

DOT 953

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

FUJI HEAVY IND. LTD., JAPAN
1986 SUBARU XT 2 DOOR

NHTSA NO. MG5502

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



JULY 1986

FINAL REPORT

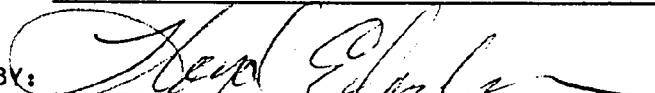
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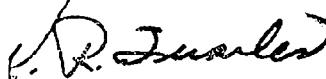
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16. Abstract A 35 mph frontal barrier impact test using a load cell barrier was conducted on a 1986 Subaru XT 4 Door at the Mobility Systems and Equipment Company (MSE) crash test facility in Mira Loma, CA on 18 June 1986. The barrier impact velocity was 35.09 mph and the ambient temperature at the barrier face at the time of impact was 94° F. The posttest vehicle crush maximum was 28.4 in. The test vehicle appears to comply with the indicant requirements of the following Federal Motor Vehicle Safety Standards: 1. FMVSS No. 219 (Partial), "Windshield Zone Intrusion" 2. FMVSS No. 301-75 "Fuel System Integrity" 3. FMVSS No. 212 "Windshield Mounting" With regard to the FMVSS 208 "Occupant Crash Protection", injury criteria, the driver and passenger dummies appeared to satisfy the head injury criteria (HIC) maximum allowable index of 1,000, the chest G's of not more than 60 for a time interval greater than 3 milliseconds and the femur requirements of 2,250 lb or less. TYPE OF RESTRAINT SYSTEM: 3-point continuous webbing 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: DEPARTMENT OF TRANSPORTATION National Highway Traffic Safety Administration Technical Reference Division, Room 5108 400 Seventh Street, 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'86 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-84-D-21149. 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 for 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 TESTS

A load cell barrier consisting of 36 cell units was impacted by a 1986 Subaru XT, 2 door, NHTSA No. MG5502, at a velocity of 35.09 mph. The frontal impact test was conducted by Mobility Systems and Equipment Company (MSE) on 18 June 1986. 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 sixteen (16) high-speed cameras. The camera location data are presented in Table 11.

Sixty-seven (67) 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 Subaru XT, 2 door was equipped with a 109 cubic inch 4 cylinder engine and 5 speed manual transmission. The test weight of the Subaru XT with two (2) 50th percentile male dummies, instrumentation, and cameras was 2,759 pounds.

The Subaru XT was involved in a frontal load cell barrier crash at a velocity of 35.09 mph. The vehicle appears to comply with FMVSS No. 301-75, "Fuel System Integrity" requirement. There was no solvent leakage from the fuel system after impact or during the subsequent rollover test.

The Subaru XT appears to comply with FMVSS No. 212, "Windshield Mounting" requirement. The windshield periphery retention was 100 percent for the right half, 100 percent for the left half, and 100 percent overall.

The Subaru XT appears comply with the FMVSS No. 219, "Windshield Zone Intrusion" requirement.

The maximum static crush for the vehicle of 28.4 inches occurred on the right side of the front bumper. The windshield was cracked but the vehicle glazing remained intact. Both the driver's and passenger's 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 744 the maximum chest acceleration (resultant clipped) was 37.8 g; and the maximum femur loads were 978 (left) and 185 (right) pounds.

The passenger ATD's head did not contact anything. Both of his knees hit the dash panel. The HIC value for the passenger ATD was

646; the maximum chest acceleration (resultant clipped) was 29.9 g; and the maximum femur loads were 440 (left) and 568 (right) pounds.

Seat belt spoolout, measured by high speed film analysis was 1.7 inches for the driver and 1.4 inch for the passenger belts.

The driver's inboard track had no track latching device, thus during the impact the seat shifted forward 1.0 inches on the inboard side; the outboard track latching device remained latched and the seat did not shift forward on the outboard side. The passenger's inboard track had no track latching device, thus during the impact the seat shifted forward 0.8 inches on the inboard side; the outboard track latching device remained latched and the seat did not shift forward on the outboard side.

Data Table No. 1 Test Vehicle Data

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1986/SUBARU/XT/2 DOOR

VEHICLE NHTSA NO.: M G 5 5 0 2 VIN: J F 1 A X 4 2 B 9 G B 3 0 7 3 5 4

VEHICLE BODY COLOR: BLUE ; MONTH & YEAR OF MANUFACTURE: 11/85

ENGINE: 4 Cylinders; 109 C.I.D.; LITERS; CC

☒ Gas; Diesel; TurbochargedPlacement— ☒ Longitudinal; Transverse (Lateral)TRANSMISSION: 5 speed; ☒ Manual; Automatic; OverdriveFINAL DRIVE: ☒ FRONT WHEEL DRIVE; REAR WHEEL DRIVE; Four Wheel Drive

DATE VEHICLE AVAILABLE FOR 35 MPH CRASH TESTING: 04/10/86

ODOMETER READING: 016 miles; OPTIONS: ☐ A/C; ☐ P/S; ☐ P/WDO.; ☒ Telescopic Wheel☒ Tilt Whl.; ☐ Cruise Control

TYPE OF OCCUPANT RESTRAINT SYSTEM FOR FRONT OUTBOARD SEATING POSITIONS: Three-point continuous webbing, manual.

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): 28 psi Front; 28 psi Rear

Recommended Tire Size: 165SR13

Tires On Vehicle: 165SR13 ; Manufacturer: Bridgestone

Number Of Occupants: 2 Front; 2 Rear; 3rd Seat; 4 TOTAL

Type Of Front Seats: ☒ Bucket; Bench; Split BenchType of Front Seat Back; Fixed; ☒ Adjustable With ☒ Lever/ ☐ Rotating Knob

Vehicle Maximum Capacity Loading = 660 lbs. (A)

No. Of Occupants x 150 lbs. - - - = 600 lbs. (B)

Cargo Capacity (A - B) - - - - - = 60 lbs.

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Right Front = 640 lbs.
Left Front = 706 lbs. } — TOTAL FRONT = 1,346 lbs. (59.6 % of TOTAL)Right Rear = 442 lbs.
Left Rear = 472 lbs. } — TOTAL REAR = 914 lbs. (40.4 % of TOTAL)

TOTAL WEIGHT = 2,260 lbs.

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

CALCULATION OF TEST VEHICLE TARGET WEIGHT:

Total test Vehicle Delivered Weight With Maximum Fluids =	<u>2,260</u>	lbs.
Maximum Cargo Carrying Capacity Of Test Vehicle - - - - -	<u>60</u>	lbs.
Weight Of Two P.572 Dummies (2 x 164 lbs.) - - - - -	<u>328</u>	lbs.
TEST VEHICLE TARGET WEIGHT - - - - -	<u>2,648</u>	lbs.

*300 lbs. for light trucks and MPVs

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front =	<u>729</u>	lbs.	
Left Front =	<u>805</u>	lbs.	TOTAL FRONT = <u>1,534</u> lbs (55.6% of TOTAL)
Right Rear =	<u>596</u>	lbs.	
Left Rear =	<u>1,629</u>	lbs.	TOTAL FRONT = <u>1,225</u> lbs (44.4% of TOTAL)
TOTAL WEIGHT= <u>2,759</u> LBS. (which includes <u>0</u> 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:

<u>As Delivered</u> —Right Front = <u>26.5</u> inches;	<u>Ready For Test</u> —Right Front= <u>25.8</u> in.
Left Front = <u>26.2</u> inches;	Left Front = <u>25.5</u> in.
Right Rear = <u>24.1</u> inches;	Right Rear = <u>22.9</u> in.
Left Rear = <u>24.0</u> inches;	Left Rear = <u>22.7</u> in.

Test Vehicle Wheelbase: 97.0 inches; C.g. = 43.1 inches rearward of front wheel centerline

Total Vehicle Length:

Total Vehicle Width:

Right Side = <u>172.7</u> inches;	Across Front Fenders <u>66.5</u> in.
Left Side = <u>172.7</u> inches;	Across Center <u>67.3</u> in.
Centerline = <u>175.4</u> inches;	Across Rear Fender <u>65.1</u> in.
	Maximum <u>67.3</u> in.

Data Table No. 2 Post Crash Test Data

DATE OF 35 MPH FRONTAL BARRIER IMPACT RATINGS TEST: 06/18/86

TIME OF TEST: 3:00 PM : AMBIENT TEMPERATURE AT BARRIER FACE: 94 °F.

VEHICLE'S OCCUPANT COMPARTMENT TEMPERATURE: 72 °F. (Spec. Range + 66 to 78° F.)

VEHICLE'S WINDSHIELD MOLDING TEMPERATURE: 72 °F.

VEHICLE IMPACT VELOCITY: Primary Speed Trap = 35.09 mph

Secondary Speed Trap = 35.12 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 = 5 ft

(b) existing the speed trap = 1 ft

VEHICLE STATIC CRUSH: (All measurements in inches)

Vehicle Pre-test Length— Right Side= 172.7 ; C/Line= 175.4 ; Left Side= 172.7

Vehicle Post-test Length —Right Side= 146.7 ; C/Line= 147.0 ; Left Side= 147.3

VEHICLE STATIC CRUSH ---- Right Side= 26.0 ; C/Line= 28.4 ; Left Side= 25.4

VEHICLE REBOUND FROM BARRIER FACE:

Vehicle Right Side = 23.0 inches

Vehicle Centerline = 24.4 inches

Vehicle Left Side = 24.2 inches

VISIBLE DUMMY CONTACT POINTS:

	DRIVER (I.D. No. <u>466</u>)		
	Strg. Col. Hub	Strg. Wheel	Instru. Panel
HEAD - - - - -	YES	YES	NO
RIGHT KNEE - - - - -			NO
LEFT KNEE - - - - -			NO

PASSENGER (I.D. No. <u>467</u>)		
Instru. Panel	Knee Assv.	Glove Box Door
NO	NO	NO
NO		YES
NO		YES

VEHICLE DOOR OPENING INFORMATION:

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

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

VEHICLE'S FRONT SEAT MOVEMENT DURING CRASH EVENT:

	RIGHT SIDE		LEFT SIDE
Seat Cushion Shift - - -	0.8	forward;	1.0 forward
Seat Adjuster Failure- -	YES	;	YES

Details Of Any Failure:

The driver's inboard track had no track latching device, thus during the impact the seat shifted forward 1.0 inch on the inboard side; the outboard track latching device remained latched and the seat did not shift forward on the outboard side. The passenger's inboard track had no track latching device, thus during the impact the seat shifted forward 0.8 inches on the inboard side; the outboard track latching device remained latched and the seat did not shift forward on the outboard side.

OTHER NOTABLE IMPACT EFFECTS: None

SECTION 3

SUMMARY OF RESULTS FOR

FMVSS 212, "Windshield Mounting"

FMVSS 219, (Partial), "Windshield Zone Intrusion"

FMVSS 301-75, "Fuel System Integrity"

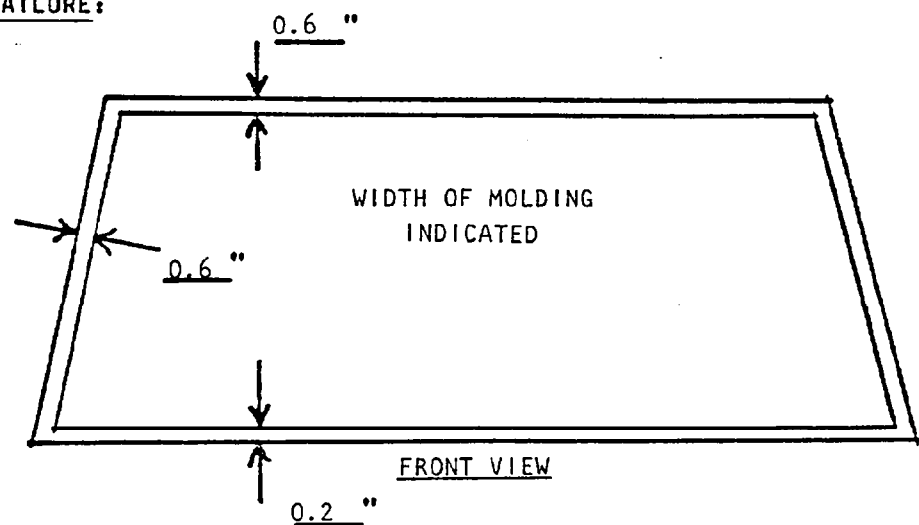
Data Table No. 3 FMVSS 212 Windshield Mounting Data

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	74.2	74.2	100%
LEFT SIDE	74.2	74.2	100%
TOTAL	148.4	148.4	100%

AREA OF RETENTION FAILURE:



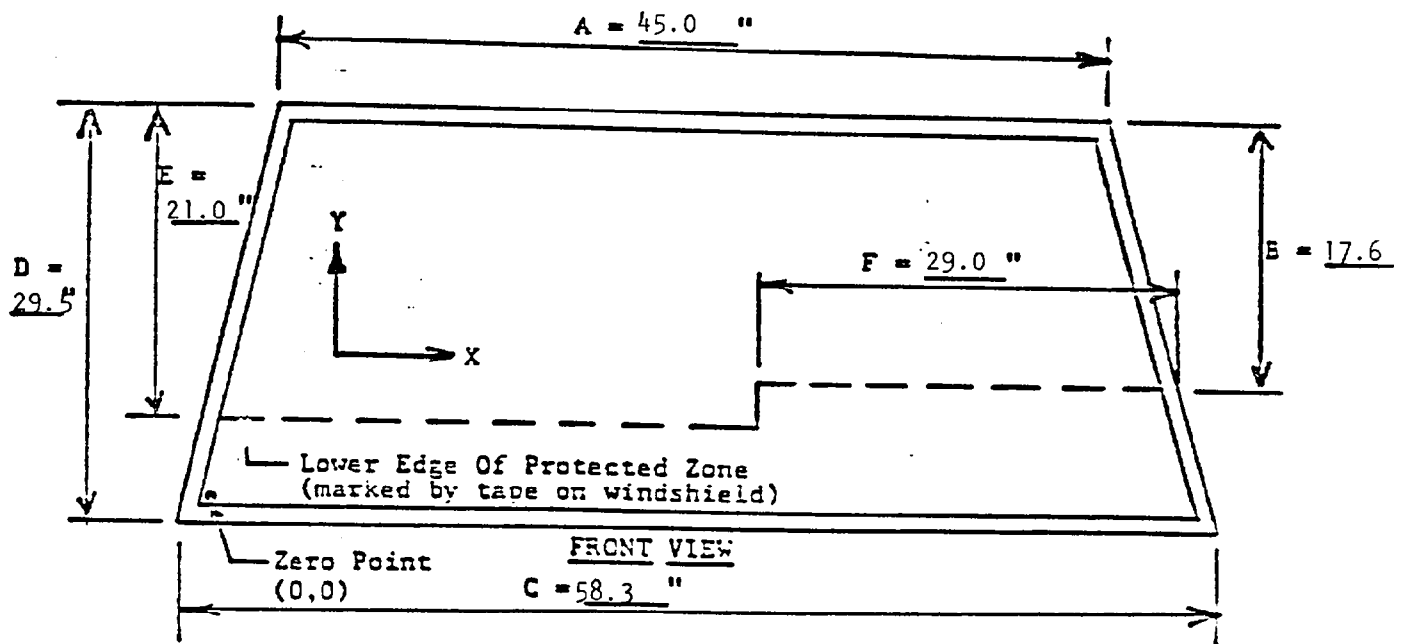
FAILURE DETAILS:

None

Data Table No. 4 FMVSS 219 Windshield Zone Intrusion

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 PROTECT 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	N/A
2.	N/A	N/A
3.	N/A	N/A
4.	N/A	N/A

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

TEST VEHICLE NHTSA NO.: MG5502; TEST DATE: 06/18/86

VEHICLE MAKE/MODEL/BODY STYLE: SUBARU/XT/2 DOOR

USABLE CAPACITY OF VEHICLE'S FRONT FUEL TANK: 15.9 Gallons (figure furnished by
vehicle manufacturer)

USABLE CAPACITY OF VEHICLE'S REAR FUEL TANK: N/A Gallons

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 STOODARD SOLVENT ADDED TO VEHICLE'S FUEL TANK:

Front Tank 14.8 Gallons which is 93.1 % of the Stated USABLE CAPACITY

Rear Tank N/A Gallons which is N/A % of the Stated USABLE CAPACITY

SOLVENT SPILLAGE MEASUREMENT AFTER 35 MPH FRONTAL BARRIER IMPACT TEST:

From impact until vehicle motion ceases - - - - None 1 oz.

For 5 min. period after vehicle motion ceases - None 5 oz.

For next 25 minutes at barrier face - - - - - None 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, 25 seconds

FMVSS 301-75 Position Hold Time = 5 minutes, 0 seconds

TOTAL - - - - - = 6 minutes, 25 seconds

Next Whole Minute Interval - - - - - = 7 minutes

Data Table No. 5 (Cont'd) 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	0.0	N/A
90 to 180° - - - - -	0.0	0.0	0.0	N/A
180 to 270° - - - - -	0.0	0.0	0.0	N/A
270 to 360° - - - - -	0.0	0.0	0.0	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/SUBARU/XT/2 DOOR

VEH. NHTSA NO.: MG5502; TEST DATE: 06/18/86

MAXIMUM ACCELERATION VALUES:

MAXIMUM ACCELERATION VALUES:		DRIVER DUMMY #	PASSENGER DUMMY #
Head Channel X	HEAD X	-86.21	45.37
Head Channel Y	Y	-28.27	6.69
Head Channel Z	Z	63.03	52.11
HEAD RESULTANT	R	95.20	56.47
Chest Channel X	CHEST X	-38.44	-29.26
Chest Channel Y	Y	-10.02	9.50
Chest Channel Z	Z	-11.14	10.36
CHEST RESULTANT (3msec Clip)	R	37.83	29.89
TIME INTERVAL (seconds)		0.0555-0.0585	0.1065-0.1095

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	HIC	744.44	646.26
t_1 (seconds)		0.07862	0.07450
t_2 (seconds)		0.09775	0.12525
Avg. Accel. t_1 to t_2		69.12	38.76

MAXIMUM FEMUR FORCES: (Compressive)

Right Side (lbs.)	FR	185	568
Left Side (lbs.)	FL	978	440

MAXIMUM SEAT BELT FORCES:

Lap Belt	LAP SHLDR	777	813		
Shoulder Belt		1,387	1,617		
		PHOTOGRAPHIC	ELECTRONIC	PHOTOGRAPHIC	ELECTRONIC
MAXIMUM SEAT BELT WEBBING SPOOL-OUT:		1.7	not measured	1.4	not measured
Belt Stretch (inches per foot)		N/A	1.32	N/A	0.72

BARRIER LOAD CELLS:

Total Load	CELLS	103,001 lb
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Data Table No. 7 Test Dummy Positioning Data

PRE-IMPACT DATA:

Make/Model: SUBARU/XT
 Body Style: 2 DOOR
 Model Year: 1986
 NHTSA No.: MG5502
 Color: BLUE

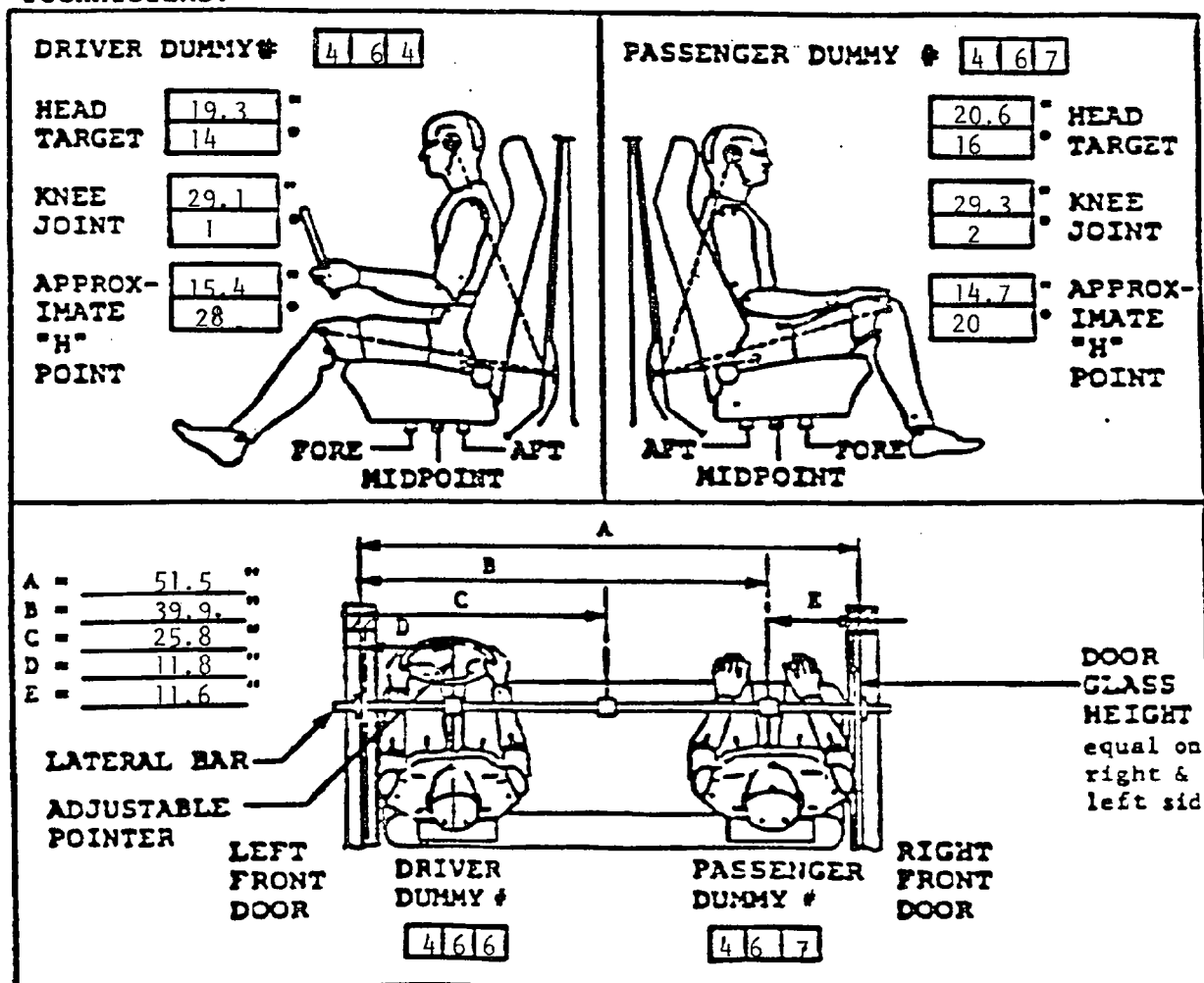
DATA FROM CERTIFICATION LABEL:

Vehicle Manufacturer: FUJI HEAVY IND. LTD., JAPAN
 Date of Manufacture: 11/85 ; VIN: JF1AX42B9GB307354
 GVWR: 3,280 lb; GAWR: Front = 1,820 lb; Rear = 1,460 lb

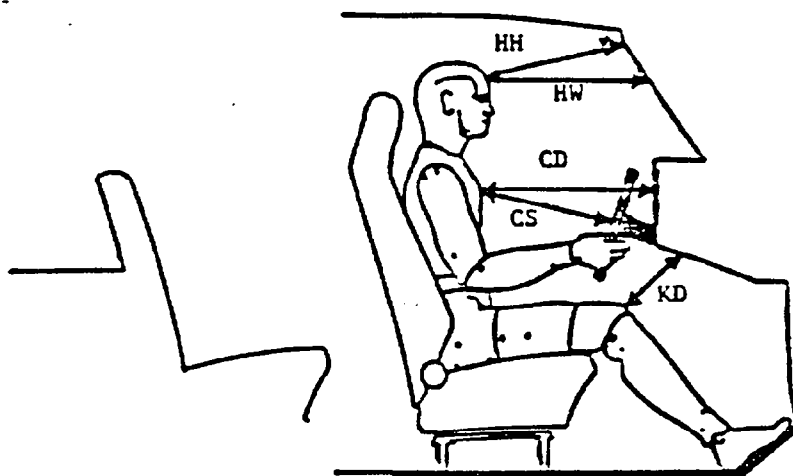
POST-IMPACT DATA:

Date of Test: 06/18/86 Time: 3:00 PM Temperature 94 °F
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: Primary = 35.09 mph Secondary = 35.12 mph
 Seat Type: BUCKET Adjuster Type: MANUAL
 Bucket Seat Back Type: LOW BACK WITH HEAD REST

Technicians:



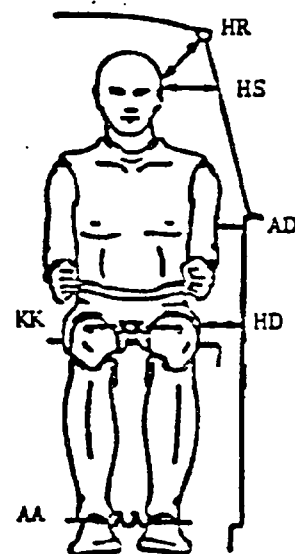
Data Table No. 7 (Cont'd) Test Dummy Positioning Data



	Driver	Passenger
HH	16.0	13.2
HW	21.7	19.0
CD	26.0	24.5
CS	16.5	N/A
KD L-	6.5	L- 6.5
KD R-	7.0	R- 6.0
Torso Angle	21	Torso Angle 21
Seat Back Angle	26	Seat Back Angle 26
HSW	N/A	N/A

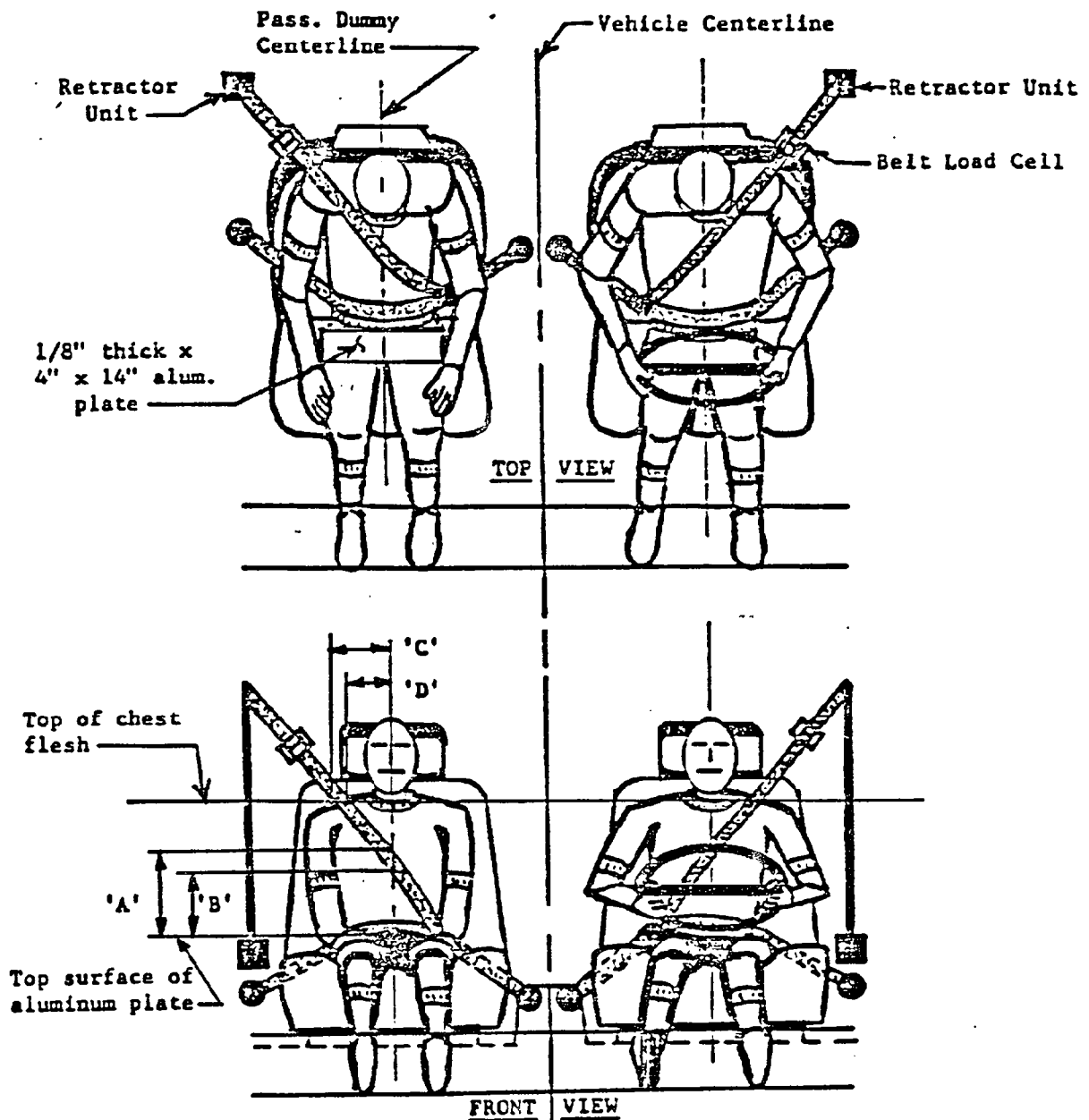
HH = Head to Windshield Header
 HW = Head to Windshield
 CD = Chest to Dash
 CS = Chest to Steering Wheel
 KD = Knees to Dash
 HR = Head to Side Roof
 HS = Head to Side Window
 AD = Arm to Door
 HD = Hip to Door
 KK = Knee to Knee
 Torso and seat back angles
 are relative to vertical.

REMARKS:



	Driver	Passenger
HR	4.0	3.5
HS	7.2	5.8
AD	3.5	3.6
HD	8.6	7.7
KK	14.5	13.5
AA	14.5	10.0

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	13.9	13.8
2. Dimension 'B'--alum. plate to belt lower edge on dummy centerline	10.2	10.1
3. Dimension 'C'--dummy centerline to outer edge at chest flesh top	4.1	4.0
4. Dimension 'D'--dummy centerline to inner edge at chest flesh top	1.6	1.5
5. Lap belt tension (lbs.)	4.0	4.0
6. Shoulder belt tension (lbs.)	2.0	2.0

Data Table No. 9: Seat Belt Performance Assessment Test Data

BELT LENGTH DATA:

Total Belt Length from 'D' 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
41.5	40.6
33.0	32.4
34.5	34.7

BELT SPOOL-OUT DATA:

As determined by film analysis

As determined electronically

As determined mechanically

DRIVER SIDE	PASSENGER SIDE
1.7	1.4
*	*
2.4	2.5

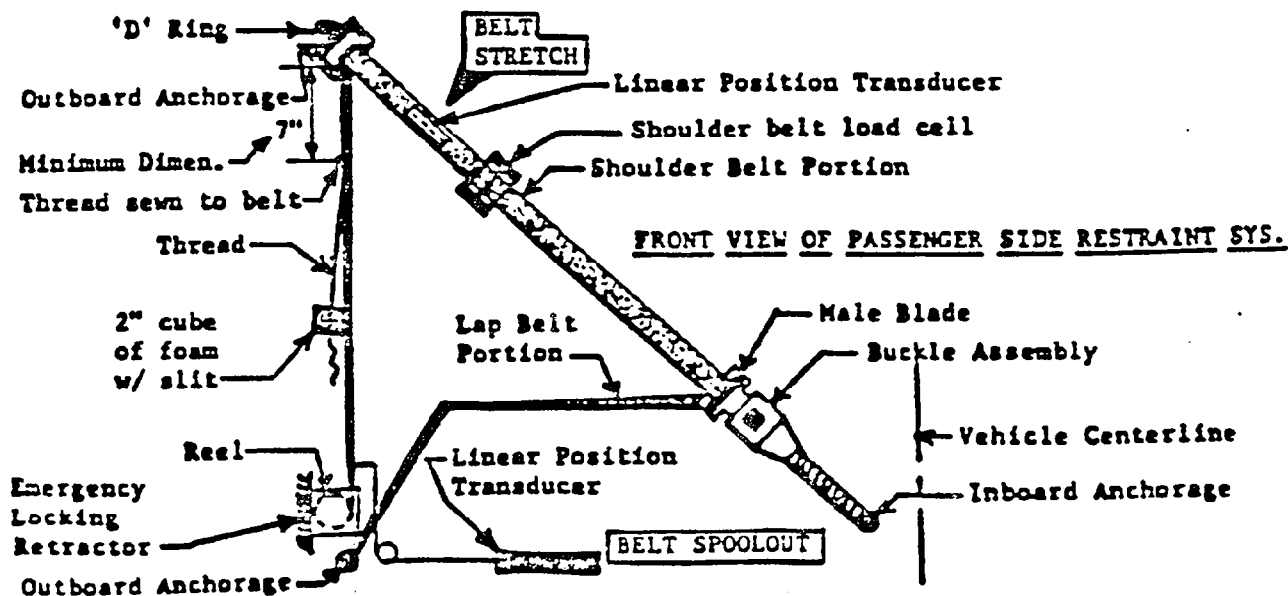
BELT STRETCH DATA:

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

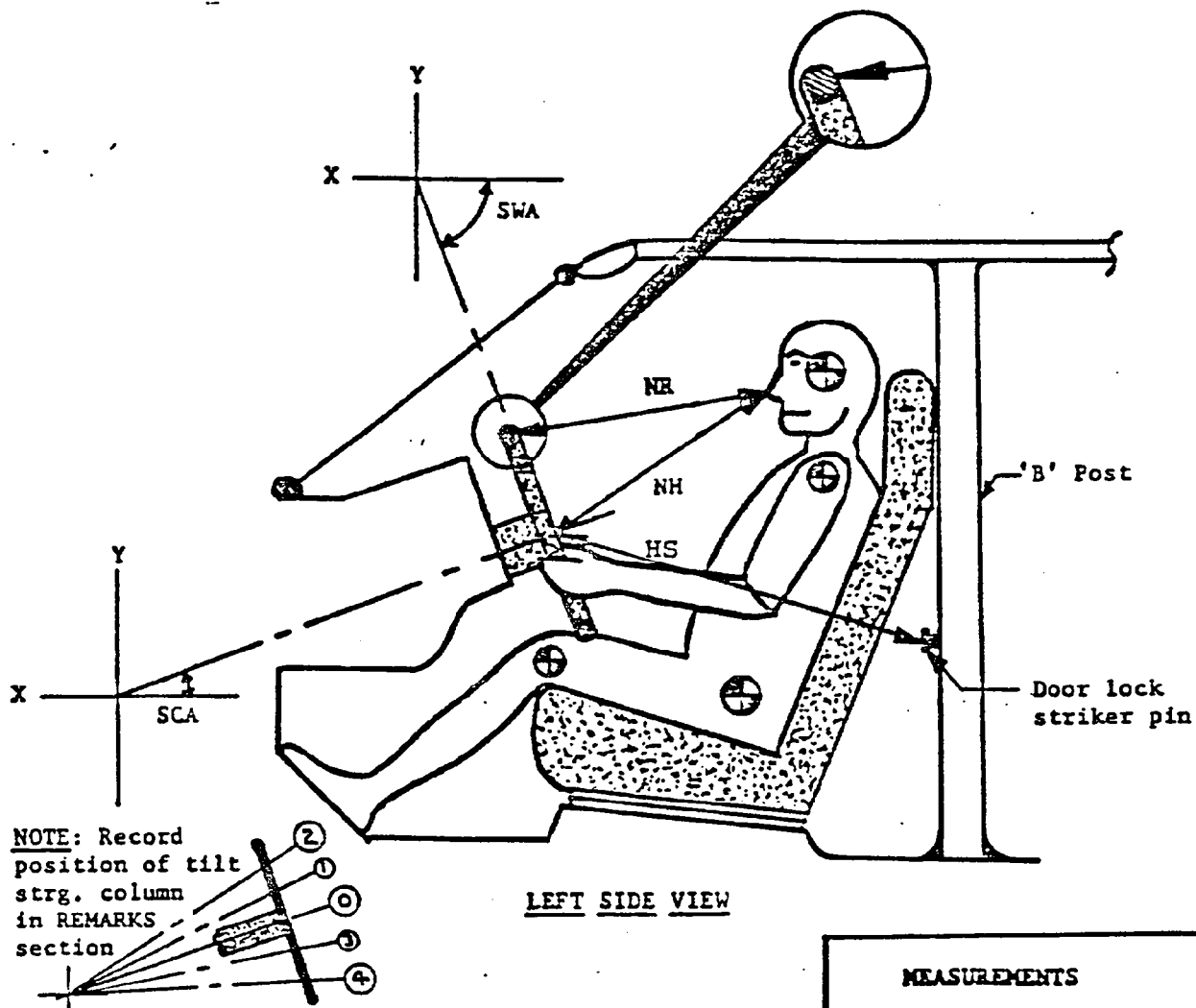
(2) Determined with 2" marked section of belt across dummy's chest (inches per foot)

Maximum Load 1,387		Maximum Load 1,617	
Elong. 1.32		Elong. 0.72	
PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
2"	2"	2"	2"
	Elong 0		Elong 0

* was not measured due to retractor location



Data Table No. 10 Driver Dummy to Steering Wheel Position



MEASUREMENTS		
NR --Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	19.1	Inches
NH --Distance from tip of dummy's nose to center of steering column hub	19.5	Inches
HS --Distance from center of steering column hub to the forward surface of the door lock striker pin.	29.7	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.	68	Degrees

REMARKS CONCERNING ADJUSTABLE OR TILT STEERING COLUMN IF VEHICLE IS SO EQUIPPED:
Tilt steering column was placed in the middle position.

Data Table No. 11 Camera Location Data

VEH. NHTSA NO.: MG5502; TEST DATE: 06/18/86; TIME: 3:00 PM

VEH. YEAR/MAKE/MODEL/BODY STYLE: 1986/SUBARU/XT/2 DOOR

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	290.0	51.5	2	796.1	12/50	24
2	Right Side View	251.9	55.2	52.5	3	237.7	16	525
3	Left Side View	951.4	60.7	41.0	0	934.1	50	580
4	Overhead	0.0	25.3	126.1	12	111.3	13	500
5	Pit-Engine	0.0	22.0	-58.0	42	N/A	13	470
6	Pit-Fuel Tank	6.4	59.5	-49.4	50	N/A	13	470
7	Front-Passenger	12.0	-16.0	101.1	60	126.8	13	580
8	Front-Driver	10.0	-16.0	101.2	56	126.9	25	490
9	Left Side-Driver	86.7	115.2	59.7	16	73.5	28	600
10	Right Side-Passenger	90.1	135.1	57.3	13	83.4	45	595
11	Right Side-'A' Post	163.2	56.0	51.5	5	150.9	35	700
12	Left Side-'A' Post	344.4	24.2	47.7	1	334.3	50	525
13	Onboard-Left Side	9.2	116.8	21.5	16	30.5	13	NAV
14	Onboard-Right Side	9.3	116.8	21.5	16	30.5	13	280
15	Left Side-Steering Col.	423.9	36.1	130.7	14	419.9	50	600
16	Left Side-Steering Col.	425.2	36.1	110.7	11	417.2	50	595
17	Right Side-Passenger **	139.7	75.3	61.8	15	125.0	13	NAV

* X = film plane to monorail centerline

Y = film plane to barrier face

Z = film plane to ground

** Film damaged during processing

1. **Introduction**

2. **Background**

3. **Methodology**

4. **Results**

5. **Discussion**

6. **Conclusion**

7. **References**

8. **Appendix**

9. **Notes**

10. **References**

11. **Appendix**

12. **Notes**

13. **References**

14. **Appendix**

15. **Notes**

16. **References**

17. **Appendix**

18. **Notes**

19. **References**

20. **Appendix**

21. **Notes**

22. **References**

23. **Appendix**

24. **Notes**

25. **References**

26. **Appendix**

27. **Notes**

28. **References**

29. **Appendix**

30. **Notes**

31. **References**

32. **Appendix**

33. **Notes**

34. **References**

35. **Appendix**

36. **Notes**

37. **References**

38. **Appendix**

39. **Notes**

40. **References**

41. **Appendix**

42. **Notes**

43. **References**

44. **Appendix**

45. **Notes**

46. **References**

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48. **Notes**

49. **References**

50. **Appendix**

51. **Notes**

52. **References**

53. **Appendix**

54. **Notes**

55. **References**

56. **Appendix**

57. **Notes**

58. **References**

59. **Appendix**

60. **Notes**

61. **References**

62. **Appendix**

63. **Notes**

64. **References**

65. **Appendix**

66. **Notes**

67. **References**

68. **Appendix**

69. **Notes**

70. **References**

71. **Appendix**

72. **Notes**

73. **References**

74. **Appendix**

75. **Notes**

76. **References**

77. **Appendix**

78. **Notes**

79. **References**

80. **Appendix**

81. **Notes**

82. **References**

83. **Appendix**

84. **Notes**

85. **References**

86. **Appendix**

87. **Notes**

88. **References**

89. **Appendix**

90. **Notes**

91. **References**

92. **Appendix**

93. **Notes**

94. **References**

95. **Appendix**

96. **Notes**

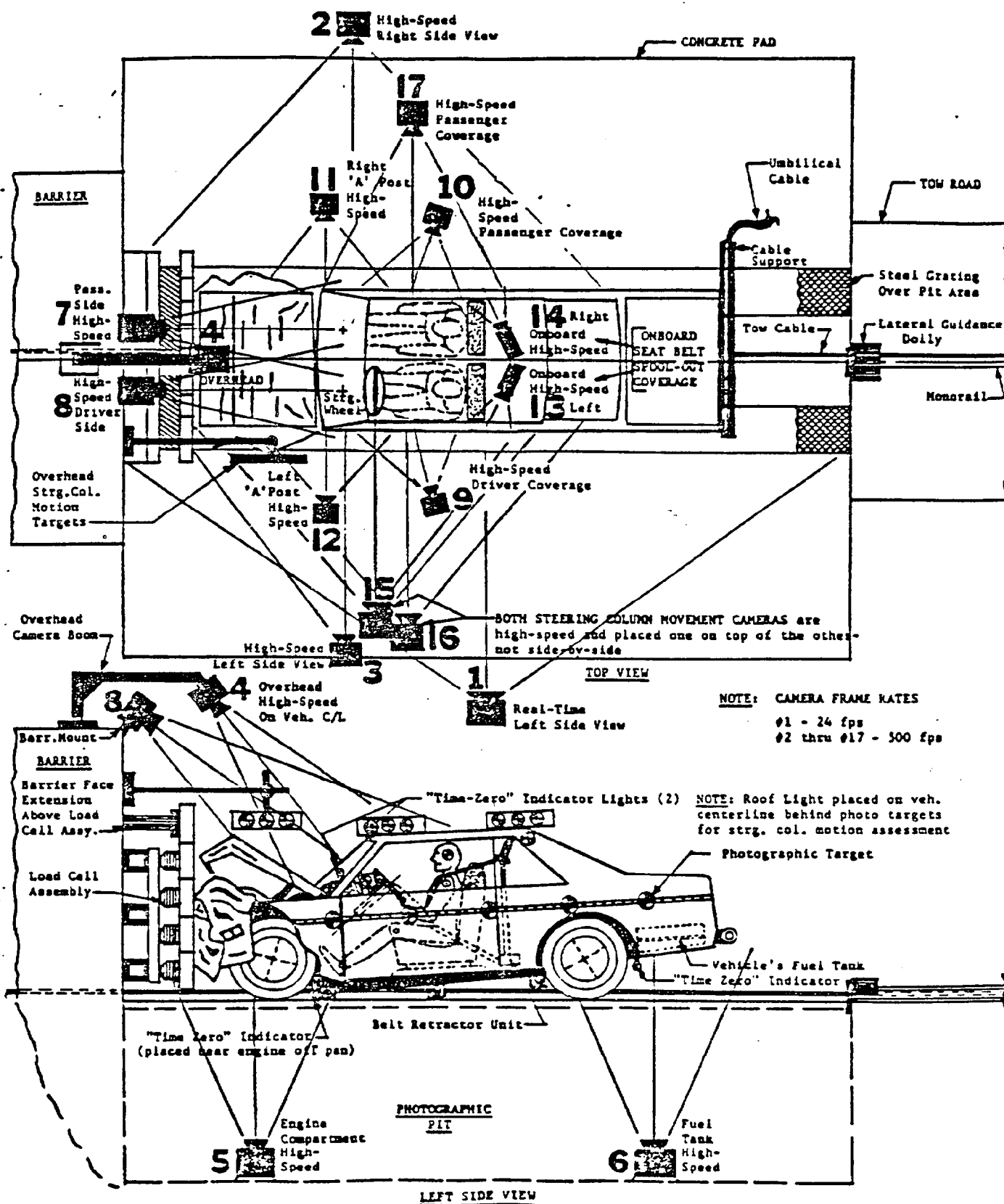
97. **References**

98. **Appendix**

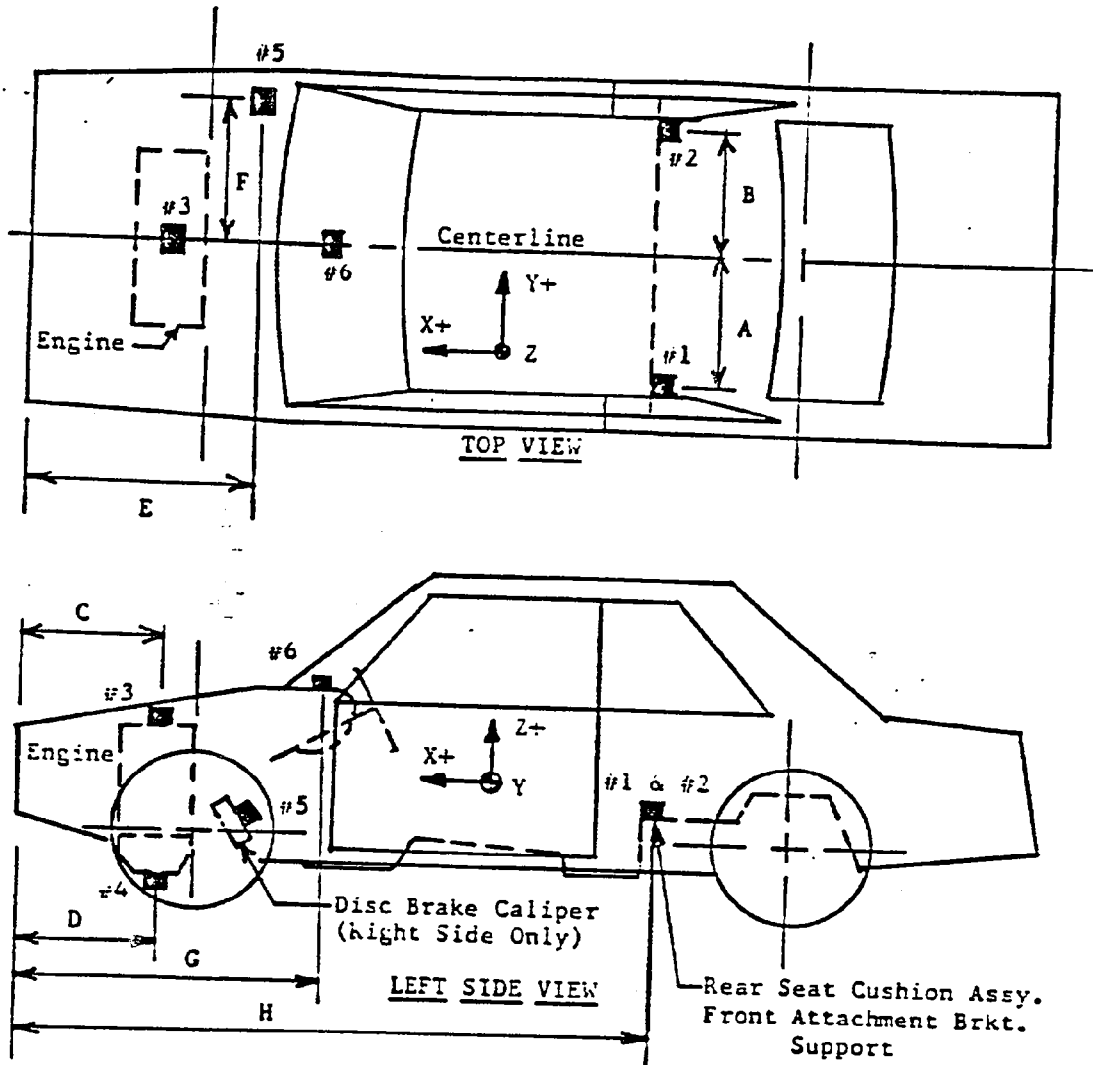
99. **Notes**

100. **References**

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	15.0
B	15.0
C	37.2
D	23.2
E	45.1
F	24.5
G	66.5
H	112.5

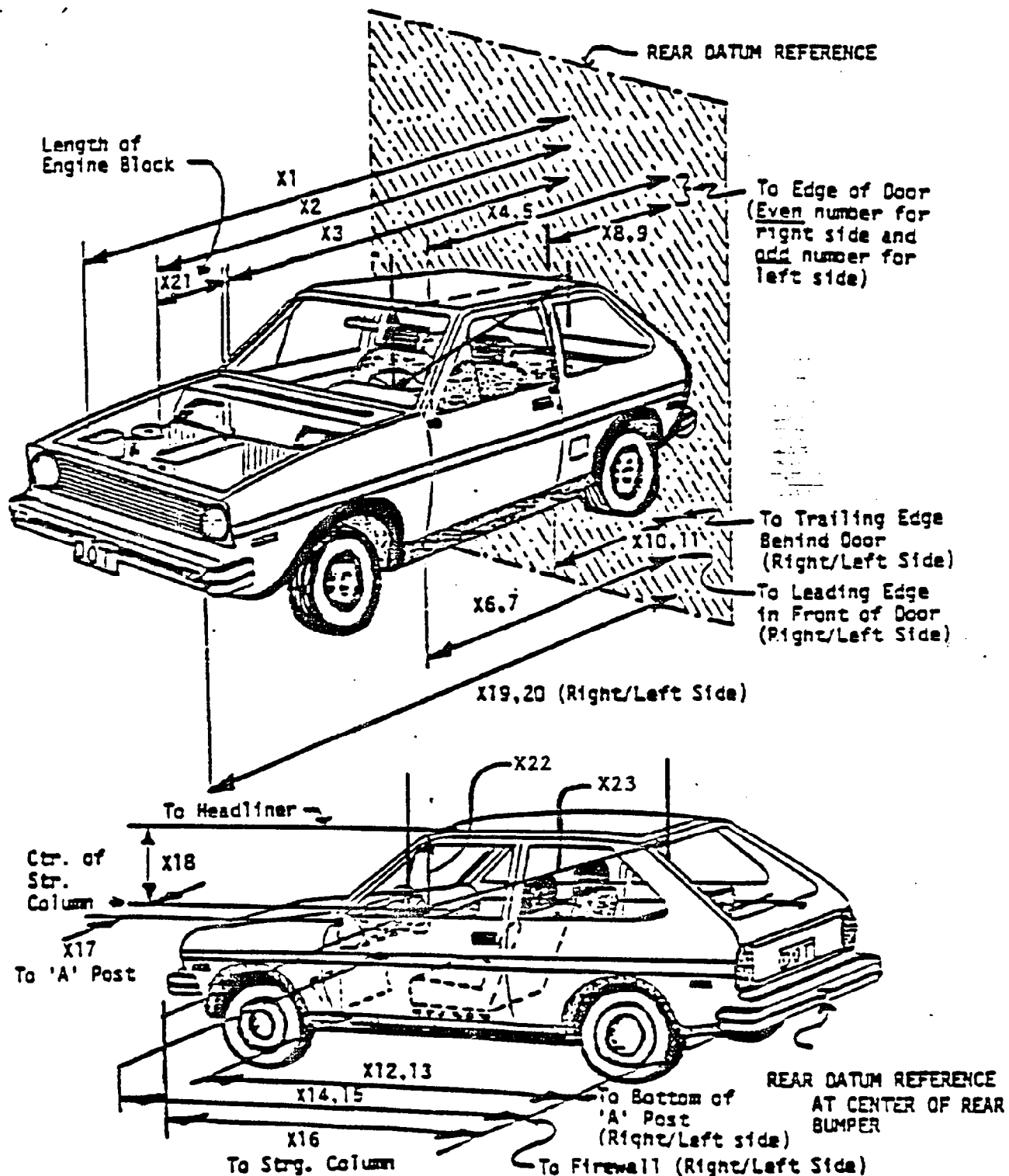
Loc. No.	Description	Maximum Value			
		X-	msec.	X+	msec.
1	Rear seat X-member @ Left Side	-28.71	65	4.01	150
2	Rear seat X-member @ Right Side	-28.64	64	3.15	149
3	Top of Engine Block	-136.41	33	57.20	43
4	Bottom of Engine	-137.22	33	35.15	42
5	Disc Brake Caliper @ Right Side	-65.45	50	21.72	68
6	Instrument Panel	-62.70	63	30.76	58
7	Vehicle c.g.	-47.25	63	5.01	44

Data Table No. 13 Test Vehicle Measurements

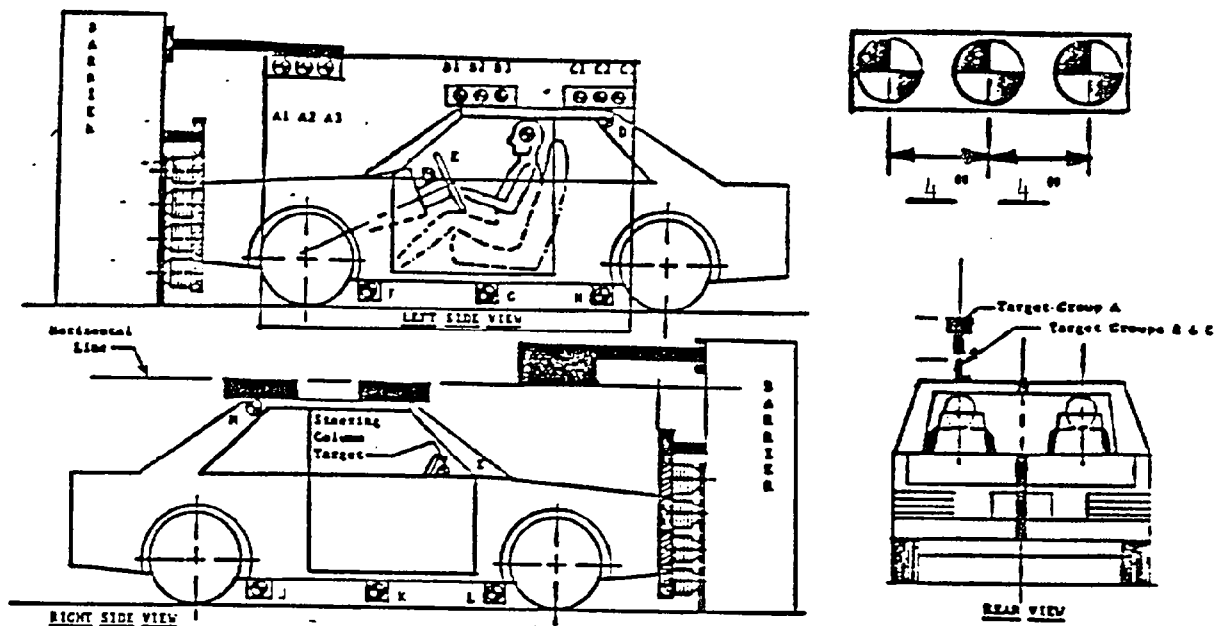
NO.	MEASUREMENT DESCRIPTION:	Pre-Test (in.)	Post-Test (in.)	Diff. (in.)
X1	Total Length of Test Vehicle at Centerline	175.4	147.0	28.4
X2	Rear Surface of Vehicle to Front of Engine	156.5	141.5	15.0
X3	Rear Surface of Vehicle to Firewall	129.5	118.1	11.4
X4	Rear Surface to Upr. Leading Edge of Right Door	114.6	114.3	0.3
X5	Rear Surface to Upr. Leading Edge of Left Door	114.6	114.5	0.1
X6	Rear Surface to Lwr. Leading Edge of Right Door	117.3	117.0	0.3
X7	Rear Surface to Lwr. Leading Edge of Left Door	117.3	116.5	0.8
X8	Rear Surface to Upr. Trailing Edge of Right Door	70.4	70.1	0.3
X9	Rear Surface to Upr. Trailing Edge of Left Door	70.4	70.3	0.1
X10	Rear Surface to Lwr. Trailing Edge of Right Door	70.5	69.8	0.7
X11	Rear Surface to Lwr. Trailing Edge of Left Door	70.5	69.1	1.4
X12	Rear Surface to Bottom of 'A' Post on Right Side	116.3	116.0	0.3
X13	Rear Surface to Bottom of 'A' Post on Left Side	116.3	115.5	0.8
X14	Rear Surface to Firewall on Right Side	128.9	124.1	4.8
X15	Rear Surface to Firewall on Left Side	129.4	125.6	3.8
X16	Rear Surface to Steering Column	99.4	96.8	2.6
X17	Center of Steering Column to 'A' Post	13.8	16.0	-2.2
X18	Center of Steering Column to Headlining	15.5	12.3	3.2
X19	Rear Surface to Right Side of Front Bumper	172.7	146.7	26.0
X20	Rear Surface to Left Side of Front Bumper	172.7	147.3	25.4
X21	Length of Engine Block	12.0	12.0	0.0
X22	Strg. Whl. Hub C/L to W/Shld. Header Interior Trim Moulding	15.0	11.8	3.2
X23	Strg. Whl. Hub C/L to Rr. Wdo. Upper Interior Trim Moulding	49.5	45.0	4.5

NOTE: Measurements are not done in the same location as Accident Investigation measurements. Therefore, measurements may not be equal.

Data Table No. 13 (Cont'd) Test Vehicle Measurements



Data Table No. 14 Pre-Test Vehicle Target Locations



BARRIER TARGETS	'X' From Imag. Barrier Face Vertical Plane	'Y' From Monorail C/L	'Z' Above Ground
A1	39.6	20.1	64.5
A2	43.6	20.1	64.5
A3	47.6	20.1	64.5

VEHICLE TARGETS	'X' From Imag. Barrier Face Vertical Plane	'Y' From Vehicle C/L	'Z' Above Ground
B1	82.3	13.1	51.2
B2	86.3	13.1	51.2
B3	90.3	13.1	51.2
C1	111.6	13.1	51.0
C2	115.6	13.1	51.0
C3	119.6	13.1	51.0
D	117.0	23.0	47.5
E	70.0	12.8	34.0
F	60.5	26.0	6.1
G	85.0	26.0	6.0
H	109.7	26.1	6.0
J	109.6	26.1	6.0
K	85.1	26.0	6.0
L	60.3	26.0	6.1
M	117.2	23.1	47.4

NOTE: Diameter of all photo targets is 4".

