REPORT NO. MSE-92-N06

R92027-06

1731

# NEW CAR ASSESSMENT PROGRAM (NCAP)
# FRONTAL BARRIER IMPACT TEST

HONDA MOTOR COMPANY, LTD.
1992 MAZDA MX3
2 DOOR HATCHBACK (ACP)
NHTSA NO. MN5401

MOBILITY SYSTEMS AND EQUIPMENT COMPANY
9920 LA CIENEGA BOULEVARD SUITE 708
INGLEWOOD, CALIFORNIA 90301

JUNE 26, 1992

FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF MARKET INCENTIVES
400 Seventh Street, S.W.
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MOBILITY SYSTEMS AND EQUIPMENT COMPANY

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SEP 03 1992
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15. Supplementary Notes

16. Abstract

A 35 mph frontal barrier impact test using a load cell barrier was conducted on a 1992 Mazda MX-3, 2 Door Hatchback at the Mobility Systems and Equipment Company (MSE) crash test facility in San Bernardino, CA, on June 5, 1992.

The barrier impact velocity was 35.23 mph, and the ambient temperature at the barrier face at the time of impact was 84 deg. F. The post-test vehicle crush maximum was 21.7 in.

A summary of occupant injury measure data from the test appears below:

| Injury Criteria Threshold Value | Driver Dummy | Passenger Dummy |
|---|---|---|
| Head Injury Criterion HIC = 1000 | 921 | 807 |
| Chest Resultant Peak 60 Gs (3 ms clip) | 54 | 51 |
| Femur Load Left | 701 | 894 |
| 2250 Pounds Right | 540 | 1098 |

TYPE OF RESTRAINT SYSTEM: 2 point automatic shoulder and 2 point manual lap belt system at each front outboard seating position.

| 17. Key Words | 18. Distribution Statement |
|---|---|
| 35 MPH FRONTAL BARRIER IMPACT TEST<br>NEW CAR ASSESSMENT PROGRAM (NCAP)<br>1992 MAZDA MX3, 2 DOOR HATCHBACK (ACP) | COPIES OF THIS REPORT ARE AVAILABLE FROM:<br>Technical Reference Division<br>Nat'l Hwy. Traffic Safety Admin.<br>Room 5108, Nassif Building<br>400 7th St. S.W. Wash. DC 20590 |

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TABLE OF CONTENTS

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## SECTION 1

## PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is a part of the FY'92 Vehicle Barrier Impact and Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-90-D-32121. 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 January 1990.

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## SECTION 2

## SUMMARY OF FRONTAL BARRIER IMPACT TEST

A barrier was impacted by a 1992 Mazda MX3, 2 Door Hatchback, NHTSA No. MN5401, at a velocity of 35.23 mph. The frontal impact test was conducted by Mobility Systems and Equipment Company (MSE) on 05 June 1992. The general test and vehicle description information are presented in Tables 1 and 2. Pretest and posttest photographs of the test vehicle and dummies are shown in Appendix A.

Two (2) Part 572 50th percentile adult male Anthropomorphic Test Devices (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 (60) channels of crash parameters were recorded using two (2) FM tape recorders and two (2) direct analog to digital acquisition unit and data acquisition computers. Time history plots of all recorded channels are presented in Appendix B.

### 2.1 GENERAL COMMENTS

The 1992 Mazda MX3, 2 Door Hatchback, was equipped with 112.5 cubic inch, 6 cylinder engine and 4 speed automatic transmission. The test weight of the 1992 Mazda MX3, 2 Door Hatchback, with two (2) 50th percentile male dummies, instrumentation, and cameras was 3,053 pounds.

The 1992 Mazda MX3, 2 Door Hatchback, was involved in a barrier crash at a velocity of 35.23 mph.

The maximum static crush for the vehicle of 21.7 inches occurred 5.5 inches to the right of the centerline of the 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's ATD's face hit the steering wheel center hub. The top of his head hit the top of the steering wheel. The driver's left and right knees hit the dash panel. The driver ATD had a HIC value of 921, the maximum chest acceleration (resultant clipped) was 54 g's and the maximum femur loads were 701 (left) and 540 (right) pounds.

The passenger ATD's head grazed the ceiling and his chin contacted his chest. Both of his knees hit the dash panel. The HIC value for the passenger ATD was 807, the maximum chest acceleration (resultant clipped) was 51 g's, and the maximum femur loads were 894 (left) and 1098 (right) pounds.

Seat belt spoolout, measured by high-speed film analysis, was 2.5 inches for the driver 2.0 inches for the passenger.

There were no apparent visual indications of any stoddard solvent leaks or windshield periphery separations. The corner of the hood contacted the extreme lower right corner of the windshield.

Appendix D shows occupant restraint system instructions by the manufacturer and Appendix E shows the instrumentation and calibration data.

Data Table No. 1 Test Vehicle Data

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1992/MAZDA MX3/2 DOOR HATCHBACK

VEHICLE NHTSA NO.: M N 5 4 0 1 VIN: J M 1 E C 4 3 2 4 N 0 1 3 0 1 3 1

VEHICLE BODY COLOR: GREEN ; MONTH & YEAR OF MANUFACTURE: 03/92

ENGINE: 6 Cylinders; 112.5 C.I.D; 1.8 Liters; _____ CC
X Gas; _____ Diesel: _____ Turbocharged
PLACEMENT-- _____ Longitudinal; X Transverse (Lateral)

TRANSMISSION: 4 Speed; ____ Manual; X Automatic;_____ Overdrive
FINAL DRIVE: X Front Wheel Drive ___ Rear Wheel Drive;
____ Four Wheel Drive

DATE VEHICLE AVAILABLE FOR 35 MPH CRASH TESTING: _____

ODOMETER READING: 80 miles; OPTIONS: X A/C; X P/S; X P/Wdo.; ___
X Tilt Whl.; X Cruise Control

**DATA RECORD FROM VEHICLE'S TIRE PLACARD:**

Tire Pressure (at capacity): 28 psi Front; 28 psi Rear
Recommended Tire Size: P205/55 R15 87V
Tires on Vehicle: P205/55 R15 87V ; Manufacturer: Yokohama
Number of Occupants: 2 Front; 2 Rear; N/A 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 = 680 lbs. (A)
No. of Occupants x 150 lbs.- - - = 600 lbs. (B)
Cargo Capacity (A - B )- - - - - = 80 lbs.

**TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:**

Right Front = 814 lbs.
Left Front = 906 lbs. TOTAL FRONT = 1720 lbs.(65.0% of TOTAL)
Right Rear = 510 lbs.
Left Rear = 432 lbs
TOTAL WEIGHT = 2662 lbs. TOTAL REAR = 942 lbs.(35.0% 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 = 2662 lbs.
Maximum Cargo Carrying Capacity of Test Vehicle*- - - - - 80 lbs.
Weight of Two P.572 Dummies (2 x 164 lbs.)- - - - - - - - 328 lbs.
TEST VEHICLE TARGET WEIGHT 3070 lbs.
*300 lbs. for light trucks and MPVs

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front = 909 lbs. TOTAL FRONT = 1874 lbs.(61.0% of TOTAL)
Left Front = 965 lbs.
Right Rear = 623 lbs. TOTAL REAR = 1179 lbs.(39.0% of TOTAL)
Left Rear = 556 lbs.

TOTAL WEIGHT= 3053 lbs. (which includes N/A lbs. of cargo ballast weight placed in the cargo/luggage area)

VEHICLE COMPONENTS REMOVED TO MEET TARGET WEIGHT:

1. X Spare Tire
2. X Rear Bumper Assembly
3. X Tail lamp hsg. X Rt.Side X Left Side
4. Rear Seat Assembly, Side Mirrors.

TEST VEHICLE ATTITUDE:

As Delivered----Right Front = 26.0 inches
Left Front = 26.0 inches
Right Rear = 26.7 inches
Left Rear = 26.0 inches

Ready For Test--Right Front = 25.4 inches
Left Front = 25.6 inches
Right Rear = 25.3 inches
Left Rear = 24.8 inches

Test Vehicle Wheelbase: 96.7 inches; C.G.= 37.3 inches rearward of front wheel centerline

Total Vehicle Length:

Right Side = 151.7 inches
Left Side = 151.7 inches
Centerline = 160.0 inches

Data Table No. 2 Post Crash Test Data

DATA OF 35 MPH FRONTAL BARRIER IMPACT RATING TEST: 06/05/92

TIME OF TEST: 4:10 PM: AMBIENT TEMPERATURE AT BARRIER FACE: 84 °F

VEHICLE'S OCCUPANT COMPARTMENT TEMPERATURE: 76 °F

(spec. Range = 66 to 78 °F.)

VEHICLE WINDSHIELD MOLDING TEMPERATURE: 76 °F.

VEHICLE IMPACT VELOCITY: Primary Speed Trap = 35.23 mph
Secondary Speed Trap 35.17 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 =151.7"; C/Line=160.0"; Left Side=151.7"
Vehicle Post-test Length-Right Side=134.8"; C/Line=139.1"; Left Side=137.0"
Vehicle Static Crush --- Right Side= 16.9"; C/Line= 20.9"; Left Side= 14.7"

VEHICLE REBOUND FROM BARRIER FACE:

Vehicle Right Side = 18.0 inches
Vehicle Centerline = 15.8 inches
Vehicle Left Side = 19.5 inches

VEHICLE DUMMY CONTACT POINTS:

| | DRIVER (I.D. No. 814) | | | PASSENGER (I.D. No. 183) | | |
|---|---|---|---|---|---|---|
| | Strg.Col. Hub | Strg. Wheel | Instru. Panel | Instru. Panel | Knee Assy. | Glove Box Door |
| HEAD | YES | YES | NO | NO | NO | NO |
| RIGHT KNEE | //////// | ///// | YES | NO | ////// | YES |
| LEFT KNEE | //////// | ///// | YES | NO | ////// | YES |

VEHICLE DOOR OPENING INFORMATION:

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

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

VEHICLE'S FRONT SEAT MOVEMENT DURING CRASH EVENT:

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

Details of Any Failure: N/A

OTHER NOTABLE IMPACT EFFECTS: N/A

## 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: 1992 MAZDA MX3 2 DOOR HATCHBACK

VEH. NHTSA NO.: MN5401 ; TEST DATE: 06/05/92

| MAXIMUM ACCELERATION VALUES: | | DRIVER DUMMY # 814 | PASSENGER DUMMY # 183 |
|---|---|---|---|
| Head Channel X | HEAD X | -78.3 | -47.7 |
| Head Channel Y | Y | -27.2 | -10.9 |
| Head Channel Z | Z | 87.2 | 68.2 |
| HEAD RESULTANT | R | 98.0 | 73.9 |
| Chest Channel X | CHEST X | -48.9 | -48.6 |
| Chest Channel Y | Y | 15.2 | -12.1 |
| Chest Channel Z | Z | 27.6 | 21.1 |
| CHEST RESULTANT | R | 53.8 | 51.4 |
| TIME INTERVAL (seconds) | | 0.0710 - 0.0740 | 0.0717 - 0.0747 |

HEAD INJURY CRITERIA (HIC) VALUES:

| | | | |
|---|---|---|---|
| HIC | HIC | 920.6 | 806.6 |
| $t_1$ (seconds) | | 0.0695 | 0.0742 |
| $t_2$ (seconds) | | 0.0994 | 0.1102 |
| Avg. Accel. $t_1$ to $t_2$ | | 62.3 | 54.9 |

MAXIMUM FEMUR FORCES:

| | | | |
|---|---|---|---|
| Right Side (lbs.) | FR | -540.4 | -1097.5 |
| Left Side (lbs.) | FL | -700.8 | -894.0 |

MAXIMUM SEAT BELT FORCES:

| | | | |
|---|---|---|---|
| Lap Belt | LAP | 1060.0 | 1040.8 |
| Shoulder Belt | SHLDR | 1889.3 | 1886.4 |

MAXIMUM SEAT BELT WEBBING SPOOL-OUT:

| | | |
|---|---|---|
| Lap/Shoulder Belt Combination | 2.5 | 2.5 |

Data Table No. 4 Test Dummy Positioning Data

PRE-IMPACT DATA:

Make/Model: MAZDA MX3

Body Style: 2 DOOR HATCHBACK Model Year: 1992

NHTSA No.: MN5401 Color: GREEN

DATA FROM CERTIFICATION LABEL:

Vehicle Manufacturer: MAZDA

Date of Manufacture: 03/92 ; VIN: JM1EC4324N0130131

GVWR: 3349 lb; GAWR: Front = 1933 lb; Rear = 1426 lb

POST-IMPACT DATA:

Date of Test: 06/05/92 Time: 4:10 PM Temperature: 84 °F

Required Impact Velocity Range: 34.5 to 35.5 mph

Impact Velocity: Primary = _____ mph Secondary = _____ mph

Seat Type: Bucket Adjuster Type: Lever

Bucket Seat Back Type: Fixed Headrest

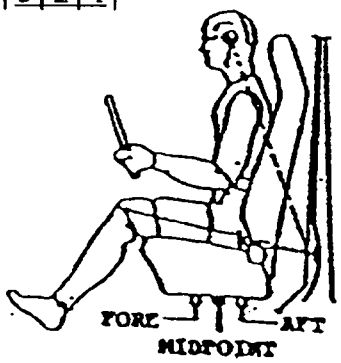
TECHNICIANS: Brian O'keefe, Levi Navarro

DRIVER DUMMY # |8|1|4|

HEAD 21.0 "
TARGET 66.0 °

KNEE 33.0 "
JOINT - 9.0 °

APPROX- 19.6 "
IMATE -25.0 °
"H"
POINT



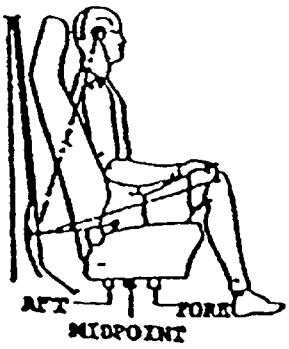

FORE AFT
MIDPOINT

PASSENGER DUMMY # |1|8|3|

21.0 " HEAD
66.0 ° TARGET

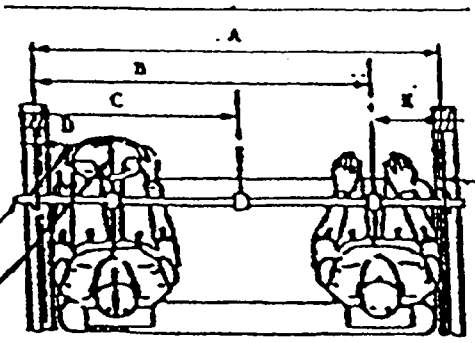
33.5 " KNEE
- 8.0 ° JOINT

19.3 " APPROX-
-25.0 ° MATE
"H"
POINT




AFT FORE
MIDPOINT

A = 56.2 "
B = 41.7 "
C = 28.1 "
D = 15.0 "
E = 14.5 "




LATERAL BAR

ADJUSTABLE
POINTER

DOOR
GLASS
HEIGHT

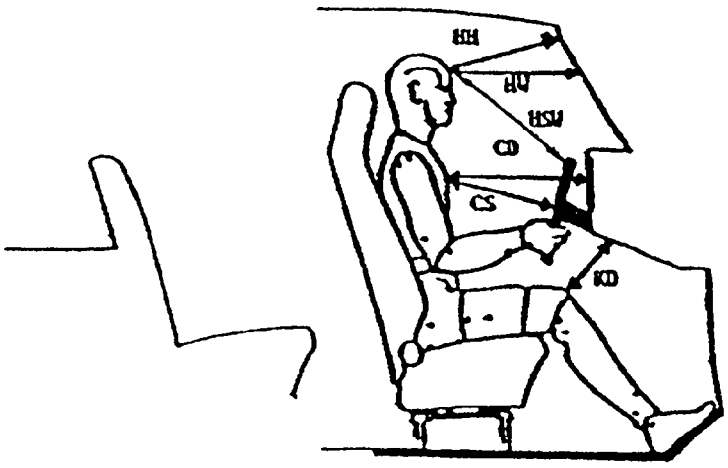
LEFT
FRONT
DOOR

RIGHT
FRONT
DOOR

DRIVER DUMMY # |8|1|4|

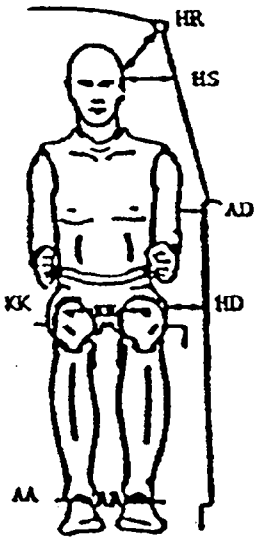
PASSENGER DUMMY # |1|8|3|

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




| | Driver | Passenger |
|---|---|---|
| HH | 14.0 | 14.0 |
| HW | 17.3 | 18.3 |
| CD | 21.5 | 21.5 |
| CS | 14.0 | N/A |
| KD | L- 6.0 | L- 6.0 |
| KD | R- 6.1 | R- 5.8 |
| Torso Angle | 19.8 | Torso Angle 16.0 |
| Seat Back Angle | 22.0 | Seat Back Angle 22.0 |
| HSW | 19.0 | 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.)

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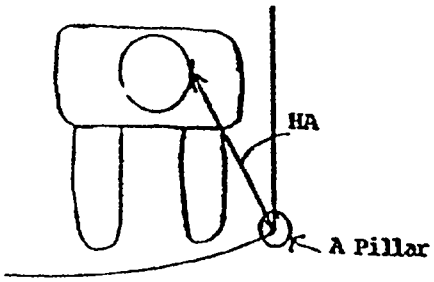
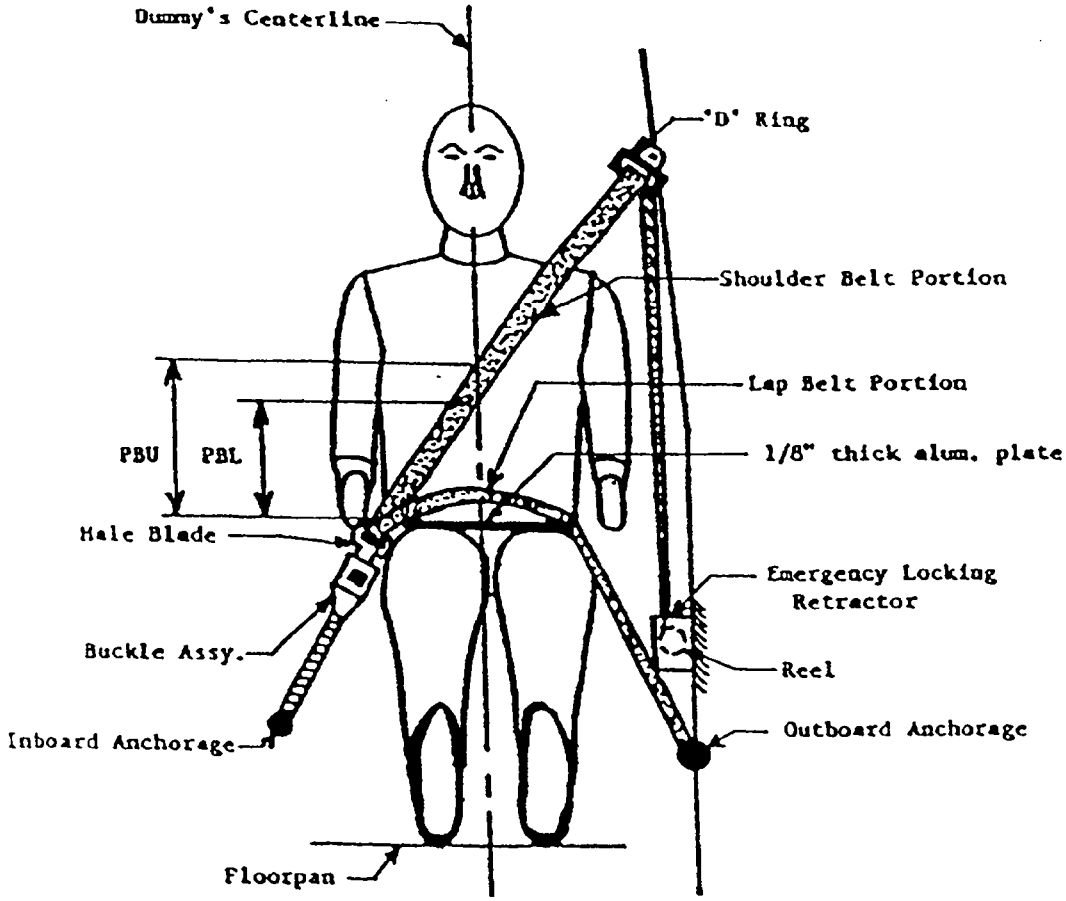



| | Driver | Passenger |
|---|---|---|
| HR | 2.5 | 3.0 |
| HS | 5.9 | 5.8 |
| AD | 3.5 | 3.5 |
| HD | 7.0 | 7.0 |
| KK | 15.0 | 12.0 |
| AA | 15.5 | 10.0 |
| HA | 14.5 | 13.0 |

Data Table No. 5 Seat Belt Positioning Data

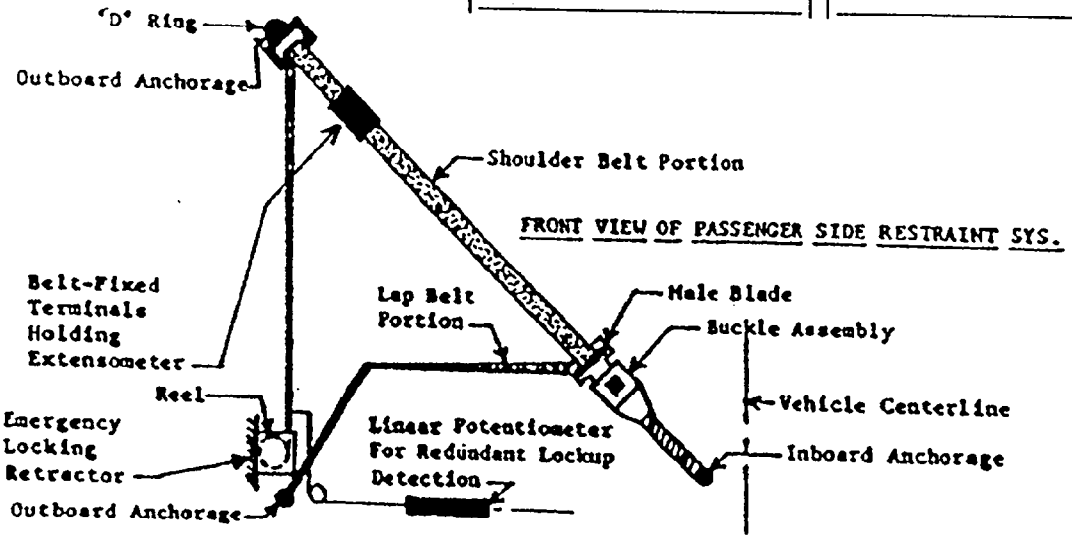



FRONT VIEW OF DRIVER DUMMY

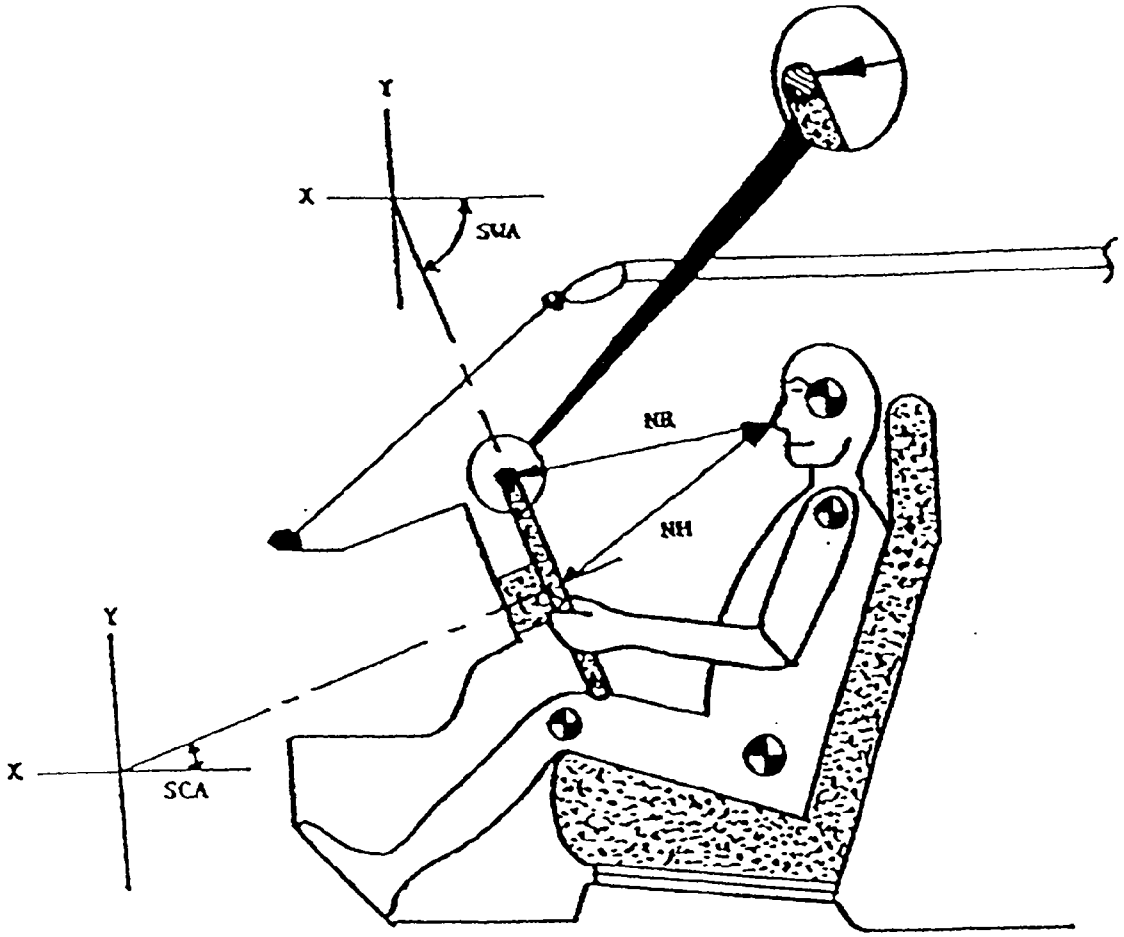
| | DRIVER DUMMY (inches) | PASSENGER DUMMY (inches) |
|---|---|---|
| PBU -- Top surface of alum. plate to belt upper edge | 15.5 | 16.9 |
| PBL -- Top surface of alum. plate to belt lower edge | 12.6 | 14.1 |
| LAP BELT TENSION, POUNDS | - | - |
| SHOULDER BELT TENSION, POUNDS | - | - |

Data Table 6 Seat Belt Performance Assessment Test Data

| | DRIVER SIDE | | PASSENGER SIDE | |
|---|---|---|---|---|
| BELT LENGTH DATA: | PRE-TEST | POST-TEST | PRE-TEST | POST-TEST |
| Total belt length from retractor reel to bolt hole anchor point for continuous webbing systems | N/A | N/A | N/A | N/A |
| Retractor reel to 'D' ring as measured on Part 572 | N/A | N/A | N/A | N/A |
| Shoulder belt length as measured on Part 572 dummy | 44.0 | 44.0 | 46.0 | 45.5 |
| Lap belt length as measured on Part 572 dummy | 30.0 | 30.0 | 29.0 | 30.0 |
| Remainder of belt webbing left on retractor reel | SH- 17.0<br>LAP-23.0 | 17.0<br>23.0 | SH- 15.5<br>LAP-23.0 | 16.0<br>22.0 |
| BELT SPOOL-OFF DATA: | | | | |
| As determined by film analysis | 2.5 in | | 2.0 in | |
| As determined electronically | N/A in | | N/A in | |
| As determined mechanically | 2.0 in | | 2.5 in | |
| BELT STRAIN DATA: | | | | |
| Measured between male blade and 'D' ring, electronically | 7.1 Percent | | 8.0 Percent | |
| mechanically | 0.0 Percent | | 0.0 Percent | |



Data Table No. 7 Driver Dummy to Steering Wheel Positioning




LEFT SIDE VIEW

| | MEASUREMENTS |
|---|---|
| NR--Distance from tip of dummy's nose to Top Rear surface of steering wheel rim. | 16.3 Inches |
| NH--Distance from tip of dummy's nose to center of steering column hub. | 18.3 Inches |
| SCA-Angle of steering column relative to the horizontal X axis. | 21.0 Degrees |
| SWA-Angle of steering wheel relative to the horizontal X axis. | 73.5 Degrees |

Data Table 8 Camera Location Data

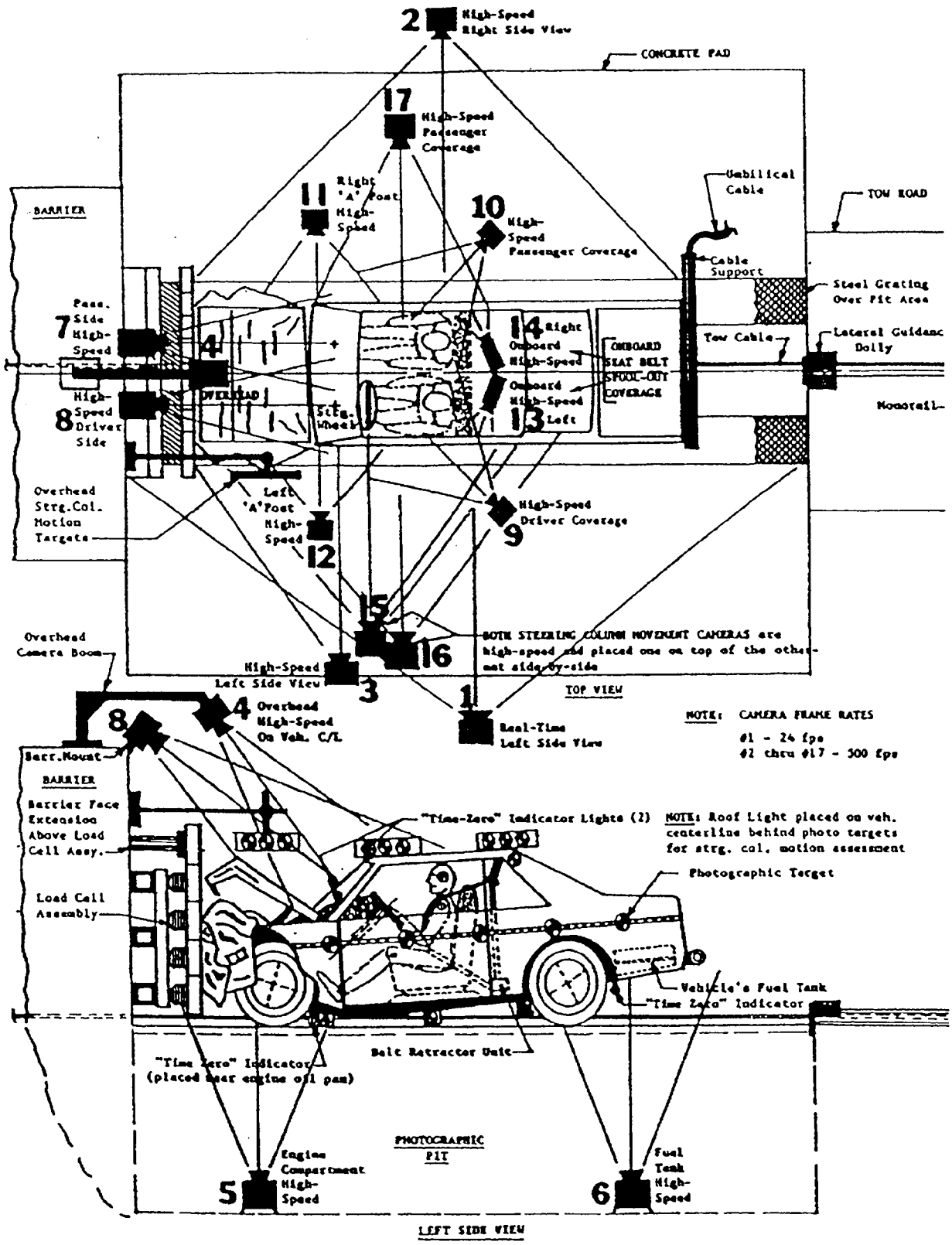
VEH. NHTSA NO.: MN5401 ; TEST DATE: 06/05/92 ; TIME: 4.10 PM

VEH. YEAR/MAKE/MODEL/BODY STYLE: 1992/MAZDA MX3, 2 DOOR HATCHBACK

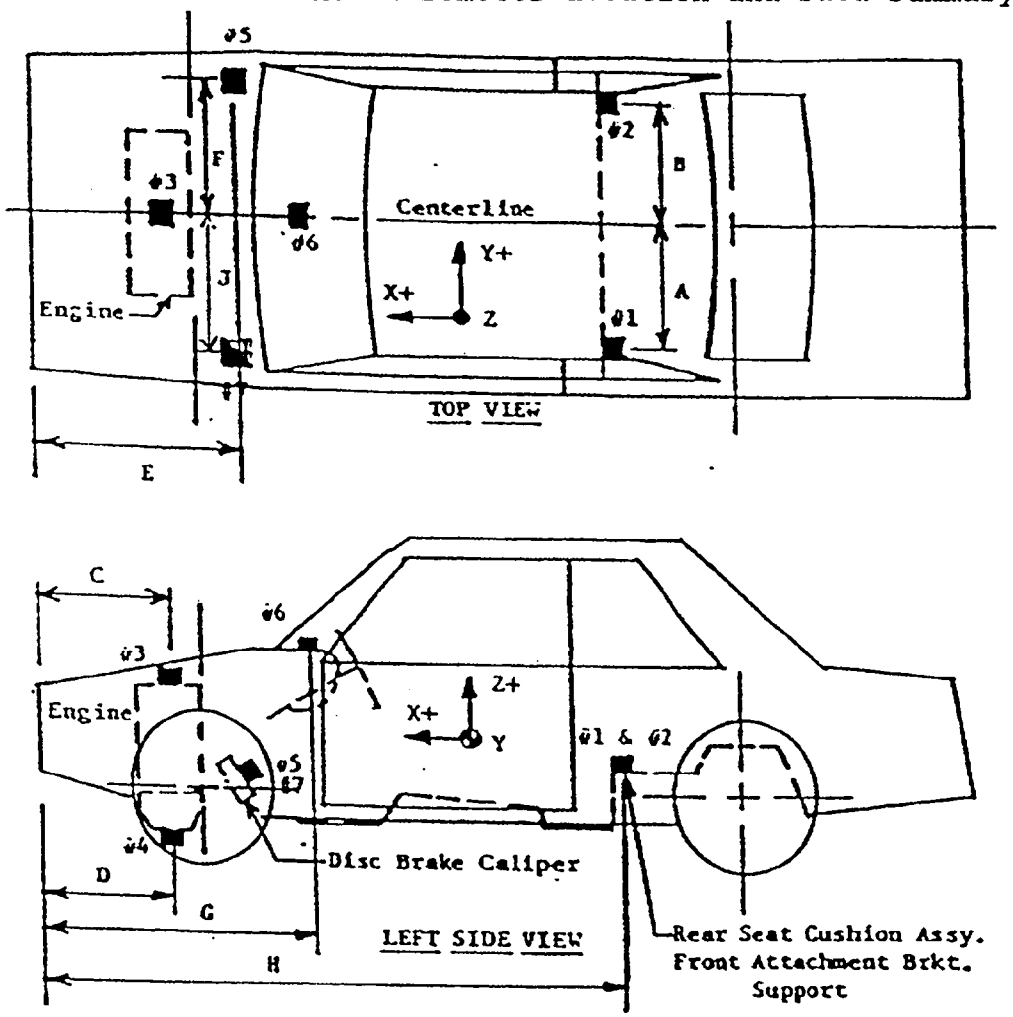
| CAMERA NO. | VIEW | CAMERA POS. (in.) X | Y | Z | ANGLE (deg) | FILM PLANE TO HEAD TARGET | LENS (mm) | SPEED (fps) |
|---|---|---|---|---|---|---|---|---|
| 1 | Left Side View | 231 | 565 | 134 | -20 | 573 | 15-70 ZOOM | 24 |
| 2 | Right Side View | 44 | 254 | 40 | + 1 | 243 | 13 | 600 |
| 3 | Left Side View | 48 | 390 | 68 | - 7 | 378 | 25 | 550 |
| 4 | Overhead | -14 | 0 | 159 | -64 | 159 | 13 | 670 |
| 5 | Pit-Engine | 25 | 0 | -72 | +90 | 135 | 13 | 600 |
| 6 | Pit-Fuel Tank | N.R. | N.R. | N.R. | N.R. | N.R. | N.R. | N.R. |
| 7 | Front-Passenger | -17 | 15 | 95 | -44 | 123 | 16 | 600 |
| 8 | Front-Driver | -17 | 13 | 95 | -41 | 123 | 16 | 610 |
| 9 | Left Side-Driver | 100 | 109 | 79 | -21 | 100 | 16 | 610 |
| 10 | Right Side-Passenger | 104 | 112 | 77 | -22 | 102 | 16 | 600 |
| 11 | Right Side-'A' Post | 6 | 197 | 45 | - 1 | 201 | 28 | 620 |
| 12 | Left Side-'A' Post | 25 | 439 | 5 | - 7 | 430 | 50 | 720 |
| 13 | Onboard-Left Side | 123 | 13 | 24 | -16 | 35 | 13 | 680 |
| 14 | Onboard-Right Side | 123 | 13 | 24 | -15 | 35 | 13 | 680 |
| 15 | Left Side-Steering Col. | 56 | 377 | 129 | -17 | 373 | 28 | 605 |
| 16 | Left Side-Steering Col. | 56 | 377 | 114 | -15 | 370 | 28 | 610 |
| 17 | Right Side Passenger | 82 | 138 | 53 | - 8 | 123 | 16 | 580 |

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

## CAMERA REQUIREMENTS FOR 35 MPH FRONTAL BARRIER IMPACT ASSESSMENT PROGRAM TEST



Data Table No. 9 Vehicle Accelerometer Location and Data Summary

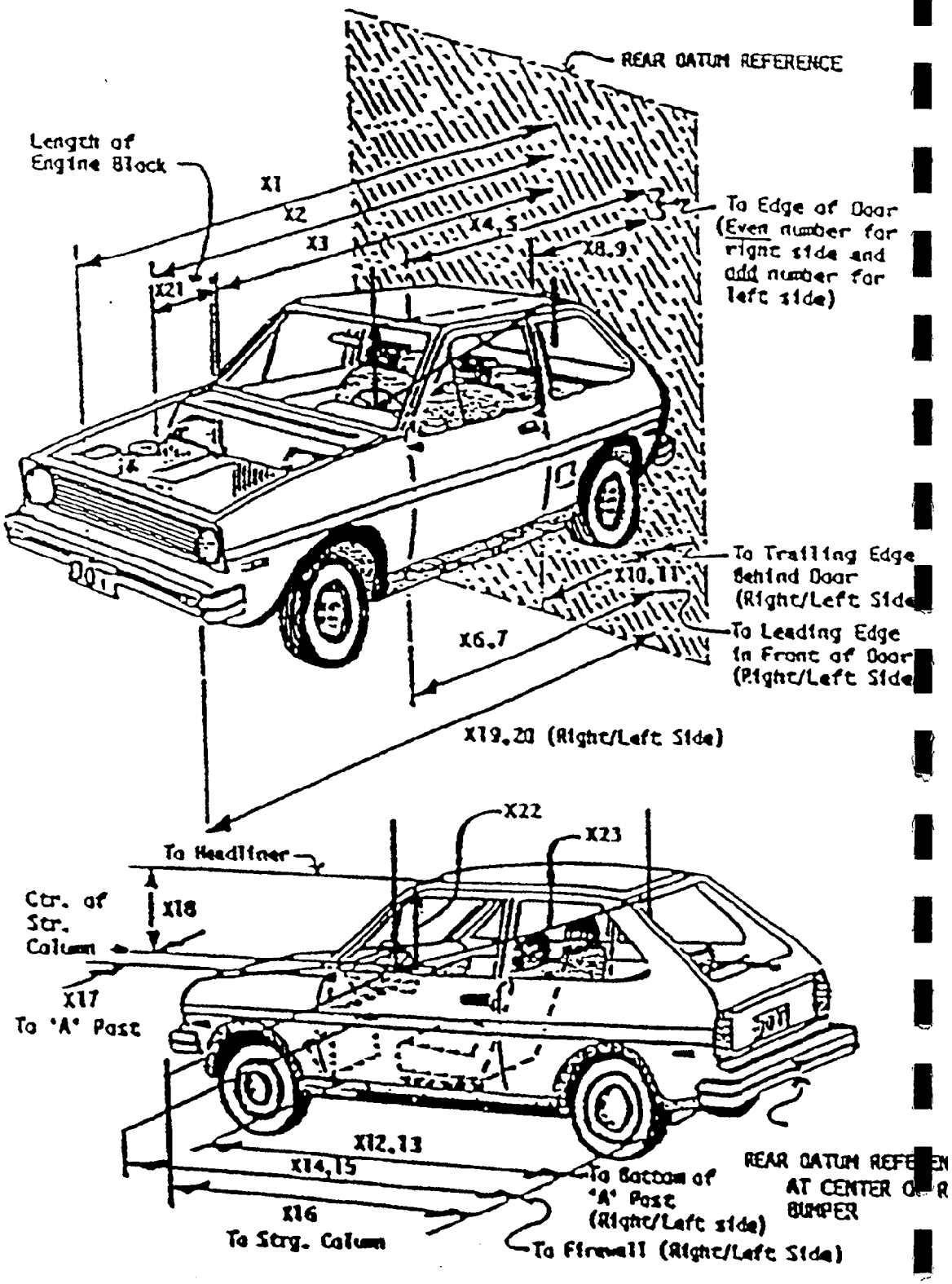



| Dimension | Length (in.) |
|---|---|
| A | 13.5 |
| B | 13.5 |
| C | 33.0 |
| D | 29.5 |
| E | 32.5 |
| F | 23.0 |
| G | 60.0 |
| H | 107.0 |
| J | 23.0 |
| K | 157.5 |

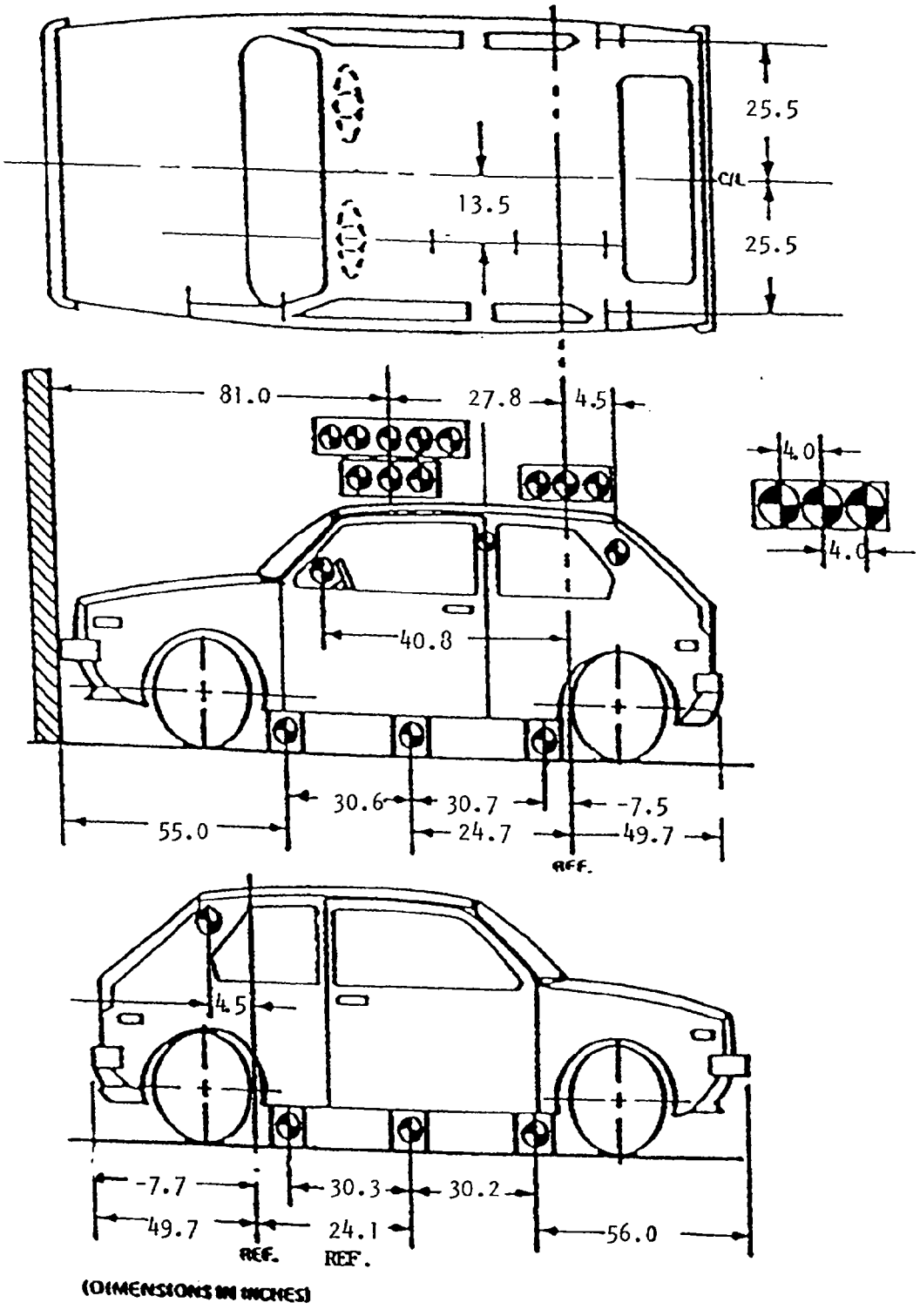
| Loc. No. | Description | Maximum Value X- | msec. | X+ | msec. |
|---|---|---|---|---|---|
| 1 | Rear seat X-member @ Left Side | 37.9 | 33.3 | 3.3 | 132.6 |
| 2 | Rear seat X-member @ Right Side | 35.7 | 49.1 | 3.3 | 132.8 |
| 3 | Top of Engine Block | 130.0 | 29.0 | 38.7 | 38.5 |
| 4 | Bottom of Engine Block | 173.0 | 23.3 | 48.6 | 70.7 |
| 5 | Disc Brake Caliper Right Side | 143.8 | 42.2 | 35.2 | 55.3 |
| 6 | Instrument Panel | 61.2 | 68.4 | 14.1 | 132.8 |
| 7 | Disc Brake Caliper @Left Side | 129.1 | 38.5 | 59.3 | 54.0 |
| Loc. No. | | Z- | msec | Z+ | msec |
| 8 | Center Rear X Member | 7.8 | 32.9 | 19.4 | 47.6 |
| 9 | Vehicle Rear | 7.6 | 18.1 | 13.3 | 57.0 |

