

DOT 1153

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

NISSAN MOTOR COMPANY, LIMITED

1988 NISSAN NL XEV PICKUP

NHTSA NO. MJ5203

MOBILITY SYSTEMS AND EQUIPMENT COMPANY
9920 La Cienega Boulevard Suite 708
Inglewood, California 90301



APRIL 21, 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-22)
Washington, DC 20590

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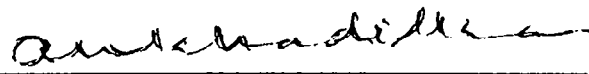
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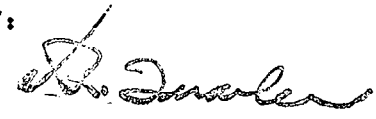
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APPROVED BY: 
Dr. Anil V. Khadilkar, Program Manager

DATE: April 21, 1988

FINAL REPORT ACCEPT BY: 
MANAGER, New Car Assessment Program

APR 20 1988

Date of Report Acceptance

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| 9. Performing Organization Name and Address MOBILITY SYSTEMS AND EQUIPMENT COMPANY 9920 La Cienega Boulevard, Suite 708 Inglewood, California 90301 | | | | 11. Contract or Grant No. DTNH22-87-D-02009 | | | | | | | | | | | | | | | | |
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| | | | | 15. Supplementary Notes | | | | | | | | | | | | | | | | |
| 16. Abstract A 35 mph frontal barrier impact test using a load cell barrier was conducted on a 1988 Nissan NL XEV Pickup at the Mobility Systems and Equipment Company (MSE) crash test facility in Mira Loma, CA on 01 April 1988. The barrier impact velocity was 35.1 mph and the ambient temperature at the barrier face at the time of impact was 82°F. The posttest vehicle crush maximum was 15.0 in. A summary of occupant injury measure data from the test. | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Injury Criteria Threshold Value</th> <th>Driver Dummy</th> <th>Passenger Dummy</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criterion HIC = 1000</td> <td>1528</td> <td>1242</td> </tr> <tr> <td>Chest Resultant Peak 60 Gs (3 ms clip)</td> <td>67</td> <td>53</td> </tr> <tr> <td>Femur Load Left</td> <td>242</td> <td>655</td> </tr> <tr> <td>2250 pounds Right</td> <td>609</td> <td>198</td> </tr> </tbody> </table> | | | | | | Injury Criteria Threshold Value | Driver Dummy | Passenger Dummy | Head Injury Criterion HIC = 1000 | 1528 | 1242 | Chest Resultant Peak 60 Gs (3 ms clip) | 67 | 53 | Femur Load Left | 242 | 655 | 2250 pounds Right | 609 | 198 |
| Injury Criteria Threshold Value | Driver Dummy | Passenger Dummy | | | | | | | | | | | | | | | | | | |
| Head Injury Criterion HIC = 1000 | 1528 | 1242 | | | | | | | | | | | | | | | | | | |
| Chest Resultant Peak 60 Gs (3 ms clip) | 67 | 53 | | | | | | | | | | | | | | | | | | |
| Femur Load Left | 242 | 655 | | | | | | | | | | | | | | | | | | |
| 2250 pounds Right | 609 | 198 | | | | | | | | | | | | | | | | | | |
| TYPE OF RESTRAINT SYSTEM: 3-point continuous webbing system at each front outboard seating positions. | | | | | | | | | | | | | | | | | | | | |
| 17. Key Words 35 MPH FRONTAL BARRIER IMPACT TEST NEW CAR ASSESSMENT PROGRAM (NCAP) 1988/NISSAN/NL XEV/PICKUP | | | | 18. Distribution Statement Copies of this report are available from Technical Reference Division Nat'l Hwy. Traffic Safety Admin. Room 5108, Nassif Building 400 7th St. S.W. Wash. DC 20590 | | | | | | | | | | | | | | | | |
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SECTION 1

PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is a part of the FY'88 Vehicle Barrier Impact and Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-87-D-02009. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 30 mph FMVSS 208/212/219/301-75 requirements.

This 35 mph frontal barrier impact test was conducted in accordance with the Office of Market Incentives (OMI) Laboratory Indicant Test Procedure, dated 01 September 1986.

SECTION 2

SUMMARY OF FRONTAL BARRIER IMPACT TESTS

A load cell barrier consisting of 36 cell units was impacted by a 1988 Nissan NL XEV Pickup, NHTSA No. MJ5203 at a velocity of 35.1 mph. The frontal impact test was conducted by Mobility Systems and Equipment Company (MSE) on 01 April 1988. The general test and vehicle description information are presented in Tables 1 and 2. Pretest and posttest photographs of the test vehicle and dummies are shown in Appendix A.

Two (2) Part 572 50th percentile adult male Anthropomorphic Test Devices (ATD's) were placed in the driver and right front passenger designated seating positions (DSP's) according to the NHTSA test requirements.

The ATD's were instrumented with head and chest triaxial accelerometers and right/left femur load cells. 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 belt loading. A summary of dummy configuration and performance verification test data is presented in Appendix C.

The frontal impact event was documented by one (1) real time camera and fifteen (15) high-speed cameras. The camera location data are presented in Table 8.

Sixty-five (65) channels of crash parameters were recorded using three (3) FM tape recorders and four (4) direct analog to digital acquisition units. Time history plots of all recorded channels are presented in Appendix B.

2.1 GENERAL COMMENTS

The 1988 Nissan NL XEV Pickup was equipped with a 145.78 cubic inches, 4 cylinder engine and 4 speed manual transmission. The test weight of the Nissan NL XEV Pickup with two (2) 50th percentile male dummies, instrumentation, and cameras was 3259 pounds.

The 1988 Nissan NL XEV Pickup was involved in a frontal load cell barrier crash at a velocity of 35.1 mph.

The maximum static crush for the vehicle of 15.0 inches occurred at the right side of the front bumper. The windshield was cracked but otherwise the vehicle glazing remained intact. Both the driver's and passenger's front doors were opened without the aid of tools.

The driver ATD's head hit the steering wheel rim and the center hub. The driver's left and right knees hit the dash panel and steering column. The driver ATD had a HIC value of 1528, the maximum chest acceleration (resultant clipped) was 67 and the maximum femur loads were 242 (left) and 609 (right) pounds.

The passenger ATD's head hit his knees. Both of his knees hit the dash panel. The HIC value for the passenger ATD was 1242, the maximum chest acceleration (resultant clipped) was 53 and the maximum femur loads were 655 (left) and 198 (right) pounds.

Seat belt spool out, measured by high speed film analysis was 4.5 inches for the driver and 4.3 inches for the passenger.

The seat latching devices of the front two seats remained latched.

There were no apparent visual indications of any stoddard solvent leaks , windshield periphery separation or hood contact with the windshield.

Data Table No. 1 Test Vehicle Data

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1988/NISSAN/NL XEV/PICKUP

VEHICLE NHTSA NO.:

| | | | | | |
|---|---|---|---|---|---|
| M | J | 5 | 2 | 0 | 3 |
|---|---|---|---|---|---|

 VIN:

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | N | 6 | N | D | 1 | 1 | S | 8 | J | C | 3 | 1 | 2 | 3 | 5 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

VEHICLE BODY COLOR: RED; MONTH & YEAR OF MANUFACTURE: 10/87

ENGINE: 4 cylinders; 145.78 C.I.D.; Liters; CC

Gas; Diesel; Turbocharged

PLACEMENT— Longitudinal; Transverse (Lateral)

TRANSMISSION: 4 speed; Manual; Automatic; Overdrive

FINAL DRIVE: Front Wheel Drive; Rear Wheel Drive; Four Wheel Drive

DATE VEHICLE AVAILABLE FOR 35 MPH CRASH TESTING: 12/18/87

ODOMETER READING: 82 miles; OPTIONS: A/C; P/S; P/Wdo;

Tilt Whl.; Cruise Control

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): 26 psi Front; 34 psi Rear

Recommended Tire Size: P185/75R14

Tires On Vehicle: P185/75R14 M+S; Manufacturer: GOODYEAR

Number Of Occupants: 3 Front; Rear; 3rd Seat; 3 TOTAL

Type Of Front Seats: Bucket; Bench; Split Bench

Type Of Front Seat Back: Fixed; Adjustable With Lever/ Knob Rotating

Vehicle Maximum Capacity Loading = 1369* lbs. (A) *(GVWR - 2631)

No. Of Occupants x 150 lbs. -- = 450 lbs. (B)

Cargo Capacity (A - B) - - - - - = 919 lbs.

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Right Front = 753 lbs. -

Left Front = 768 lbs. -

Right Rear = 565 lbs. -

Left Rear = 545 lbs. -

TOTAL WEIGHT= 2631 lbs.

TOTAL FRONT = 1521.0 lbs (57.8% of TOTAL)

TOTAL REAR = 1110.0 lbs. (42.2% of TOTAL)

Data Table No. 1 (Cont'd) Test Vehicle Data

CALCULATION OF TEST VEHICLE TARGET WEIGHT:

Total Test Vehicle Delivered Weight With Maximum Fluids = 2631 lbs.
Maximum Cargo Carrying Capacity Of Test Vehicle* - - - - = 300 lbs.
Weight Of Two P.572 Dummies (2 x 164 lbs.) - - - - - = 328 lbs.
TEST VEHICLE TARGET WEIGHT - - - - - = 3259 lbs.

*300 lbs. for light trucks and MPVs

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front = 901 lbs.
Left Front = 916 lbs.
Right Rear = 731 lbs.
Left Rear = 711 lbs.
TOTAL FRONT = 1817 lbs. (55.8% of TOTAL)
TOTAL REAR = 1442 lbs. (44.2% of TOTAL)
TOTAL WEIGHT = 3259 lbs. (which includes 102 lbs. of cargo ballast weight placed in the cargo/luggage area)

VEHICLE COMPONENTS REMOVED TO MEET TARGET WEIGHT:

1. Spare Tire, Jack, Jack Stand 3. Tail lamp hsg. Rt. Side Left Side
2. Rear Bumper Assembly 4. DRIVER MIRROR

TEST VEHICLE ATTITUDE:

As Delivered— Right Front = 29.5 inches; Ready For Test— Right Front = 28.7 inches
Left Front = 29.6 inches Left Front = 29.4 inches
Right Rear = 31.8 inches Right Rear = 29.7 inches
Left Rear = 31.8 inches Left Rear = 29.7 inches
Test Vehicle Wheelbase: 104.3 inches; C.G. = 46.1 inches rearward of front wheel centerline

Total Vehicle Length:

Right Side = 170.3 inches
Left Side = 170.1 inches
Centerline = 171.4 inches

Data Table No. 2 Post Crash Test Data

DATE OF 35 MPH FRONTAL BARRIER IMPACT RATINGS TEST: 04/01/88

TIME OF TEST: 2:15 PM : AMBIENT TEMPERATURE AT BARRIER FACE: 82 °F.

VEHICLE'S OCCUPANT COMPARTMENT TEMPERATURE: 71 °F. (Spec. Range + 66 to 78° F.)

VEHICLE'S WINDSHIELD MOLDING TEMPERATURE: 71 °F.

VEHICLE IMPACT VELOCITY: Primary Speed Trap = 35.09 mph

Secondary Speed Trap = 35.10 mph

(Specified Range = 34.5 to 35.5 mph)

Distance from vehicles's front bumper forwardmost surface to barrier face when—

(a) entering the speed trap = 60 in

(b) existing the speed trap = 12 in

VEHICLE STATIC CRUSH: (All measurements in inches)

Vehicle Pre-test Length— Right Side= 170.3 ; C/Line= 171.4 ; Left Side= 170.1

Vehicle Post-test Length —Right Side= 155.3 ; C/Line= 156.5 ; Left Side= 155.3

VEHICLE STATIC CRUSH ---- Right Side= 15.0 ; C/Line= 14.9 ; Left Side= 14.8

VEHICLE REBOUND FROM BARRIER FACE:

Vehicle Right Side = 21.8 inches

Vehicle Centerline = 18.0 inches

Vehicle Left Side = 15.5 inches

VISIBLE DUMMY CONTACT POINTS:

| | DRIVER (I.D. No. <u>464</u>) | | | PASSENGER (I.D. No. <u>467</u>) | | |
|----------------------|-------------------------------|-------------|---------------|----------------------------------|------------|----------------|
| | Strg. Col. Hub | Strg. Wheel | Instru. Panel | Instru. Panel | Knee Assv. | Glove Box Door |
| HEAD - - - - - | YES | YES | NO | NO | YES | NO |
| RIGHT KNEE - - - - - | | | YES | NO | | YES |
| LEFT KNEE - - - - - | | | YES | NO | | YES |

VEHICLE DOOR OPENING INFORMATON:

| | RIGHT SIDE | | LEFT SIDE | |
|-----------------------|------------|--------|-----------|--------|
| | OPENED | JAMMED | OPENED | JAMMED |
| FRONT DOORS - - - - - | YES | NO | YES | NO |
| REAR DOORS - - - - - | N/A | N/A | N/A | N/A |

Data Table No. 2 (Cont'd) Post Crash Data

VEHICLE'S FRONT SEAT MOVEMENT DURING CRASH:

| | RIGHTSIDE | | LEFT SIDE |
|--------------------------|-------------|------------|----------------------|
| Seat Cushion Shift - - - | <u>0.0</u> | " forward; | <u>0.3</u> " forward |
| Seat Adjuster Failure-- | <u>None</u> | " | <u>None</u> |

Details Of Any Failure: N/A

OTHER NOTABLE IMPACT EFFECTS:

SECTION 3

OCCUPANT AND VEHICLE INFORMATION

I. OMI DATA

Dummy Injury Criteria Data Summary
Dummy Positioning Data
Seat Belt Positioning Data
Seat Belt Performance Assessment Data
Driver Dummy to Steering Column Dimensions
Camera Locations

II. OVR DATA

Load Cell Barrier Data
Vehicle Accelerometer Data

Data Table No. 3 FMVSS No. 208 Occupant Crash Protection Data Sheet

VEH. YR./MAKE/MODEL/BODY STYLE: 1988/NISSAN/NL XEV/PICKUP

VEH. NHTSA NO.: MJ5203; TEST DATE: 04/01/88

| MAXIMUM ACCELERATION VALUES: | DRIVER DUMMY # <u>464</u> | PASSENGER DUMMY # <u>467</u> |
|--------------------------------|---------------------------|------------------------------|
| Head Channel X HEAD X | -108.980 | -89.367 |
| Head Channel Y Y | 17.675 | -19.707 |
| Head Channel Z Z | -57.237 | -108.970 |
| HEAD RESULTANT R | 117.520 | 140.570 |
| Chest Channel X CHEST X | -74.974 | -52.353 |
| Chest Channel Y Y | -30.023 | -50.613 |
| Chest Channel Z Z | -26.319 | -33.314 |
| CHEST RESULTANT R | 66.486 | 53.048 |
| TIME INTERVAL (seconds) | 0.0580 - 0.0610 | 0.0550 - 0.0580 |

HEAD INJURY CRITERIA (HIC) VALUES:

| HIC | HIC | 1527.50 | 1241.63 |
|----------------------------|-----|---------|---------|
| t_1 (seconds) | | 46.75 | 63.13 |
| t_2 (seconds) | | 82.75 | 99.13 |
| Avg. Accel. t_1 to t_2 | | 70.97 | 65.32 |

MAXIMUM FEMUR FORCES:

| | | | |
|-------------------|-----------|-------|-------|
| Right Side (lbs.) | FR | 609.1 | 197.9 |
| Left Side (lbs.) | FL | 242.1 | 654.9 |

MAXIMUM SEAT BELT FORCES:

| | | | |
|---------------|--------------|--------|--------|
| Lap Belt | LAP | 2245.6 | 2078.5 |
| Shoulder Belt | SHLDR | 2148.0 | 2110.3 |

MAXIMUM SEAT BELT WEBBING SPOOL-OUT:

| | | | |
|-------------------------------|--|-----|-----|
| Lap/Shoulder Belt Combination | | 4.5 | 4.3 |
|-------------------------------|--|-----|-----|

Data Table No. 4 Test Dummy Positioning Data

PRE-IMPACT DATA:

Make/Model: NISSAN/NL XEV
 Body Style: PICKUP Model Year: 1988
 NHTSA No.: MJ5203 Color: RED

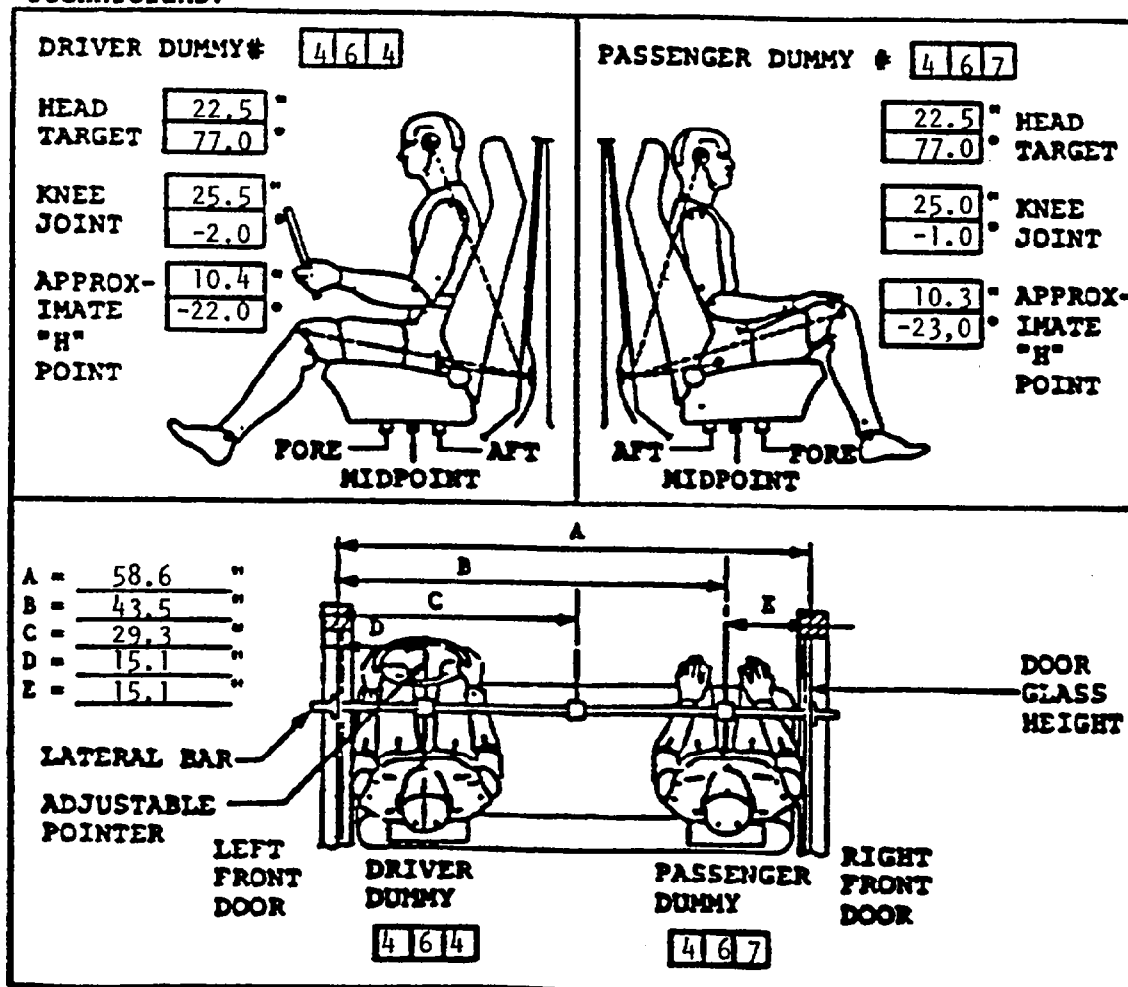
DATA FROM CERTIFICATION LABEL:

Vehicle Manufacturer: NISSAN MOTOR COMPANY
 Date of Manufacture: 10/87; VIN: 1N6ND11S8JC312354
 GVWR: 4000 lb; GAWR: Front = 2200 lb; Rear = 2200 lb

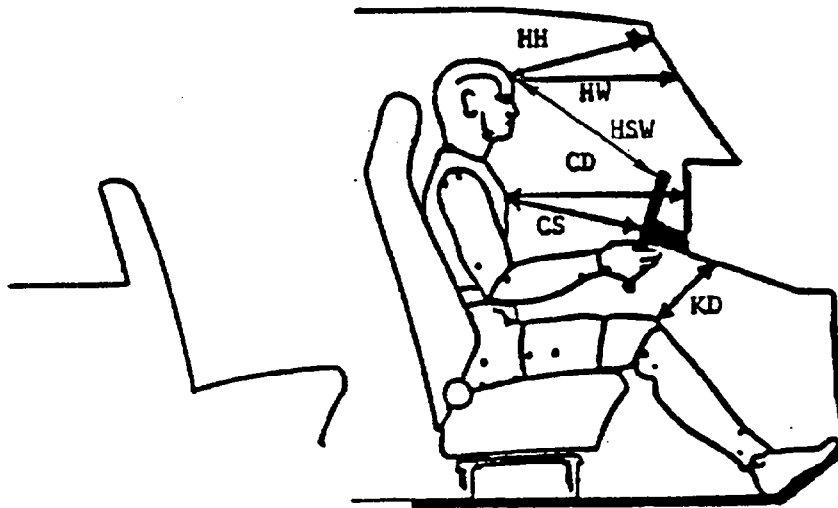
POST-IMPACT DATA:

Date of Test: 04/01/88 Time: 2:15 PM Temperature 82 °F
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: Primary = 35.09 mph Secondary = 35.10 mph
 Seat Type: BENCH Adjuster Type: MANUAL
 Bucket Seat Back Type: N/A

Technicians:



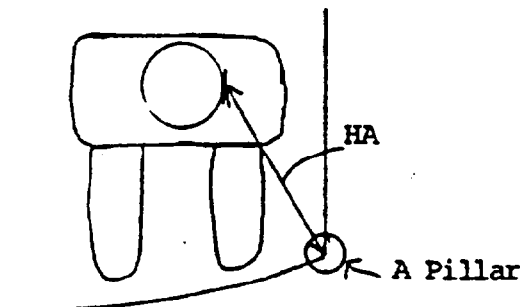
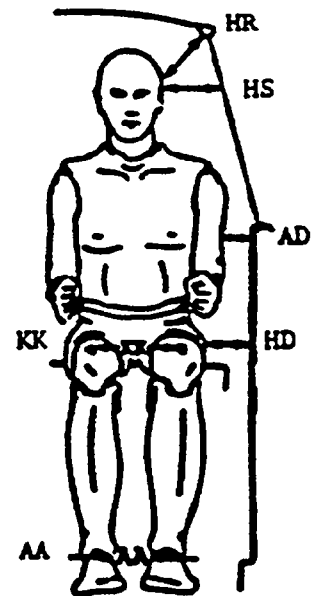
Data Table No. 4 (Cont'd) Test Dummy Positioning Data



| | Driver | Passenger |
|-----------------|--------|----------------------|
| HH | 16.3 | 16.1 |
| HW | 21.4 | 21.3 |
| CD | 23.3 | 23.1 |
| CS | 14.1 | N/A |
| KD L- | 6.5 | L- 6.3 |
| KD R- | 6.4 | R- 6.5 |
| Torso Angle | 18.0 | Torso Angle 18.0 |
| Seat Back Angle | 22.0 | Seat Back Angle 22.0 |
| HSW | 18.4 | N/A |

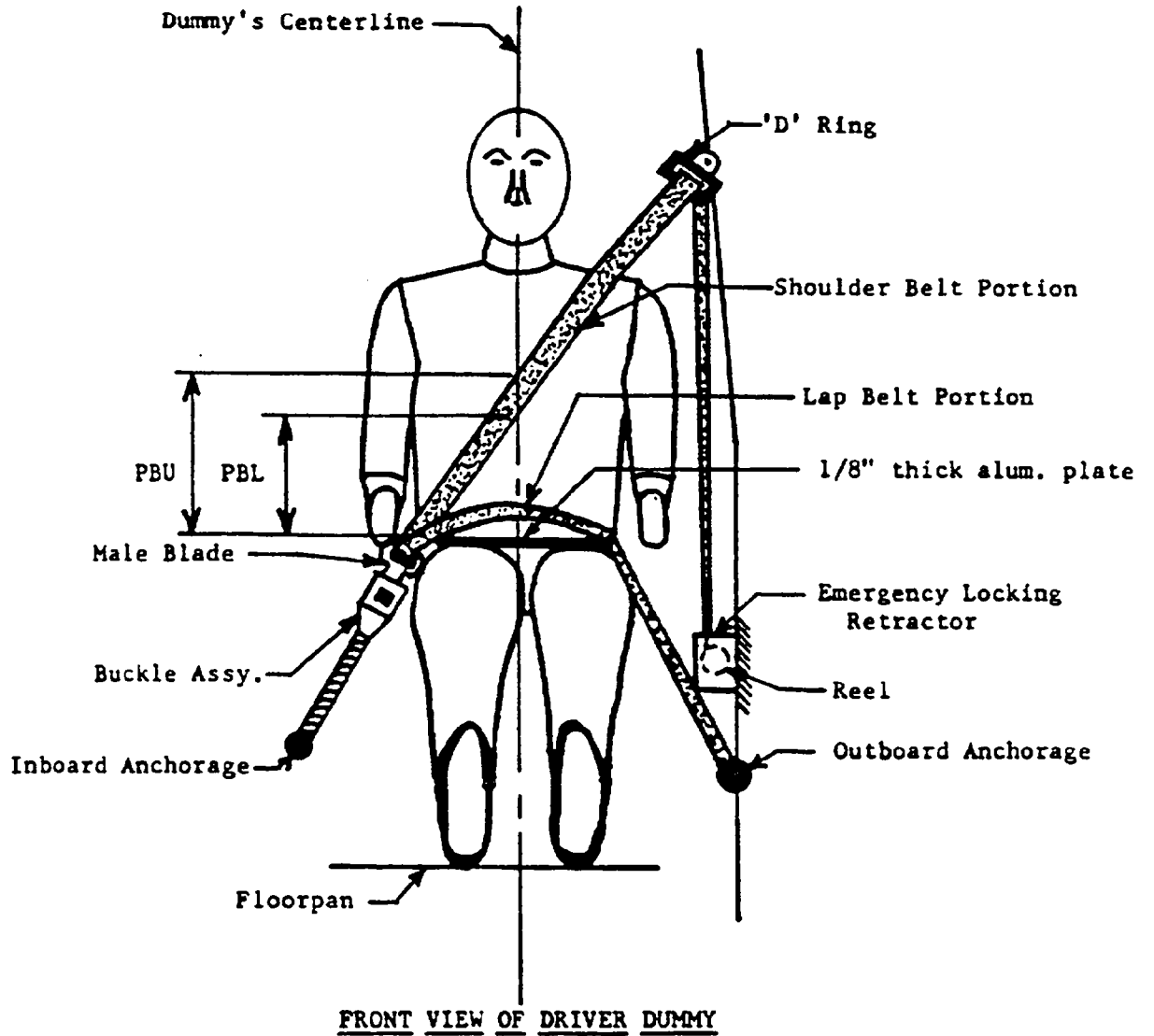
- HSW = Head to Steering Wheel
 - HA = Head Target to A pillar
 - HH = Head to Windshield Header
 - HW = Head to Windshield
 - CD = Chest to Dash
 - CS = Chest to Steering Wheel
 - KD = Knees to Dash
 - HR = Head to Side Roof
 - HS = Head to Side Window
 - AD = Arm to Door
 - HD = Hip to Door
 - KK = Knee to Knee
- Torso and seat back angles are relative to vertical.

REMARKS:



| | Driver | Passenger |
|----|--------|-----------|
| HR | 8.0 | 8.0 |
| HS | 9.5 | 9.0 |
| AD | 3.5 | 3.7 |
| HD | 6.8 | 7.2 |
| KK | 14.5 | 14.5 |
| AA | 9.0 | 9.0 |
| HA | 24.0 | 24.5 |

Data Table No. 5 Seat Belt Positioning Data



| | DRIVER DUMMY (inches) | PASSENGER DUMMY (inches) |
|--|--------------------------|-----------------------------|
| <u>PBU</u> --Top surface of alum. plate to belt upper edge | 15.2 | 13.6 |
| <u>PBL</u> --Top surface of alum. plate to belt lower edge | 11.7 | 10.2 |
| <u>LAP BELT TENSION, POUNDS</u> | 3.0 | 3.0 |
| <u>SHOULDER BELT TENSION, POUNDS</u> | 3.0 | 3.0 |

Data Table No. 6 Seat Belt Performance Assessment Test Data

BELT LENGTH DATA:

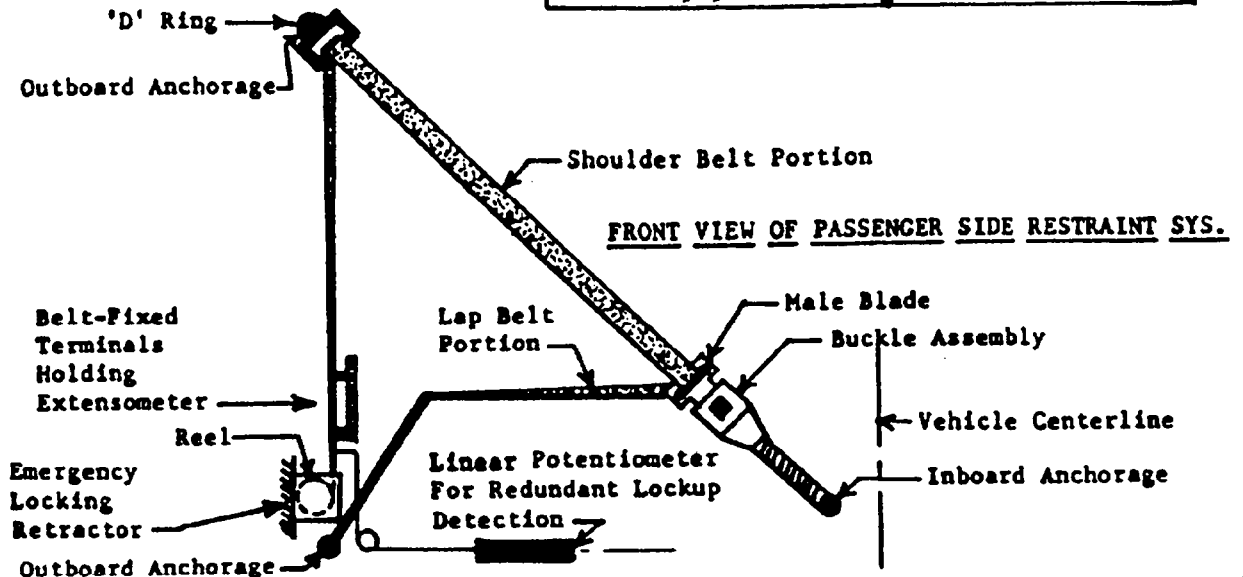
| | DRIVER SIDE | | PASSENGER SIDE | |
|--|-------------|-----------|----------------|-----------|
| | PRE-TEST | POST-TEST | PRE-TEST | POST-TEST |
| Total Belt Length from retractor reel to bolt hole anchor point for continuous webbing systems | 123.6 | 123.6 | 125.4 | 125.4 |
| Retractor reel to 'D' ring as measured on Part 572 dummy | 25.0 | 25.0 | 24.7 | 24.7 |
| Shoulder belt length as measured on Part 572 dummy | 59.2 | 60.5 | 59.1 | 60.2 |
| Lap belt length as measured on Part 572 dummy | 33.4 | 33.5 | 34.6 | 35.5 |
| Remainder of belt webbing left on retractor reel | 31.0 | 29.6 | 31.7 | 29.7 |

BELT SPOOL-OFF DATA:

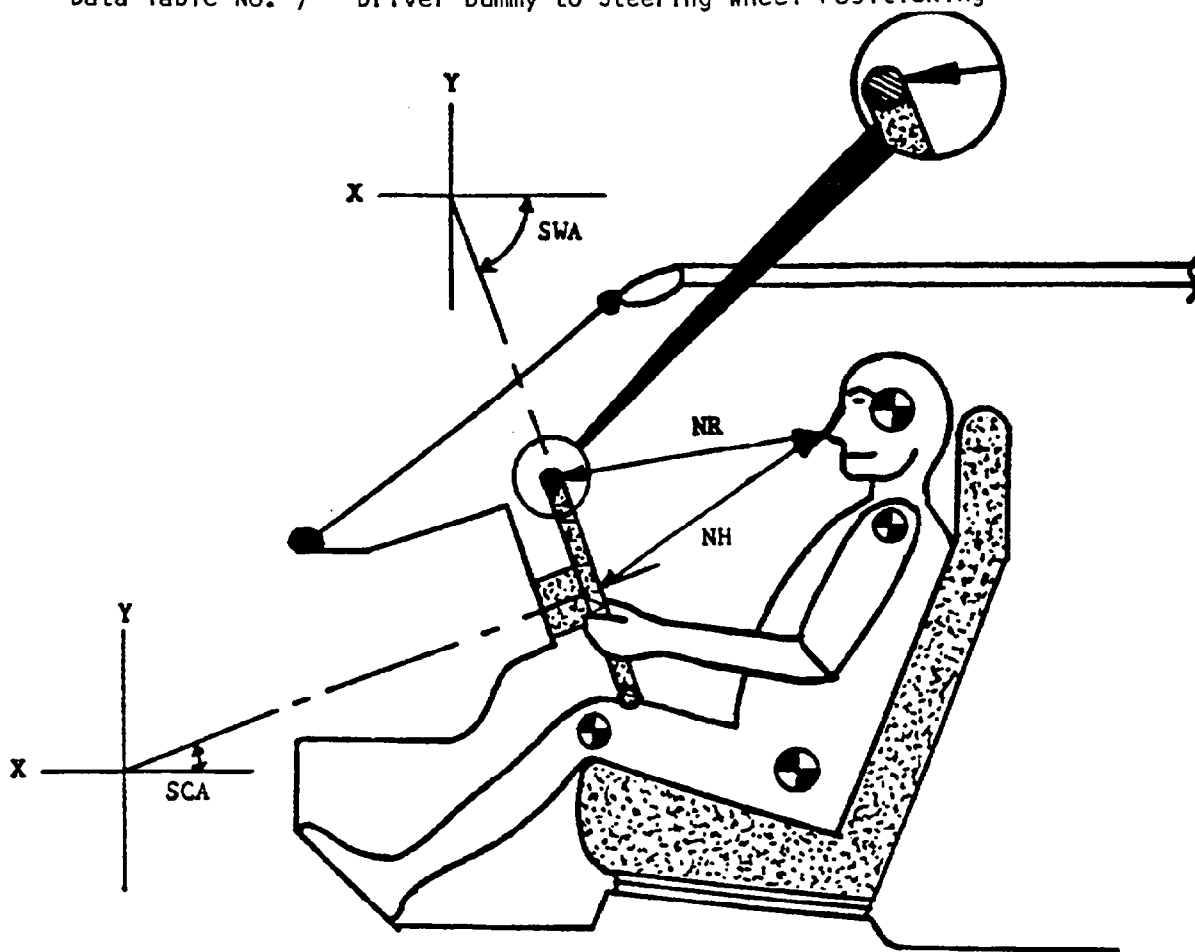
| | | |
|--------------------------------|-----|-----|
| As determined by film analysis | 4.5 | 4.3 |
| As determined electronically | N/A | N/A |
| As determined mechanically | 4.5 | 4.7 |

BELT STRAIN DATA:

| | | |
|--|-------------|-------------|
| Measured between retractor reel and 'D' ring | 3.3 Percent | 4.5 Percent |
|--|-------------|-------------|



Data Table No. 7 Driver Dummy to Steering Wheel Positioning



LEFT SIDE VIEW

| | | MEASUREMENTS | |
|------------|---|--------------|---------|
| <u>NR</u> | --Distance from tip of dummy's nose to Top Rear surface of steering wheel rim | 16.4 | Inches |
| <u>NH</u> | --Distance from tip of dummy's nose to center of steering column hub | 18.1 | Inches |
| <u>SCA</u> | --Angle of steering column relative to the horizontal X axis | 23.0 | Degrees |
| <u>SWA</u> | --Angle of steering wheel relative to the horizontal X axis. | 66.0 | Degrees |

Data Table No. 8 Camera Location Data

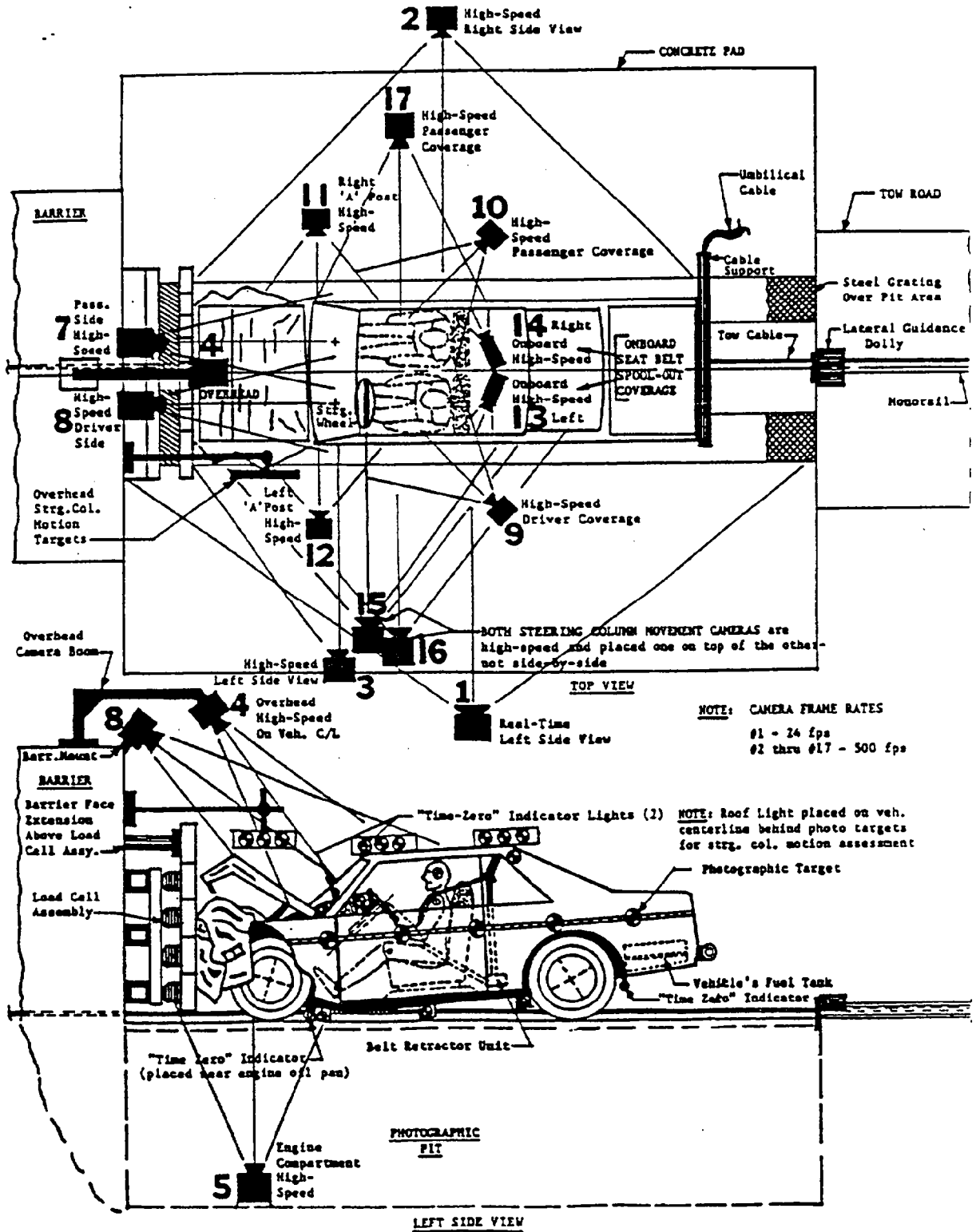
VEH. NHTSA NO.: MJ5203 ; TEST DATE: 04/01/88 ; TIME: 2:15 PM

VEH. YEAR/MAKE/MODEL/BODY STYLE: 1988/NISSAN/NL XEV/PICKUP

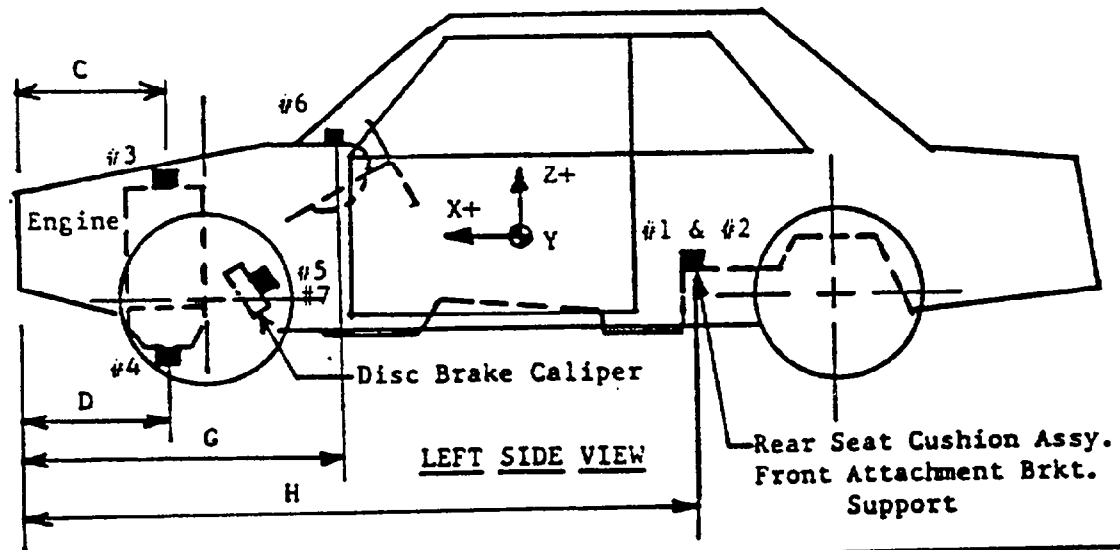
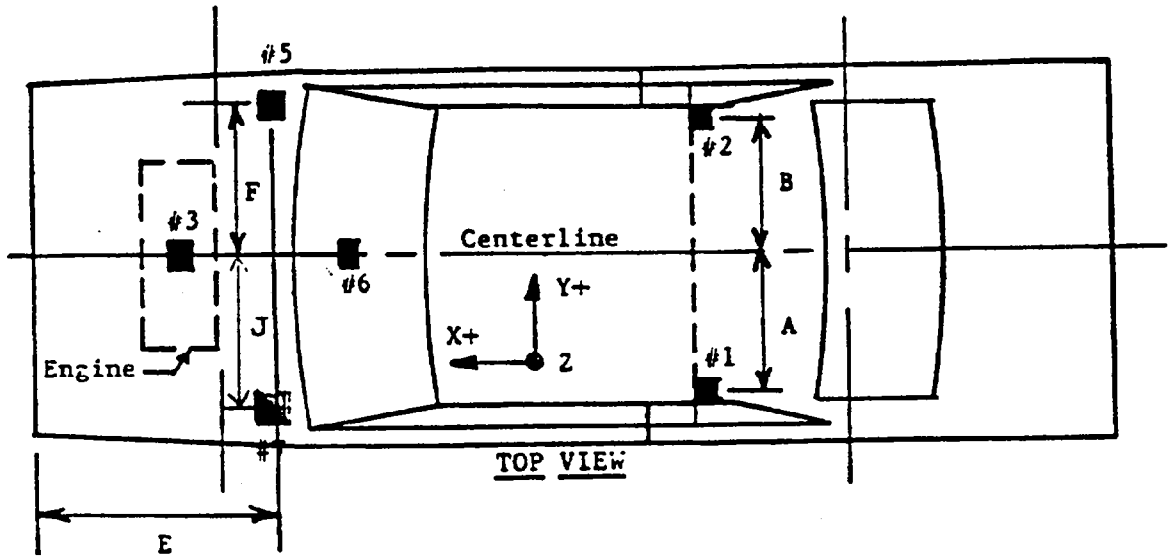
| CAMERA NO. | VIEW | CAMERA POSITIONS (in.)* | | | ANGLE (deg) | FILM PLANE TO HEAD TARGET | LENS (mm) | SPEED (fps) |
|------------|-------------------------|-------------------------|-------|-------|-------------|---------------------------|------------|-------------|
| | | X | Y | Z | | | | |
| 1 | Left Side View | 338.0 | 250.5 | 59.6 | 0.0 | 305.5 | 15-70 zoom | 24 |
| 2 | Right Side View | -237.6 | 105.2 | 49.4 | -3.5 | 262.5 | 13 | 500 |
| 3 | Left Side View | 364.4 | 40.5 | 43.0 | -4.0 | 330.2 | 13 | 650 |
| 4 | Overhead | 0.0 | -21.0 | 197.7 | -70.0 | 81.0 | 13 | 700 |
| 5 | Pit-Engine | 0.0 | 50.3 | -57.1 | -12.0 | 28.1 | 13 | 500 |
| 6 | Pit-Fuel Tank | N.R. | N.R. | N.R. | N.R. | N.R. | N.R. | N.R. |
| 7 | Front-Passenger | -13.9 | -13.0 | 103.4 | -53.0 | 80.5 | 16 | 600 |
| 8 | Front-Driver | 11.5 | -13.0 | 103.5 | -50.0 | 75.6 | 16 | 600 |
| 9 | Left Side-Driver | 84.2 | 98.8 | 80.0 | -20.0 | 58.5 | 16 | 800 |
| 10 | Right Side-Passenger | -87.5 | 96.2 | 78.8 | -20.0 | 116.2 | 16 | 600 |
| 11 | Right Side-'A' Post | -175.2 | 39.0 | 55.2 | -0.5 | 236.8 | 28 | None |
| 12 | Left Side-'A' Post | 336.5 | 1.8 | 54.3 | 0.0 | 359.5 | 50 | 700 |
| 13 | Onboard-Left Side | 13.5 | 108.0 | 46.8 | 4.5 | 34.2 | 13 | 600 |
| 14 | Onboard-Right Side | -13.5 | 108.0 | 46.8 | 1.5 | 21.4 | 13 | 600 |
| 15 | Left Side-Steering Col. | 370.2 | 74.5 | 132.0 | -20.0 | 333.4 | 28 | 600 |
| 16 | Left Side-Steering Col. | 370.2 | 74.5 | 109.3 | -11.0 | 333.4 | 28 | 600 |
| 17 | Right Side-Passenger | -148.2 | 47.2 | 51.8 | -1.5 | 172.9 | 16 | None |

* X = film plane to monorail centerline
 Y = film plane to barrier face
 Z = film plane to ground

Data Table No. 8 (Cont'd) Camera Location Data



Data Table No. 9 Vehicle Accelerometer Location and Data Summary



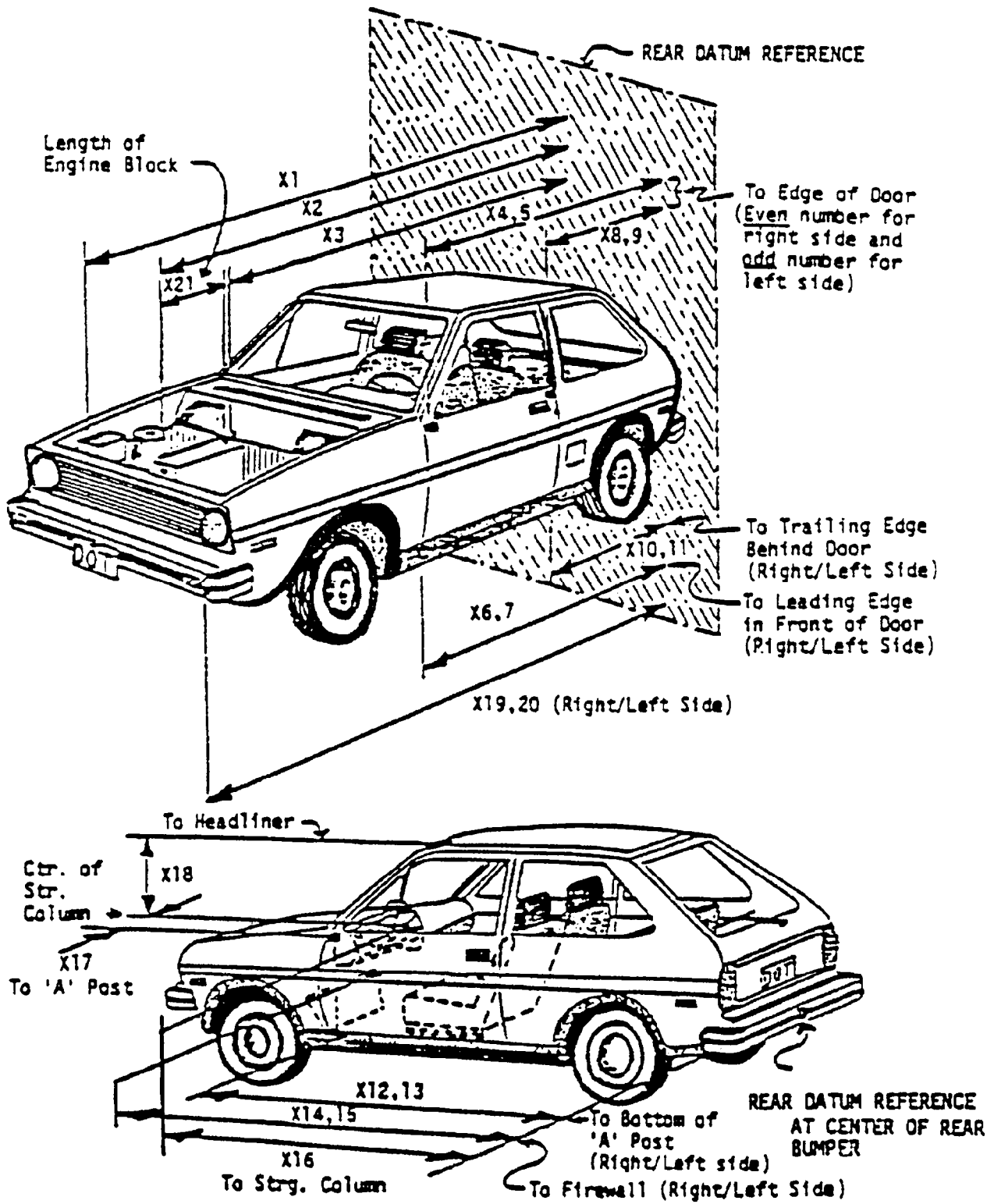
| Dimension | Length (in.) |
|-----------|--------------|
| A | 18.1 |
| B | 18.8 |
| C | 21.0 |
| D | 34.4 |
| E | 35.0 |
| F | 20.5 |
| G | 55.1 |
| H | 89.7 |
| J | 20.5 |

| Loc. No. | Description | Maximum Value | | | |
|----------|---------------------------------|---------------|-------|-------|-------|
| | | X- | msec. | X+ | msec. |
| 1 | Rear seat X-member @ Left Side | -127.1 | 60.0 | 50.2 | 71.8 |
| 2 | Rear seat X-member @ Right Side | -122.8 | 63.8 | 90.3 | 65.8 |
| 3 | Top of Engine Block | -290.2 | 68.8 | 222.8 | 59.5 |
| 4 | Bottom of Engine | -311.6 | 71.8 | 270.4 | 68.6 |
| 5 | Disc Brake Caliper @ Right Side | -280.1 | 59.4 | 171.1 | 76.4 |
| 6 | Instrument Panel | -98.8 | 104.1 | 43.2 | 100.1 |
| 7 | Disc Brake Caliper @ Left Side | -323.6 | 60.2 | 156.8 | 68.2 |

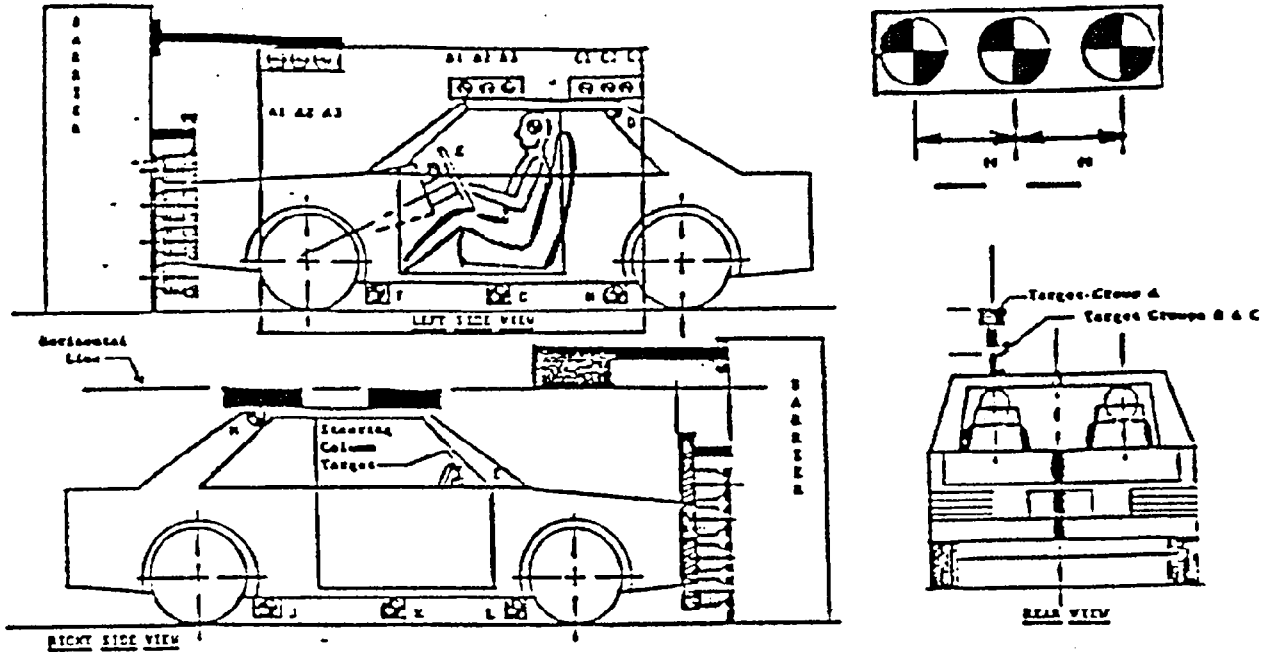
Data Table No. 10 Test Vehicle Measurements

| NO. | MEASUREMENT DESCRIPTION: | Pre-Test (in.) | Post-Test (in.) | Diff. (in.) |
|-----|--|----------------|-----------------|-------------|
| X1 | Total Length of Test Vehicle at Centerline | 171.4 | 156.5 | 14.9 |
| X2 | Rear Surface of Vehicle to Front of Engine | 157.8 | 150.5 | 7.3 |
| X3 | Rear Surface of Vehicle to Firewall | 135.6 | 133.7 | 1.9 |
| X4 | Rear Surface to Upr. Leading Edge of Right Door | 127.6 | 127.2 | 0.4 |
| X5 | Rear Surface to Upr. Leading Edge of Left Door | 127.6 | 126.8 | 0.8 |
| X6 | Rear Surface to Lwr. Leading Edge of Right Door | 125.8 | 124.6 | 1.2 |
| X7 | Rear Surface to Lwr. Leading Edge of Left Door | 125.9 | 124.1 | 1.8 |
| X8 | Rear Surface to Upr. Trailing Edge of Right Door | 82.4 | 82.1 | 0.3 |
| X9 | Rear Surface to Upr. Trailing Edge of Left Door | 82.4 | 82.0 | 0.4 |
| X10 | Rear Surface to Lwr. Trailing Edge of Right Door | 81.4 | 80.3 | 1.1 |
| X11 | Rear Surface to Lwr. Trailing Edge of Left Door | 81.4 | 79.8 | 1.6 |
| X12 | Rear Surface to Bottom of 'A' Post on Right Side | 125.4 | 125.0 | 0.4 |
| X13 | Rear Surface to Bottom of 'A' Post on Left Side | 125.8 | 124.2 | 1.6 |
| X14 | Rear Surface to Firewall on Right Side | 134.6 | 135.5 | -0.9 |
| X15 | Rear Surface to Firewall on Left Side | 135.3 | 135.5 | -0.2 |
| X16 | Rear Surface to Steering Column | 109.0 | 107.5 | 1.5 |
| X17 | Center of Steering Column to 'A' Post | 14.4 | 12.0 | 2.4 |
| X18 | Center of Steering Column to Headlining | 17.7 | 17.2 | 0.5 |
| X19 | Rear Surface to Right Side of Front Bumper | 170.3 | 155.3 | 15.0 |
| X20 | Rear Surface to Left Side of Front Bumper | 170.1 | 155.3 | 14.8 |
| X21 | Length of Engine Block | 19.0 | 19.0 | 0.0 |

Data Table No. 10 (Cont'd) Test Vehicle Measurements



Data Table No. 11 Pretest Vehicle Target Locations



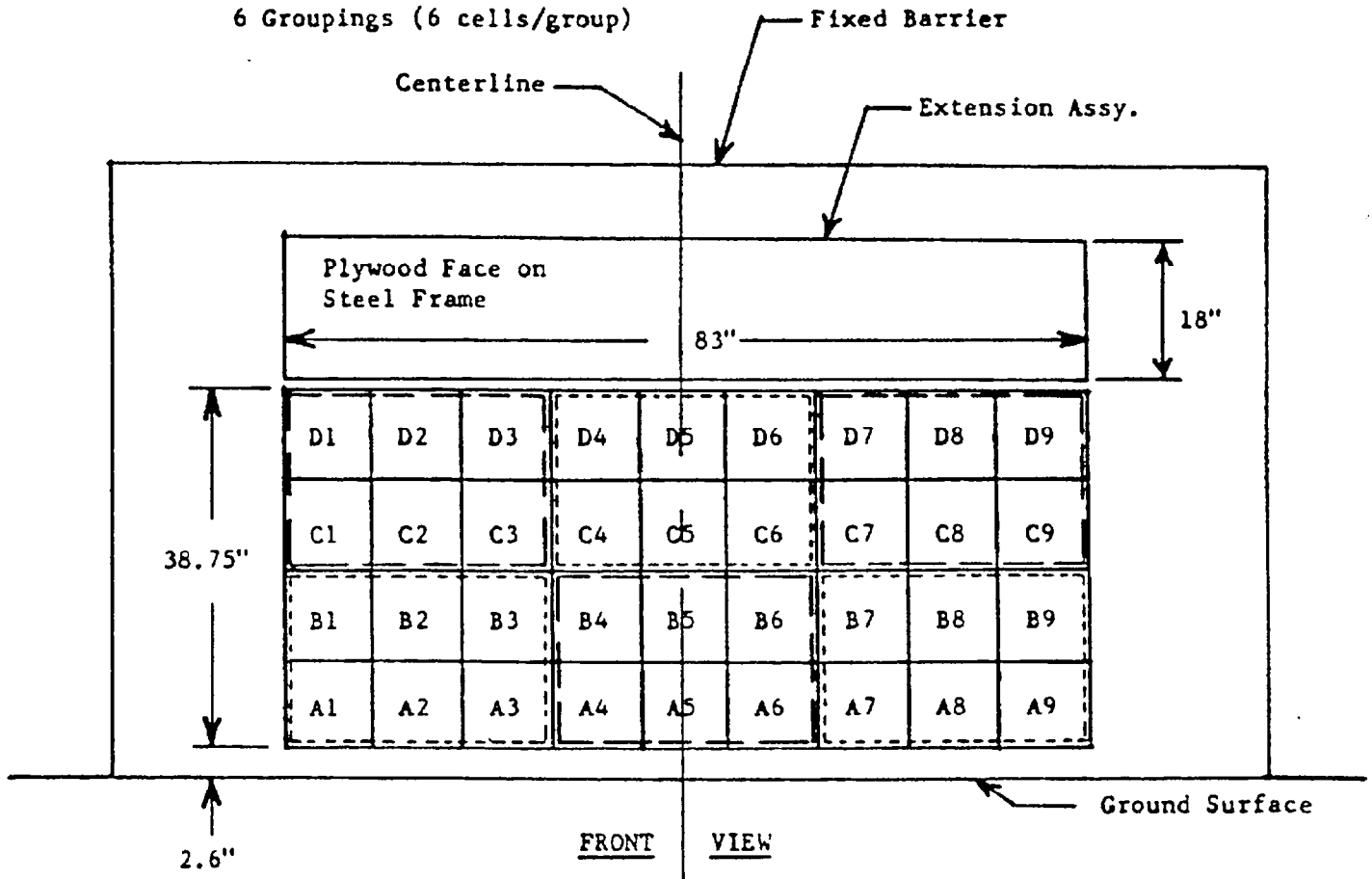
| BARRIER TARGETS | 'X' From Imag. Barrier Face Vertical Plane | 'Y' From Monorail C/L | 'Z' Above Ground |
|-----------------|--|--------------------------|---------------------|
| A1 | 80.3 | 20.8 | 70.5 |
| A2 | 84.3 | 20.8 | 70.5 |
| A3 | 88.3 | 20.8 | 70.5 |

| VEHICLE TARGETS | 'X' From Imag. Barrier Face Vertical Plane | 'Y' From Vehicle C/L | 'Z' Above Ground |
|-----------------|--|-------------------------|---------------------|
| B1 | 80.8 | 14.7 | 62.4 |
| B2 | 84.8 | 14.7 | 62.4 |
| B3 | 88.8 | 14.7 | 62.4 |
| C1 | 109.7 | 14.7 | 43.6 |
| C2 | 113.7 | 14.7 | 43.6 |
| C3 | 117.7 | 14.7 | 43.6 |
| D | N/A | N/A | N/A |
| E | 60.4 | 15.0 | 41.6 |
| F | 47.0 | 29.7 | 11.3 |
| G | 80.5 | 30.0 | 11.7 |
| H | 114.1 | 29.9 | 12.4 |
| J | 114.0 | 30.0 | 11.0 |
| K | 80.5 | 30.0 | 11.5 |
| L | 47.6 | 29.7 | 12.1 |
| M | N/A | N/A | N/A |

NOTE: Diameter of all photo targets is 5" except for target 'E' which is "3".