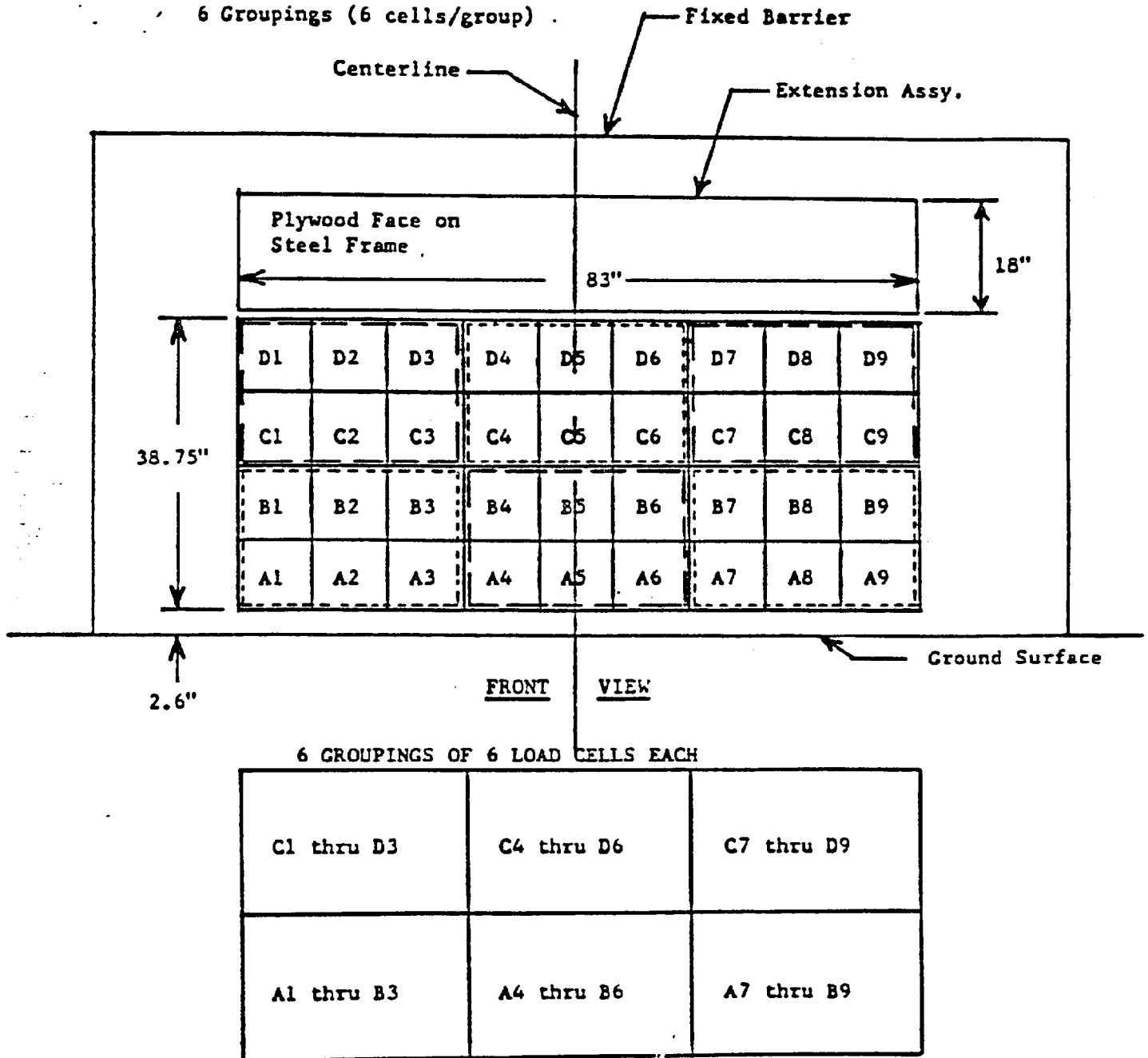
Data Table No. 15 Load Cell Locations on Fixed Barrier

36 Load Cells

4 Rows

9 Columns

6 Groupings (6 cells/group)



- 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: SUBARU/XT/2 DOOR

VEH. NHTSA NO.: MG5502; VIN: JF1AX42B9GB307354

MODEL YEAR: 1986; BUILD DATE: 11/85; TEST DATE: 06/18/86

VEH. SIZE CATEGORY: COMPACT; TEST WEIGHT: 2,759 lb

VEH. WHEELBASE: 97.0; FRONT OVERHANG: 39.8; OVERALL WIDTH: 67.3

ACCELEROMETER DATA:

LOCATION: LEFT REAR FLOOR PAN

CALIBRATION PROCEDURE: VOLTAGE INSERTION

LINEARITY: 3%; INTEGRATION ALGORITHM: AREA SUMMUATION

VEH. IMPACT SPEED: 35.09 mph; TIME OF SEPARATION: 150 msec

VELOCITY CHANGE: 41.97 mph

☒ COLLISION DEFORMATION CLASSIFICATION (CDC) CODE:

F (Frontal) 12FDEW5

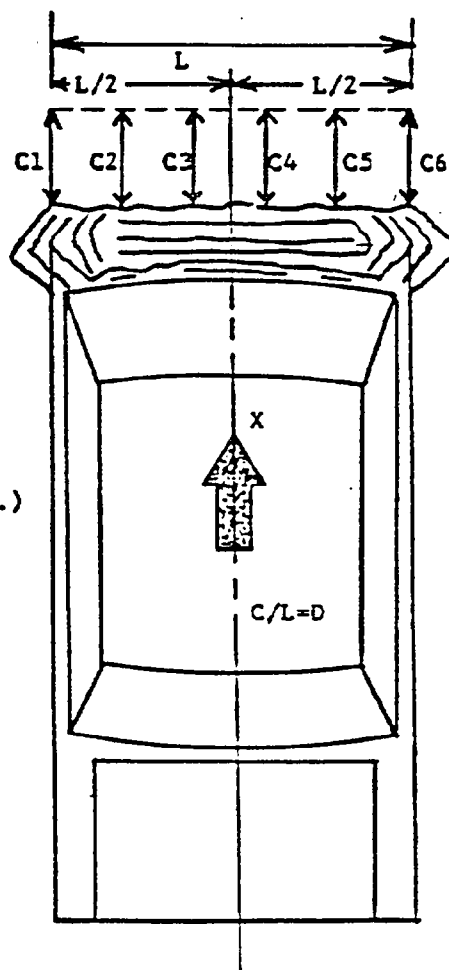
CRUSH DEPTH
DIMENSIONS:

C1=	<u>25.4</u>	<u>inches</u>
C2=	<u>27.9</u>	<u>inches</u>
C3=	<u>28.4</u>	<u>inches</u>
C4=	<u>28.3</u>	<u>inches</u>
C5=	<u>27.5</u>	<u>inches</u>
C6=	<u>26.0</u>	<u>inches</u>

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

LENGTH OF DAMAGED
REGION:

L = 57.5 inches



APPENDIX A

PHOTOGRAPHS

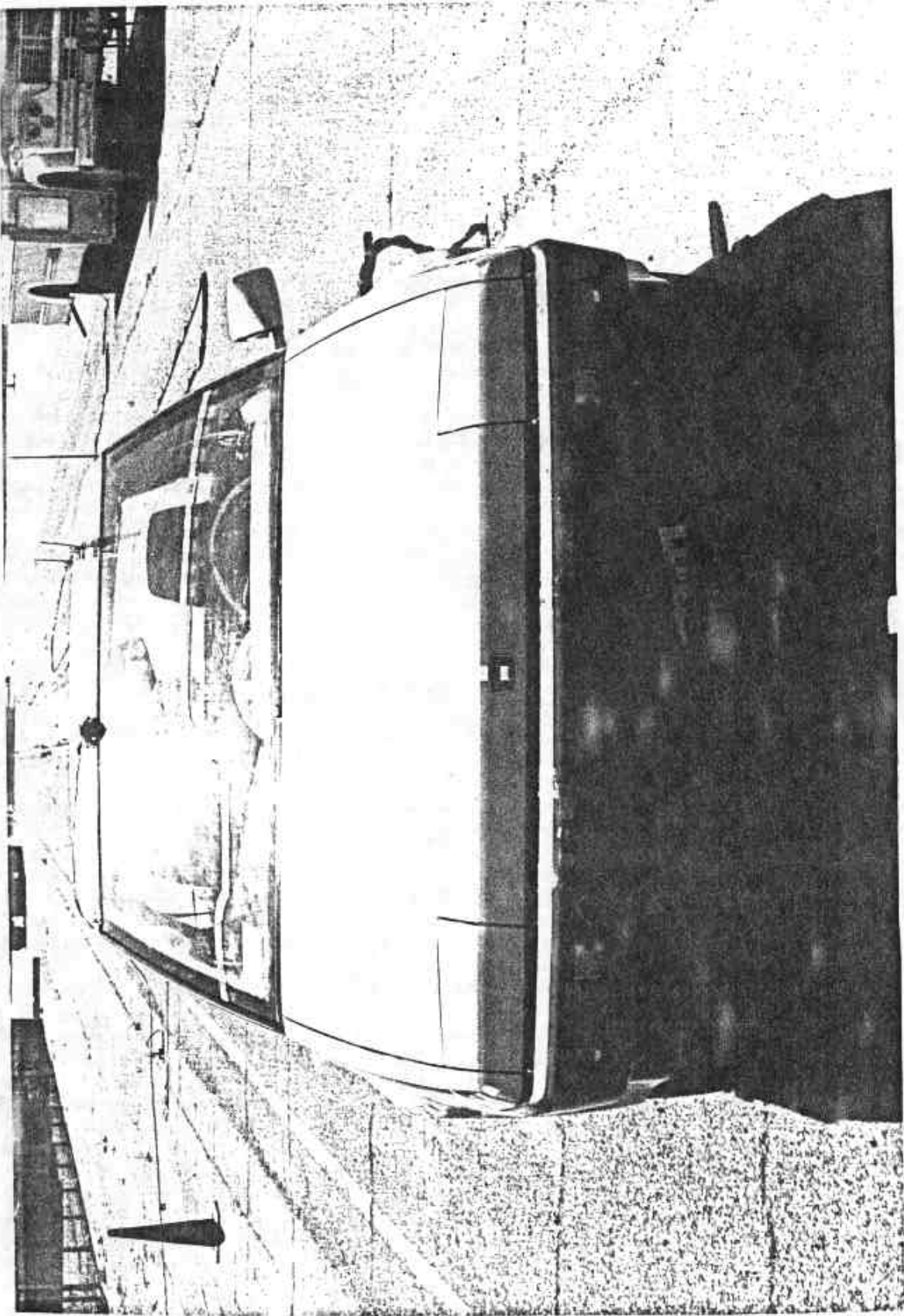
PRETEST FRONT VIEW
POSTTEST FRONT VIEW
PRETEST LEFT SIDE VIEW
POSTTEST LEFT SIDE VIEW
PRETEST RIGHT SIDE VIEW
POSTTEST RIGHT SIDE VIEW
PRETEST RIGHT FRONT 3/4 VIEW
POSTTEST RIGHT FRONT 3/4 VIEW
PRETEST LEFT REAR 3/4 VIEW
POSTTEST LEFT REAR 3/4 VIEW
POSTTEST TOP VIEW (Vehicle on Rollover Machine)
PRETEST WINDSHIELD VIEW
POSTTEST WINDSHIELD VIEW
PRETEST ENGINE COMPARTMENT VIEW
POSTTEST ENGINE COMPARTMENT VIEW
PRETEST FUEL FILLER CAP VIEW
PRETEST FRONT UNDERBODY VIEW
POSTTEST FRONT UNDERBODY VIEW
PRETEST REAR UNDERBODY VIEW
POSTTEST REAR UNDERBODY VIEW
PRETEST DRIVER DUMMY POSITION VIEW
POSTTEST DRIVER DUMMY POSITION VIEW
PRETEST PASSENGER DUMMY POSITION VIEW
POSTTEST PASSENGER DUMMY 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)

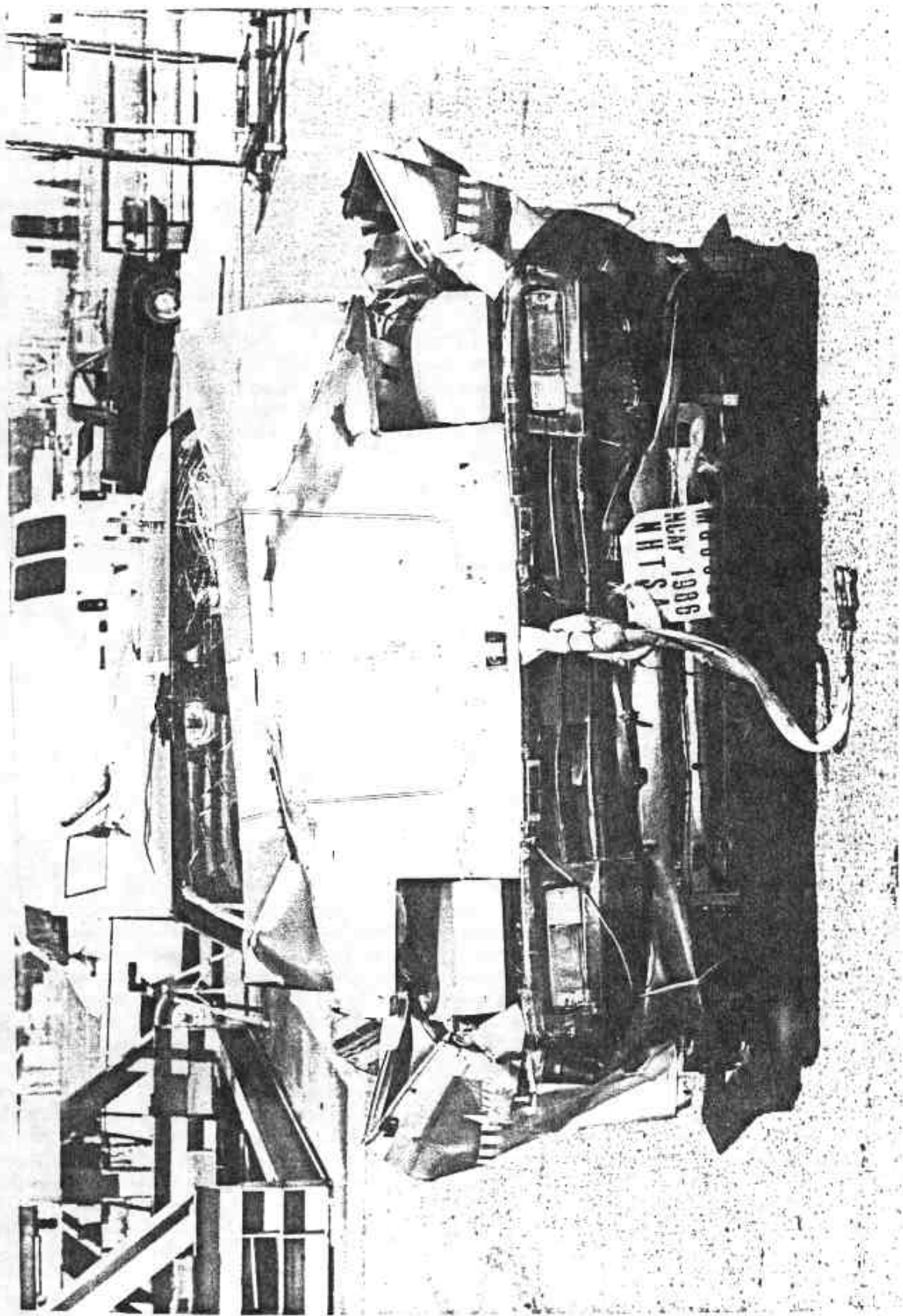
POSTTEST DRIVER DUMMY HEAD/KNEE CONTACT AREA

POSTTEST STEERING COLUMN HUB/RIM CONTACT BY DUMMY DRIVER

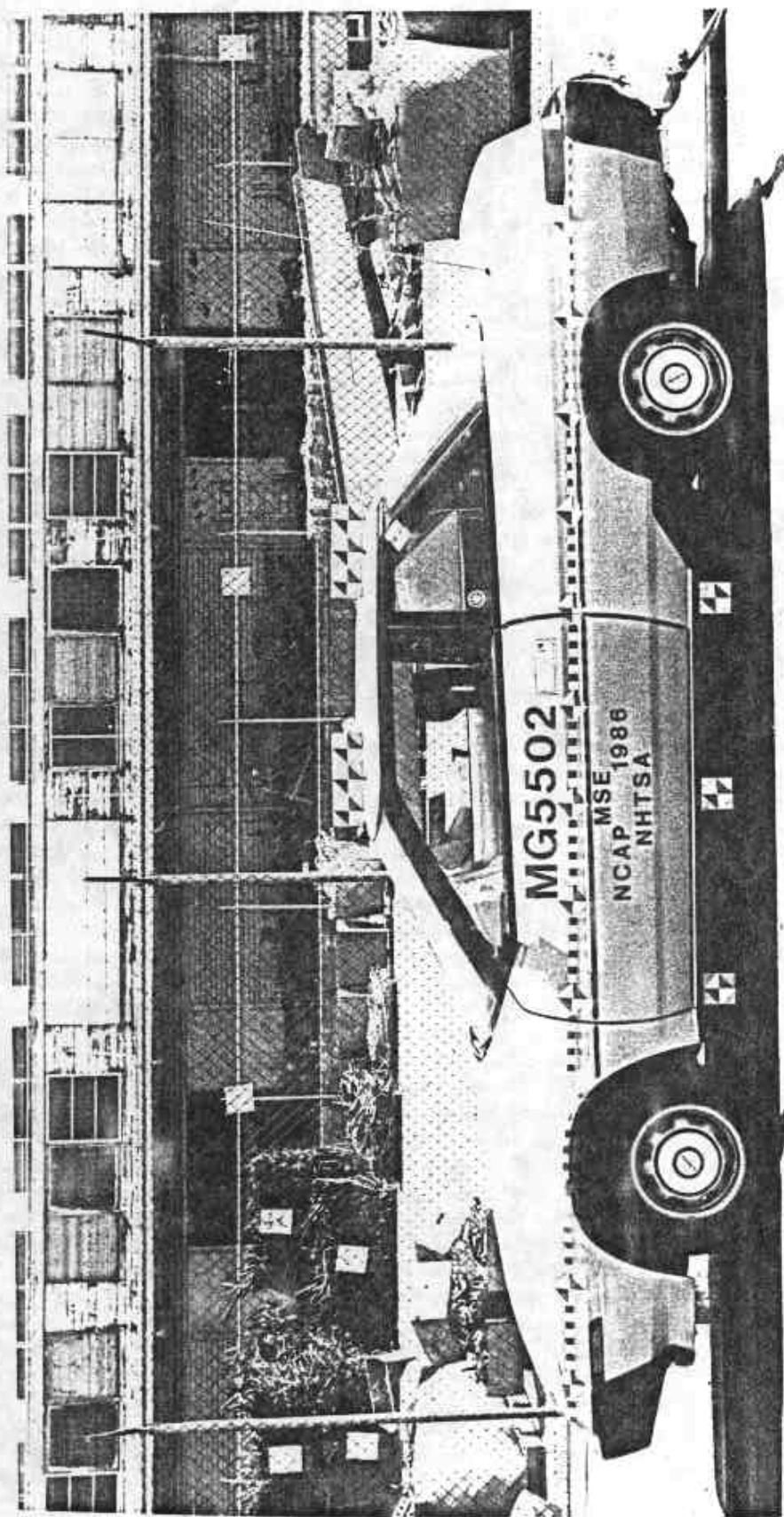
- POSTTEST PASSENGER DUMMY KNEE CONTACT



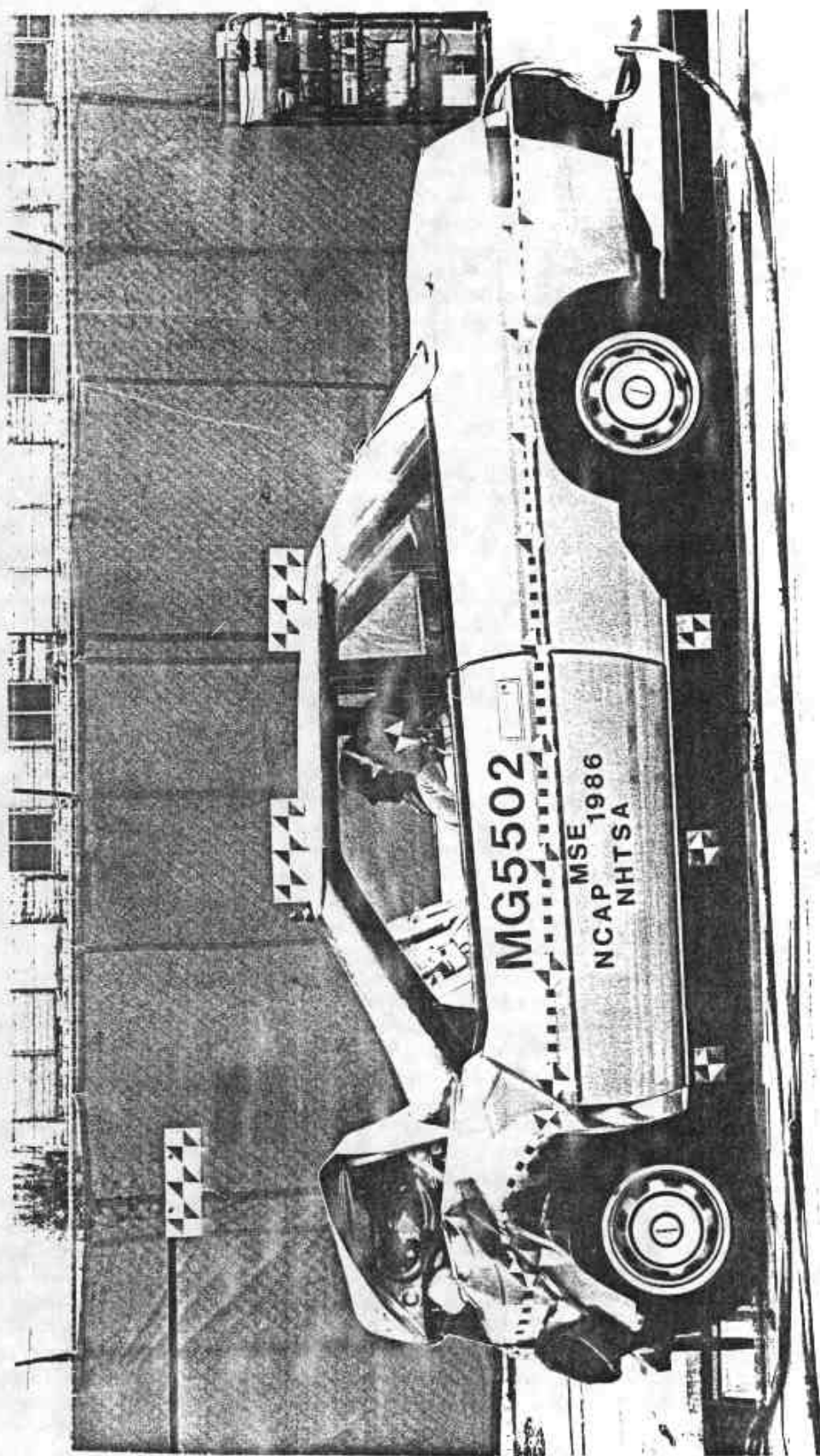
PRETEST FRONT VIEW



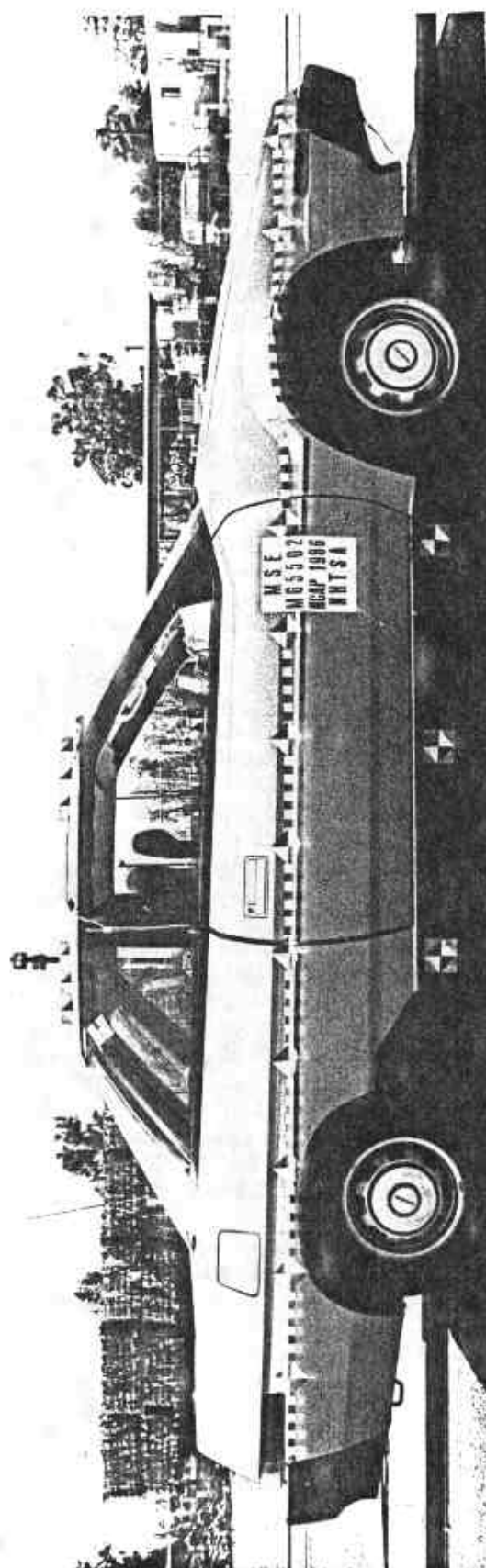
POSTTEST FRONT VIEW



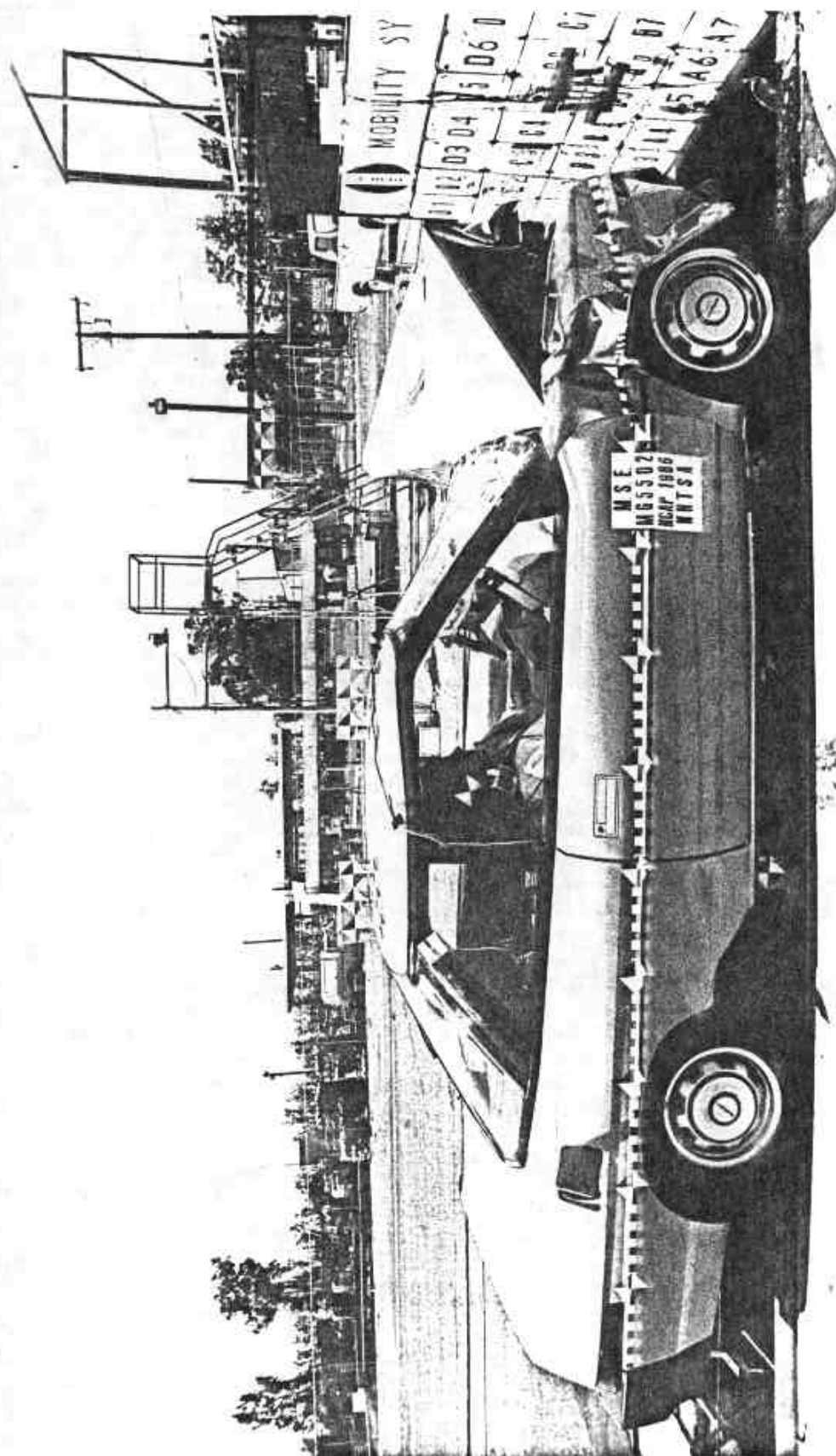
PRETEST LEFT SIDE VIEW



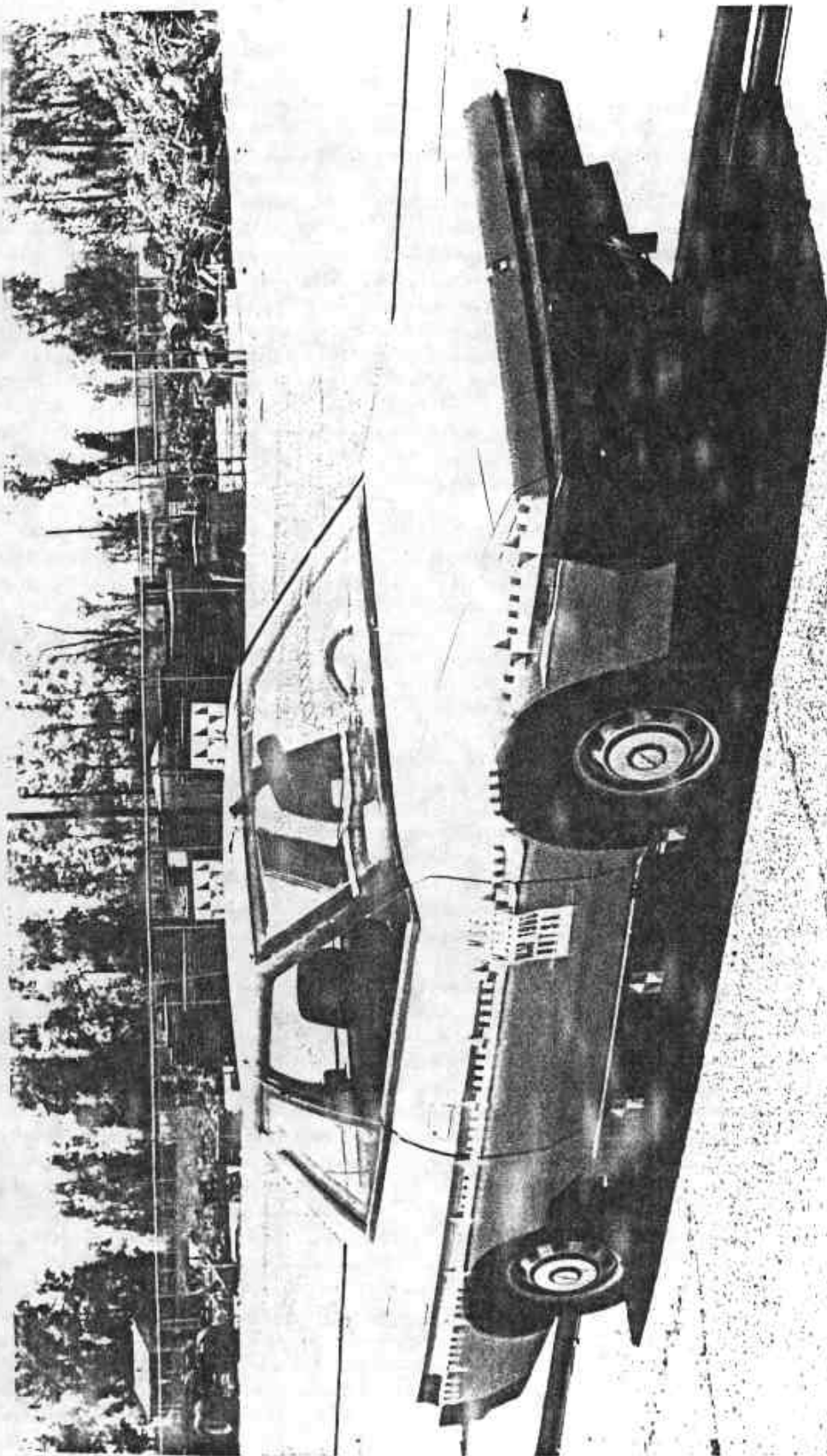
POSTTEST LEFT SIDE VIEW



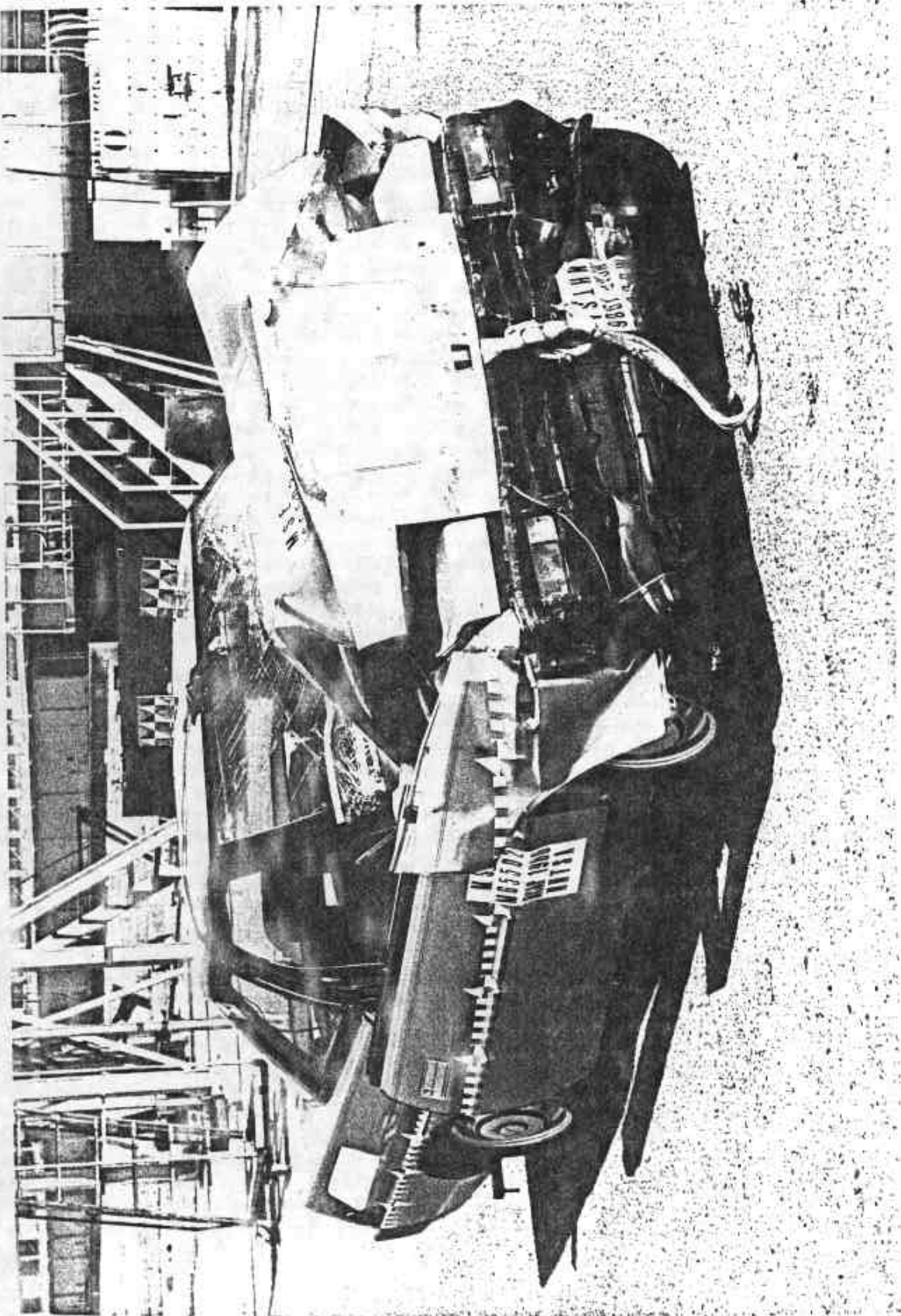
PRETEST RIGHT SIDE VIEW



POSTTEST RIGHT SIDE VIEW



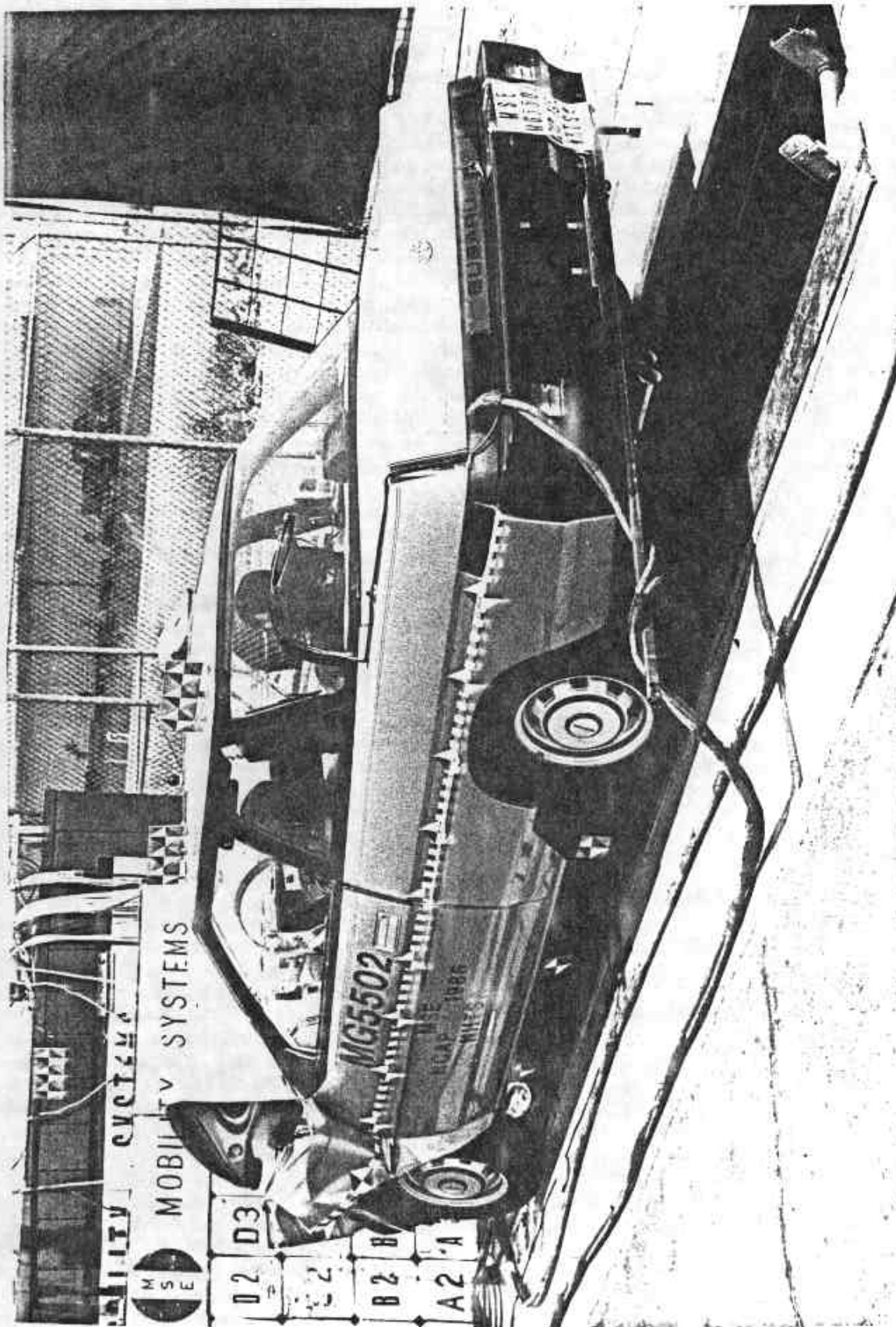
PRETEST RIGHT FRONT 3/4 VIEW



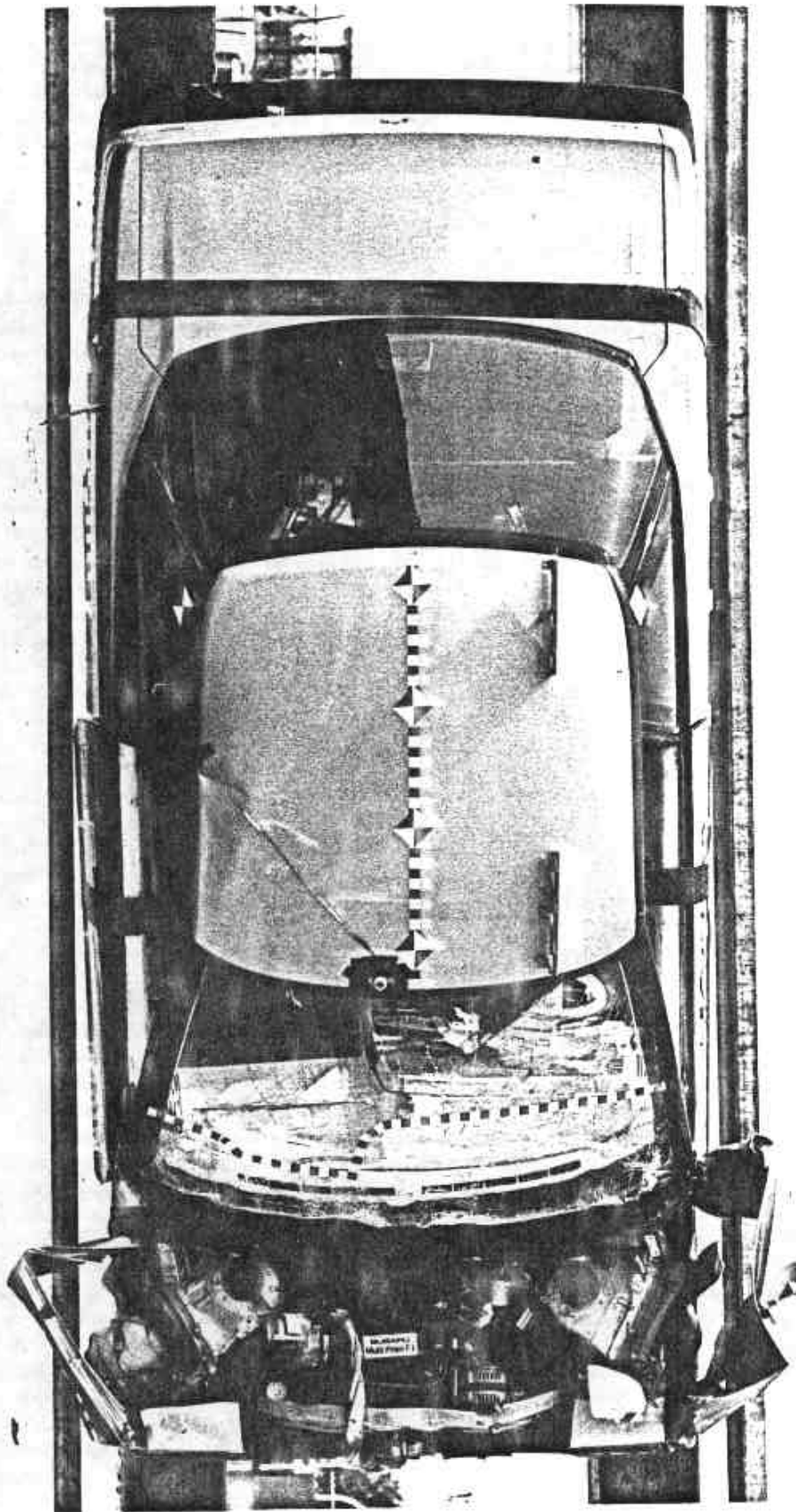
POSTTEST RIGHT FRONT 3/4 VIEW



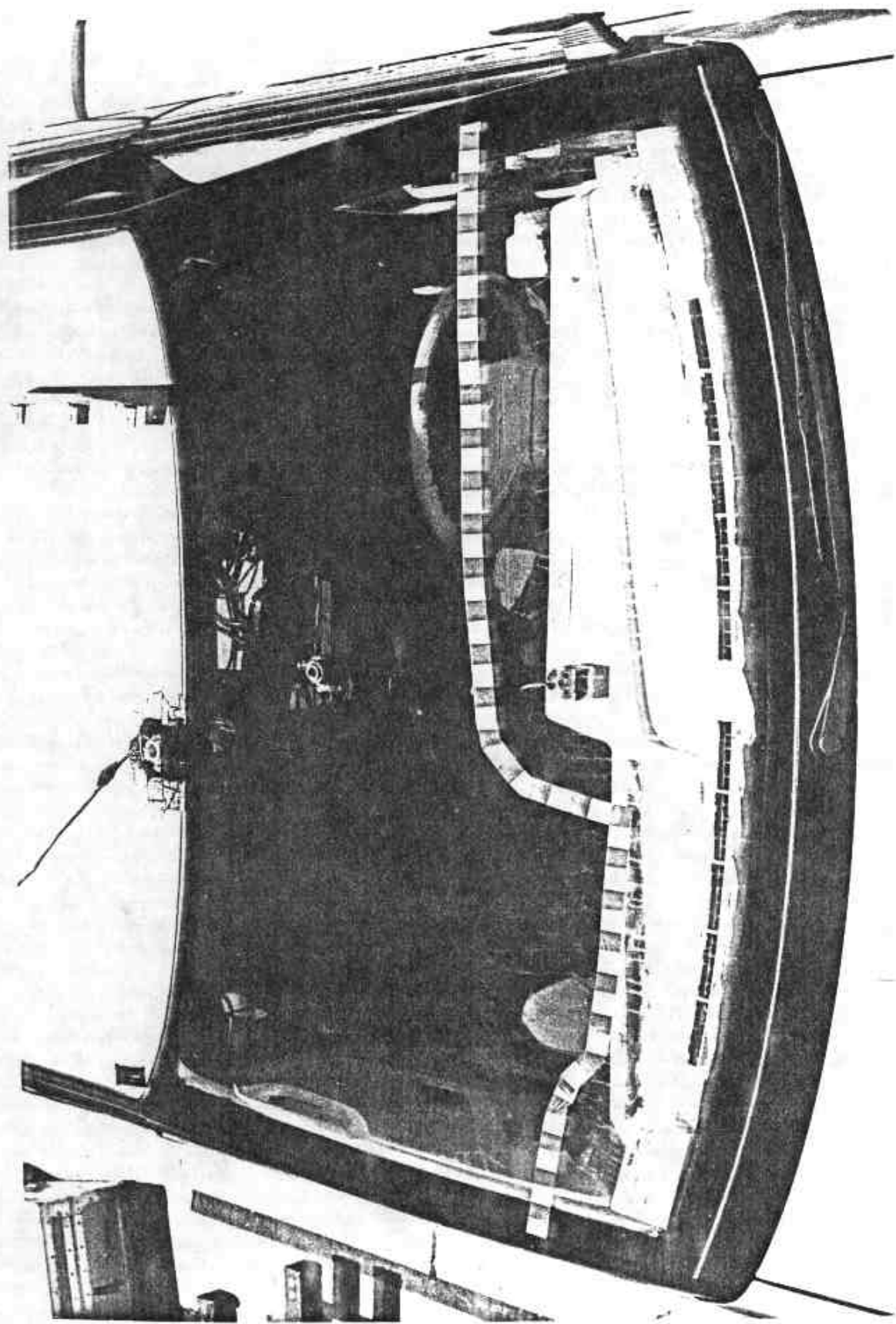
PRETEST LEFT REAR 3/4 VIEW



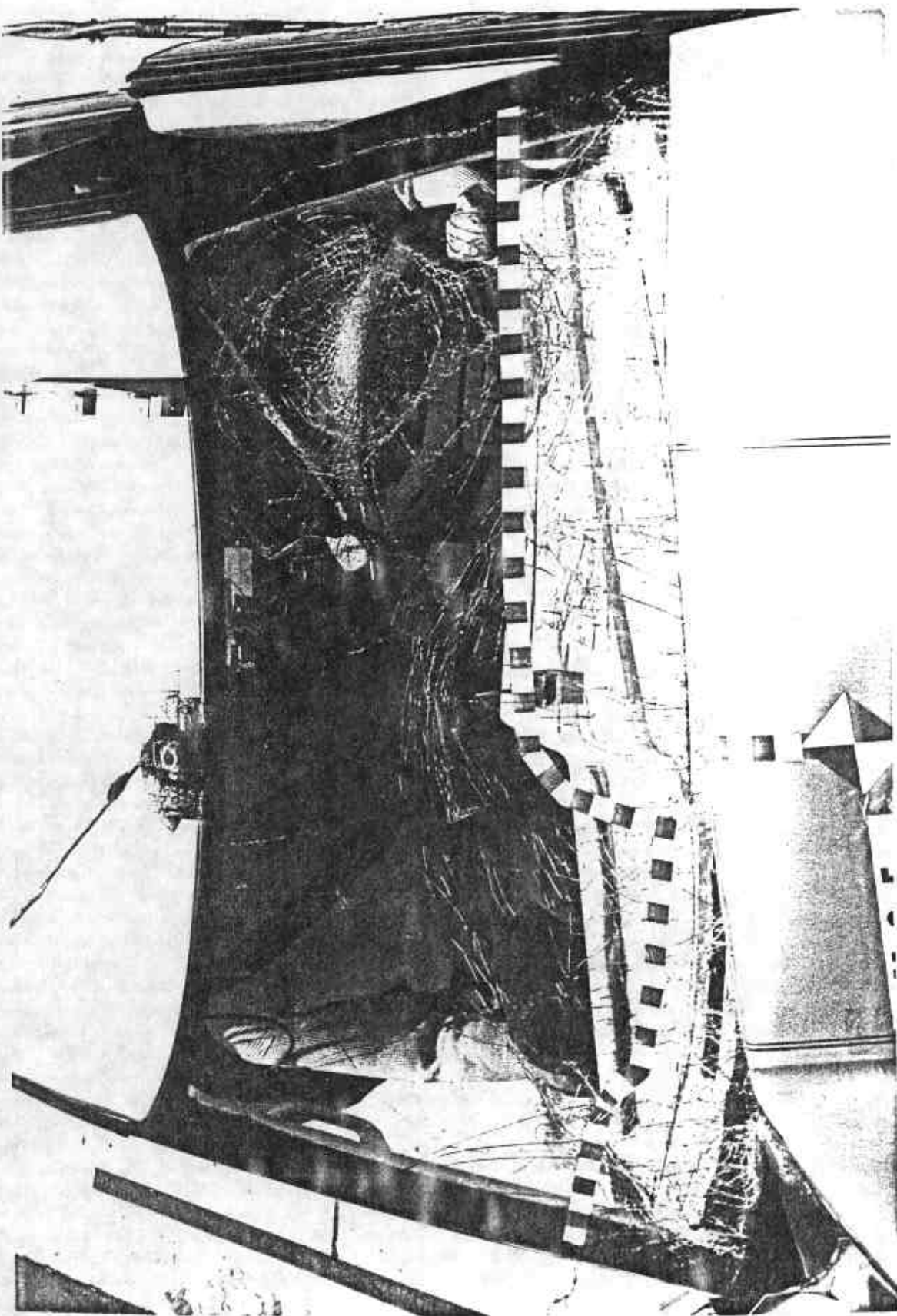
POSTTEST LEFT REAR 3/4 VIEW



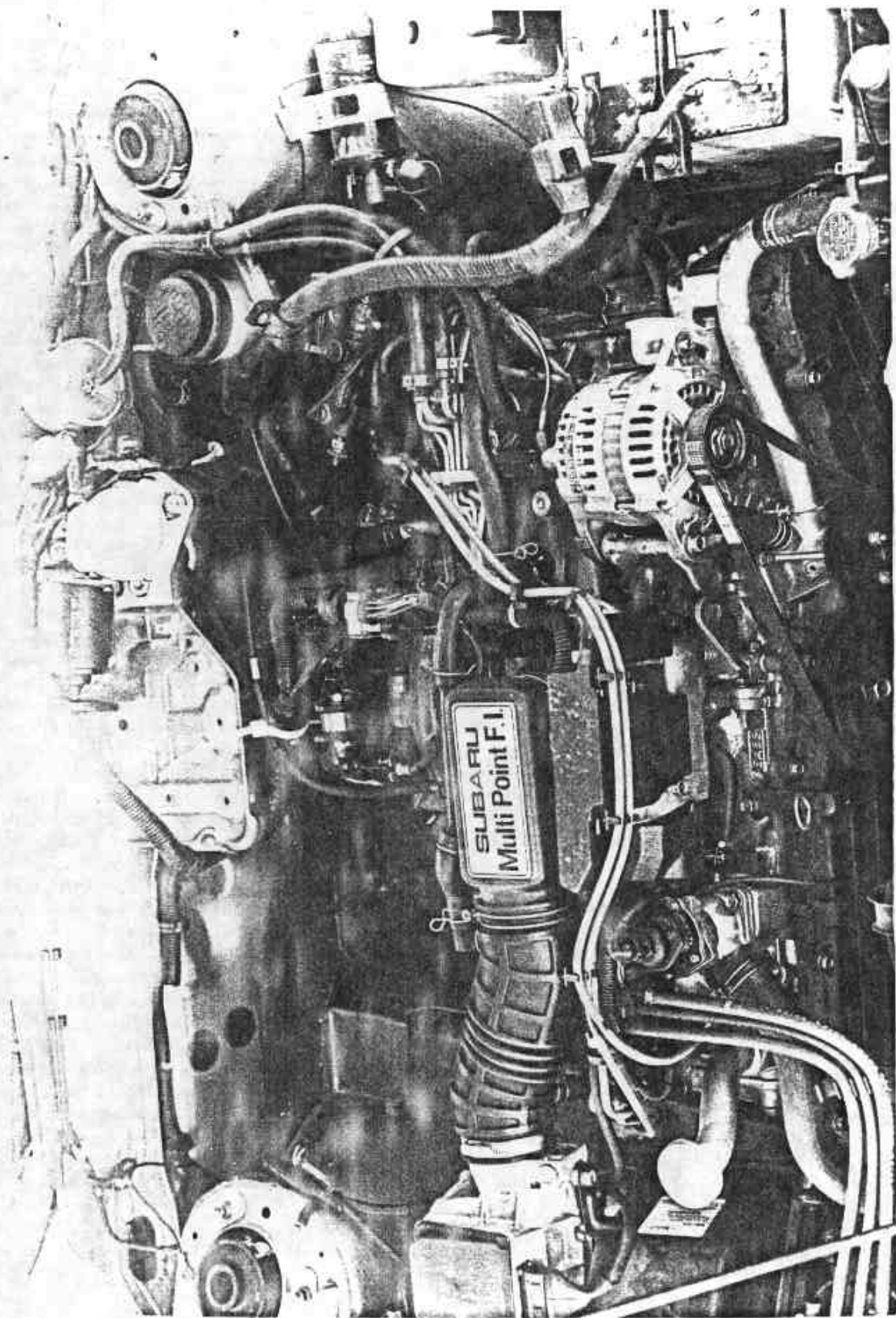
POSTTEST TOP VIEW (Vehicle on Rollover Machine)