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 | 160.0 | 139.1 | 20.9 |
| X2 | Rear Surface of Vehicle to Front of Engine | 143.0 | 133.5 | 9.5 |
| X3 | Rear Surface of Vehicle to Firewall | 116.0 | 108.1 | 7.9 |
| X4 | Rear Surface to Upr. Leading Edge of Right Door | 80.3 | 79.0 | 1.3 |
| X5 | Rear Surface to Upr. Leading Edge of Left Door | 80.6 | 79.9 | 0.7 |
| X6 | Rear Surface to Lwr. Leading Edge of Right Door | 102.4 | 101.0 | 1.4 |
| X7 | Rear Surface to Lwr. Leading Edge of Left Door | 102.9 | 102.0 | 0.9 |
| X8 | Rear Surface to Upr. Trailing Edge of Right Door | 53.0 | 51.6 | 1.4 |
| X9 | Rear Surface to Upr. Trailing Edge of Left Door | 53.5 | 52.8 | 0.7 |
| X10 | Rear Surface to Lwr. Trailing Edge of Right Door | 59.0 | 57.8 | 1.2 |
| X11 | Rear Surface to Lwr. Trailing Edge of Left Door | 59.4 | 58.6 | 0.8 |
| X12 | Rear Surface to Bottom 'A' Post on Right Side | 104.5 | 102.6 | 1.9 |
| X13 | Rear Surface to Bottom 'A' Post on Left Side | 105.0 | 104.0 | 1.0 |
| X14 | Rear Surface to Firewall on Right Side | 113.8 | 109.5 | 4.3 |
| X15 | Rear Surface to Firewall on Left Side | 114.5 | 112.0 | 2.5 |
| X16 | Rear Surface to Steering Column | 85.5 | 83.0 | 2.5 |
| X17 | Center of Steering Column to 'A' Post | 17.5 | 18.5 | -1.0 |
| X18 | Center Steering Column to Headlining | 16.0 | 16.0 | 0.0 |
| X19 | Rear Surface to Right Side of Front Bumper | 151.7 | 134.8 | 16.9 |
| X20 | Rear Surface to Left Side of Front Bumper | 151.7 | 137.0 | 14.7 |
| X21 | Length of Engine Block | 9.0 | 9.0 | 0.0 |

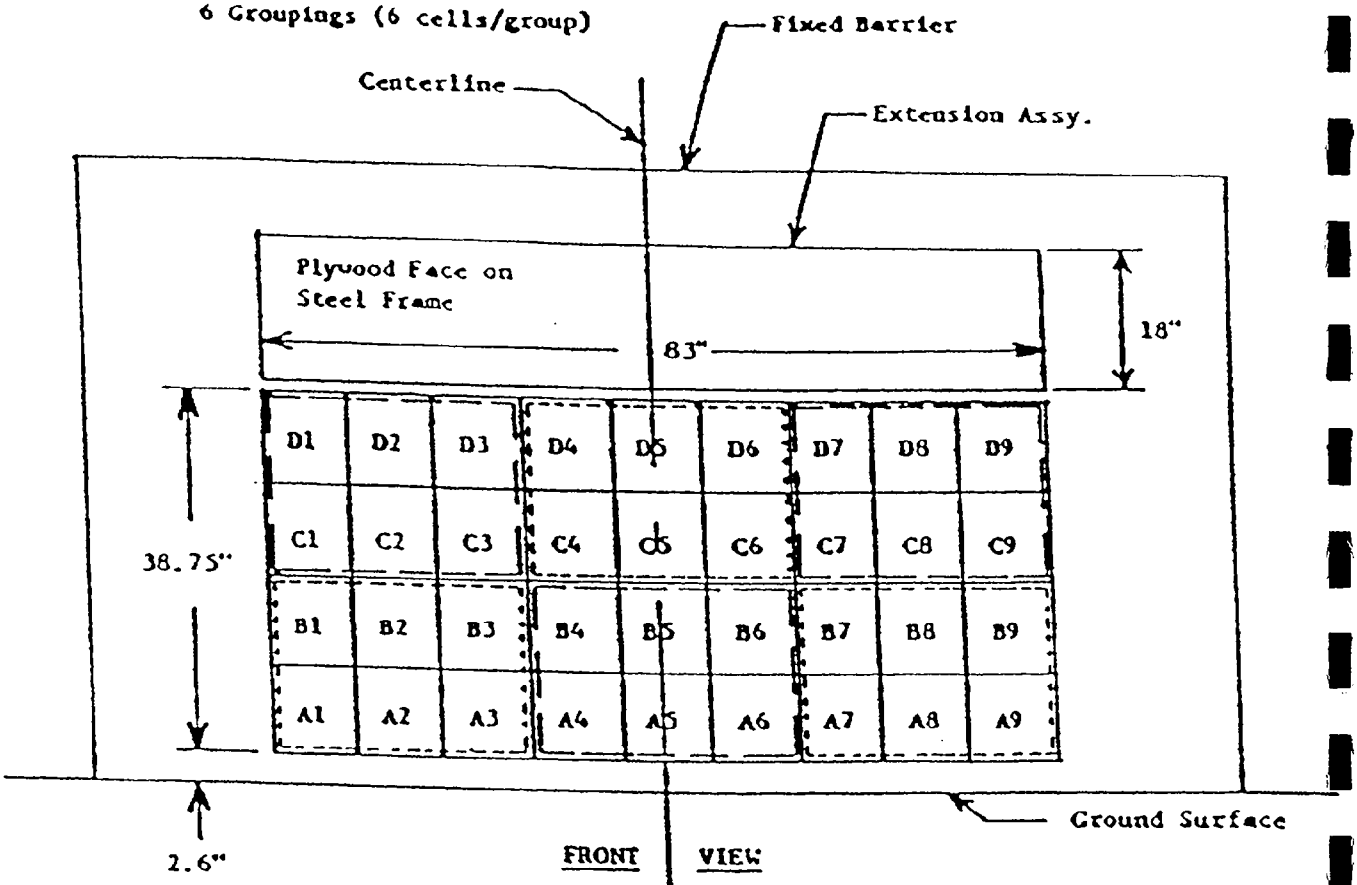

REAR DATUM REFERENCE
Length of Engine Block
X1
X2
X3
X4,5
X8,9
X21
To Edge of Door (Even number for right side and odd number for left side)
To Trailing Edge Behind Door (Right/Left Side)
X10,11
To Leading Edge In Front of Door (Right/Left Side)
X6,7
X19,20 (Right/Left Side)
X22
X23
To Headliner
Ctr. of Str. Column
X18
X17
To 'A' Post
X12,13
X14,15
X16
To Strg. Column
To Bottom of 'A' Post (Right/Left side)
To Firewall (Right/Left Side)
REAR DATUM REFERENCE AT CENTER OF REAR BUMPER

DATA TABLE No. 11 VEHICLE TARGET LOCATIONS



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)

ACCIDENT INVESTIGATION DIVISION DATA FOR 35 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY/STYLE: 1992 MAZDA MX3, 2 DOOR HATCHBACK

VEH. NHTSA NO.: MN5401 ; VIN: JM1EC4324NO130131

MODEL YEAR: 1992 ; BUILD DATE: 03/92 ; TEST DATE: 06/05/92

VEH. SIZE CATEGORY: 2 DOOR HATCHBACK; TEST WEIGHT: 3053 LB.

VEH. WHEELBASE: 96.7 IN; FRONT OVERHANG: 36.0 IN; OVERALL WIDTH: 66.7 IN

ACCELEROMETER DATA:

LOCATION: LEFT AND RIGHT SIDE PASSENGER COMPARTMENT

CALIBRATION PROCEDURE: 6 MO.S/DROP TEST

LINEARITY: GOOD ; INTEGRATION ALGORITHM: NHTSA STANDARD

VEH. IMPACT SPEED: 35.23 MPH ; TIME OF SEPARATION: 76 MSEC

VELOCITY CHANGE: 40.48 MPH (LEFT), 40.37 MPH (RIGHT)

COLLISION DEFORMATION CLASSIFICATION (CDC) CODE:

F (FRONTAL)

CRUSH DEPTH DIMENSIONS:

C1 = 16.4 INCHES

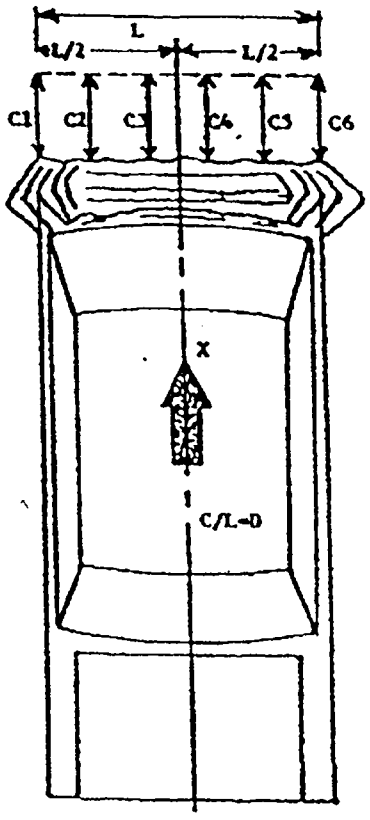
C2 = 20.5 INCHES

C3 = 21.0 INCHES

C4 = 21.7 INCHES

C5 = 20.4 INCHES

C6 = 17.4 INCHES




MIDPOINT OF DAMAGE:

D = VEHICLE CENTERLINE (LONGITUD.)

LENGTH OF DAMAGED REGION:

L = 55.0 INCHES



MSE-92-R92027-N06

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## 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 DUMMY & VEHICLE INTERIOR VIEW (Door Open)
POSTTEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
POSTTEST DRIVER DUMMY (ATD) STEERING COLUMN HUB/RIM CONTACT AND KNEE CONTACT AREA
POSTTEST PASSENGER DUMMY (ATD) KNEE CONTACT AREA