Data Table No. 12 Load Cell Locations on Fixed Barrier

- 36 Load Cells
- 4 Rows
- 9 Columns
- 6 Groupings (6 cells/group)



6 GROUPINGS OF 6 LOAD CELLS EACH

| | | |
|------------|------------|------------|
| C1 thru D3 | C4 thru D6 | C7 thru D9 |
| A1 thru B3 | A4 thru B6 | A7 thru B9 |

- DATA REQUIREMENTS:**
- (1) Data from 36 individual load cells
 - (2) Total or Sum of 36 individual load cells
 - (3) Data from 6 Groupings shown above (6 cells/group)

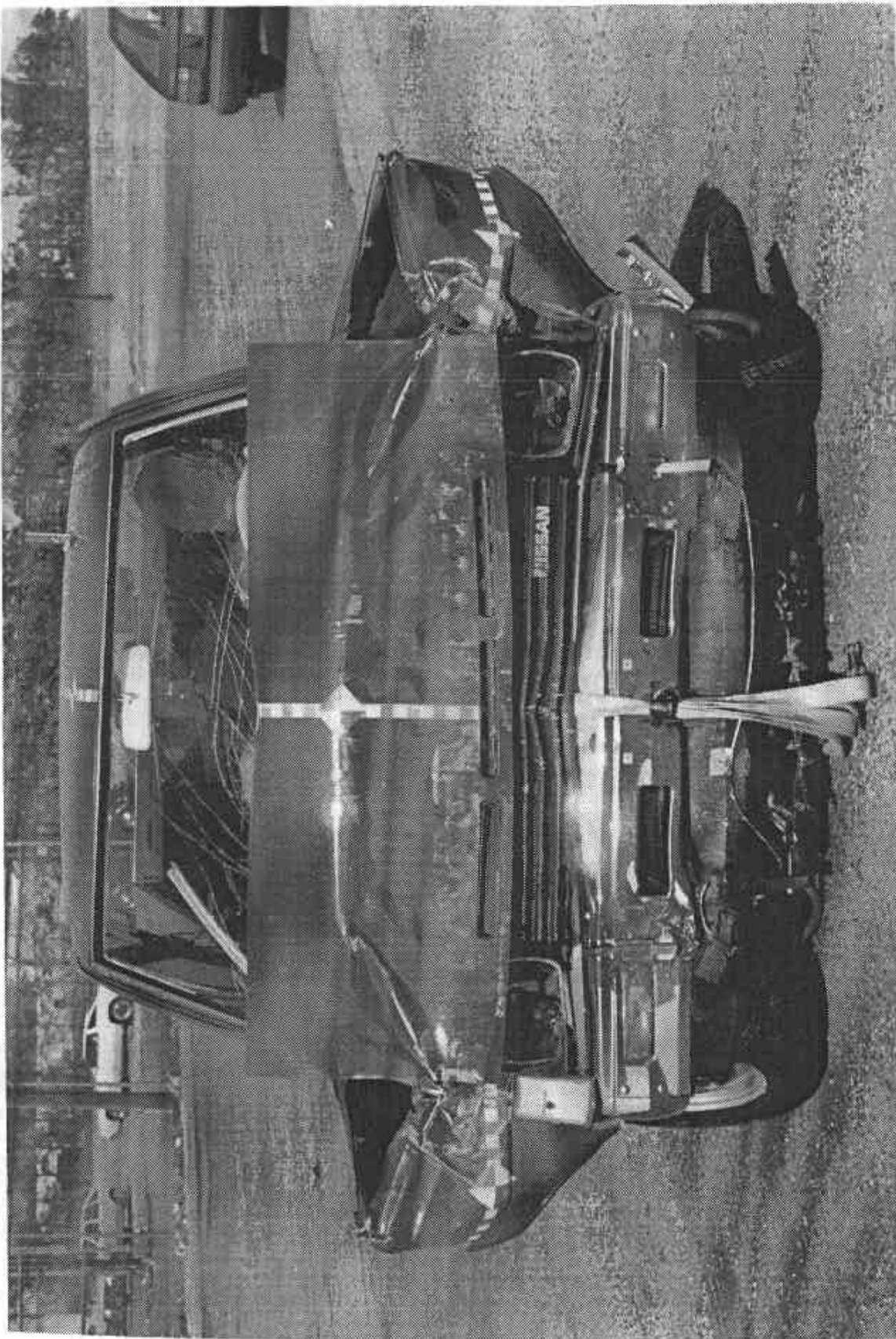
APPENDIX A

PHOTOGRAPHS

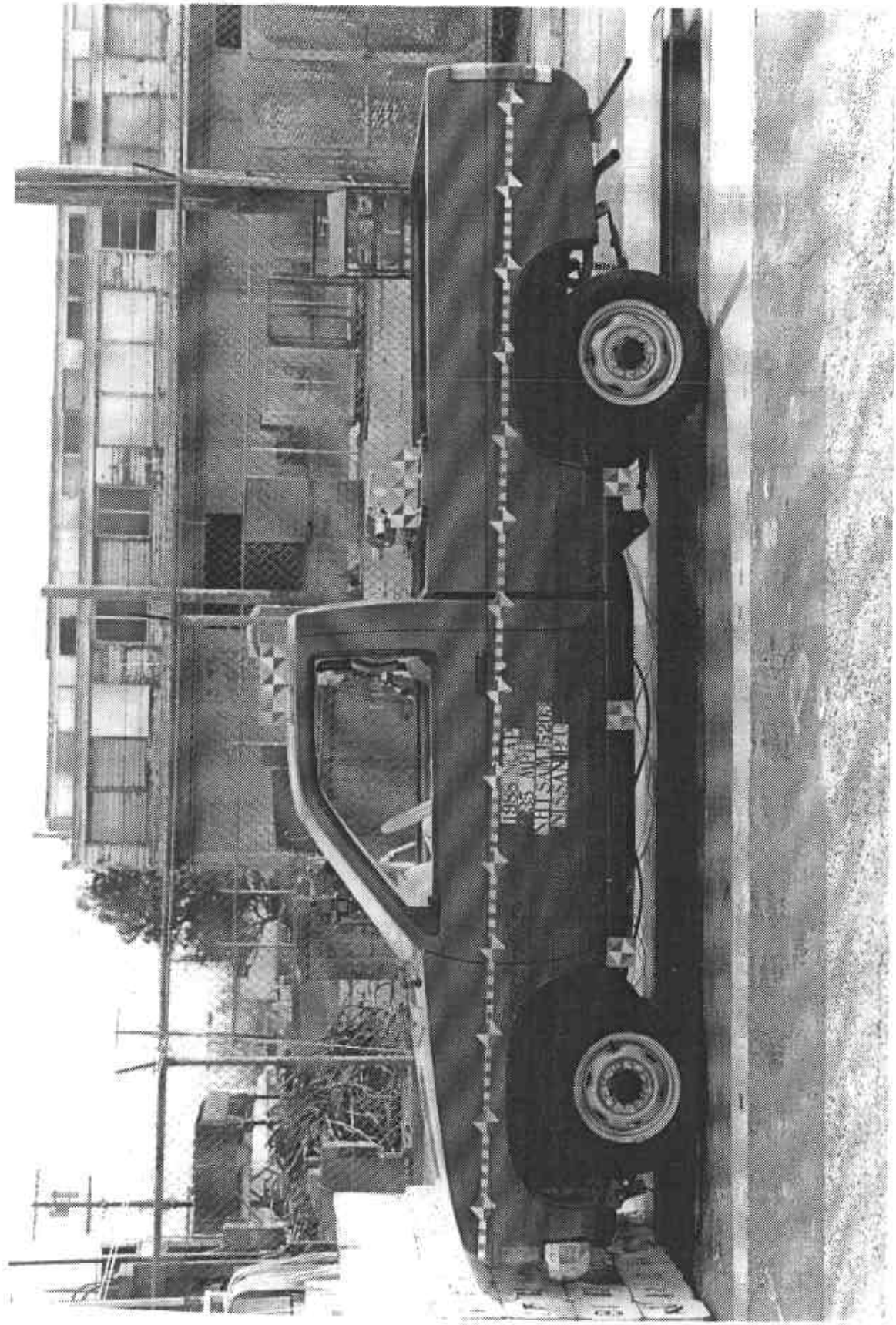
PRETEST FRONT VIEW
POSTTEST FRONT VIEW
PRETEST LEFT SIDE VIEW
POSTTEST LEFT SIDE VIEW
PRETEST RIGHT SIDE VIEW
POSTTEST RIGHT SIDE VIEW
PRETEST RIGHT FRONT 3/4 VIEW
POSTTEST RIGHT FRONT 3/4 VIEW
PRETEST LEFT REAR 3/4 VIEW
POSTTEST LEFT REAR 3/4 VIEW
PRETEST WINDSHIELD VIEW
POSTTEST WINDSHIELD VIEW
PRETEST ENGINE COMPARTMENT VIEW
POSTTEST ENGINE COMPARTMENT VIEW
PRETEST FRONT UNDERBODY VIEW
POSTTEST FRONT UNDERBODY VIEW
PRETEST REAR UNDERBODY VIEW
POSTTEST REAR UNDERBODY VIEW
PRETEST DRIVER DUMMY (ATD) POSITION VIEW
POSTTEST DRIVER DUMMY (ATD) POSITION VIEW
PRETEST PASSENGER DUMMY (ATD) POSITION VIEW
POSTTEST PASSENGER DUMMY (ATD) POSITION VIEW
PRETEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
POSTTEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
PRETEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
POSTTEST PASSENGER DUMMY (ATD) & VEHICLE INTERIOR VIEW (Door Open)
POSTTEST DRIVER DUMMY (ATD) STEERING COLUMN HUB/RIM CONTACT
POSTTEST DRIVER DUMMY (ATD) KNEE CONTACT AREA
POSTTEST PASSENGER DUMMY (ATD) HEAD/KNEE CONTACT
POSTTEST PASSENGER DUMMY (ATD) KNEE CONTACT



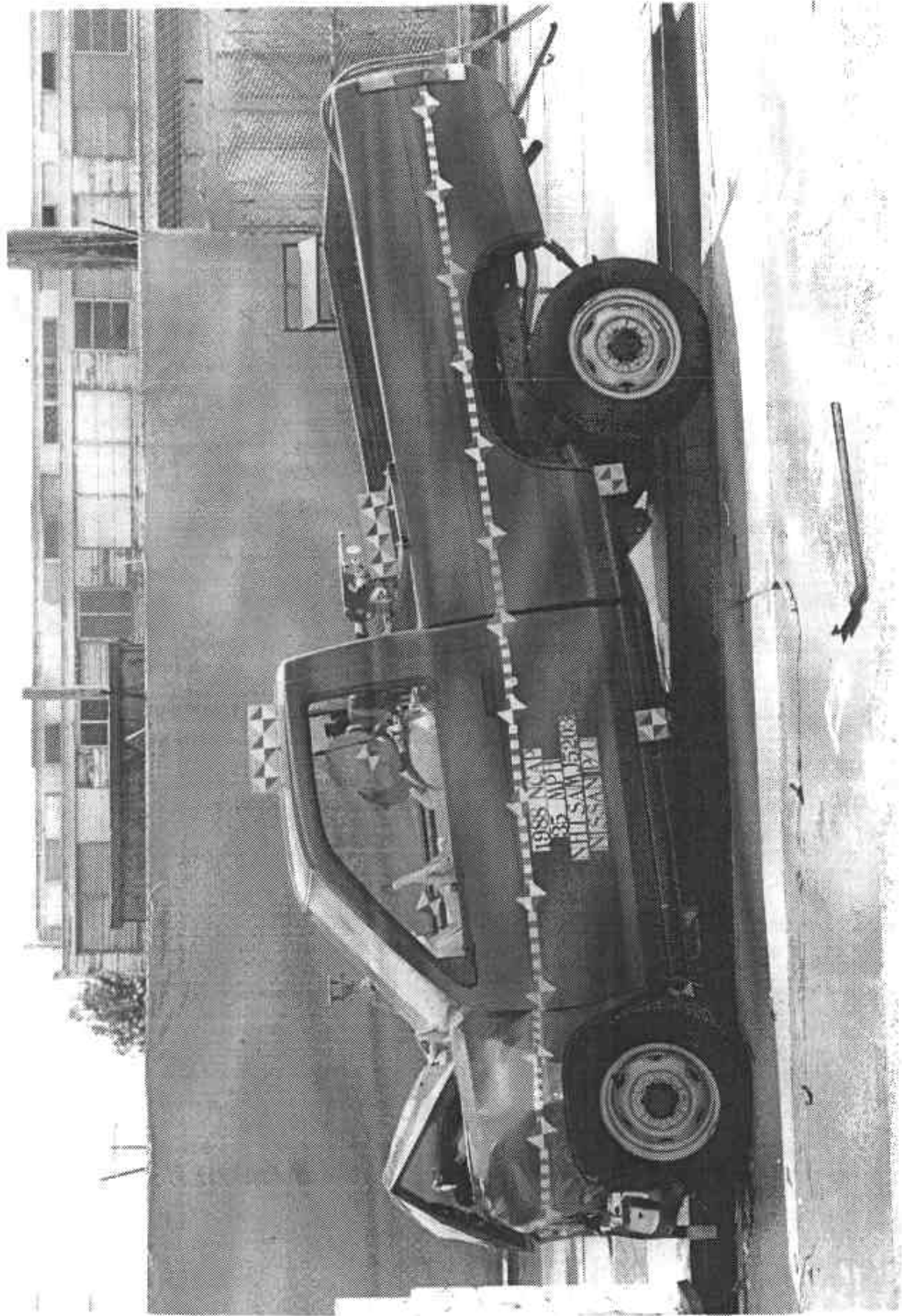
PRETEST FRONT VIEW



POSTTEST FRONT VIEW



PRETEST LEFT SIDE VIEW

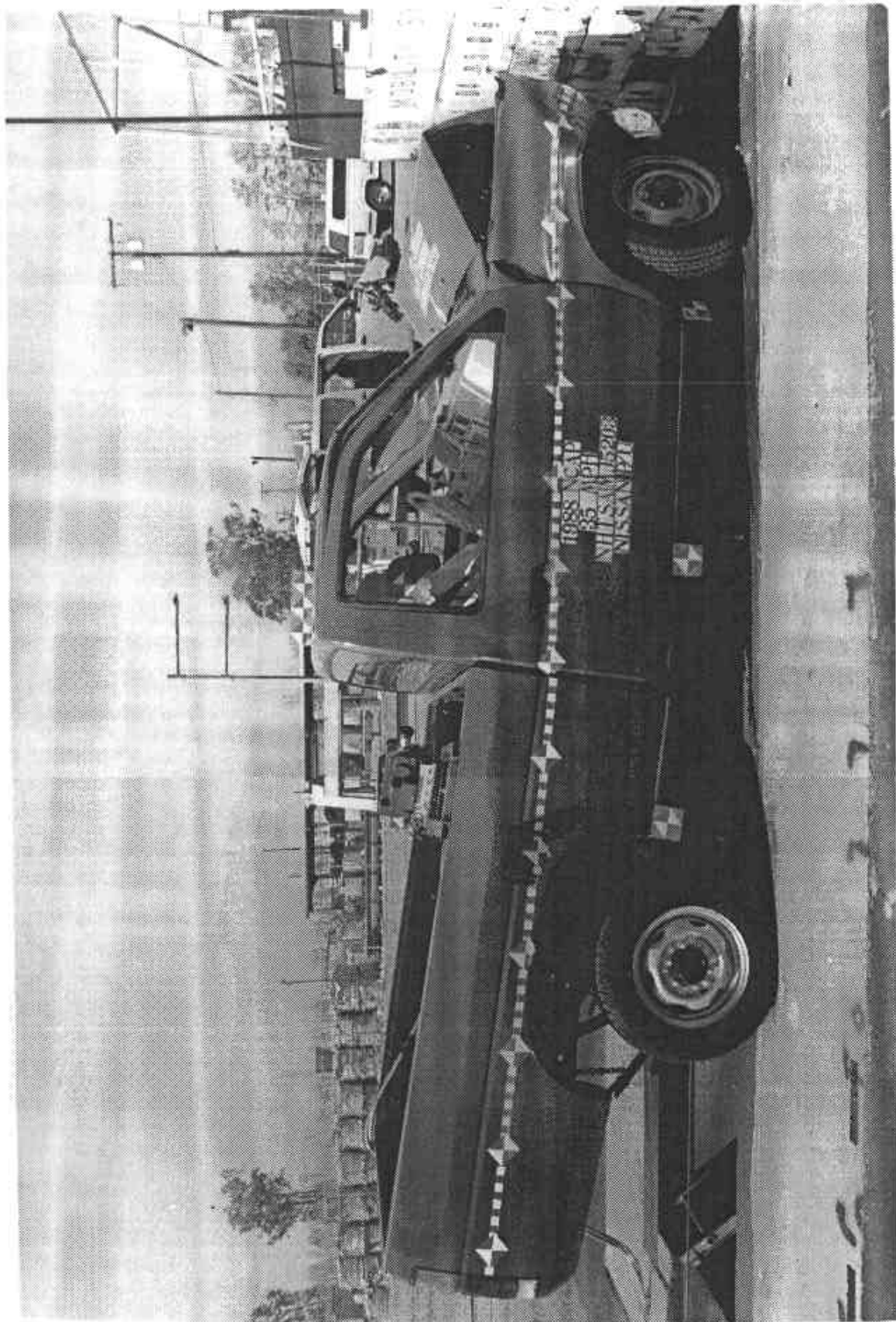


POSTTEST LEFT SIDE VIEW

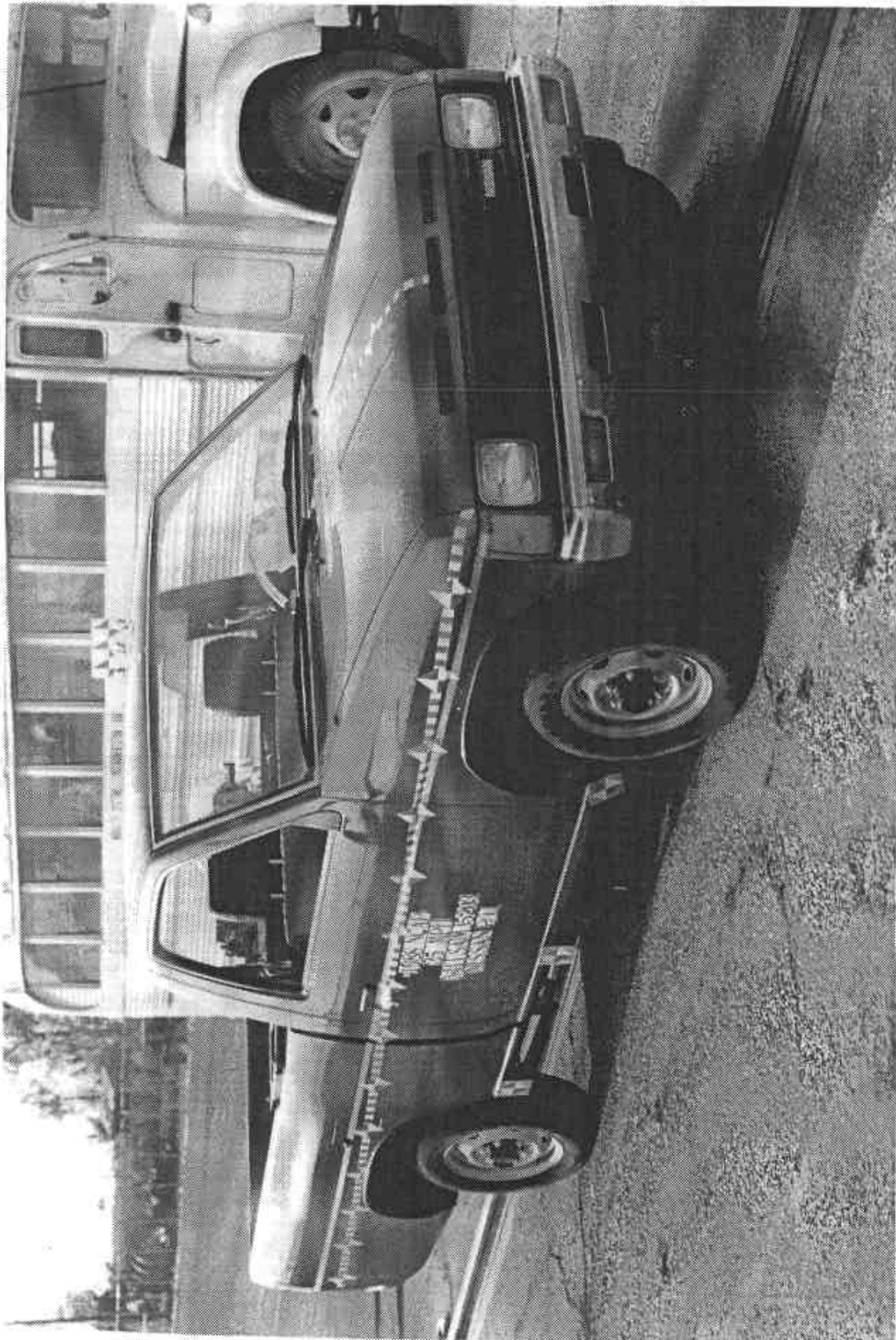


PHOTOGRAPH NOT AVAILABLE

PRETEST RIGHT SIDE VIEW



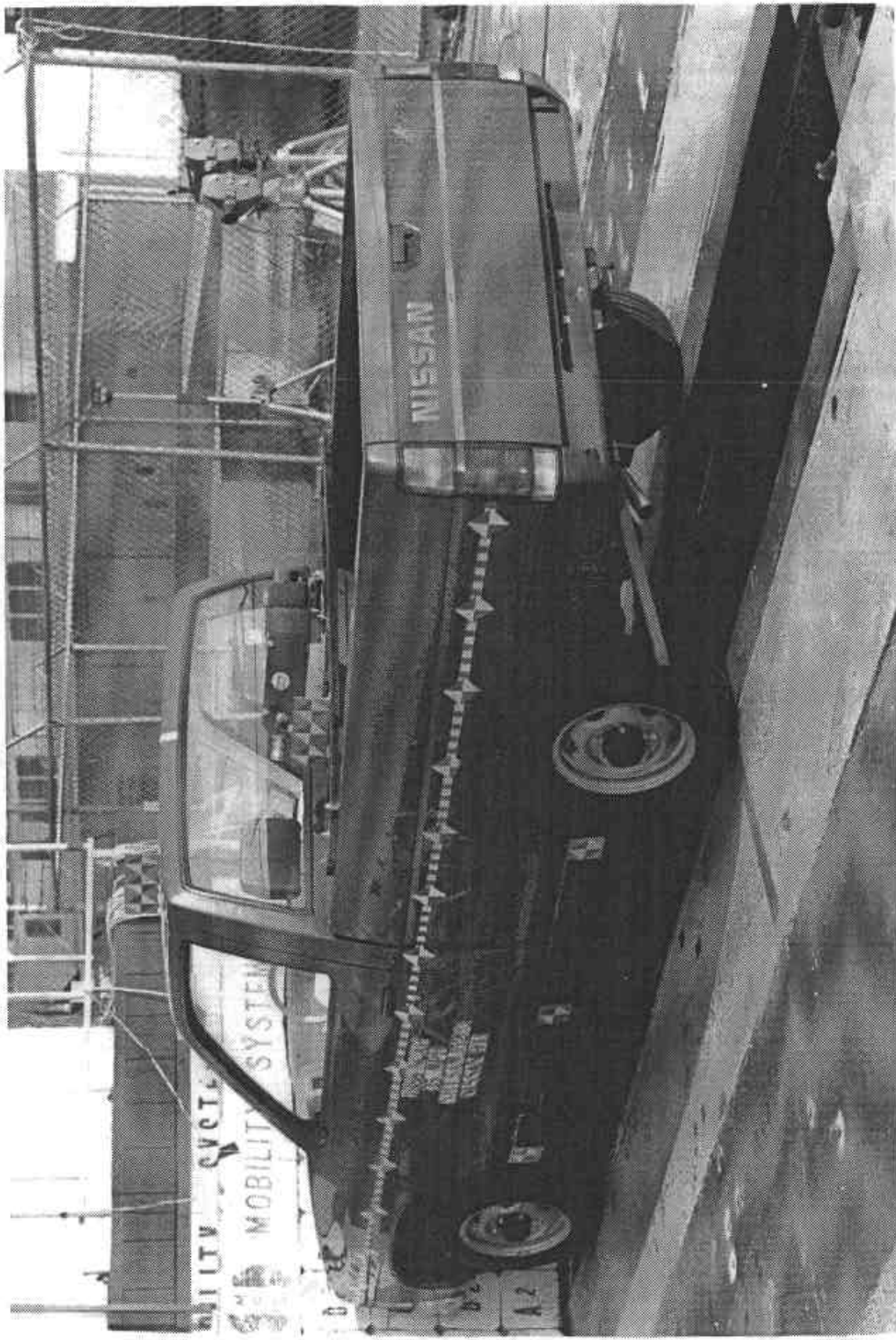
POSTTEST RIGHT SIDE VIEW



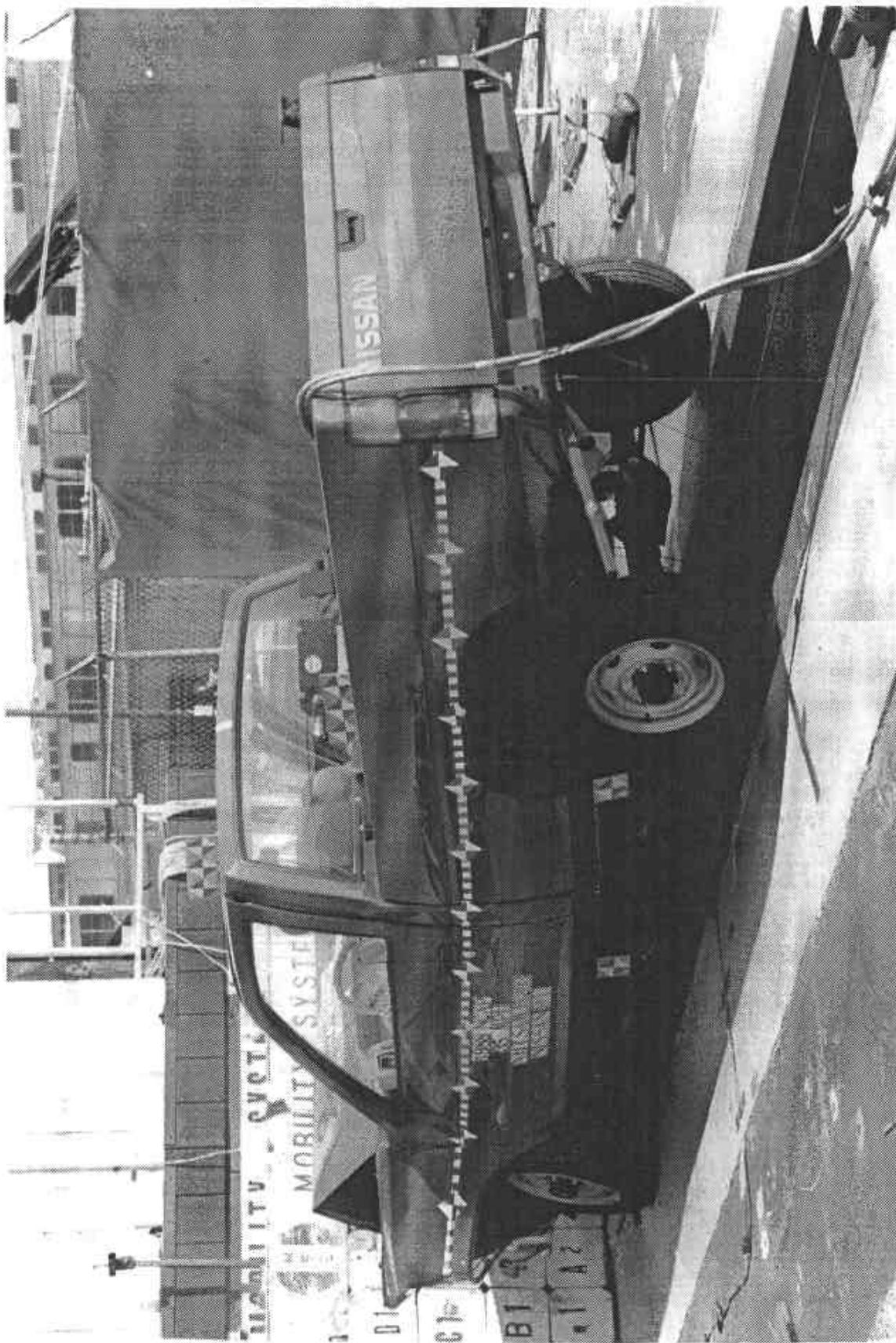
PRETEST RIGHT FRONT 3/4 VIEW



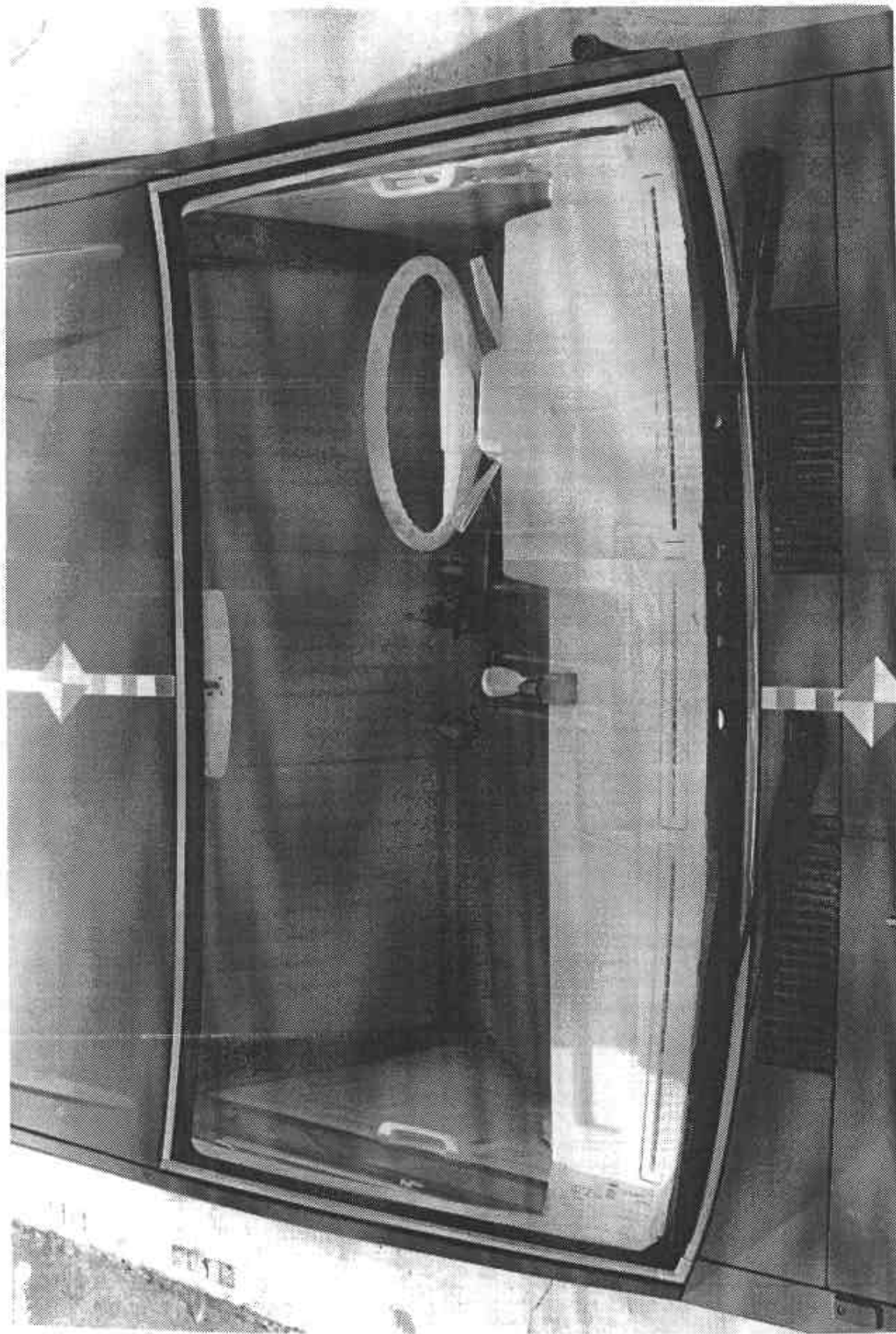
POSTTEST RIGHT FRONT 3/4 VIEW



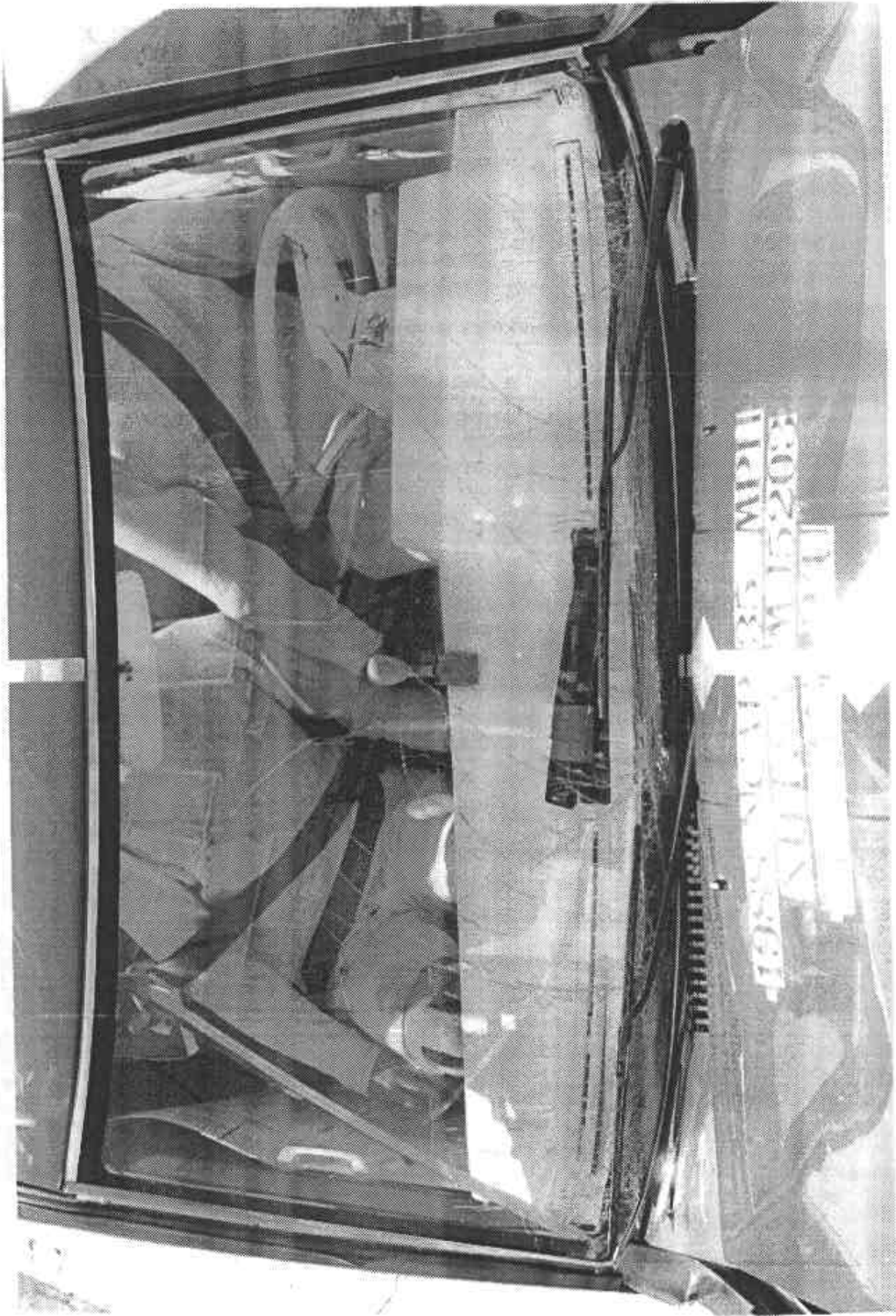
PRETEST LEFT REAR 3/4 VIEW



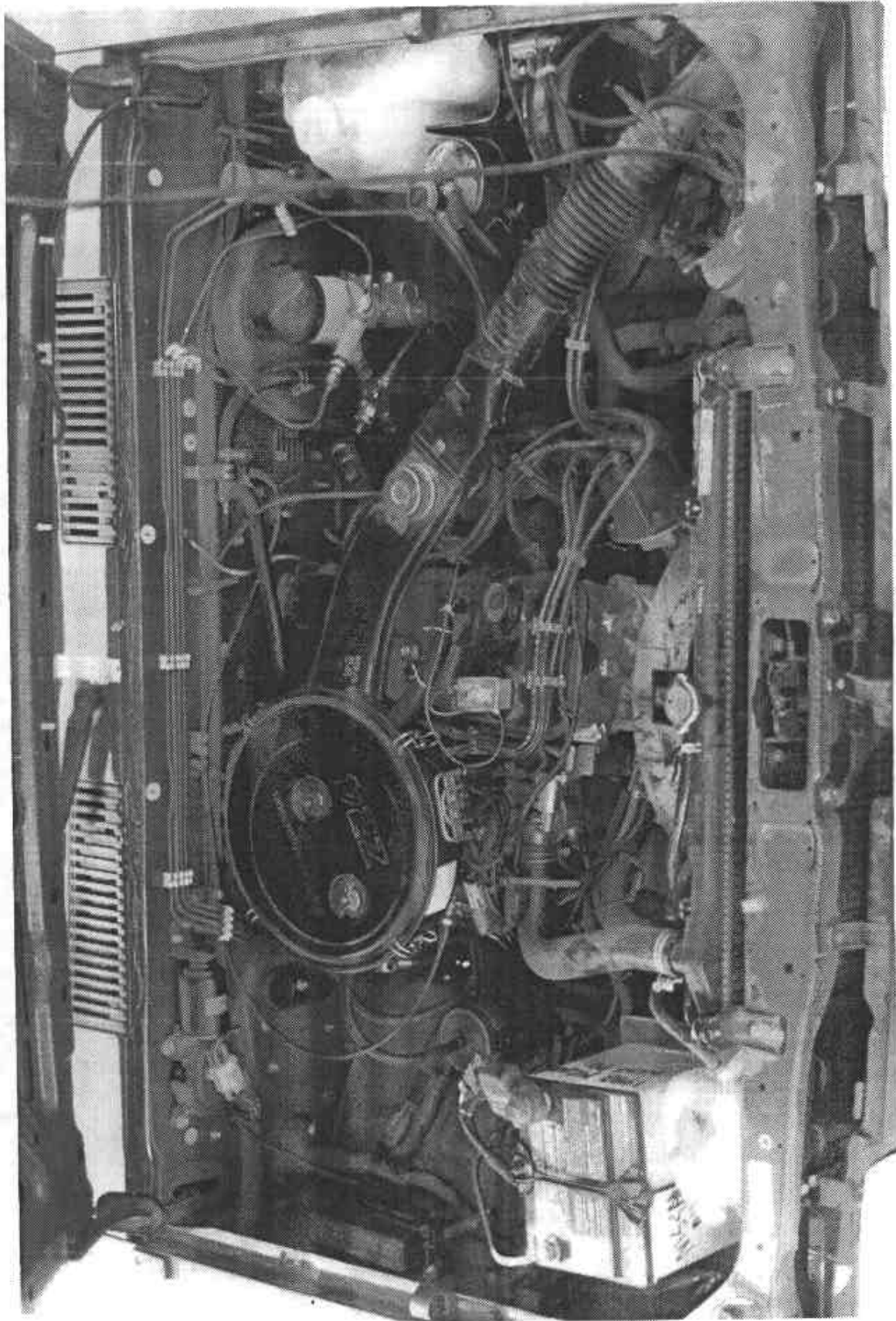
POSTTEST LEFT REAR 3/4 VIEW



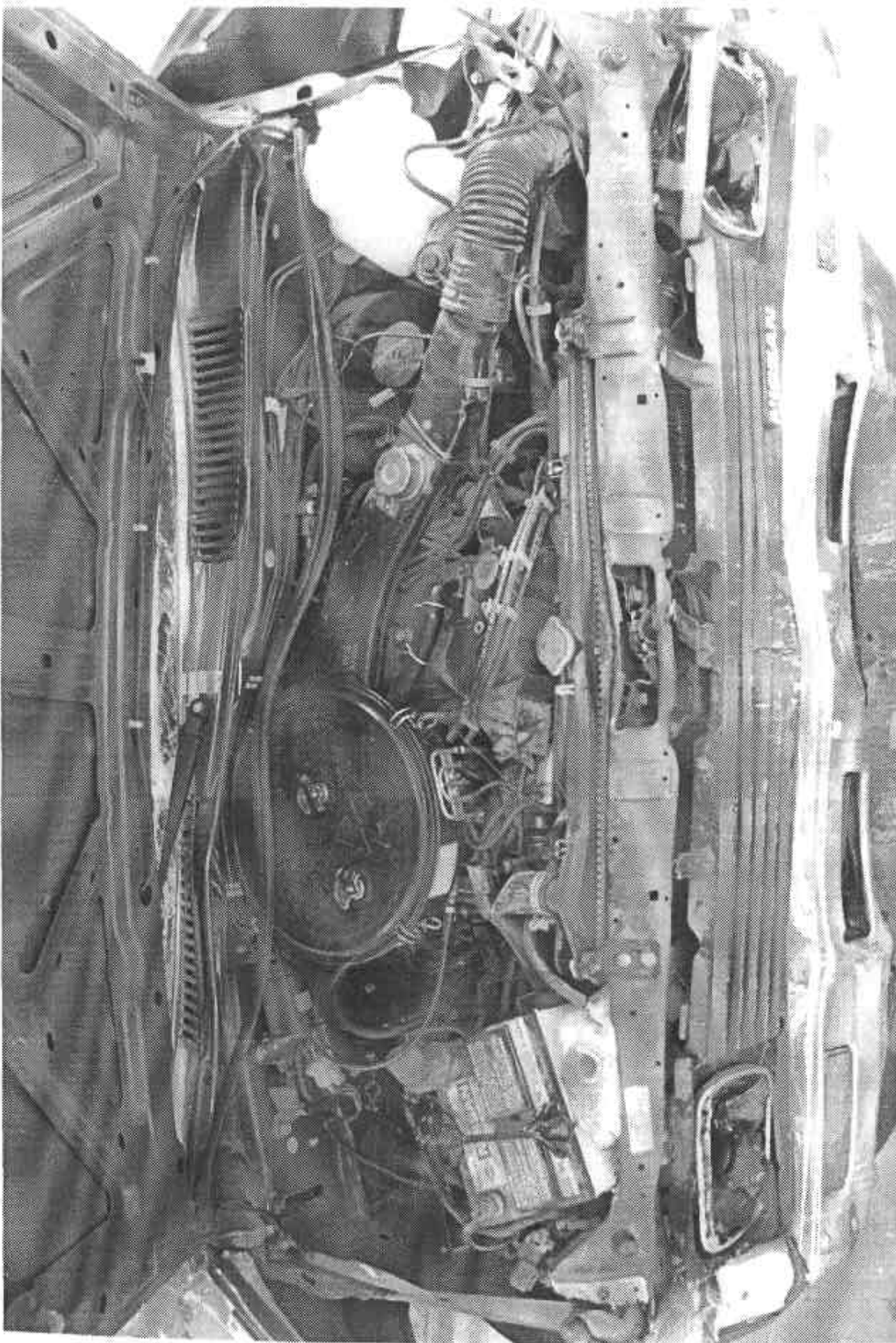
PRETEST WINDSHIELD VIEW



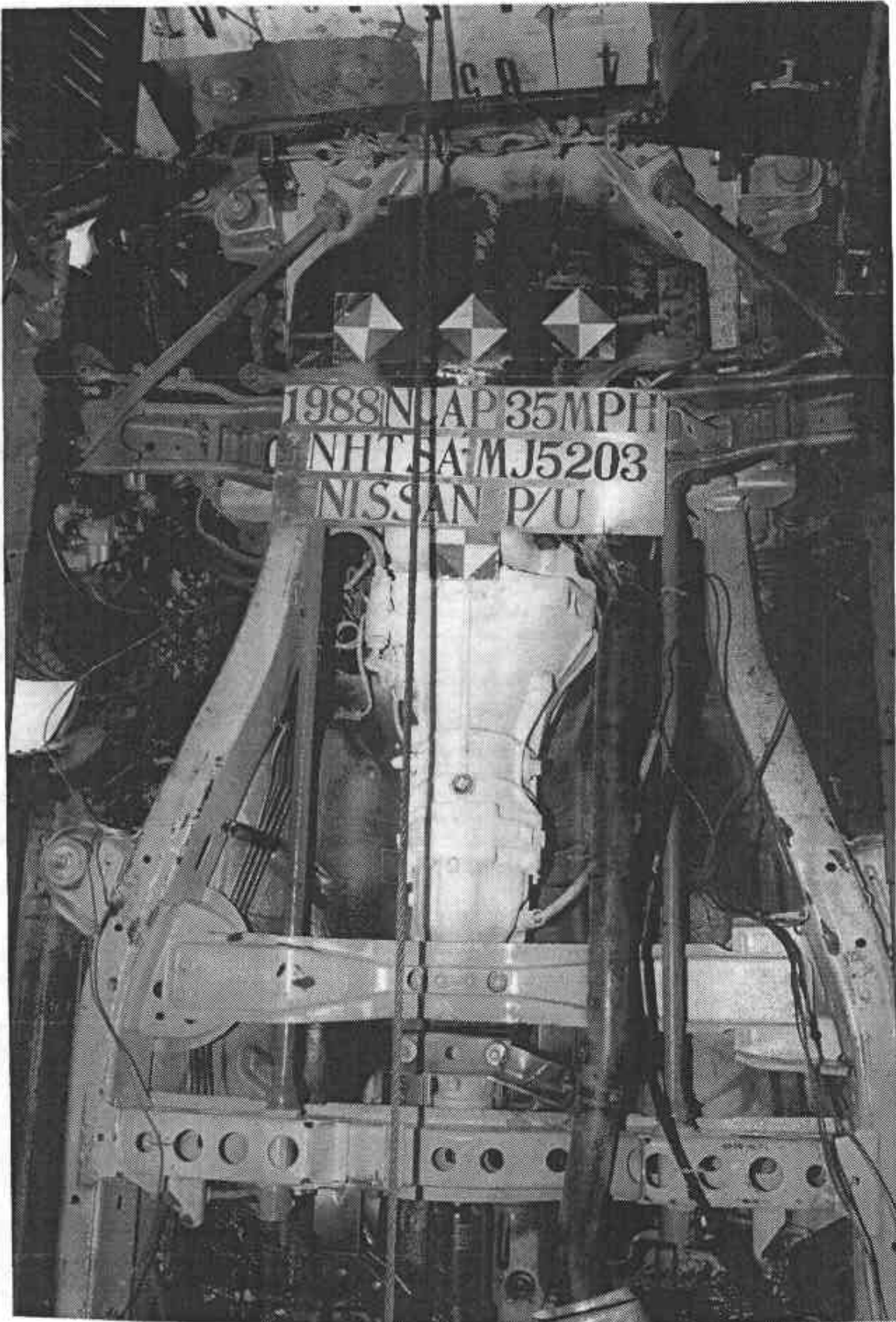
POSTTEST WINDSHIELD VIEW



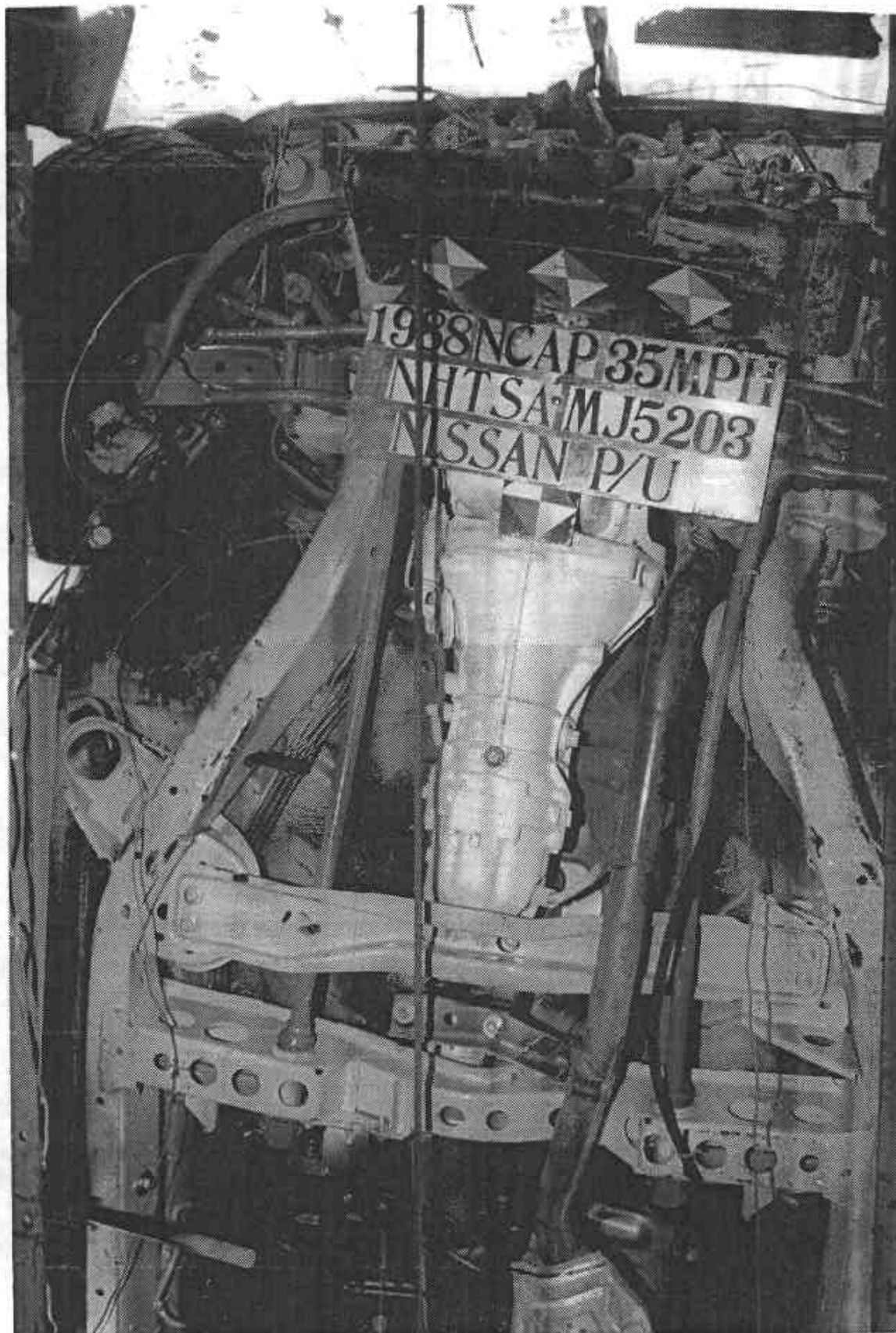
PRETEST ENGINE COMPARTMENT VIEW



POSTTEST ENGINE COMPARTMENT VIEW



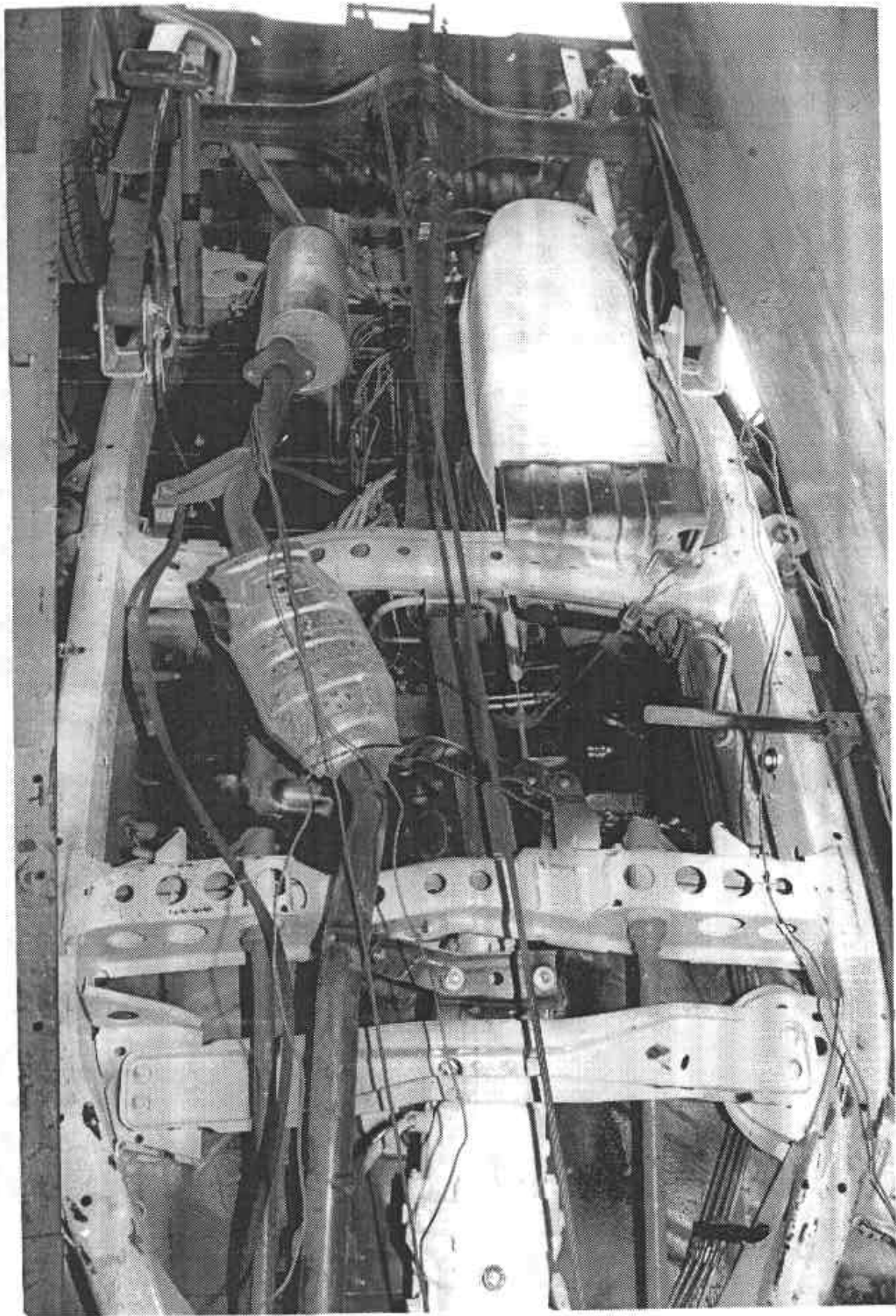
PRETEST FRONT UNDERBODY VIEW



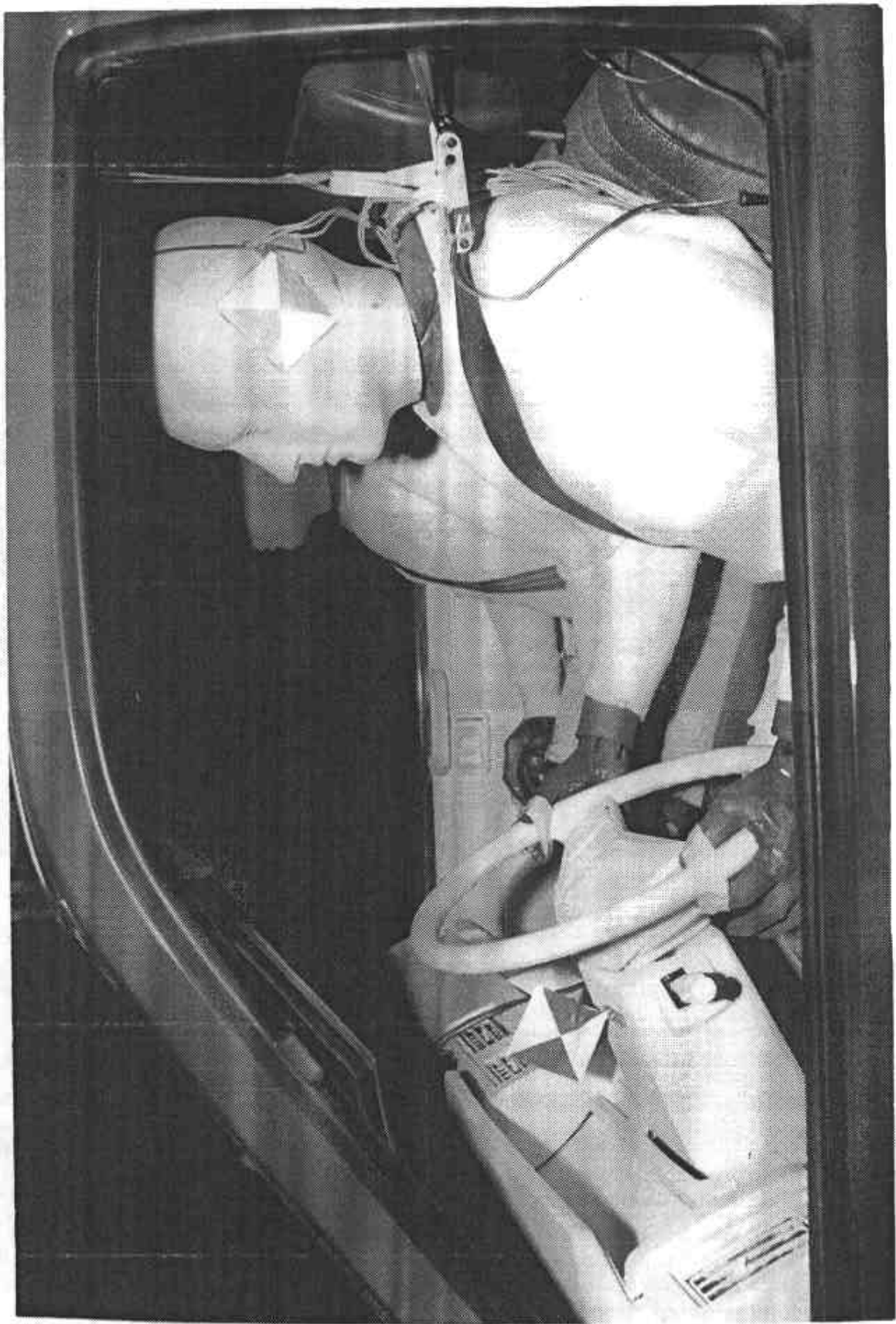
POSTTEST FRONT UNDERBODY VIEW



PRETEST REAR UNDERBODY VIEW



POSTTEST REAR UNDERBODY VIEW



PRETEST DRIVER DUMMY (ATD) POSITION VIEW



POSTTEST DRIVER DUMMY (ATD) POSITION VIEW



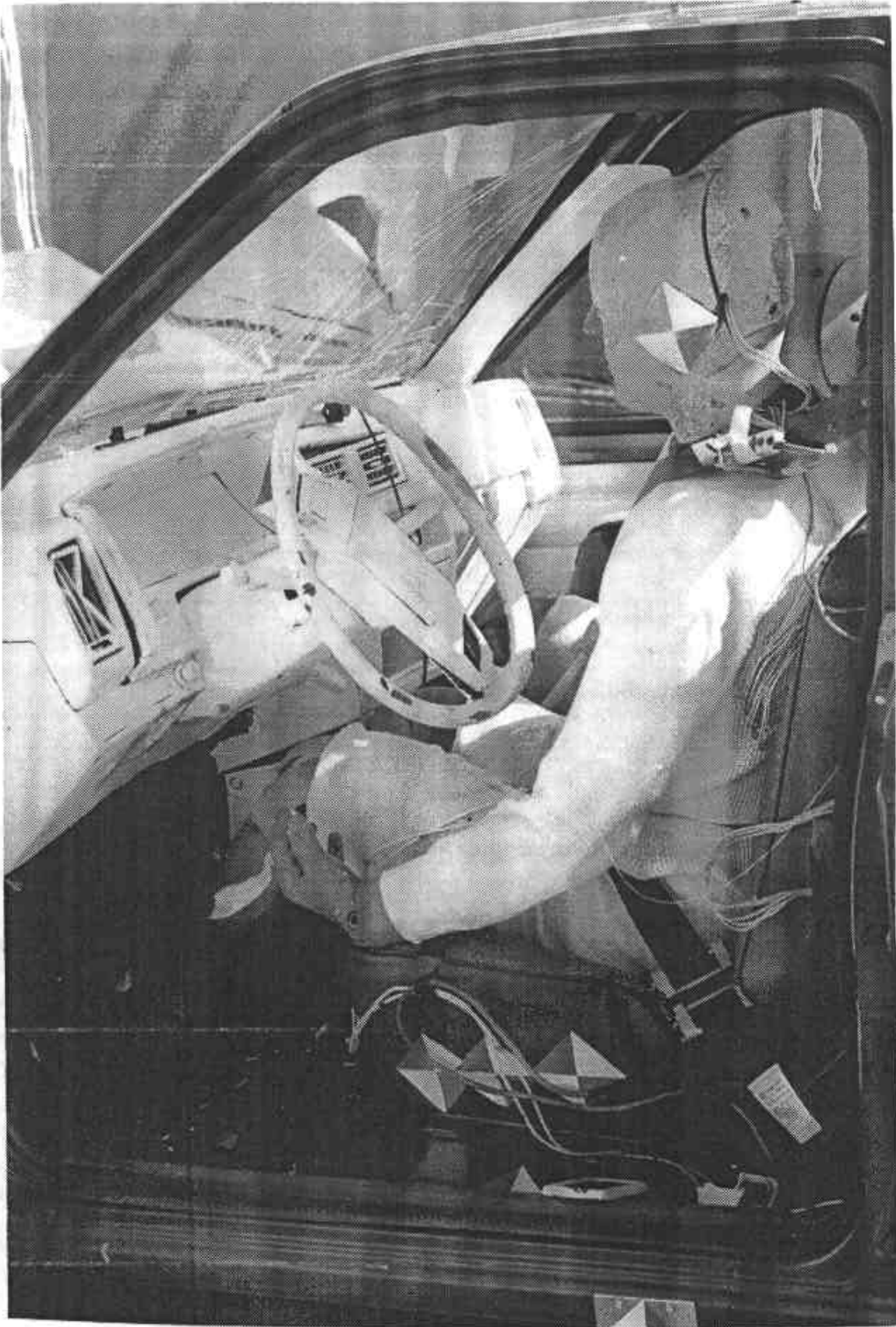
PRETEST PASSENGER DUMMY (ATD) POSITION VIEW