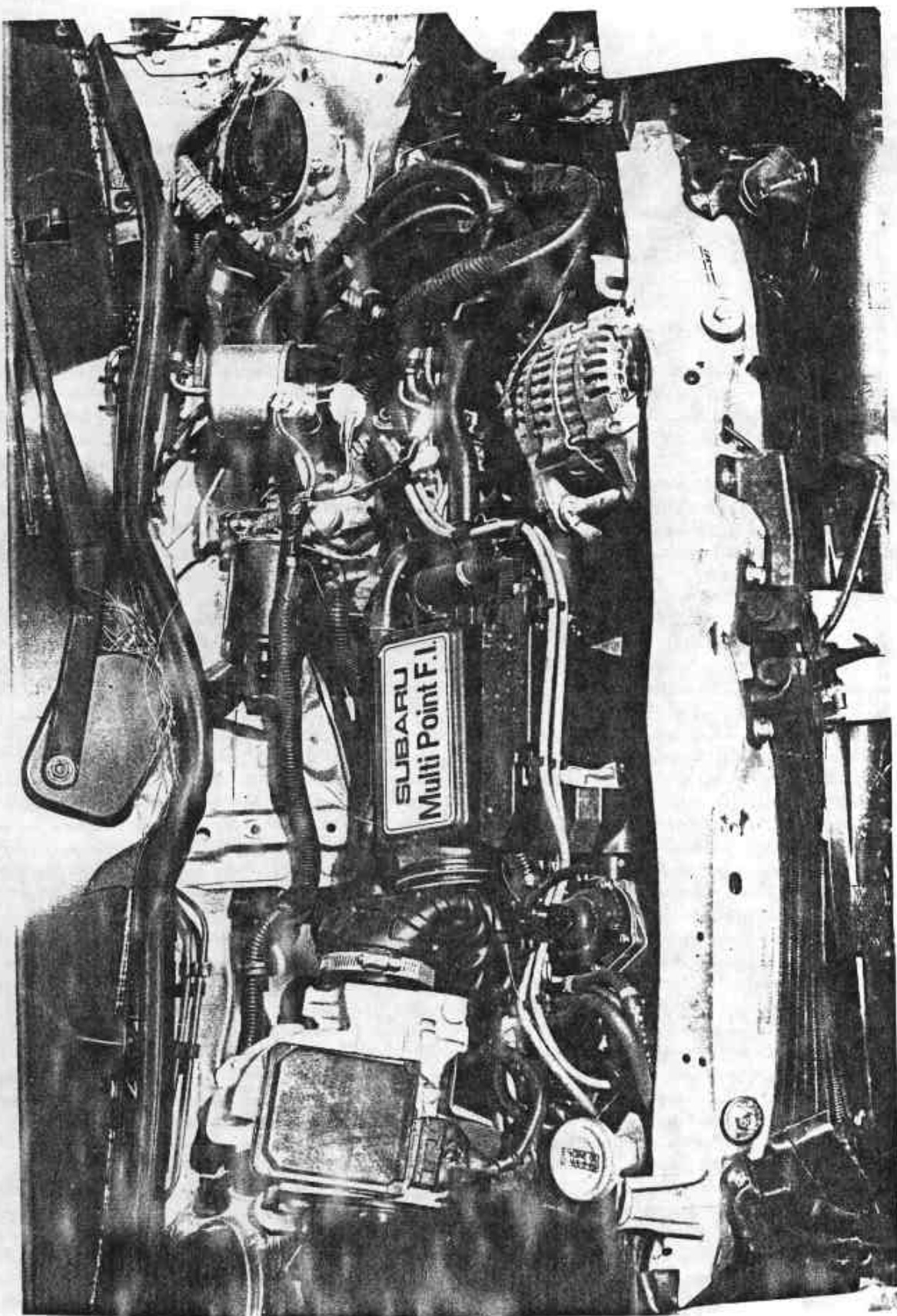
PRETEST WINDSHIELD VIEW



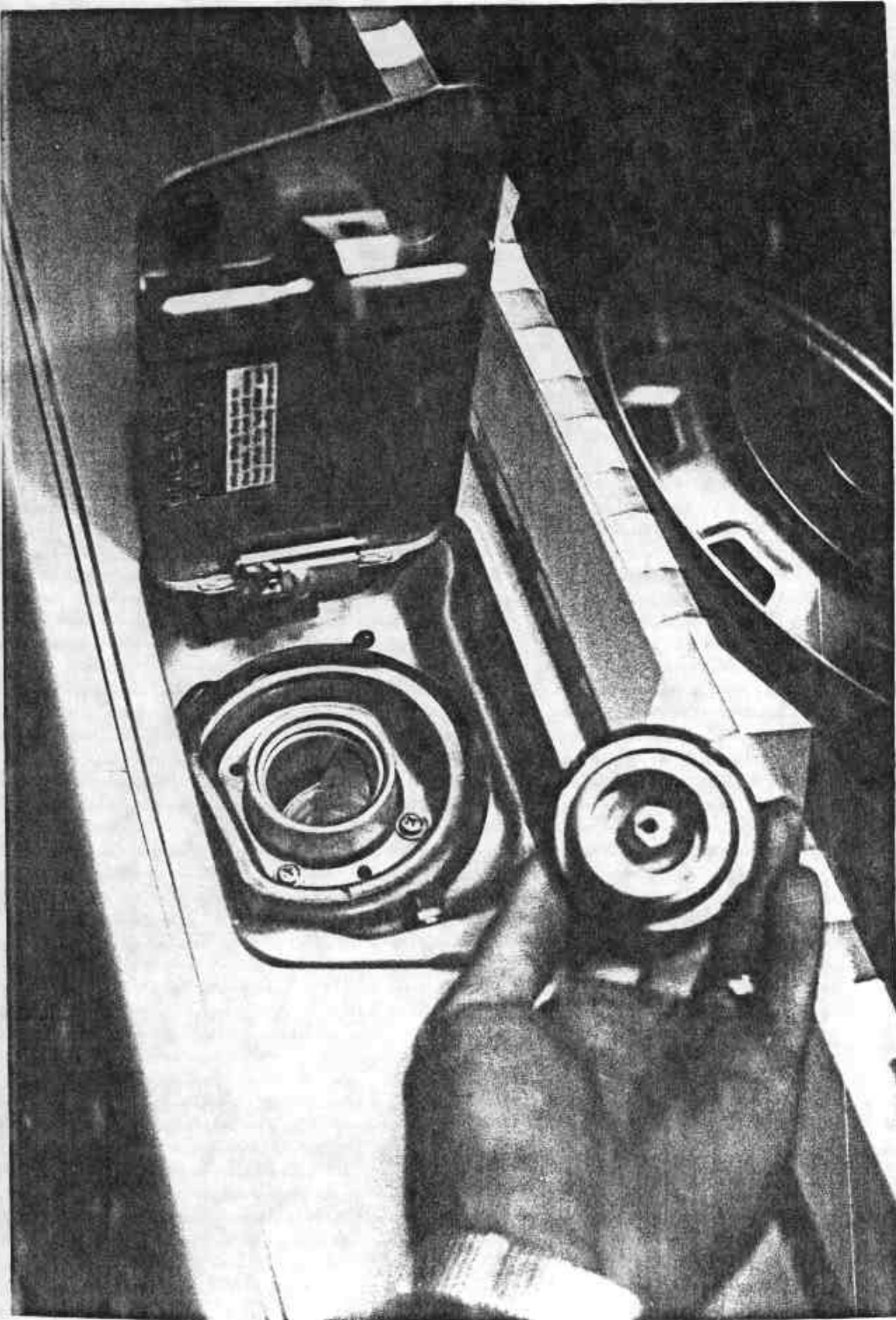
POSTTEST WINDSHIELD VIEW

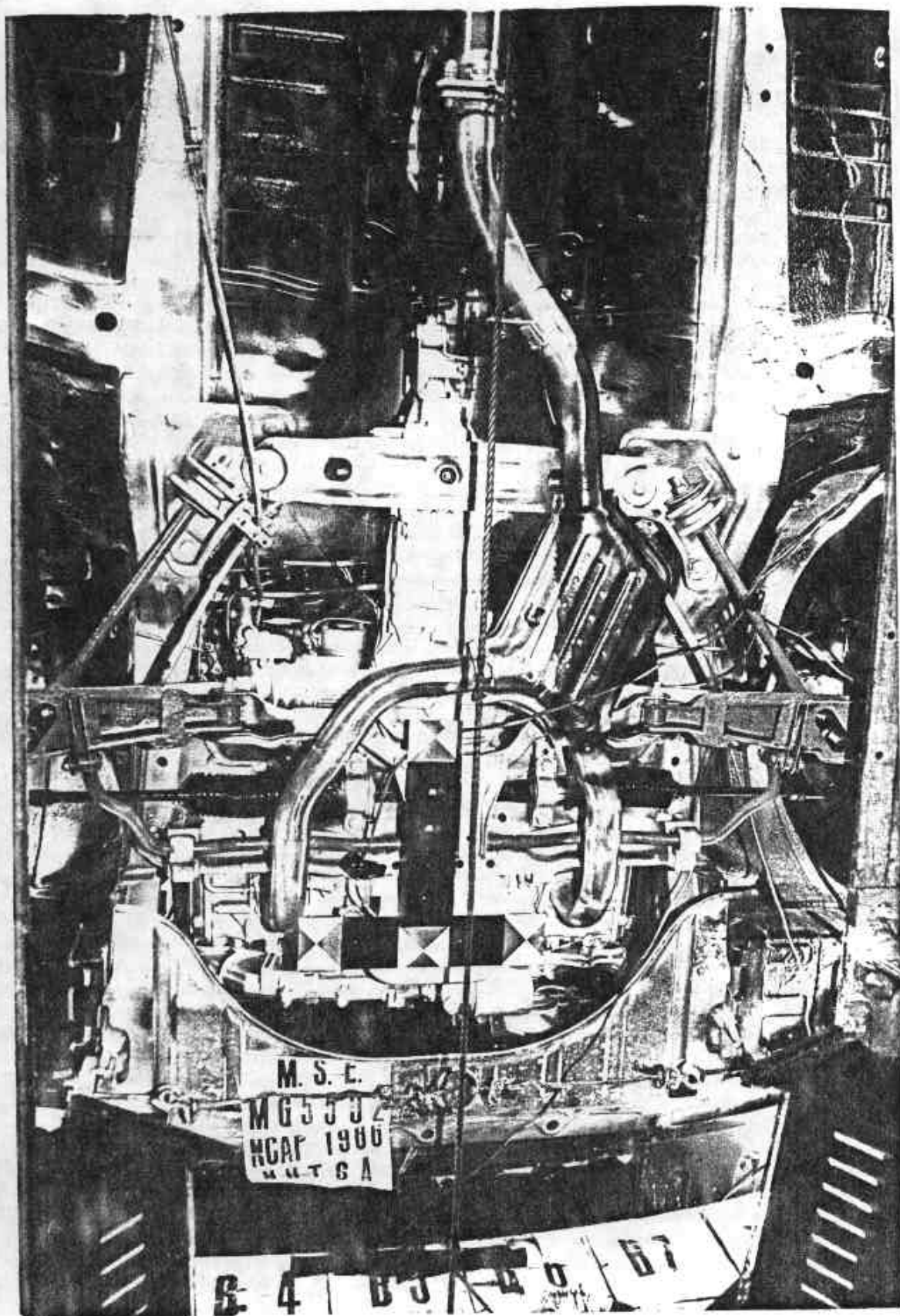


PRETEST ENGINE COMPARTMENT VIEW

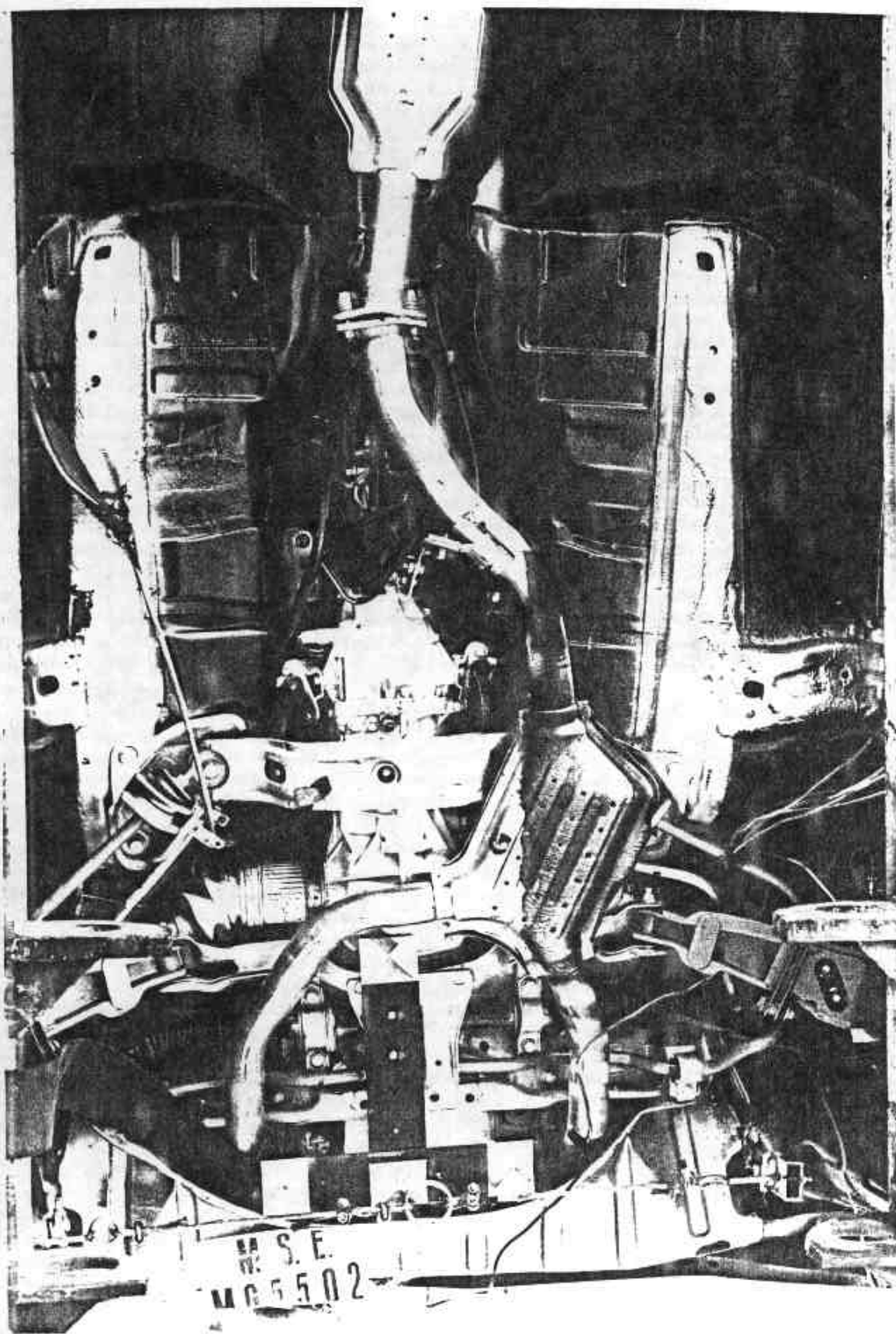


POSTTEST ENGINE COMPARTMENT VIEW

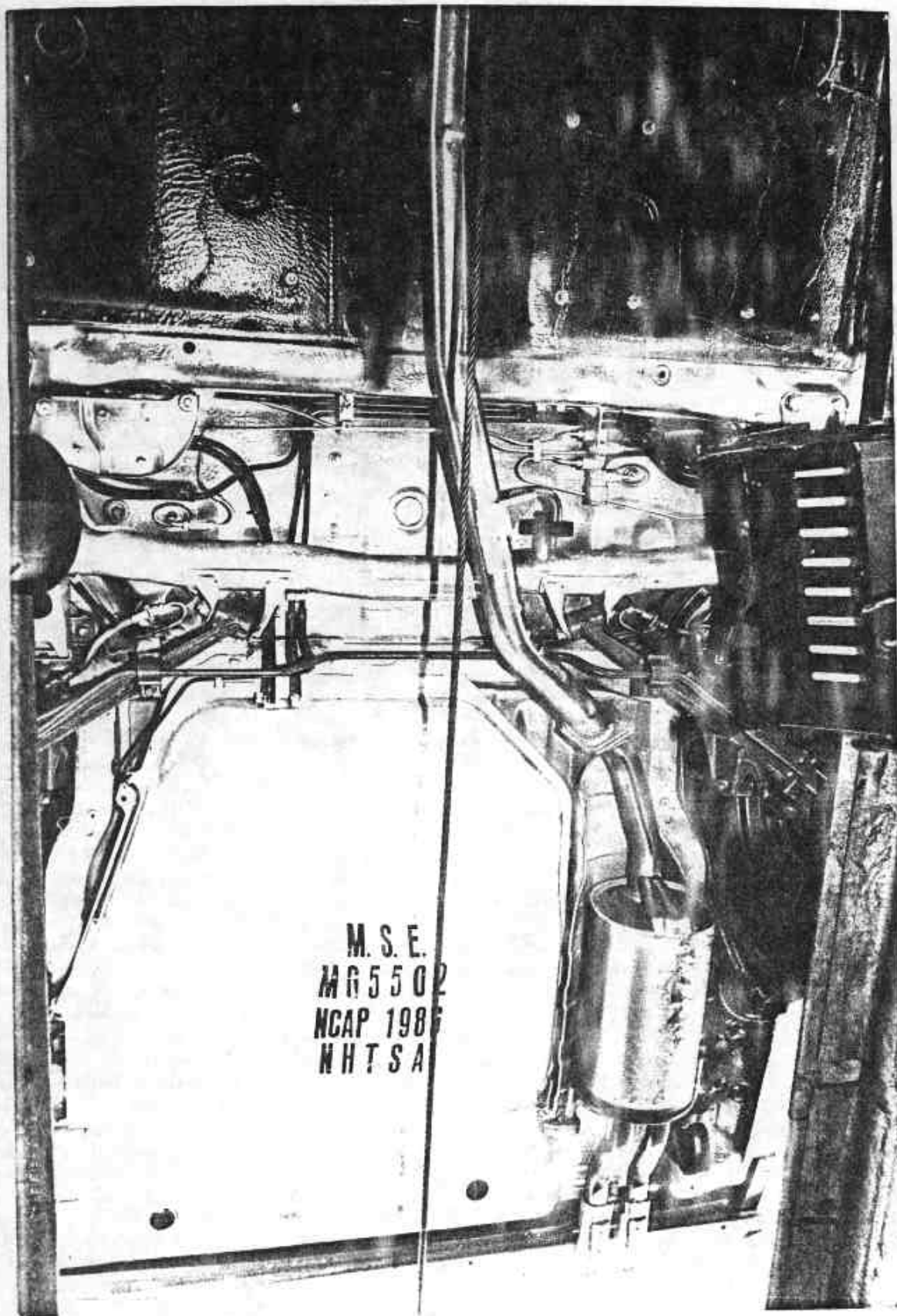




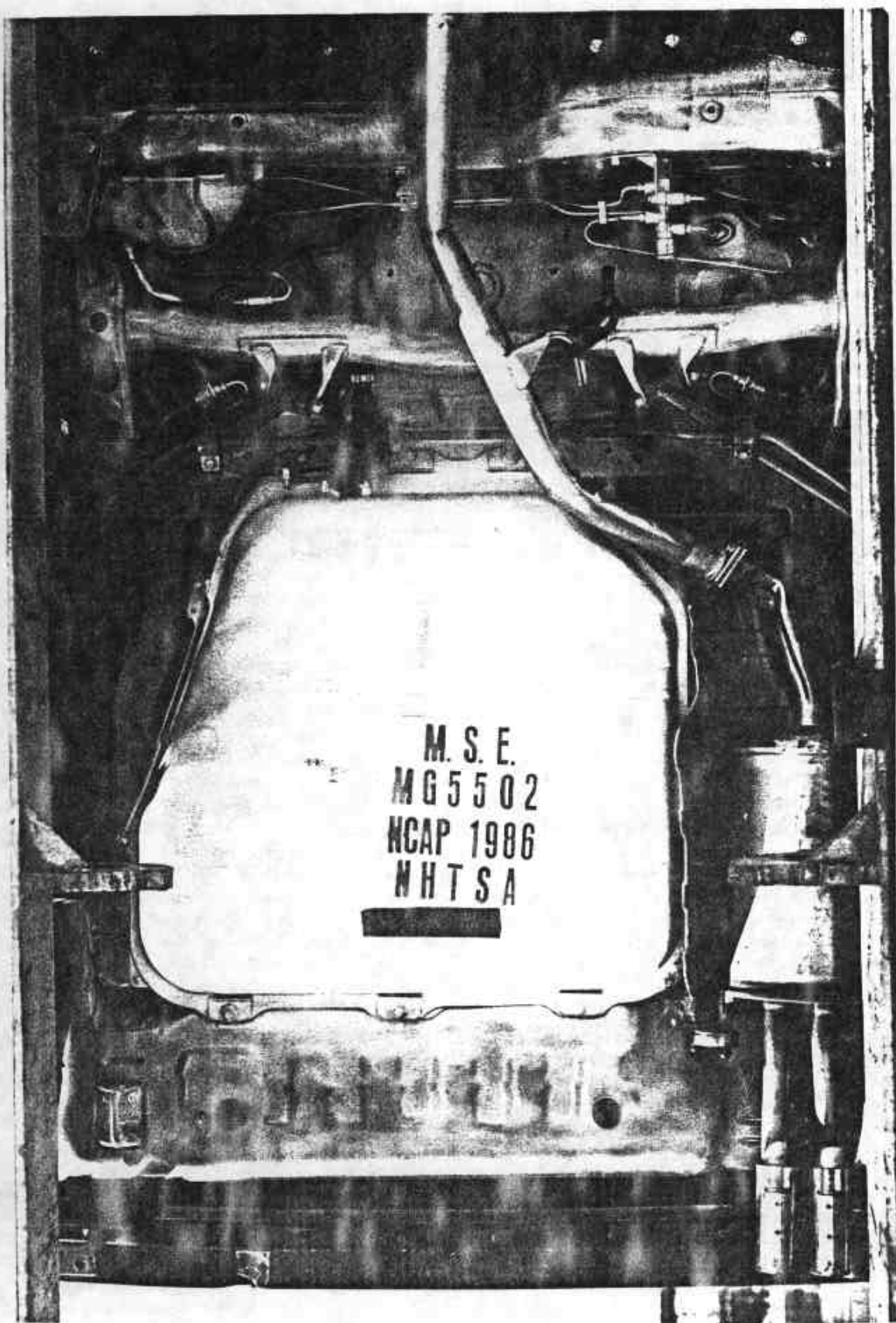
PRETEST FRONT UNDERBODY VIEW



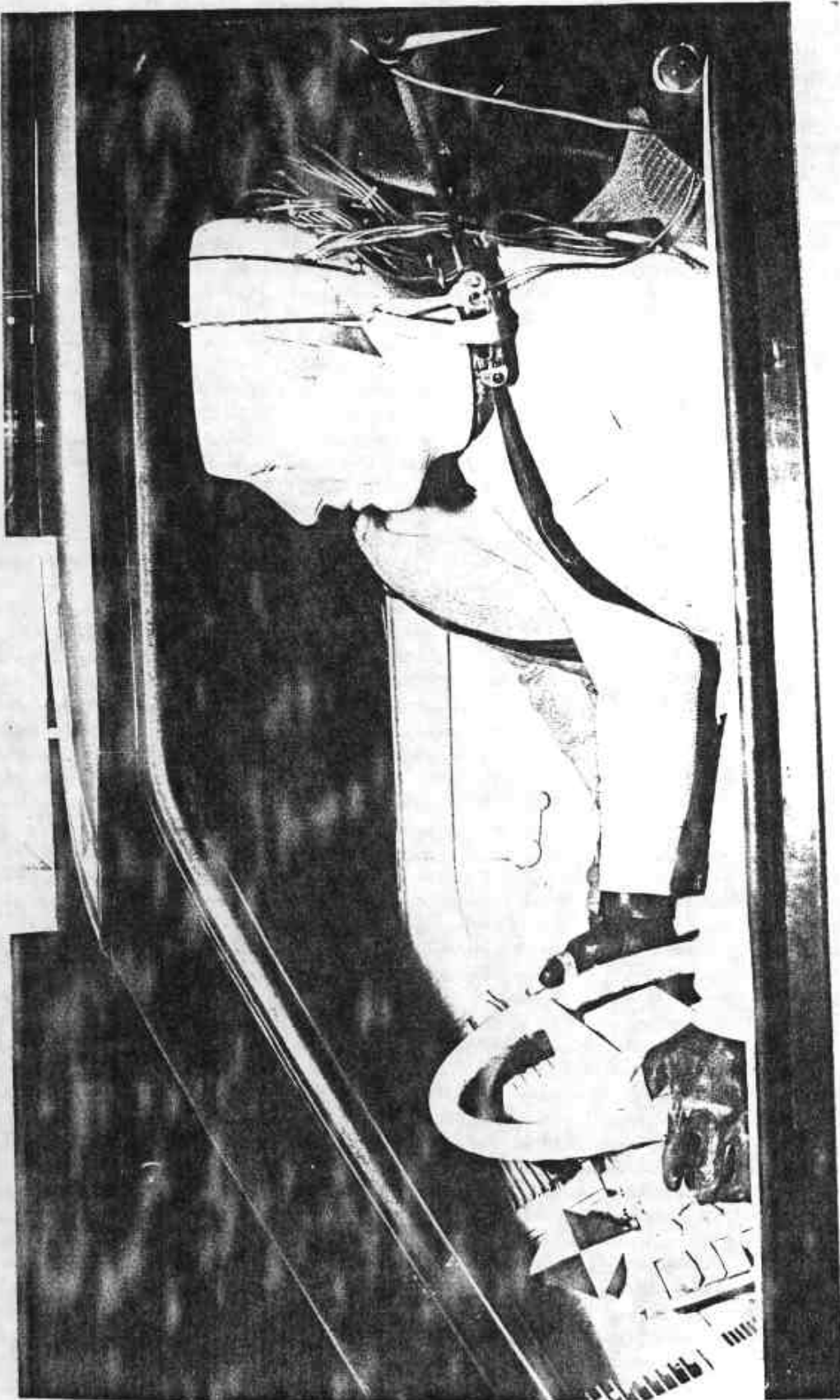
POSTTEST FRONT UNDERBODY VIEW



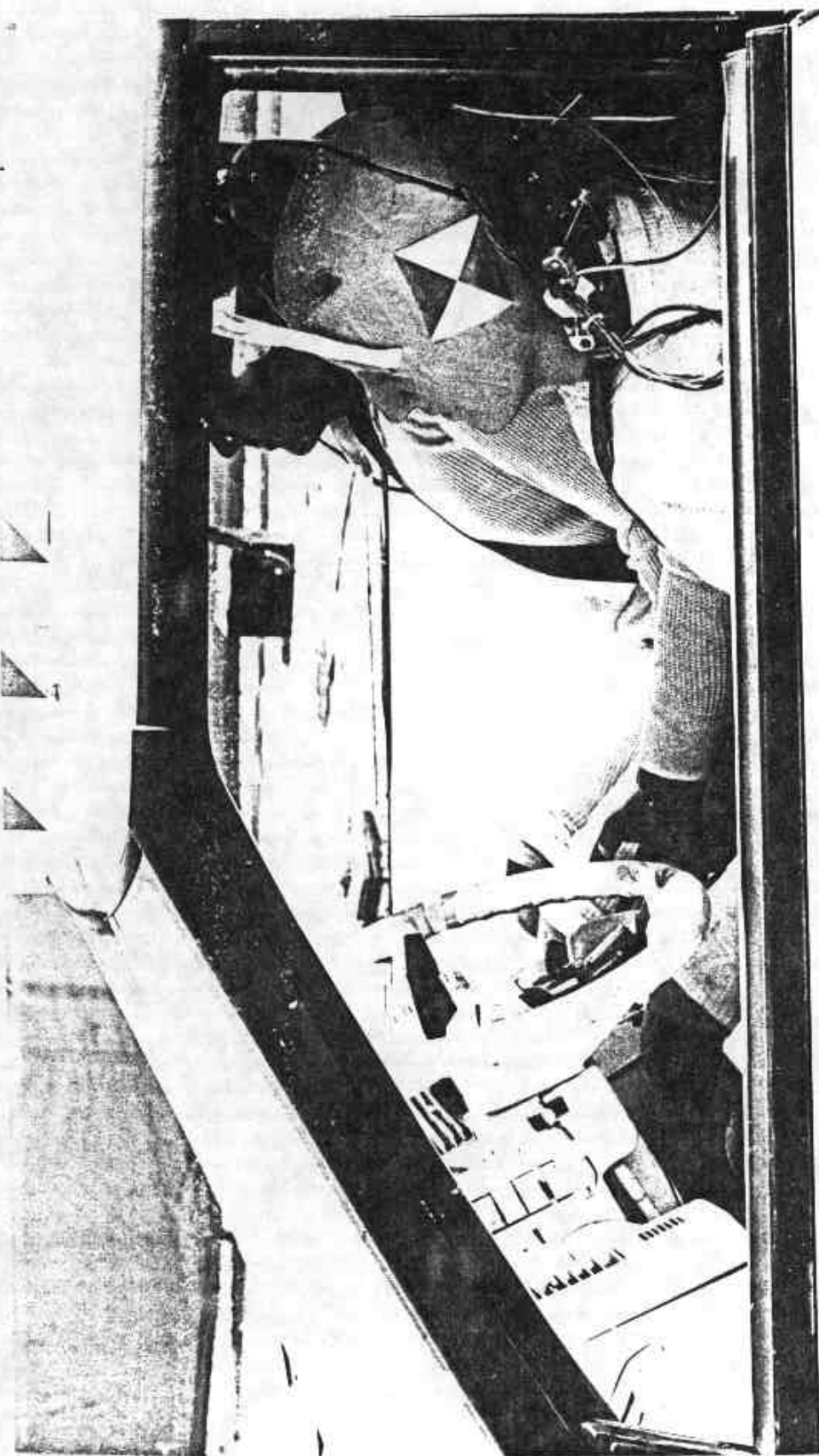
PRETEST REAR UNDERBODY VIEW



POSTTEST REAR UNDERBODY VIEW

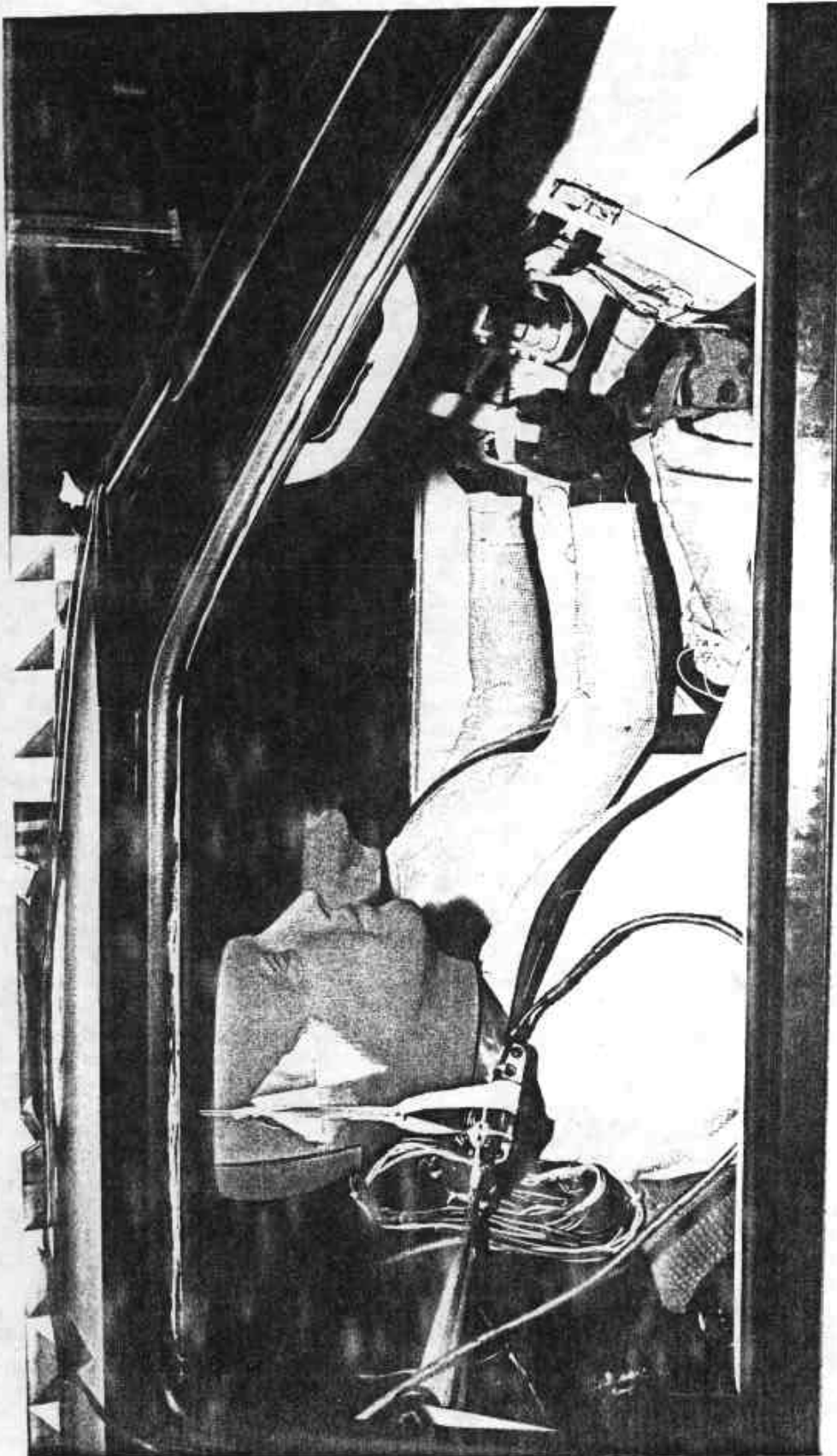


PRETEST DRIVER DUMMY POSITION VIEW



MCFRNC

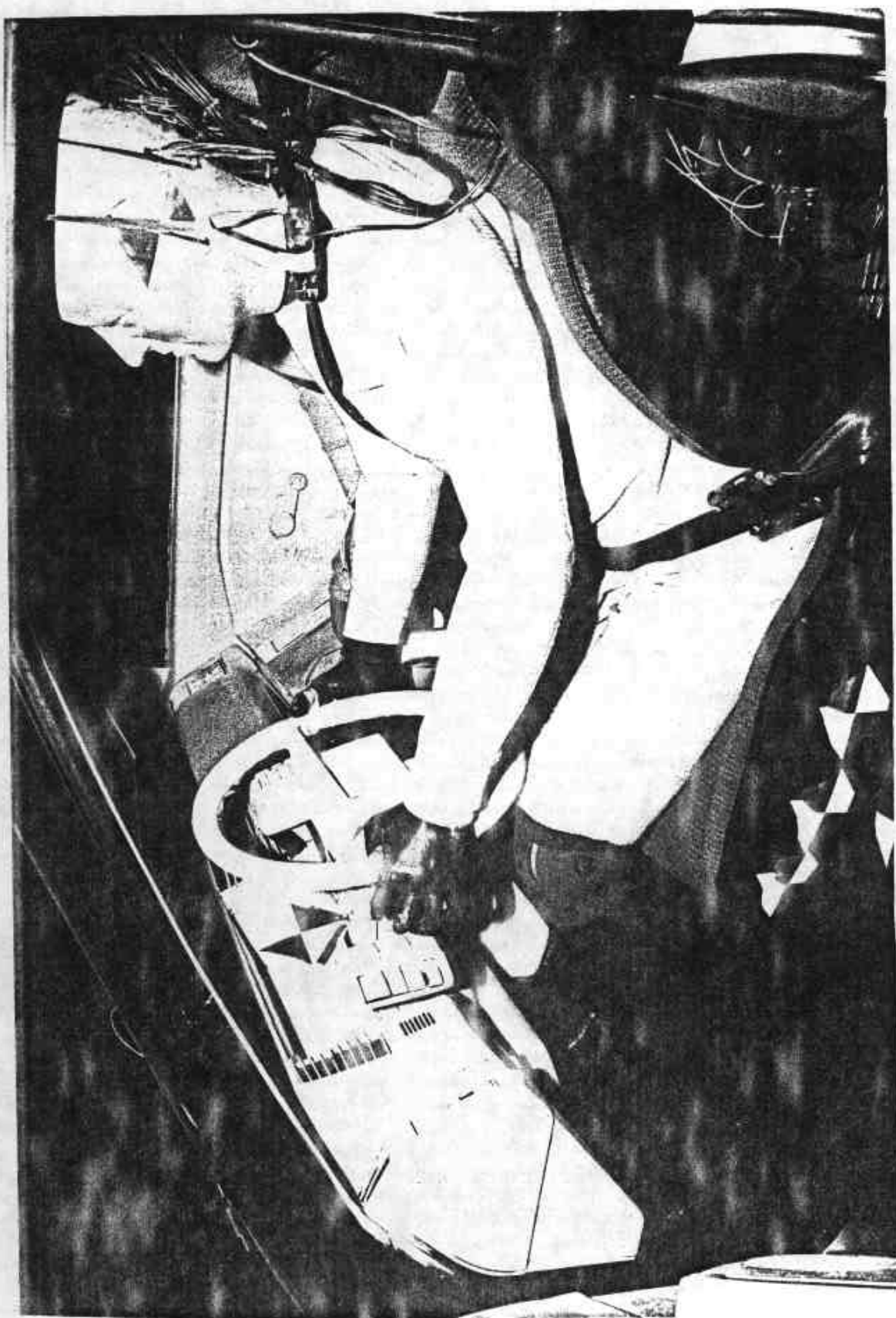
POSTTEST DRIVER DUMMY POSITION VIEW



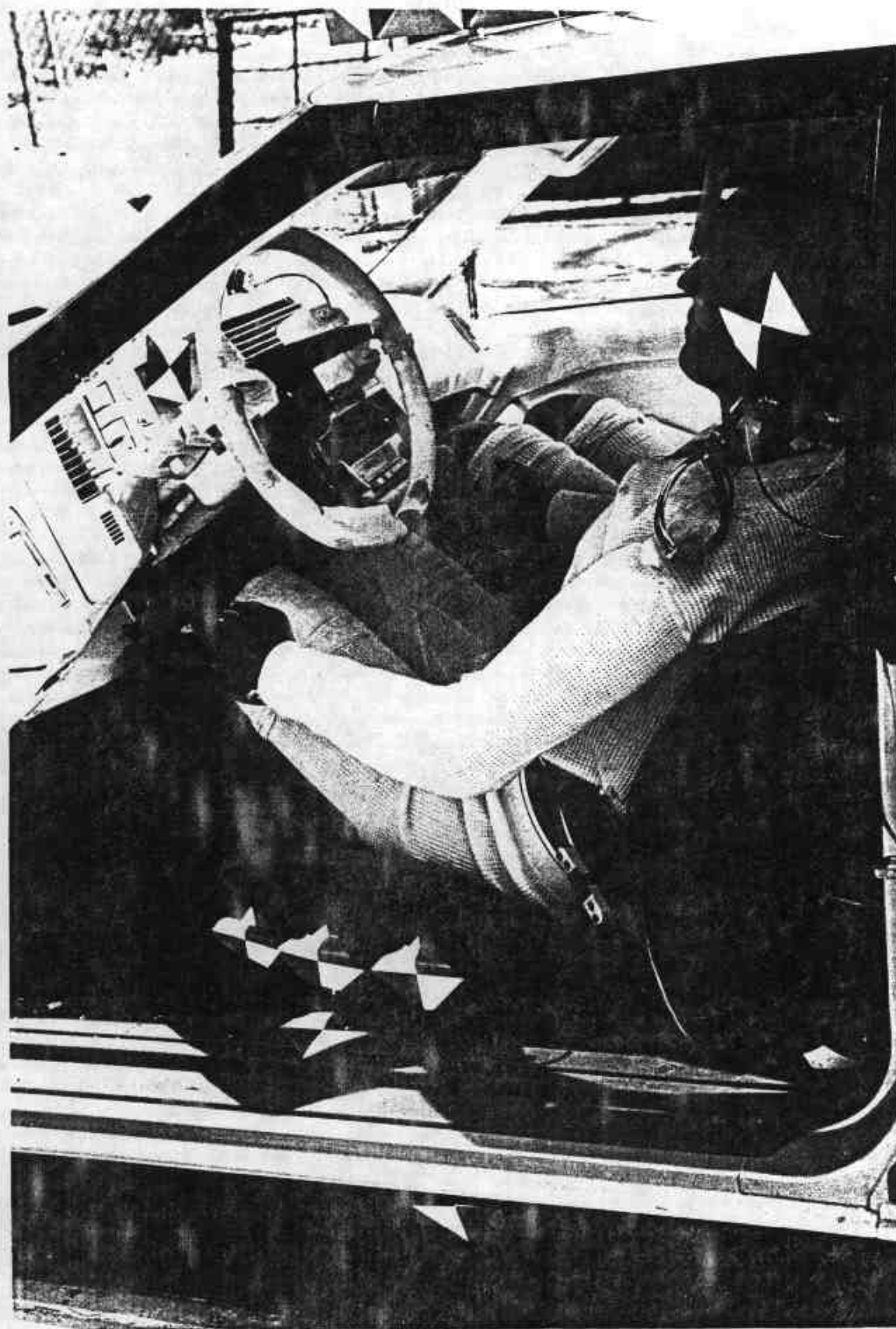
PRETEST PASSENGER DUMMY POSITION VIEW



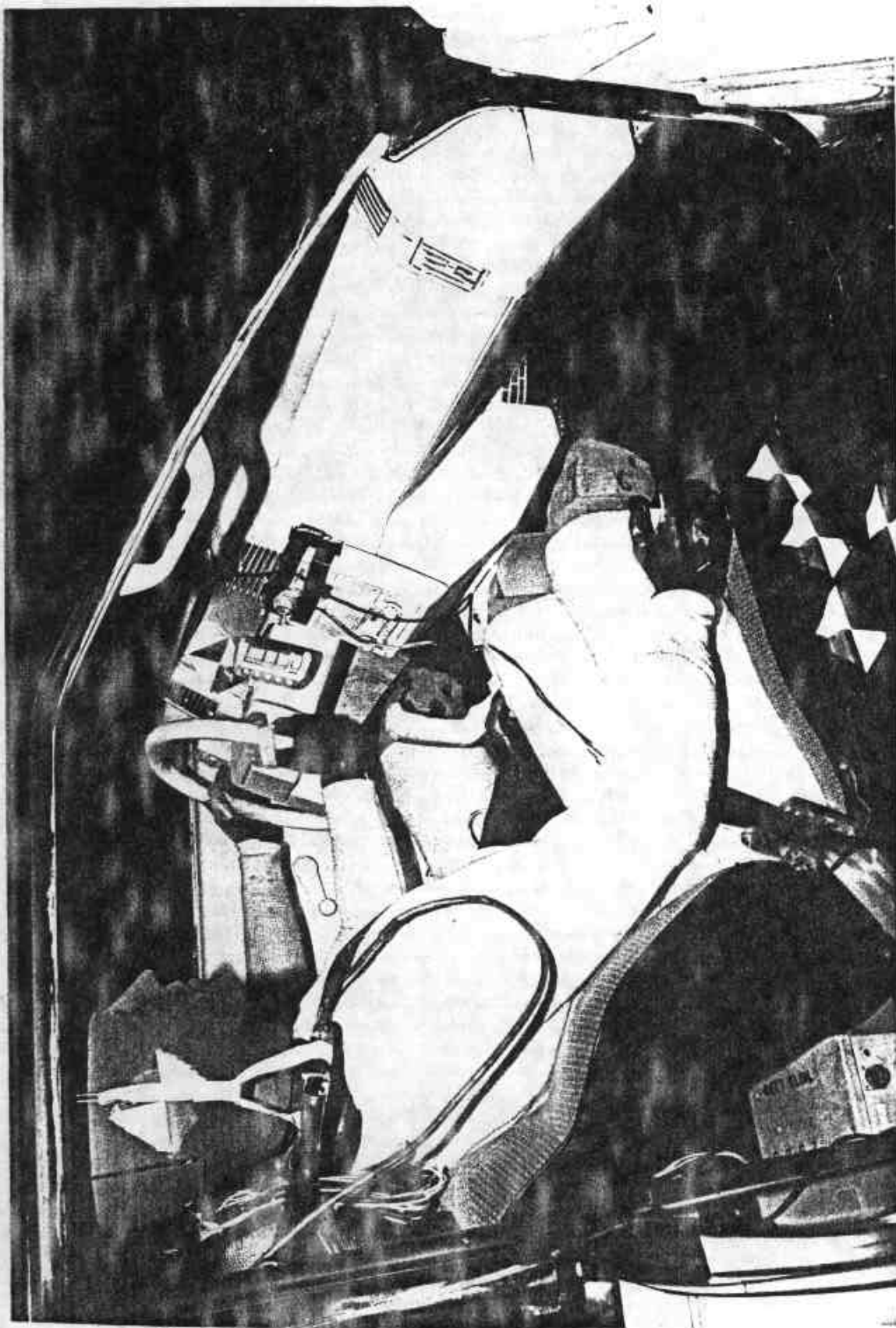
POSTTEST PASSENGER DUMMY POSITION VIEW



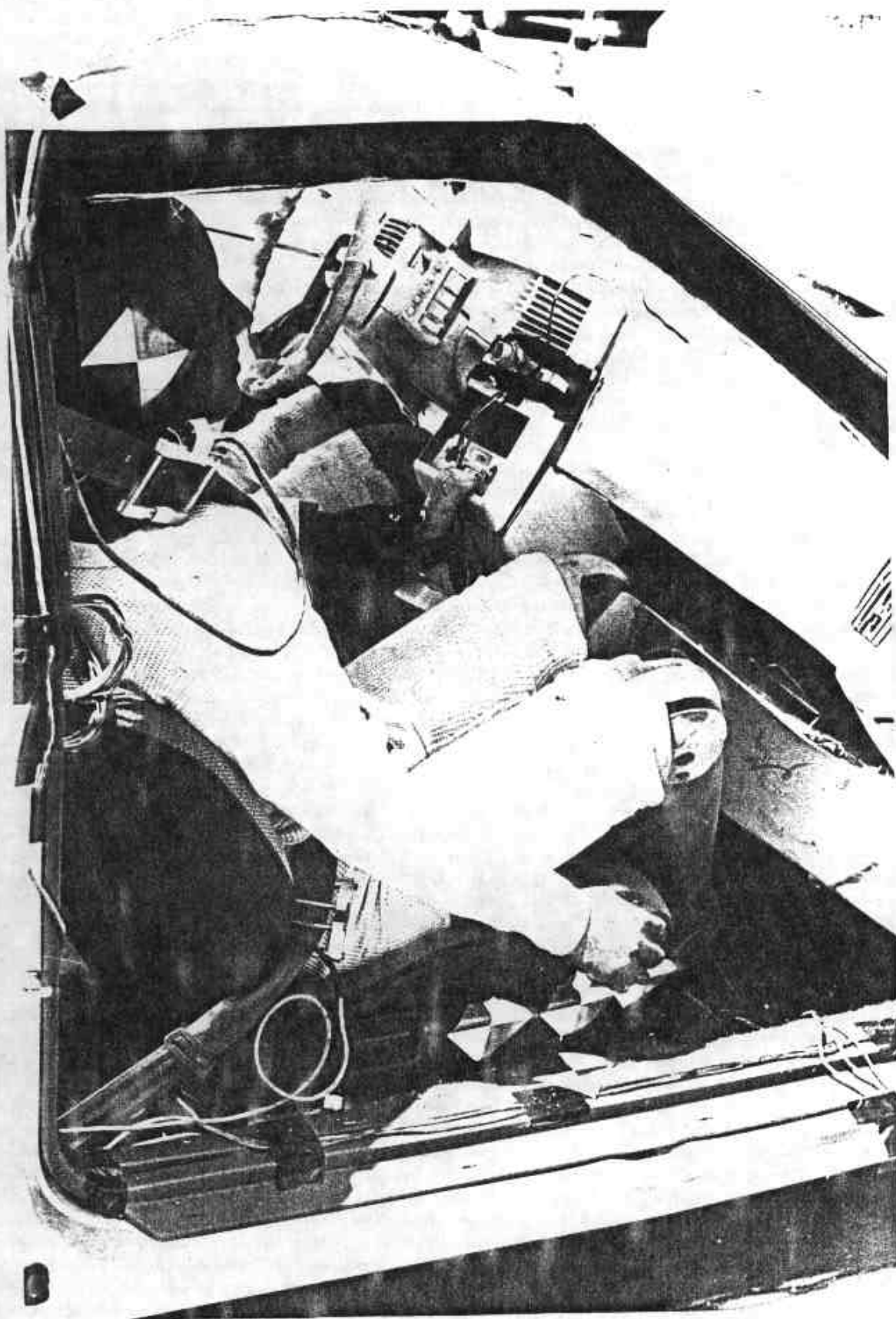
PRETEST DRIVER DURRY & VEHICLE INTERIOR VIEW (Door Open)



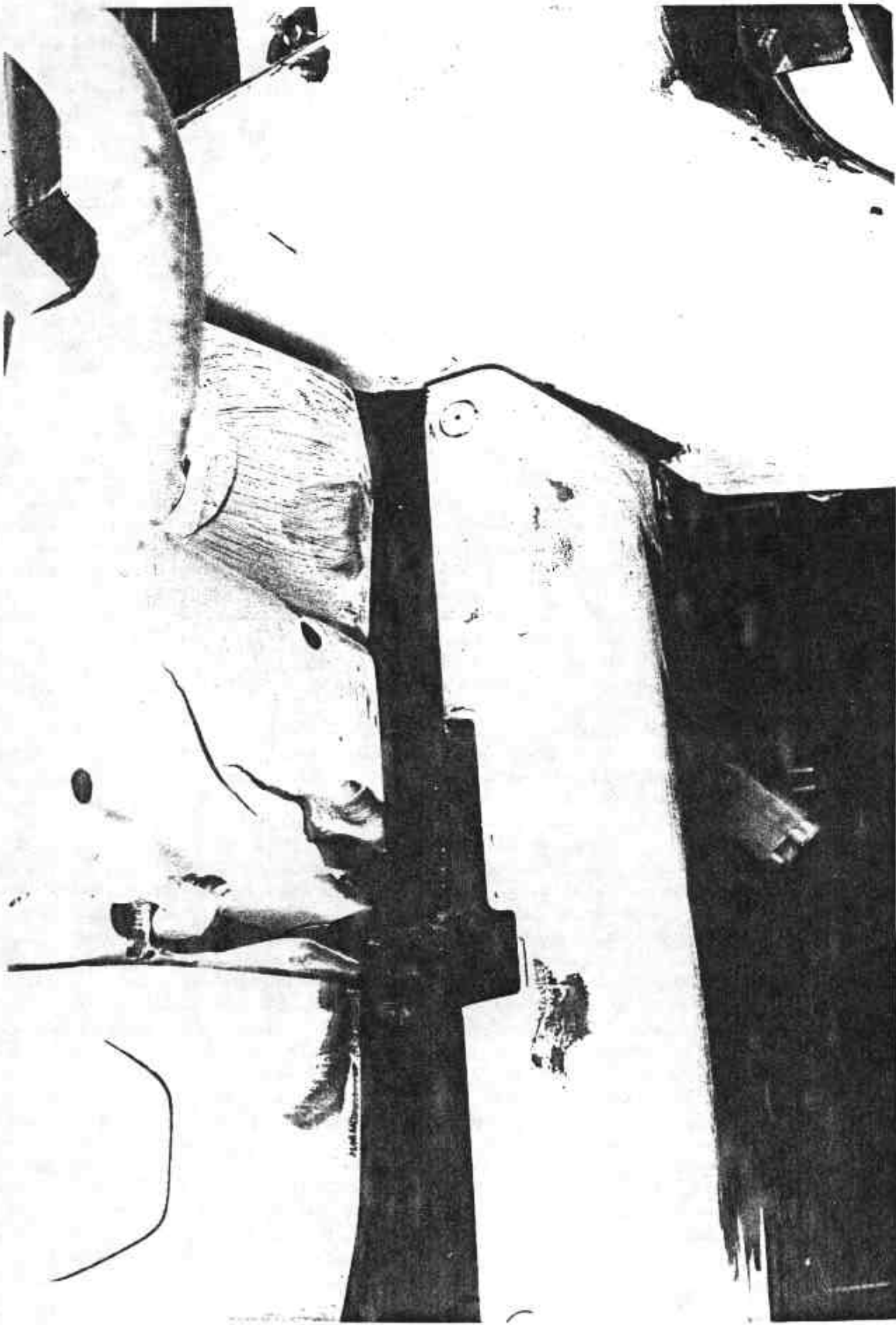
POSTTEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



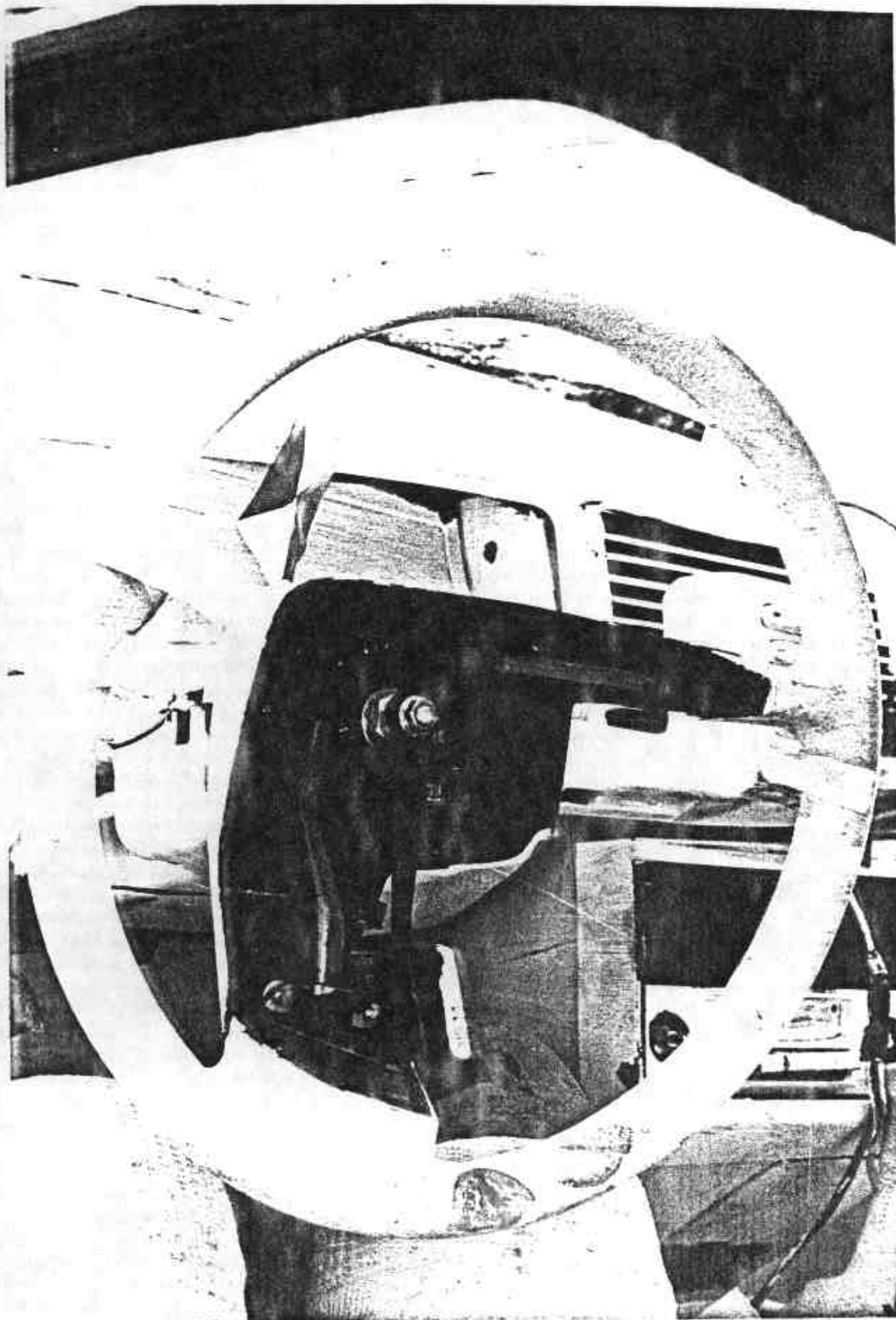
PRETEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



POSTTEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

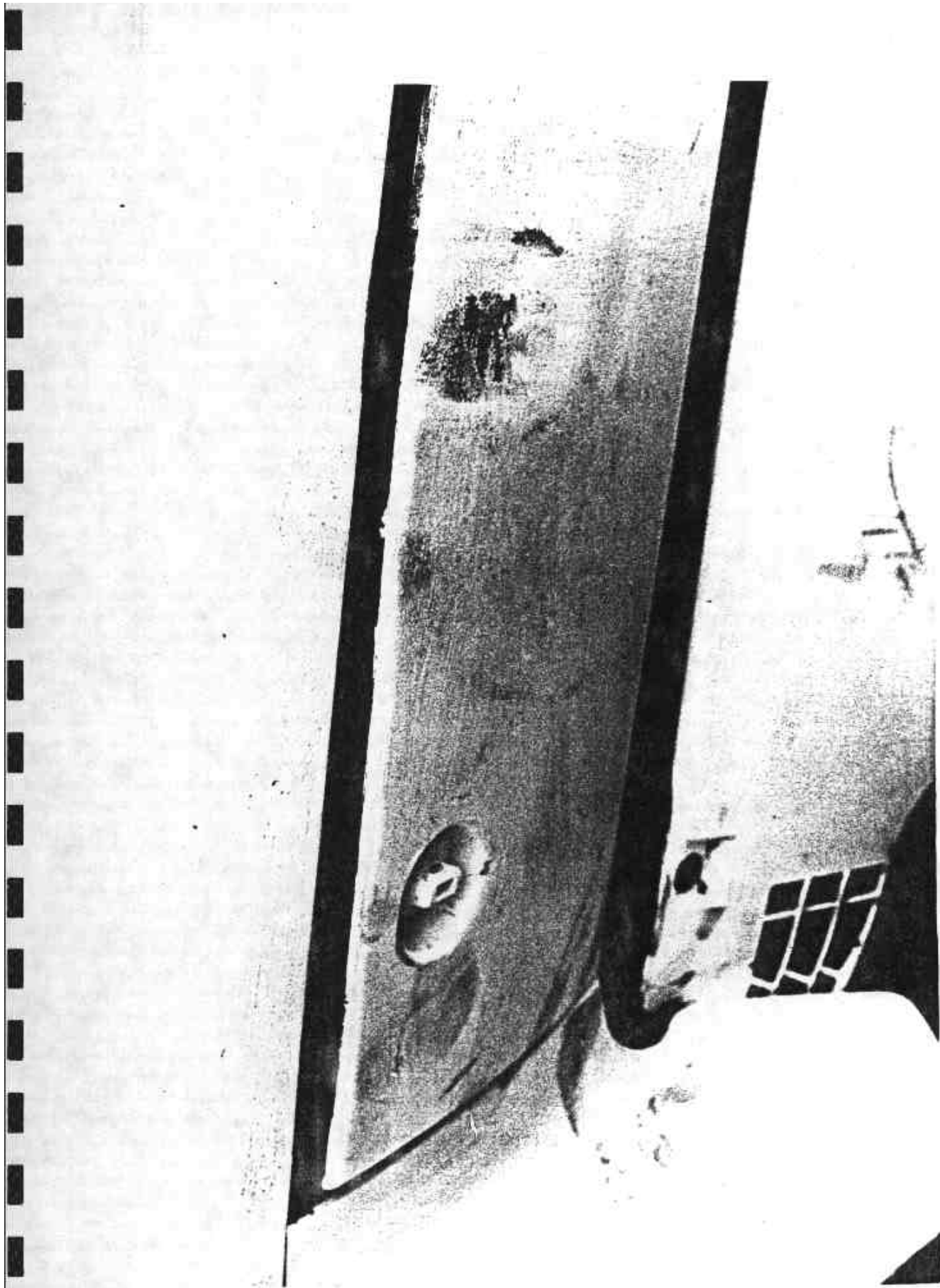


POSTTEST DRIVER DUNNY HEAD/KNEE CONTACT AREA



POSTTEST STEERING COLUMN HUB/RIM CONTACT BY DUMMY DRIVER
60

R5077-06



POSTTEST 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

IFY 86 35MPH NCAP FRONTAL 86/18/86MSEDTH2284021149N26866 ACQUIRE NCAP DATA PLUS EVALUATE COMPLIANCE TO FMVSS 212.219,
 301-75 & 208NCAVSB 35.100000.0999.9CONDY 94FMTUMBENG
 212001864-ILF 109 CI MF202759 97.0175.467.343.150THPONE
 35.100000.12FDEH5999 57.525.427.928.428.327.526.0 0.028.4

3LCB 00 R
 411RD 050M HUMANOID SYSTEMS 466 2ND IMP AFTER CAL16.021.7 4.0 7.226.016.5 3.5 8.6 6.83PTSTONASHNODP
 412RD 050M HUMANOID SYSTEMS 467 3RD IMP AFTER CAL13.219.0 3.5 5.824.599.9 3.6 7.7 6.33PTSTONANONODP
 501AC011HED 6000 1650 0.72860 360000125G'SX35.1G000
 502AC011HED 6000 1650 0.72860 360000125G'SY00.0G000
 503AC011HED 6000 1650 0.72860 360000125G'SZ00.0G000
 504AC011CST 6000 1650 0.72860 360000125G'SX35.1G000
 505AC011CST 2800 1650 0.72860 360000125G'SY00.0G000
 506AC011CST 6000 1650 0.72860 360000125G'SZ00.0G000
 507AC012HED 6000 1650 0.72860 360000125G'SX35.1G000
 508AC012HED 6000 1650 0.72860 360000125G'SY00.0G000
 509AC012HED 6000 1650 0.72860 360000125G'SZ00.0G000
 510AC012CST 6000 1650 0.72860 360000125G'SX35.1G000
 511AC012CST 2800 1650 0.72860 360000125G'SY00.0G000
 512AC012CST 6000 1650 0.72860 360000125G'SZ00.0G000
 513LC011LFM 9999 1650999.92860 360000125LBS0 GOOD
 514LC011RFM 9999 1650999.92860 360000125LBS0 GOOD
 515LC012LFM 9999 1650999.92860 360000125LBS0 GOOD
 516LC012RFM 9999 1650999.92860 360000125LBS0 GOOD
 517LC011LBO 9999 1650999.92860 360000125LBS0 GOOD
 518LC011SHB 9999 1650999.92860 360000125LBS0 GOOD
 519LC012LBO 9999 1650999.92860 360000125LBS0 GOOD
 520LC012SHB 9999 1650999.92860 360000125LBS0 GOOD
 521DT011SHB 9999 1650999.92860 360000125INCO NO DATA RECORDED
 522DT012SHB 9999 1650999.92860 360000125INCO NO DATA RECORDED
 523DT011SHB 9999 1650999.92860 360000125IP10 GOOD
 524DT012SHB 9999 1650999.92860 360000125IP10 GOOD
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 526AC01NRR 2800 1650 0.72860 360000125G'SX35.1G000
 527AC01NENG 2800 1650 0.72860 360000125G'SX35.1G000
 528AC01NENG 2800 1650 0.72860 360000125G'SX35.1G000
 529AC01NCR 2800 1650 0.72860 360000125G'SX35.1G000
 530AC01NDC 2800 1650 0.72860 360000125G'SX35.1G000
 531AC01NVC 2800 1650 0.72860 360000125G'SX35.1G000
 532LCBANBA1 9999 1650999.92800 360000125LBS0 GOOD
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 534LCBANBA3 9999 1650999.92800 360000125LBS0 GOOD
 535LCBANBA4 9999 1650999.92800 360000125LBS0 GOOD
 536LCBANBA5 9999 1650999.92800 360000125LBS0 GOOD
 537LCBANBA6 9999 1650999.92800 360000125LBS0 GOOD
 538LCBANBA7 9999 1650999.92800 360000125LBS0 GOOD
 539LCBANBA8 9999 1650999.92800 360000125LBS0 GOOD
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 545LCBANBB5 9999 1650999.92800 360000125LBS0 GOOD
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 549LCBANBB9 9999 1650999.92800 360000125LBS0 GOOD
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 554LCBANBC5 9999 1650999.92800 360000125LBS0 GOOD

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561LCBANBD3	9999	1650999.92800	360000	125LBS0	GOOD
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563LCBANBD5	9999	1650999.92800	360000	125LBS0	GOOD
564LCBANBD6	9999	1650999.92800	360000	125LBS0	GOOD
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566LCBANBD8	9999	1650999.92800	360000	125LBS0	GOOD
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1

IFY 86 35MPH NCAP FRONTAL 06/18/84 SEDTNH2284021149M26866 ACQUIRE NCAP DATA PL
US EVALUATE COMPLIANCE TO FMVSS 212.219.381-75 & 208NCAUSB 35.1800000.0999.9COND
RY 94FMTUMBENG 212601364-ILF 189 CI MF2D2759 97.8175.467.
343.150THPONE 35.180
000012FDEW5999 57.525.427.928.428.327.526.8 0.828.43LCB 00 R

411RD

050M HUMANOID SYSTEMS 466 2ND IMP AFTER CAL16.021.7 4.0 7.226.016.5 3.5 8.6 6
.83PTSTONASIN6DP412RD 050M HUMANOID SYSTEMS 467 3RD IMP AFTER CAL13.219.0
3.5 5.824.599.9 3.6 7.7 6.33PTSTONANONOP501AC011HED 6000 1650 0.72860 36000012
5G'SX35.1G00D 502AC011HED 6000 1650 0.72860 360000125G
'SY00.0G00D 503AC011HED 6000 1650 0.72860 360000125G'S
200.0G00D 504AC011CST 6000 1650 0.72860 360000125G'SX3
5.1G00D 505AC011CST 2800 1650 0.72860 360000125G'SY00.
0G00D 506AC011CST 6000 1650 0.72860 360000125G'SZ00.0G
00D 507AC012HED 6000 1650 0.72860 360000125G'SX35.1G00
0 508AC012HED 6000 1650 0.72860 360000125G'SY00.0G00D
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510AC012CST 6000 1650 0.72860 360000125G'SX35.1G00D

511AC012CST 2800 1650 0.72860 360000125G'SY00.0G00D

512AC012CST 6000 1650 0.72860 360000125G'SZ00.0G00D

513LC011LFM 9999 1650999.92860 360000125LBS0 GOOD

514LC011RFM 9999 1650999.92860 360000125LBS0 GOOD

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516LC012RFM 9999 1650999.92860 360000125LBS0 GOOD

517LC011LBD 9999 1650999.92860 360000125LBS0 GOOD

518LC011SHB 9999 1650999.92860 360000125LBS0 GOOD

519LC012LBD 9999 1650999.92860 360000125LBS0 GOOD

520LC012SHB 9999 1650999.92860 360000125LBS0 GOOD

521DT011SHB 9999 1650999.92860 360000125INCO NO DATA RECORDED 5

22DT012SHB 9999 1650999.92860 360000125INCO NO DATA RECORDED 523

DT011SHB 9999 1650999.92860 360000125IPI0 GOOD 524DT

012SHB 9999 1650999.92860 360000125IPI0 GOOD 525AC01

NLRF 2800 1650 0.72860 360000125G'SX35.1G00D 526AC01NR

RF 2800 1650 0.72860 360000125G'SX35.1G00D 527AC01NENG

2800 1650 0.72860 360000125G'SX35.1G00D 528AC01NENG 2

800 1650 0.72860 360000125G'SX35.1G00D 529AC01NCR 280

0 1650 0.72860 360000125G'SX35.1G00D 530AC01NDC 2800

1650 0.72860 360000125G'SX35.1G00D 531AC01NVC 2800 16

50 0.72860 360000125G'SX35.1G00D 532LCBANBA1 9999 1650

999.92800 360000125LBS0 GOOD 533LCBANBA2 9999 165099

9.92800 360000125LBS0 GOOD 534LCBANBA3 9999 1650999.

