

D074827

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

MAZDA CORPORATION

1986 MAZDA B 2000 TRUCK PICKUP

NHTSA No. CG0601

MOBILITY SYSTEMS AND EQUIPMENT COMPANY
6151 West Century Boulevard Suite 912
Los Angeles, California 90045



JUNE 1985

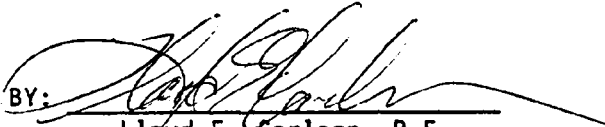
FINAL REPORT

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 1986 Mazda B 2000 Truck, at the Mobility Systems and Equipment Company (MSE) crash test facility in Mira Loma, CA on 4 June 1985. The barrier impact velocity was 35.01 mph and the ambient temperature at the barrier face at the time of impact was 88°F. The post-test vehicle crush maximum was 17.0 inches. The test vehicle appears to comply with the indicant requirements of the following Federal Motor Vehicle Safety Standards: 1. FMVSS No. 212, "Windshield Mounting" 2. FMVSS No. 219 (Partial), "Windshield Zone Intrusion" 3. FMVSS No. 301-75 "Fuel System Integrity" With regard to FMVSS 208, "Occupant Crash Protection", injury criteria, the driver dummy appeared to exceed the head injury criteria (HIC) maximum allowable index of 1,000 and the chest G's of more than 60 for a time interval greater than 3 milliseconds, but did satisfy the femur requirements of 2250 lb or less. The passenger dummy appeared to exceed the HIC, but did satisfy the chest and femur requirements. <u>TYPE OF RESTRAINT SYSTEM:</u> 3-point continuous webbing manual system at each front outboard seating position.			
17. Key Words 35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP) FMVSS 212 Indicant Testing FMVSS 219 (Partial) Indicant Testing FMVSS 301-75 Indicant Testing		18. Distribution Statement COPIES OF THIS REPORT ARE AVAILABLE FROM: Technical Reference Division National Highway Traffic Safety Admin. Nassif Building, Room 5108 400 Seventh St., SW, Washington, DC 20590	
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SECTION I

PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is part of the Composite FY'85 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-85-D-01045. 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 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. Standards Enforcement Indicant Test Program data from FMVSS No. 212, "Windshield Mounting", FMVSS No. 219 (partial), "Windshield Zone Intrusion", FMVSS No. 301-75, "Fuel System Integrity", as well as occupant performance data are provided herein.

SECTION 2

SUMMARY OF FRONTAL BARRIER IMPACT TEST

A load cell barrier consisting of 36 cell units was impacted by a 1986 Mazda B-2000 Truck, Pickup, NHTSA No. CG0601, at a velocity of 35.01 mph. The frontal impact test was conducted by Mobility Systems and Equipment Company (MSE) on 4 June 1985. 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 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 fourteen (14) high-speed cameras. The camera location data are presented in Table 11.

Sixty-six (66) 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 1986 Mazda B-2000 Truck Pickup was equipped with a 121.9 cubic inch 4 cylinder engine and 5 speed manual transmission. The test weight of the Mazda B-2000 with two (2) 50th percentile male dummies and instrumentation was 3,080 pounds.

The Mazda B-2000 was involved in a frontal load cell barrier crash at a velocity of 35.01 mph. The vehicle appears to comply with FMVSS No. 301-75, "Fuel System Integrity". There was no solvent leakage from the fuel system after impact or during the subsequent rollover test.

The Mazda B-2000 appears to comply with FMVSS No. 212, "Windshield Mounting". Percent of windshield periphery retention was 100 percent for the right half, 100 percent for the left half, and 100 percent overall.

The Mazda B-2000 appears to comply with FMVSS No. 219, "Windshield Zone Intrusion".

A maximum static crush for the vehicle of 17.0 inches occurred at the center of the front bumper. The windshield was cracked, but all vehicle glazing remained intact. Both the driver's and passenger's doors were opened by hand.

The driver ATD's head hit the steering wheel upper rim and the center hub. His knees hit the dash panel and both sides of the steering column, and his right knee also hit the parking brake release lever. The driver ATD had a HIC value of 1434; maximum chest acceleration (resultant clipped) was 64.6 g; maximum femur loads were 620 and 97 pounds.

The passenger ATD's head contacted the dash panel and his knees. Both of his knees also hit the glove box door and the dash panel below the glove box. The HIC value for the passenger ATD was 1647; maximum chest acceleration (resultant clipped) was 58.3 g; maximum femur loads were 628 and 311 pounds.

Seat belt spoolouts, measured as the distance a string attached to the shoulder belt was pulled through a foam block, were 7.1 inches for the driver and 6.1 inches for the passenger. The driver's and passenger's seat belt spoolout measurement transducers' attaching cables failed during the impact.

Data Table No. 1 Test Vehicle Data

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1986/Mazda/B-2000/Truck/ Pickup
 VEHICLE NHTSA NO.: C G O 6 0 1; VIN: J M 2 U F I 1 1 0 G 0 5 3 2 9 8 2
 VEHICLE BODY COLOR: RED; MONTH & YEAR OF MANUFACTURE: MARCH 1985
 ENGINE: 4 cylinders; 121.9 C.I.D.; Liters; CC
X Gas; Diesel; Turbocharged
 PLACEMENT-- X Longitudinal; Transverse (Lateral)
 TRANSMISSION: 5 speed; X Manual; Automatic; Overdrive
 FINAL DRIVE: Front Wheel Drive; X Rear Wheel Drive; Four Wheel Drive
 DATE VEHICLE AVAILABLE FOR 35 MPH CRASH TESTING: 05/15/85
 ODOMETER READING: 048 miles; OPTIONS: A/C; P/S; P/Wdo.;
 Tilt Whl.; Cruise Control
 TYPE OF OCCUPANT RESTRAINT SYSTEM FOR FRONT OUTBOARD SEATING POSITIONS: 3-point continuous webbing manual system

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): 26 psi Front; 34 psi Rear
 Recommended Tire Size: P205/75R-14
 Tires On Vehicles: P205/75R-14; Manufacturer: Bridgestone
 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/ Rotating Knob
 Vehicle Maximum Capacity Loading = 1095 lbs. (A)
 No. Of Occupants x 150 lbs. - - - = 450 lbs. (B)
 Cargo Capacity (A - B) - - - - = 645 (Max) 300 (Truck) lbs.

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Right Front = <u>757</u> lbs.	] TOTAL FRONT = <u>1500</u> lbs. (<u>58.0</u> % of TOTAL)
Left Front = <u>743</u> lbs.	
Right Rear = <u>568</u> lbs.	] TOTAL REAR = <u>1088</u> lbs. (<u>42.0</u> % of TOTAL)
Left Rear = <u>520</u> lbs.	
TOTAL WEIGHT = <u>2588</u> lbs.	

Data Table No. 1 (Con't) Test Vehicle Data

CALCULATION OF TEST VEHICLE TARGET WEIGHT:

Total Test Vehicle Delivered Weight With Maximum Fluids = 2588 lbs.
Maximum Cargo Carrying Capacity Of Test Vehicle - - - = 300 lbs.
Weight Of Two P.372 Dummies (2 x 164 lbs.) - - - - - = 328 lbs.
TEST VEHICLE TARGET WEIGHT - - - - - = 3216 lbs.

*300 lbs. for light trucks and MPVs

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front = 813 lbs. TOTAL FRONT = 1674 lbs. (54.4 % of TOTAL)
Left Front = 861 lbs.
Right Rear = 702 lbs. TOTAL REAR = 1406 lbs. (45.6 % of TOTAL)
Left Rear = 704 lbs.
TOTAL WEIGHT = 3080 lbs. (which includes 0 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. _____

TEST VEHICLE ATTITUDE:

As Delivered--Right Front = 28.7 inches; Ready For Test--Right Front = 27.8 in.
Left Front = 28.3 inches Left Front = 27.4 in.
Right Rear = 31.6 inches Right Rear = 30.1 in.
Left Rear = 31.8 inches Left Rear = 30.4 in.

Test Vehicle Wheelbase: 108.6 inches; C.G. = 40.6 inches rearward of front
wheel centerline

Total Vehicle Length:

Right Side = 174.3 inches
Left Side = 174.3 inches
Centerline = 177.3 inches

Total Vehicle Width

Across Front Fenders = 62.3 in.
Across Center = 65.9 in.
Across Rear Fenders = 65.5 in.
Maximum = 65.9 in.

Data Table No.2 Post Crash Test Data

DATE OF 35 MPH FRONTAL BARRIER IMPACT RATINGS TEST: 06/04/85

TIME OF TEST: 4:00 pm: AMBIENT TEMPERATURE AT BARRIER FACE: 88° 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 = 35.01 mph

Secondary Speed Trap = 35.05 mph

(Specified Range = 34.5 to 35.5 mph)

Distance from vehicle's front bumper forwardmost surface to barrier face when--

(a) entering the speed trap = 5 ft.

(b) exiting the speed trap = 1 ft.

VEHICLE STATIC CRUSH:

Vehicle Pre-test Length-- Right Side=174.3"; C/Line=177.3"; Left Side=174.3"

Vehicle Post-test Length- Right Side=158.2"; C/Line=160.3"; Left Side=158.4"

VEHICLE STATIC CRUSH----- Right Side=16.1"; C/Line=17.0"; Left Side=15.9"

VEHICLE REBOUND FROM BARRIER FACE:

Vehicle Right Side = 18.0 inches

Vehicle Centerline = 18.3 inches

Vehicle Left Side = 23.3 inches

VISIBLE DUMMY CONTACT POINTS:

	DRIVER (I.D. No. <u>464</u>)		
	Strg. Col. Hub	Strg. Wheel	Instru. Panel
HEAD - - - - -	Yes	Yes	No
RIGHT KNEE - - - - -			Yes
LEFT KNEE - - - - -			Yes

PASSENGER (I.D. No. <u>467</u>)		
Instru. Panel	Knee Assy.	Glove Box Door
No	Yes	Yes
No		Yes
No		Yes

VEHICLE DOOR OPENING INFORMATION:

	RIGHT SIDE	
	OPENED	JAMMED
FRONT DOORS- - - - -	Yes	No
REAR DOORS - - - - -	N/A	N/A

LEFT SIDE	
OPENED	JAMMED
Yes	No
N/A	N/A

Data Table No.2 (Con't) Post Crash Test Data

VEHICLE'S FRONT SEAT MOVEMENT DURING CRASH EVENT:

	RIGHT SIDE	LEFT SIDE
Seat Cushion Shift - - -	None " forward;	None " forward
Seat Adjuster Failure- -	None ;	None

Details Of Any Failure:

OTHER NOTABLE IMPACT EFFECTS:

SECTION 3

SUMMARY OF RESULTS FOR

FMVSS 212, "Windshield Mounting"

FMVSS 219, (Partial) "Windshield Zone Intrusion"

FMVSS 301-75, "Fuel System Integrity"

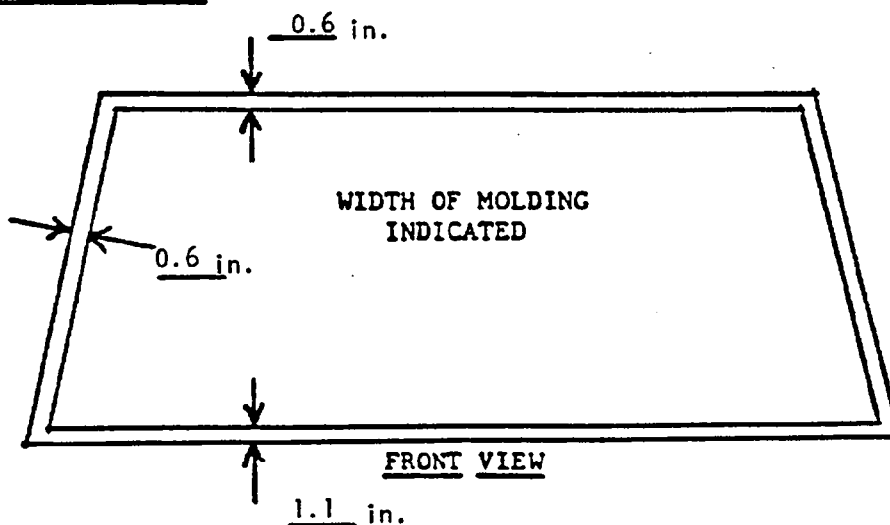
Data Table No. 3 FMVSS 212 Windshield Mounting Data

FMVSS 212 REQUIREMENTS: The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

FMVSS 212 TEST DATA:

	WINDSHIELD PERIPHERY		
	PRE-TEST (in.)	POST-TEST (in.)	PERCENT RETENTION
RIGHT SIDE	74.3	74.3	100%
LEFT SIDE	74.3	74.3	100%
TOTAL	148.6	148.6	100%

AREA OF RETENTION FAILURE: NONE

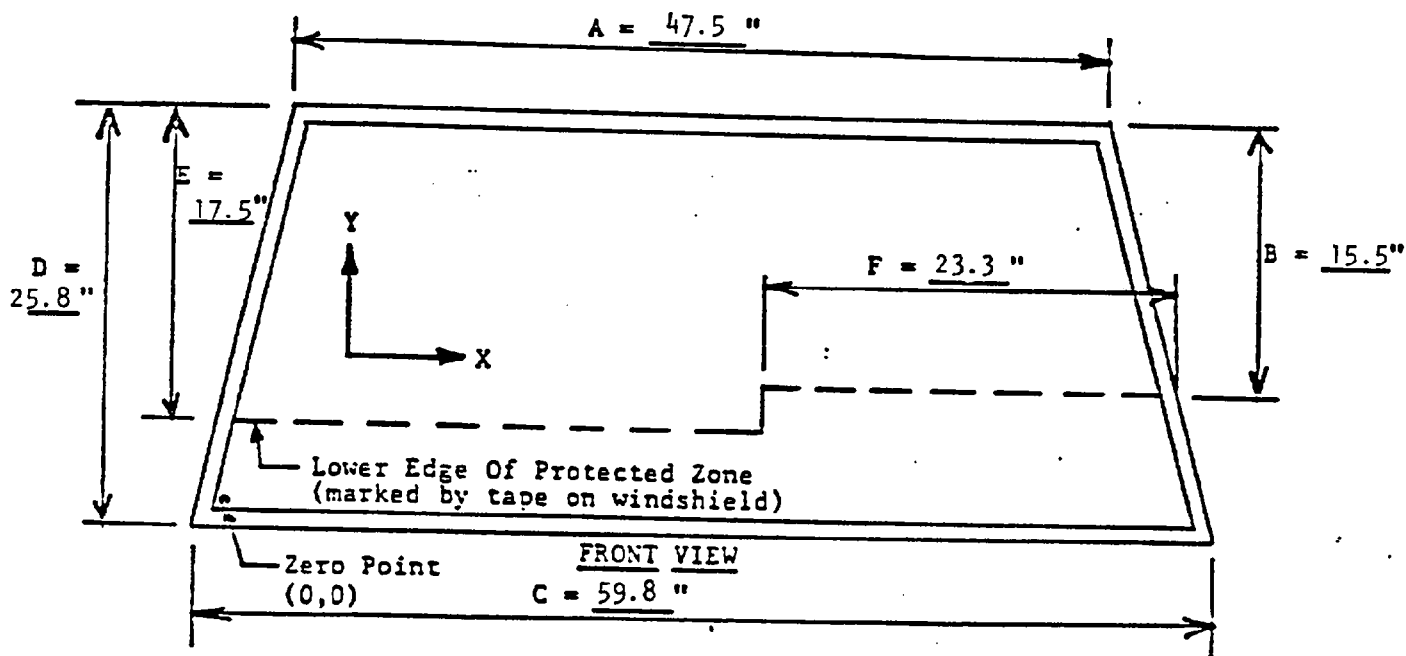


FAILURE DETAILS: NONE

Data Table No.4 FMVSS 219 Windshield Zone Intrusion Data

The lower edge of the protected zone is determined by placing a 6.5" dia. rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. Draw the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 1/2" distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection onto the outer surface of the windshield of this line.

FMVSS 219 TEST DATA:



DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 1/4":
(Show location of penetration on above sketch)

COORDINATES	
X	Y
1.	N/A
2.	N/A
3.	N/A
4.	N/A

Data Table No.5 FMVSS 301-75 Fuel System Integrity

TEST VEHICLE NHTSA NO.: CG0601; TEST DATE: 06/04/85

VEHICLE MAKE/MODEL/BODY STYLE: 1986/Mazda/B 2000/Truck/Pickup

USABLE CAPACITY OF VEHICLE'S FUEL TANK: 14.79 Gallons (figure furnished by vehicle manufacturer)

TEST REQUIREMENTS:

Test vehicle's engine operated to "run dry" condition, and then a small amount of Stoddard solvent which has been dyed RED shall be added to the vehicle's fuel tank. Operate the fuel pump enough to completely fill the fuel system ahead of the fuel tank, and add 92 to 94% of the stated USABLE CAPACITY to the fuel tank.

AMOUNT OF STODDARD SOLVENT ADDED TO VEHICLE'S FUEL TANK:

13.75 Gallons Which is 93.0 % of the Stated USABLE CAPACITY.

SOLVENT SPILLAGE MEASUREMENT AFTER 35 MPH FRONTAL BARRIER IMPACT TEST:

	<u>Actual</u>	<u>Maximum Allowable</u>
From impact until vehicle motion ceases - - - -	<u>0.0</u>	1 oz.
For 5 min. period after vehicle motion ceases -	<u>0.0</u>	5 oz.
For next 25 minutes at barrier face - - - - -	<u>0.0</u>	1 oz./1 minute

SOLVENT SPILLAGE DETAILS:

STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1 to 3 minutes)

Time reqd. for machine to rotate 90° = 1 minutes, 20 seconds
FMVSS 301-75 Position Hold Time = 5 minutes, 0 seconds
TOTAL - - - - - = 6 minutes, 20 seconds
Next Whole Minute Interval - - - - - = 7 minutes

Data Table No.5 (Con't) FMVSS 301-75 Fuel System Integrity

VEHICLE STATIC ROLLOVER DATA:

	First 5 Minutes FROM ONSET OF ROTATION	6th. Minute	7th. Minute	8th. Minute
Maximum Allowable Solvent Spillage - -	5 oz.	1 oz.	1 oz.	1 oz.
0 to 90° (filler cap down) - - - - -	0.0	0.0	N/A	N/A
90 to 180° - - - - -	0.0	0.0	N/A	N/A
150 to 270° - - - - -	0.0	0.0	N/A	N/A
270 to 360° - - - - -	0.0	0.0	N/A	N/A

Solvent Spillage Location(s): NONE

SECTION 4

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

III. AID DATA:

- Test Vehicle Measurements
- Accident Investigation Damage Data Summary

Data Table No. 6 FMVSS No. 208 Occupant Crash Protection Data Sheet

VEH. YR./MAKE/MODEL/BODY STYLE: 1986/Mazda/B 2000/Truck / Pickup

VEH. NHTSA NO.: CG0601; TEST DATE: 06/04/85

MAXIMUM ACCELERATION VALUES:

		DRIVER DUMMY #464	PASSENGER DUMMY #467
Head Channel X	HEAD X	- 256.25	- 61.51
Head Channel Y	Y	- 53.74	45.45
Head Channel Z	Z	- 59.12	120.50
HEAD RESULTANT	R	262.80	133.80
Chest Channel X	CHEST X	- 72.54	- 51.16
Chest Channel Y	Y	- 29.46	34.28
Chest Channel Z	Z	37.73	28.31
CHEST RESULTANT (3 msec Clip)	R	64.63	58.35
TIME INTERVAL (msec)		61.5 - 64.5	55.0 - 58.0

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	HIC	1433.74	1646.97
t_1 (msec)		44.13	61.13
t_2 (msec)		85.88	95.88
Avg. Accel. t_1 to t_2		65.33	74.33

MAXIMUM FEMUR FORCES: (Compressive)

Right Side (lbs.)	FR	97	311
Left Side (lbs.)	FL	620	628

MAXIMUM SEAT BELT FORCES:

Lap Belt	LAP	1983	1722		
Shoulder Belt	SHLDR	1701	1535		
		PHOTOGRAPHIC	ELECTRONIC	PHOTOGRAPHIC	ELECTRONIC
MAXIMUM SEAT BELT WEBBING SPOOL-OUT:		N/A	Invalid	N/A	Invalid
Belt Stretch (inches per foot)		N/A	0.72	N/A	2.28

BARRIER LOAD CELLS:

Total Load	CELLS	167,020 lb
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Data Table No. 7 Test Dummy Positioning Data

PRE-IMPACT DATA:

Make/Model: Mazda/B 2000/Truck/Pickup
 Body Style: Truck Model Year: 1986
 NHTSA No.: CG0601 Color: RED

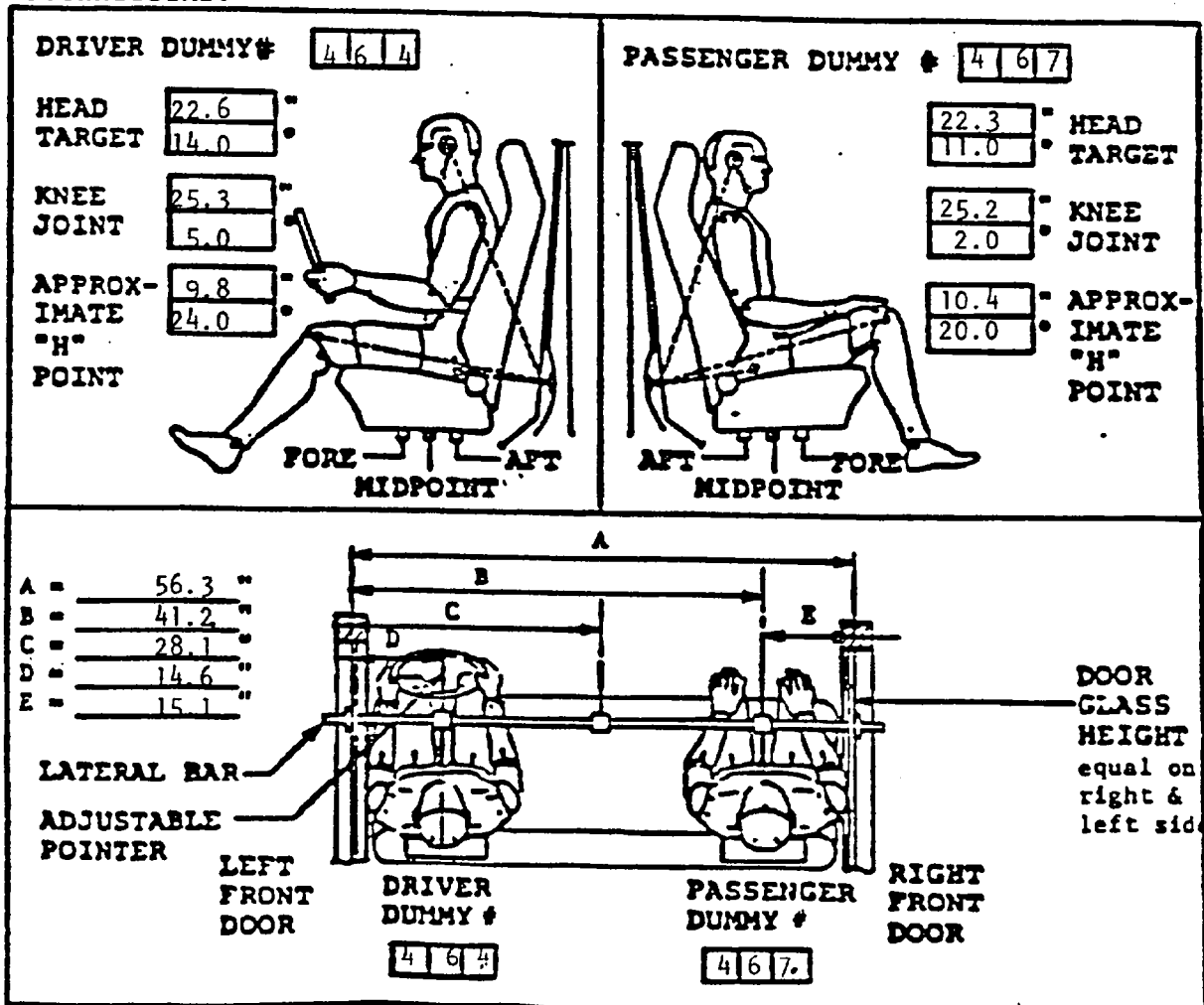
DATA FROM CERTIFICATION LABEL:

Vehicle Manufacturer: Mazda Corporation
 Date of Manufacture: March 85 VIN: JM2UF1110G0532982
 GVWR: 4175 lb; GAWR: Front = 2005 lb; Rear = 2685 lb

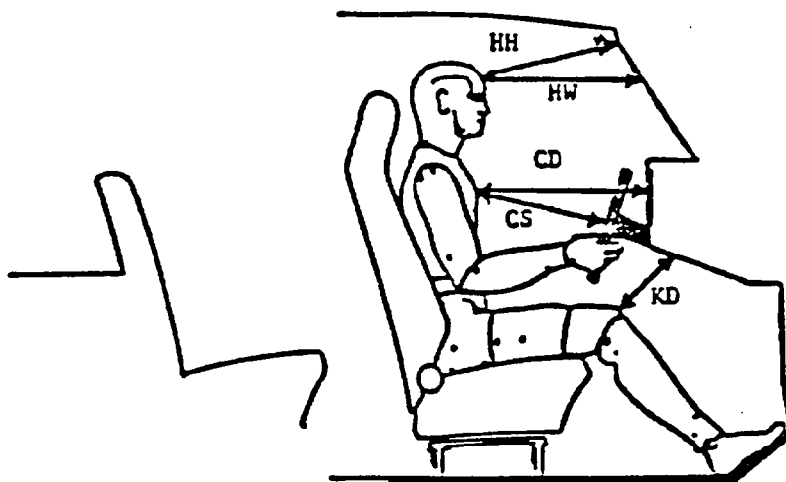
POST-IMPACT DATA:

Date of Test: 06/04/85 Time: 4:00 pm Temperature 88 °F
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: Primary = 35.01 mph Secondary = 35.05 mph
 Seat Type: Bench Adjuster Type: Manual
 Bucket Seat Back Type: Low

Technicians:



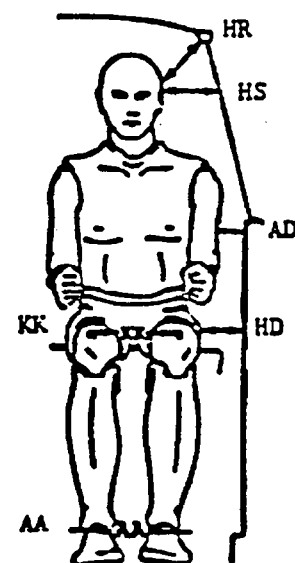
Data Table No. 7 (Con't) Test Dummy Positioning Data



	Driver	Passenger
HH	14.3	15.5
HW	18.0	19.0
CD	23.3	25.3
CS	14.0	N/A
KD L-	8.5	L- 7.0
KD R-	7.0	R- 7.5
Torso Angle	17	Torso Angle 19
Seat Back Angle	19	Seat Back Angle 19
HSW	N/A	N/A

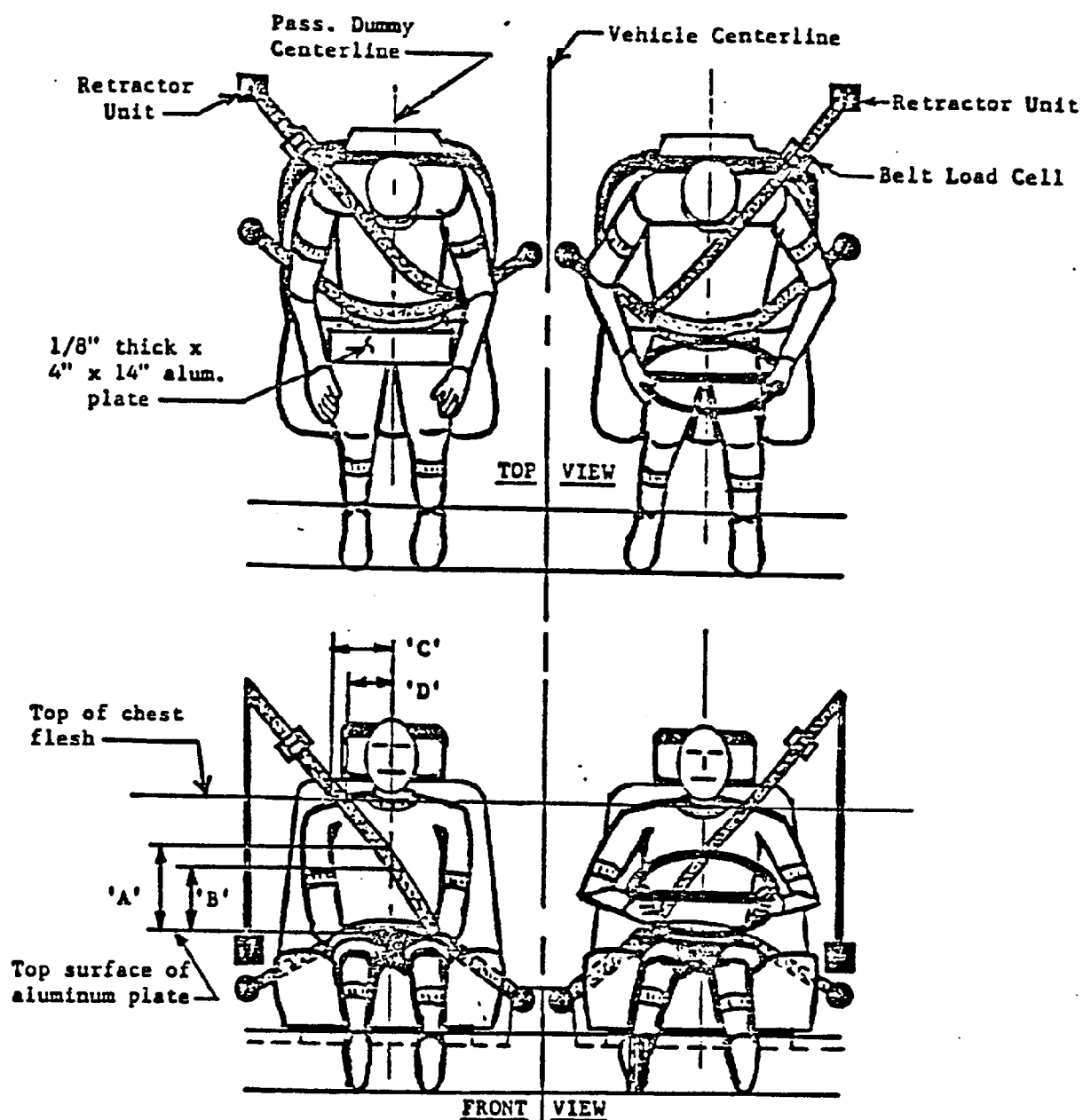
HH = Head to Windshield Header
 HW = Head to Windshield
 CD = Chest to Dash
 CS = Chest to Steering Wheel
 KD = Knees to Dash
 HR = Head to Side Roof
 HS = Head to Side Window
 AD = Arm to Door
 HD = Hip to Door
 KK = Knee to Knee
 Torso and seat back angles
 are relative to vertical.

REMARKS:



	Driver	Passenger
HR	6.0	7.8
HS	9.0	16.3
AD	4.5	5.0
HD	7.0	6.8
KK	14.5	14.5
AA	14.0	13.8

Data Table No. 8 Seat Belt Positioning Data



	DRIVER DUMMY (in.)	PASS. DUMMY (in.)
1. Dimension 'A'--alum. plate to belt upper edge on dummy centerline	14.4	12.4
2. Dimension 'B'--alum. plate to belt lower edge on dummy centerline	11.1	9.6
3. Dimension 'C'--dummy centerline to outer edge at chest flesh top	5.0	5.8
4. Dimension 'D'--dummy centerline to inner edge at chest flesh top	2.9	3.4
5. Lap belt tension (lbs.)	1.5	1.5
6. Shoulder belt tension (lbs.)	1.0	1.0

Data Table No. 9 Seat Belt Performance Assessment Test Data

BELT LENGTH DATA:

Total Belt Length from 'B' Post trim panel to "male blade"

Shoulder belt length measured from the 'D' ring to the male blade across the dummy

Lap belt length measured from the outboard side sill anchor bolt to the male blade across dummy

PRE-TEST	
DRIVER	PASSENGER
120.6	120.5
33.4	34.0
32.5	33.8

BELT SPOOL-OUT DATA:

As determined by film analysis

As determined electronically

As determined mechanically

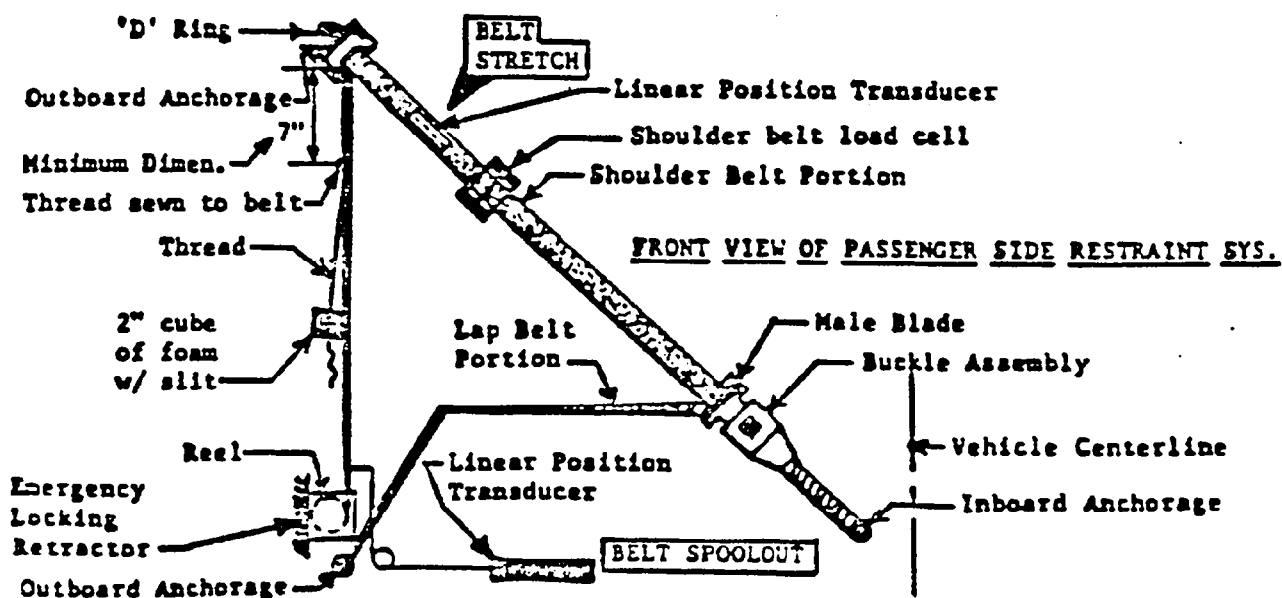
DRIVER SIDE	PASSENGER SIDE
N/A	N/A
Invalid	Invalid
7.1	6.1

BELT STRETCH DATA:

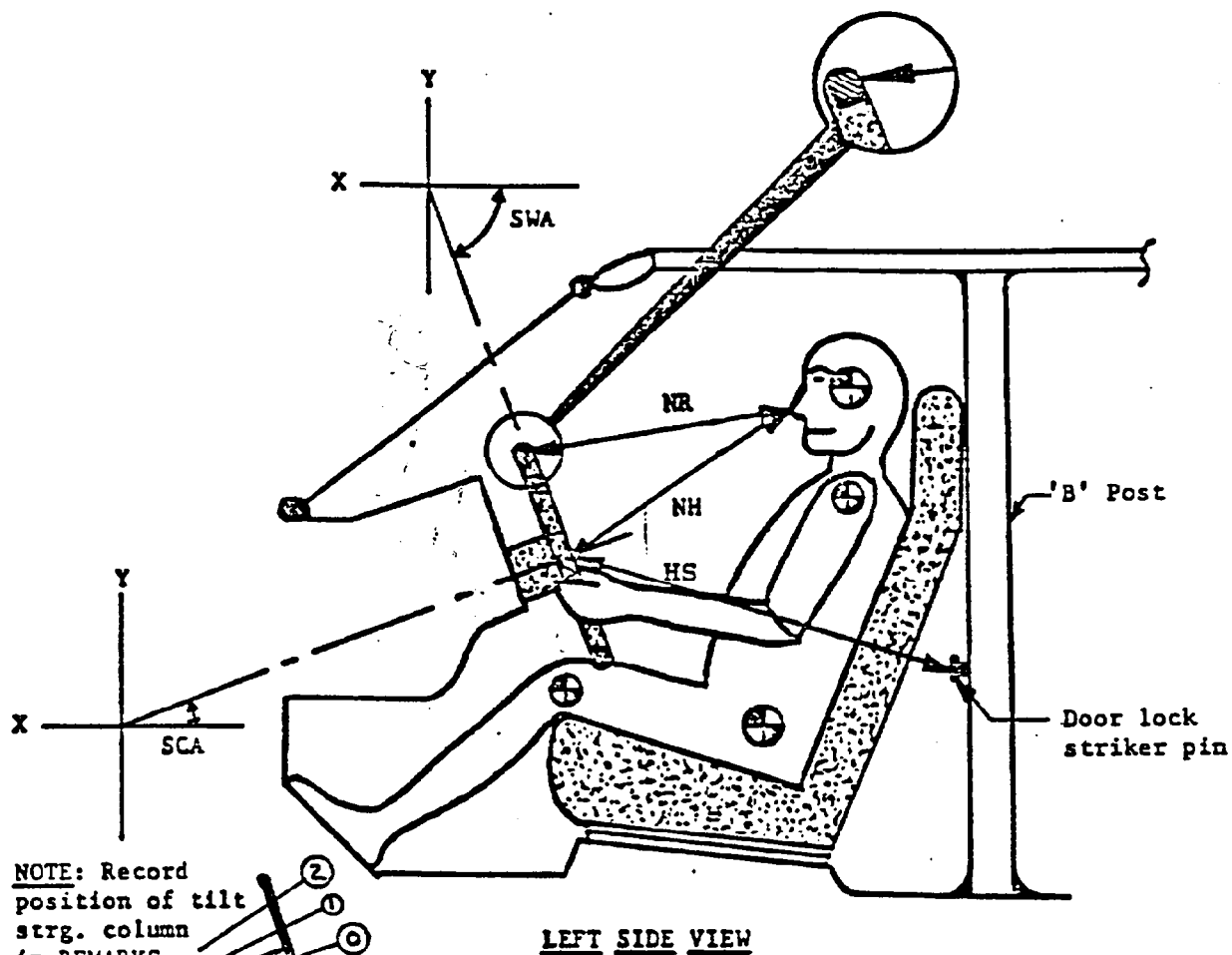
(1) Determined electronically with linear position transducer in inches per foot.

(2) Determined with 2" marked section of belt across dummy's chest (inches per foot)

Maximum Load 1701		Maximum Load 1535	
Elong. 0.72		Elong. 2.28	
PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
2"	2"	2"	2"
	Elong. 0		Elong. 0



Data Table No. 10 Driver Dummy to Steering Wheel Position



NOTE: Record position of tilt strg. column in REMARKS section

MEASUREMENTS		
NR--Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	16.3	Inches
NH--Distance from tip of dummy's nose to center of steering column hub	17.4	Inches
HS--Distance from center of steering column hub to the forward surface of the door lock striker pin.	28.0	Inches
SCA--Angle of steering column relative to the horizontal X axis	22	Degrees
SWA--Angle of steering wheel relative to the horizontal X axis.	24	Degrees

REMARKS CONCERNING ADJUSTABLE OR TILT STEERING COLUMN IF VEHICLE IS SO EQUIPPED:
N/A

Data Table No. 11 Camera Location Data

VEH. NHTSA NO.: CG0601 ; TEST DATE: 06/04/85 ; TIME: 4:00 pm

VEH. YEAR/MAKE/MODEL/BODY STYLE: 1986/Mazda/B 2000/Truck / 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	790.0	300.0	51.5	2	800	12/50	24
2	Right Side View	254.0	65.0	96.3	5	231.6	16	710
3	Left Side View	795.6	36.9	51.3	0	777.5	50	640
4	Overhead	-1.1	-39.2	129.1	15	97.3	13	580
5	Pit-Engine	1.5	11.8	-56.0	50	N/A	13	500
6	Pit-Fuel Tank	0.5	43.0	-52.0	51	N/A	13	550
7	Front-Passenger	11.8	-15.8	107.3	46	127.5	13	880
8	Front-Driver	-12.9	-14.8	109.1	45	129.4	25	480
9	Left Side-Driver	-153.3	113.1	-60.4	6	137.5	28	680
10	Right Side-Passenger	148.5	145.0	64.4	7	150.0	45	420
11	Right Side-'A' Post	251.5	49.1	51.8	5	232.8	35	660
12	Left Side-'A' Post	417.1	86.3	54.3	2	399.3	50	420
13	Onboard-Left Side	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14	Onboard-Right Side	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15	Left Side-Steering Col.	665.5	96.9	130.3	8	647.4	50	740
16	Left Side-Steering Col.	663.4	93.3	110.1	6	645.5	50	740
17	Right Side-Passenger	149.1	69.5	65.3	10	130.3	13	580

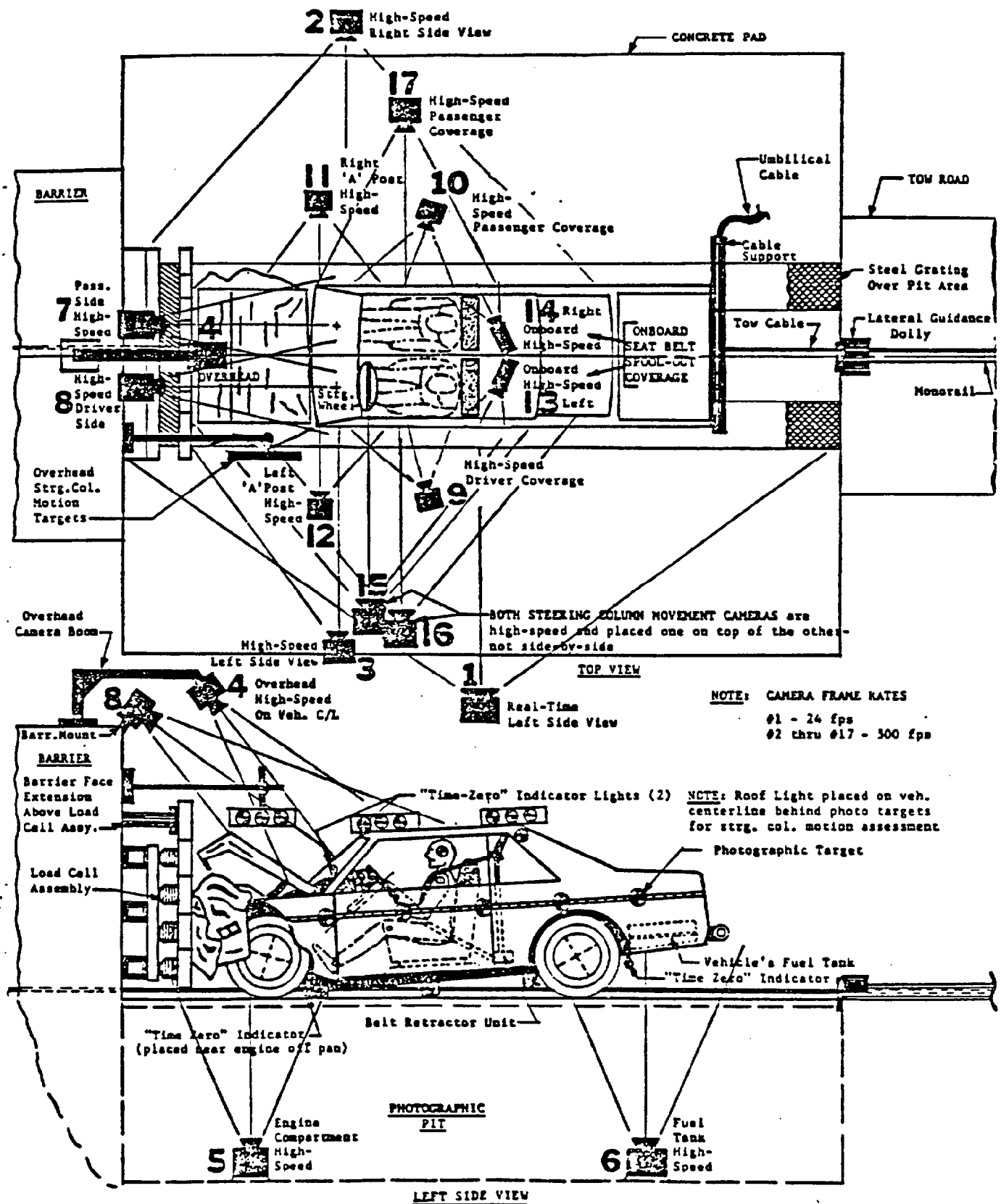
* X = film plane to monorail centerline

Y = film plane to barrier face

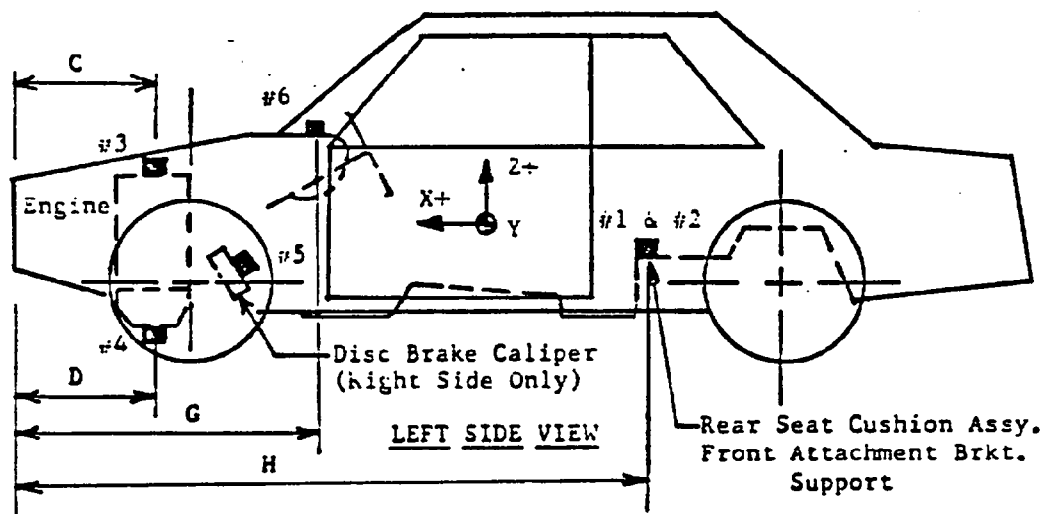
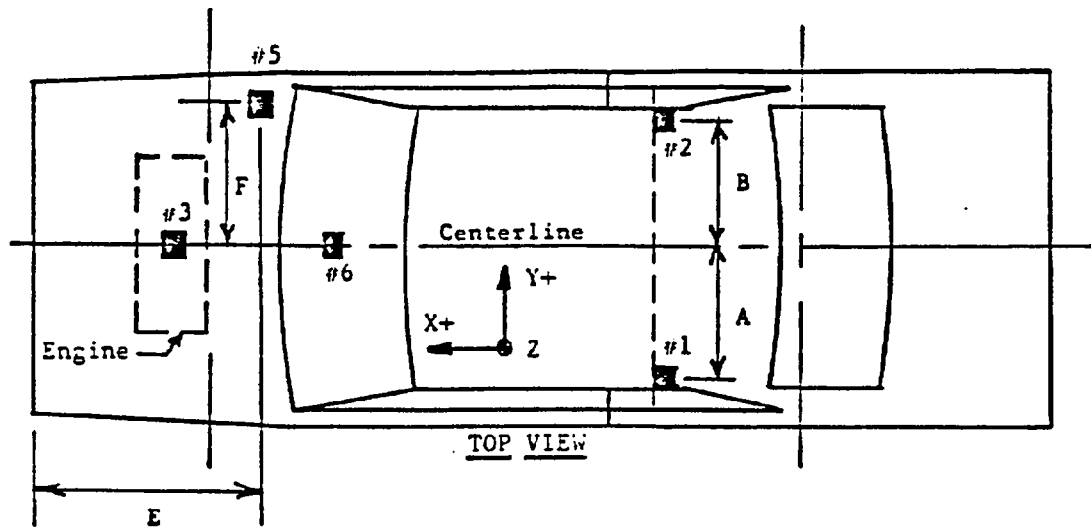
Z = film plane to ground

Data Table No. 11 (Con't) Camera Location Data

CAMERA REQUIREMENTS FOR 35 MPH FRONTAL BARRIER IMPACT ASSESSMENT PROGRAM TEST



Data Table No. 12 Vehicle Accelerometer Location and Data Summary



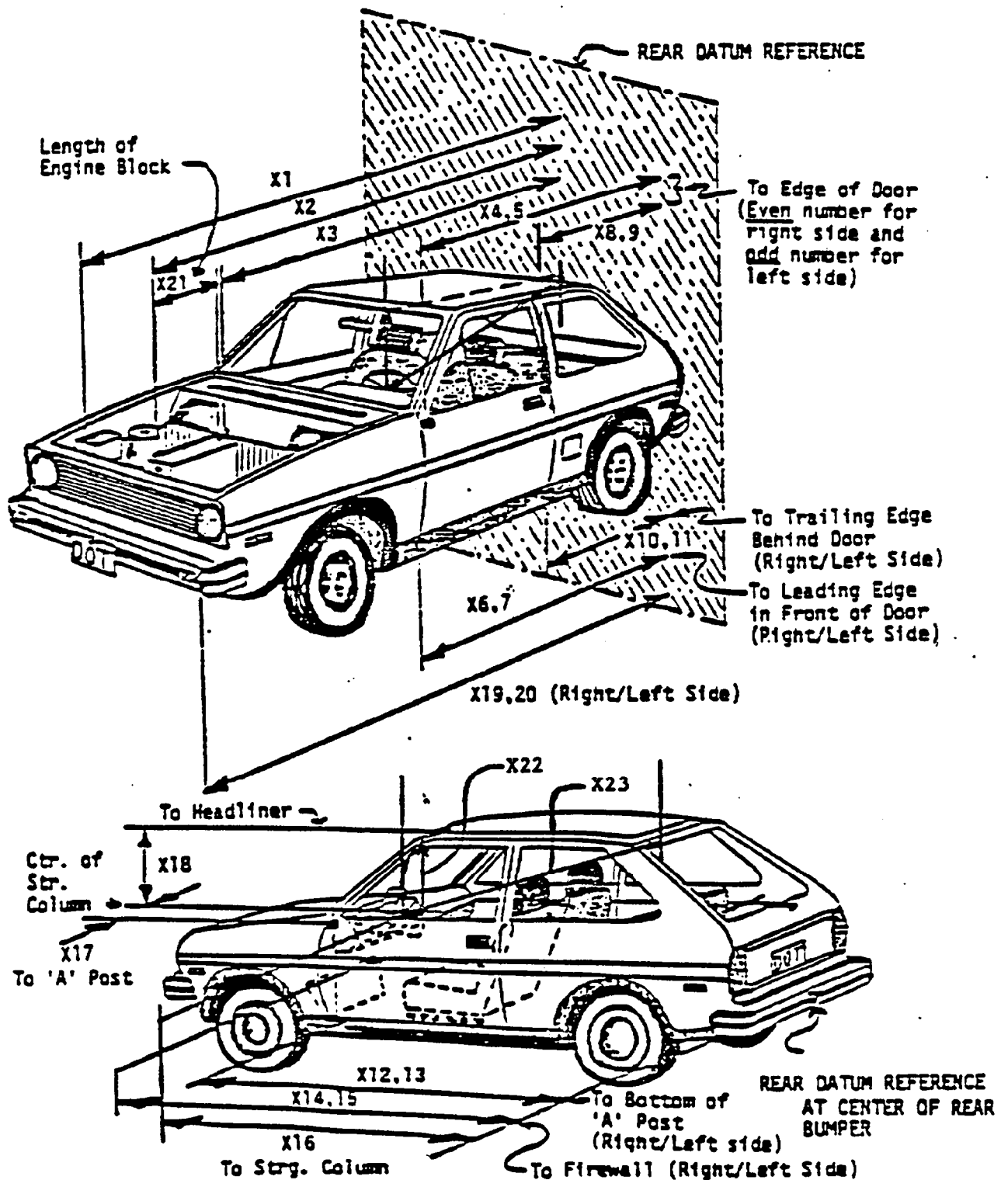
Dimension	Length (in.)
A	20.6
B	10.8
C	21.8
D	33.8
E	35.1
F	24.3
G	53.3
H	89.5

Loc. No.	Description	Maximum Value			
		X-	msec.	X+	msec.
1	Rear seat X-member @ Left Side	60.51	15.0	6.88	88.5
2	Rear seat X-member @ Right Side	60.65	35.0	5.40	92.0
3	Top of Engine Block	78.68	26.5	38.30	36.0
4	Bottom of Engine	72.52	26.5	22.13	36.0
5	Disc Brake Caliper @ Right Side	107.02	23.0	15.02	51.5
6	Instrument Panel	84.39	11.5	35.58	17.5

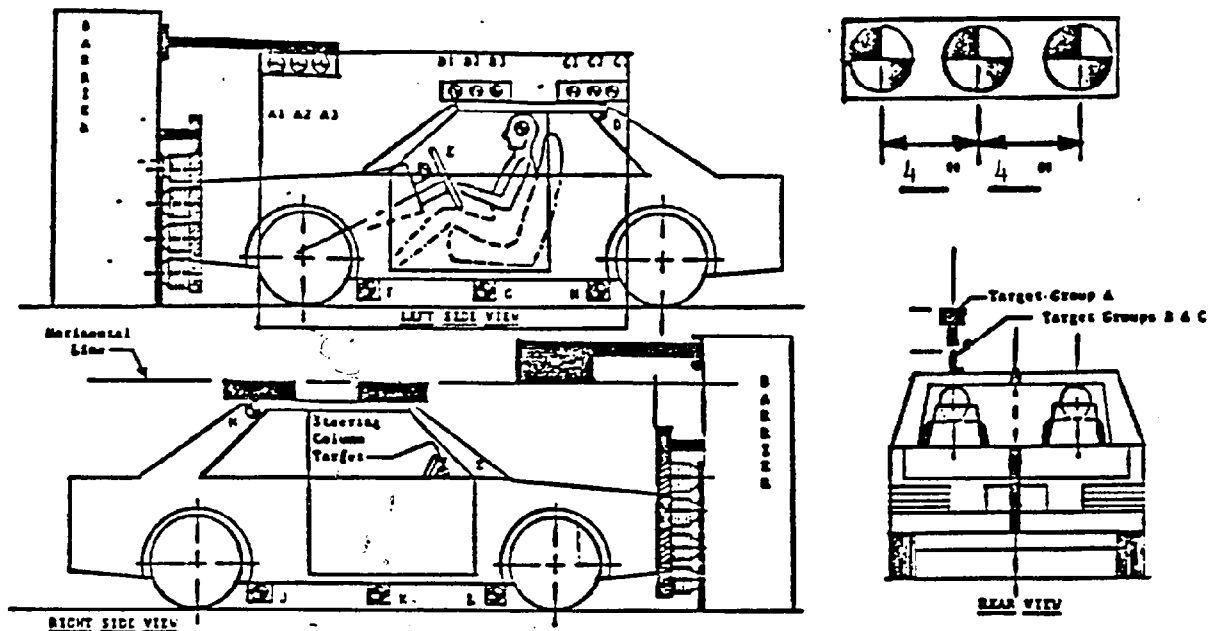
Data Table No. 13 Test Vehicle Measurements

NO.	MEASUREMENT DESCRIPTION:	Pre-Test (in.)	Post-Test (in.)	Diff. (in.)
X1	Total Length of Test Vehicle at Centerline	177.3	160.3	17.0
X2	Rear Surface of Vehicle to Front of Engine	159.4	155.1	4.3
X3	Rear Surface of Vehicle to Firewall	137.9	138.6	- 0.7
X4	Rear Surface to Upr. Leading Edge of Right Door	124.4	124.3	0.1
X5	Rear Surface to Upr. Leading Edge of Left Door	124.3	124.8	- 0.5
X6	Rear Surface to Lwr. Leading Edge of Right Door	124.8	123.9	0.9
X7	Rear Surface to Lwr. Leading Edge of Left Door	124.4	124.3	0.1
X8	Rear Surface to Upr. Trailing Edge of Right Door	84.3	84.1	0.2
X9	Rear Surface to Upr. Trailing Edge of Left Door	84.1	84.6	- 0.5
X10	Rear Surface to Lwr. Trailing Edge of Right Door	83.0	82.2	0.8
X11	Rear Surface to Lwr. Trailing Edge of Left Door	82.8	82.8	0.0
X12	Rear Surface to Bottom of 'A' Post on Right Side	122.6	121.8	0.8
X13	Rear Surface to Bottom of 'A' Post on Left Side	122.3	122.2	0.1
X14	Rear Surface to Firewall on Right Side	137.9	137.6	0.3
X15	Rear Surface to Firewall on Left Side	138.0	138.0	0.0
X16	Rear Surface to Steering Column	113.1	109.5	3.6
X17	Center of Steering Column to 'A' Post	13.4	12.5	0.9
X18	Center of Steering Column to Headlining	17.3	19.1	- 1.8
X19	Rear Surface to Right Side of Front Bumper	174.3	158.2	16.1
X20	Rear Surface to Left Side of Front Bumper	174.3	158.4	15.9
X21	Length of Engine Block	19.4	19.4	0.0
X22	Strg. Whl. Hub C/L to W/Shld. Header Interior Trim Moulding	17.5	19.4	- 1.9
X23	Strg. Whl. Hub C/L to Rr. Wdo. Upper Interior Trim Moulding	35.3	34.9	0.4

Data Table No. 13 (Con't) Test Vehicle Measurements



Data Table No. 14 Pre-Test Vehicle Target Location



BARRIER TARGETS	'X' From Imag. Barrier Face Vertical Plane	'Y' From Monorail C/L	'Z' Above Ground
A1	16.9	20.7	73.6
A2	20.9	20.7	73.6
A3	24.9	20.7	73.6

VEHICLE TARGETS	'X' From Imag. Barrier Face Vertical Plane	'Y' From Vehicle C/L	'Z' Above Ground
B1	77.6	13.9	63.1
B2	81.6	13.6	63.3
B3	85.6	13.4	63.4
C1	115.5	12.0	44.6
C2	119.5	12.0	44.6
C3	123.5	12.0	44.6
D	95.3	25.5	56.8
E	64.2	15.8	41.3
F	48.9	31.2	11.8
G	84.4	31.5	12.6
H	119.5	31.1	13.5
J	119.5	31.1	13.1
K	84.4	31.5	12.5
L	48.9	31.2	11.5
M	95.2	25.4	56.6

NOTE: Diameter of all photo targets is 4"

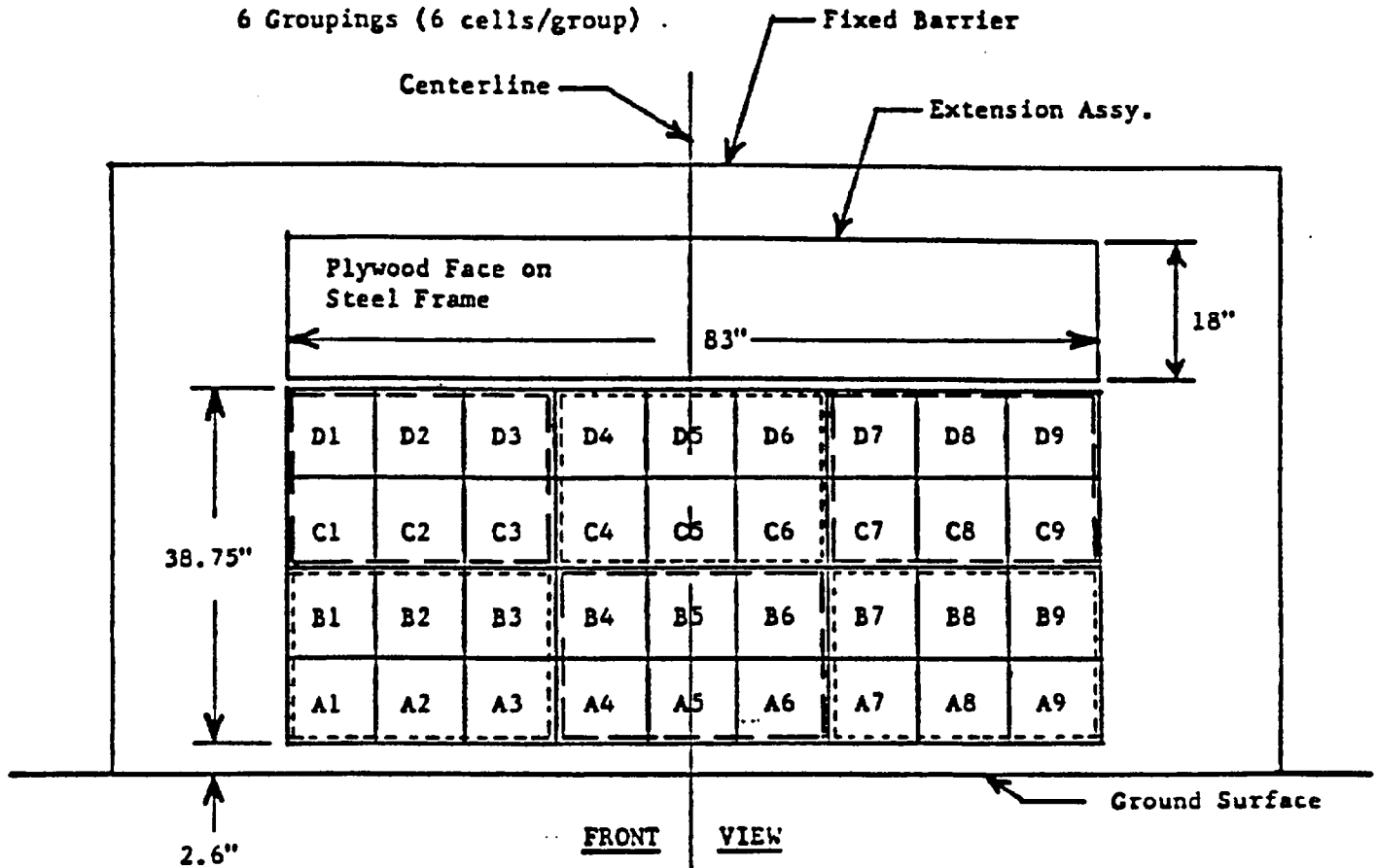
Data Table No. 15 Load Cell Locations on Fixed Barrier

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)

Data Table No. 16 Accident Investigation Division Data

VEHICLE MAKE/MODEL/BODY STYLE: Mazda/B 2000/Truck/Pickup

VEH. NHTSA NO.: CG0601; VIN: JM2UF1110G0532982

MODEL YEAR: 1986; BUILD DATE: 03/85; TEST DATE: 06/04/85

VEH. SIZE CATEGORY: Pickup; TEST WEIGHT: 3080

VEH. WHEELBASE: 108.9; FRONT OVERHANG: 29.8; OVERALL WIDTH: 65.9

ACCELEROMETER DATA:

LOCATION: Left Rear Floor Pan

CALIBRATION PROCEDURE: Voltage insertion

LINEARITY: 3 %; INTEGRATION ALGORITHM: Area Summation

VEH. IMPACT SPEED: 35.01; TIME OF SEPARATION: 0.080 sec.