PRETEST FRONT VIEW

POSTTEST FRONT VIEW

PRETEST LEFT SIDE VIEW


POSTTEST LEFT SIDE VIEW

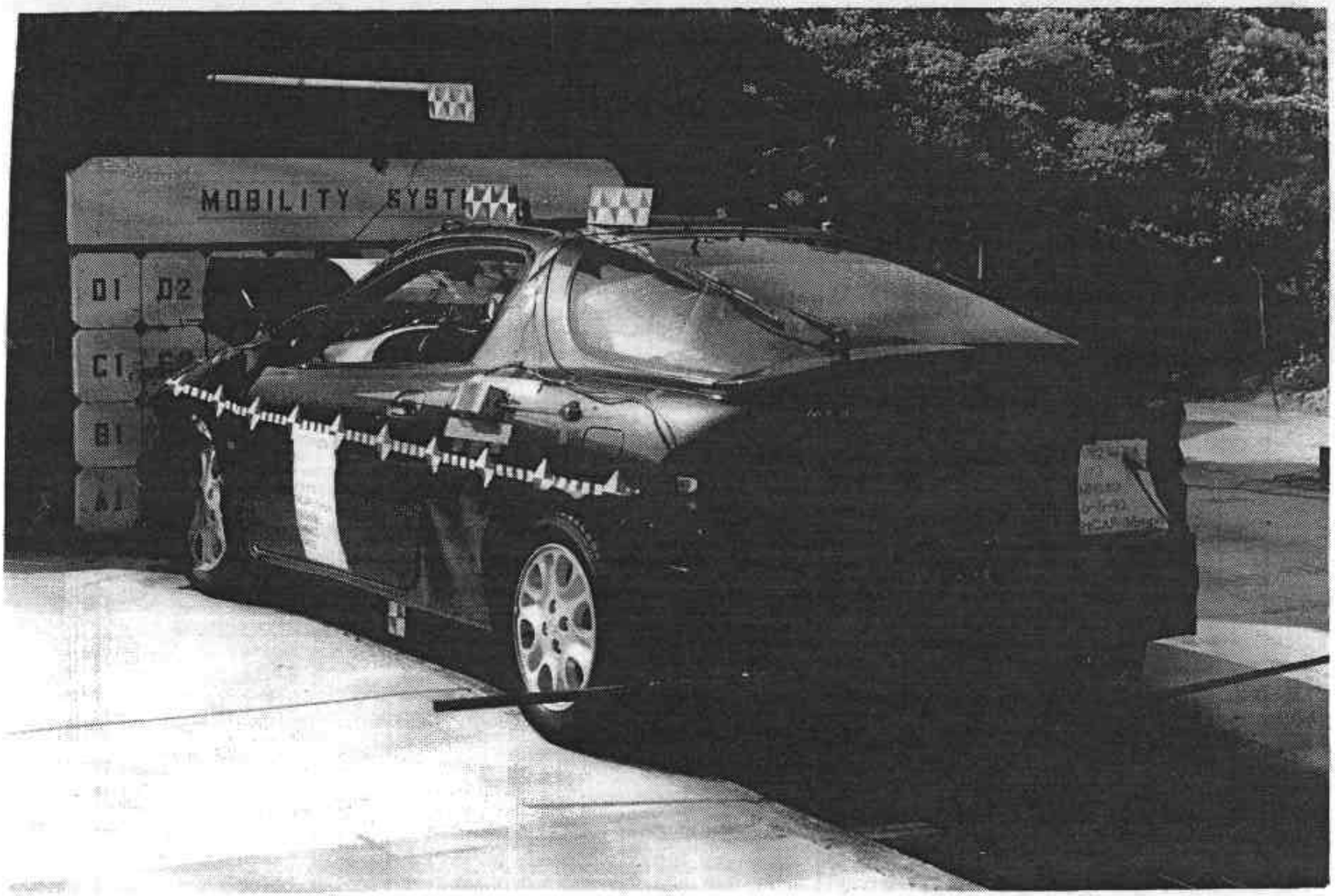
PRETEST RIGHT SIDE VIEW

POSTTEST RIGHT SIDE VIEW

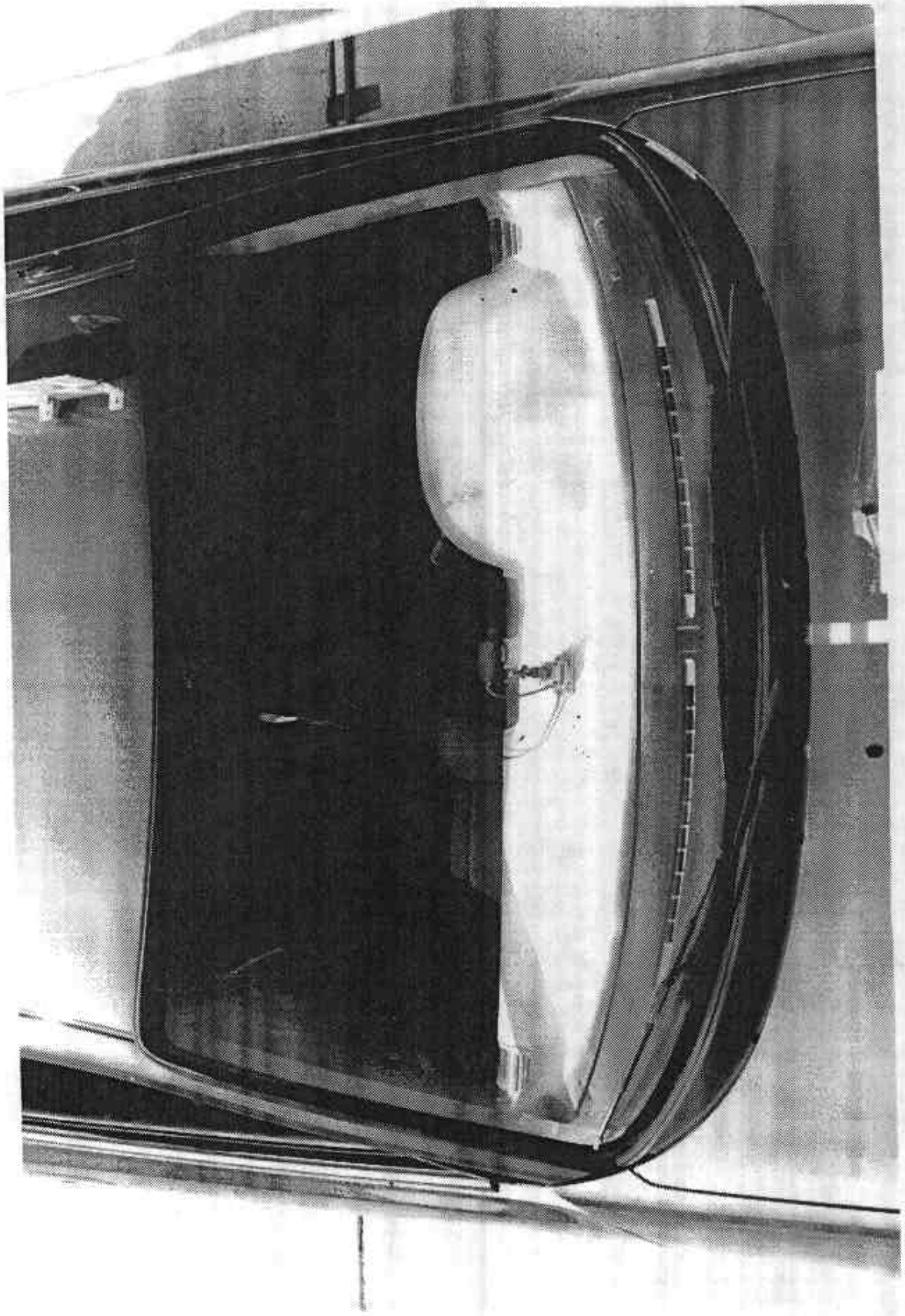
PRETEST RIGHT FRONT 3/4 VIEW


POSTTEST RIGHT FRONT 3/4 VIEW

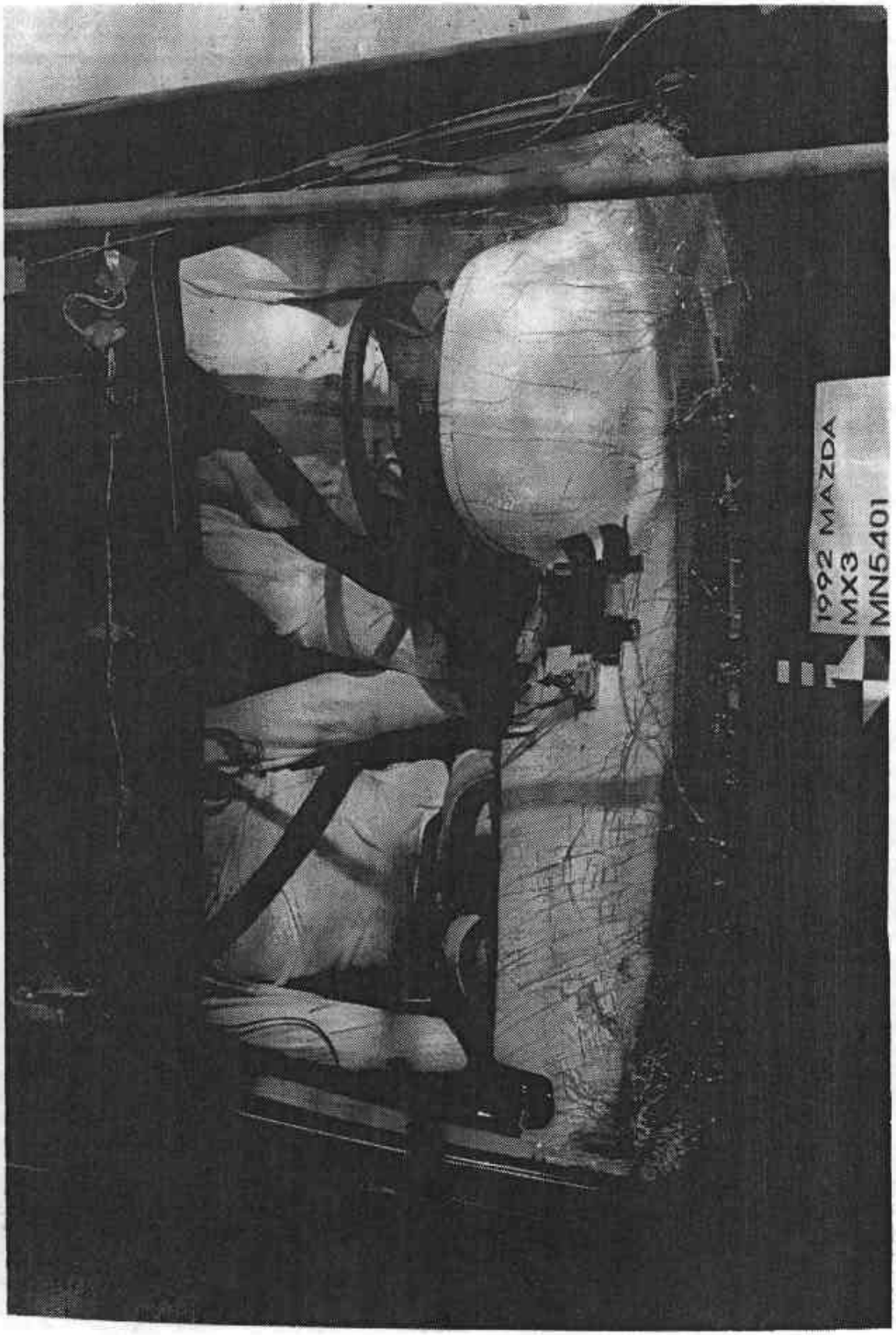
PRETEST LEFT REAR 3/4 VIEW



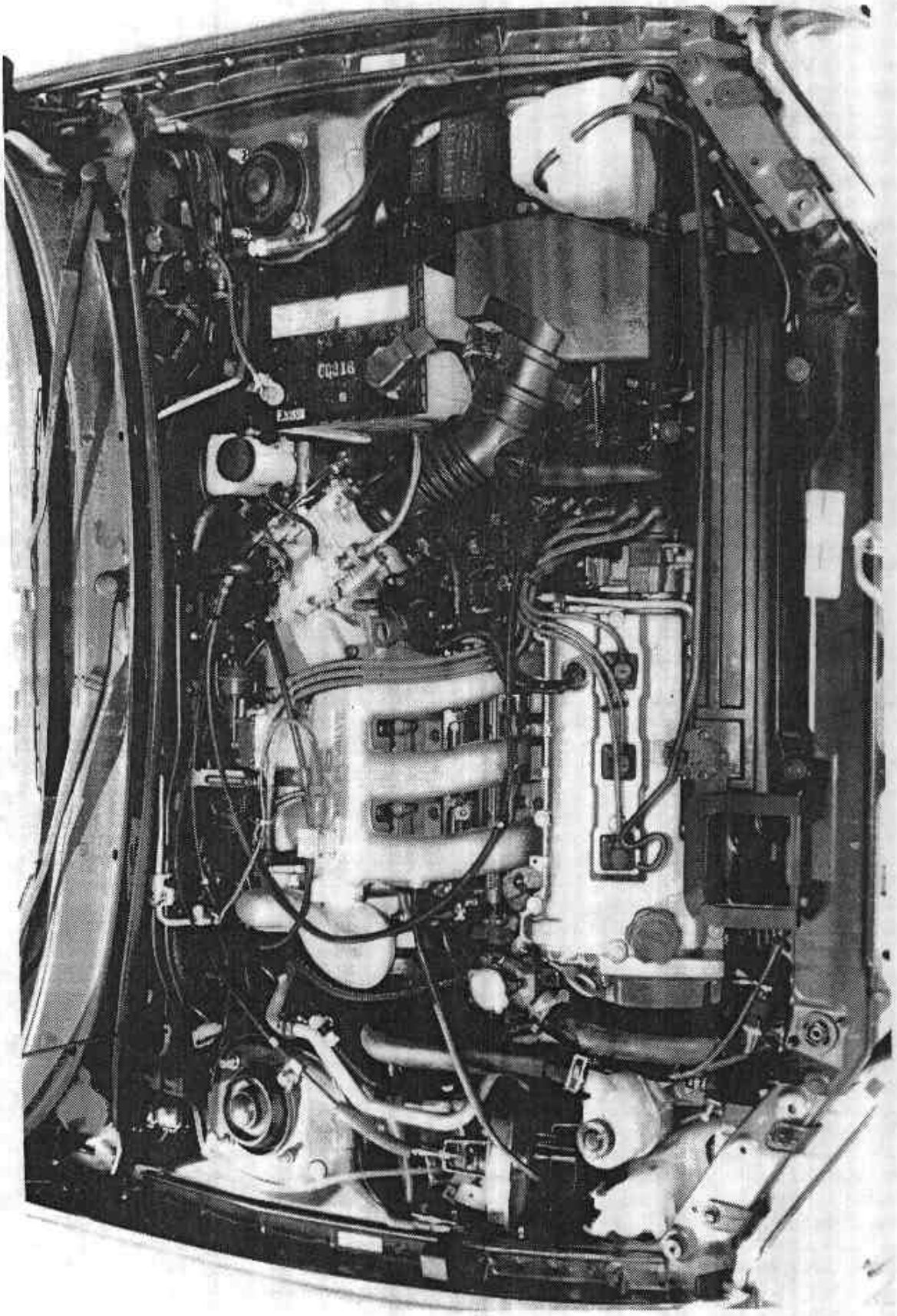

POSTTEST LEFT REAR 3/4 VIEW



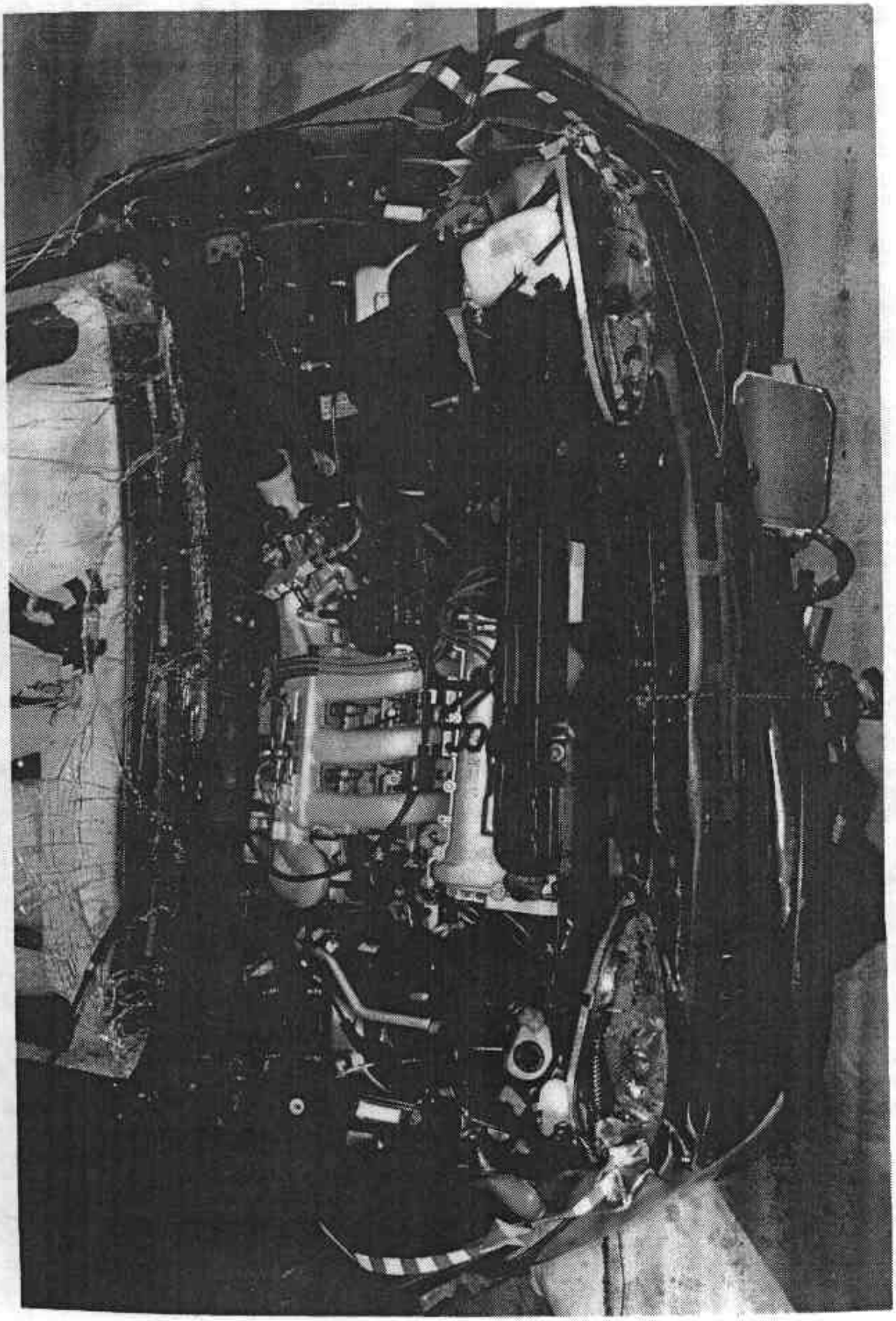
PRETEST WINDSHIELD VIEW



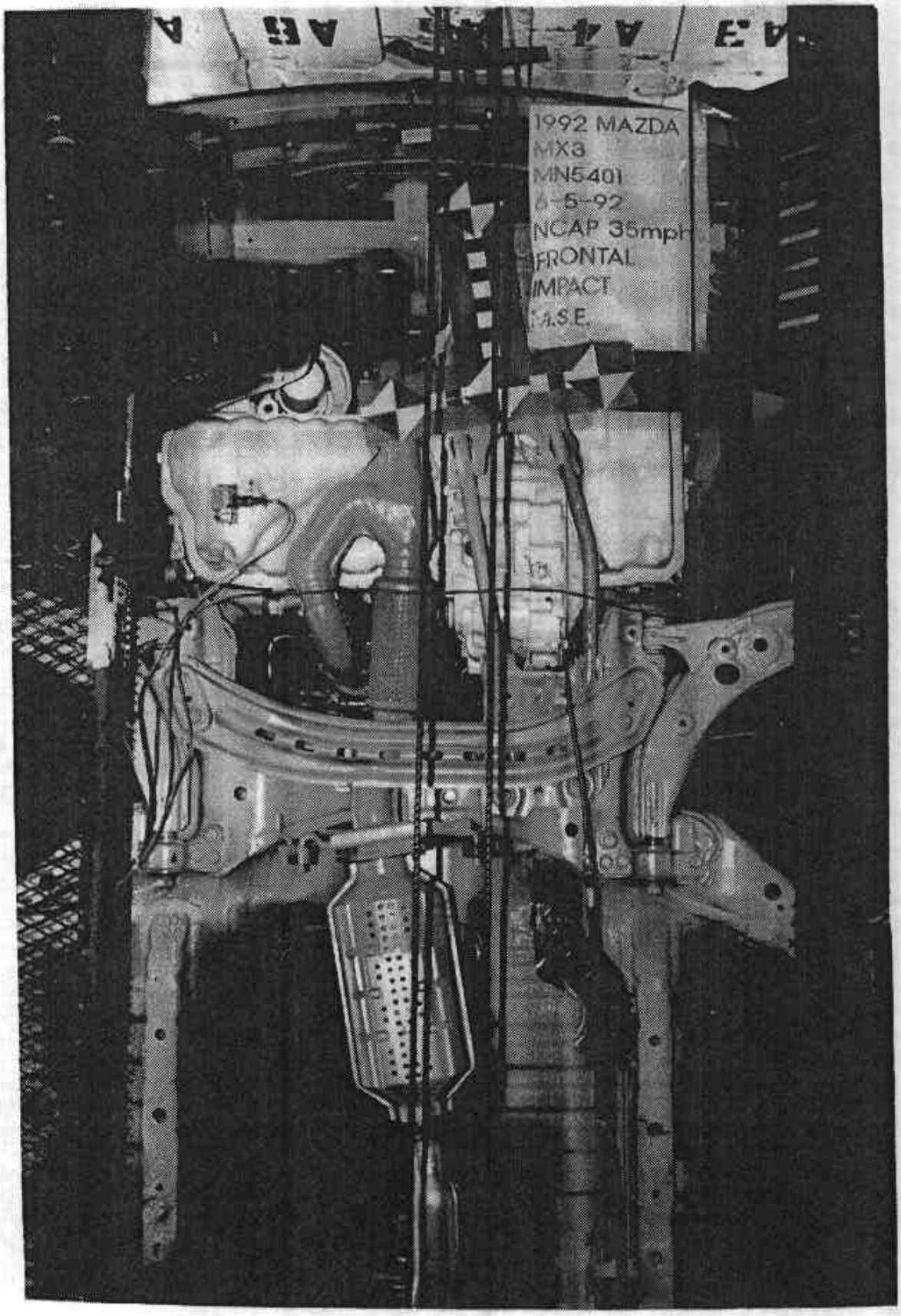

POSTTEST WINDSHIELD VIEW



PRETEST ENGINE COMPARTMENT VIEW

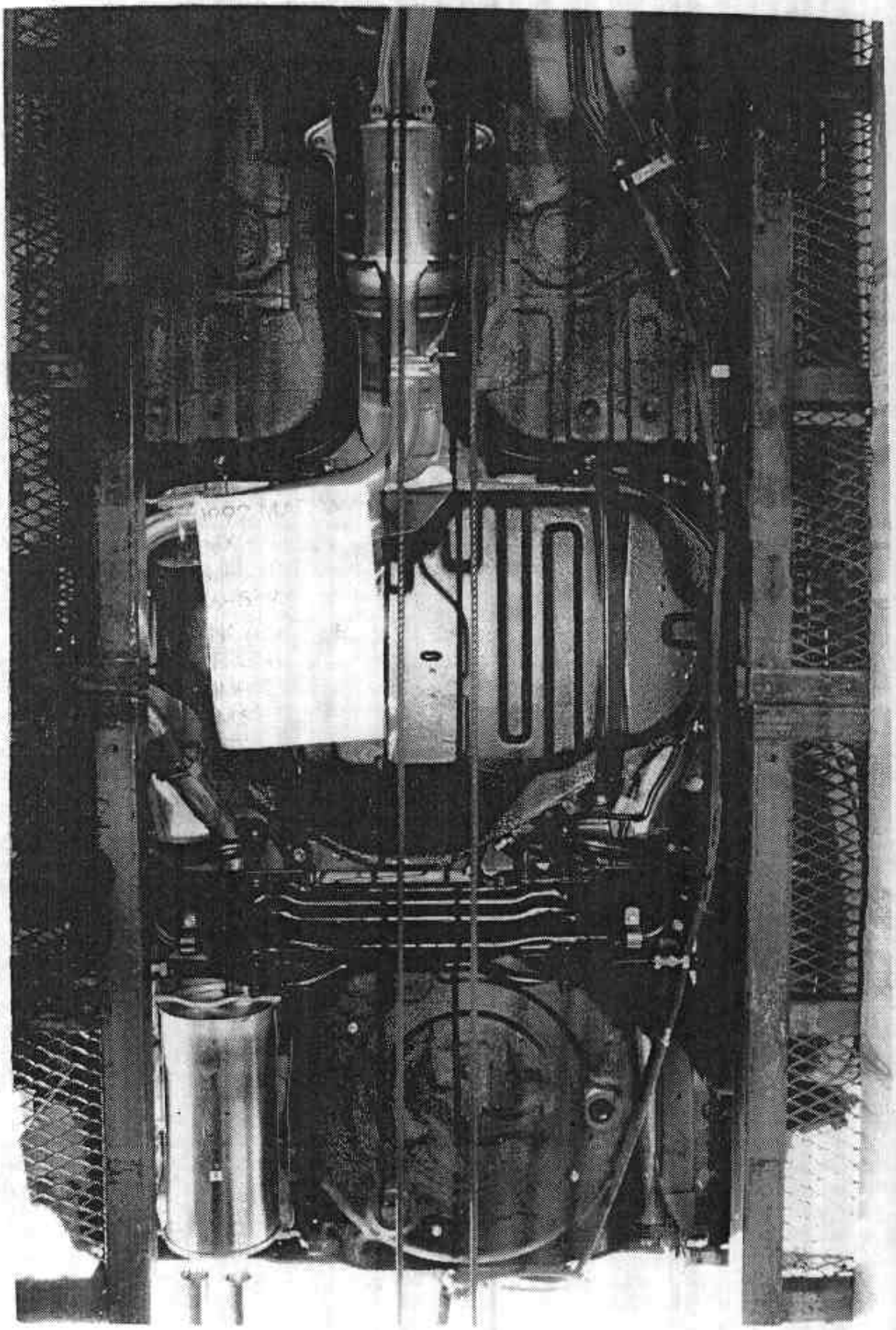


POSTTEST ENGINE COMPARTMENT VIEW

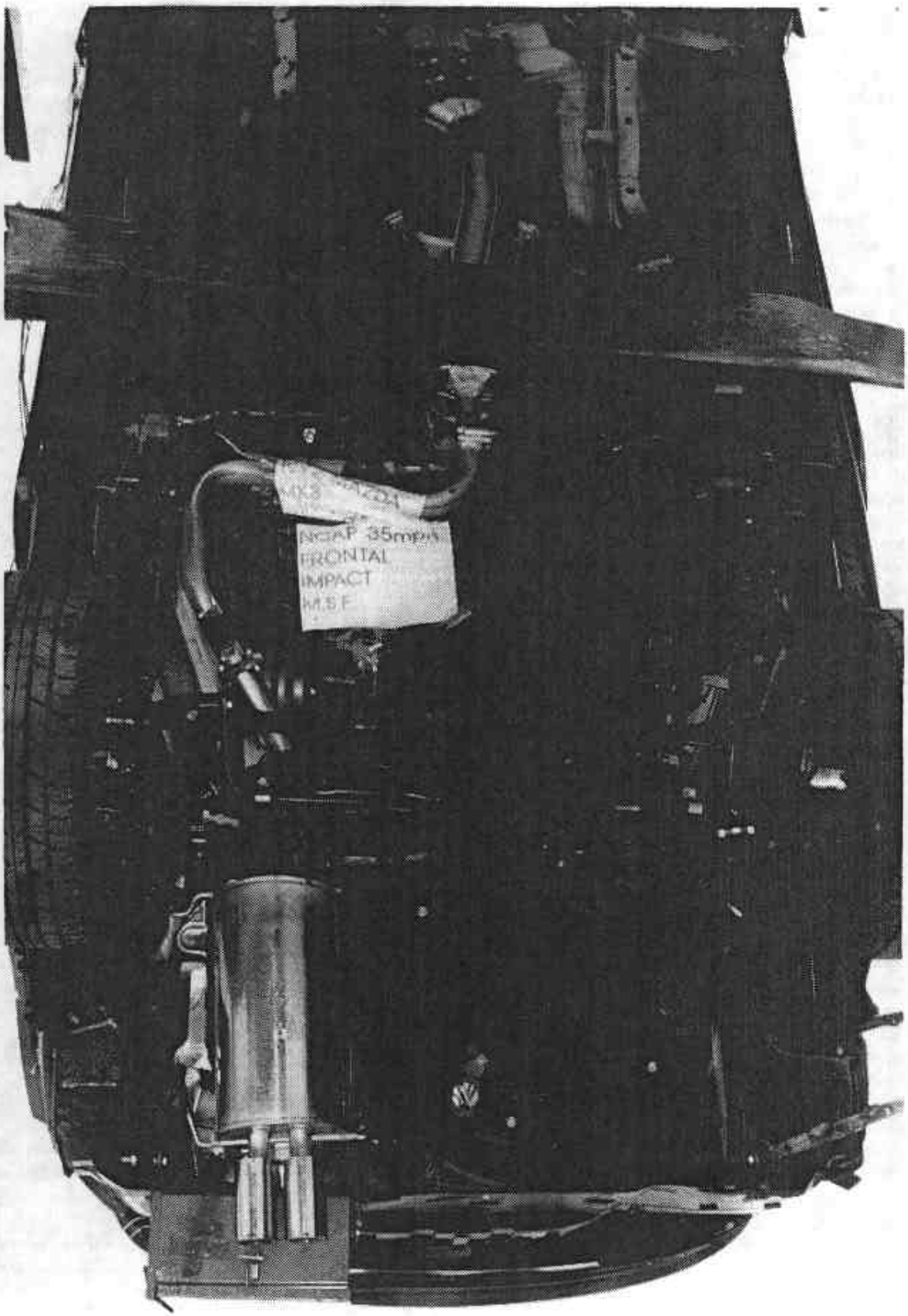



PRETEST FRONT UNDERBODY VIEW

POSTTEST FRONT UNDERBODY VIEW



PRETEST REAR UNDERBODY VIEW




POSTTEST REAR UNDERBODY VIEW

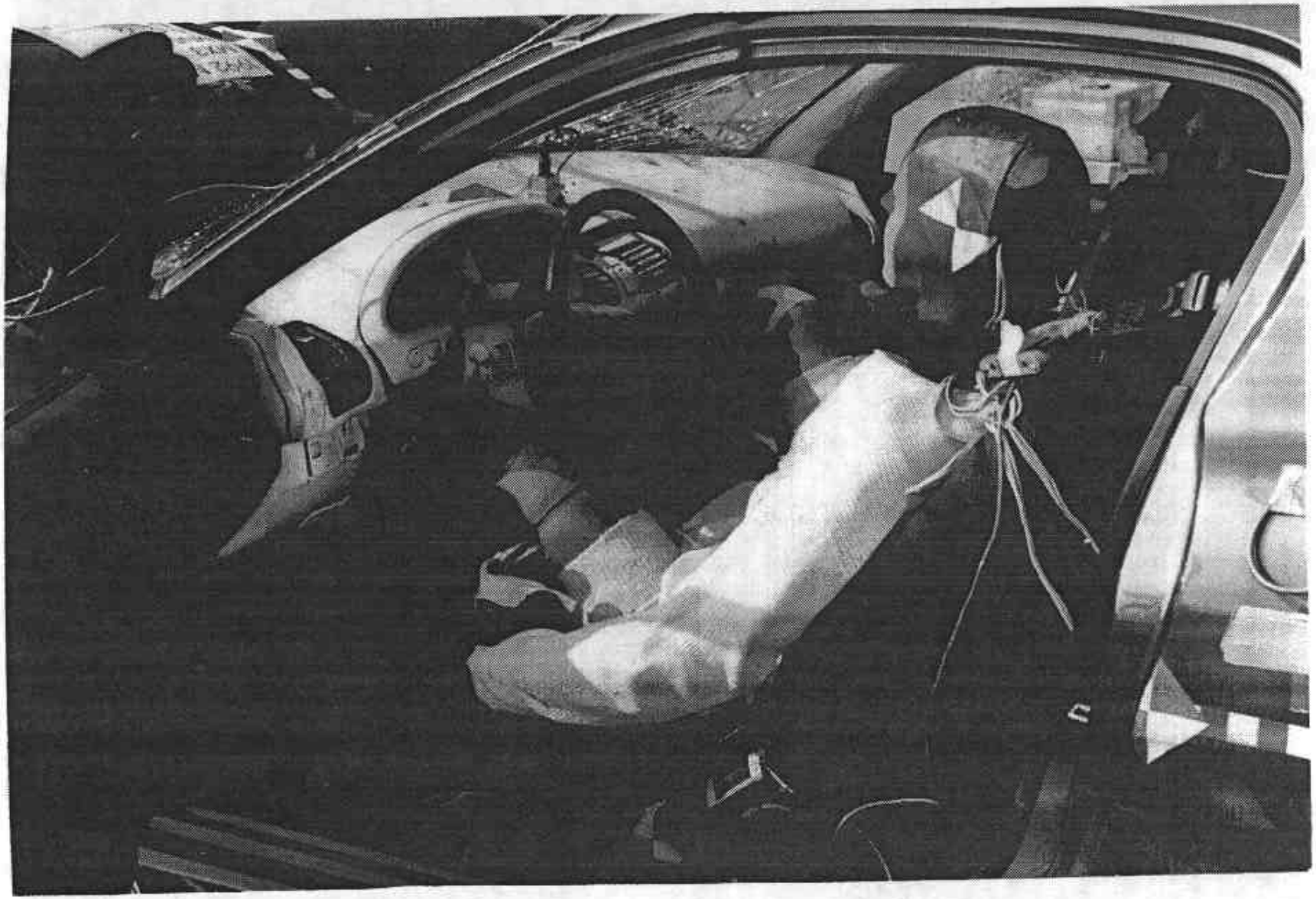
PRETEST DRIVER DUMMY POSITION VIEW

POSTTEST DRIVER DUMMY POSITON VIEW

PRETEST PASSENGER DUMMY POSITION VIEW

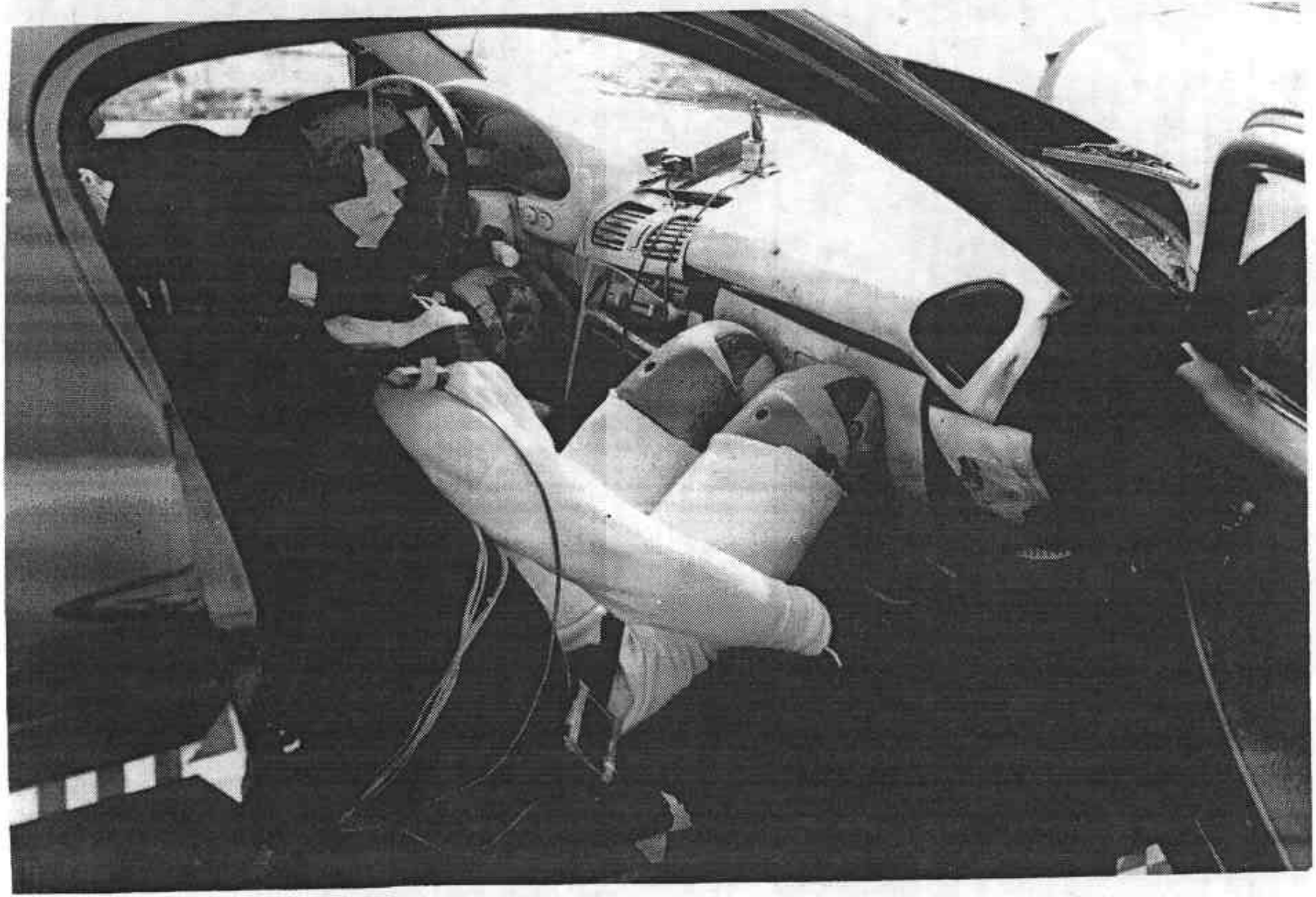
POSTTEST PASSENGER DUMMY POSITION VIEW

PRETEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



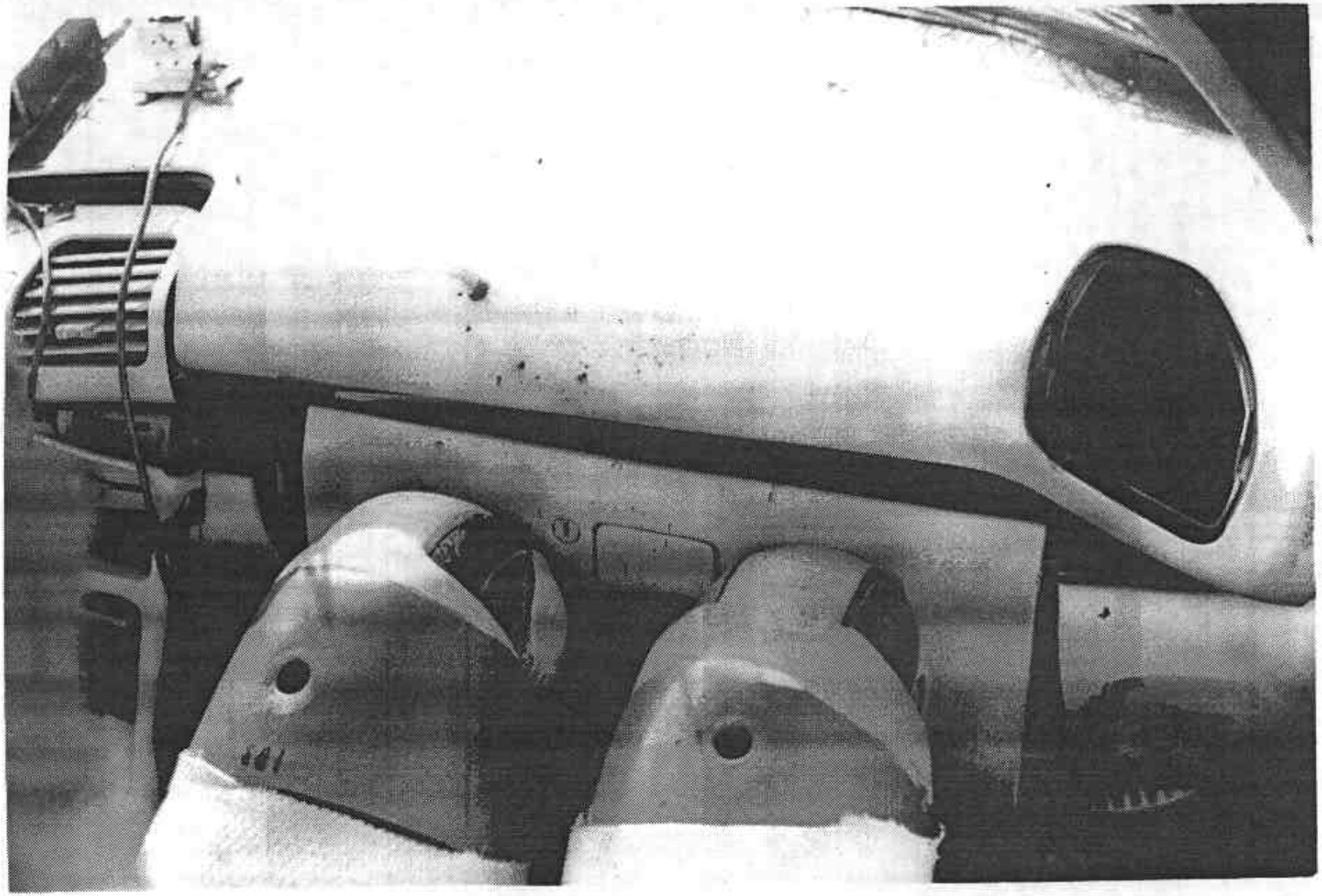
POSTTEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

PRETEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



POSTTEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

POSTTEST DRIVER DUMMY (ATD) STEERING COLUMN HUB/RIM CONTACT AND KNEE CONTACT AREA



POSTTEST PASSENGER DUMMY (ATD) KNEE CONTACT AREA

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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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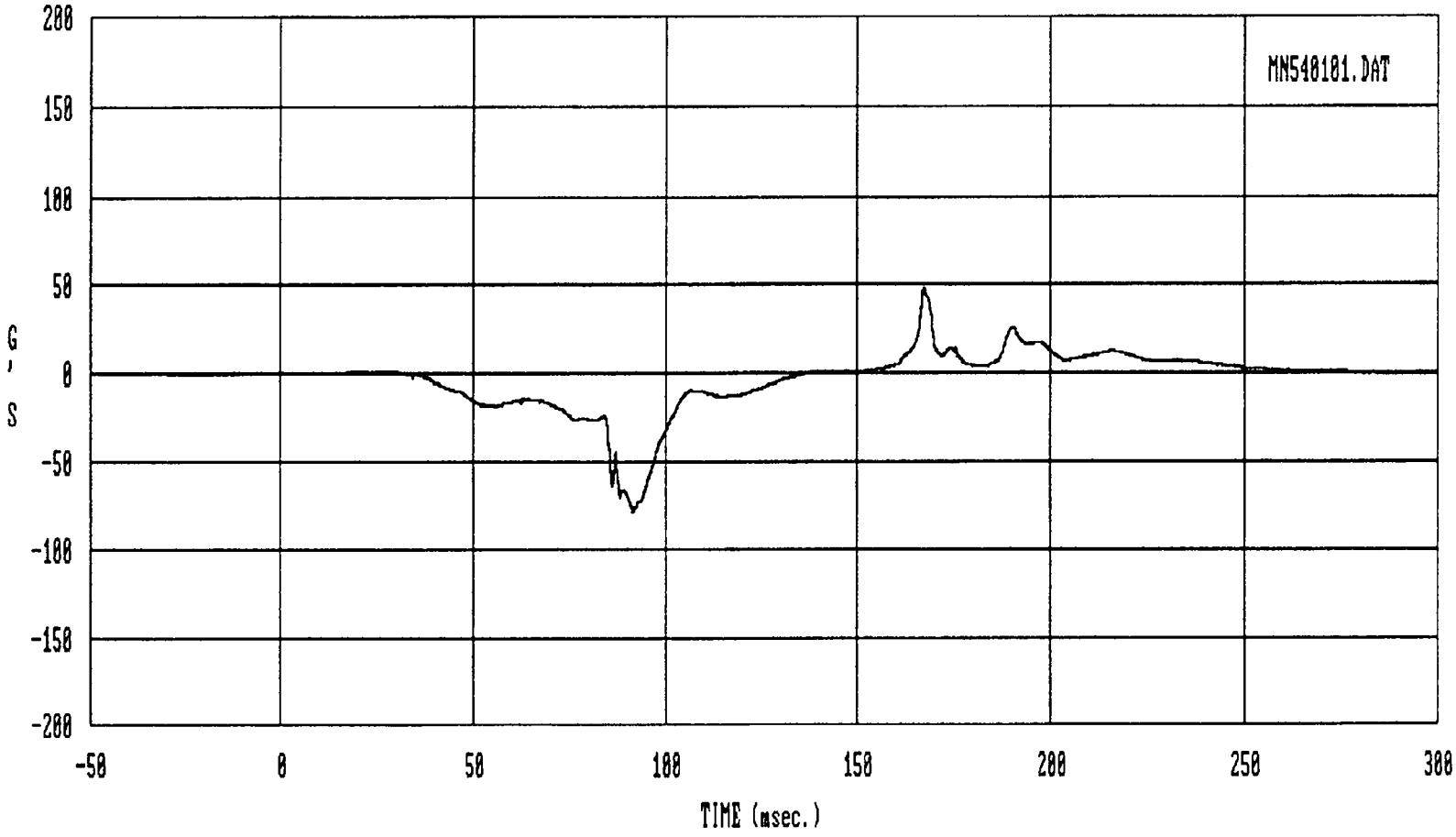
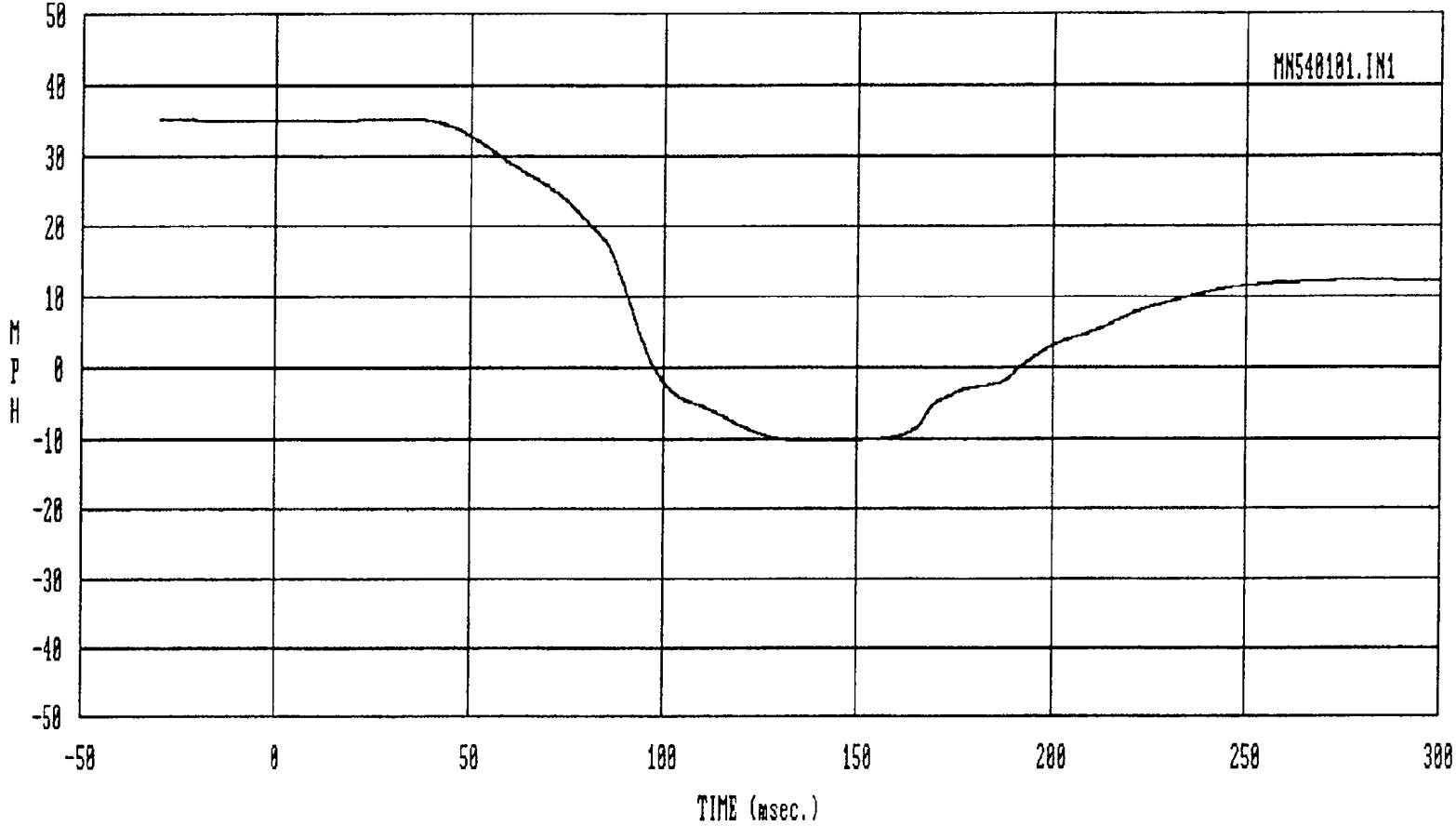



Curve: Driver head acceleration -- X axis  Filter: SAE CLASS 1000  Max = 48.066  Min = -78.307

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3

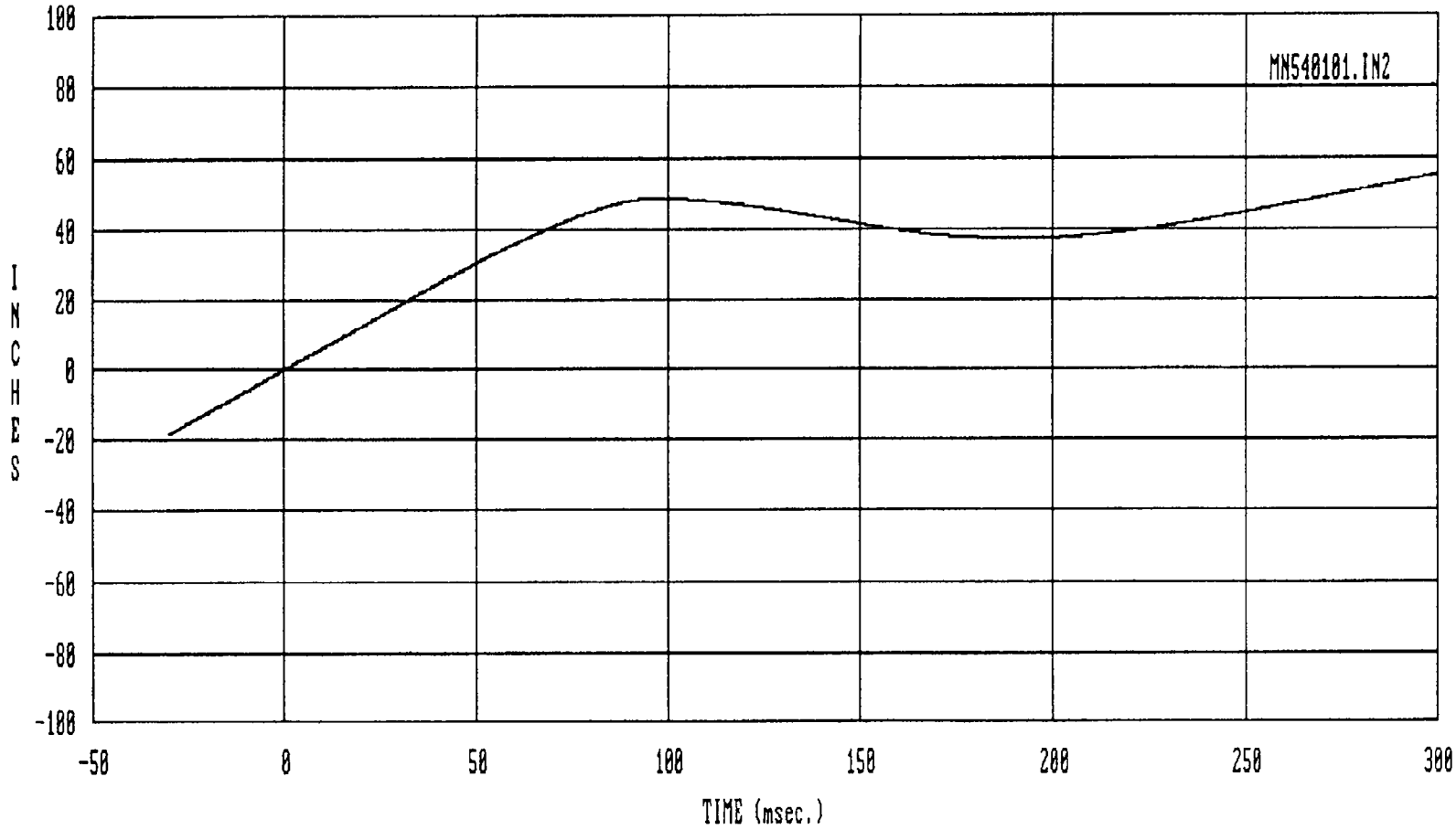
B1-1

MSE-92-R92027-N06



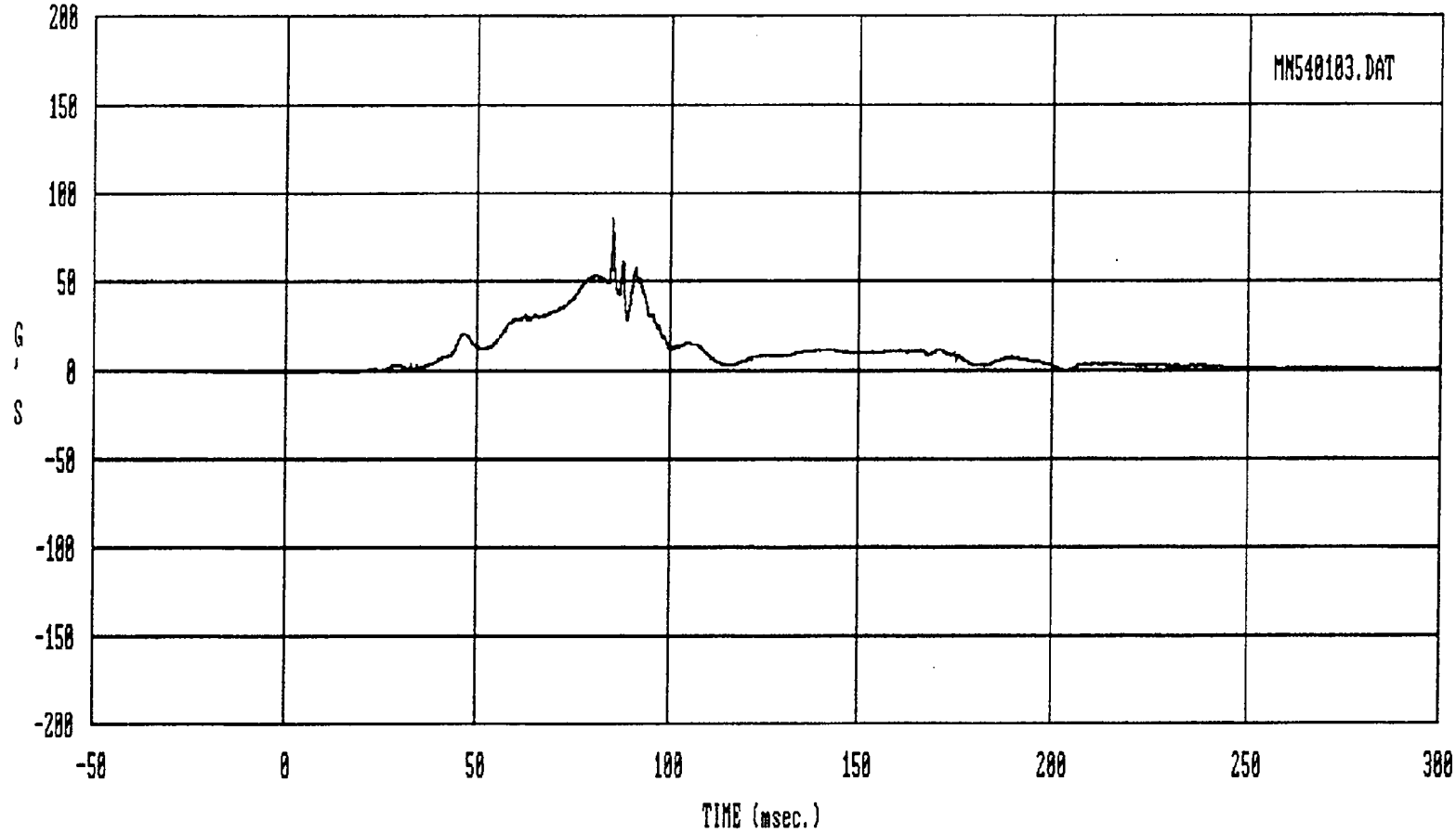

Curve: Driver head delta V -- X axis  Filter: SAE CLASS 180  Max = 35.414  Min = -10.298

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



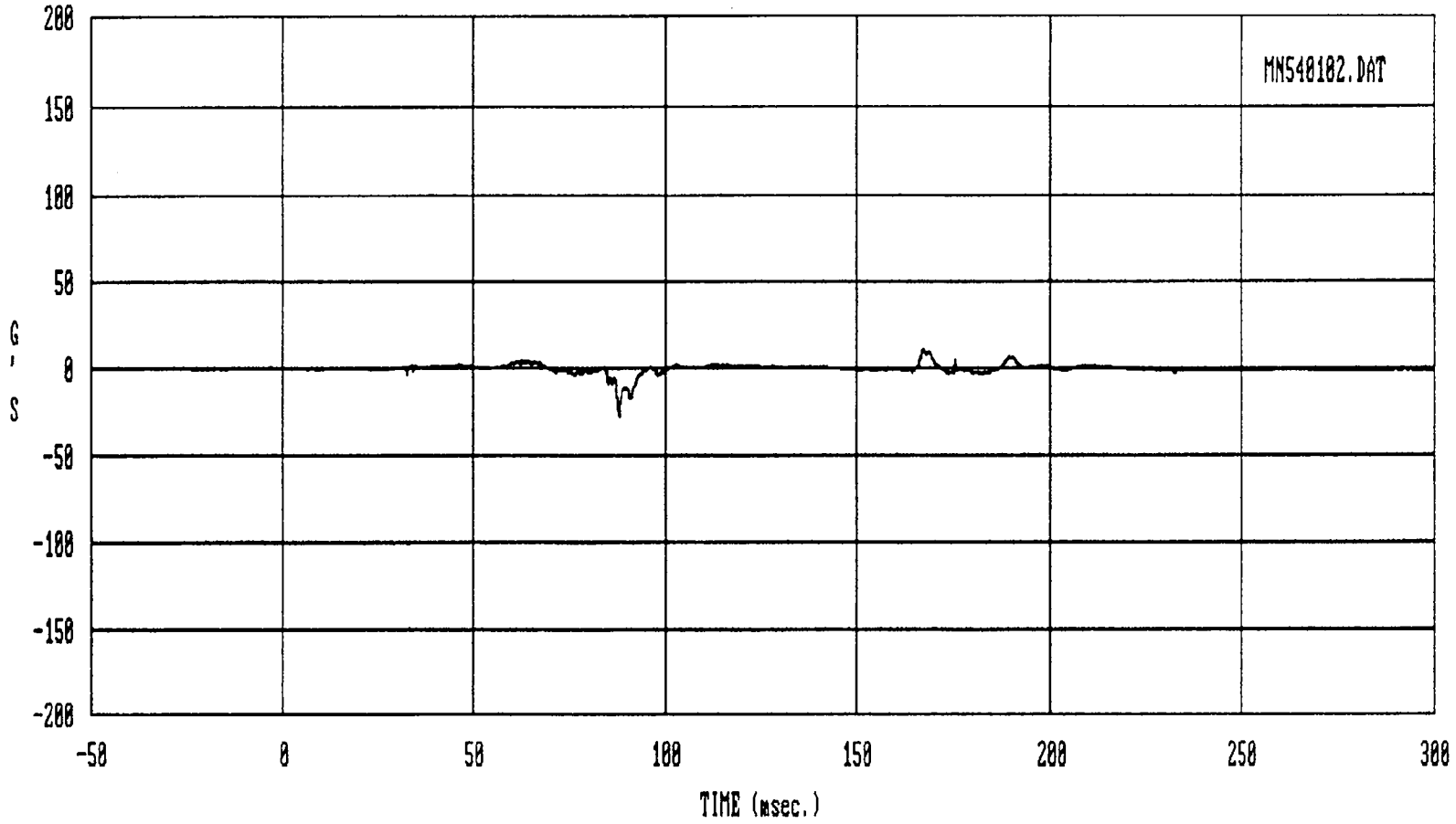

Curve: Driver head displacement -- X axis  Filter: SAE CLASS 180  Max = 55.590  Min = 37.565

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



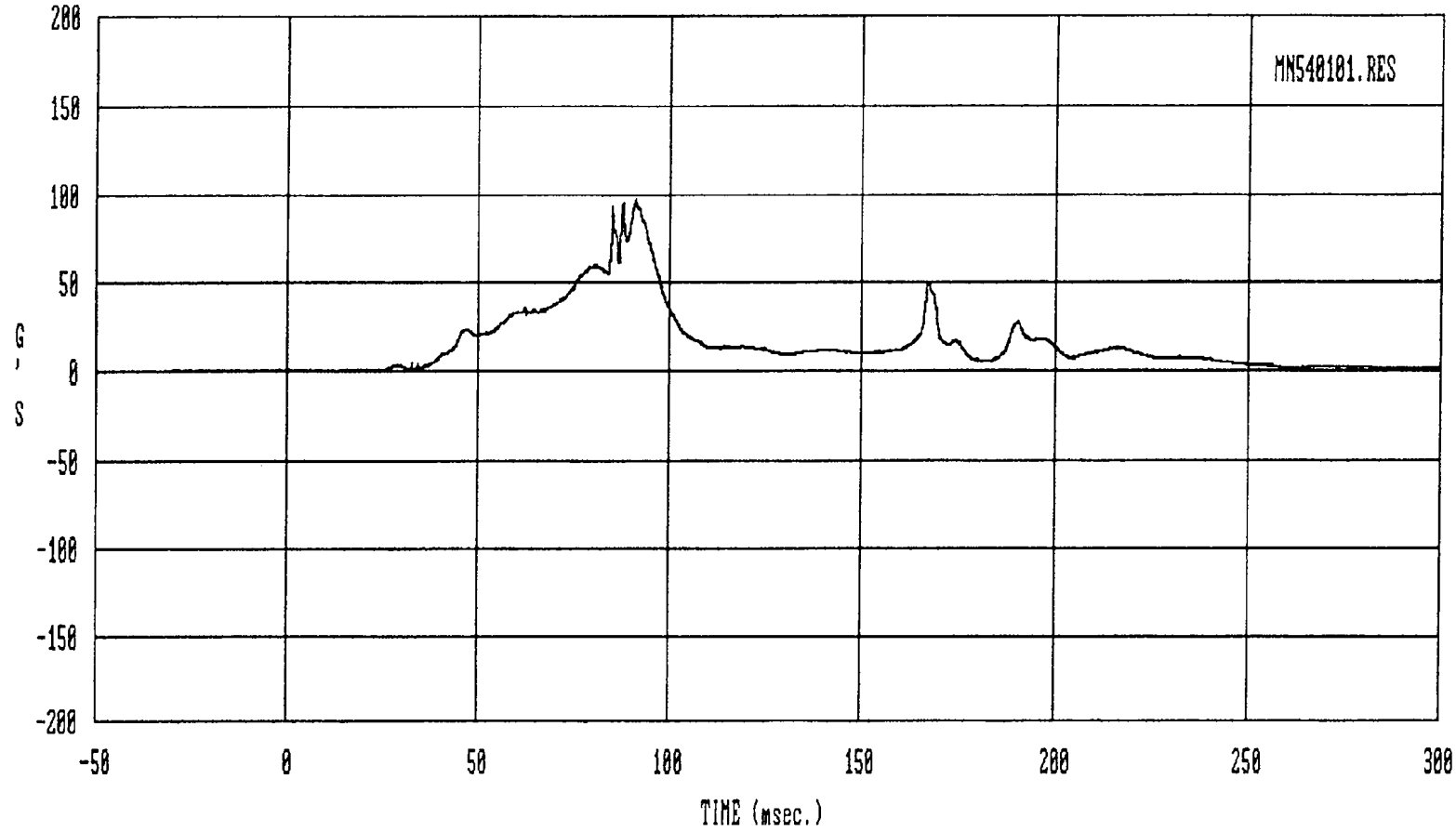

Curve: Driver head acceleration — Z axis  Filter: SAE CLASS 1000  Max = 87.158  Min = -.83234

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



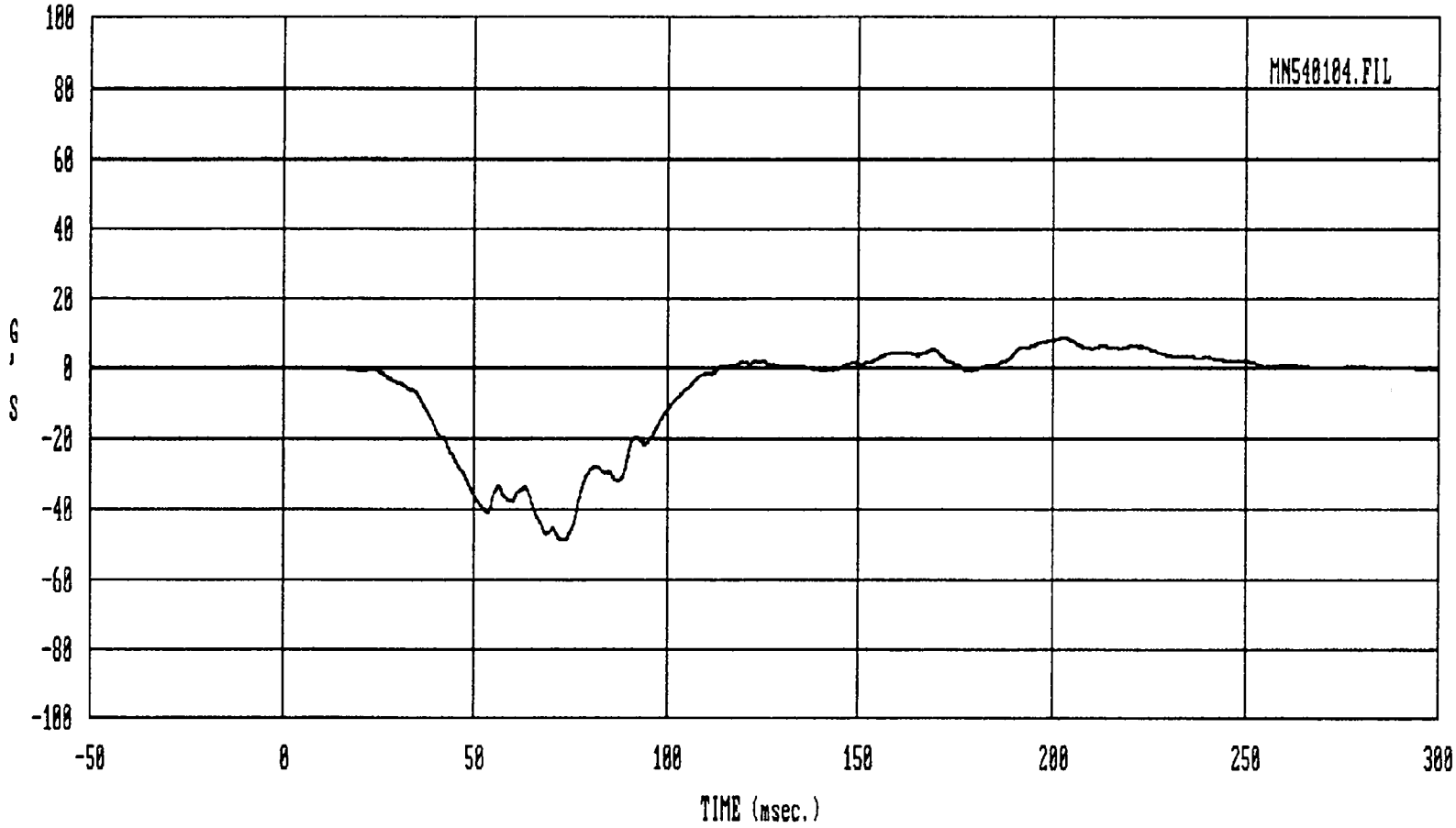

Curve: Driver head acceleration -- Y axis  Filter: SAE CLASS 1000  Max = 10.881  Min = -27.283

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



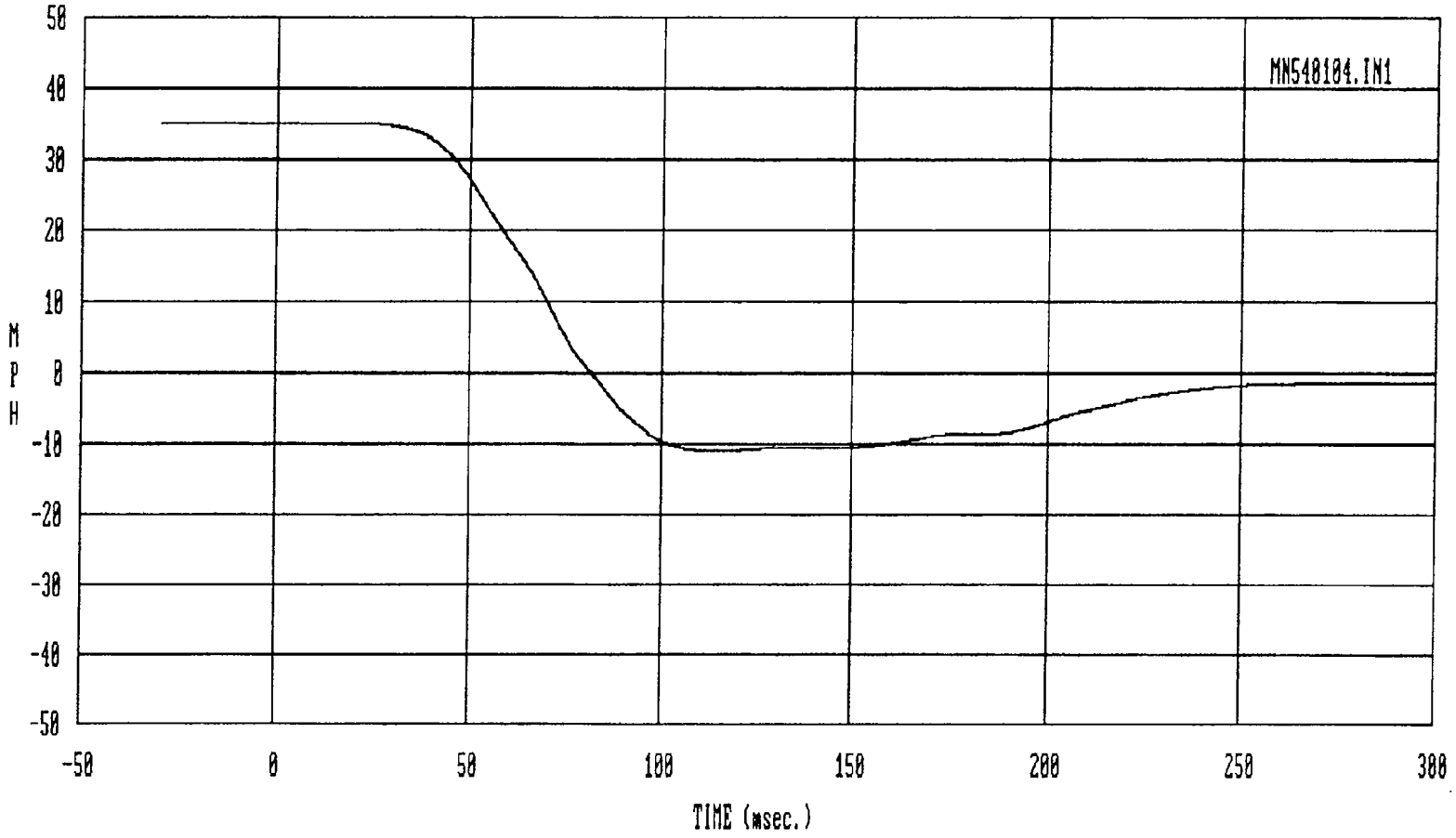

Curve: Driver head acceleration -- Resultant  Filter: SAE CLASS 1000  Max = 98.038  Min = .14308

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



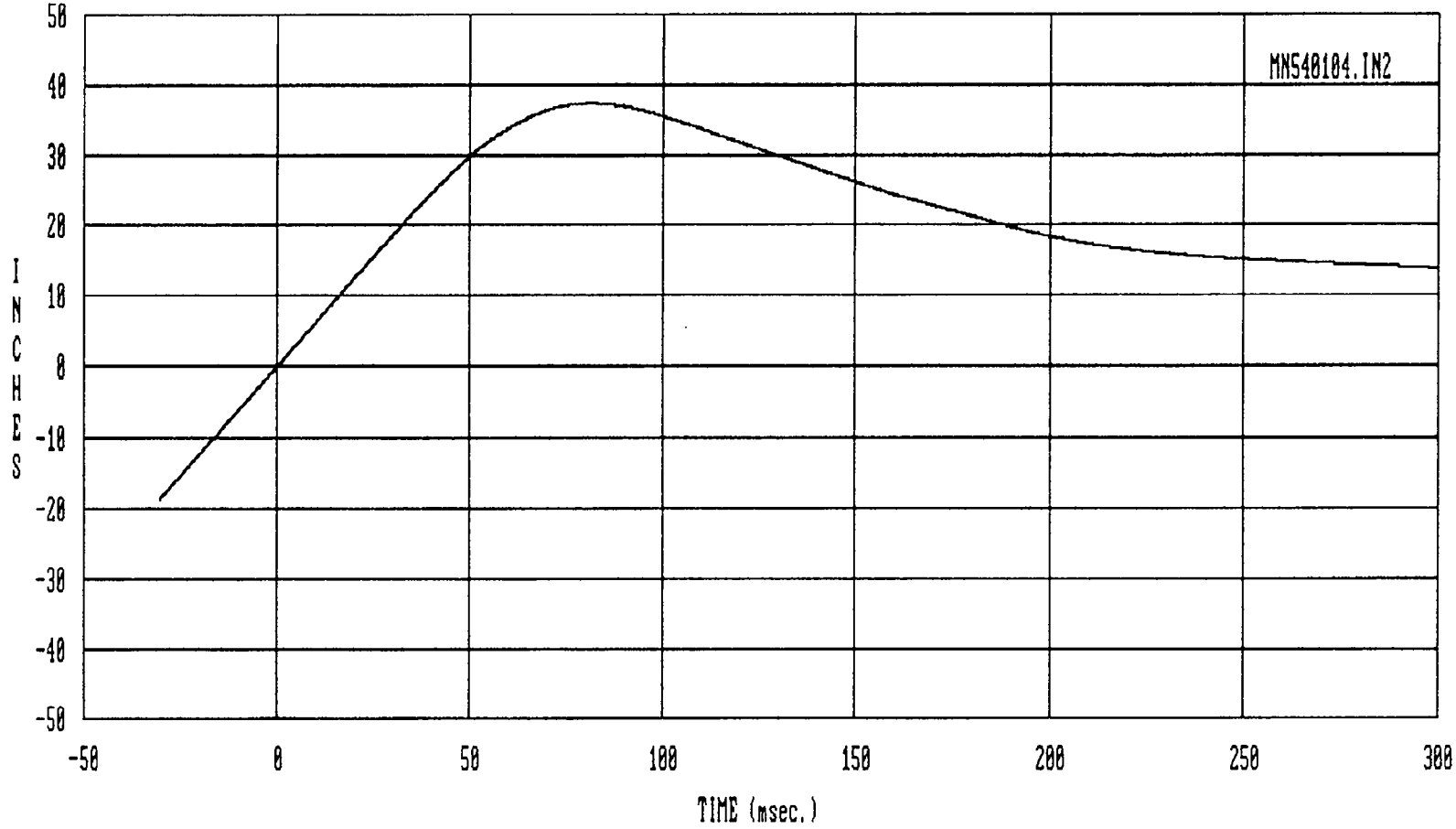

Curve: Driver chest acceleration -- X axis  Filter: SAE CLASS 180  Max = 8.5954  Min = -48.859