92800 360000125LBS0 GOOD 535LCBANBA4 9999 1650999.92

800 360000125LBS0 GOOD 536LCBANBA5 9999 1650999.9280

0 360000125LBS0 GOOD 537LCBANBA6 9999 1650999.92800

360000125LBS0 GOOD 538LCBANBA7 9999 1650999.92800 36

0000125LBS0 GOOD 539LCBANBA8 9999 1650999.92800 3600

00125LBS0 GOOD 540LCBANBA9 9999 1650999.92800 360000

125LBS0 GOOD 541LCBANBB1 9999 1650999.92800 36000012

5LBS0 GOOD 542LCBANBB2 9999 1650999.92800 360000125L

BS0 GOOD 543LCBANBB3 9999 1650999.92800 360000125LBS

0 GOOD 544LCBANBB4 9999 1650999.92800 360000125LBS0

GOOD 545LCBANBB5 9999 1650999.92800 360000125LBS0

GOOD 546LCBANBB6 9999 1650999.92800 360000125LBS0 G

00D 547LCBANBB7 9999 1650999.92800 360000125LBS0 GOO

0 548LCBANBB8 9999 1650999.92800 360000125LBS0 GOOD

549LCBANBB9 9999 1650999.92800 360000125LBS0 GOOD

550LCBANBC1 9999 1650999.92800 360000125LBS0 GOOD

551LCBANBC2 9999 1650999.92800 360000125LBS0 GOOD

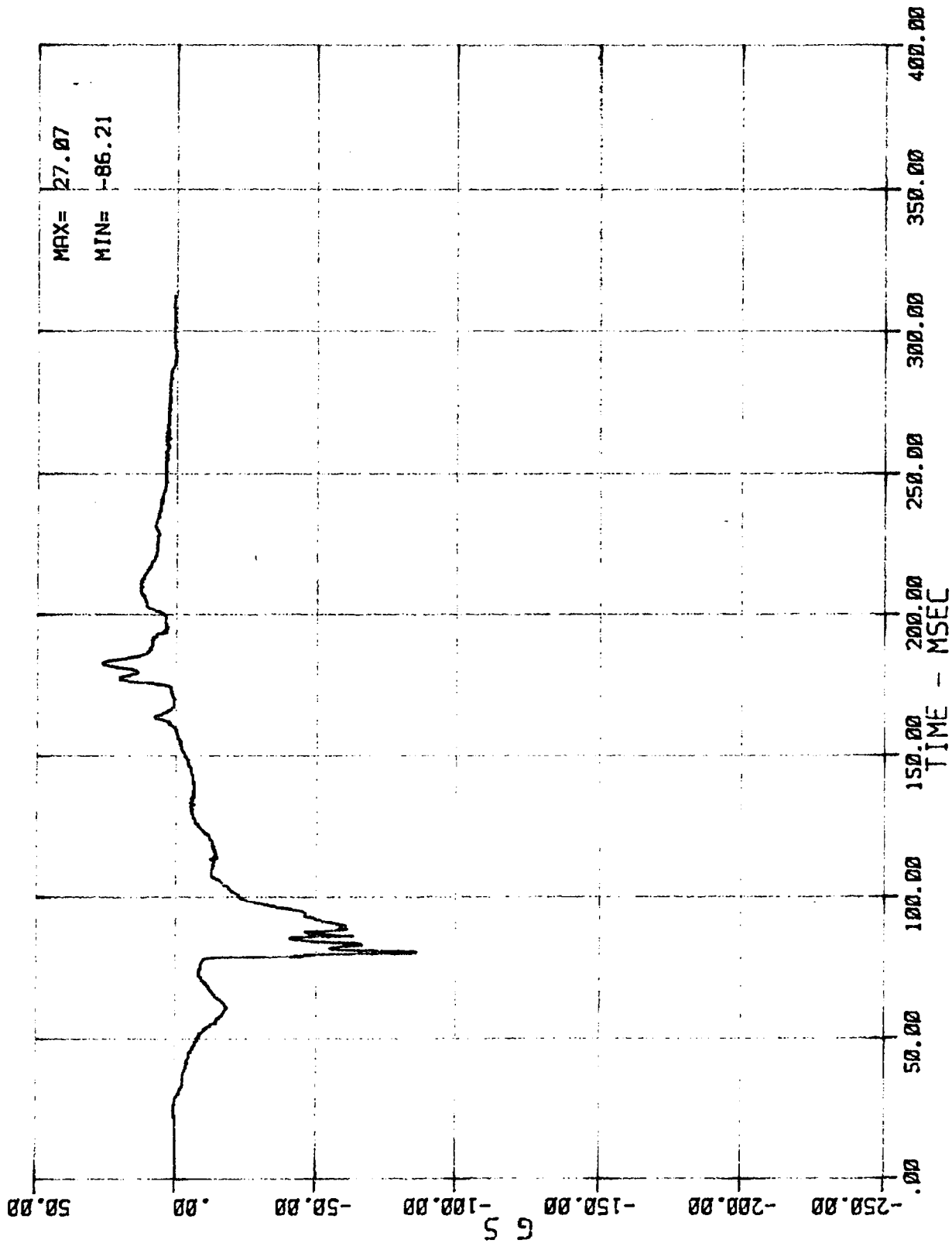
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554LCBANBC5 9999 1650999.92800 360000125LBS0 GOOD

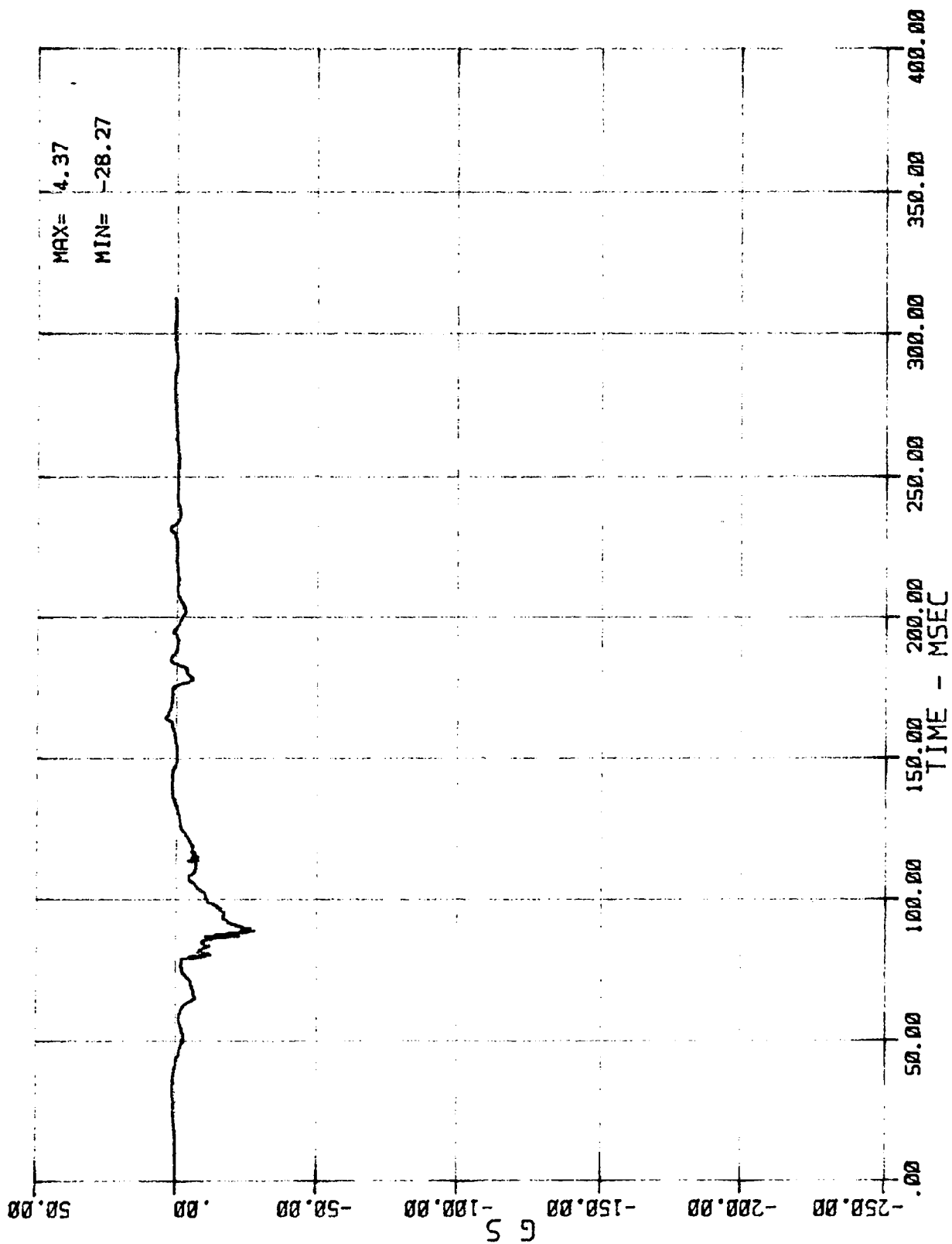
R5077-06

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556LCBANBC7 9999 1650999.92800 360000125LBS0	GOOD	
557LCBANBC8 9999 1650999.92800 360000125LBS0	GOOD	
558LCBANBC9 9999 1650999.92800 360000125LBS0	GOOD	
559LCBANBD1 9999 1650999.92800 360000125LBS0	GOOD	
560LCBANBD2 9999 1650999.92800 360000125LBS0	GOOD	
561LCBANBD3 9999 1650999.92800 360000125LBS0	GOOD	5
62LCBANBD4 9999 1650999.92800 360000125LBS0	GOOD	563
LCBANBD5 9999 1650999.92800 360000125LBS0	GOOD	564LC
BANBD6 9999 1650999.92800 360000125LBS0	GOOD	565LCBA
NBD7 9999 1650999.92800 360000125LBS0	GOOD	566LCBANB
D8 9999 1650999.92800 360000125LBS0	GOOD	567LCBANBD9
9999 1650999.92800 360000125LBS0	GOOD	



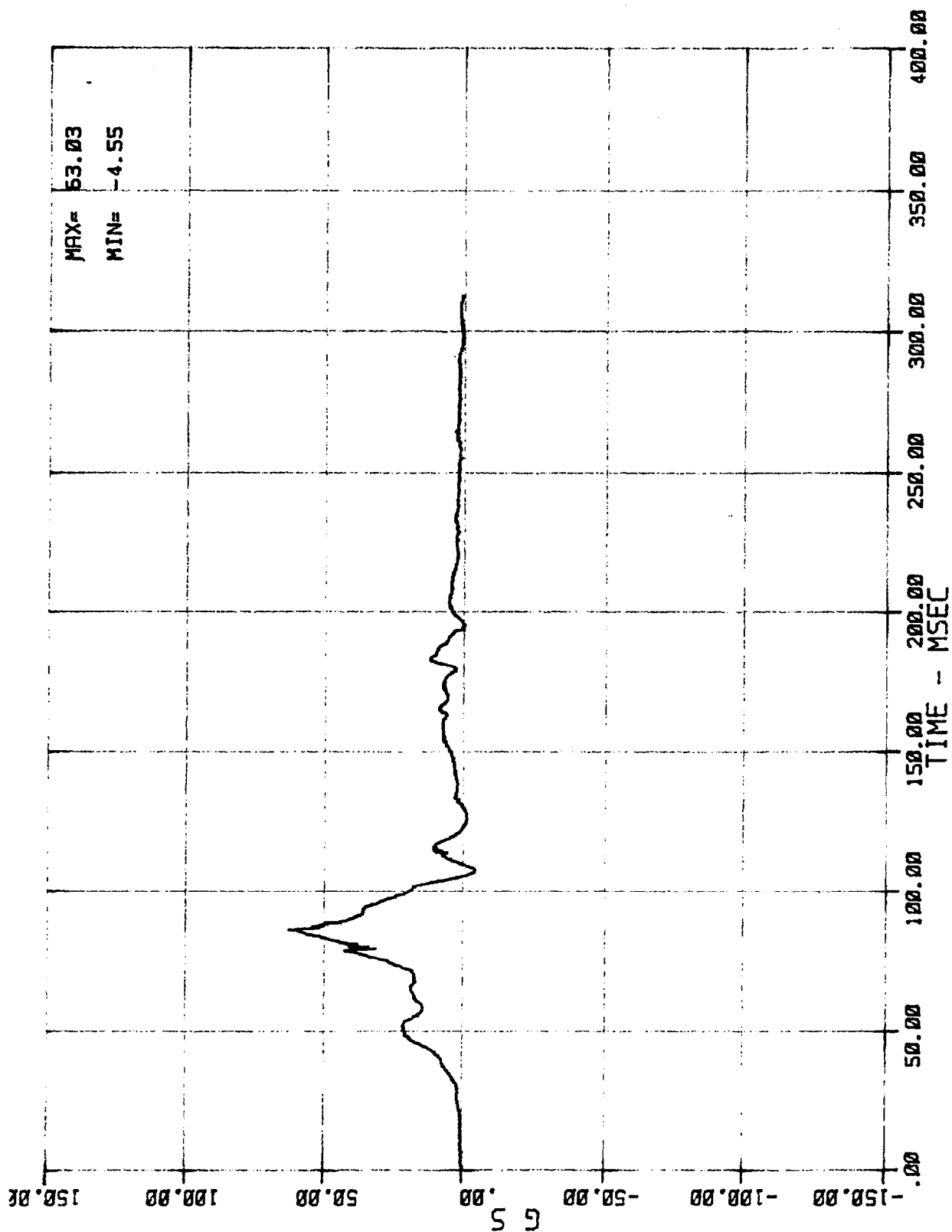
01 AC 01 1 HED X (DRIVER HEAD ACCEL. -- X AXIS)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



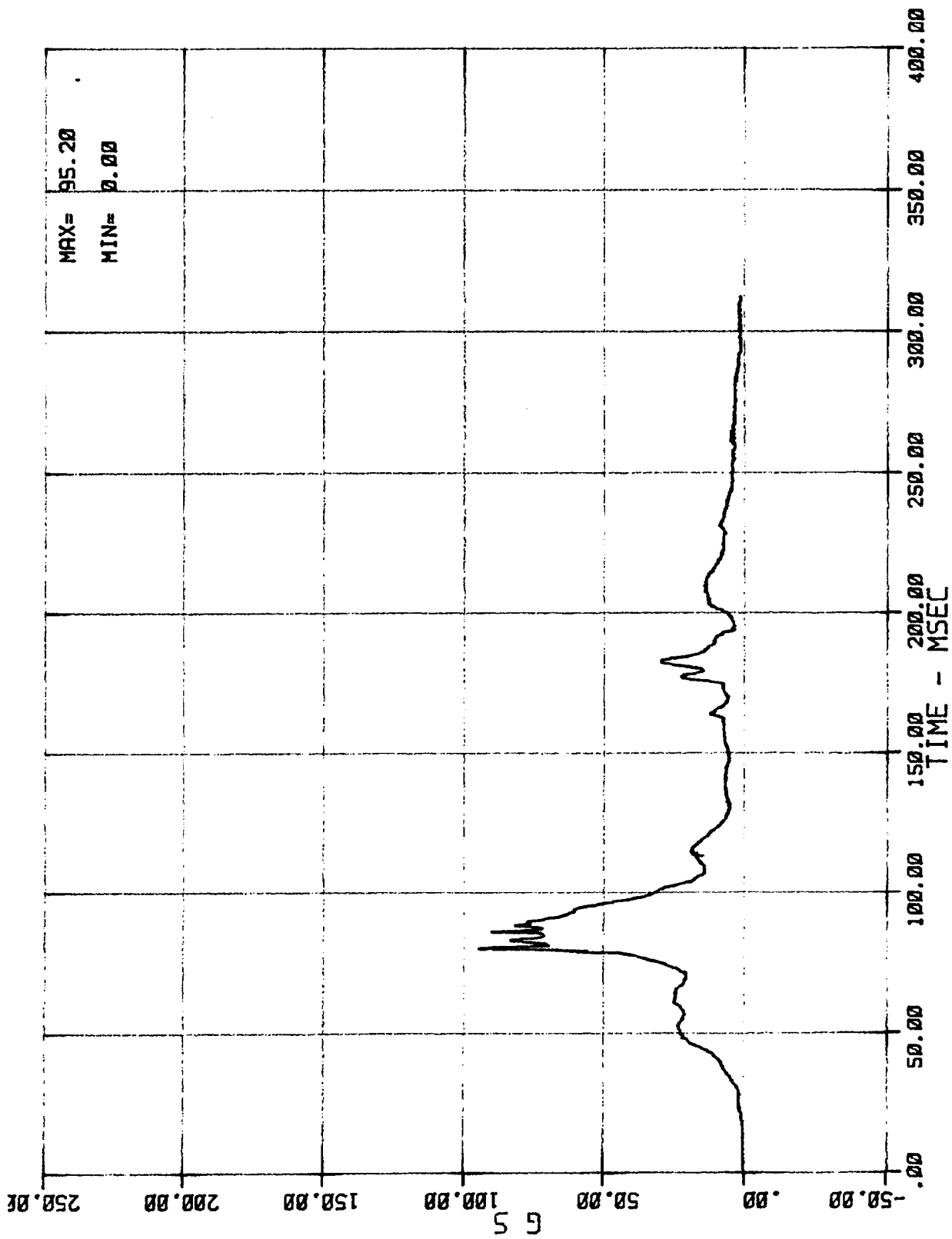
02 AC 01 1 HED Y (DRIVER HEAD ACCEL. -- Y AXIS)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



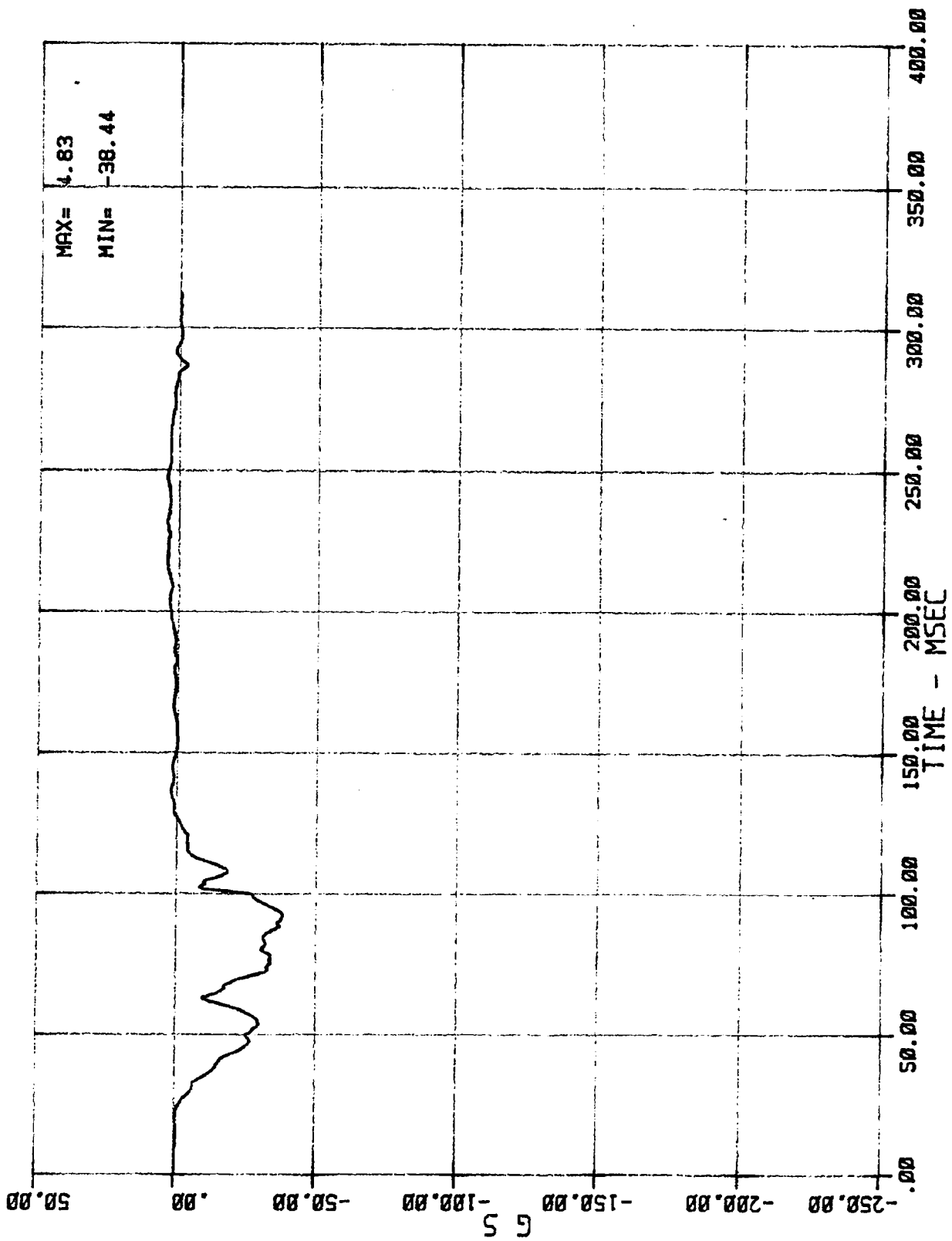
03 AC 01 1 HED Z (DRIVER HEAD ACCEL. -- Z AXIS)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



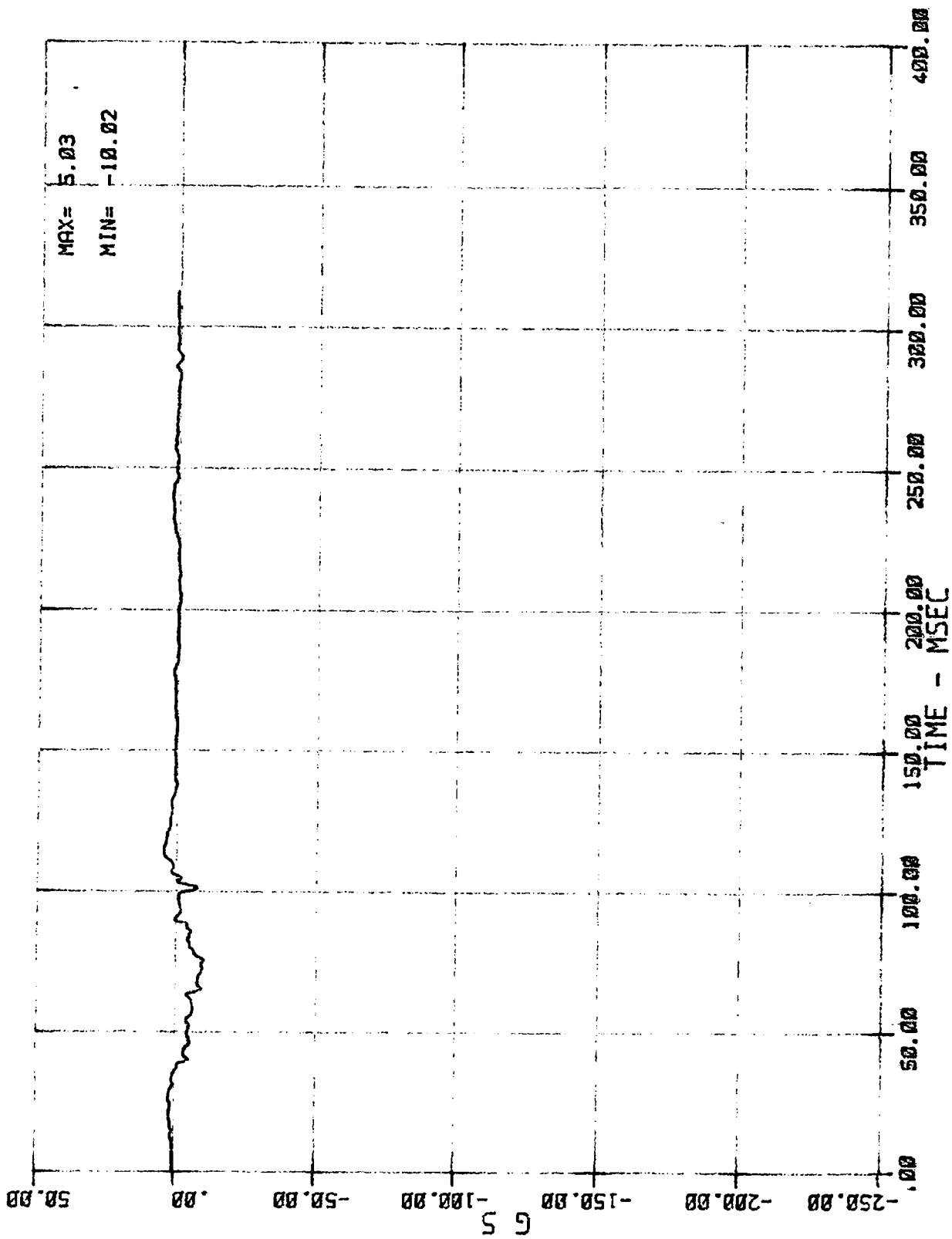
DRIVER HEAD RESULTANT ACCELERATION
MSE N26066 1986 SUBARU XT COUPE

05/18/86



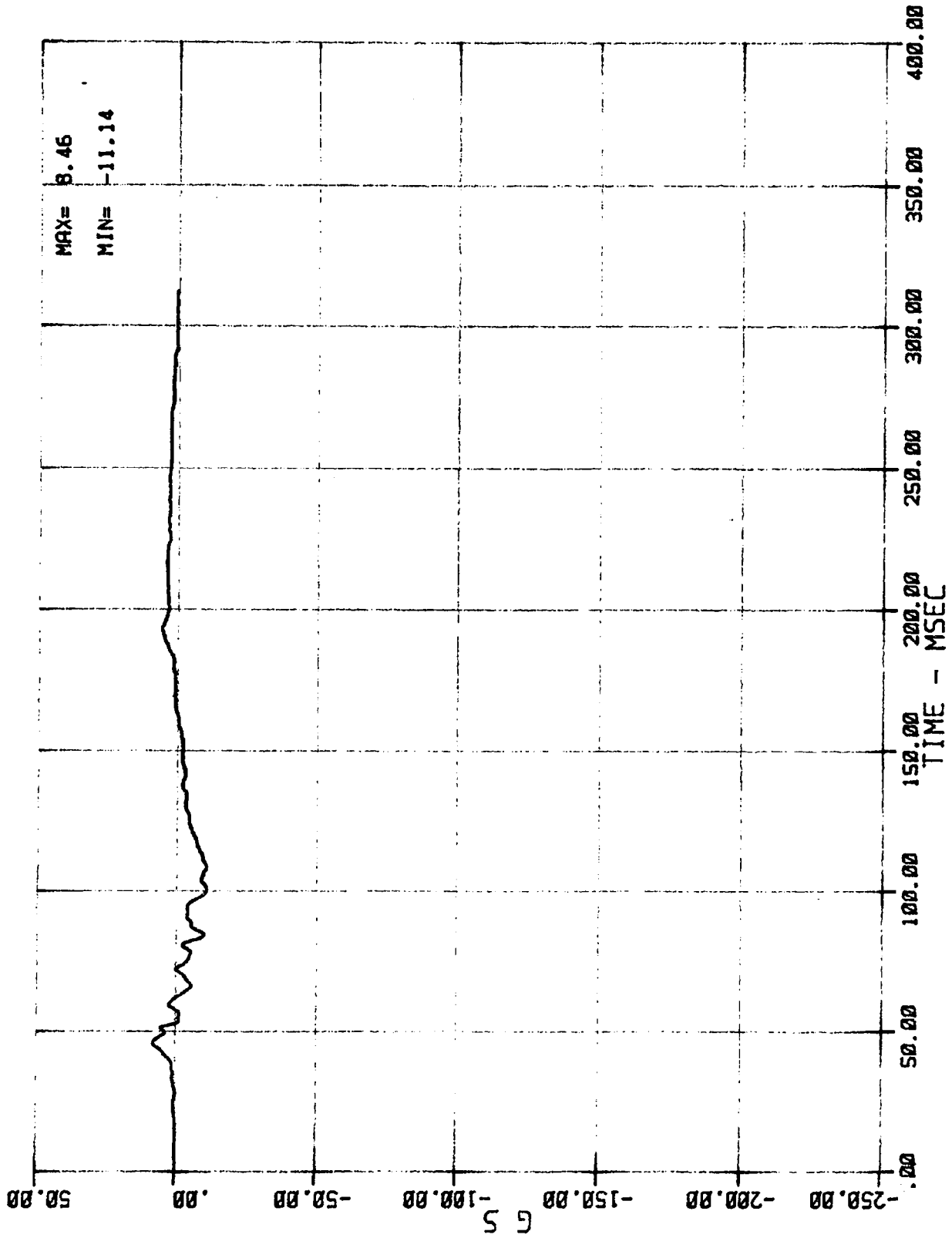
04 AC 01 1 CST X (DRIVER ACCEL. -- X AXIS)
MSE N26056 1986 SUBARU XT COUPE

06/18/86



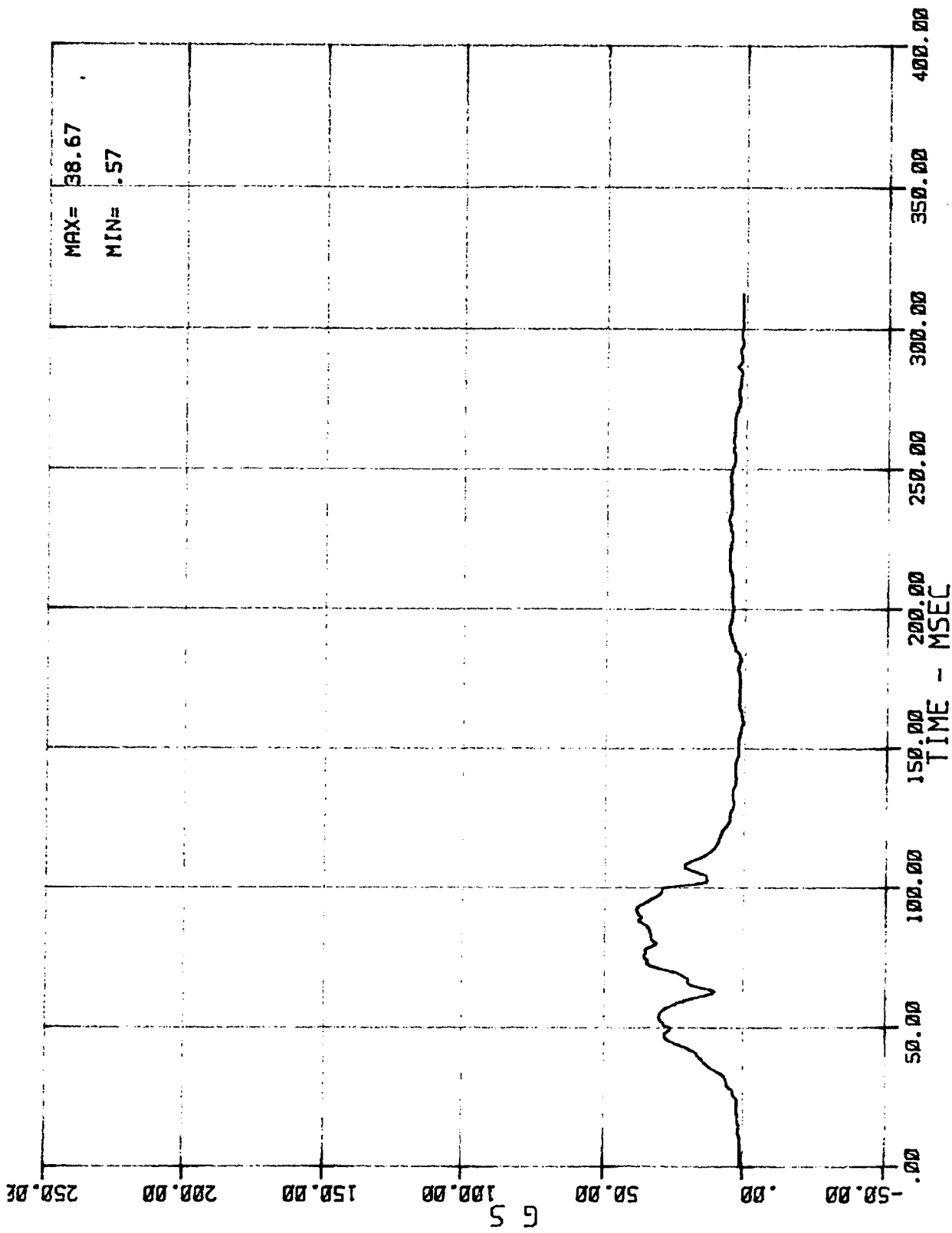
05 AC 01 1 CST Y (DRIVER CHEST ACCEK. -- YAXIS)
NSE N26066 1986 SUBARU XT COUPE

06/18/86



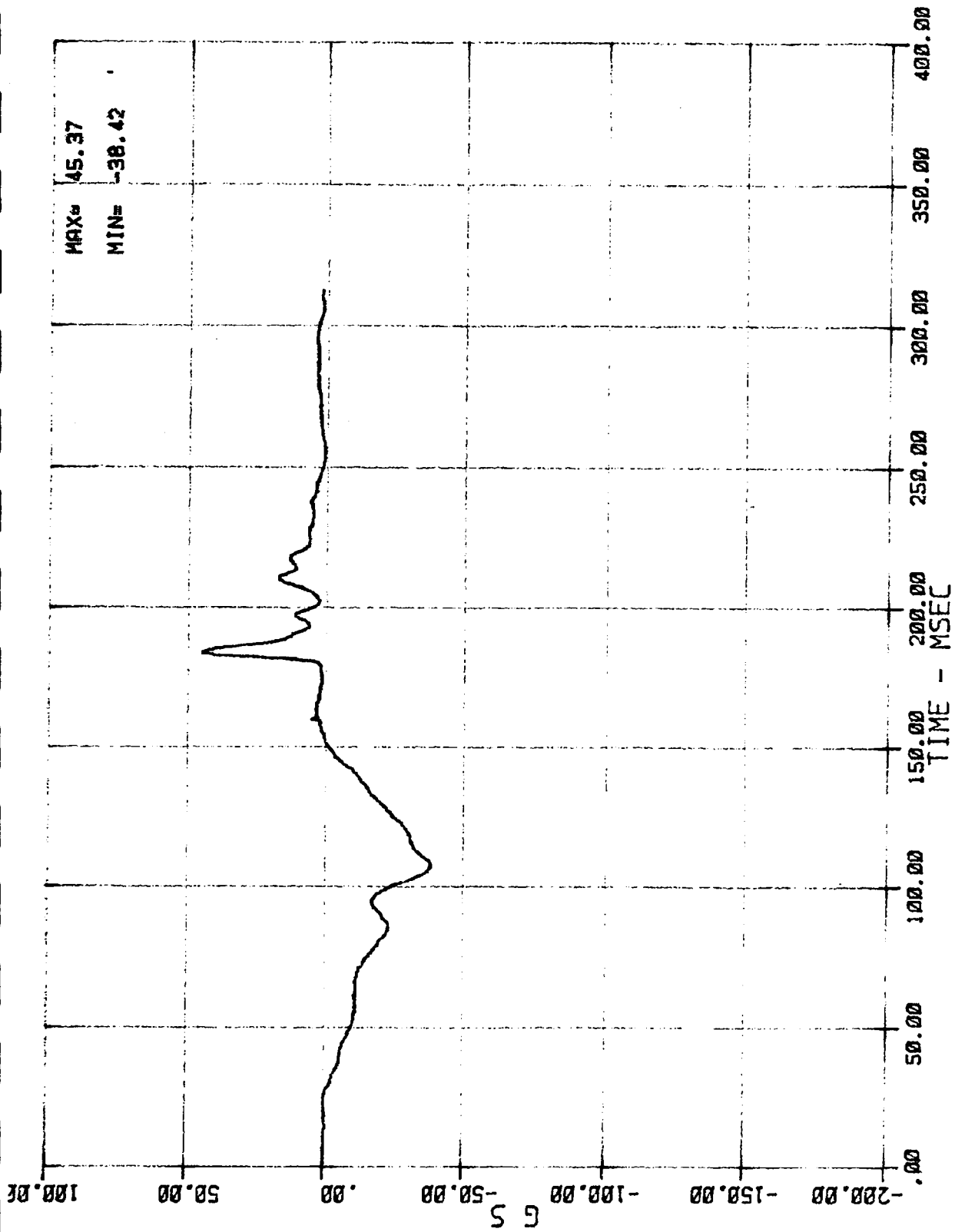
06 AC 01 1 CST Z (DRIVER CHEST ACCEL. -- Z AXIS)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



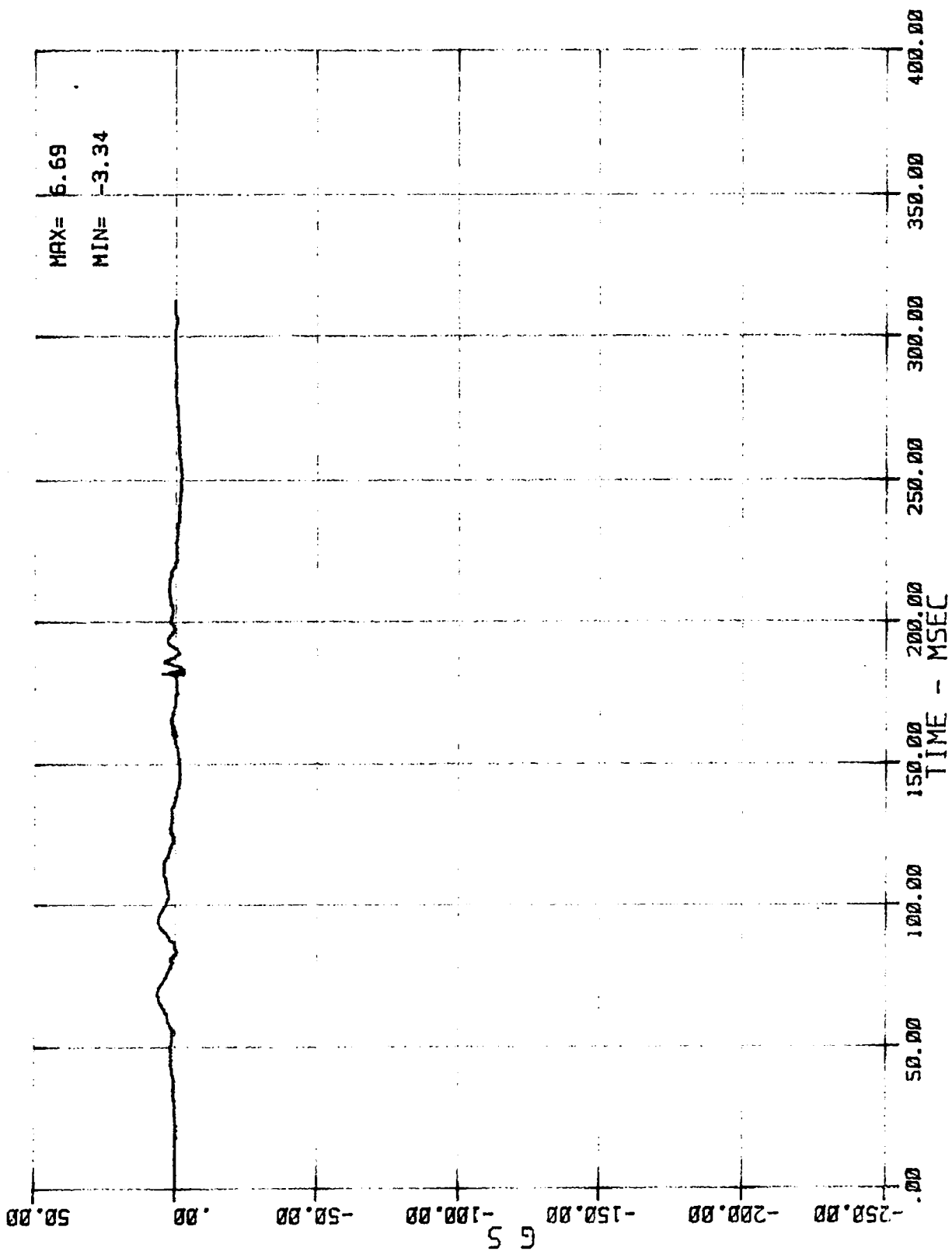
DRIVER CHEST RESULTANT ACCELERATION
NSE N26066 1986 SUBARU XT COUPE

06/18/86



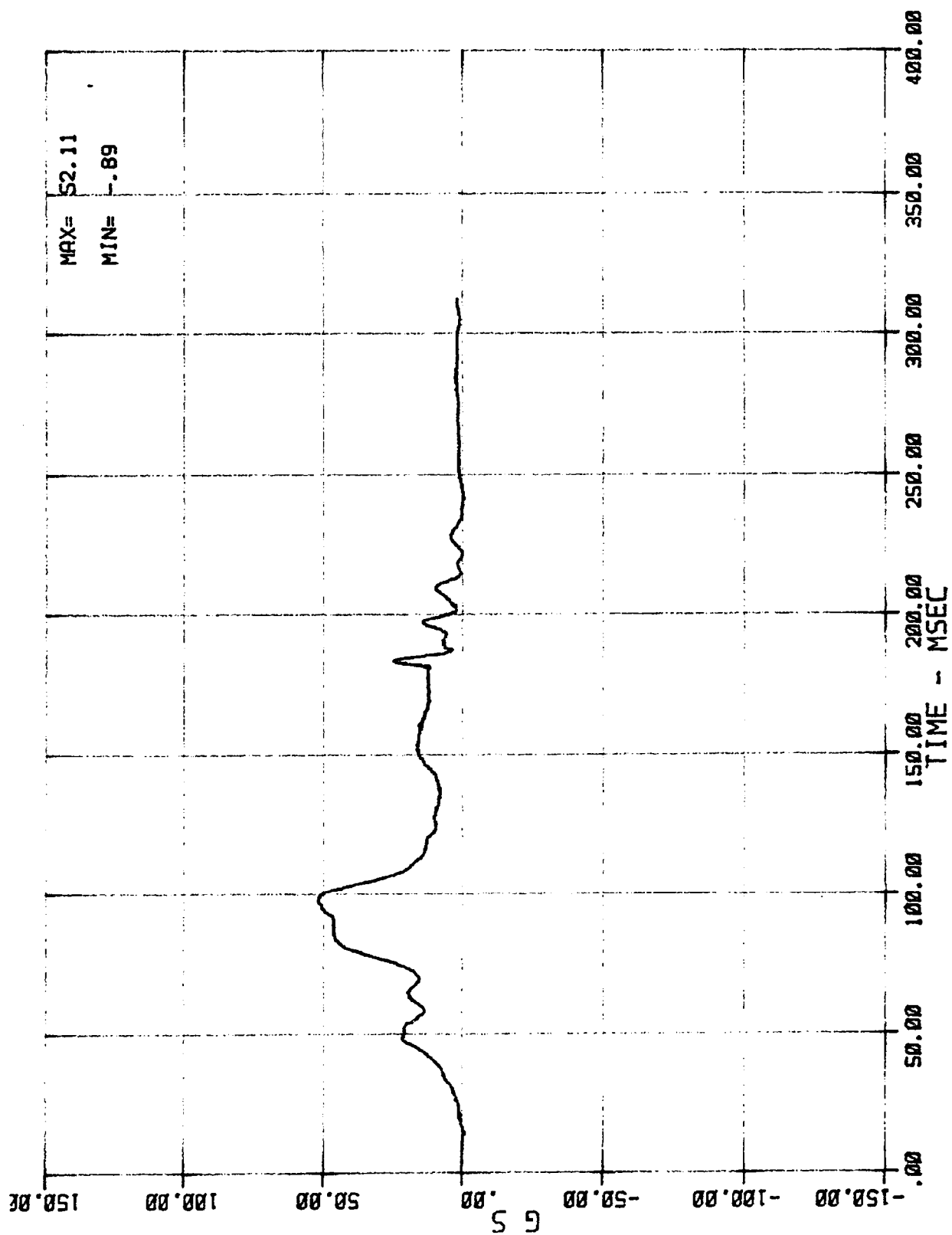
07 AC 01 2 HED X (PASSENGER HEAD ACCEL. -- X AXIS)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



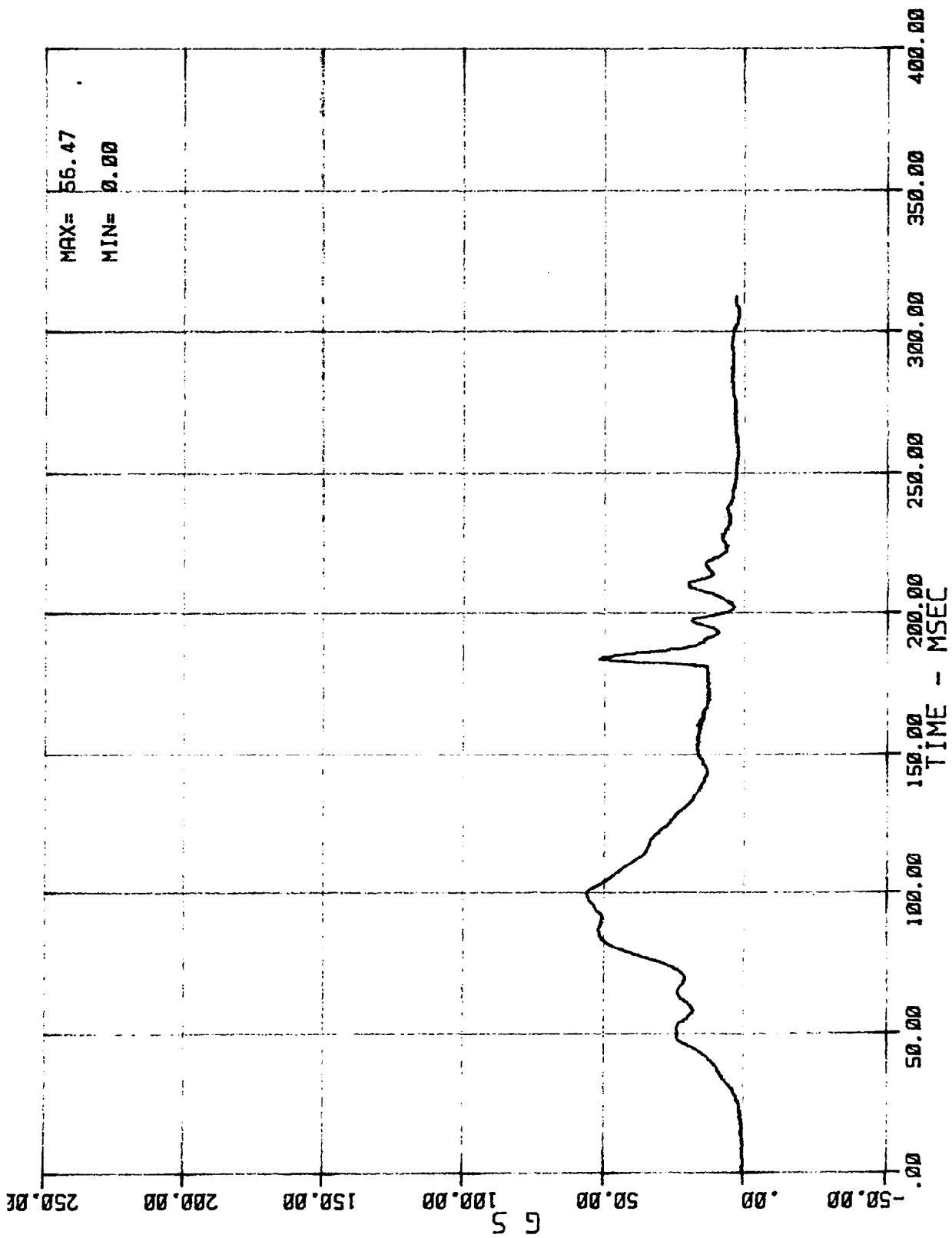
08 AC 01 2 HED Y (PASSENGER HEAD ACCEL. -- Y AXIS)
MSE N26066 1986 SUBARU XT COUPE

05/18/86



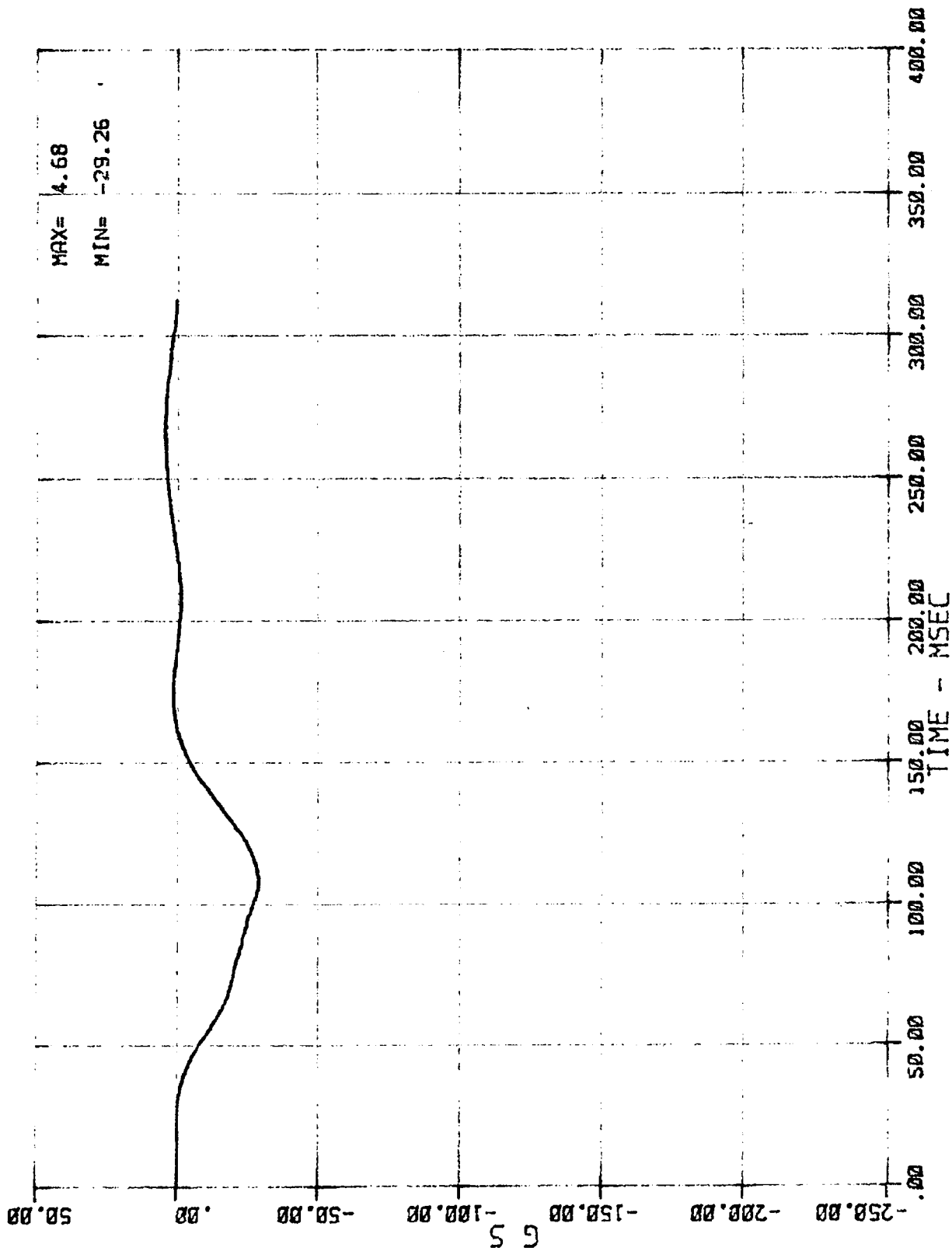
09 AC 01 2 HED Z (PASSENGER HEAD ACCEL. -- Z AXIS)
MSE N25056 1986 SUBARU XT COUPE

05/18/86



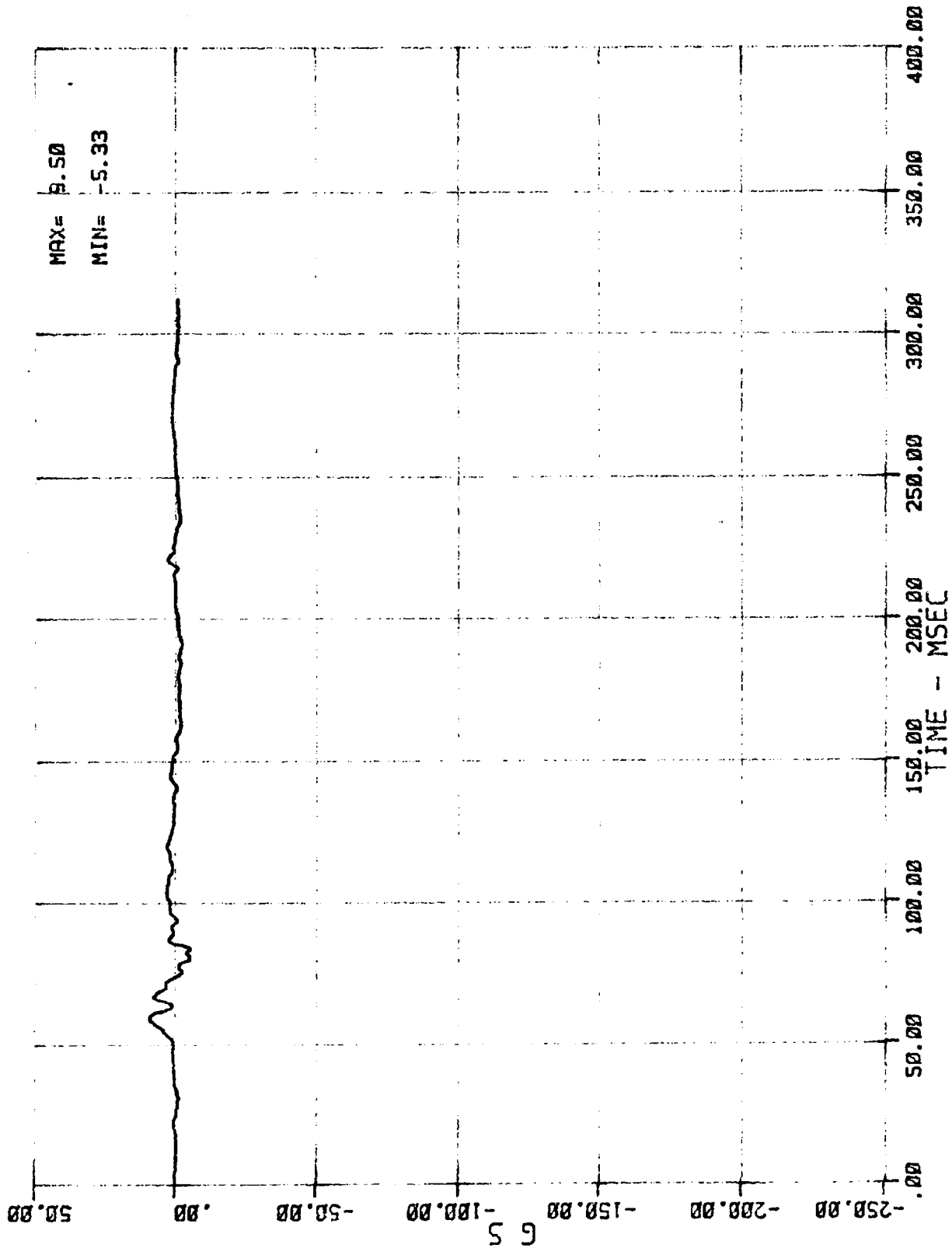
PASSENGER HEAD RESULTANT ACCELERATION
MSE N26066 1986 SUBARU XT COUPE

06/18/86



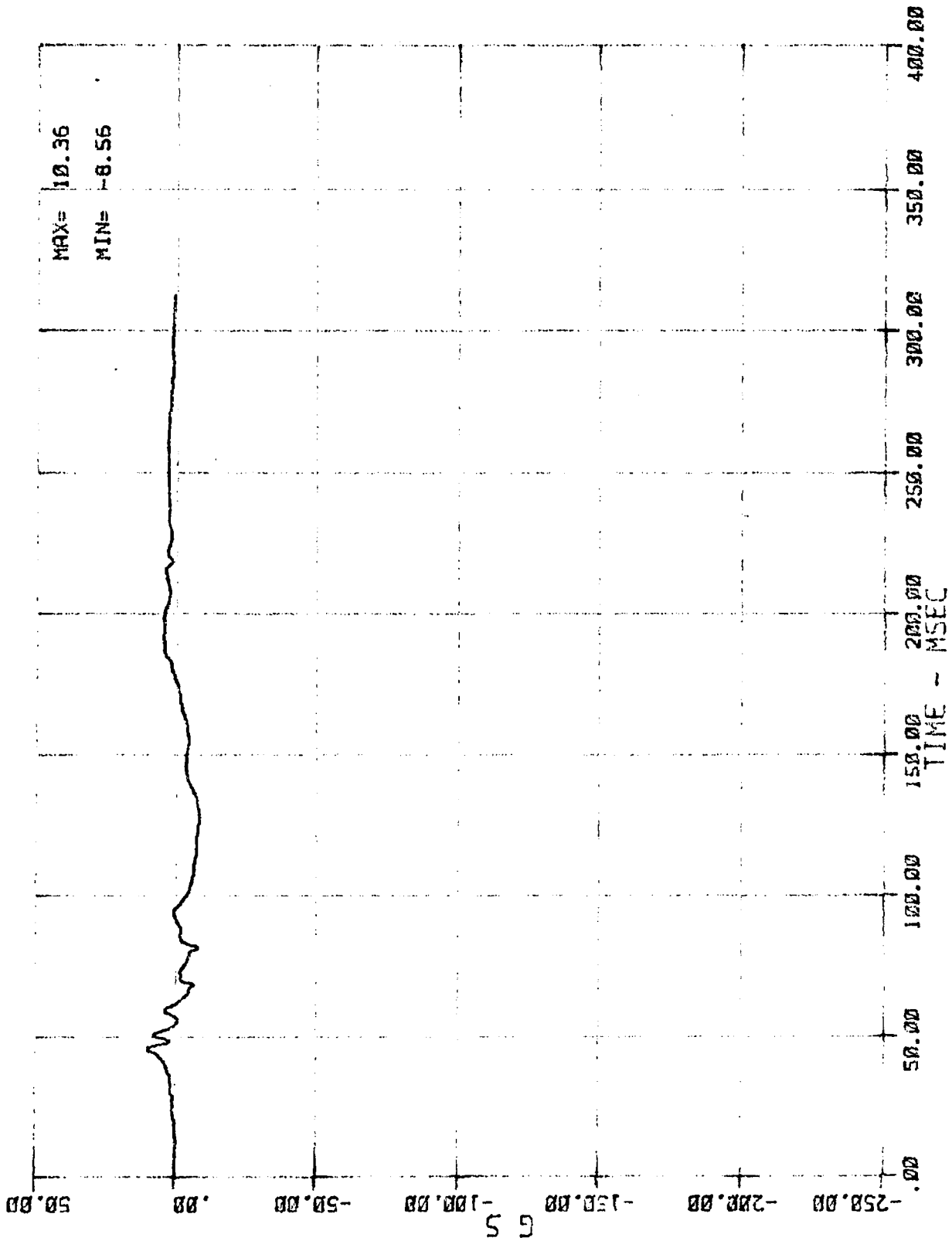
10 AC 01 2 CST X (PASSENGER CHEST ACCEL. -- X AXIS)
MSE N26066 1986 SUBARU XT COUPE

05/18/86



11 AC 01 2 CST Y (PASSENGER CHEST ACCEL. -- Y AXIS)
MSE N26066 1986 SUBARU XT COUPE

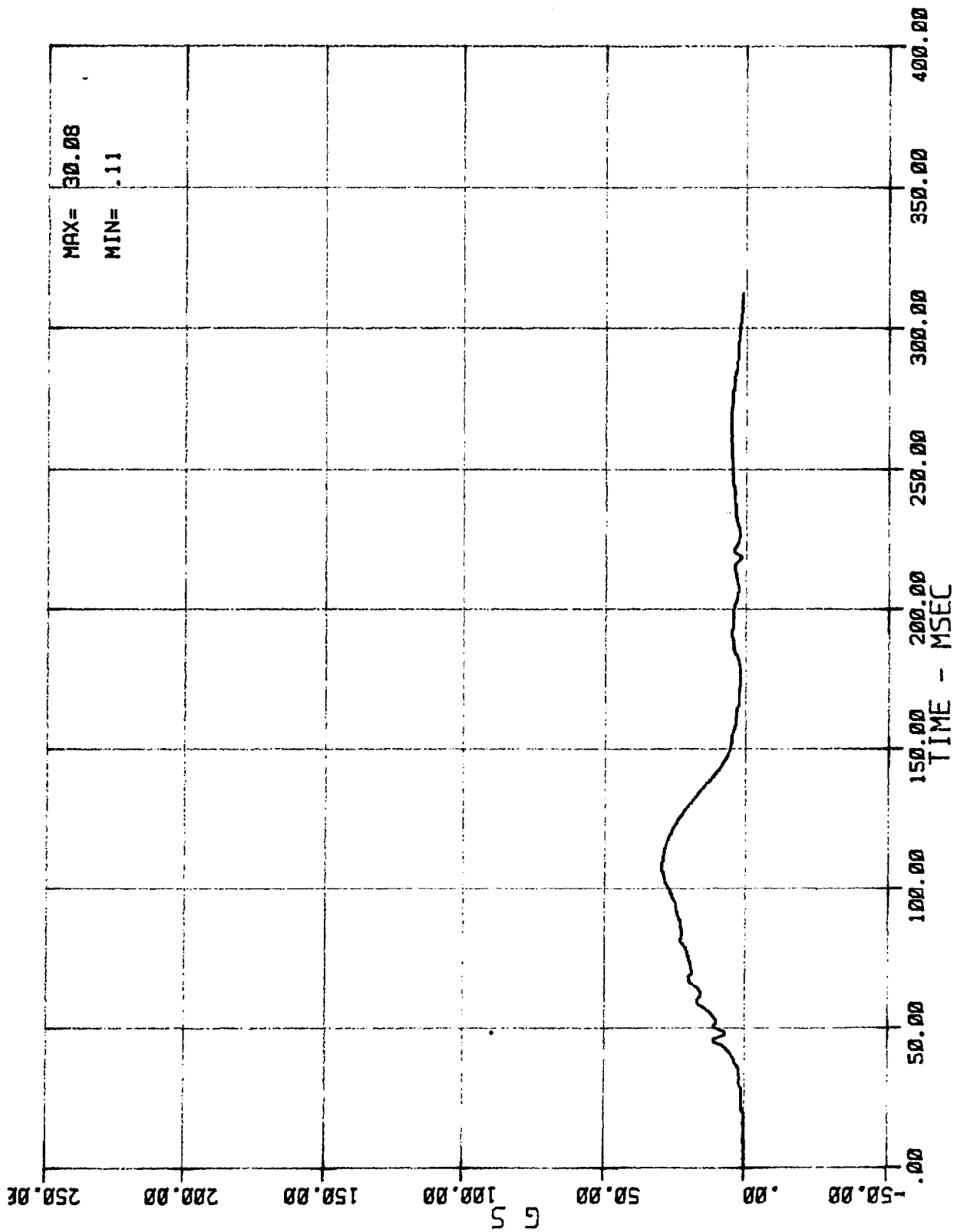
06/18/86



12 AC 01 2 CST Z PASSENGER CHEST ACCEL. -- Z AX(15)

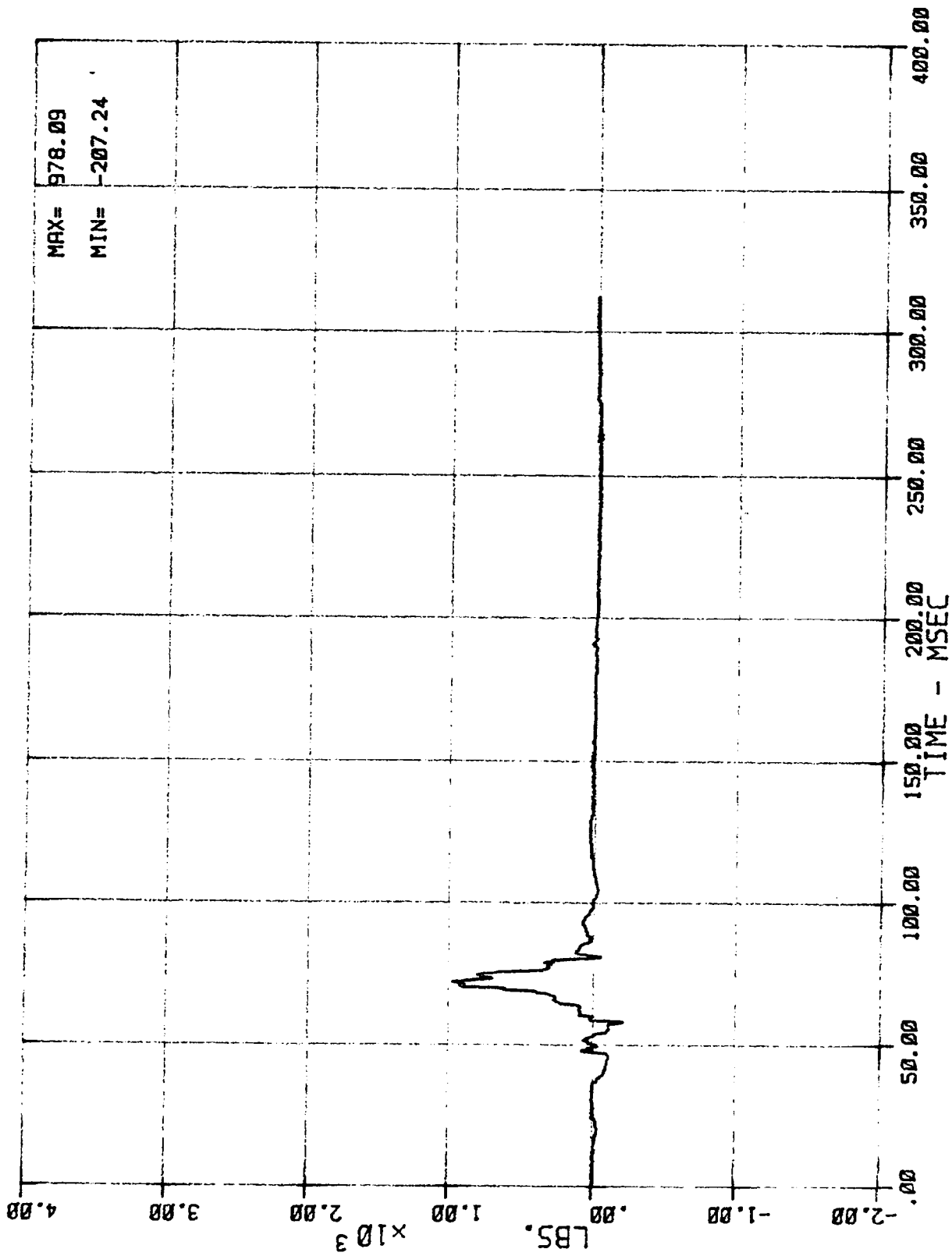
MSE N26066 1986 SUBARU XT COUPE

06/18/86



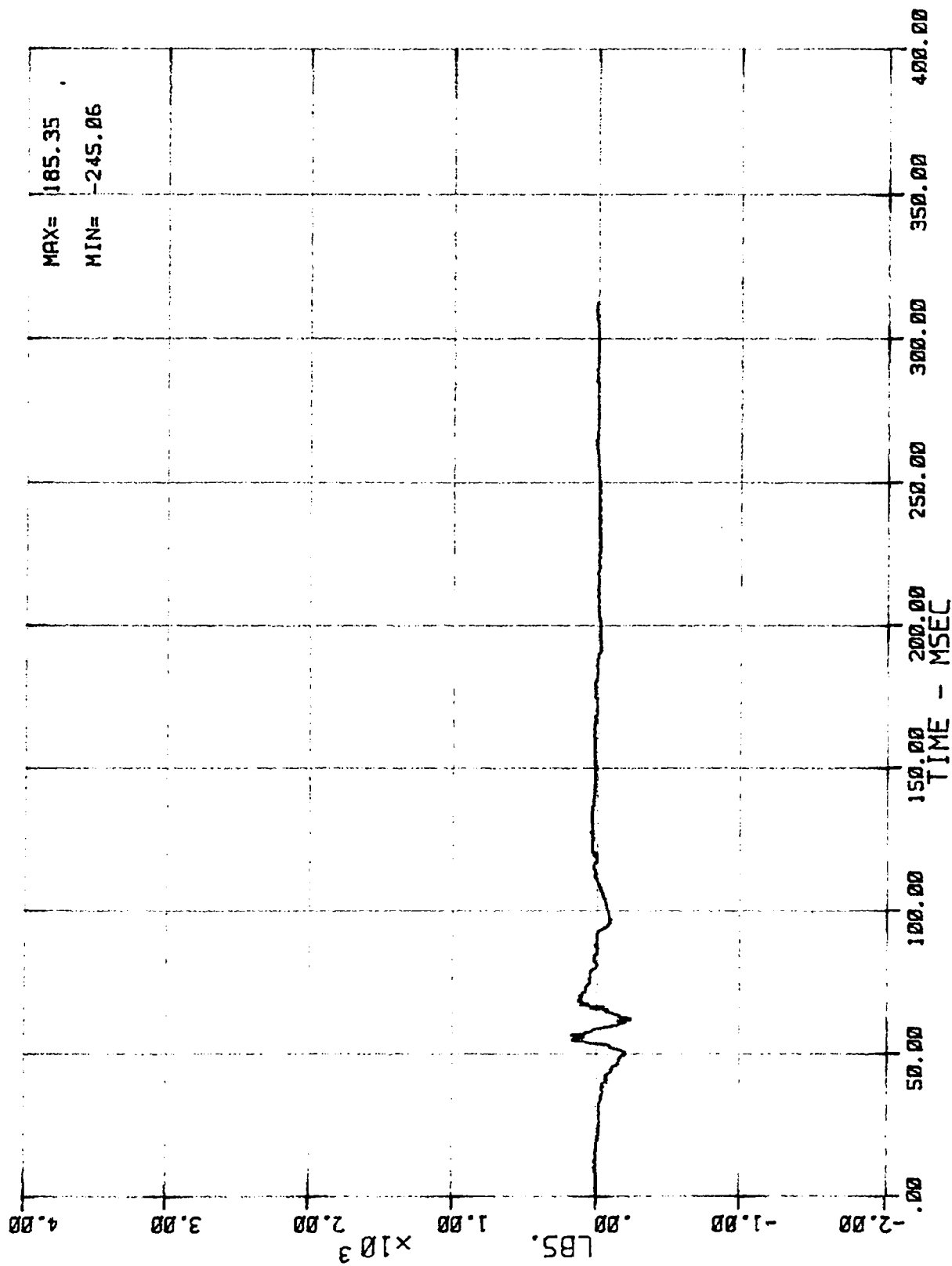
PASSENGER CHEST RESULTANT ACCELERATION
MSE N26066 1986 SUBARU XT COUPE

06/18/86



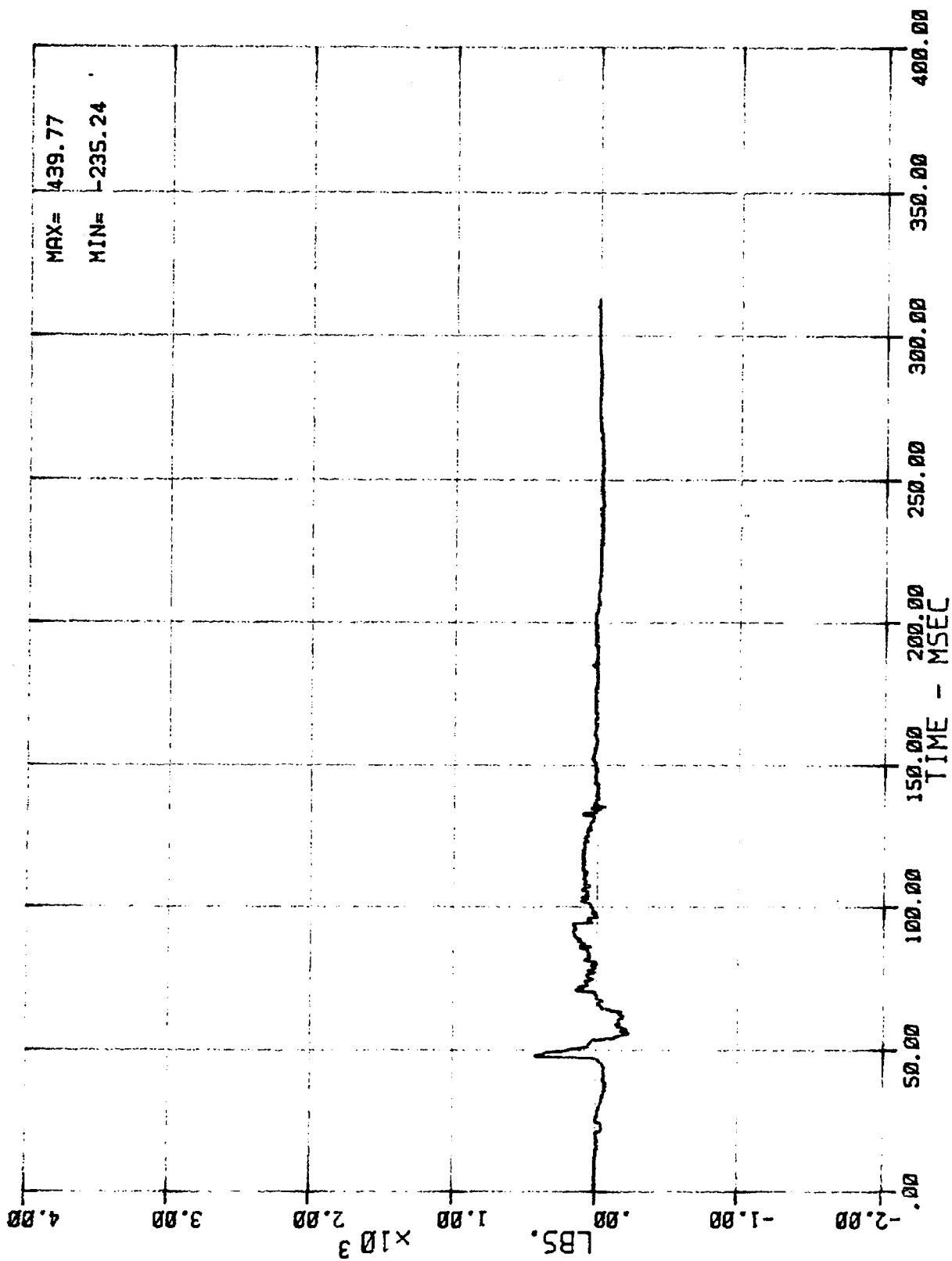
13 LC 01 1 LFM (DRIVER LEFT FEMUR FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



