

DOT 1150

NEW CAR ASSESSMENT PROGRAM (NCAP)  
FRONTAL BARRIER IMPACT TEST

CHRYSLER CORPORATION  
1988 DODGE D-150 PICKUP  
NHTSA NO. MJ0301

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



APRIL 07, 1988

FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
OFFICE OF MARKET INCENTIVES  
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16. Abstract A 35 mph frontal barrier impact test using a load cell barrier was conducted on a 1988 Dodge D-150 Pickup at the Mobility Systems and Equipment Company (MSE) crash test facility in Mira Loma, CA on 22 March 1988.  The barrier impact velocity was 35.2 mph and the ambient temperature at the barrier face at the time of impact was 74°F. The posttest vehicle crush maximum was 30.1 in.  A summary of occupant injury measure data from the test.																							
<table border="1"> <thead> <tr> <th>Injury Criteria</th> <th>Driver Dummy</th> <th>Passenger Dummy</th> </tr> </thead> <tbody> <tr> <td>Threshold Value</td> <td></td> <td></td> </tr> <tr> <td>Head Injury Criterion HIC = 1000</td> <td>685</td> <td>466</td> </tr> <tr> <td>Chest Resultant Peak 60 Gs (3 ms clip)</td> <td>40</td> <td>35</td> </tr> <tr> <td>Femur Load Left</td> <td>1481</td> <td>361</td> </tr> <tr> <td>2250 pounds Right</td> <td>396</td> <td>276</td> </tr> </tbody> </table>						Injury Criteria	Driver Dummy	Passenger Dummy	Threshold Value			Head Injury Criterion HIC = 1000	685	466	Chest Resultant Peak 60 Gs (3 ms clip)	40	35	Femur Load Left	1481	361	2250 pounds Right	396	276
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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/DODGE/D-150/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 Dodge D-150 Pickup, NHTSA No. MJ0301 at a velocity of 35.2 mph. The frontal impact test was conducted by Mobility Systems and Equipment Company (MSE) on 22 March 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 Dodge D-150 Pickup was equipped with a 239 cubic inch, 6 cylinder engine and 4 speed manual transmission. The test weight of the Dodge D-150 Pickup with two (2) 50th percentile male dummies, instrumentation, and cameras was 4178 pounds.

The 1988 Dodge D-150 Pickup was involved in a frontal load cell barrier crash at a velocity of 35.2 mph.

The maximum static crush for the vehicle of 30.1 inches occurred at the left 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. The driver ATD had a HIC value of 685, the maximum chest acceleration (resultant clipped) was 40 and the maximum femur loads were 1481 (left) and 396 (right) pounds.

The passenger ATD's knees hit the dash panel. The HIC value for the passenger ATD was 466, the maximum chest acceleration (resultant clipped) was 35 and the maximum femur loads were 361 (left) and 276 (right) pounds.

Seat belt spool out, measured by high speed film analysis was 3.3 inches for the driver and 3.4 inches for the passenger.

The seat latching devices on 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.

VEHICLE NHTSA NO.: 

M	J	0	3	0	1
---	---	---	---	---	---

 VIN: 

1	B	7	F	D	1	4	X	5	J	S	6	7	6	9	4	6
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

VEHICLE BODY COLOR: WHITE ; MONTH & YEAR OF MANUFACTURE: 11/87

ENGINE: 6 cylinders; 239 C.I.D.;      Liters;      CC  
X Gas;      Diesel;      Turbocharged

PLACEMENT— X Longitudinal;      Transverse (Lateral)

TRANSMISSION: 4 speed; X Manual;      Automatic; X Overdrive

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

DATE VEHICLE AVAILABLE FOR 35 MPH CRASH TESTING: 12/15/87

ODOMETER READING: 71 miles; OPTIONS:  A/C;  P/S;  P/Wdo;      

Tilt Whl.;  Cruise Control

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): 35 psi Front; 35 psi Rear

Recommended Tire Size: P195/75R15

Tires On Vehicle: P195/75R15 ; Manufacturer: GOODYEAR VECTOR

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

Type Of Front Seats:      Bucket; X Bench;      Split Bench

Type Of Front Seat Back: X Fixed;      Adjustable With  Lever /  <sup>Rotating</sup> Knob

Vehicle Maximum Capacity Loading = 1400\* lbs. (A) \*(GVWR - 3550)

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

Cargo Capacity (A - B) - - - - - = 950 lbs.

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Right Front = 1019 lbs. ]  
Left Front = 1114 lbs. ] TOTAL FRONT = 2133 lbs ( 60.0% of TOTAL)

Right Rear = 671 lbs. ]  
Left Rear = 746 lbs. ] TOTAL REAR = 1417.0 lbs. ( 40.0% of TOTAL)

TOTAL WEIGHT= 3550 lbs.

CALCULATION OF TEST VEHICLE TARGET WEIGHT:

Total Test Vehicle Delivered Weight With Maximum Fluids	=	<u>3550</u>	lbs.
Maximum Cargo Carrying Capacity Of Test Vehicle*	- - - - =	<u>300</u>	lbs.
Weight Of Two P.572 Dummies (2 x 164 lbs.)	- - - - - =	<u>328</u>	lbs.
TEST VEHICLE TARGET WEIGHT	- - - - - =	<u>4178</u>	lbs.

\*300 lbs. for light trucks and MPVs

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front	=	<u>1156</u>	lbs.	
Left Front	=	<u>1251</u>	lbs.	TOTAL FRONT = <u>2407</u> lbs. ( <u>57.6%</u> of TOTAL)
Right Rear	=	<u>848</u>	lbs.	
Left Rear	=	<u>923</u>	lbs.	TOTAL REAR = <u>1771</u> lbs. ( <u>42.4%</u> of TOTAL)
TOTAL WEIGHT	=	<u>4178</u>	lbs.	(which includes <u>100</u> lbs. of cargo ballast weight placed in the cargo/luggage area)

VEHICLE COMPONENTS REMOVED TO MEET TARGET WEIGHT:

- |   |   |
|---|---|
| 1. <input checked="" type="checkbox"/> Spare Tire, Jack, Jack Stand | 3. <input type="checkbox"/> Tail lamp hsg. <input type="checkbox"/> Rt. Side <input type="checkbox"/> Left Side |
| 2. <input type="checkbox"/> Rear Bumper Assembly                    | 4. <u>DRIVER AND PASSENGER SIDE VIEW MIRRORS</u>  |

TEST VEHICLE ATTITUDE:

<u>As Delivered</u> — Right Front	=	<u>32.5</u>	inches;	<u>Ready For Test</u> — Right Front	=	<u>32.0</u>	inches
Left Front	=	<u>32.5</u>	inches	Left Front	=	<u>32.0</u>	inches
Right Rear	=	<u>36.2</u>	inches	Right Rear	=	<u>34.3</u>	inches
Left Rear	=	<u>35.8</u>	inches	Left Rear	=	<u>33.6</u>	inches
Test Vehicle Wheelbase:	<u>115.2</u>	inches;	C.G.=	<u>48.8</u>	inches rearward of front wheel centerline		

Total Vehicle Length:

Right Side	=	<u>189.9</u>	inches
Left Side	=	<u>189.6</u>	inches
Centerline	=	<u>193.0</u>	inches

Data Table No. 2 Post Crash Test Data

DATE OF 35 MPH FRONTAL BARRIER IMPACT RATINGS TEST: 03/22/88

TIME OF TEST: 3:45 PM ; AMBIENT TEMPERATURE AT BARRIER FACE: 74 °F.

VEHICLE'S OCCUPANT COMPARTMENT TEMPERATURE: 74 °F. (Spec. Range + 66 to 78° F.)

VEHICLE'S WINDSHIELD MOLDING TEMPERATURE: 74 °F.

VEHICLE IMPACT VELOCITY: Primary Speed Trap = 35.21 mph

Secondary Speed Trap = 35.20 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= 189.9 ; C/Line= 193.0 ; Left Side= 189.6

Vehicle Post-test Length —Right Side= 161.7 ; C/Line= 162.9 ; Left Side= 162.7

VEHICLE STATIC CRUSH ---- Right Side= 28.2 ; C/Line= 30.1 ; Left Side= 26.9

VEHICLE REBOUND FROM BARRIER FACE:

Vehicle Right Side = 24.0 inches

Vehicle Centerline = 26.2 inches

Vehicle Left Side = 29.1 inches

VISIBLE DUMMY CONTACT POINTS:

	DRIVER (I.D. No. 465)			PASSENGER (I.D. No. 466)		
	Strg. Col. Hub	Strg. Wheel	Instru. Panel	Instru. Panel	Knee Assv.	Glove Box Door
HEAD - - - - -	YES	YES	NO	NO	NO	NO
RIGHT KNEE - - - - -			YES			YES
LEFT KNEE - - - - -			YES			YES

VEHICLE DOOR OPENING INFORMATON:

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

VEHICLE'S FRONT SEAT MOVEMENT DURING CRASH:

	RIGHTSIDE		LEFT SIDE
Seat Cushion Shift - - -	<u>2.0</u>	" backward;	<u>2.2</u> " backward
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/DODGE/D-150/PICKUP

VEH. NHTSA NO.: MJ0301; TEST DATE: 03/22/88

MAXIMUM ACCELERATION VALUES:

		DRIVER DUMMY # <u>465</u>	PASSENGER DUMMY # <u>466</u>
Head Channel X	<b>HEAD X</b>	-97.28	128.56
Head Channel Y	<b>Y</b>	16.41	-55.67
Head Channel Z	<b>Z</b>	-34.13	-43.72
HEAD RESULTANT	<b>R</b>	98.23	142.33
Chest Channel X	<b>CHEST X</b>	-44.73	-37.71
Chest Channel Y	<b>Y</b>	17.00	-10.36
Chest Channel Z	<b>Z</b>	-17.65	17.19
CHEST RESULTANT	<b>R</b>	40.27	34.69
TIME INTERVAL (seconds)		0.075 - 0.078	0.098 - 0.101

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	<b>HIC</b>		
HIC		684.58	466.21
t <sub>1</sub> (seconds)		71.62	89.13
t <sub>2</sub> (seconds)		101.12	125.13
Avg. Accel. t <sub>1</sub> to t <sub>2</sub>		56.67	43.34

MAXIMUM FEMUR FORCES:

Right Side (lbs.)	<b>FR</b>	395.90	275.48
Left Side (lbs.)	<b>FL</b>	1481.05	360.60

MAXIMUM SEAT BELT FORCES:

Lap Belt	<b>LAP</b>	1065.39	No Data
Shoulder Belt	<b>SHLDR</b>	1421.92	1735.12

MAXIMUM SEAT BELT WEBBING SPOOL-OUT:

Lap/Shoulder Belt Combination		3.3	3.4
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Data Table No. 4 Test Dummy Positioning Data

**PRE-IMPACT DATA:**

Make/Model: DODGE/D-150  
 Body Style: PICKUP Model Year: 1988  
 NHTSA No.: MJ0301 Color: WHITE

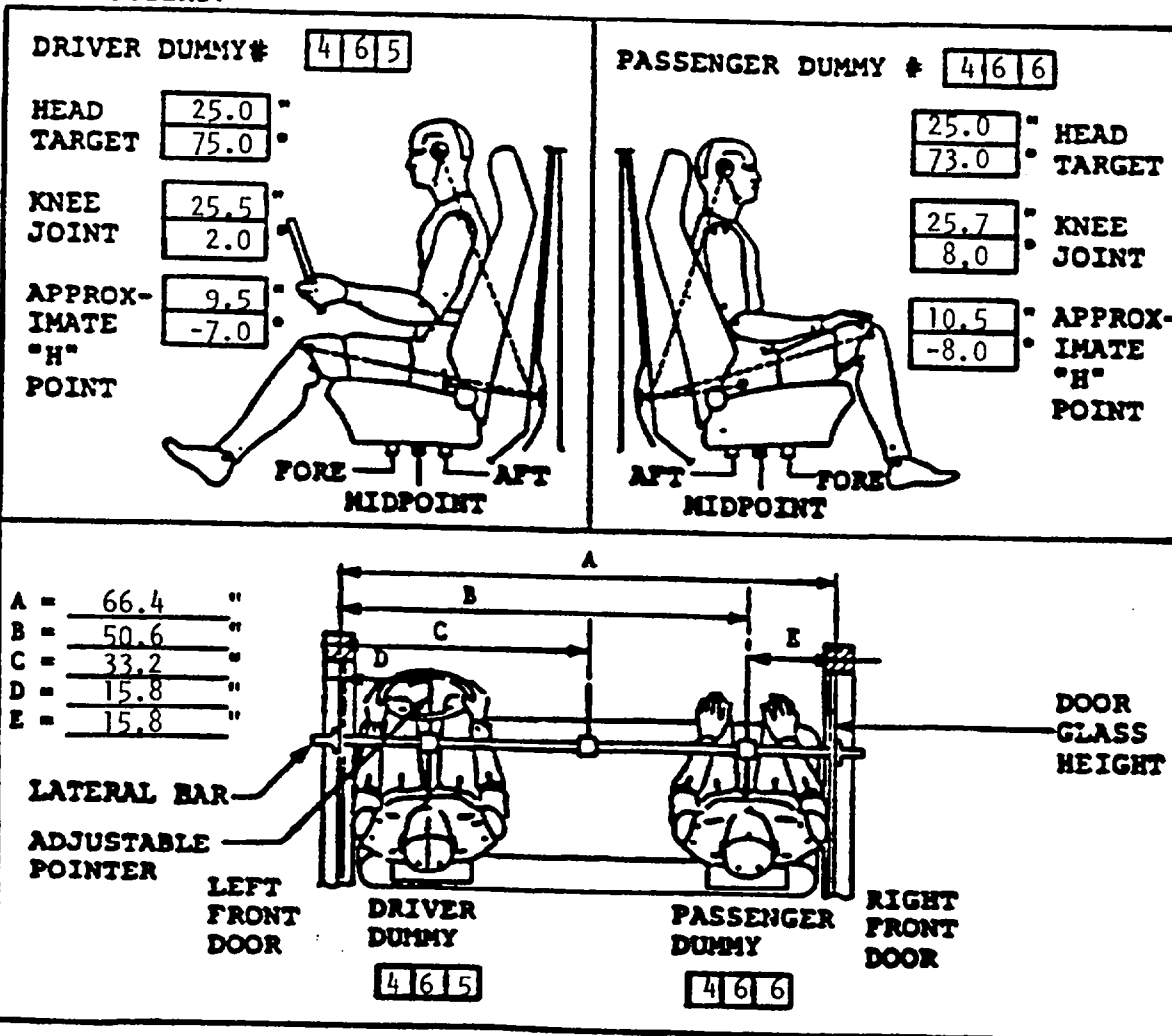
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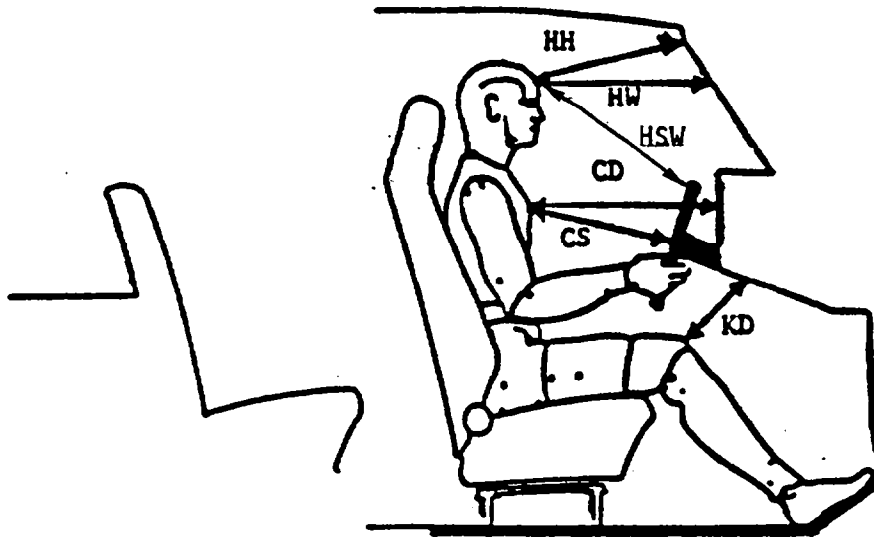
Vehicle Manufacturer: CHRYSLER CORPORATION  
 Date of Manufacture: 11/87; VIN: 1B7FD14X5JS676946  
 GVWR: 4950 lb; GAWR: Front = 2600 lb; Rear = 2684 lb

**POST-IMPACT DATA:**

Date of Test: 03/22/88 Time: 3:45 PM Temperature 74 °F  
 Required Impact Velocity Range: 34.5 to 35.5 mph  
 Impact Velocity: Primary = 35.21 mph Secondary = 35.20 mph  
 Seat Type: BENCH Adjuster Type: MANUAL  
 Bucket Seat Back Type: \_\_\_\_\_

Technicians: \_\_\_\_\_

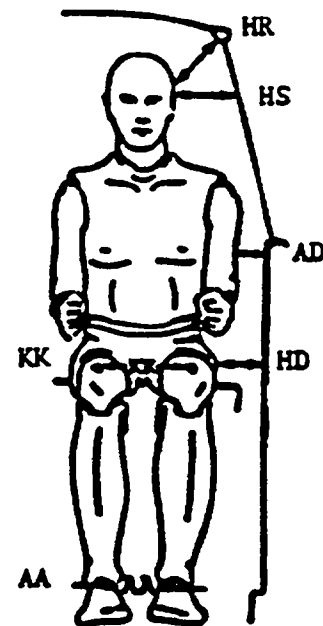




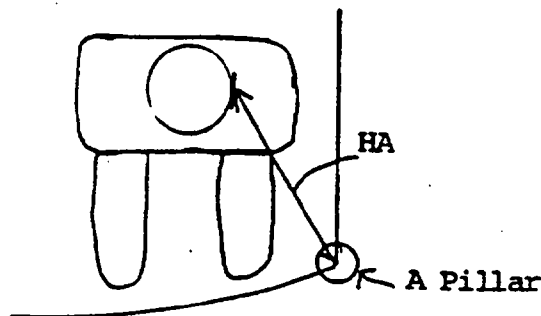
	Driver	Passenger
HH	19.4	18.5
HW	24.0	24.0
CD	24.0	24.2
CS	13.3	N/A
KD L-	8.7	L- 9.0
KD R-	9.0	R- 9.5
Torso Angle	17.0	Torso Angle 17.0
Seat Back Angle	18.0	Seat Back Angle 18.0
HSW	17.0	N/A

- 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.

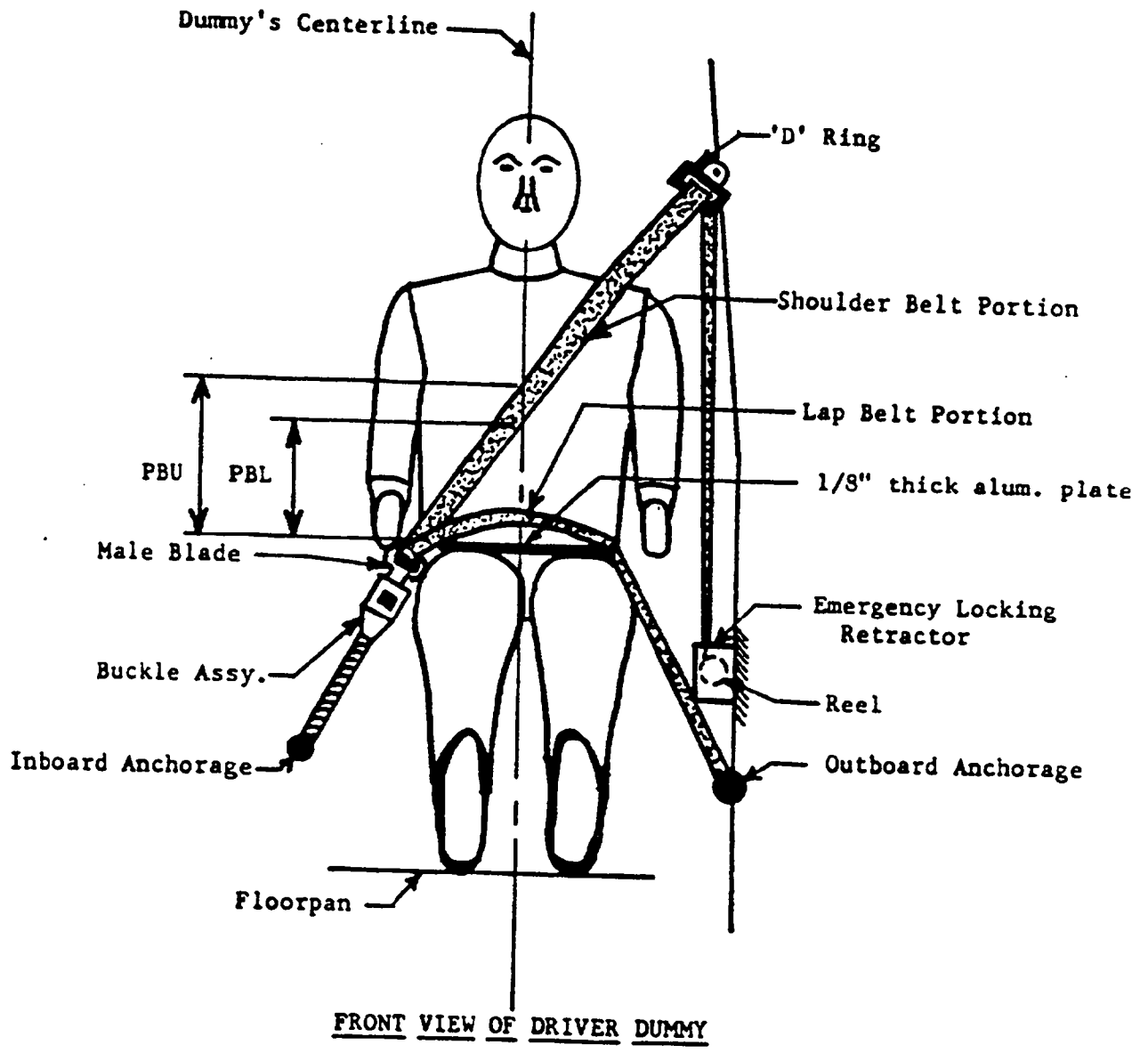
**REMARKS:**



	Driver	Passenger
HR	8.5	8.3
HS	10.0	9.5
AD	4.0	5.0
HD	7.0	8.0
KK	14.5	14.5
AA	10.5	9.0
HA	24.0	23.5



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	14.6	14.0
<u>PBL</u> --Top surface of alum. plate to belt lower edge	11.0	10.2
<u>LAP BELT TENSION, POUNDS</u>	3.0	3.0
<u>SHOULDER BELT TENSION, POUNDS</u>	3.0	3.0

**BELT LENGTH DATA:**

Total Belt Length from retractor reel to bolt hole anchor point for continuous webbing systems

Retractor reel to 'D' ring as measured on Part 572 dummy

Shoulder belt length as measured on Part 572 dummy

Lap belt length as measured on Part 572 dummy

Remainder of belt webbing left on retractor reel

	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	120.3	120.3	119.3	119.3
Retractor reel to 'D' ring as measured on Part 572 dummy	29.3	29.0	29.0	29.0
Shoulder belt length as measured on Part 572 dummy	62.8	63.0	62.0	64.0
Lap belt length as measured on Part 572 dummy	33.5	33.8	33.3	34.0
Remainder of belt webbing left on retractor reel	24.0	23.5	24.0	21.3

**BELT SPOOL-OFF DATA:**

As determined by film analysis

As determined electronically

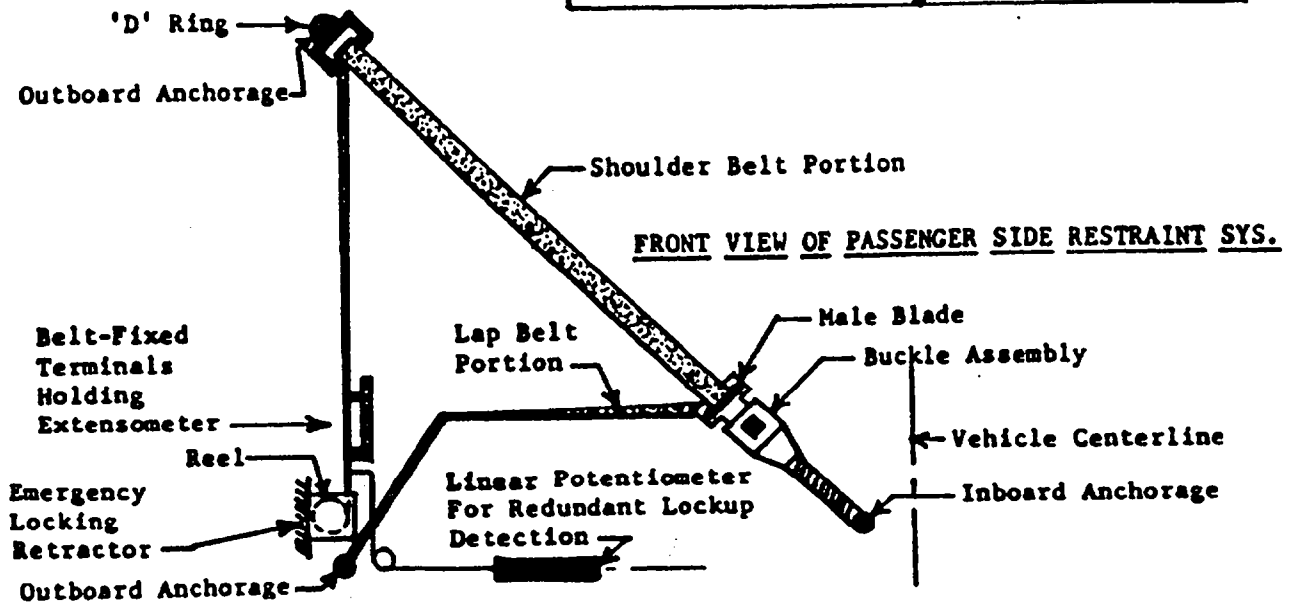
As determined mechanically

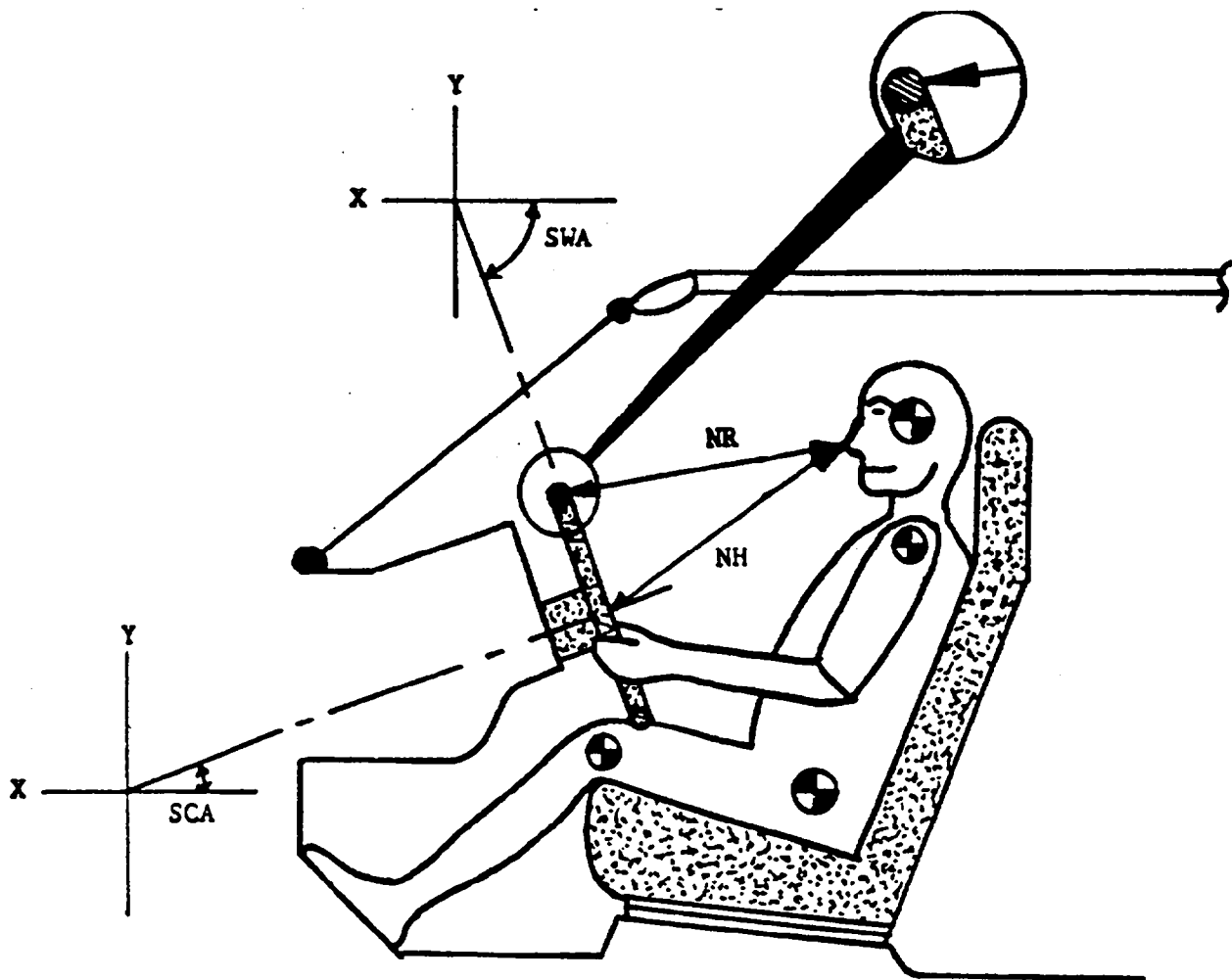
As determined by film analysis	3.3	3.4
As determined electronically	N/A	N/A
As determined mechanically	3.0	3.7

**BELT STRAIN DATA:**

Measured between retractor reel and 'D' ring

Measured between retractor reel and 'D' ring	2.0 Percent	4.0 Percent
--	-------------	-------------





LEFT SIDE VIEW

		MEASUREMENTS	
<u>NR</u>	--Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	15.0	Inches
<u>NH</u>	--Distance from tip of dummy's nose to center of steering column hub	16.5	Inches
<u>SCA</u>	--Angle of steering column relative to the horizontal X axis	25.0	Degrees
<u>SWA</u>	--Angle of steering wheel relative to the horizontal X axis.	65.0	Degrees

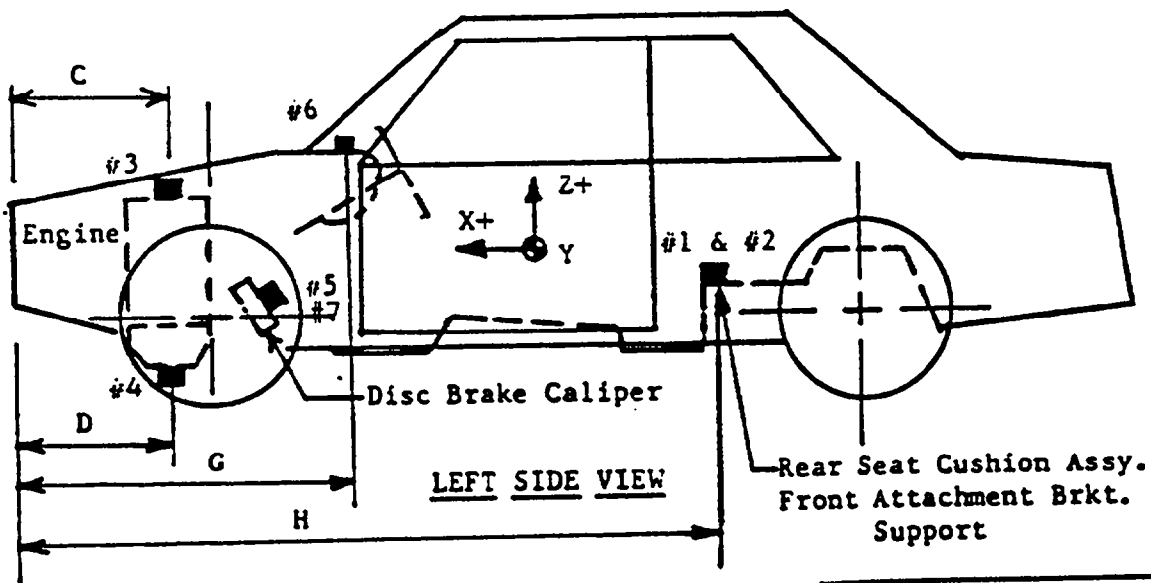
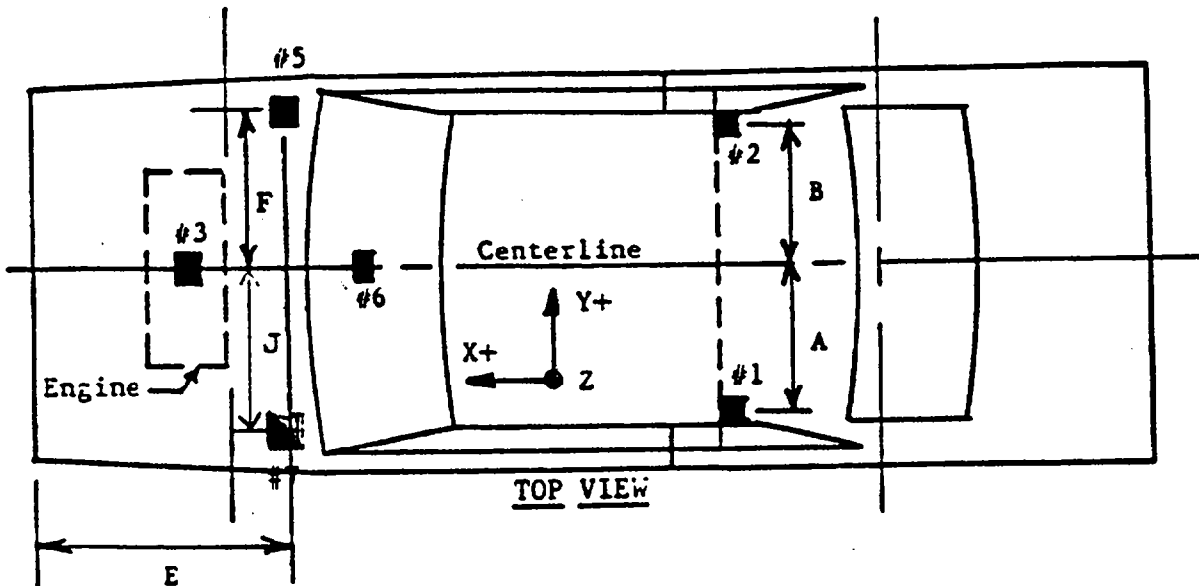
VEH. NHTSA NO.: MJ0301 ; TEST DATE: 03/22/88 ; TIME: 3:45 PM

VEH. YEAR/MAKE/MODEL/BODY STYLE: 1988/DODGE/D-150/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	340.0	298.5	58.0	0.0	298.8	15-70 zoom	24
2	Right Side View	-240.0	80.3	50.0	-1.5	360.2	13	500
3	Left Side View	433.6	112.0	42.5	-1.0	364.9	13	650
4	Overhead	0.0	-21.0	197.9	-7.0	87.5	13	700
5	Pit-Engine	0.0	50.3	-57.1	-12.5	26.9	13	600
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	-52.0	85.8	16	600
8	Front-Driver	11.5	-13.0	103.5	-41.0	81.5	16	600
9	Left Side-Driver	104.5	105.2	82.9	-18.5	66.3	16	600
10	Right Side-Passenger	-100.2	105.6	78.2	-12.0	115.0	16	600
11	Right Side-'A' Post	-195.0	46.5	63.0	0.0	216.2	28	800
12	Left Side-'A' Post	375.2	36.0	64.5	0.0	362.7	50	700
13	Onboard-Left Side	13.7	117.0	51.0	+2.0	22.5	13	850
14	Onboard-Right Side	-13.7	117.0	51.0	+1.5	37.2	13	850
15	Left Side-Steering Col.	422.5	81.3	131.9	-18.5	398.0	28	600
16	Left Side-Steering Col.	422.5	81.3	109.7	-10.0	398.0	28	600
17	Right Side-Passenger	-140.0	60.5	54.0	+1.5	157.6	16	650

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



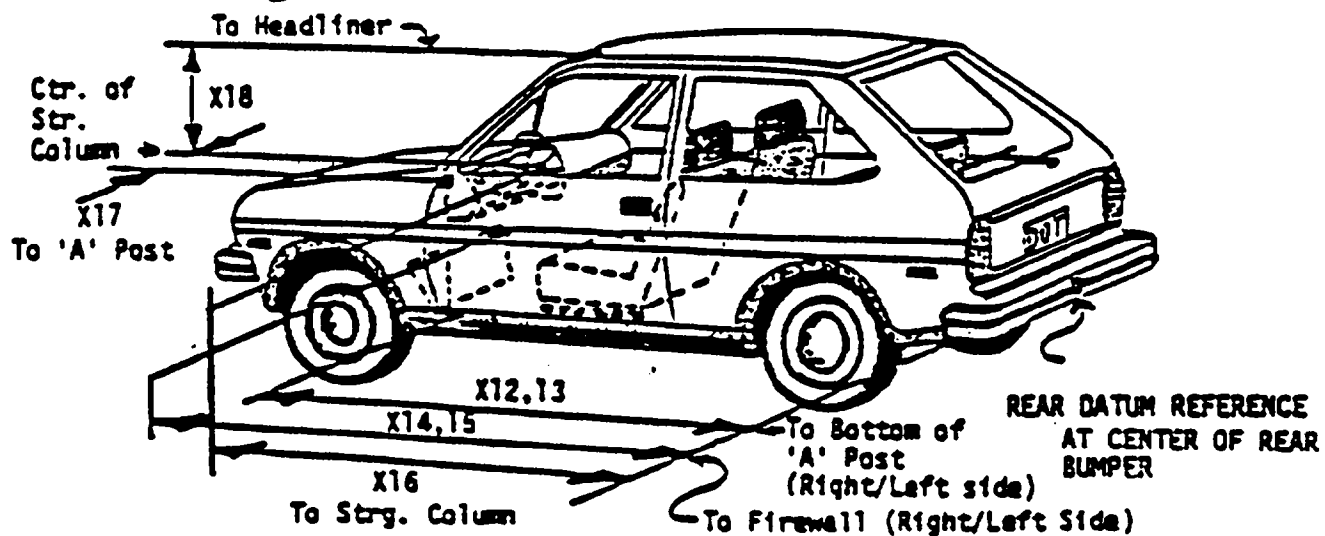
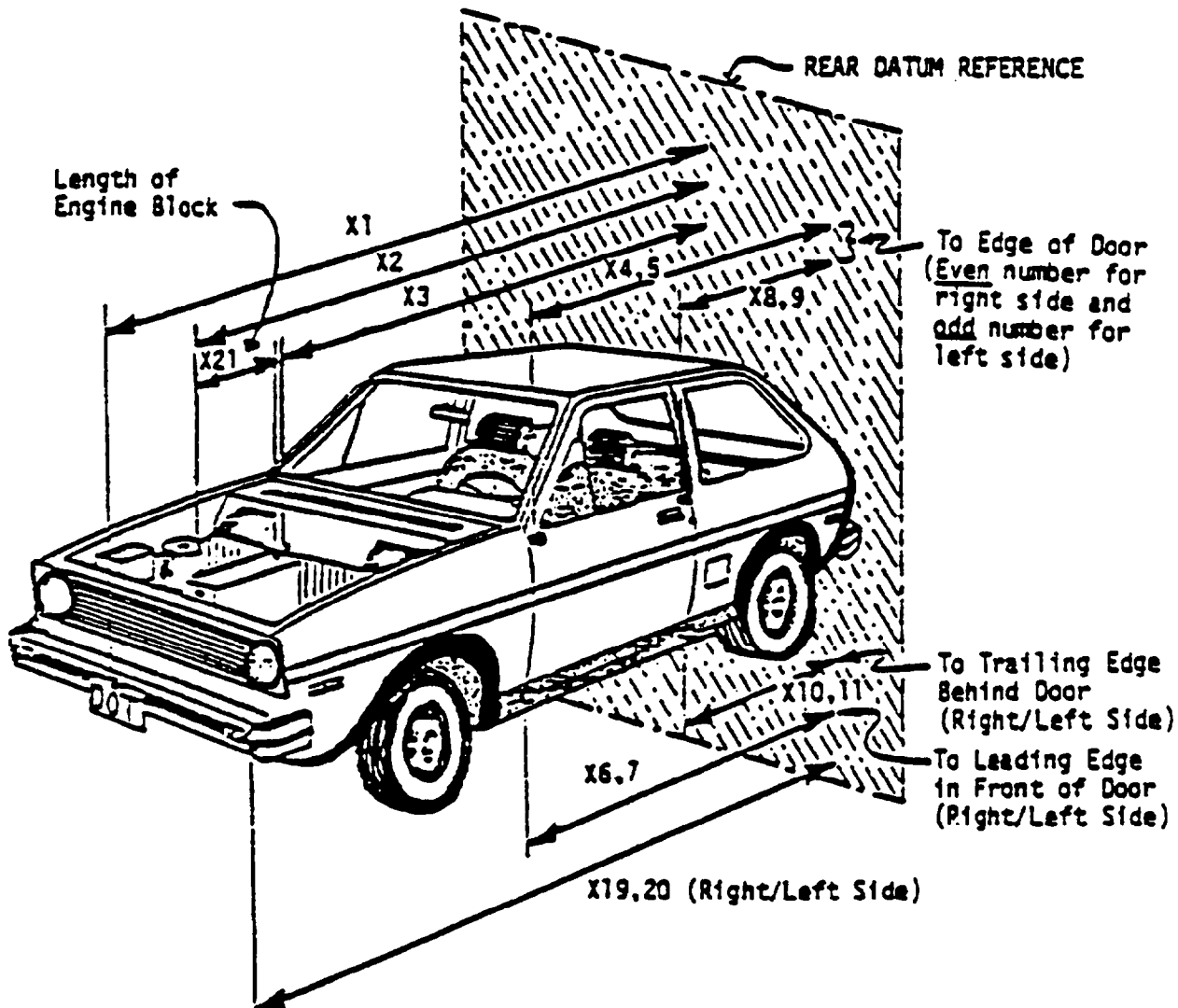


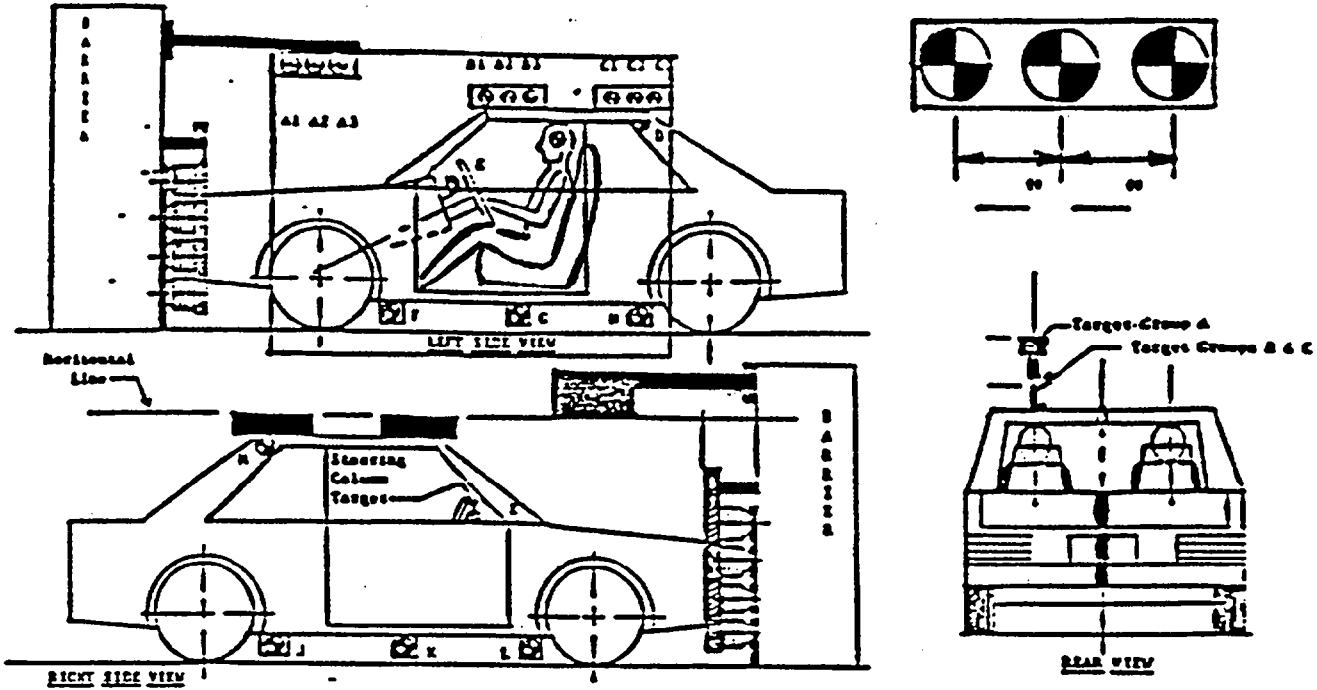
Dimension	Length (in.)
A	15.1
B	15.0
C	35.2
D	47.0
E	44.6
F	26.3
G	68.5
H	107.0
J	26.3

Loc. No.	Description	Maximum Value			
		X-	msec.	X+	msec.
1	Rear seat X-member @ Left Side	-46.7	60.8	10.2	80.9
2	Rear seat X-member @ Right Side	-42.4	60.6	7.1	243.9
3	Top of Engine Block	-82.9	92.5	27.4	100.9
4	Bottom of Engine	-96.3	93.8	33.8	107.8
5	Disc Brake Caliper @ Right Side	-103.1	57.6	97.6	77.8
6	Instrument Panel	-67.2	57.5	35.5	105.0
7	Disc Brake Caliper @ Left Side	-95.8	59.2	37.2	121.4

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	193.0	162.9	30.1
X2	Rear Surface of Vehicle to Front of Engine	162.3	150.9	11.4
X3	Rear Surface of Vehicle to Firewall	140.8	134.9	5.9
X4	Rear Surface to Upr. Leading Edge of Right Door	129.2	125.6	3.6
X5	Rear Surface to Upr. Leading Edge of Left Door	129.0	125.1	3.9
X6	Rear Surface to Lwr. Leading Edge of Right Door	128.5	126.3	2.2
X7	Rear Surface to Lwr. Leading Edge of Left Door	128.7	125.0	3.7
X8	Rear Surface to Upr. Trailing Edge of Right Door	88.7	85.4	3.3
X9	Rear Surface to Upr. Trailing Edge of Left Door	88.7	85.0	3.7
X10	Rear Surface to Lwr. Trailing Edge of Right Door	87.0	85.0	2.0
X11	Rear Surface to Lwr. Trailing Edge of Left Door	87.1	84.3	2.8
X12	Rear Surface to Bottom of 'A' Post on Right Side	126.9	124.7	2.2
X13	Rear Surface to Bottom of 'A' Post on Left Side	126.4	123.6	2.8
X14	Rear Surface to Firewall on Right Side	140.9	136.2	4.7
X15	Rear Surface to Firewall on Left Side	141.0	136.4	4.6
X16	Rear Surface to Steering Column	115.3	109.0	6.3
X17	Center of Steering Column to 'A' Post	16.2	15.2	1.0
X18	Center of Steering Column to Headlining	18.0	21.0	-3.0
X19	Rear Surface to Right Side of Front Bumper	189.9	161.7	28.2
X20	Rear Surface to Left Side of Front Bumper	189.6	162.7	26.9
X21	Length of Engine Block	15.5	15.5	0.0





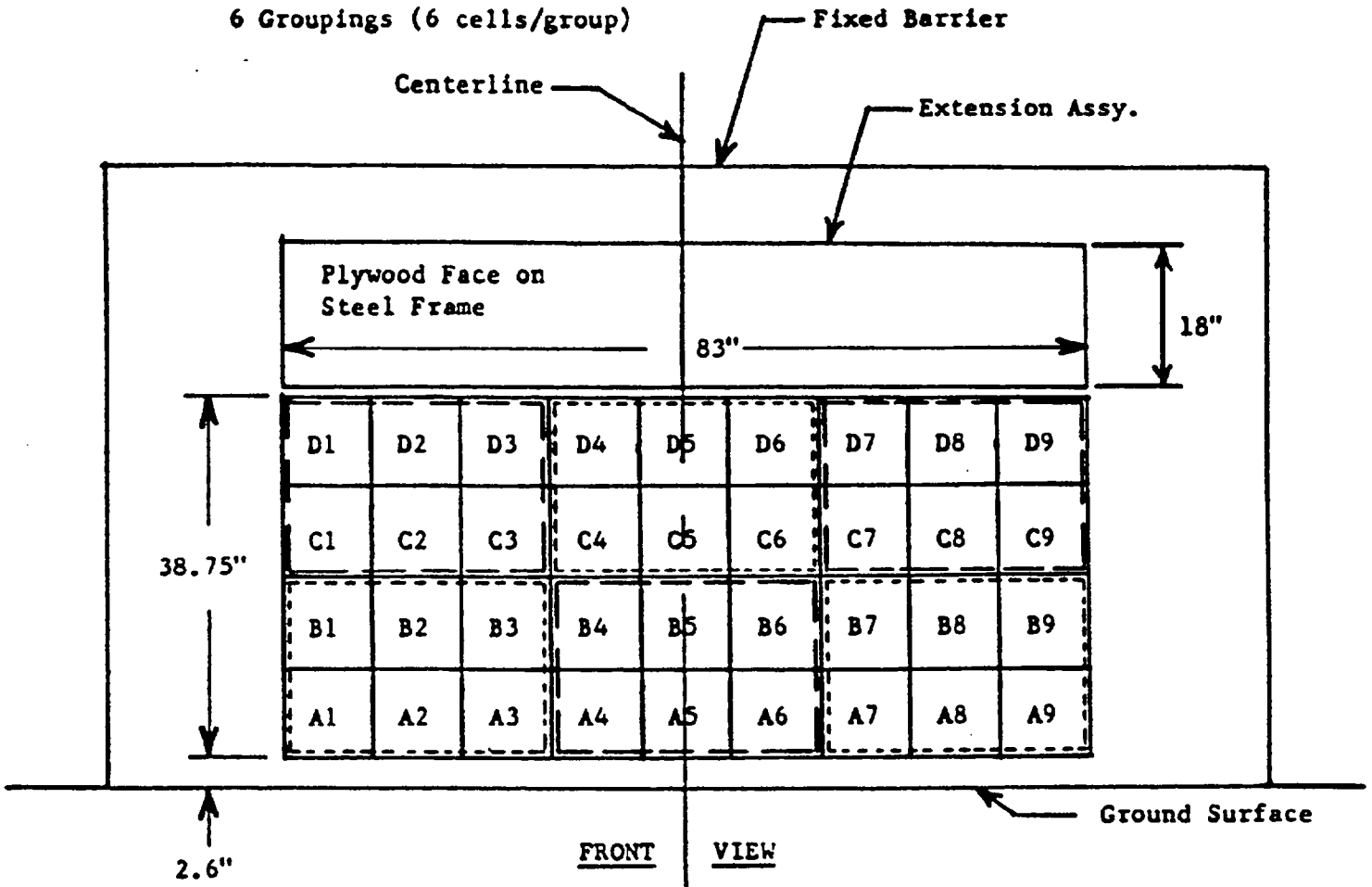
BARRIER TARGETS	'X' From Imag. Barrier Face Vertical Plane	'Y' From Monorail C/L	'Z' Above Ground
A1	94.0	20.8	77.0
A2	98.0	20.8	77.0
A3	102.0	20.8	77.0

VEHICLE TARGETS	'X' From Imag. Barrier Face Vertical Plane	'Y' From Vehicle C/L	'Z' Above Ground
B1	93.5	19.1	70.8
B2	97.5	19.1	70.8
B3	101.5	19.1	70.8
C1	125.3	17.0	49.4
C2	129.3	17.0	49.4
C3	133.3	17.0	49.4
D	N/A	N/A	N/A
E	71.0	19.0	47.3
F	56.7	34.0	11.0
G	93.3	34.2	12.4
H	129.2	34.2	13.7
J	93.4	34.2	13.8
K	129.5	34.2	12.7
L	57.0	34.0	11.7
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

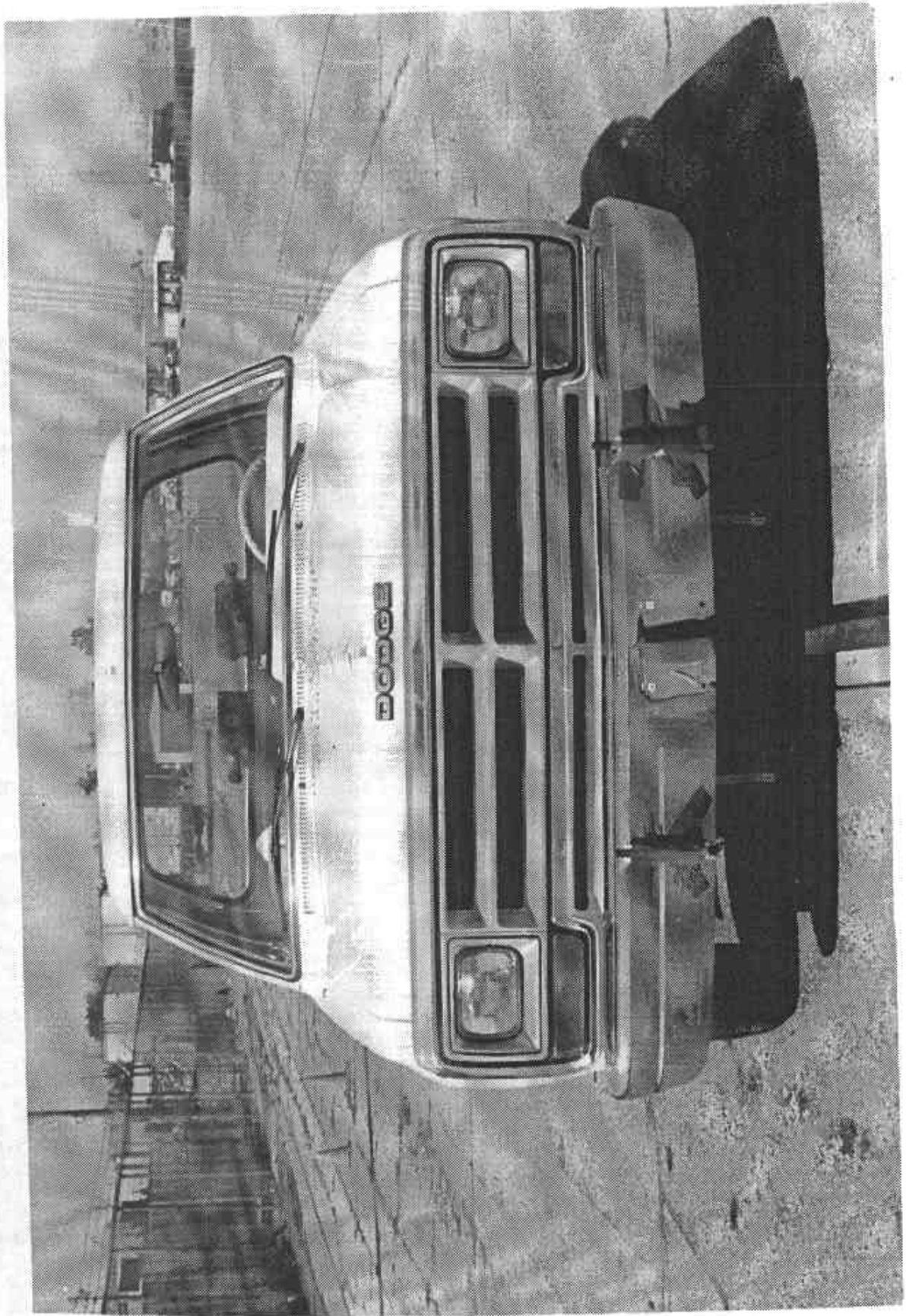
C1 thru D3	C4 thru D6	C7 thru D9
A1 thru B3	A4 thru B6	A7 thru B9

- 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)