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



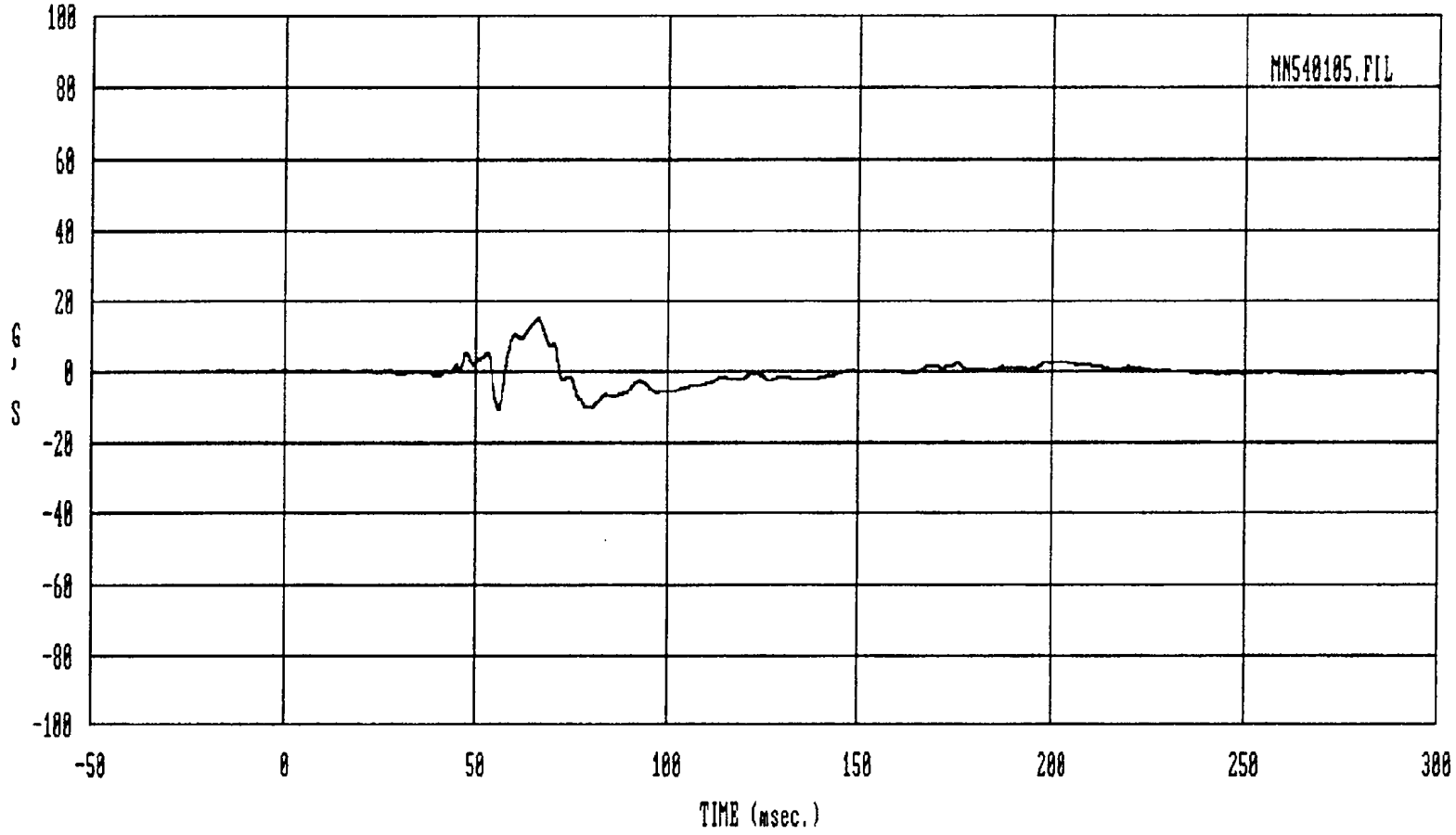

Curve: Driver chest delta V — X axis  Filter: SAE CLASS 180  Max = 35.225  Min = -11.033

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



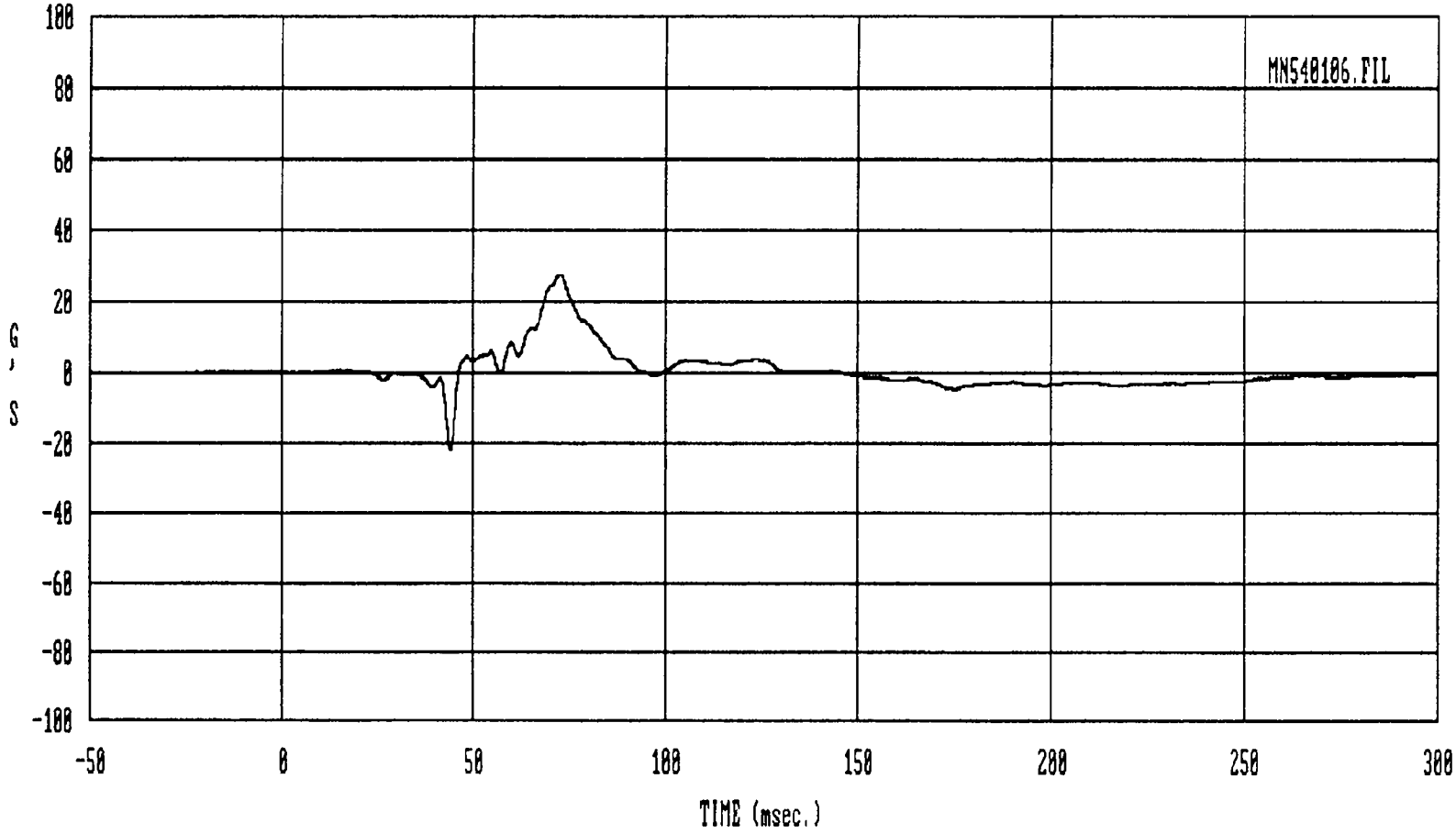

Curve: Driver chest displacement — X axis  Filter: SAE CLASS 180  Max = 37.444  Min = 13.807

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



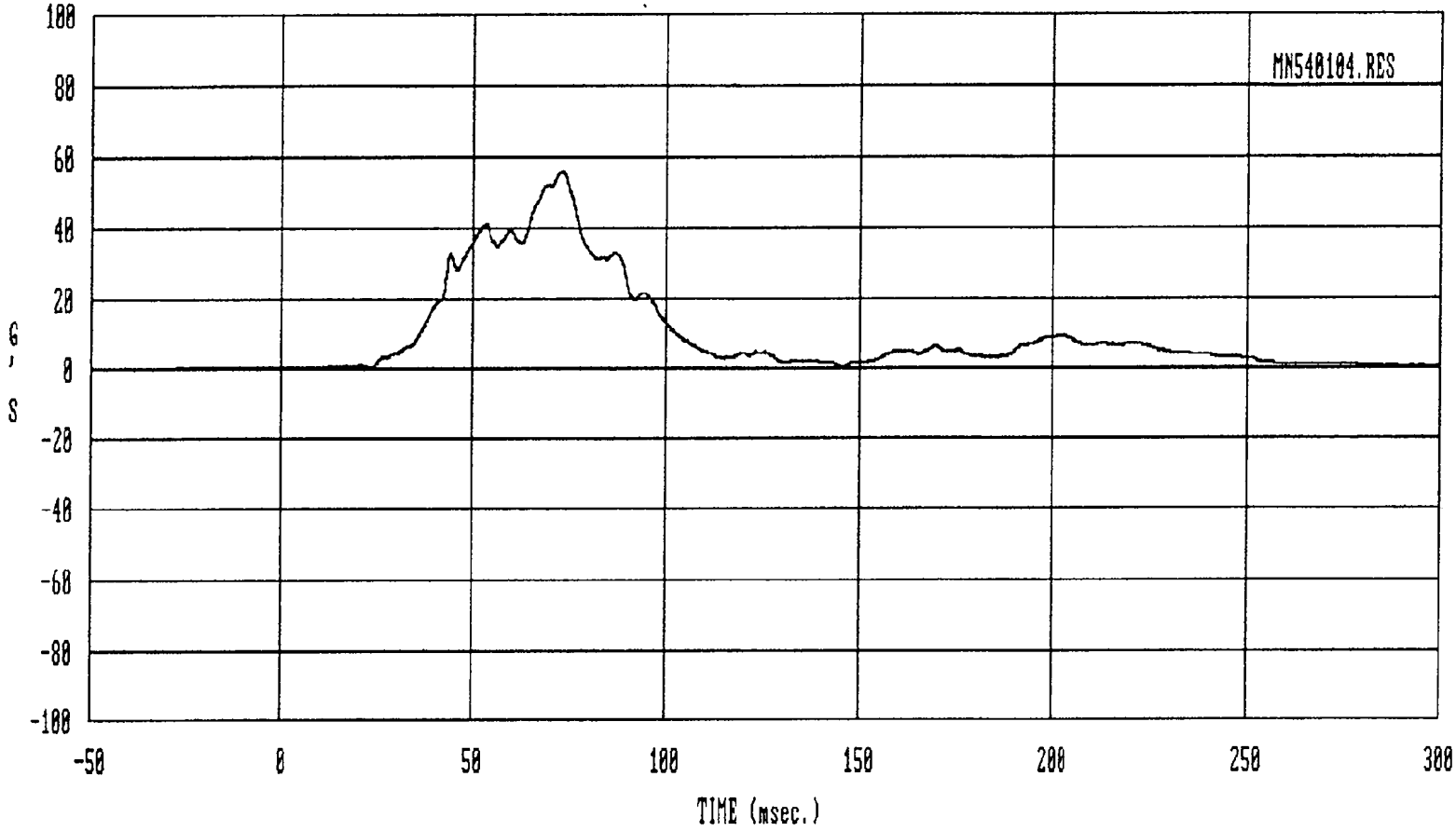

Curve: Driver chest acceleration -- Y axis  Filter: SAE CLASS 180  Max = 15.233  Min = -10.569

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



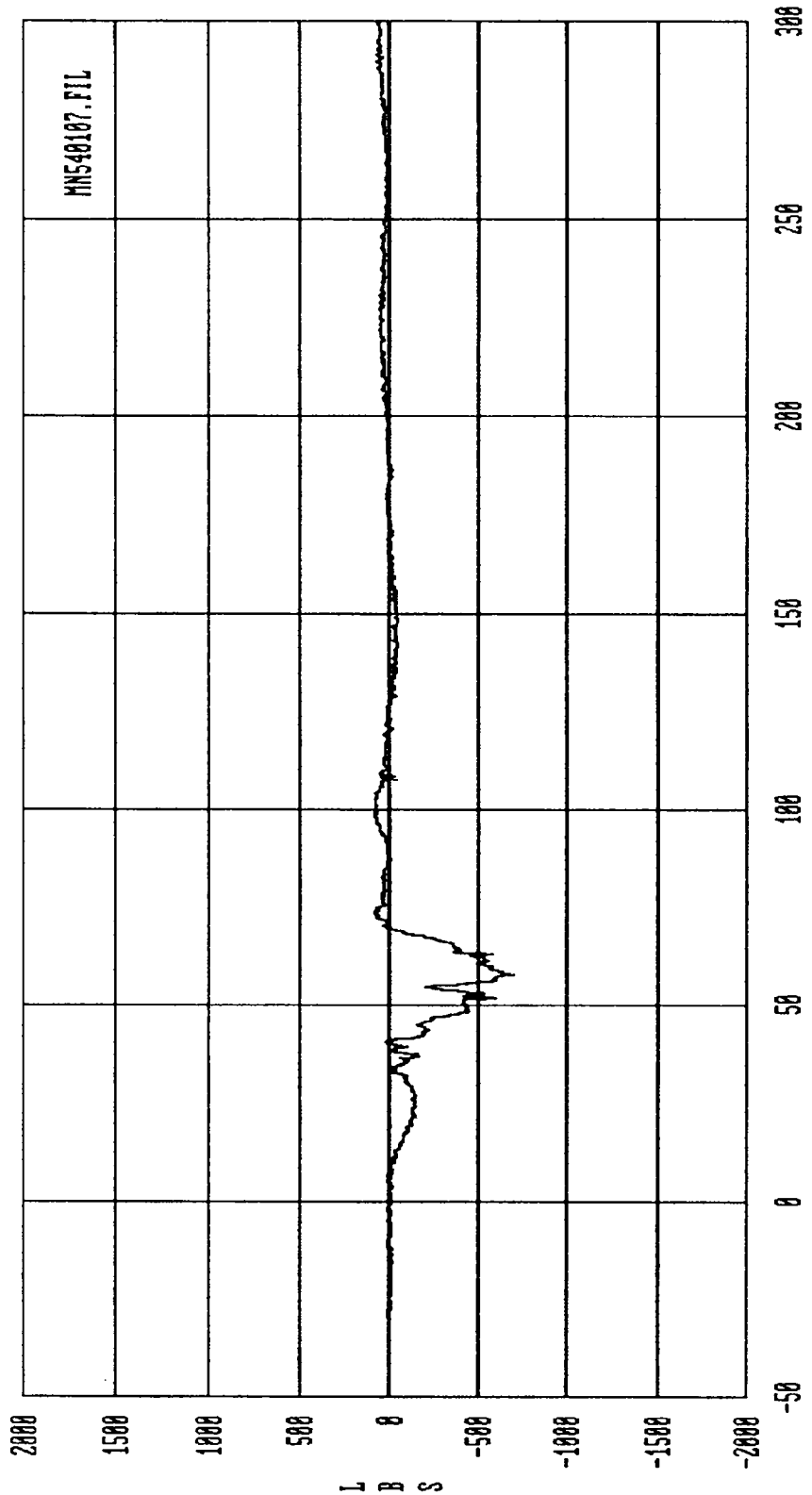

Curve: Driver chest acceleration -- Z axis  Filter: SAE CLASS 180  Max = 27.551  Min = -22.038

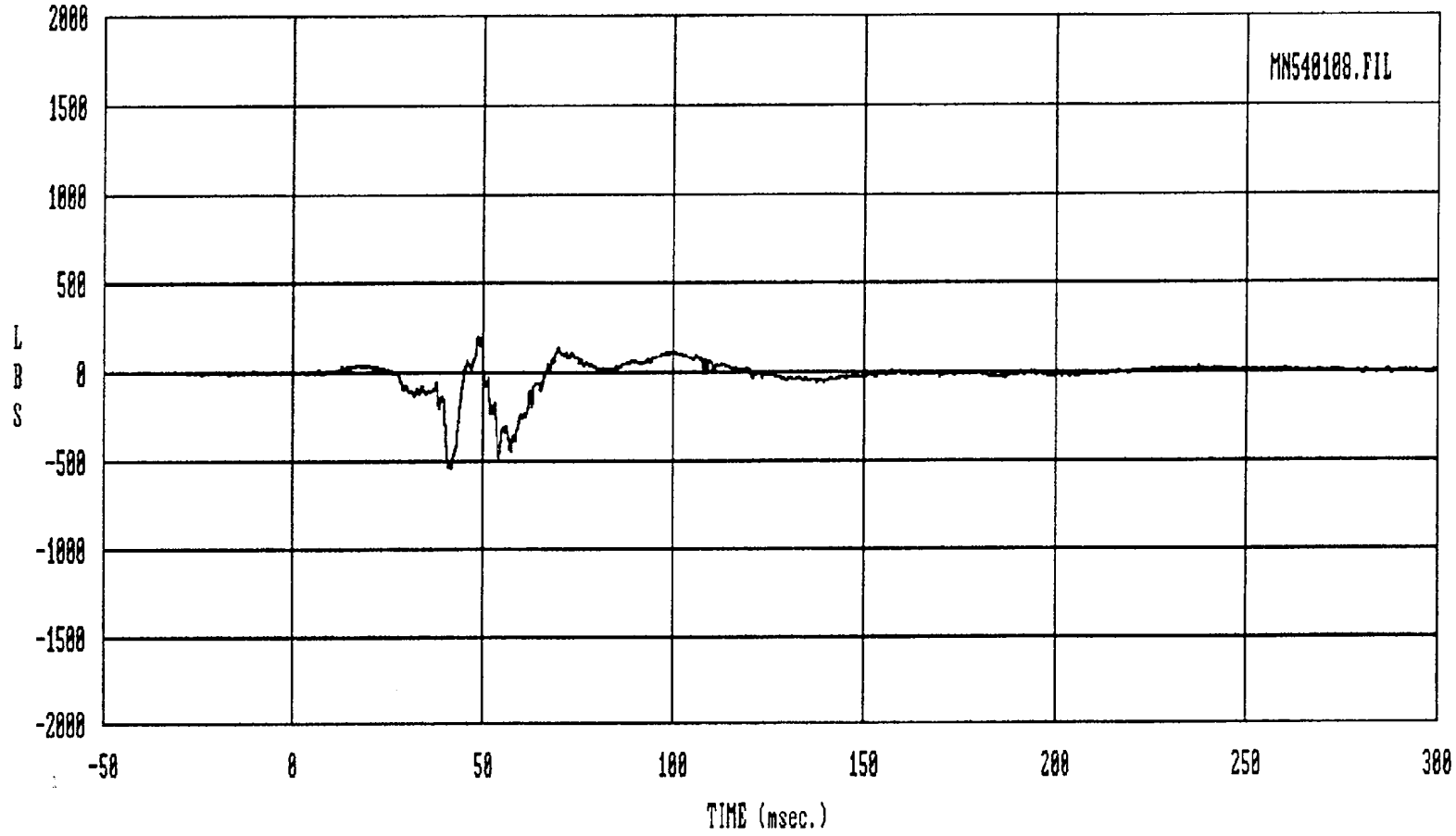
MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3




Curve: Driver chest acceleration -- Resultant  Filter: SAE CLASS 180  Max = 56.041  Min = .21415

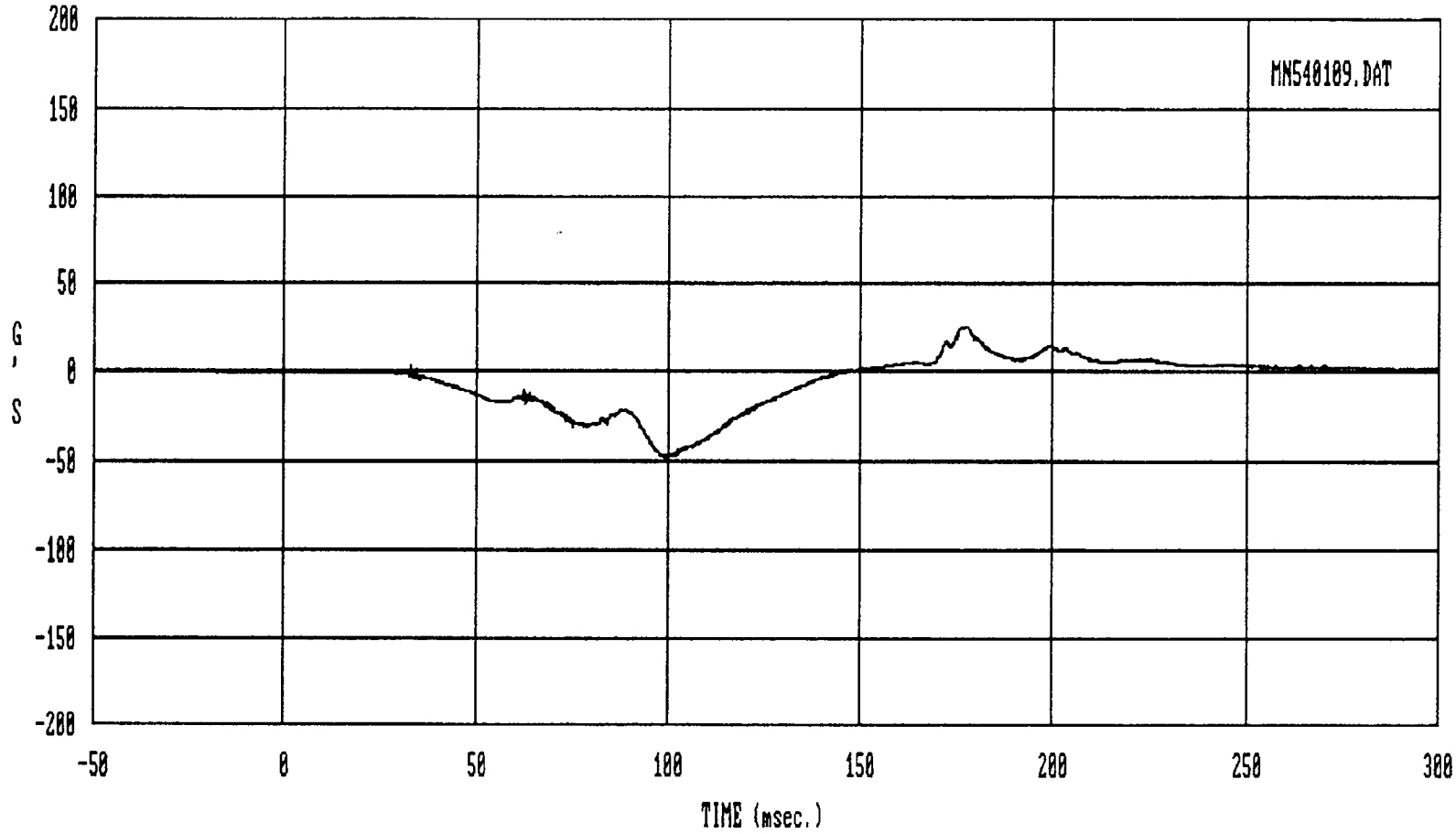
MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3


MNS40107.FIL
2000
1500
1000
500
0
-500
-1000
-1500
-2000
LBS
-50
0
50
100
150
200
250
300
TIME (msec.)
Curve: Driver femur load -- Left femur
Filter: SAE CLASS 600
Max = 86.310
Min = -700.84
MSE
Date: 06/05/92
Program: 1992 NCAP - #6
Vehicle: 1992 Mazda MX3



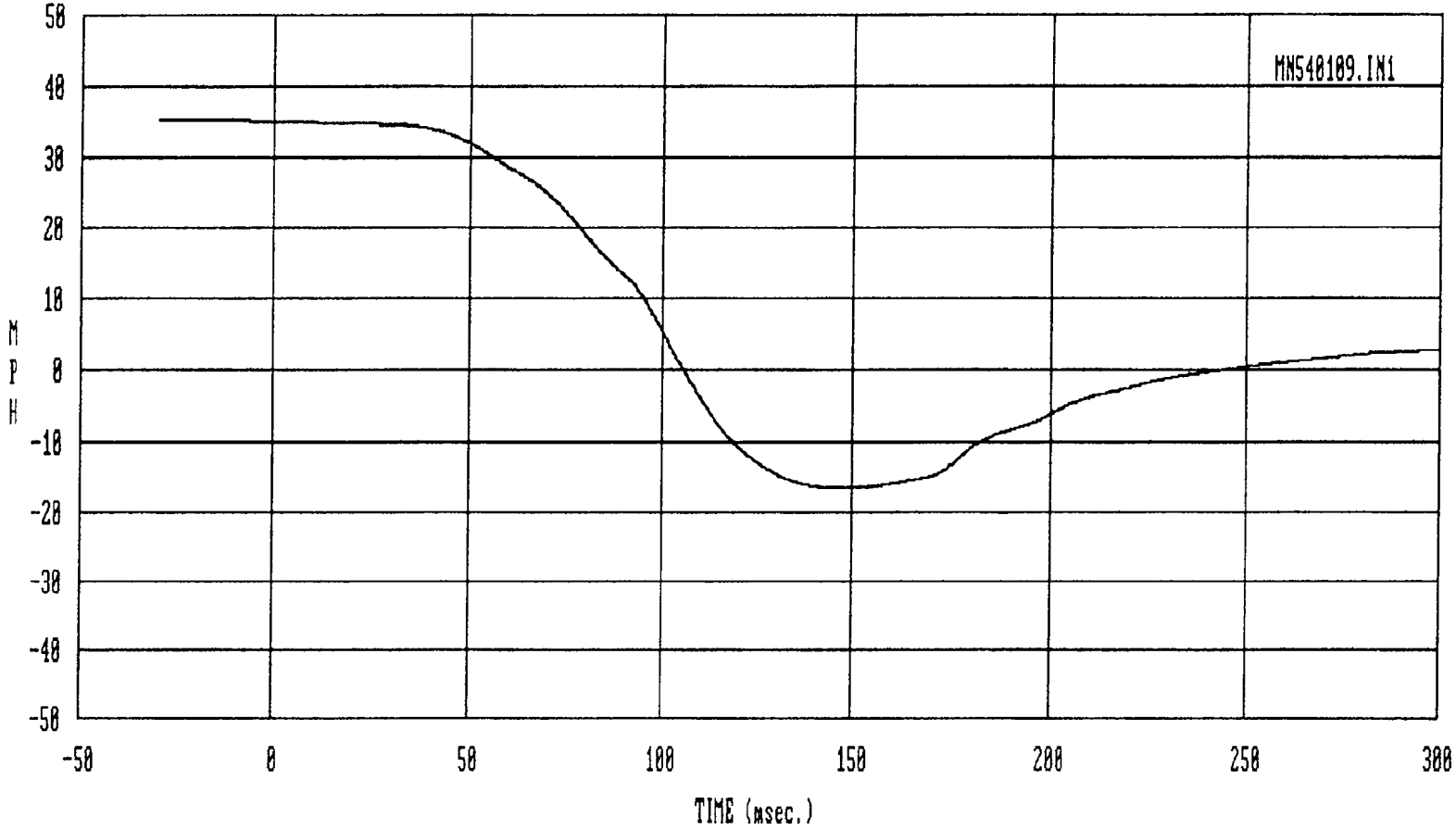

Curve: Driver femur load -- Right femur  Filter: SAE CLASS 600  Max = 205.29  Min = -540.35

MSE  Date: 06/05/92  Program: 1992 NCAP - N6  Vehicle: 1992 Mazda MX3



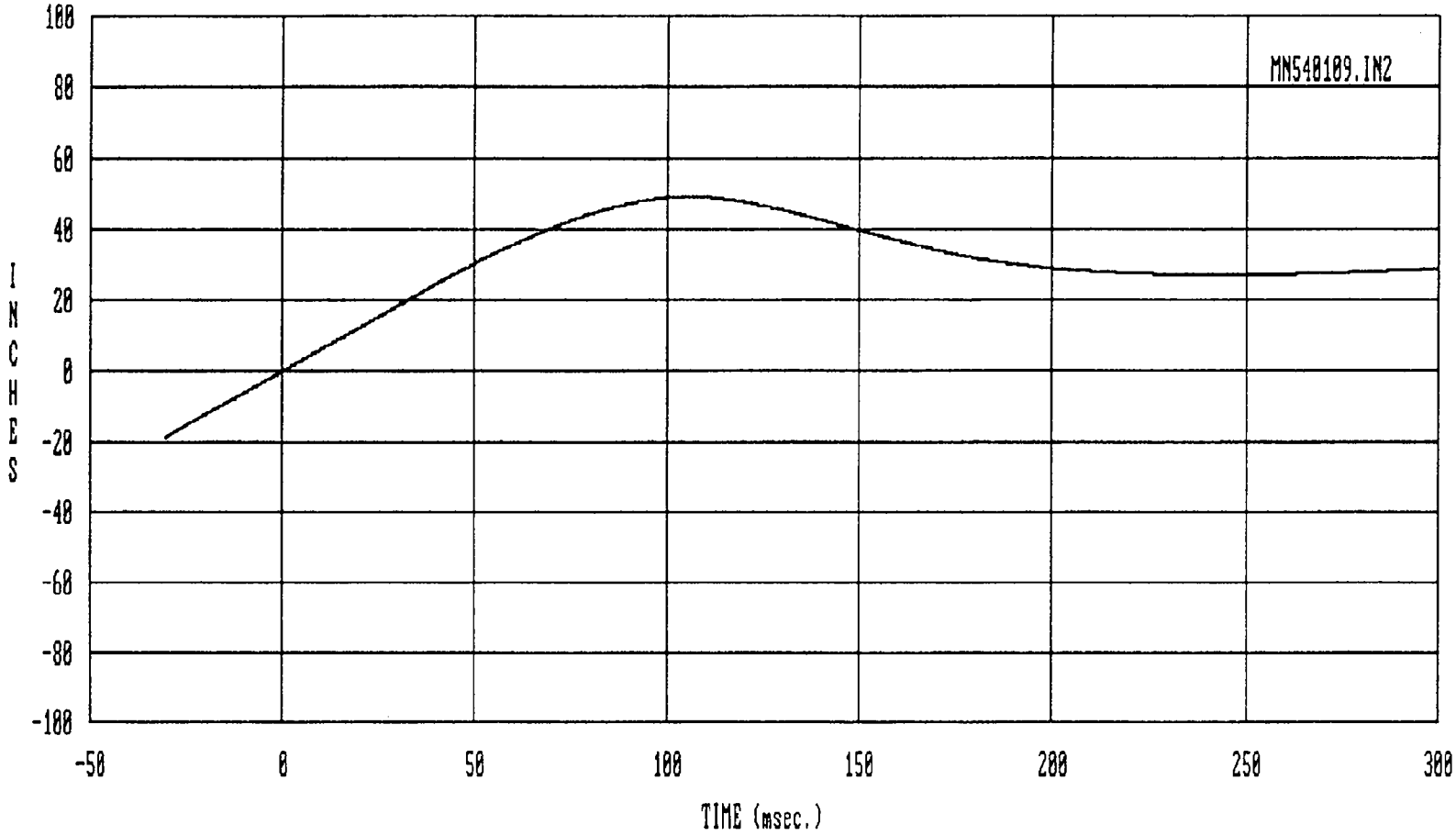

Curve: Passenger head acceleration -- X axis  Filter: SAE CLASS 1000  Max = 25.557  Min = -47.656

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



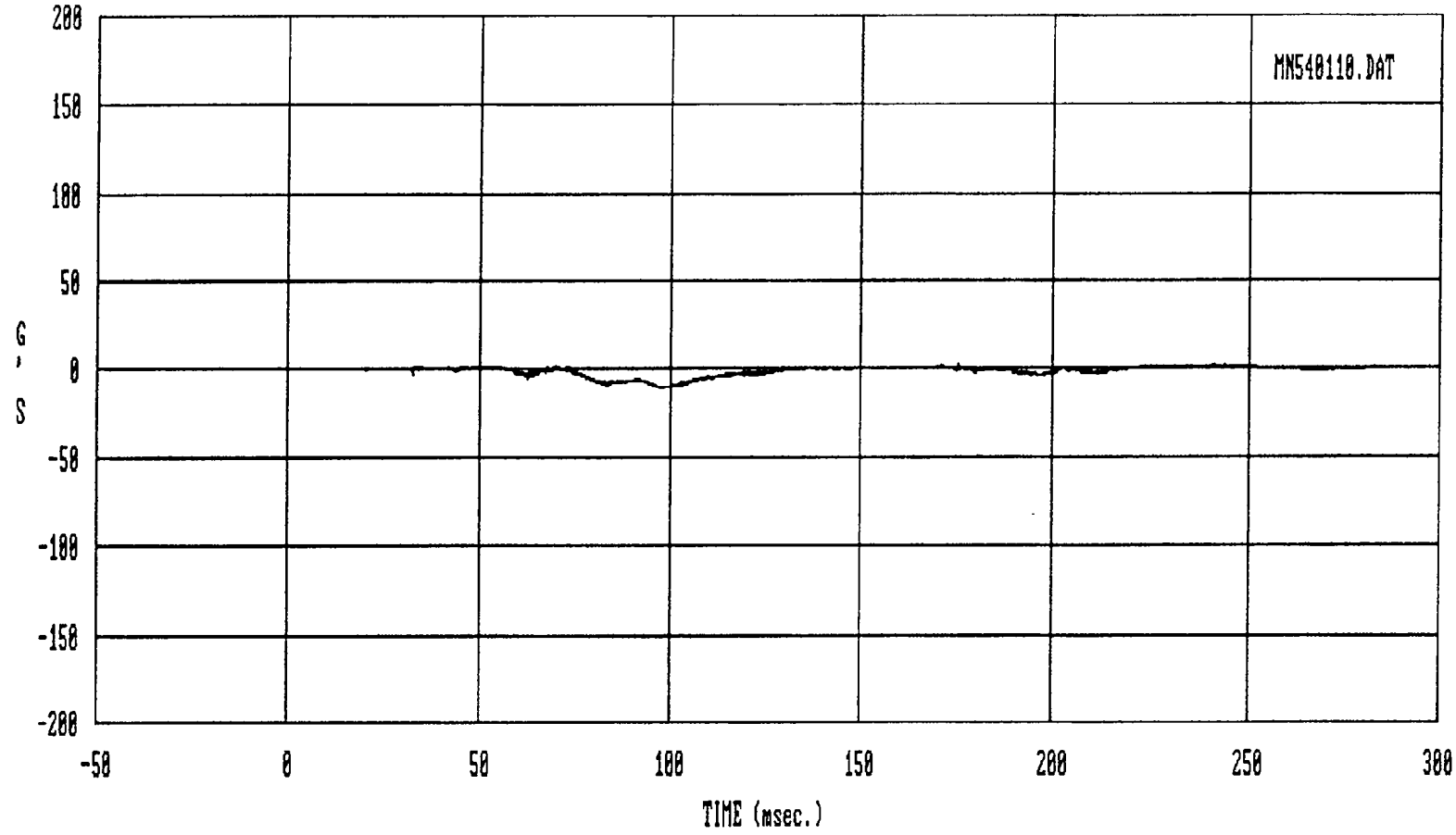

Curve: Passenger head delta V -- X axis  Filter: SAE CLASS 180  Max = 35.199  Min = -16.567

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



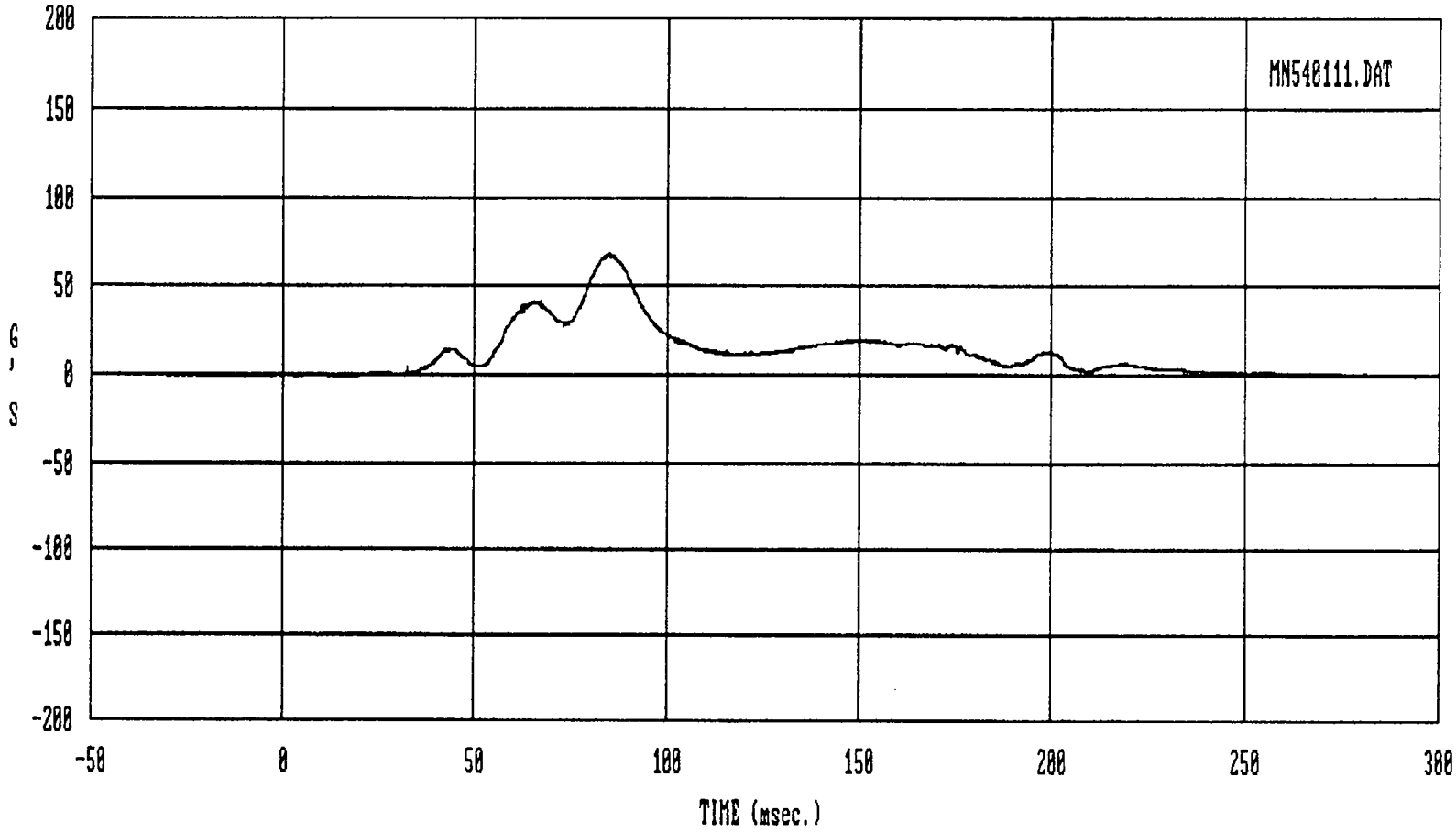

Curve: Passenger head displacement -- X axis  Filter: SAE CLASS 180  Max = 49.222  Min = 27.181

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



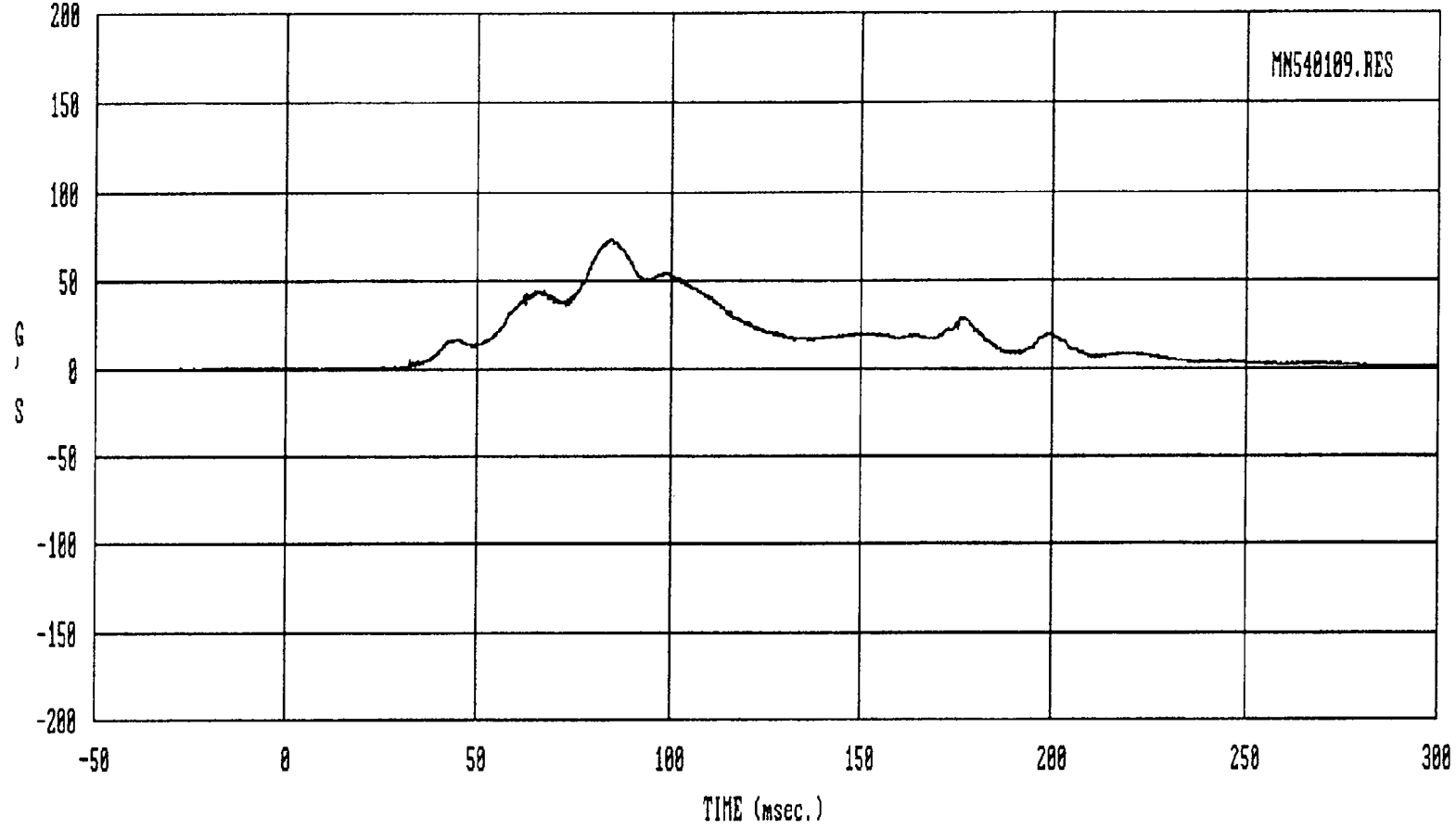

Curve: Passenger head acceleration -- Y axis  Filter: SAE CLASS 1000  Max = 3.8518  Min = -10.853

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



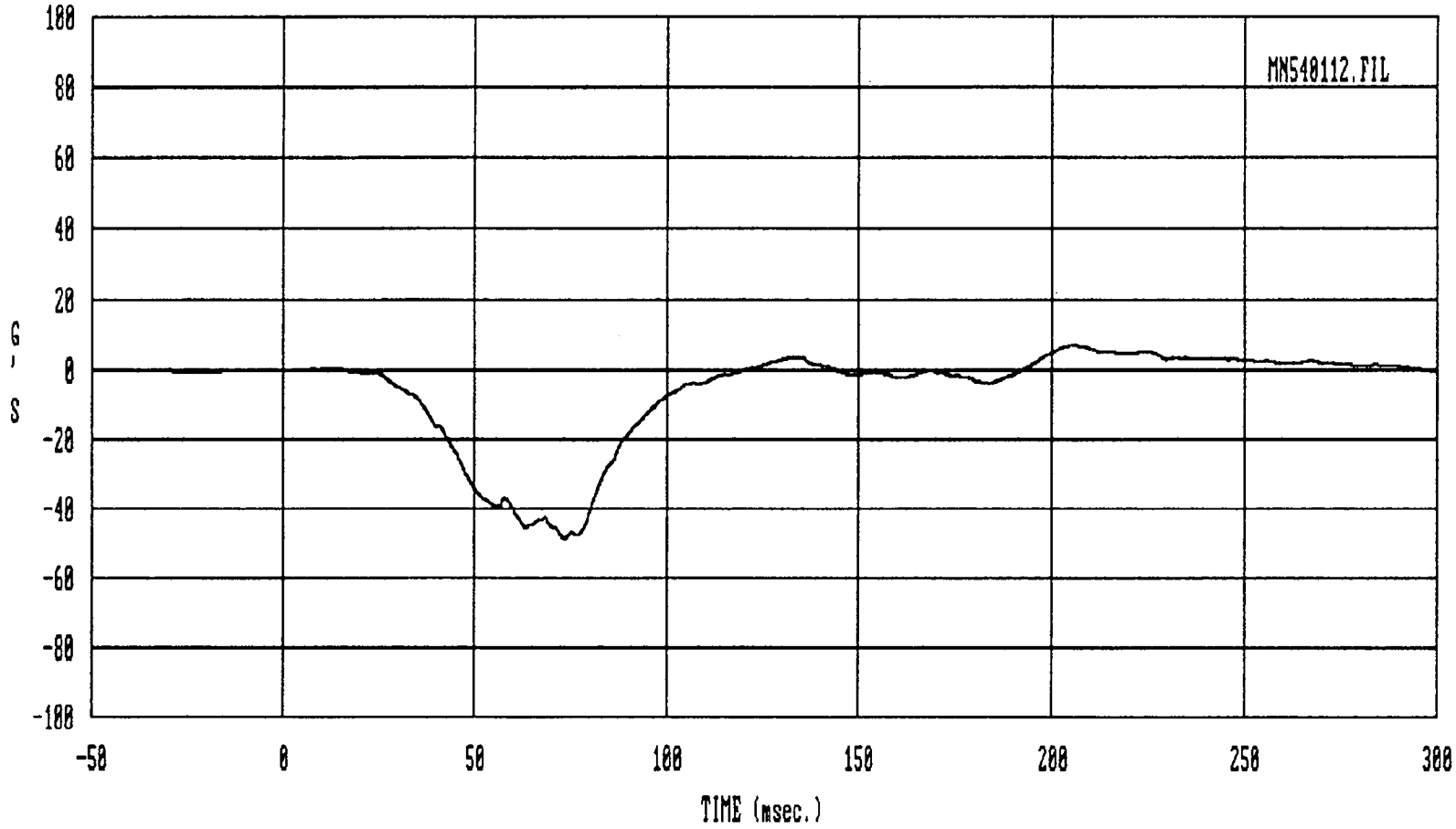

Curve: Passenger head acceleration -- Z axis  Filter: SAE CLASS 1000  Max = 68.215  Min = -.88336