VELOCITY CHANGE: 41.6 mph

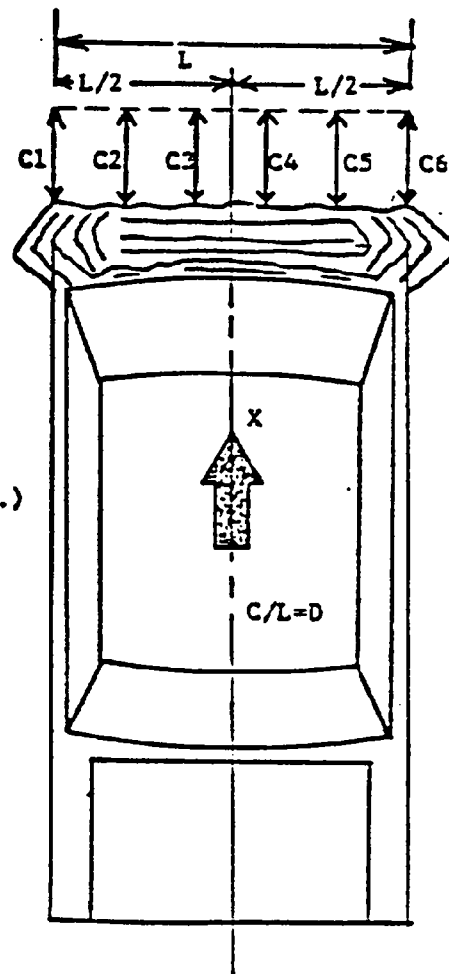
☒ COLLISION DEFORMATION CLASSIFICATION (CDC) CODE:

F (Frontal) 12FDEW5

CRUSH DEPTH	C1=	<u>15.9</u>	<u>inches</u>
DIMENSIONS:	C2=	<u>16.2</u>	<u>inches</u>
	C3=	<u>16.8</u>	<u>inches</u>
	C4=	<u>17.0</u>	<u>inches</u>
	C5=	<u>16.6</u>	<u>inches</u>
	C6=	<u>16.1</u>	<u>inches</u>

MIDPOINT OF DAMAGE: D = Vehicle Centerline (Longitud.)

LENGTH OF DAMAGED REGION: L = 54.3 inches



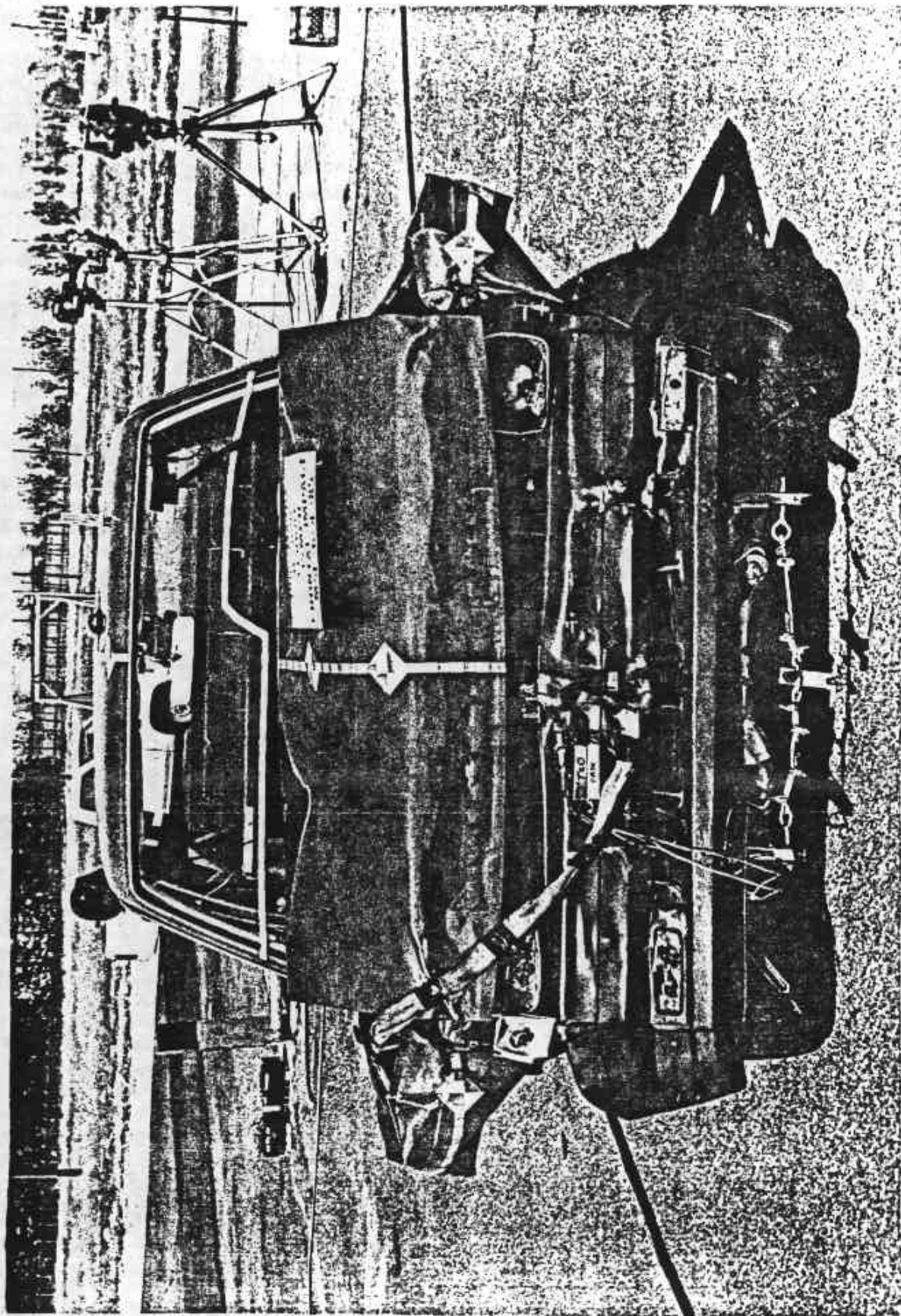
APPENDIX A

PHOTOGRAPHS

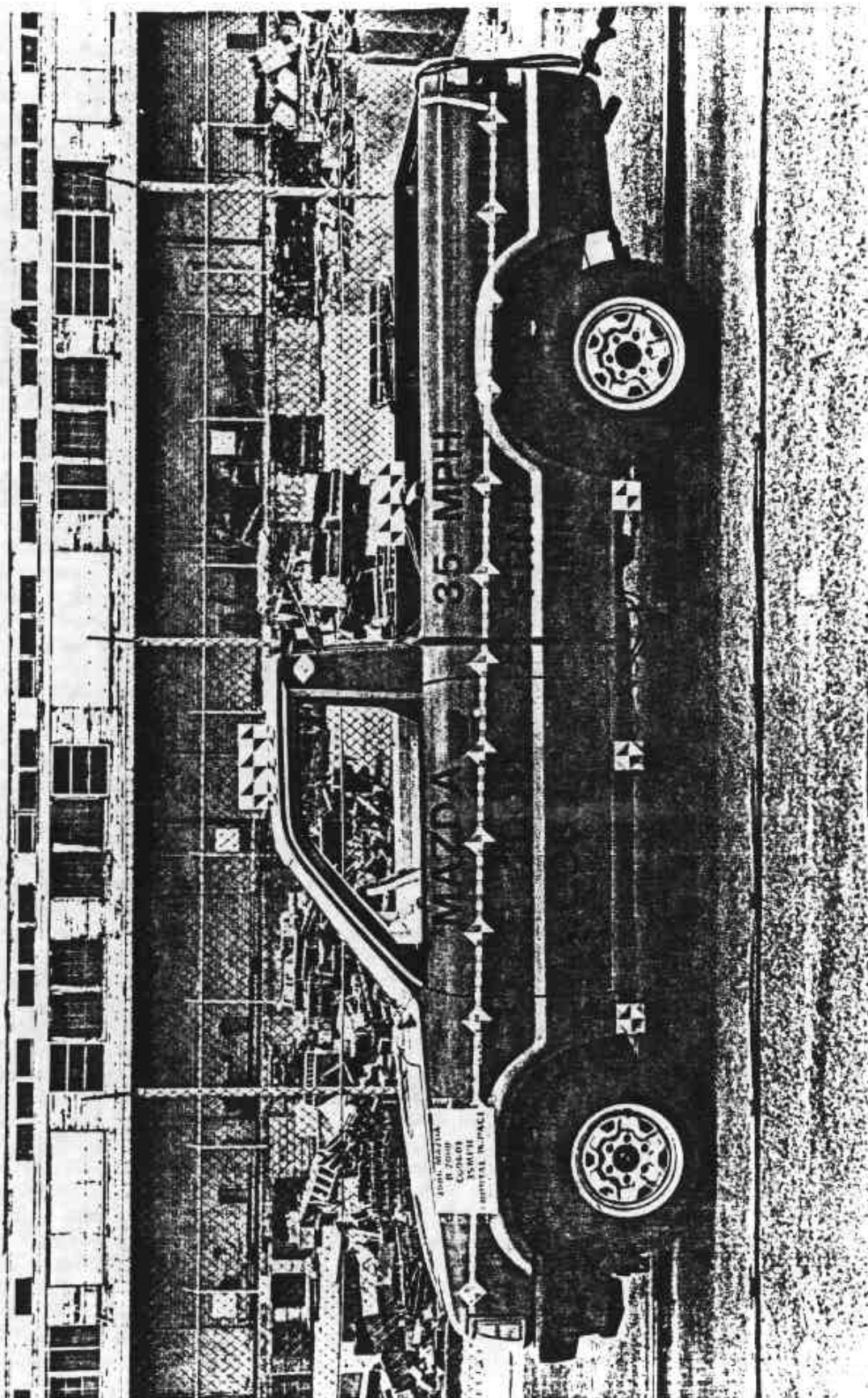
PRE TEST FRONT VIEW
POST TEST FRONT VIEW
PRE TEST LEFT SIDE VIEW
POST TEST LEFT SIDE VIEW
PRE TEST RIGHT SIDE VIEW
POST TEST RIGHT SIDE VIEW
PRE TEST RIGHT FRONT THREE QUARTER VIEW
POST TEST RIGHT FRONT THREE QUARTER VIEW
PRE TEST LEFT REAR THREE QUARTER VIEW
POST TEST LEFT REAR THREE QUARTER VIEW
POST TEST TOP VIEW (Vehicle on Rollover Machine)
PRE TEST WINDSHIELD VIEW
POST TEST WINDSHIELD VIEW
PRE TEST ENGINE COMPARTMENT VIEW
POST TEST ENGINE COMPARTMENT VIEW
PRE TEST FUEL FILLER CAP VIEW
PRE TEST FRONT UNDERBODY VIEW
POST TEST FRONT UNDERBODY VIEW
PRE TEST REAR UNDERBODY VIEW
POST TEST REAR UNDERBODY VIEW
PRE TEST DRIVER DUMMY POSITION VIEW
POST TEST DRIVER DUMMY POSITION VIEW
PRE TEST PASSENGER DUMMY POSITION VIEW
POST TEST PASSENGER DUMMY POSITION VIEW
PRE TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
POST TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
PRE TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
POST TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
POST TEST STEERING COLUMN HUB/RIM CONTACT BY DUMMY DRIVER
POST TEST PASSENGER DUMMY KNEE CONTACT



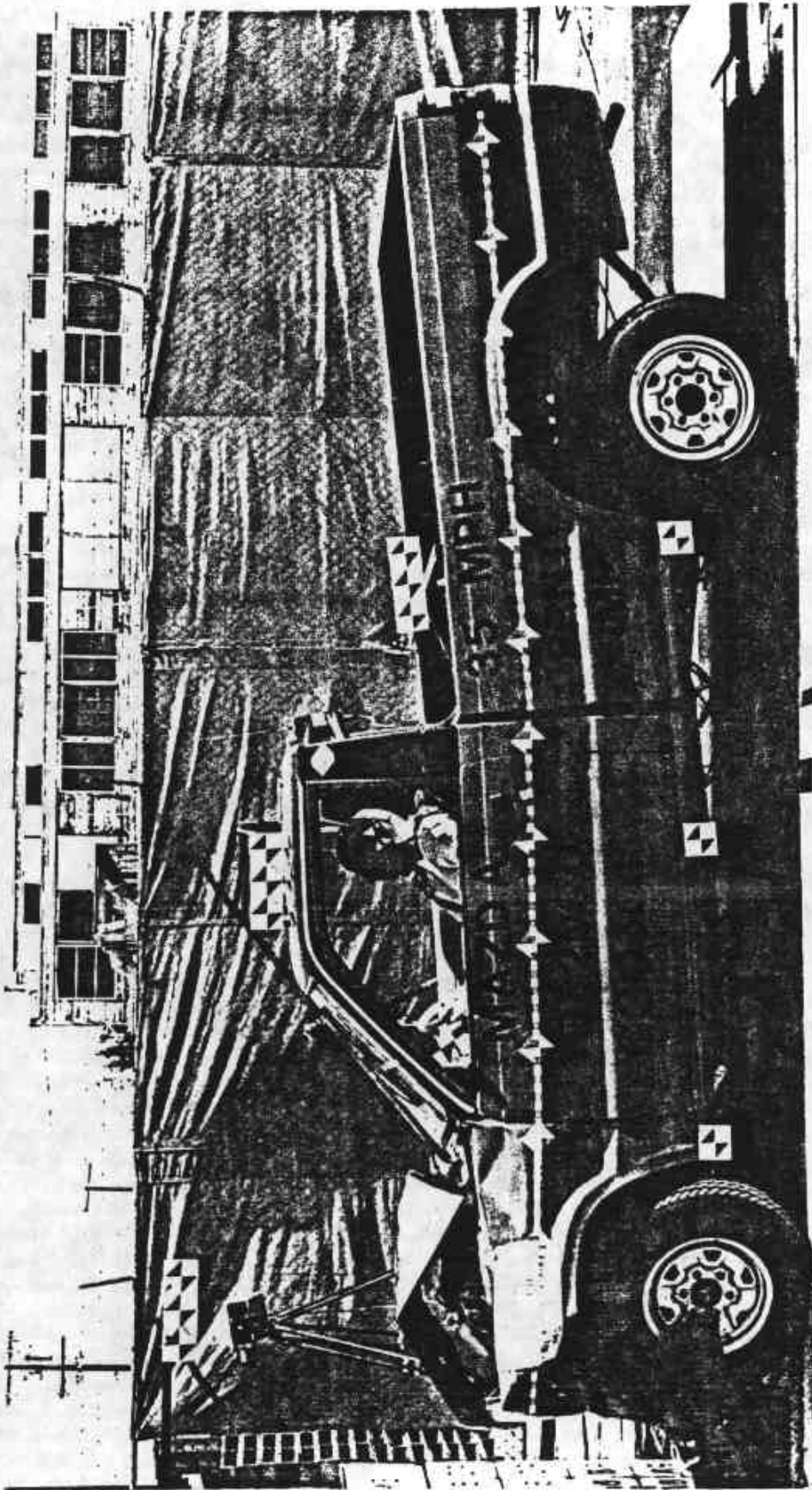
PRE TEST FRONT VIEW



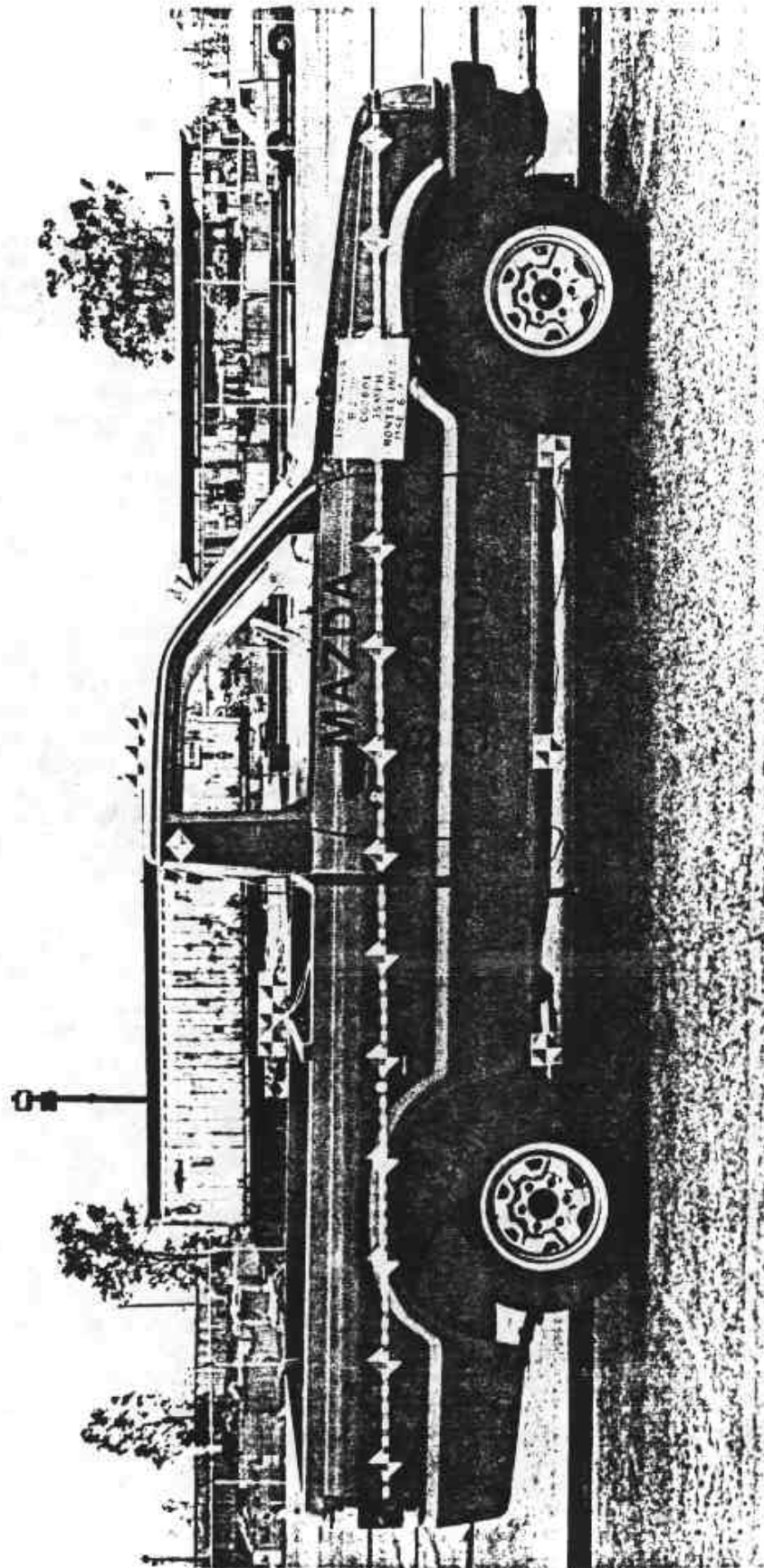
POST TEST FRONT VIEW



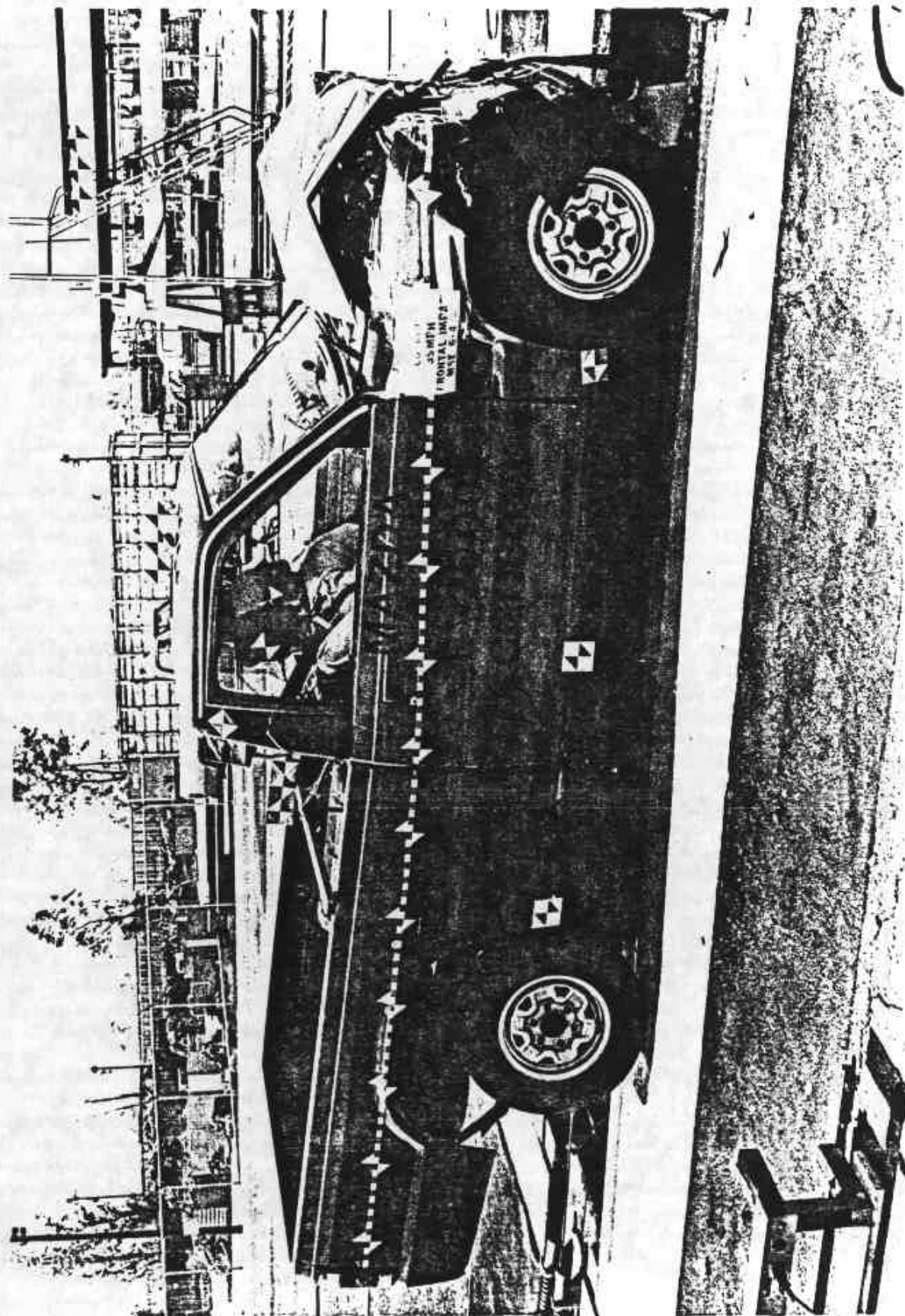
PRE TEST LEFT SIDE VIEW



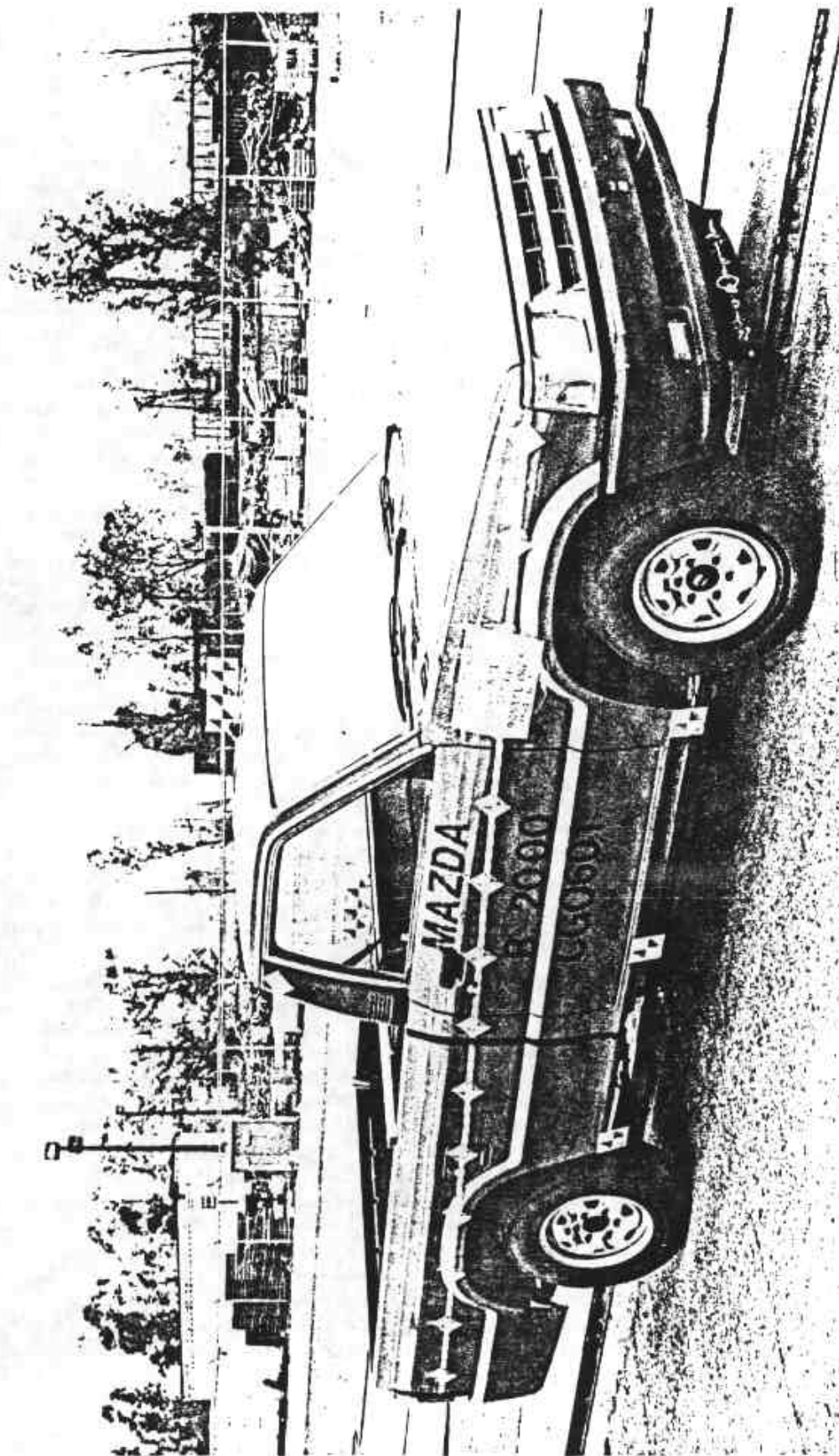
POST TEST LEFT SIDE VIEW



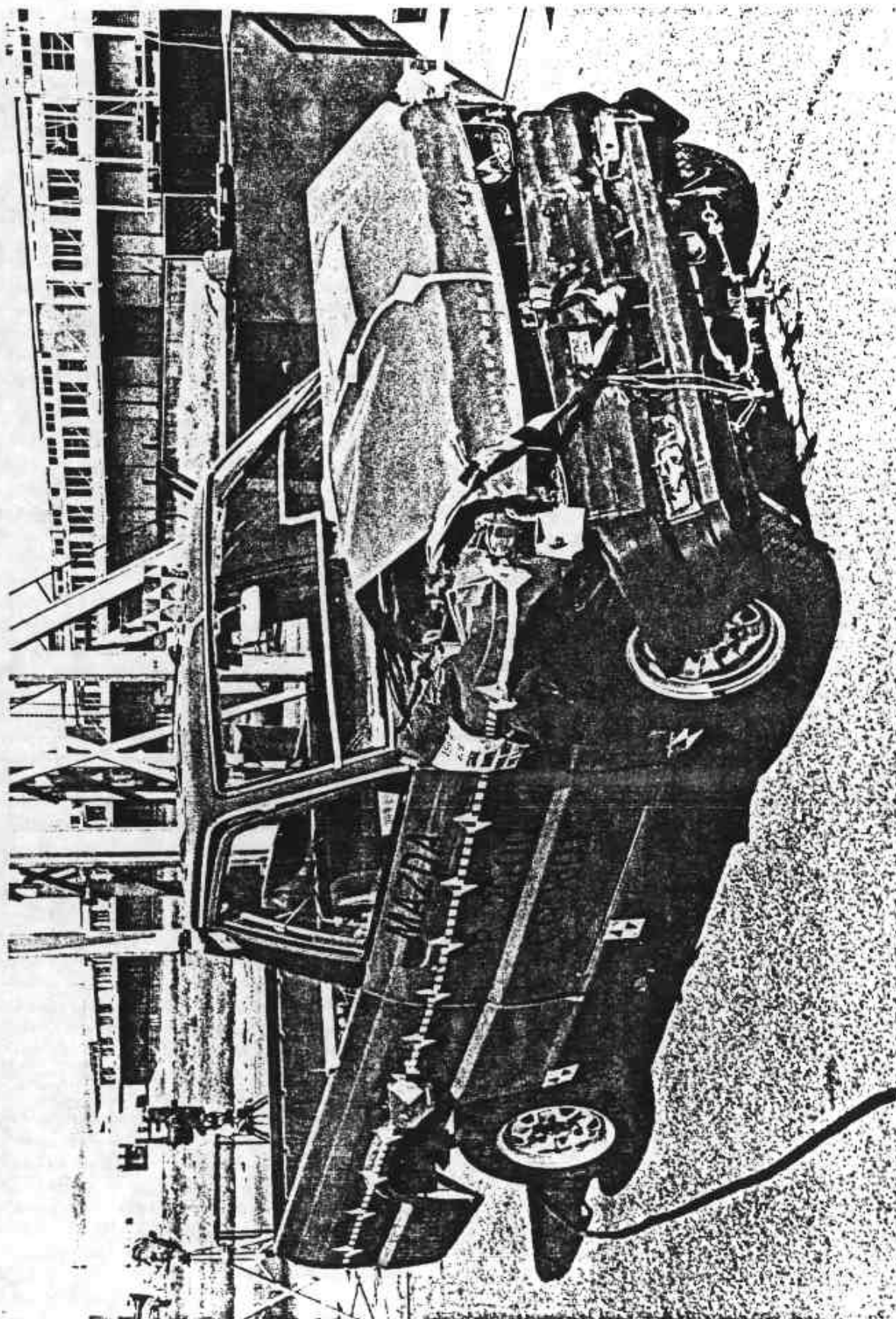
PRE TEST RIGHT SIDE VIEW



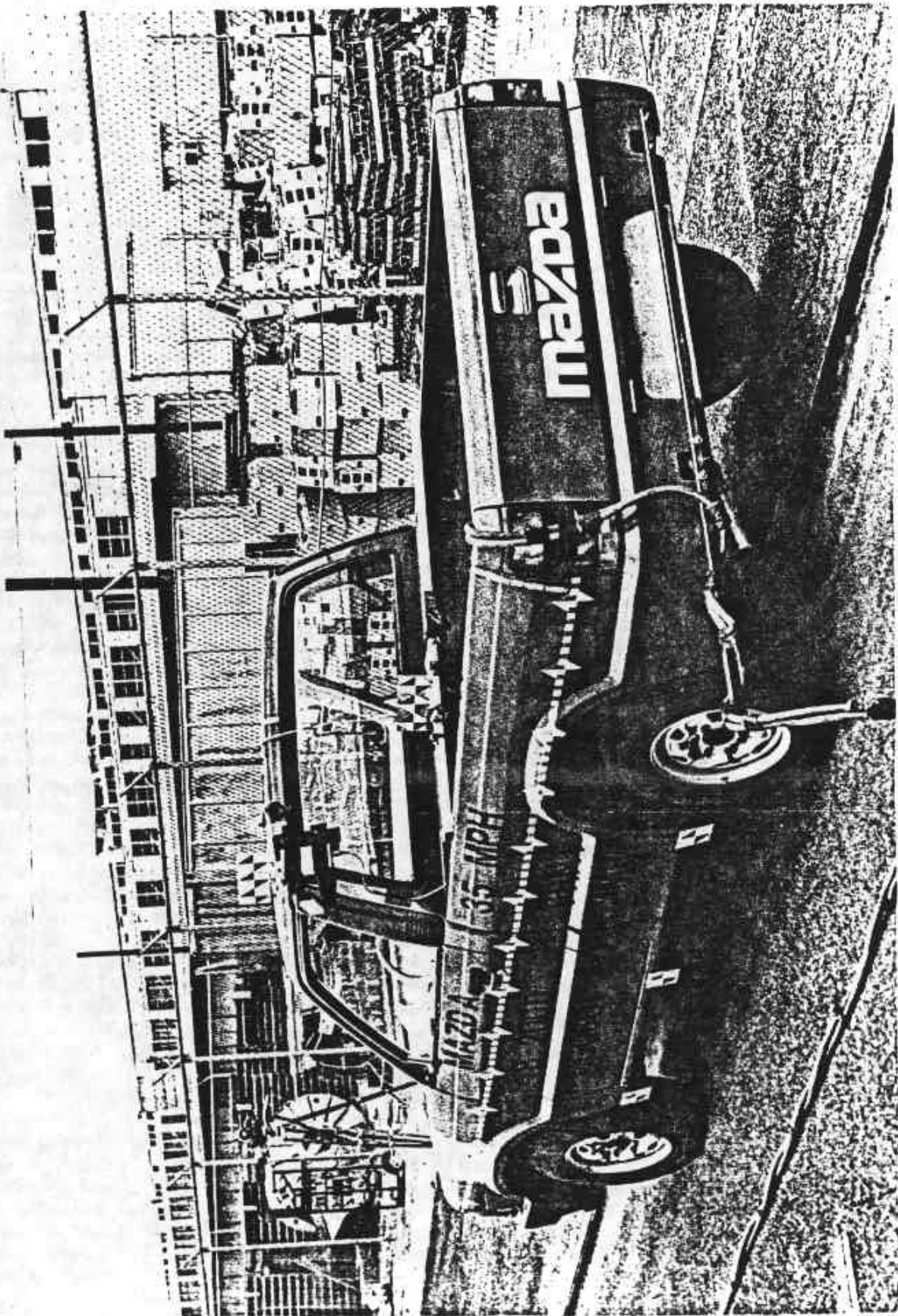
POST TEST RIGHT SIDE VIEW



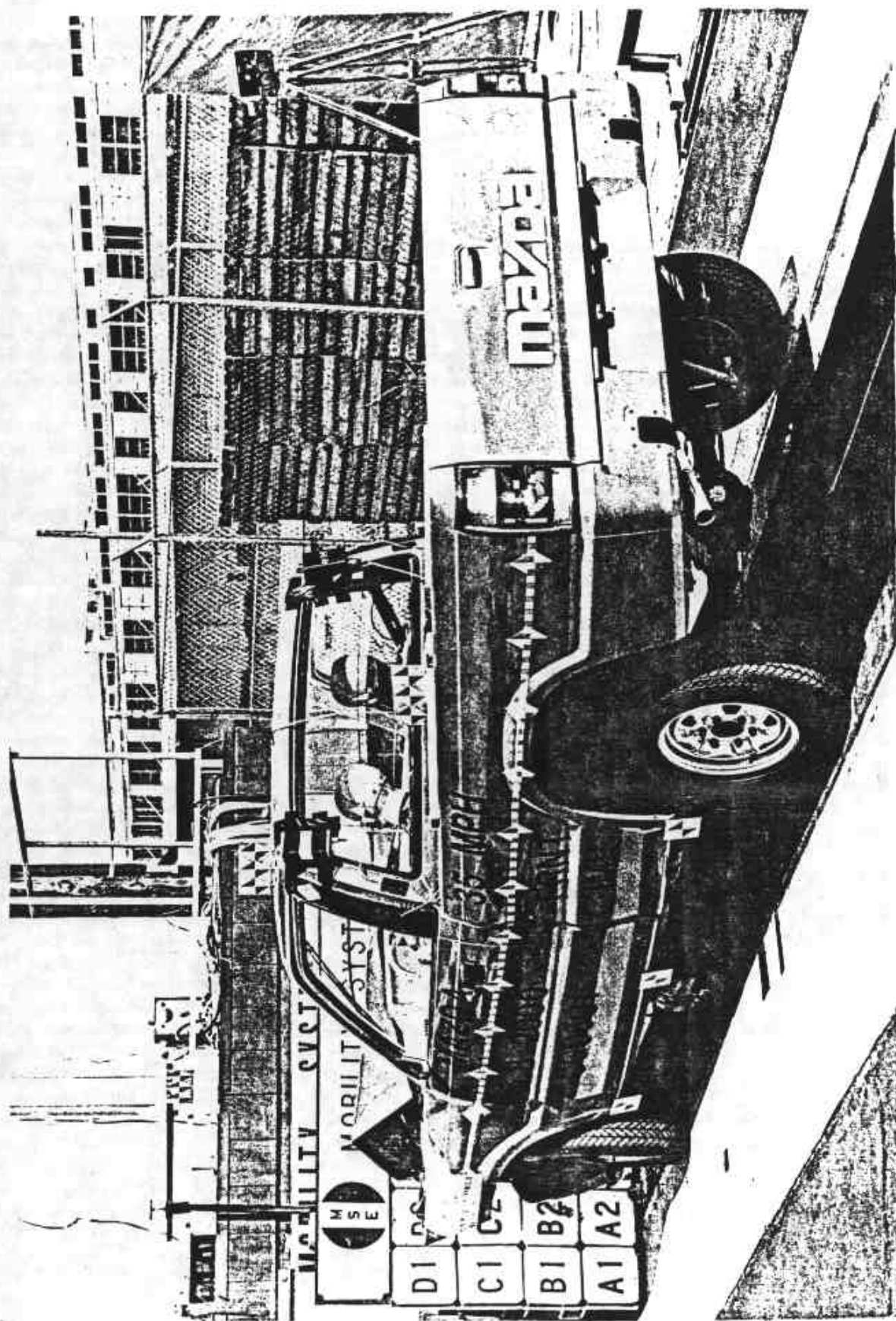
PRE TEST RIGHT FRONT THREE-QUARTER VIEW



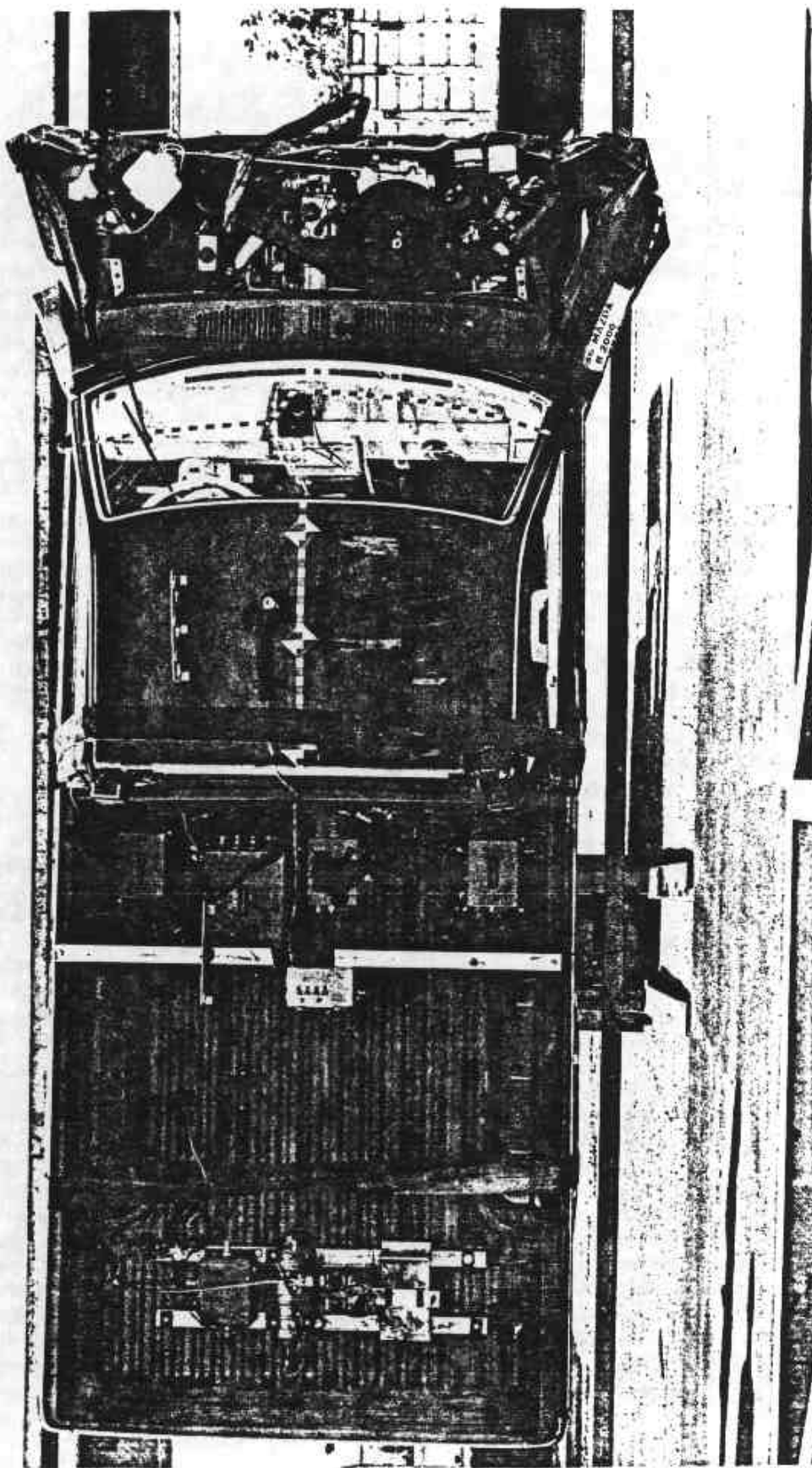
POST TEST RIGHT FRONT THREE - QUARTER VIEW



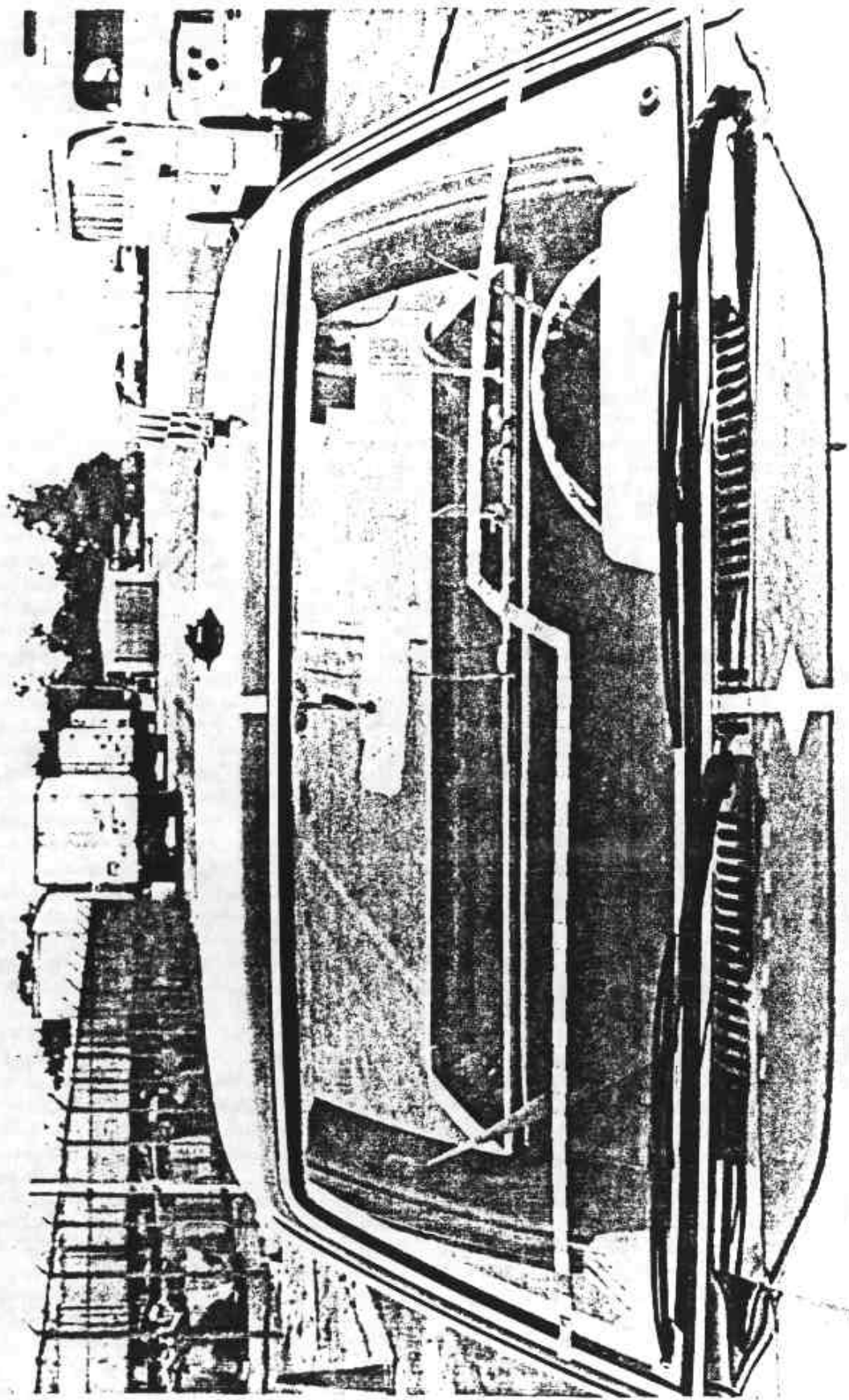
PRE TEST LEFT REAR THREE QUARTER VIEW



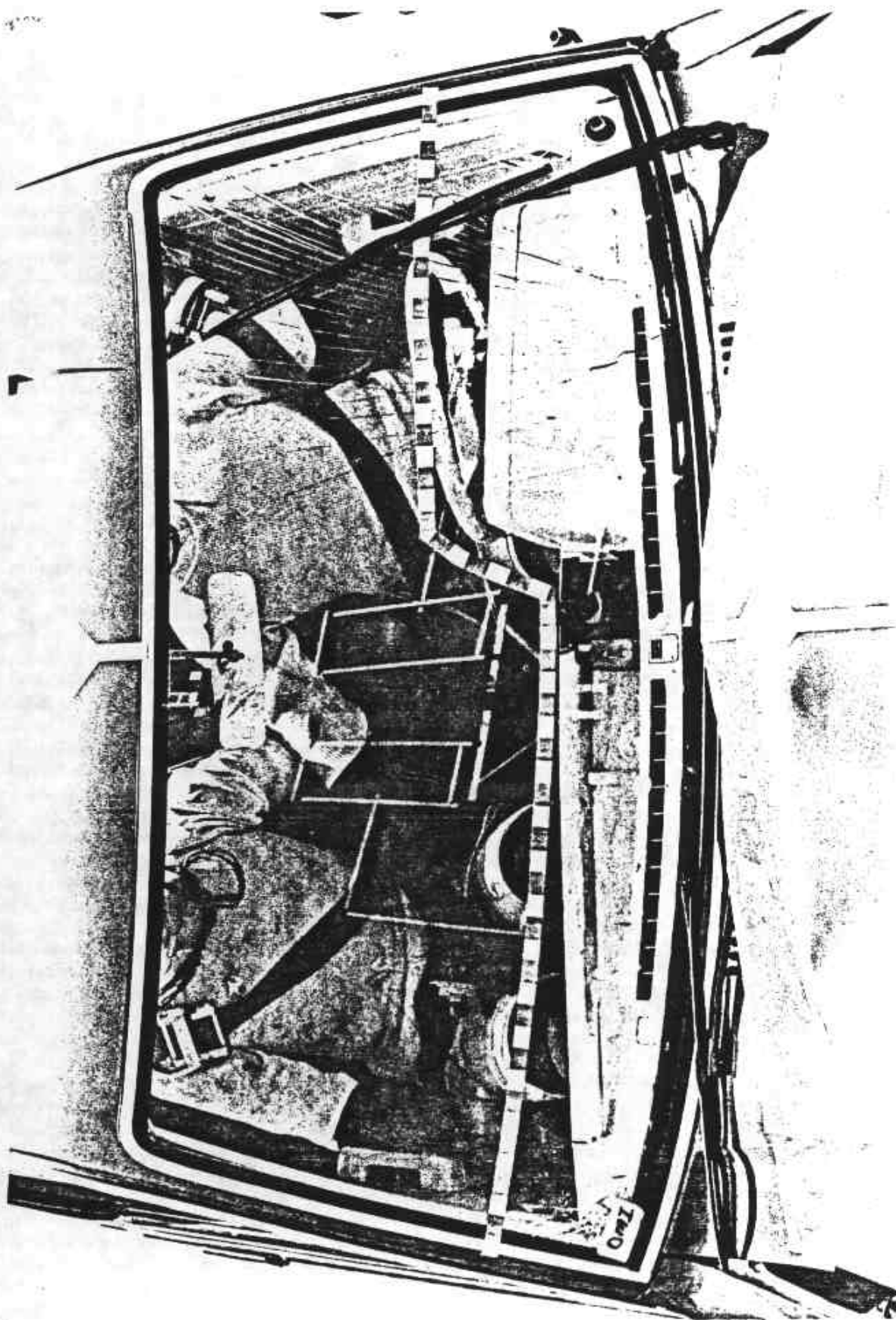
POST TEST LEFT REAR THREE-QUARTER VIEW



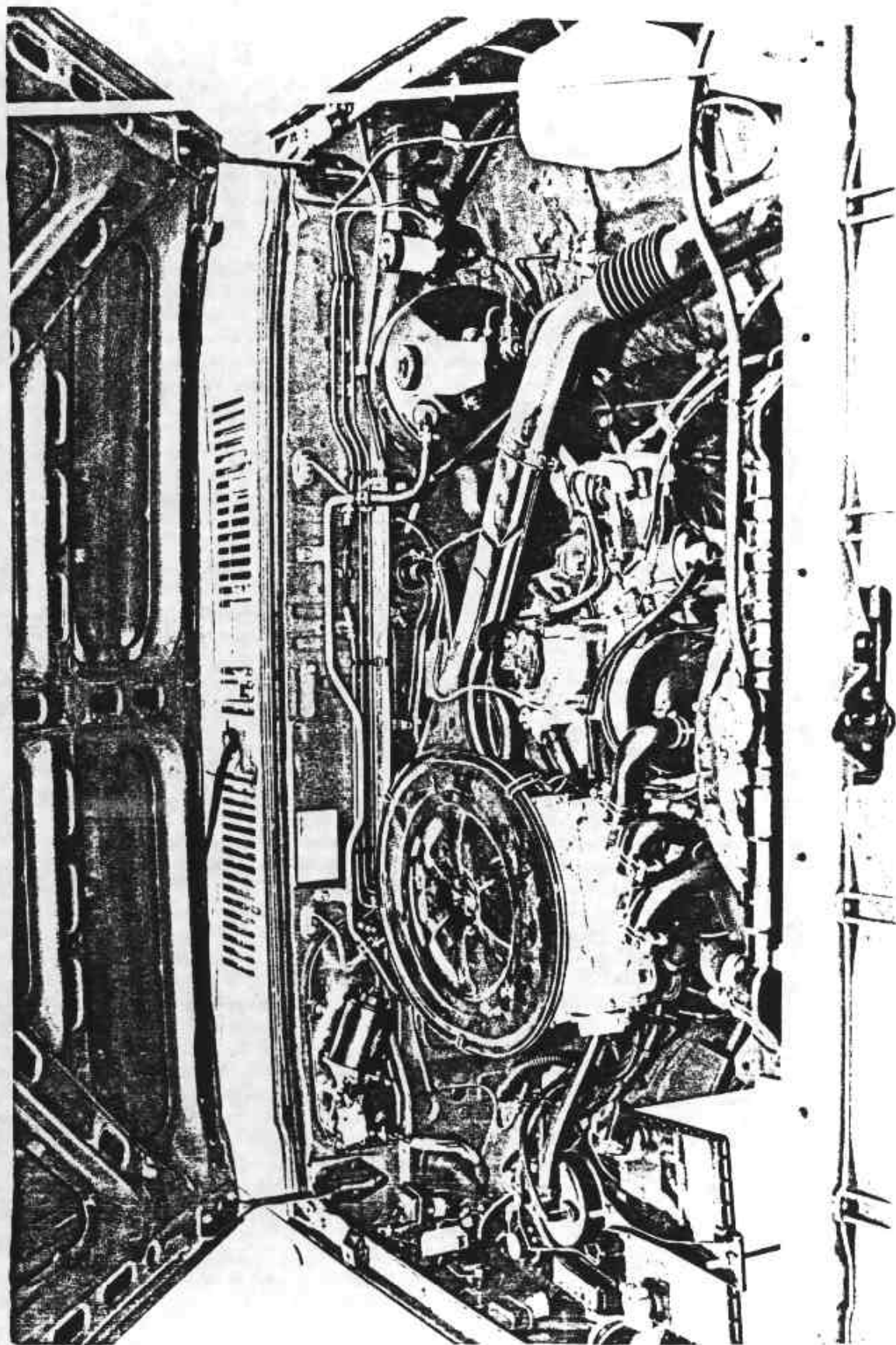
POST TEST TOP VIEW (Vehicle on Rollover Machine)