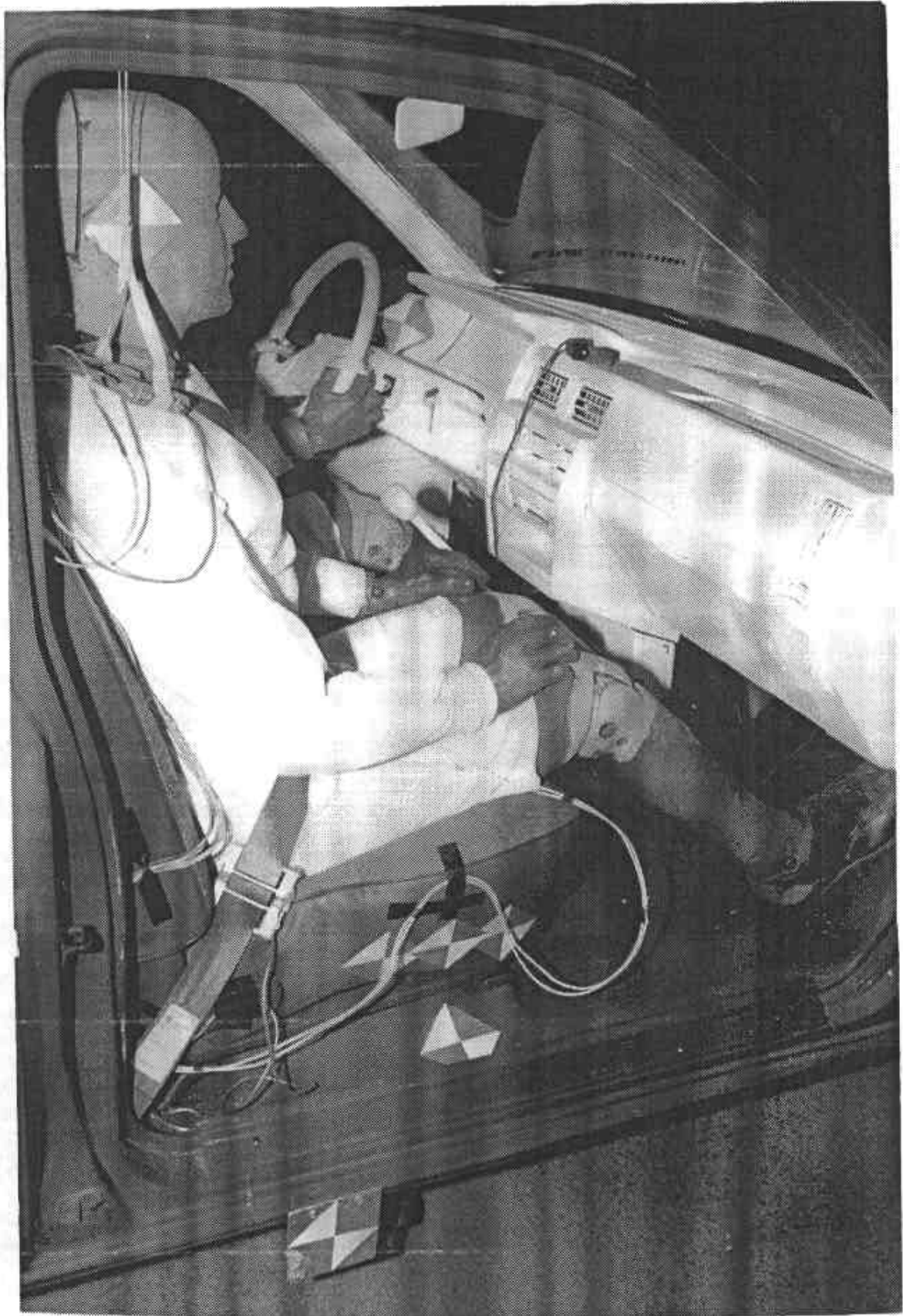
POSTTEST PASSENGER DUMMY (ATD) POSITION VIEW



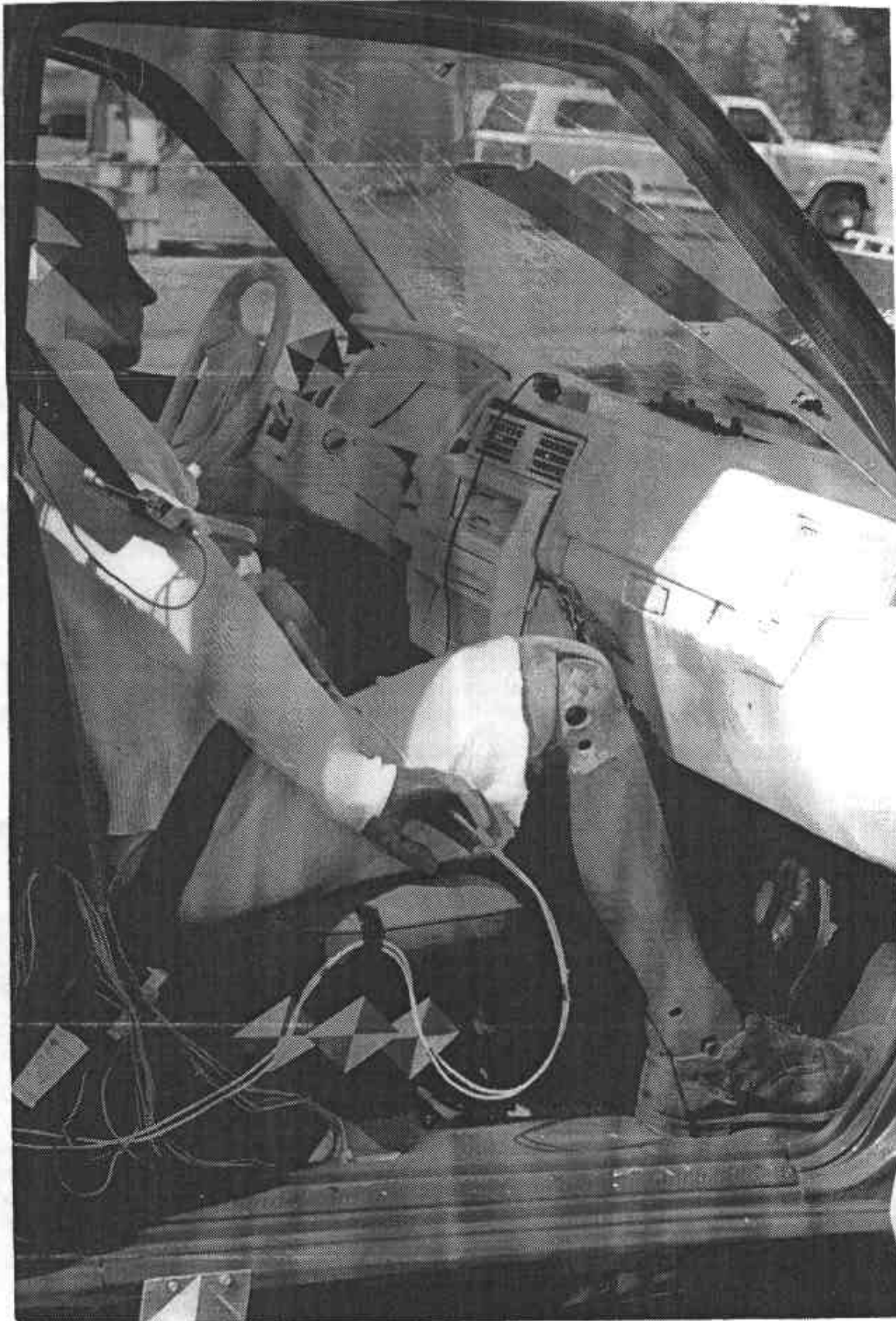
PRETEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



POSTTEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



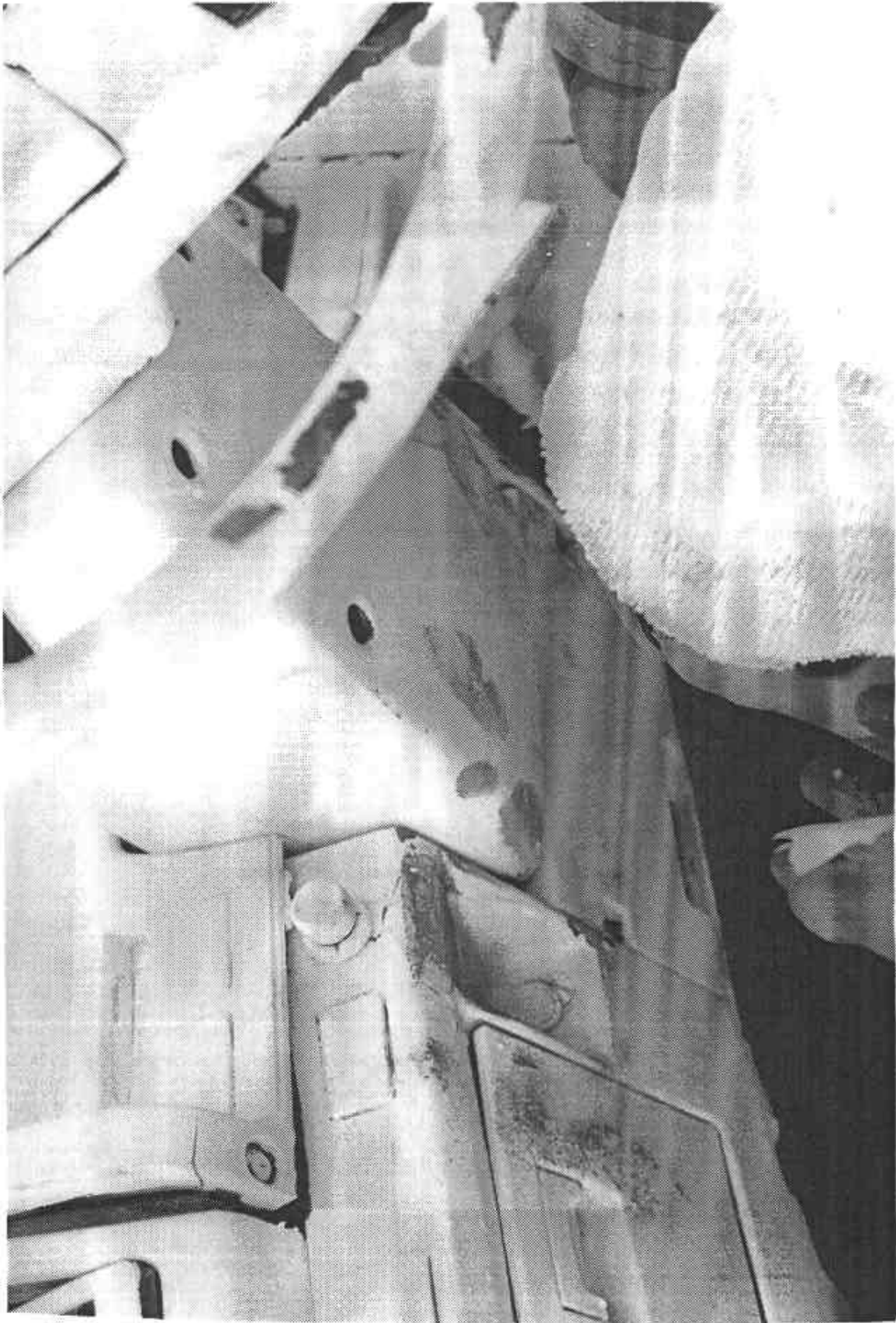
PRETEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



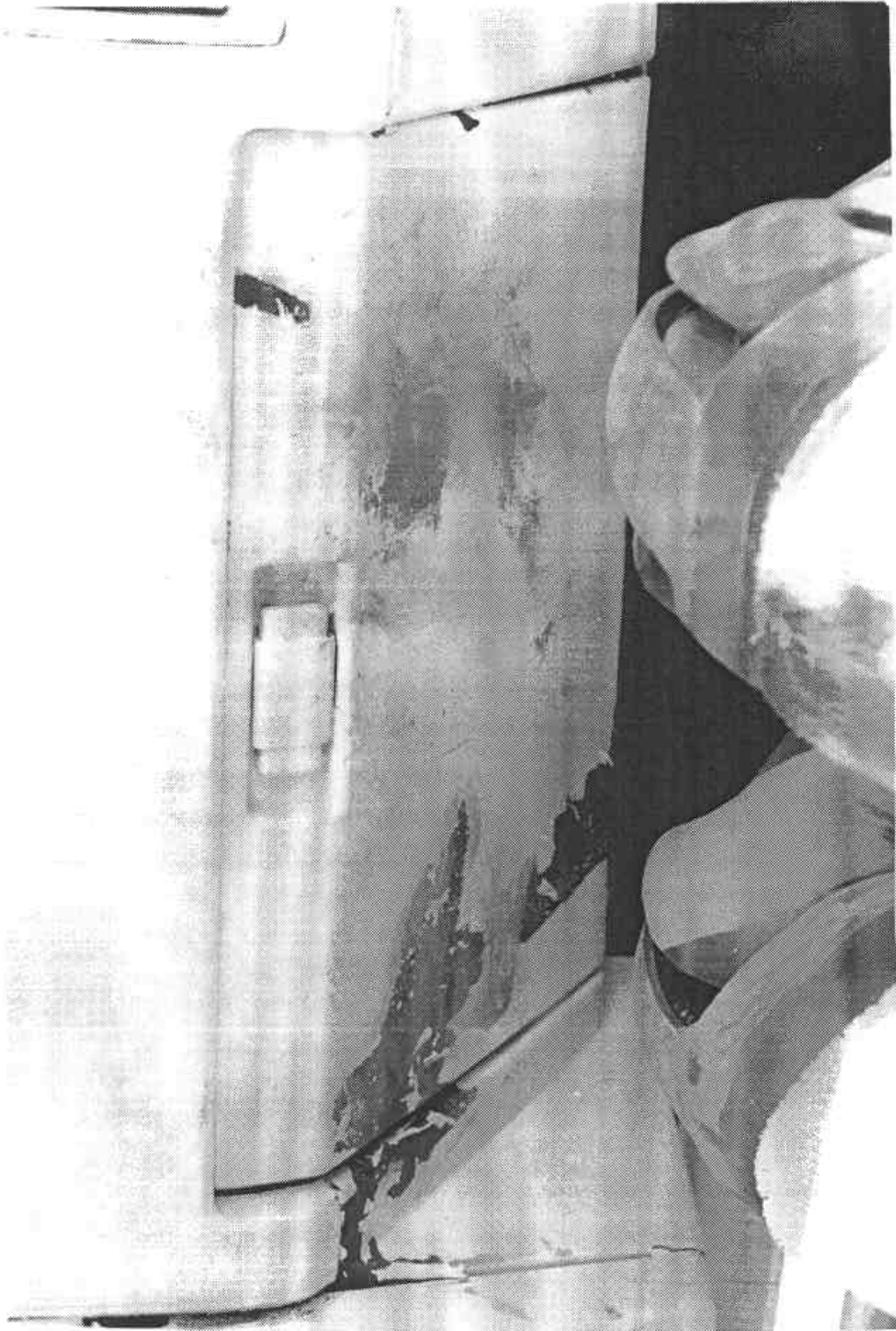
POSTTEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



POSTTEST STEERING COLUMN HUB/RIM CONTACT BY DRIVER DUMMY



POSTTEST DRIVER DUMMY KNEE CONTACT AREA



POSTTEST PASSENGER DUMMY KNEE CONTACT

APPENDIX B-1

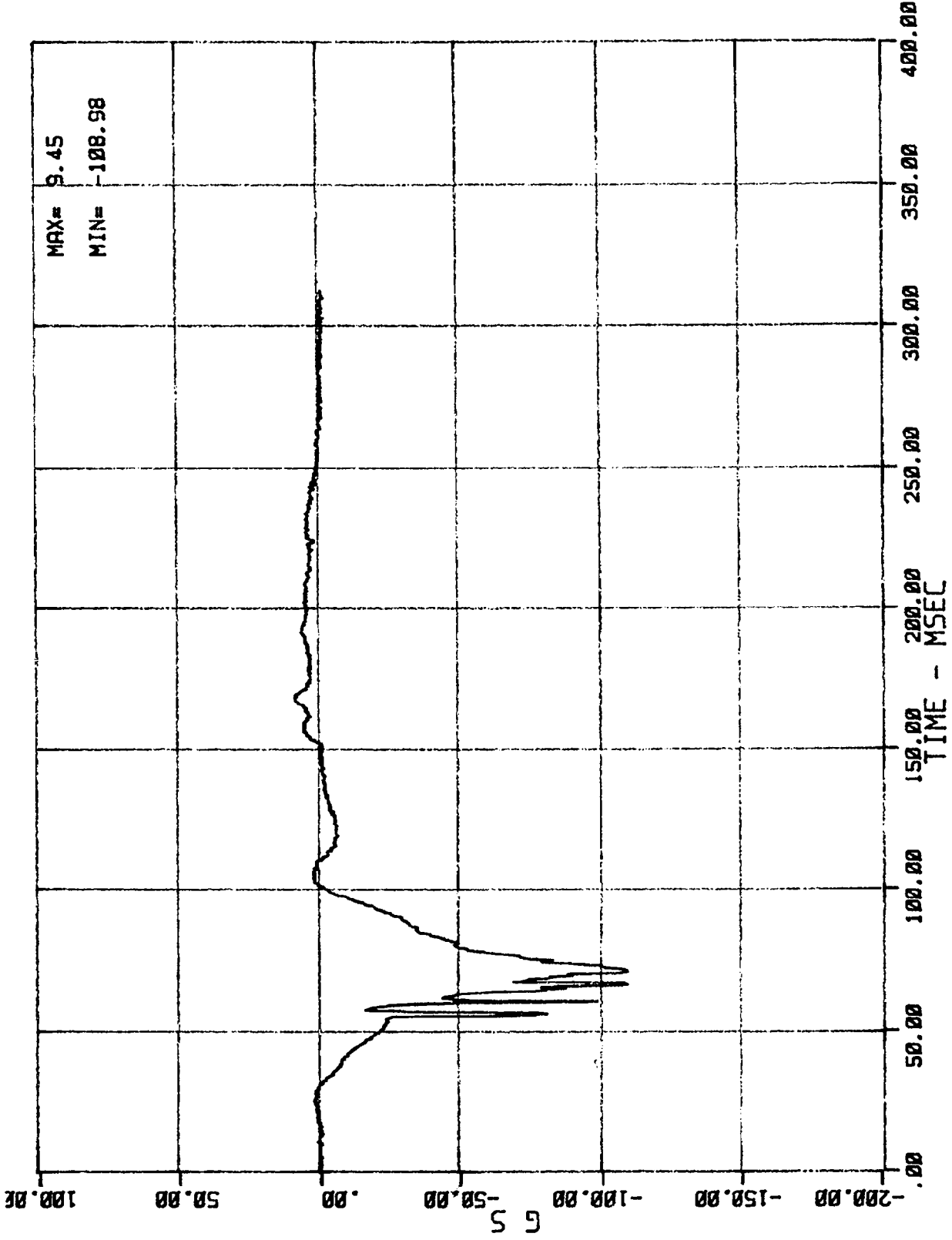
VEHICLE AND DUMMY (ATD) RESPONSE DATA

DATA FILTERING:

| | |
|--------------------|--------------|
| ATD Head Channels | - Class 1000 |
| ATD Chest Channels | - Class 180 |
| ATD Femur Channels | - Class 600 |
| Vehicle Channels | - Class 60 |

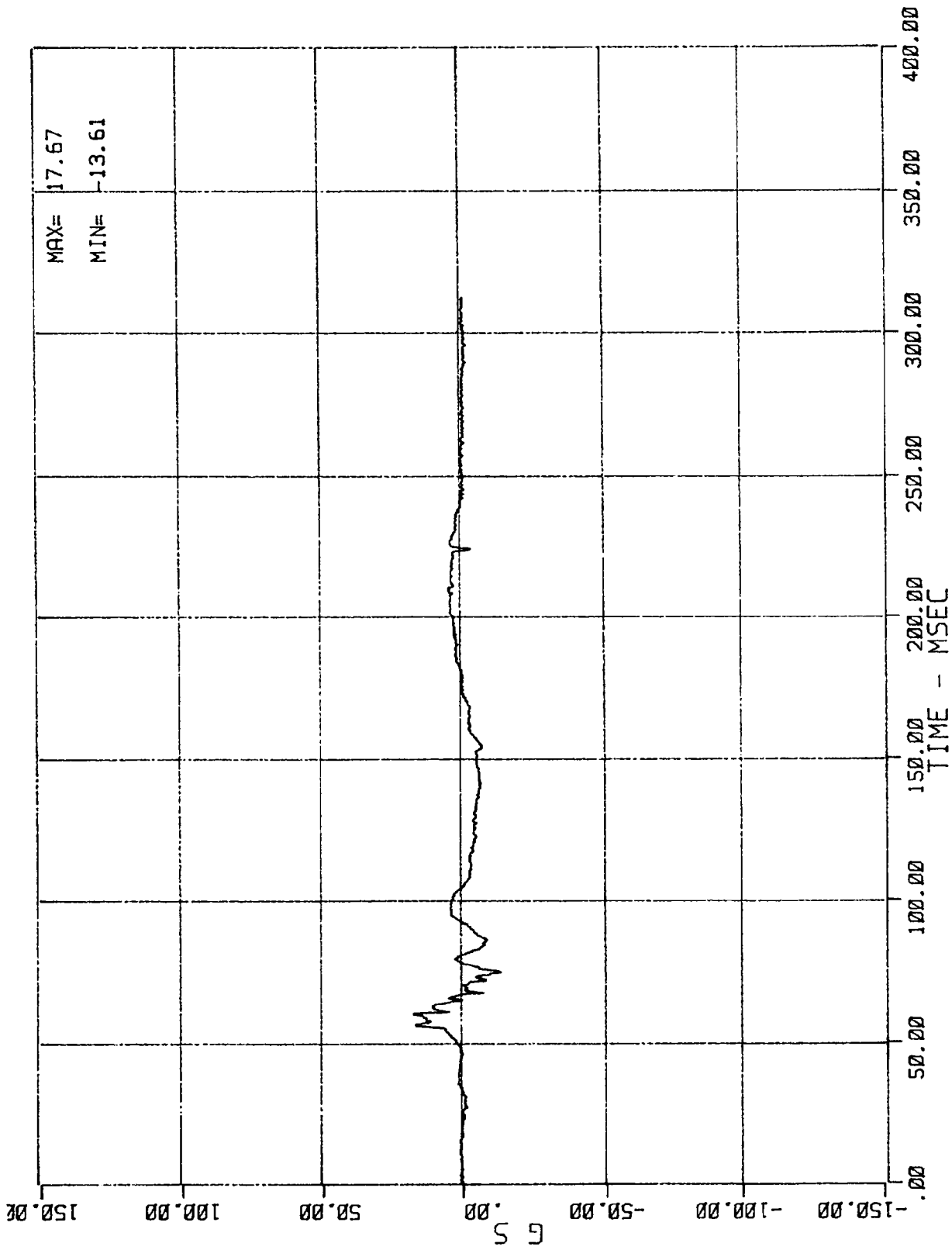
| | |
|---|----------------------------|
| 51018LC01LP800TLBS 1650MFG: LEBOW. MODEL: 3371. S/N: 327 | 01/MAR/88 3500 61 0.0 -360 |
| 02499 125AM | |
| 51019LC02SHT0TLBS 1650MFG: LEBOW. MODEL: 3371. S/N: 330 | 01/MAR/88 3500 59 0.0 -360 |
| 02499 125AM | |
| 51020LC02LP800TLBS 1650MFG: LEBOW. MODEL: 3371. S/N: 308 | 01/MAR/88 3500 60 0.0 -360 |
| 02499 125AM | |
| 510210S01SHBEOTINS 1650MFG: BOURNS. MODEL: 8 IN LIN S/N: NAW | 03/MAR/88 8999 0.0 -360 |
| 02499 125AM NOT USED IN THIS TEST | |
| 510220S02SHBEOTINS 1650MFG: BOURNS. MODEL: 8 IN LIN S/N: NAW | 03/MAR/88 8999 0.0 -360 |
| 02499 125AM NOT USED IN THIS TEST | |
| 510230S01SHBTOT0TH 1650MFG: BOURNS. MODEL: 2051414101 S/N: NAW | 03/MAR/88 30 11 0.0 -360 |
| 02499 125AM SEAT BELT ELONGATION. UNITS ARE INCHES/IN.(PERCENTAGE BELT STRETCH) | |
| 510240S02SHBTOT0TH 1650MFG: BOURNS. MODEL: 2051414101 S/N: NAW | 03/MAR/88 30 15 0.0 -360 |
| 02499 125AM SEAT BELT ELONGATION. UNITS ARE INCHES/IN.(PERCENTAGE BELT STRETCH) | |
| 51025AC0ASULFX08'S 1650MFG: SETRA. MODEL: 111 S/N: 1109 | 03/MAR/88 250129 35.1 -360 |
| 02499 125AM LEFT FRONT BRAKE CALIPER | |
| 51026AC0ASURFX06'S 1650MFG: SETRA. MODEL: 111 S/N: 1116 | 03/MAR/88 250112 35.1 -360 |
| 02499 125AM RIGHT FRONT BRAKE CALIPER | |
| 51027AC0AEN0X08'S 1650MFG: SETRA. MODEL: 111 S/N: 1070 | 03/MAR/88 250125 35.1 -360 |
| 02499 125AM ENGINE BOTTOM | |
| 51028AC0AEN0X06'S 1650MFG: SETRA. MODEL: 113 S/N: 1076 | 03/MAR/88 250116 35.1 -360 |
| 02499 125AM ENGINE TOP | |
| 51029AC0ADPLC0G'S 1650MFG: SETRA. MODEL: 111 S/N: 1111 | 03/MAR/88 250 40 35.1 -360 |
| 02499 125AM TOP OF DASH AT LATERAL C/L | |
| 51030AC0AFLR0G'S 1650MFG: SETRA. MODEL: 111 S/N: 1121 | 03/MAR/88 250 51 35.1 -360 |
| 02499 125AM LEFT SIDE FLOOR ON CROSSMEMBER BEHIND SEAT | |
| 51031AC0AFLR0G'S 1650MFG: SETRA. MODEL: 111 S/N: 1123 | 03/MAR/88 250 49 35.1 -360 |
| 02499 125AM RIGHT SIDE FLOOR ON CROSS MEMBER BEHIND SEAT | |
| 50032L0NALC0IX0LBS 1650MFG: INTERFACE MODEL: 1220-FS S/N: 15777 | 14/MAY/8550000 4 0.0 -360 |
| 04239 125AM | |
| 50033L0NALC0AZ0LBS 1650MFG: INTERFACE MODEL: 1220-FS S/N: 19324 | 14/MAY/8550000 4 0.0 -360 |
| 04239 125AM | |
| 50034L0NALC0A30LBS 1650MFG: INTERFACE MODEL: 1220-FS S/N: 19203 | 14/MAY/8550000 10 0.0 -360 |
| 04239 125AM | |
| 50035L0NALC0A00LBS 1650MFG: INTERFACE MODEL: 1220-FS S/N: 19263 | 14/MAY/8550000 15 0.0 -360 |
| 04239 125AM | |
| 50036L0NALC0AS0LBS 1650MFG: INTERFACE MODEL: 1220-FS S/N: 19265 | 14/MAY/8550000 14 0.0 -360 |
| 04239 125AM | |
| 50037L0NALC0A00LBS 1650MFG: INTERFACE MODEL: 1220-FS S/N: 19266 | 14/MAY/8550000 12 0.0 -360 |
| 04239 125AM | |
| 50038L0NALC0A70LBS 1650MFG: INTERFACE MODEL: 1220-FS S/N: 19268 | 14/MAY/8550000999 0.0 -360 |
| 04239 125AM LOAD CELL FAILURE | |
| 50039L0NALC0AB0LBS 1650MFG: INTERFACE MODEL: 1220-FS S/N: 19270 | 14/MAY/8550000 15 0.0 -360 |
| 04239 125AM | |
| 50040L0NALC0A90LBS 1650MFG: INTERFACE MODEL: 1220-FS S/N: 19250 | 14/MAY/8550000 15 0.0 -360 |
| 04239 125AM | |
| 50041L0NALC0B00LBS 1650MFG: INTERFACE MODEL: 1220-FS S/N: 19273 | 14/MAY/8550000 16 0.0 -360 |
| 04239 125AM | |
| 50042L0NALC0B20LBS 1650MFG: INTERFACE MODEL: 1220-FS S/N: 19276 | 14/MAY/8550000 9 0.0 -360 |
| 04239 125AM | |

| | |
|--|----------------------------|
| 50043LONALCB3XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19277 04239 125AH | 14/MAY/8550000 82 0.0 -360 |
| 50044LONALCB4XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19278 04239 125AH | 14/MAY/8550000 58 0.0 -360 |
| 50045LONALCB5XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19279 04239 125AH | 14/MAY/8550000 60 0.0 -360 |
| 50046LONALCB6XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19282 04239 125AH | 14/MAY/8550000 66 0.0 -360 |
| 50047LONALCB7XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19262 04239 125AH | 14/MAY/8550000 48 0.0 -360 |
| 50048LONALCB8XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19285 04239 125AH | 14/MAY/8550000 18 0.0 -360 |
| 50049LONALCB9XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19286 04239 125AH | 14/MAY/8550000 4 0.0 -360 |
| 50050LONALCC1XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19287 04239 125AH | 14/MAY/8550000 5 0.0 -360 |
| 50051LONALCC2XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19288 04239 125AH | 14/MAY/8550000 15 0.0 -360 |
| 50052LONALCC3XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19289 04239 125AH | 14/MAY/8550000 14 0.0 -360 |
| 50053LONALCC4XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19291 04239 125AH | 14/MAY/8550000 19 0.0 -360 |
| 50054LONALCC5XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19324 04239 125AH | 14/MAY/8550000 90 0.0 -360 |
| 50055LONALCC6XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19313 04239 125AH | 14/MAY/8550000 26 0.0 -360 |
| 50056LONALCC7XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19314 04239 125AH | 14/MAY/8550000 15 0.0 -360 |
| 50057LONALCC8XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19315 04239 125AH | 14/MAY/8550000 20 0.0 -360 |
| 50058LONALCC9XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19316 04239 125AH | 14/MAY/8550000 6 0.0 -360 |
| 50059LONALCD1XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19317 04239 125AH | 14/MAY/8550000 5 0.0 -360 |
| 50060LONALCD2XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19318 04239 125AH | 14/MAY/8550000 16 0.0 -360 |
| 50061LONALCD3XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19322 04239 125AH | 14/MAY/8550000 6 0.0 -360 |
| 50062LONALCD4XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19323 04239 125AH | 14/MAY/8550000 14 0.0 -360 |
| 50063LONALCD5XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19268 04239 125AH | 14/MAY/8550000 10 0.0 -360 |
| 50064LONALCD6XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19325 04239 125AH | 14/MAY/8550000 12 0.0 -360 |
| 50065LONALCD7XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19332 04239 125AH | 14/MAY/8550000 18 0.0 -360 |
| 50066LONALCD8XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19333 04239 125AH | 14/MAY/8550000 13 0.0 -360 |
| 50067LONALCD9XGLBS 1650MF6: INTERFACE MODEL: 1220-FS S/N: 19338 04239 125AH | 14/MAY/8550000 6 0.0 -360 |



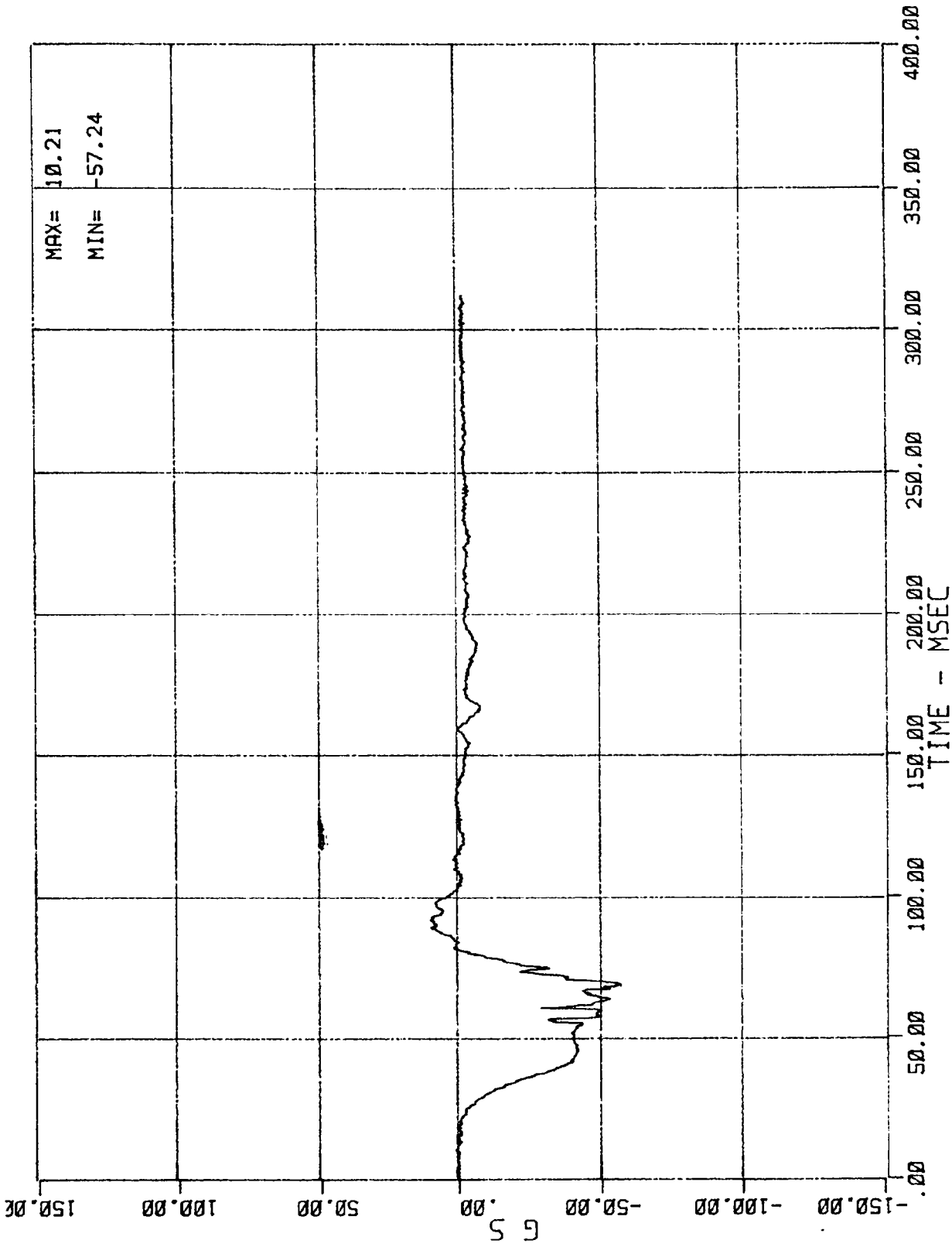
01 AC 01 1 HED X (DRIVER HEAD ACCEL. --- X-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



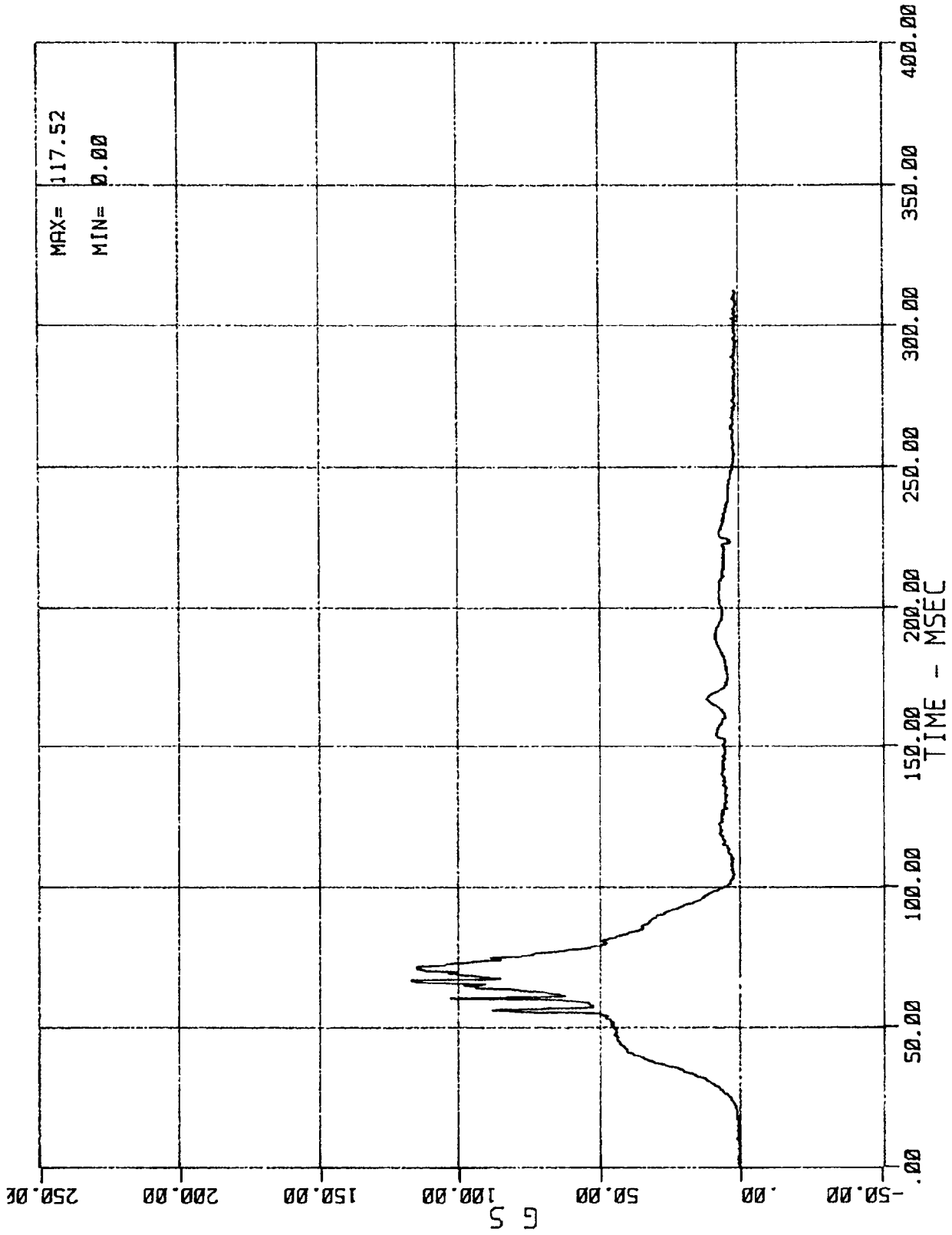
02 AC 01 HED Y (DRIVER HEAD ACCEL. -- Y-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88

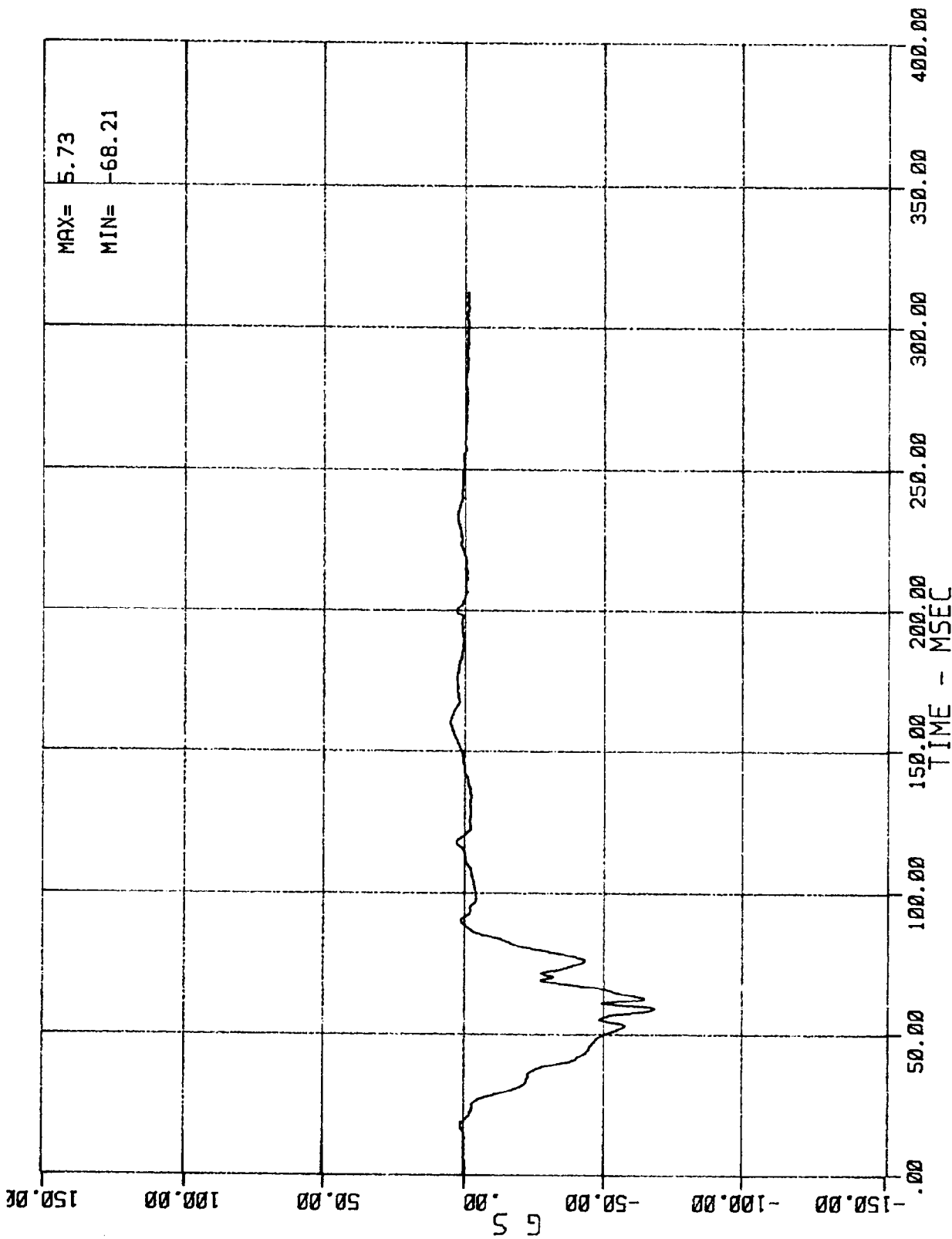


03 AC 01 1 HED Z (DRIVER HEAD ACCEL. -- Z-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88

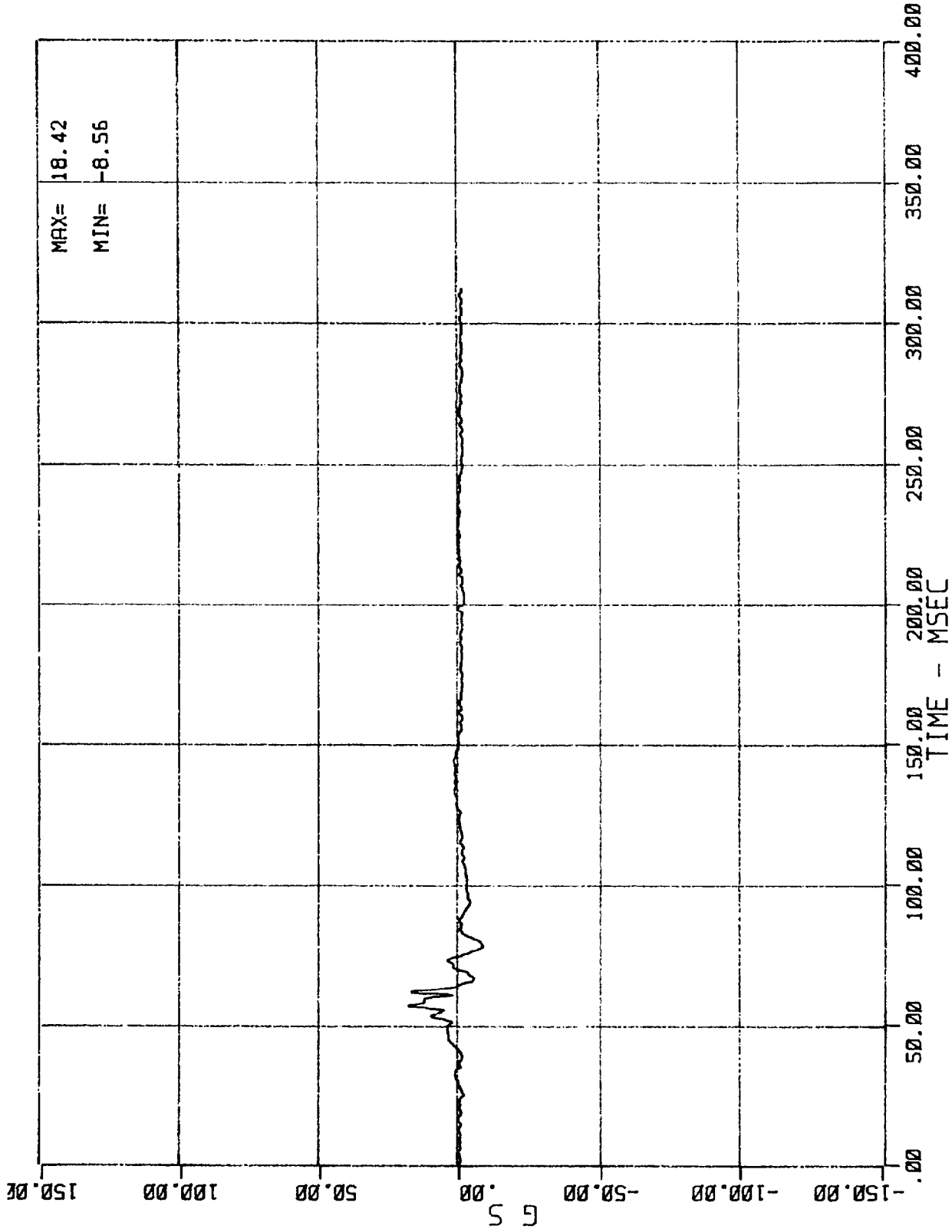


DRIVER HEAD RESULTANT ACCELERATION
MSE N64088 1988 NISSAN PICKUP TRUCK 04/01/88



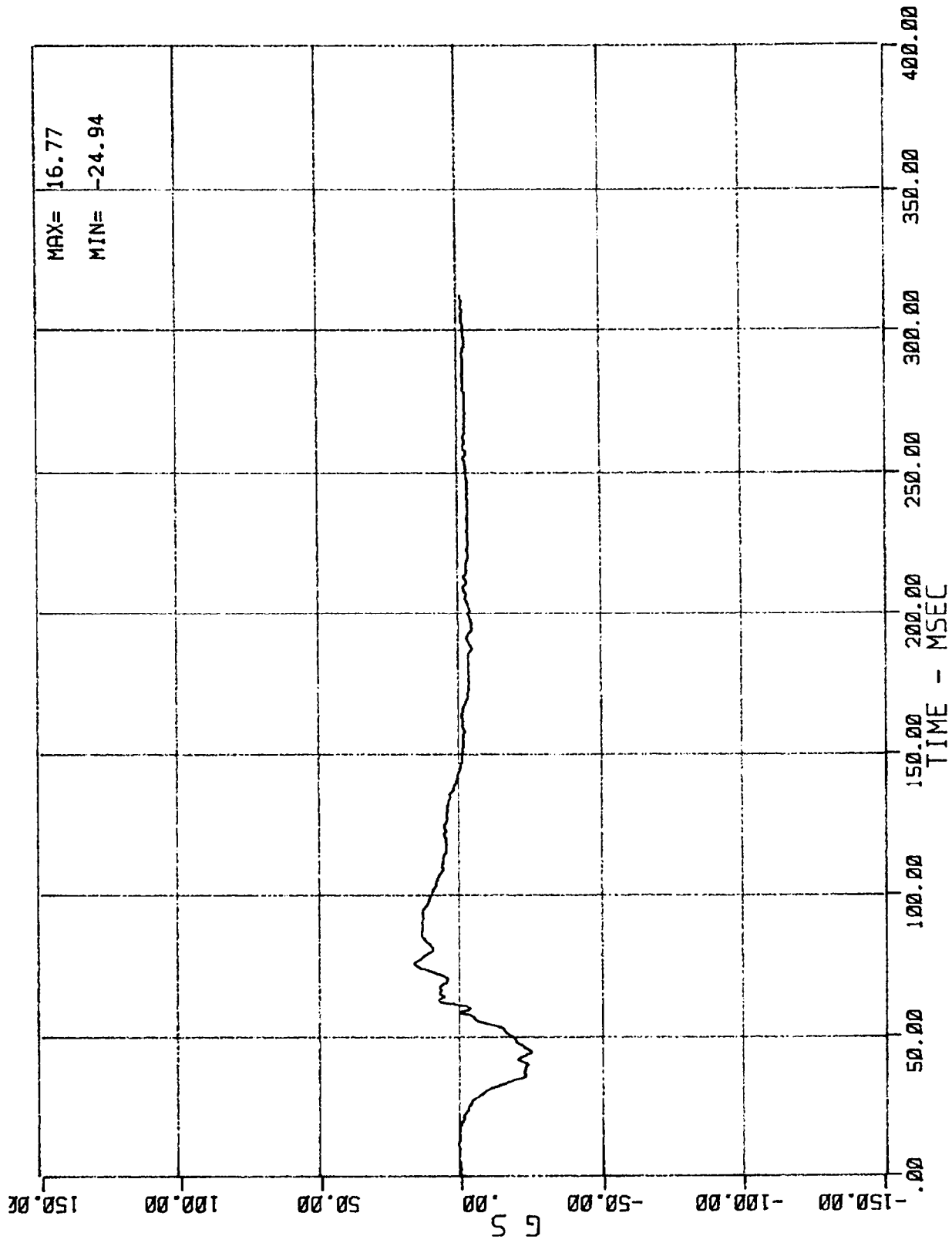
04 AC 01 I CST X (DRIVER CHEST ACCEL. -- X-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



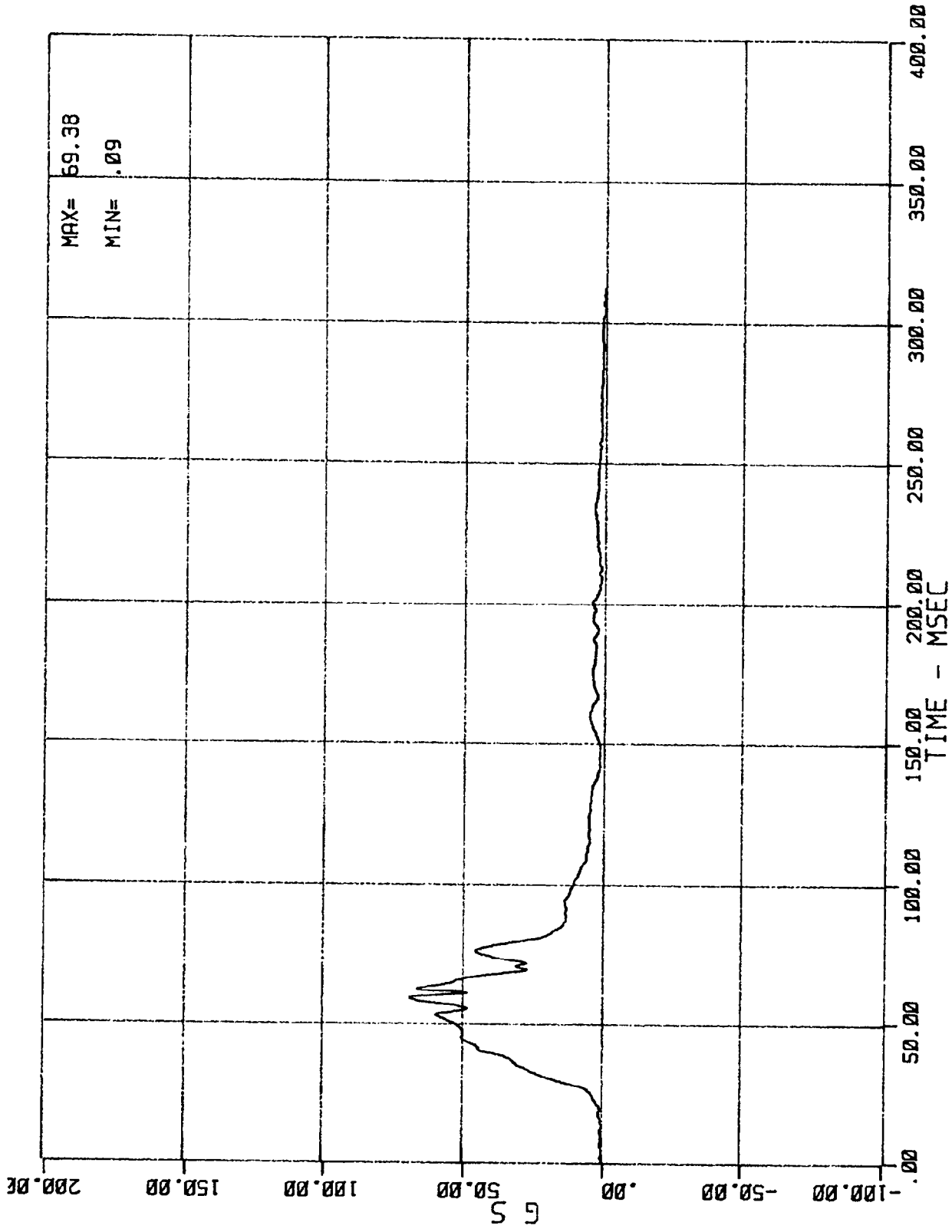
05 AC 01 1 CST Y (DRIVER CHEST ACCEL. --- Y-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



