REPORT NO. MSE-88-N04

DOT 1147

R7157-N04

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

FORD MOTOR COMPANY

1988 FORD F-150 CUSTOM PICKUP

NHTSA NO. MJ0201

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

APRIL 04, 1988

FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF MARKET INCENTIVES
400 Seventh Street, S. W.
Room No. 5313 (NRM-22)
Washington, DC 20590

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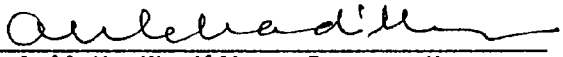
APPROVED BY: 

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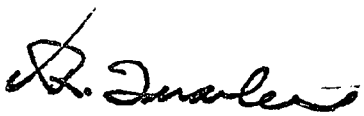
DATE: April 04, 1988

FINAL REPORT ACCEPT BY: 

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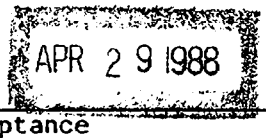

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16. Abstract

A 35 mph frontal barrier impact test using a load cell barrier was conducted on a 1988 Ford F-150 Custom Pickup at the Mobility Systems and Equipment Company (MSE) crash test facility in Mira Loma, CA on 15 March 1988.

The barrier impact velocity was 35.4 mph and the ambient temperature at the barrier face at the time of impact was 62°F. The posttest vehicle crush maximum was 27.5 in.

A summary of occupant injury measure data from the test.

Injury Criteria Threshold Value		Driver Dummy	Passenger Dummy
Head Injury Criterion HIC = 1000		1074	587
Chest Resultant Peak 60 Gs (3 ms clip)		56	38
Femur Load 2250 pounds	Left	1024	644
	Right	1090	295

TYPE OF RESTRAINT SYSTEM: 3-point continuous webbing system at each front outboard seating positions.

17. Key Words	18. Distribution Statement
35 MPH FRONTAL BARRIER IMPACT TEST NEW CAR ASSESSMENT PROGRAM (NCAP) 1988/FORD/F-150 CUSTOM PICKUP	Copies of this report are available from Technical Reference Division Nat'l Hwy. Traffic Safety Admin. Room 5108, Nassif Building 400 7th St. S.W. Wash. DC 20590

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SECTION 1

PURPOSE AND TEST PROCEDURE

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

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

SECTION 2

SUMMARY OF FRONTAL BARRIER IMPACT TESTS

A load cell barrier consisting of 36 cell units was impacted by a 1988 Ford F-150 Custom Pickup, NHTSA No. MJ0201 at a velocity of 35.4 mph. The frontal impact test was conducted by Mobility Systems and Equipment Company (MSE) on 15 March 1988. The general test and vehicle description information are presented in Tables 1 and 2. Pretest and posttest photographs of the test vehicle and dummies are shown in Appendix A.

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

The ATD's were instrumented with head and chest triaxial accelerometers and right/left femur load cells. In addition, load cells were placed on the driver's and passenger's lap and shoulder belts to measure dummy upper torso and pelvic section belt loading. A summary of dummy configuration and performance verification test data is presented in Appendix C.

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

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

2.1 GENERAL COMMENTS

The 1988 Ford F-150 Custom Pickup was equipped with a 4.9 liter, 6 cylinder engine and 5 speed manual transmission. The test weight of the Ford F-150 Custom Pickup with two (2) 50th percentile male dummies, instrumentation, and cameras was 4385 pounds.

The 1988 Ford F-150 Custom Pickup was involved in a frontal load cell barrier crash at a velocity of 35.4 mph.

The maximum static crush for the vehicle of 27.5 inches occurred at the left side of the front bumper. The windshield was cracked but otherwise the vehicle glazing remained intact. The driver's door required tools to open. The passenger door 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 1074, the maximum chest acceleration (resultant clipped) was 56 and the maximum femur loads were 1024 (left) and 1090 (right) pounds.

The passenger ATD's head hit his right knee. Both of his knees hit the glove box door. The HIC value for the passenger ATD was 587, the maximum chest acceleration (resultant clipped) was 38 and the maximum femur loads were 644 (left) and 295 (right) pounds.

Seat belt spool out, measured by high speed film analysis was 3.0 inches for the driver and 3.2 inches for the passenger.

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

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

Data Table No. 1 Test Vehicle Data

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1988/FORD/F-150 CUSTOM/PICKUP

VEHICLE NHTSA NO.: MJ0201 VIN: 1FTDF15Y7JPA16175

VEHICLE BODY COLOR: WHITE ; MONTH & YEAR OF MANUFACTURE: 09/87

ENGINE: 6 cylinders; ___ C.I.D.; 4.9 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: 12/07/87

ODOMETER READING: 28 miles; OPTIONS: [ ] A/C; [X] P/S; [ ] P/Wdo; [ ] ___

[ ] Tilt Whl.; [ ] Cruise Control

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

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

Recommended Tire Size: P215/75R15SL

Tires On Vehicle: P215/75R15 M+S ; Manufacturer: FIRESTONE

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 = 1693* lbs. (A) *(GVWR - 3757)

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

Cargo Capacity (A - B) - - - - - = 1243 lbs.

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Right Front = 1149 lbs.
Left Front = 1152 lbs. — TOTAL FRONT = 2301 lbs (61.2% of TOTAL)

Right Rear = 732 lbs.
Left Rear = 724 lbs. — TOTAL REAR = 1456.0 lbs. (38.8% of TOTAL)

TOTAL WEIGHT= 3757 lbs.

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

CALCULATION OF TEST VEHICLE TARGET WEIGHT:

Total Test Vehicle Delivered Weight With Maximum Fluids = 3757 lbs.
Maximum Cargo Carrying Capacity Of Test Vehicle* - - - - = 300 lbs.
Weight Of Two P.572 Dummies (2 x 164 lbs.) - - - - - - - = 328 lbs.
TEST VEHICLE TARGET WEIGHT - - - - - - - = 4385 lbs.

*300 lbs. for light trucks and MPVs

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front = 1293 lbs.
Left Front = 1296 lbs.
Right Rear = 902 lbs.
Left Rear = 894 lbs.
TOTAL WEIGHT= 4385 lbs. (which includes 100 lbs. of cargo ballast weight placed in the cargo/luggage area)

TOTAL FRONT = 2589 lbs. (59.0% of TOTAL)

TOTAL REAR = 1796 lbs. (41.0% of TOTAL)

VEHICLE COMPONENTS REMOVED TO MEET TARGET WEIGHT:

1. [X] Spare Tire, Jack, Jack Stand
2. [ ] Rear Bumper Assembly
3. [ ] Tail lamp hsg. [ ] Rt. Side [ ] Left Side
4. DRIVER AND PASSENGER MIRRORS

TEST VEHICLE ATTITUDE:

As Delivered— Right Front = 34.5 inches; Ready For Test— Right Front = 34.2 inches
Left Front = 34.9 inches Left Front = 34.8 inches
Right Rear = 35.4 inches Right Rear = 34.2 inches
Left Rear = 35.6 inches Left Rear = 34.0 inches
Test Vehicle Wheelbase: 133.0 inches; C.G.= 54.5 inches rearward of front wheel centerline

Total Vehicle Length:
Right Side = 208.0 inches
Left Side = 207.6 inches
Centerline = 209.8 inches

Data Table No. 2 Post Crash Test Data

DATE OF 35 MPH FRONTAL BARRIER IMPACT RATINGS TEST: 03/15/88

TIME OF TEST: 4:45 PM ; AMBIENT TEMPERATURE AT BARRIER FACE: 62 °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 = 35.37 mph

Secondary Speed Trap = 35.37 mph

(Specified Range = 34.5 to 35.5 mph)

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

(a) entering the speed trap = 60 in

(b) existing the speed trap = 12 in

VEHICLE STATIC CRUSH: (All measurements in inches)

Vehicle Pre-test Length— Right Side= 208.0 ; C/Line= 209.8 ; Left Side= 207.6

Vehicle Post-test Length -Right Side= 183.8 ; C/Line= 183.5 ; Left Side= 180.1

VEHICLE STATIC CRUSH ---- Right Side= 24.2 ; C/Line= 26.3 ; Left Side= 27.5

VEHICLE REBOUND FROM BARRIER FACE:

Vehicle Right Side = 17.4 inches

Vehicle Centerline = 17.7 inches

Vehicle Left Side = 16.5 inches

VISIBLE DUMMY CONTACT POINTS:

	DRIVER (I.D. No. 464)			PASSENGER (I.D. No. 467)		
	Strg. Col. Hub	Strg. Wheel	Instru. Panel	Instru. Panel	Knee Assy.	Glove Box Door
HEAD	YES	YES	NO	NO	*YES	NO
RIGHT KNEE			YES	NO		YES
LEFT KNEE			YES	YES		YES

*right knee only

VEHICLE DOOR OPENING INFORMATON:

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

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

VEHICLE'S FRONT SEAT MOVEMENT DURING CRASH:

	RIGHTSIDE	LEFT SIDE
Seat Cushion Shift - - -	0.5 " forward;	1.0 " forward
Seat Adjuster Failure- -	None "	None

Details Of Any Failure: N/A

OTHER NOTABLE IMPACT EFFECTS:

SECTION 3

OCCUPANT AND VEHICLE INFORMATION

I. OMI DATA

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

II. OVR DATA

- Load Cell Barrier Data
- Vehicle Accelerometer Data

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

VEH. YR./MAKE/MODEL/BODY STYLE: 1988/FORD/F-150 CUSTOM/PICKUP

VEH. NHTSA NO.: MJ0201 ; TEST DATE: 03/15/88

MAXIMUM ACCELERATION VALUES:		DRIVER DUMMY # 464	PASSENGER DUMMY # 467
Head Channel X	HEAD X	-203.44	-71.23
Head Channel Y	Y	15.82	-52.37
Head Channel Z	Z	-62.41	-71.67
HEAD RESULTANT	R	213.32	113.13
Chest Channel X	CHEST X	-57.86	-34.85
Chest Channel Y	Y	17.08	-19.47
Chest Channel Z	Z	-26.06	-20.48
CHEST RESULTANT (3 msec clip)	R	56.20	37.67
TIME INTERVAL (seconds)		0.065 to 0.068	0.089 to 0.092

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	HIC	1073.74	586.80
t_1 (seconds)		64.00	82.00
t_2 (seconds)		97.25	118.00
Avg. Accel. t_1 to t_2		63.20	48.40

MAXIMUM FEMUR FORCES:

Right Side (lbs.)	FR	1089.90	295.20
Left Side (lbs.)	FL	1023.80	643.70

MAXIMUM SEAT BELT FORCES:

Lap Belt	LAP	1400.11	1670.78
Shoulder Belt	SHLDR	1511.03	1537.92

MAXIMUM SEAT BELT WEBBING SPOOL-OUT:

Lap/Shoulder Belt Combination	3.00	3.20

Data Table No. 4 Test Dummy Positioning Data

PRE-IMPACT DATA:

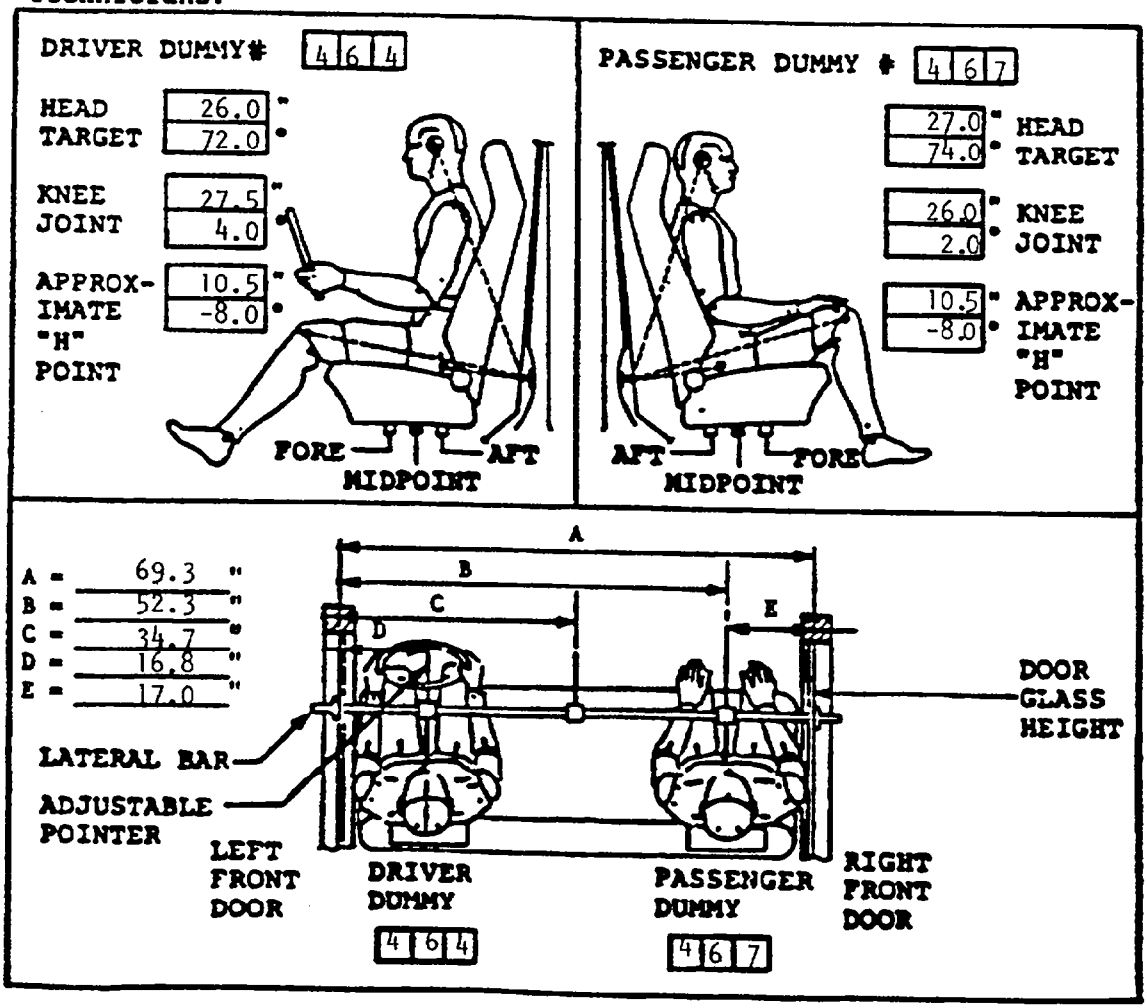
Make/Model: FORD/F-150 CUSTOM
Body Style: PICKUP **Model Year:** 1988
NHTSA No.: MJ0201 **Color:**

DATA FROM CERTIFICATION LABEL:

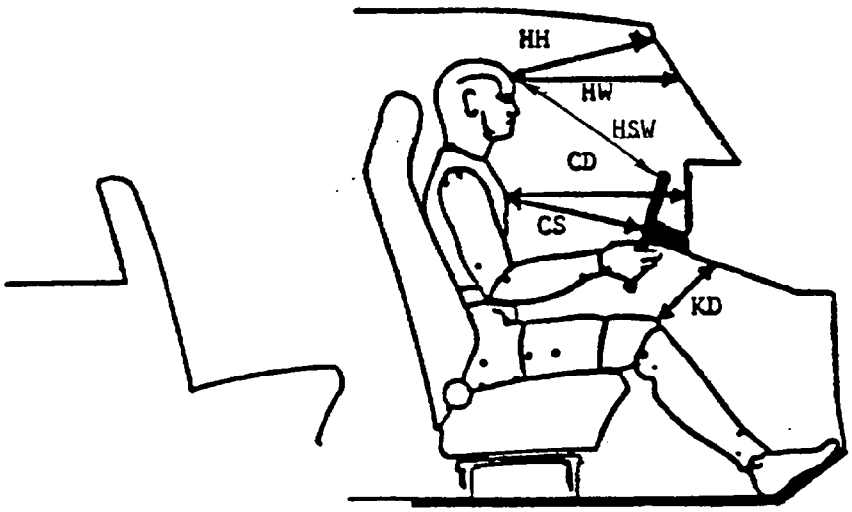
Vehicle Manufacturer: FORD MOTOR COMPANY
Date of Manufacture: 09/87 ; **VIN:** 1FTDF15Y7JPA16175
GVWR: 5450 lb; **GAWR:** Front = 2650 lb; Rear = 3166 lb

POST-IMPACT DATA:

Date of Test: 03/15/88 **Time:** 4:45 PM **Temperature** 62 °F
Required Impact Velocity Range: 34.5 to 35.5 mph
Impact Velocity: Primary = 35.37 mph Secondary = 35.37 mph
Seat Type: BENCH **Adjuster Type:** MANUAL
Bucket Seat Back Type: N/A
Technicians:



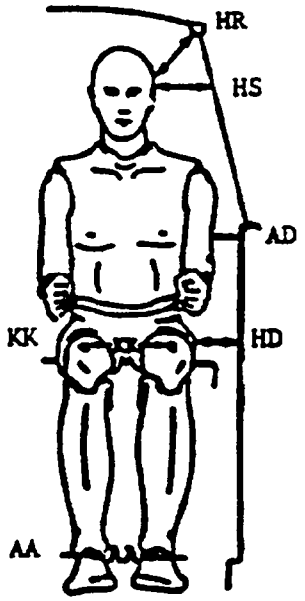
Data Table No. 4 (Cont'd) Test Dummy Positioning Data

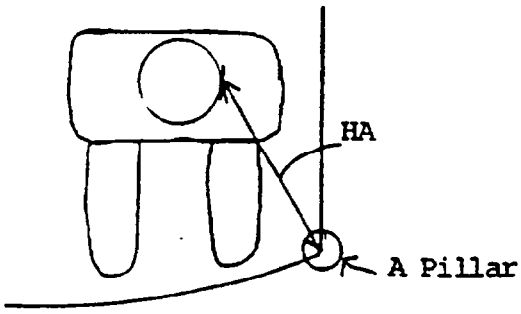


	Driver	Passenger
HH	18.5	18.5
HW	24.0	23.3
CD	23.2	24.0
CS	12.2	N/A
KD	L- 6.0	L- 8.9
KD	R- 6.1	R- 9.0
Torso Angle	18.0	Torso Angle 18.0
Seat Back Angle	21.0	Seat Back Angle 21.0
HSW	17.0	N/A

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

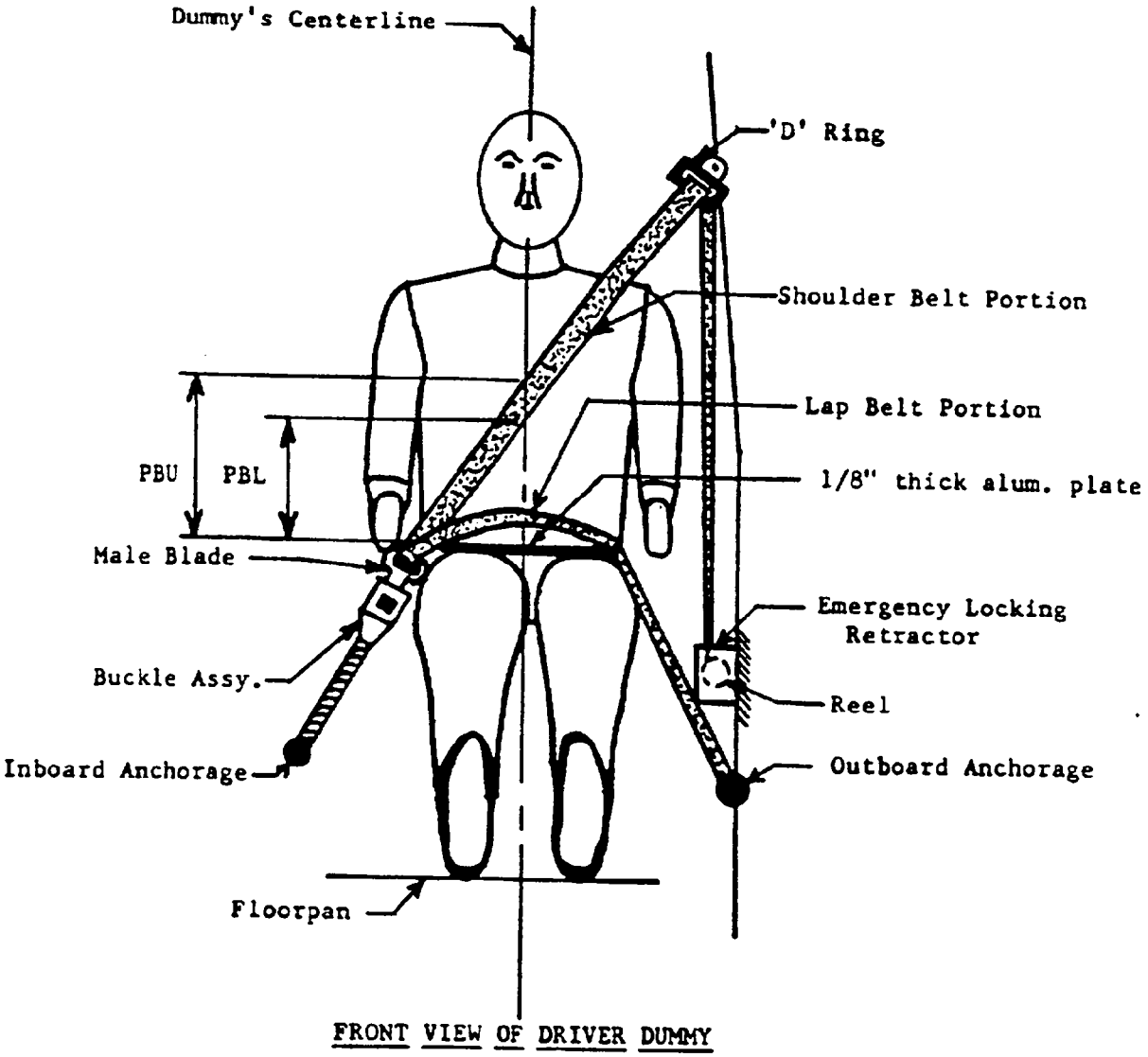
REMARKS:





	Driver	Passenger
HR	9.3	9.3
HS	10.5	11.0
AD	5.1	5.4
HD	7.3	5.5
KK	14.5	14.5
AA	11.4	8.7
HA	20.2	22.6

Data Table No. 5 Seat Belt Positioning Data



FRONT VIEW OF DRIVER DUMMY

	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
PBU--Top surface of alum. plate to belt upper edge	12.0	13.5
PBL--Top surface of alum. plate to belt lower edge	8.5	9.5
LAP BELT TENSION, POUNDS	3.0	3.0
SHOULDER BELT TENSION, POUNDS	3.0	3.0

Data Table No. 6 Seat Belt Performance Assessment Test Data

BELT LENGTH DATA:

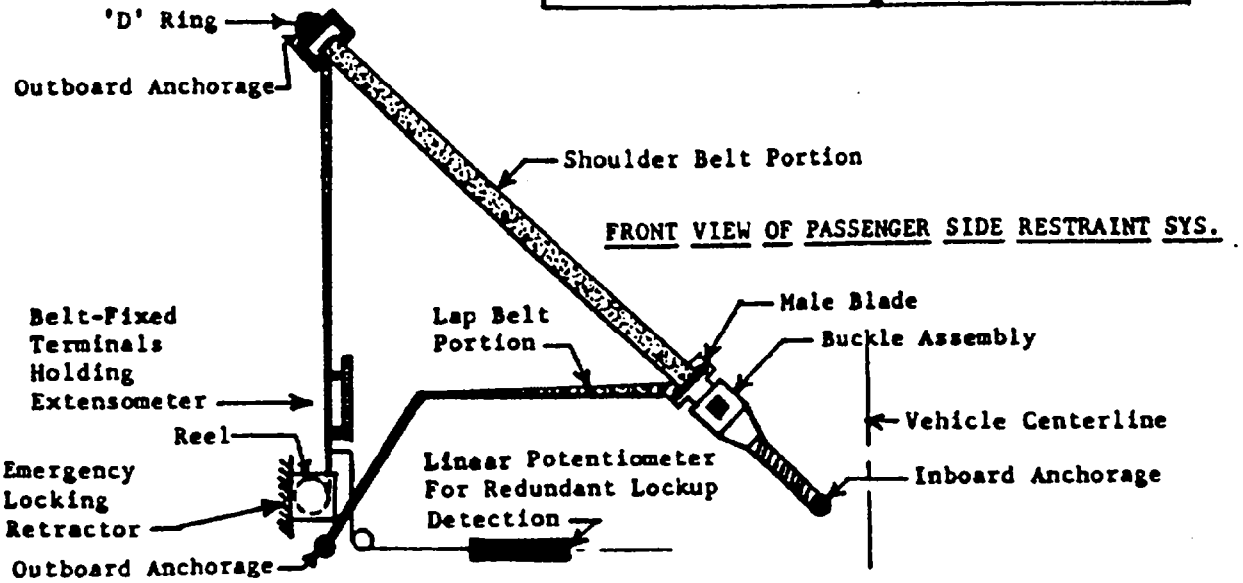
	DRIVER SIDE		PASSENGER SIDE	
	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
Total Belt Length from retractor reel to bolt hole anchor point for continuous webbing systems	117.8	117.8	119.5	119.5
Retractor reel to 'D' ring as measured on Part 572 dummy	25.0	25.0	24.8	25.0
Shoulder belt length as measured on Part 572 dummy	57.5	59.0	58.2	59.7
Lap belt length as measured on Part 572 dummy	37.0	38.0	37.3	37.5
Remainder of belt webbing left on retractor reel	24.3	20.8	24.0	22.3

BELT SPOOL-OFF DATA:

As determined by film analysis	3.0	3.2
As determined electronically	N/A	N/A
As determined mechanically	3.2	2.9

BELT STRAIN DATA:

Measured between retractor reel and 'D' ring	2.0 Percent	3.0 Percent



FRONT VIEW OF PASSENGER SIDE RESTRAINT SYS.

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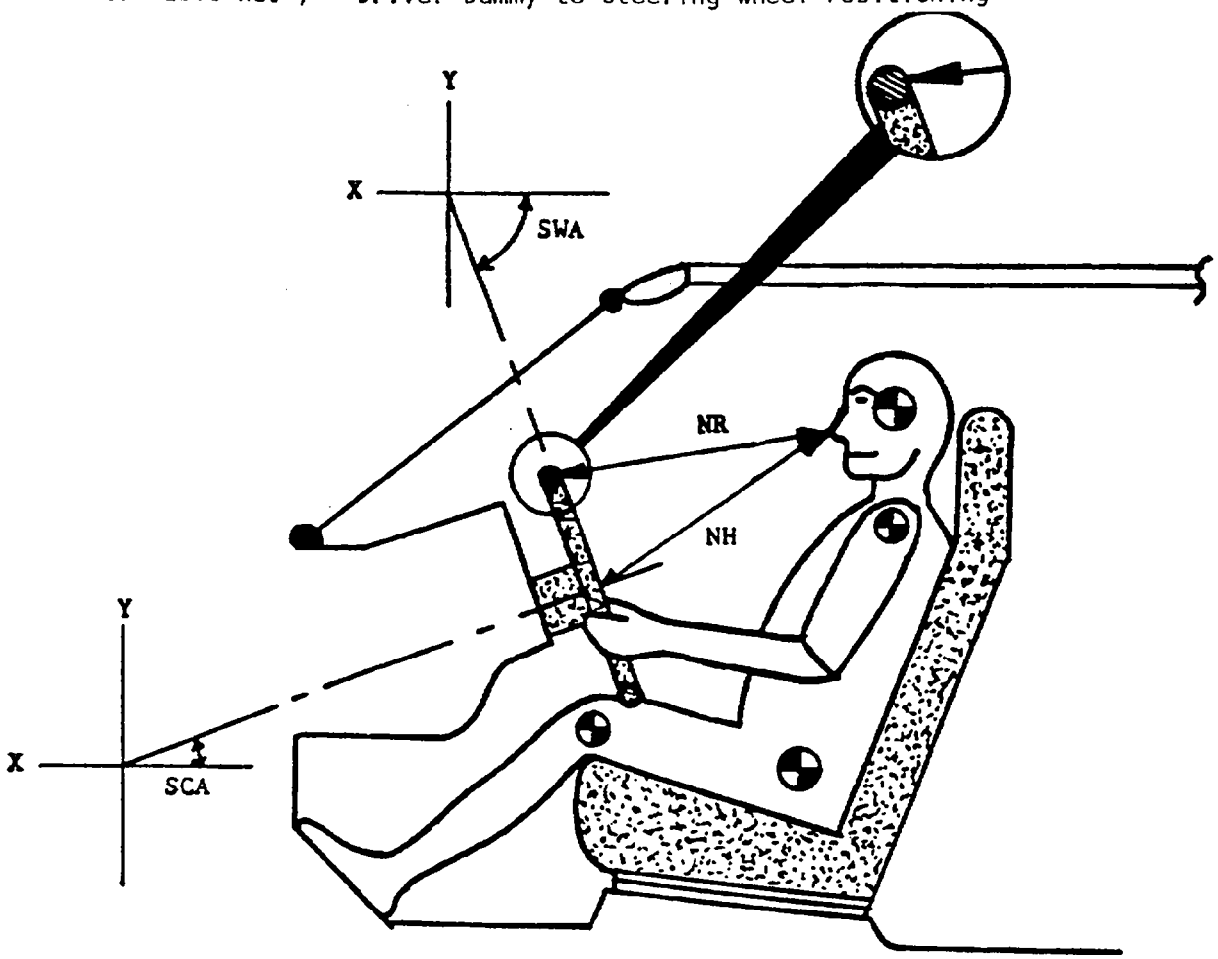
Data Table No. 7 Driver Dummy to Steering Wheel Positioning



LEFT SIDE VIEW

	MEASUREMENTS	
NR--Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	15.25	Inches
NH--Distance from tip of dummy's nose to center of steering column hub	16.25	Inches
SCA--Angle of steering column relative to the horizontal X axis	25.0	Degrees
SWA--Angle of steering wheel relative to the horizontal X axis.	66.0	Degrees

Data Table No. 8 Camera Location Data

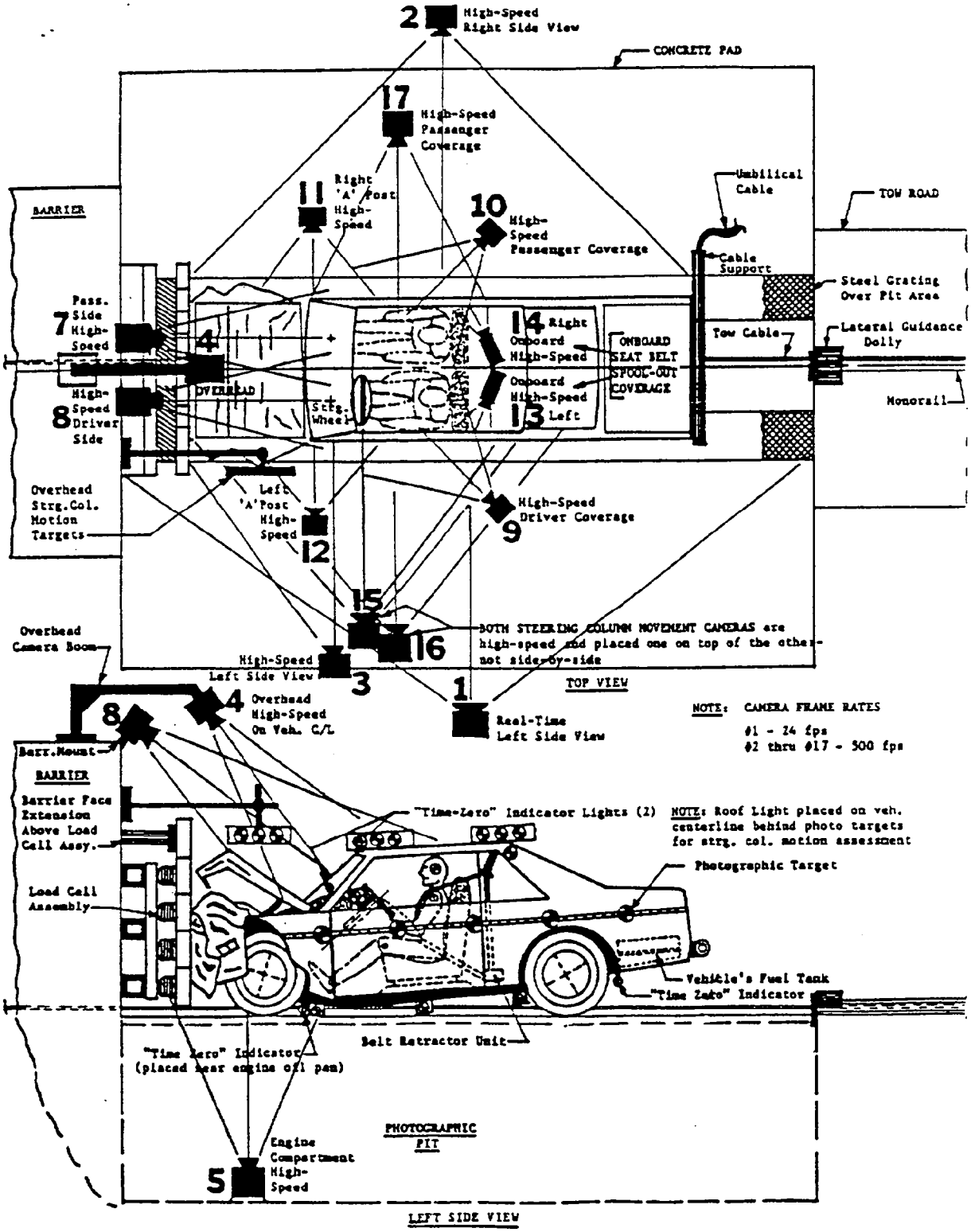
VEH. NHTSA NO.: MJ0201 ; TEST DATE: 03/15/88 ; TIME: 4:45 PM

VEH. YEAR/MAKE/MODEL/BODY STYLE: 1988/FORD/F-150 CUSTOM/PICKUP

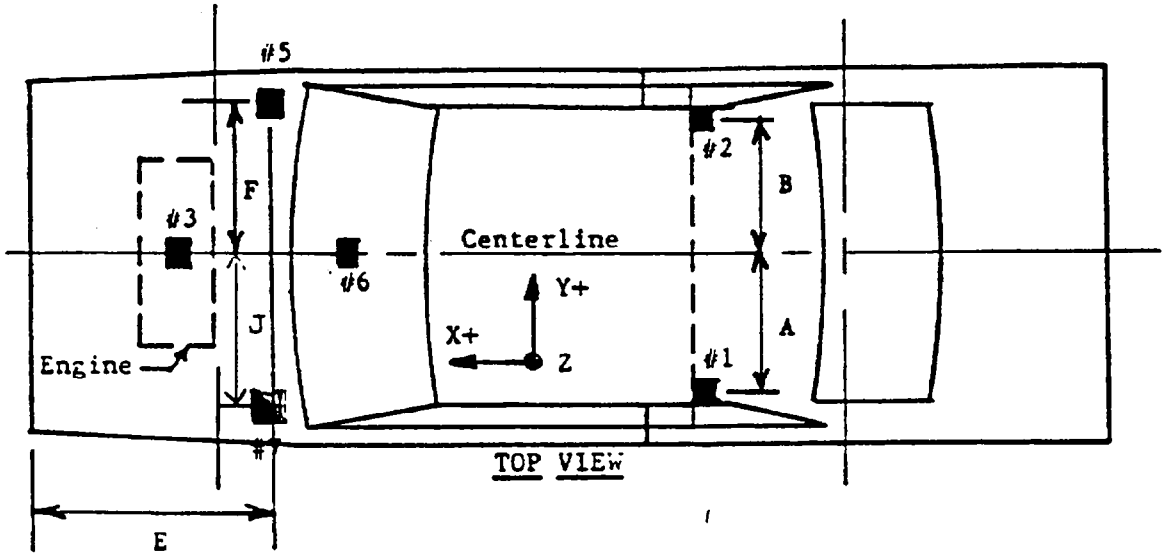
CAMERA NO.	VIEW	CAMERA POSITIONS (in.)*			ANGLE (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Left Side View	340.0	248.5	58.0	0.0	300.5	15-70 zoom	24
2	Right Side View	-239.5	84.0	50.2	-1.0	258.5	13	500
3	Left Side View	434.3	112.8	42.7	-1.0	366.8	13	750
4	Overhead	0.0	-21.0	197.7	-71.0	88.2	13	700
5	Pit-Engine	0.0	50.3	-57.1	-12.5	28.0	13	500
6	Pit-Fuel Tank	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
7	Front-Passenger	-13.9	-13.0	103.4	-51.0	86.2	16	600
8	Front-Driver	11.5	-13.0	103.5	-41.0	82.1	16	600
9	Left Side-Driver	105.0	105.3	81.5	-20.0	67.0	16	660
10	Right Side-Passenger	-101.5	111.6	78.5	-12.0	117.9	16	600
11	Right Side-'A' Post	-196.3	46.6	63.4	0.0	219.0	28	650
12	Left Side-'A' Post	375.2	36.0	64.5	0.0	365.0	50	750
13	Onboard-Left Side	12.5	115.5	55.3	+6.0	24.0	13	900
14	Onboard-Right Side	12.5	115.0	55.3	+8.0	38.0	13	900
15	Left Side-Steering Col.	422.5	81.3	131.9	-18.5	398.5	28	600
16	Left Side-Steering Col.	422.5	81.3	109.7	-10.0	398.5	28	600
17	Right Side-Passenger	-140.0	60.5	54.5	1.0	159.6	16	600

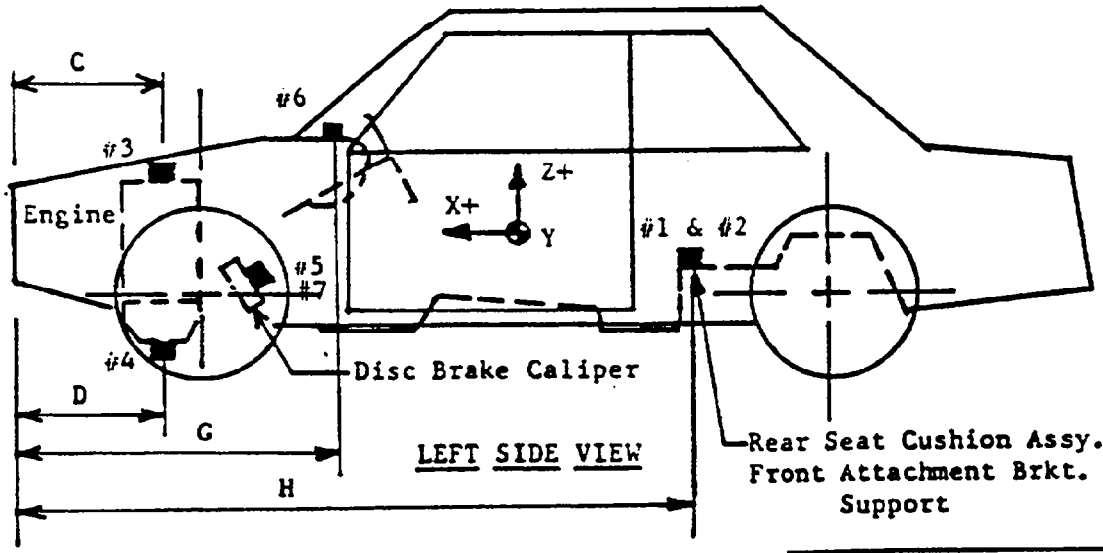
* X = film plane to monorail centerline
  Y = film plane to barrier face
  Z = film plane to ground

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



Data Table No. 9 Vehicle Accelerometer Location and Data Summary





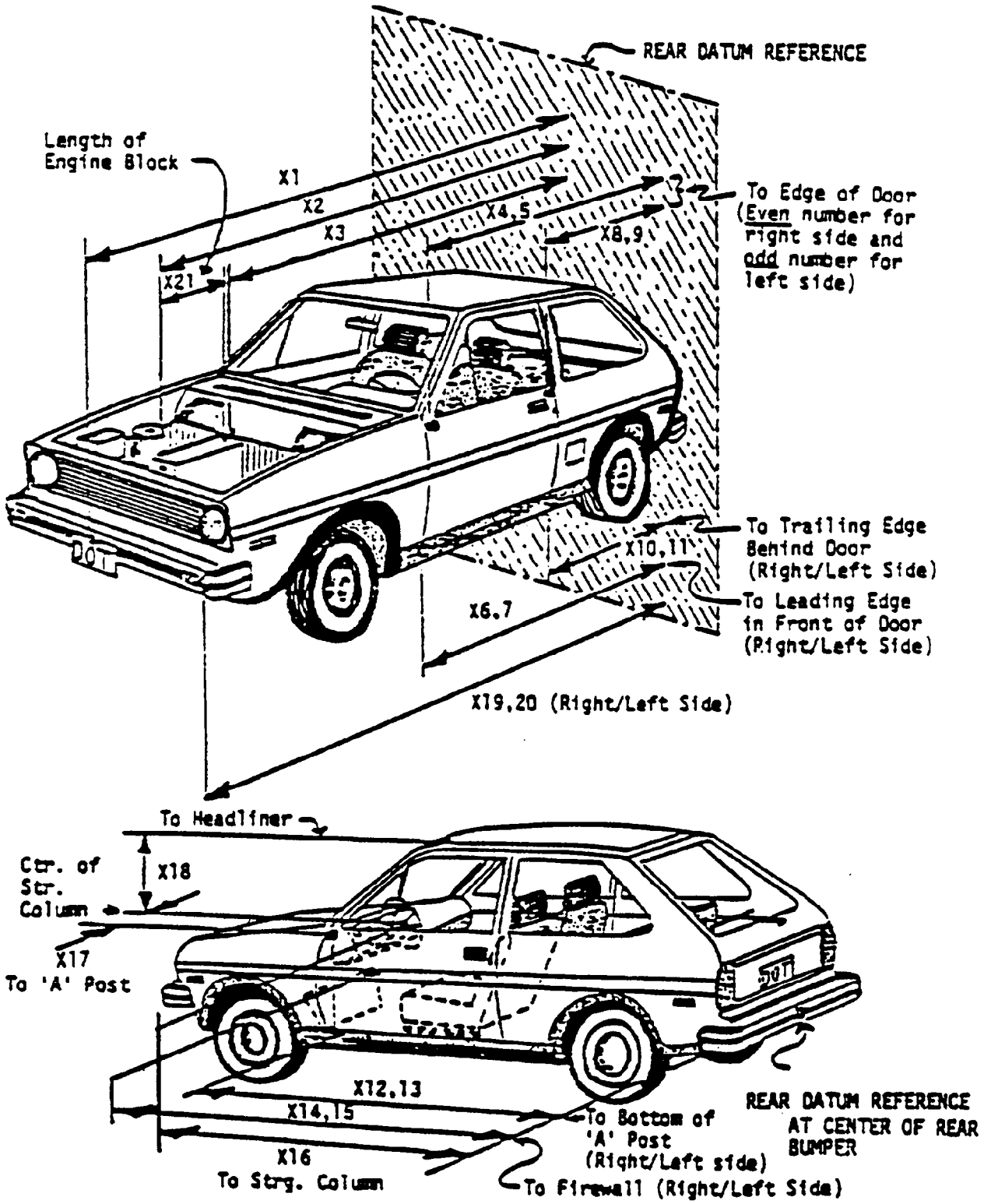
Dimension	Length (in.)
A	17.5
B	17.5
C	25.4
D	42.0
E	37.3
F	28.0
G	61.5
H	104.3
J	28.0

Loc. No.	Description	Maximum Value			
		X-	msec.	X+	msec.
1	Rear seat X-member @ Left Side	47.0	35.5	24.8	45.0
2	Rear seat X-member @ Right Side	51.3	39.0	7.6	58.5
3	Top of Engine Block	145.8	32.0	46.4	43.0
4	Bottom of Engine	188.3	32.0	55.6	40.5
5	Disc Brake Caliper @ Right Side	114.5	38.0	49.3	55.0
6	Instrument Panel	76.5	47.0	35.5	58.0
7	Disc Brake Caliper @ Left Side	82.1	39.5	58.6	62.5

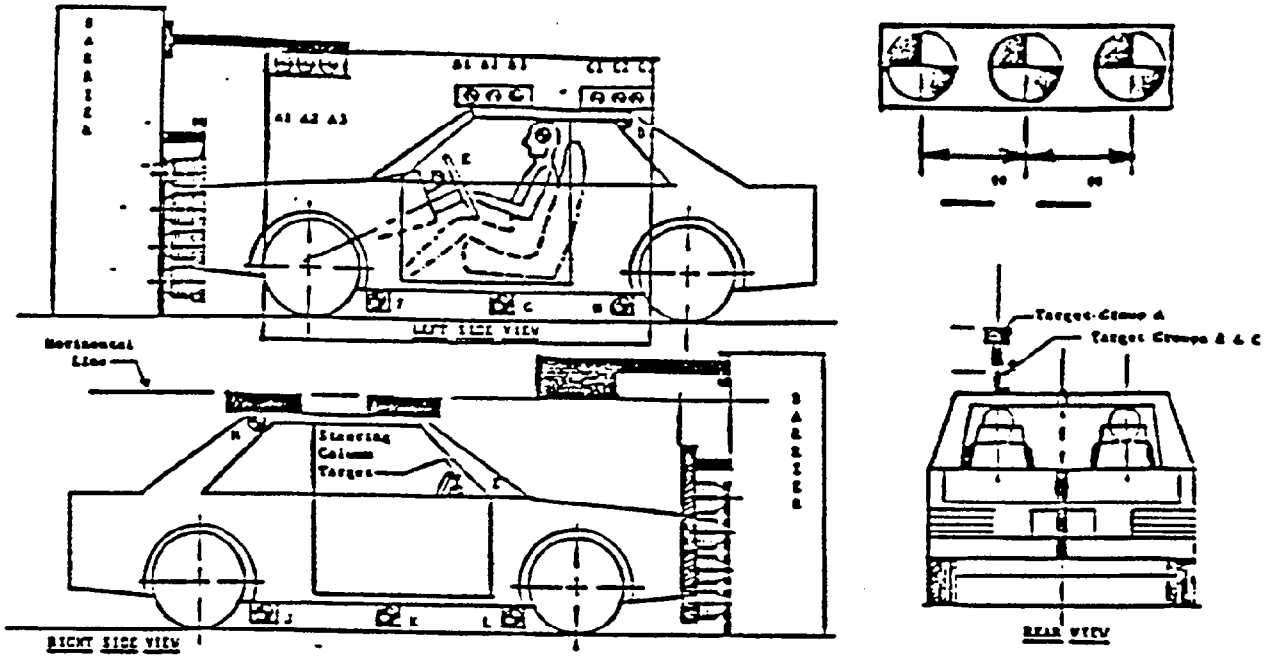
Data Table No. 10 Test Vehicle Measurements

NO.	MEASUREMENT DESCRIPTION:	Pre-Test (in.)	Post-Test (in.)	Diff. (in.)
X1	Total Length of Test Vehicle at Centerline	209.8	183.5	26.3
X2	Rear Surface of Vehicle to Front of Engine	188.8	177.5	11.3
X3	Rear Surface of Vehicle to Firewall	160.3	153.1	7.2
X4	Rear Surface to Upr. Leading Edge of Right Door	149.8	147.3	2.5
X5	Rear Surface to Upr. Leading Edge of Left Door	149.5	146.2	3.3
X6	Rear Surface to Lwr. Leading Edge of Right Door	148.8	147.2	1.6
X7	Rear Surface to Lwr. Leading Edge of Left Door	148.9	146.2	2.7
X8	Rear Surface to Upr. Trailing Edge of Right Door	111.3	110.5	0.8
X9	Rear Surface to Upr. Trailing Edge of Left Door	111.0	108.5	2.5
X10	Rear Surface to Lwr. Trailing Edge of Right Door	106.8	105.3	1.5
X11	Rear Surface to Lwr. Trailing Edge of Left Door	106.6	104.2	2.4
X12	Rear Surface to Bottom of 'A' Post on Right Side	148.0	146.3	1.7
X13	Rear Surface to Bottom of 'A' Post on Left Side	148.4	145.5	2.9
X14	Rear Surface to Firewall on Right Side	160.4	158.0	2.4
X15	Rear Surface to Firewall on Left Side	160.4	159.2	1.2
X16	Rear Surface to Steering Column	134.1	130.9	3.2
X17	Center of Steering Column to 'A' Post	16.4	16.3	0.1
X18	Center of Steering Column to Headlining	18.4	21.0	-2.6
X19	Rear Surface to Right Side of Front Bumper	208.0	183.8	24.2
X20	Rear Surface to Left Side of Front Bumper	207.6	180.1	27.5
X21	Length of Engine Block	29.0	29.0	0.0

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



Data Table No. 11 Pretest Vehicle Target Locations



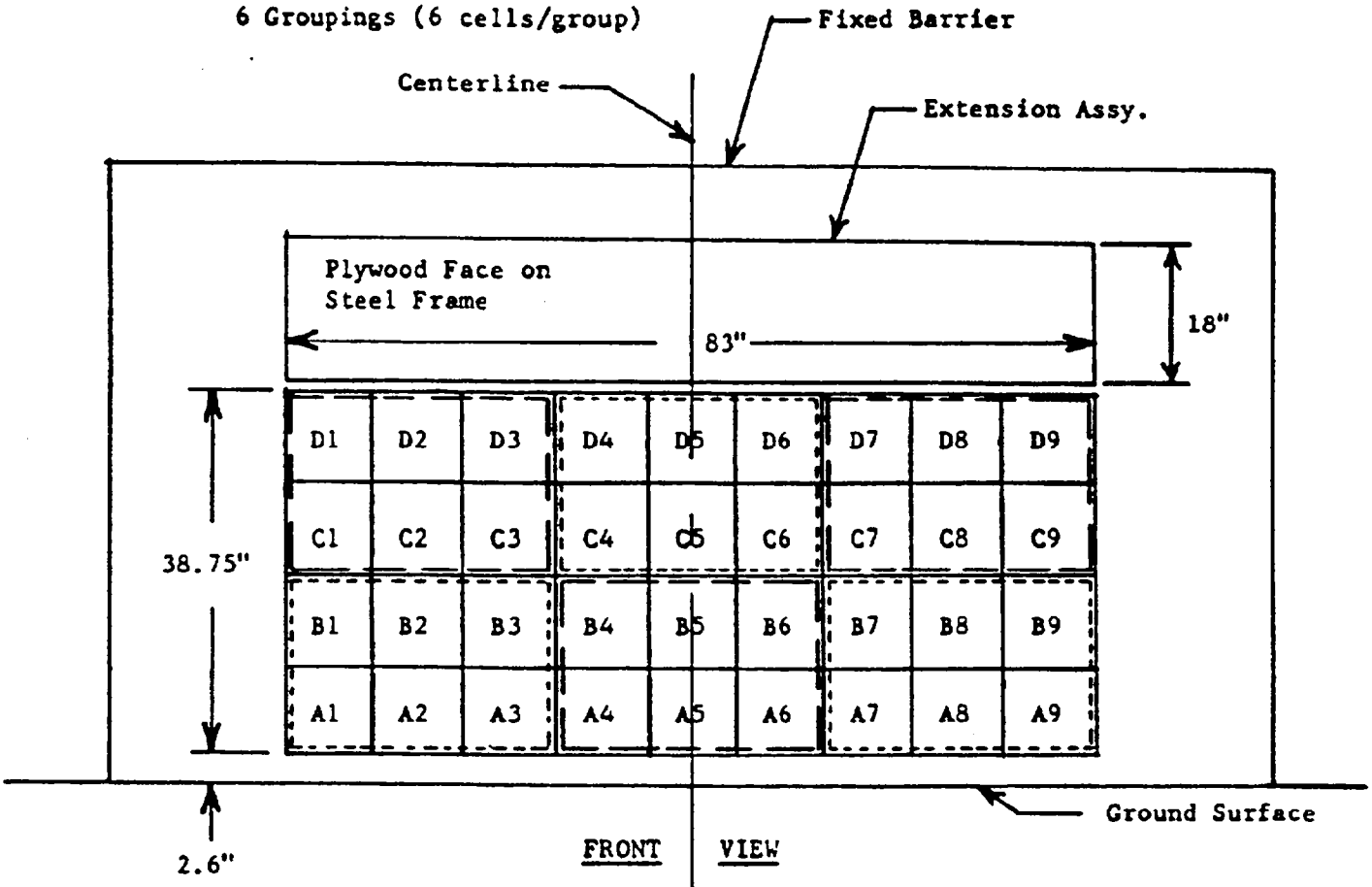
BARRIER TARGETS	'X' From Imag. Barrier Face Vertical Plane	'Y' From Monorail C/L	'Z' Above Ground
A1	69.0	18.2	78.0
A2	73.0	18.2	78.0
A3	77.0	18.2	78.0