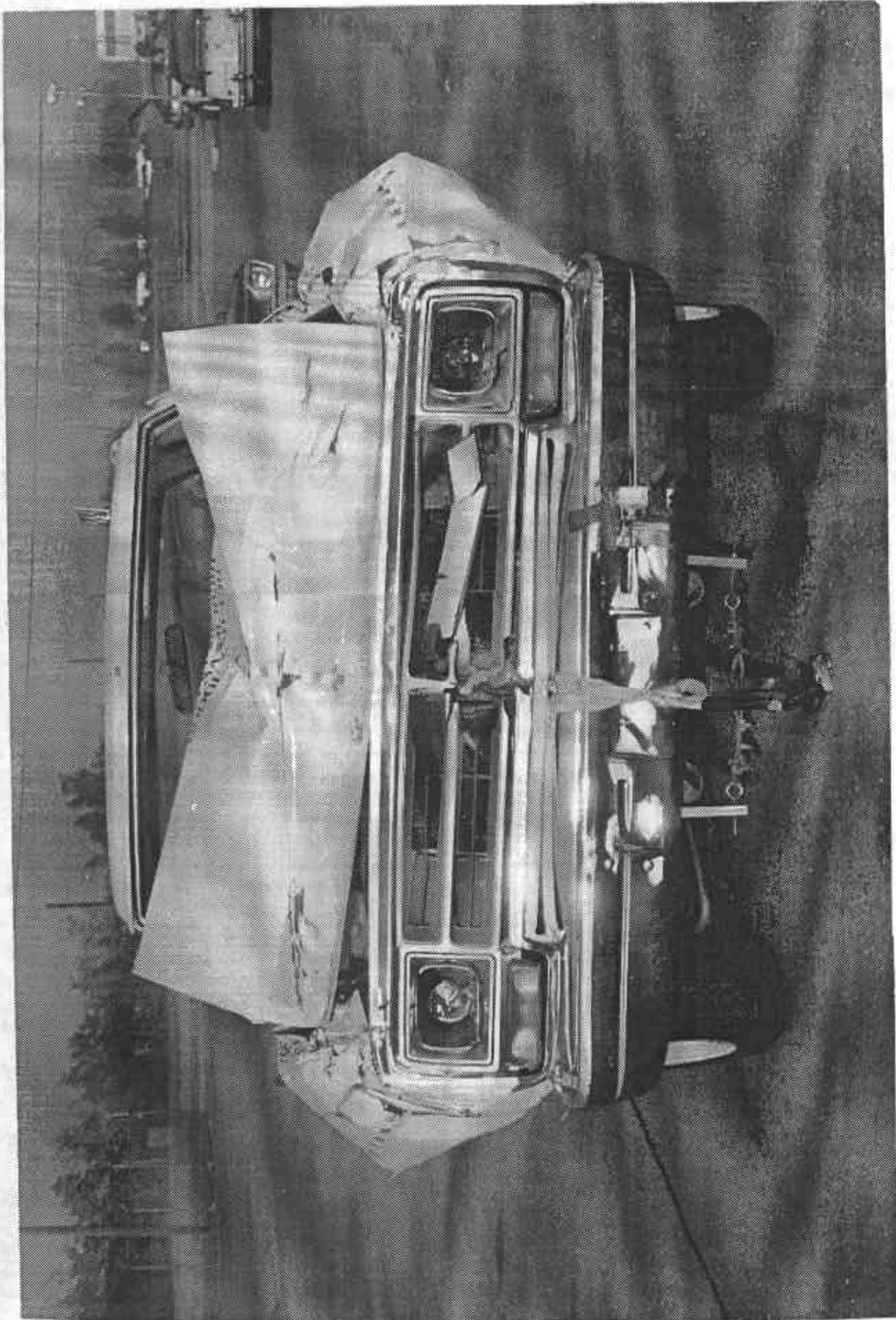
APPENDIX A

PHOTOGRAPHS

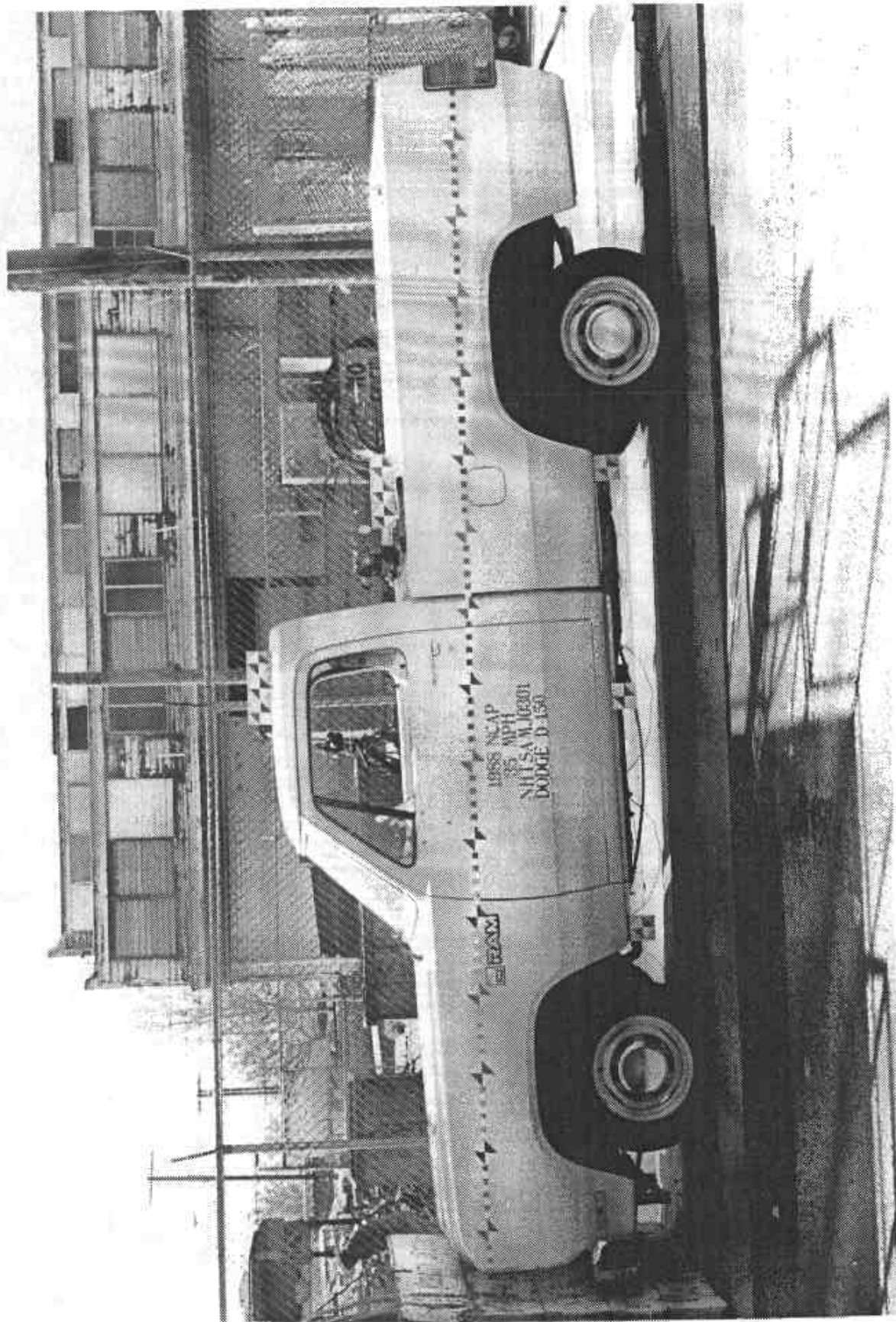
PRETEST FRONT VIEW  
POSTTEST FRONT VIEW  
PRETEST LEFT SIDE VIEW  
POSTTEST LEFT SIDE VIEW  
PRETEST RIGHT SIDE VIEW  
POSTTEST RIGHT SIDE VIEW  
PRETEST RIGHT FRONT 3/4 VIEW  
POSTTEST RIGHT FRONT 3/4 VIEW  
PRETEST LEFT REAR 3/4 VIEW  
POSTTEST LEFT REAR 3/4 VIEW  
PRETEST WINDSHIELD VIEW  
POSTTEST 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



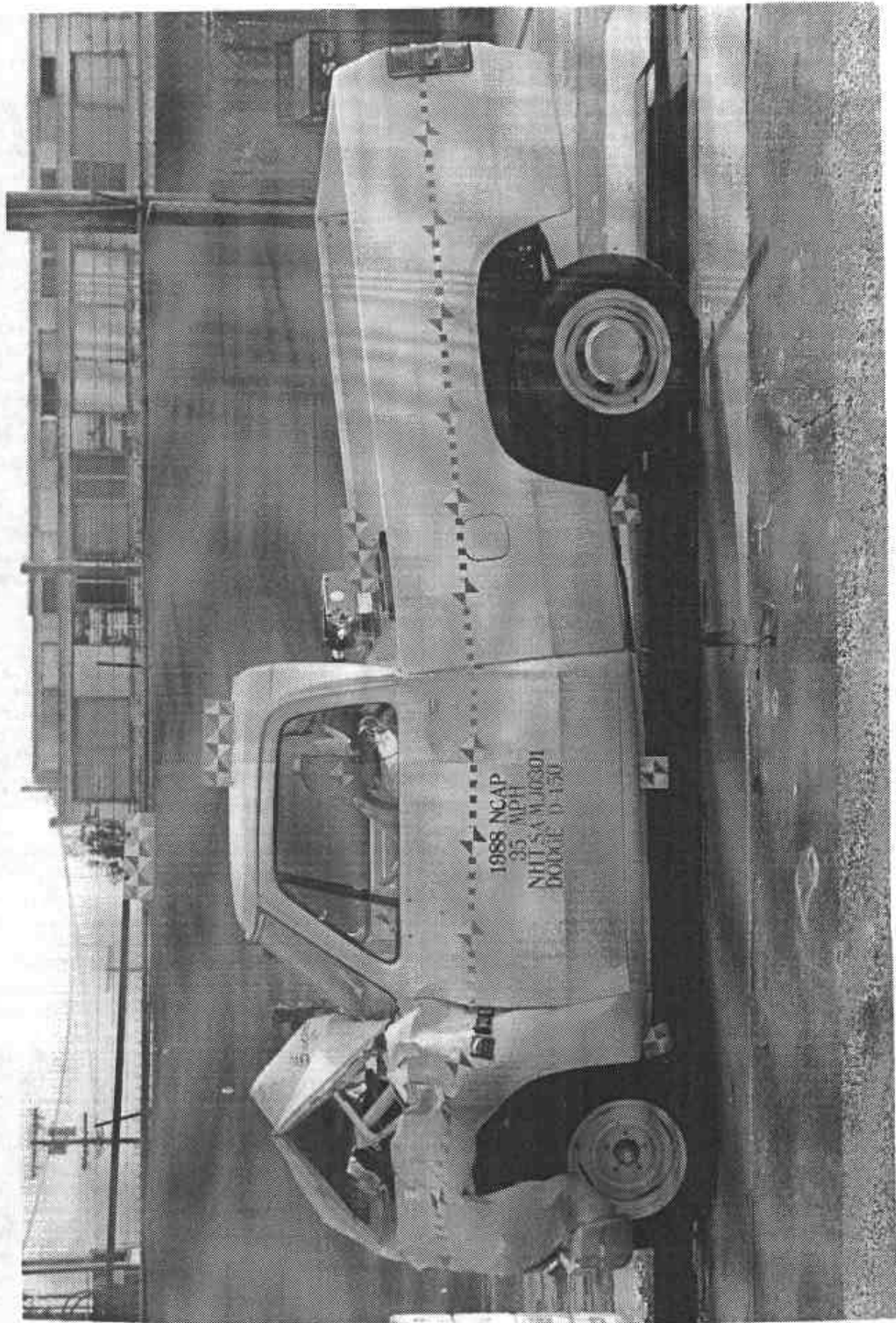
PRETEST FRONT VIEW



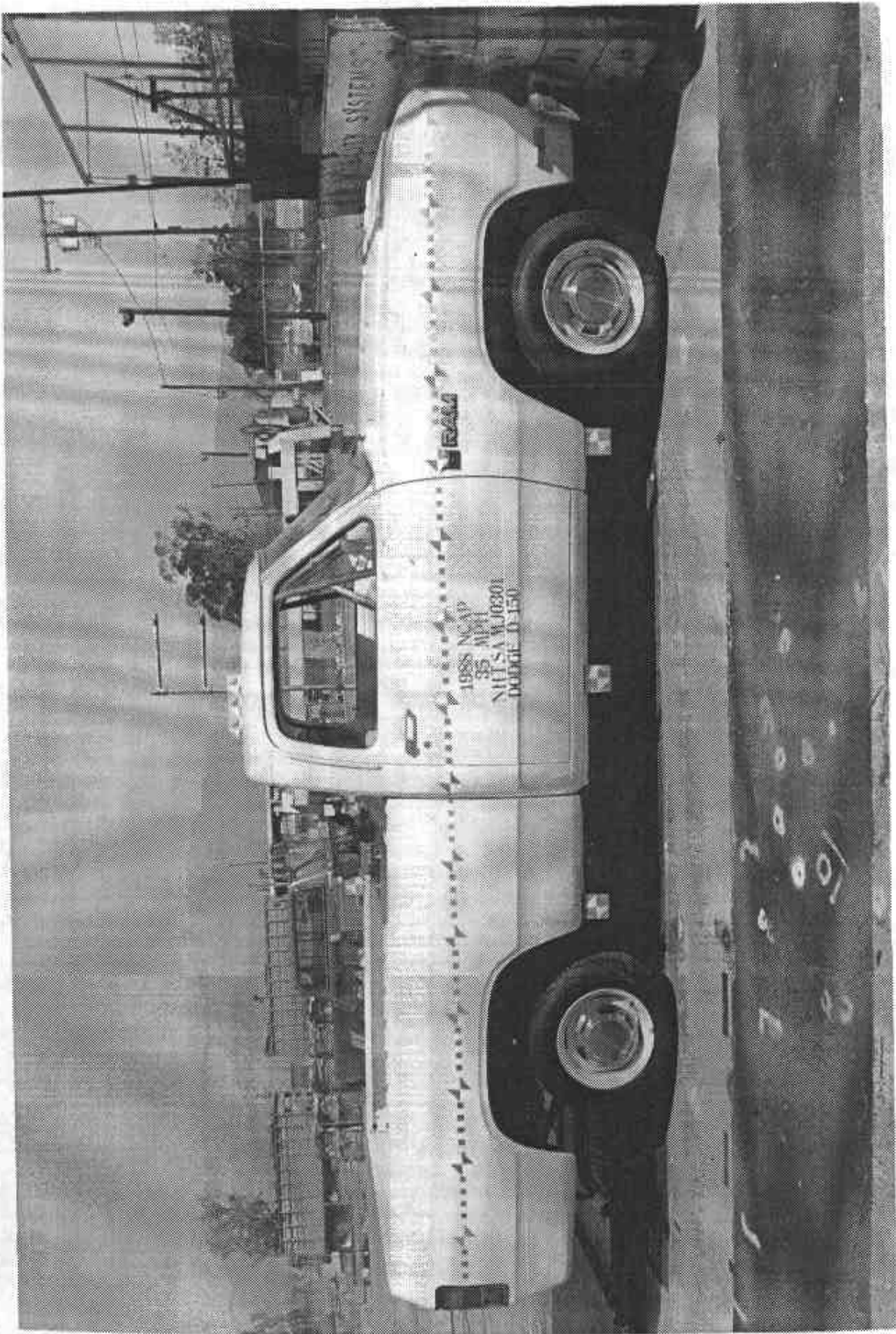
POSTTEST FRONT VIEW



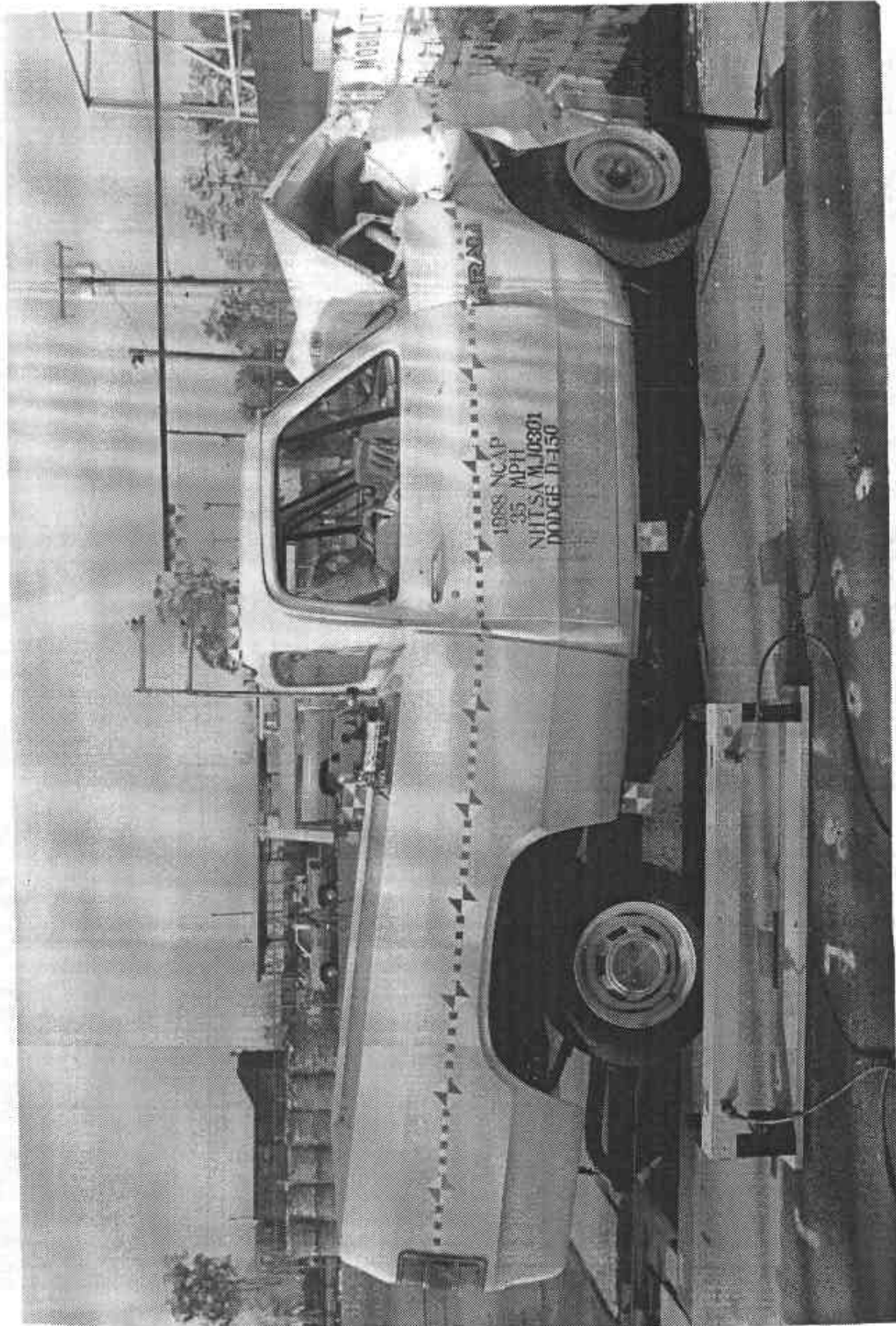
PRETEST LEFT SIDE VIEW



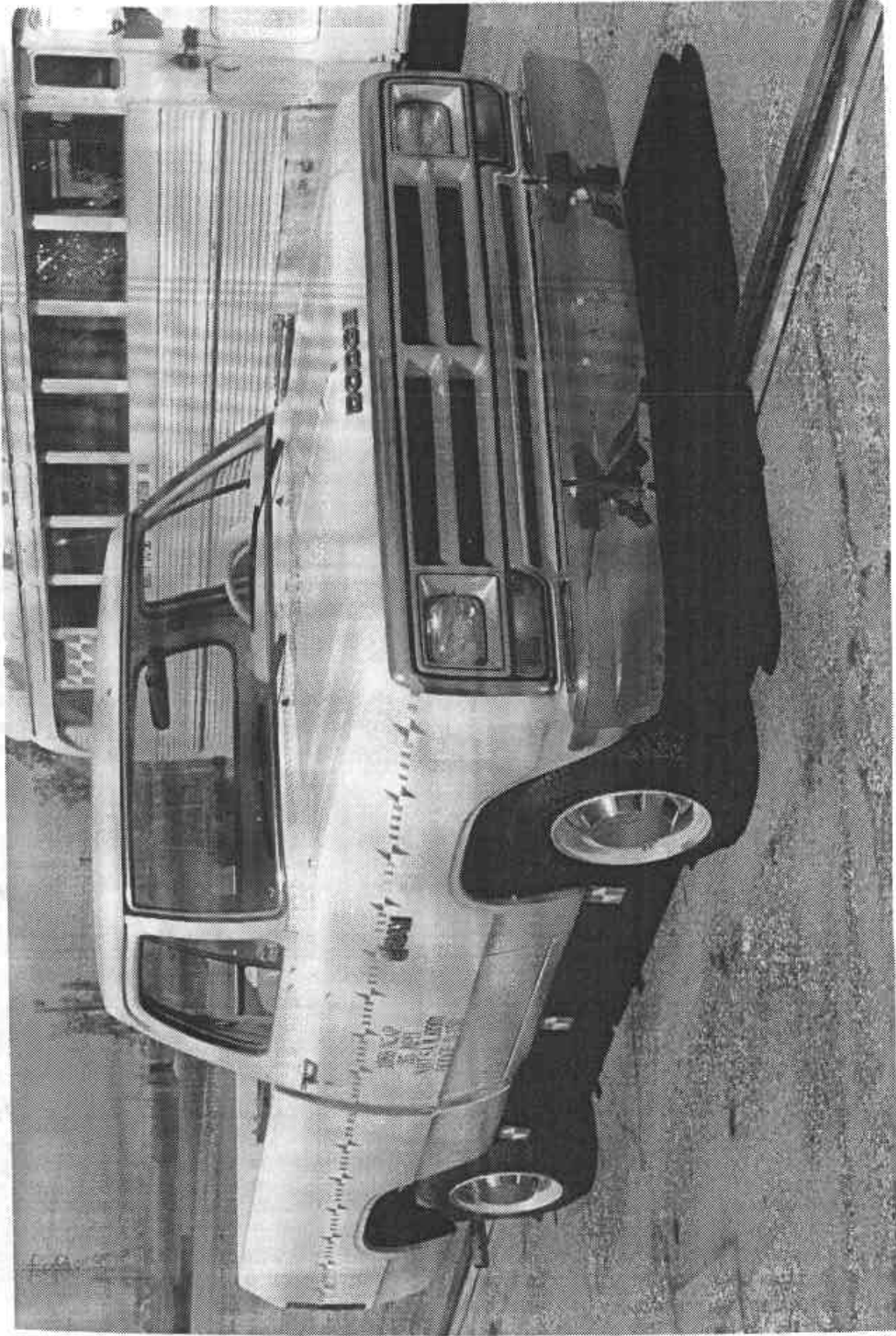
POSTTEST LEFT SIDE VIEW



PRETEST RIGHT SIDE VIEW



POSTTEST RIGHT SIDE VIEW



PRETEST RIGHT FRONT 3/4 VIEW



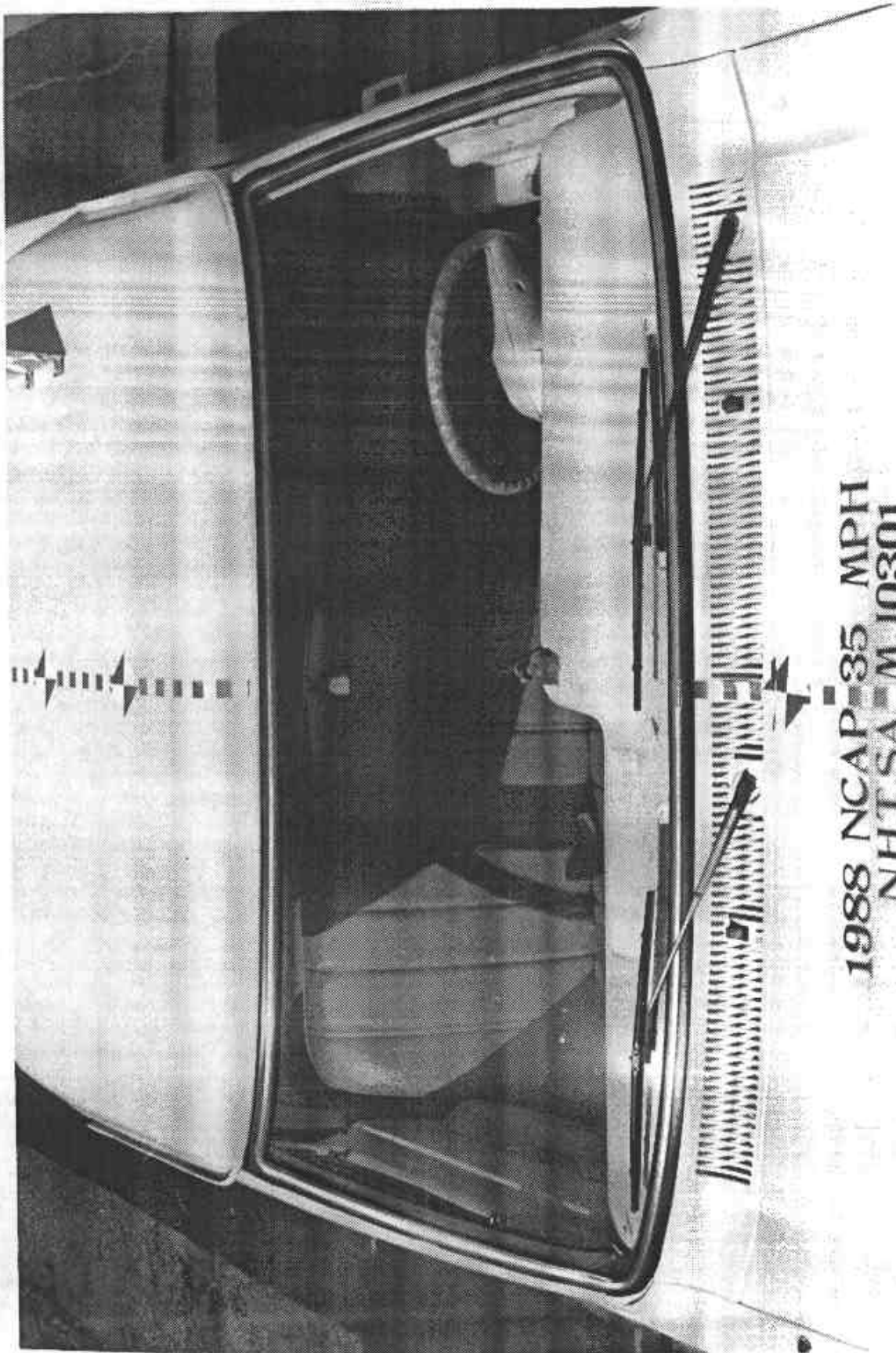
POSTTEST RIGHT FRONT 3/4 VIEW



PRETEST LEFT REAR 3/4 VIEW

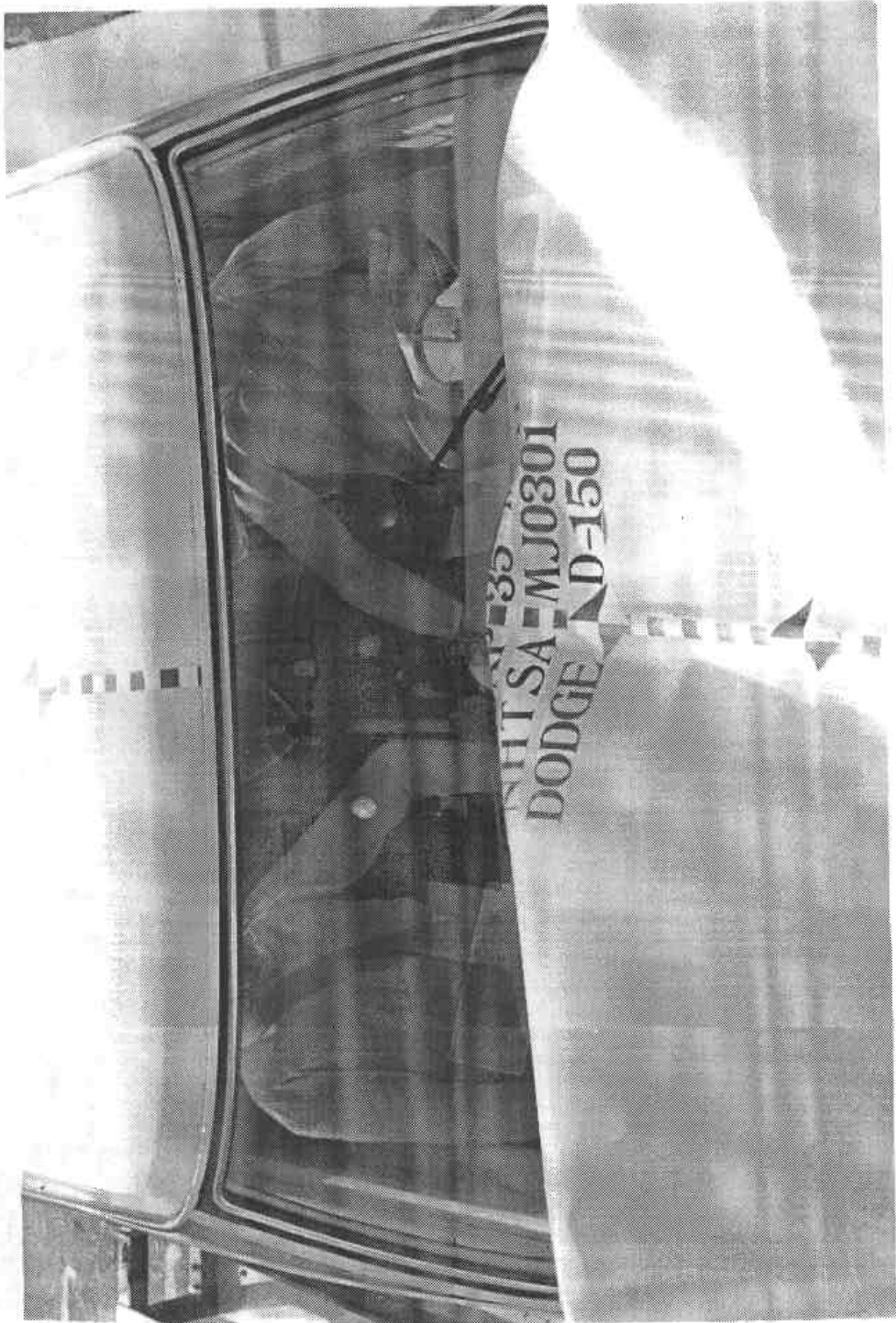


POSTTEST LEFT REAR 3/4 VIEW



1988 NCAP 35 MPH  
NHTSA MJ0301

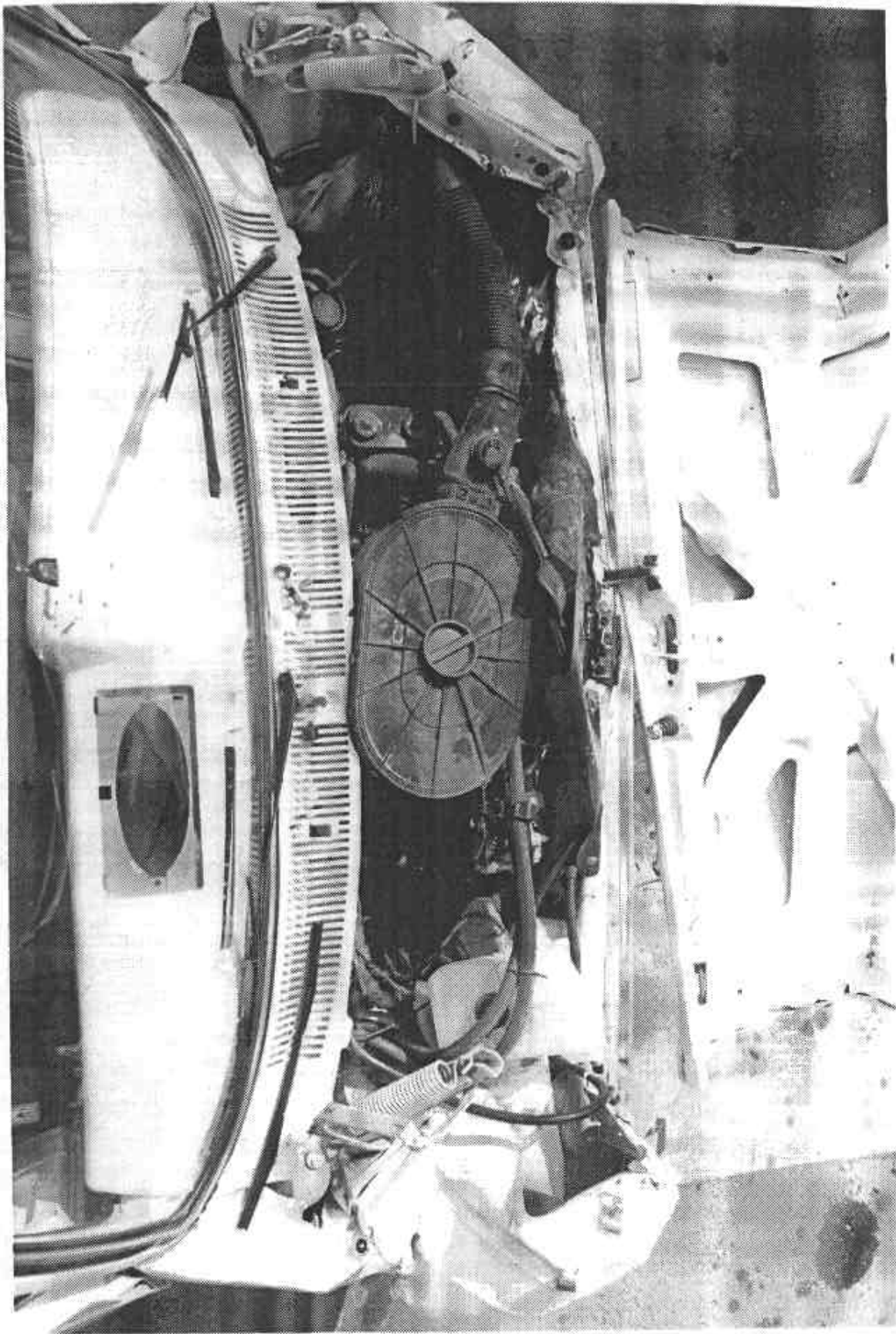
PRETEST WINDSHIELD VIEW



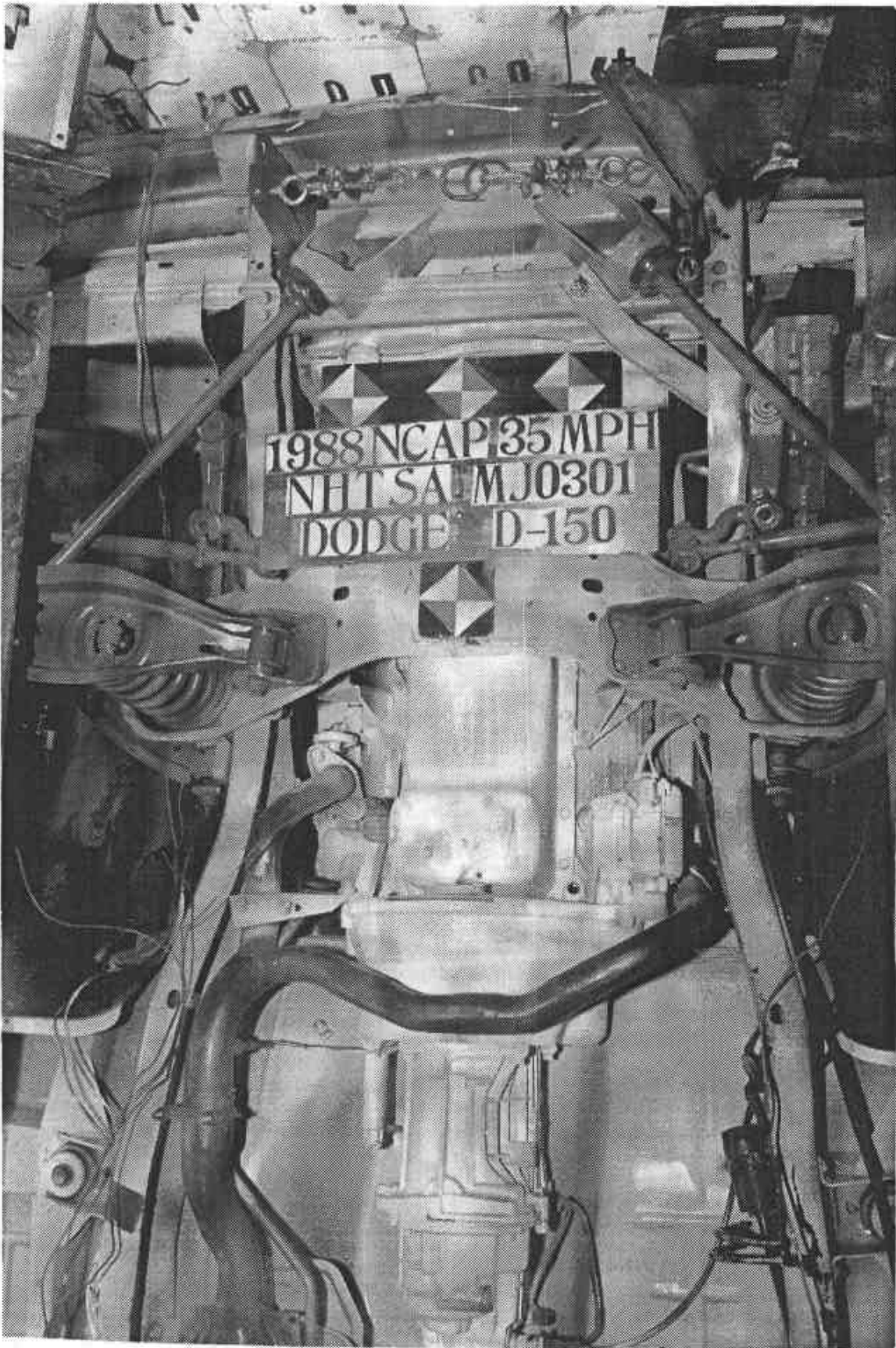
POSTTEST WINDSHIELD VIEW



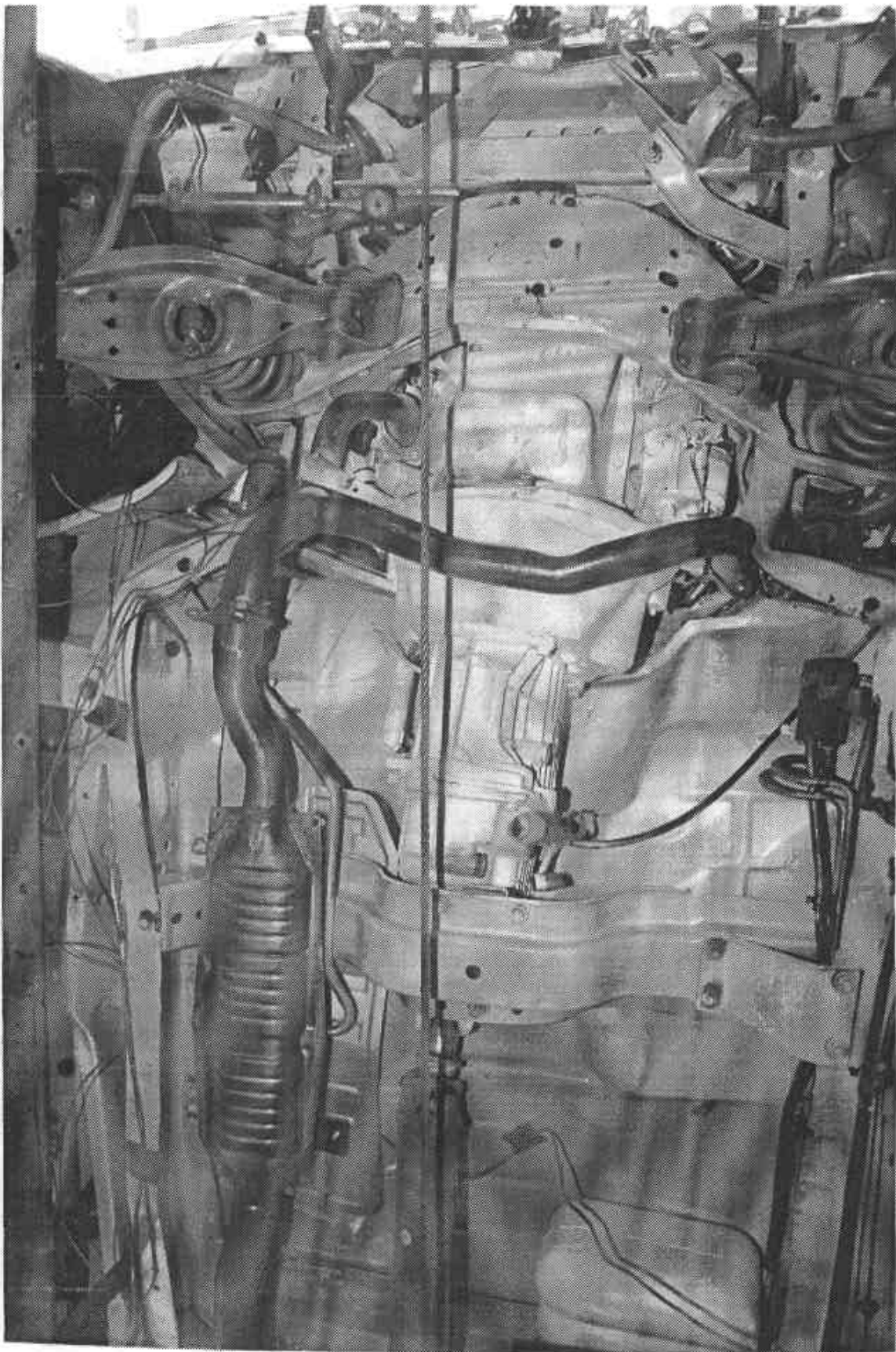
PRETEST ENGINE COMPARTMENT VIEW



POSTTEST ENGINE COMPARTMENT VIEW

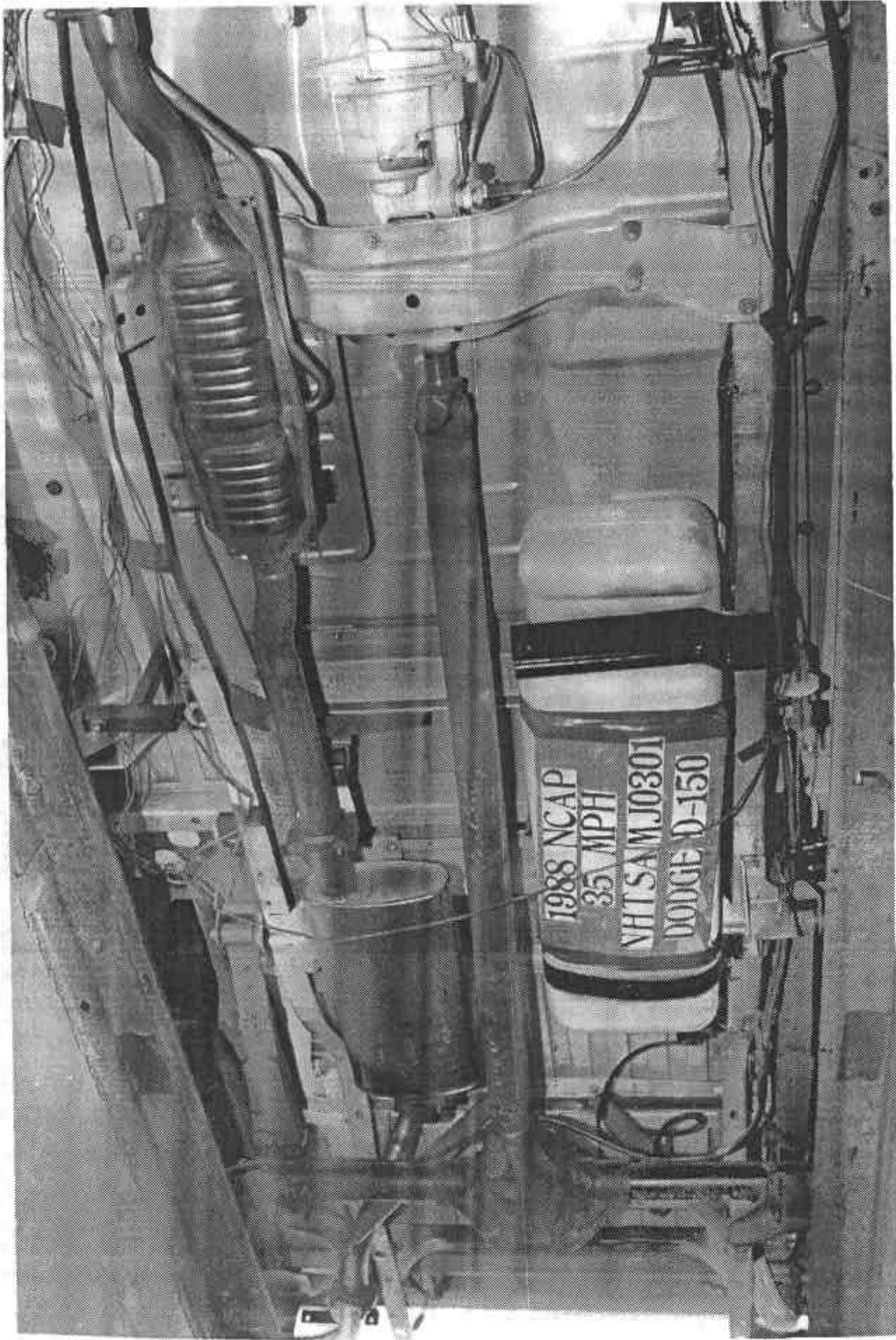


PRETEST FRONT UNDERBODY VIEW



POSTTEST FRONT UNDERBODY VIEW  
39

MSE-88-R7157-N05



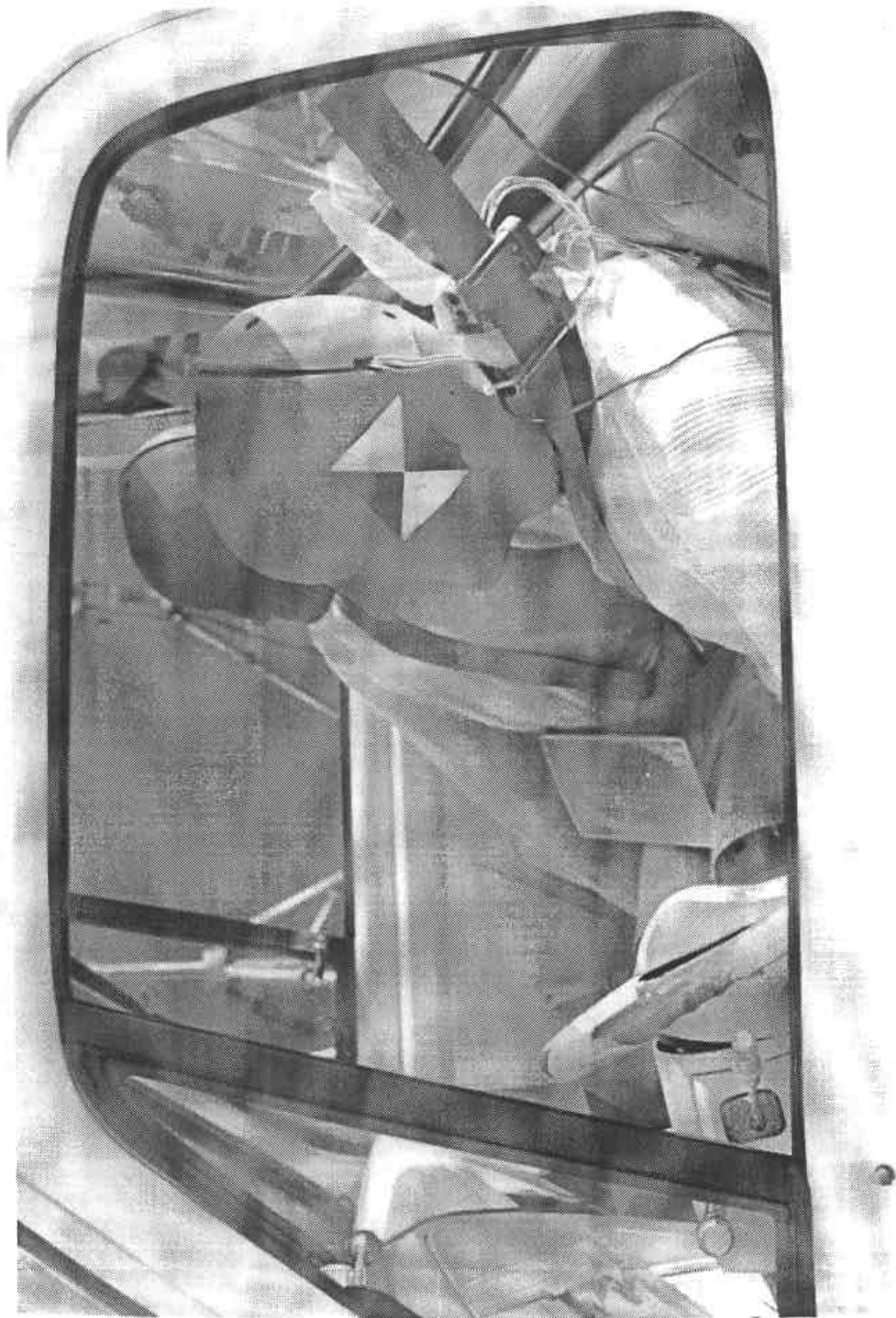
PRETEST REAR UNDERBODY VIEW



POSTTEST REAR UNDERBODY VIEW



PRETEST DRIVER DUMMY (ATD) POSITION VIEW



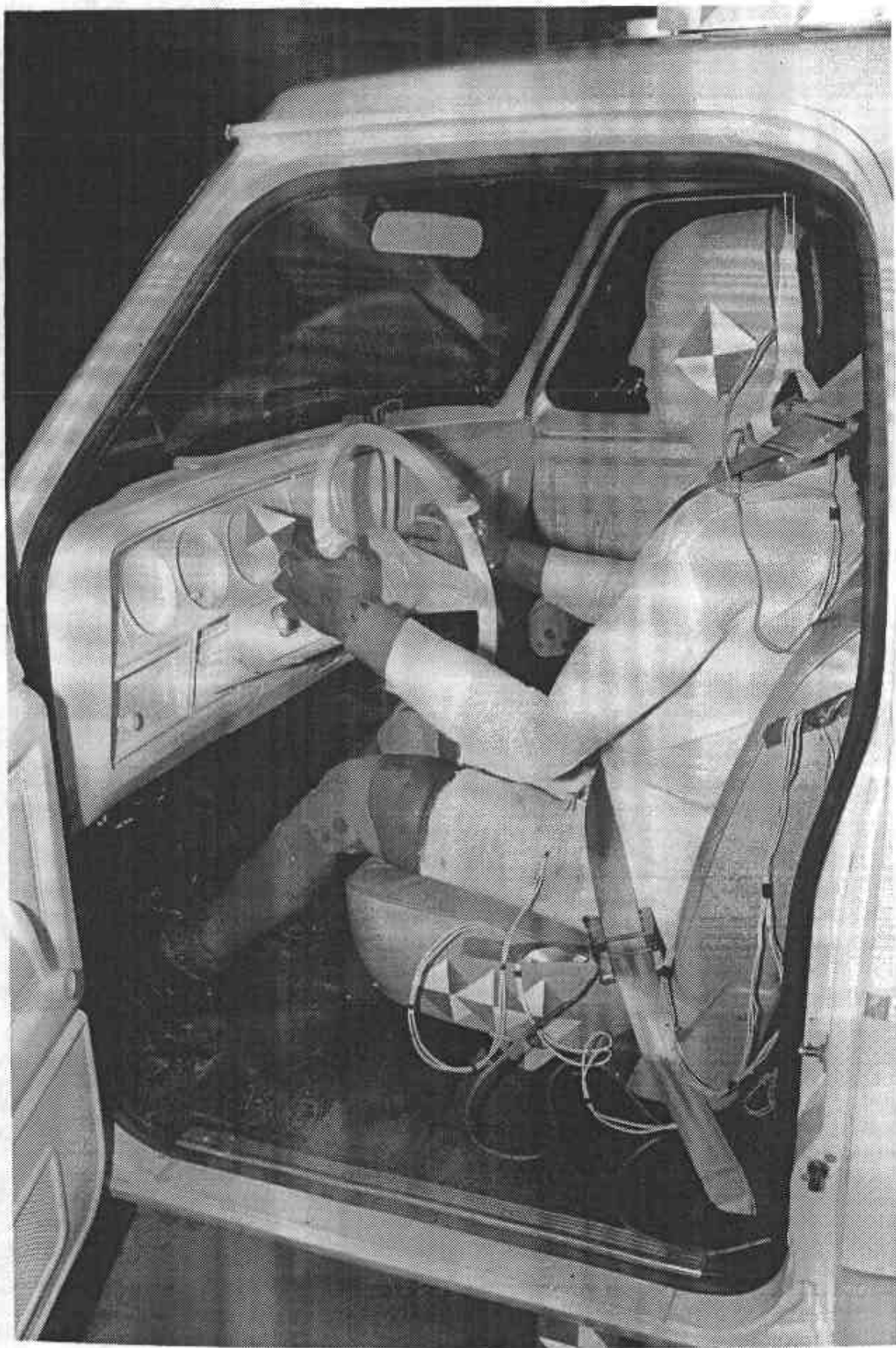
POSTTEST DRIVER DUMMY (ATD) POSITION VIEW



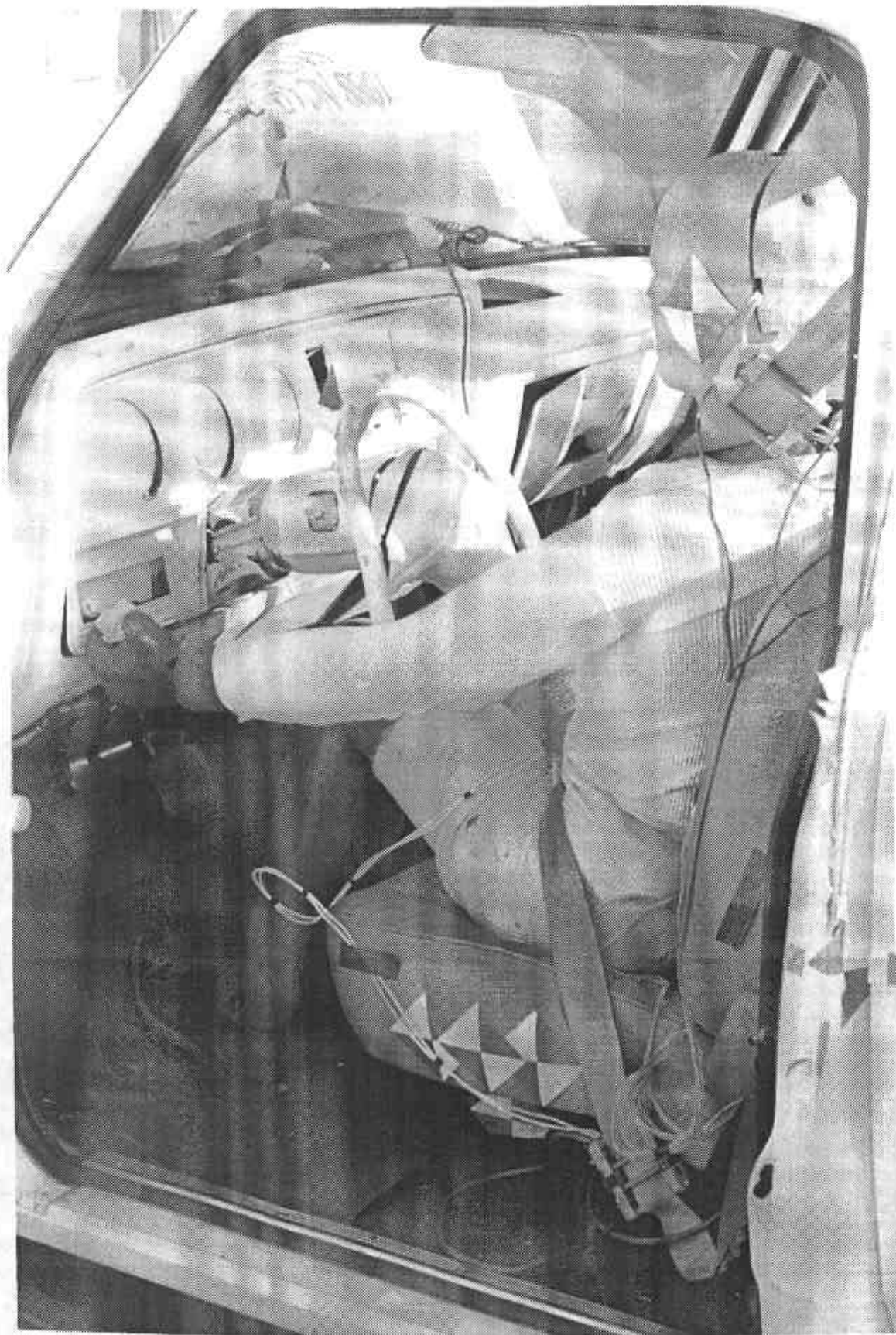
PRETEST PASSENGER DUMMY (ATD) POSITION VIEW