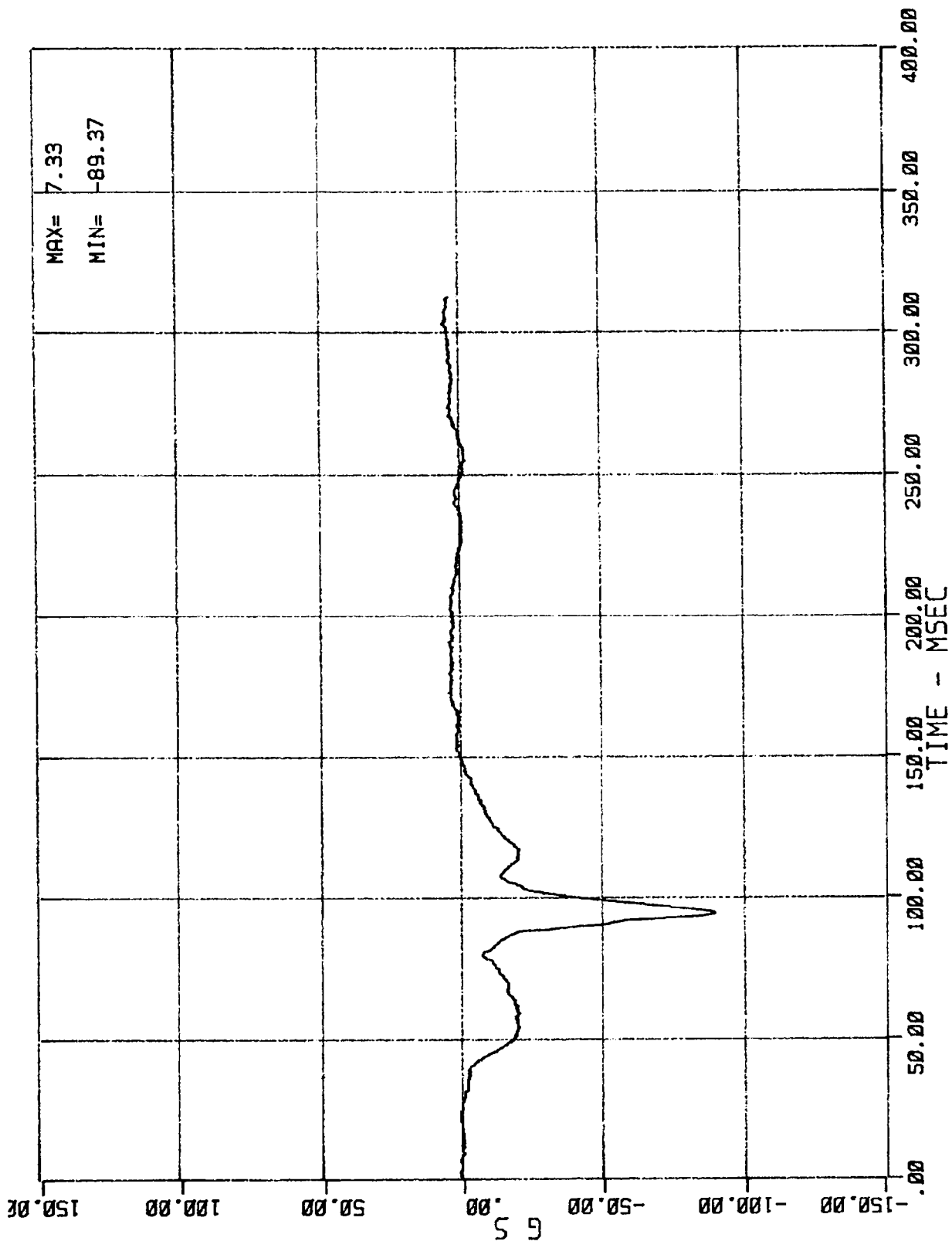
06 AC 01 1 CST Z (DRIVER CHEST ACCEL. -- Z-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



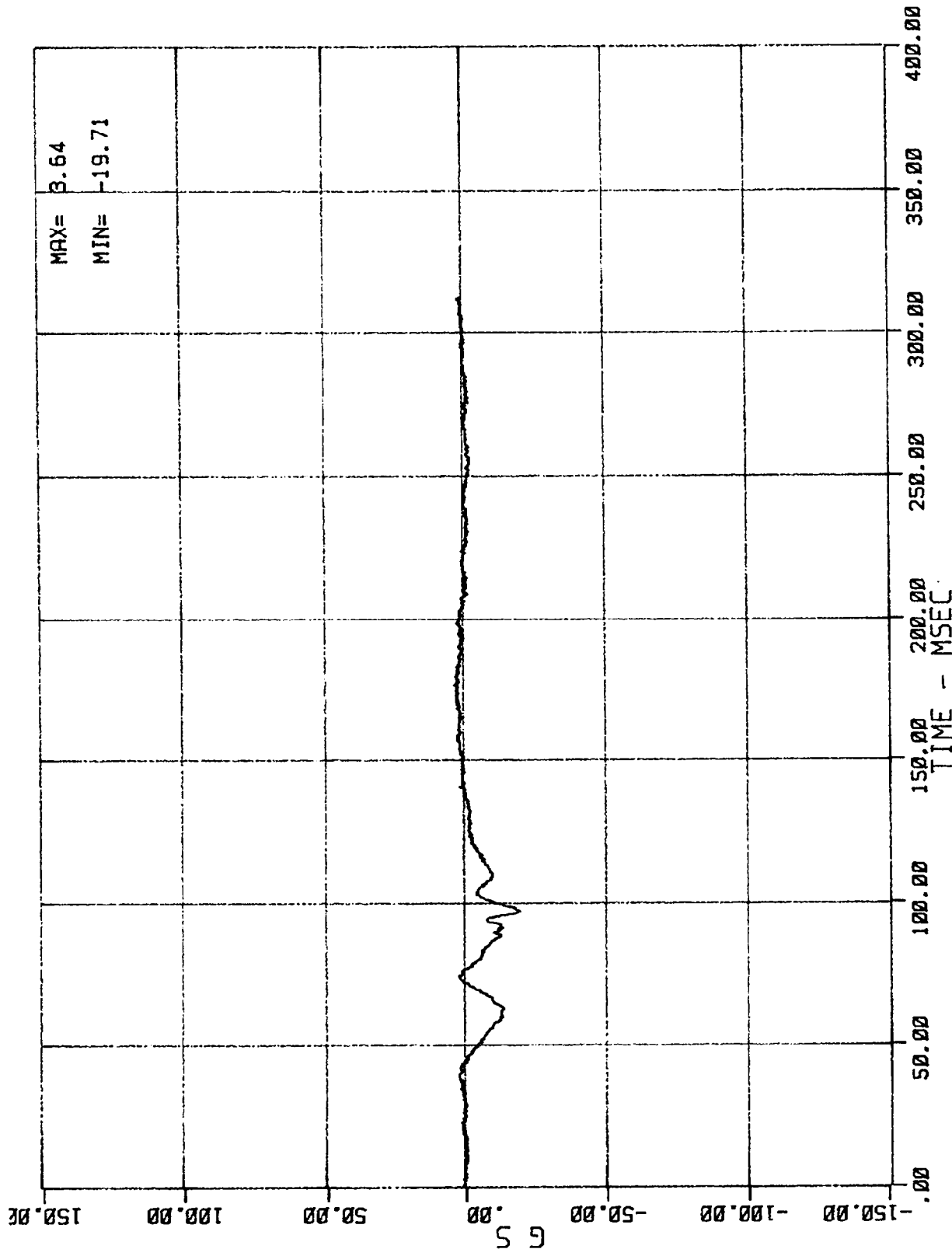
DRIVER'S CHEST RESULTANT ACCELERATION
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



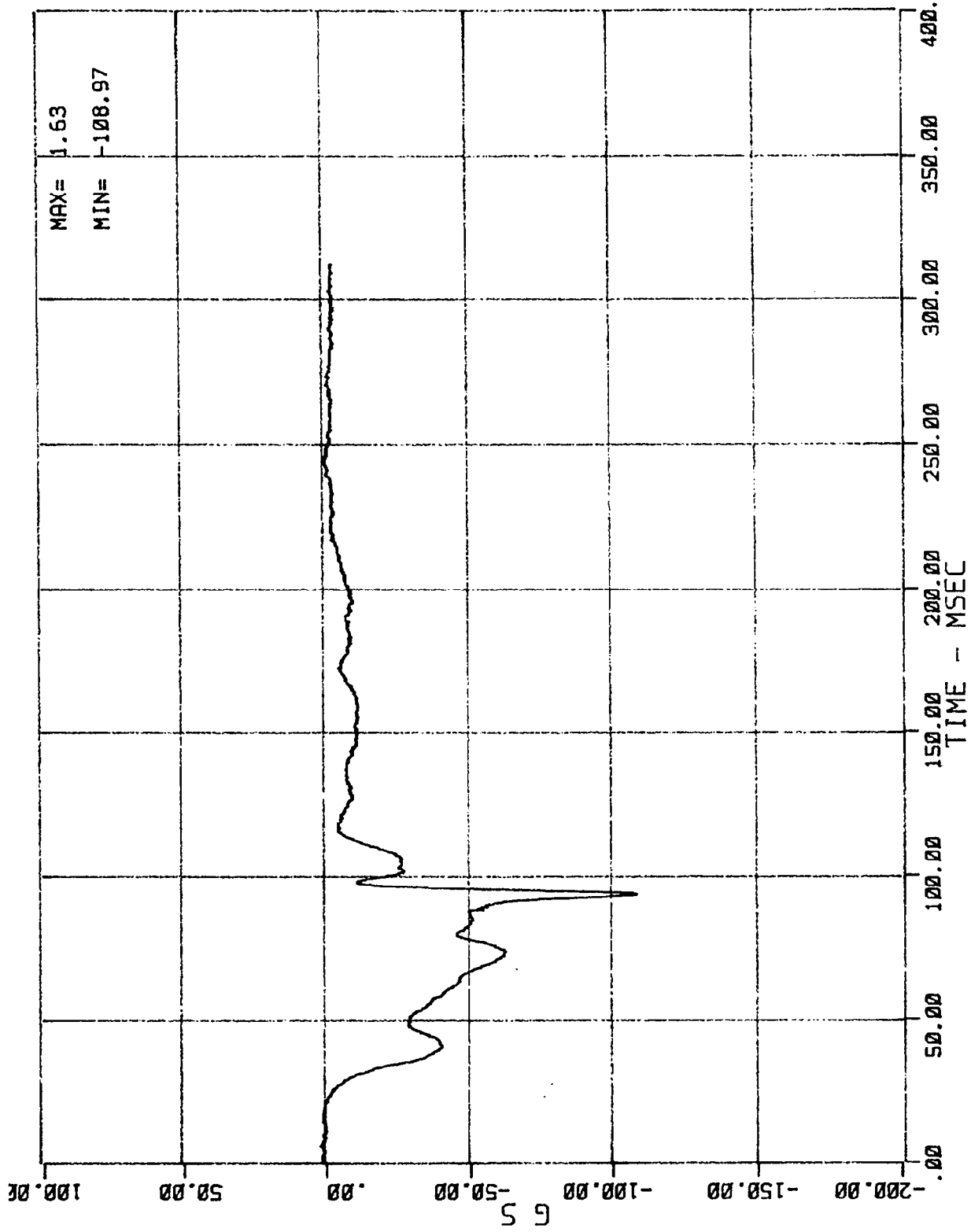
07 AC 01 2 HED X (PASSENGER HEAD ACCEL. -- X-AXIS)
MSE N64068 1988 NISSAN PICKUP TRUCK

04/01/88



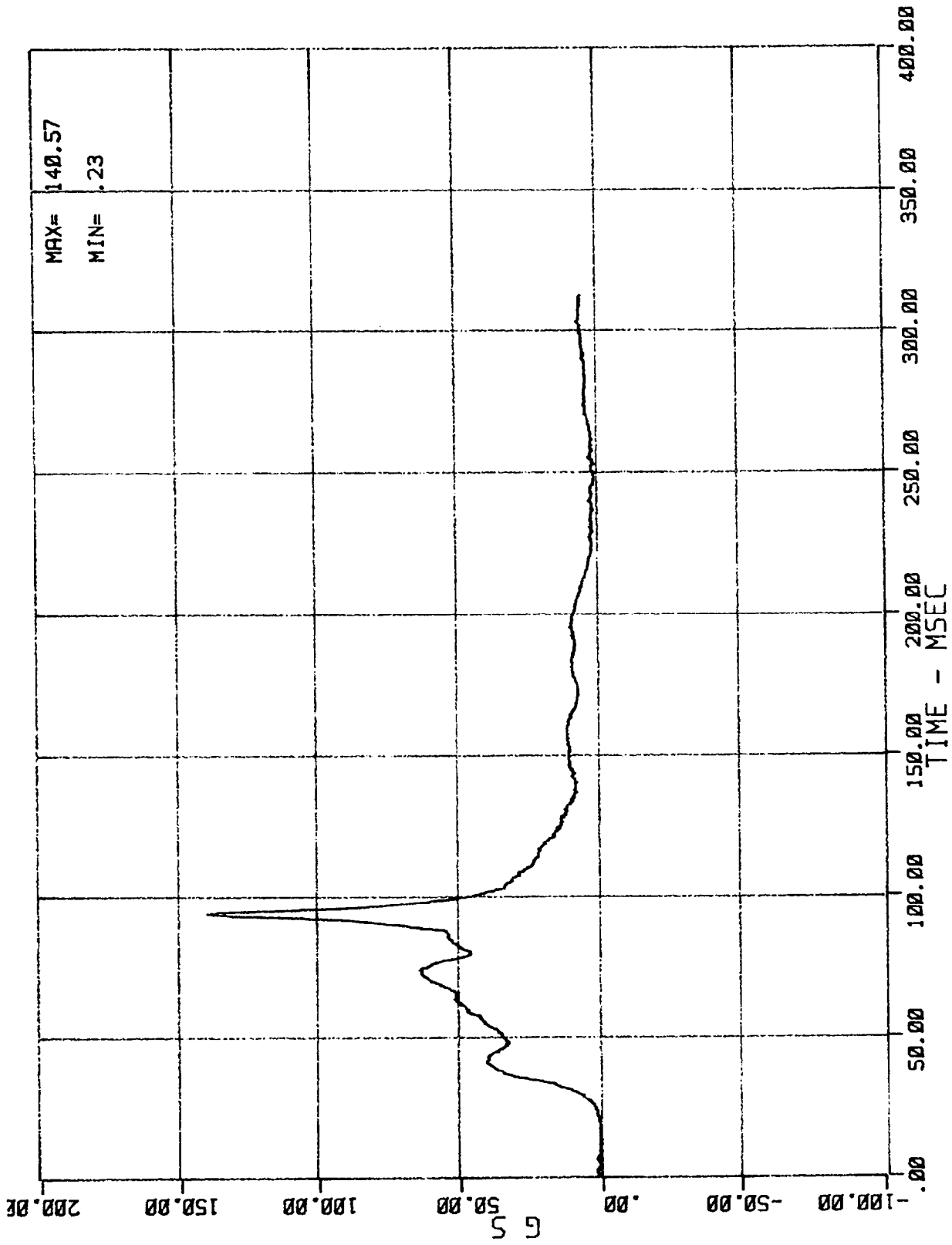
08 AC 01 2 HED Y (PASSENGER HEAD ACCEL. -- Y-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



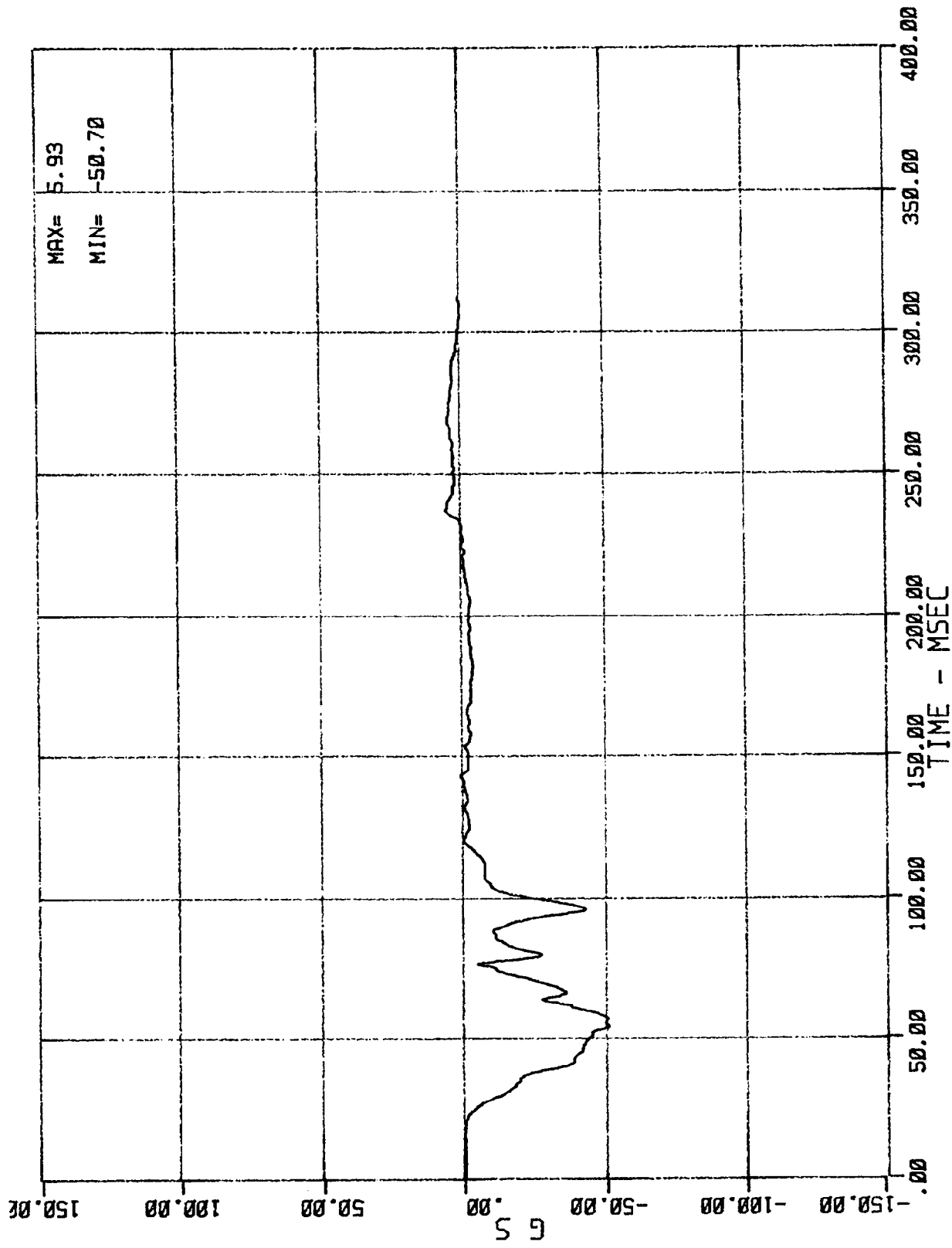
09 AC 01 2 HED Z (PASSENGER HEAD ACCEL. -- Z-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



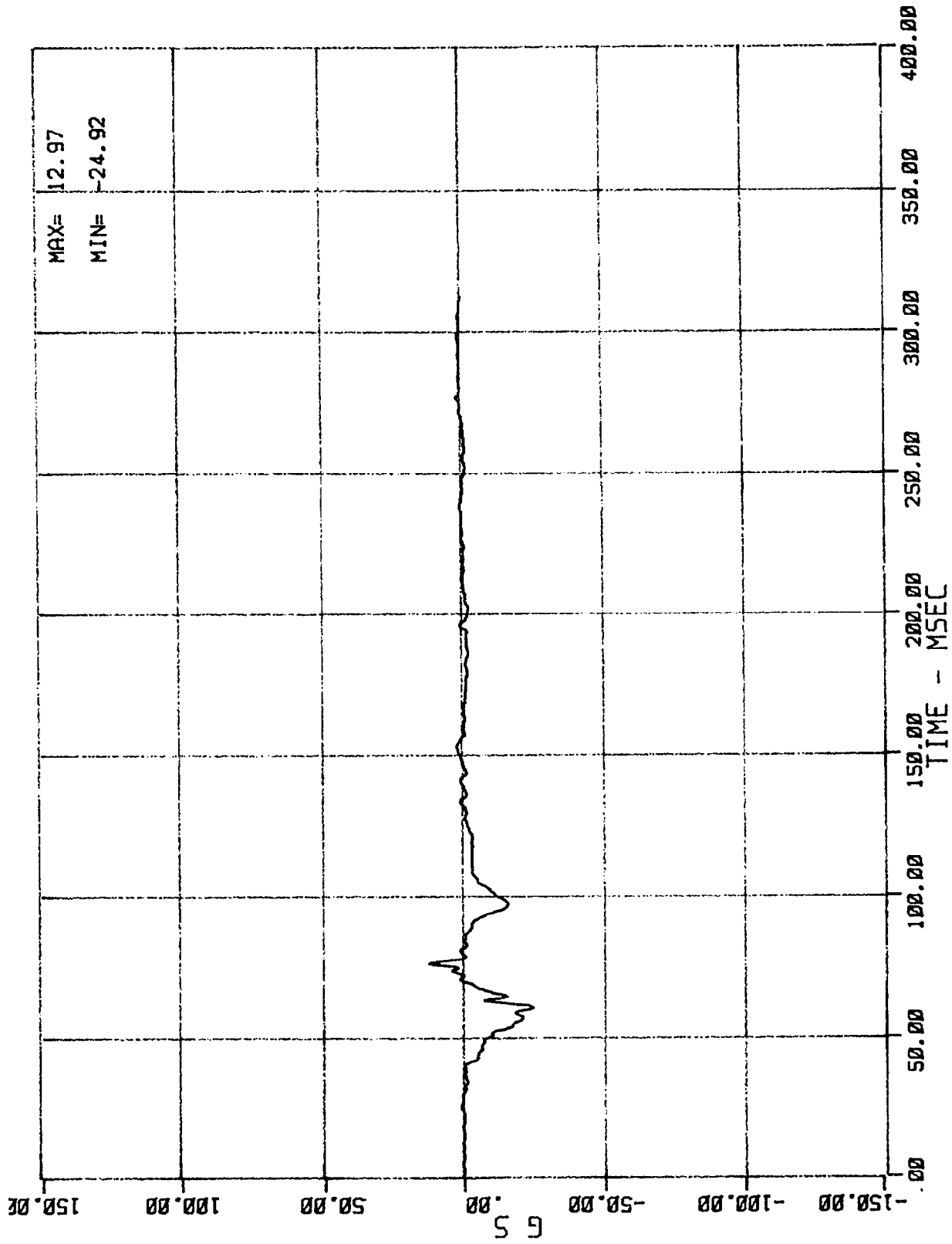
04/01/88

PASSENGER'S HEAD RESULTANT ACCELERATION
MSE N64088 1988 NISSAN PICKUP TRUCK



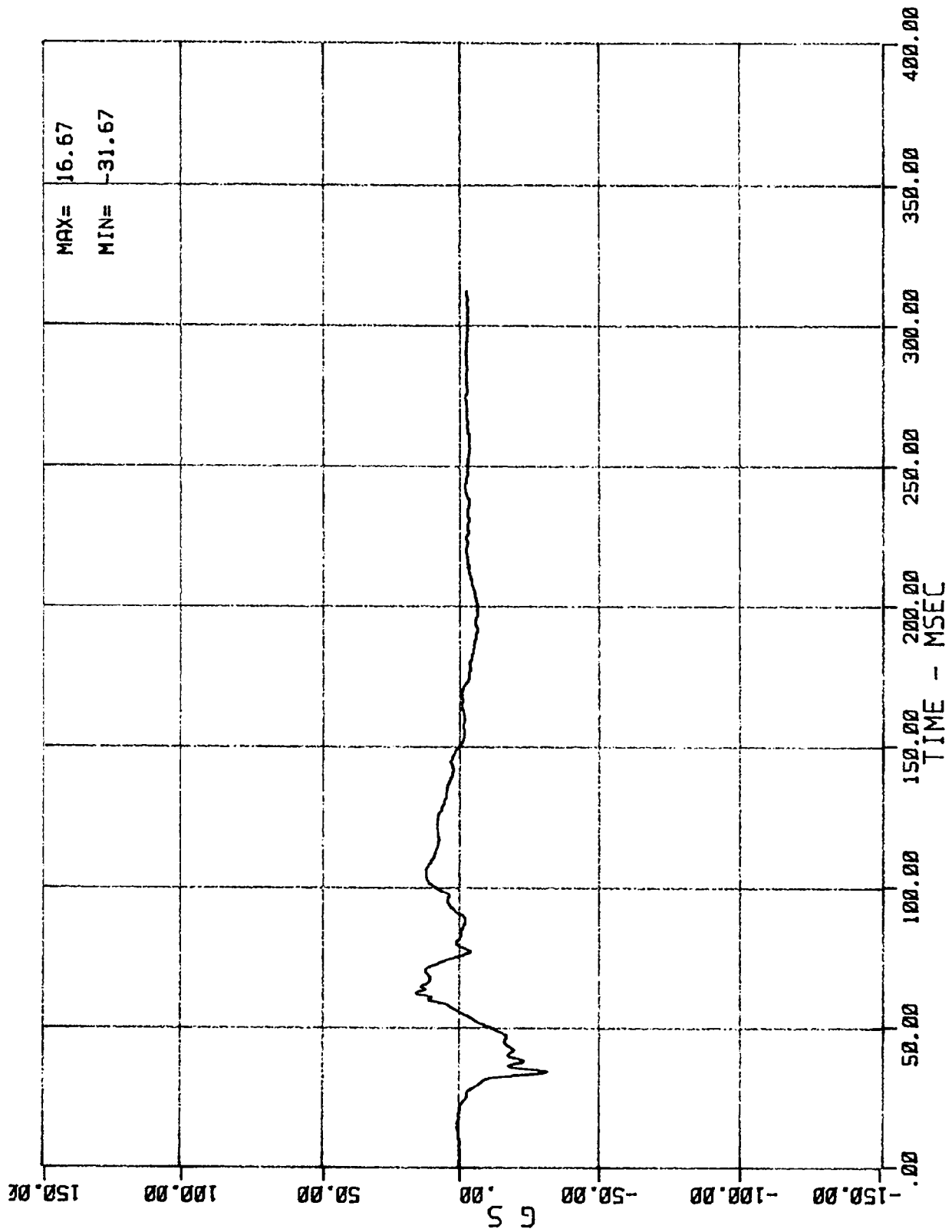
10 AC 01 2 CST X (PASSENGER CHEST ACCEL. --- X-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



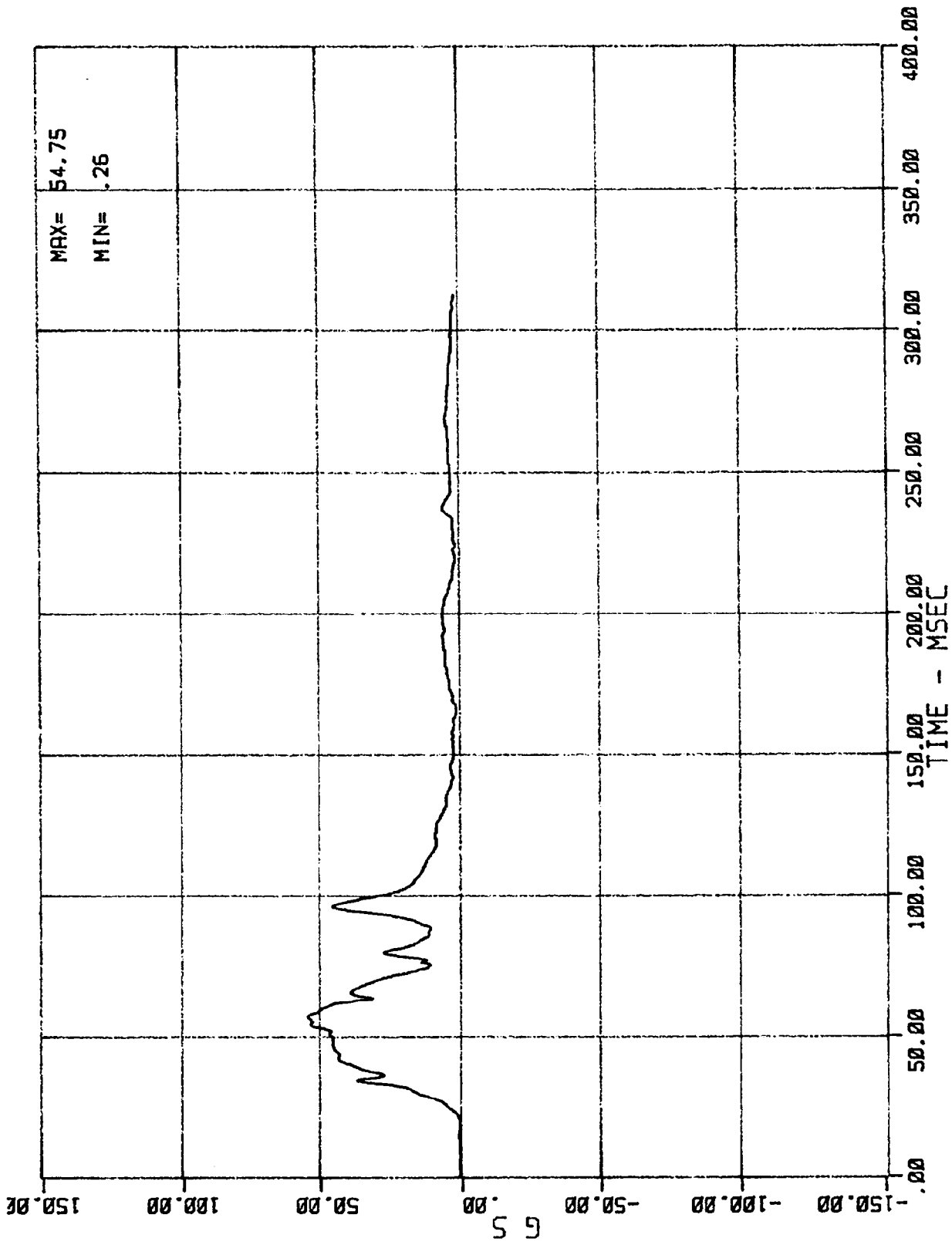
11 AC 01 2 CST Y (PASSENGER CHEST ACCEL. -- Y-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88

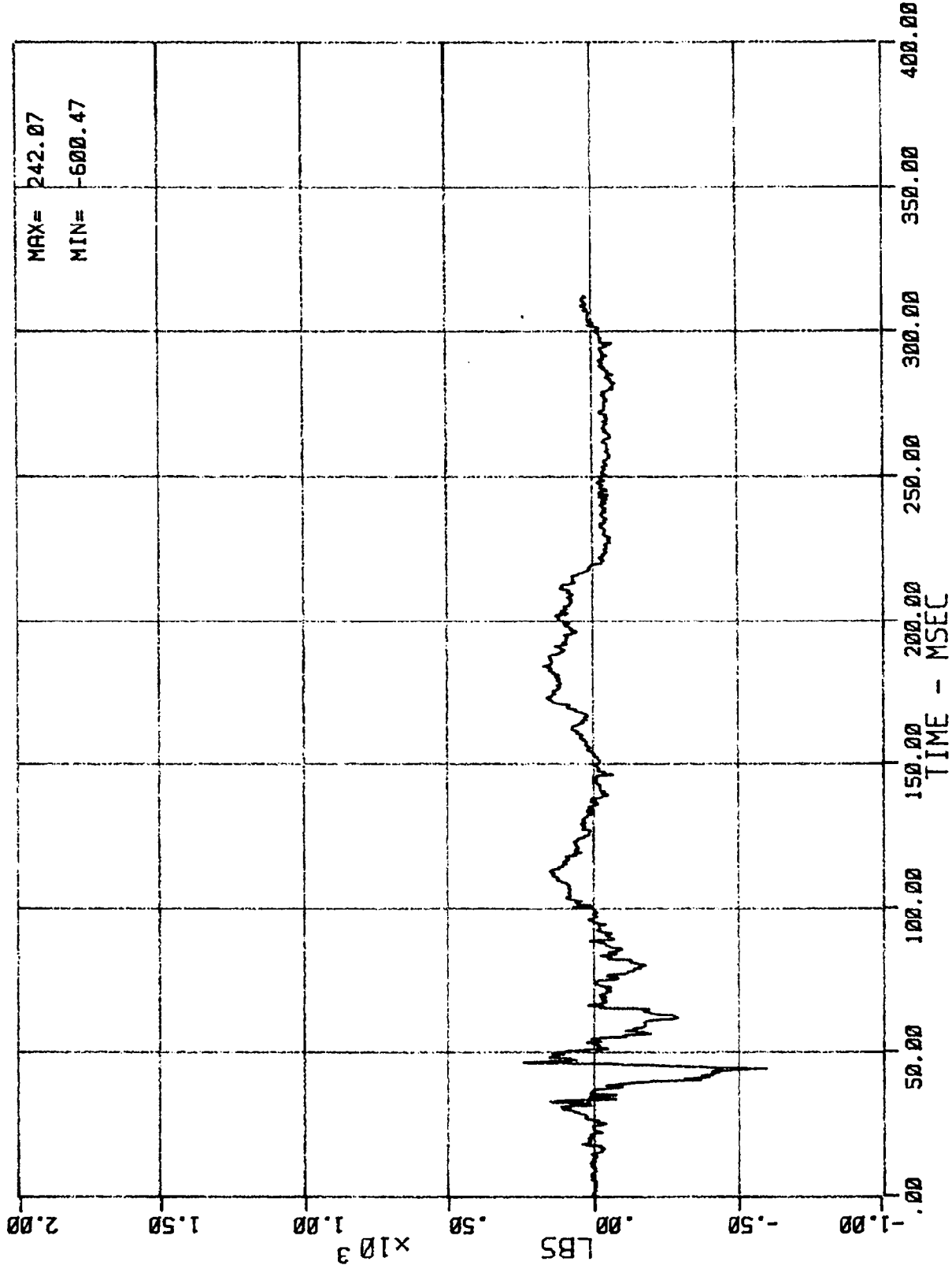


12 AC 01 2 CST Z (PASSENGER CHEST ACCEL. --- Z-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88

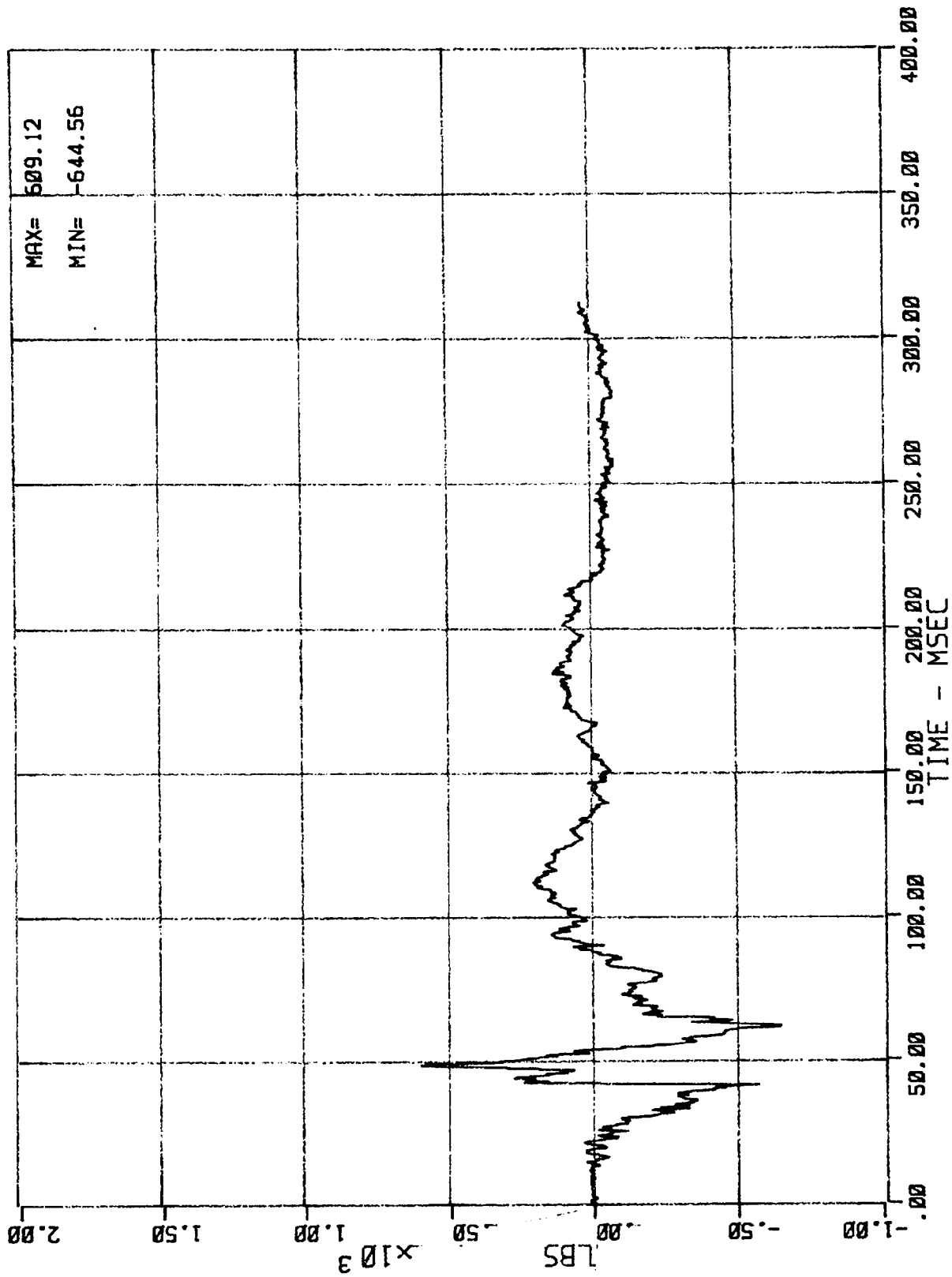


PASSENGER'S CHEST RESULTANT ACCELERATION
MSE N64088 1988 NISSAN PICKUP TRUCK 04/01/88



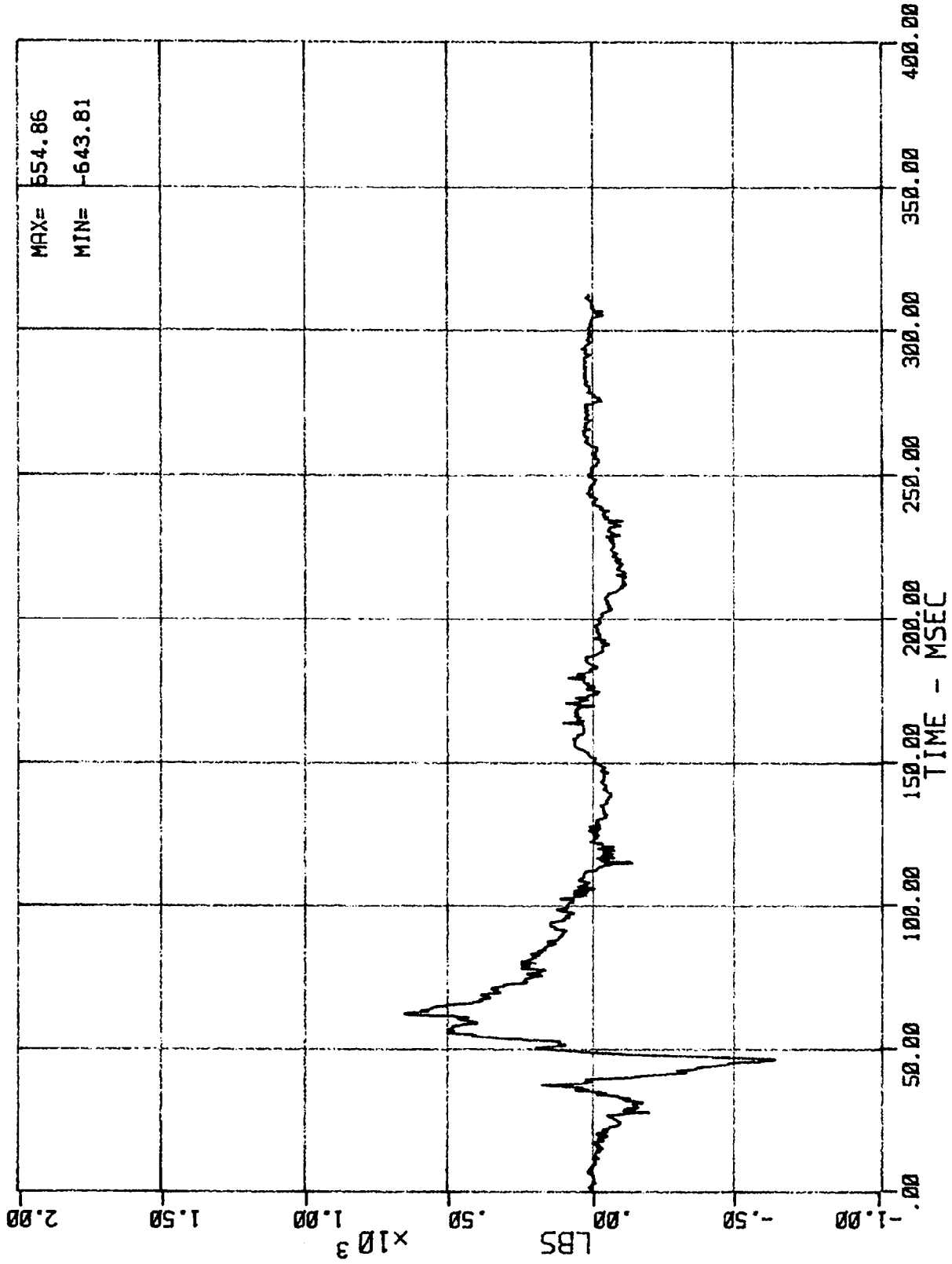
13 LC 01 1 LFM (DRIVER LEFT FEMUR FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



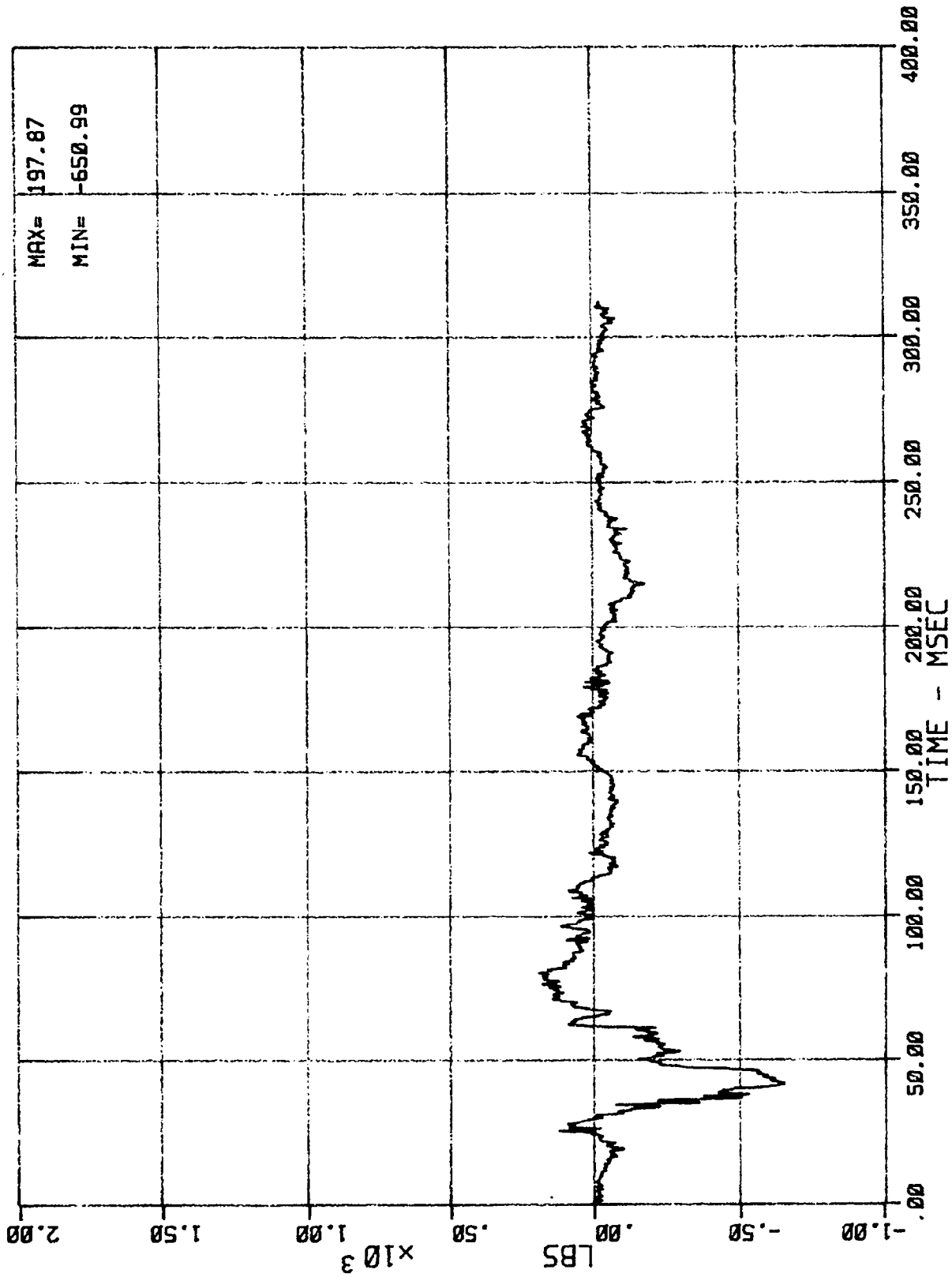
14 LC 01 1 RFM (DRIVER RIGHT FEMUR FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



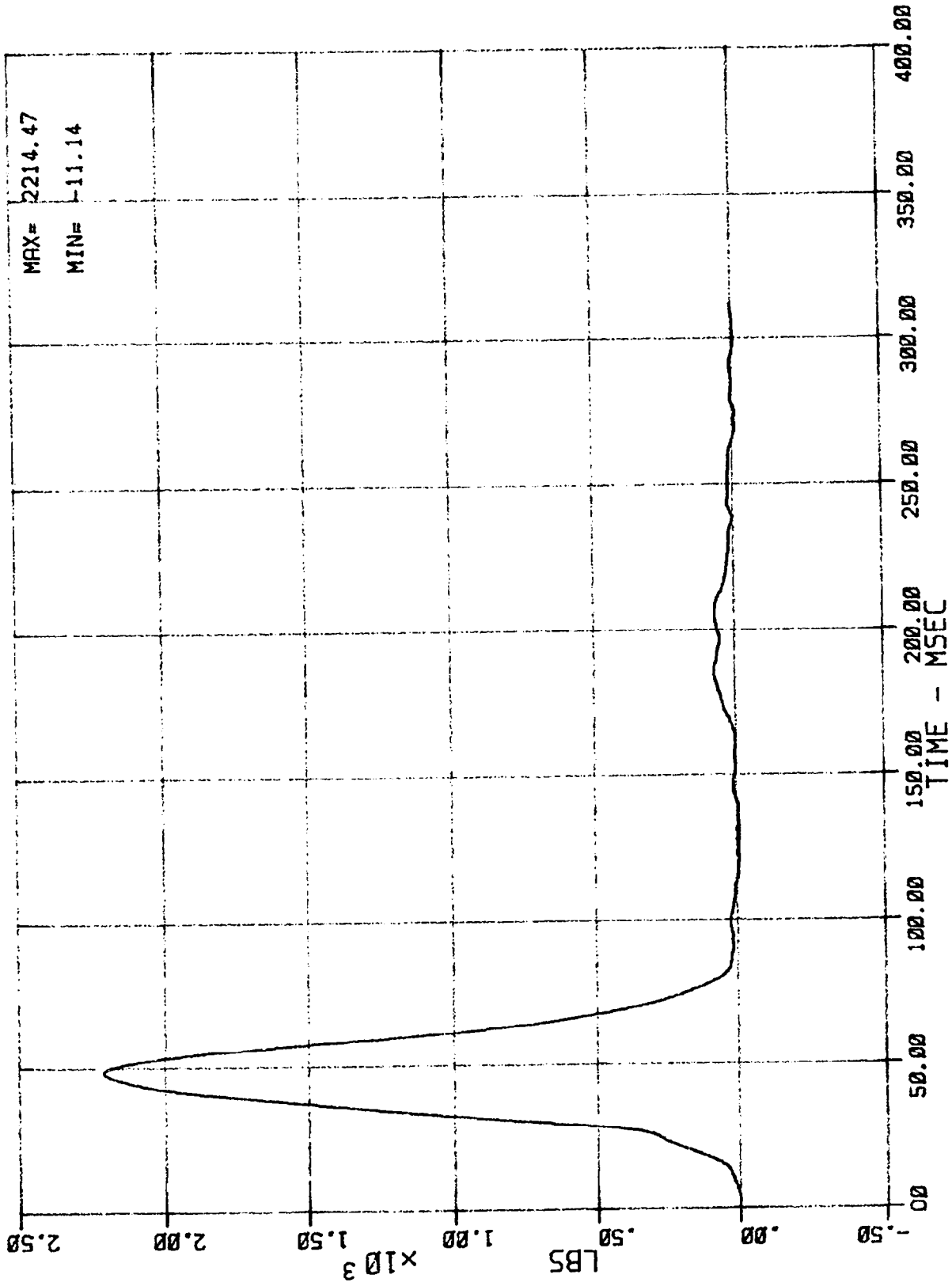
15 LC 01 2 LFM (PASSENGER LEFT FEMUR FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



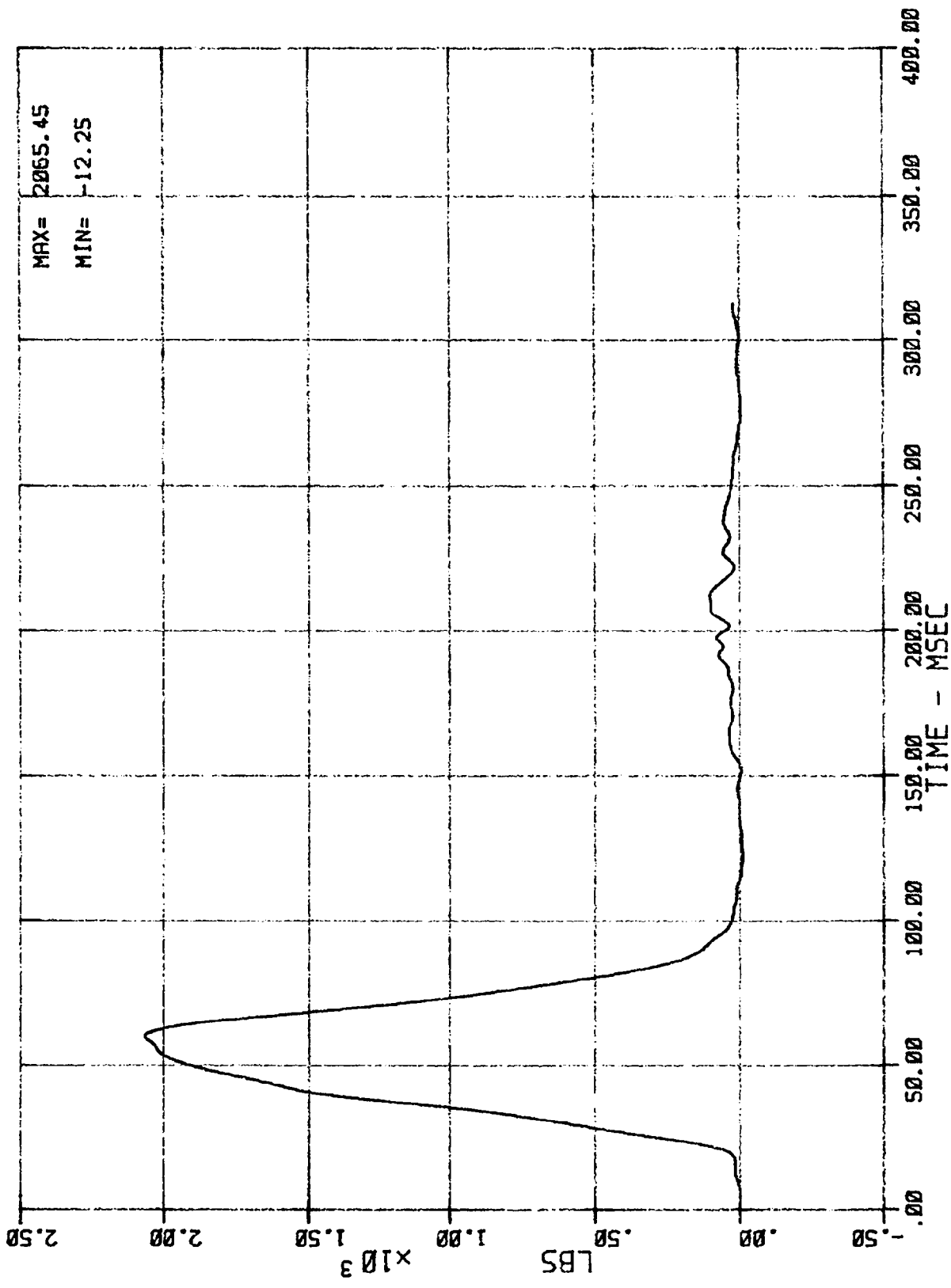
16 LC 01 2 RFM (PASSENGER RIGHT FEMUR FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



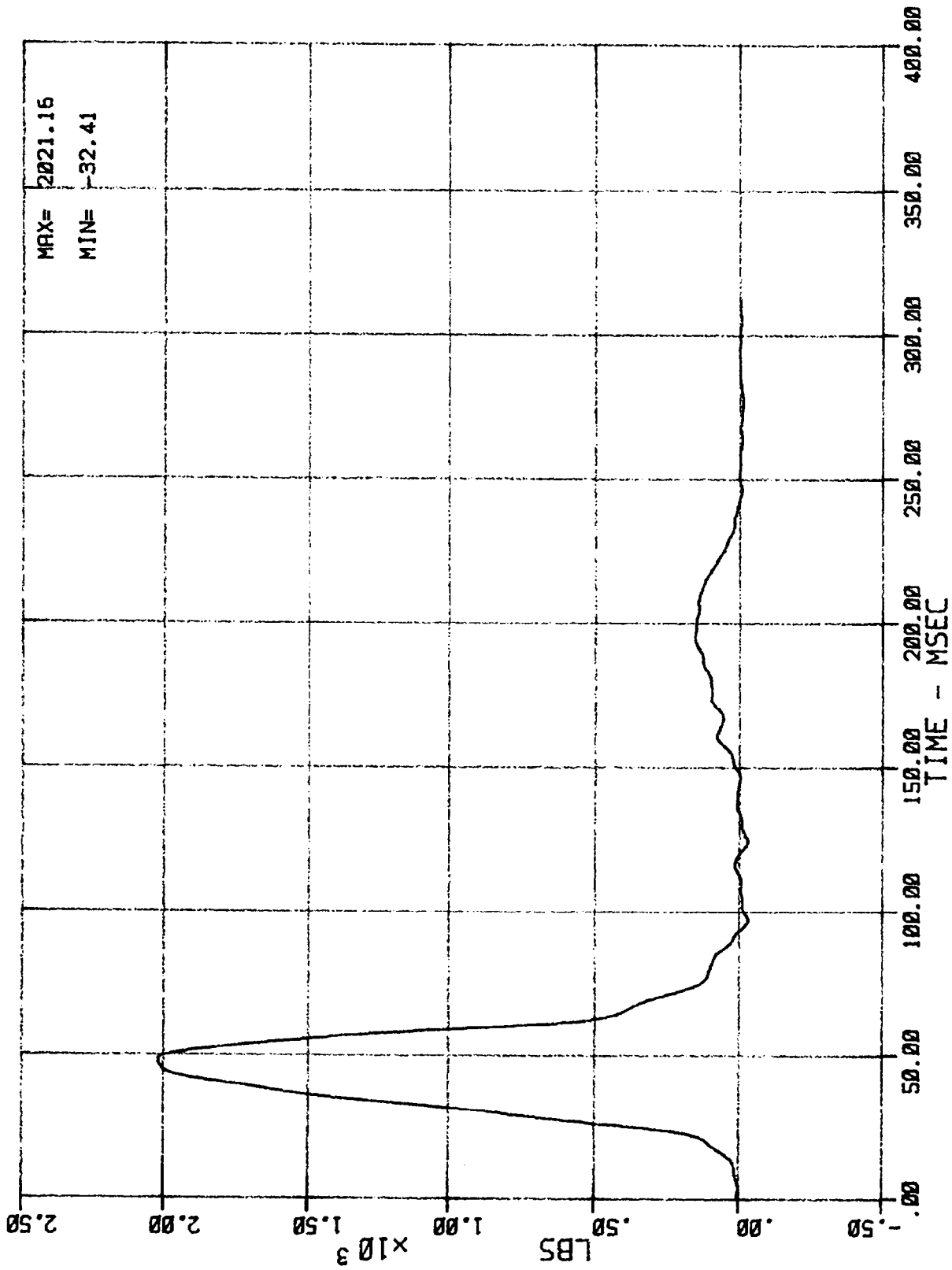
17 LC 01 1 LBD (DRIVER LAP BELT FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



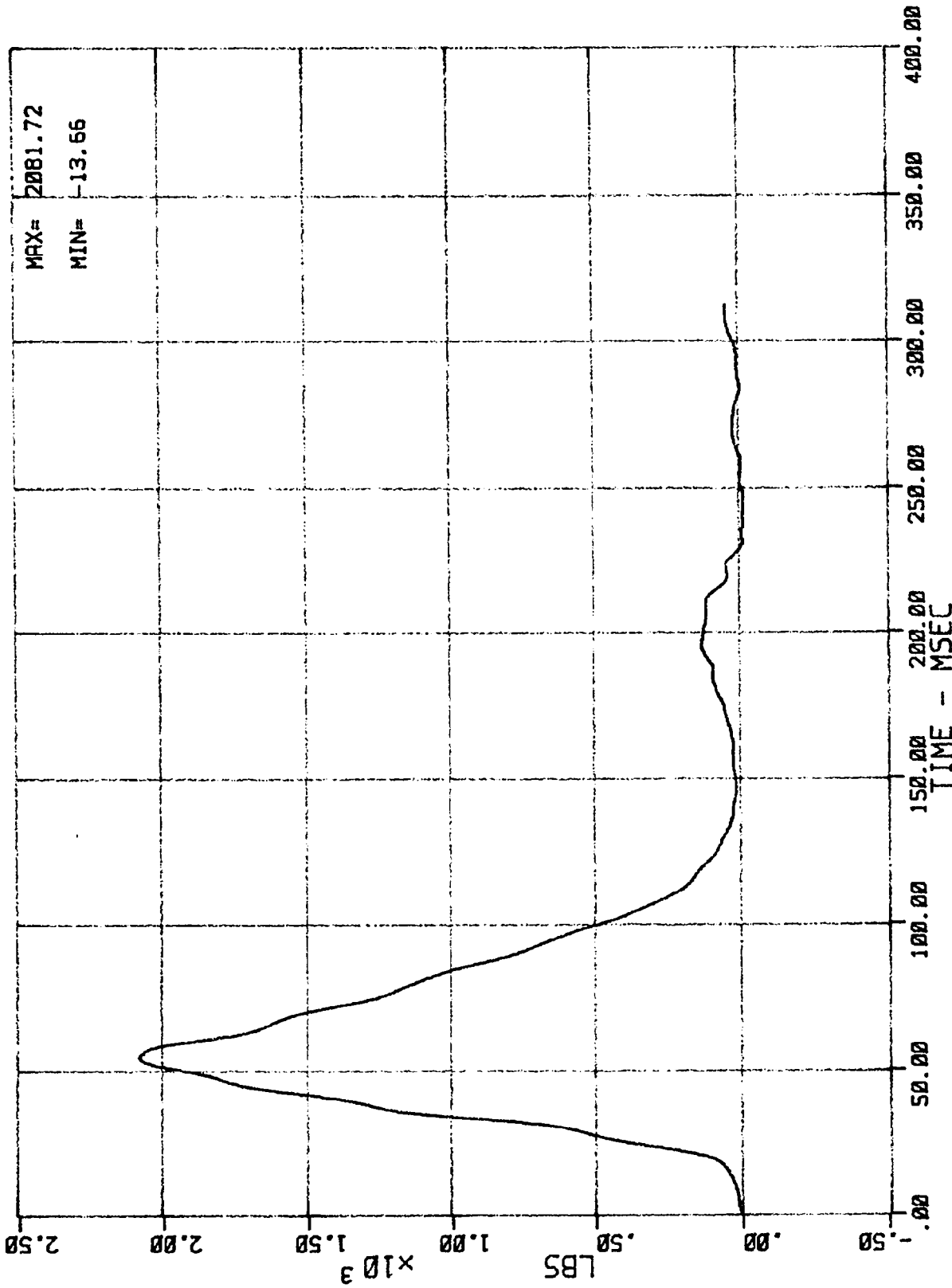
18 LC 01 1 SHB (DRIVER SHOULDER BELT FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