VEHICLE TARGETS	'X' From Imag. Barrier Face Vertical Plane	'Y' From Vehicle C/L	'Z' Above Ground
B1	87.8	18.2	71.0
B2	91.8	18.2	71.0
B3	95.8	18.2	71.0
C1	138.6	18.2	51.8
C2	142.6	18.2	51.8
C3	146.6	16.0	51.8
D	N/A	N/A	N/A
E	67.8	18.2	49.4
F	50.5	36.2	14.3
G	97.0	36.5	14.9
H	142.7	36.5	16.2
J	143.1	36.5	16.5
K	98.0	36.5	14.8
L	51.1	36.3	13.8
M	N/A	N/A	N/A

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

Data Table No. 12 Load Cell Locations on Fixed Barrier

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



6 GROUPINGS OF 6 LOAD CELLS EACH

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

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

APPENDIX A

PHOTOGRAPHS

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

PRETEST FRONT VIEW

POSTTEST FRONT VIEW

PRETEST LEFT SIDE VIEW

POSTTEST LEFT SIDE VIEW

PRETEST RIGHT SIDE VIEW

POSTTEST RIGHT SIDE VIEW

PRETEST RIGHT FRONT 3/4 VIEW

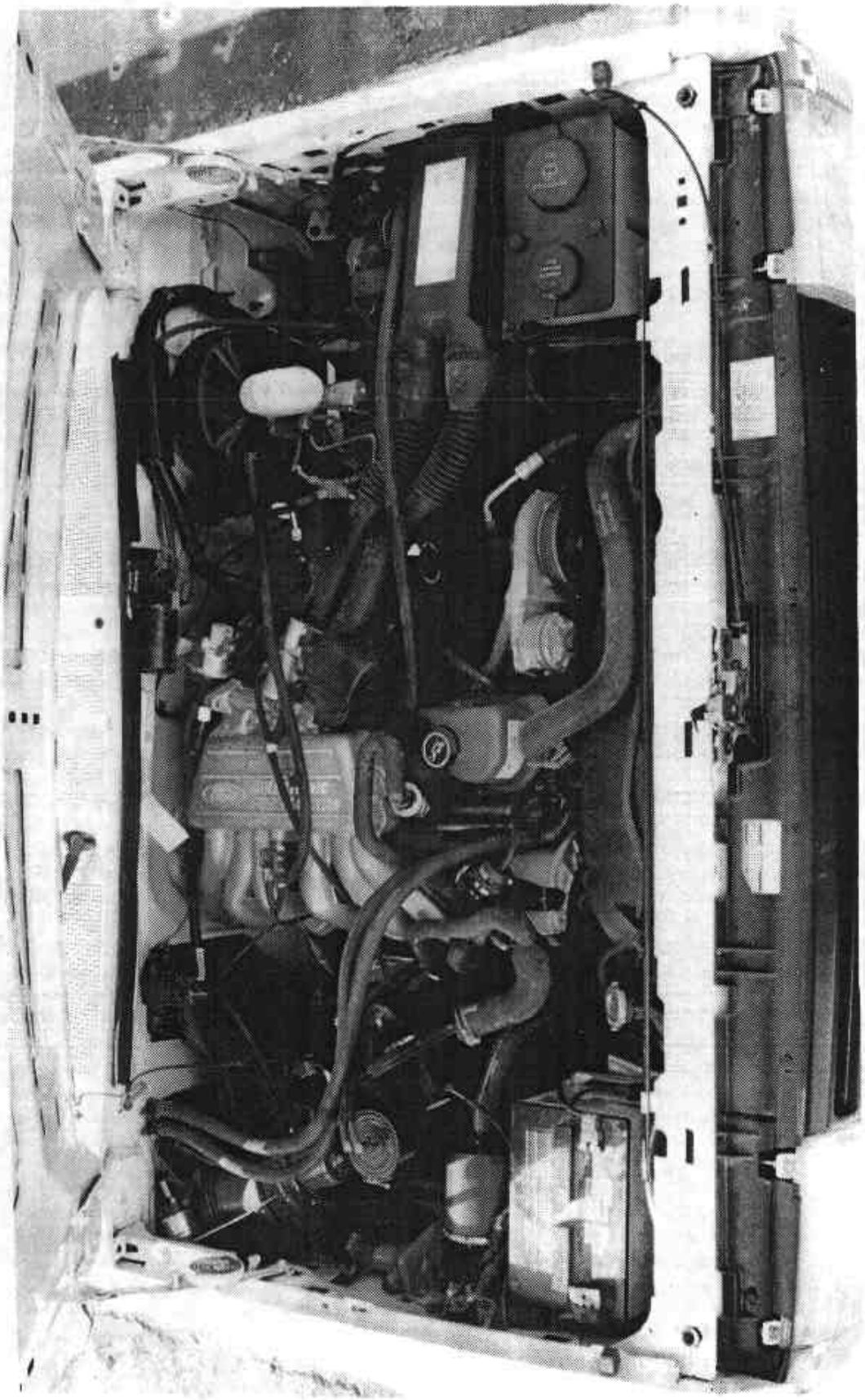
POSTTEST RIGHT FRONT 3/4 VIEW

PRETEST LEFT REAR 3/4 VIEW

POSTTEST LEFT REAR 3/4 VIEW

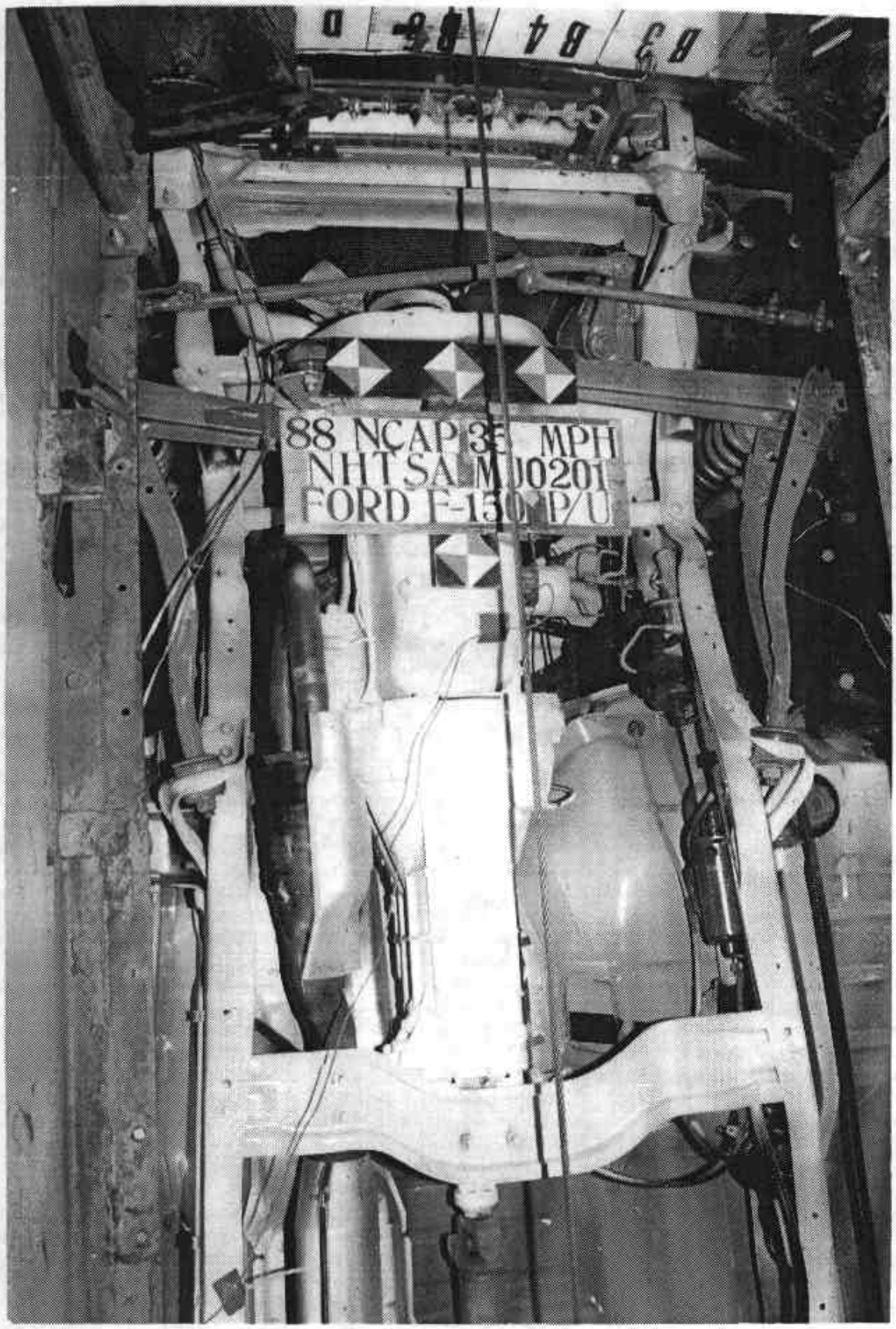
PRETEST WINDSHIELD VIEW

POSTTEST WINDSHIELD VIEW



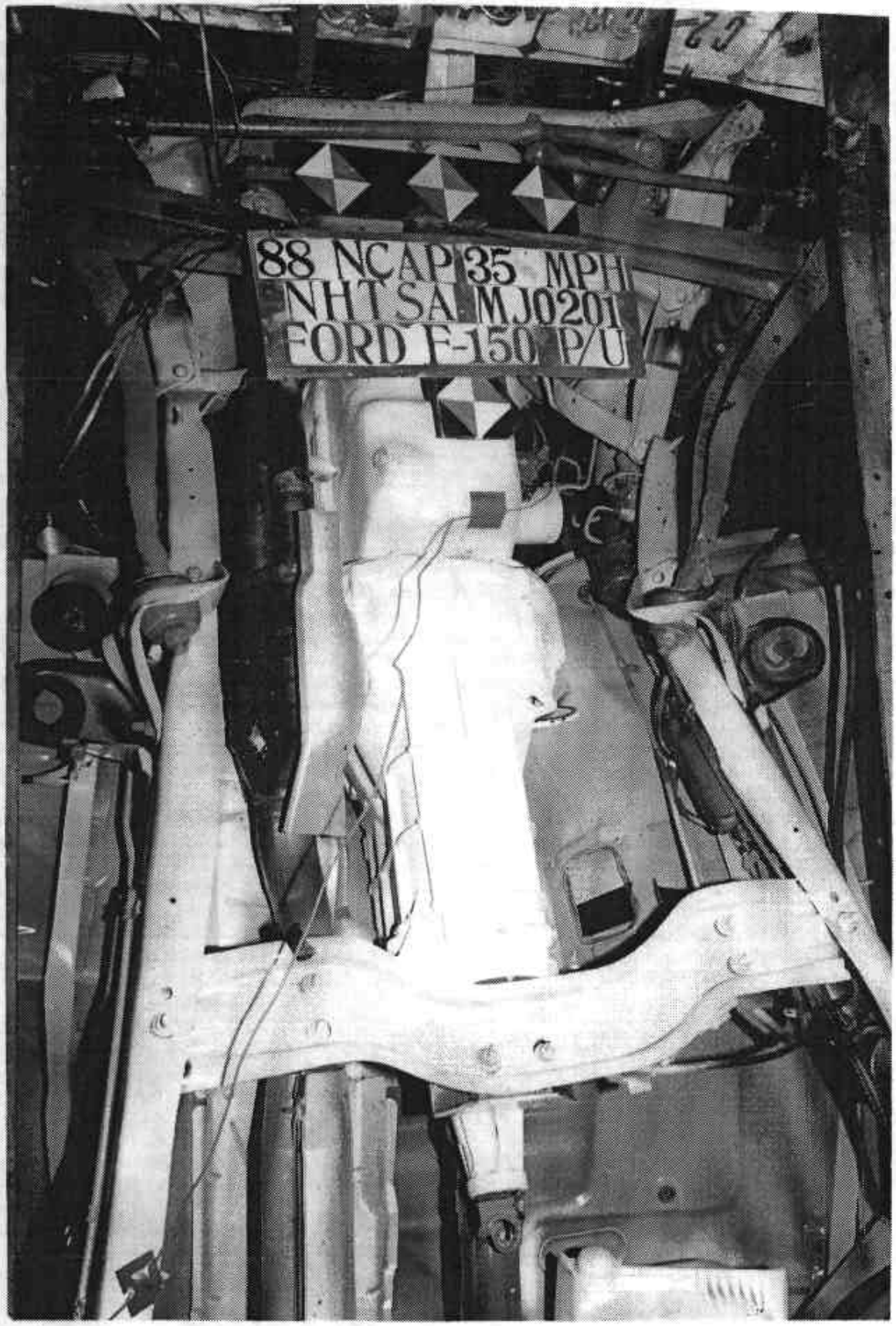
PRETEST ENGINE COMPARTMENT VIEW

POSTTEST ENGINE COMPARTMENT VIEW

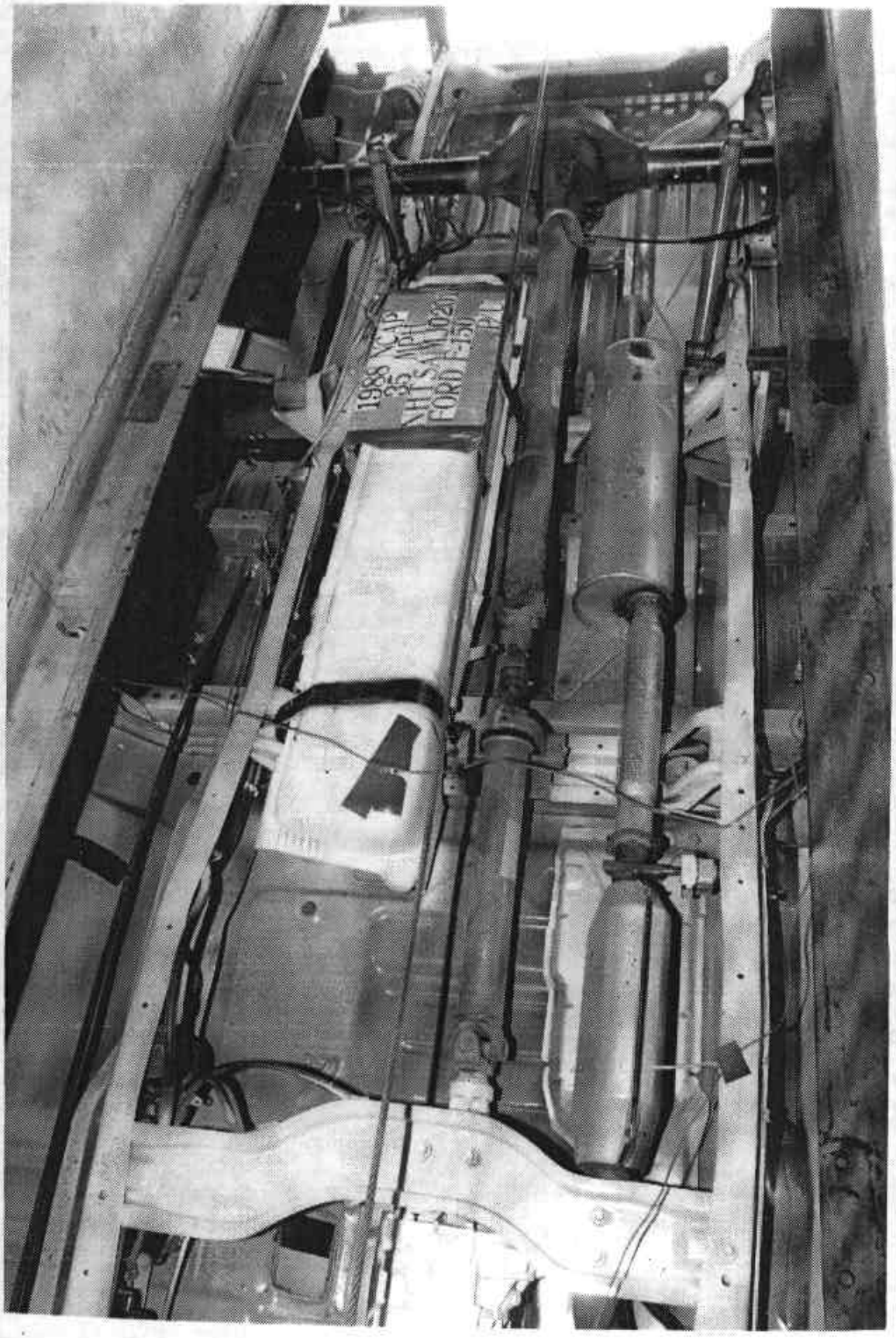


PRETEST FRONT UNDERBODY VIEW

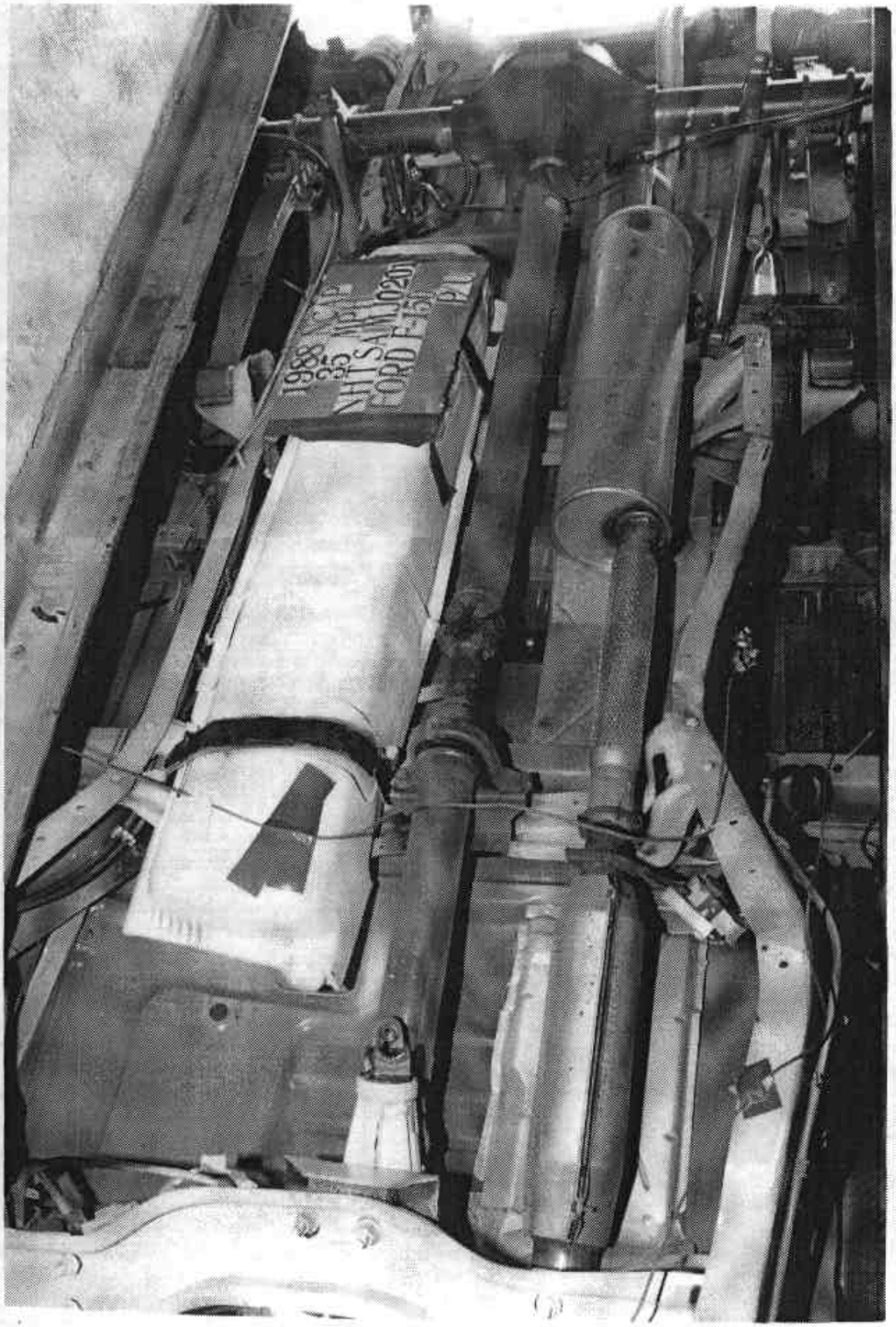
MSE-88-R7157-N04



POSTTEST FRONT UNDERBODY VIEW



PRETEST REAR UNDERBODY VIEW



POSTTEST REAR UNDERBODY VIEW

PRETEST DRIVER DUMMY (ATD) POSITION VIEW

POSTTEST DRIVER DUMMY (ATD) POSITION VIEW

PRETEST PASSENGER DUMMY (ATD) POSITION VIEW

POSTTEST PASSENGER DUMMY (ATD) POSITION VIEW

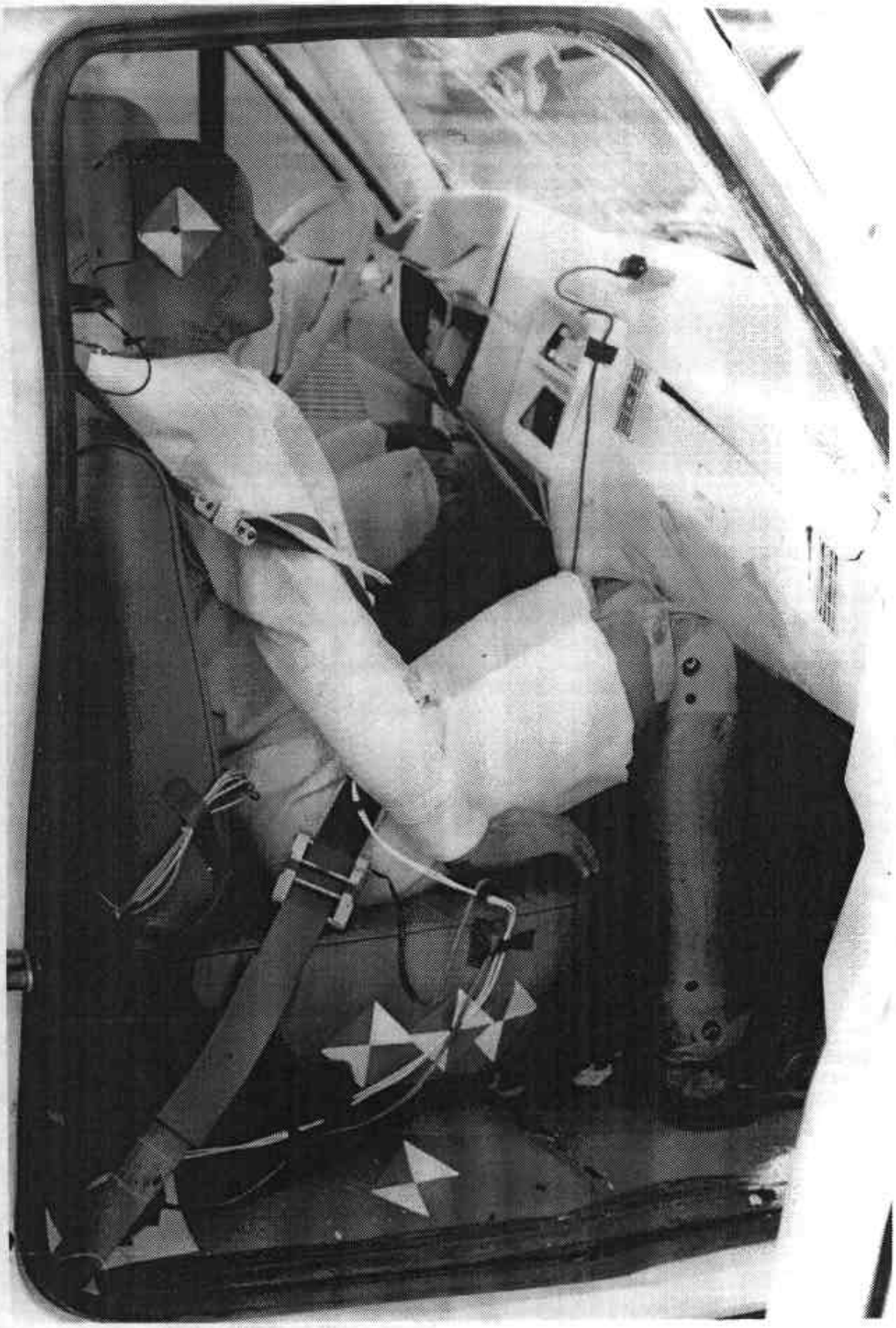
PRETEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

MSE-88-R/157-N04

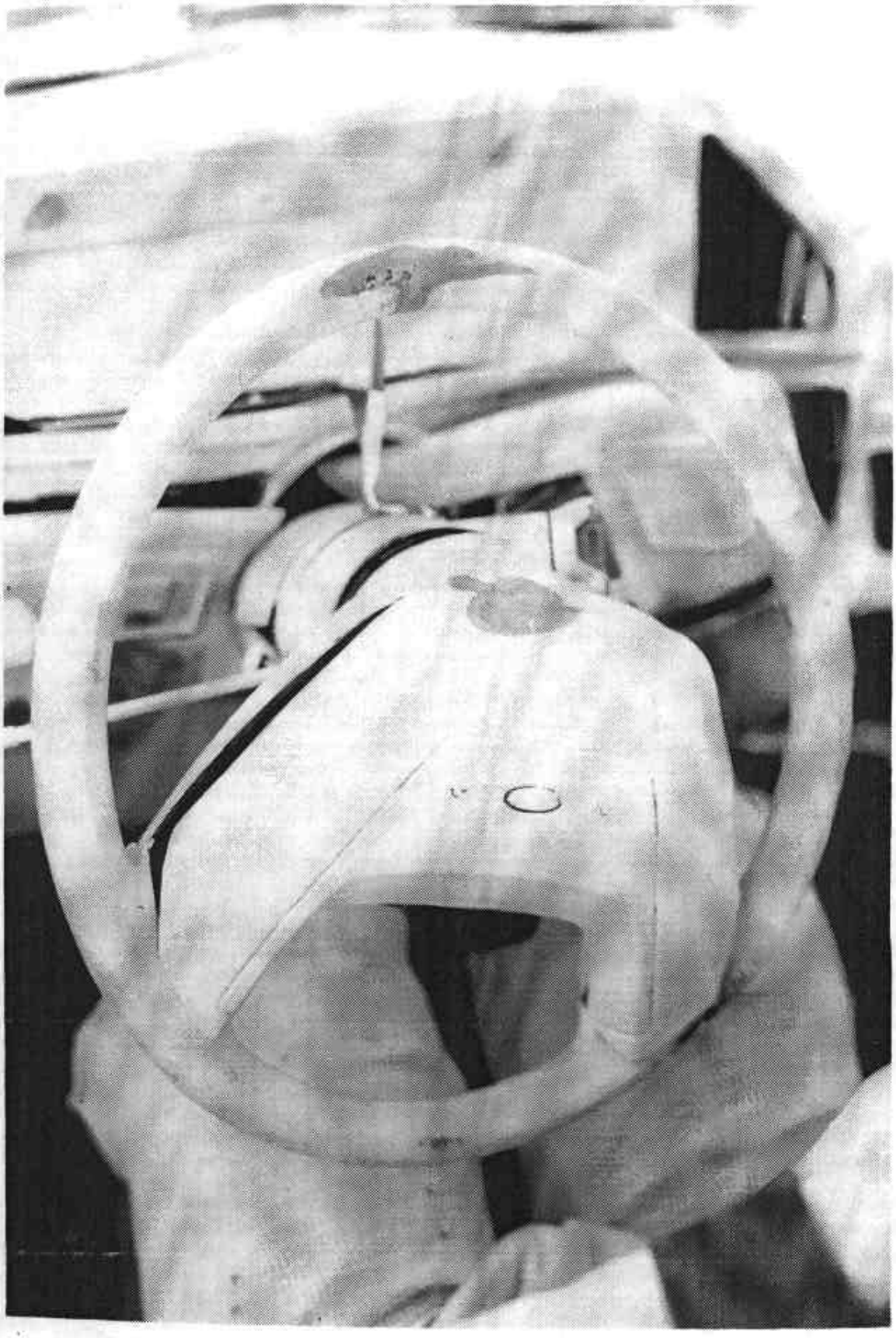
POSTTEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

PRETEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

MSE-88-R7157-N04



POSTTEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open) MSE-88-R7157-N04



POSTTEST STEERING COLUMN HUB/RIM CONTACT BY DRIVER DUMMY

POSTTEST DRIVER DUMMY KNEE CONTACT AREA

POSTTEST PASSENGER DUMMY KNEE CONTACT

APPENDIX B-1

VEHICLE AND DUMMY (ATD) RESPONSE DATA

DATA FILTERING:

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

1988 FORD F-150 CUSTOM PICKUP HEADER 03/21/88

V2I 1988 35 MPH NCAP FRONTAL BARRIER IMPACT ACQUIRE NCAP DATA USING TWO INSTR. DUMMIES AND
LOAD CELL BARRIER 15/MAR/88HSEDTNH22-87-D-02009 N02048NCAVTBASHDR7 82FHTUM8 35.4000000.09999.9ENG0677

21022288PU1FTDF15Y7JPA16175 6CIF4.9 LITERS AR 4385 133.0 209.8 77.5 54.5SPOTHP UNMODIFIED
209.3 188.8 160.3 149.8 149.5 143.8 148.9 111.3 111.0 186.8 186.6 148.0 148.4 160.4 168.
4 134.1 16.4 18.4 208.0 207.6 29.0 35.4000000NANANA999.9999.9999.9999.9999.9999.912FCAW9 77.5 0.0 27.5 183.5 177.5
153.1 147.3 146.2 147.2 146.2 110.5 108.5 105.3 104.2 146.3 145.5 158.0 159.2 130.9 16.3 21.0 183.8 188.1 29.0999999N
0 COMMENTS
3RLCB000999.9 36 50KLB LOAD CELLS ARRANGED IN A 9 WIDE BY 4 HIGH MATRIX.
4101P599M999999P550MFG: HUMANOID SYSTEMS. S/N 464 UNMODIFIED
NO COMMENTS 18.5 24.0
9.3 10.5 23.2 12.2 5.1 7.3 6.1999.9999.9999.9999.93PTSNNO COMMENTS
CNNASRSHSNNODPNO1074. 64.000 97.250 56.21024.1090. 435.1400.1511.NO COMMENTS

4102P599M999999P550MFG: HUMANOID SYSTEMS. S/N 467 UNMODIFIED
NO COMMENTS 18.5 23.3
9.3 11.0 24.0999.9 5.4 5.5 8.9999.9999.9999.9999.93PTDPLNO COMMENTS
CNNAHKNONONODPOT 587. 82.000118.000 37.7 644. 295. 334.1671.1538.NO COMMENTS

51001AC01HDCGXLG'S 1650MFG: ENDEVCO. MODEL: 7264-200. S/N: AT34 28/FEB/88 200102 35.4 -360
02499 125AM
51002AC01HDCGYLG'S 1650MFG: ENDEVCO. MODEL: 7264-200. S/N: BB91H 28/FEB/88 200 9 0.0 -360
02499 125AM
51003AC01HDCGZLG'S 1650MFG: ENDEVCO. MODEL: 7264-200. S/N: BF82H 28/FEB/88 200 31 0.0 -360
02499 125AM
51004AC01CHSTXLG'S 1650MFG: ENDEVCO. MODEL: 7264-200. S/N: BJ28H 28/FEB/88 200 30 35.4 -360
02499 125AM
51005AC01CHSTYLG'S 1650MFG: ENDEVCO. MODEL: 7264-200. S/N: AC97 28/FEB/88 200 17 0.0 -360
02499 125AM
51006AC01CHSTZLG'S 1650MFG: ENDEVCO. MODEL: 7264-200. S/N: AE29 28/FEB/88 200 15 0.0 -360
02499 125AM
51007AC02HDCGXLG'S 1650MFG: ENDEVCO. MODEL: 7264-200. S/N: BG75H 28/feb/88 200 36 35.4 -360
02499 125AM
51008AC02HDCGYLG'S 1650MFG: ENDEVCO. MODEL: 7264-200. S/N: BJ61H 28/FEB/88 200 26 0.0 -360
02499 125AM
51009AC02HDCGZLG'S 1650MFG: ENDEVCO. MODEL: 7264-200. S/N: BJ54H 28/FEB/88 200 36 0.0 -360
02499 125AM
51010AC02CHSTXLG'S 1650MFG: ENDEVCO. MODEL: 7264-200. S/N: BJ27H 28/FEB/88 200 18 35.4 -360
02499 125AM
51011AC02CHSTYLG'S 1650MFG: ENDEVCO. MODEL: 7264-200. S/N: BG78H 28/FEB/88 200 15 0.0 -360
02499 125AM
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02499 125AM
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02499 125AM
51014LC01FMRRXLLBS 1650MFG: ENDEVCO. MODEL: 7160C. S/N: BA14 29/FEB/88 3000 37 0.0 -360
02499 125AM
51015LC02FMRLXLLBS 1650MFG: ENDEVCO. MODEL: 7160C. S/N: BA24 29/FEB/88 3000 22 0.0 -360
02499 125AM
51016LC02FMRRXLLBS 1650MFG: ENDEVCO. MODEL: 7160C. S/N: BA55 29/FEB/88 3000 15 0.0 -360
02499 125AM
51017LC01SHBTOTLBS 1650MFG: LEBOW. MODEL: 3371. S/N: 333 01/MAR/88 3500 40 0.0 -360
02499 125AM
51018LC01LPBOOTLBS 1650MFG: LEBOW. MODEL: 3371. S/N: 327 01/MAR/88 3500 44 0.0 -360
02499 125AM
51019LC02SHBTOTLBS 1650MFG: LEBOW. MODEL: 3371. S/N: 330 01/MAR/88 3500 49 0.0 -360
02499 125AM
51020LC02LPBOOTLBS 1650MFG: LEBOW. MODEL: 3371. S/N: 308 01/MAR/88 3500 49 0.0 -360
02499 125AM

