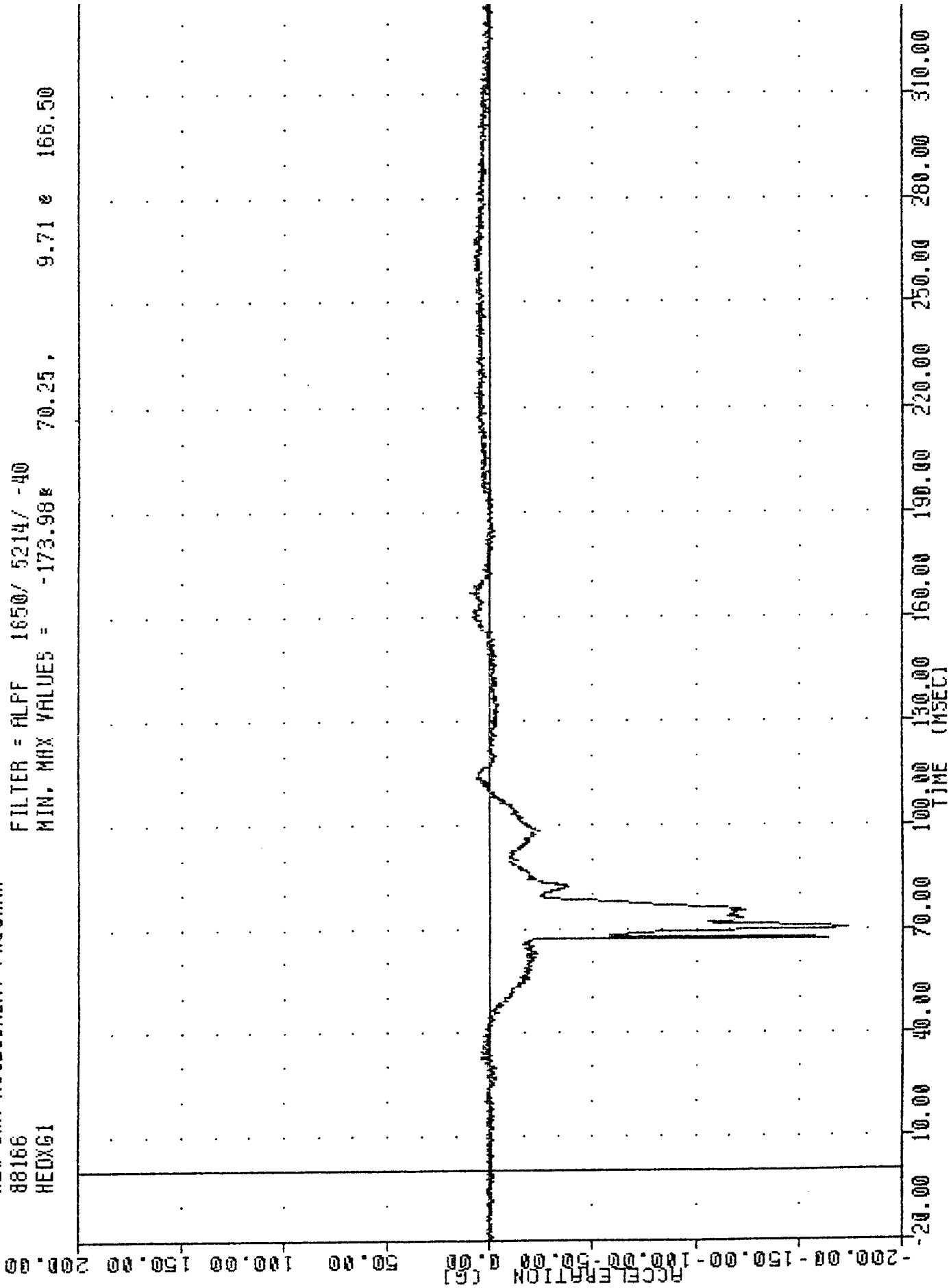
Figure A-41. POST-TEST LOAD CELL BARRIER DAMAGE - VIEW 2

APPENDIX B

DATA PLOTS

# NEW CAR ASSESSMENT PROGRAM

88166  
 HEDX61  
 FILTER = ALPF 1650/ 5214/ -40  
 MIN. MAX VALUES = -173.98 70.25, 9.71 166.50



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
 DRIVER HEAD ACCELERATION X AXIS

NEW CAR ASSESSMENT PROGRAM

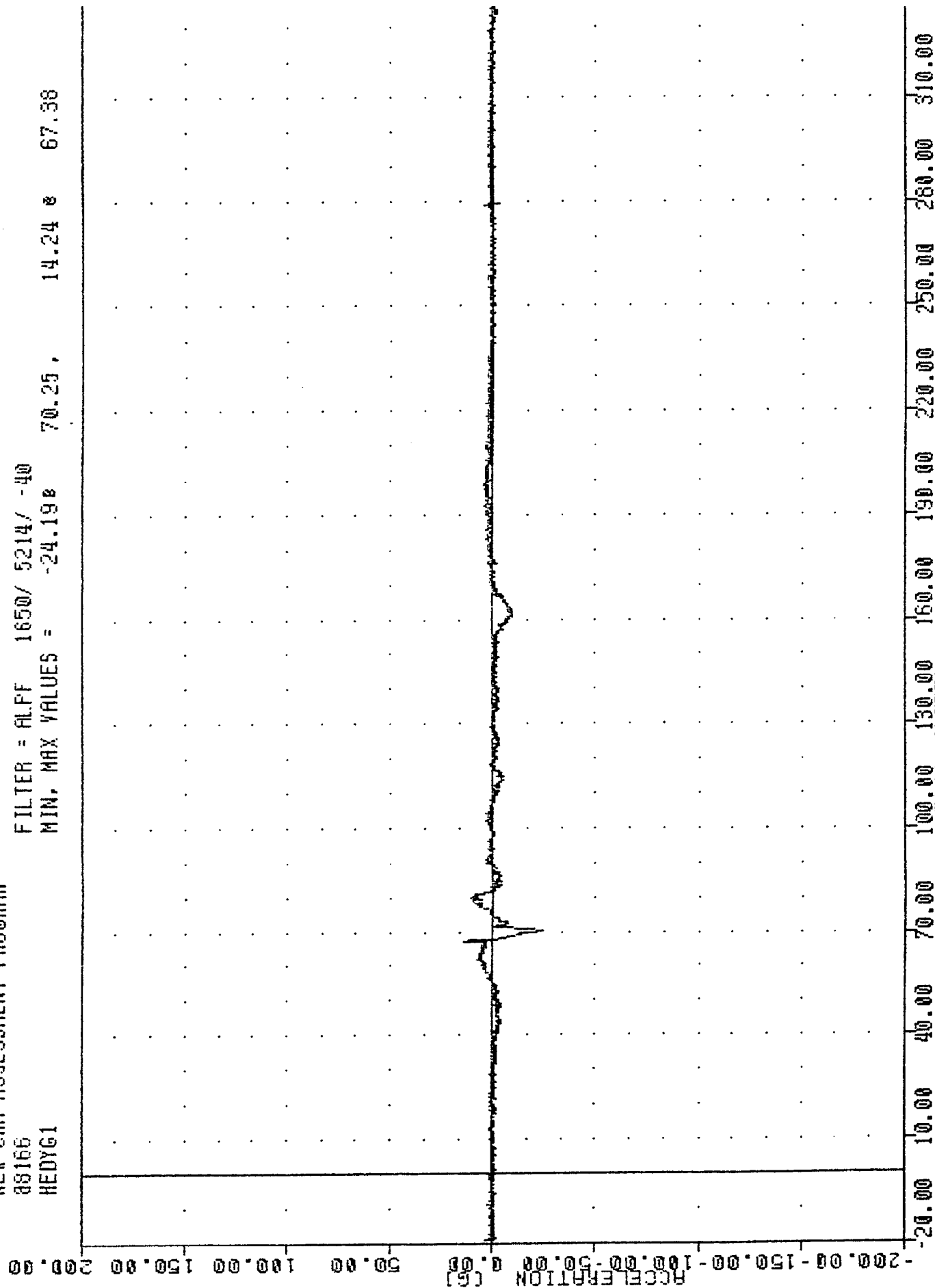
88166

HEDYG1

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -24.19g 70.25g

14.24g 67.38



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
DRIVER HEAD ACCELERATION Y AXIS

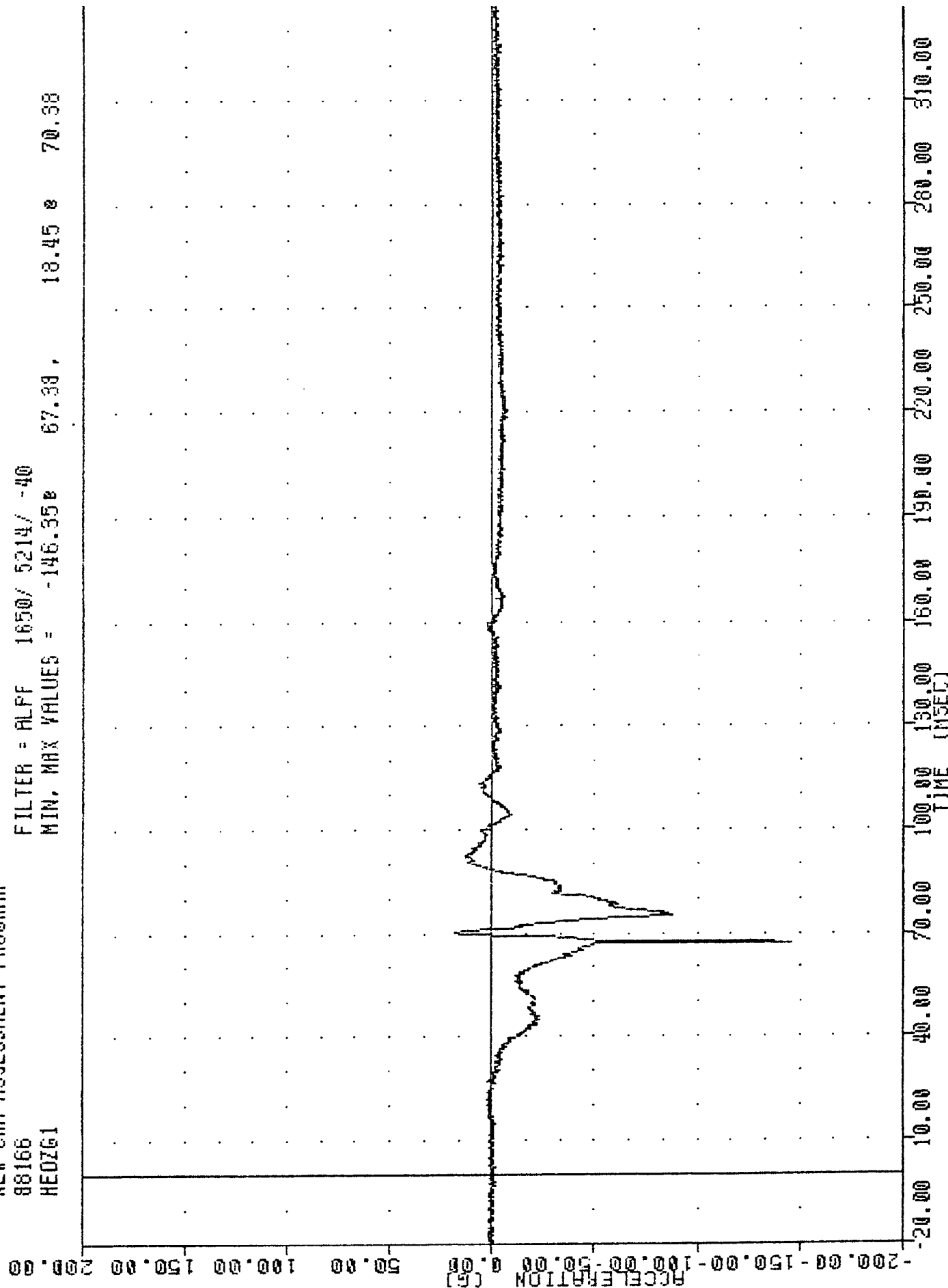
NEW CAR ASSESSMENT PROGRAM

88166

HE0261

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = -146.350 67.38 , 18.45 0 70.38



# NEW CAR ASSESSMENT PROGRAM

88166

HEDRG1

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = 0.19g

-11.13.

220.62 g

67.38

ACCELERATION (G)

400.00

350.00

300.00

250.00

200.00

150.00

100.00

50.00

0.00

-50.00

-100.00

-150.00

-200.00

-250.00

-300.00

-350.00

-400.00

-450.00

-500.00

-550.00

-600.00

-650.00

-700.00

-750.00

-800.00

-850.00

-900.00

-950.00

-1000.00

-1050.00

-1100.00

-1150.00

-1200.00

-1250.00

-1300.00

-1350.00

-1400.00

-1450.00

-1500.00

-1550.00

-1600.00

-1650.00

-1700.00

-1750.00

-1800.00

-1850.00

-1900.00

-1950.00

-2000.00

-2050.00

-2100.00

-2150.00

-2200.00

-2250.00

-2300.00

-2350.00

-2400.00

-2450.00

-2500.00

-2550.00

-2600.00

-2650.00

-2700.00

-2750.00

-2800.00

-2850.00

-2900.00

-2950.00

-3000.00

-3050.00

-3100.00

-3150.00

-3200.00

-3250.00

-3300.00

-3350.00

-3400.00

-3450.00

-3500.00

-3550.00

-3600.00

-3650.00

-3700.00

-3750.00

-3800.00

-3850.00

-3900.00

-3950.00

-4000.00

-4050.00

-4100.00

-4150.00

-4200.00

-4250.00

-4300.00

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-4650.00

-4700.00

-4750.00

-4800.00

-4850.00

-4900.00

-4950.00

-5000.00

-5050.00

-5100.00

-5150.00

-5200.00

-5250.00

-5300.00

-5350.00

-5400.00

-5450.00

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-5700.00

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-5800.00

-5850.00

-5900.00

-5950.00

-6000.00

-6050.00

-6100.00

-6150.00

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-6250.00

-6300.00

-6350.00

-6400.00

-6450.00

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-6550.00

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-6650.00

-6700.00

-6750.00

-6800.00

-6850.00

-6900.00

-6950.00

-7000.00

-7050.00

-7100.00

-7150.00

-7200.00

-7250.00

-7300.00

-7350.00

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-7550.00

-7600.00

-7650.00

-7700.00

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-7800.00

-7850.00

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-7950.00

-8000.00

-8050.00

-8100.00

-8150.00

-8200.00

-8250.00

-8300.00

-8350.00

-8400.00

-8450.00

-8500.00

-8550.00

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-8650.00

-8700.00

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-8950.00

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-9100.00

-9150.00

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-9250.00

-9300.00

-9350.00

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-10150.00

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-10300.00

-10350.00

-10400.00

-10450.00

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-10550.00

-10600.00

-10650.00

-10700.00

-10750.00

-10800.00

-10850.00

-10900.00

-10950.00

-11000.00

-11050.00

-11100.00

-11150.00

-11200.00

-11250.00

-11300.00

-11350.00

-11400.00

-11450.00

-11500.00

-11550.00

-11600.00

-11650.00

-11700.00

-11750.00

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-11900.00

-11950.00

-12000.00

-12050.00

-12100.00

-12150.00

-12200.00

-12250.00

-12300.00

-12350.00

-12400.00

-12450.00

-12500.00

-12550.00

-12600.00

-12650.00

-12700.00

-12750.00

-12800.00

-12850.00

-12900.00

-12950.00

-13000.00

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-13100.00

-13150.00

-13200.00

-13250.00

-13300.00

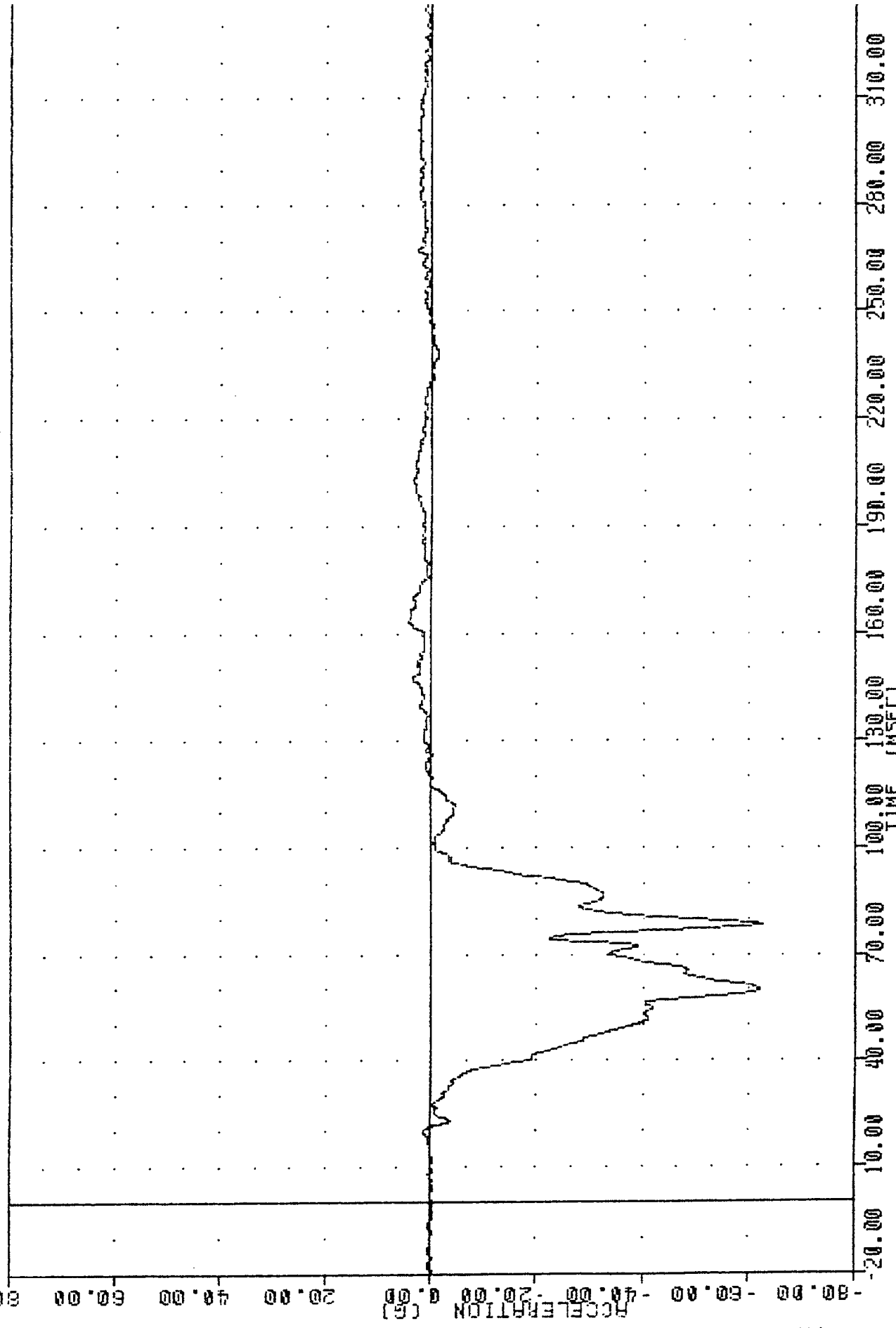
-13350.00

-13400.00

-13450.00

NEW CAR ASSESSMENT PROGRAM  
 88166  
 CSTXG1

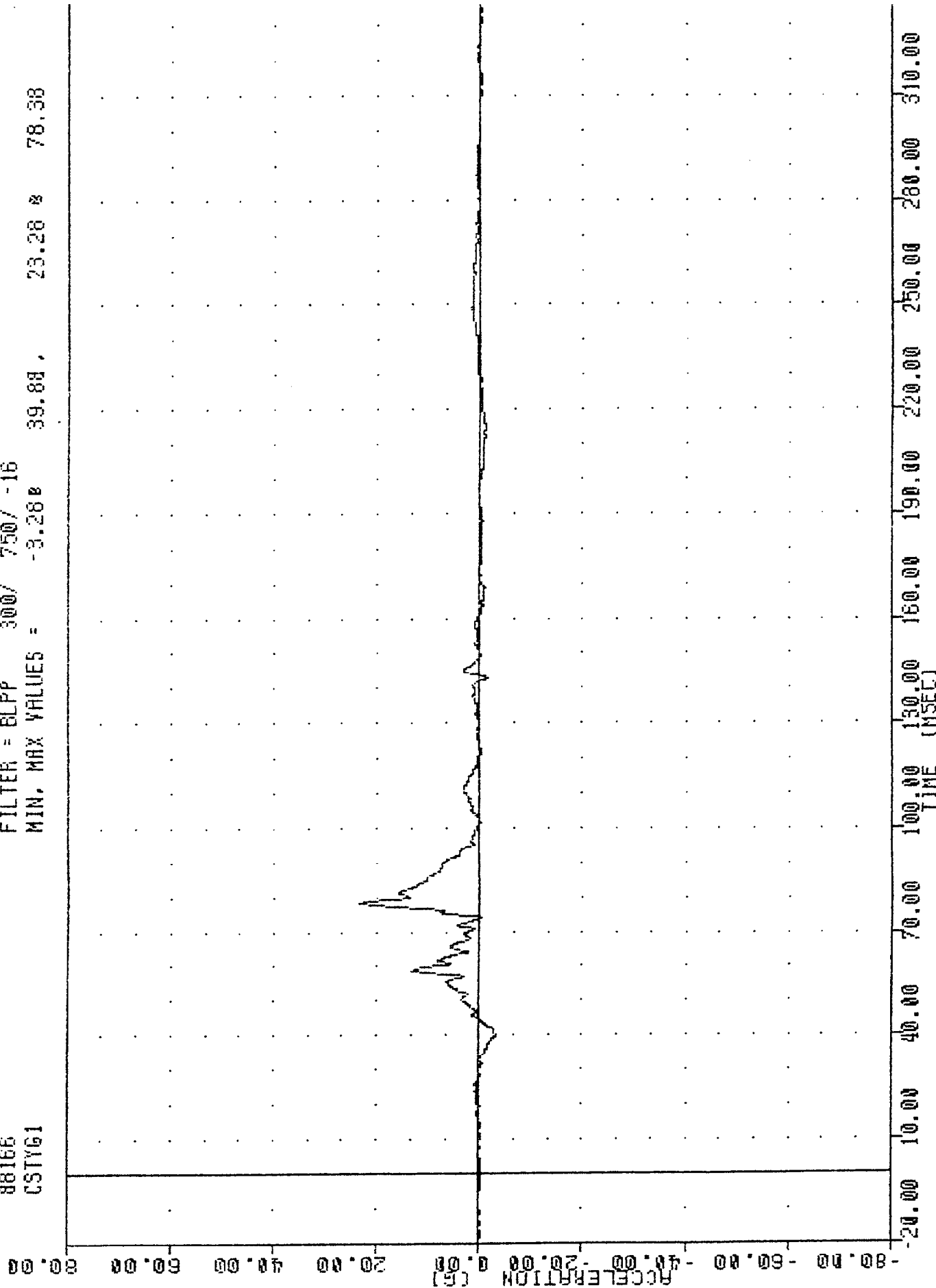
FILTER = BLPP 300/ 750/ -16  
 MIN, MAX VALUES = -62.64 78.38 , 4.23 163.25



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
 DRIVER CHEST ACCELERATION X AXIS

# NEW CAR ASSESSMENT PROGRAM

88166  
 CSTYG1  
 FILTER = BLPP 300/ 750/ -16  
 MIN, MAX VALUES = -3.28 39.88 23.28 78.38



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880614

ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
 DRIVER CHEST ACCELERATION Y AXIS

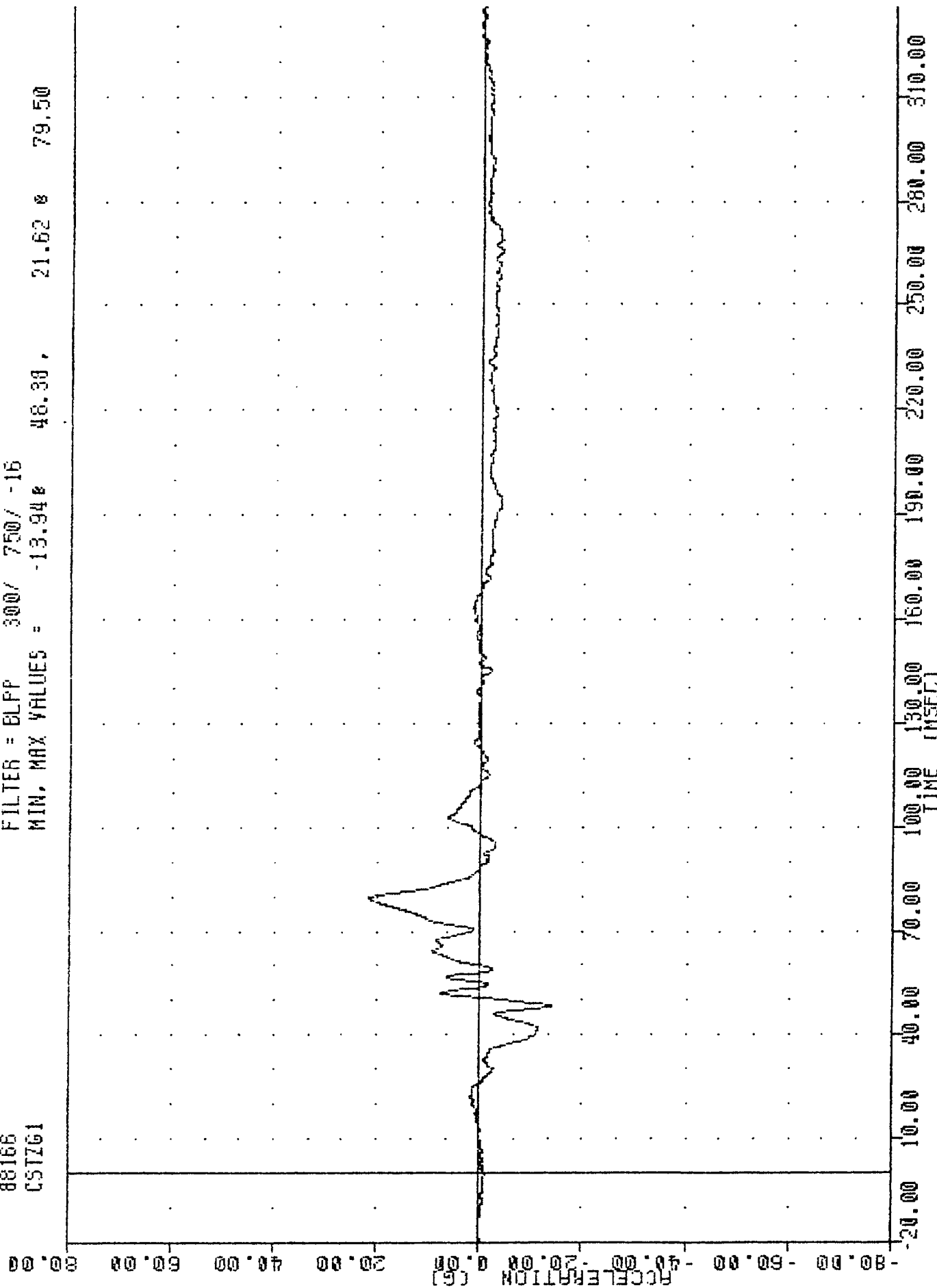
# NEW CAR ASSESSMENT PROGRAM

88166

CSTZG1

FILTER = BLFP 300/ 750/ -16

MIN, MAX VALUES = -13.94 48.38 21.62 79.50



B-8

880614

ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
DRIVER CHEST ACCELERATION Z AXIS

NEW CAR ASSESSMENT PROGRAM

88166

CSTRG1

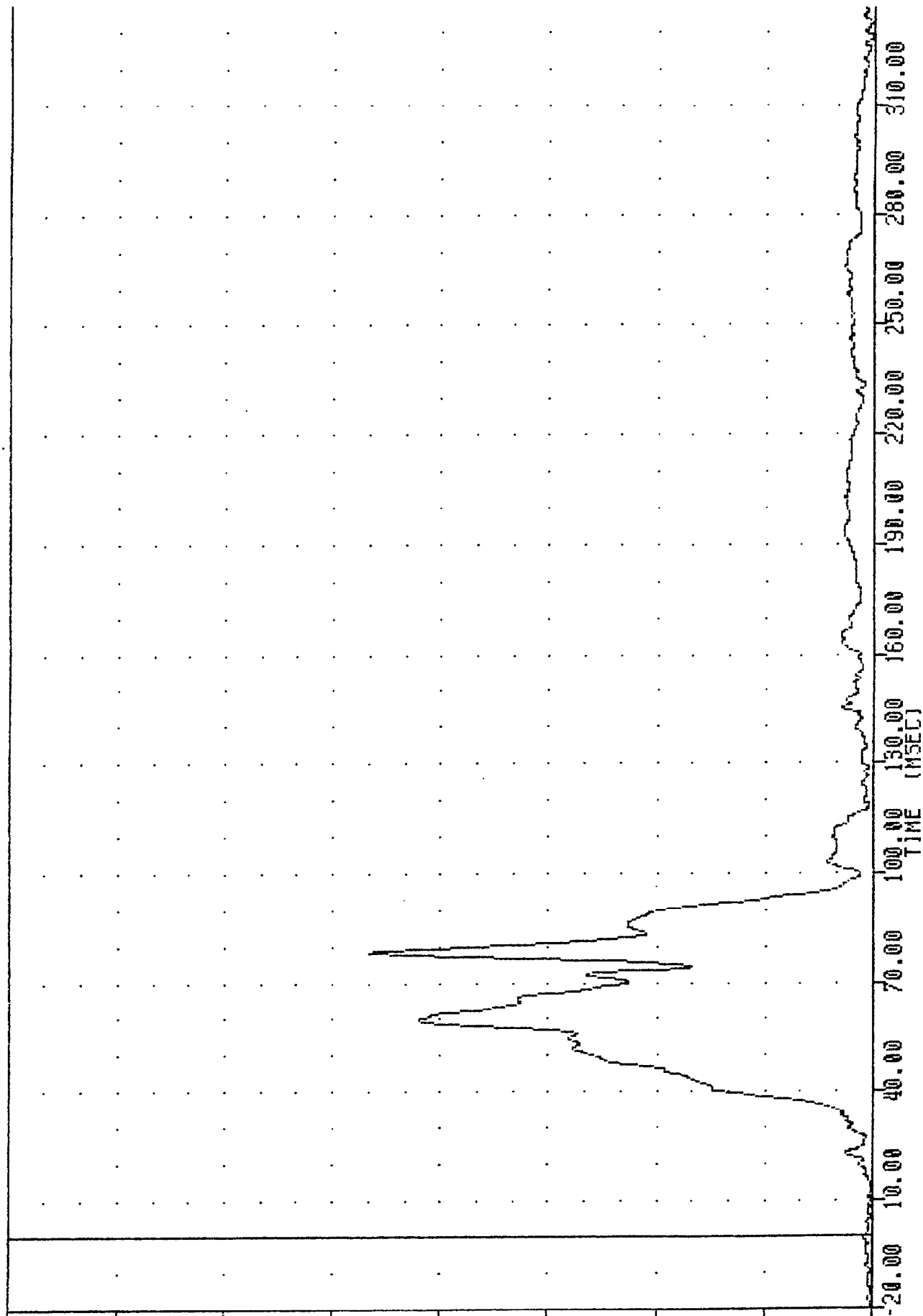
FILTER = BLPP 300/ 750/ -16

MIN. MAX VALUES = 0.04e -19.00, 69.85 e 78.38

ACCELERATION (G)

B-9

880614



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
DRIVER CHEST RESULTANT ACCELERATION

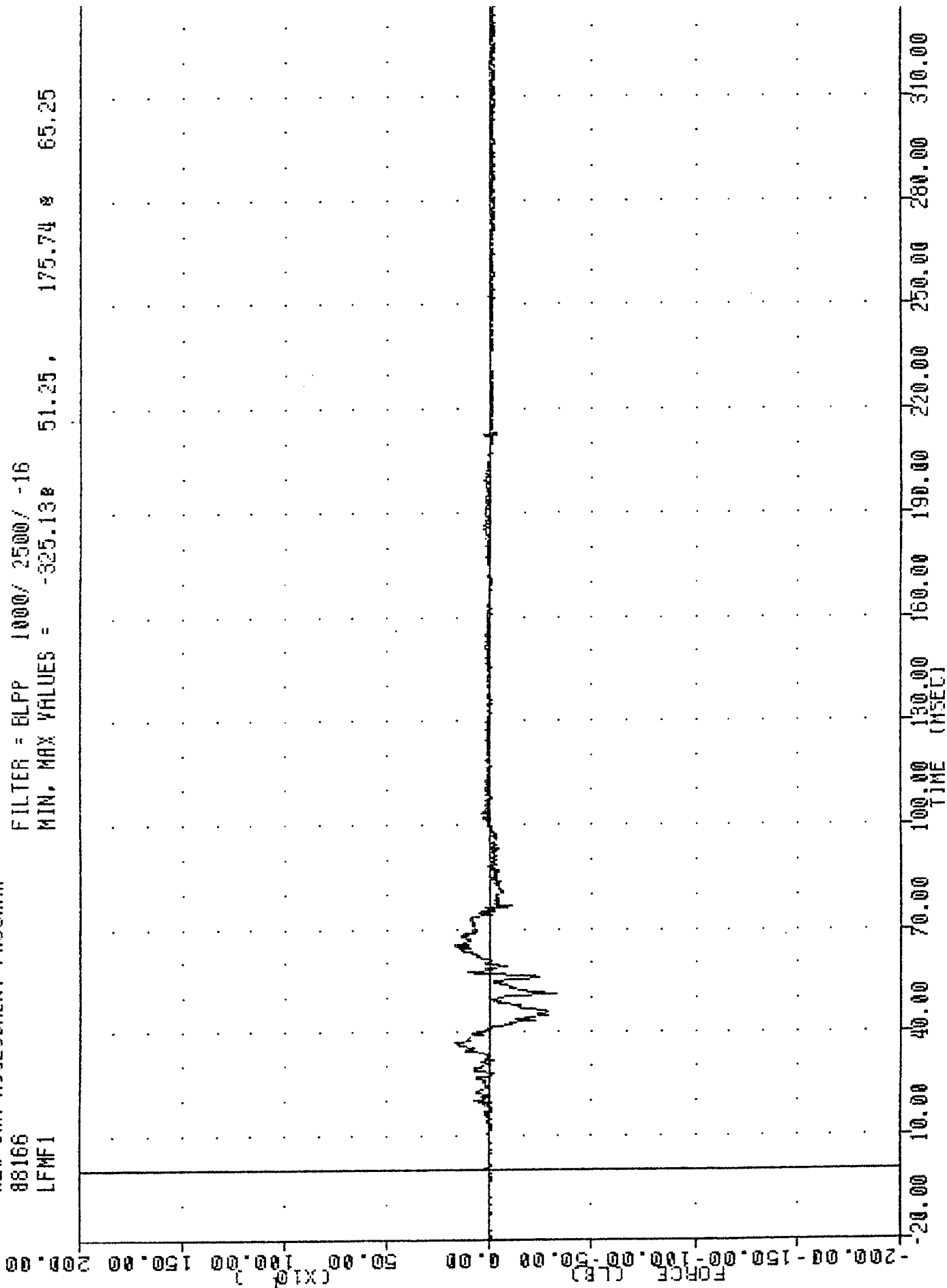
NEW CAR ASSESSMENT PROGRAM

88166

LFMF1

FILTER = BLPP 1000/ 2500/ -16

MIN, MAX VALUES = -325.13 51.25, 175.74 65.25



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
DRIVER LEFT FEMUR FORCE

NEW CAR ASSESSMENT PROGRAM

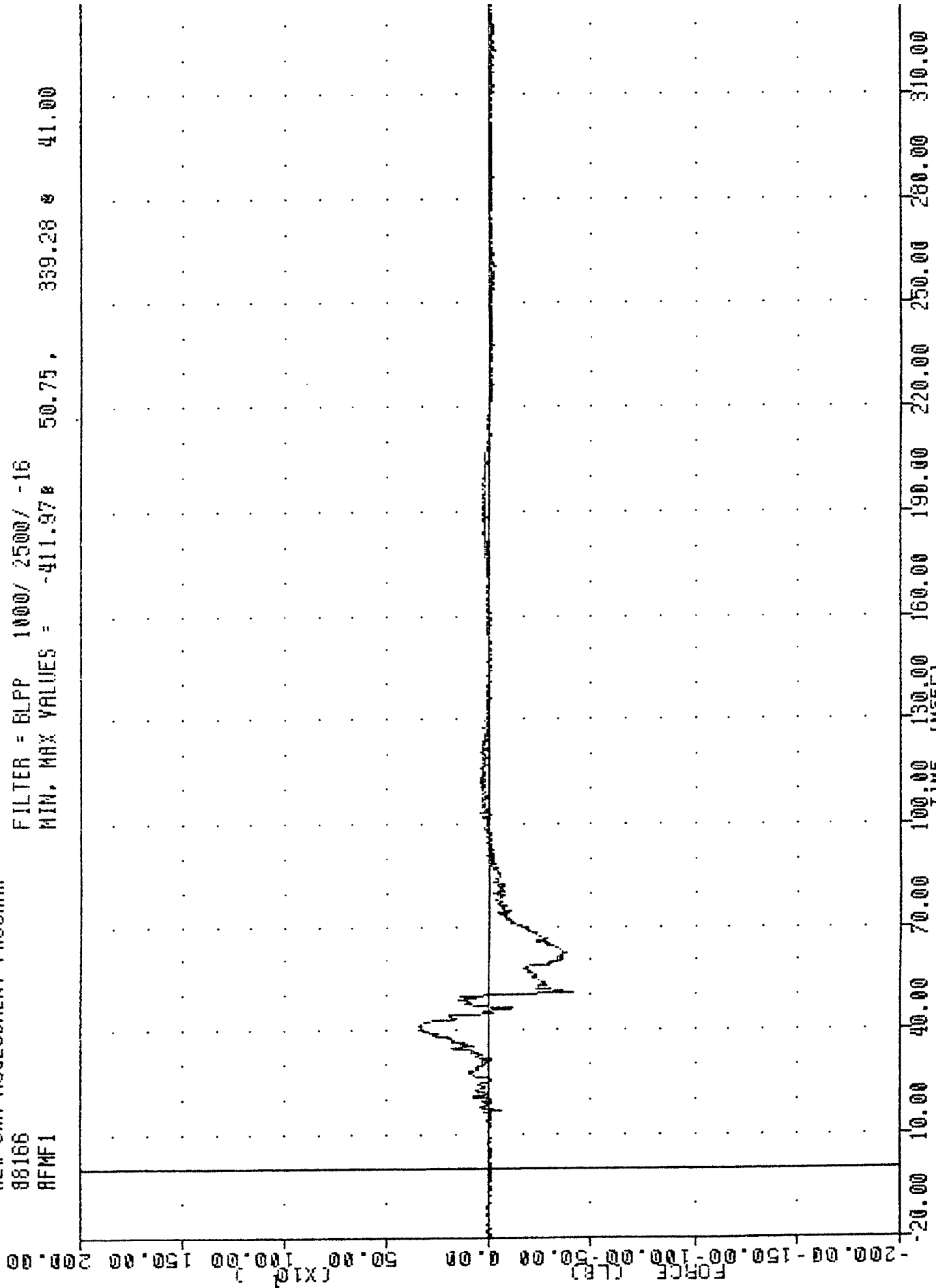
88166

AFMF1

FILTER = BLPP 1000/ 2500/ -16

MIN. MAX VALUES = -411.97 50.75

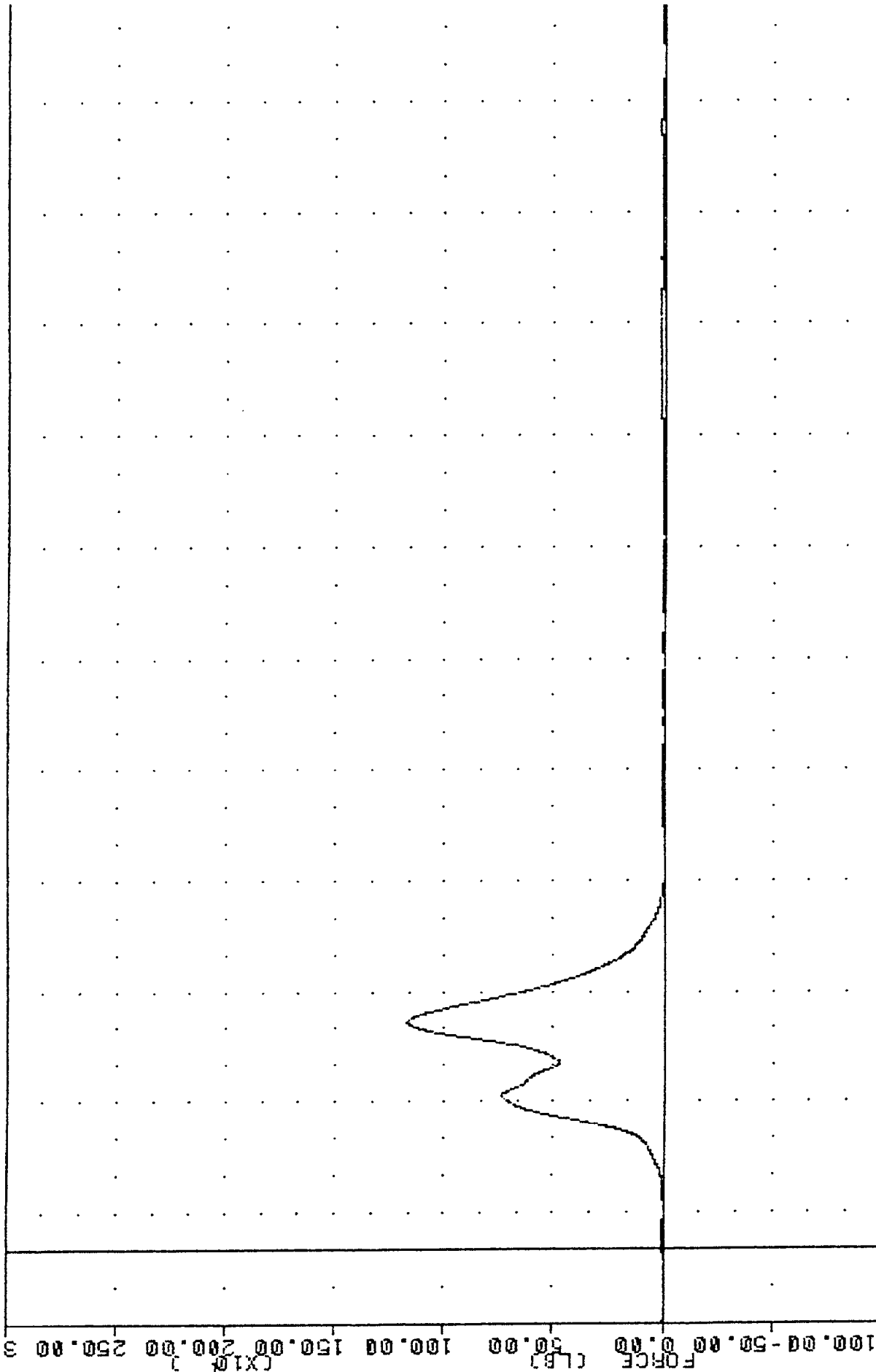
339.28 41.00



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
DRIVER RIGHT FEMUR FORCE

NEW CAR ASSESSMENT PROGRAM  
 88166  
 LBOF1

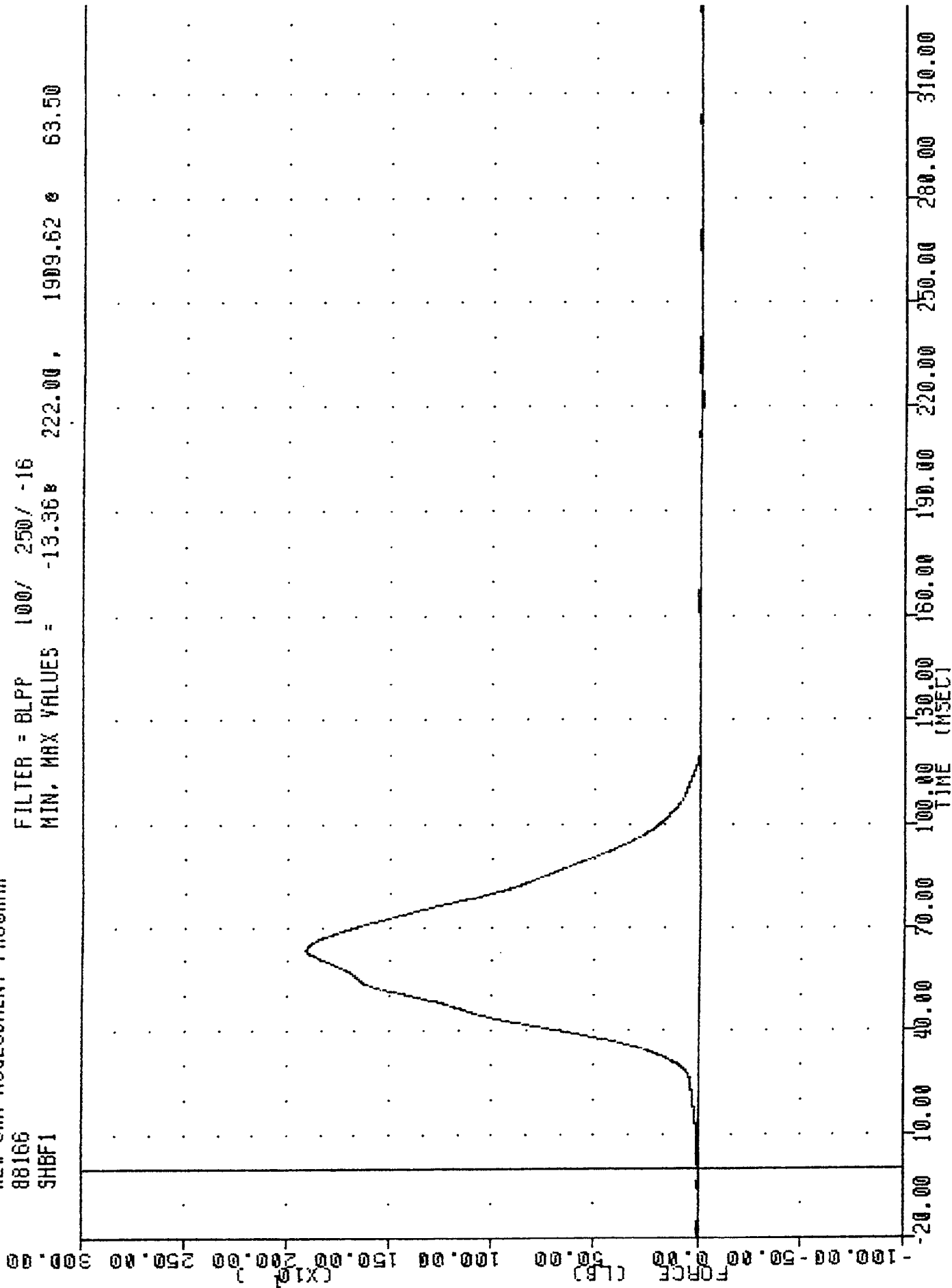
FILTER = BLPP 100/ 250/ -16  
 MIN, MAX VALUES = -7.938 108.00, 1169.29 61.75