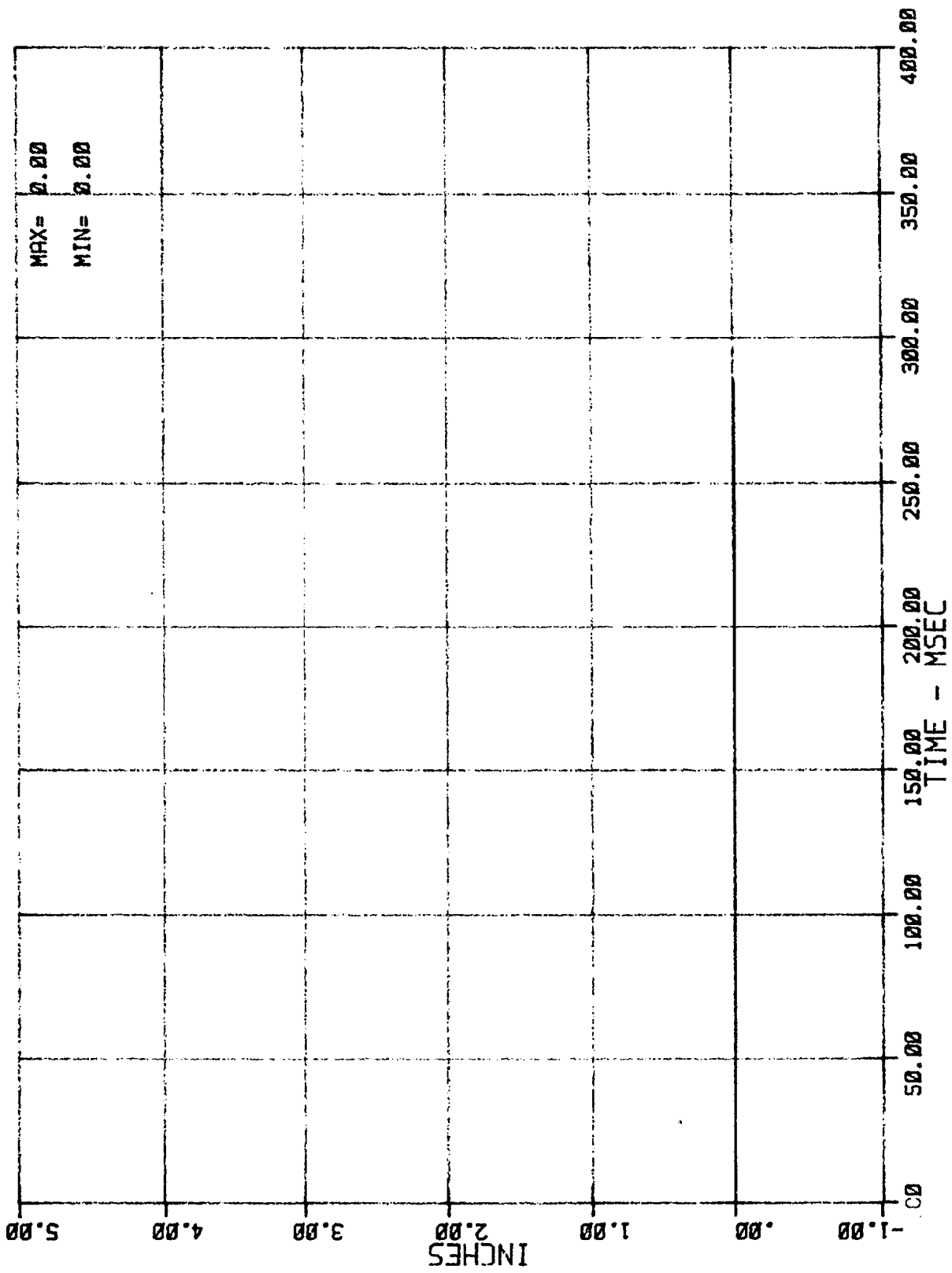
19 LC 01 2 LBD (PASSENGER LAP BELT FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88

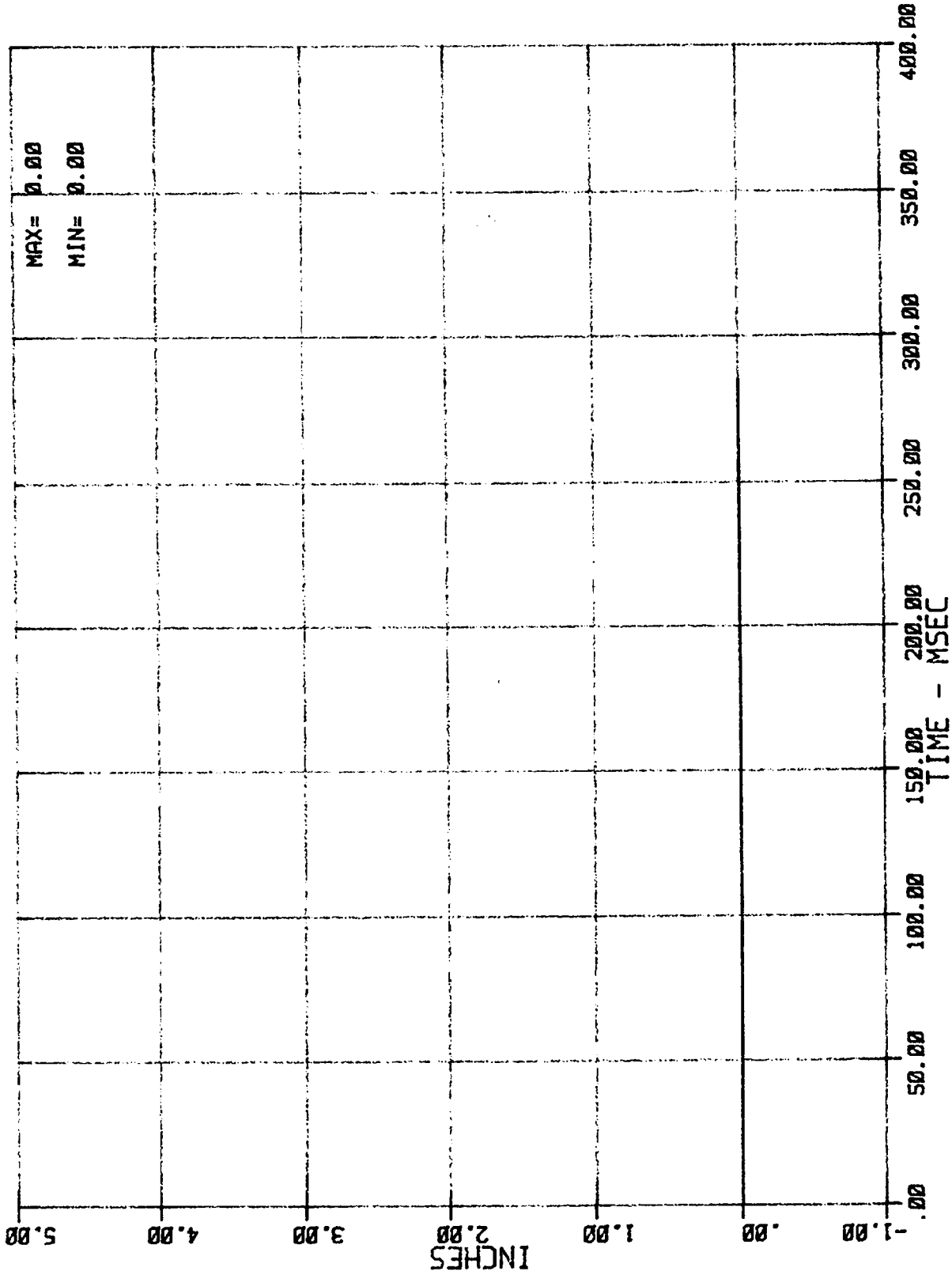


20 LC 01 2 SHB (PASSENGER SHOULDER BELT FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

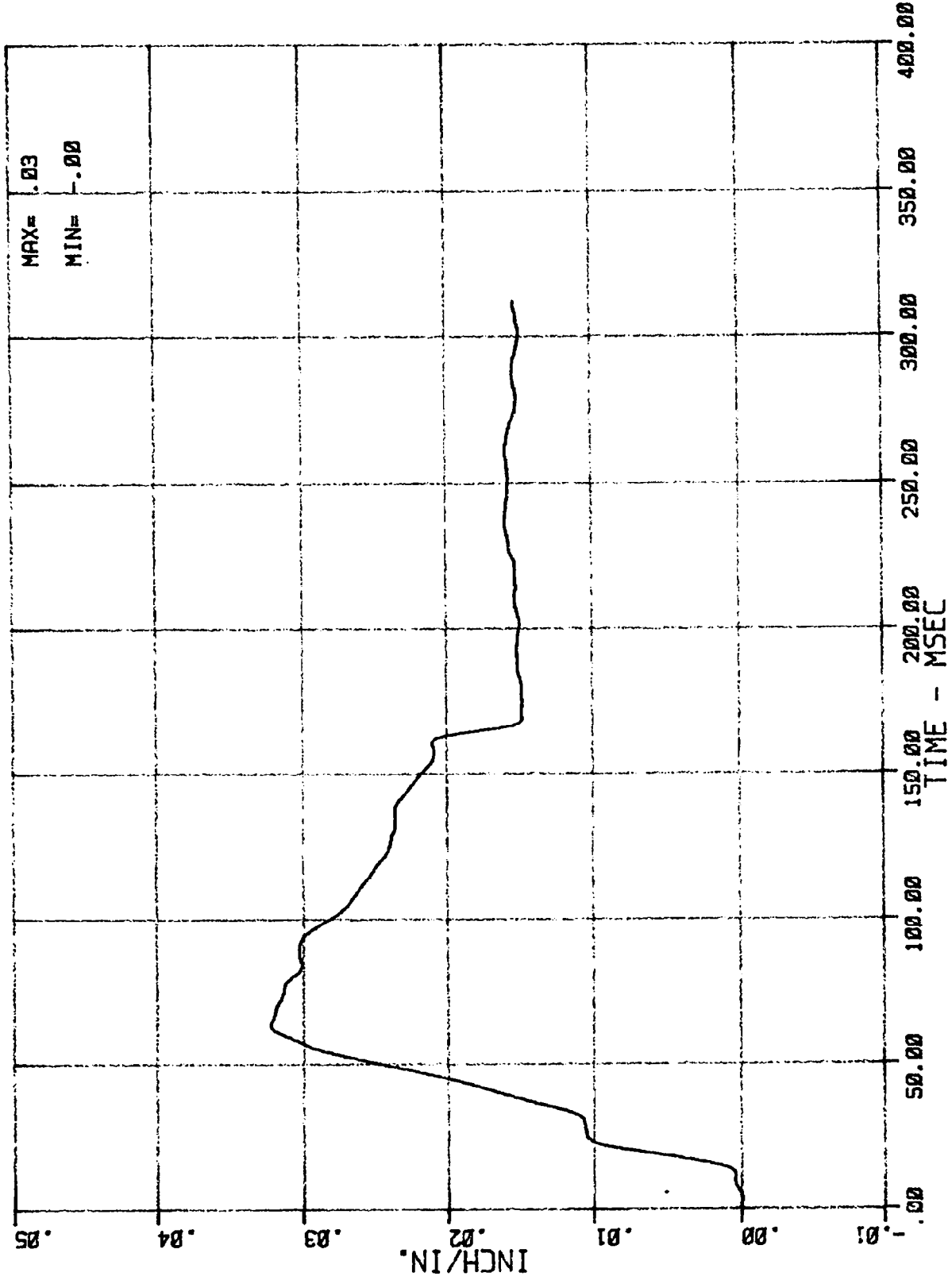
04/01/88



21 DT 01 1 SHB (DRIVER SHOULDER BELT PULLOUT) NOT RECORDED
MSE N64088 1988 NISSAN PICKUP TRUCK 04/01/88

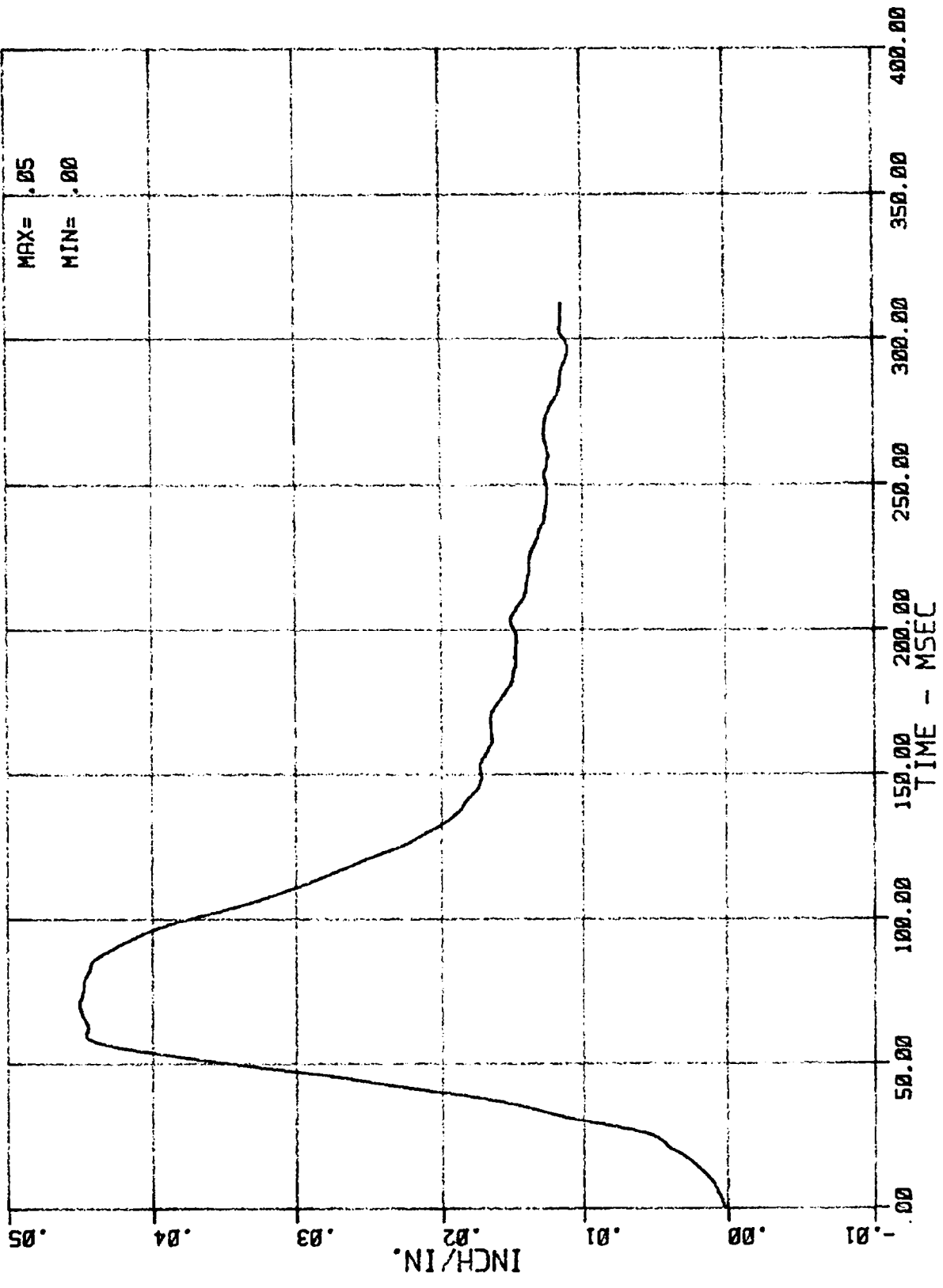


22 DT 01 2 (PASSENGER SHOULDER BELT PULLOUT) NOT RECORDED
MSE N64088 1988 NISSAN PICKUP TRUCK 04/01/88



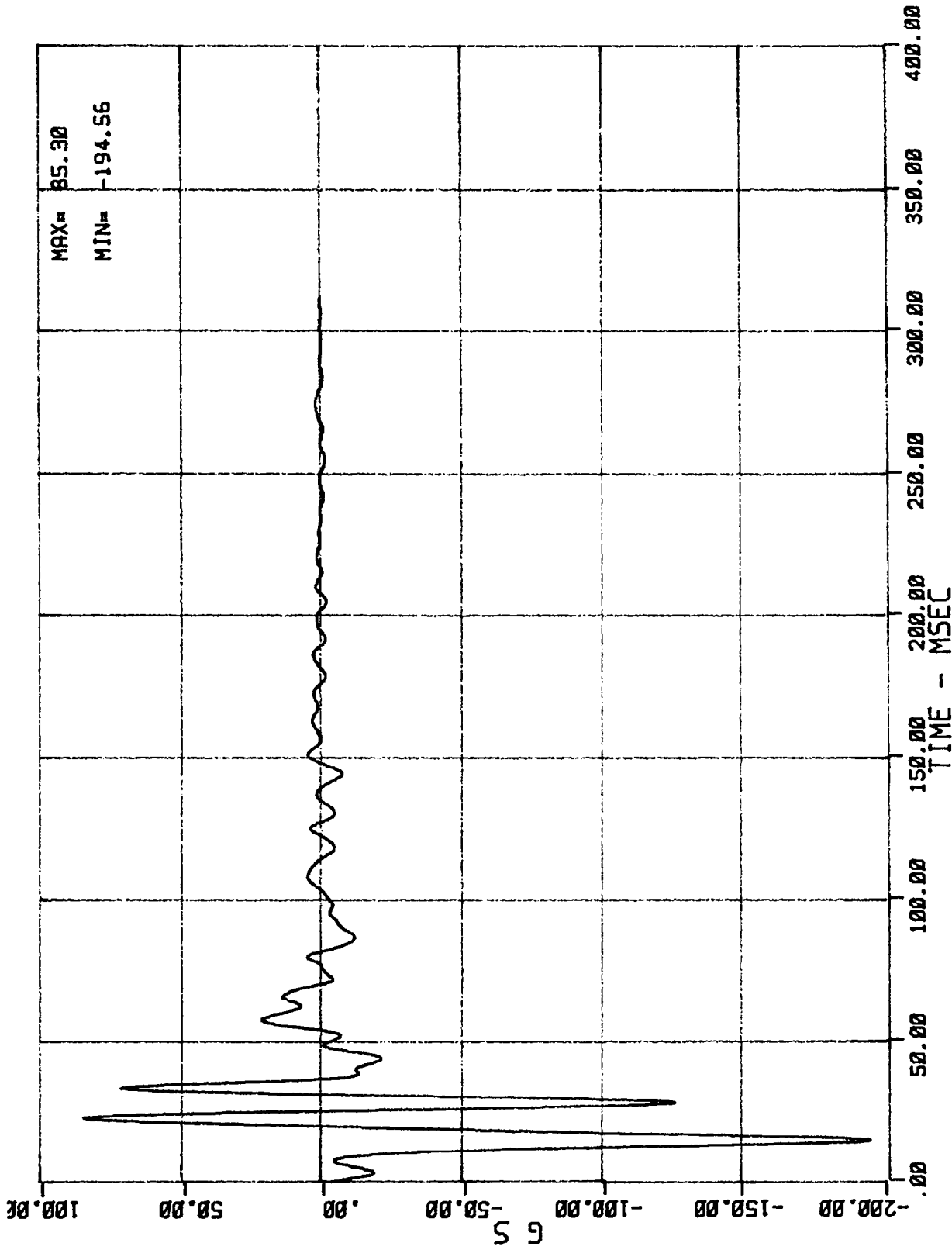
23 DT 01 1 SHB (DRIVER'S SHOULDER BELT ELONGATION)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



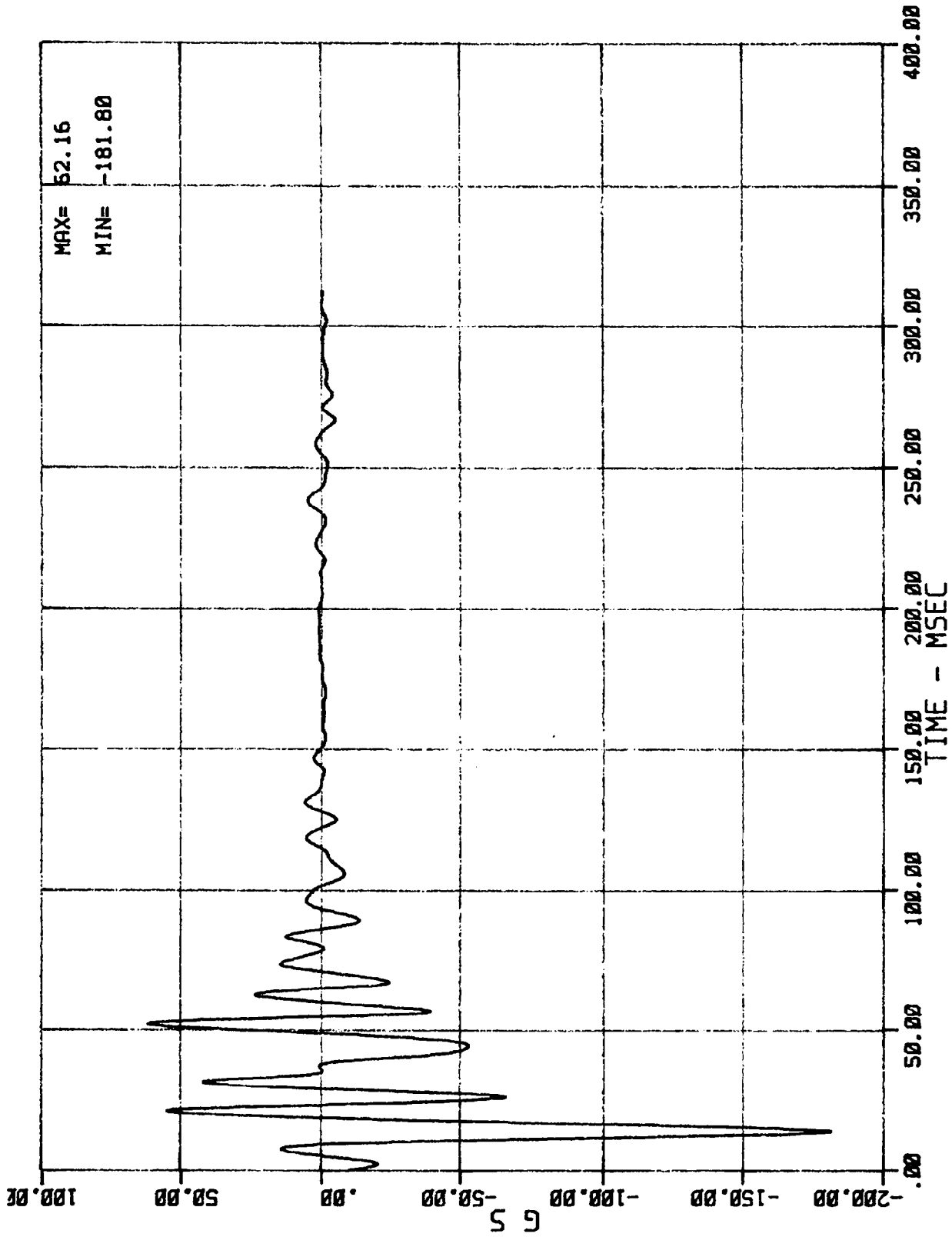
24 DT 01 2 SHB (PASSENGER'S SHOULDER BELT ELONGATION)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



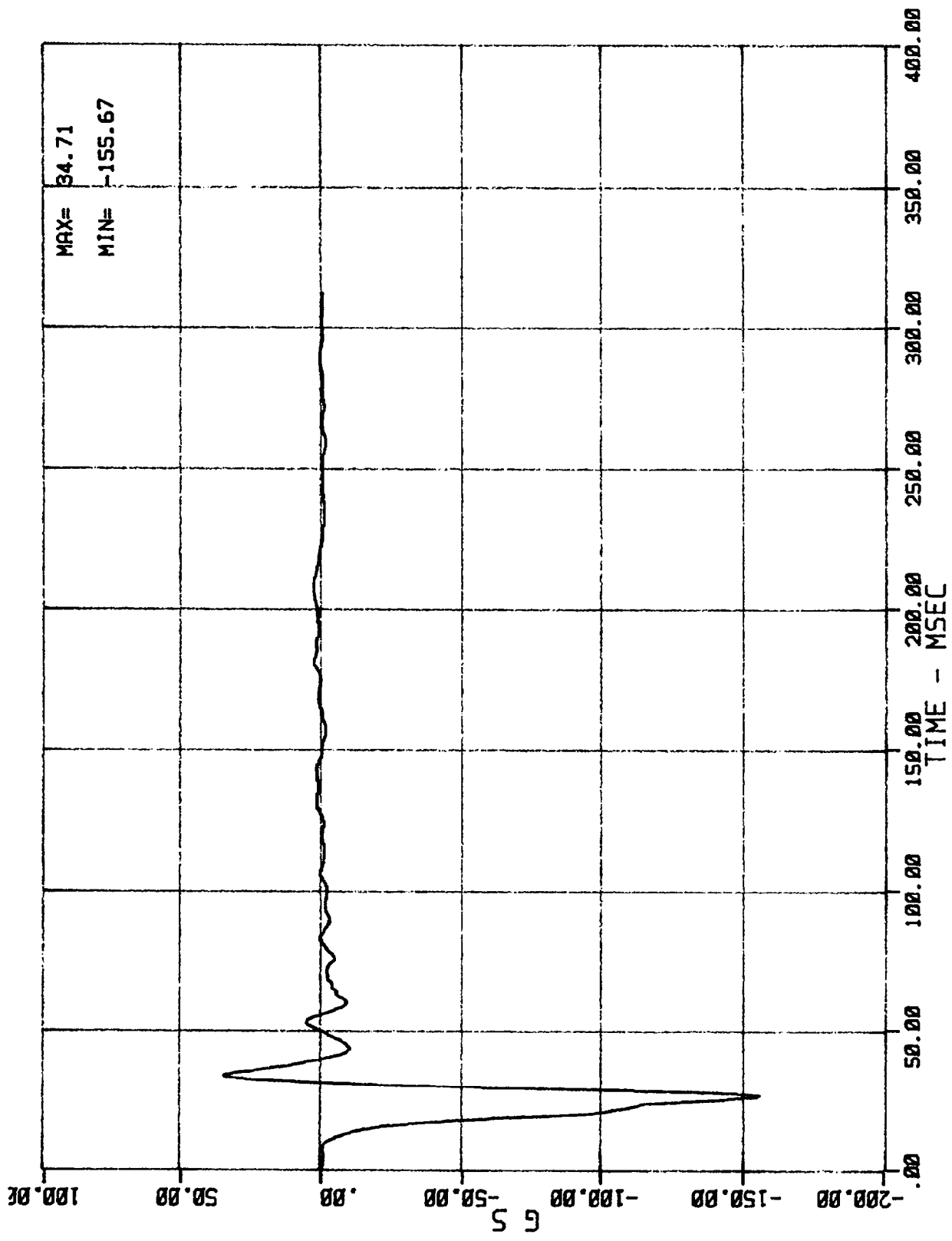
25 AC 01 N BCR X (LEFT FRONT WHEEL ACCEL. -- X-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



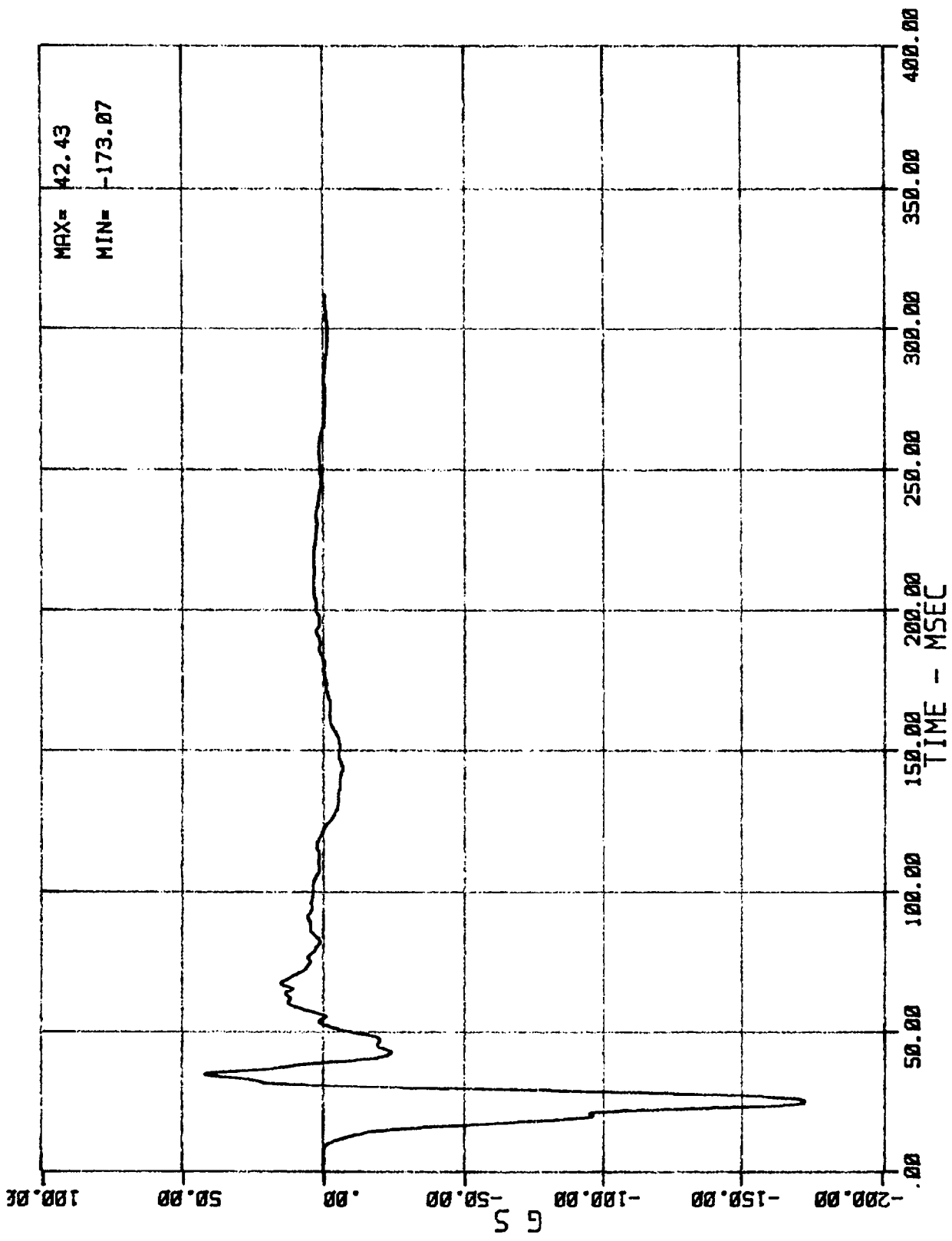
26 AC 01 N BCR X (RIGHT FRONT WHEEL ACCEL. -- X-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



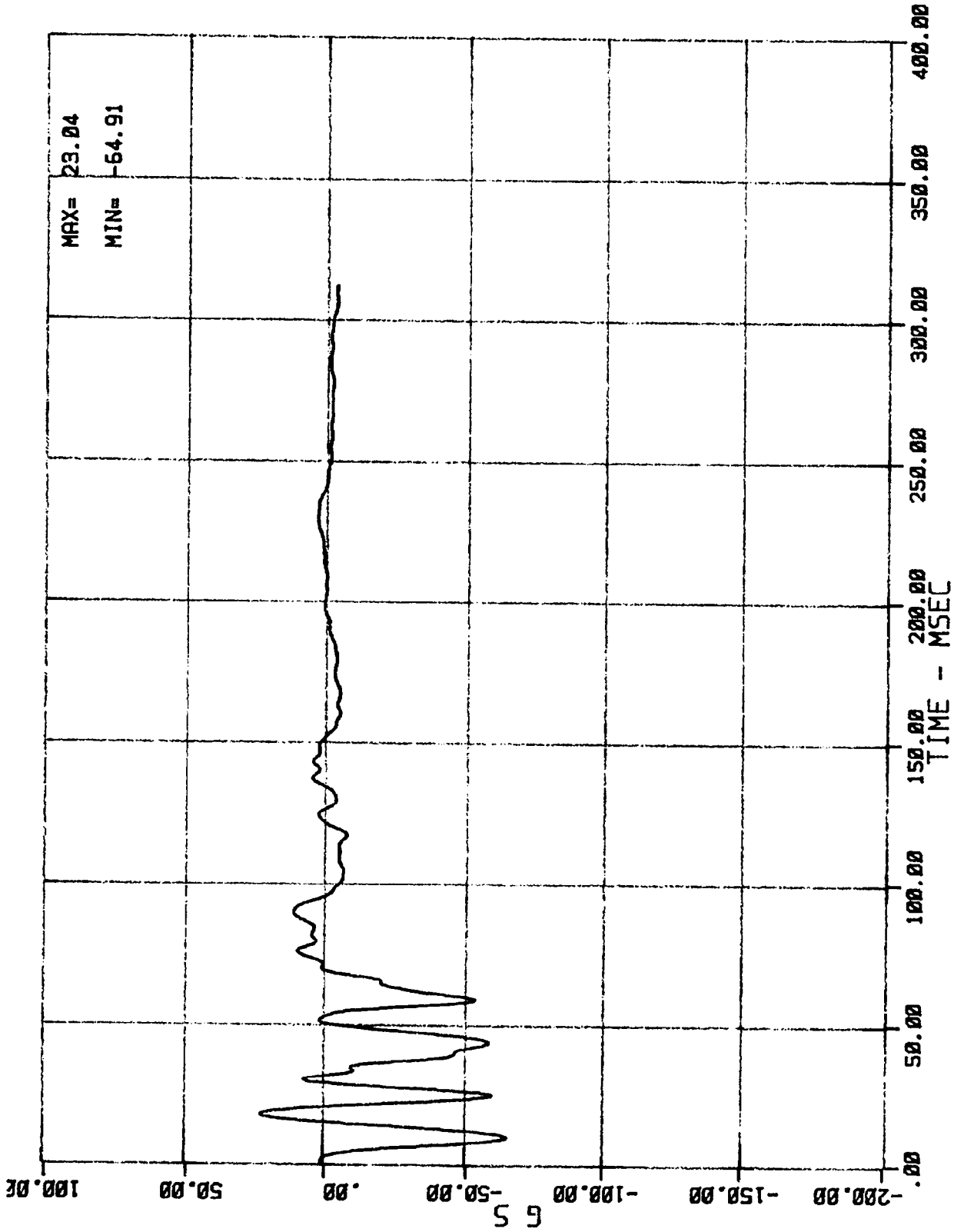
27 AC 01 N ENG X (BOTTOM OF ENGINE ACCEL. -- X-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



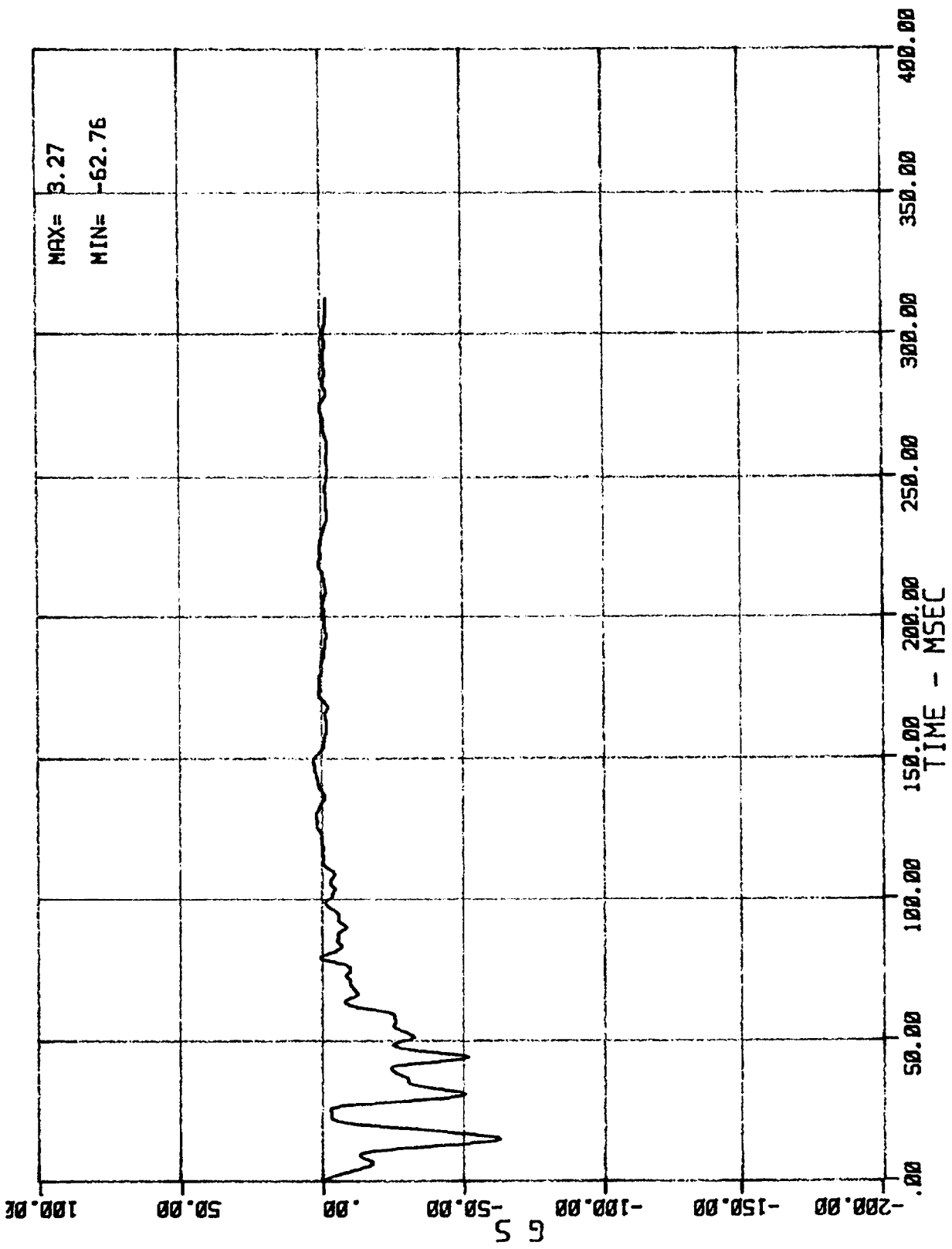
28 AC 01 N ENG X (TOP OF ENGINE ACCEL. -- X-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



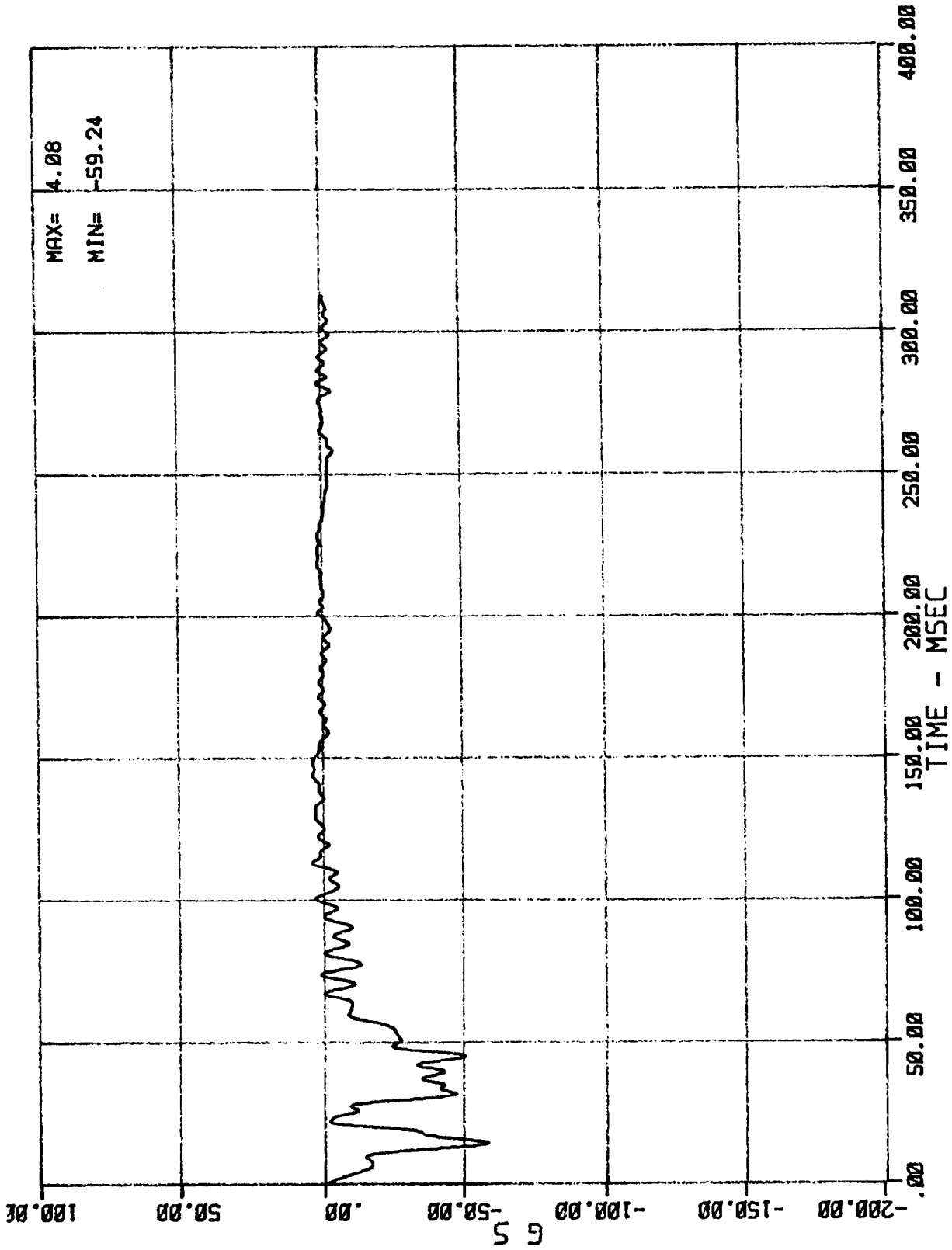
29 AC 01 N OPC X (CENTER OF DASH ACCEL. -- X-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



30 AC 01 N LRF (LEFT REAR FLOOR ACCEL. -- X-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



31 AC 01 N RRF (RIGHT REAR FLOOR ACCEL. -- X-AXIS)
MSE N64088 1988 NISSAN PICKUP TRUCK

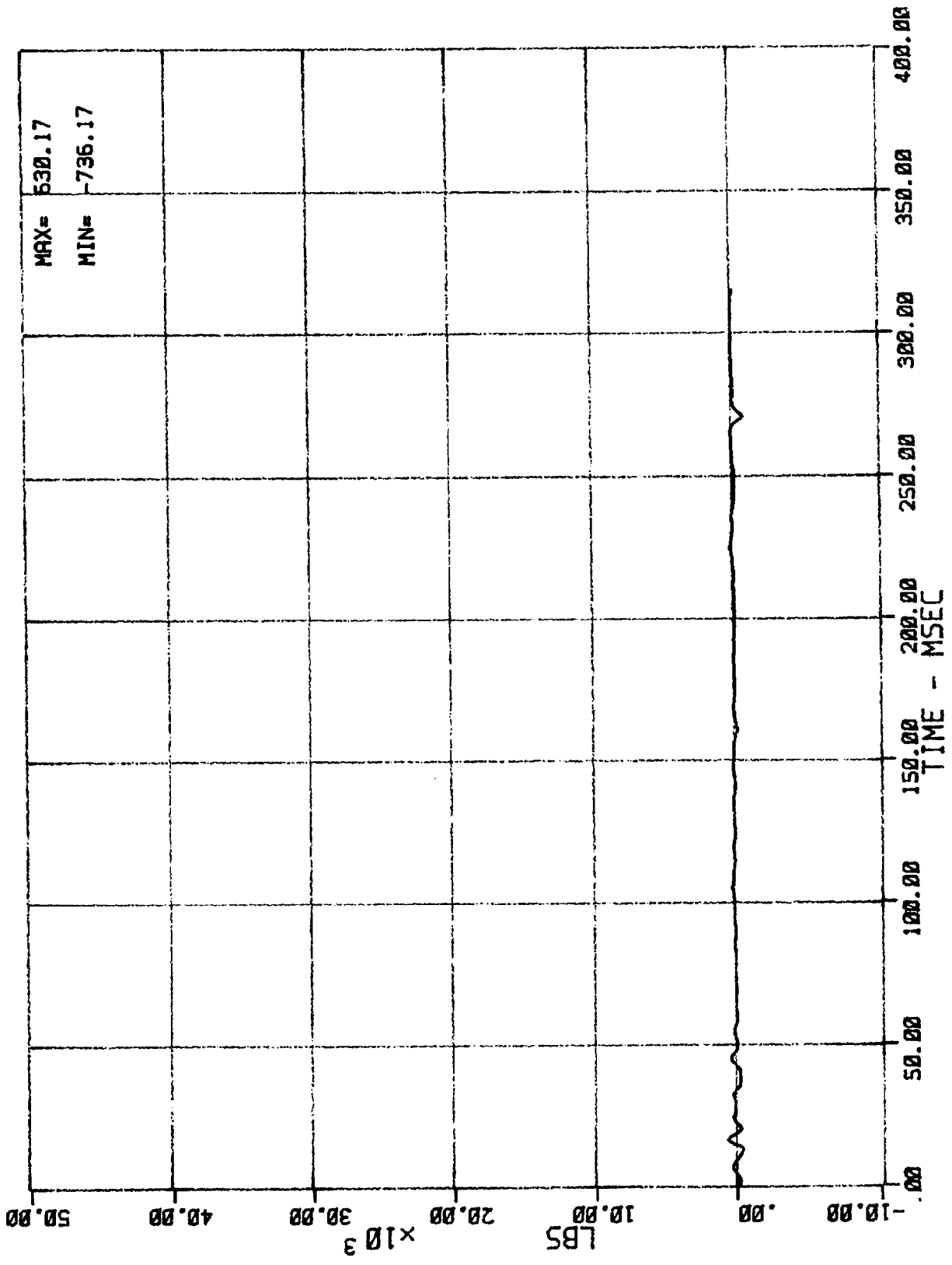
04/01/88

APPENDIX B-2

LOAD CELL BARRIER DATA

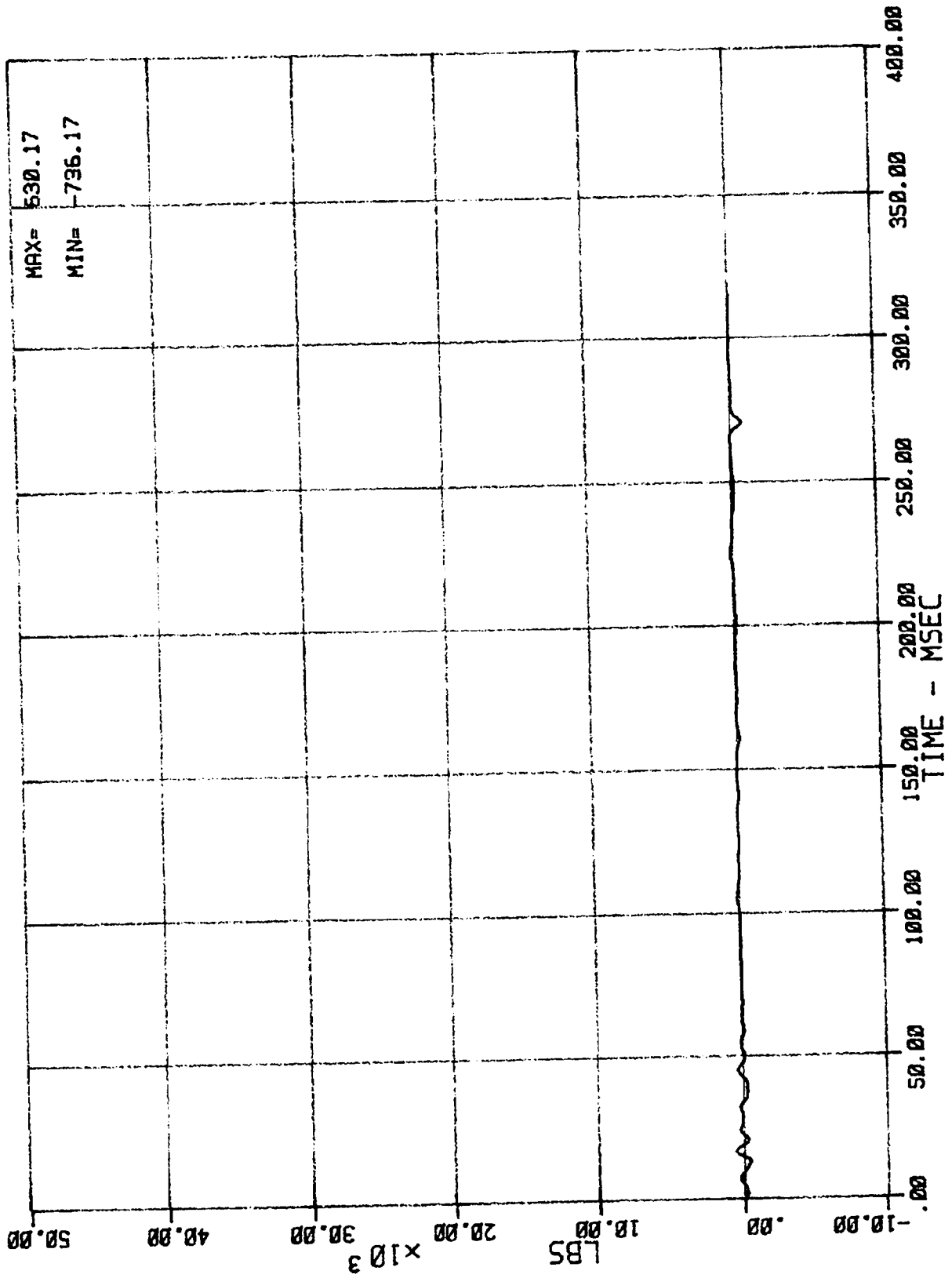
DATA FILTERING:

Load Cell Barrier channels - Class 60



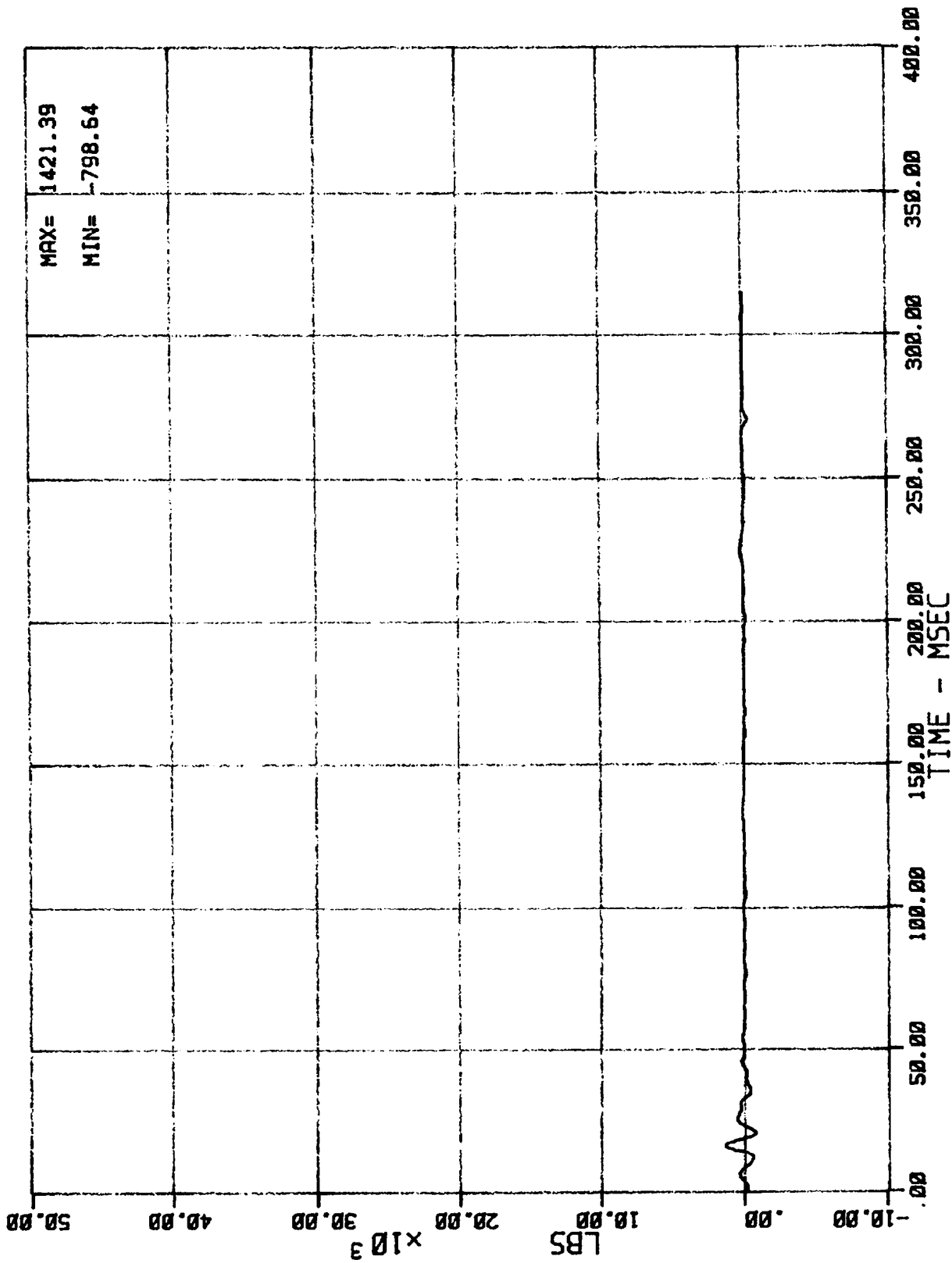
32 LC BA N BA1 (BARRIER LOAD CELL A1 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



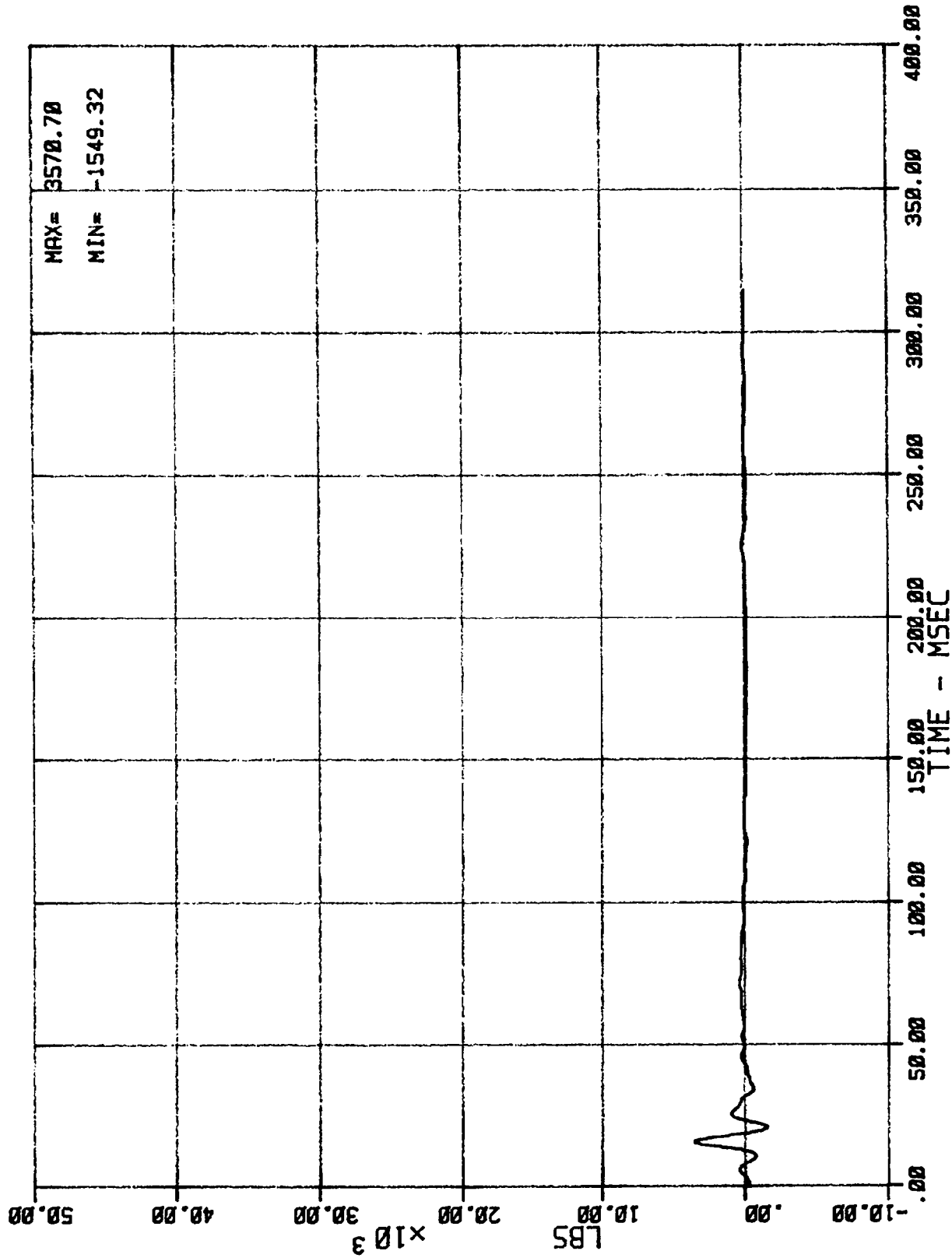
33 LC BA N BA2 (BARRIER LOAD CELL A2 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



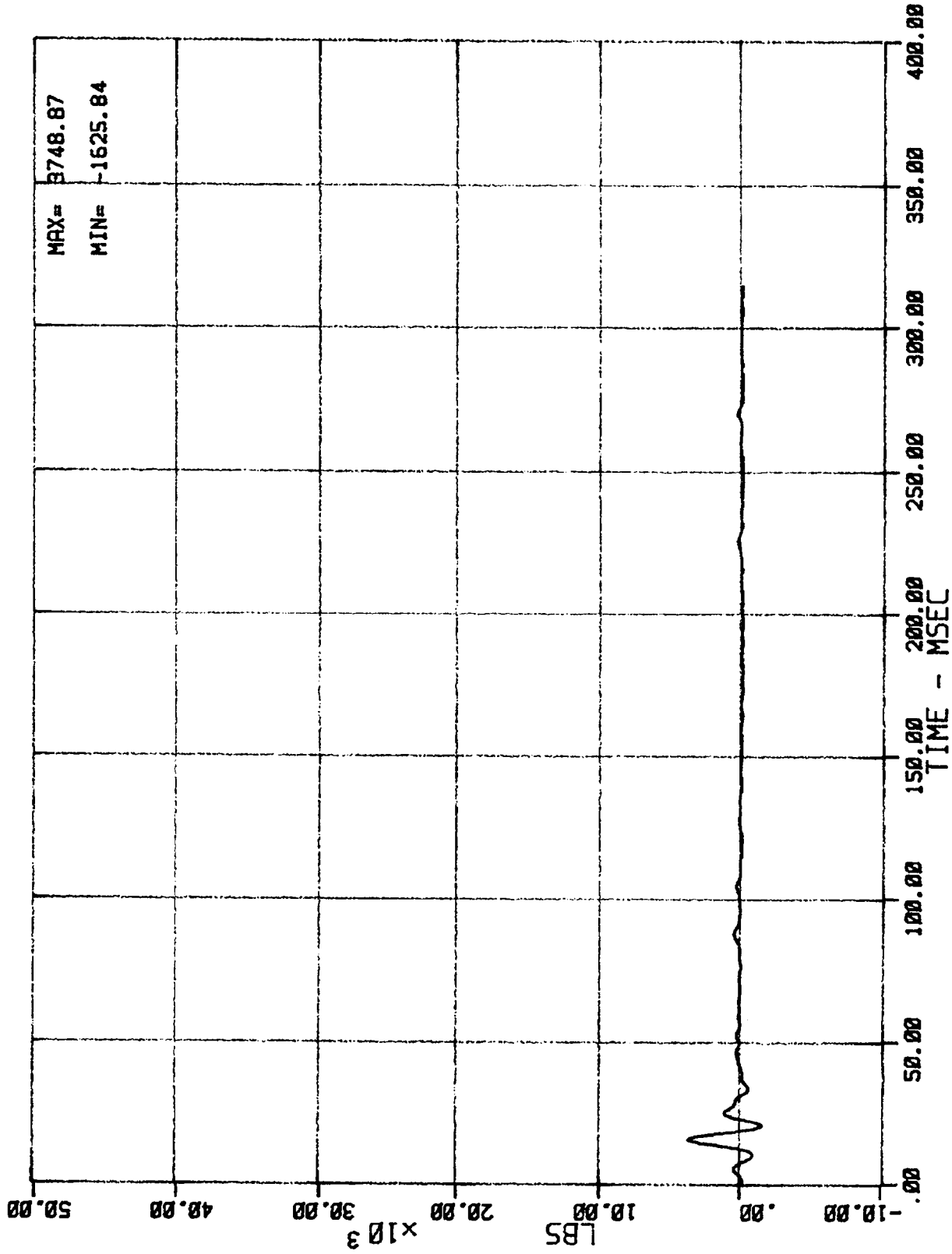
34 LC BA N BA3 (BARRIER LOAD CELL A3 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