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)



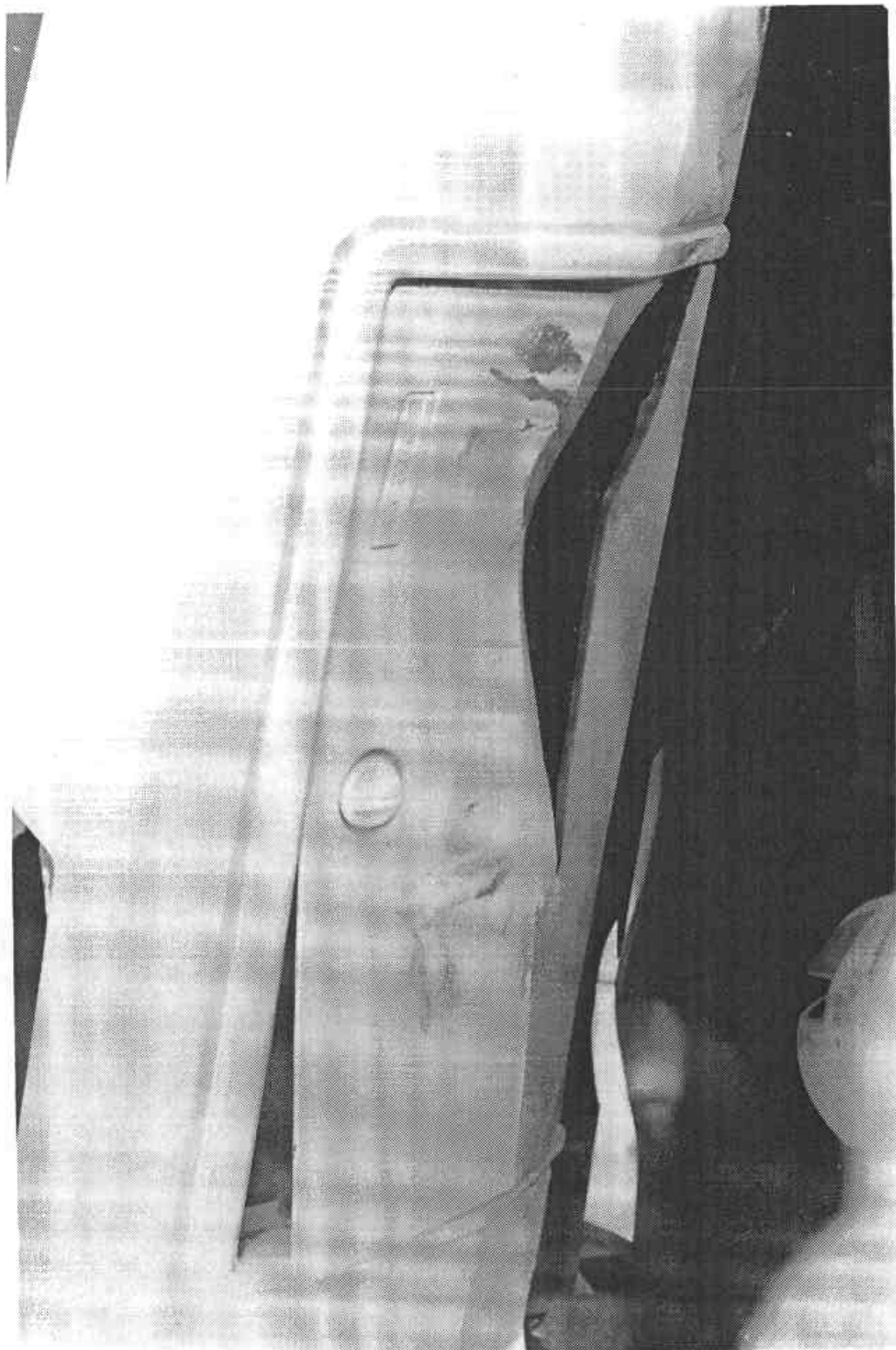
POSTTEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



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

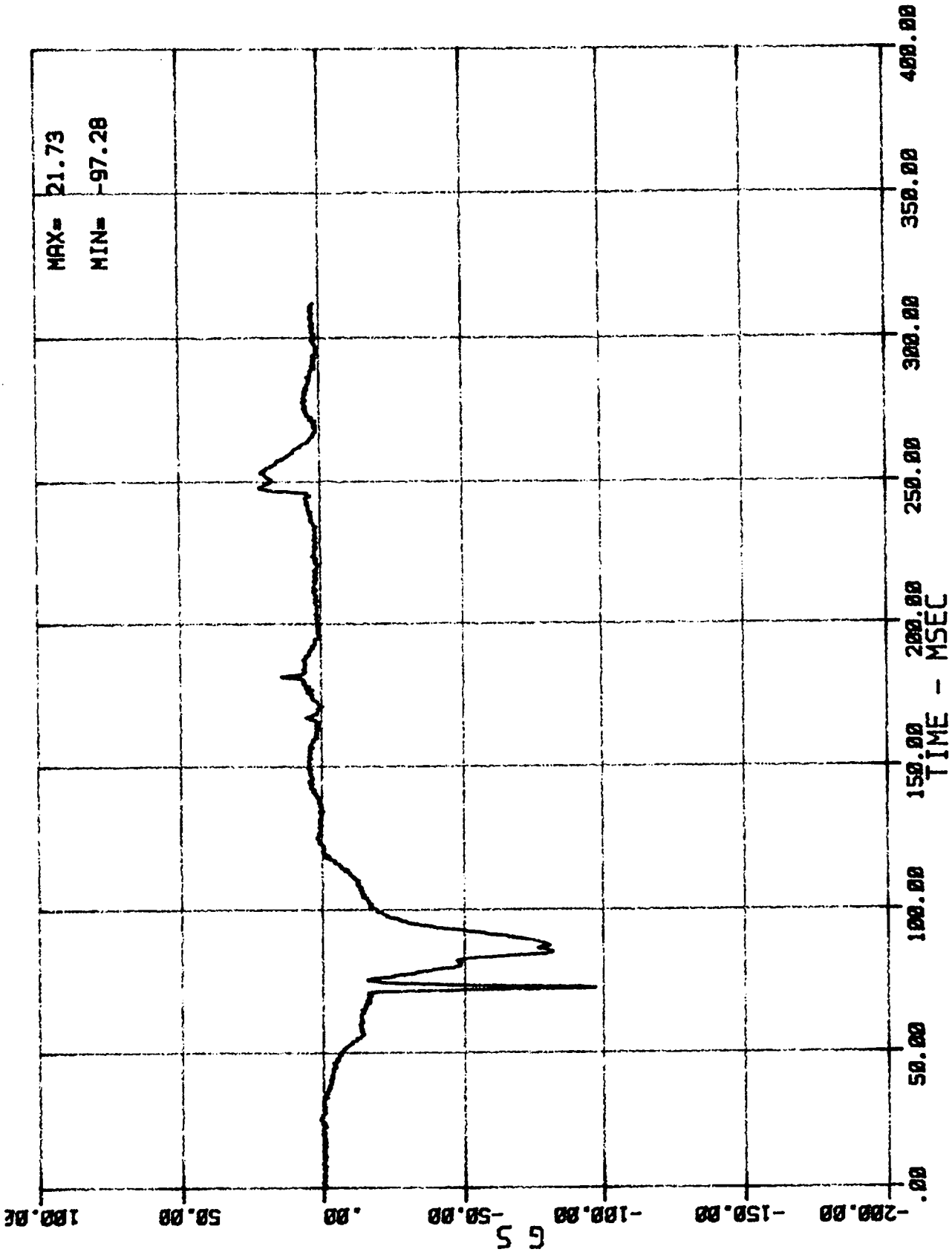
DATA FILTERING:

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



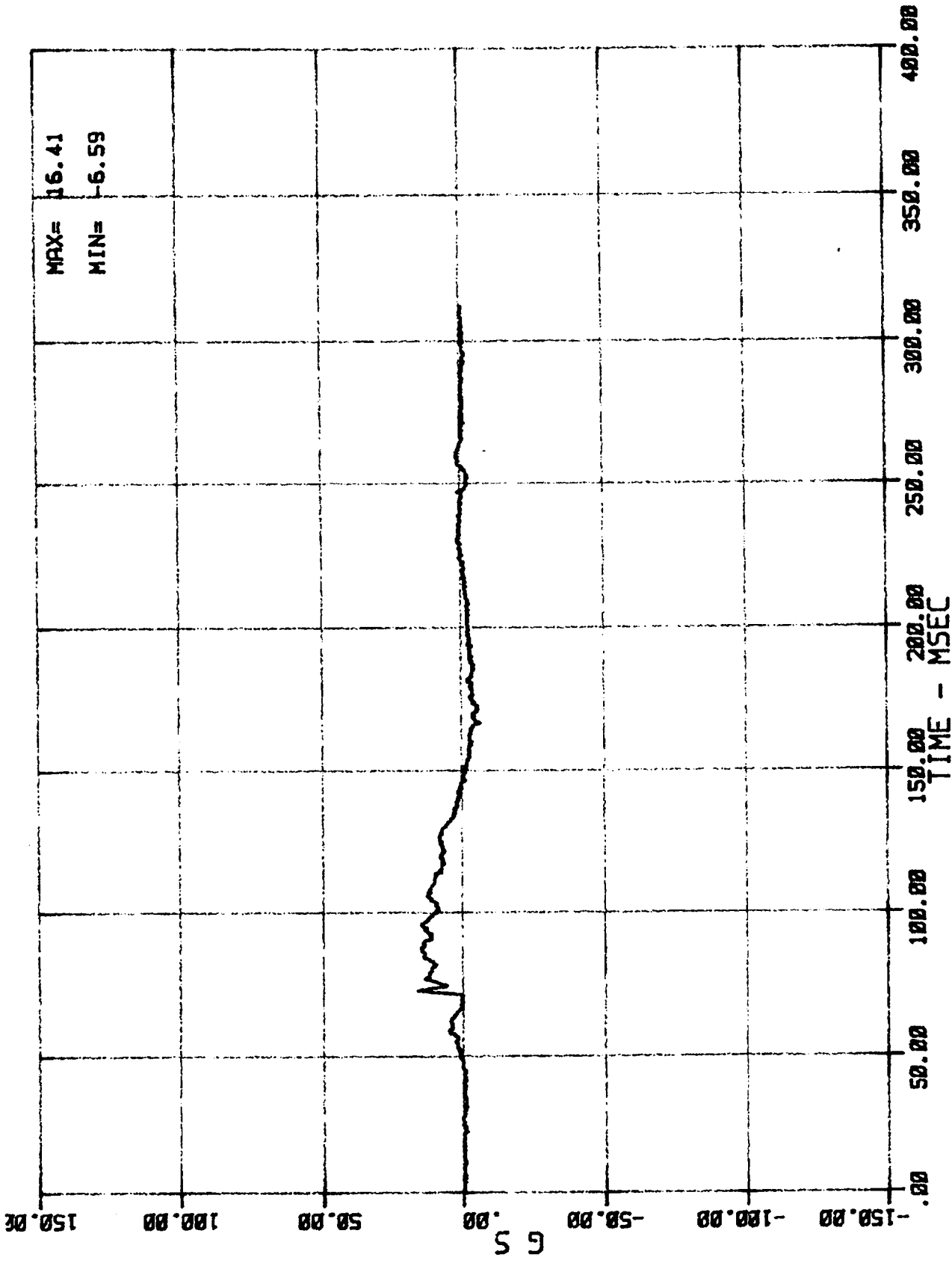
02499 125MM BELT PULLOUT POTS WERE NOT USED IN THIS TEST	04/MAR/88	8	1999.9- 368
510220S02SHBTOT0TH01650MFG: BOURNS. MODEL: 8 IN LIN S/N: NAV			
02499 125MM BELT PULLOUT POTS WERE NOT USED IN THIS TEST	04/MAR/88	30	8999.9- 368
510230S01SHBTOT0TH01650MFG: BOURNS. MODEL: 2051414101 S/N: NAV			
02499 125MM SEAT BELT ELONGATION. UNITS ARE INCHES/IN.(PERCENTAGE BELT STRETCH)	04/MAR/88	30	14999.9- 368
510240S02SHBTOT0TH01650MFG: BOURNS. MODEL: 2051414101 S/N: NAV			
02499 125MM SEAT BELT ELONGATION. UNITS ARE INCHES/IN.(PERCENTAGE BELT STRETCH)	28/FEB/88	250108	35.2- 368
510250A0BRCLXGG'S01650MFG: SETRA. MODEL: 111 S/N: 1109			
02499 125MM LEFT FRONT BRAKE CALIPER	28/FEB/88	250111	35.2- 368
510260A0BRRCRXGG'S01650MFG: SETRA. MODEL: 111 S/N: 1116			
02499 125MM RIGHT FRONT BRAKE CALIPER	28/FEB/88	250 76	35.2- 368
510270A0AENGXGG'S01650MFG: SETRA. MODEL: 113 S/N: 1878			
02499 125MM ENGINE BOTTOM	28/FEB/88	250 50	35.2- 368
510280A0AENGXGG'S01650MFG: SETRA. MODEL: 113 S/N: 1876			
02499 125MM ENGINE TOP	28/FEB/88	250 62	35.2- 368
510290A0NDPLCXGG'S01650MFG: SETRA. MODEL: 111 S/N: 1111			
02499 125MM TOP OF DASH AT LATERAL C/L	29/FEB/88	250 72	35.2- 368
510300A0AFLRXGG'S01650MFG: SETRA. MODEL: 111 S/N: 1121			
02499 125MM LEFT SIDE FLOOR ON CROSS MEMBER BEHIND SEAT	28/FEB/88	250 52	35.2- 368
510310A0AFLRRXGG'S01650MFG: SETRA. MODEL: 111 S/N: 1123			
02499 125MM RIGHT SIDE FLOOR ON CROSS MEMBER BEHIND SEAT	14/MAY/8550000	7	0.0- 368
50032L0NALCAIXGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 15777			
04239 125MM	14/MAY/8550000	7	0.0- 368
50033L0NALCAZXGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19261			
04239 125MM	14/MAY/8550000	7	0.0- 368
50034L0NALCA3XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19283			
04239 125MM	14/MAY/8550000	10	0.0- 368
50035L0NALCA4XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19263			
04239 125MM	14/MAY/8550000	13	0.0- 368
50036L0NALCA5XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19265			
04239 125MM	14/MAY/8550000	6	0.0- 368
50037L0NALCA6XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19266			
04239 125MM	14/MAY/8550000	10	0.0- 368
50038L0NALCA7XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19268			
04239 125CF PROBABLE TRANSDUCER WIRING FAILURE (NO SIGNIFICANT IMPACT)	14/MAY/8550000	5	0.0- 368
50039L0NALCA8XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19270			
04239 125MM	14/MAY/8550000	5	0.0- 368
50040L0NALCA9XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19258			
04239 125MM	14/MAY/8550000	11	0.0- 368
50041L0NALCB1XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19273			
04239 125MM	14/MAY/8550000	13	0.0- 368
50042L0NALCB2XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19276			
04239 125MM	14/MAY/8550000	88	0.0- 368
50043L0NALCB3XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19277			
04239 125MM	14/MAY/8550000	46	0.0- 368
50044L0NALCB4XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19278			
04239 125MM	14/MAY/8550000	32	0.0- 368
50045L0NALCB5XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19279			
04239 125MM	14/MAY/8550000	87	0.0- 368
50046L0NALCB6XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19282			
04239 125MM	14/MAY/8550000	42	0.0- 368
50047L0NALCB7XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19262			
04239 125MM	14/MAY/8550000	14	0.0- 368
50048L0NALCB8XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19285			
04239 125MM	14/MAY/8550000	9	0.0- 368
50049L0NALCB9XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19286			
04239 125MM	14/MAY/8550000	11	0.0- 368
50050L0NALCC1XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19287			
04239 125MM	14/MAY/8550000	12	0.0- 368
50051L0NALCC2XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19288			
04239 125MM	14/MAY/8550000	20	0.0- 368
50052L0NALCC3XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19289			
04239 125MM	14/MAY/8550000	12	0.0- 368
50053L0NALCC4XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19291			
04239 125MM	14/MAY/8550000	42	0.0- 368
50054L0NALCC5XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19324			

50055LONALCC6XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19313 04239 125AM	14/MAY/8550000 12 0.0- 360
50056LONALCC7XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19314 04239 125AM	14/MAY/8550000 9 0.0- 360
50057LONALCC8XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19315 04239 125AM	14/MAY/8550000 21 0.0- 360
50058LONALCC9XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19316 04239 125AM	14/MAY/8550000 11 0.0- 360
50059LONALCD1XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19317 04239 125AM	14/MAY/8550000 11 0.0- 360
50060LONALCD2XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19318 04239 125AM	14/MAY/8550000 14 0.0- 360
50061LONALCD3XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19322 04239 125AM	14/MAY/8550000 9 0.0- 360
50062LONALCD4XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19323 04239 125AM	14/MAY/8550000 11 0.0- 360
50063LONALCD5XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19260 04239 125AM	14/MAY/8550000 50 0.0- 360
50064LONALCD6XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19325 04239 125AM	14/MAY/8550000 7 0.0- 360
50065LONALCD7XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19332 04239 125AM	14/MAY/8550000 11 0.0- 360
50066LONALCD8XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19333 04239 125AM	14/MAY/8550000 15 0.0- 360
50067LONALCD9XGLBS01650MFG: INTERFACE MODEL: 1220-FS S/N: 19338 04239 125AM	14/MAY/8550000 11 0.0- 360



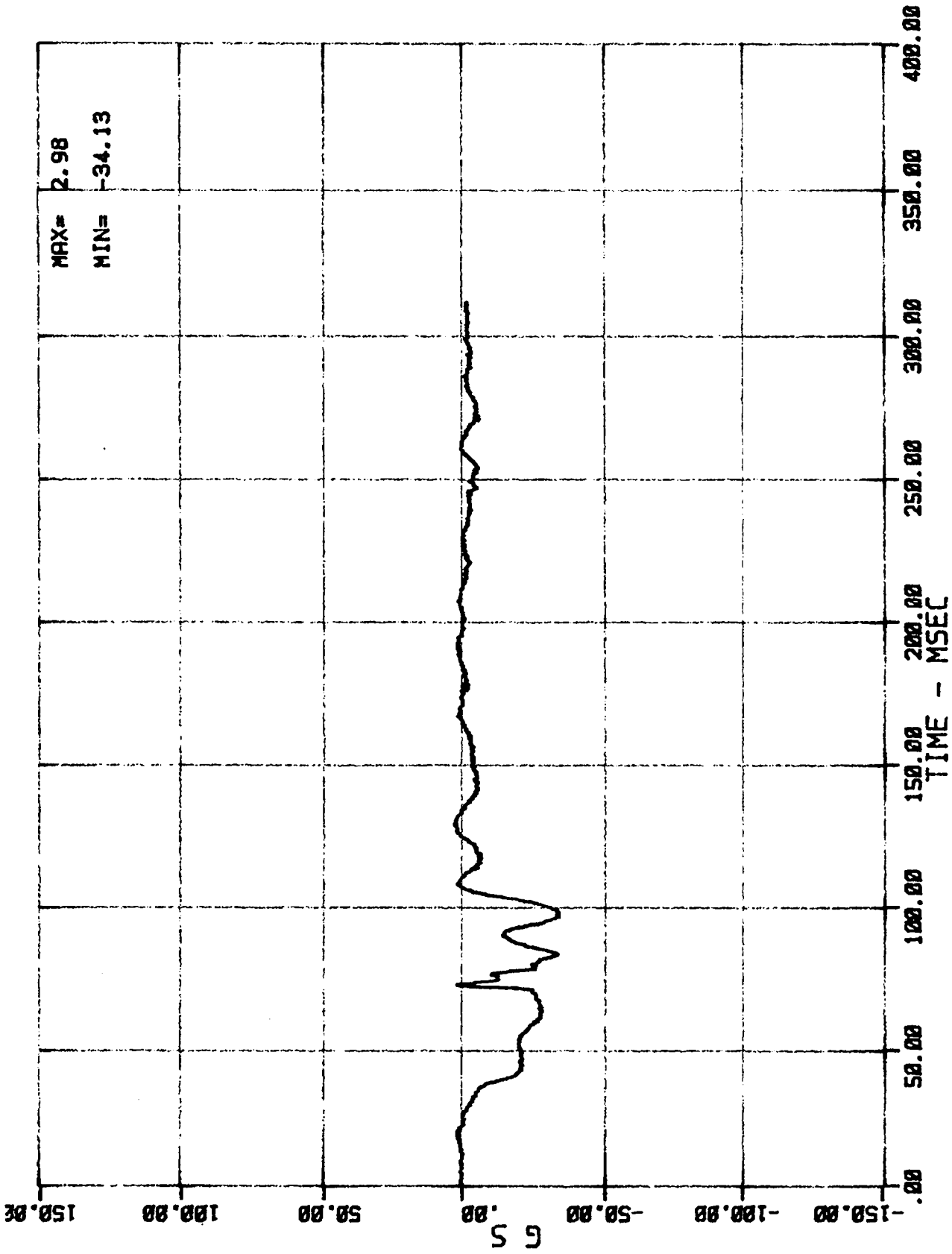
01 AC 01 1 HED X (DRIVER HEAD ACCEL. -- X-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



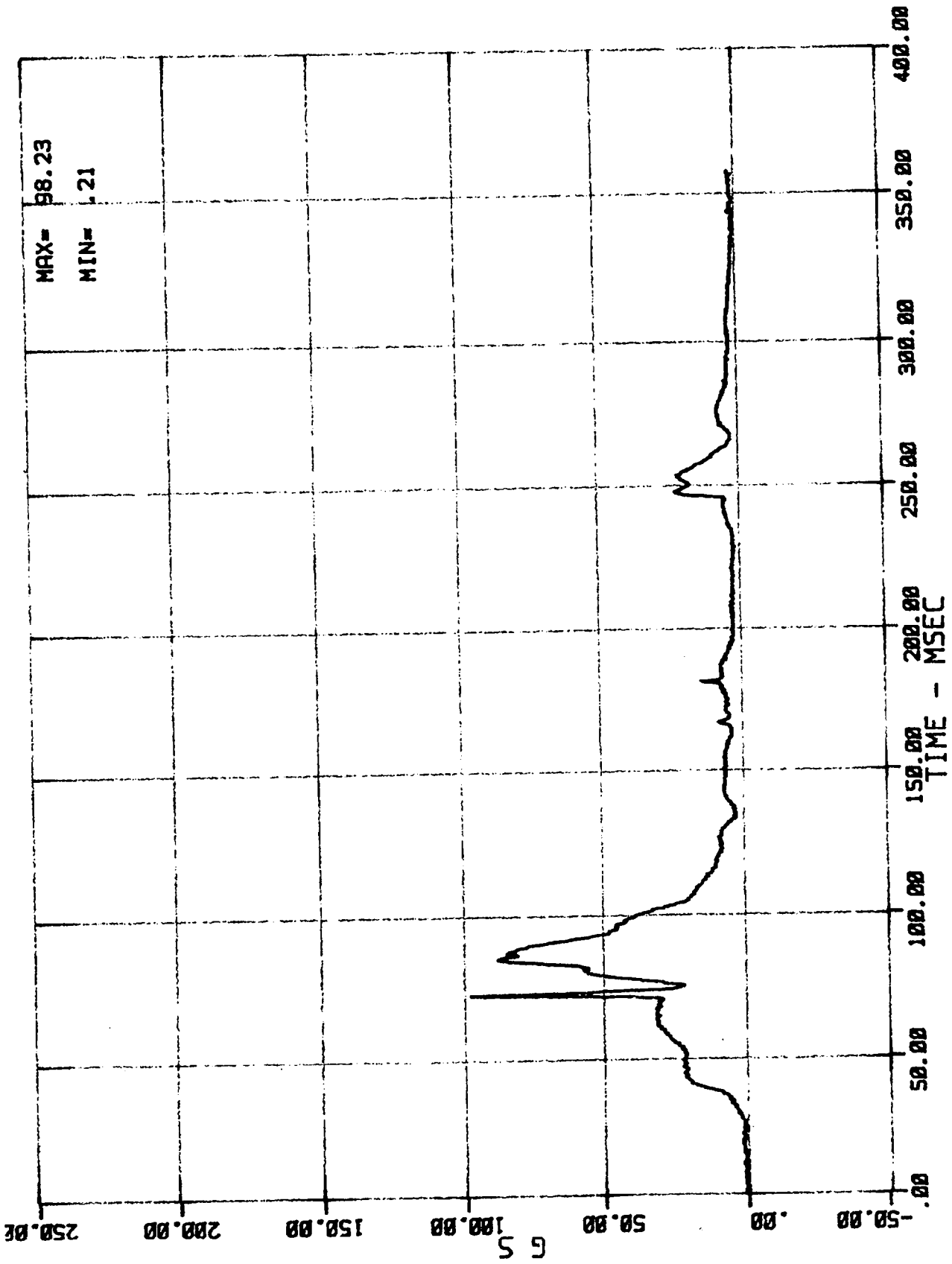
02 AC 01 HED Y (DRIVER HEAD ACCEL. -- Y-AXIS)  
MSE N07050 1988 DODGE D150 PICKUP

03/22/88



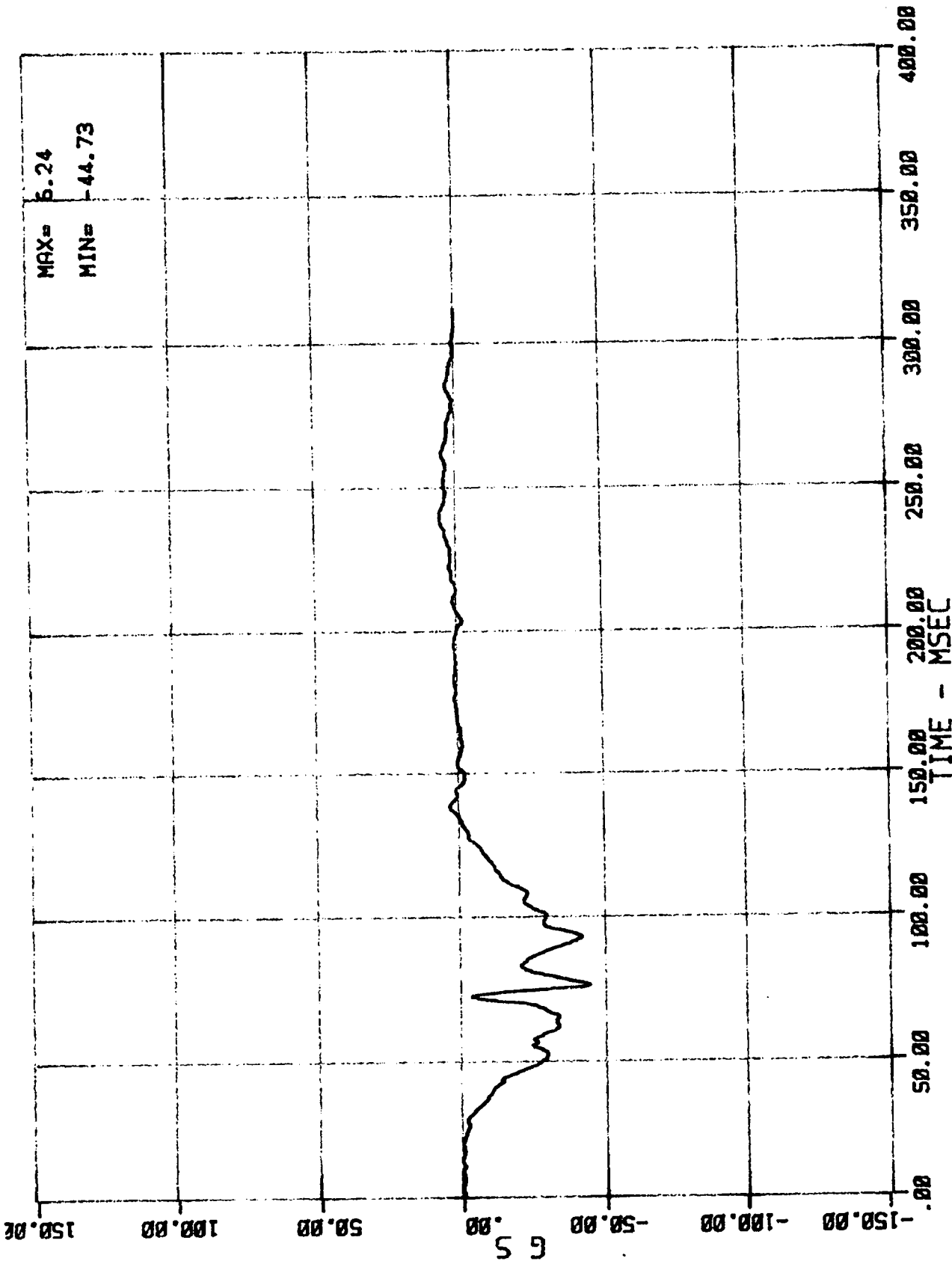
03 AC 01 1 HED Z (DRIVER HEAD ACCEL. --- Z-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



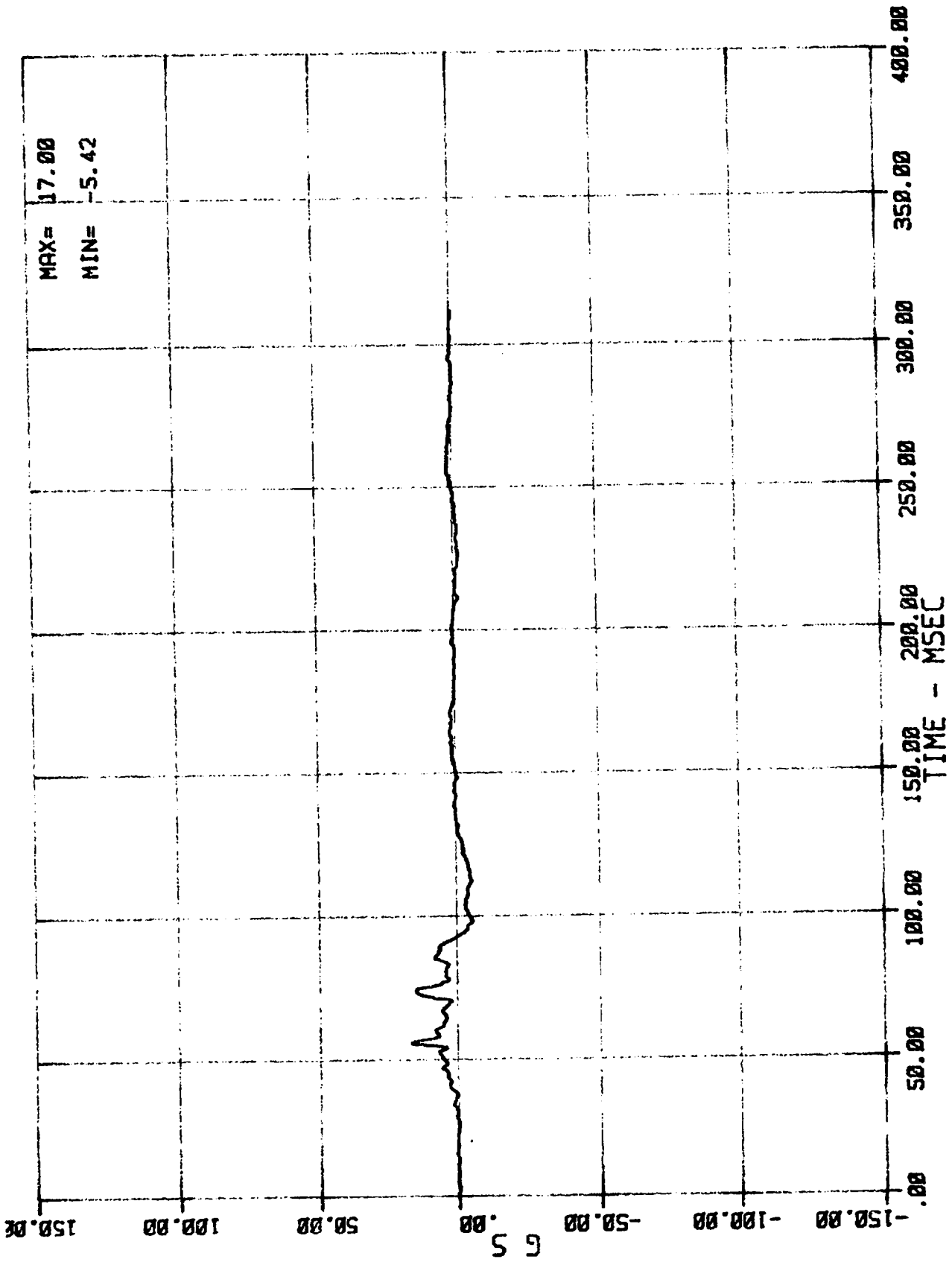
DRIVER HEAD RESULTANT ACCELERATION  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



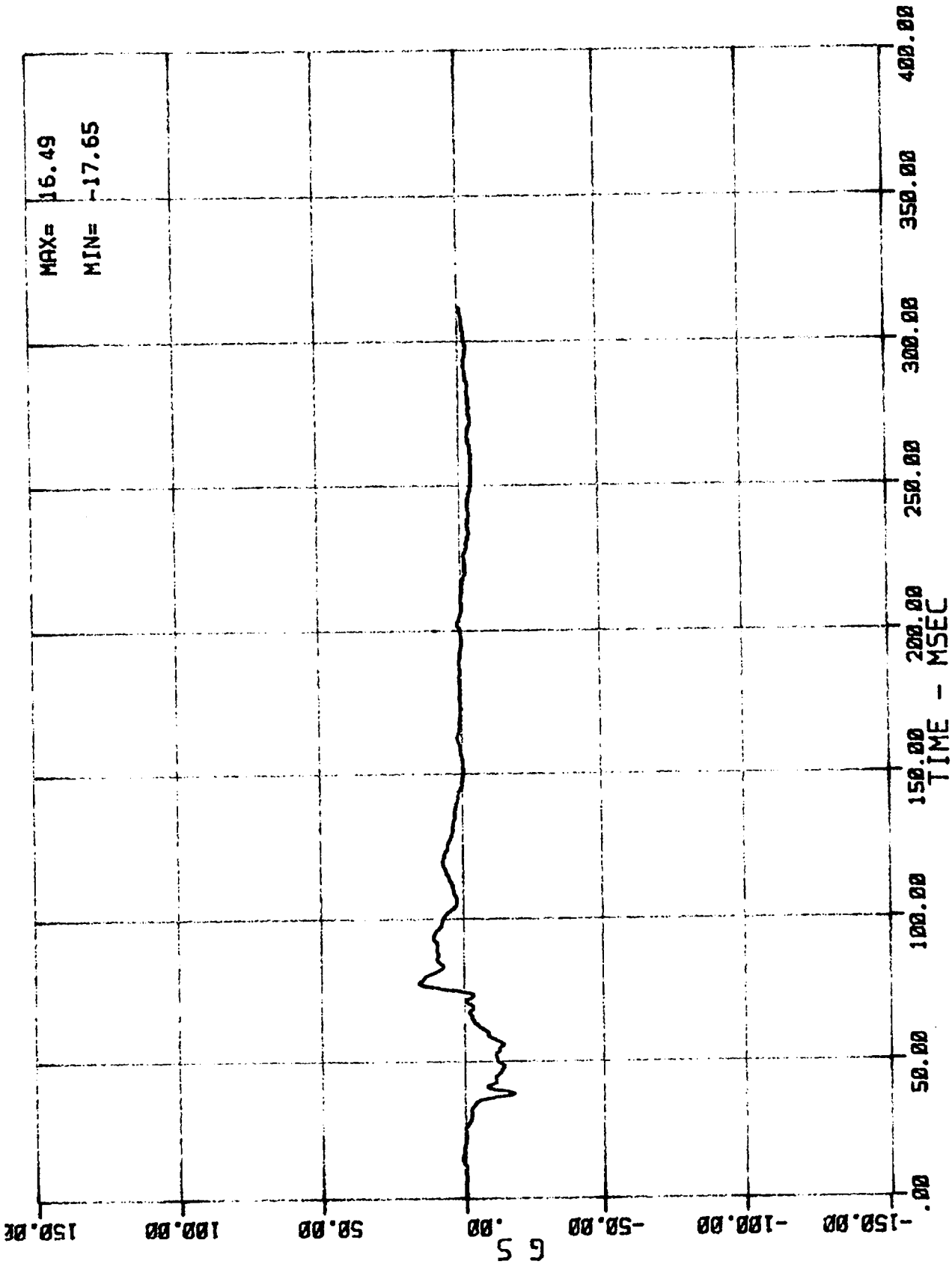
04 AC 01 1 CST X (DRIVER CHEST ACCEL. -- X-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



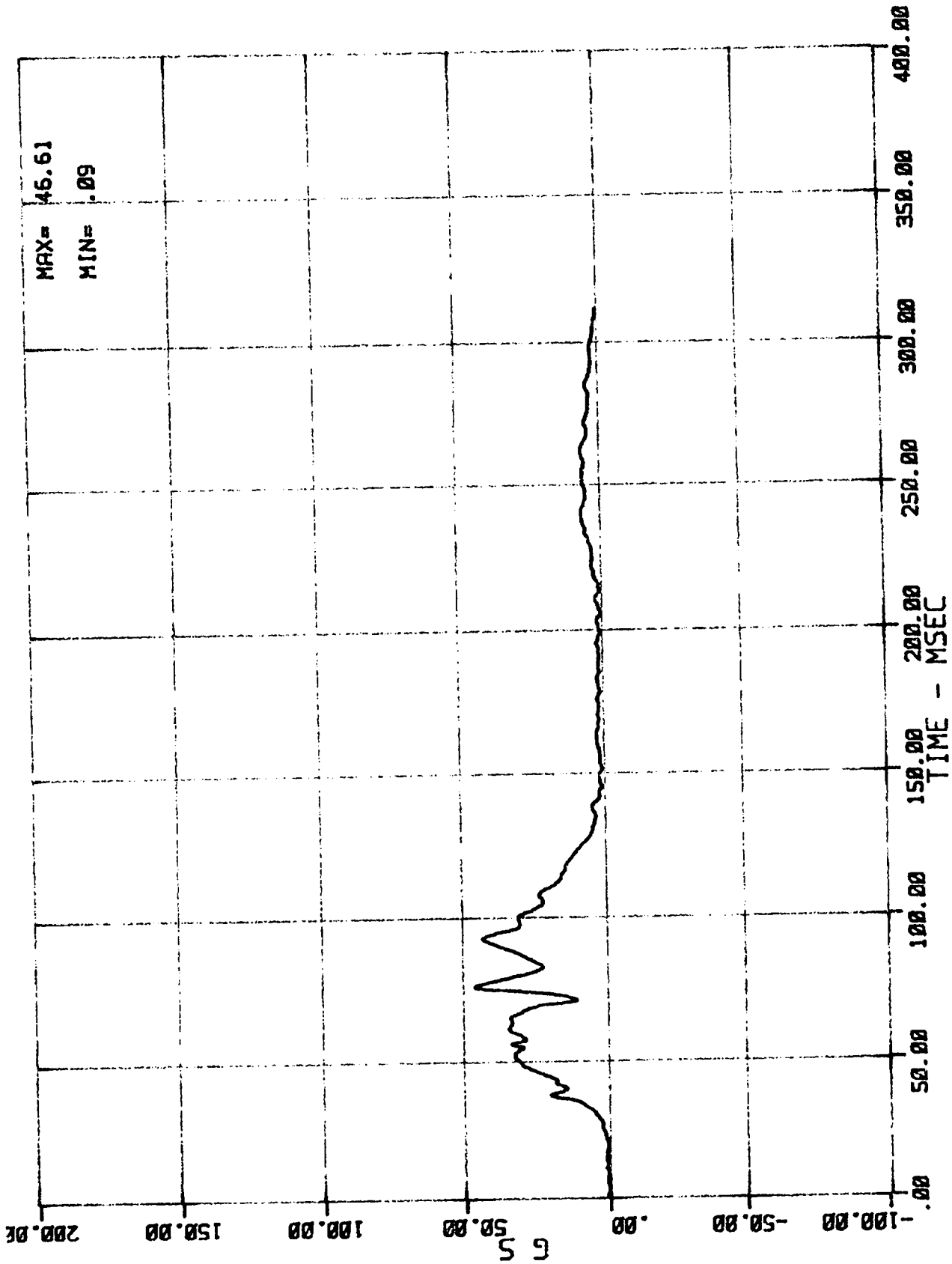
05 AC 01 1 CST Y (DRIVER CHEST ACCEL. --- Y-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88

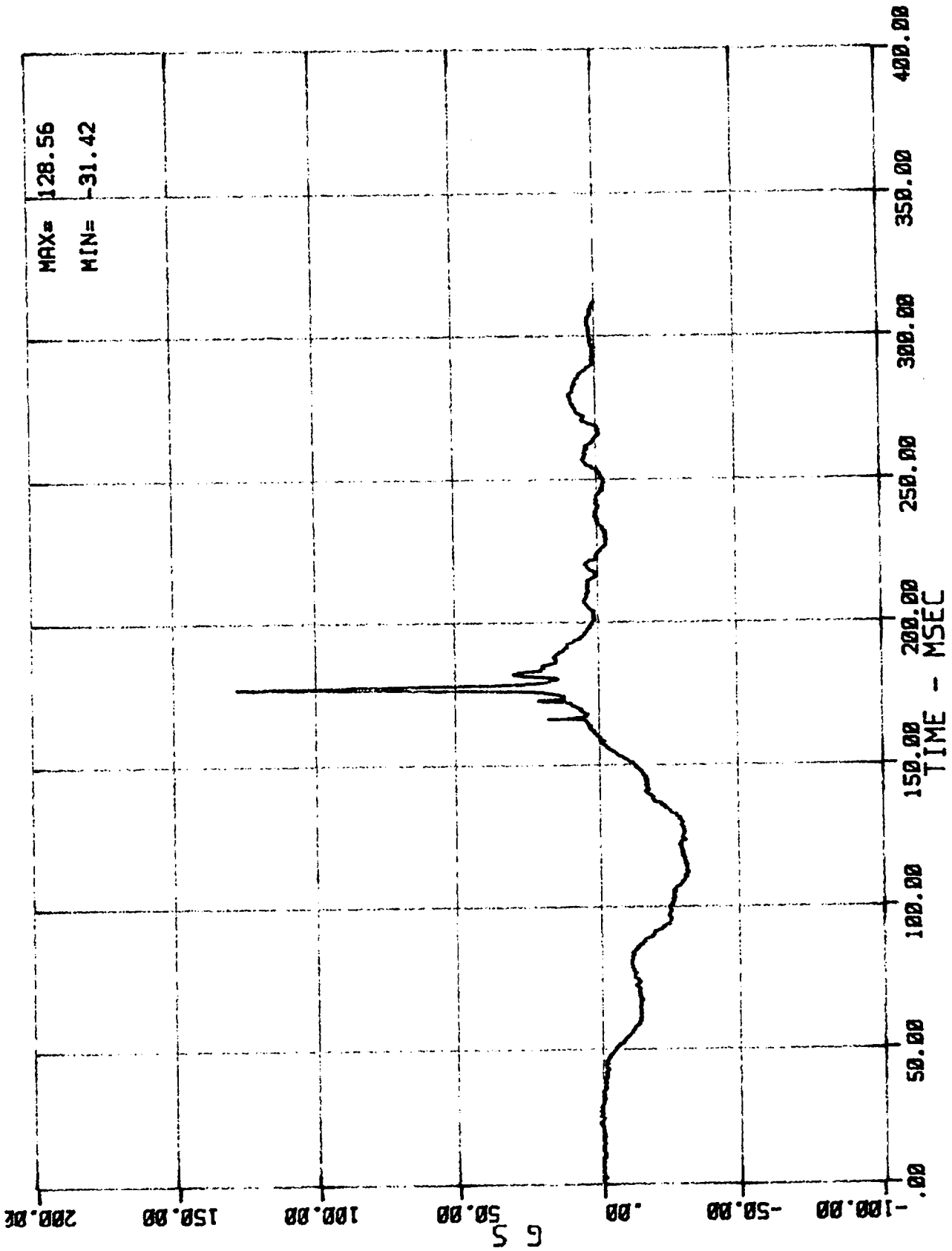


06 AC 01 1 CST Z (DRIVER CHEST ACCEL. -- Z-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88

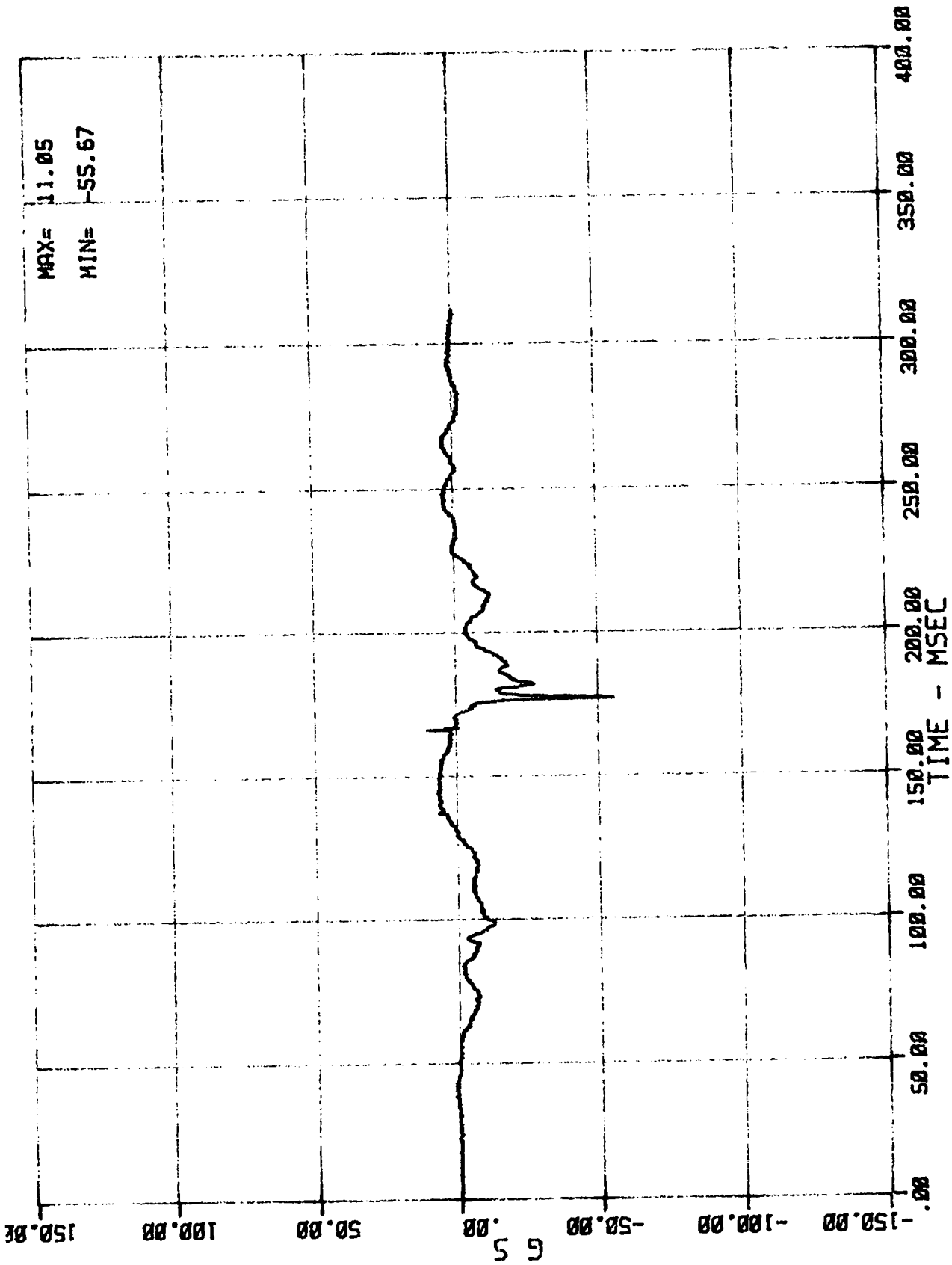


DRIVER'S CHEST RESULTANT ACCELERATION  
MSE N07058 1988 DODGE D150 PICKUP 03/22/88



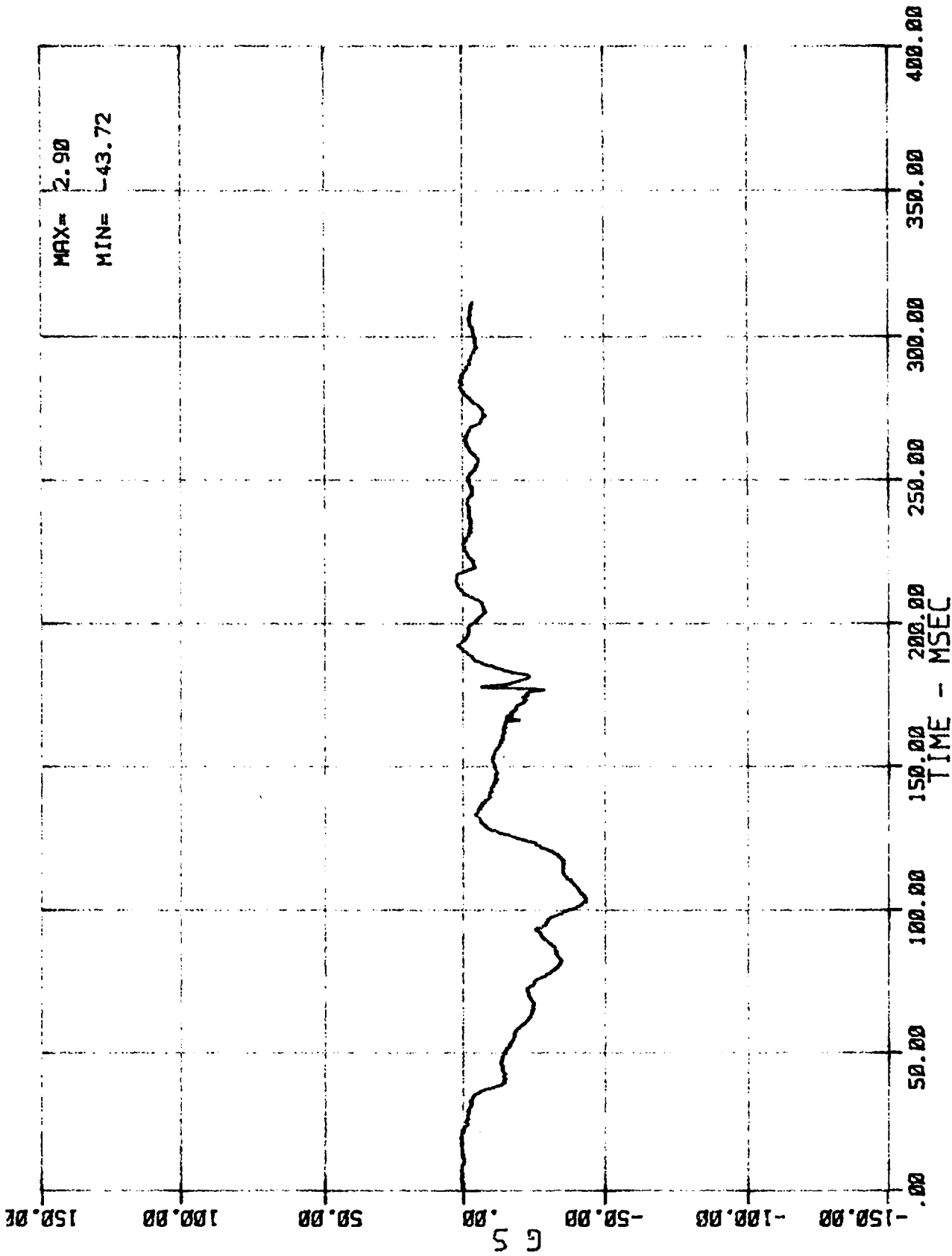
07 AC 01 2 HED X (PASSENGER HEAD ACCEL. -- X-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



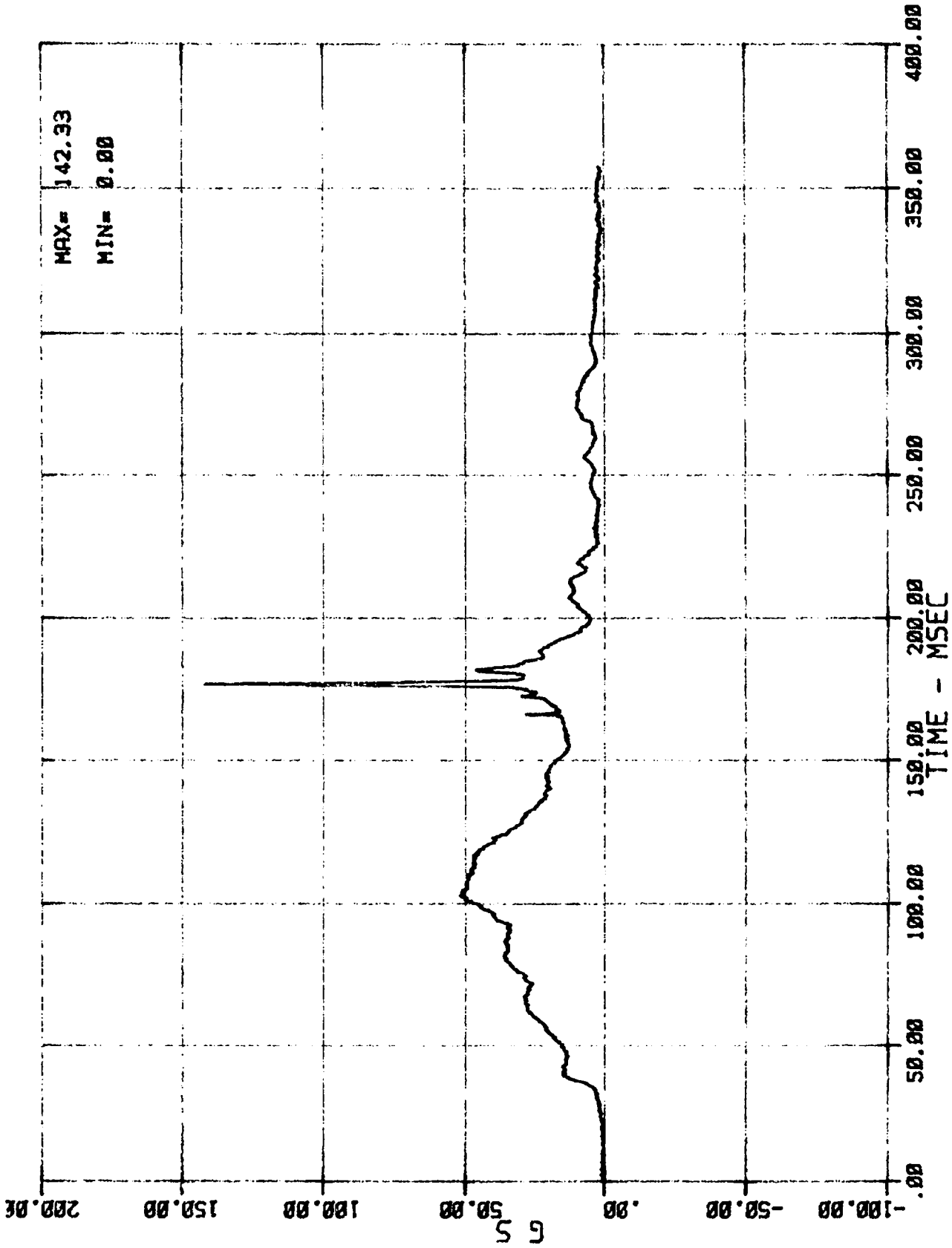
08 AC 01 2 HED Y (PASSENGER HEAD ACCEL. -- Y-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