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



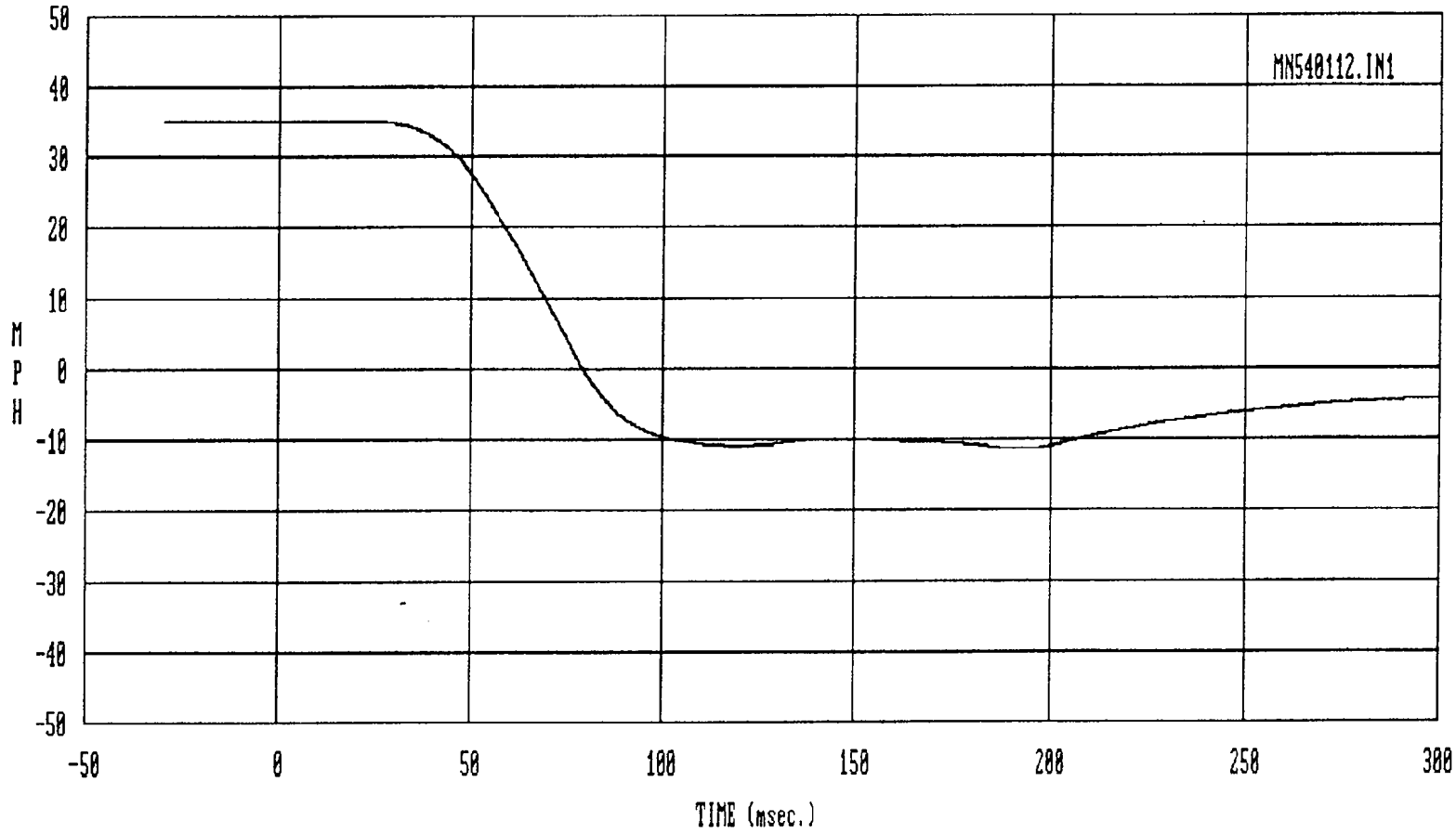

Curve: Passenger head acceleration — Resultant  Filter: SAE CLASS 1000  Max = 73.936  Min = .24692

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



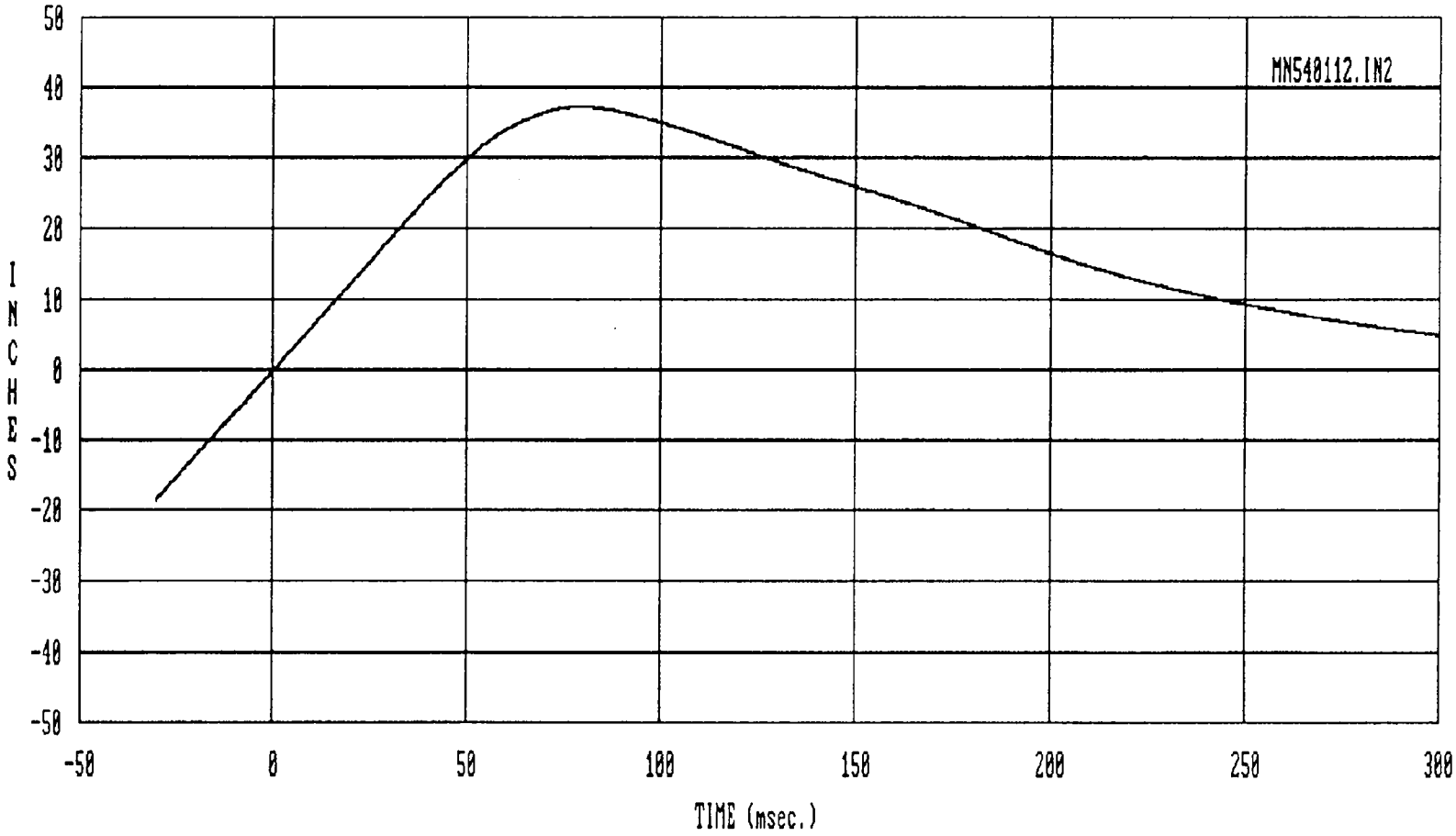

Curve: Passenger chest acceleration -- X axis  Filter: SAE CLASS 180  Max = 7.0458  Min = -48.559

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



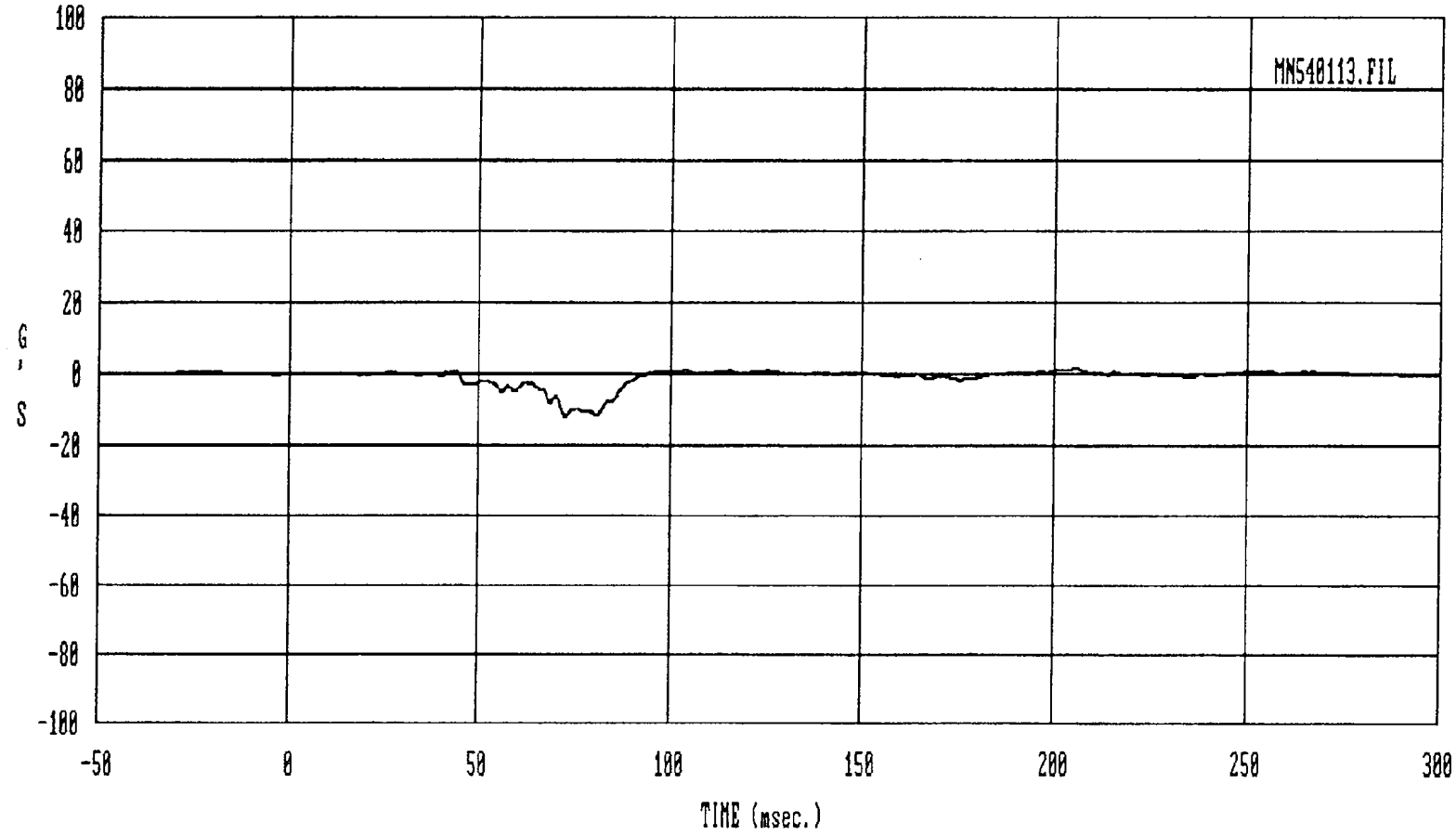

Curve: Passenger chest delta V -- X axis  Filter: SAE CLASS 180  Max = 35.270  Min = -11.438

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



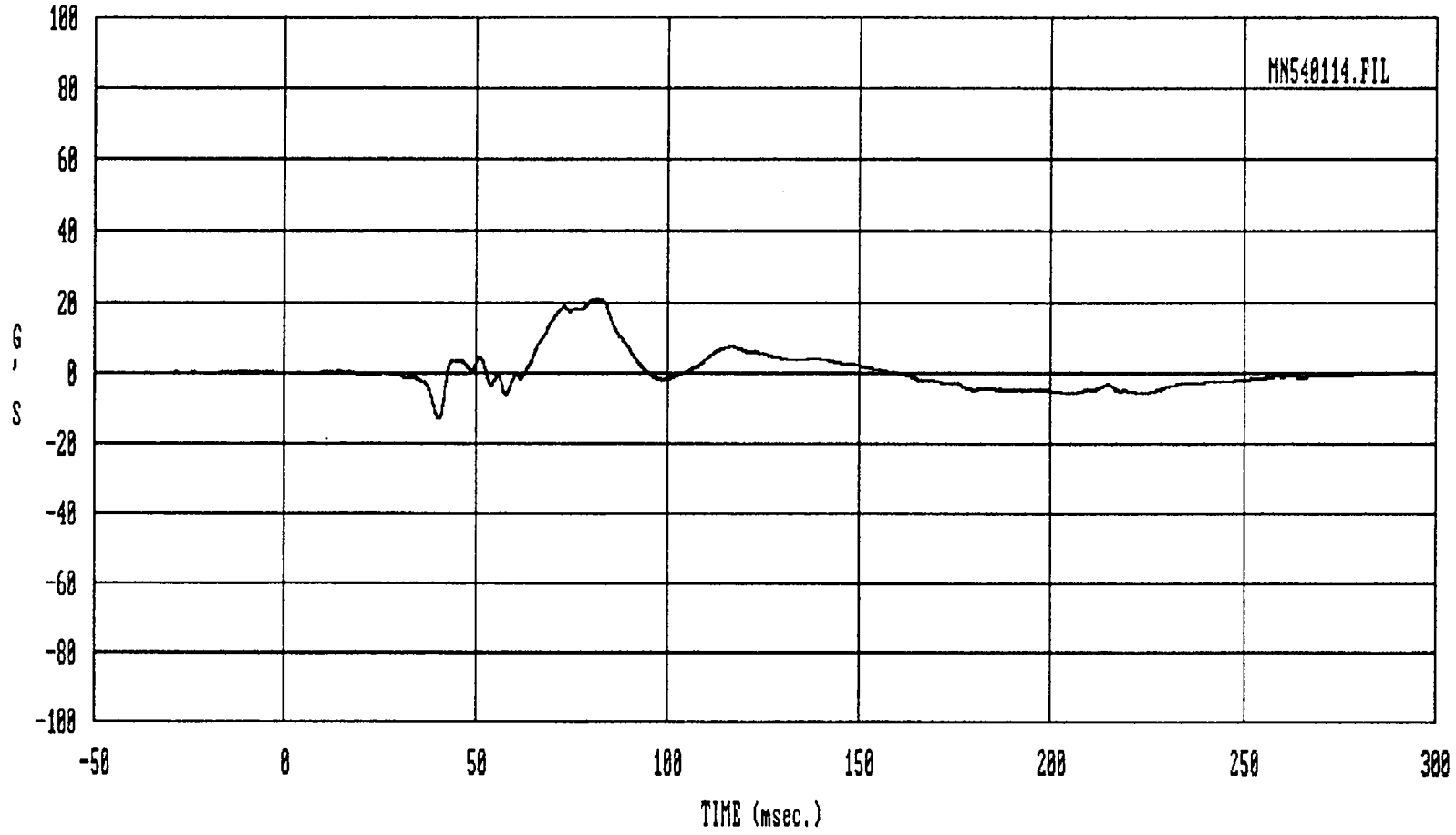

Curve: Passenger chest displacement -- X axis  Filter: SAE CLASS 180  Max = 37.323  Min = 4.9413

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



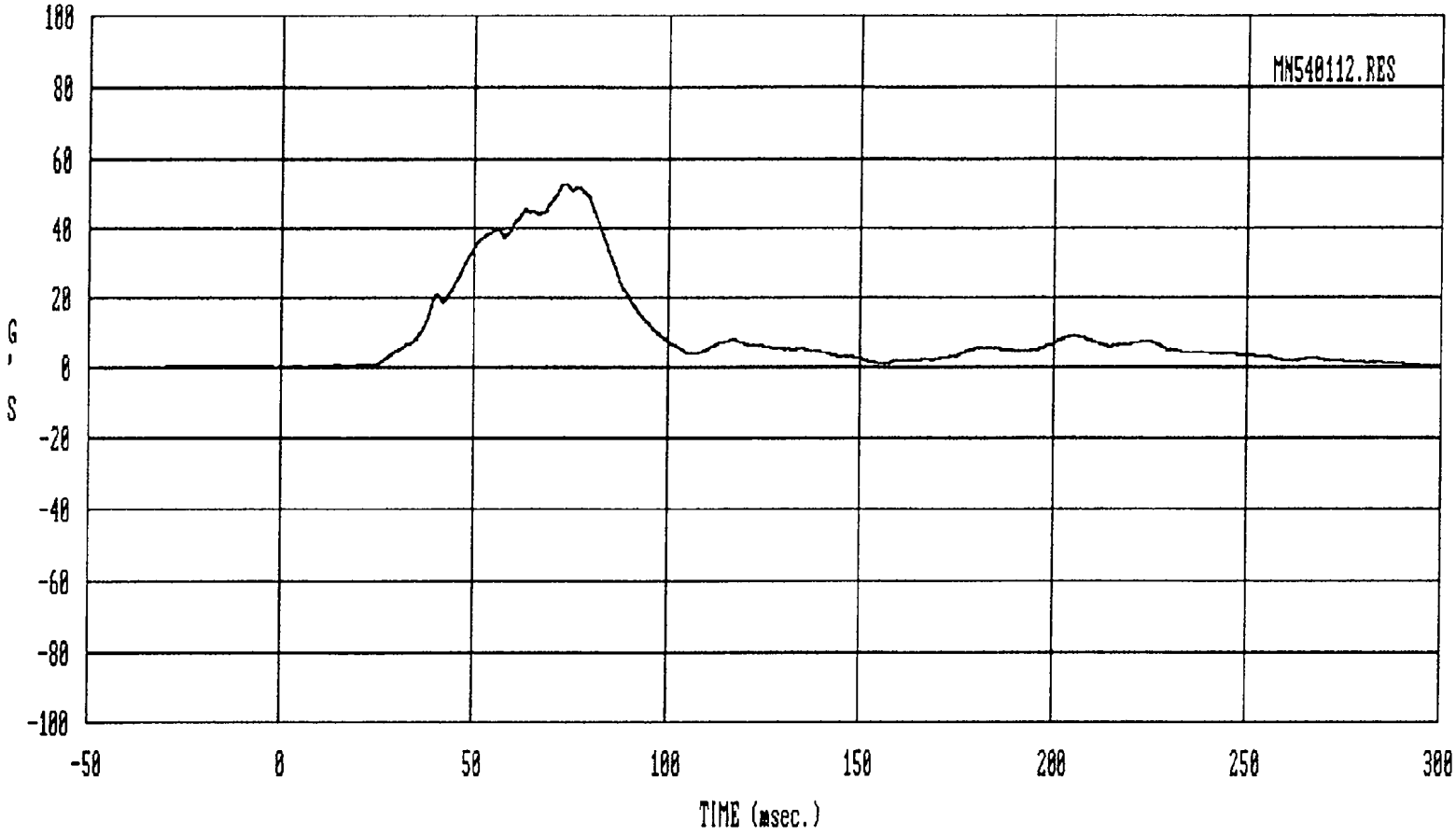

Curve: Passenger chest acceleration -- Y axis  Filter: SAE CLASS 180  Max = 1.4700  Min = -12.056

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



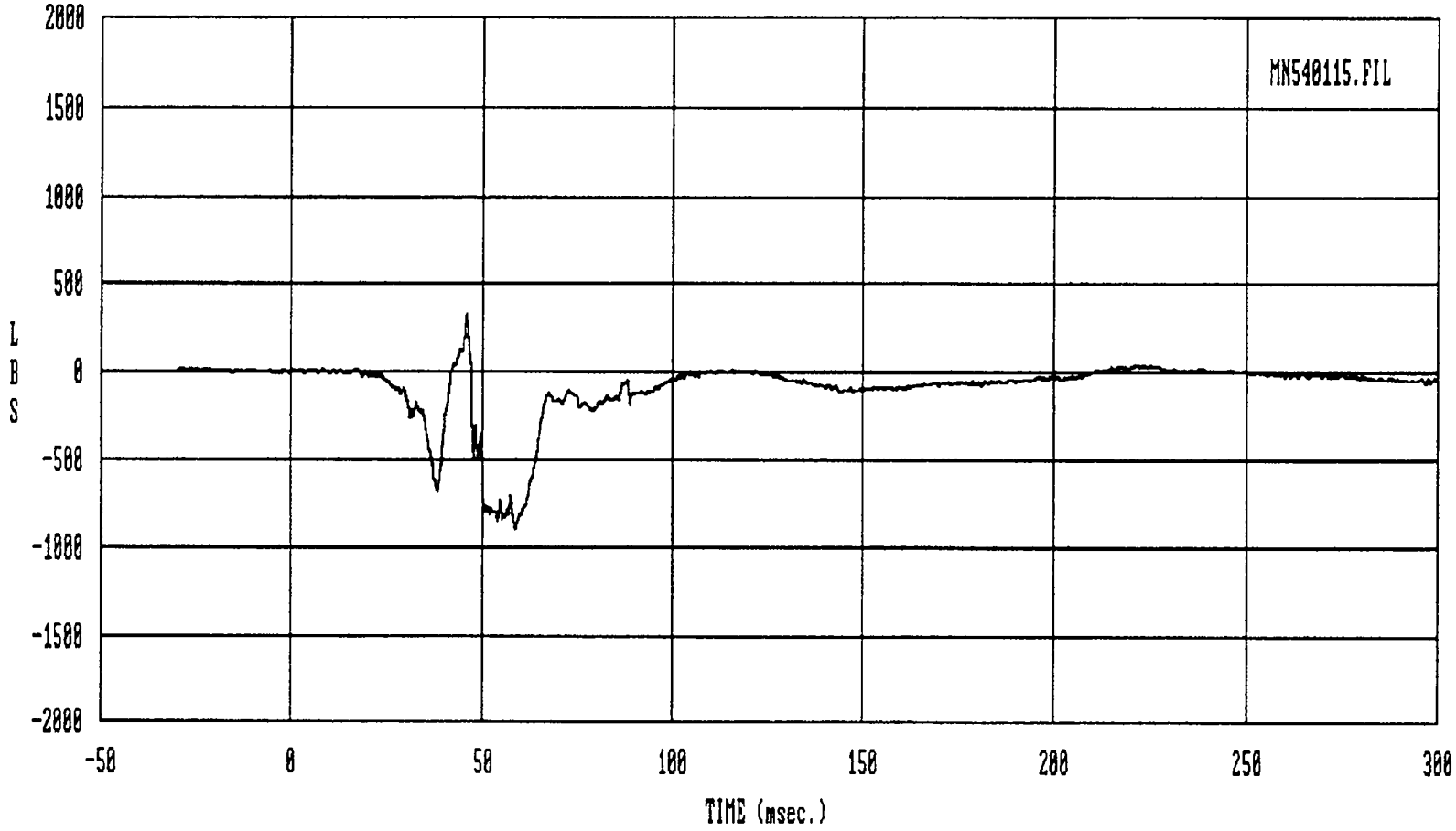

Curve: Passenger chest acceleration -- Z axis  Filter: SAE CLASS 180  Max = 21.100  Min = -12.977

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



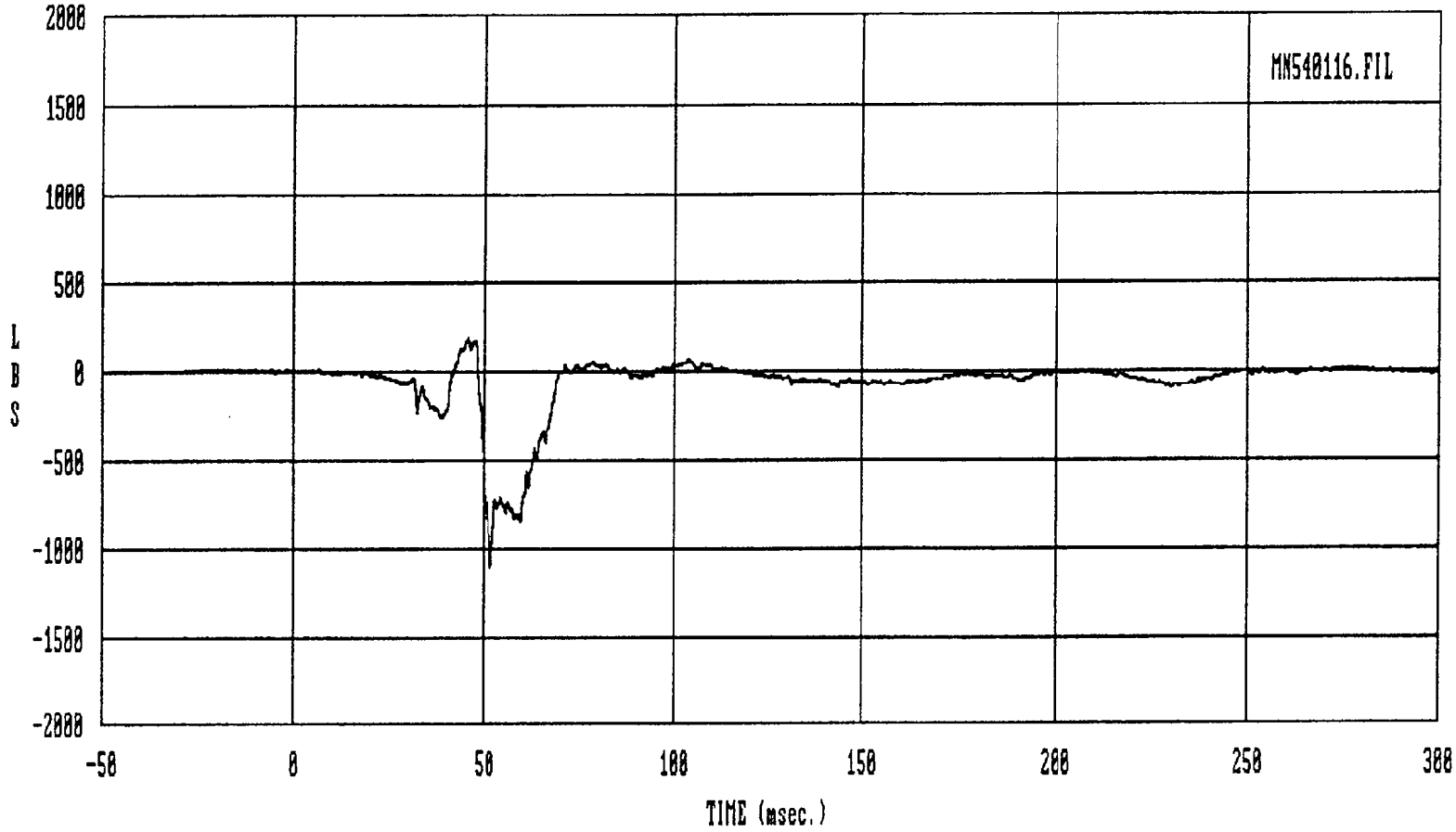

Curve: Passenger chest acceleration -- Resultant  Filter: SAE CLASS 180  Max = 53.180  Min = .10841

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



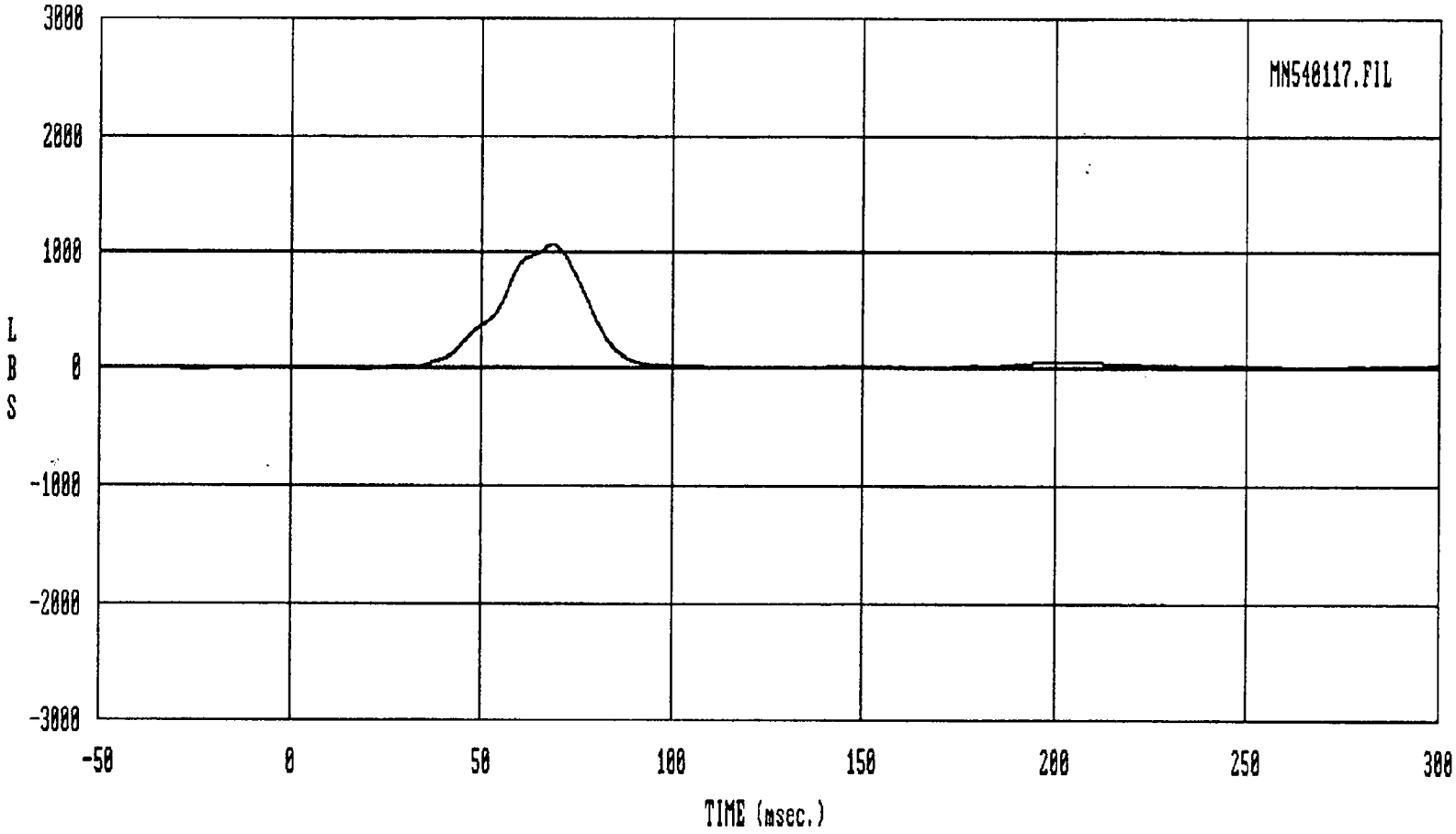

Curve: Passenger femur load -- Left femur  Filter: SAE CLASS 600  Max = 328.15  Min = -893.97

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



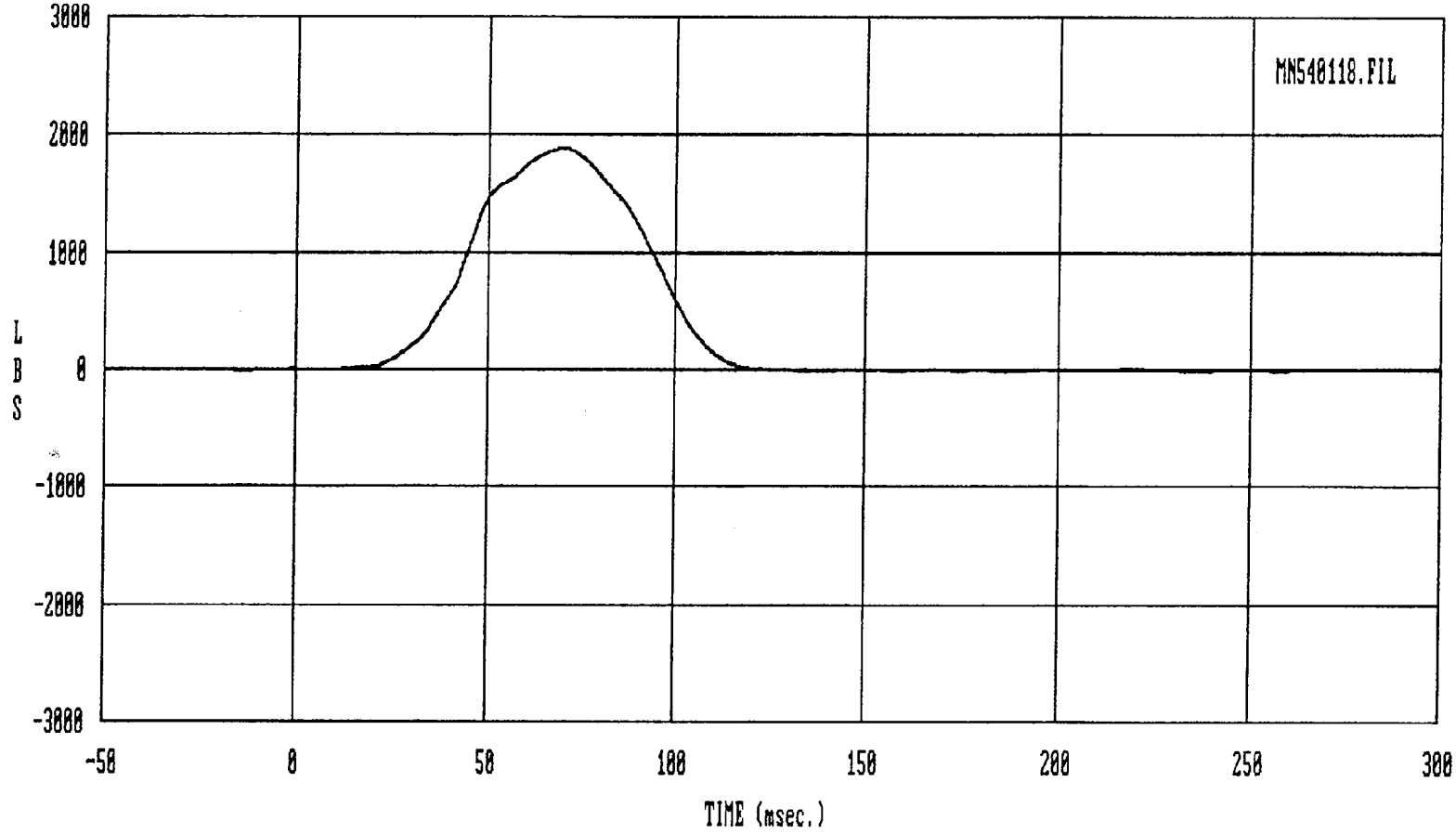

Curve: Passenger femur load — Right femur  Filter: SAE CLASS 600  Max = 192.49  Min = -1897.5

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



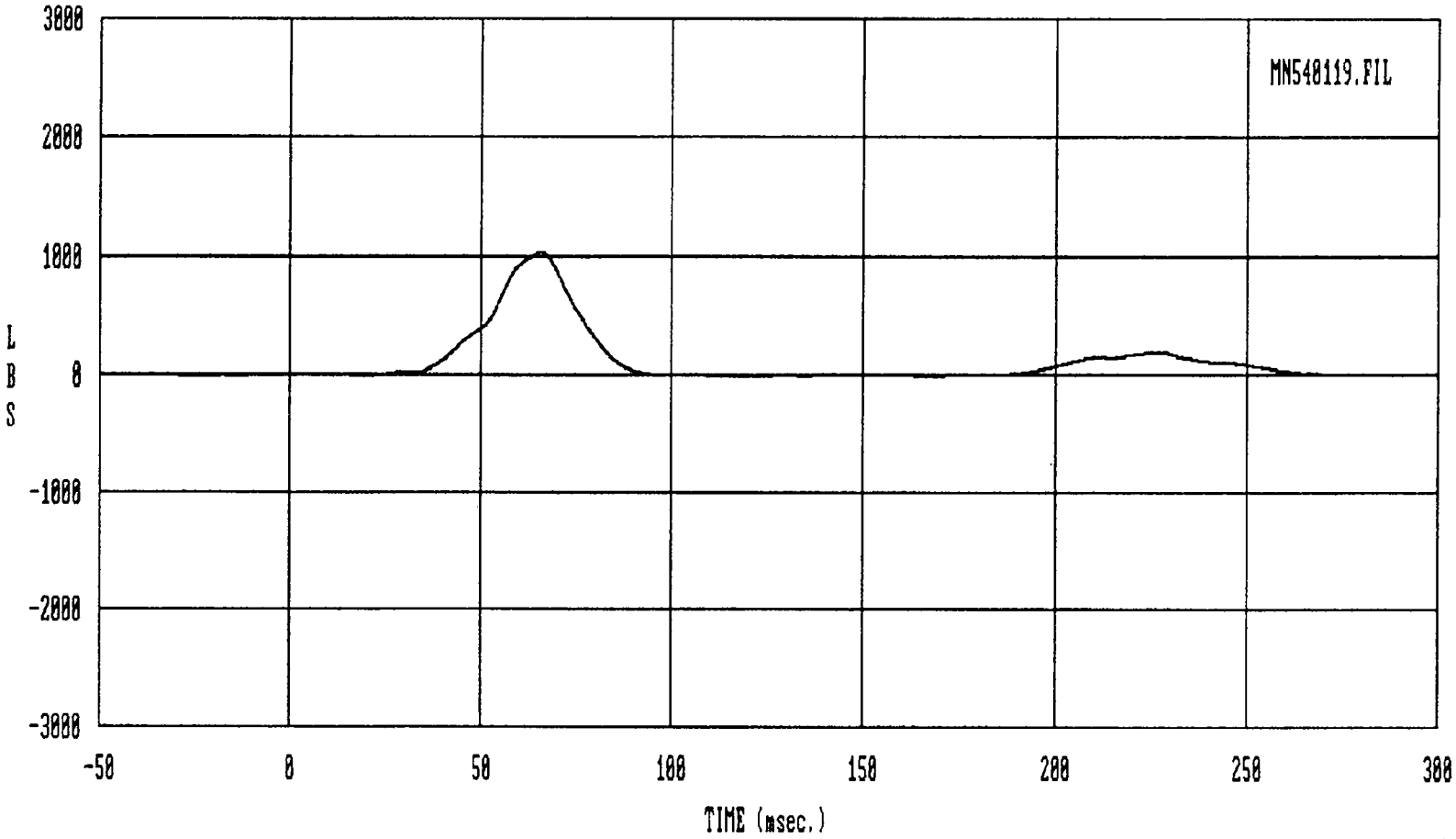

Curve: Driver lap belt load  Filter: SAE CLASS 60  Max = 1060.0  Min = -6.0145

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



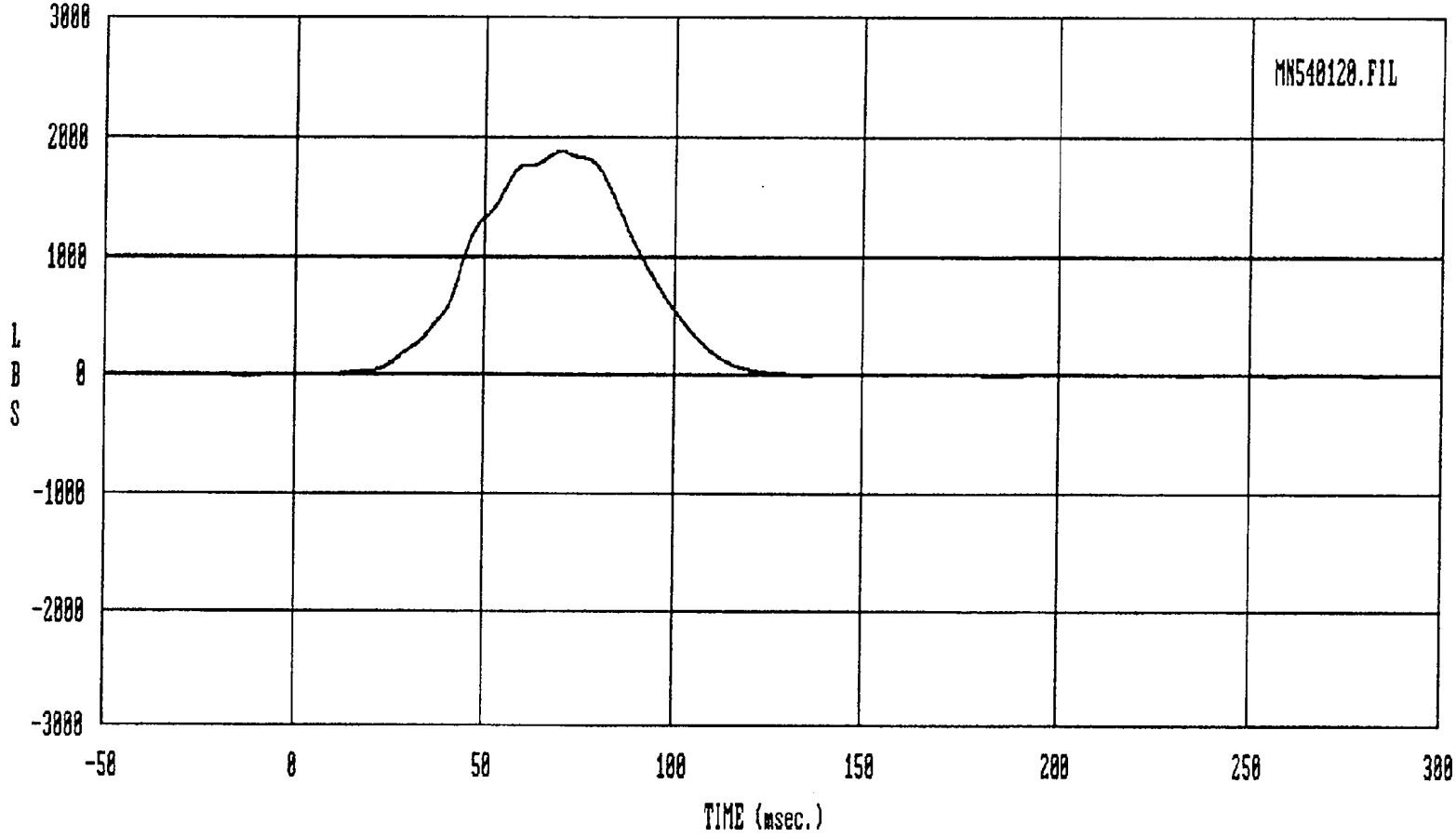

Curve: Driver shoulder belt load  Filter: SAE CLASS 60  Max = 1889.3  Min = -11.920

