

NEW CAR ASSESSMENT PROGRAM (NCAP) FRONTAL BARRIER IMPACT TEST

DIAMOND - STAR MOTOR CORPORATION
1990 MITSUBISHI ECLIPSE
2 DOOR HATCHBACK (ACP)
NHTSA NO. ML5600

MOBILITY SYSTEMS AND EQUIPMENT COMPANY
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OCTOBER 16, 1989

FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION
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OFFICE OF MARKET INCENTIVES
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16. Abstract A 35 mph frontal barrier impact test using a load cell barrier was conducted on a 1990 Mitsubish Eclipse, 2 Door Hatchback at the Mobility Systems and Equipment Company (MSE) crash test facility in Mira Loma, CA, on 27 September 1989. The barrier impact velocity was 35.1 mph, and the ambient temperature at the barrier face at the time of impact was 94 deg. F. The post-test vehicle crush maximum was 22.3 in. A summary of occupant injury measure data from the test appears below: <table border="1"> <thead> <tr> <th>Injury Criteria Threshold Value</th> <th>Driver Dummy</th> <th>Passenger Dummy</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criterion HIC = 1000</td> <td>772</td> <td>612</td> </tr> <tr> <td>Chest Resultant Peak 60 Gs (3 ms clip)</td> <td>43.7</td> <td>40.1</td> </tr> <tr> <td>Femur Load Left</td> <td>1152</td> <td>499</td> </tr> <tr> <td>2250 Pounds Right</td> <td>1033</td> <td>413</td> </tr> </tbody> </table> TYPE OF RESTRAINT SYSTEM: A motorized 2-point belt system and knee bolster as a passive restraint system and an active lap belt at each front outboard seating position.				Injury Criteria Threshold Value	Driver Dummy	Passenger Dummy	Head Injury Criterion HIC = 1000	772	612	Chest Resultant Peak 60 Gs (3 ms clip)	43.7	40.1	Femur Load Left	1152	499	2250 Pounds Right	1033	413
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SECTION 1

PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is a part of the FY 90 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.

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SECTION 2

SUMMARY OF FRONTAL BARRIER IMPACT TESTS

A load cell barrier consisting of 36 cell units was impacted by a 1990 Mitsubishi Eclipse, 2 Door Hatchback, NHTSA No. ML5600, at a velocity of 35.1 mph. The frontal impact test was conducted by Mobility Systems and Equipment Company (MSE) on 27 September 1989. The general test and vehicle description information is 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 (ATDs) 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 two (2) FM tape recorders, three (3) computers and associated data acquisition system. Time history plots of all recorded channels are presented in Appendix B.

2.1 GENERAL COMMENTS

The 1990 Mitsubishi Eclipse, 2 Door Hatchback, was equipped with a 110 cubic inch, 4 cylinder engine and manual transmission. The test weight of the 1990 Mitsubishi Eclipse, 2 Door Hatchback, with two (2) 50th percentile male dummies, instrumentation, and cameras was 2,977 pounds.

The 1990 Mitsubishi Eclipse was involved in a frontal load cell barrier crash at a velocity of 35.1 mph.

The maximum static crush for the vehicle of 22.3 inches occurred at the centerline of the front bumper. The windshield was cracked but, otherwise the vehicle glazing remained intact. Both the driver's and passenger's front doors were opened without the aid of tools.

The driver ATD's head hit the steering wheel rim. The driver's left and right knees hit the dash panel and steering column. The driver ATD had a HIC value of 772, the maximum chest acceleration (resultant clipped) was 43.7 g's, and the maximum femur loads were 1,152 (left) and 1,033 (right) pounds.

The passenger ATD's head did not hit the glove box door and both of his knees hit the dash panel and glove box door. The HIC value for the passenger ATD was 612, the maximum chest acceleration (resultant clipped) was 40.1 g's, and the maximum femur loads were 499 (left) and 413 (right) pounds.

Seat belt spool out, measured by high-speed film analysis, was 2.3 inches for the driver and 1.9 inches for the passenger.

There were no apparent visual indications of any standard solvent leaks, however, there was battery acid leakage.

Each of the test vehicle's front outboard seating position was equipped with a 2-point, motorized belt system with a knee bolster as vehicle's Automatic Crash Protection System. Additionally, each position had an active lap belt. The vehicle was tested with both the active lap belt and the ACP system.

Data Table No. 1 Test Vehicle Data

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1990/MITSUBISHI/ECLIPSE/2 DOOR HATCHBACK

VEHICLE NHTSA NO.: M L 5 6 0 0 VIN: 4 A 3 C S 3 4 T 8 L E 0 2 0 1 6 0

VEHICLE BODY COLOR: BLUE; MONTH & YEAR OF MANUFACTURE: 05/89

ENGINE: 4 Cylinders; C.I.D; 1.8 Liters; CC
X Gas; Diesel; Turbocharged
PLACEMENT-- Longitudinal; X Transverse (Lateral)

TRANSMISSION: 5 Speed; X Manual; Automatic; Overdrive
FINAL DRIVE: X Front Wheel Drive Rear Wheel Drive;
 Four Wheel Drive

DATE VEHICLE AVAILABLE FOR 35 MPH CRASH TESTING: 07/27/89

ODOMETER READING: 36 miles; OPTIONS: X A/C; P/S; P/Wdo.;
X Tilt Whl.; Cruise Control

DATA RECORD FROM VEHICLE'S TIRE PLACARD:

=====

Tire Pressure (at capacity): 29 psi Front; 26 psi Rear
Recommended Tire Size: P185/70R14
Tires on Vehicle: P175/70R14; Manufacturer: GOODYEAR
Number of Occupants: 2 Front; 2 Rear; 3rd Seat; 4 TOTAL
Type of Front Seats: X Bucket; Bench; Split Bench
Type of Front Seat Back: Fixed; X Adjustable With X Lever
 Rotating Knob

Vehicle Maximum Capacity Loading = 661 lbs. (A)
No. of Occupants x 150 lbs.- - - = 600 lbs. (B)
Cargo Capacity (A - B) - - - - - = 61 lbs.

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

=====

Right Front	=	<u>776</u>	lbs.	
Left Front	=	<u>806</u>	lbs.	TOTAL FRONT = <u>1582</u> lbs. (<u>61.0%</u> of TOTAL)
Right Rear	=	<u>496</u>	lbs.	
Left Rear	=	<u>516</u>	lbs.	
TOTAL WEIGHT	=	<u>2594</u>	lbs.	TOTAL REAR = <u>1012</u> lbs. (<u>39.0%</u> of TOTAL)

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

CALCULATION OF TEST VEHICLE TARGET WEIGHT:

Total Test Vehicle Delivered Weight With Maximum Fluids =	2594	lbs.
Maximum Cargo Carrying Capacity of Test Vehicle*- - - - -	61	lbs.
Weight of Two P.572 Dummies (2 x 164 lbs.)- - - - -	328	lbs.
TEST VEHICLE TARGET WEIGHT	2983	lbs.

*300 lbs. for light trucks and MPVs

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front =	887	lbs.	TOTAL FRONT =	1776	lbs. (59.7% of TOTAL)
Left Front =	889	lbs.			
Right Rear =	594	lbs.	TOTAL REAR =	1201	lbs. (40.3% of TOTAL)
Left Rear =	607	lbs.			

TOTAL WEIGHT= 2977 lbs. (which includes 25 lbs. of cargo ballast weight placed in the cargo/luggage area)

VEHICLE COMPONENTS REMOVED TO MEET TARGET WEIGHT:

- | | | | |
|----------------------------------|------------------------------|------------------|--------------------|
| 1. <u>X</u> Spare Tire | 3. <u>X</u> Tail lamp hsg. | <u>X</u> Rt.Side | <u>X</u> Left Side |
| 2. <u>X</u> Rear Bumper Assembly | 4. <u>Rear Seat Assembly</u> | | |

TEST VEHICLE ATTITUDE:

As Delivered----Right Front = 28.0 inches
Left Front = 27.5 inches
Right Rear = 27.9 inches
Left Rear = 28.0 inches

Ready For Test--Right Front = 27.3 inches
Left Front = 26.8 inches
Right Rear = 26.9 inches
Left Rear = 27.1 inches

Test Vehicle Wheelbase: 96.5 inches; C.G.= 38.9 inches rearward of front wheel centerline

Total Vehicle Length:

Right Side =	158.0	inches
Left Side =	158.0	inches
Centerline =	167.3	inches

Data Table No. 2 Post Crash Test Data

DATA OF 35 MPH FRONTAL BARRIER IMPACT RATING TEST: 09/27/89

TIME OF TEST: 4:30 PM: AMBIENT TEMPERATURE AT BARRIER FACE: 94 °F

VEHICLE'S OCCUPANT COMPARTMENT TEMPERATURE: 74 °F

(spec. Range = 66 to 78 F.)

VEHICLE WINDSHIELD HOLDING TEMPERATURE: 74 °F.

VEHICLE IMPACT VELOCITY: Primary Speed Trap = 35.13 mph
Secondary Speed Trap 35.13 mph
(Specified Range = 34.5 to 35.5 mph)

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

(a) entering the speed trap = 5.0 ft
(b) exiting the speed trap = 1.0 ft

VEHICLE STATIC CRUSH:

Vehicle Pre-test Length-Right Side = 158.0"; C/Line=167.3"; Left Side=158.0"
Vehicle Post-test Length-Right Side=143.4"; C/Line=145.0"; Left Side=143.8"
Vehicle Static Crush --- Right Side=14.6"; C/Line=22.3"; Left Side=14.2"

VEHICLE REBOUND FROM BARRIER FACE:

Vehicle Right Side = 16.0 inches
Vehicle Centerline = 18.0 inches
Vehicle Left Side = 18.0 inches

VEHICLE DUMMY CONTACT POINTS:

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

VEHICLE DOOR OPENING INFORMATION:	RIGHT SIDE		LEFT SIDE	
	OPENED	JAMMED	OPENED	JAMMED
FRONT DOORS - - - - -	YES		YES	
REAR DOORS - - - - -	N/A	N/A	N/A	N/A

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

VEHICLE'S FRONT SEAT MOVEMENT DURING CRASH EVENT:

	LEFT	RIGHT
Seat Cushion Shift - - - - -	0.0 "	0.0 " forward
Seat Adjuster Failure- - - - -	None ;	None

Details Of Any Failure: N/A

OTHER NOTABLE IMPACT EFFECTS:

No windshield separation. No hood contact. Tell-tale on driver's lap belt pulled out as expected.

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: 1990/MITSUBISHI/ECLIPSE/2 DOOR HATCHBACK

VEH. NHTSA NO.: ML5600; TEST DATE: 09/27/89

MAXIMUM ACCELERATION VALUES:		DRIVER DUMMY # 465	PASSENGER DUMMY # 466
Head Channel X	HEAD X	-84.77	-29.93
Head Channel Y	Y	13.45	-9.47
Head Channel Z	Z	71.37	59.32
HEAD RESULTANT	R	110.30	62.16
Chest Channel X	CHEST X	-45.44	-40.12
Chest Channel Y	Y	8.93	-13.53
Chest Channel Z	Z	-8.99	-13.08
CHEST RESULTANT (3 ms clip)	R	43.70	40.10
TIME INTERVAL (seconds)		0.0664 to 0.0694	0.0765 to 0.0795

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	HIC	771.88	611.51
t_1 (seconds)		0.0605	0.0656
t_2 (seconds)		0.0945	0.1016
Avg. Accel. t_1 to t_2		55.20	49.18

MAXIMUM FEMUR FORCES:

Right Side (lbs.)	FR	1033.00	413.00
Left Side (lbs.)	FL	1152.00	498.80

MAXIMUM SEAT BELT FORCES:

Lap Belt	LAP	131.60	735.30
Shoulder Belt	SHLDR	1582.00	1704.00

MAXIMUM SEAT BELT WEBBING SPOOL-OUT:

Lap/Shoulder Belt Combination	2.8	3.9
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Data Table No. 4 Test Dummy Positioning Data

PRE-IMPACT DATA:

Make/Model: MITSUBISHI/ECLIPSE

Body Style: 2 DOOR HATCHBACK

Model Year: 1990

NHTSA No.: ML5600

Color: BLUE

DATA FROM CERTIFICATION LABEL:

Vehicle Manufacturer: DIAMOND-STAR MOTORS CORPORATION

Date of Manufacture: 05/89 ; VIN: 4A3CS34T8LE020160

POST-IMPACT DATA:

Date of Test: 09/27/89 Time: 4:30 PM Temperature: 94 °F

Required Impact Velocity Range: 34.5 to 35.5 mph

Impact Velocity: Primary = 35.13 mph Secondary = 35.13 mph

Seat Type: Bucket Adjuster Type: Lever

Bucket Seat Back Type: Integral Headrest

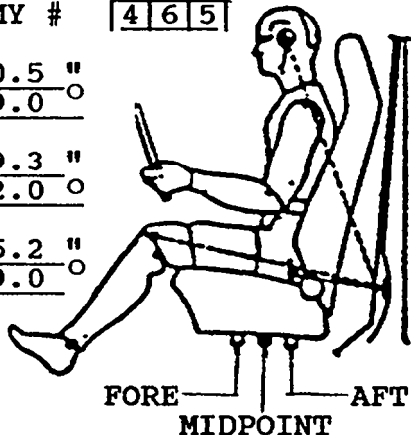
TECHNICIANS: Enrique Marin

DRIVER DUMMY # 465

HEAD 20.5 " TARGET +69.0 °

KNEE 29.3 " JOINT -2.0 °

APPROX- 15.2 " IMATE -19.0 ° "H" POINT

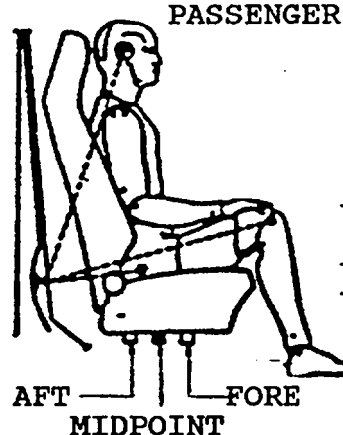


PASSENGER DUMMY # 466

20.4 " HEAD TARGET +69.0 °

29.7 " KNEE JOINT -2.0 °

16.0 " APPROX- -14.0 ° MATE "H" POINT

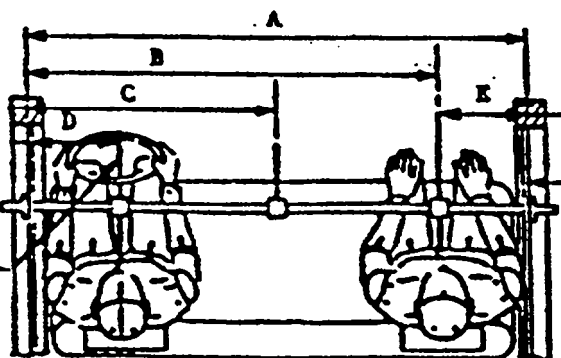


A = 57.4 " B = 42.4 " C = 28.7 " D = 14.9 " E = 15.0 "

LATERAL BAR

ADJUSTABLE POINTER

LEFT FRONT DOOR



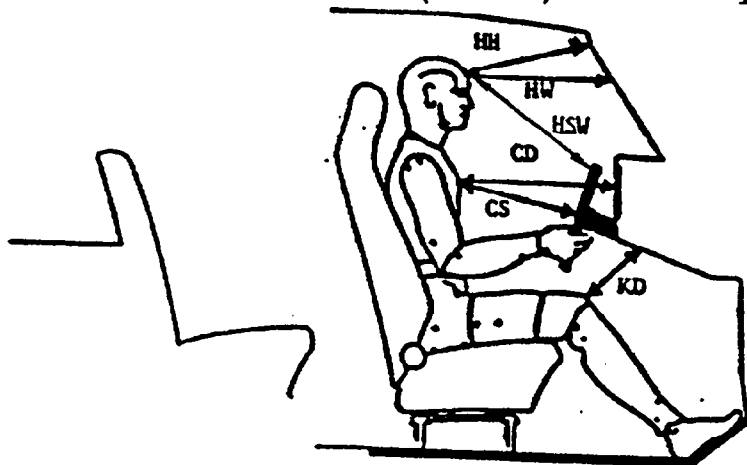
DOOR GLASS HEIGHT

RIGHT FRONT DOOR

DRIVER DUMMY # 465

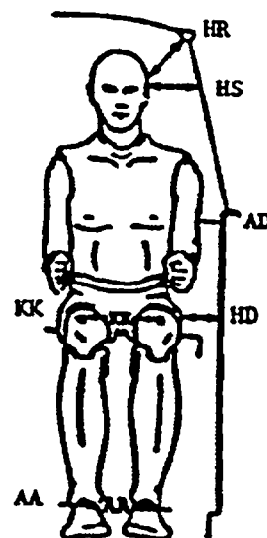
PASSENGER DUMMY # 466

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

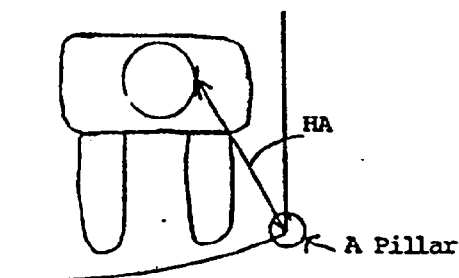


	Driver	Passenger
HH	11.5	12.6
HW	18.4	18.7
CD	21.5	23.4
CS	15.0	N/A
KD	L- 6.3	L- 5.4
KD	R- 5.9	R- 5.0
Torso Angle	20.0	Torso Angle 20.0
Seat Back Angle	23.0	Seat Back Angle 23.0
HSW	17.2	N/A

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

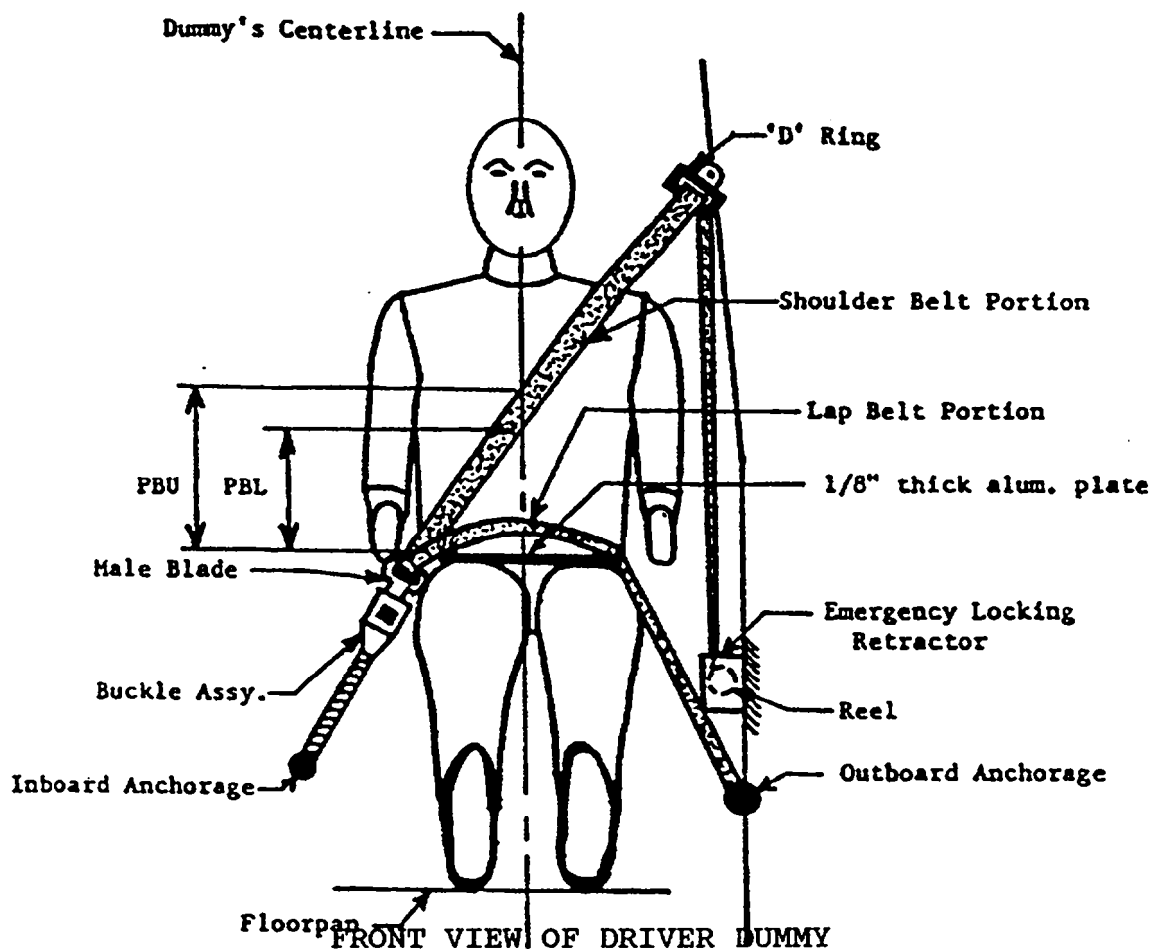


REMARKS



	Driver	Passenger
HR	4.9	5.4
HS	7.0	7.5
AD	3.3	3.8
HD	4.8	5.1
KK	14.5	11.8
AA	14.0	11.0
HA	17.4	17.5

Data Table No. 5 Seat Belt Positioning Data



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to belt upper edge	13.5	13.5
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	10.4	9.9
<u>LAP BELT TENSION, POUNDS</u>	< 3.0	< 3.0
<u>SHOULDER BELT TENSION, POUNDS</u>	< 3.0	< 3.0

Data Table 6 Seat Belt Performance Assessment Test Data

BELT LENGTH DATA:

Total belt length from retractor reel to bolt hole anchor point for continuous webbing systems _____

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

Shoulder belt length as measured on Part 572 dummy _____

Lap belt length as measured on Part 572 dummy _____

Remainder of belt webbing left on retractor reel _____

DRIVER SIDE		PASSENGER SIDE	
PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
S-62.2 L-48.2	S-62.2 L-48.2	S-61.5 L-45.7	S-61.5 L-48.7
8.5	9.5	8.5	9.3
36.2	35.5	36.0	35.5
32.5	31.0	31.0	31.4
S-17.5 L-15.7	S-17.2 L-17.2	S-17.0 L-14.7	S-16.7 L-14.3

BELT SPOOL-OFF DATA:

As determined by film analysis _____

As determined by electronically _____

As determined mechanically _____

2.3 in	1.9 in
NOT MEASURED	NOT MEASURED
2.8 in	3.9 in

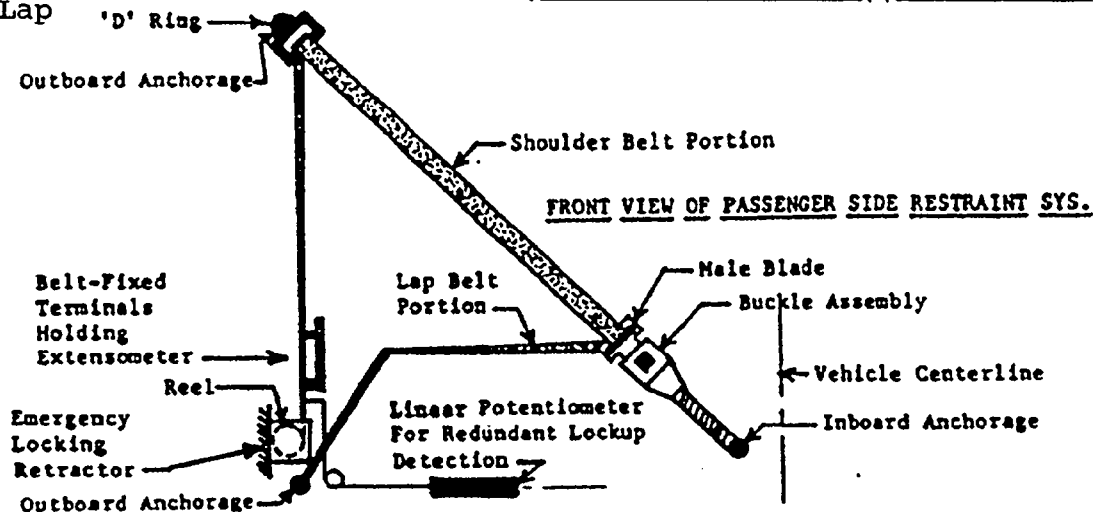
BELT STRAIN DATA:

Measured between retractor reel and 'D' ring _____

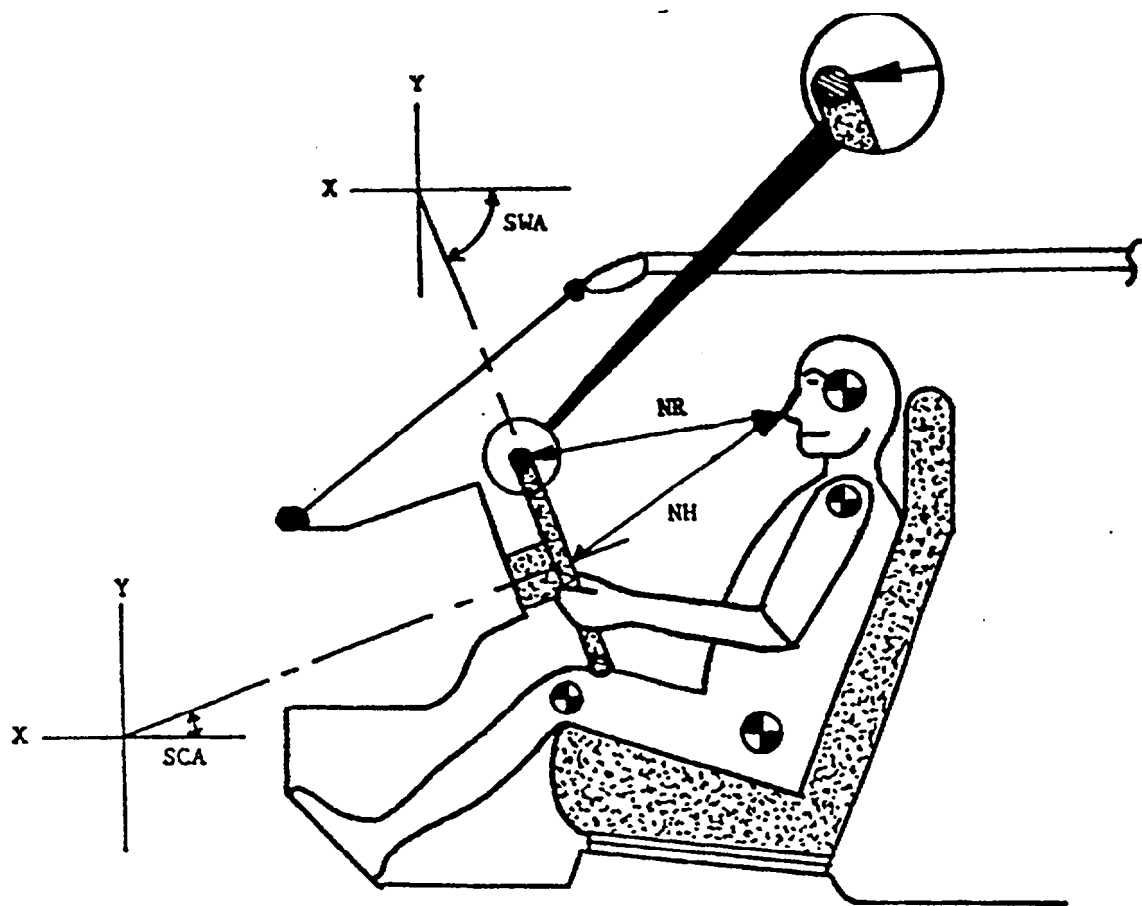
*S = Shoulder

L = Lap 'D' Ring

8.6 Percent	5.4 Percent
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Data Table No. 7 Driver Dummy to Steering Wheel Positioning



LEFT SIDE VIEW

MEASUREMENTS	
<u>NR</u> --Distance from tip of dummy's nose to Top Rear surface of steering wheel rim.	15.3 Inches
<u>NH</u> --Distance from tip of dummy's nose to center of steering column hub.	17.2 Inches
<u>SCA</u> --Angle of steering column relative to the horizontal X axis.	20.0 Degrees
<u>SWA</u> --Angle of steering wheel relative to the horizontal X axis.	73.0 Degrees

Data Table 8 Camera Location Data

VEH. NHTSA NO.: ML5600 ; TEST DATE: 09/27/89 ; TIME: 4:30 PMVEH. YEAR/MAKE/MODEL/BODY STYLE: 1990/MITSUBISHI/ECLIPSE/2 DOOR HATCHBACK

CAMERA NO.	VIEW	CAMERA POS. (in.)			ANGLE (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Left Side View	-676	268	57	3	688	15-70 ZOOM	24
2	Right Side View	244	63	53	2	237	13	600
3	Left Side View	-358	44	38	0	352	16	500
4	Overhead	-1	-2	129	48	97	13	400
5	Pit-Engine	12	40	-50	40	**	13	600
6	Pit-Fuel Tank	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
7	Front-Passenger	12	-13	105	46	165	16	600
8	Front-Driver	-12	-14	106	44	67	16	500
9	Left Side-Driver	-97	121	80	22	98	16	600
10	Right Side-Passenger	108	120	80	21	108	16	600
11	Right Side-'A' Post	168	9	53	2	181	28	600
12	Left Side-'A' Post	-344	-20	49.5	2	353	50	1000
13	Onboard-Left Side	-14	110	18	12	38	13	750
14	Onboard-Right Side	12	110	18	14	37	13	750
15	Left Side-Steering Col.	-441	82	128	14	439	25.4	600
16	Left Side-Steering Col.	-442	81	110	10	437	25.4	400
17	Right Side Passenger	148	89	52	9	139	16	700

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

** Pit camera uses refractor lens for imagery.

2 High-Speed Right Side View

CONCRETE PAD

17 High-Speed Passenger Coverage

11 Right 'A' Post High-Speed

10 High-Speed Passenger Coverage

Umbilical Cable

TOW ROAD

Steel Grating Over Pit Area

Lateral Guidance Dolly

Monorail

Barrier

Pass. Side High-Speed

7 High-Speed

8 High-Speed Driver Side

OVERHEAD

Strg. Wheel

14 Right Onboard High-Speed

ONBOARD SEAT BELT SPOOL-OUT COVERAGE

13 Left Onboard High-Speed

High-Speed Driver Coverage

9

12 Left 'A' Post High-Speed

15

16

BOTH STEERING COLUMN MOVEMENT CAMERAS are high-speed and placed one on top of the other - not side-by-side

TOP VIEW

NOTE: CAMERA FRAME RATES
#1 - 24 fps
#2 thru #17 - 300 fps

8

4

Overhead High-Speed On Veh. C/L

3

1 Real-Time Left Side View

Barrier

Barrier Face Extension Above Load Cell Assy.

Load Cell Assembly

"Time-Zero" Indicator Lights (2)

NOTE: Roof Light placed on veh. centerline behind photo targets for strg. col. motion assessment

Photographic Target

Vehicle's Fuel Tank

"Time Zero" Indicator

Belt Retractor Unit

"Time Zero" Indicator (placed near engine oil pan)

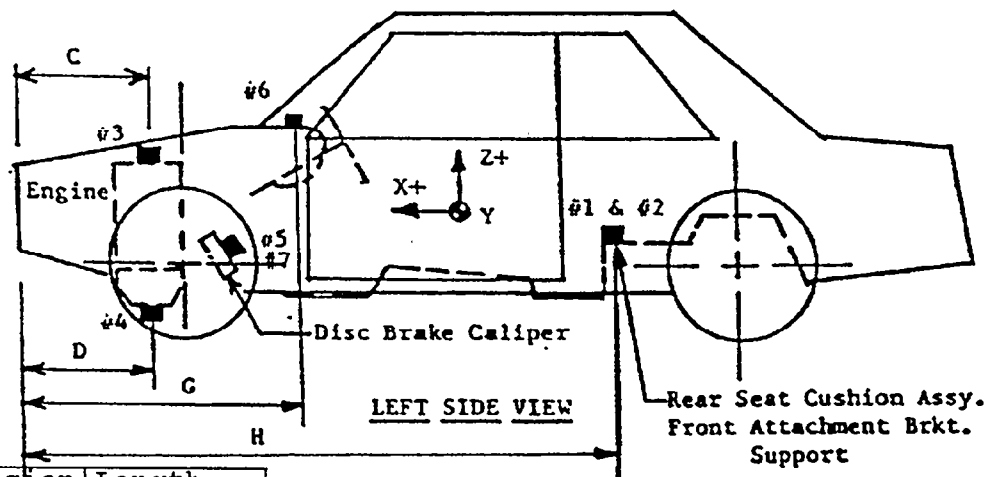
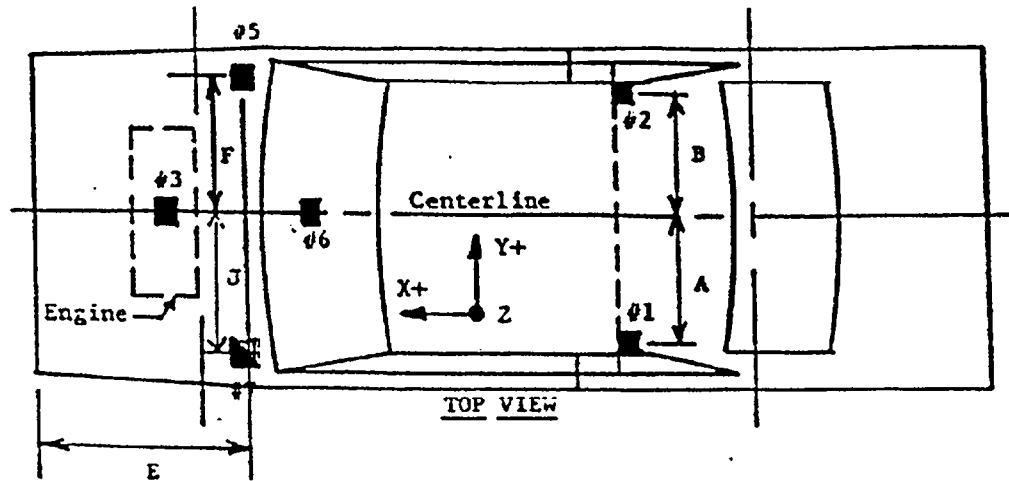
Engine Compartment High-Speed

5

PHOTOGRAPHIC PIT

LEFT SIDE VIEW

Data Table No. 9 Vehicle Accelerometer Location and Data Summary



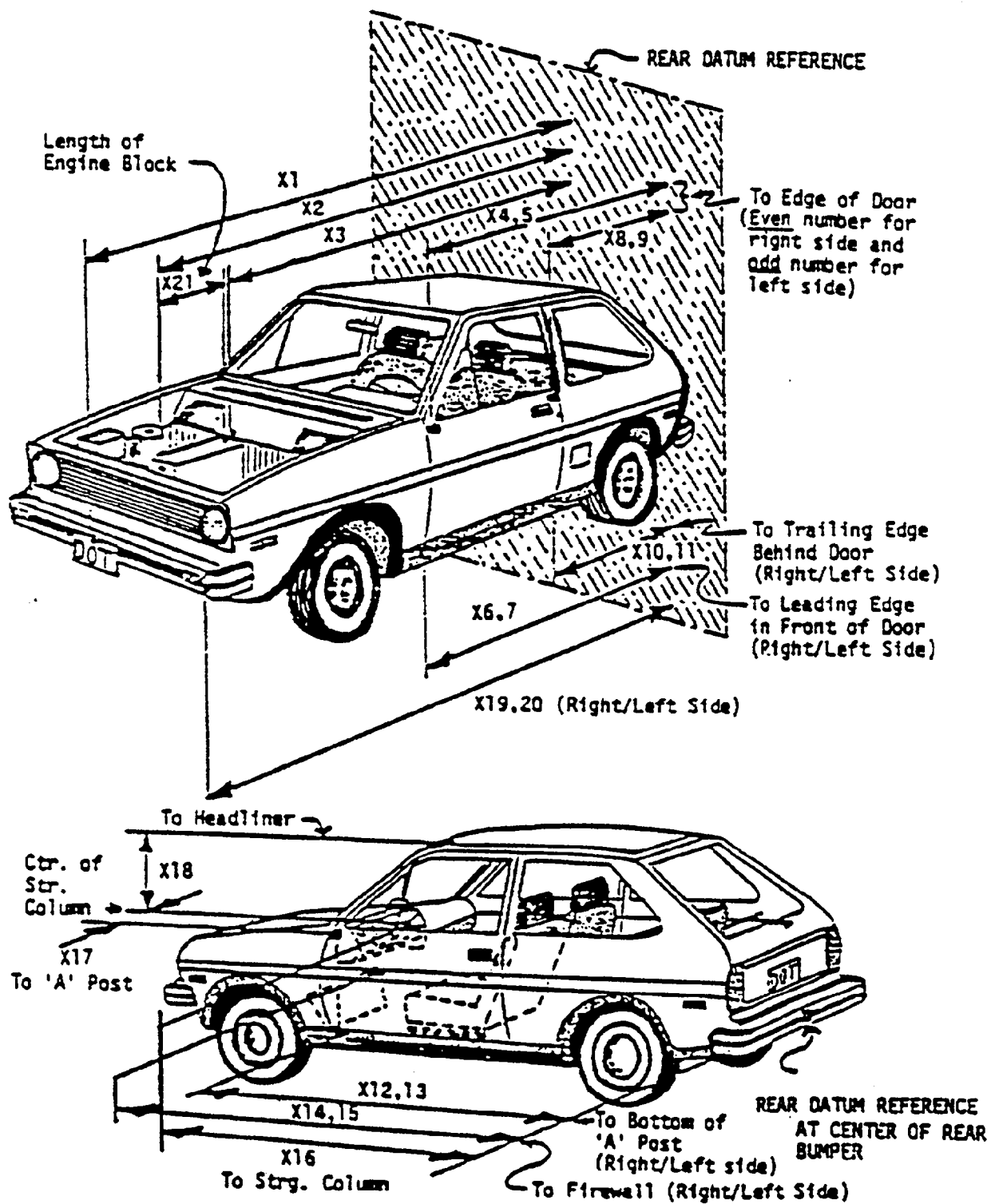
Dimension	Length (in.)
A	21.5
B	21.5
C	30.8
D	31.5
E	32.0
F	25.2
G	65.0
H	110.0
J	25.2

Loc. No.	Description	Maximum Value			
		X-	msec.	X+	msec.
1	Rear seat X-member @ Left Side	-31.4	62.1	4.1	135.
2	Rear seat X-member @ Right Side	-26.3	71.2	4.4	129.4
3	Top of Engine Block	-148.2	29.2	32.8	44.
4	Bottom of Engine	-111.5	30.7	34.7	39.2
5	Disc Brake Caliper Right Side	-120.0	40.7	61.0	61.
6	Instrument Panel	- 82.4	53.2	47.5	61.9
7	Disc Brake Caliper @Left Side	-127.6	42.3	38.7	62.

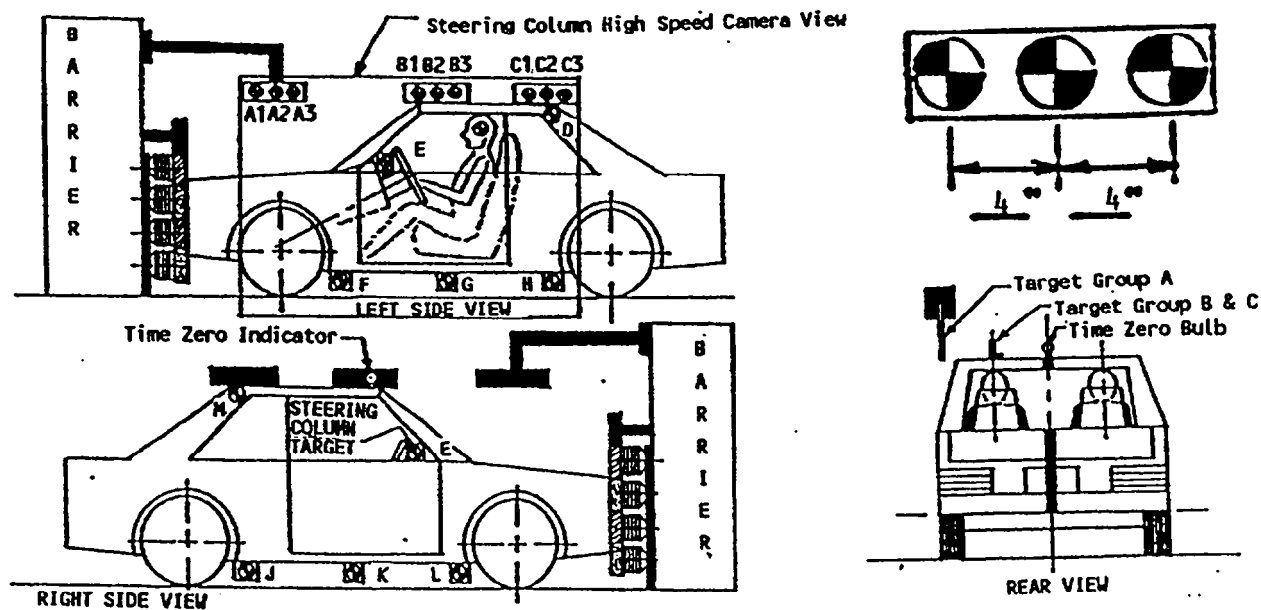
Data Table No. 10 Test Vehicle Measurements

NO.	MEASUREMENT DESCRIPTION	Pre-Test (in.)	Post-Test (in.)	Diff. (in.)
X1	Total Length of Test Vehicle at Centerline	167.3	145.0	22.3
X2	Rear Surface of Vehicle to Front of Engine	142.3	137.8	4.5
X3	Rear Surface of Vehicle to Firewall	119.3	117.8	1.5
X4	Rear Surface to Upr. Leading Edge of Right Door	111.0	111.0	0.0
X5	Rear Surface to Upr. Leading Edge of Left Door	111.5	111.5	0.0
X6	Rear Surface to Lwr. Leading Edge of Right Door	111.5	111.3	0.2
X7	Rear Surface to Lwr. Leading Edge of Left Door	111.5	111.1	0.4
X8	Rear Surface to Upr. Trailing Edge of Right Door	61.2	61.1	0.1
X9	Rear Surface to Upr. Trailing Edge of Left Door	61.0	59.9	1.1
X10	Rear Surface to Lwr. Trailing Edge of Right Door	65.8	65.5	0.3
X11	Rear Surface to Lwr. Trailing Edge of Left Door	66.0	65.5	0.5
X12	Rear Surface to Bottom 'A' Post on Right Side	110.5	110.5	0.0
X13	Rear Surface to Bottom 'A' Post on Left Side	110.5	110.5	0.0
X14	Rear Surface to Firewall on Right Side	118.8	118.8	0.0
X15	Rear Surface to Firewall on Left Side	118.8	119.3	-0.5
X16	Rear Surface to Steering Column	93.0	92.3	0.7
X17	Center of Steering Column to 'A' Post	17.5	16.8	0.7
X18	Center Steering Column to Headlining	16.2	15.5	0.7
X19	Rear Surface to Right Side of Front Bumper	158.0	143.4	14.6
X20	Rear Surface to Left Side of Front Bumper	158.0	143.8	14.2
X21	Length of Engine Block	16.0	16.0	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
A-1	69.0	20.7	65.0
A-2	73.0	20.7	65.0
A-3	77.0	20.7	65.0
BARRIER TARGETS	'X' From Imag. Barrier Face Vertical Plane	'Y' From Monorail C/L	'Z' Above Ground
B-1	80.0	14.5	51.0
B-2	84.0	14.5	51.0
B-3	88.0	14.5	51.0
C-1	112.5	14.5	51.0
C-2	116.5	14.5	51.0
C-3	121.5	14.5	51.0
D	118.5	28.5	46.0
E	71.0	14.0	33.7
F	55.0	26.7	5.2
G	85.7	26.7	4.7
H	115.5	26.7	5.0
J	116.0	26.7	4.7
K	85.7	26.7	5.0
L	55.1	26.7	5.0
M	118.0	28.5	46.0

NOTE: Diameter of all photo targets is 4".

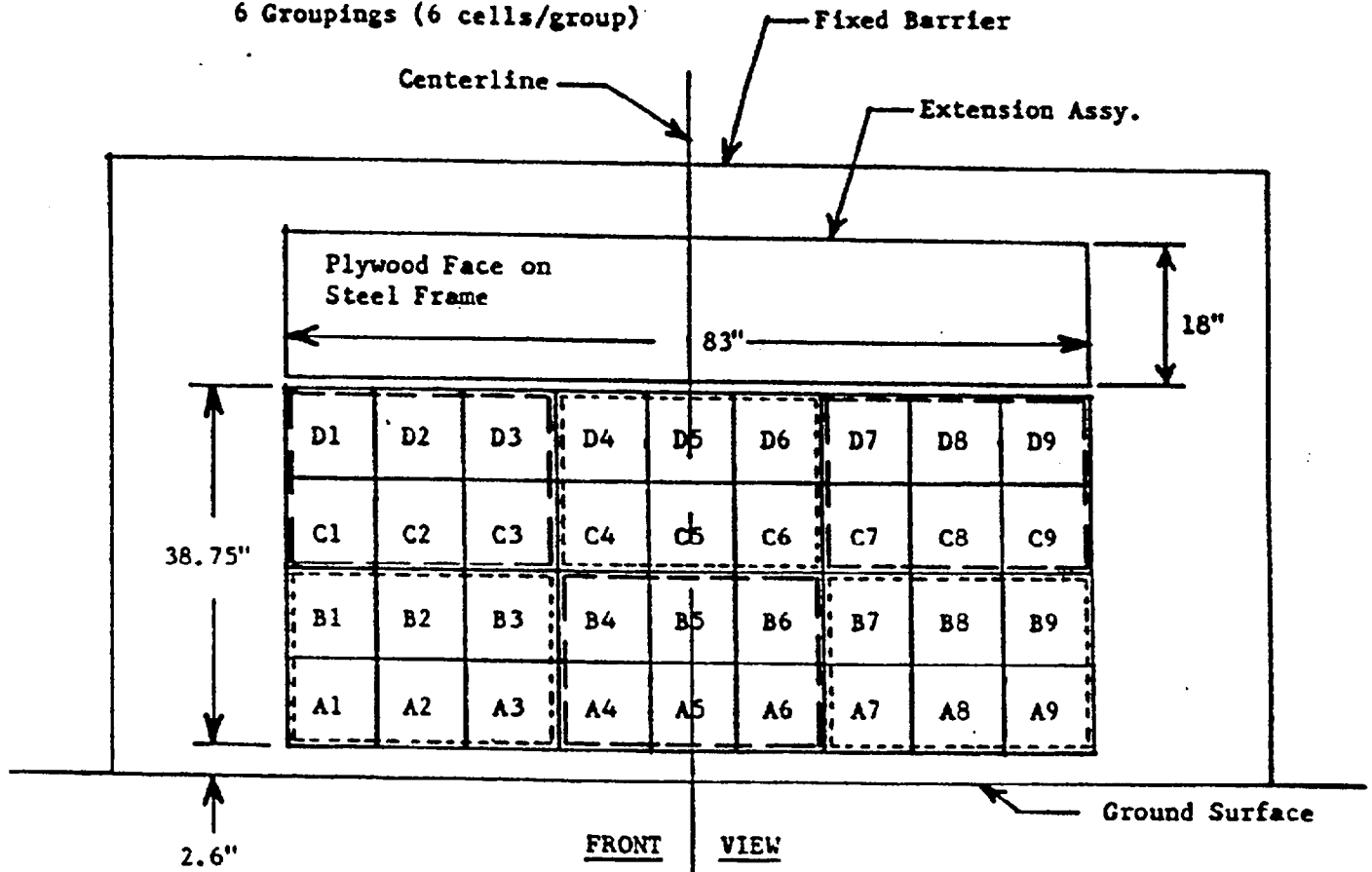
Data Table No. 12 Load Cell Locations on Fixed Barrier

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

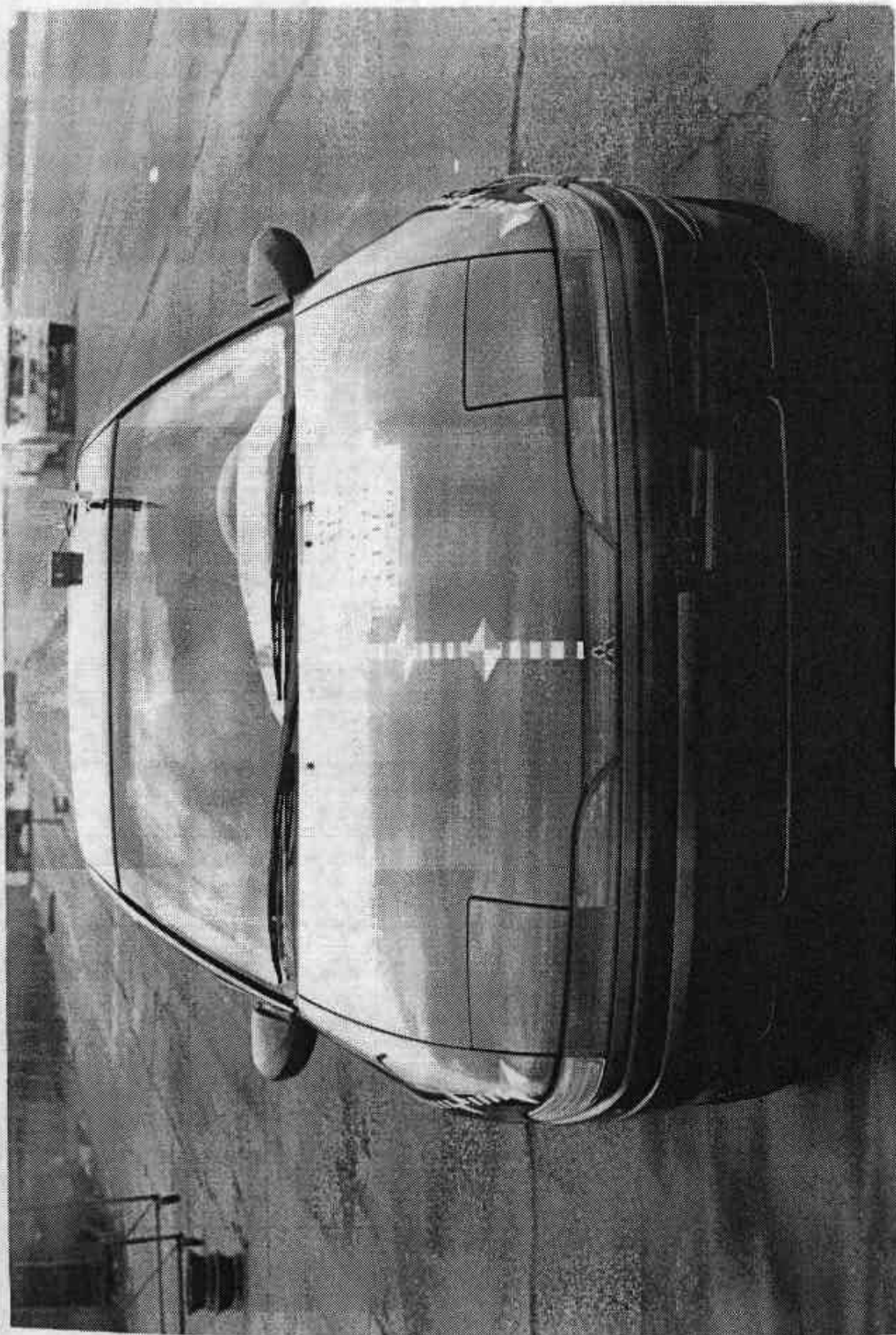
- DATA REQUIREMENTS:
- (1) Data from 36 individual load cells
 - (2) Total or Sum of 36 individual load cells
 - (3) Data from 6 Groupings shown above (6 cells/group)

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 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 & VEHICLE INTERIOR VIEW (Door Open)
POSTTEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
POSTTEST DRIVER DUMMY (ATD) HEAD AND KNEE CONTACT AREA
POSTTEST PASSENGER DUMMY (ATD) KNEE CONTACT AREA

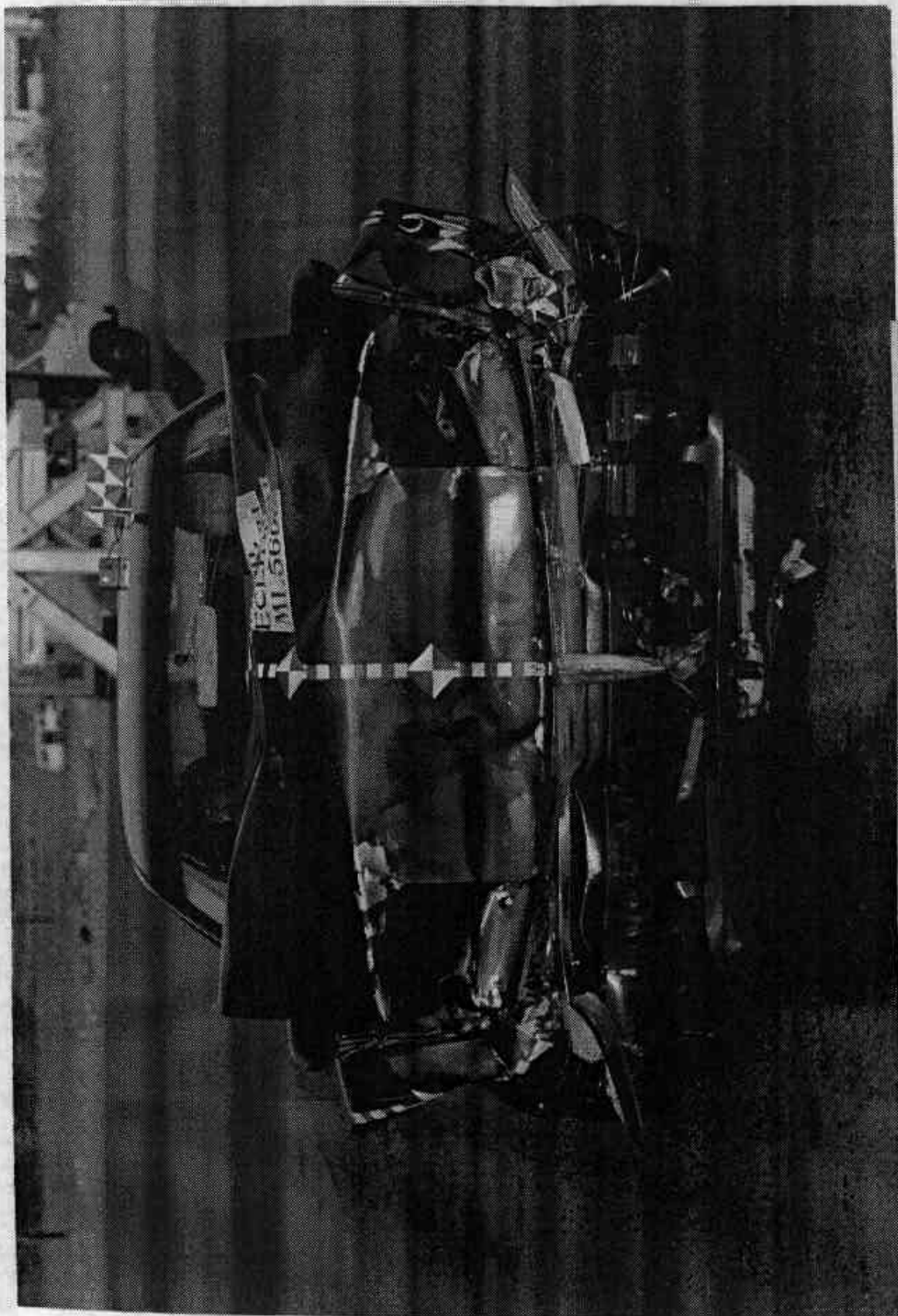
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PRETEST FRONT VIEW