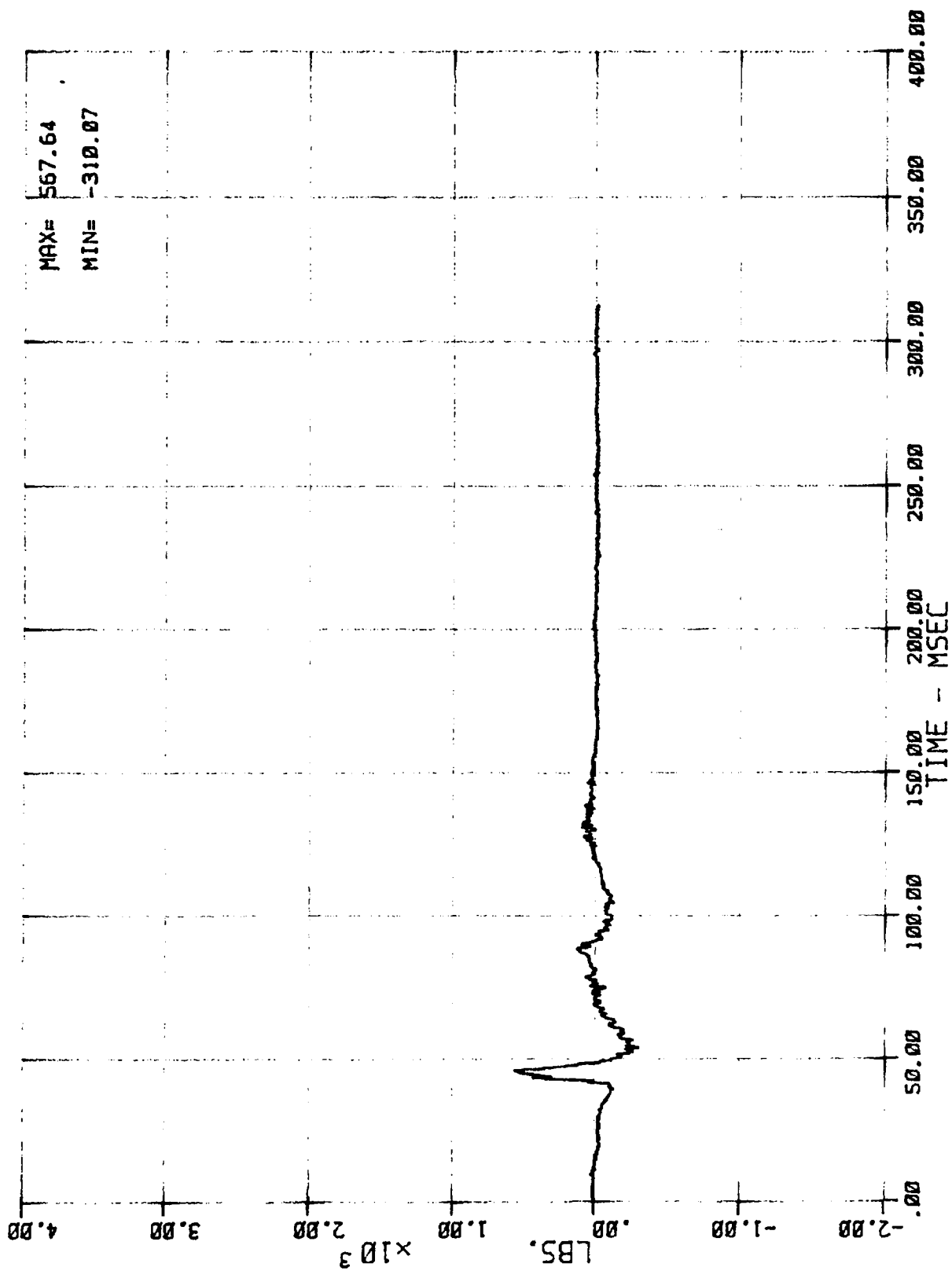
14 LC 01 1 RFM (DRIVER RIGHT FEMUR FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



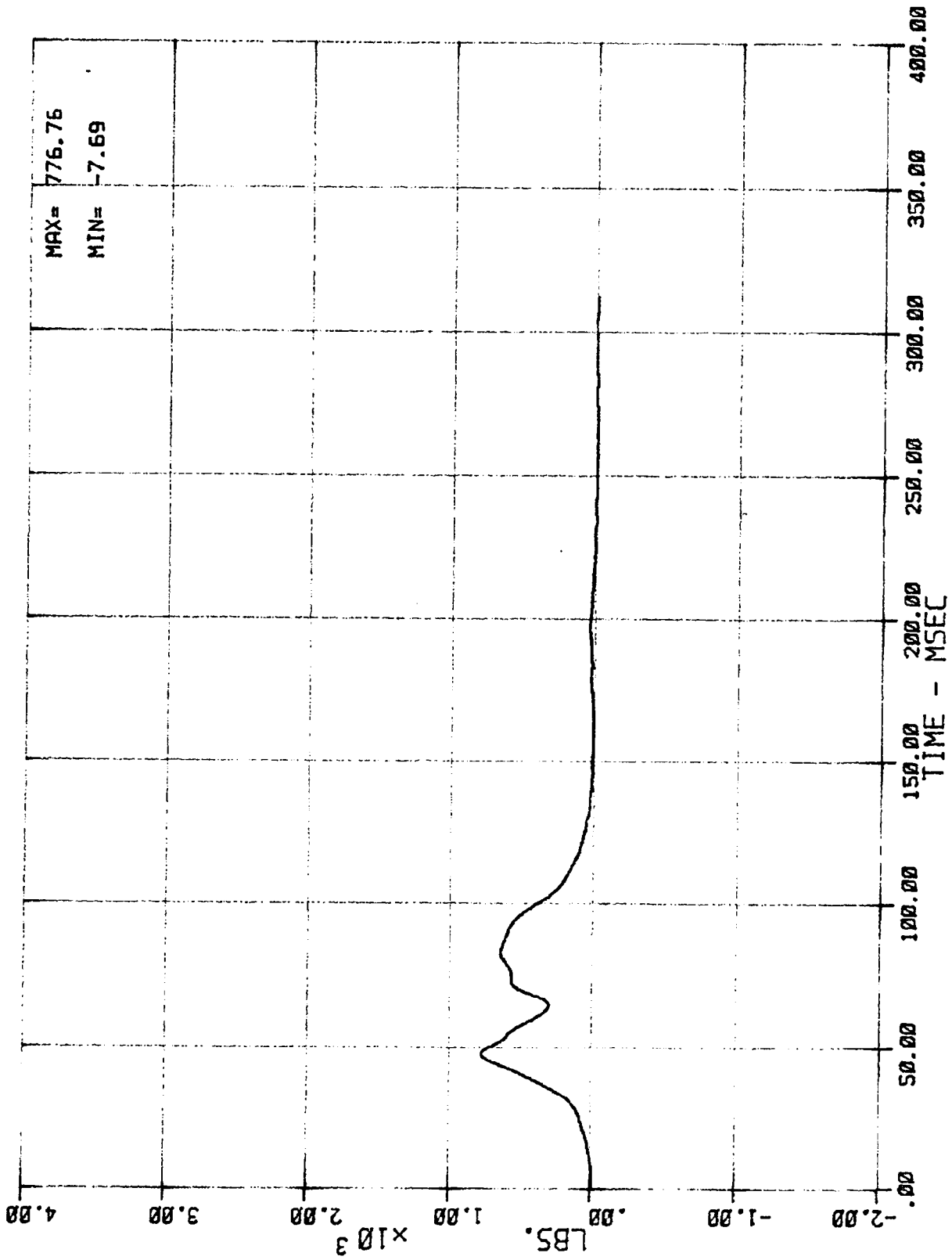
15 LC 01 2 LFM (PASSENGER LEFT FEMUR FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



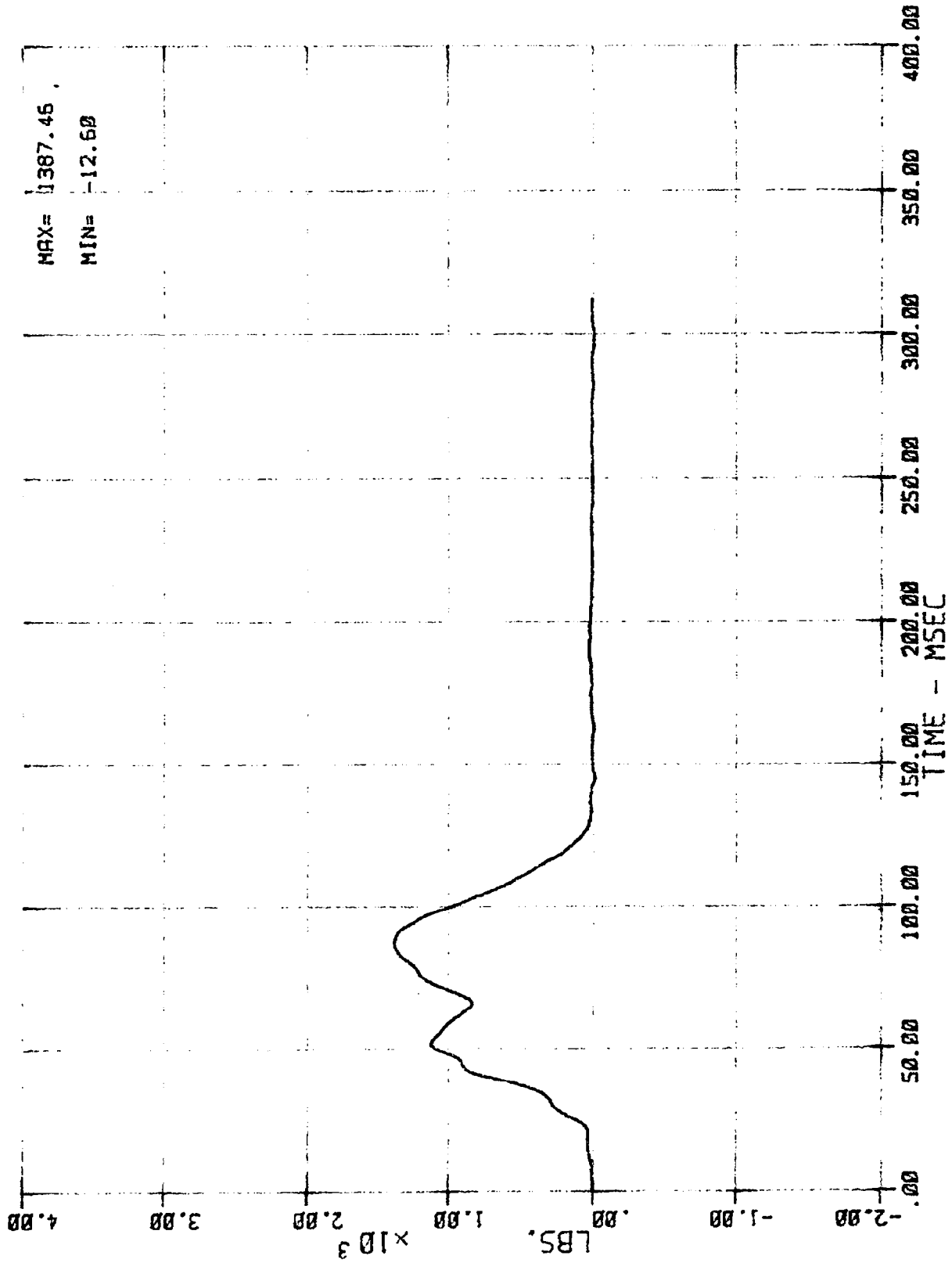
16 LC 01 2 RFM (PASSENGER RIGHT FEMUR FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



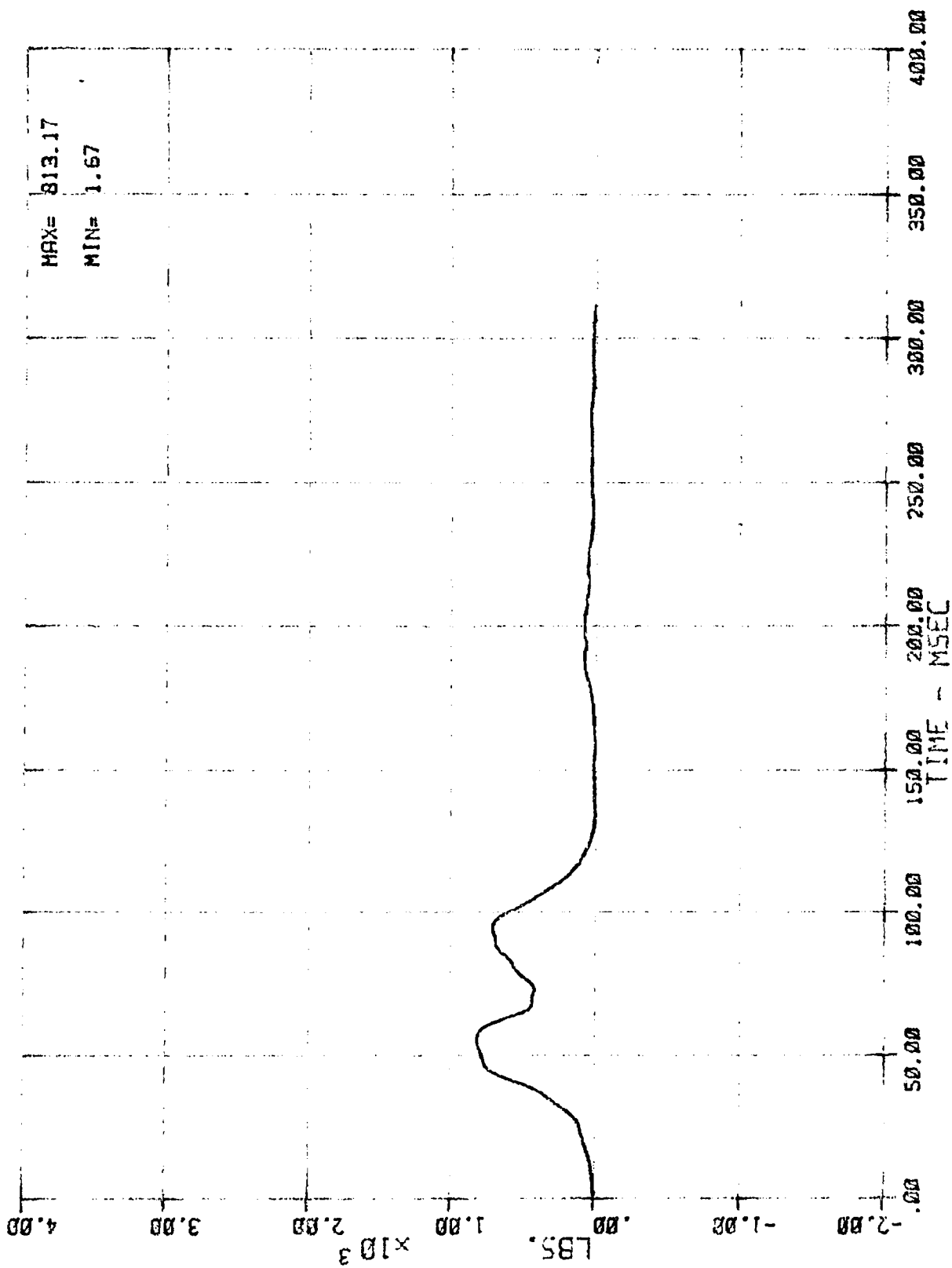
17 LC 01 1 LBO (DRIVER LAP BELT FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



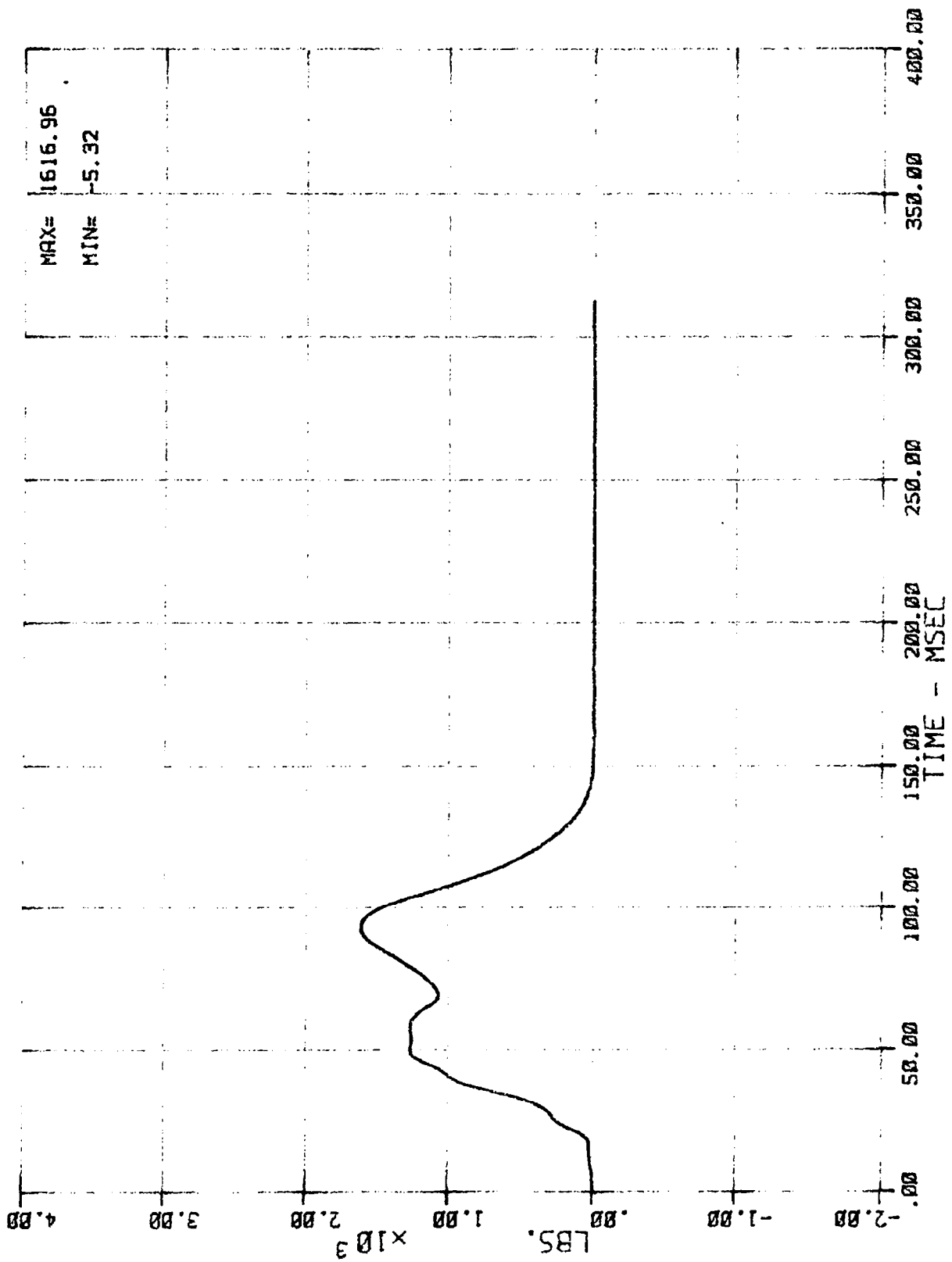
18 LC 01 1 SHB (DRIVER SHOULDER BELT FORCE)
MSE N26066 1986 SUBARU XT COUPE

05/18/86



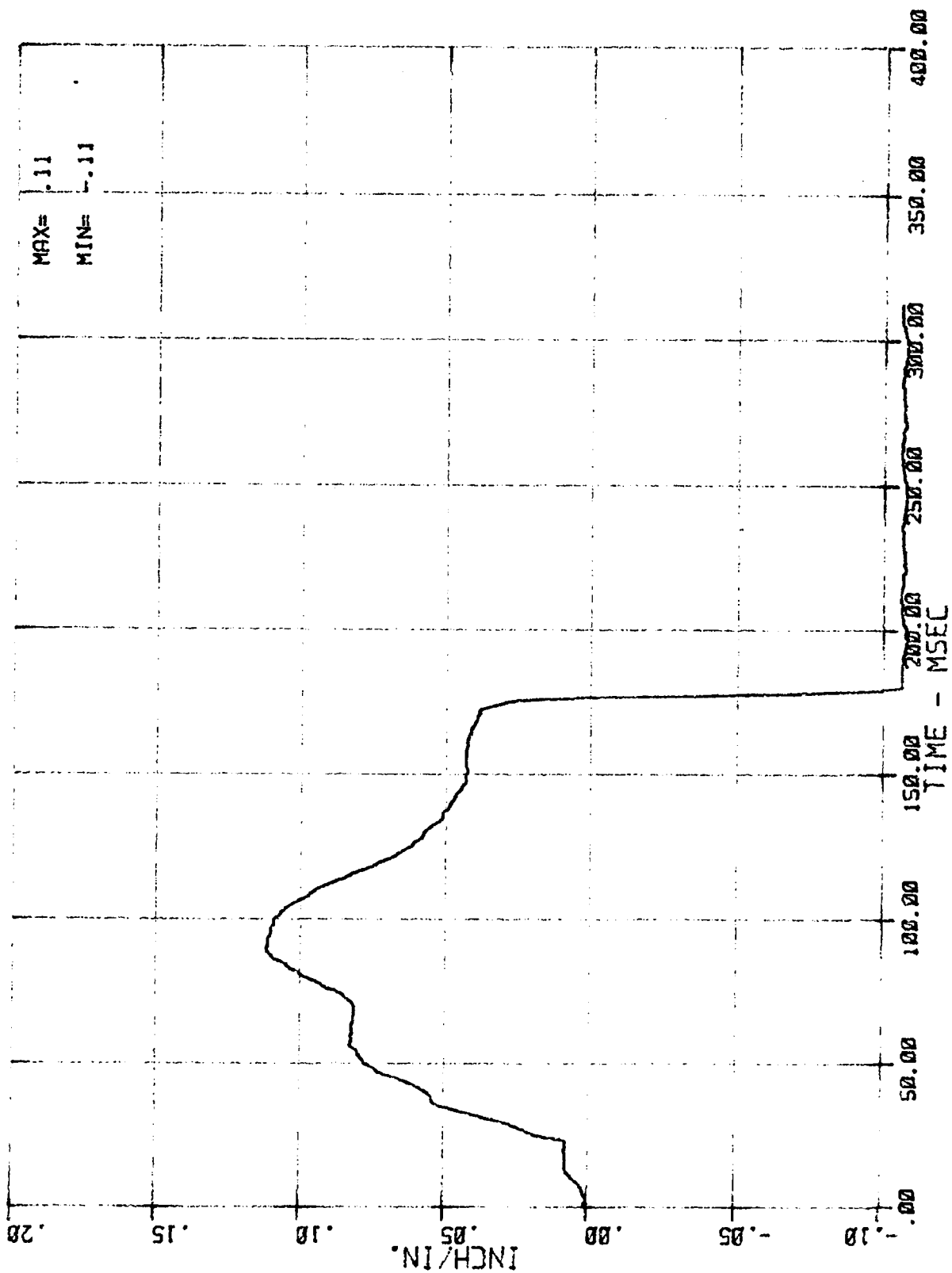
19 LC 01 2 LBO (PASSENGER LAP BELT FORCE)
NSE N26066 1986 SUBARU XT COUPE

06/18/85



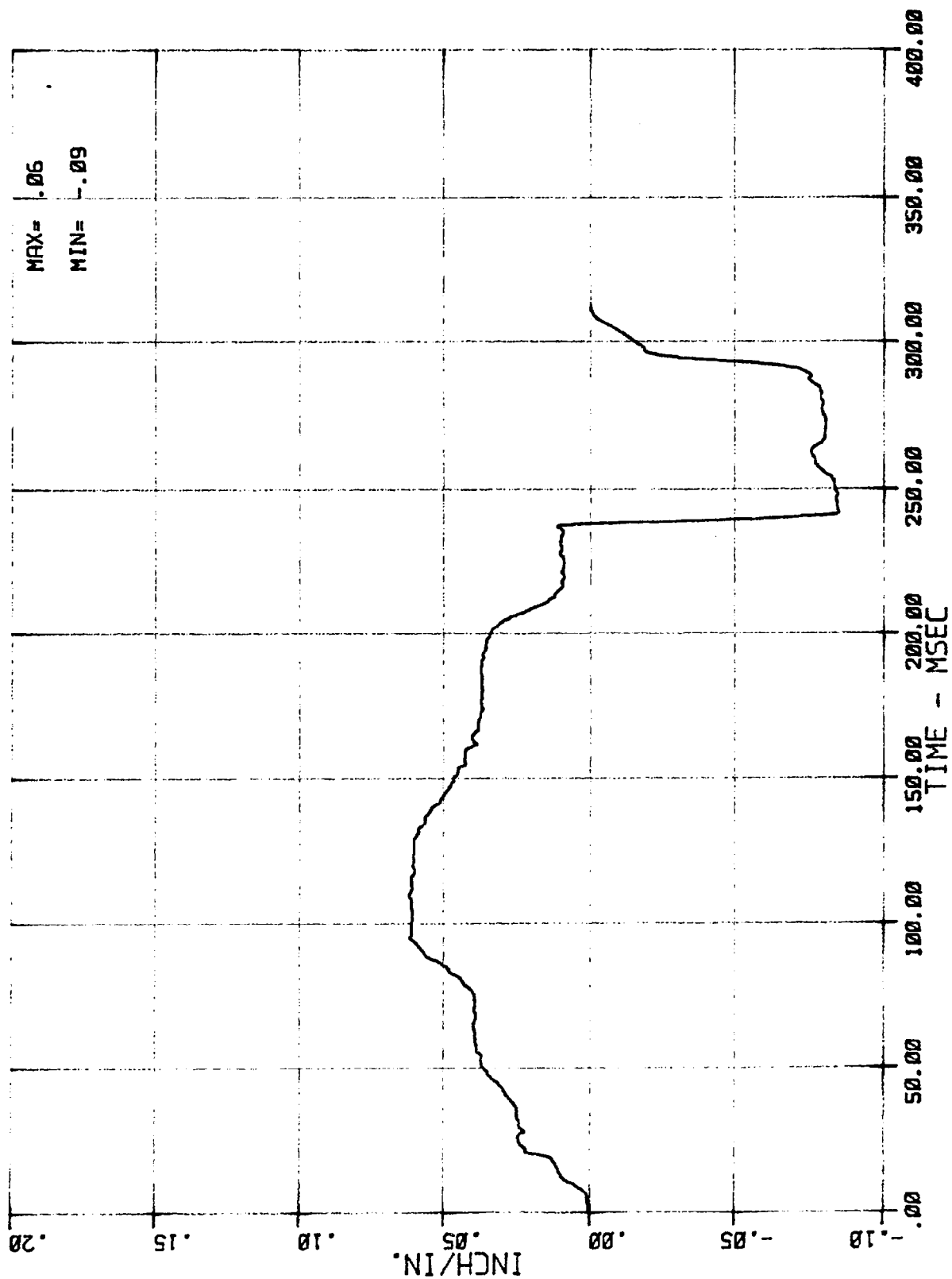
20 LC 01 2 SHB (PASSENGER SHOULDER BELT FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



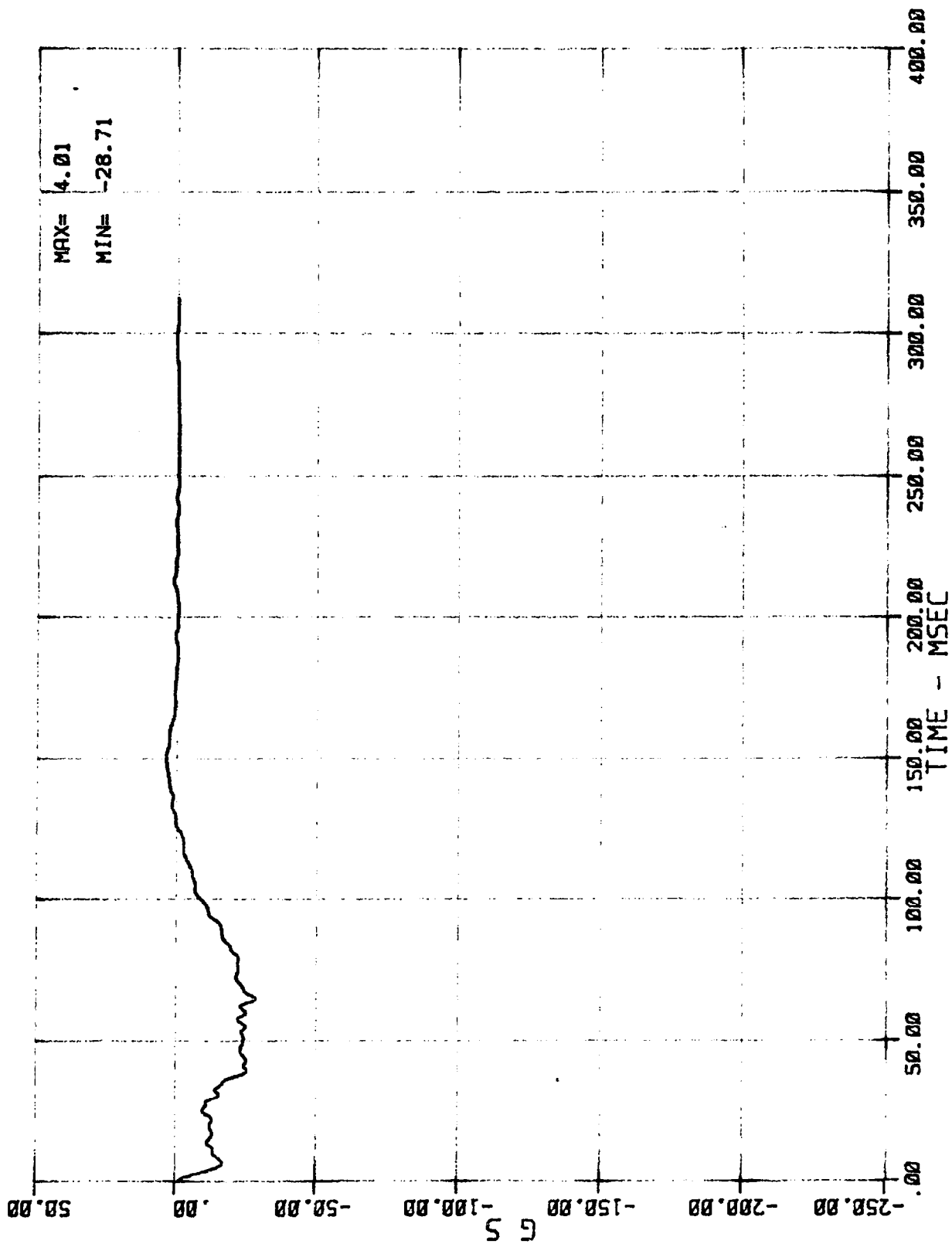
23 DT 01 1 SHB (DRIVER SHOULDER BELT STRETCH)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



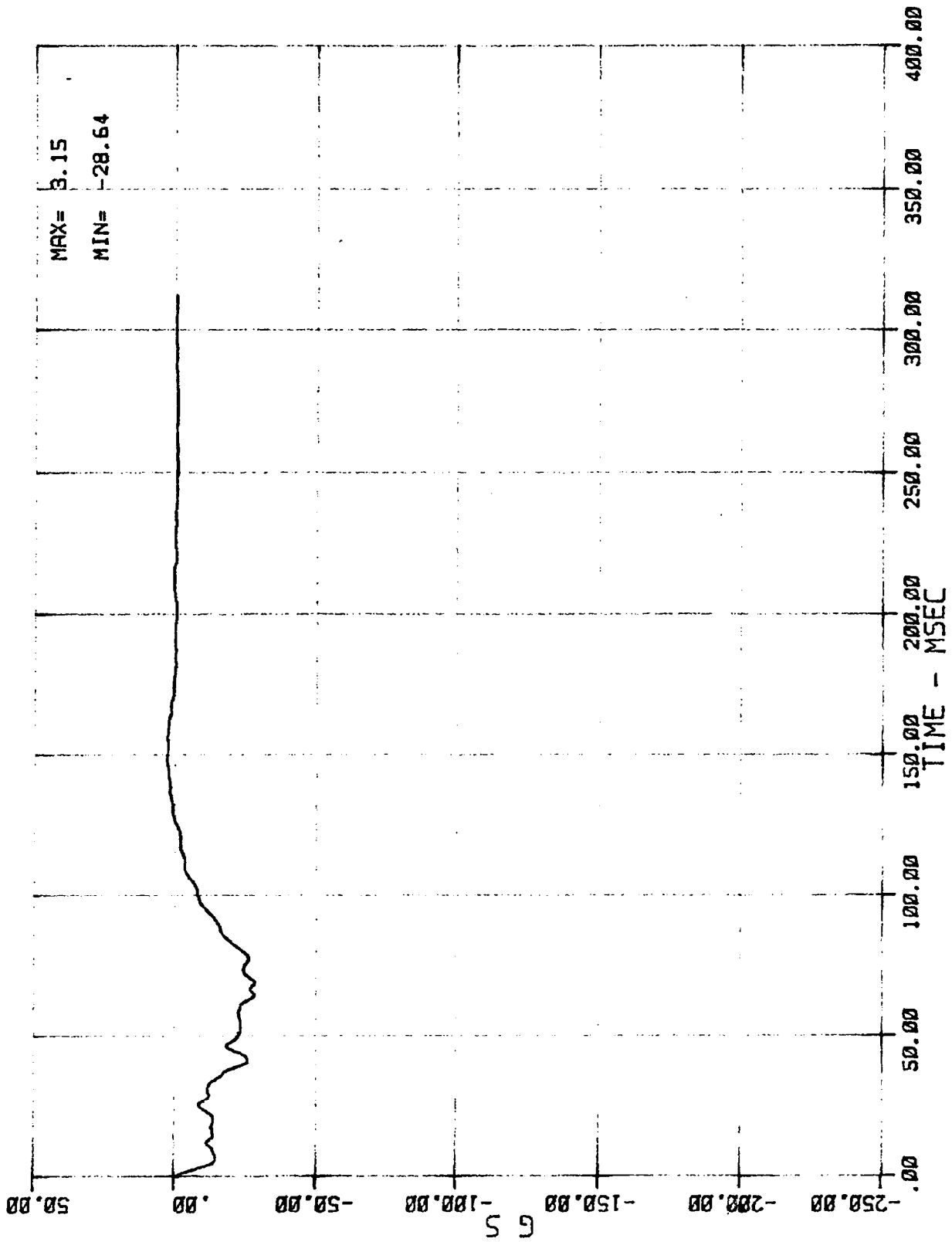
24 DT 01 2 SHB (PASSENGER SHOULDER BELT STRETCH)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



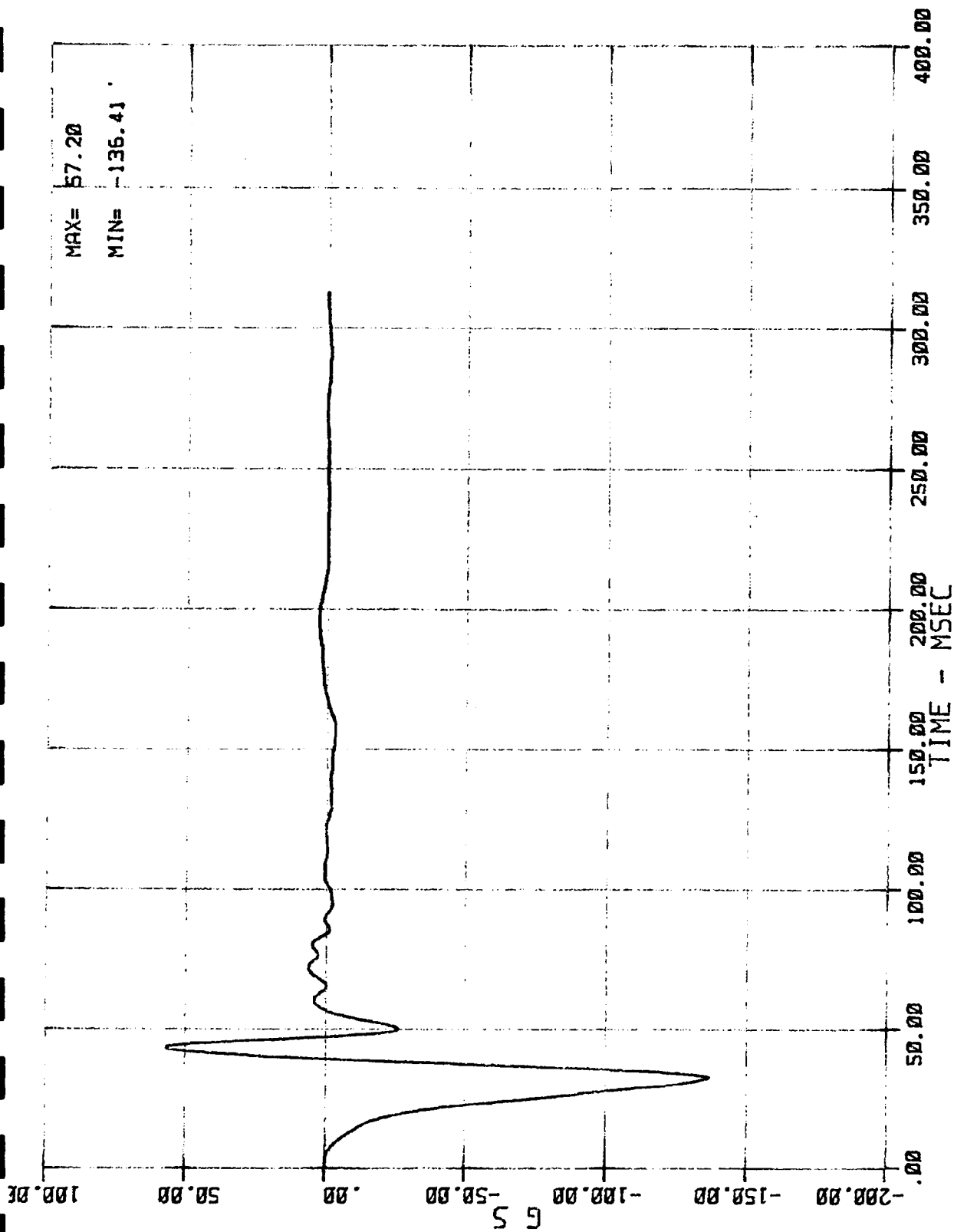
25 AC 01 N LRF X (LEFT REAR FLOOR ACCE. -- X AXIS)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



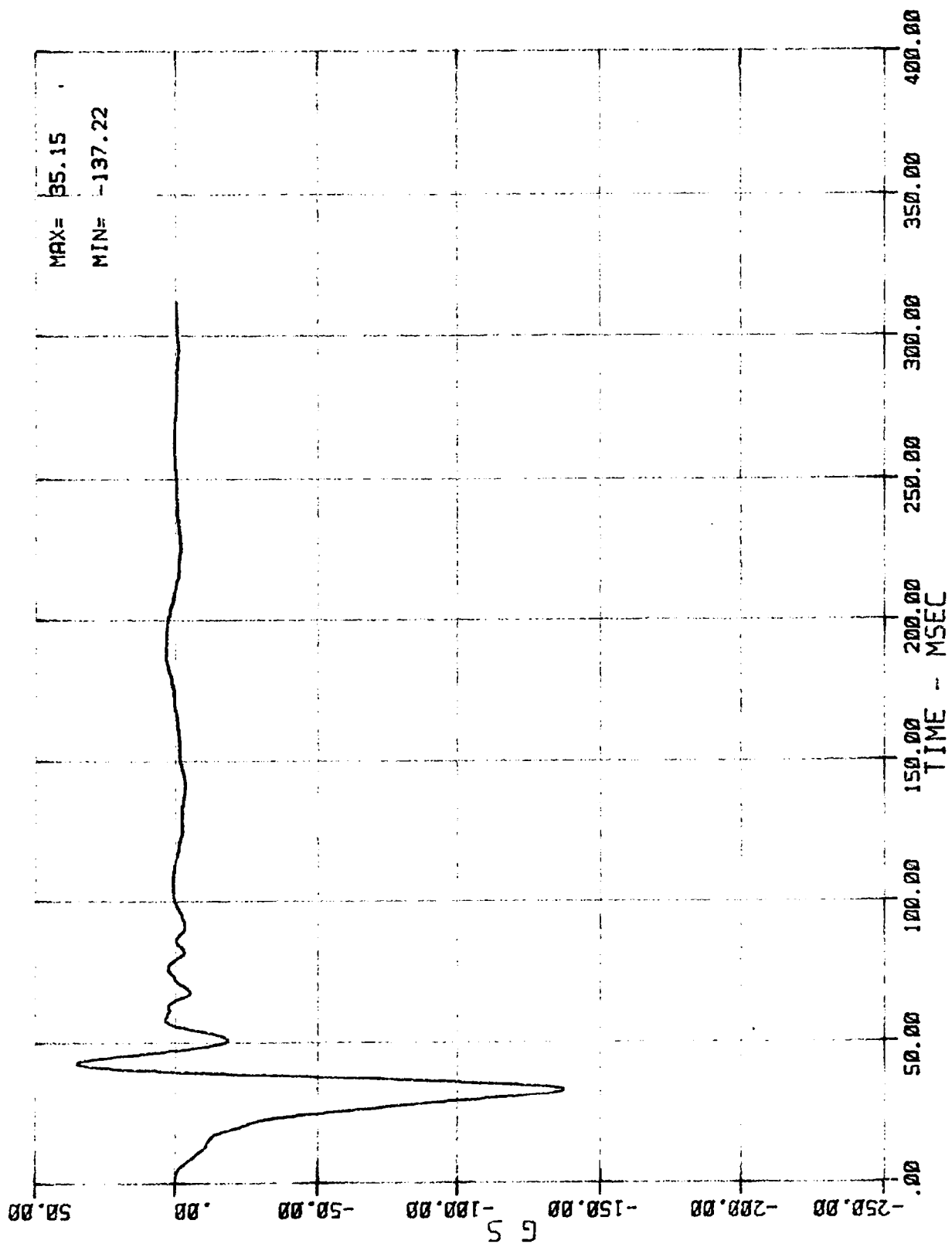
26 AC 01 N RRF X (RIGHT REAR FLOOR ACCEL. --- X AXIS)
MSE N26066 1986 SUBARU XT COUPE

05/18/86



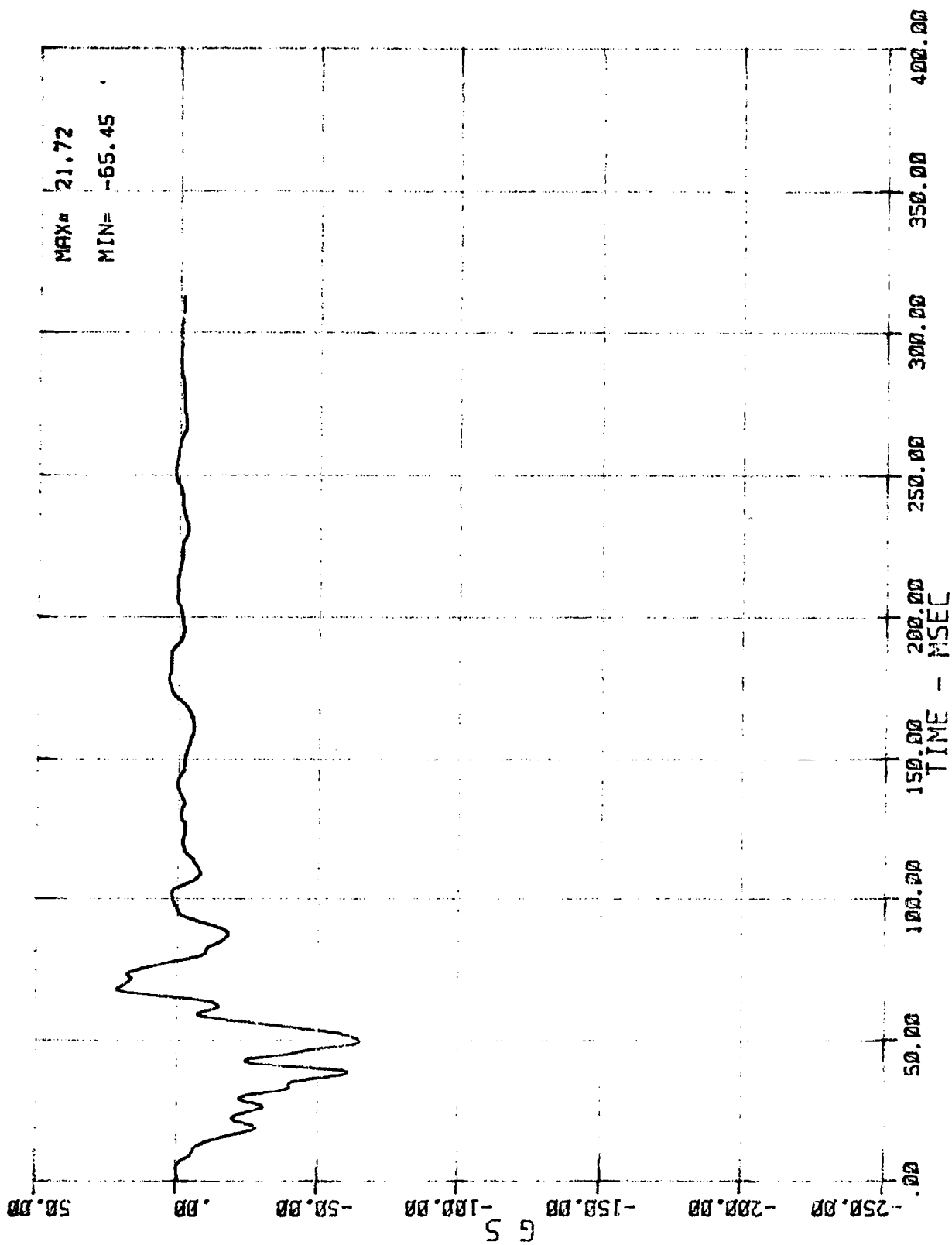
27 AC 01 N ENG X (TOP OF ENGINE ACCEL. -- X AXIS)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



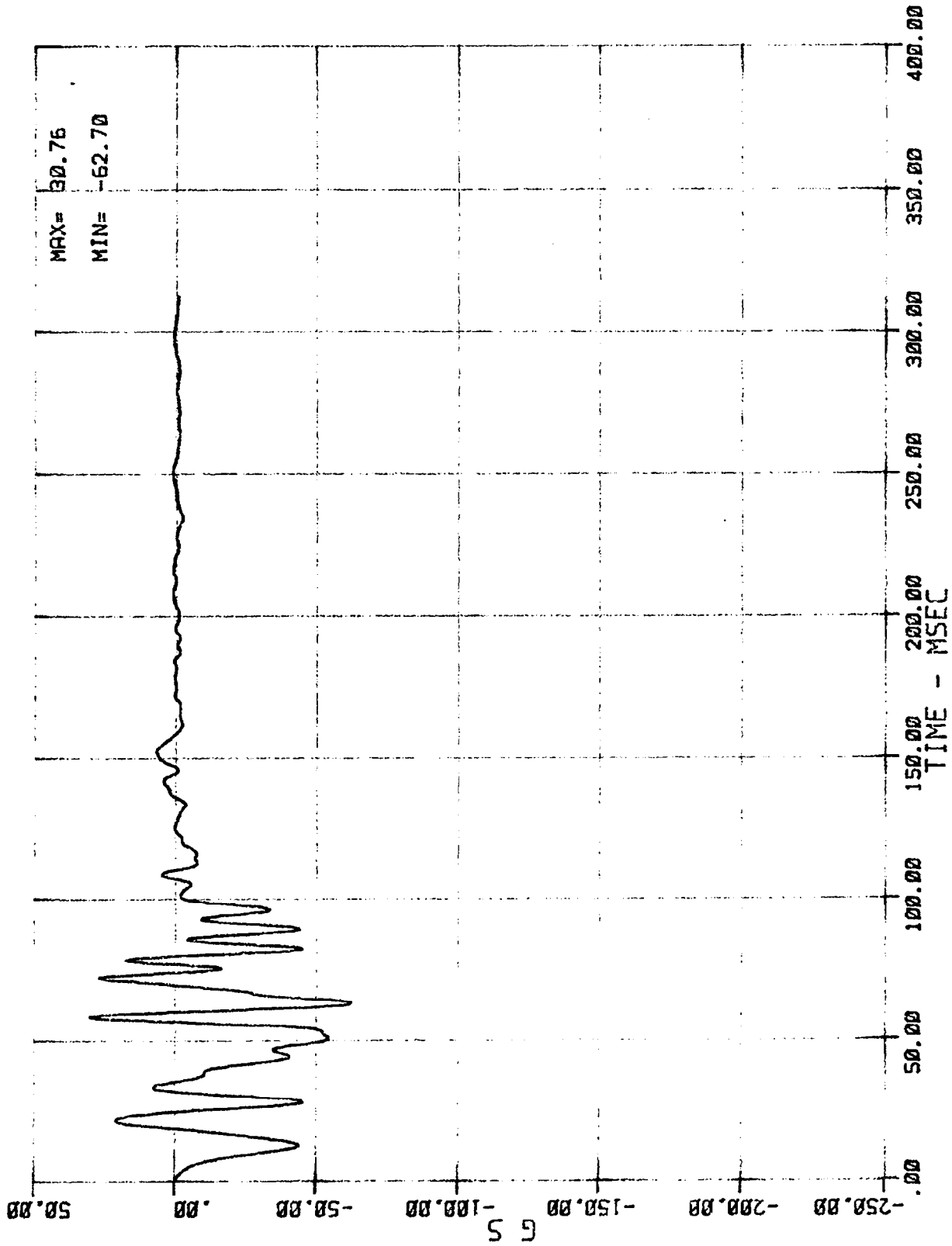
28 AC 01 N ENG X (BOTTOM OF ENGINE ACCEL. -- AXIS)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



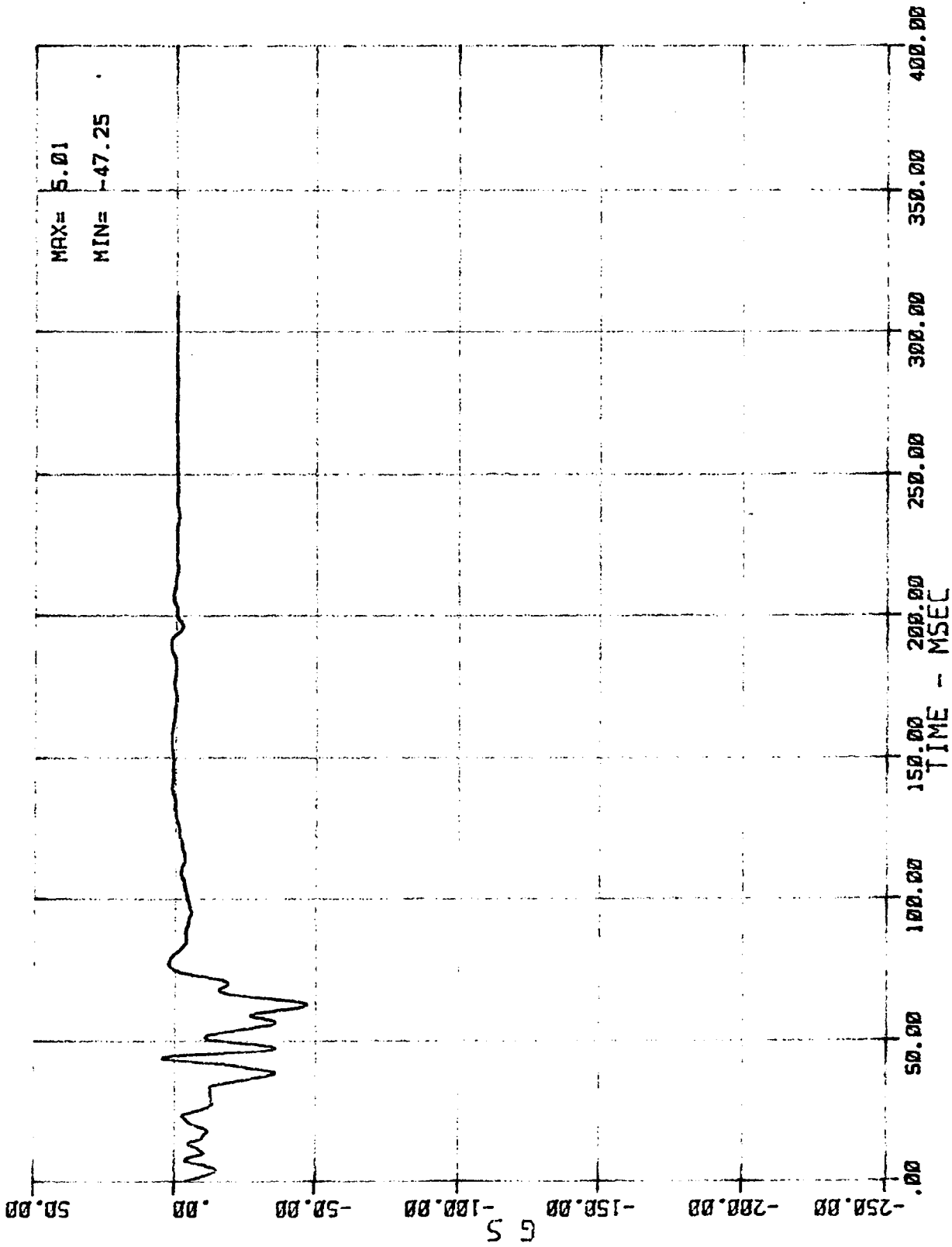
29 AC 01 N BCR X (RIGHT FRONT WHEEL ACCEL. -- AXIS)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



30 AC 01 N DPC X (CENTER OF DASH ACCEL. -- Y AXIS)
MSE N26066 1986 SUBARU XT COUPE

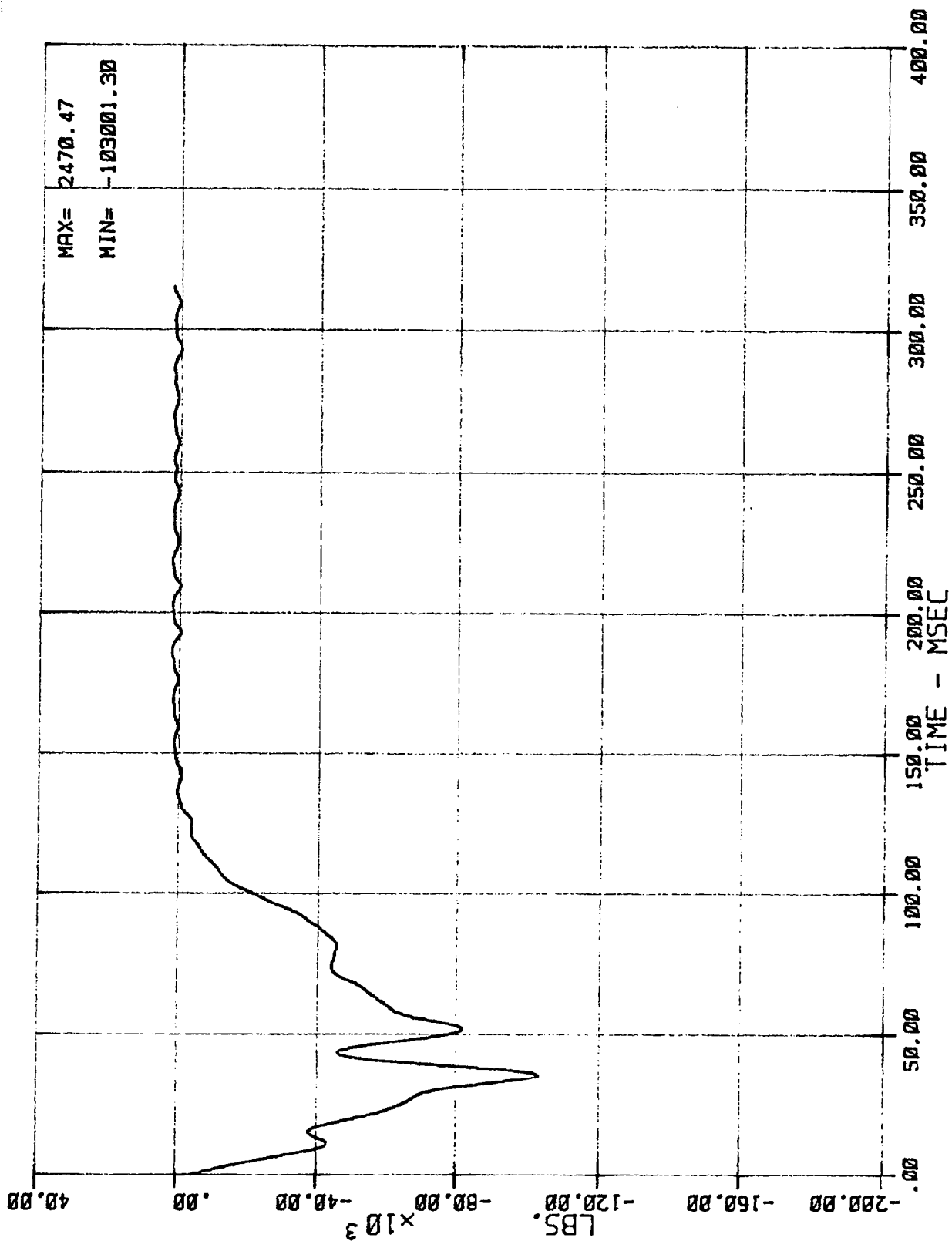
06/18/86



31 AC 01 N VCG X (VEHICLE C.G. ACCEL. -- X AXIS)
MSE N26066 1986 SUBARU XT COUPE

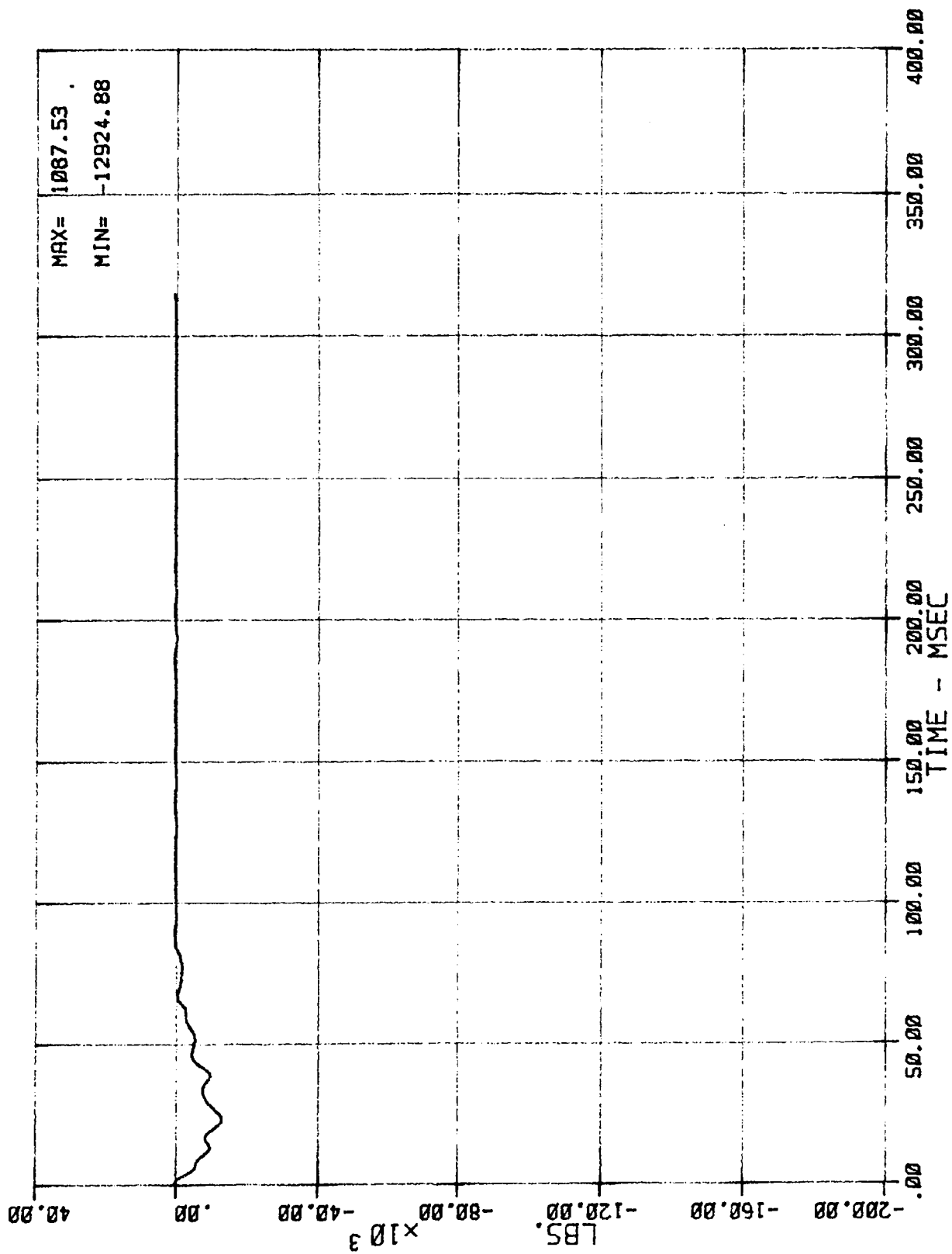
06/18/86

APPENDIX B-2
LOAD CELL BARRIER
DATA



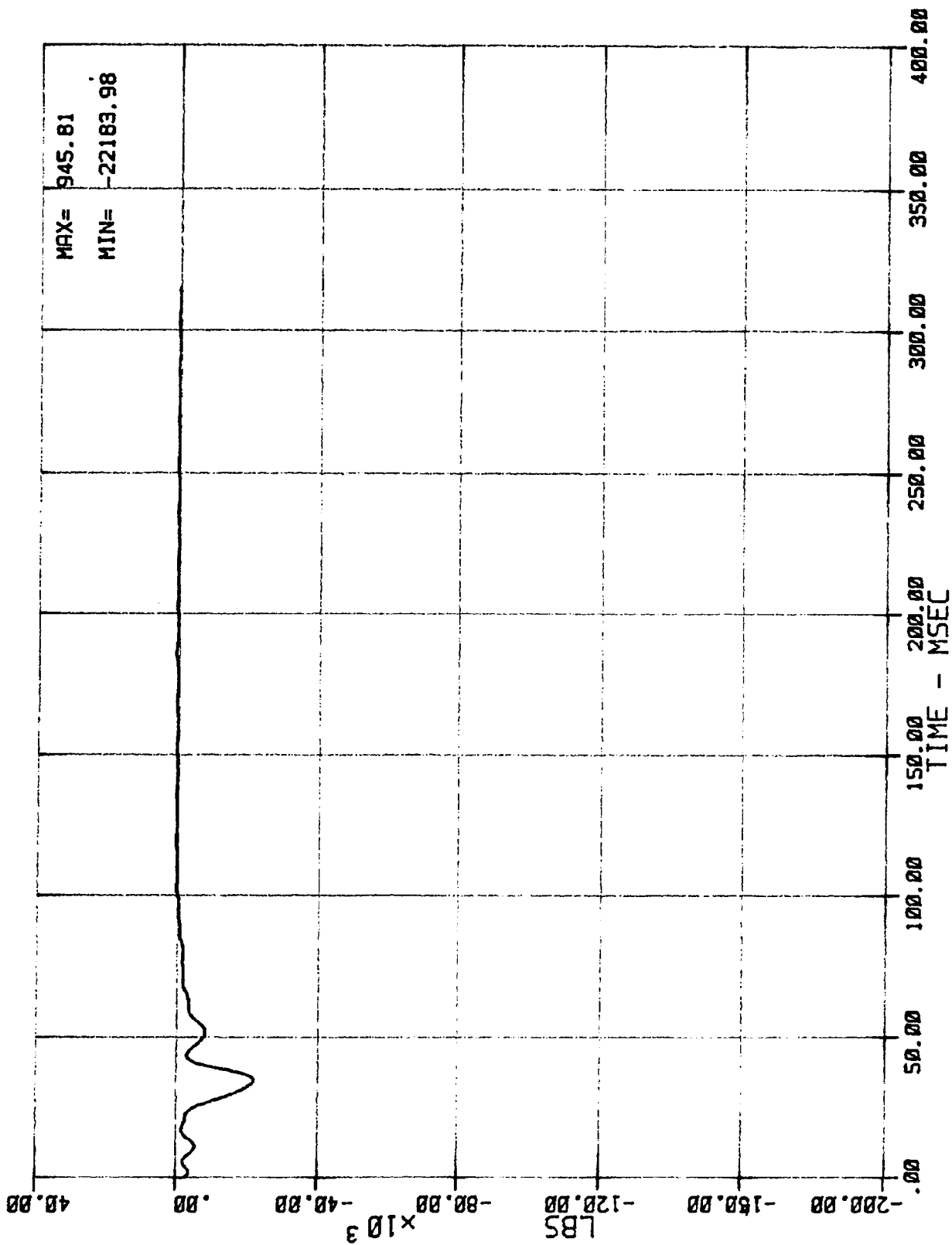
TOTAL SUM, LOAD CELL BARRIER FORCE
MSE N25066 1986 SUBARU XT COUPE