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51021DS01SHBEOTINS 1650MFG: BOURNS.  MODEL: 8 IN LIN  S/N: NAV                    03/MAR/88   8999  0.0 -360
02499   125AM NOT USED IN THIS TEST
51022DS02SHBEOTINS 1650MFG: BOURNS.  MODEL: 8 IN LIN  S/N: NAV                    03/MAR/88   8999  0.0 -360
02499   125AM NOT USED IN THIS TEST
51023DS01SHBTOTOTH 1650MFG: BOURNS.  MODEL: 2051414101  S/N: NAV                  03/MAR/88   30  6  0.0 -360
02499   125AM SEAT BELT ELONGATION. UNITS ARE INCHES/IN.(PERCENTAGE BELT STRETCH)
51024DS02SHBTOTOTH 1650MFG: BOURNS.  MODEL: 2051414101  S/N: NAV                  03/MAR/88   30 11  0.0 -360
02499   125AM SEAT BELT ELONGATION. UNITS ARE INCHES/IN.(PERCENTAGE BELT STRETCH)
51025ACNASULFXGG'S 1650MFG: SETRA.   MODEL: 111       S/N: 1109                   03/MAR/88  250 98 35.4 -360
02499   125AM LEFT FRONT BRAKE CALIPER
51026ACNASURFXGG'S 1650MFG: SETRA.   MODEL: 111       S/N: 1116                   03/MAR/88  250 66 35.4 -360
02499   125AM RIGHT FRONT BRAKE CALIPER
51027ACNAENGNXGG'S 1650MFG: SETRA.   MODEL: 111       S/N: 1878                   03/MAR/88  250119 35.4 -360
02499   125AM ENGINE BOTTOM
51028ACNAENGNXGG'S 1650MFG: SETRA.   MODEL: 113       S/N: 1876                   03/MAR/88  250114 35.4 -360
02499   125AM ENGINE TOP
51029ACNADPLCXGG'S 1650MFG: SETRA.   MODEL: 111       S/N: 1111                   03/MAR/88  250 59 35.4 -360
02499   125AM TOP OF DASH AT LATERAL C/L
51030ACNAFLLRXGG'S 1650MFG: SETRA.   MODEL: 111       S/N: 1121                   03/MAR/88  250 50 35.4 -360
02499   125AM LEFT SIDE FLOOR ON CROSS MEMBER BEHIND SEAT
51031ACNAFLRRXGG'S 1650MFG: SETRA.   MODEL: 111       S/N: 1123                   03/MAR/88  250 67 35.4 -360
02499   125AM RIGHT SIDE FLOOR ON CROSS MEMBER BEHIND SEAT
50032LCNALCA1XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 15777               14/MAY/8550000  5  0.0 -360
04239   125AM
50033LCNALCA2XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19324               14/MAY/8550000  5  0.0 -360
04239   125AM
50034LCNALCA3XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19283               14/MAY/8550000  6  0.0 -360
04239   125AM
50035LCNALCA4XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19263               14/MAY/8550000 10  0.0 -360
04239   125AM
50036LCNALCA5XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19265               14/MAY/8550000 15  0.0 -360
04239   125AM
50037LCNALCA6XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19266               14/MAY/8550000  6  0.0 -360
04239   125AM
50038LCNALCA7XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19268               14/MAY/85500000999  0.0 -360
04239   125CF LOAD CELL FAILURE
50039LCNALCA8XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19270               14/MAY/8550000  4  0.0 -360
04239   125AM
50040LCNALCA9XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19258               14/MAY/8550000  4  0.0 -360
04239   125AM
50041LCNALCB1XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19273               14/MAY/8550000 24  0.0 -360
04239   125AM
50042LCNALCB2XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19276               14/MAY/8550000 21  0.0 -360
04239   125AM
50043LCNALCB3XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19277               14/MAY/8550000 85  0.0 -360
04239   125AM
50044LCNALCB4XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19278               14/MAY/8550000 15  0.0 -360
04239   125AM
50045LCNALCB5XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19279               14/MAY/8550000 35  0.0 -360
04239   125AM
50046LCNALCB6XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19282               14/MAY/8550000 29  0.0 -360
04239   125AM
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04239   125AM
50049LCNALCB9XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19286               14/MAY/8550000 28  0.0 -360
04239   125AM
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04239   125AM
50051LCNALCC2XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19288               14/MAY/8550000 24  0.0 -360
```

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50052LCNALCC3XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19289   14/MAY/8550000 42  0.0 -360
04239   125AM
50053LCNALCC4XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19291   14/MAY/8550000 18  0.0 -360
04239   125AM
50054LCNALCC5XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19324   14/MAY/8550000114  0.0 -360
04239   125AM
50055LCNALCC6XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19313   14/MAY/8550000 40  0.0 -360
04239   125AM
50056LCNALCC7XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19314   14/MAY/8550000 49  0.0 -360
04239   125AM
50057LCNALCC8XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19315   14/MAY/8550000 22  0.0 -360
04239   125AM
50058LCNALCC9XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19316   14/MAY/8550000 16  0.0 -360
04239   125AM
50059LCNALCD1XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19317   14/MAY/8550000 14  0.0 -360
04239   125AM
50060LCNALCD2XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19318   14/MAY/8550000 11  0.0 -360
04239   125AM
50061LCNALCD3XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19322   14/MAY/8550000 12  0.0 -360
04239   125AM
50062LCNALCD4XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19323   14/MAY/8550000 22  0.0 -360
04239   125AM
50063LCNALCD5XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19260   14/MAY/8550000 26  0.0 -360