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



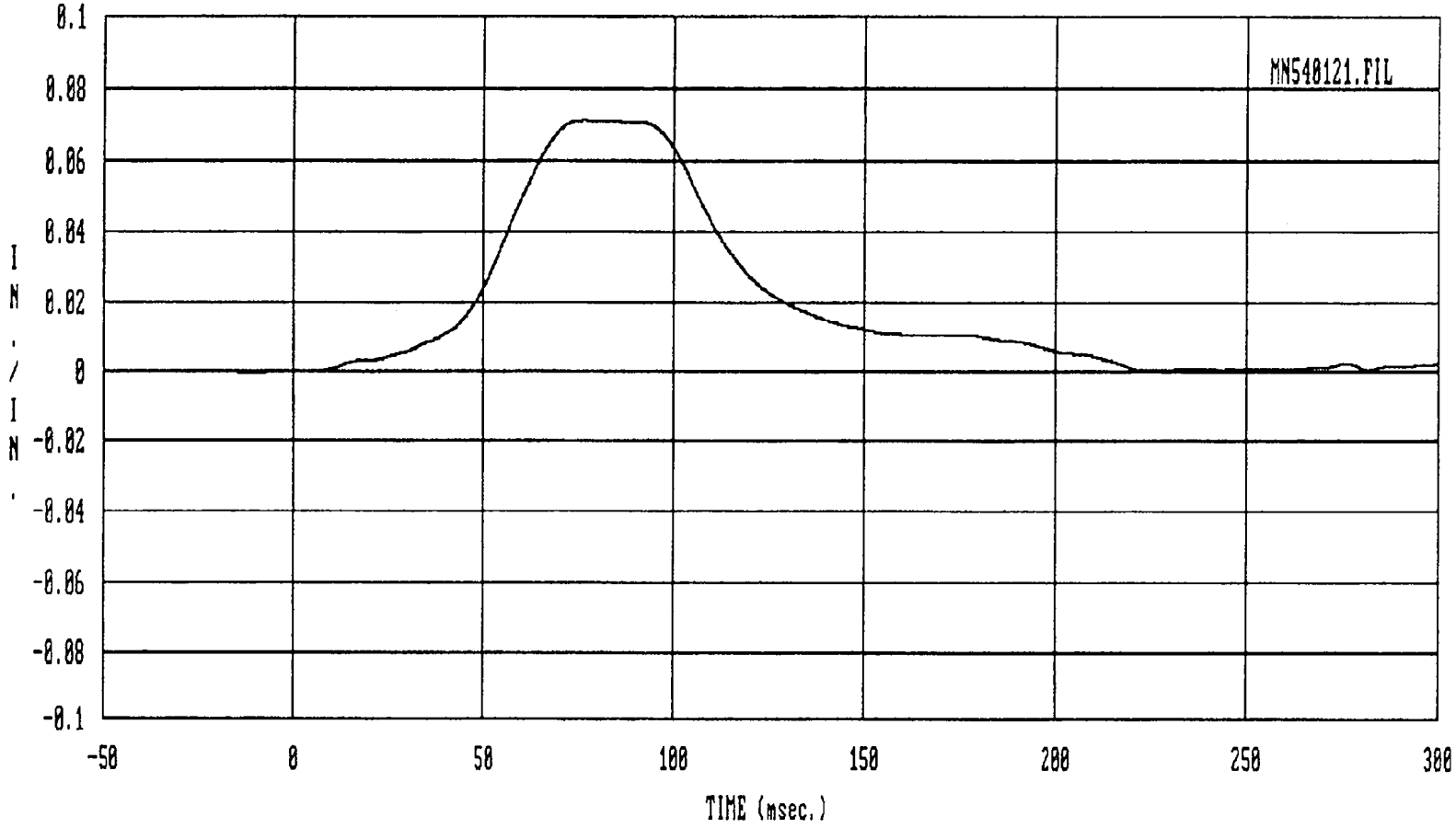

Curve: Passenger lap belt load  Filter: SAE CLASS 60  Max = 1040.8  Min = -10.887

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



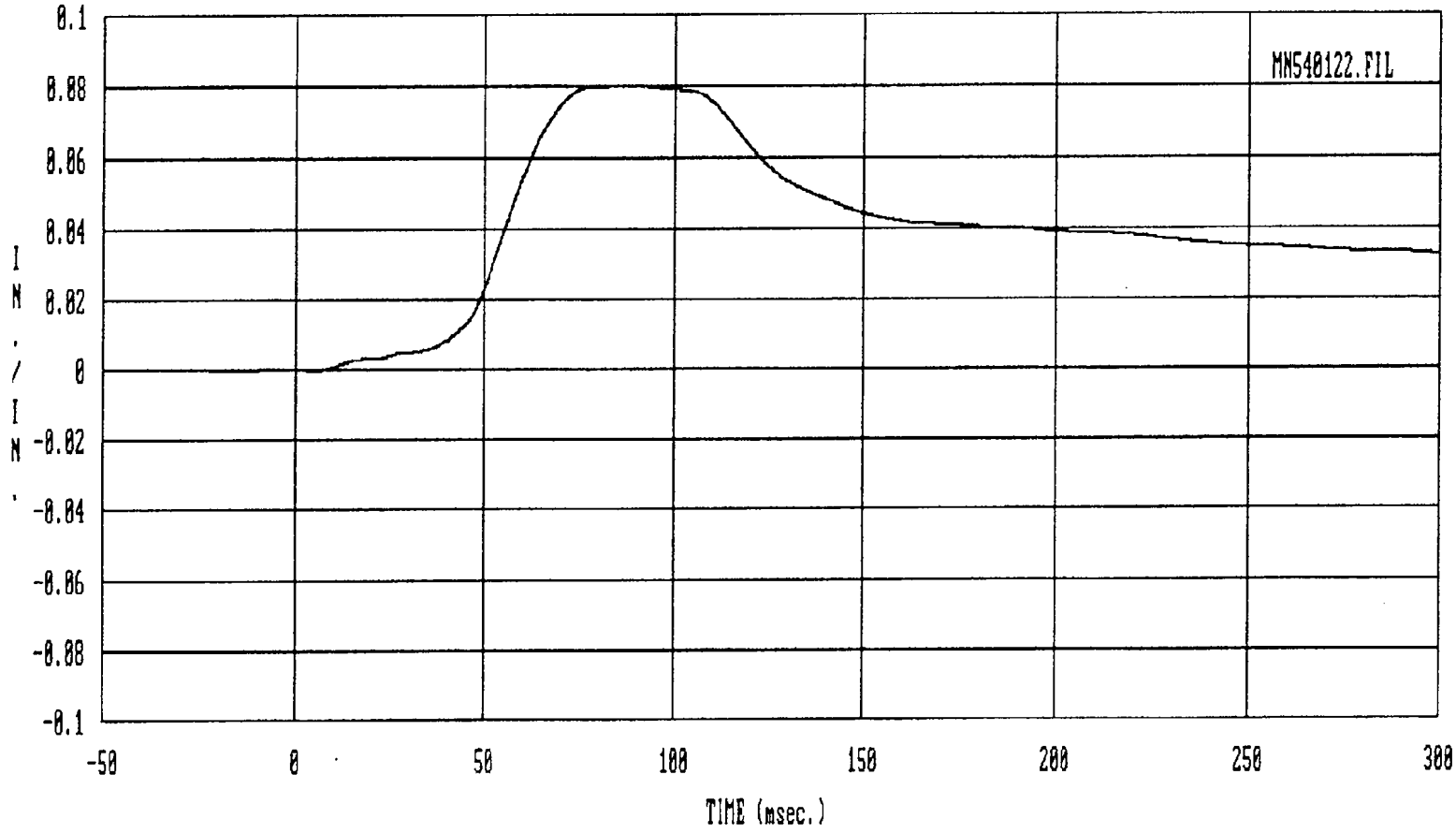

Curve: Passenger shoulder belt load  Filter: SAE CLASS 60  Max = 1886.4  Min = -10.885

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



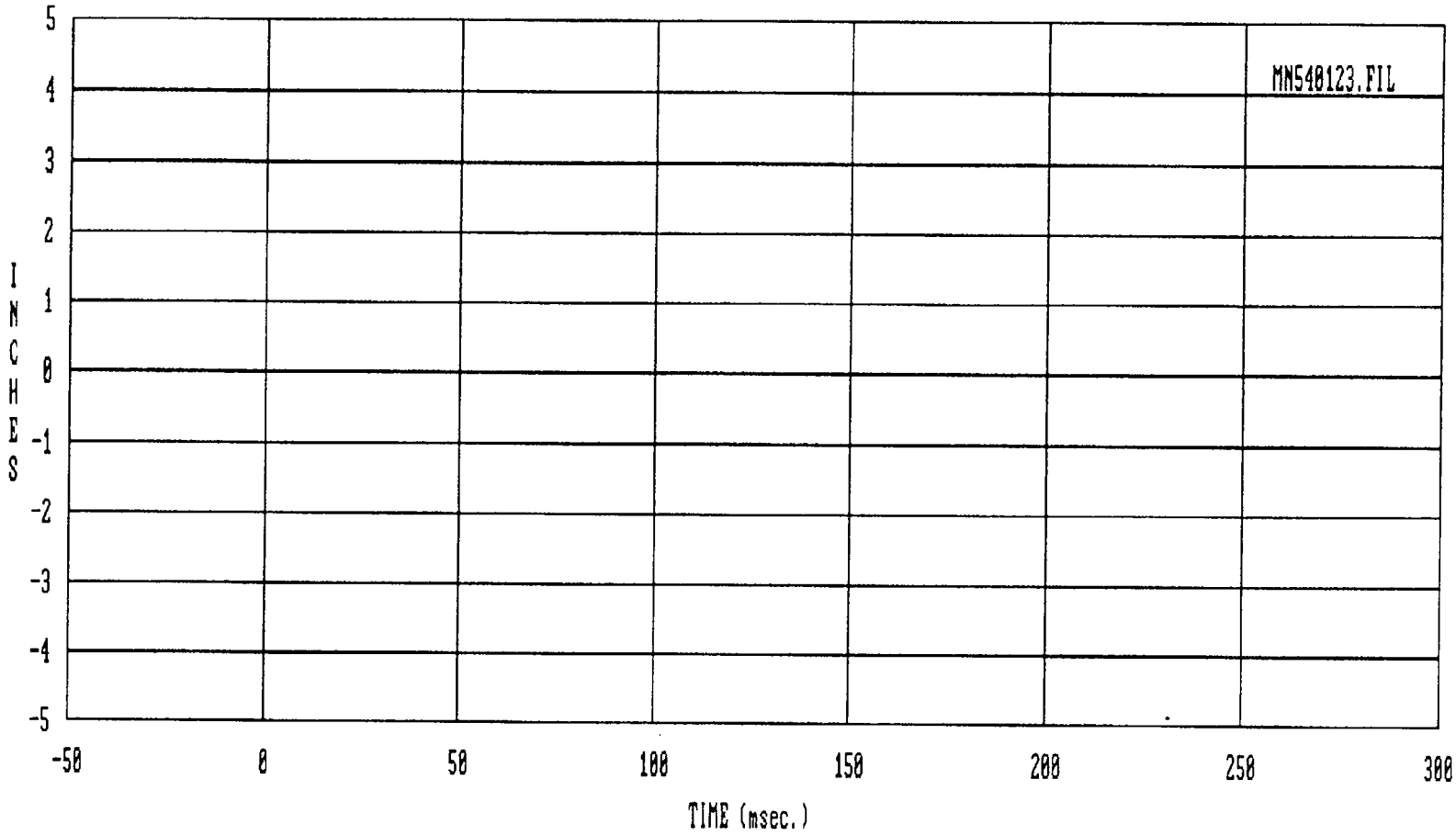

Curve: Driver seat belt elongation  Filter: SAE CLASS 60  Max = .71343E-01  Min = -.57156E-04

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



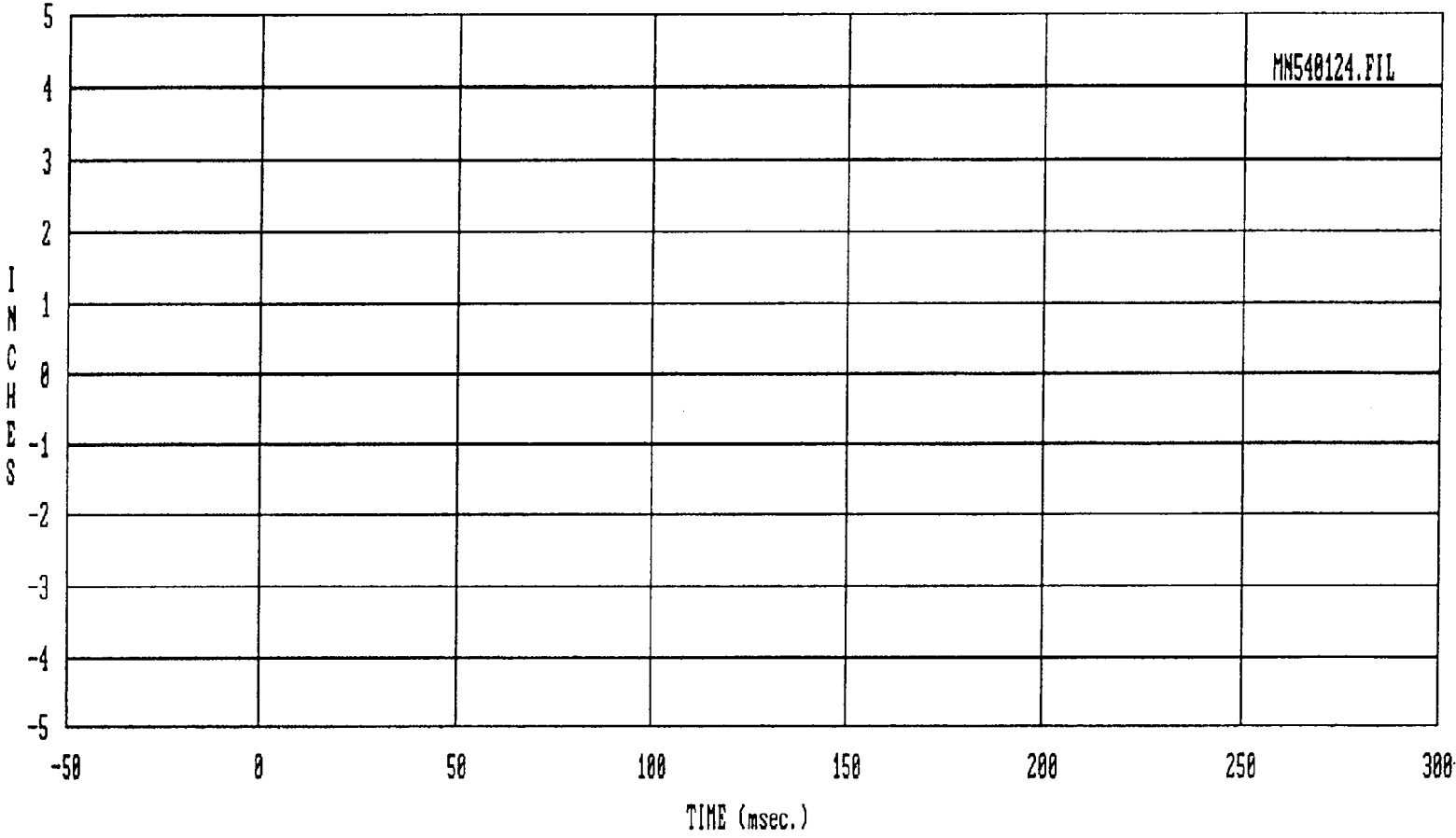

Curve: Passenger seat belt elongation  Filter: SAE CLASS 60  Max = .80129E-01  Min = -.26358E-03

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



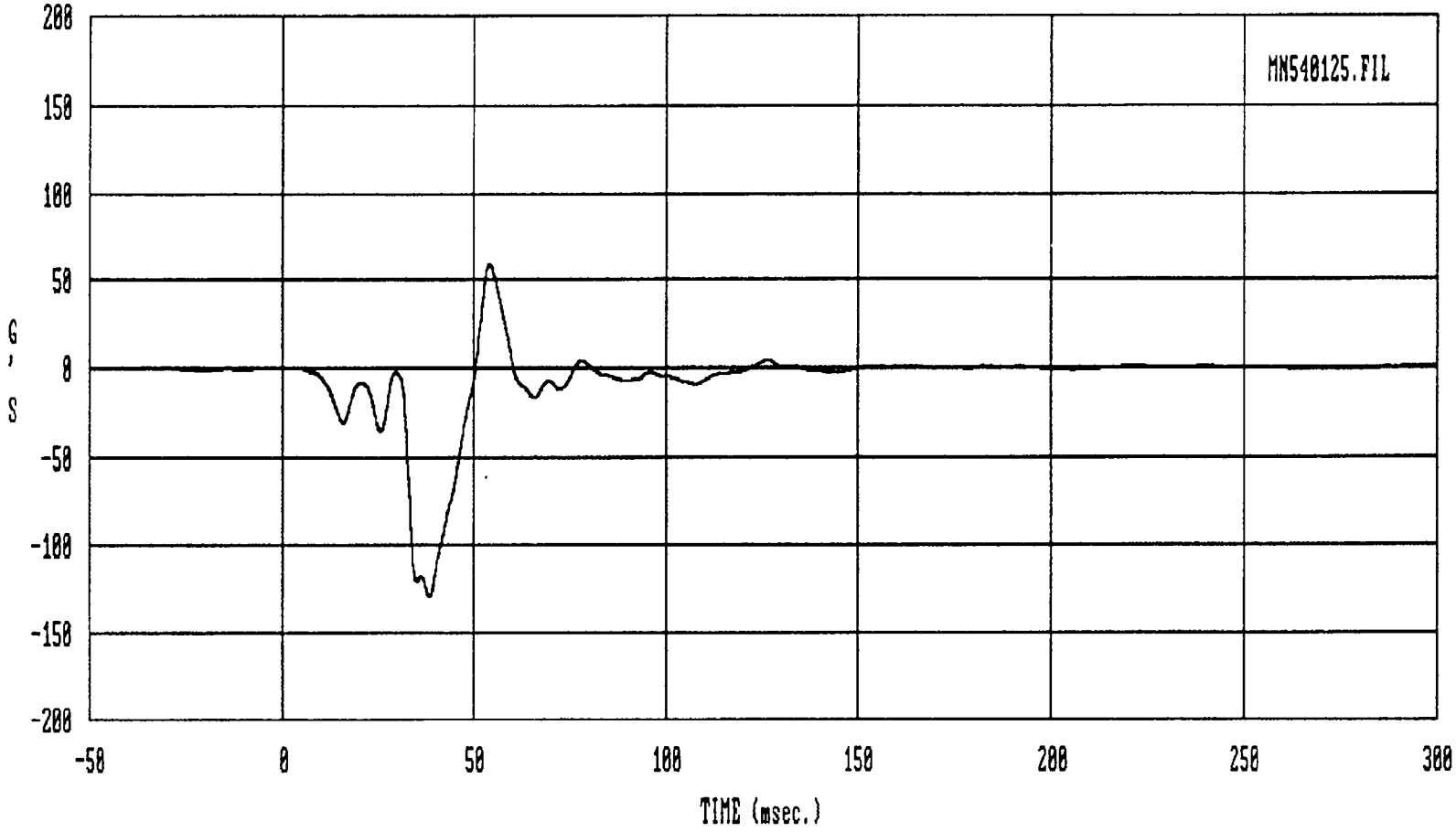

Curve: Driver seat belt pullout  Filter: SAE CLASS 60  Max = .00000  Min = .00000

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



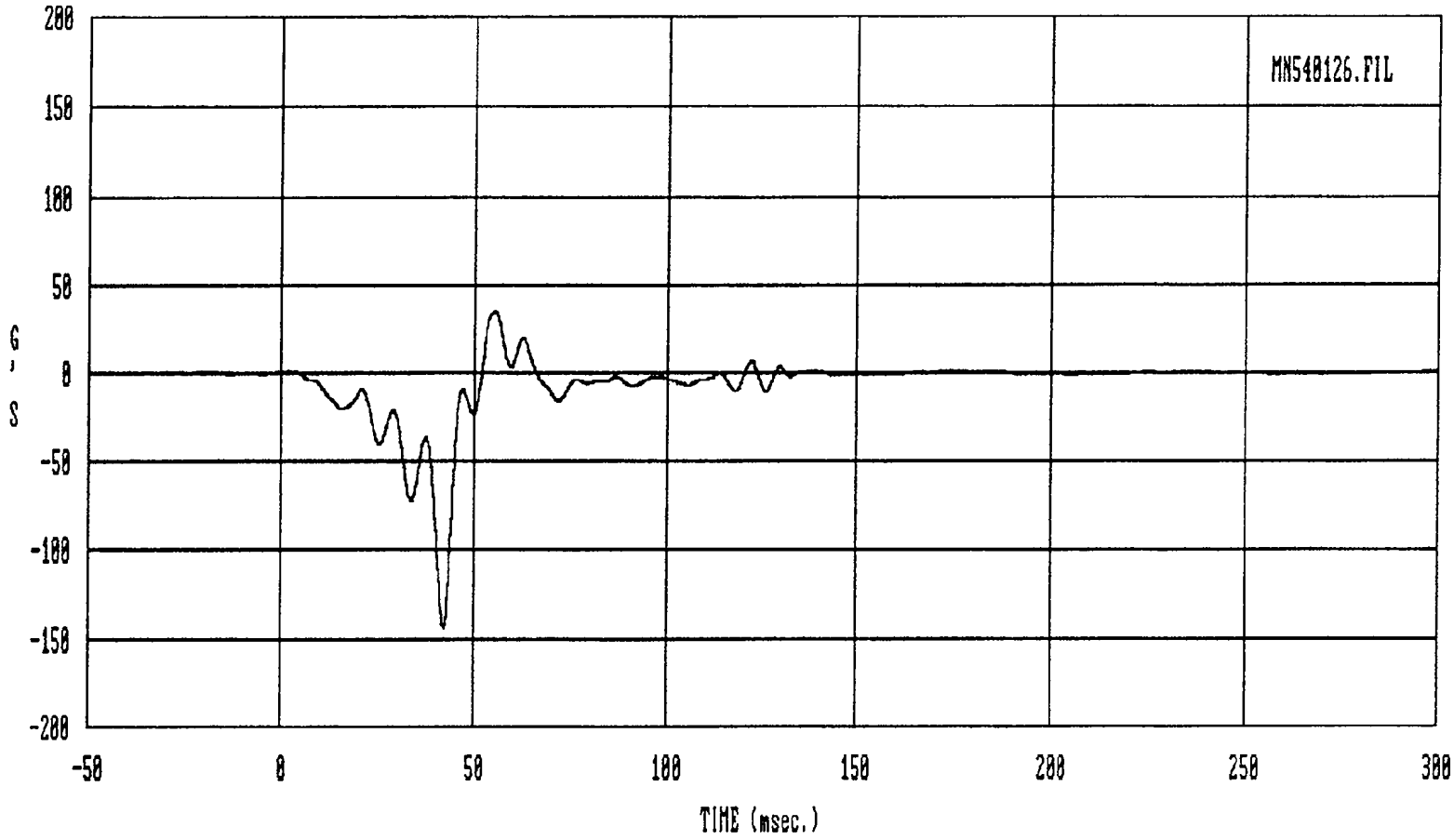

Curve: Passenger seat belt pullout  Filter: SAE CLASS 60  Max = .00000  Min = .00000

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



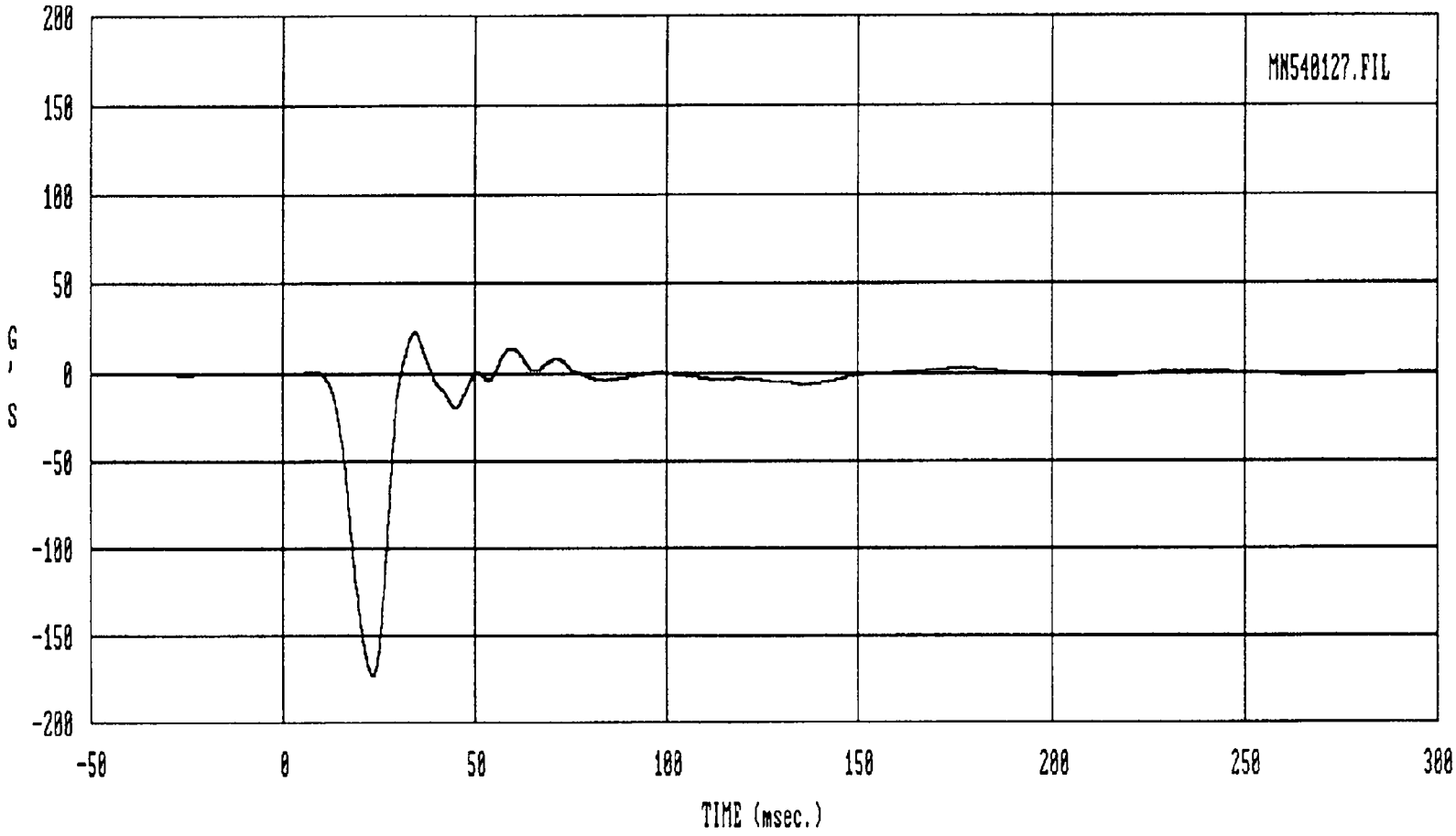

Curve: Left front caliper acceleration -- X axis  Filter: SAE CLASS 60  Max = 59.321  Min = -129.11

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



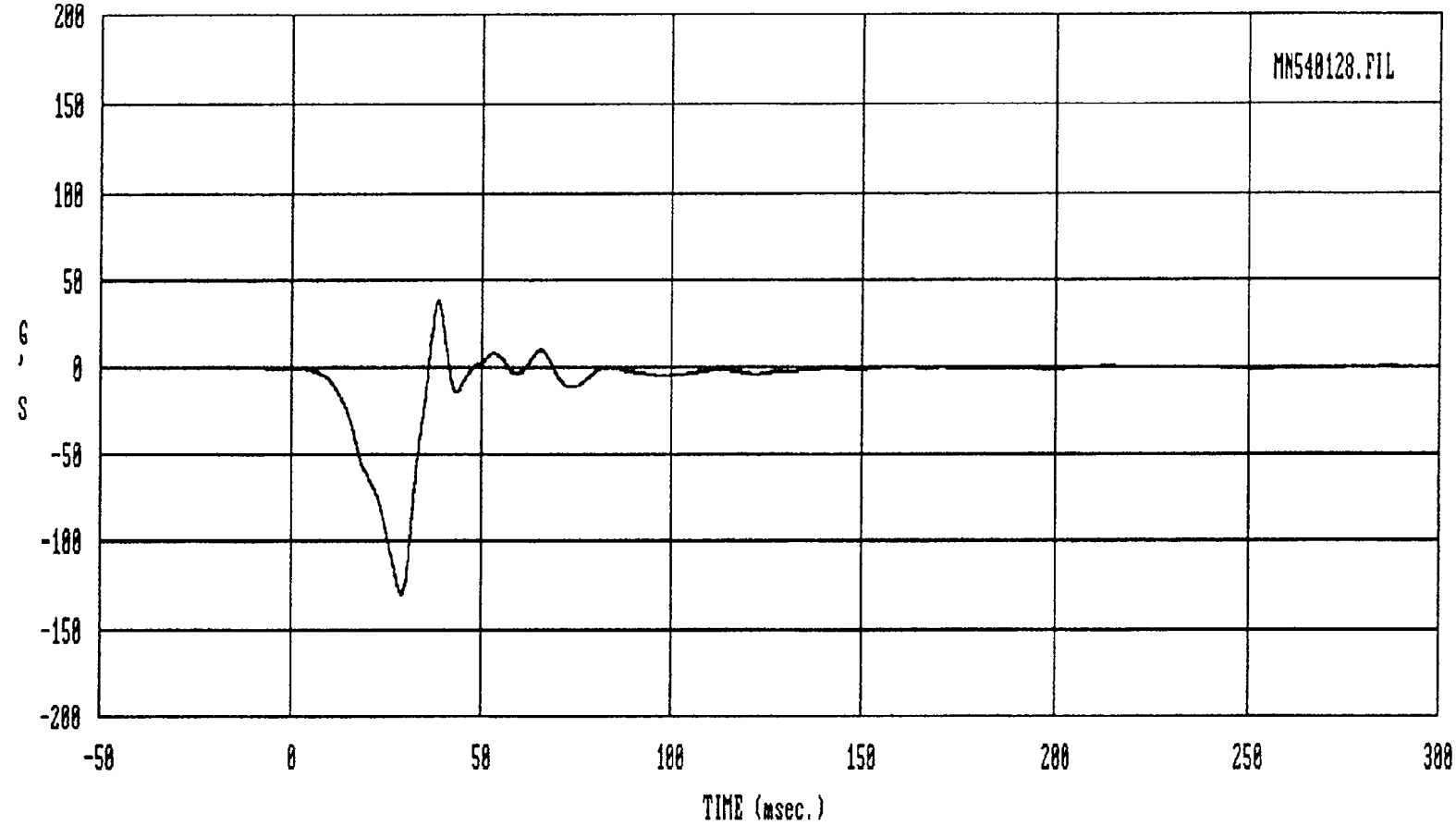

Curve: Right front caliper acceleration -- X axis Filter: SAE CLASS 60 Max = 35.186 Min = -143.81

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



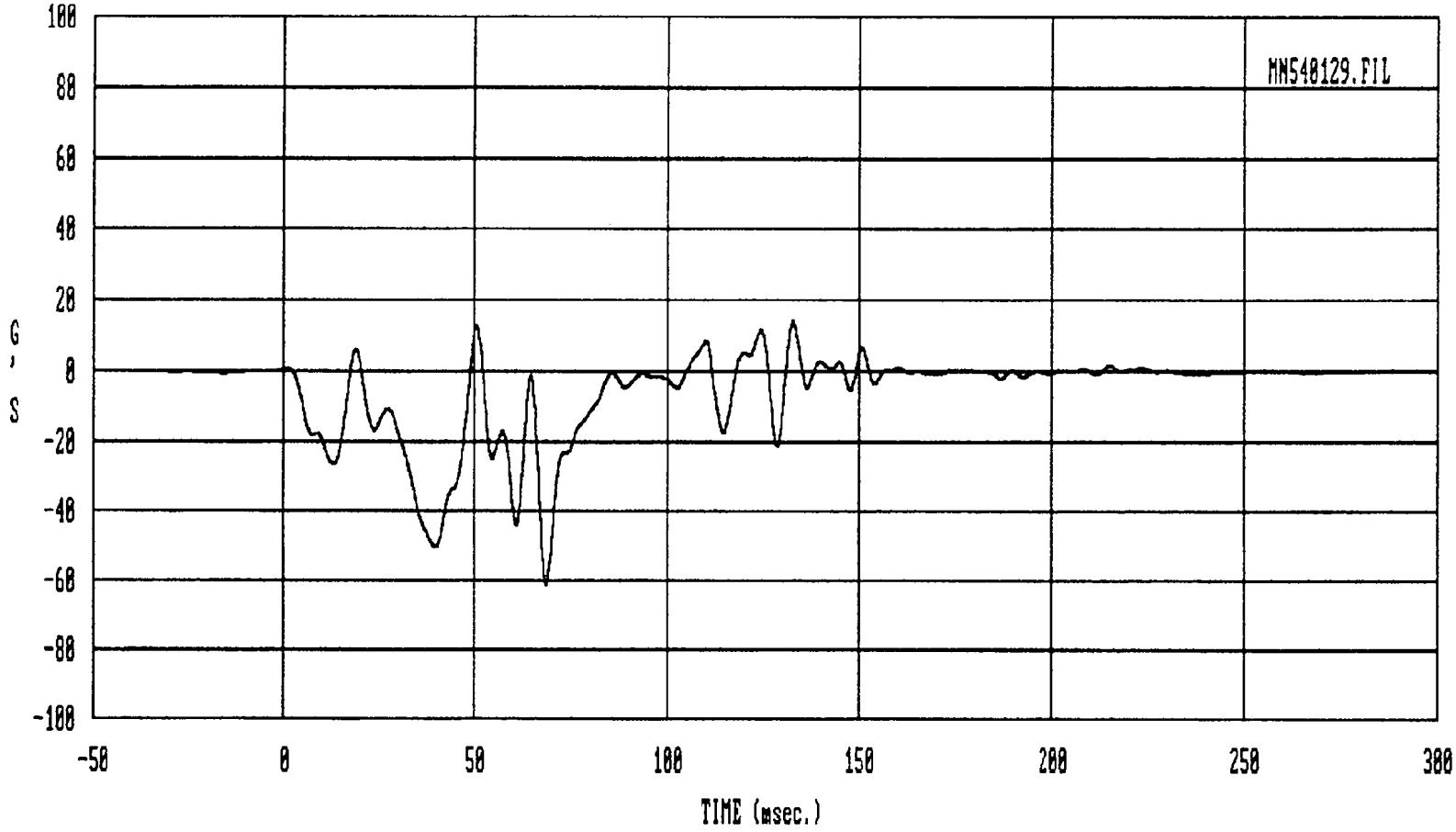

Curve: Engine bottom acceleration -- X axis  Filter: SAE CLASS 60  Max = 23.649  Min = -173.01

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



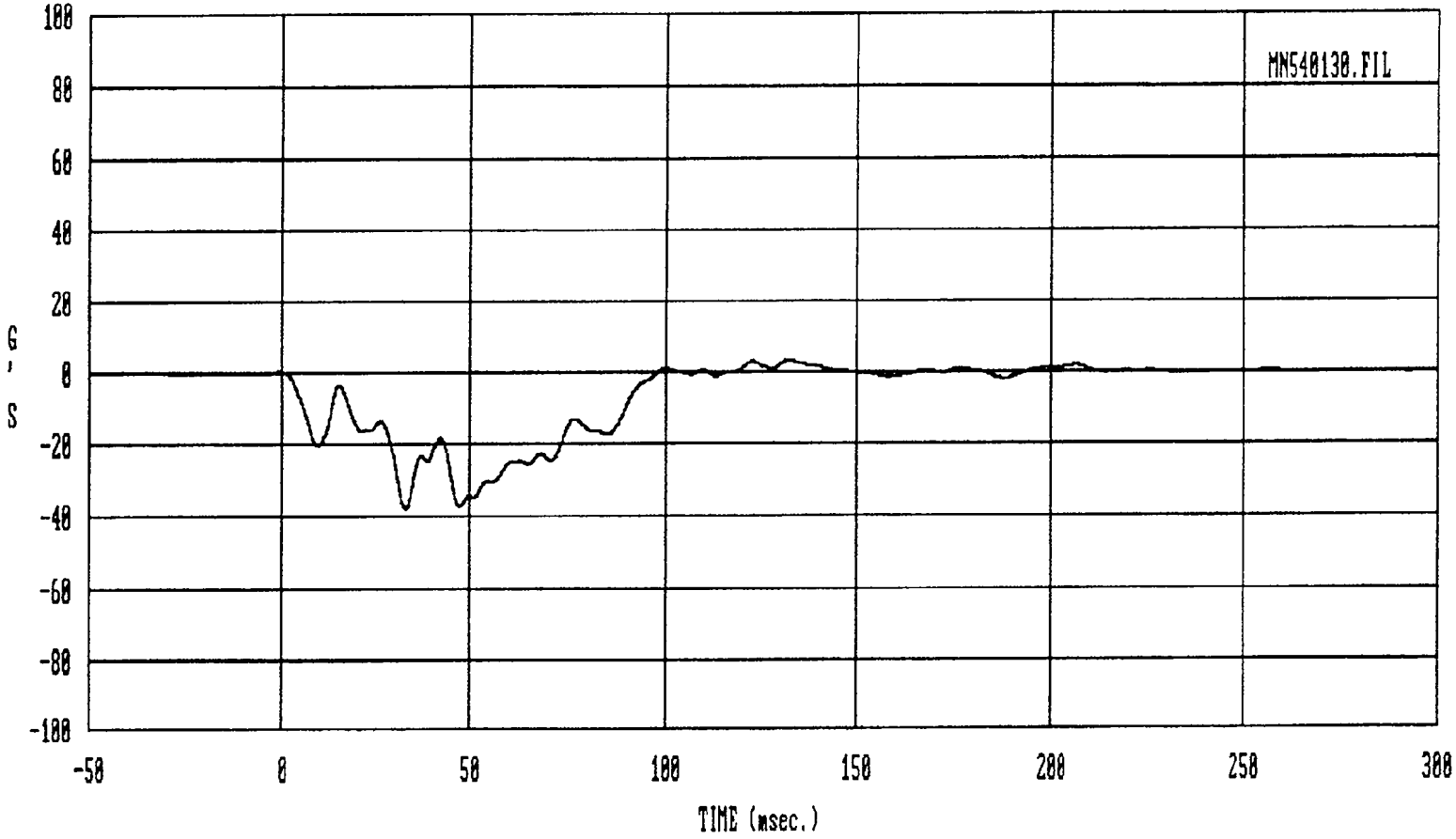

Curve: Engine top acceleration -- X axis  Filter: SAE CLASS 60  Max = 38.681  Min = -130.82

MSE  Date: 06/05/92  Program: 1992 NCAP - 06  Vehicle: 1992 Mazda MX3



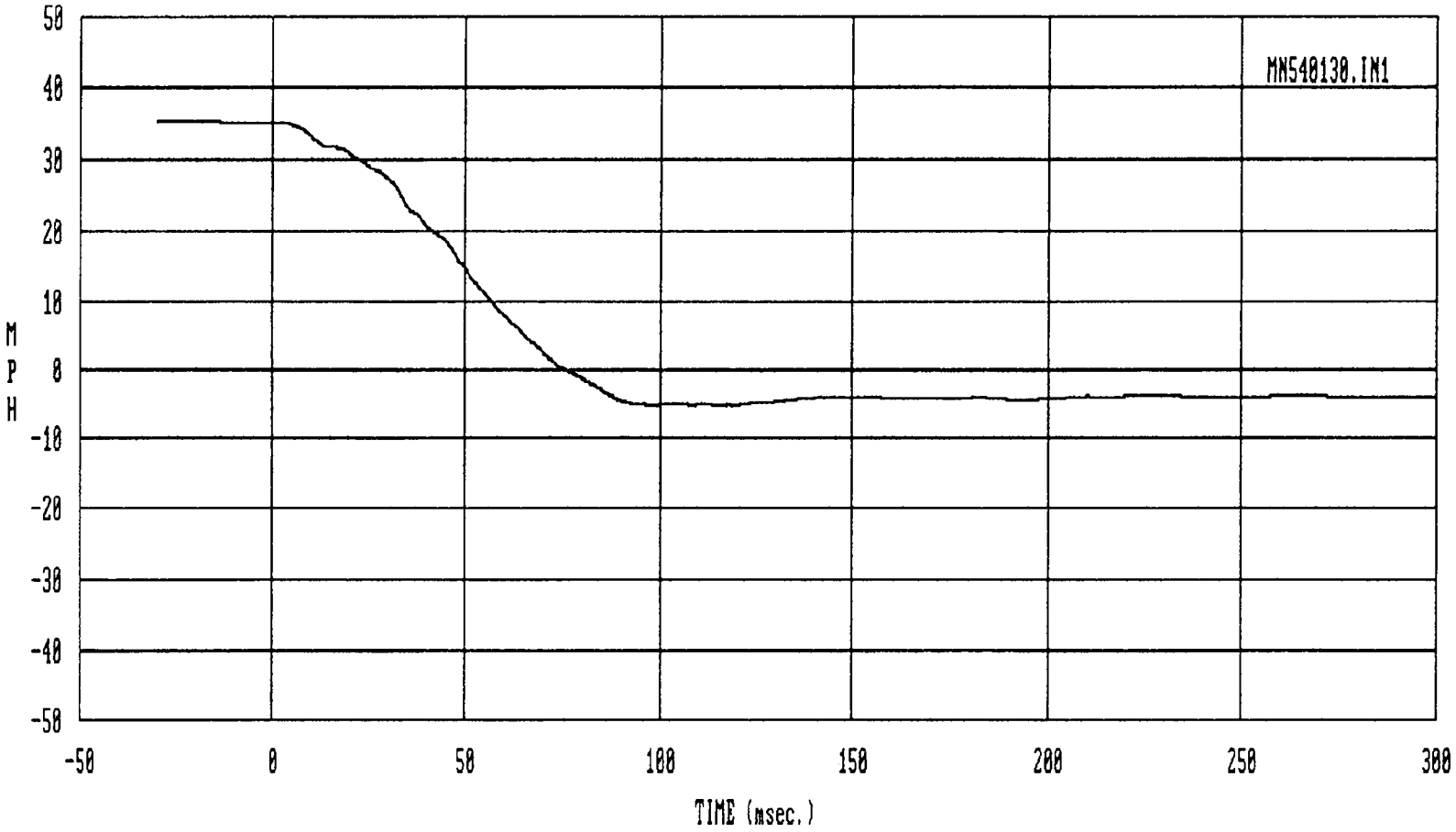

Curve: Dashpanel acceleration -- X axis  Filter: SAE CLASS 60  Max = 14.140  Min = -61.170

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



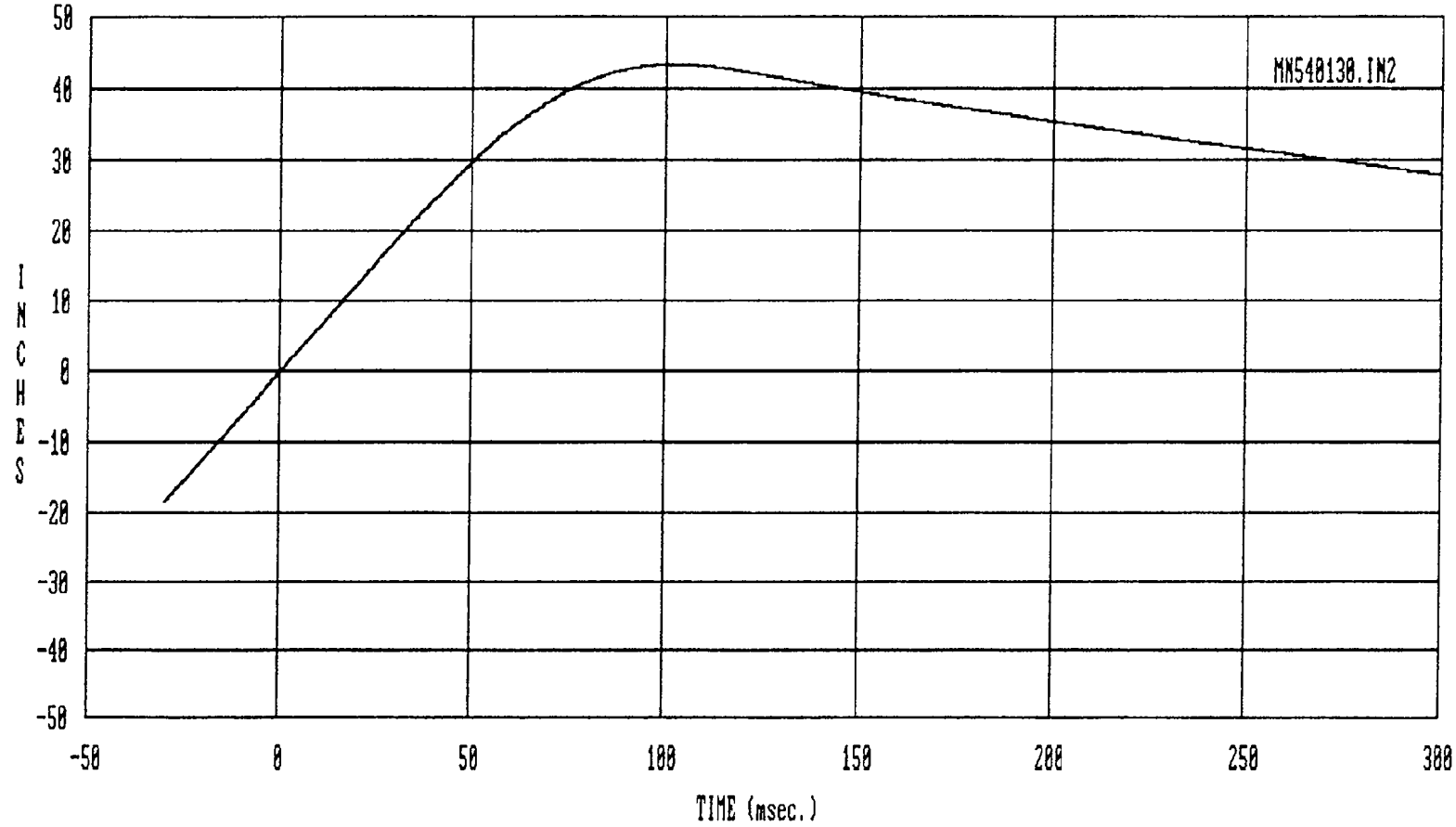

Curve: Left rear cross-member accel. — X axis  Filter: SAE CLASS 60  Max = 3.3299  Min = -37.917