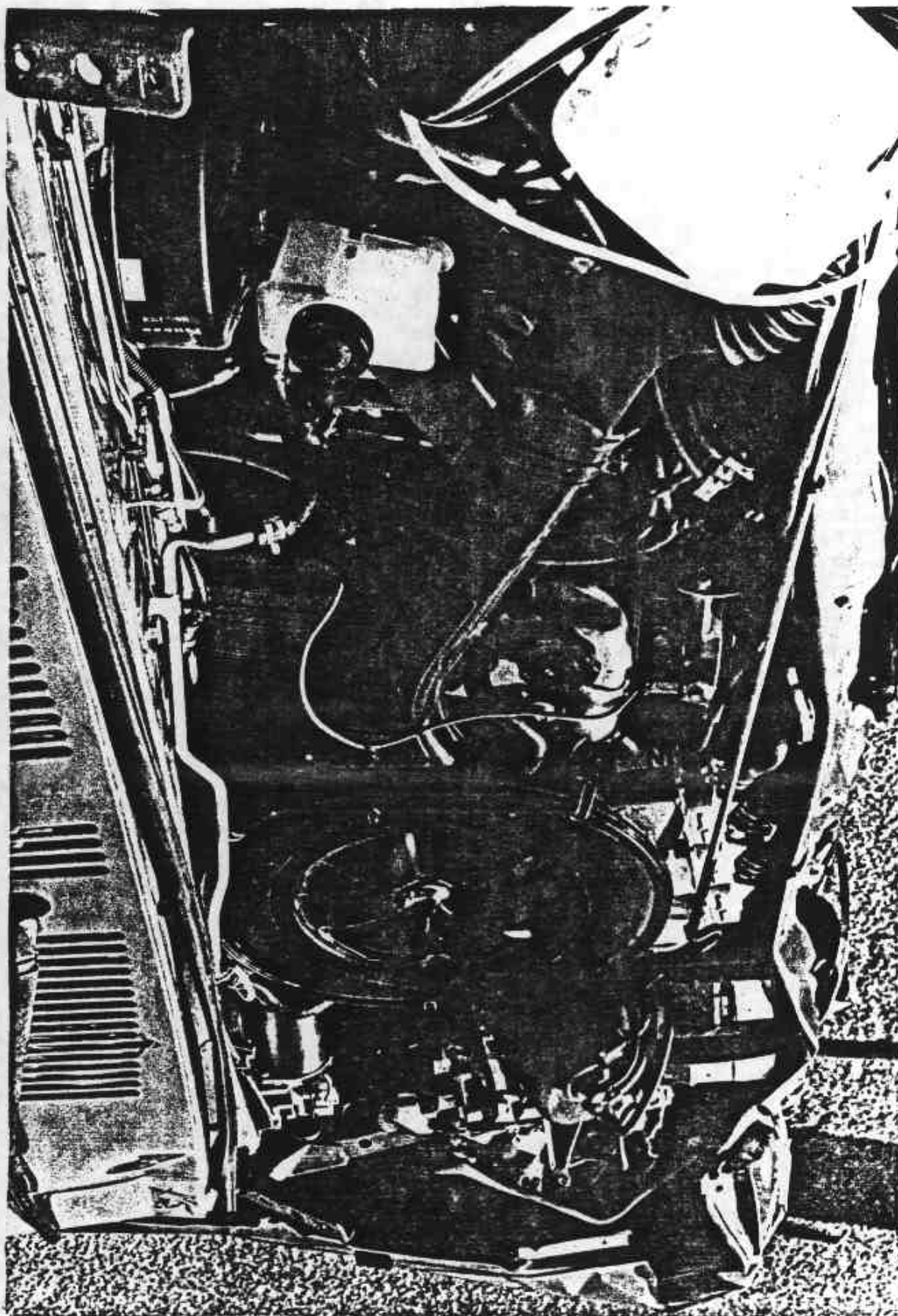
PRE TEST WINDSHIELD VIEW



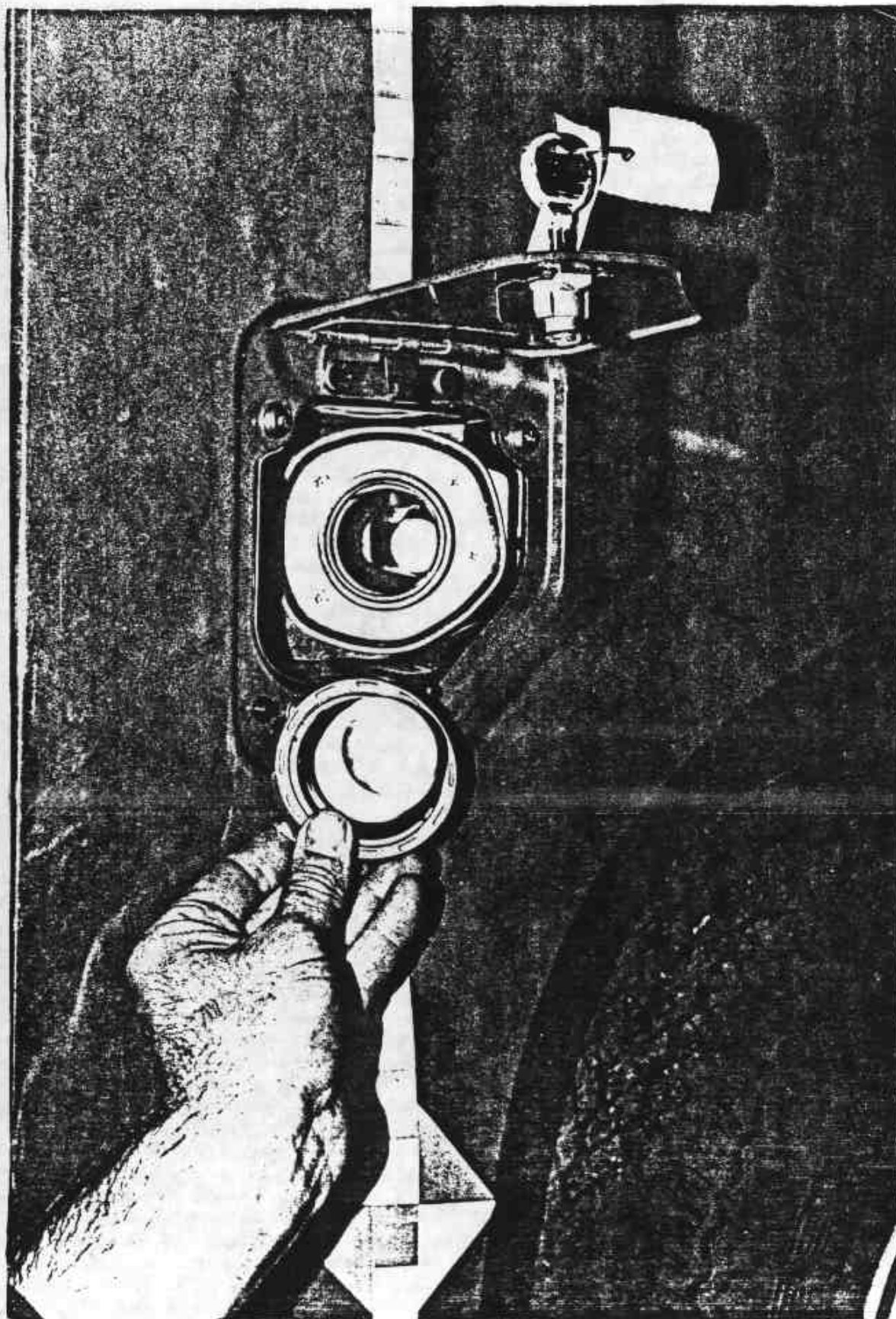
POST TEST WINDSHIELD VIEW



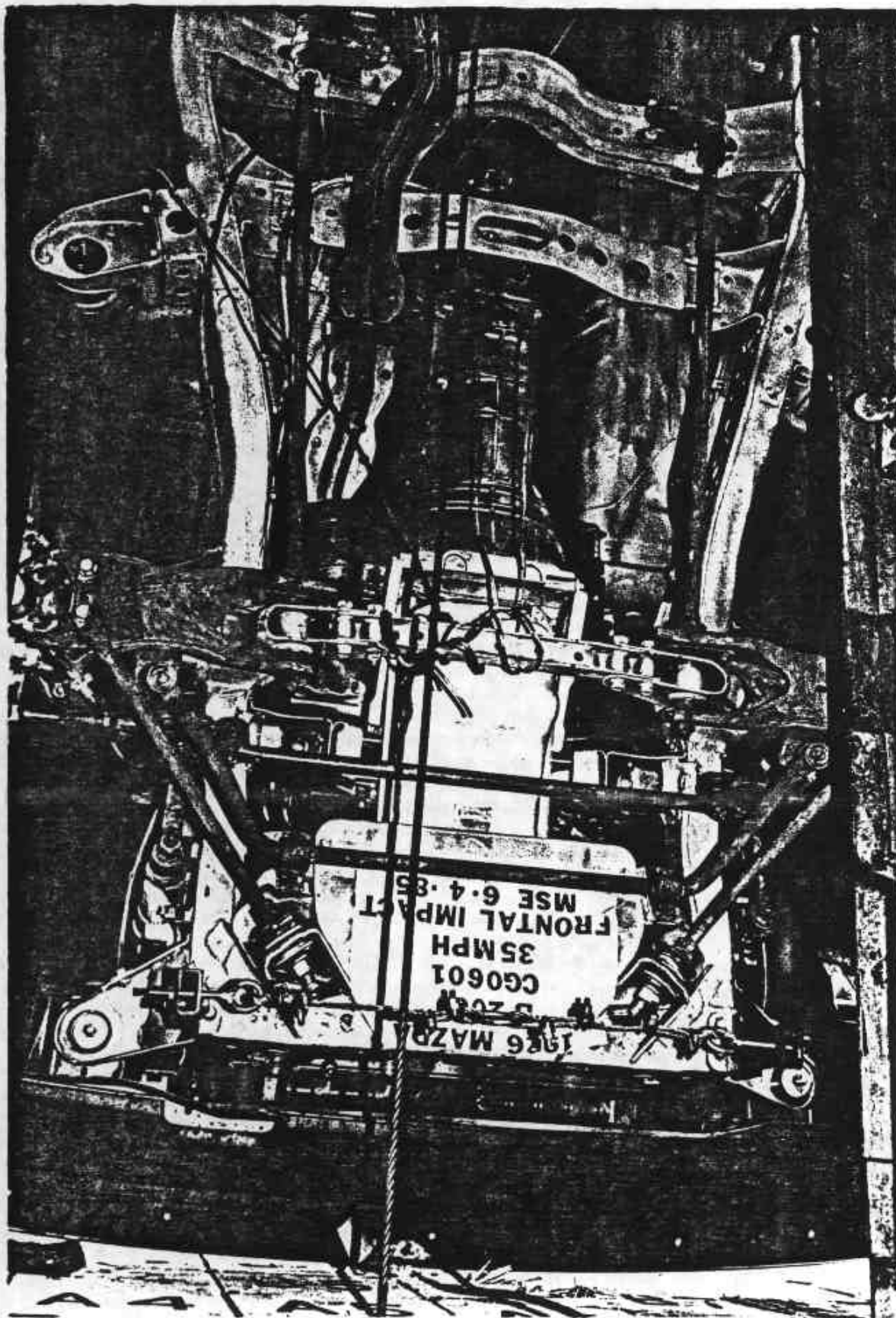
PRE TEST ENGINE COMPARTMENT VIEW



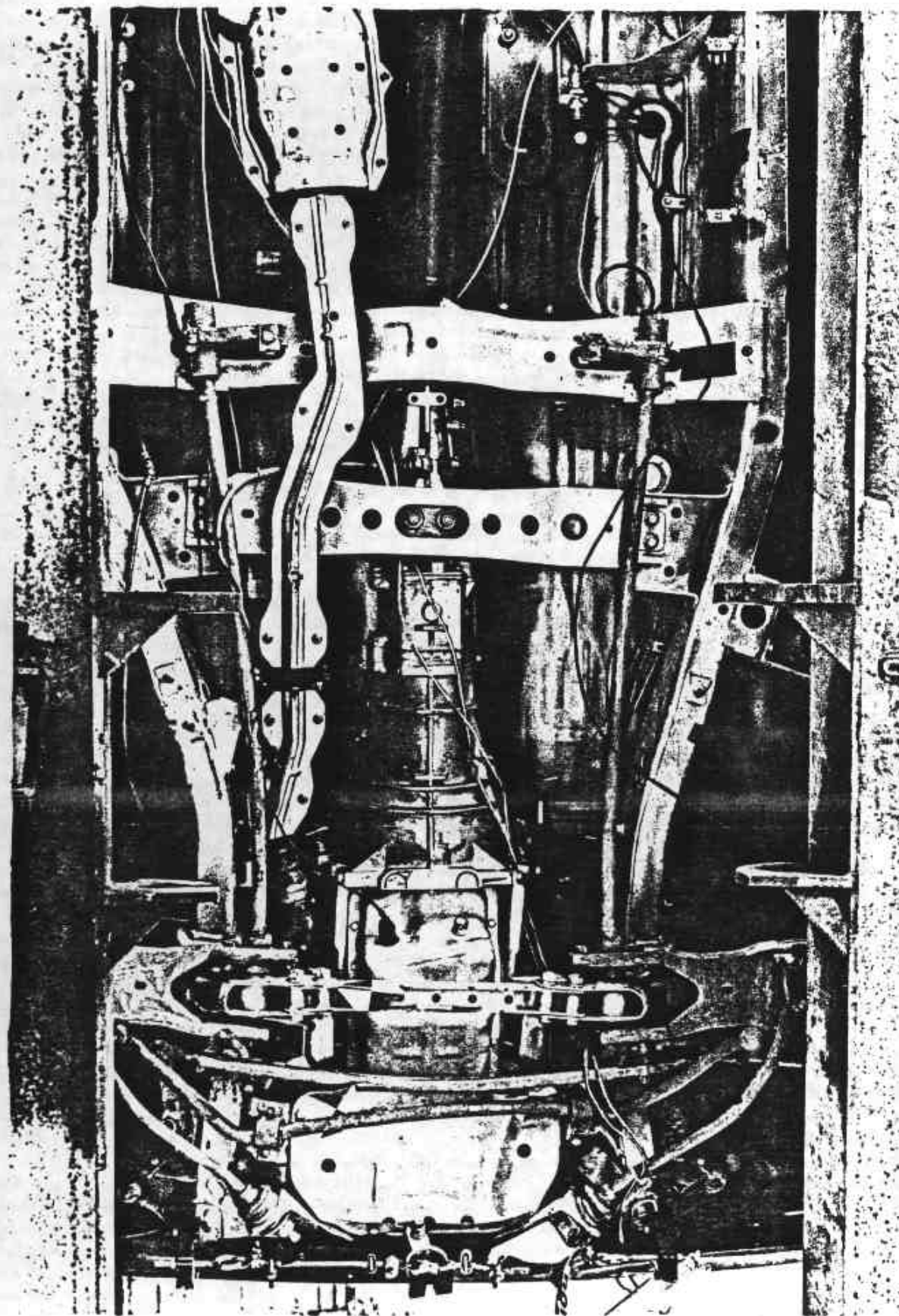
POST TEST ENGINE COMPARTMENT VIEW



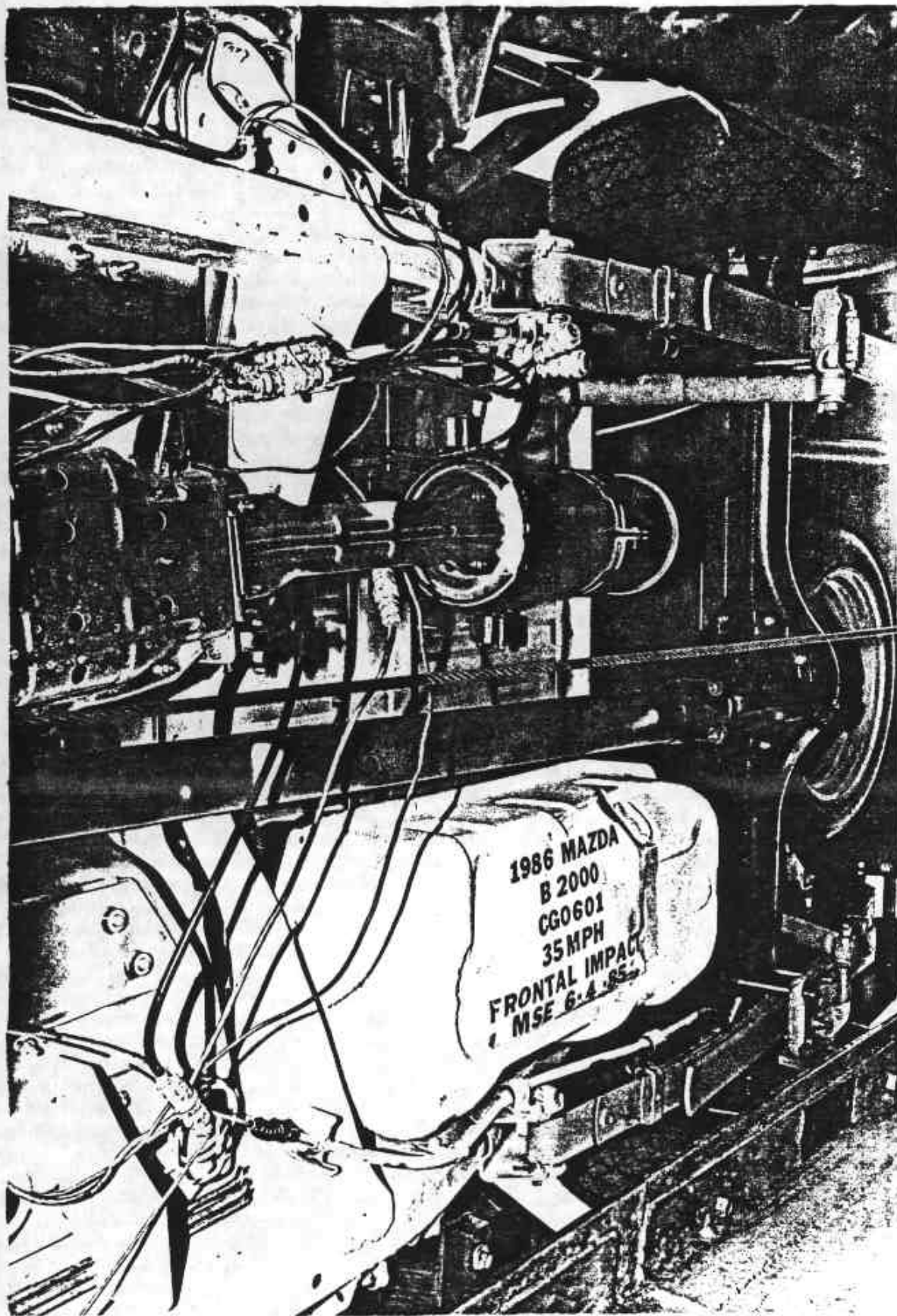
PRE TEST FUEL FILLER CAP VIEW



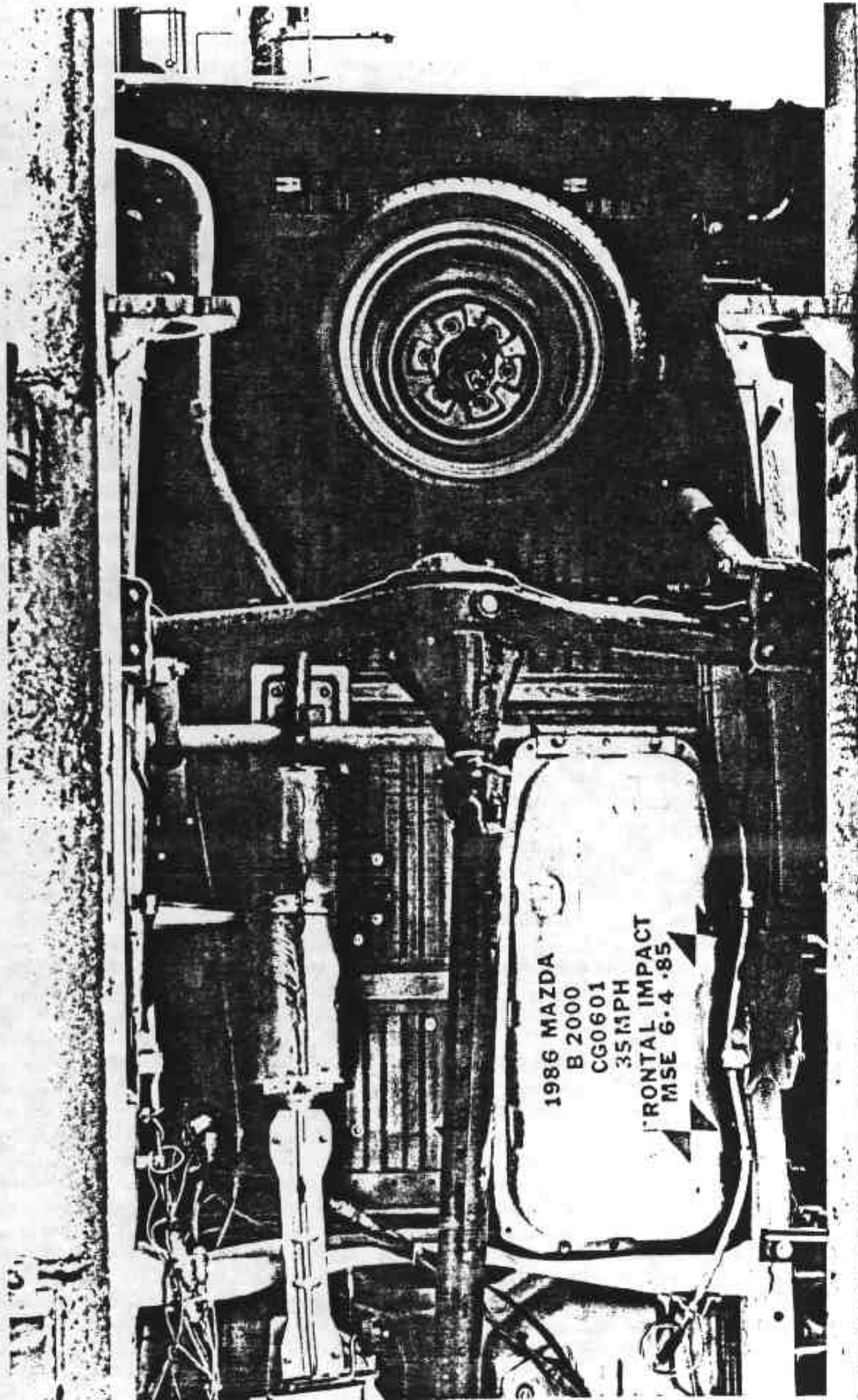
PRE TEST FRONT UNDERBODY VIEW



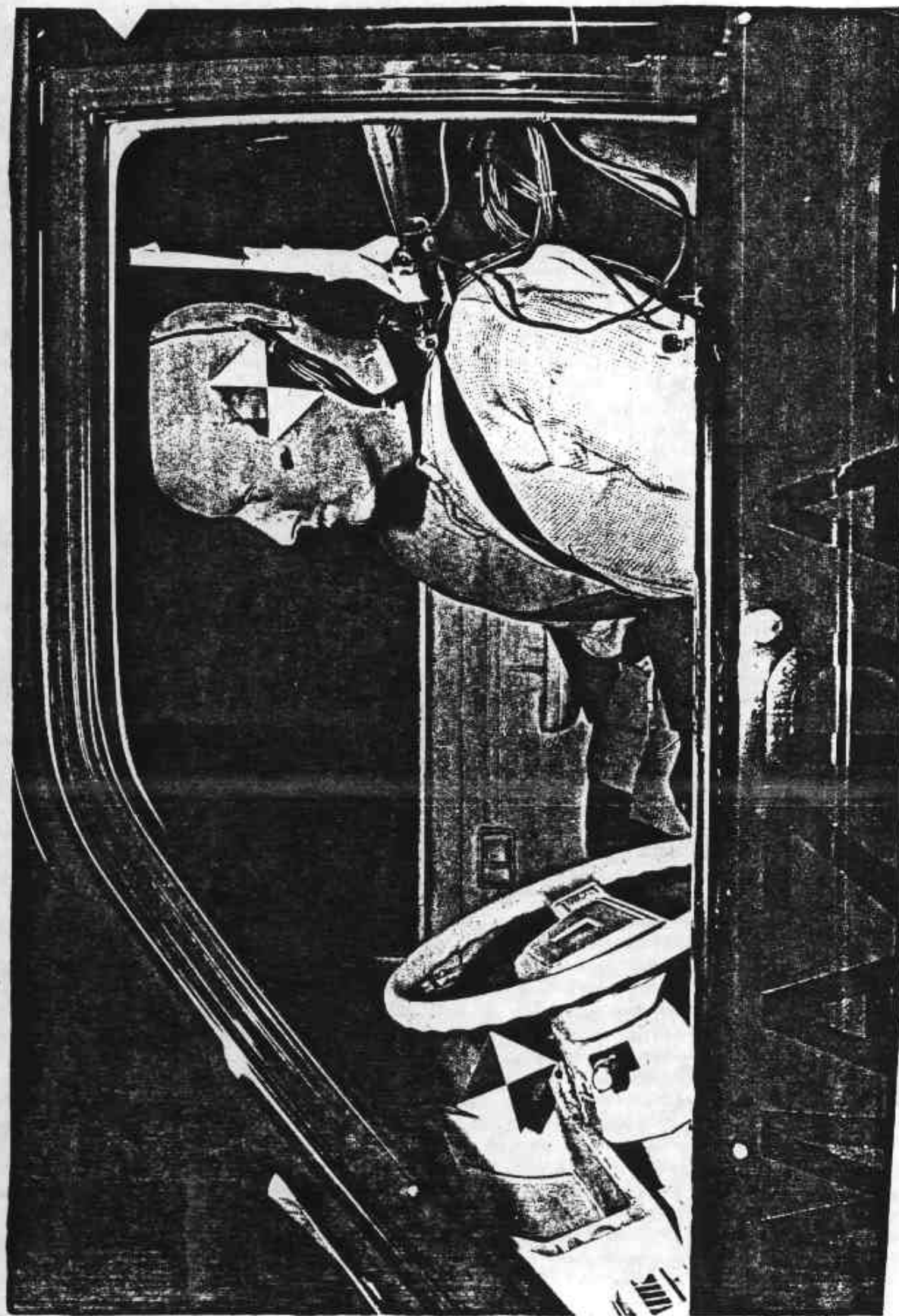
POST TEST FRONT UNDERBODY VIEW



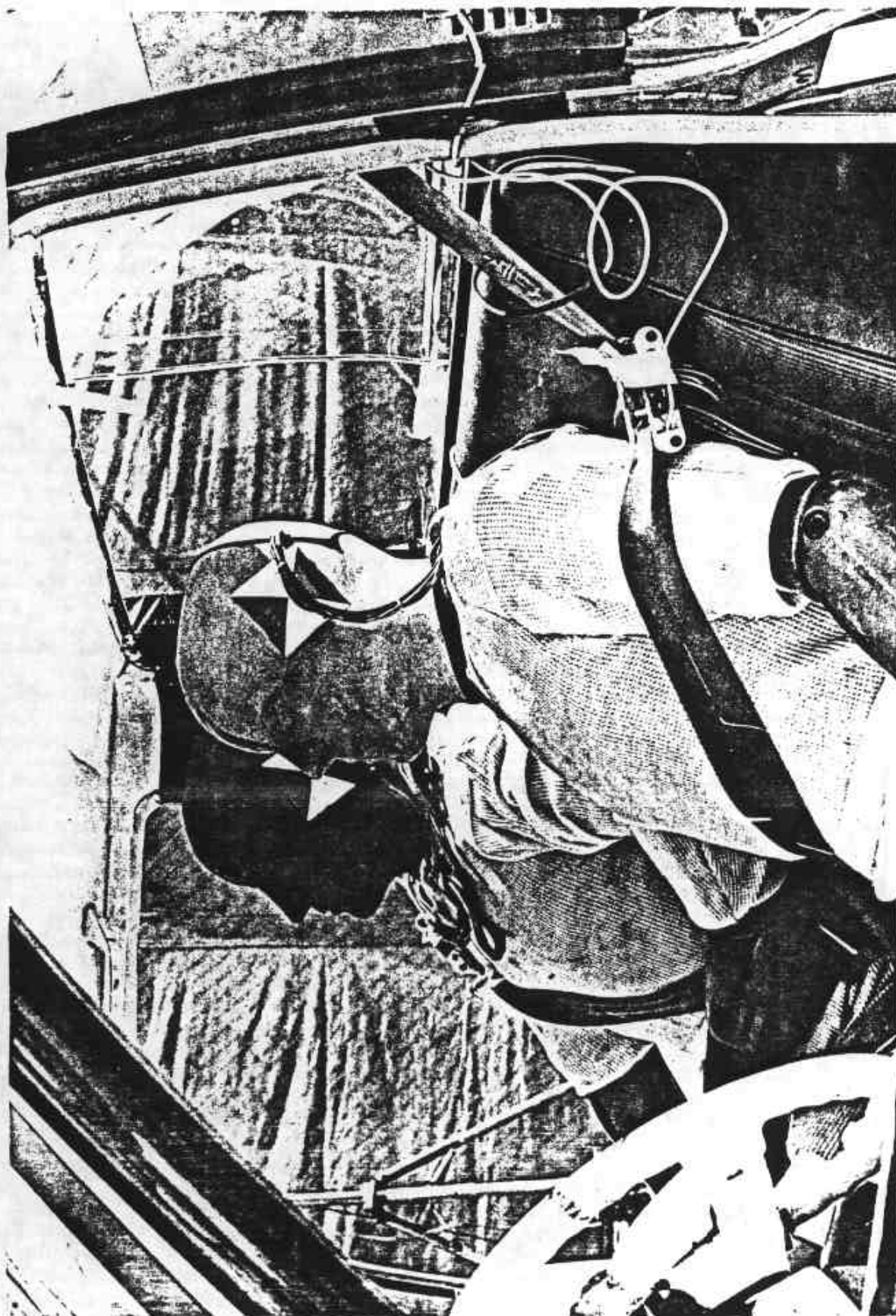
PRE TEST REAR UNDERBODY VIEW



POST TEST REAR UNDERBODY VIEW



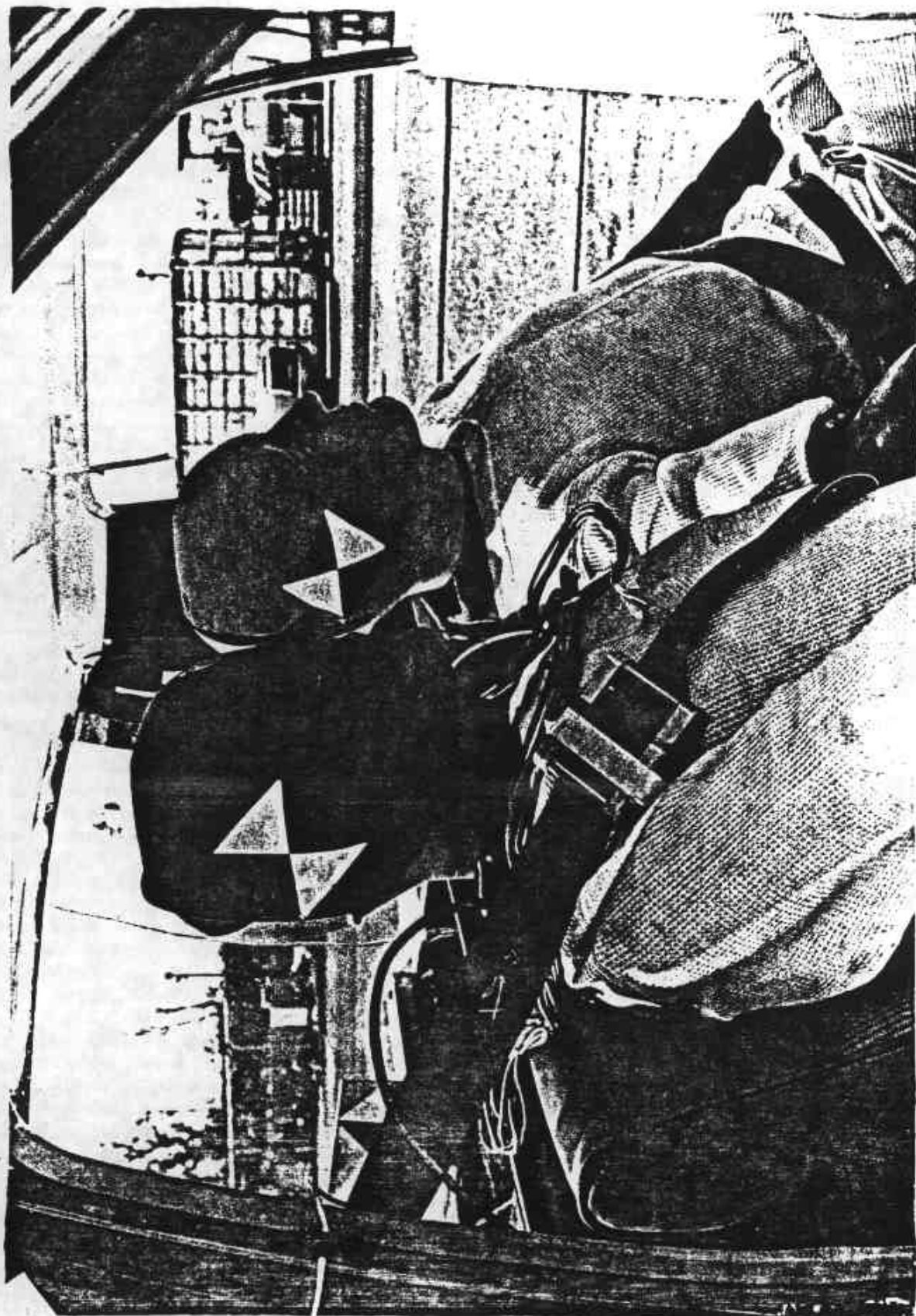
PRE TEST DRIVER DUMMY POSITION VIEW



POST TEST DRIVER DUMMY POSITION VIEW



PRE TEST PASSENGER DUMMY POSITION VIEW



POST TEST PASSENGER DUMMY POSITION VIEW



PRE TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



POST TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



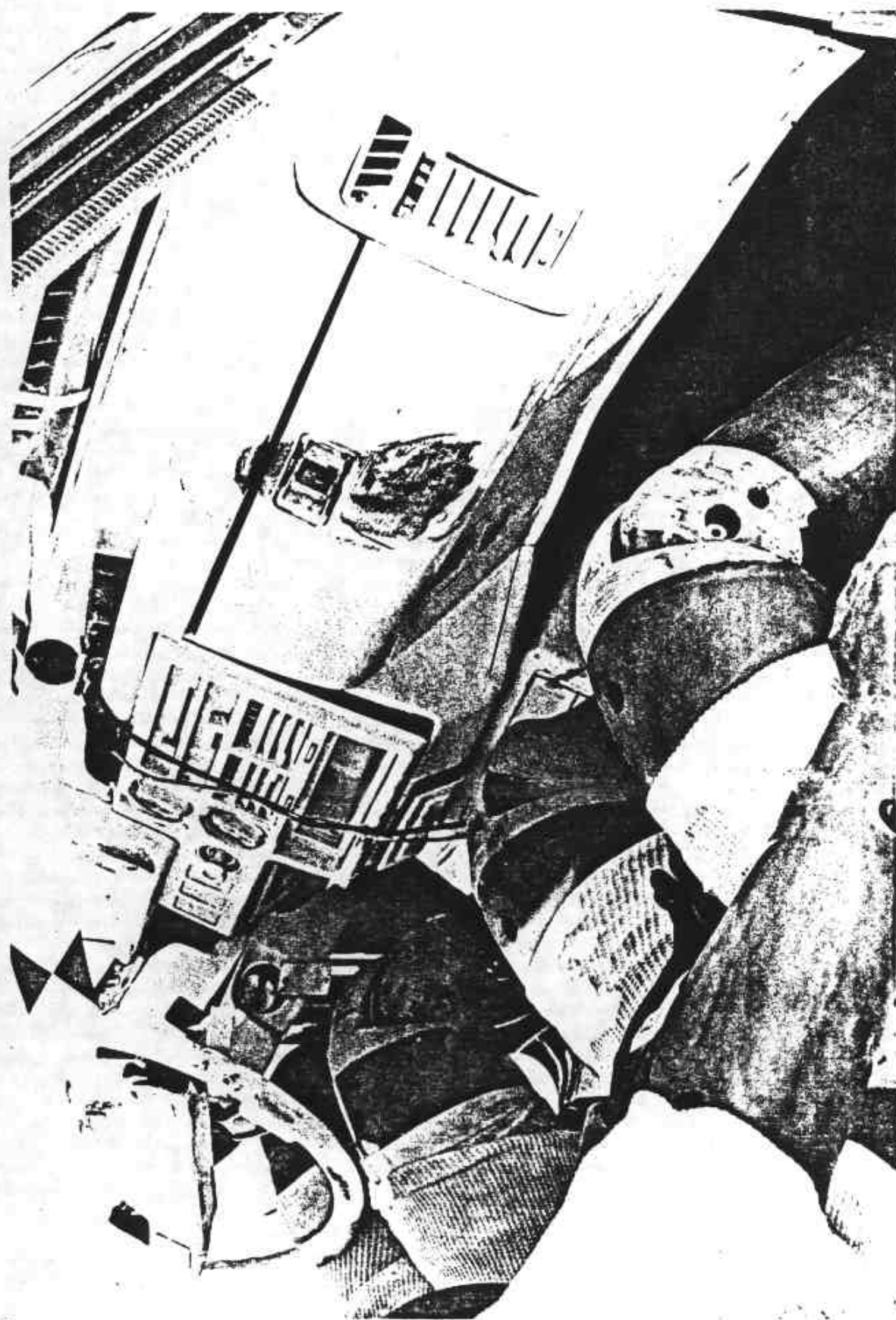
PRE TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



POST TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



POST TEST STEERING COLUMN HUB/RIM CONTACT BY DUMMY DRIVER



POST TEST PASSENGER DUMMY KNEE CONTACT

APPENDIX B-1

VEHICLE AND DUMMY RESPONSE DATA

DATA FILTERING:

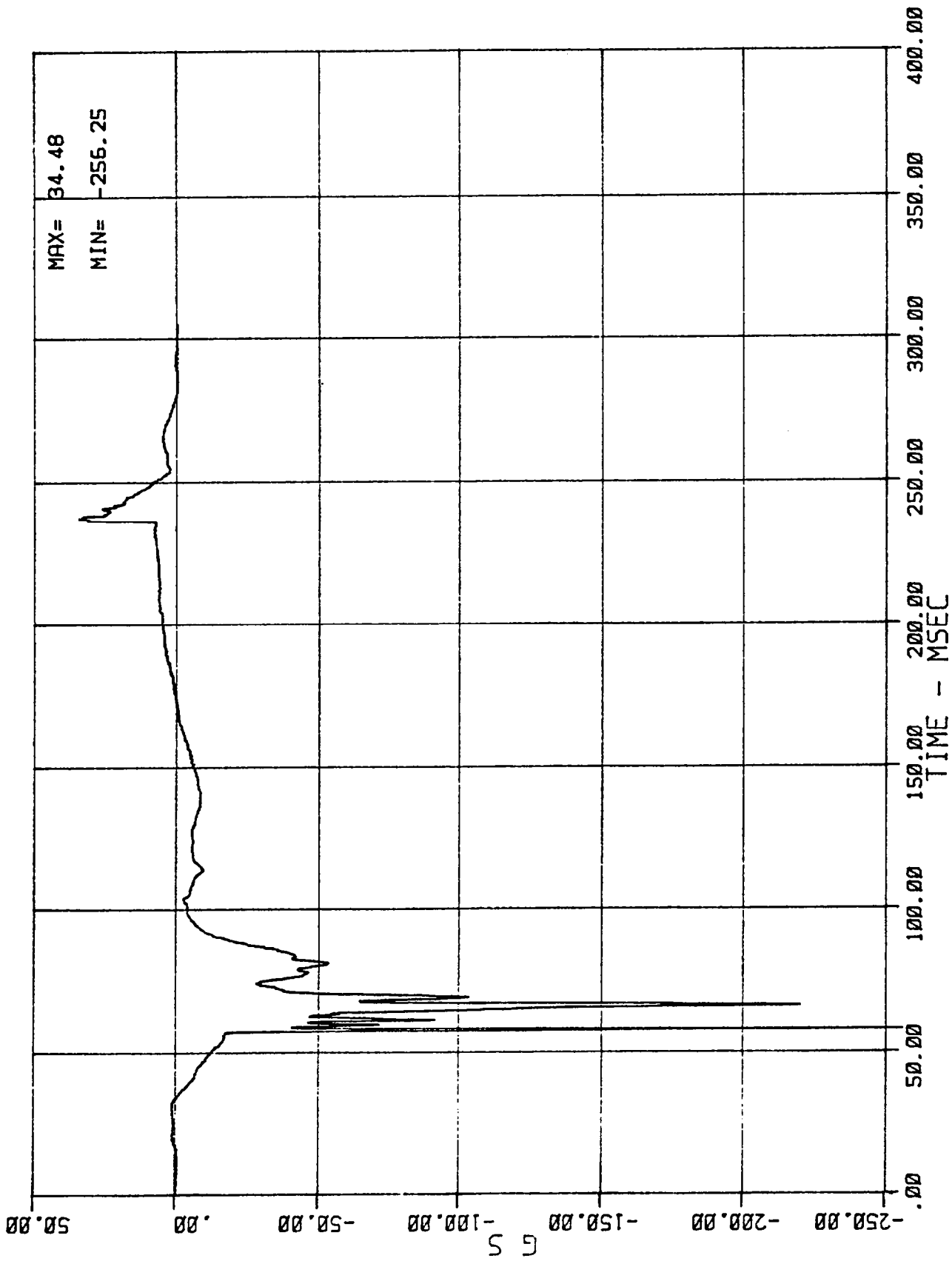
ATD Head Channels	- Class 1000
ATD Chest Channels	- Class 180
ATD Femur Channels	- Class 600
Vehicle Channels	- Class 60

1FY 35 35MPH NCAP FRONTAL 06/04/05MSDTHH2205001045N10025 ACQUIRE NCAP DATA PLUS EVALUATE COMPLIANCE TO FMVSS 212.219,
 301-75 & 208NCAVSB 35.000000.0799.9CONDY 73FMTUMBENG
 21101004-ILF2.0 LITER MRP03000100.6177.365.949.650THPHONE
 35.00000012FDEW5999 54.315.916.216.817.016.616.1 0.017.0

3LCB	00	R
411RD	050M	HUMANOID SYSTEMS 464 1ST IMP AFTER CAL14.319.0 6.0 9.023.314.0 4.5 7.0 8.53PTSTONASHSHOT
412RD	050M	HUMANOID SYSTEMS 467 2ND IMP AFTER CAL15.519.0 7.811.325.399.9 5.0 6.8 7.53PTSTONADPNODP
501AC011HED	6000	1650 0.72860 360000125G'SX35.56000
502AC011HED	6000	1650 0.72860 360000125G'SY00.06000
503AC011HED	6000	1650 0.72860 360000125G'SZ00.06000
504AC011CST	6000	1650 0.72860 360000125G'SX35.56000
505AC011CST	6000	1650 0.72860 360000125G'SY00.06000
506AC011CST	6000	1650 0.72860 360000125G'SZ00.06000
507AC012HED	6000	1650 0.72860 360000125G'SX35.56000
508AC012HED	6000	1650 0.72860 360000125G'SY00.06000
509AC012HED	6000	1650 0.72860 360000125G'SZ00.06000
510AC012CST	6000	1650 0.72860 360000125G'SX35.56000
511AC012CST	2800	1650 0.72860 360000125G'SY00.06000
512AC012CST	6000	1650 0.72860 360000125G'SZ00.06000
513LC011LFM	9999	1650999.92860 360000125LBS0 6000
514LC011RFM	9999	1650999.92860 360000125LBS0 6000
515LC012LFM	9999	1650999.92860 360000125LBS0 6000
516LC012RFM	9999	1650999.92860 360000125LBS0 6000
517LC011LBO	9999	1650999.92860 360000125LBS0 6000
518LC011SHB	9999	1650999.92860 360000125LBS0 6000
519LC012LBO	9999	1650999.92860 360000125LBS0 6000
520LC012SHB	9999	1650999.92860 360000125LBS0 6000
521DT011SHB	9999	1650999.92860 360000125INCO 6000
522DT012SHB	9999	1650999.92860 360000125INCO INVALID INPUT EXCEEDED GAGE RANGE
523DT011SHB	9999	1650999.92860 360000125IP10 6000
524DT012SHB	9999	1650999.92860 360000125IP10 6000
525AC01NLR	2800	1650 0.72860 360000125G'SX35.56000
526AC01NRR	2800	1650 0.72860 360000125G'SX35.56000
527AC01NENG	2800	1650 0.72860 360000125G'SX35.56000
528AC01NENG	2800	1650 0.72860 360000125G'SX35.56000
529AC01NCR	2800	1650 0.72860 360000125G'SX35.56000
530AC01NDC	2800	1650 0.72860 360000125G'SX35.56000
531LCBANBA1	9999	1650999.92800 360000125LBS0 NO LOAD CELL IN THIS LOC.
532LCBANBA2	9999	1650999.92800 360000125LBS0 NOISE NO MEANINGFUL FORCE LEVEL
533LCBANBA3	9999	1650999.92800 360000125LBS0 6000
534LCBANBA4	9999	1650999.92800 360000125LBS0 6000
535LCBANBA5	9999	1650999.92800 360000125LBS0 6000
536LCBANBA6	9999	1650999.92800 360000125LBS0 6000
537LCBANBA7	9999	1650999.92800 360000125LBS0 6000
538LCBANBA8	9999	1650999.92800 360000125LBS0 6000
539LCBANBA9	9999	1650999.92800 360000125LBS0 6000
540LCBANBB1	9999	1650999.92800 360000125LBS0 6000
541LCBANBB2	9999	1650999.92800 360000125LBS0 6000
542LCBANBB3	9999	1650999.92800 360000125LBS0 6000
543LCBANBB4	9999	1650999.92800 360000125LBS0 6000
544LCBANBB5	9999	1650999.92800 360000125LBS0 6000
545LCBANBB6	9999	1650999.92800 360000125LBS0 6000
546LCBANBB7	9999	1650999.92800 360000125LBS0 6000
547LCBANBB8	9999	1650999.92800 360000125LBS0 6000
548LCBANBB9	9999	1650999.92800 360000125LBS0 6000
549LCBANBC1	9999	1650999.92800 360000125LBS0 6000
550LCBANBC2	9999	1650999.92800 360000125LBS0 6000
551LCBANBC3	9999	1650999.92800 360000125LBS0 6000
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553LCBANBC5	9999	1650999.92800 360000125LBS0 6000

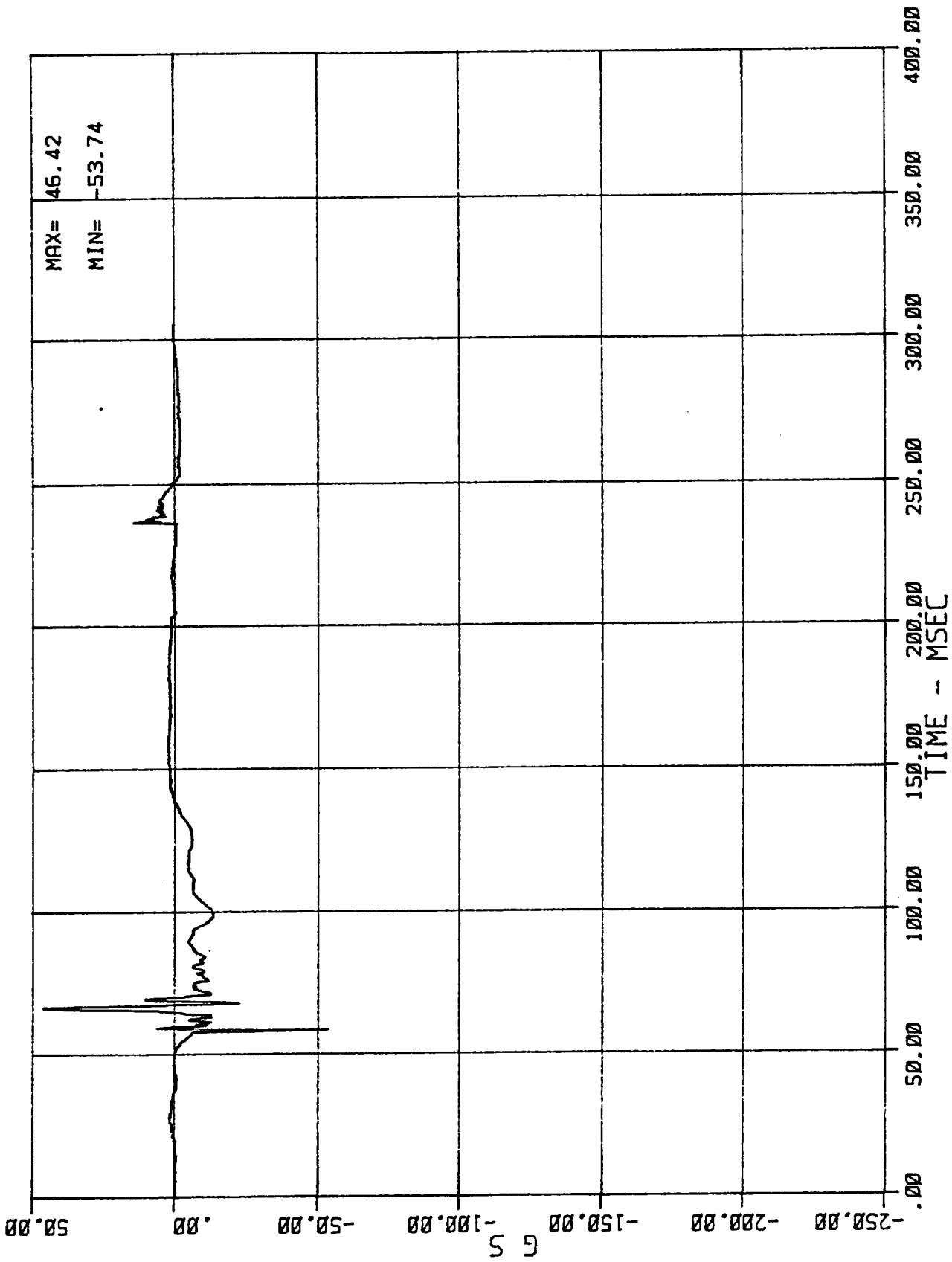
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555LCBANBC7	9999	1650999.92800	360000125LBS0	GOOD
556LCBANBC8	9999	1650999.92800	360000125LBS0	GOOD
557LCBANBC9	9999	1650999.92800	360000125LBS0	GOOD
558LCBANBD1	9999	1650999.92800	360000125LBS0	GOOD
559LCBANBD2	9999	1650999.92800	360000125LBS0	GOOD
560LCBANBD3	9999	1650999.92800	360000125LBS0	GOOD
561LCBANBD4	9999	1650999.92800	360000125LBS0	GOOD
562LCBANBD5	9999	1650999.92800	360000125LBS0	GOOD
563LCBANBD6	9999	1650999.92800	360000125LBS0	GOOD
564LCBANBD7	9999	1650999.92800	360000125LBS0	GOOD
565LCBANBD8	9999	1650999.92800	360000125LBS0	GOOD
566LCBANBD9	9999	1650999.92800	360000125LBS0	GOOD

1



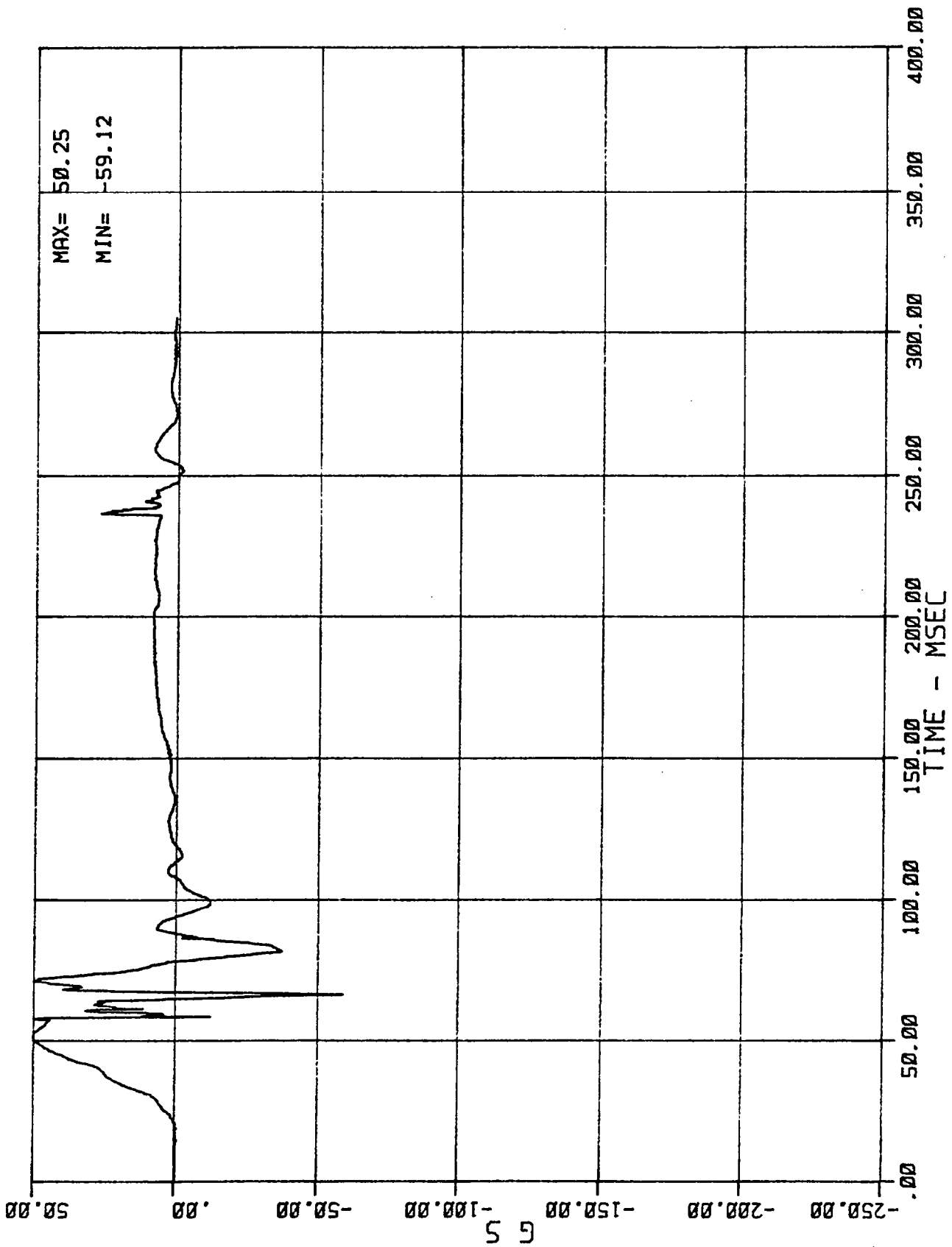
01 AC 01 1 HED X (DRIVER HEAD ACCEL. -- X AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



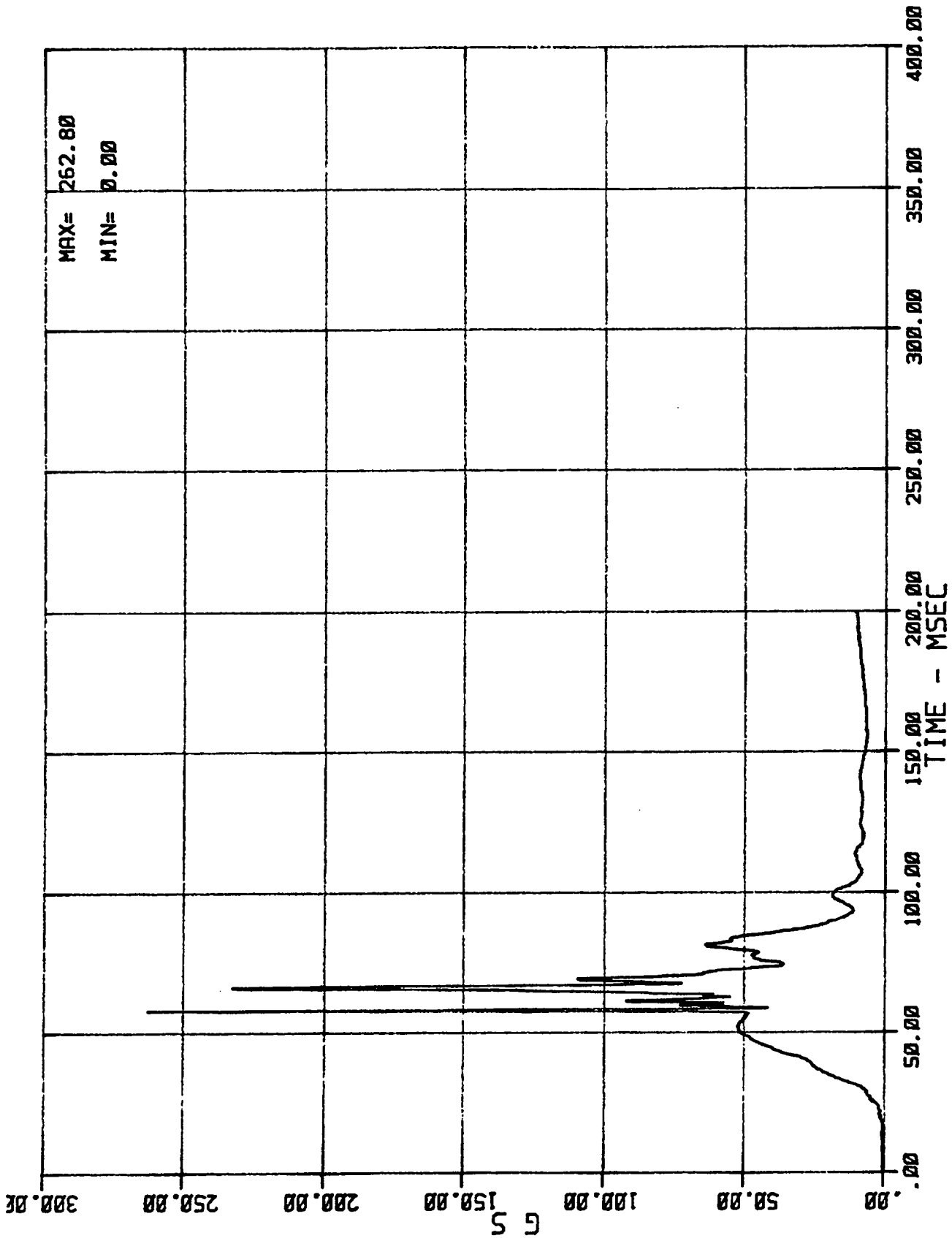
02 AC 01 1 HED Y (DRIVER HEAD ACCEL. -- Y AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



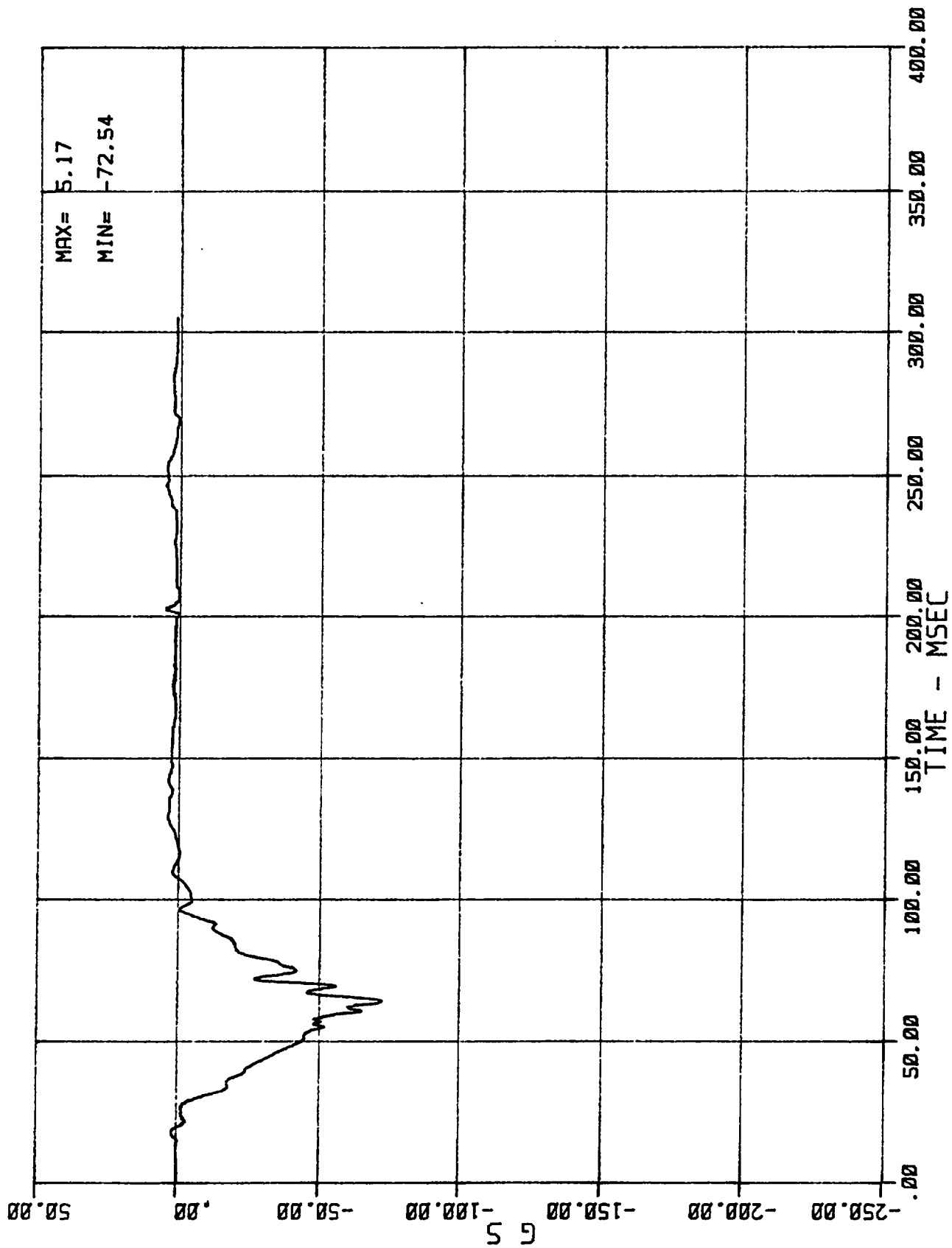
03 AC 01 1 HED Z (DRIVER HEAD ACCEL. -- Z AXIS)
MSE N18025 1985 MAZDA B-2000 P.U.