04239   125AM
50064LCNALCD6XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19325   14/MAY/8550000 20  0.0 -360
04239   125AM
50065LCNALCD7XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19332   14/MAY/8550000 17  0.0 -360
04239   125AM
50066LCNALCD8XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19333   14/MAY/8550000 11  0.0 -360
04239   125AM
50067LCNALCD9XGLBS 1650MFG: INTERFACE  MODEL: 1220-FS   S/N: 19338   14/MAY/8550000 16  0.0 -360
04239   125AM
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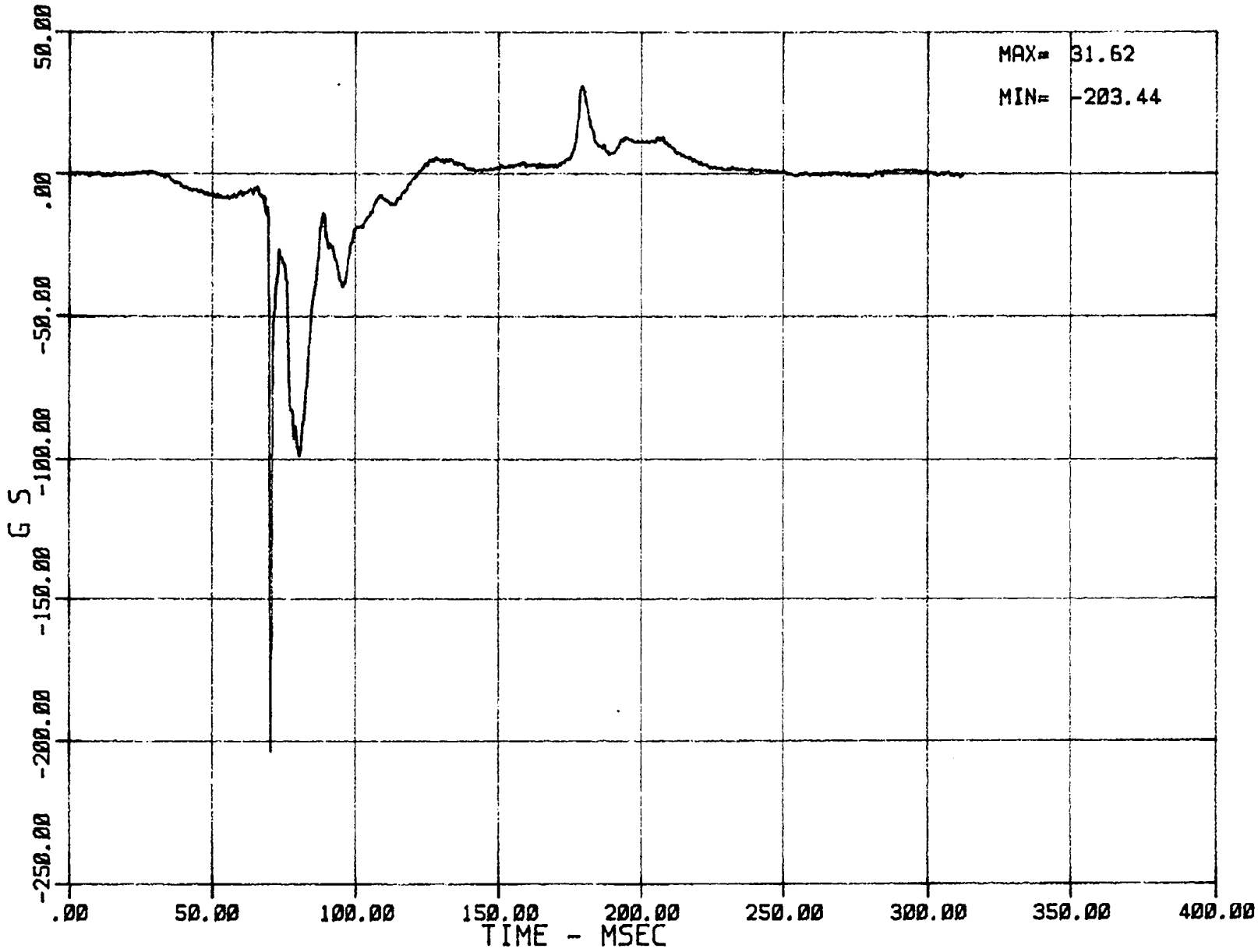
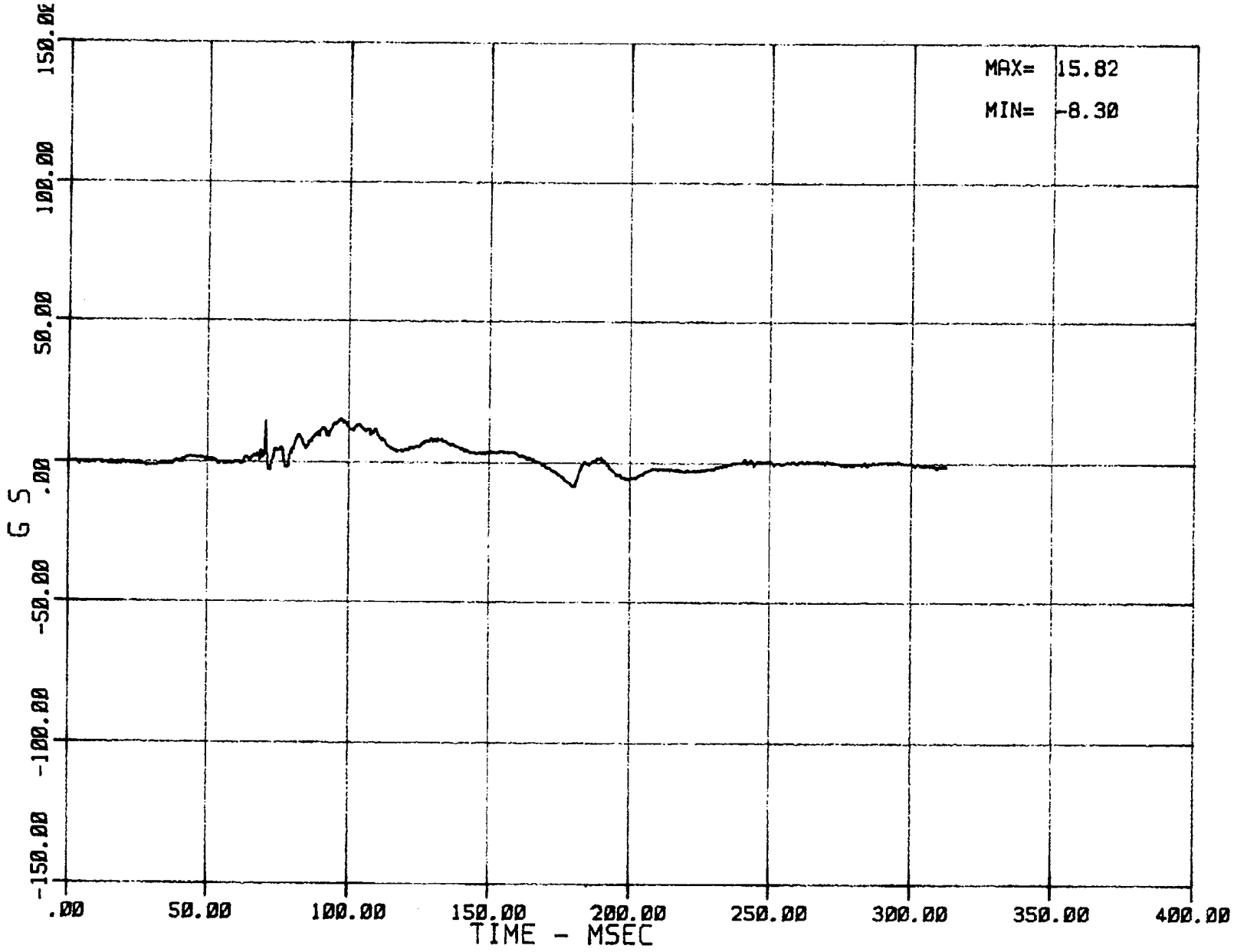


01 AC 01 1 HED X (DRIVER HEAD ACCEL. -- X-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



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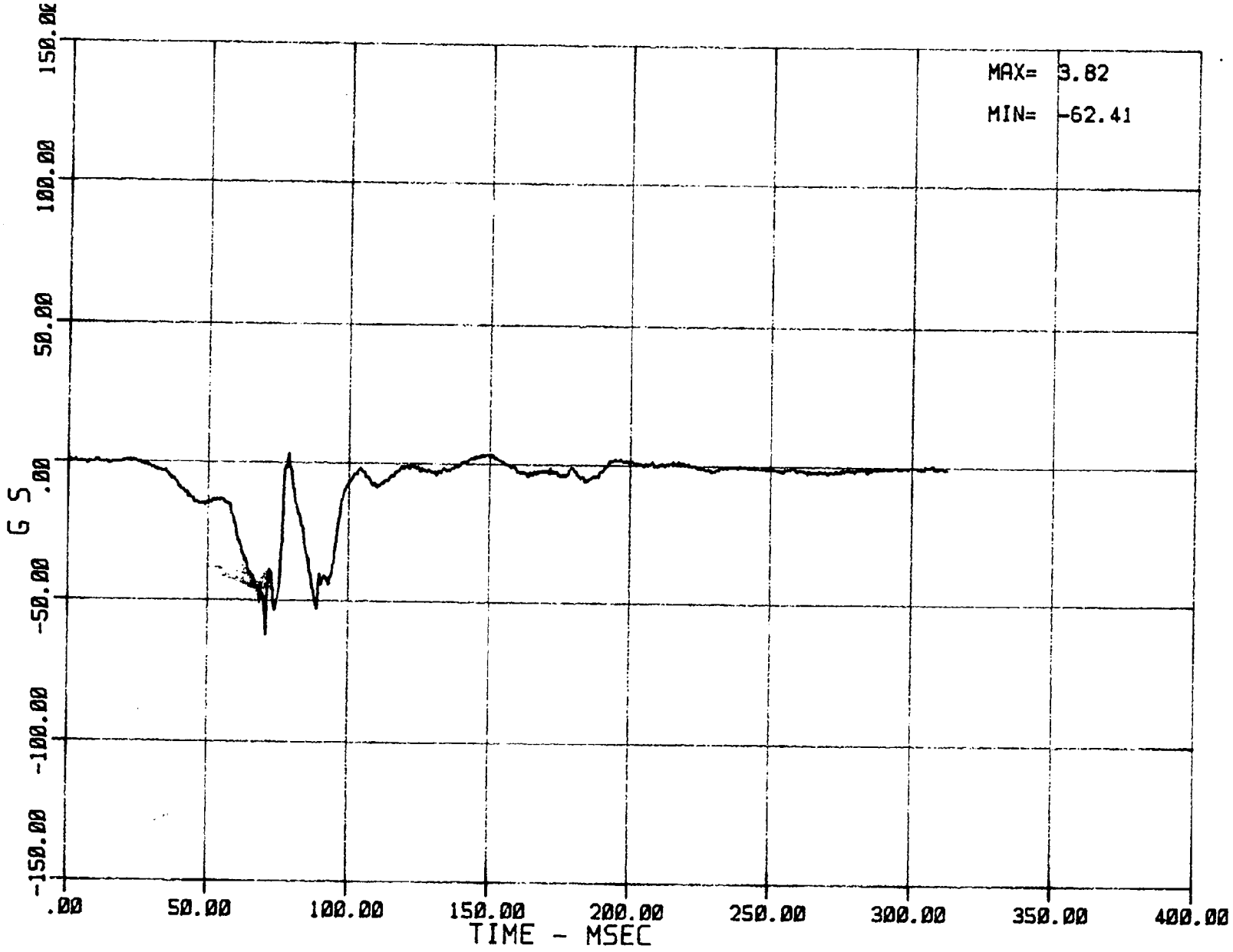
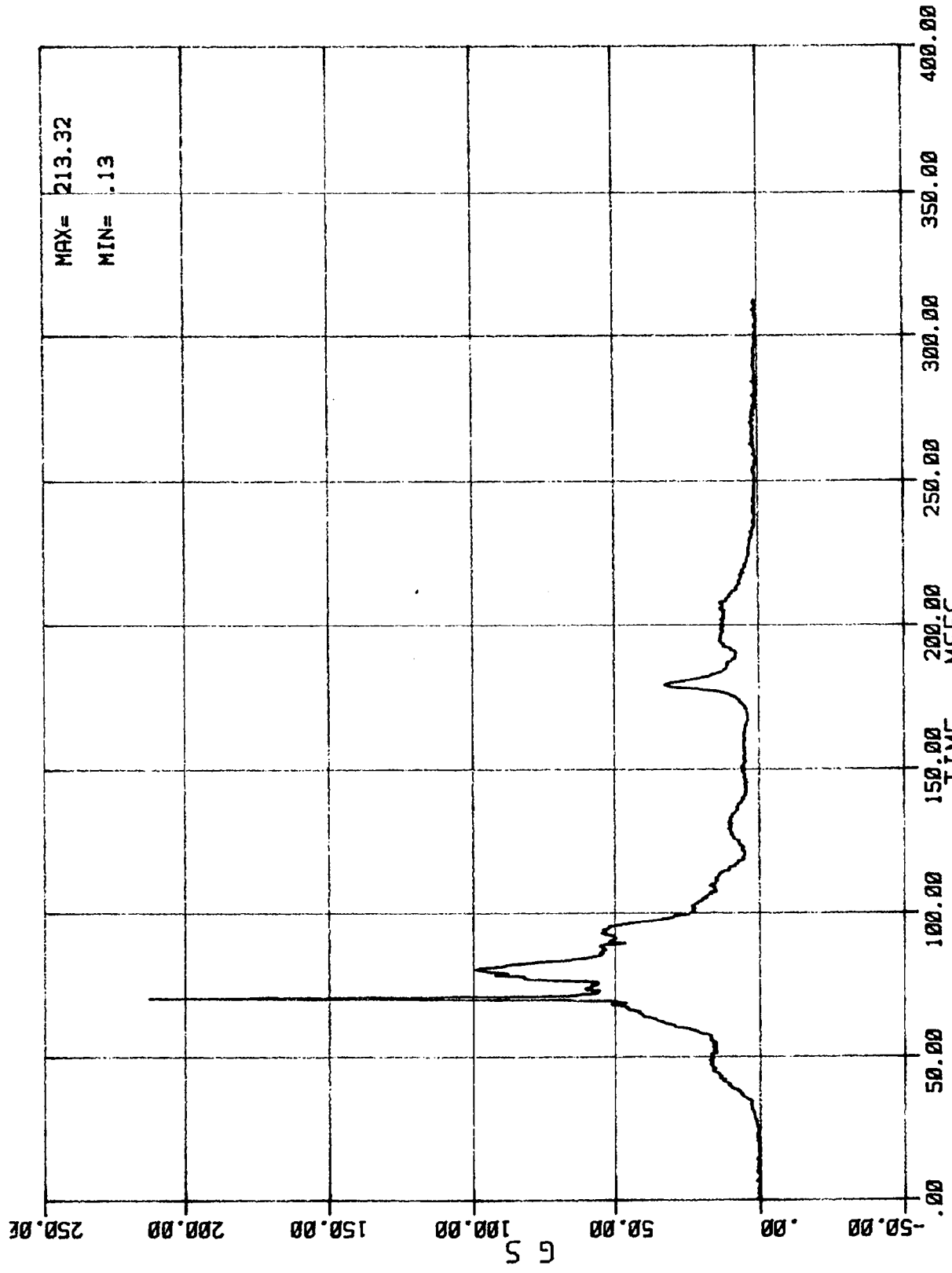
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



Ø3 AC Ø1 1 HED Z (DRIVER HEAD ACCEL. -- Z-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88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100.00
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300.00
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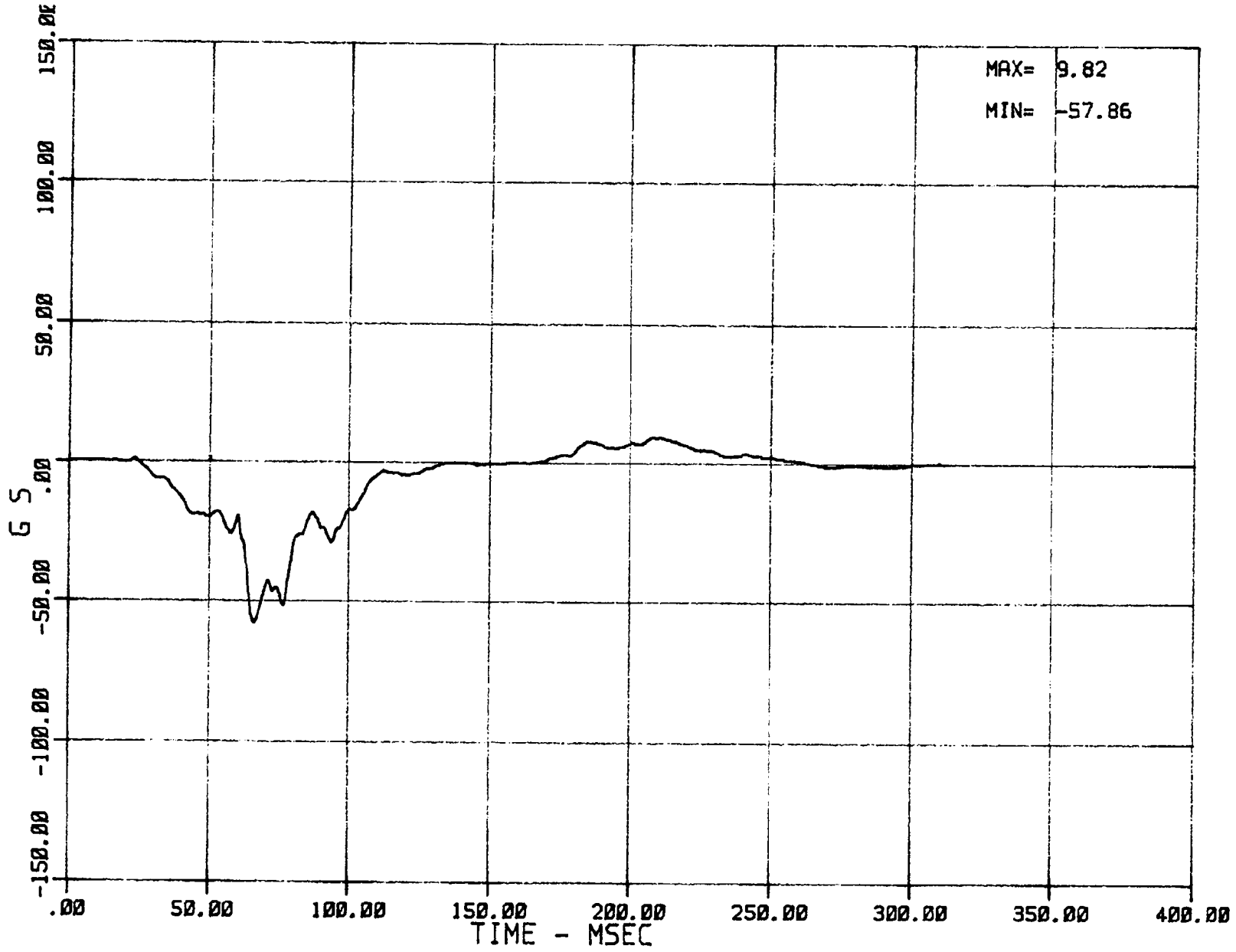
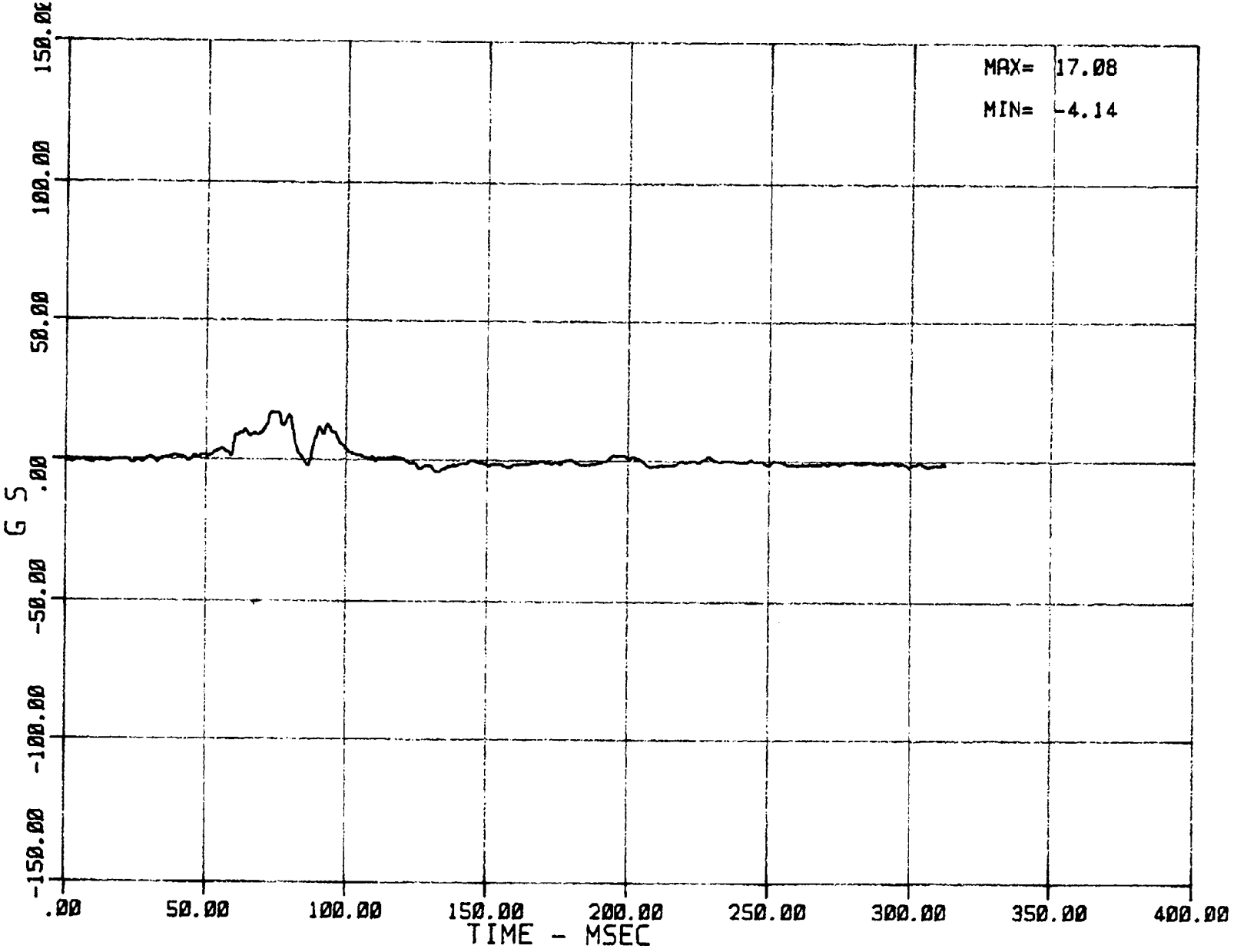
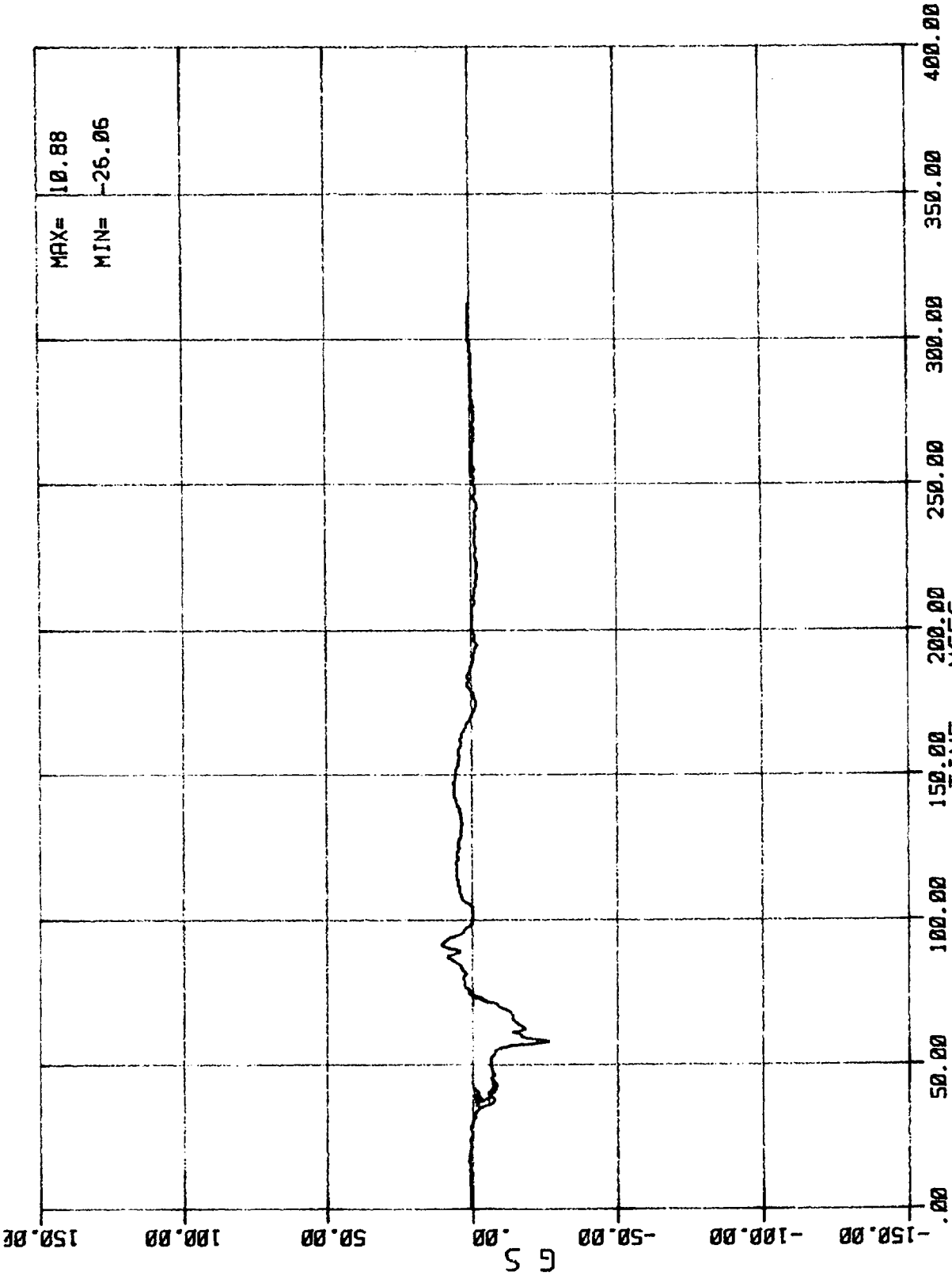
TIME - MSEC
G S
DRIVER HEAD RESULTANT ACCELERATION
MSE N02048 1988 FORD F-150 PICKUP TRUCK
03/15/88



04 AC 01 1 CST X (DRIVER CHEST ACCEL. -- X-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

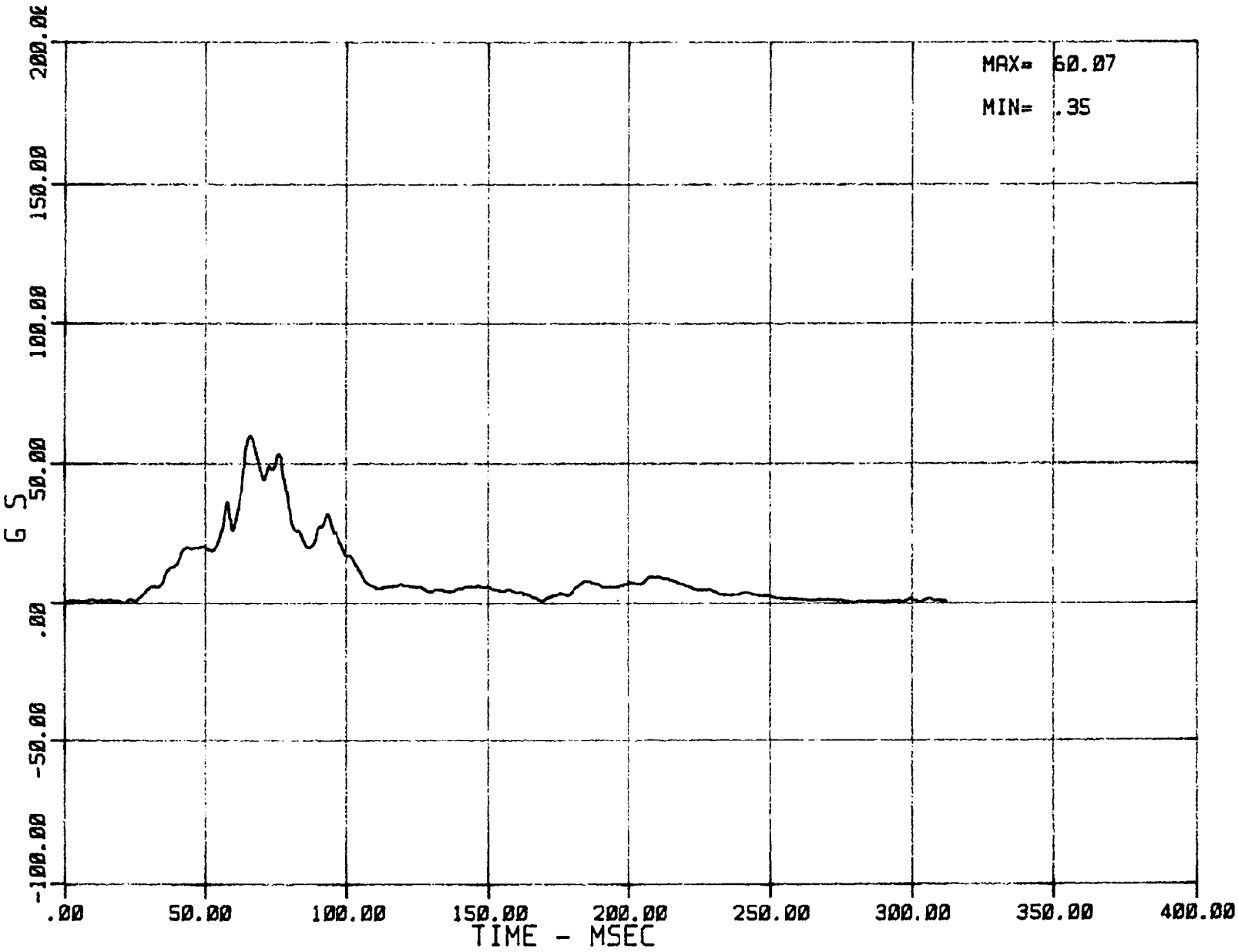


05 AC 01 1 CST Y (DRIVER CHEST ACCEL. -- Y-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

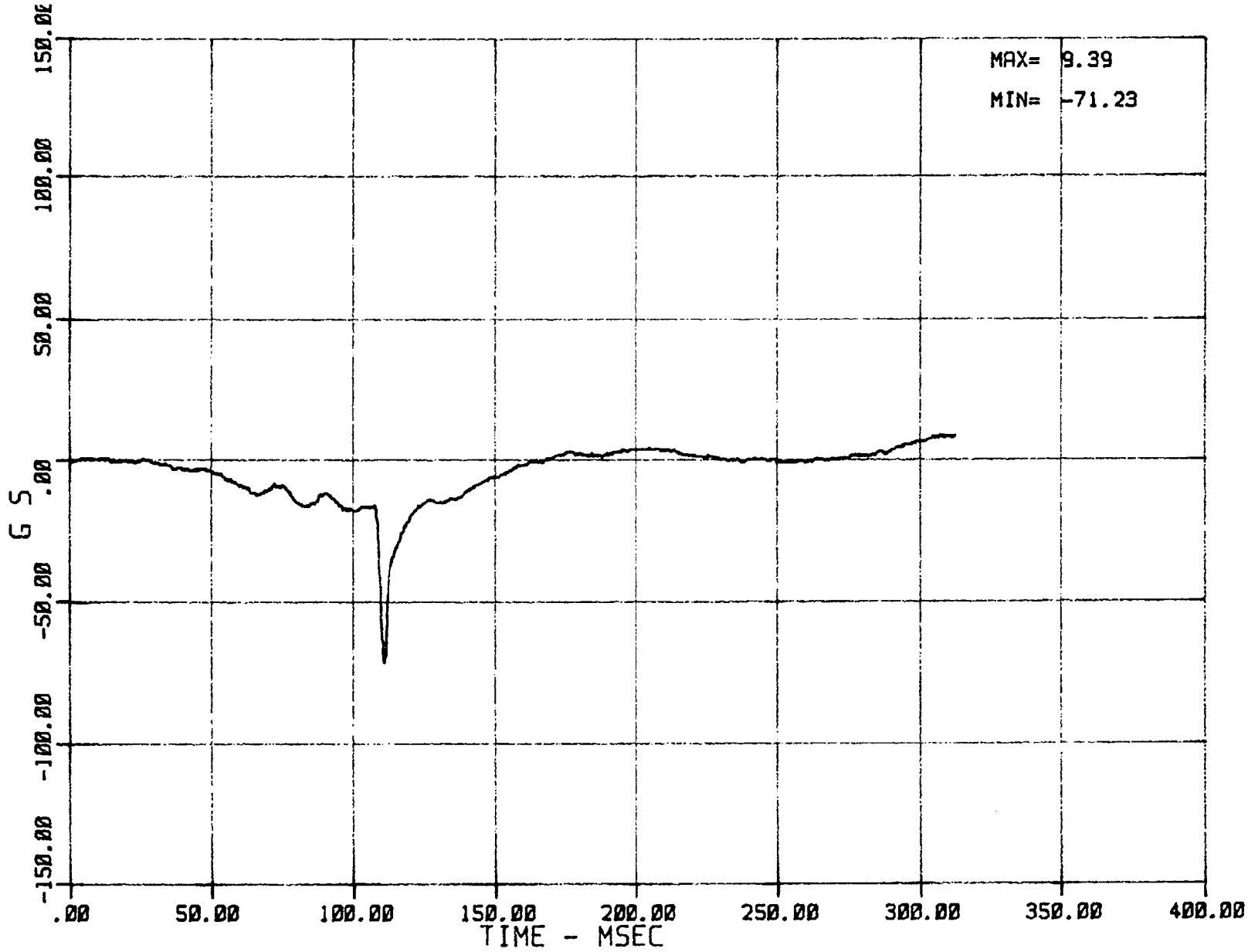


06 AC 01 1 CST Z (DRIVER CHEST ACCEL. -- Z-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK

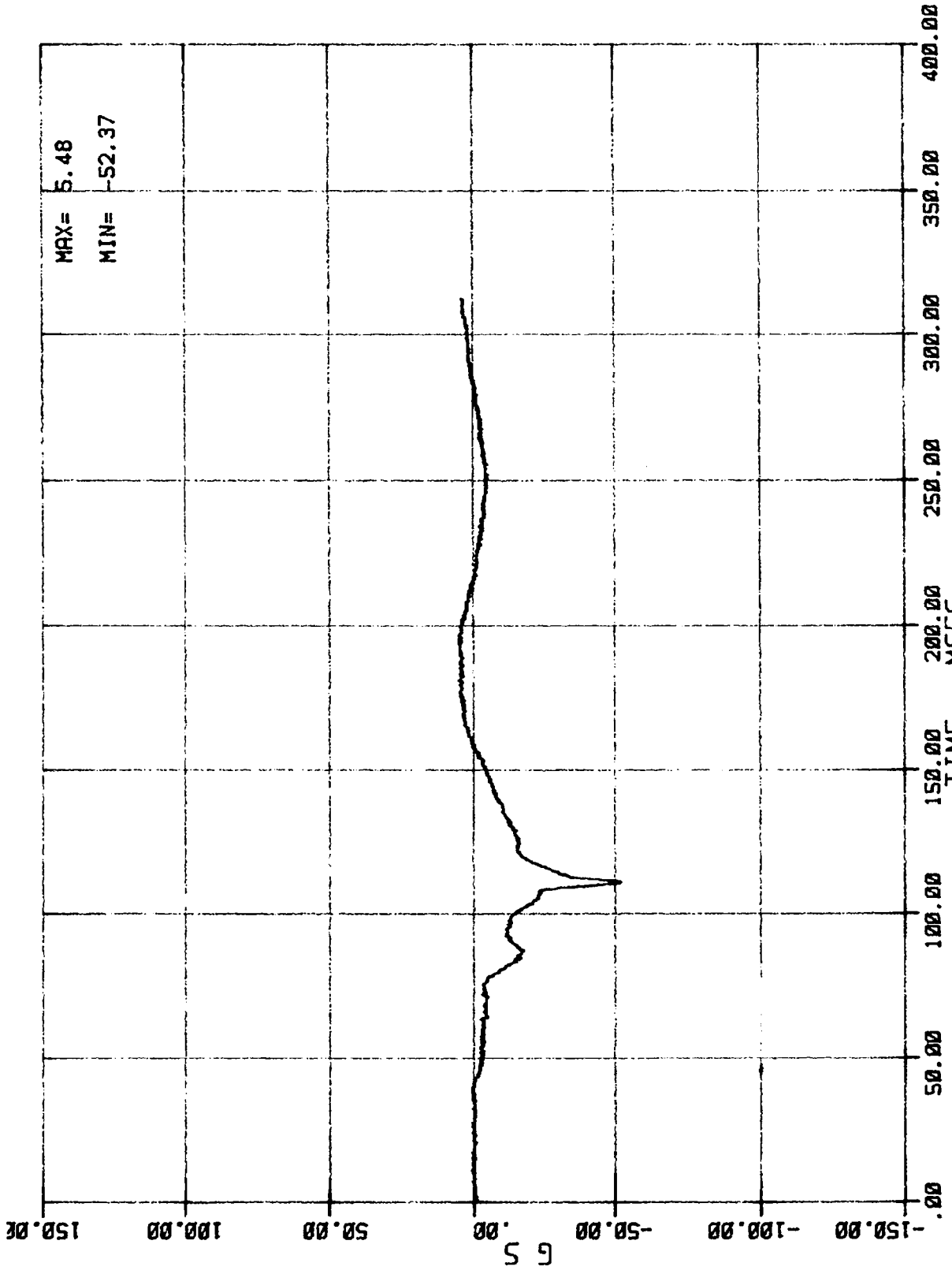
03/15/88



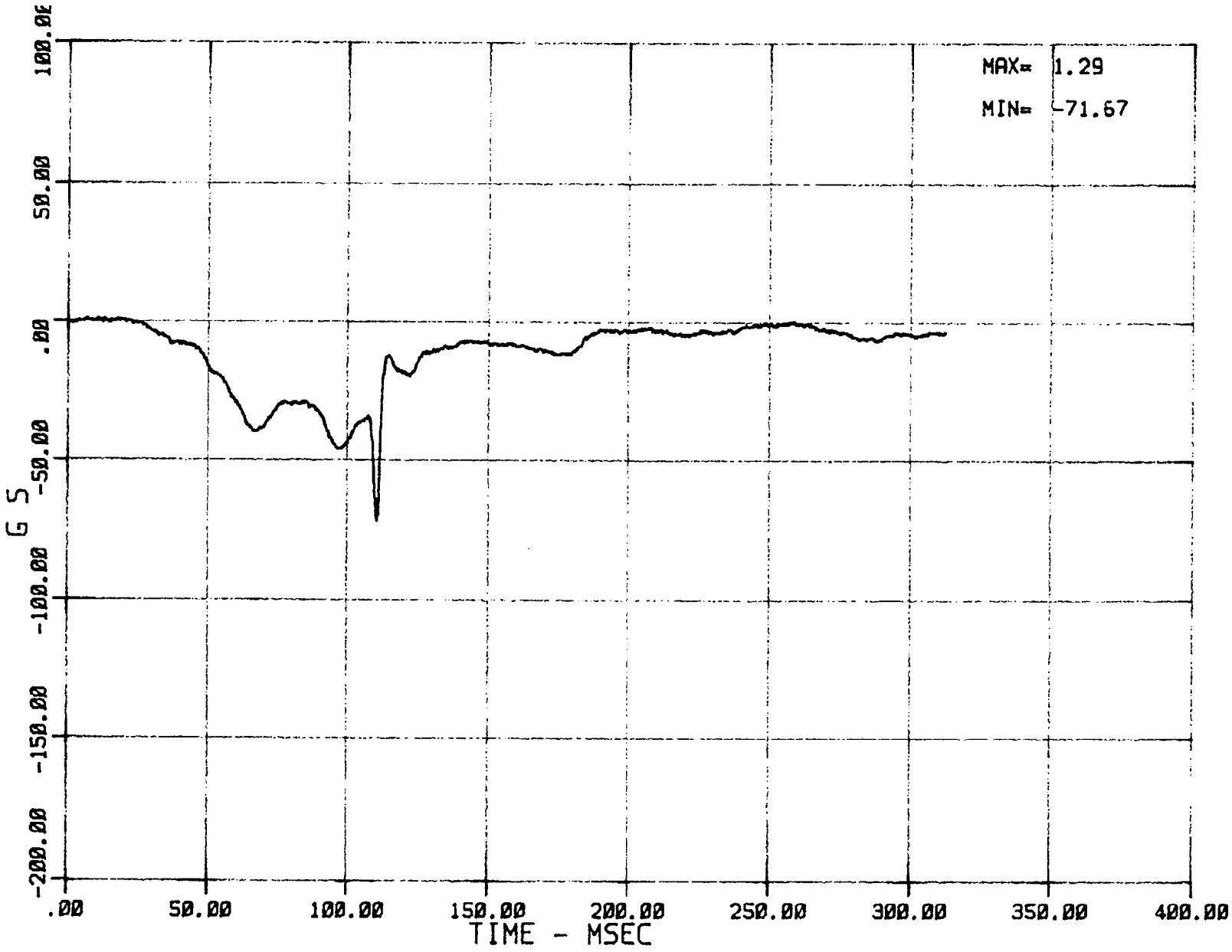
DRIVER'S CHEST RESULTANT ACCELERATION
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



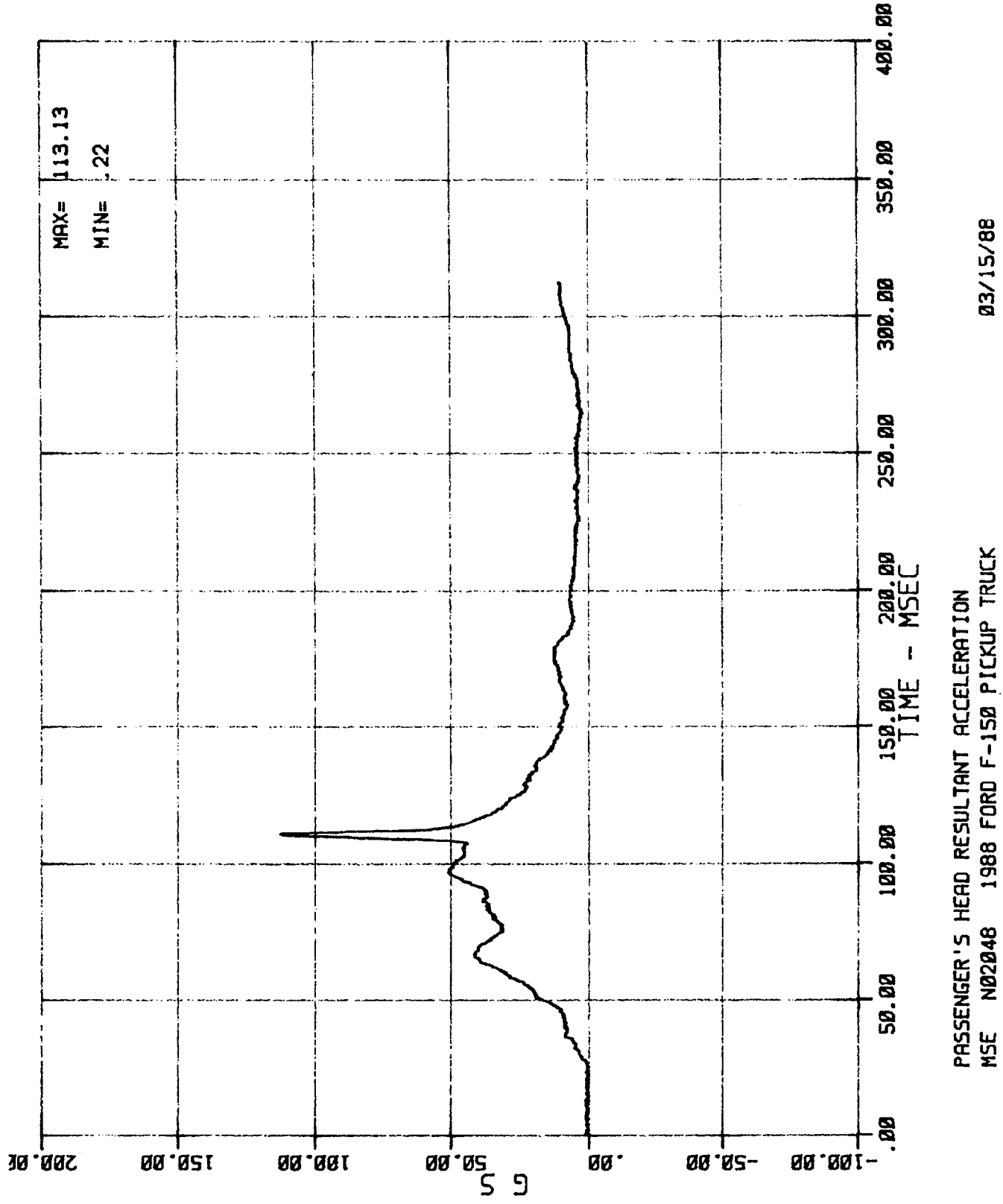
07 AC 01 2 HED X (PASSENGER HEAD ACCEL. -- X-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



08 AC 01 2 HED Y (PASSENGER HEAD ACCEL. -- Y-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

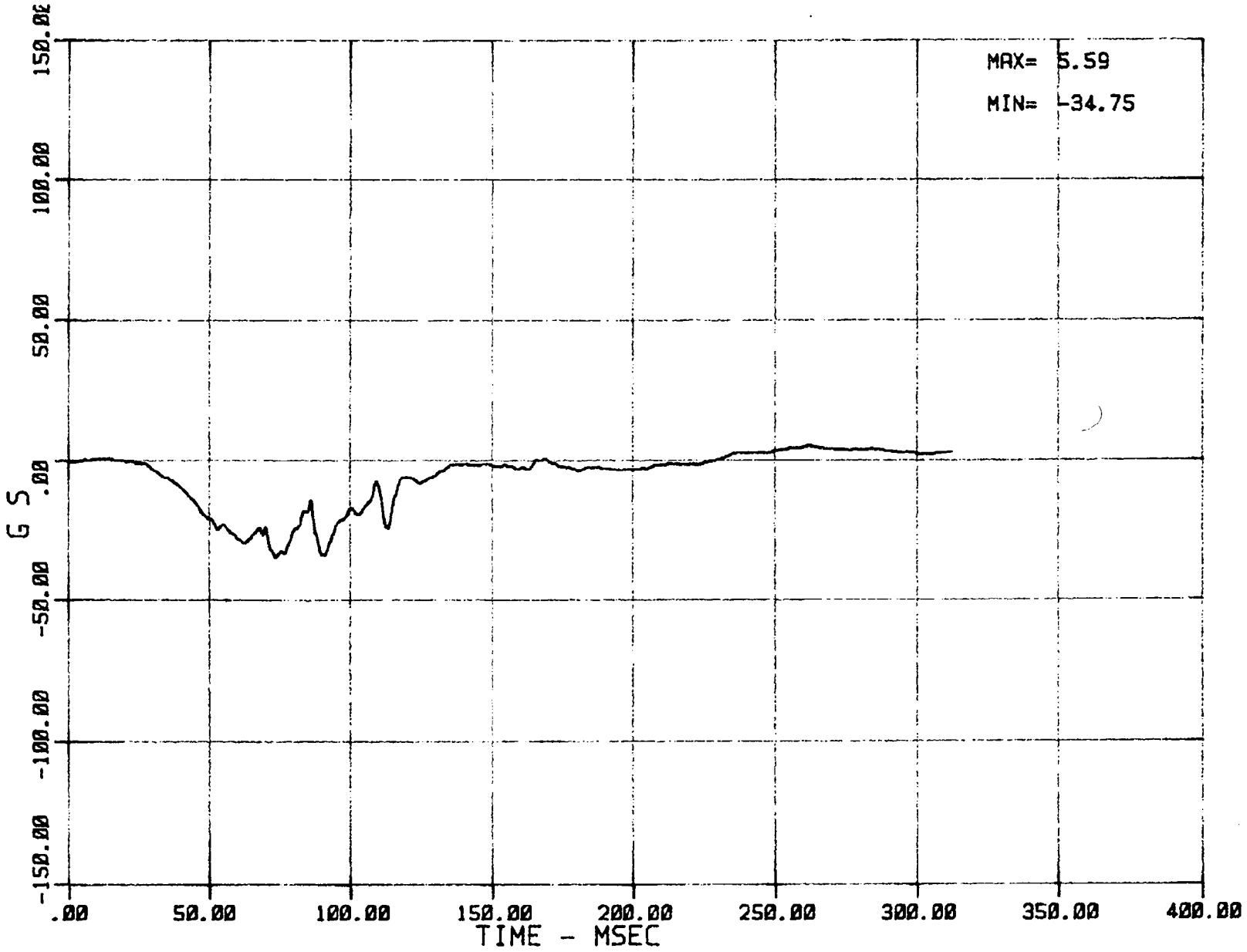


09 AC 01 2 HED Z (PASSENGER HEAD ACCEL. -- Z-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

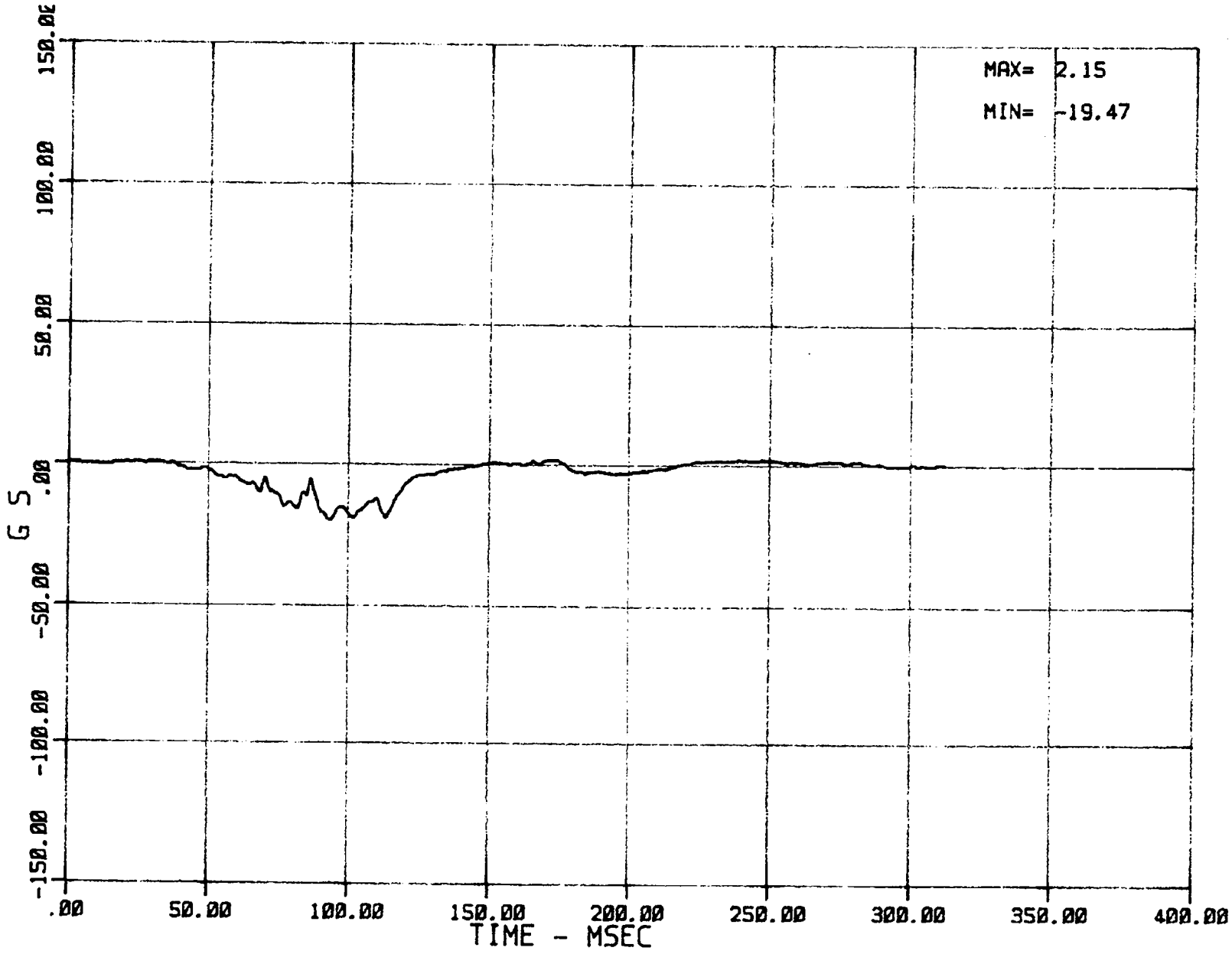


PASSENGER'S HEAD RESULTANT ACCELERATION
MSE N02048 1988 FORD F-150 PICKUP TRUCK

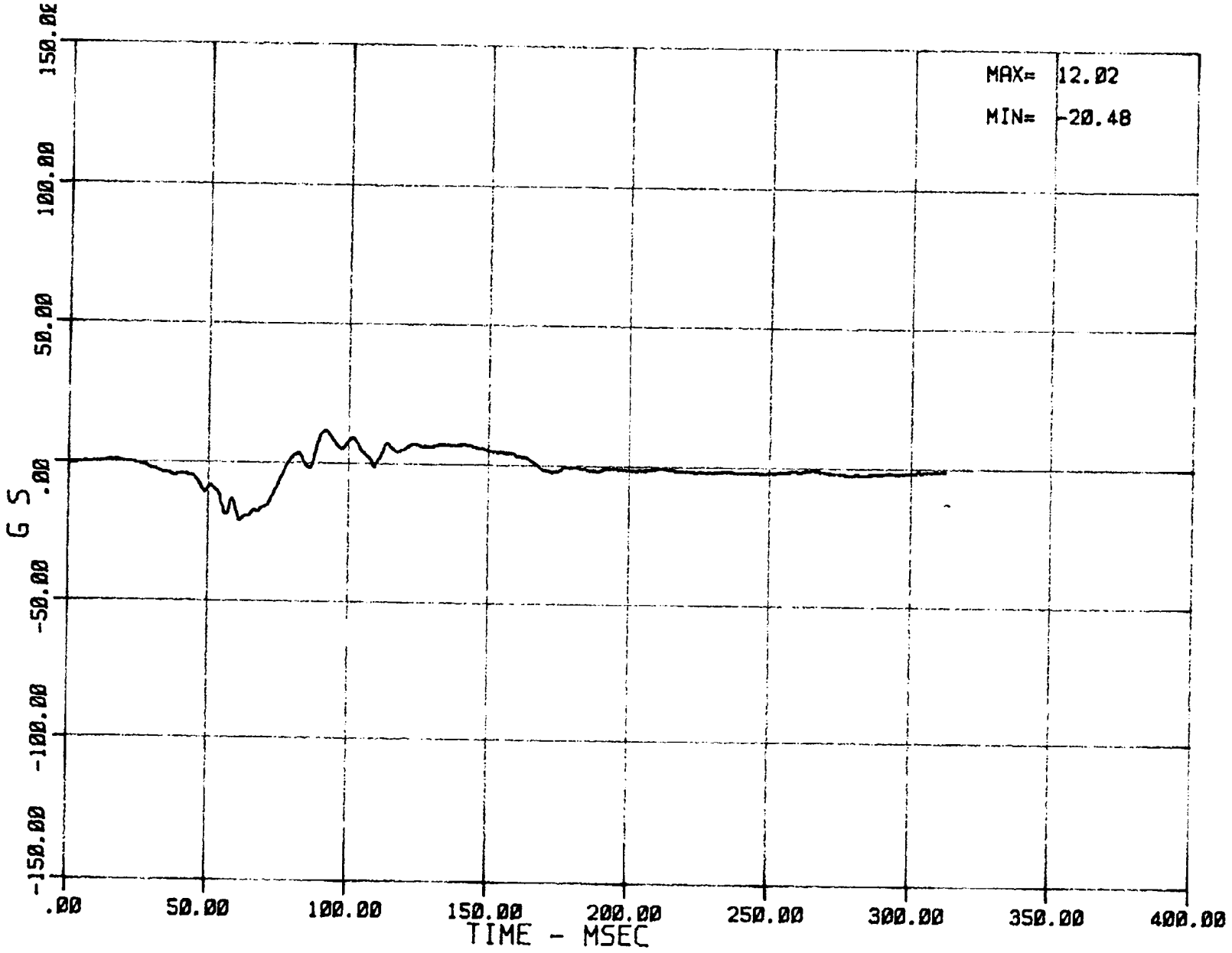
03/15/88



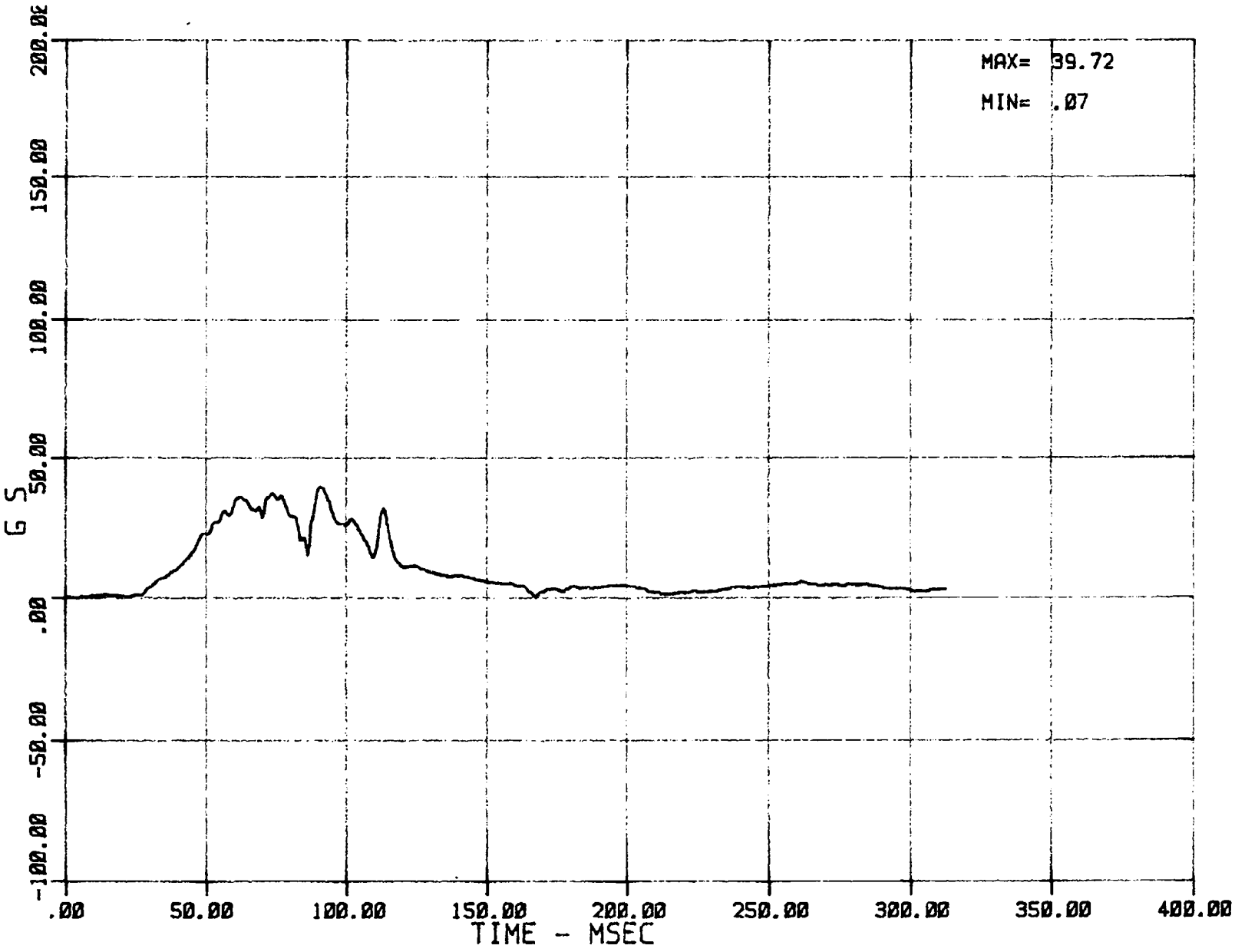
10 AC 01 2 CST X (PASSENGER CHEST ACCEL. -- X-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



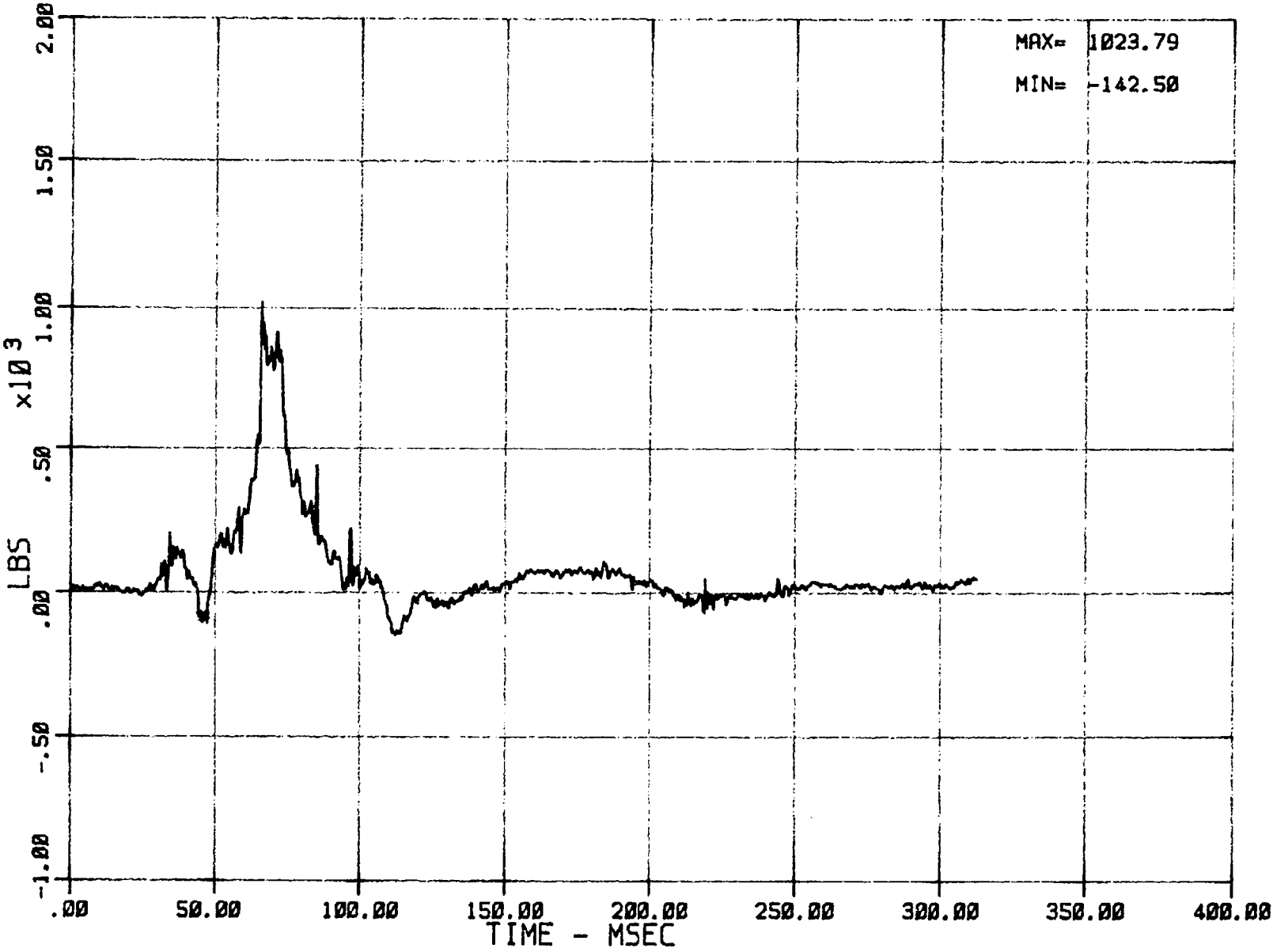
11 AC 01 2 CST Y (PASSENGER CHEST ACCEL. — Y-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



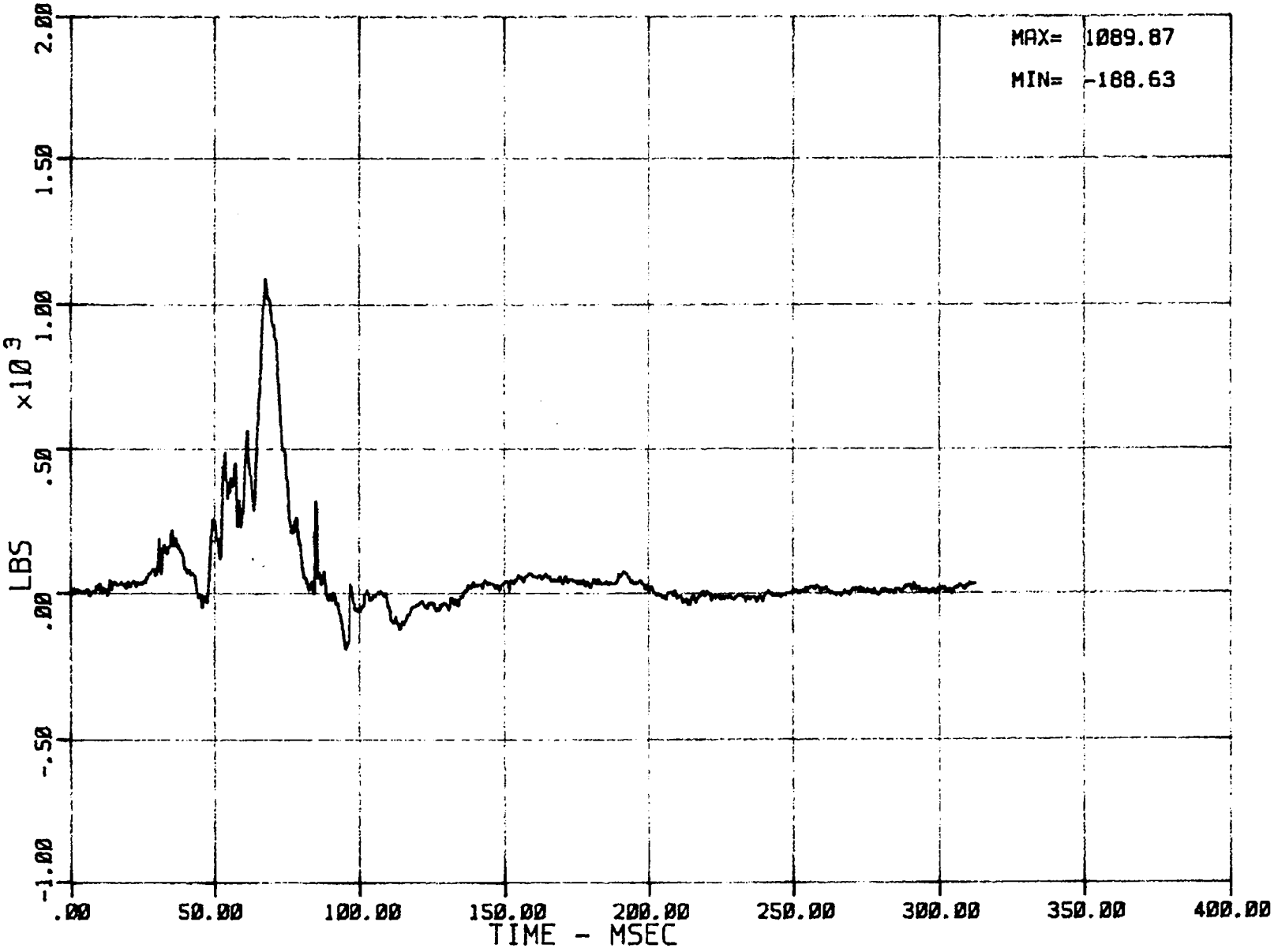
12 AC 01 2 CST Z (PASSENGER CHEST ACCEL. -- Z-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



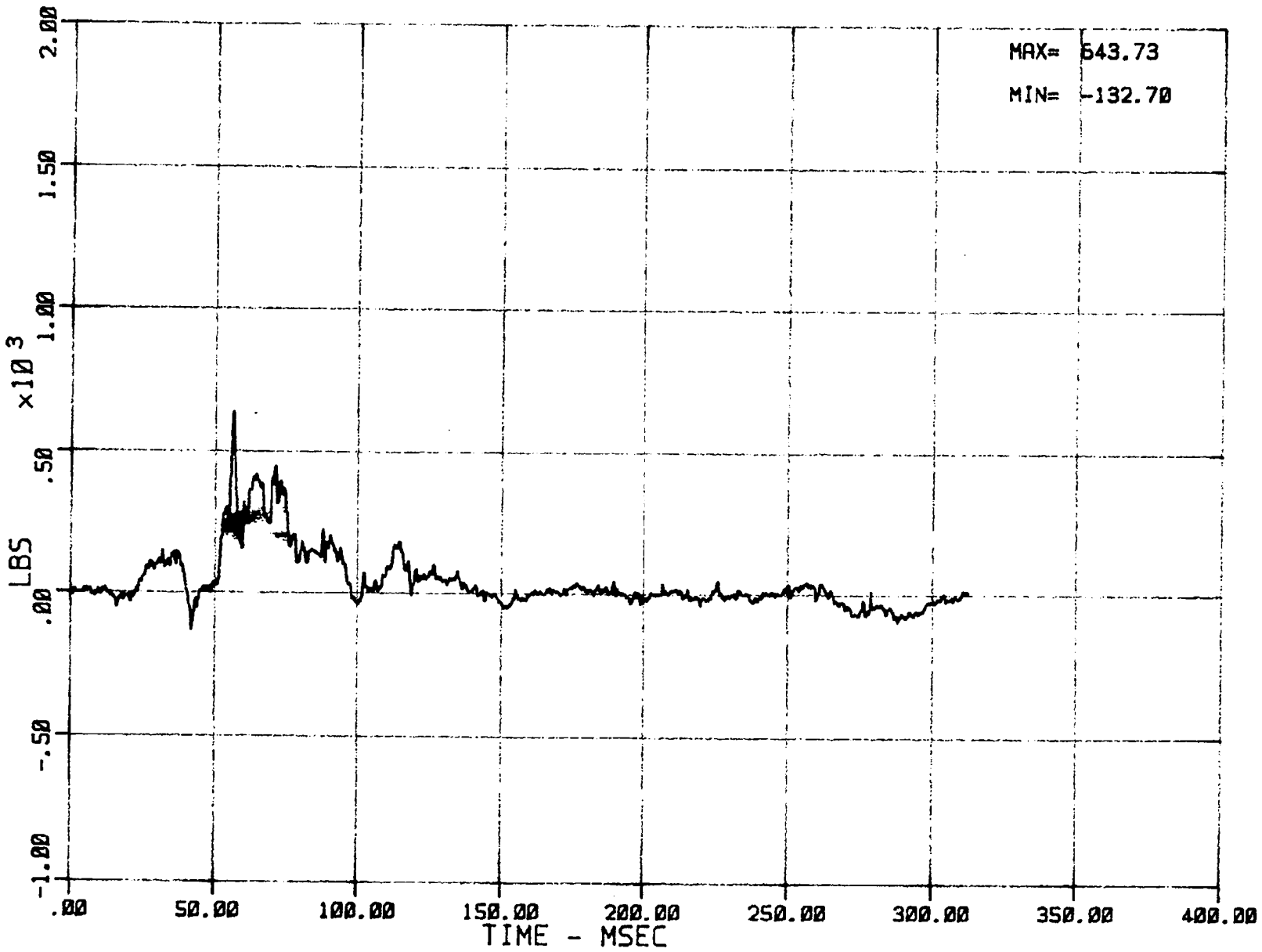
PASSENGER'S CHEST RESULTANT ACCELERATION
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



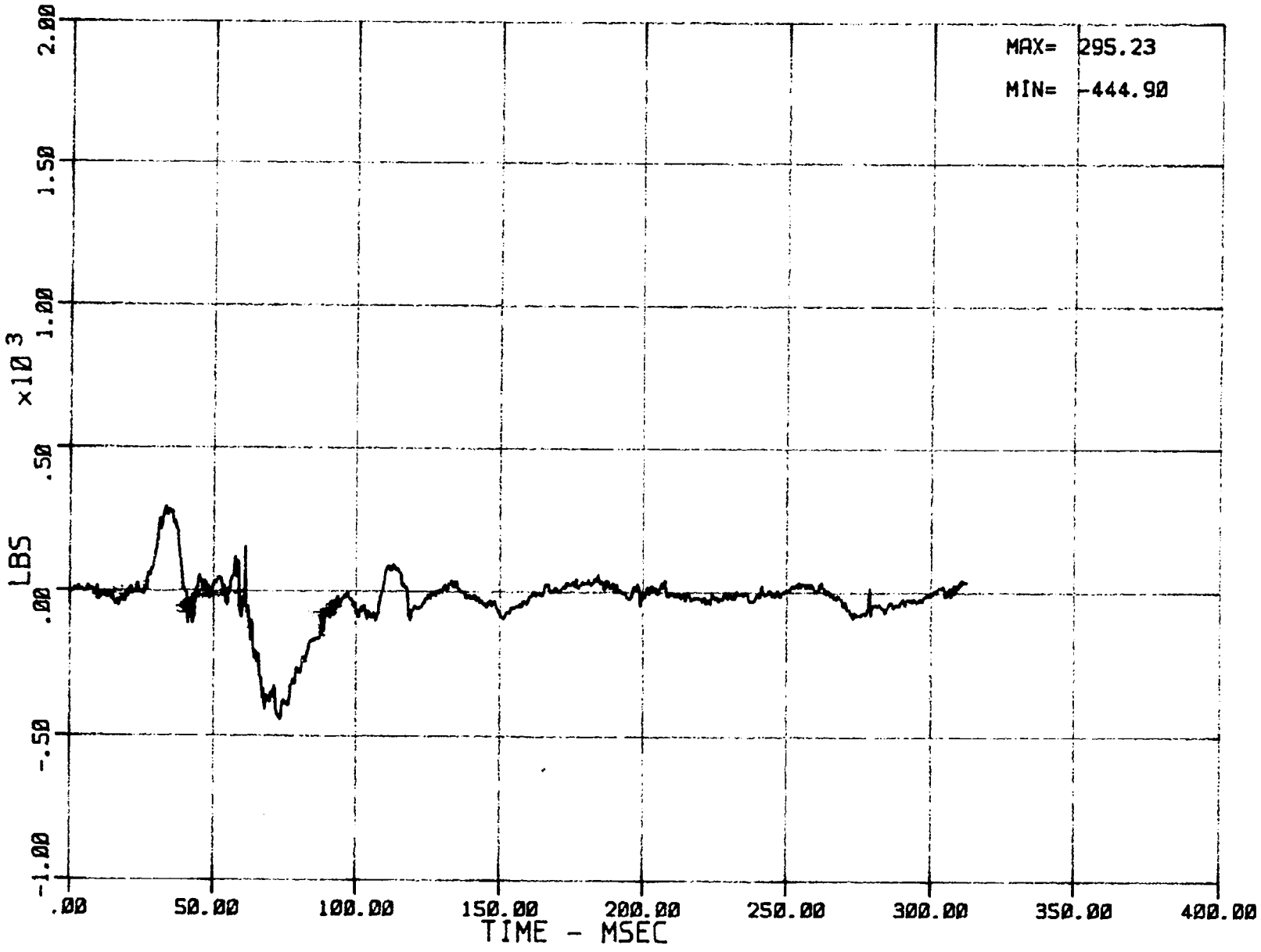
13 LC 01 1 LFM (DRIVER LEFT FEMUR FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



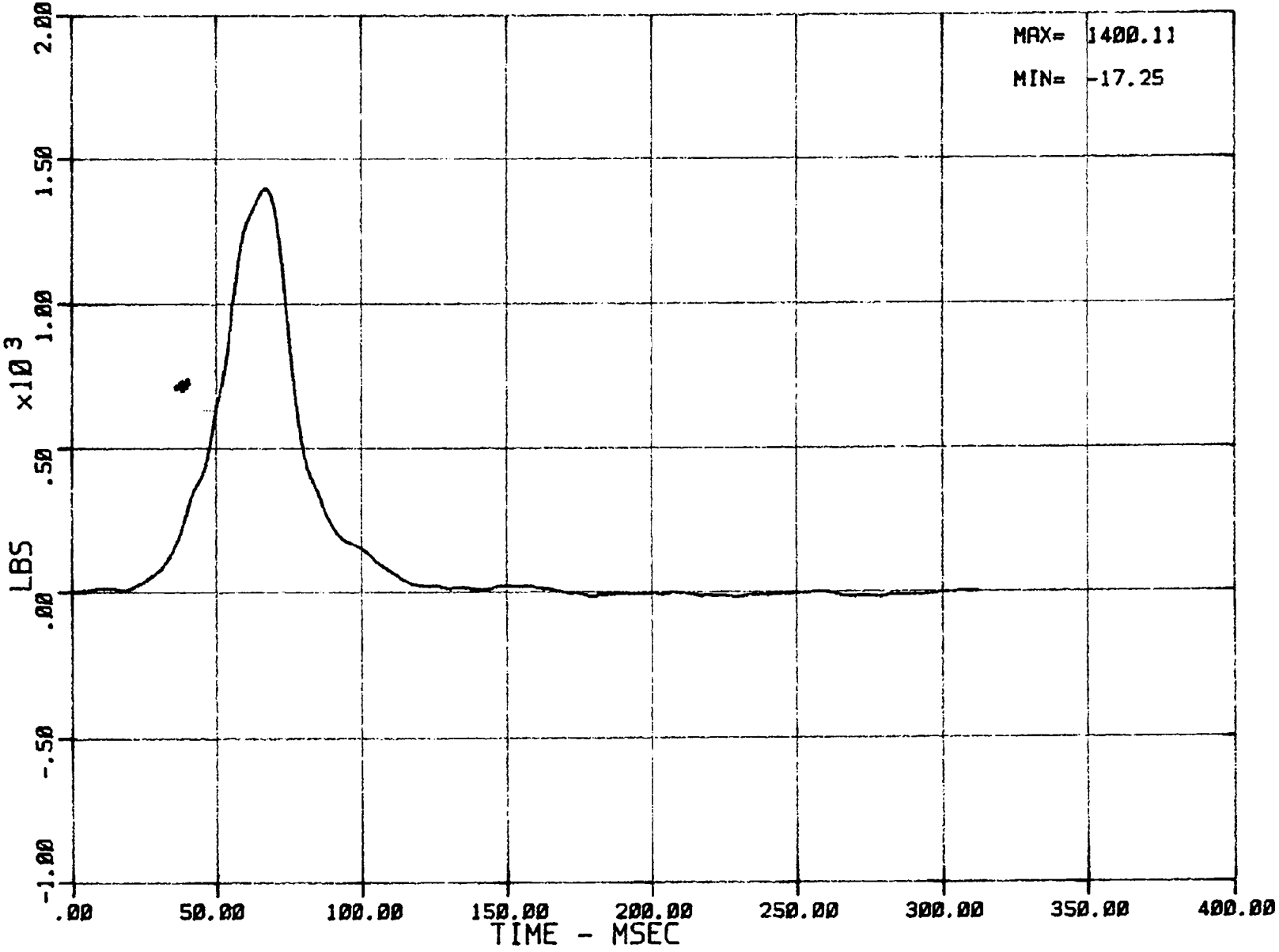
14 LC 01 1 RFM (DRIVER RIGHT FEMUR FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



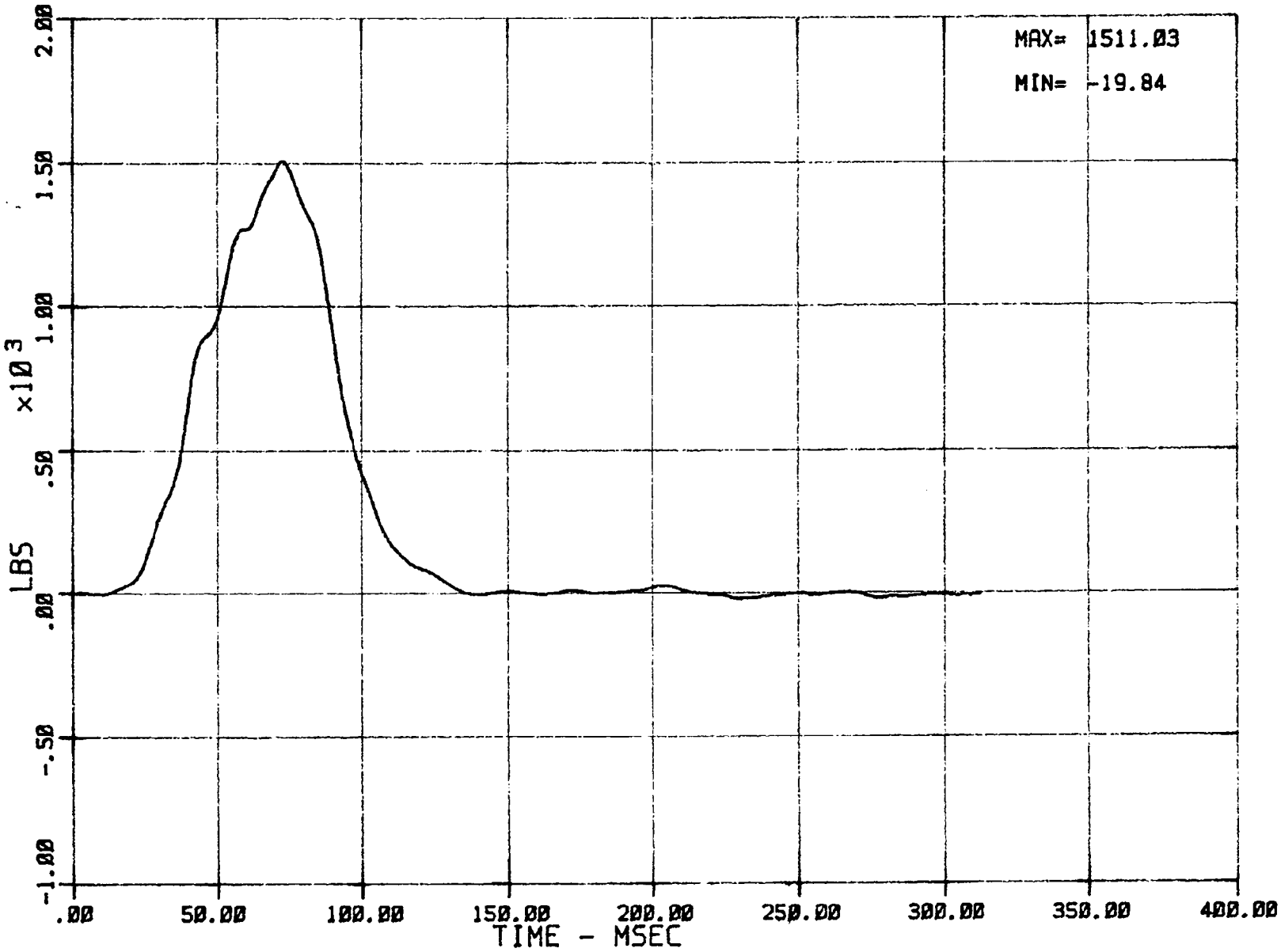
15 LC 01 2 LFM (PASSENGER LEFT FEMUR FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



16 LC 01 2 RFM (PASSENGER RIGHT FEMUR FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



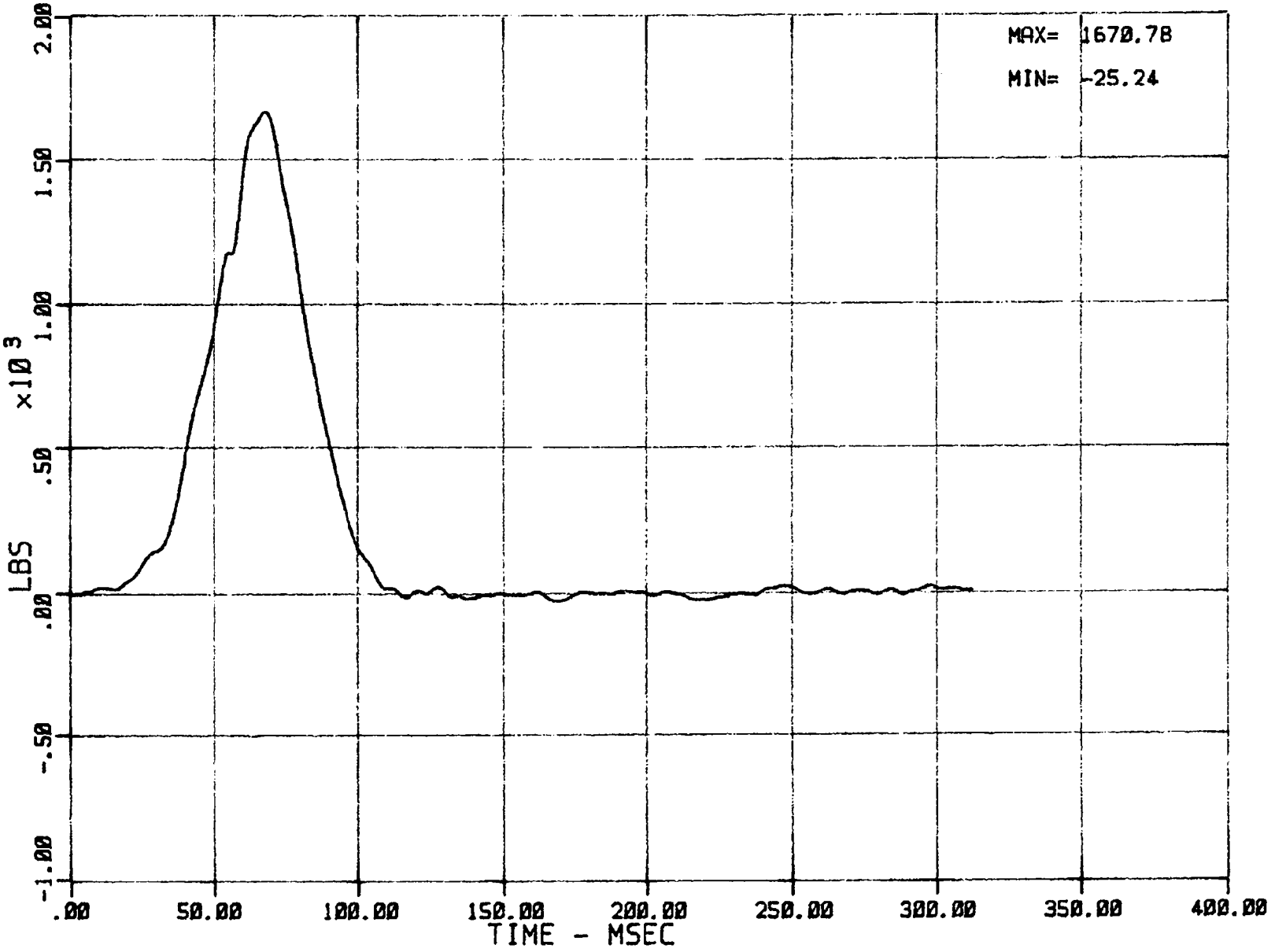
17 LC 01 1 LBD (DRIVER LAP BELT FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



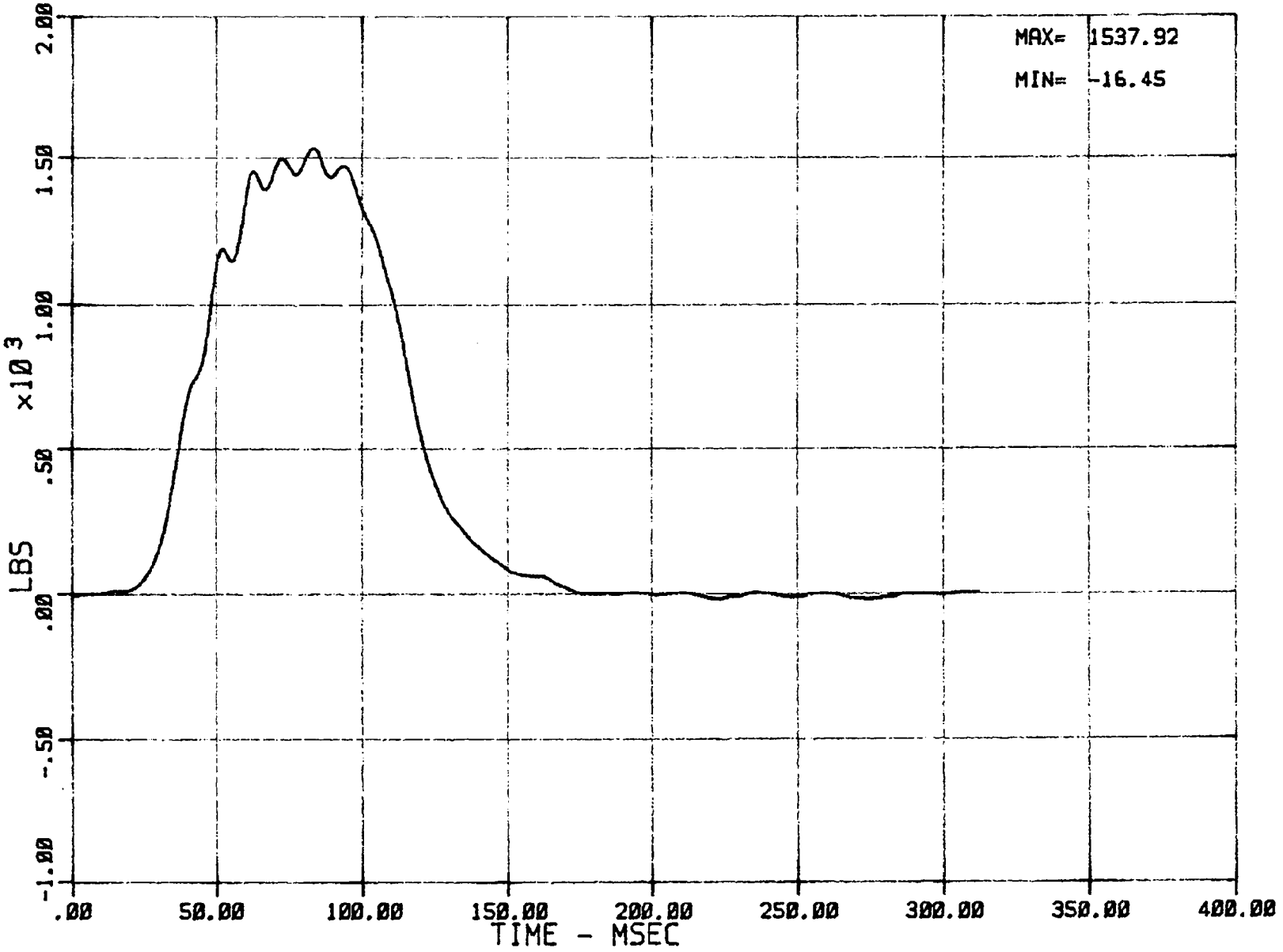
18 LC 01 1 SHB (DRIVER SHOULDER BELT FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

78

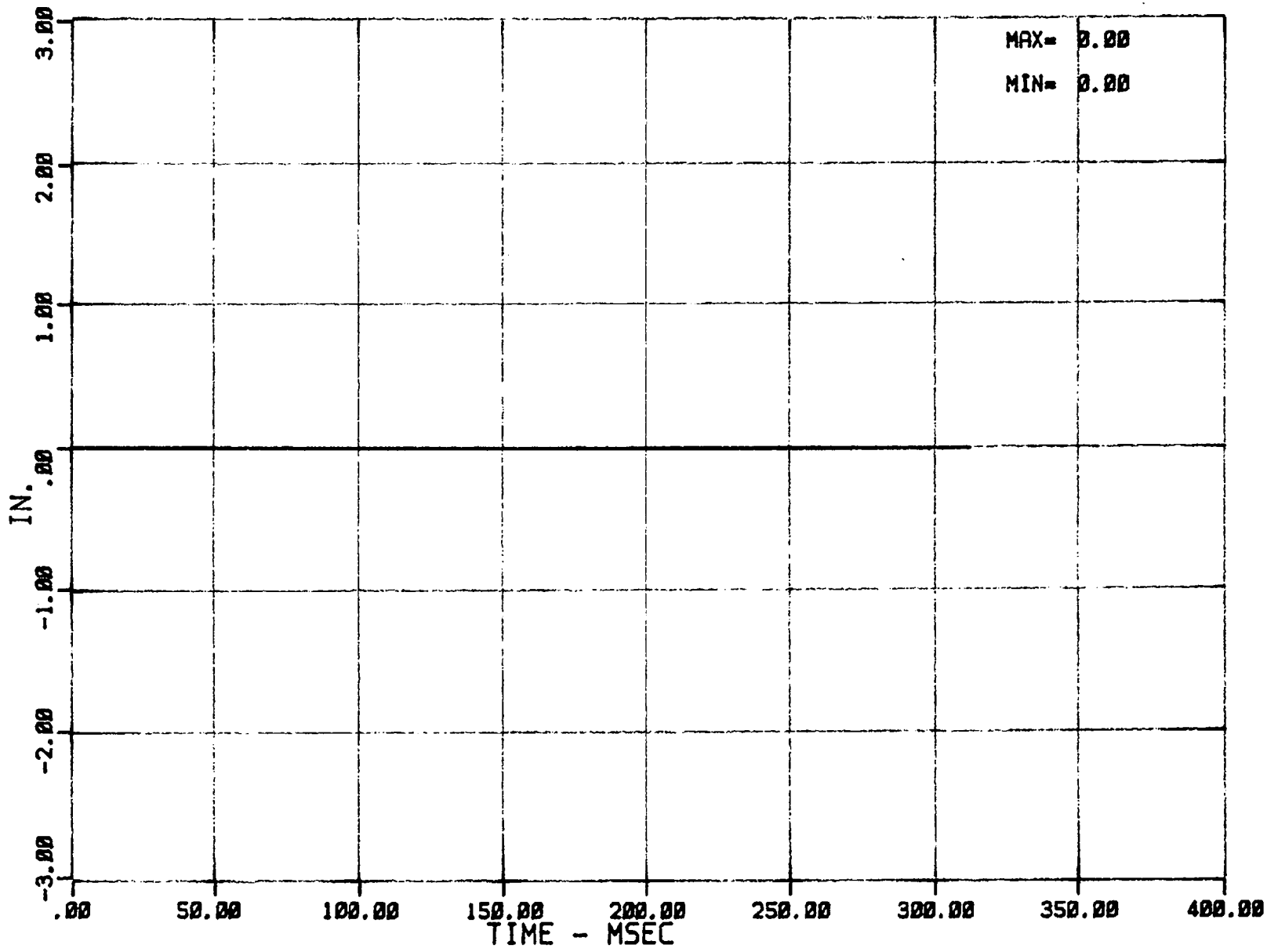
MSE-88-R157-N04



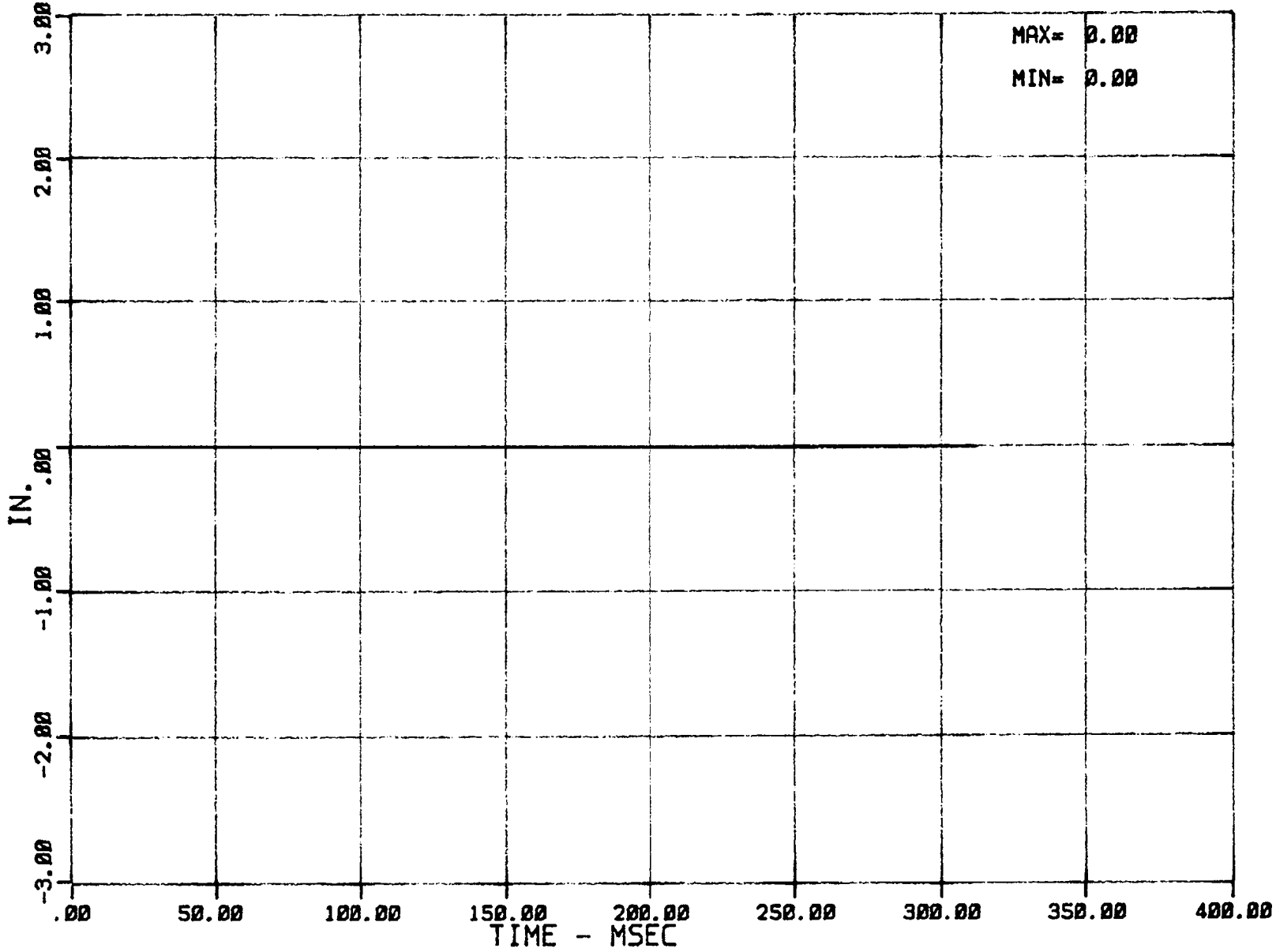
19 LC 01 2 LBD (PASSENGER LAP BELT FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



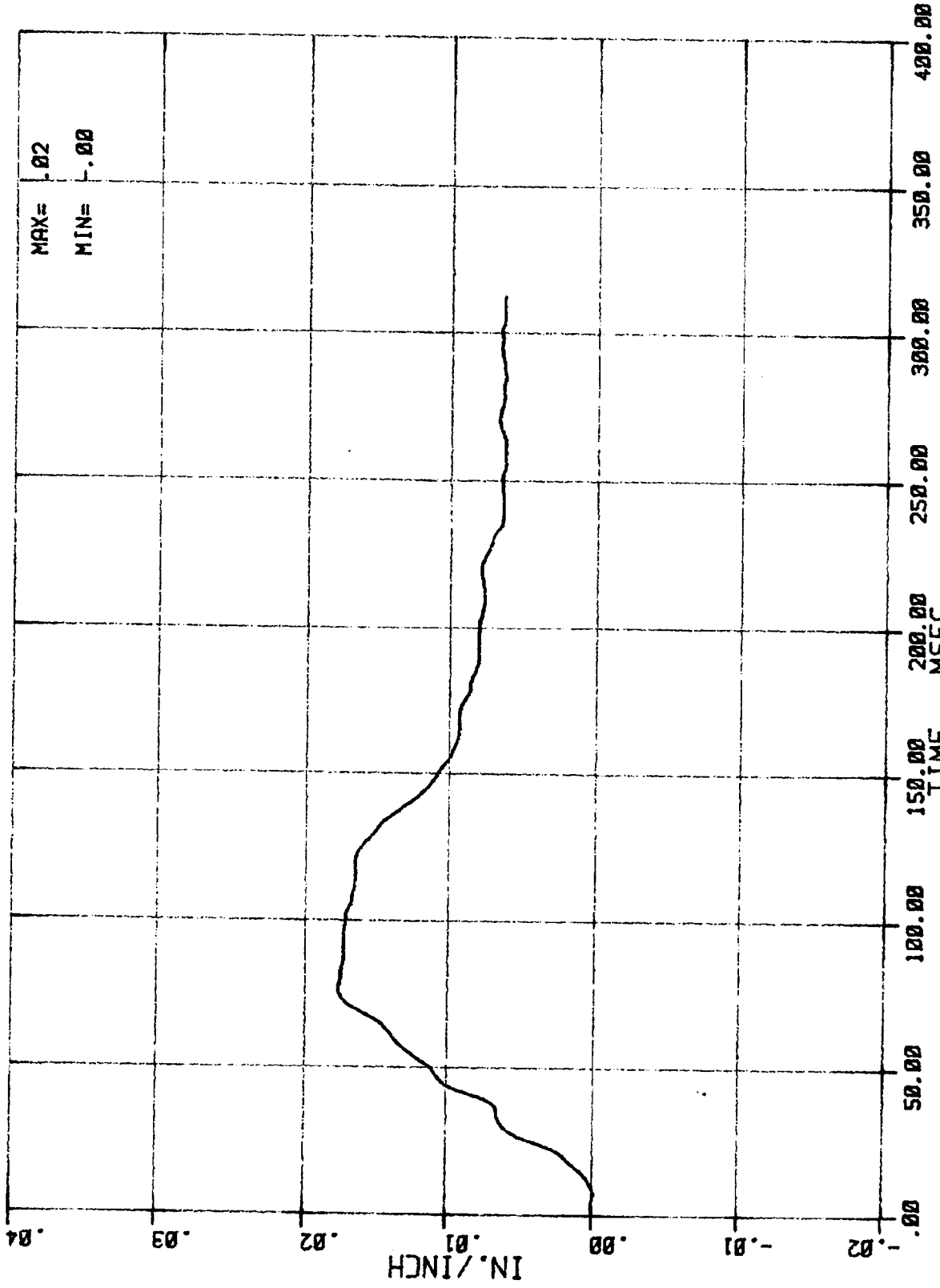
20 LC 01 2 SHB (PASSENGER SHOULDER BELT FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



21 OT 01 1 SHB (DRIVER SHOULDER BELT PULLOUT -- NOT USED THIS TEST)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

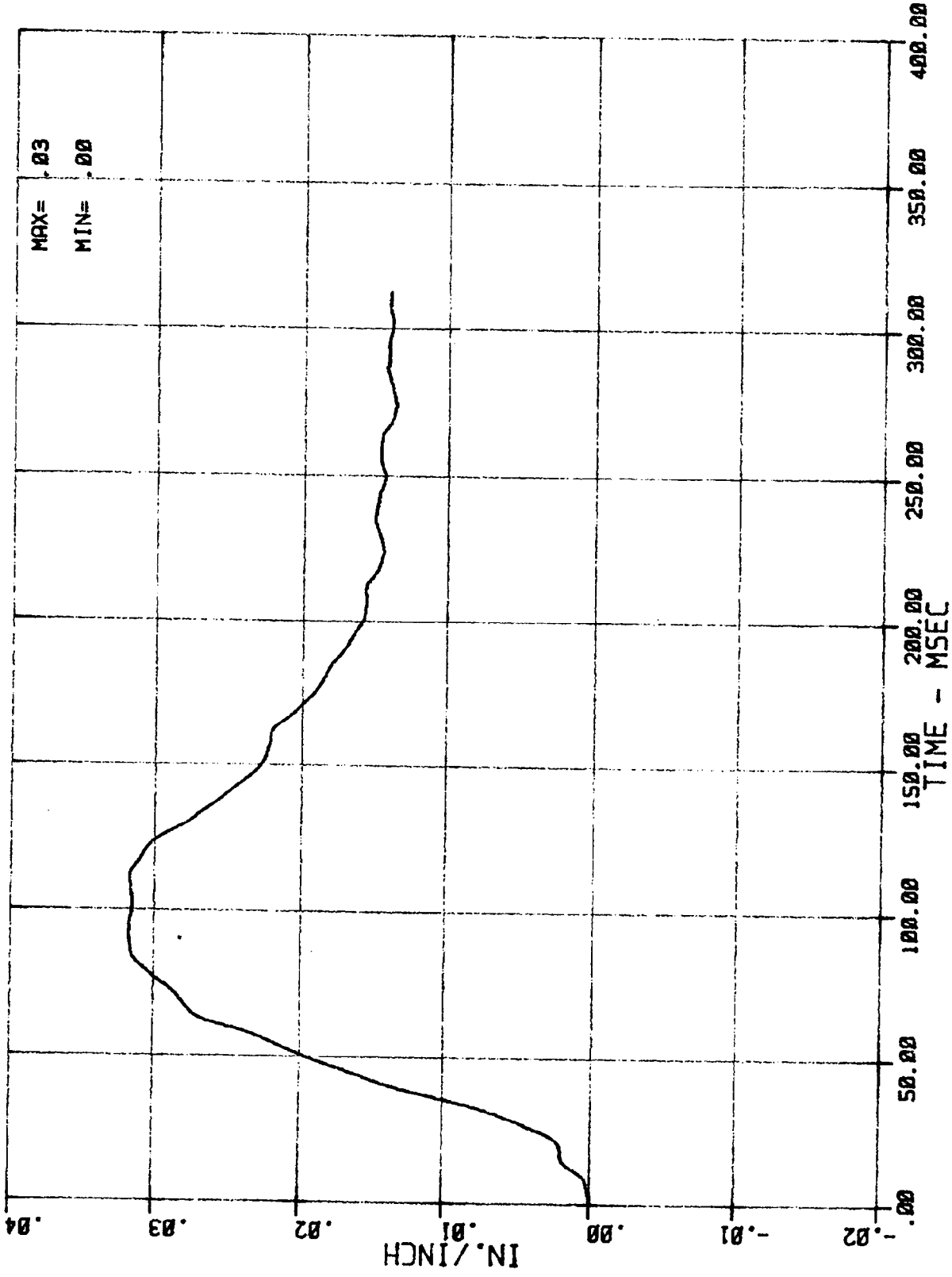


22 DT 01 2 (PASSENGER SHOULDER BELT PULLOUT -- NOT USED THIS TEST)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



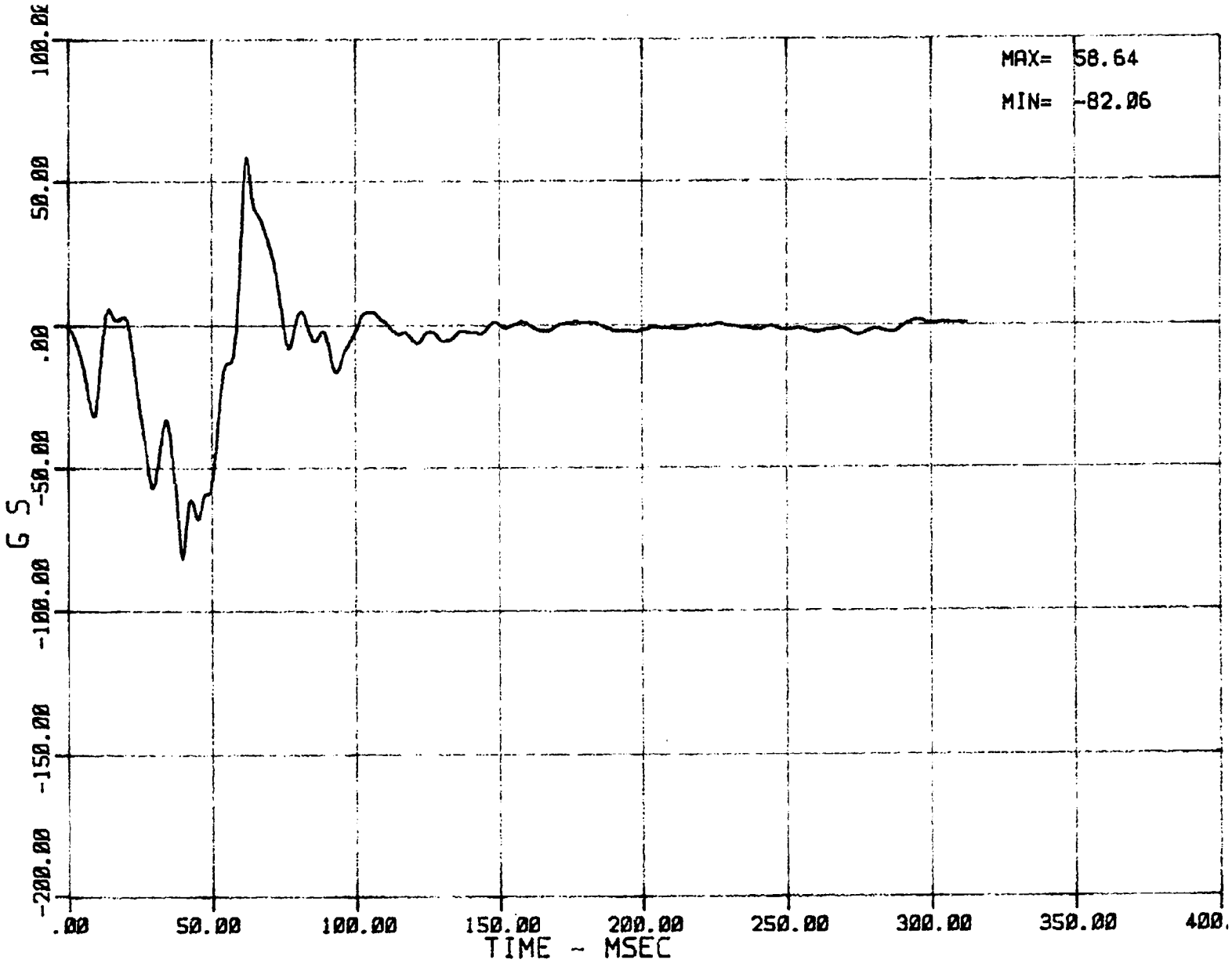
23 DT 01 1 SHB (DRIVER'S SHOULDER BELT ELONGATION)
MSE N02048 1988 FORD F-150 PICKUP TRUCK

03/15/88

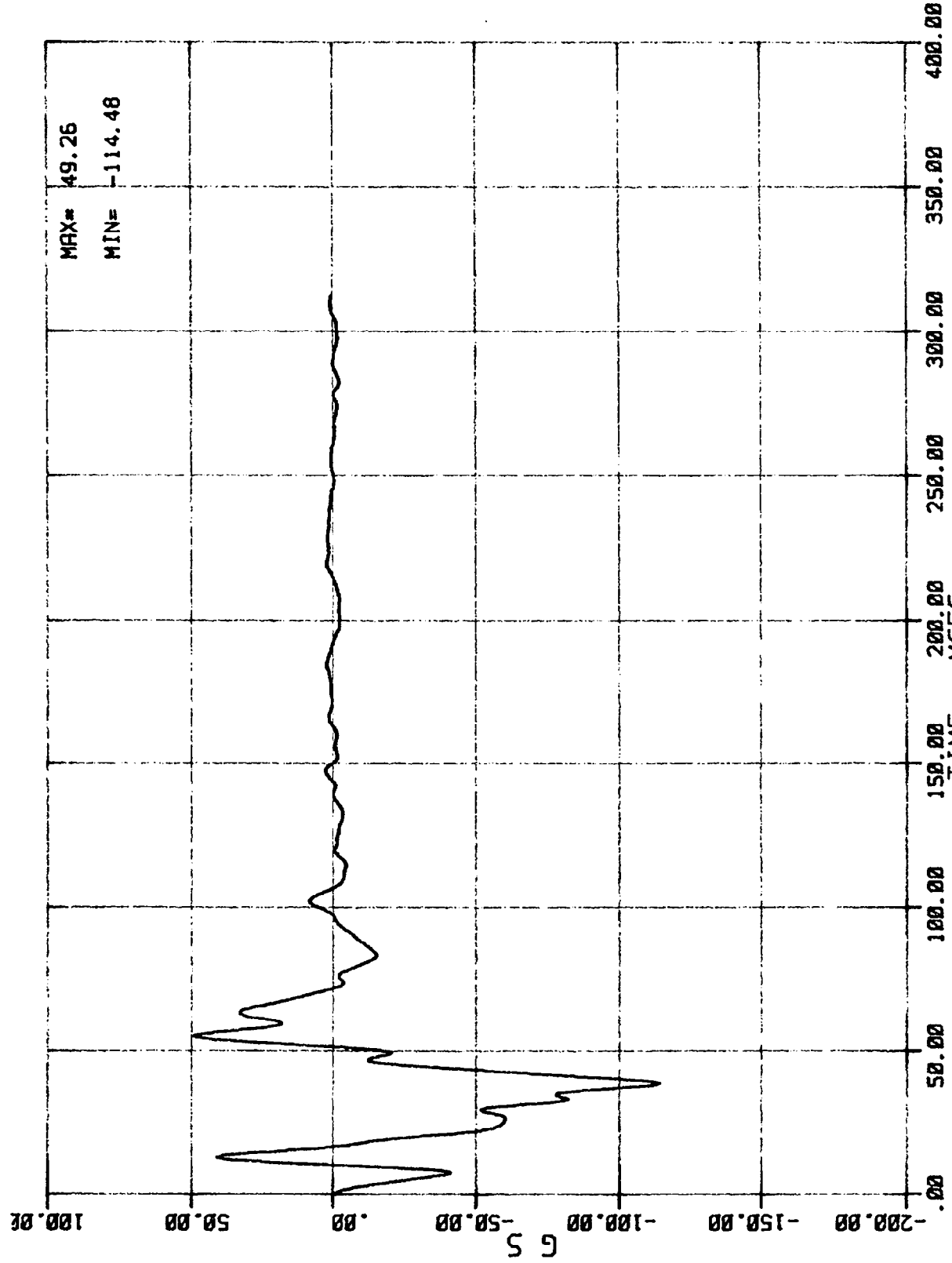


24 DT 01 2 SHB (PASSENGER'S SHOULDER BELT ELONGATION)
MSE N02048 1988 FORD F-150 PICKUP TRUCK

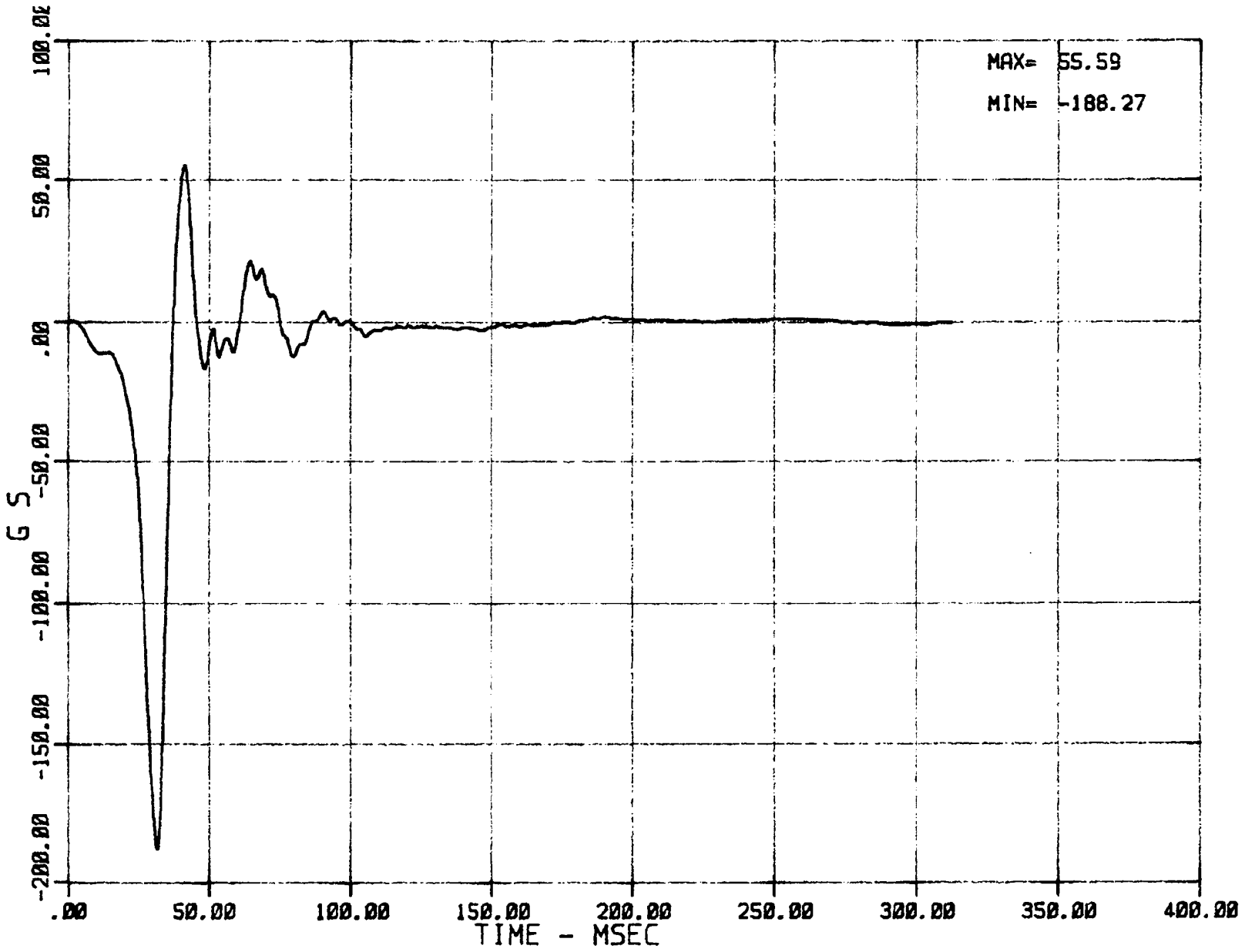
03/15/88



25 AC 01 N BCR X (LEFT FRONT WHEEL ACCEL. -- X-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



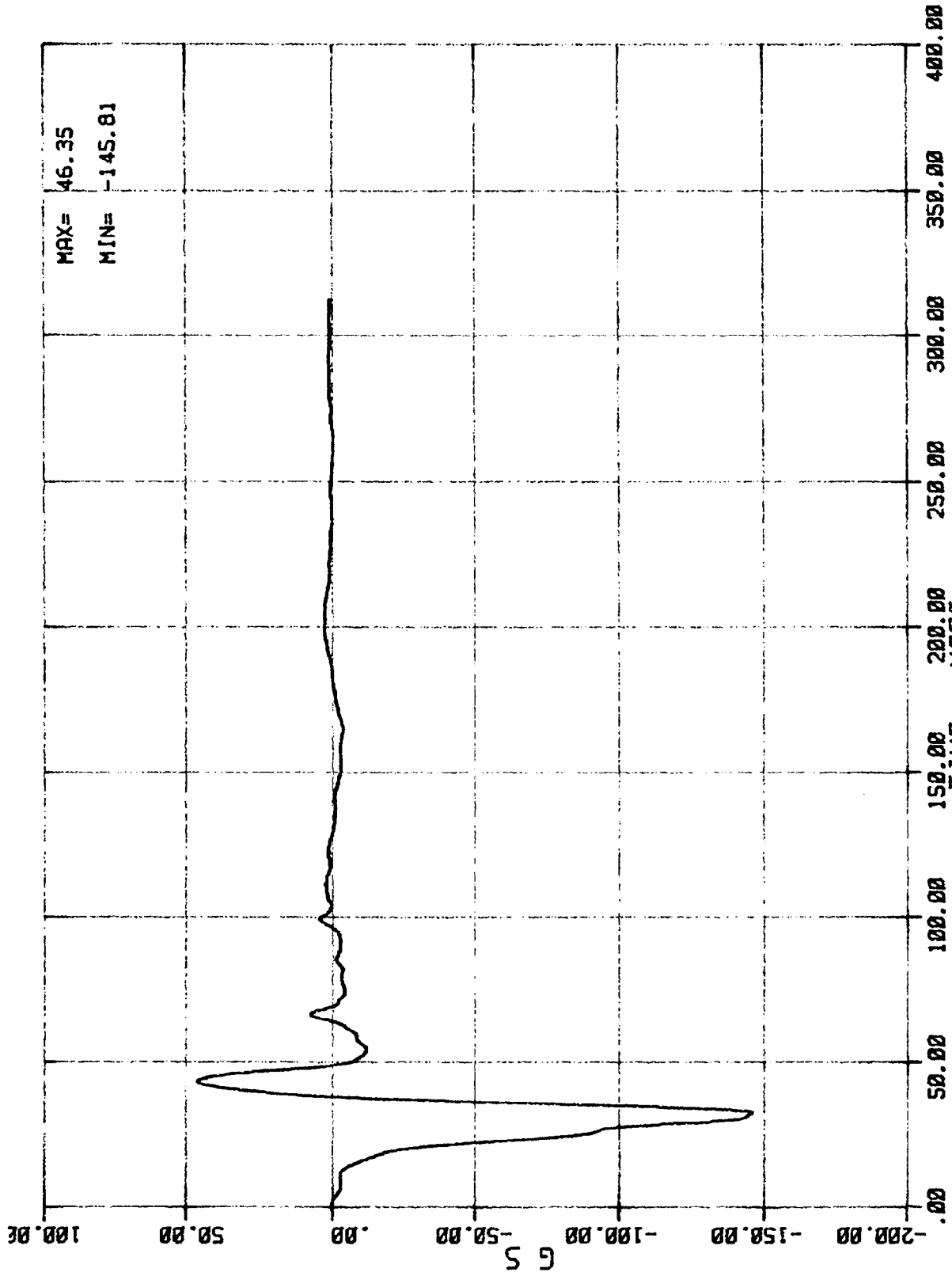
26 AC 01 N BCR X (RIGHT FRONT WHEEL ACCEL. -- X-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK
03/15/88



27 AC 01 N ENG X (BOTTOM OF ENGINE ACCEL. -- X-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

87

MSE-88-R7157-N04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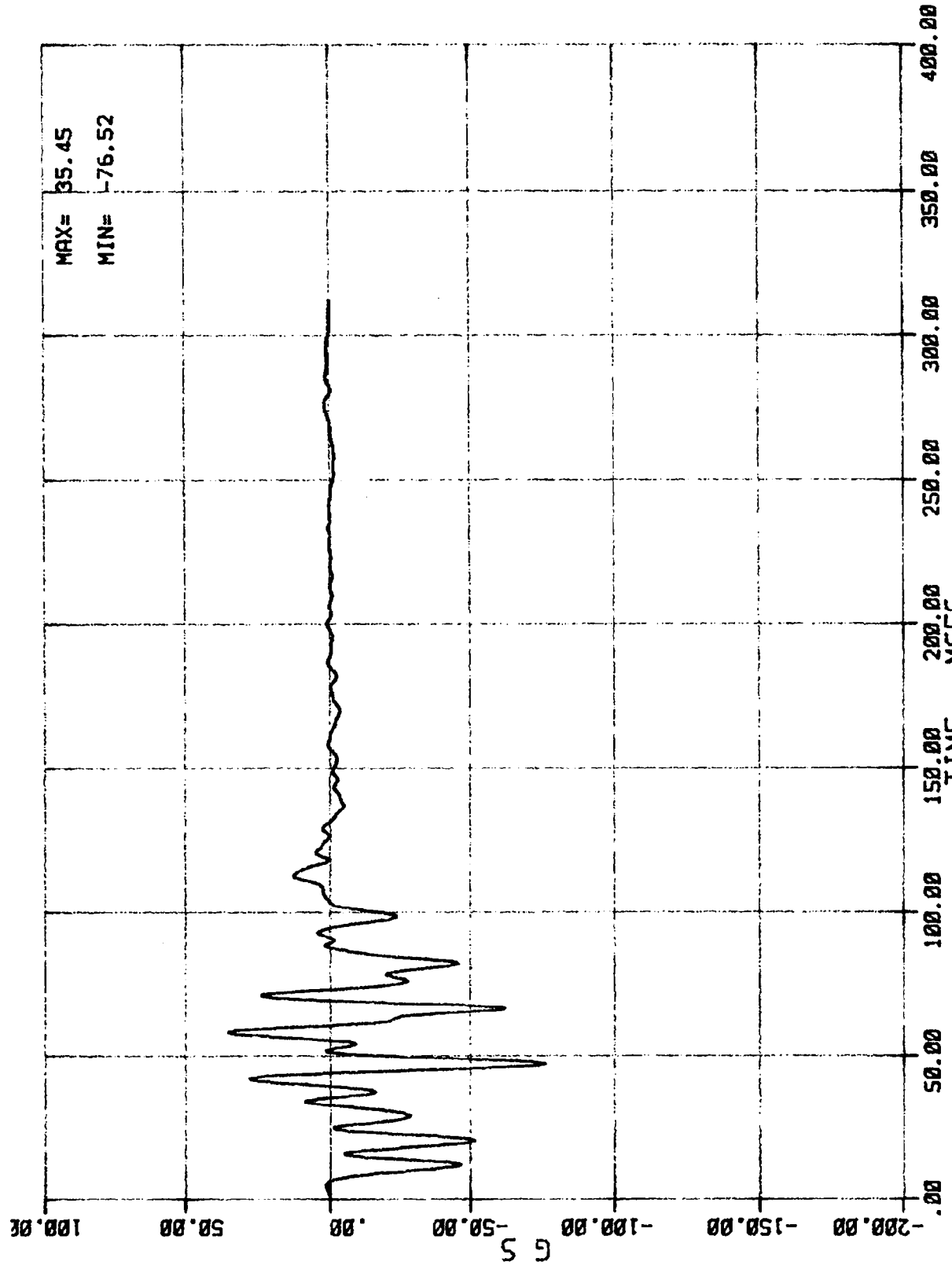
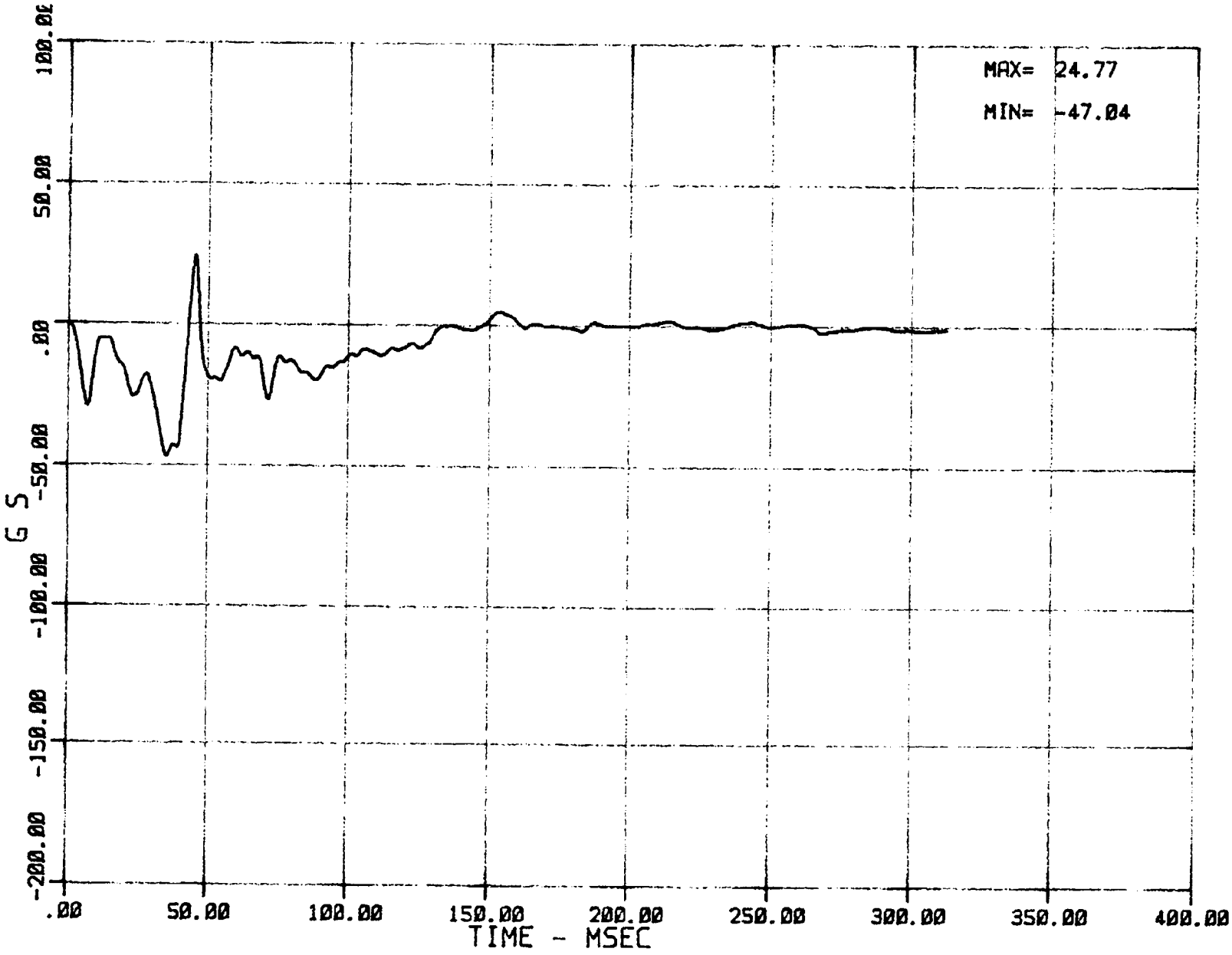
-200.00
-150.00
-100.00
-50.00
.00
50.00
100.00
G S
TIME - MSEC
28 AC 01 N ENG X (TOP OF ENGINE ACCEL. -- X-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK
03/15/88

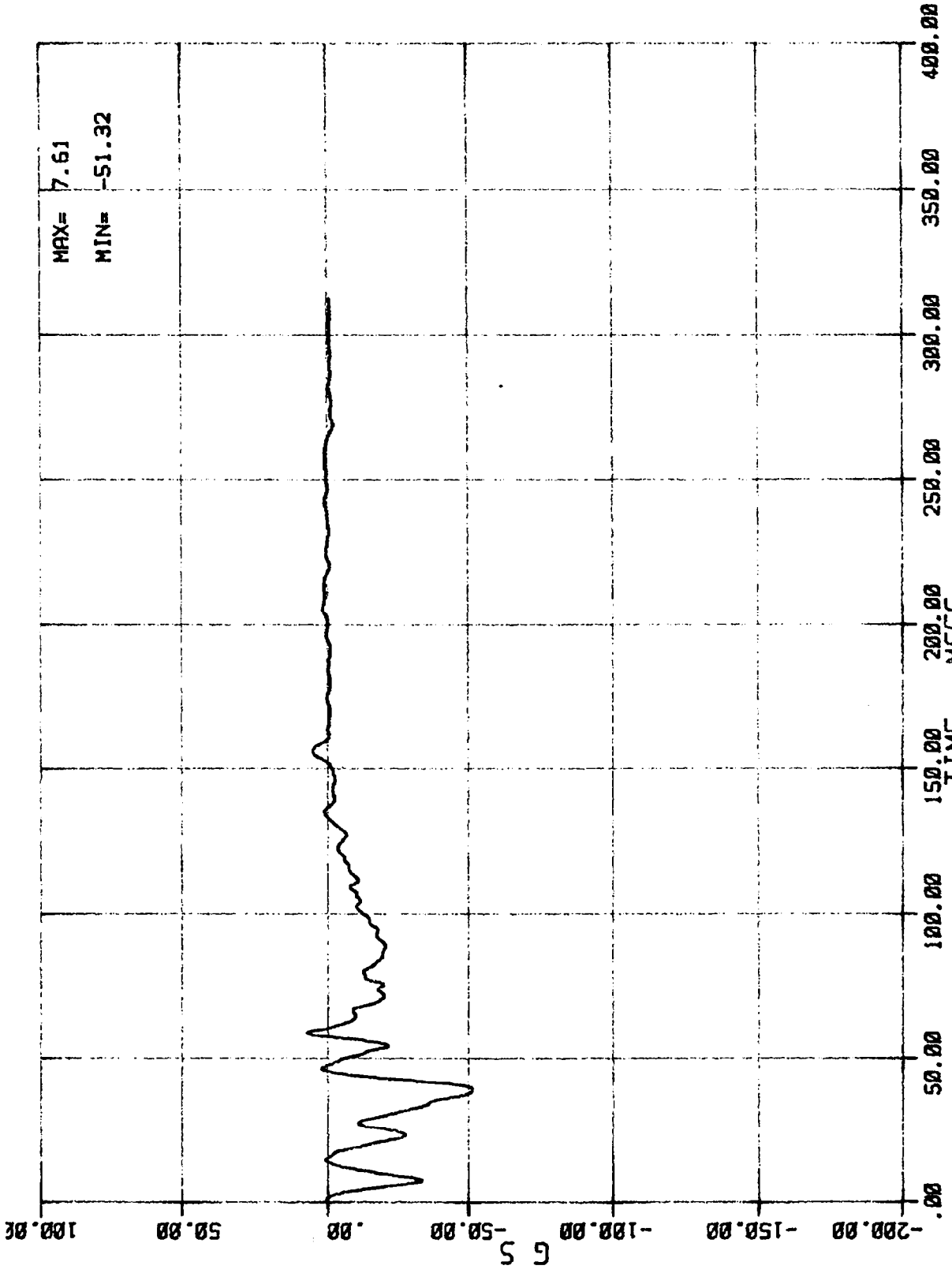


29 AC 01 N DPC X (CENTER OF DASH ACCEL, -- X-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK

03/15/88



30 AC 01 N LRF (LEFT REAR FLOOR ACCEL. -- X-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



31 AC 01 N RRF (RIGHT REAR FLOOR ACCEL. -- X-AXIS)
MSE N02048 1988 FORD F-150 PICKUP TRUCK

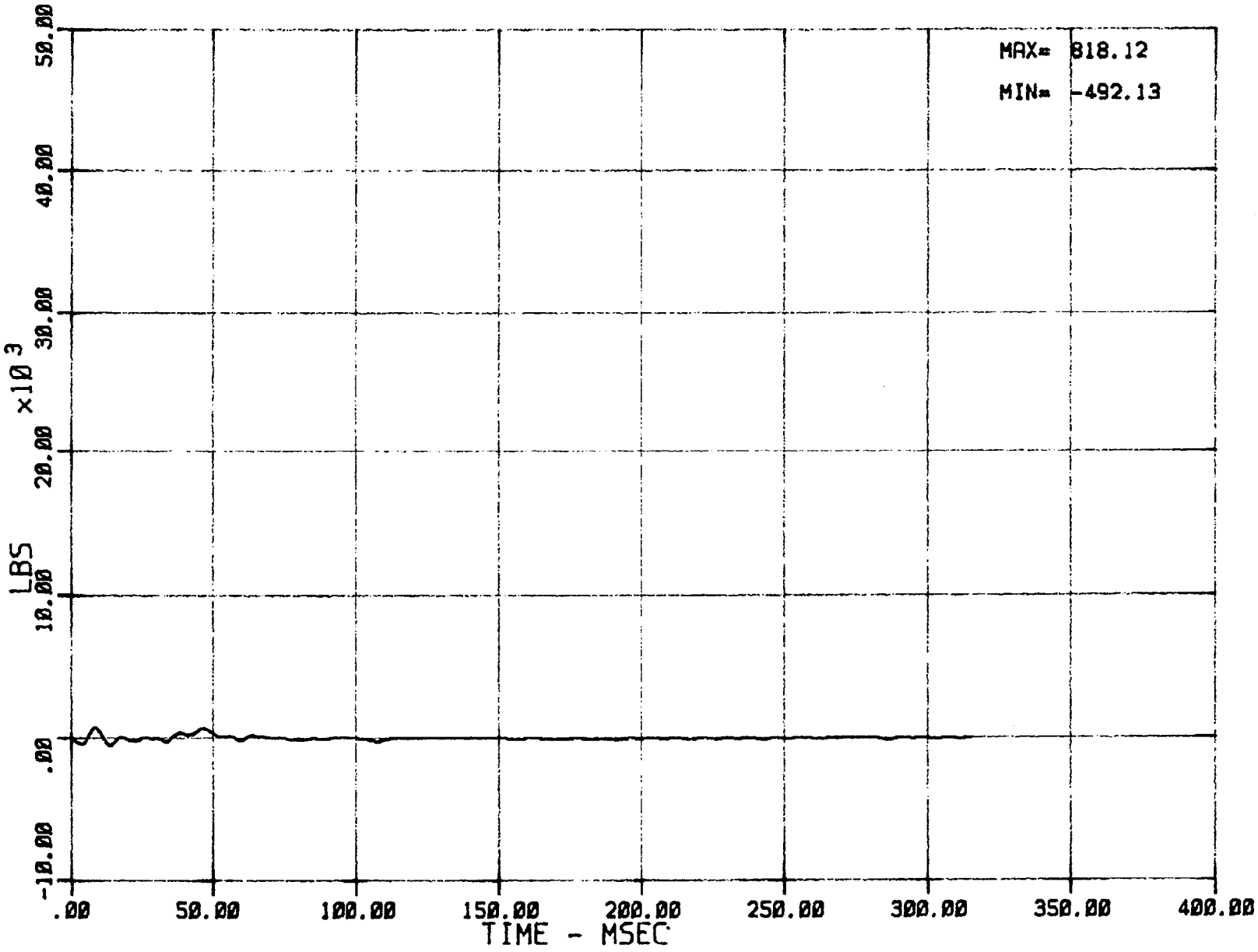
03/15/88

APPENDIX B-2

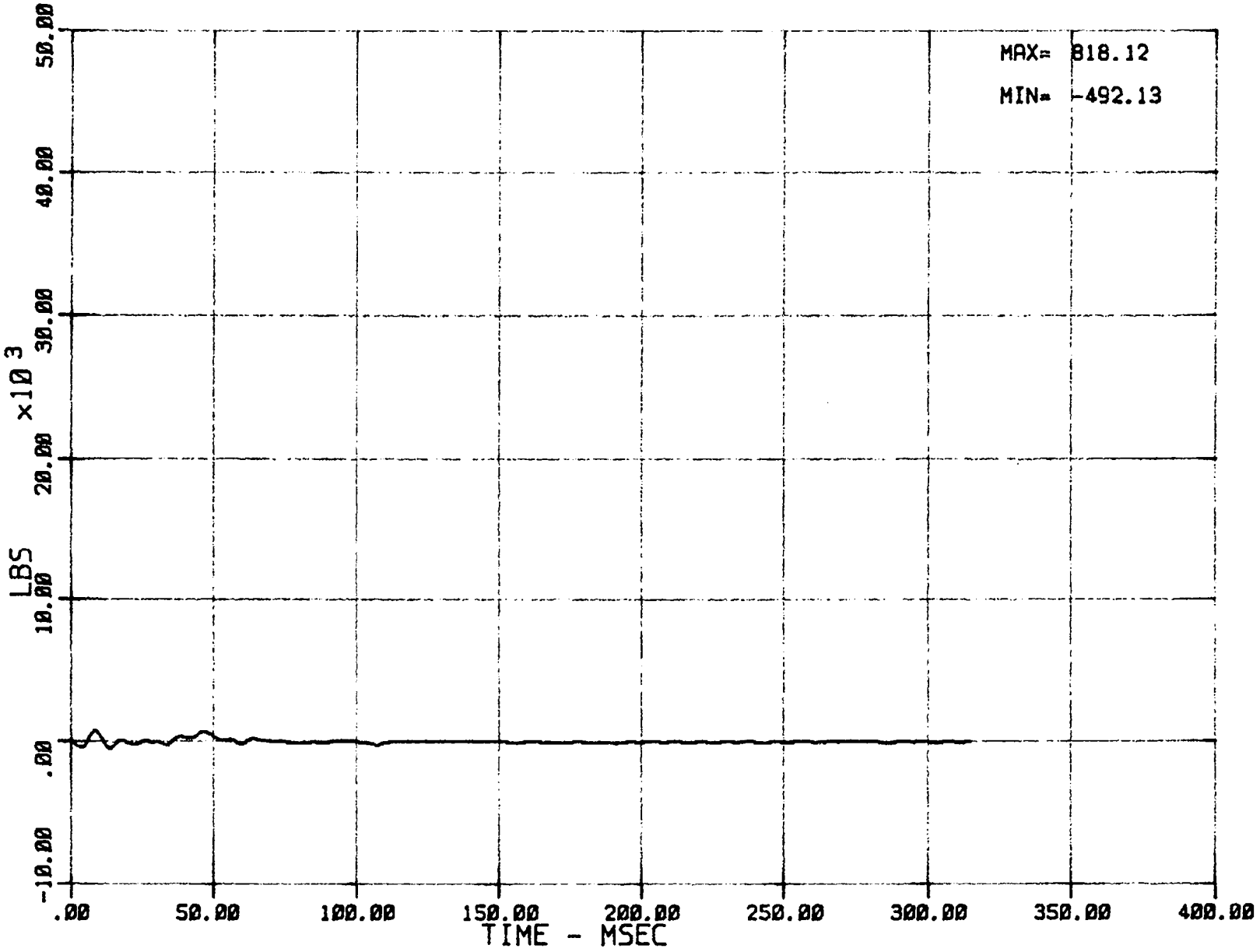
LOAD CELL BARRIER DATA

DATA FILTERING:

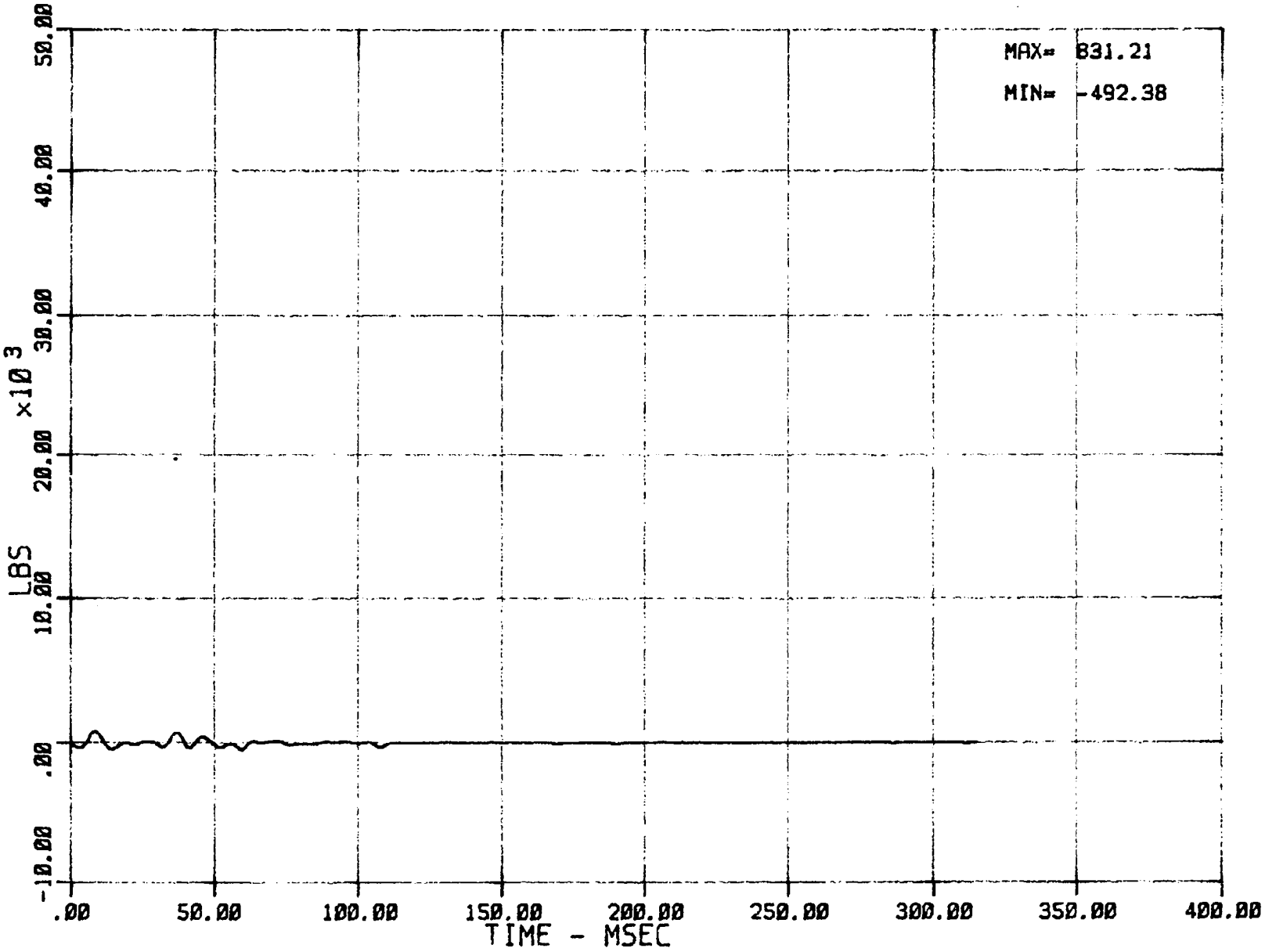
Load Cell Barrier channels - Class 60



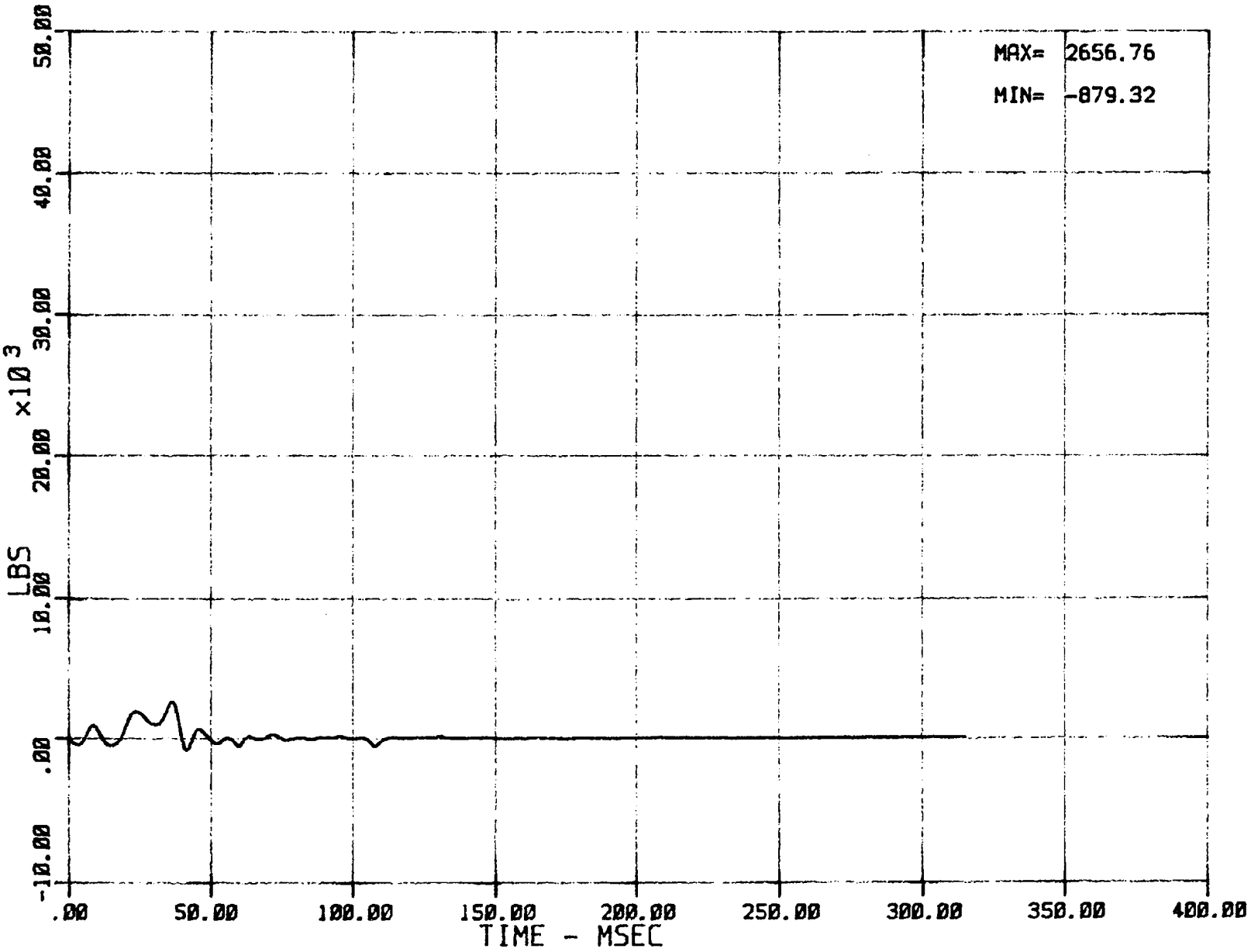
32 LC BA N BA1 (BARRIER LOAD CELL A1 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



33 LC BA N BA2 (BARRIER LOAD CELL A2 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



34 LC BA N BA3 (BARRIER LOAD CELL A3 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



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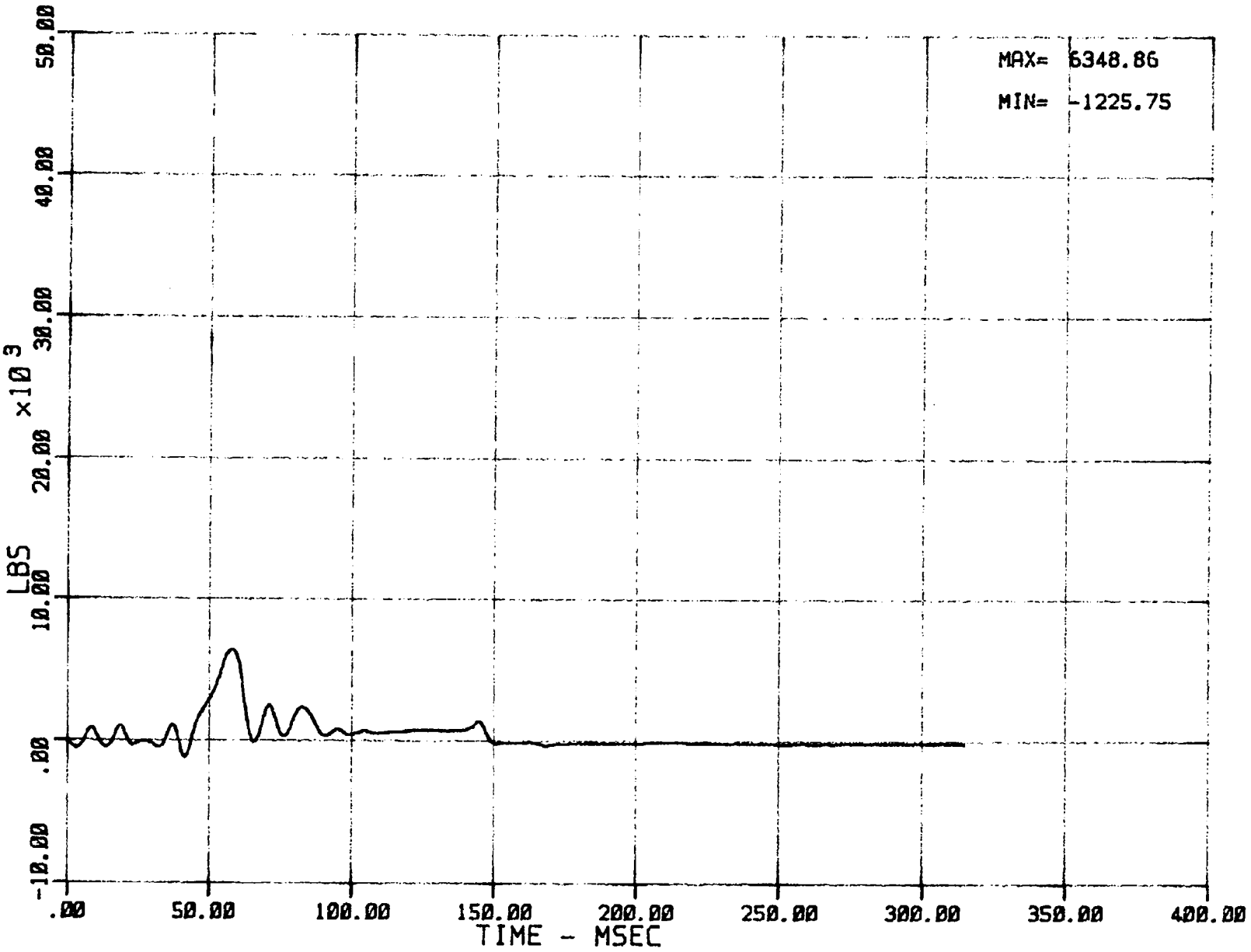
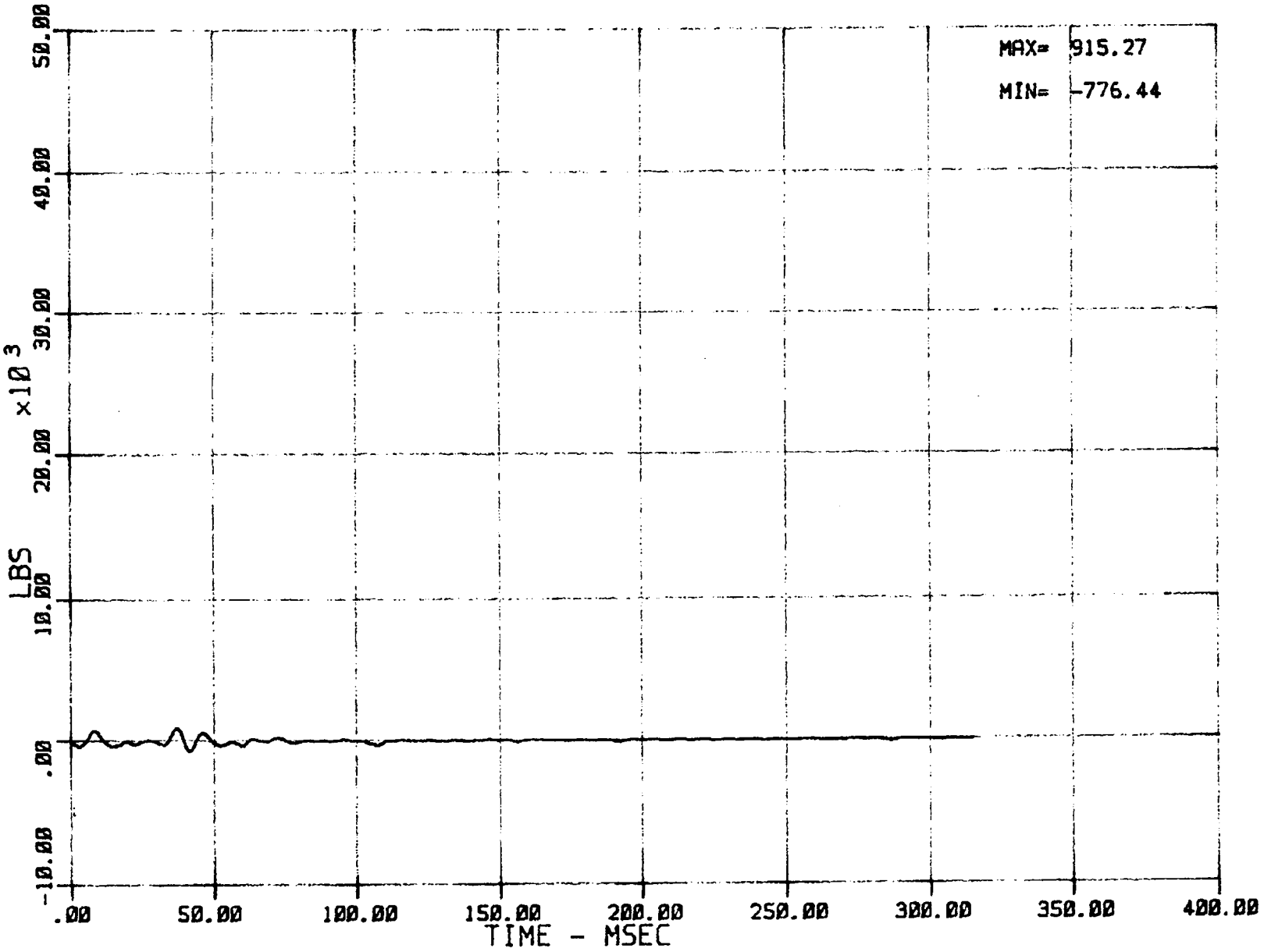
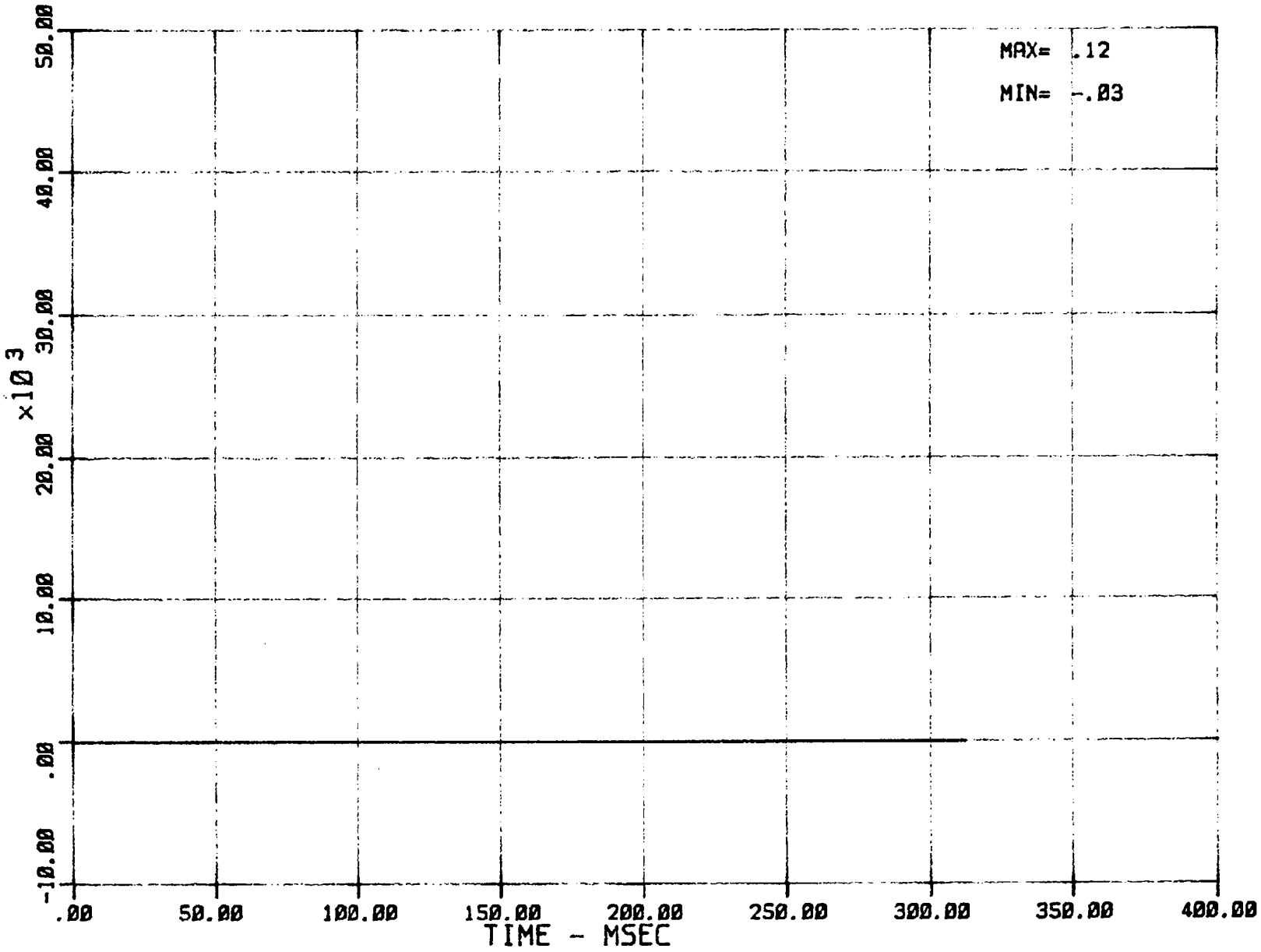
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



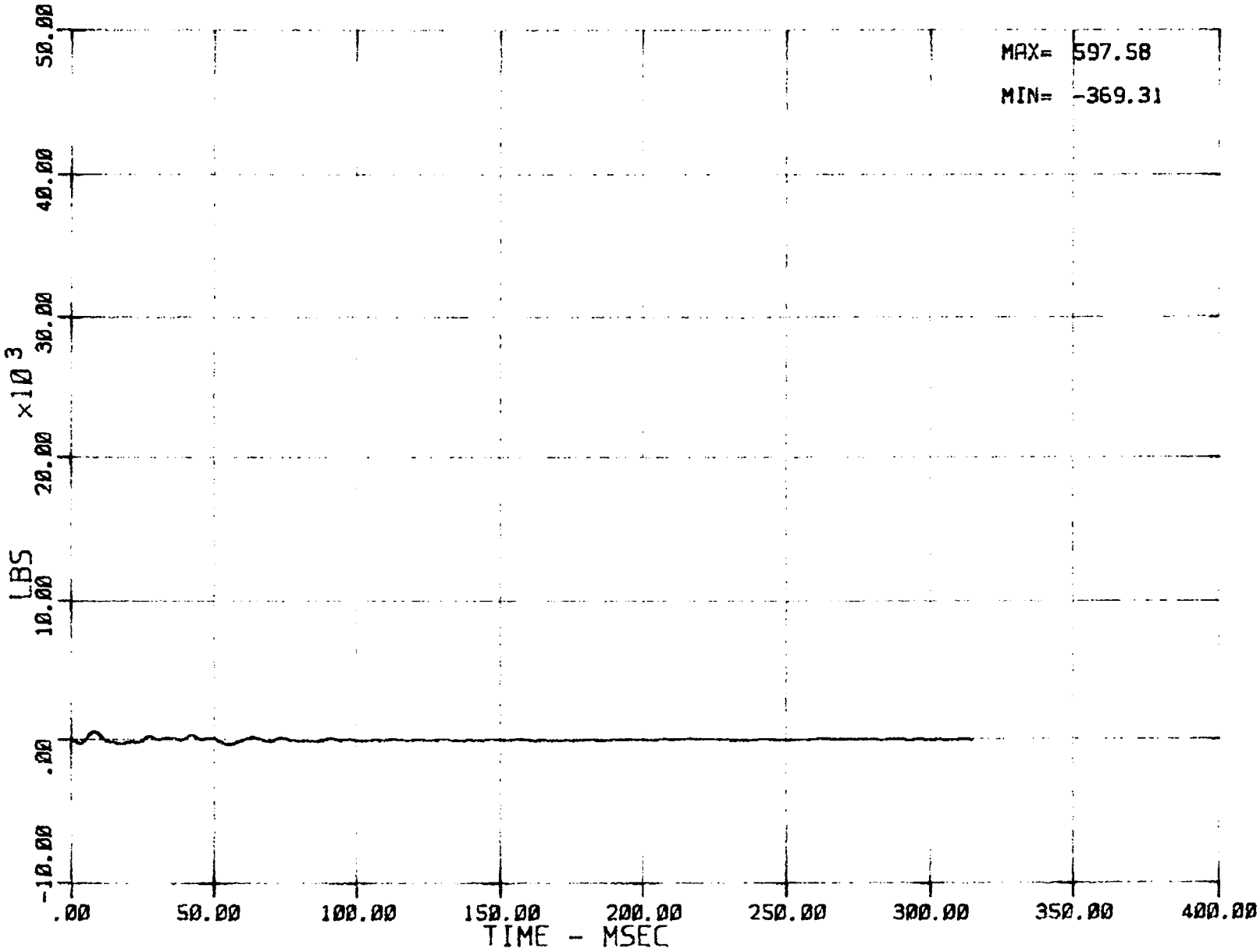
36 LC BA N BAS (BARRIER LOAD CELL AS - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



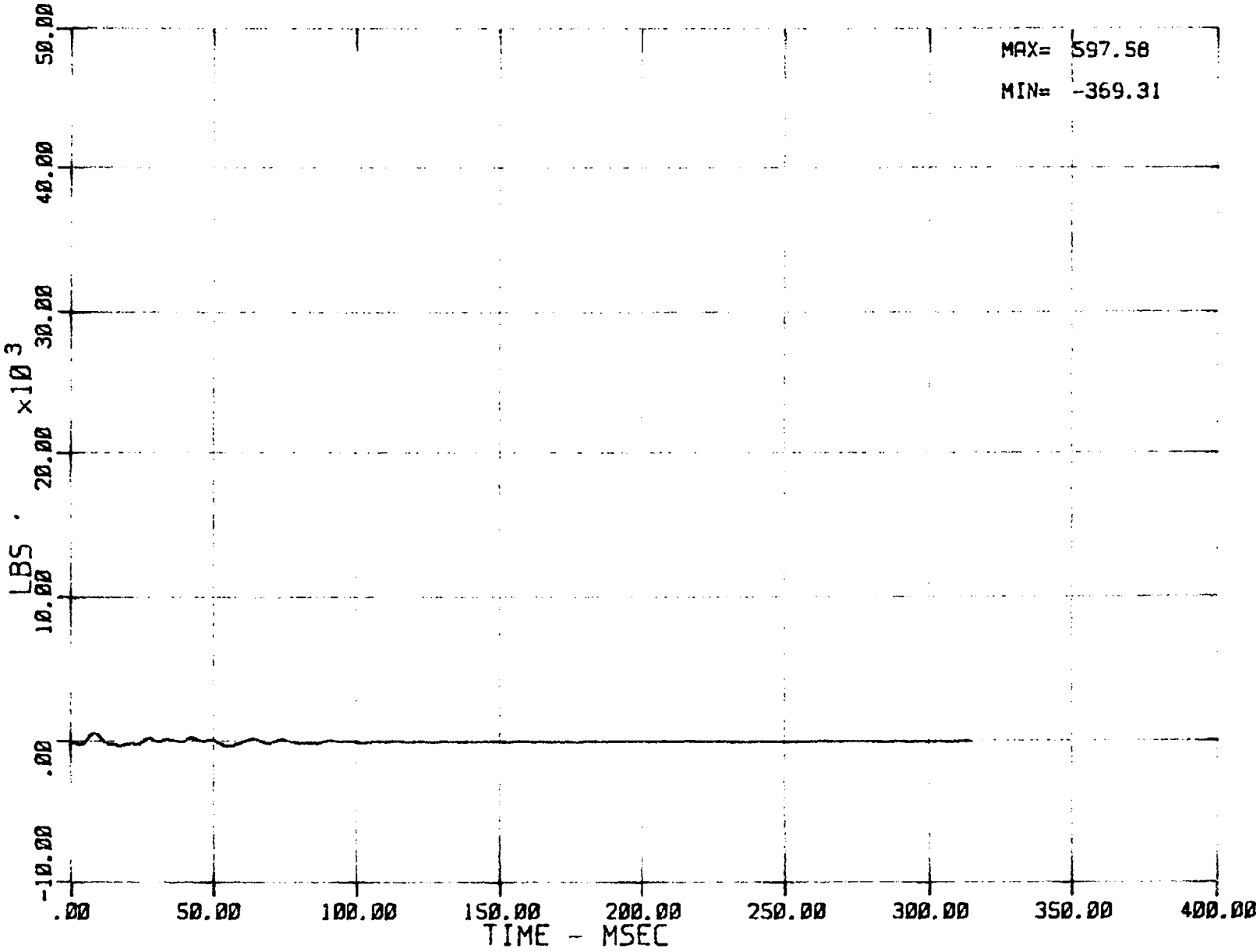
37 LC BA N BA6 (BARRIER LOAD CELL A6 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



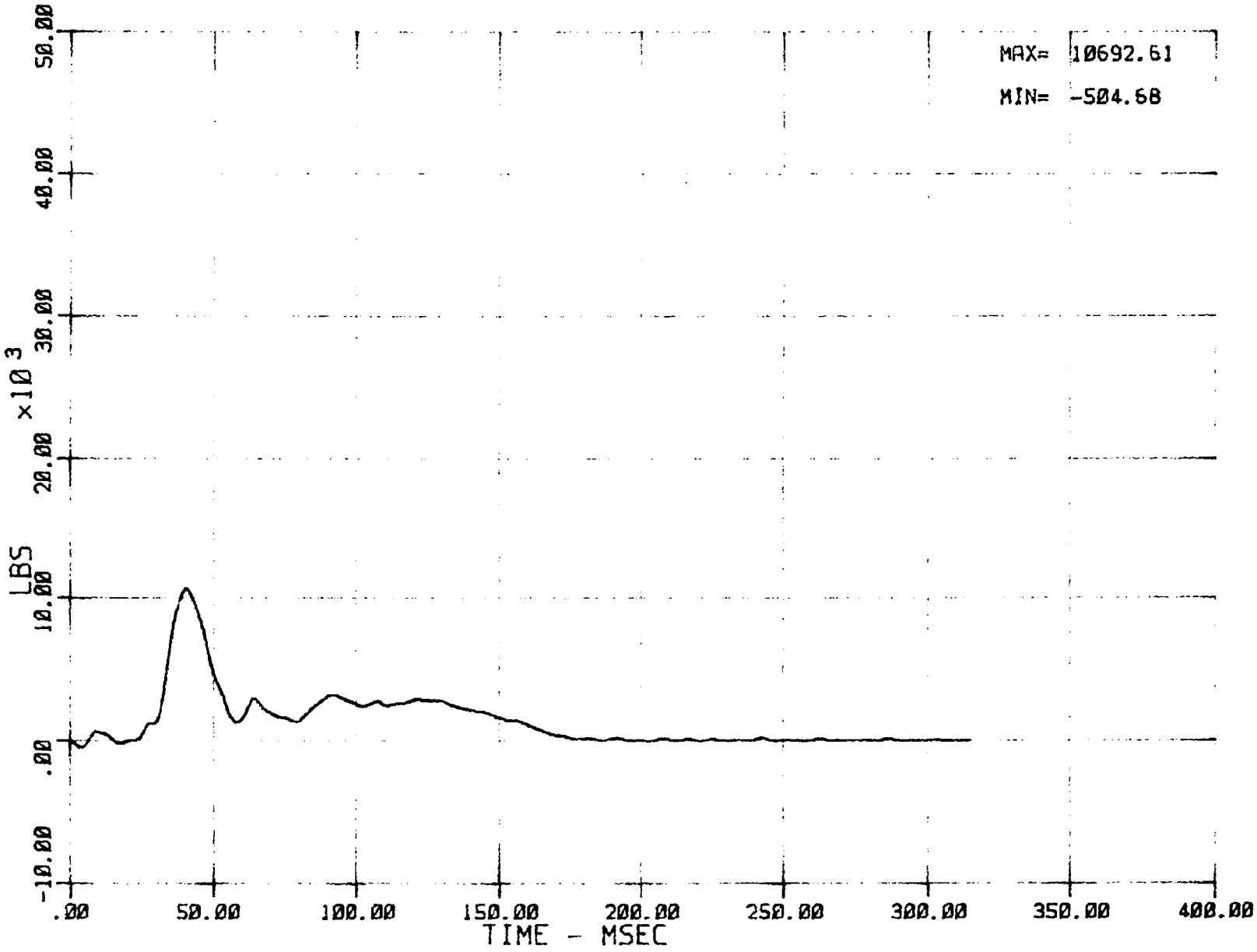
38 LC BA N BA7 (BARRIER LOAD CELL A7 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



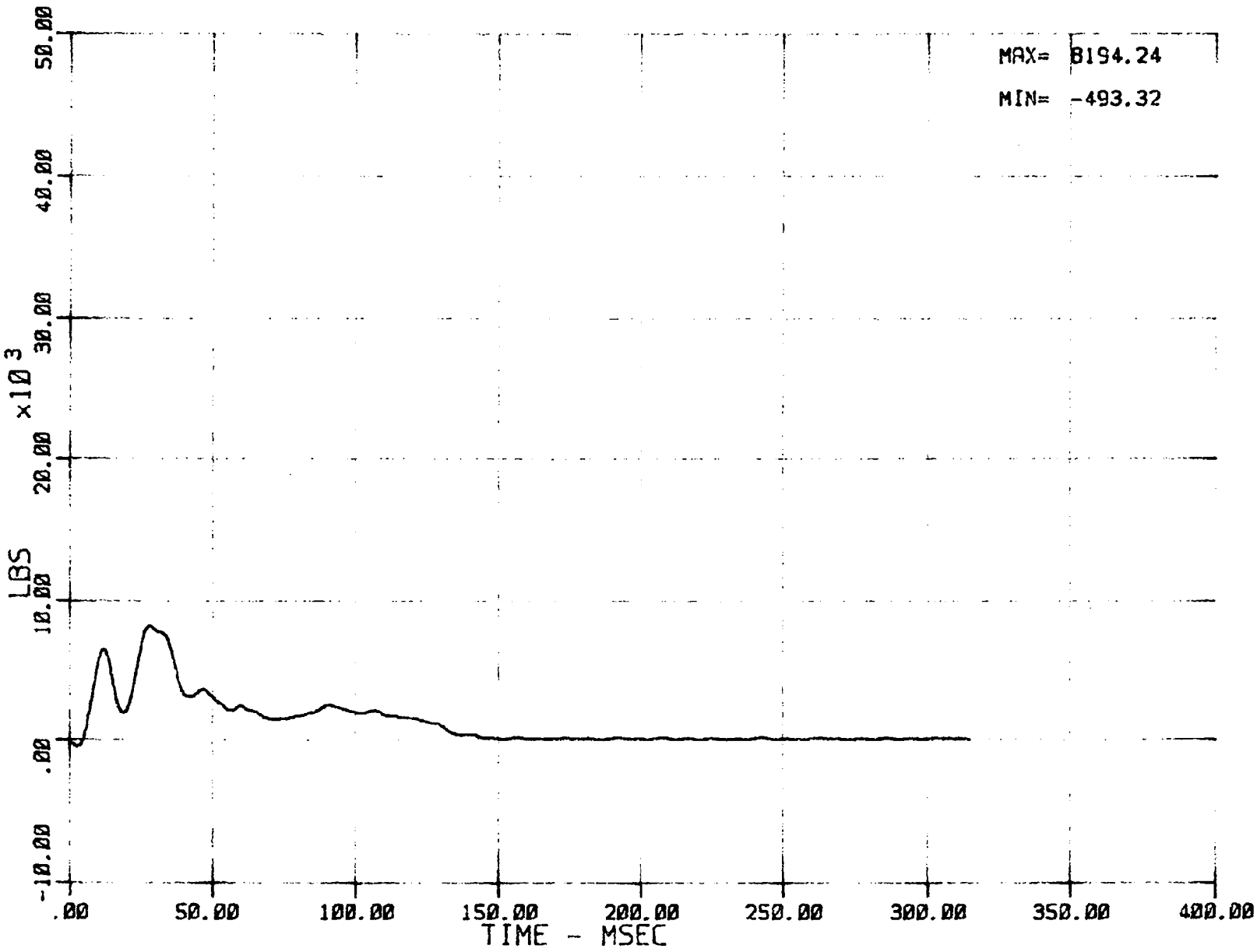
39 LC BA N BAB (BARRIER LOAD CELL AB - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



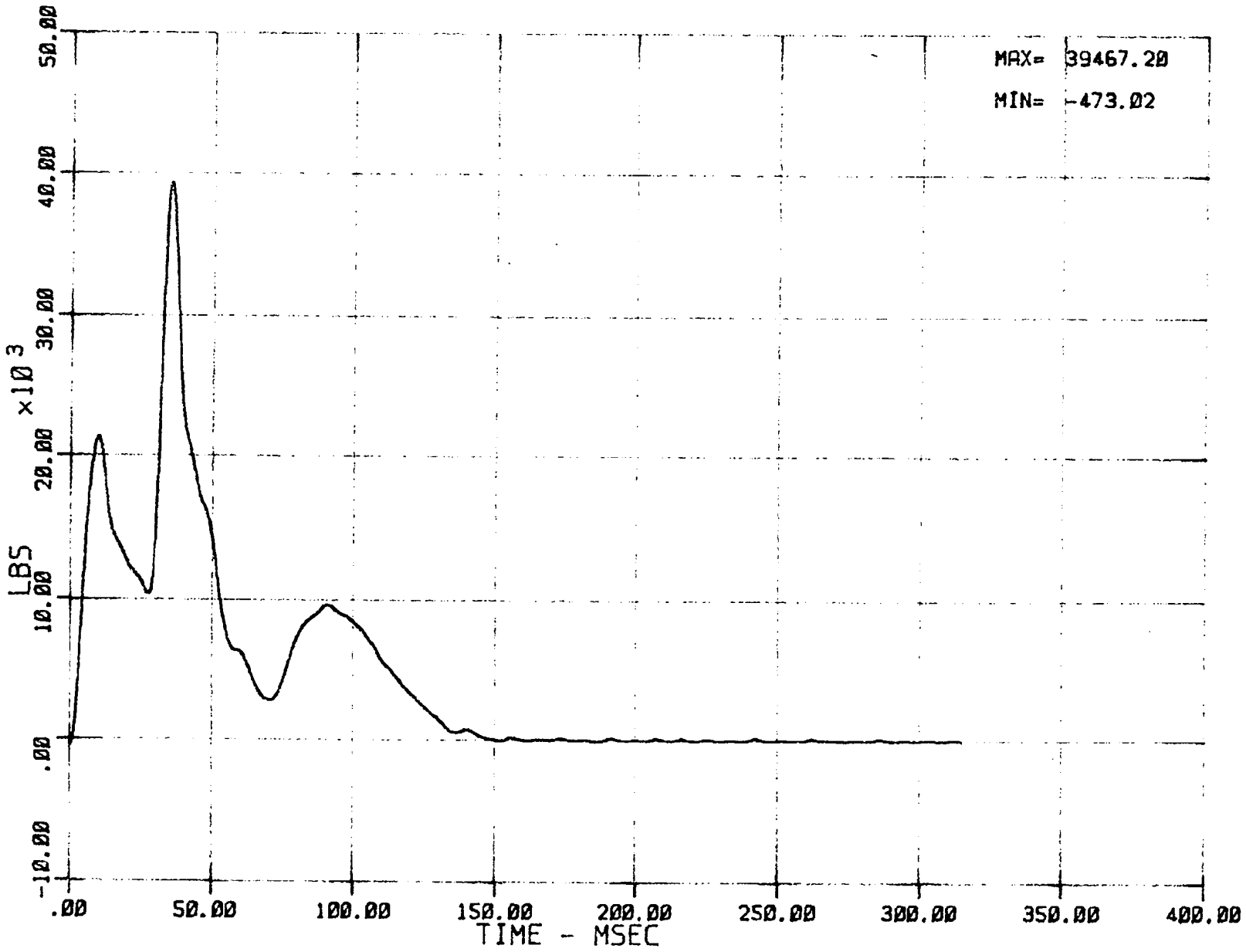
40 LC BA N BA9 (BARRIER LOAD CELL AS - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



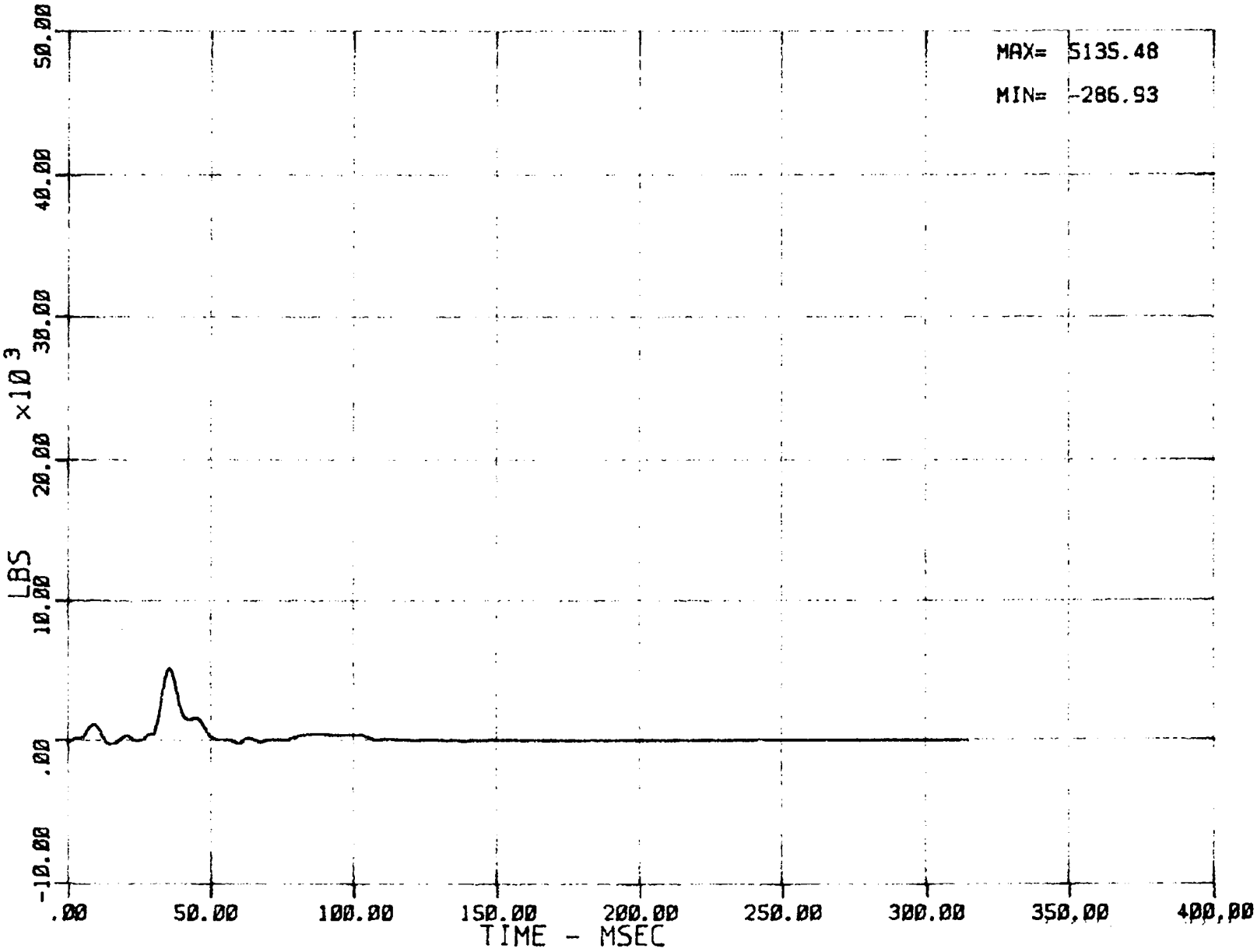
41 LC BA N BB1 (BARRIER LOAD CELL B1 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



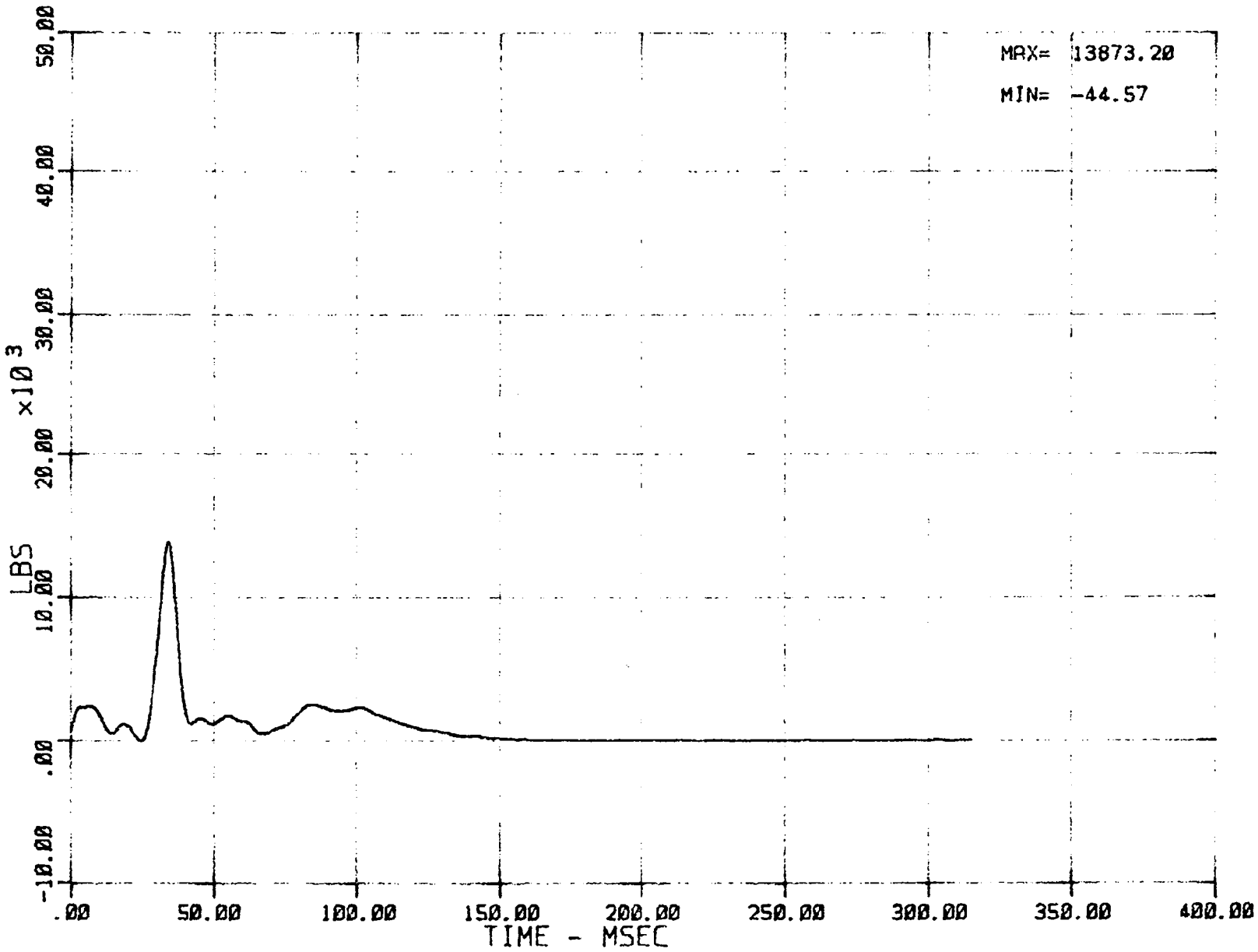
42 LC BA N BB2 (BARRIER LOAD CELL B2 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



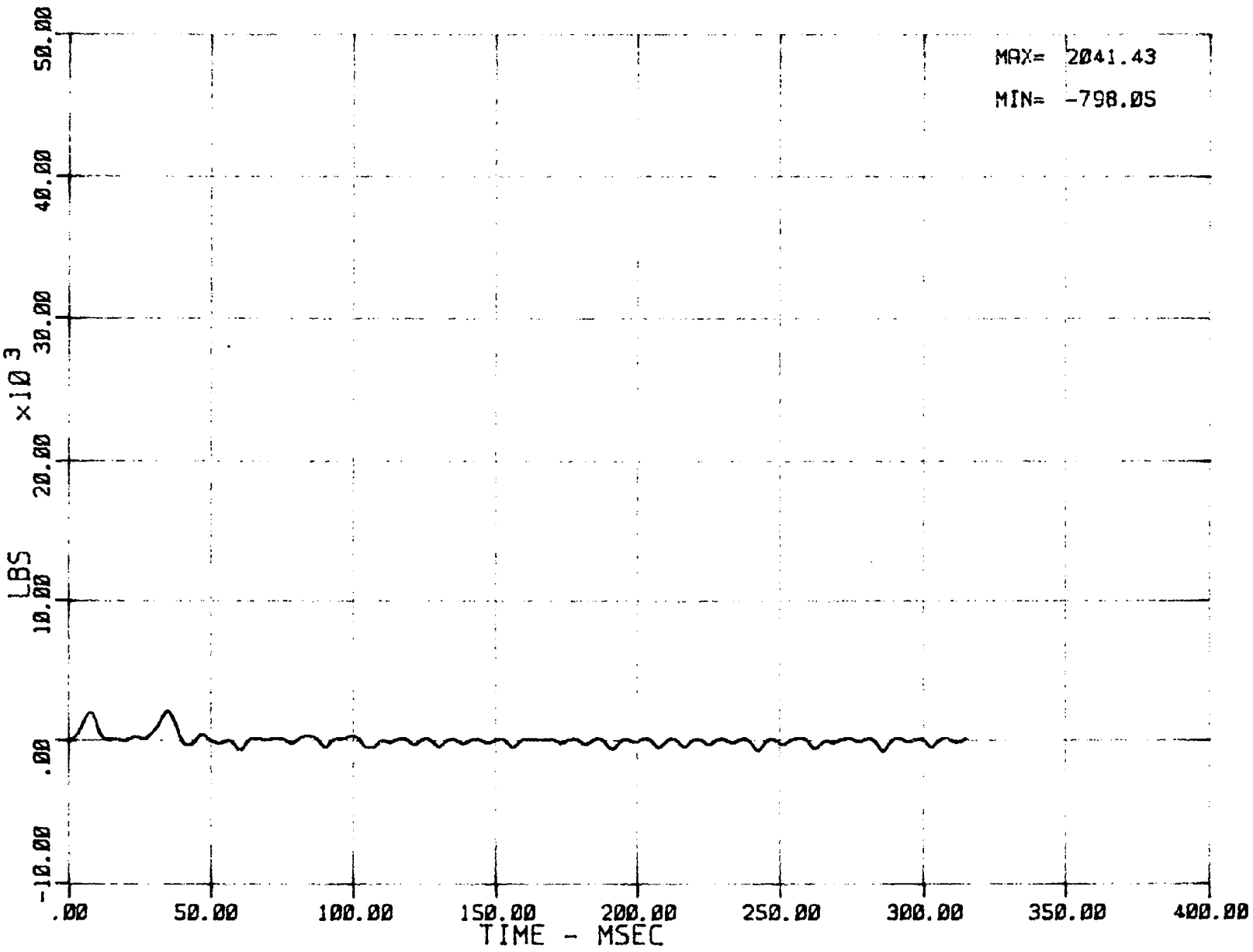
43 LC BA N BB3 (BARRIER LOAD CELL B3 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



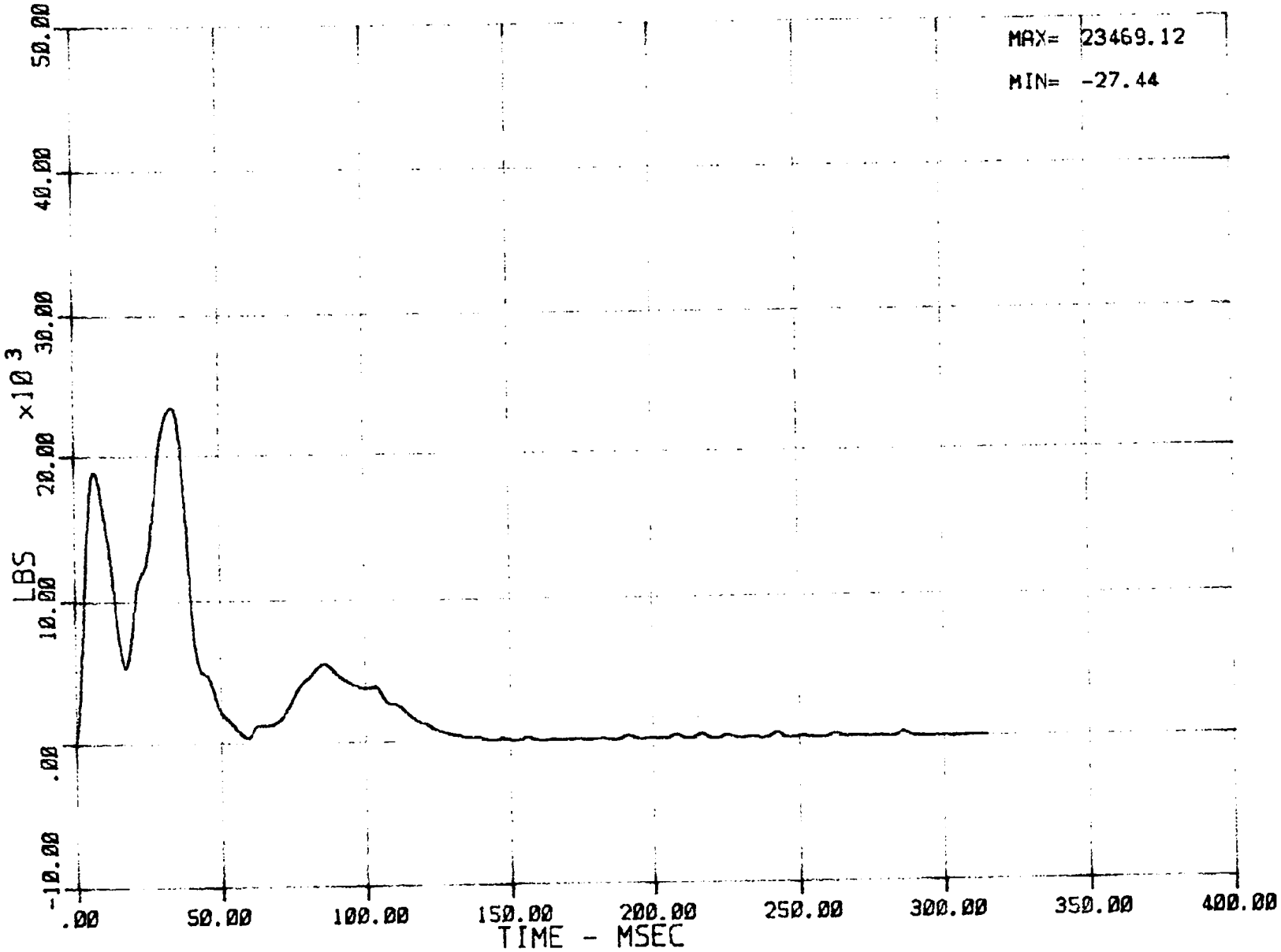
44 LC BA N BB4 (BARRIER LOAD CELL B4 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



45 LC BA N BBS (BARRIER LOAD CELL BS - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

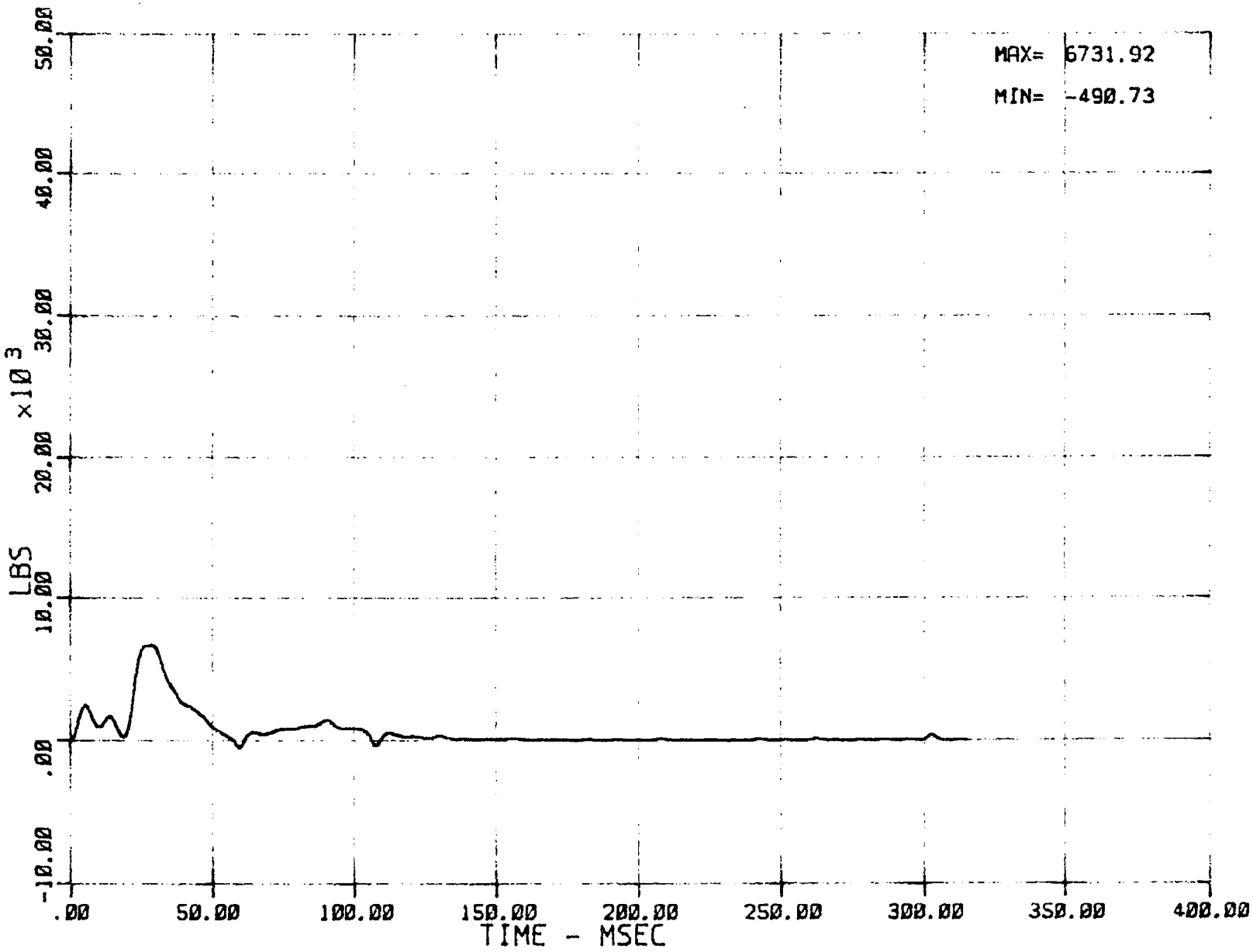


46 LC BA N BB6 (BARRIER LOAD CELL B6 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

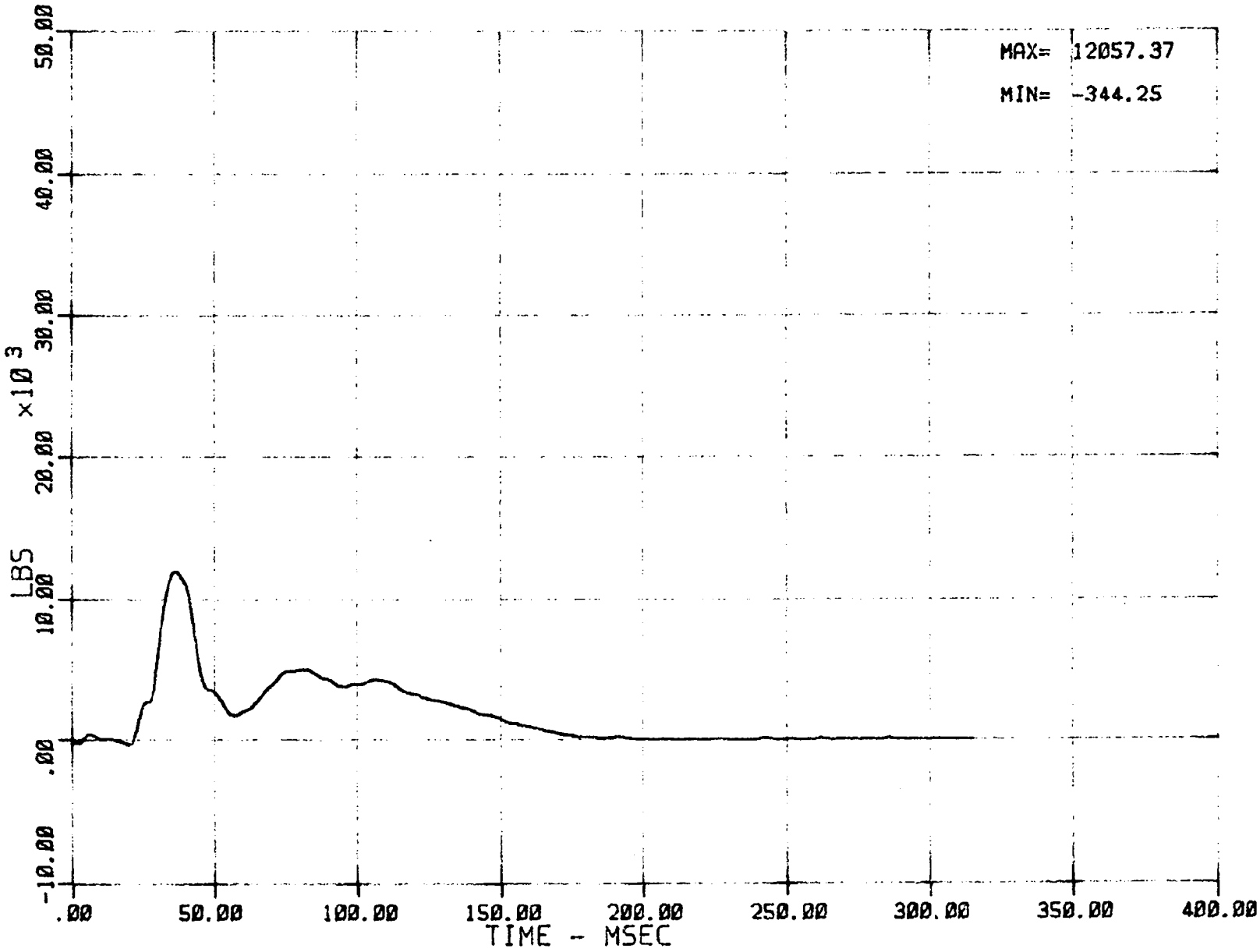


47 LC BA N BB7 (BARRIER LOAD CELL B7 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK

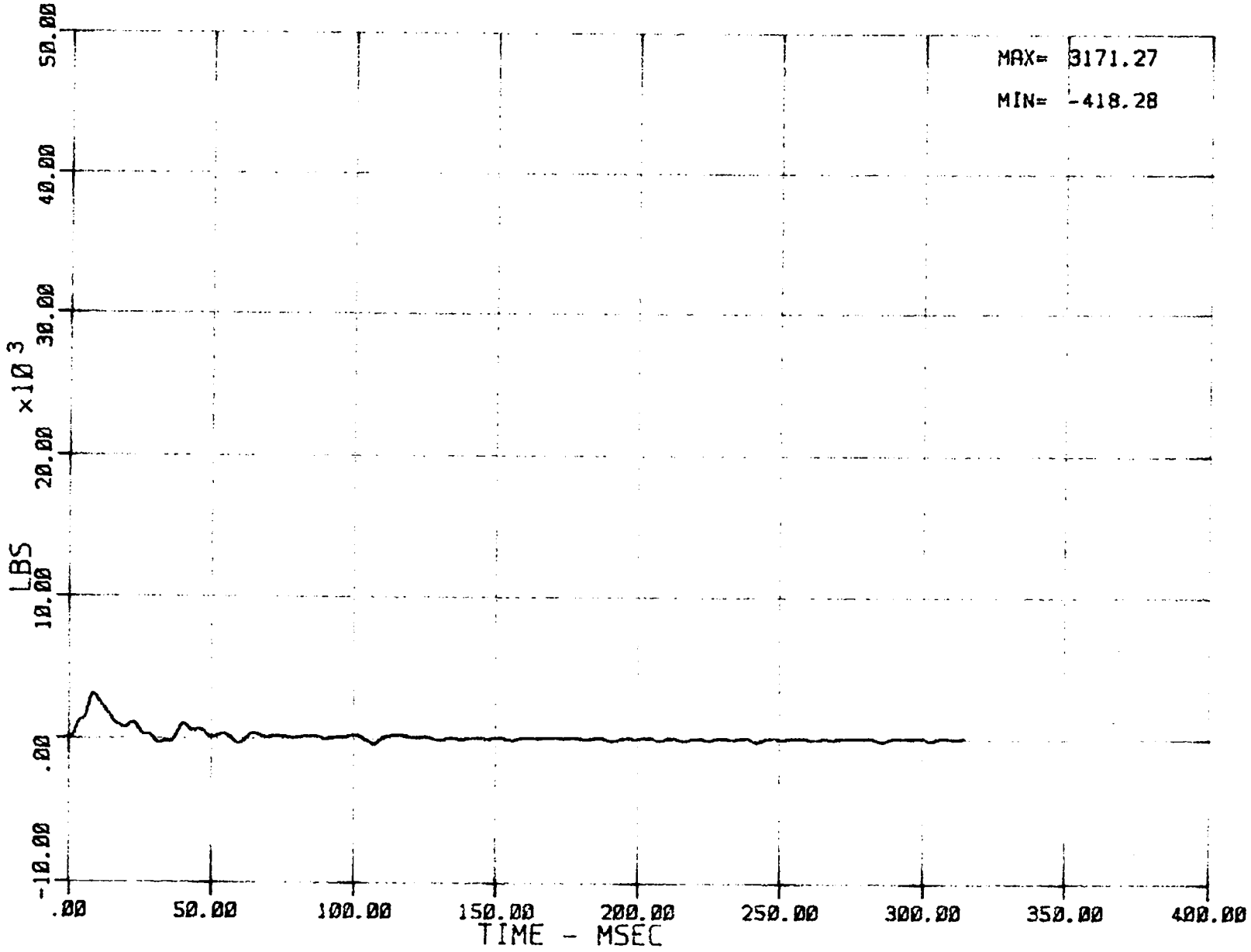
03/15/88



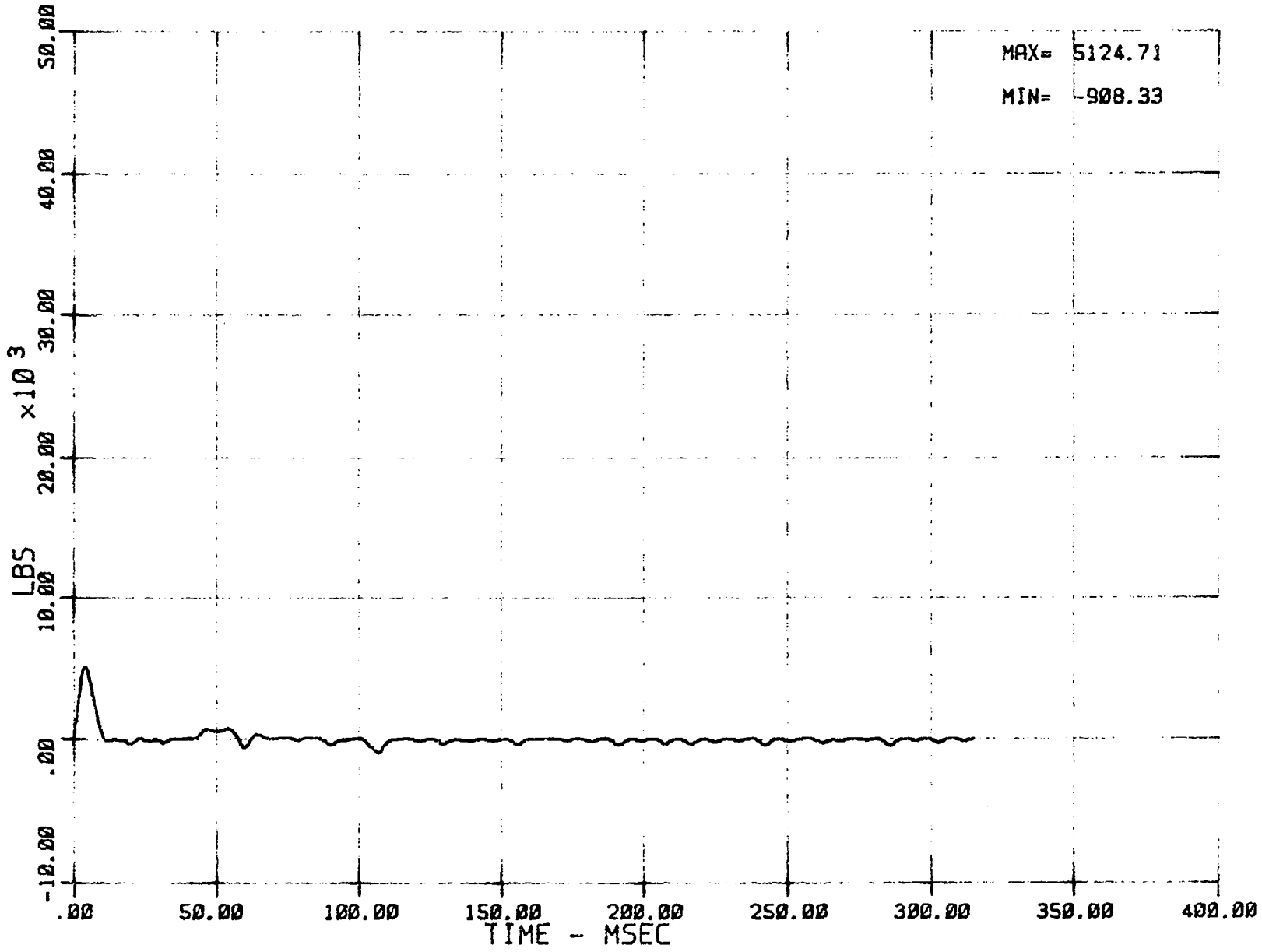
48 LC BA N 888 (BARRIER LOAD CELL B8 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



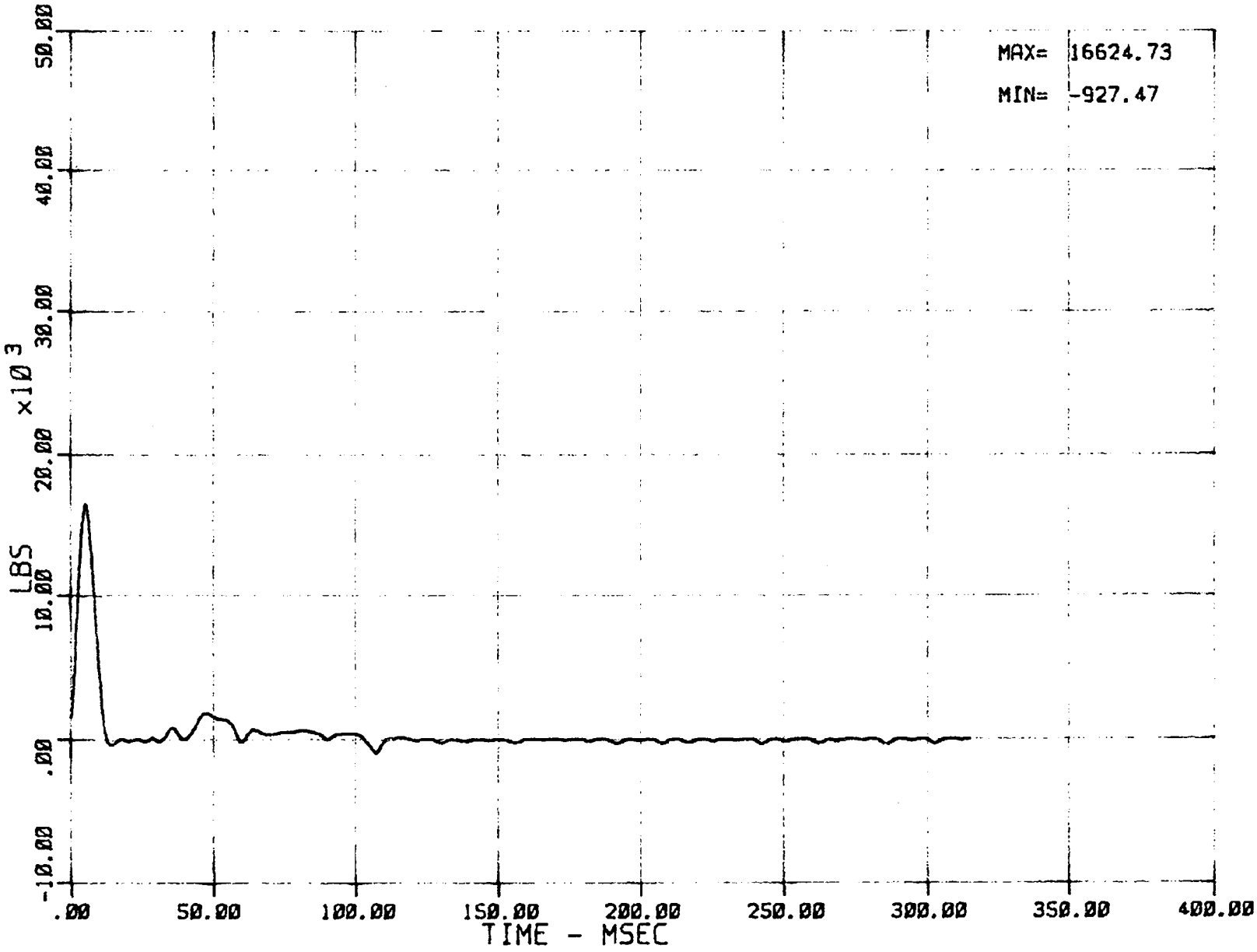
49 LC BA N BB9 (BARRIER LOAD CELL B9 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



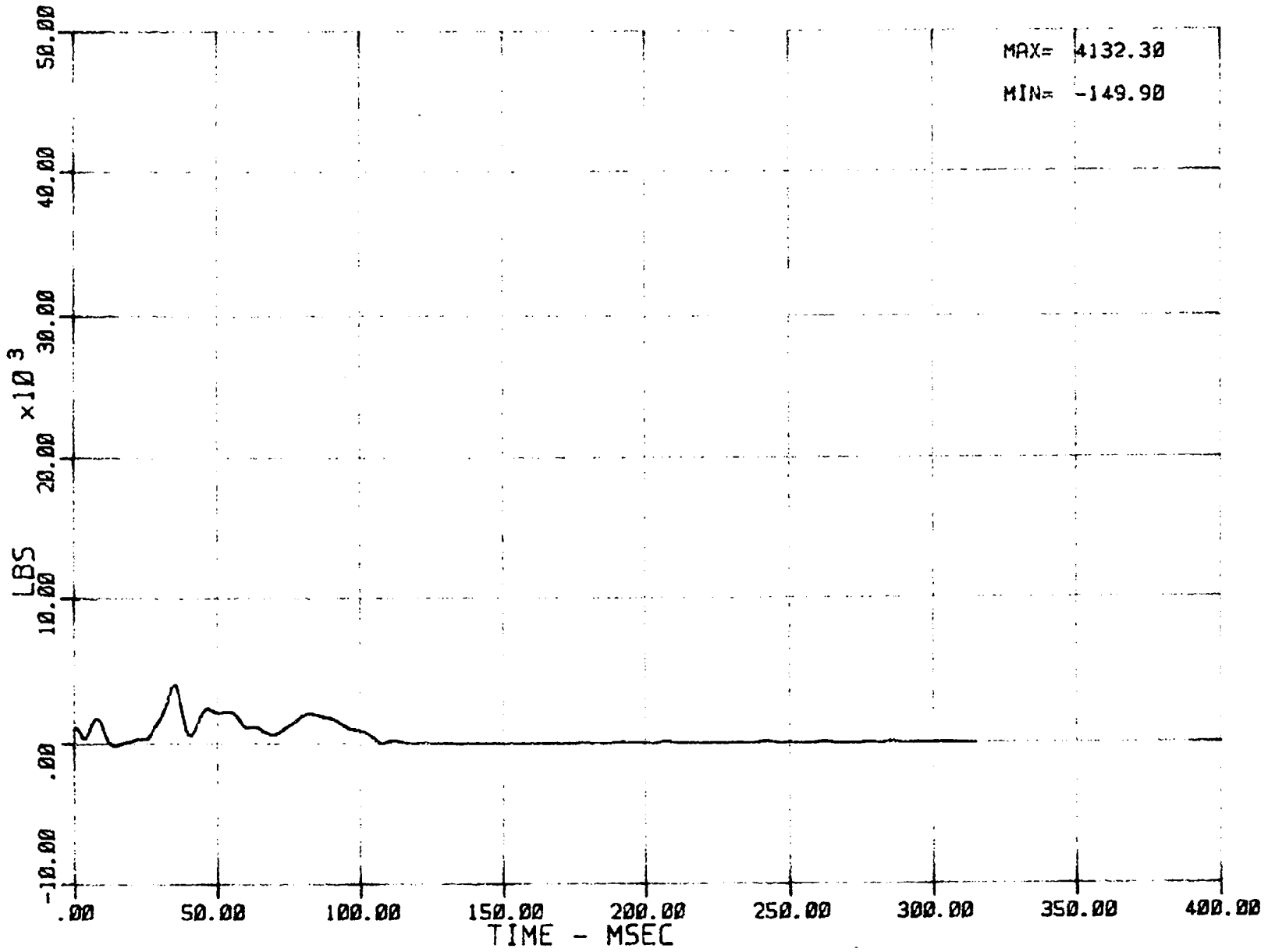
50 LC BA N BC1 (BARRIER LOAD CELL C1 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



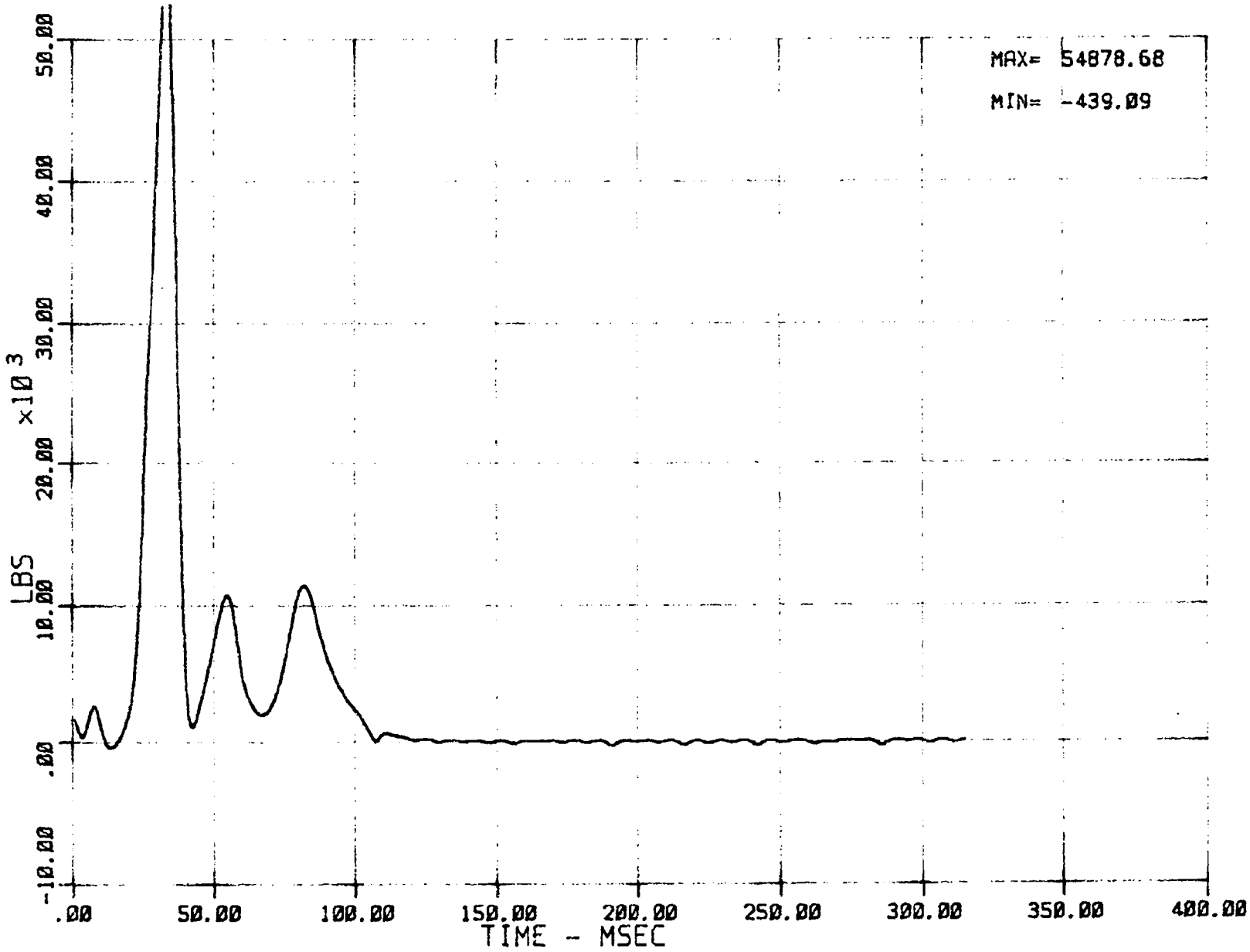
51 LC BA N BC2 (BARRIER LOAD CELL C2 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



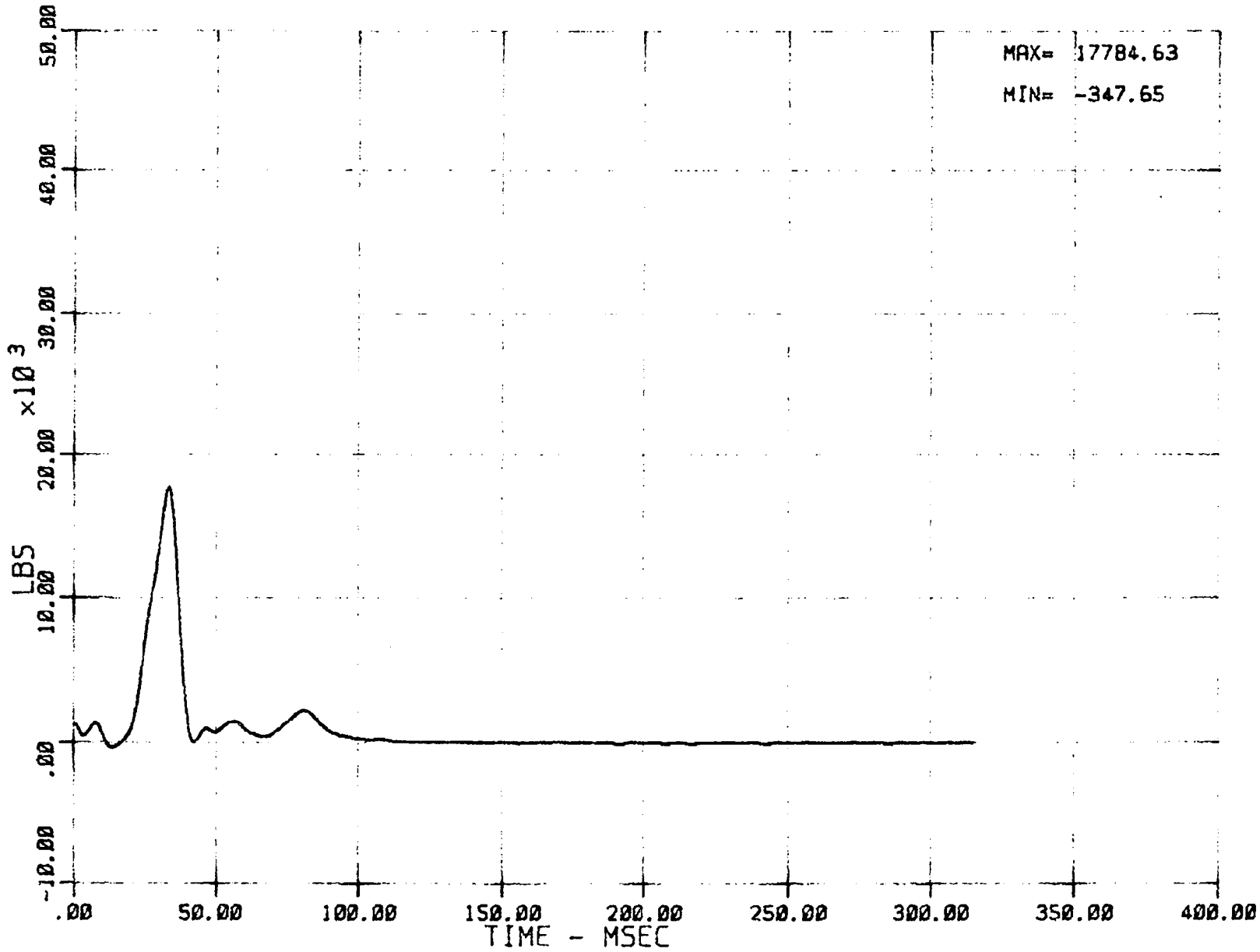
S2 LC BA N BC3 (BARRIER LOAD CELL C3 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



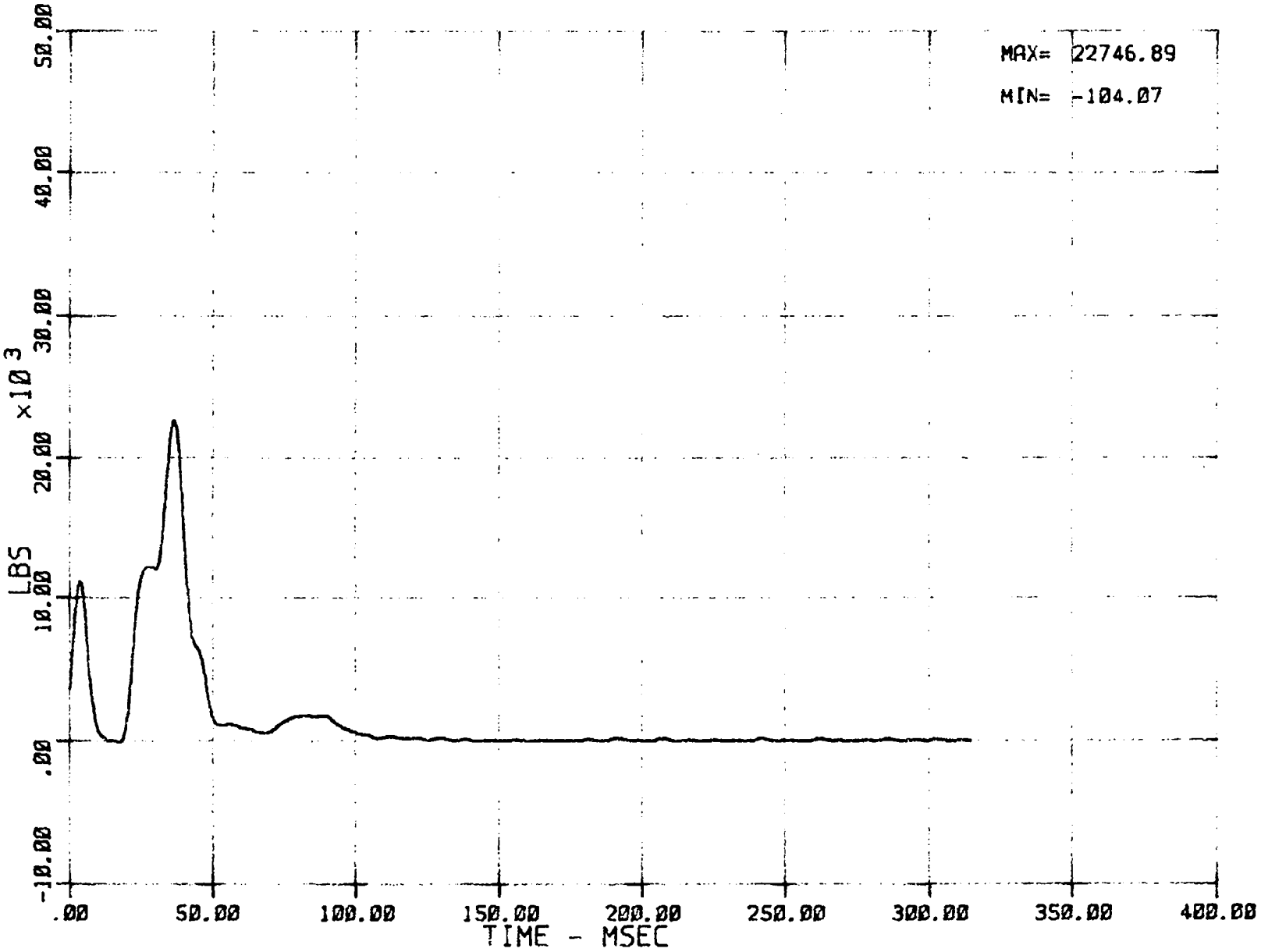
53 LC BA N BC4 (BARRIER LOAD CELL C4 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



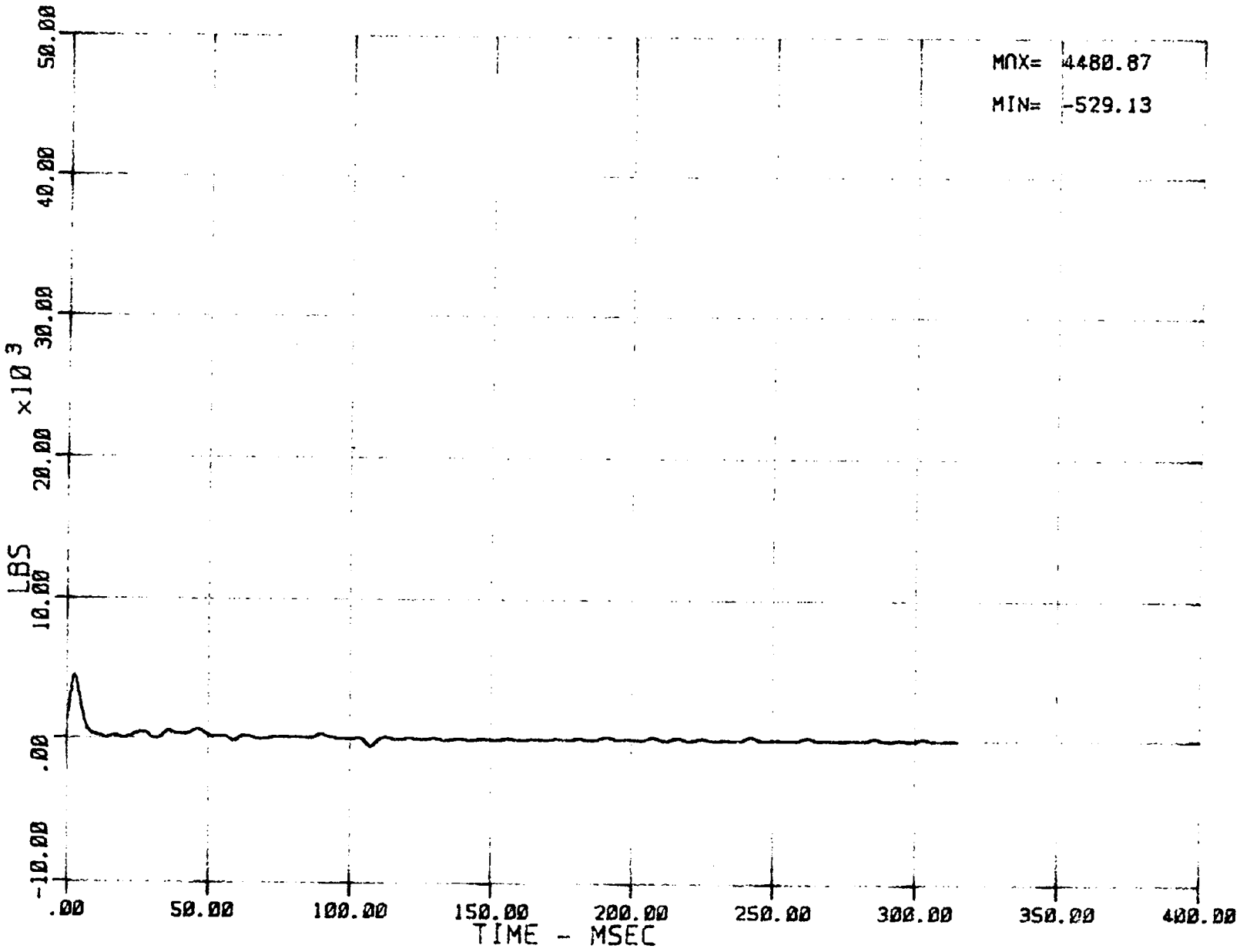
54 LC BA N BC5 (BARRIER LOAD CELL C5 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



SS LC BA N BC6 (BARRIER LOAD CELL C6 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

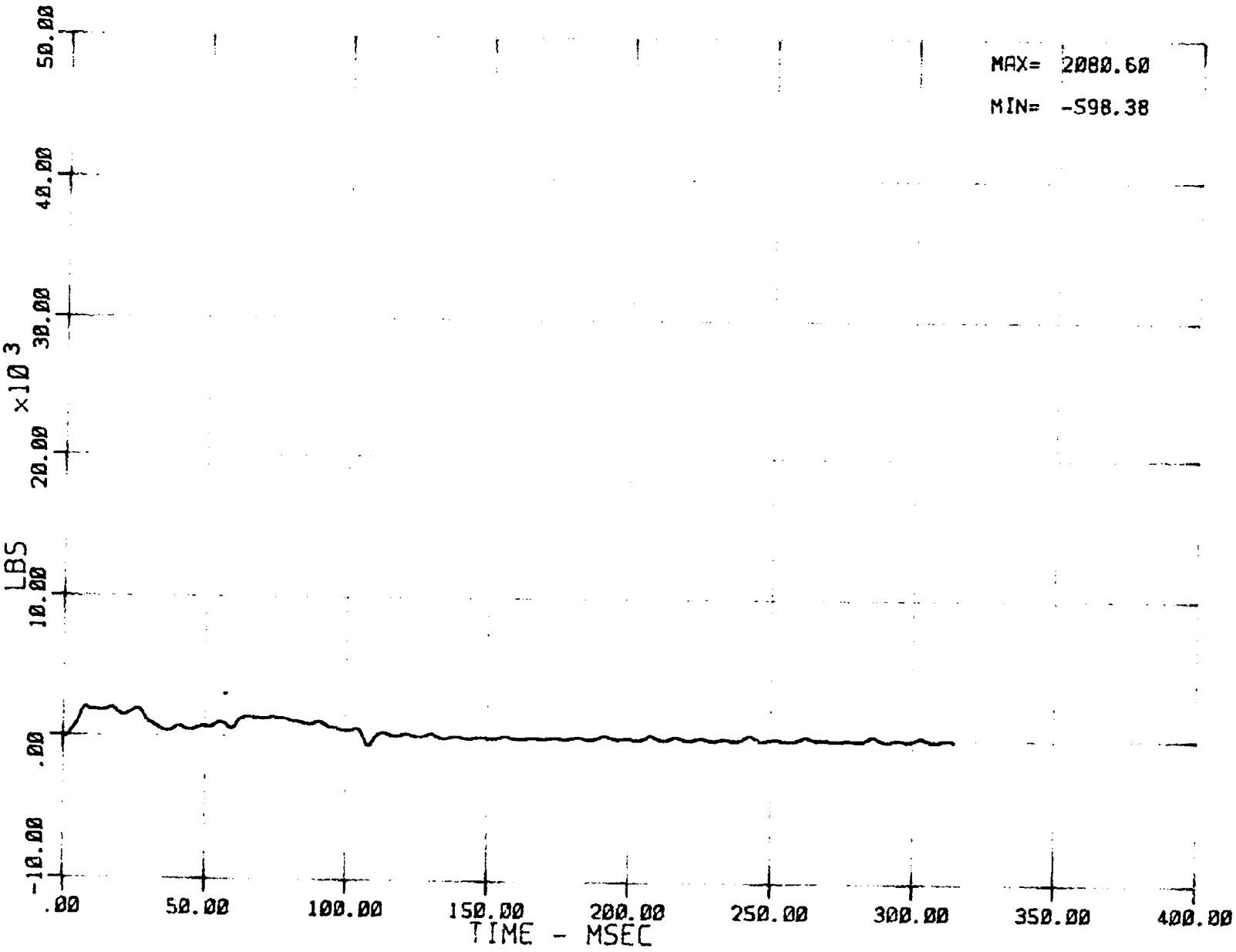


56 LC BA N BC7 (BARRIER LOAD CELL C7 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



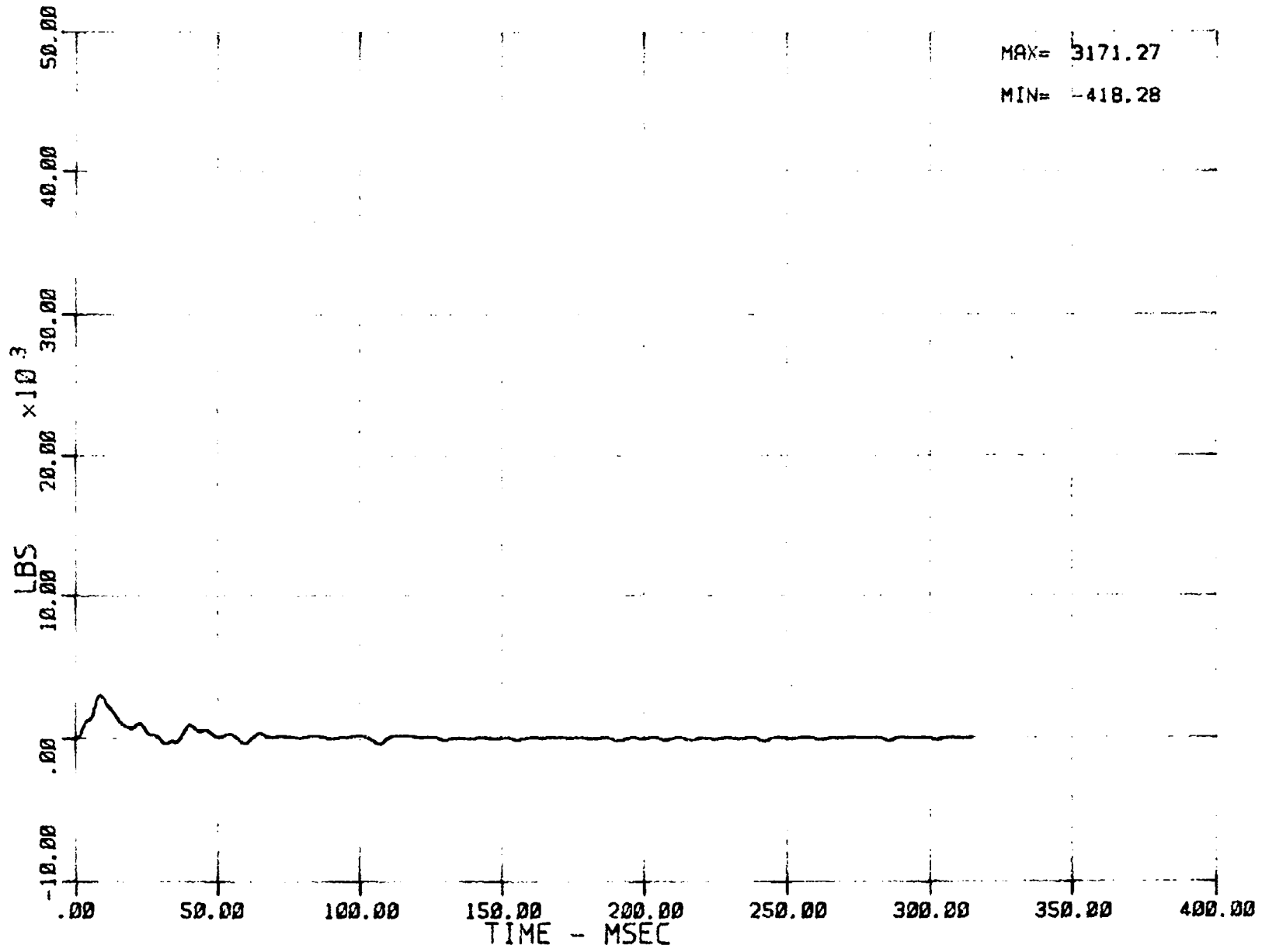
S7 LC BA N BC8 (BARRIER LOAD CELL C8 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK

03/15/88

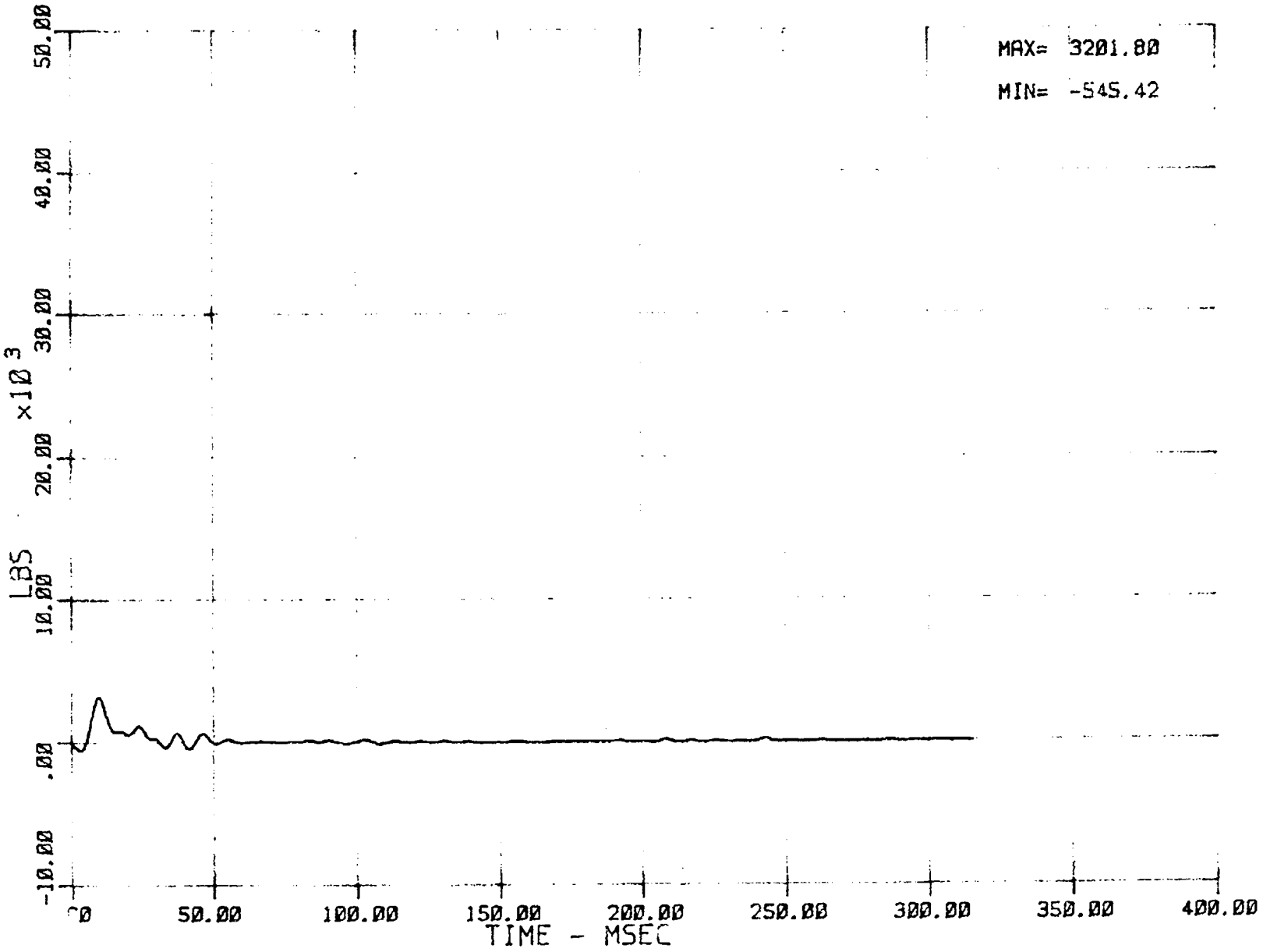


S8 LC BA N BC9 (BARRIER LOAD CELL C9 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK

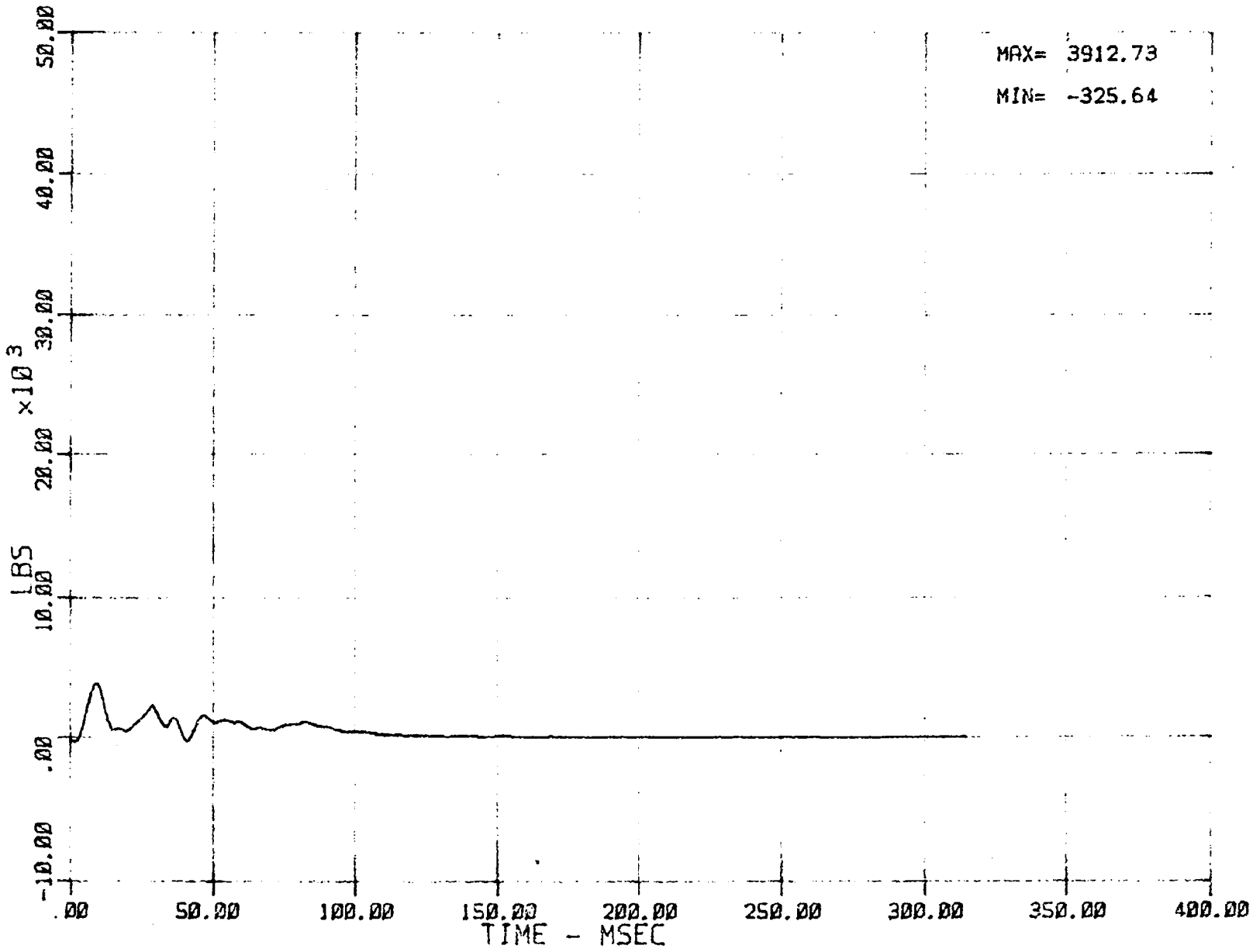
03/15/88



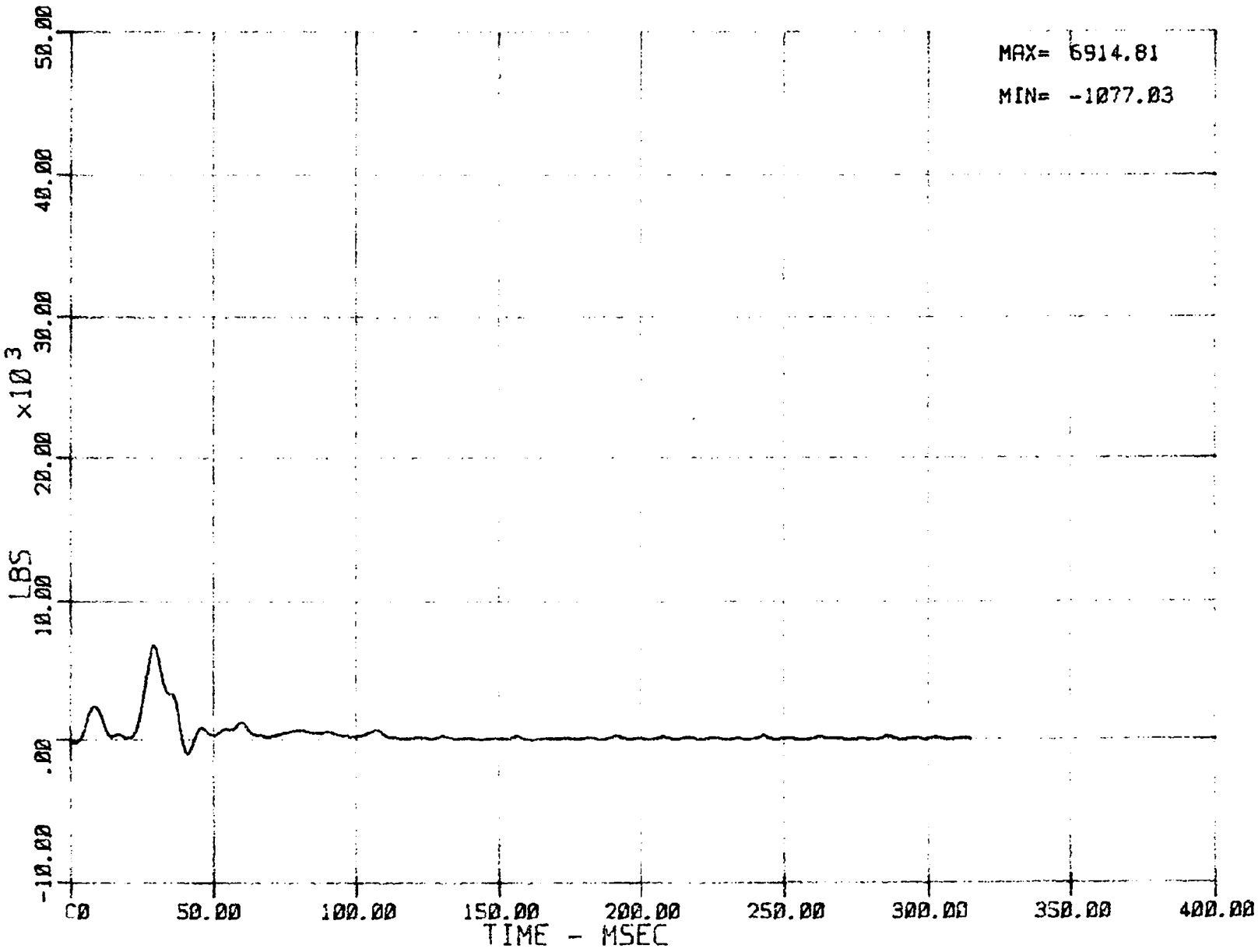
59 LC BA N BD1 (BARRIER LOAD CELL D1 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



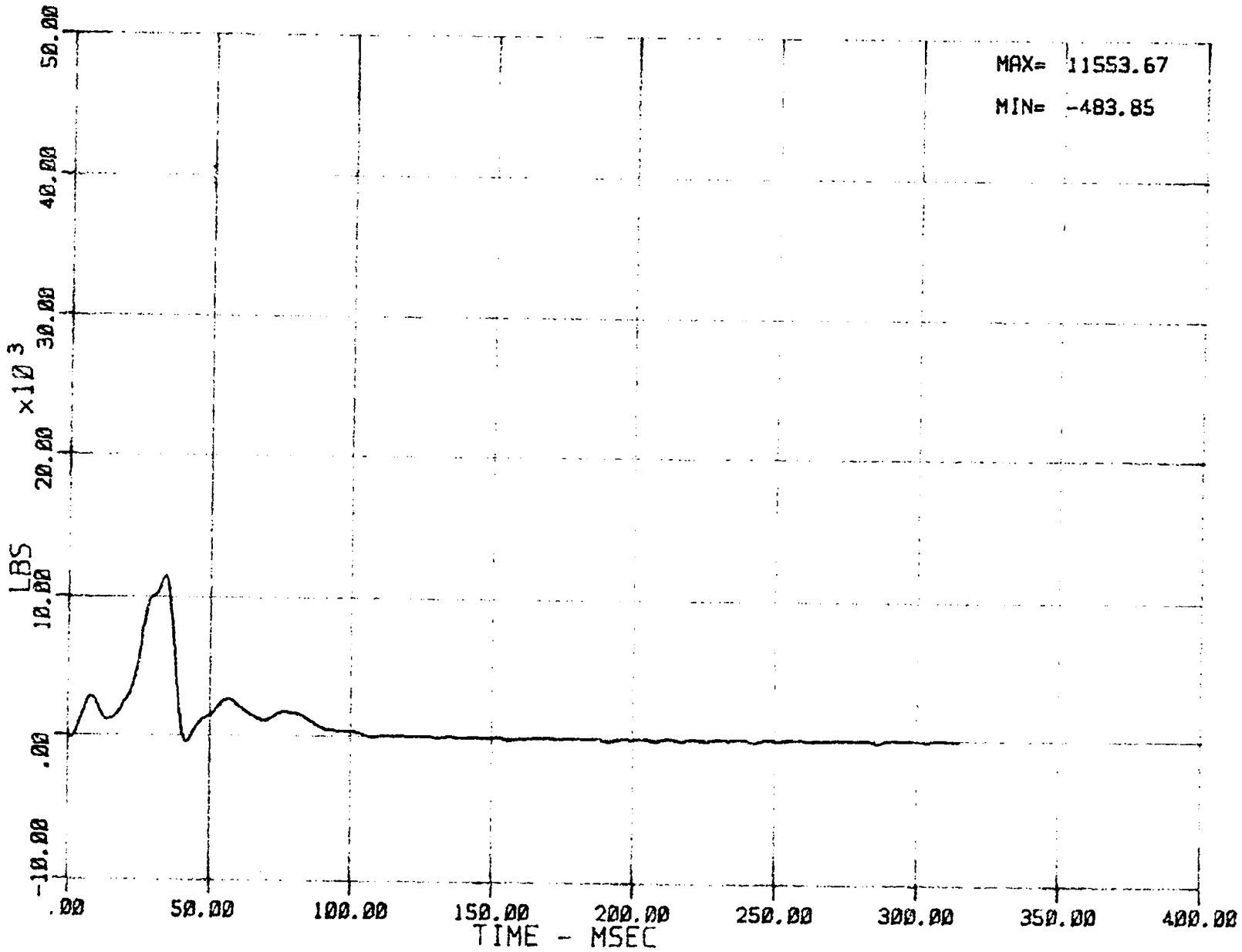
60 LC BA N 002 (BARRIER LOAD CELL D2 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



61 LC BA N BD3 (BARRIER LOAD CELL D3 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

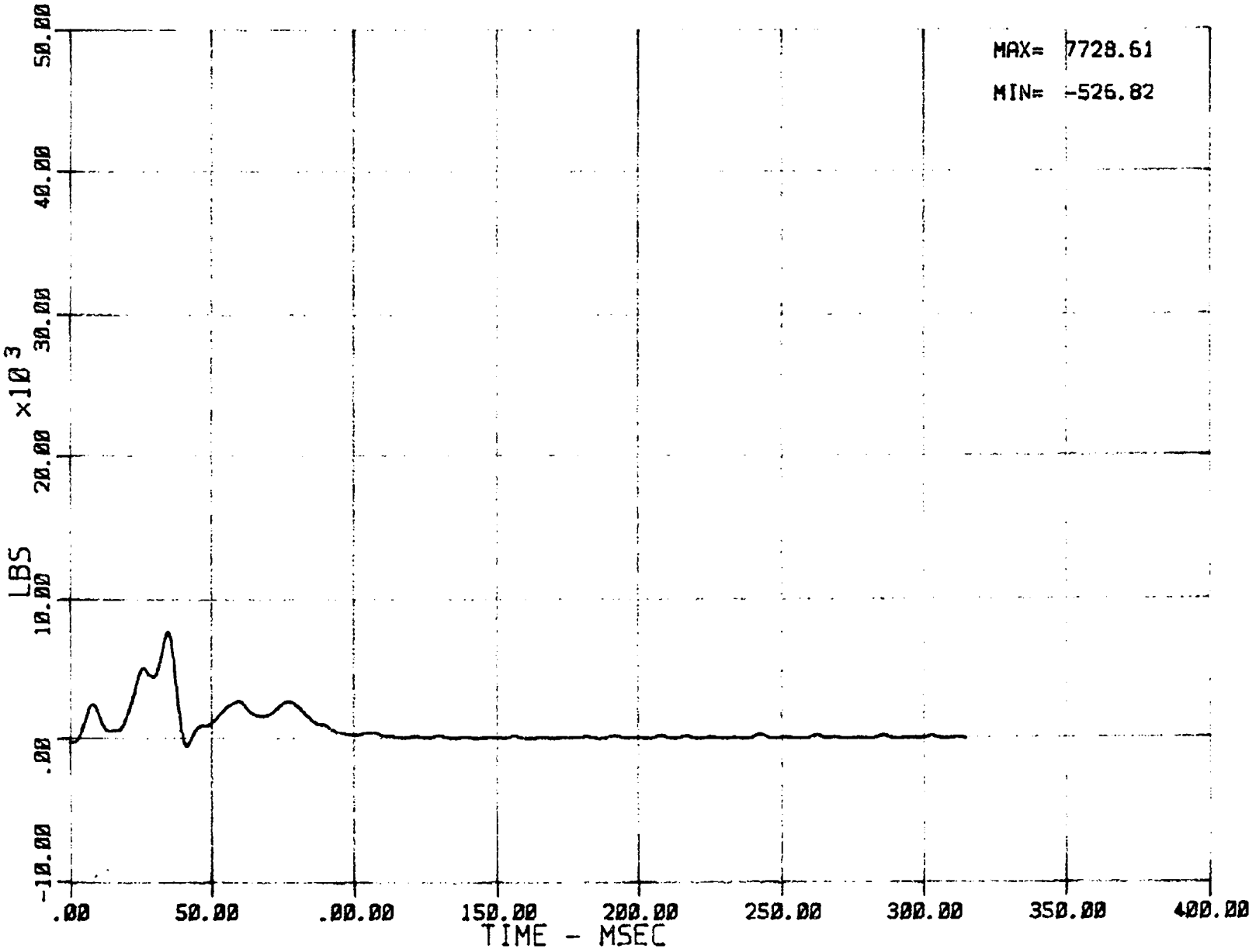


62 LC BA N BD4 (BARRIER LOAD CELL D4 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



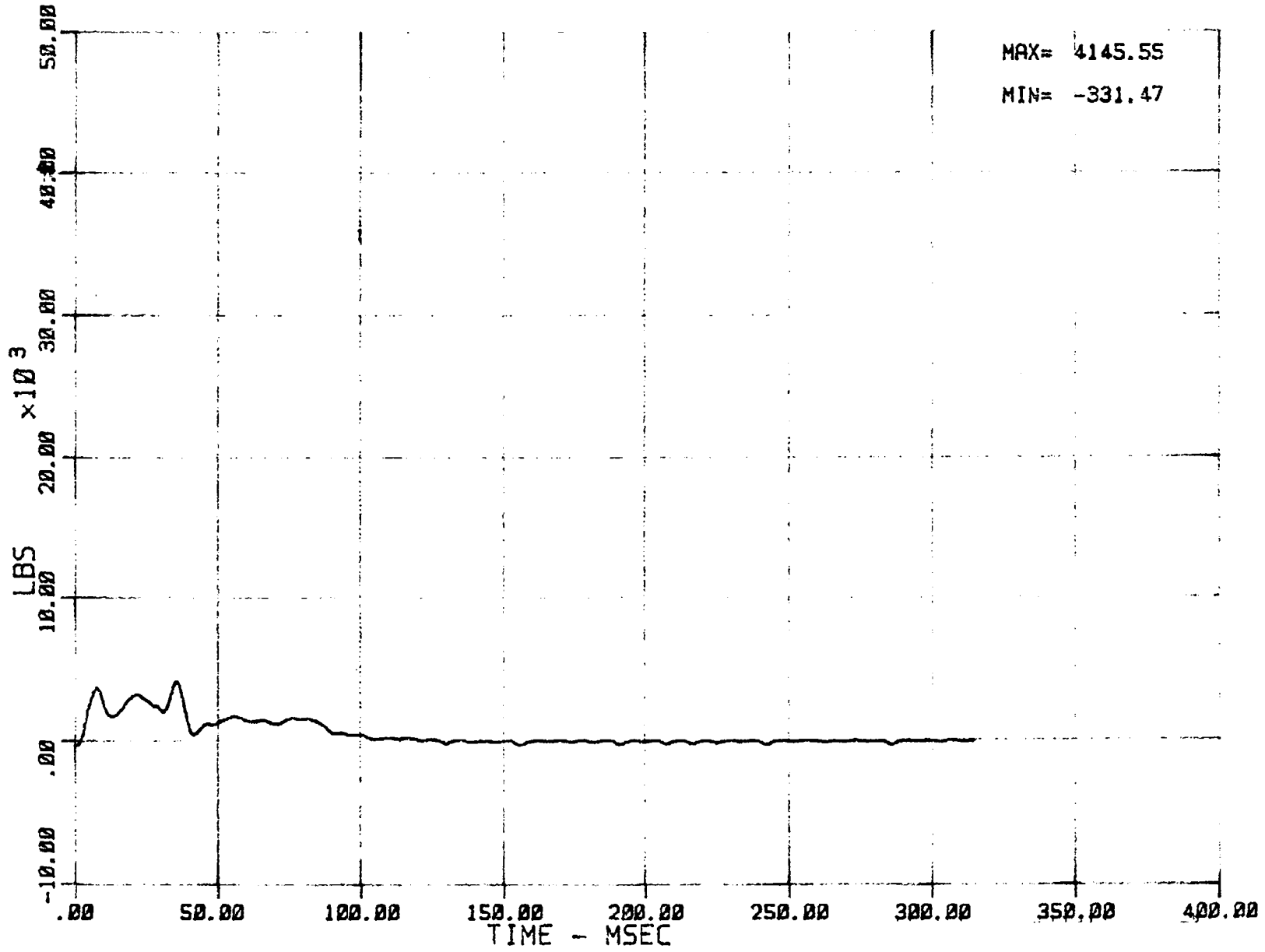
63 LC BA N BDS (BARRIER LOAD CELL DS - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK

03/15/88

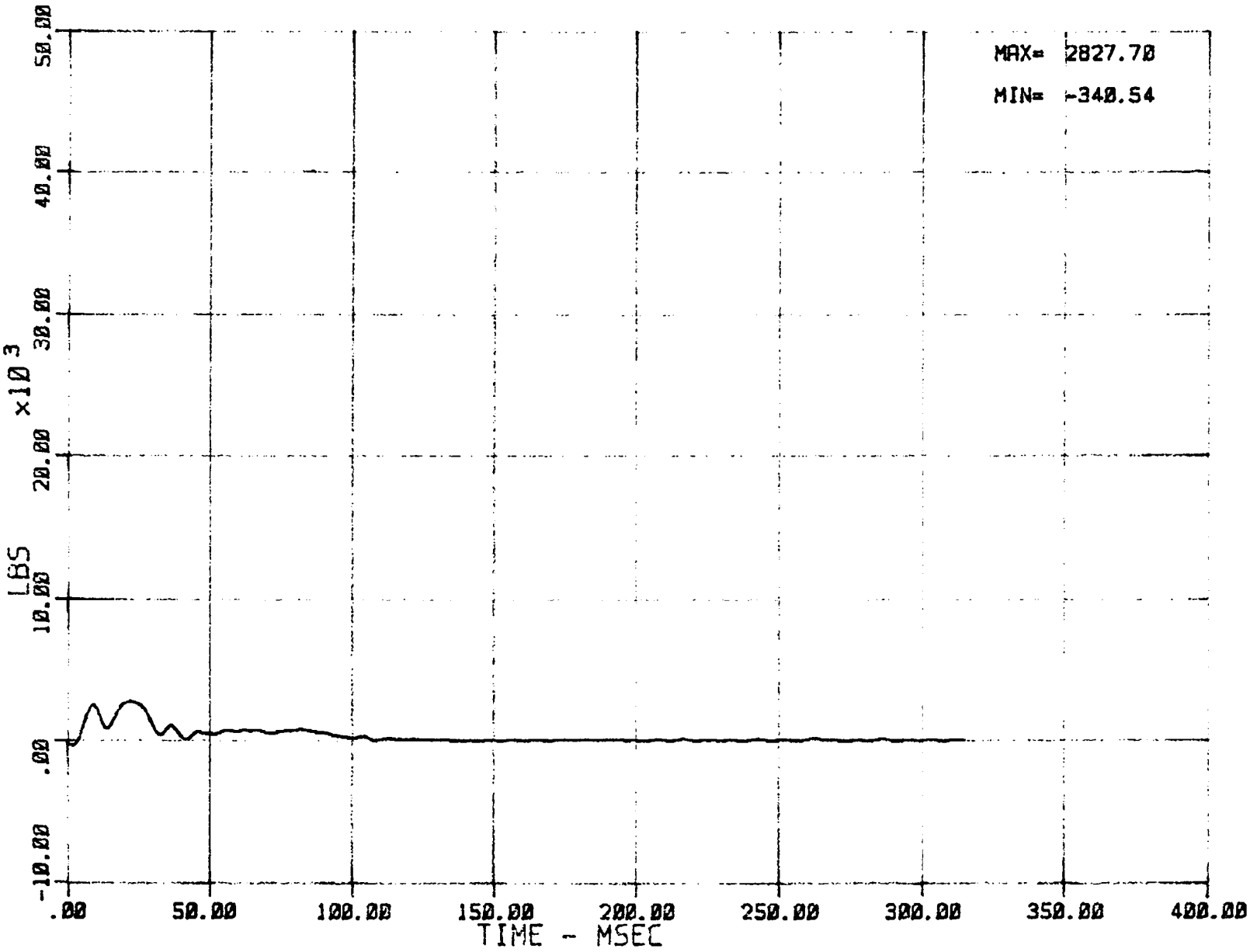


64 LC BA N BD6 (BARRIER LOAD CELL D6 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

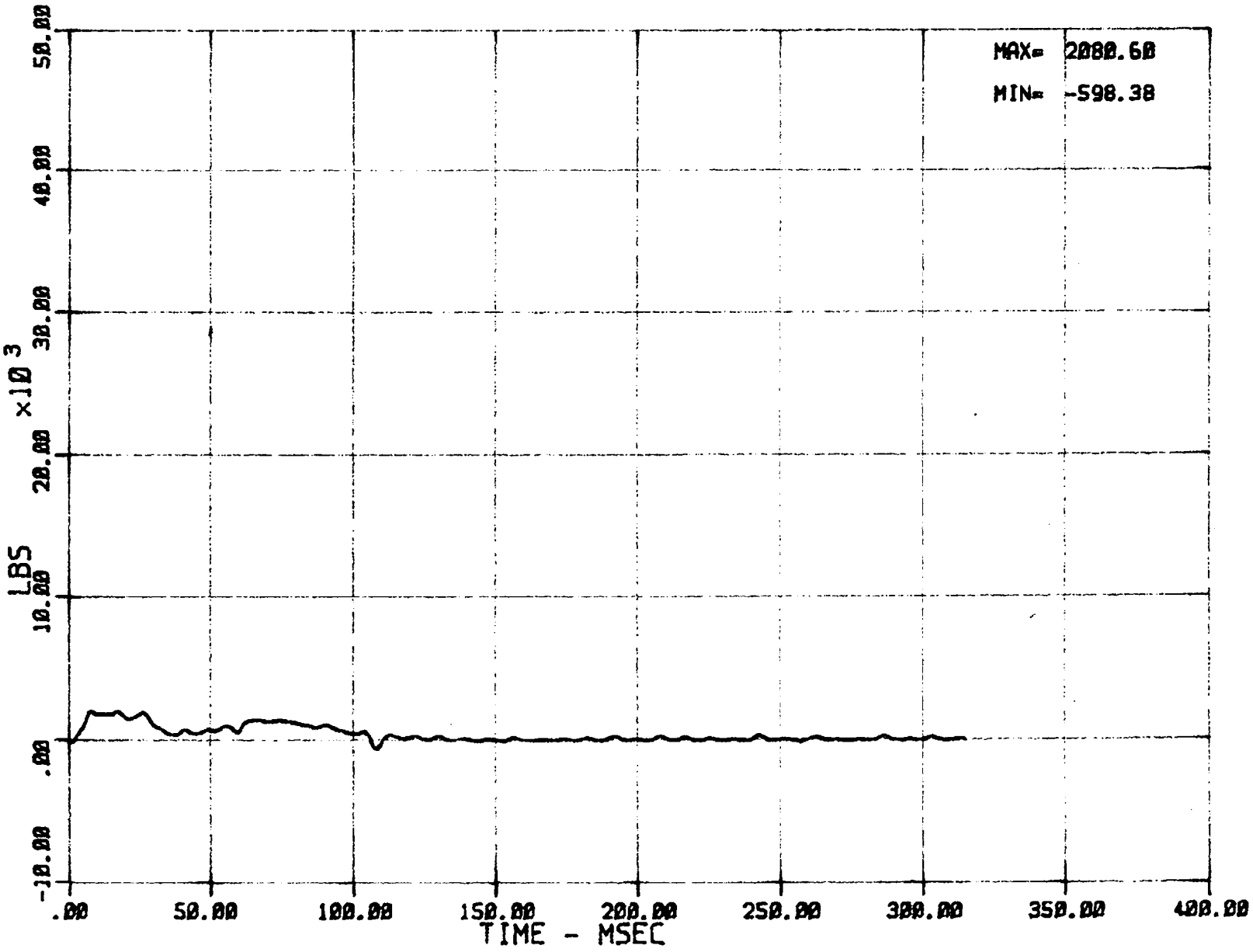
MSE-88-R715-N04



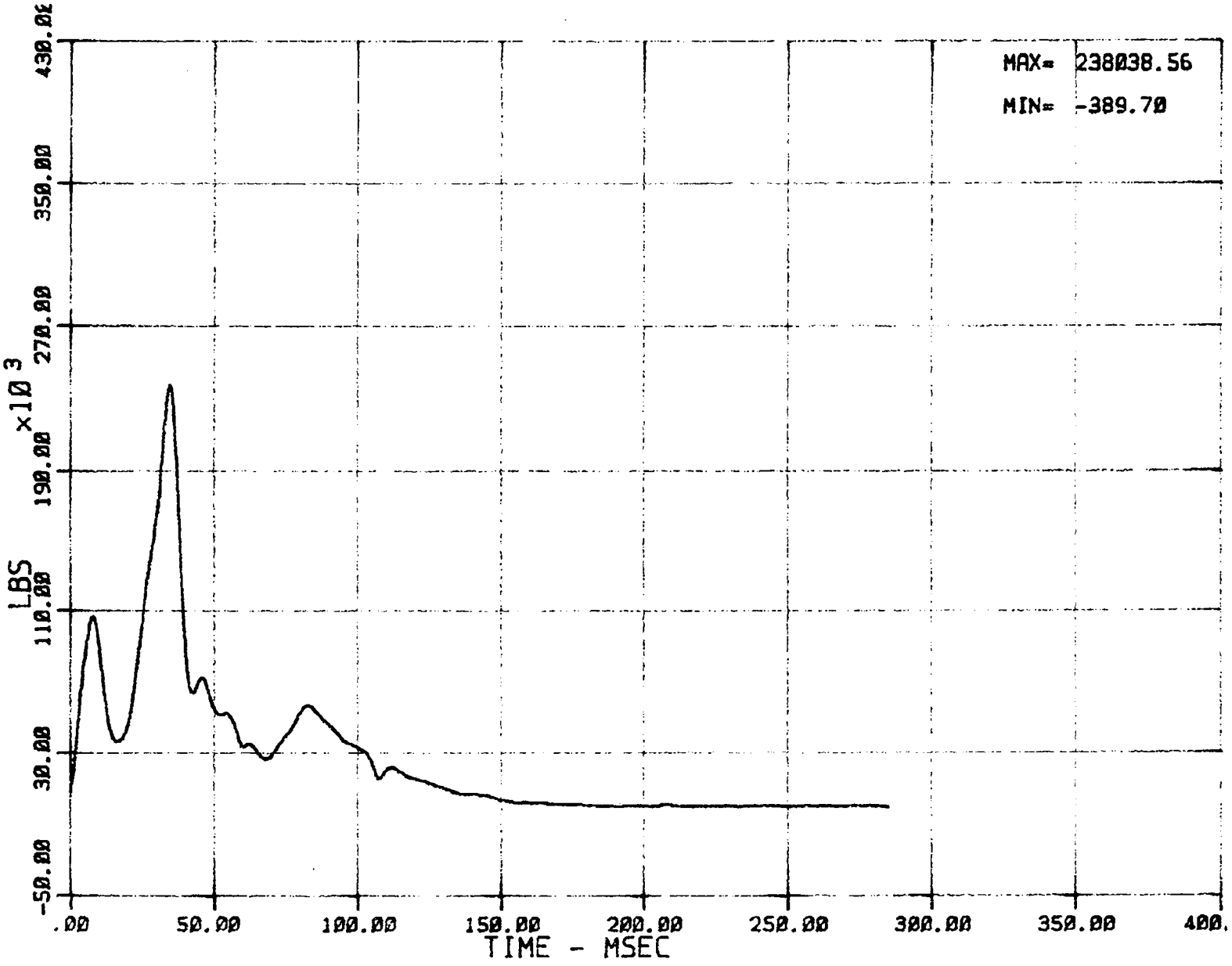
65 LC BA N BD7 (BARRIER LOAD CELL D7 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



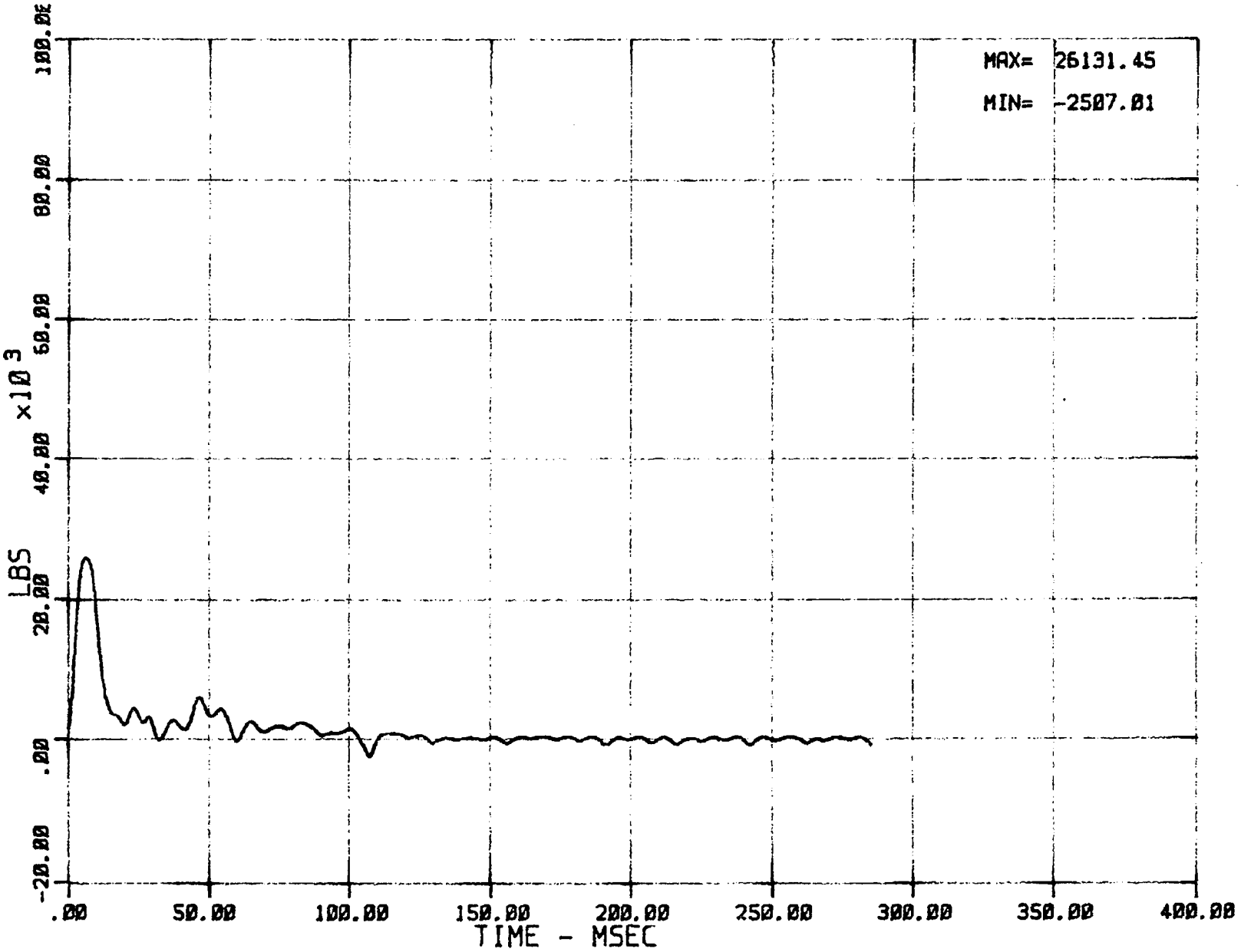
66 LC BA N B08 (BARRIER LOAD CELL DB - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



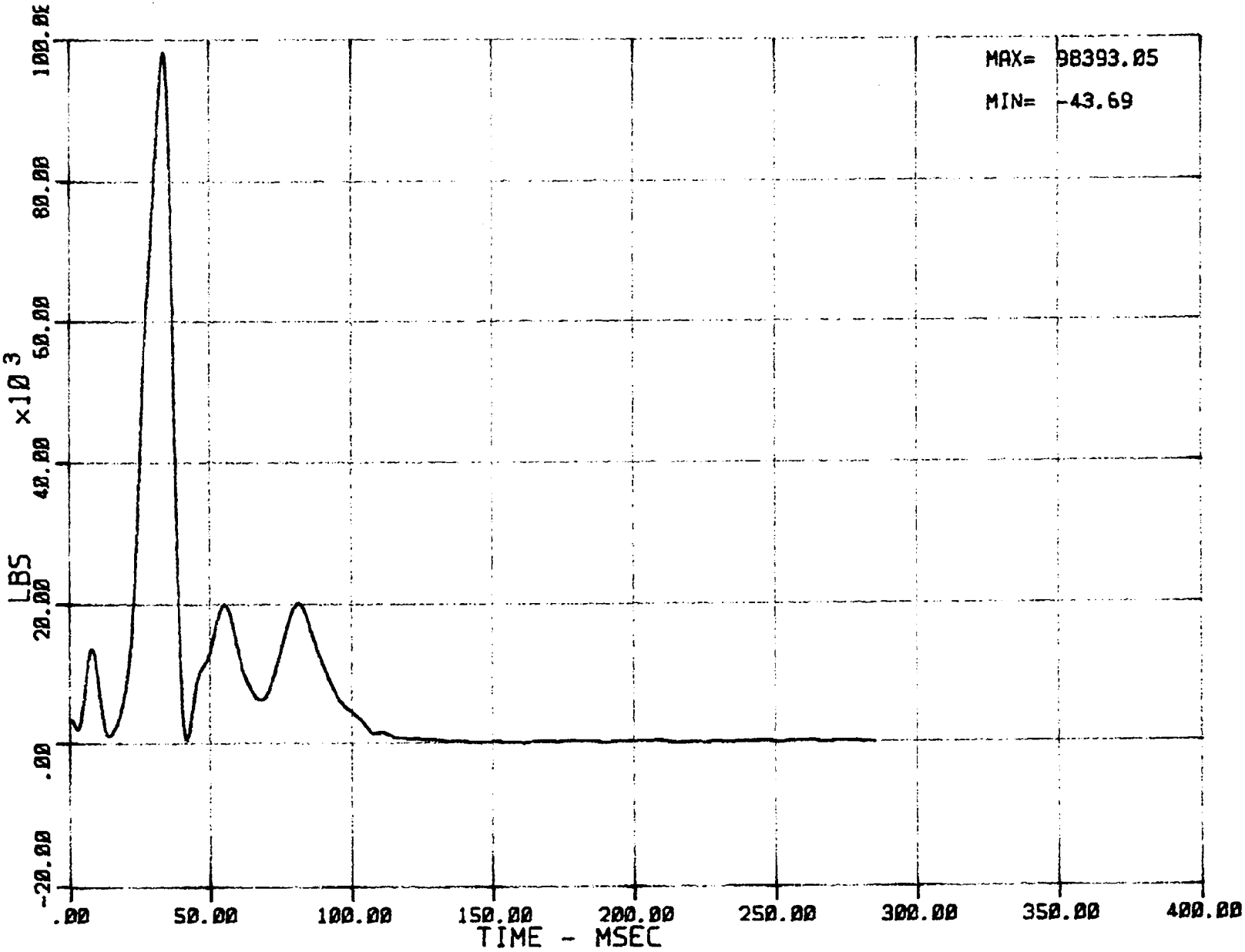
67 LC BA N BD9 (BARRIER LOAD CELL D9 - FORCE)
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