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



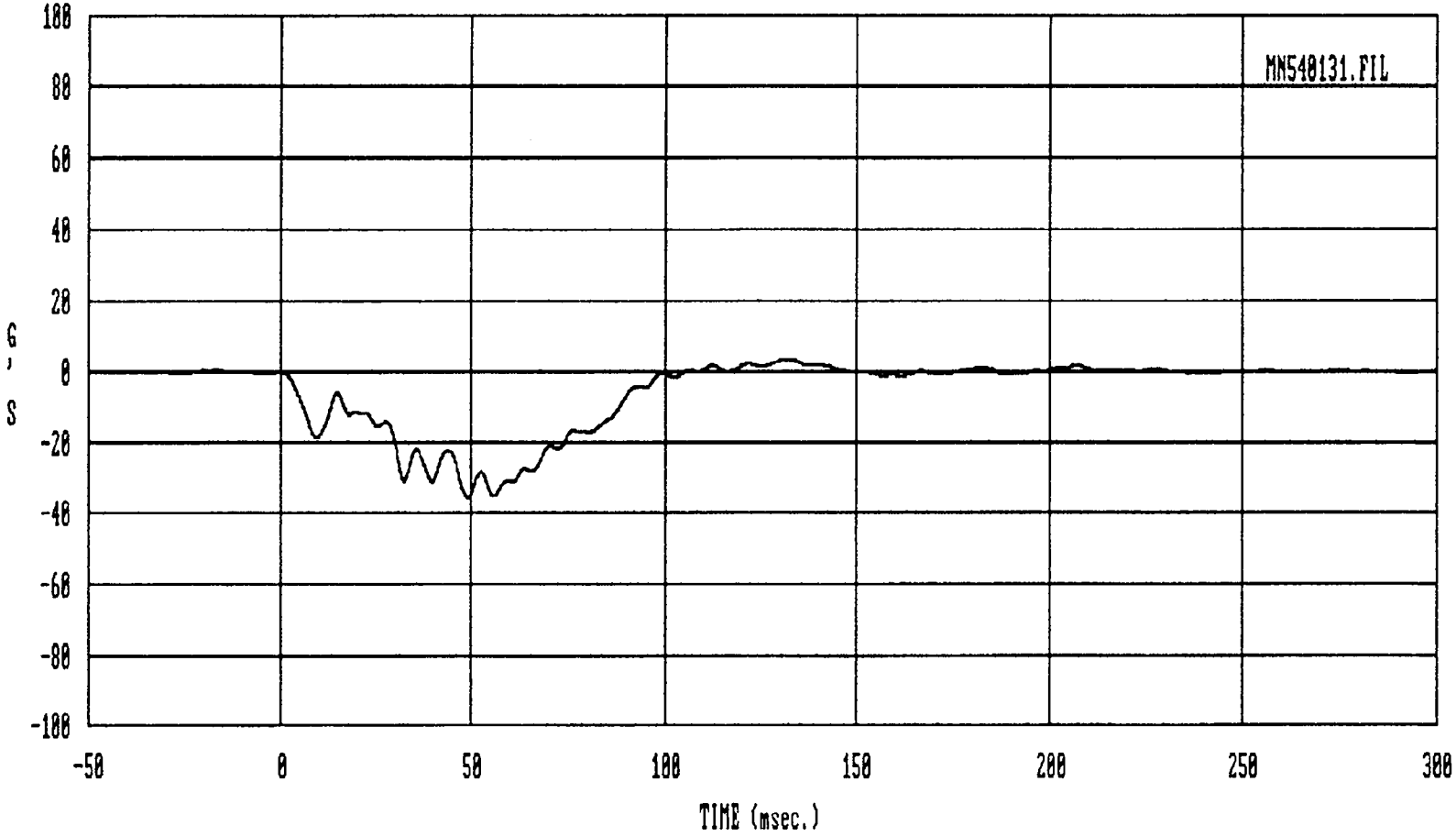

Curve: Left rear seat cross-member delta V -- X axis Filter: SAE CLASS 180 Max = 35.200 Min = -5.2761

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



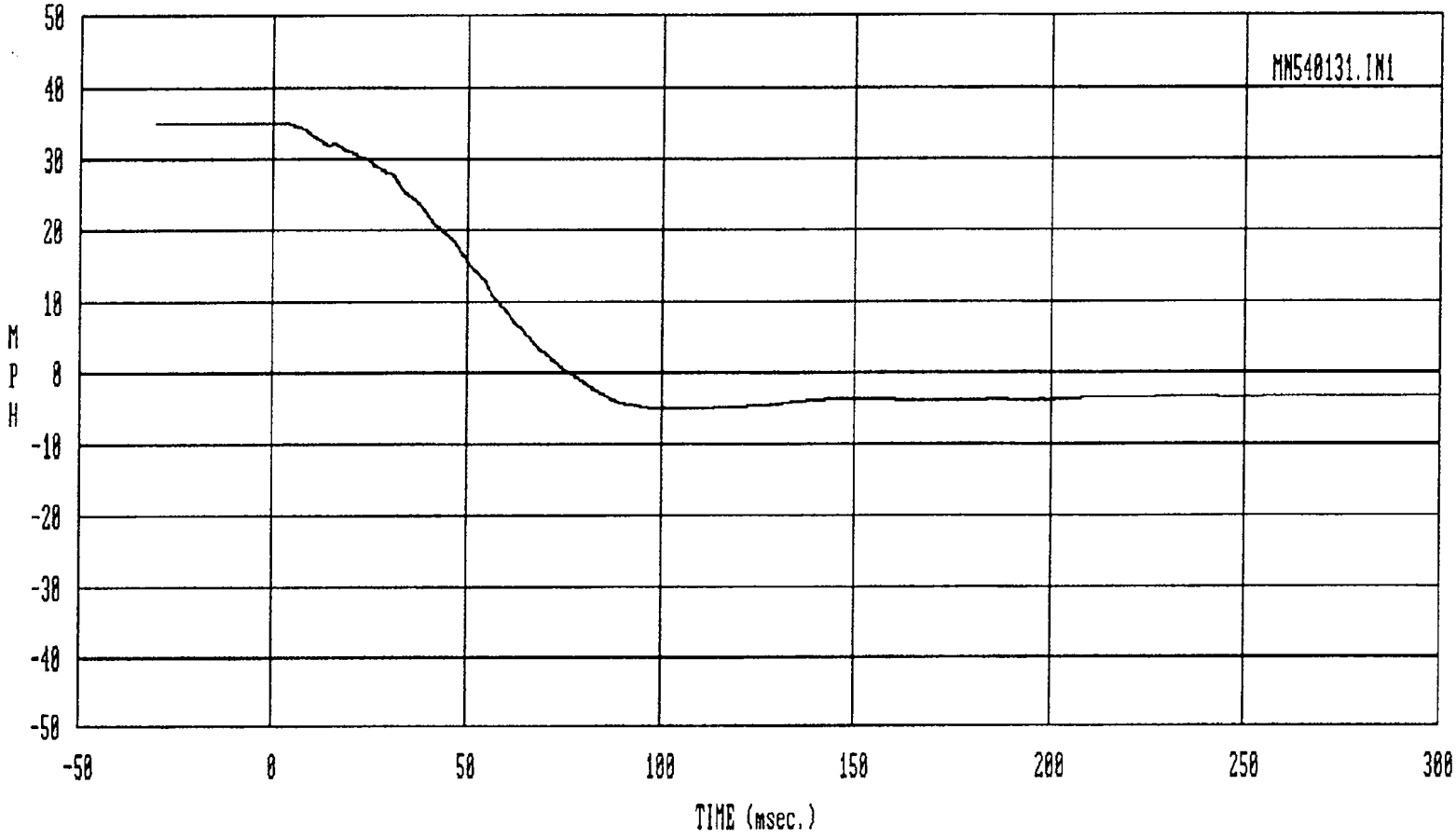

Curve: Left rear seat cross-member disp. -- X axis Filter: SAE CLASS 180 Max = 43.413 Min = 27.968

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



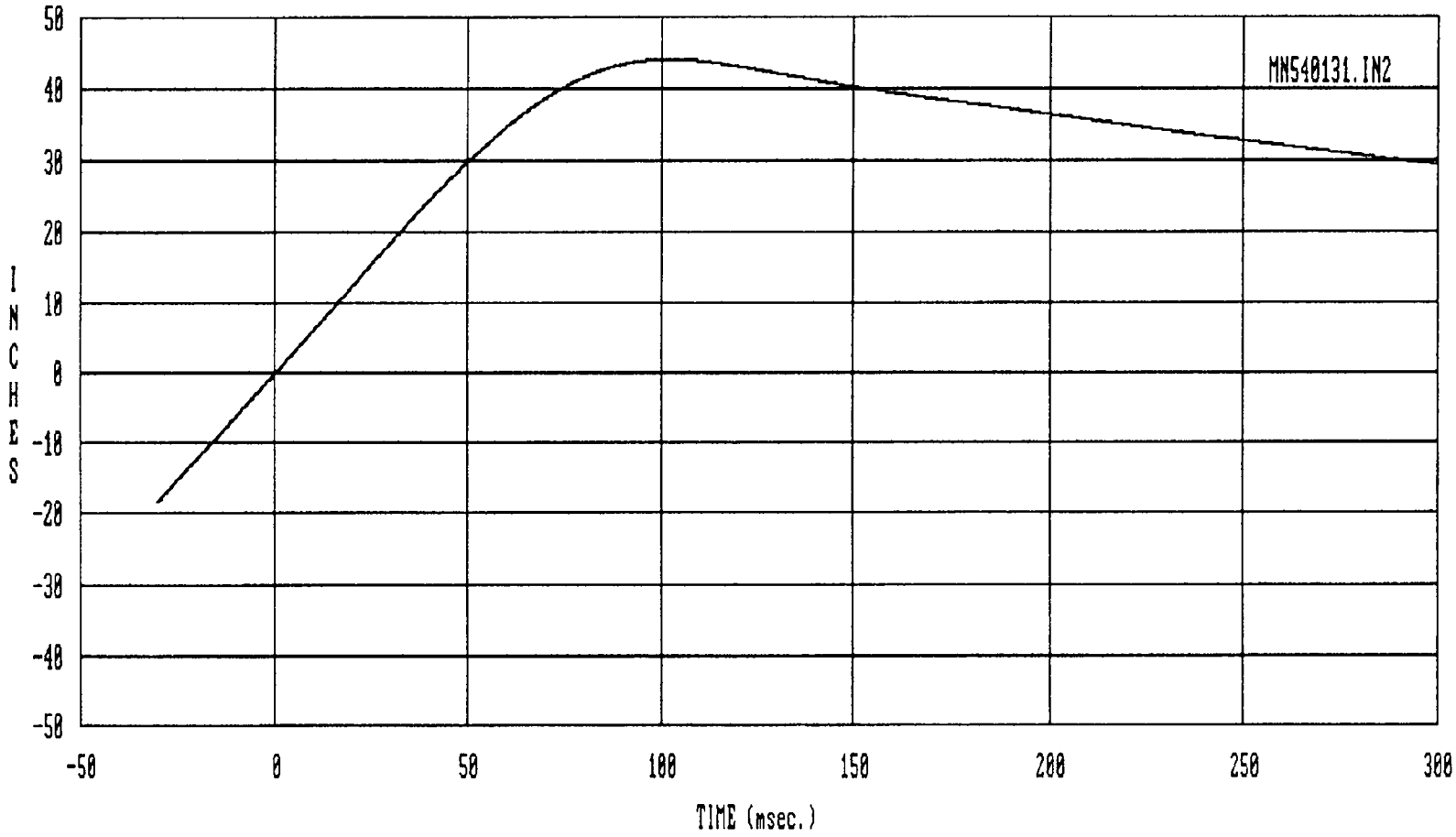

Curve: Right rear cross-member accel. -- X axis  Filter: SAE CLASS 60  Max = 3.3282  Min = -35.716

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



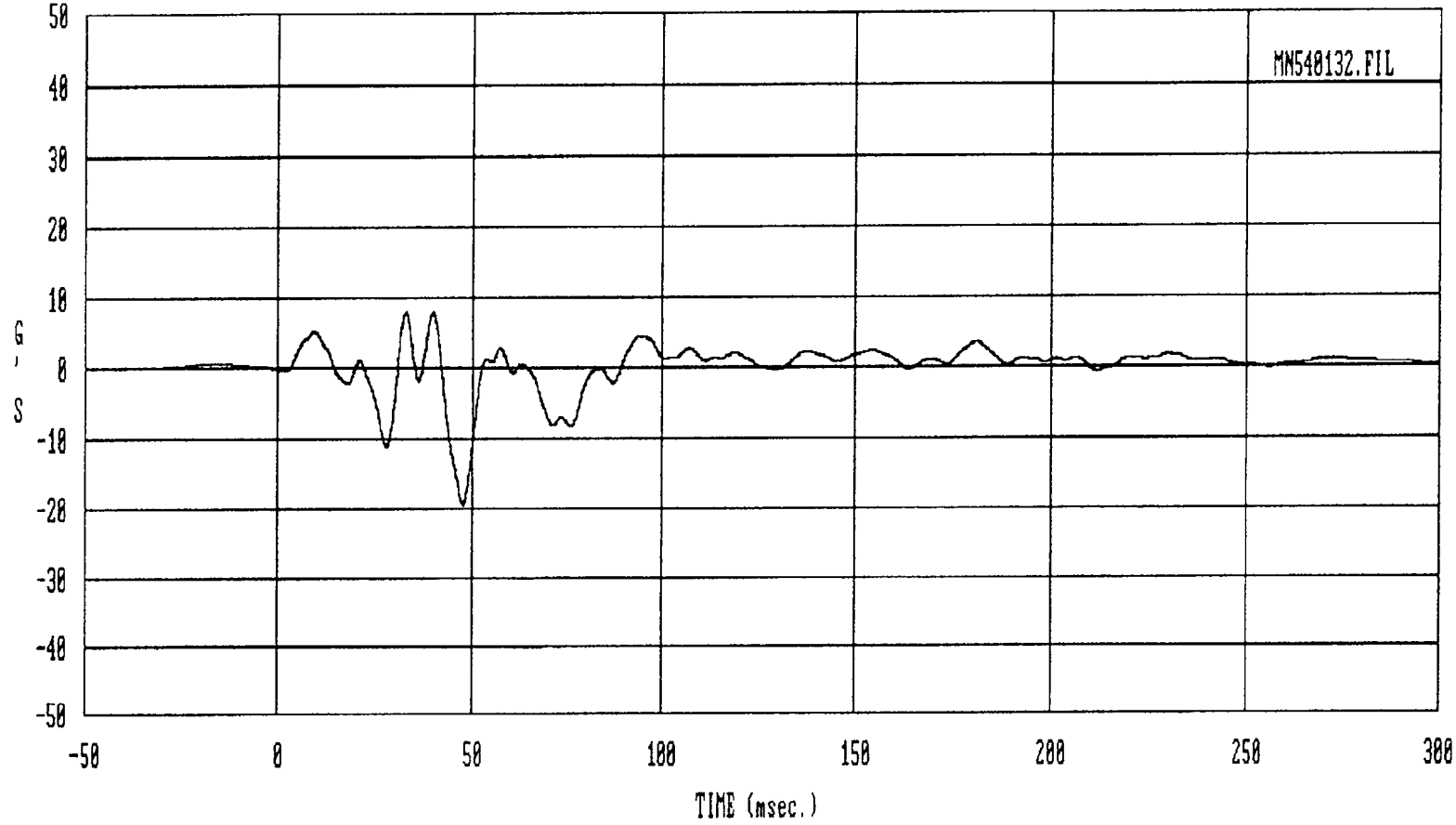

Curve: Right rear seat cross-member delta V -- X axis Filter: SAE CLASS 180 Max = 35.199 Min = -5.1662

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



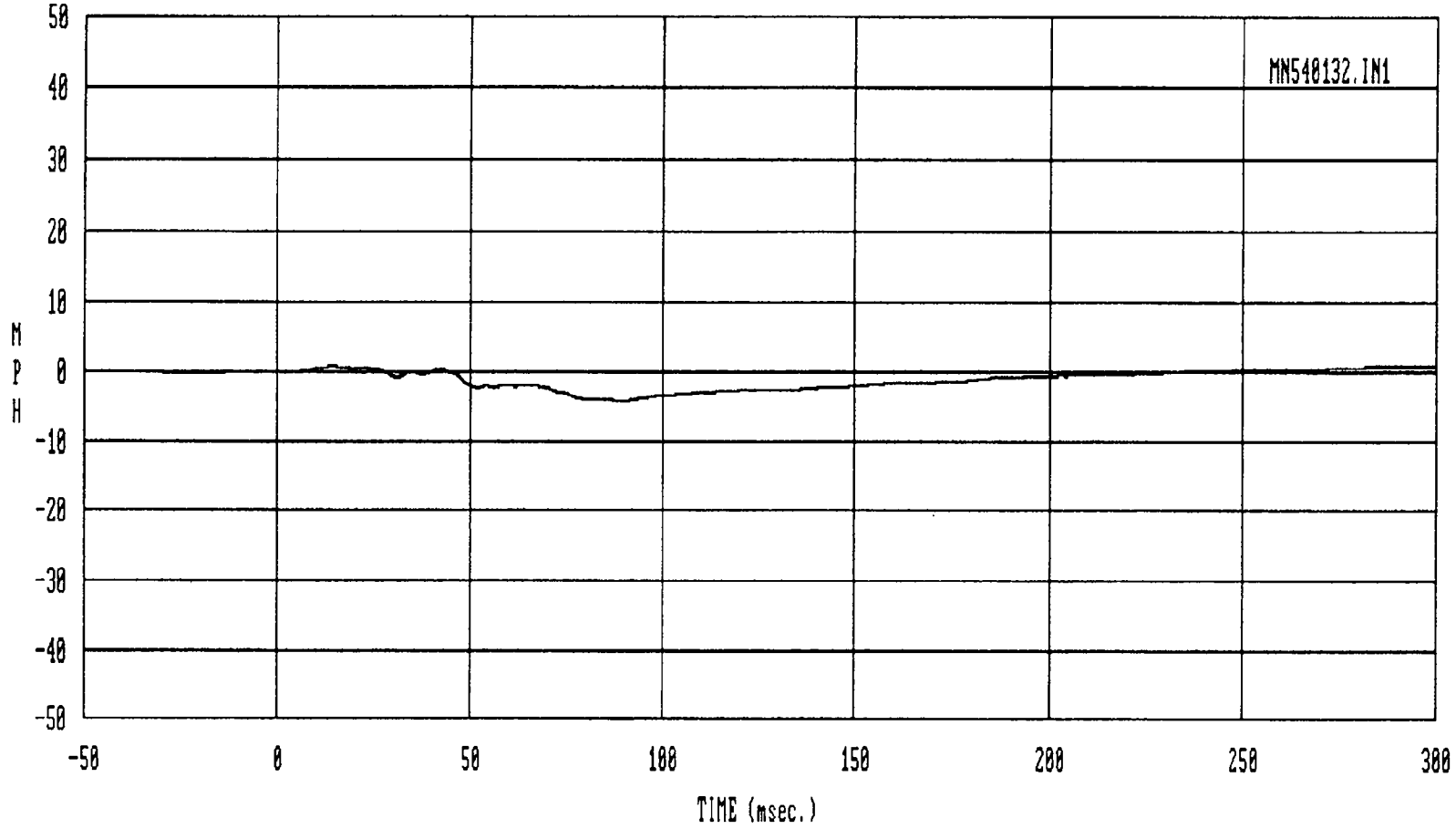

Curve: Right rear seat cross-member disp. -- X axis Filter: SAE CLASS 180 Max = 44.075 Min = 29.455

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



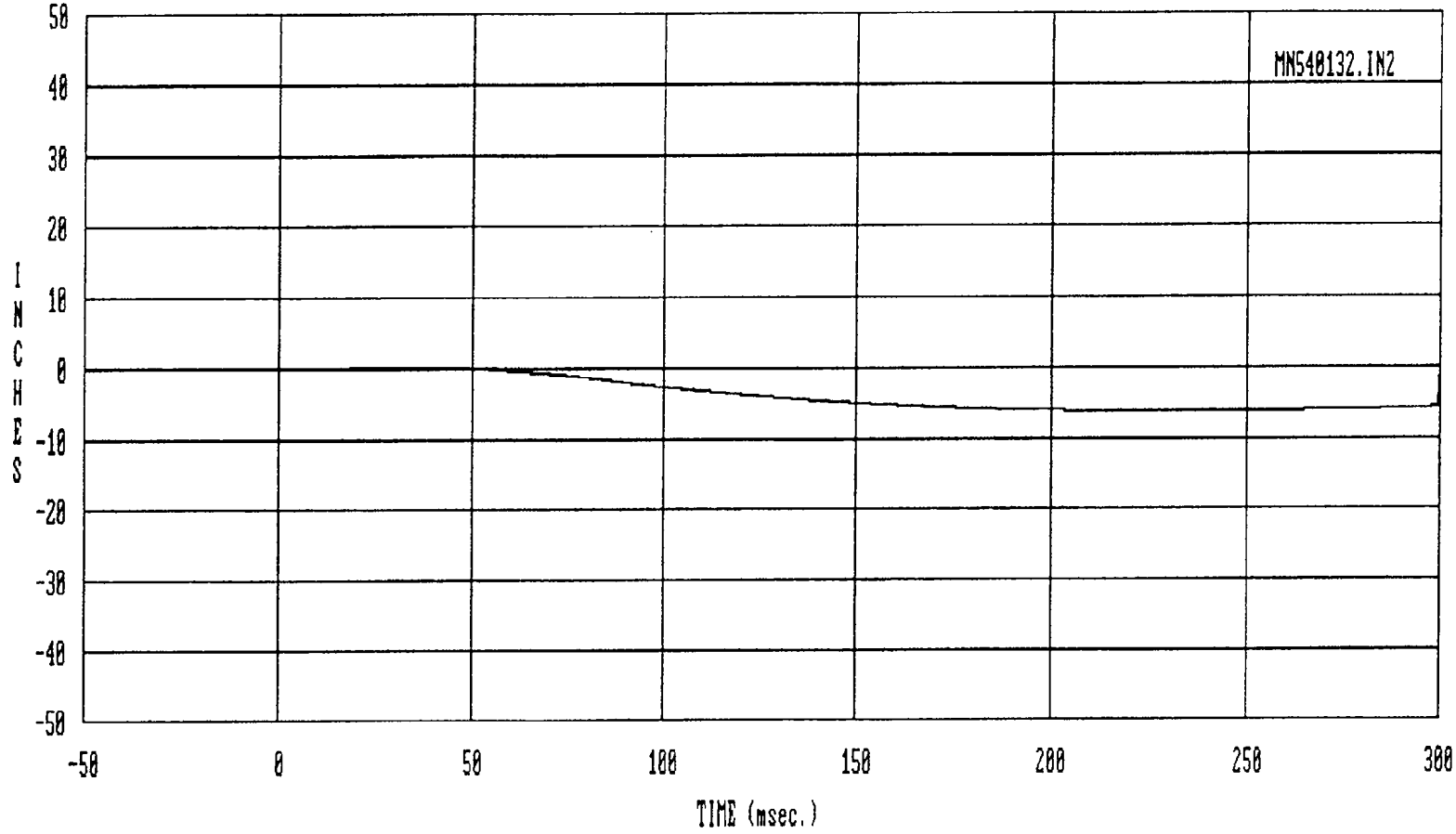

Curve: Center rear cross-member accel. -- Z axis  Filter: SAE CLASS 60  Max = 7.8226  Min = -19.363

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3



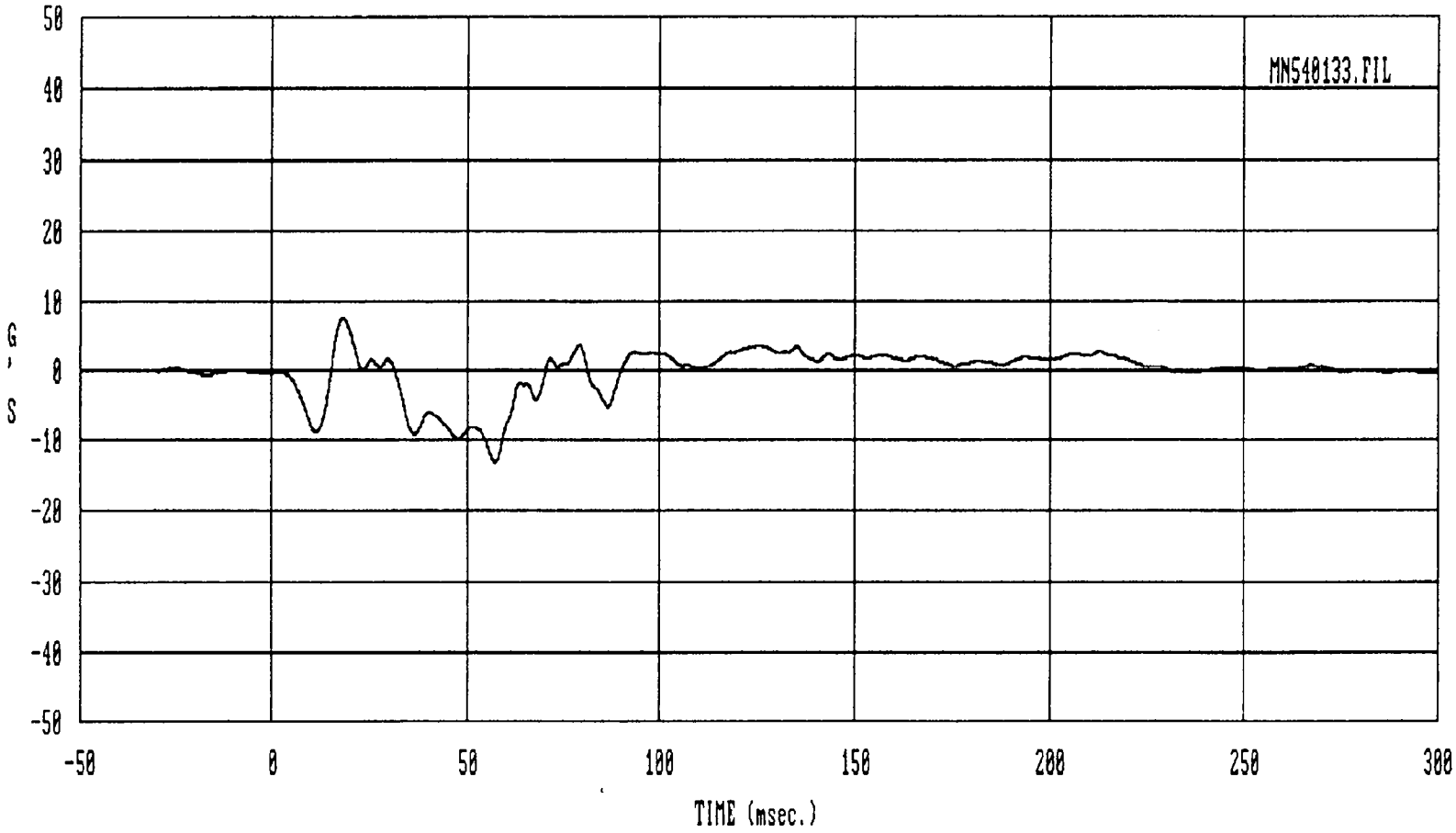

Curve: Center rear seat cross-member delta V -- Z axis Filter: SAE CLASS 180 Max = .89866 Min = -4.0856

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



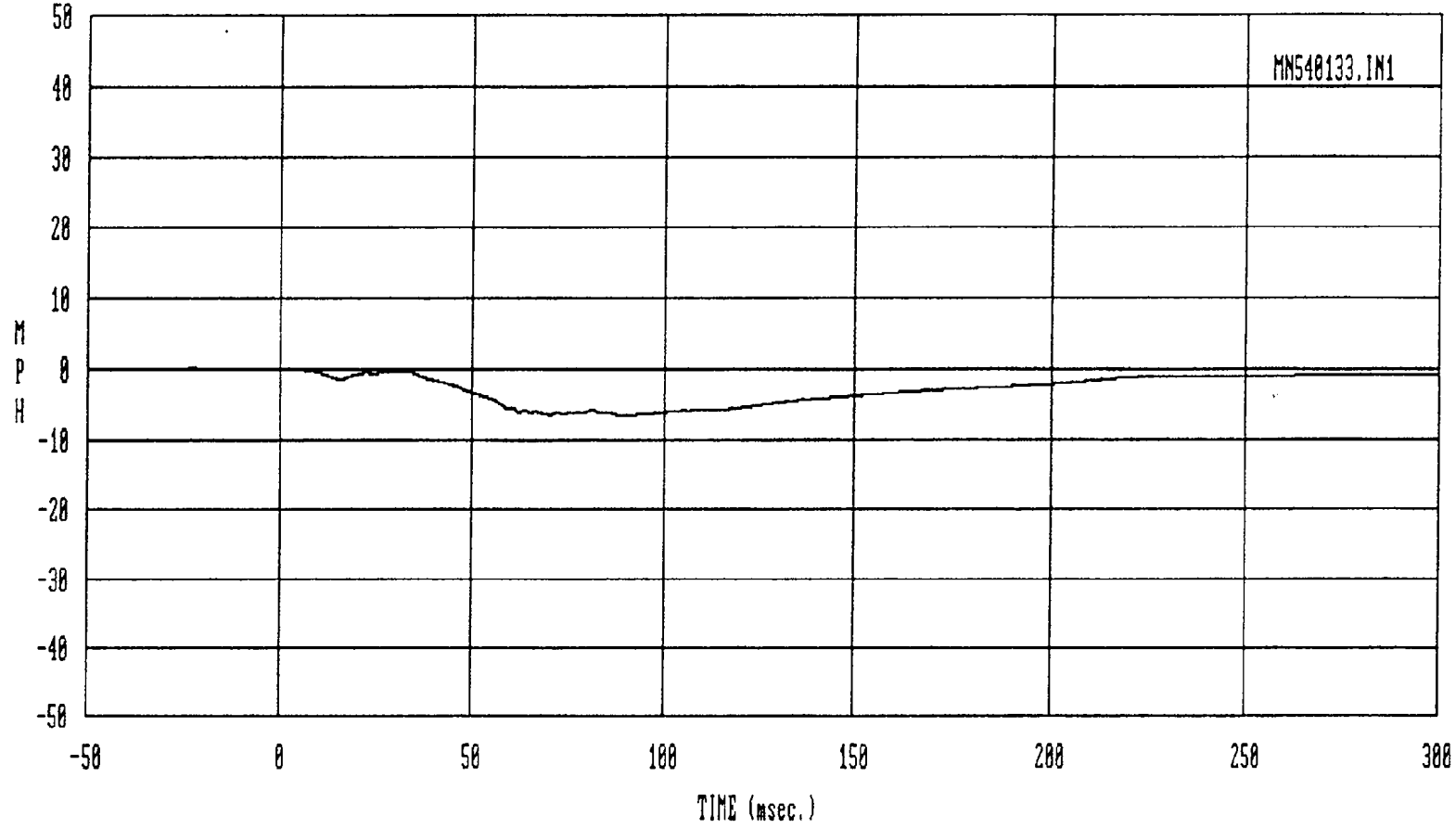

Curve: Center rear seat cross-member disp. -- Z axis Filter: SAE CLASS 180 Max = .19532 Min = -6.1262

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



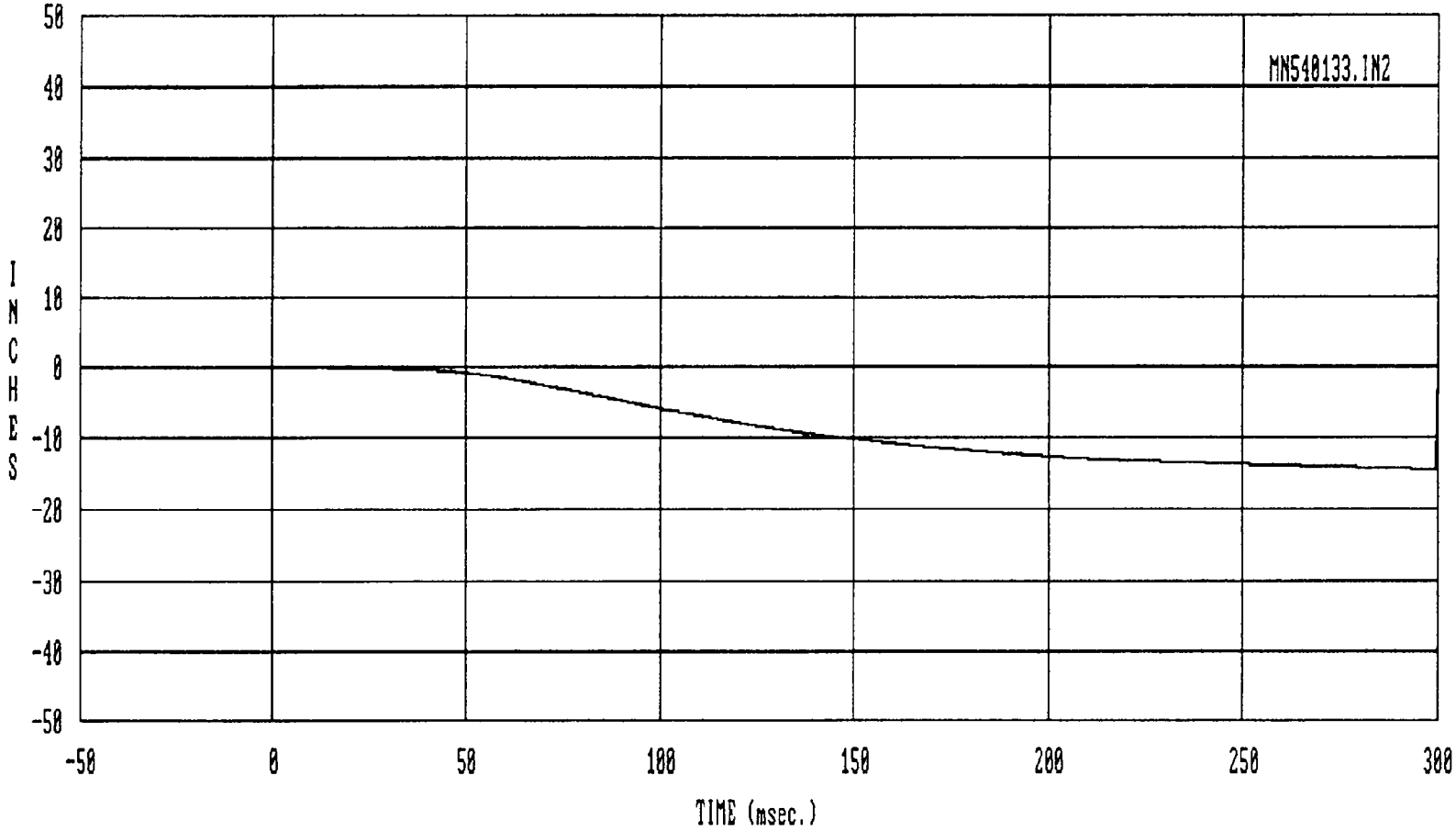

Curve: Center rear acceleration -- Z axis  Filter: SAE CLASS 60  Max = 7.6337  Min = -13.277

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3




Curve: Center rear delta V -- Z axis  Filter: SAE CLASS 180  Max = -.57988E-03 Min = -6.4824

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3




Curve: Center rear disp. -- Z axis  Filter: SAE CLASS 180  Max = -.58959E-06 Min = -14.514

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3

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APPENDIX B-2

LOAD CELL BARRIER DATA

DATA FILTERING:
Load Cell Barrier Channels - Class 60

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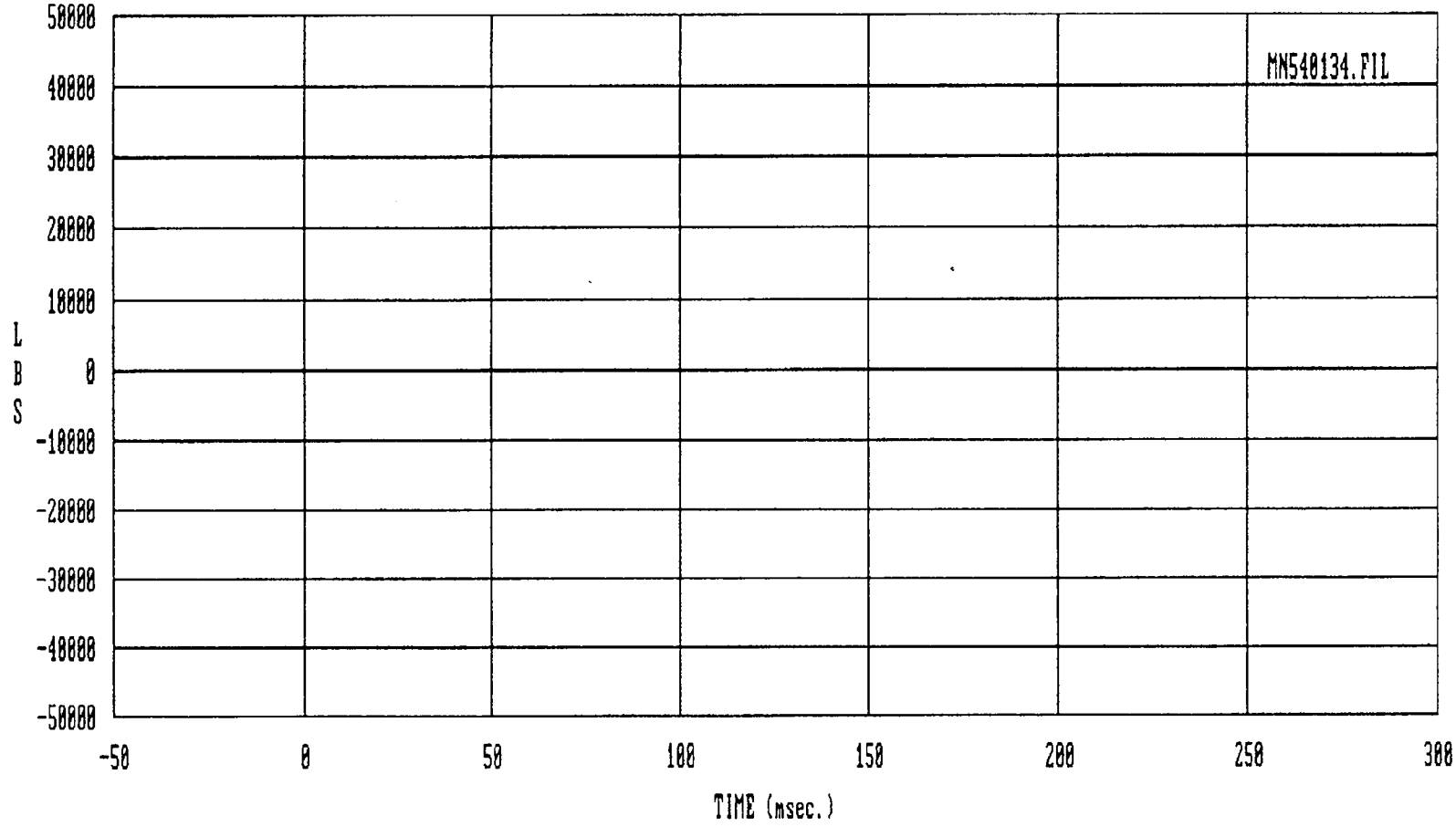
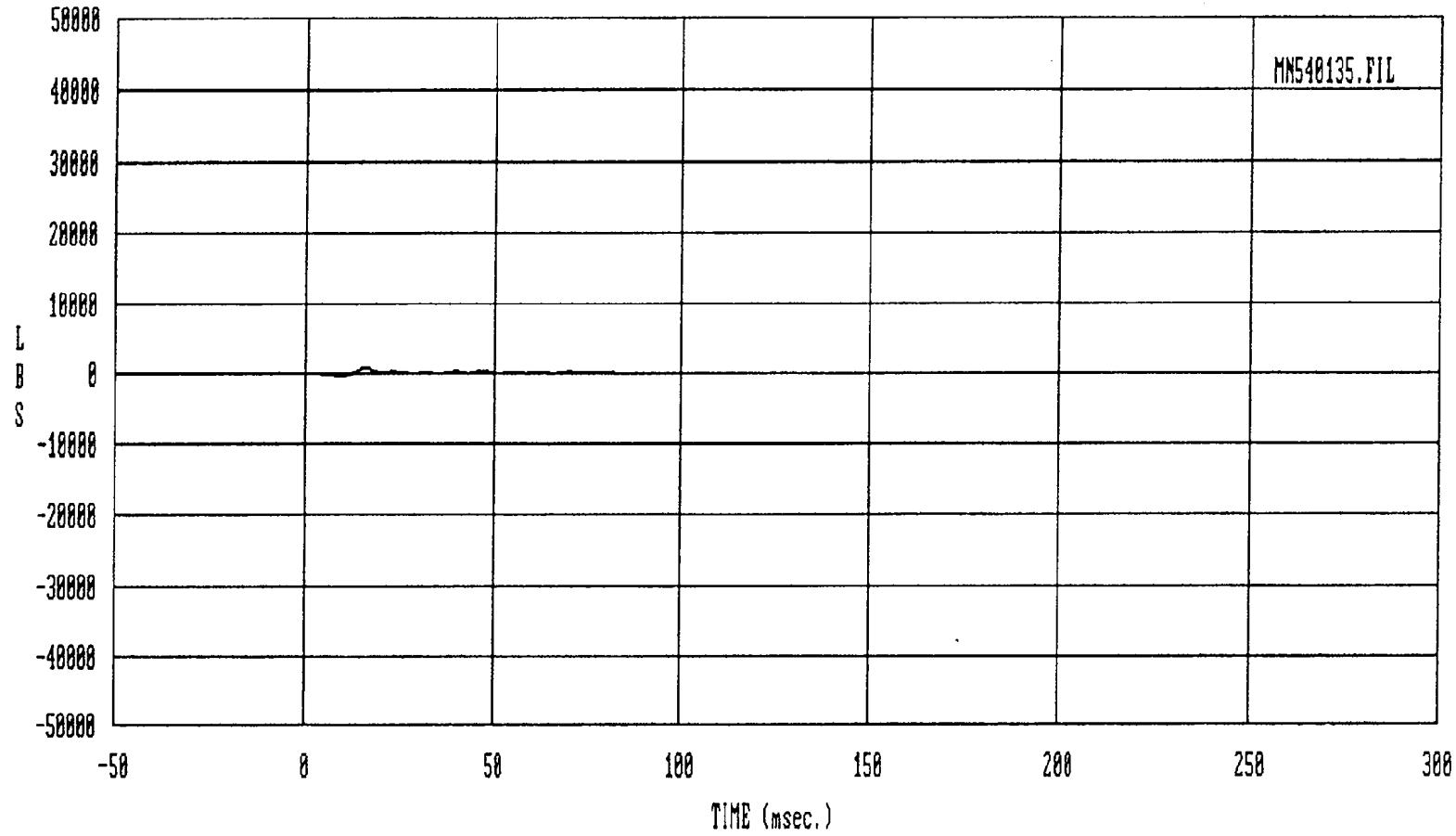