06/04/85

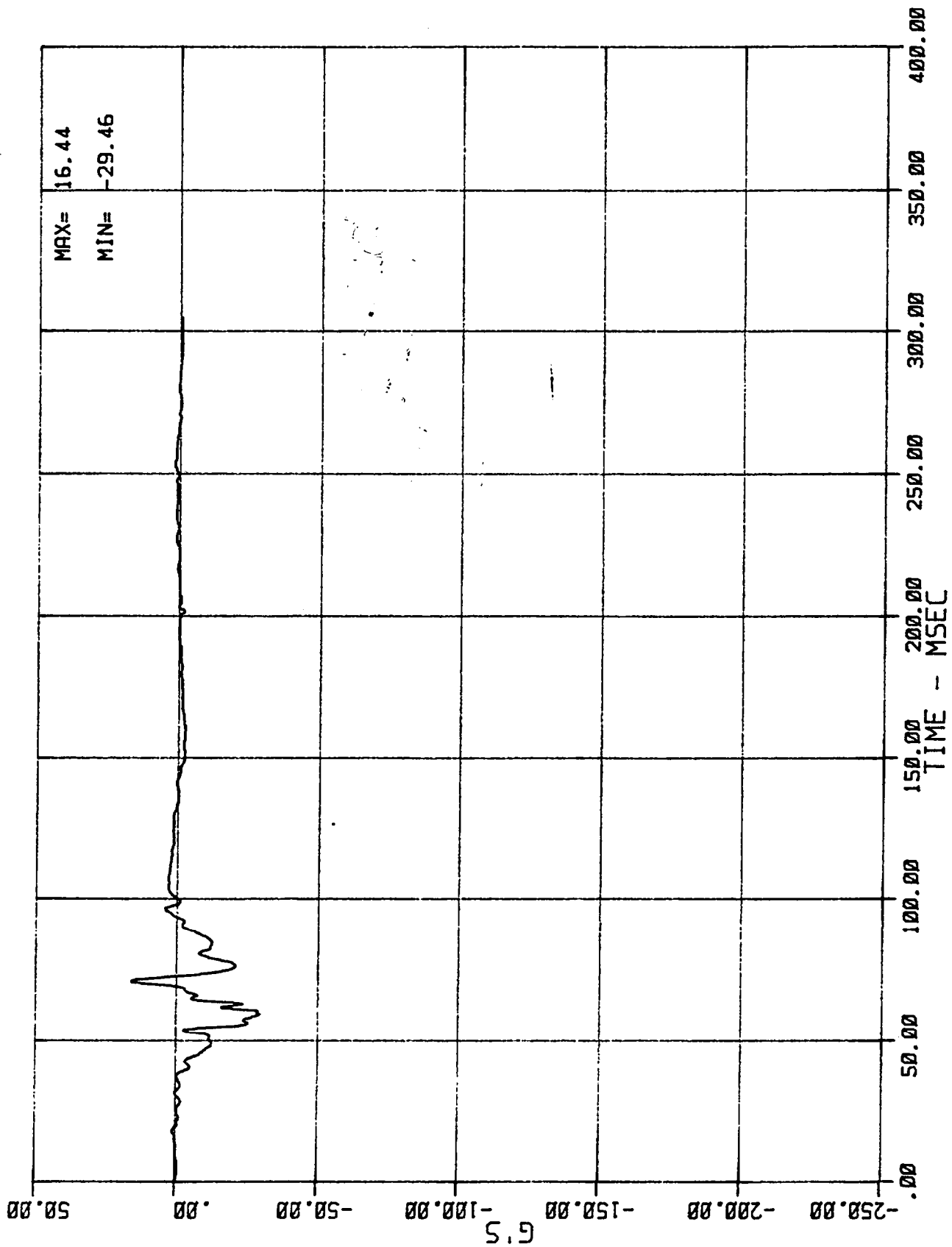


DRIVER HEAD RESULTANT ACCELERATION
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85

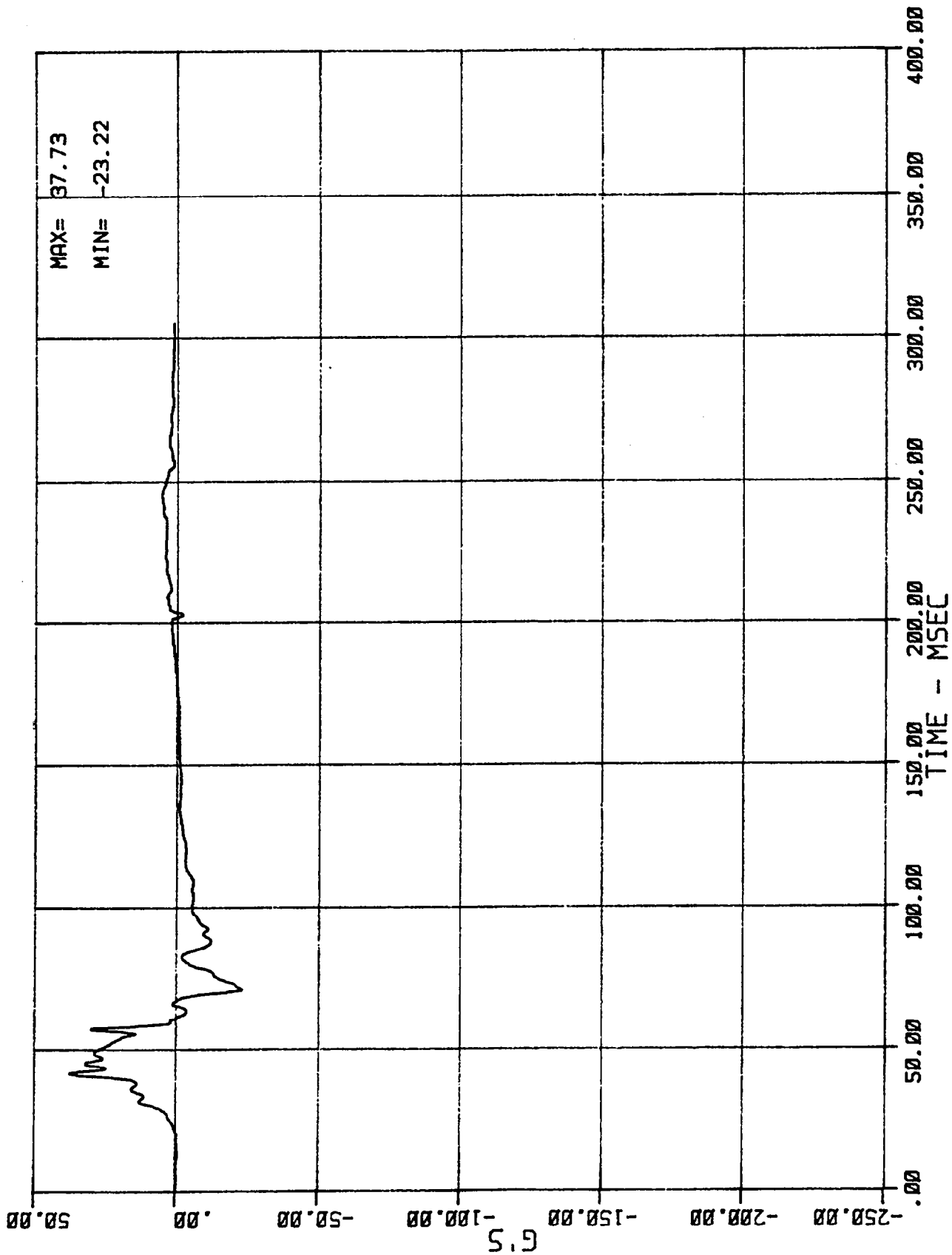


06/04/85



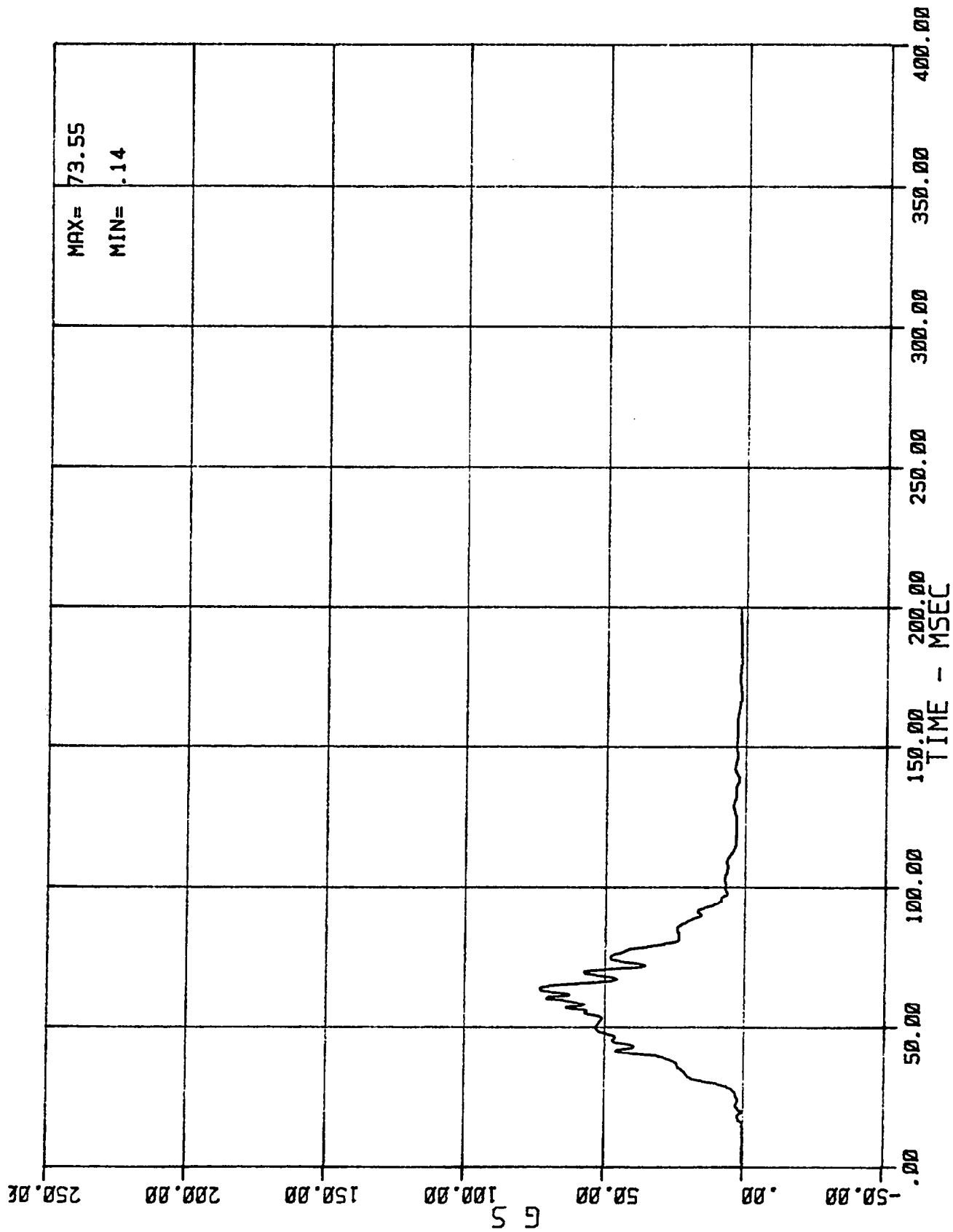
05 AC 01 J CST Y (DRIVER CHEST ACCEL. -- Y AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

05/04/85



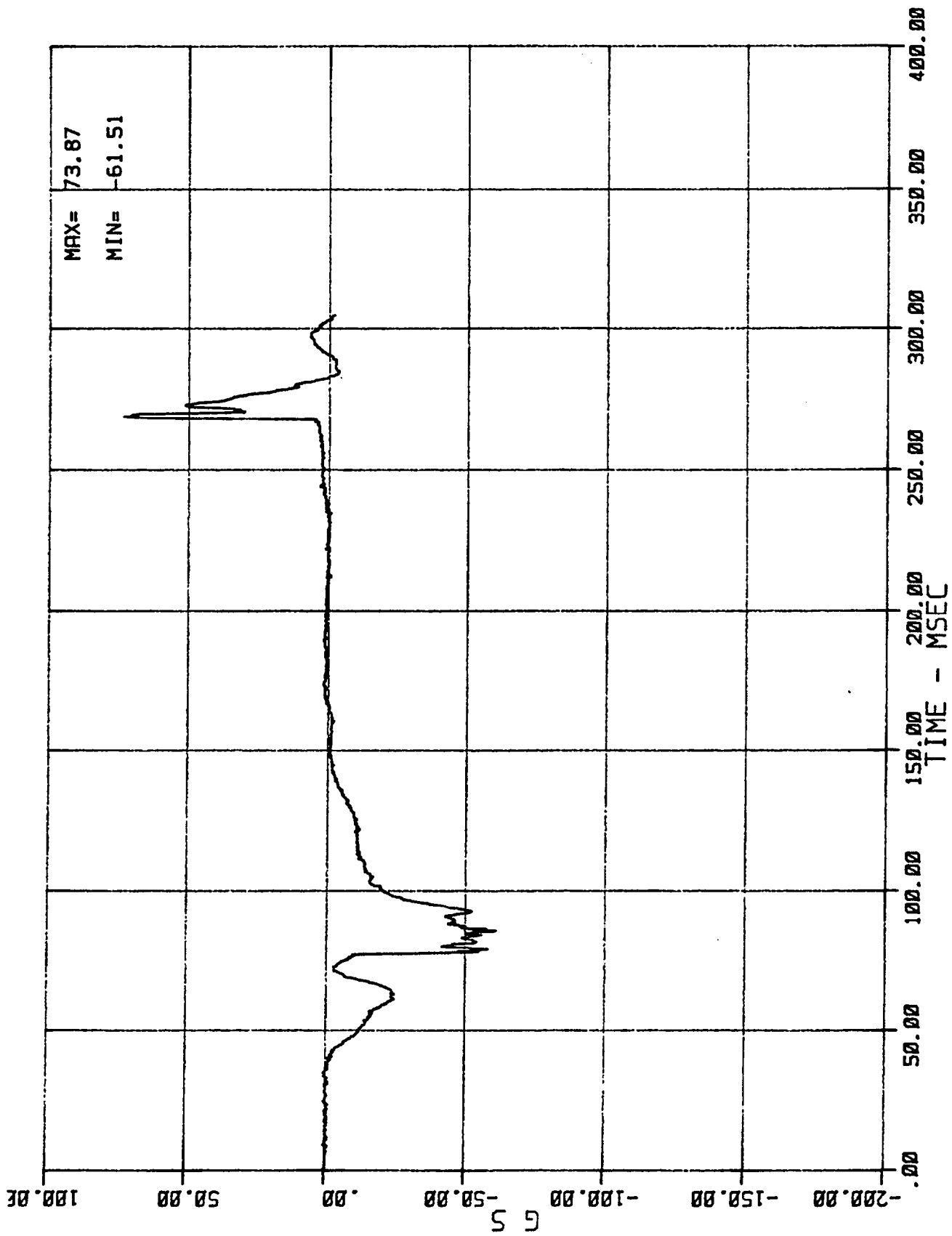
06 AC 01 1 CST Z (DRIVER CHEST ACCEL. -- Z AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



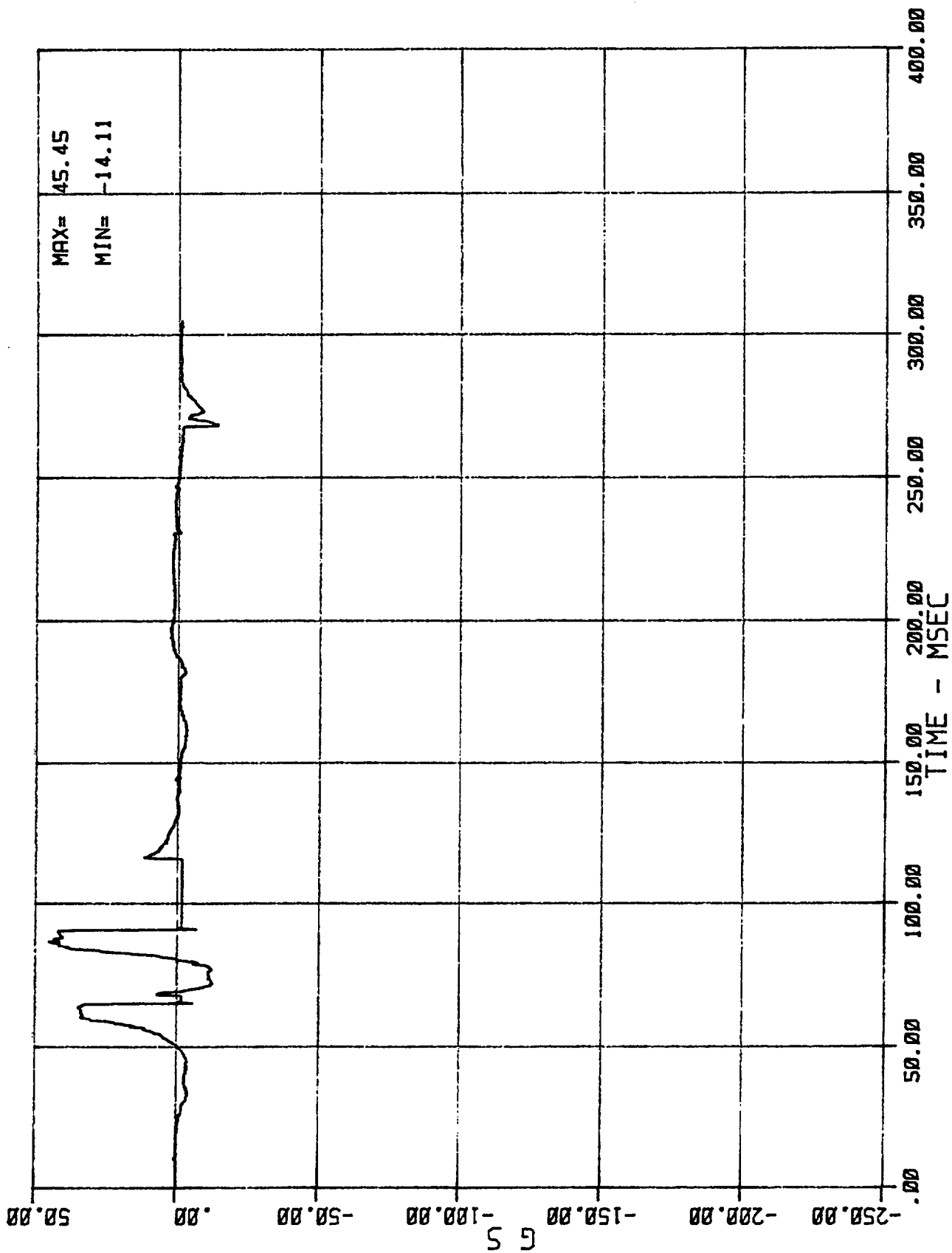
DRIVERS CHEST RESULTANT ACCELERATION
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



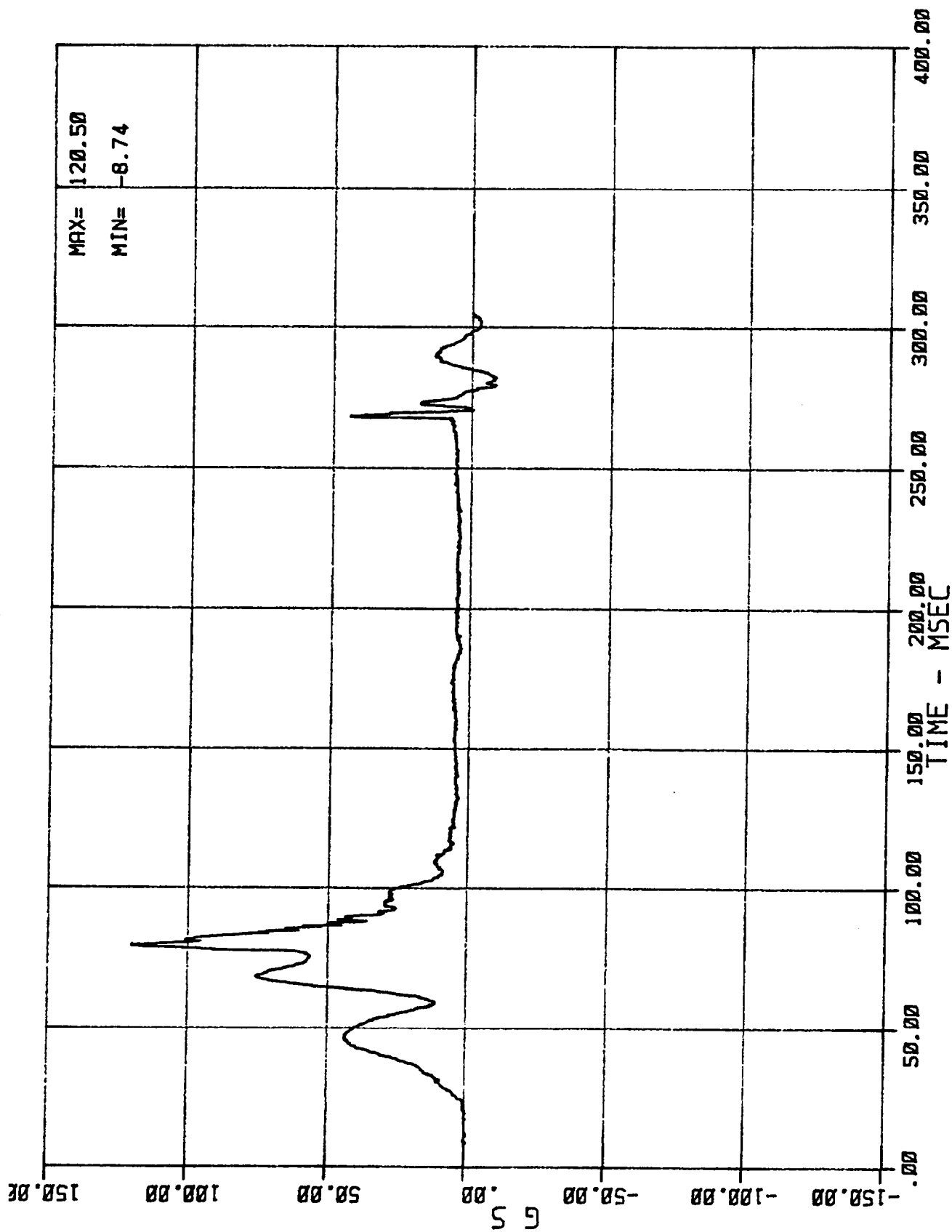
07 AC 01 2 HED X (PASSENGER HEAD ACCEL. -- X AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



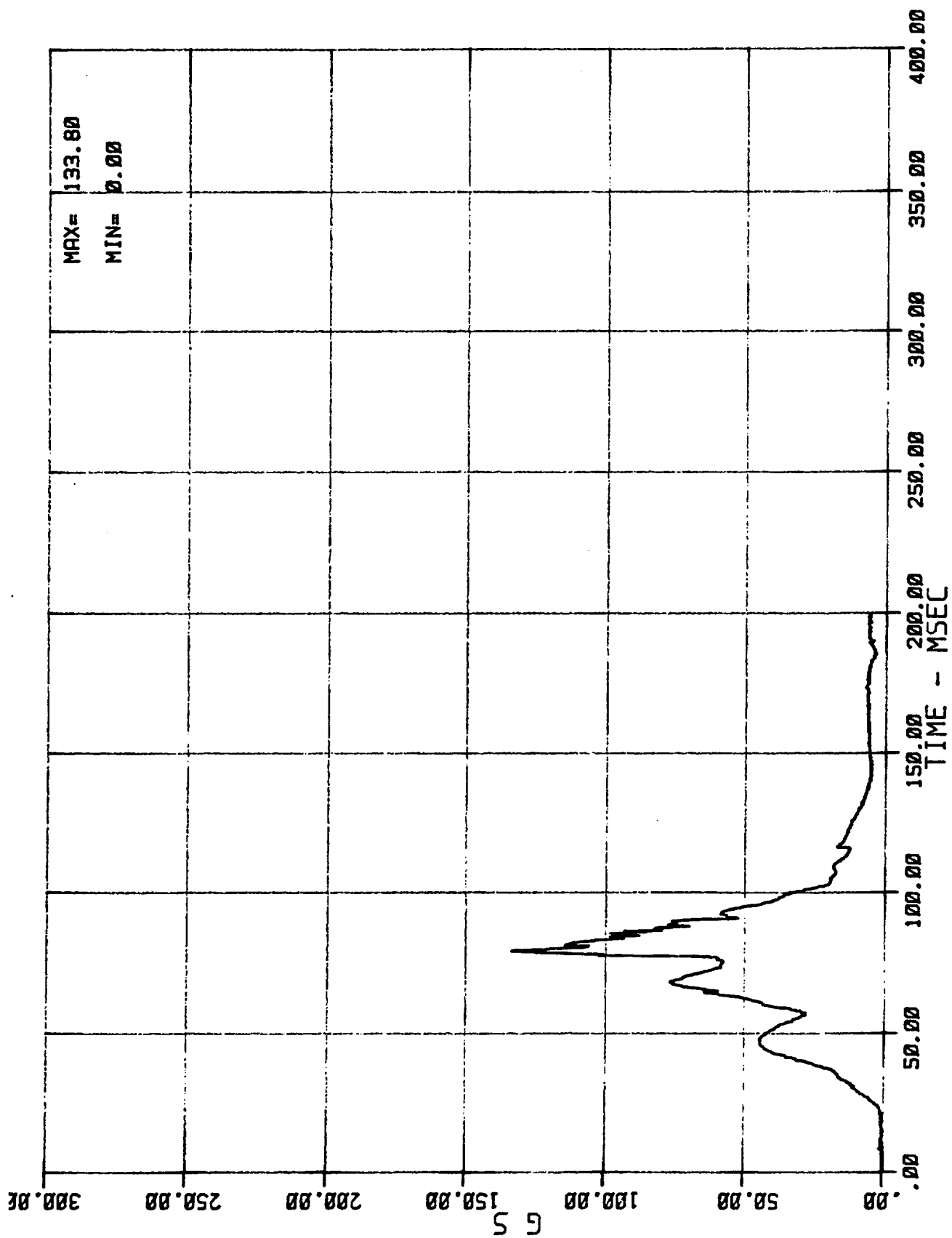
08 AC 01 2 HED Y (PASSENGER HEAD ACCEL. -- Y AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



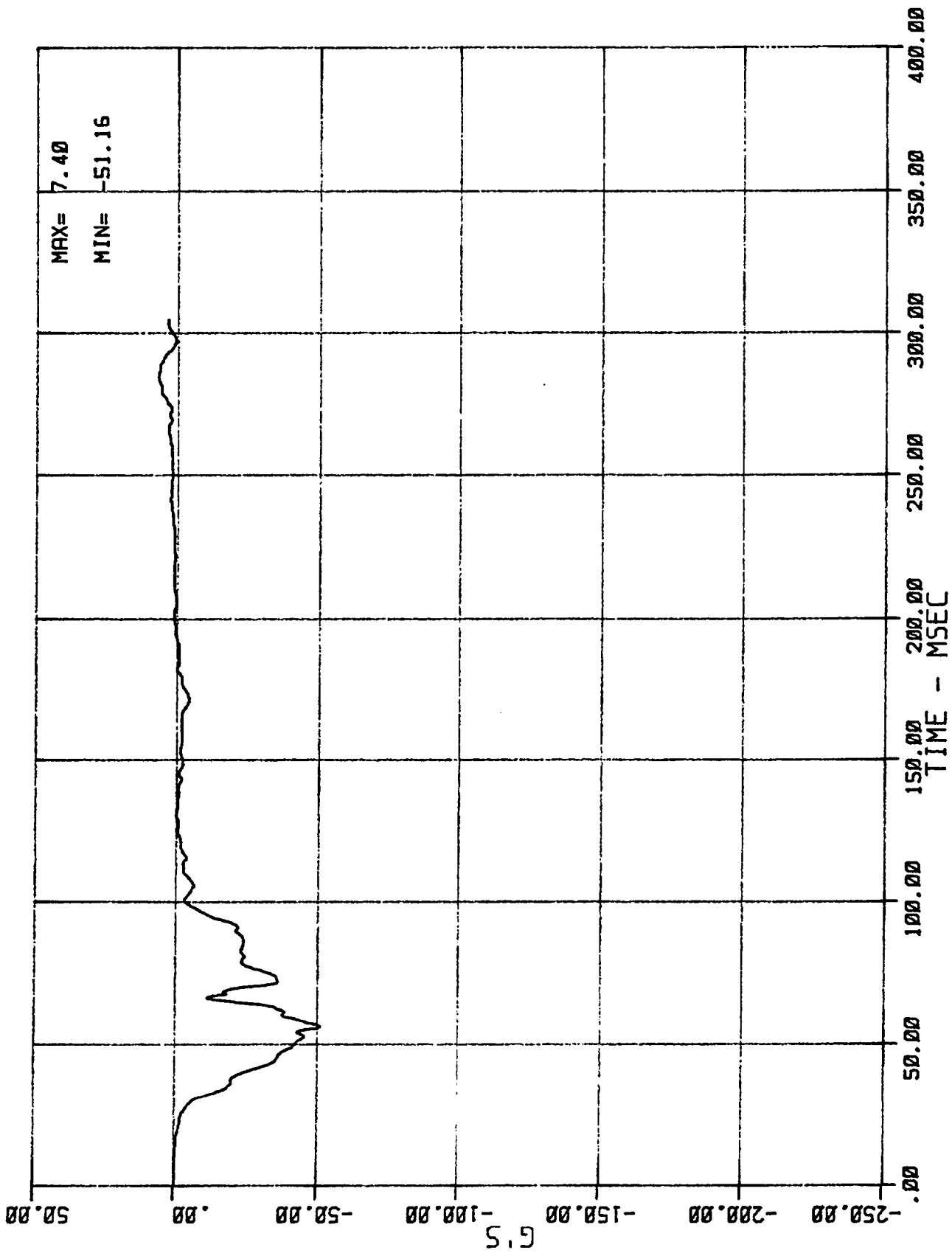
09 AC 01 2 HED Z (PASSENGER HEAD ACCEL. -- Z AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



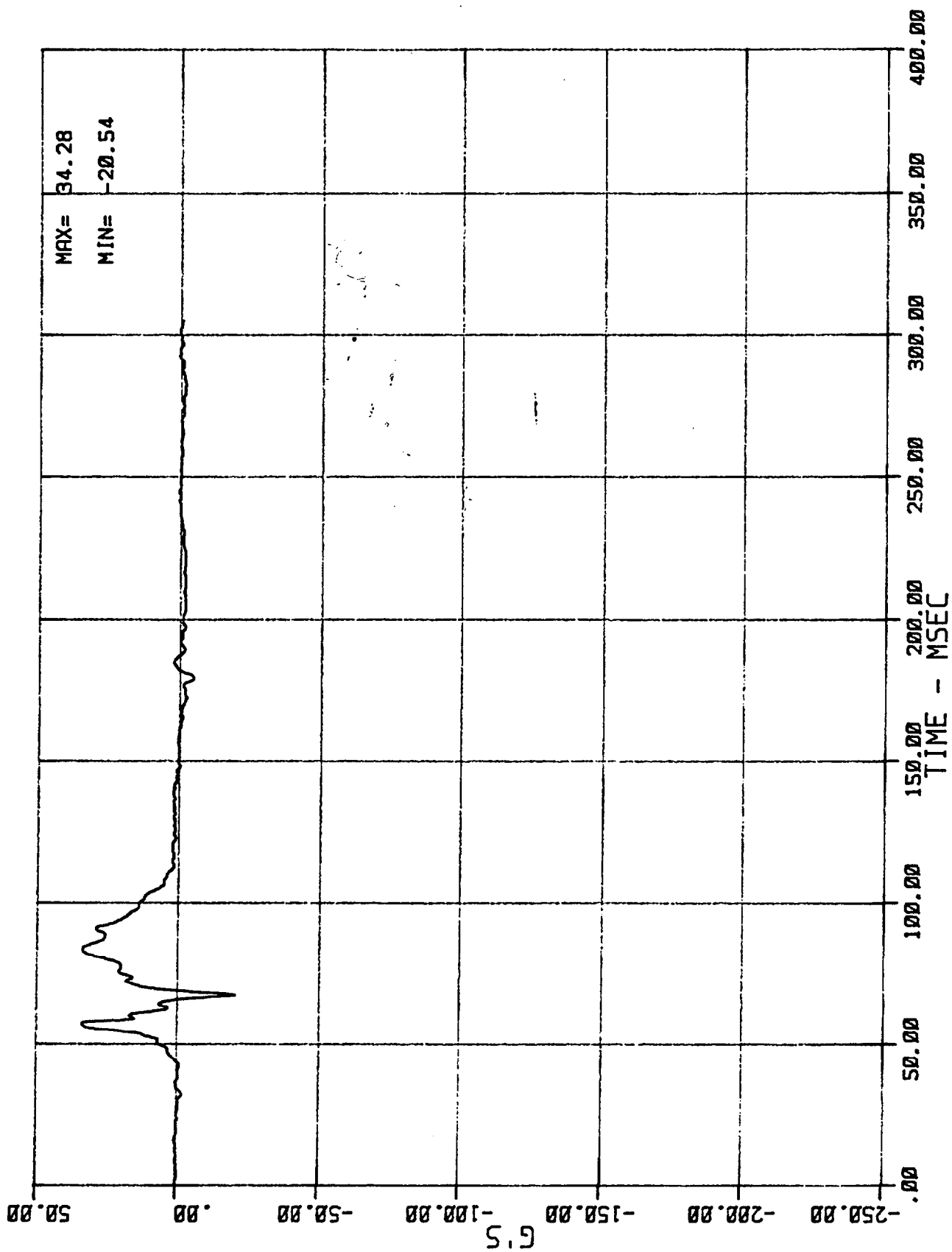
PASSENGER HEAD RESULTANT ACCELERATION
MSE N18025 1985 MAZDA B-2000 P.U.

06/04/85



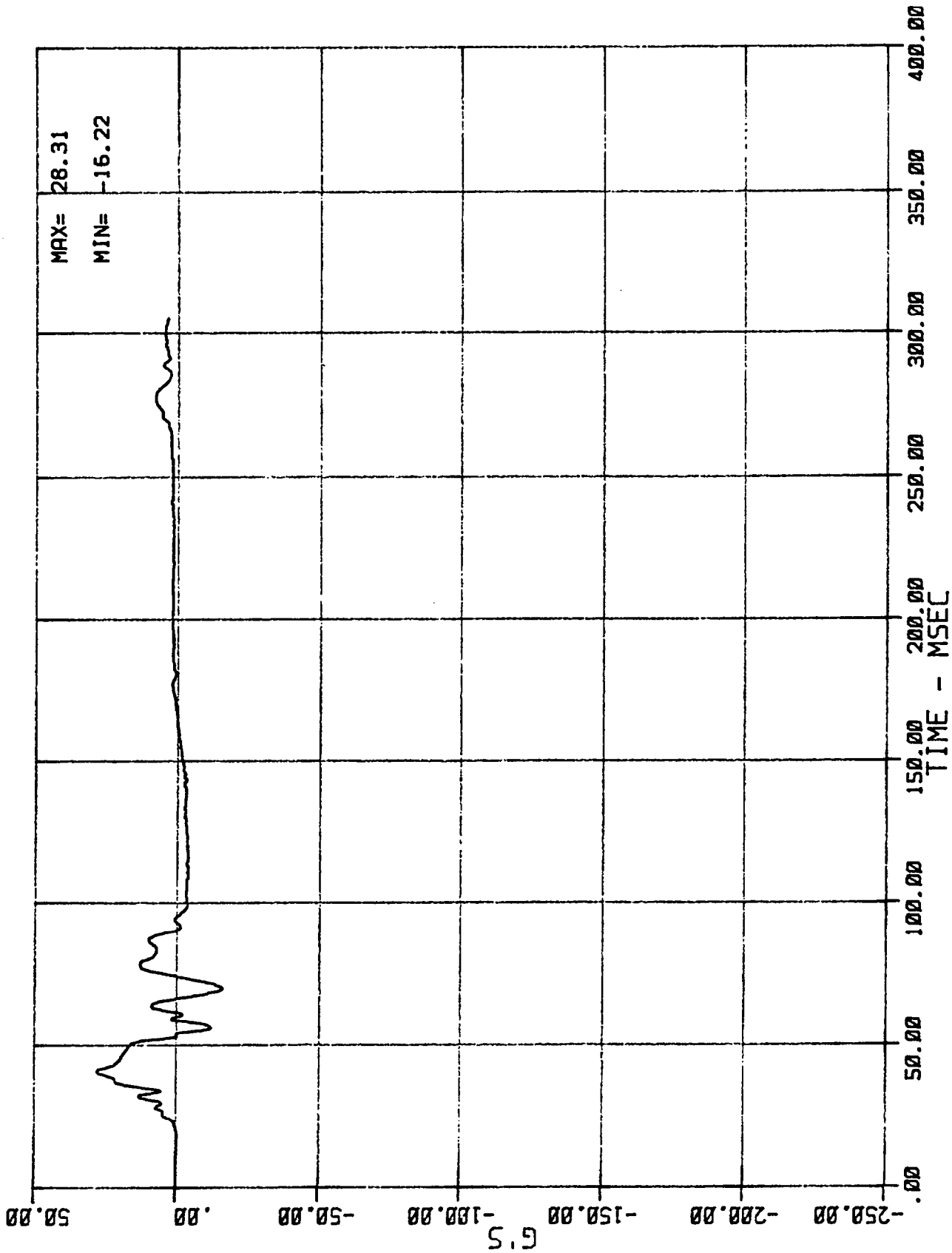
10 AC 01 2 CST X (PASSENGER CHEST ACCEL. -- X AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



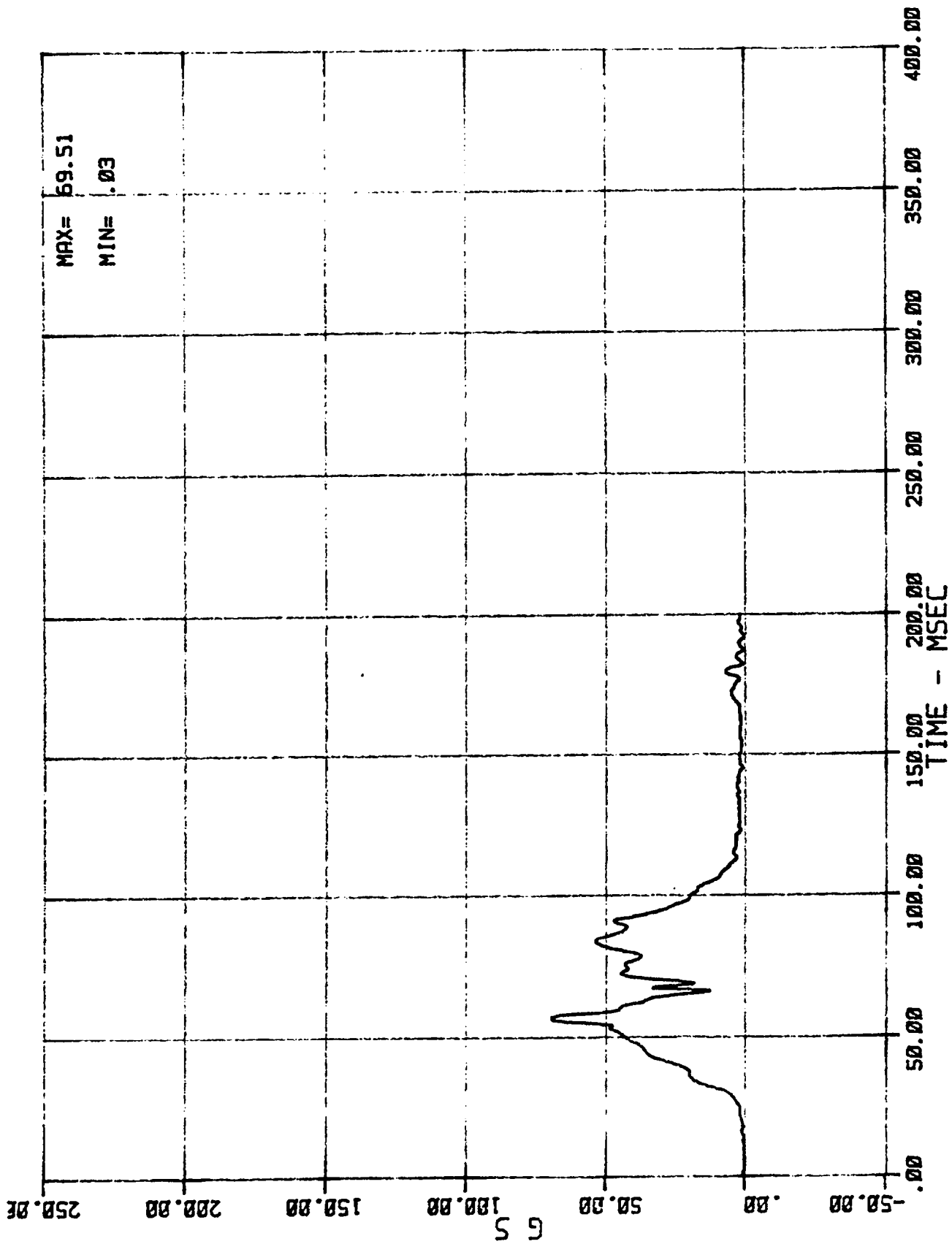
11 AC 01 2 CST Y (PASSENGER CHEST ACCEL. --- Y AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



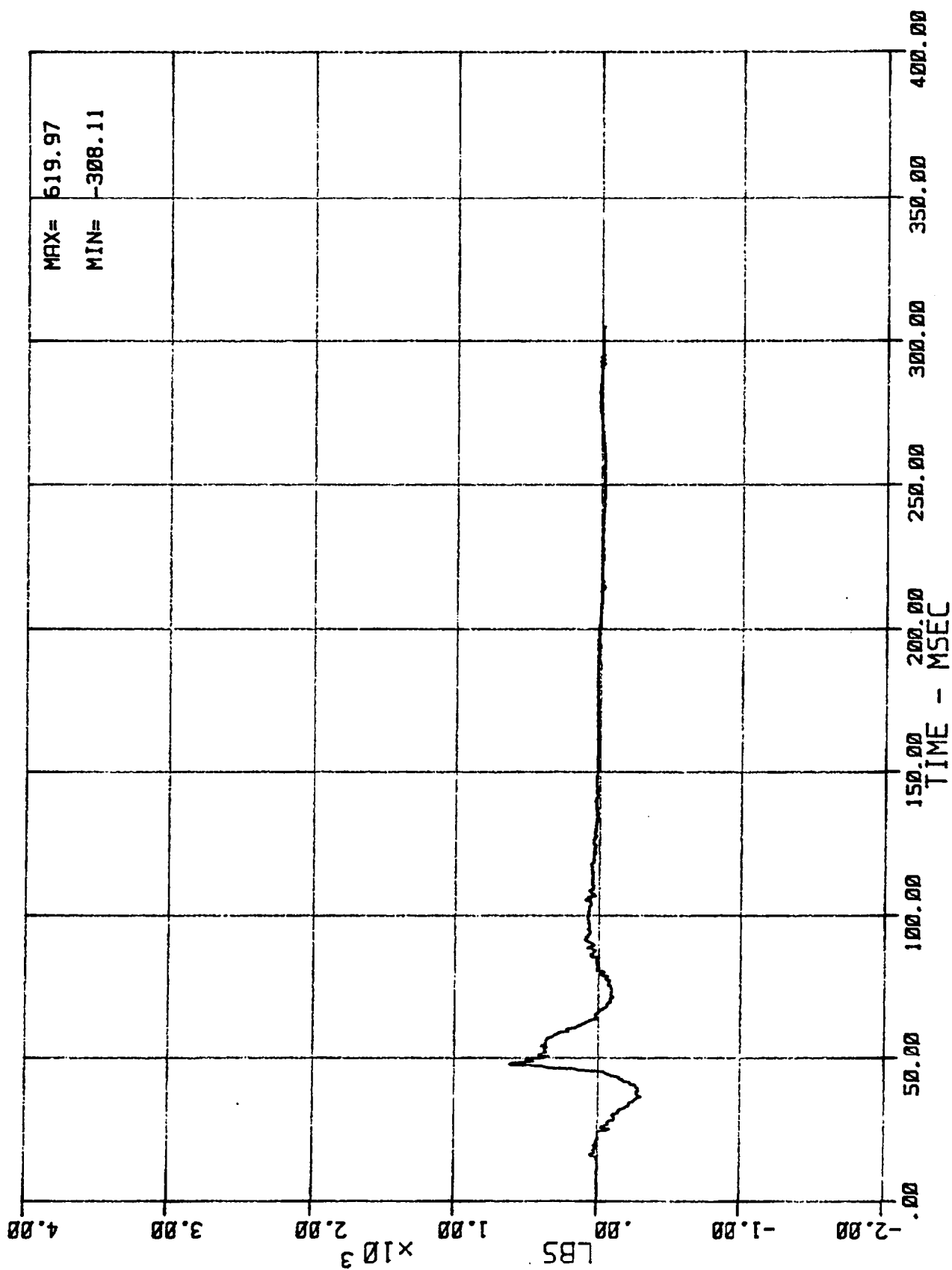
12 AC 01 2 CST Z (PASSENGER CHEST ACCEL. -- Z AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



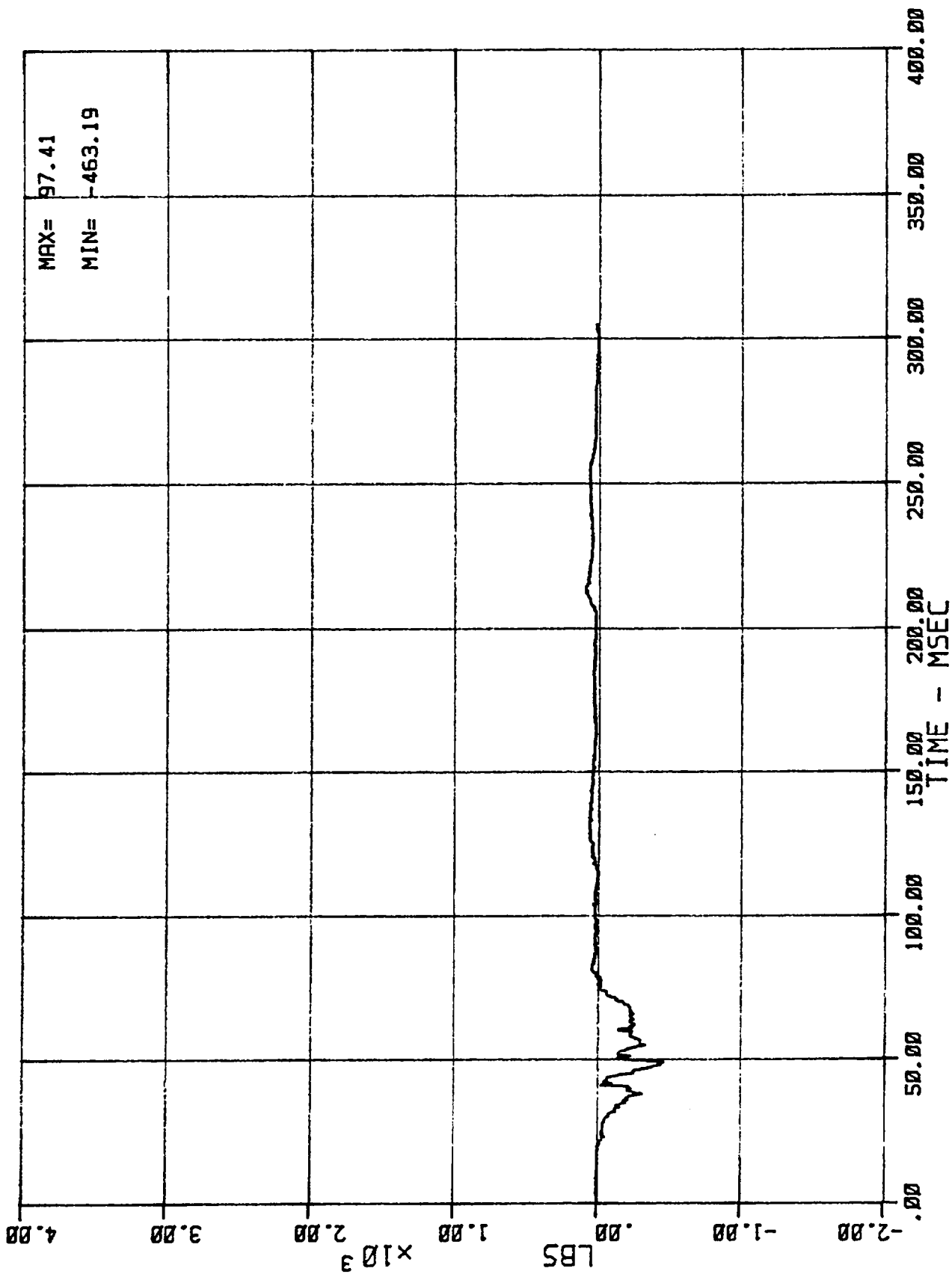
PASSENGER CHEST RESULTANT ACCELERATION
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



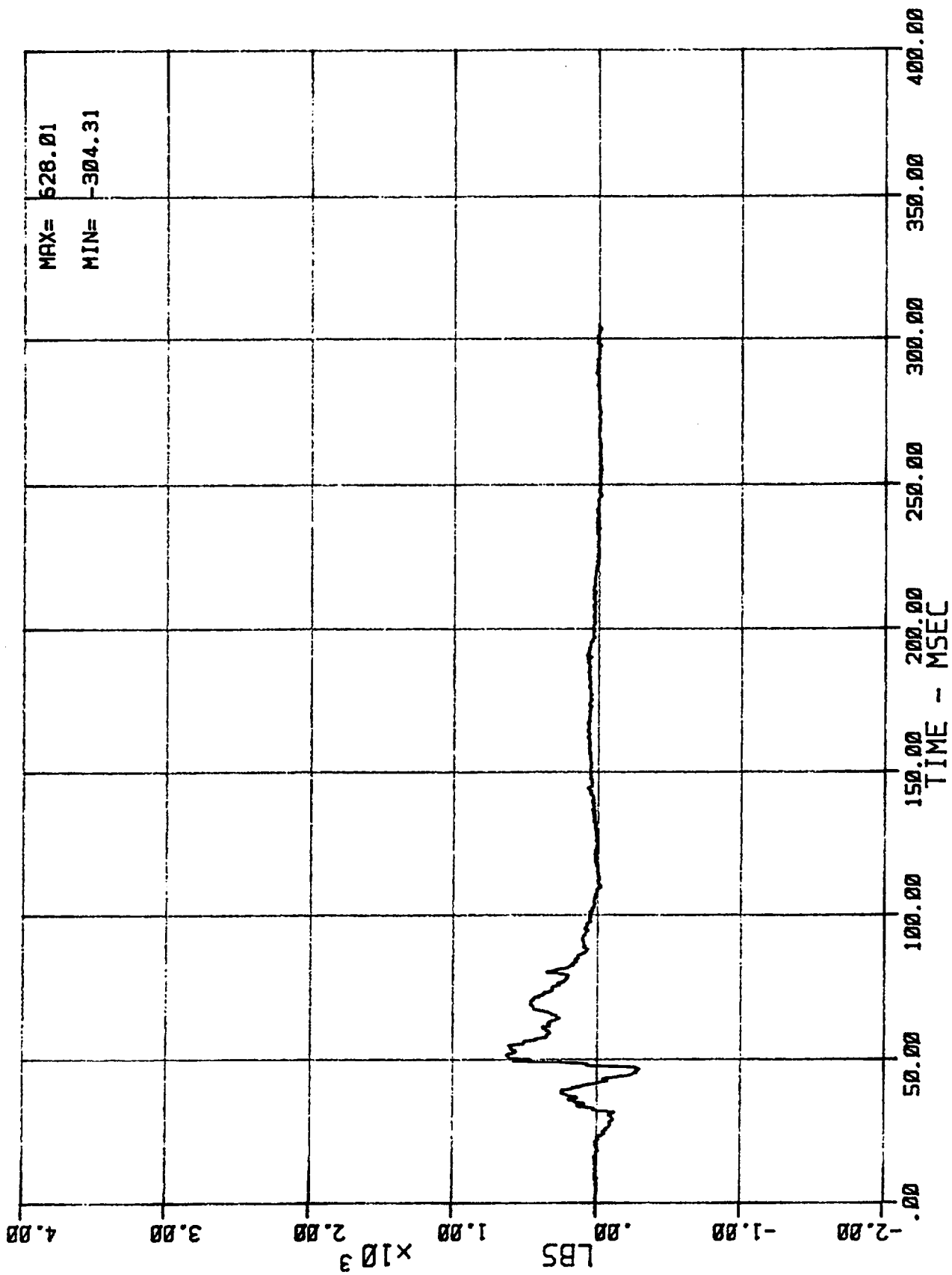
13 LC 01 1 LFM (DRIVER LEFT FEMUR FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



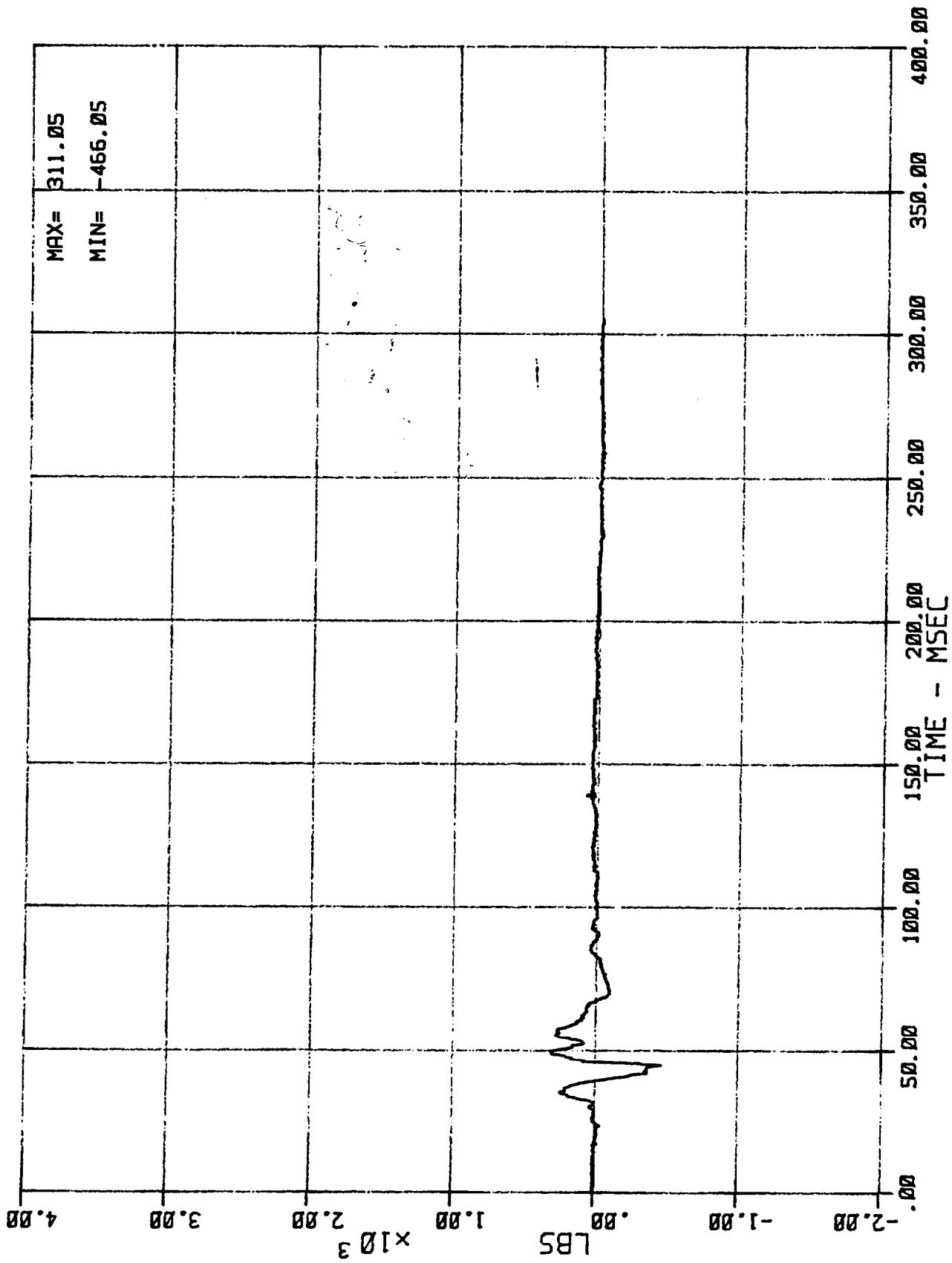
14 LC 01 1 RFM (DRIVER RIGHT FEMUR FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