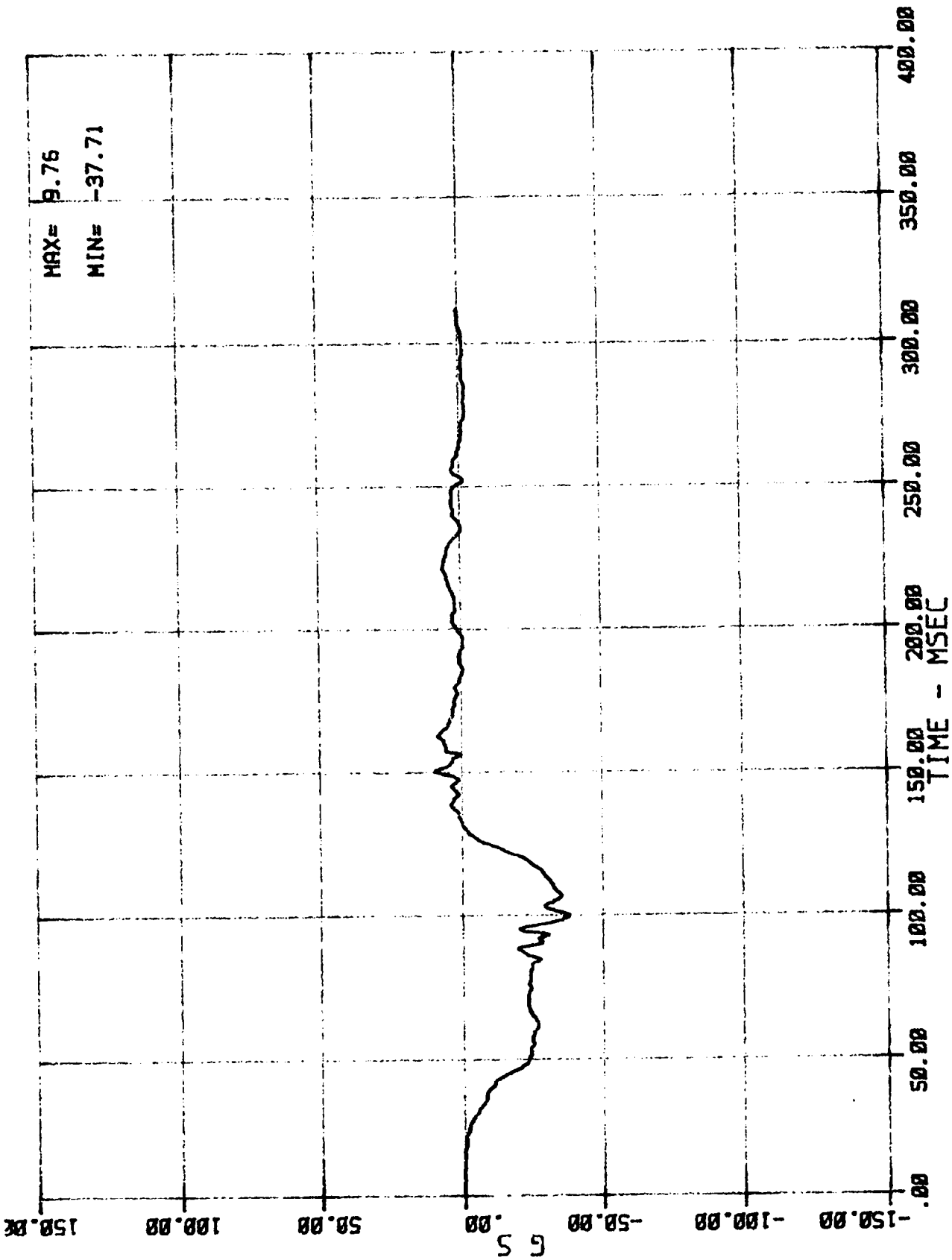
09 AC 01 2 HED Z (PASSENGER HEAD ACCEL. --- Z-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



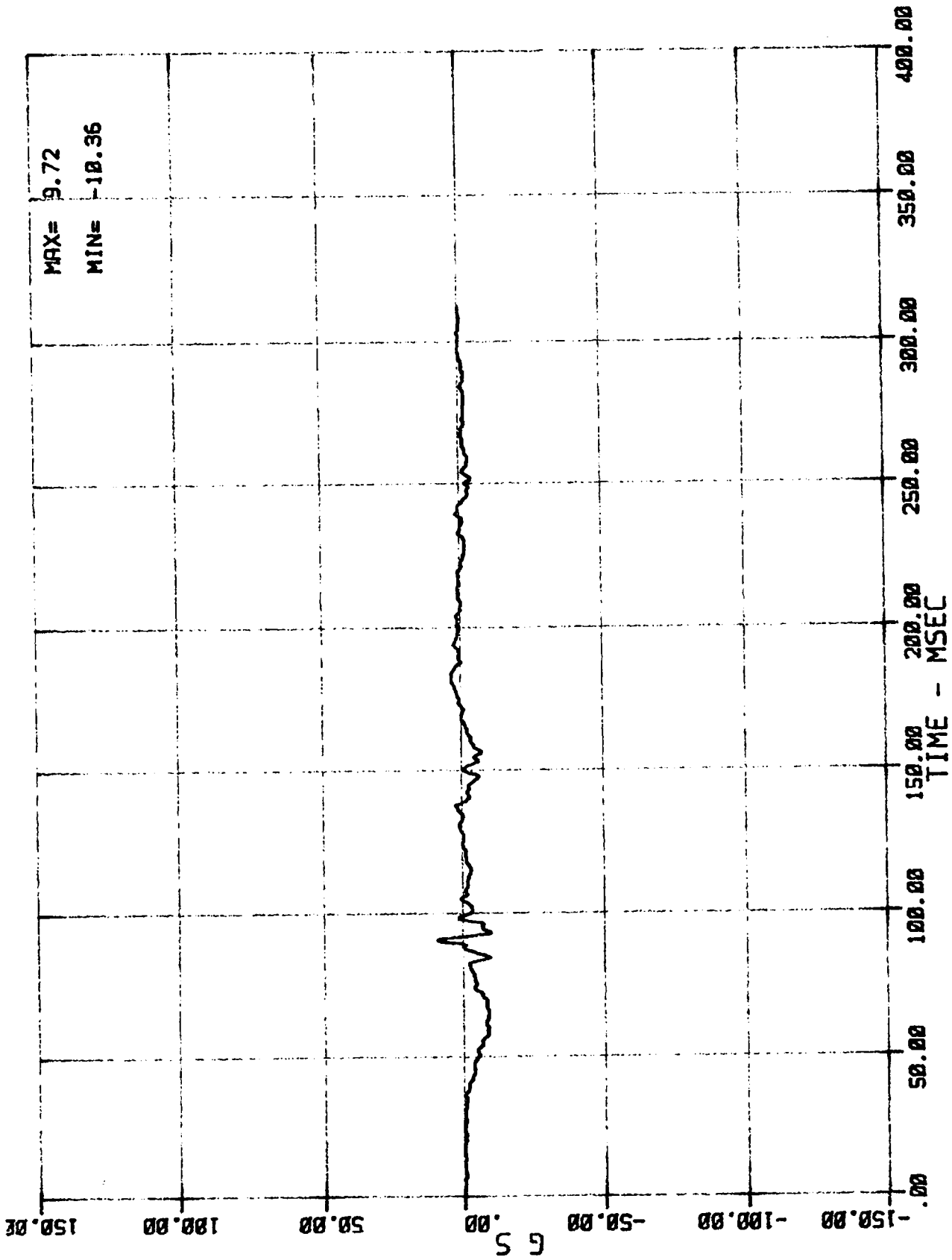
PASSENGER'S HEAD RESULTANT ACCELERATION  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



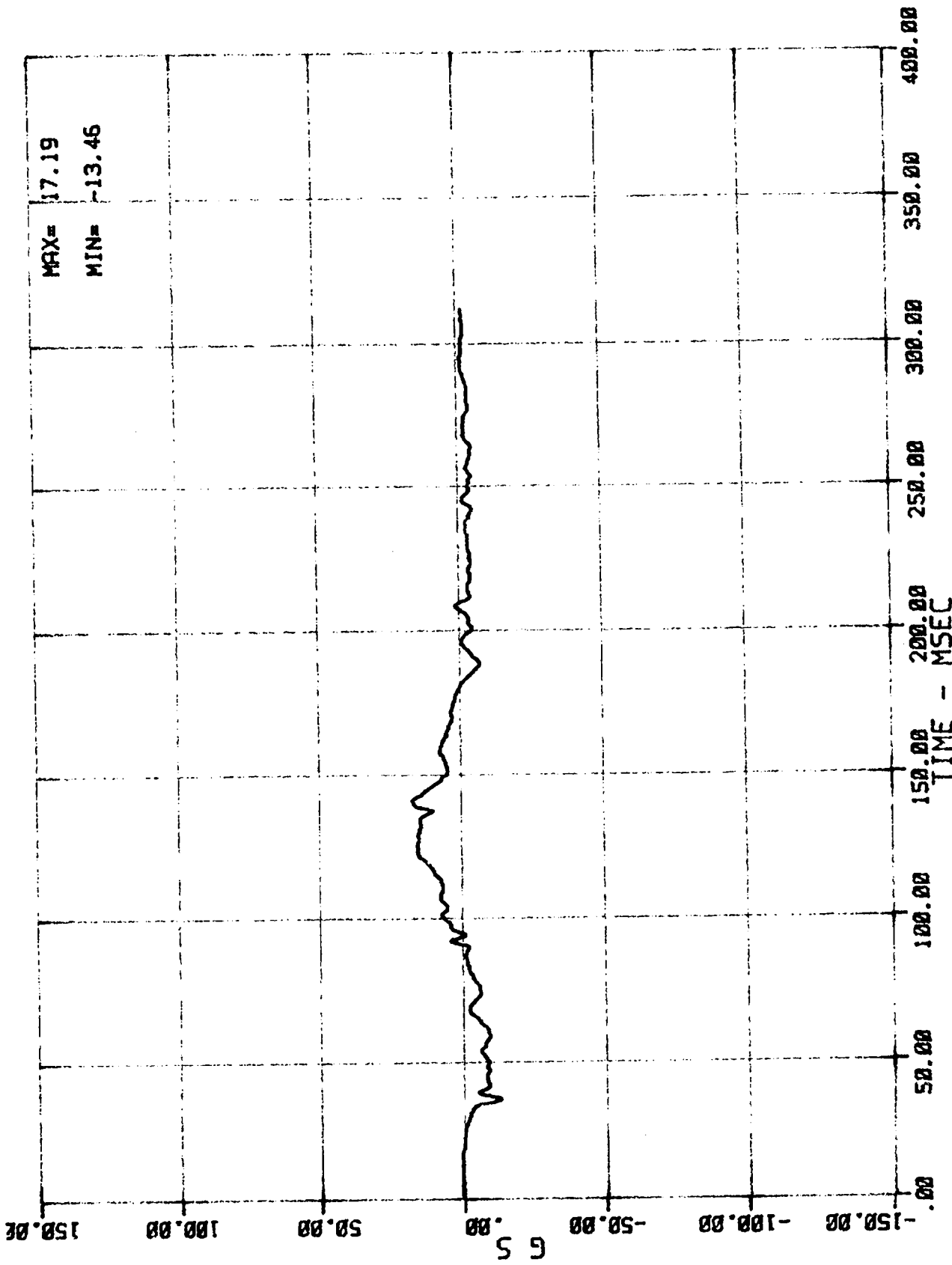
10 AC 01 2 CST X (PASSENGER CHEST ACCEL. -- X-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



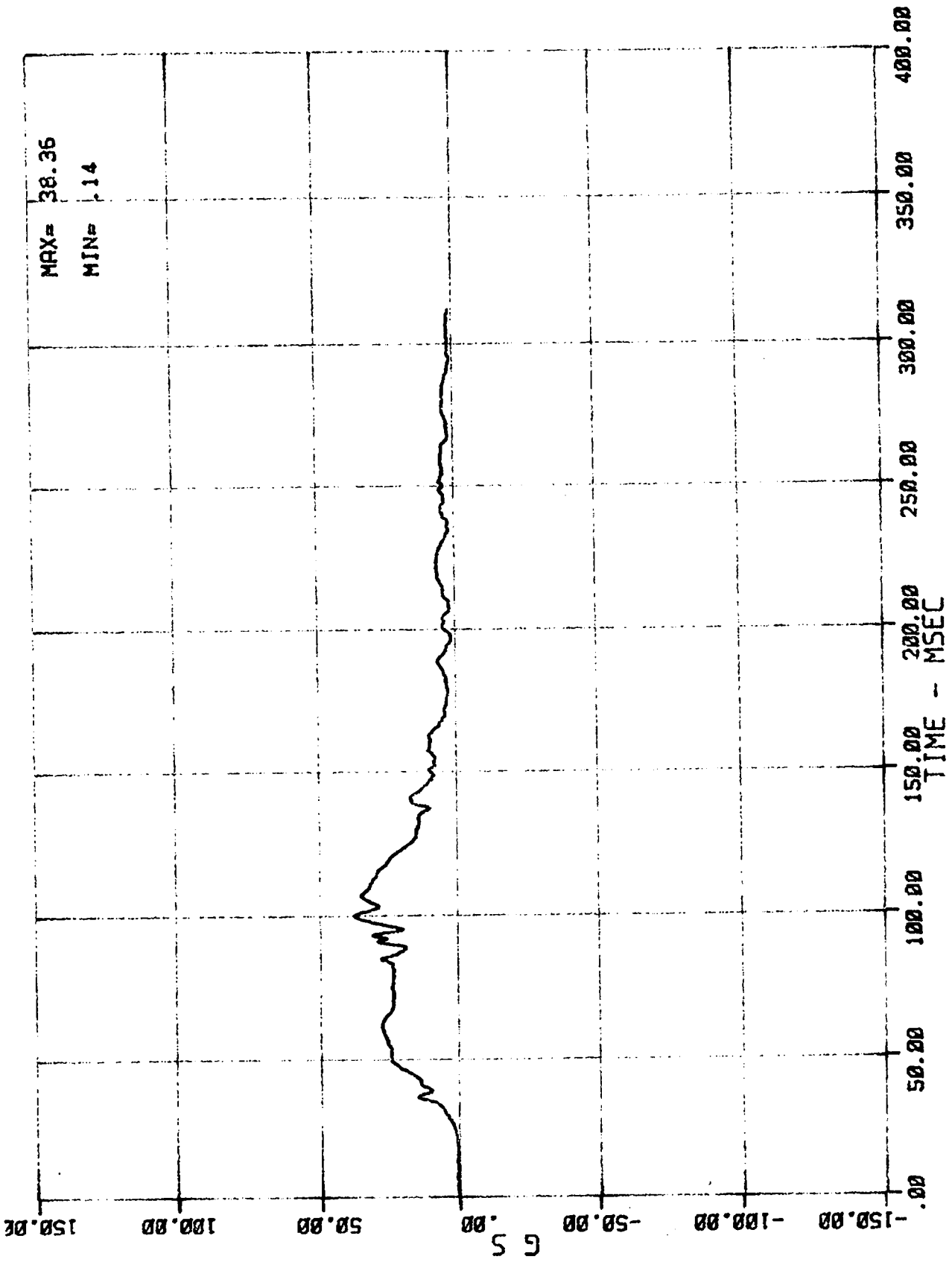
11 AC 01 2 CST Y (PASSENGER CHEST ACCEL. --- Y-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88

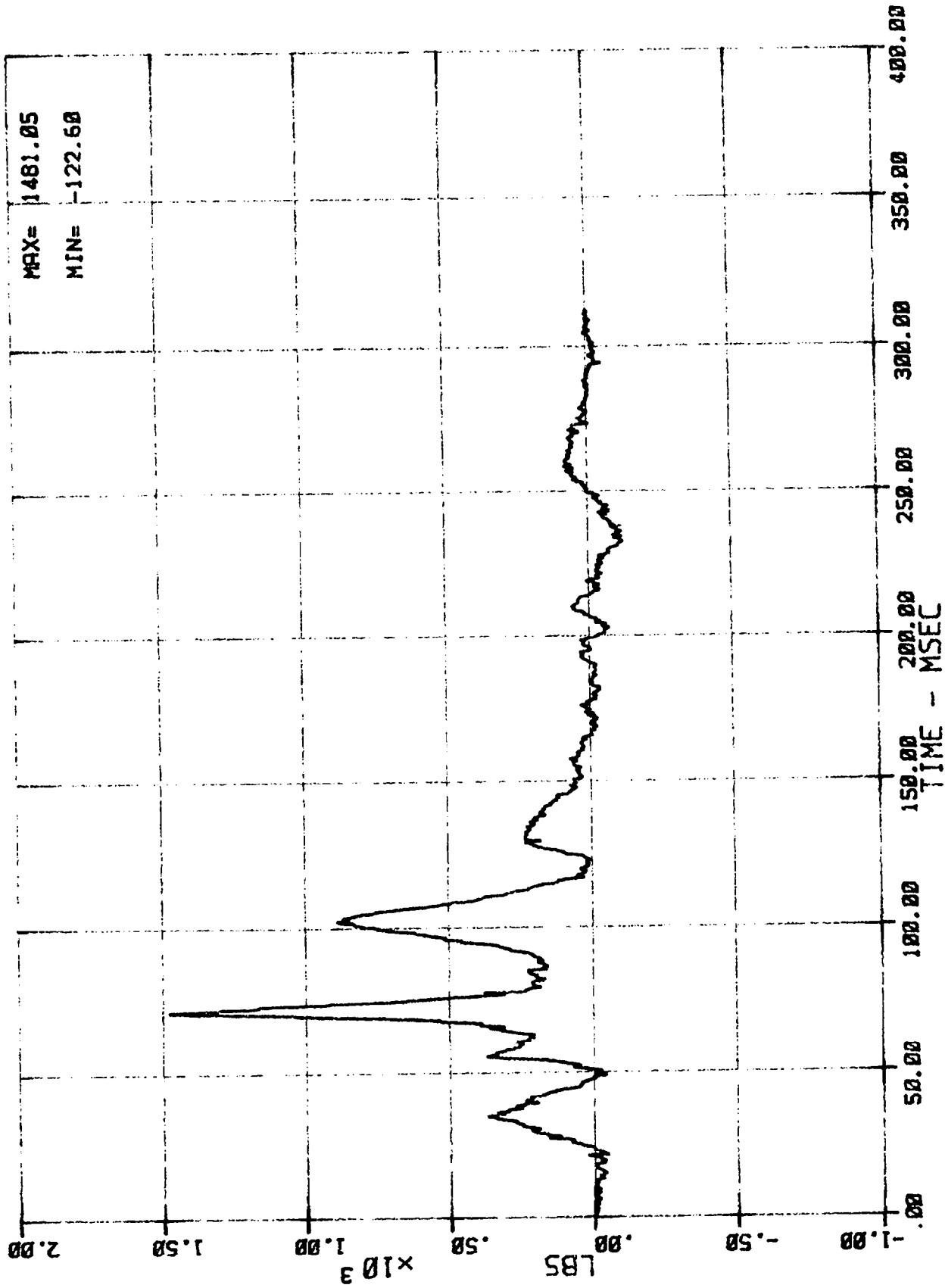


12 AC 01 2 CST Z (PASSENGER CHEST ACCEL. - Z-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88

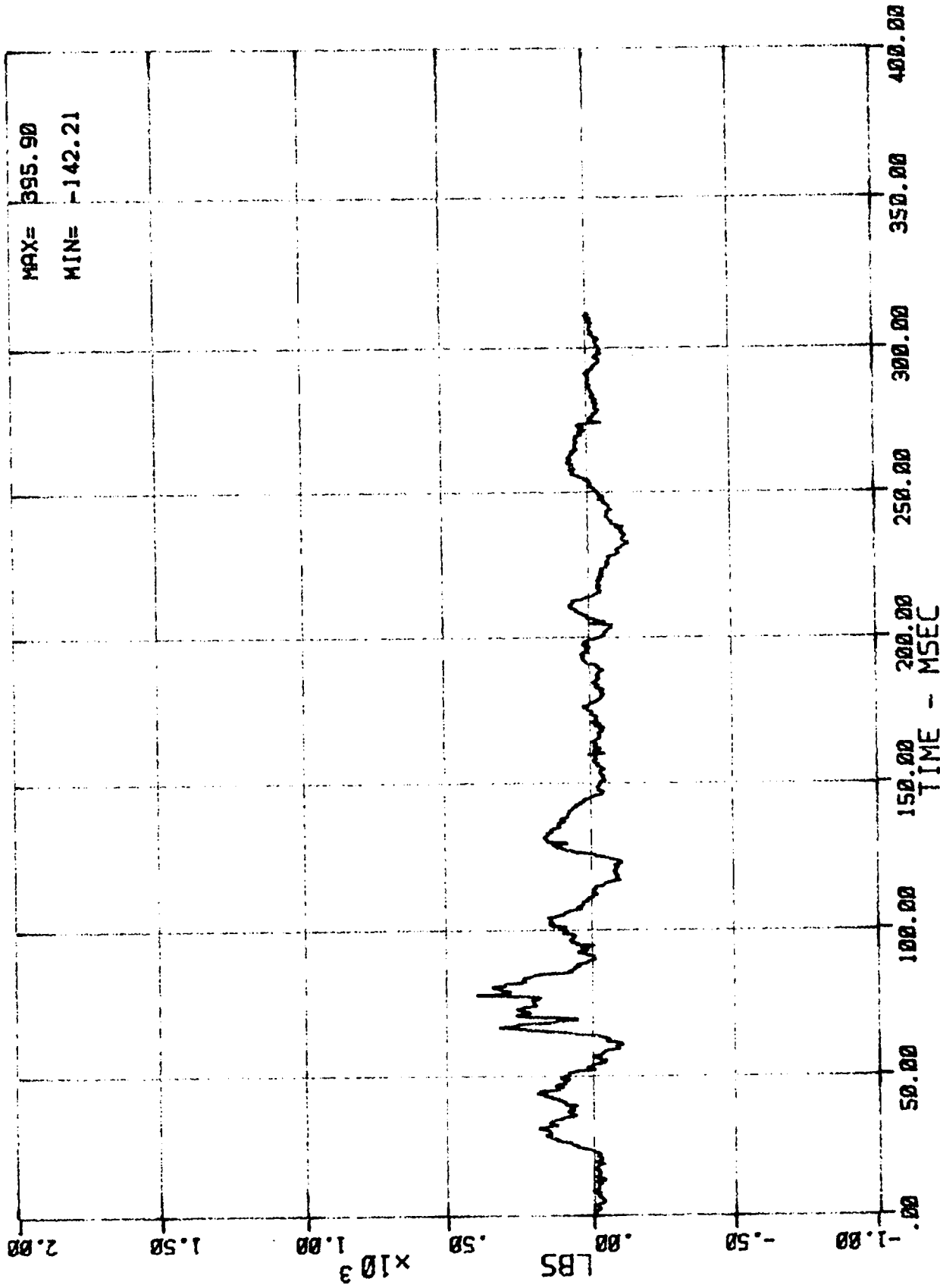


PASSENGER'S CHEST RESULTANT ACCELERATION  
MSE N07058 1988 DODGE D150 PICKUP 03/22/88



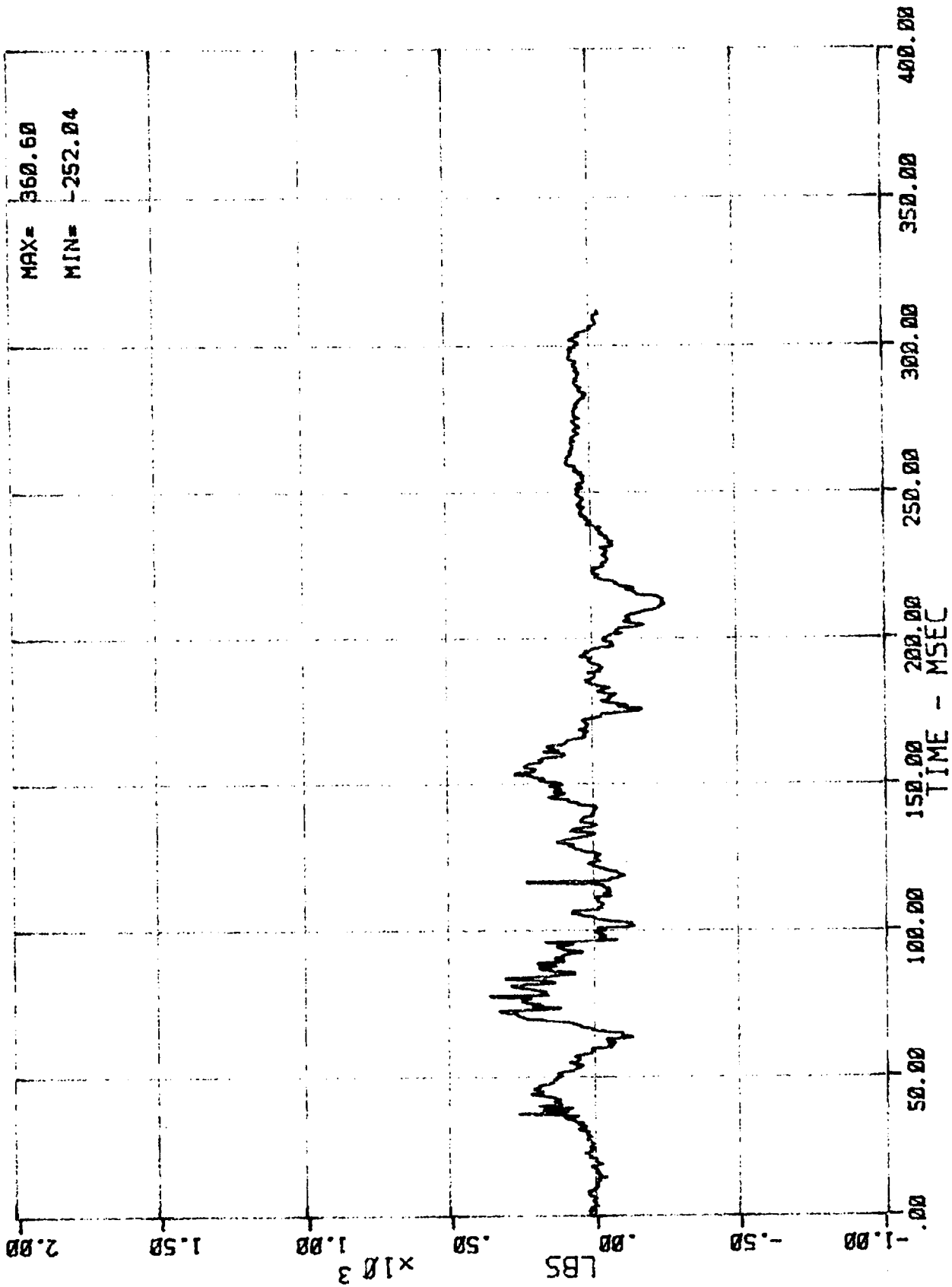
MAX= 1481.05  
 MIN= -122.60

13 LC 01 1 LFM (DRIVER LEFT FEMUR FORCE)  
 MSE N07058 1988 DODGE D150 PICKUP  
 03/22/88



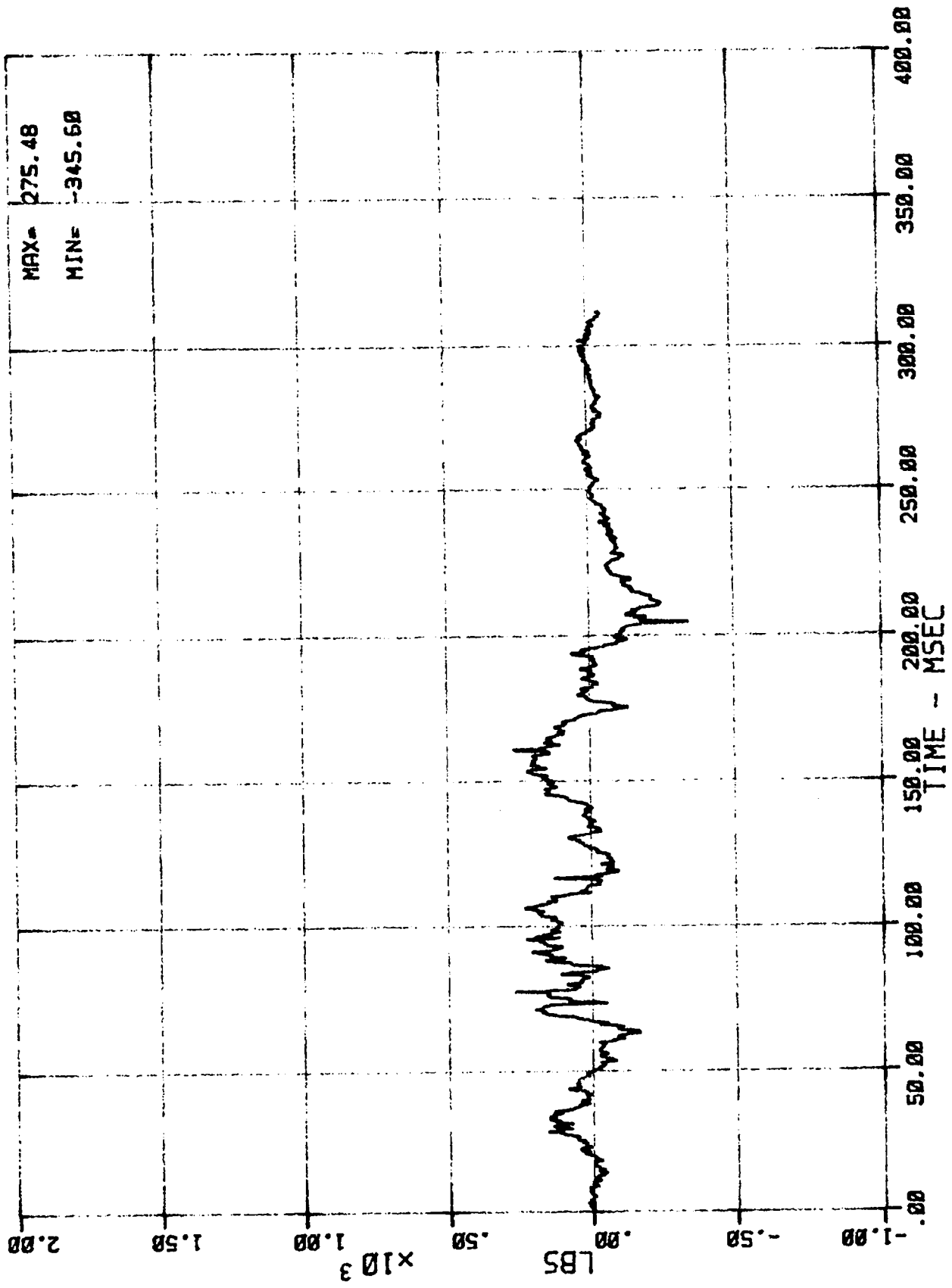
14 LC 01 J RFM (DRIVER RIGHT FEMUR FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



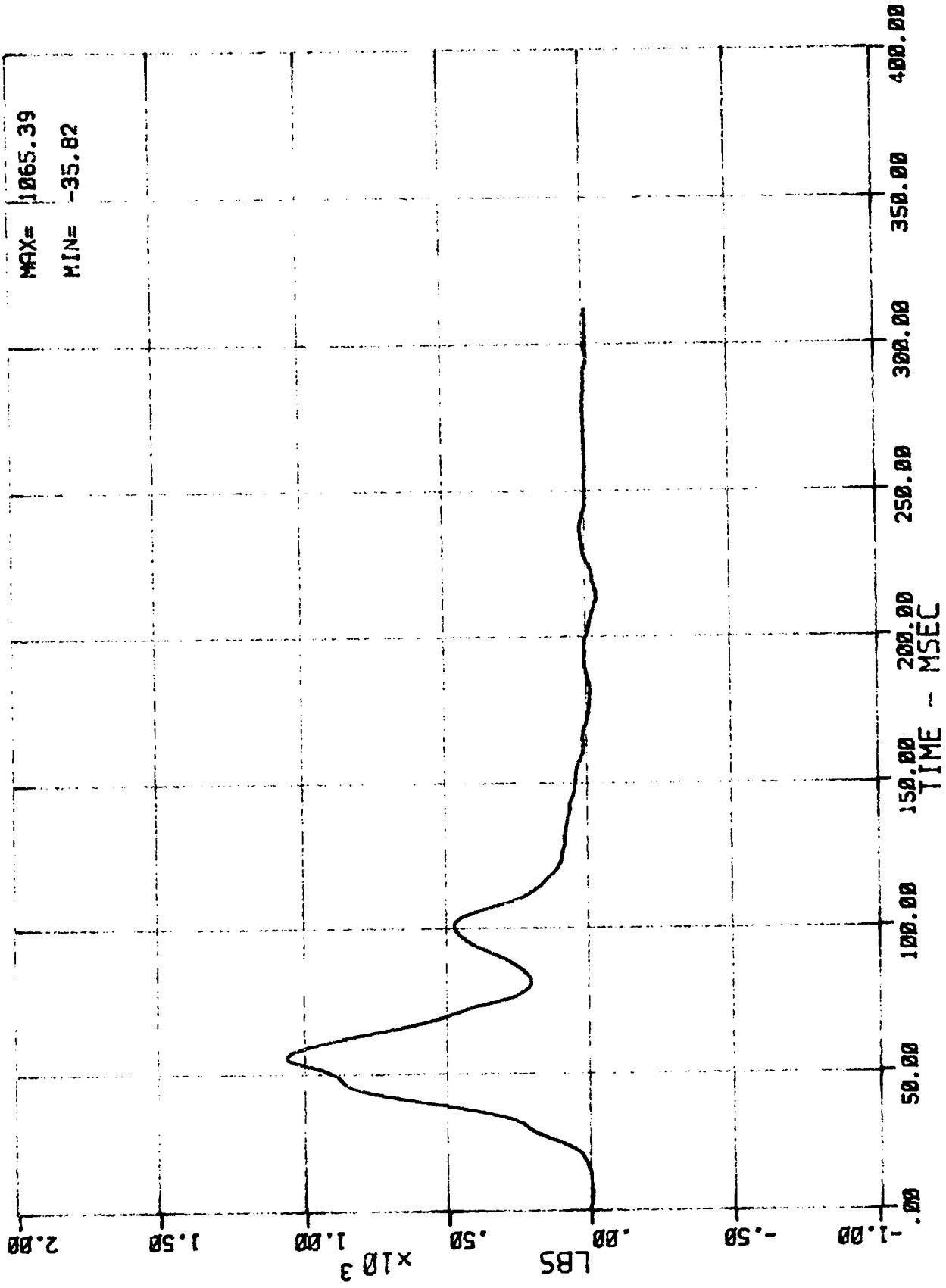
15 LC 01 2 LFM (PASSENGER LEFT FEMUR FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



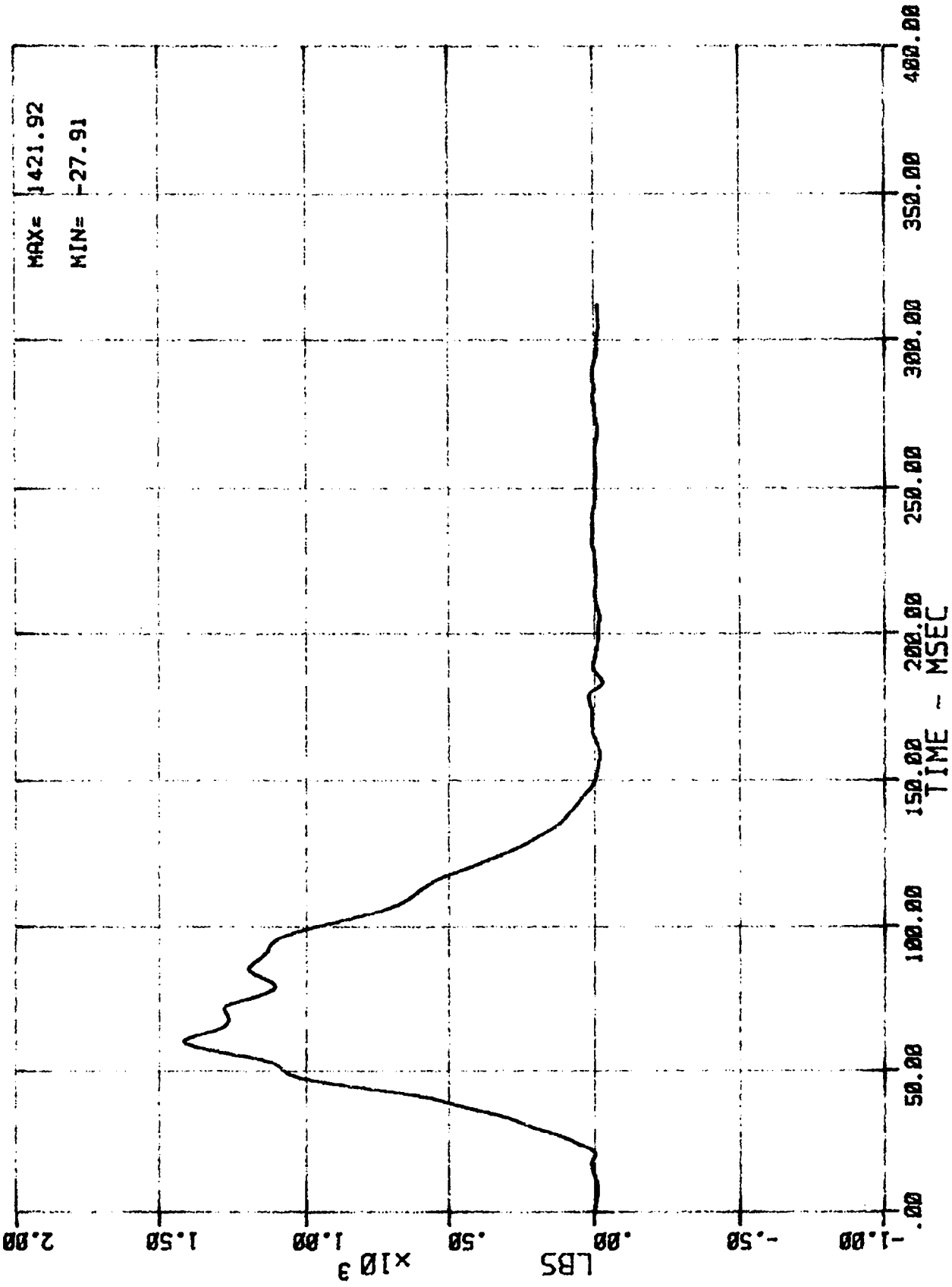
16 LC 01 2 RFM (PASSENGER RIGHT FEMUR FORCE)  
 MSE N07058 1988 DODGE D150 PICKUP

03/22/88



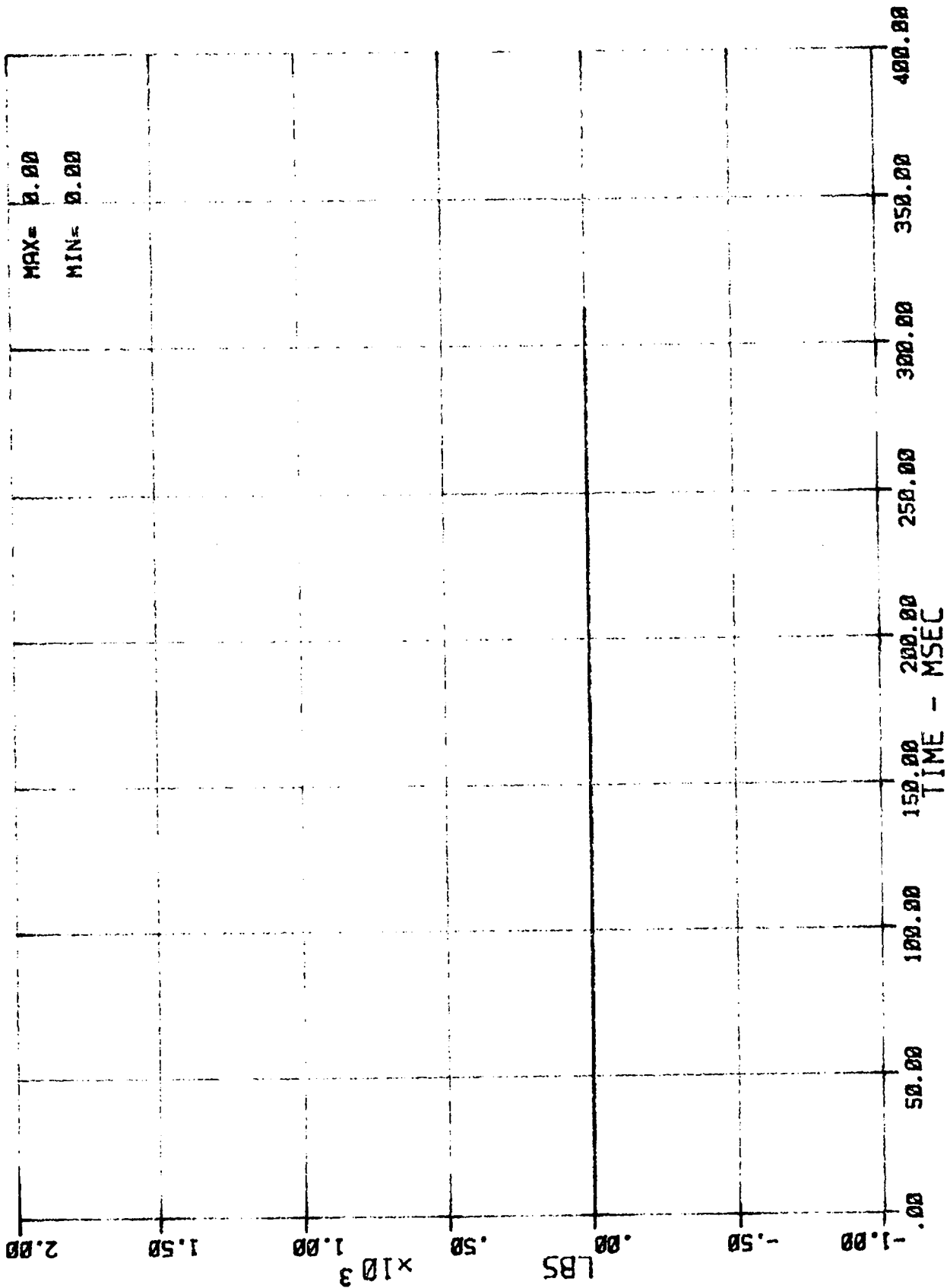
MAX= 1065.39  
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17 LC 01 1 LBD (DRIVER LAP BELT FORCE)  
 MSE N07056 1988 DODGE D150 PICKUP  
 03/22/88



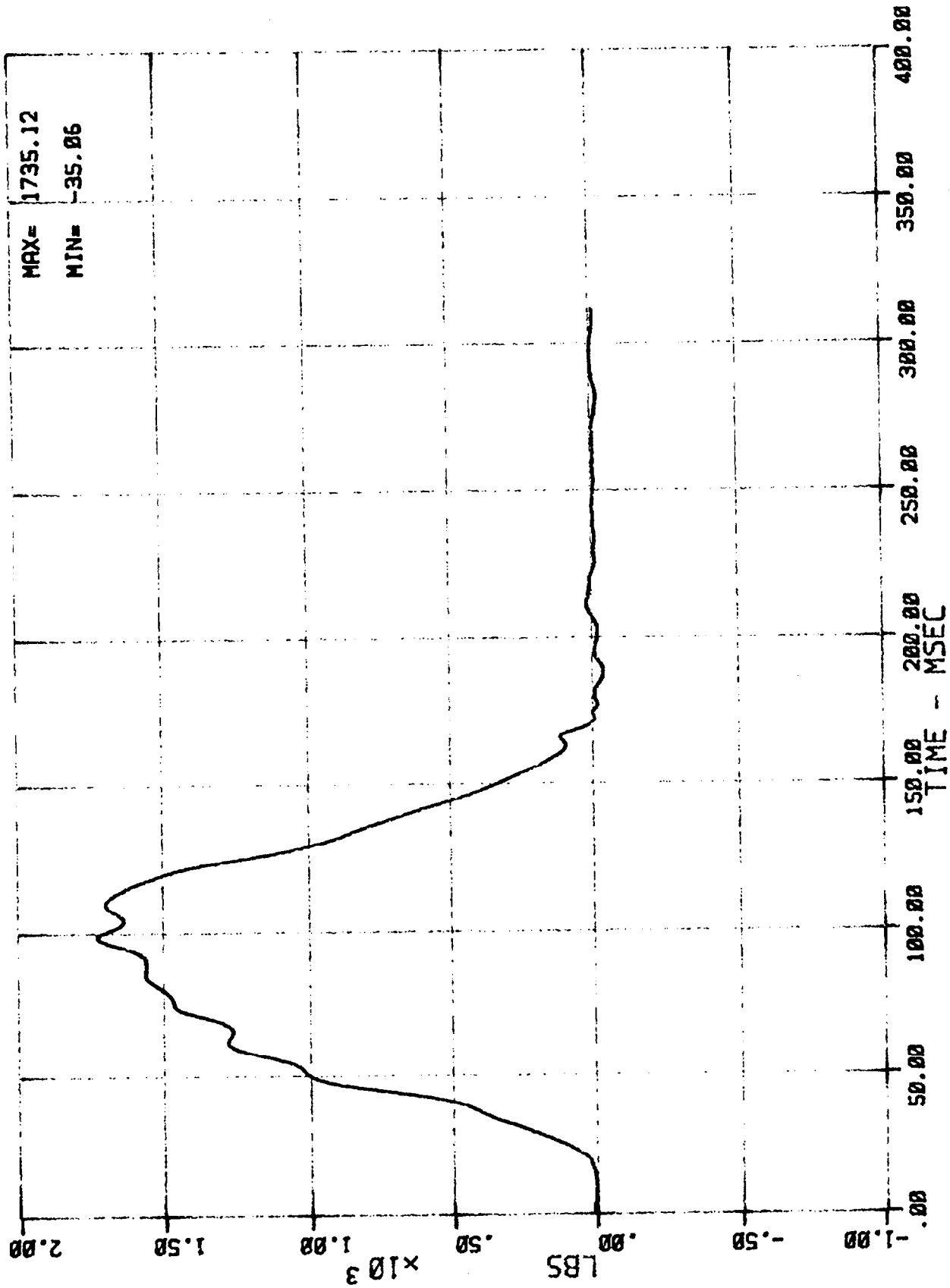
18 LC 01 1 SHB (DRIVER SHOULDER BELT FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



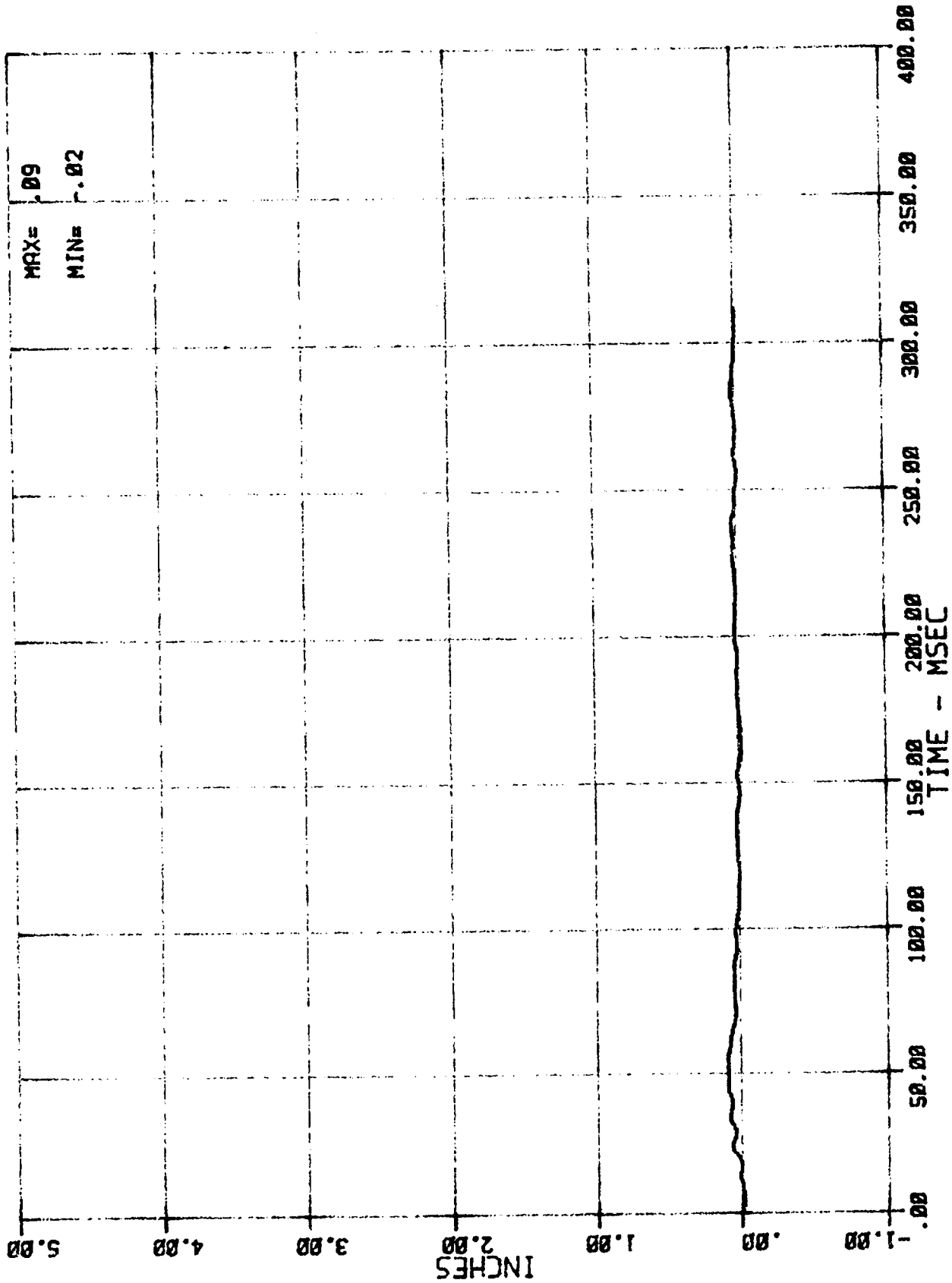
19 LC 01 2 LBD (PASSENGER LAP BELT FORCE)  
MSE N07058 1988 DODGE 0150 PICKUP

03/22/88



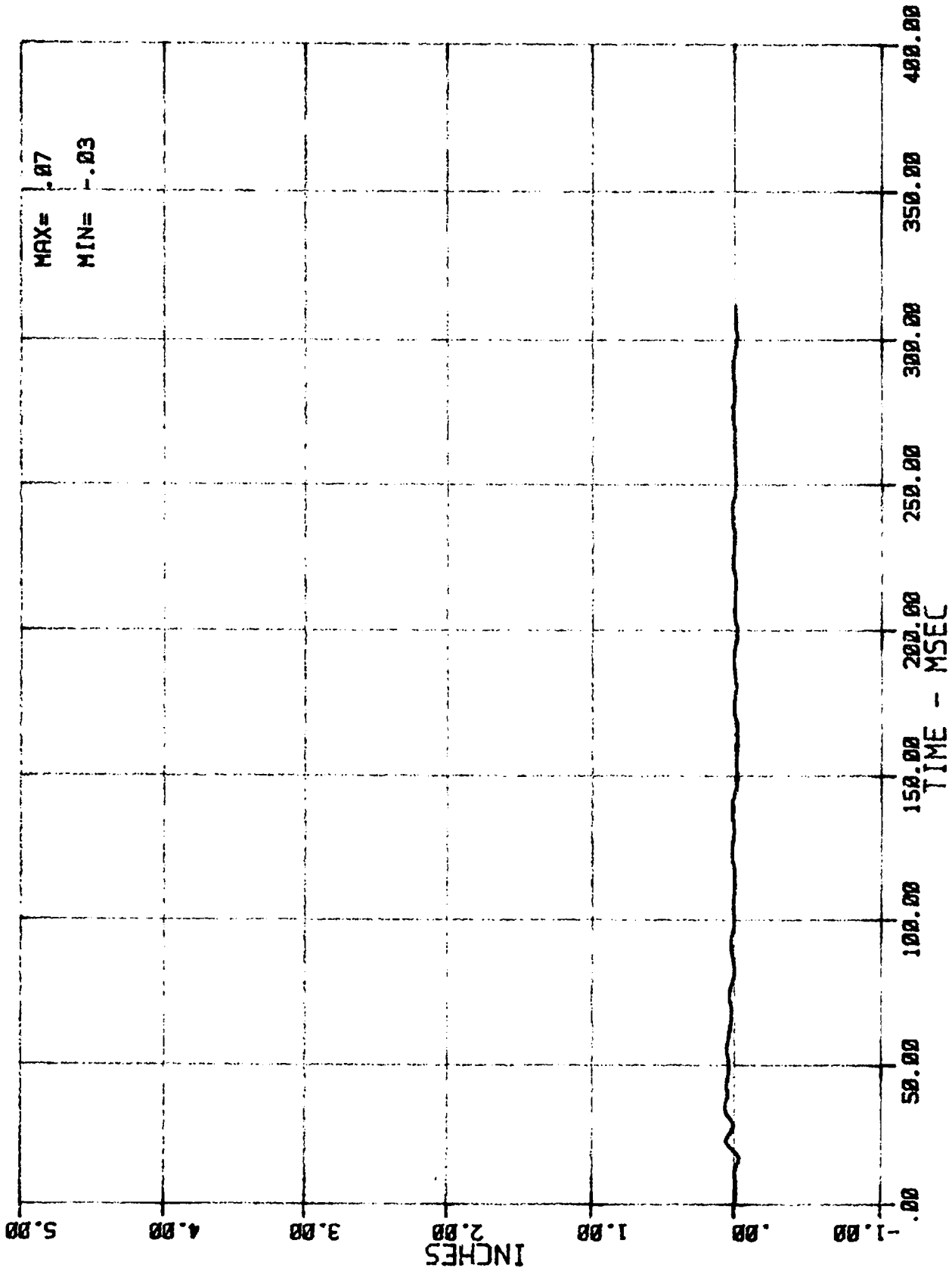
20 LC 01 2 SHB (PASSENGER SHOULDER BELT FORCE)  
 MSE N07058 1988 DODGE D150 PICKUP