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
 DRIVER LAP BELT OUTBOARD FORCE

NEW CAR ASSESSMENT PROGRAM  
 88166  
 9HBF1

FILTER = BLPP 100/ 250/ -16  
 MIN, MAX VALUES = -13.36% 222.00, 1909.62 @ 63.50



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
 DRIVER SHOULDER BELT FORCE

# NEW CAR ASSESSMENT PROGRAM

88166

SHED1

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = 0.00e -2.75, 5.03 e 65.88

7.00

6.00

5.00

4.00

3.00

2.00

1.00

0.00

-1.00

DISPLACEMENT (IN)

B-14

880614

-20.00

10.00

40.00

70.00

100.00

130.00

160.00

190.00

220.00

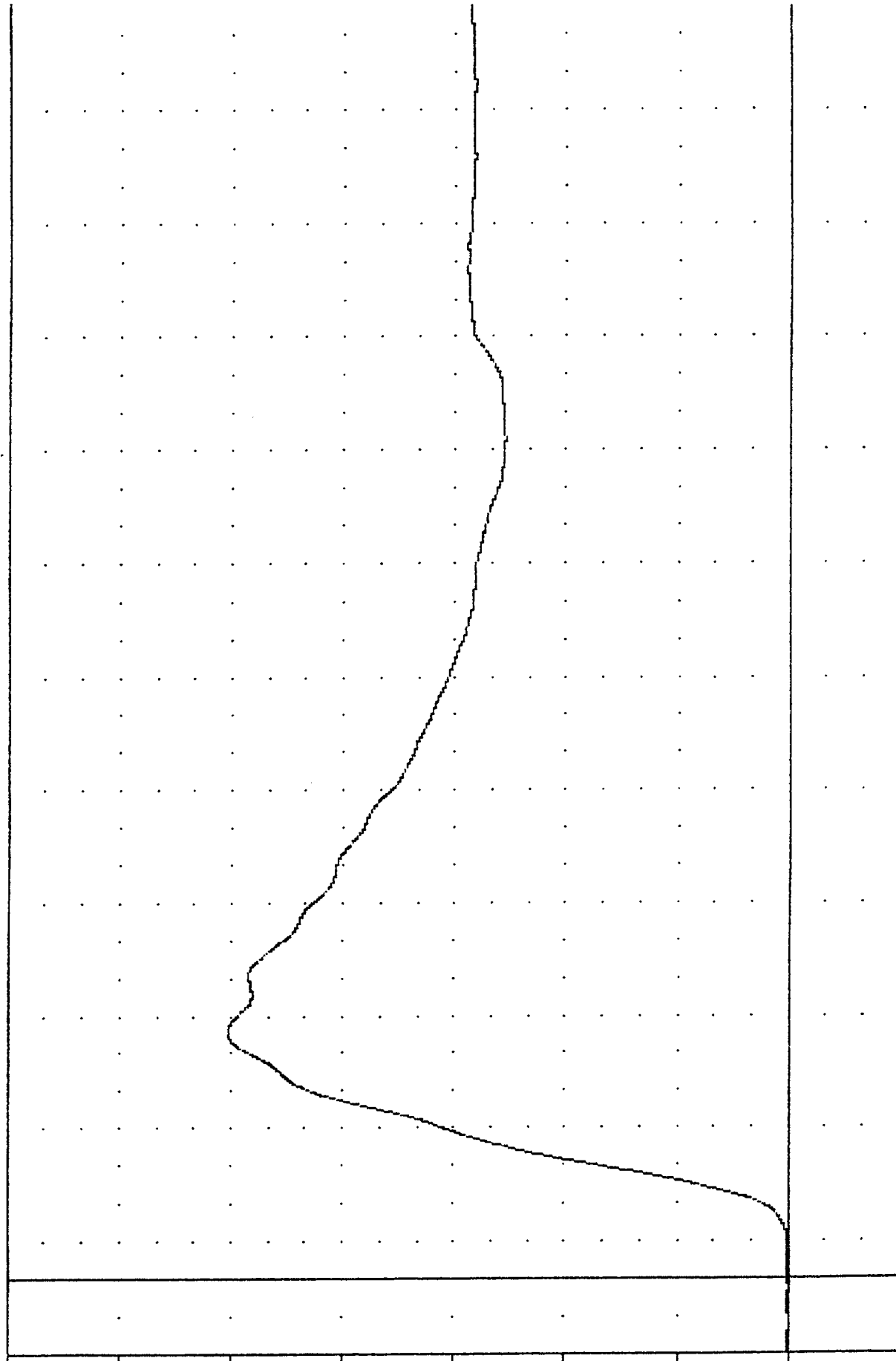
250.00

280.00

310.00

TIME (MSEC)

ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
DRIVER SHOULDER BELT DISPLACEMENT



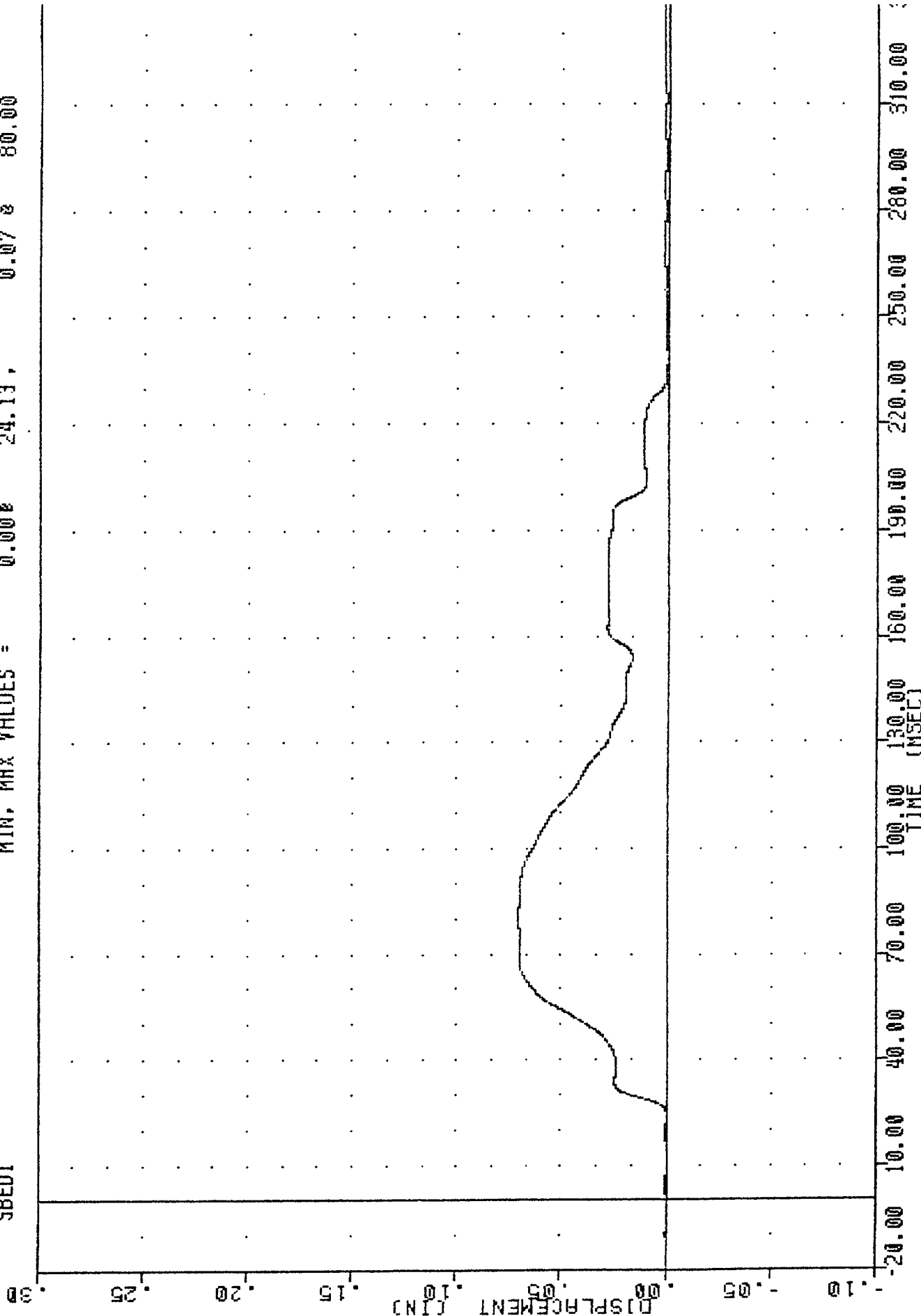
# NEW CAR ASSESSMENT PROGRAM

88166

SBED1

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = 0.00e 24.13, 0.07 e 80.00



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
DRIVER SEAT BELT EXTENSION

# NEW CAR ASSESSMENT PROGRAM

88166

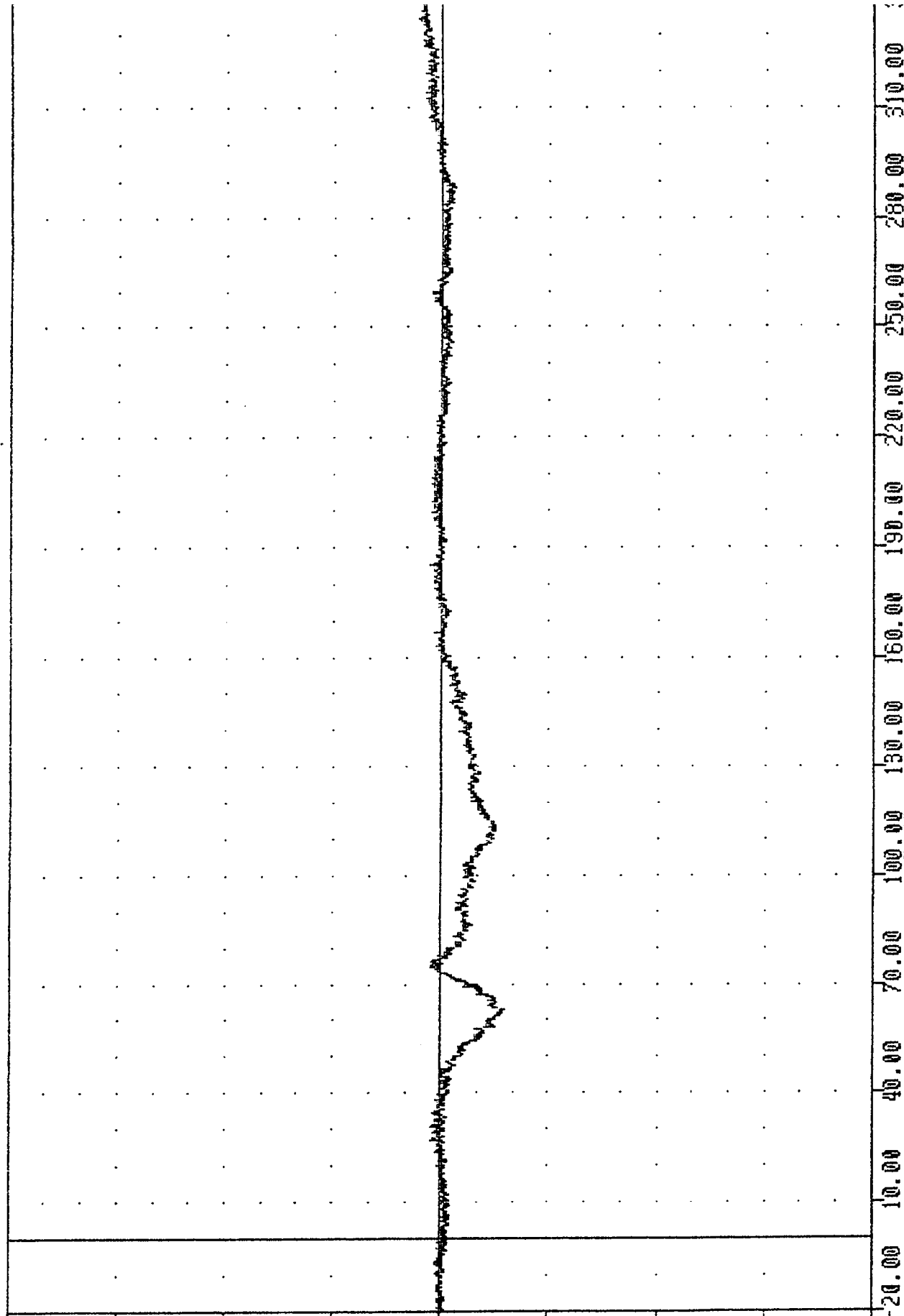
HEDX62

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = -29.42 63.00

10.98 334.63

ACCELERATION (G)



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER HEAD ACCELERATION X AXIS

# NEW CAR ASSESSMENT PROGRAM

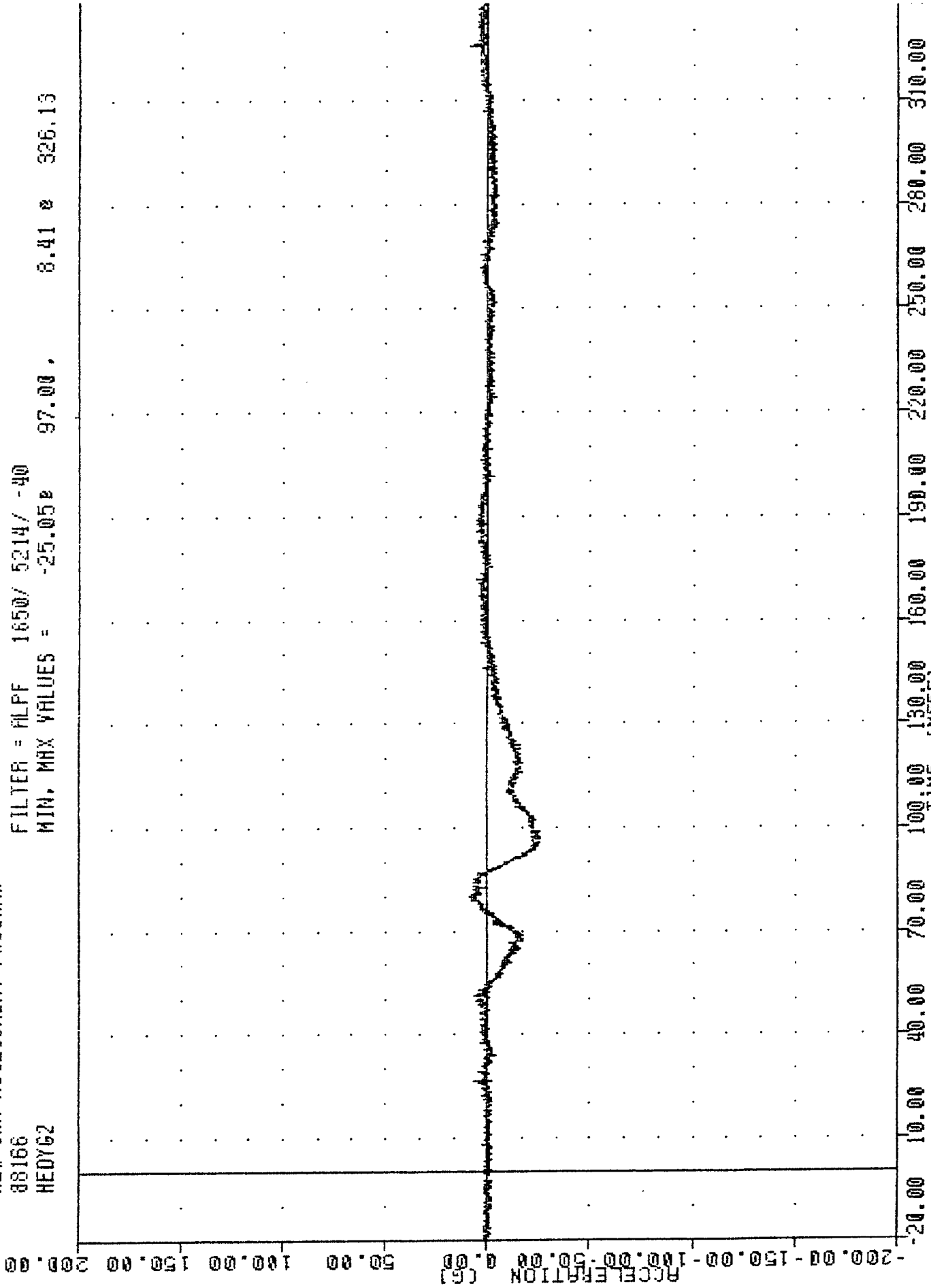
88166

HEDY62

FILTER = HILPF 1650/ 5214/ -40

MIN. MAX VALUES = -25.05e 97.00.

8.41 e 326.13



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER HEAD ACCELERATION Y AXIS

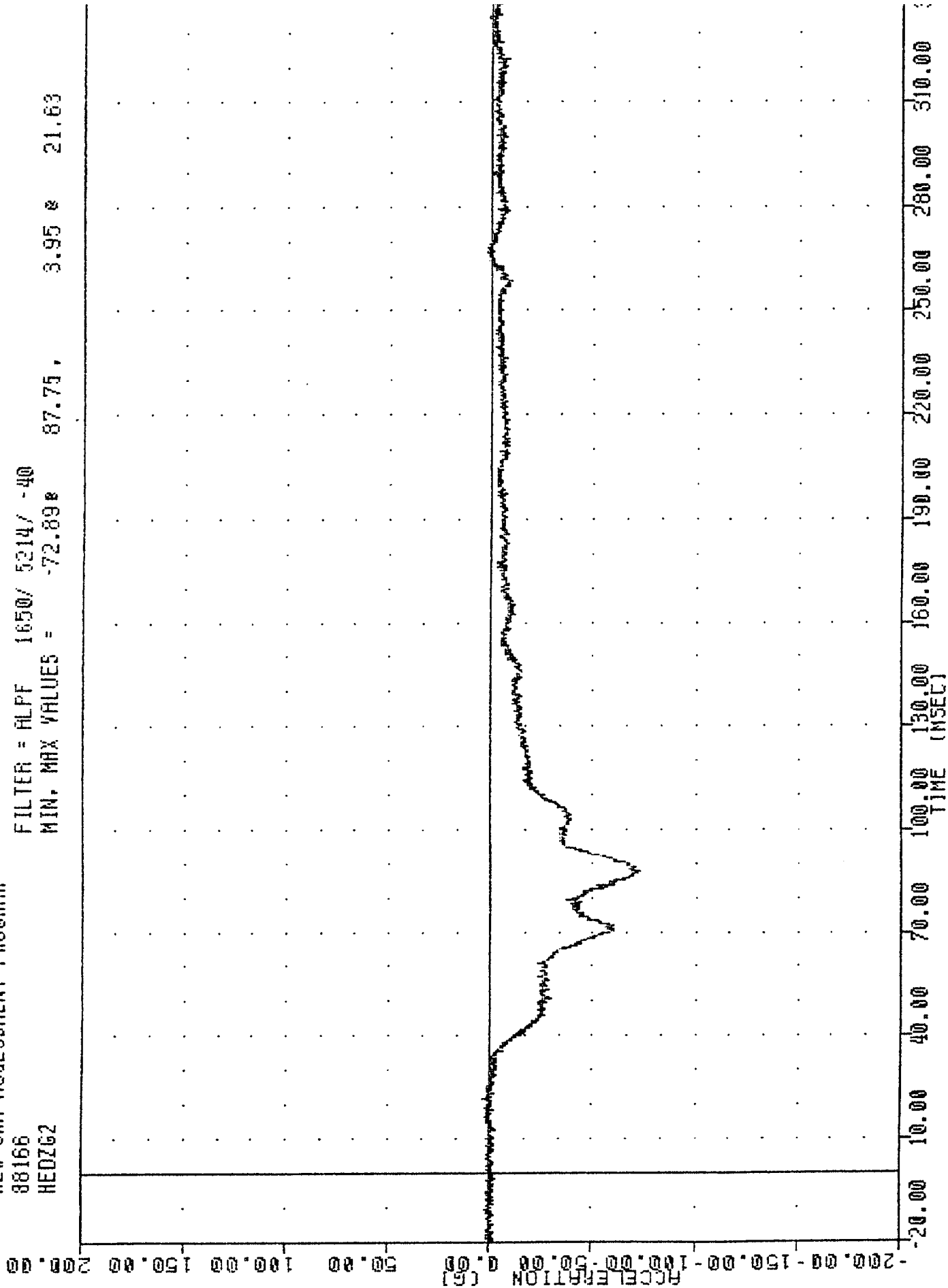
# NEW CAR ASSESSMENT PROGRAM

88166

HEDZ62

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -72.89 87.75, 3.95 21.63



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER HEAD ACCELERATION Z AXIS

# NEW CAR ASSESSMENT PROGRAM

88166

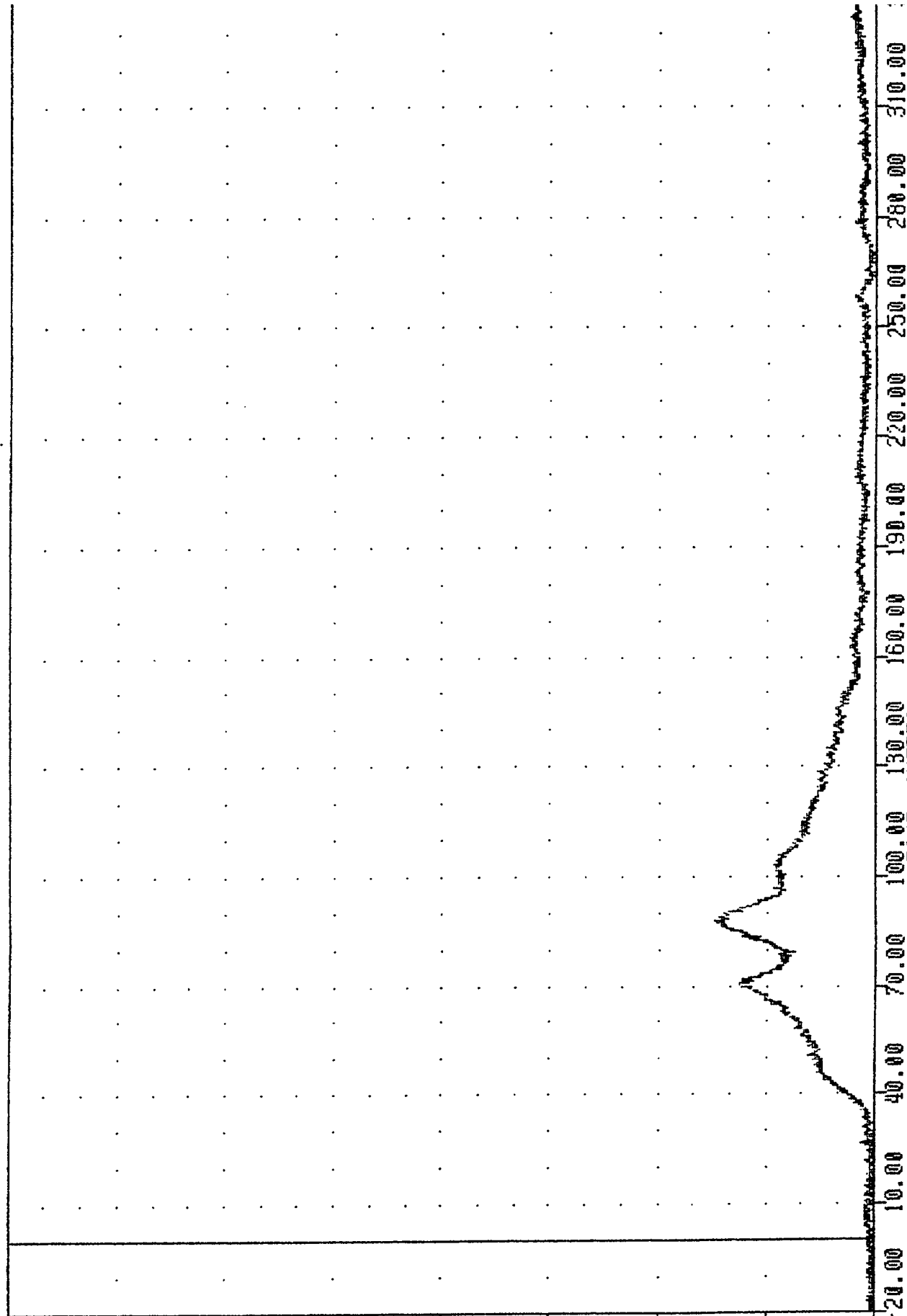
HEDR62

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = 0.13e

-12.88, 73.74 e 87.75

ACCELERATION (G)



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER HEAD RESULTANT ACCELERATION

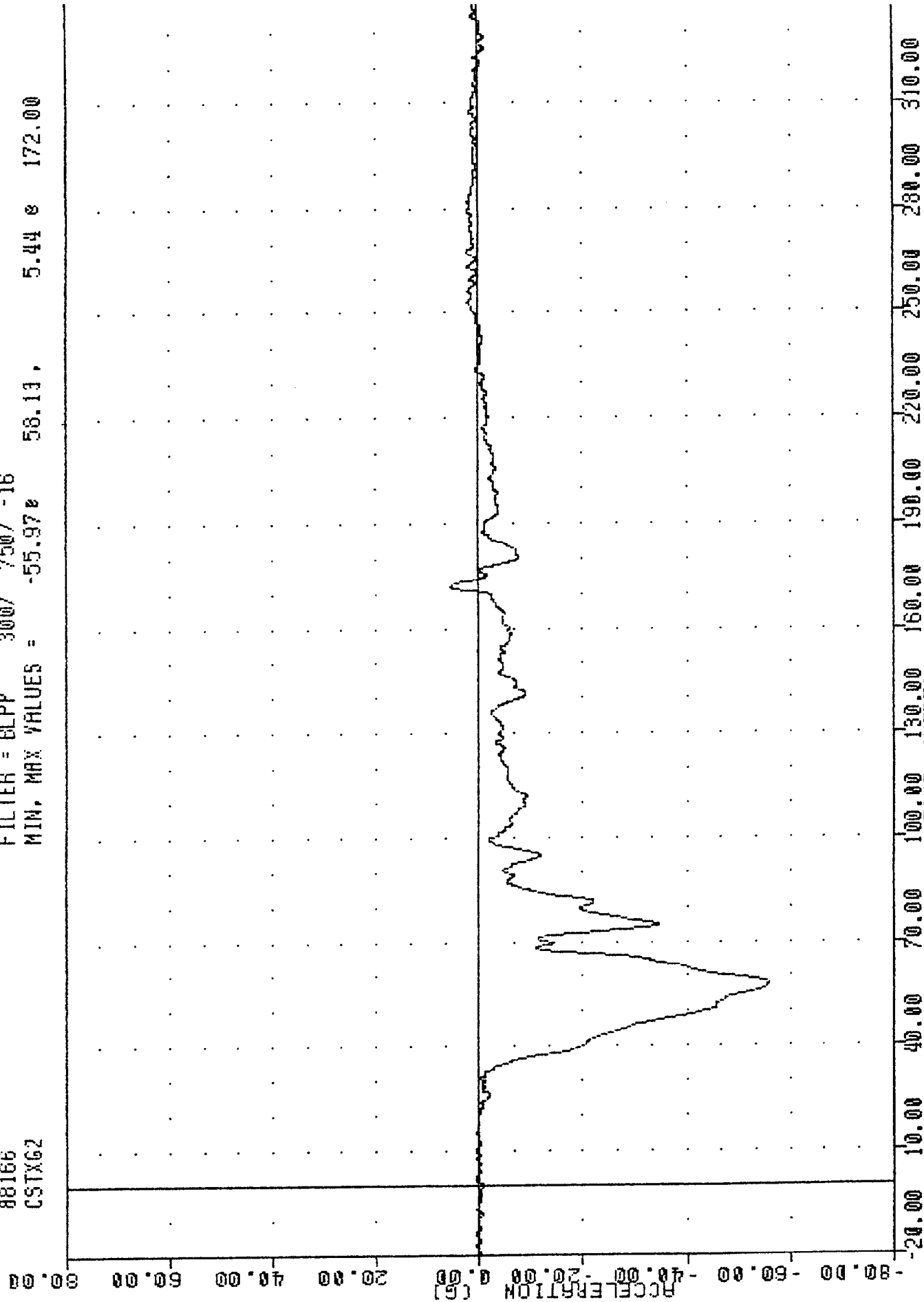
# NEW CAR ASSESSMENT PROGRAM

88166

CSTX62

FILTER = BLPP 300/ 750/ -16

MIN. MAX VALUES = -55.97 58.13 5.44 172.00



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER CHEST ACCELERATION X AXIS

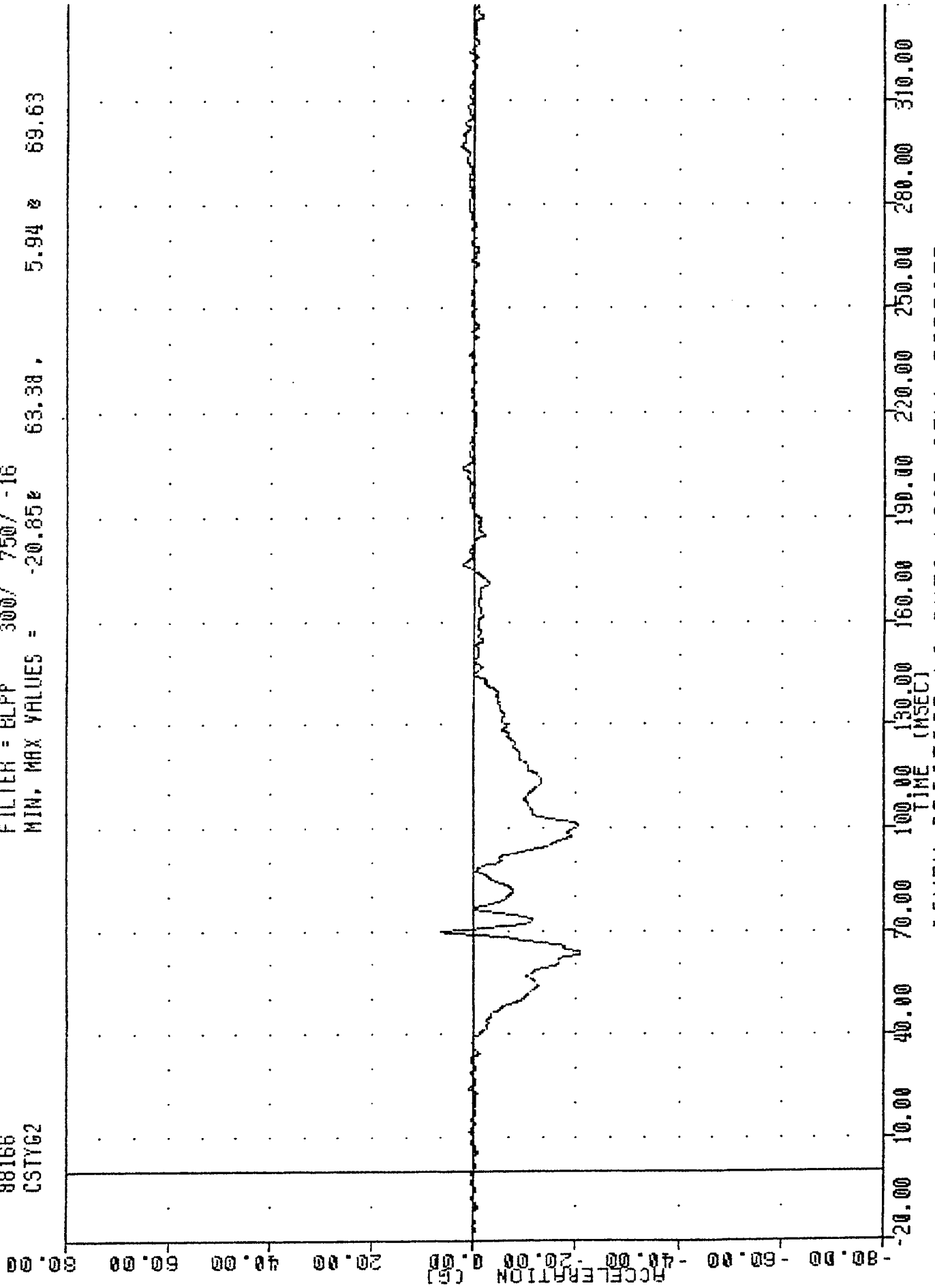
NEW CAR ASSESSMENT PROGRAM

88166

CSTYG2

FILTER = BLPP 300/ 750/ -16

MIN, MAX VALUES = -20.85 63.38, 5.94 8 69.63



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER CHEST ACCELERATION Y AXIS

# NEW CAR ASSESSMENT PROGRAM

88166

FILTER = BLPP 300/ 750/ -16

CSTZG2

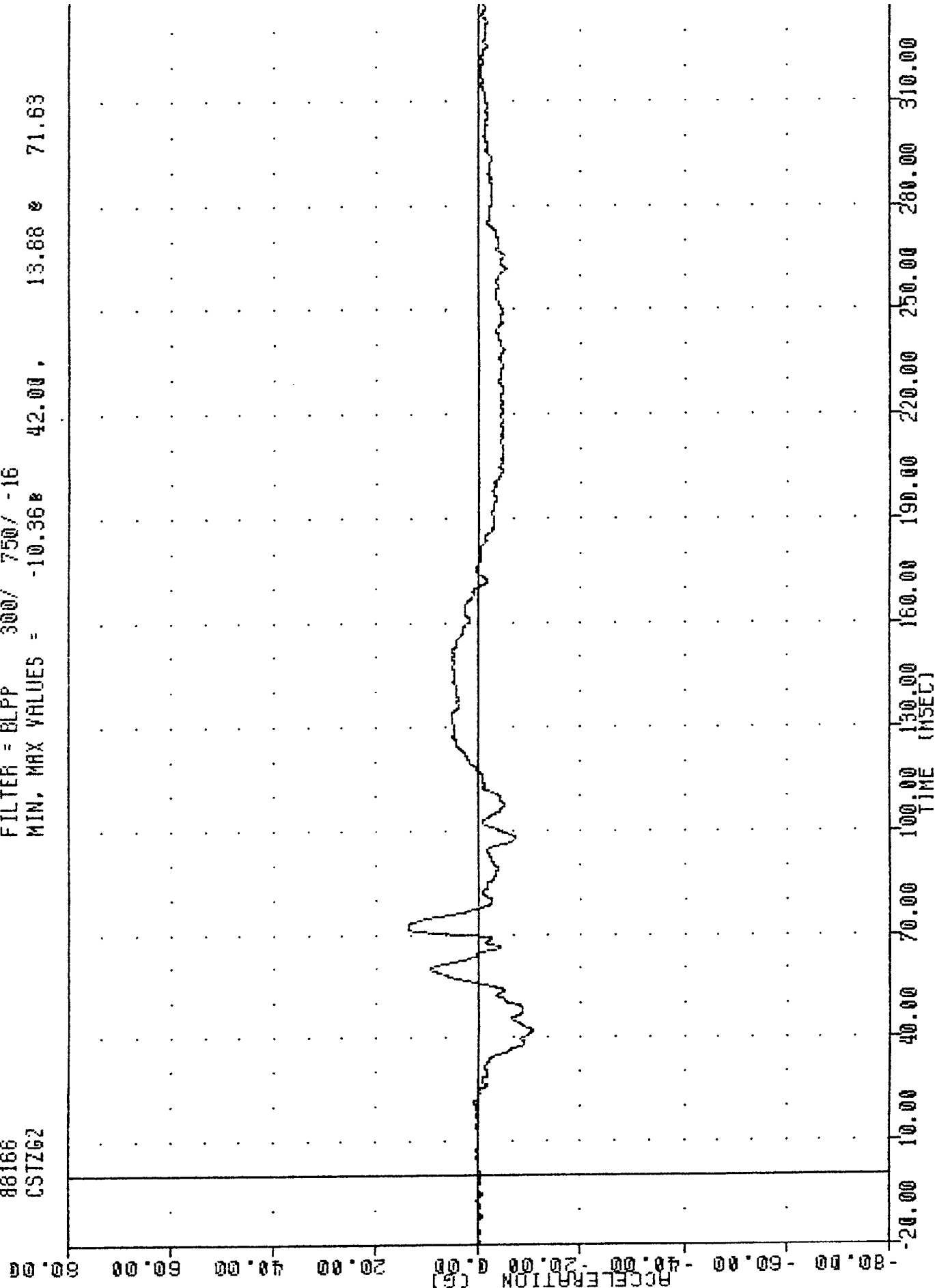
MIN, MAX VALUES =

-10.36%

42.00,

13.88

71.63



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER CHEST ACCELERATION Z AXIS

NEW CAR ASSESSMENT PROGRAM

88166

CSTR62

FILTER = BLPP

300/ 750/ -16

MIN, MAX VALUES =

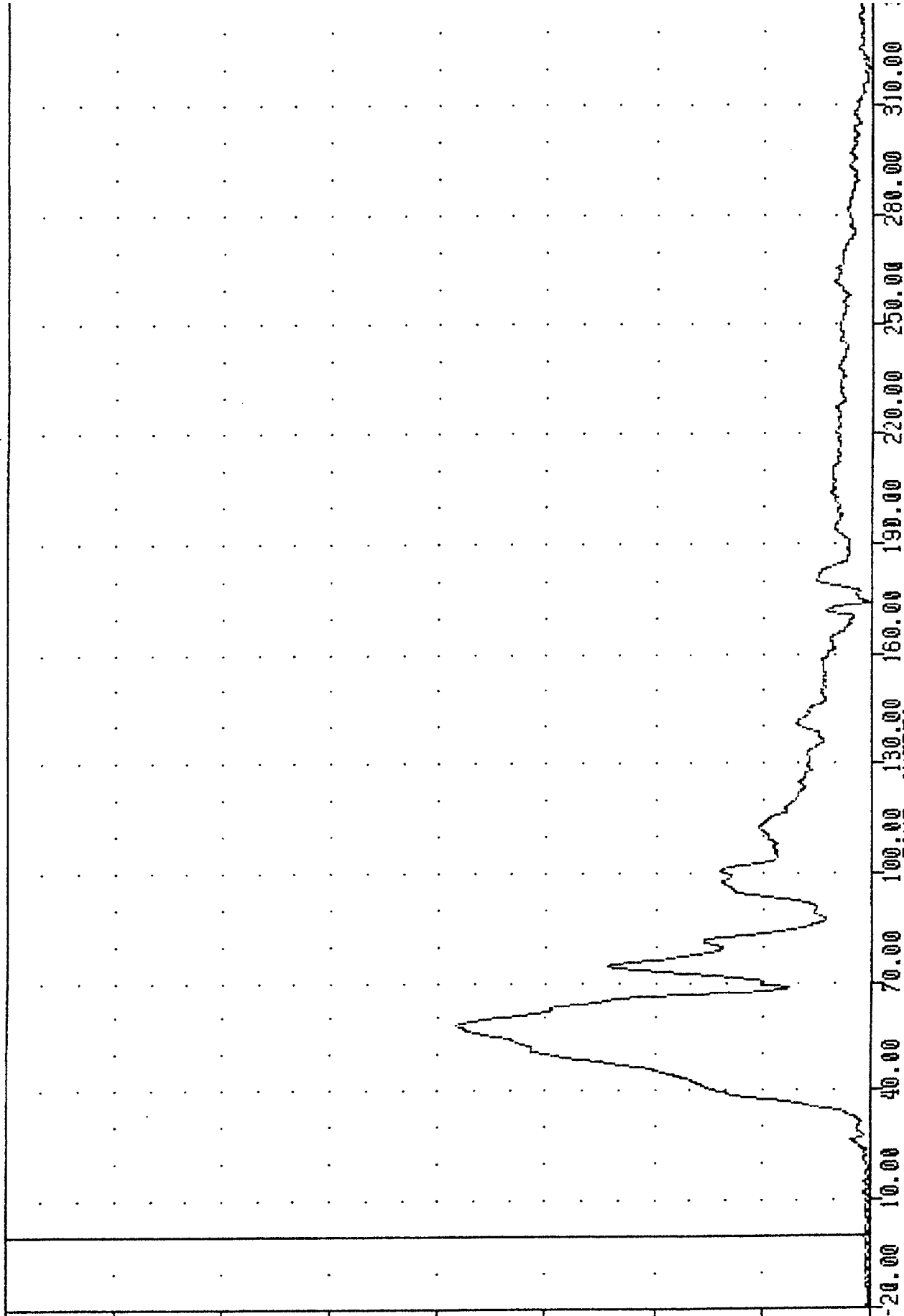
0.068

-18.63,

57.53 @

58.25

ACCELERATION (G)