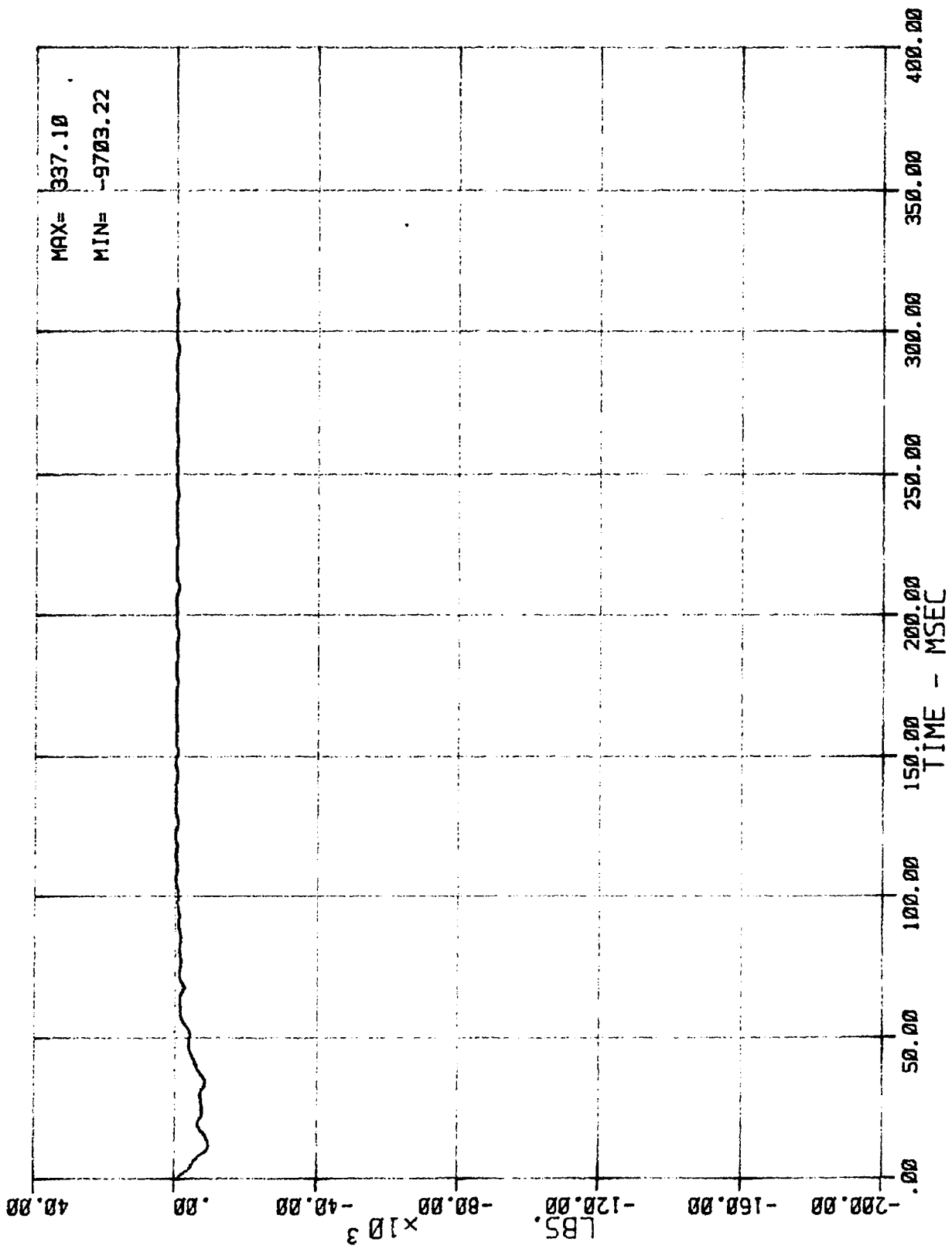
06/18/86



GROUP 1 SUM (C1,C2,C3,D1,D2,D3) LOAD CELL BARRIER FORCE
MSE N26066 1986 SUBARU XT COUPE

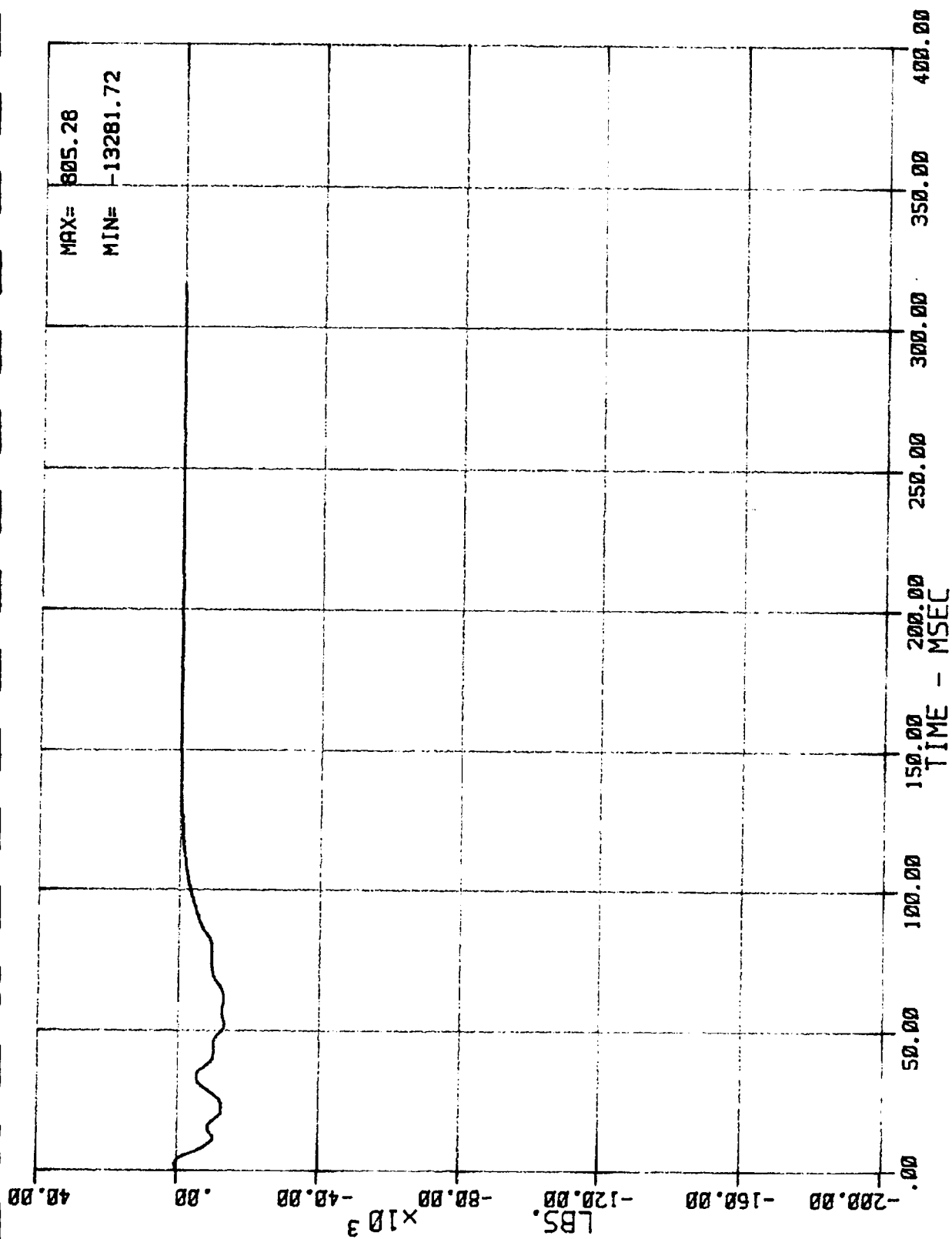
06/18/86





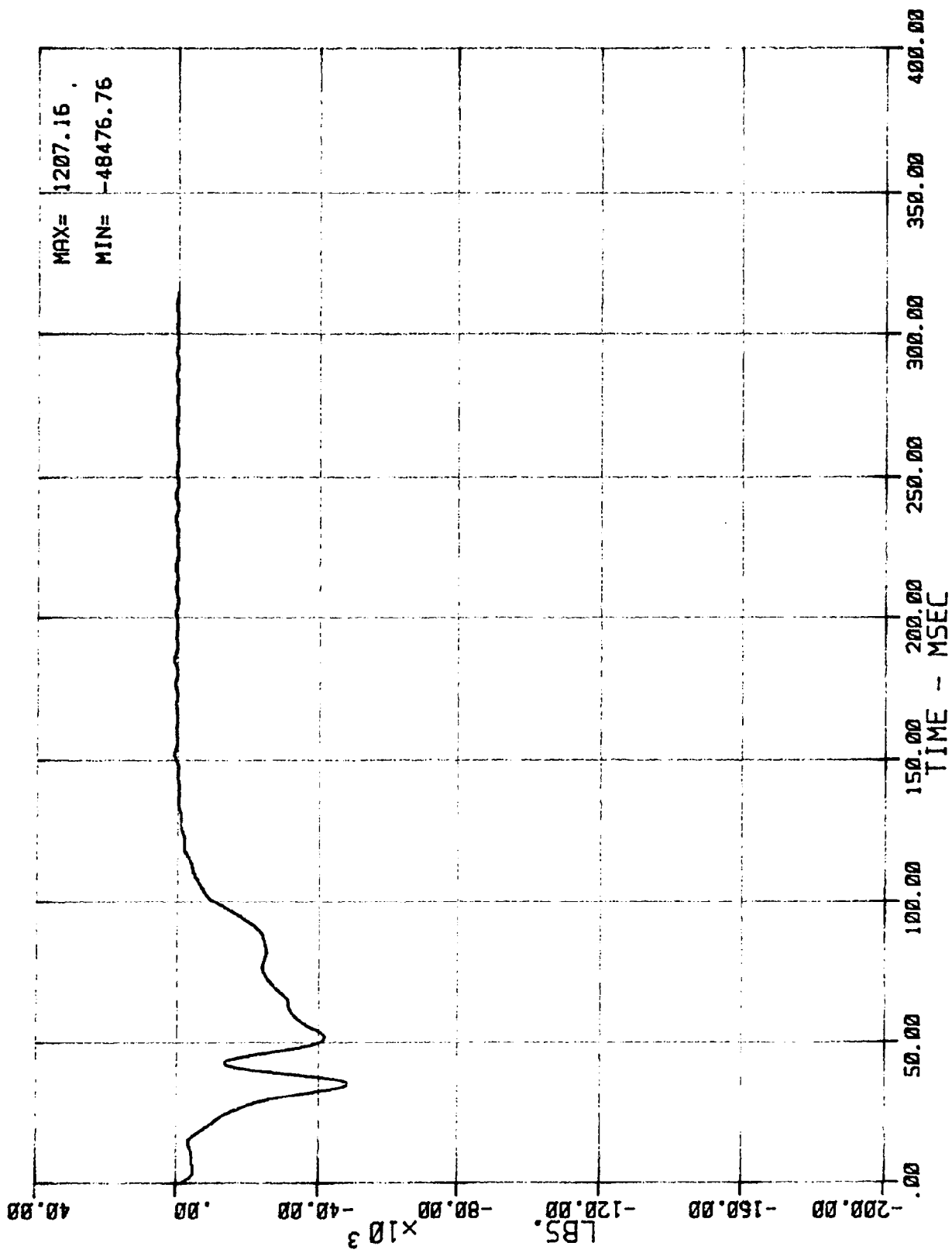
GROUP 3 SUM (C7,C8,C9,D7,D8,D9) LOAD CELL BARRIER FORCE
MSE N26066 1986 SUBARU XT COUPE

06/18/86



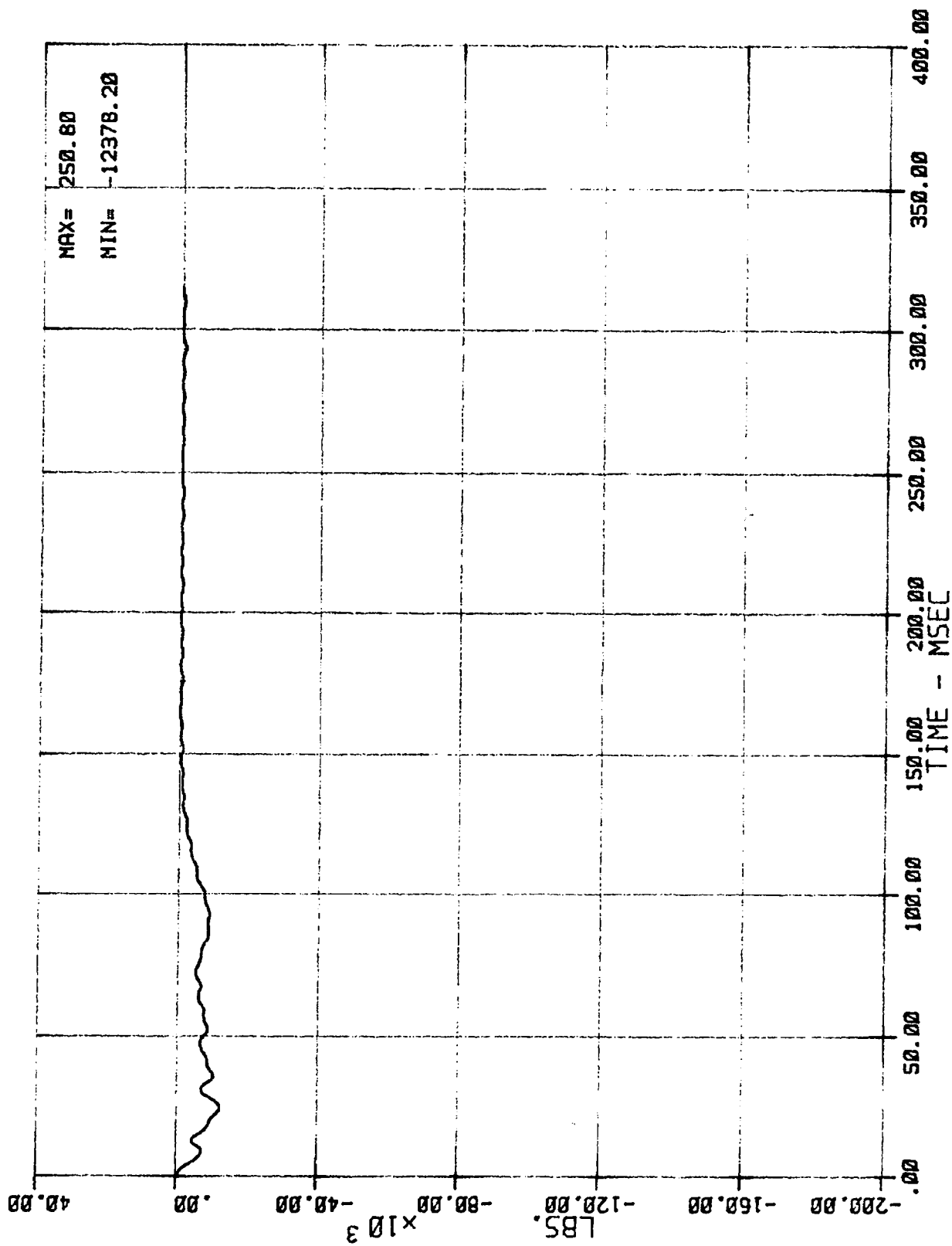
GROUP 4 SUM (A1,A2,A3,B1,B2,B3) LOAD CELL BARRIER FORCE
MSE N25066 1985 SUBARU XT COUPE

05/18/86



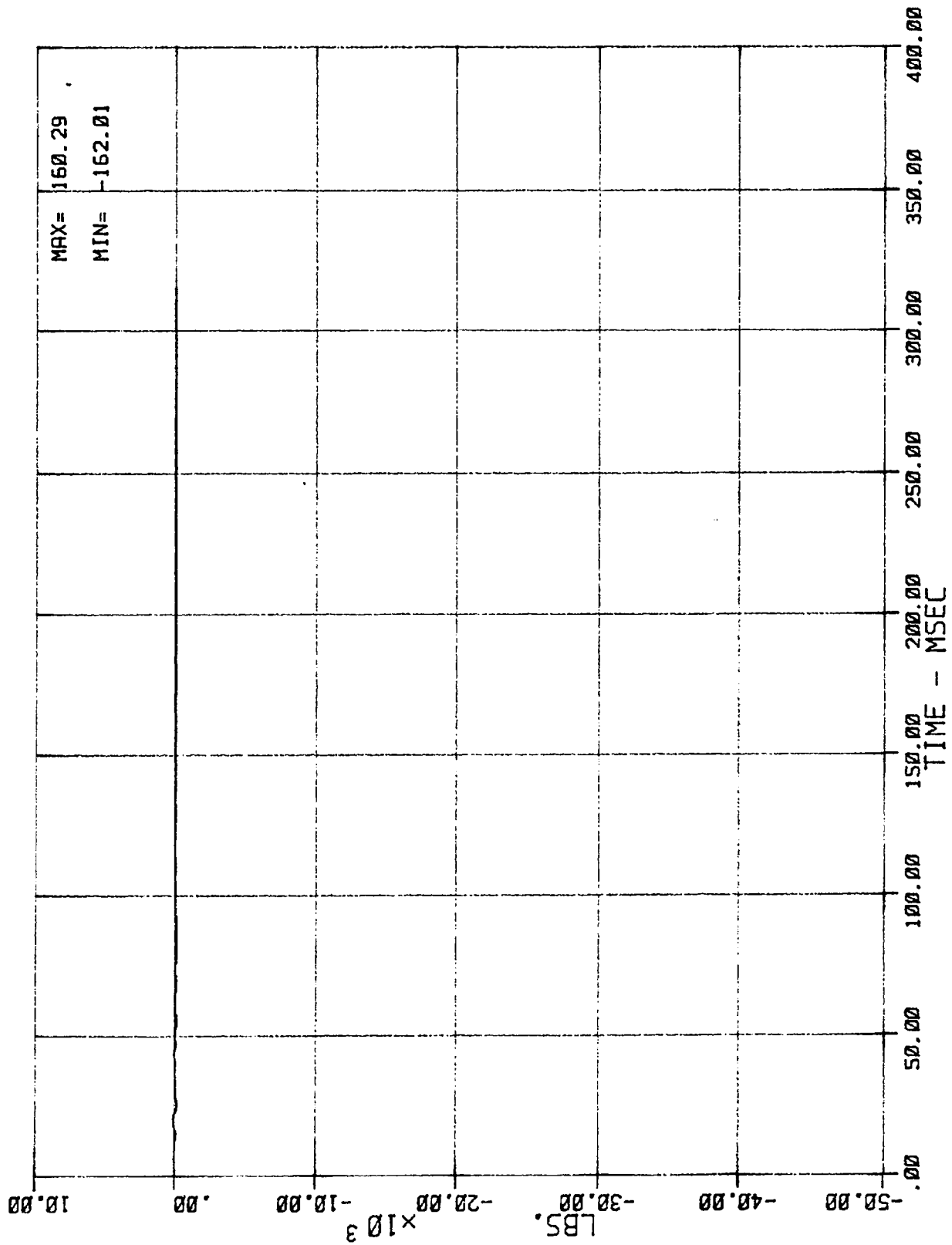
GROUP 5 SUM (A4,A5,A6,B4,B5,B6) LOAD CELL BARRIER FORCE
MSE N26066 1986 SUBARU XT COUPE

06/18/86



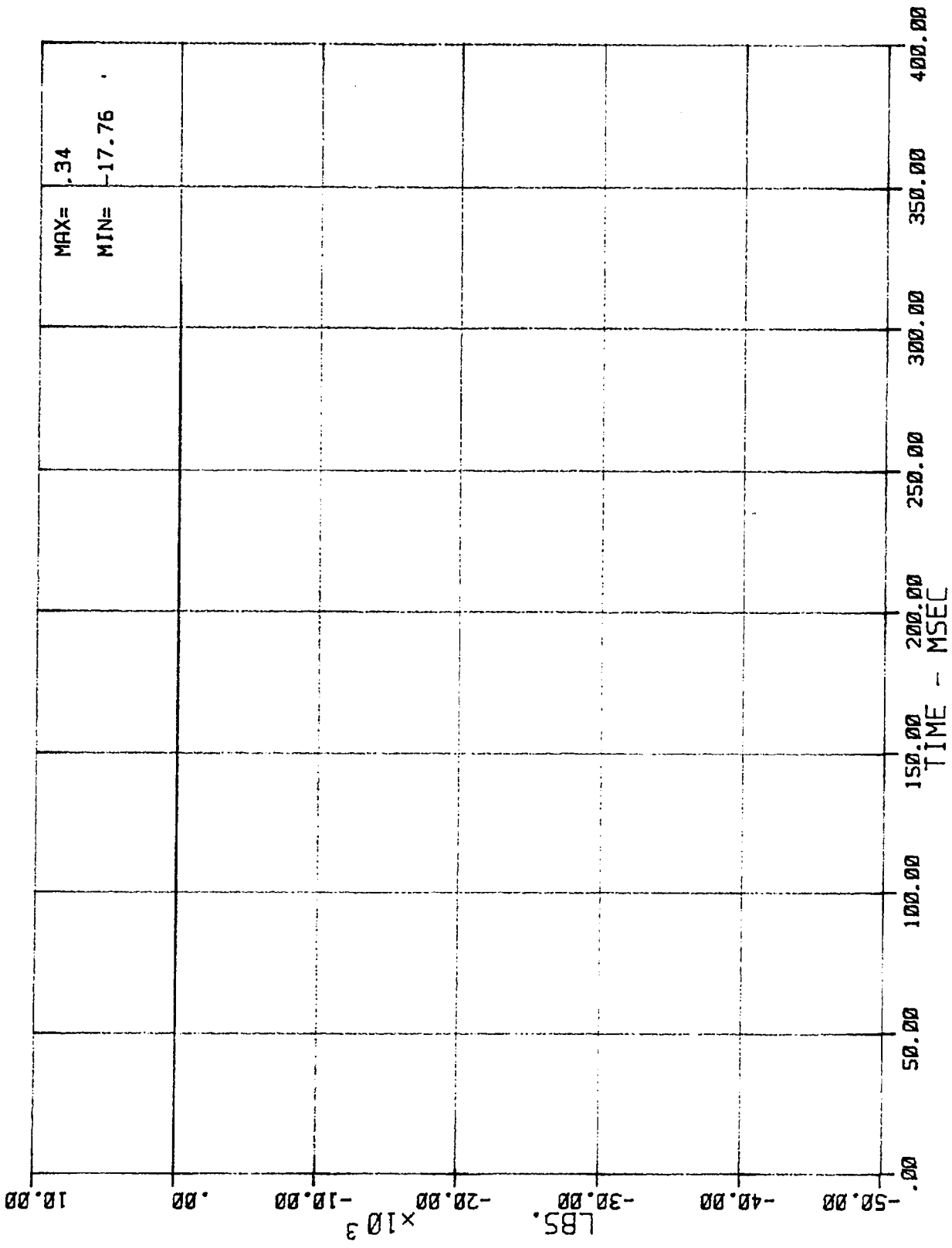
GROUP 6 SUM (A7,A8,A9,B7,B8,B9) LOAD CELL BARRIER FORCE
MSE N26066 1986 SUBARU XT COUPE

06/18/86



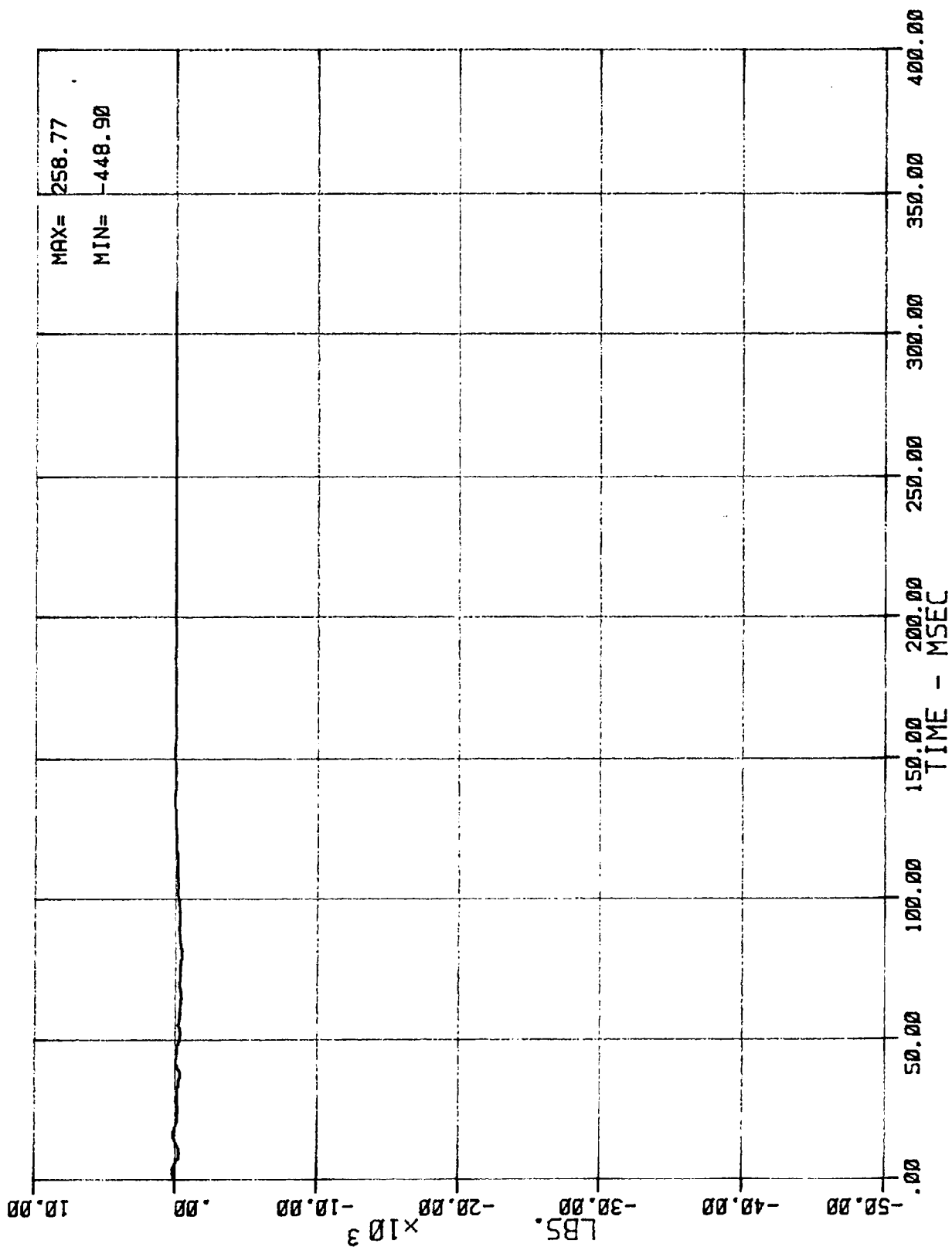
32 LC BA N BAI (BARRIER LOAD CELL A1 FORCE)
MSE N26066 1986 SUBARU XT COUPE

05/18/86



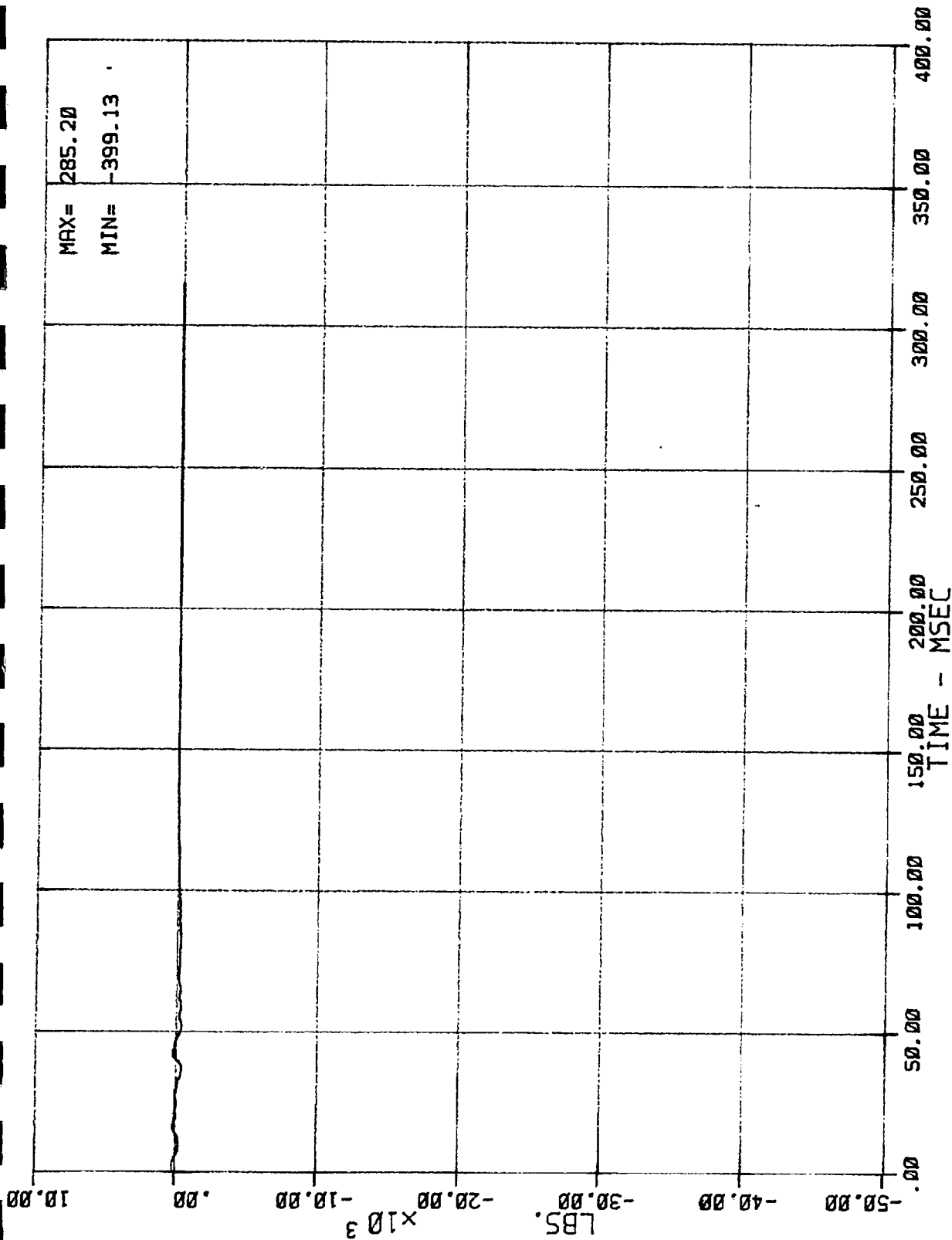
33 LC BA N BA2 (BARRIER LOAD CELL A2 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



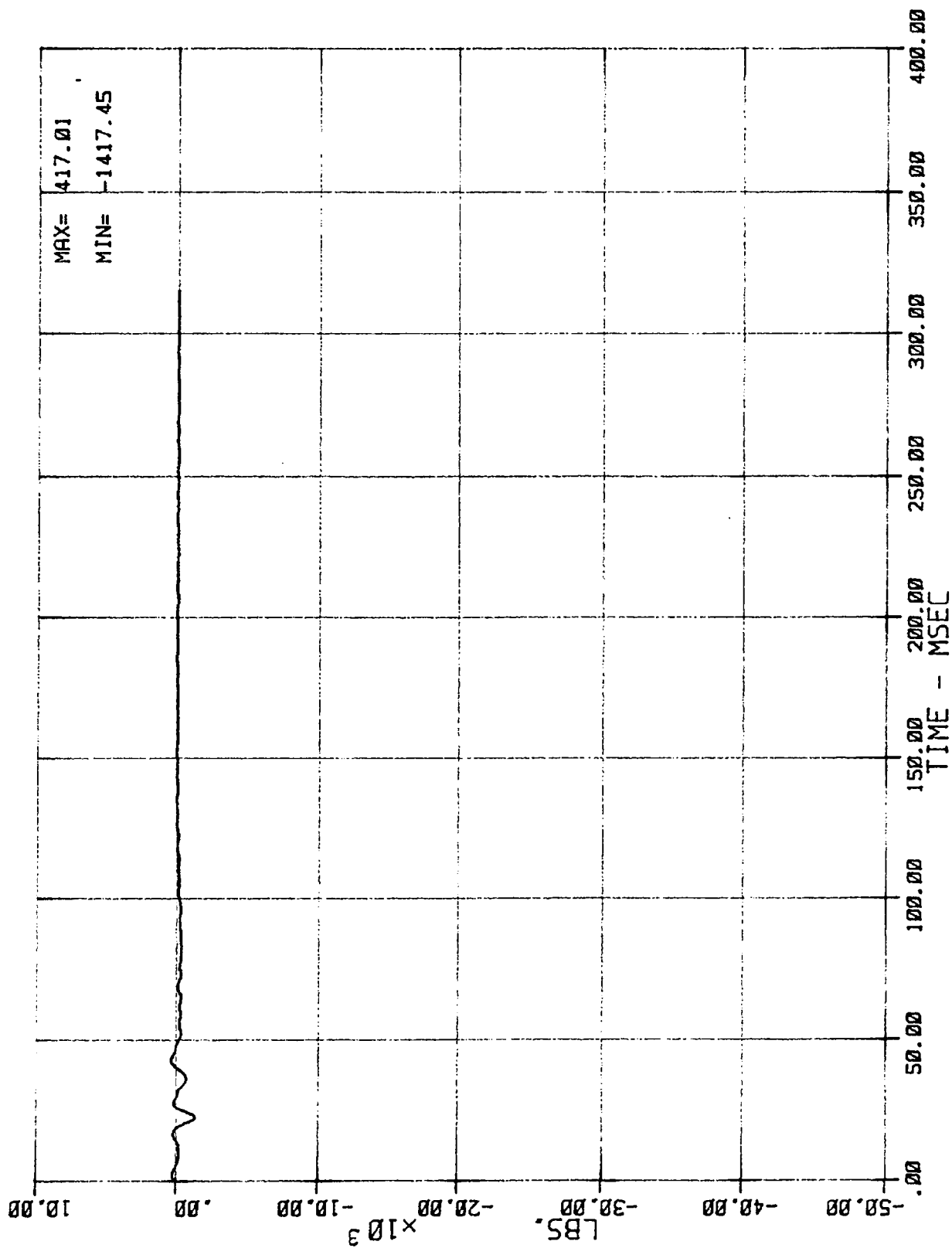
34 LC BA N BA3 (BARRIER LOAD CELL A3 FORCE)
MSE N26066 1986 SUBARU XT COUPE

05/18/86



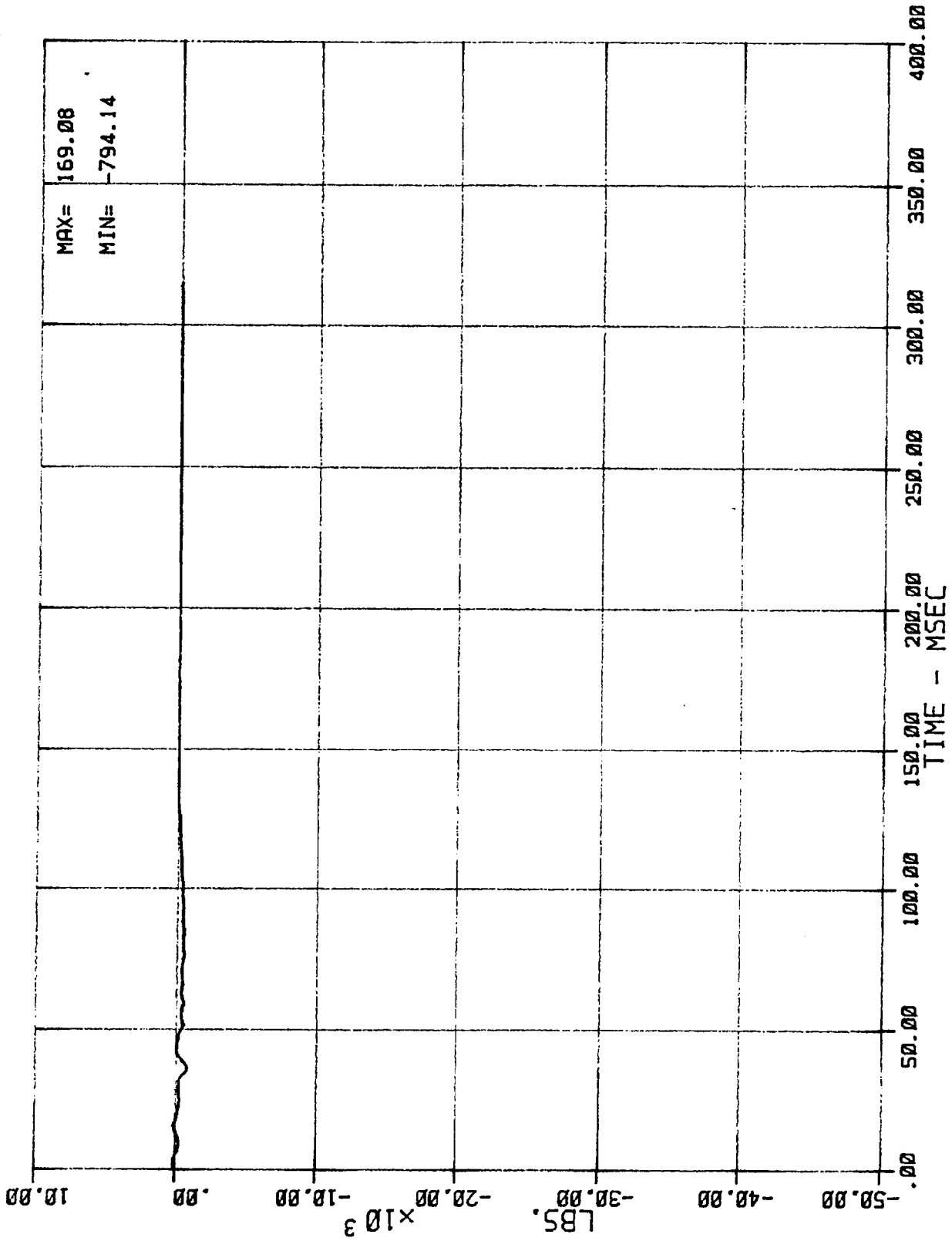
35 LC BA N BA4 (BARRIER LOAD CELL A4 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



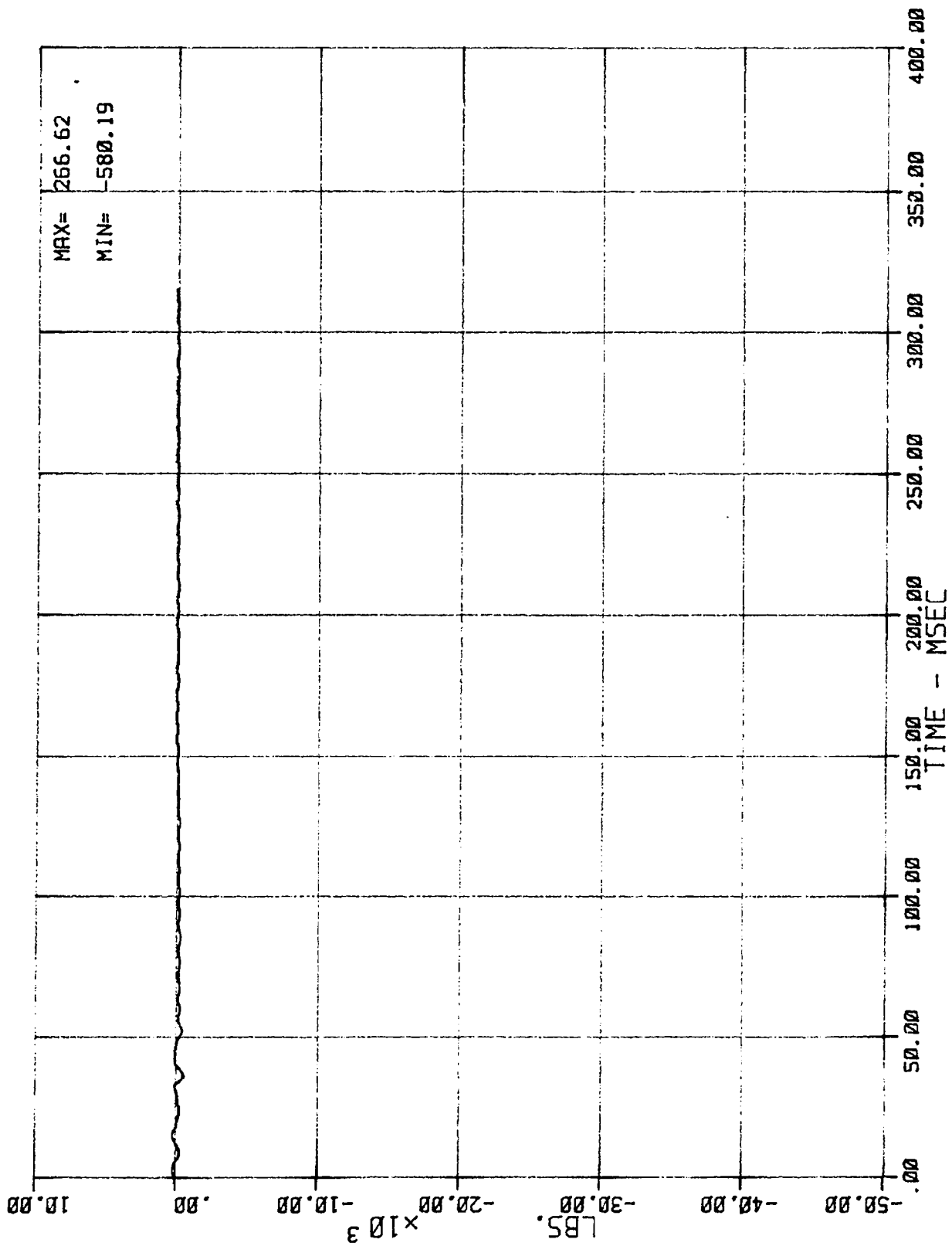
36 LC BA N BA5 (BARRIER LOAD CELL AS FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



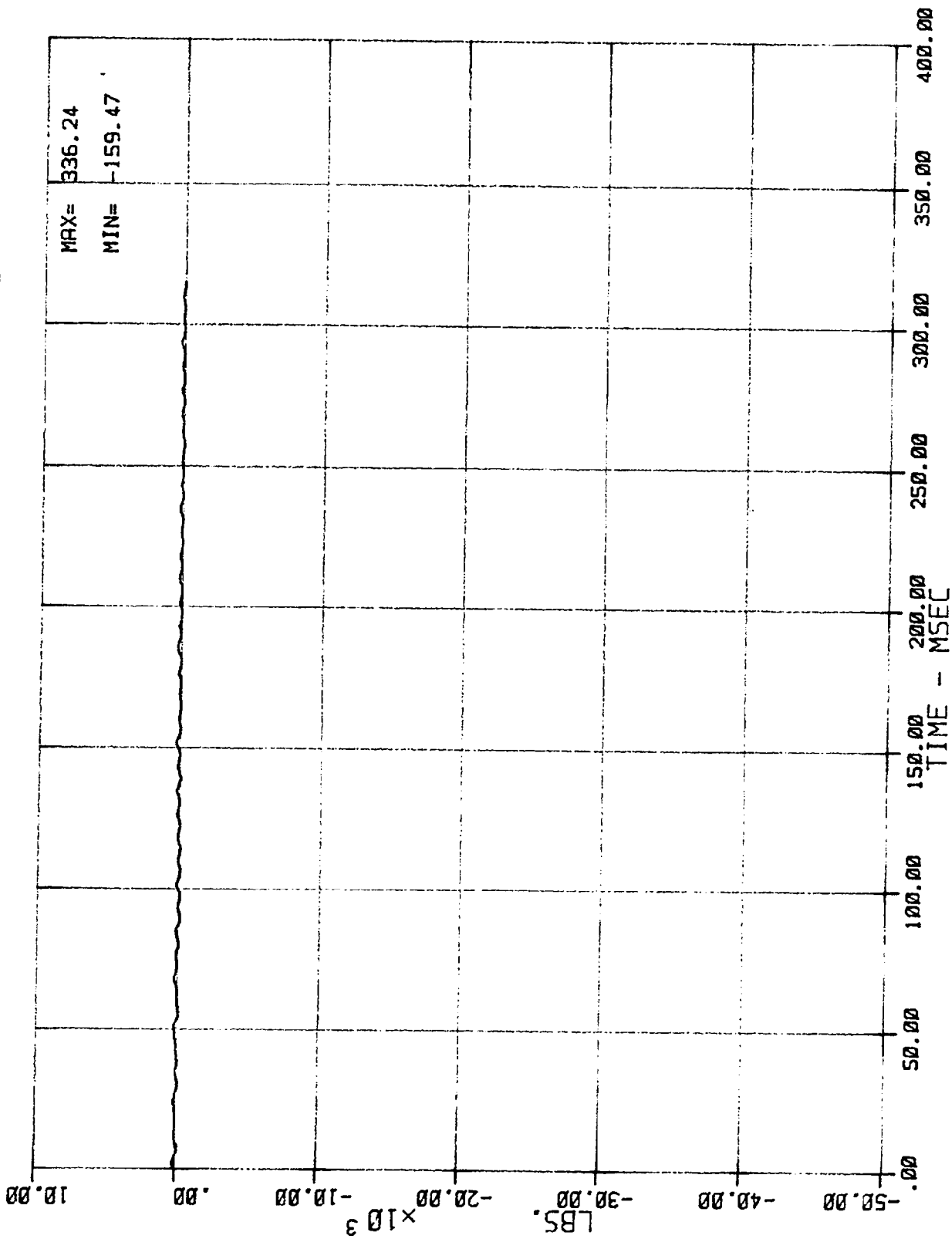
37 LC BA N BA6 (BARRIER LOAD CELL A6 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



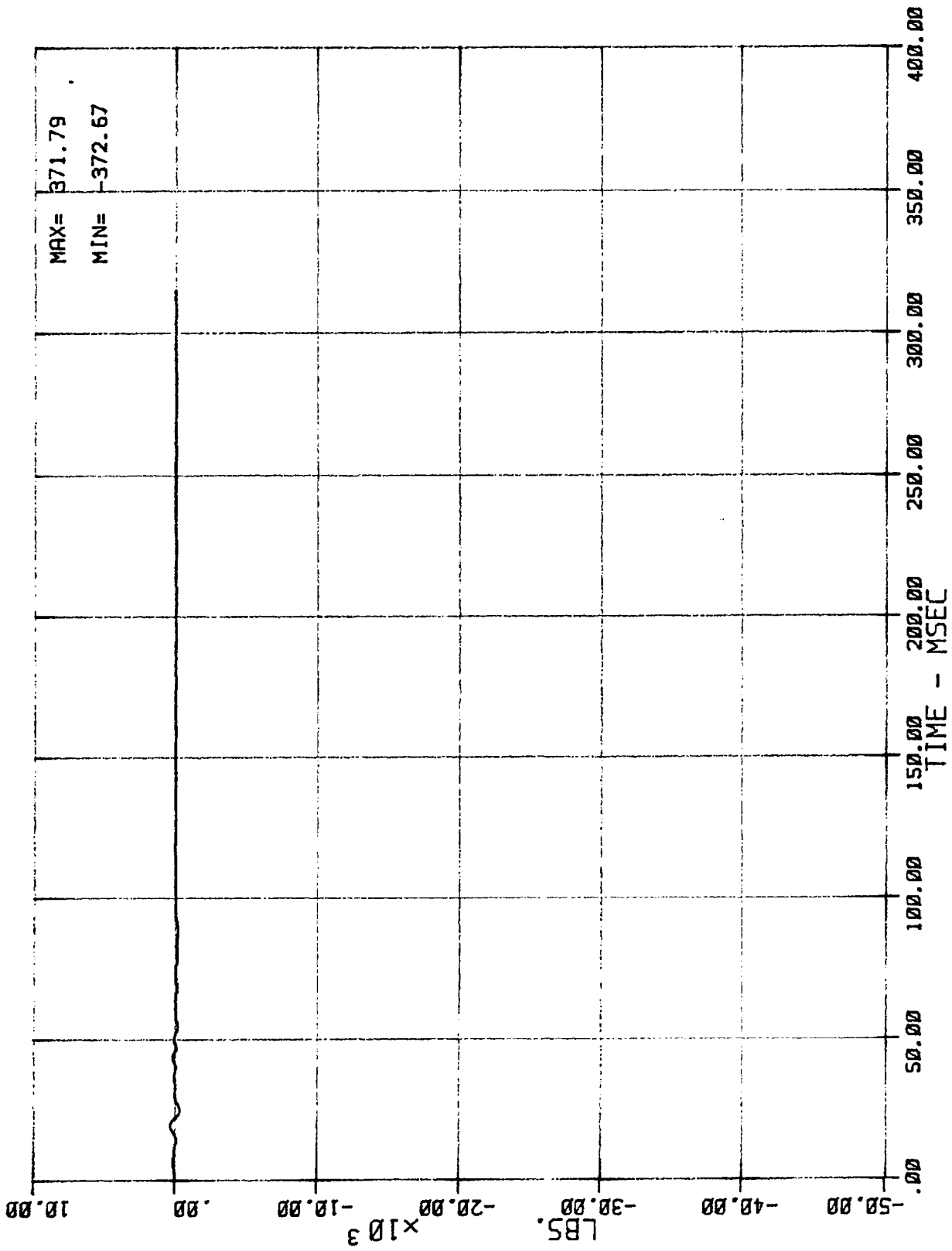
38 LC BA N BA7 (BARRIER LOAD CELL A7 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



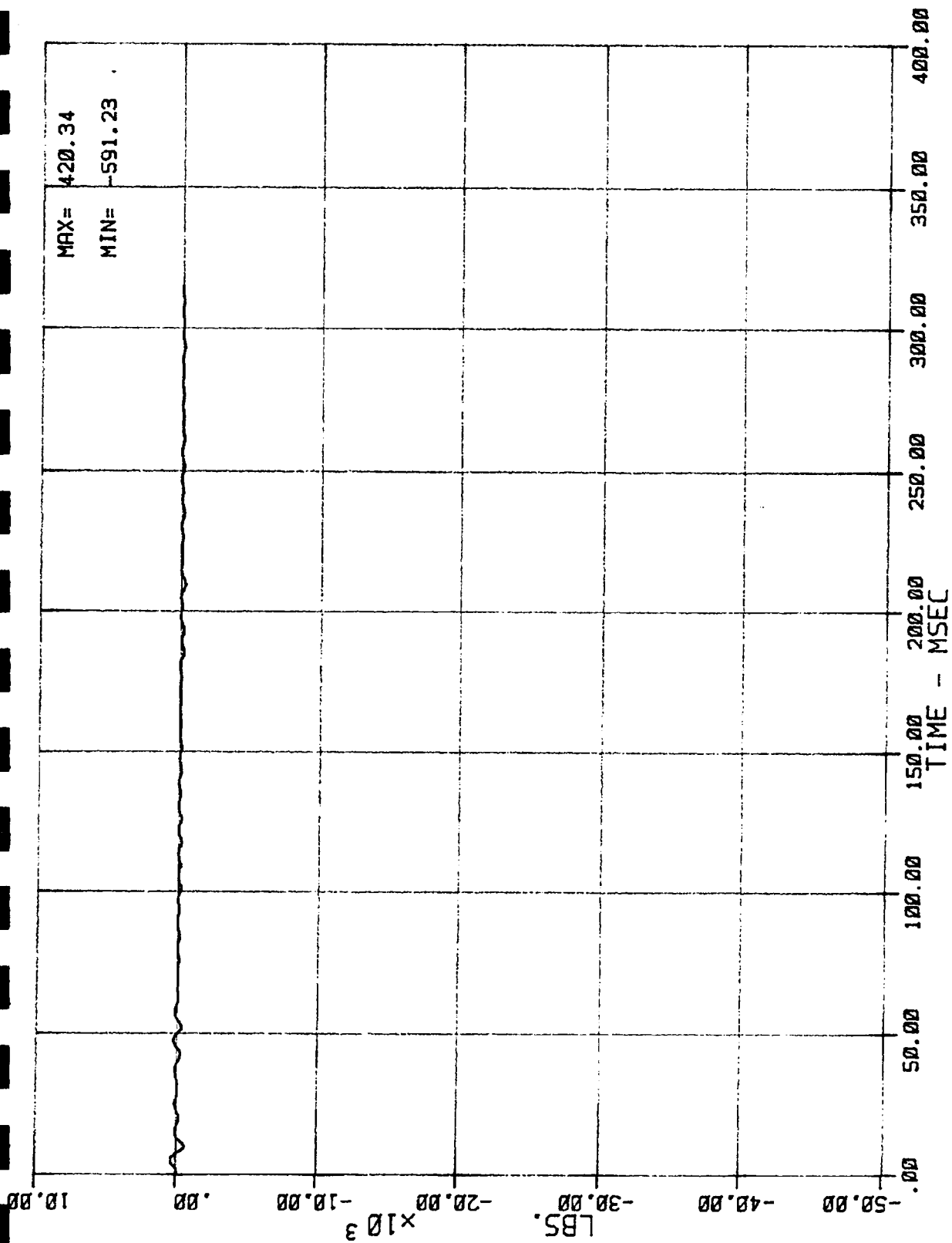
39 LC BA N (BARRIER LOAD CELL A8 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



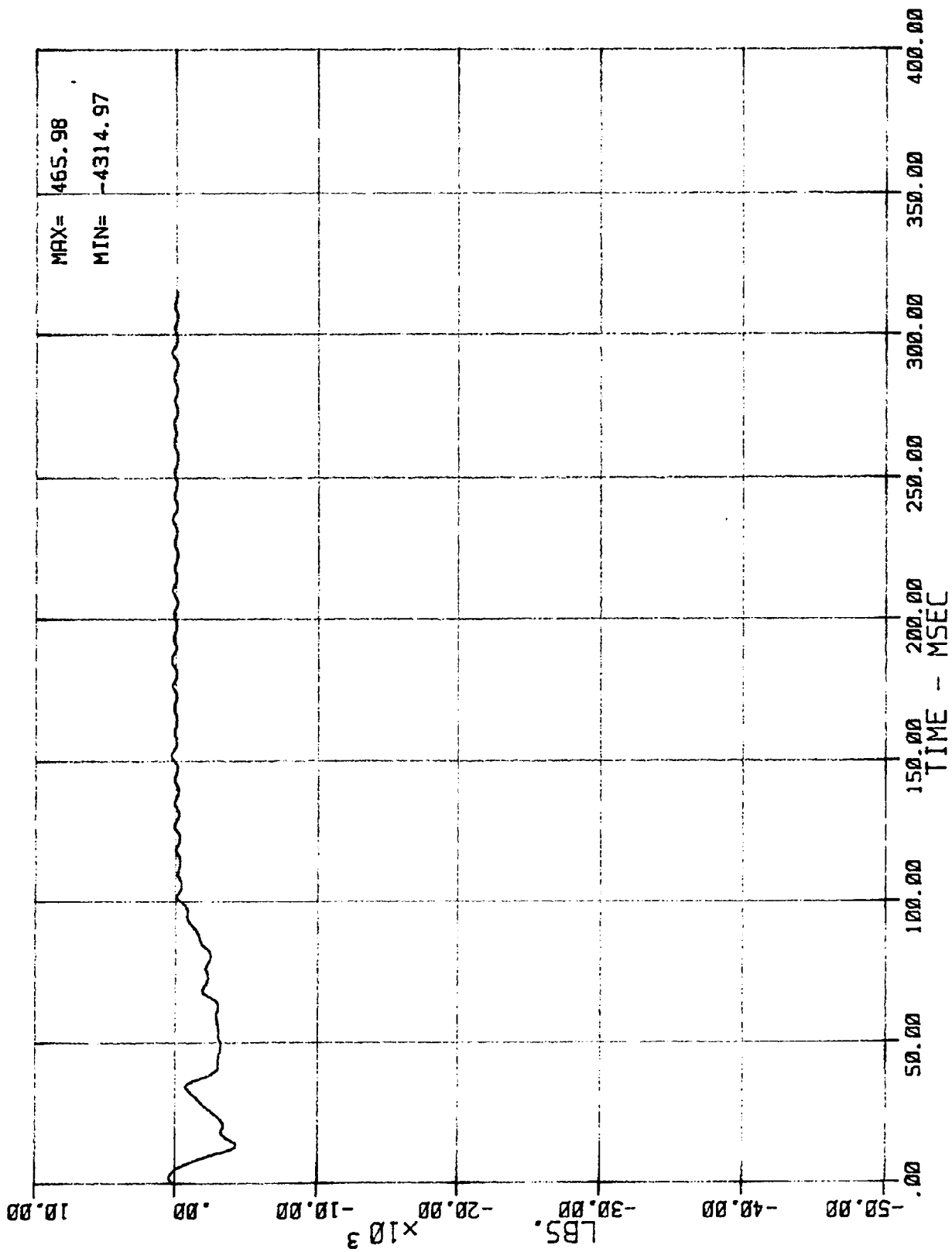
40 LC BA N BA9 (BARRIER LOAD CELL A9 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



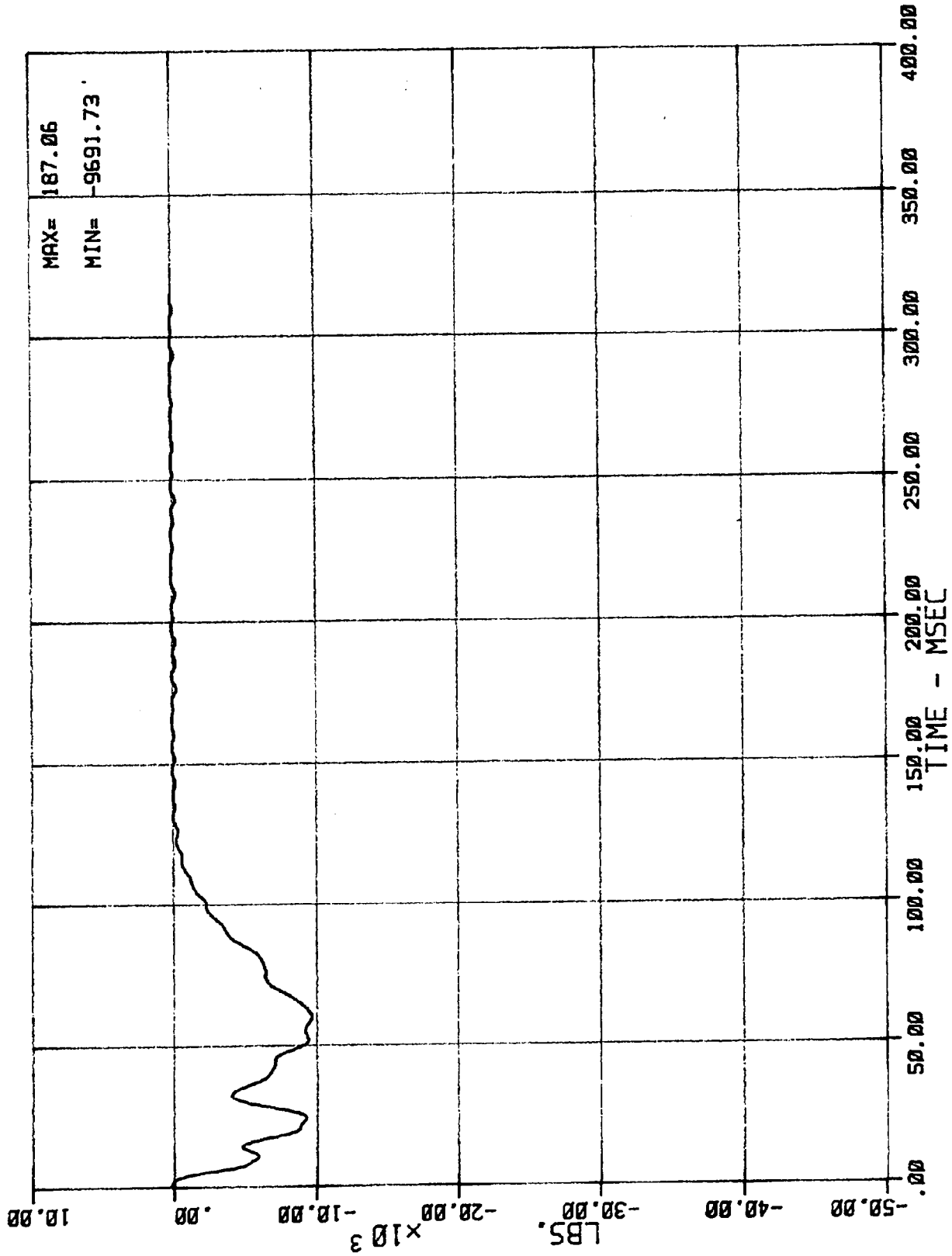
41 LC BA N BB1 (BARRIER LOAD CELL B1 FORCE)
MSE N25065 1986 SUBARU XT COUPE