A-1

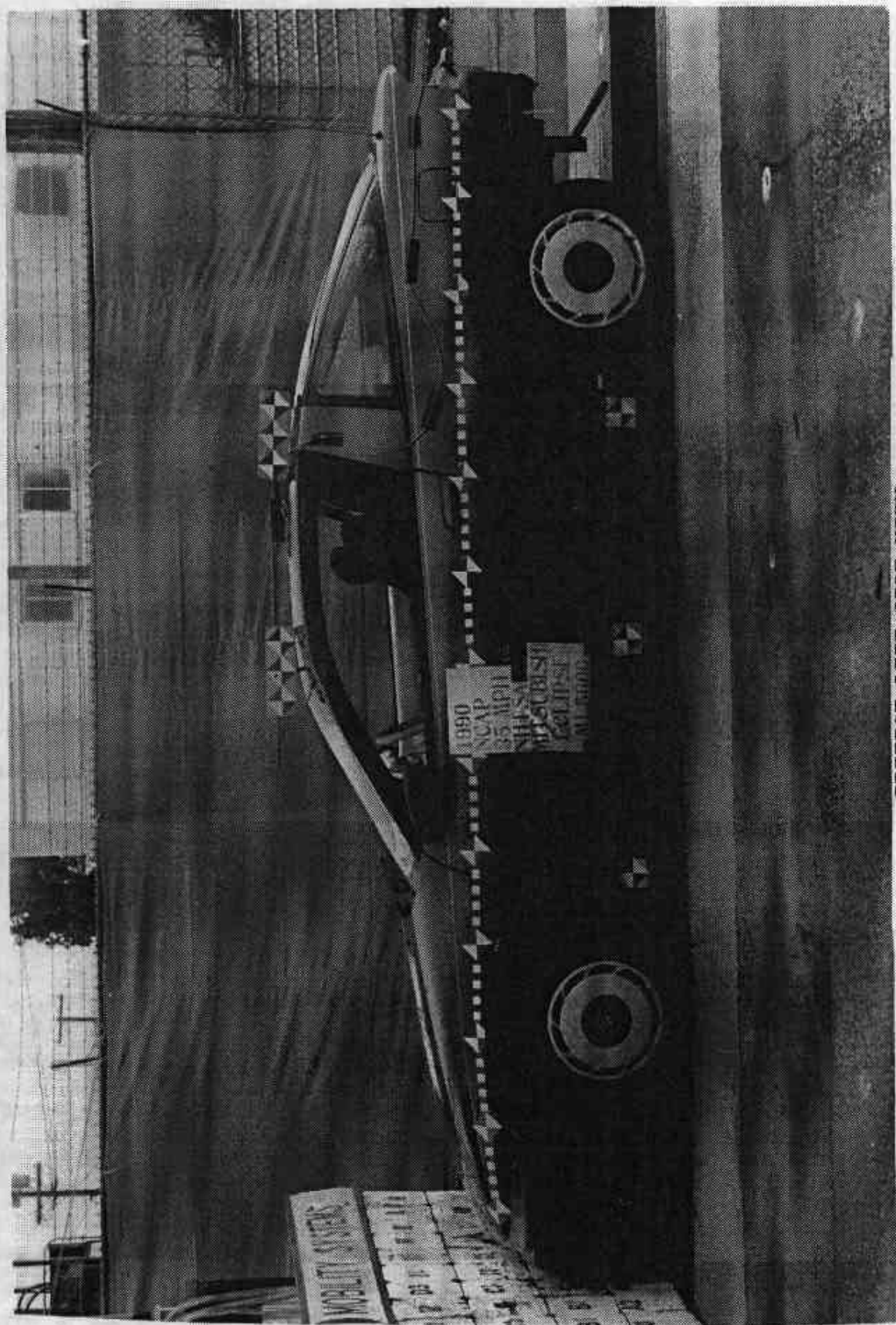
MSE-90-R9063-N03



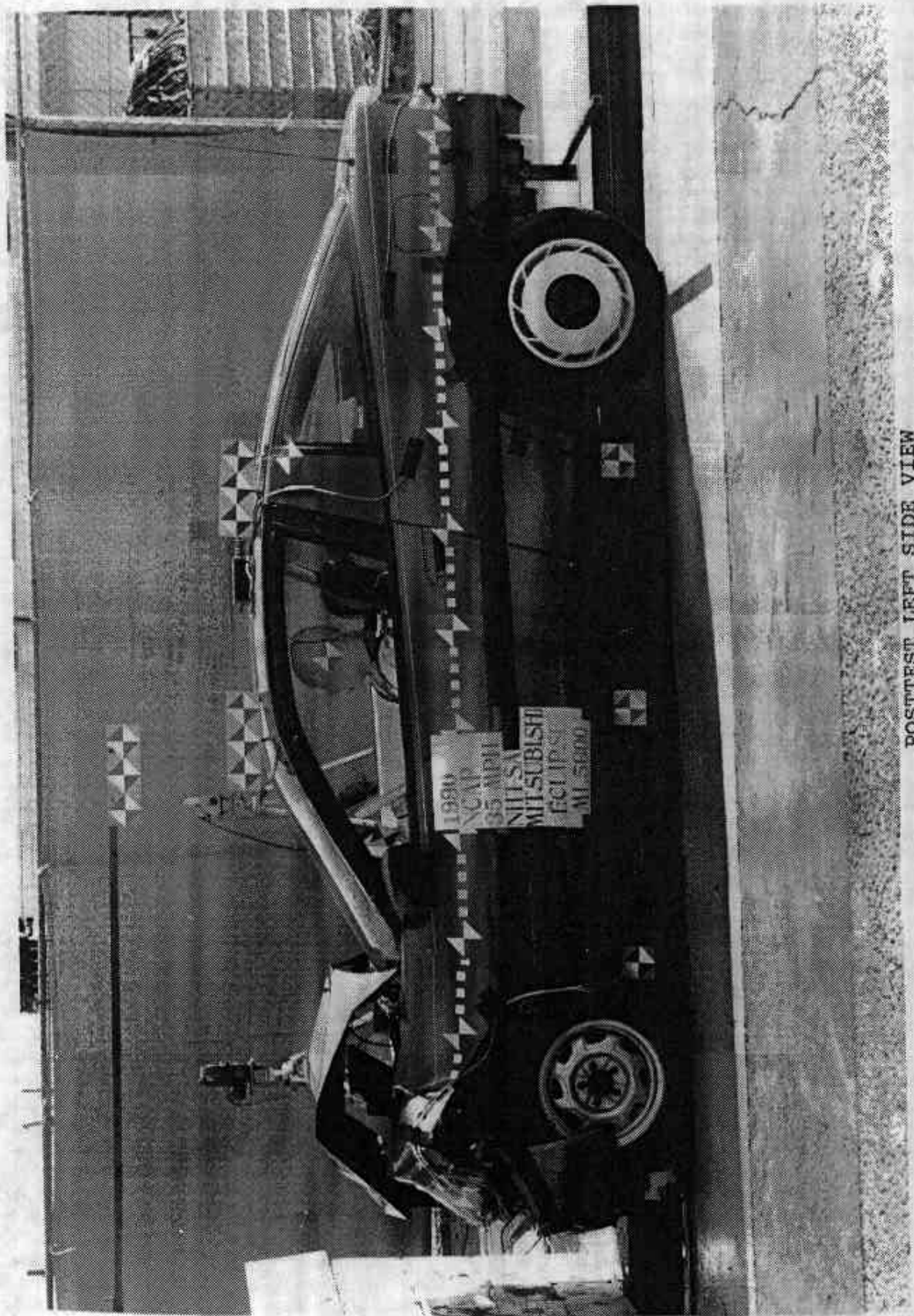
POSTTEST FRONT VIEW

A-2

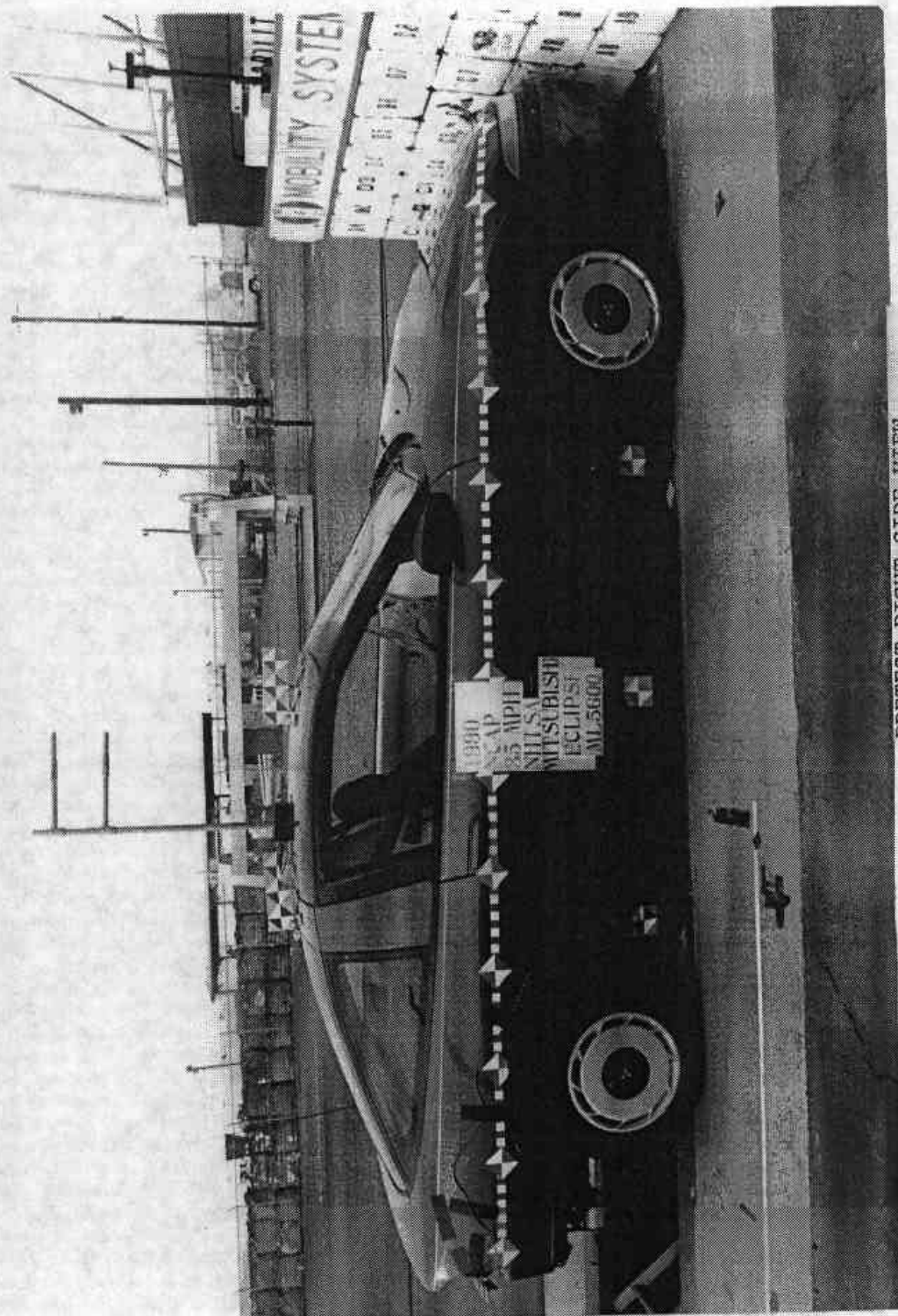
MSE-90-R9063-N03



PRETEST LEFT SIDE VIEW



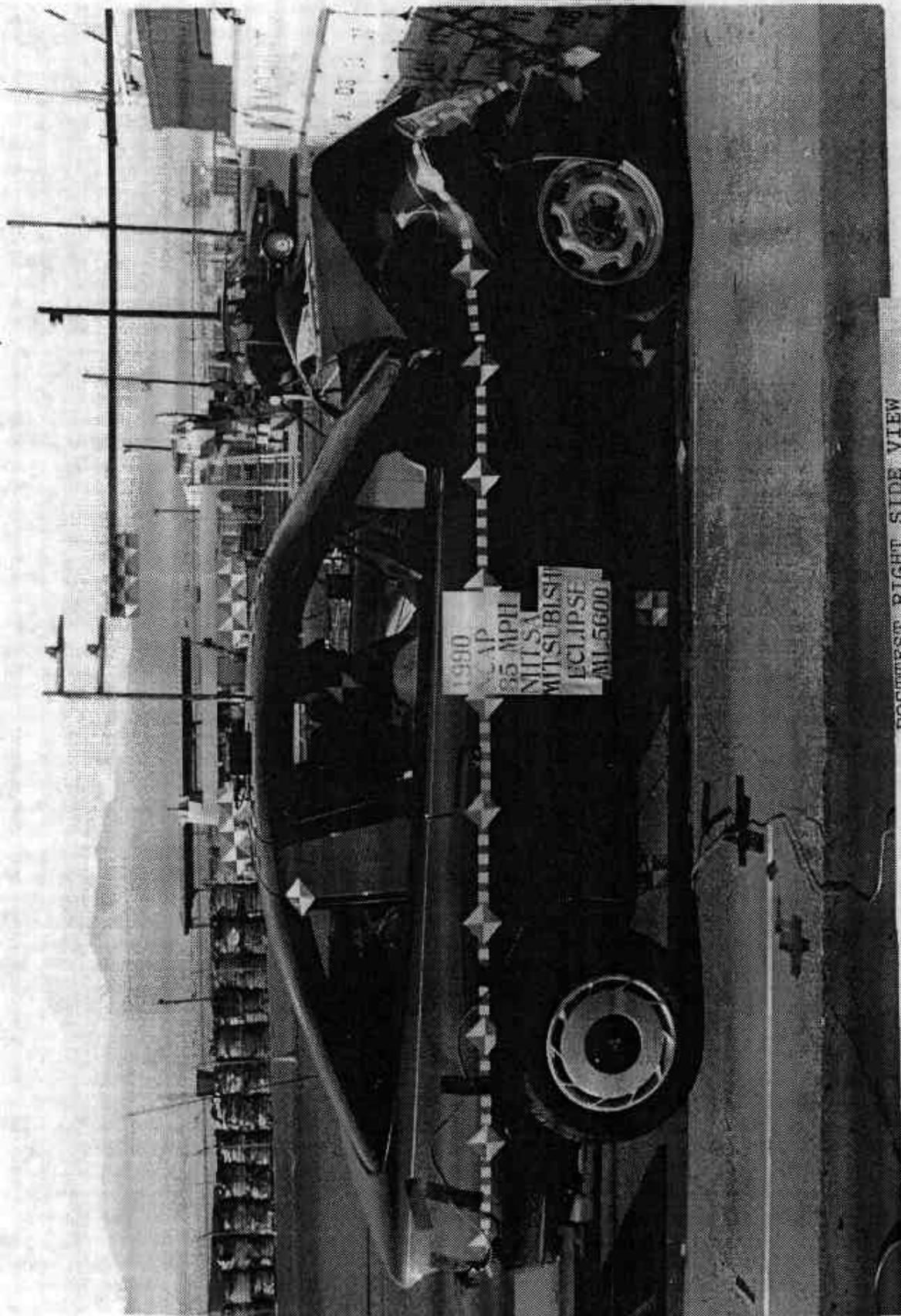
POSTTEST LEFT SIDE VIEW



PRETEST RIGHT SIDE VIEW

A-5

MSE-90-R9063-N03



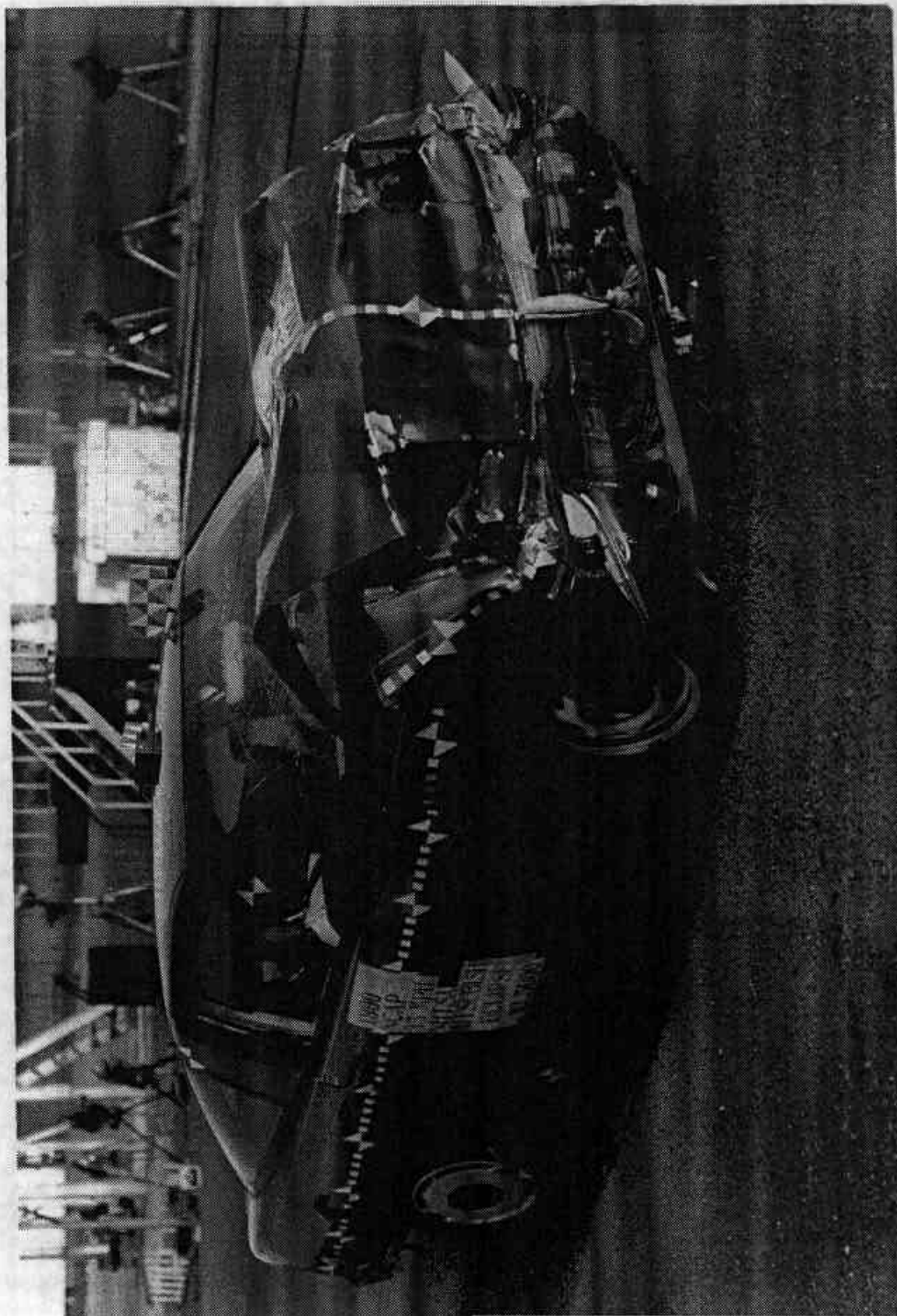
POSTTEST RIGHT SIDE VIEW



PRETEST RIGHT FRONT 3/4 VIEW

A-7

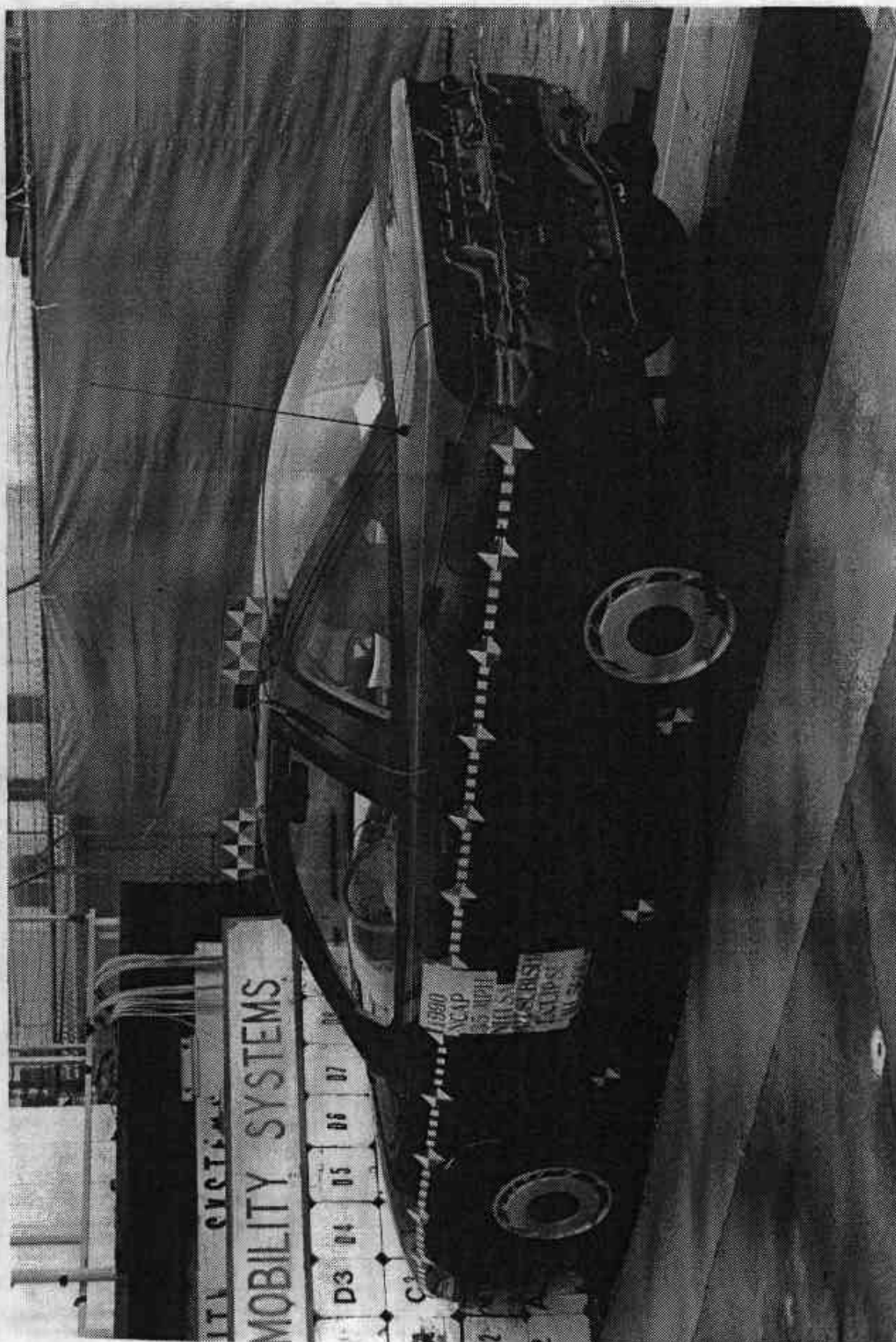
MSE-90-R9063-N03



POSTTEST RIGHT FRONT 3/4 VIEW

A-8

MSE-90-R9063-N03



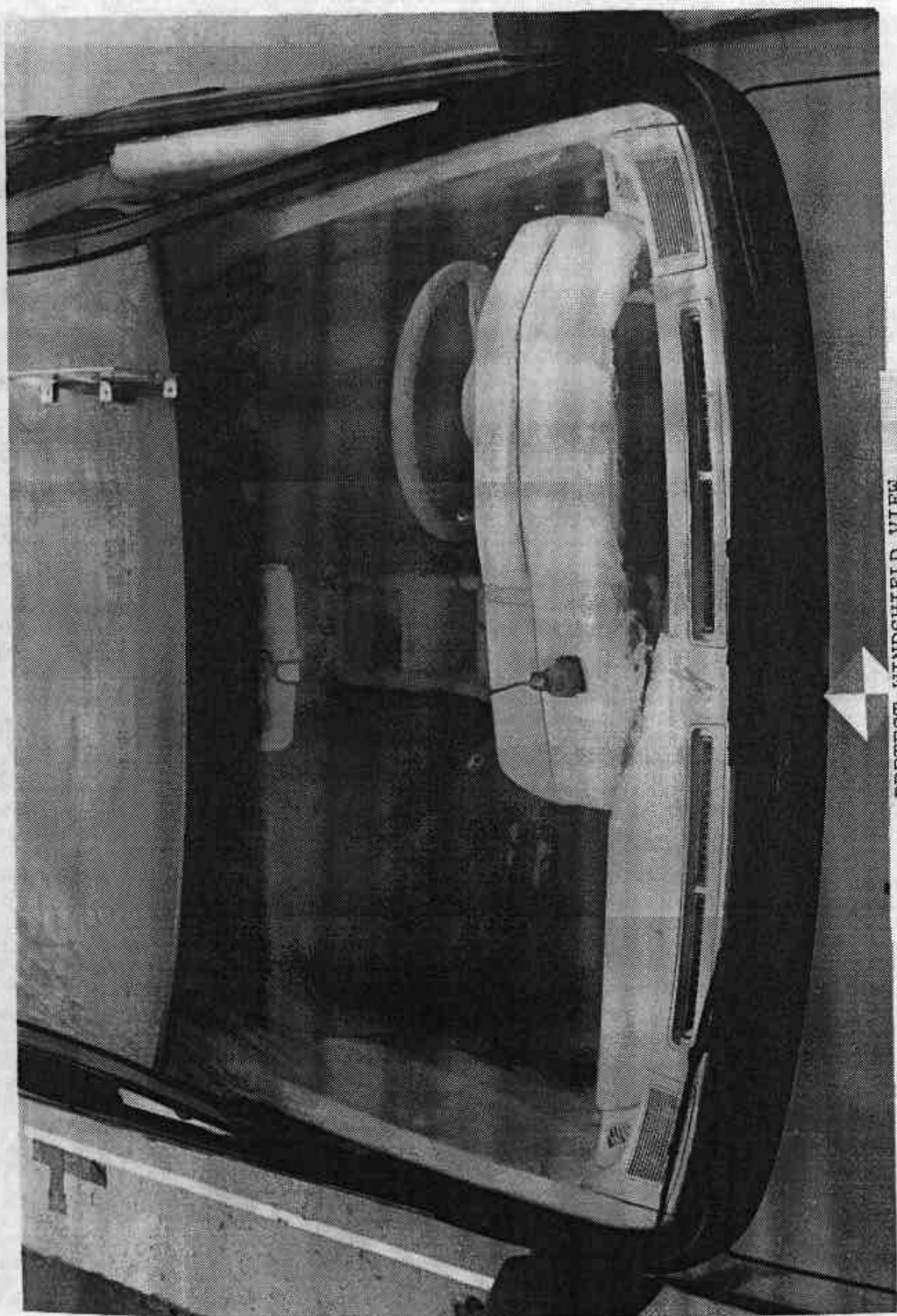
PRETEST LEFT REAR 3/4 VIEW



POSTTEST LEFT REAR 3/4 VIEW

A-10

MSE-90-R9063-N03



PRETEST WINDSHIELD VIEW

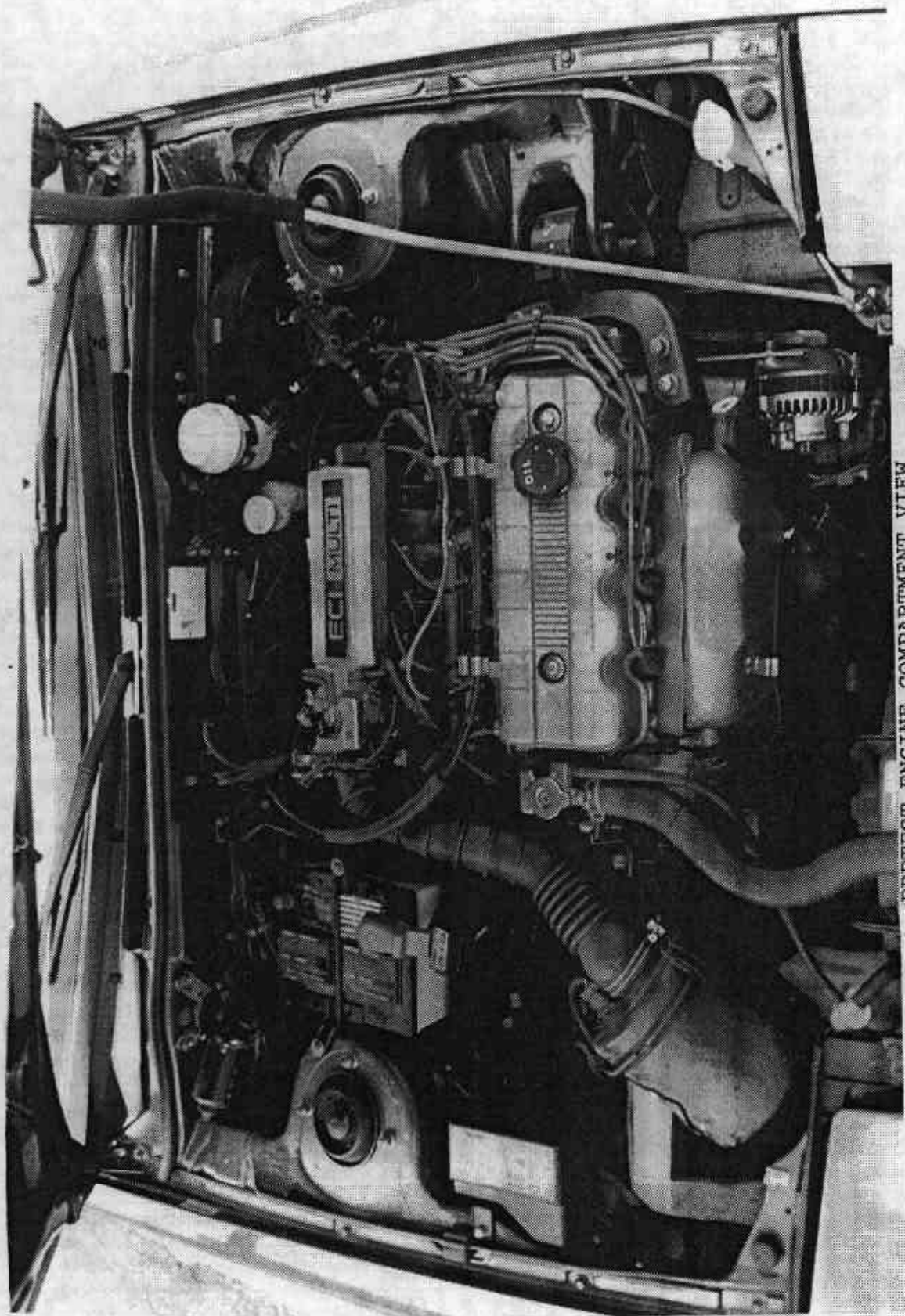
A-11

MSE-90-R9063-N03



A-12

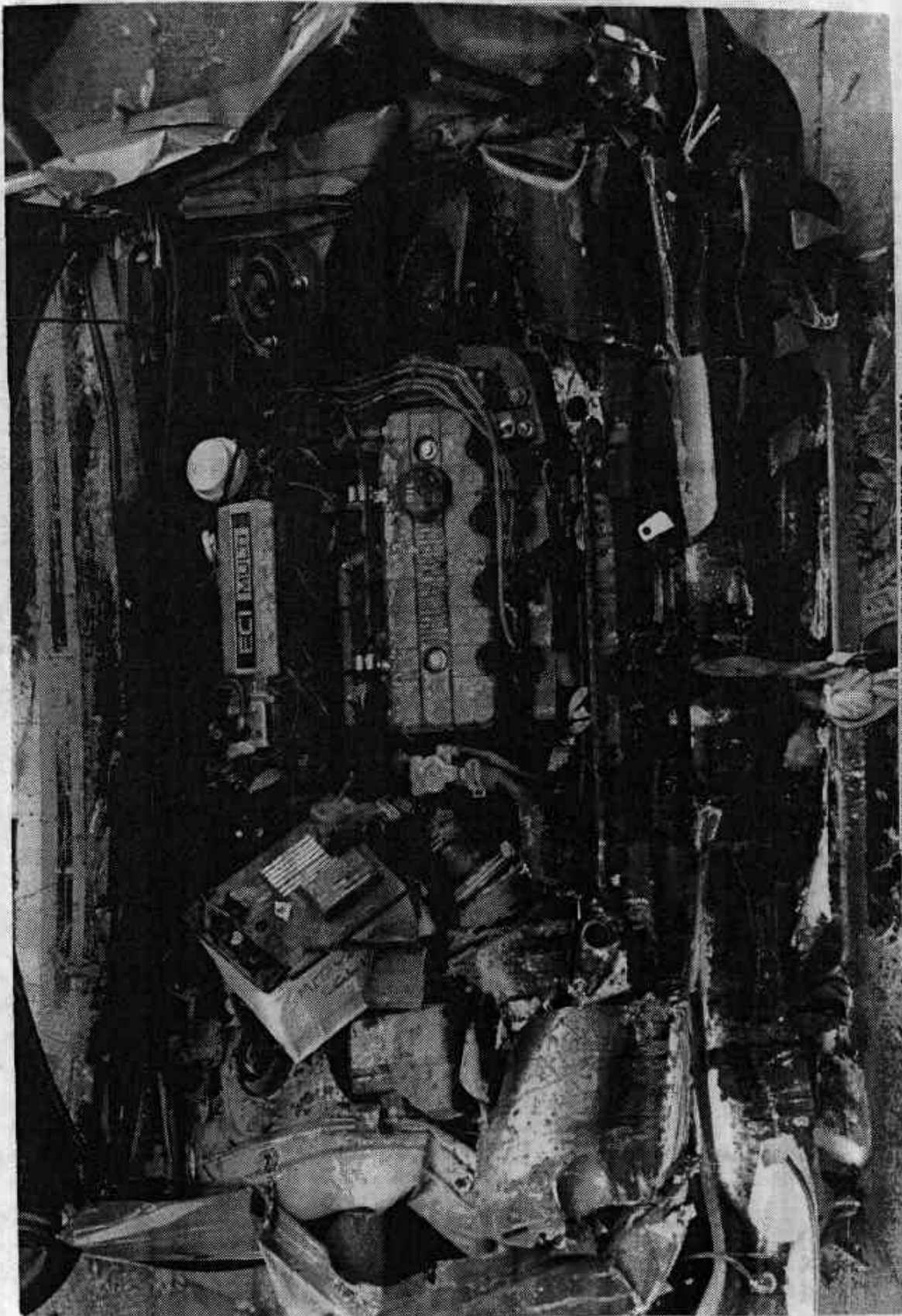
MSE-90-R9063-N03



PRETEST ENGINE COMPARTMENT VIEW

A-13

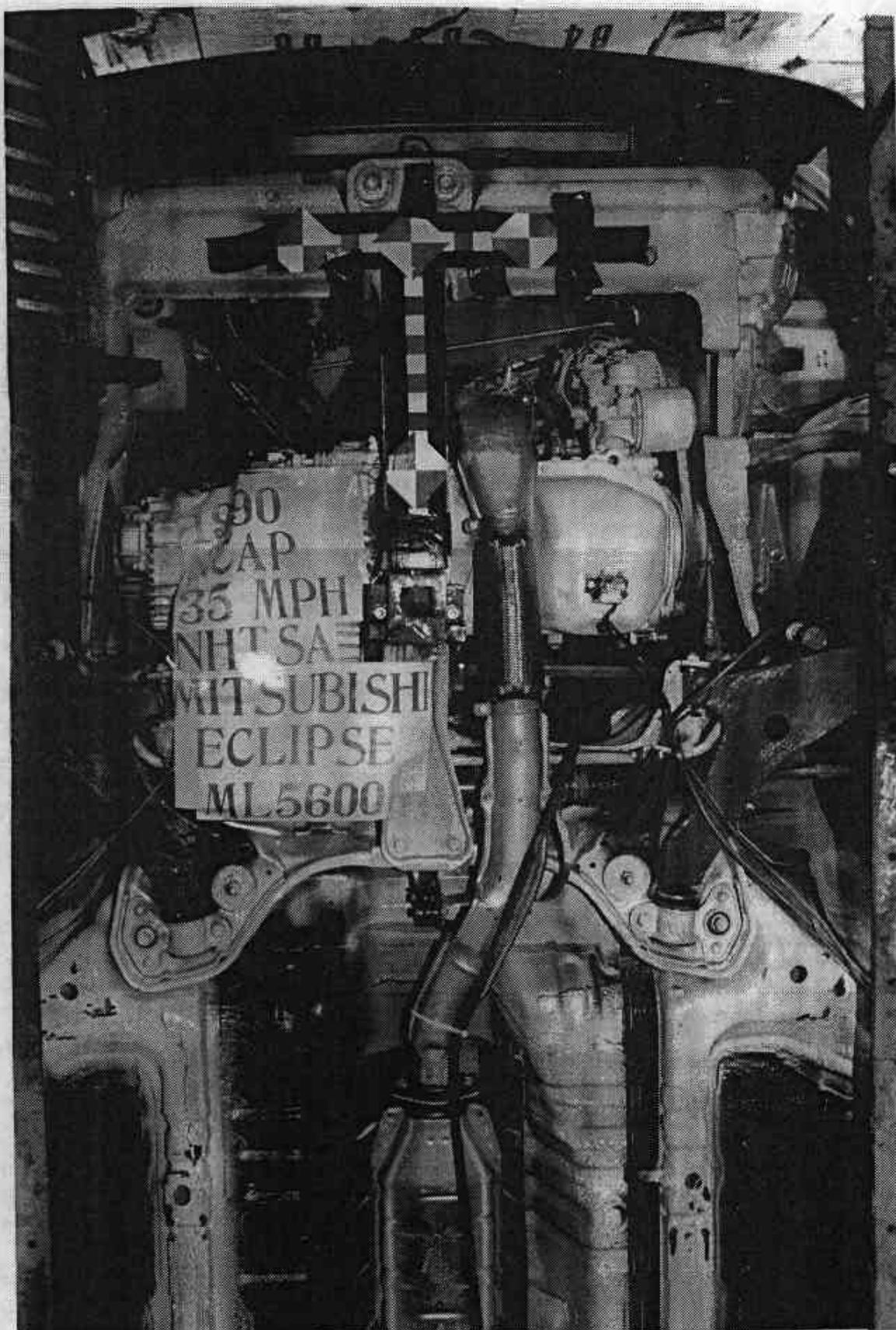
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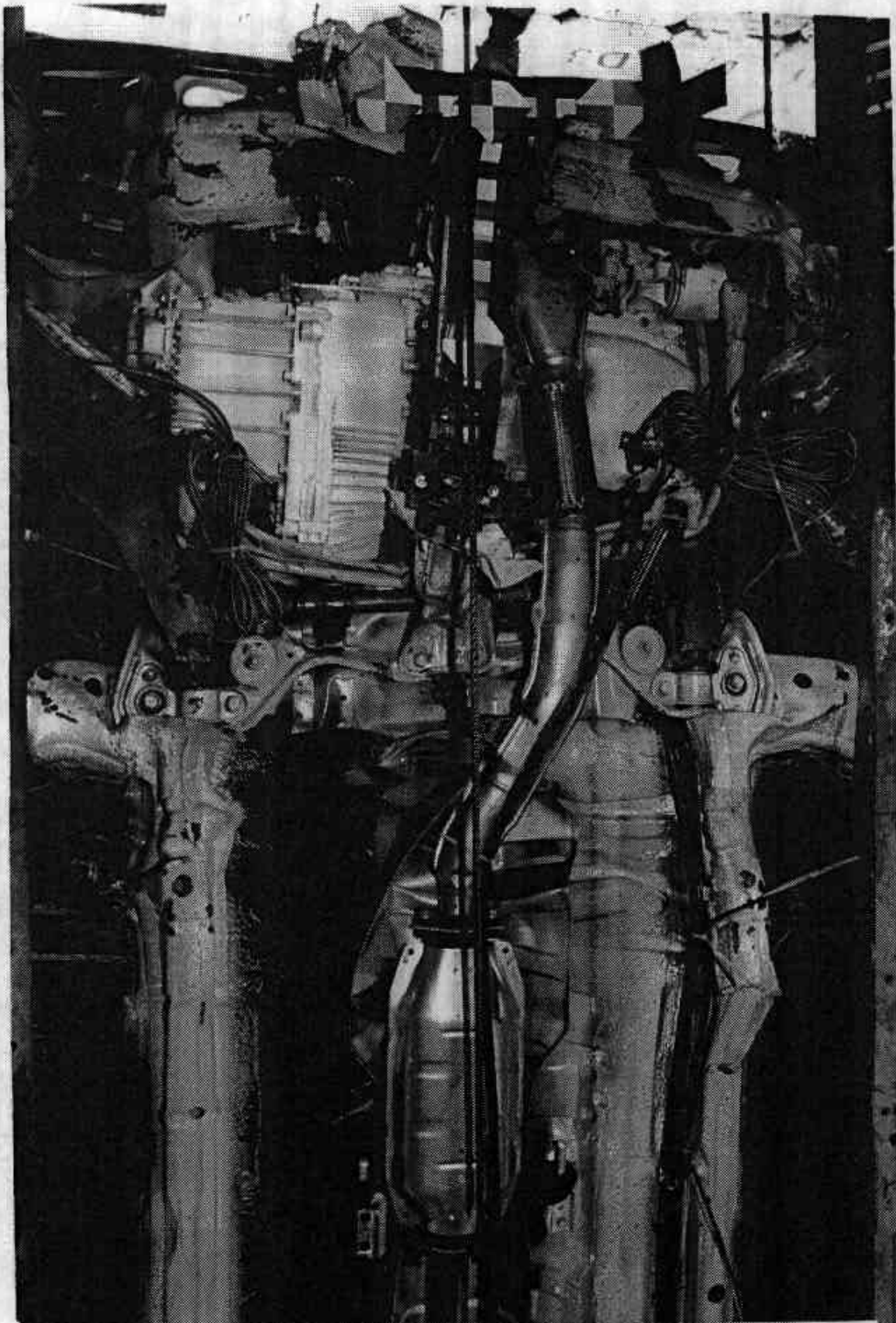
POSTTEST ENGINE COMPARTMENT VIEW

A-14

MSE-90-R9063-N03



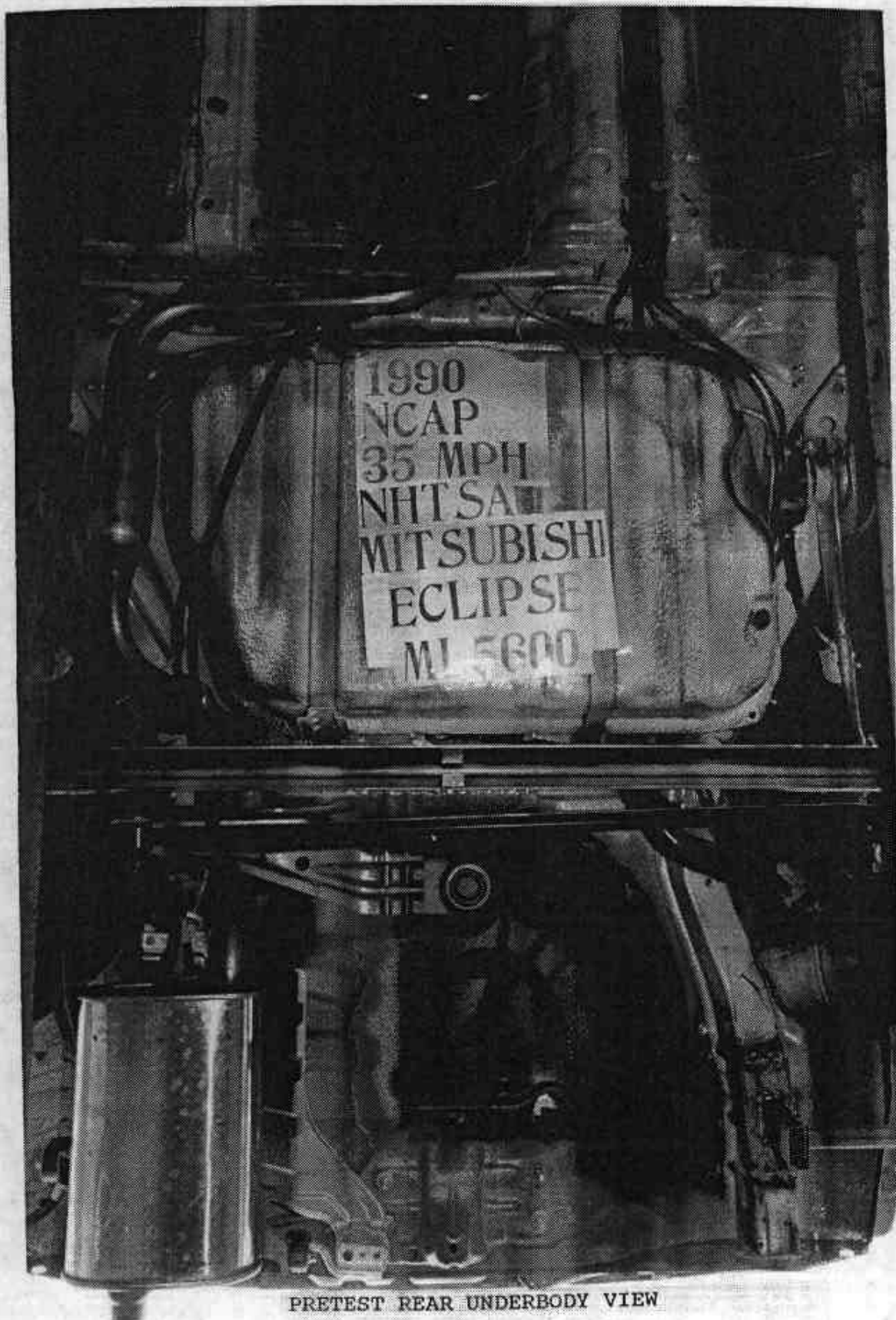
PRETEST FRONT UNDERBODY VIEW



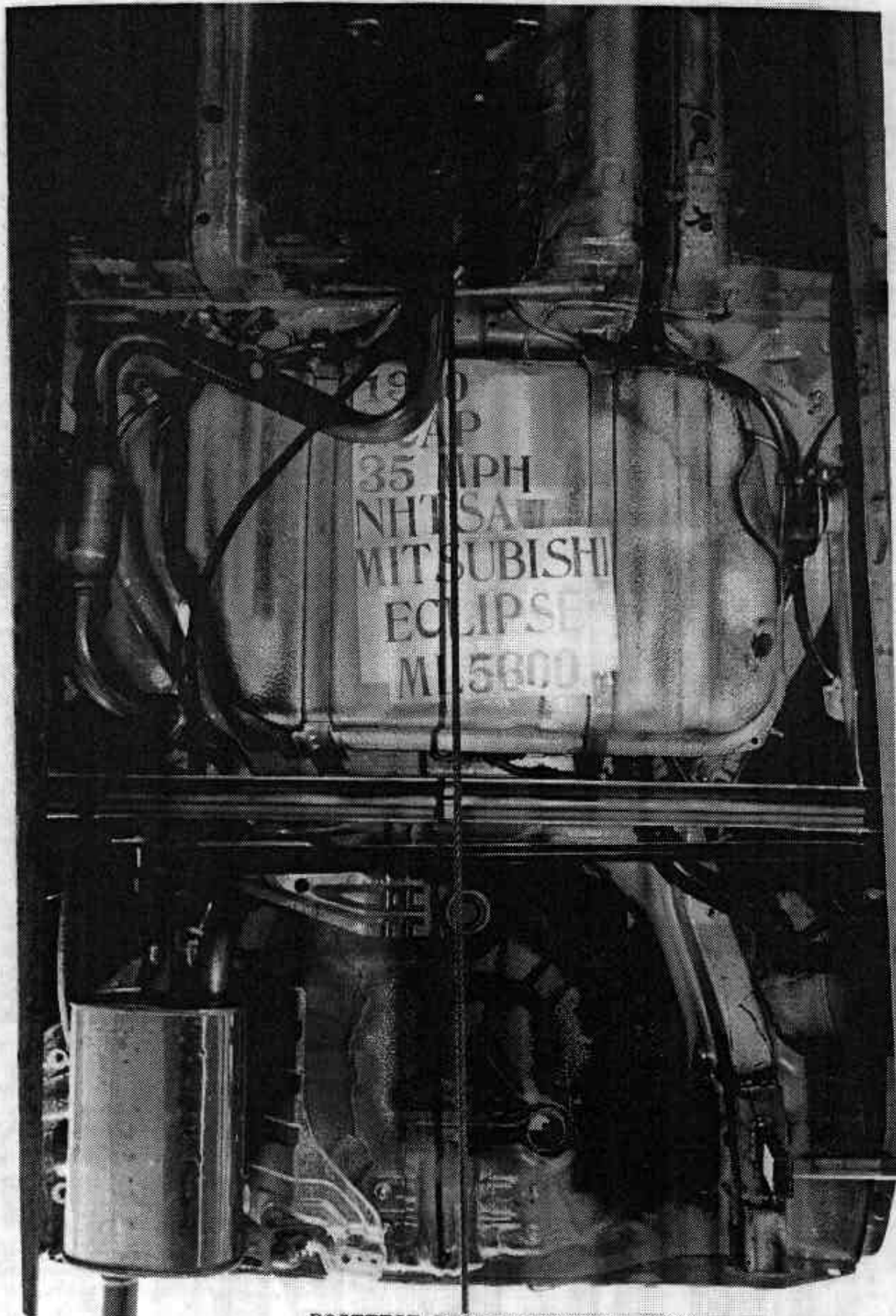
POSTTEST FRONT UNDERBODY VIEW

A-16

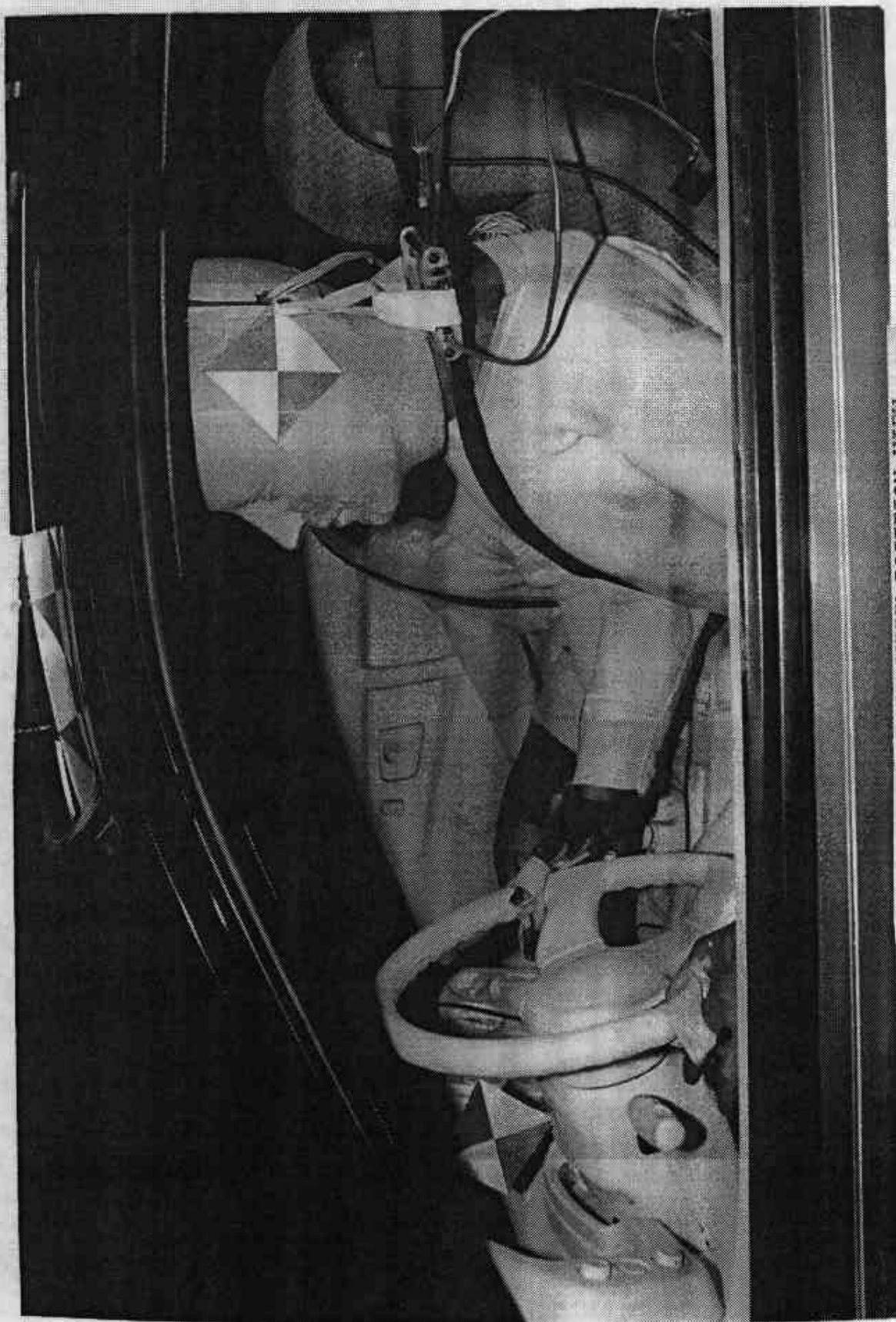
MSE-90-R9063-N03



PRETEST REAR UNDERBODY VIEW



POSTTEST REAR UNDERBODY VIEW



PRETEST DRIVER DUMMY POSITION VIEW



POSTTEST DRIVER DUMMY POSITION VIEW

A-20

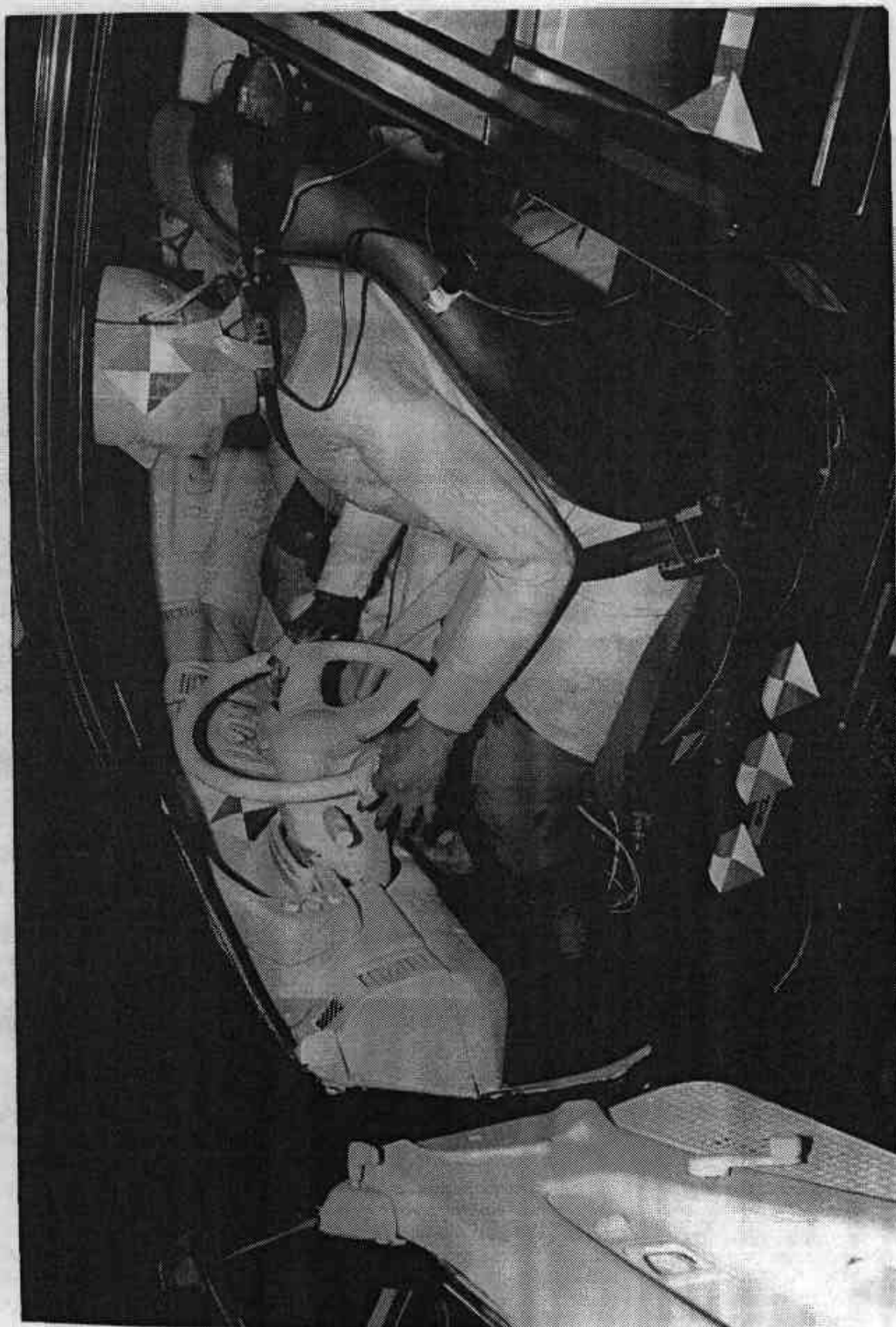
MSE-90-R9063-N03



PRETEST PASSENGER DUMMY POSITION VIEW



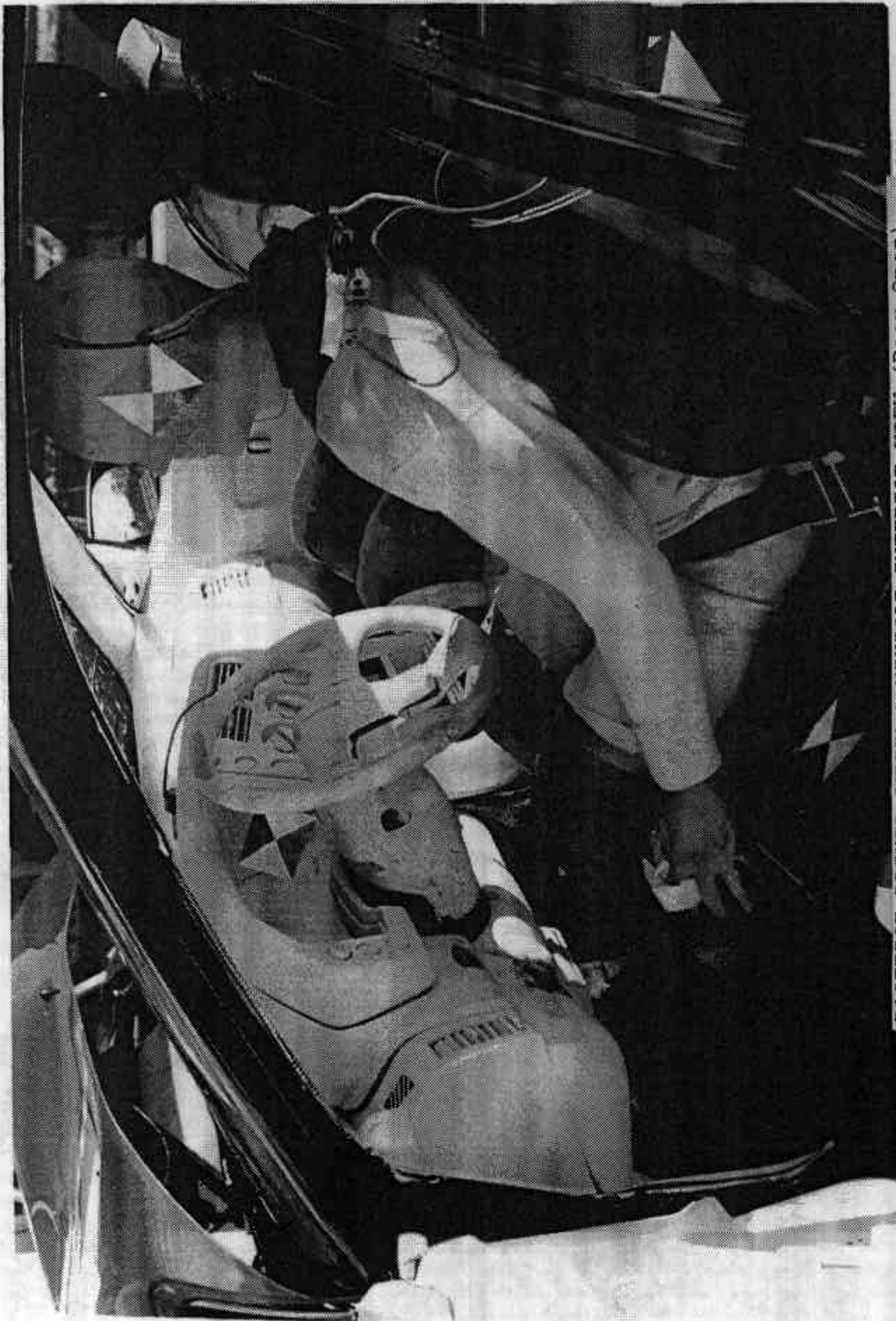
POSTTEST PASSENGER DUMMY POSITION VIEW



PRETEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

A-23

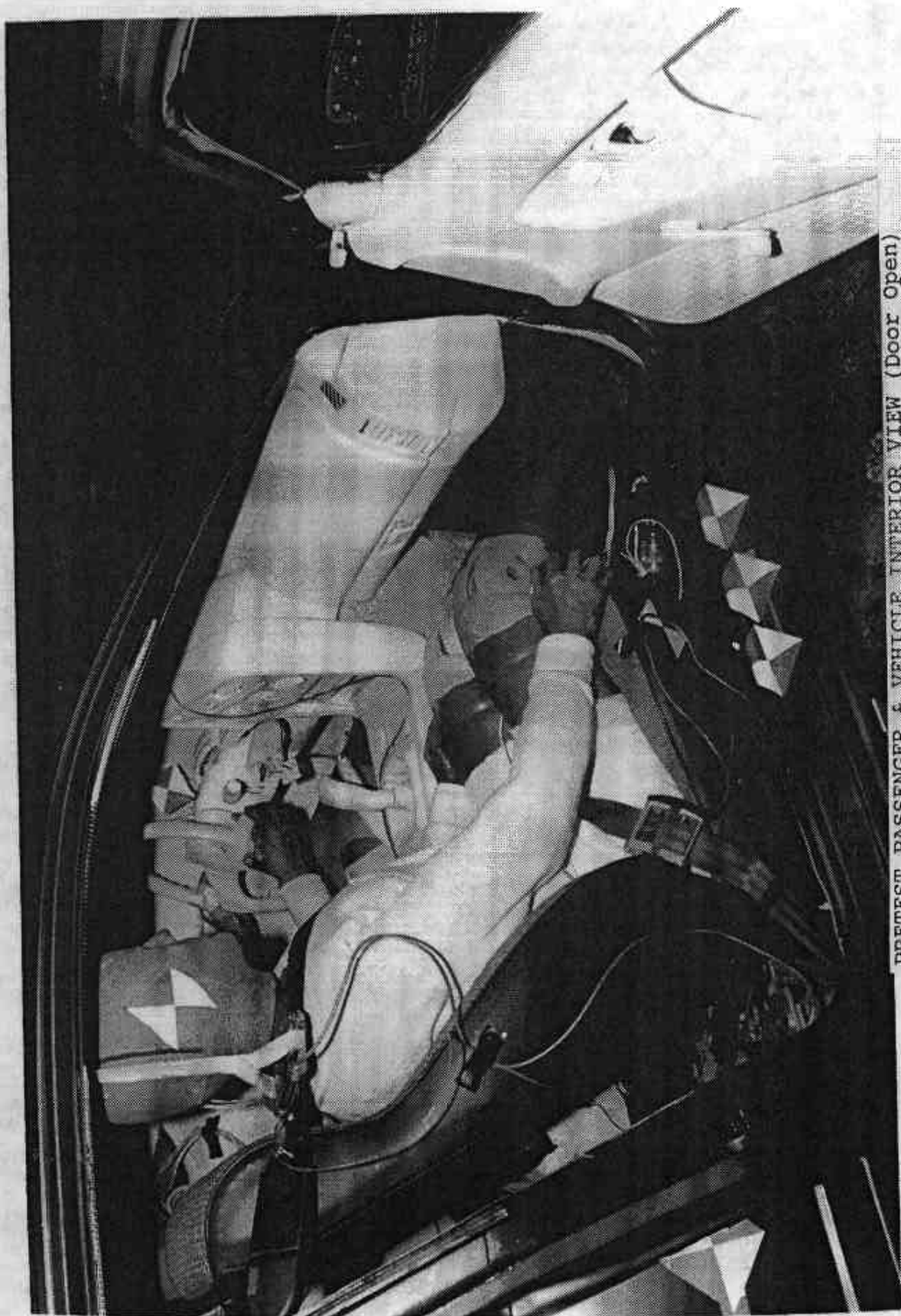
MSE-90-R9063-N03



POSTTEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

A-24

MSE-90-R9063-N03



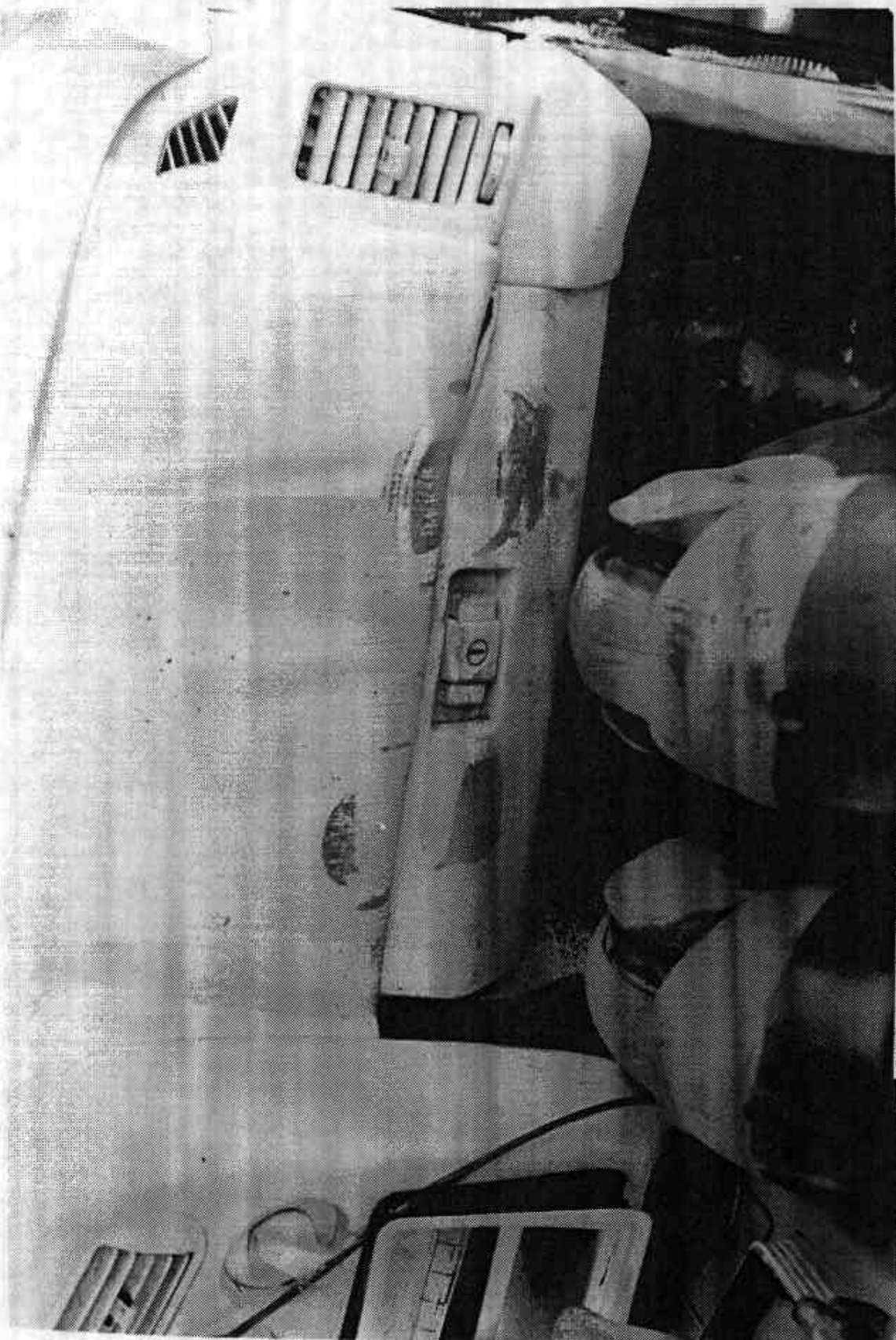
PRETEST PASSENGER & VEHICLE INTERIOR VIEW (Door Open)



POSTTEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



POSTTEST DRIVER DUMMY (ATD) HEAD AND KNEE CONTACT AREA



POSTTEST PASSENGER DUMMY (ATD) KNEE CONTACT AREA

A-28

MSE-90-R9063-N03

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

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General Test Information

VERSNO: V2 TGID: 1
TITLE: 1990 35MPH NCAP FRONTAL BARRIER IMPACT
TSTOBJ: ACQUIRE NCAP DATA USING TWO INSTR. DUMMIES AND LOAD CELL BARRIER
TSTDAT: 27/SEP/89 TSTPRF: MSE CONNO: DTNH22-87-D-02009
TSTREF: N62030 TSTTYP: NCA TSTCFN: VT8
TKSURF: ASH TKCOND: DRY TEMP: 94 RECTYP: FMT
LINK: UMB CLSSPD: 95.1 IMPANG: 0 OFFSET: 0.0
IMPPNT: 9999.9 MEASUR: ENG TOTCRV: 67
TSTCOM: NO COMMENTS

Vehicle Information

VGID: 2 VEHNO: 1 MAKE: 62 MODEL: 99 YEAR: 90 BODY: 3H
 VIN: 4A3CS34T8LE020160 ENGINE: 4CTF ENGDISP: 1.8 LITERS TRANSM: MF
 VEHTWT: 2977 WHLBAS: 96.5 VEHLN: 167.3 VEHWID: 67.0
 VEHCG: 38.9 STRSEP: NO COLMEC: OTH MODIND: P
 MODDSC: UNMODIFIED

BX

1: 167.3
 2: 142.3
 3: 119.3
 4: 111.0
 5: 111.5
 6: 111.5
 7: 111.5
 8: 61.2
 9: 61.0
 10: 65.8
 11: 66.0
 12: 110.5
 13: 110.5
 14: 118.8
 15: 118.8
 16: 93.0
 17: 17.5
 18: 16.2
 19: 158.0
 20: 158.0
 21: 16.0

VEHSPD: 35.1 CRBANG: 0 PDOF: 0 BMPENG: NA
 SILENG: NA APLENG: NA

DPD

1: 11.3
 2: 21.4
 3: 23.0
 4: 22.9
 5: 21.5
 6: 11.9

VDI: 12FCAW9 LENCNT: 67.0 DAMDST: 0.0 CRHDST: 23.0

AX

1: 145.0
 2: 137.8
 3: 117.8
 4: 111.0
 5: 111.5
 6: 111.3
 7: 111.1
 8: 61.1
 9: 59.9
 10: 65.5
 11: 65.5
 12: 110.5
 13: 110.5
 14: 118.8
 15: 119.3
 16: 92.3
 17: 16.8
 18: 15.5
 19: 143.4
 20: 143.8
 21: 16.0

CARANG: 999 VEHOR: 999
 VEHCOM: NO COMMENTS

Barrier Information

Barrier ID: 3

BARRIG: R

BARSHP: LCB

BARANG: 0

BARDIA: 999.9

BARCOM: 36 50KLB LOAD CELLS ARRANGED IN A 9 WIDE BY 4 HIGH MATRIX.

Occupant Information

Occupant Group ID: 4 VEHNO: 1
OCCLOC: 01 OCCTYP: P5 OCCAGE: 99 OCCSEX: M OCCHT: 999 OCCWT: 999
MTHCAL: P5 DUMSIZ: 50
DUMMAN: MFG: HUMANOID SYSTEMS. S/N 465
DUMMOD: UNMODIFIED
DUMDSC: NO COMMENTS
HH: 11.5 HW: 18.4 HR: 4.9 HS: 7.0 CD: 21.5 CS: 15.0 AD: 3.3 HD: 4.8
KD: 5.9 HB:999.9 NB:999.9 CB:999.9 KB:999.9
RESTR1: PS2 RESTR2: OTH
REXTXT: NO COMMENTS
SEPOSN: CN AIRDEP: NA
CNTRH1: SR CNTRH2: SH CNTRC1: SW CNTRC2: NO CNTRL1: DP CNTRL2: OT
HIC: 772. T1: 60.500 T2: 94.500
CLIP3M: 43.7 LFEM: 1152. RFEM: 1033. CSI: 417. LBELT: 132. SBELT: 1582.
OCCCOM: RESTR2 IS ACTIVE LAP BELT; CNTRL2 IS STEERING COLUMN

Occupant Information

Occupant Group ID: 4 VEHNO: 1
OCCLOC: 02 OCCTYP: P5 OCCAGE: 99 OCCSEX: M OCCHT: 999 OCCWT: 999
MTHCAL: P5 DUMSIZ: 50
DUMMAN: MFG: HUMANOID SYSTEMS. S/N 466
DUMMOD: UNMODIFIED
DUMDSC: NO COMMENTS
HH: 12.6 HW: 18.7 HR: 5.4 HS: 7.5 CD: 23.4 CS:999.9 AD: 3.8 HD: 5.1
KD: 5.0 HB:999.9 NB:999.9 CB:999.9 KB:999.9
RESTR1: PS2 RESTR2: OTH
REXTXT: NO COMMENTS
SEPOSN: CN AIRDEP: NA
CNTRH1: NO CNTRH2: NO CNTRC1: NO CNTRC2: NO CNTRL1: DP CNTRL2: NO
HIC: 612. T1: 65.600 T2: 101.600
CLIP3M: 40.1 LFEM: 499. RFEM: 413. CSI: 274. LBELT: 735. SBELT: 1704.
OCCCOM: RESTR2 IS ACTIVE LAP BELT

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 001	
SENTYP: AC	SENLOC: 01	SENATT: HDCG	
AXIS: XL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: BF83H			
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 42	INIVEL: 35.1
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 002	
SENTYP: AC	SENLOC: 01	SENATT: HDCG	
AXIS: YL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: BJ15H			
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 7	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 003	
SENTYP: AC	SENLOC: 01	SENATT: HDCG	
AXIS: ZL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: BG29H			
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 36	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 004	
SENTYP: AC	SENLOC: 01	SENATT: CHST	
AXIS: XL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: AD76			
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 23	INIVEL: 35.1
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 005	
SENTYP: AC	SENLOC: 01	SENATT: CHST	
AXIS: YL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: AD99			
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 5	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 006	
SENTYP: AC	SENLOC: 01	SENATT: CHST	
AXIS: ZL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: BI60H			
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 5	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 007	
SENTYP: LC	SENLOC: 01	SENATT: FMRL	
AXIS: XL	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: GSE INC, MODEL: 2430, S/N: 701			
CALDAT: 28/AUG/89	INSRAT: 3000	CHLMAX: 43	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 008	
SENTYP: LC	SENLOC: 01	SENATT: FMRR	
AXIS: YL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: GSE INC, MODEL: 2430, S/N: 707			
CALDAT: 28/AUG/89	INSRAT: 3000	CHLMAX: 35	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 009	
SENTYP: AC	SENLOC: 02	SENATT: HDCG	
AXIS: XL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: AD61			
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 15	INIVEL: 35.1
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 010	
SENTYP: AC	SENLOC: 02	SENATT: HDCG	
AXIS: YL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: AE09			
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 5	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 011	
SENTYP: AC	SENLOC: 02	SENATT: HDGG	
AXIS: ZL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200,	S/N: AD98		
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 30	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 012	
SENTYP: AC	SENLOC: 02	SENATT: CHST	
AXIS: XL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200,	S/N: B119H		
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 22	INIVEL: 35.1
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 013	
SENTYP: AC	SENLOC: 02	SENATT: CHST	
AXIS: YL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200,	S/N: B114H		
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 10	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 014	
SENTYP: AC	SENLOC: 02	SENATT: CHST	
AXIS: ZL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200,	S/N: B192H		
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 11	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 015	
SENTYP: LC	SENLOC: 02	SENATT: FMRL	
AXIS: XL	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: GSE INC, MODEL: 2430,	S/N: 709		
CALDAT: 28/AUG/89	INSRAT: 3000	CHLMAX: 18	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 016	
SENTYP: LC	SENLOC: 02	SENATT: FMRR	
AXIS: XL	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: GSE INC,	MODEL: 2430, S/N: 710		
CALDAT: 28/AUG/89	INSRAT: 3000	CHLMAX: 14	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 017	
SENTYP: LC	SENLOC: 01	SENATT: LPB0	
AXIS: OT	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: LEBOW,	MODEL: 3371, S/N: 333		
CALDAT: 25/AUG/89	INSRAT: 3500	CHLMAX: 5	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 018	
SENTYP: LC	SENLOC: 01	SENATT: SHBT	
AXIS: OT	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: LEBOW,	MODEL: 3371, S/N: 327		
CALDAT: 25/AUG/89	INSRAT: 3500	CHLMAX: 46	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 019	
SENTYP: LC	SENLOC: 02	SENATT: LPB0	
AXIS: OT	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: LEBOW,	MODEL: 3371, S/N: 330		
CALDAT: 25/AUG/89	INSRAT: 3500	CHLMAX: 21	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 020	
SENTYP: LC	SENLOC: 02	SENATT: SHBT	
AXIS: OT	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: LEBOW,	MODEL: 3371, S/N: 308		
CALDAT: 25/AUG/89	INSRAT: 3500	CHLMAX: 49	INIVEL: 0.0
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 021
 SENTYP: DS SENLOC: 01 SENATT: SHBE
 AXIS: OT UNITS: INS PREFIL: 1650
 INSMAN: MFG: MSE, MODEL: 24 IN. LIN, S/N: 112
 CALDAT: 12/SEP/89 INSRAT: 24 CHLMAX: 0 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: MN
 INSCOM: DRIVER BELT PULLOUT CHANNEL; NOT USED THIS TEST

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 022
 SENTYP: DS SENLOC: 01 SENATT: SHBT
 AXIS: OT UNITS: INS PREFIL: 1650
 INSMAN: MFG: BOURNS, MODEL: 2051414101/0.5 IN LIN, S/N: NAV
 CALDAT: 27/SEP/89 INSRAT: 30 CHLMAX: 29 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM: UNITS ARE INCHES/IN. (PERCENT STRETCH);

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 023
 SENTYP: DS SENLOC: 02 SENATT: SHBE
 AXIS: OT UNITS: OTH PREFIL: 1650
 INSMAN: MFG: MSE; MODEL: 24 IN LIN, S/N: 113
 CALDAT: 12/SEP/89 INSRAT: 8 CHLMAX: 0 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: MN
 INSCOM: PASSENGER BELT PULLOUT CHANNEL; NOT USED THIS TEST

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 024
 SENTYP: DS SENLOC: 02 SENATT: SHBT
 AXIS: OT UNITS: OTH PREFIL: 1650
 INSMAN: MFG: BOURNS, MODEL: 2051414101/0.5 IN LIN, S/N: NAV
 CALDAT: 27/SEP/89 INSRAT: 30 CHLMAX: 18 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM: UNITS ARE INCHES/IN. (PERCENT STRETCH);

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 025
 SENTYP: AC SENLOC: NA SENATT: SULF
 AXIS: XG UNITS: G'S PREFIL: 1650
 INSMAN: MFG: SETRA, MODEL: 111, S/N: 1108
 CALDAT: 10/JUL/89 INSRAT: 250 CHLMAX: 80 INIVEL: 35.1
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM:

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 026	
SENTYP: AC	SENLOC: NA	SENATT: SURF	
AXIS: XG	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: SETRA,	MODEL: 111, S/N: 1109		
CALDAT: 10/JUL/89	INSRAT: 250	CHLMAX: 124	INIVEL: 35.1
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 027	
SENTYP: AC	SENLOC: NA	SENATT: ENGN	
AXIS: XG	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: SETRA,	MODEL: 111, S/N: 1113		
CALDAT: 10/JUL/89	INSRAT: 250	CHLMAX: 71	INIVEL: 35.1
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 028	
SENTYP: AC	SENLOC: NA	SENATT: ENGN	
AXIS: XG	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: SETRA,	MODEL: 1138, S/N: 1878		
CALDAT: 10/JUL/89	INSRAT: 250	CHLMAX: 82	INIVEL: 35.1
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 029	
SENTYP: AC	SENLOC: NA	SENATT: DPLC	
AXIS: XG	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: SETRA,	MODEL: 111, S/N: 1105		
CALDAT: 10/JUL/89	INSRAT: 250	CHLMAX: 37	INIVEL: 35.1
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 030	
SENTYP: AC	SENLOC: NA	SENATT: FLLR	
AXIS: XG	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: SETRA,	MODEL: 1138, S/N: 1875		
CALDAT: 10/JUL/89	INSRAT: 250	CHLMAX: 21	INIVEL: 35.1
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 031	
SENTYP: AC	SENLOC: NA	SENATT: FLRR	
AXIS: XG	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: SETRA,	MODEL: 113B, S/N: 1871		
CALDAT: 10/JUL/89	INSRAT: 250	CHLMAX: 57	INIVEL: 35.1
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 032	
SENTYP: LC	SENLOC: NA	SENATT: LCA1	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19349		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 4	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 033	
SENTYP: LC	SENLOC: NA	SENATT: LCA2	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19324		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 6	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 034	
SENTYP: LC	SENLOC: NA	SENATT: LCA3	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19283		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 10	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 035	
SENTYP: LC	SENLOC: NA	SENATT: LCA4	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19263		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 10	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 036	
SENTYP: LC	SENLOC: NA	SENATT: LCA5	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19265		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 32	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 037	
SENTYP: LC	SENLOC: NA	SENATT: LCA6	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19266		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 9	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 038	
SENTYP: LC	SENLOC: NA	SENATT: LCA7	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19317		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 3	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 039	
SENTYP: LC	SENLOC: NA	SENATT: LCA8	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19270		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 5	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 040	
SENTYP: LC	SENLOC: NA	SENATT: LCA9	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19428		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 6	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 041	
SENTYP: LC	SENLOC: NA	SENATT: LCB1	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19273		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 7	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 042	
SENTYP: LC	SENLOC: NA	SENATT: LCB2	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19276		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 30	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 043	
SENTYP: LC	SENLOC: NA	SENATT: LCB3	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19258		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 61	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 044	
SENTYP: LC	SENLOC: NA	SENATT: LCB4	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19278		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 28	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 045	
SENTYP: LC	SENLOC: NA	SENATT: LCB5	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19279		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 46	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 046	
SENTYP: LC	SENLOC: NA	SENATT: LCB6	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19282		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 40	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 047	
SENTYP: LC	SENLOC: NA	SENATT: LCB7	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19262		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 52	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 048	
SENTYP: LC	SENLOC: NA	SENATT: LCB8	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19285		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 7	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 049	
SENTYP: LC	SENLOC: NA	SENATT: LCB9	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19286		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 6	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 050	
SENTYP: LC	SENLOC: NA	SENATT: LCC1	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19287		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 7	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 051	
SENTYP: LC	SENLOC: NA	SENATT: LCC2	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19288		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 17	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 052	
SENTYP: LC	SENLOC: NA	SENATT: LCC3	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19289		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 13	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 053	
SENTYP: LC	SENLOC: NA	SENATT: LCC4	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19291		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 8	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 054	
SENTYP: LC	SENLOC: NA	SENATT: LCC5	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19324		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 9	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 055	
SENTYP: LC	SENLOC: NA	SENATT: LCC6	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19313		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 11	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 056	
SENTYP: LC	SENLOC: NA	SENATT: LCC7	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19314		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 14	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 057	
SENTYP: LC	SENLOC: NA	SENATT: LCC8	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19315		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 12	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 058	
SENTYP: LC	SENLOC: NA	SENATT: LCC9	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19316		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 6	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 059	
SENTYP: LC	SENLOC: NA	SENATT: LCD1	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19460		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 7	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 060	
SENTYP: LC	SENLOC: NA	SENATT: LCD2	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19318		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 7	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 061	
SENTYP: LC	SENLOC: NA	SENATT: LCD3	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19322		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 10	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 062	
SENTYP: LC	SENLOC: NA	SENATT: LCD4	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19323		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 5	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 063	
SENTYP: LC	SENLOC: NA	SENATT: LCD5	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 120-FS,	S/N: 19260		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 5	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 0	CURNO: 064	
SENTYP: LC	SENLOC: NA	SENATT: LCD6	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19325		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 4	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

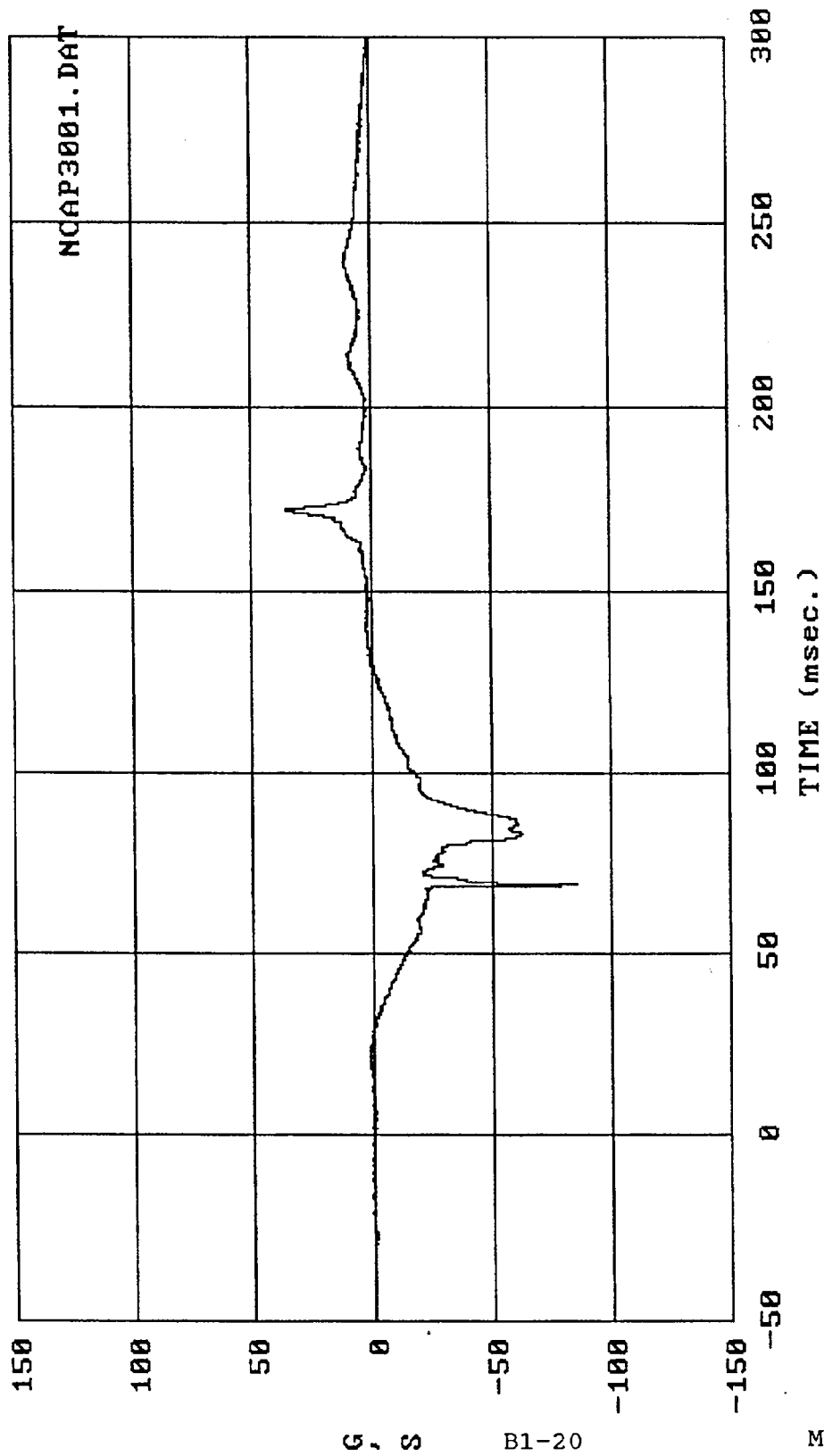
Inst. Group ID: 5	VEHNO: 0	CURNO: 065	
SENTYP: LC	SENLOC: NA	SENATT: LCD7	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19332		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 6	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

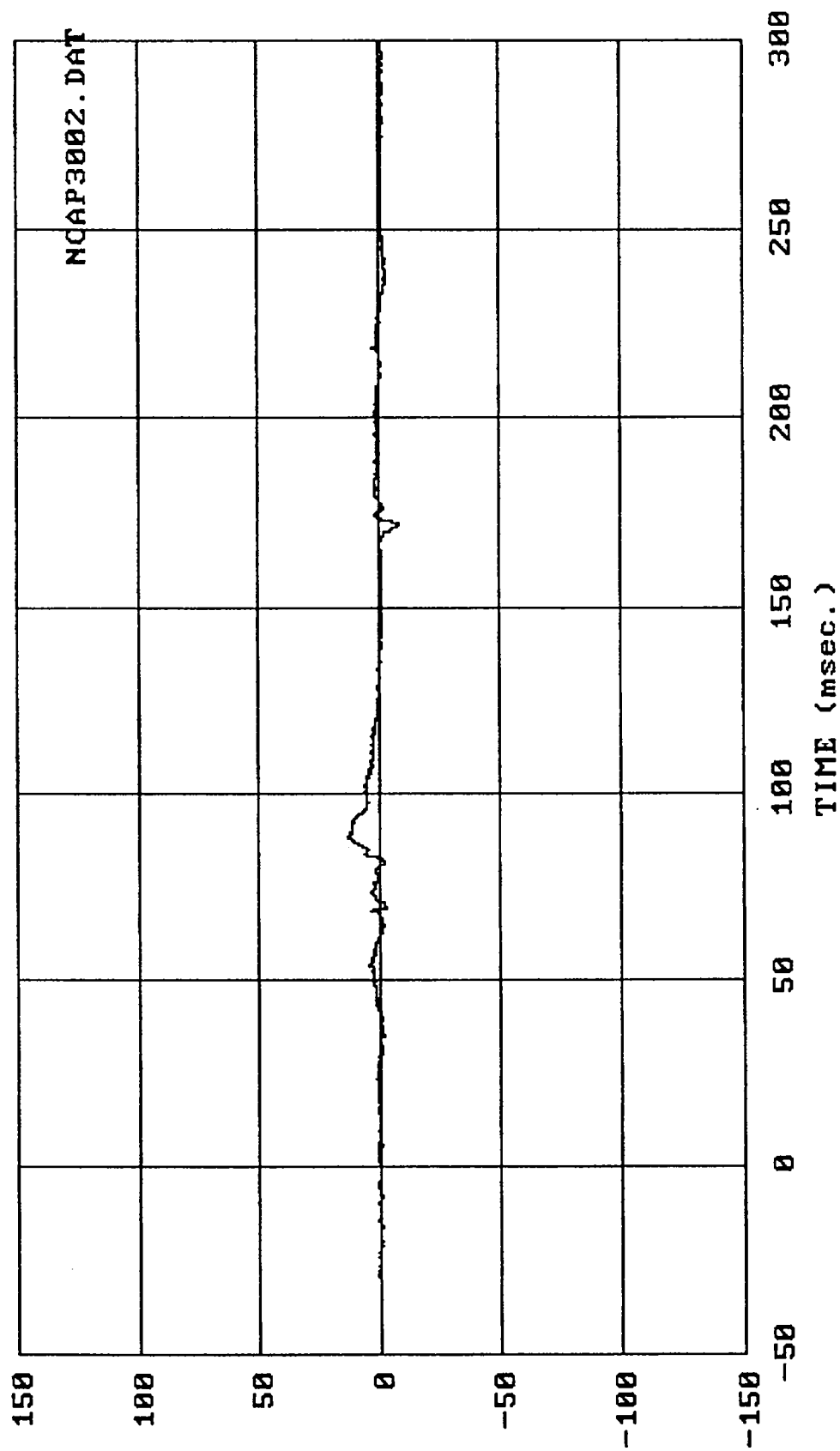
Inst. Group ID: 5	VEHNO: 0	CURNO: 066	
SENTYP: LC	SENLOC: NA	SENATT: LCD8	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19333		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 4	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

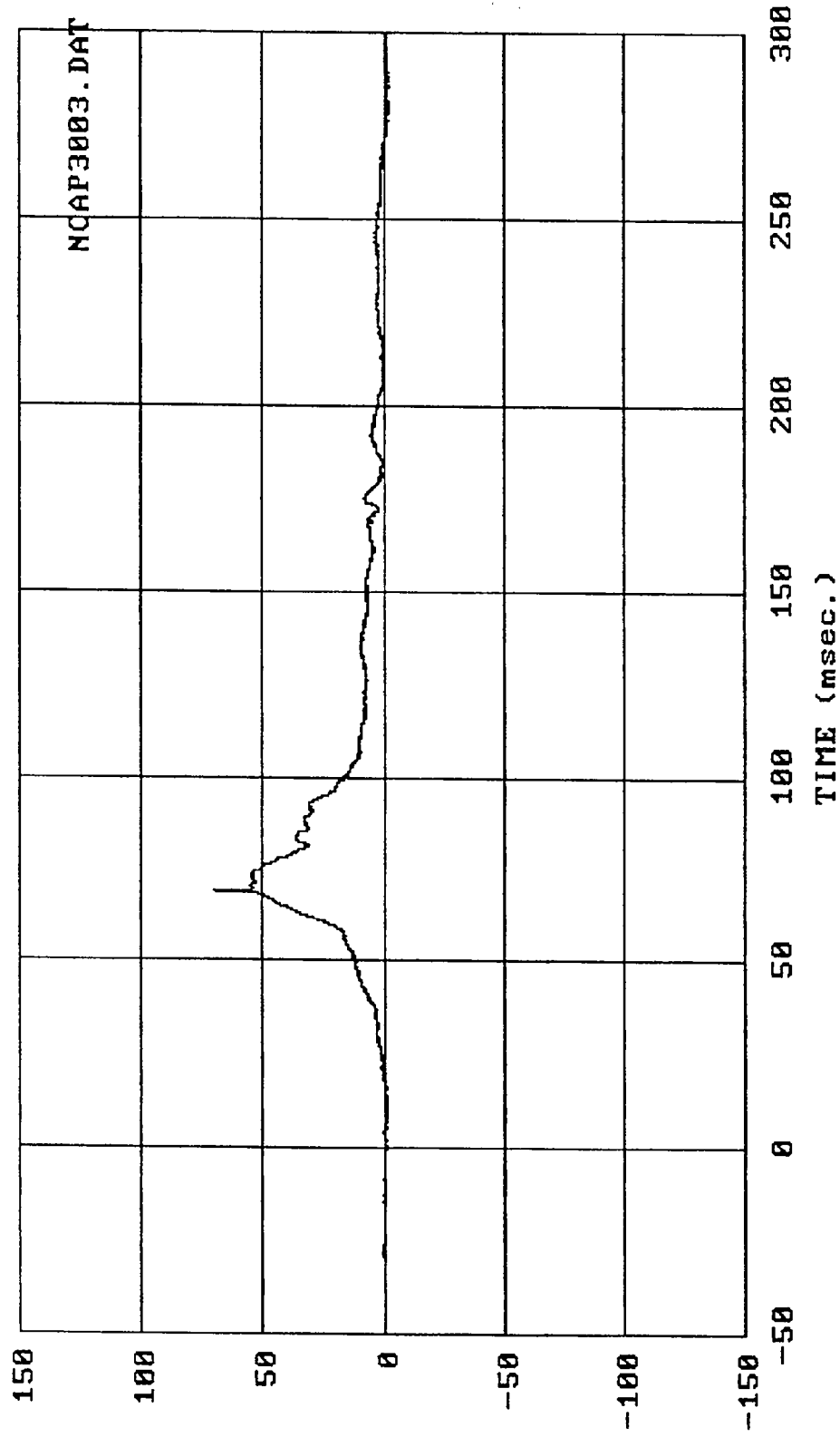
Inst. Group ID: 5	VEHNO: 0	CURNO: 067	
SENTYP: LC	SENLOC: NA	SENATT: LCD9	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19466		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 3	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			



Filter: SAE CLASS 1000 Max = 36.38 Min = -84.77 Axis: X
MSE 09/27/89 -- 1990 Mits. Eclipse : Driver Head acceleration

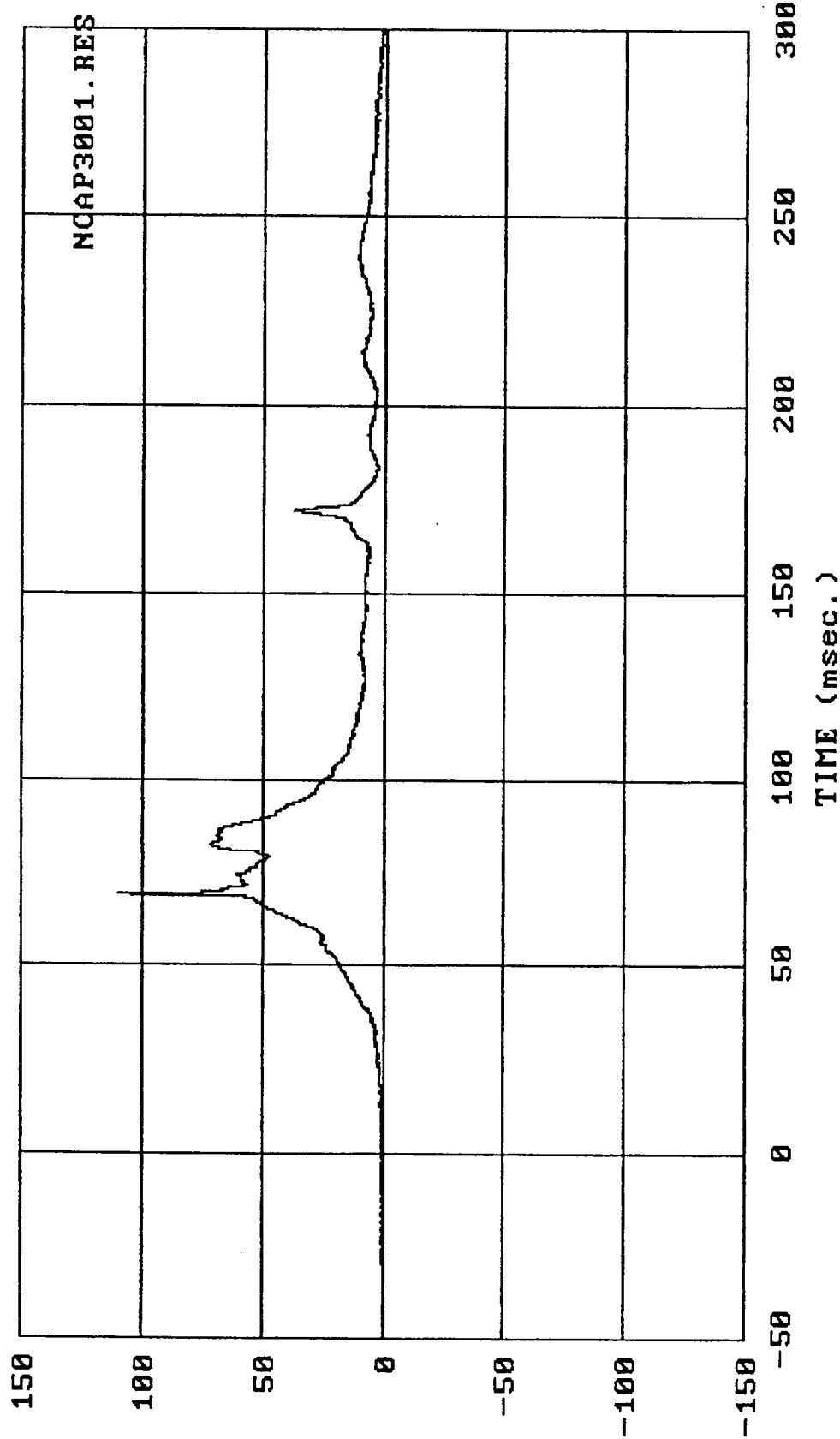


Filter: SAE CLASS 1000 Max = 13.45 Min = -8.408 Axis: Y
MSE 09/27/89 -- 1990 Mits. Eclipse : Driver Head acceleration



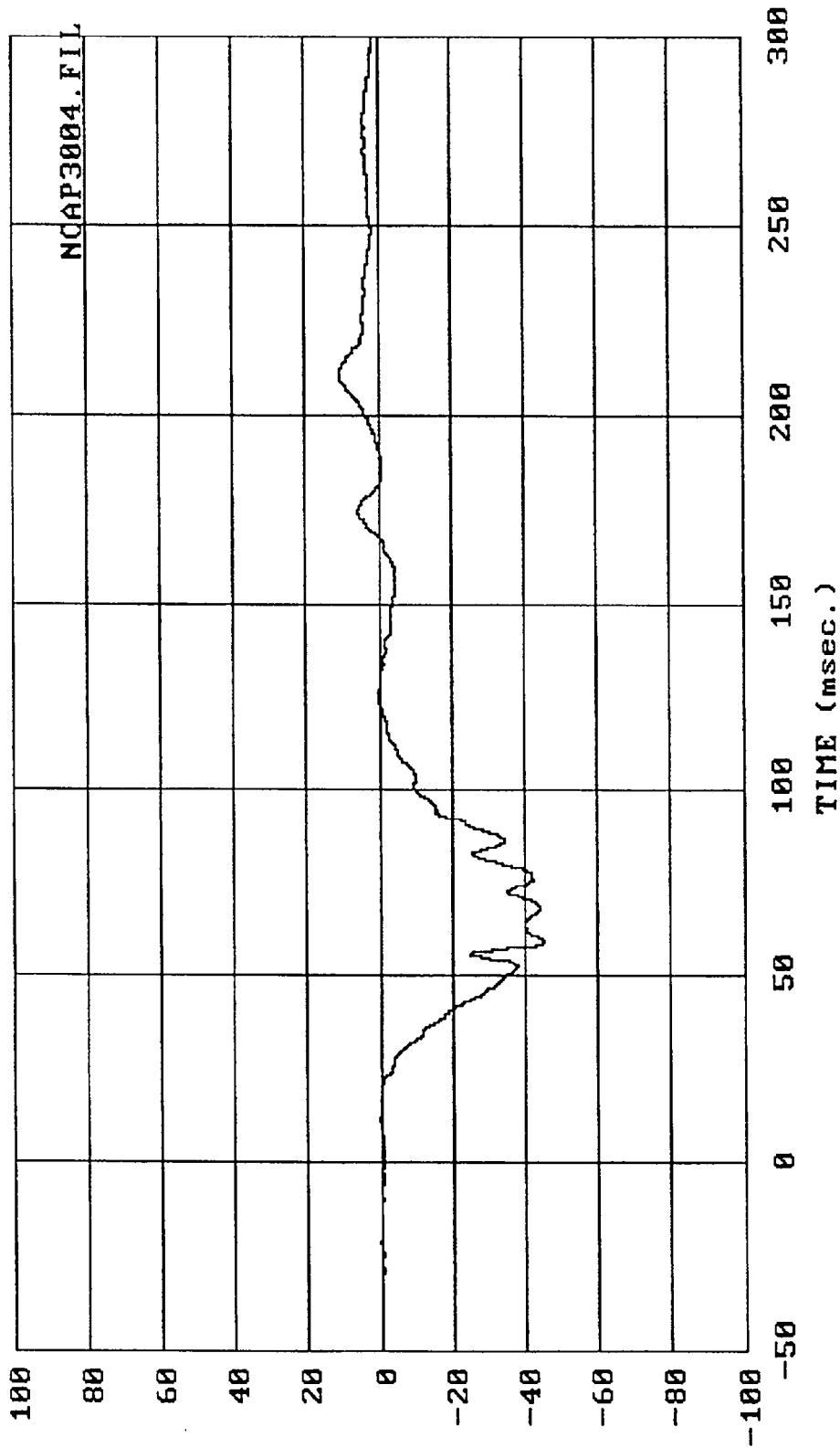
Filter: SAE CLASS 1000 Max = 71.37 Min = -1.695 Axis: Z

MSE 09/27/89 -- 1990 Mits. Eclipse : Driver Head acceleration



Filter: SAE CLASS 1000 Max = 110.3 Min = .1682 Axis:

MSE 09/27/89 -- 1990 Mts. Eclipse : Driver Head resultant accel.



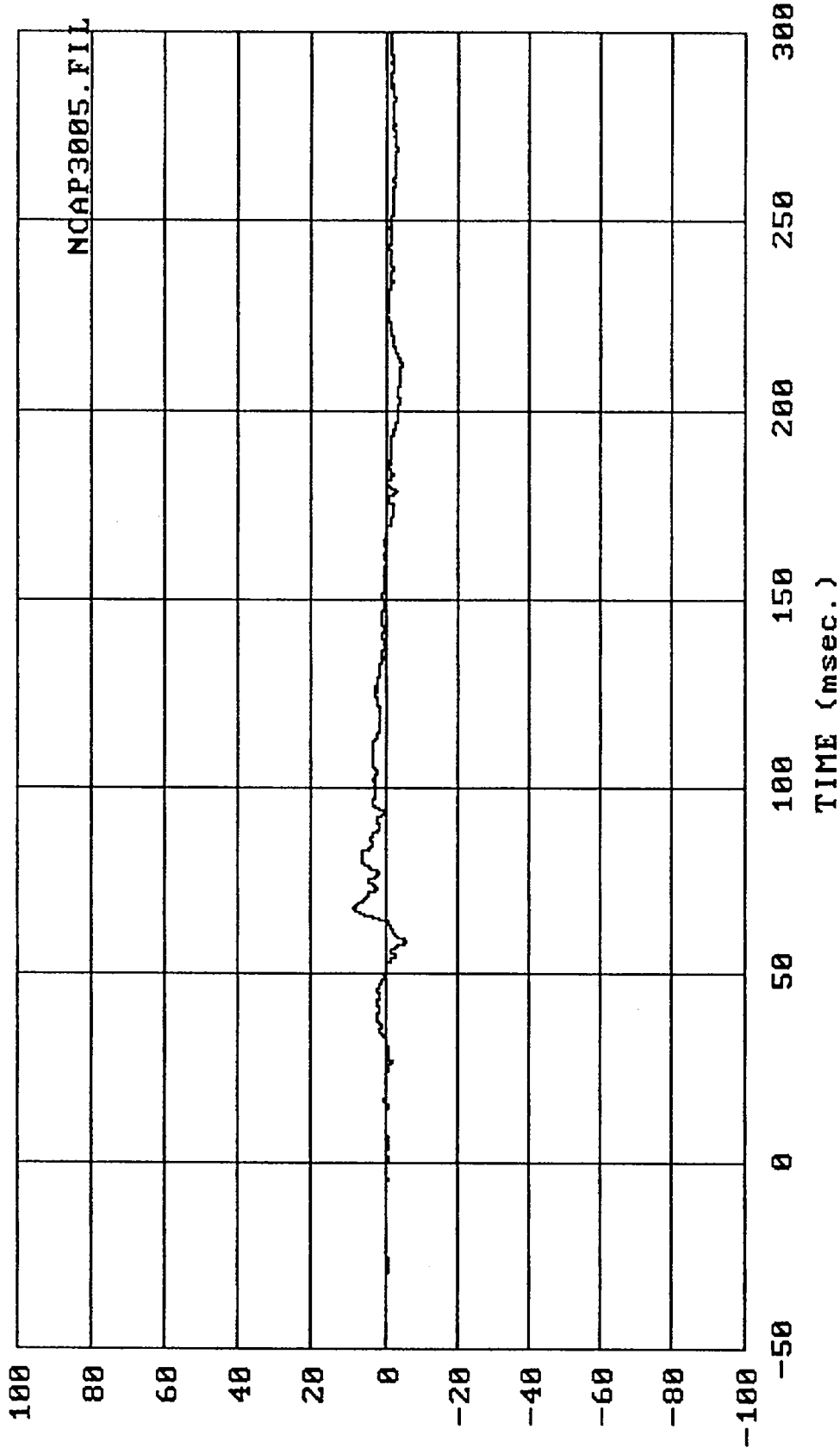
Filter: SAE CLASS 180 Max = 10.99 Min = -45.44 Axis: X

MSE 09/27/89 -- 1990 Mits. Eclipse : Driver Chst acceleration

G, S

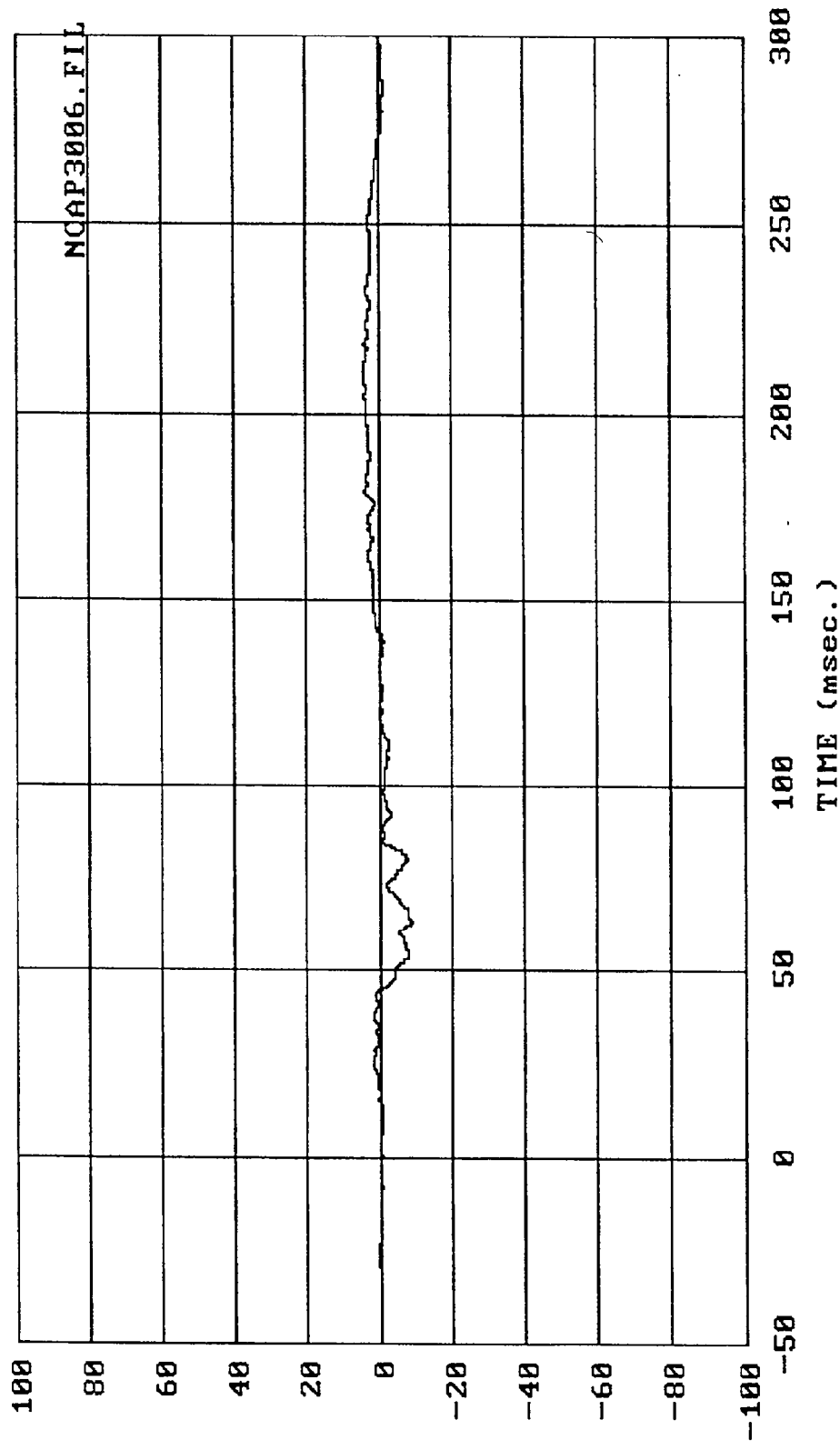
B1-24

MSE-90-R9063-N03



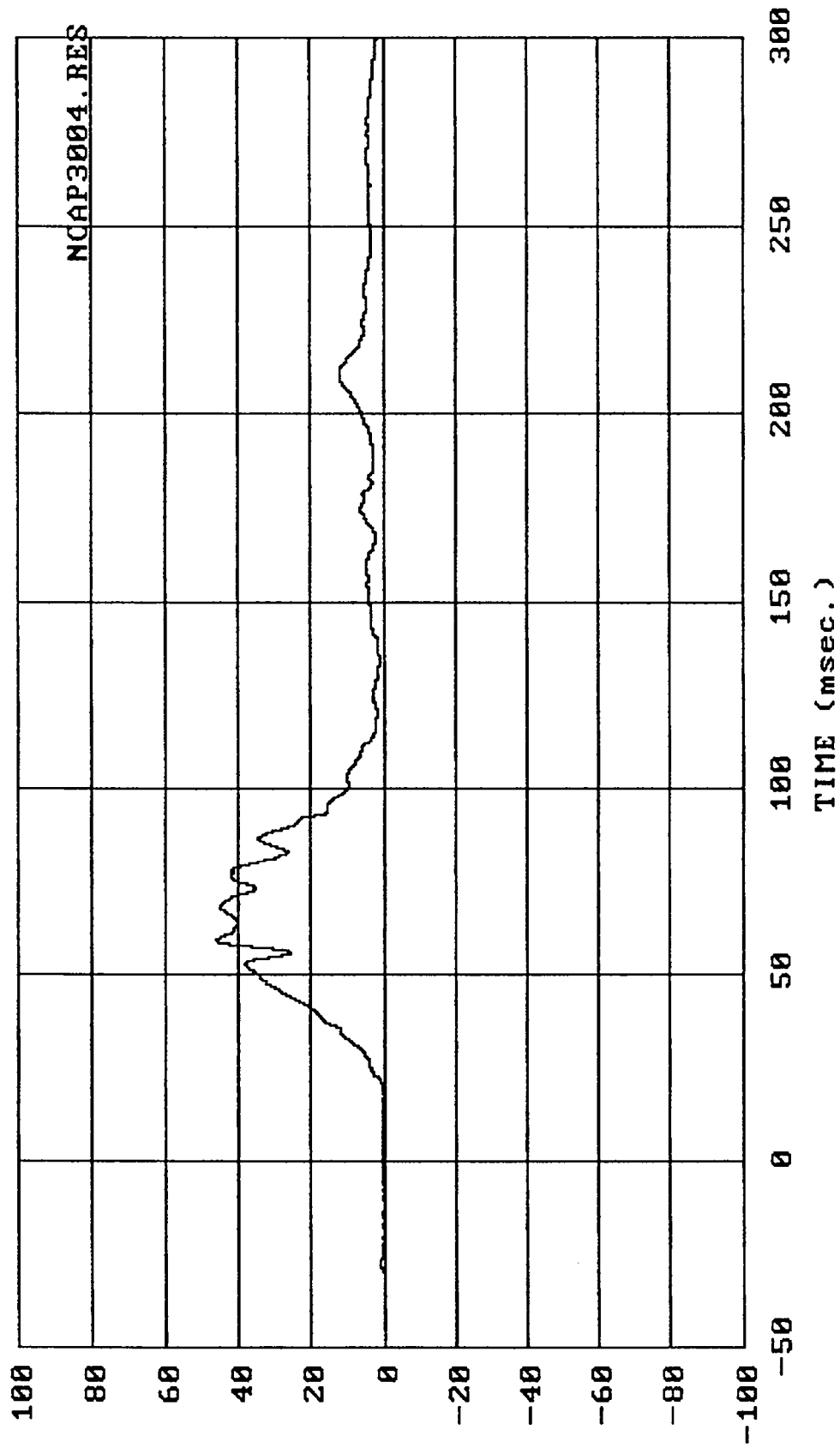
Filter: SAE CLASS 180 Max = 8.934 Min = -5.300 Axis: Y

MSE 09/27/89 -- 1990 Mits. Eclipse : Driver Chst acceleration



Filter: SAE CLASS 180 Max = 4.082 Min = -8.991 Axis: Z

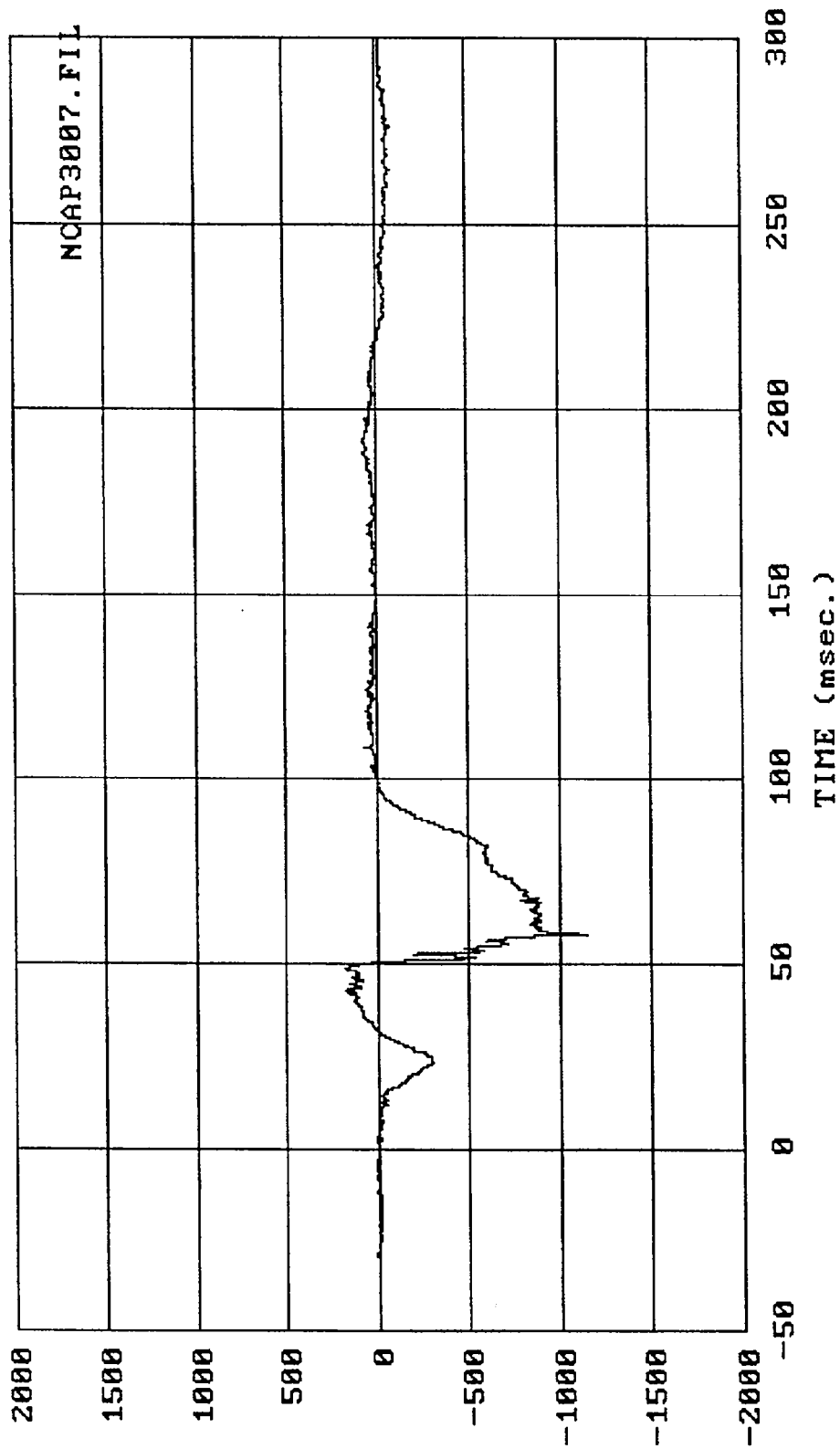
MSE 09/27/89 -- 1990 Mits. Eclipse : Driver Chst acceleration