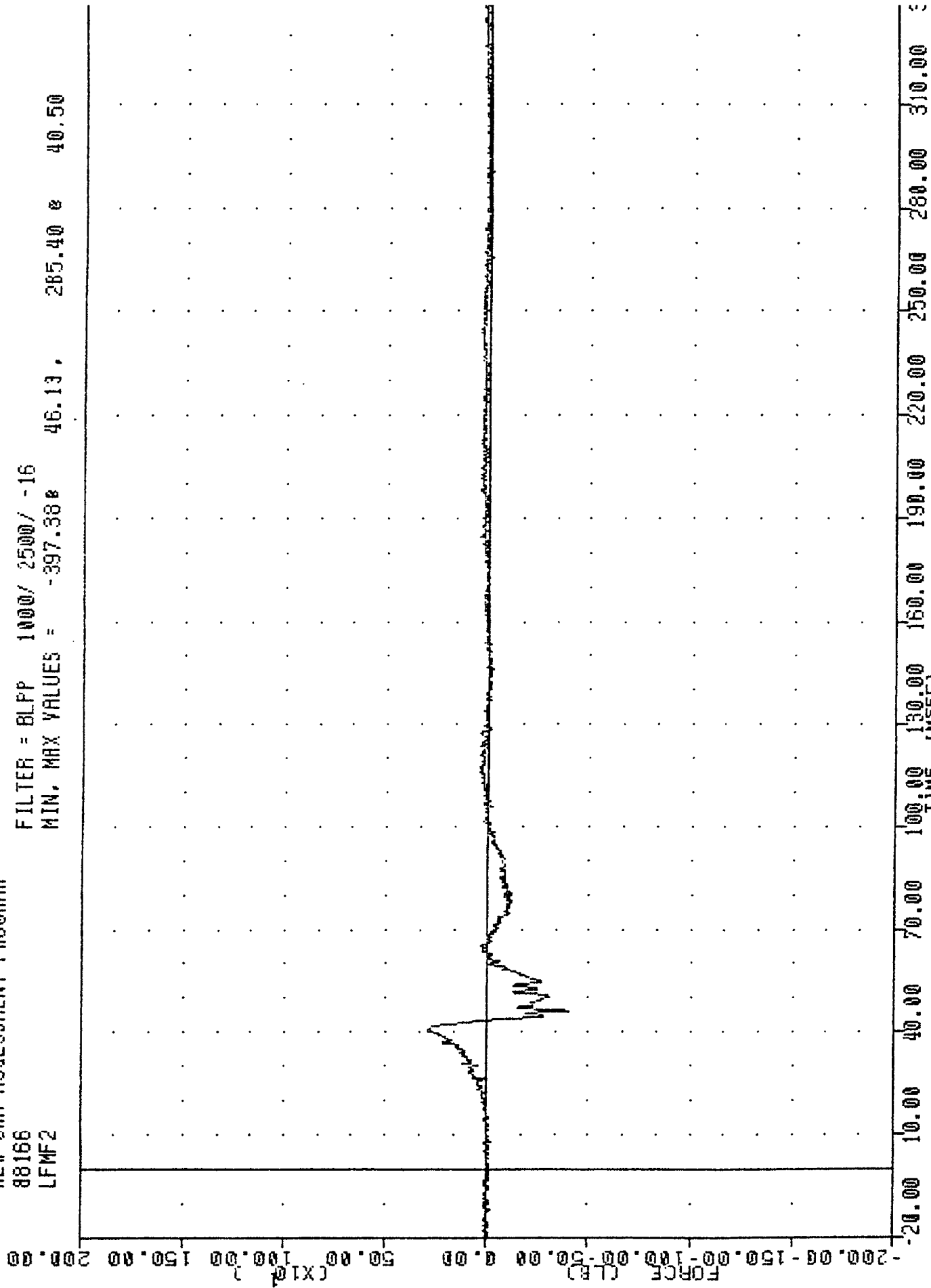
ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER CHEST RESULTANT ACCELERATION

# NEW CAR ASSESSMENT PROGRAM

88166  
LFMF2

FILTER = BLPP 1000/ 2500/ -16  
MIN, MAX VALUES = -397.38 46.13,

285.40 40.50



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER LEFT FEMUR FORCE

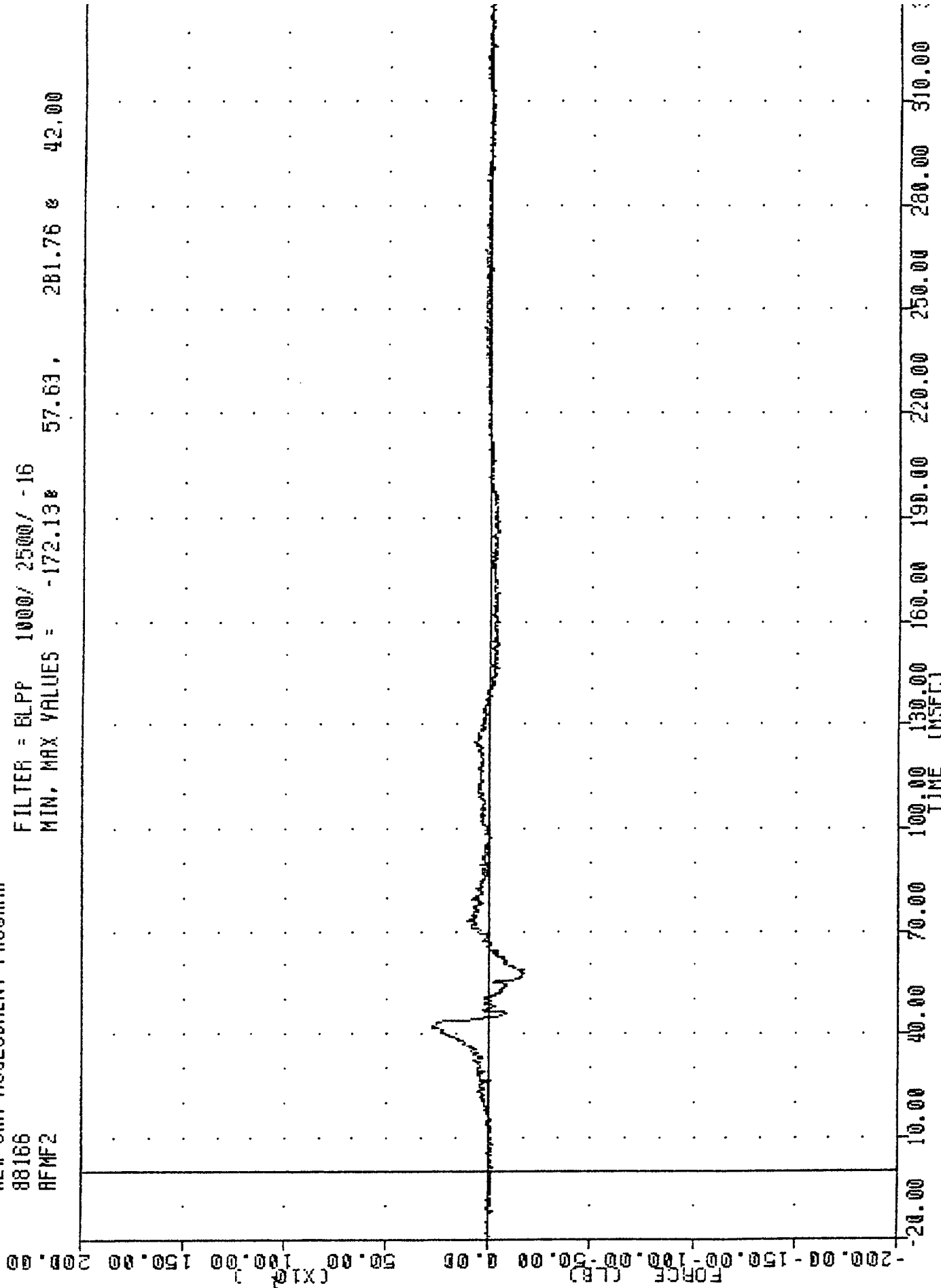
NEW CAR ASSESSMENT PROGRAM

88166

RFMF2

FILTER = BLPP 1000/ 2500/ -16

MIN, MAX VALUES = -172.13 57.63, 281.76 42.00



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER RIGHT FEMUR FORCE

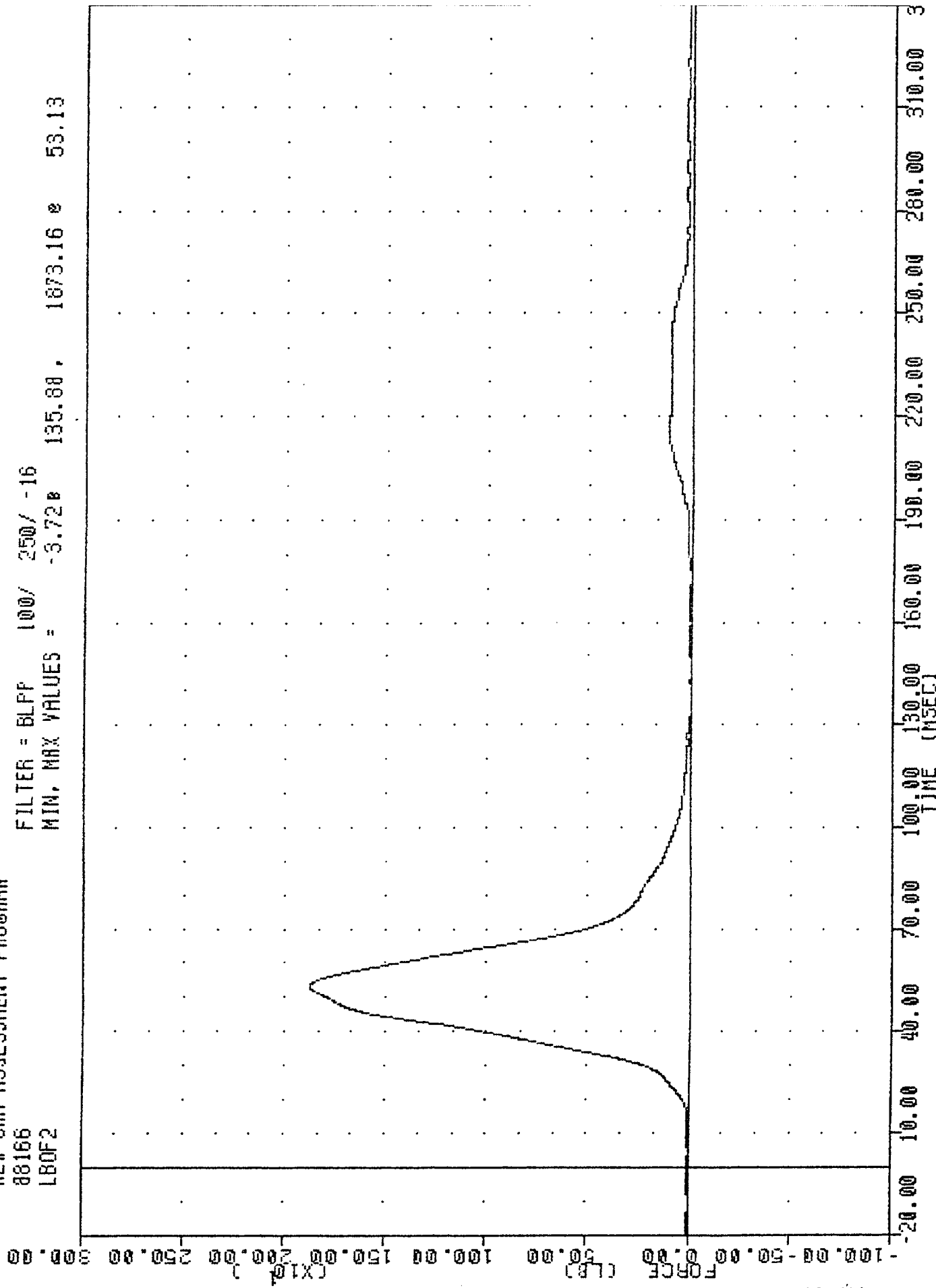
# NEW CAR ASSESSMENT PROGRAM

88166

LB0F2

FILTER = BLPF 100/ 250/ -16

MIN, MAX VALUES = -3.72e 135.88 , 1873.16 e 53.13



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER LAP BELT OUTBOARD FORCE

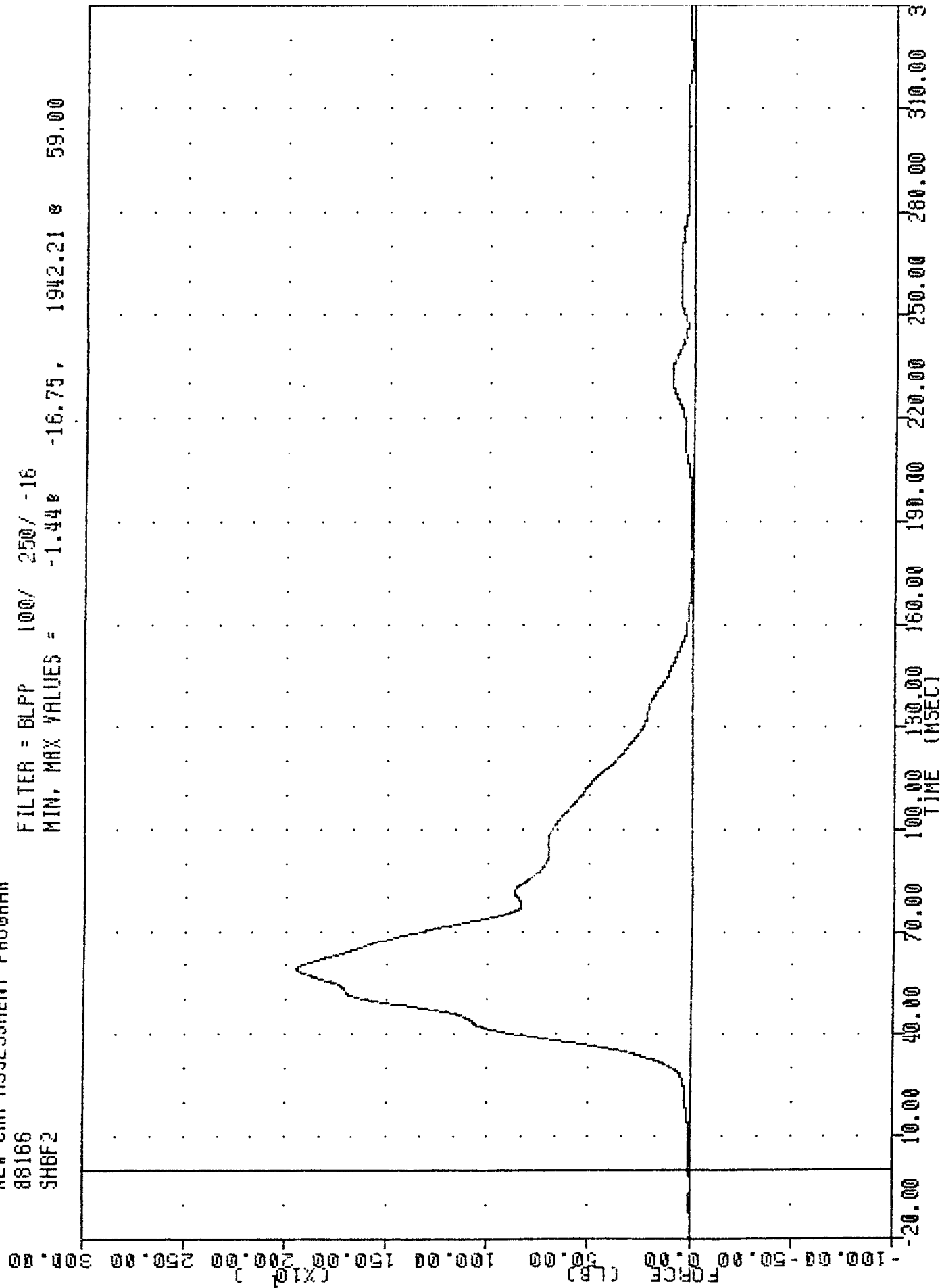
# NEW CAR ASSESSMENT PROGRAM

88166

SHBF2

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -1.44e -16.75, 1942.21 e 59.00

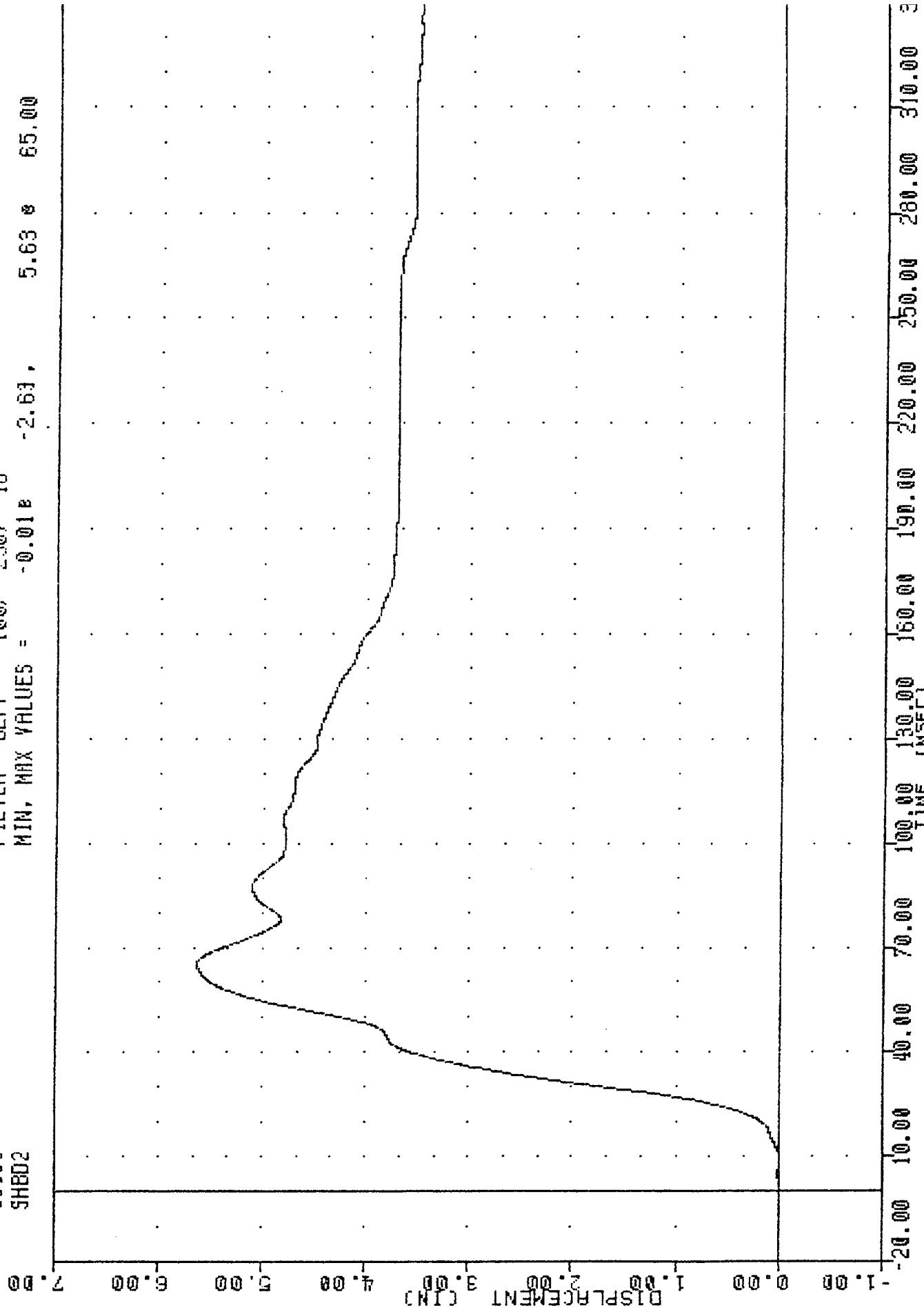


ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER SHOULDER BELT FORCE

# NEW CAR ASSESSMENT PROGRAM

88166  
SHBD2

FILTER = BLPP 100/ 250/ -16  
MIN, MAX VALUES = -0.018 -2.63, 5.63 & 65.00



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER SHOULDER BELT DISPLACEMENT

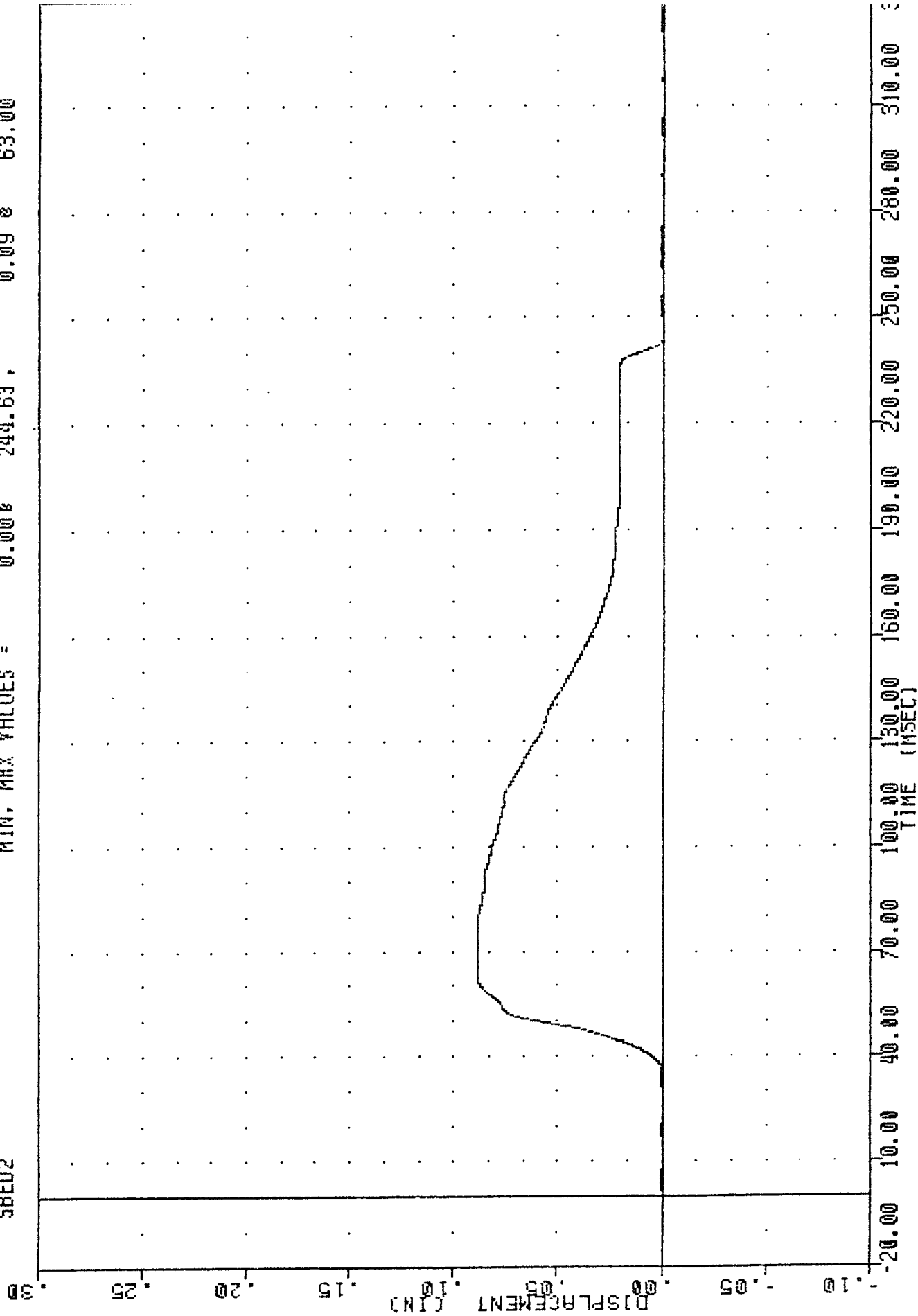
# NEW CAR ASSESSMENT PROGRAM

88166

SBED2

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = 0.00% 244.63, 0.09 % 63.00



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
PASSENGER SEAT BELT EXTENSION

# NEW CAR ASSESSMENT PROGRAM

88186

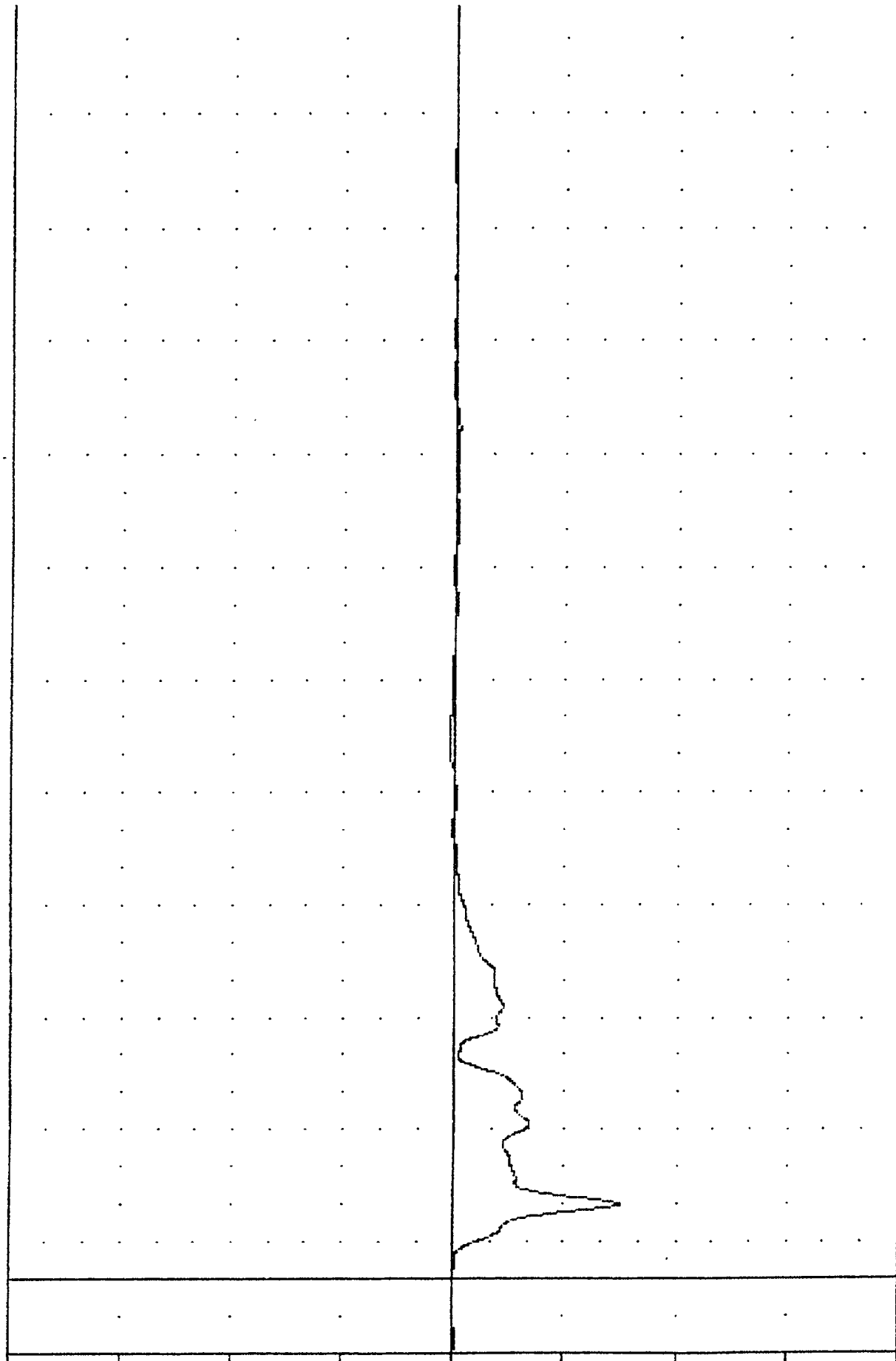
TLRXG1

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -74.67 19.75

2.66 146.50

ACCELERATION (G)



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LEFT REAR SEAT ACCELERATION X AXIS

# NEW CAR ASSESSMENT PROGRAM

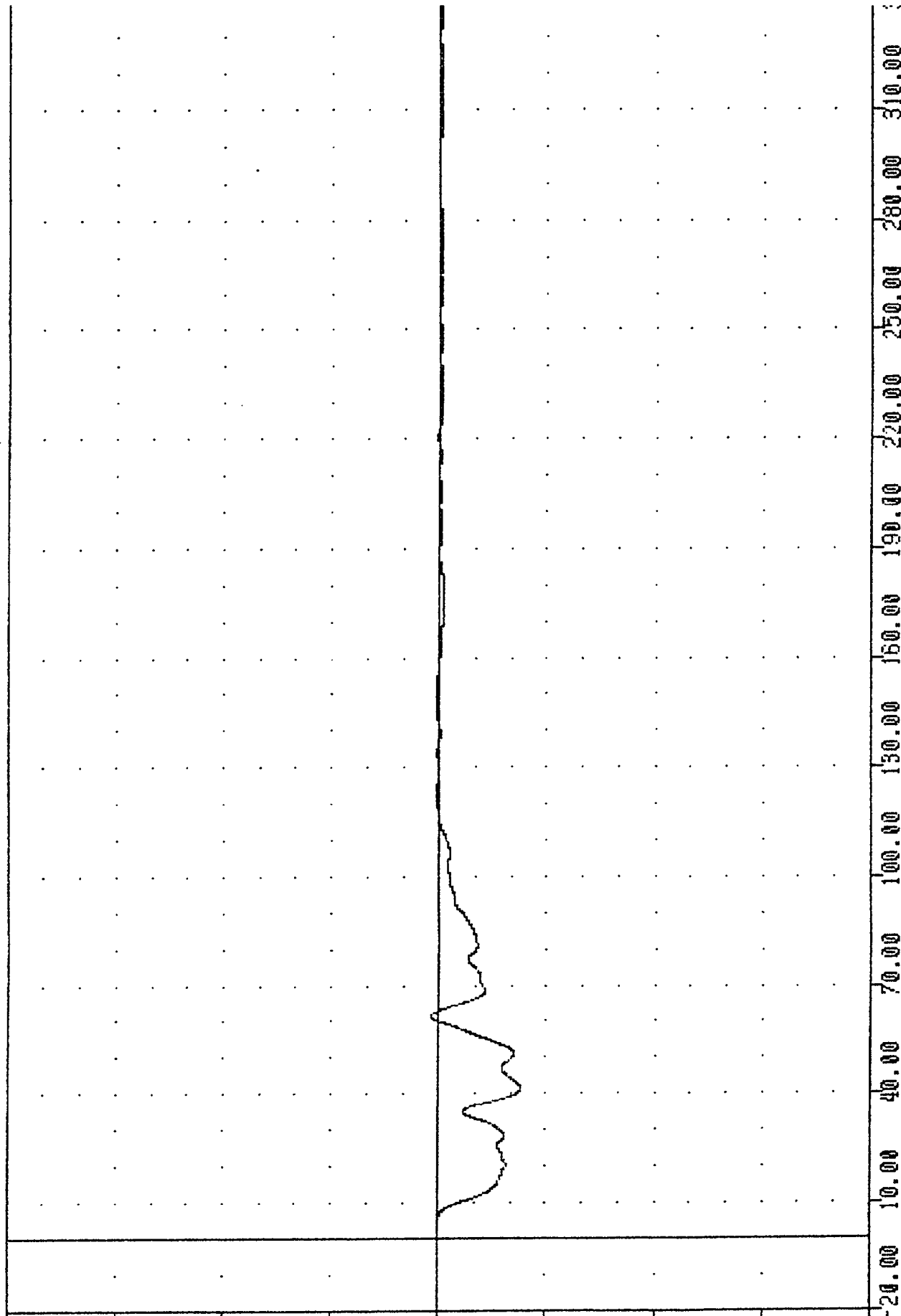
88166

TRRXG1

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -37.85e 41.25, 3.66 e 61.50

ACCELERATION [G]

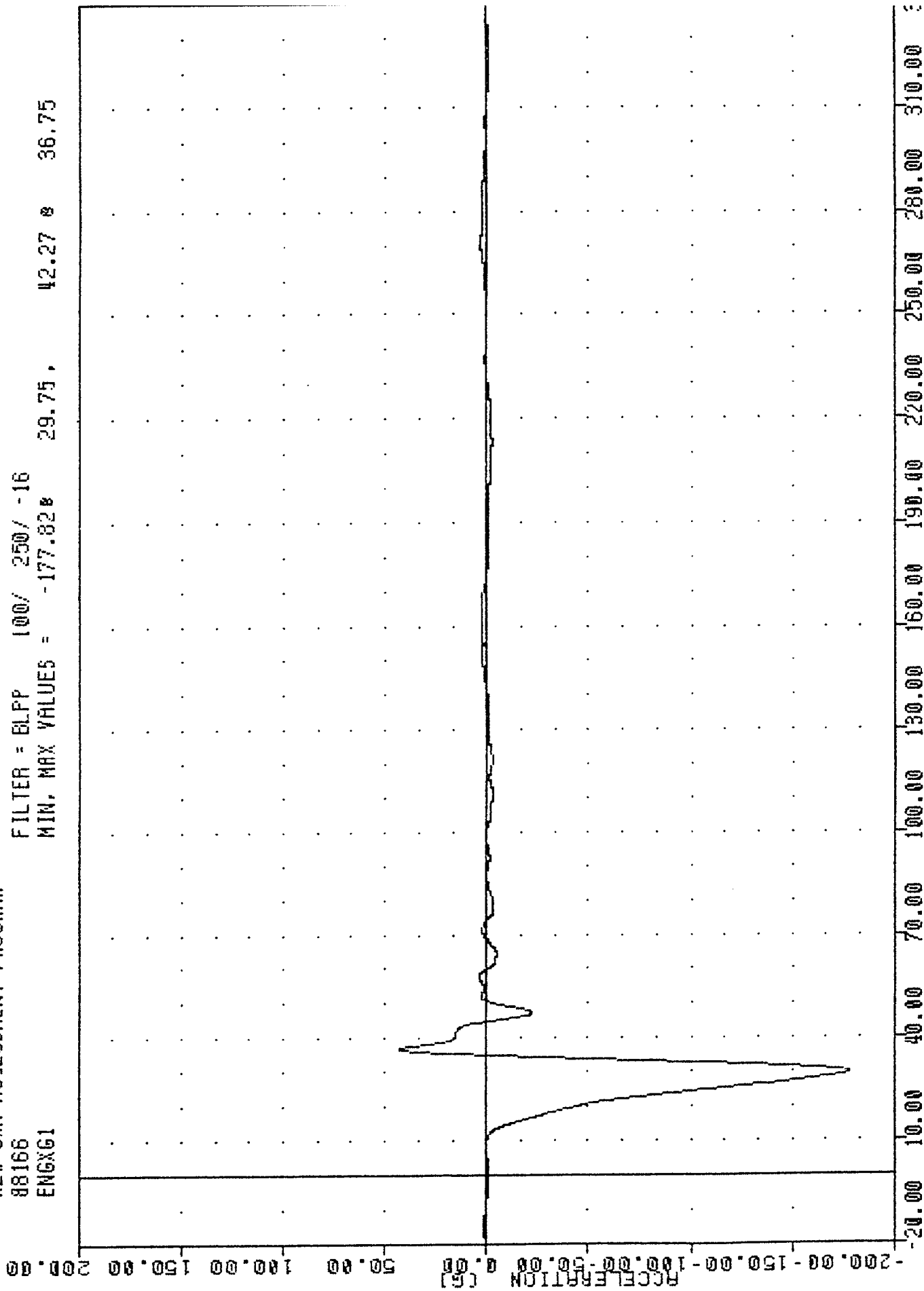


ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
RIGHT REAR SEAT ACCELERATION X AXIS

# NEW CAR ASSESSMENT PROGRAM

88166  
ENGXG1

FILTER = BLPP 100/ 250/ -16  
MIN. MAX VALUES = -177.82 29.75 , 42.27 36.75

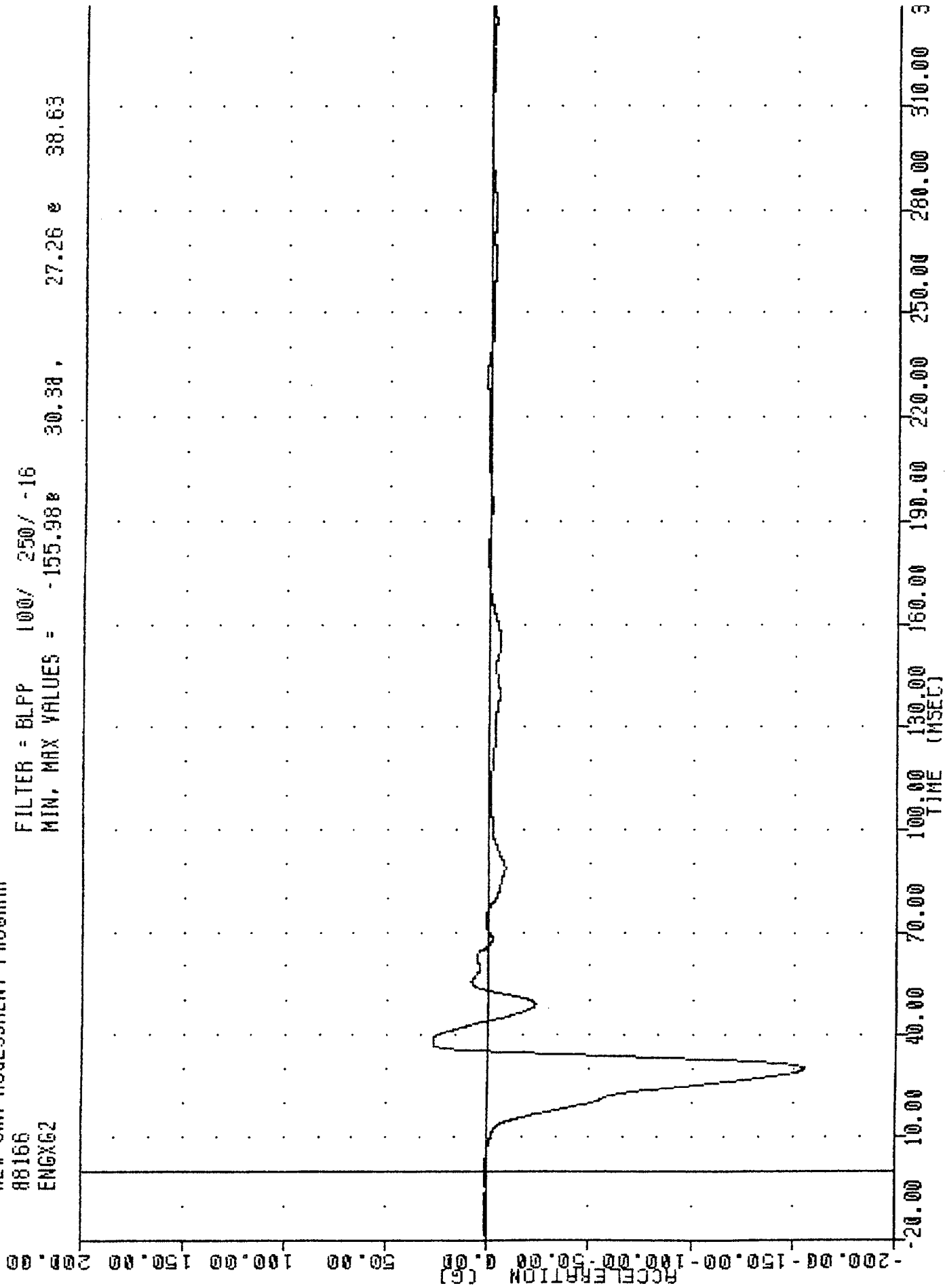


ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
ENGINE UPPER BLOCK ACCELERATION X AXIS

# NEW CAR ASSESSMENT PROGRAM

88166  
ENGX62

FILTER = BLPP 100/ 250/ -16  
MIN, MAX VALUES = -155.98 30.30 , 27.26 e 38.63



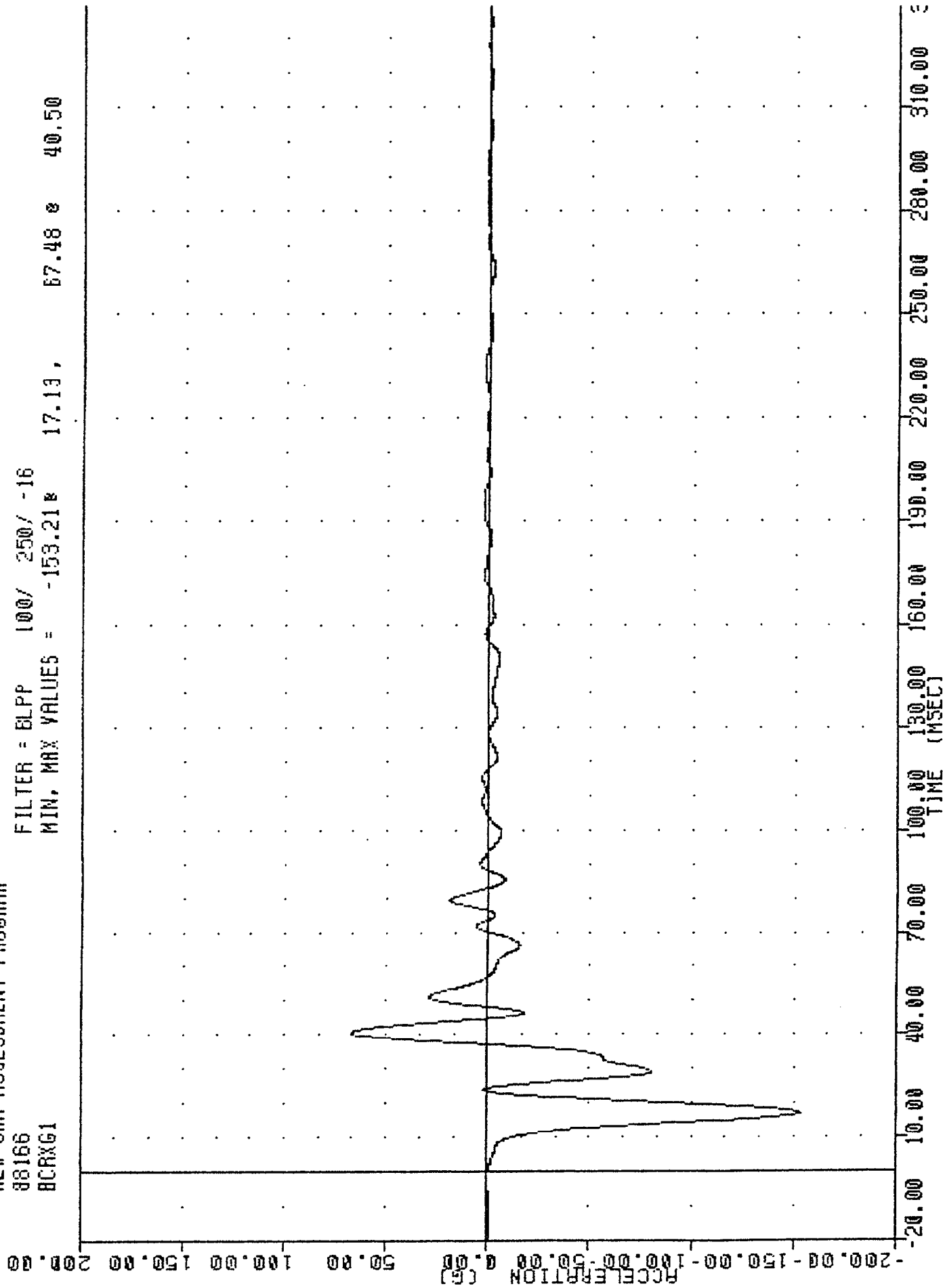
ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
ENGINE LOWER BLOCK ACCELERATION X AXIS