06/18/86



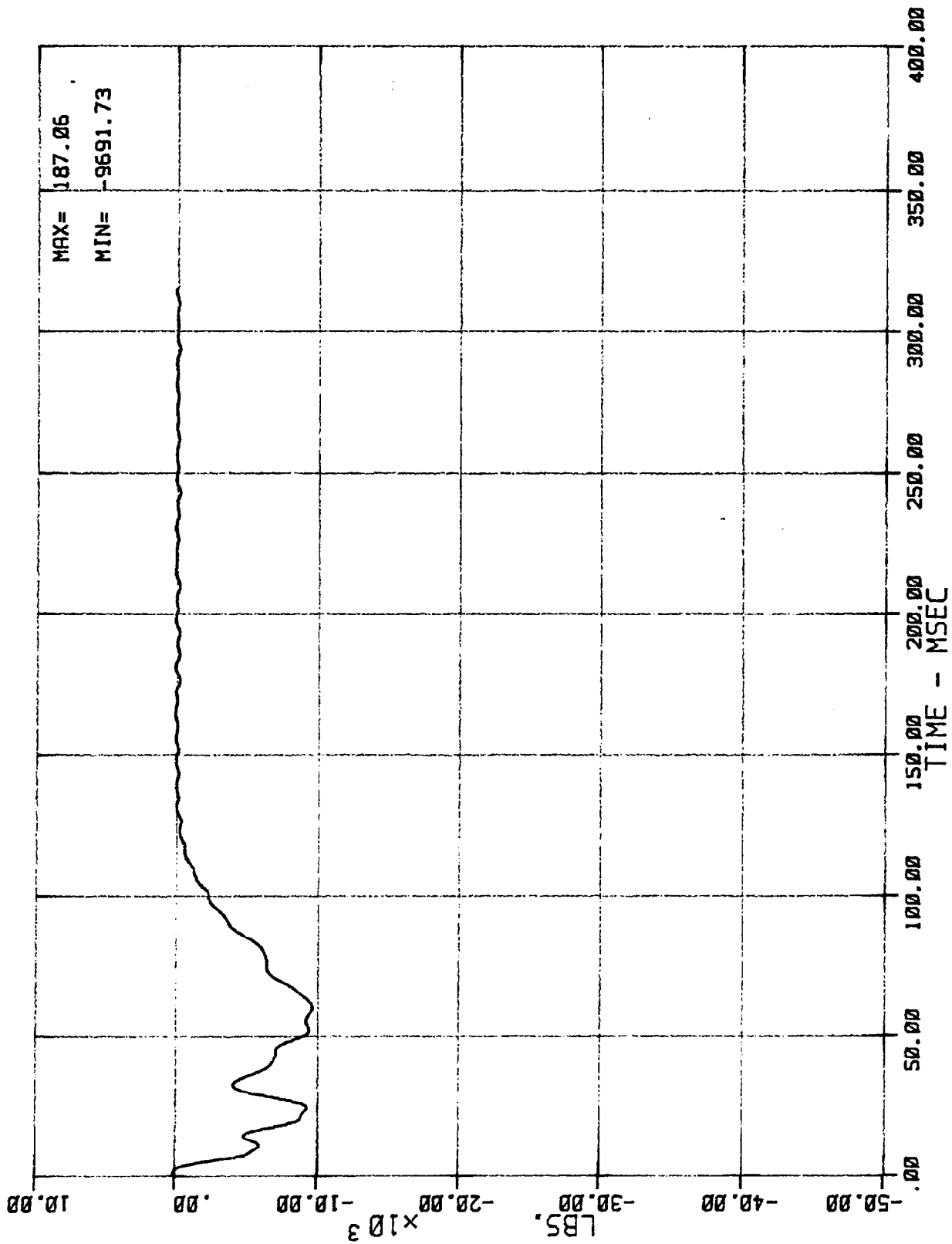
42 LC 88 N 882 (BARRIER LOAD CELL B2 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



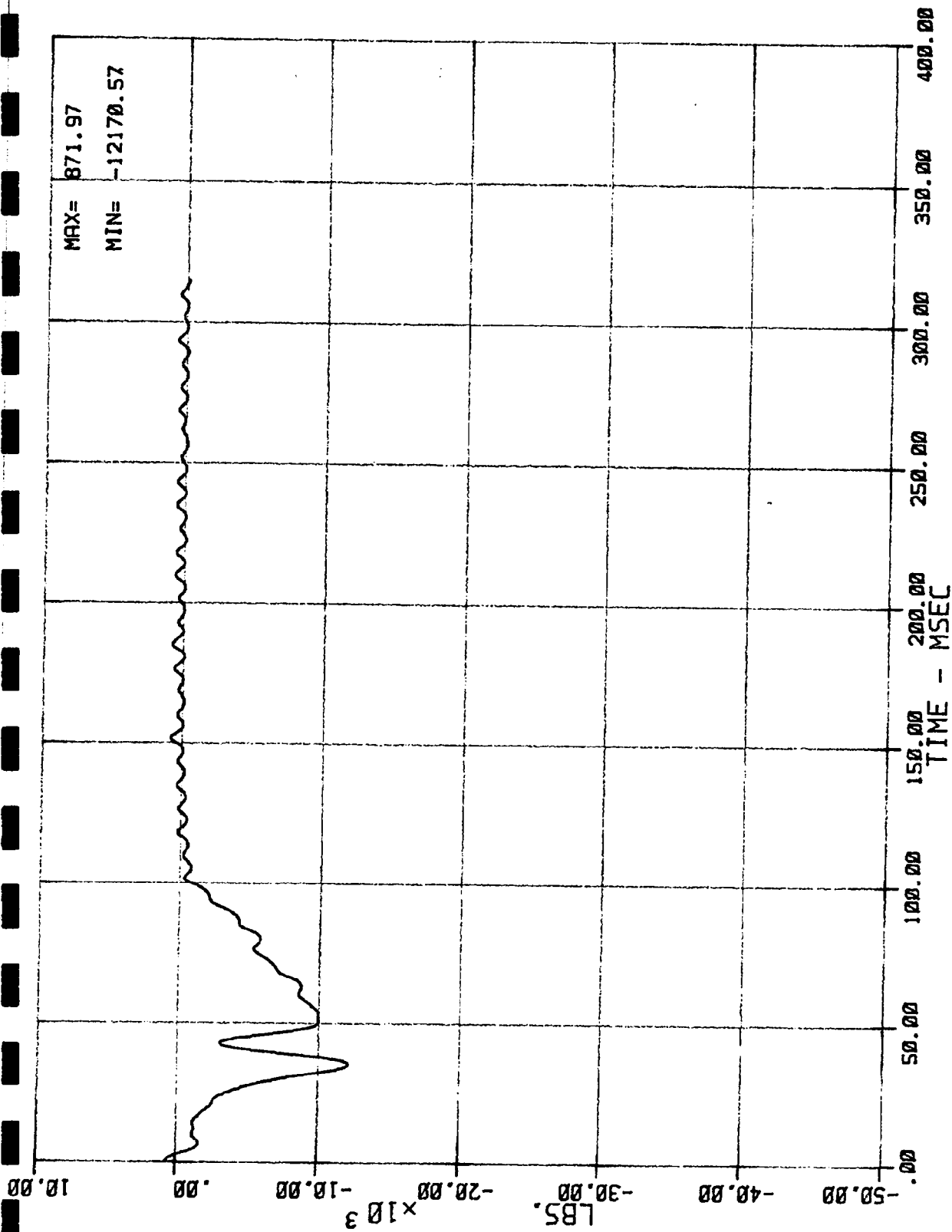
43 LC BB N BB3 (BARRIER LOAD CELL B3 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



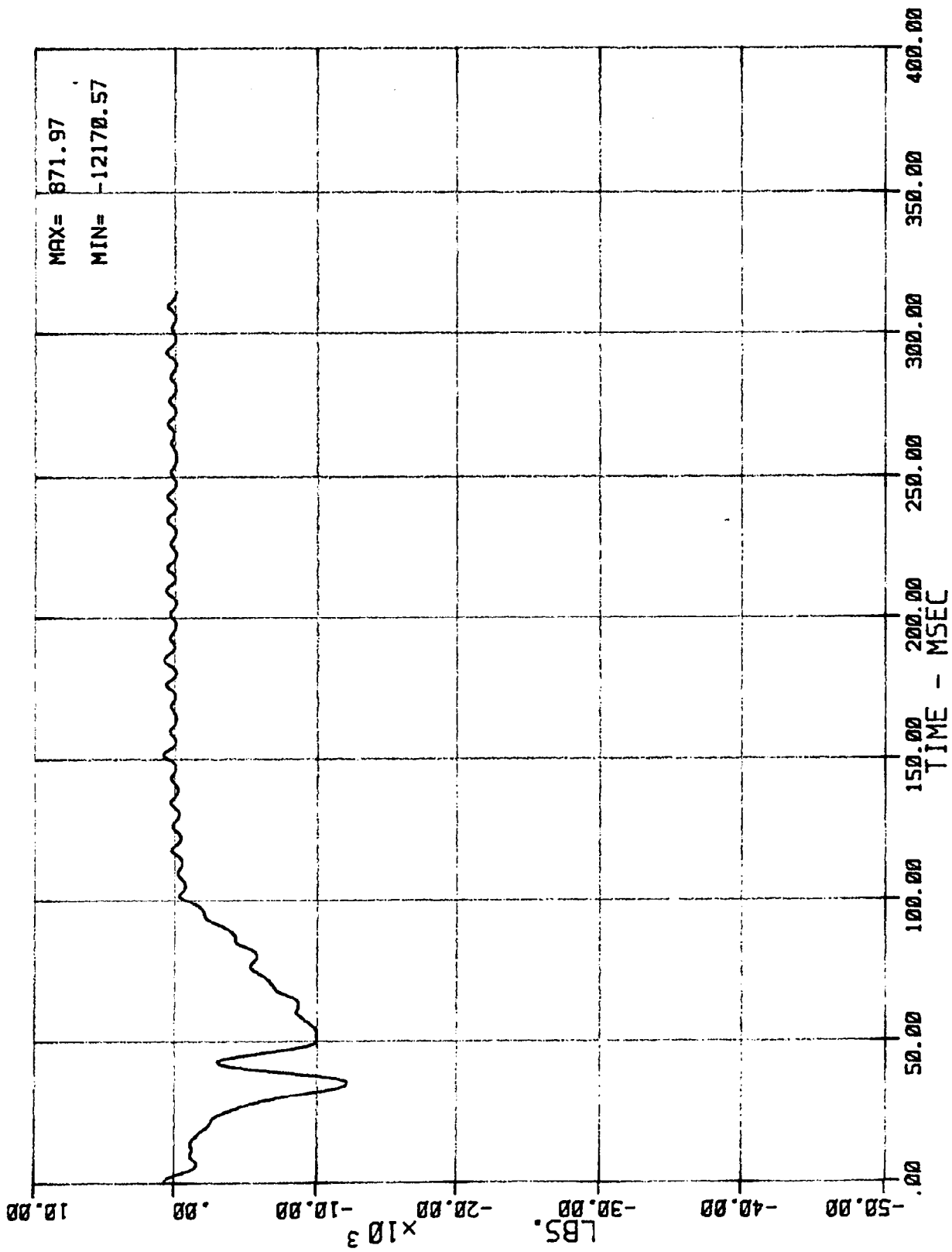
43 LC BB N BB3 (BARRIER LOAD CELL B3 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



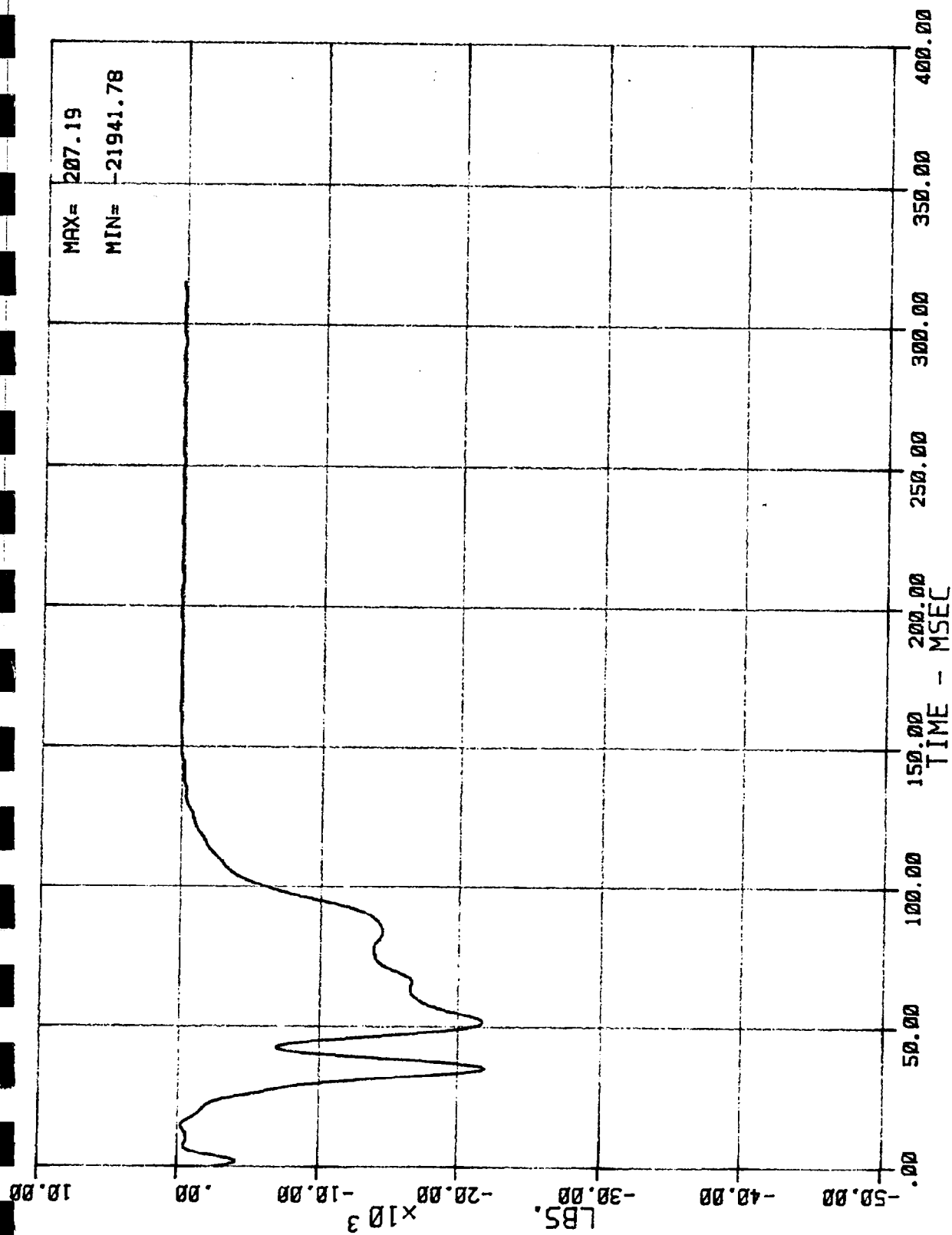
44 LC BB N BB4 (BARRIER LOAD CELL B4 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



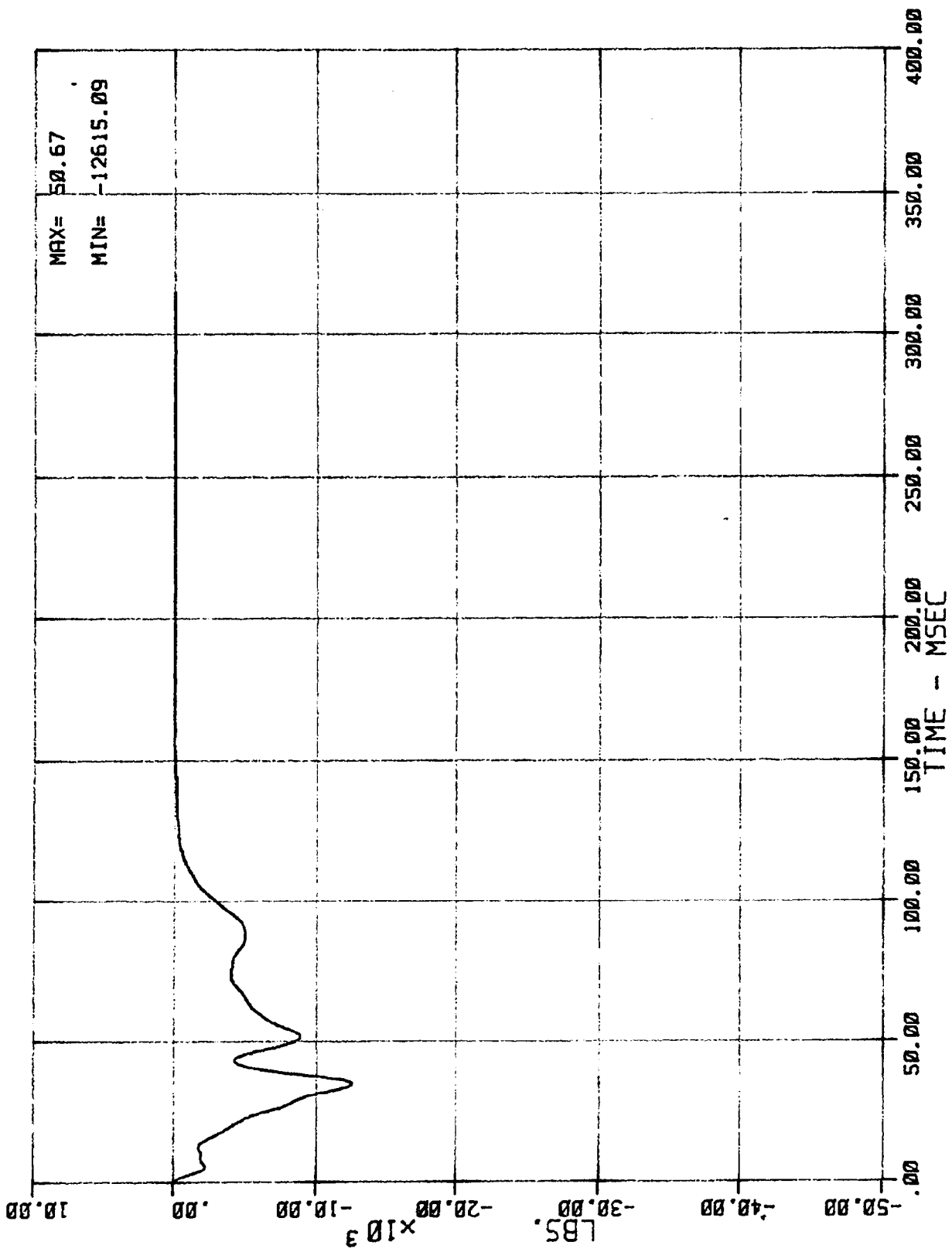
44 LC BB N BB4 (BARRIER LOAD CELL B4 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



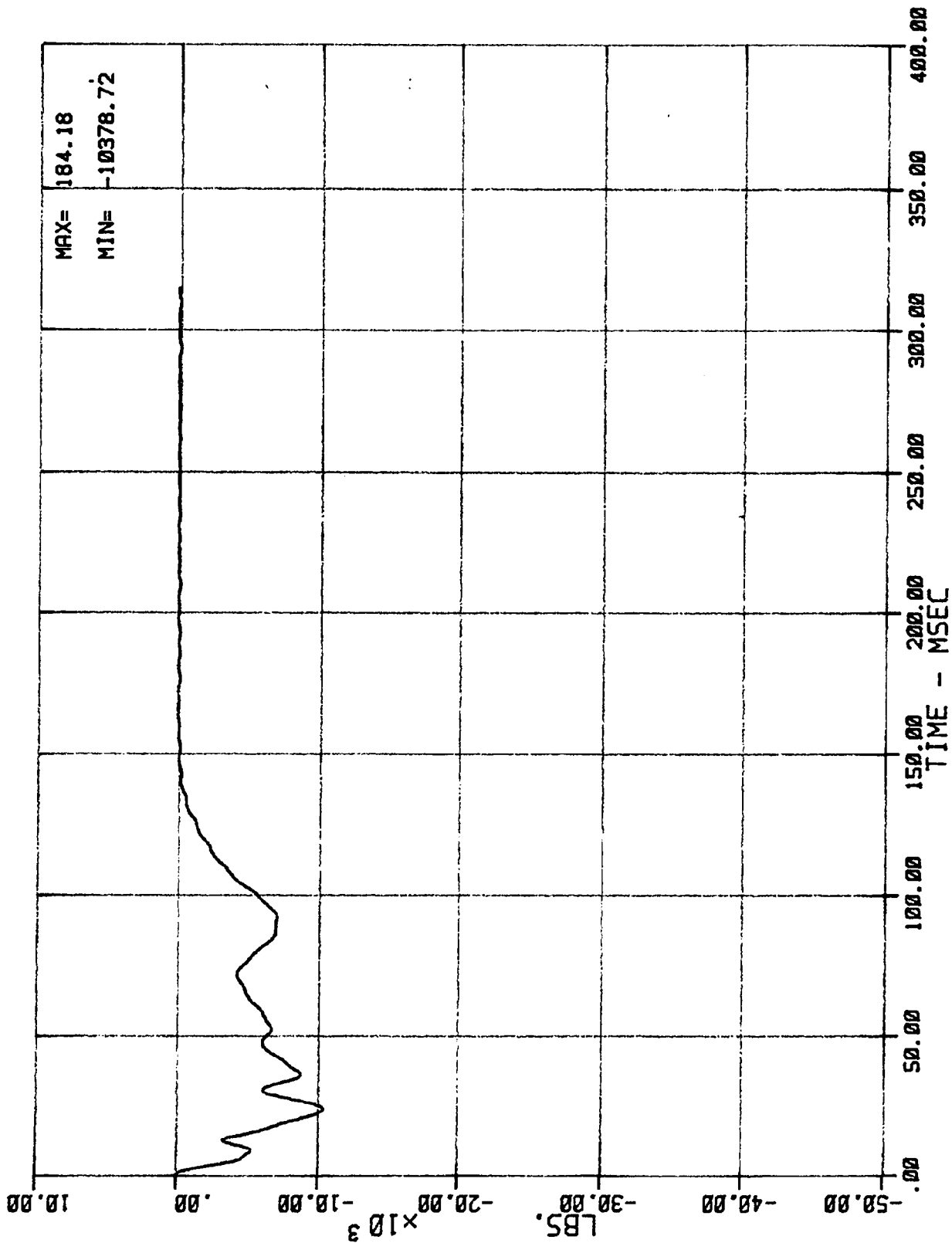
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MSE N26066 1986 SUBARU XT COUPE

06/18/86



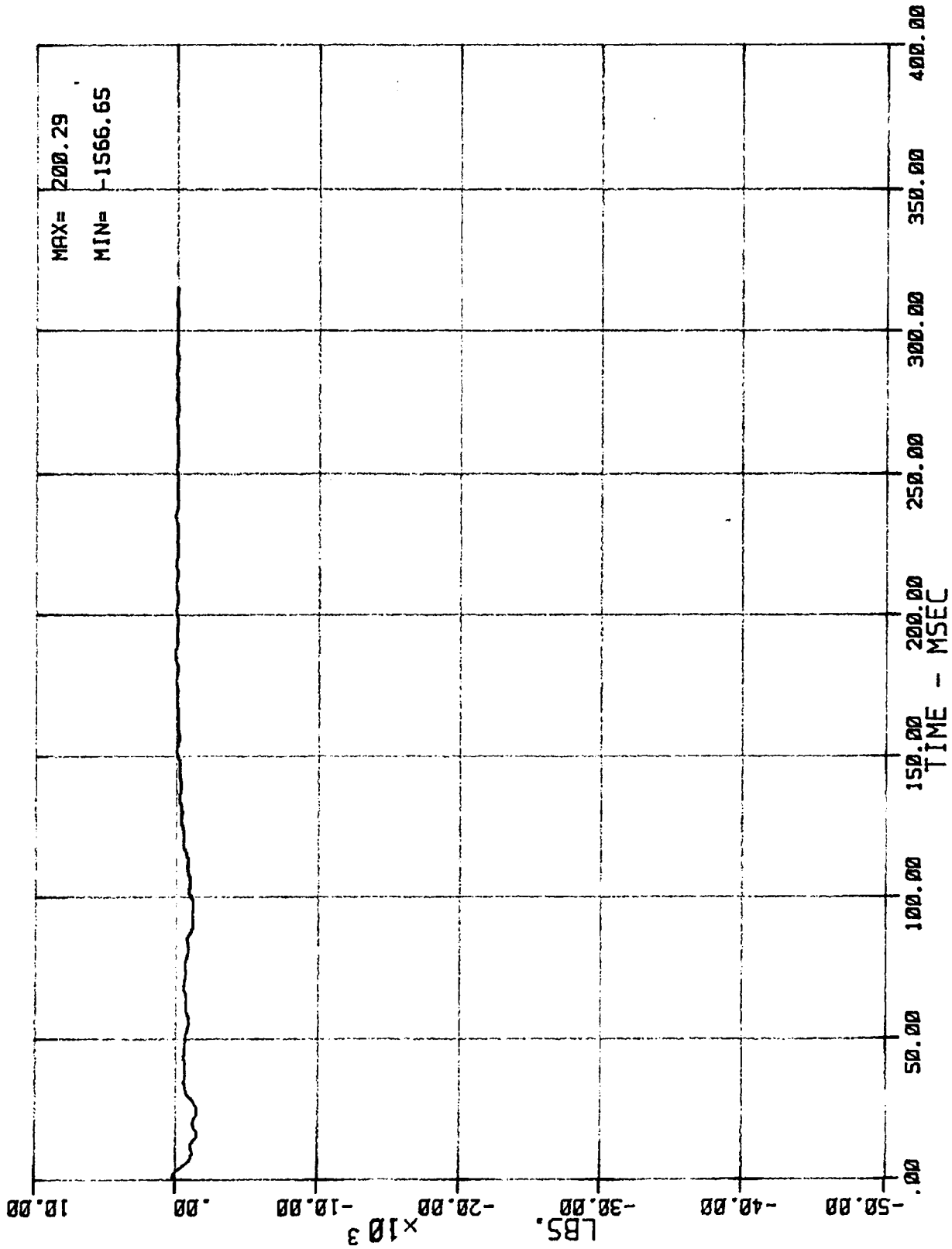
46 LC BA N 886 (BARRIER LOAD CELL B6 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



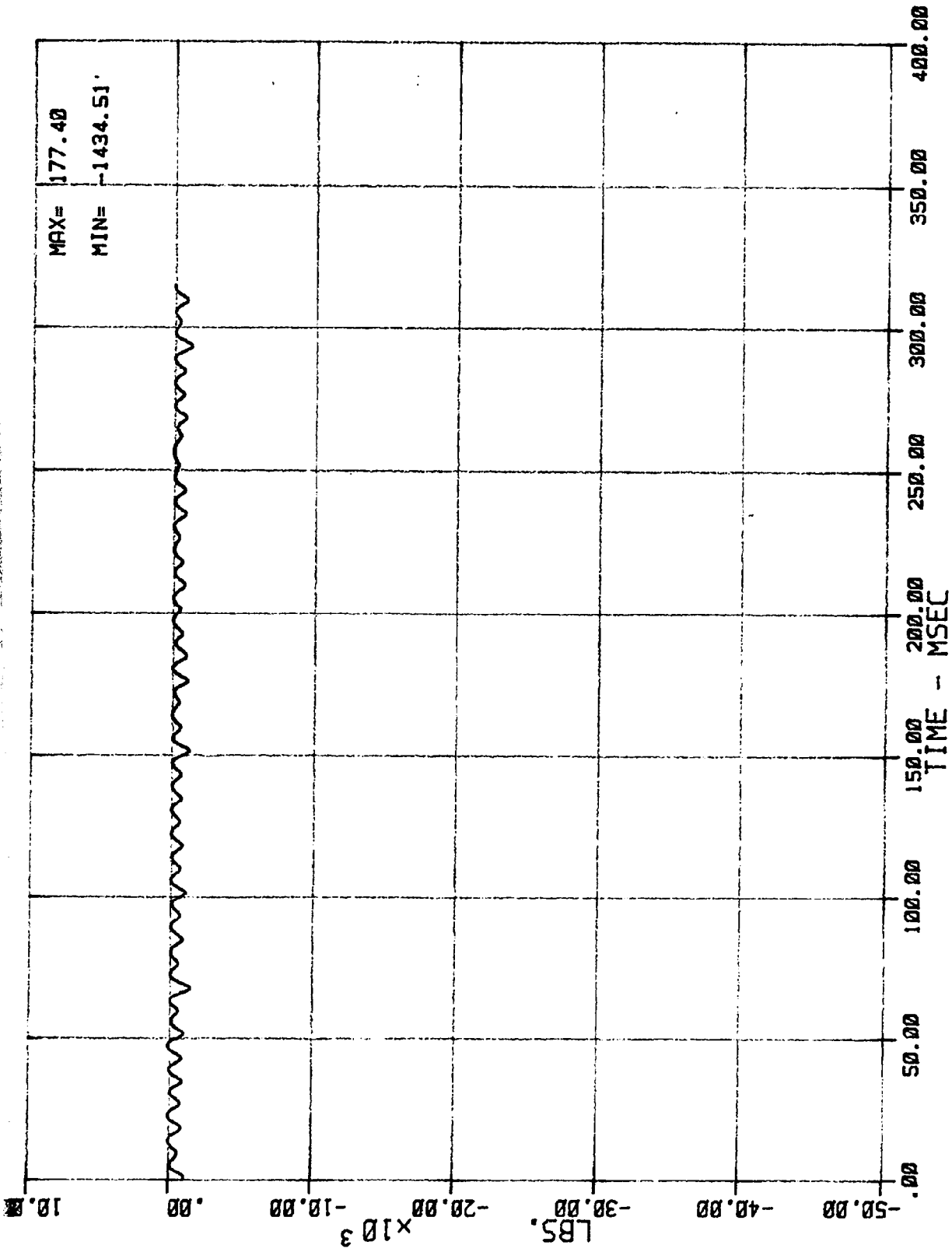
47 LC BA N 887 (BARRIER LOAD CELL B7 FORCE)
MSE N25066 1986 SUBARU XT COUPE

05/18/86



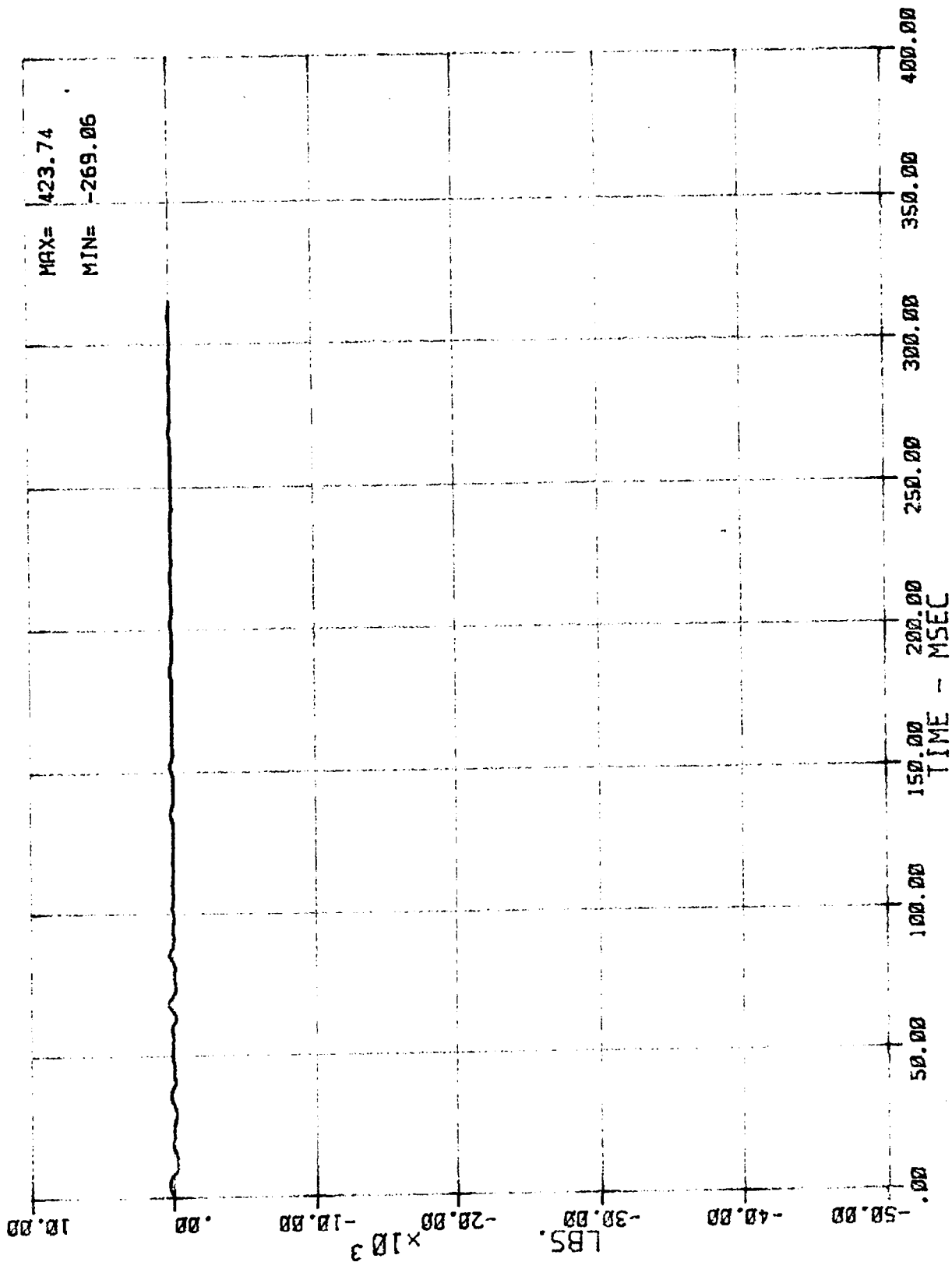
48 LC BA N 888 (BARRIER LOAD CELL 88 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



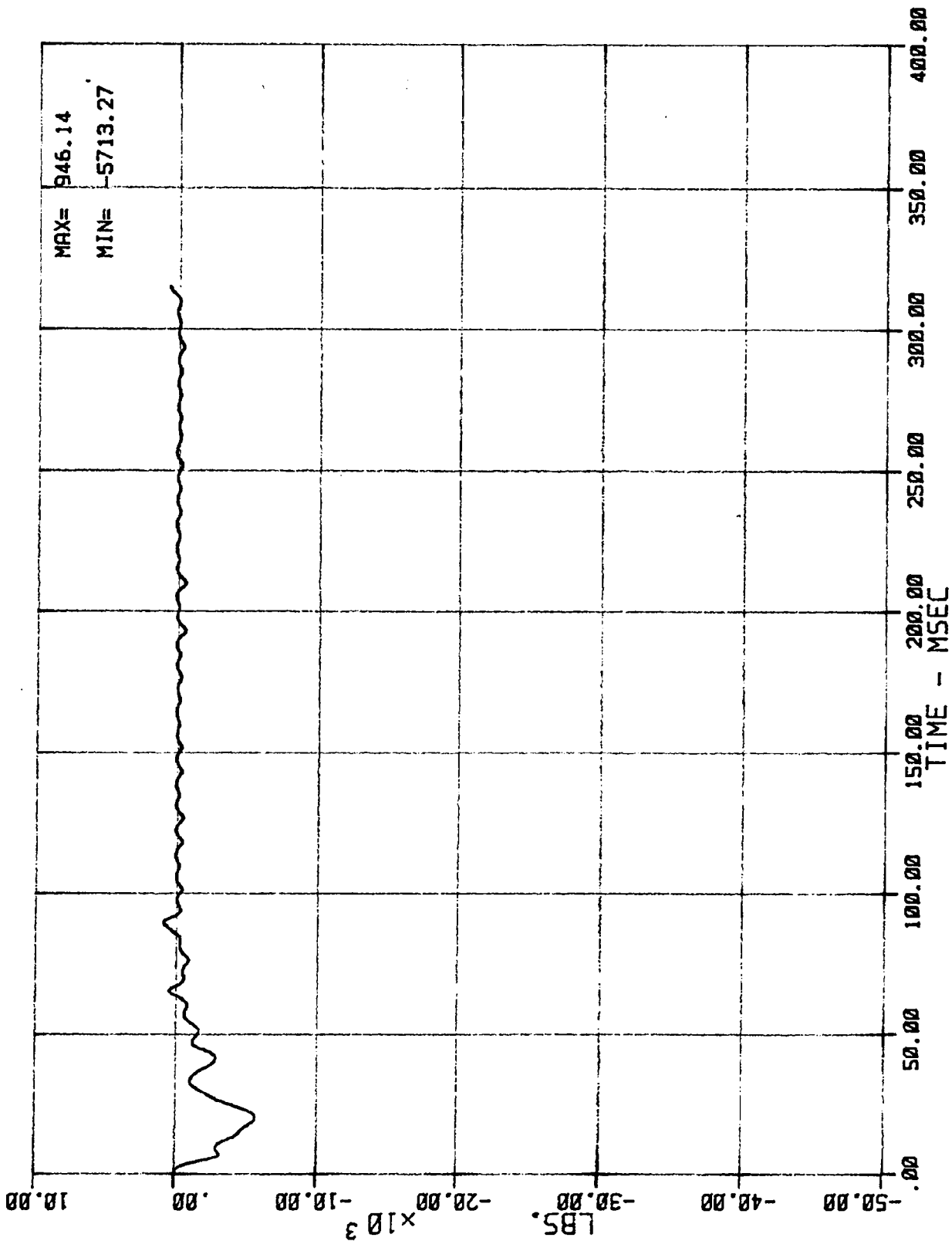
49 LC BA N BB9 (BARRIER LOAD CELL B9 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



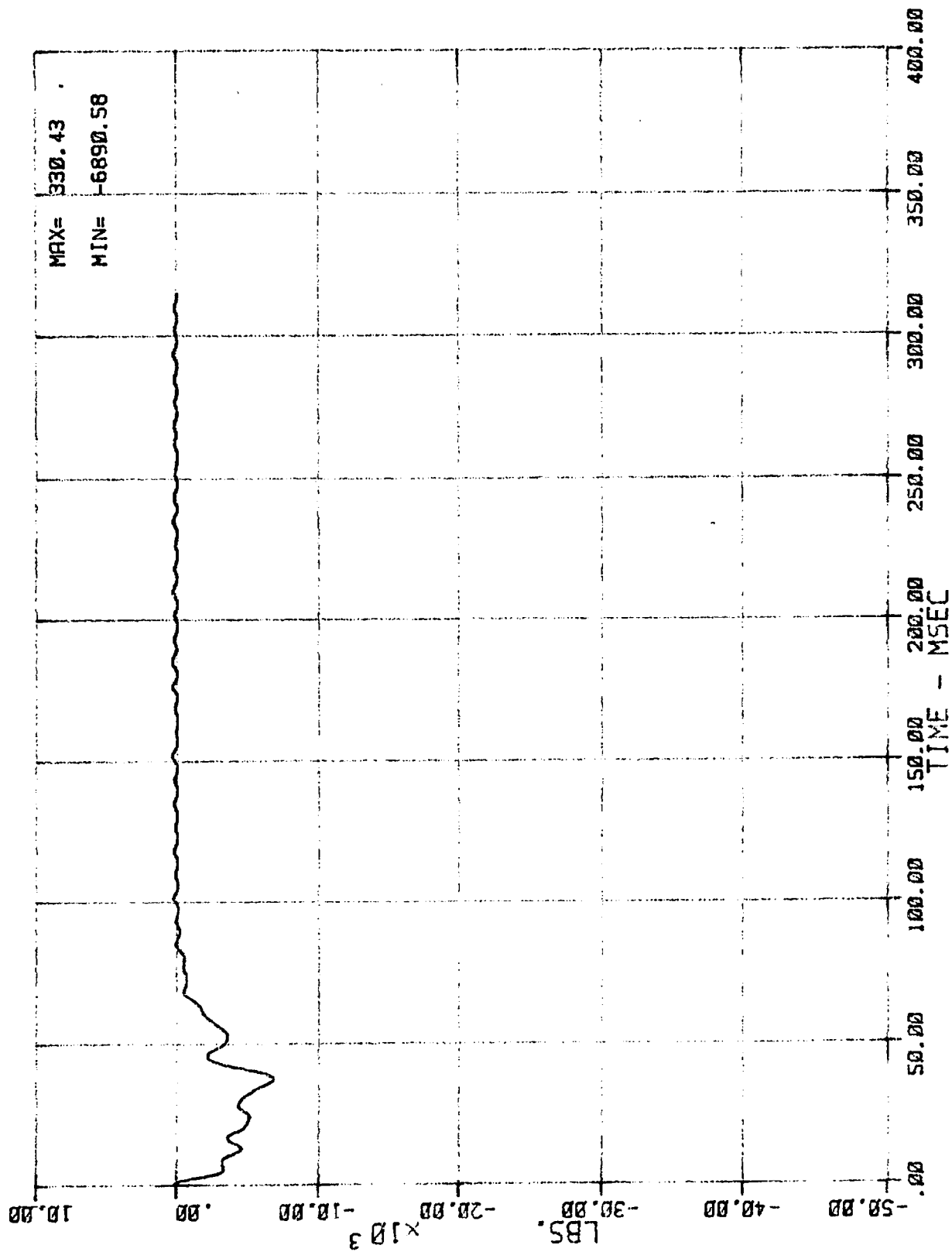
50 LC BA N BC1 (BARRIER LOAD CELL C1 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



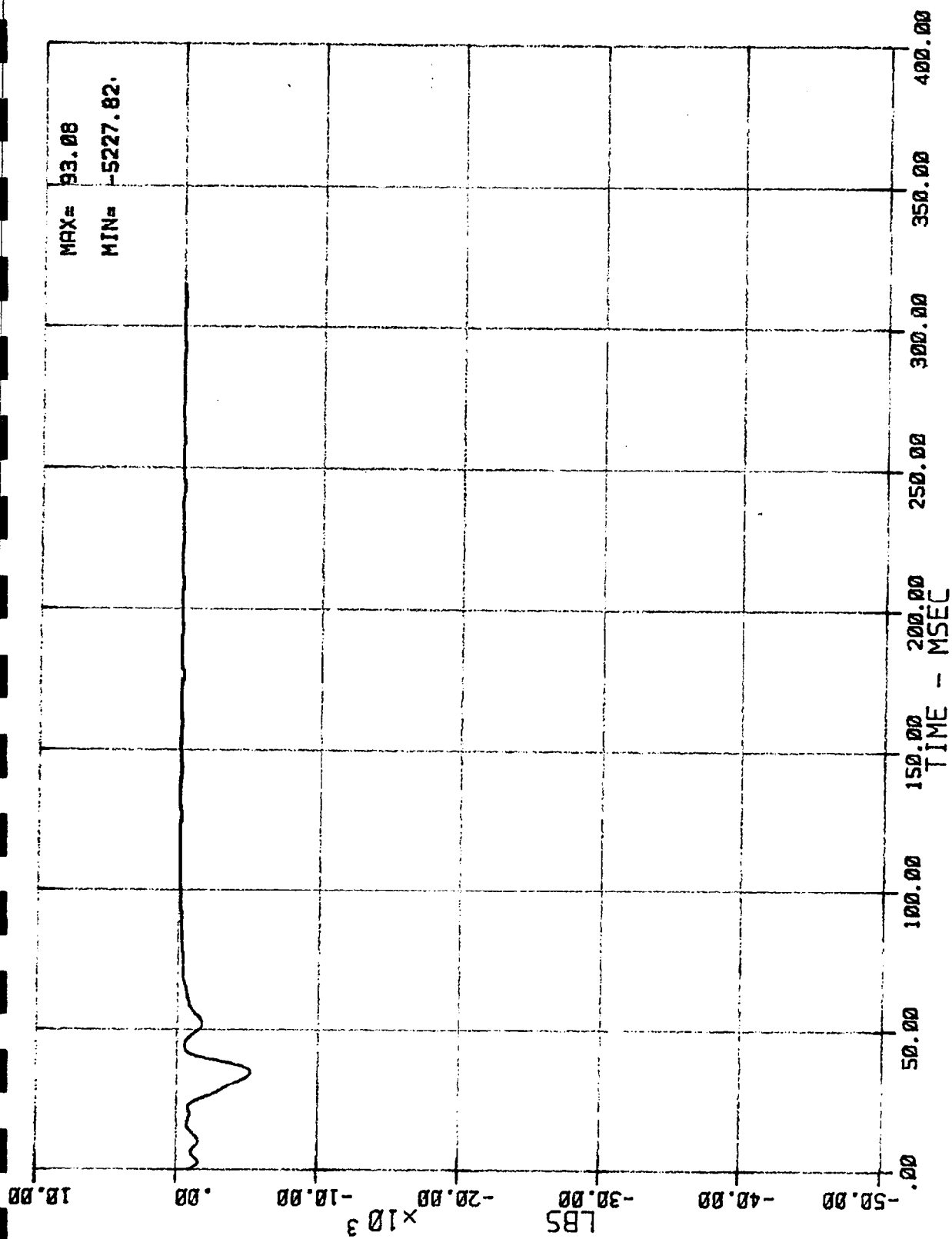
S1 LC BA BC2 (BARRIER LOAD CELL C2 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



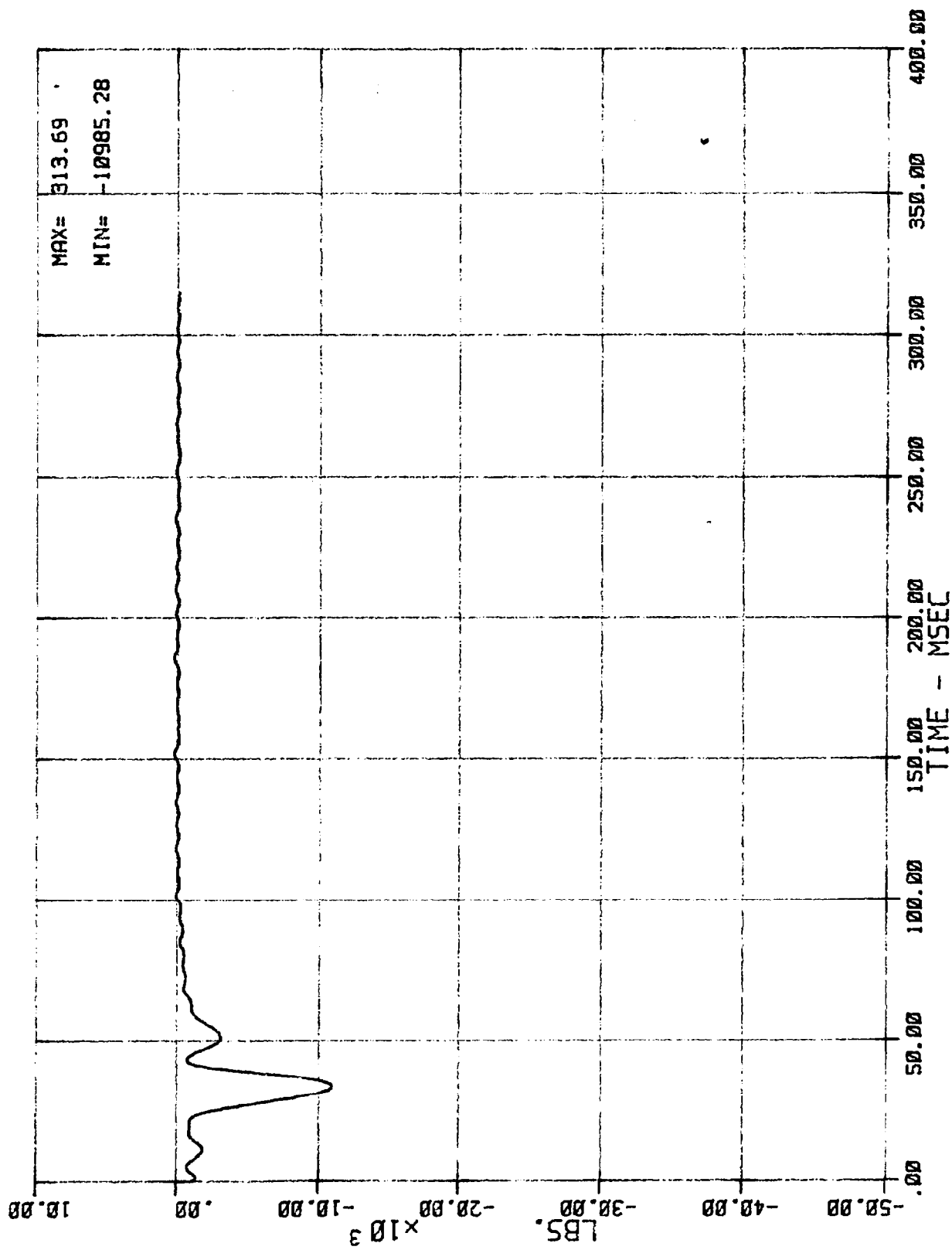
52 LC BA N BC3 (BARRIER LOAD CELL C3 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



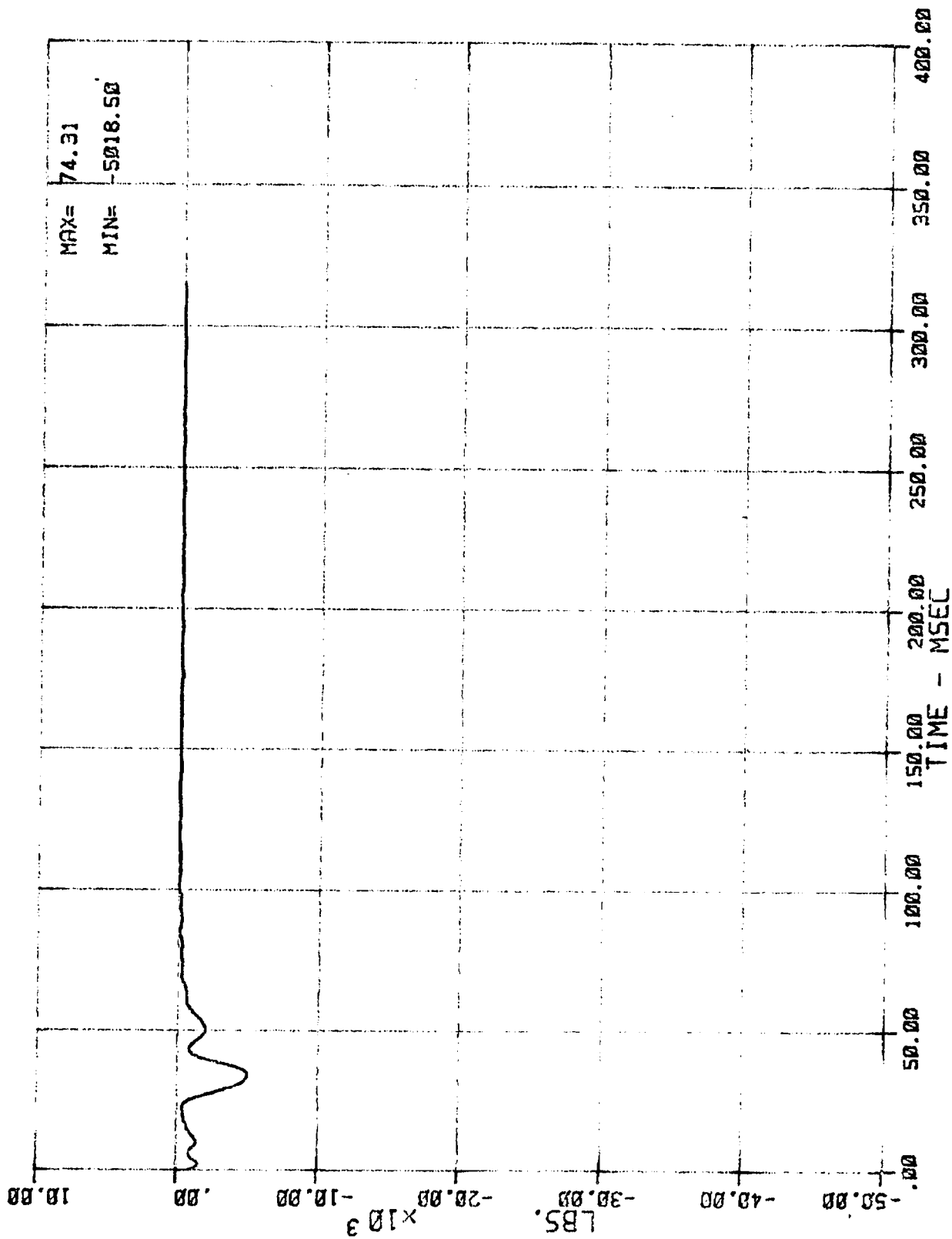
53 LC BA N BC4 (BARRIER LOAD CELL C4 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



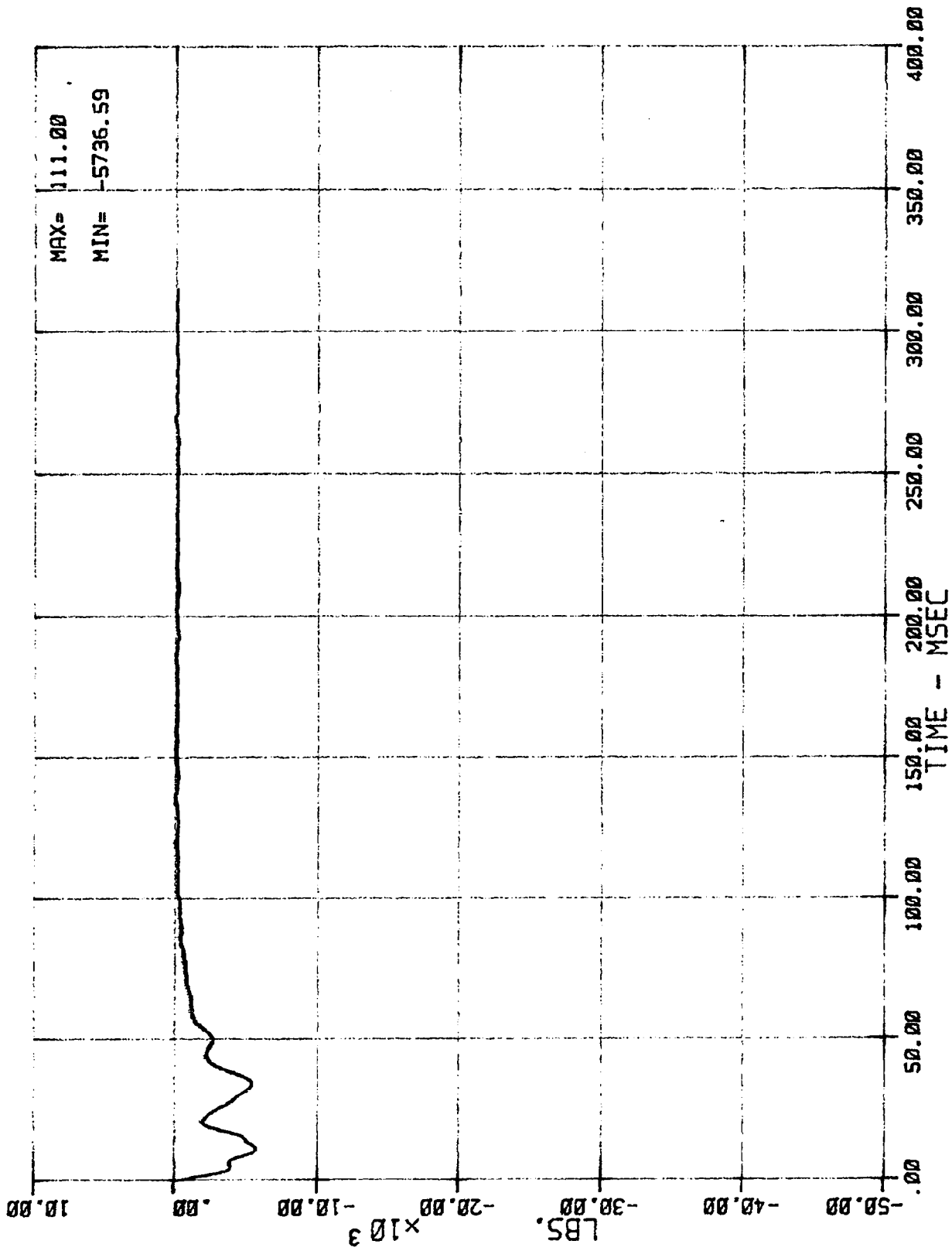
54 LC BA N BCS (BARRIER LOAD CELL CS FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



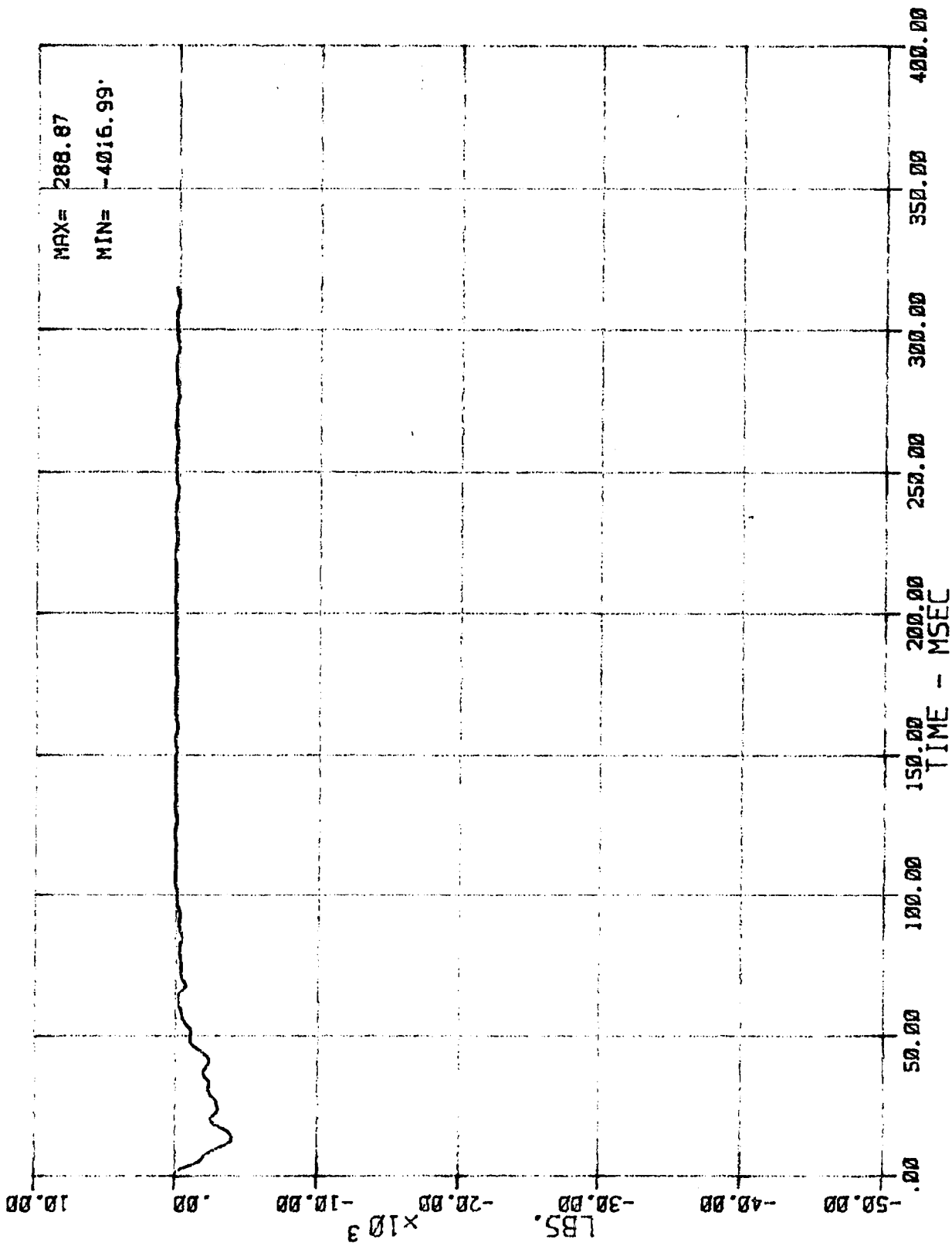
SS LC BA N BC6 (BARRIER LOAD CELL C6 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



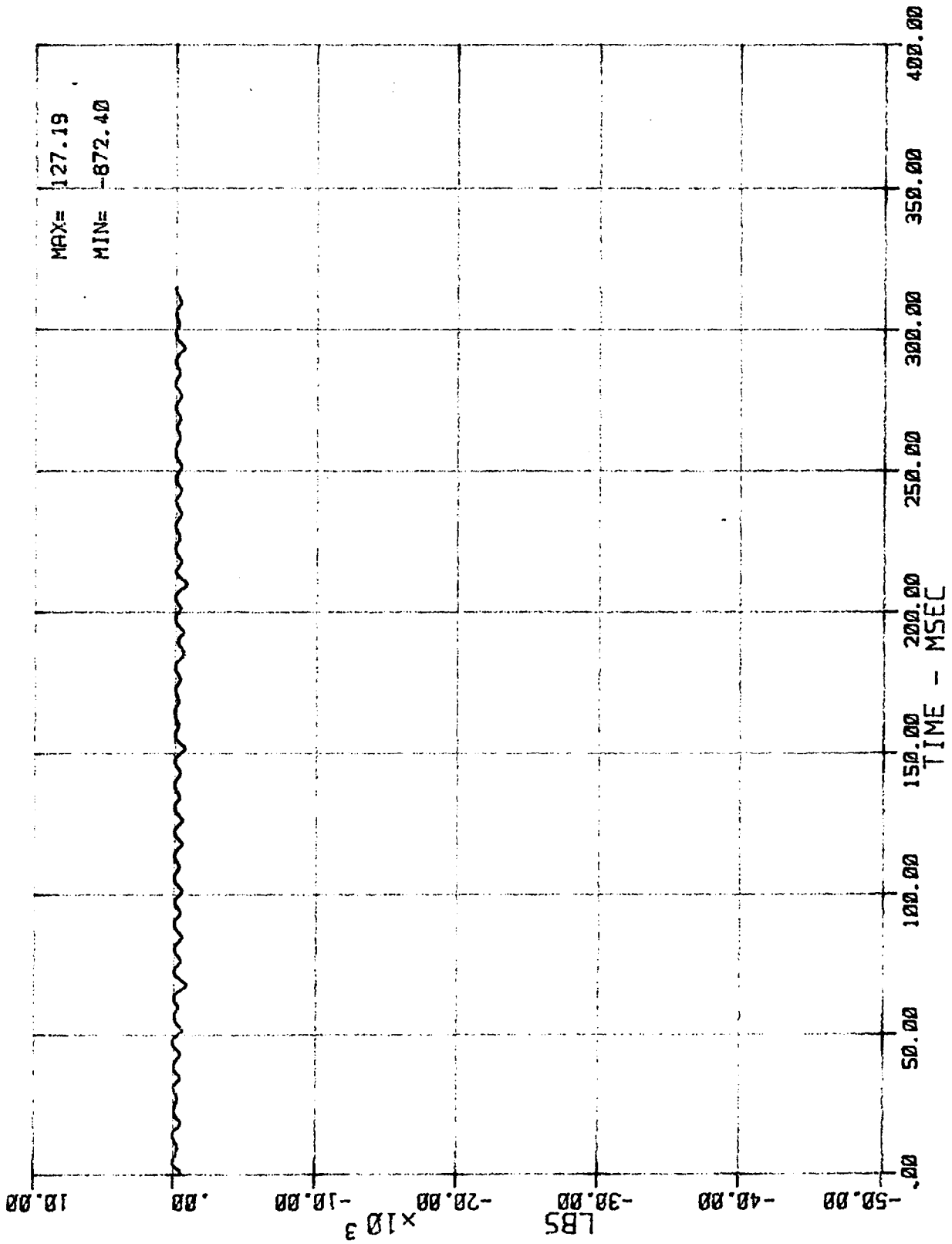
S6 LC BA N BC7 (BARRIER LOAD CELL C7 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