G, S

B1-27

MSE-90-R9063-N03

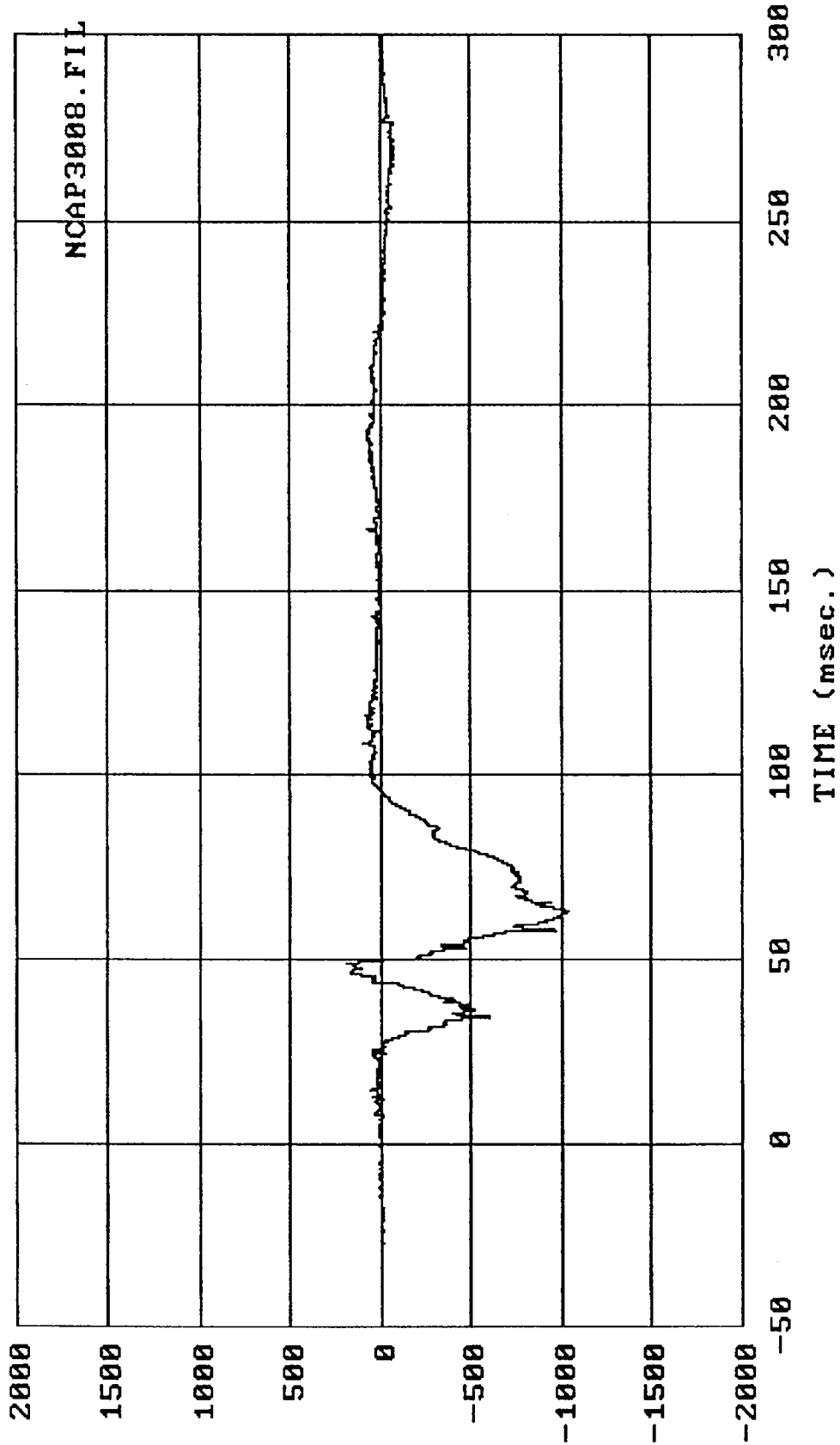


L B S

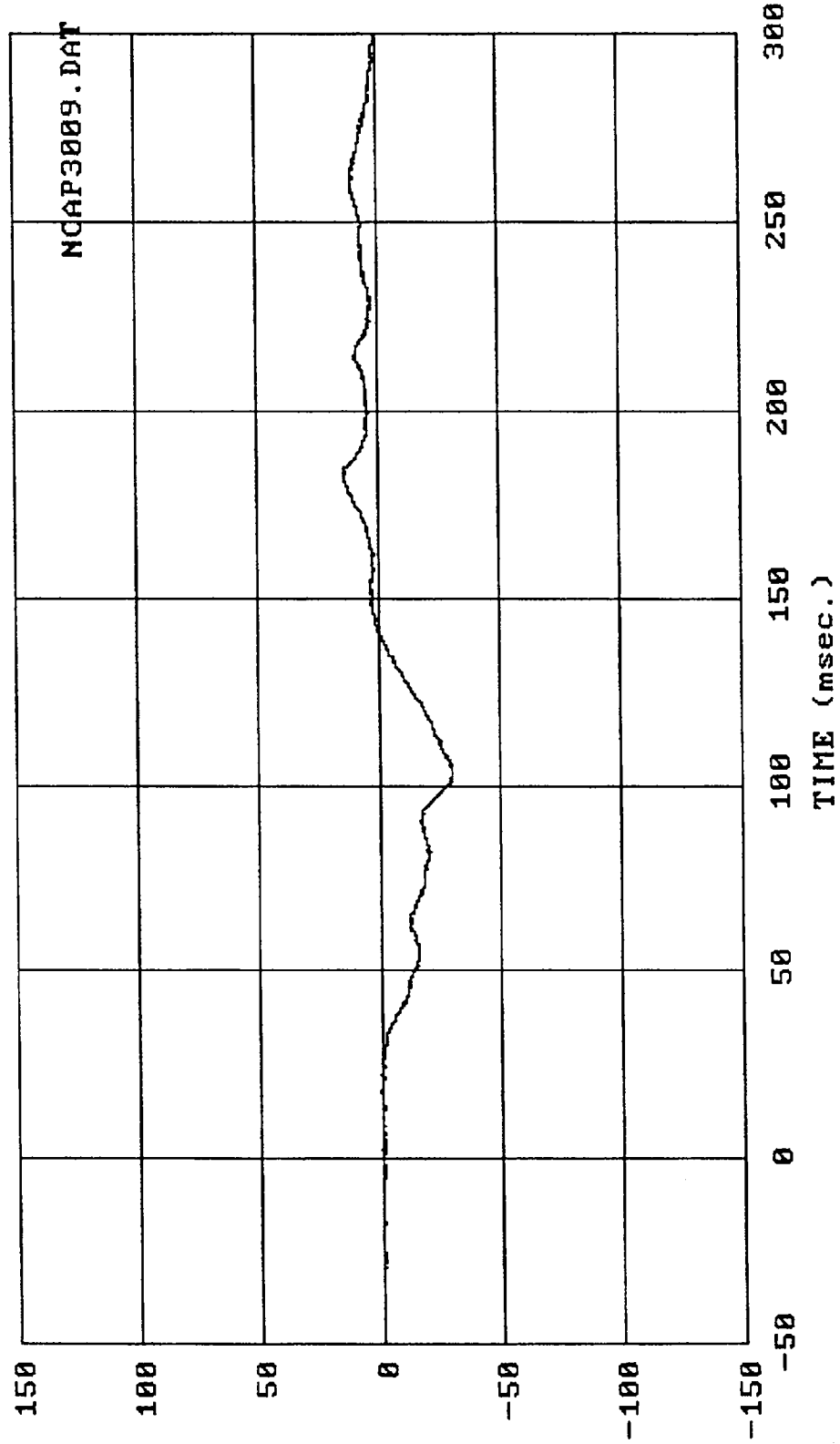
B1-28

MSE-90-R9063-N03

Filter: SAE CLASS 600 Max = 180.6 Min = -1152. Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Driver Left Femur force

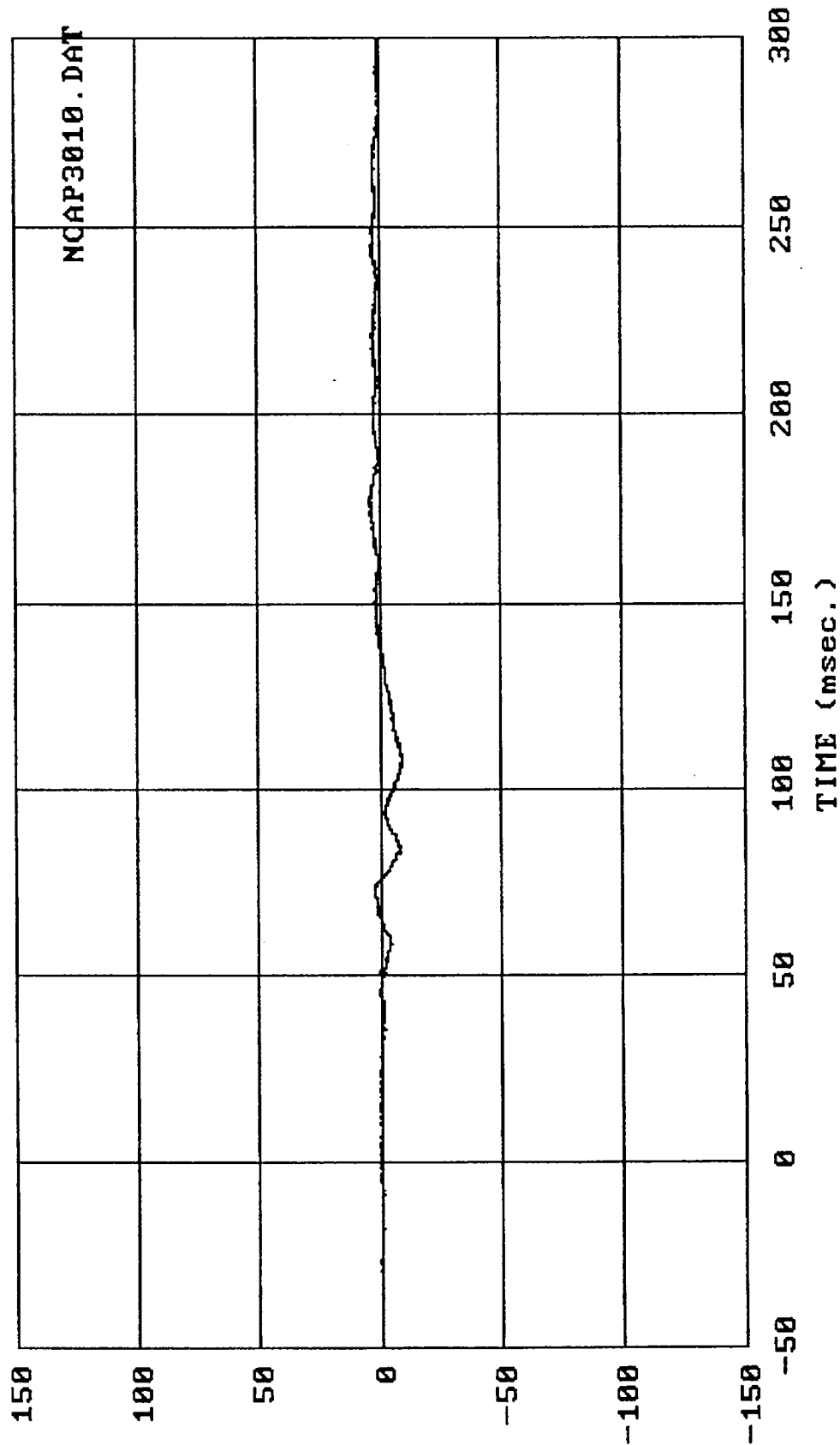


Filter: SAE CLASS 600 Max = 192.9 Min = -1033. Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Driver Rght Femur force



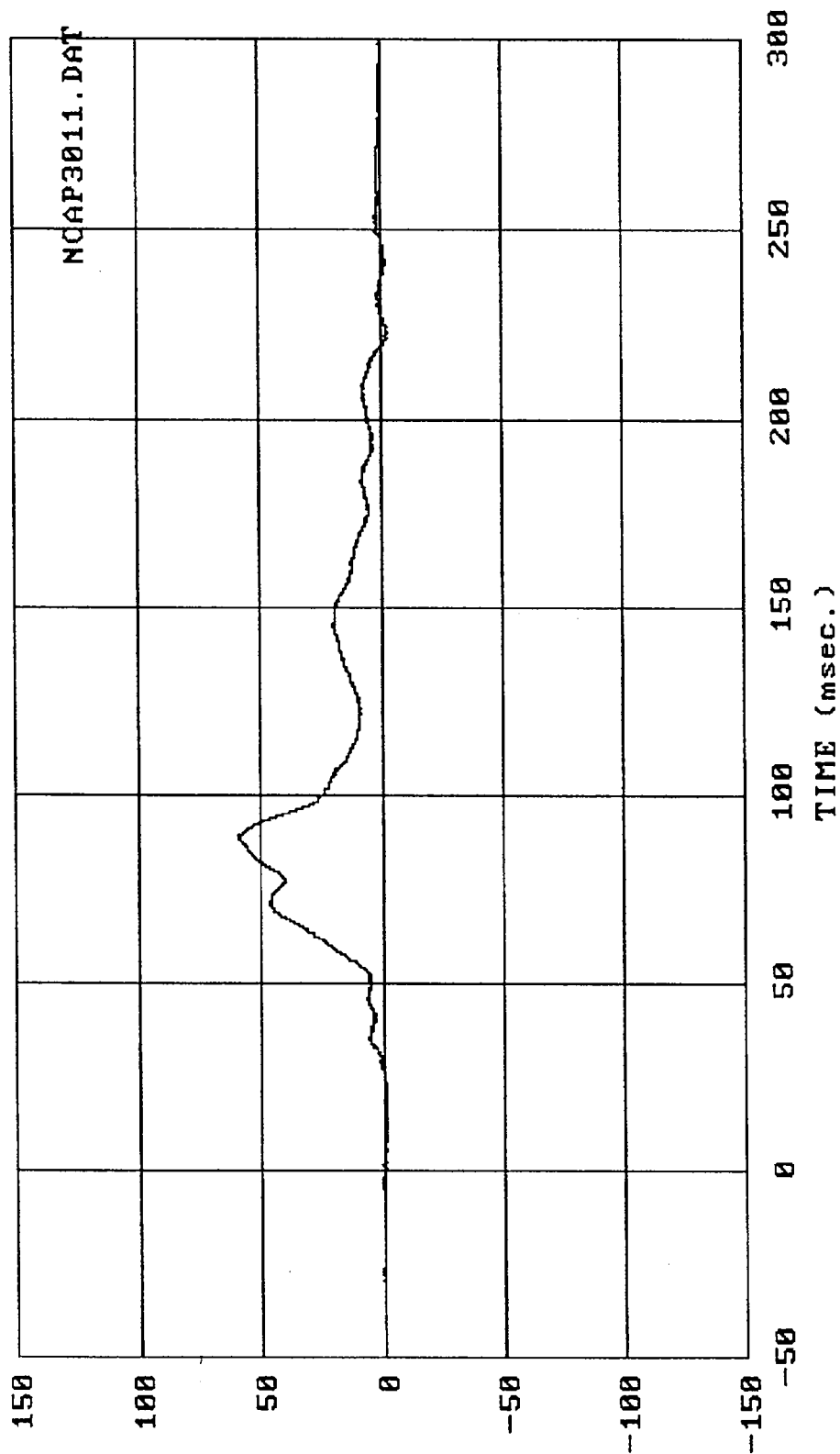
Filter: SAE CLASS 1000 Max = 14.78 Min = -29.93 Axis: X

MSE 09/27/89 -- 1990 Mits. Eclipse : Pasngr Head acceleration



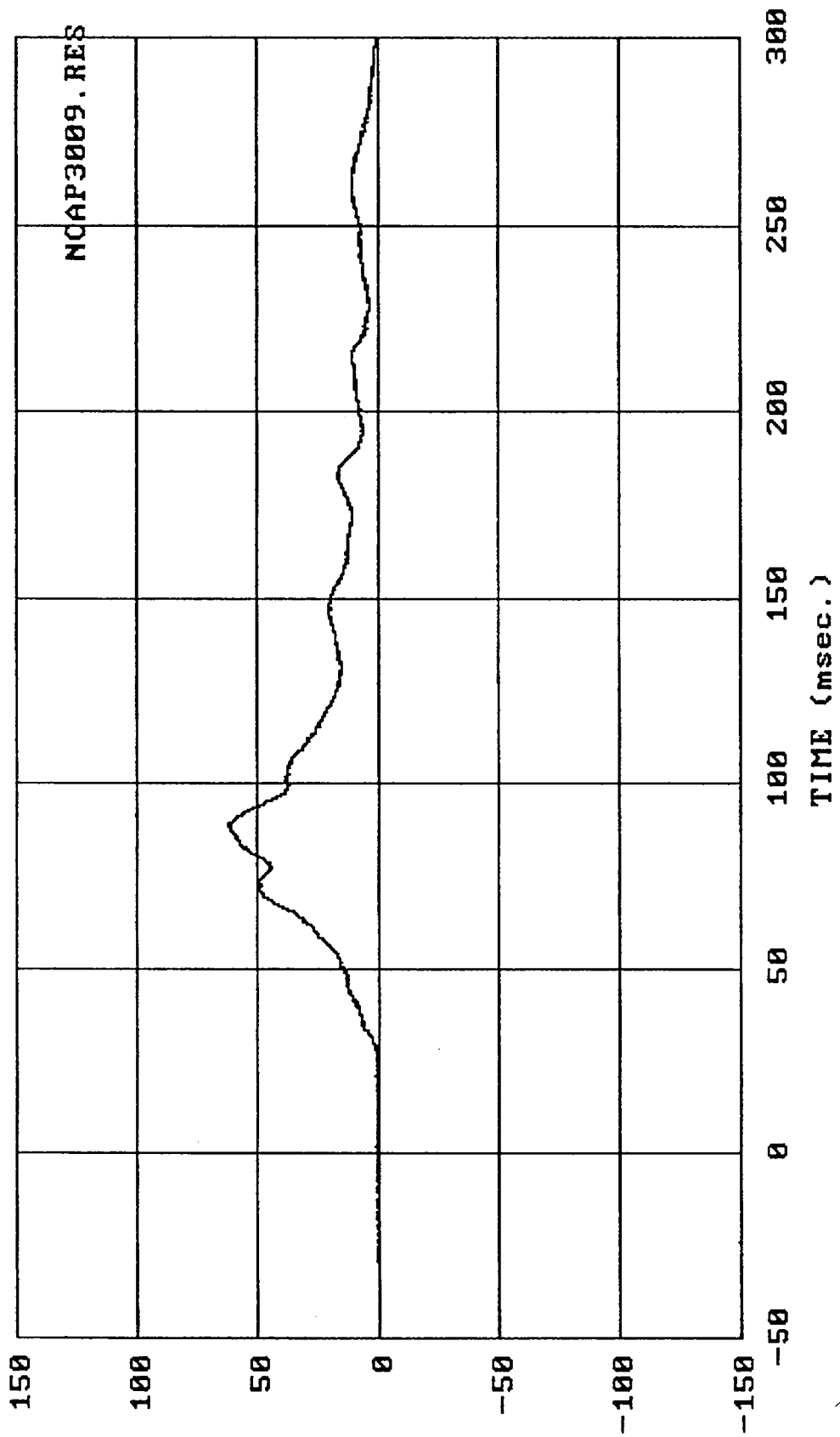
Filter: SAE CLASS 1000 Max = 4.735 Min = -9.470 Axis: Y

MSE 09/27/89 --- 1990 Mits. Eclipse : Pasngr Head acceleration



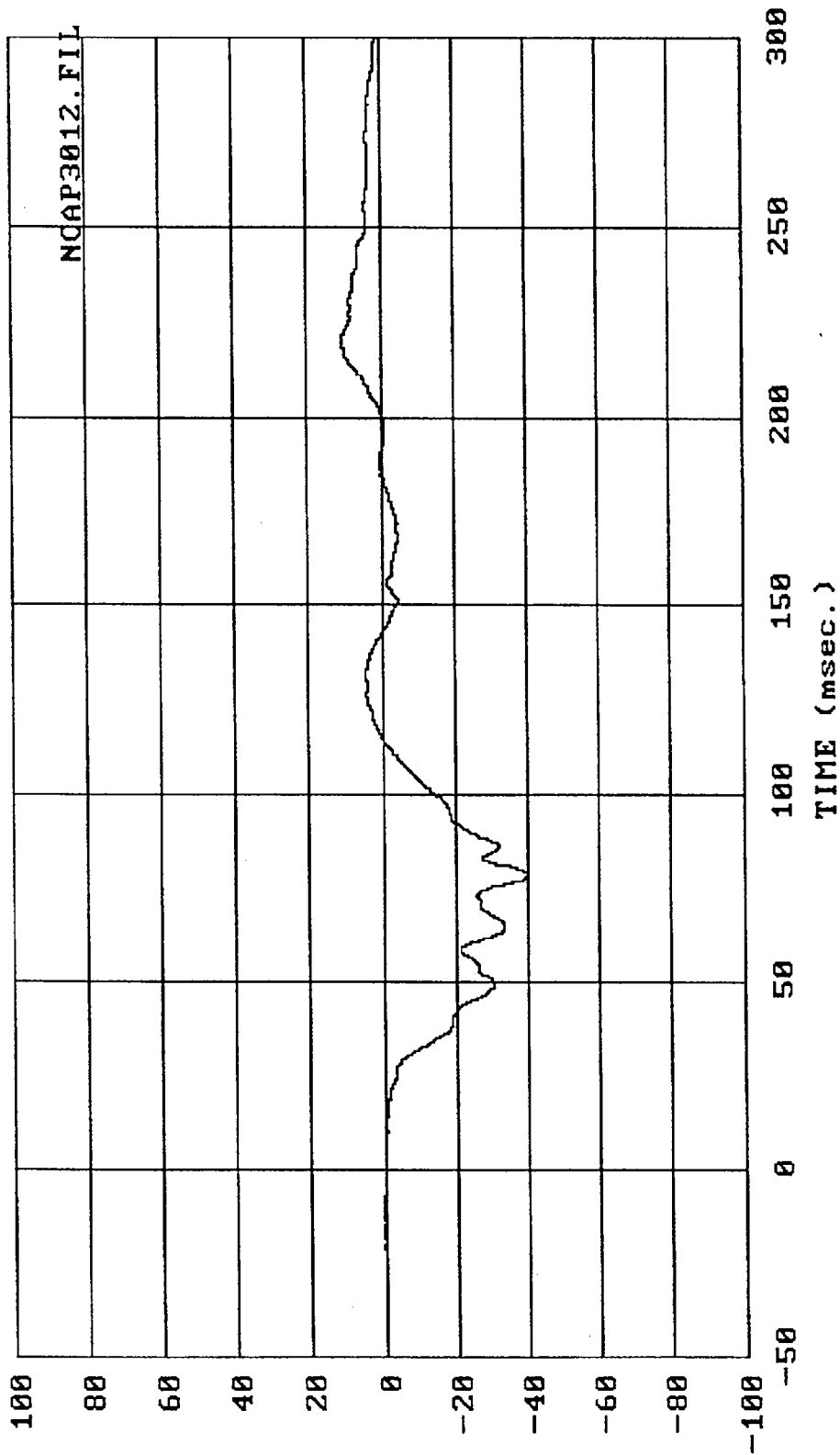
Filter: SAE CLASS 1000 Max = 59.32 Min = -2.727 Axis: Z

MSE 09/27/89 -- 1990 Mits. Eclipse : Pasngr Head acceleration



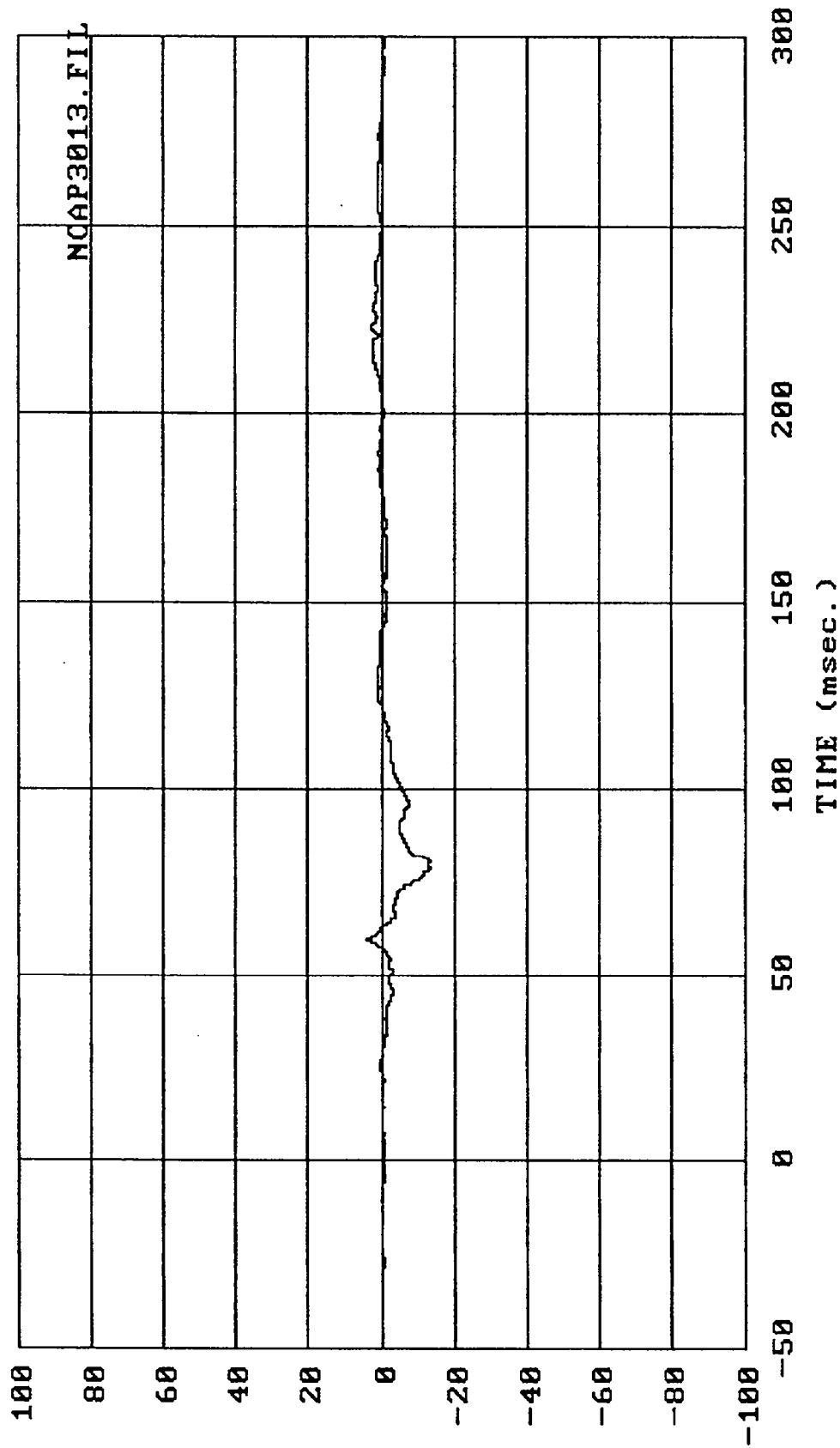
Filter: SAE CLASS 1000 Max = 62.16 Min = .0000 Axis:

MSE 09/27/89 -- 1990 Mits. Eclipse : Pasngr Head resultant accel.



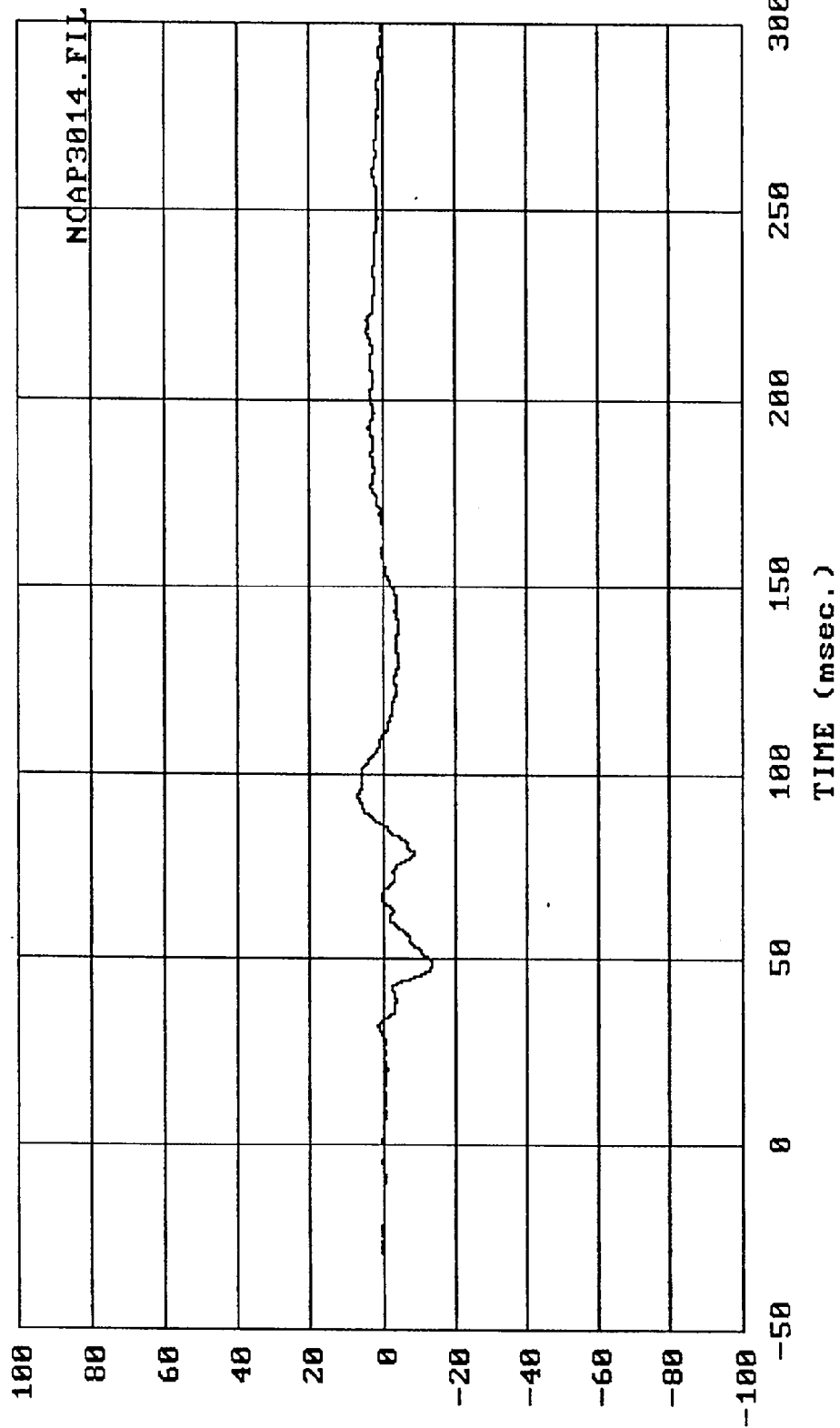
Filter: SAE CLASS 180 Max = 10.75 Min = -40.12 Axis: X

MSE 09/27/89 -- 1990 Mits. Eclipse : Pasngr Chst acceleration



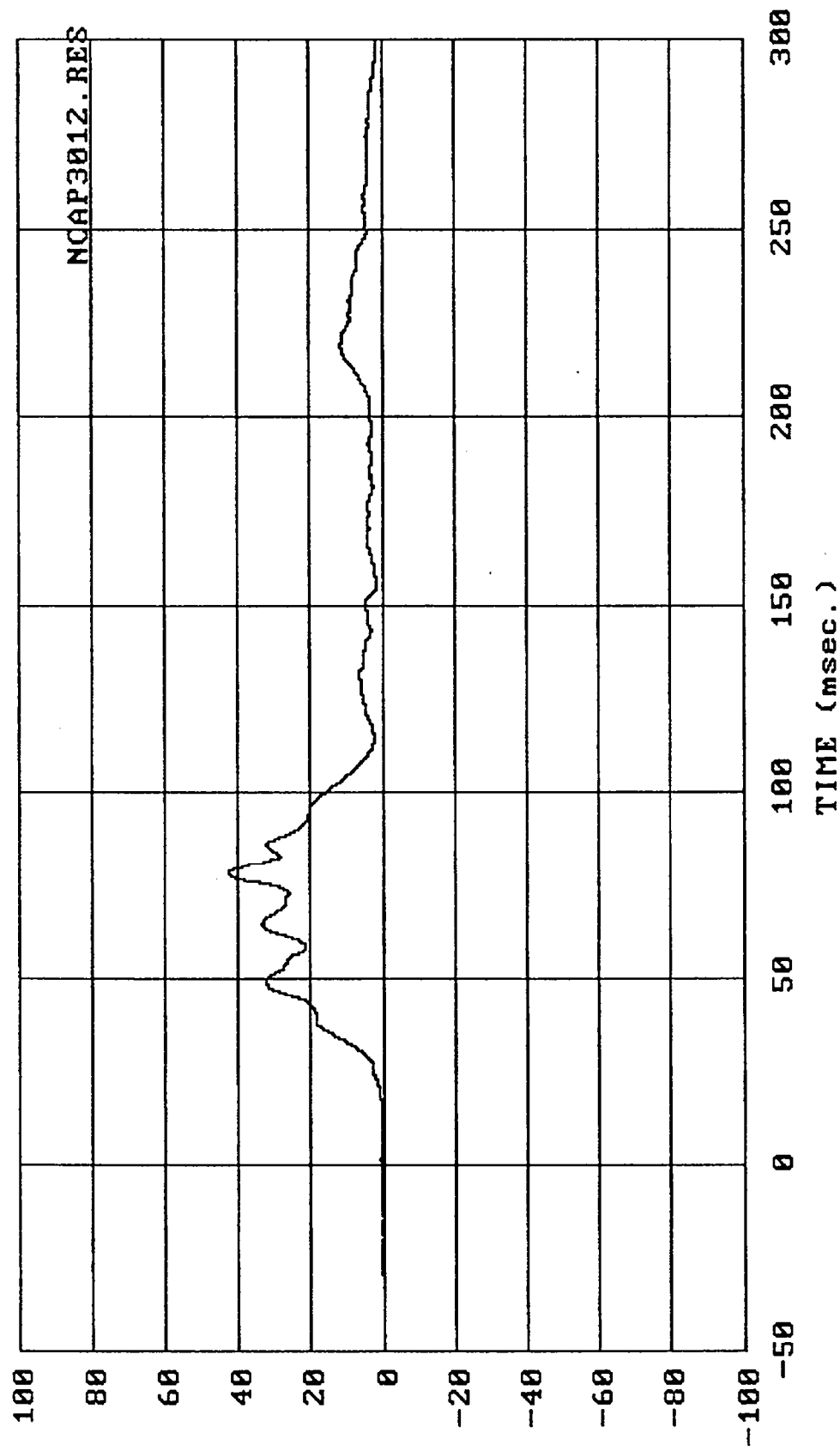
Filter: SAE CLASS 180 Max = 4.444 Min = -13.53 Axis: Y

MSE 09/27/89 -- 1990 Mits. Eclipse : Pasngr Chst acceleration



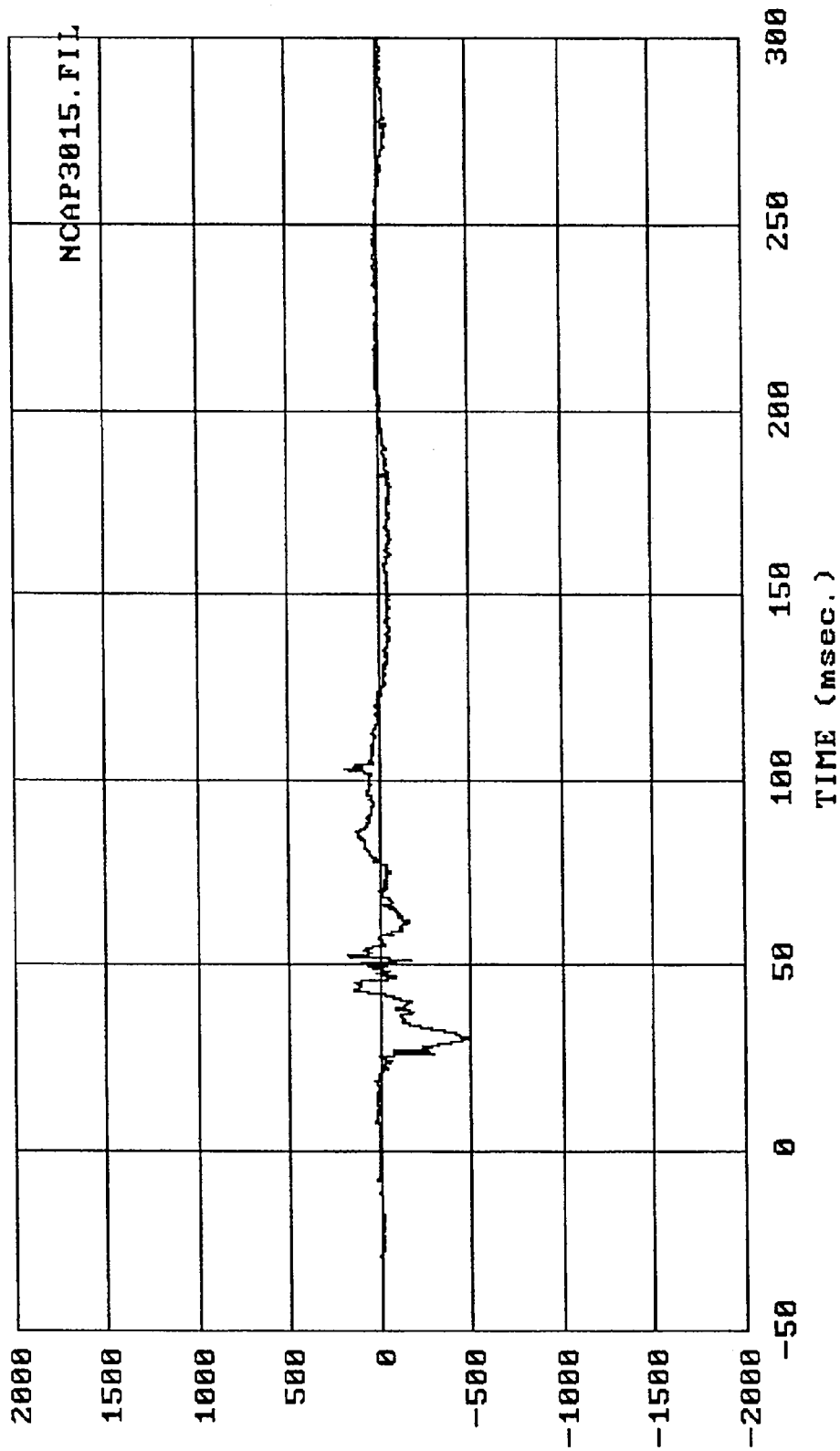
Filter: SAE CLASS 180 Max = 6.944 Min = -13.08 Axis: Z

MSE 09/27/89 -- 1990 Mits. Eclipse : Pasngr Chst acceleration

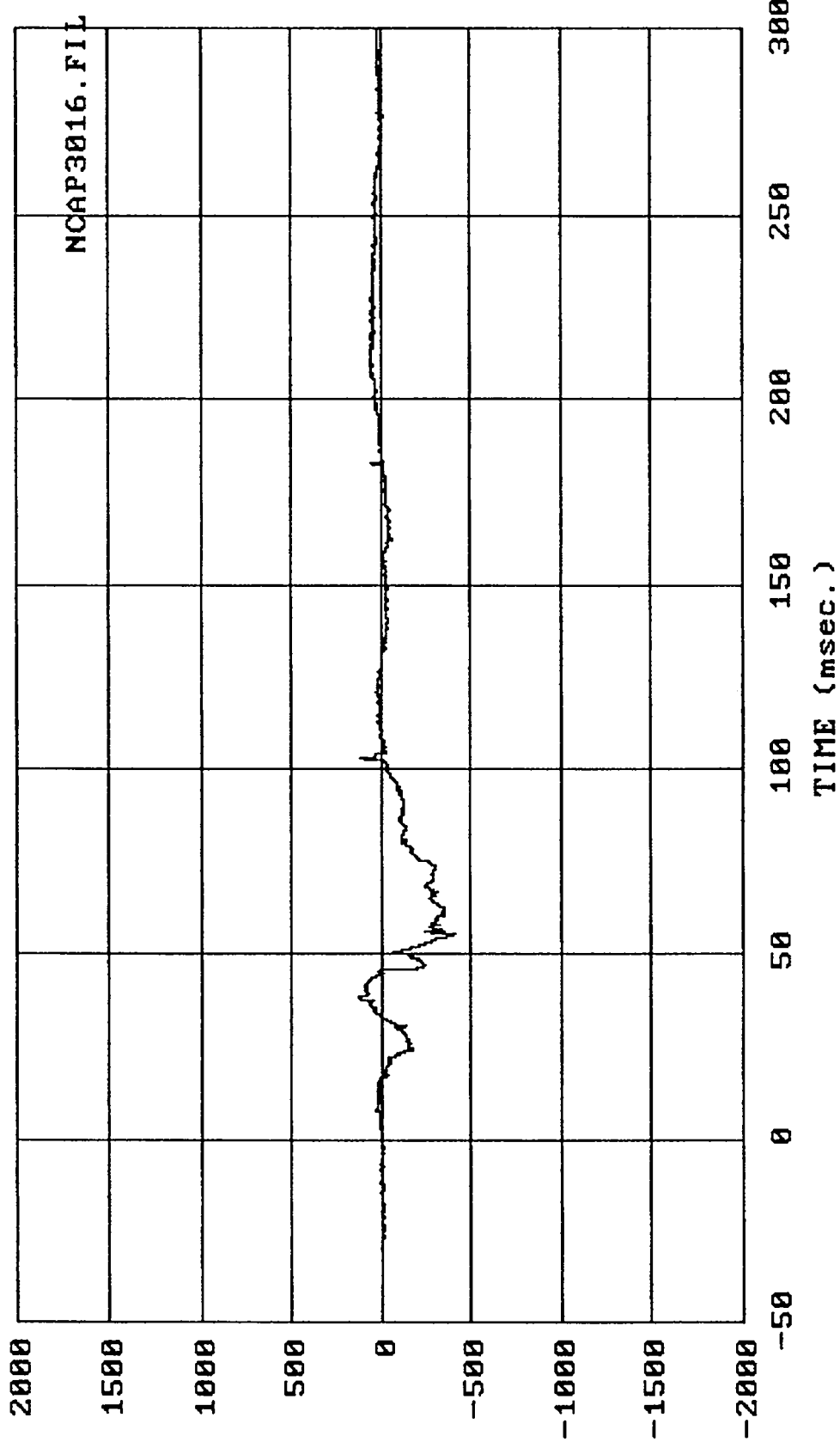


Filter: SAE CLASS 100 Max = 42.85 Min = .3119 Axis:

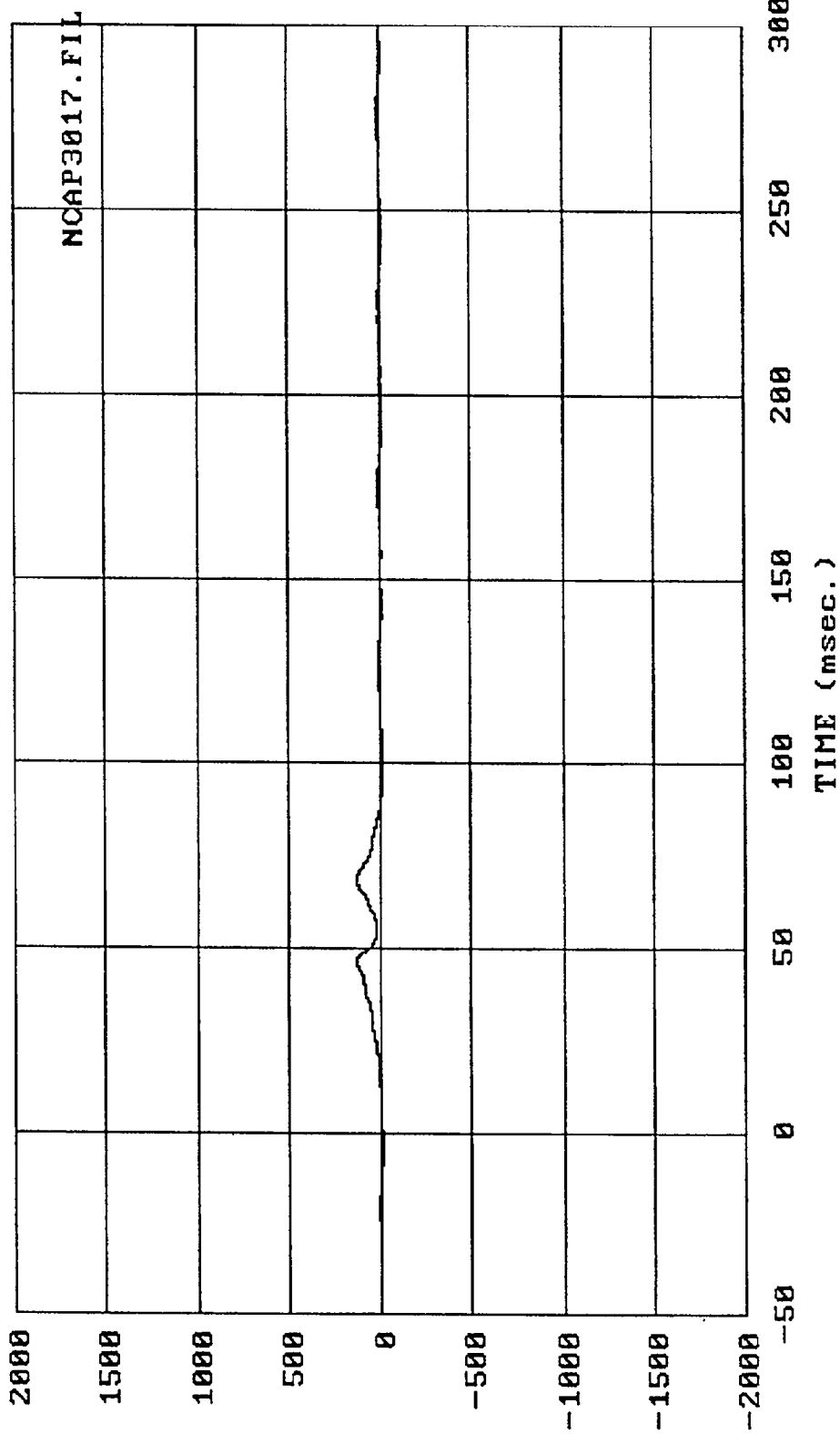
MSE 09/27/89 -- 1990 Mits. Eclipse : Pasngr Chst resultant accel.



Filter: SAE CLASS 600 Max = 190.8 Min = -498.8 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Pasngr Left Femur force



Filter: SAE CLASS 600 Max = 137.5 Min = -413.0 Axis:
MSE 09/27/89 -- 1990 Mts. Eclipse : Pasngr Rght Femur force

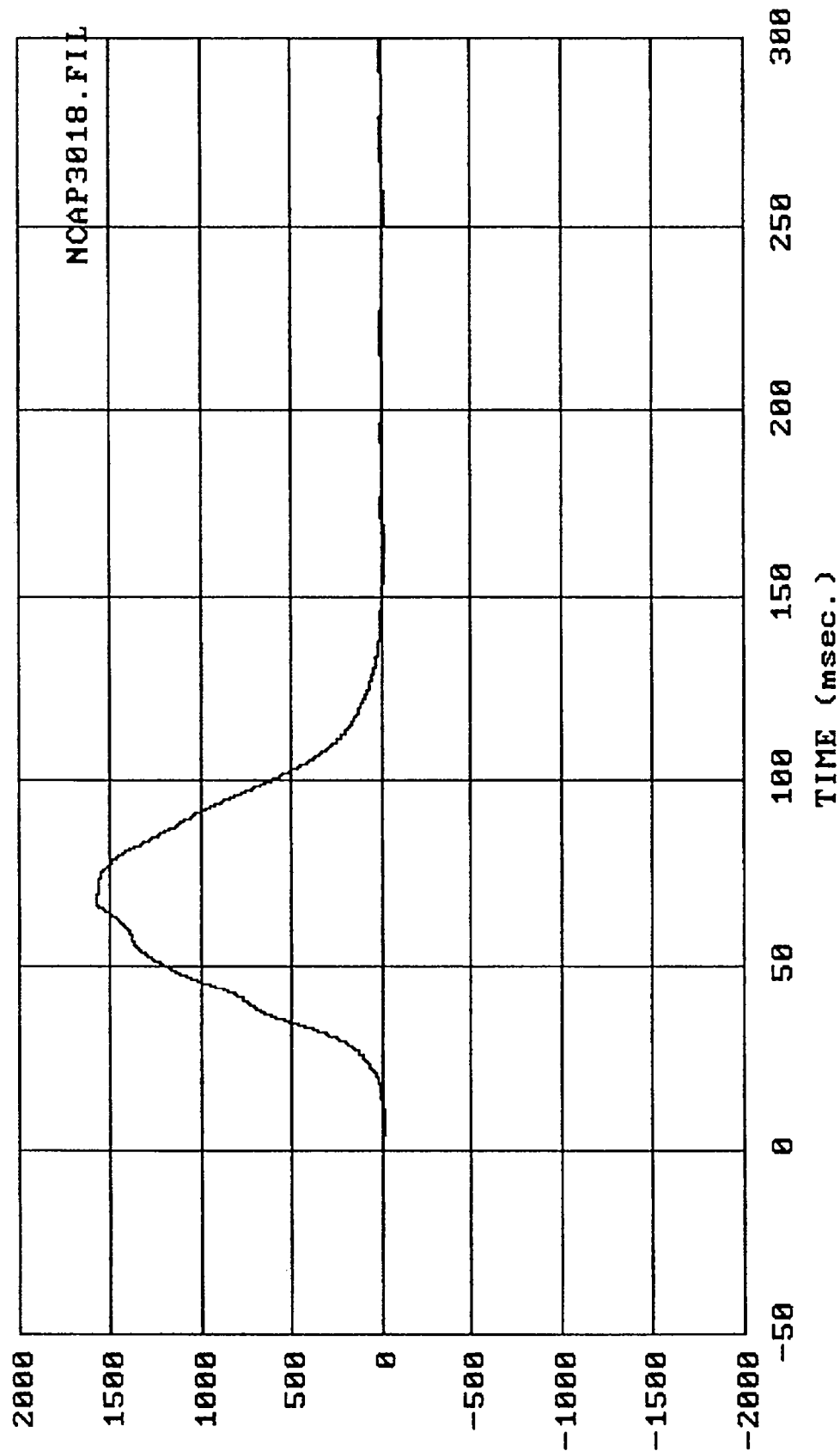


LBS

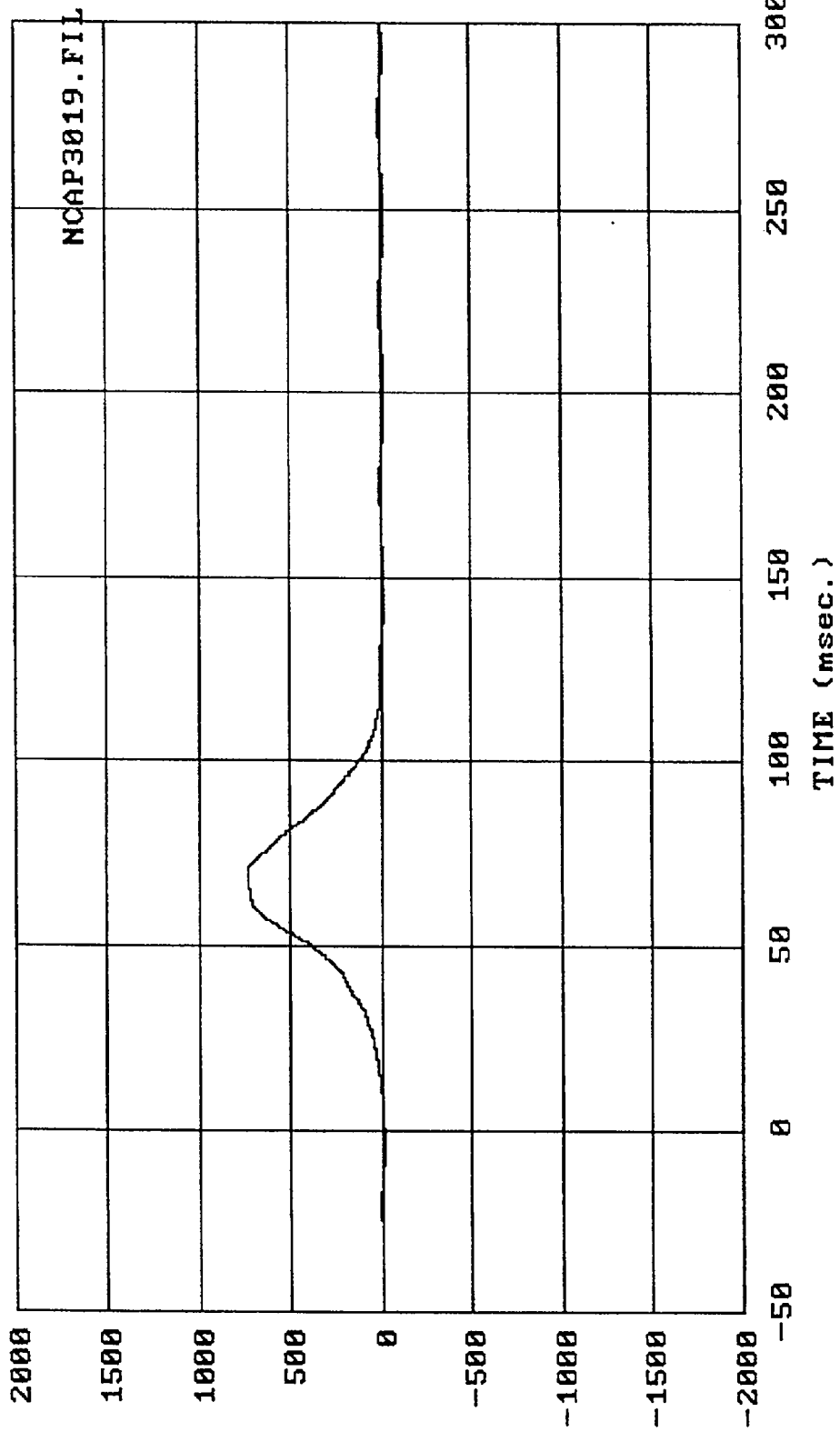
B1-40

MSE-90-R9063-N03

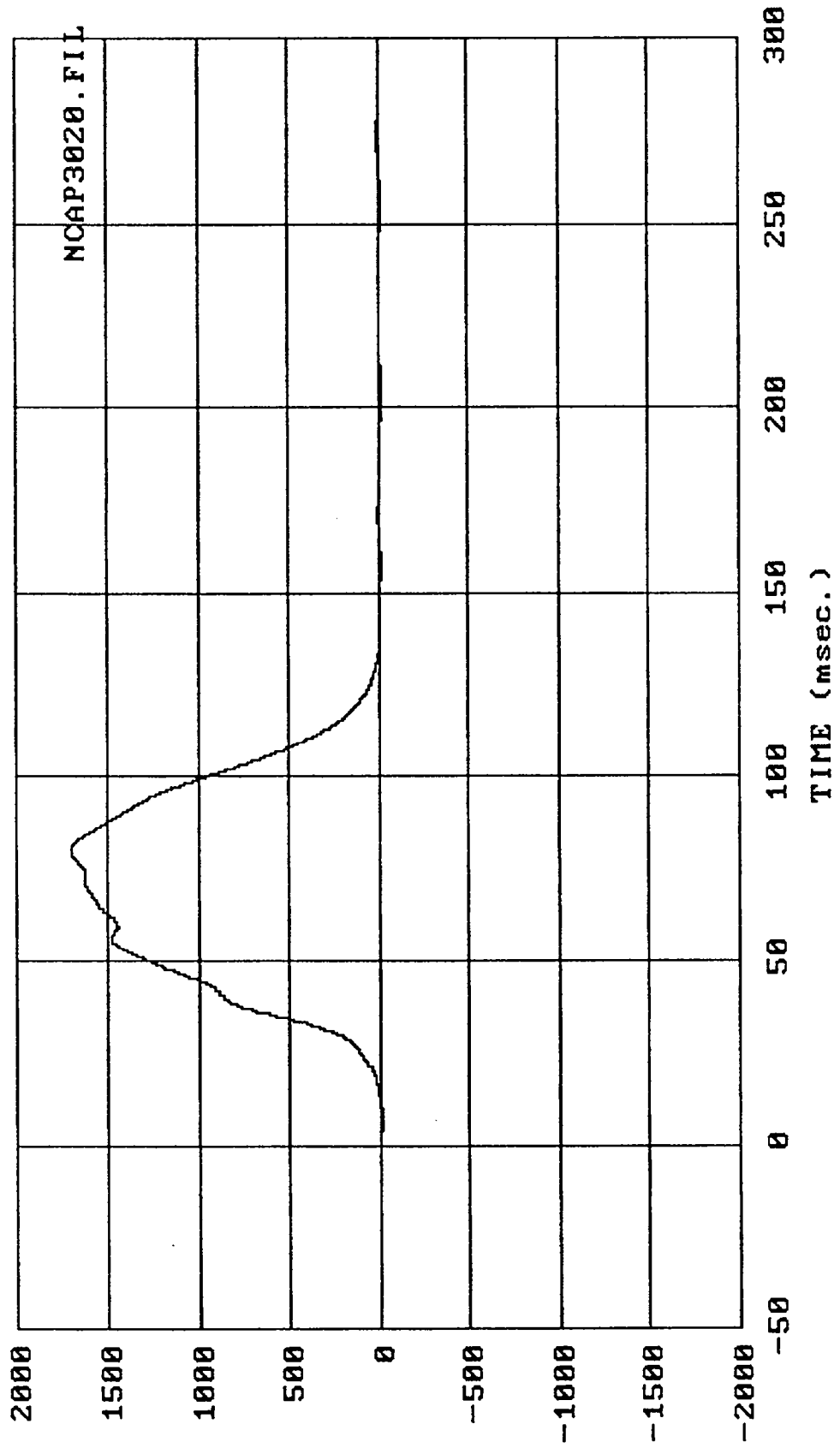
Filter: SAE CLASS 60 Max = 131.6 Min = -13.61 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Driver Lap Belt force



Filter: SAE CLASS 60 Max = 1582. Min = -15.77 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Driver Shoulder Belt force



Filter: SAE CLASS 60 Max = 735.3 Min = -14.62 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Pasngr Lap Belt force