# NEW CAR ASSESSMENT PROGRAM

88166  
BCRXG1

FILTER = BLPP 100/ 250/ -16  
MIN, MAX VALUES = -153.21 17.13 ,

67.48 8 40.50

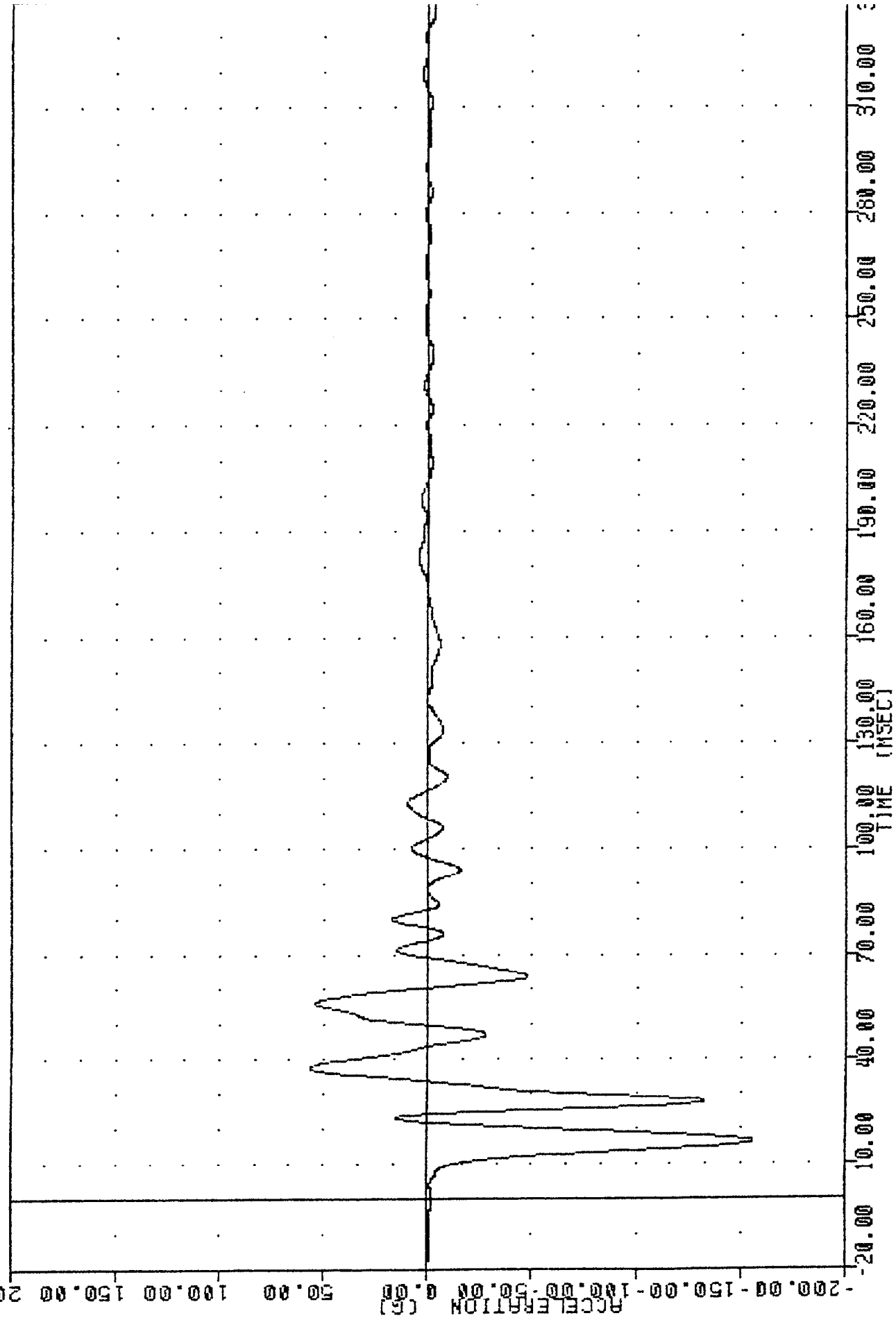


ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
RIGHT BRAKE CALIPER ACCELERATION X AXIS

NEW CAR ASSESSMENT PROGRAM

88166  
BCLXG1

FILTER = BLPP 100/ 250/ -16  
MIN, MAX VALUES = -156.05 16.38, 56.61 37.50

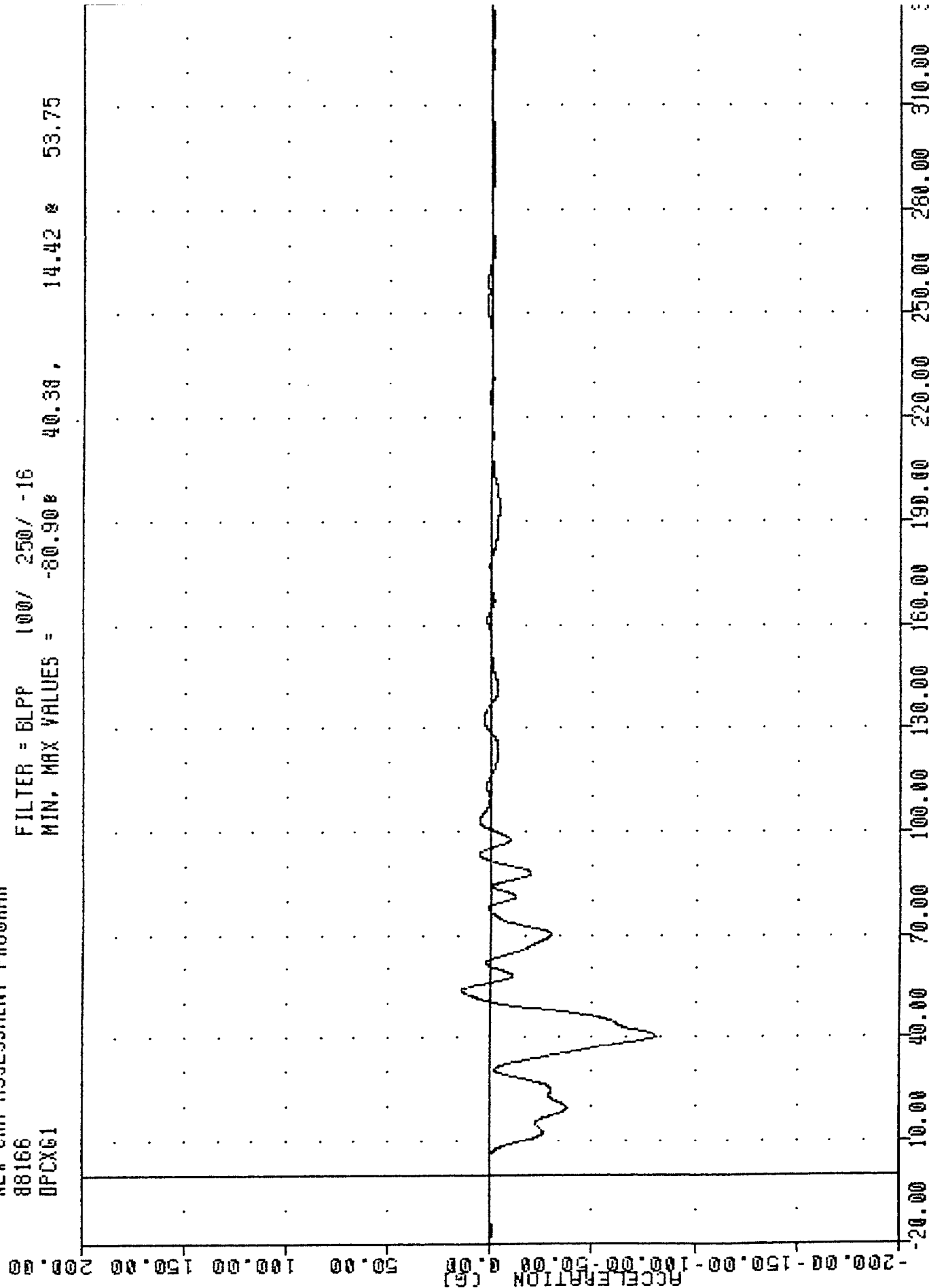


ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LEFT BRAKE CALIPER ACCELERATION X AXIS

# NEW CAR ASSESSMENT PROGRAM

88166  
DPCXG1

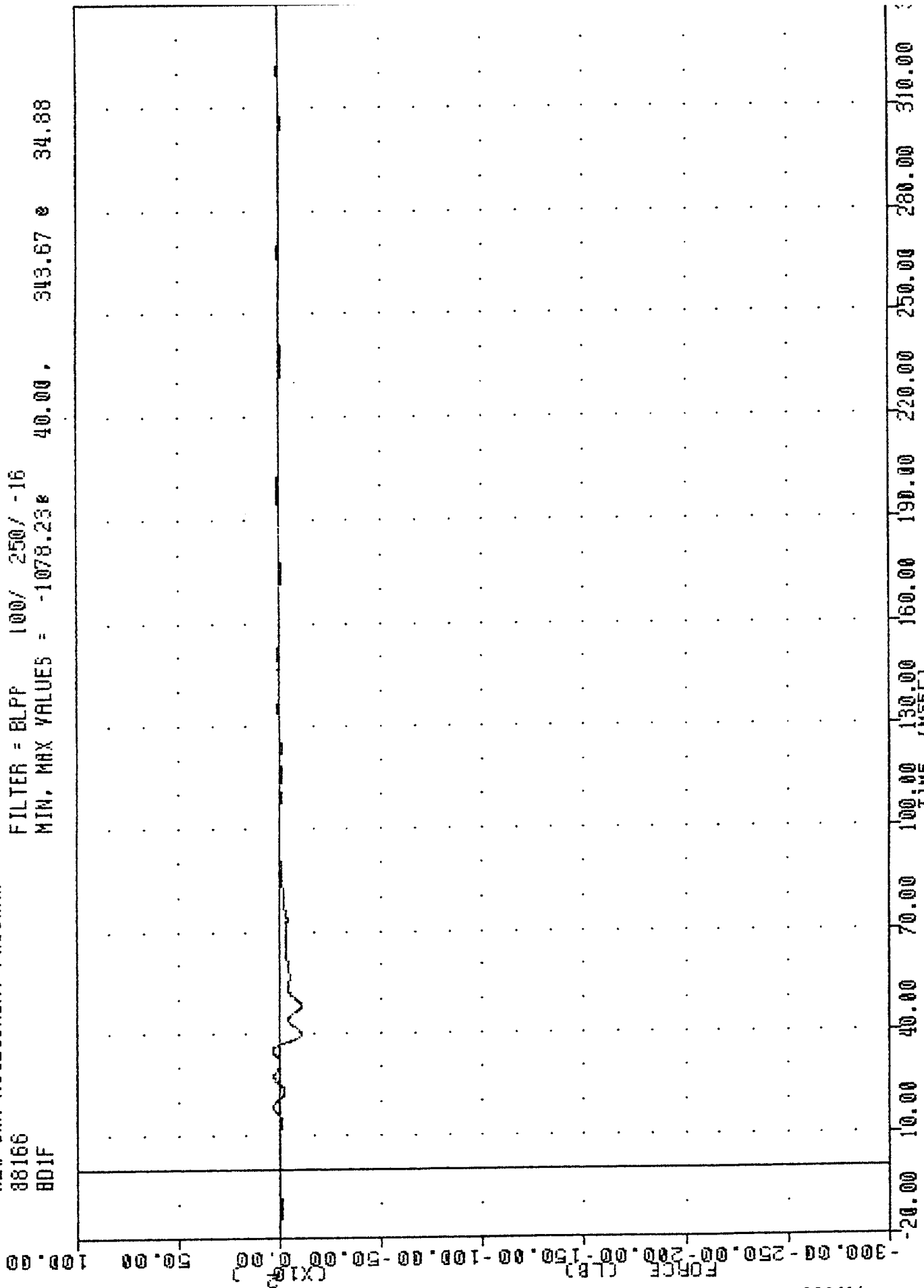
FILTER = BLPP 100/ 250/ -16  
MIN, MAX VALUES = -80.90 40.38, 14.42 53.75



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
DASH PANEL CENTER ACCELERATION X AXIS

1110  
 NEW CAR ASSESSMENT PROGRAM  
 88166  
 801F

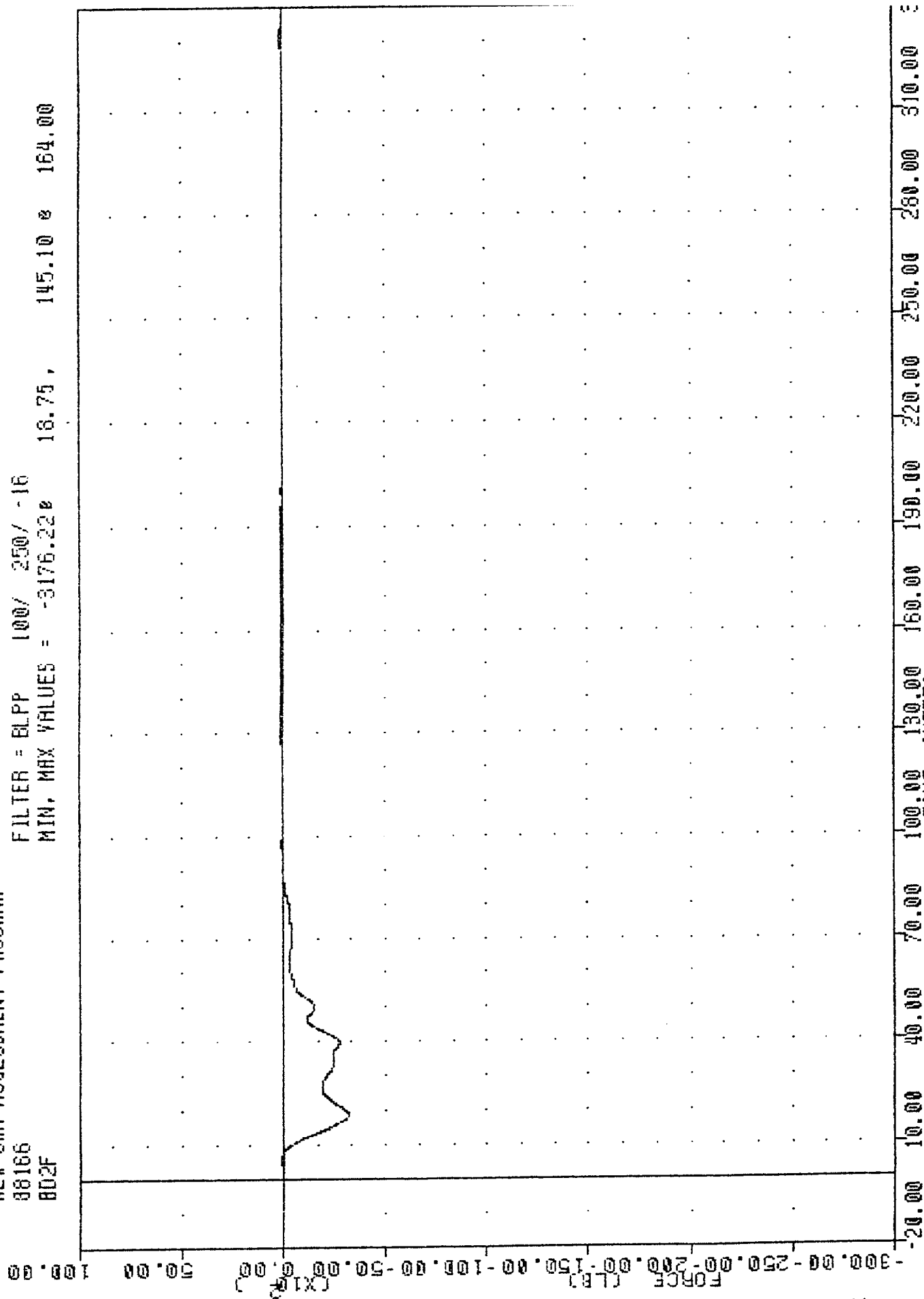
FILTER = BLPP 100/ 250/ -16  
 MIN. MAX VALUES = -1078.23 40.00 343.67 34.88



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
 LOAD CELL BARRIER POSITION 01 FORCE

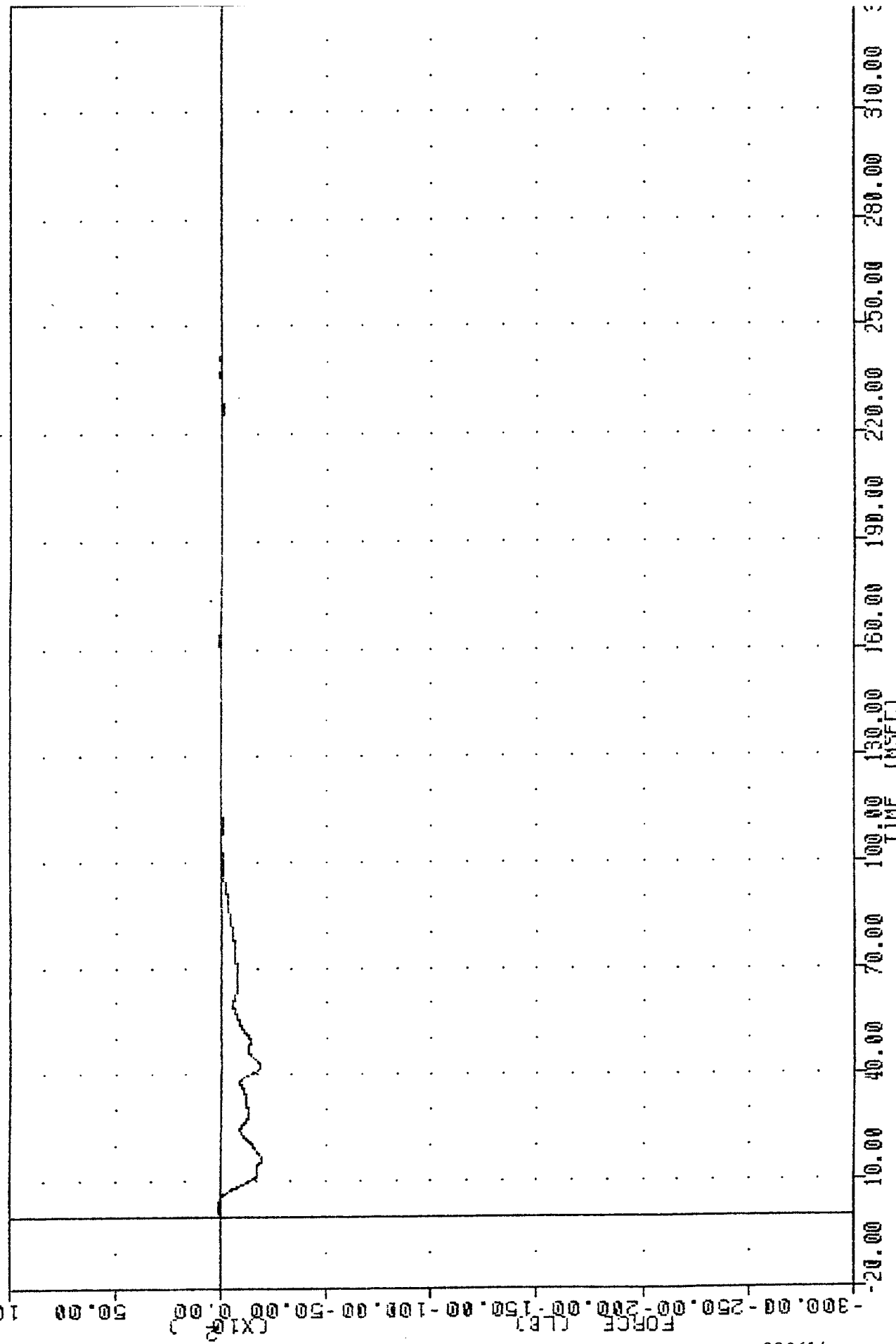
NEW CAR ASSESSMENT PROGRAM  
 88166  
 BD2F

FILTER = BLPP 100/ 250/ -16  
 MIN, MAX VALUES = -3176.22 18.75, 145.10 164.00



NEW CAR ASSESSMENT PROGRAM  
 88166  
 BD3F

FILTER = BLPP 100/ 250/ -16  
 MIN. MAX VALUES = -1909.19 16.38 80.15 2.75



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
 LOAD CELL BARRIER POSITION 03 FORCE

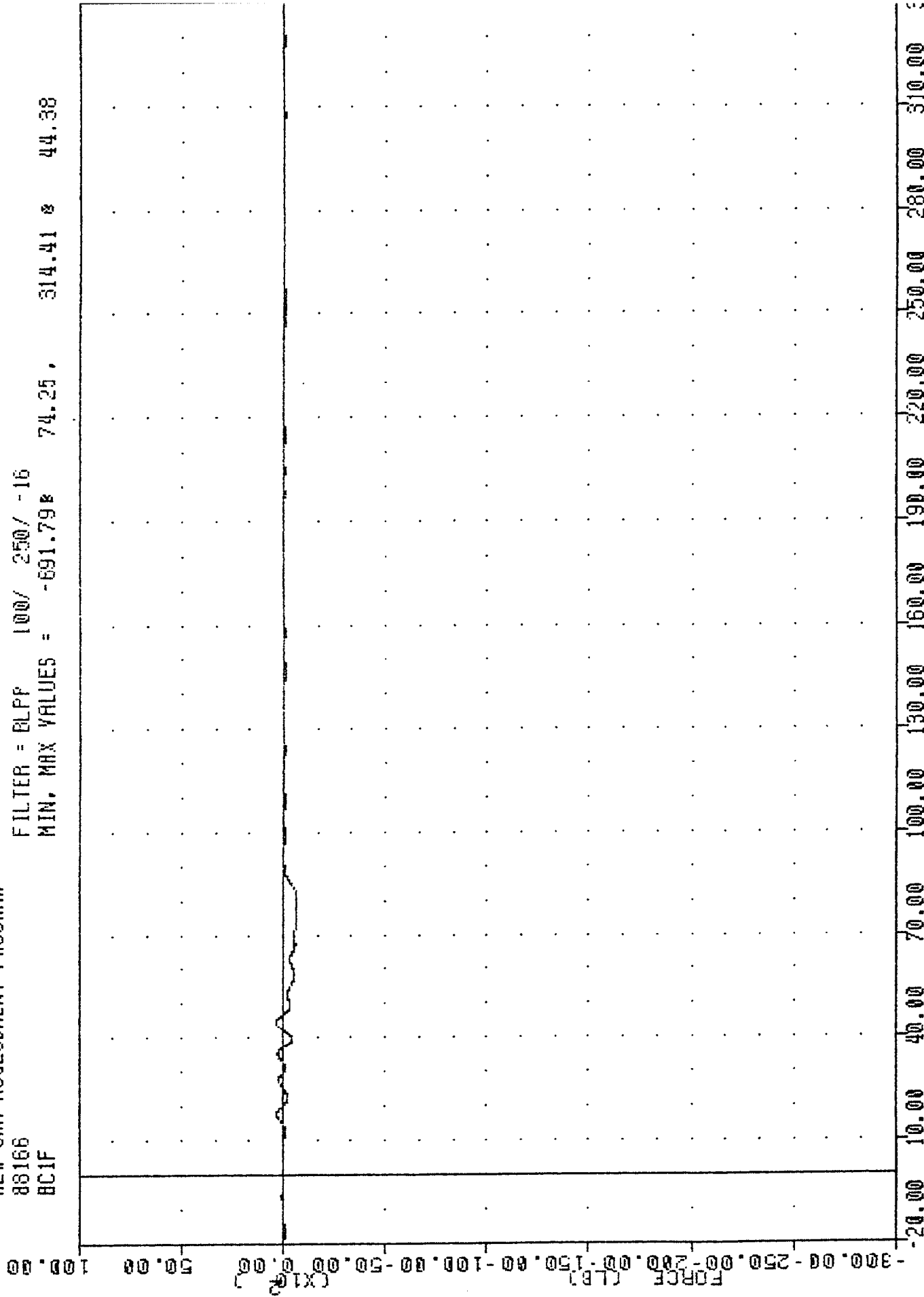
NEW CAR ASSESSMENT PROGRAM

88166

BC1F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -691.798 74.25 , 314.41 8 44.38



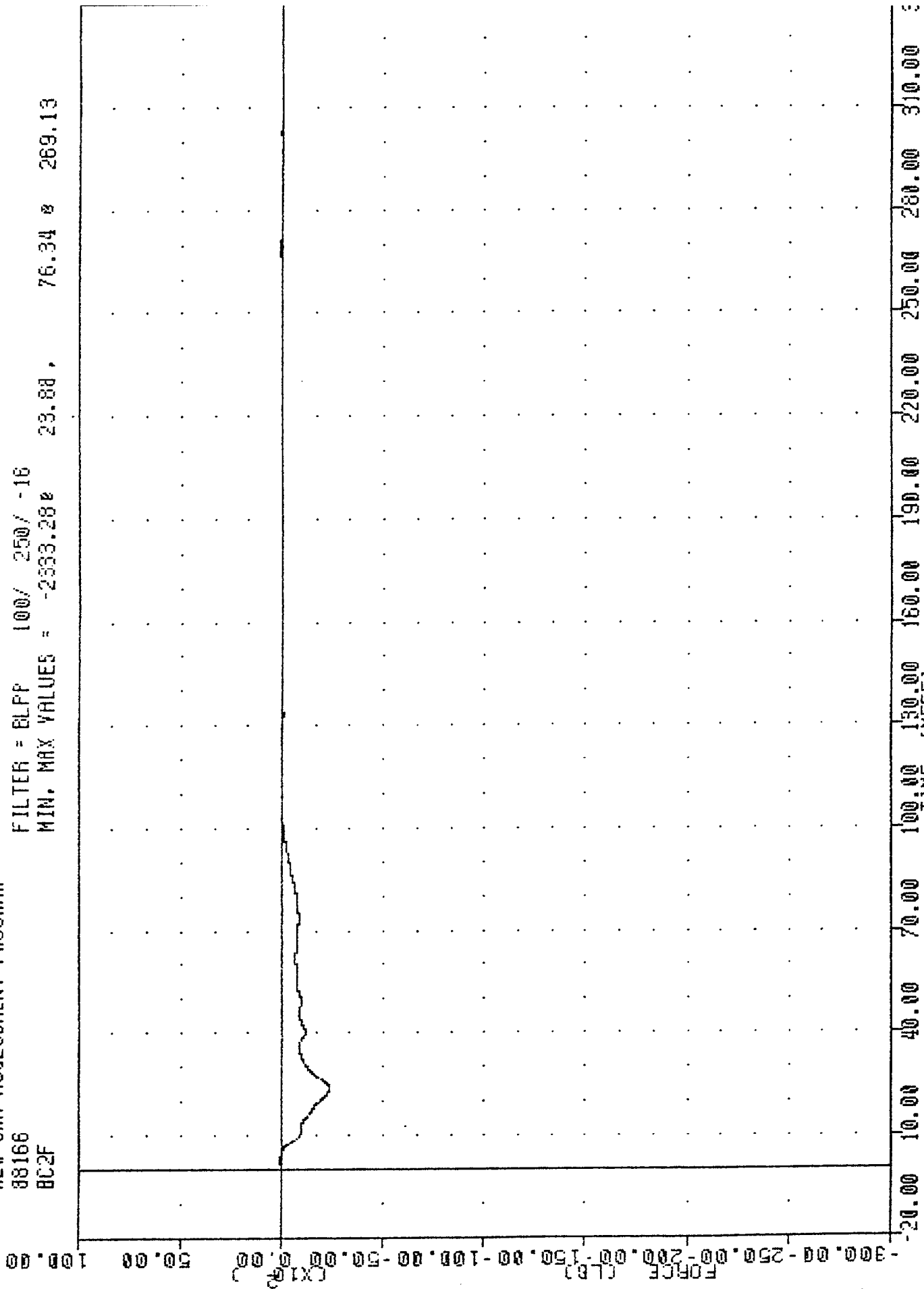
# NEW CAR ASSESSMENT PROGRAM

88166

BC2F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -2533.28 23.88 , 76.34 269.13



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION C2 FORCE

# NEW CAR ASSESSMENT PROGRAM

88166

BC3F

FILTER = BLPP 100/ 250/ -16

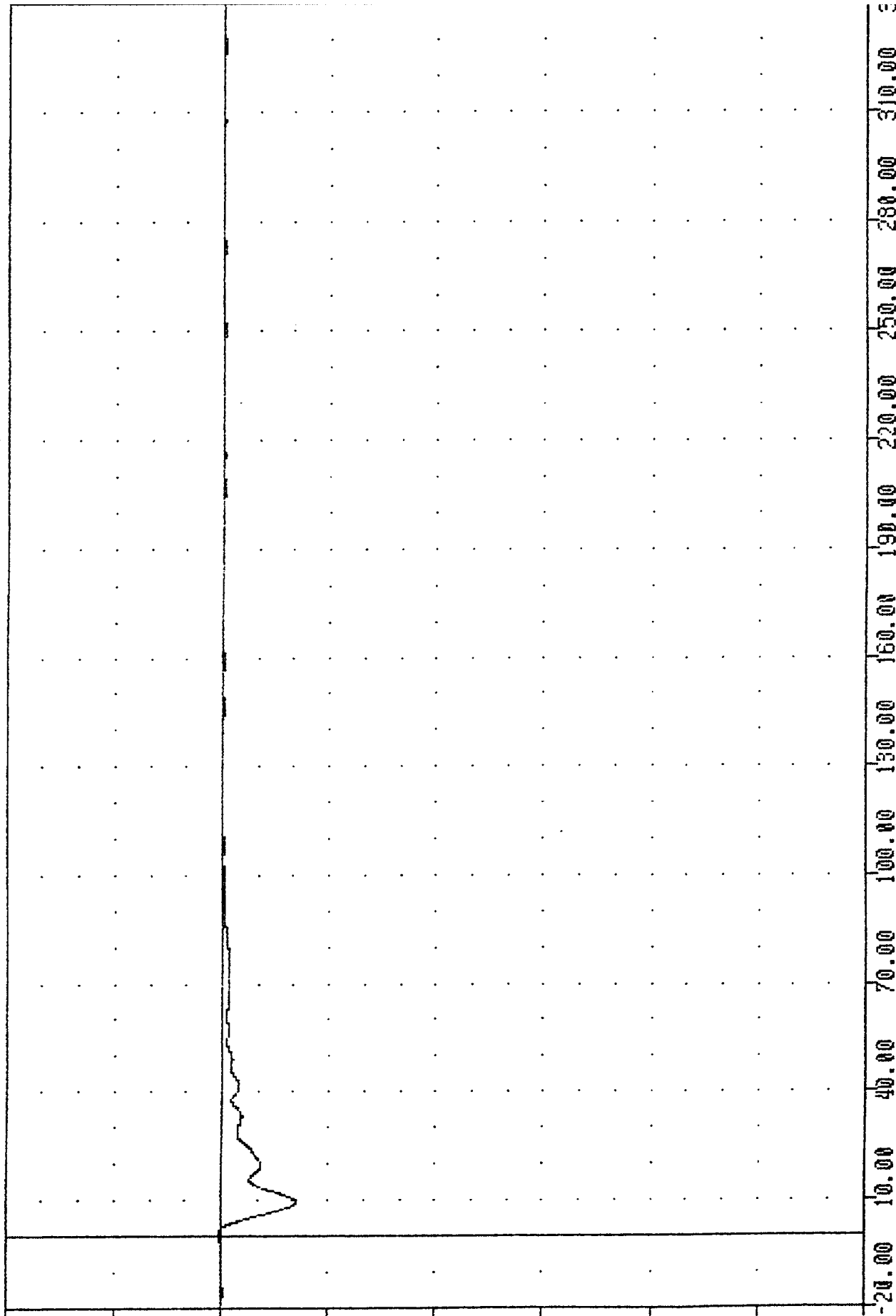
MIN, MAX VALUES = -3515.38 9.50 , 118.29 0 0.50

FORCE (LB)  
-300.00 -250.00 -200.00 -150.00 -100.00 -50.00 0.00 50.00 100.00

(X10<sup>2</sup>)

B-42

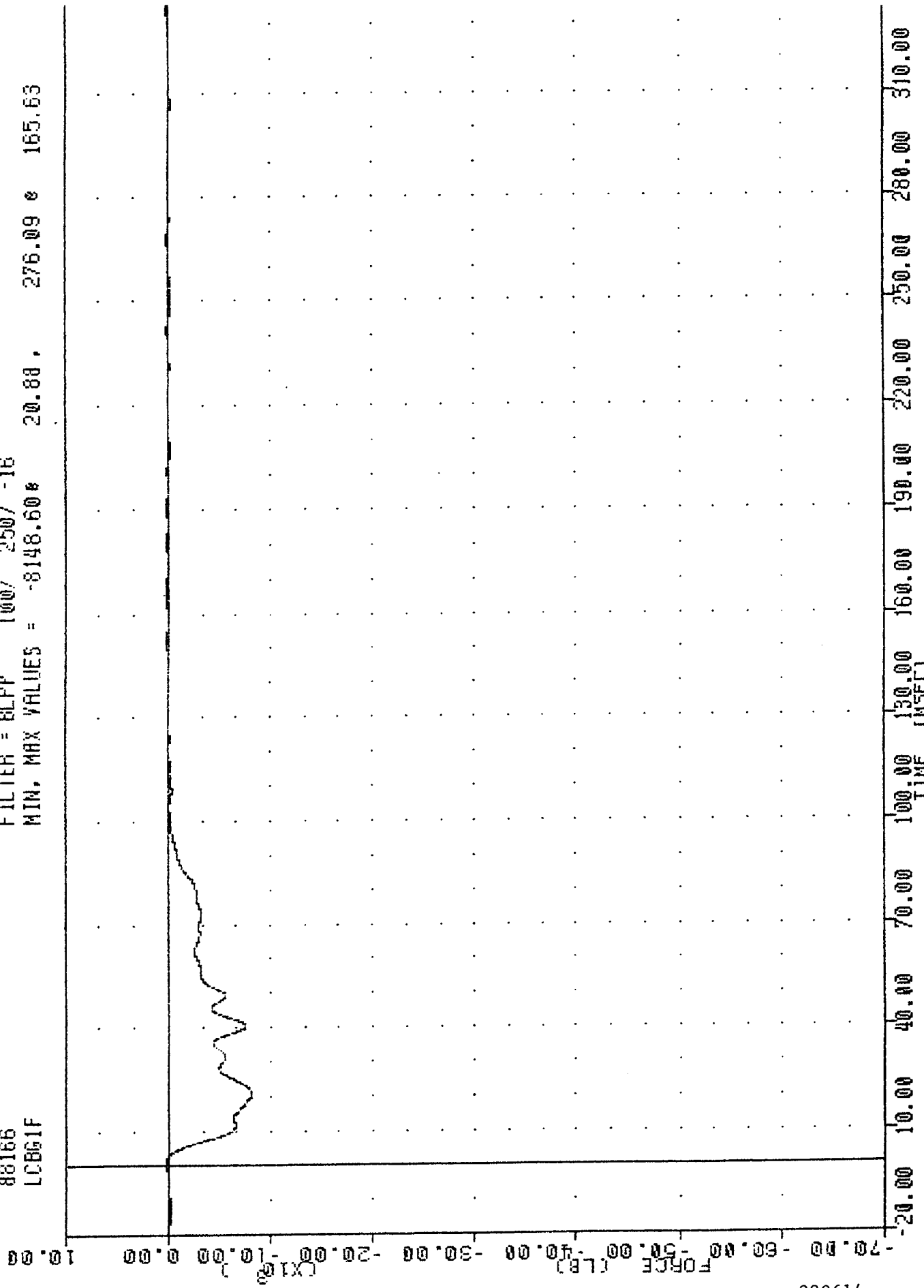
880614



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION C3 FORCE

NEW CAR ASSESSMENT PROGRAM  
 88186  
 LCBG1F

FILTER = BLPP 100/ 250/ -16  
 MIN, MAX VALUES = -8148.60# 20.88 276.09 # 165.63



ISUZU SPACECAR LS INTO LOAD CELL BARRIER  
 LOAD CELL BARRIER GROUP - 1 FORCE TOTAL

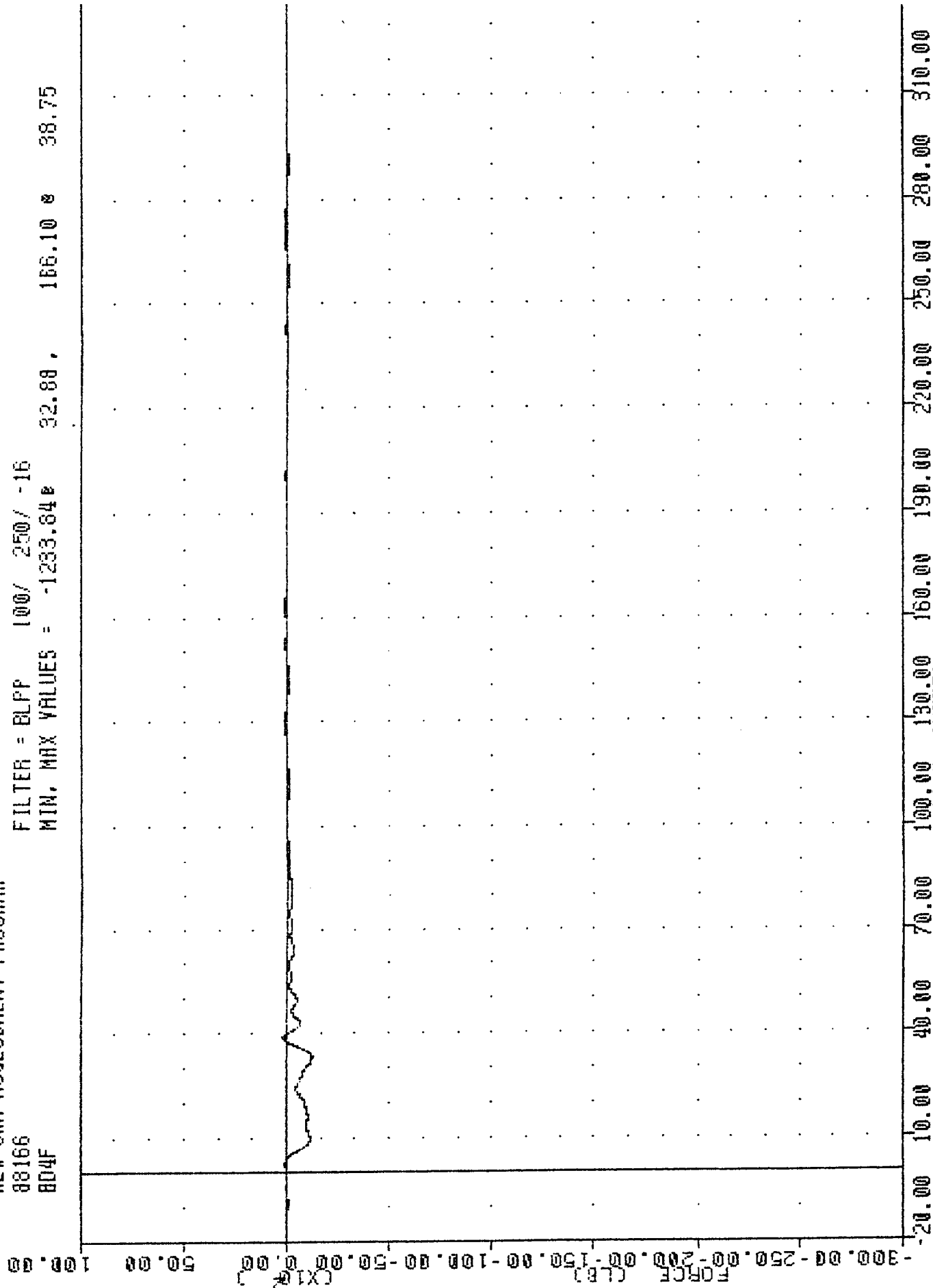
NEW CAR ASSESSMENT PROGRAM

88166

804F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -1233.84e 32.88, 166.10 e 38.75