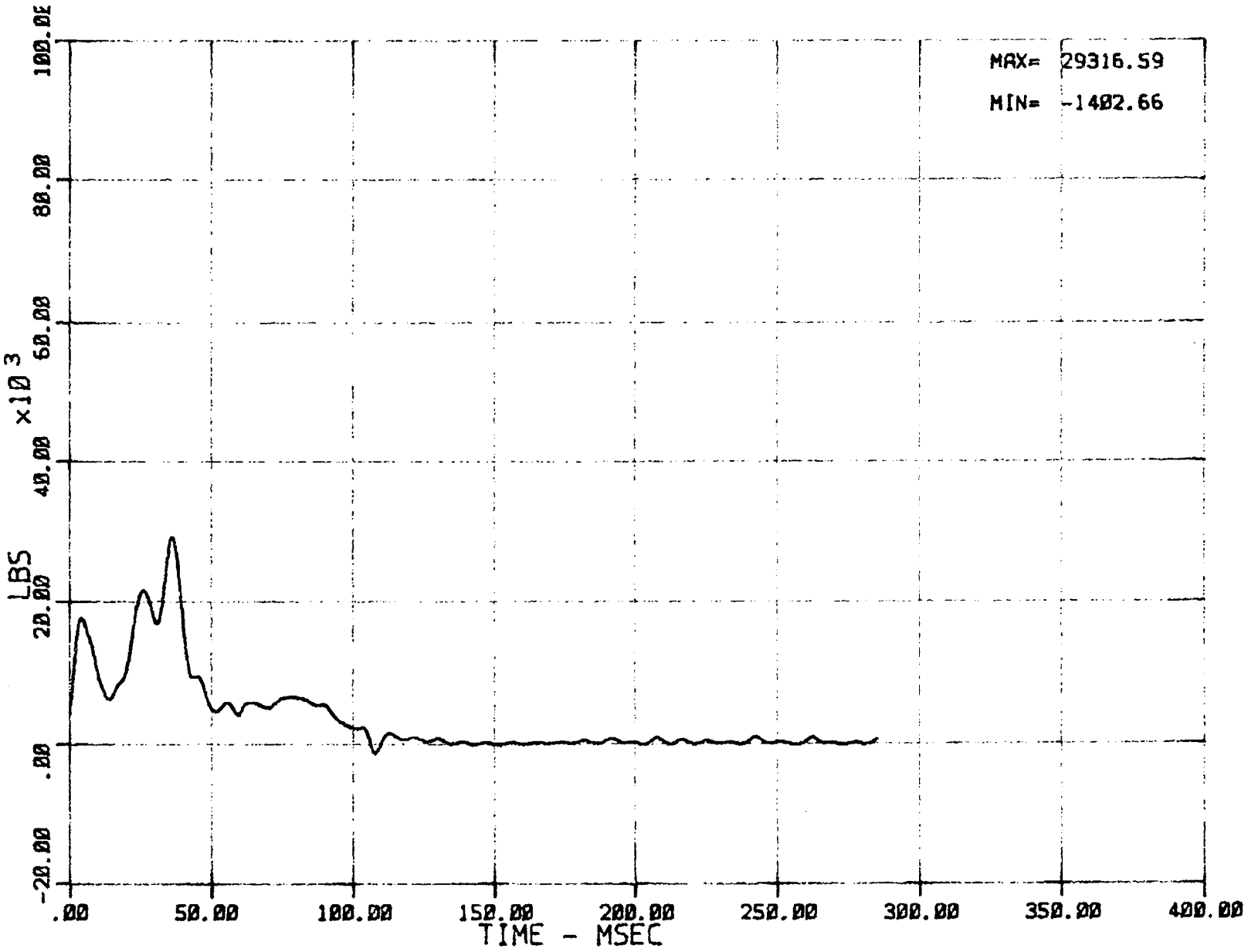
TOTAL SUM, LOAD CELL BARRIER FORCE
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



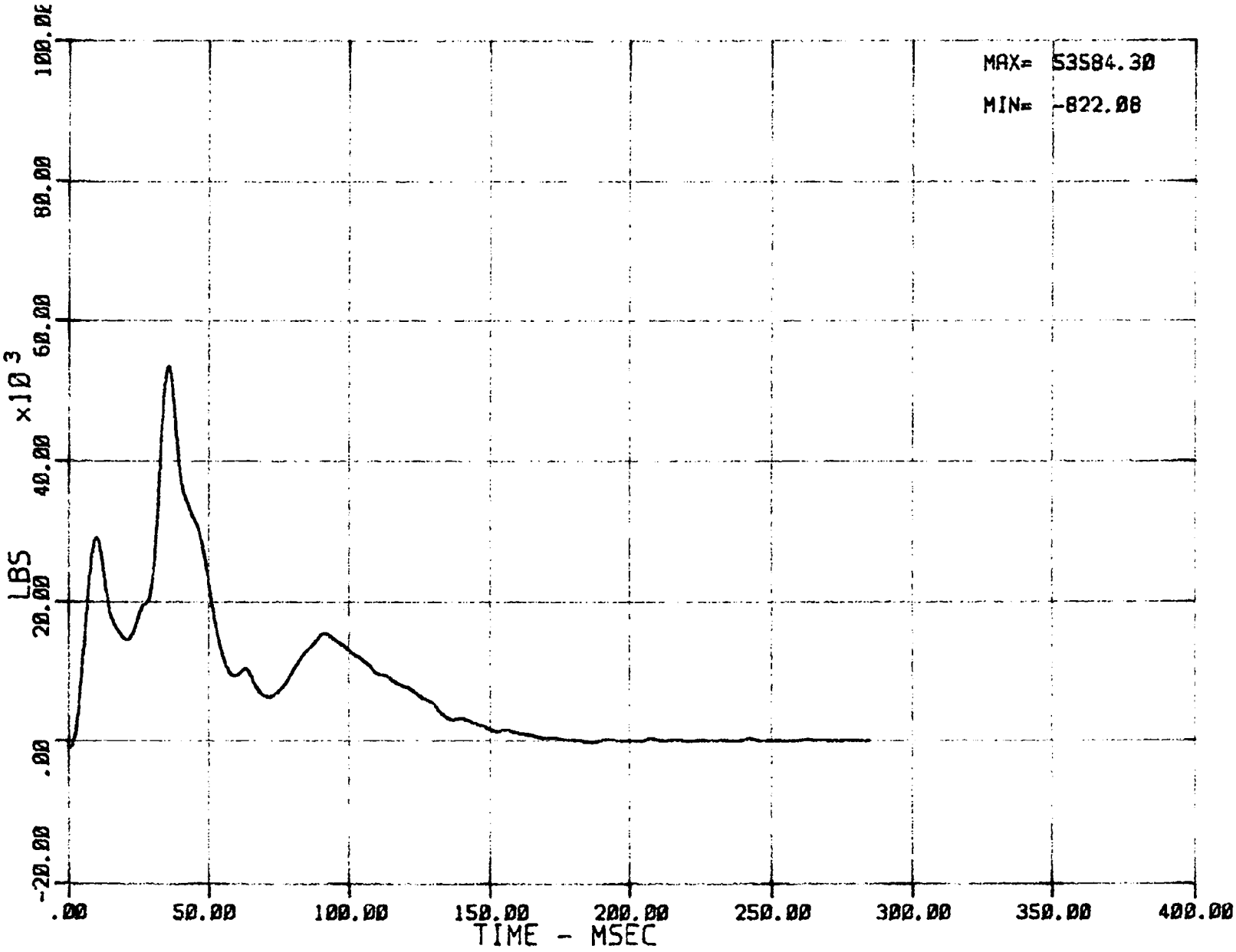
GROUP 1 SUM (C1,C2,C3,D1,D2,D3) LOAD CELL BARRIER FORCE
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



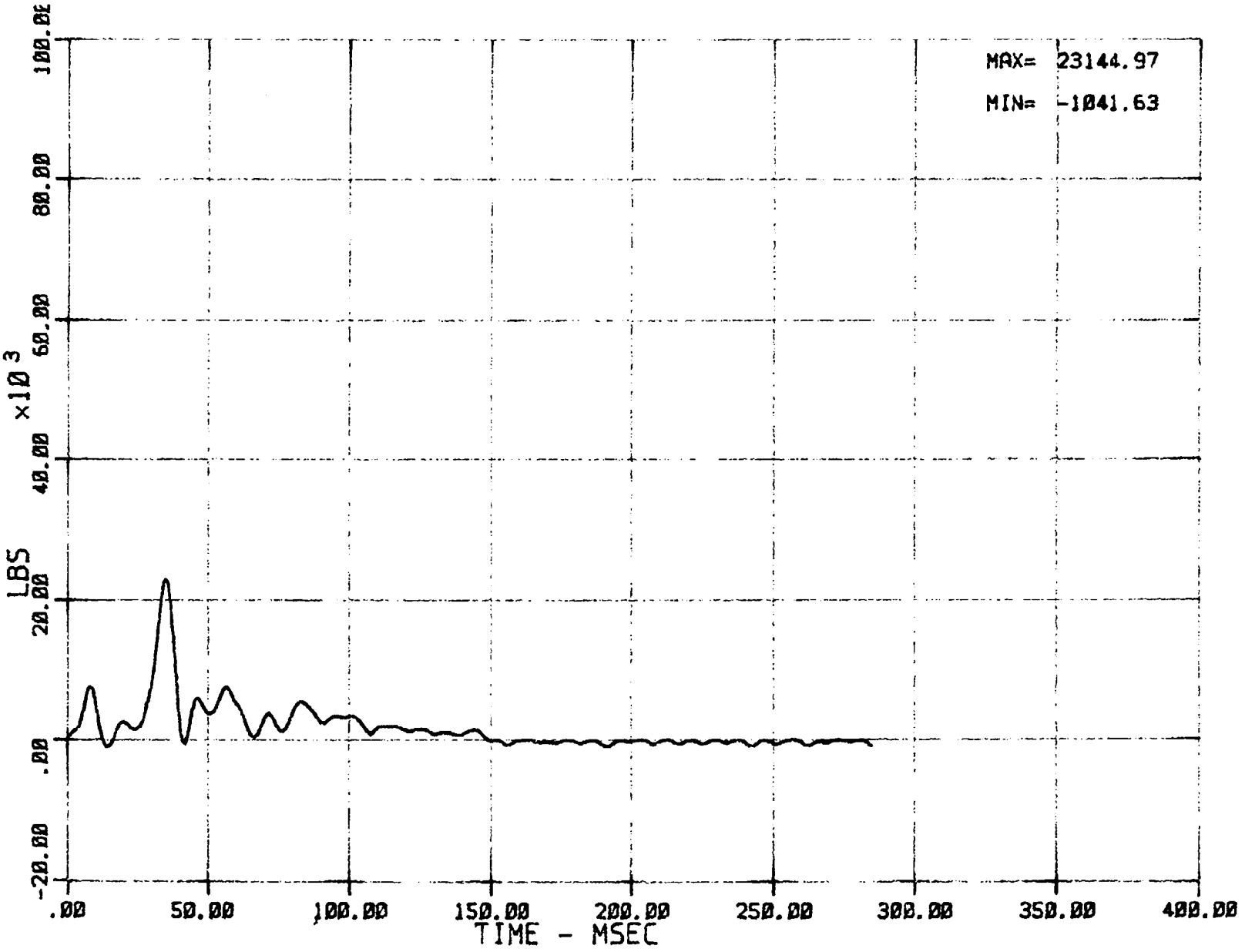
GROUP 2 SUM (C4,C5,C6,D4,D5,D6) LOAD CELL BARRIER FORCE
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



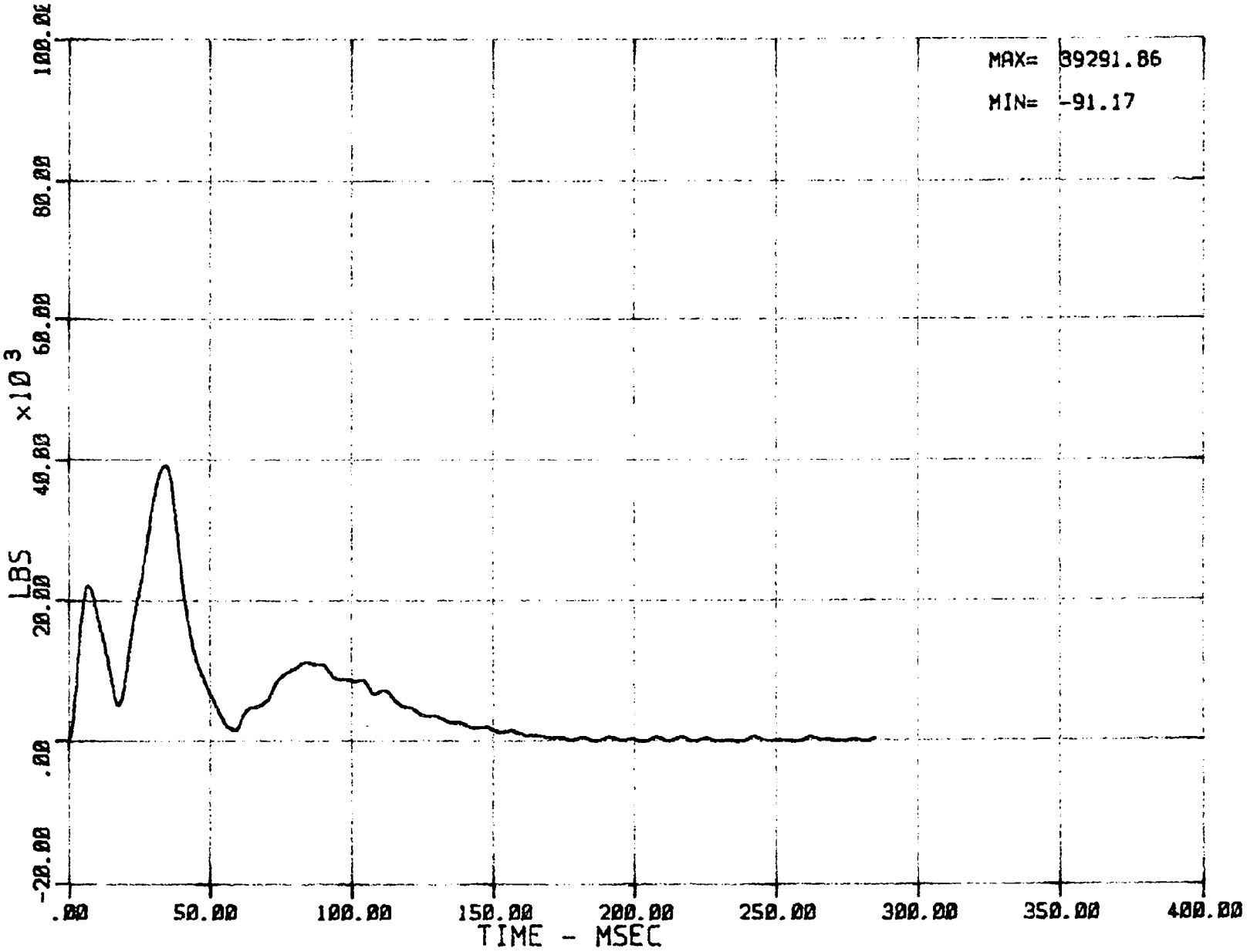
GROUP 3 SUM (C7,C8,C9,D7,D8,D9) LOAD CELL BARRIER FORCE
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



GROUP 4 SUM (A1,A2,A3,B1,B2,B3) LOAD CELL BARRIER FORCE
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



GROUP 5 SUM (A4,A5,A6,B4,B5,B6) LOAD CELL BARRIER FORCE
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88



GROUP 6 SUM (A7,A8,A9,B7,B8,B9) LOAD CELL BARRIER FORCE
MSE N02048 1988 FORD F-150 PICKUP TRUCK 03/15/88

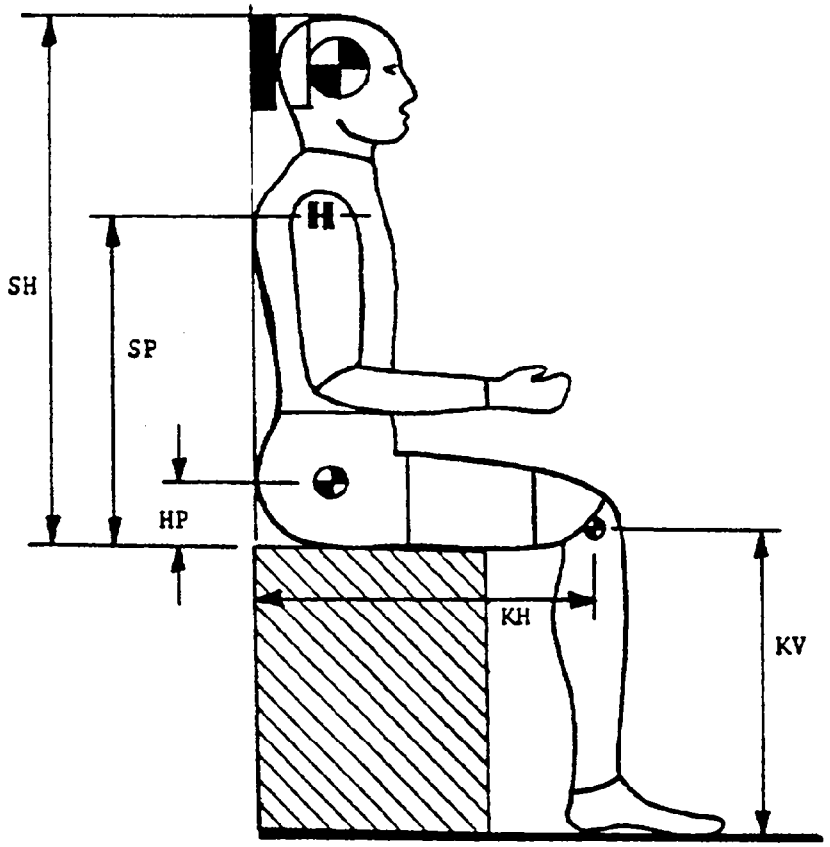
APPENDIX C

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION TESTS

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

I. CONFIGURATION VERIFICATION DATA:



	P.572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		03/13 -03/14/88	
VERIFICATION NUMBER FOR DUMMY*		2	
SH - Seated Height- - - - - - - -	35.6 to 35.8"	35.7	
SP - Shoulder Pivot Height- - - -	21.8 to 22.4"	22.1	
HP - Hip Pivot Height - - - - - -	3.9" ref.	3.9	
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.6	
KV - Knee Pivot from floor- - - -	19.3 to 19.9"	19.5	
SW - Shoulder Width - - - - - - -	17.8 to 18.4"	18.1	
HW - Hip Width- - - - - - - - - -	14.0 to 15.4"	14.8	

TECHNICIAN'S NAME: Mark Walker

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

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

II. PERFORMANCE VERIFICATION DATA:

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

TECHNICIAN'S NAME: Mark Walker

			PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION----------			03/13 - 03/14/88	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*------			2	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----			71-74 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)			17-34 %	%
TEST PARAMETER		SPECIFICATION		
1. HEAD DROP TEST--				
a. Peak Resultant Accel.-		210 to 260G	225.2	
b. Peak Lateral Accel.- -		- 10G	-2.88	
c. Time above 100G- - - -		0.9 to 1.5ms	1.25	
2. NECK BENDING TEST--				
a. Pendulum Speed - - - -		21.5 to 25.5 fps	22.2	
b. Pend. Avg. Decel. over $t_3 - t_2$		20 to 24G	21.0	
c. Peak Resultant Head Acceleration - - - - -		26G max.	25.7	
d. Pendulum Decel.(t_2-t_1)		- 3ms	2.8	
e. Pendulum Decel.(t_3-t_2)		25 to 30 ms	27.0	
f. Pendulum Decel.(t_4-t_3)		- 10ms	8.6	
g. Max. Head Rotation - -		63 to 73°	70.0	
h. Chordal Displacement--				
Head Rotation Angle-				
0°	Time- -	-2 to 2 ms	0	
	Displ.-	-.5 to .5"	0	
30°	Time- -	25.6 to 34.4ms	30.4	
	Displ.-	2.1 to 3.1"	2.72	
60°	Time- -	40.3 to 51.7ms	45.4	
	Displ.-	4.3 to 5.3"	5.07	
Maximum (70.0°)	Time- -	53.2 to 66.8ms	60.0	
	Displ.-	5.0 to 6.0"	5.86	

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

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

II. PERFORMANCE VERIFICATION DATA (Continued) NHTSA DUMMY I.D. NO.: 4 6 4

TECHNICIAN'S NAME: Mark Walker

TEST PARAMETER		SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
2. NECK BENDING TEST.... Continued:				
h. Chordal Displacement:				
Head Rotation Angle--				
60°	Time	67.0 to 83.0 ms	72.6	
	Displ.	4.3 to 5.3 in.	5.06	
30°	Time	85.4 to 104.6 ms	89.6	
	Displ.	2.1 to 3.1 in.	2.36	
0°	Time	101.0 to 123.0 ms	101.4	
	Displ.	-.5 to 0.5 in.	2.0	
3. ABDOMINAL COMPRESSION TEST:				
(Preload = 10 pounds)				
a. Force @ .5" - - - - -		23 to 36 lbs.	26.0	
b. Force @ .75" - - - - -		36 to 50 lbs.	39.0	
c. Force @ 1.0" - - - - -		50 to 63 lbs.	54.0	
d. Force @ 1.3" - - - - -		73 to 88 lbs.	81.0	
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - - -		22 to 34 lbs.	31.8	
b. Force @ 30° - - - - -		34 to 46 lbs.	42.0	
c. Force @ 40° - - - - -		46 to 58 lbs.	55.2	
d. Return Angle - - - - -		12° maximum	11.0	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed- - -		21.78-22.22 fps	21.84	
(2) Peak Deflection-		1.7" maximum	1.65	
(3) Peak Resistive Force- - - - - -		2250 lbs. maximum	1933.6	
(4) Internal Hysteresis - - -		50 to 70%	64.3	
b. Low Speed				
(1) Probe Speed- - -		13.86-14.14 fps	14.03	
(2) Peak Deflection-		1.1" maximum	1.0	
(3) Peak Resistive Force- - - - - -		1450 lbs. maximum	1036.13	
(4) Internal Hyster.		50 to 70%	55.6	

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

II. PERFORMANCE VERIFICATION DATA (Continued) NHTSA DUMMY I.D. NO.: 4 6 4

TECHNICIAN'S NAME: Mark Walker

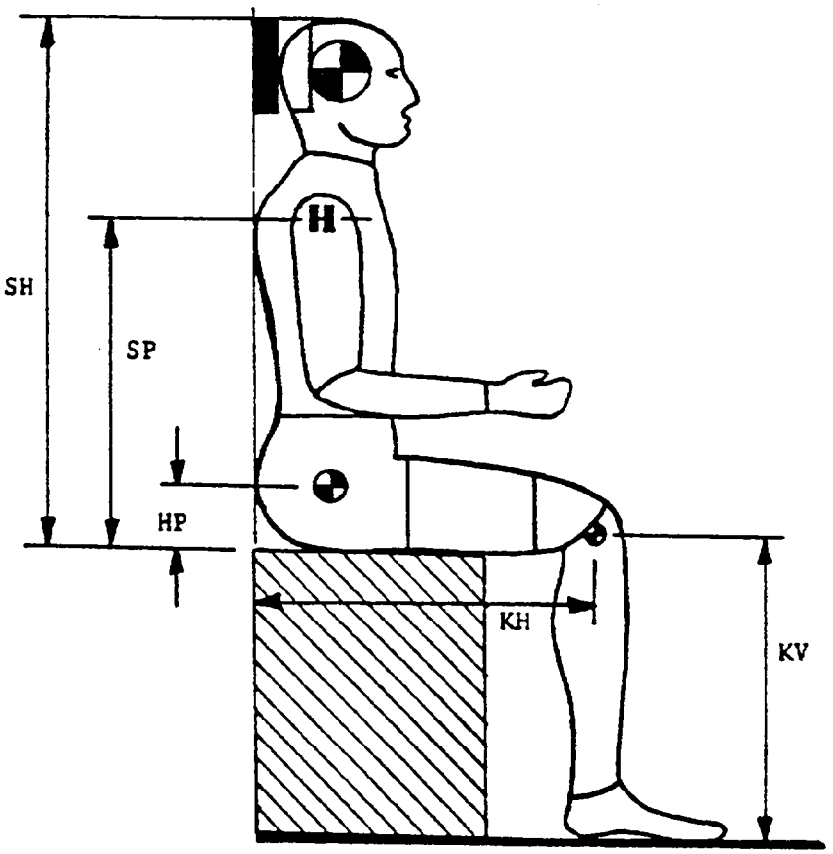
TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
6. KNEE IMPACT TESTS:			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.88	
(2) Maximum Force - -	1850 to 2500 lbs.	1948.0	
(3) Time Above 1000#	1.7 ms minimum	2.0	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.85	
(2) Maximum Force - -	1850 to 2500 lbs.	1933.0	
(3) Time Above 1000#	1.7 ms minimum	1.87	

REMARKS:

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

I. CONFIGURATION VERIFICATION DATA:



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

TECHNICIAN'S NAME: Mark Walker

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

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

II. PERFORMANCE VERIFICATION DATA:

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

TECHNICIAN'S NAME: Mark Walker

			PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION----------			03/13 - 03/14/88	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*------			2	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----			69-74 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)			16-35 %	%
TEST PARAMETER		SPECIFICATION		
1. HEAD DROP TEST--				
a. Peak Resultant Accel.-		210 to 260G	220.0	
b. Peak Lateral Accel.- -		- 10G	6.6	
c. Time above 100G- - - -		0.9 to 1.5ms	1.2	
2. NECK BENDING TEST--				
a. Pendulum Speed - - - -		21.5 to 25.5 fps	22.42	
b. Pend. Avg. Decel. over $t_3 - t_2$		20 to 24G	21.0	
c. Peak Resultant Head Acceleration - - - - -		26G max.	23.7	
d. Pendulum Decel.(t_2-t_1)		- 3ms	3.0	
e. Pendulum Decel.(t_3-t_2)		25 to 30 ms	26.8	
f. Pendulum Decel.(t_4-t_3)		- 10ms	10.0	
g. Max. Head Rotation - -		63 to 73°	67.5	
h. Chordal Displacement-- Head Rotation Angle-				
0°	Time- -	-2 to 2 ms	0	
	Displ.-	-.5 to .5"	0	
30°	Time- -	25.6 to 34.4ms	33.2	
	Displ.-	2.1 to 3.1"	2.56	
60°	Time- -	40.3 to 51.7ms	49.2	
	Displ.-	4.3 to 5.3"	4.81	
Maximum (67,5°)	Time- -	53.2 to 66.8ms	61.6	
	Displ.-	5.0 to 6.0"	5.39	

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

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

II. PERFORMANCE VERIFICATION DATA (Continued) NHTSA DUMMY I.D. NO.: 4 6 7

TECHNICIAN'S NAME: Mark Walker

TEST PARAMETER		SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
2. NECK BENDING TEST.... Continued:				
h. Chordal Displacement:				
Head Rotation Angle--				
60°	Time	67.0 to 83.0 ms	73.2	
	Displ.	4.3 to 5.3 in.	4.68	
30°	Time	85.4 to 104.6 ms	89.6	
	Displ.	2.1 to 3.1 in.	2.23	
0°	Time	101.0 to 123.0 ms	101.0	
	Displ.	-.5 to 0.5 in.	0.215	
3. ABDOMINAL COMPRESSION TEST:				
(Preload = 10 pounds)				
a. Force @ .5" - - - - -		23 to 36 lbs.	28.0	
b. Force @ .75" - - - - -		36 to 50 lbs.	40.0	
c. Force @ 1.0" - - - - -		50 to 63 lbs.	57.0	
d. Force @ 1.3" - - - - -		73 to 88 lbs.	76.0	
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - - -		22 to 34 lbs.	29.9	
b. Force @ 30° - - - - -		34 to 46 lbs.	37.0	
c. Force @ 40° - - - - -		46 to 58 lbs.	53.6	
d. Return Angle - - - - -		12° maximum	12.0	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed- - -		21.78-22.22 fps	21.94	
(2) Peak Deflection-		1.7" maximum	1.70	
(3) Peak Resistive Force- - - - - -		2250 lbs. maximum	2161.0	
(4) Internal Hysteresis - - -		50 to 70%	59.5	
b. Low Speed				
(1) Probe Speed- - -		13.86-14.14 fps	14.04	
(2) Peak Deflection-		1.1" maximum	0.99	
(3) Peak Resistive Force- - - - - -		1450 lbs. maximum	1114.0	
(4) Internal Hyster.		50 to 70%	69.0	

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

II. PERFORMANCE VERIFICATION DATA (Continued) NHTSA DUMMY I.D. NO.: 4 6 7

TECHNICIAN'S NAME: Mark Walker

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
6. KNEE IMPACT TESTS:			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.87	
(2) Maximum Force - -	1850 to 2500 lbs.	1933.0	
(3) Time Above 1000#-	1.7 ms minimum	1.88	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.88	
(2) Maximum Force - -	1850 to 2500 lbs.	2.77	
(3) Time Above 1000#-	1.7 ms minimum	1.88	

REMARKS:

APPENDIX D

VEHICLE'S OWNER MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

OCCUPANT RESTRAINT SYSTEMS

WARNING — Be sure to LOCK ALL DOORS before driving away. Locking the doors, along with using the safety belt provided, will minimize the risk of injury or ejection in an accident.

Ford Motor Company recommends that you always "buckle up." In some areas restraint system use is required by law.

WARNING — Passengers should not be allowed to ride in the cargo area of any vehicle. Persons who are not riding in a seat with a fastened safety belt are much more likely to suffer serious bodily injury in the event of a collision.

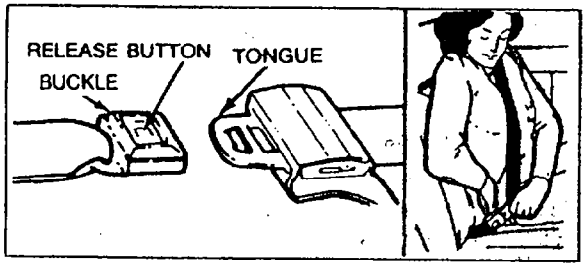
WARNING — All vehicle occupants, including pregnant women, should wear their safety belts for maximum protection in the event of a collision. All vehicle occupants, including pregnant women, should be sure the lap belt, or lap belt portion of the lap-shoulder belt, is fitted snugly and as low as possible around the hips, not on the waist. Shoulder belts should also be properly adjusted for minimum slack. Failure to properly utilize the safety belts may increase the chance and/or severity of injury in the event of a collision.

According to accident statistics, properly restrained children are safer in the rear seat (of vehicles with rear seats) than in the front seat. For young children, infant and child restraints should be obtained and used in accordance with the instructions provided by the manufacturer of the infant and child restraint. See "Infant and Child Restraints" in this section. Child restraint use is required by law.

Front Lap-Shoulder Belts

The belt system allows freedom of movement, locking tight only on hard braking or impacts of 5 mph (8 km/h) or more. The system cannot be made to lock by jerking on the belt, except for F-350 crew cabs.

After entering your vehicle, close the door and adjust the front seat to obtain the best position for your driving comfort, access to controls and visibility. Then pull the lap-shoulder belt from the retractor so the shoulder portion of the belt crosses your outboard shoulder and chest and insert the belt tongue into the proper buckle until you hear a snap and feel it latch.