03/22/88



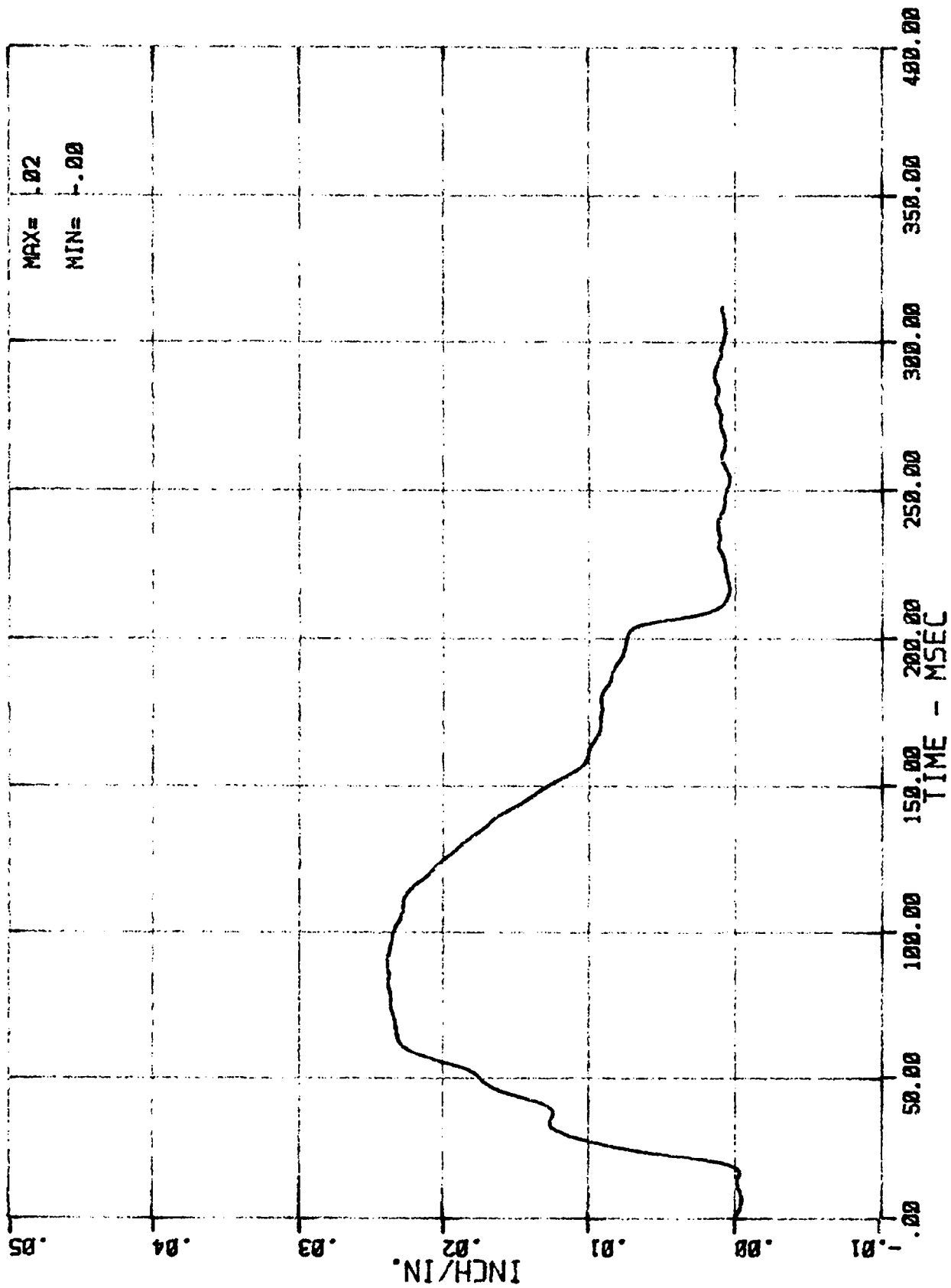
21 DT 01 1 SHB (DRIVER SHOULDER BELT PULLOUT)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



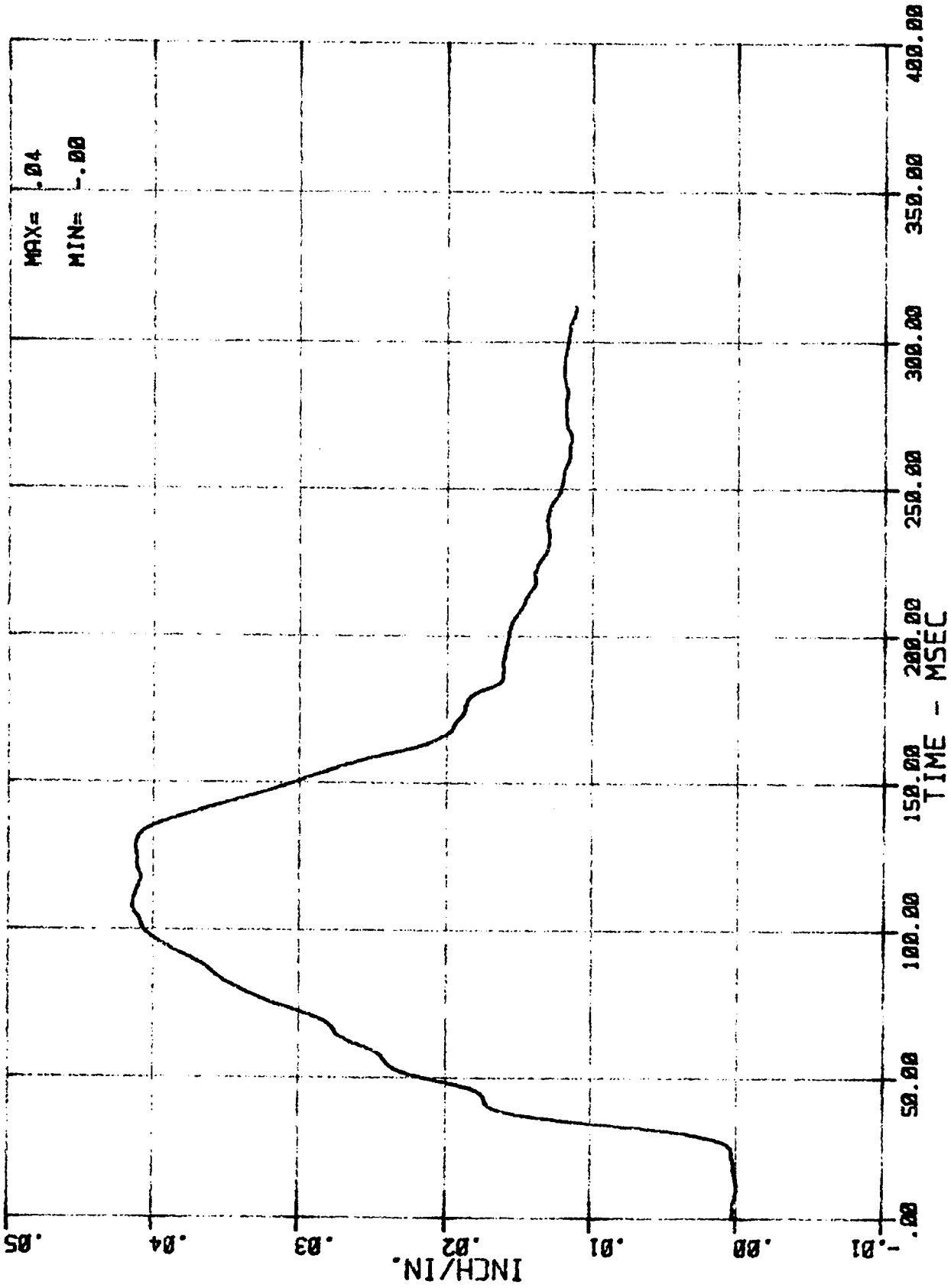
22 DT 01 2 (PASSENGER SHOULDER BELT PULLOUT)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



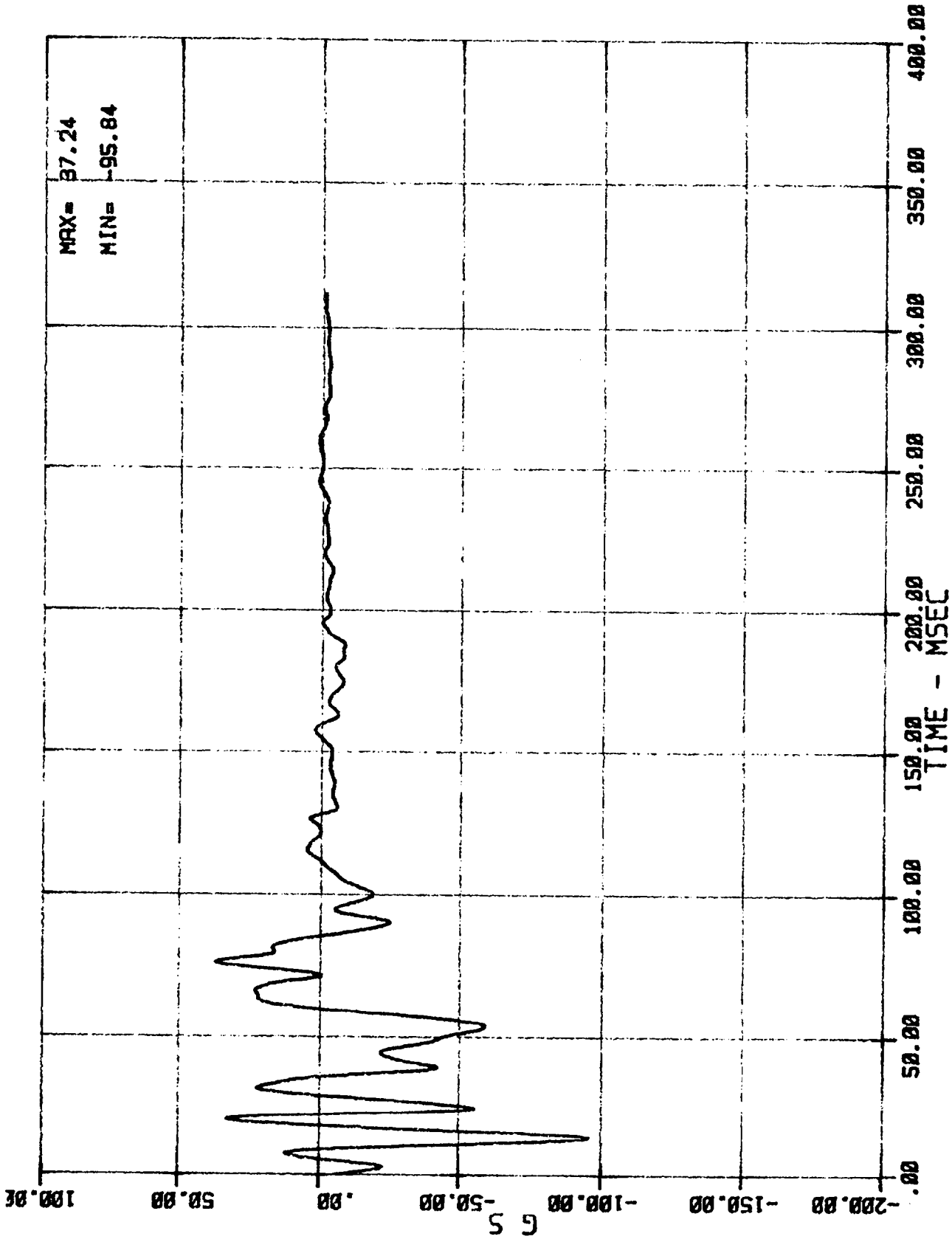
23 DT 01 1 SHB (DRIVER'S SHOULDER BELT ELONGATION)  
MSE N07050 1988 DODGE D150 PICKUP

03/22/88



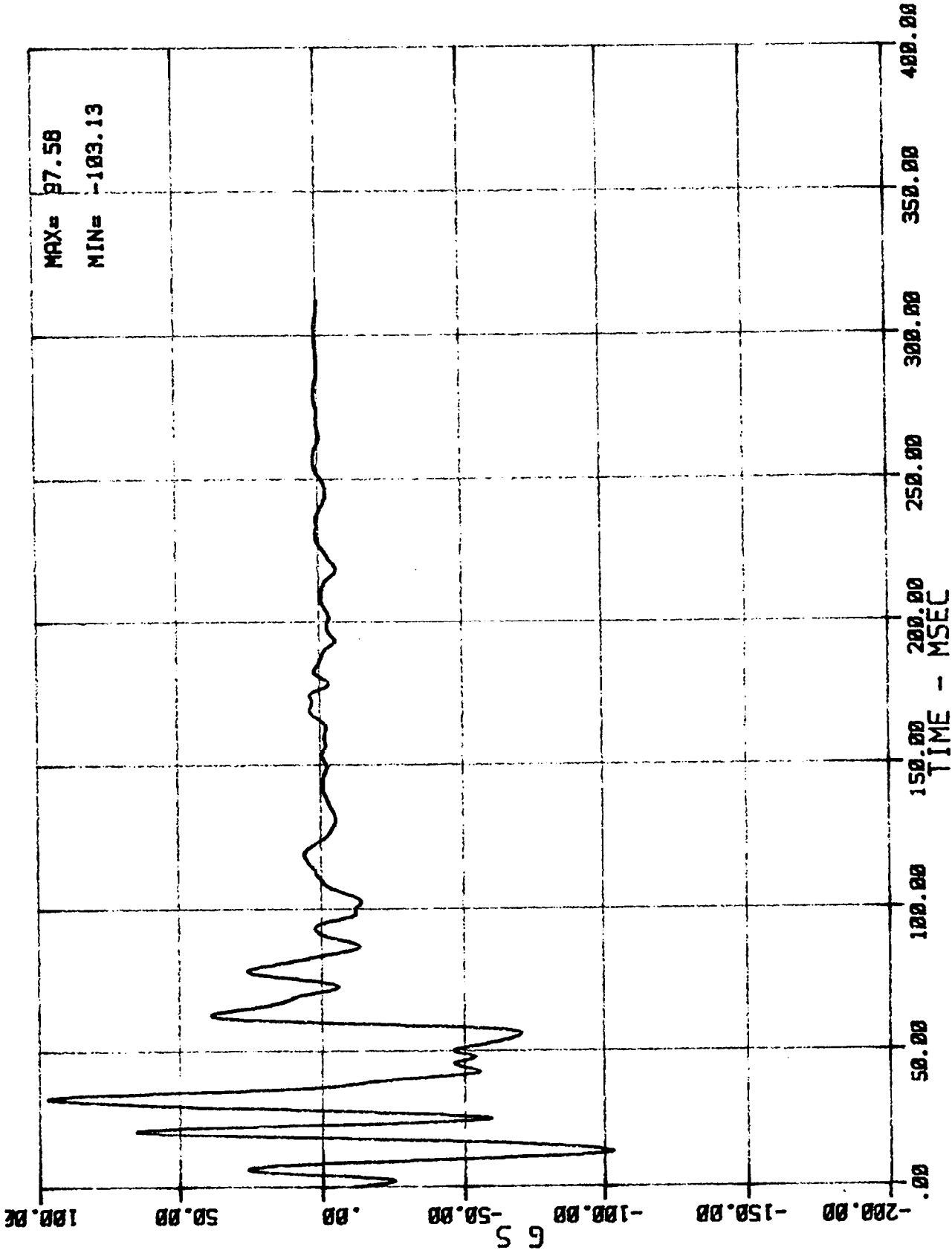
24 DT 01 2 SHB (PASSENGER'S SHOULDER BELT ELONGATION)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



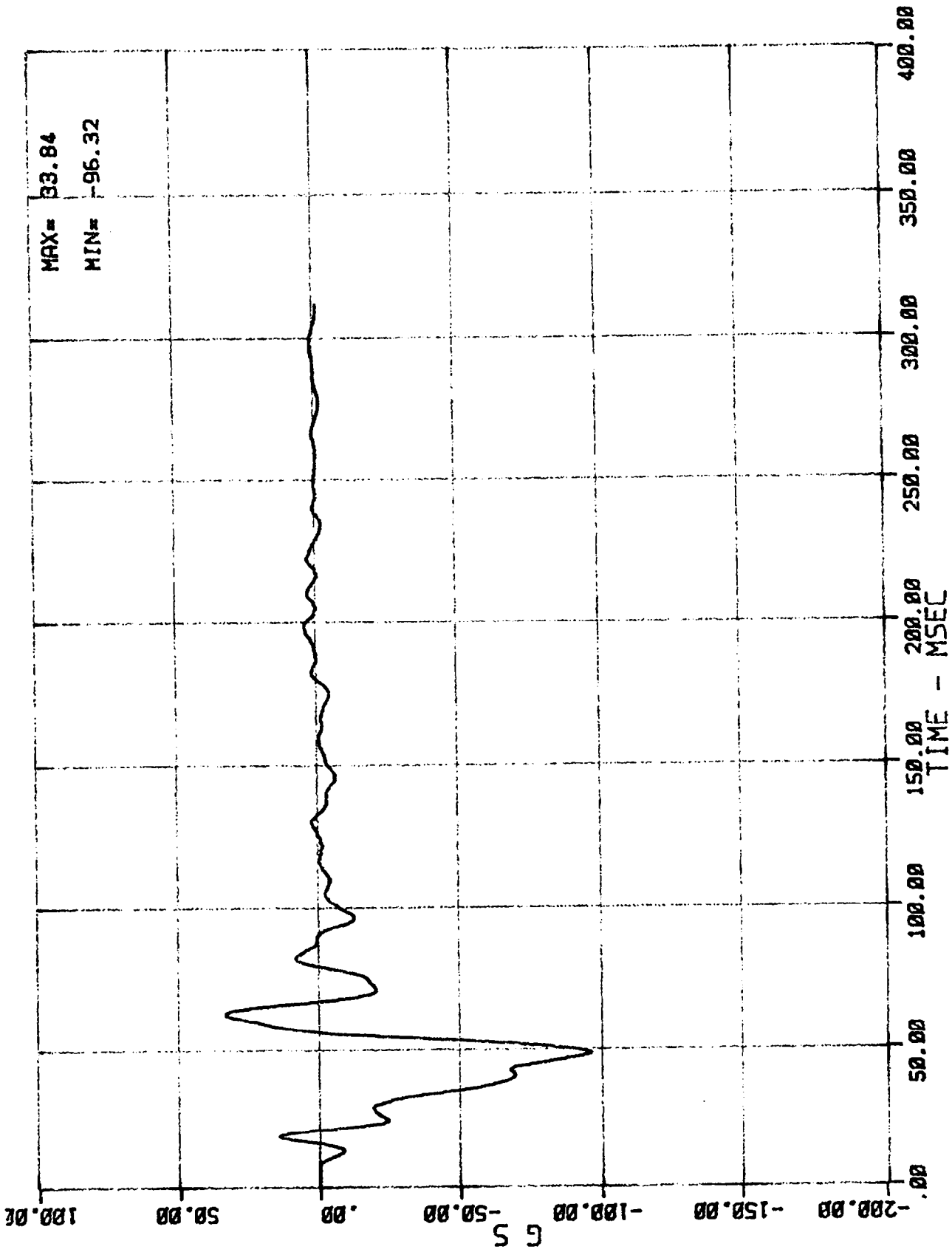
25 AC 01 N BCR X (LEFT FRONT WHEEL ACCEL. --- X-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



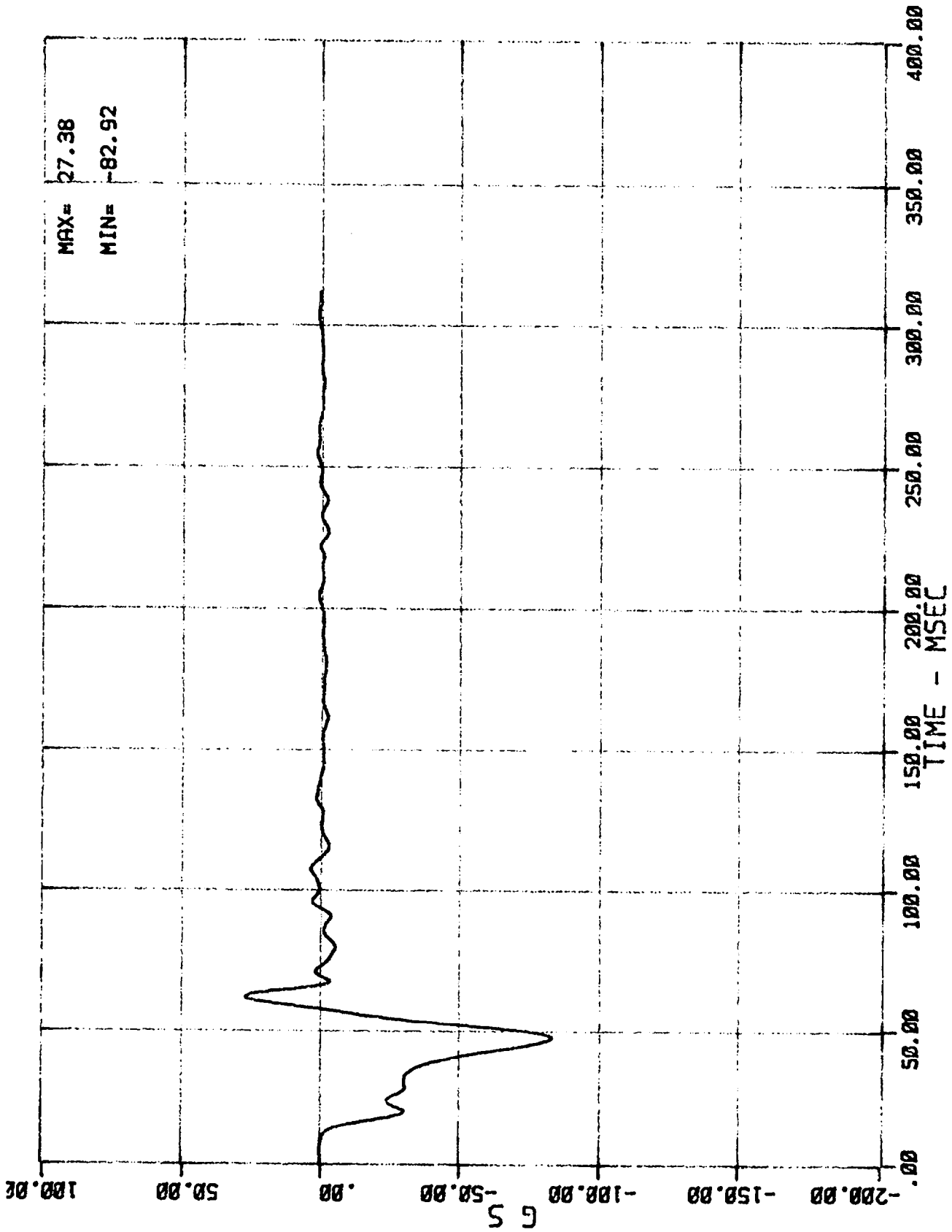
26 AC 01 N BCR X (RIGHT FRONT WHEEL ACCEL. -- X-AXIS)  
MSE N07058 1988 DODGE PICKUP

03/22/88



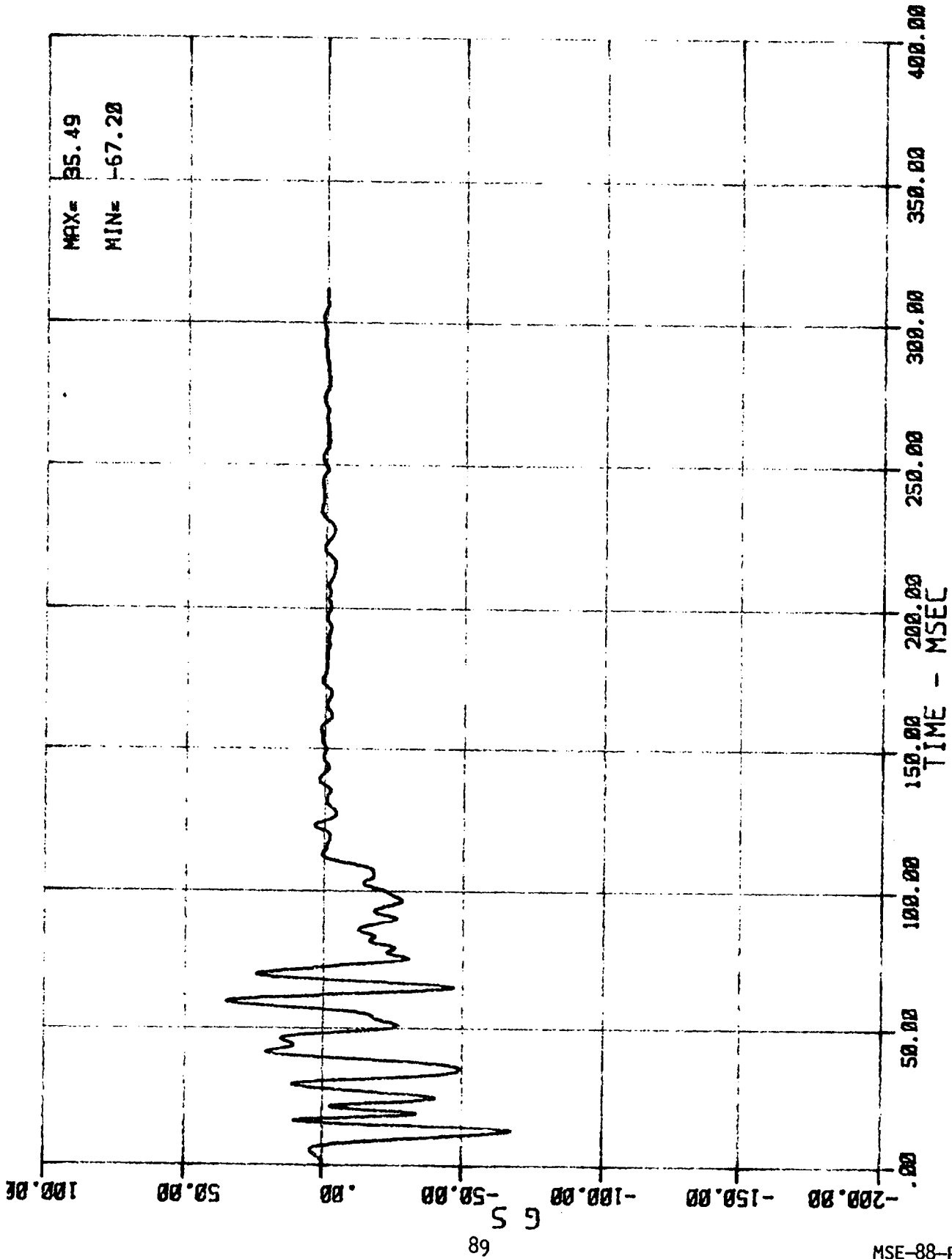
27 AC 01 N ENG X (BOTTOM OF ENGINE ACCEL. --- X-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



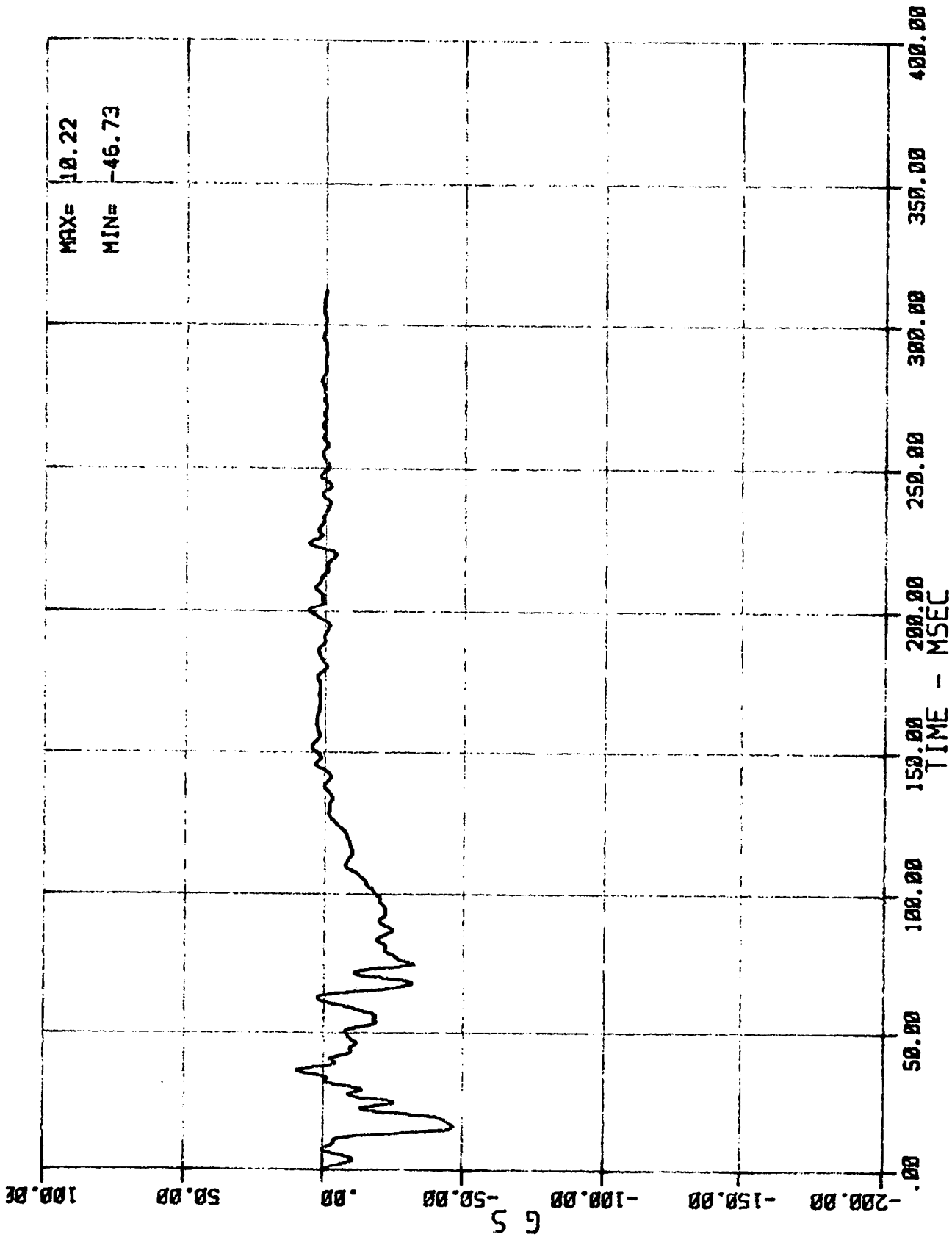
28 AC 01 N ENG X (TOP OF ENGINE ACCEL. -- X-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



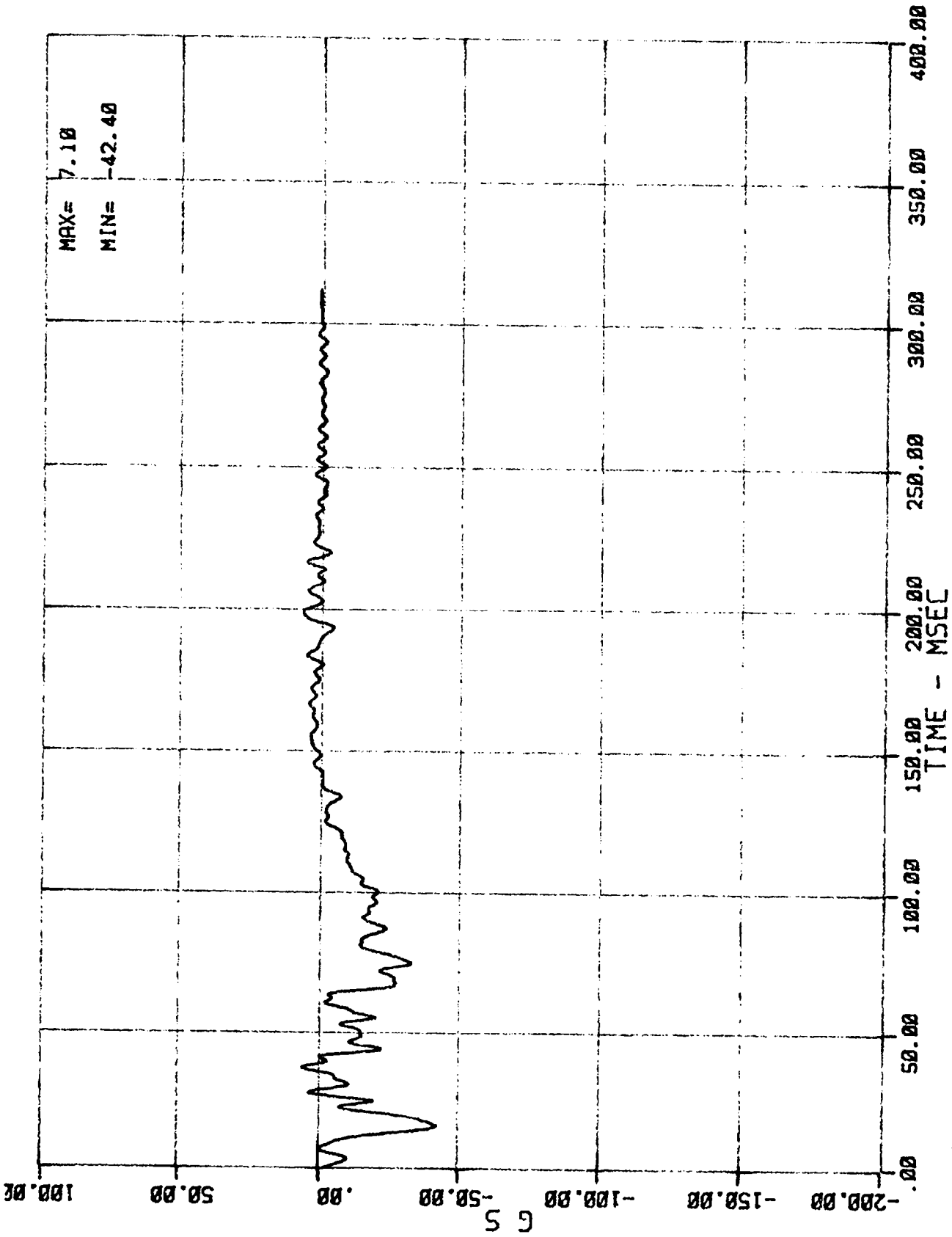
29 AC 01 N DPC X (CENTER OF DASH ACCEL. -- X-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



30 AC 01 N LRF (LEFT REAR FLOOR ACCEL. --- X-AXIS)  
MSE N07050 1988 DODGE D150 PICKUP

03/22/88



31 AC 01 N RRF (RIGHT REAR FLOOR ACCEL. --- X-AXIS)  
MSE N07058 1988 DODGE D150 PICKUP

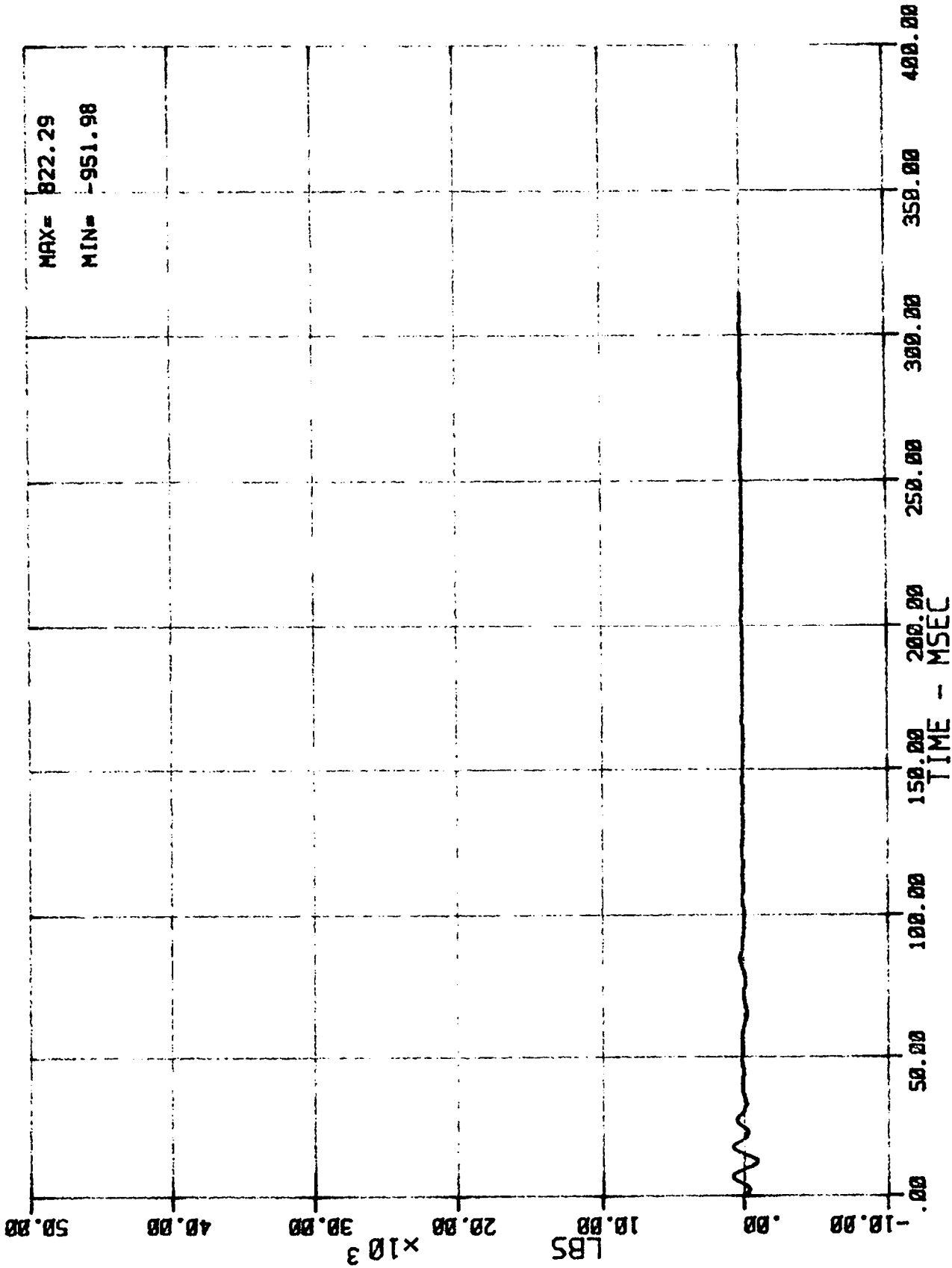
03/22/88

APPENDIX B-2

LOAD CELL BARRIER DATA

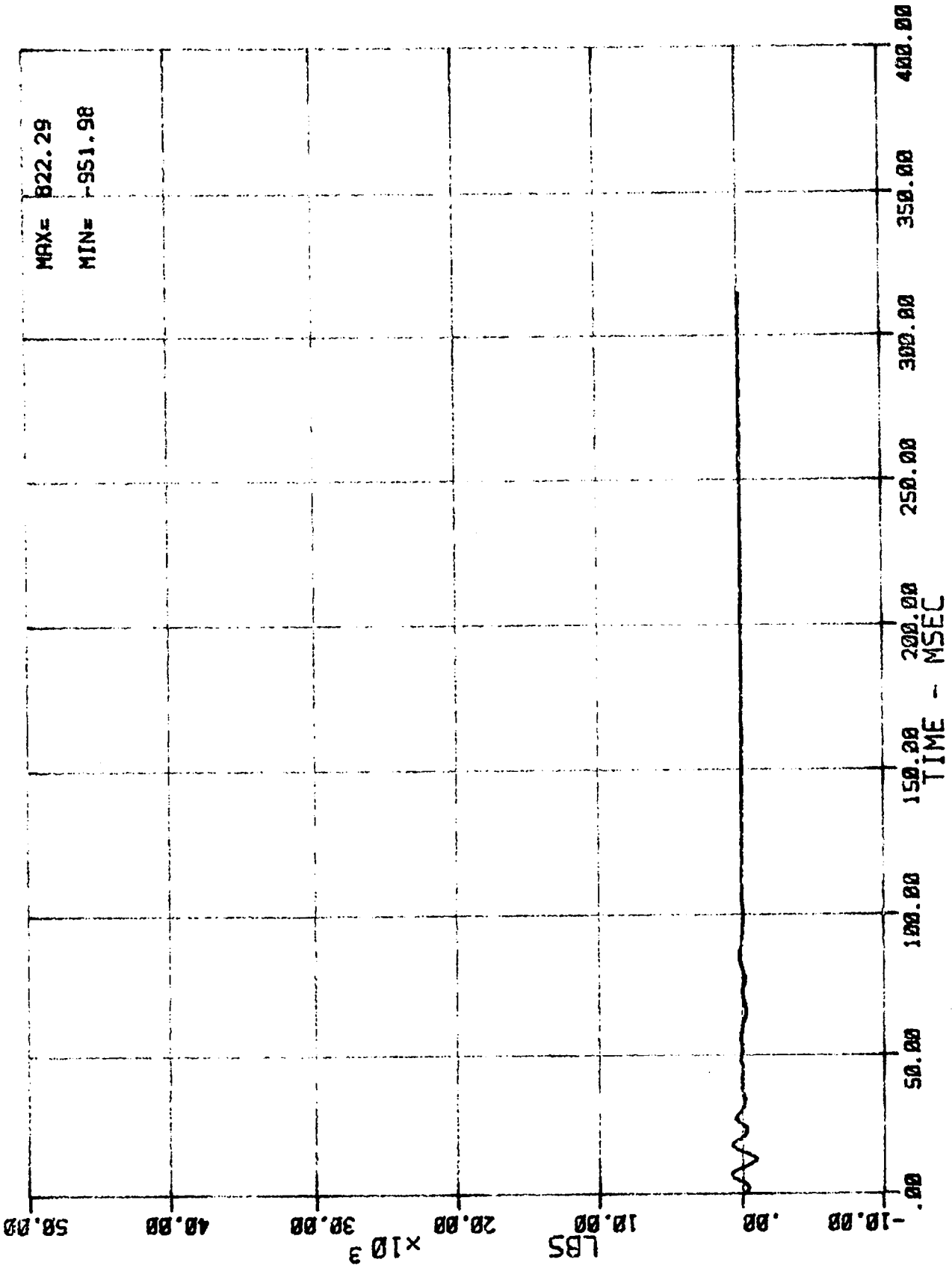
DATA FILTERING:

Load Cell Barrier channels - Class 60



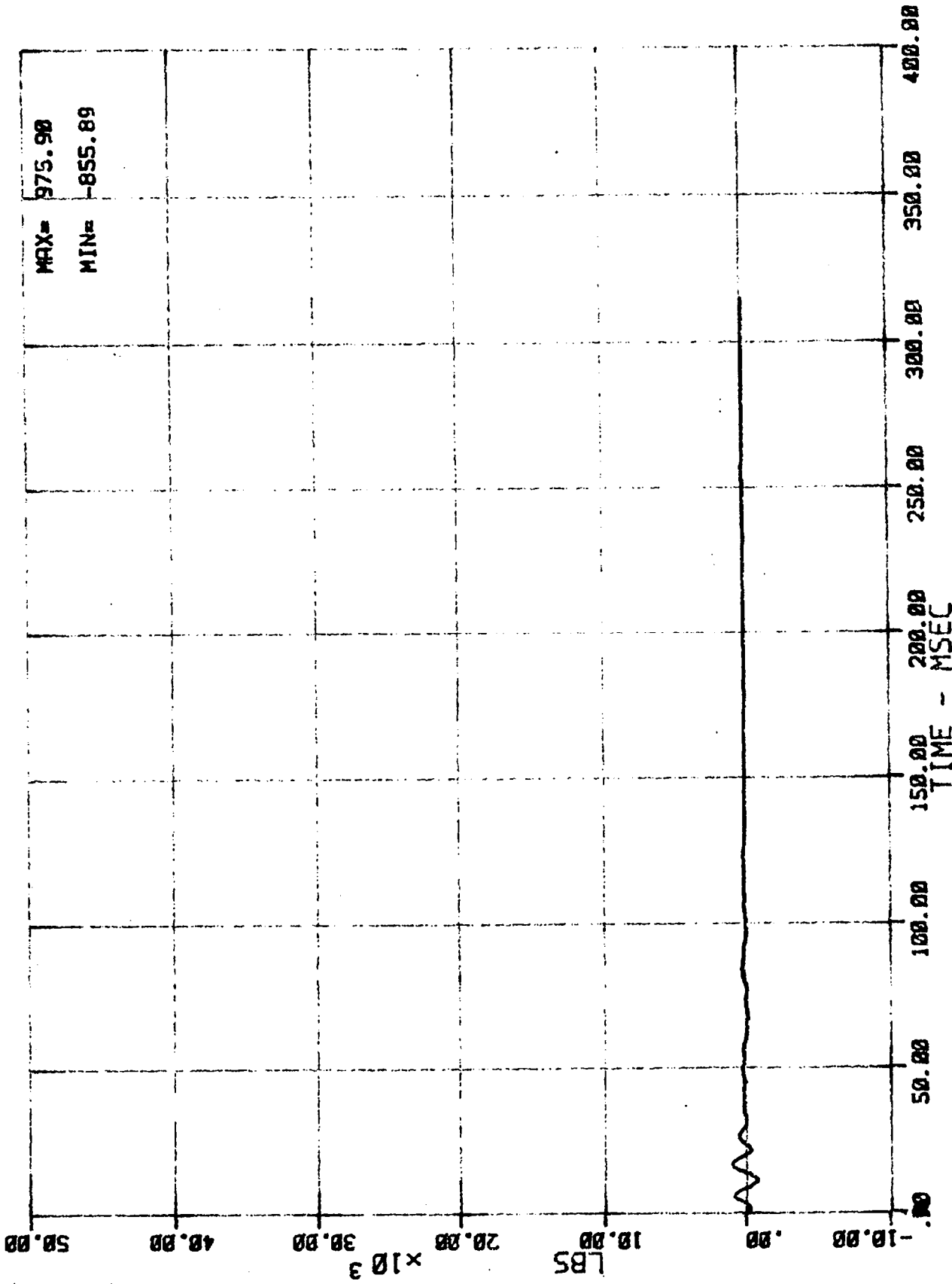
32 LC BA N BA1 (BARRIER LOAD CELL A1 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



33 LC BA N BA2 (BARRIER LOAD CELL A2 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

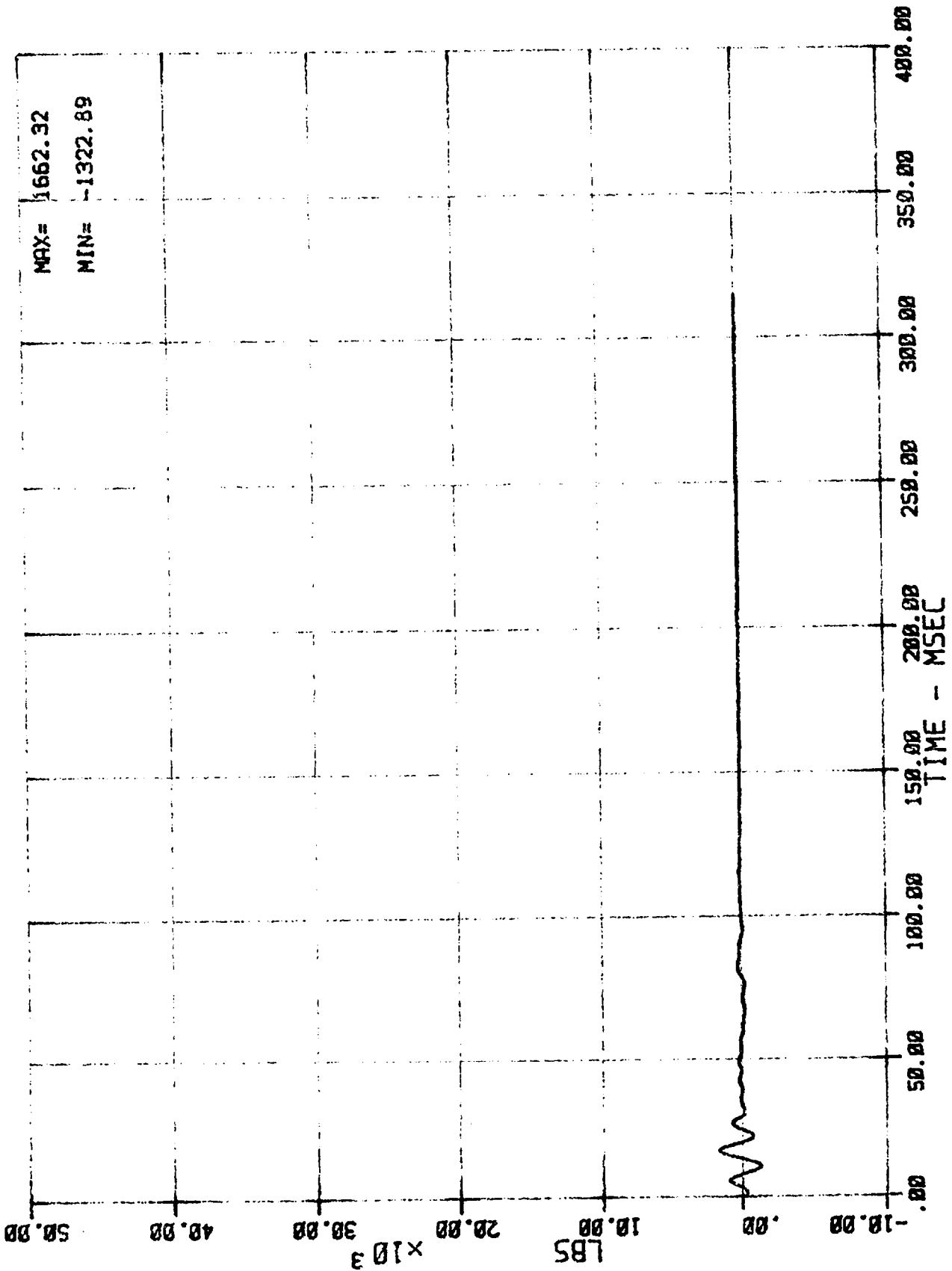
03/22/88



MAX= 975.90  
MIN= -855.89

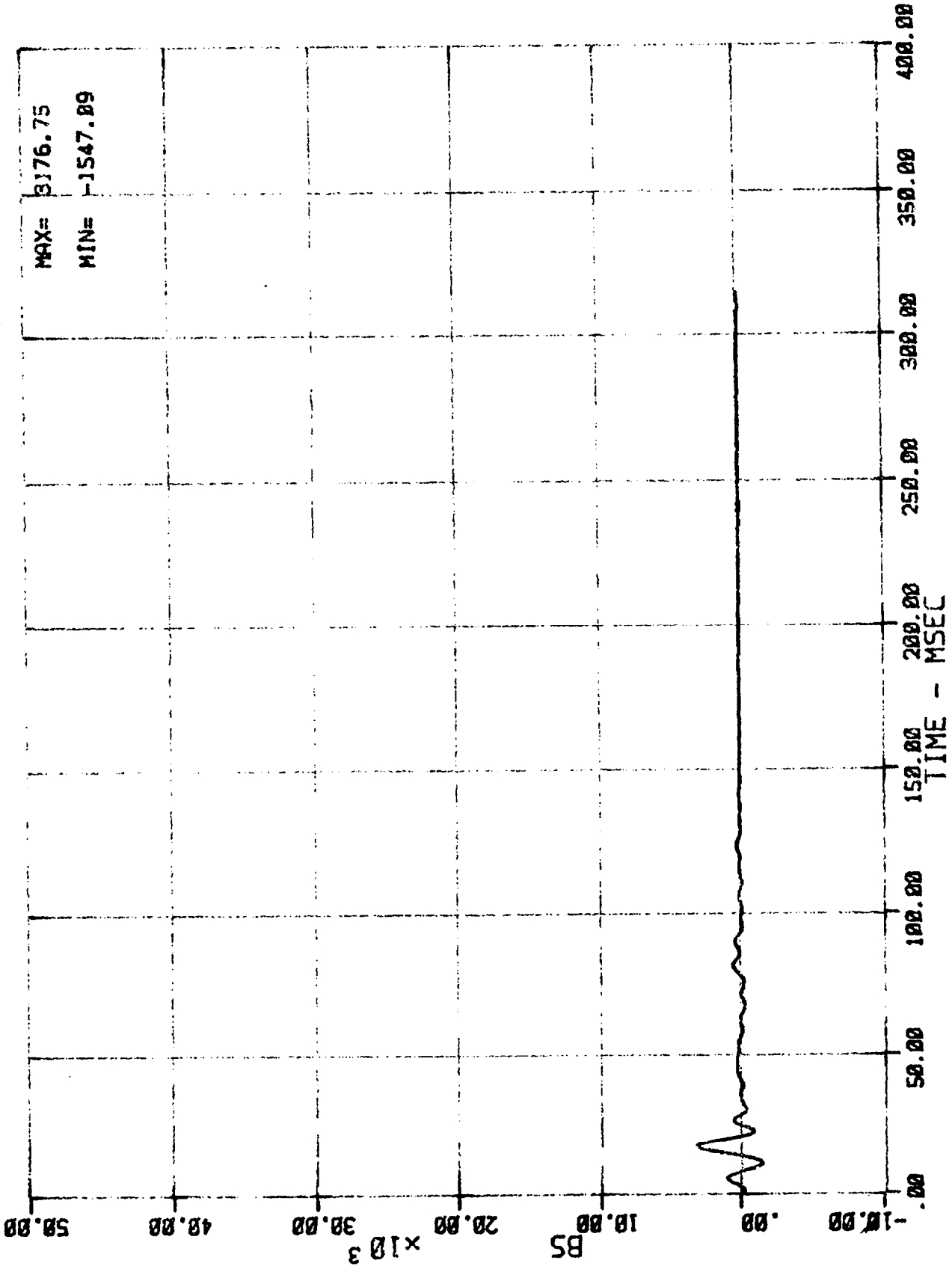
34 LC BR N BR3 (BARRIER LOAD CELL R3 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



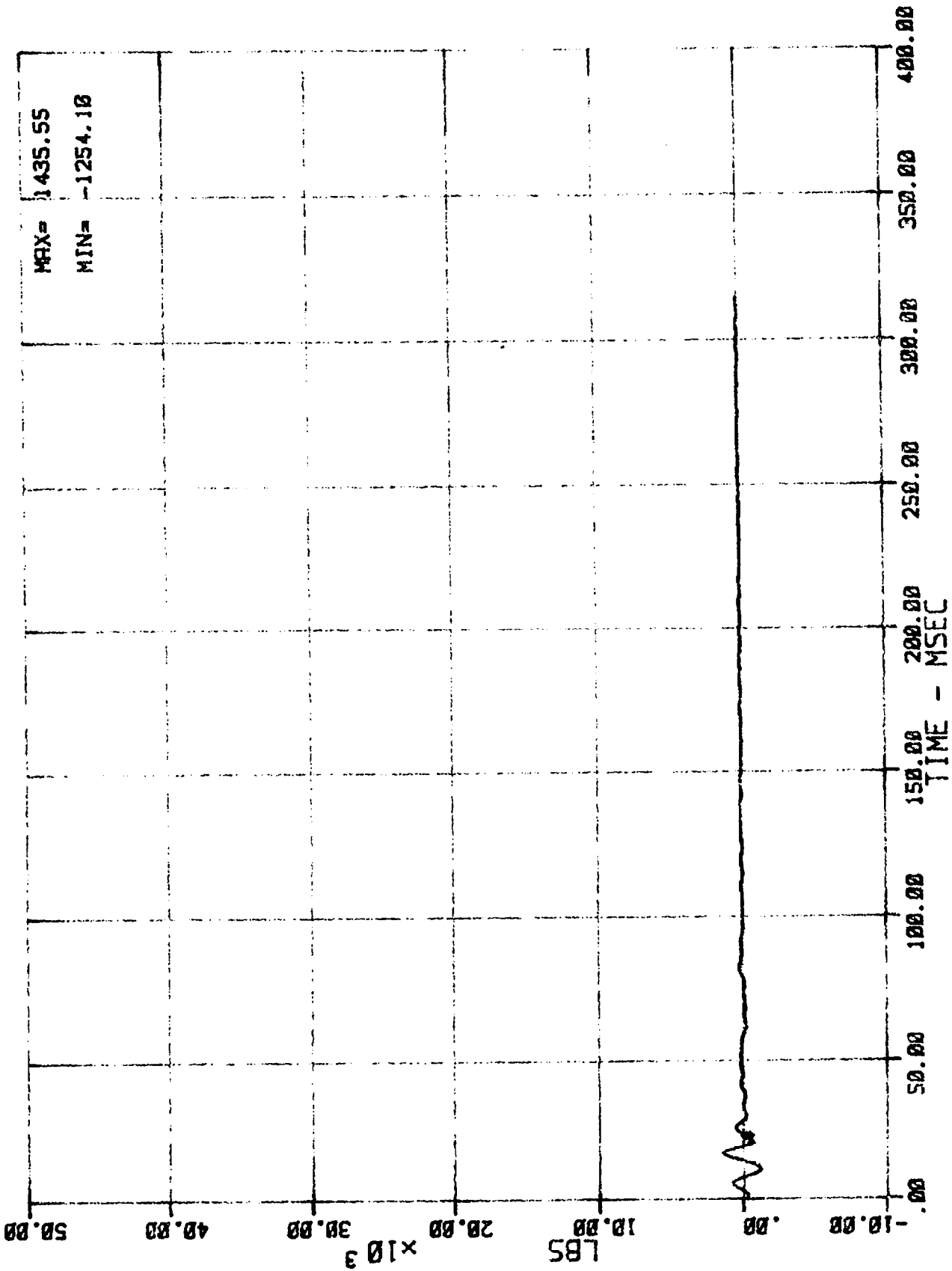
35 LC 8A N 8A4 (BARRIER LOAD CELL A4 - FORCE)  
MSE N07058 1988 DODGE 0150 PICKUP