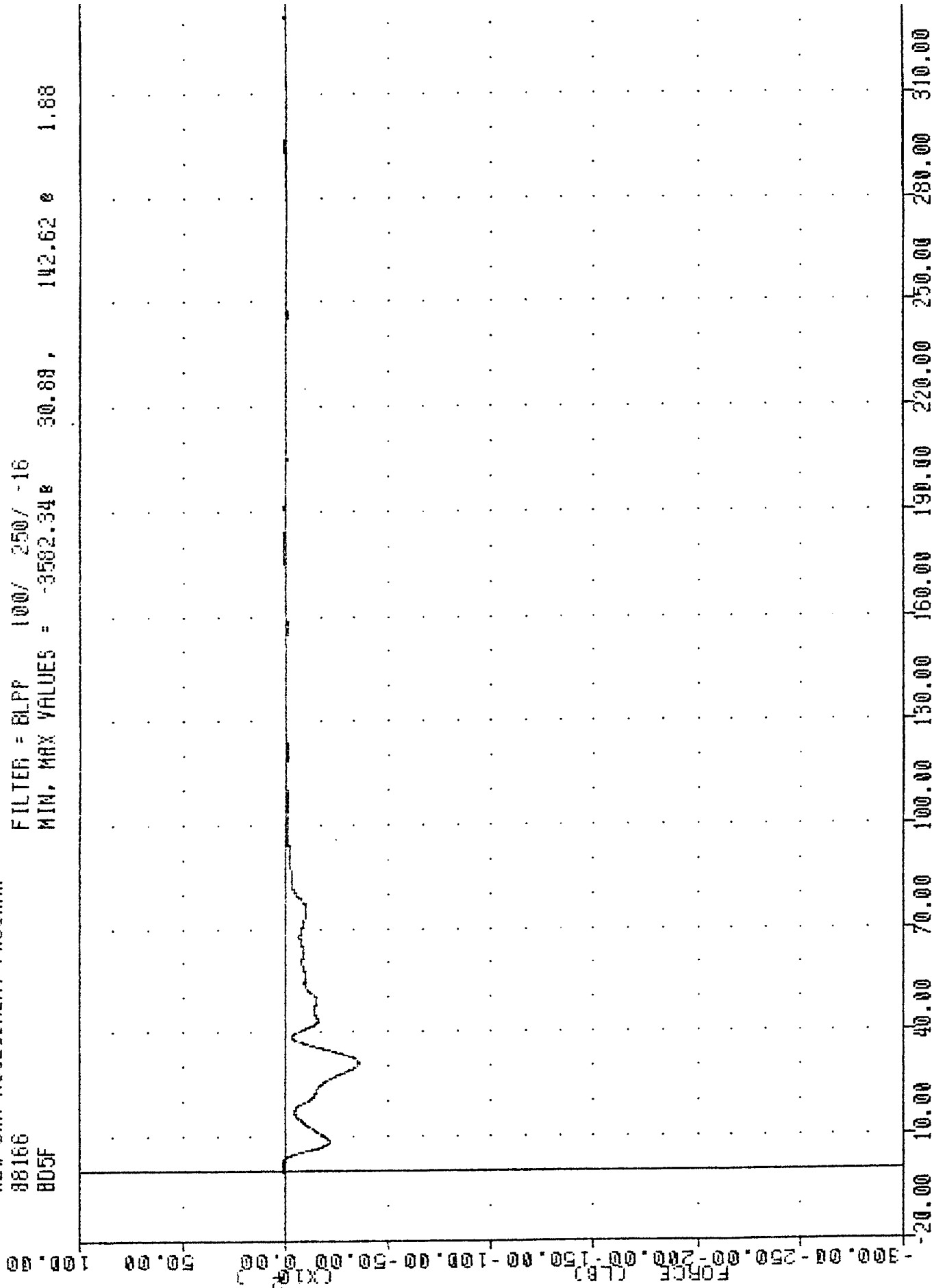
# NEW CAR ASSESSMENT PROGRAM

88166

BD5F

FILTER = BLPP 100/ 250/ -16

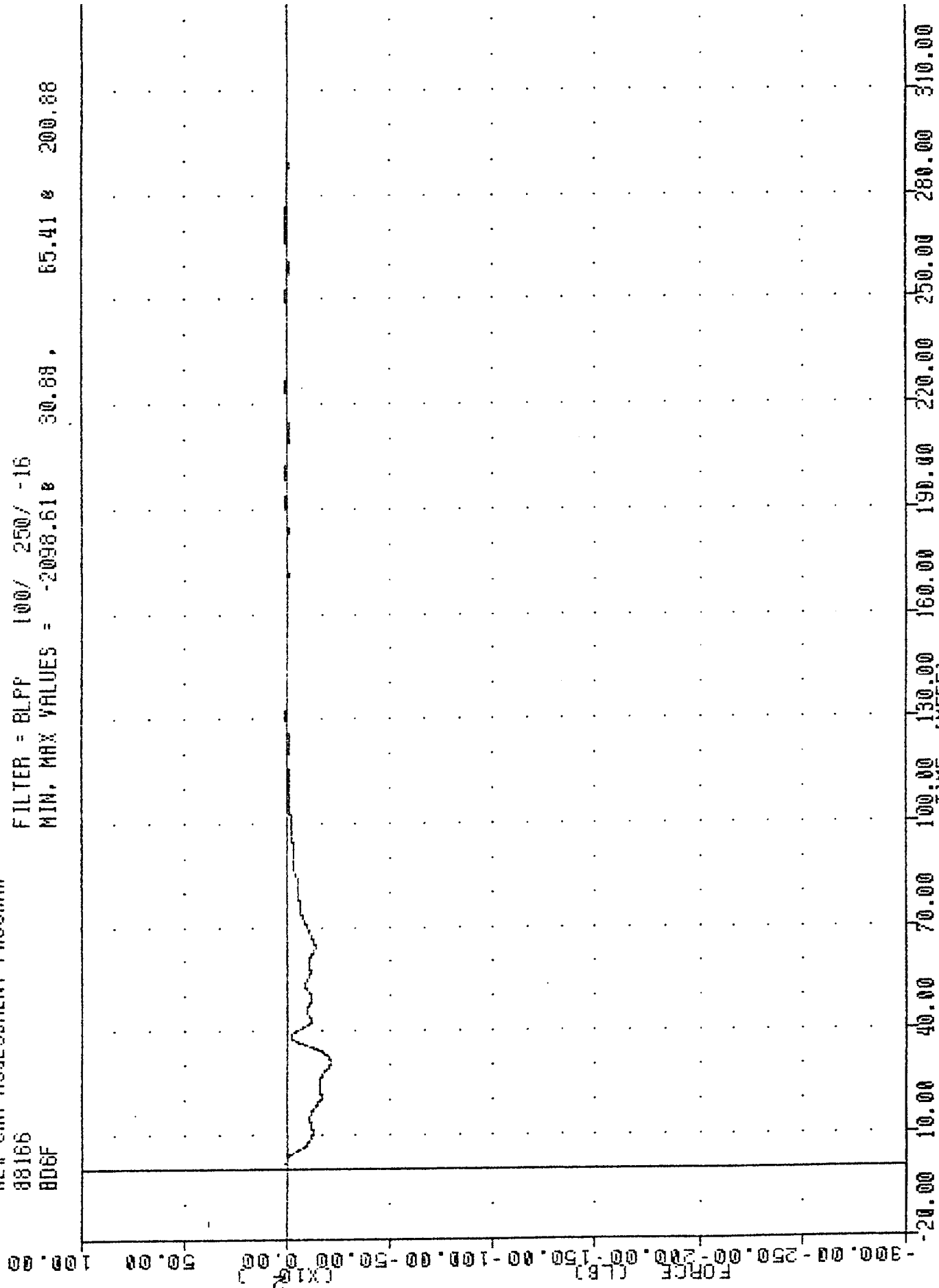
MIN, MAX VALUES = -3582.348 30.88 , 142.62 0 1.88



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION 05 FORCE

NEW CAR ASSESSMENT PROGRAM  
 88166  
 BD6F

FILTER = BLPF 100/ 250/ -16  
 MIN. MAX VALUES = -2098.618 30.88 65.41 200.88



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
 LOAD CELL BARRIER POSITION 06 FORCE

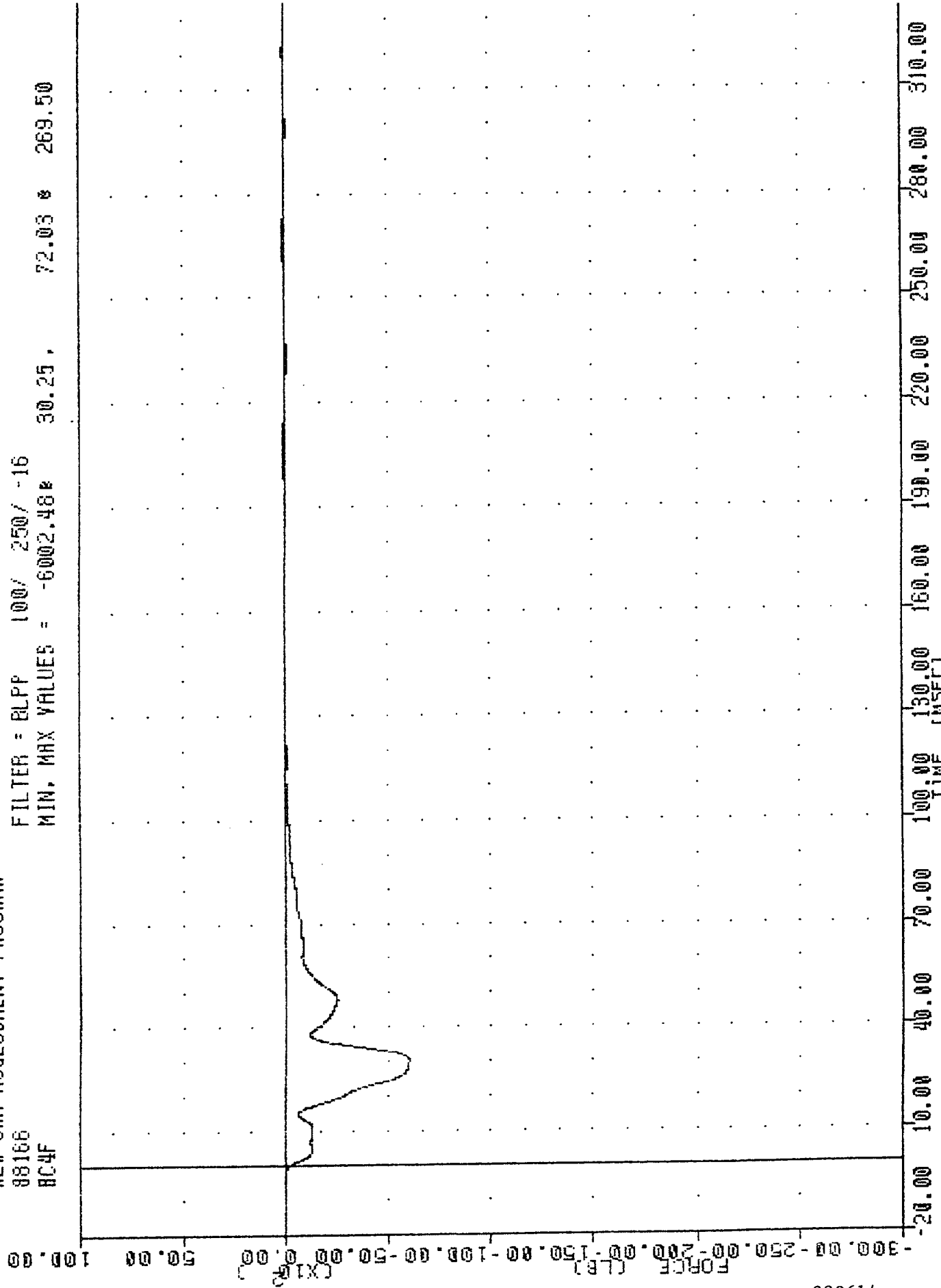
NEW CAR ASSESSMENT PROGRAM

88166

BC4F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -6002.48# 30.25, 72.03 # 269.50



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION C4 FORCE

# NEW CAR ASSESSMENT PROGRAM

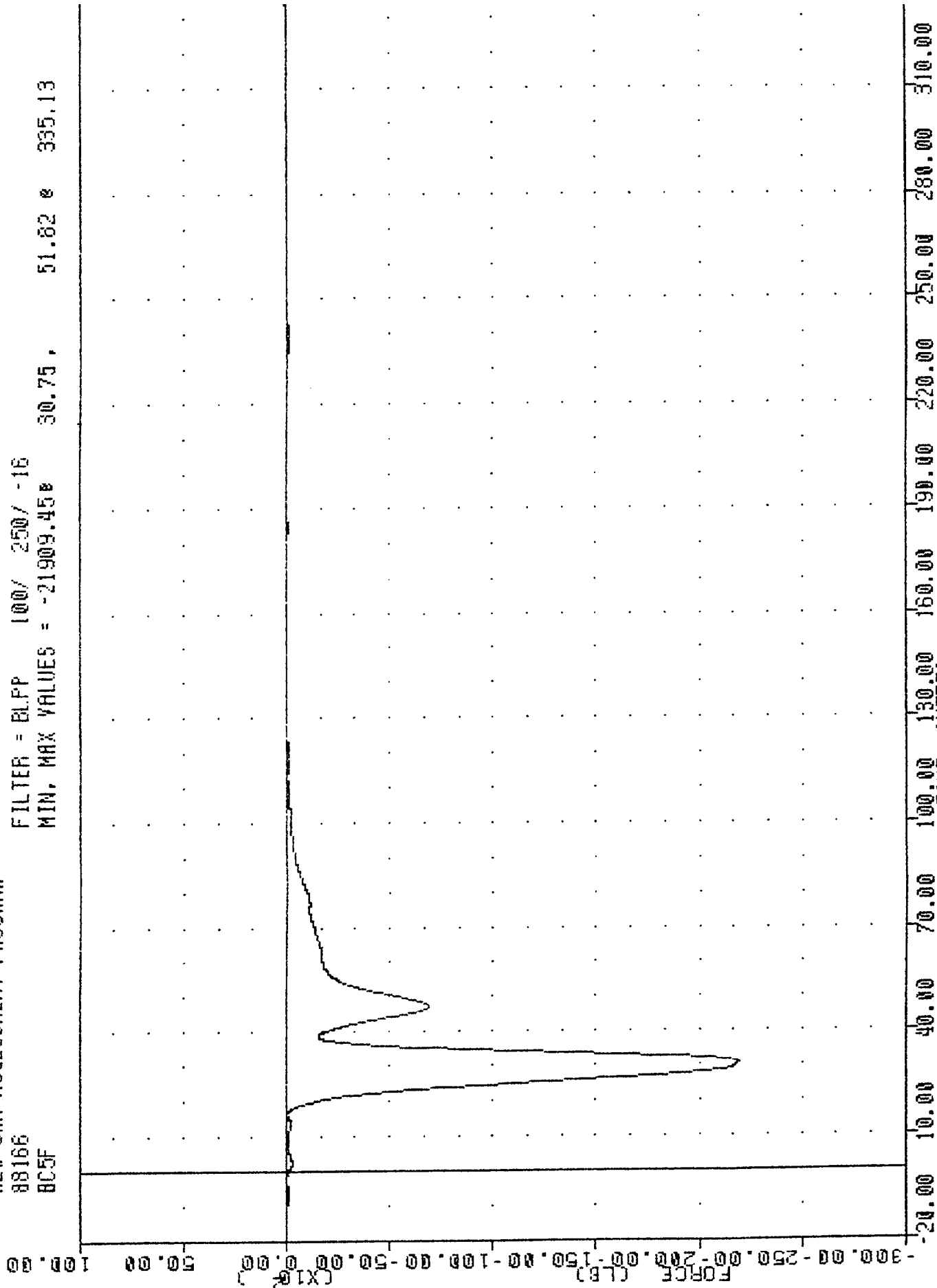
88166

BC5F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -21909.450

30.75, 51.62 & 335.13



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION C5 FORCE

# NEW CAR ASSESSMENT PROGRAM

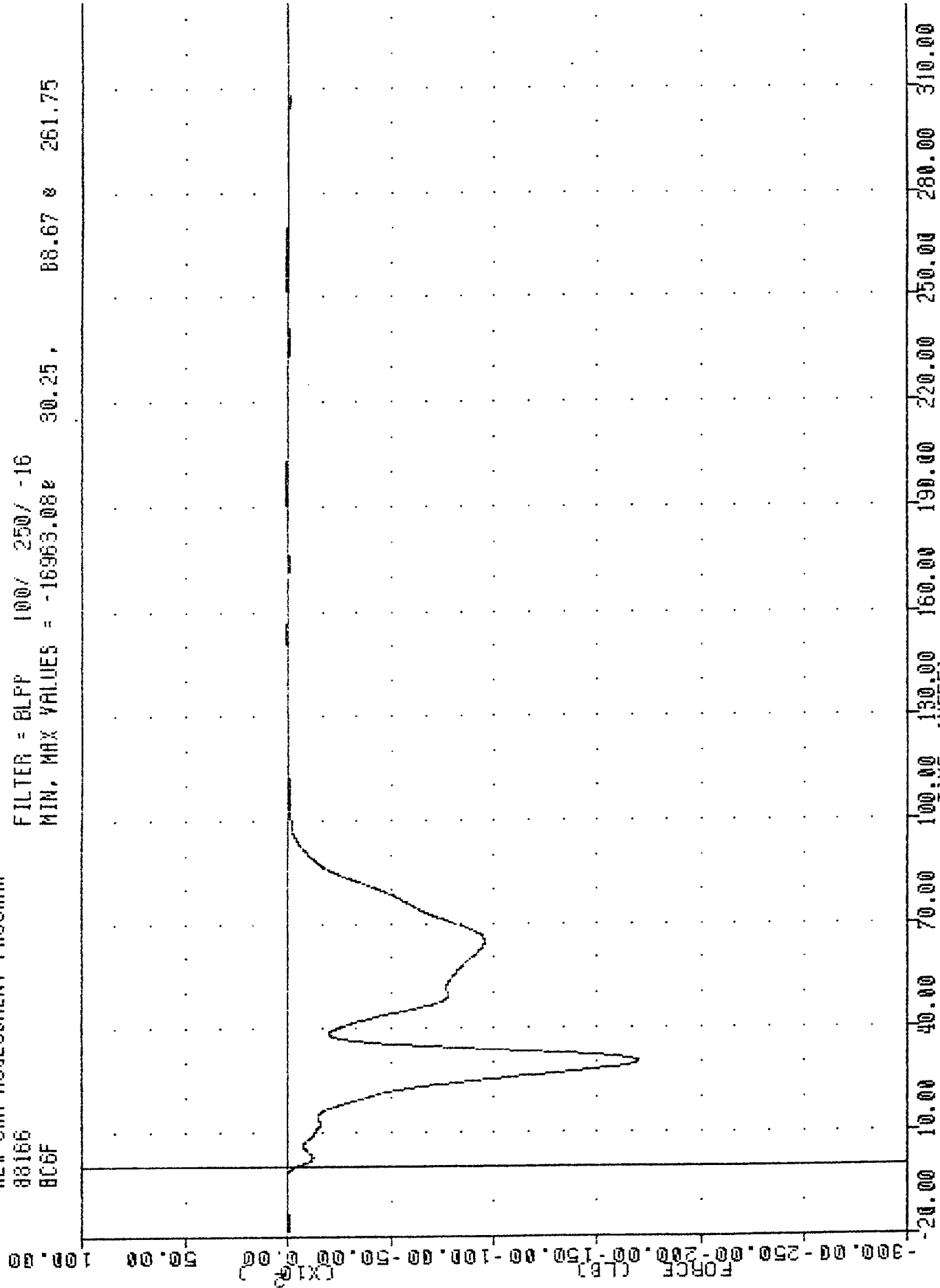
88166

BC6F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -16963.08e 30.25.

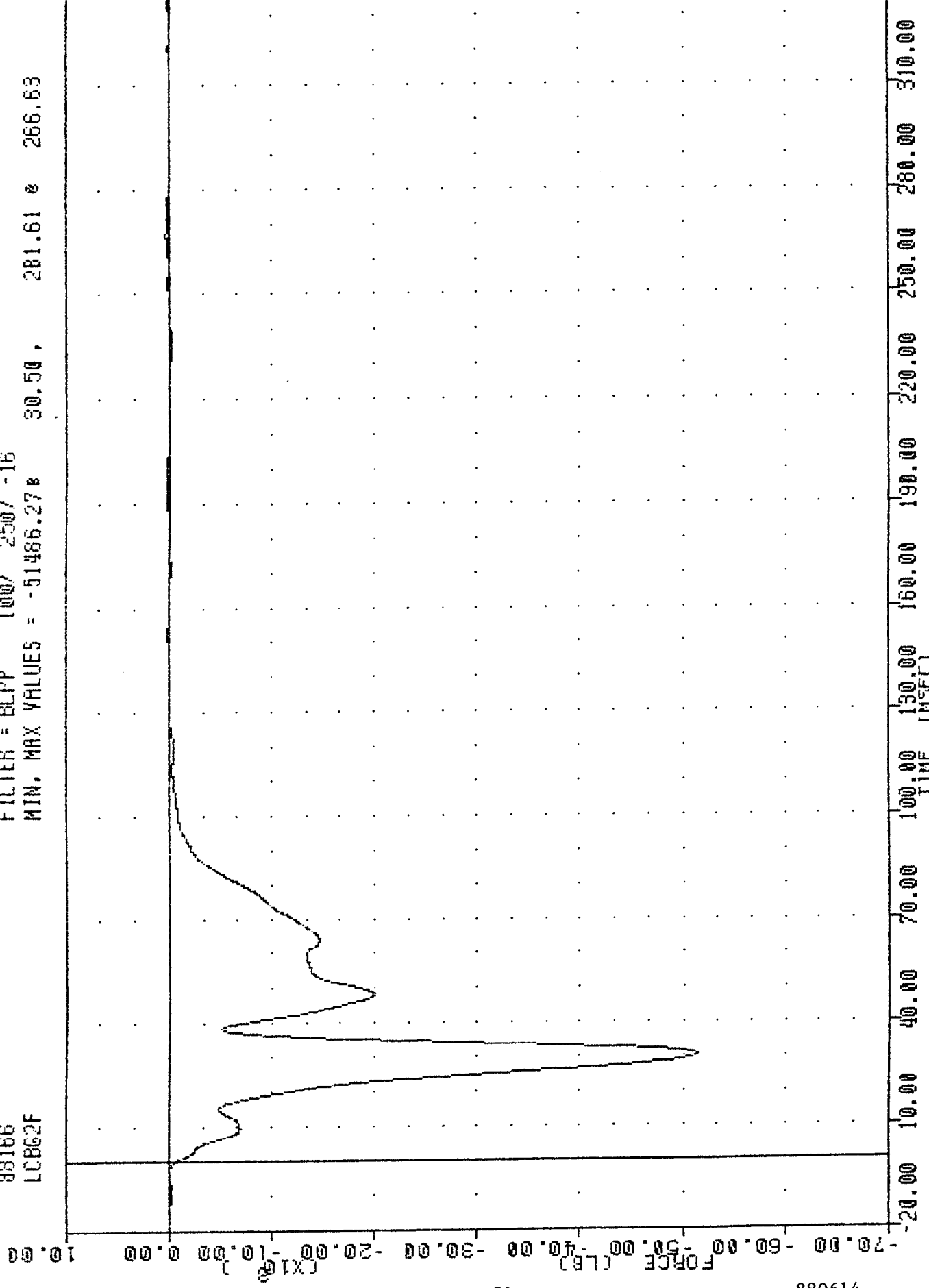
88.67 e 261.75



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION C6 FORCE

NEW CAR ASSESSMENT PROGRAM  
 88166  
 LCBG2F

FILTER = BLPP 100/ 250/ -16  
 MIN. MAX VALUES = -51486.27 281.61 266.63



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
 LOAD CELL BARRIER GROUP - 2 FORCE TOTAL

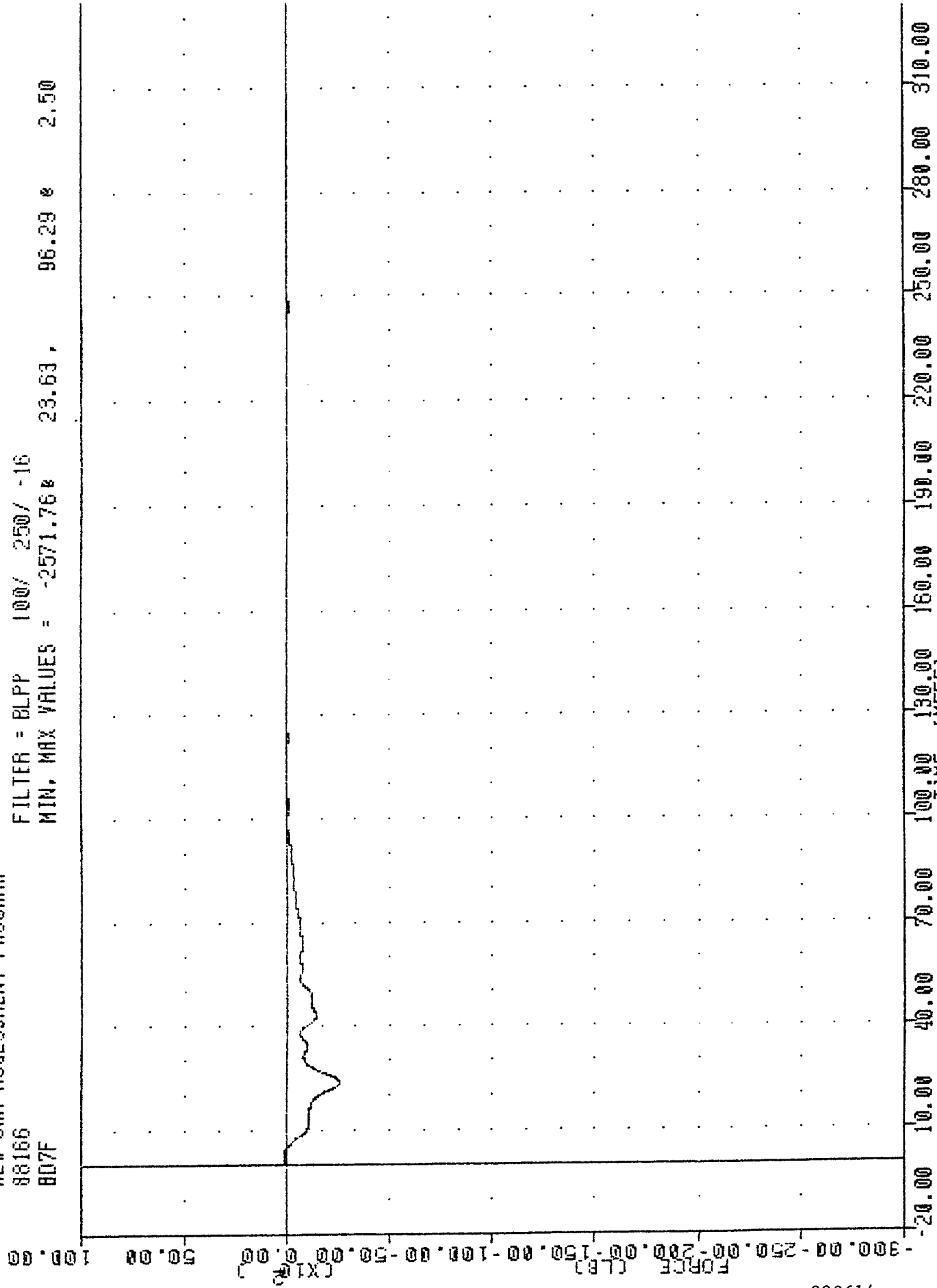
NEW CAR ASSESSMENT PROGRAM

88166

BD7F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -2571.76# 23.63 , 96.29 # 2.50



NEW CAR ASSESSMENT PROGRAM

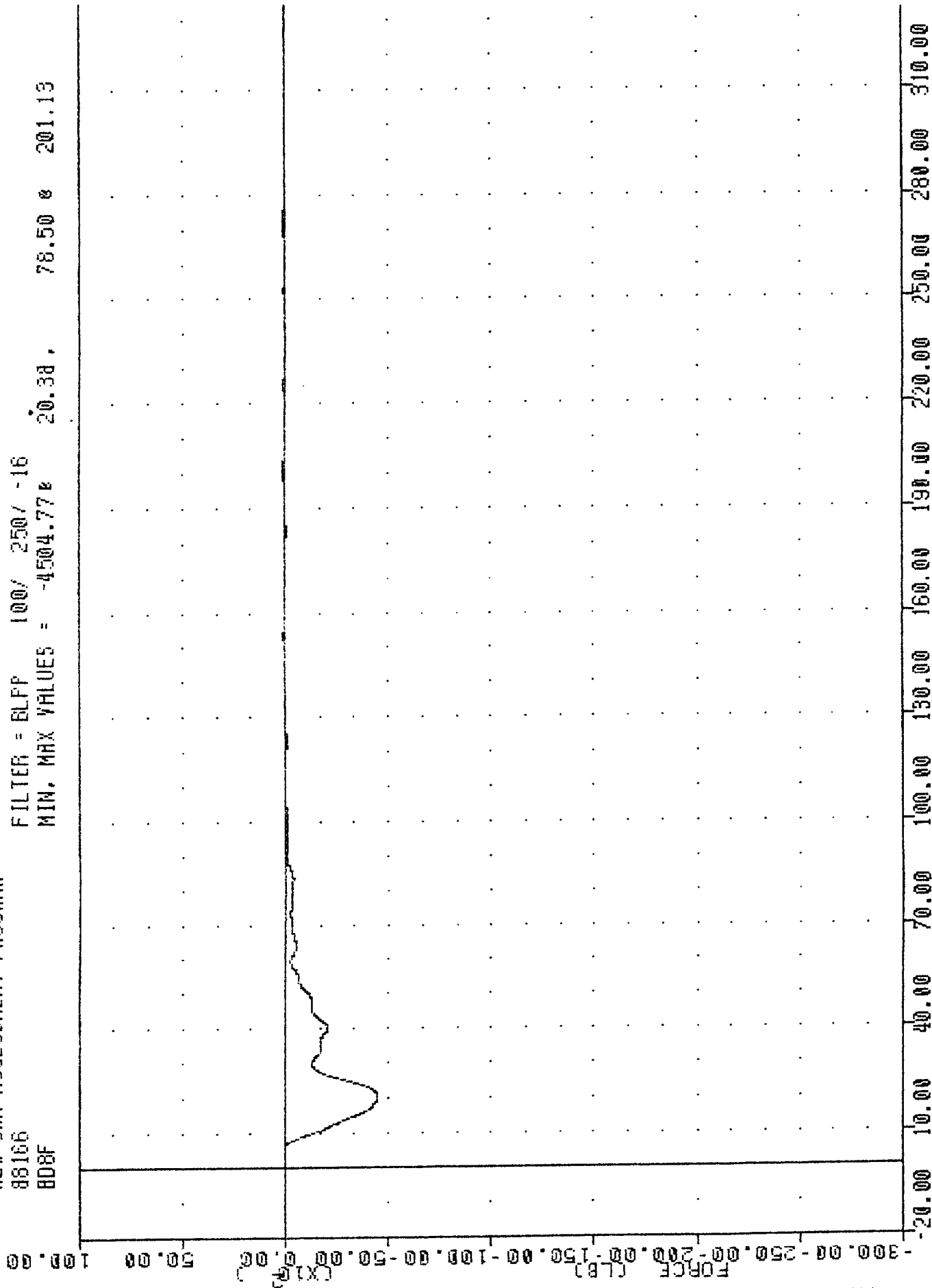
88166

BD8F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -4504.77 20.38,

78.50 201.13



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION D8 FORCE

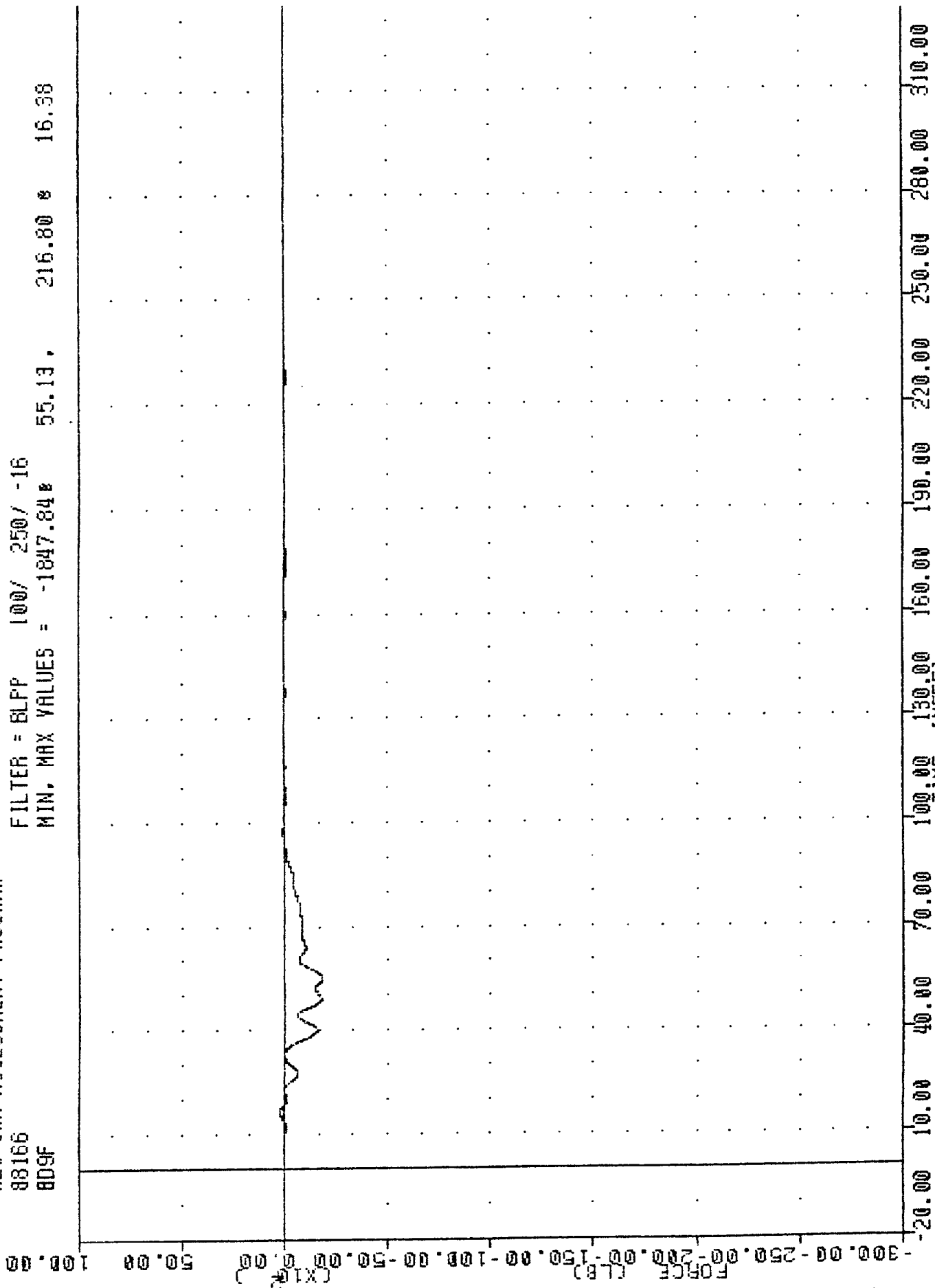
NEW CAR ASSESSMENT PROGRAM

88166

809F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -1847.84# 55.13, 216.80 # 16.38



# NEW CAR ASSESSMENT PROGRAM

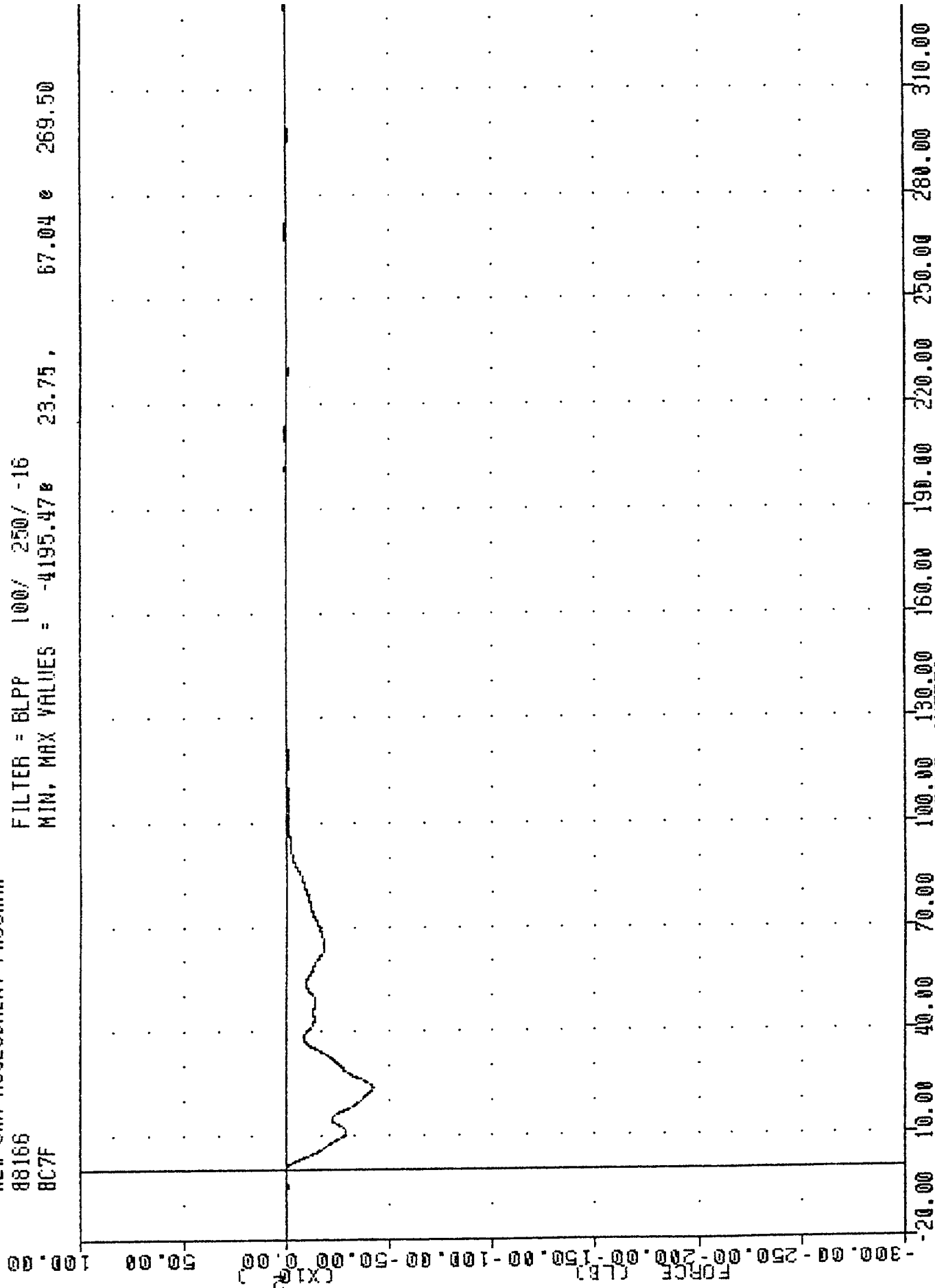
88166

BC7F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -4195.47# 23.75,

67.04 # 269.50



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION C7 FORCE

NEW CAR ASSESSMENT PROGRAM

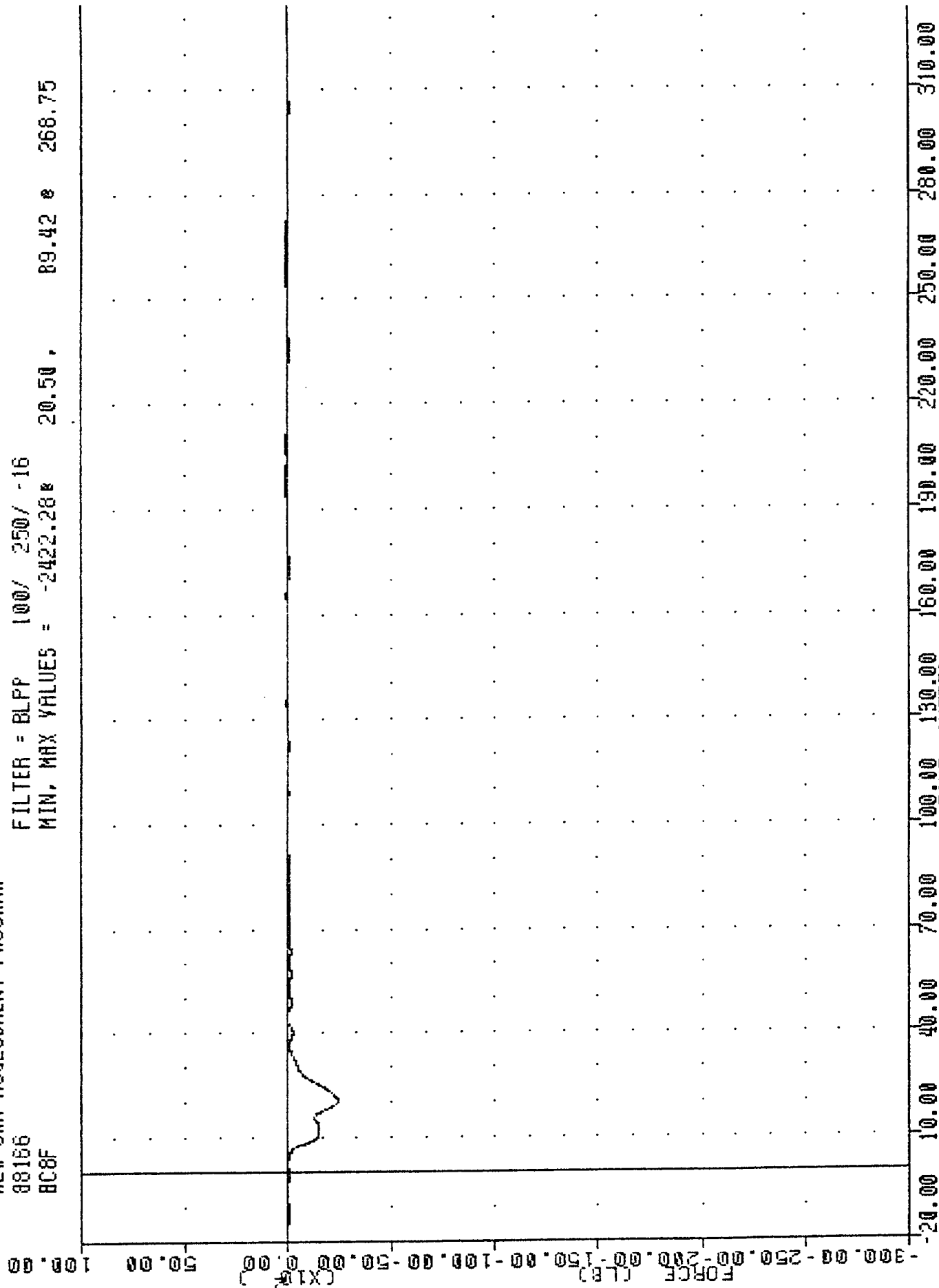
88166

BC8F

FILTER = BLPP 100/ 250/ -16

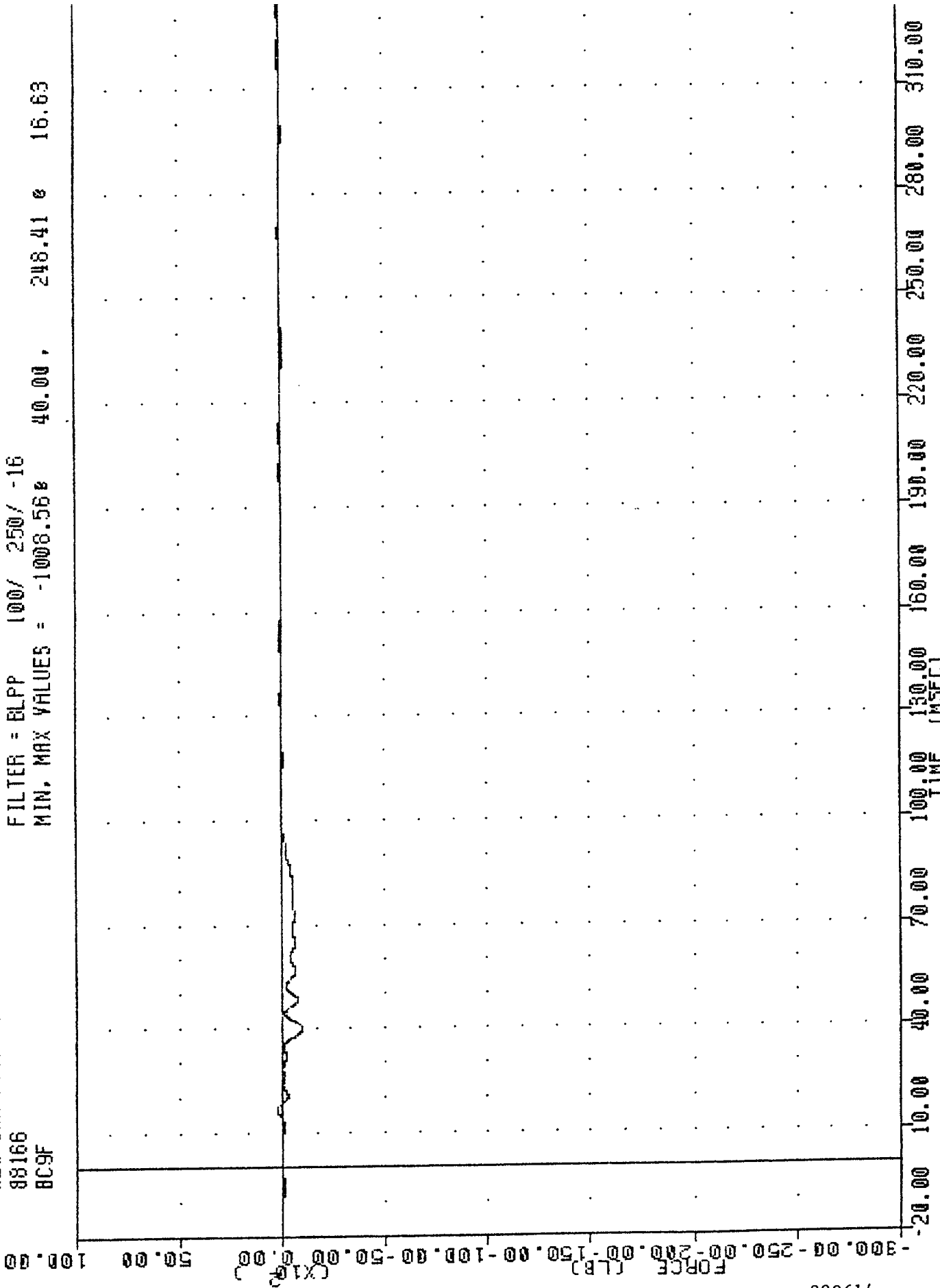
MIN, MAX VALUES = -2422.28 20.50

89.42 268.75



NEW CAR ASSESSMENT PROGRAM  
 88166  
 BC9F

FILTER = BLPP 100/ 250/ -16  
 MIN, MAX VALUES = -1008.56 40.00, 248.41 16.63



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
 LOAD CELL BARRIER POSITION C9 FORCE