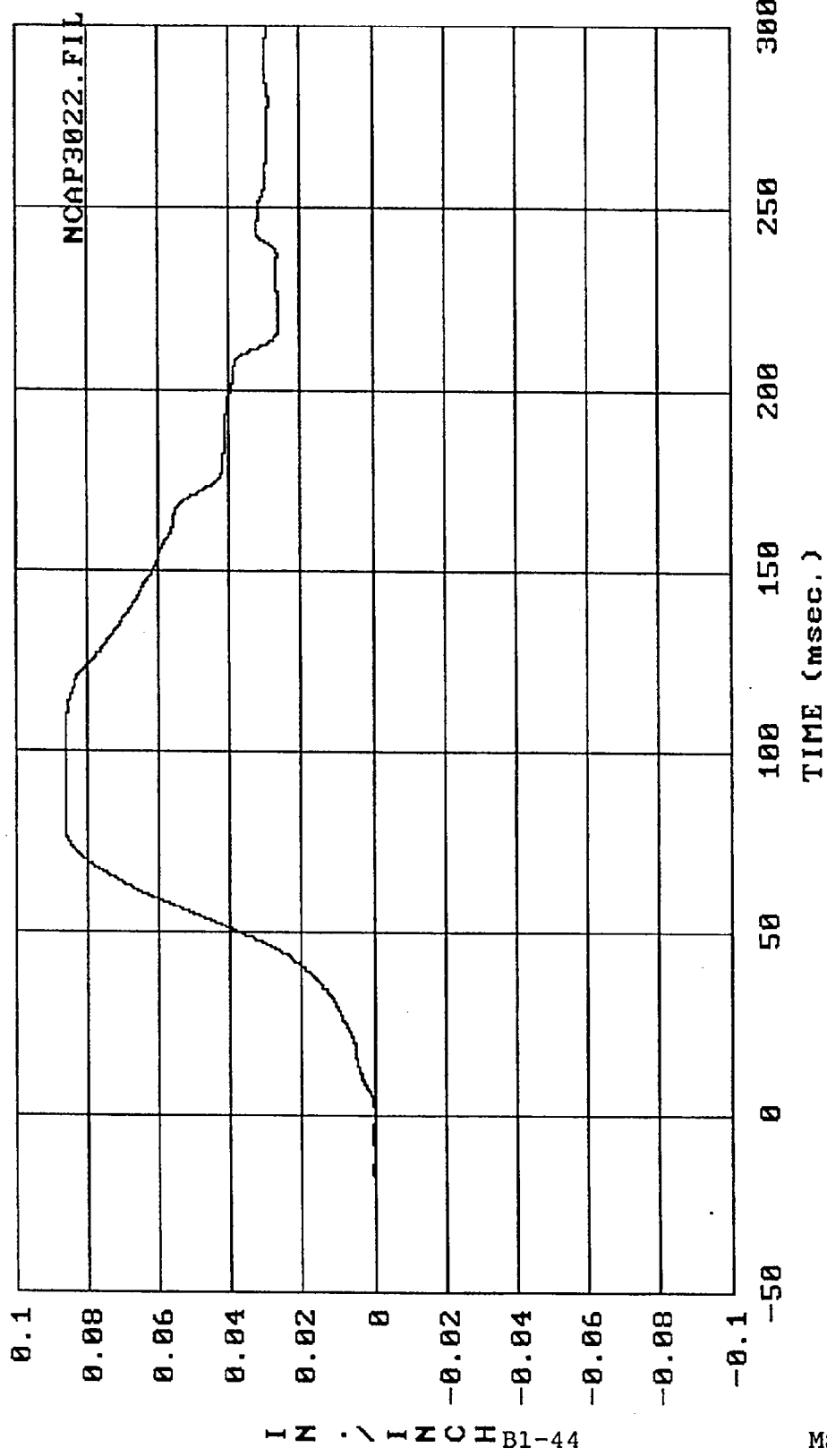


LBS

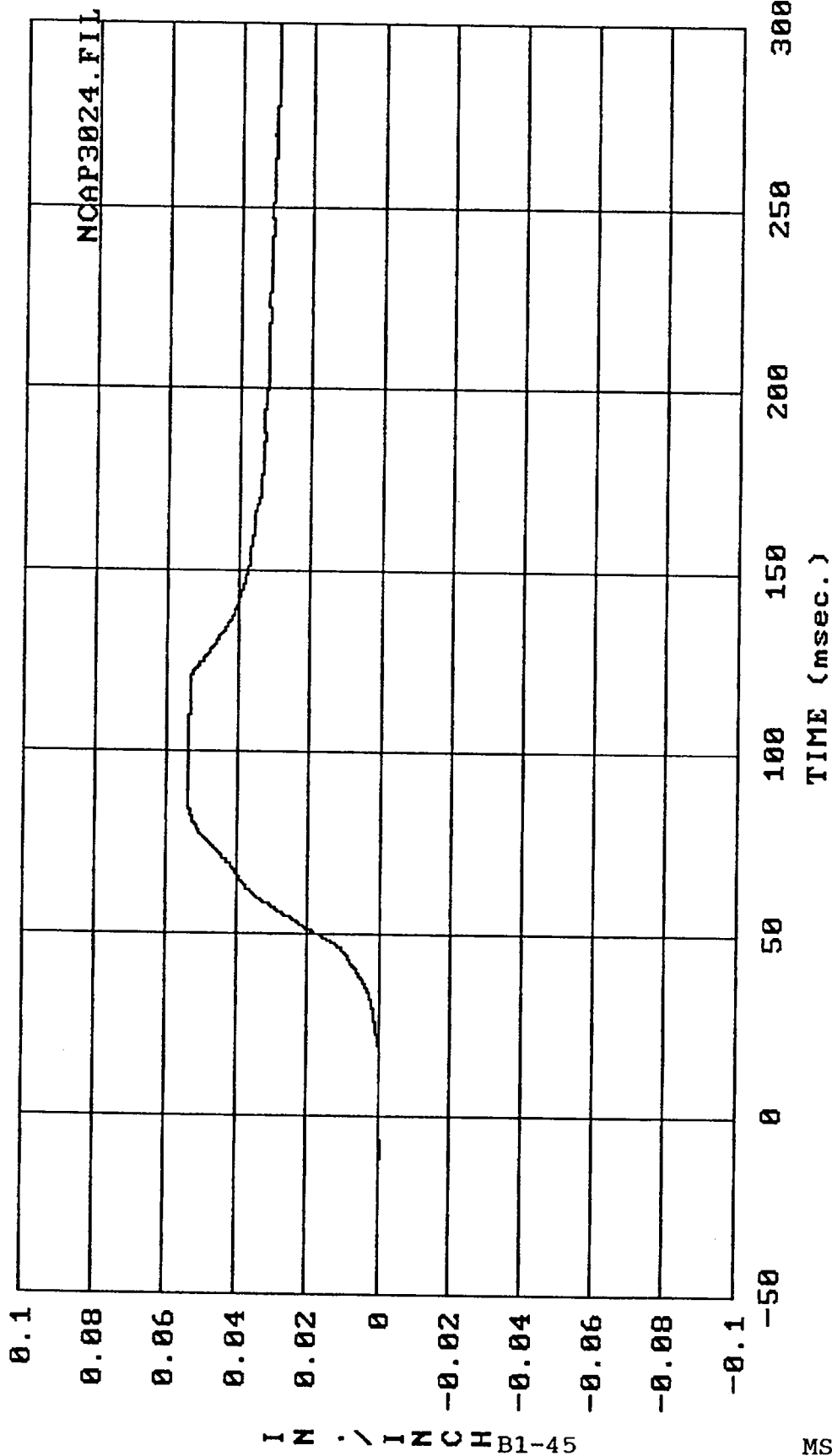
B1-43

MSE-90-R9063-N03

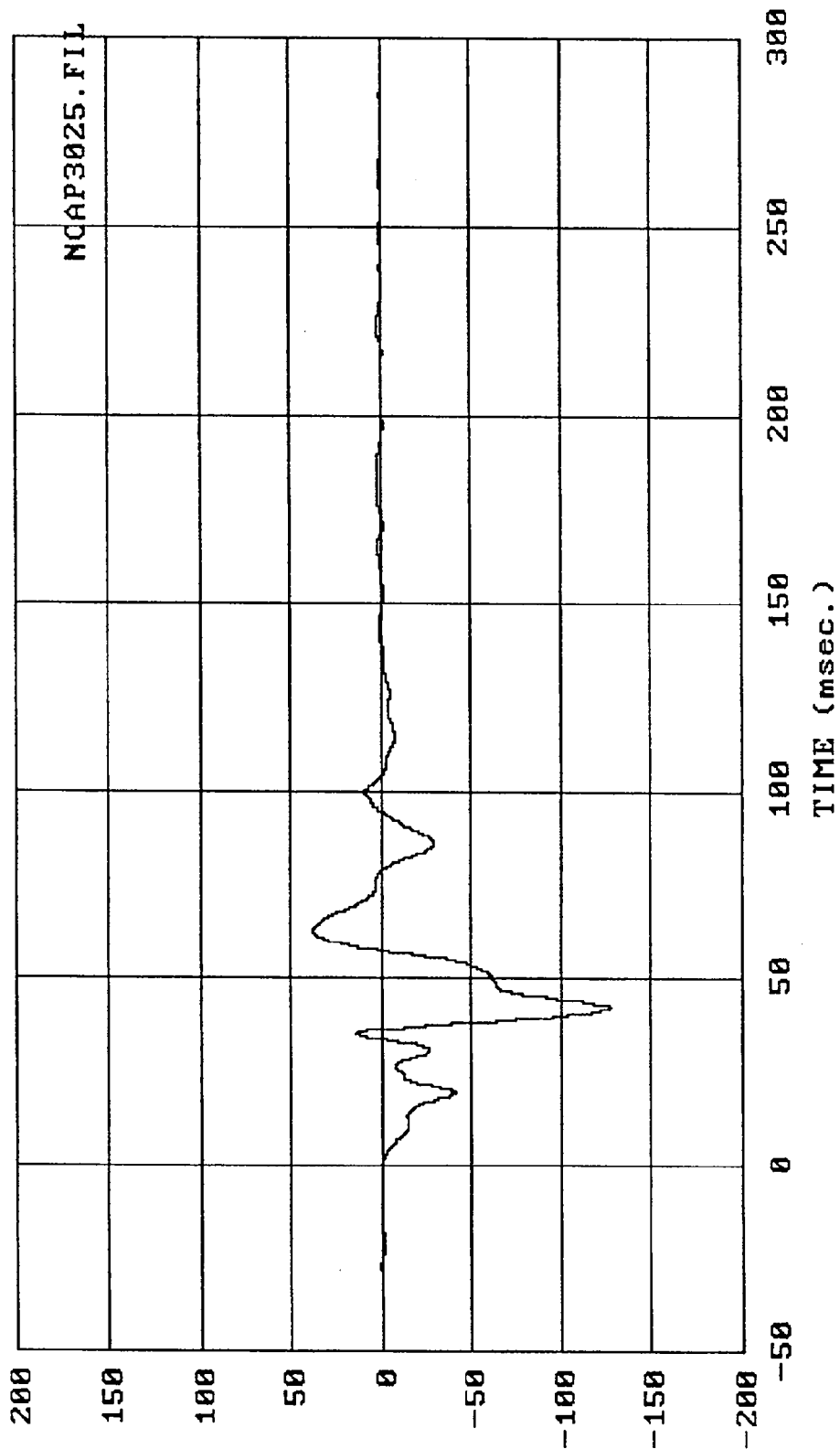
Filter: SAE CLASS 60 Max = 1704. Min = -15.27 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Pasngr Shoulder Belt force



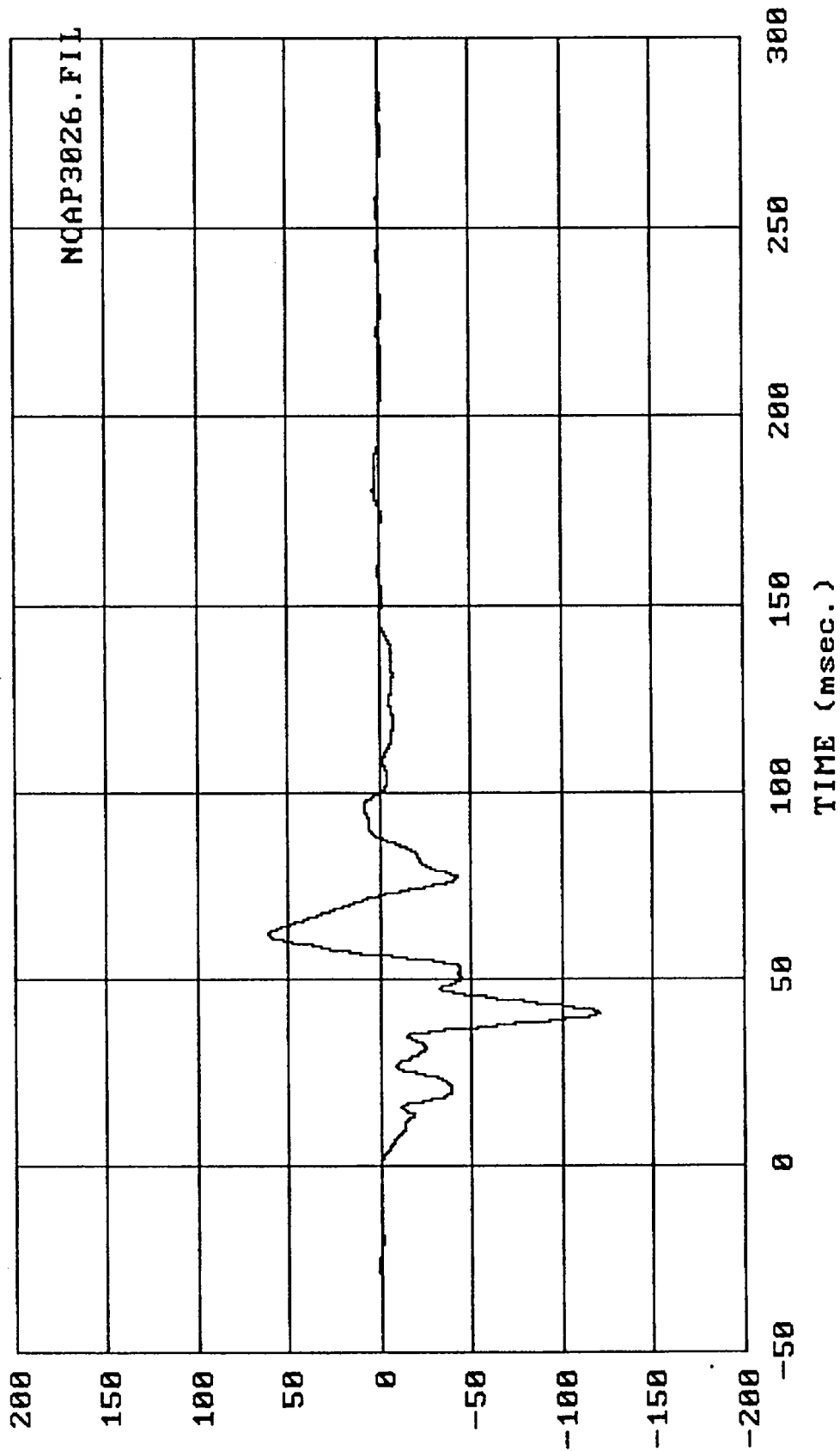
Filter: SAE CLASS 60 Max = .8625E-01 Min = .2618E-01 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Driver Belt percent elongation



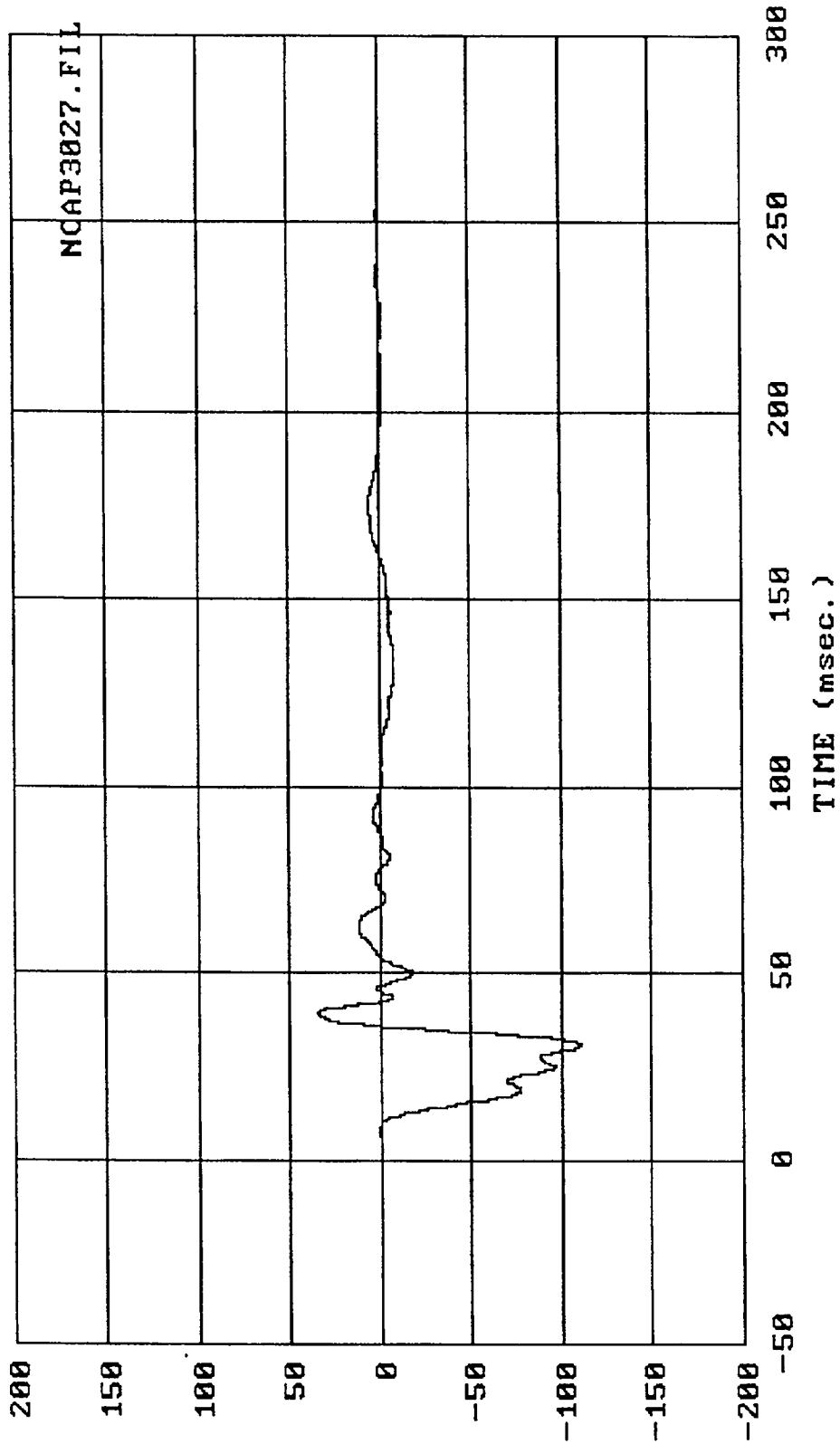
Filter: SAE CLASS 60 Max = .5429E-01 Min = -.1546E-03 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Pasngr Belt percent elongation



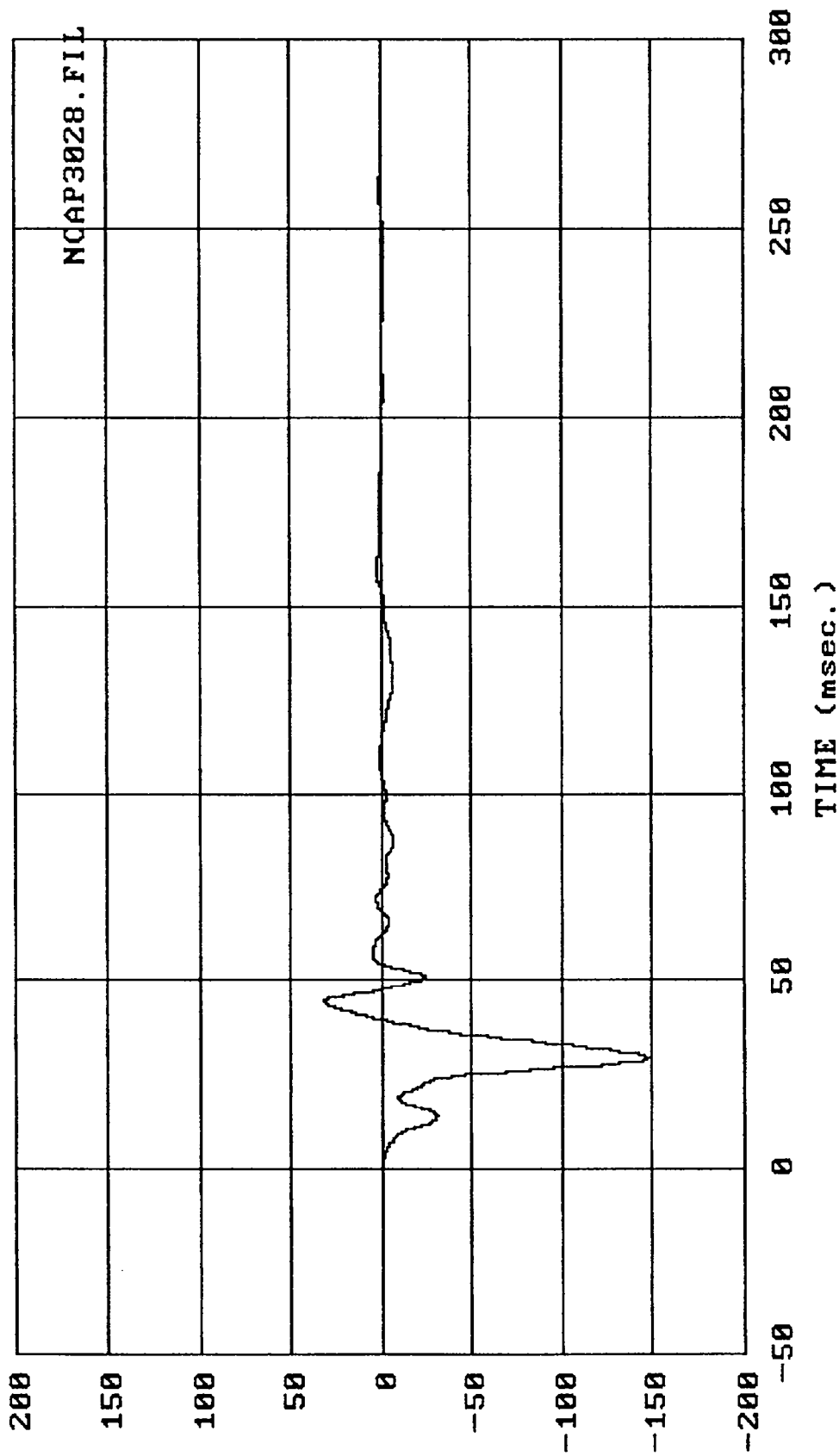
Filter: SAE CLASS 60 Max = 38.71 Min = -127.6 Axis: X
MSE 09/27/89 -- 1990 Mits. Eclipse : Left front caliper accel.



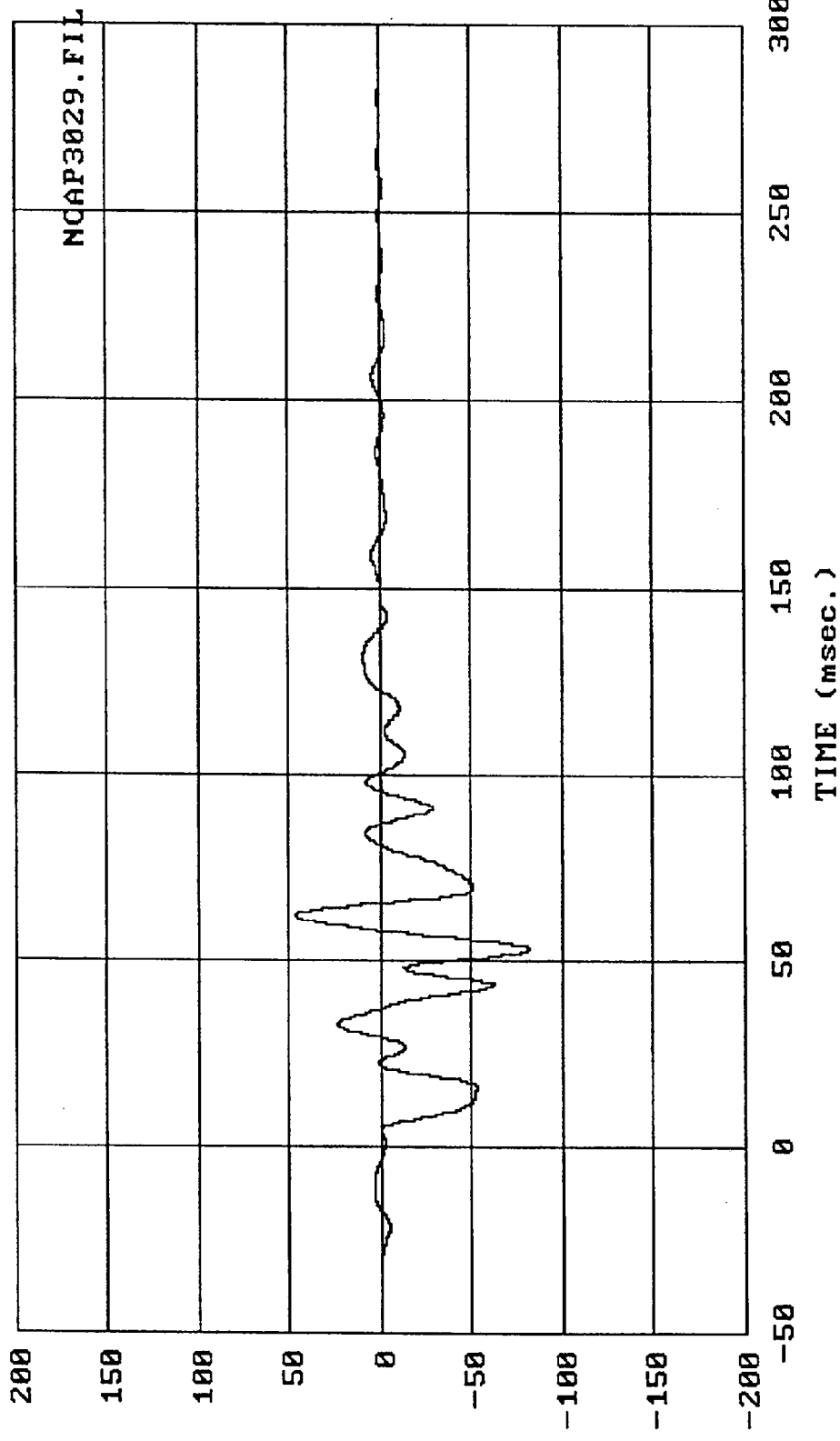
Filter: SAE CLASS 60 Max = 60.99 Min = -120.0 Axis: X
MSE 09/27/89 -- 1990 Mits. Eclipse : Right front caliper accel.



Filter: SAE CLASS 60 Max = 34.69 Min = -111.5 Axis: X
MSE 09/27/89 -- 1990 Mits. Eclipse : Engine bottom acceleration



Filter: SAE CLASS 60 Max = 32.80 Min = -148.2 Axis: X
MSE 09/27/89 -- 1990 Mits. Eclipse : Engine top acceleration



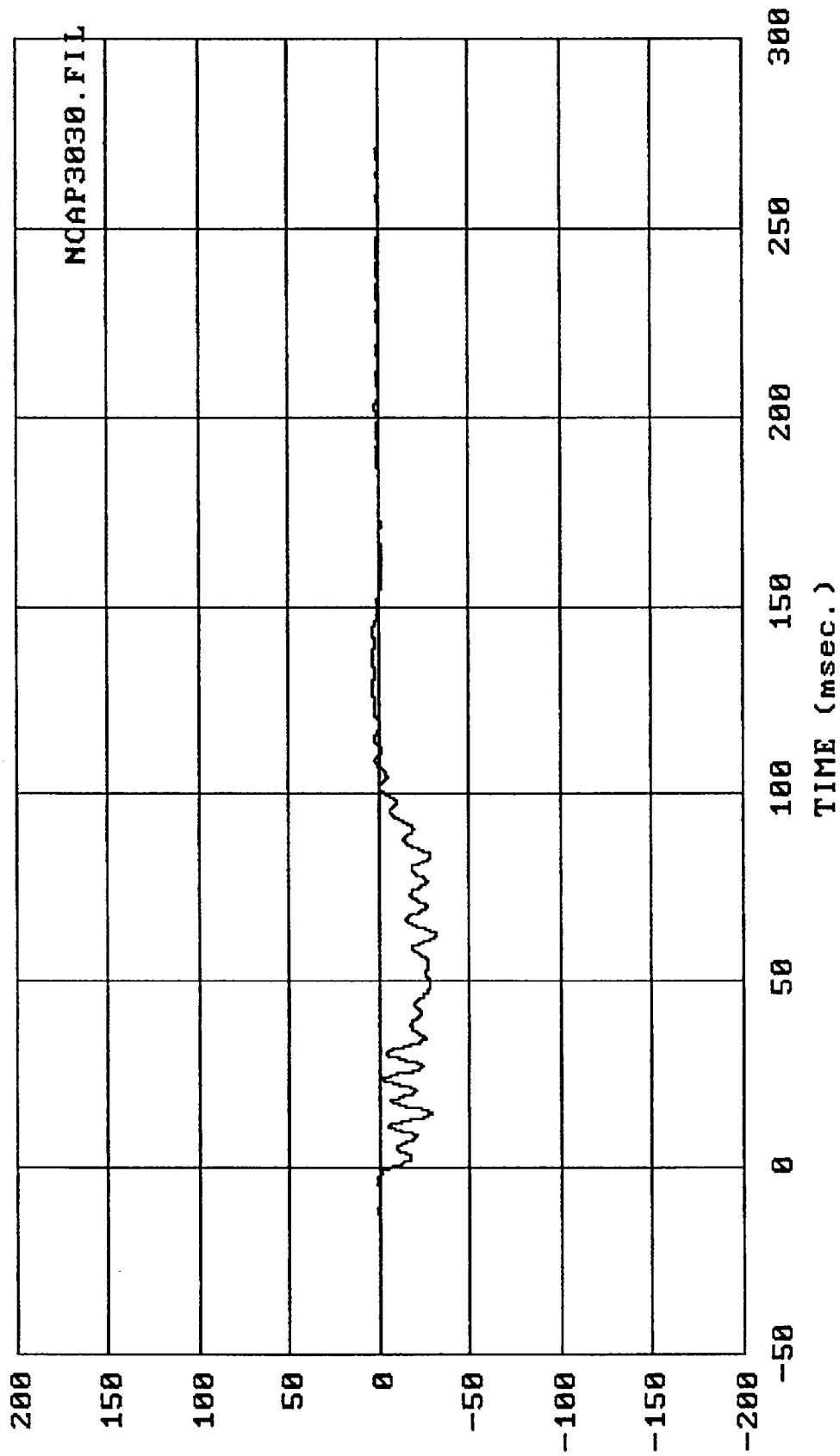
Filter: SAE CLASS 60 Max = 47.47 Min = -82.40 Axis: X

MSE 09/27/89 -- 1990 Mits. Eclipse : Instrument panel accel.

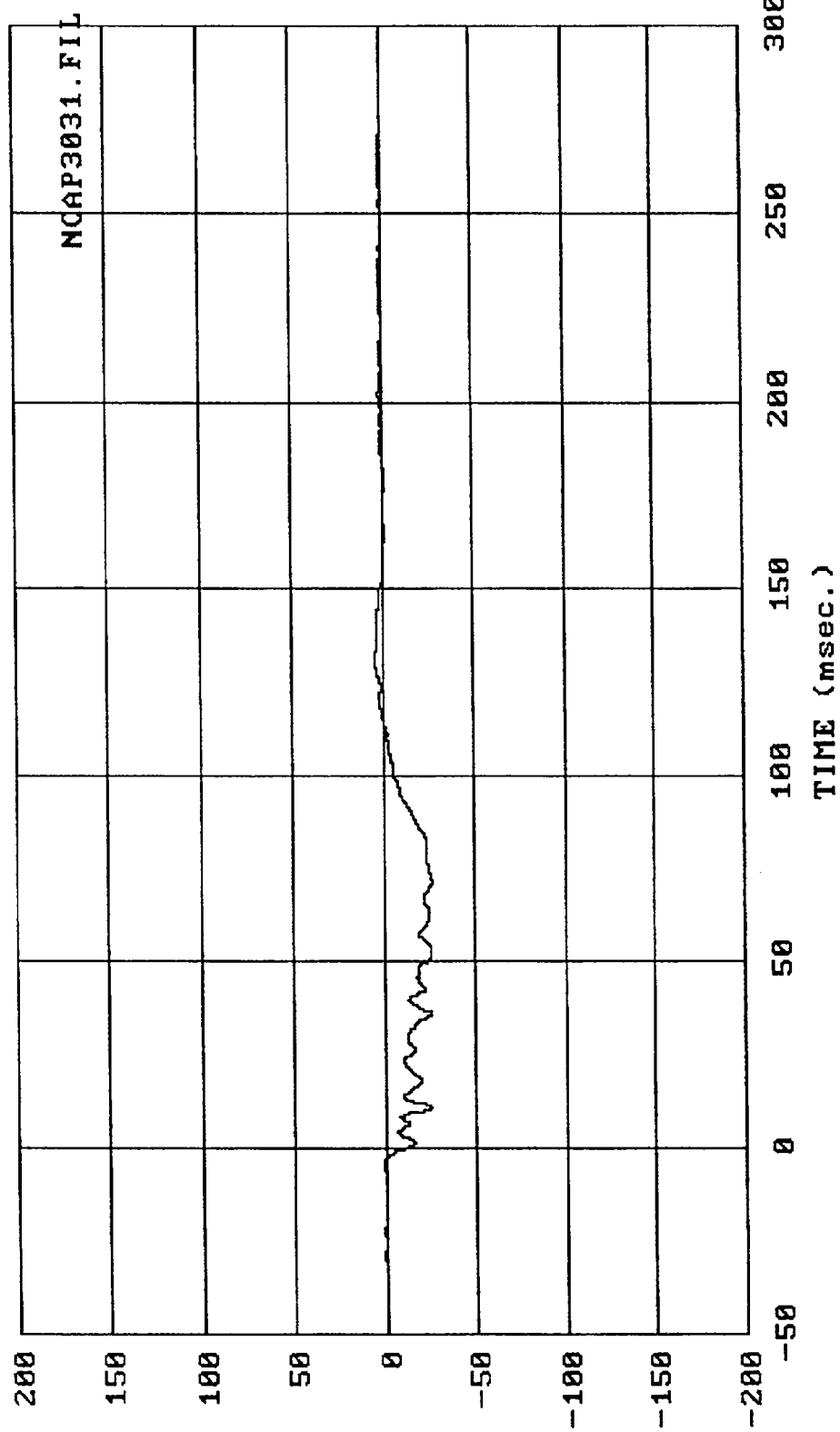
G, S

B1-50

MSE-90-R9063-N03



Filter: SAE CLASS 60 Max = 4.149 Min = -31.38 Axis: X
 MSE 09/27/89 -- 1990 Mits. Eclipse : Left-rear seat X-member accel.



Filter: SAE CLASS 60 Max = 4.367 Min = -26.29 Axis: X
 MSE 09/27/89 -- 1990 Mits. Eclipse : Right-rear seat X-member accel.

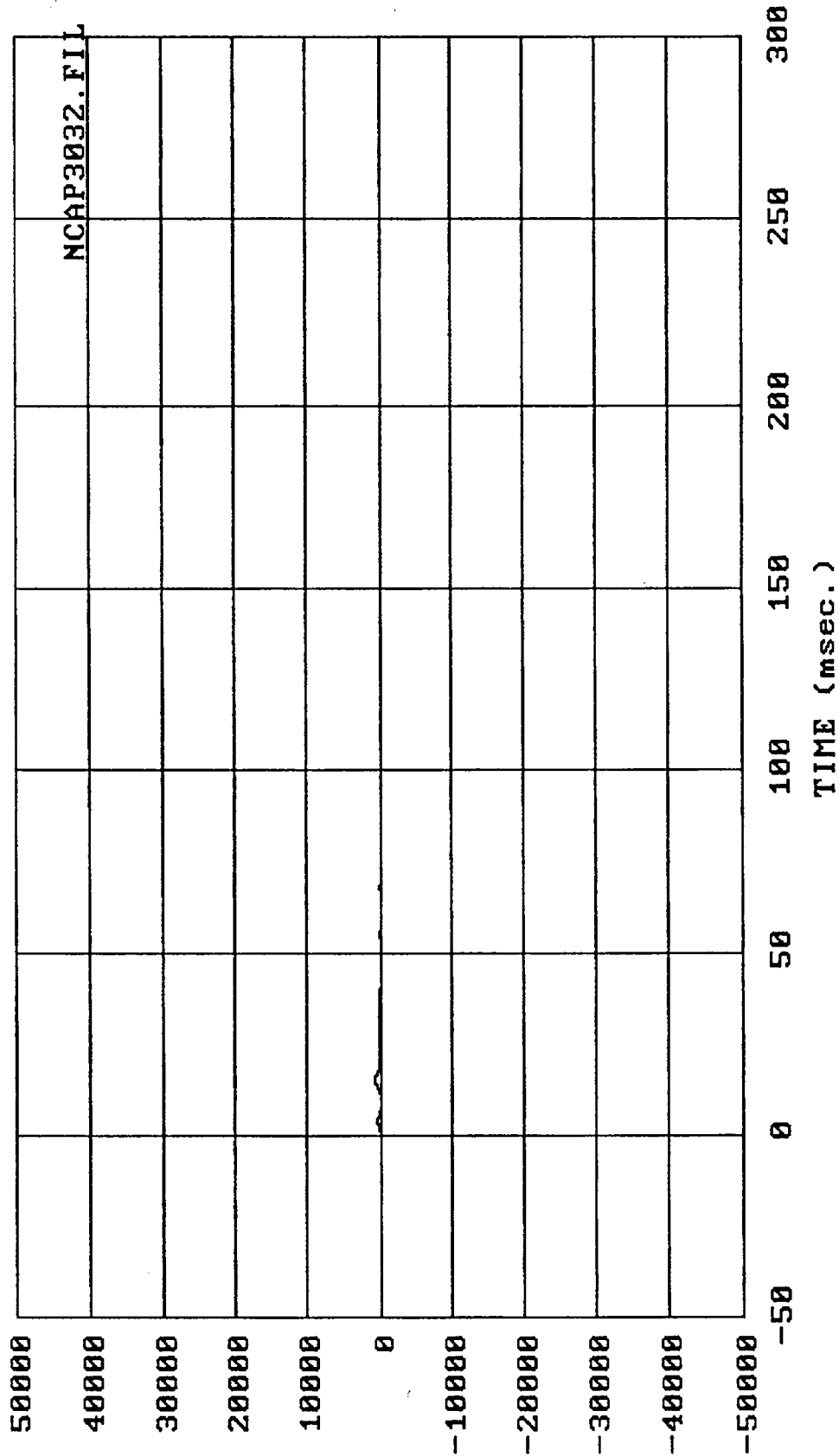
APPENDIX B-2

LOAD CELL BARRIER DATA

DATA FILTERING:

Load Cell Barrier Channels - Class 60

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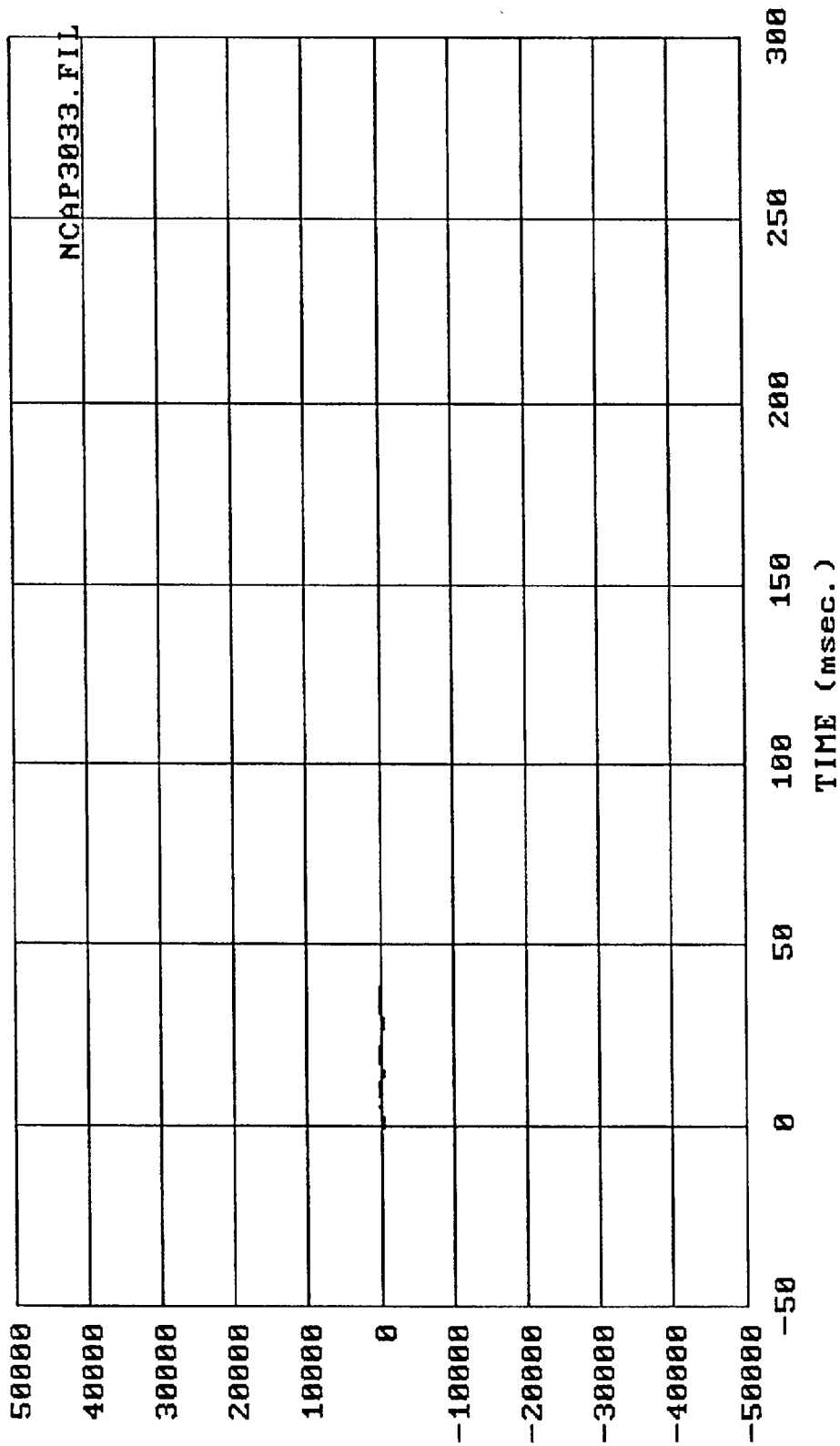


LBS

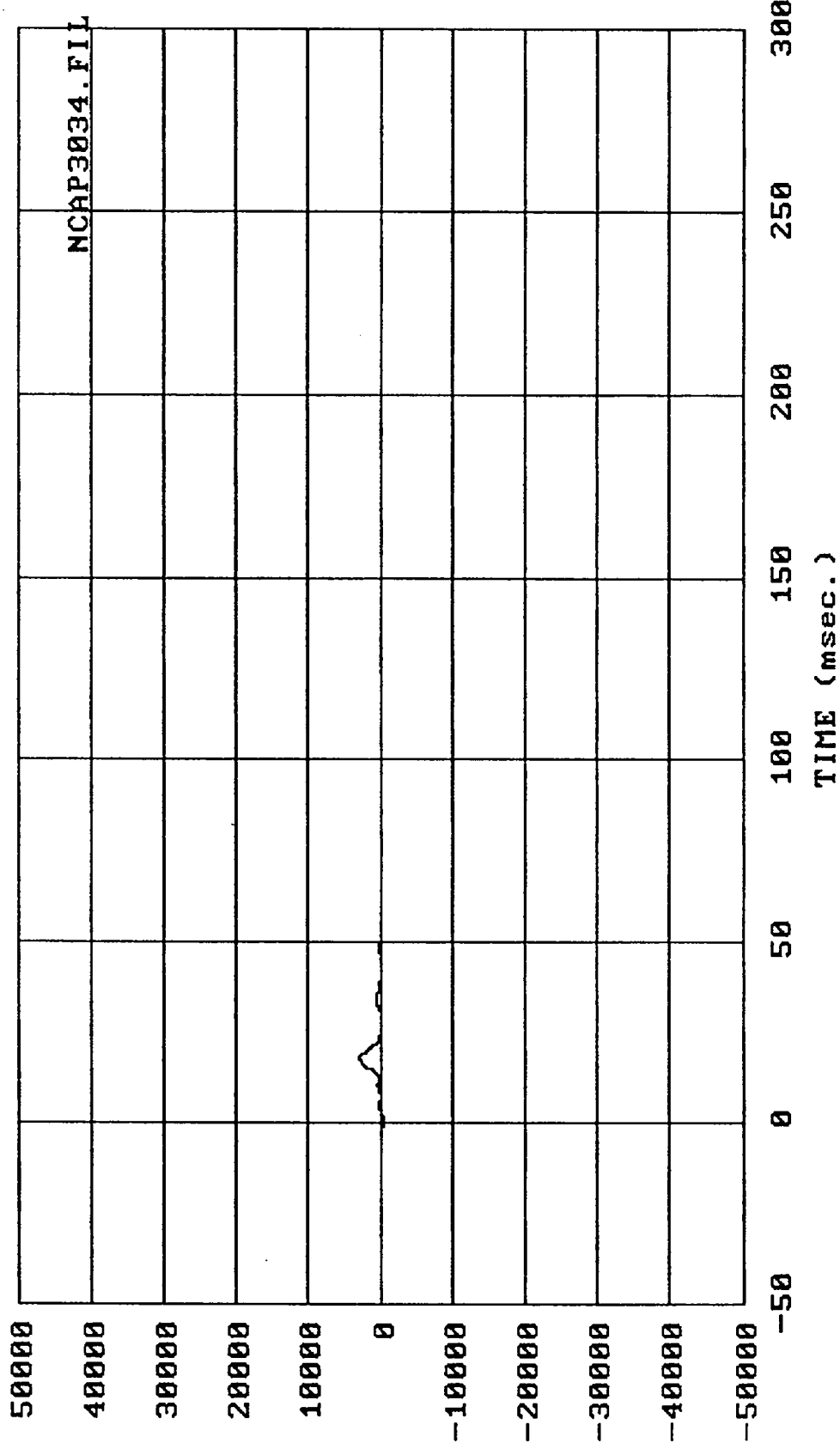
B2-1

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 907.7 Min = -52.92 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell A1



Filter: SAE CLASS 60 Max = 429.3 Min = -269.5 Axis:
 MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell A2

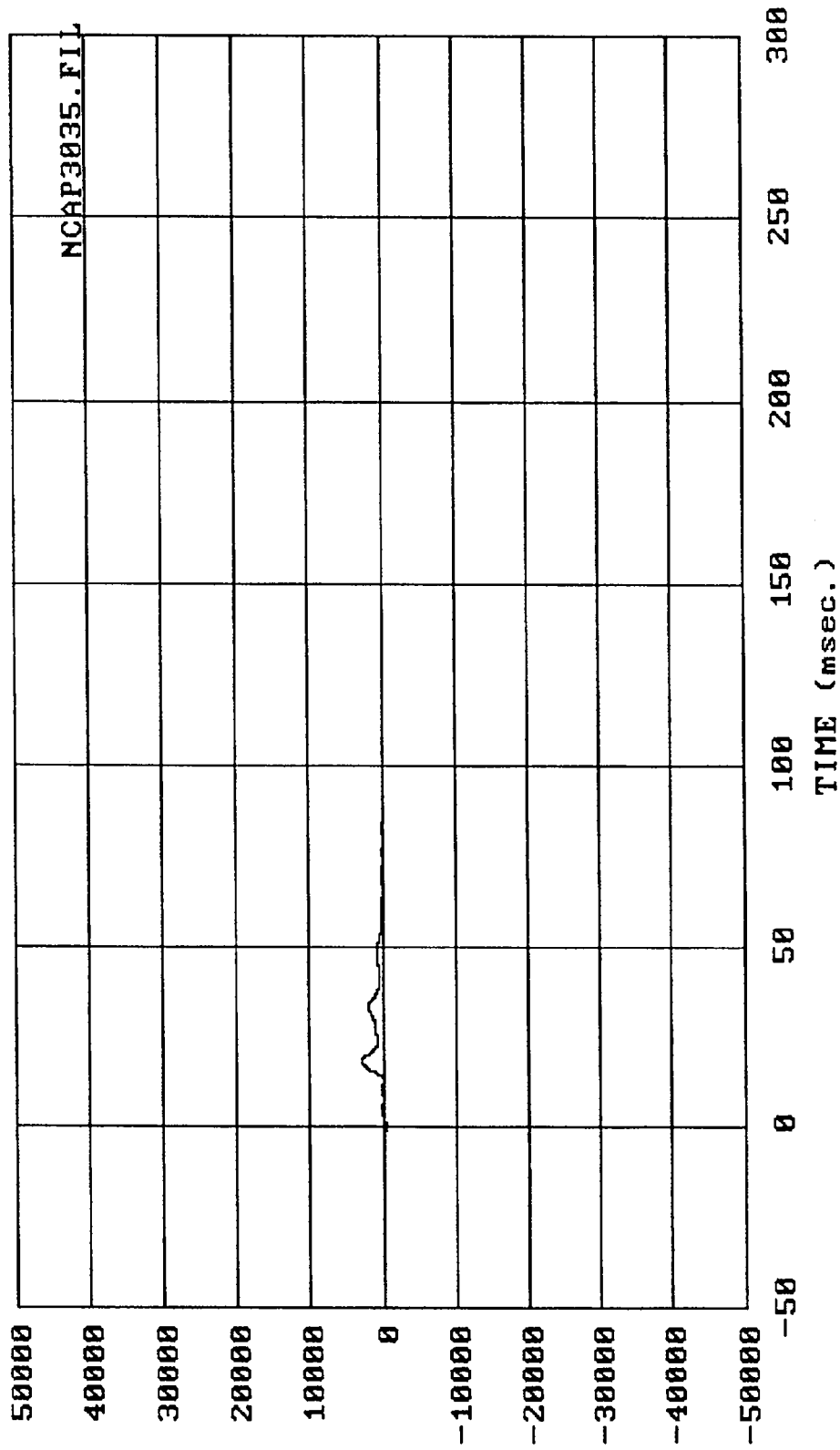


LBS

B2-3

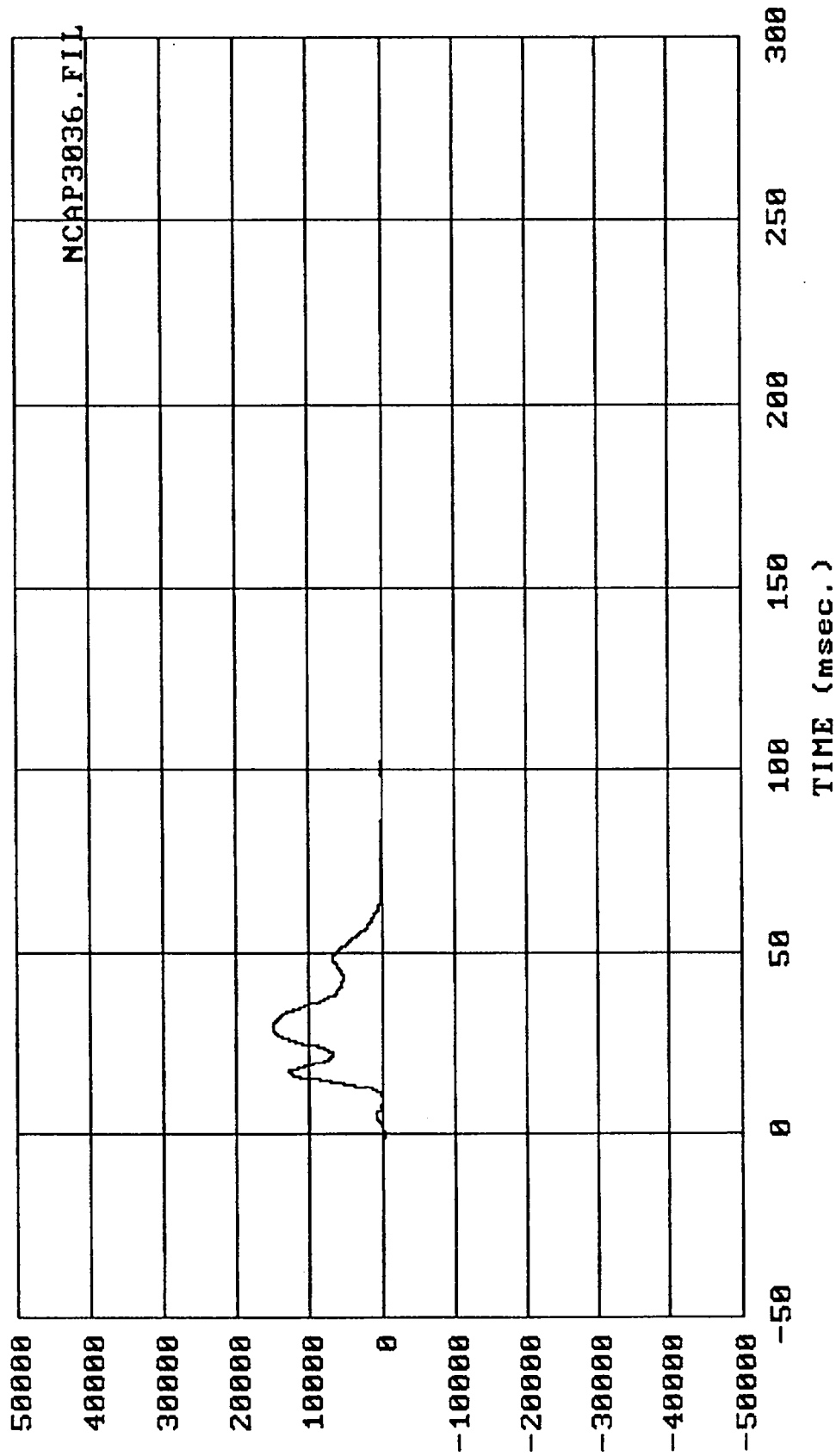
MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 3013. Min = -353.4 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell A3



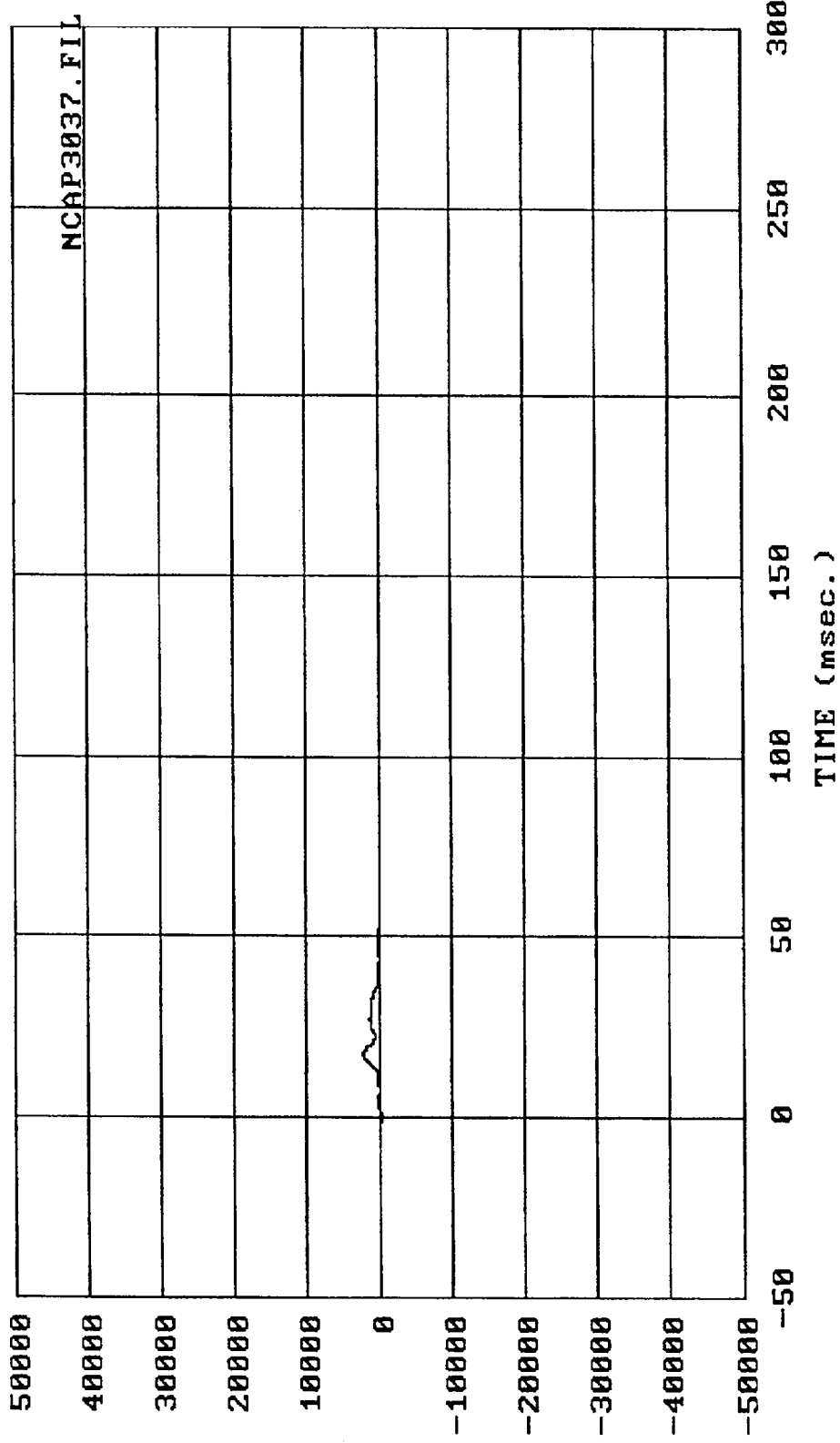
Filter: SAE CLASS 60 Max = 3087. Min = -40.38 Axis:

MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell A4

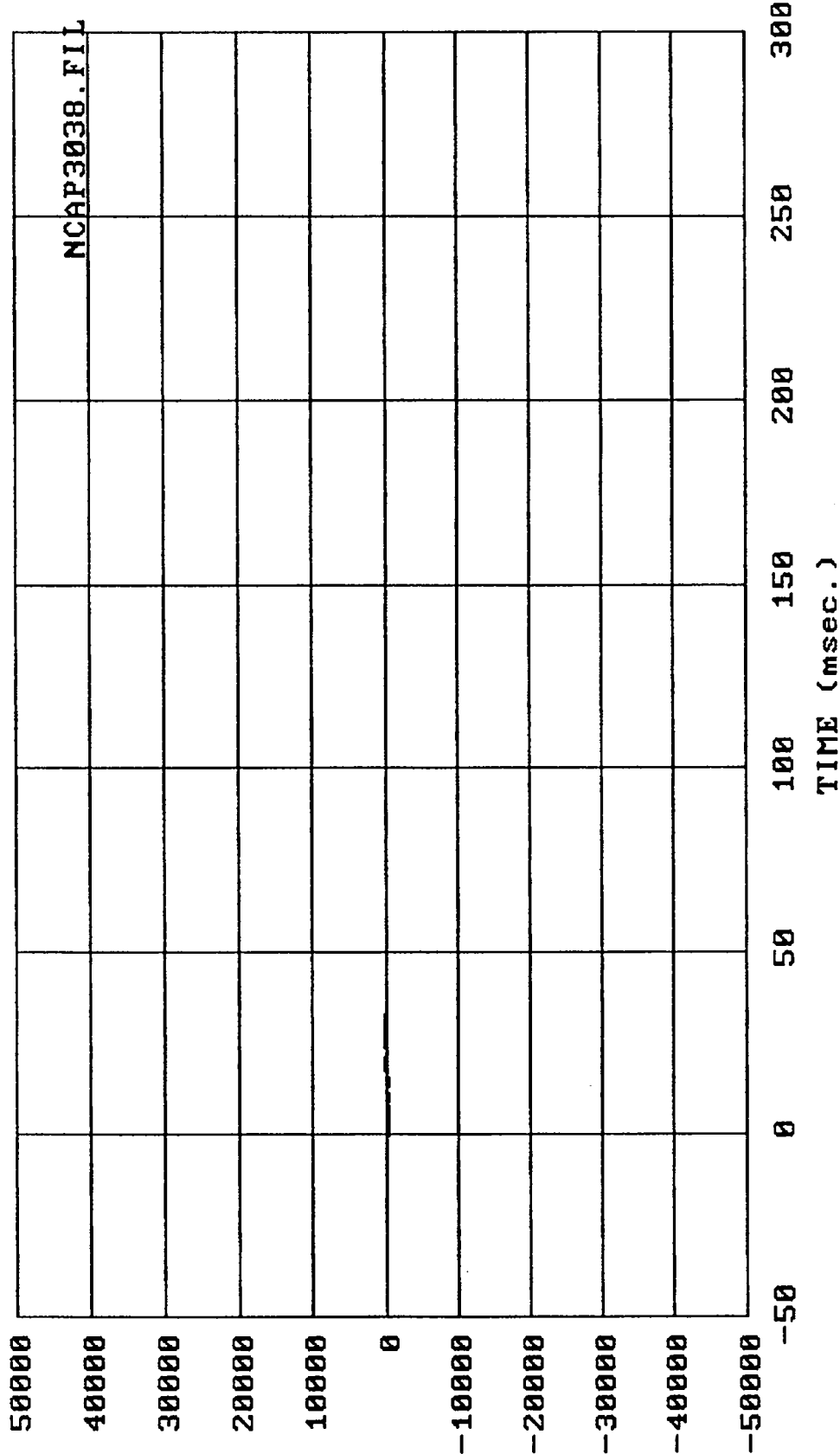


Filter: SAE CLASS 60 Max = .1507E+05 Min = -30.96 Axis:

MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell A5



Filter: SAE CLASS 60 Max = 2261. Min = -91.80 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell A6

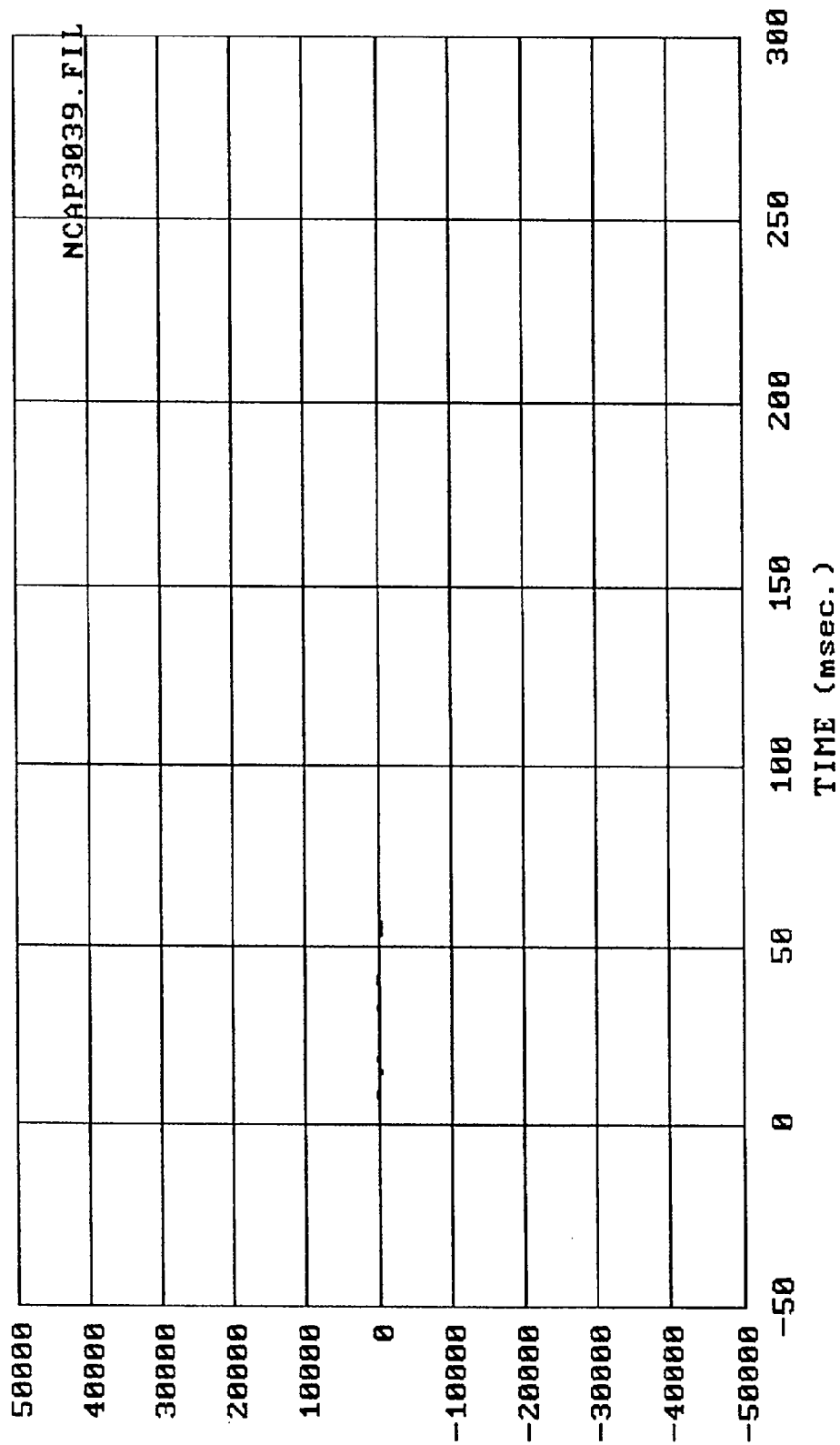


LBS

B2-7

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 422.0 Min = -280.1 Axis:
MSE 09/27/89 -- 1990 Mts. Eclipse : Barrier force - Load cell A7

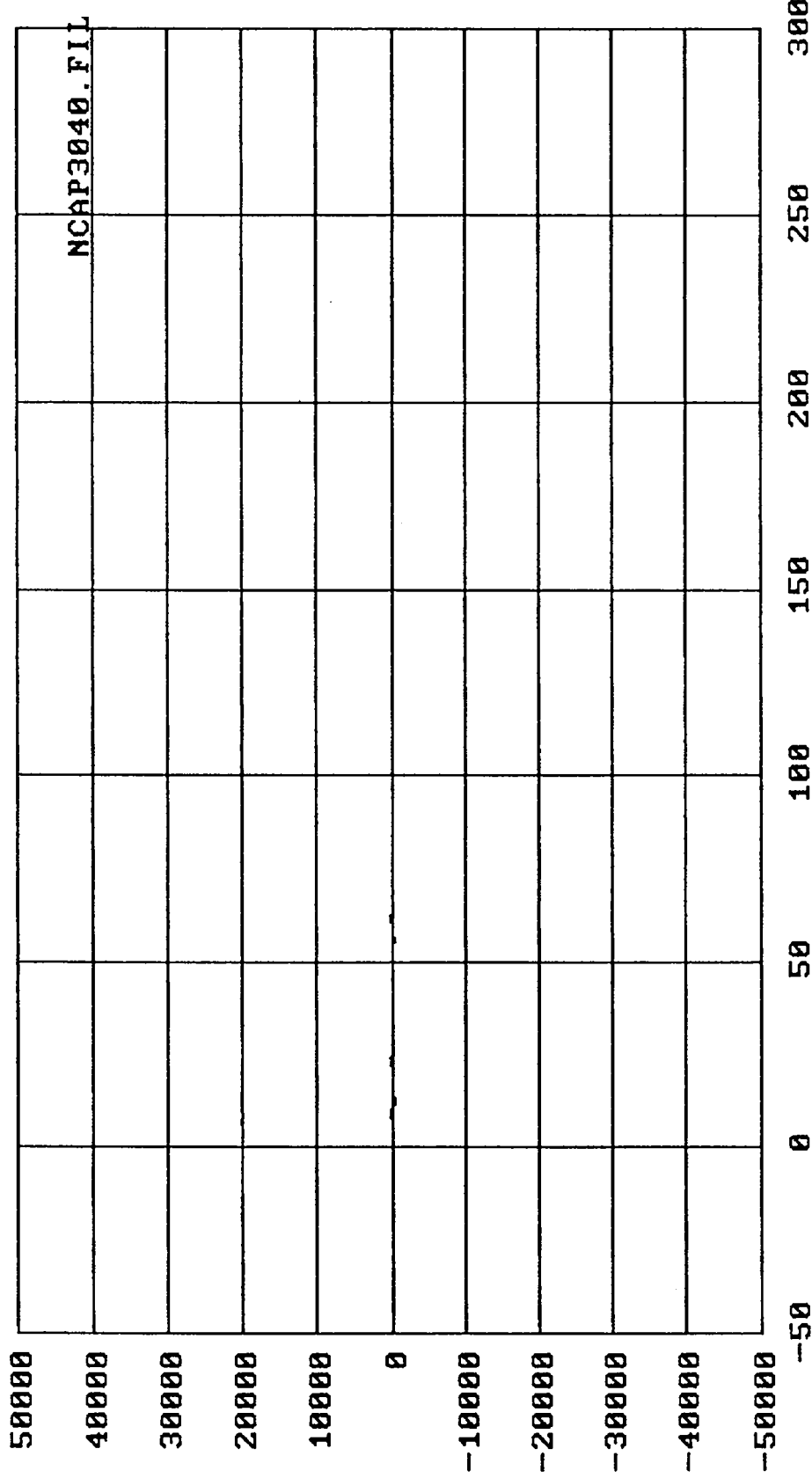


LBS

B2-8

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 192.5 Min = -300.6 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell A8

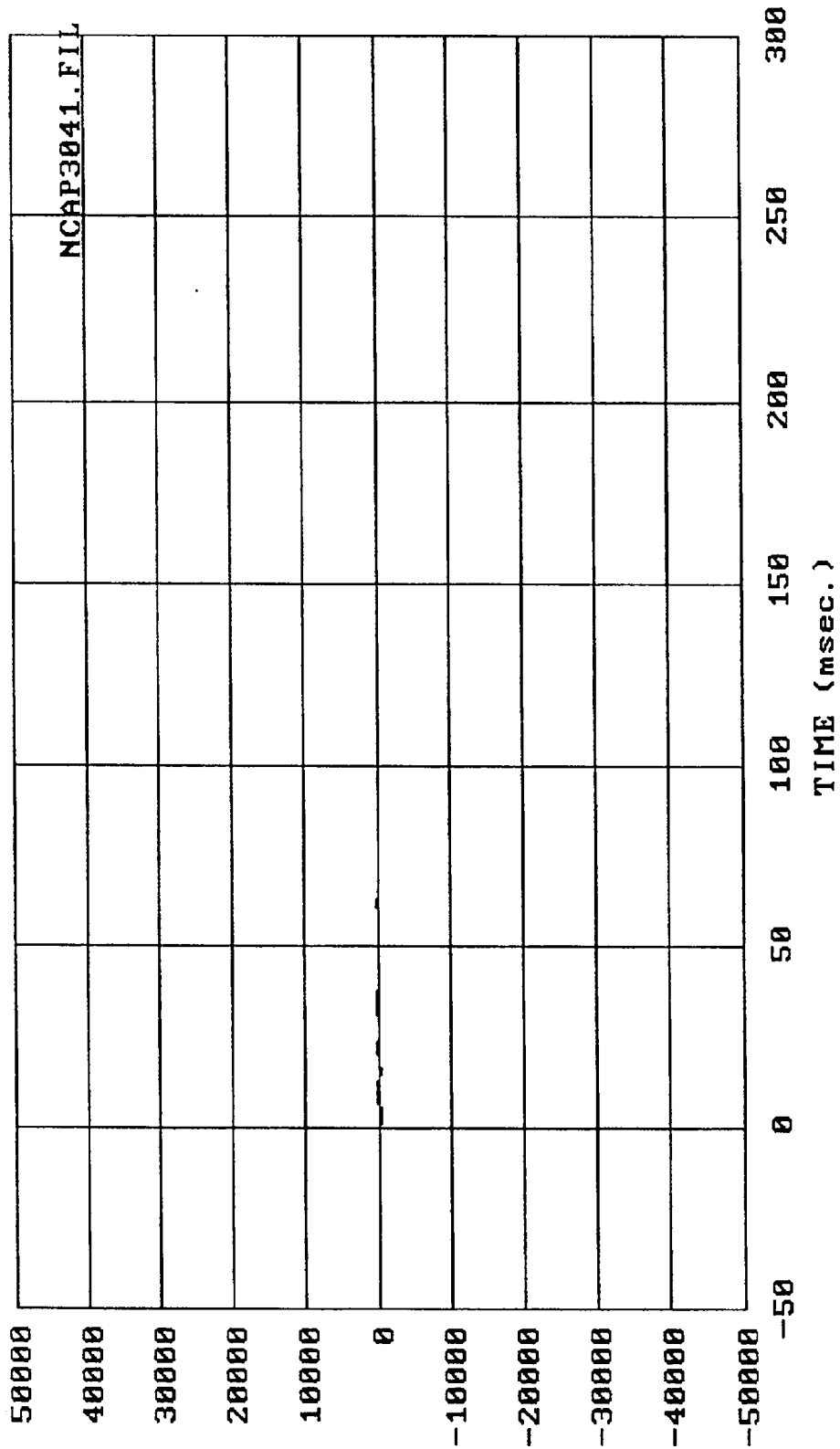


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B
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B2-9

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 230.3 Min = -200.5 Axis:
 MSE 09/27/89 -- 1990 Mts. Eclipse : Barrier force - Load cell A9

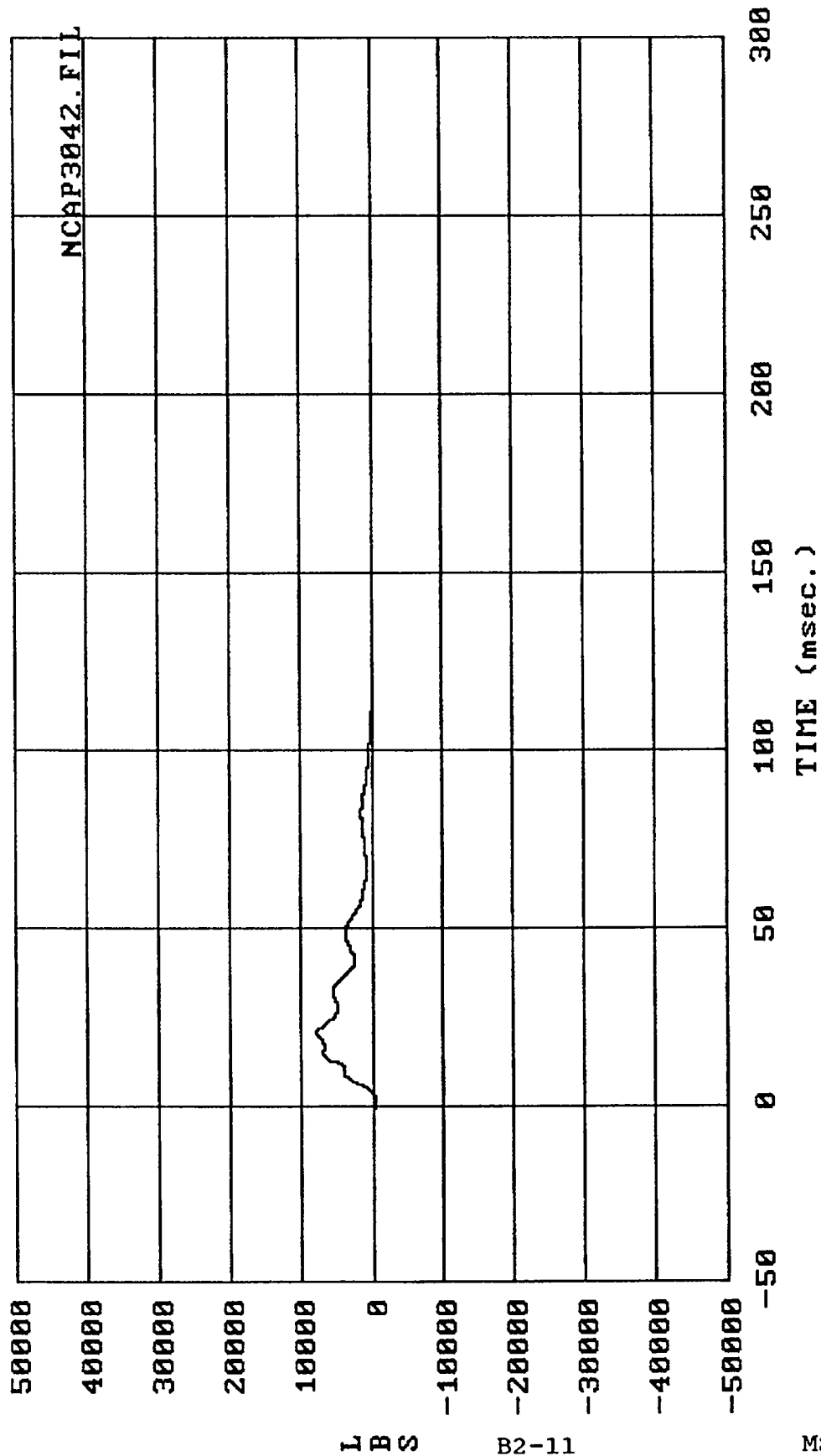


LBS

B2-10

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 332.7 Min = -325.8 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell B1

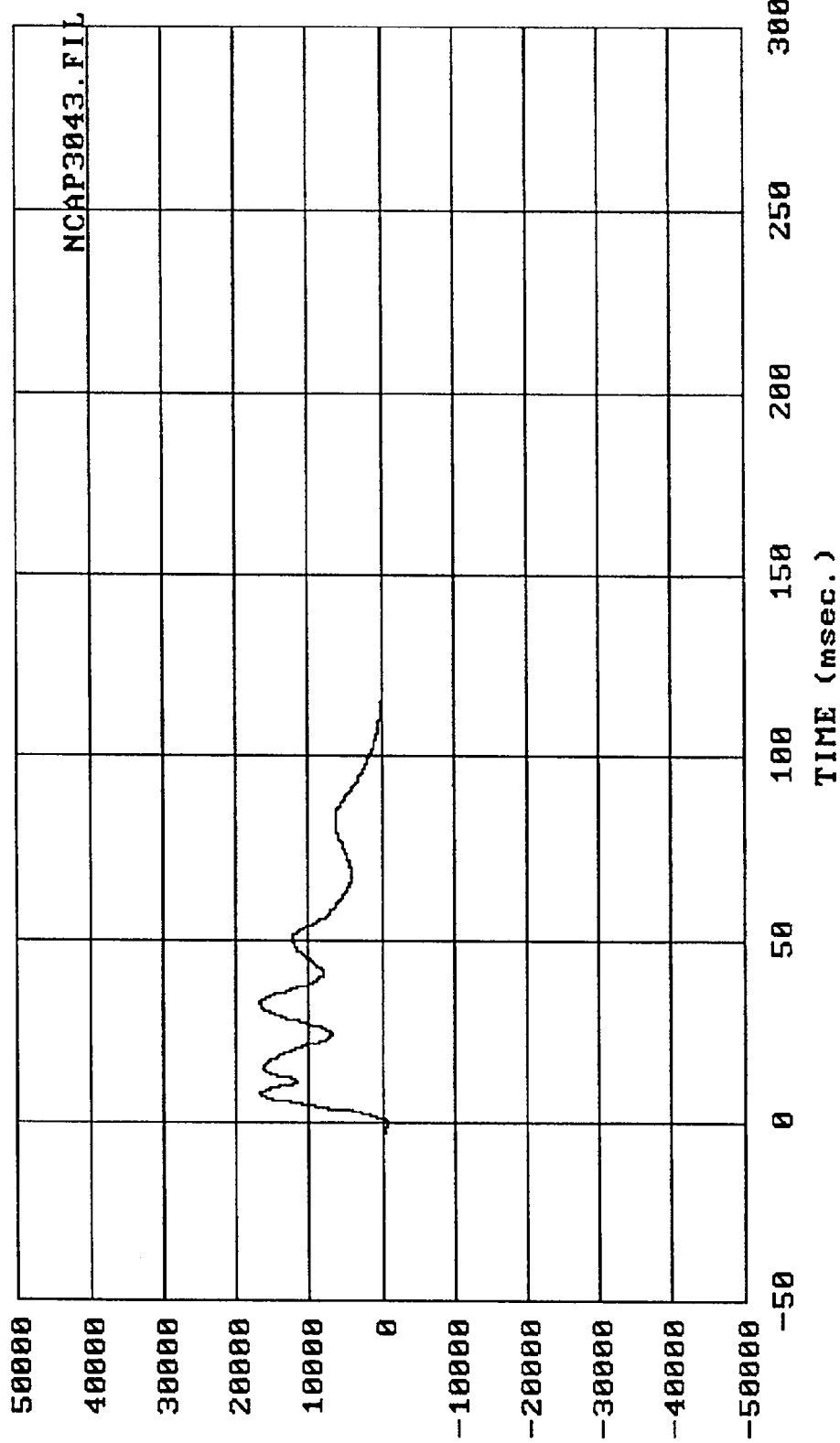


LBS

B2-11

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 8004. Min = -301.3 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell B2

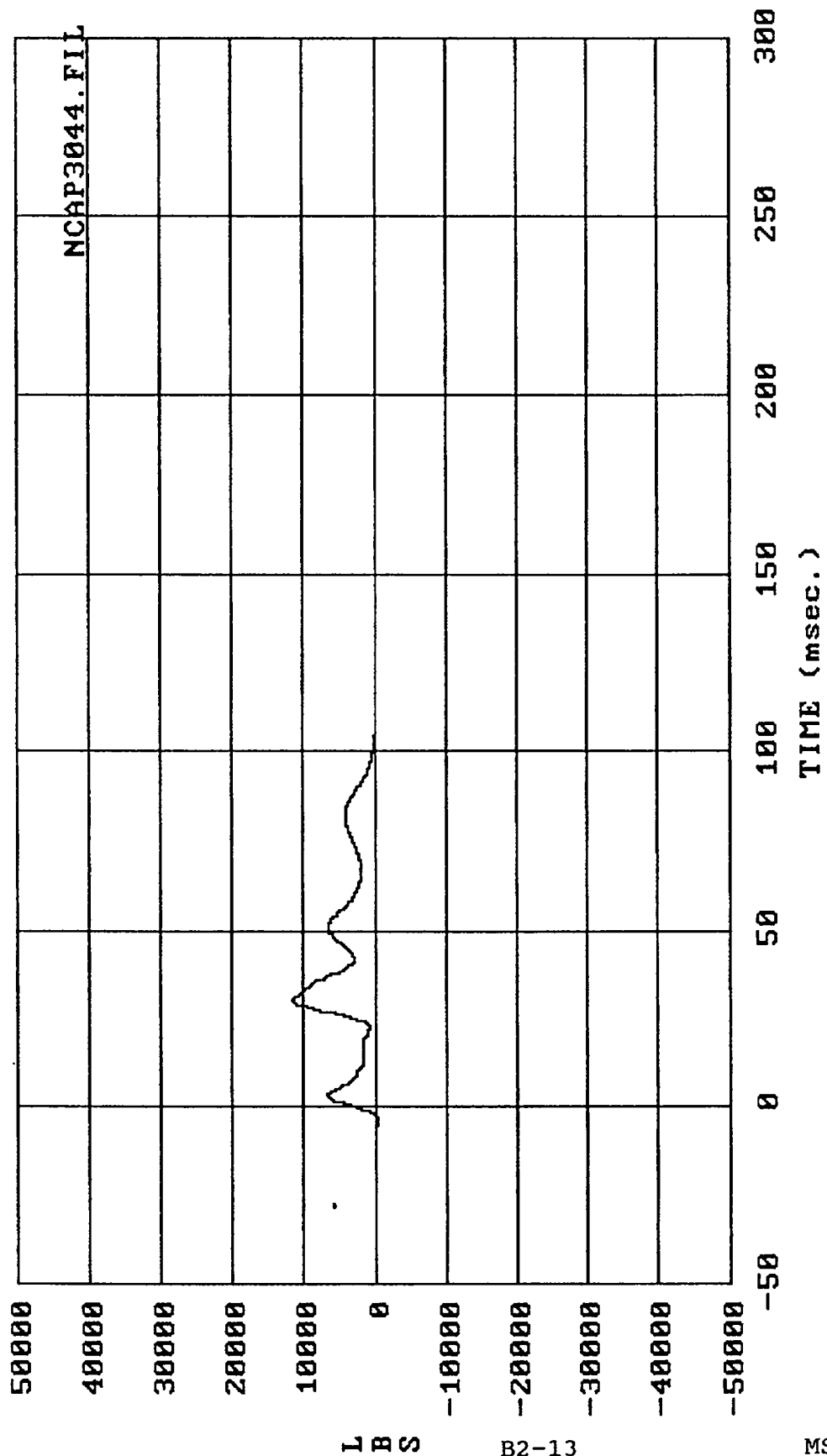


L
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S

B2-12

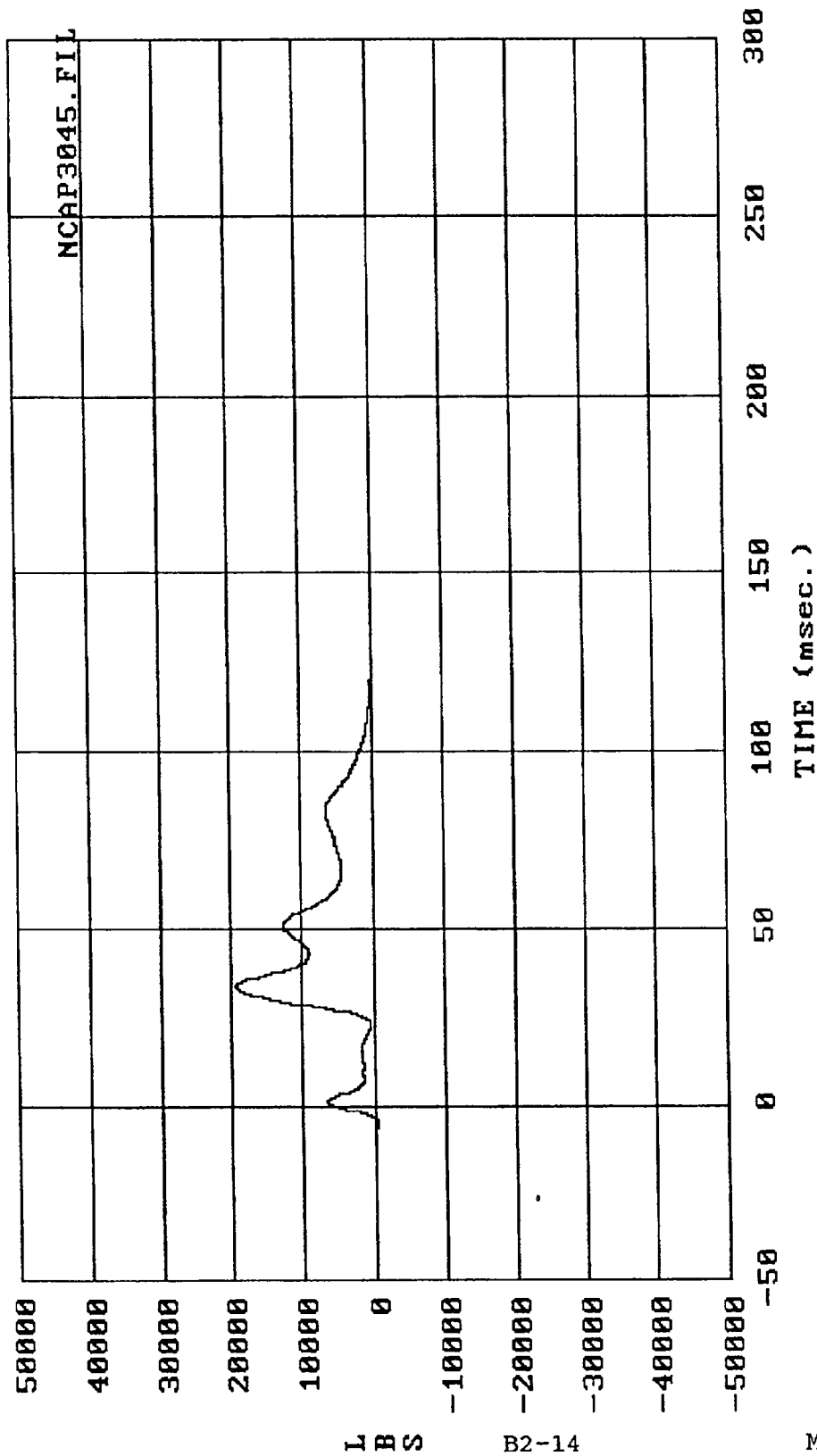
MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = .1679E+05 Min = -25.73 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell B3



Filter: SAE CLASS 60 Max = .1162E+05 Min = -55.48 Axis:

MSE 09/27/89 -- 1990 Mts. Eclipse : Barrier force - Load cell B4

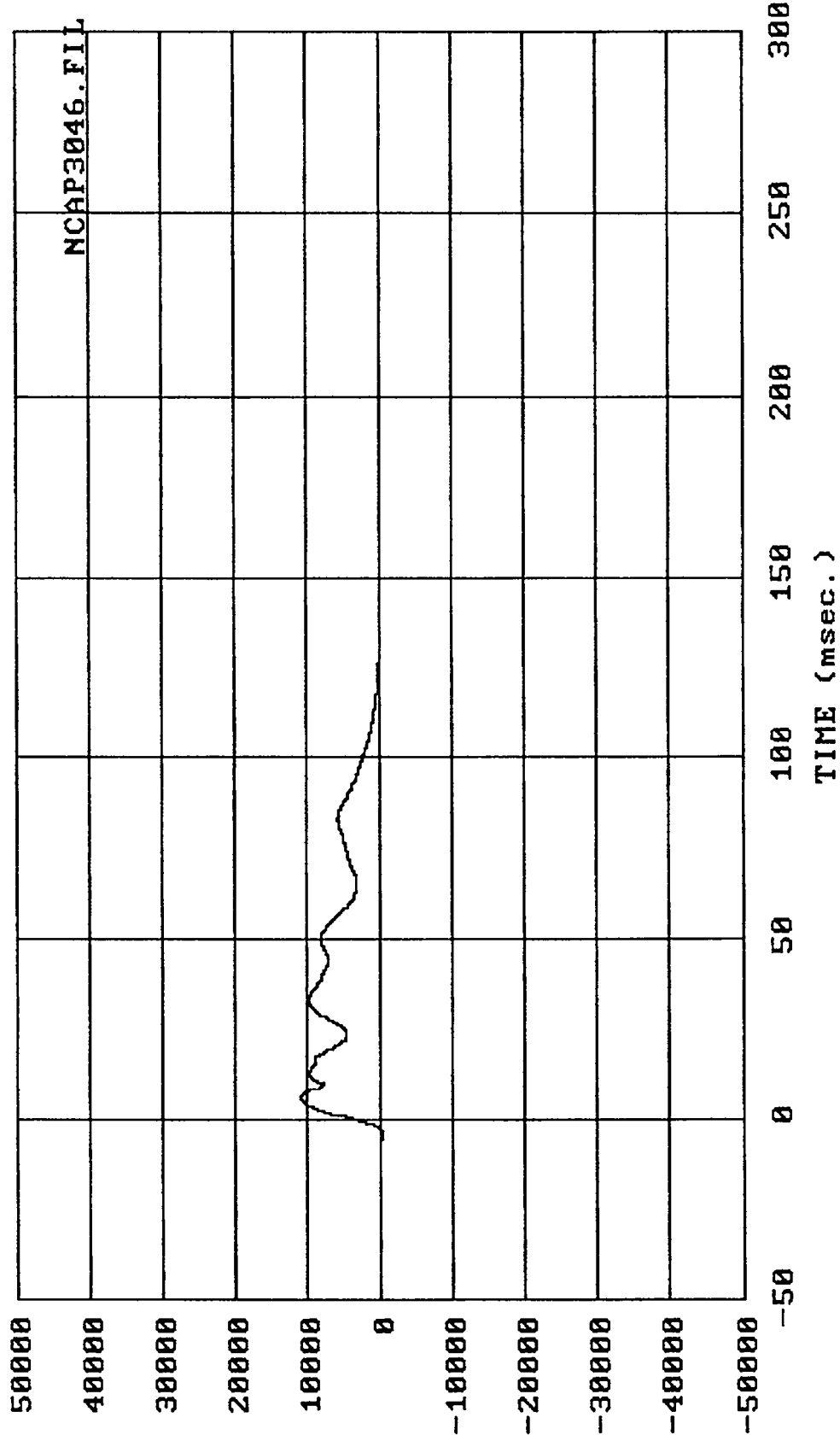


LBS

B2-14

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = .1957E+05 Min = -62.56 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell B5

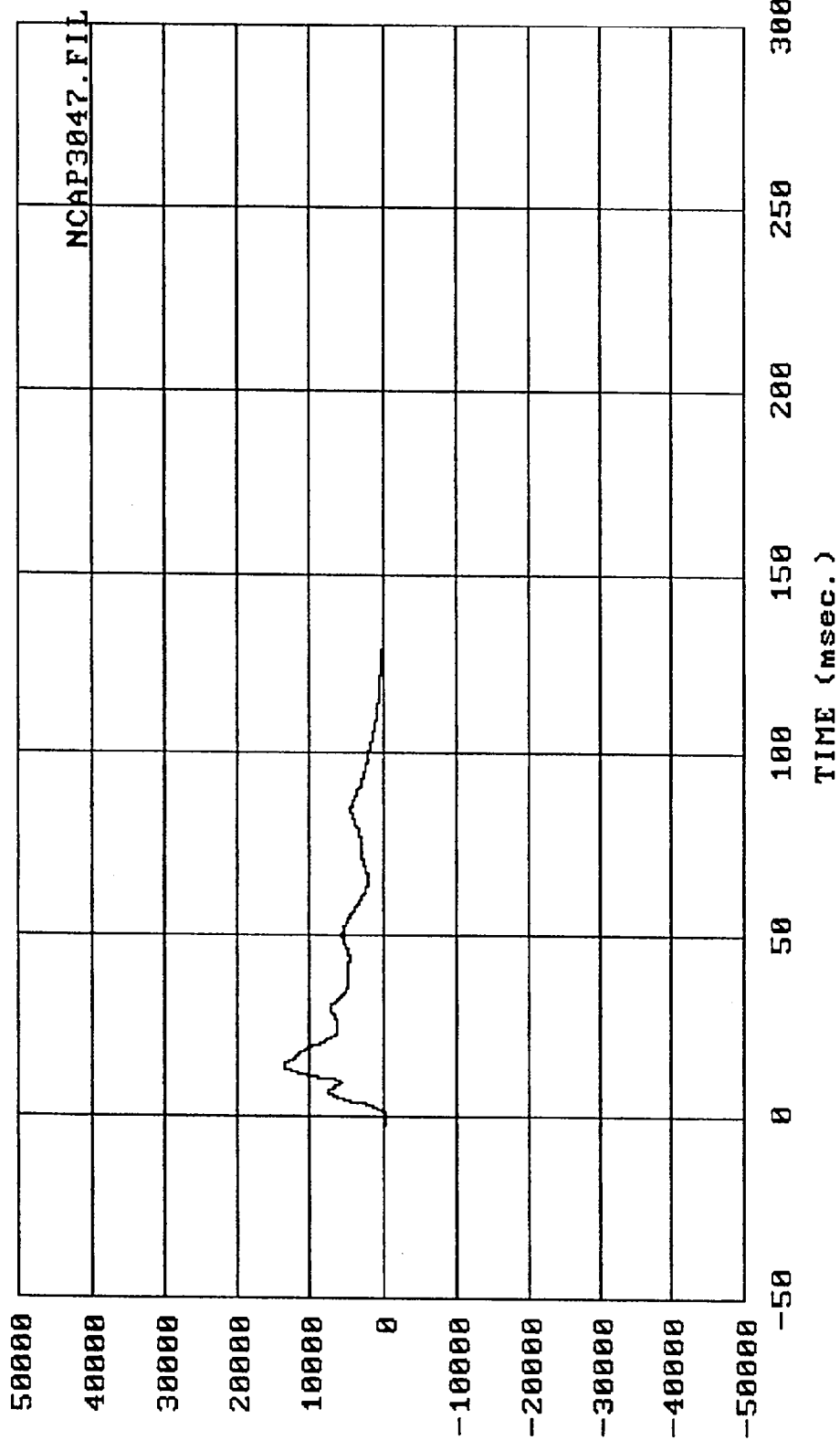


LBS

B2-15

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = .1121E+05 Min = -77.20 Axis:
 MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell B6

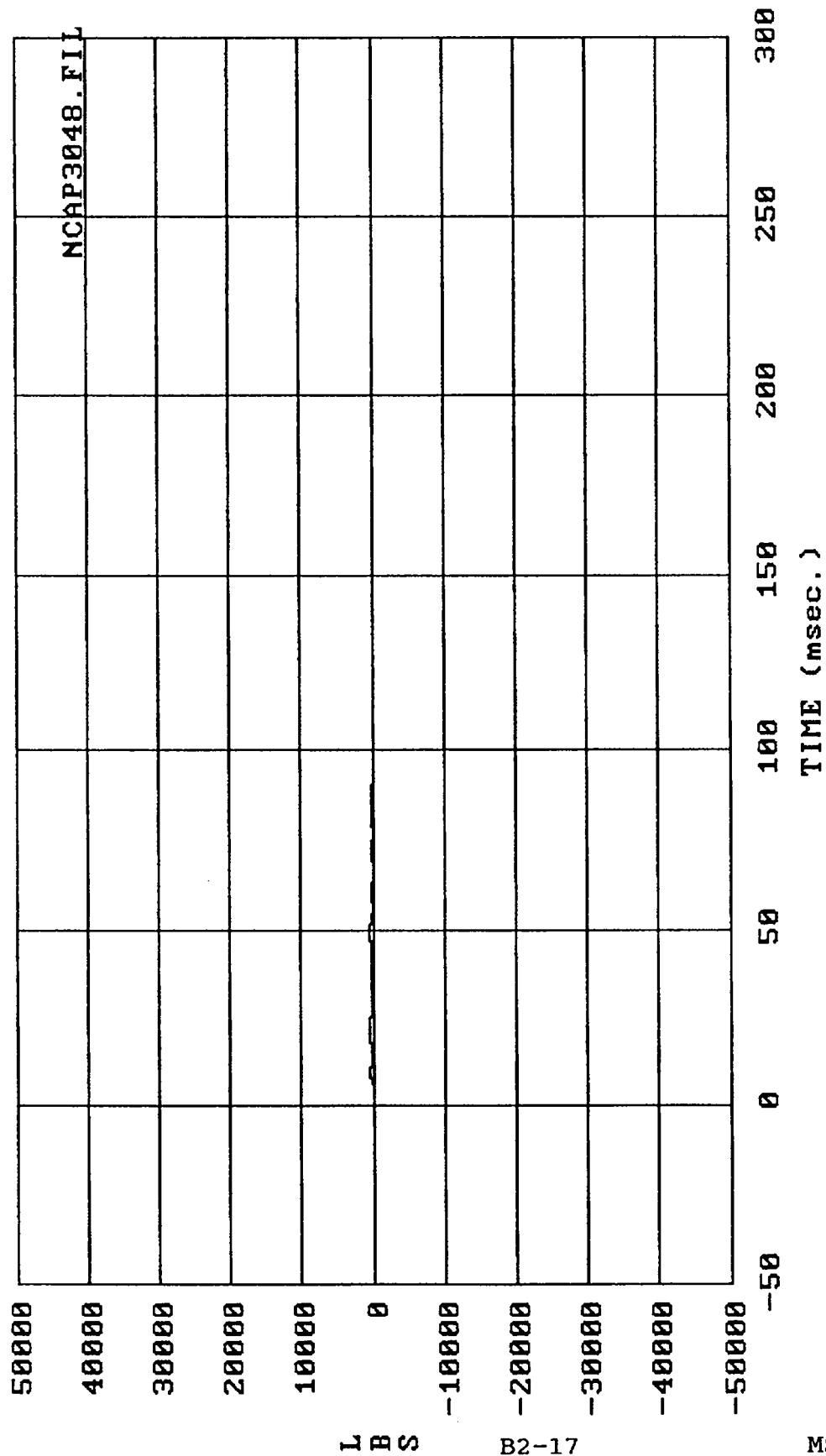


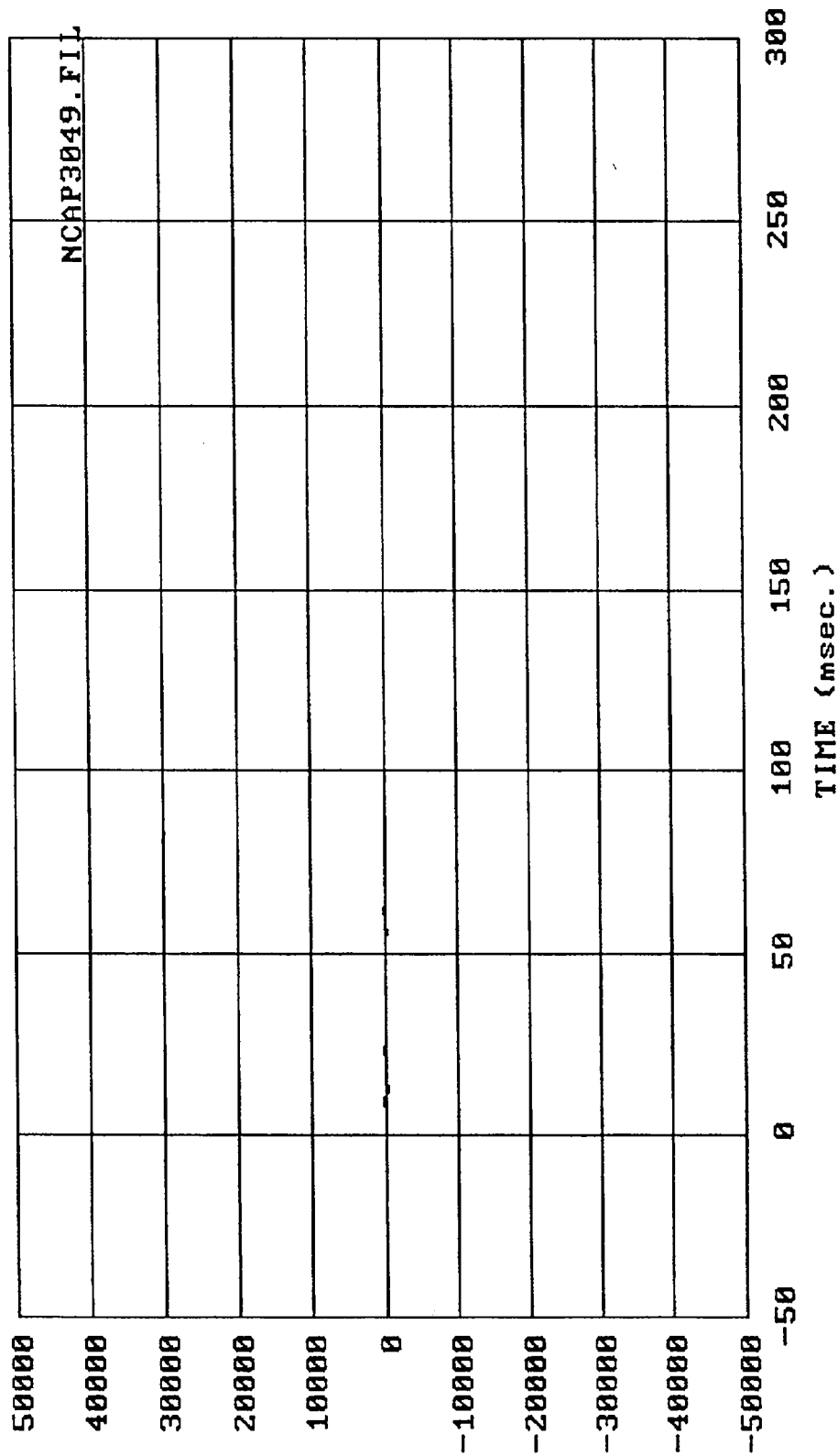
LBS

B2-16

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = .1360E+05 Min = -82.27 Axis:
 MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell B7



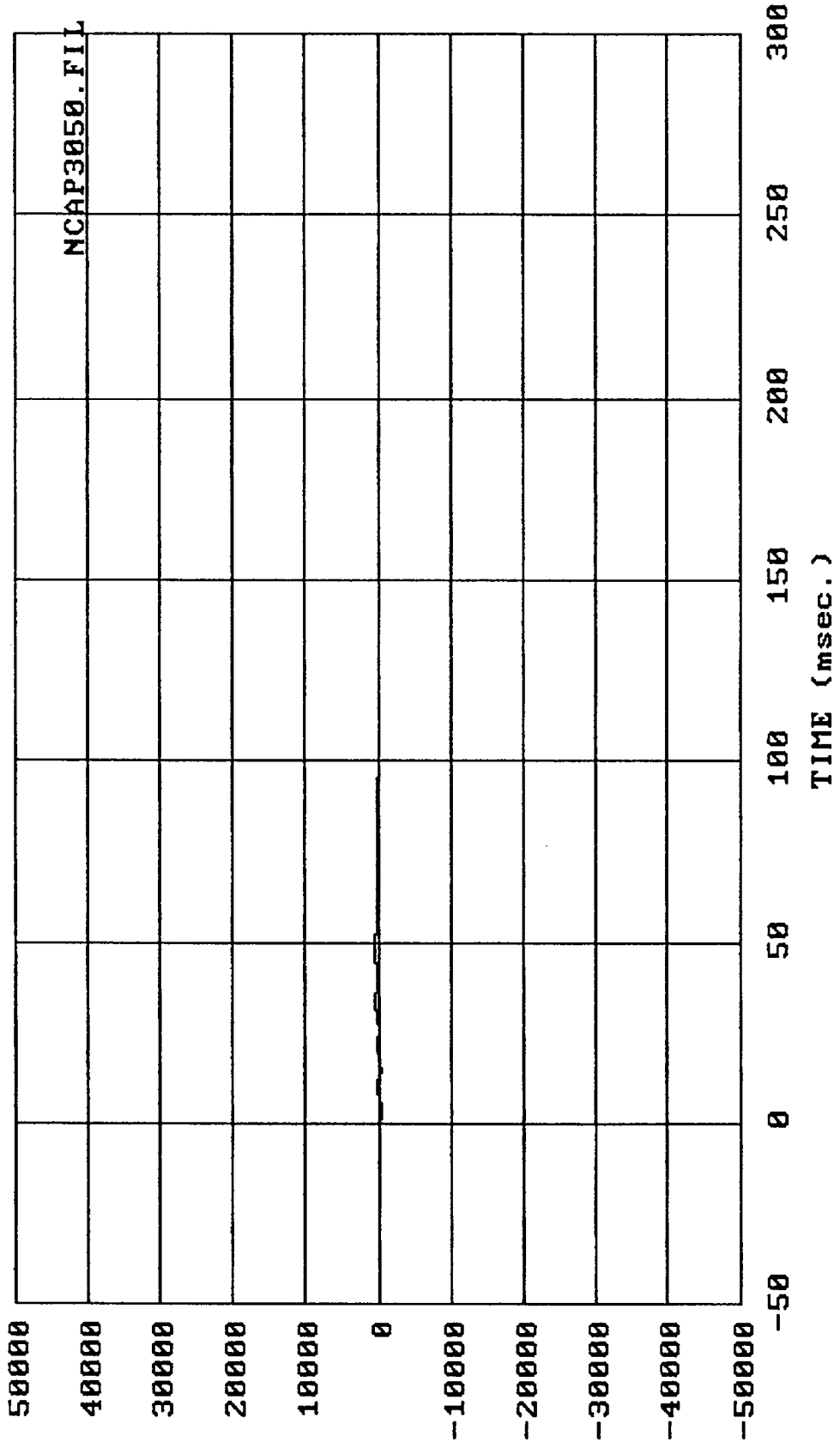


LBS

B2-18

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 230.3 Min = -200.5 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell B9

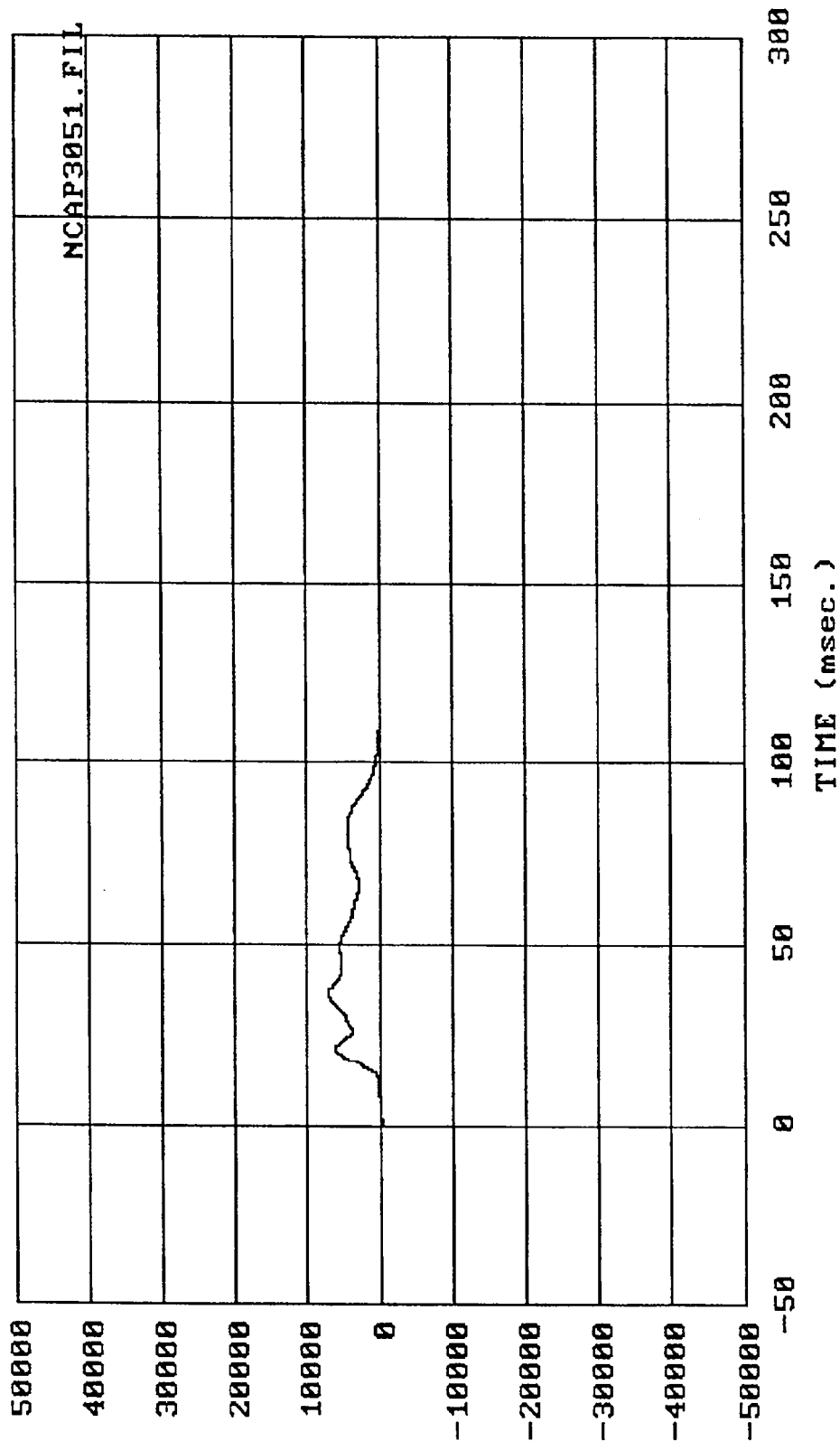


LBS

B2-19

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 716.4 Min = -257.4 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell C1

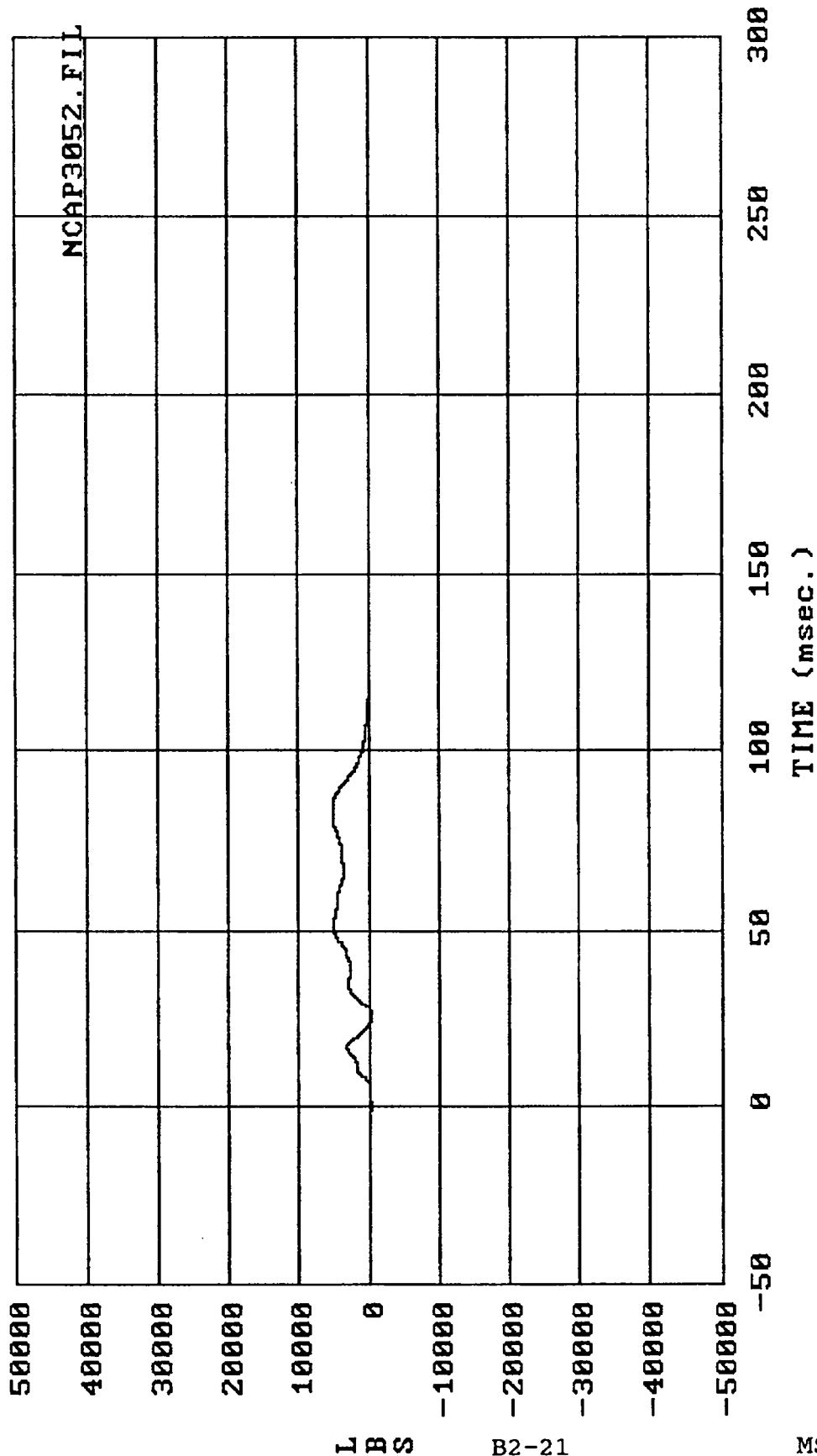


L B S

B2-20

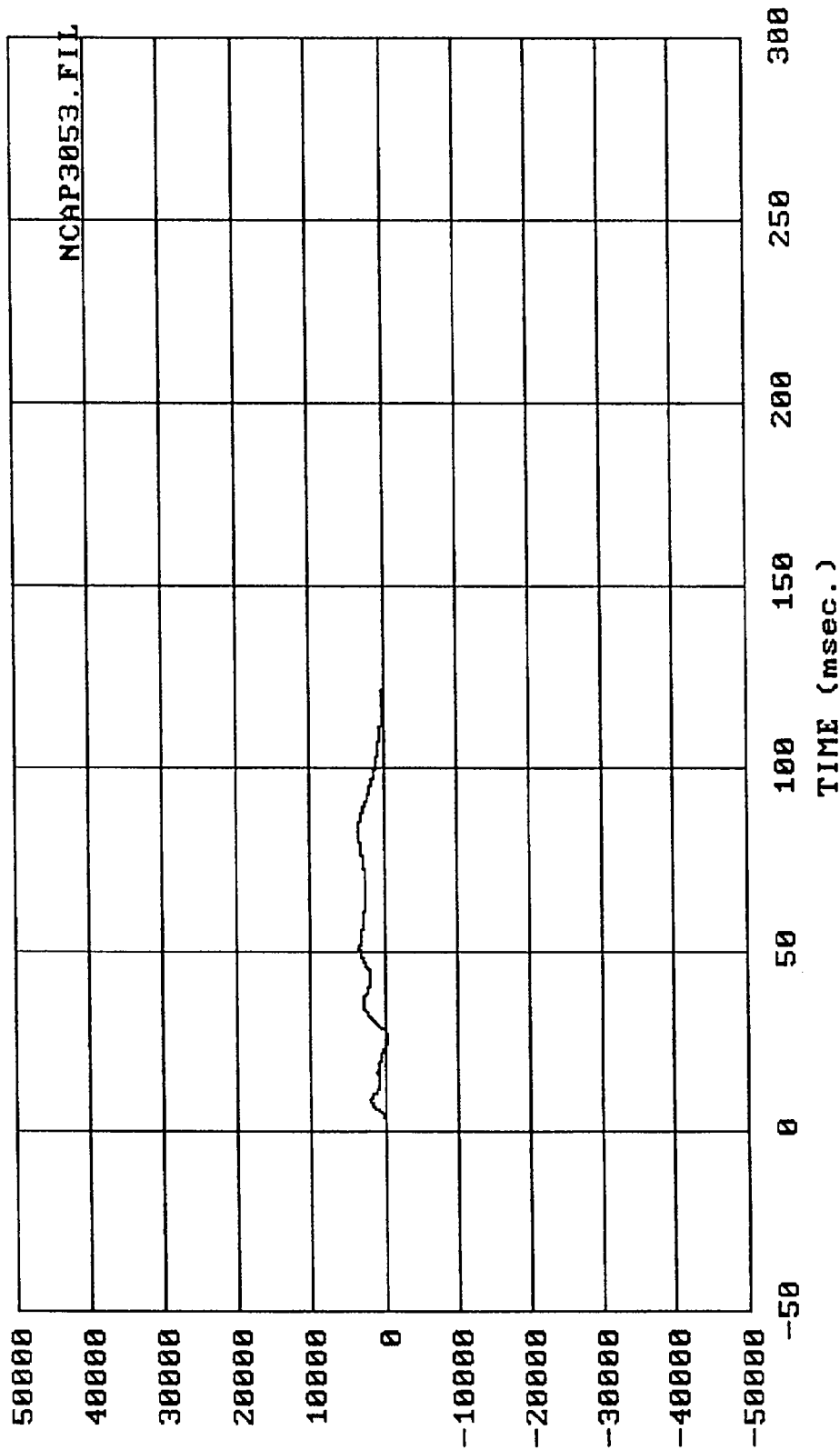
MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 7188. Min = -174.2 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell C2