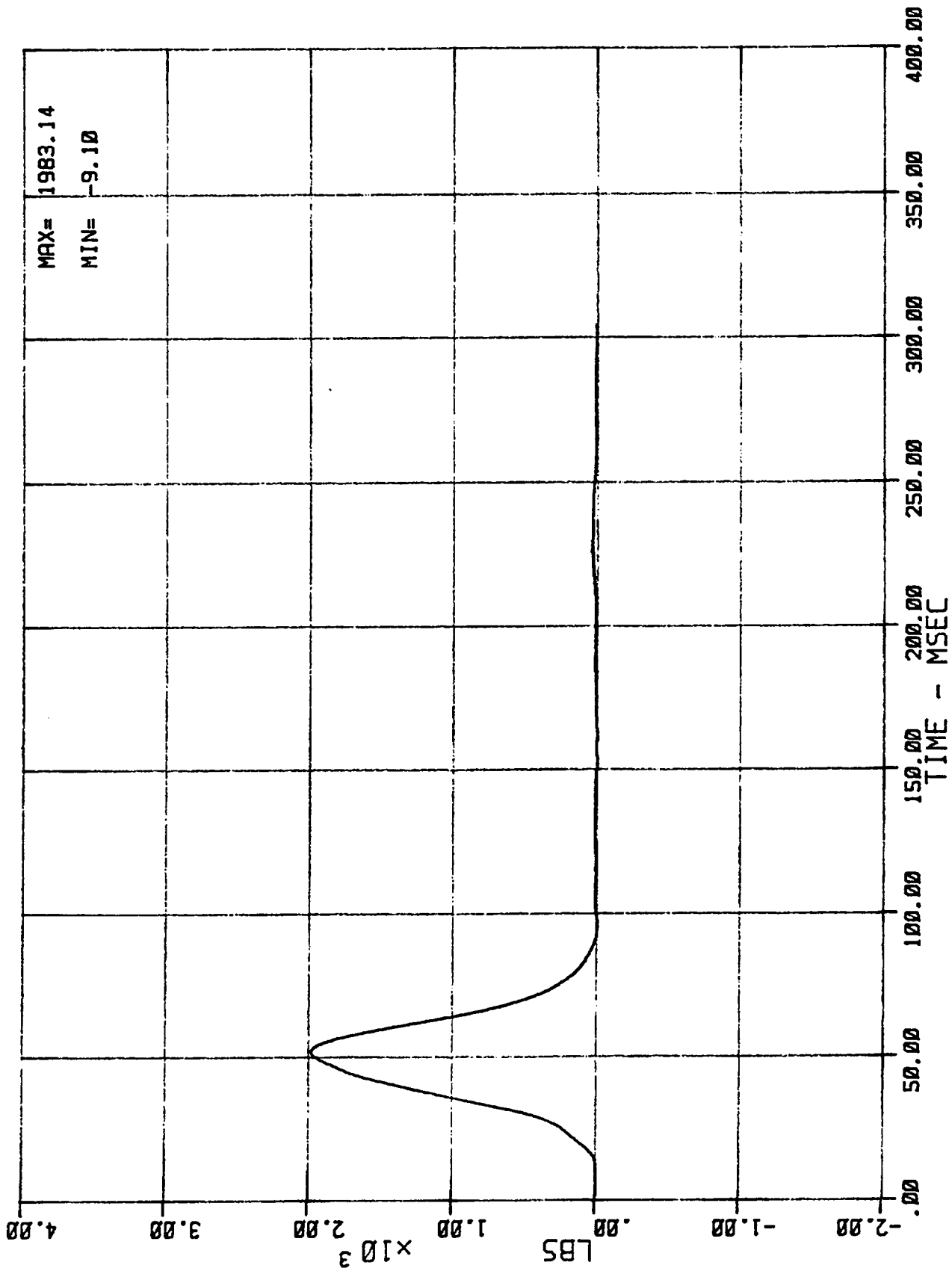
15 LC 01 2 LFM (PASSENGER LEFT FEMUR FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



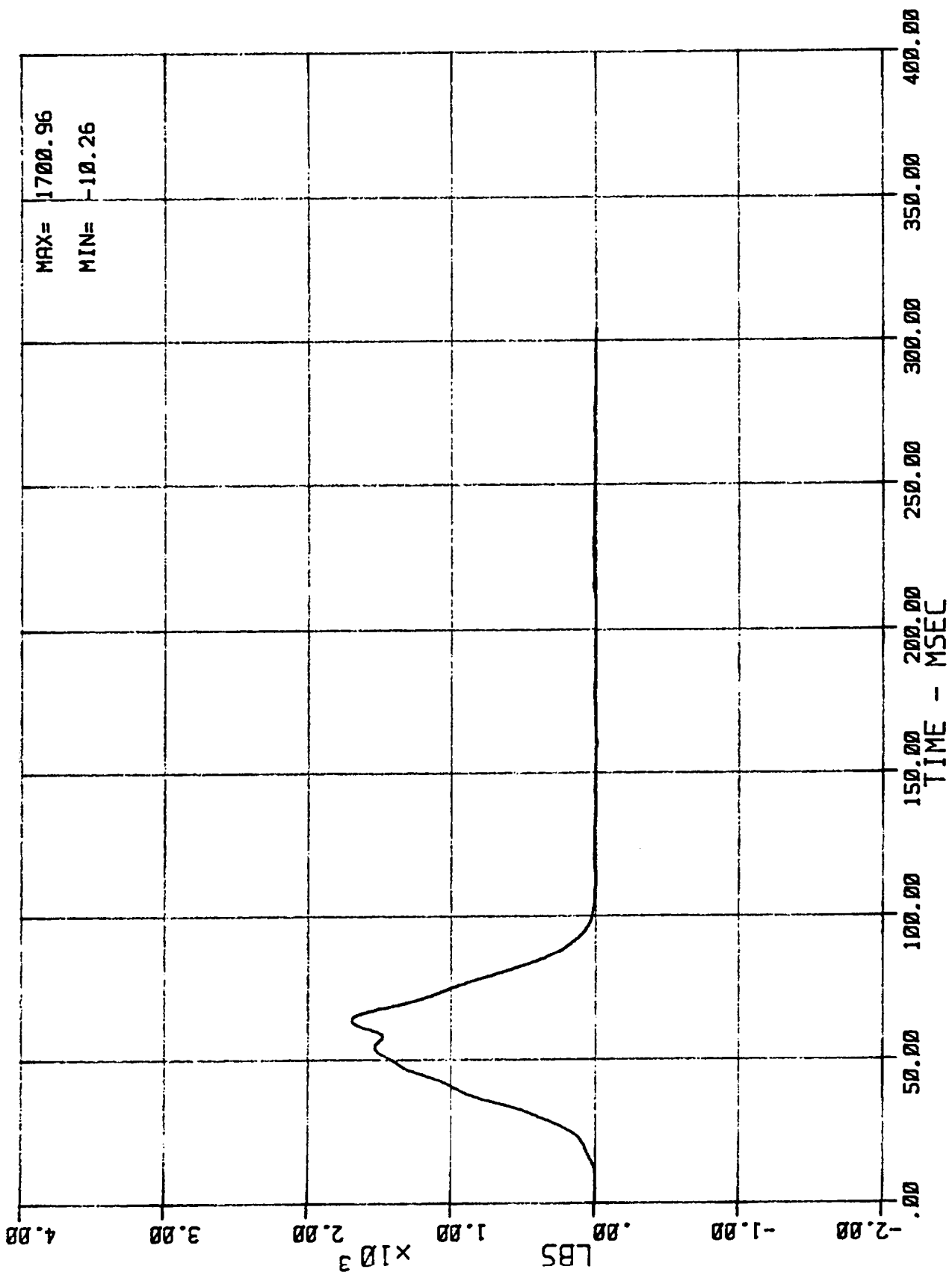
16 LC 01 2 RFM (PASSENGER RIGHT FEMUR FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



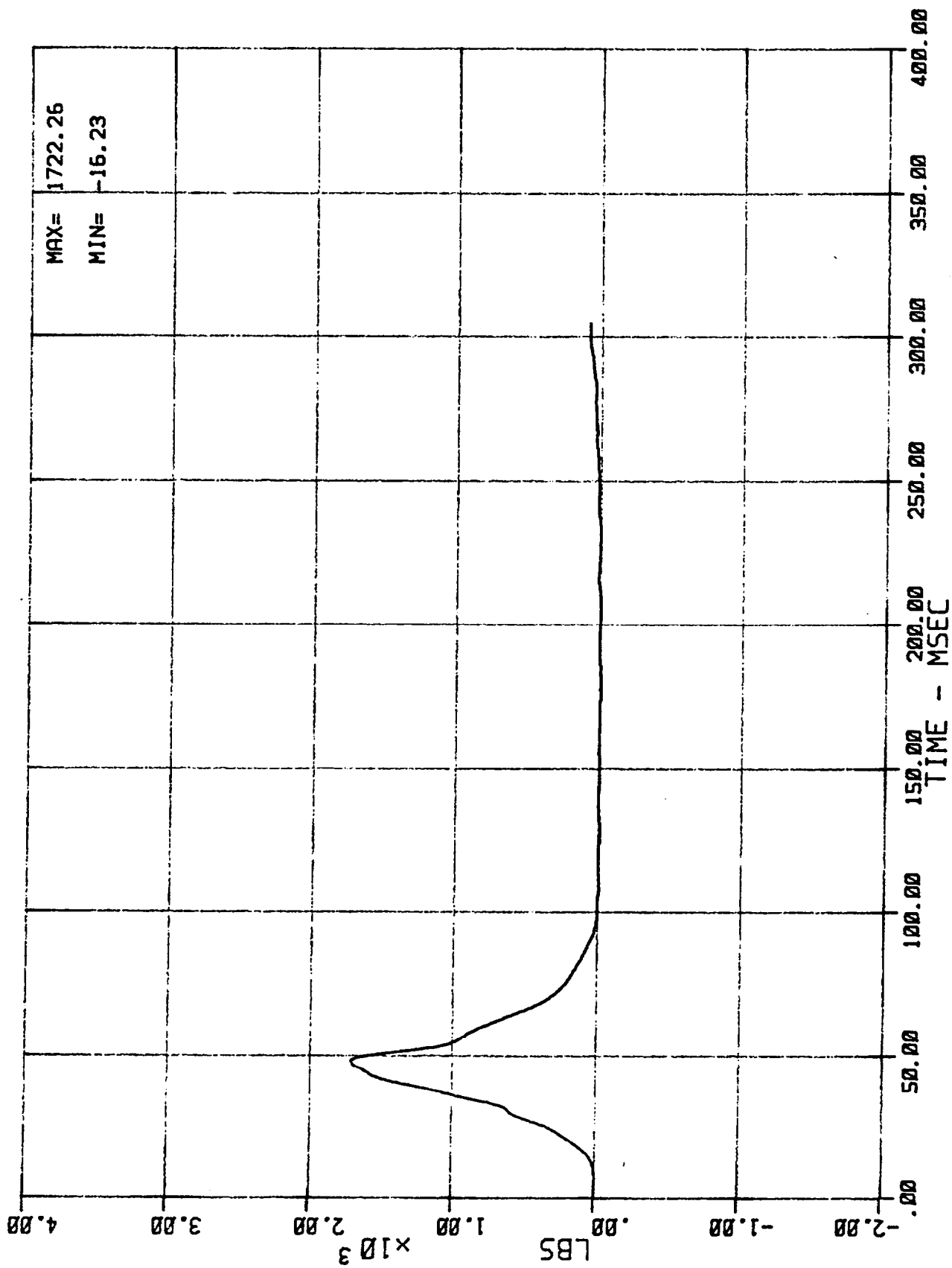
17 LC 01 1 LBO (DRIVER LAP BELT FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



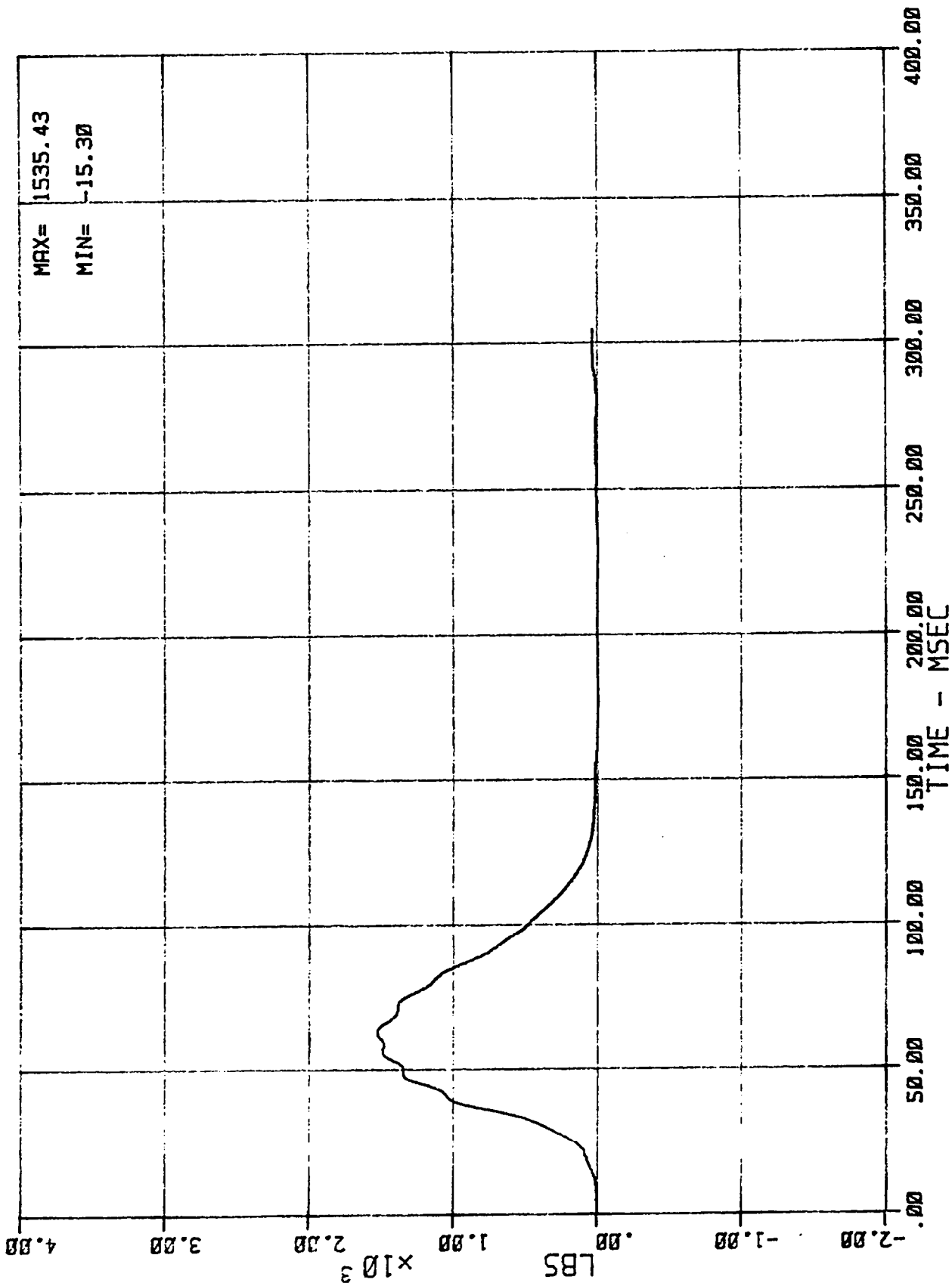
18 LC 01 1 SHB (DRIVER SHOULDER BELT FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



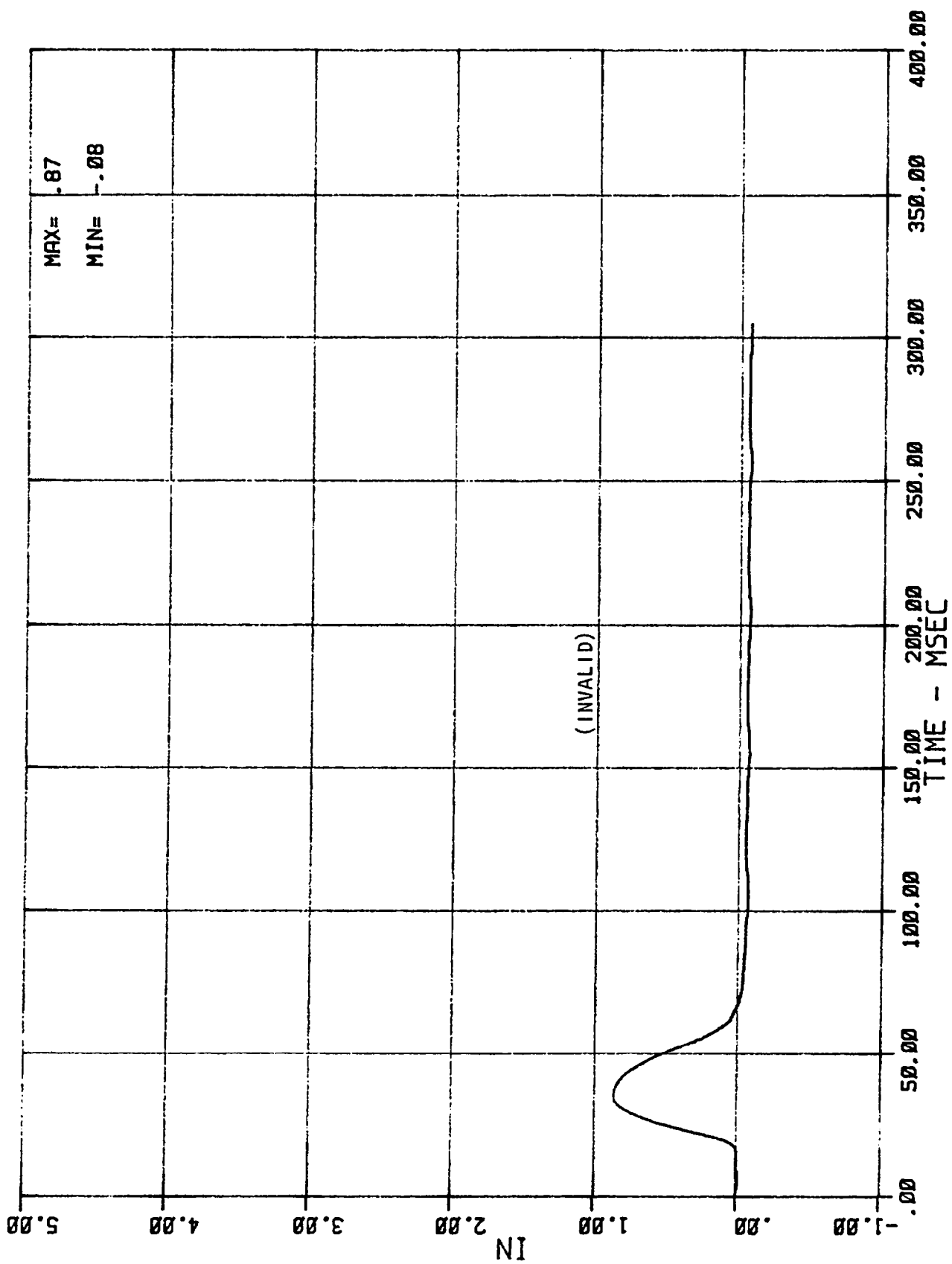
19 LC 01 2 LBO (PASSENGER LAP BELT FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



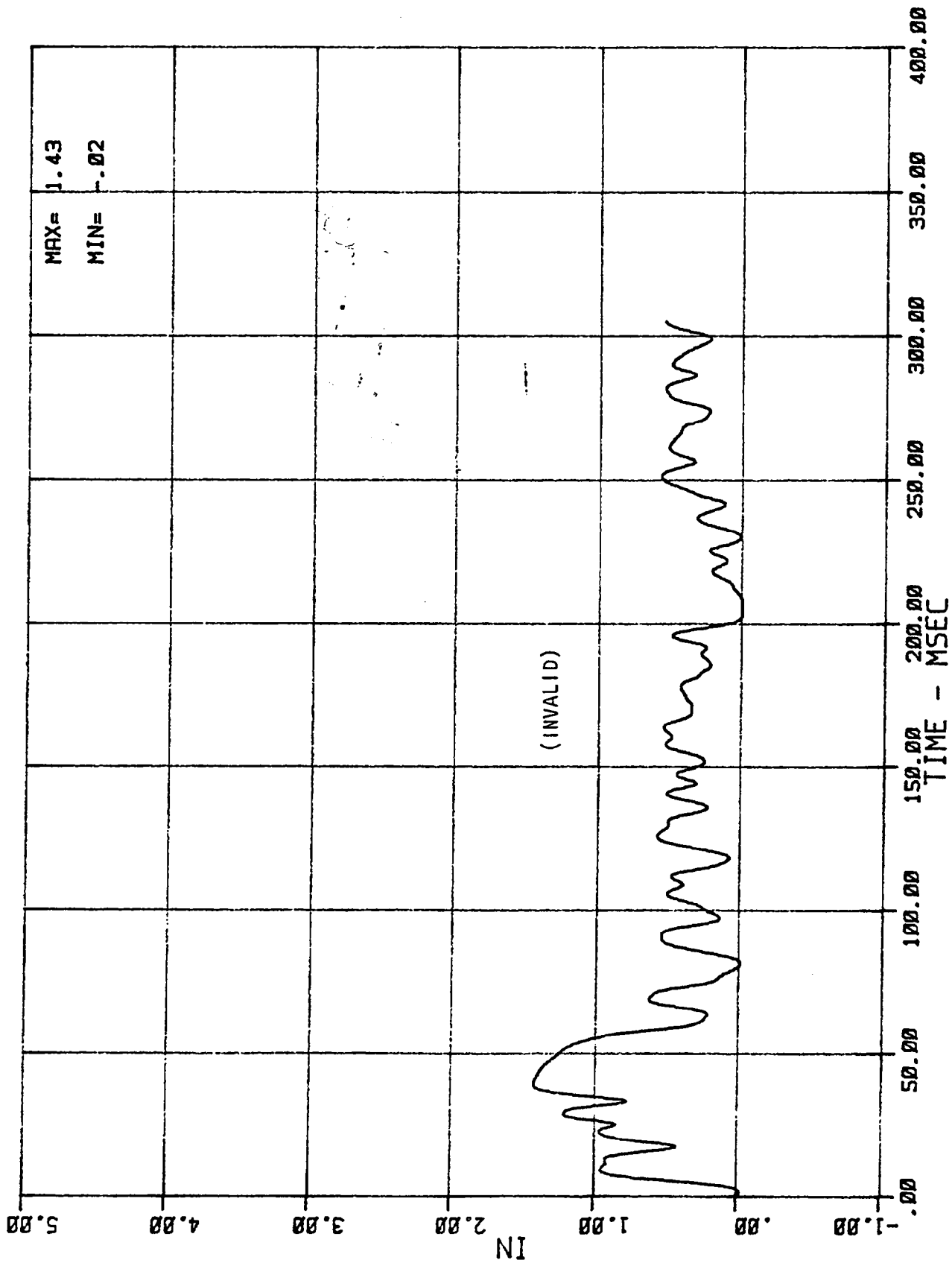
20 LC 01 2 SHB (PASSENGER SHOULDER BELT FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



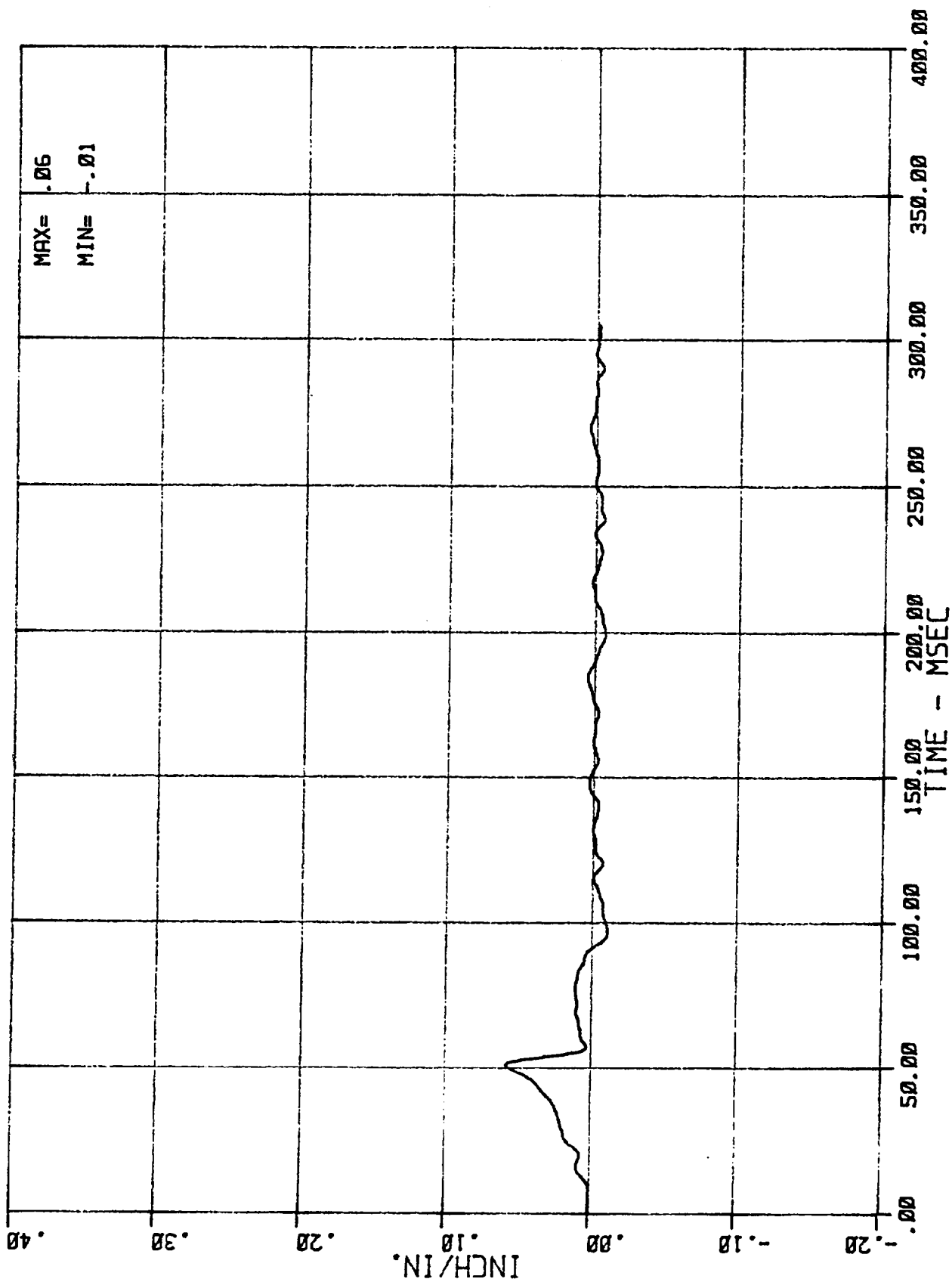
21 DT 01 1 SHB (DRIVER SHOULDER BELT PULLOUT)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



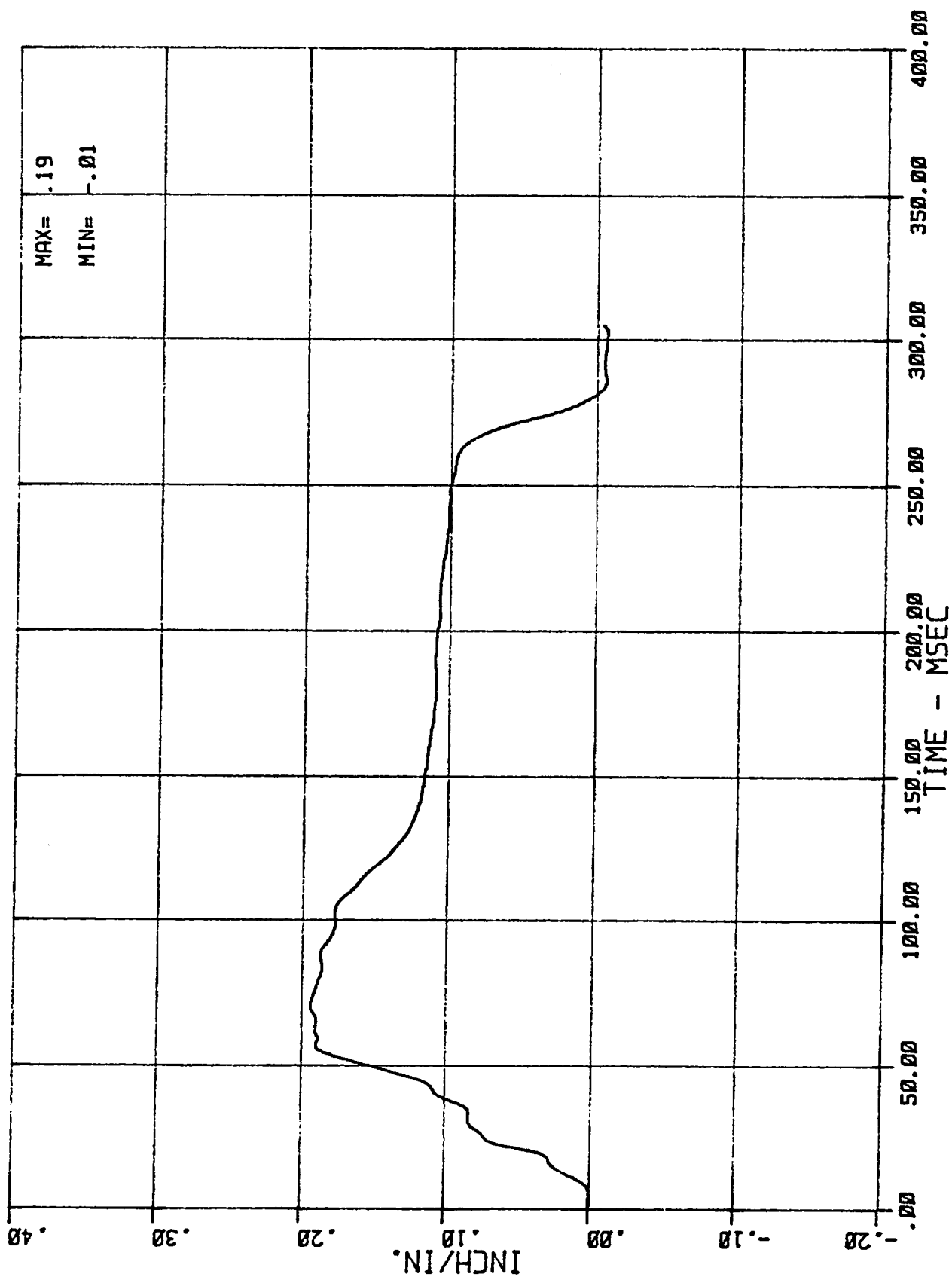
22 DT 01 2 SHB (PASSENGER SHOULDER BELT PULLOUT)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



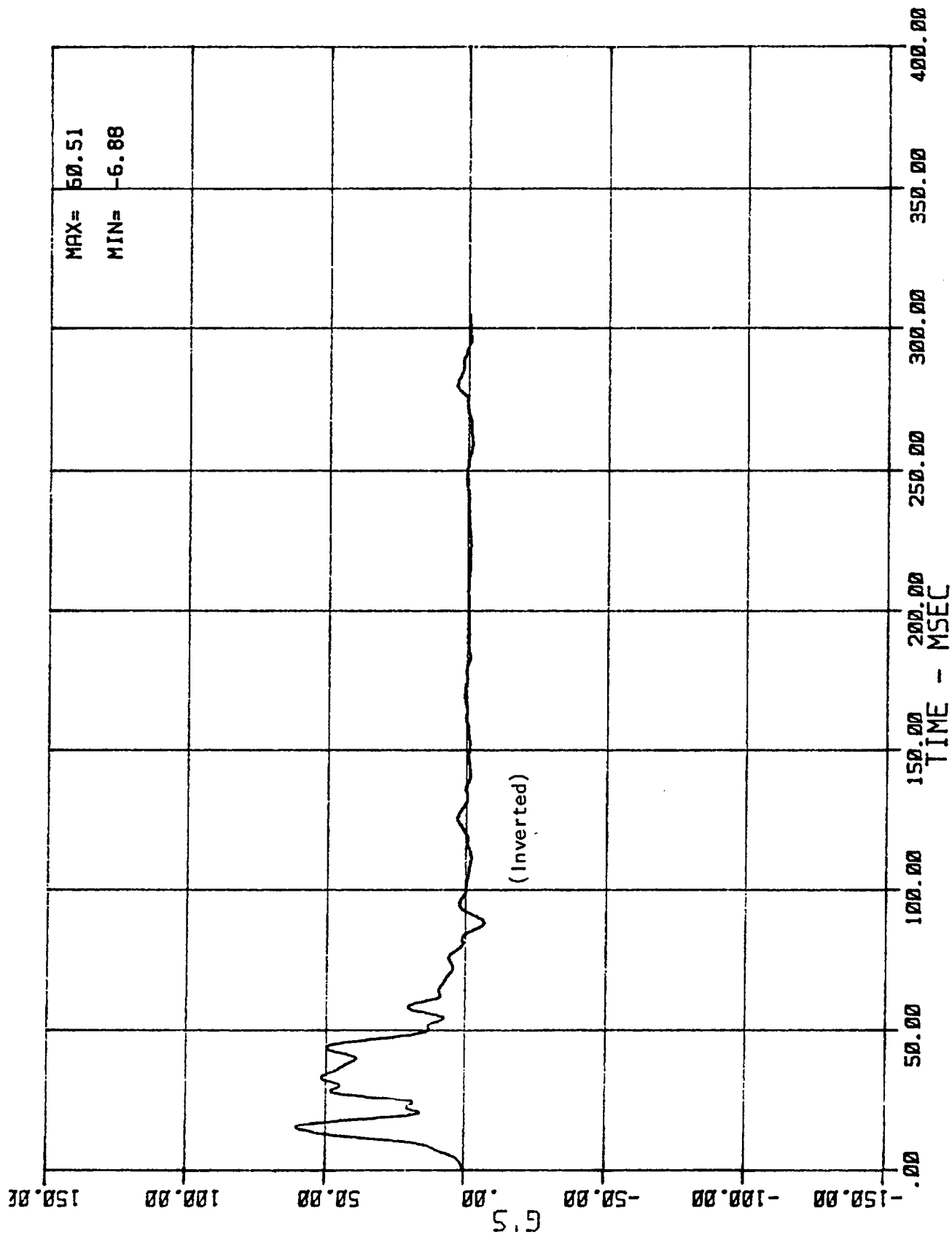
23 DT 01 1 SHB (DRIVER SHOULDER BELT ELONGATION)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



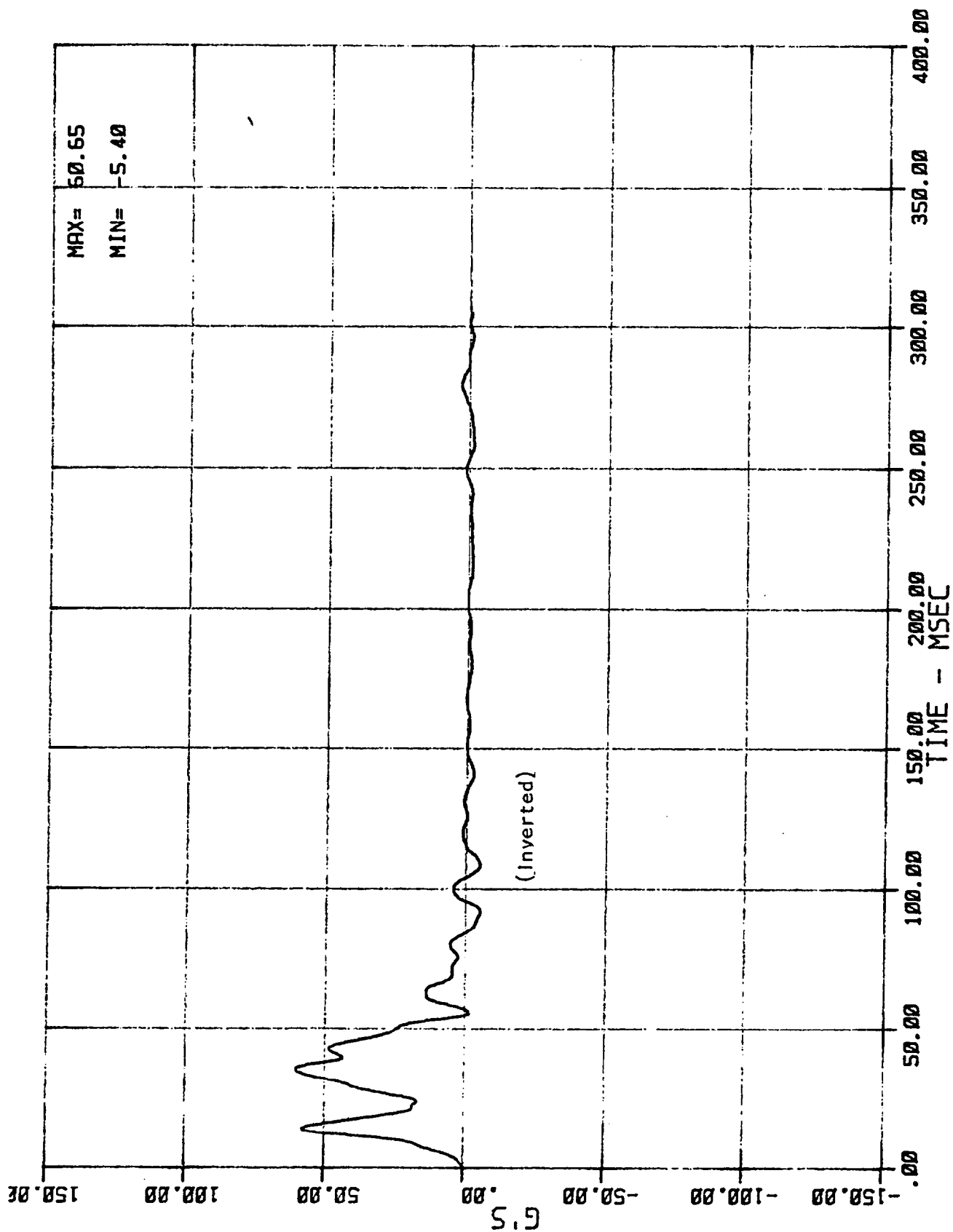
24 DT 01 2 SHB (PASSENGER SHOULDER BELT ELONGATION)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



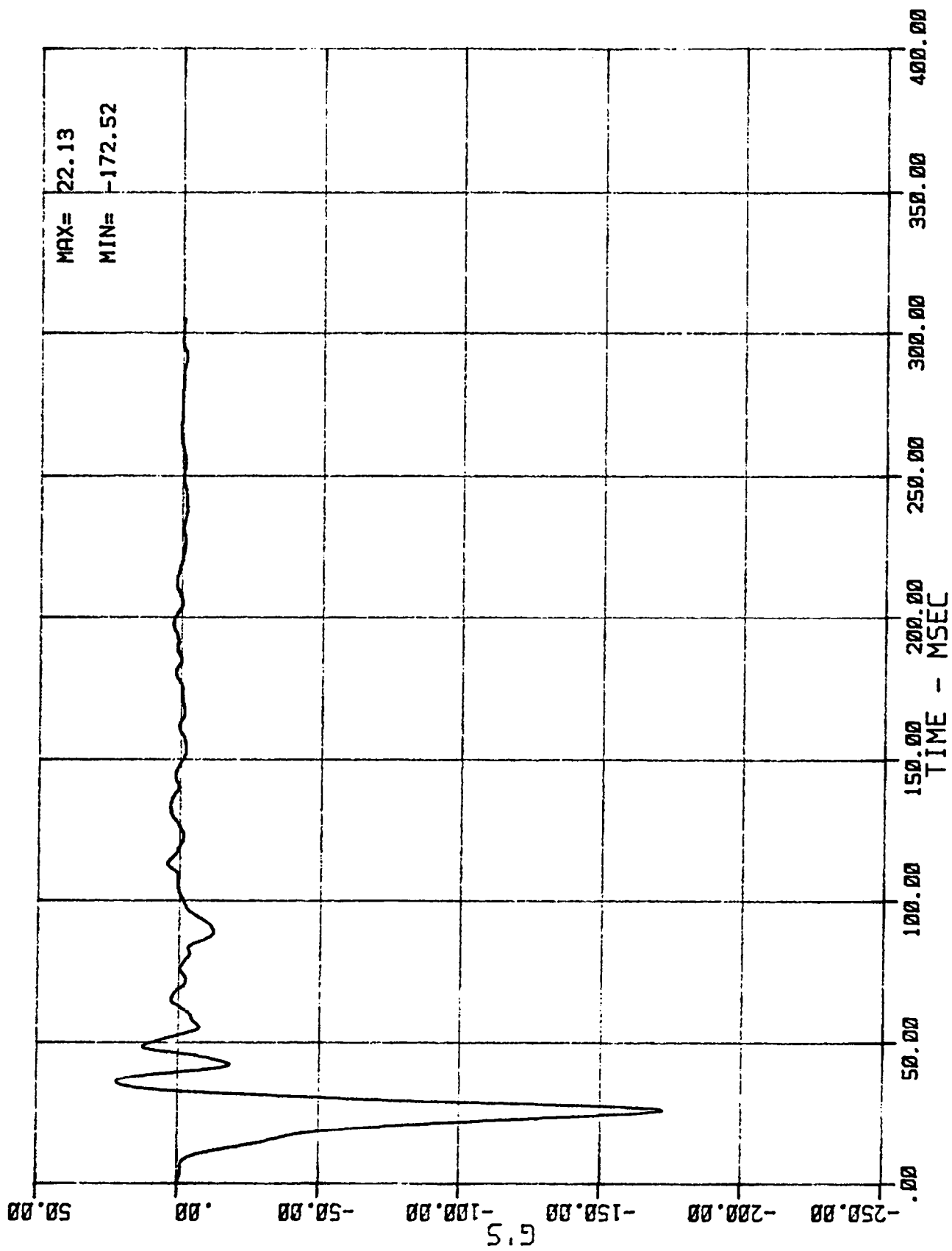
25 AC 01 N LRF X (LEFT REAR FLOOR ACCEL. --- X AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



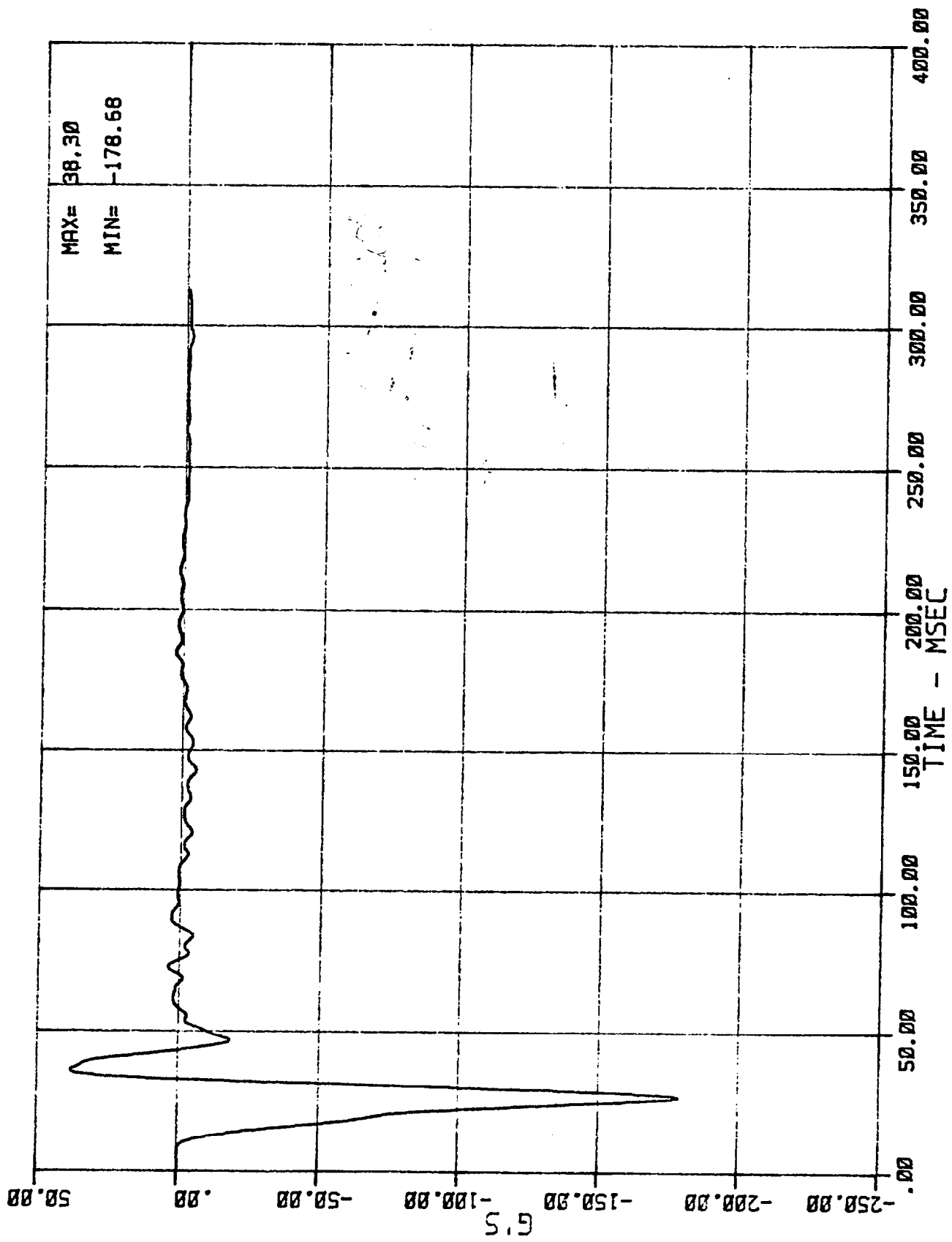
26 AC 01 N RRF X (RIGHT REAR FLOOR ACCEL. -- X AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



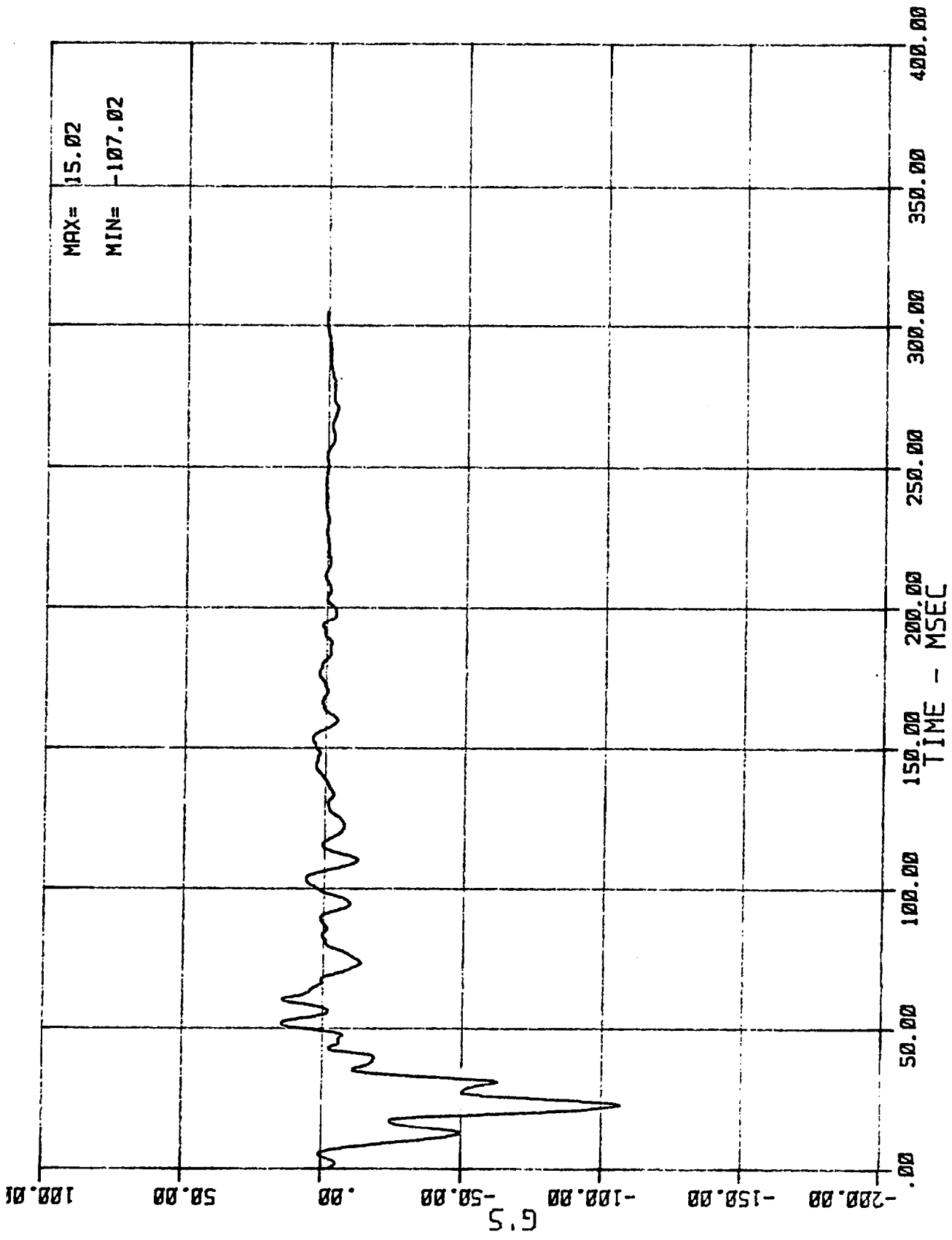
28 AC 01 N ENG X (BOTTOM OF ENGINE ACCEL. -- X AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



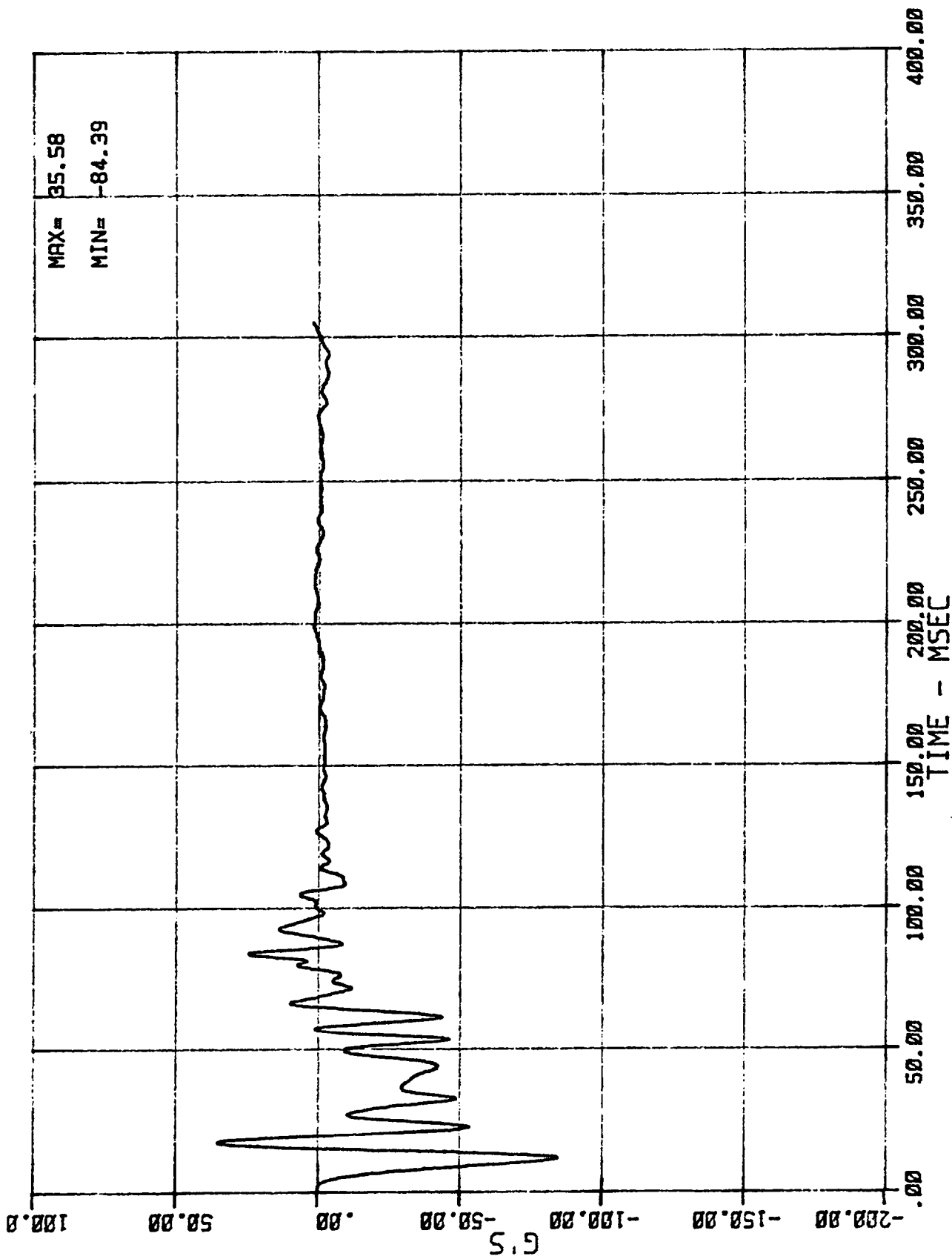
27 AC 01 N ENG X (TOP OF ENGINE ACCEL. -- X AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

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29 AC 01 N BCR X (RIGHT FRONT WHEEL ACCEL. -- X AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

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30 AC 01 N DPC X (CENTER DASH PANEL ACCEL. -- X AXIS)
MSE N18025 1986 MAZDA B-2000 P.U.