NEW CAR ASSESSMENT PROGRAM

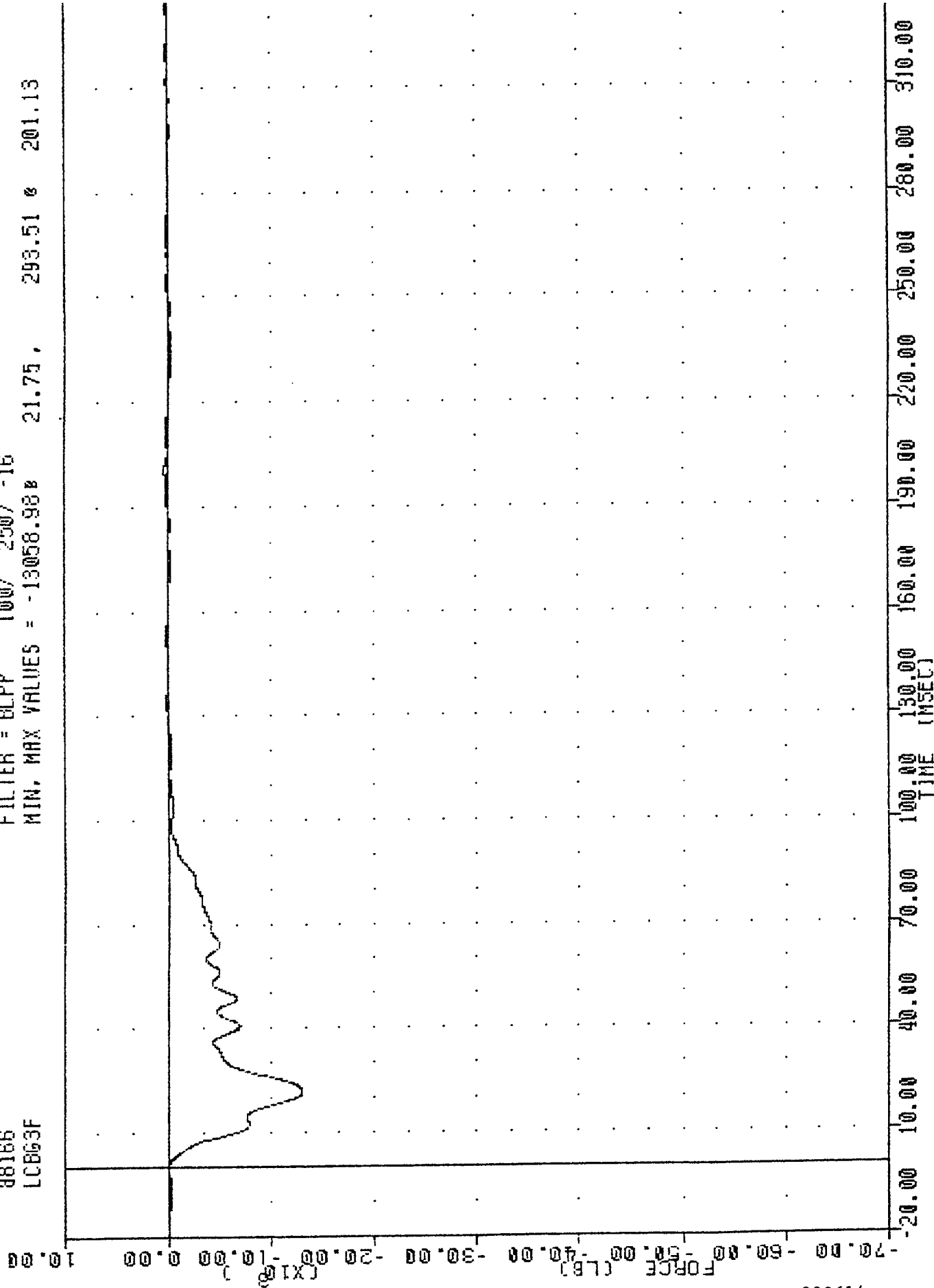
88166

LCB63F

FILTER = BLPP 100/ 250/ -18

MIN. MAX VALUES = -13058.98 21.75,

293.51 201.13



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER GROUP - 3 FORCE TOTAL

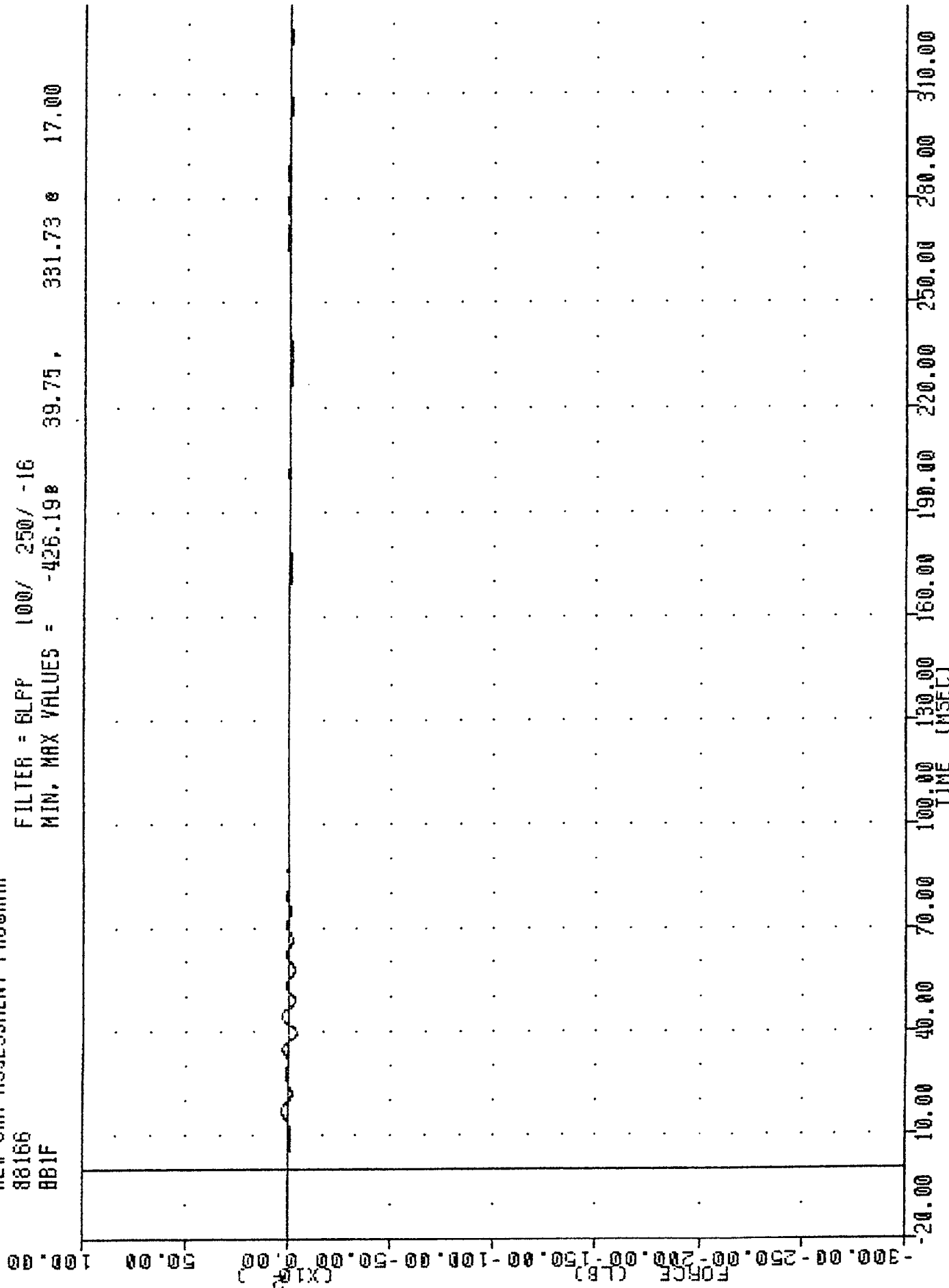
NEW CAR ASSESSMENT PROGRAM

88166

BB1F

FILTER = BLFP 100/ 250/ -16

MIN. MAX VALUES = -426.19 39.75 331.73 17.00



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION B1 FORCE

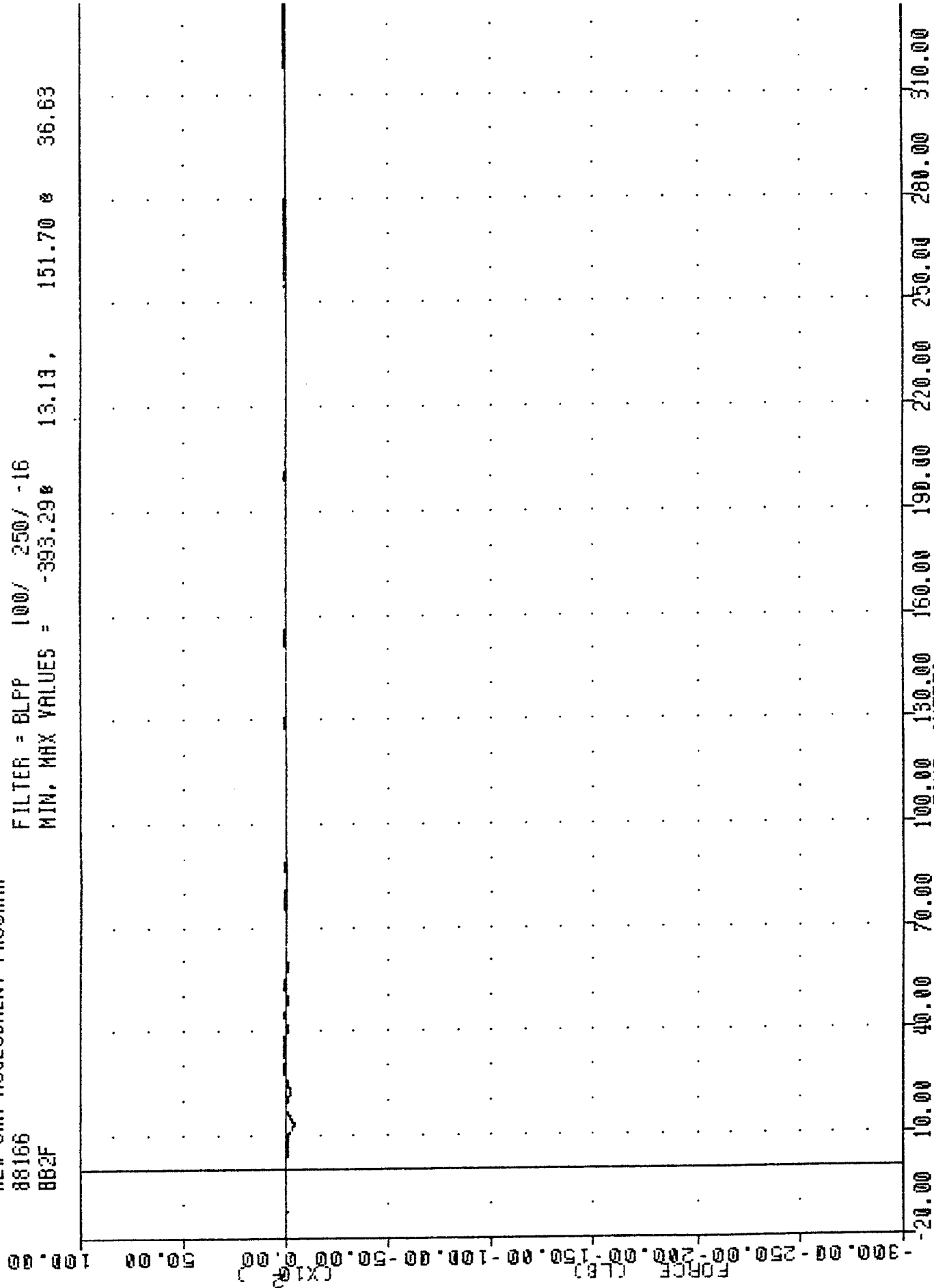
NEW CAR ASSESSMENT PROGRAM

88166

BB2F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -393.29 13.13, 151.70 36.63



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION B2 FORCE

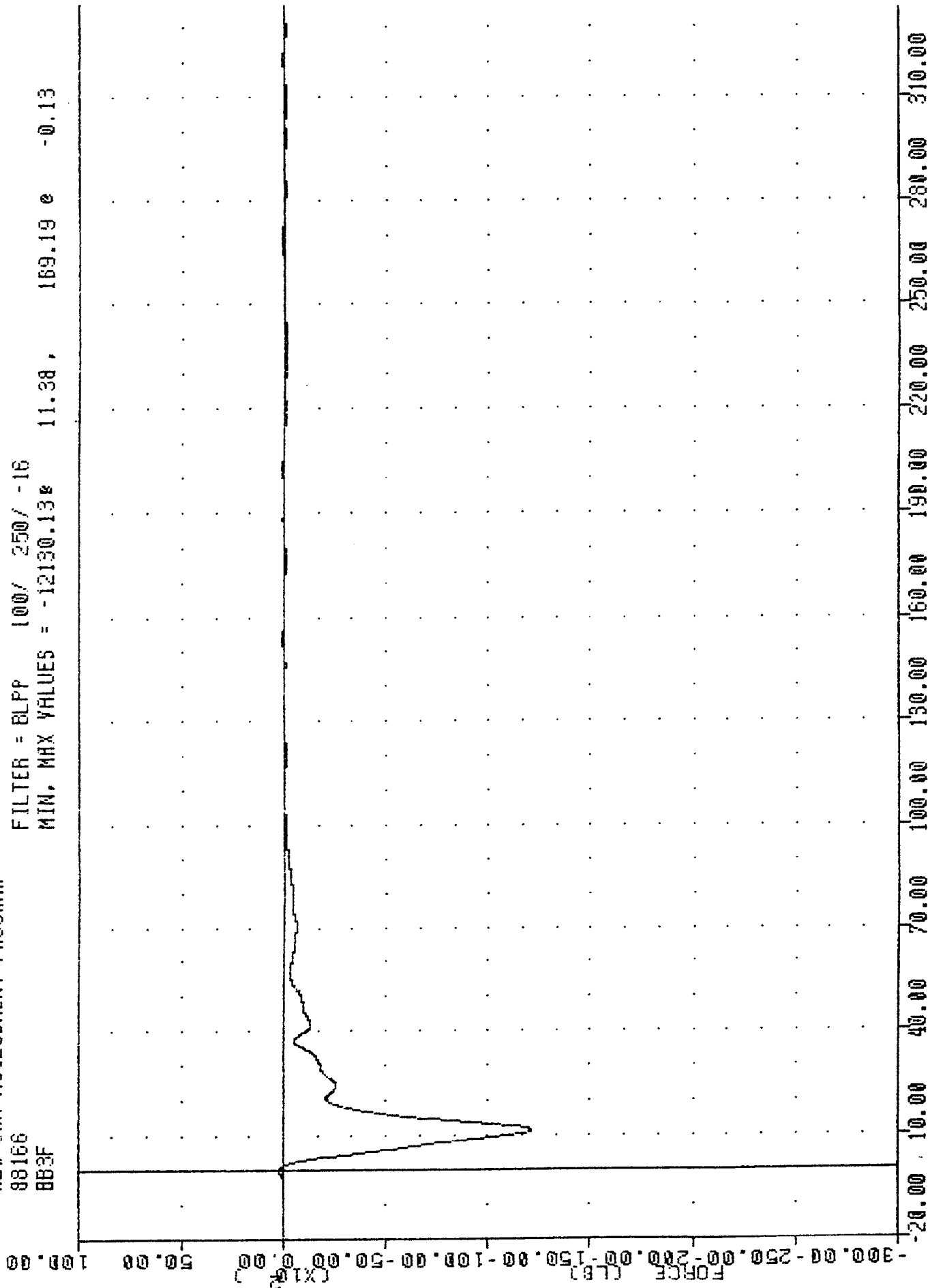
# NEW CAR ASSESSMENT PROGRAM

88166

BB3F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -12130.13 11.38 , 169.19 0 -0.13



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION B3 FORCE

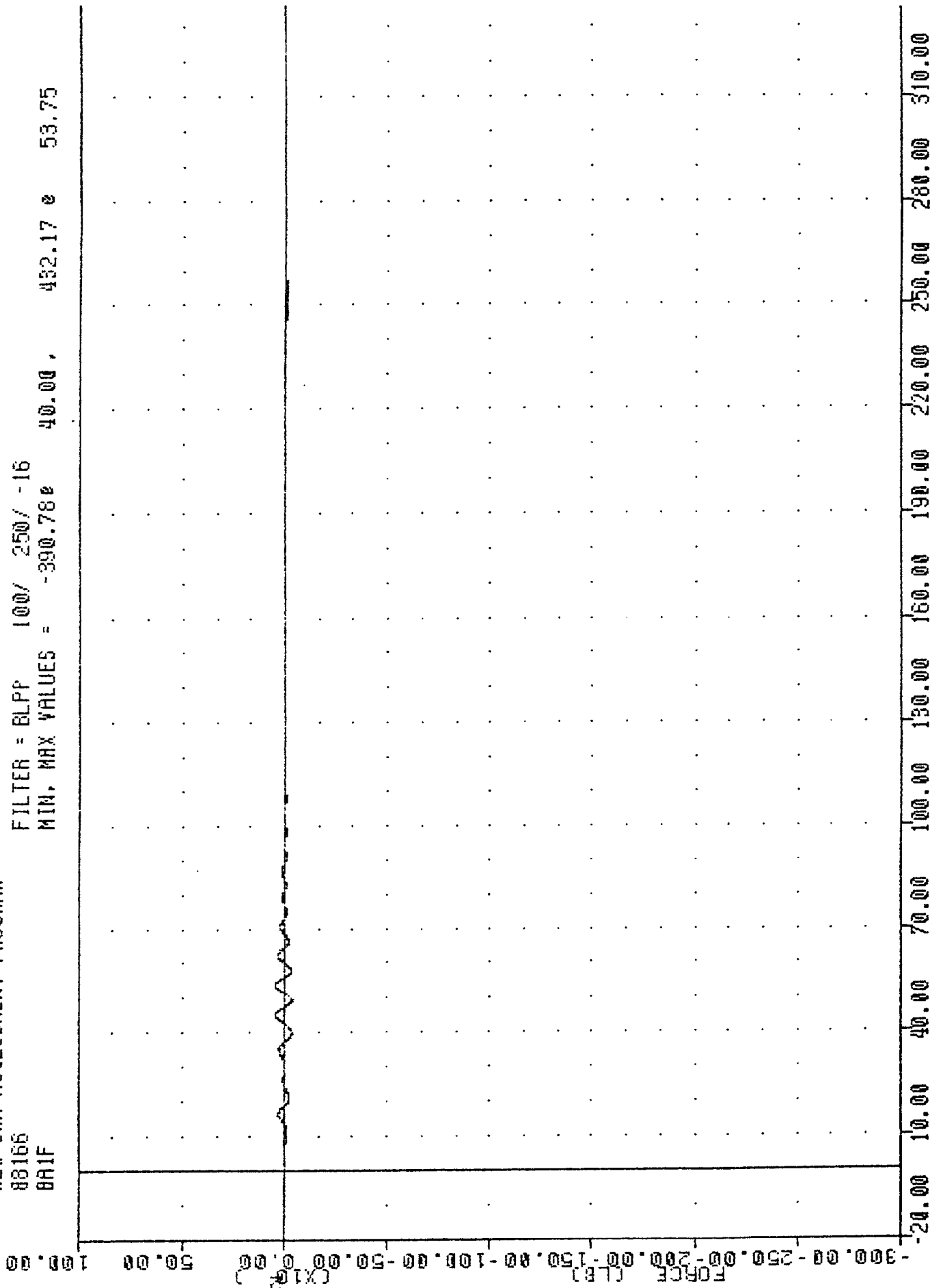
NEW CAR ASSESSMENT PROGRAM

88166

BA1F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -390.78 40.00, 432.17 53.75



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION AT FORCE

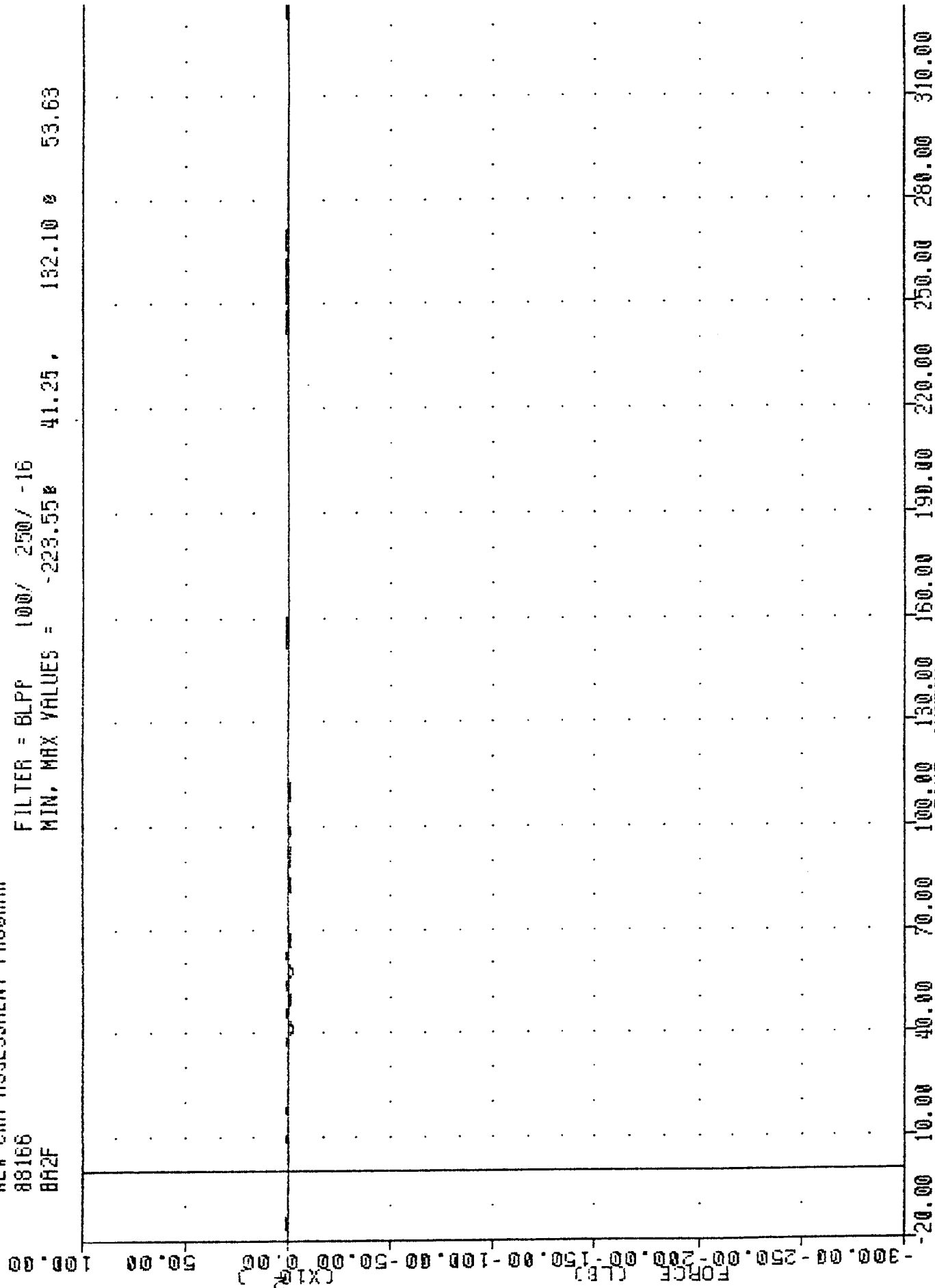
NEW CAR ASSESSMENT PROGRAM

88166

BA2F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -223.55 41.25, 132.10 53.63



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION A2 FORCE

# NEW CAR ASSESSMENT PROGRAM

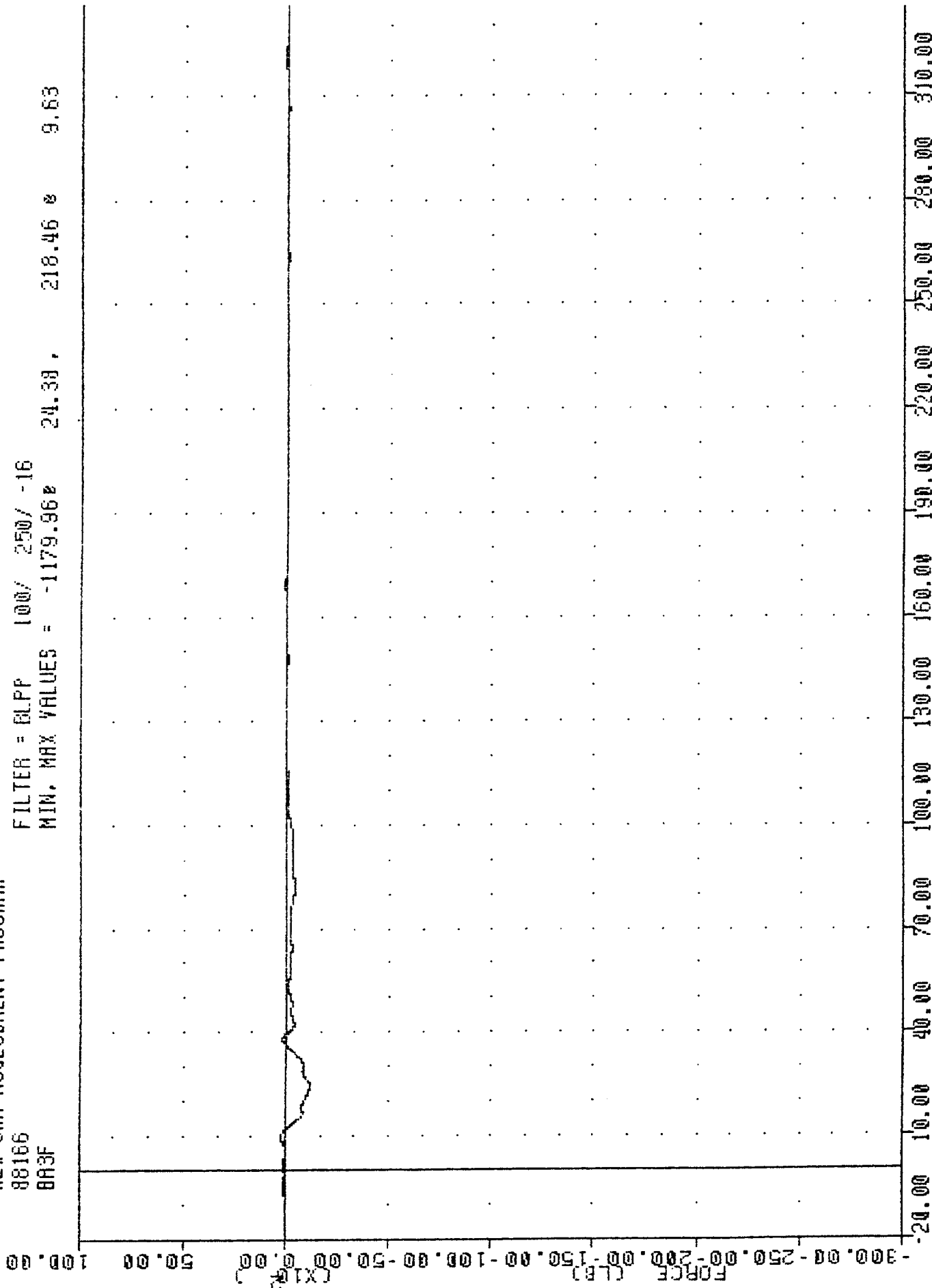
88166

BA3F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -1179.96 24.38

218.46 9.63



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION A3 FORCE

NEW CAR ASSESSMENT PROGRAM

88166

LC864F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -12614.95 11.63 , 396.55 269.00

10.00

0.00

0.00

0.00

0.00

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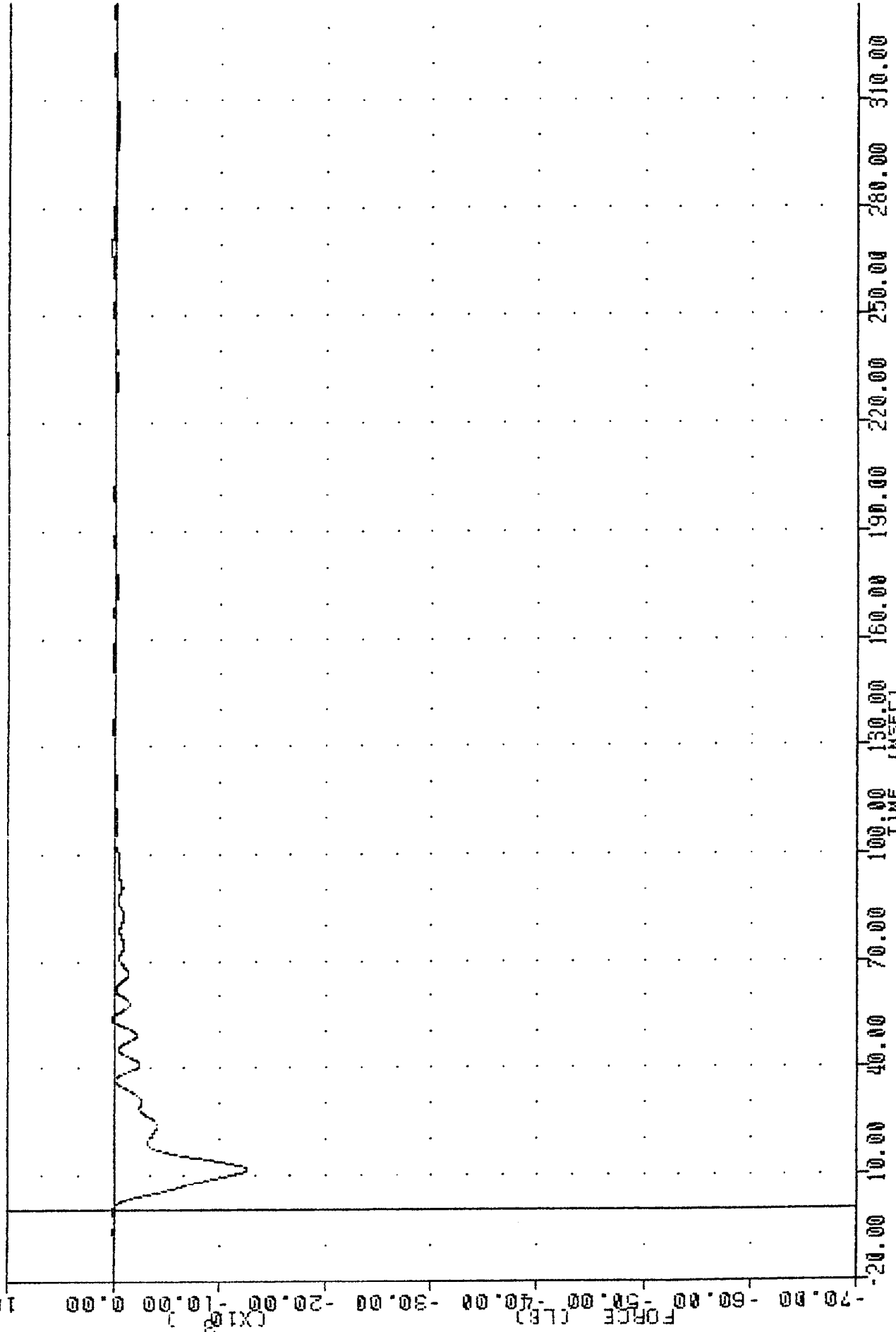
0.00

0.00

0.00

0.00

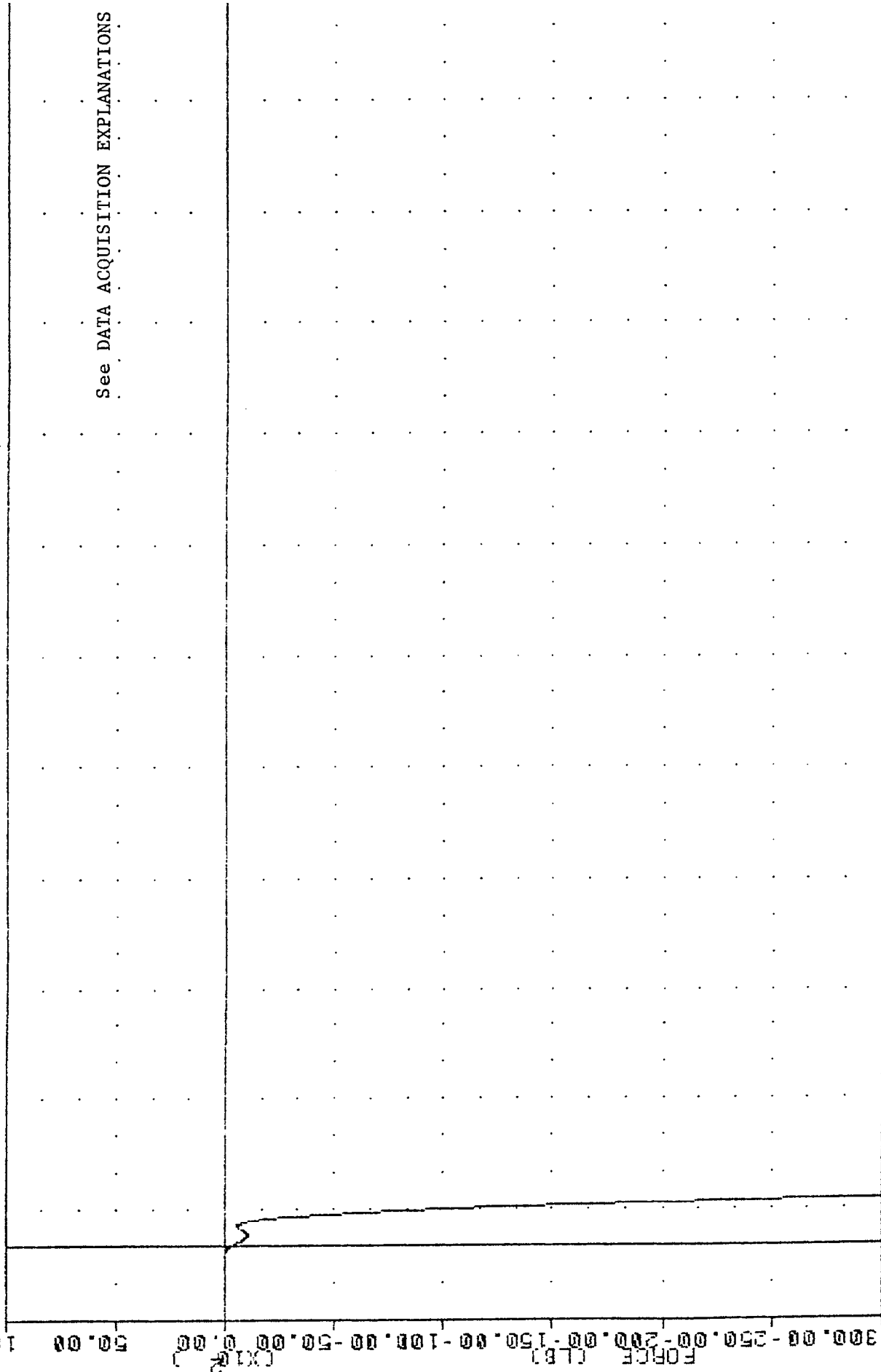
0.00



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER GROUP - 4 FORCE TOTAL

NEW CAR ASSESSMENT PROGRAM  
 88166  
 BB4F

FILTER = BLPP 100/ 250/ -16  
 MIN, MAX VALUES = -61756.050 31.13, 9.08 & -3.50



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
 LOAD CELL BARRIER POSITION B4 FORCE

# NEW CAR ASSESSMENT PROGRAM

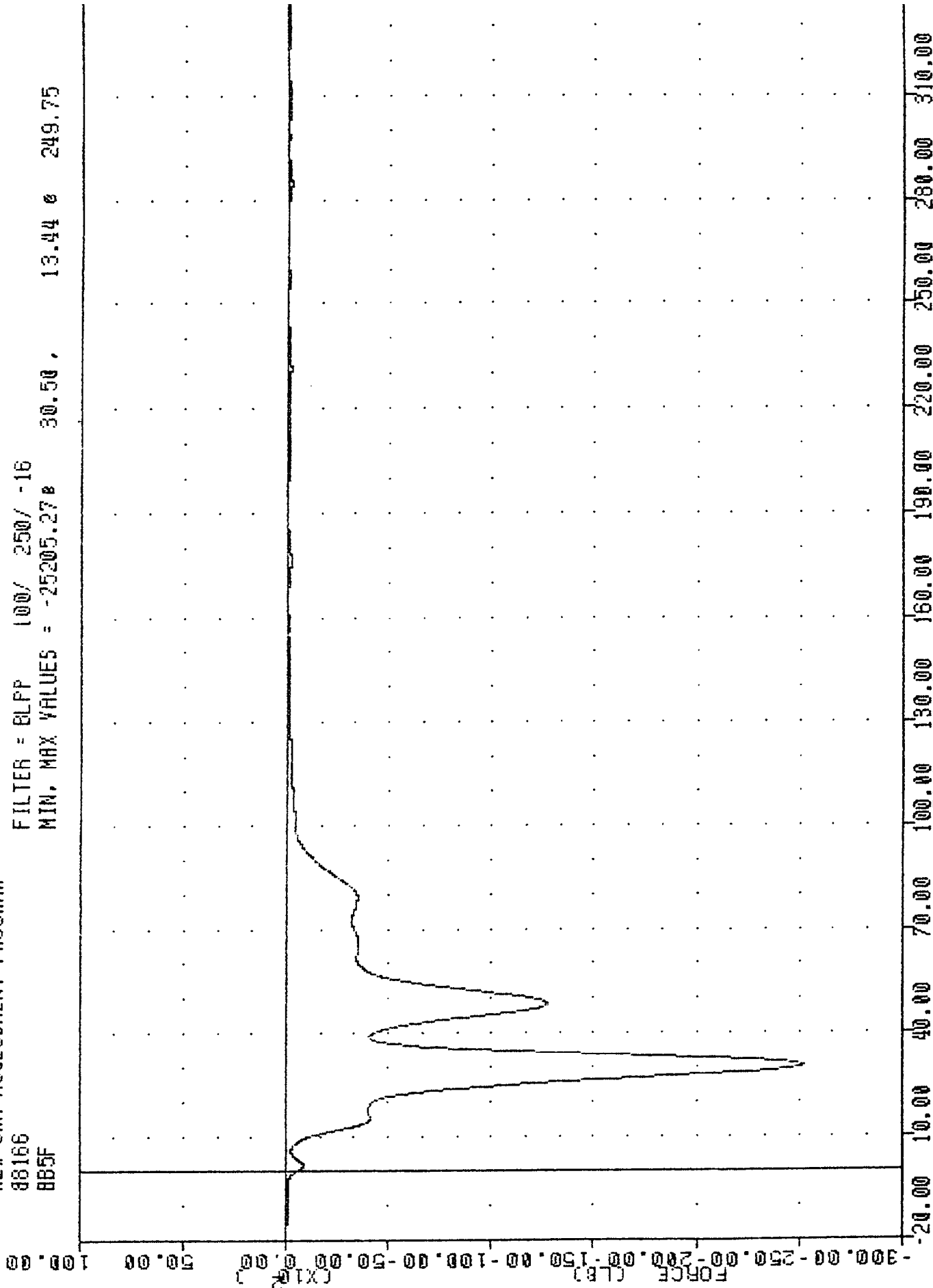
88166

BB5F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -25205.27 30.50 ,

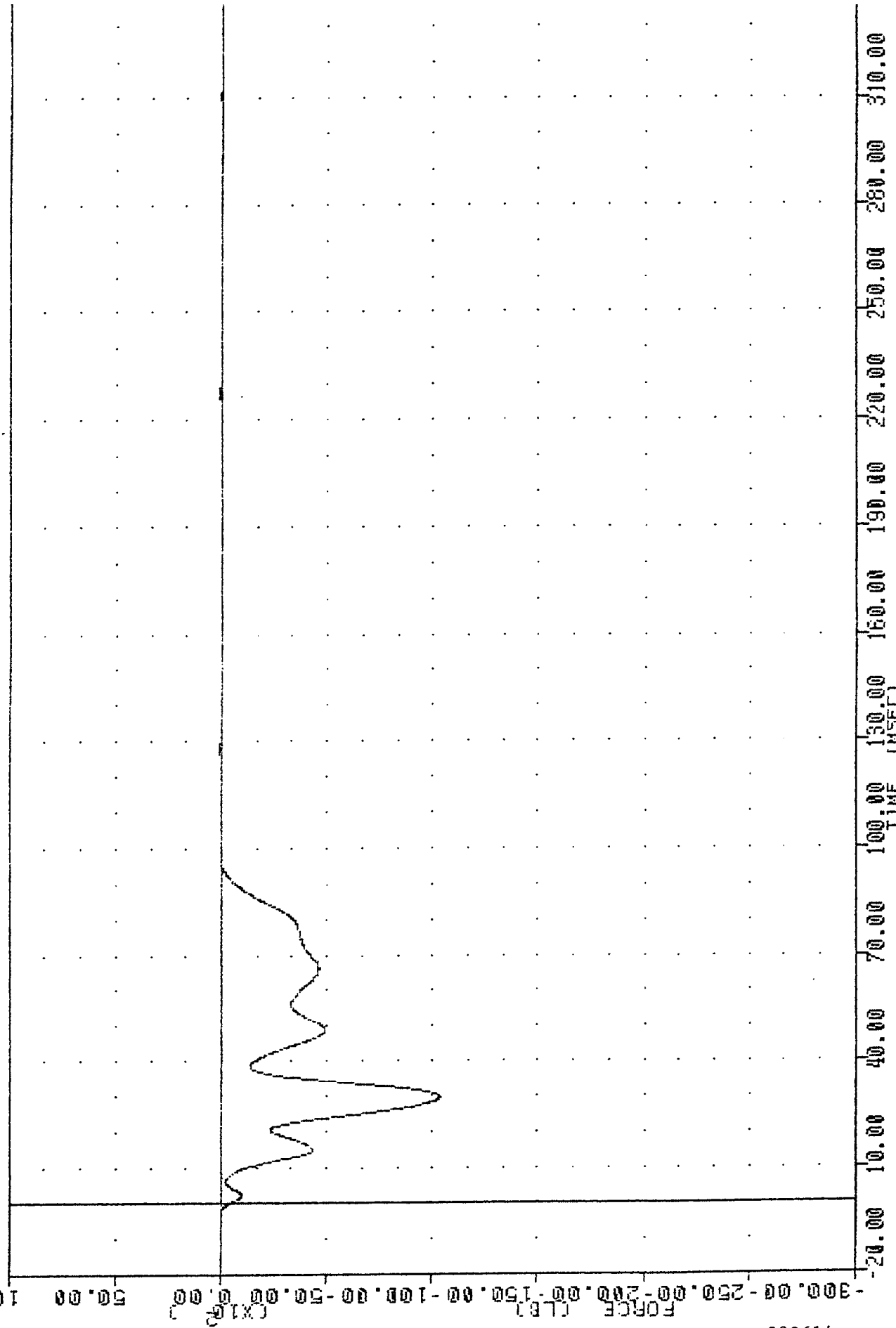
13.44 0 249.75



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION B5 FORCE

NEW CAR ASSESSMENT PROGRAM  
 88166  
 888F

FILTER = 6LPP 100/ 250/ -16  
 MIN, MAX VALUES = -10346.13 29.61 58.35 128.00



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
 LOAD CELL BARRIER POSITION 86 FORCE