Pull up on the shoulder portion of the belt to tighten the lap portion to a snug fit. Be sure the belt is as low on your hips as possible. If the shoulder belt is uncomfortably tight, a comfort regulator is provided in the shoulder belt retractor (except for F-350 crew cabs) to reduce belt pressure against your chest. The shoulder belt can be adjusted much like a window shade to maintain a small amount of slack in the belt. The adjacent door must be closed to use this comfort regulator feature.

Adjustment Procedure

To set the comfort regulator, the shoulder belt initially should be positioned snugly against the chest. If the belt is not positioned snugly, the comfort regulator

may already be engaged. Disengagement is accomplished by the following procedure:

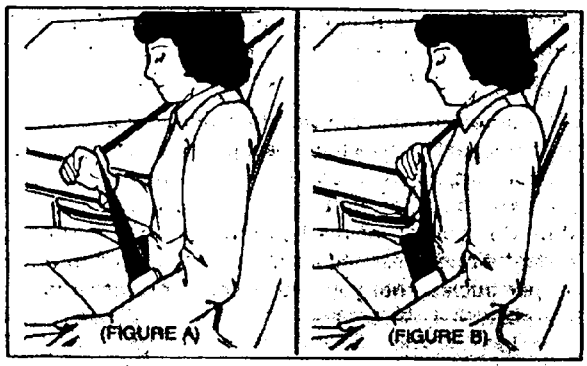


Figure A — Pull the shoulder belt outward 4 or 5 inches (10 to 13 cm), then release it and allow belt to fully retract. Repeat procedure if belt is not snug to the chest.

Figure B — Now the belt tension may be adjusted by pulling down **slightly** on the shoulder belt and releasing. The **least amount of slack** needed to relieve tension, but not more than 1-1/2 inches (3.8 cm) should be pulled out when using the comfort regulator system as the belt does not retract at a sudden stop but "locks" in its current adjusted position.

- If the desired setting is not achieved or excess slack develops as you change seat position, repeat the above procedure.
- When the door is opened, the comfort regulator will release automatically, permitting the lap-shoulder belt to retract. After unbuckling the belt it is recommended that you guide the tongue during retraction to prevent it from striking you or the vehicle.

WARNING — The belt system must be snug to restrain you properly. Never allow more than 1-1/2 inches (3.8 cm) of slack to be introduced into your safety belt system because the belt locks upon impact where it is positioned. Wearing the belt too loosely will negate any real safety protection. Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around your neck over the inside shoulder. Never use a single belt for more than one person. Be sure the lap portion of the belt is fitted snugly and as low as possible around the hips, not on the waist. Failure to follow these precautions could increase the chance and/or severity of injury in an accident.

Lap Belts Without Retractors

Because the center lap belts and side facing seat lap belts do not have retractors, they should be shortened and fastened when not in use. To lengthen the belt, tip the tongue at a right angle to the belt and pull the belt over your lap until the tongue reaches the buckle.

To fasten the belt, insert the tongue into the open end of the proper buckle until you hear a snap and feel the latch engage. Then pull on the loose end of the webbing to snug the belt. The belt should be snug and as low as possible around the hips, never around the waist.

Rear Lap Belts with Retractors

Pull the belt out of the retractor with a steady motion and insert the tongue into the buckle until you hear a snap and feel the latch engage.

WARNING — Be sure the lap belt is fitted snugly and as low as possible around the hips, not around the waist. Failure to do so may increase the chance of injury in the event of a collision.

If you should jam the lap belt retractor by allowing the belt to retract when it is twisted, you can free the webbing with this procedure:

- Pull on the belt with both hands to tighten it on the retractor spool.
- Feed the belt back into the retractor until it is on the retractor spool.
- Pull the belt out of the retractor as far as it will go. Remove any foreign matter or untwist the belt as necessary and let the belt retract.
- Extend and retract the belt about five times to make sure the belt retractor operates properly.

Unfastening Safety Belts

Push the release button in the buckle and allow the belts to unlatch.

Safety Belt Extension Assembly

A safety belt assembly that is too short even when fully extended can be lengthened approximately eight inches (20 cm) with a safety belt extension assembly (54611C22) available from your dealer.

WARNING — To ensure that the safety belt extension assembly will hold in the event of a collision, only safety belt extensions manufactured by the same manufacturer as the safety belt should be used. Supplier identification is located at the end of the webbing on a label.

Safety Belt Maintenance

Safety belt assemblies should be periodically inspected to assure that they have not become damaged and that they remain in proper operating condition, particularly if they have been subjected to severe stress.

WARNING — All safety belt assemblies, including retractors and attaching hardware, should be inspected after any collision. Ford recommends that all safety belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

Infant and Child Restraints

WARNING — For maximum protection in the event of a collision or sudden stop, always protect the infant and child occupants of your vehicle with an infant or child safety seat designed especially for them and which conforms to applicable motor vehicle safety standards. Do not permit children to sit where they cannot be properly restrained.

According to accident statistics, properly restrained children are safer in the rear seat (of vehicles with rear seats) than in the front seat.

If infant and child safety seats are not installed and used correctly, they may not provide the protection which they are designed to provide. Be sure to read and follow carefully all of the installation and use instructions, and obey all warnings supplied with the infant and child safety seats.