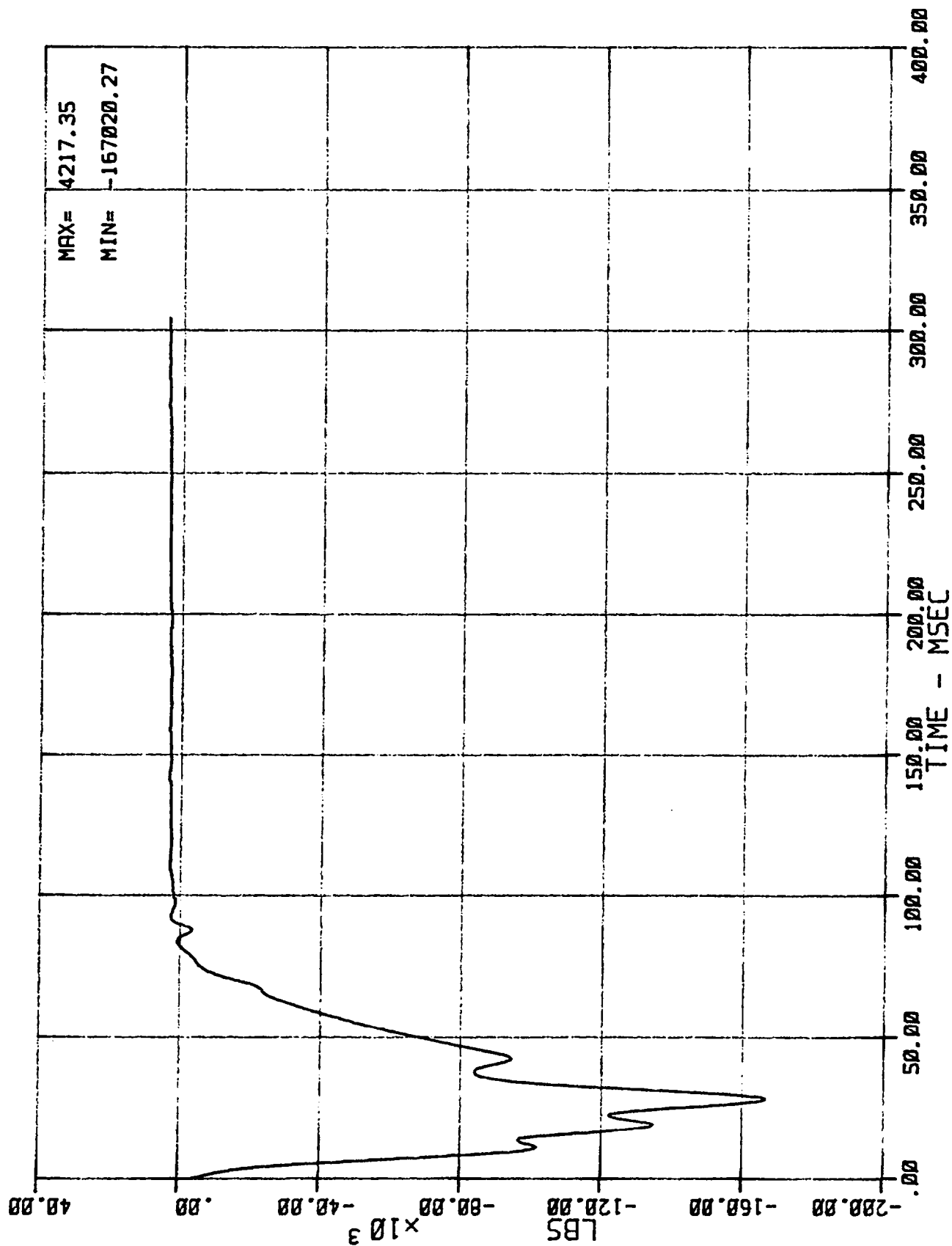
06/04/85

APPENDIX B-2

LOAD CELL BARRIER
DATA

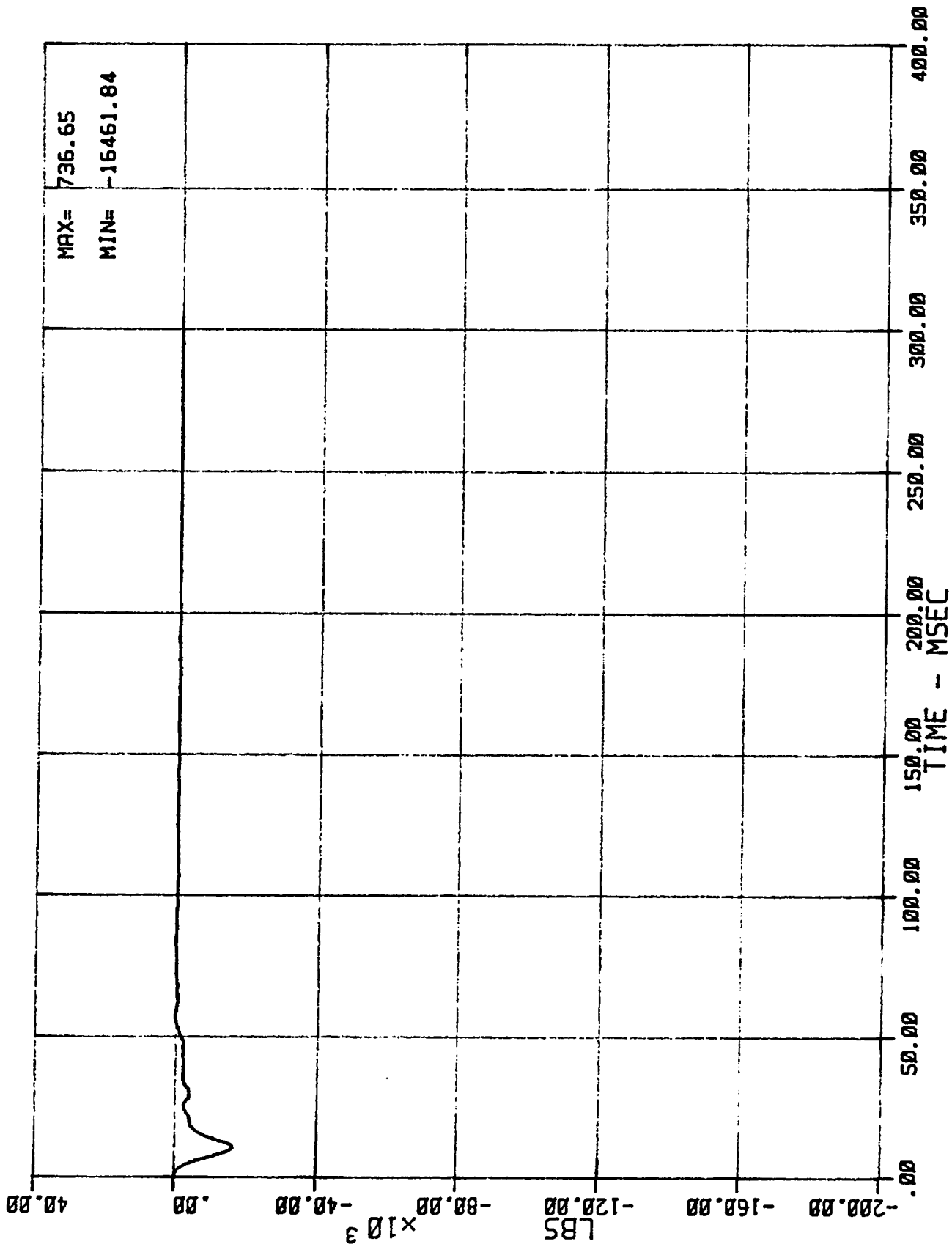
DATA FILTERING:

All Load Cell Barrier Channels - Class 60



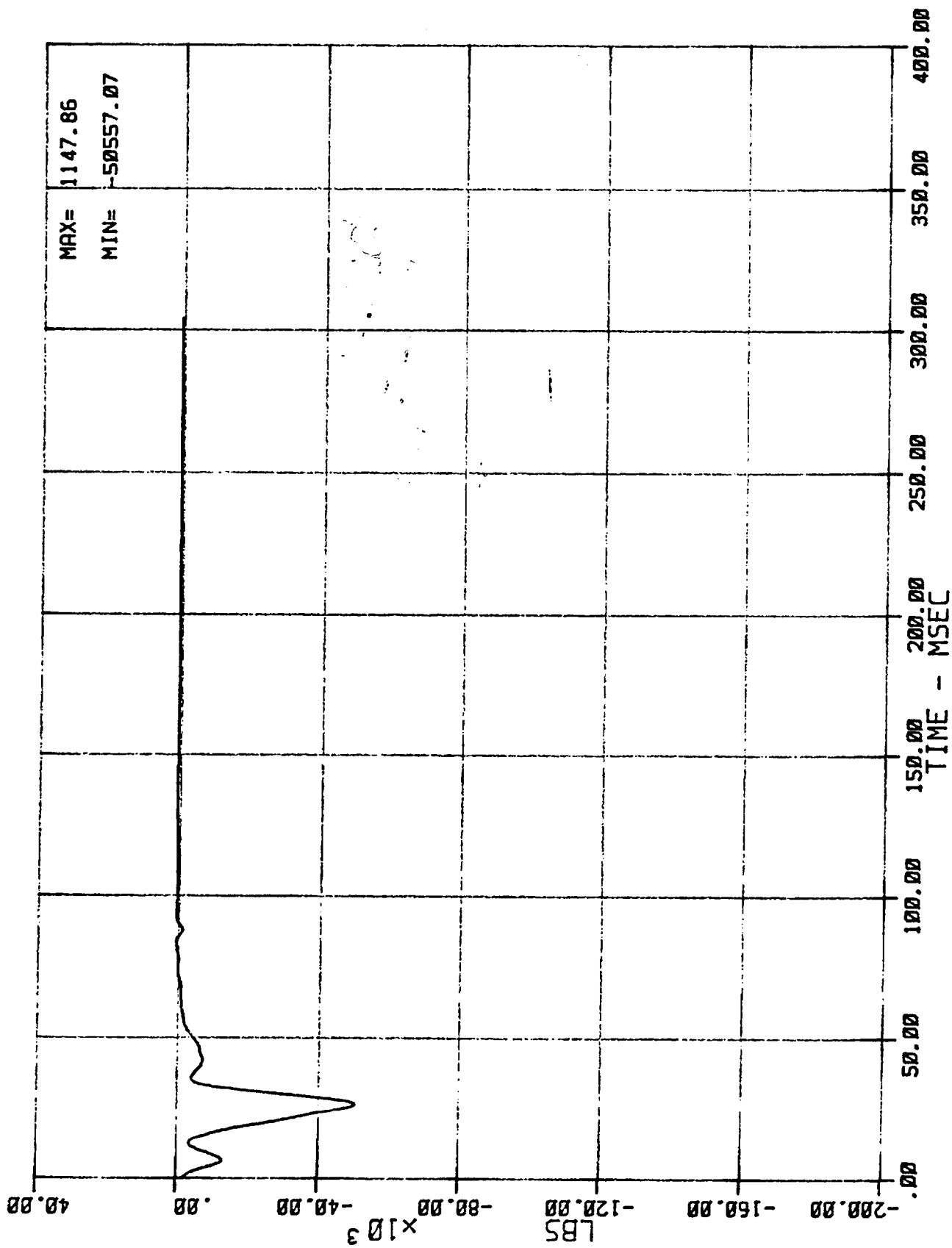
TOTAL SUM, LOAD CELL BARRIER FORCE
 MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



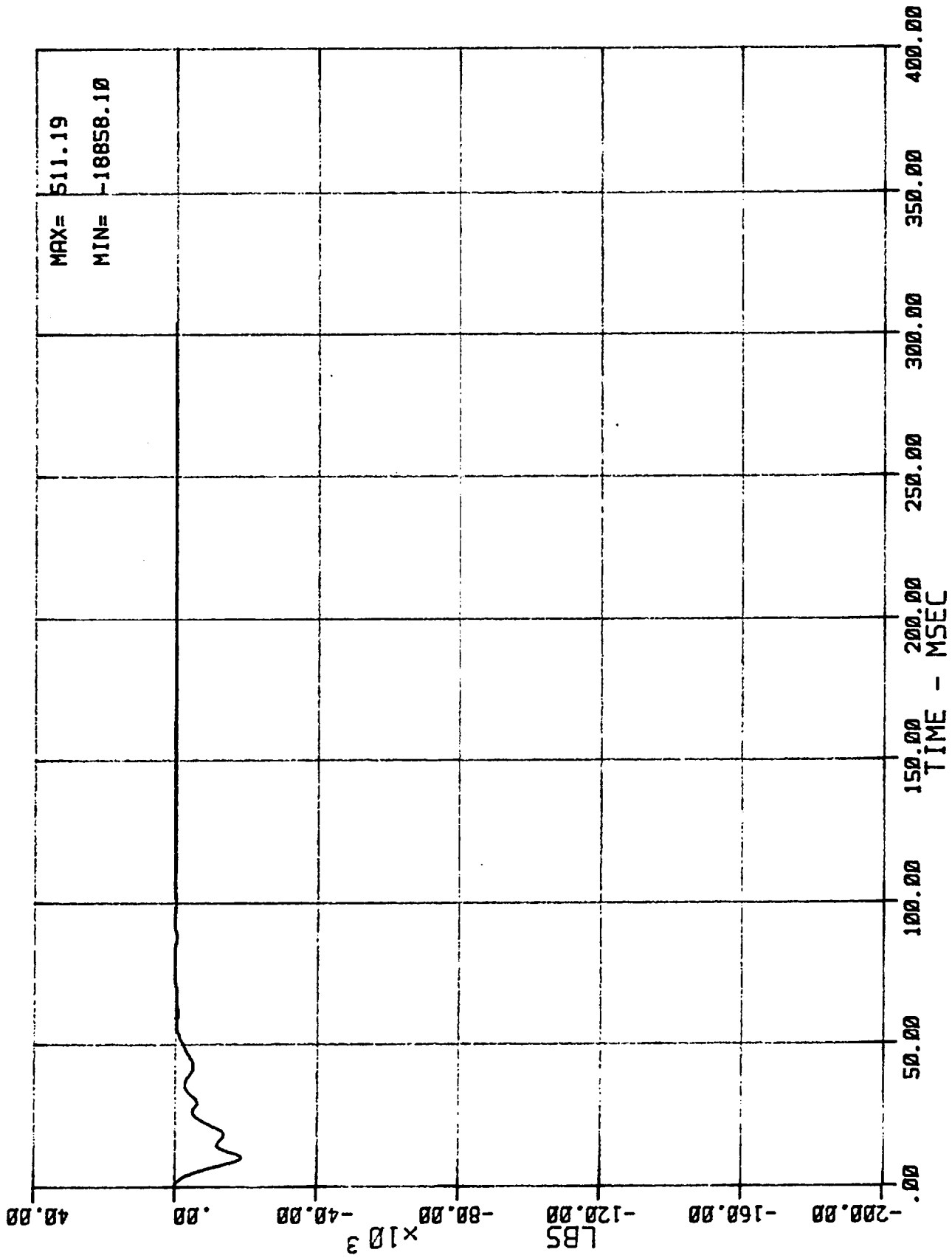
GROUP 1 SUM (C1,C2,C3,D1,D2,D3) LOAD CELL BARRIER FORCE
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



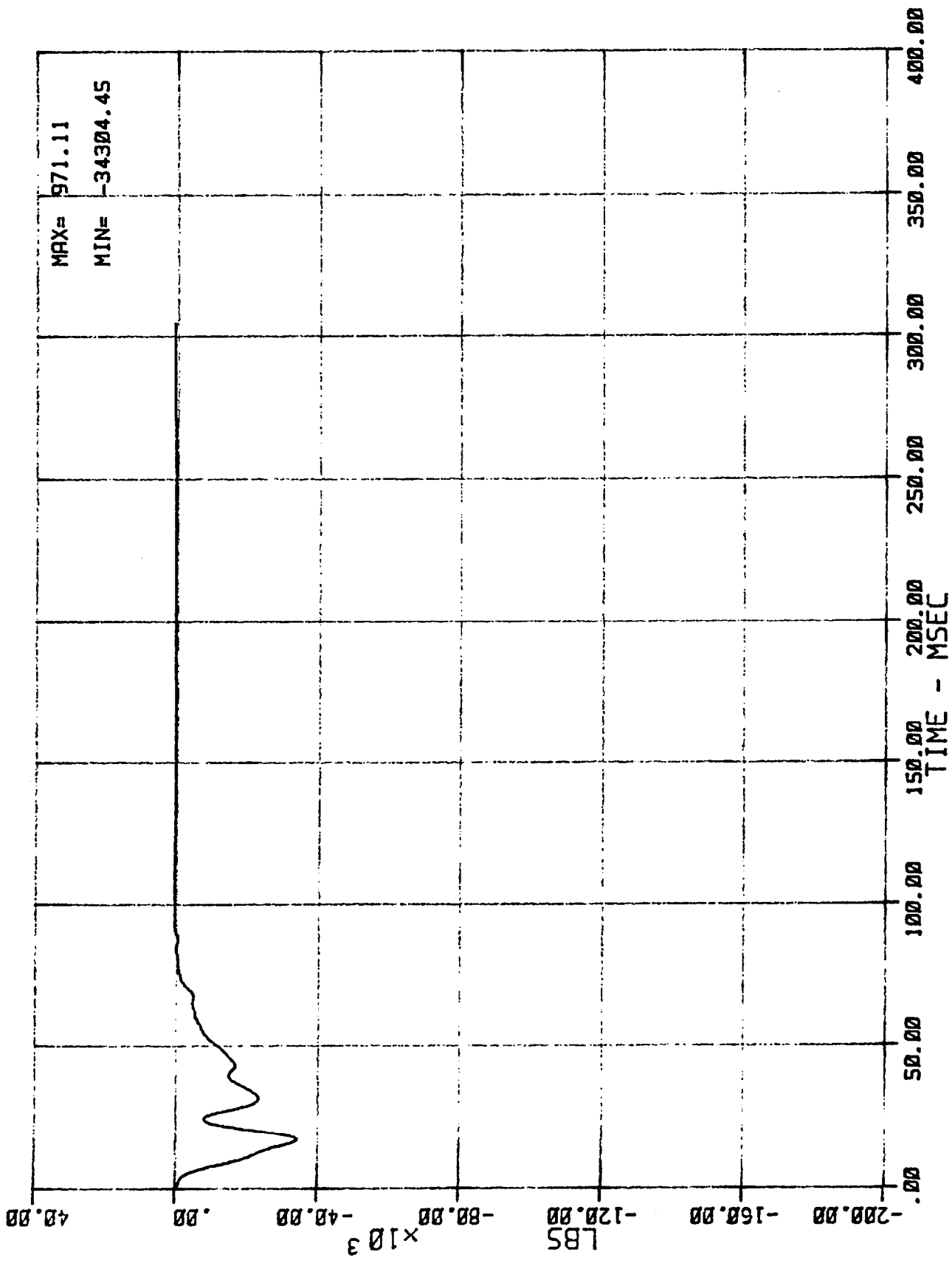
GROUP 2 SUM (C4,C5,C6,D4,D5,D6) LOAD CELL BARRIER FORCE
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



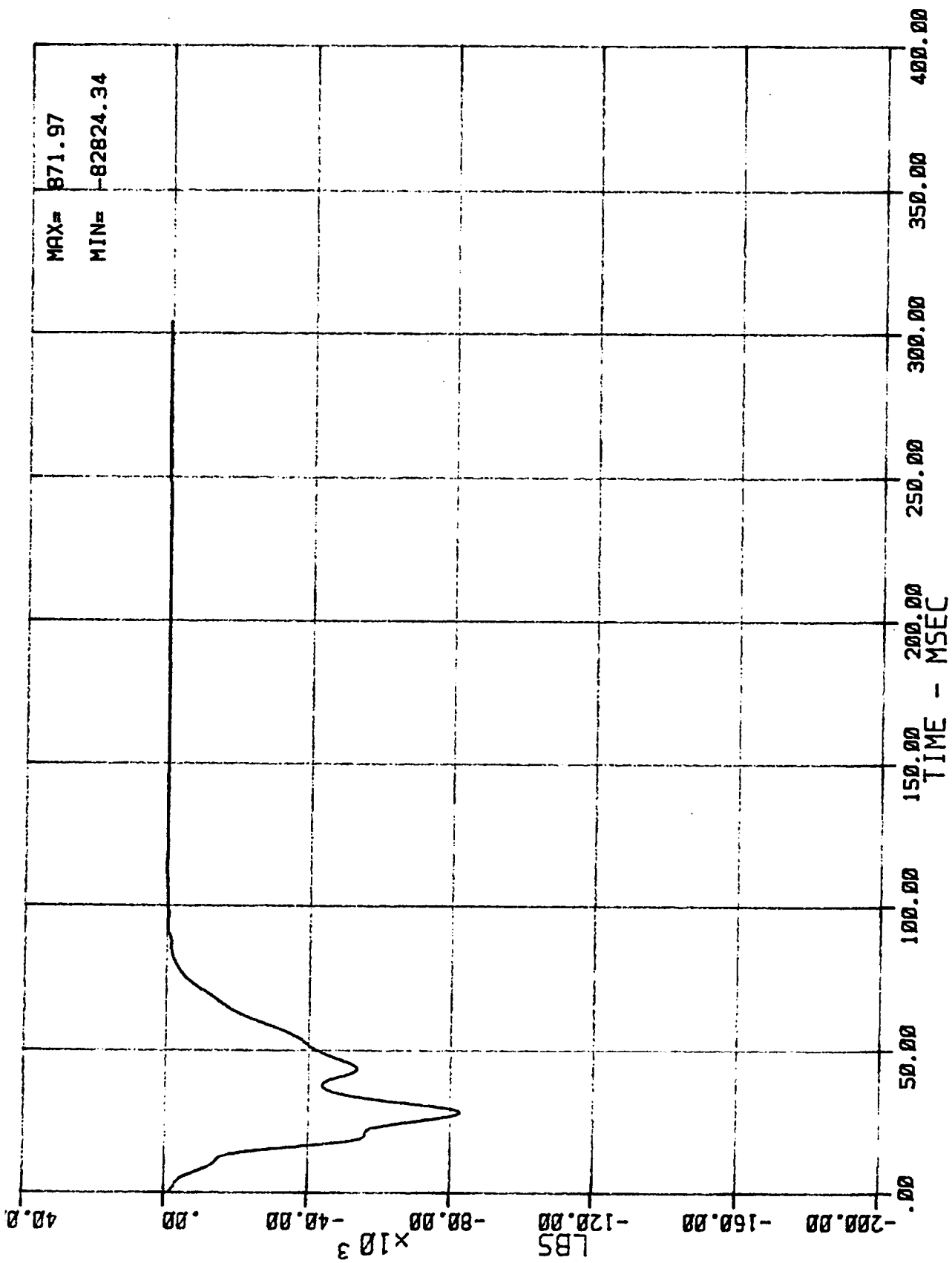
GROUP 3 SUM (C7,C8,C9,D7,D8,D9) LOAD CELL BARRIER FORCE
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



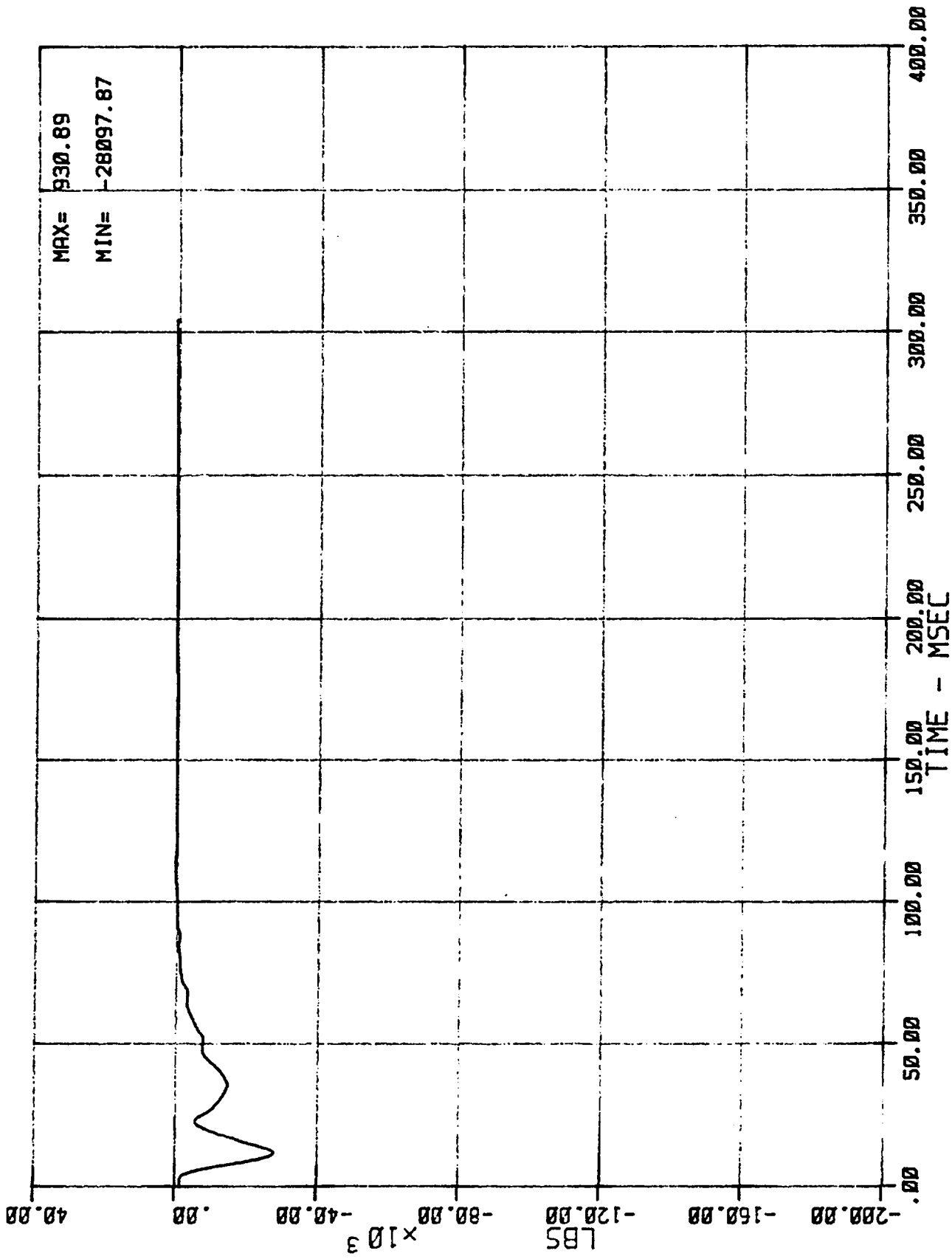
GROUP 4 SUM (A1,A2,A3,B1,B2,B3) LOAD CELL BARRIER FORCE
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



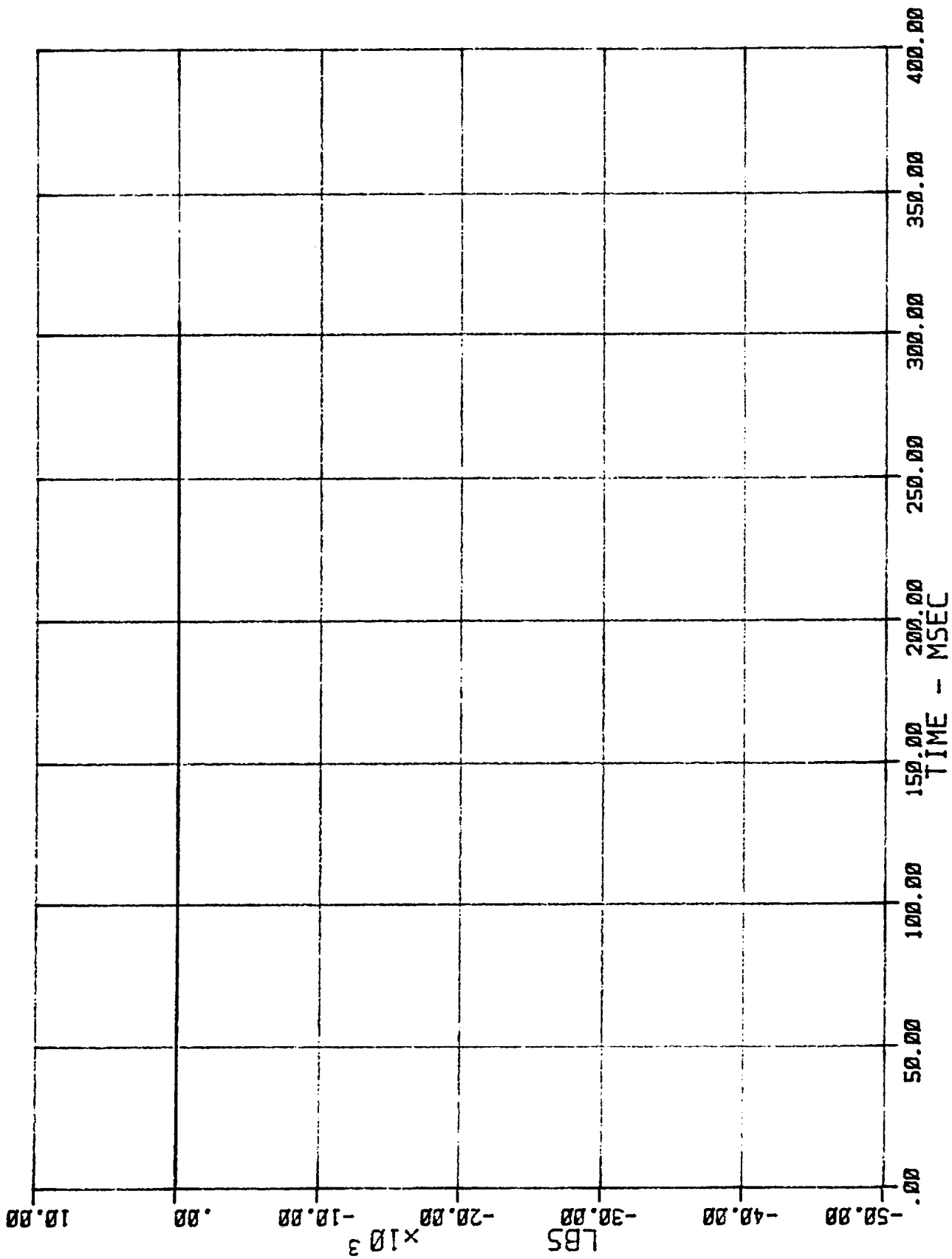
GROUP 5 SUM (A4,A5,A6,B4,B5,B6) LOAD CELL BARRIER FORCE
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



GROUP 6 SUM (A7,A8,A9,B7,B8,B9) LOAD CELL BARRIER FORCE
MSE N18025 1986 MAZDA B-2000 P.U.

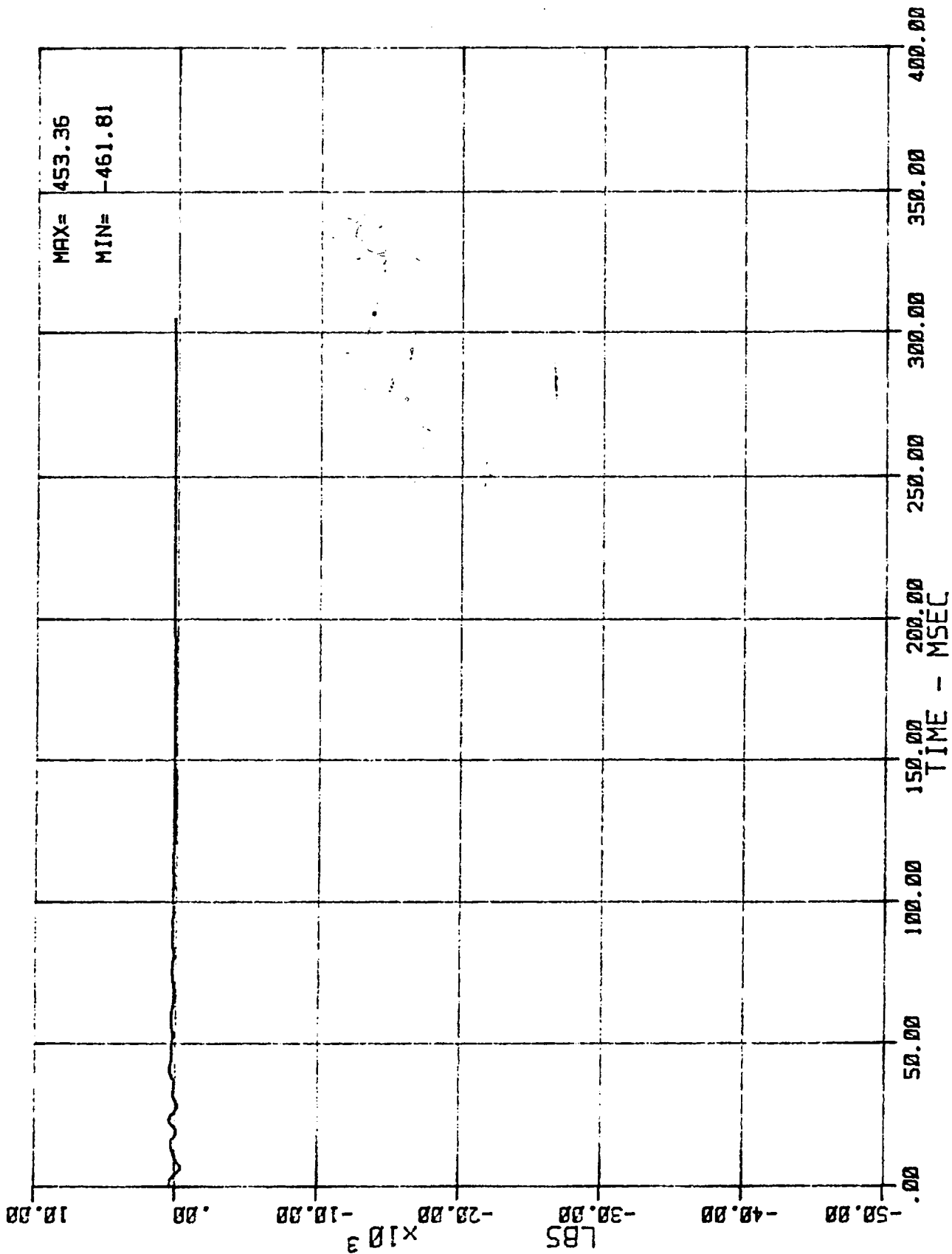
06/04/85



31 LC BA N BAJ (BARRIER LOAD CELL A1 FORCE: NO L.C.)

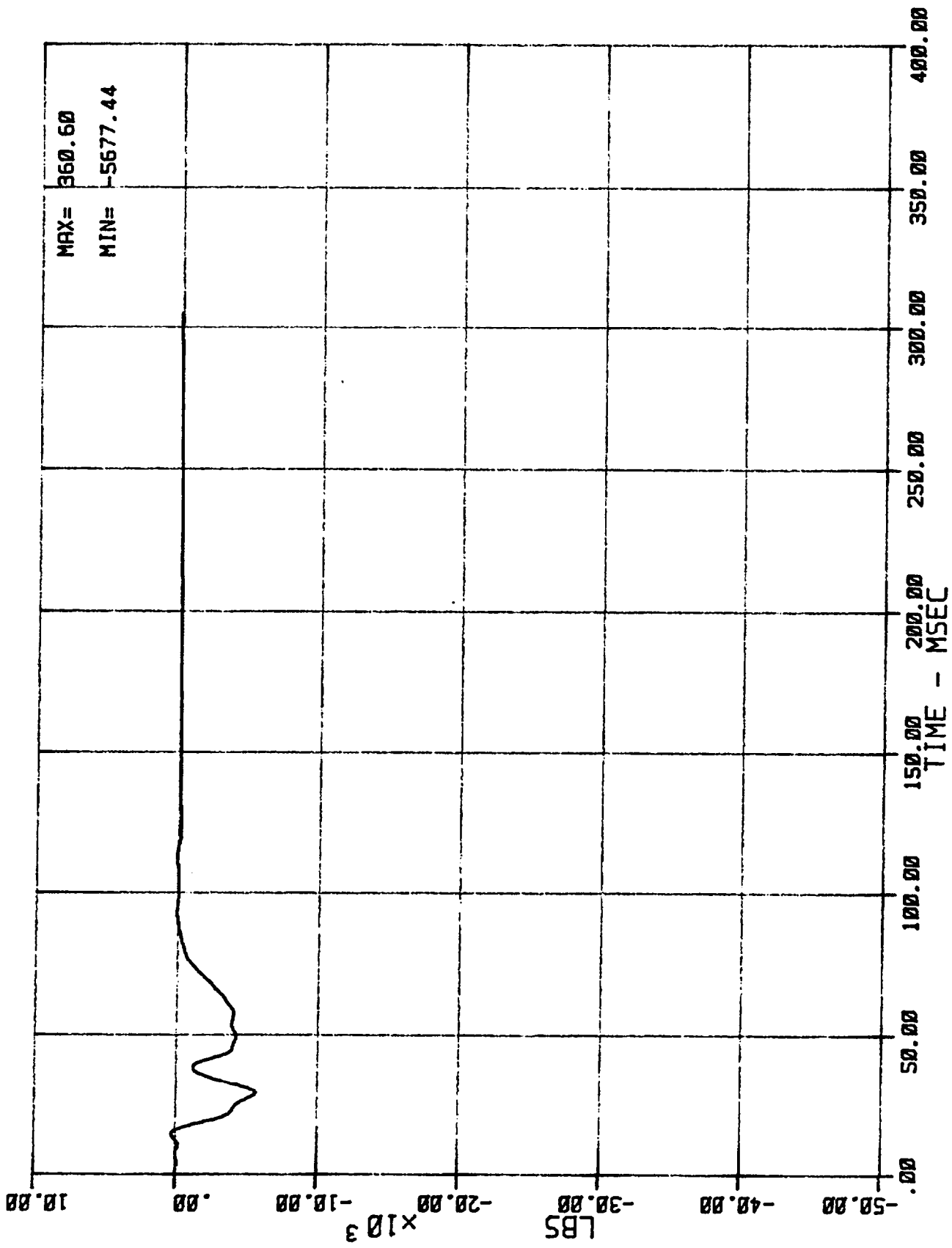
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



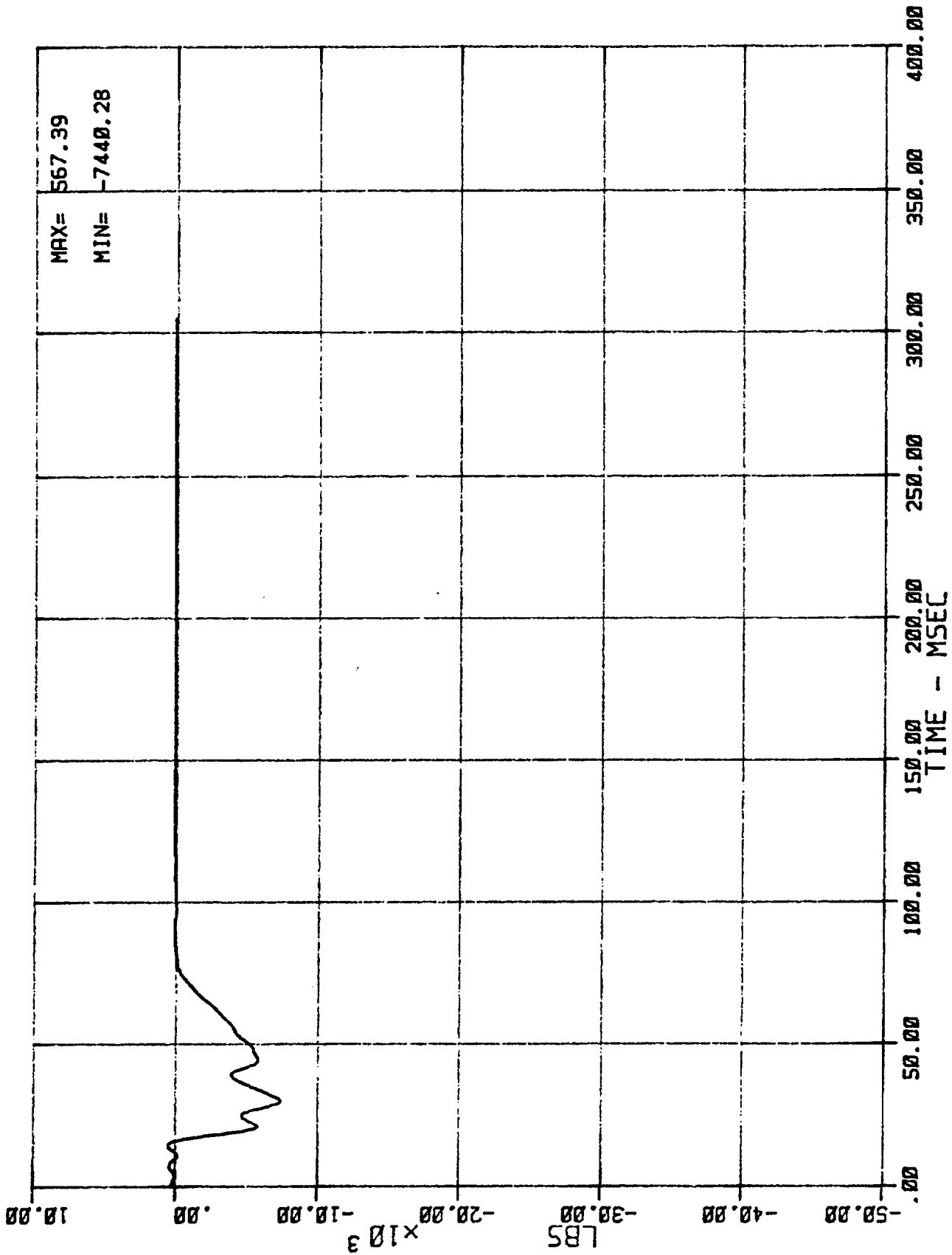
32 LC BA N BA2 (BARRIER LOAD CELL A2 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



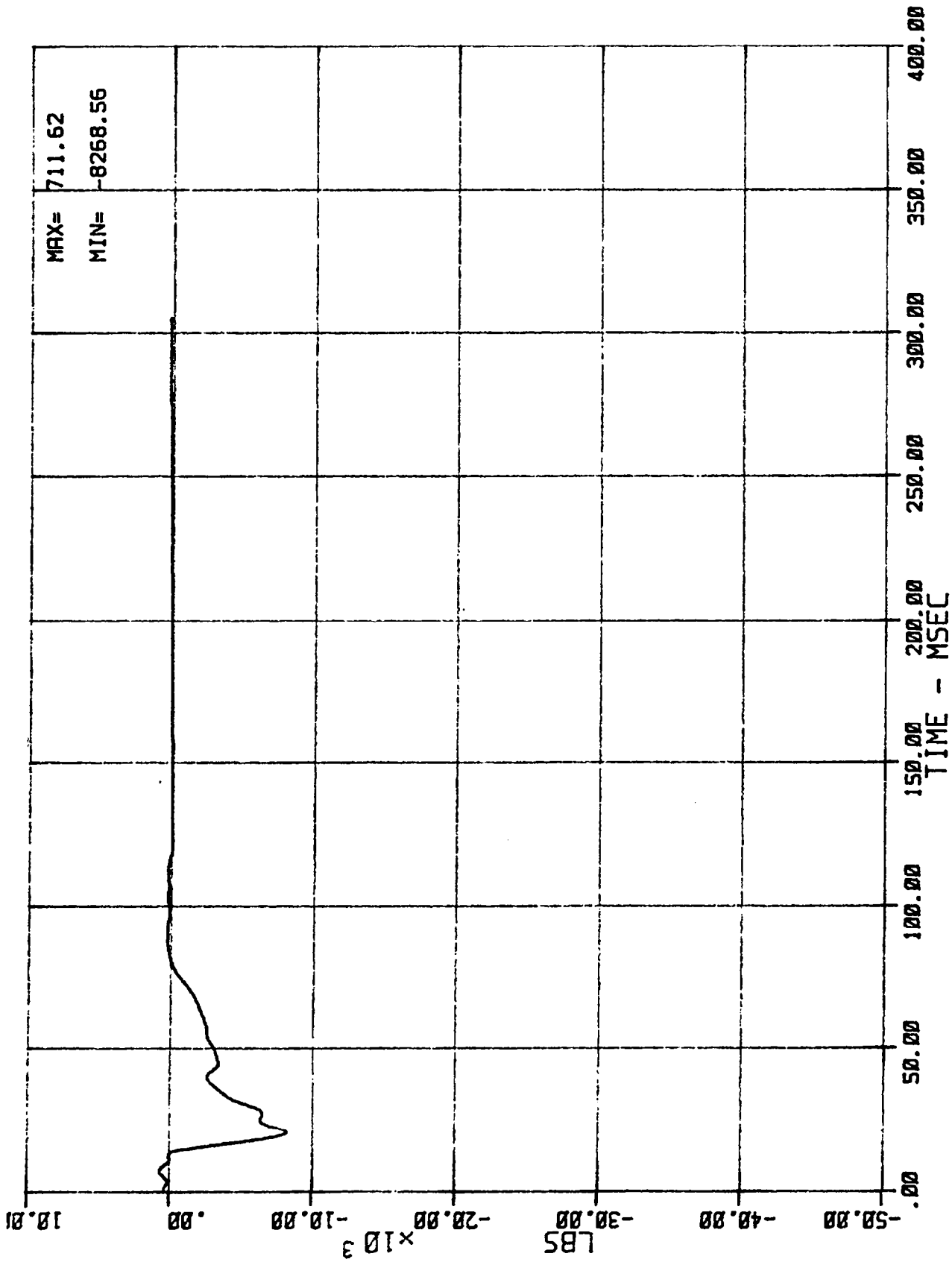
33 LC BA N BA3 (BARRIER LOAD CELL A3 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



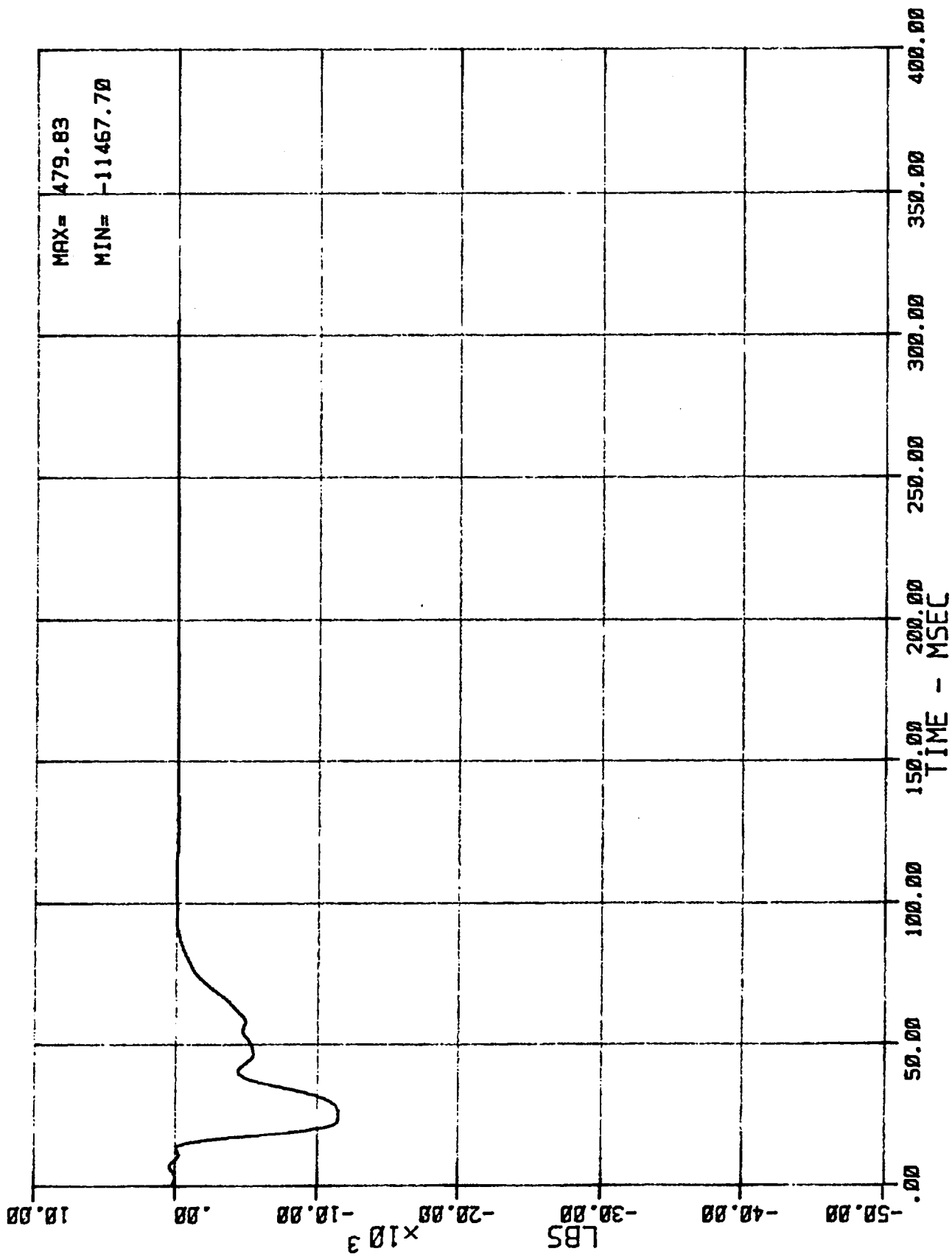
34 LC BA N BA4 (BARRIER LOAD CELL A4 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



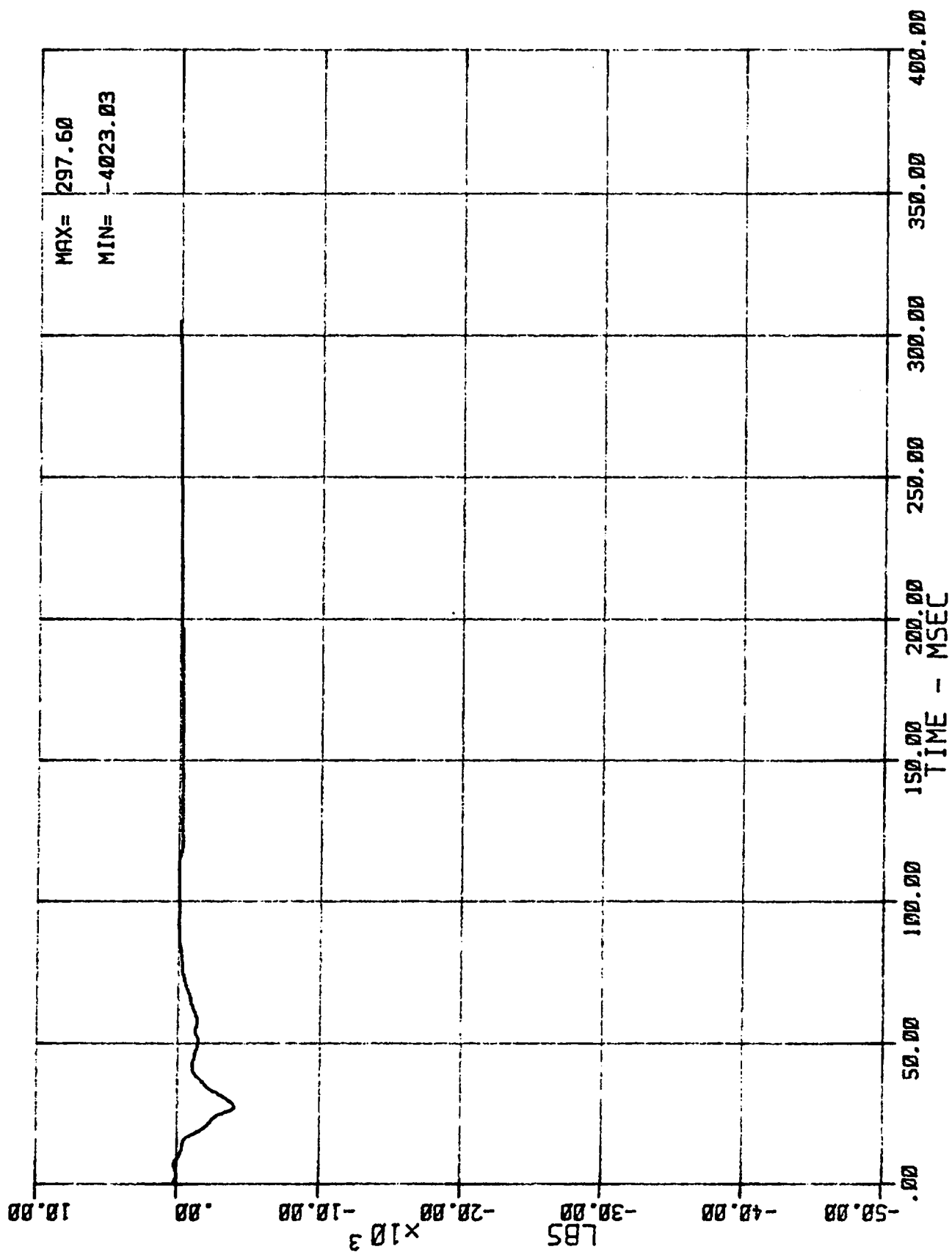
35 LC BA N BAS (BARRIER LOAD CELL AS FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



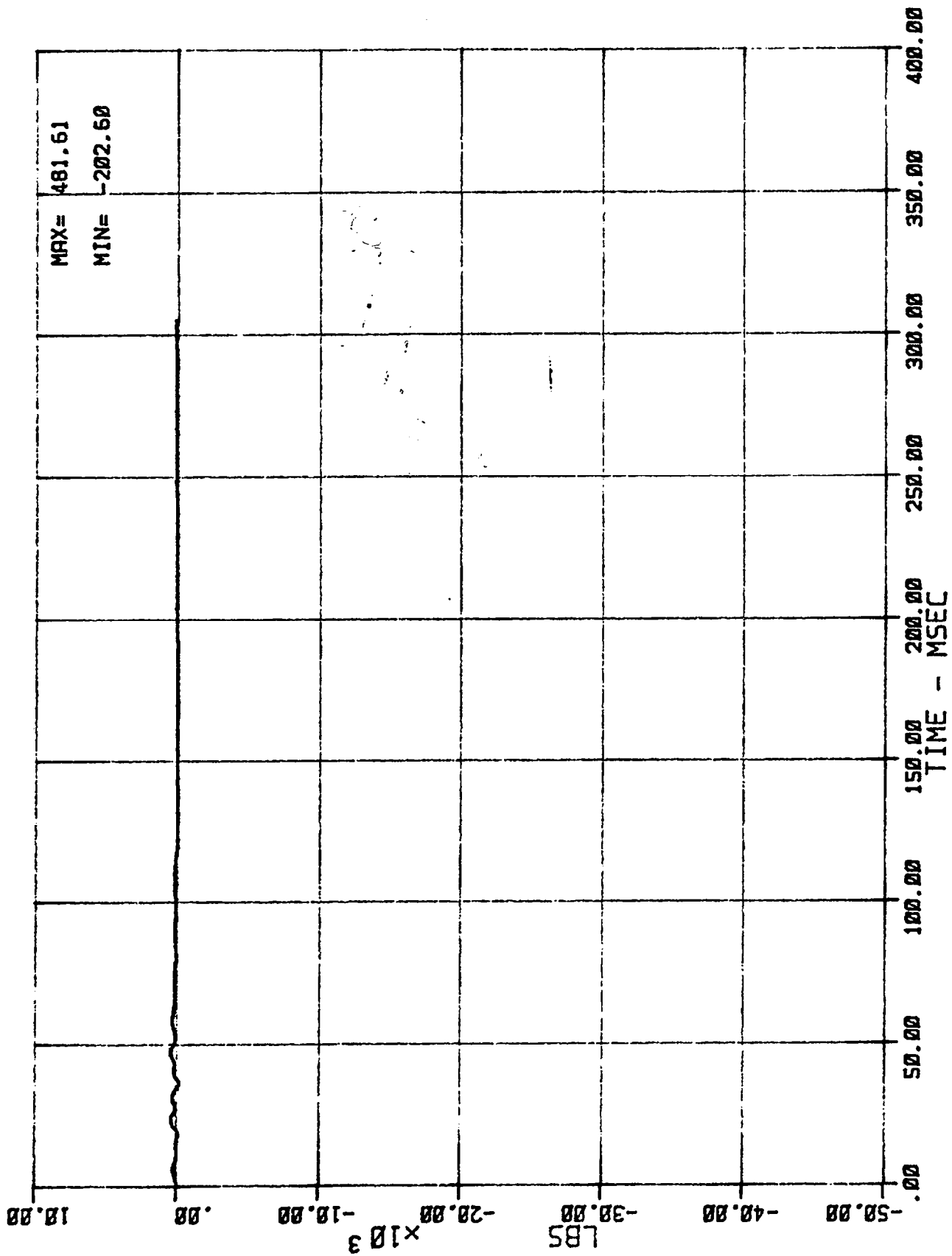
36 LC BA N BA6 (BARRIER LOAD CELL A6 FORCE)
MSE N18025 1986 MAZDA P.U.