Filter: SAE CLASS 60 Max = 5205. Min = -302.7 Axis:

MSE 09/27/89 -- 1990 Mts. Eclipse : Barrier force - Load cell C3

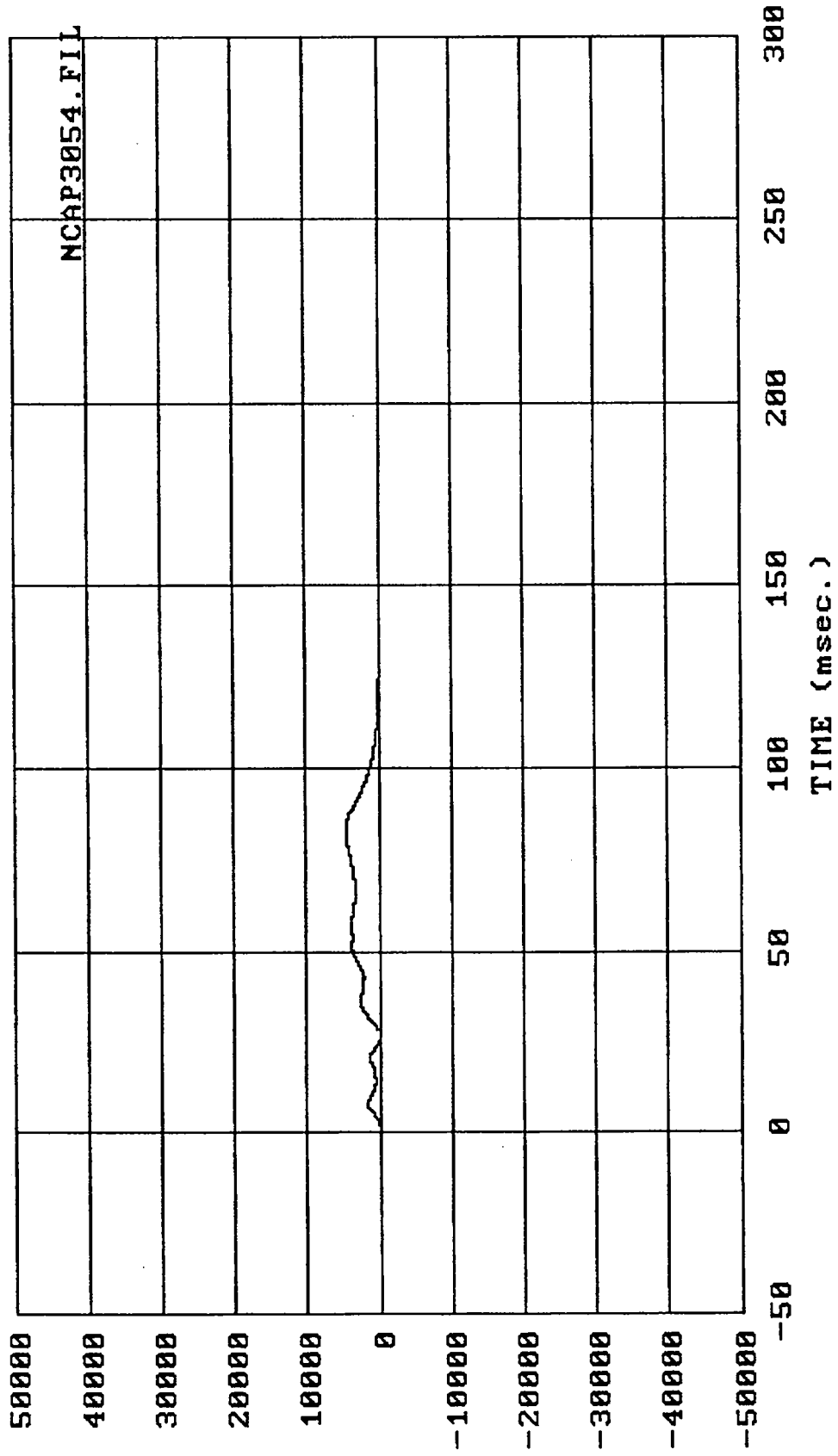


LBS

B2-22

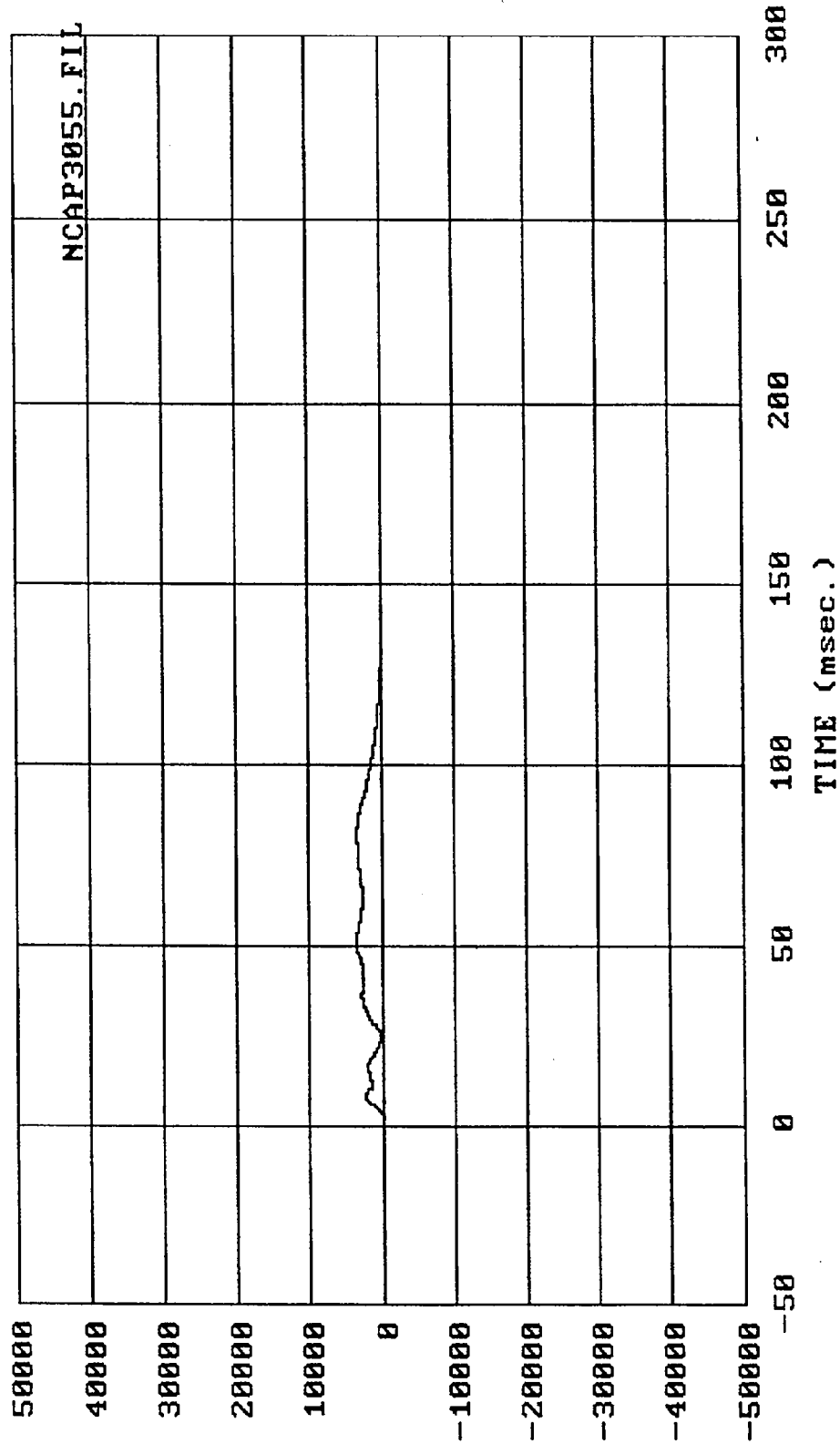
MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 3545. Min = -295.6 Axis:
 MSE 09/27/89 -- 1990 Mts. Eclipse : Barrier force - Load cell C4



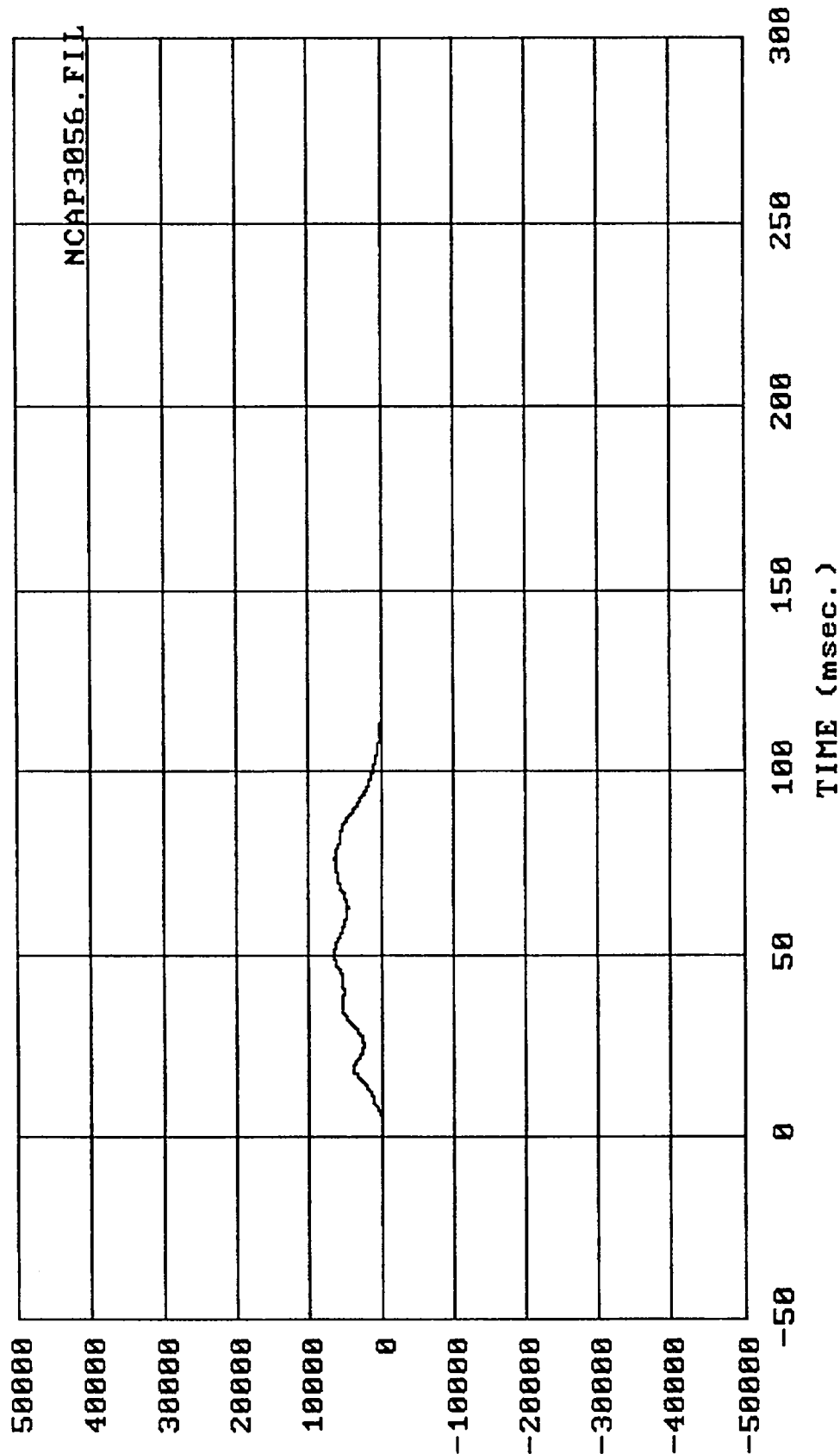
Filter: SAE CLASS 60 Max = 4563. Min = -33.69 Axis:

MSE 09/27/89 -- 1990 Mts. Eclipse : Barrier force - Load cell C5



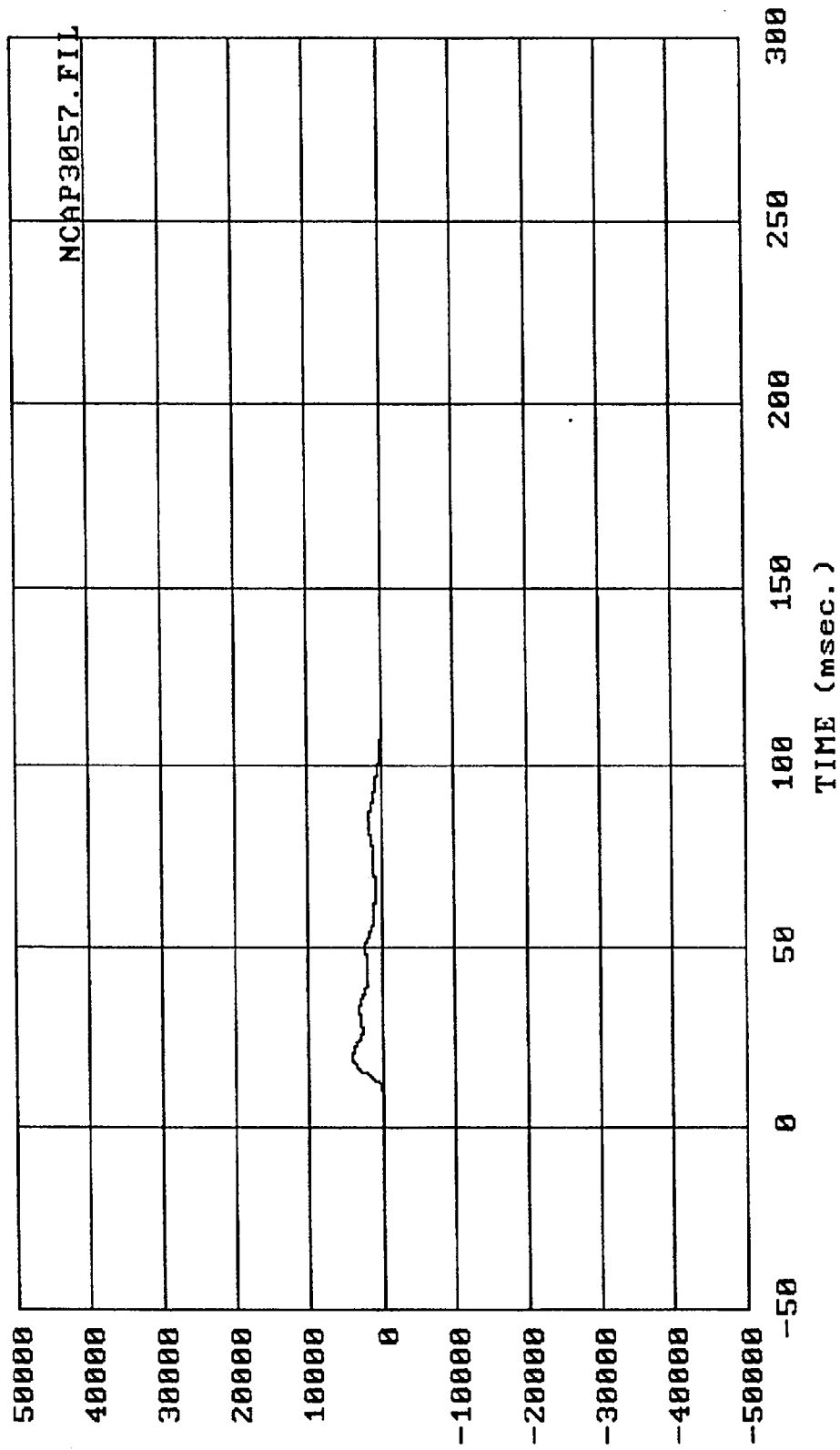
Filter: SAE CLASS 60 Max = 3716. Min = -62.09 Axis:

MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell C6



Filter: SAE CLASS 60 Max = 6621. Min = -75.76 Axis:

MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell C7

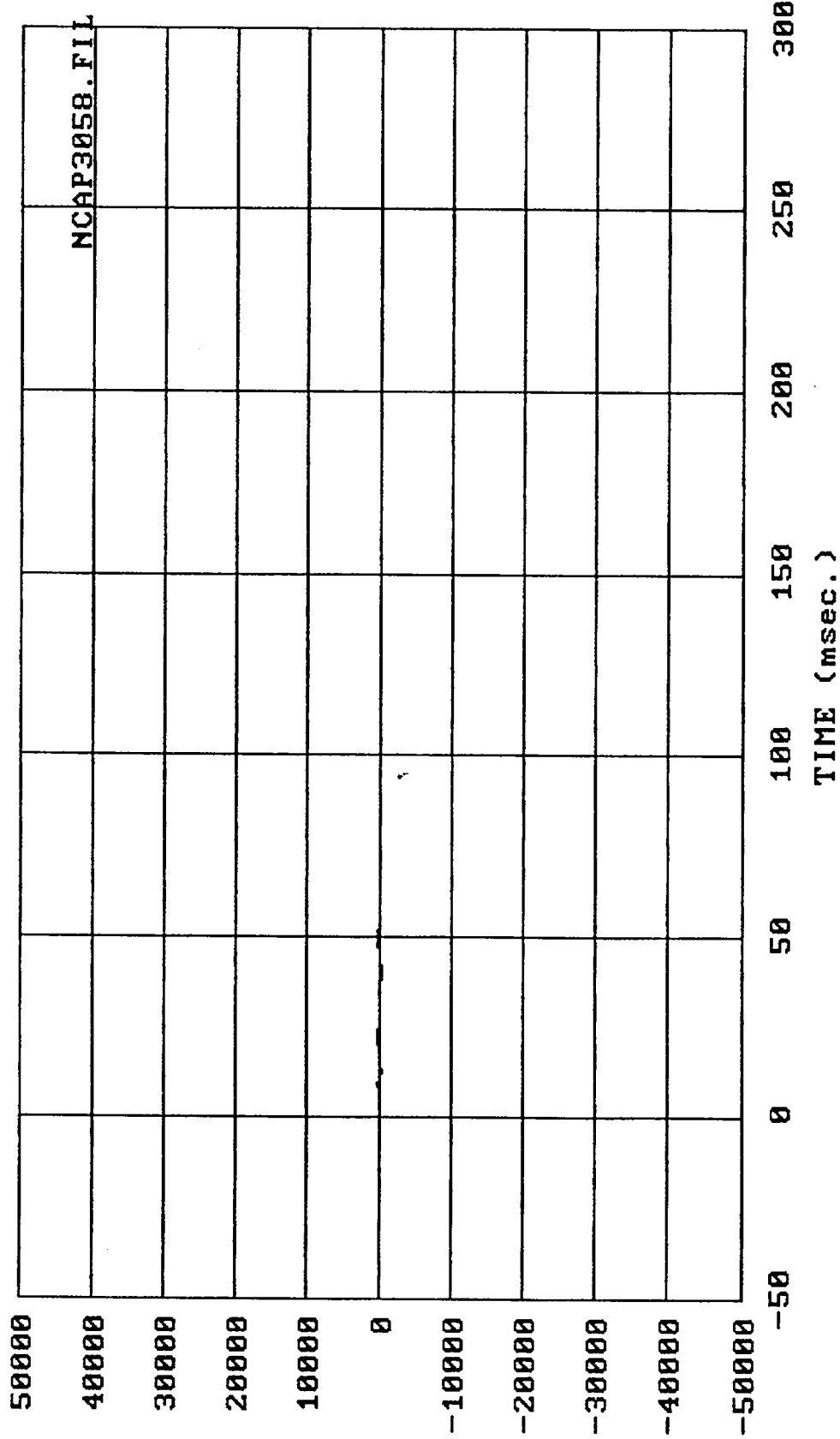


LBS

B2-26

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 4105. Min = -78.65 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell C8

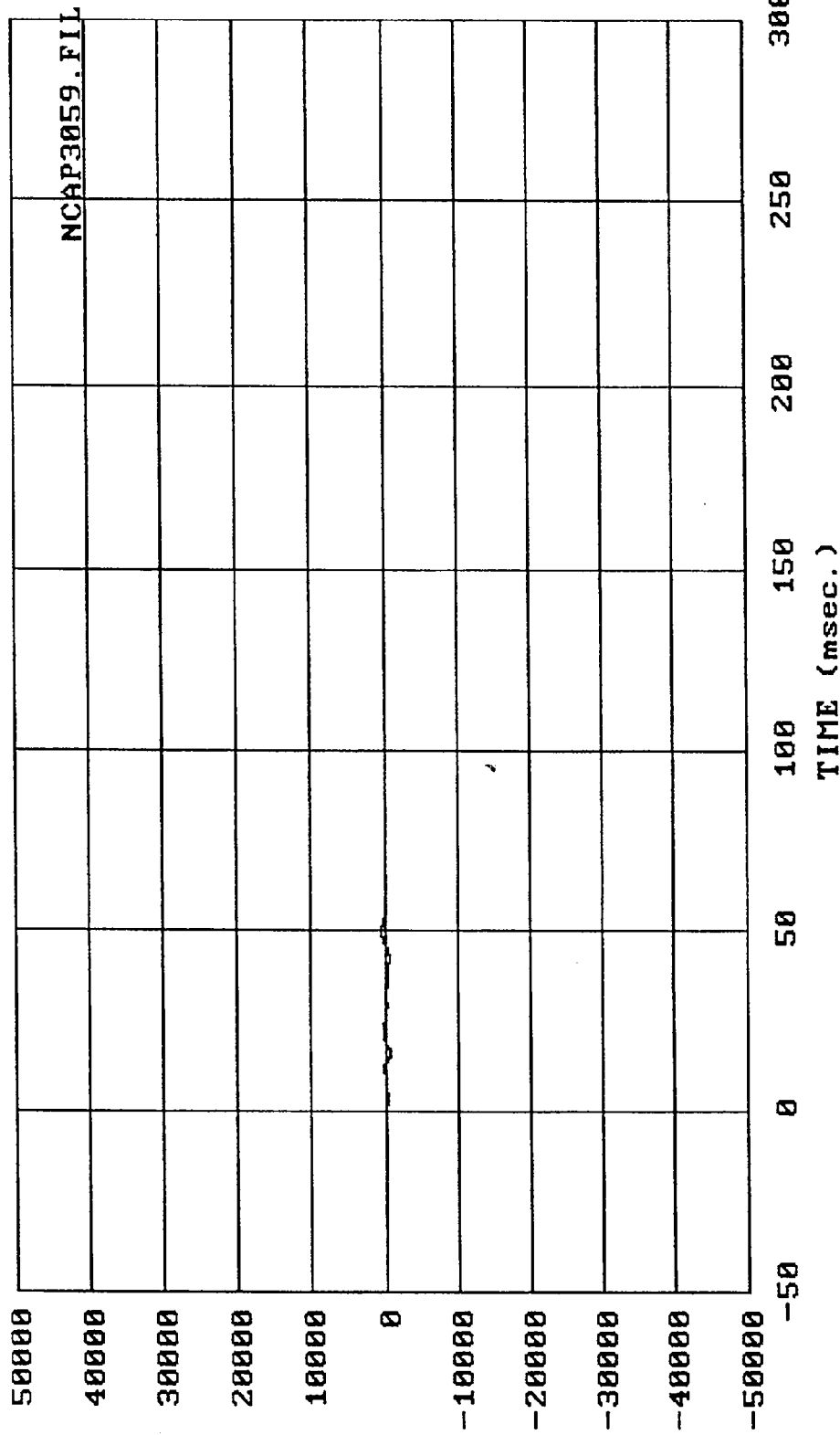


LBS

B2-27

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 328.8 Min = -286.9 Axis:
 MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell C9



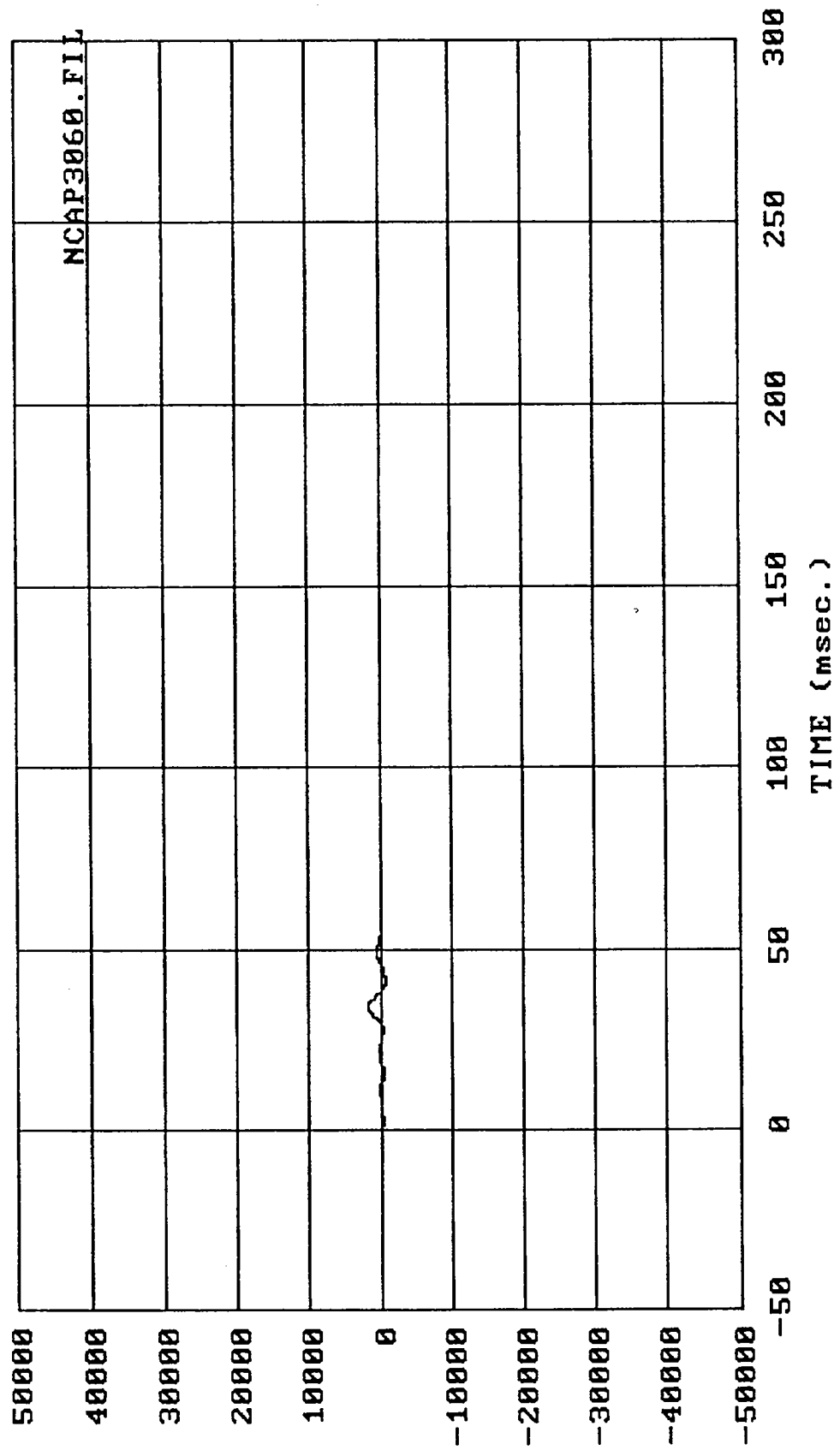
LBS

B2-28

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 555.5 Min = -634.7 Axis:

MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell D1



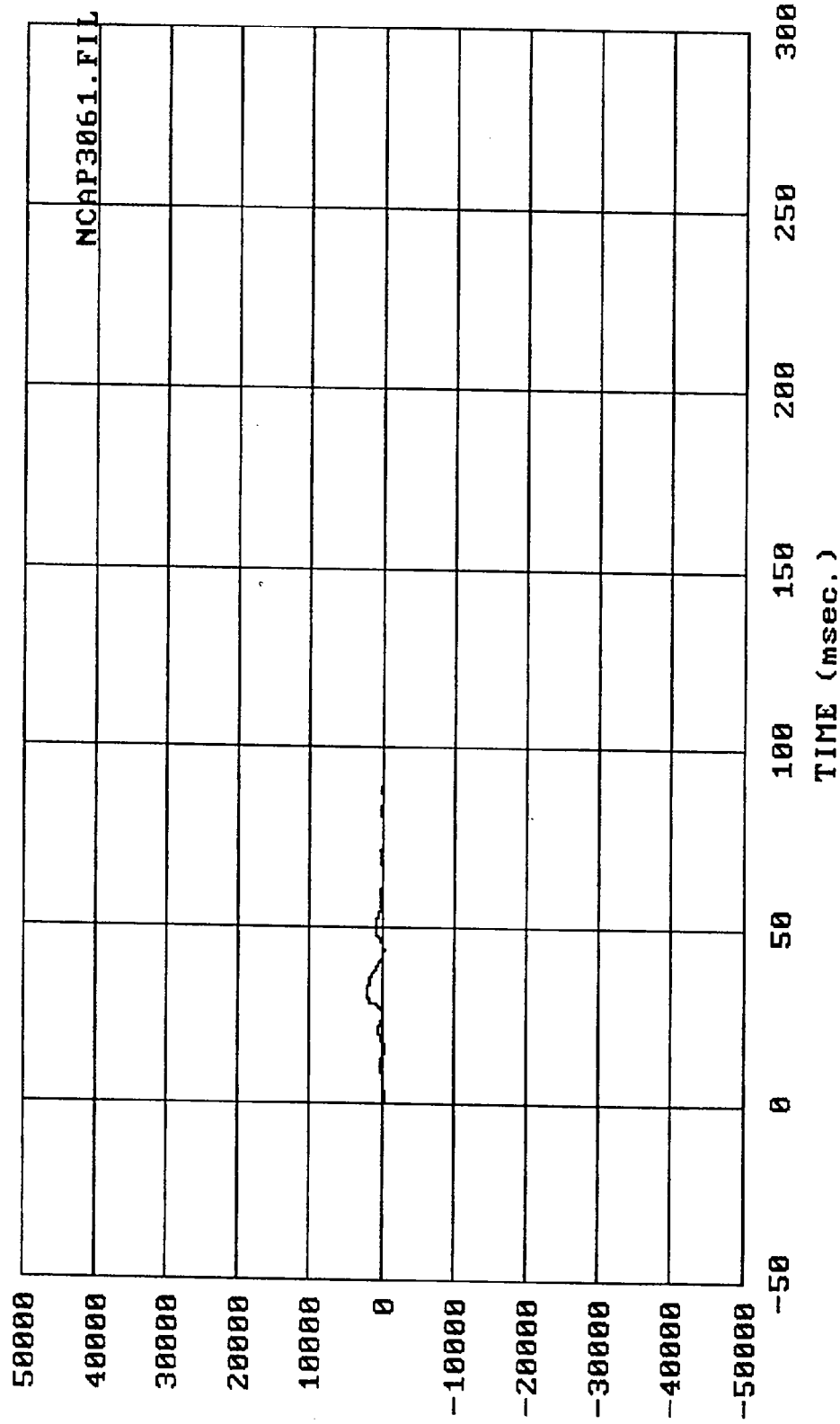
NCAP3060.FIL

L B S

B2-29

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 1884. Min = -512.4 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell D2

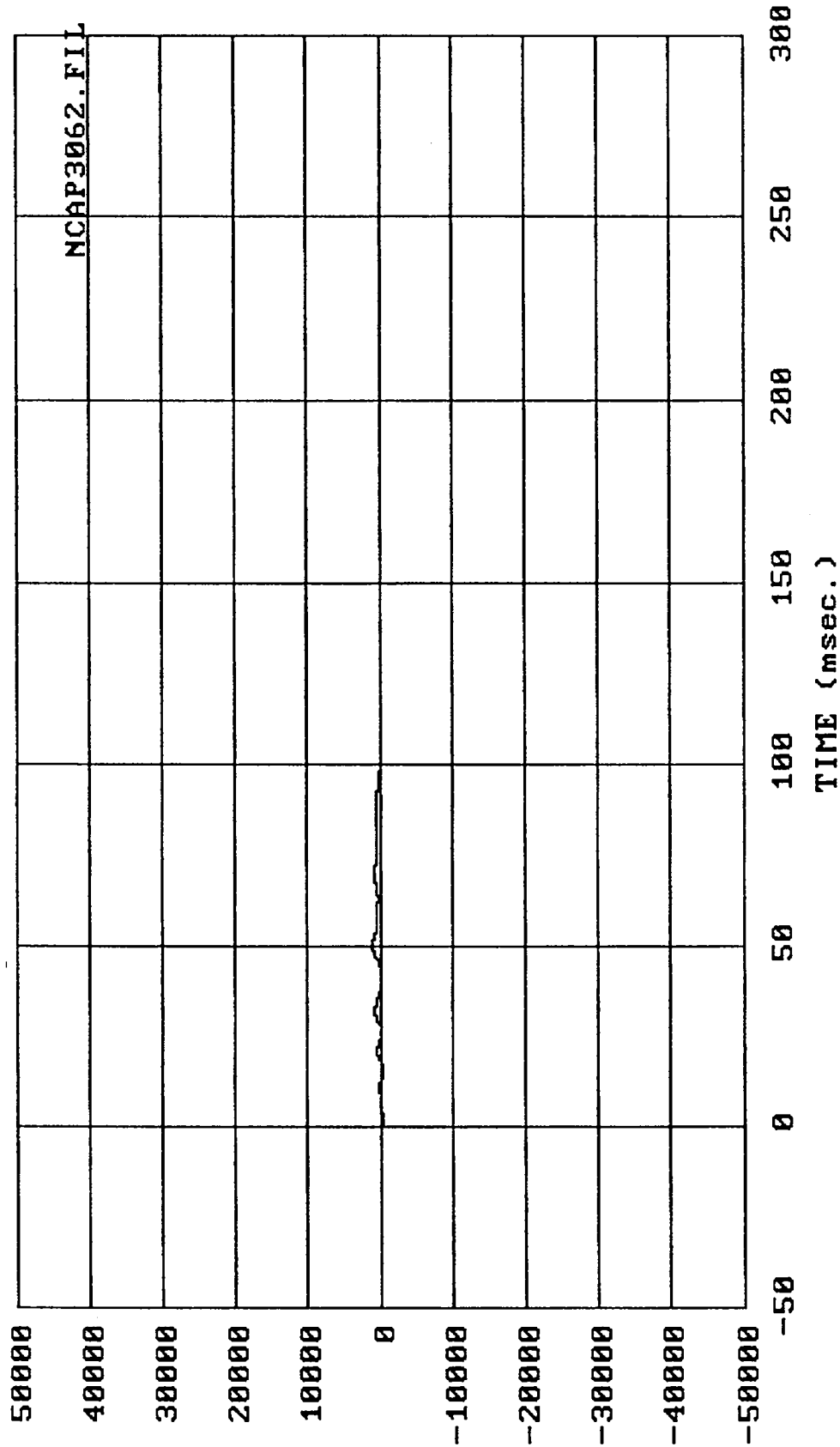


L
B
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B2-30

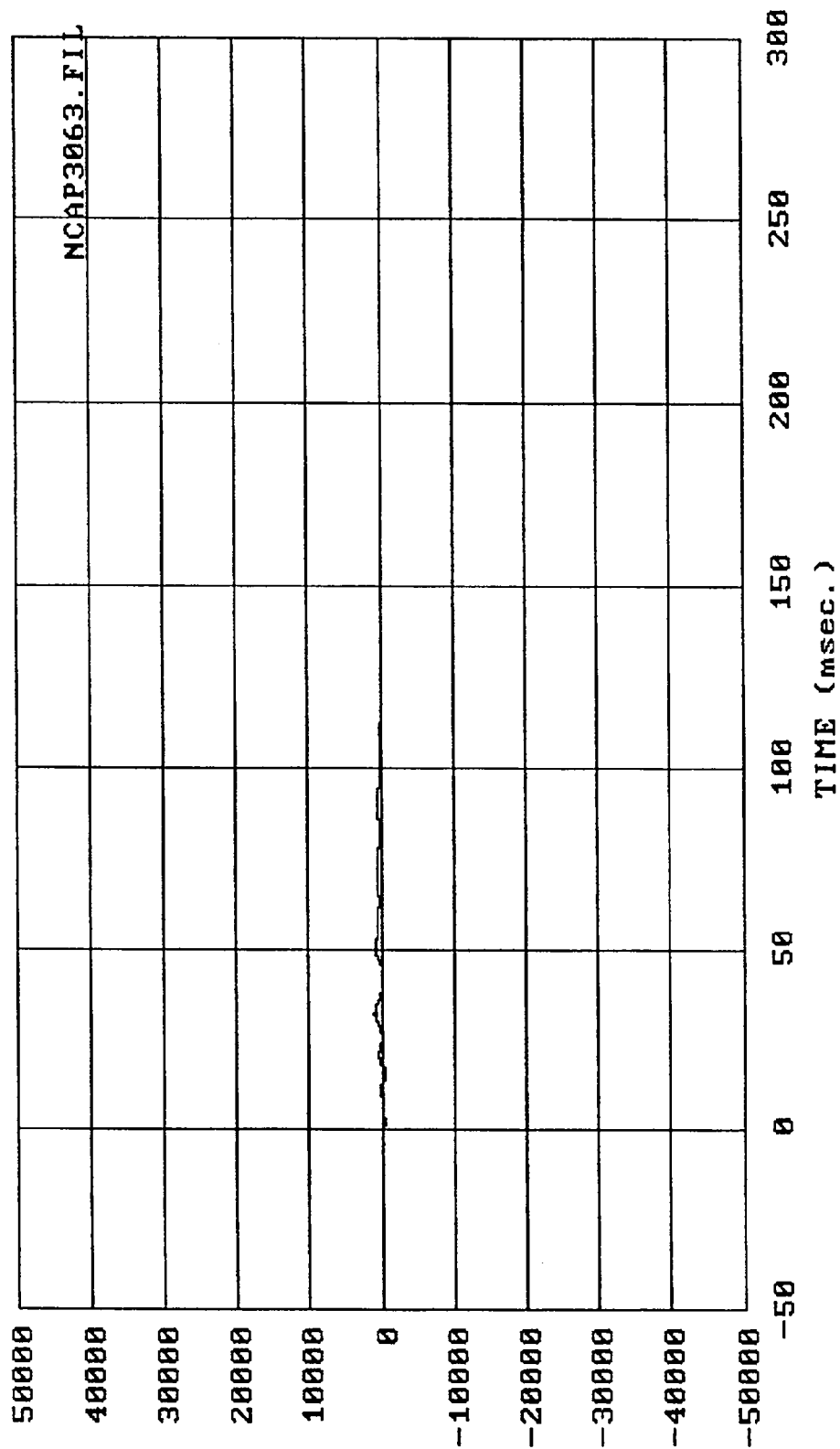
MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 2195. Min = -366.2 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell D3



Filter: SAE CLASS 60 Max = 1147. Min = -338.6 Axis:

MSE 09/27/89 -- 1990 Mts. Eclipse : Barrier force - Load cell D4

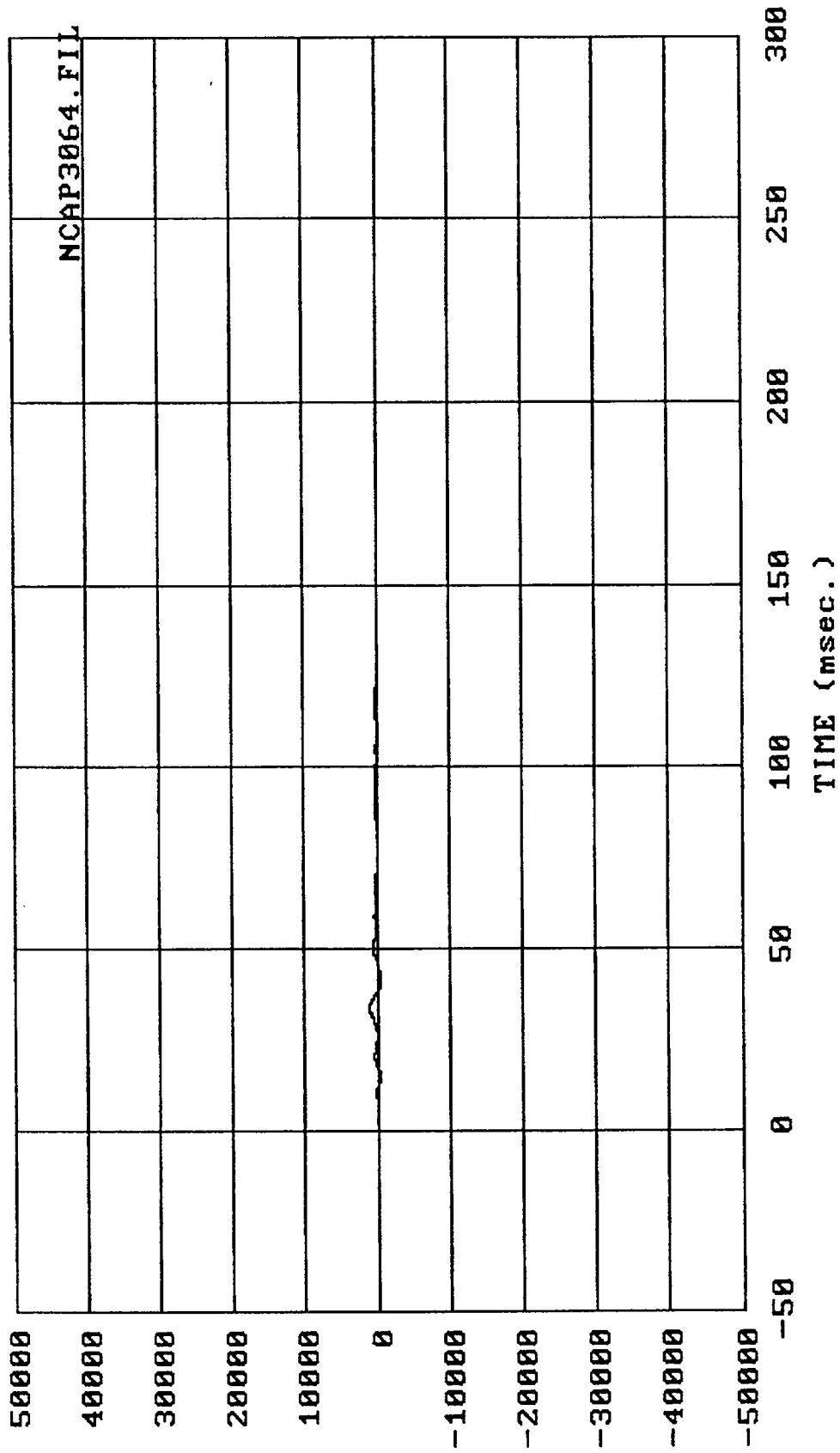


LBS

B2-32

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 1059. Min = -318.7 Axis:
MSE 09/27/89 -- 1990 Mts. Eclipse : Barrier force - Load cell D5

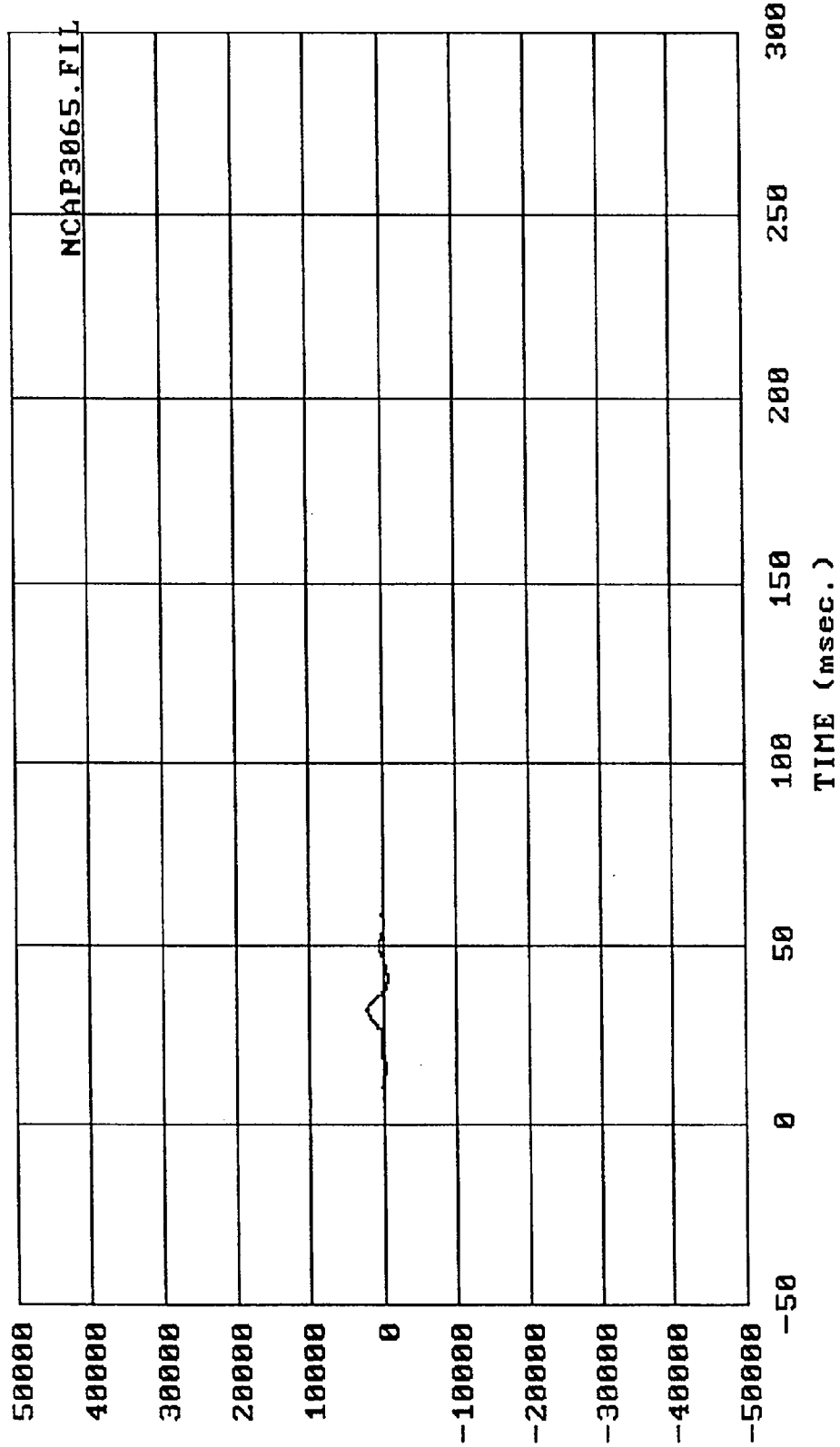


LBS

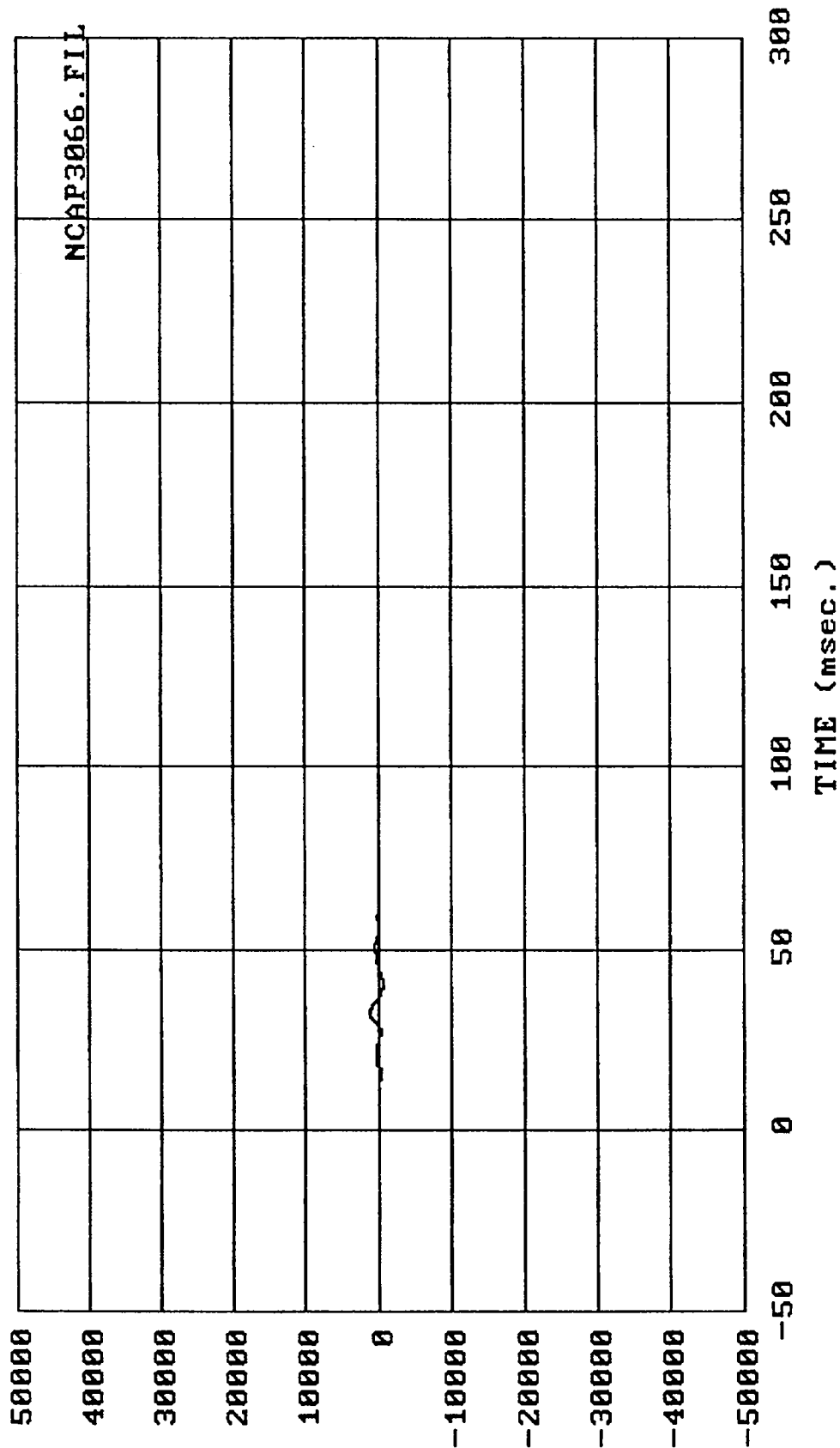
B2-33

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 1166. Min = -370.3 Axis:
MSE 09/27/89 -- 1990 Mts. Eclipse : Barrier force - Load cell D6



Filter: SAE CLASS 60 Max = 2266. Min = -506.5 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell D7

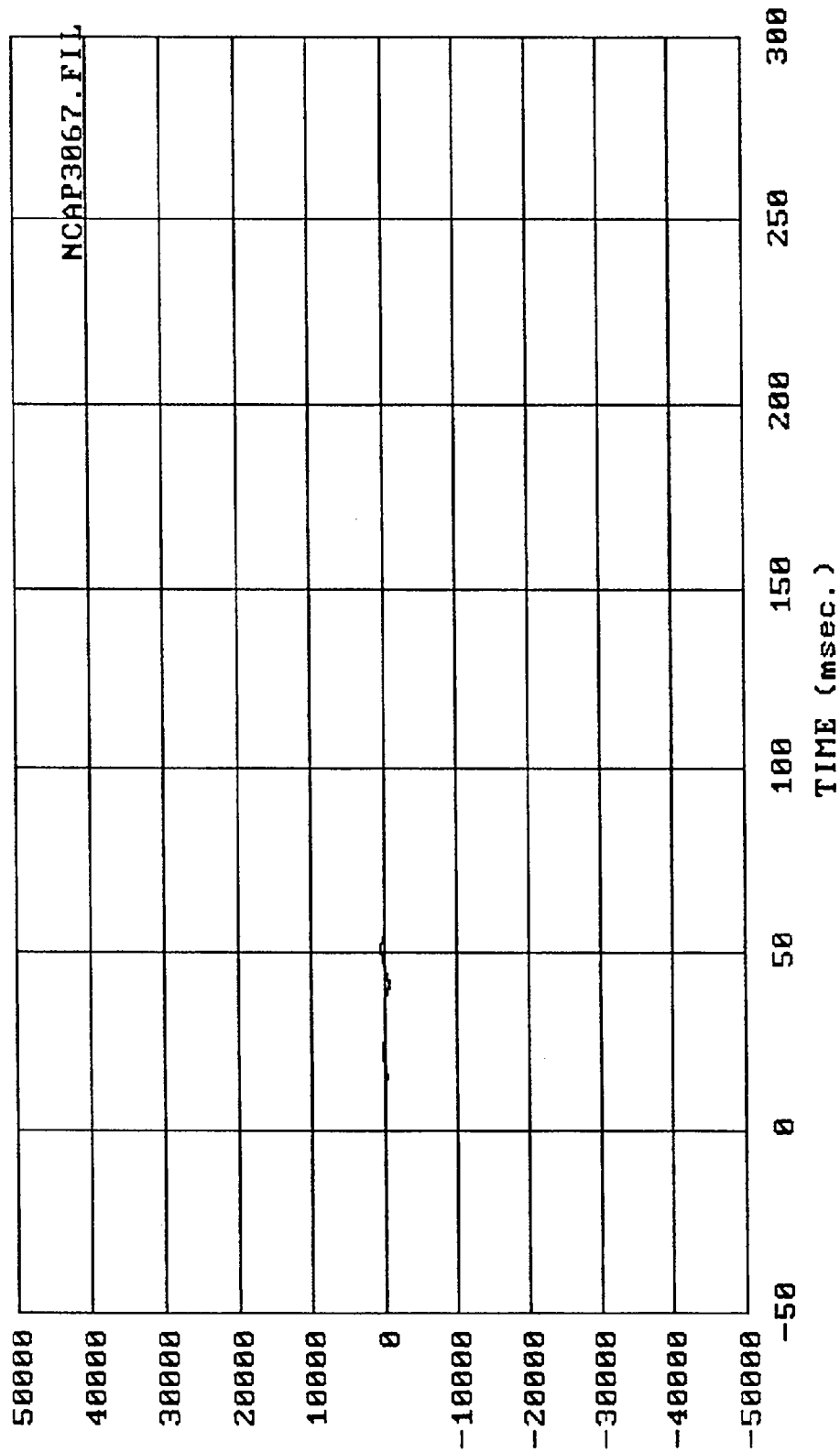


LBS

B2-35

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 1298. Min = -565.9 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell D8