# NEW CAR ASSESSMENT PROGRAM

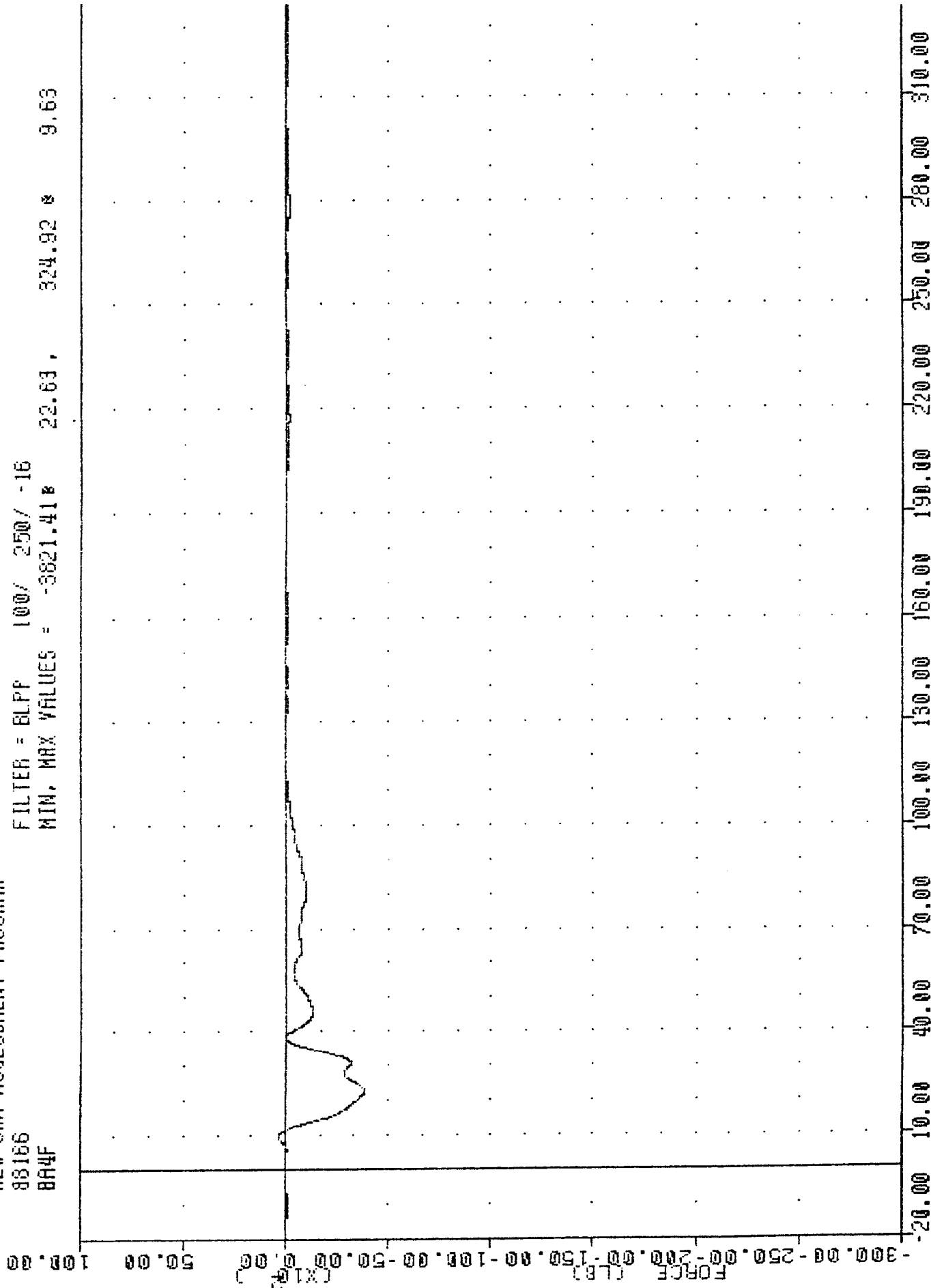
88166

BA4F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -3821.41 22.63,

324.92 9.63



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION A4 FORCE

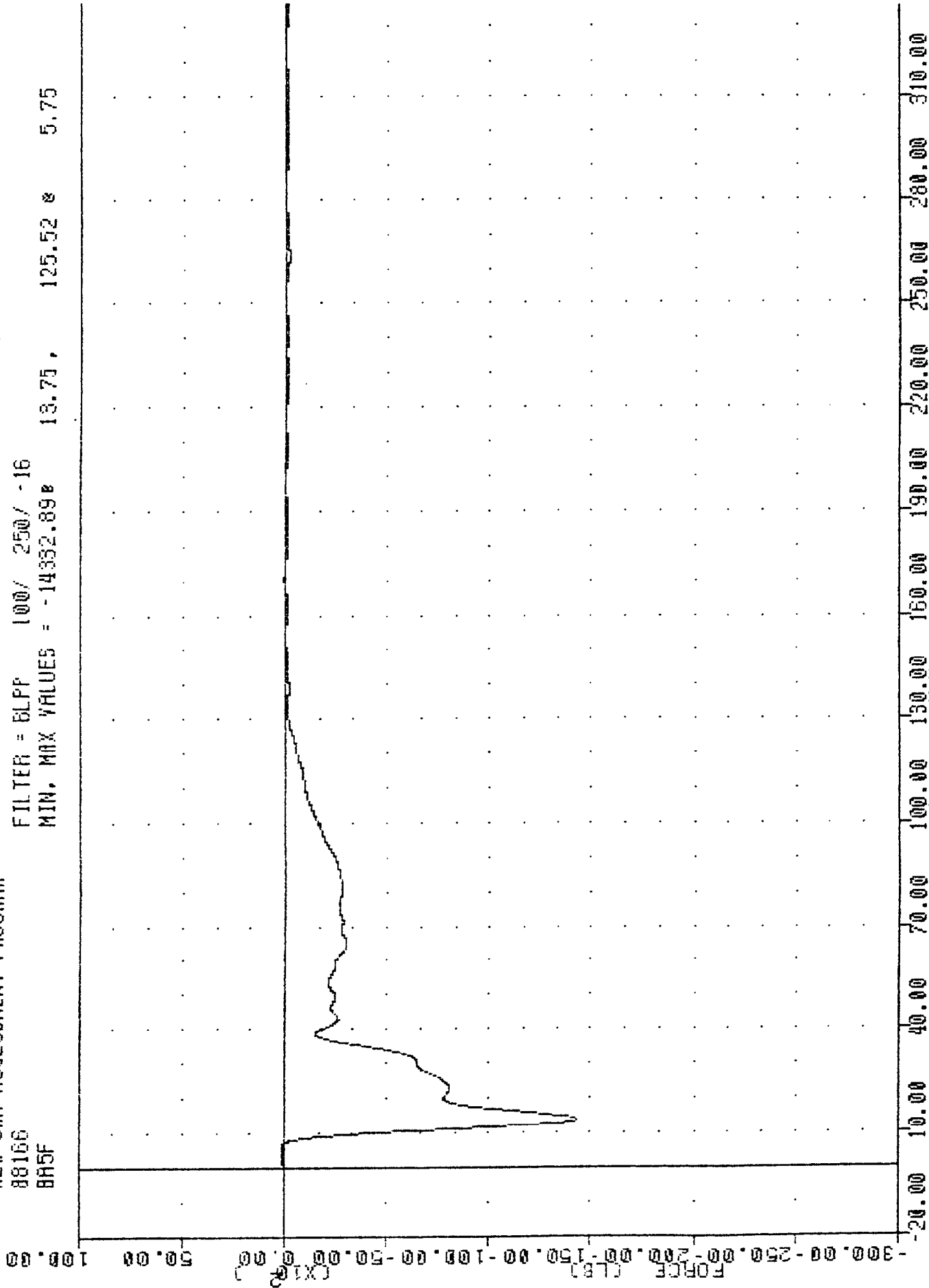
# NEW CAR ASSESSMENT PROGRAM

88166

885F

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -14352.89 13.75 , 125.52 5.75



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION #5 FORCE

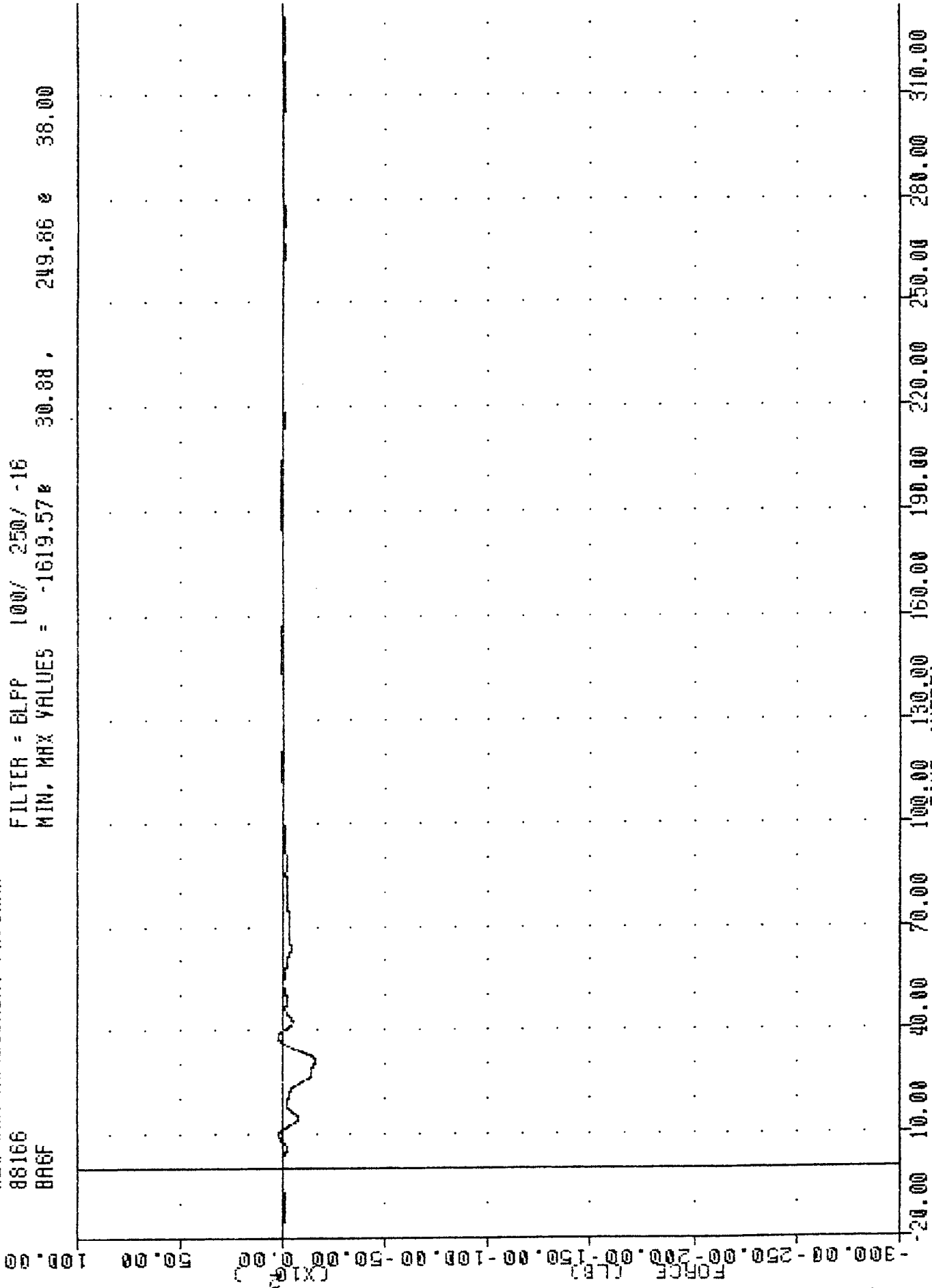
NEW CAR ASSESSMENT PROGRAM

88166

BA6F

FILTER = BLFP 100/ 250/ -16

MIN, MAX VALUES = -1619.57# 30.88, 249.86 # 38.00



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION A6 FORCE

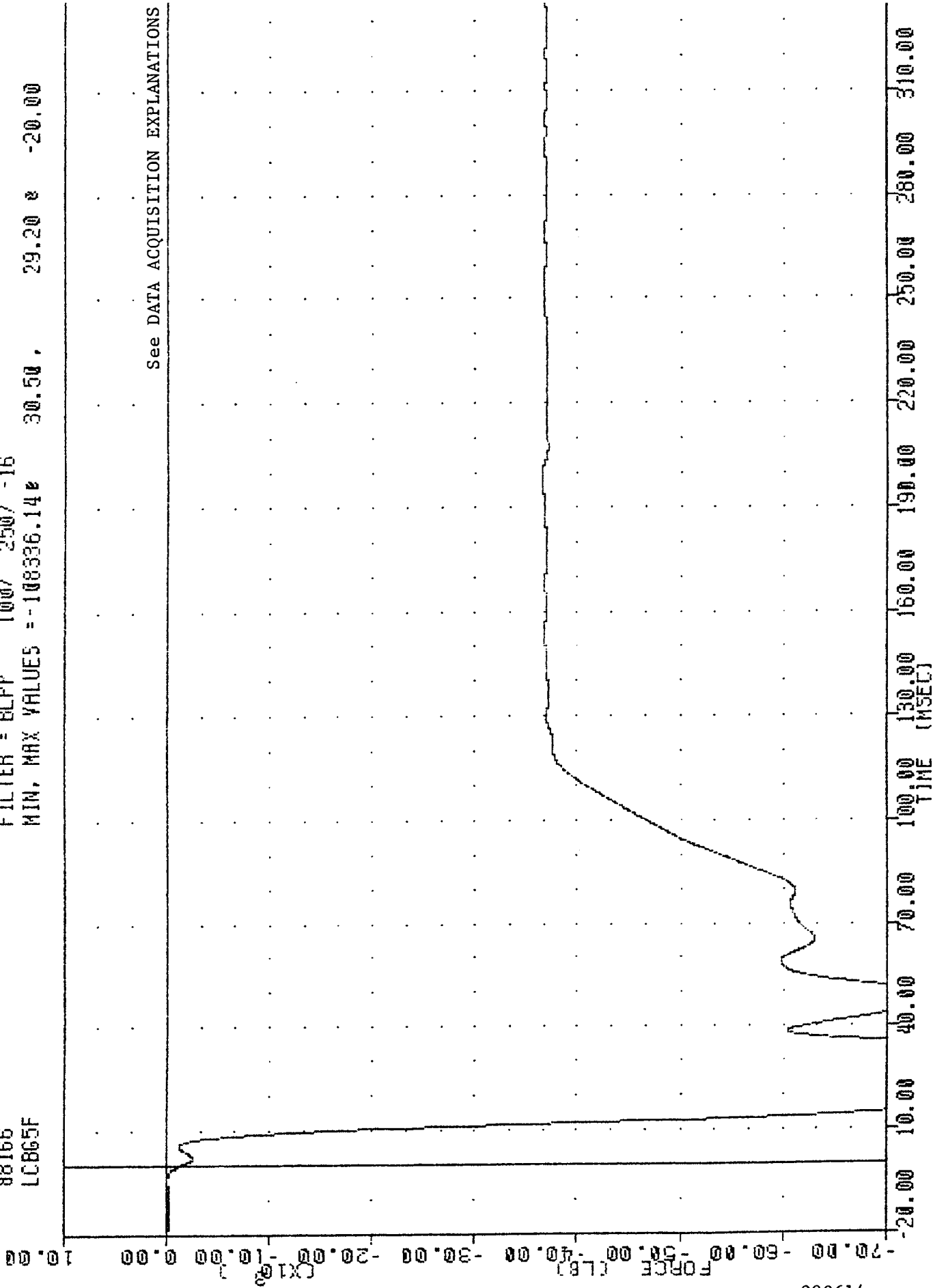
# NEW CAR ASSESSMENT PROGRAM

88166

LC865F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -108336.14 30.50 , 29.20 & -20.00



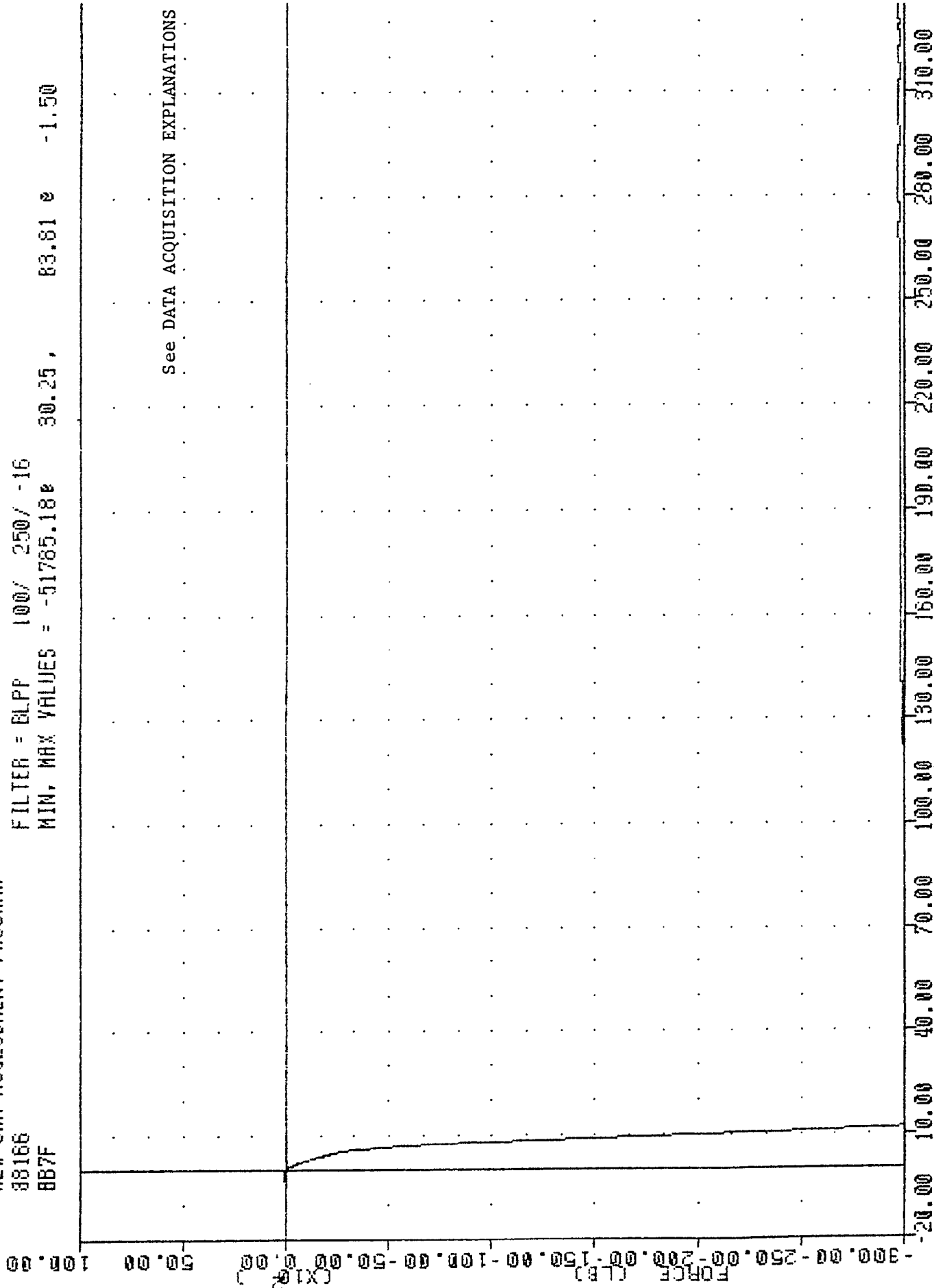
# NEW CAR ASSESSMENT PROGRAM

88166

BB7F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -51785.18 30.25, 83.61 2 -1.50



ISUZU SPACECAB LS INTO LOAD CELL BARRIER

LOAD CELL BARRIER POSITION B7 FORCE

# NEW CAR ASSESSMENT PROGRAM

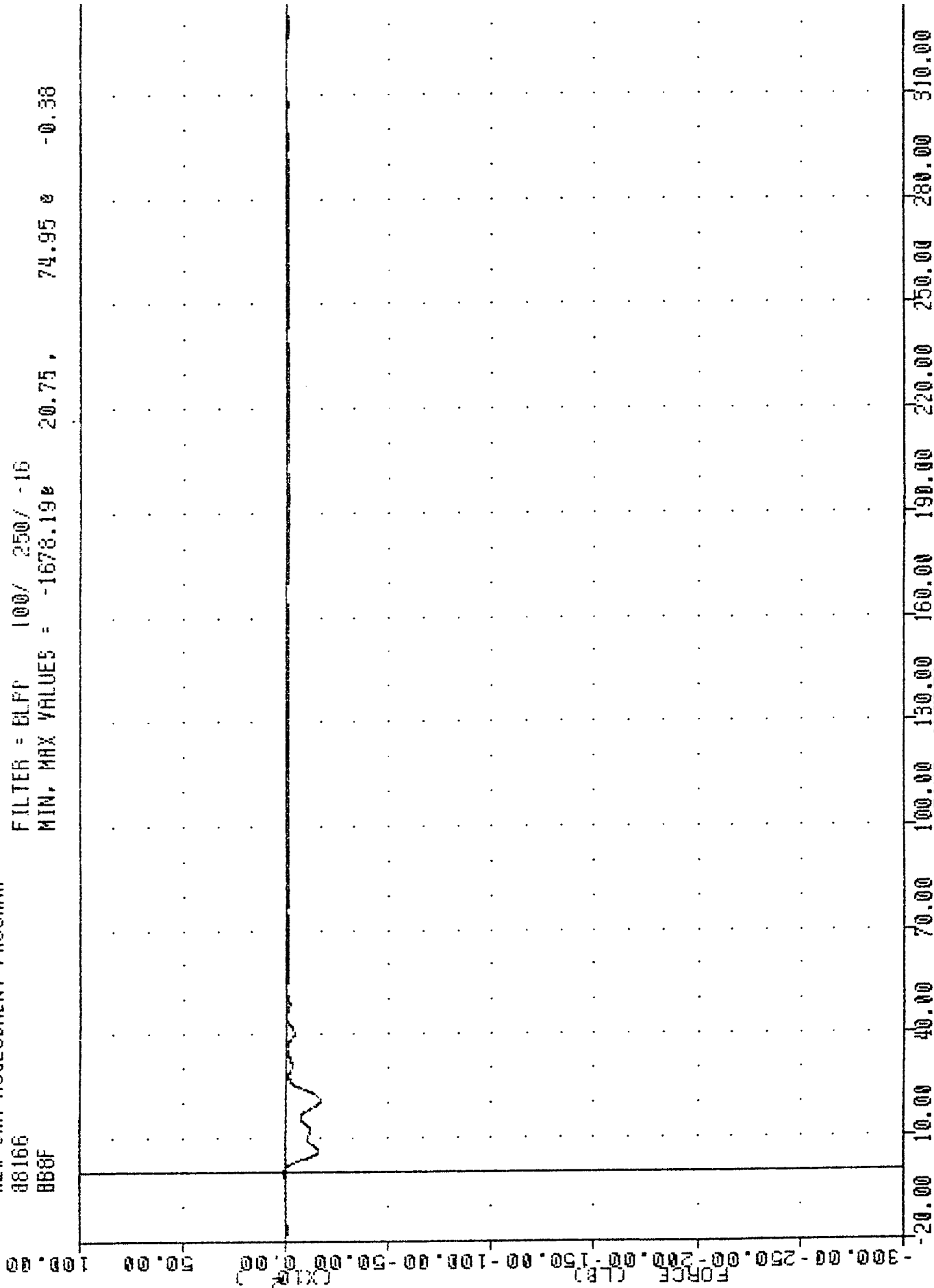
08166

BB8F

FILTER = BLFF 100/ 250/ -16

MIN, MAX VALUES = -1678.19# 20.75,

74.95 0 -0.38



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER POSITION B8 FORCE

# NEW CAR ASSESSMENT PROGRAM

88166

BB9F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -410.79 39.88

322.18 44.50

100.00 50.00 0.00 -50.00 -100.00 -150.00 -200.00 -250.00 -300.00

FORCE (LB)

-20.00

10.00

40.00

70.00

100.00

130.00

160.00

190.00

220.00

250.00

280.00

310.00

TIME (MSEC)

ISUZU SPACECAB LS INTO LOAD CELL BARRIER

LOAD CELL BARRIER POSITION B9 FORCE

# NEW CAR ASSESSMENT PROGRAM

88166

BA7F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -1934.02 26.63 , 310.58 38.13

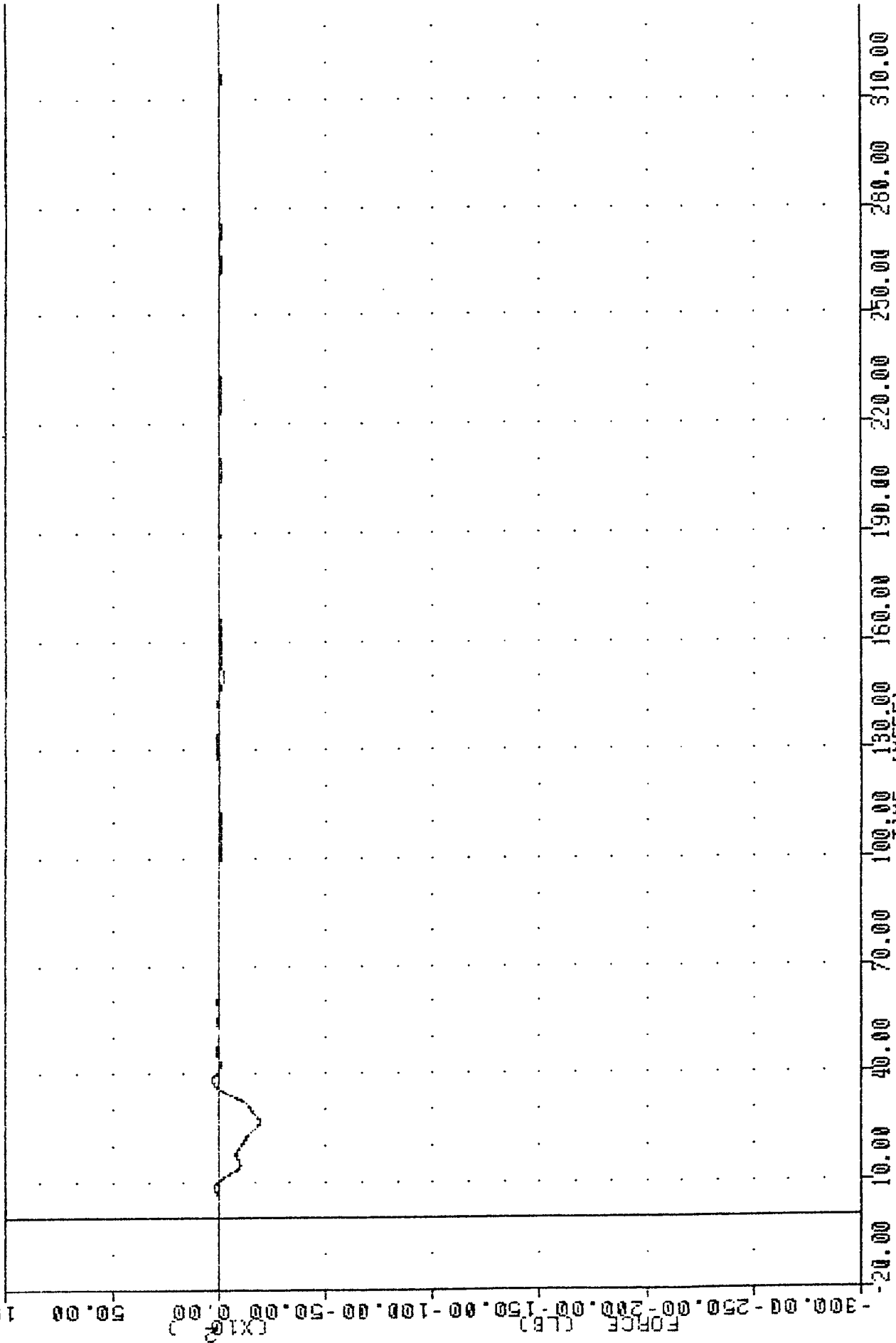
100.00

50.00

0.00

B-75

880614



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

TIME (MSEC)

FORCE (LB)

# NEW CAR ASSESSMENT PROGRAM

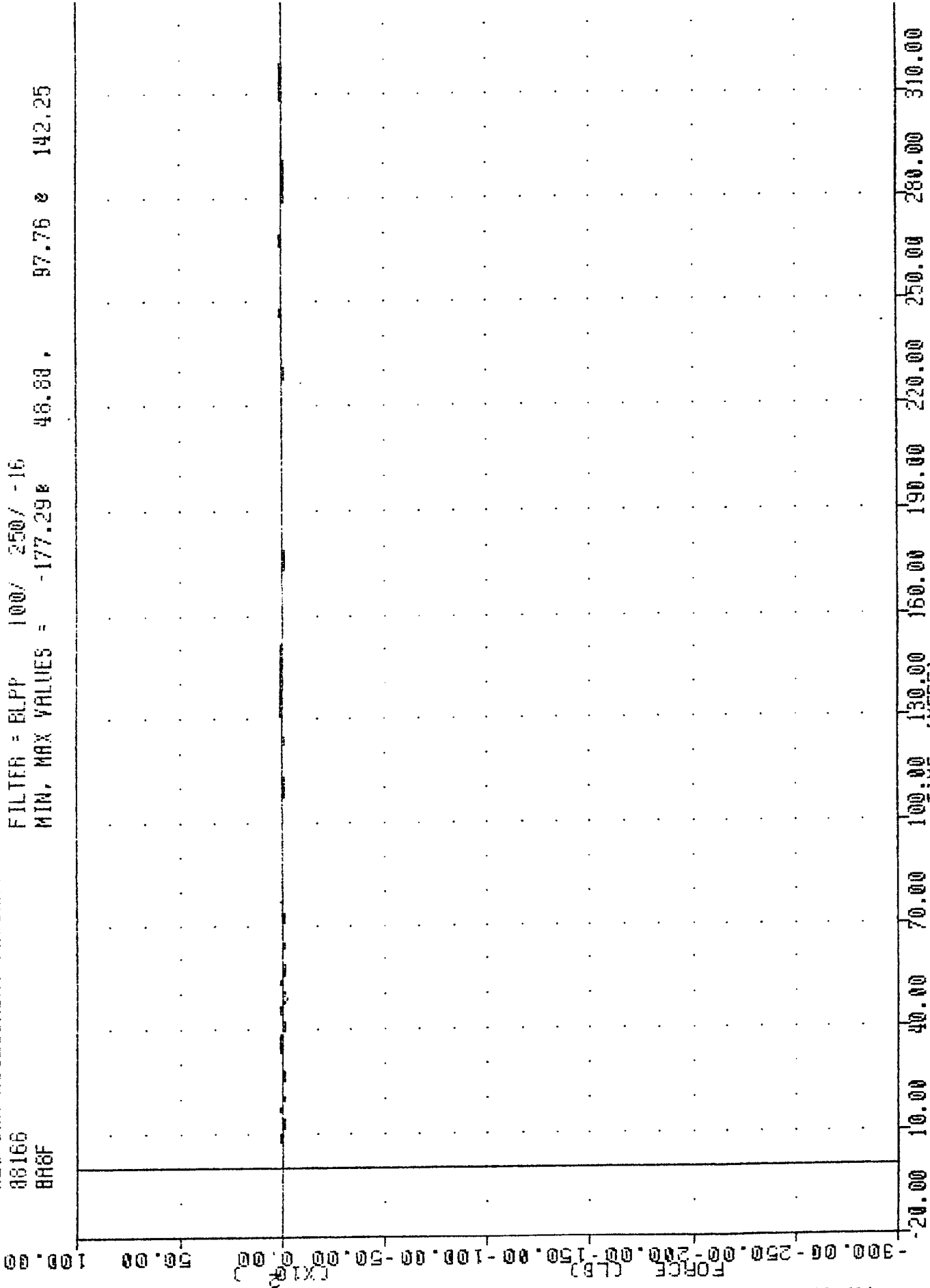
88166

BA8F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -177.29 48.88 ,

97.76 142.25



# NEW CAR ASSESSMENT PROGRAM

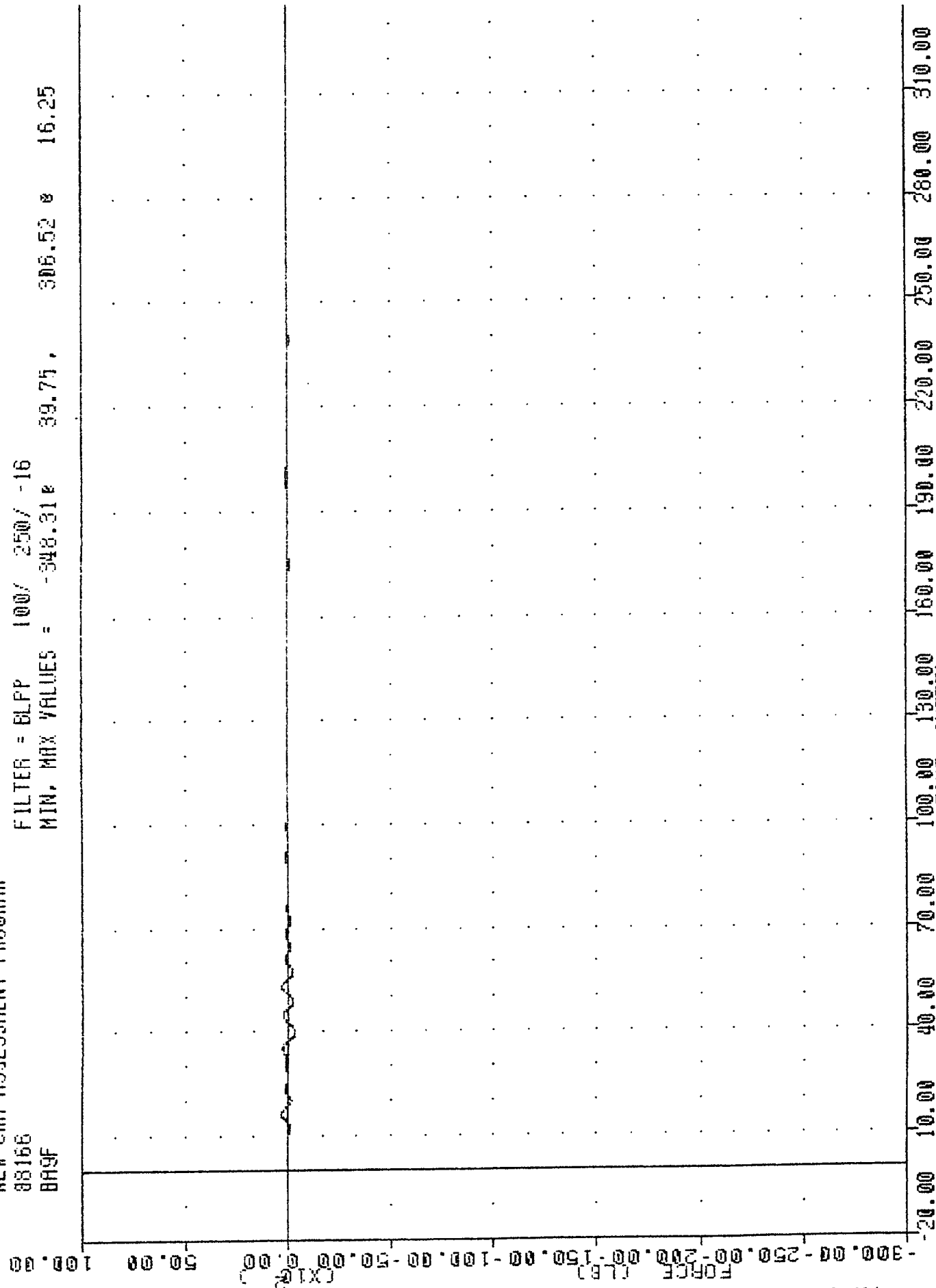
88166

BA9F

FILTER = BLFP 100/ 250/ -16

MIN. MAX VALUES = -348.31 39.75

306.52 16.25



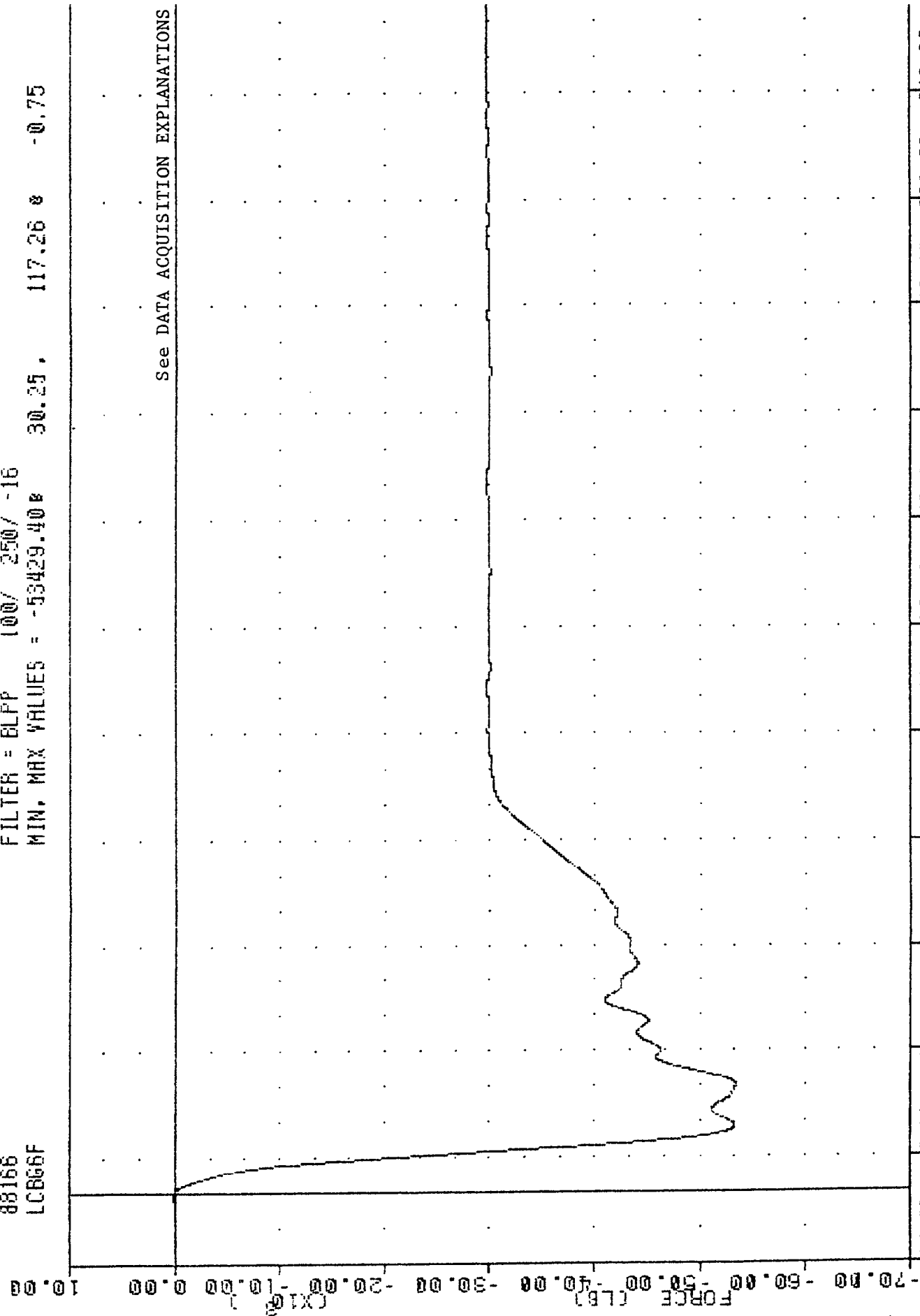
88166

LCB66F

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -53429.40#

30.25, 117.26 # -0.75



See DATA ACQUISITION EXPLANATIONS

ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
LOAD CELL BARRIER GROUP - 6 FORCE TOTAL