06/04/85



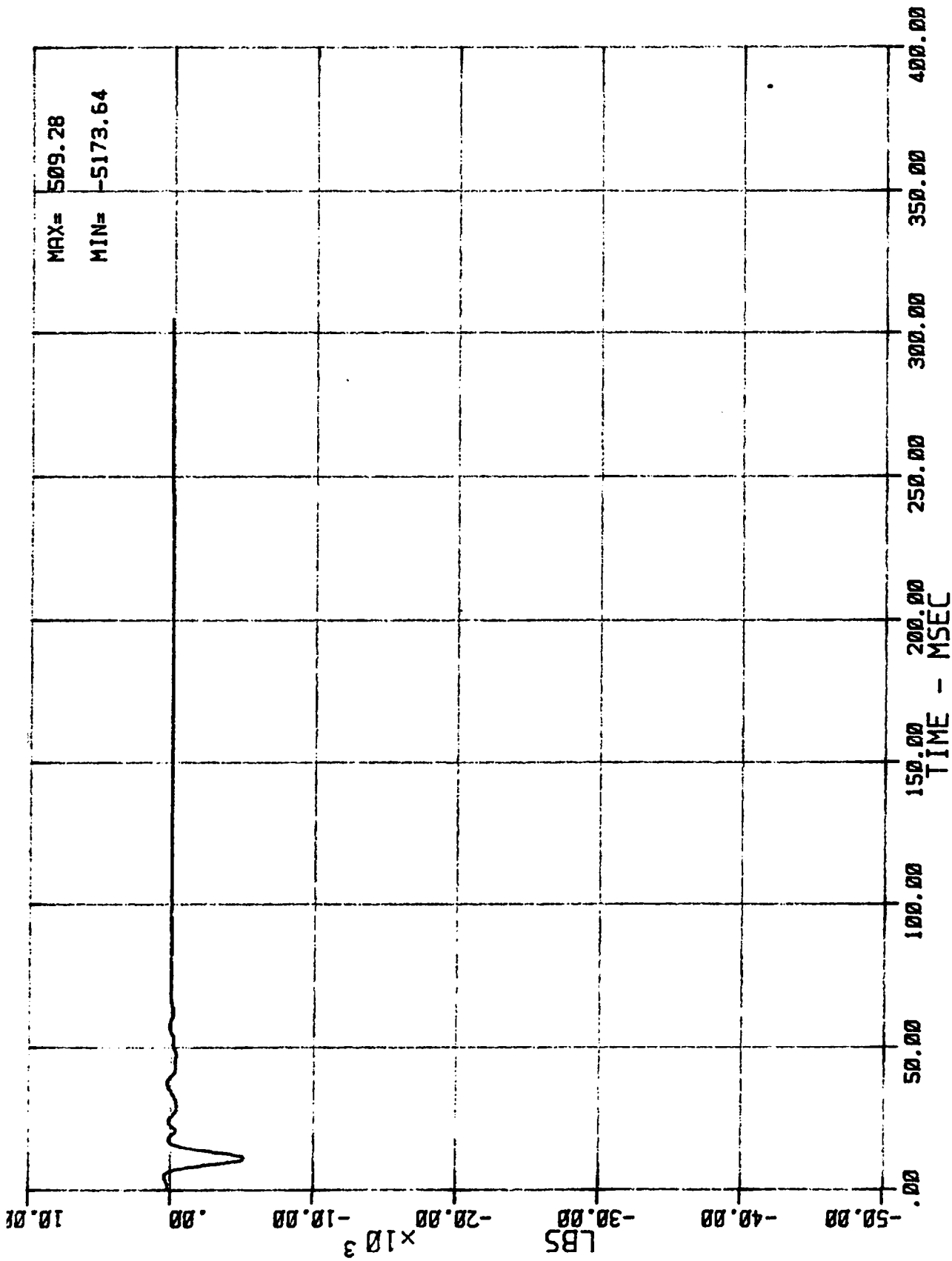
37 LC BA N BA7 (BARRIER LOAD CELL A7 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



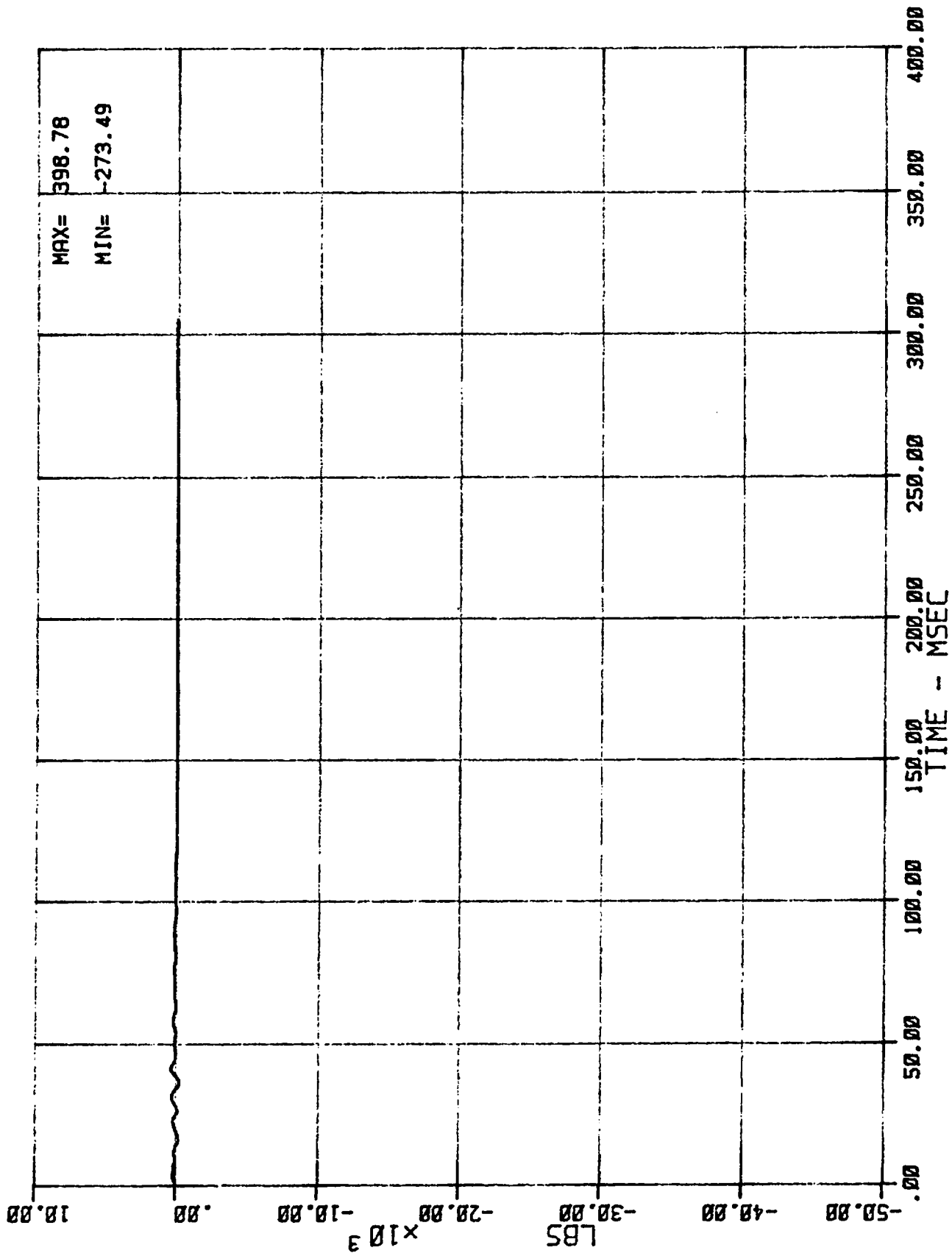
38 LC BA N BAB (BARRIER LOAD CELL AB FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



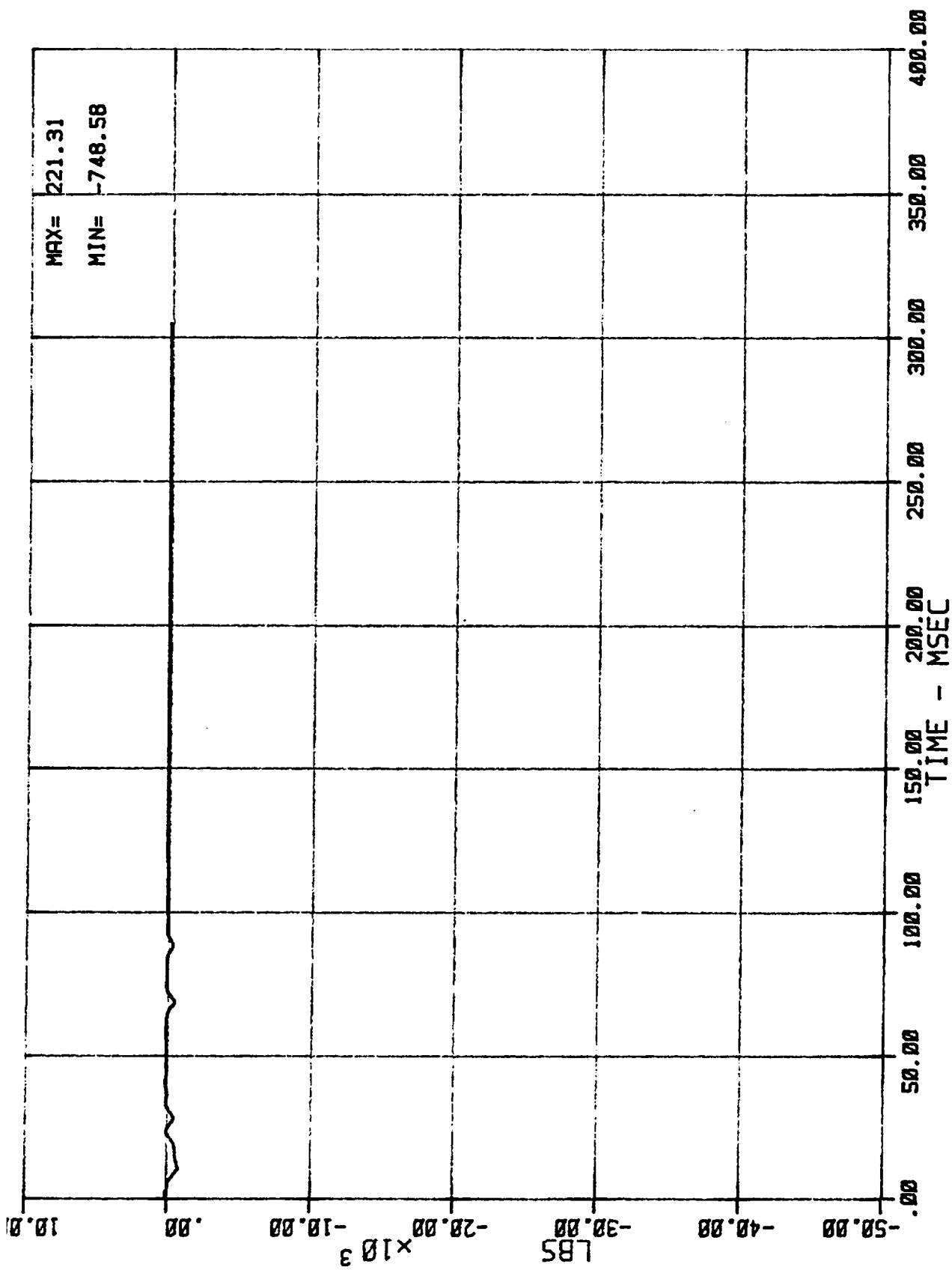
39 LC BA N BA9 (BARRIER LOAD CELL A9 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



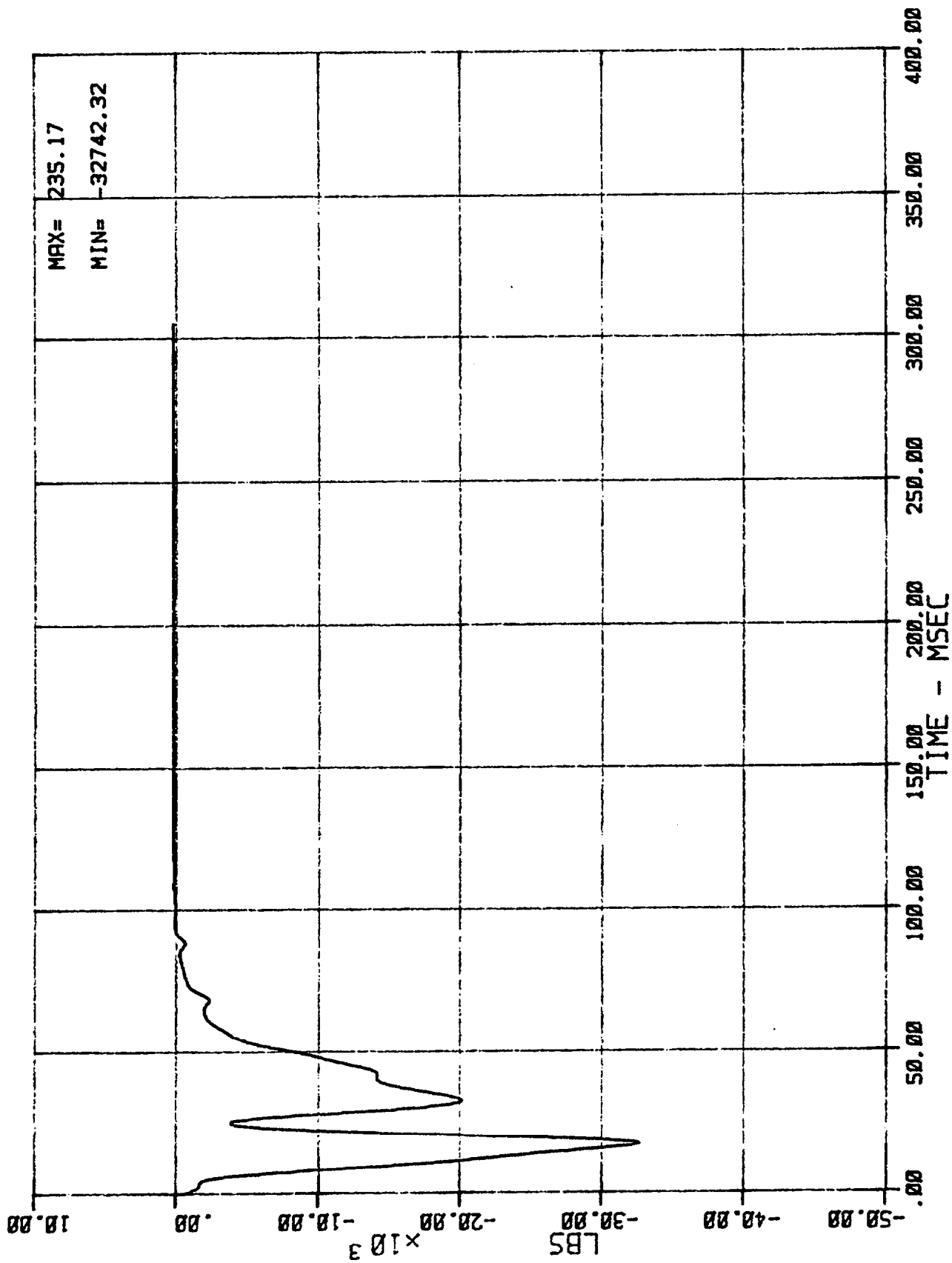
40 LC BA N BB1 (BARRIER LOAD CELL B1 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



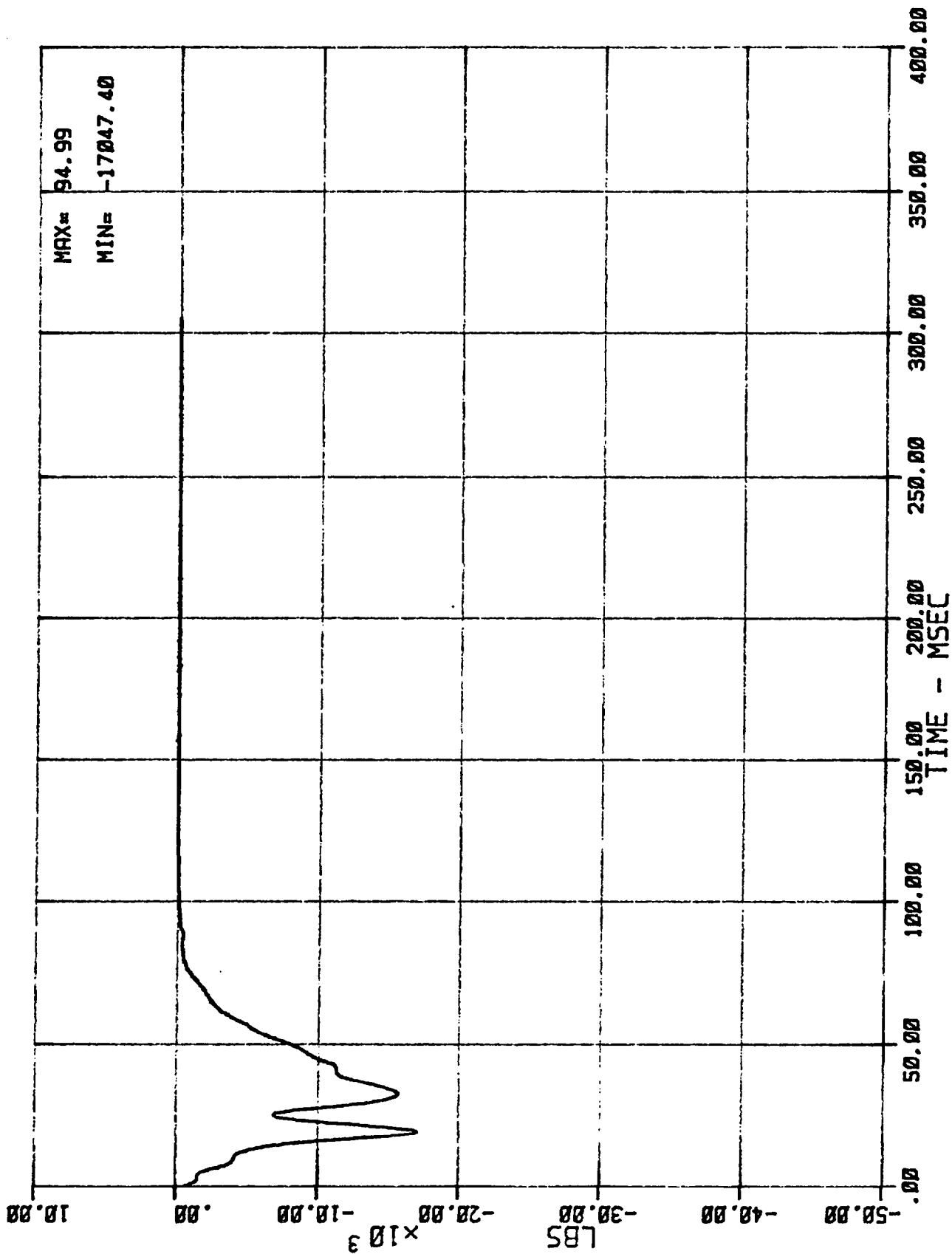
41 LC BA N BB2 (BARRIER LOAD CELL B2 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



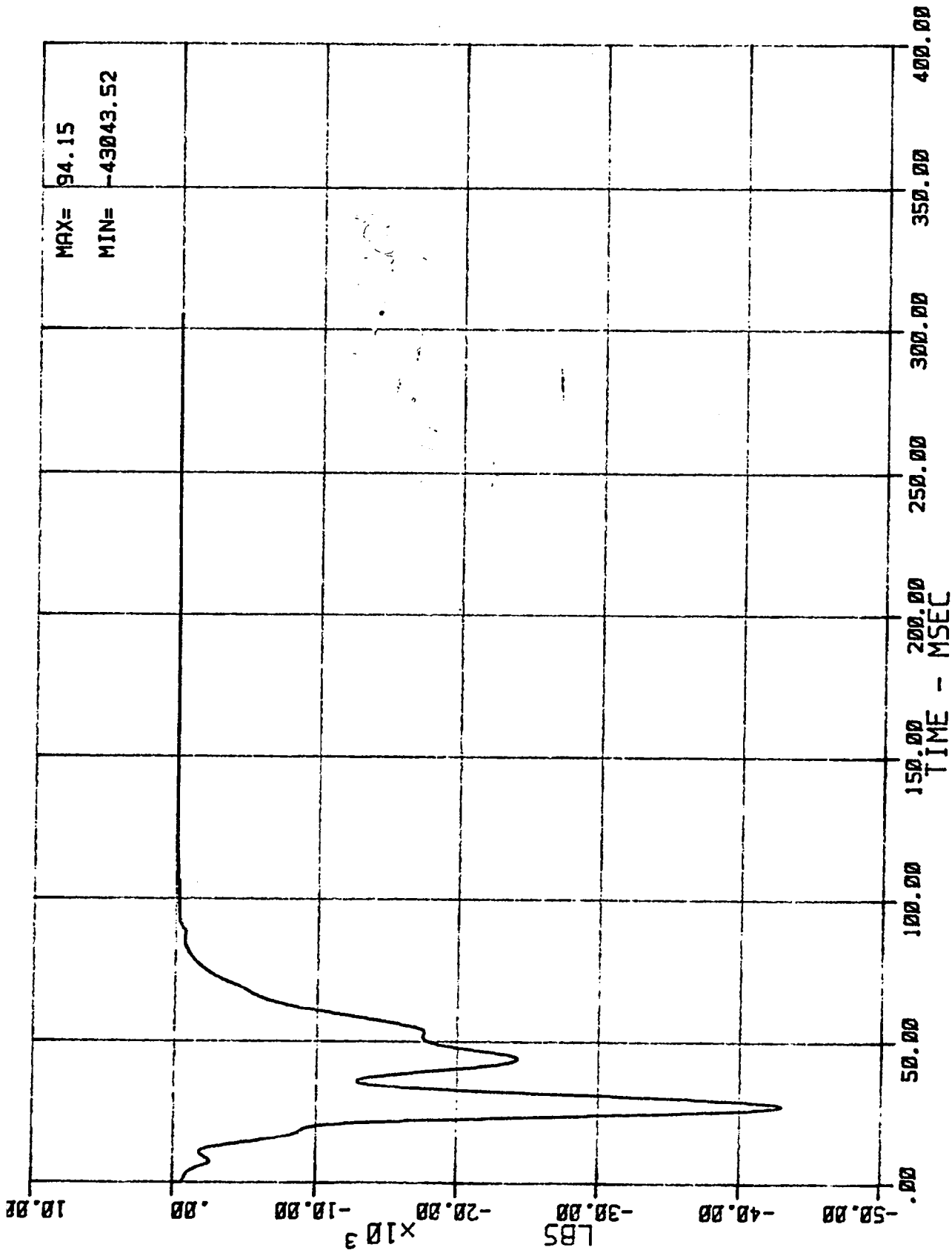
42 LC BA N BB3 (BARRIER LOAD CELL B3 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

05/04/85



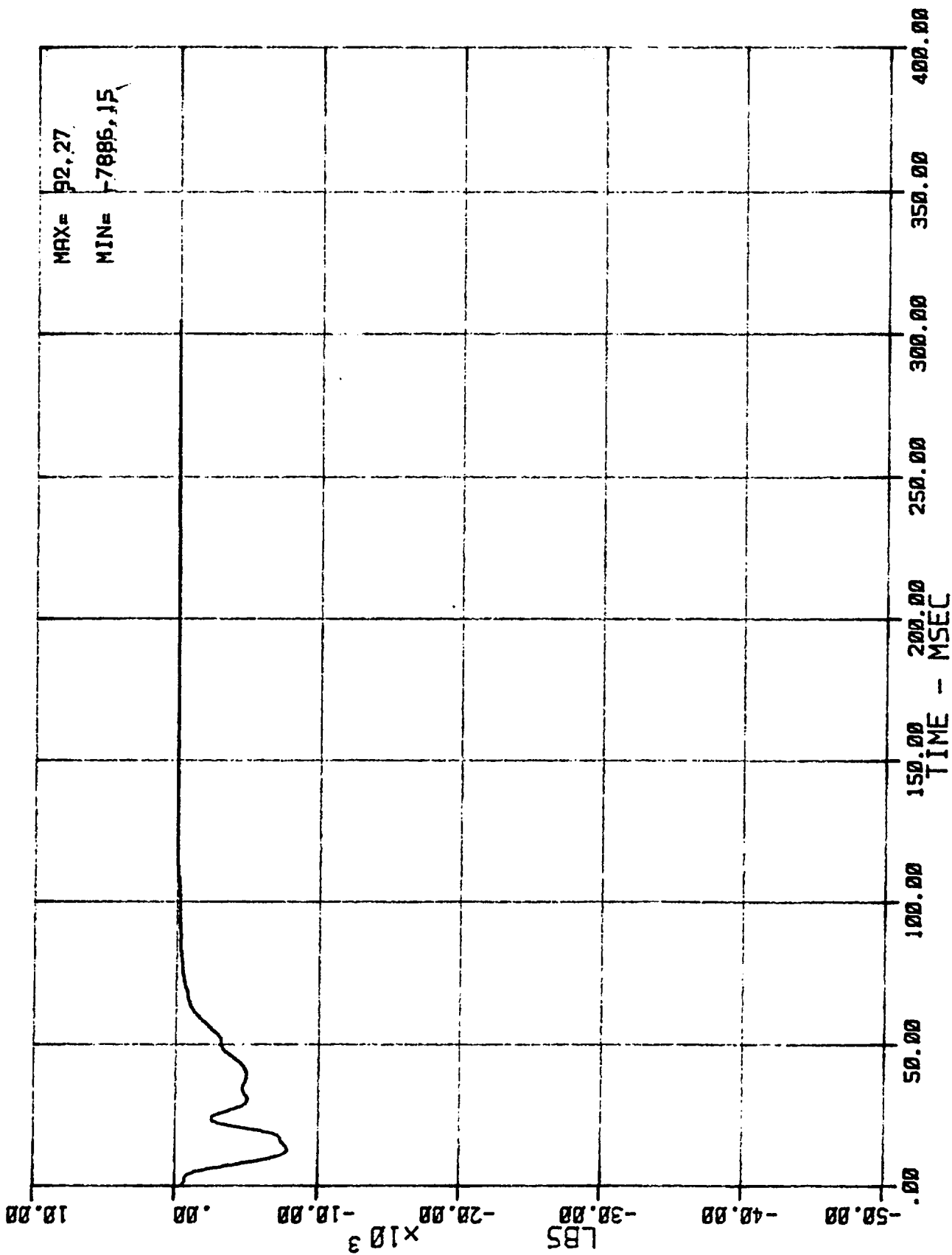
43 LC BA N BB4 (BARRIER LOAD CELL B4 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



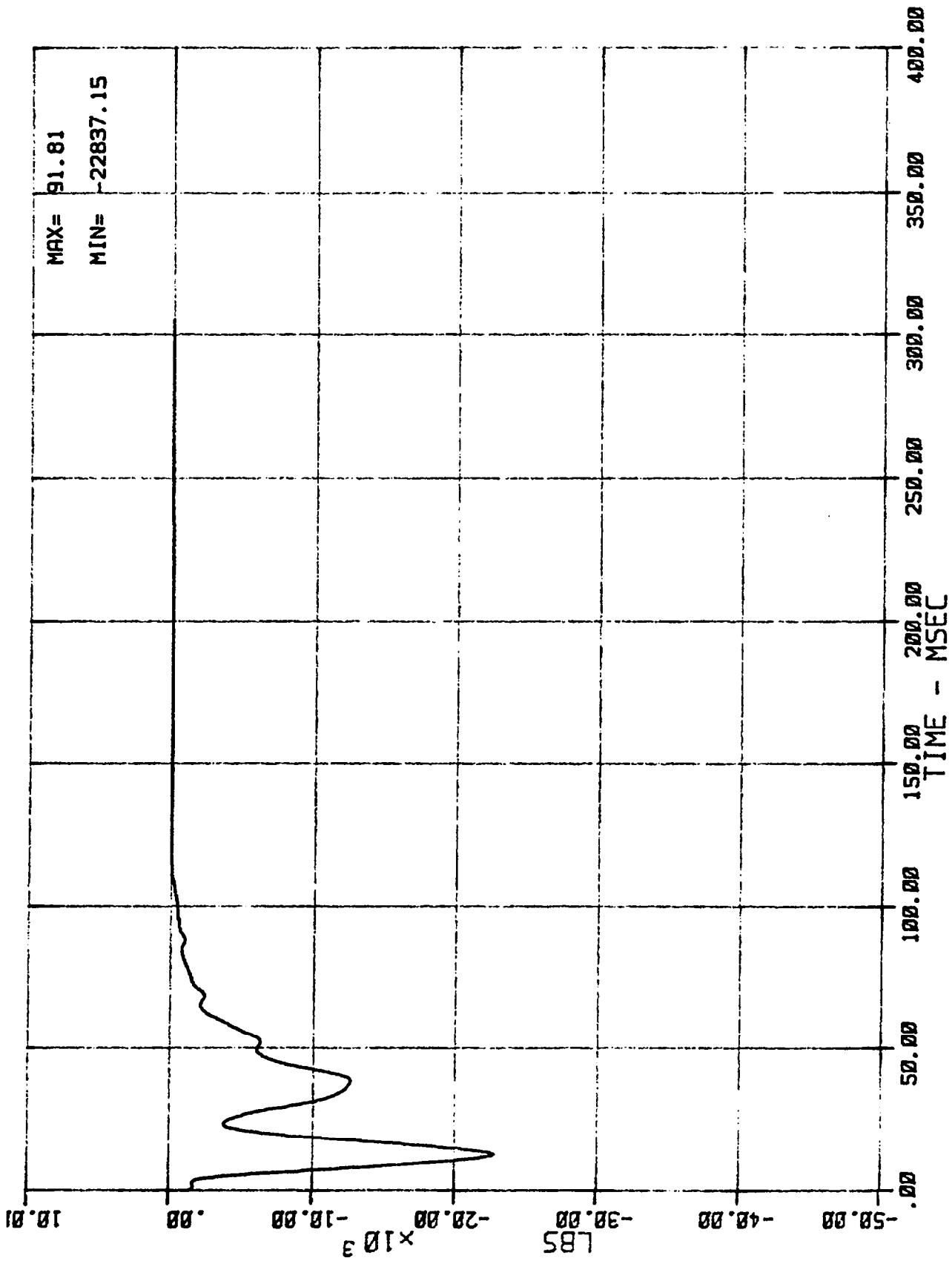
44 LC BA N BB5 (BARRIER LOAD CELL B5 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



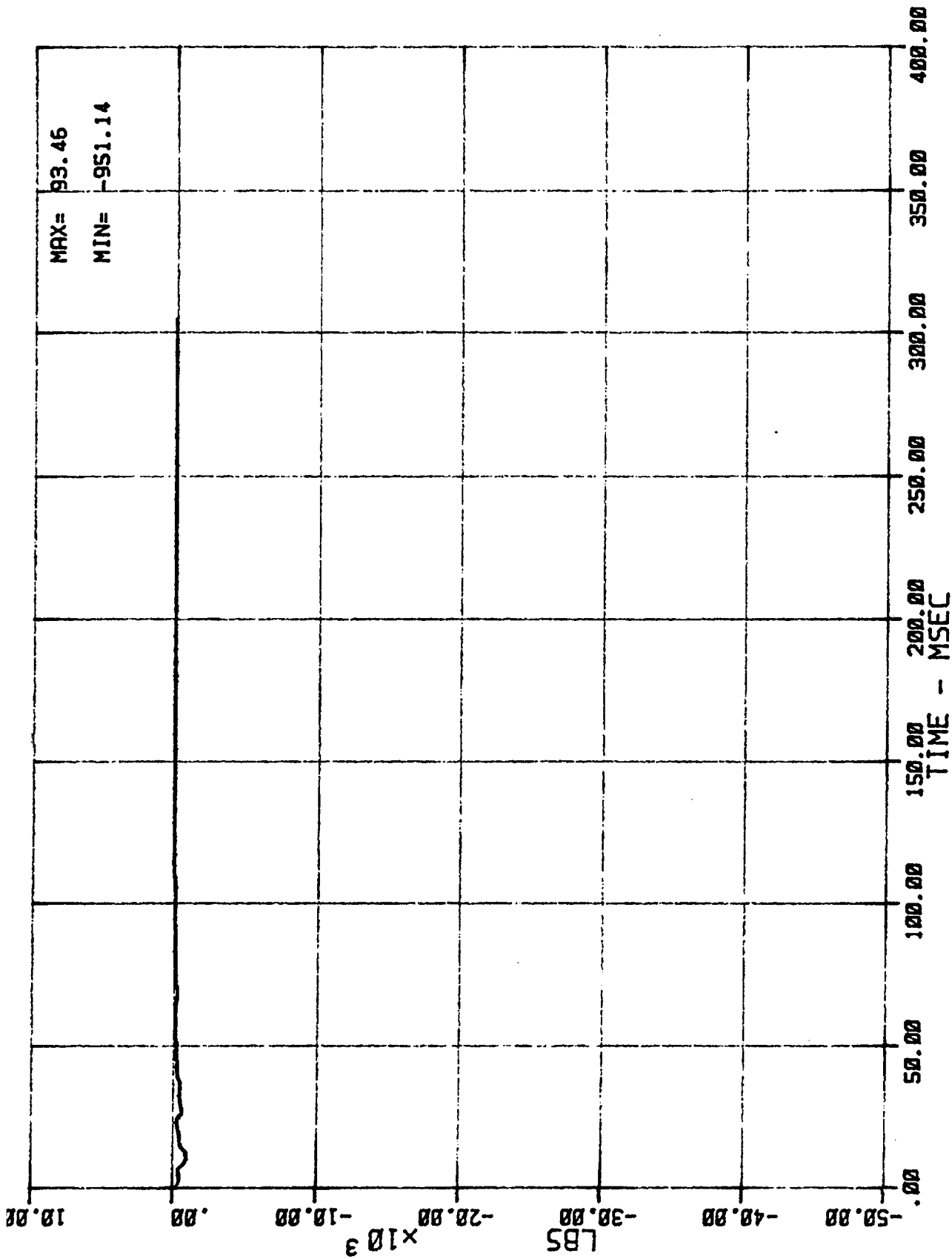
45 LC BA N BB6 (BARRIER LOAD CELL B6 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



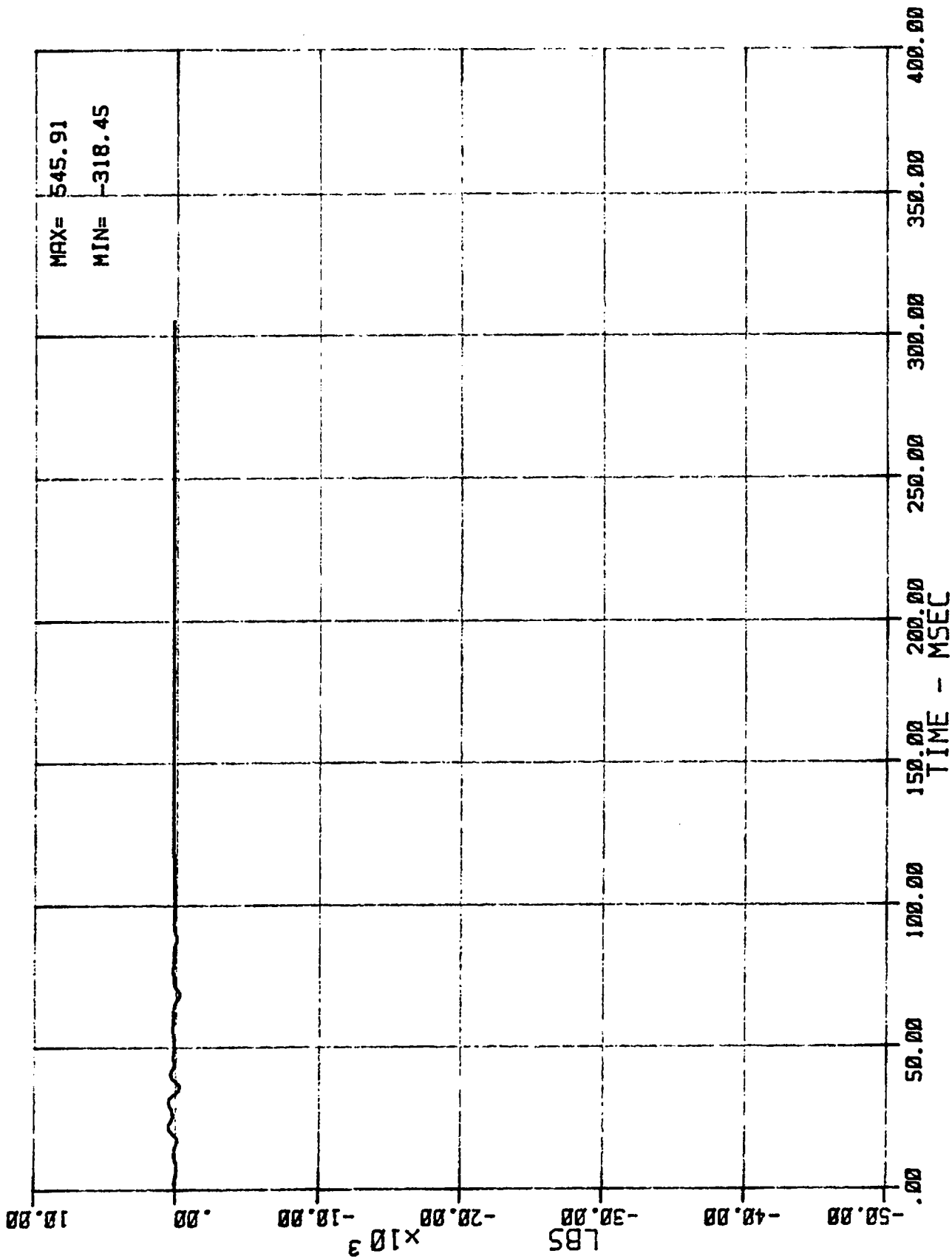
46 LC BA N BB7 (BARRIER LOAD CELL B7 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



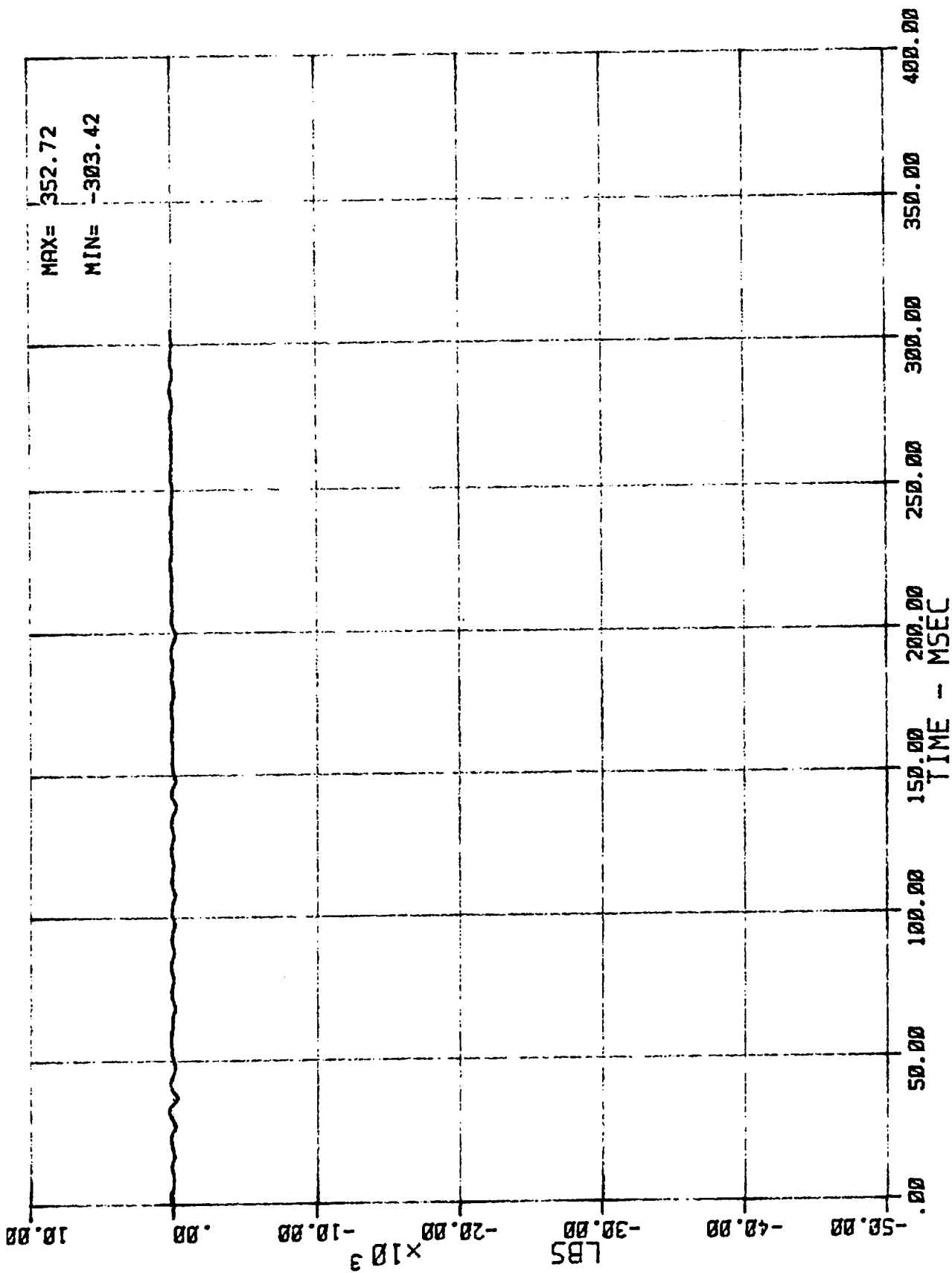
47 LC BA N BB8 (BARRIER LOAD CELL BB FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



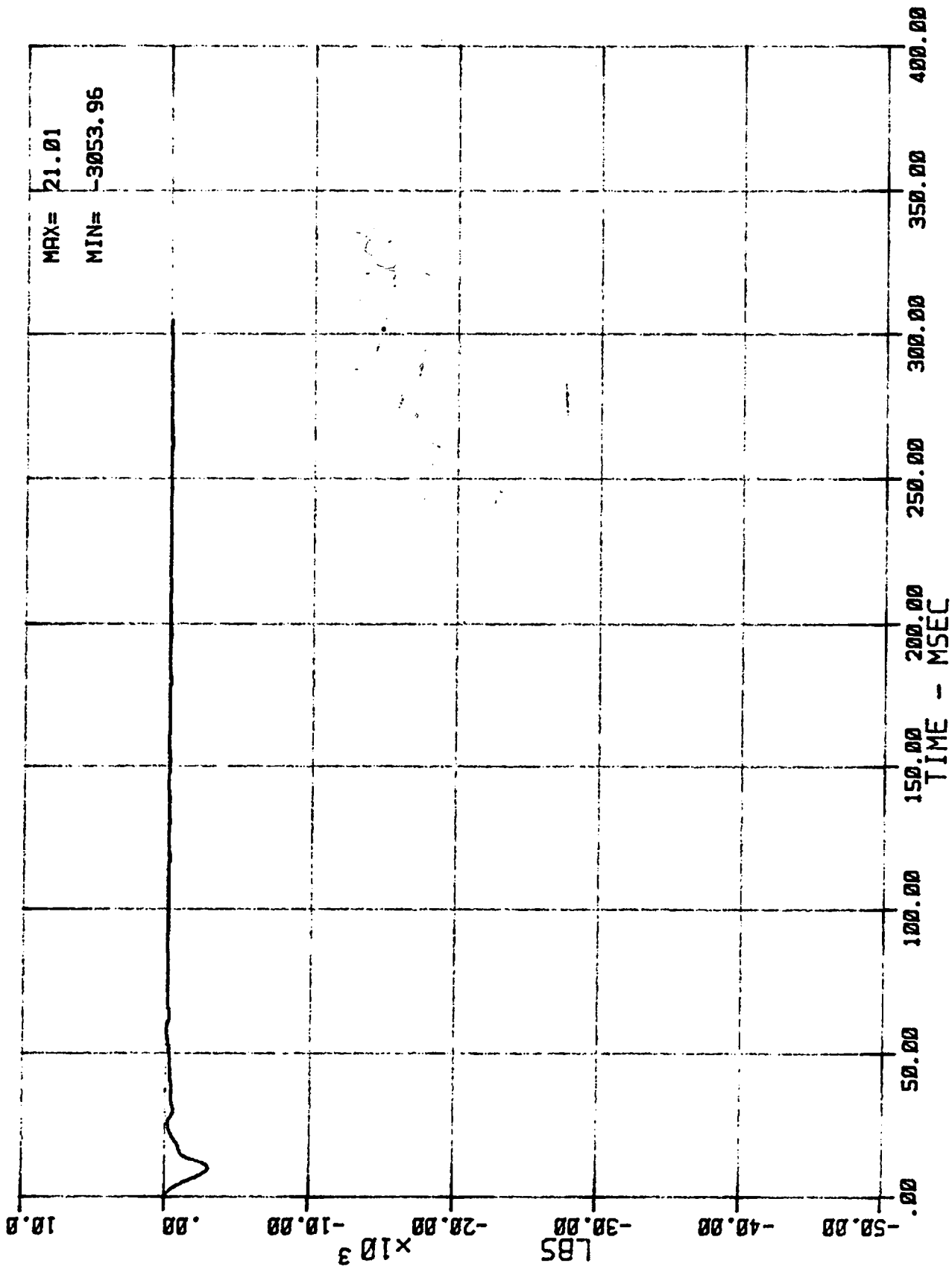
48 LC BA N BB9 (BARRIER LOAD CELL B9 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



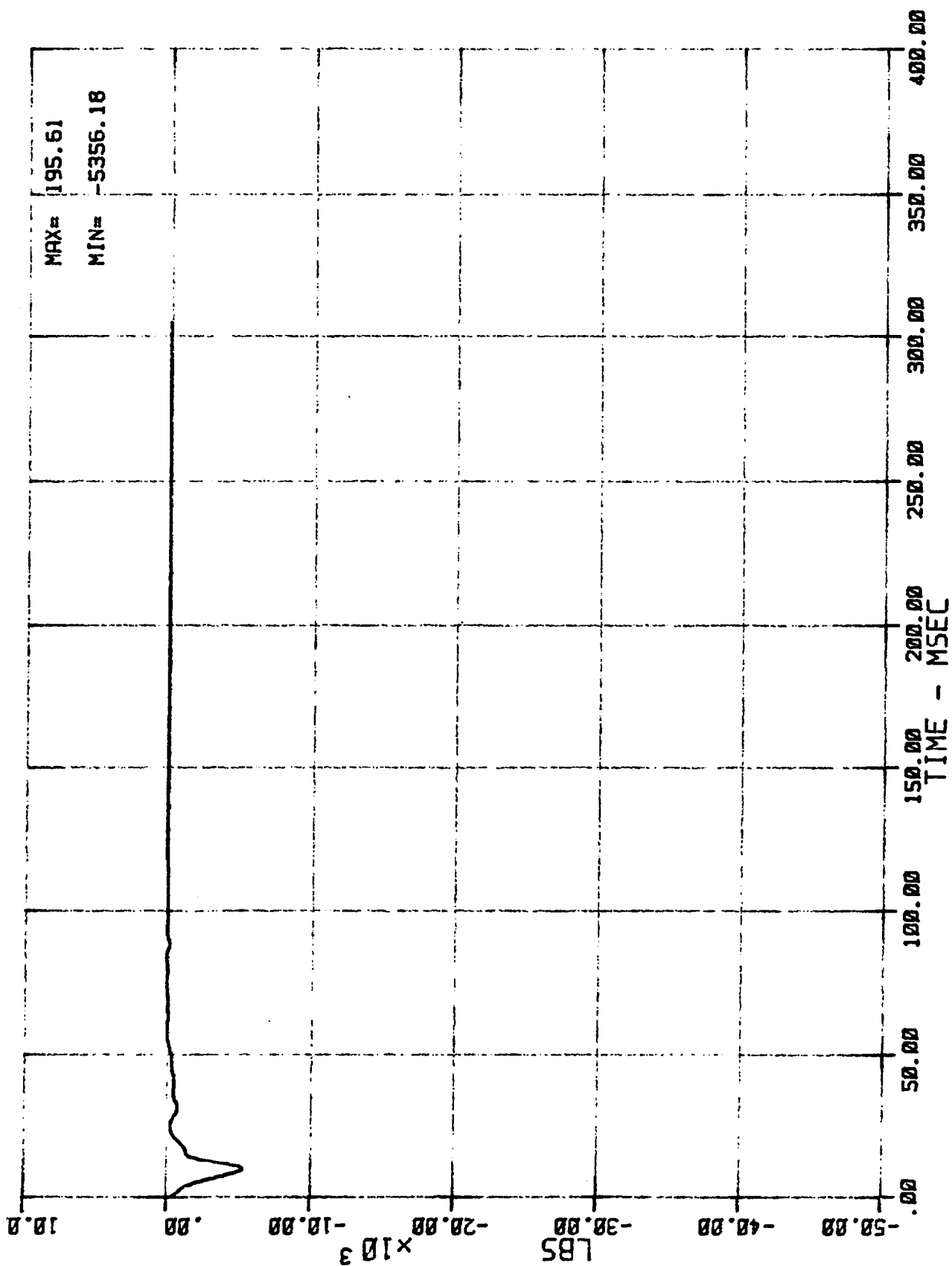
49 LC BA N BC1 (BARRIER LOAD CELL C1 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



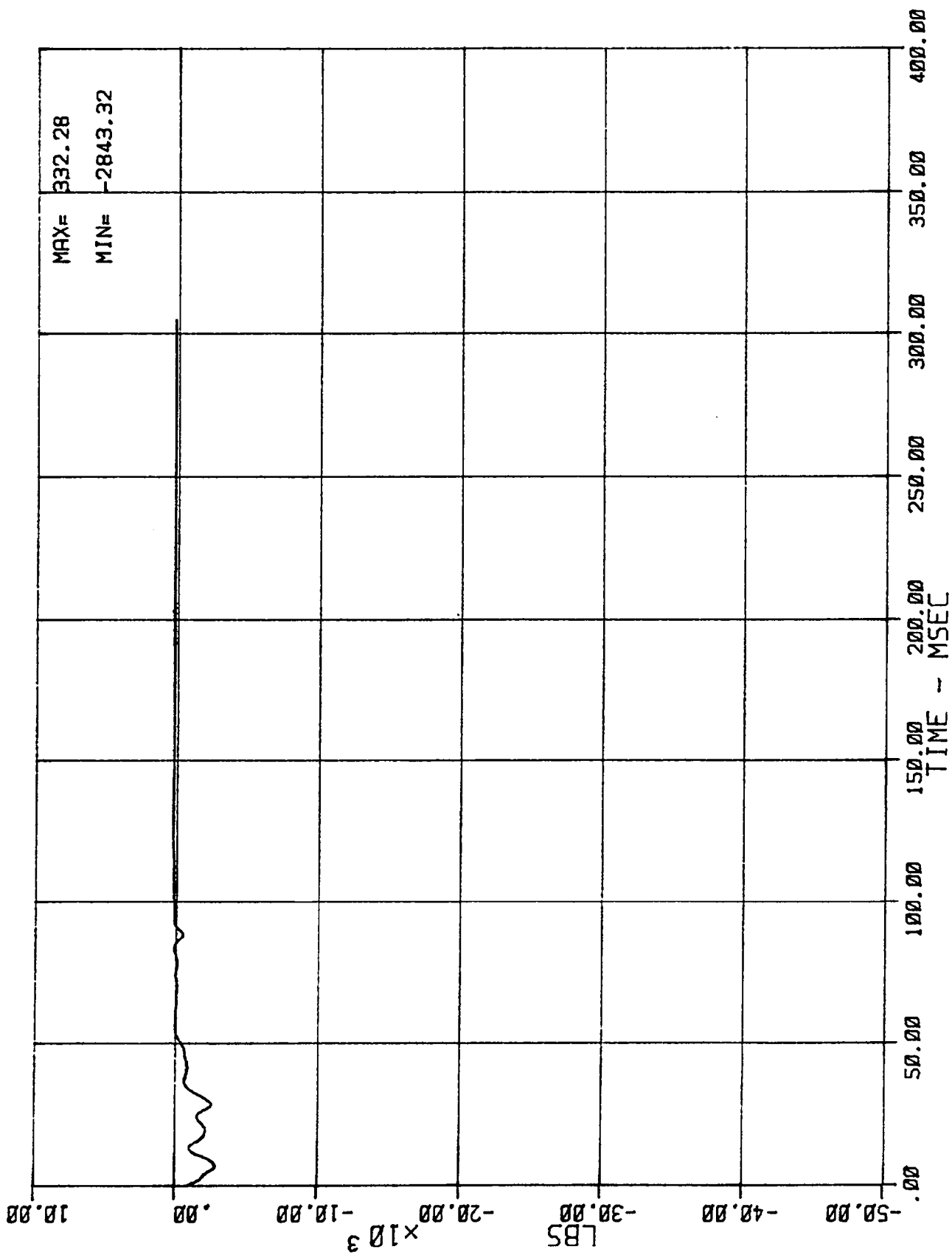
S0 LC BA N BC2 (BARRIER LOAD CELL C2 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



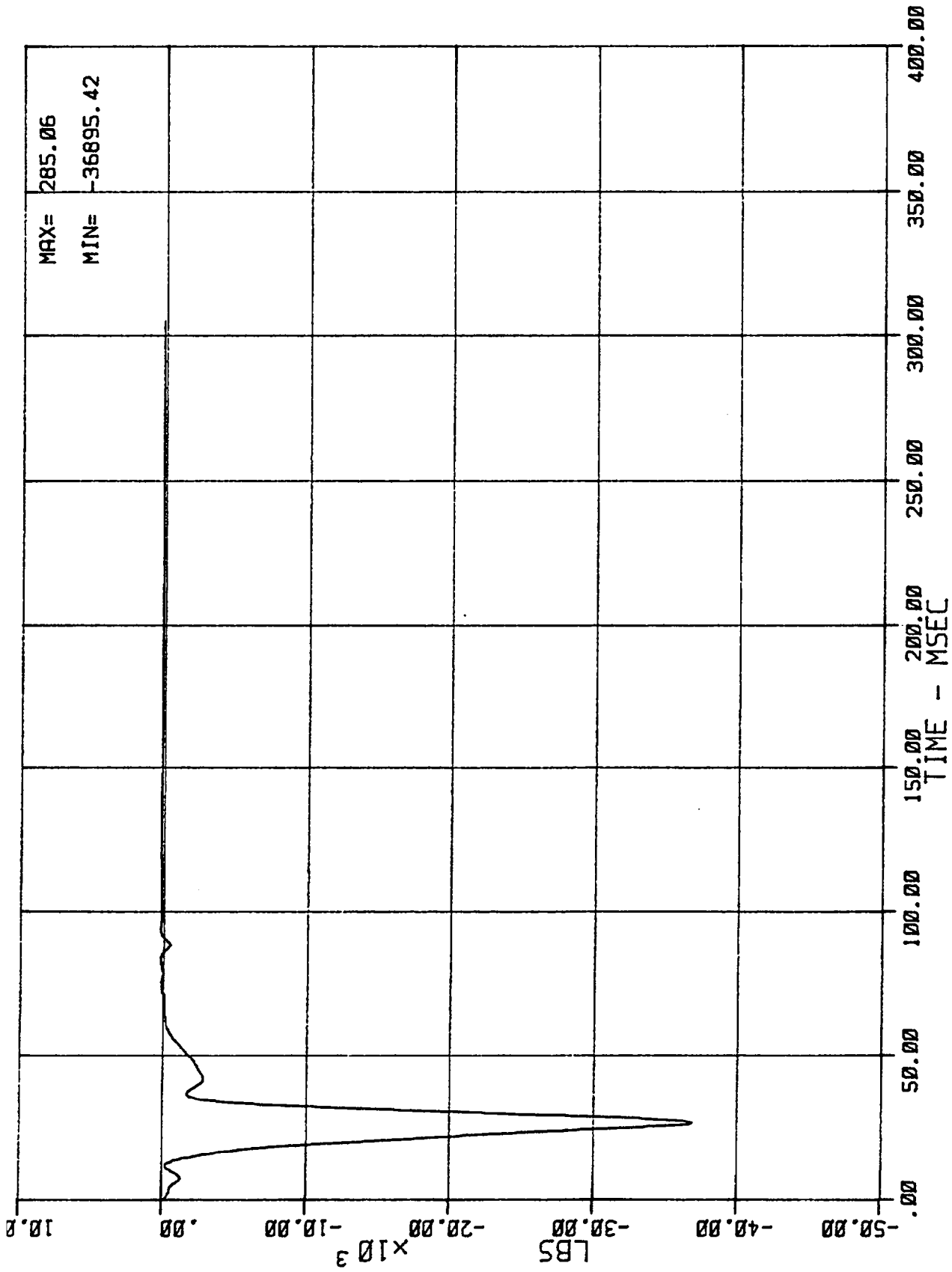
51 LC BA N BC3 (BARRIER LOAD CELL C3 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



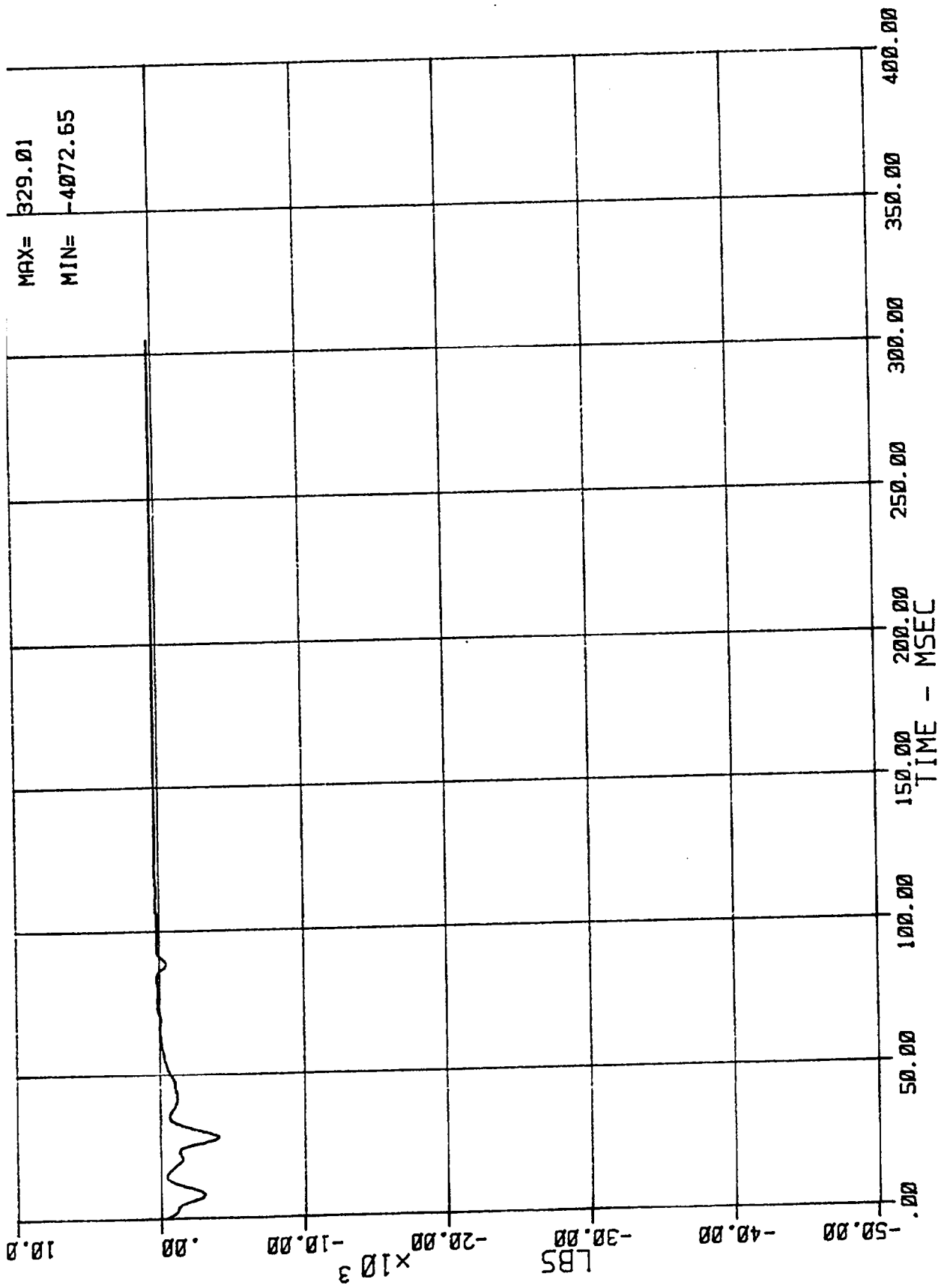
52 LC BA N BC4 (BARRIER LOAD CELL C4 FORCE)
MSE NJ8025 1986 MAZDA B-2000 P.U.