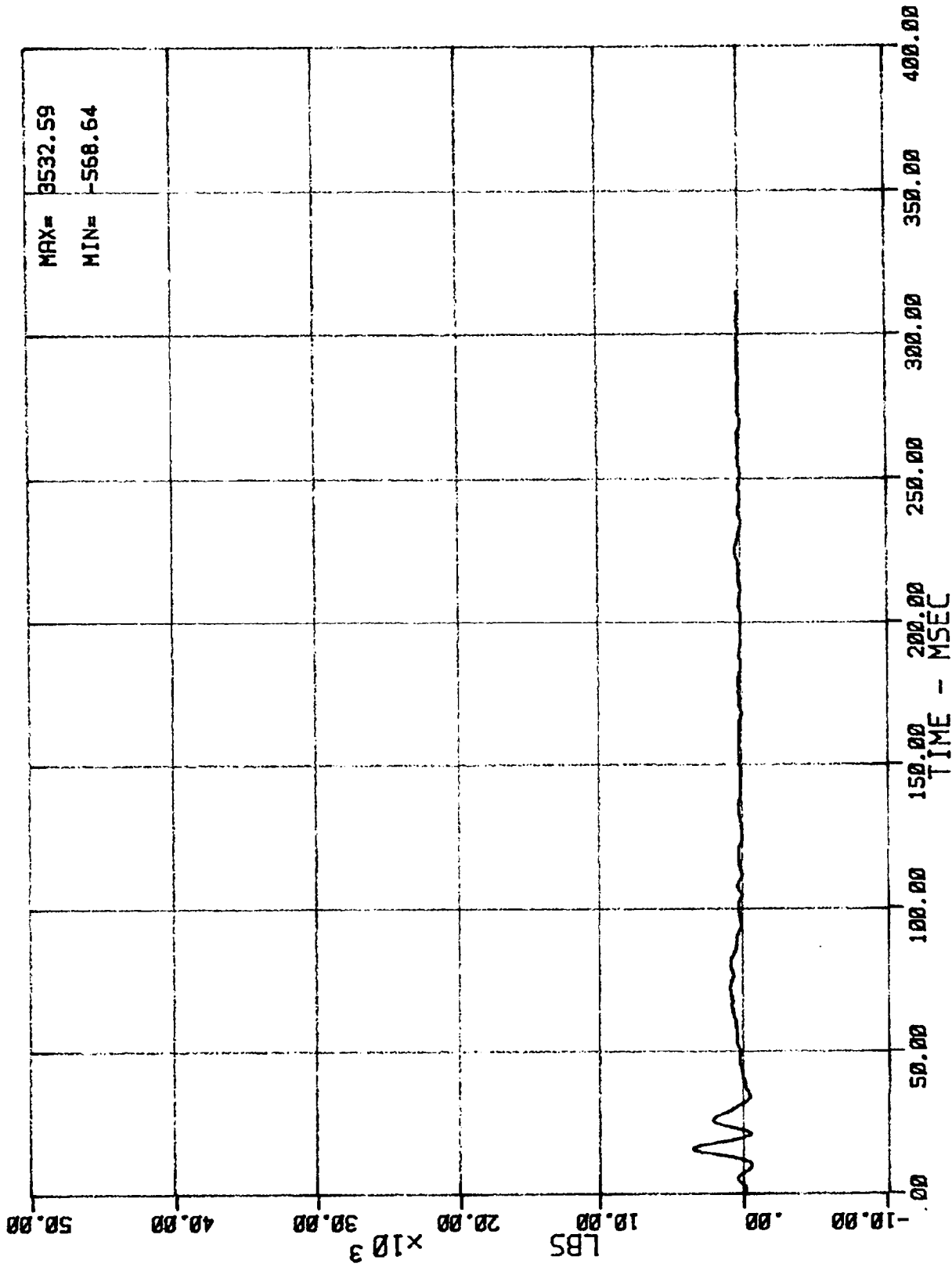
35 LC N BR4 (BARRIER LOAD CELL R4 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



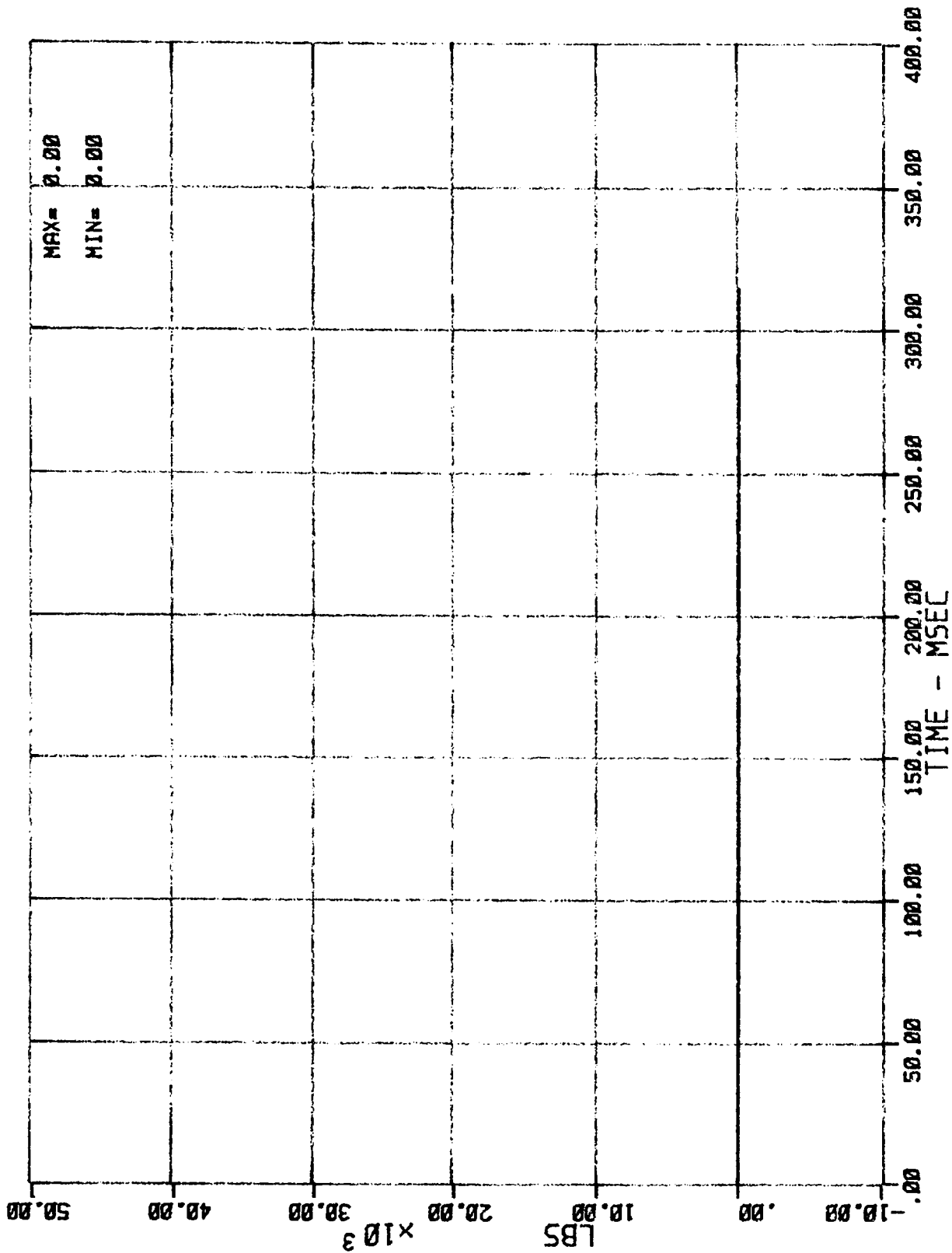
36 LC BA N BAS (BARRIER LOAD CELL AS - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



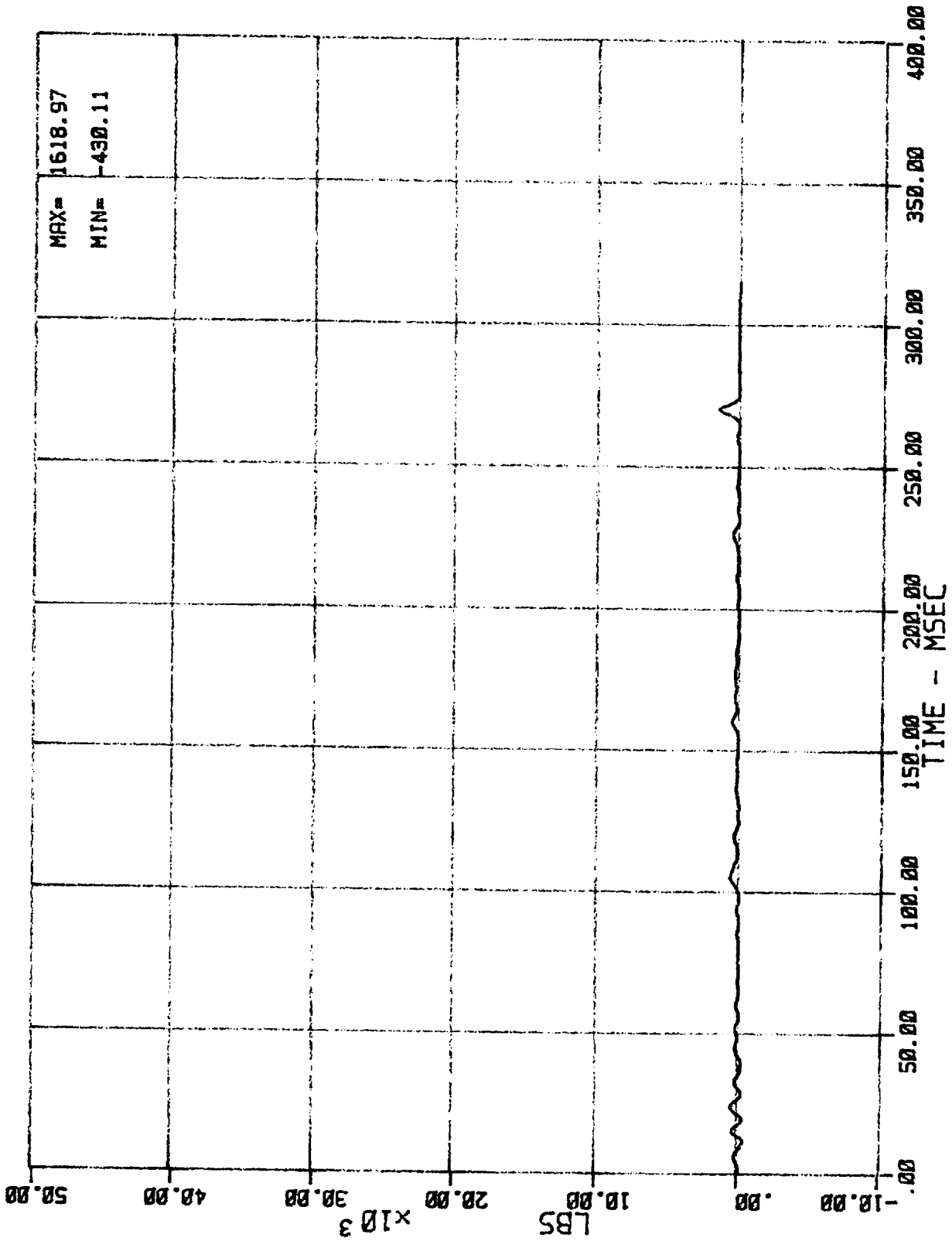
37 LC BA N BA6 (BARRIER LOAD CELL A6 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



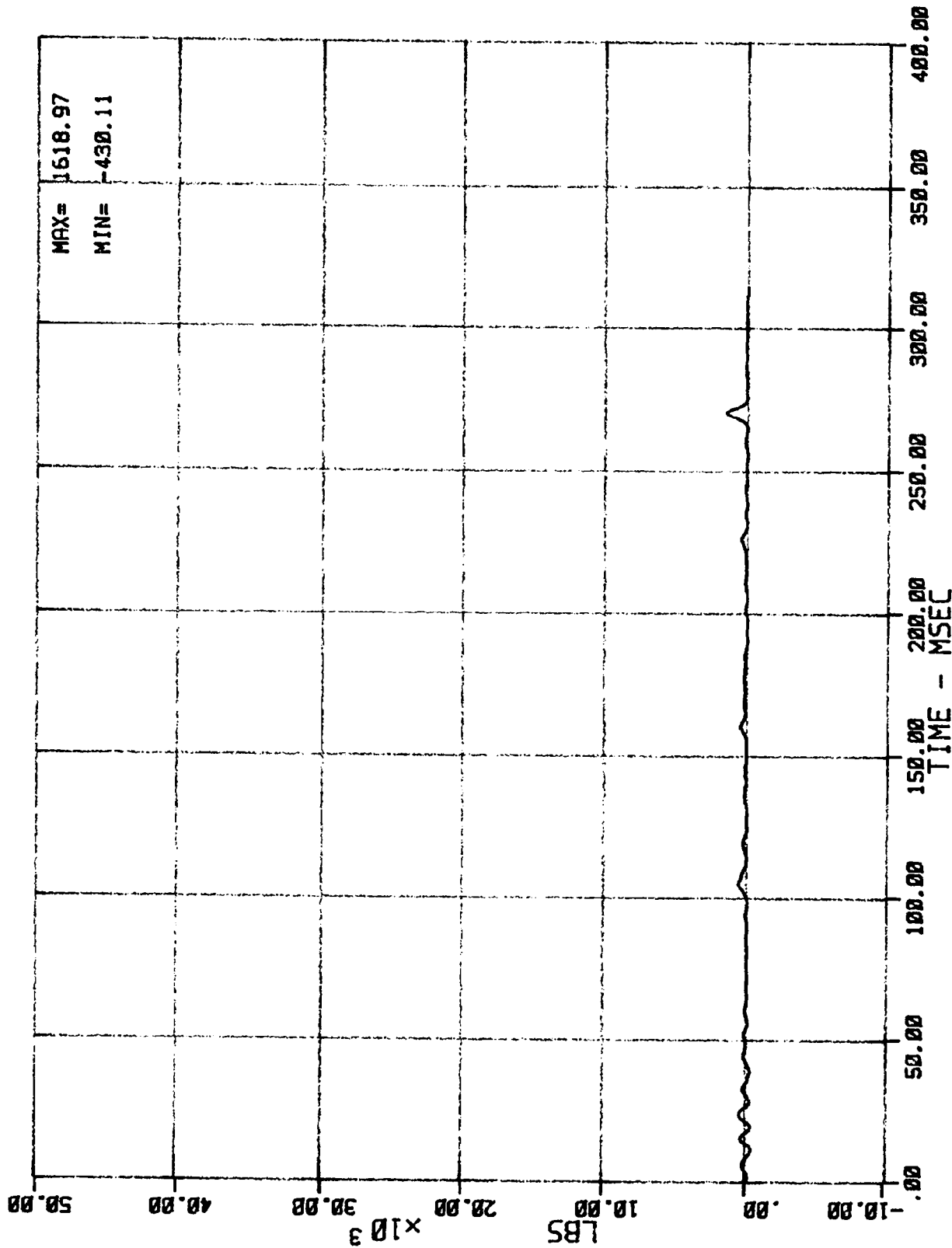
38 LC BA N BA7 (BARRIER LOAD CELL A7 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



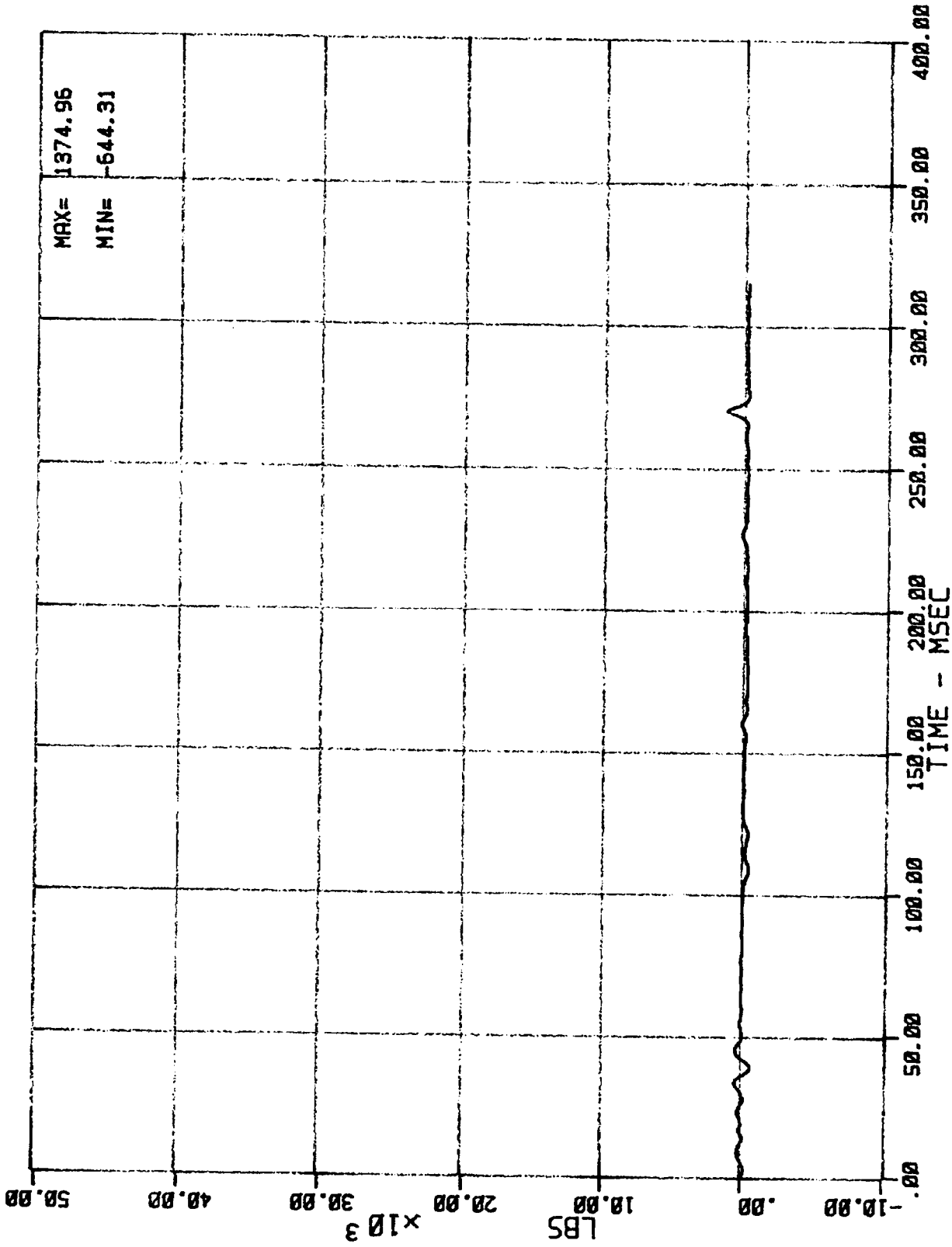
39 LC BR N BR8 (BARRIER LOAD CELL A8 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



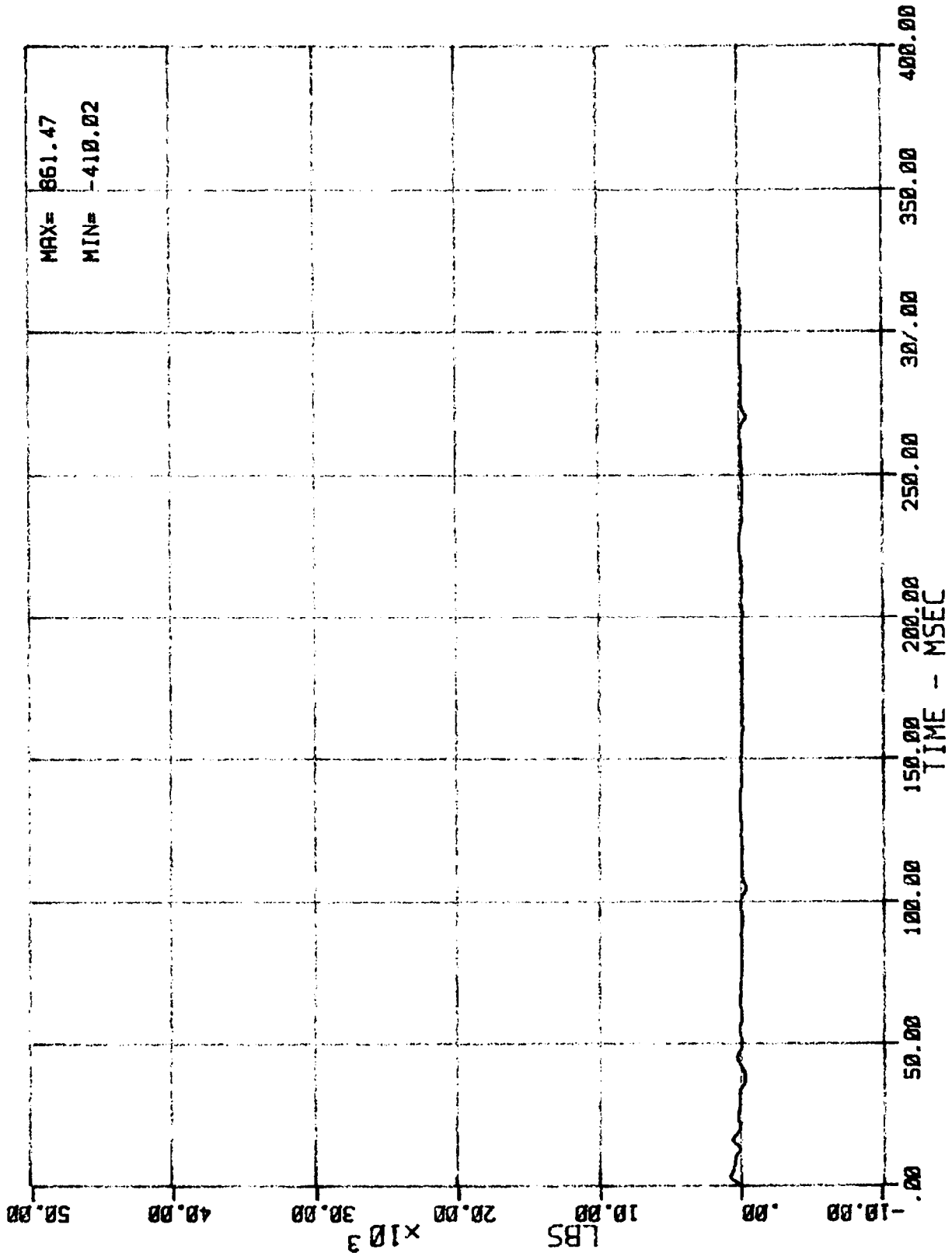
40 LC BA N BA9 (BARRIER LOAD CELL A9 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



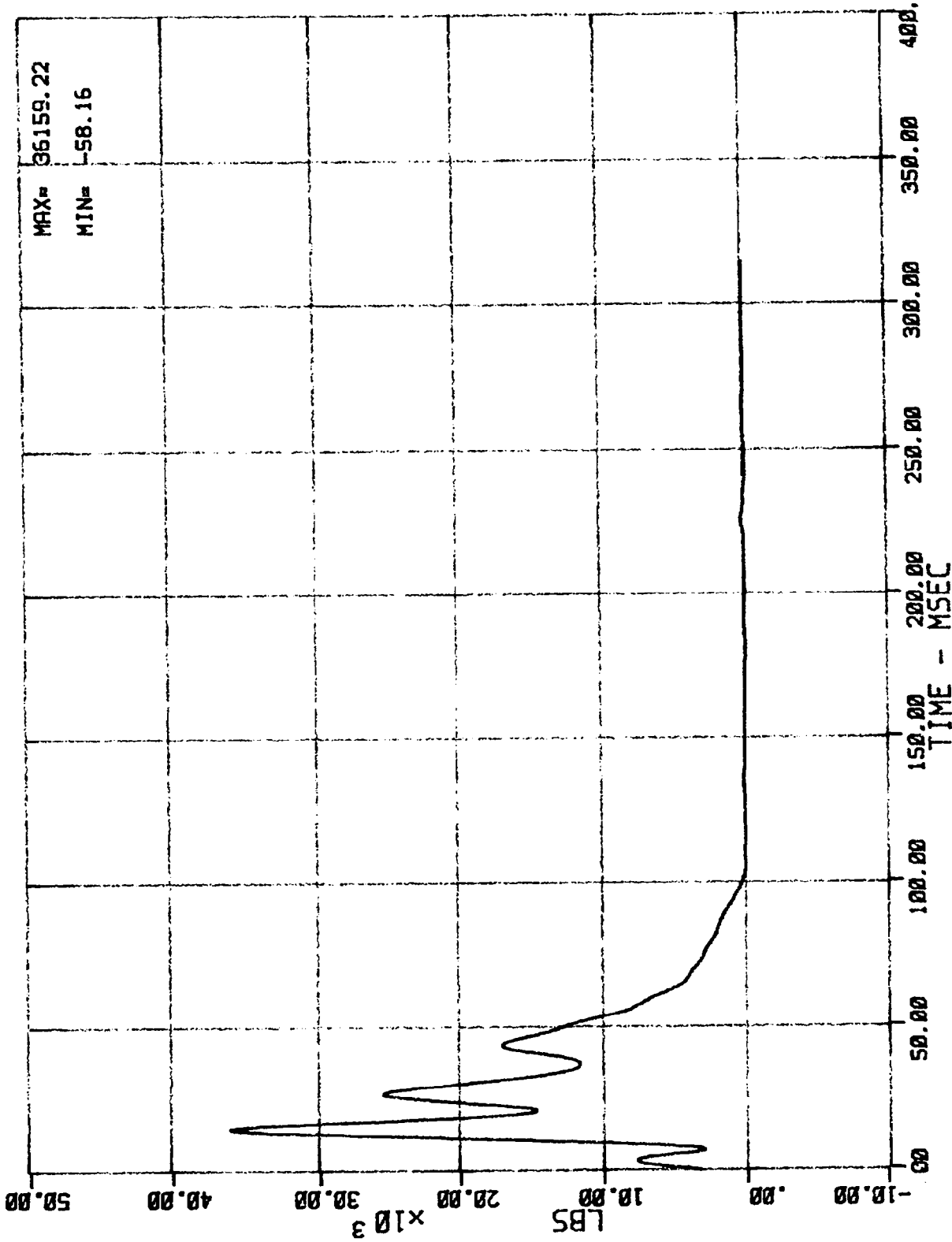
41 LC BA N BB1 (BARRIER LOAD CELL B1 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



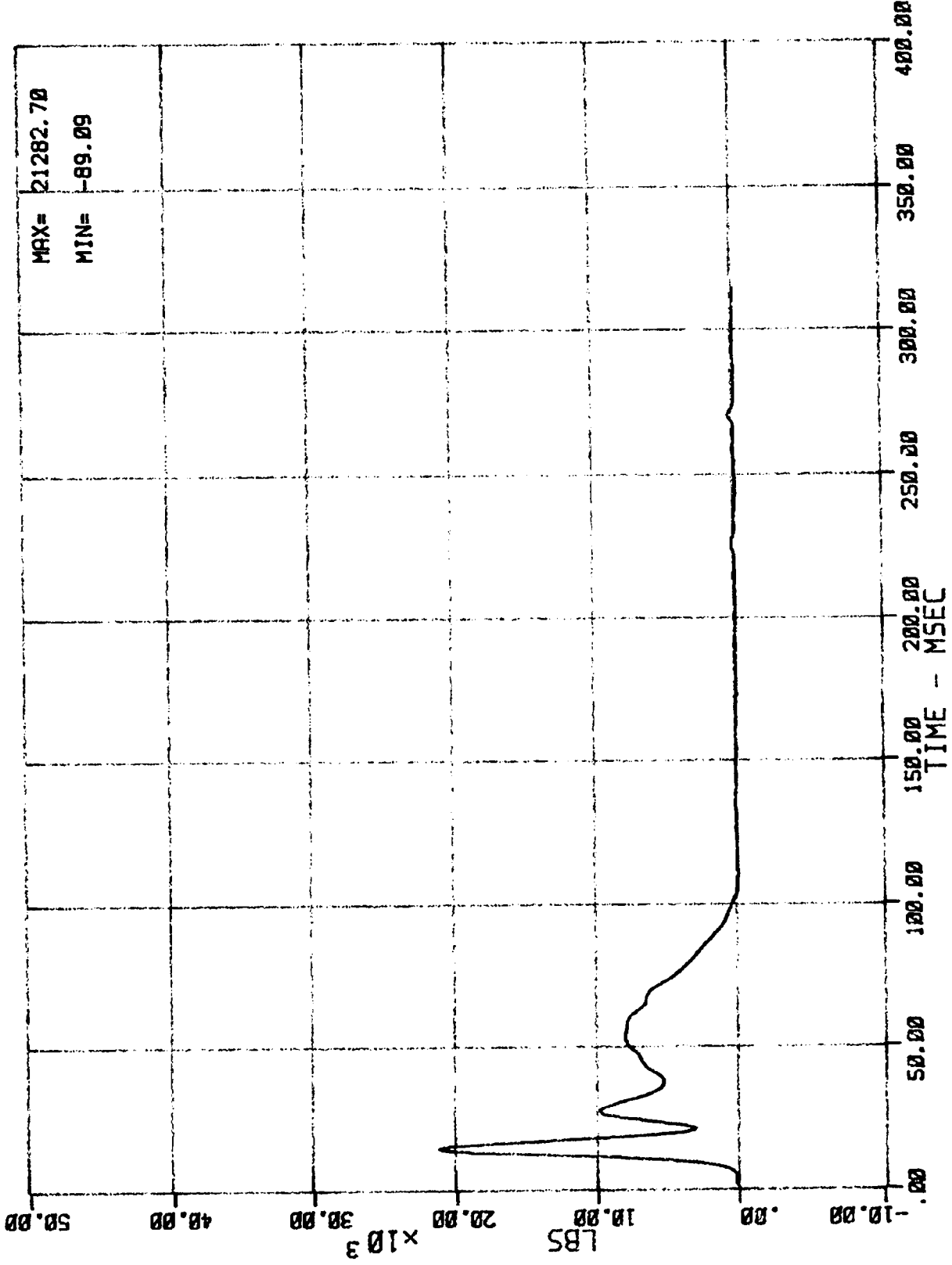
42 LC BA N BB2 (BARRIER LOAD CELL B2 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



43 LC BA N BB3 (BARRIER LOAD CELL B3 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

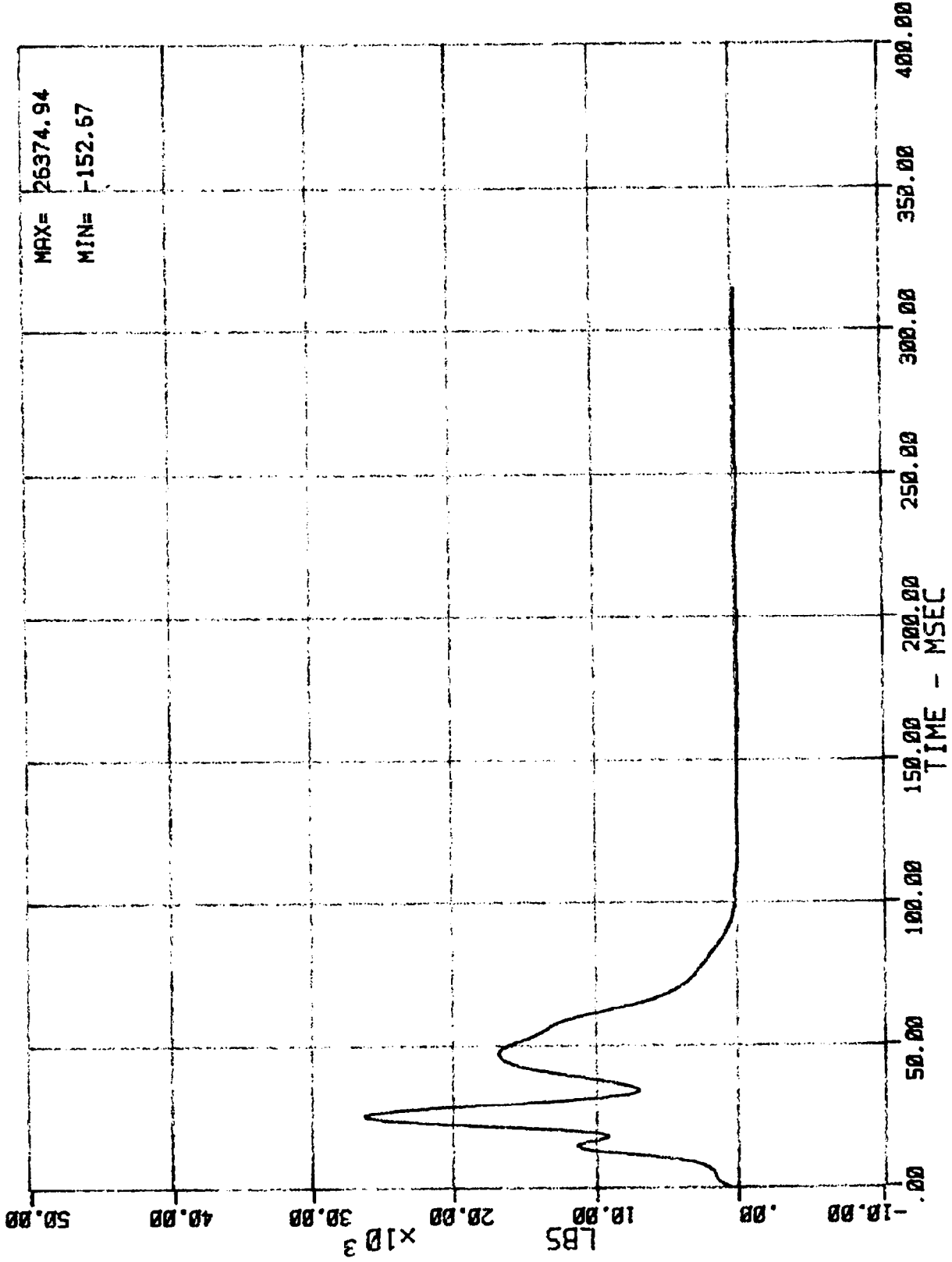
04/01/88



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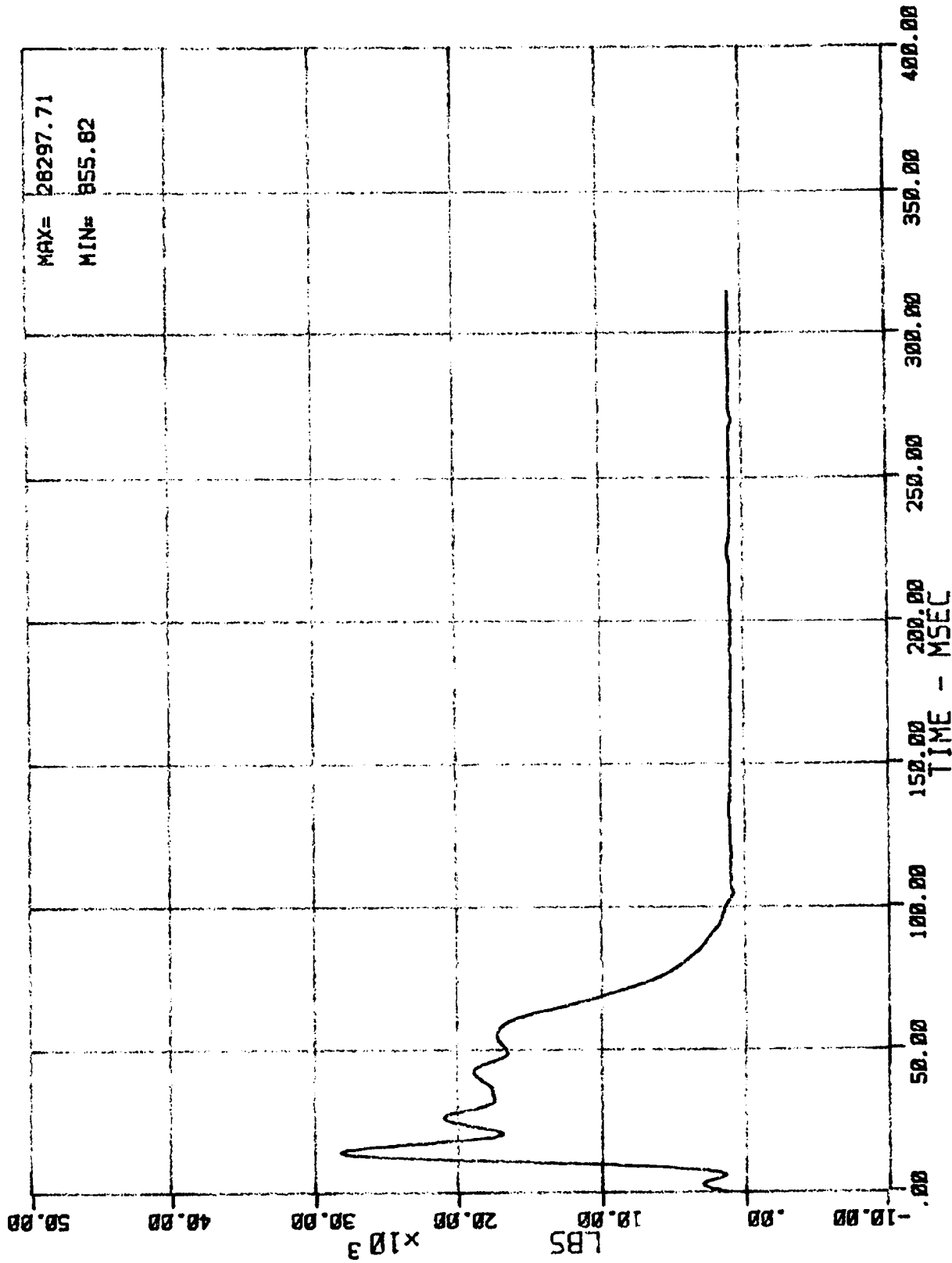
44 LC BR N 884 (BARRIER LOAD CELL B4 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



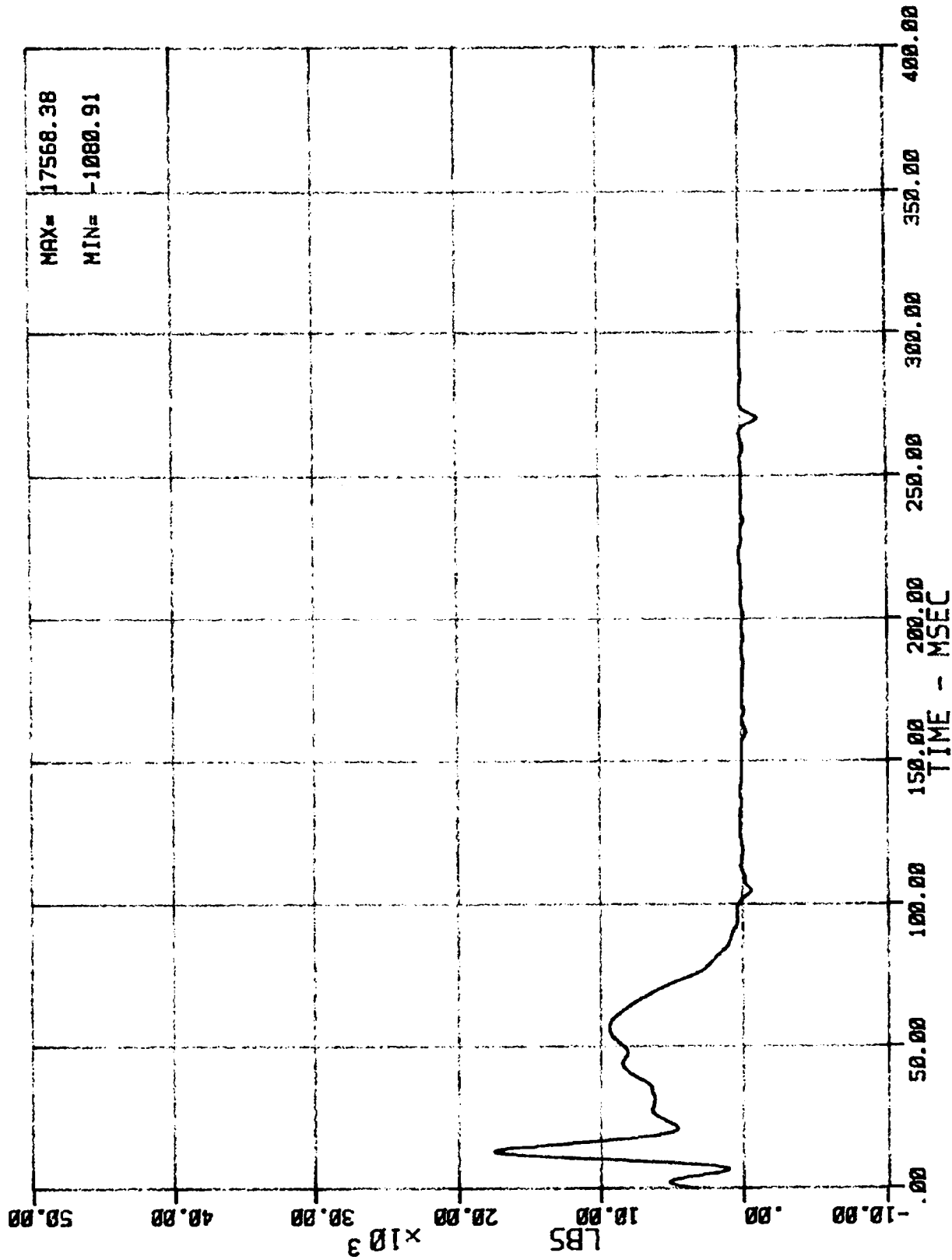
45 LC BR N BB5 (BARRIER LOAD CELL BS - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



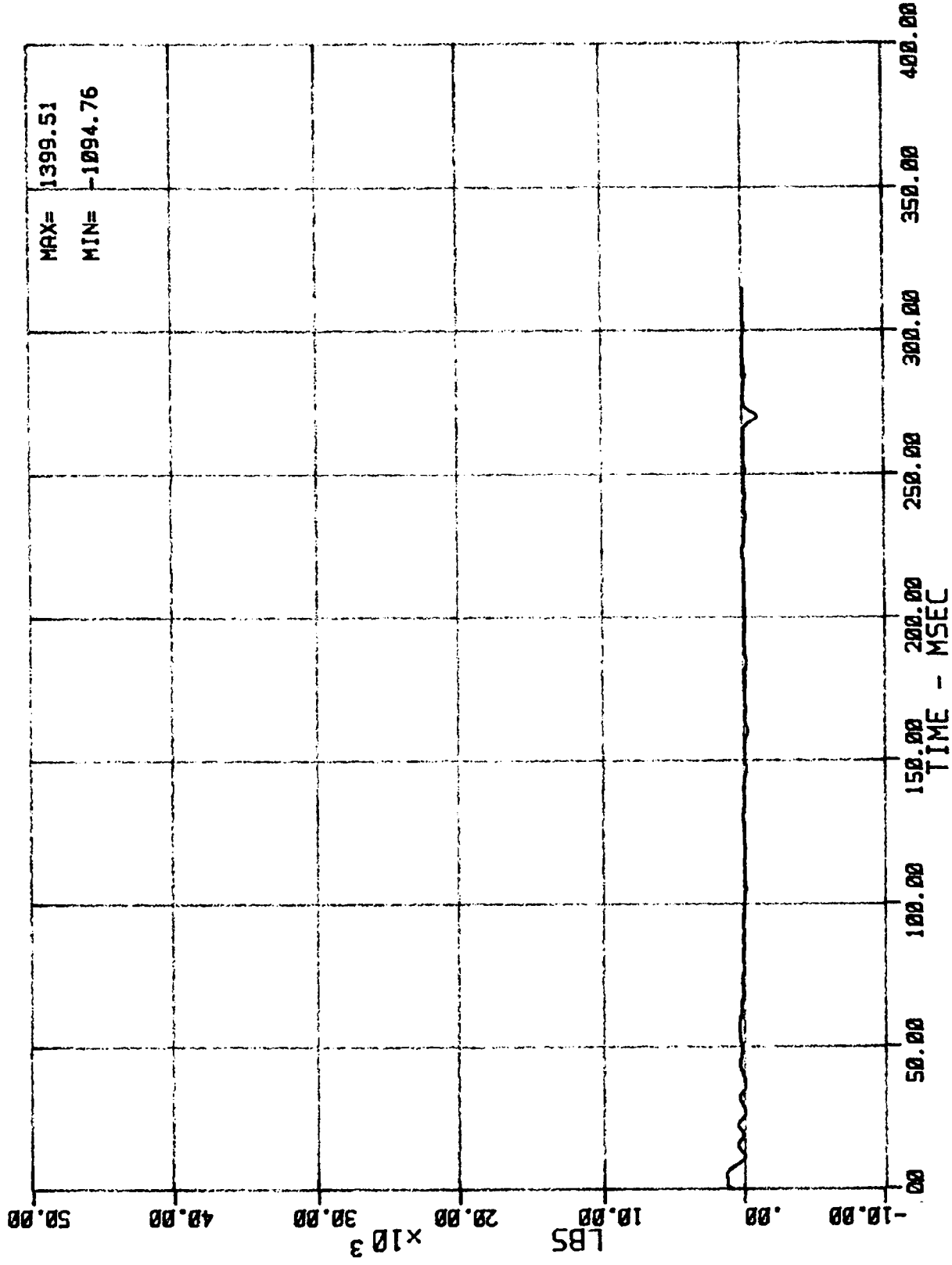
46 LC BR N 886 (BARRIER LOAD CELL 86 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



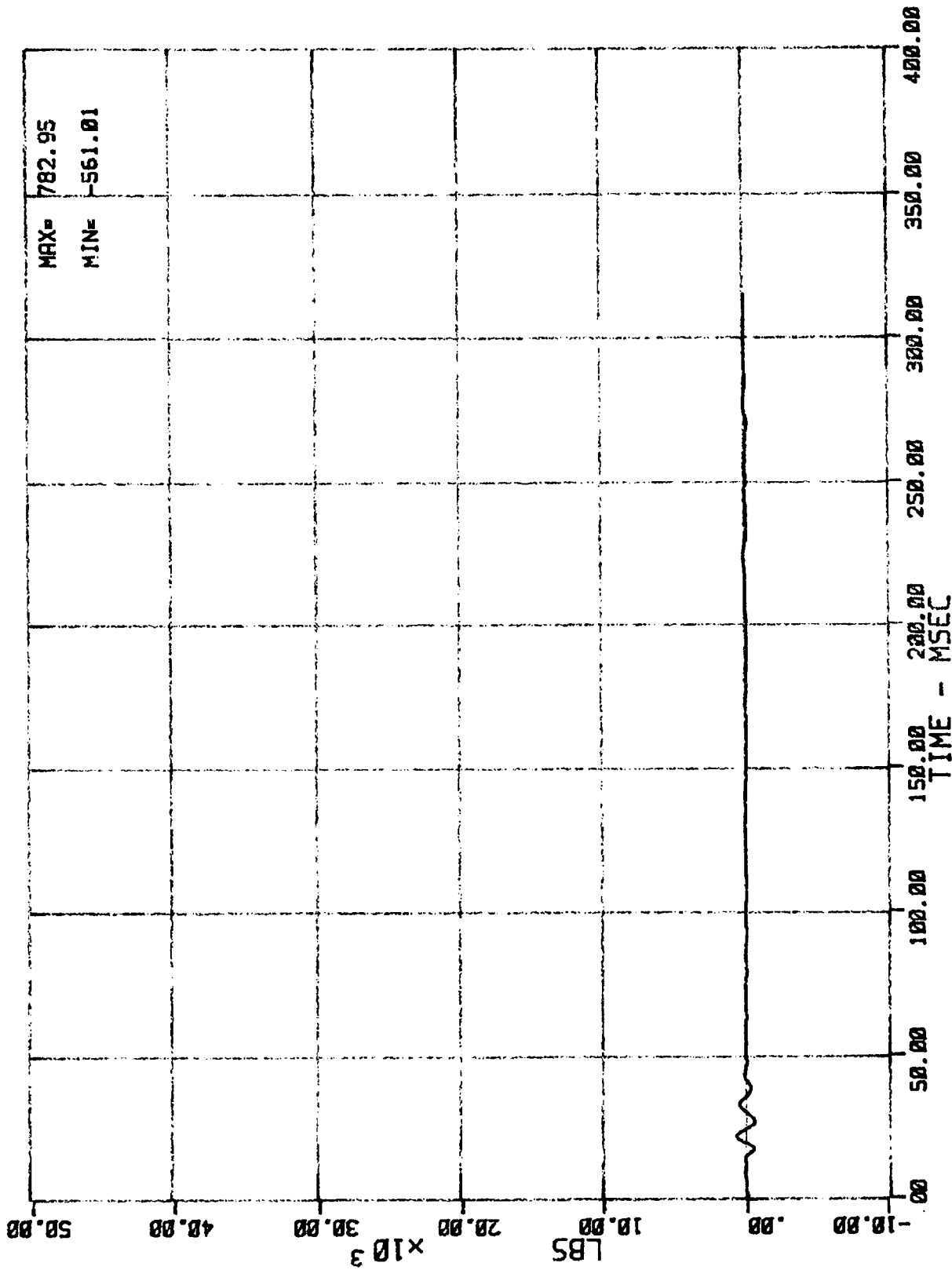
47 LC BA N BB7 (BARRIER LOAD CELL B7 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



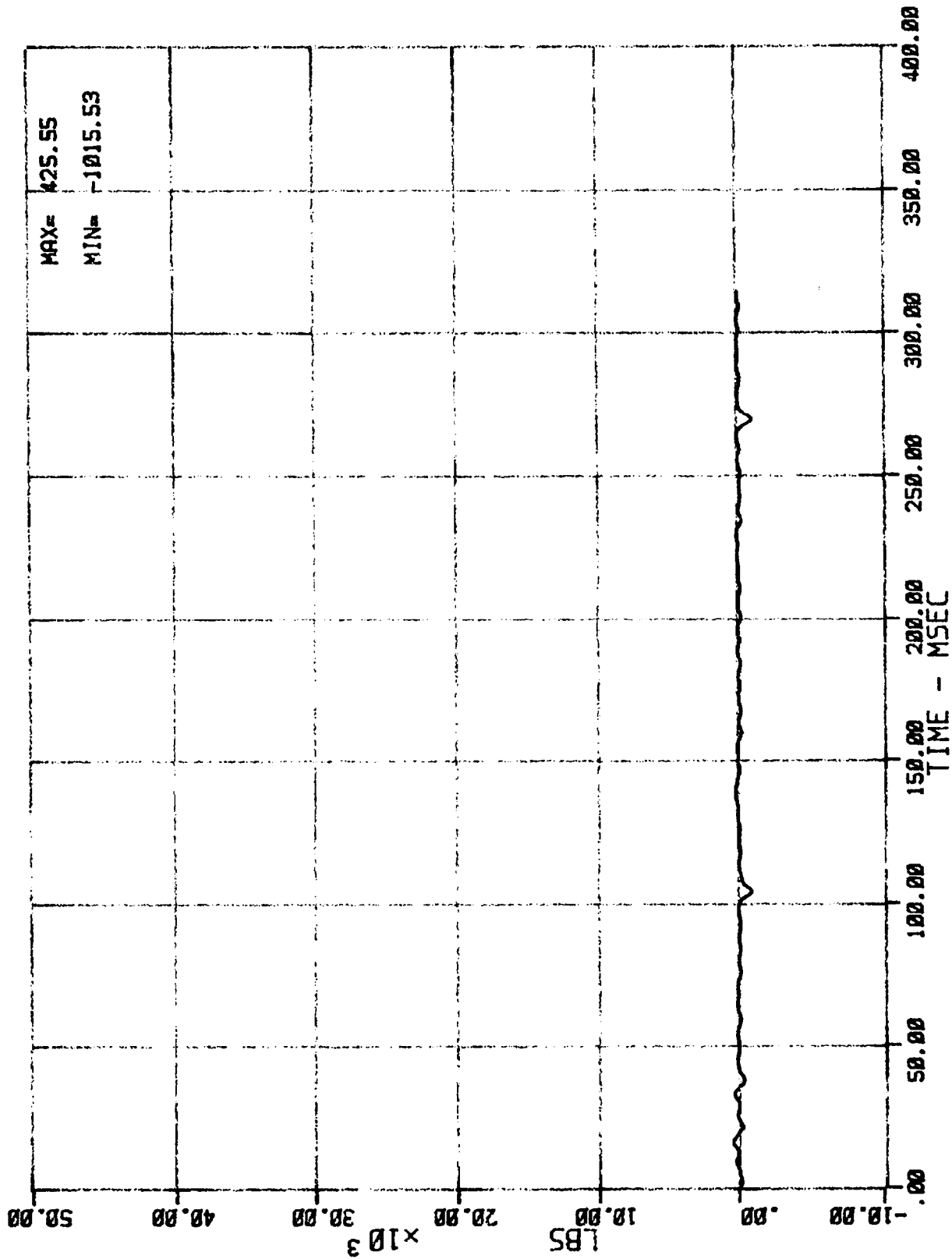
48 LC BA N 888 (BARRIER LOAD CELL 88 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



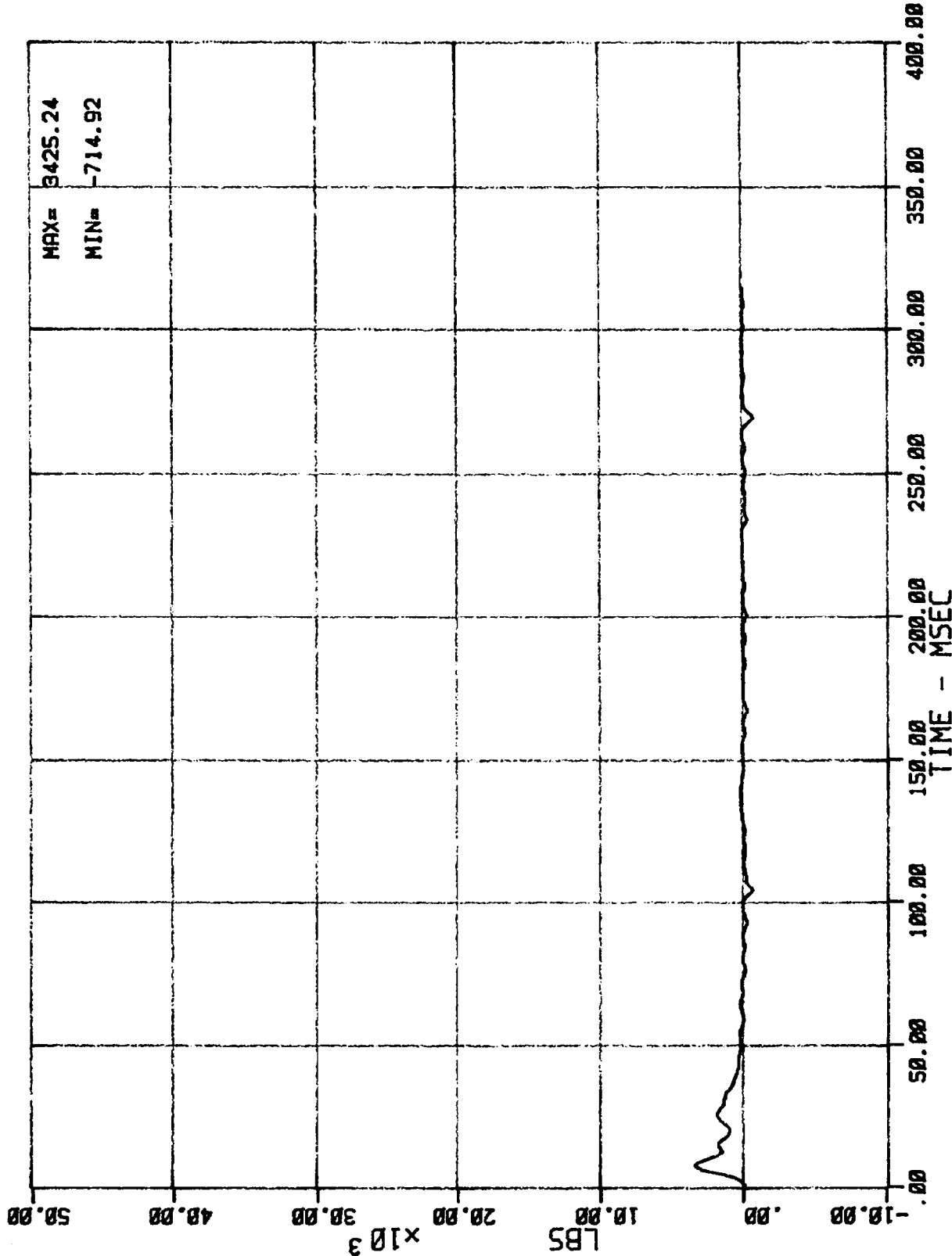
49 LC BA N BB9 (BARRIER LOAD CELL B9 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



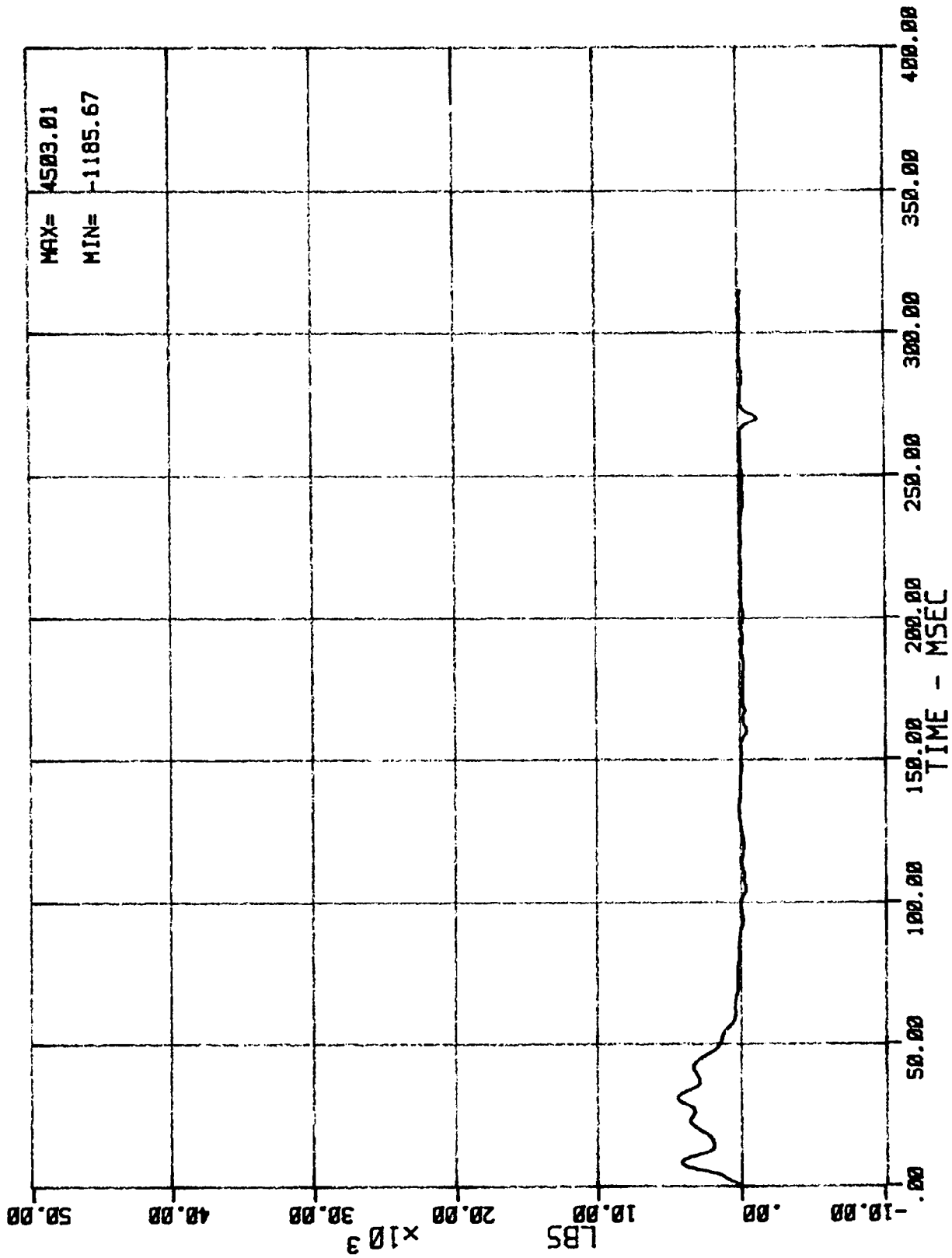
50 LC BA N BC1 (BARRIER LOAD CELL C1 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