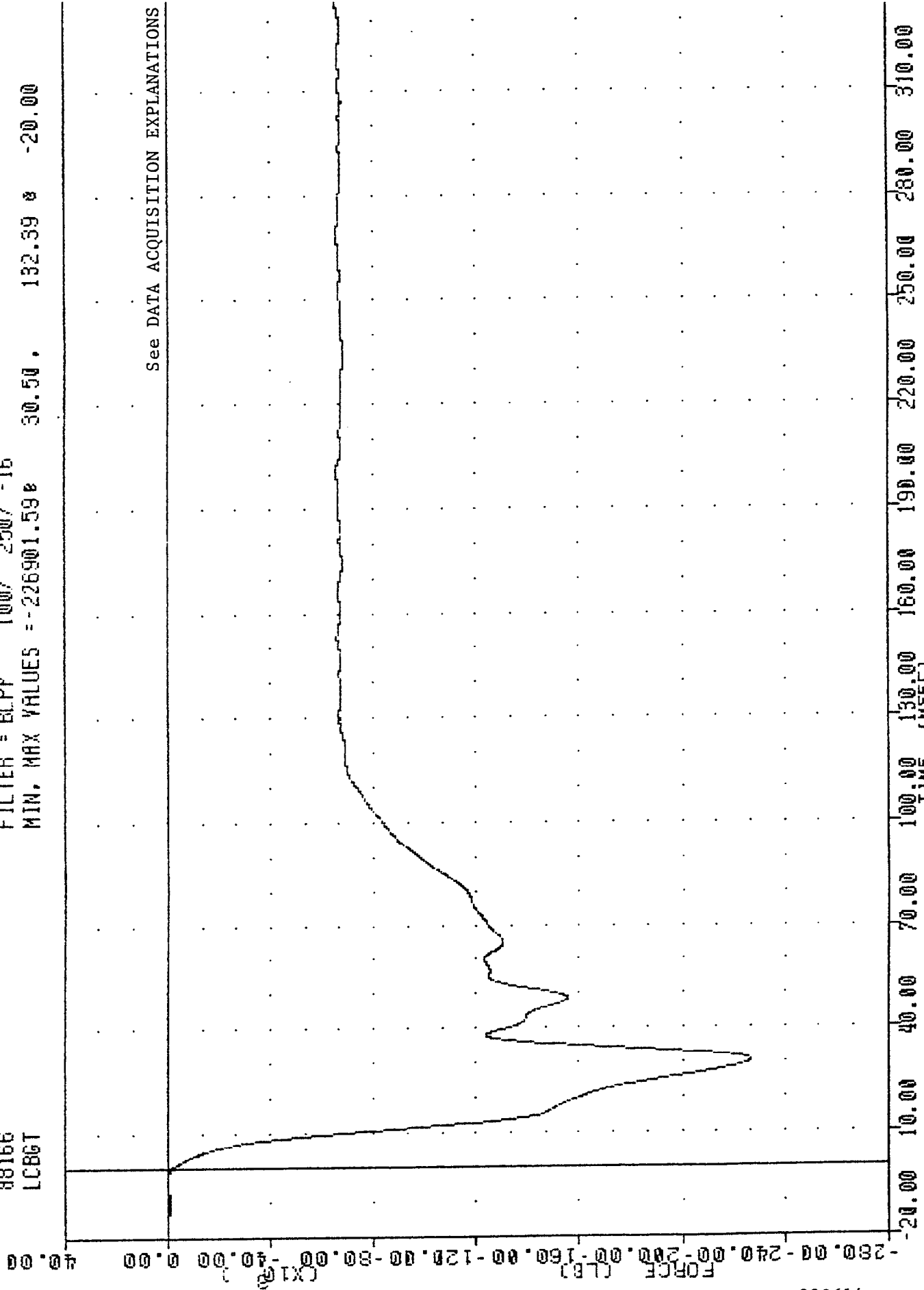
NEW CAR ASSESSMENT PROGRAM

88166

LC8GT

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -226901.59e 30.50 . 132.39 e -20.00



ISUZU SPACECAB LS INTO LOAD CELL BARRIER  
SUM OF LOAD CELL BARRIER FORCES

APPENDIX C

DUMMY CERTIFICATION

## EXTERNAL DIMENSIONS

PART 572

18-APR-88

TEMPERATURE 71.00 F  
NHTSA ED82625

RELATIVE HUMIDITY 32.00 %  
572B SN826 EXT.DIMENSION CAL25

| DESCRIPTION                       | SPECIFICATION  | TEST RESULTS |
|-----------------------------------|----------------|--------------|
| SN 826 ALDERSON                   |                |              |
| Sitting Height                    | 35.6 - 35.8 IN | 35.6 IN      |
| Shoulder Pivot Height             | 21.8 - 22.4 IN | 22.0 IN      |
| Hip Pivot Height                  | 3.9 IN (ref)   | 3.9 IN       |
| Hip Pivot From Backline           | 4.8 IN (ref)   | 4.8 IN       |
| Knee Pivot From Backline          | 20.1 - 20.7 IN | 20.4 IN      |
| Rear of Head From Backline        | 1.7 IN (ref)   | 1.7 IN       |
| Chest Depth                       | 9.1 - 9.6 IN   | 9.4 IN       |
| Shoulder Width                    | 17.8 - 18.4 IN | 18.0 IN      |
| Chest Circumference Over Nipples  | 36.8 - 40.0 IN | 37.5 IN      |
| Waist Circumference at Min. Girth | 31.4 - 32.6 IN | 31.9 IN      |
| Hip Width                         | 14.0 - 15.4 IN | 14.8 IN      |
| Knee Pivot From Floor             | 19.3 - 19.9 IN | 19.4 IN      |

## DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Chas. Middleton*

## TRANSPORTATION RESEARCH CENTER OF OHIO

## HEAD DROP TEST

PART 572

18-Apr-88

TEMPERATURE 72 F  
NHTSA HD82625

RELATIVE HUMIDITY 33 %  
5728 SN826 HEAD DROP CAL 25

| TEST PARAMETER                  | SPECIFICATION  | TEST RESULTS |
|---------------------------------|----------------|--------------|
| PEAK RESULTANT ACCELERATION     | 210 - 260 G    | 239.08 G     |
| TIME ABOVE 100 G LEVEL          | 0.9 - 1.5 MSEC | 1.21 MSEC    |
| PEAK LATERAL ACCELERATION       | 10 G MAX       | -3.17 G      |
| IS ACCELERATION CURVE UNIMODAL? |                | YES          |

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Chas. Middleton*

## TRANSPORTATION RESEARCH CENTER OF OHIO

## NECK PENDULUM TEST

PART 572

19-APR-88

TEMPERATURE 72.00 F  
NHTSA HN82625

RELATIVE HUMIDITY 25.00 %  
572B SN 826 HEAD/NECK CAL 25

| Test Parameter            | Specification       | Test Results |
|---------------------------|---------------------|--------------|
| Pendulum velocity         | 21.5 to 25.5 ft/sec | 23.45 ft/sec |
| Pendulum Deceleration:    |                     |              |
| T1 - T2: 5 - 20 G         | 3 msec max          | 2.41 msec    |
| T2 - T3: 20 - 20 G        | 25 - 30 msec        | 27.69 msec   |
| T3 - T4: 20 - 5 G         | 10 msec max         | 5.00 msec    |
| Avg. G level T2 - T3      | 20 - 24 G           | 23.16 G      |
| Maximum Rotation Angle    | 63 - 73 deg         | 68.84 deg    |
| Peak Head Resultant Accel | 26 G max            | 23.64 G      |

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

\* DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Chas. Middel*

## TRANSPORTATION RESEARCH CENTER OF OHIO

## THORAX IMPACT TEST

PART 572

19-Apr-88

TEMPERATURE 72 F  
NHTSA TL82625

RELATIVE HUMIDITY 25 %  
572B SN 826 L.S.THORAX CAL25

|                      |                    |              |
|----------------------|--------------------|--------------|
|                      | LOW SPEED TEST     |              |
| TEST PARAMETER       | SPECIFICATION      | TEST RESULTS |
| PENDULUM VELOCITY    | 13.86-14.14 FT/SEC | 14.04 FT/SEC |
| PEAK DEFLECTION      | 1.1 IN max.        | 0.98 IN      |
| PEAK RESISTIVE FORCE | 1,450. LB max.     | 1278. LB     |
| INTERNAL HYSTERESIS  | 50% - 70%          | 65.2%        |

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Chas. Middleton*

## TRANSPORTATION RESEARCH CENTER OF OHIO

## THORAX IMPACT TEST

PART 572

19-APR-88

TEMPERATURE 72 F  
NHTSA TH82625

RELATIVE HUMIDITY 26 %  
572B SN 826 H.S. THORAX CAL 25

| -----                |                    |              |
|----------------------|--------------------|--------------|
|                      | HIGH SPEED TEST    |              |
| TEST PARAMETER       | SPECIFICATION      | TEST RESULTS |
| =====                |                    |              |
| PENDULUM VELOCITY    | 21.78-22.22 FT/SEC | 21.92 FT/SEC |
| -----                |                    |              |
| PEAK DEFLECTION      | 1.7 IN max.        | 1.51 IN      |
| -----                |                    |              |
| PEAK RESISTIVE FORCE | 2,250. LB max.     | 2046. LB     |
| -----                |                    |              |
| INTERNAL HYSTERESIS  | 50% - 70%          | 63.2%        |
| -----                |                    |              |

## DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Chas. Middleton*

# ABDOMINAL COMPRESSION TEST

PART 572

18-APR-88

TEMPERATURE 72.00 F  
NHTSA AB82625

RELATIVE HUMIDITY 33.00 %  
572B SN 826 ABDOM COMPR CAL25

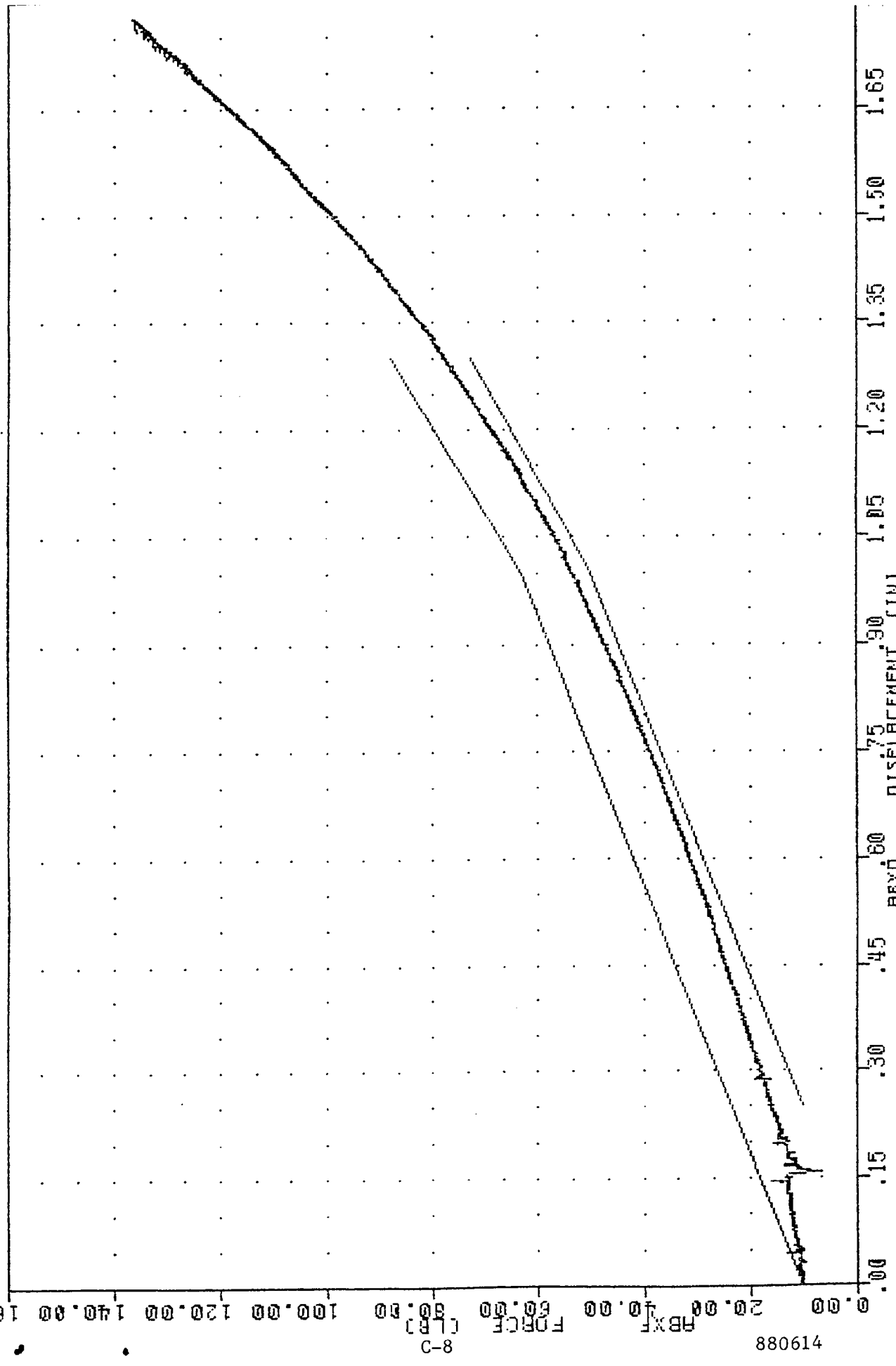
| TEST CORRIDORS |                   |              |
|----------------|-------------------|--------------|
| DISPLACEMENT   | FORCE             | TEST RESULTS |
| 0.00 IN        | 10.00 LBS         | 10.00 LBS    |
| 0.50 IN        | 23.00 - 36.00 LBS | 26.67 LBS    |
| 0.75 IN        | 36.00 - 50.00 LBS | 38.57 LBS    |
| 1.00 IN        | 50.00 - 63.00 LBS | 53.62 LBS    |
| 1.30 IN        | 73.00 - 88.00 LBS | 77.68 LBS    |

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Chas. Muddlet*

ABXD FILTER = ALPF 1650/ 5214/ -40 MIN. MAX = 0.00 136.51  
 ABXF FILTER = ALPF 1650/ 5214/ -40 MIN. MAX = 0.16 136.60 1.78



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

## LUMBAR FLEXION TEST

PART 572

18-APR-88

TEMPERATURE 72.00 F  
NHTSA LFB2625

RELATIVE HUMIDITY 31.00 %  
572B SN826 LUMBAR FLEX CAL25

| DEFLECTION       | SPECIFICATION    | TEST RESULTS |
|------------------|------------------|--------------|
| 0 DEG            | 0 LB             | 0.00 LB      |
| 20 DEG           | 22.00 - 34.00 LB | 30.00 LB     |
| 30 DEG           | 34.00 - 46.00 LB | 40.00 LB     |
| 40 DEG           | 46.00 - 58.00 LB | 48.00 LB     |
| NET RETURN ANGLE | < 12 DEG         | 8.50 DEG     |

## DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middleton

## KNEE IMPACT TEST

PART 572

20-Apr-88

TEMPERATURE 72 F  
LEFT KNEE  
NHTSA LKB2625

RELATIVE HUMIDITY 28 %  
572B SN826 L.KNEE IMP CAL25

| TEST PARAMETER         | SPECIFICATION      | TEST RESULTS |
|------------------------|--------------------|--------------|
| PROBE VELOCITY         | 6.75 - 7.04 FT/SEC | 6.90 FT/SEC  |
| PEAK KNEE IMPACT FORCE | 1850 - 2500 LB     | 1978.11 LB   |
| DURATION ABOVE 1000 LB | $\geq 1.7$ MSEC    | 1.88 MSEC    |

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Chas. Middleton*

## KNEE IMPACT TEST

PART 572

19-Apr-88

TEMPERATURE 72 F  
RIGHT KNEE  
NHTSA RK82625

RELATIVE HUMIDITY 28 %  
572B SN826 R.KNEE IMP CAL25

| TEST PARAMETER         | SPECIFICATION      | TEST RESULTS |
|------------------------|--------------------|--------------|
| PROBE VELOCITY         | 6.76 - 7.04 FT/SEC | 6.90 FT/SEC  |
| PEAK KNEE IMPACT FORCE | 1850 - 2500 LB     | 2115.82 LB   |
| DURATION ABOVE 1000 LB | $\geq 1.7$ MSEC    | 1.78 MSEC    |

## DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Chas. Middleton*

## TRANSPORTATION RESEARCH CENTER OF OHIO

## EXTERNAL DIMENSIONS

PART 572

38-MAR-88

TEMPERATURE 71.00 F  
NHTSA ED41114

RELATIVE HUMIDITY 43.00 %  
5728 SN411 EXT.DIMENSION CAL14

| DESCRIPTION                       | SPECIFICATION  | TEST RESULTS |
|-----------------------------------|----------------|--------------|
| SN 411 HUMANOID                   |                |              |
| Sitting Height                    | 35.6 - 35.8 IN | 35.6 IN      |
| Shoulder Pivot Height             | 21.8 - 22.4 IN | 22.4 IN      |
| Hip Pivot Height                  | 3.9 IN (ref)   | 3.9 IN       |
| Hip Pivot From Backline           | 4.8 IN (ref)   | 4.8 IN       |
| Knee Pivot From Backline          | 20.1 - 20.7 IN | 20.5 IN      |
| Rear of Head From Backline        | 1.7 IN (ref)   | 1.7 IN       |
| Chest Depth                       | 9.1 - 9.6 IN   | 9.5 IN       |
| Shoulder Width                    | 17.8 - 18.4 IN | 17.9 IN      |
| Chest Circumference Over Nipples  | 36.8 - 40.0 IN | 37.0 IN      |
| Waist Circumference at Min. Girth | 31.4 - 32.6 IN | 31.6 IN      |
| Hip Width                         | 14.0 - 15.4 IN | 14.4 IN      |
| Knee Pivot From Floor             | 19.3 - 19.9 IN | 19.6 IN      |

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Chas. Middleton*

## TRANSPORTATION RESEARCH CENTER OF OHIO

## HEAD DROP TEST

PART 572

30-Mar-88

TEMPERATURE 72 F  
NHTSA HD41114

RELATIVE HUMIDITY 42 %  
572B SN 411 HEAD DROP CAL 14

| TEST PARAMETER                     | SPECIFICATION  | TEST RESULTS |
|------------------------------------|----------------|--------------|
| PEAK RESULTANT ACCELERATION        | 210 - 260 G    | 234.44 G     |
| TIME ABOVE 100 G LEVEL             | 0.9 - 1.5 MSEC | 1.24 MSEC    |
| PEAK LATERAL ACCELERATION          | 10 G MAX       | -7.05 G      |
| IS ACCELERATION CURVE<br>UNIMODAL? |                | YES          |

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Chas. Middleton*

## TRANSPORTATION RESEARCH CENTER OF OHIO

## NECK PENDULUM TEST

PART 572

30-Mar-88

TEMPERATURE 72.00 F  
NHTSA HN41114

RELATIVE HUMIDITY 42.00 %  
572B SN 411 HEAD/NECK CAL 14

| Test Parameter            | Specification       | Test Results |
|---------------------------|---------------------|--------------|
| Pendulum velocity         | 21.5 to 25.5 ft/sec | 23.50 ft/sec |
| Pendulum Deceleration:    |                     |              |
| T1 - T2: 5 - 20 G         | 3 msec max          | 2.45 msec    |
| T2 - T3: 20 - 20 G        | 25 - 30 msec        | 28.56 msec   |
| T3 - T4: 20 - 5 G         | 10 msec max         | 5.58 msec    |
| Avg. G level T2 - T3      | 20 - 24 G           | 22.08 G      |
| Maximum Rotation Angle    | 63 - 73 deg         | 64.80 deg    |
| Peak Head Resultant Accel | 26 G max            | 24.12 G      |

| Test Parameter | Specification             | Test Results       |
|----------------|---------------------------|--------------------|
| Rotation Angle | Time Chordal Disp.        | Time Chordal Disp. |
| (degrees)      | (msec) (in)               | (msec) (in)        |
| 0              | -2.0 - +2.0 -0.5 - +0.5   | 1.25 0.00          |
| 30             | 25.6 - 34.4 2.1 - 3.1     | 32.01 2.55         |
| 60             | 40.3 - 51.7 4.3 - 5.3     | 50.35 4.96         |
| max            | 53.2 - 66.8 5.0 - 6.0     | 61.38 5.30         |
| 60             | 67.0 - 83.0 4.3 - 5.3     | 71.68 4.86         |
| 30             | 85.4 - 104.6 2.1 - 3.1    | 91.76 2.27         |
| 0              | 101.0 - 123.0 -0.5 - +0.5 | 105.21 0.12        |

\* DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Chas. Middleton*

880614

## TRANSPORTATION RESEARCH CENTER OF OHIO

## THORAX IMPACT TEST

PART 572

30-Mar-88

TEMPERATURE 72 F  
NHTSA TL41114

RELATIVE HUMIDITY 42 %  
572B SN 411 L.S.THORAX CAL 14

| -----                |                    |              |
|----------------------|--------------------|--------------|
|                      | LOW SPEED TEST     |              |
| TEST PARAMETER       | SPECIFICATION      | TEST RESULTS |
| =====                |                    |              |
| PENDULUM VELOCITY    | 13.86-14.14 FT/SEC | 14.03 FT/SEC |
| -----                |                    |              |
| PEAK DEFLECTION      | 1.1 IN max.        | 1.02 IN      |
| -----                |                    |              |
| PEAK RESISTIVE FORCE | 1,450. LB max.     | 1325. LB     |
| -----                |                    |              |
| INTERNAL HYSTERESIS  | 50% - 70%          | 59.3%        |
| -----                |                    |              |

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Char. Middle

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

30-Mar-88

TEMPERATURE 72 F  
NHTSA TH41114

RELATIVE HUMIDITY 42 %  
572B SN 411 H.S.THORAX CAL 14

| HIGH SPEED TEST      |                    |              |
|----------------------|--------------------|--------------|
| TEST PARAMETER       | SPECIFICATION      | TEST RESULTS |
| PENDULUM VELOCITY    | 21.78-22.22 FT/SEC | 22.22 FT/SEC |
| PEAK DEFLECTION      | 1.7 IN max.        | 1.60 IN      |
| PEAK RESISTIVE FORCE | 2,250. LB max.     | 2071. LB     |
| INTERNAL HYSTERESIS  | 50% - 70%          | 54.4%        |

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMINAL COMPRESSION TEST

PART 572

29-Mar-88

TEMPERATURE 71.00 F  
NHTSA AB41114

RELATIVE HUMIDITY 43.00 %  
572B SN 411 ABDOM COMPRESS CAL 14

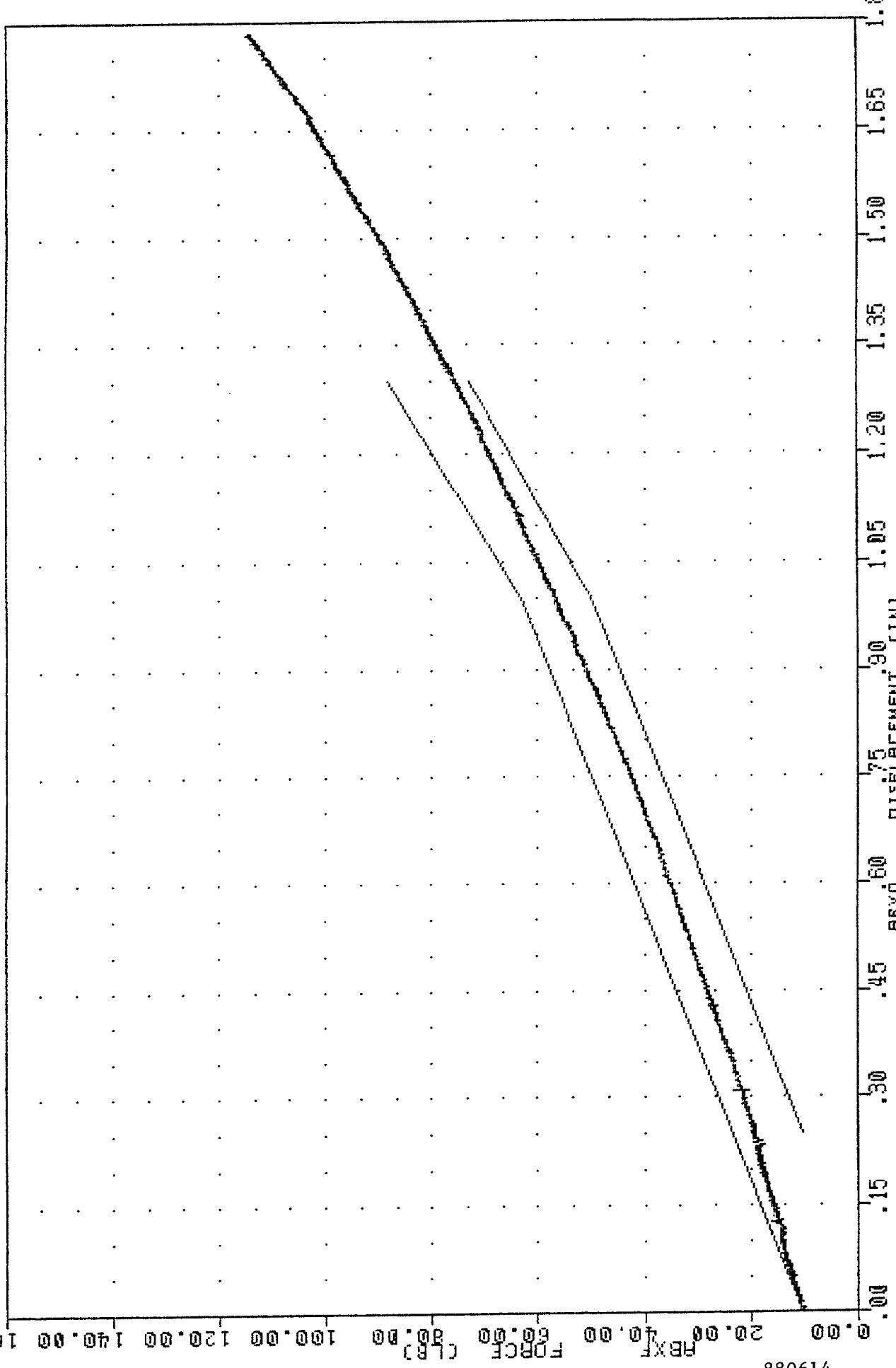
| TEST CORRIDORS |                   |              |
|----------------|-------------------|--------------|
| DISPLACEMENT   | FORCE             | TEST RESULTS |
| 0.00 IN        | 10.00 LBS         | 10.00 LBS    |
| 0.50 IN        | 23.00 - 36.00 LBS | 30.75 LBS    |
| 0.75 IN        | 36.00 - 50.00 LBS | 42.67 LBS    |
| 1.00 IN        | 50.00 - 63.00 LBS | 56.81 LBS    |
| 1.30 IN        | 73.00 - 88.00 LBS | 75.58 LBS    |

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Chas Middleton*

ABXD 1650/ 5214/ -40 MIN. MAX = 0.00 1.79 114.44  
 ABXF 1650/ 5214/ -40 MIN. MAX = 0.00 1.78



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

## TRANSPORTATION RESEARCH CENTER OF OHIO

## KNEE IMPACT TEST

PART 572

30-Mar-88

TEMPERATURE 72 F  
LEFT KNEE  
NHTSA LK41114

RELATIVE HUMIDITY 42 %  
572B SN 411 L.KNEE IMP CAL 14

| TEST PARAMETER         | SPECIFICATION      | TEST RESULTS |
|------------------------|--------------------|--------------|
| PROBE VELOCITY         | 6.76 - 7.04 FT/SEC | 6.96 FT/SEC  |
| PEAK KNEE IMPACT FORCE | 1850 - 2500 LB     | 2141.60 LB   |
| DURATION ABOVE 1000 LB | >=1.7 MSEC         | 1.74 MSEC    |

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

*Ch. Middleton*

## TRANSPORTATION RESEARCH CENTER OF OHIO

## LUMBAR FLEXION TEST

PART 572

29-MAR-88

TEMPERATURE 72.00 F  
NHTSA LF41114

RELATIVE HUMIDITY 42.00 %  
572B SN 411 LUMBAR FLEX CAL14

| DEFLECTION       | SPECIFICATION    | TEST RESULTS |
|------------------|------------------|--------------|
| 0 DEG            | 0 LB             | 0.00 LB      |
| 20 DEG           | 22.00 - 34.00 LB | 30.00 LB     |
| 30 DEG           | 34.00 - 46.00 LB | 40.00 LB     |
| 40 DEG           | 46.00 - 58.00 LB | 48.00 LB     |
| NET RETURN ANGLE | < 12 DEG         | 5.00 DEG     |

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

30-Mar-88

TEMPERATURE 69 F  
RIGHT KNEE  
NHTSA RK41114

RELATIVE HUMIDITY 42 %  
572B SN 411 R.KNEE IMP CAL 14

| TEST PARAMETER         | SPECIFICATION      | TEST RESULTS |
|------------------------|--------------------|--------------|
| PROBE VELOCITY         | 6.76 - 7.04 FT/SEC | 6.96 FT/SEC  |
| PEAK KNEE IMPACT FORCE | 1850 - 2500 LB     | 2124.35 LB   |
| DURATION ABOVE 1000 LB | >=1.7 MSEC         | 1.89 MSEC    |

DUMMY MEETS SPECIFICATIONS

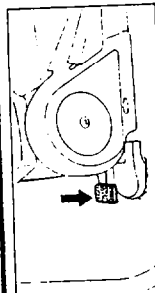
TECHNICIAN Chas. Middleton

880614

APPENDIX D

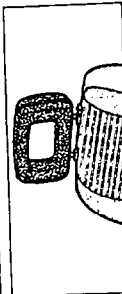
RESTRAINT INSTRUCTIONS FROM OWNER'S MANUAL

## WALK-IN DEVICE (Spacecab only)



To get into and out of the rear seat of spacecab model, press the pedal on the back of the front passenger seat and tilt the front seat back forward (passenger seat side) and pull the latch on the back of the driver seat and tilt the front seat back forward (driver seat side). The passenger seat automatically moves forward when the seatback is tilted forward.

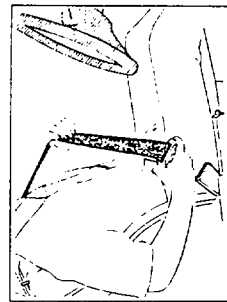
## HEAD RESTRAINT



## FRONT SEAT LAP/SHOULDER BELT

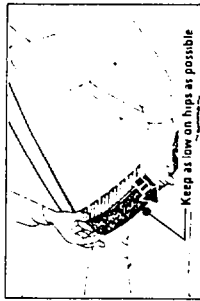


the body. At the same time, slide the latch plate along the belt until it reaches the buckle. Push the latch plate into the buckle until it clicks.



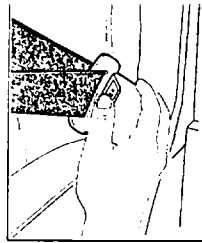
To lessen the chance of injury and/or the severity of injury in accidents or sudden stops, driver and passengers should be properly restrained at all times, using the seat belts provided. (See the following pages for the use of restraints by children and pregnant women.) A seat belt is provided at each position designed for occupant seating. Thus, the seat in this vehicle is equipped with seat belts for two (bucket seat) or three occupants (bench seat).

- Adjust the front seat as needed and sit up straight and well back in the seat.
- Take hold of the seat belt latch plate and pull the lap/shoulder belt webbing across



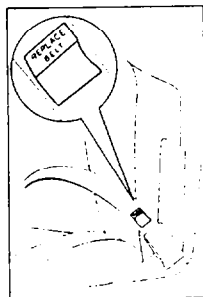
## WARNING

- A snug fit with the lap belt positioned low on the hips is necessary to lessen the chance of injury and/or the degree of injury in an accident. This spreads the force of the lap belt over the hip bone instead of across the abdomen.
- Never use the same seat belt for more than one person at a time. A seat belt worn by more than one person will not provide adequate protection in the event of a collision.
- Never wear twisted seat belts.
- Be very careful not to damage seat belts or seat belt buckles by pinching them in the seat or the door.



To unfasten the belts push in the button at the top of the buckle. When no longer in use seat belts should be stowed by letting them rewind into the retractor.

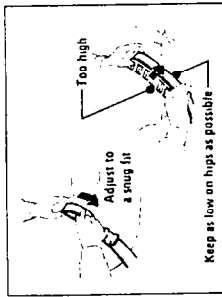
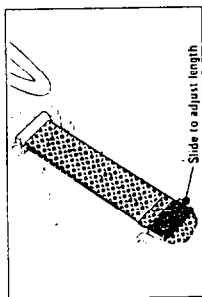
- Too much slack could increase the degree of injury because the belt would not properly restrain you in an accident. DO NOT wear shoulder belts if you are not seated properly. Such use increases the chance of injury and the degree of injury in an accident.
- According to Federal accident statistics, children are safer when properly restrained in rear seating positions (if so equipped) than in the front seating positions.



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

### CENTER SEAT BELT (Bench seat and Jump seat only)

- To lengthen a lap belt, place the latch plate at right angles to the belt webbing and pull on the latch plate; the belt should then slide easily through the latch plate.
- Remove excess length of the belt and adjust the belt position.
- To shorten the belt, pull the free end of the belt.



**NOTE**  
Position the lap belt as low as possible on your hips — not on your waist, then adjust it to a snug fit. Failure to do so could increase the chance of injury due to sliding under the lap belt during an accident.

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### SEAT BELT INSPECTION

- Occasionally check that the belts, buckles, latch plates, retractors, reminder systems, guide loops, keepers, and anchors work properly. Also check for damage that could keep the restraint system from doing its job.
- Keep sharp edges and damaging objects away from the belts and other parts of the restraint system.
- Replace belts if cut, weakened, or frayed. Also, have belts replaced if they have been worn in a collision.
- If there is any doubt have all related parts including belts replaced.
- Keep belts clean and dry.
- Clean only with mild soap and lukewarm water.
- Do not bleach or dye belts since this may badly weaken them.

### CHILD RESTRAINT

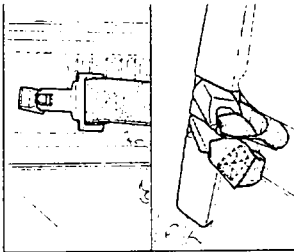
Children in vehicles should be restrained to help lessen the chance and/or severity of injury in accidents or sudden stops. Never let a child of any age stand or kneel on any seat. Use of infant or child restraint systems which conform to federal motor vehicle safety standards and which are installed ac-

be secured in vehicle seats by lap belts or the lap belt portion of a lap-shoulder belt.

- Children could be endangered in a crash if the child restraint is not properly secured in your vehicle.

### RESTRAINT OF PREGNANT WOMEN

It is recommended that pregnant women use seat belts. Check with your doctor for specific recommendations. The lap belt should be snug and positioned as low as possible around the hips. Do not position the lap belt around the waist. This can be very dangerous in the event of an accident or sudden stop.



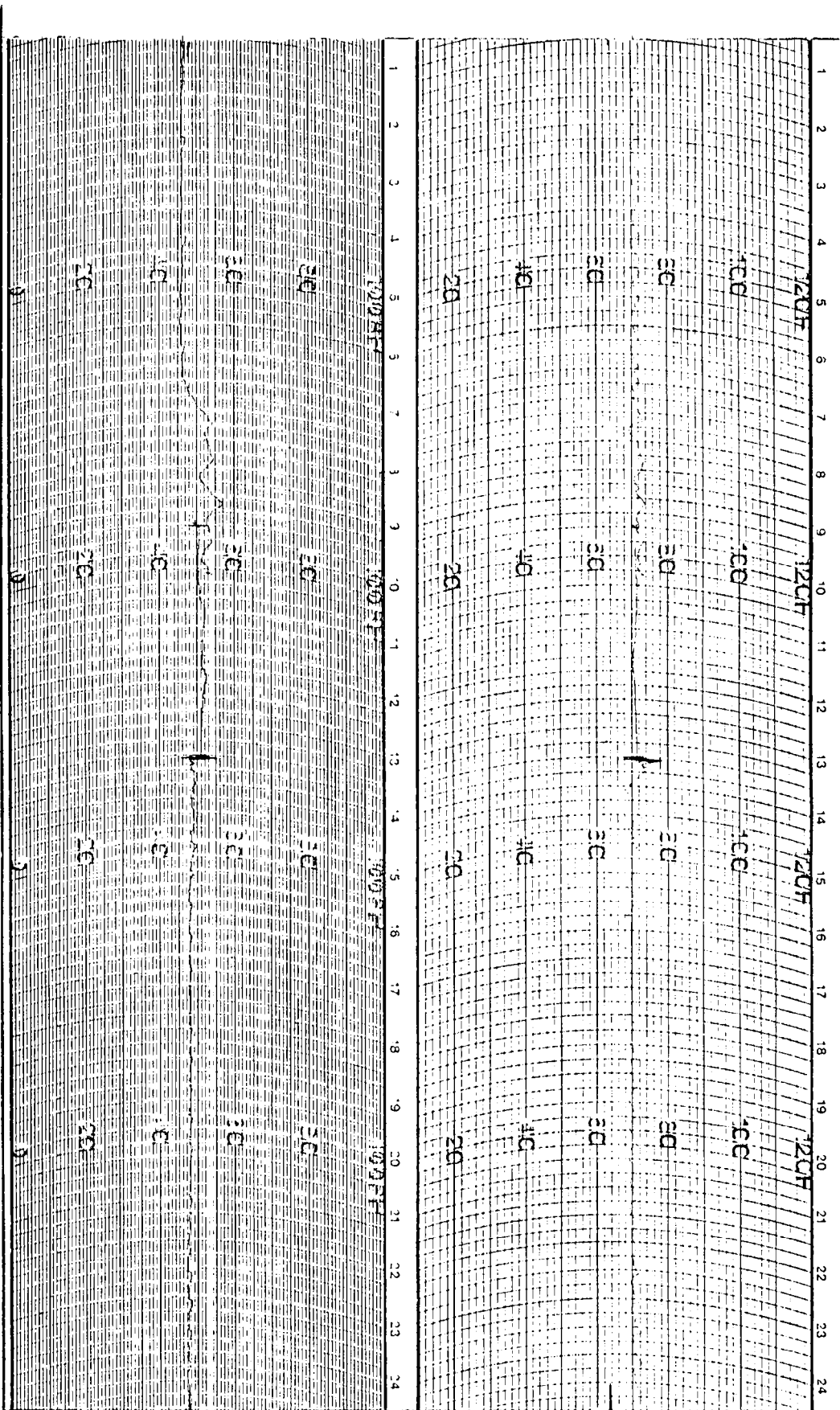
The jump seat lap belts should be strapped to the clips (latch plate located at the buckle located at rear of cab) to keep from rattling when not in use.

### WARNING

- Never let anyone ride in the area between the front seat of a spacecab without a jump seat and seat lap belt.

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- *To help lessen the chance of injury and/or the severity of injury in accidents or sudden maneuvers, we urge that people riding in the vehicle be properly restrained at all times. Always wear the seat belt when using the jump seat.*



WEATHER MEASURE  
 PO BOX 41257  
 SACRAMENTO CA 95841  
 PHONE (916) 481-7265

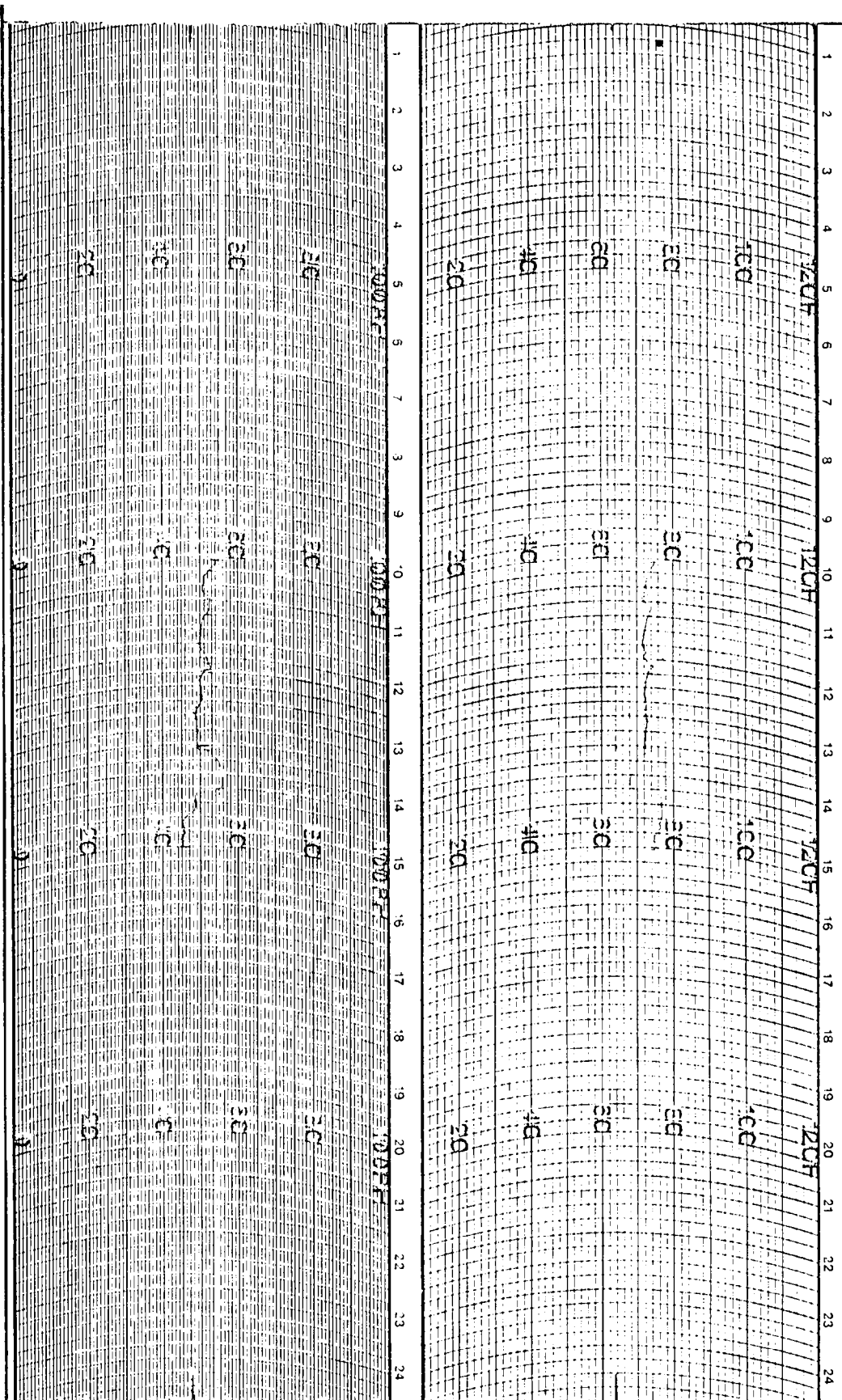
HYGROTHERMOGRAPH  
 1 DAY

CHART # C311 D HF  
 PART # 699123

STATION SPACECAB

DATE ON 6/13/80

DATE OFF 6/14/80



WEATHER MEASURE  
PO BOX 41257  
SACRAMENTO, CA 95841  
PHONE (916) 481-7555

HYGROTHERMOGRAPH  
1 DAY

CHART # C311 D HF  
PART # 699123

STATION SPACE CAB

DATE ON 6/14/00

DATE OFF 6/14/00