03/22/88



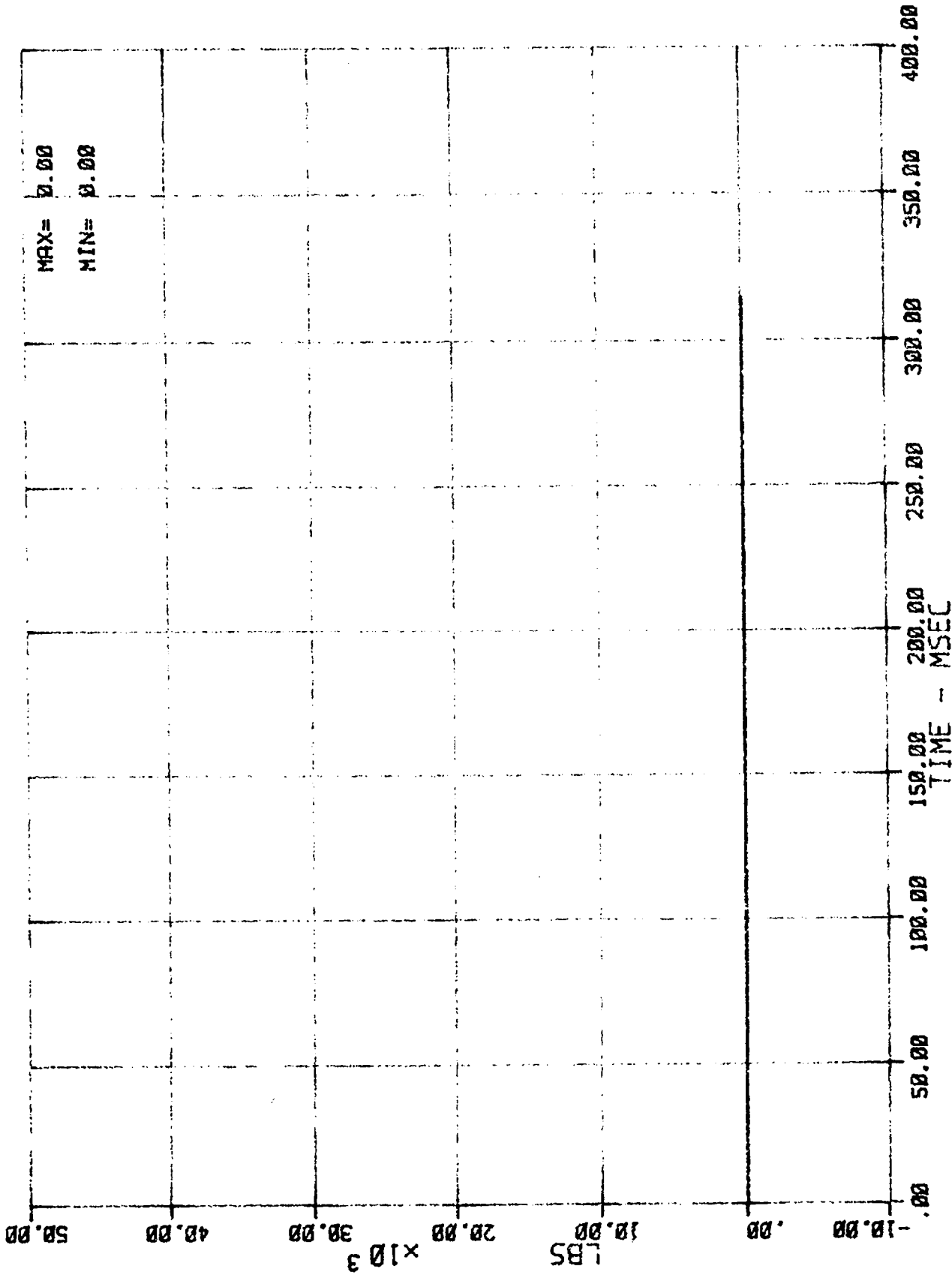
36 LC BA N BA5 (BARRIER LOAD CELL AS - FORCE)  
MSE N07056 1988 DODGE D150 PICKUP

03/22/88



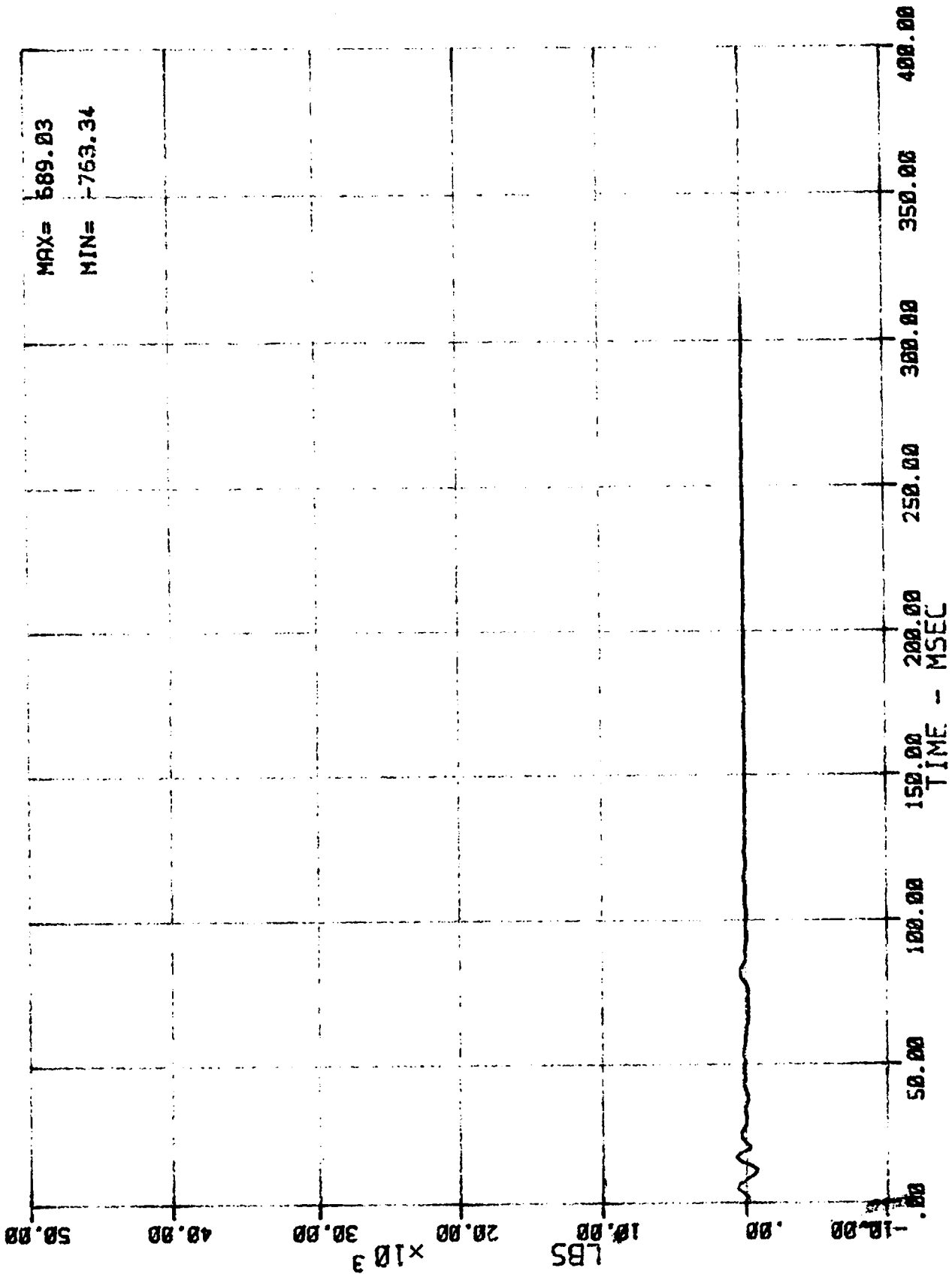
37 LC BA N BA6 (BARRIER LOAD CELL A6 - FORCE)  
 MSE N07058 1988 DODGE D150 PICKUP

03/22/88



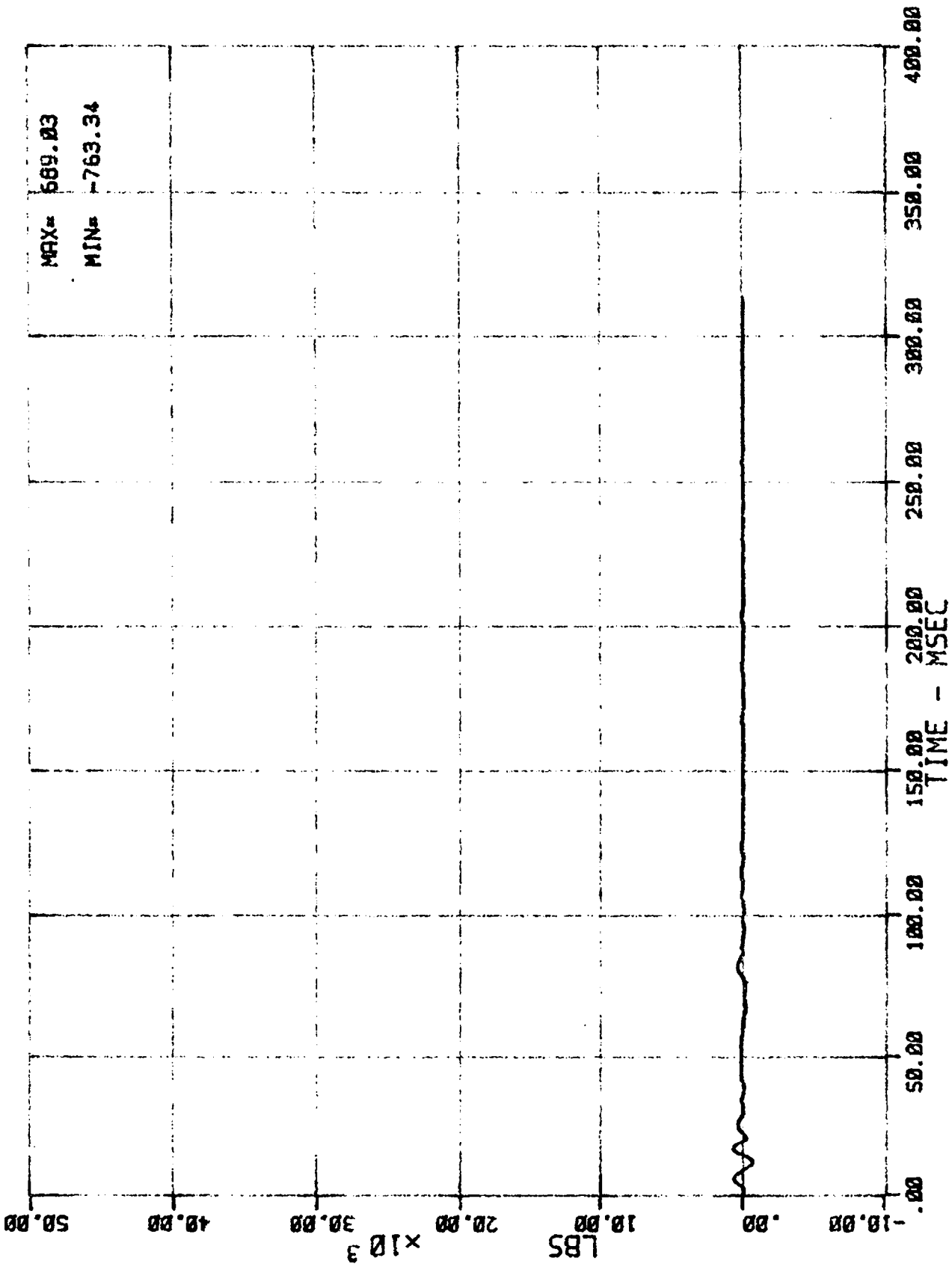
38 LC BA N BA7 (BARRIER LOAD CELL A7 - FORCE)  
 MSE N07058 1988 DODGE D150 PICKUP

03/22/88



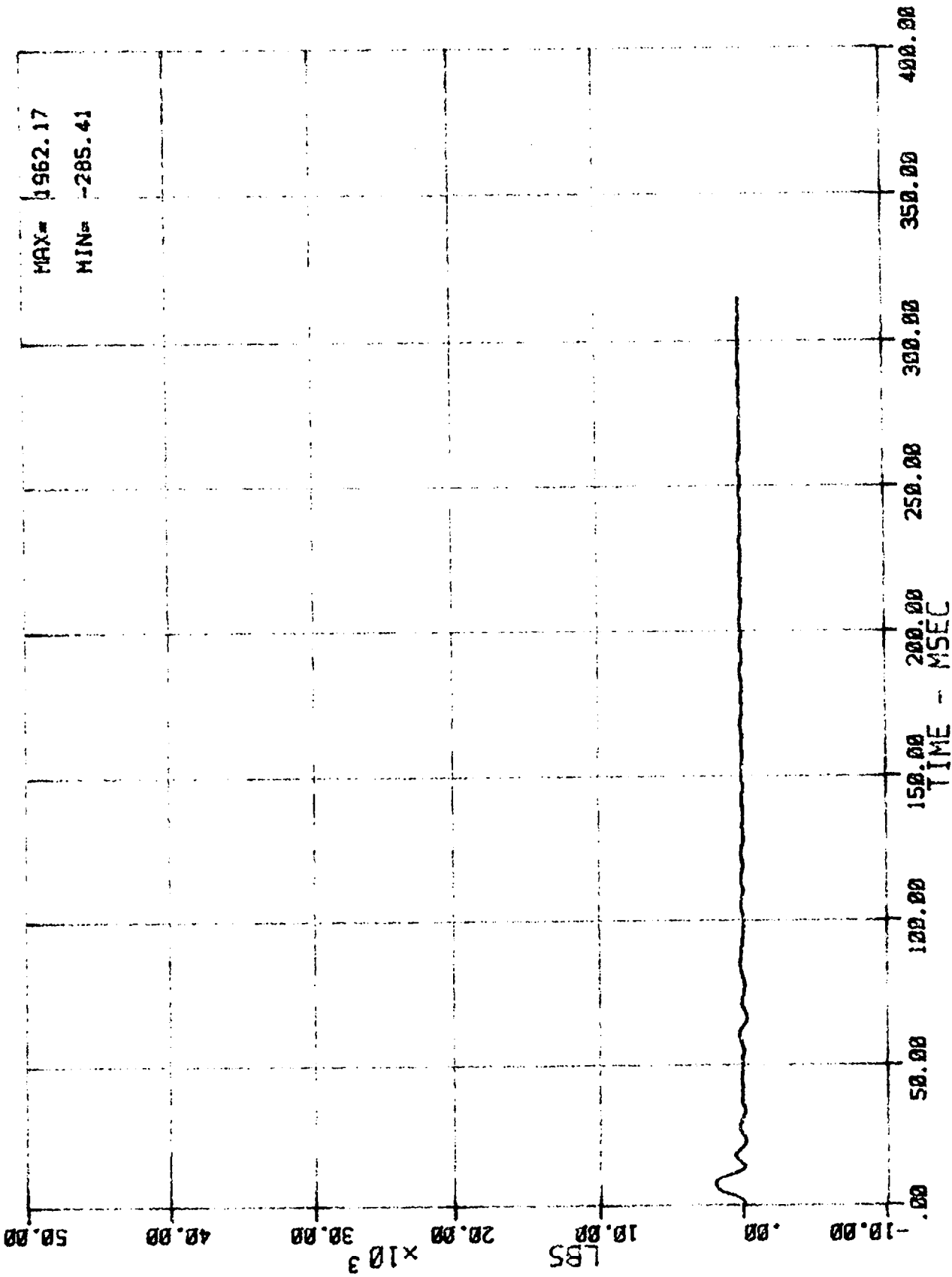
39 LC 8A N 8A8 (BARRIER LOAD CELL AB - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



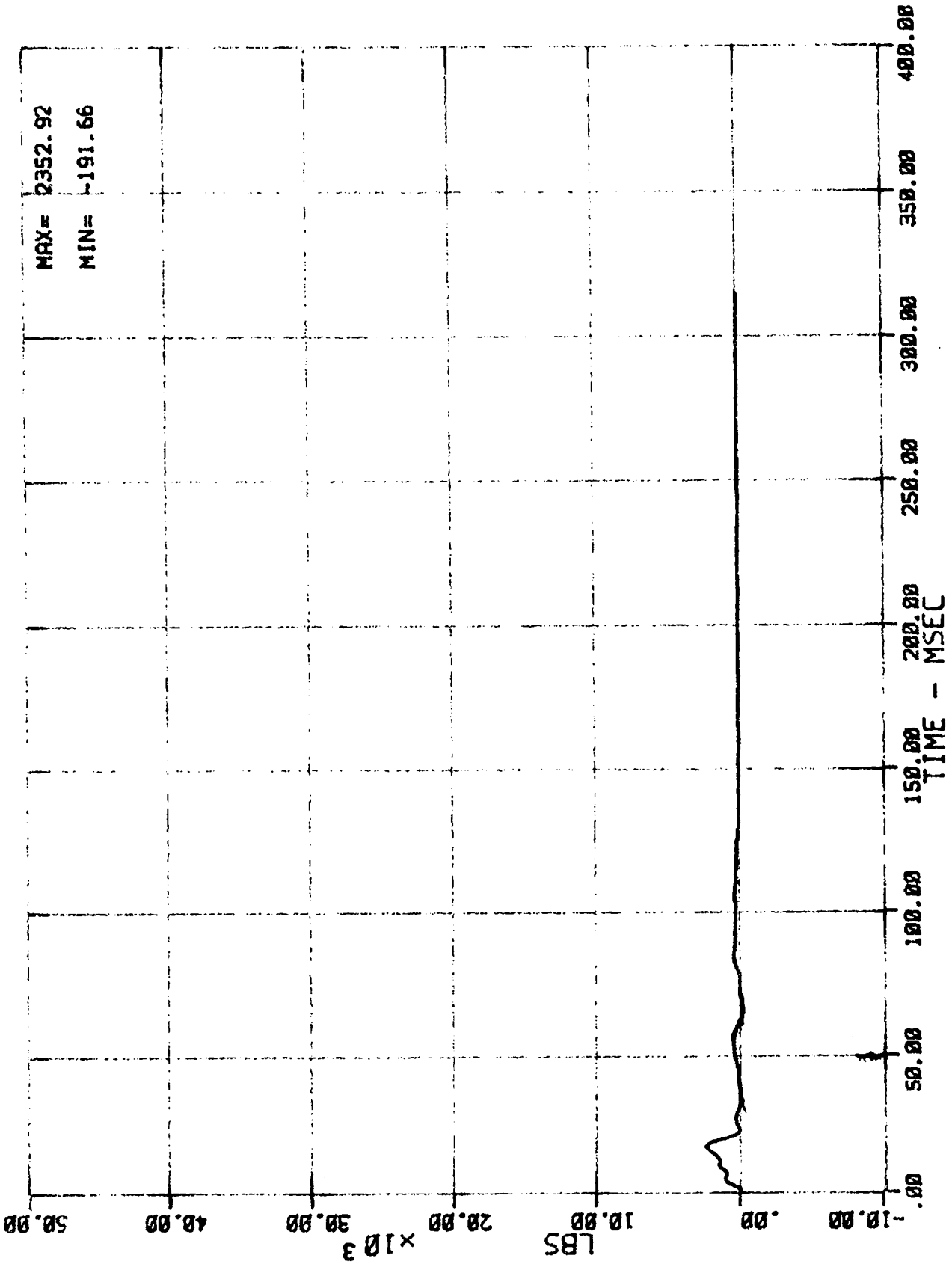
40 LC BA N BA9 (BARRIER LOAD CELL A9 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



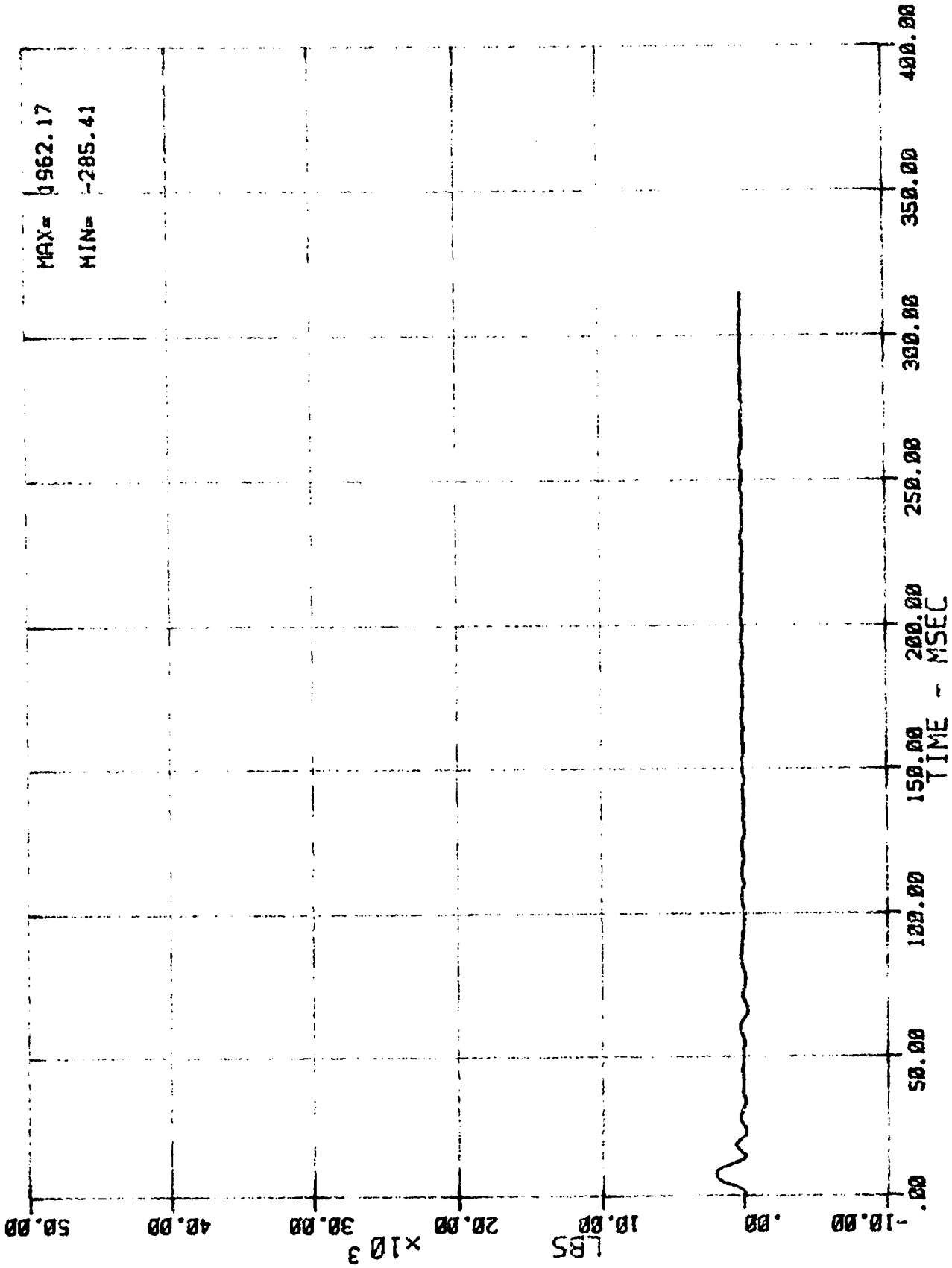
41 LC BA N BB1 (BARRIER LOAD CELL B1 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



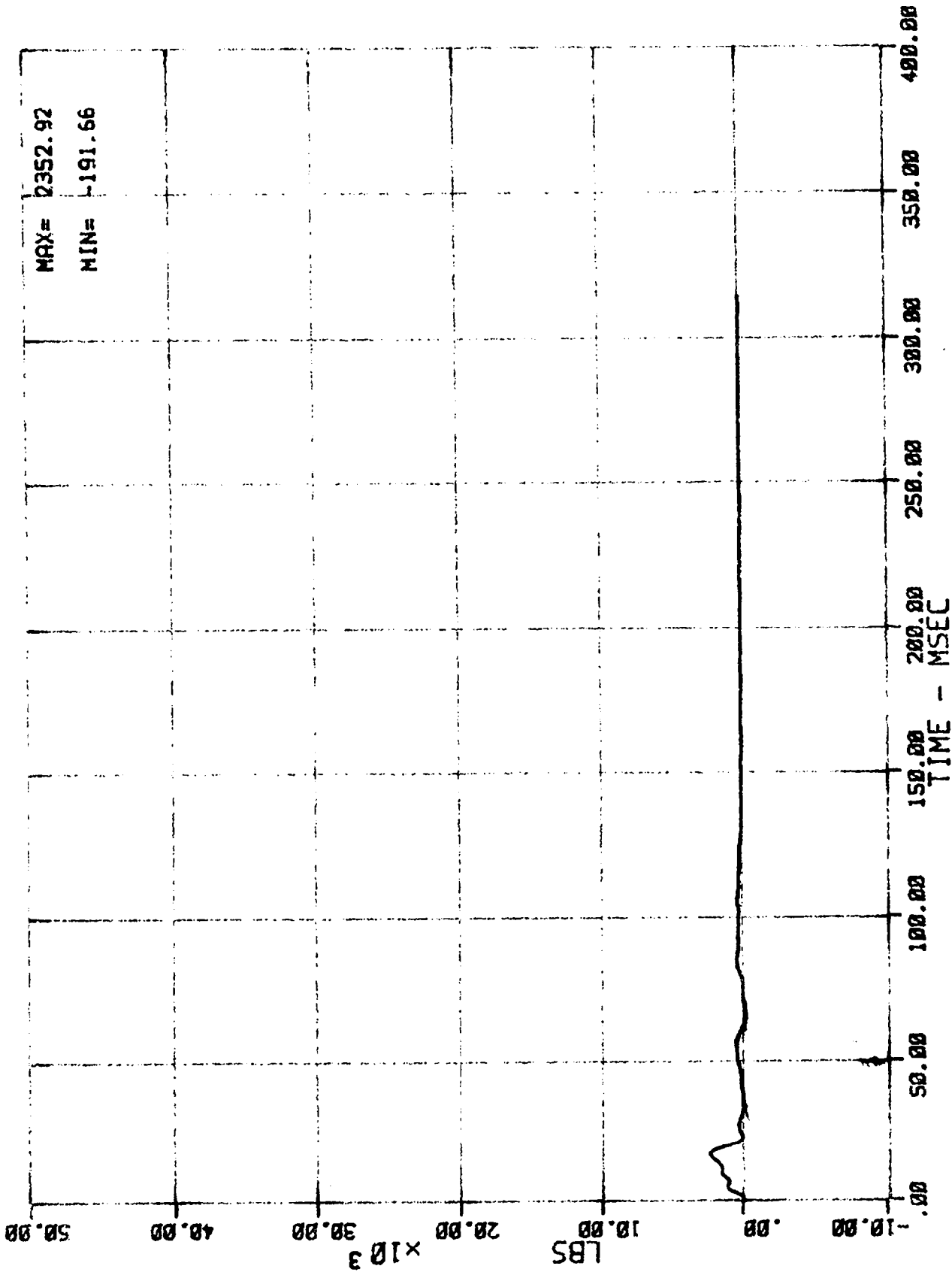
42 LC BA N 002 (BARRIER LOAD CELL B2 - FORCE)  
MSE N07056 1988 DODGE D150 PICKUP

03/22/88



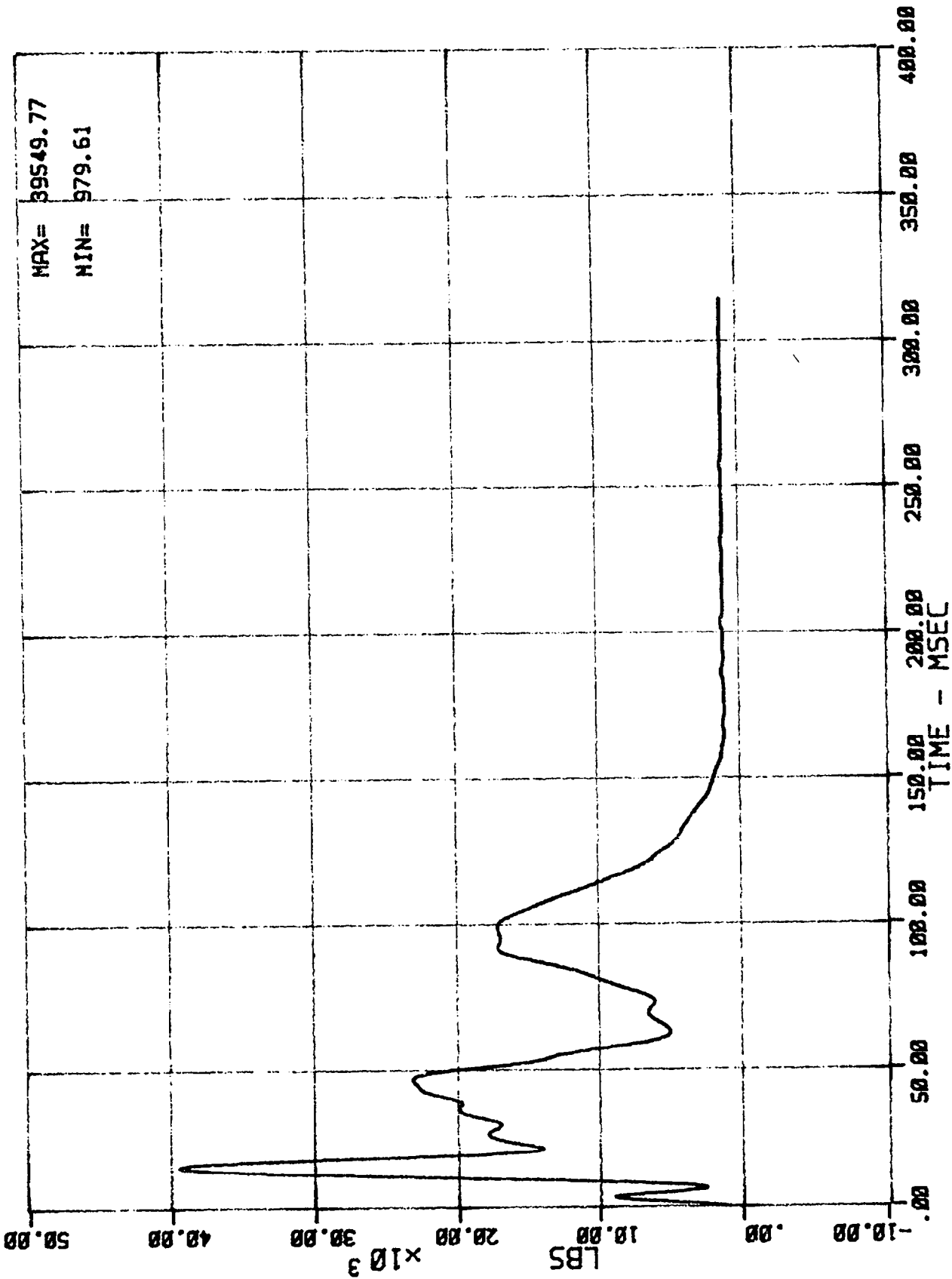
41 LC BA N BB1 (BARRIER LOAD CELL B1 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



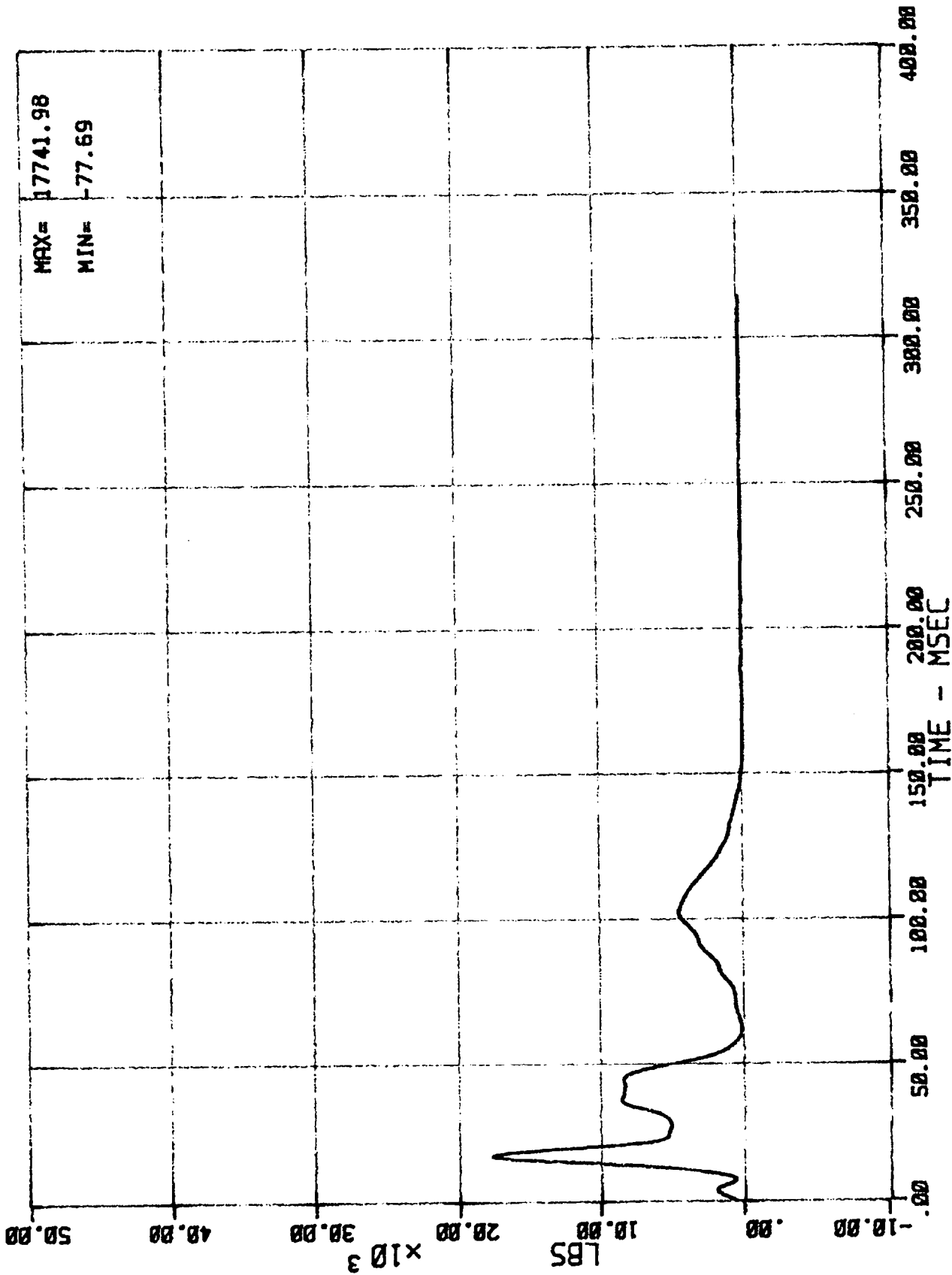
42 LC BA N BB2 (BARRIER LOAD CELL B2 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



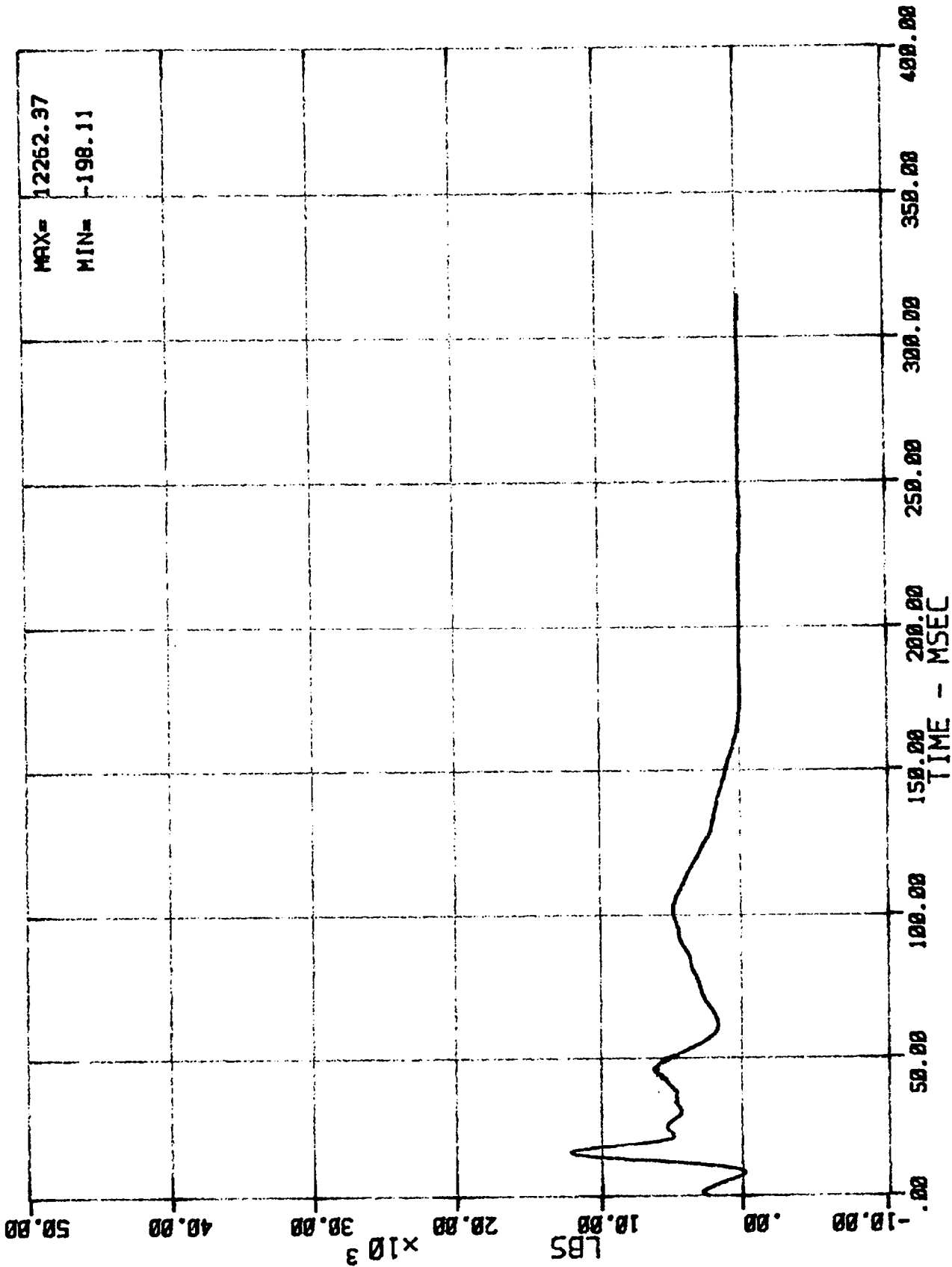
43 LC BA N B83 (BARRIER LOAD CELL B3 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



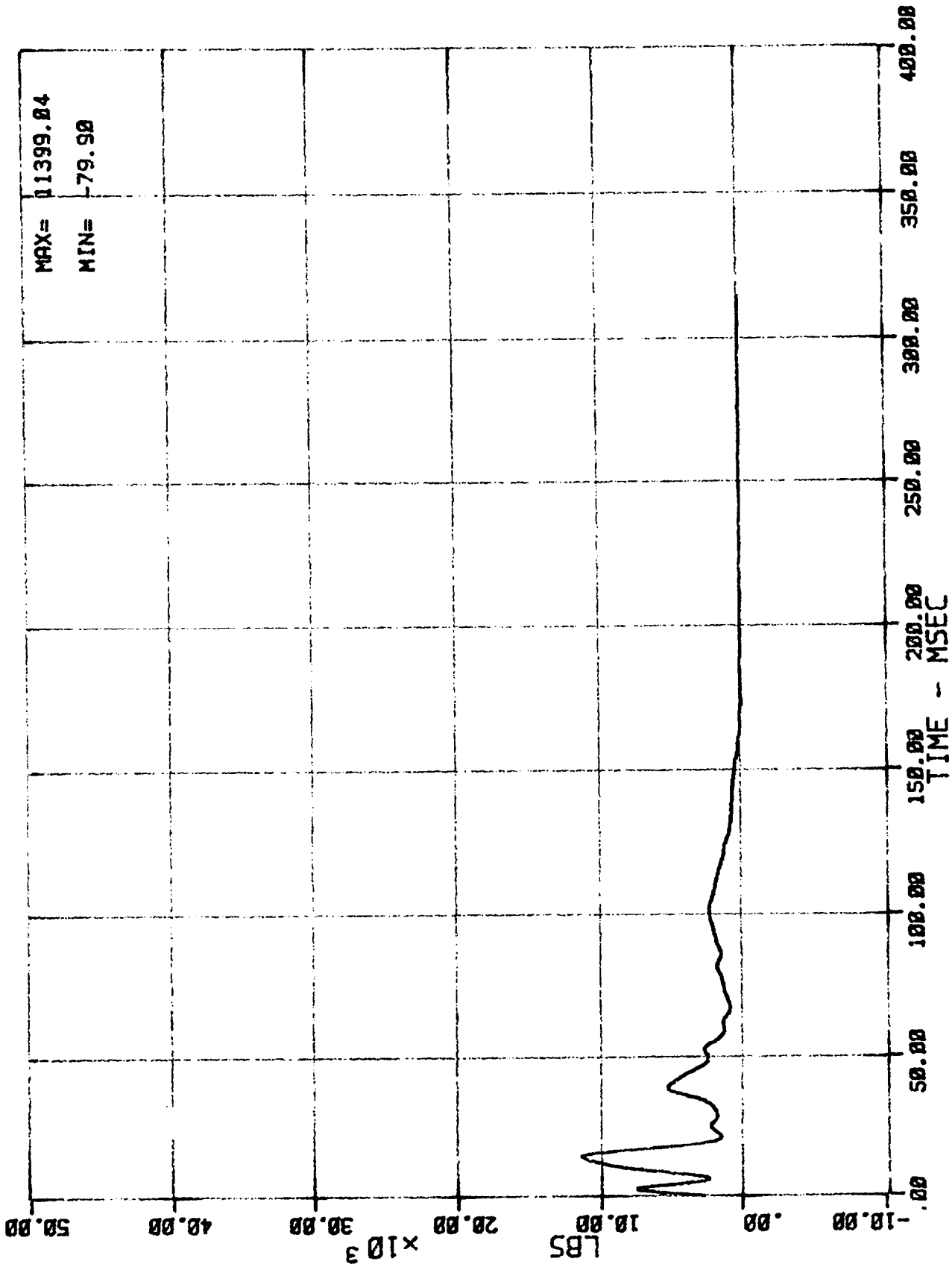
44 LC BR N 884 (BARRIER LOAD CELL B4 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



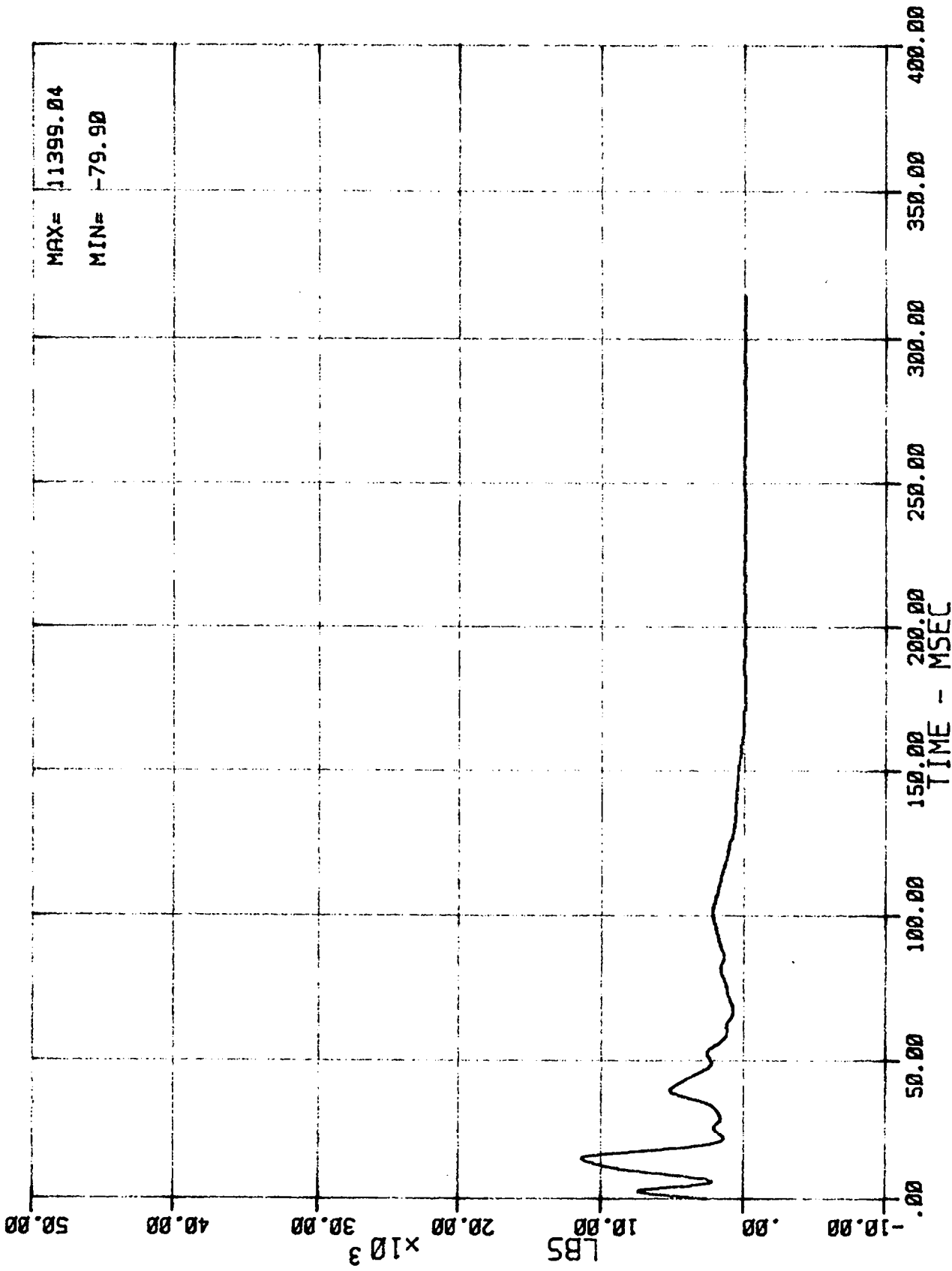
45 LC BA N BBS (BARRIER LOAD CELL BS - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



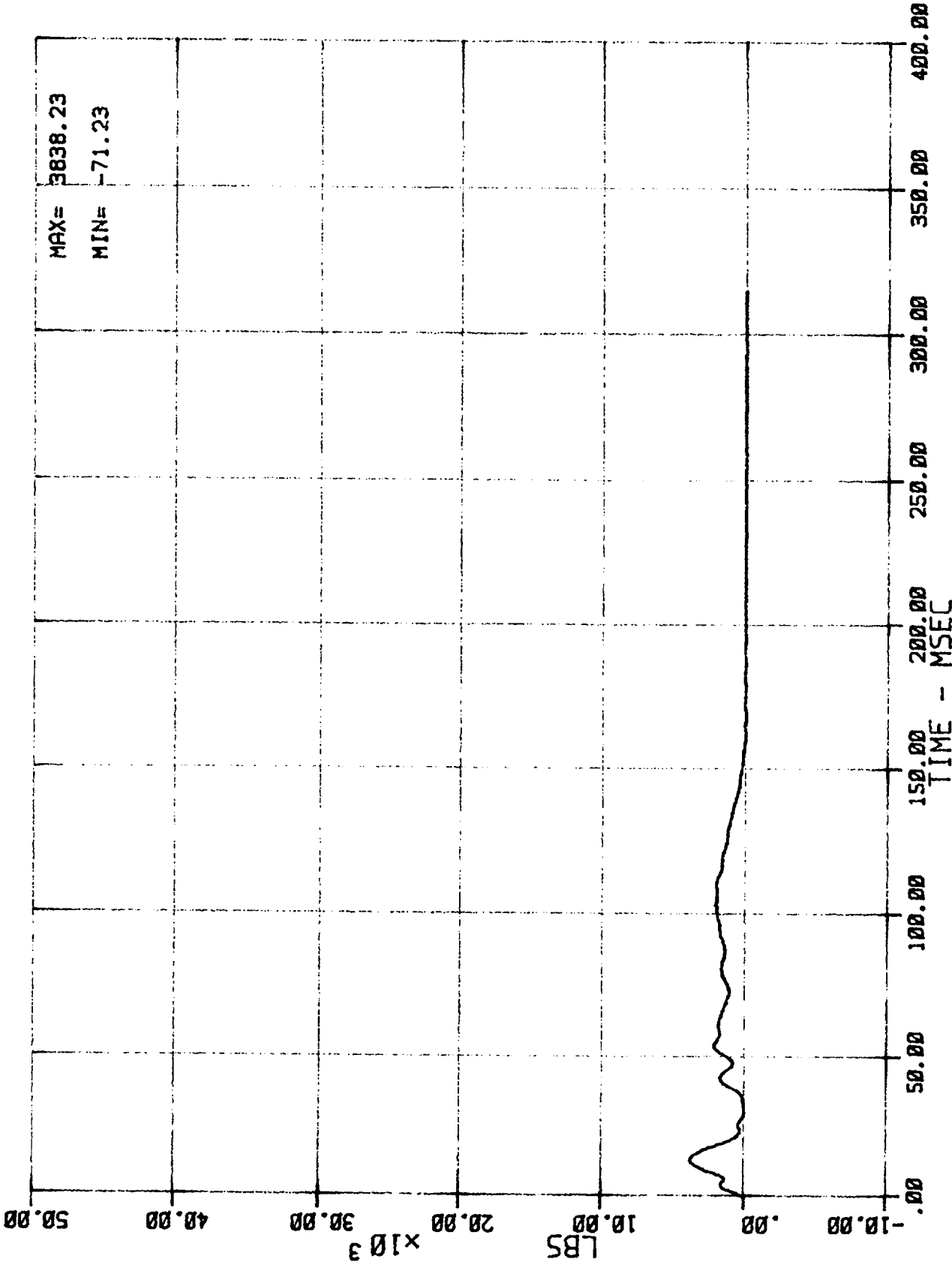
46 LC BA N 886 (BARRIER LOAD CELL B6 - FORCE)  
 MSE N07058 1988 DODGE D150 PICKUP

03/22/88



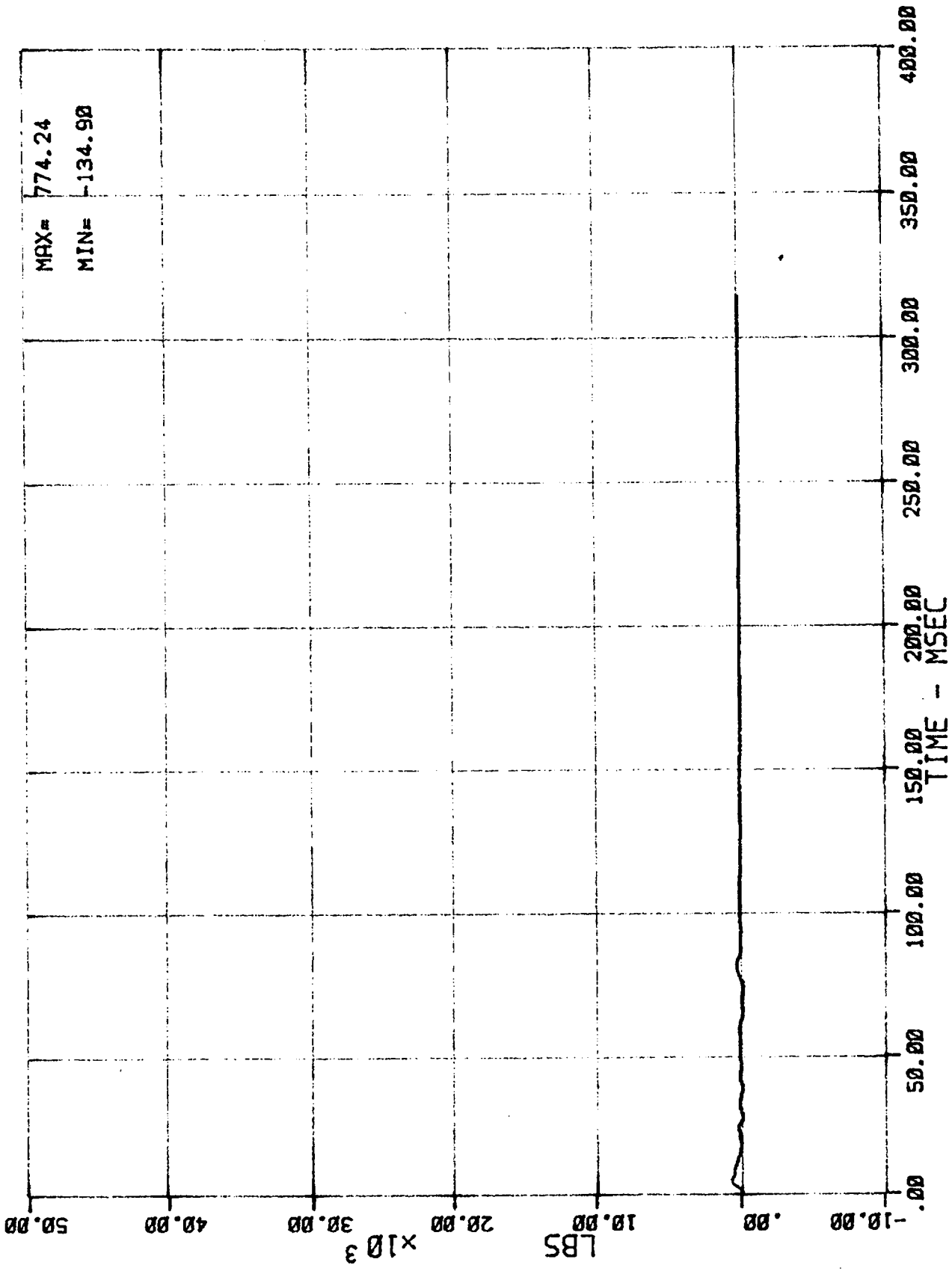
47 LC BA N BB7 (BARRIER LOAD CELL B7 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