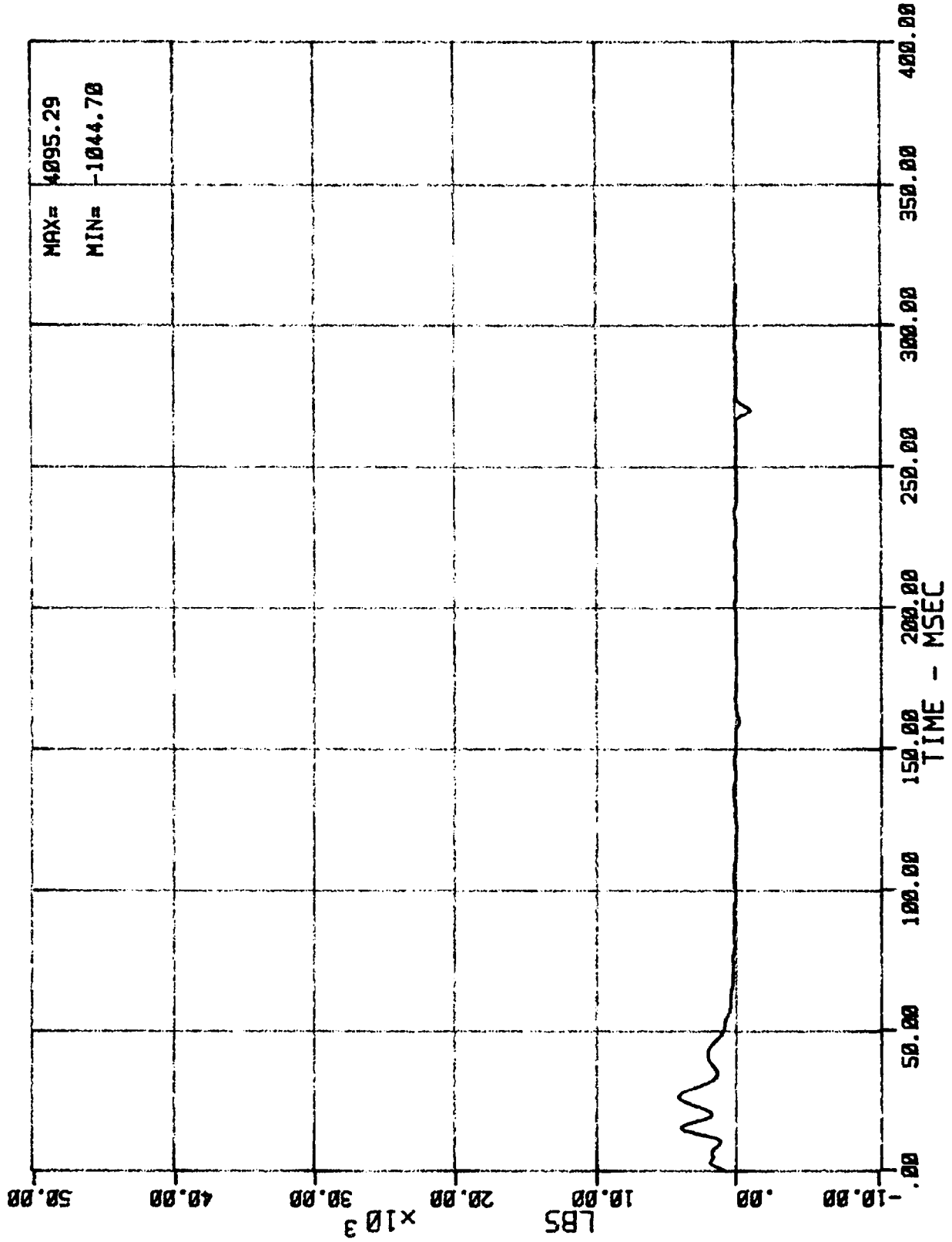
51 LC BA N BC2 (BARRIER LOAD CELL C2 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



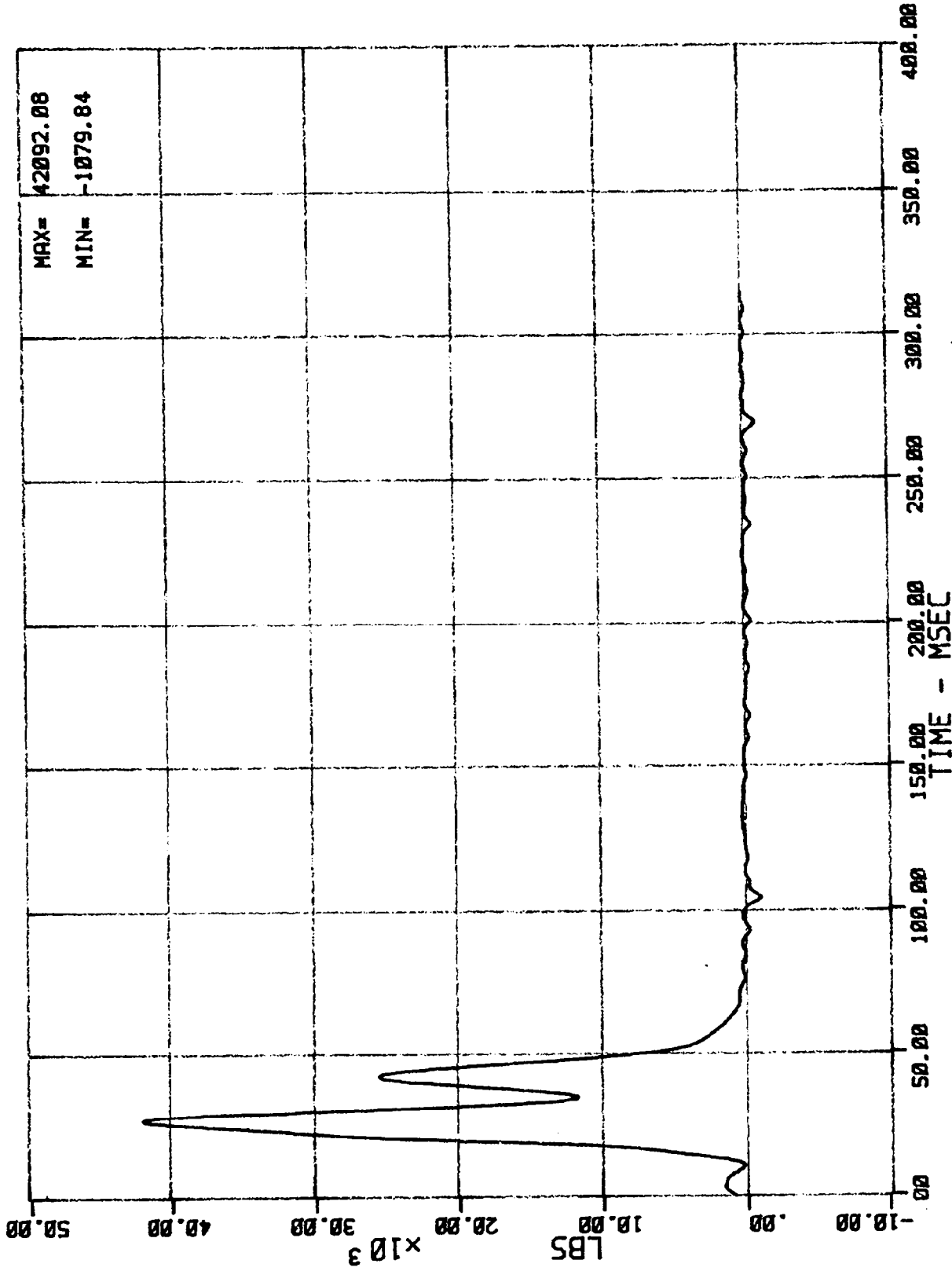
S2 LC BA N BC3 (BARRIER LOAD CELL C3 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



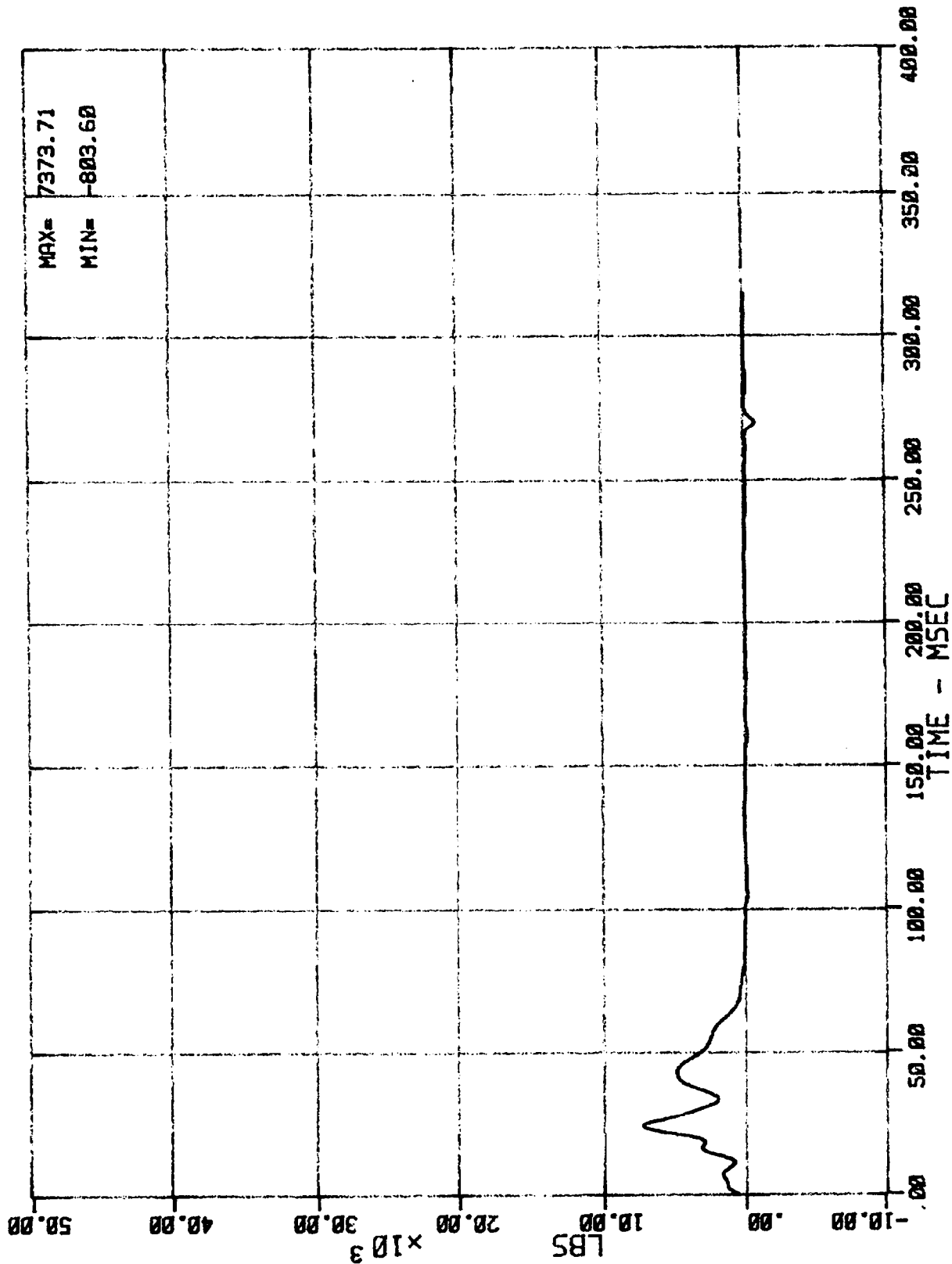
53 LC BA N BC4 (BARRIER LOAD CELL C4 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



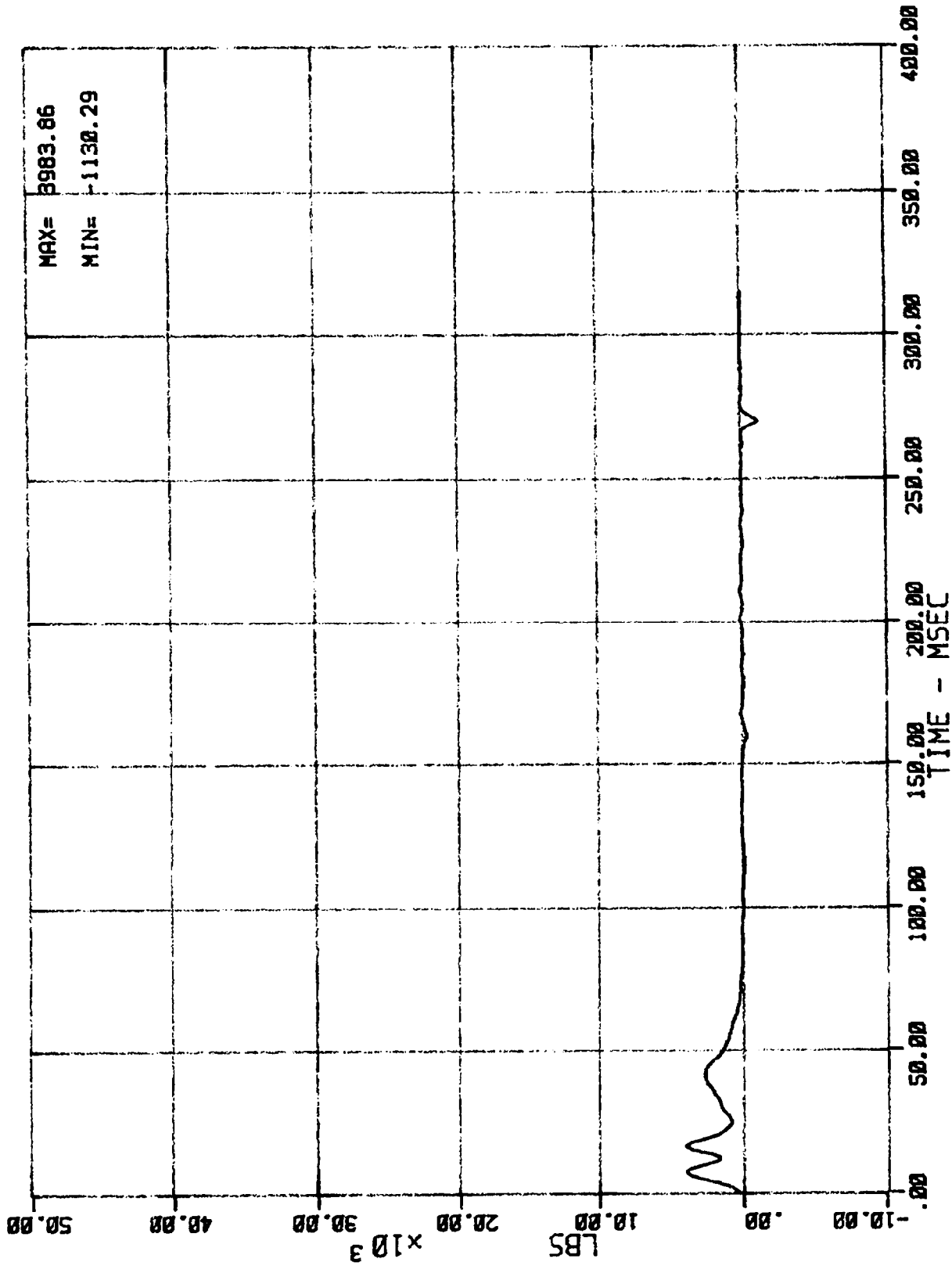
54 LC BA N BCS (BARRIER LOAD CELL C5 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



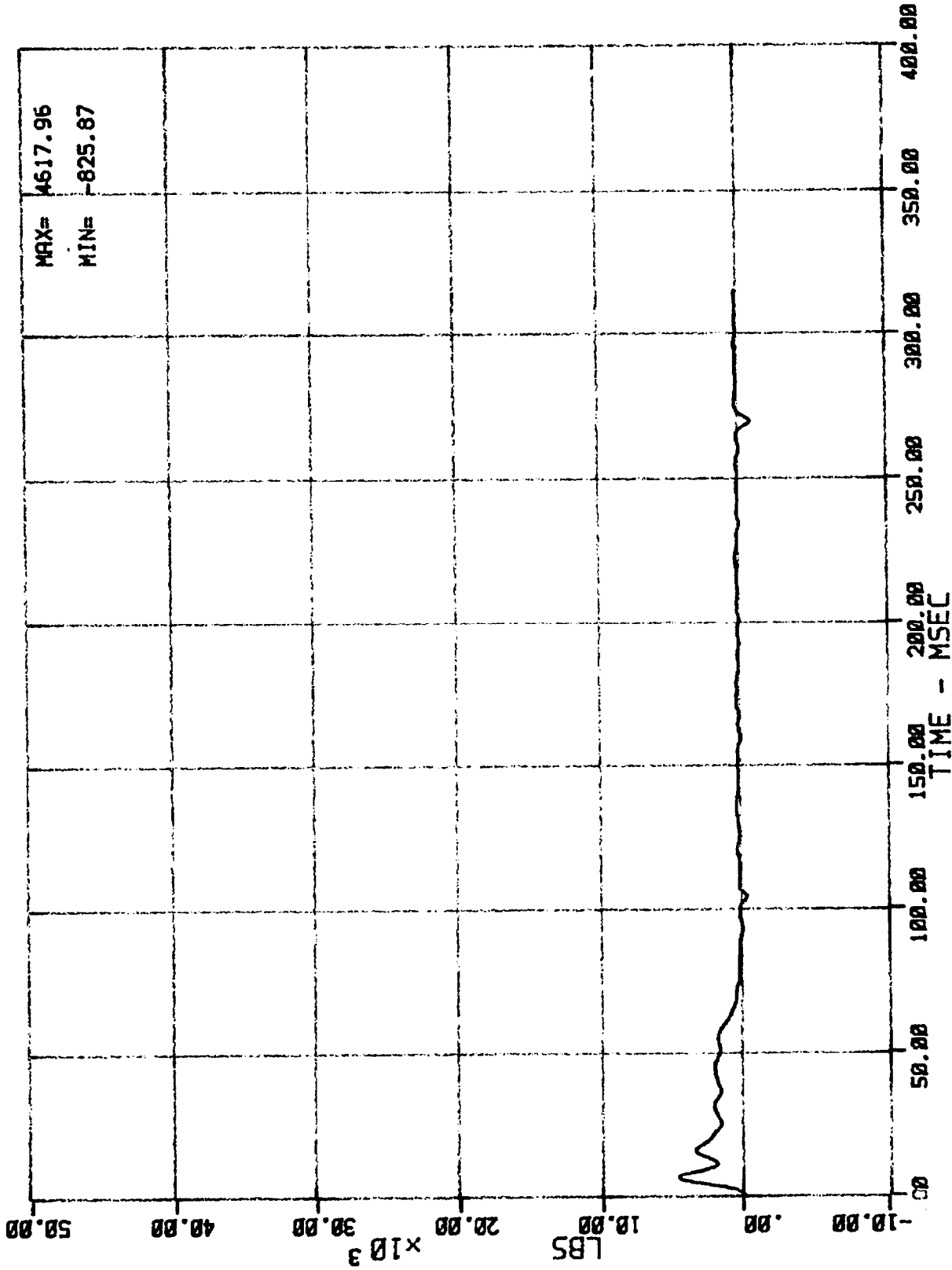
55 LC BA N B06 (BARRIER LOAD CELL C6 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



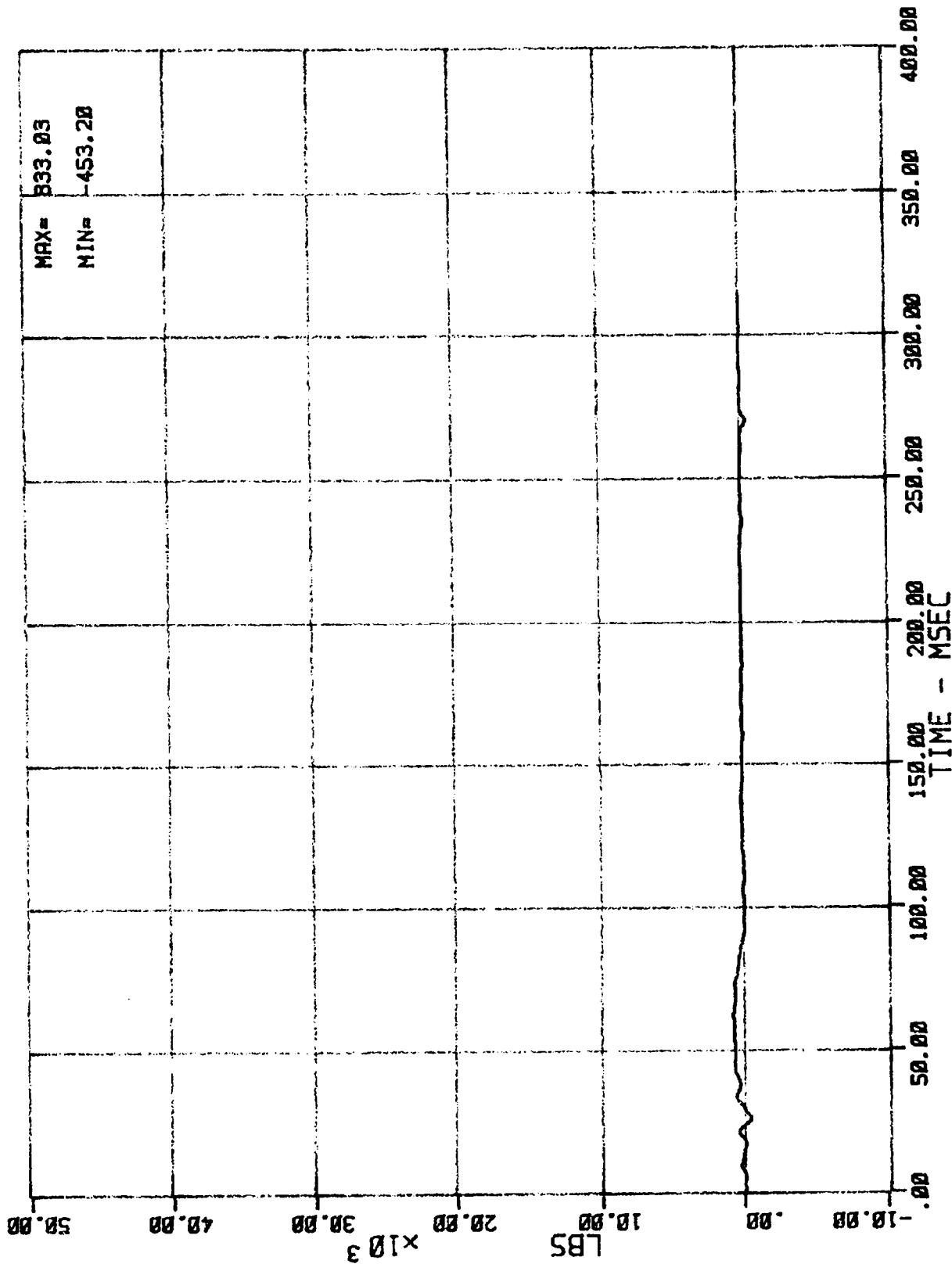
56 LC BA N BC7 (BARRIER LOAD CELL C7 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



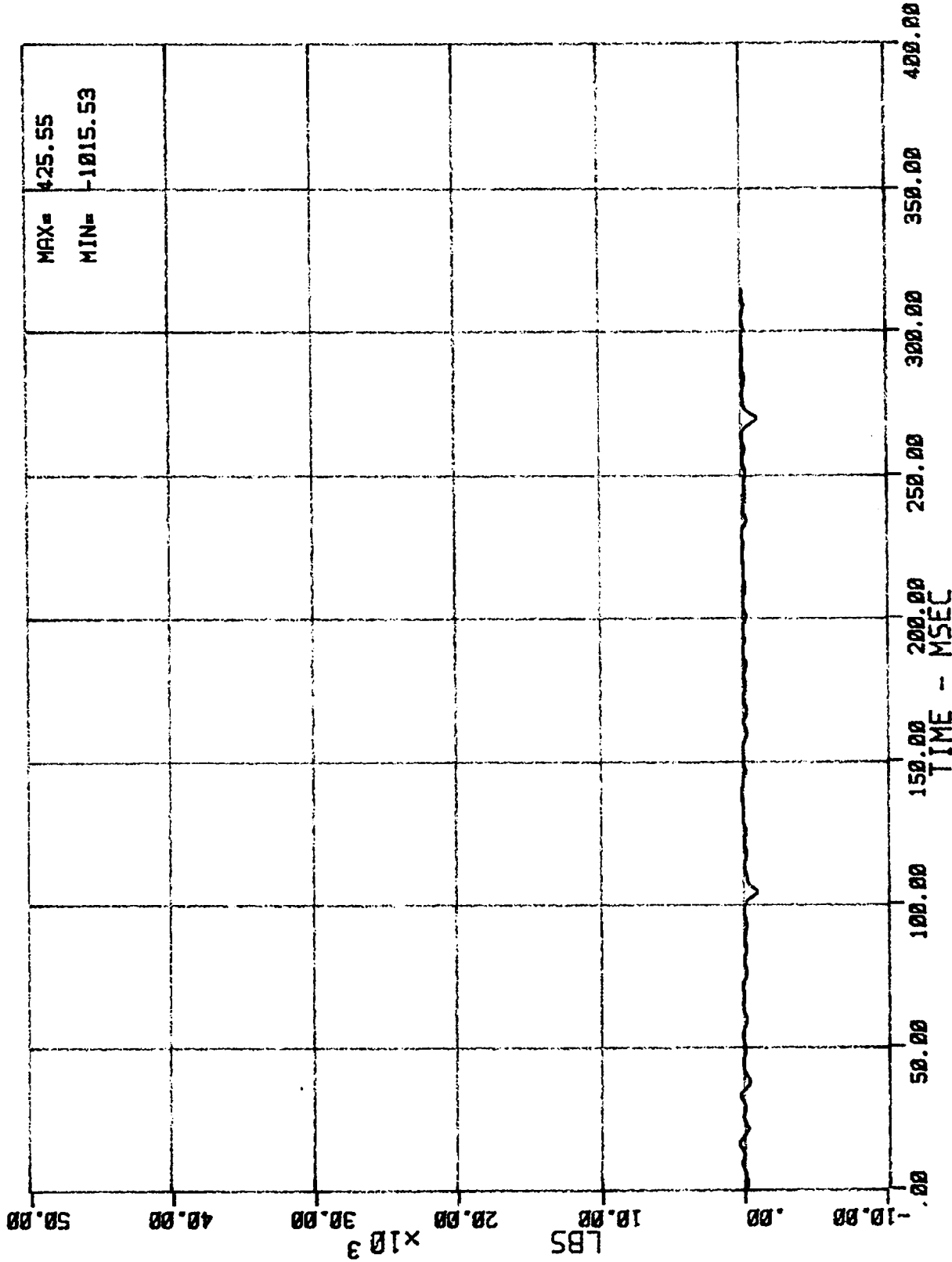
S7 LC BR N BC8 (BARRIER LOAD CELL C8 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



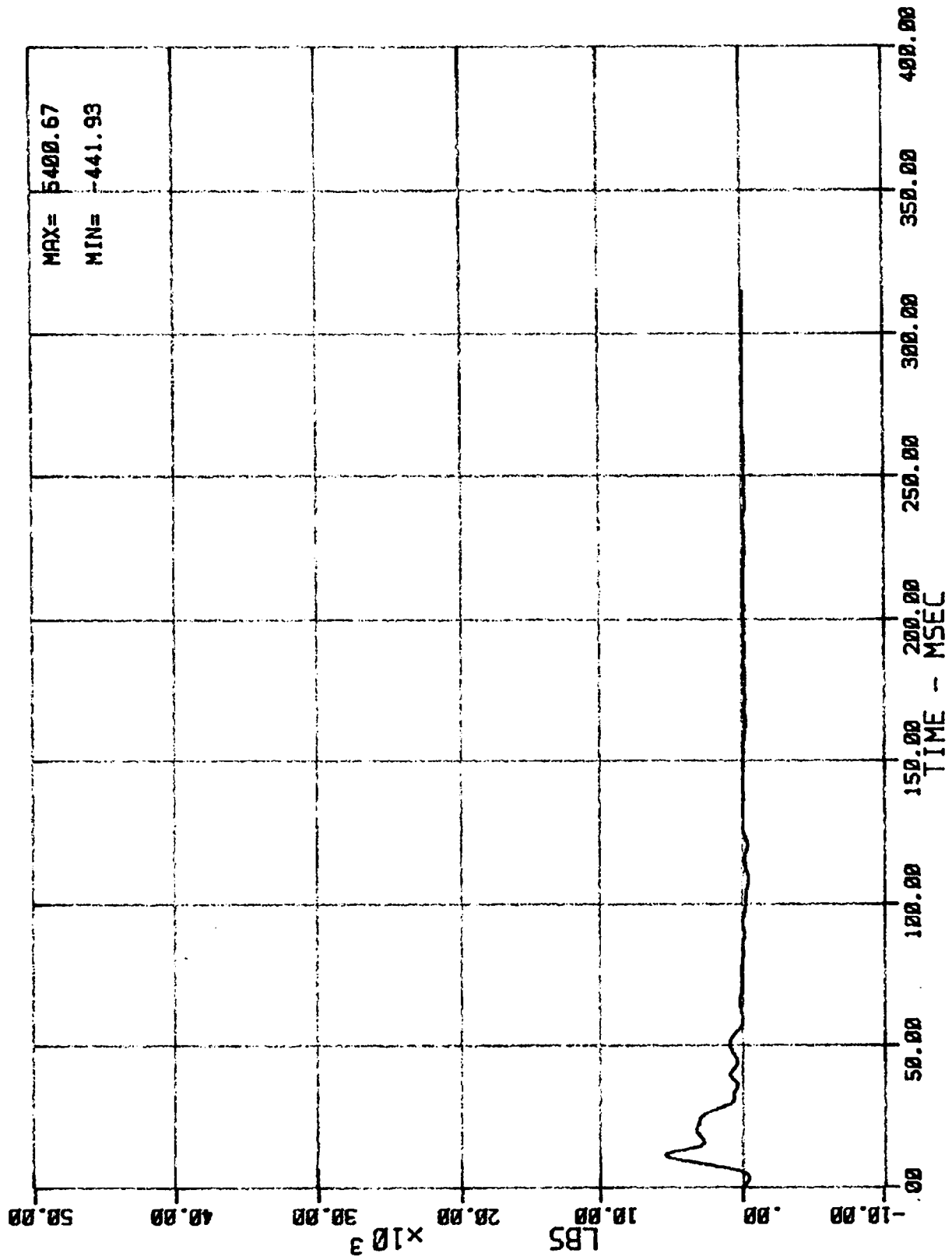
58 LC BA N BC9 (BARRIER LOAD CELL C9 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



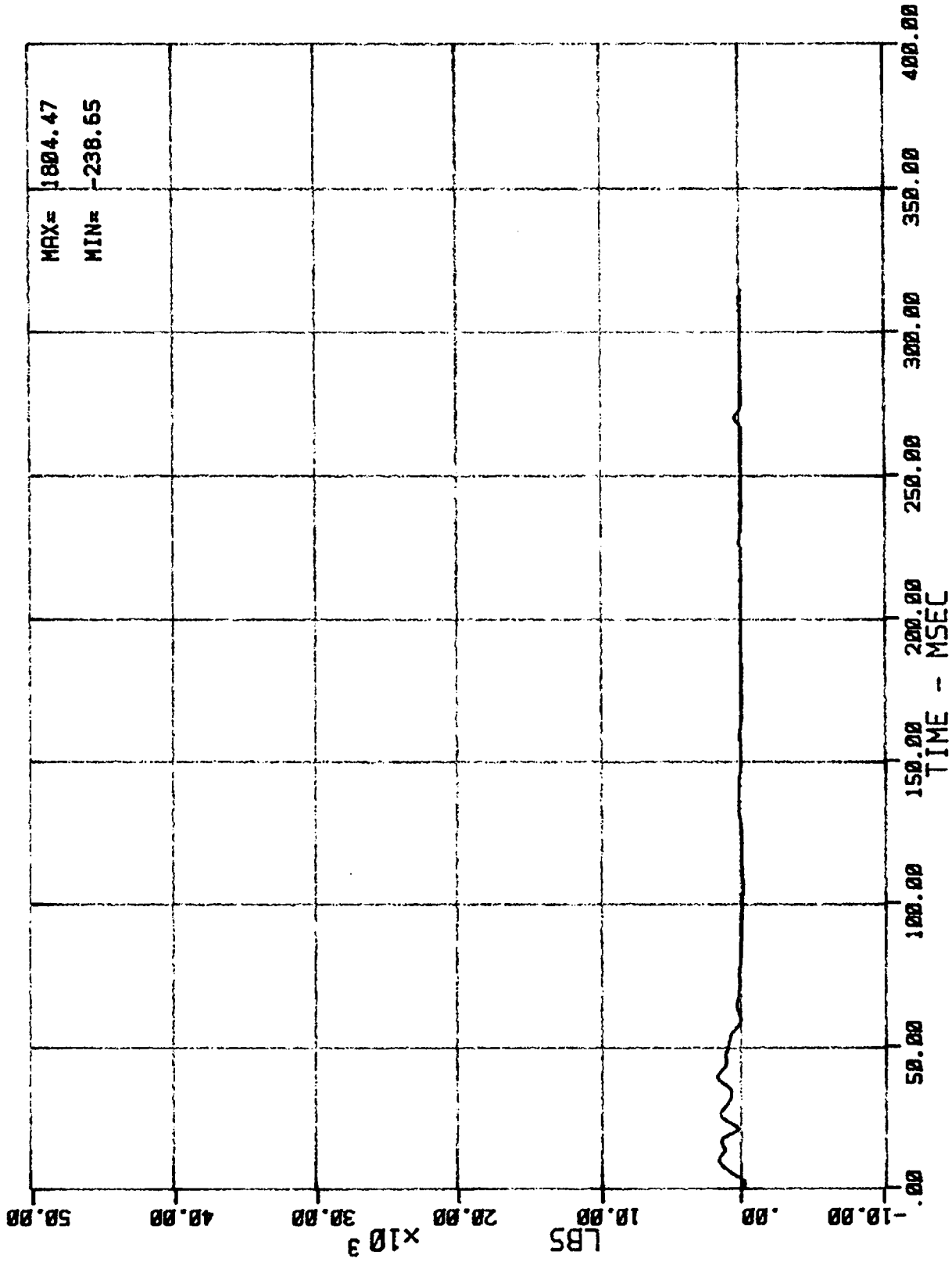
59 LC BA N BD1 (BARRIER LOAD CELL D1 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



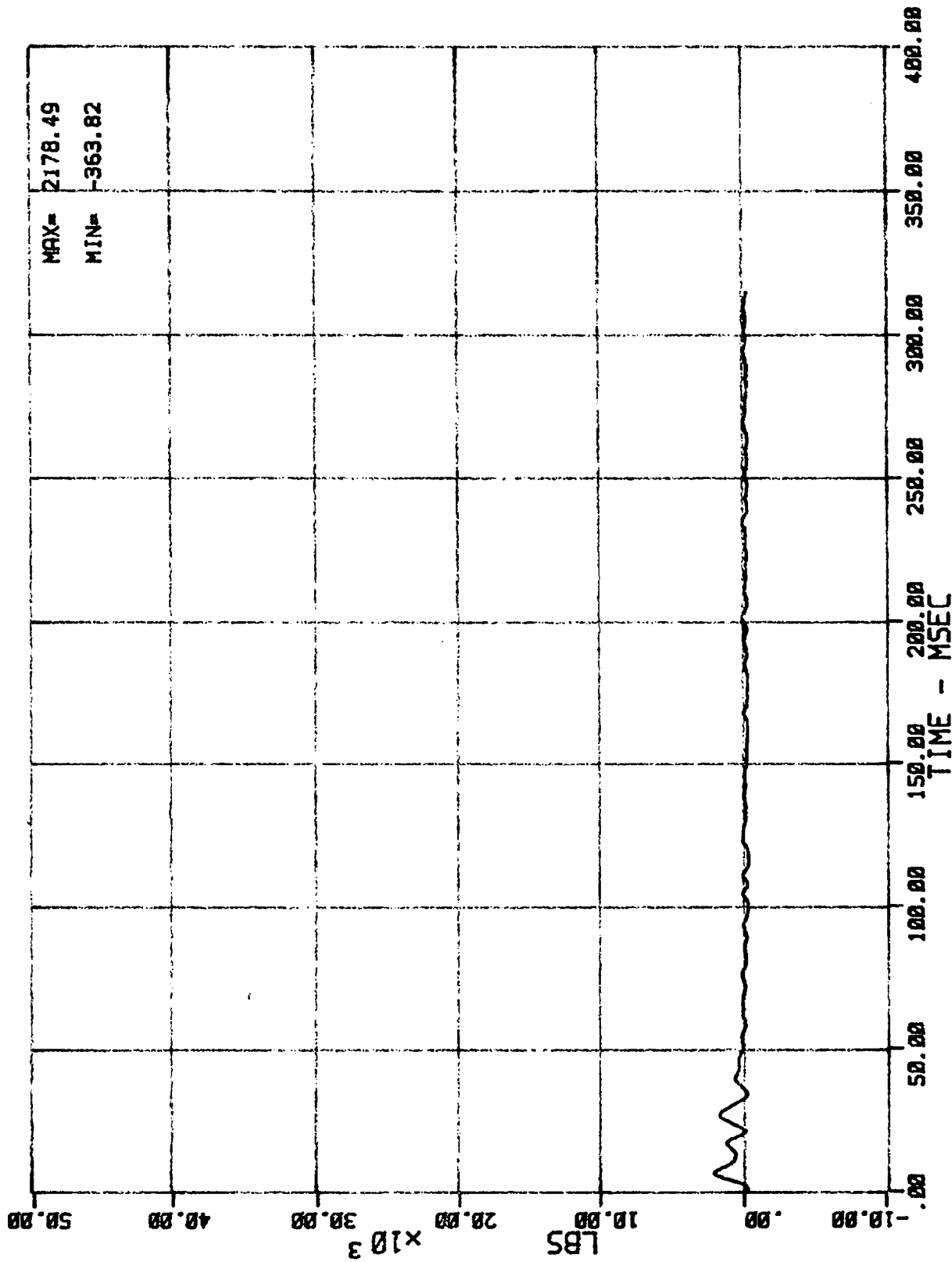
60 LC BA N BC2 (BARRIER LOAD CELL D2 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



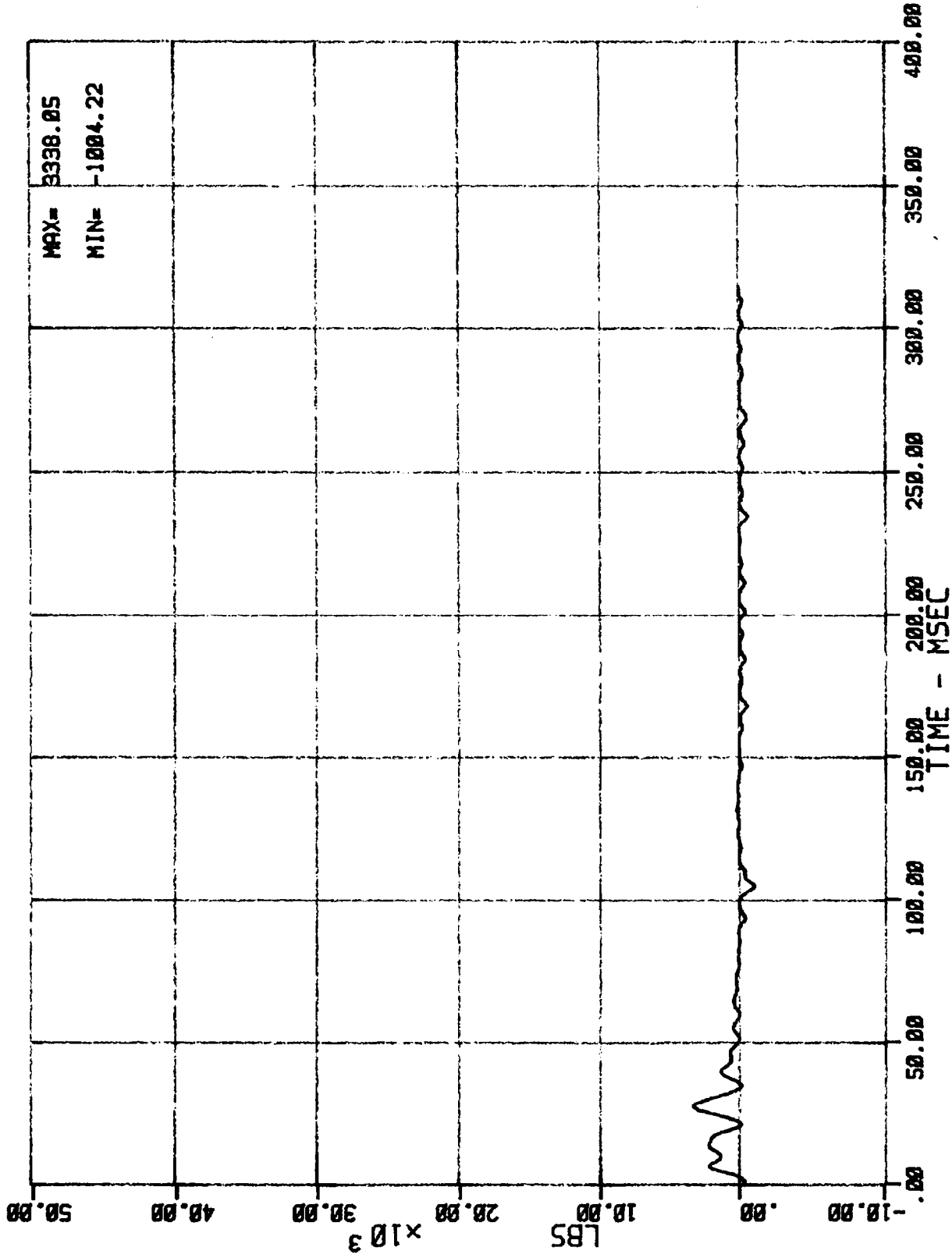
61 LC BA N 8D3 (BARRIER LOAD CELL D3 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



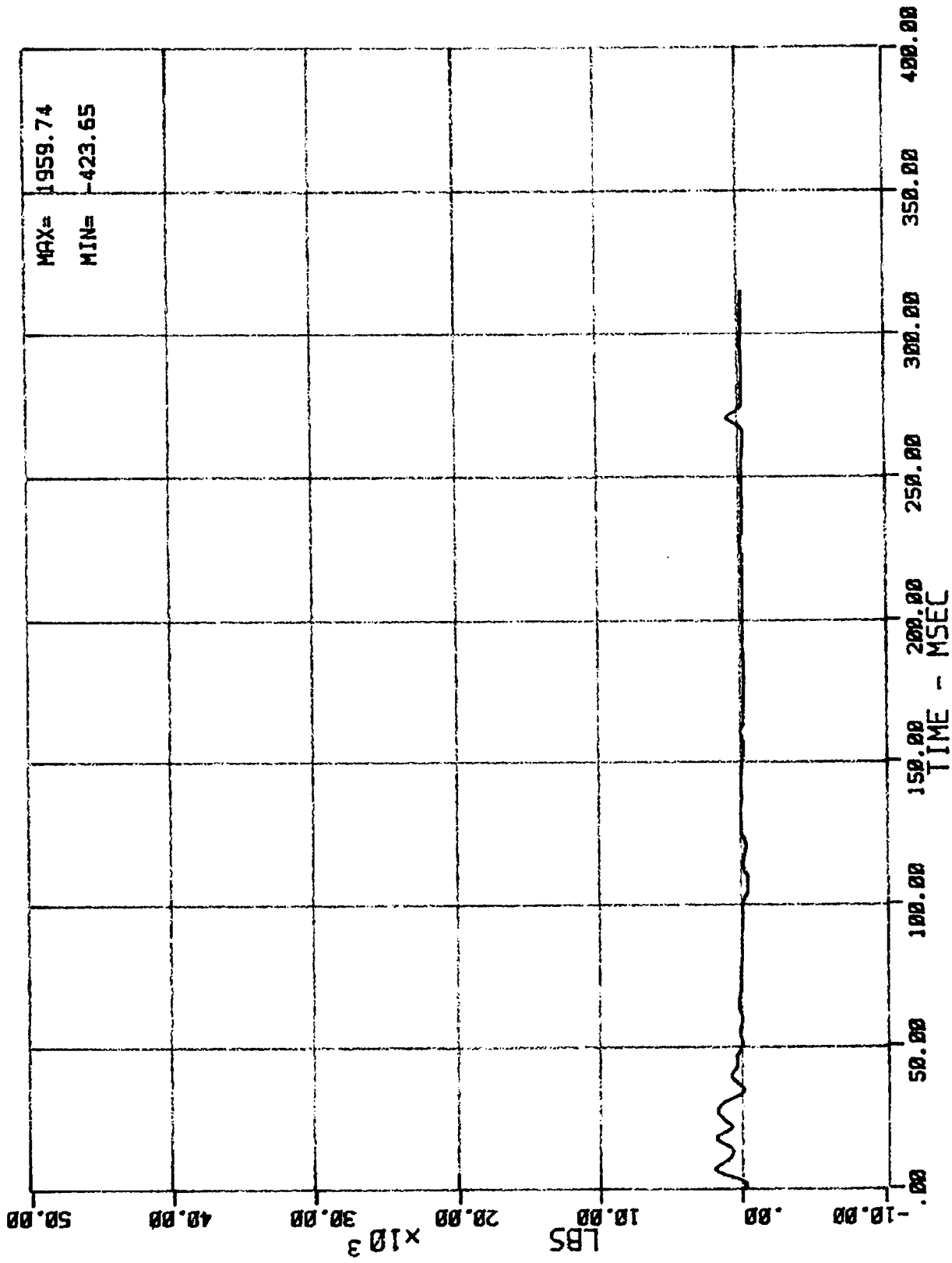
62 LC BR N BD4 (BARRIER LOAD CELL D4 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



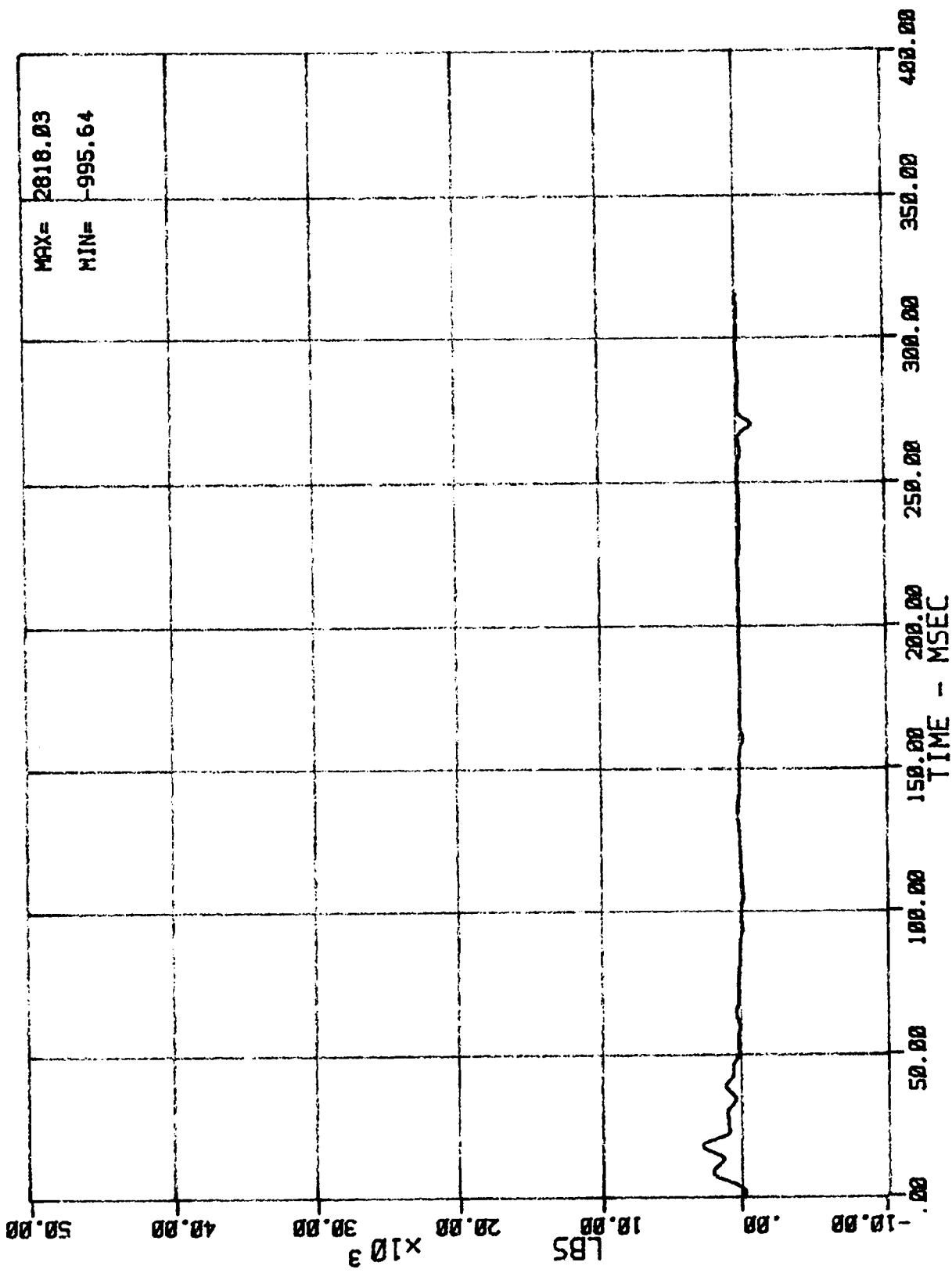
63 LC BA N BDS (BARRIER LOAD CELL DS - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



64 LC BA N BD6 (BARRIER LOAD CELL D6 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

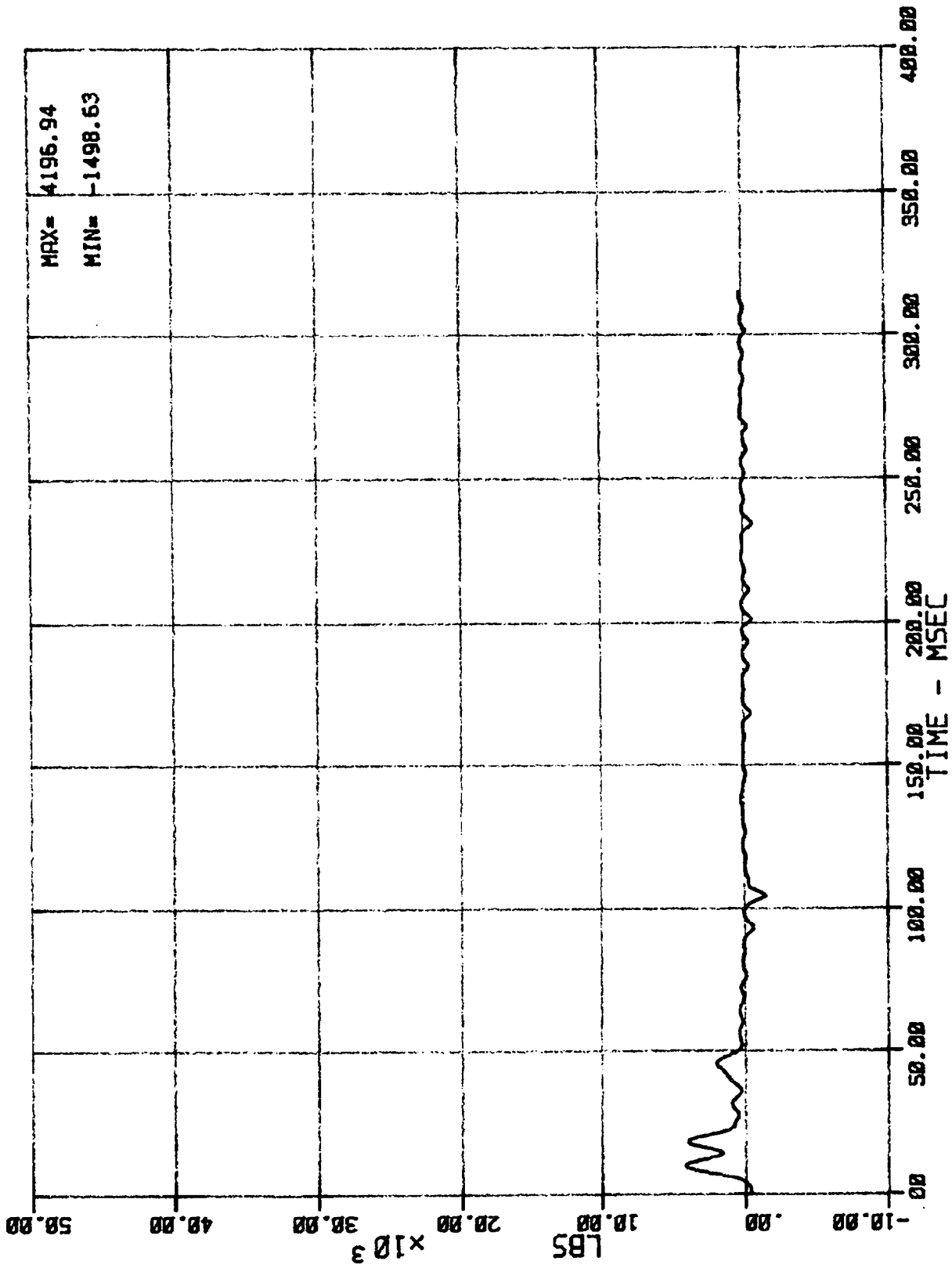
04/01/88



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 MIN= -995.64

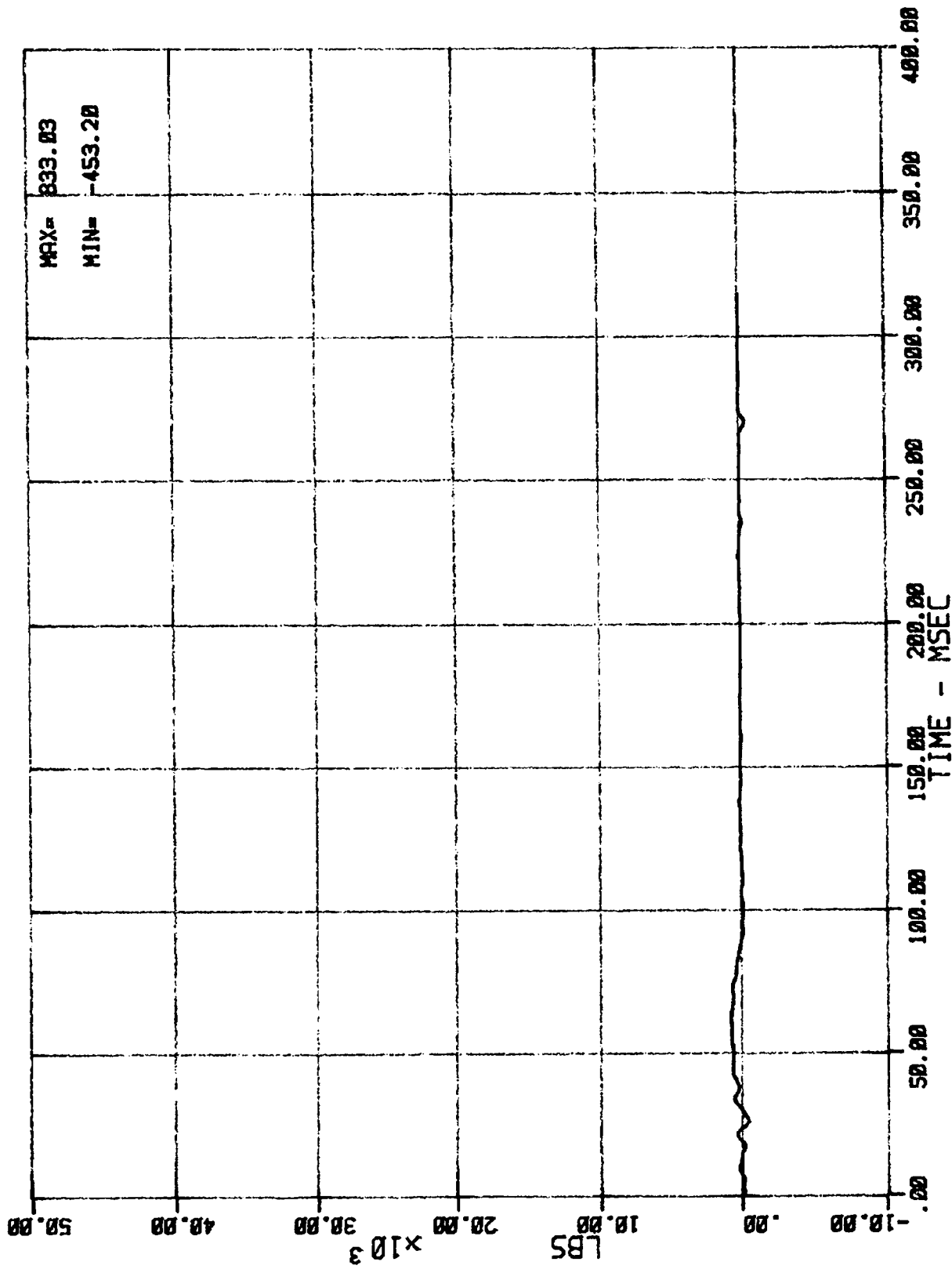
65 LC BA N B07 (BARRIER LOAD CELL D7 - FORCE)
 MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88