06/04/85



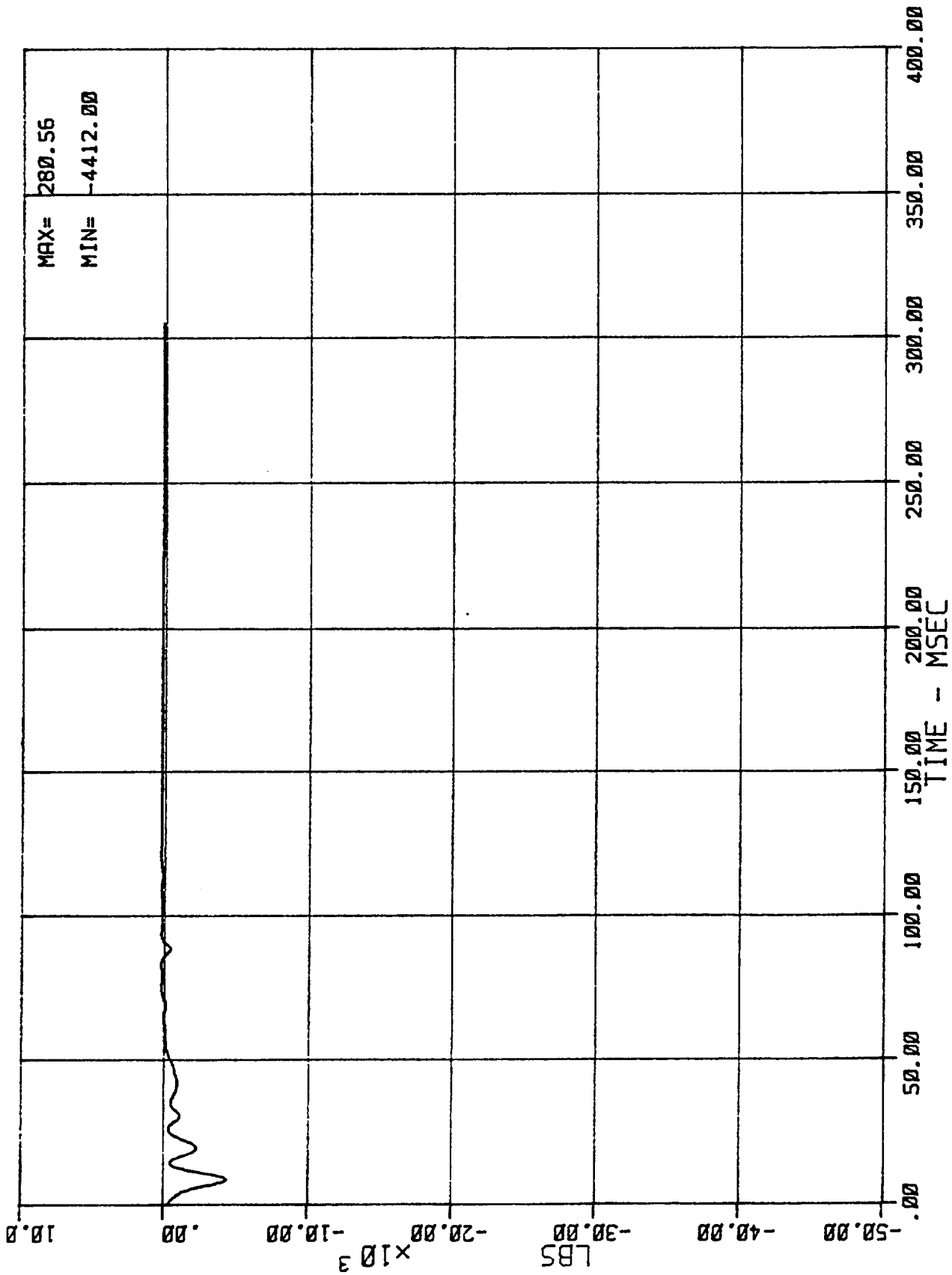
53 LC BA N BCS (BARRIER LOAD CELL CS FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



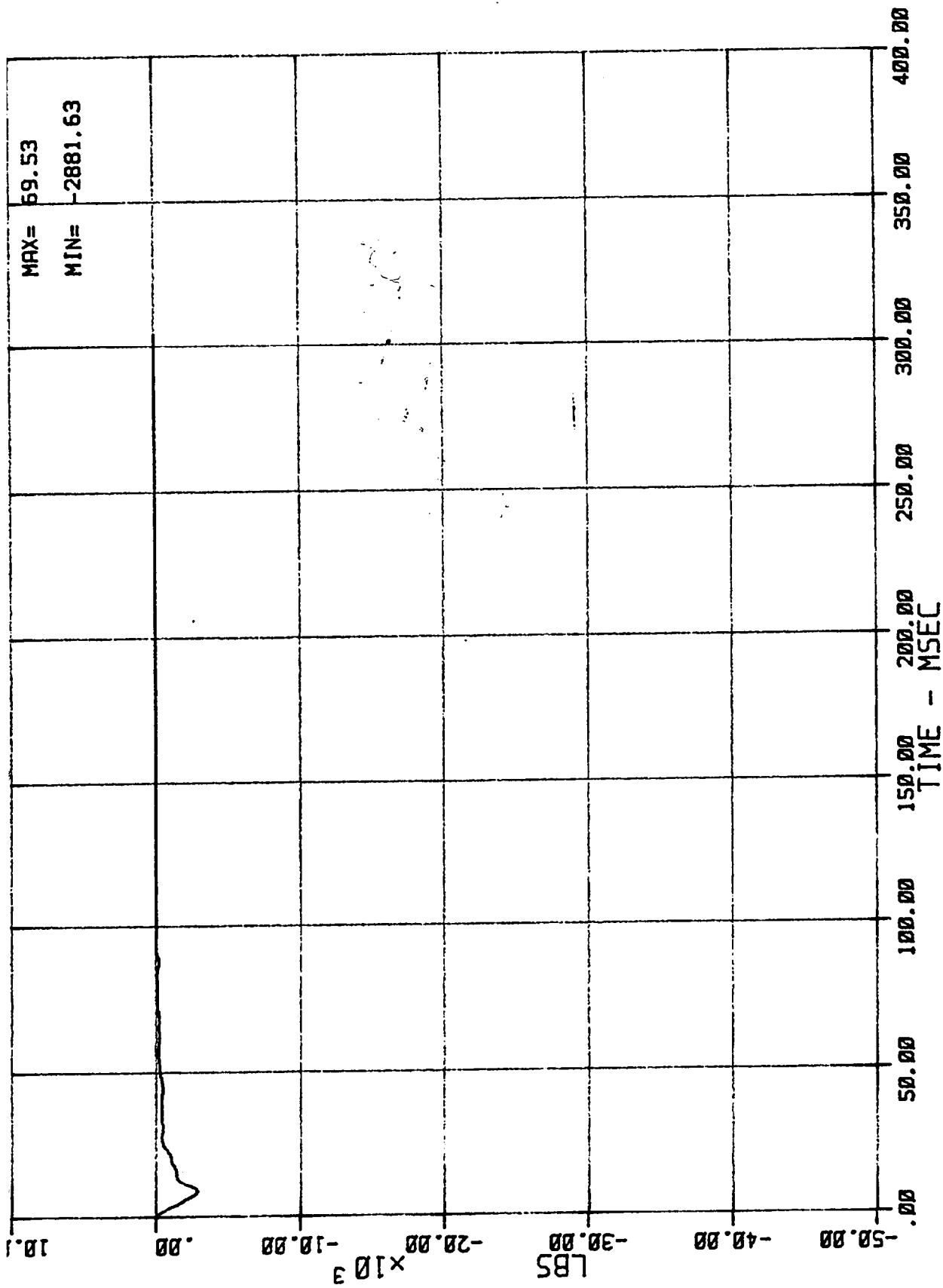
54 LC BA N BC6 (BARRIER LOAD CELL C6 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



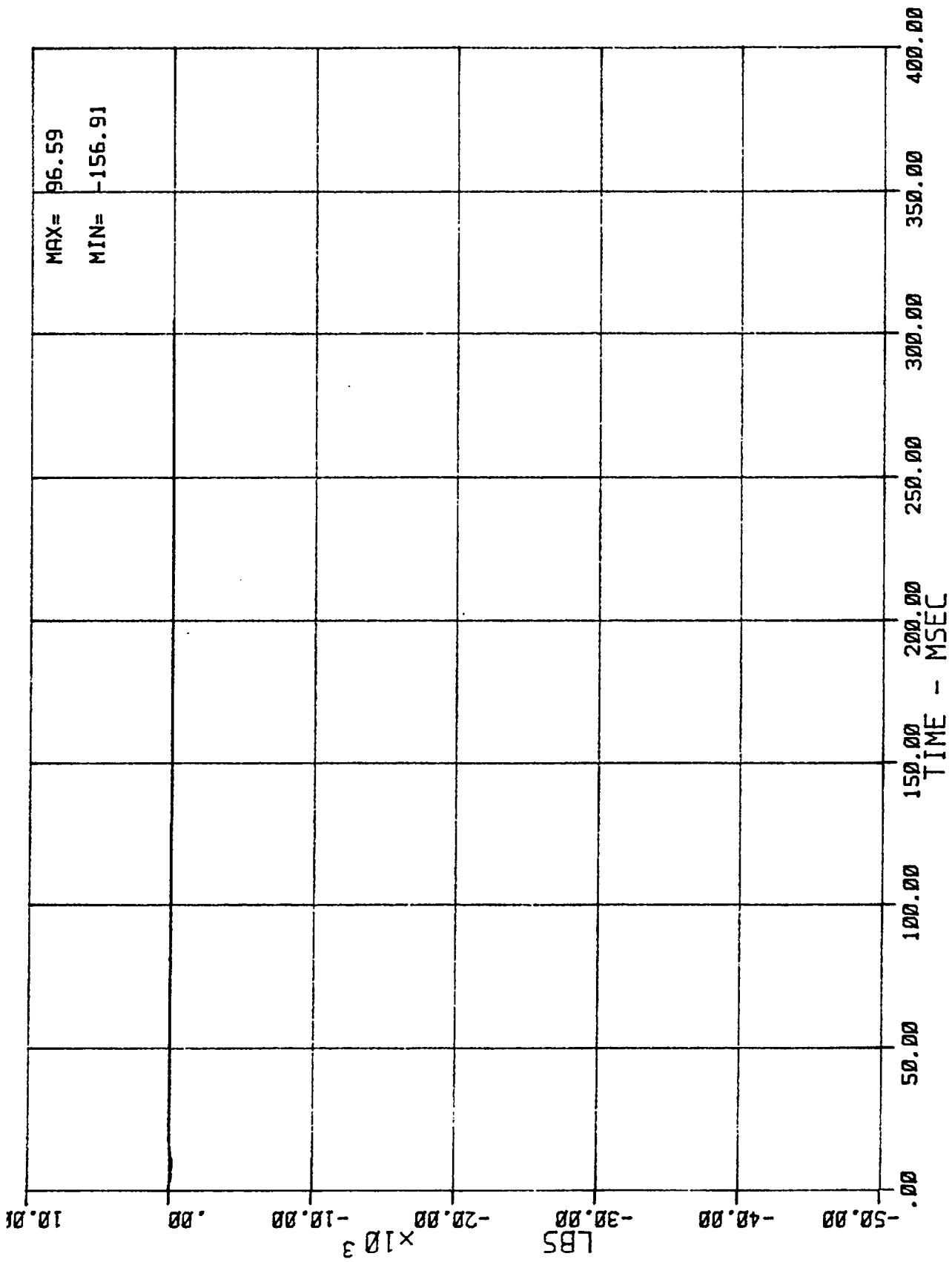
55 LC BA N BC7 (BARRIER LOAD CELL C7 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



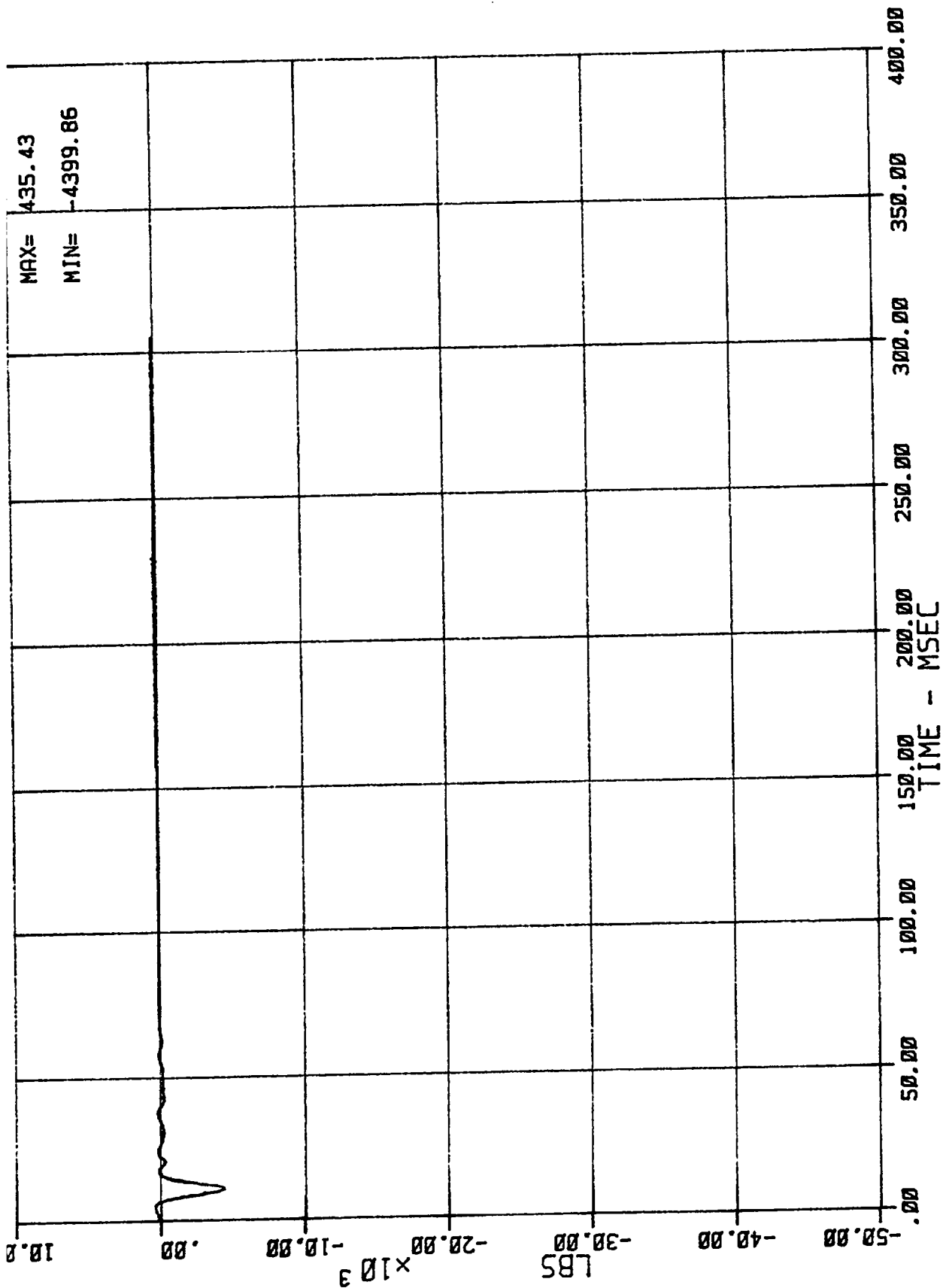
56 LC BA N BC8 (BARRIER LOAD CELL C8 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



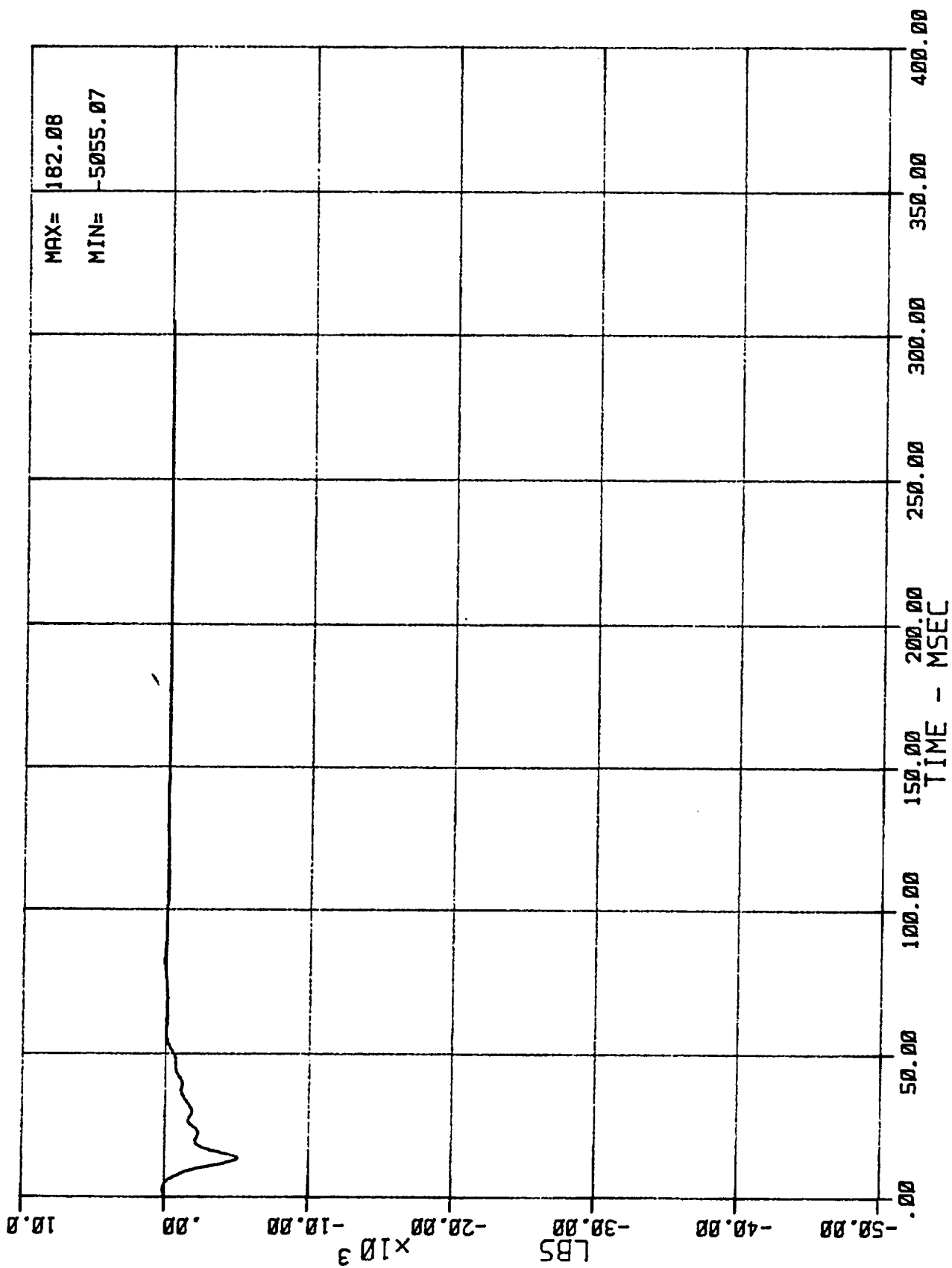
57 LC BA N BC9 (BARRIER LOAD CELL C9 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



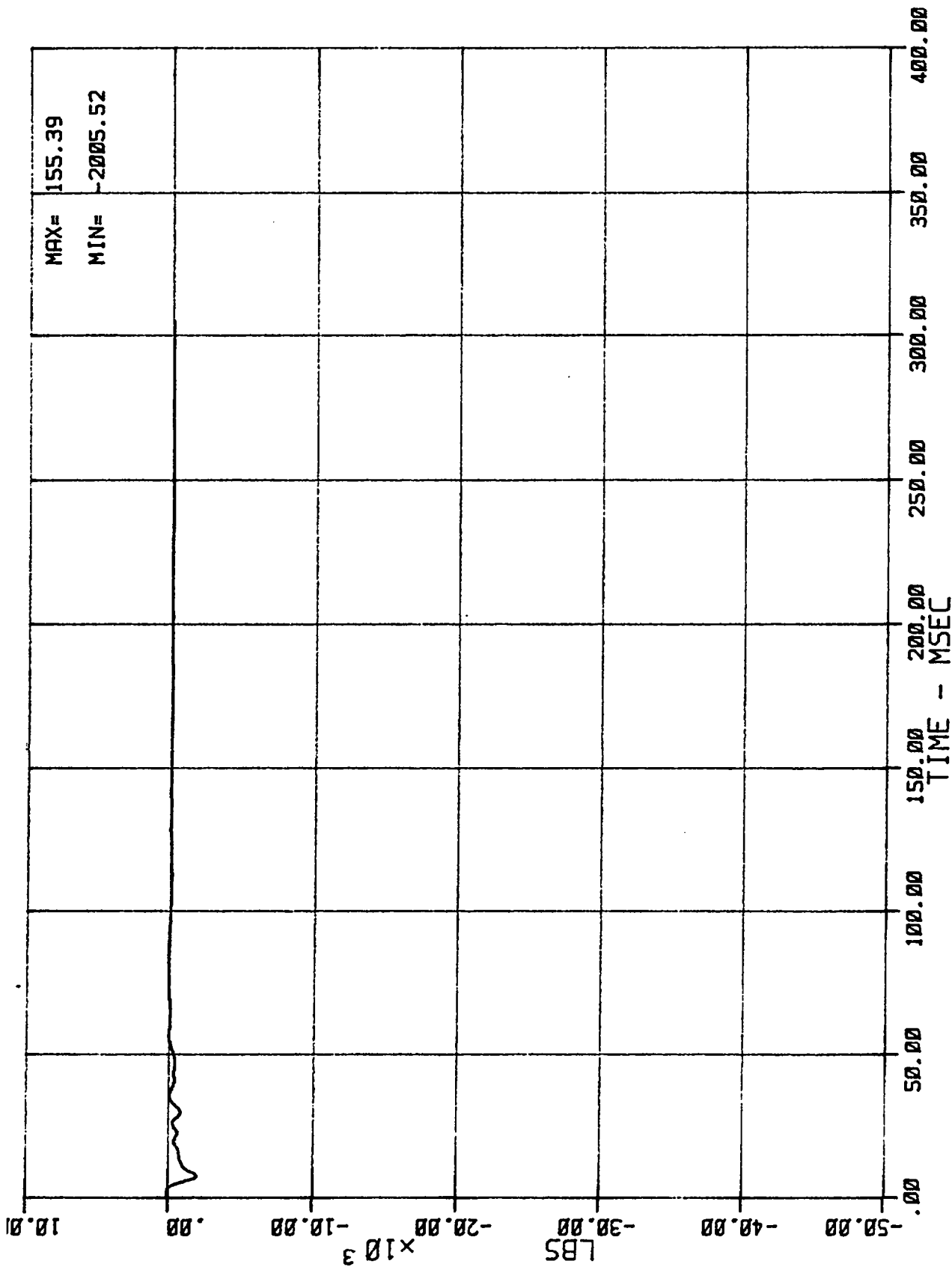
58 LC BA N BD1 (BARRIER LOAD CELL D1 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



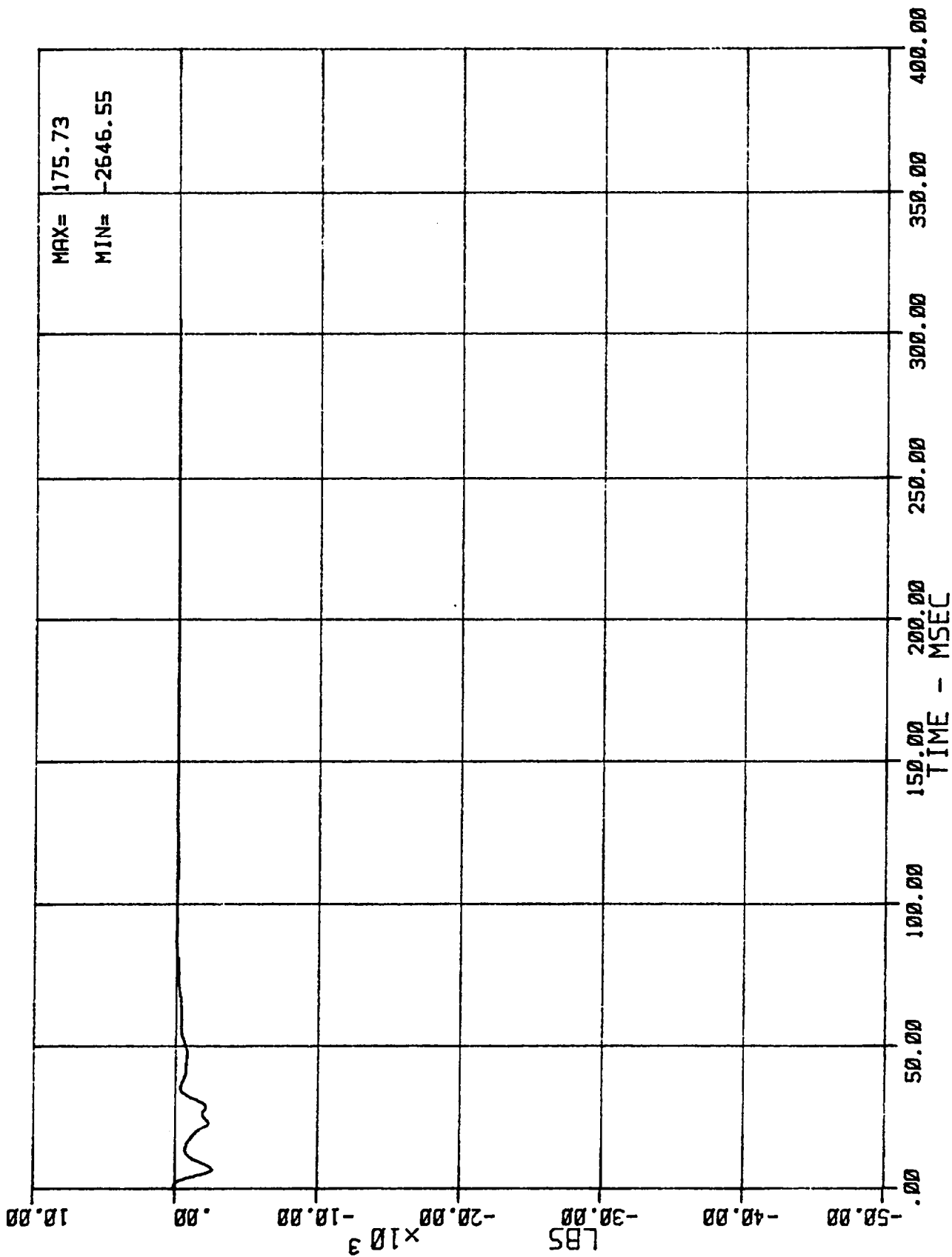
59 LC BA N B02 (BARRIER LOAD CELL D2 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



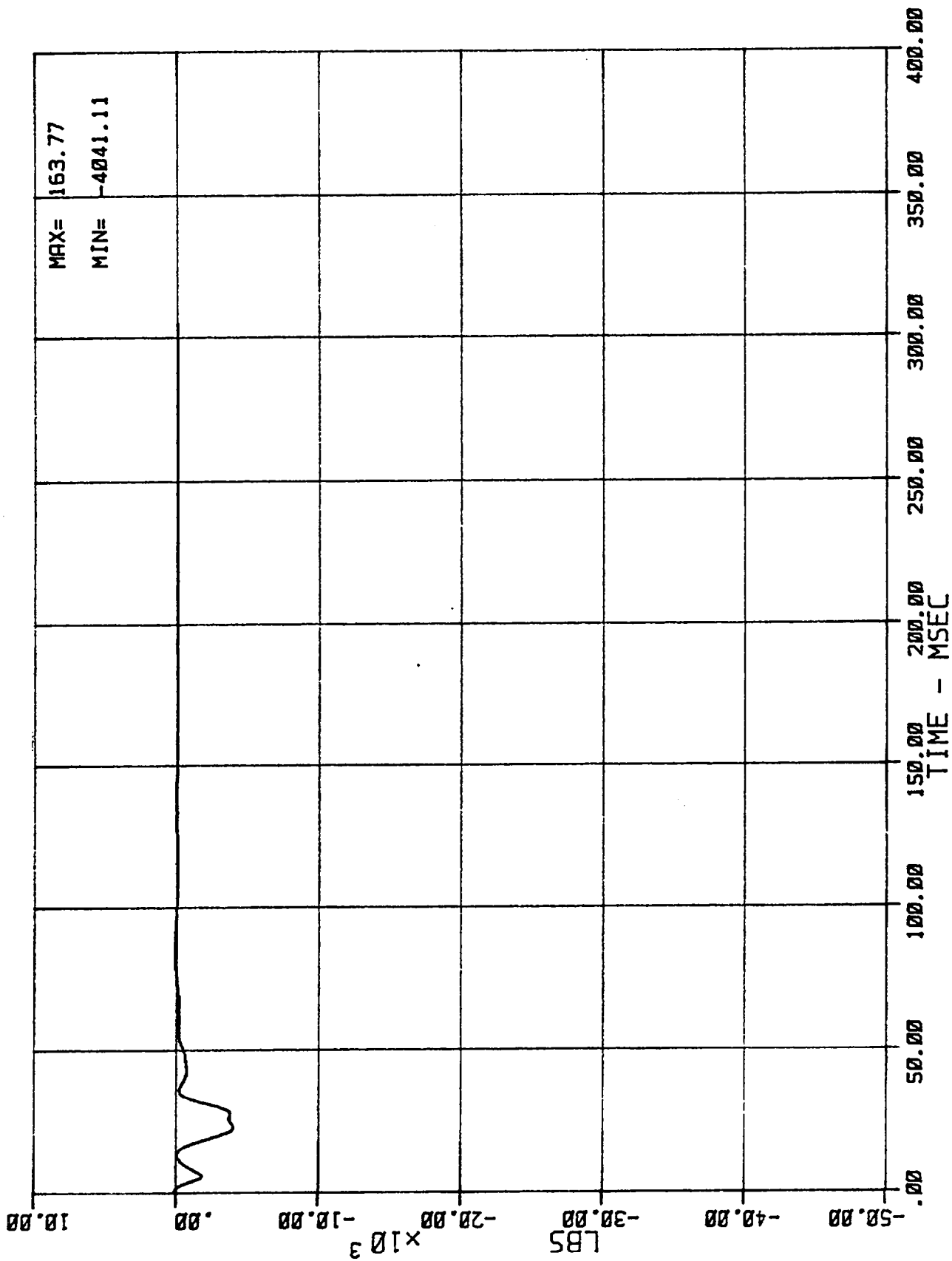
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MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



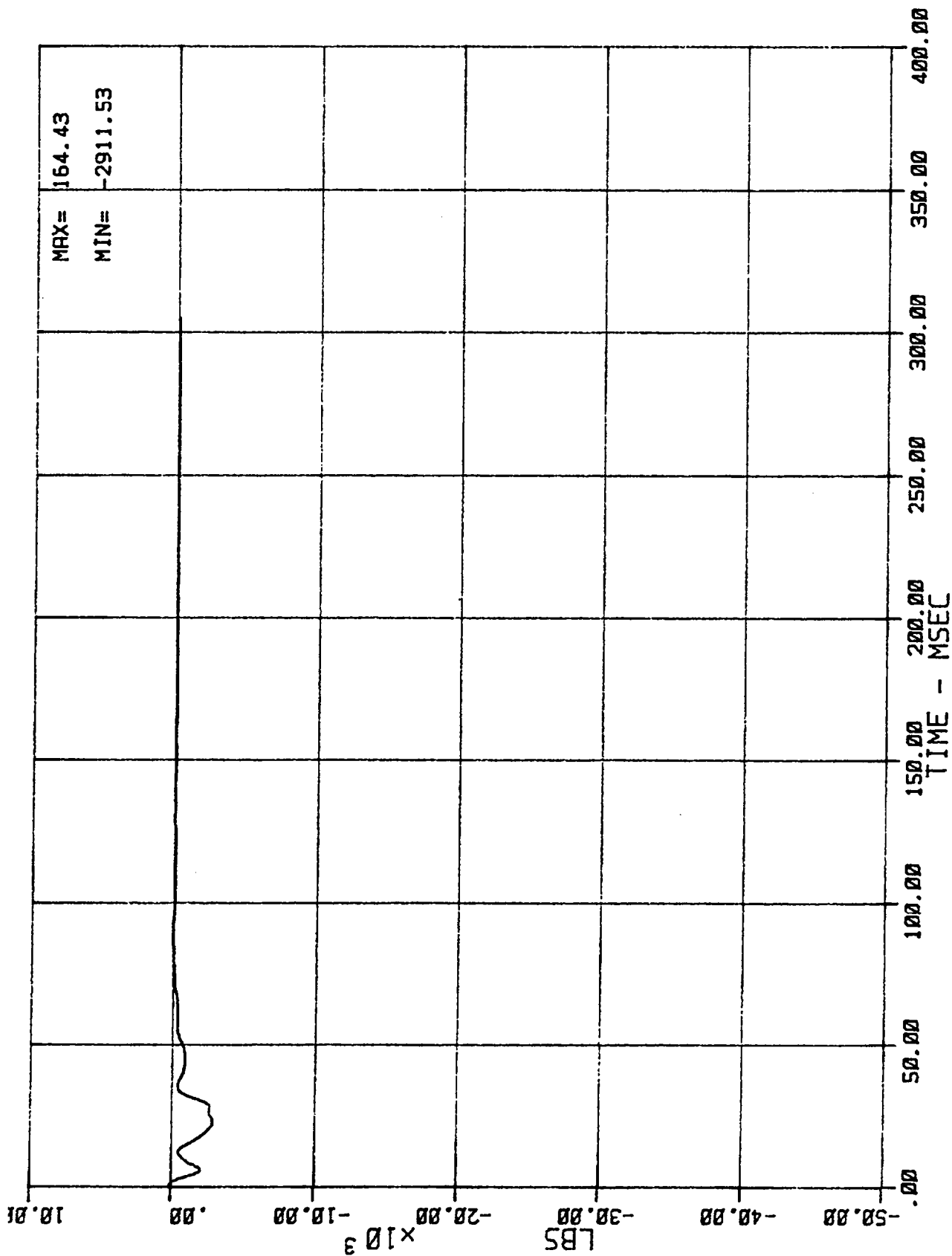
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 MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



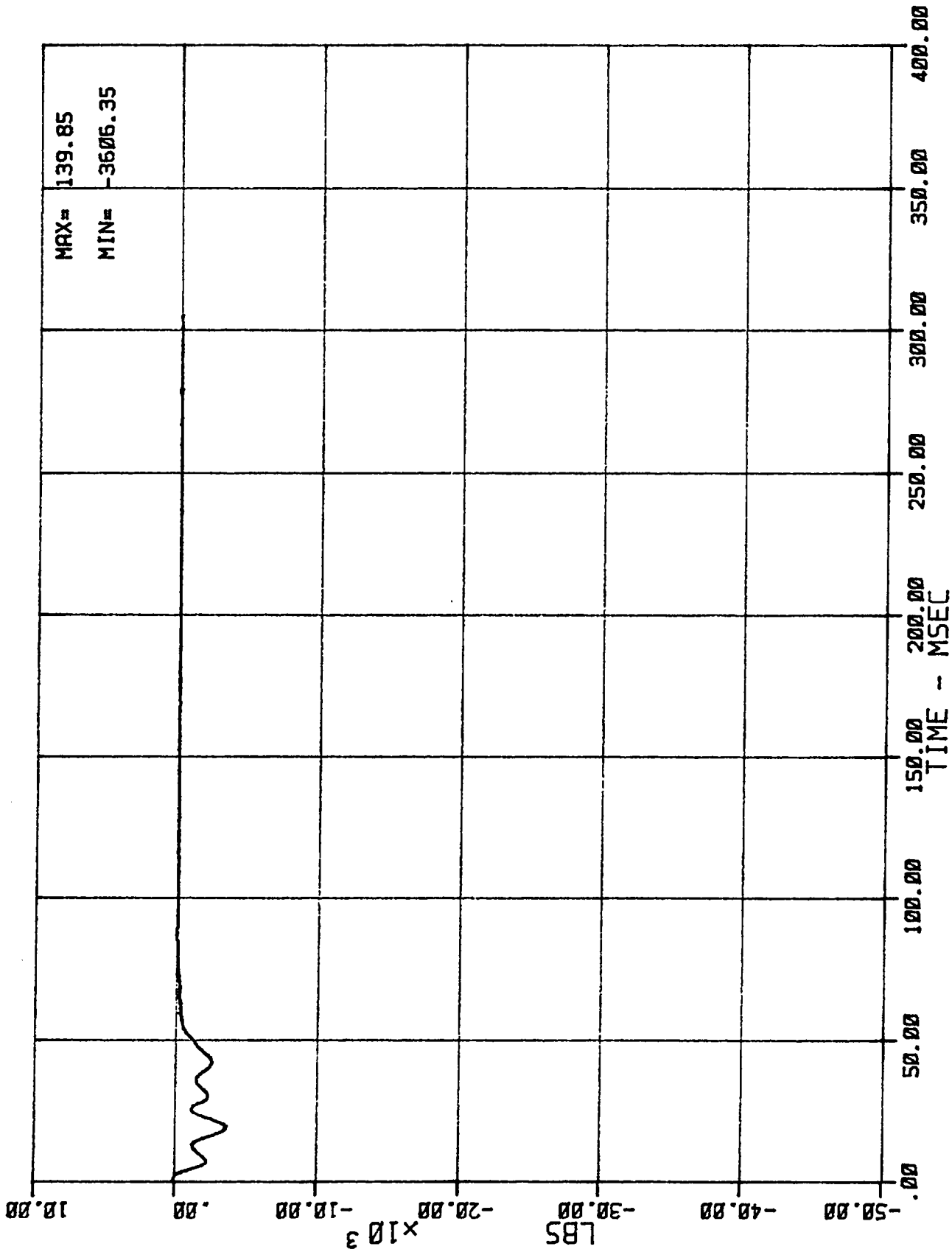
62 LC BA N BDS (BARRIER LOAD CELL DS FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



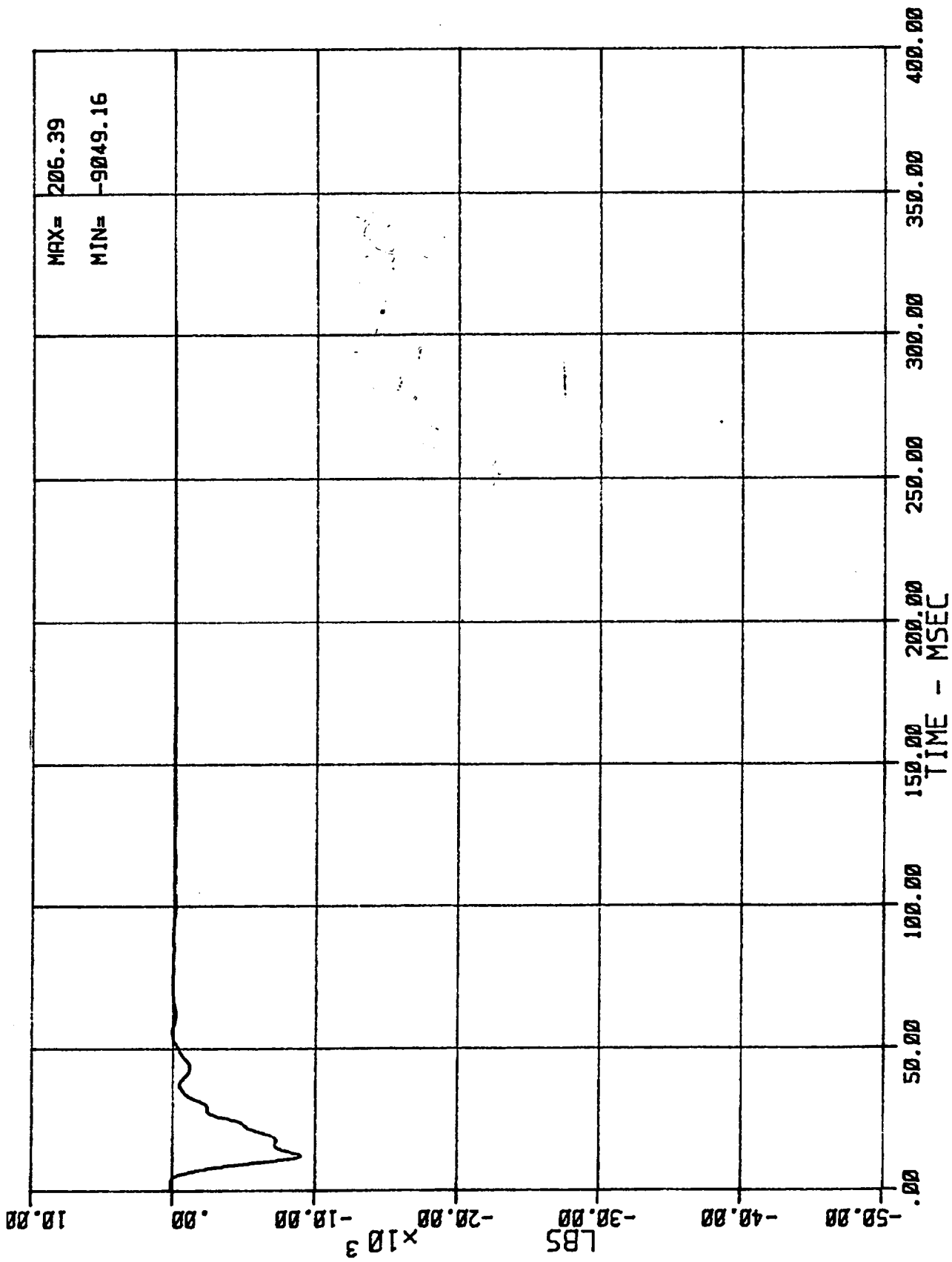
63 LC BA N B06 (BARRIER LOAD CELL D6 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



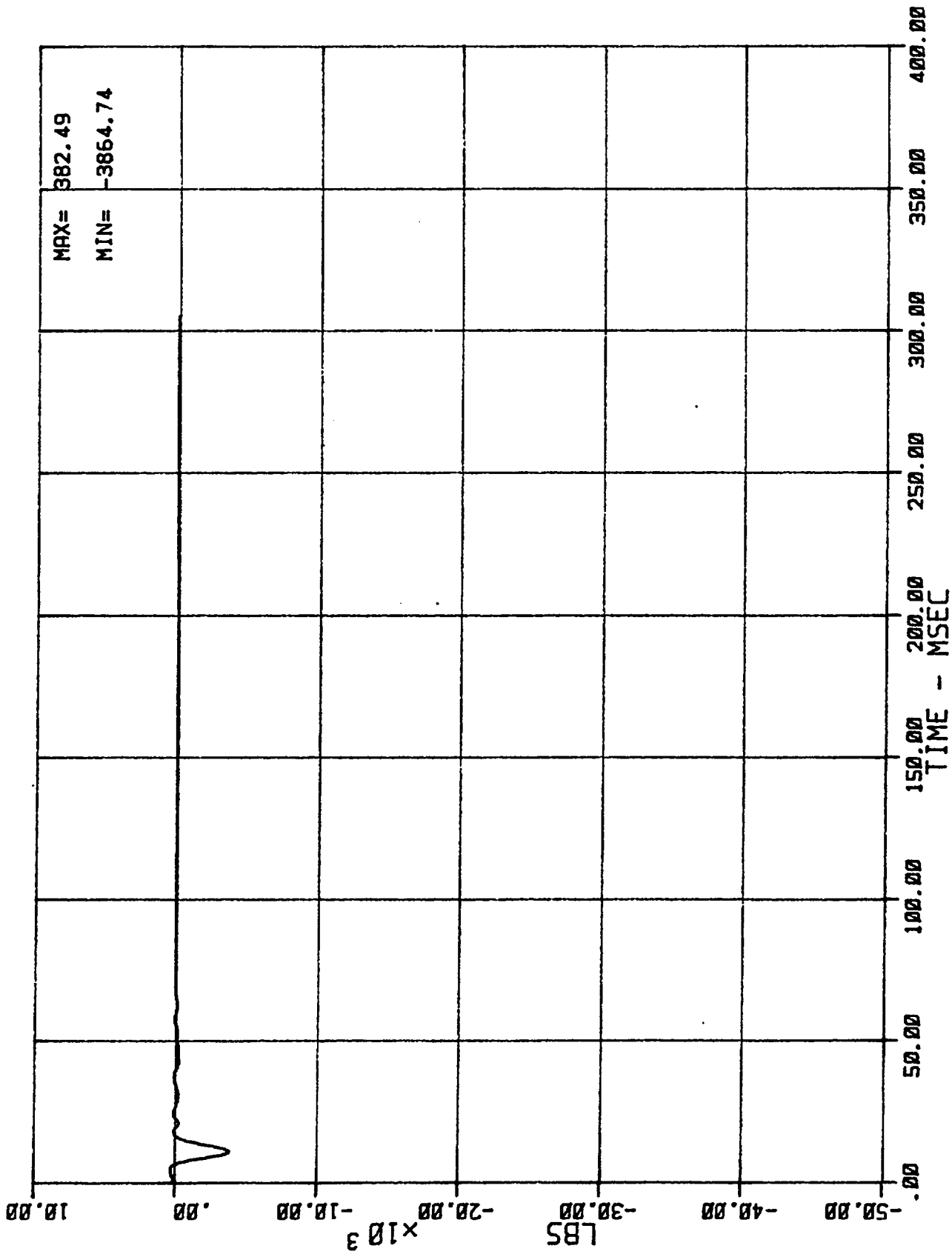
64 LC BA N B07 (BARRIER LOAD CELL D7 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85



65 LC BA N B08 (BARRIER LOAD CELL 08 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

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66 LC BA BD9 (BARRIER LOAD CELL D9 FORCE)
MSE N18025 1986 MAZDA B-2000 P.U.

06/04/85

APPENDIX C

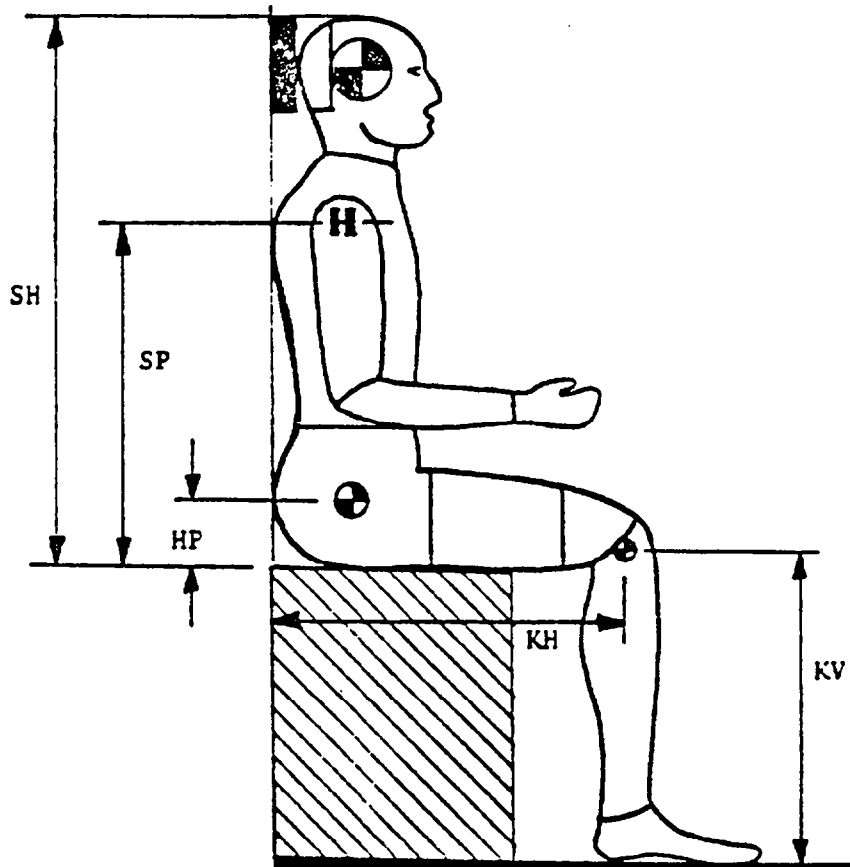
PART 572 DUMMY CONFIGURATION AND
PERFORMANCE VERIFICATION TESTS

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.:

4	6	4
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I. CONFIGURATION VERIFICATION DATA:



	P.572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		05/15 - 05/28/85	06/07 - 06/11/85
VERIFICATION NUMBER FOR DUMMY*		1	2
SH - Seated Height- - - - -	35.6 to 35.8"	35.6	35.6
SP - Shoulder Pivot Height- - -	21.8 to 22.4"	21.9	22.0
HP - Hip Pivot Height - - - - -	3.9" ref.	3.9	3.9
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.4	20.4
KV - Knee Pivot from floor- - -	19.3 to 19.9"	19.4	19.4
SW - Shoulder Width - - - - -	17.8 to 18.4"	18.2	18.1
HW - Hip Width- - - - -	14.0 to 15.4"	14.6	14.5

TECHNICIAN'S NAME: P. Leonard

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

TABLE - PART 572 ATD CERTIFICATION TEST DATA, SUMMARY

NHTSA ATD I.D. NO.: 464LABORATORY TECHNICIAN: P. Leonard

		Pre-Test Calibration	Post-Test Calibration
DATE OF PERFORMANCE VERIFICATION		05/15-05/28/85	06/07-06/11/85
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY-----		1	2
VERIF. LAB. TEMPERATURE (66 to 70% Range)-----		70° - 74°F	70°-75°F
VERIF. LAB. HUMIDITY (10 to 70% Range)		40 - 50 %	40 - 58 %
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST:			
a. Peak Resultant Accel. -	210 to 260g	217	235
b. Peak Lateral Accel. -	≤10g	2.0	2.4
c. Time above 100G - - - -	0.9 to 1.5 ms	1.2	1.4
2. NECK BENDING TEST:			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	21.60	22.22
b. Pendulum Avg. Decel. (over $t_3 - t_2$) - - - -	20 to 24G	23.8	23.3
c. Peak Resultant Head Acceleration - - - - -	26G maximum	20.6	21.2
d. Pendulum Decel. ($t_2 - t_1$)	≤3 ms	2.2	2.0
e. Pendulum Decel. ($t_3 - t_2$)	25 to 30 ms	25.8	27.2
f. Pendulum Decel. ($t_4 - t_3$)	≤ 10 ms	10.0	9.2
g. Pendulum Direction Reversal Time - - - - -	≥123 ms	N/A	N/A
h. Max. Head Rotation - -	63 to 73°	64.2	66.6
i. Chordal Displacement: Head Rotation Angle - -			
0°	Time	-2 to 2 ms	0.0
	Displ.	-.5 to .5 in.	0.00
30°	Time	25.6 to 34.4 ms	33.2
	Displ.	2.1 to 3.1 in.	2.67
60°	Time	40.3 to 51.7 ms	50.8
	Displ.	4.3 to 5.3 in.	5.08
Maximum (64°) (67°)	Time	53.2 to 66.8 ms	63.6
	Displ.	5.0 to 6.0 in.	5.44

TABLE - PART 572 ATD CERTIFICATION TEST DATA, SUMMARY (CONT'D)

NHTSA ATD I.D. NO.: 464

TEST PARAMETER		SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
2. NECK BENDING TEST <u>Continued:</u>				
i. Chordal Displacement:				
Head Rotation Angle -				
60°	Time	67.0 to 83.0 ms	71.2	73.6
	Disp.	4.3 to 5.3 in.	5.06	4.96
30°	Time	85.4 to 104.6 ms	88.0	91.0
	Displ.	2.1 to 3.1 in.	2.33	2.26
0°	Time	101.0 to 123.0 ms	101.6	101.4
	Displ.	-.5 to 0.5 in.	0.2	0.16
3. ABDOMINAL COMPRESSION TEST: (Preload = 10 pounds)				
a. Force @ .5" - - - - -		23 - 36 lbs.	24.0	28.0
b. Force @ .75" - - - - -		36 - 50 lbs.	43.0	40.5
c. Force @ 1.0" - - - - -		50 - 63 lbs.	58.0	59.0
d. Force @ 1.3" - - - - -		73 - 88 lbs.	82.0	86.5
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - - -		22 to 34 lbs.	32.4	32.0
b. Force @ 30° - - - - -		34 to 46 lbs.	42.8	44.0
d. Force @ 40° - - - - -		46 to 58 lbs.	53.2	56.0
e. Return Angle - - - - -		12° maximum	12	9
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed - - -		21.78-22.22 fps	22.00	22.01
(2) Peak Deflection -		1.7" maximum	1.67	1.48
(3) Peak Resistive Force - - - - -		2250 lbs. maximum	1930	1770
(4) Internal Hysteresis - - -		50 to 70%	55.3	53.8

TABLE - PART 572 ATD CERTIFICATION TEST DATA, SUMMARY (CONT'D)

NHTSA ATD I.D. NO.: 464

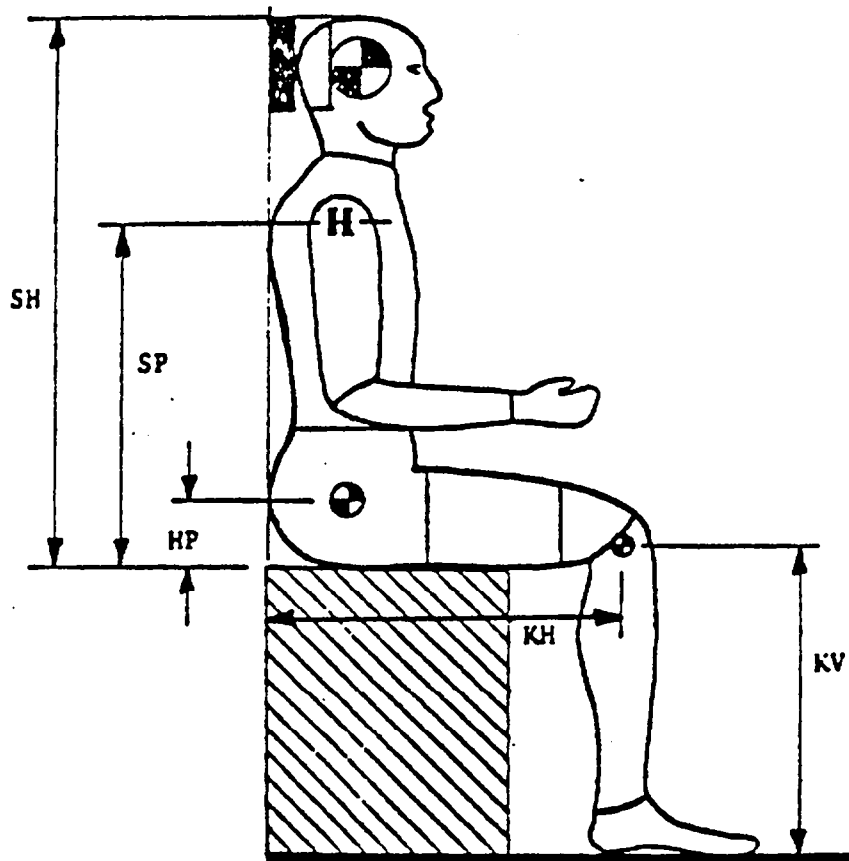
TEST PARAMETER	SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
5. CHEST IMPACT TESTS:			
<u>Continued:</u>			
b. Low Speed			
(1) Probe Speed - - -	13.86-14.14 fps	14.02	13.96
(2) Peak Deflection -	1.1" maximum	1.10	1.00
(3) Peak Resistive Force - - - - -	1450 lbs. maximum	1226	1130
(4) Internal Hysteresis - - -	50 to 70%	51.6	65.0
6. KNEE IMPACT TESTS:			
a. Right Side			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.99	7.02
(2) Maximum Force - -	1850 to 2500 lbs.	2010	2180
(3) Time Above 1000# -	1.7 ms minimum	1.77	1.80
b. Left Side			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.95	7.02
(2) Maximum Force - -	1850 to 2500 lbs.	2290	2200
(3) Time Above 1000# -	1.7 ms. minimum	1.83	1.70

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.:

4	6	7
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I. CONFIGURATION VERIFICATION DATA:



	P. 572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		05/17-05/28/85	06/07-06/12/85
VERIFICATION NUMBER FOR DUMMY*		1	2
SH - Seated Height- - - - -	35.6 to 35.8"	35.6	35.6
SP - Shoulder Pivot Height- - -	21.8 to 22.4"	22.0	22.1
HP - Hip Pivot Height - - - - -	3.9" ref.	3.9	3.9
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.6	20.6
KV - Knee Pivot from floor- - -	19.3 to 19.9"	19.4	19.4
SW - Shoulder Width - - - - -	17.8 to 18.4"	18.0	18.1
HW - Hip Width- - - - -	14.0 to 15.4"	14.5	14.5

TECHNICIAN'S NAME: P. Leonard

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

TABLE - PART 572 ATD CERTIFICATION TEST DATA, SUMMARY

NHTSA ATD I.D. NO.: 467LABORATORY TECHNICIAN: Paul Leonard

		Pre-Test Calibration	Post-Test Calibration
DATE OF PERFORMANCE VERIFICATION		05/17-05/28/85	06/07-06/12/85
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY		1	2
VERIF. LAB. TEMPERATURE (66 to 78°F Range)		68-74°F	70-74°F
VERIF. LAB. HUMIDITY (10 to 70% Range)		39-54%	44-58%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST:			
a. Peak Resultant Accel. -	210 to 260g	229	226
b. Peak Lateral Accel. -	≤10g	5.0	2.0
c. Time above 100G - - - -	0.9 to 1.5 ms	1.3	1.1
2. NECK BENDING TEST:			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	22.30	22.18
b. Pendulum Avg. Decel. (over $t_3 - t_2$) - - - -	20 to 24G	23.9	24.0
c. Peak Resultant Head Acceleration - - - - -	26G maximum	21.5	20.9
d. Pendulum Decel. ($t_2 - t_1$)	≤3 ms	2.6	2.0
e. Pendulum Decel. ($t_3 - t_2$)	25 to 30 ms	26.0	28.6
f. Pendulum Decel. ($t_4 - t_3$)	≤10 ms	10.0	8.4
g. Pendulum Direction Reversal Time - - - - -	≥123 ms	N/A	N/A
h. Max. Head Rotation - -	63 to 73°	64.8	66.3
i. Chordal Displacement: Head Rotation Angle - -			
0°	Time	-2 to 2 ms	0.0
	Displ.	-.5 to .5 in.	0.00
30°	Time	25.6 to 34.4 ms	34.2
	Displ.	2.1 to 3.1 in.	2.62
60°	Time	40.3 to 51.7 ms	51.6
	Displ.	4.3 to 5.3 in.	5.06
Maximum (65°) (66°)	Time	53.2 to 66.8 ms	62.4
	Displ.	5.0 to 6.0 in.	5.31

TABLE - PART 5/2 ATD CERTIFICATION TEST DATA, SUMMARY (CONT'D)

NHTSA ATD I.D. NO.: 467

TEST PARAMETER		SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
2. NECK BENDING TEST <u>Continued:</u>				
i. Chordal Displacement:				
Head Rotation Angle -				
60°	Time	67.0 to 83.0 ms	70.4	72.4
	Disp.	4.3 to 5.3 in.	4.81	4.85
30°	Time	85.4 to 104.6 ms	89.0	89.8
	Displ.	2.1 to 3.1 in.	2.14	2.12
0°	Time	101.0 to 123.0 ms	101.4	101.0
	Displ.	-.5 to 0.5 in.	0.20	0.20
3. ABDOMINAL COMPRESSION TEST: (Preload = 10 pounds)				
a. Force @ .5" - - - - -		23 - 36 lbs.	24.0	26.5
b. Force @ .75" - - - - -		36 - 50 lbs.	40.0	41.0
c. Force @ 1.0" - - - - -		50 - 63 lbs.	62.0	59.0
d. Force @ 1.3" - - - - -		73 - 88 lbs.	84.0	87.0
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - - -		22 to 34 lbs.	30.0	32.0
b. Force @ 30° - - - - -		34 to 46 lbs.	45.2	42.0
d. Force @ 40° - - - - -		46 to 58 lbs.	56.4	52.0
e. Return Angle - - - - -		12° maximum	12	12
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed - - -		21.78-22.22 fps	22.09	21.84
(2) Peak Deflection -		1.7" maximum	1.40	1.60
(3) Peak Resistive Force - - - - -		2250 lbs. maximum	2060	1930
(4) Internal Hysteresis - - -		50 to 70%	67.4	50.3

TABLE - PART 572 ATD CERTIFICATION TEST DATA, SUMMARY (CONT'D)

NHTSA ATD I.D. NO.: 467

TEST PARAMETER	SPECIFICATION	Pre-Test Calibration	Post-Test Calibration
5. CHEST IMPACT TESTS:			
<u>Continued:</u>			
b. Low Speed			
(1) Probe Speed - - -	13.86-14.14 fps	14.03	13.86
(2) Peak Deflection -	1.1" maximum	0.88	1.03
(3) Peak Resistive Force - - - - -	1450 lbs. maximum	1220	1050
(4) Internal Hysteresis - - -	50 to 70%	54.7	69.2
6. KNEE IMPACT TESTS:			
a. Right Side			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.97	7.01
(2) Maximum Force - -	1850 to 2500 lbs.	2080	2480
(3) Time Above 1000#-	1.7 ms minimum	1.77	2.00
b. Left Side			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.95	7.03
(2) Maximum Force - -	1850 to 2500 lbs.	1960	2290
(3) Time Above 1000#-	1.7 ms. minimum	1.76	1.70

APPENDIX D

VEHICLE'S OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

Position the lap belt across your lap as LOW ON THE HIPS as possible to reduce the risk of sliding under it during an accident. Adjust it to a SNUG FIT by pulling the belt through the tongue plate. The belt retractor is designed to take up excess webbing automatically and maintain tension on the belt.

To Unfasten Outboard Seat Belt:

To unfasten the belt, depress the push button in the center of the buckle.

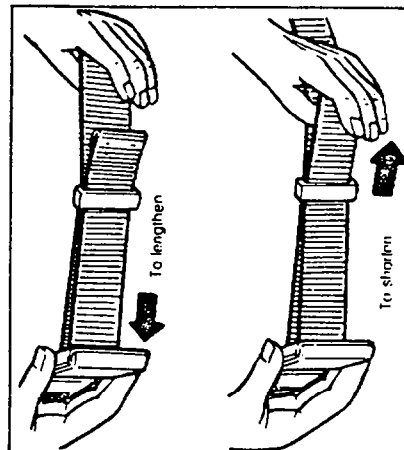
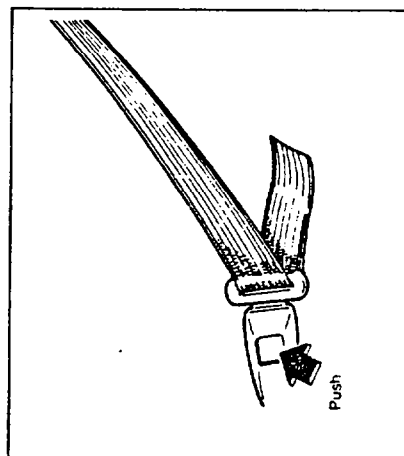
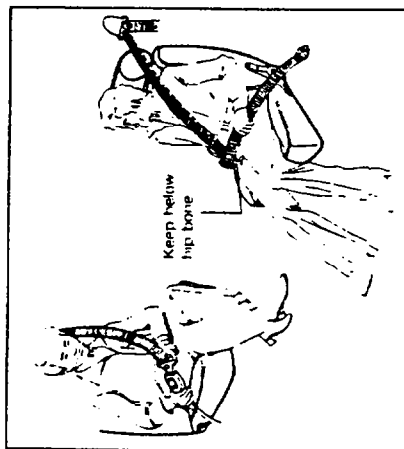
NOTE

If the belt does not fully retract, pull it out and check for kinks or twists. Then make sure that it remains untwisted as it retracts.

To Fasten Inboard Seat Belt: (if equipped)

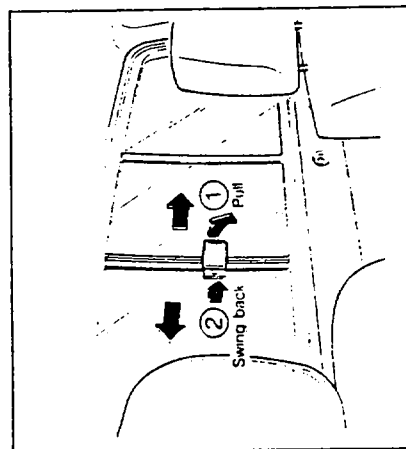
1. Grasp the buckle end and tongue plate.
2. Position the lap belt across the body and lap as LOW ON THE HIPS as possible.
3. If necessary, lengthen or shorten the lap belt. To adjust, hold the tongue at right angles to the webbing and pull them to lengthen. Pull the loose end of the belt webbing to shorten.
4. Insert the tongue plate into the open end of the buckle until an audible click is heard.

Then, pull the belt to get a snug fit around the hips. The snug fit and low position are essential in order that the force exerted



REAR SLIDING WINDOW (if equipped)

To open the rear sliding window, first pull the end of the lock handle toward you. Then open the window either to the right or left.



SEAT BELT RESTRAINT SYSTEM

To help decrease the possibility of severity of injury in accidents or sudden stops, we recommend that you and your passengers, in the vehicle be properly restrained at all times, using the seat belts provided. The front seat lap-shoulder belts have retractors with inertia locks.

The retractors keep the belts out of the way while passengers enter or exit the vehicle. Inertia locks allow the belts to remain slack on the passengers for comfort until a deceleration force occurs (such as a sudden stop or collision). At that time the belts will automatically lock in position, and the passengers will not be thrown forward.

Before fastening the seat belts, the driver should always adjust the seat to the most comfortable driving position.

CAUTION

Replace seat and shoulder belt assemblies that have undergone stress by occupants in a collision.

To Fasten Outboard Seat Belt:

1. Grasp the buckle end and tongue plate.
2. Slowly pull out the lap-shoulder belt.
3. Insert the tongue plate into the open end of the buckle. An audible click will indicate the belt is securely locked.

WARNING

Do not wear the shoulder belt under the arm, across the neck or over the inside shoulder. Any of these practices can reduce effectiveness of the restraint system.