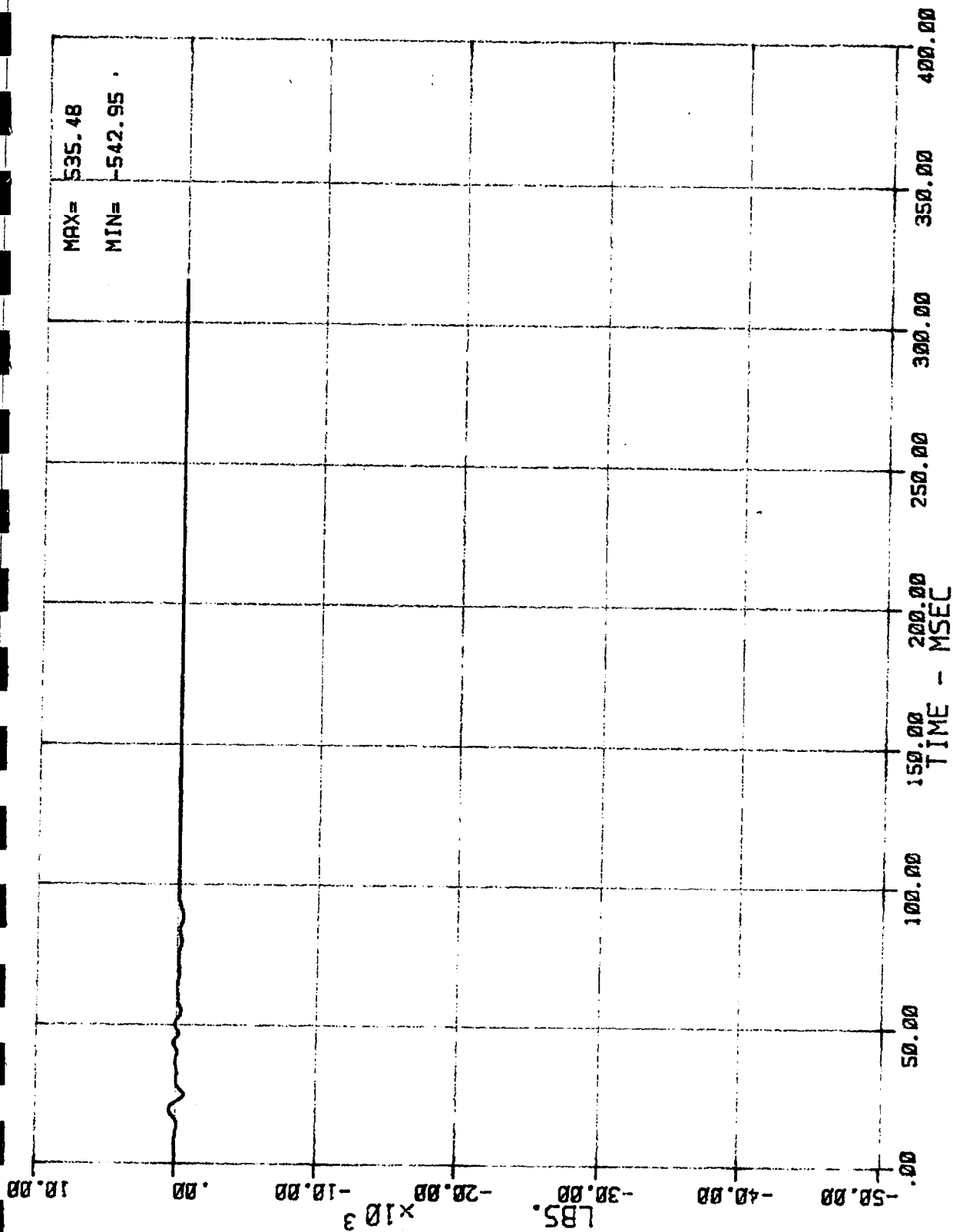
57 LC BA N BC8 (BARRIER LOAD CELL C8 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



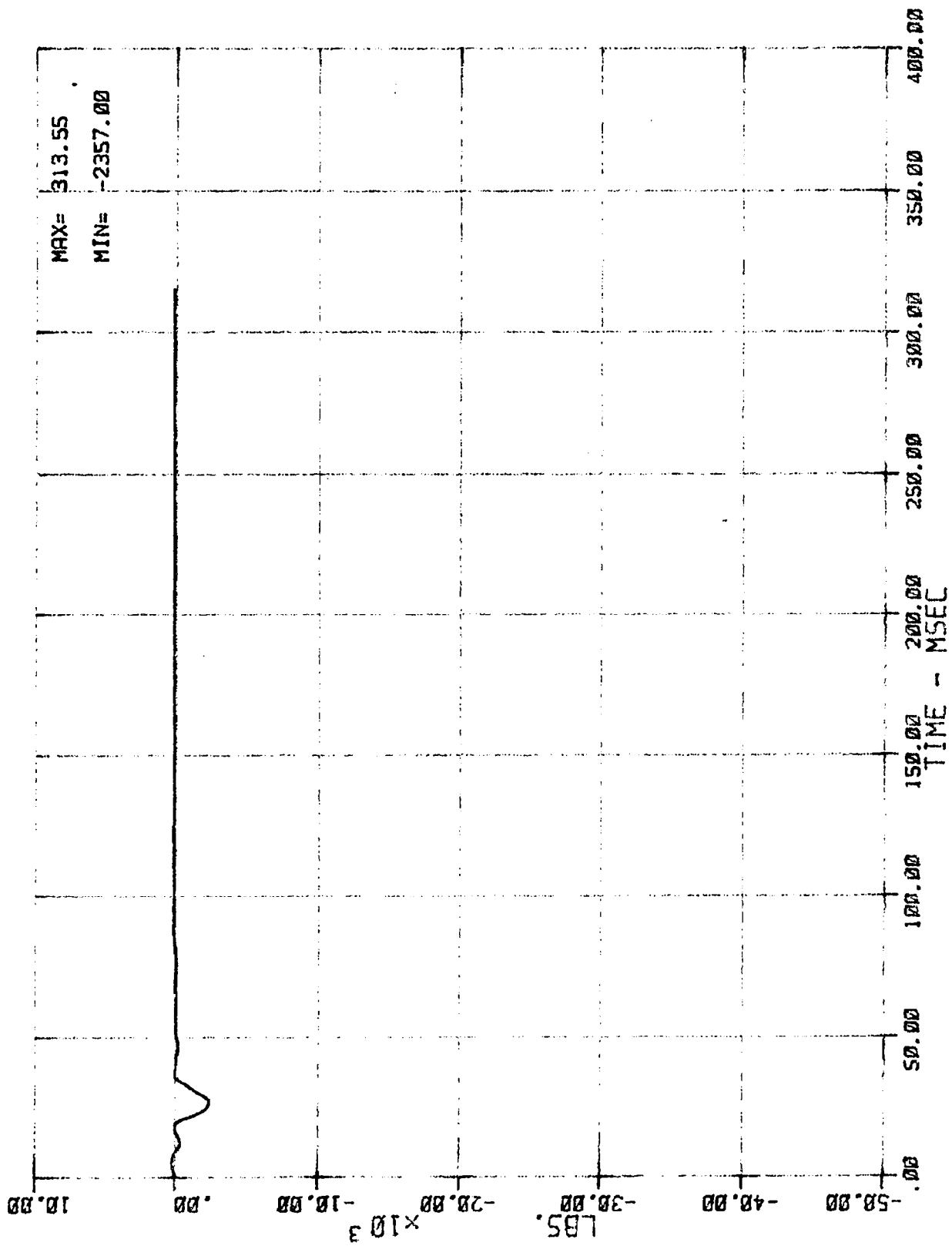
58 LC BA N BC9 (BARRIER LOAD CELL C9 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



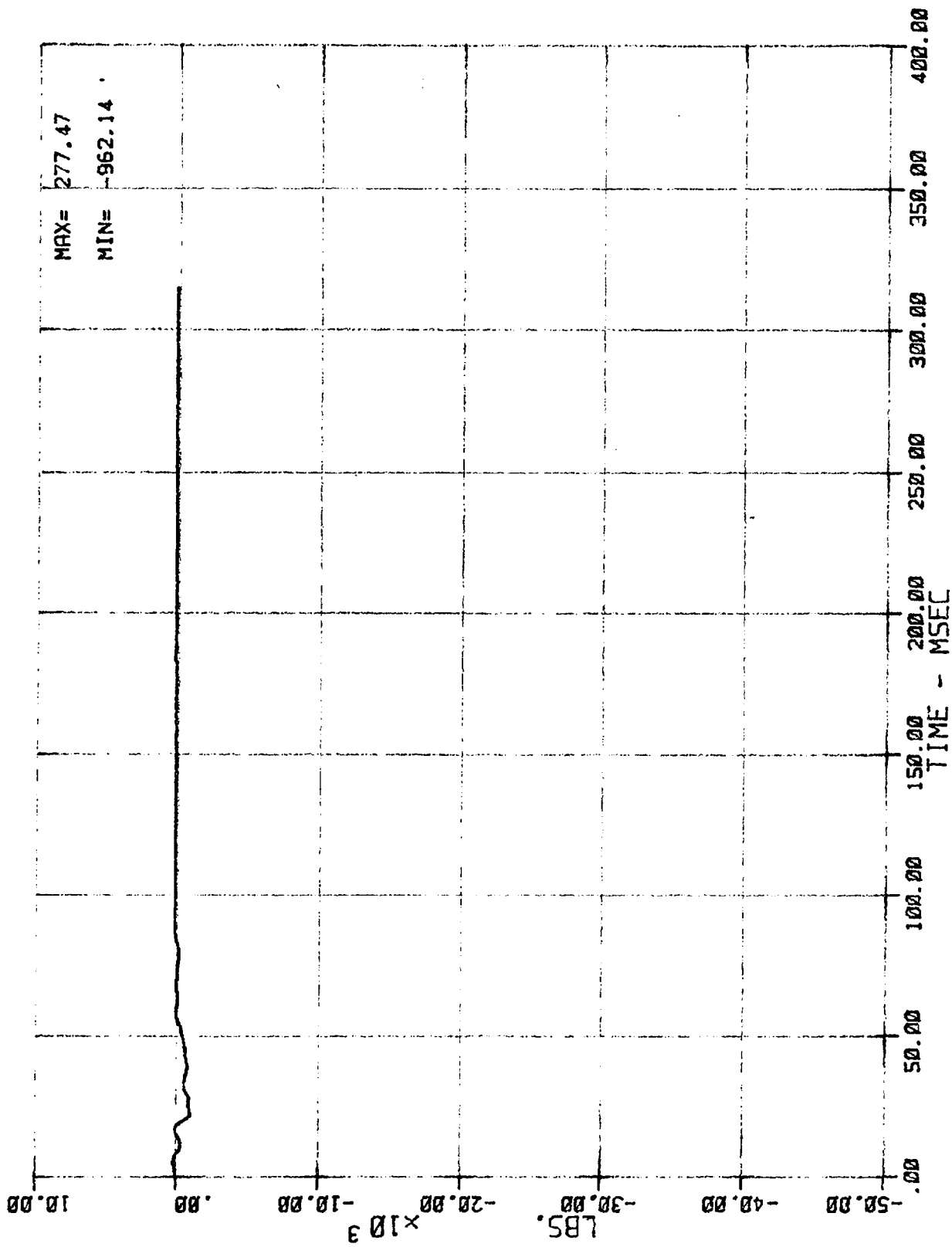
59 LC BA N BD1 (BARRIER LOAD CELL D1 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



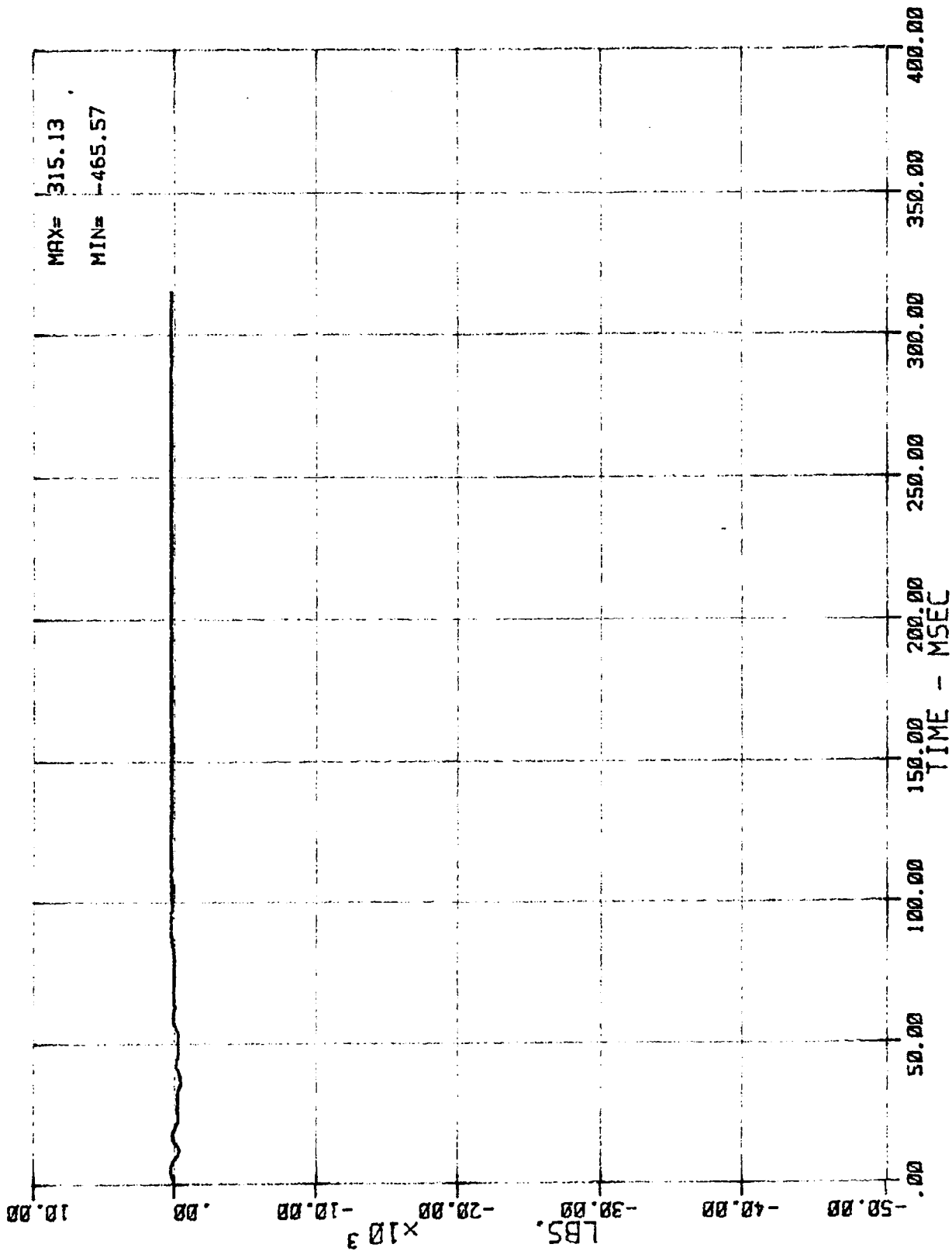
60 LC BA N 802 (BARRIER LOAD CELL D2 FORCE)
MSE N26066 1986 SUBARU XT COUPE

05/18/86



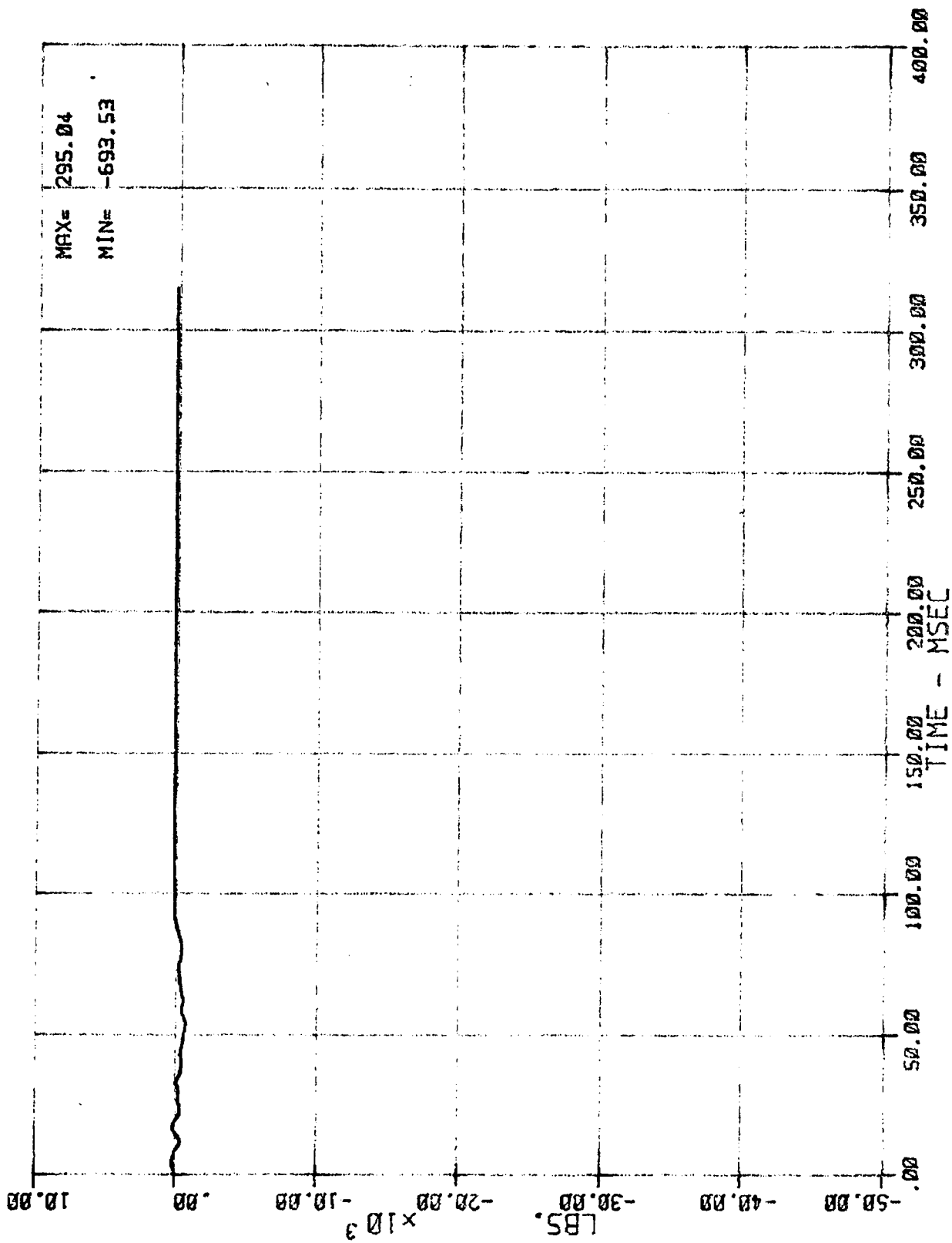
61 LC BA N B03 (BARRIER LOAD CELL D3 FORCE)
MSE N26065 1985 SUBARU XT COUPE

06/18/86



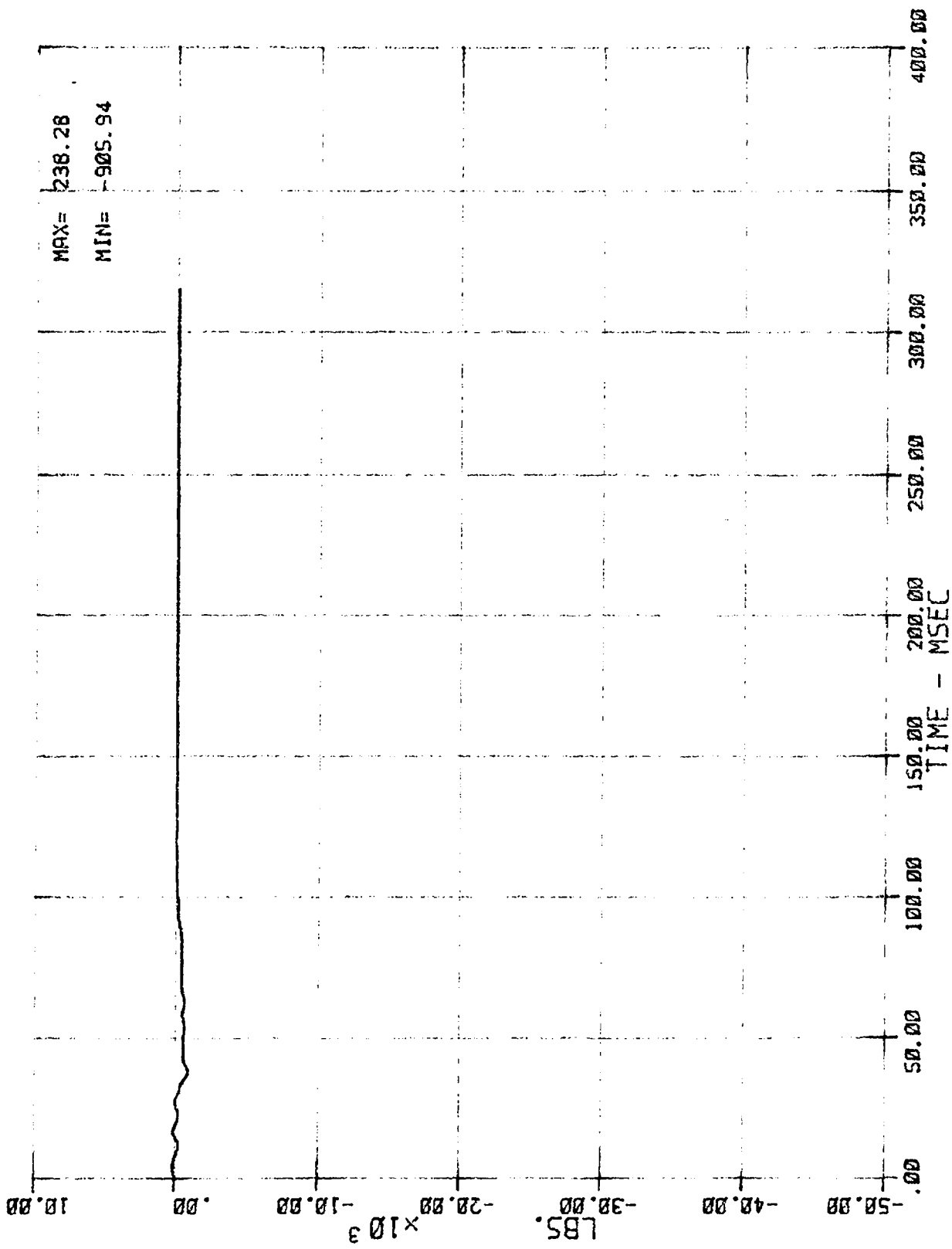
62 LC BA N BD4 (BARRIER LOAD CELL D4 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86



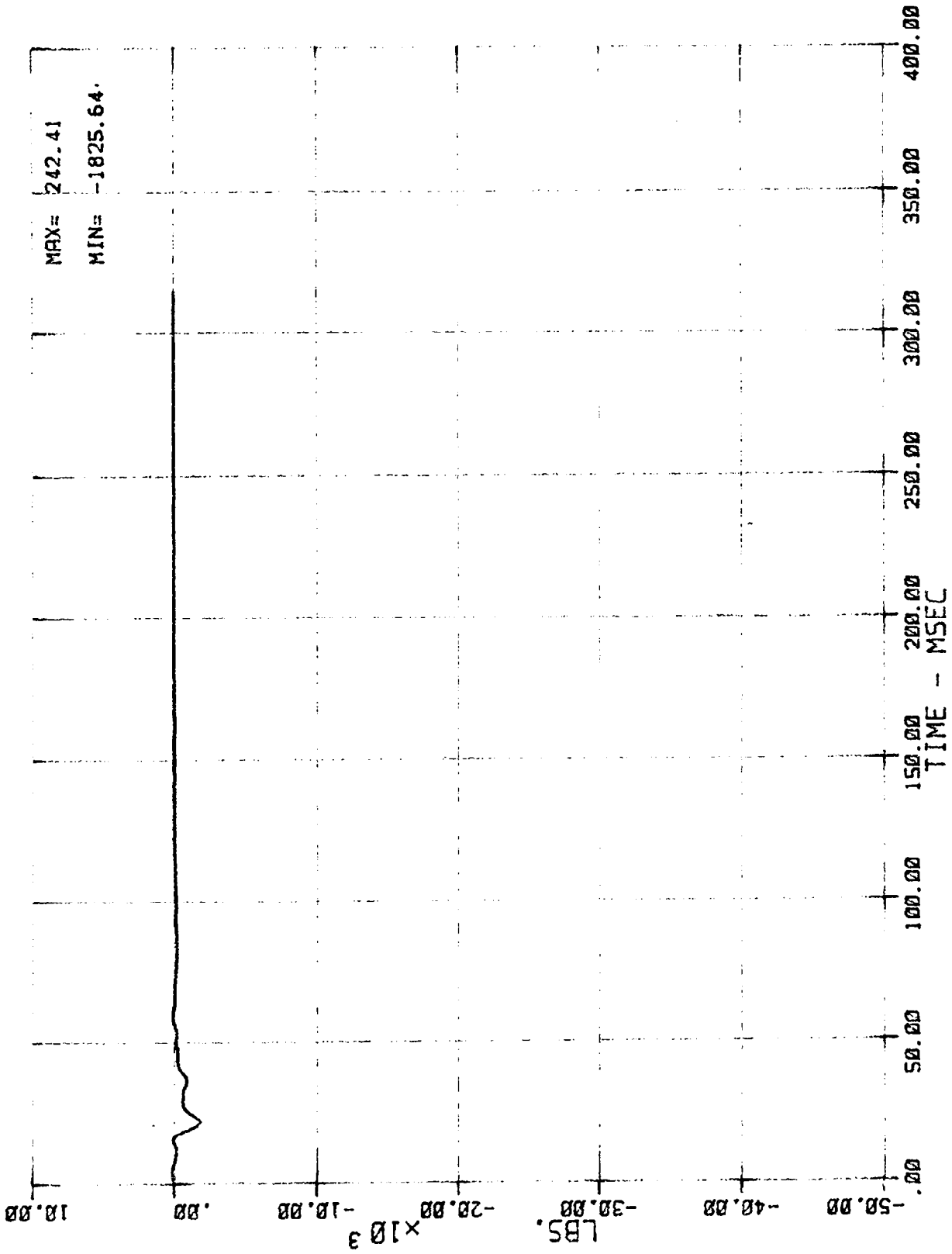
63 LC BA N B05 (BARRIER LOAD CELL 05 FORCE)
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06/18/86



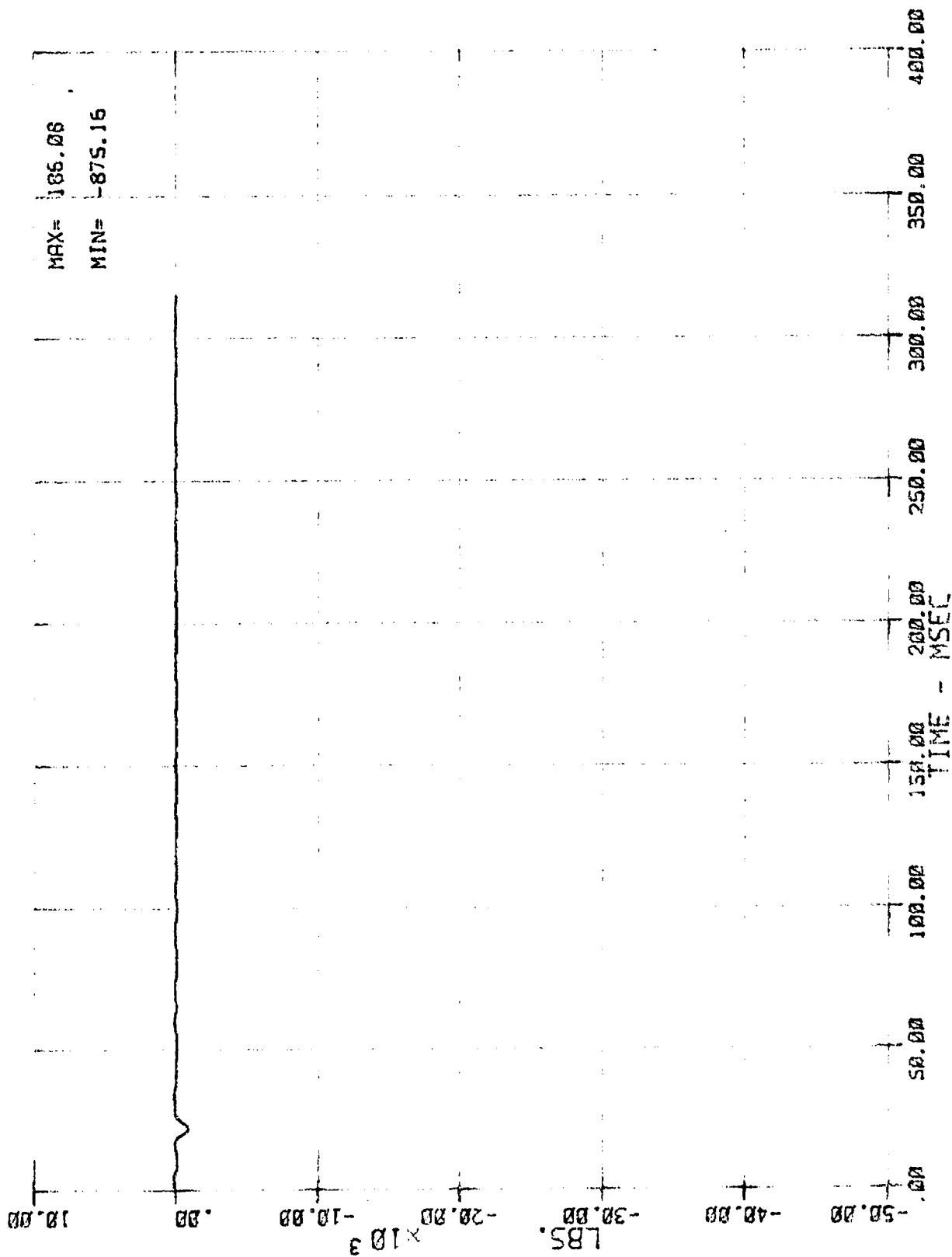
64 LC BA N 306 (BARRIER LOAD CELL D6 FORCE)
MSE N26056 1986 SUBARU XT COUPE

05/18/86



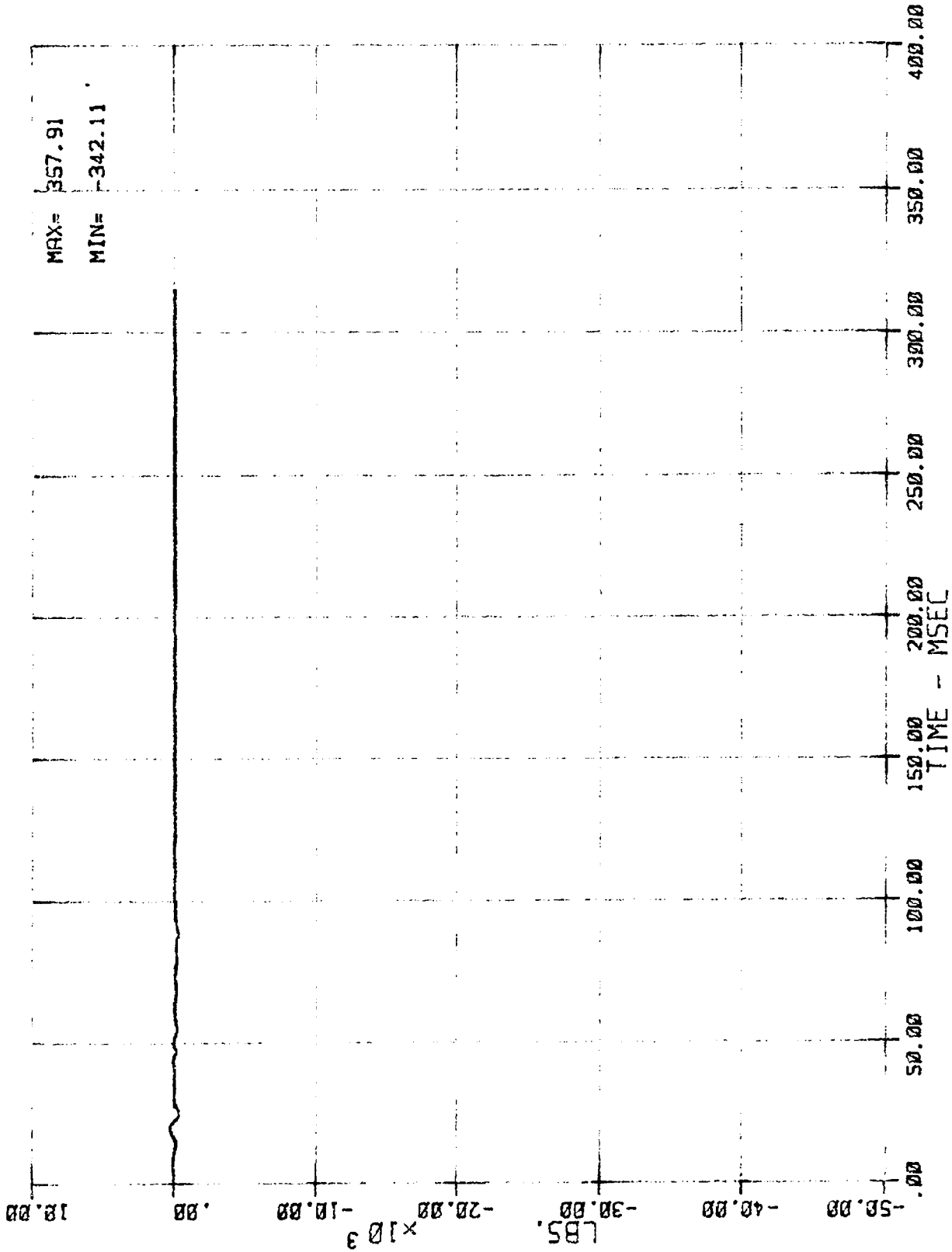
65 LC BA N B07 (BARRIER LOAD CELL 07 FORCE)
NSE N26066 1986 SUBARU XT COUPE

06/18/86



66 LC BA N 508 (BARRIER LOAD CELL DB FORCE)
NSE N26066 1986 SUBARU XT COUPE

06/18/86



67 LC BA N BD9 (BARRIER LOAD CELL D9 FORCE)
MSE N26066 1986 SUBARU XT COUPE

06/18/86

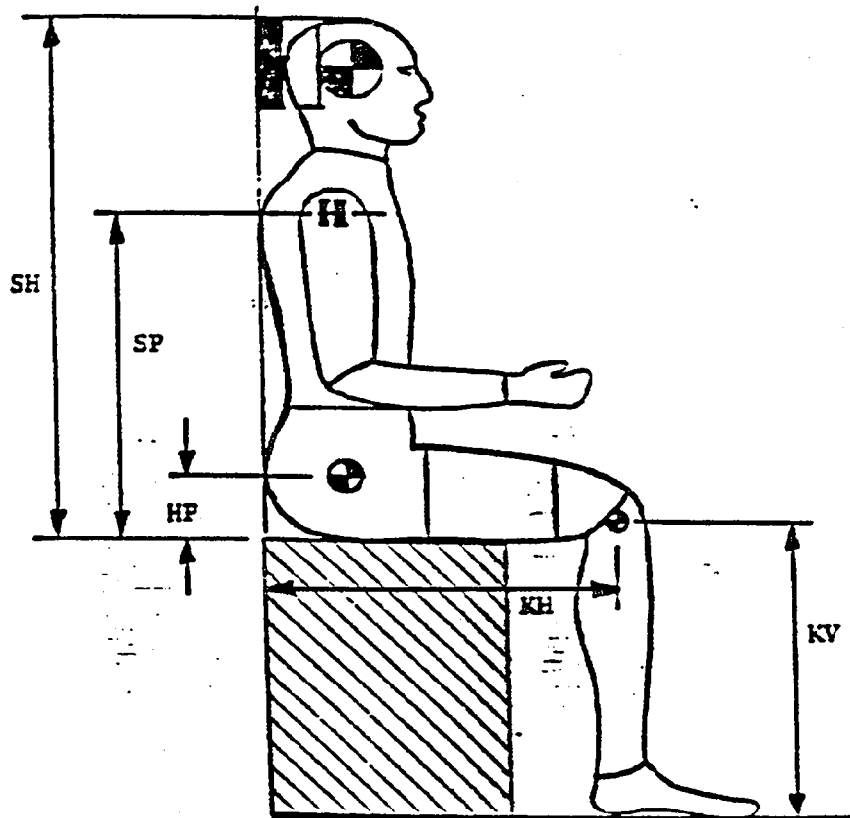
APPENDIX C

PART 572 DUMMY CONFIGURATION AND
PERFORMANCE VERIFICATION TESTS

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

I. CONFIGURATION VERIFICATION DATA:



	P. 572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		06/04/86	
VERIFICATION NUMBER FOR DUMMY*		2	
SH - Seated Height- - - - -	35.6 to 35.8"	35.7	
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"	18.1	
HW - Hip Width- - - - -	14.0 to 15.4"	14.8	

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.: 466

LABORATORY TECHNICIAN: Paul Leonard

Sheet 1 of 3		Pre-Test Calibration	Post-Test Calibration
Date of ATD Calibration - - - - -		06/02-06/04/86	
Calibration Sequential Number For Dummy - - -		2	
Temperature in Lab. (Spec. = 66 to 78° F) - -		70-74	
Relative Humidity in Lab. (Spec. = 10 to 70%)		54-60	
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST:			
a. Peak Resultant Accel. -	210 to 260G	221	
b. Peak Lateral Accel. -	≤10G	2.9	
c. Time above 100G - - -	0.9 to 1.5 ms	1.3	
2. NECK BENDING TEST:			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	22.1	
b. Pendulum Avg. Decel. (over $t_3 - t_2$) - - - -	20 to 24G	23.3	
c. Peak Resultant Head Acceleration - - - - -	26G maximum	21.7	
d. Pendulum Decel. ($t_2 - t_1$)	≤3 ms	2.8	
e. Pendulum Decel. ($t_3 - t_2$)	25 to 30 ms	27.6	
f. Pendulum Decel. ($t_4 - t_3$)	≤10 ms	10.0	
g. Pendulum Direction Reversal Time - - - - -	≥123 ms	N/A	
h. Max. Head Rotation - -	63 to 73°	63.4	
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	32.0
	Displ.	2.1 to 3.1 in.	2.71
60°	Time	40.3 to 51.7 ms	50.1
	Displ.	4.3 to 5.3 in.	5.21
Maximum (63°)	Time	53.2 to 66.8 ms	63.0
	Displ.	5.0 to 6.0 in.	5.47

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

NHTSA ATD I.D. NO.: 466

Sheet 2 of 3			Pre-Test Calibration	Post-Test Calibration
TEST PARAMETER		SPECIFICATION		
2. <u>NECK BENDING TEST</u>				
<u>Continued:</u>				
i. Chordal Displacement:				
Head Rotation Angle -				
60°	Time	67.0 to 83.0 ms	71.2	
	Disp.	4.3 to 5.3 in.	5.17	
30°	Time	85.4 to 104.6 ms	89.4	
	Displ.	2.1 to 3.1 in.	2.44	
0°	Time	101.0 to 123.0 ms	101.2	
	Displ.	-.5 to 0.5 in.	0.12	
3. <u>ABDOMINAL COMPRESSION TEST:</u>				
(Preload = 10 pounds)				
a. Force @ .5" - - - - -		23 - 36	27.0	
b. Force @ .75" - - - - -		36 - 50	40.5	
c. Force @ 1.0" - - - - -		50 - 63	56.0	
d. Force @ 1.3" - - - - -		73 - 88	84.5	
4. <u>LUMBAR FLEXION TEST:</u>				
a. Force @ 20° - - - - -		22 to 34 lbs.	32.2	
b. Force @ 30° - - - - -		34 to 46 lbs.	43.3	
d. Force @ 40° - - - - -		46 to 58 lbs.	49.1	
e. Return Angle - - - - -		12° maximum	11°	
5. <u>CHEST IMPACT TESTS:</u>				
a. High Speed				
(1) Probe Speed - - -		21.78-22.22 fps	21.90	
(2) Peak Deflection -		1.7" maximum	1.67	
(3) Peak Resistive Force - - - - -		2250 lbs. maximum	2,063	
(4) Internal Hysteresis - - -		50 to 70%	65.7	

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

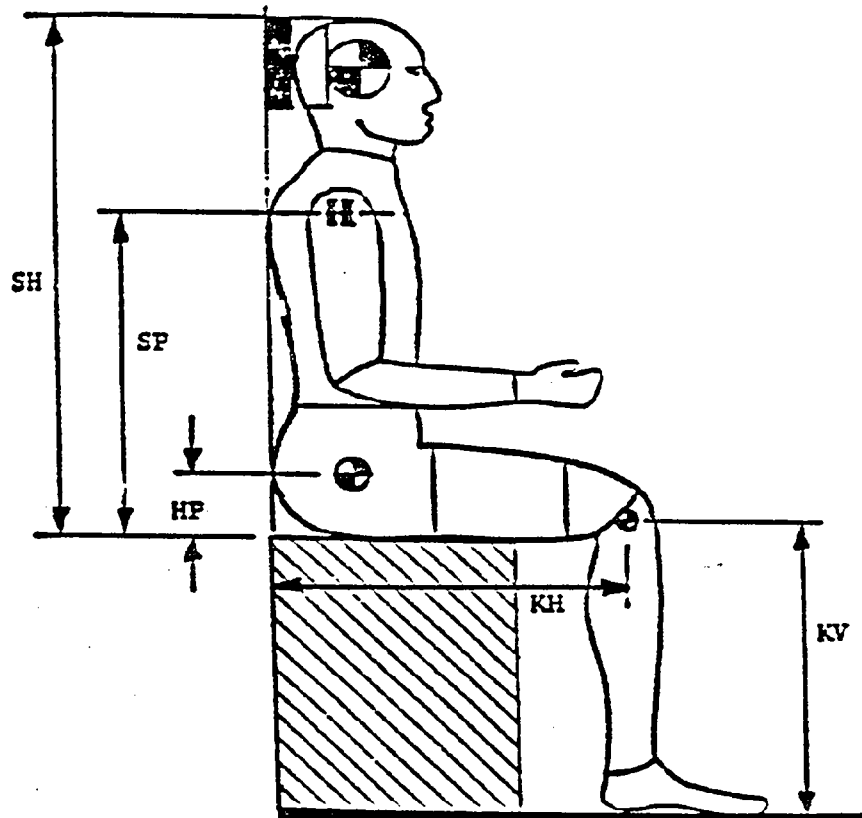
NHTSA ATD I.D. NO.: 466

Sheet 3 of 3		Pre-Test Calibration	Post-Test Calibration
TEST PARAMETER	SPECIFICATION		
5. CHEST IMPACT TESTS: <u>Continued:</u>			
b. Low Speed			
(1) Probe Speed - - -	13.86-14.14 fps	13.95	
(2) Peak Deflection -	1.1" maximum	0.93	
(3) Peak Resistive, Force - - - - -	1450 lbs. maximum	1336	
(4) Internal Hysteresis - - -	50 to 70%	68.9	
6. KNEE IMPACT TESTS:			
a. Right Side			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.90	
(2) Maximum Force - -	1850 to 2500 lbs.	2205	
(3) Time Above 1000#-	1.7 ms minimum	1.8	
b. Left Side			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.91	
(2) Maximum Force - -	1850 to 2500 lbs.	1873	
(3) Time Above 1000#-	1.7 ms. minimum	1.7	

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

I. CONFIGURATION VERIFICATION DATA:



	P. 572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		05/28/86	
VERIFICATION NUMBER FOR DUMMY*		1	
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"	19.5	
SW - Shoulder Width - - - - -	17.8 to 18.4"	17.9	
HW - Hip Width- - - - -	14.0 to 15.4"	14.9	

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.: 467

LABORATORY TECHNICIAN: Paul Leonard

Sheet 1 of 3		Pre-Test Calibration	Post-Test Calibration
Date of ATD Calibration - - - - -		02/27-05/28/86	
Calibration Sequential Number For Dummy - - -		1	
Temperature In Lab. (Spec. = 66 to 78° F) - -		70-74	
Relative Humidity In Lab. (Spec. = 10 to 70%)		26-52	
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST:			
a. Peak Resultant Accel. -	210 to 260G	223	
b. Peak Lateral Accel. -	≤10G	6.2	
c. Time above 100G - - -	0.9 to 1.5 ms	1.3	
2. NECK BENDING TEST:			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	22.2	
b. Pendulum Avg. Decel. (over $t_3 - t_2$) - - - -	20 to 24G	23.8	
c. Peak Resultant Head Acceleration - - - - -	26G maximum	22.4	
d. Pendulum Decel. ($t_2 - t_1$)	≤3 ms	2.8	
e. Pendulum Decel. ($t_3 - t_2$)	25 to 30 ms	28.8	
f. Pendulum Decel. ($t_4 - t_3$)	≤ 10 ms	10.0	
g. Pendulum Direction Reversal Time - - - - -	≥123 ms	N/A	
h. Max. Head Rotation - -	63 to 73°	66	
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	32.4
	Displ.	2.1 to 3.1 in.	2.63
60°	Time	40.3 to 51.7 ms	49.6
	Displ.	4.3 to 5.3 in.	5.01
Maximum (66 °)	Time	53.2 to 66.8 ms	60.0
	Displ.	5.0 to 6.0 in.	5.42

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

NHTSA ATD I.D. NO.: 467

Sheet 2 of 3		Pre-Test Calibration		Post-Test Calibration	
TEST PARAMETER		SPECIFICATION			
2. NECK BENDING TEST <u>Continued:</u>					
1. Chordal Displacement:					
Head Rotation Angle -					
60°	Time	67.0 to 83.0 ms	71.4		
	Disp.	4.3 to 5.3 in.	4.82		
30°	Time	85.4 to 104.6 ms	91.4		
	Displ.	2.1 to 3.1 in.	2.33		
0°	Time	101.0 to 123.0 ms	101.4		
	Displ.	-.5 to 0.5 in.	0.13		
3. ABDOMINAL COMPRESSION TEST:					
(Preload = 10 pounds)					
a. Force @ .5" - - - - -		23 - 36	28.0		
b. Force @ .75" - - - - -		36 - 50	43.0		
c. Force @ 1.0" - - - - -		50 - 63	63.0		
d. Force @ 1.3" - - - - -		73 - 88	84.0		
4. LUMBAR FLEXION TEST:					
a. Force @ 20° - - - - -		22 to 34 lbs.	33.0		
b. Force @ 30° - - - - -		34 to 46 lbs.	44.0		
d. Force @ 40° - - - - -		46 to 58 lbs.	52.8		
e. Return Angle - - - - -		12° maximum	11°		
5. CHEST IMPACT TESTS:					
a. High Speed					
(1) Probe Speed - - -		21.78-22.22 fps	21.92		
(2) Peak Deflection -		1.7" maximum	1.40		
(3) Peak Resistive Force - - - - -		2250 lbs. maximum	2208		
(4) Internal Hysteresis - - -		50 to 70%	69.2		

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

NHTSA ATD I.D. NO.: 467

Sheet 3 of 3		Pre-Test Calibration	Post-Test Calibration
TEST PARAMETER	SPECIFICATION		
5. CHEST IMPACT TESTS: <u>Continued:</u>			
b. Low Speed			
(1) Probe Speed - - -	13.86-14.14 fps	13.99	
(2) Peak Deflection -	1.1" maximum	1.02	
(3) Peak Resistive. Force - - - - -	1450 lbs. maximum	1380	
(4) Internal Hysteresis - - -	50 to 70%	59.7	
6. KNEE IMPACT TESTS:			
a. Right Side			
(1) Probe Speed - - -	6.76 to 7.04 fps	7.03	
(2) Maximum Force - -	1850 to 2500 lbs.	1960	
(3) Time Above 1000#-	1.7 ms minimum	1.8	
b. Left Side			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.97	
(2) Maximum Force - -	1850 to 2500 lbs.	1851	
(3) Time Above 1000#-	1.7 ms. minimum	1.8	

APPENDIX D
VEHICLE'S OWNER MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

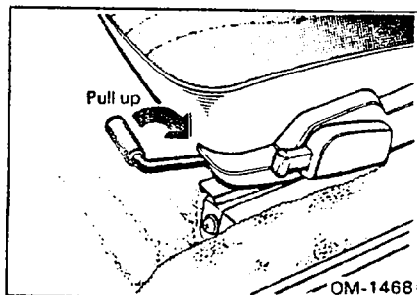
Front seats

Seat fore-and-aft adjustment

To move the seat back and forward, pull the adjuster lever up, slide the seat to the desired position, then release the lever. After adjusting the seat, always try to slide it back and forth to check that it is properly locked in place.

CAUTION:

- For safety, never adjust the seat while driving.
- Before operating the lever, check that hands and feet of rear seat passengers are away from the slide mechanism.

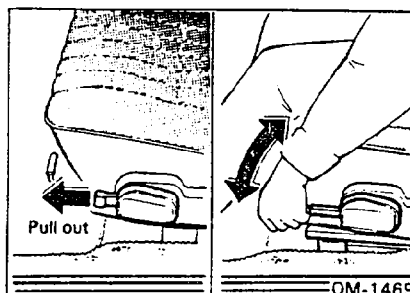


Seat up-and-down adjustment

Seat position can be adjusted up or down steplessly. To raise the seat, pull out the lever and pull it up, then when the seat cushion is at the desired height, release the lever. To lower the seat, pull out the lever and push it down. Release the lever when the seat cushion is at the desired height. Operate the lever while you are seated, otherwise more force is required to lower it.

CAUTION:

- Never adjust seat position while driving.
- Before operating the lever, always check that hands and feet of rear seat passengers are away from the lift mechanism or not under the seat cushion.



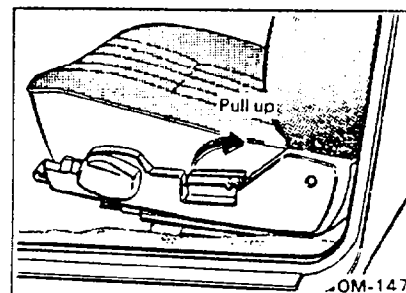
Reclining seat back

To recline the front seat back, pull the reclining lever up, then adjust the seat back to the desired position and release the lever.

After adjustment, be sure seat is securely locked.

CAUTION:

- For safety, never adjust the seat while driving.
- Never ride in a moving vehicle with the seat back in the reclining position. Seat belts operate most effectively when the wearer is in a fully upright position.



Getting into and out of the rear seat

For more convenient access to or from the rear seat, pull up the reclining lever or depress the pedal at the lower rear side of the seat, and the front passenger seat automatically slides forward.

When returning the front passenger seat to the rear, return the seat back to the vertical position and then slide the seat backward until it locks.

After the seat back is returned, be sure to slide the seat until it locks.

Lumbar support

Lumbar support pressure is adjusted by the adjuster lever. Set it at the most comfortable position.

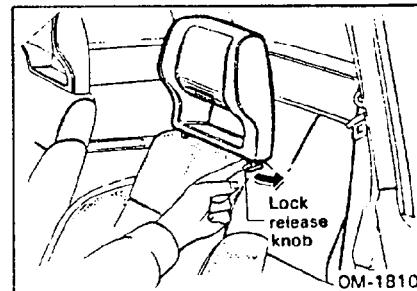
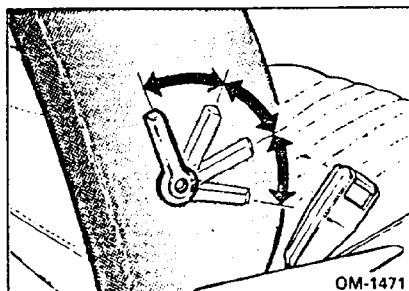
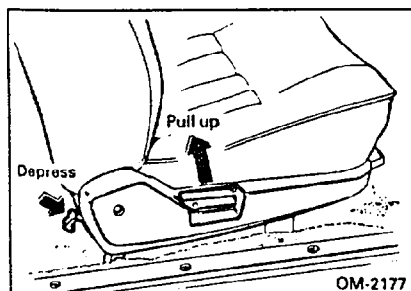
Removing head restraints

To remove a head restraint, slightly turn the knob between the head restraint bottom and seat back top on the seat left side, then pull the head restraint up.

To replace the head restraint, simply insert it until it snaps.

CAUTION:

Never remove the head restraints since they are designed to reduce risk of serious neck injury if the vehicle is struck from the rear.



Rear seats

GL, GL-10 models

- Folding the seat back

The rear seat is designed to fold allowing more loading area.

To fold down the seat back and gain access to the trunk, pull down on the strap located at the upper position of the seat back to release the seat back lock.

To return the seat to its original position, raise the seat back and push it back for locking.

CAUTION:

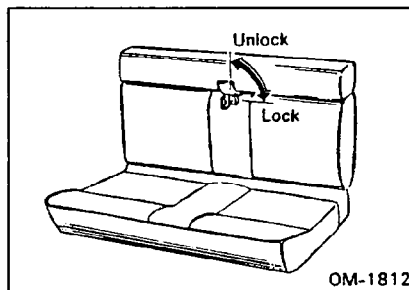
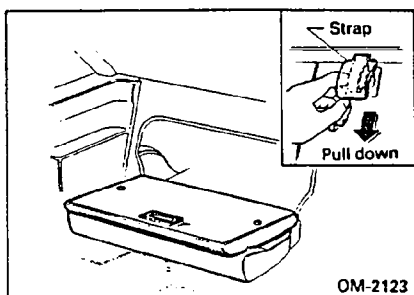
To return seat back to the closed position, slam shut. Check to make sure it is latched by pulling forward on the seat back (not the strap).

- To prevent illegal entry into the trunk, insert the key, then turn it.

Then the seat back is locked. Make sure that the operation of the trunk lid opener is cancelled.

CAUTION:

- For safety of all passengers, never stack luggage or other cargo higher than the top of the seat back.
- Never allow anyone to ride on the folded seat back while traveling.
- Fix skis or other long items securely in position to prevent them from shooting forward at sudden braking.
- When folding down the seat back, ensure that the key is not in the key slot.
- When standing the seat back upright with the seat back locked, make sure that the key is not left in the trunk.



DL model

Use the space at the back of the front seats only as a cargo compartment.

CAUTION:

- For safety of all passengers, never stack luggage or other cargo higher than the top of the seat back.
- For safety, never allow anyone to ride in the cargo area. This area is designed only for carrying luggage and miscellaneous items. It should never be used by passengers.

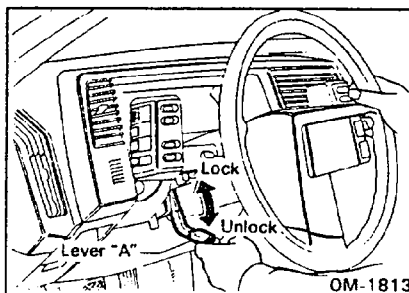
Tilt/telescopic steering wheel

Steering wheel position can be adjusted in vertically and front-and-back. Optimum driving position is obtained by adjusting together, the seat slide and seat back reclining adjustment.

The steering wheel is also equipped with a spring-up feature: it springs up out of the way to make entering and leaving the seat easier.

Up-and-down adjustment

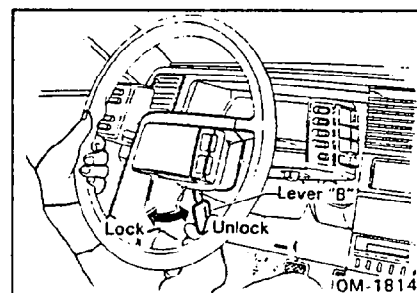
To adjust the steering wheel, press lever "A" by left hand while holding the steering wheel by right hand and set it in the best position for all driving conditions. Then pull up lever "A" strongly to lock.

**Front-and-back adjustment**

To adjust the steering wheel, turn lever "B" counterclockwise by the right hand while holding the steering wheel by the left hand. Then, with the steering wheel held in both hands, set it in the best position for all driving conditions. Next, turn lever "B" clockwise to lock the wheel in position.

CAUTION:

- Never operate the steering wheel levers while driving. The steering wheel can loosen suddenly, making driving dangerous.
- If levers "A" and "B", are not fully tightened, they can loosen when driving on rough dirt roads.



Whenever making adjustment, afterward try to move the steering wheel up-and-down and back-and-front to check that it is properly locked.

- If lever "A" or "B" does not position properly when tightened, have your SUBARU dealer check your vehicle.

For easier access, pull the knob and the steering wheel automatically springs up; to replace the wheel, bring the wheel down until it snaps into position.

It will stop and lock at the original position. Always hold the steering wheel when operating the knob.

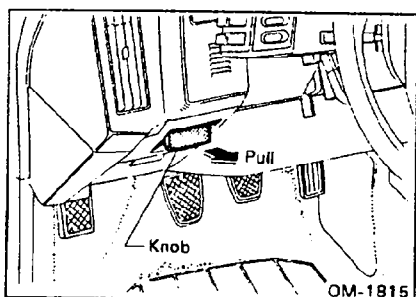
CAUTION

- Never operate the knob while driving as the steering wheel will spring up making driving extremely dangerous.
- Do not operate the knob with the lever "A" loose.

- If the knob is not properly locked, the wheel may spring up while driving on rough dirt roads.

With the wheel set back in its original position, try to move it up-and-down force to check that it is properly locked in position.

- If there is any play in the wheel when locked, have your SUBARU dealer check your vehicle.



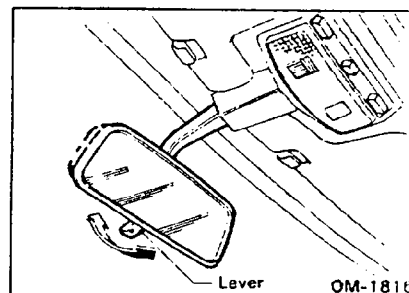
Inside rear-view mirror

The inside mirror can be adjusted to reduce glare while driving at night.

Pull the lever toward you to switch the mirror from "Day" to "Night", and push forward to return it to "Day" position.

This helps protect the driver from reflected glare while driving at night.

Before you drive, always check that the inside and outside rear-view mirrors are correctly adjusted.



Outside rear-view mirror

Convex mirror

Some models have a convex rear-view mirror on the passenger's side.

Vehicles and other objects seen in a convex mirror will appear smaller and further away than when seen in a flat mirror. Always be careful not to misjudge the size or distance of vehicles and/or other objects viewed in a convex mirror.

Remote control mirrors

First select either the right or left mirror by the selection switch. Then by pressing the desired direction button, adjust the mirror to the best position.

- Each mirror can also be adjusted with the hand by pushing the mirror itself.

CAUTION:

Never press the button longer than necessary, as damage to the mirror adjusting mechanism, may result.

Front seat belts

The front seat belts are the three-point type with an emergency locking retractor.

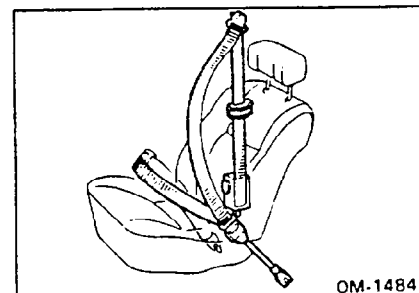
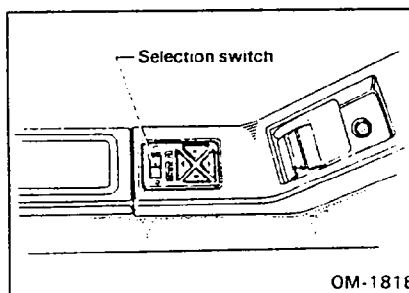
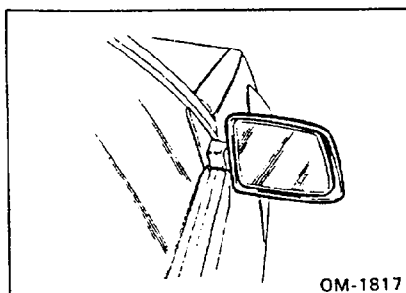
During sharp deceleration as when the vehicle suddenly stops, turns sharply, or strikes another object in an accident, the seat belt retractor automatically locks the belts. The belt is not locked if it is suddenly pulled out of the retractor by hand, but this is not a break down.

To fasten the front seat belt, pull the belt out of the retractor, then insert the tongue into the buckle until it snaps.

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

CAUTION:

- **Never use a belt while twisted or reversed.**



- **Never wear the shoulder belt under the arm. If an accident occurs, this can increase the risk or severity of injury.**

Rear seat belts

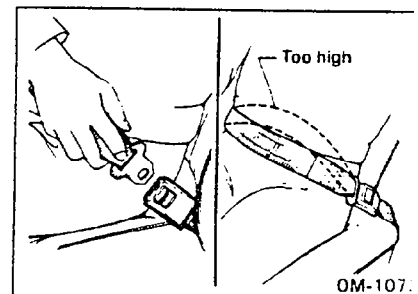
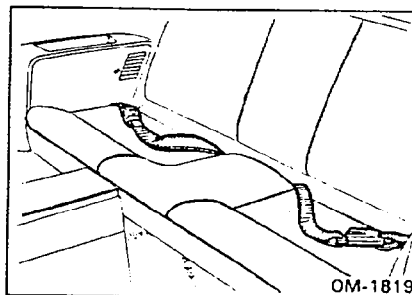
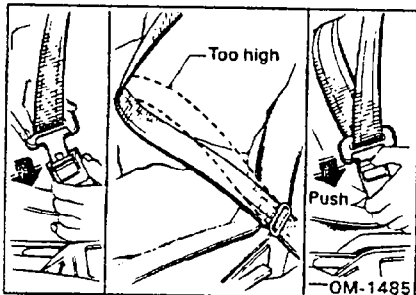
The two rear seat belts are a two-point type. The belts have automatic locking retractors. To fasten the rear seat belt, pull it out continuously from the retractor, then insert the tongue into the buckle until it snaps. To unfasten the belt, push the button on the buckle.

If the belt is allowed to stop and return slightly, the belt will lock. If this happens and further adjustment is required, first return the belt to the retracted position, then pull it out again.

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

CAUTION:

Never use a belt that is twisted reversed.



Seat belt tips

- To help reduce the risk or severity of injury in accidents or sudden stops, all persons riding in the vehicle should always protect themselves by using the seat belts provided.

- Make it a rule to have everyone, including the driver, fasten their seat belts before starting the vehicle.

- Never use one belt for more than one person at a time.

- Position the lap belt across your lap as low as possible on your hips.

This is necessary to help reduce the risk or severity of injury in an accident. This spreads the force of the lap belt over the strong hip bones instead of across the soft abdomen.

- Never let any foreign object enter the buckle or retractor. Anything inside may prevent them from working properly.

- When fastening the front seat belt, to take up the slack in the belt, pull the shoulder strap through the tongue until the belt fits snugly. Then return the shoulder belt to its retractor until the shoulder strap also fits snugly.

- **Children.** It is recommended that they sit in the rear seat and be restrained with the seat belts. If sitting in front, never allow a child to stand up or kneel on the seat. Children especially should be restrained by seat belts at all times.

- **Baby or small child.** Use a child safety seating system which fits your vehicle. Before installing, always read the manufacturer's instructions carefully.

- **Expectant mother.** Seat belt use is recommended. Ask your doctor for specific recommendations. The lap belt should be worn securely and as low as possible over the hips and not on the waist.

Seat belt maintenance

- Keep sharp edges or damaging objects away from belts and other parts of the restraint system.

- Use care to keep the webbing free of polishes, oils and chemicals, and particularly battery acid.

- Never attempt to modify or make changes that will prevent the seat belt adjustment from operating properly.

- To clean the webbing, use a mild soap solution and water. Never attempt to bleach or redye the webbing since this could seriously affect its strength.

- Inspect the seat belts and attachments periodically for cracks, damage, loose bolts or worn webbing. Replace the seat belt as necessary.

- Replace seat belt assemblies after use in any serious accident.

Fasten seat-belt warning light and chime

Your vehicle is equipped with a seat-belt warning device at the driver's seat as required by current safety standards.

This device causes the seatbelt warning light on the instrument panel to light for about six seconds when the ignition switch is turned "ON".

If the driver has not fastened his seat belt, the warning chime sounds at the same time.