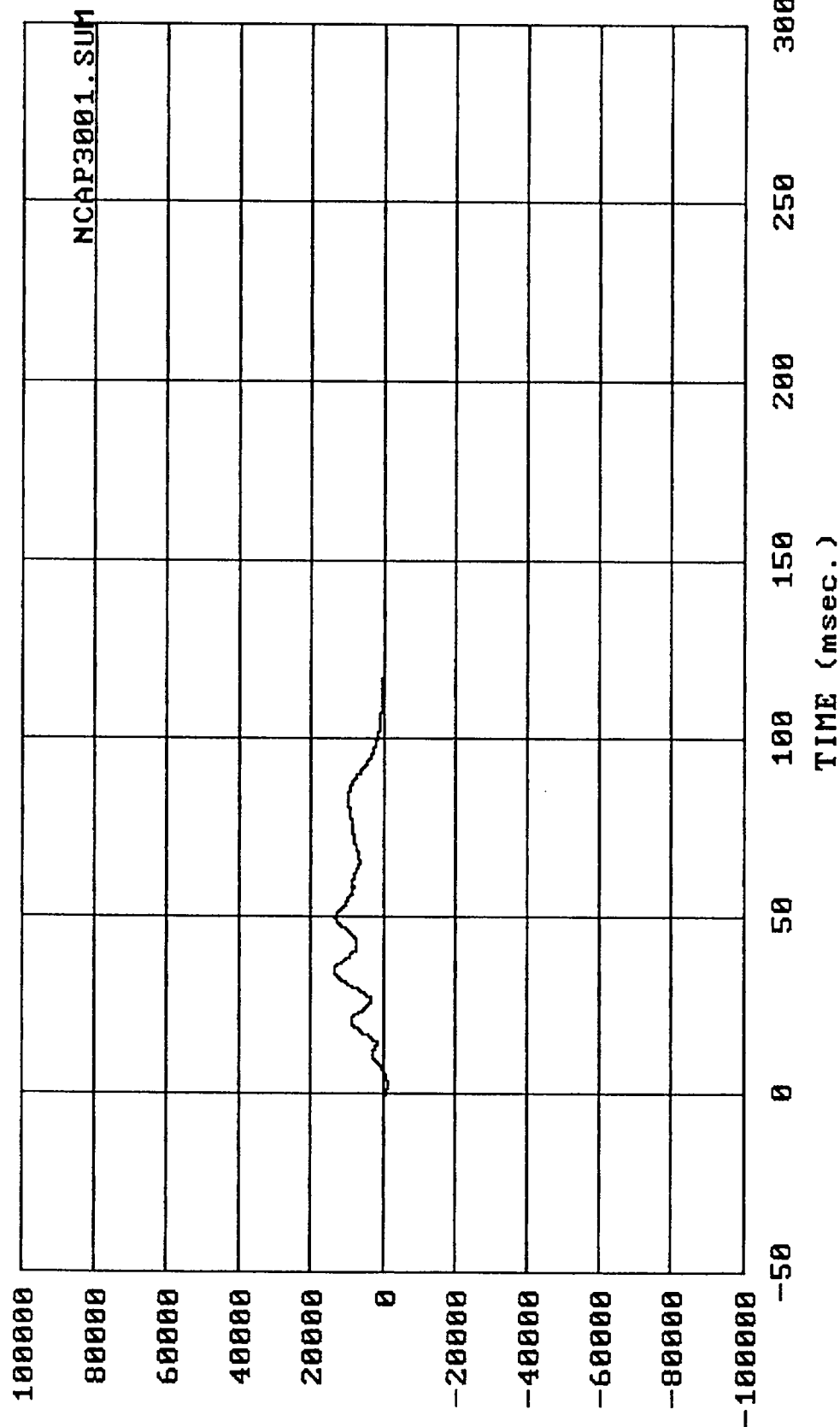


LBS

B2-36

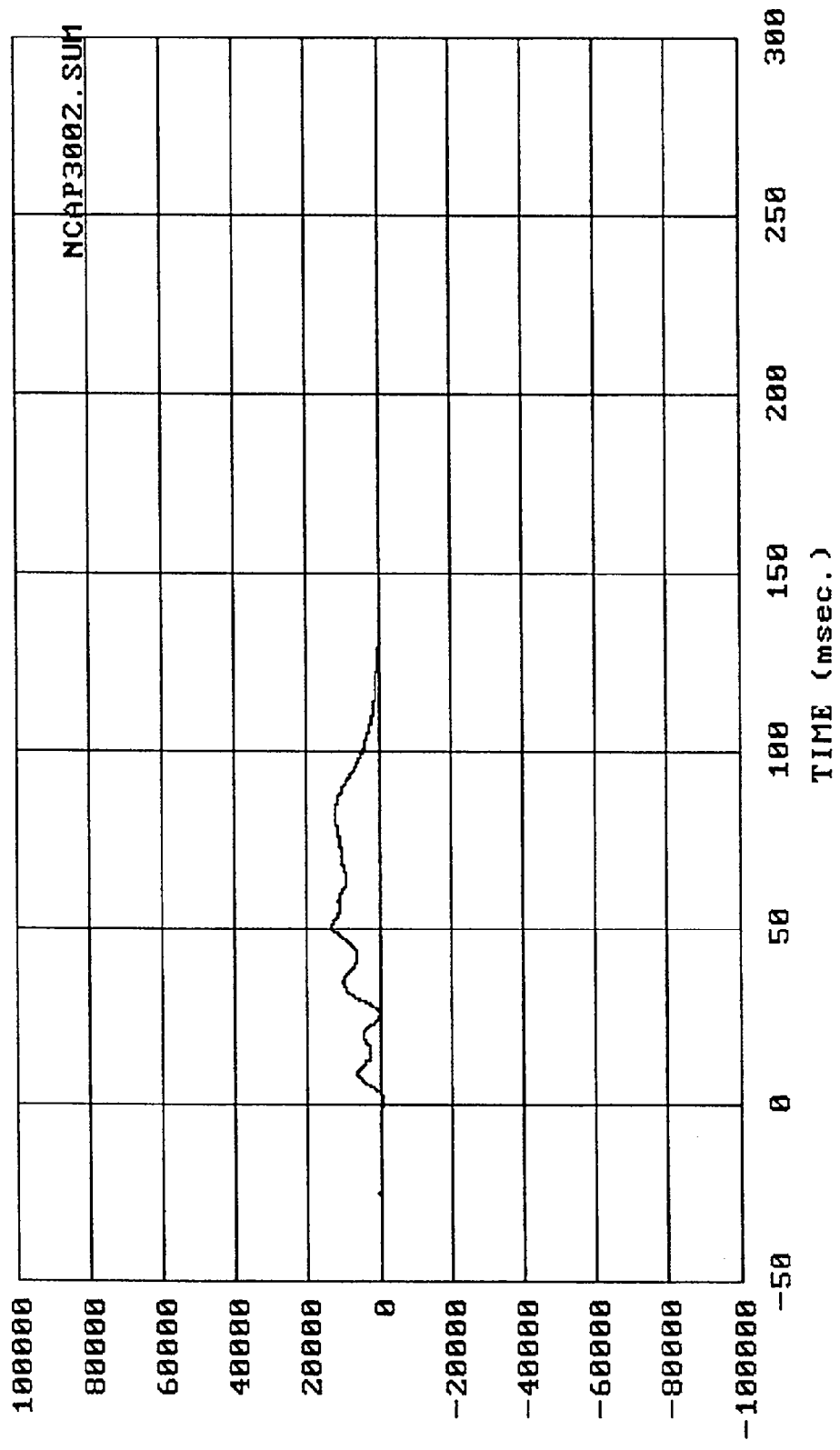
MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = 596.5 Min = -510.0 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : Barrier force - Load cell D9

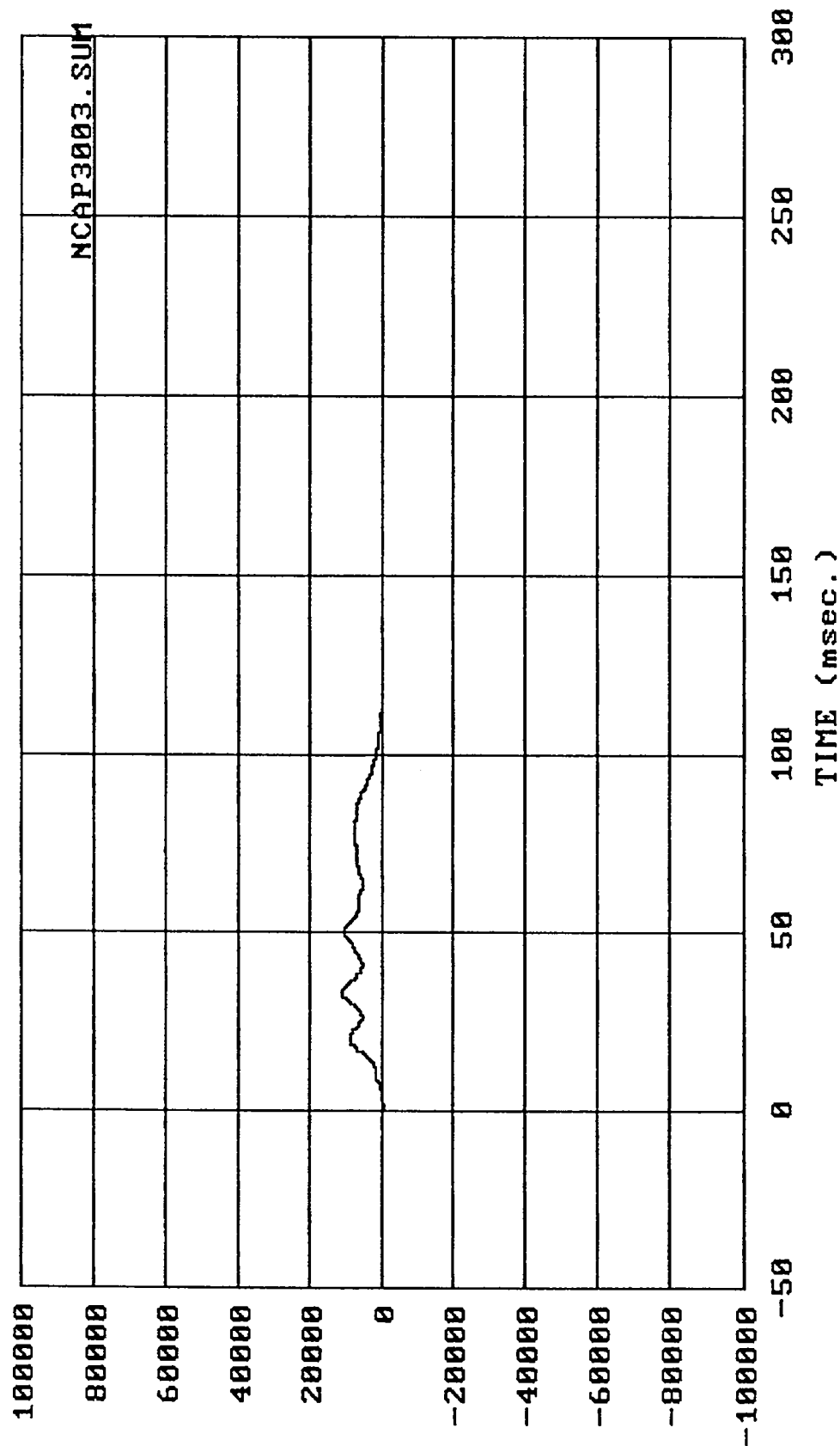


Filter: SAE CLASS 60 Max = .1394E+05 Min = -1104. Axis:

MSE 09/27/89 -- 1990 Mits. Eclipse : LCB sum frc C1,C2,C3,D1,D2,D3
(Group1)

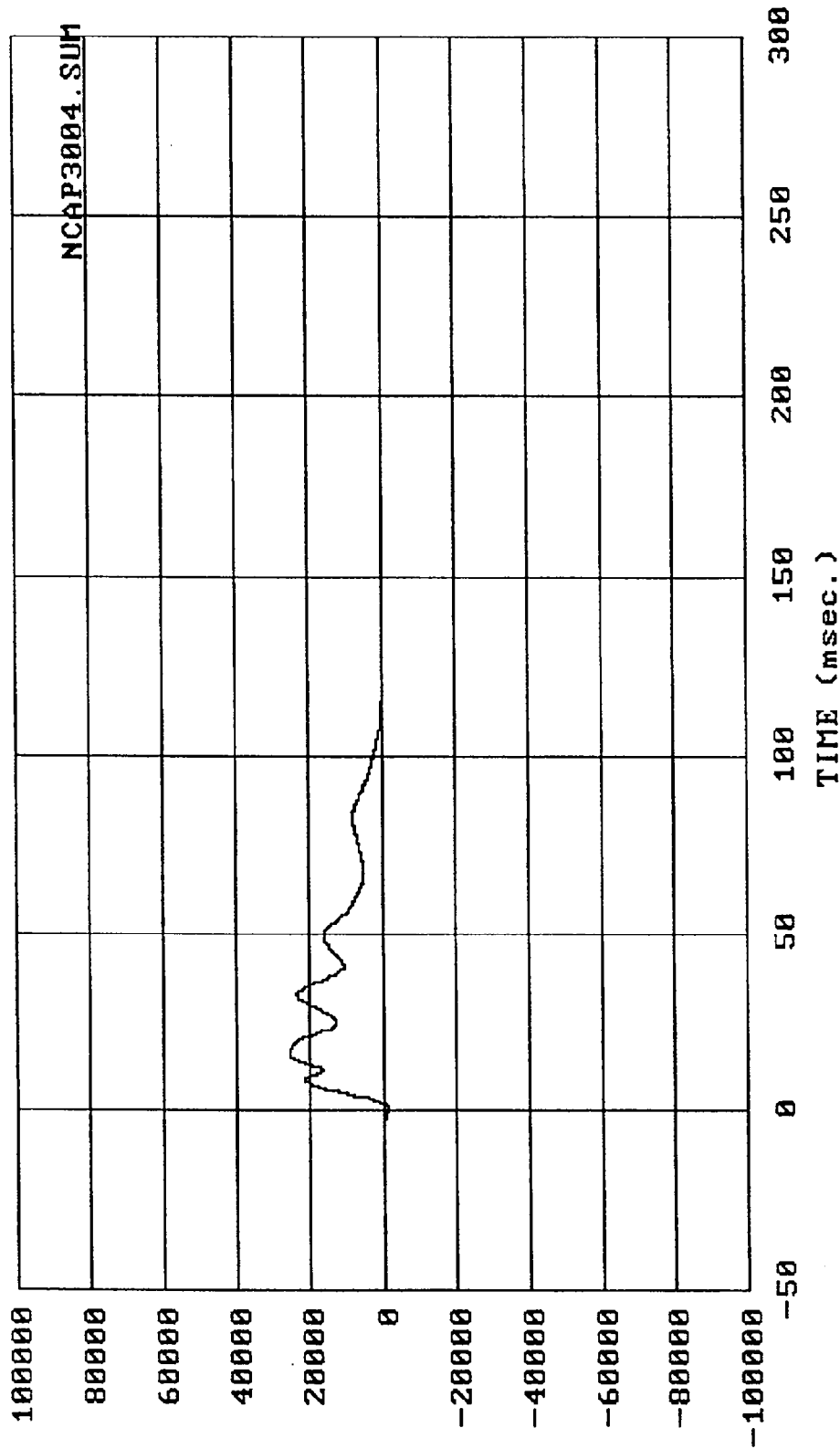


Filter: SAE CLASS 60 Max = .1376E+05 Min = -459.6 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : LCB sum frc C4,C5,C6,D4,D5,D6
(Group2)

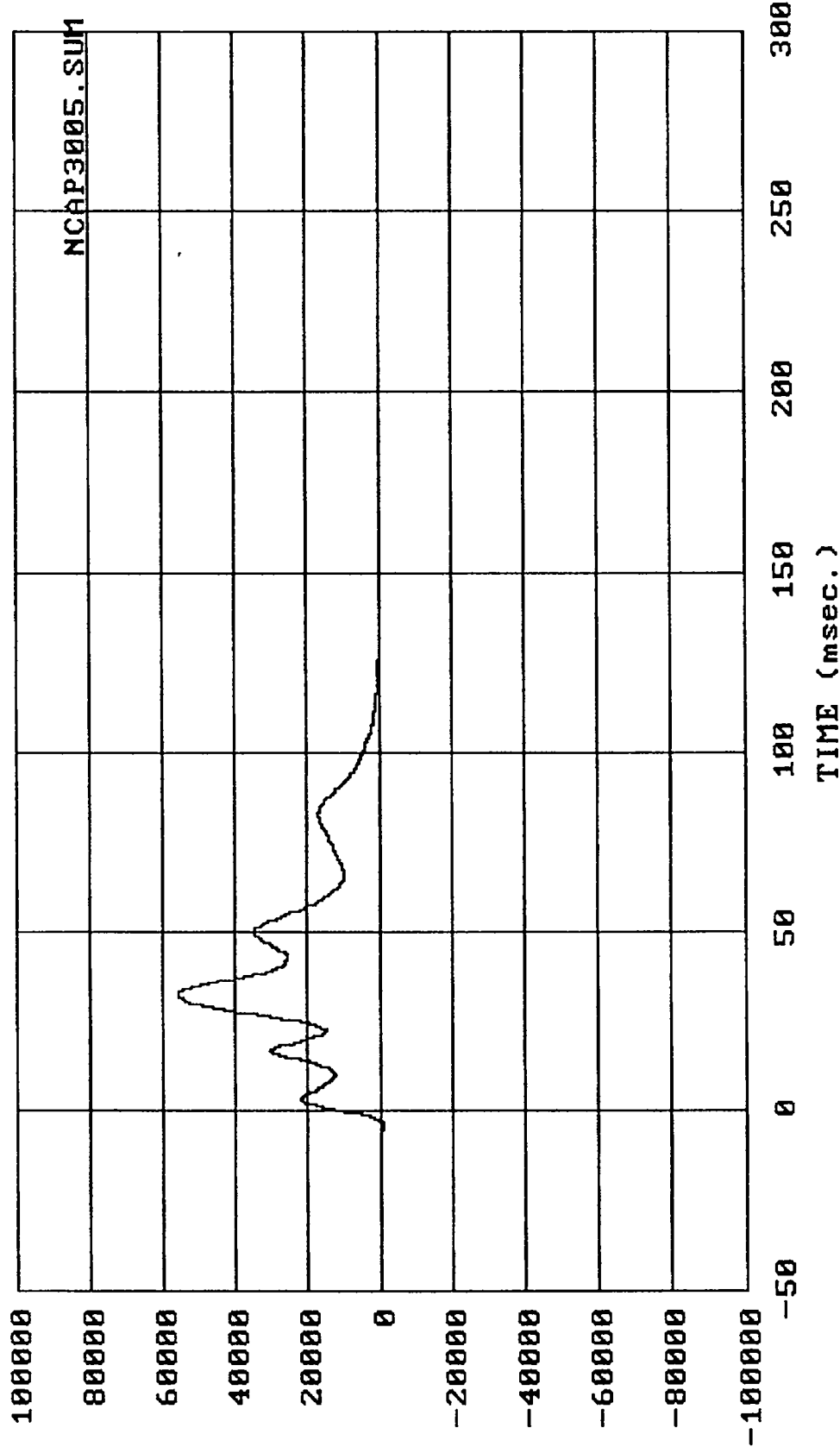


Filter: SAE CLASS 60 Max = .1159E+05 Min = -330.7 Axis:

MSE 09/27/89 -- 1990 Mits. Eclipse : LCB sum frc C7,C8,C9,D7,D8,D9
(Group3)

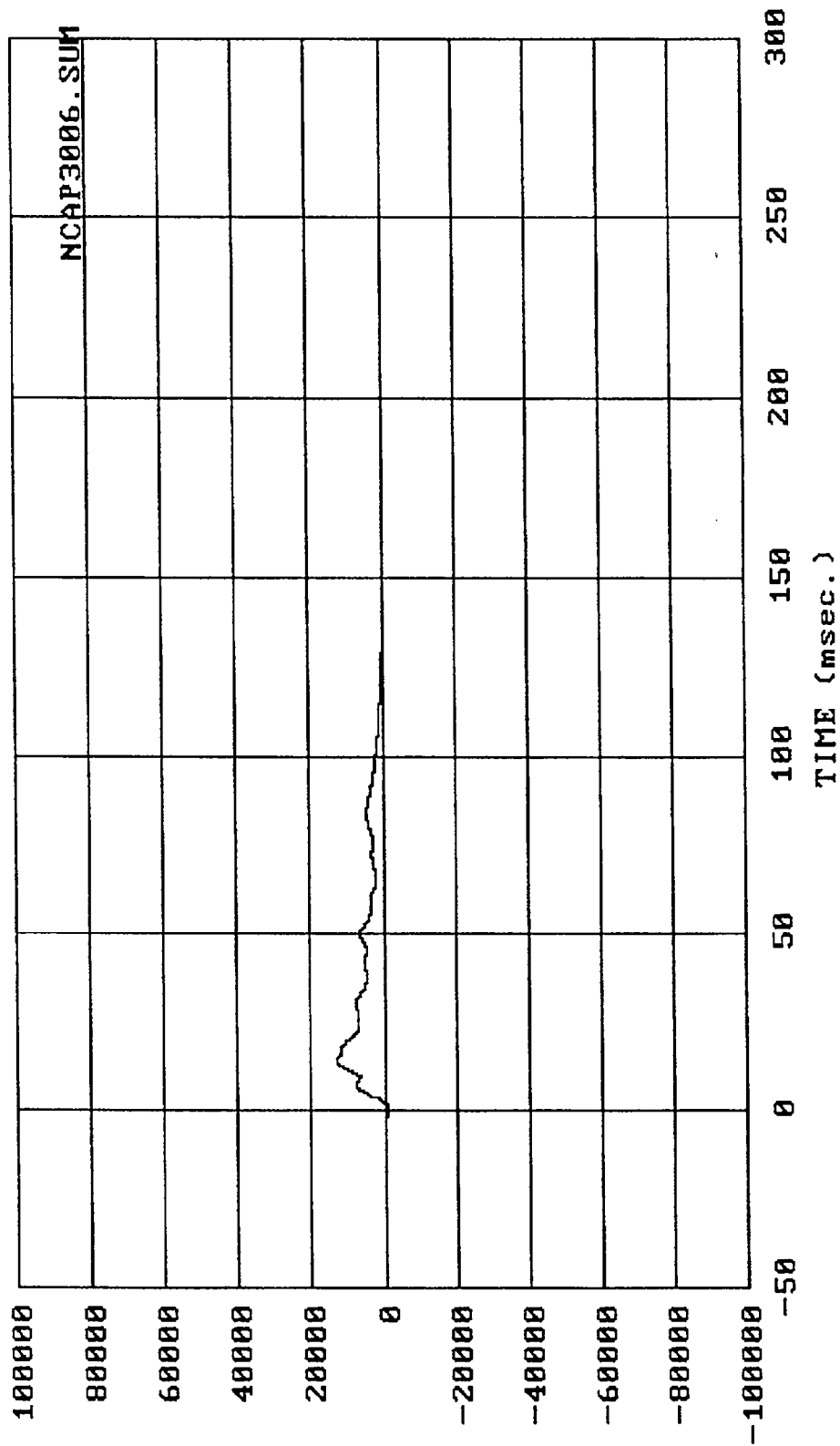


Filter: SAE CLASS 60 Max = .2593E+05 Min = -51.94 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : LCB sum frc A1,A2,A3,B1,B2,B3
(Group4)



Filter: SAE CLASS 60 Max = .5594E+05 Min = -260.7 Axis:

MSE 09/27/89 --- 1990 Mits. Eclipse : LCB sum frc A4,A5,A6,B4,B5,B6
(Group5)

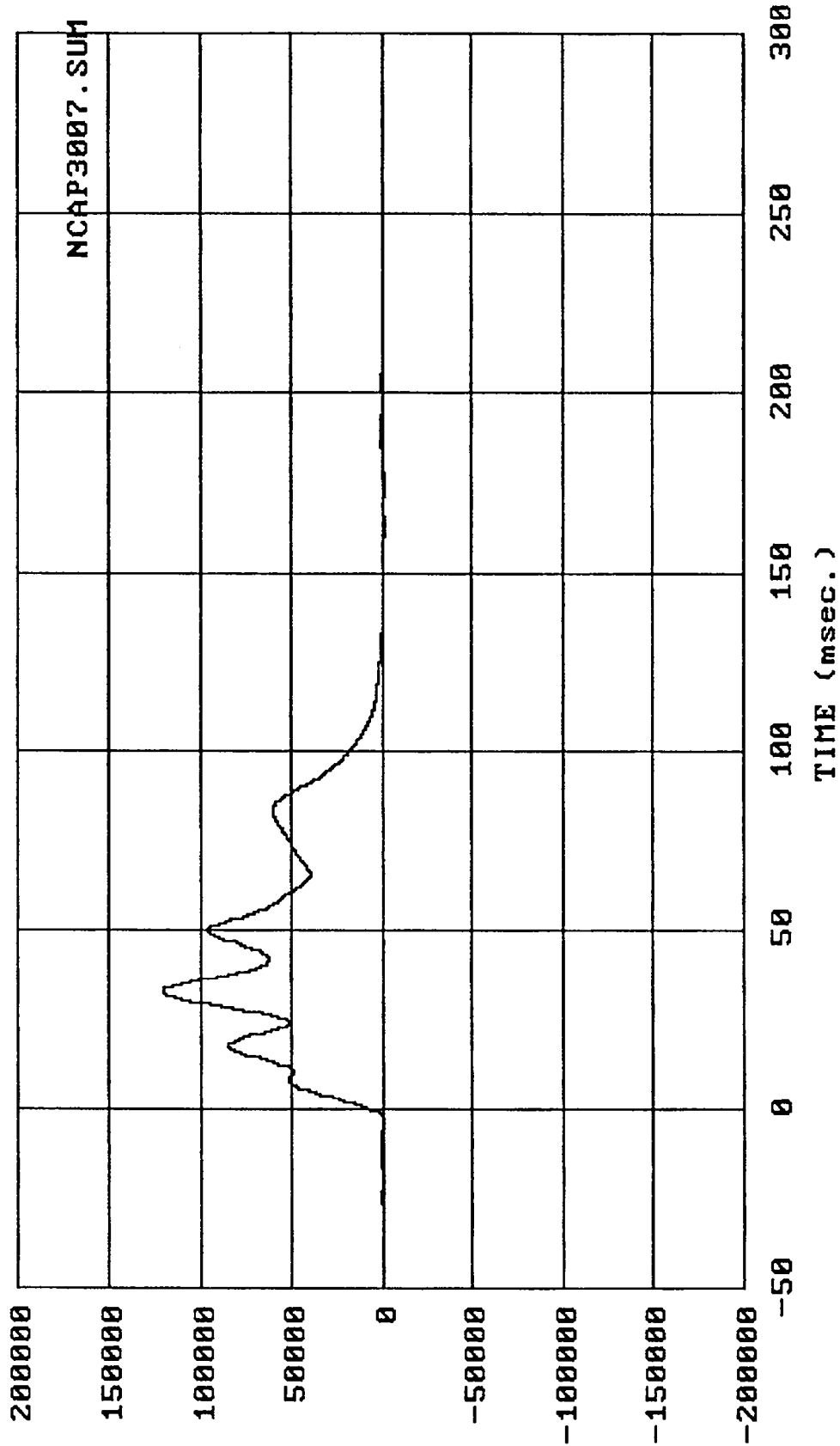


LBS

B2-42

MSE-90-R9063-N03

Filter: SAE CLASS 60 Max = .1332E+05 Min = -181.6 Axis:
MSE 09/27/89 -- 1990 Mits. Eclipse : LCB sum frc A7,A8,A9,B7,B8,B9
(Group6)



Filter: SAE CLASS 60 Max = .1207E+06 Min = -788.2 Axis:

MSE 09/27/89 -- 1990 Mits. Eclipse : Load Cell Barrier total force

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APPENDIX C

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

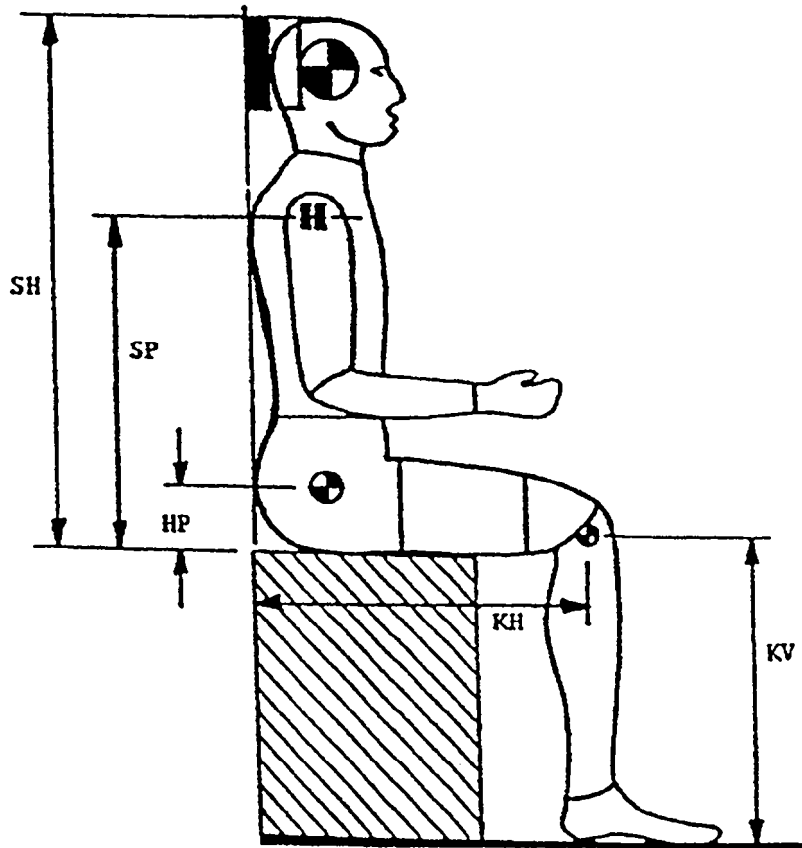
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PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.:

4	6	5
---	---	---

I. CONFIGURATION VERIFICATION DATA:



	P. 572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION	////////////////	08/04/89	
VERIFICATION NUMBER FOR DUMMY* ---	////////////////	01	
SH - Seated Height- - - - -	35.6 to 35.8"	35.6	
SP - Shoulder Pivot Height- - - -	21.8 to 22.4"	21.8	
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"	19.3	
SW - Shoulder Width - - - - -	17.8 to 18.4"	18.2	
HW - Hip Width- - - - -	14.0 to 15.4"	15.0	

TECHNICIAN'S NAME: APURVA MAPARA

*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	5
---	---	---

TECHNICIAN NAME: APURVA MAPARA

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION-----		07/21-08/01/89	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		01	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)----		68-74 °F	°F
VERIF. LAB. HUMIDITY (10 to 70% Range)-----		60-70 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST--			
a. Peak Resultant Accel.	210 to 260G	257.78	
b. Peak Lateral Accel.--	≤10G	4.99	
c. Time above 100G - - -	0.9 to 1.5 ms	1.2	
2. NECK BENDING TEST--			
a. Pendulum Speed- - - -	21.5 to 22.5 fps	21.8	
b. Pend. Avg. Decel. over $t_3 - t_2$	20 to 24G	21.3	
c. Peak Resultant Head Acceleration - - - -	26G max.	23.4	
d. Pendulum Decel. ($t_2 - t_1$)	≤ 3 ms	2.8	
e. Pendulum Decel. ($t_3 - t_2$)	25 to 30 ms	27.4	
f. Pendulum Decel. ($t_4 - t_3$)	≤10 ms	9.6	
g. Max. Head Rotation -	63 to 73°	63.9	
h. Chordal Displacement- Head Rotation Angle-			
0°	Time- -	-2 to 2 ms	0.0
	Displ.-	-.5 to .5"	0.003
30°	Time- -	22.6 to 34 ms	34.0
	Displ.-	2.1 to 3.1"	2.24
60°	Time- -	40.3 to 51.7ms	51.7
	Displ.-	4.3 to 5.3"	4.3
Maximum	Time- -	53.2 to 66.8ms	62.4
(62.4°)	Displ.-	5.0 to 6.0"	5.00

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

TECHNICIAN NAME: APURVA MAPARA

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	70	
	Displ.-	4.3 to 5.3 in.	4.3	
30°	Time- -	85.4 to 104.6 ms	88.6	
	Displ.-	2.1 to 3.1 in.	2.1	
0°	Time- -	101.0 to 123.0 ms	101.0	
	Displ.-	-.5 to 0.5 in.	0.081	
3. ABDOMINAL COMPRESSION TEST: (Preload=10 pounds)				
a. Force @ .5" - - - -		23 to 36 lbs.	25.75	
b. Force @ .75" - - - -		36 to 50 lbs.	36.75	
c. Force @ 1.0" - - - -		50 to 63 lbs.	54.0	
d. Force @ 1.3" - - - -		73 to 88 lbs.	78.7	
4. LUMBAR FLEXION TEST:				
a. Force @ 20 - - - -		22 to 34 lbs.	33.0	
b. Force @ 30 - - - -		34 to 46 lbs.	41.2	
c. Force @ 40 - - - -		46 to 58 lbs.	54.2	
d. Return Angle- - - -		12 maximum	11.0	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed - - -		21.78-22.22 fps	21.81	
(2) Peak Deflection -		1.7" maximum	1.64	
(3) Peak Resistive Force - - - - -		2250 lbs.maximum	2156.2	
(4) Internal Mysteresis		50 to 70%	68.3	
b. Low Speed				
(1) Probe Speed - - -		13.86-14.14 fps	14.13	
(2) Peak Deflection -		1.1" maximum	1.05	
(3) Peak Resistive Force - - - - -		1450 lbs.maximum	1385.35	
(4) Internal Mysteresis		50 to 70%	65.7	

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

II. PERFORMANCE VERIFICATION DATA:

NHTSA DUMMY I.D. NO.:

4	6	5
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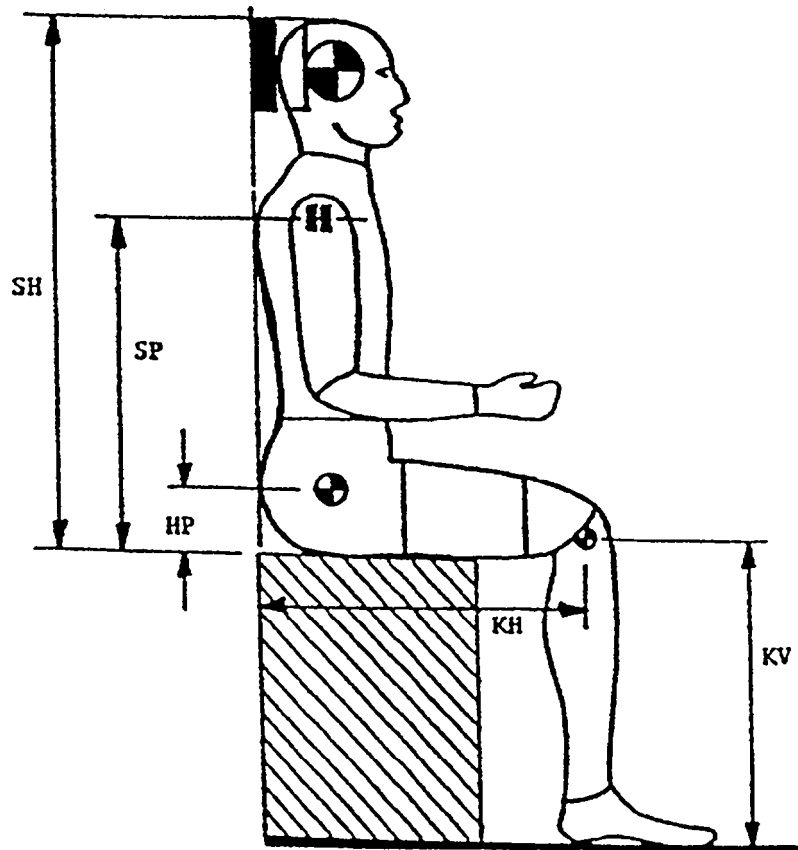
TECHNICIAN NAME: APURVA MAPARA

TEST PARAMETER	SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
6. <u>KNEE IMPCT TESTS:</u>			
a. <u>Right Side--</u>			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.83	
(2) Maximum Force - -	1850 to 2500 lbs	2352.53	
(3) Time Above 1000#-	1.7 ms minimum	1.9	
b. <u>Left Side--</u>			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.84	
(2) Maximum Force - -	1850 to 2500 lbs	2382.06	
(3) Time Above 1000#-	1.7 ms minimum	1.8	

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	////////////////	08/03/89	
VERIFICATION NUMBER FOR DUMMY* ---	////////////////	01	
SH - Seated Height- - - - -	35.6 to 35.8"	35.6	
SP - Shoulder Pivot Height- - - -	21.8 to 22.4"	21.9	
HP - Hip Pivot Height - - - - -	3.9 ref.	3.9	
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.5	
KV - Knee Pivot from floor- - - -	19.3 to 19.9"	19.3	
SW - Shoulder Width - - - - -	17.8 to 18.4"	18.4	
HW - Hip Width- - - - -	14.0 to 15.4"	15.0	

TECHNICIAN'S NAME: APURVA MAPARA

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

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

II. PERFORMANCE VERIFICATION DATA:

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

TECHNICIAN NAME: APURVA MAPARA

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION-----		07/21-08/02/89	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		01	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)----		68-74 °F	°F
VERIF. LAB. HUMIDITY (10 to 70% Range)-----		60-70 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST--			
a. Peak Resultant Accel.	210 to 260G	229.9	
b. Peak Lateral Accel.--	≤ 10G	6.34	
c. Time above 100G - - -	0.9 to 1.5 ms	1.25	
2. NECK BENDING TEST--			
a. Pendulum Speed- - - -	22.5 to 22.5 fps	21.89	
b. Pend. Avg. Decel. over $t_3 - t_2$	20 to 24G	22.69	
c. Peak Resultant Head Acceleration - - - -	26G max.	25.4	
d. Pendulum Decel. ($t_2 - t_1$)	≤ 3 ms	2.3	
e. Pendulum Decel. ($t_3 - t_2$)	25 to 30 ms	29.3	
f. Pendulum Decel. ($t_4 - t_3$)	≤ 10 ms	8.4	
g. Max. Head Rotation -	63 to 73°	65.765	
h. Chordal Displacement- Head Rotation Angle-			
0°	Time- -	-2 to 2 ms	-2.0
	Displ.-	-.5 to .5"	0.008
30°	Time- -	22.6 to 34 ms	31.8
	Displ.-	2.1 to 3.1"	2.256
60°	Time- -	40.3 to 51.7ms	49.3
	Displ.-	4.3 to 5.3"	4.45
Maximum	Time- -	53.2 to 66.8ms	60.0
(60°)	Displ.-	5.0 to 6.0"	4.9

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

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	70.2	
	Displ.-	4.3 to 5.3 in.	4.4	
30°	Time- -	85.4 to 104.6 ms	87.1	
	Displ.-	2.1 to 3.1 in.	2.1	
0°	Time- -	101.0 to 123.0 ms	102.0	
	Displ.-	-.5 to 0.5 in.	0.169	
3. ABDOMINAL COMPRESSION TEST: (Preload=10 pounds)				
a. Force @ .5" - - - -		23 to 36 lbs.	28.0	
b. Force @ .75" - - - -		36 to 50 lbs.	43.0	
c. Force @ 1.0" - - - -		50 to 63 lbs.	58.0	
d. Force @ 1.3" - - - -		73 to 88 lbs.	84.5	
4. LUMBAR FLEXION TEST:				
a. Force @ 20 - - - -		22 to 34 lbs.	28.6	
b. Force @ 30 - - - -		34 to 46 lbs.	40.3	
c. Force @ 40 - - - -		46 to 58 lbs.	52.6	
d. Return Angle- - - -		12 maximum	11.0	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed - - -		21.78-22.22 fps	21.8	
(2) Peak Deflection -		1.7" maximum	1.69	
(3) Peak Resistive Force - - - - -		2250 lbs.maximum	2145.68	
(4) Internal Mysteresis		50 to 70%	68.2	
b. Low Speed				
(1) Probe Speed - - -		13.86-14.14 fps	13.88	
(2) Peak Deflection -		1.1" maximum	1.02	
(3) Peak Resistive Force - - - - -		1450 lbs.maximum	1388.97	
(4) Internal Mysteresis		50 to 70%	58.6	

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

II. PERFORMANCE VERIFICATION DATA:

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

TECHNICIAN NAME: APURVA MAPARA

TEST PARAMETER	SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
6. KNEE IMPCT TESTS:			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.88	
(2) Maximum Force - -	1850 to 2500 lbs	2099.69	
(3) Time Above 1000#-	1.7 ms minimum	2.1	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.83	
(2) Maximum Force - -	1850 to 2500 lbs	2130.35	
(3) Time Above 1000#-	1.7 ms minimum	1.9	

APPENDIX D

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

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Seat Belts

ND06A-A3

Seat belts are installed in your car for the protection of the driver and passengers. Use the seat belts. In the event of an accident, injury to the driver and passengers may be reduced if seat belts are properly used.

The following pages contain the recommended procedure for fastening, adjusting, and wearing of belts for comfort and safety.

Combined Automatic Shoulder Belt and Manual Lap Belt Restraint System

ND08B-Gb

The front seat belt restraint system consists of the automatic shoulder belt and the manual lap belt. This system is designed to provide comfort and safety by automatic fastening and unfastening of the shoulder belt as well as automatic retraction of the belts during normal car operation.

Sensing devices inside the belt retractors (for shoulder and lap belts) are designed to lock the retractors in the event of an abrupt change in car motion.

CAUTION

For full restraint, the manual lap belt and the automatic shoulder belt must be securely fastened.

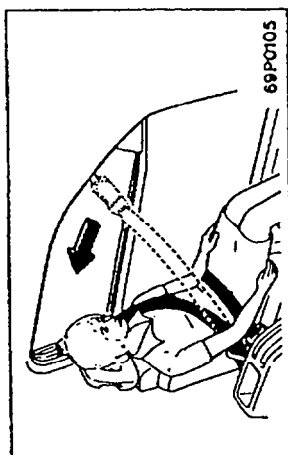
Adjust the front seat position so that the front passenger's shoe soles may touch the toeboard when he or she sits up straight and well back in the seat. Failure to follow these instructions could increase the chance and/or the severity of injury in accident.



Automatic Shoulder Belt

ND08D-H

The shoulder belt moves automatically to the set position (fasten) when a door is closed and the ignition key is turned to the "ON" position. When the door is opened, the shoulder belt automatically moves to the set-off (unfastened) position. For the driver's seat, the shoulder belt automatically moves to the set-off position when the ignition key is removed from the ignition.





Seat Belt Reminder Light/Warning Light and Buzzer

The seat belt reminder light/warning light will illuminate or blink on and off and/or the buzzer will sound in the following instances.

(1) LAP BELT REMINDER LIGHT AND BUZZER

When the ignition key is turned to the "ON" position, the reminder light in the instrument cluster will illuminate for about 6 seconds. If the driver does not fasten his/her lap belt, the buzzer will also sound for about 6 seconds intermittently. The buzzer will immediately stop sounding, however, when the lap belt is fastened.

(2) SHOULDER BELT INSTALLATION REMINDER LIGHT

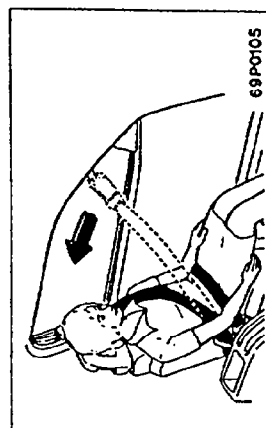
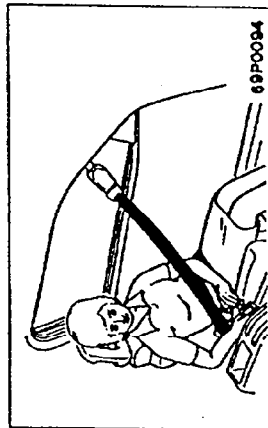
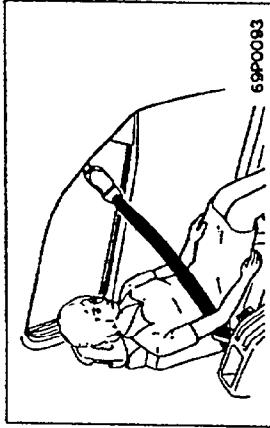
While the shoulder belt moves automatically to the set position (fasten), when the door is closed and the ignition key is turned to the "ON" position, the shoulder belt reminder light will blink on and off during that time.

(3) SHOULDER BELT RELEASE BUCKLE WARNING LIGHT AND BUZZER

If the release button for the belt at the driver's seat side is accidentally pressed, the buzzer will sound for about 6 seconds and the warning light will also blink on and off continuously for about one minute; for the belt at the passenger seat side, the warning light will illuminate for about one minute. If this happens, again buckle the shoulder belt, the buzzer will stop when the belt is buckled, and the warning light will stop.

(4) SHOULDER BELT RELEASE REMINDER BUZZER

When the door is opened and the sliding anchor begins to move to release the shoulder belt, the buzzer sounds for about one second.



Front Seat Belt Instructions

1. Get in the car, close the door and adjust the seat position.
2. Grasp the lap belt latch plate and pull the webbing, then push the latch plate into the buckle until a "click" is heard.

NOTE

Pull the lap belt fully out to convert the ELR (emergency locking retractor) to the ALR (automatic locking retractor) function in order to install a child restraint system to the front passenger's seat. (See "Installing a Child Restraint System to the Front Passenger's Seat" on page 27.)

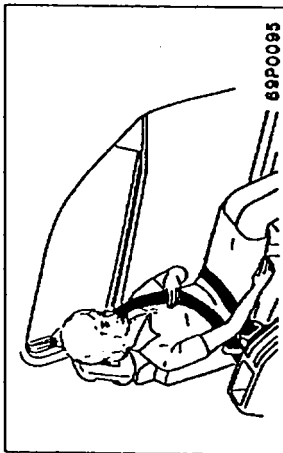
3. Turn the ignition key to the "ON" position; the shoulder belt will move automatically to the set position (fasten).

CAUTION

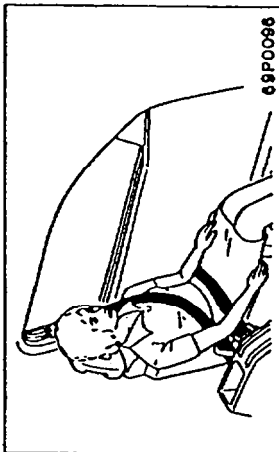
Be careful that the driver's or a passenger's finger is not caught and pinched by the shoulder belt sliding anchor while it is moving. Be careful that the shoulder and lap belts do not cross. If they do, the lap belt could injure the abdomen in the event of sudden braking or a collision.

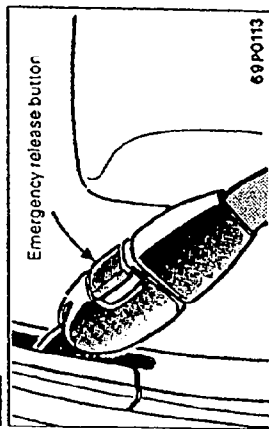


4. Pull up the shoulder belt and lap belt slightly to be sure that there is no excess slack or tightness in the belts. The belts will retain a small amount of looseness necessary for comfort during driving. If a belt is too tight, pull it up slightly and let it return. The belts will not tighten during normal use; therefore you can set them once for safe, comfortable snugness.



5. The belts will allow unrestricted movement under normal conditions. The belts will lock in the event of an accident.

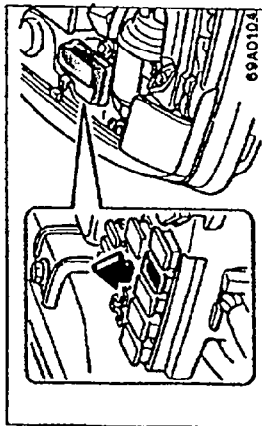




Emergency Release Button
If the shoulder belt sliding anchor is locked in an emergency, push the emergency release button to release the shoulder belt. Use this button only when the shoulder belt prevents you from leaving the car in an accident or when installing a child restraint system to the front passenger's seat.

CAUTION

Do not press the emergency release button except in an emergency in order to maintain the normal shoulder belt restraint.



MANUAL INSTALLATION OF AUTOMATIC SHOULDER BELTS

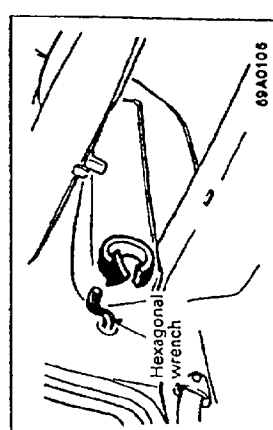
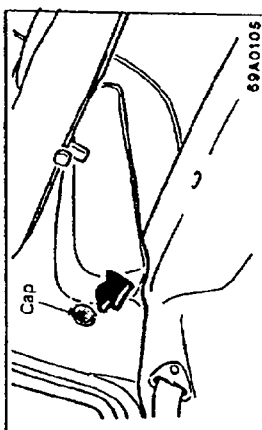
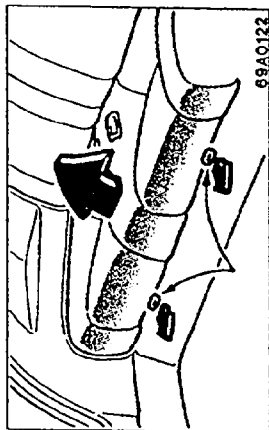
If the automatic shoulder belt sliding anchor stops before its movement is complete and does not move farther, follow the steps below to turn the motor manually, move the sliding anchor to the installation position, and then attach the shoulder belt to the buckle.

Before driving, be sure your belt is properly fastened.

When the motor is turned manually, remove the fusible link in the relay box.

CAUTION

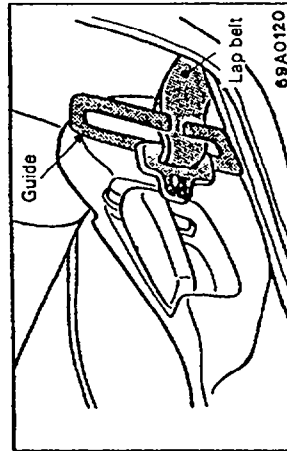
If the fusible link is not removed, an injury may result when the motor starts.



1. Pull out the lock knobs at the lower part of the rear seat cushion, and then lift the cushion.

2. Remove the cap.

3. Fit the wrench (included with the car's tools) into the trim hole; turn the wrench so as to move the sliding anchor to the installation position.



NOTE
 (1) Do not try to use the air conditioner while the fusible link is removed so that the automatic seat belt can be moved manually. This fusible link is also used for the condenser fan of the air conditioner, so the air conditioner cannot be used while the fusible link is removed.

- (2) If the movement of the sliding anchor of the shoulder belt is not smooth (if, for example, dirt or other foreign material increases the sliding resistance of the sliding anchor, etc.), or if it stops before its movement is complete, request an authorized dealer to check the belt; if the problem cannot be resolved, the shoulder belt must be replaced as a complete assembly.
- (3) If the outside air temperature is low, the time required for the operation of the sliding anchor becomes longer; this is not a malfunction, however, that time becomes shorter when the temperature increases.

- (4) In order to maintain smooth operation of the lap belt, be sure to use it after first passing the webbing through the guide shown in the figure.

- (5) If the belt does not fully retract, pull it out and check for kinks or twists. Then make sure that it remains unwisted as it retracts. Be sure that the latch plate is at the stowed position. If the shoulder belt and/or lap belt become scarred or otherwise damaged, replace the belts as a complete assembly.

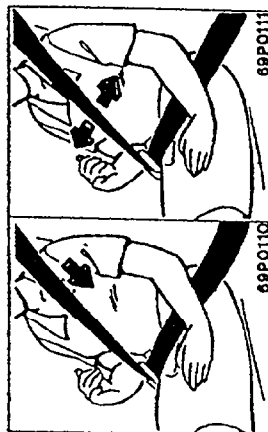
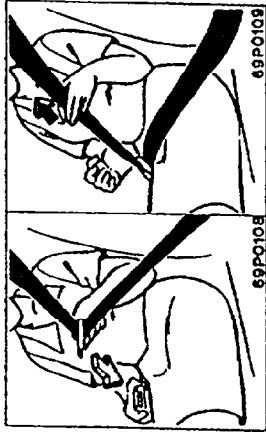


Seat Unibelt Restraint System

ND068-Ka

Rear seats are equipped with a UNIBELT system which uses a single belt and an emergency locking retractor.

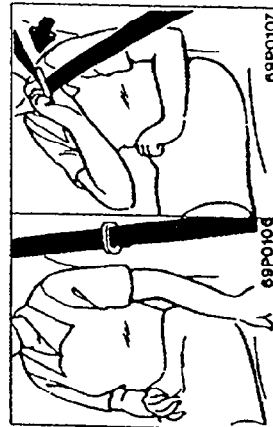
This system is designed to provide comfort and safety by permitting full extension and automatic retraction of the belts during normal car operation. A sensing device inside the belt retractor is designed to lock the retractor in the event of an abrupt change in car motion.



Unibelt Instructions

ND06D-Ab

1. Get in the car and sit in the normal correct posture.
2. Grasp the movable latch plate and slide it up the webbing as far as necessary so that it will be easy to pull across your body. After a couple of tries, this will become an automatic one-handed operation.



3. Pull the webbing, and move the movable latch plate toward the buckle. This system will not lock up if you stop or hesitate, so relax and continue to "buckle-up". Push the latch plate into the buckle until a "click" is heard.
 4. Pull up on the shoulder belt to insure that there is no slack in the lap belt. The lap belt will not tighten during use; therefore, you can set it once for safe, comfortable snugness.
 5. Check the belt slackness. The belt will retain the small amount of slack necessary for comfort when you return to your normal seating position. If the belt is still too tight, pull out 6" or 8" of webbing, let it return to your chest, and repeat the above motion.
 6. The shoulder belt will allow unrestricted movement under normal conditions. The belt will lock in the event of an accident.
- To release the belt, push the button on the buckle. To return the belt to its stowed position, pull the shoulder belt down slightly and release immediately.

Child Restraint

ND06F.AR

When transporting children in your car, some type of restraint system should be used regardless of the size of the child. This is required by law in most states.

The child restraint system is most effective when installed in the rear seat by using a locking clip. It may be installed in the front passenger's seat by converting from the ELR (emergency locking retractor) to the ALR (automatic locking retractor) function of the lap belt.

However, according to accident statistics, children are safer when properly restrained in the rear seating positions rather than the front. Holding a child in your arms is no substitute for a restraint system. Failure to use a proper restraint system can result in severe or fatal injury to your child.

Infants and Small Children

For babies weighing up to approximately 9 kg (20 lbs.), a good infant carrier should be used. For small children over 9 kg (20 lbs.), a good child seat should be used.

Before purchasing a restraint system, make sure that it has a label certifying that it meets applicable Federal Motor Vehicle Safety Standards.



The restraint system should be appropriate for your child's weight and height.

This information can be found on the restraint system's label or instructions. After purchasing the restraint system, carefully follow the instructions that come with it. Failure to do so can result in severe or fatal injury to your child.

When not in use, keep your child or infant seat secured with the seat belt or remove it from the car in order to prevent injury to occupants in the event of a sudden stop.

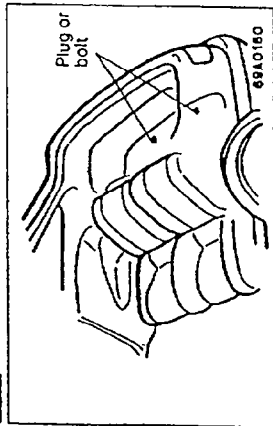
Installing a Child Restraint System in the Rear Seat

A seat belt locking clip must be used with your child restraint system when used with unbelt. If a locking clip has not been supplied with your child restraint system, it may be purchased from your authorized dealer. Failure to use the seat belt locking clip as directed may result in severe or fatal injury to your child in the event of an accident.

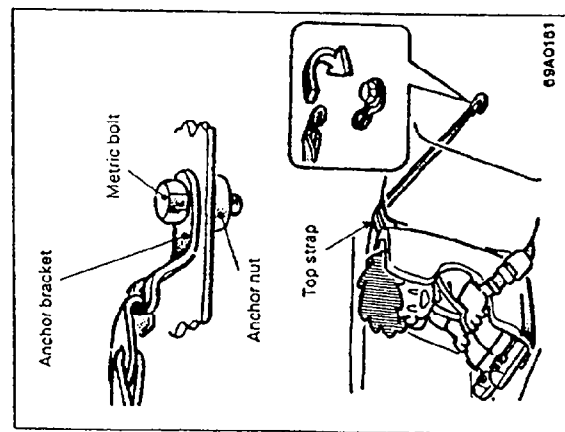
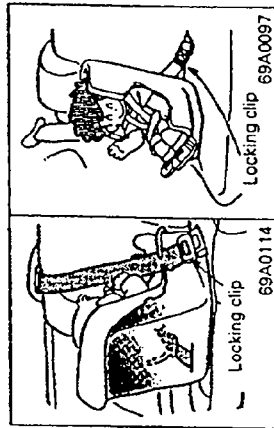
To use the locking clip, install the child restraint system according to the instructions that come with the child restraint system/locking clip.

Make sure that the seat belt is snug on the child restraint system.

Do not allow the latch plate to slide along the webbing.



Your car is provided with anchor bracket mounting nuts to secure the top strap of the child seat. If your child seat has a top strap, observe the following. The anchor nuts are welded to the back of the sheet metal of the rear floor panel and concealed by plugs, or bolts.

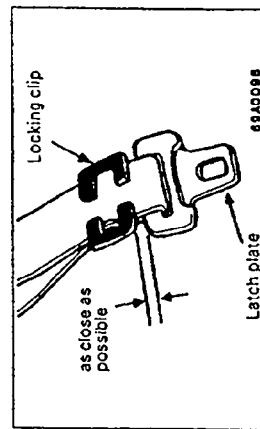


A metric bolt is required to install the anchor bracket.

NOTE

- (1) The bolt attached to the child restraint system may not be a metric type.
- (2) Anchorage hard wear (anchor bracket and metric bolt) and installation instructions are available from authorized dealer.

Hook the top strap to the anchor bracket and tighten the top strap.



Installation

1. Place the child restraint system on the seating position as shown in the illustration.

NOTE

For safety, an infant carrier should face backward; a child seat should face forward.

2. Fasten the seat belt around or through the child restraint system according to manufacturer's instructions.
3. Buckle the seat belt and keep all slack out of the lap portion of the belt.
4. Grasp the lap and shoulder portions of the seat belt as close to the latch plate as possible and unbuckle the seat belt.
5. Install a locking clip as shown in the illustration.
6. Buckle the seat belt again and check that the seat belt is snug against the child restraint system.

CAUTION

To help lessen the severity of injury in an accident, the locking clip must be removed from the seat belt webbing when the seat belt is to be used for normal restraint.



Installing the Child Restraint System in the Front Passenger's Seat

1. Push the emergency release button to detach the automatic shoulder belt and stow the belt in the retractor.

CAUTION

Do not use the automatic shoulder belt when installing an infant carrier or a child seat. Use the lap belt as described below.

2. Slide the seat all the way backward and place the infant carrier or child seat onto the seat.

NOTE

For safety, an infant carrier should face backward; a child seat should face forward.

3. Pull the lap belt out so that all webbing is exposed, and convert the retractor function from ELR (emergency locking retractor) to ALR (automatic locking retractor). To convert the ALR to the ELR function, move the latch plate to the fully stowed position.

Convert the retractor function from

ELR
(emergency locking retractor)

to

ALR
(automatic locking retractor)



CAUTION

Be absolutely sure to make the conversion of the retractor from the ELR function to the ALR function. By doing so, the infant carrier or child seat is always tightly secured to the front passenger seat by the automatic lock. If the conversion to ALR is not made, the infant carrier or child seat will move forward in the event of sudden braking or an accident.

4. Pass the lap belt through the infant carrier or child seat and insert the latch plate into the buckle.

CAUTION

Be sure the lap belt is not twisted.

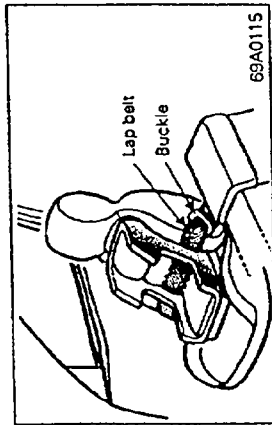
5. Once again check to be sure the lap belt has been converted to the ALR function and that it is securely locked.

Children too Large for Child Seats

Children too large for child seats can use the combination lap shoulder belt.

If the shoulder belt crosses the face or neck, place the child closer to the center of car.

Make sure that the child is seated upright in the seat with the lap belt fastened low on the hips and as snug as possible. Belt fit should be checked periodically, in case the belt has been mispositioned by the child's squirming or slouching.



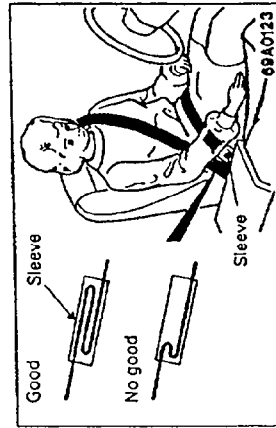
CAUTION

A child should never be left unattended in your car.

Pregnant Woman Restraint

ND06G-A

Mitsubishi Motor Sales of America, Inc. recommends that pregnant women use the available seat belts. This will reduce the likelihood of injury to both the woman and the unborn child. The lap belt should be worn across the thighs and as snug against the hips as possible, but not across the waist.



Maintenance and Inspection of Seat Belts

ND06H-Ca

The webbing used in belts may be cleaned with a hydrocarbon dry cleaner or with soap or detergent in water.

Do not attempt to bleach or re-dye belts. The resulting color may rub off and webbing strength could be affected.

Regularly check lap belt buckles and release mechanisms for positive action and automatic locking retractors for positive engagement.

Check that the anchor mounting bolts are tight. If the seat belt webbing shows obvious cuts, protruding broken fibers causing a local increase in webbing thickness, or severe fading which indicates weakening by exposure to sunlight, the seat belt should be replaced.

The lap belt of the driver's seat has on it a sleeve inside which the seat belt webbing is folded back over itself in a loop so as to absorb the energy of a shock by pulling loose and releasing slack. In the event that the loop inside the sleeve has come loose, replace the seat belt.

D-12

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