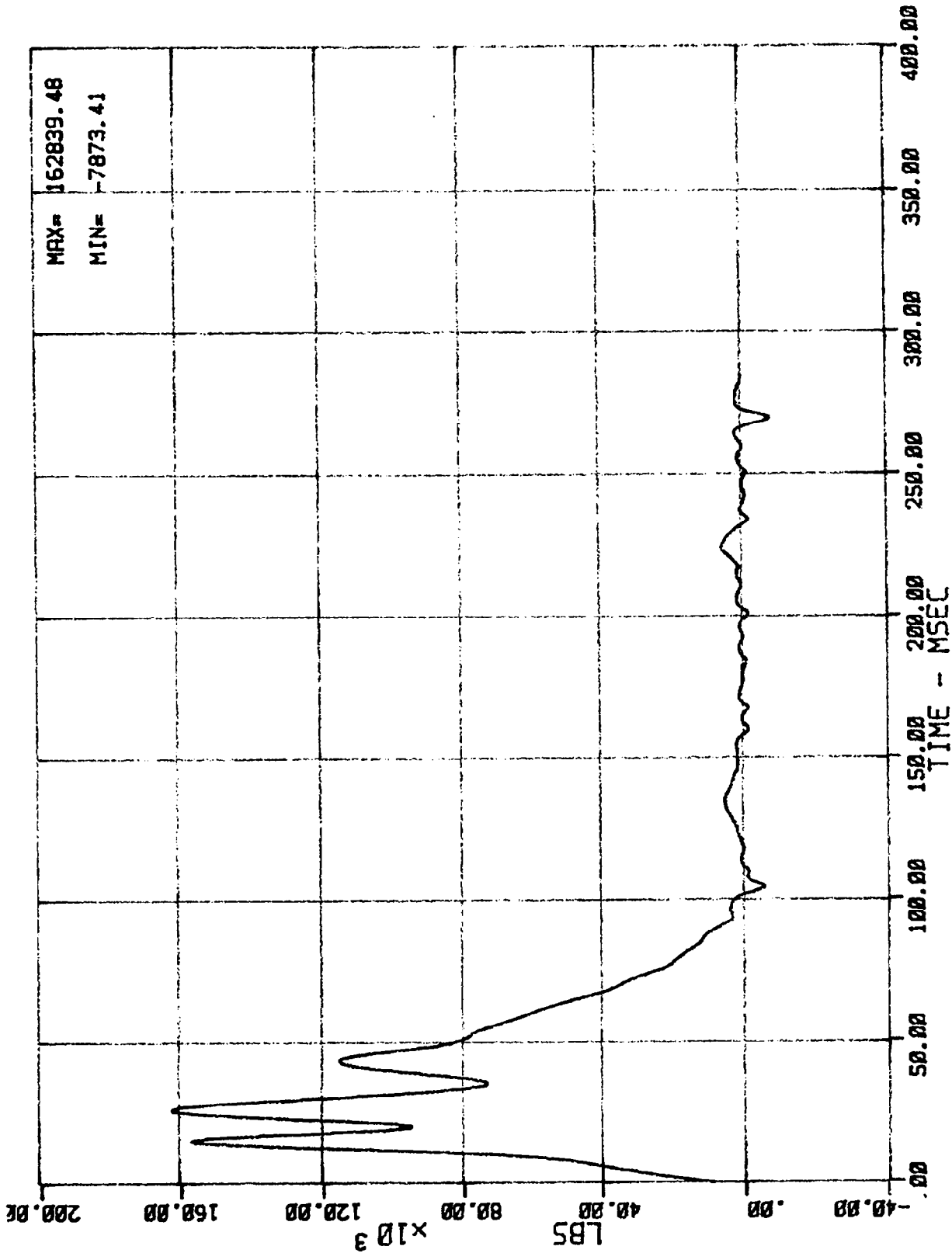
66 LC BA N 808 (BARRIER LOAD CELL 08 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88

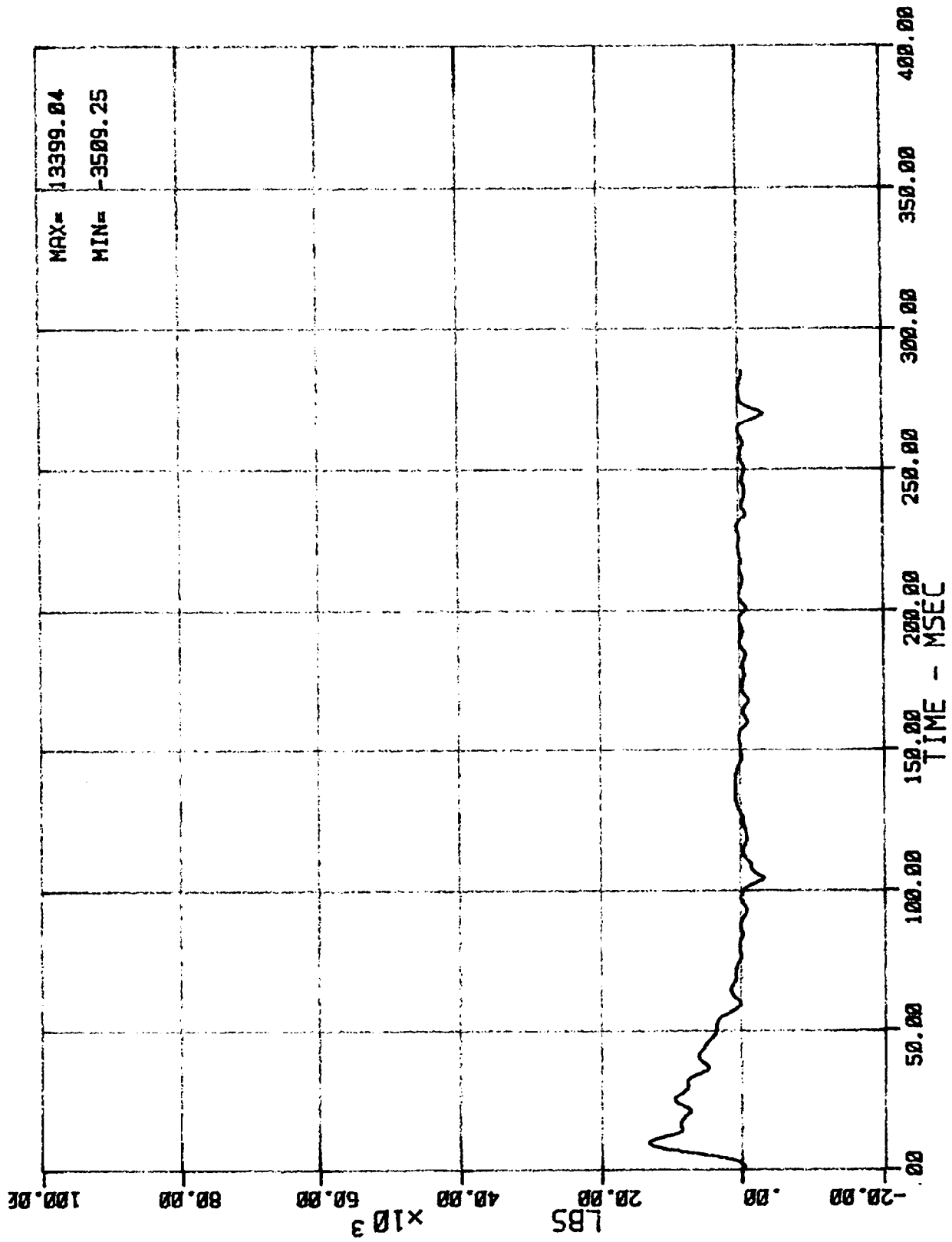


67 LC BR N B09 (BARRIER LOAD CELL D9 - FORCE)
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88

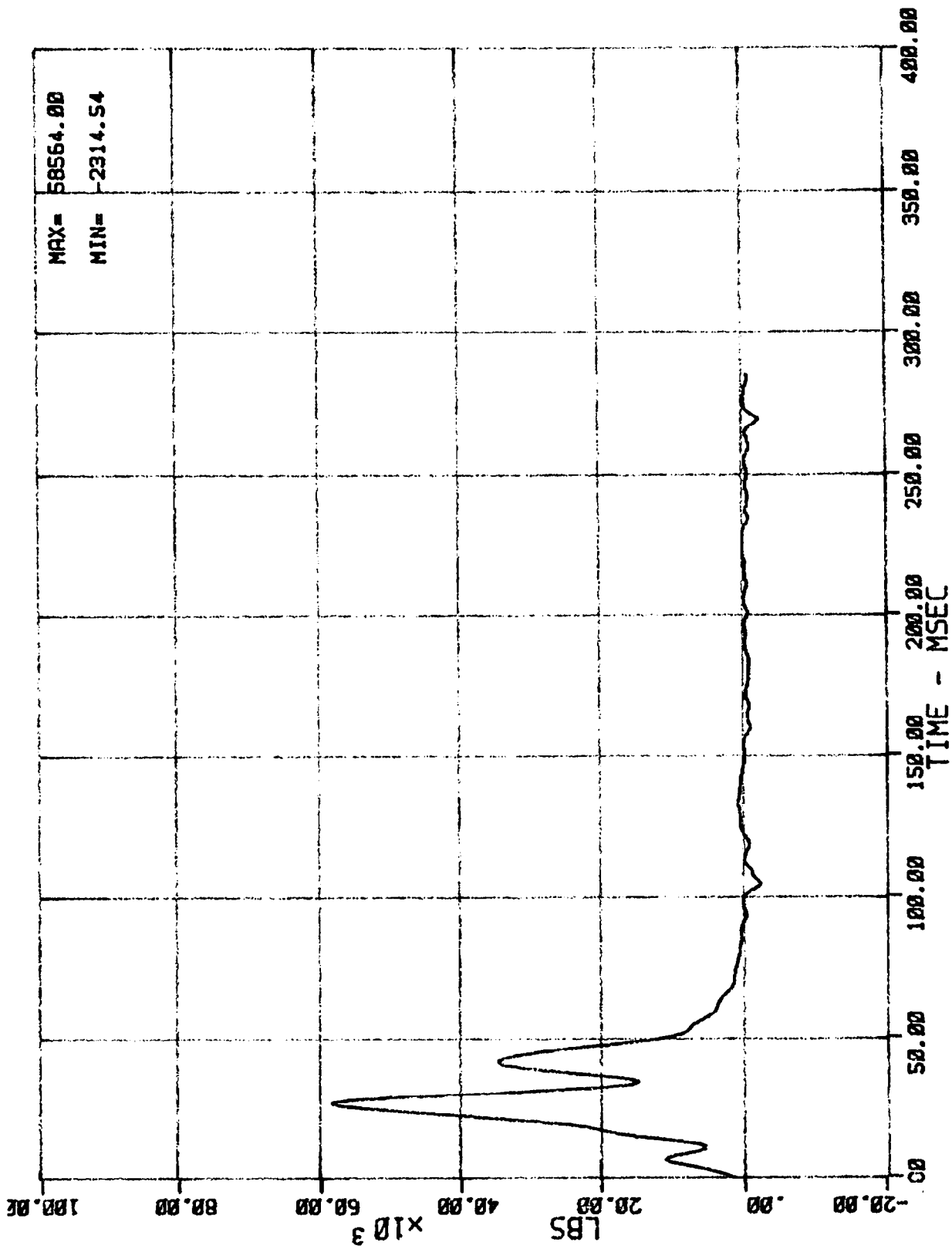


TOTAL SUM, LOAD CELL BARRIER FORCE
MSE N64088 1988 NISSAN PICKUP TRUCK 04/01/88

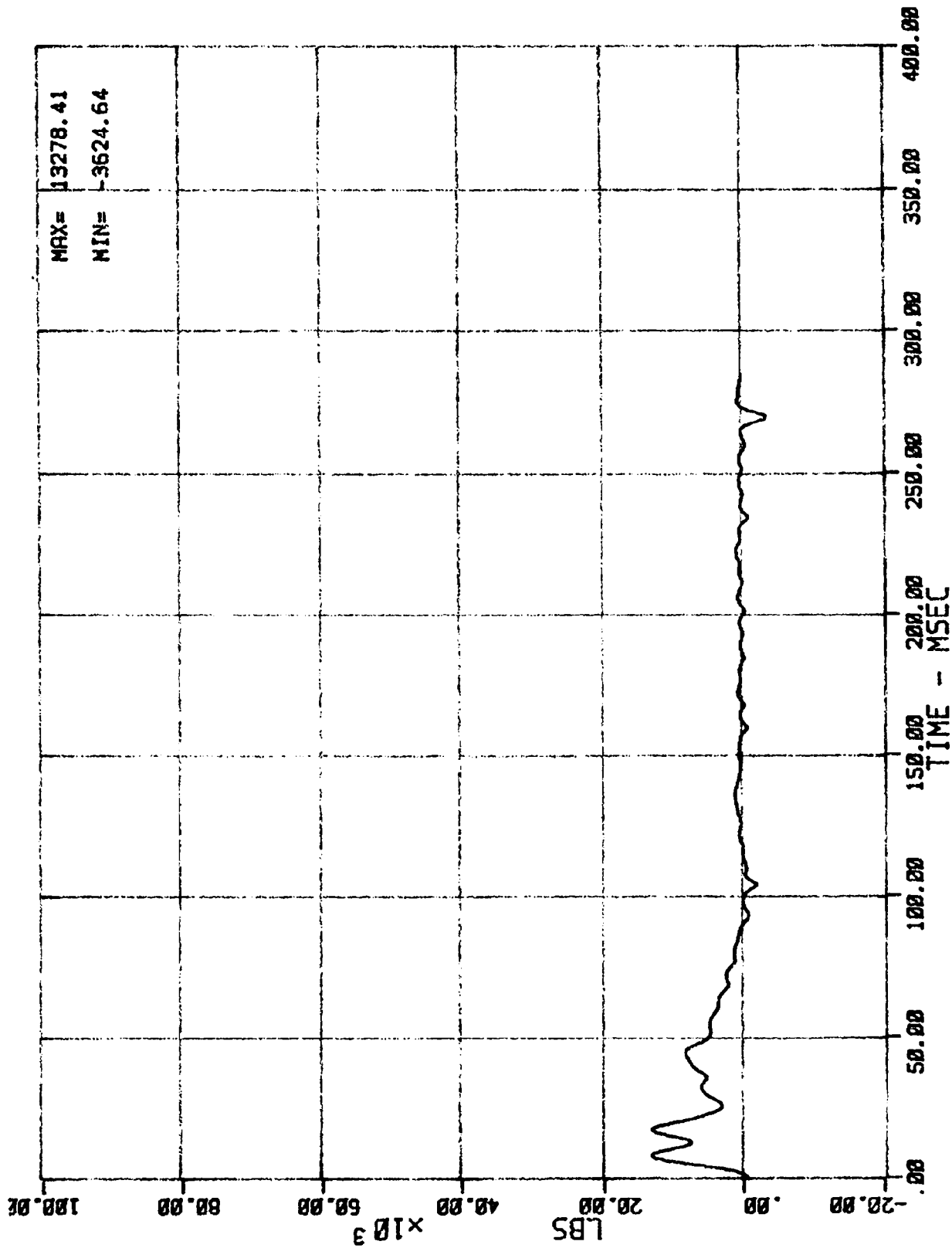


GROUP 1 SUM (C1,C2,C3,D1,D2,D3) LOAD CELL BARRIER FORCE
MSE N64088 1988 NISSAN PICKUP TRUCK

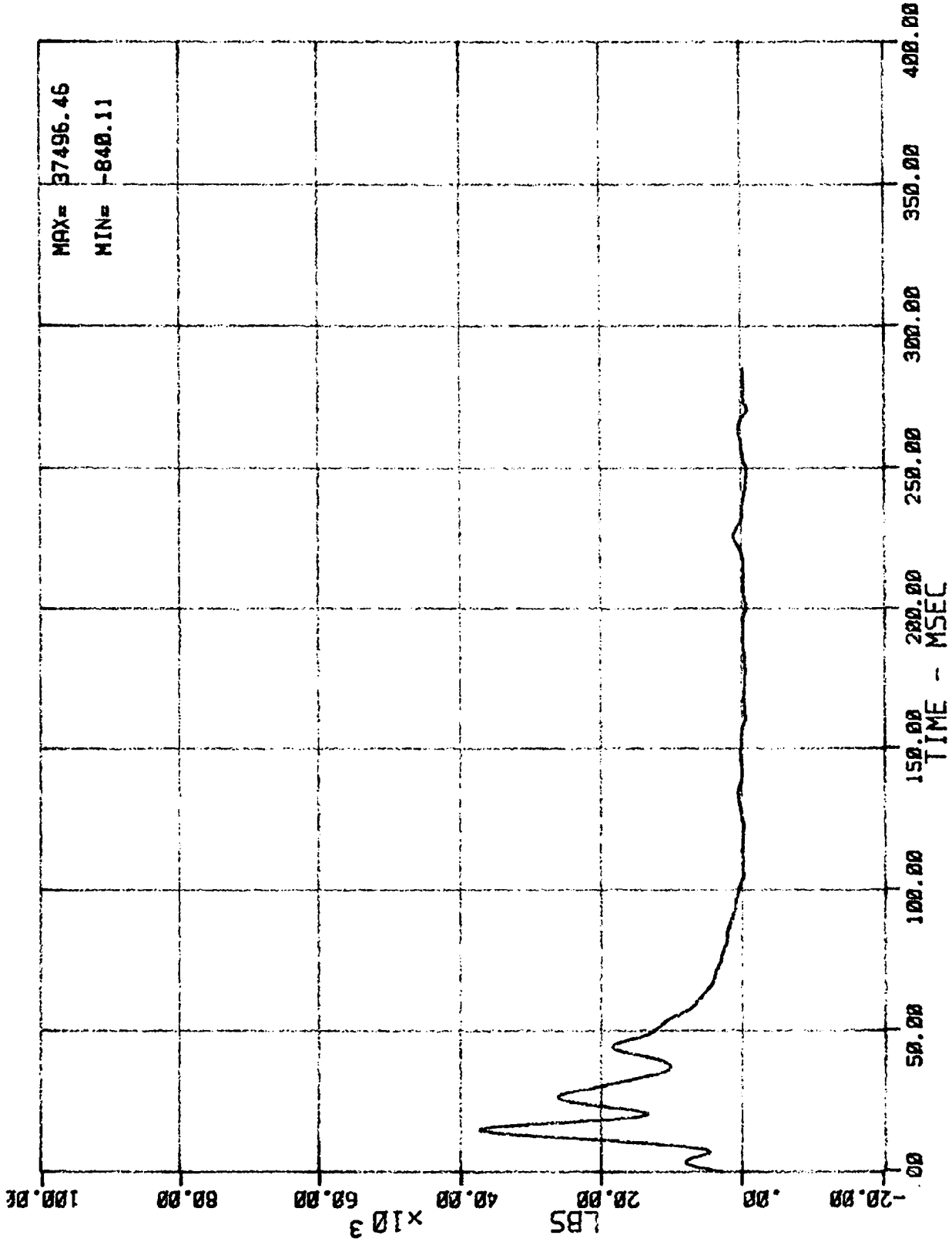
04/01/88



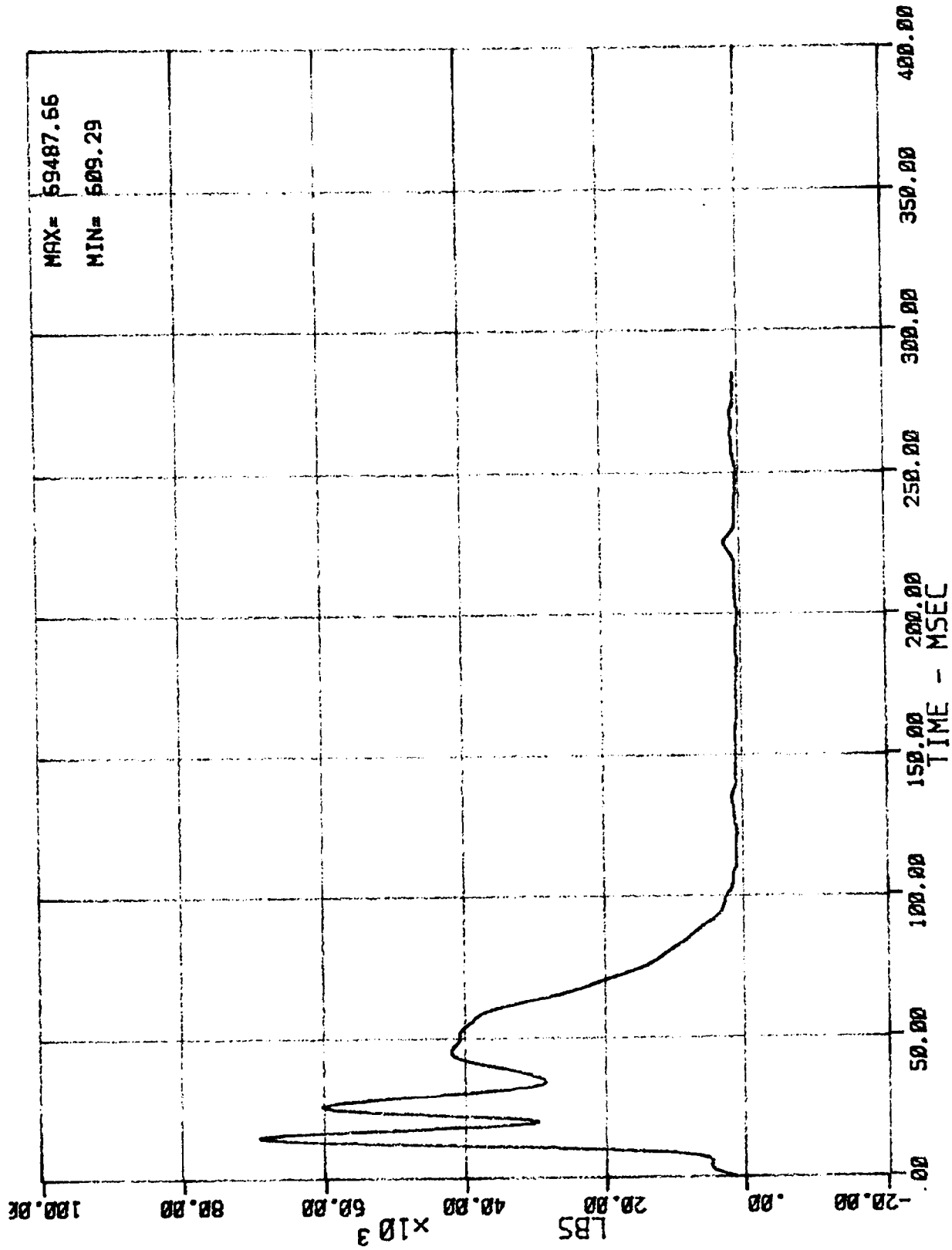
GROUP 2 SUM (C4,C5,C6,D4,D5,D6) LOAD CELL BARRIER FORCE
 MSE N64068 1988 NISSAN PICKUP TRUCK 04/01/88



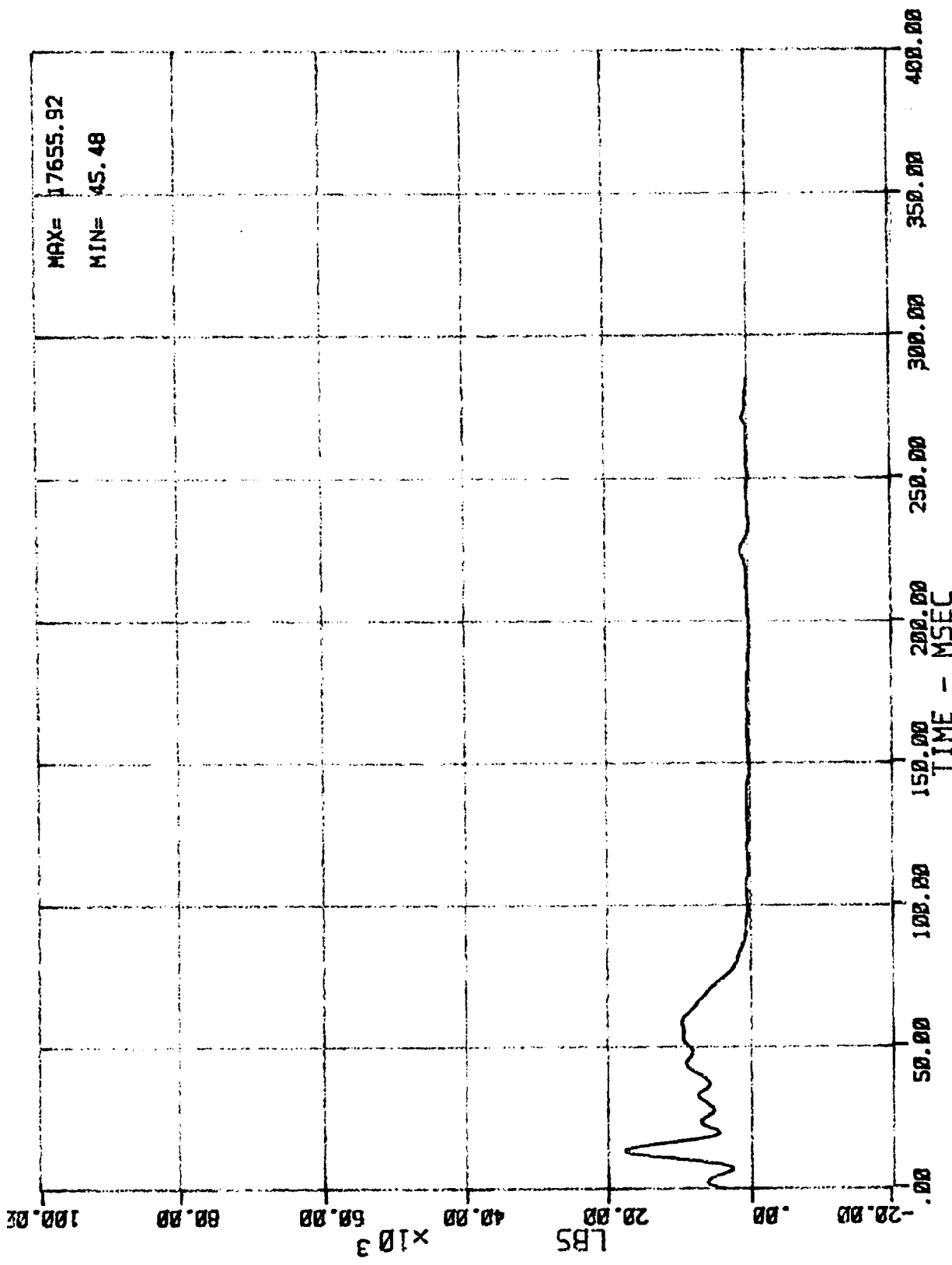
GROUP 3 SUM (C7,C8,C9,D7,D8,D9) LOAD CELL BARRIER FORCE
 MSE N64088 1986 NISSAN PICKUP TRUCK 04/01/88



GROUP 4 SUM (A1,A2,A3,B1,B2,B3) LOAD CELL BARRIER FORCE
MSE N64088 1988 NISSAN PICKUP TRUCK 04/01/88



GROUP 5 SUM (A4,A5,A6,B4,B5,B6) LOAD CELL BARRIER FORCE
 MSE N64088 1988 NISSAN PICKUP TRUCK 04/01/88



GROUP 6 SUM (A7,A8,A9,B7,B8,B9) LOAD CELL BARRIER FORCE
MSE N64088 1988 NISSAN PICKUP TRUCK

04/01/88

APPENDIX C

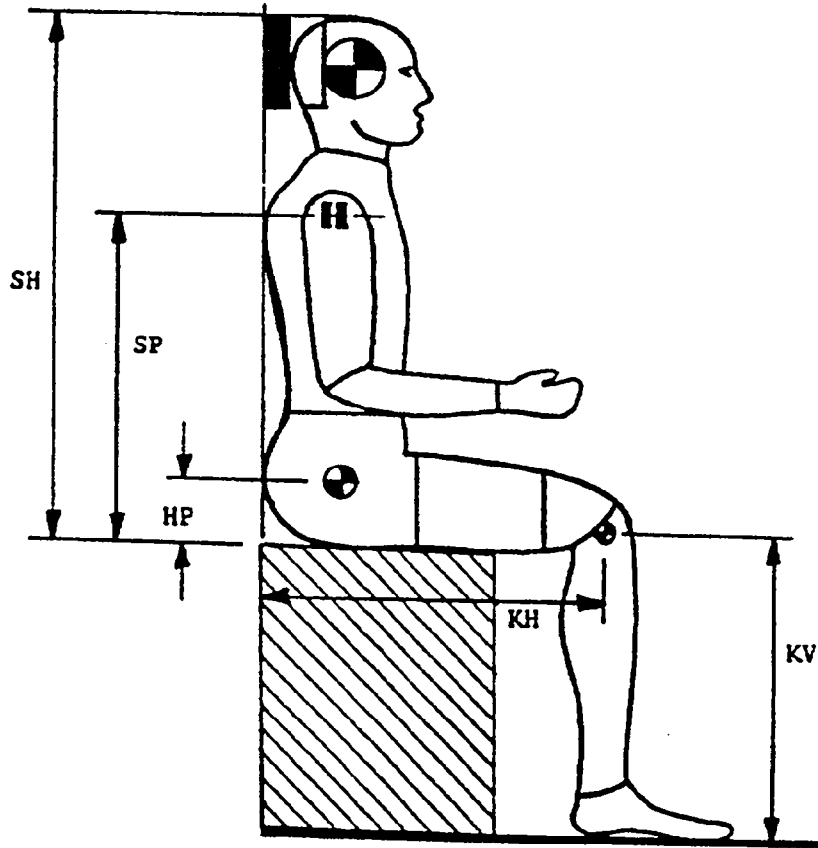
PART 572 DUMMY CONFIGURATION AND
PERFORMANCE VERIFICATION TESTS

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.:

| | | |
|---|---|---|
| 4 | 6 | 4 |
|---|---|---|

I. CONFIGURATION VERIFICATION DATA:



| | P. 572 SPECIFICATION | PRE-TEST (if required) | POST-TEST (if required) |
|------------------------------------|-------------------------|---------------------------|----------------------------|
| DATE OF CONFIGURATION VERIFICATION | | 03/26 - 03/28/88 | |
| VERIFICATION NUMBER FOR DUMMY* | | 4 | |
| SH - Seated Height- - - - - | 35.6 to 35.8" | 35.6 | |
| SP - Shoulder Pivot Height- - - - | 21.8 to 22.4" | 22.1 | |
| HP - Hip Pivot Height - - - - - | 3.9" ref. | 3.9 | |
| KH - Knee Pivot from back line- - | 20.1 to 20.7" | 20.6 | |
| KV - Knee Pivot from floor- - - - | 19.3 to 19.9" | 19.4 | |
| SW - Shoulder Width - - - - - | 17.8 to 18.4" | 18.2 | |
| HW - Hip Width- - - - - | 14.0 to 15.4" | 14.8 | |

TECHNICIAN'S NAME: Mark Walker

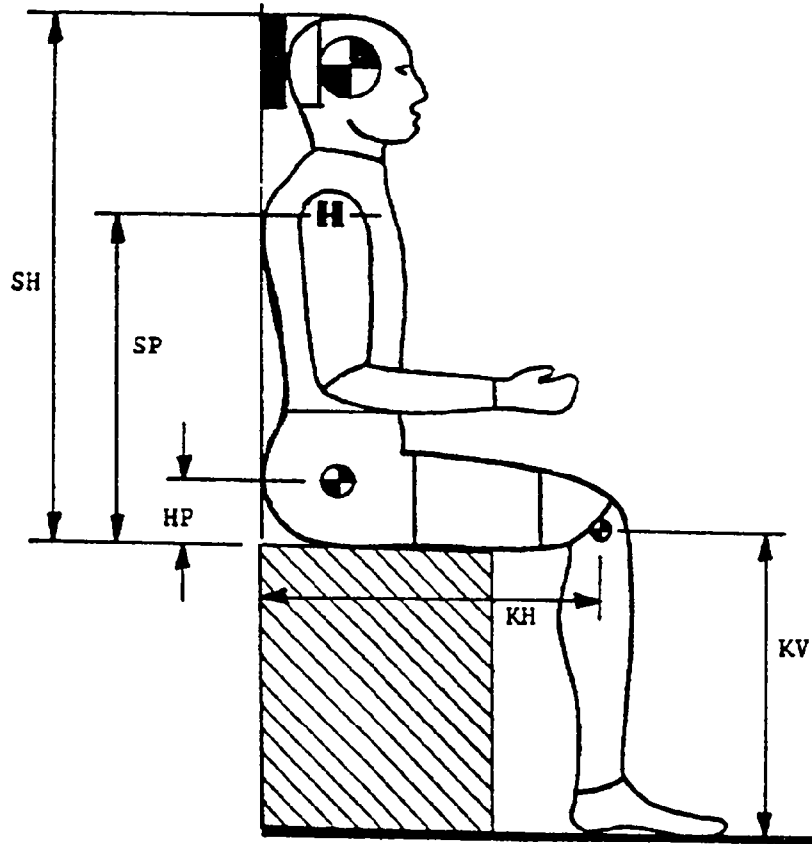
* Sequential number beginning with "1" at the start of each fiscal year's crash test program

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.:

| | | |
|---|---|---|
| 4 | 6 | 4 |
|---|---|---|

I. CONFIGURATION VERIFICATION DATA:



| | P. 572 SPECIFICATION | PRE-TEST (if required) | POST-TEST (if required) |
|------------------------------------|-------------------------|---------------------------|----------------------------|
| DATE OF CONFIGURATION VERIFICATION | | 03/26 - 03/28/88 | |
| VERIFICATION NUMBER FOR DUMMY* | | 4 | |
| SH - Seated Height - - - - - | 35.6 to 35.8" | 35.6 | |
| SP - Shoulder Pivot Height - - - | 21.8 to 22.4" | 22.1 | |
| HP - Hip Pivot Height - - - - - | 3.9" ref. | 3.9 | |
| KH - Knee Pivot from back line - - | 20.1 to 20.7" | 20.6 | |
| KV - Knee Pivot from floor - - - - | 19.3 to 19.9" | 19.4 | |
| SW - Shoulder Width - - - - - | 17.8 to 18.4" | 18.2 | |
| HW - Hip Width - - - - - | 14.0 to 15.4" | 14.8 | |

TECHNICIAN'S NAME: Mark Walker

* Sequential number beginning with "1" at the start of each fiscal year's crash test program

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA:

NHTSA DUMMY I.D. NO.:

| | | |
|---|---|---|
| 4 | 6 | 4 |
|---|---|---|

TECHNICIAN'S NAME: Mark Walker

| | | PRE-TEST (if required) | POST-TEST (if required) |
|--|------------------|---------------------------|----------------------------|
| DATE OF PERFORMANCE VERIFICATION----- | | 03/26 - 03/28/88 | |
| SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*----- | | 4 | |
| VERIF. LAB. TEMPERATURE (66 to 78°F Range)----- | | 70-74 °F. | °F. |
| VERIF. LAB. HUMIDITY (10 to 70% Range) | | 26-36 % | % |
| TEST PARAMETER | SPECIFICATION | | |
| 1. HEAD DROP TEST-- | | | |
| a. Peak Resultant Accel.- | 210 to 260G | 219.8 | |
| b. Peak Lateral Accel.- - | - 10G | -6.6 | |
| c. Time above 100G- - - - | 0.9 to 1.5ms | 1.3 | |
| 2. NECK BENDING TEST-- | | | |
| a. Pendulum Speed - - - - | 21.5 to 25.5 fps | 22.4 | |
| b. Pend. Avg. Decel. over t ₃ - t ₂ | 20 to 24G | 21.0 | |
| c. Peak Resultant Head Acceleration - - - - - | 26G max. | 25.0 | |
| d. Pendulum Decel.(t ₂ -t ₁) | - 3ms | 3.0 | |
| e. Pendulum Decel.(t ₃ -t ₂) | 25 to 30 ms | 26.6 | |
| f. Pendulum Decel.(t ₄ -t ₃) | - 10ms | 9.6 | |
| g. Max. Head Rotation - - | 63 to 73° | 72.0 | |
| h. Chordal Displacement-- | | | |
| Head Rotation Angle- | | | |
| 0° | Time- - | -2 to 2 ms | 0 |
| | Displ.- | -.5 to .5" | 0 |
| 30° | Time- - | 25.6 to 34.4ms | 31.4 |
| | Displ.- | 2.1 to 3.1" | 2.6 |
| 60° | Time- - | 40.3 to 51.7ms | 46.8 |
| | Displ.- | 4.3 to 5.3" | 5.0 |
| Maximum (72 °) | Time- - | 53.2 to 66.8ms | 62.8 |
| | Displ.- | 5.0 to 6.0" | 6.0 |

*beginning with "1" at the start of each fiscal year's crash test program

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.:

| | | |
|---|---|---|
| 4 | 6 | 4 |
|---|---|---|

TECHNICIAN'S NAME: Mark Walker

| TEST PARAMETER | SPECIFICATION | Pre-Test (if required) | Post-Test (if required) |
|---------------------------------------|-------------------|---------------------------|----------------------------|
| 2. NECK BENDING TEST.... | | | |
| <u>Continued:</u> | | | |
| h. Chordal Displacement: | | | |
| Head Rotation Angle-- | | | |
| 60° | Time | 67.0 to 83.0 ms | 77.4 |
| | Displ. | 4.3 to 5.3 in. | 5.04 |
| 30° | Time | 85.4 to 104.6 ms | 92.8 |
| | Displ. | 2.1 to 3.1 in. | 2.5 |
| 0° | Time | 101.0 to 123.0 ms | 104.0 |
| | Displ. | -.5 to 0.5 in. | 0.2 |
| 3. ABDOMINAL COMPRESSION TEST: | | | |
| (Preload = 10 pounds) | | | |
| a. Force @ .5" - - - - | 23 to 36 lbs. | 27.0 | |
| b. Force @ .75" - - - - | 36 to 50 lbs. | 40.0 | |
| c. Force @ 1.0" - - - - | 50 to 63 lbs. | 55.0 | |
| d. Force @ 1.3" - - - - | 73 to 88 lbs. | 75.0 | |
| 4. LUMBAR FLEXION TEST: | | | |
| a. Force @ 20° - - - - | 22 to 34 lbs. | 24.1 | |
| b. Force @ 30° - - - - | 34 to 46 lbs. | 37.9 | |
| c. Force @ 40° - - - - | 46 to 58 lbs. | 52.2 | |
| d. Return Angle - - - - | 12° maximum | 12.0 | |
| 5. CHEST IMPACT TESTS: | | | |
| a. High Speed | | | |
| (1) Probe Speed- - - | 21.78-22.22 fps | 21.8 | |
| (2) Peak Deflection- | 1.7" maximum | 1.5 | |
| (3) Peak Resistive Force- - - - - | 2250 lbs. maximum | 1814.5 | |
| (4) Internal Hysteresis - - - - | 50 to 70% | 64.1 | |
| b. Low Speed | | | |
| (1) Probe Speed- - - | 13.86-14.14 fps | 13.9 | |
| (2) Peak Deflection- | 1.1" maximum | 1.1 | |
| (3) Peak Resistive Force- - - - - | 1450 lbs. maximum | 1077.8 | |
| (4) Internal Hyster. | 50 to 70% | 50.0 | |

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.:

| | | |
|---|---|---|
| 4 | 6 | 4 |
|---|---|---|

TECHNICIAN'S NAME: Mark Walker

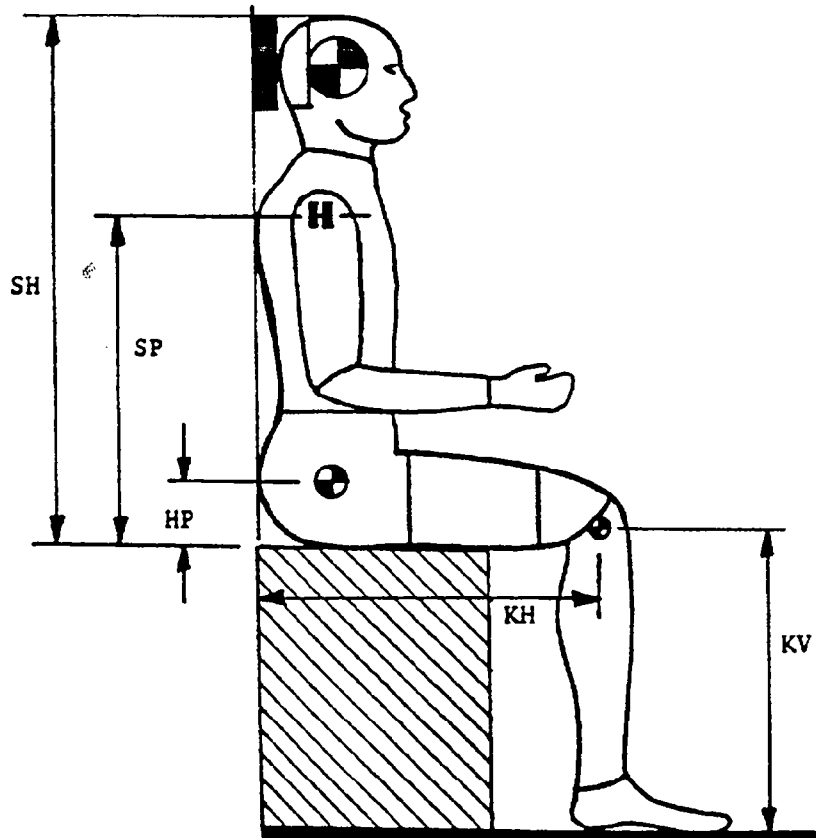
| TEST PARAMETER | SPECIFICATION | Pre-Test (if required) | Post-Test (if required) |
|------------------------------|-------------------|---------------------------|----------------------------|
| 6. KNEE IMPACT TESTS: | | | |
| a. Right Side-- | | | |
| (1) Probe Speed - - - | 6.76 to 7.04 fps | 6.91 | |
| (2) Maximum Force - - | 1850 to 2500 lbs. | 2217.0 | |
| (3) Time Above 1000g- | 1.7 ms minimum | 1.8 | |
| b. Left Side-- | | | |
| (1) Probe Speed - - - | 6.76 to 7.04 fps | 6.9 | |
| (2) Maximum Force - - | 1850 to 2500 lbs. | 1889.0 | |
| (3) Time Above 1000g- | 1.7 ms minimum | 1.8 | |

REMARKS:

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.: 4 6 7

I. CONFIGURATION VERIFICATION DATA:



| | P. 572 SPECIFICATION | PRE-TEST (if required) | POST-TEST (if required) |
|------------------------------------|-------------------------|---------------------------|----------------------------|
| DATE OF CONFIGURATION VERIFICATION | | 03/13 - 03/14/88 | |
| VERIFICATION NUMBER FOR DUMMY* | | 2 | |
| SH - Seated Height- - - - - | 35.6 to 35.8" | 35.6 | |
| SP - Shoulder Pivot Height-- - - | 21.8 to 22.4" | 22.0 | |
| HP - Hip Pivot Height - - - - - | 3.9" ref. | 3.9 | |
| KH - Knee Pivot from back line- - | 20.1 to 20.7" | 20.6 | |
| KV - Knee Pivot from floor- - - - | 19.3 to 19.9" | 19.5 | |
| SW - Shoulder Width - - - - - | 17.8 to 18.4" | 17.9 | |
| HW - Hip Width- - - - - | 14.0 to 15.4" | 15.0 | |

TECHNICIAN'S NAME: Mark Walker

* Sequential number beginning with "1" at the start of each fiscal year's crash test program

DUMMY CONFIG. & PERF. VERIF. DATA...Continued:

II. PERFORMANCE VERIFICATION DATA:

NHTSA DUMMY I.D. NO.:

| | | |
|---|---|---|
| 4 | 6 | 7 |
|---|---|---|

TECHNICIAN'S NAME: Mark Walker

| | | PRE-TEST (if required) | POST-TEST (if required) |
|--|------------------------|---------------------------|----------------------------|
| DATE OF PERFORMANCE VERIFICATION----- | | 03/13 - 03/14/88 | |
| SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*----- | | 2 | |
| VERIF. LAB. TEMPERATURE (66 to 78°F Range)----- | | 69 - 74 °F. | °F. |
| VERIF. LAB. HUMIDITY (10 to 70% Range) | | 16 - 35 % | % |
| TEST PARAMETER | SPECIFICATION | | |
| 1. HEAD DROP TEST-- | | | |
| a. Peak Resultant Accel.- | 210 to 260G | 220.0 | |
| b. Peak Lateral Accel.- - | - 10G | 6.6 | |
| c. Time above 100G- - - - | 0.9 to 1.5ms | 1.2 | |
| 2. NECK BENDING TEST-- | | | |
| a. Pendulum Speed - - - - | 21.5 to 25.5 fps | 22.4 | |
| b. Pend. Avg. Decel. over t ₃ - t ₂ | 20 to 24G | 21.0 | |
| c. Peak Resultant Head Acceleration - - - - - | 26G max. | 23.7 | |
| d. Pendulum Decel.(t ₂ -t ₁) | - 3ms | 3.0 | |
| e. Pendulum Decel.(t ₃ -t ₂) | 25 to 30 ms | 26.8 | |
| f. Pendulum Decel.(t ₄ -t ₃) | - 10ms | 10.0 | |
| g. Max. Head Rotation - - | 63 to 73° | 67.5 | |
| h. Chordal Displacement-- Head Rotation Angle- | | | |
| 0° | Time- - -2 to 2 ms | 0 | |
| | Displ.- -.5 to .5" | 0 | |
| 30° | Time- - 25.6 to 34.4ms | 33.2 | |
| | Displ.- 2.1 to 3.1" | 2.56 | |
| 60° | Time- - 40.3 to 51.7ms | 49.2 | |
| | Displ.- 4.3 to 5.3" | 4.8 | |
| Maximum (67.5°) | Time- - 53.2 to 66.8ms | 61.6 | |
| | Displ.- 5.0 to 6.0" | 5.4 | |

*beginning with "1" at the start of each fiscal year's crash test program

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.:

| | | |
|---|---|---|
| 4 | 6 | 7 |
|---|---|---|

TECHNICIAN'S NAME: Mark Walker

| TEST PARAMETER | SPECIFICATION | Pre-Test (if required) | Post-Test (if required) |
|---------------------------------------|-------------------|---------------------------|----------------------------|
| 2. NECK BENDING TEST.... | | | |
| <u>Continued:</u> | | | |
| h. Chordal Displacement: | | | |
| Head Rotation Angle-- | | | |
| 60° | Time | 67.0 to 83.0 ms | 73.2 |
| | Displ. | 4.3 to 5.3 in. | 4.69 |
| 30° | Time | 85.4 to 104.6 ms | 89.6 |
| | Displ. | 2.1 to 3.1 in. | 2.2 |
| 0° | Time | 101.0 to 123.0 ms | 101.0 |
| | Displ. | -.5 to 0.5 in. | 0.2 |
| 3. ABDOMINAL COMPRESSION TEST: | | | |
| (Preload = 10 pounds) | | | |
| a. Force @ .5" - - - - | 23 to 36 lbs. | 28.0 | |
| b. Force @ .75" - - - - | 36 to 50 lbs. | 40.0 | |
| c. Force @ 1.0" - - - - | 50 to 63 lbs. | 57.0 | |
| d. Force @ 1.5" - - - - | 73 to 88 lbs. | 76.0 | |
| 4. LUMBAR FLEXION TEST: | | | |
| a. Force @ 20° - - - - | 22 to 34 lbs. | 29.9 | |
| b. Force @ 30° - - - - | 34 to 46 lbs. | 37.0 | |
| c. Force @ 40° - - - - | 46 to 58 lbs. | 53.6 | |
| d. Return Angle - - - - | 12° maximum | 12.0 | |
| 5. CHEST IMPACT TESTS: | | | |
| a. High Speed | | | |
| (1) Probe Speed - - - | 21.78-22.22 fps | 21.9 | |
| (2) Peak Deflection - | 1.7" maximum | 1.7 | |
| (3) Peak Resistive Force - - - - - | 2250 lbs. maximum | 2161.0 | |
| (4) Internal Hysteresis - - - | 50 to 70% | 59.5 | |
| b. Low Speed | | | |
| (1) Probe Speed - - - | 13.86-14.14 fps | 14.04 | |
| (2) Peak Deflection - | 1.1" maximum | 1.0 | |
| (3) Peak Resistive Force - - - - - | 1450 lbs. maximum | 1114.0 | |
| (4) Internal Hyster. - | 50 to 70% | 69.0 | |

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.:

| | | |
|---|---|---|
| 4 | 6 | 7 |
|---|---|---|

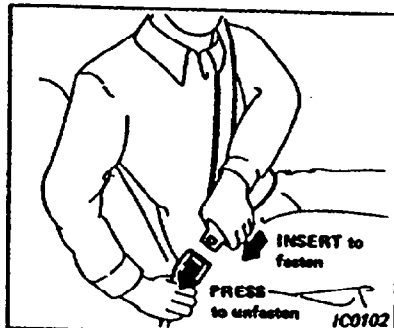
TECHNICIAN'S NAME: Mark Walker

| TEST PARAMETER | SPECIFICATION | Pre-Test (if required) | Post-Test (if required) |
|------------------------------|-------------------|---------------------------|----------------------------|
| 6. KNEE IMPACT TESTS: | | | |
| a. Right Side-- | | | |
| (1) Probe Speed - - - | 6.76 to 7.04 fps | 6.9 | |
| (2) Maximum Force - - | 1850 to 2500 lbs. | 1933.0 | |
| (3) Time Above 1000g- | 1.7 ms minimum | 1.9 | |
| b. Left Side-- | | | |
| (1) Probe Speed - - - | 6.76 to 7.04 fps | 6.9 | |
| (2) Maximum Force - - | 1850 to 2500 lbs. | 2177.0 | |
| (3) Time Above 1000g- | 1.7 ms minimum | 1.9 | |

REMARKS:

APPENDIX D
VEHICLE'S OWNER MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

SEAT BELTS 3-POINT TYPE WITH RETRACTOR



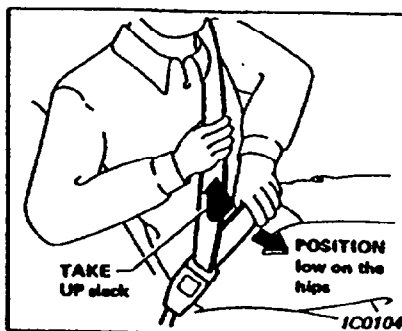
Every person who drives or rides in this vehicle should wear a seat belt at all times.

Fastening the belts

1. Adjust the seat.

The seatback should not be in a reclining position any more than needed for comfort. Seat belts are most effective when the passenger sits well back and straight up in the seat.

2. Slowly pull the seat belt out of the retractor and insert the tongue into the buckle until it snaps.



The retractor is designed to lock during a sudden stop or on impact. A slow pulling motion will permit the belt to move, and allow you some freedom of movement in the seat.

3. Position the lap belt portion low on the hips as shown.
4. Pull the shoulder belt portion toward the retractor to take up extra slack.

Unfastening the belts

To unfasten the belt, press the button on the buckle. The seat belt will automatically retract.

Checking seat belt operation

Your seat belt retractors are designed to lock belt movement by two separate methods:

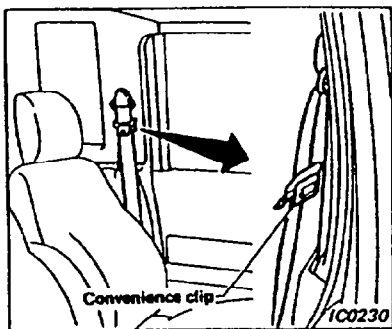
- 1) When the belt is pulled quickly from the retractor.
- 2) When the vehicle slows down rapidly.

To increase your confidence in the belts, check the operation as follows:

- Grasp the shoulder belt and pull quickly forward. The retractor should lock and restrict further belt movement.

If the retractor does not lock during this check or if you have any question about belt operation see your NISSAN dealer.

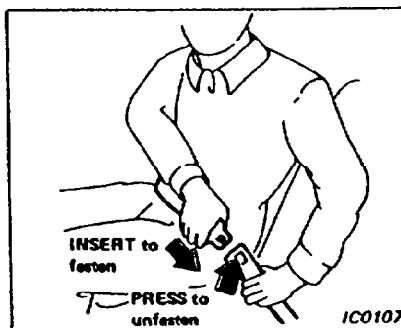
2-POINT TYPE WITHOUT RETRACTOR



Convenience clip

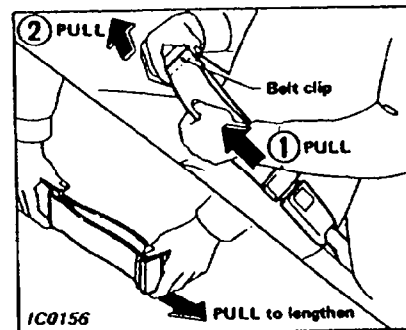
The convenience clip is provided to keep the belt tongue in an accessible position when not being used.

Slide it away from the buckle if the convenience clip contacts the belt tongue when the belt is worn.

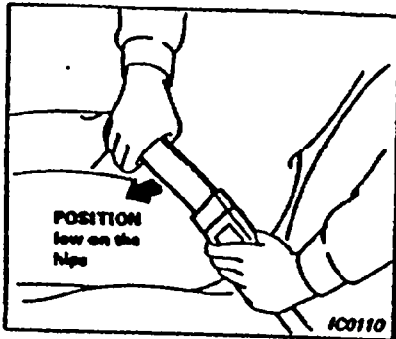


Fastening the belts

1. Insert the tongue into the buckle until it snaps.



2. To lengthen, hold the tongue at a right angle to the belt and pull on the belt. To shorten, pull the free end of the belt away from the tongue, then pull the belt clip to take up the slack.



3. Position the lap belt low on the hips as illustrated.

Unfastening the belts

To unfasten the belt, press the button on the buckle.

SEAT BELT EXTENDERS

If, because of body size or driving position, it is not possible to properly fit the lap-shoulder belt and fasten it, an extender is available which is compatible with the installed seat belts. The extender adds approximately 8 inches (200 mm) of length and may be used for either the driver or passenger seating position. See your NISSAN dealer for assistance if the extender is required.

- Only NISSAN belt extenders, made by the same company which made the original equipment belts, should be used with NISSAN belts.
- Persons who can use the standard seat belt should not use an extender. Such unnecessary use could result in serious personal injury in the event of an accident.

PRECAUTIONS ON SEAT BELT USAGE

NISSAN strongly encourages you and all of your passengers to buckle up every time you drive.

Your chances of being injured in an accident and/or the severity of injury may be greatly reduced if you are wearing your seat belt and it is properly adjusted.

Some states, provinces or territories may require by law that seat belts be worn at all times when a vehicle is being driven.

- The belt should be adjusted to a snug fit. Slack in the lap-shoulder belt will reduce the effectiveness of the entire restraint system.
- Never wear the belt inside out or twisted.
- Do not allow more than one person to use the same belt.

Infant or small child

NISSAN recommends that infants or small children be seated in a child restraint system. You should choose a child restraint system which fits your vehicle and always follow the manufacturer's instructions for installation and use.

Children

Children who are too large for child restraint systems should be seated and restrained by the seat belts which are provided.

Never let a child stand or kneel on any seat or allow a child in the cargo areas while the vehicle is moving.

Pregnant women

NISSAN recommends that pregnant women use seat belts. Contact your doctor for specific recommendations. The lap belt should be worn snug and positioned as low as possible around the hips, not the waist.

Injured persons

NISSAN recommends that injured persons use seat belts, depending on the injury. Check with your doctor for specific recommendations.

SEAT BELT MAINTENANCE

- To clean the belt webbings, apply a mild soap solution or any solution recommended for cleaning upholstery or carpets. Then brush it, wipe with a cloth and allow it to dry in the shade. Do not allow the belts to retract until they are completely dry.
- Periodically check to see that the belt and the metal components such as buckles, tongues, retractors, flexible wires and anchors work properly. If loose parts, deterioration, cuts or other damage on the webbing is found, or if the belt has been stressed because it was worn during an accident, the entire belt assembly should be replaced.

CHILD RESTRAINT SYSTEMS FOR INFANTS AND SMALL CHILDREN

It is very important that infants and small children riding in a vehicle be placed in a restraint system.

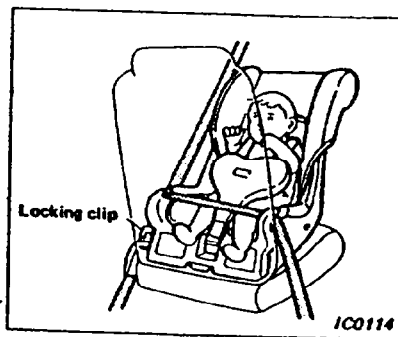
Children and infants should never be carried on your lap; it is not possible for even the strongest adult to resist the forces of an accident. The child could be crushed between the adult and parts of the vehicle. Also, do not put the same seat belt around both your child and yourself. Do not install the child restraint system on the jump seats, because they are not suitable for a child restraint system.

Child restraint systems specially designed for infants and small children are offered by several manufacturers. Some systems may be used for both infants and small children. When selecting any child restraint system, keep the following points in mind:

- 1) Choose only a system with a label certifying that it complies with Federal Motor Vehicle Safety Standard 213 or Canadian Motor Vehicle Safety Standard 213.
- 2) Place your child in the child restraint and check the various adjustments to be sure the child restraint is compatible with your child. Always follow all of the recommended procedures.

3) Check the child restraint in your vehicle to be sure it is compatible with the vehicle's seat belt system.

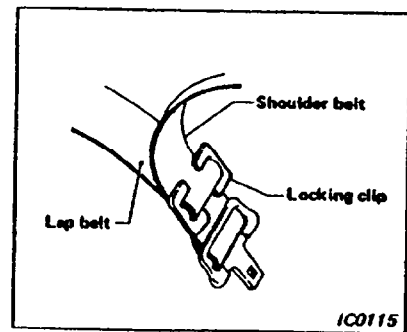
- Follow all of the child restraint manufacturer's instructions for installation and use. When purchasing a child restraint, be sure to select one which will fit your child and vehicle as it may not be possible to properly install some types of child restraints in your vehicle.
- When your child restraint system is not in use, store it in the luggage room or keep it secured with a seat belt to prevent it from being thrown forward in case of a sudden stop or accident.
- Remember that a child restraint left in a closed vehicle can become very hot. Check the seating surface and buckles before placing your child back in the child restraint.
- All U.S. states and some provinces or territories require that infants and small children be restrained in approved child restraint systems at all times while the vehicle is being operated.



Installation on front seat

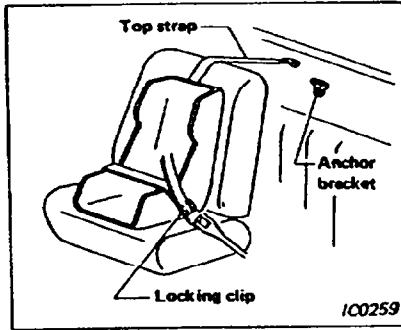
Before using the locking clip, read the instructions attached to the clip.

Secure the child restraint with the lap belt as illustrated. To prevent slack in the lap belt, it will be necessary to secure the lap/shoulder belt in place with a locking clip.



Use a NISSAN genuine locking clip (part number 999JW-A3000, available from your NISSAN dealer), or one which is equivalent in dimensions and strength.

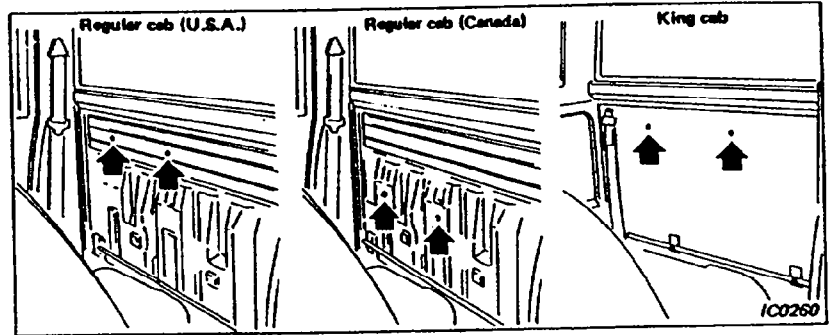
When your child restraint system is not in use, keep the locking clip in the glove box to prevent it from being lost.



If your child restraint has a top strap, install the anchor bracket to the provided anchorage. To install the anchor bracket, a metric bolt of the dimensions listed below must be used.

Bolt diameter: 8.0 mm
Bolt length: more than 30 mm
Thread pitch: 1.25 mm

Child restraint anchorages are designed to withstand only these loads imposed by correctly fitted child restraints. Under no circumstances are they to be used for adult seat belts or harnesses.



Anchorage location

Anchorage locations are located under the rear window. On King Cab models, the back panel carpet is perforated to allow access to the anchorage.