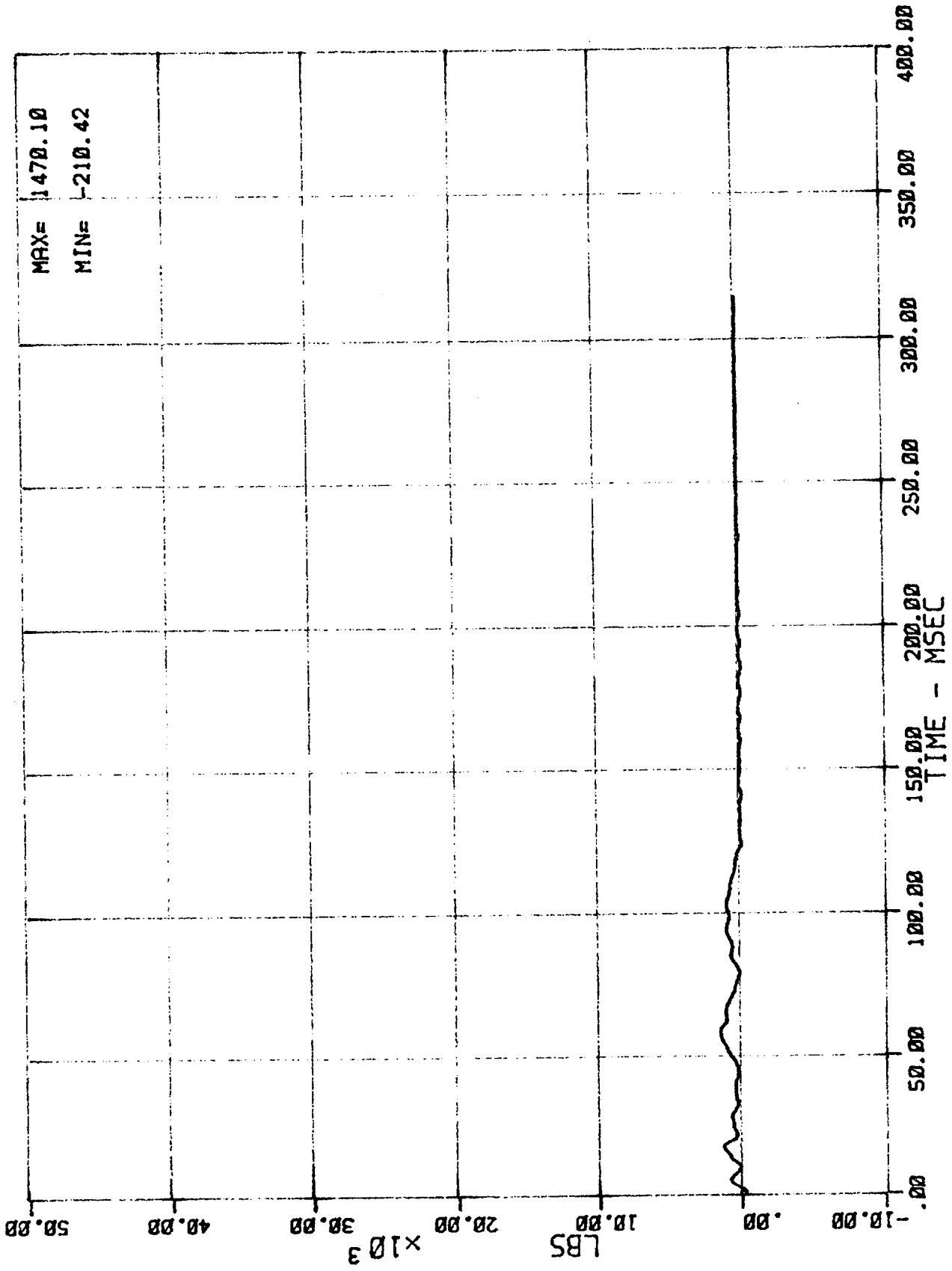
48 LC BA N BB8 (BARRIER LOAD CELL B8 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



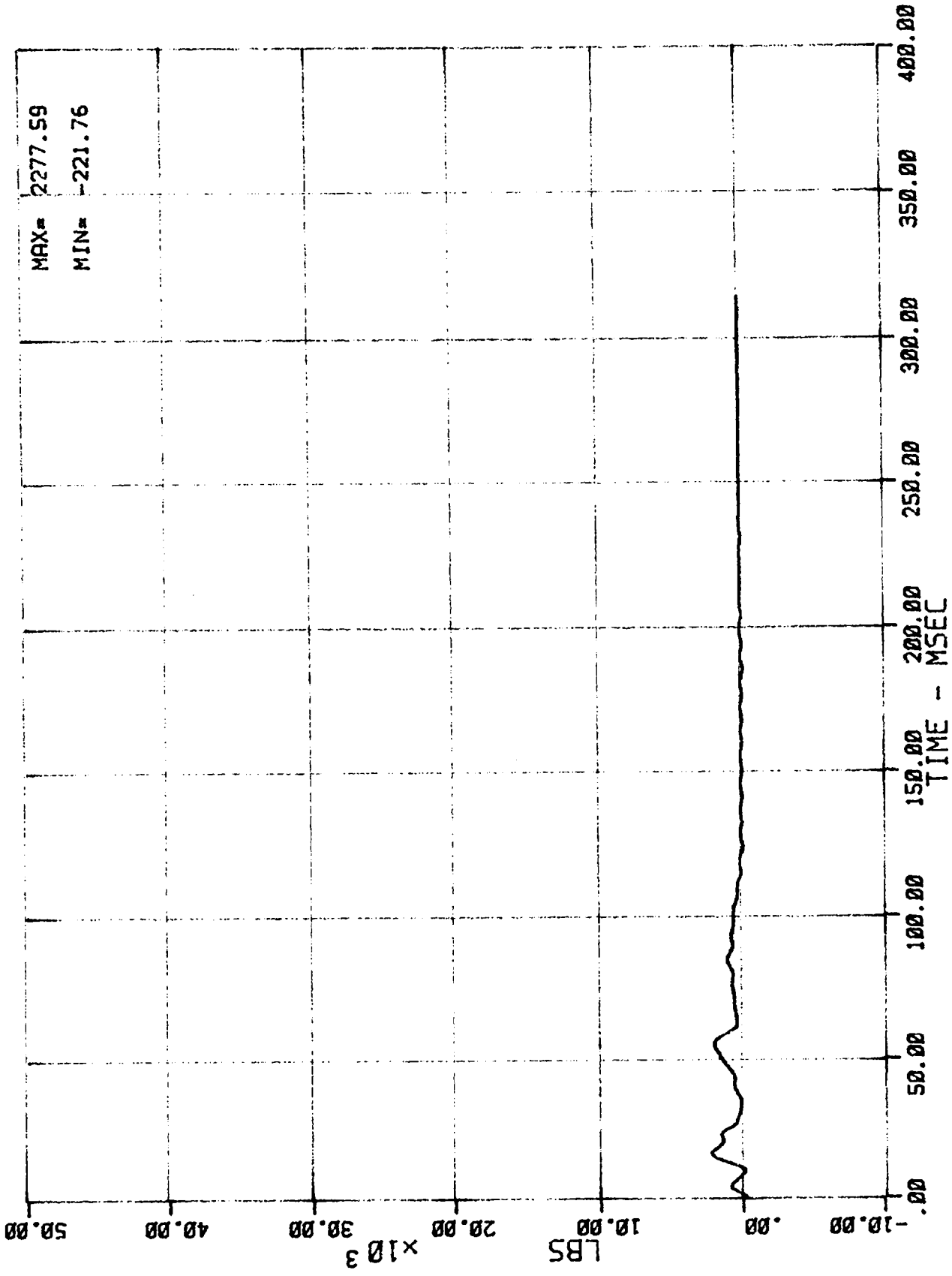
49 LC BA N BB9 (BARRIER LOAD CELL B9 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



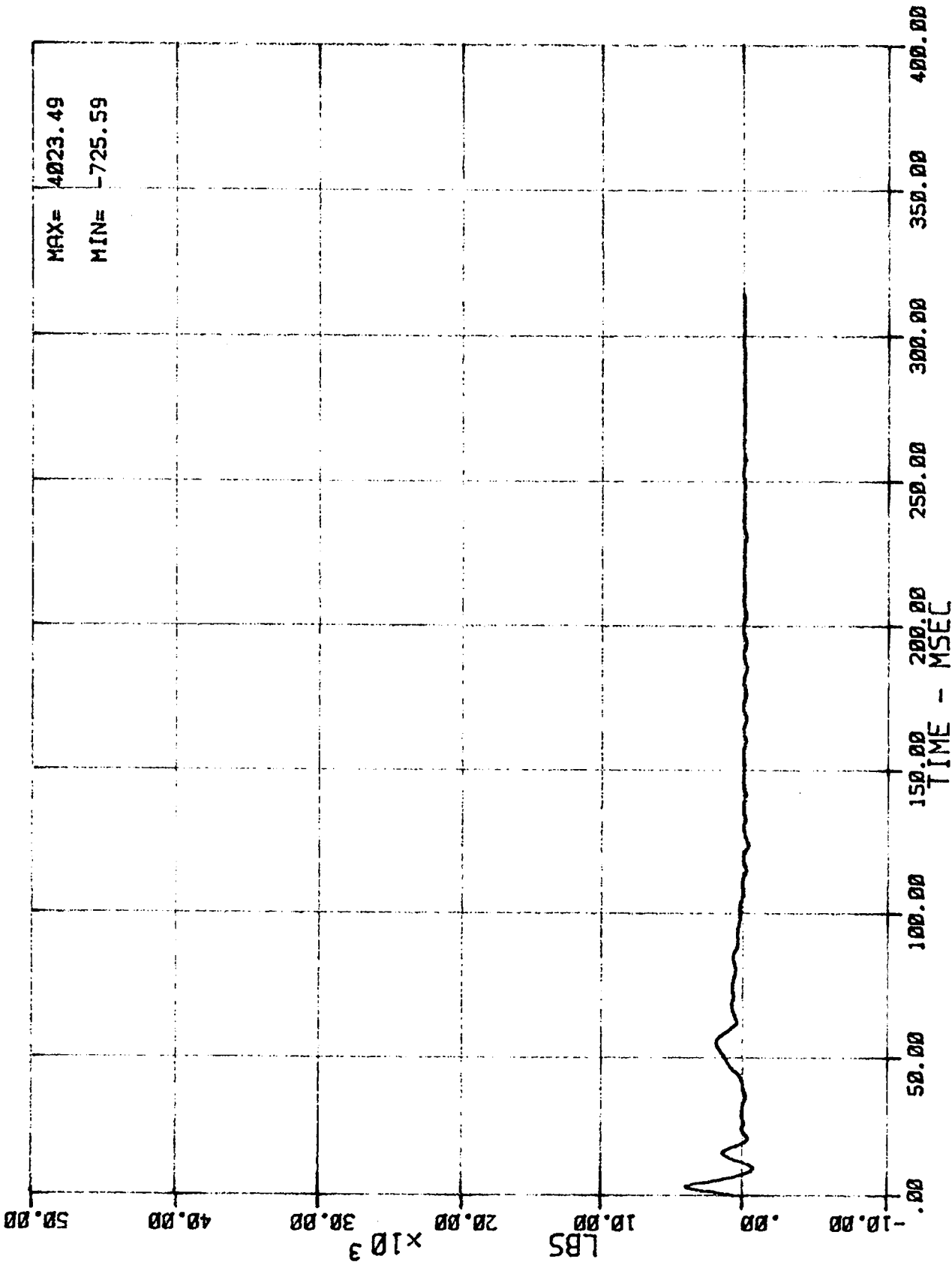
50 LC BA N BC1 (BARRIER LOAD CELL C1 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



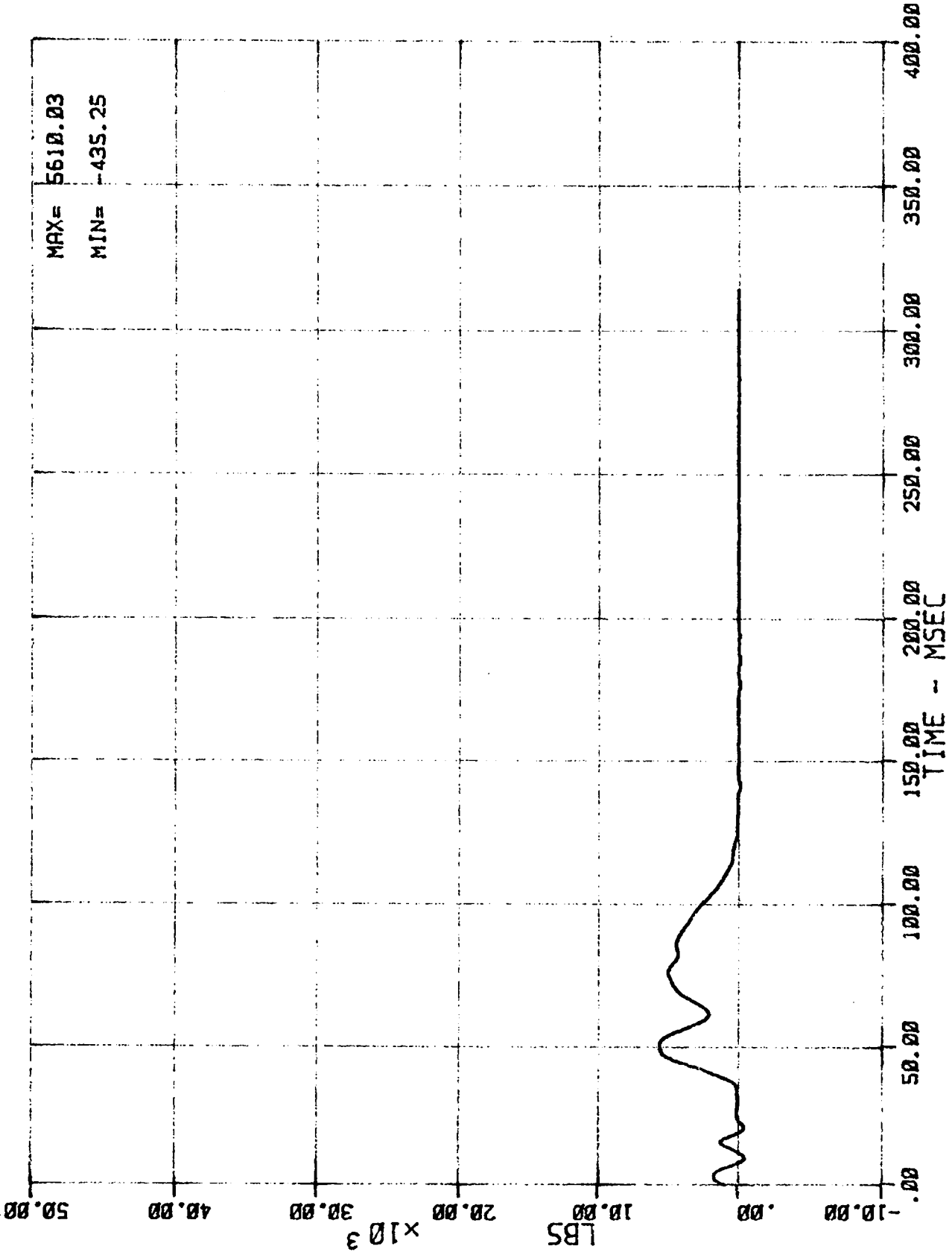
51 LC BA N BC2 (BARRIER LOAD CELL C2 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



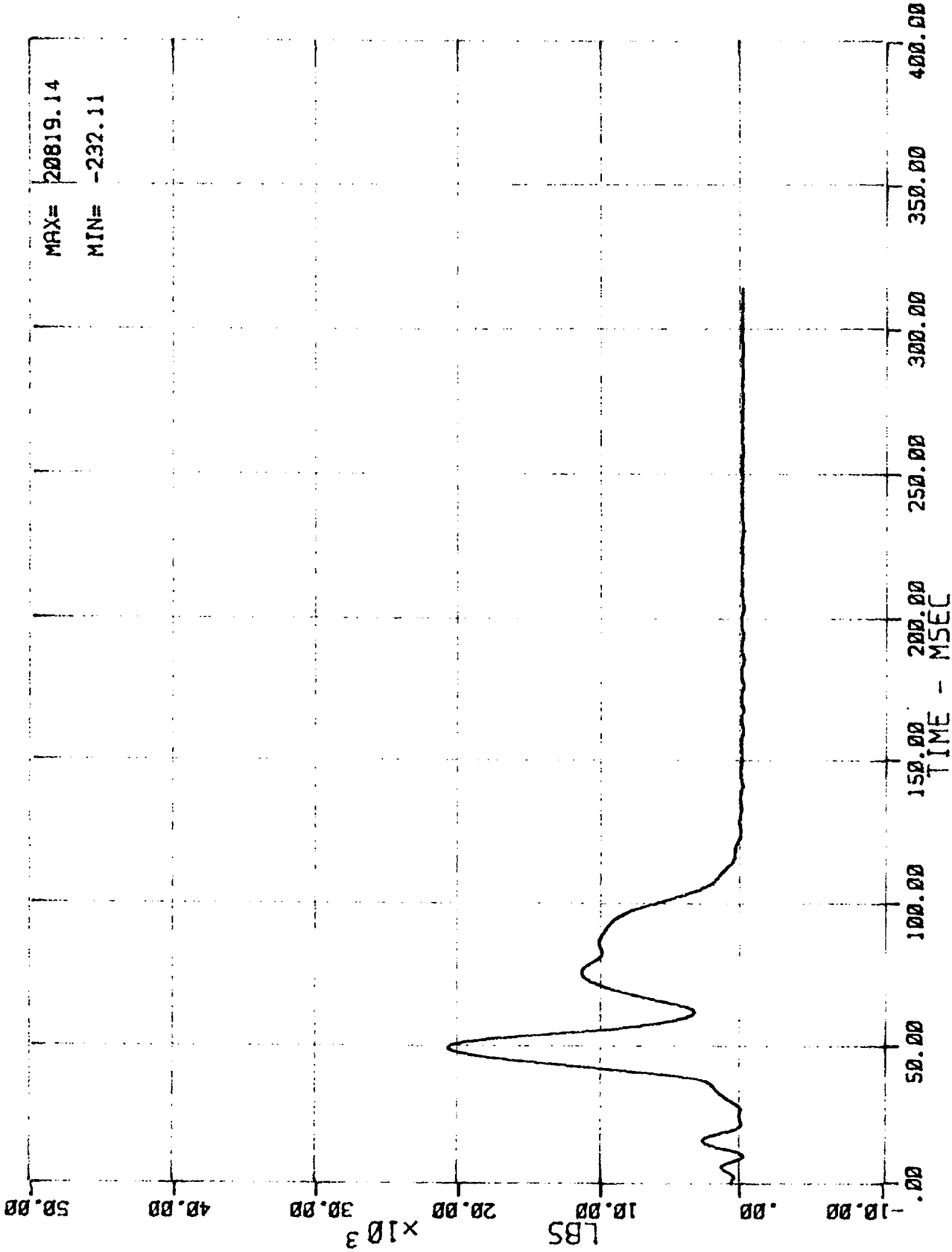
S2 LC BA N BC3 (BARRIER LOAD CELL C3 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



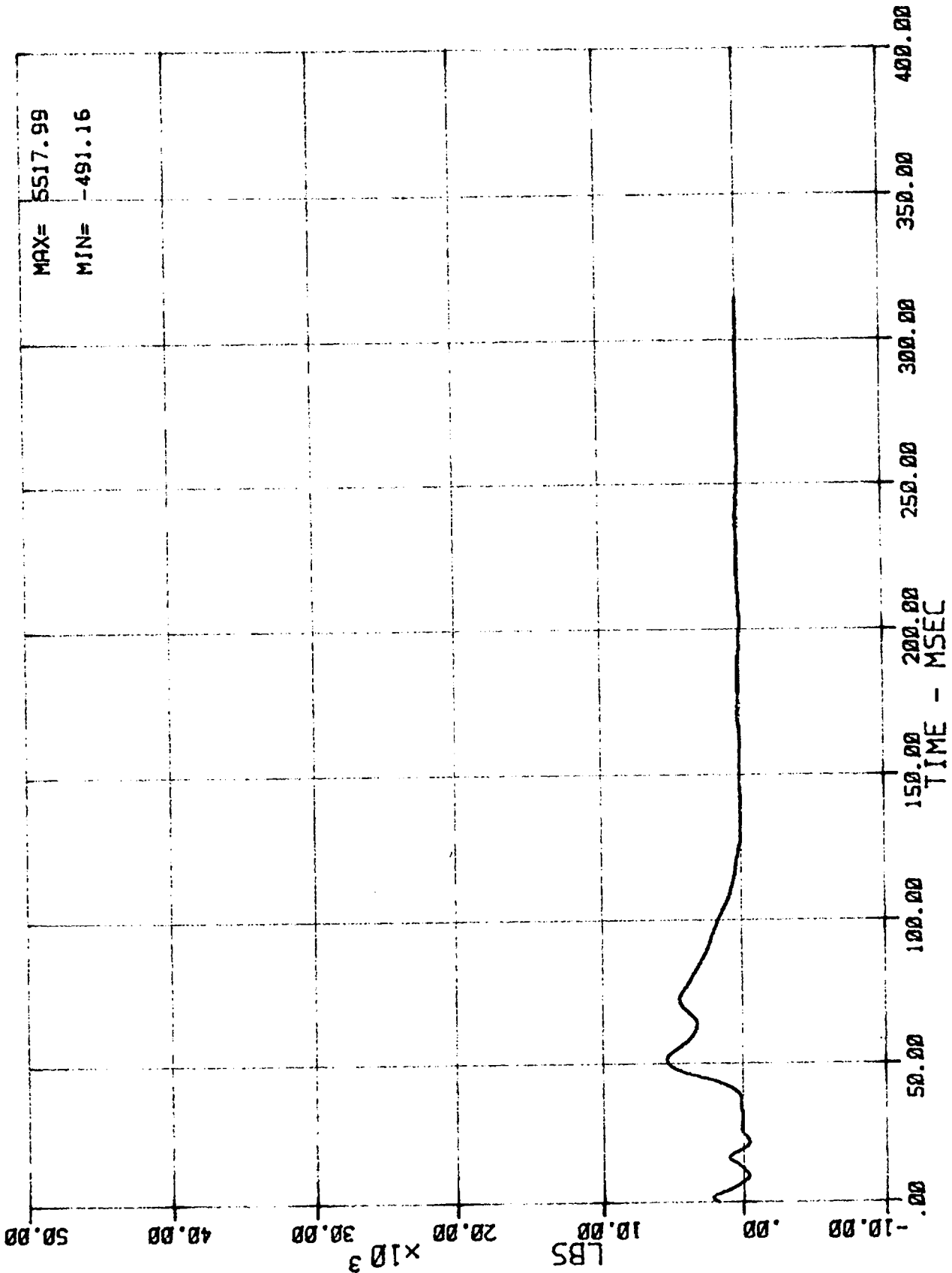
53 LC BA N BC4 (BARRIER LOAD CELL C4 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



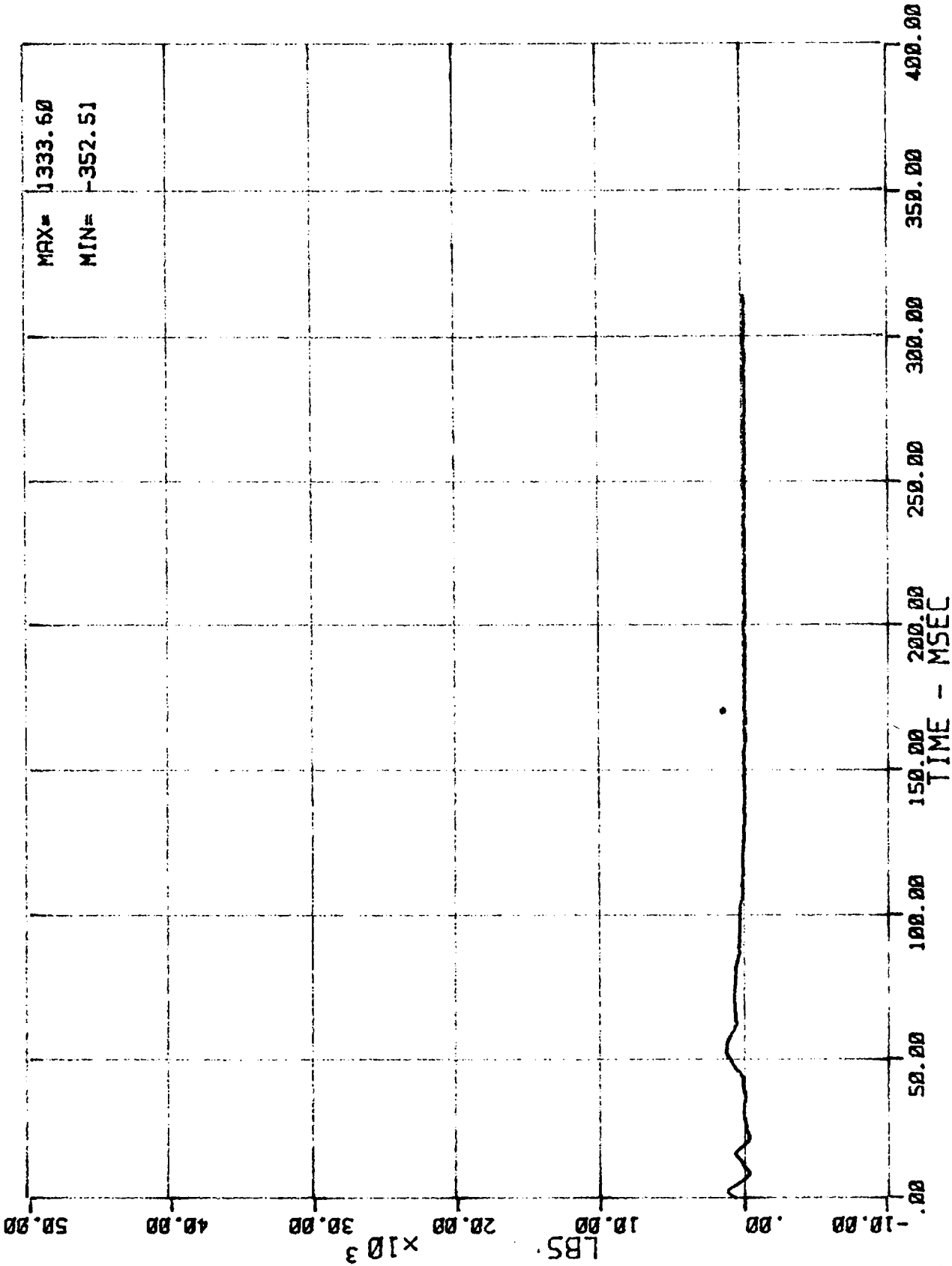
S4 LC BA N BC5 (BARRIER LOAD CELL C5 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



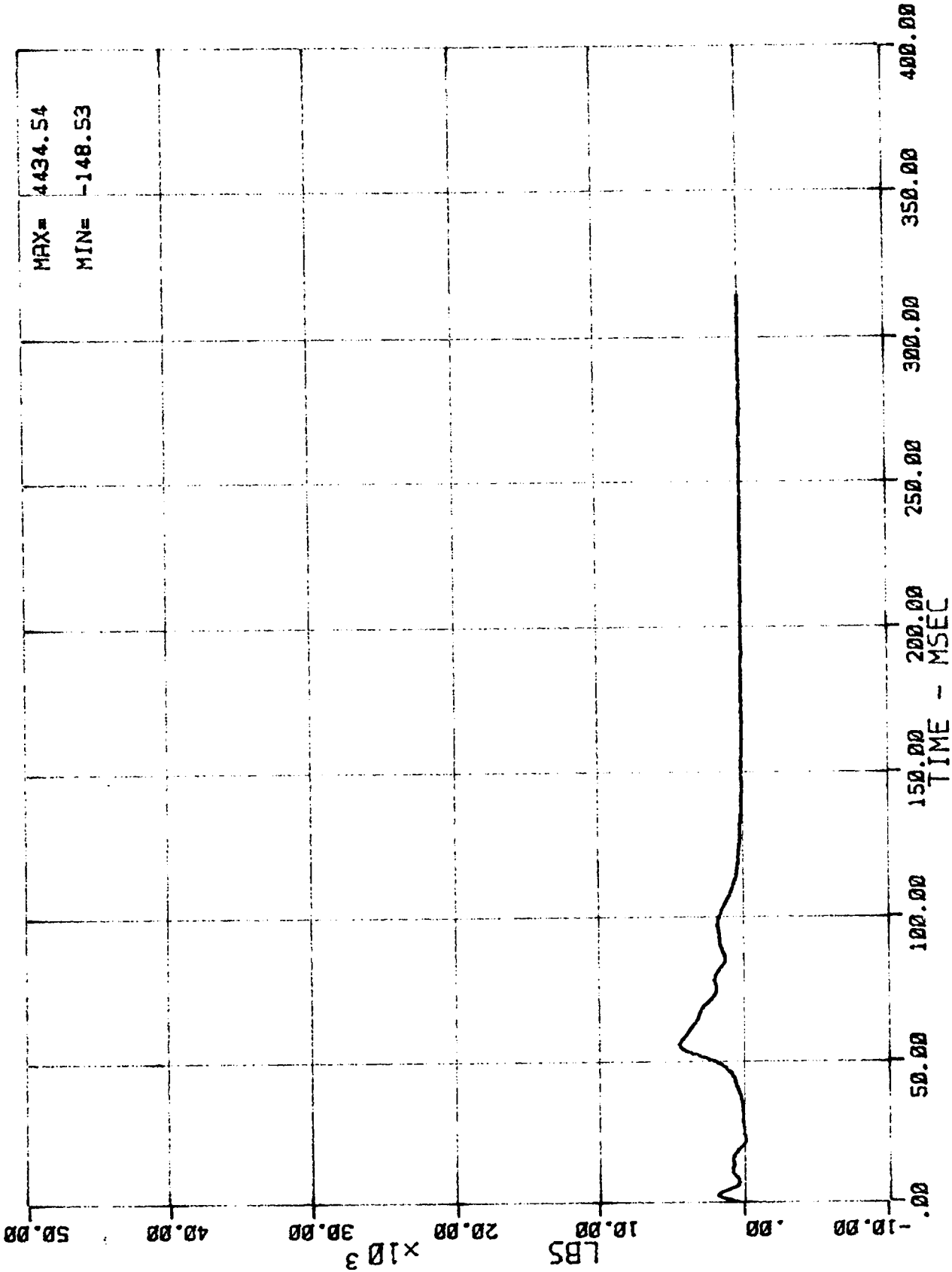
55 LC BA N BC6 (BARRIER LOAD CELL C6 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



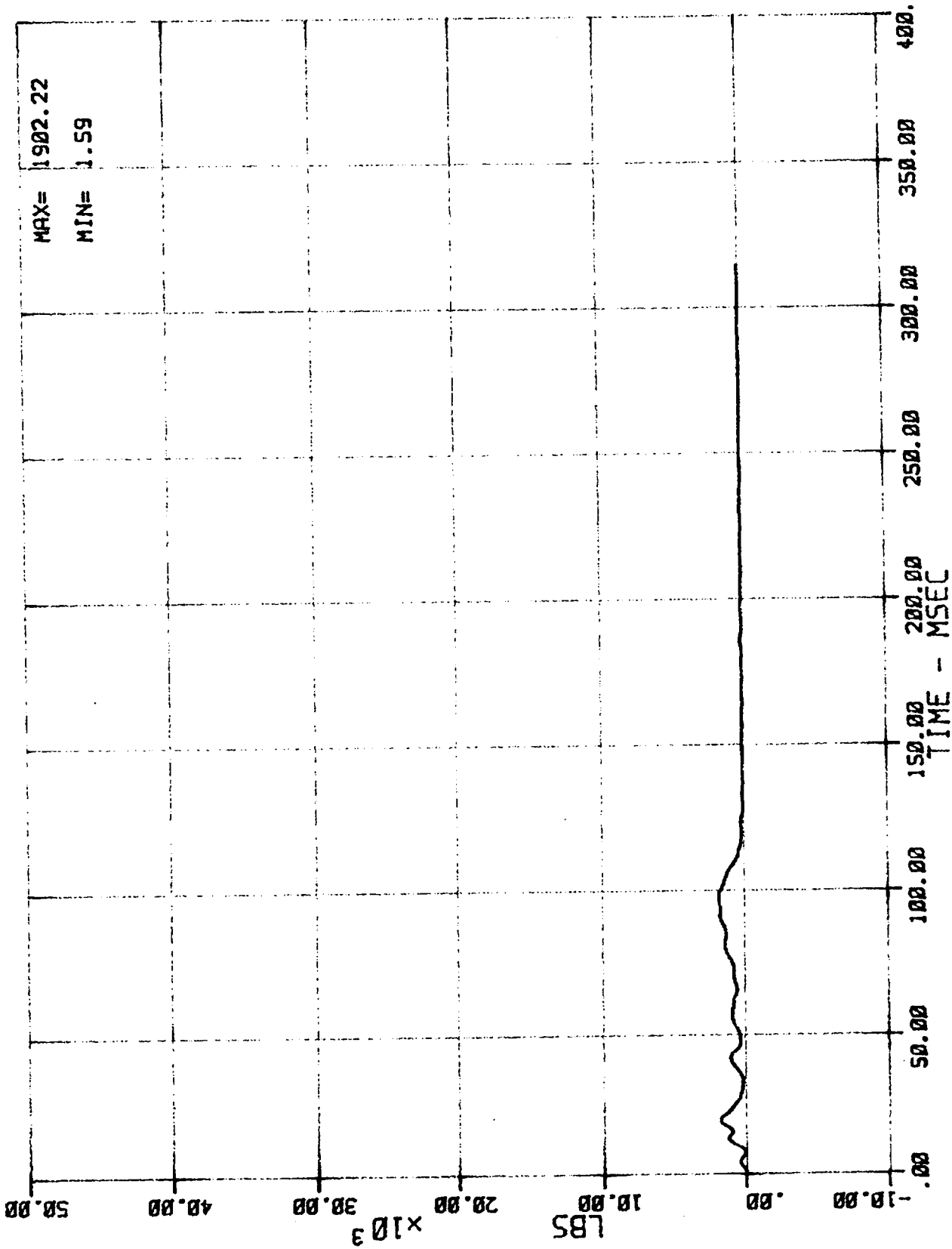
56 LC BA N BC7 (BARRIER LOAD CELL C7 - FORCE)  
 MSE N07058 1988 DODGE D150 PICKUP

03/22/88



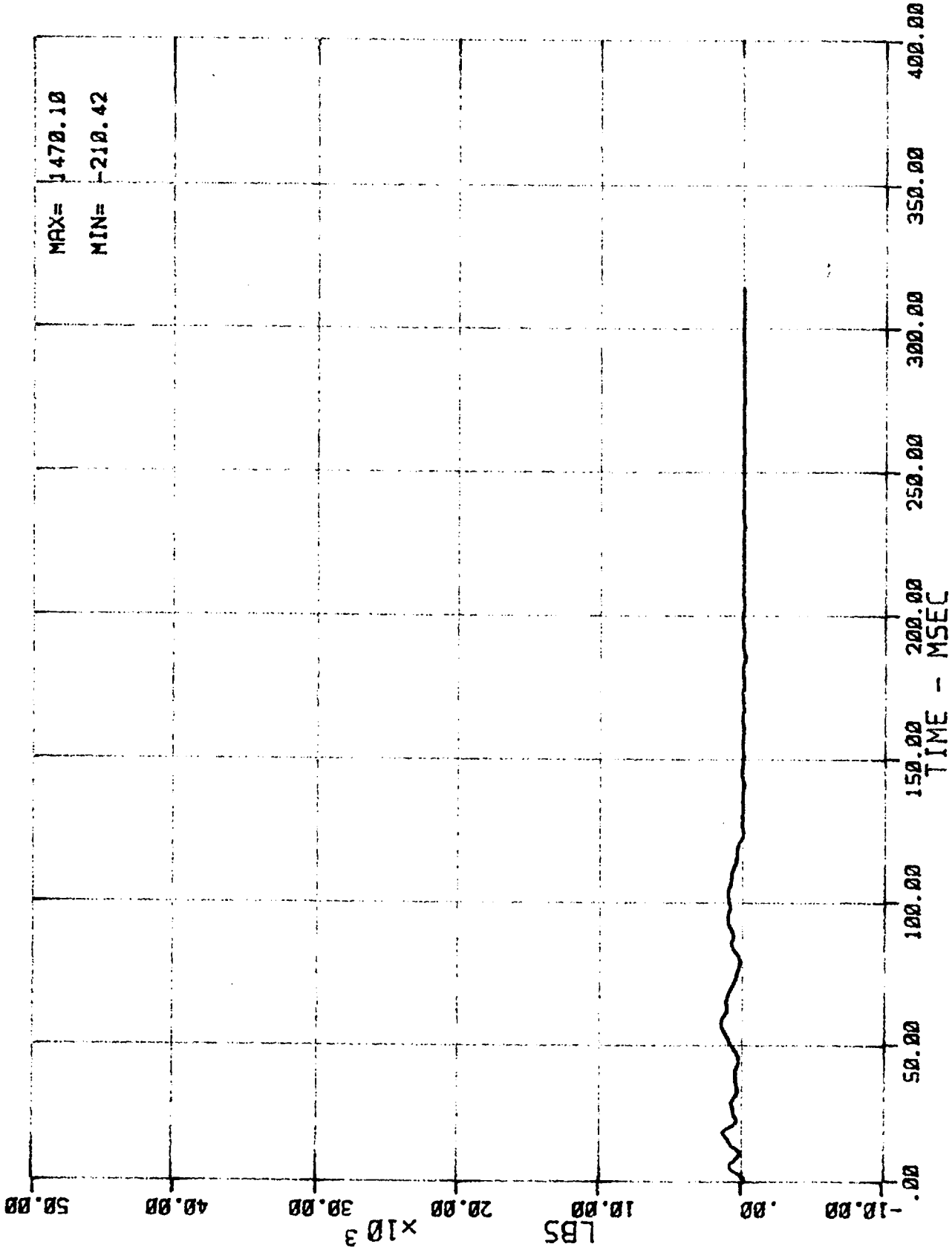
57 LC BA N BC8 (BARRIER LOAD CELL CB - FORCE)  
 MSE N07058 1988 DODGE D150 PICKUP

03/22/88



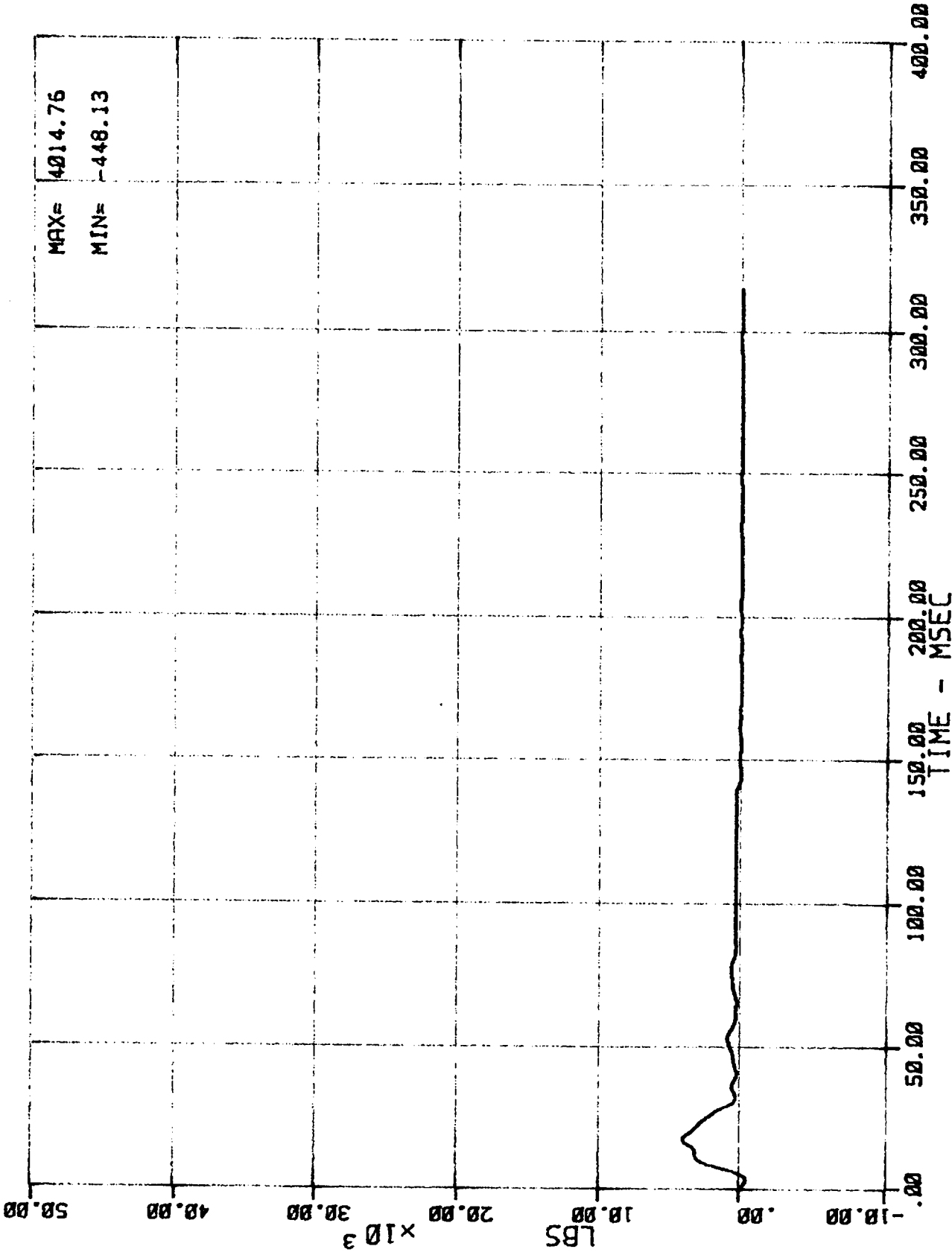
58 LC BA N BC9 (BARRIER LOAD CELL C9 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



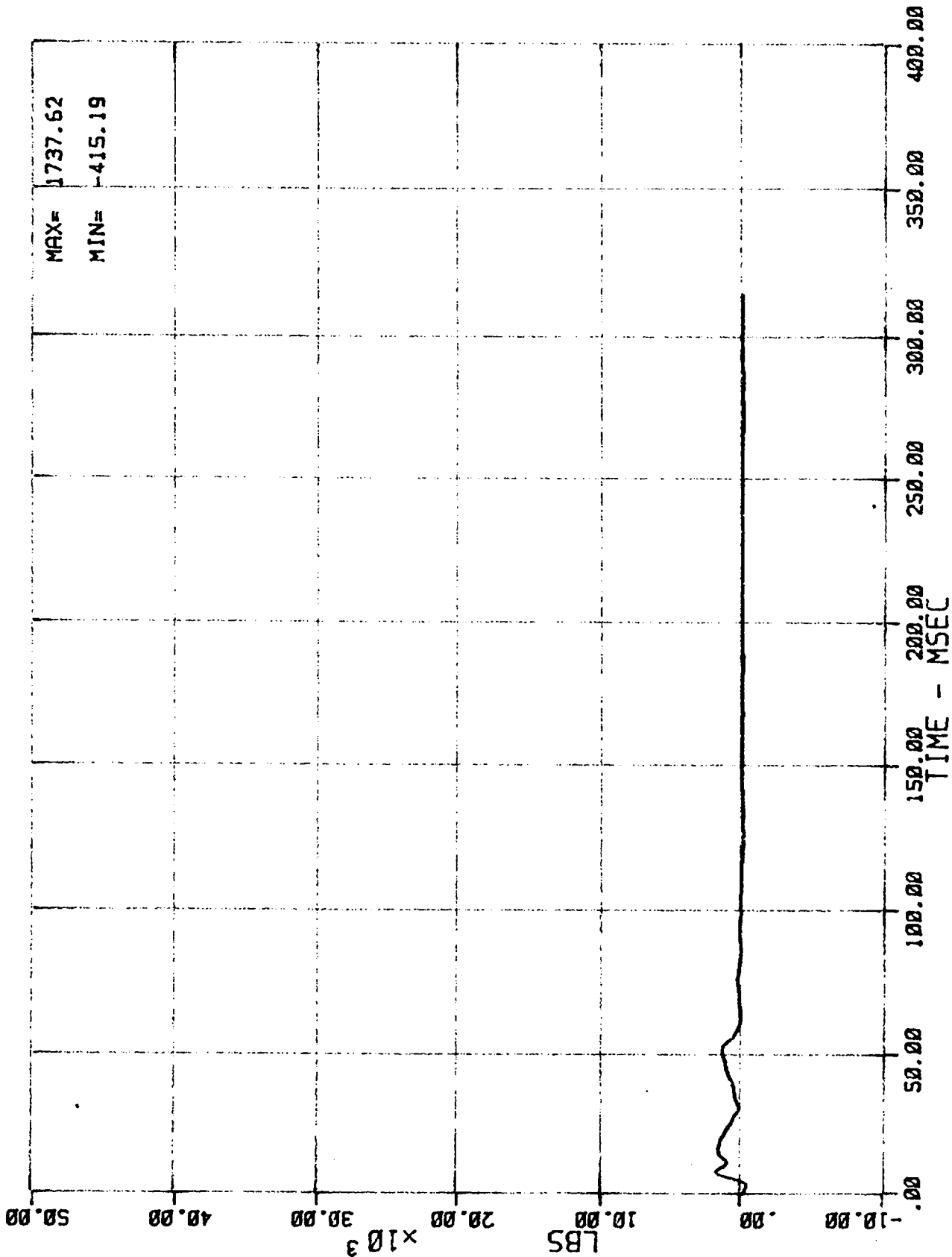
59 LC BA N BDI (BARRIER LOAD CELL D1 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



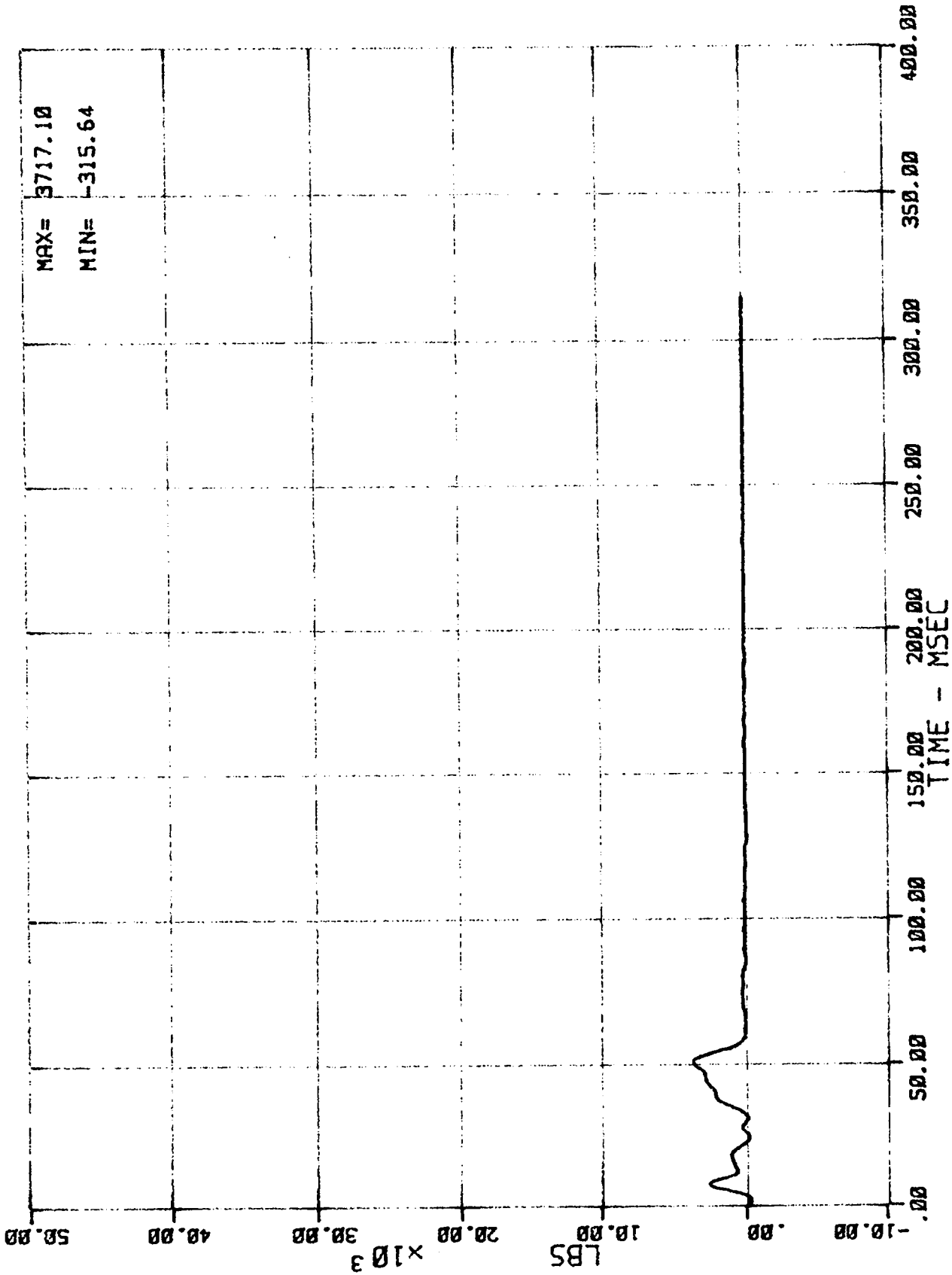
60 LC BA N BD2 (BARRIER LOAD CELL D2 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



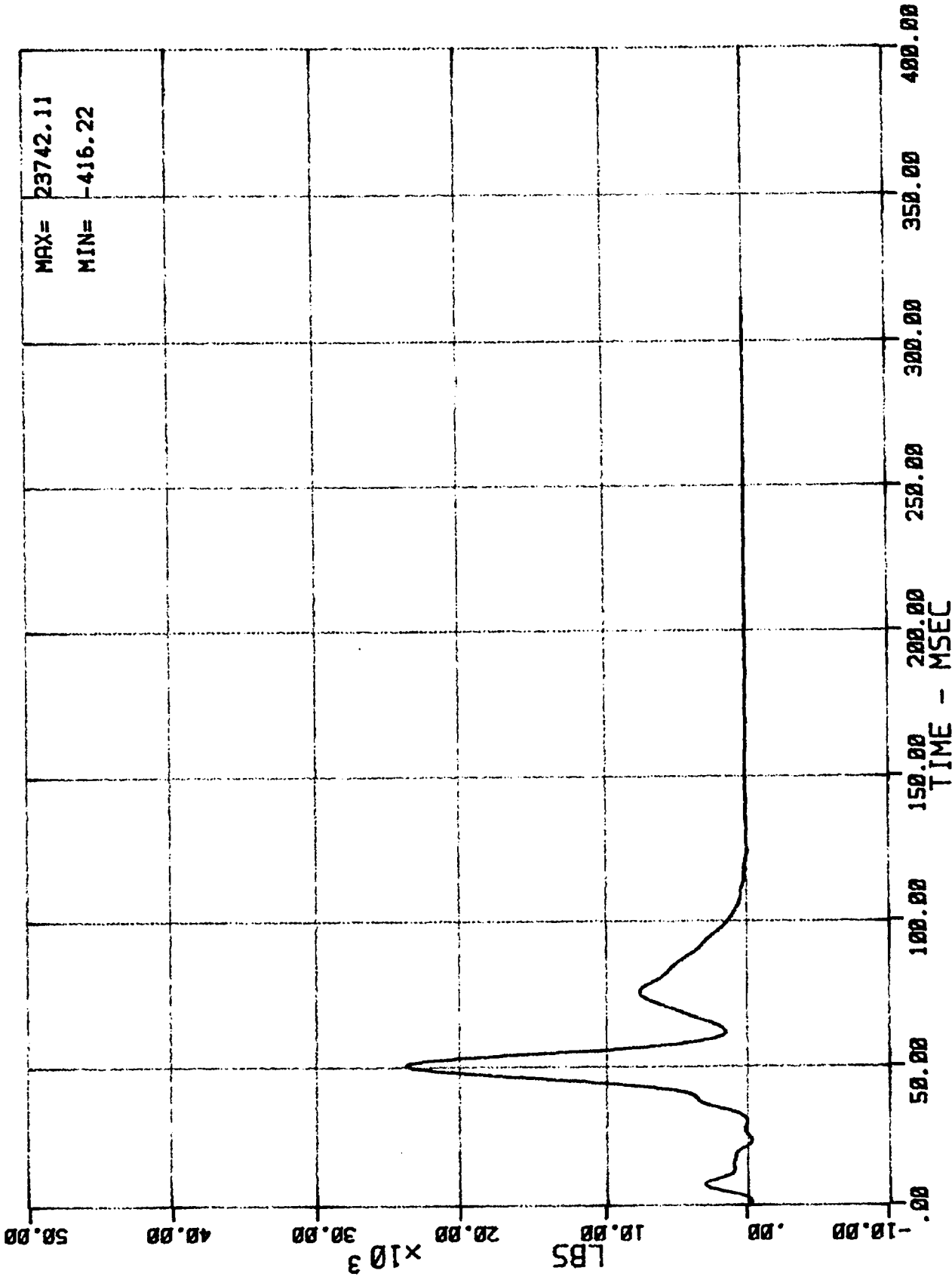
61 LC BA N BD3 (BARRIER LOAD CELL D3 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



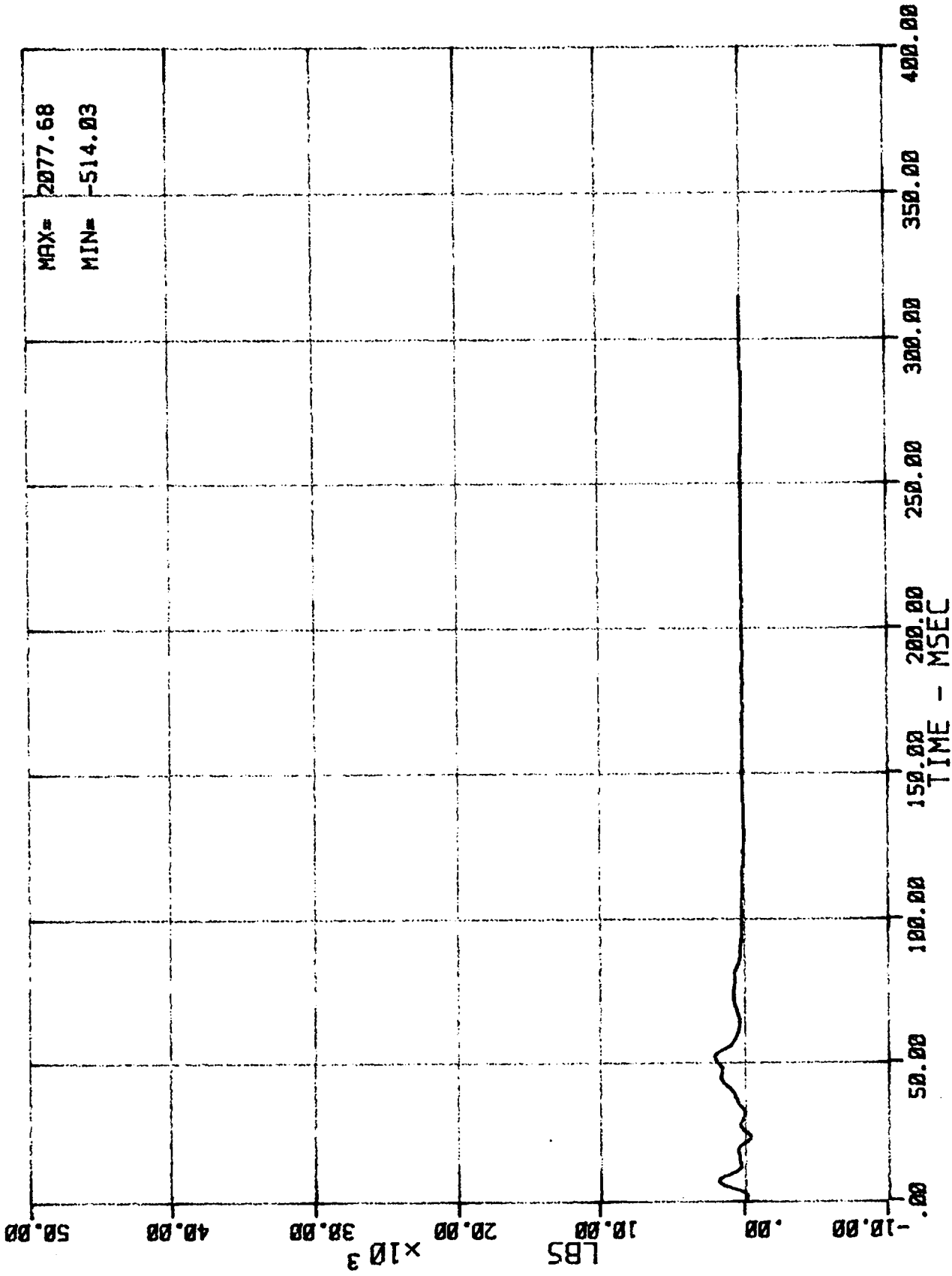
62 LC BR N 804 (BARRIER LOAD CELL 04 - FORCE)  
MSE N07058 1988 DODGE 0150 PICKUP

03/22/88



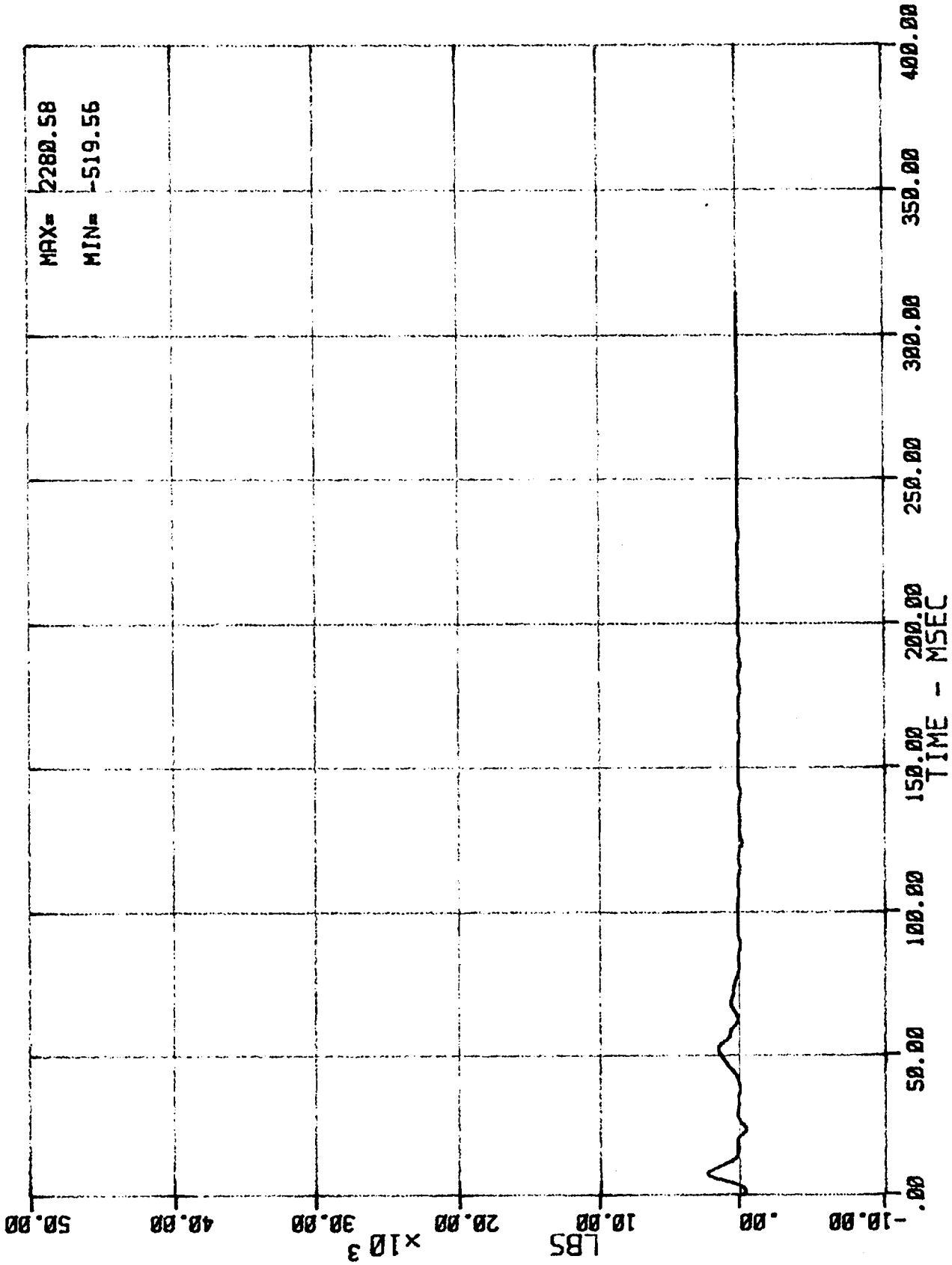
63 LC BA N BDS (BARRIER LOAD CELL D5 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



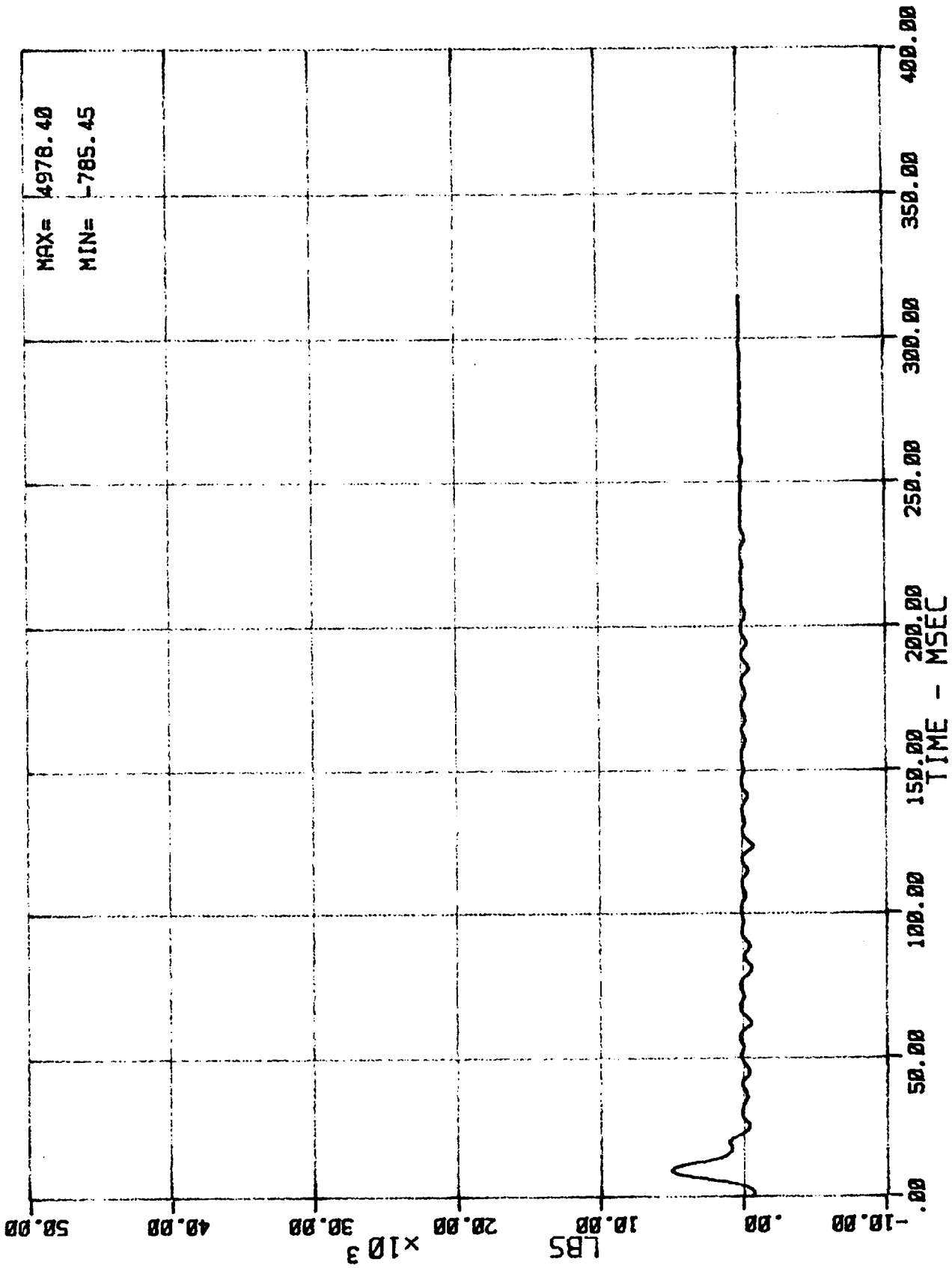
64 LC BA N 006 (BARRIER LOAD CELL 06 - FORCE)  
MSE N07058 1988 DODGE DIS0 PICKUP

03/22/88



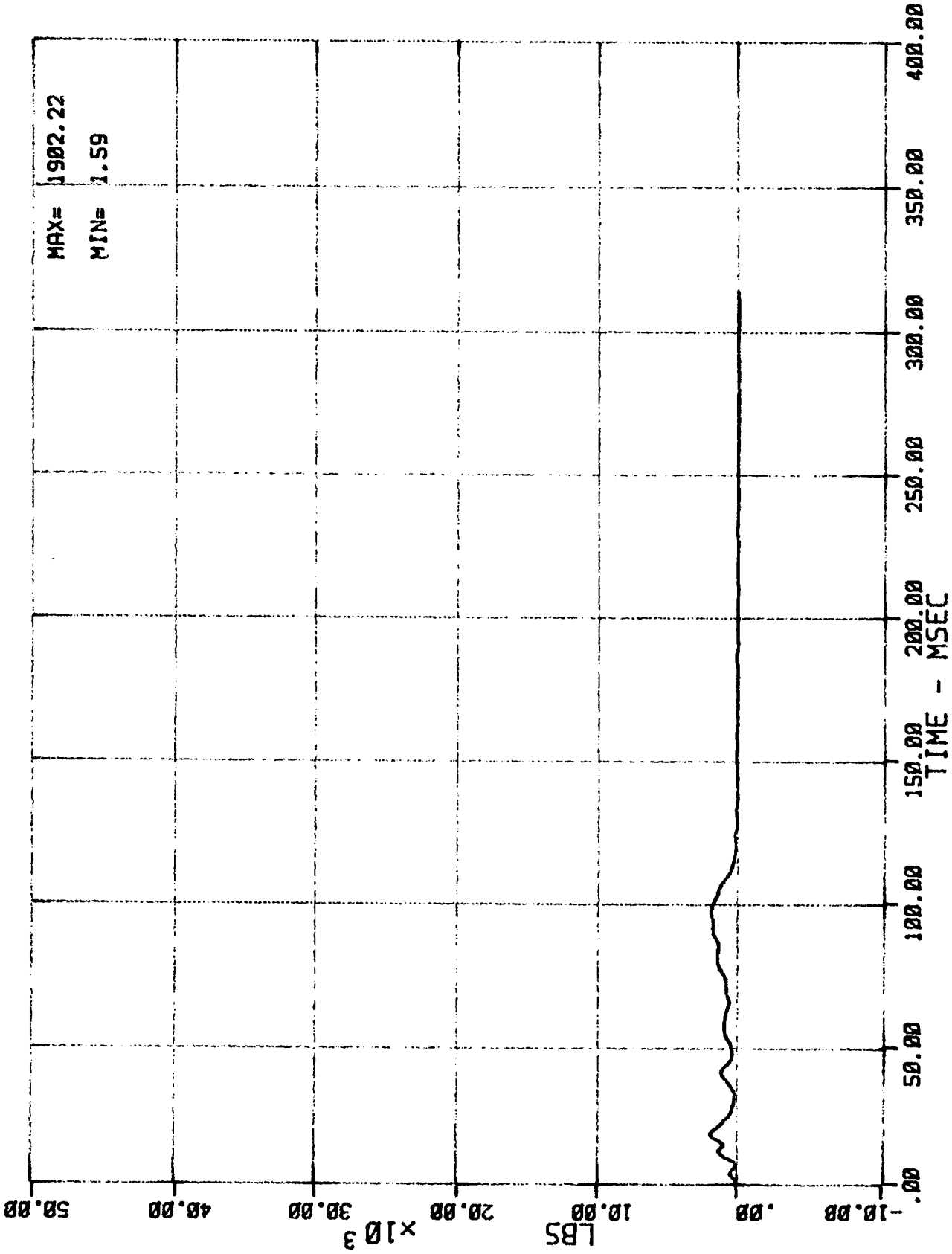
65 LC BA N 0D7 (BARRIER LOAD CELL D7 - FORCE)  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



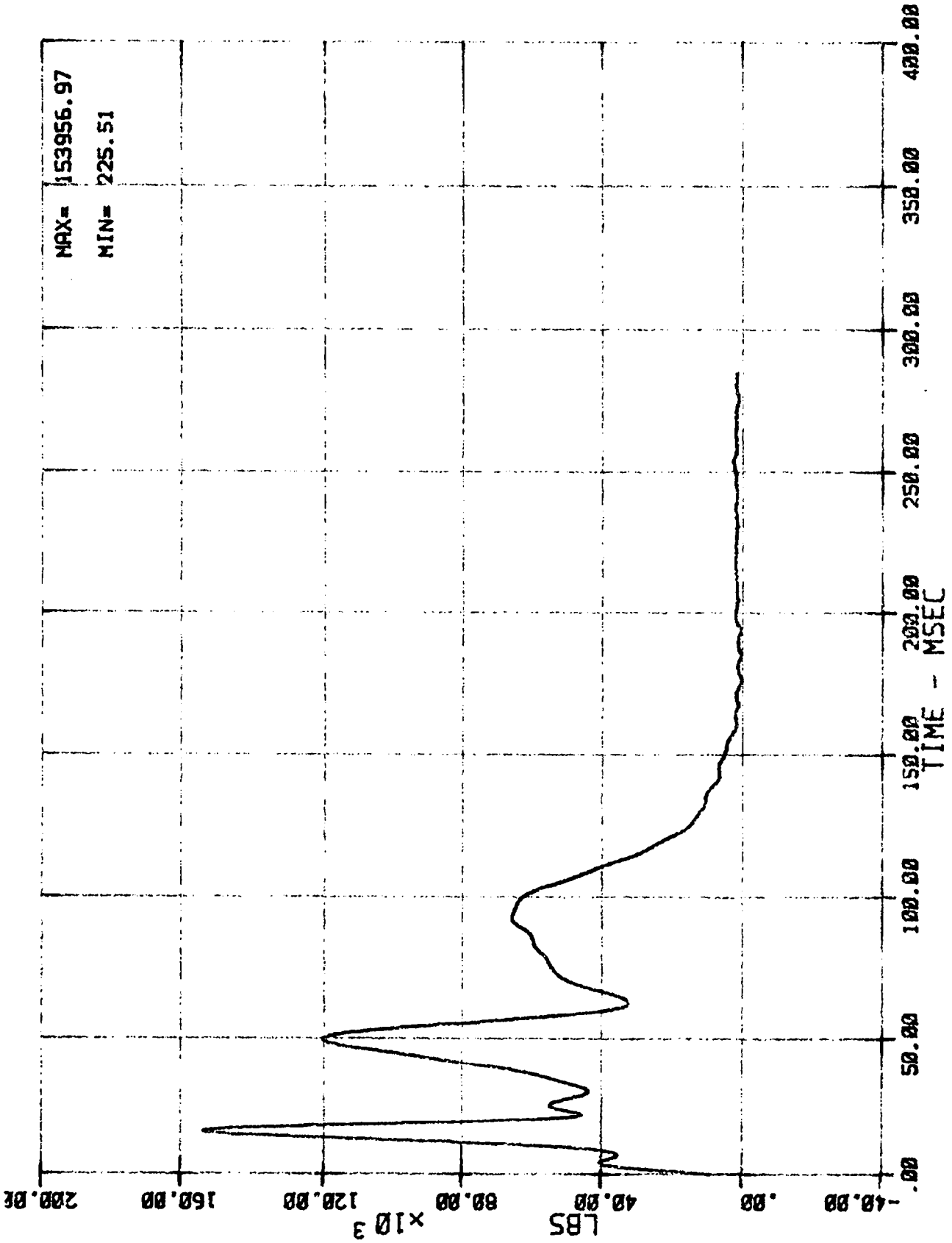
66 LC BA N 808 (BARRIER LOAD CELL 08 - FORCE)  
 MSE N07058 1988 DODGE 0150 PICKUP

03/22/88



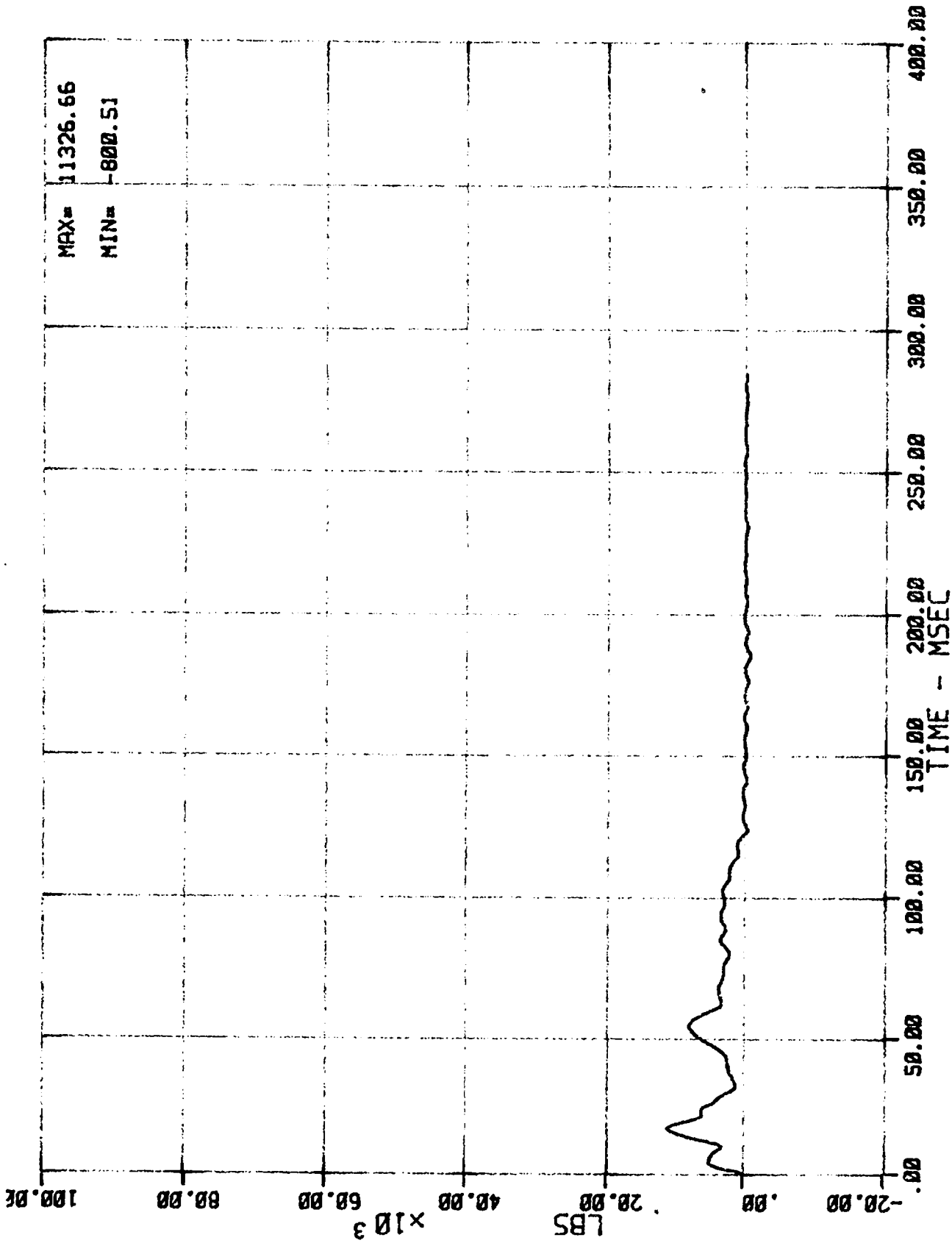
67 LC BA N 809 (BARRIER LOAD CELL 09 - FORCE)  
MSE N07056 1988 DODGE D150 PICKUP

03/22/88



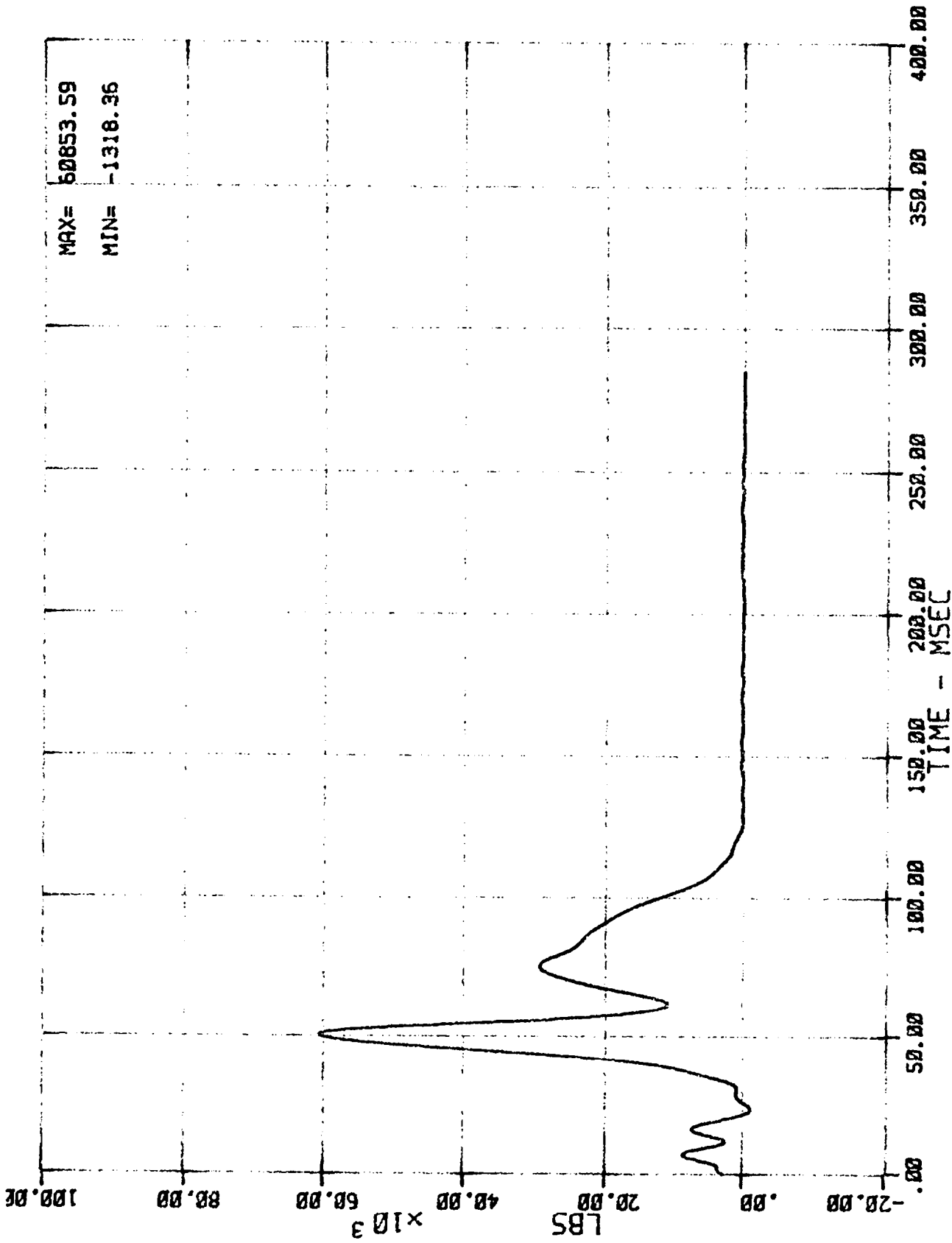
TOTAL SUM, LOAD CELL BARRIER FORCE  
MSE N07058 1988 DODGE D150 PICKUP

03/22/68



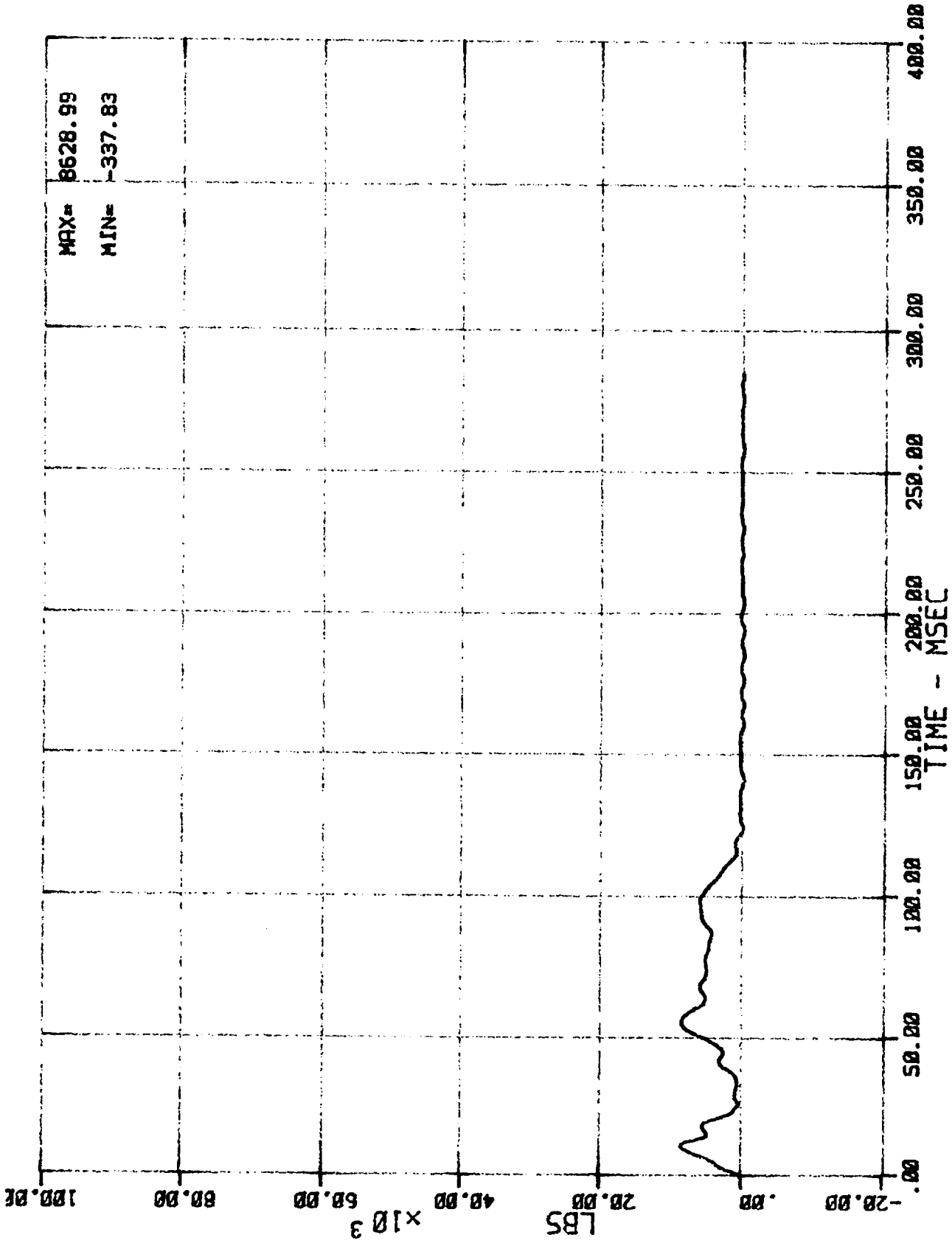
GROUP 1 SUM (C1.C2.C3.D1.D2.D3) LOAD CELL BARRIER FORCE  
 MSE N07058 1988 DODGE D150 PICKUP

03/22/88



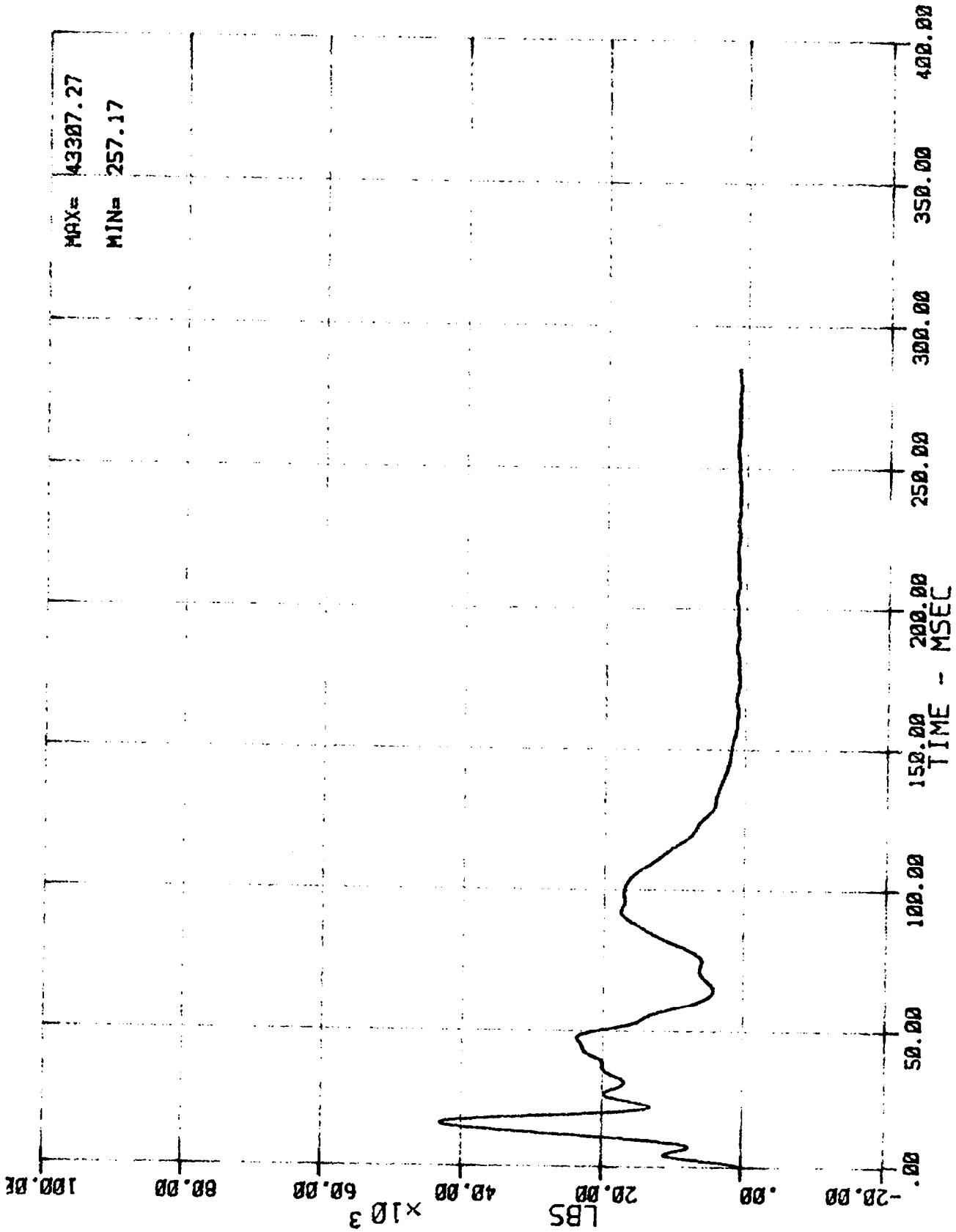
GROUP 2 SUM (C4.C5.C6.D4.D5.D6) LOAD CELL BARRIER FORCE  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



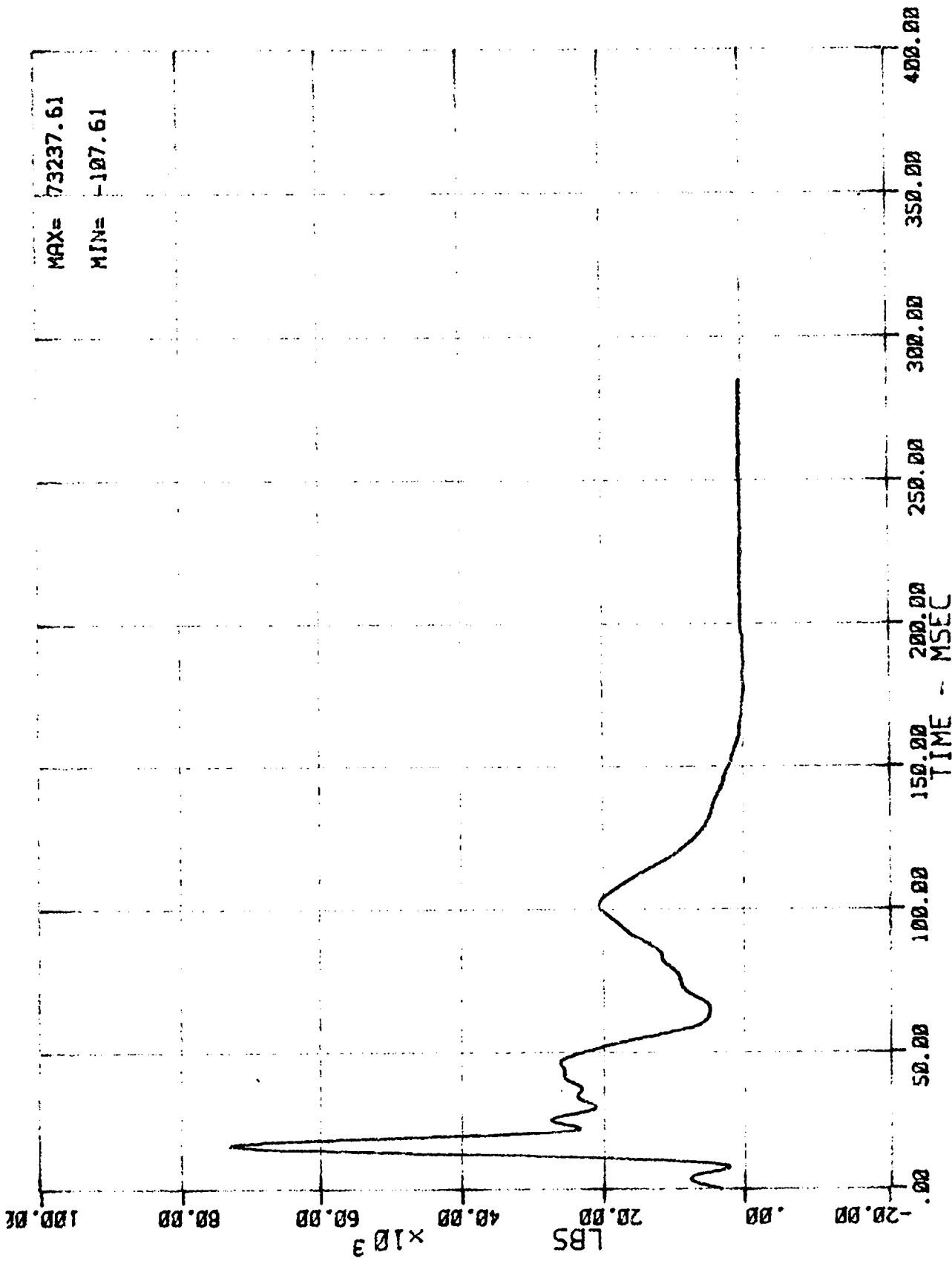
GROUP 3 SUM (C7,C8,C9,07,08,09) LOAD CELL BARRIER FORCE  
 MSE N07058 1988 DODGE D150 PICKUP

03/22/88



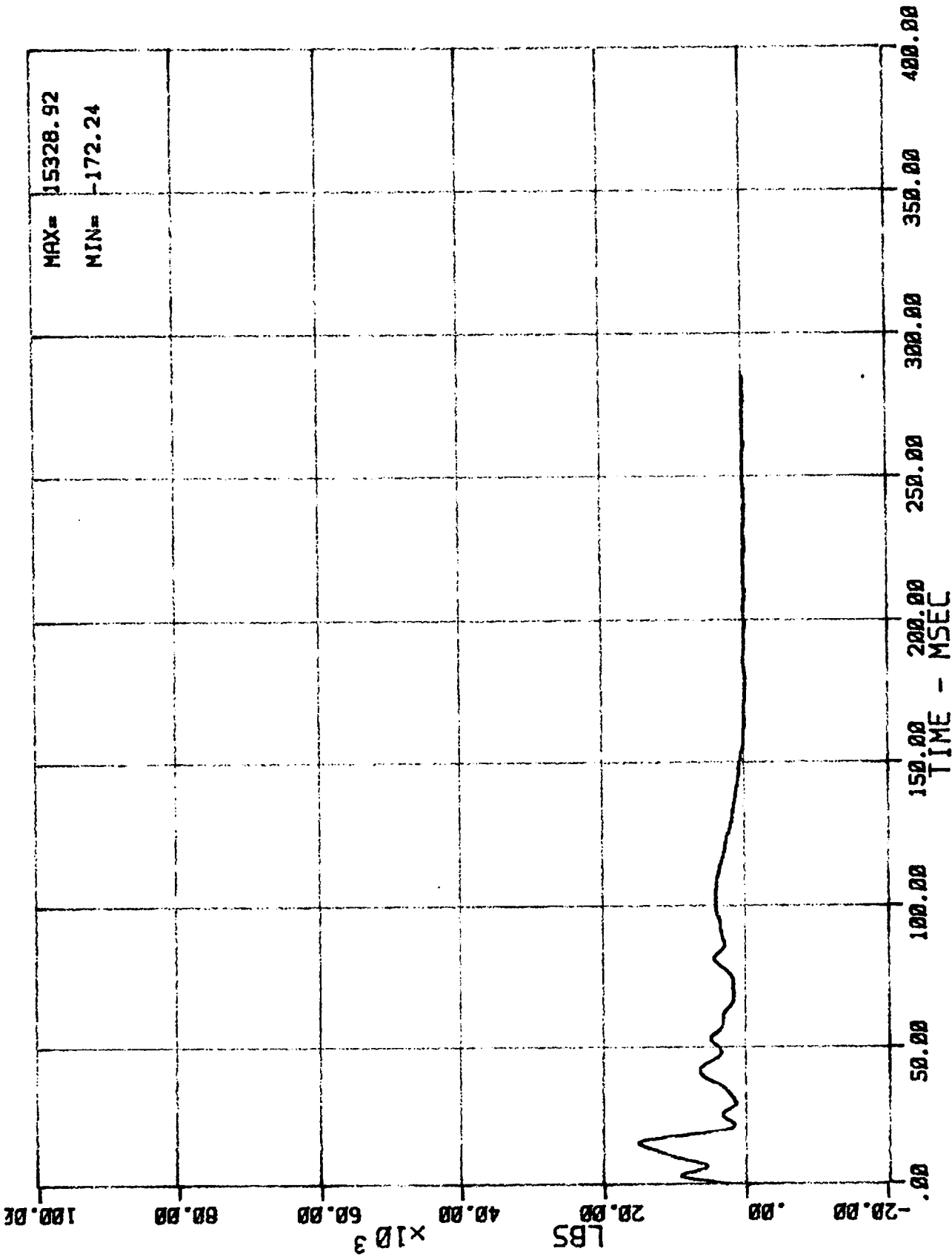
GROUP 4 SUM (A1.A2.A3.B1.B2.B3) LOAD CELL BARRIER FORCE  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



GROUP 5 SUM (A4.A5.A6.A4.B5.B6) LOAD CELL BARRIER FORCE  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88



GROUP 6 SUM (A7,A8,A9,B7,B8,B9) LOAD CELL BARRIER FORCE  
MSE N07058 1988 DODGE D150 PICKUP

03/22/88

**APPENDIX C**

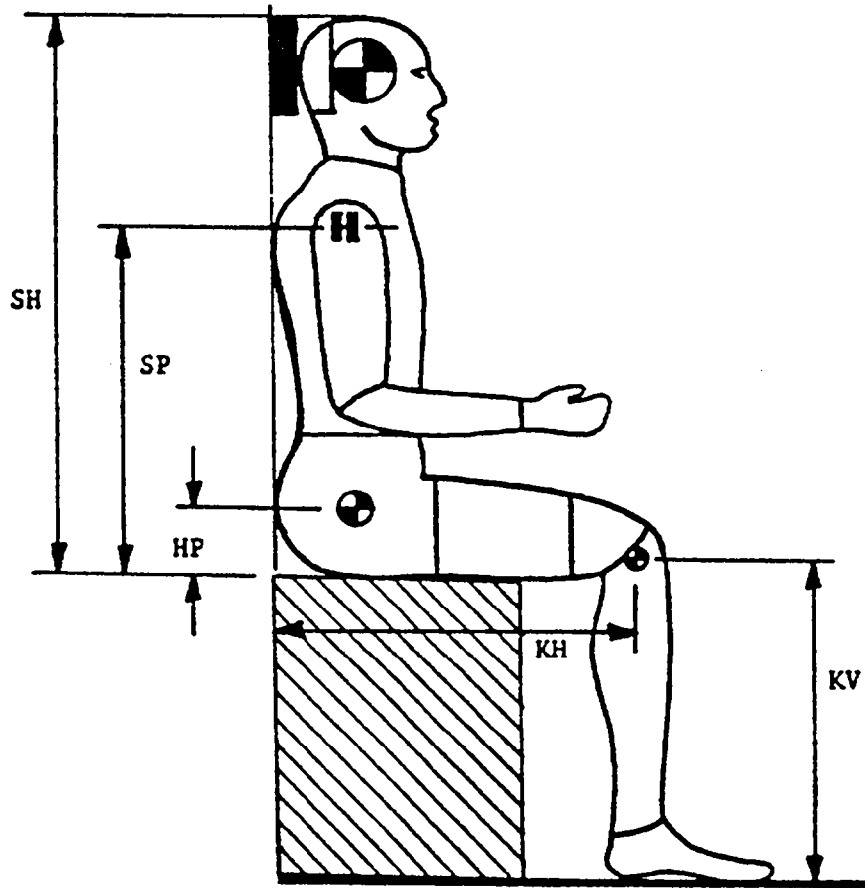
**PART 572 DUMMY CONFIGURATION AND  
PERFORMANCE VERIFICATION TESTS**

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.: 

4	6	5
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I. CONFIGURATION VERIFICATION DATA:



	P. 572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		03/05 - 03/08/88	
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"	20.5	
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"	14.4	

TECHNICIAN'S NAME: Mark Walker

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

II. PERFORMANCE VERIFICATION DATA:

NHTSA DUMMY I.D. NO.:

4	6	5
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TECHNICIAN'S NAME: Mark Walker

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION-----		03/05 - 03/08/88	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		2	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		68-71 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		46-68 %	%
TEST PARAMETER	SPECIFICATION		
<b>1. HEAD DROP TEST--</b>			
a. Peak Resultant Accel.-	210 to 260G	254.0	
b. Peak Lateral Accel.- -	- 10G	-1.59	
c. Time above 100G- - - -	0.9 to 1.5ms	1.2	
<b>2. NECK BENDING TEST--</b>			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	22.42	
b. Pend. Avg. Decel. over t <sub>3</sub> - t <sub>2</sub>	20 to 24G	23.0	
c. Peak Resultant Head Acceleration - - - -	26G max.	25.42	
d. Pendulum Decel.(t <sub>2</sub> -t <sub>1</sub> )	- 3ms	2.8	
e. Pendulum Decel.(t <sub>3</sub> -t <sub>2</sub> )	25 to 30 ms	30.0	
f. Pendulum Decel.(t <sub>4</sub> -t <sub>3</sub> )	- 10ms	5.2	
g. Max. Head Rotation - -	63 to 73°	66.0	
<b>h. Chordal Displacement--</b>			
<b>Head Rotation Angle-</b>			
0°	Time- -	-2 to 2 ms	0
	Displ.-	-.5 to .5"	0
30°	Time- -	25.6 to 34.4ms	33.6
	Displ.-	2.1 to 3.1"	2.45
60°	Time- -	40.3 to 51.7ms	50.0
	Displ.-	4.3 to 5.3"	4.62
Maximum ( 66 °)	Time- -	53.2 to 66.8ms	61.4
	Displ.-	5.0 to 6.0"	5.19

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

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.:

4	6	5
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TECHNICIAN'S NAME: Mark Walker

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
<b>2. NECK BENDING TEST....</b>			
<u>Continued:</u>			
h. Chordal Displacement:			
Head Rotation Angle--			
60°	Time	67.0 to 83.0 ms	72.2
	Displ.	4.3 to 5.3 in.	4.66
30°	Time	85.4 to 104.6 ms	89.0
	Displ.	2.1 to 3.1 in.	2.10
0°	Time	101.0 to 123.0 ms	101.0
	Displ.	-.5 to 0.5 in.	.09
<b>3. ABDOMINAL COMPRESSION TEST:</b>			
(Preload = 10 pounds)			
a. Force @ .5" - - - -	23 to 36 lbs.	26.0	
b. Force @ .75" - - - -	36 to 50 lbs.	40.0	
c. Force @ 1.0" - - - -	50 to 63 lbs.	57.0	
d. Force @ 1.3" - - - -	73 to 88 lbs.	83.0	
<b>4. LUMBAR FLEXION TEST:</b>			
a. Force @ 20° - - - -	22 to 34 lbs.	31.9	
b. Force @ 30° - - - -	34 to 46 lbs.	43.8	
c. Force @ 40° - - - -	46 to 58 lbs.	53.7	
d. Return Angle - - - -	12° maximum	11.7	
<b>5. CHEST IMPACT TESTS:</b>			
a. High Speed			
(1) Probe Speed - - - -	21.78-22.22 fps	21.92	
(2) Peak Deflection - - - -	1.7" maximum	1.52	
(3) Peak Resistive Force - - - - -	2250 lbs. maximum	2247.0	
(4) Internal Hysteresis - - - -	50 to 70%	66.3	
b. Low Speed			
(1) Probe Speed - - - -	13.86-14.14 fps	13.93	
(2) Peak Deflection - - - -	1.1" maximum	1.10	
(3) Peak Resistive Force - - - - -	1450 lbs. maximum	1114.0	
(4) Internal Hyster. - - - -	50 to 70%	58.7	

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

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.:

4	6	5
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TECHNICIAN'S NAME: Mark Walker

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
<b>6. KNEE IMPACT TESTS:</b>			
<b>a. Right Side--</b>			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.87	
(2) Maximum Force - -	1850 to 2500 lbs.	1986.0	
(3) Time Above 1000g-	1.7 ms minimum	2.00	
<b>b. Left Side--</b>			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.87	
(2) Maximum Force - -	1850 to 2500 lbs.	2091.0	
(3) Time Above 1000g-	1.7 ms minimum	2.00	

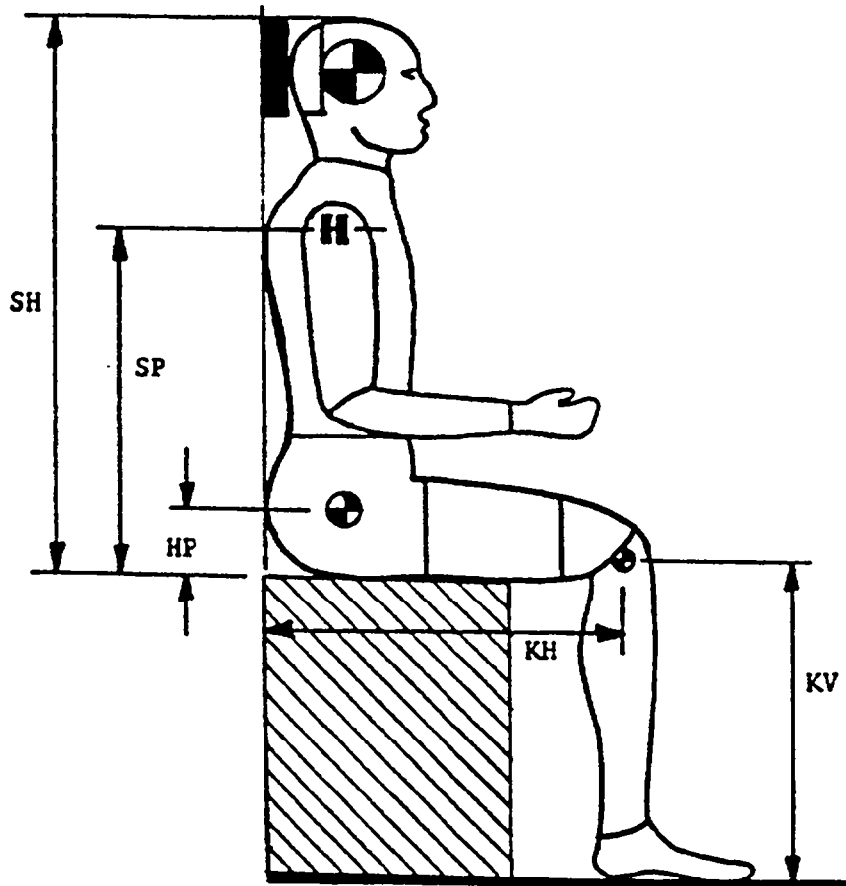
REMARKS:

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.: 

4	6	6
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I. CONFIGURATION VERIFICATION DATA:



	P. 572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		03/05 - 03/10/88	
VERIFICATION NUMBER FOR DUMMY*		2	
SH - Seated Height- - - - -	35.6 to 35.8"	35.6	
SP - Shoulder Pivot Height- - -	21.8 to 22.4"	21.9	
HP - Hip Pivot Height - - - - -	3.9" ref.	3.9	
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.5	
KV - Knee Pivot from floor- - - -	19.3 to 19.9"	19.5	
SW - Shoulder Width - - - - -	17.8 to 18.4"	18.1	
HW - Hip Width- - - - -	14.0 to 15.4"	14.5	

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	6
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TECHNICIAN'S NAME: Mark Walker

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION-----		03/05 - 03/10/88	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		2	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		68-74 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		53-68 %	%
TEST PARAMETER	SPECIFICATION		
<b>1. HEAD DROP TEST--</b>			
a. Peak Resultant Accel.-	210 to 260G	223.0	
b. Peak Lateral Accel.-	- 10G	7.3	
c. Time above 100G- - -	0.9 to 1.5ms	1.3	
<b>2. NECK BENDING TEST--</b>			
a. Pendulum Speed - - -	21.5 to 25.5 fps	22.4	
b. Pend. Avg. Decel. over t <sub>3</sub> - t <sub>2</sub>	20 to 24G	23.75	
c. Peak Resultant Head Acceleration - - - -	26G max.	25.14	
d. Pendulum Decel.(t <sub>2</sub> -t <sub>1</sub> )	- 3ms	3.0	
e. Pendulum Decel.(t <sub>3</sub> -t <sub>2</sub> )	25 to 30 ms	26.6	
f. Pendulum Decel.(t <sub>4</sub> -t <sub>3</sub> )	- 10ms	8.8	
g. Max. Head Rotation - -	63 to 73°	68.0	
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	34.0	
	Displ.- 2.1 to 3.1"	2.49	
60°	Time- - 40.3 to 51.7ms	49.0	
	Displ.- 4.3 to 5.3"	4.65	
Maximum ( 68 °)	Time- - 53.2 to 66.8ms	62.4	
	Displ.- 5.0 to 6.0"	5.31	

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

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.:

4	6	6
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TECHNICIAN'S NAME: Mark Walker

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
<b>2. NECK BENDING TEST....</b>			
<u>Continued:</u>			
h. Chordal Displacement:			
Head Rotation Angle--			
60°	Time	67.0 to 83.0 ms	74.2
	Displ.	4.3 to 5.3 in.	4.62
30°	Time	85.4 to 104.6 ms	89.4
	Displ.	2.1 to 3.1 in.	2.18
0°	Time	101.0 to 123.0 ms	101.0
	Displ.	-.5 to 0.5 in.	0.15
<b>3. ABDOMINAL COMPRESSION TEST:</b>			
(Preload = 10 pounds)			
a. Force @ .5" - - - - -	23 to 36 lbs.	29.0	
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.	82.0	
<b>4. LUMBAR FLEXION TEST:</b>			
a. Force @ 20° - - - - -	22 to 34 lbs.	33.9	
b. Force @ 30° - - - - -	34 to 46 lbs.	45.1	
c. Force @ 40° - - - - -	46 to 58 lbs.	57.0	
d. Return Angle - - - - -	12° maximum	11.4	
<b>5. CHEST IMPACT TESTS:</b>			
a. High Speed			
(1) Probe Speed- - - - -	21.78-22.22 fps	21.83	
(2) Peak Deflection- - - - -	1.7" maximum	1.63	
(3) Peak Resistive Force- - - - -	2250 lbs. maximum	1907.0	
(4) Internal Hysteresis - - - - -	50 to 70%	61.4	
b. Low Speed			
(1) Probe Speed- - - - -	13.86-14.14 fps	13.89	
(2) Peak Deflection- - - - -	1.1" maximum	1.08	
(3) Peak Resistive Force- - - - -	1450 lbs. maximum	1040.0	
(4) Internal Hyster. - - - - -	50 to 70%	63.6	

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

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.:

4	6	6
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TECHNICIAN'S NAME: Mark Walker

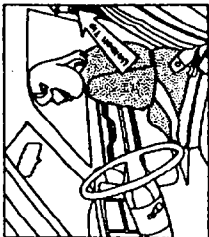
TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
<b>6. KNEE IMPACT TESTS:</b>			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.88	
(2) Maximum Force - -	1850 to 2500 lbs.	1961.0	
(3) Time Above 1000g-	1.7 ms minimum	1.88	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.83	
(2) Maximum Force - -	1850 to 2500 lbs.	2319.0	
(3) Time Above 1000g-	1.7 ms minimum	1.75	

REMARKS:

**APPENDIX D**  
**VEHICLE'S OWNER MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS**

## UNIBELT OPERATING INSTRUCTIONS

1. Enter the vehicle and close the door. Sit well back and erect and adjust the seat. Note the metal tip of the unibelt in its stowed position.



2. Grasp the metal tip and slide it up the webbing as far as necessary to go around your lap as you pull out the webbing. A couple of tries and this will become an automatic one-handed operation.



3. As you pull the webbing across your lap and over your shoulder, move the metal tip toward the buckle. Insert the tip into the buckle until a "click" is heard.

Do not wear the shoulder belt under your arm or otherwise out of position. Such use could increase the chance and/or severity of injury in an accident.

4. Position the lap belt with the upper edge of the belt drawn across the thighs and snug against the hips. Slack will automatically be removed due to tension created by the retractor. If a snug fit in the lap belt portion is desired, pull up on the shoulder belt as shown. A snug belt reduces the risk of sliding under the belt in a collision.



5. Position the shoulder belt on your chest so that it is comfortable and not resting on your neck. Any slack in the belt will be withdrawn automatically by the retractor.

If the shoulder belt feels too tight, pull about an inch of webbing from the retractor; just enough to allow your closed fist to fit between the belt and



your chest. This small amount of slack will be retained by the retractor.

The amount of slack in the shoulder belt should be kept to a minimum. Too much slack may prevent the belt from properly restraining you in the event of an accident.

If the slack is not retained, pull out 6 to 8 inches of webbing, let it return to your chest, and repeat the procedure.

The shoulder belt will allow unrestricted movement of the upper body under normal conditions. Extreme movements will probably require resetting the slack. The retractor will lock in the event of an accident.

6. To release the belt, push the button on the buckle. The belt will automatically retract to its stowed position when the door is opened. If needed, slide the tip down the webbing to allow the belt to fully retract.



**CAUTION:** When operating the folding front seat in a 3-man conventional cab, use care in repositioning seat to its normal position in order to prevent shoulder belt harness from being caught behind seat or tangled in the seat back latching mechanism.

## Center Front and Rear Seat Lap Belts (if so equipped)

The center front and rear seating positions are equipped with lap belts only. The lap belts should be worn with the upper edge of the belt drawn across the thighs and snug against the hips. To lengthen the belt, tilt the latch plate relative to the webbing and pull to the desired length. To reduce the risk of sliding under the belt in a collision, it should be adjusted as tight as comfort will allow, WHILE SITTING WELL BACK AND ERECT IN THE SEAT.

The outboard rear seat positions are equipped with automatic locking retractors. Unlike the inertia sensitive retractors on the front seat lap/shoulder belts, these retractors will lock if the webbing is pulled or jerked after withdrawal from the retractor. To don the safety belt, withdraw the belt from the retractor in a continuous motion, forward and upward away from the seat, until the belt is extended as far as possible. Bring the belt across the body and insert the latch plate in the buckle until a click is heard. If the belt has not been pulled out far enough to reach the buckle, return the belt to its stowed position. This will unlock the retractor so that the belt can be pulled out a greater amount. To tighten the belt pull the webbing back toward, and into, the retractor until the belt fits snugly on the hips.

Slouching, sitting on the forward edge of the seat, or lying down should be avoided while wearing a lap belt, since there is the risk of sliding under the belt and incurring injury.

**To Unfasten** — Depress button in center of buckle and slide tip end out of buckle.

*Never use a seat belt on more than one person at a time.*

**Use of Seat Belts During Pregnancy**

Chrysler Motors recommends that pregnant women use the available safety belts. This will reduce the likelihood of injury to both the woman and the unborn child. The lap belt should be worn across the thighs and as snug against the hips as possible, *but not across the waist.*

**Safety Belt Extender**

If the safety belt is too short, even when fully extended, a safety belt extender can be purchased from your dealer. This extender should only be used if the existing belt is not long enough. When not required, it must be removed and stowed because the use of the extender when not required may deactivate the seat belt locking mechanism.