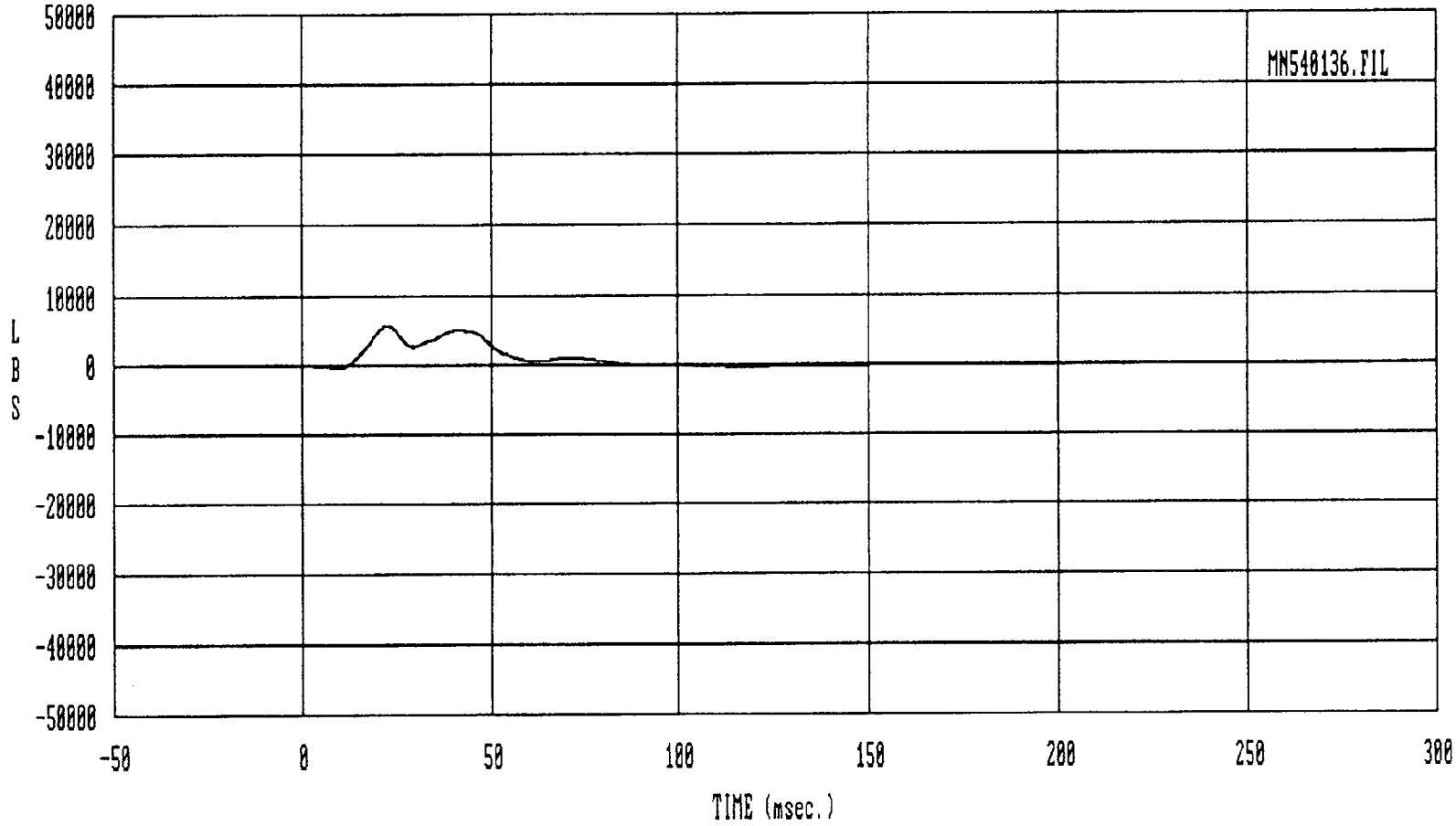

Curve: Force on Barrier load cell A1 Filter: SAE CLASS 60 Max = .00000 Min = .00000

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



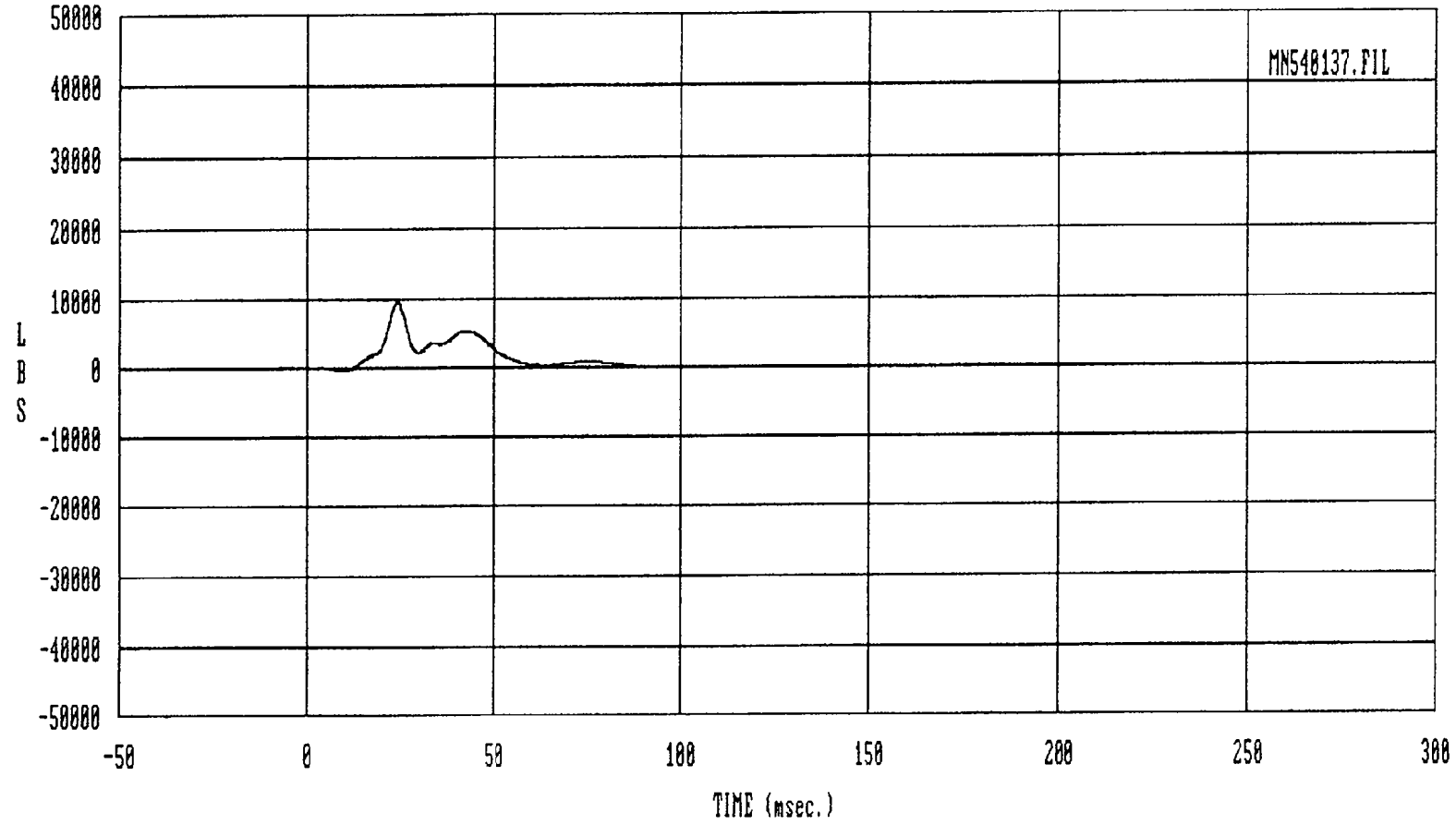

Curve: Force on Barrier load cell A2 Filter: SAE CLASS 60 Max = 878.78 Min = -382.35

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



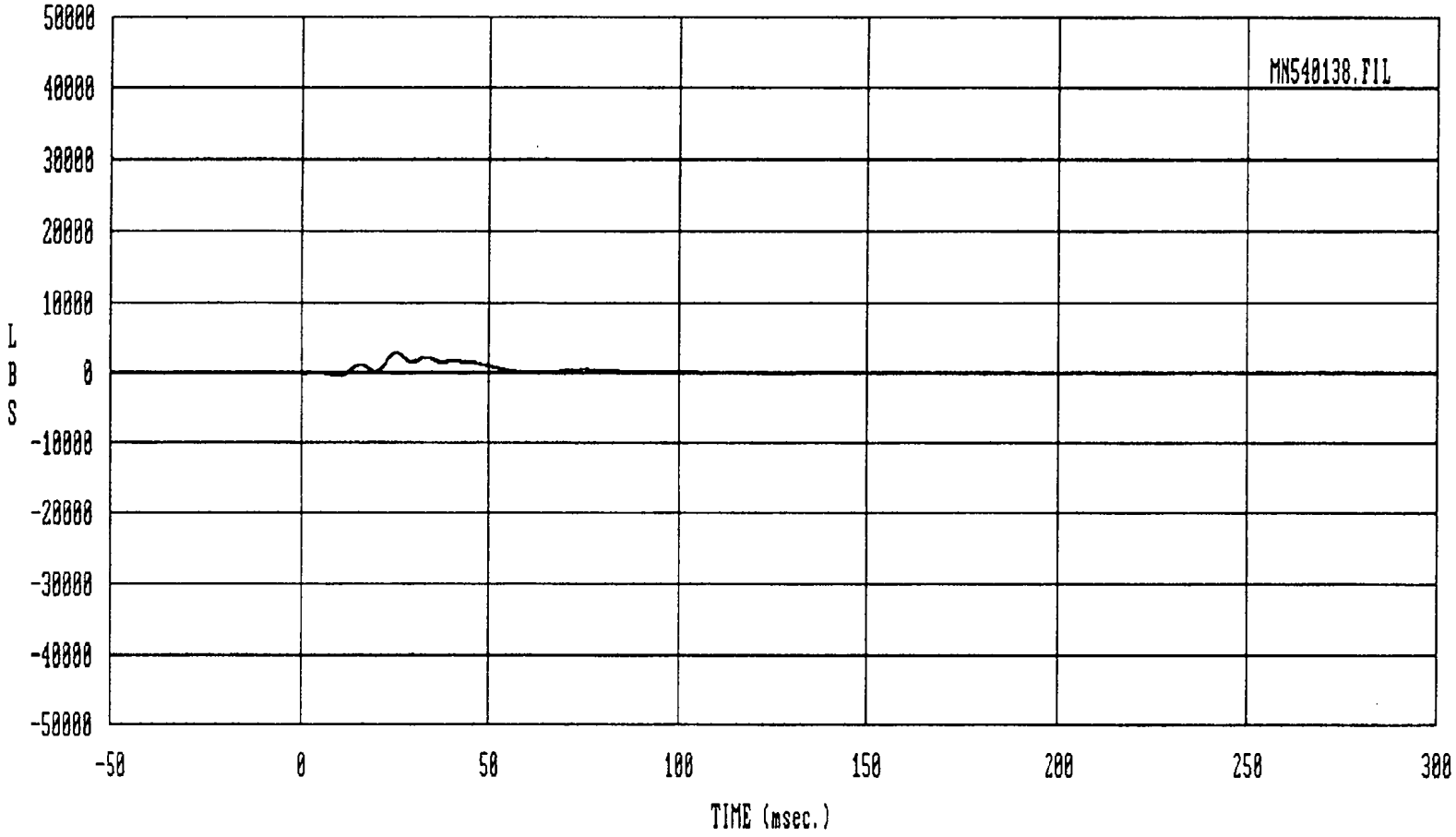

Curve: Force on Barrier load cell A3 Filter: SAE CLASS 60 Max = 5704.6 Min = -419.29

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



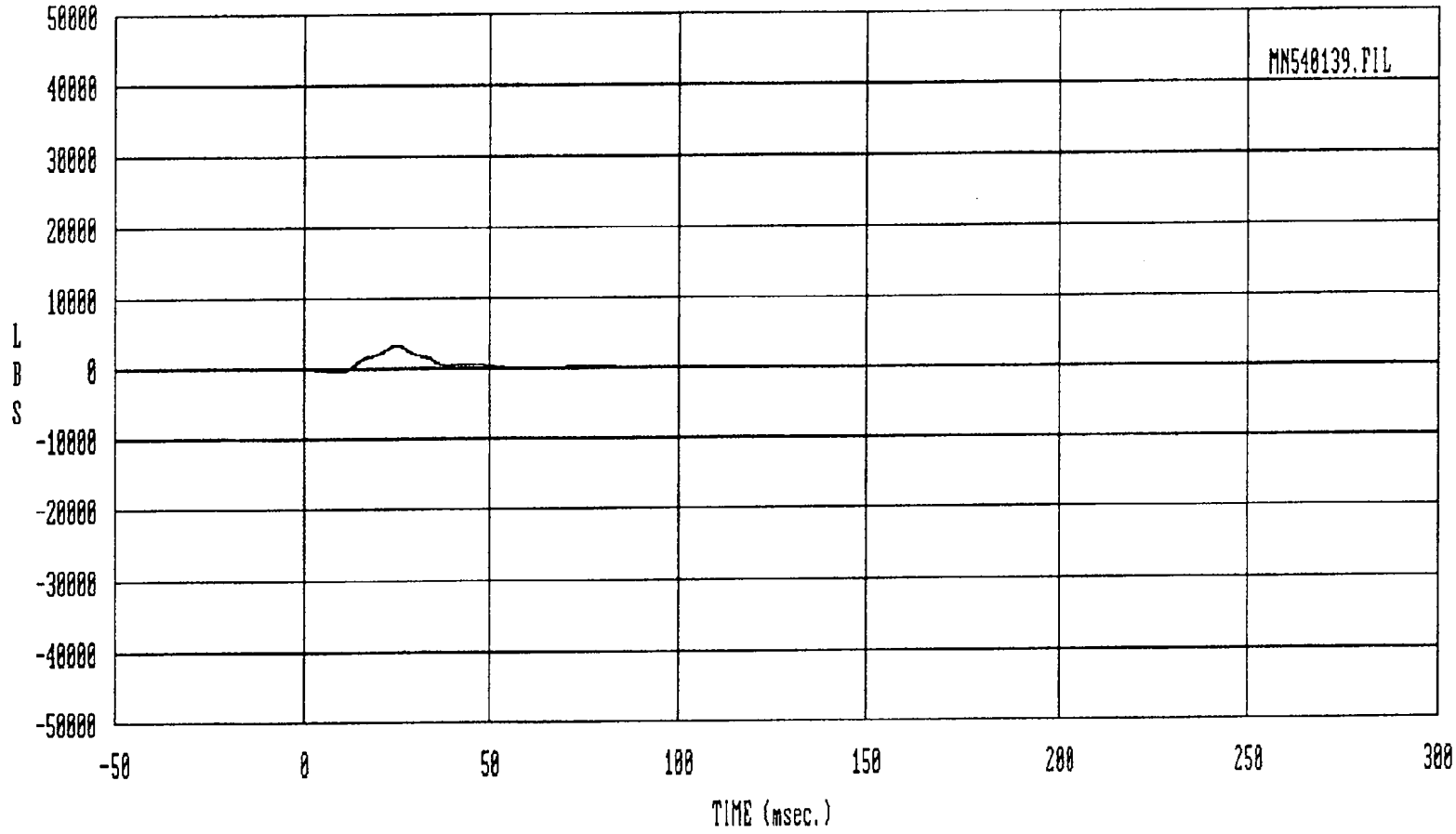

Curve: Force on Barrier load cell A4 Filter: SAE CLASS 60 Max = 9548.3 Min = -436.93

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



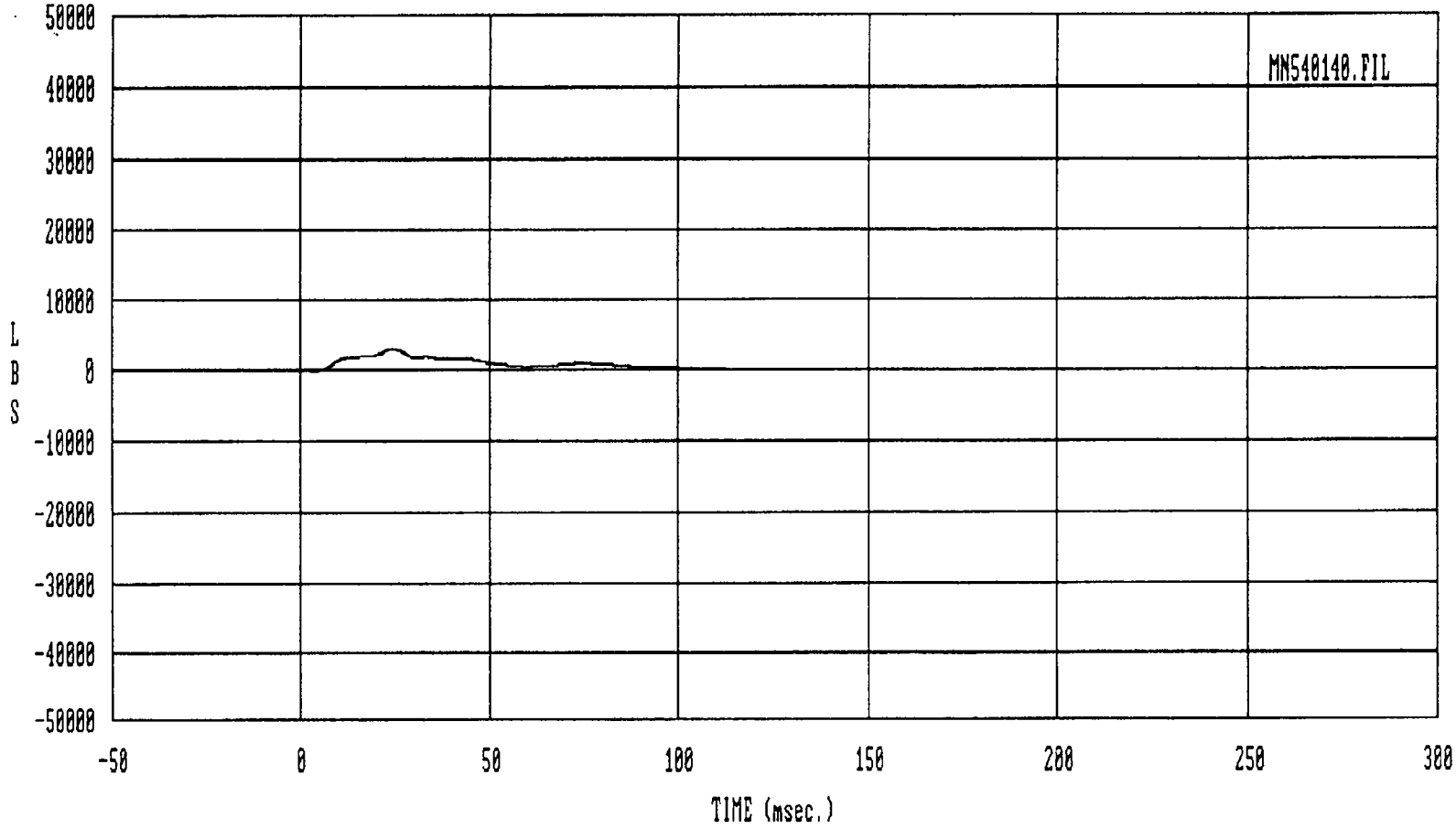

Curve: Force on Barrier load cell A5 Filter: SAE CLASS 60 Max = 2950.2 Min = -437.65

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



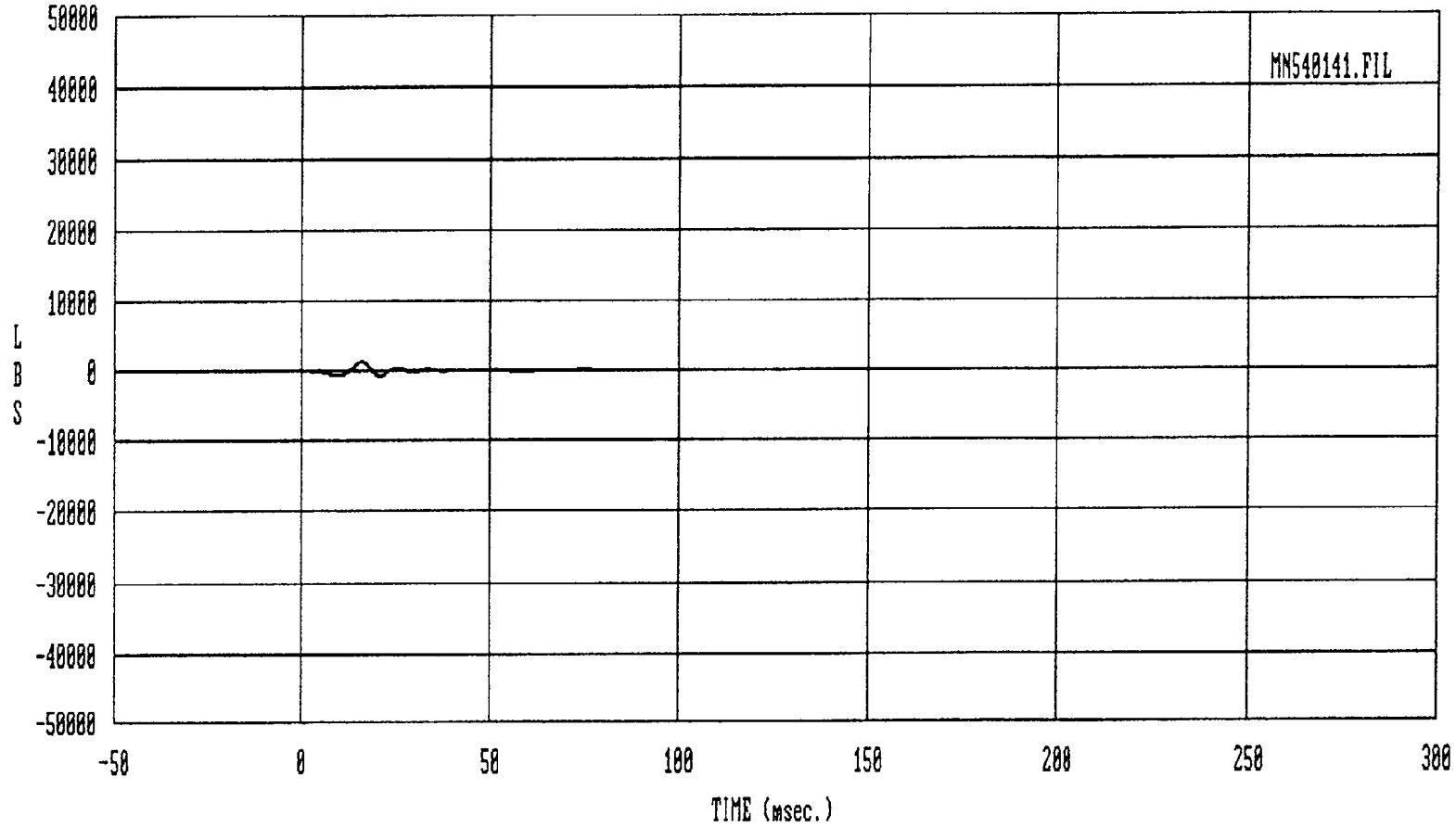

Curve: Force on Barrier load cell A6 Filter: SAE CLASS 60 Max = 3360.0 Min = -449.40

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



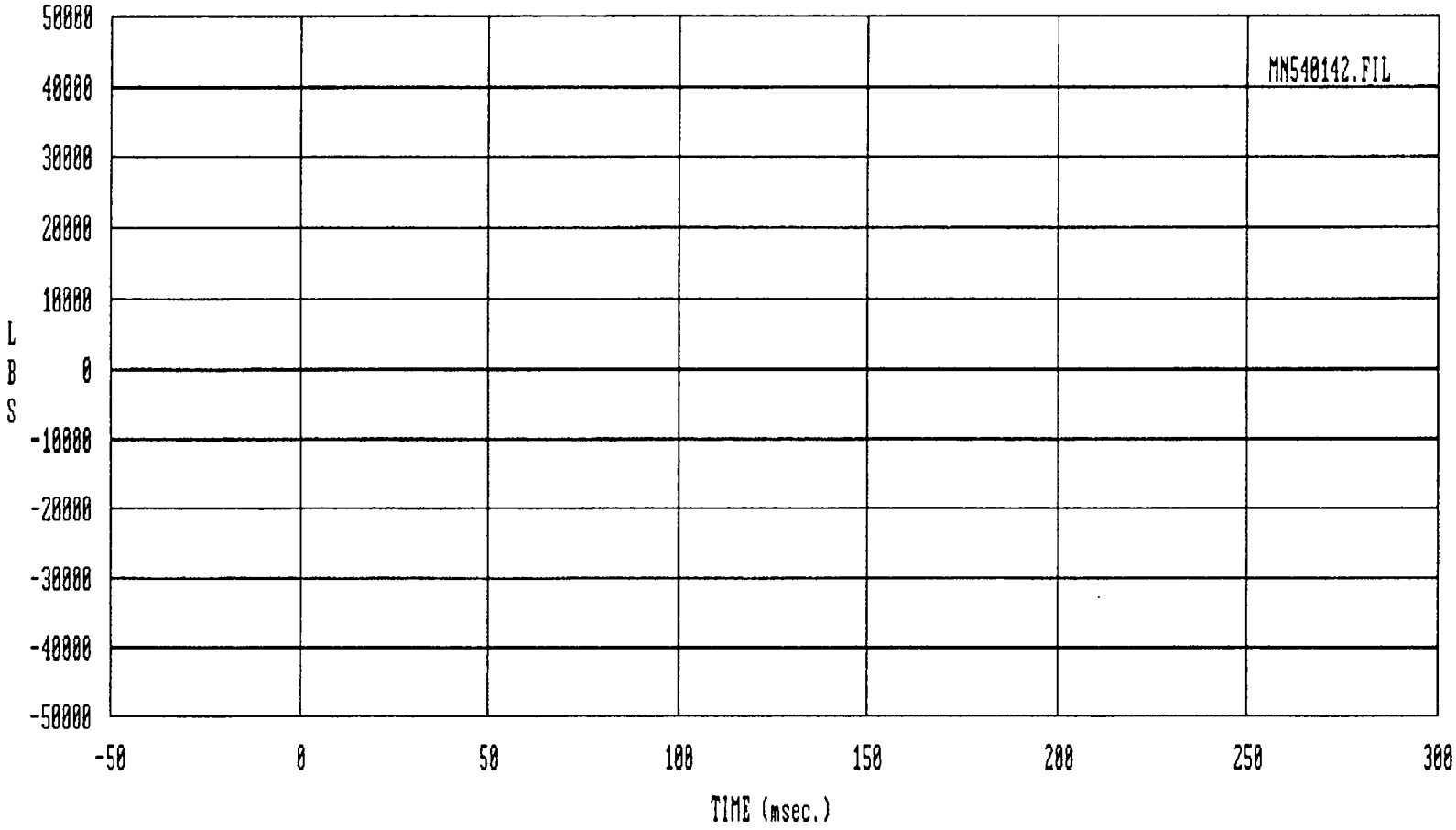

Curve: Force on Barrier load cell A7 Filter: SAE CLASS 60 Max = 2954.1 Min = -91.982

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



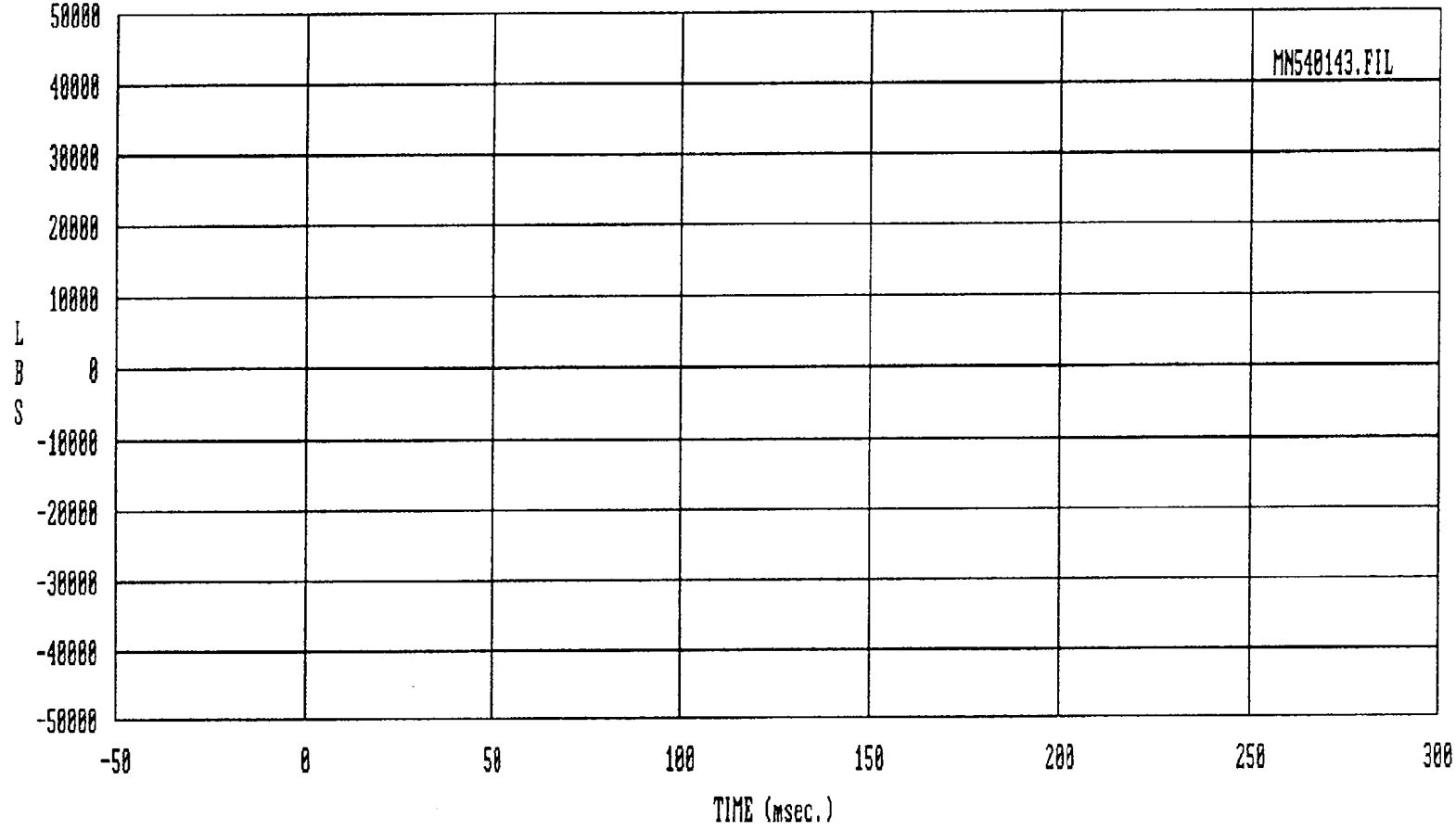

Curve: Force on Barrier load cell A8 Filter: SAE CLASS 60 Max = 1333.3 Min = -751.27

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



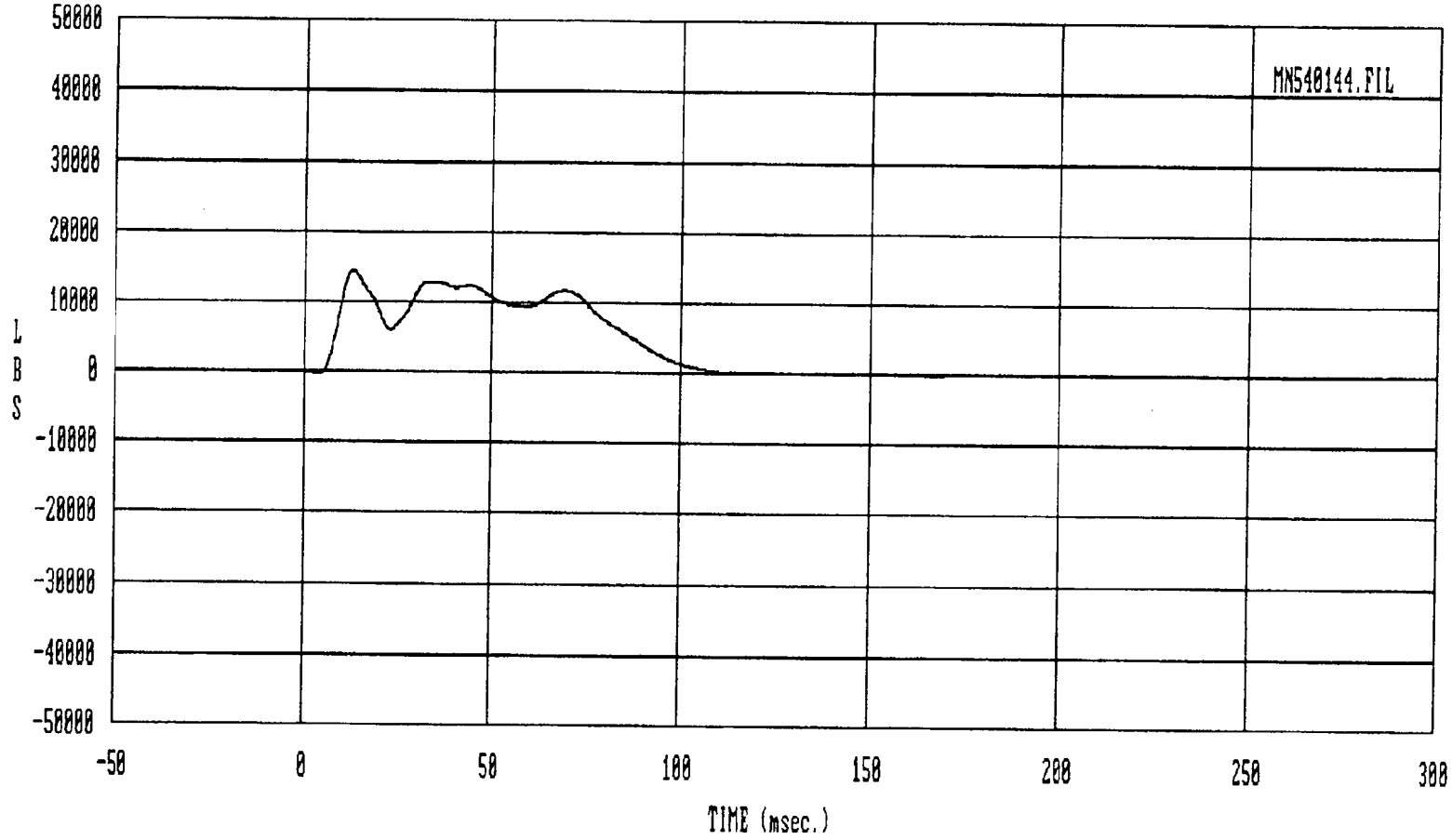

Curve: Force on Barrier load cell A9 Filter: SAE CLASS 60 Max = .00000 Min = .00000

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



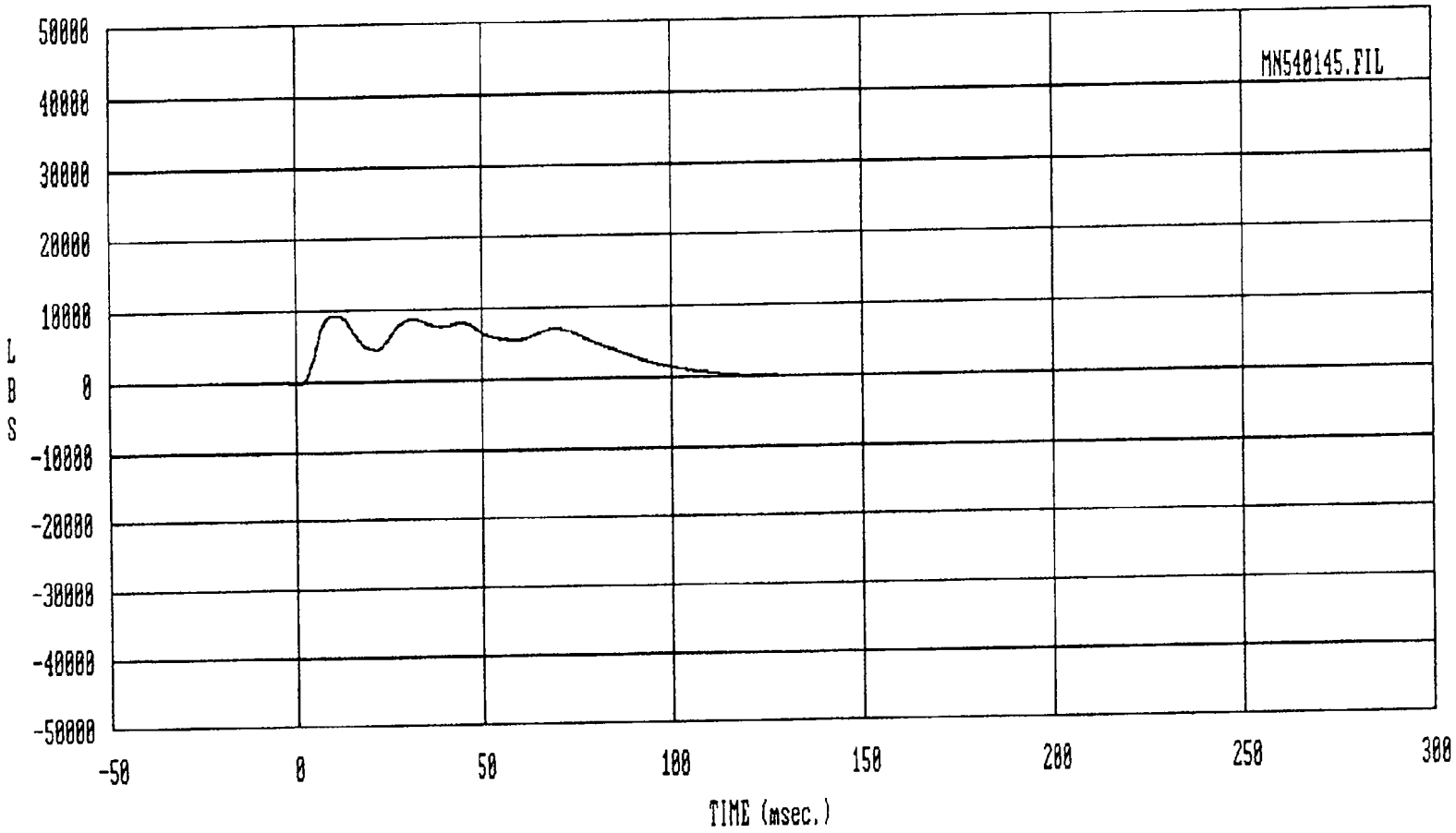

Curve: Force on Barrier load cell B1 Filter: SAE CLASS 60 Max = .00000 Min = .00000

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



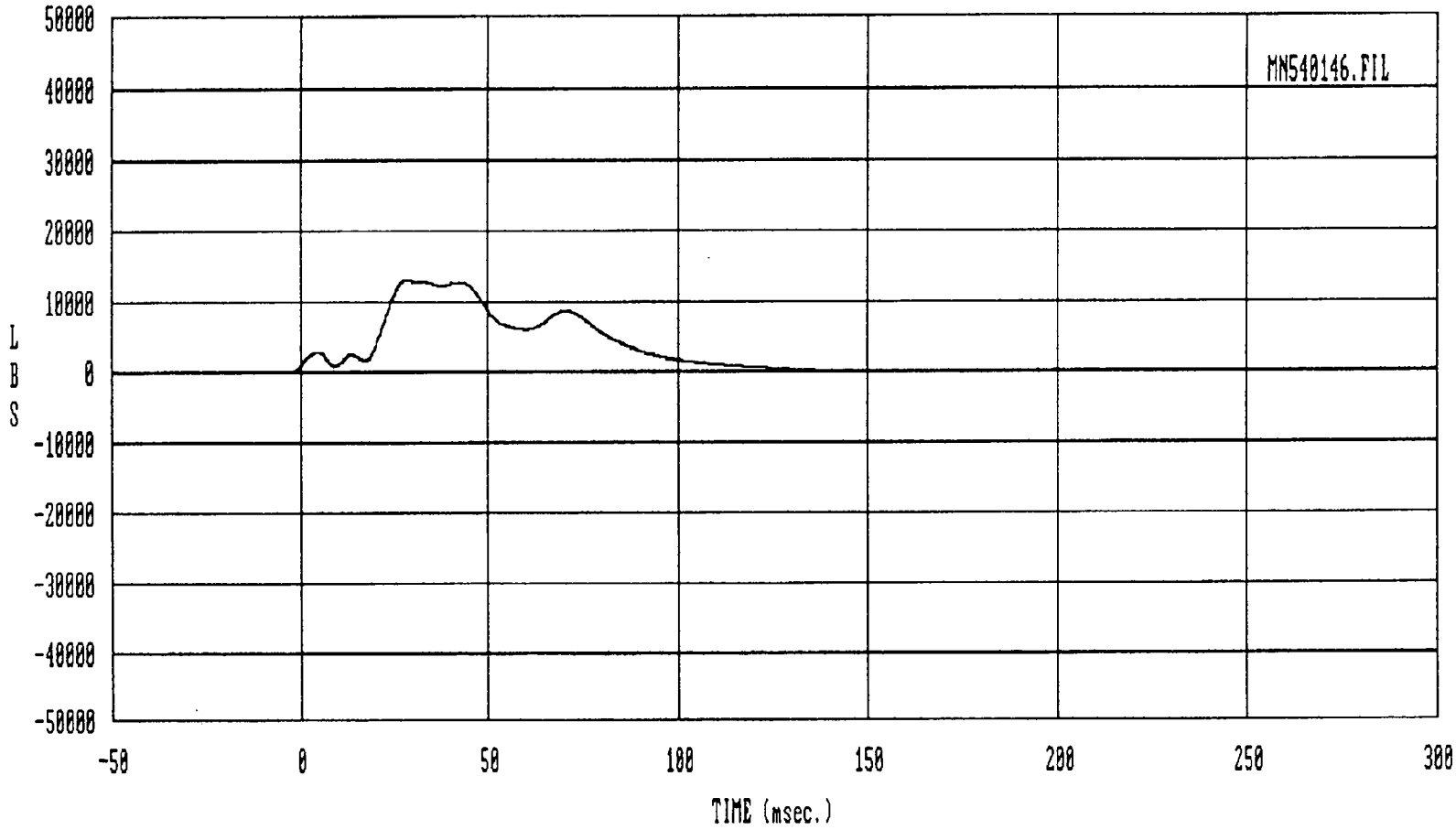

Curve: Force on Barrier load cell B2 Filter: SAE CLASS 60 Max = 14533. Min = -362.44

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



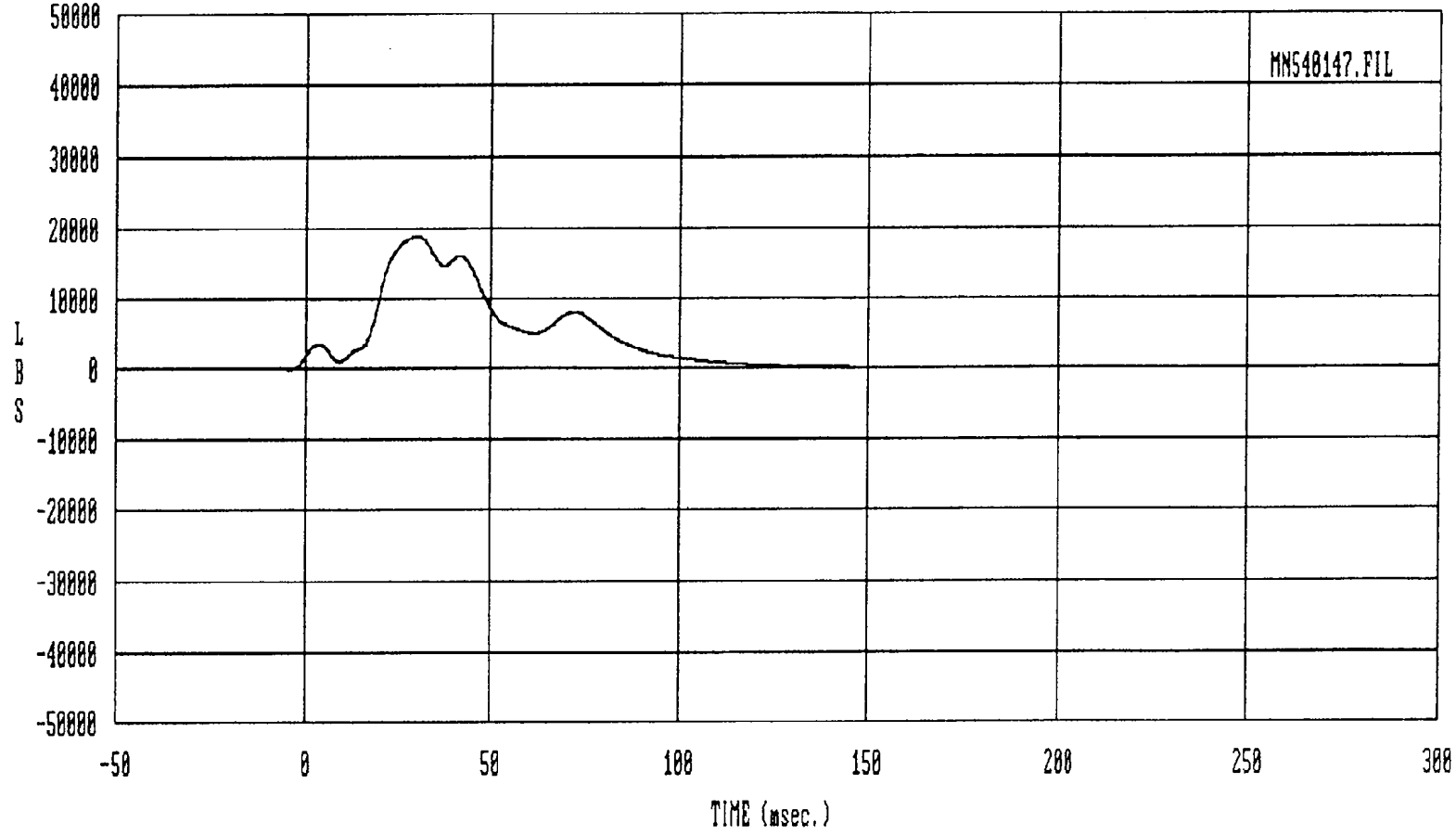

Curve: Force on Barrier load cell B3 Filter: SAE CLASS 60 Max = 9263.0 Min = -240.35

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



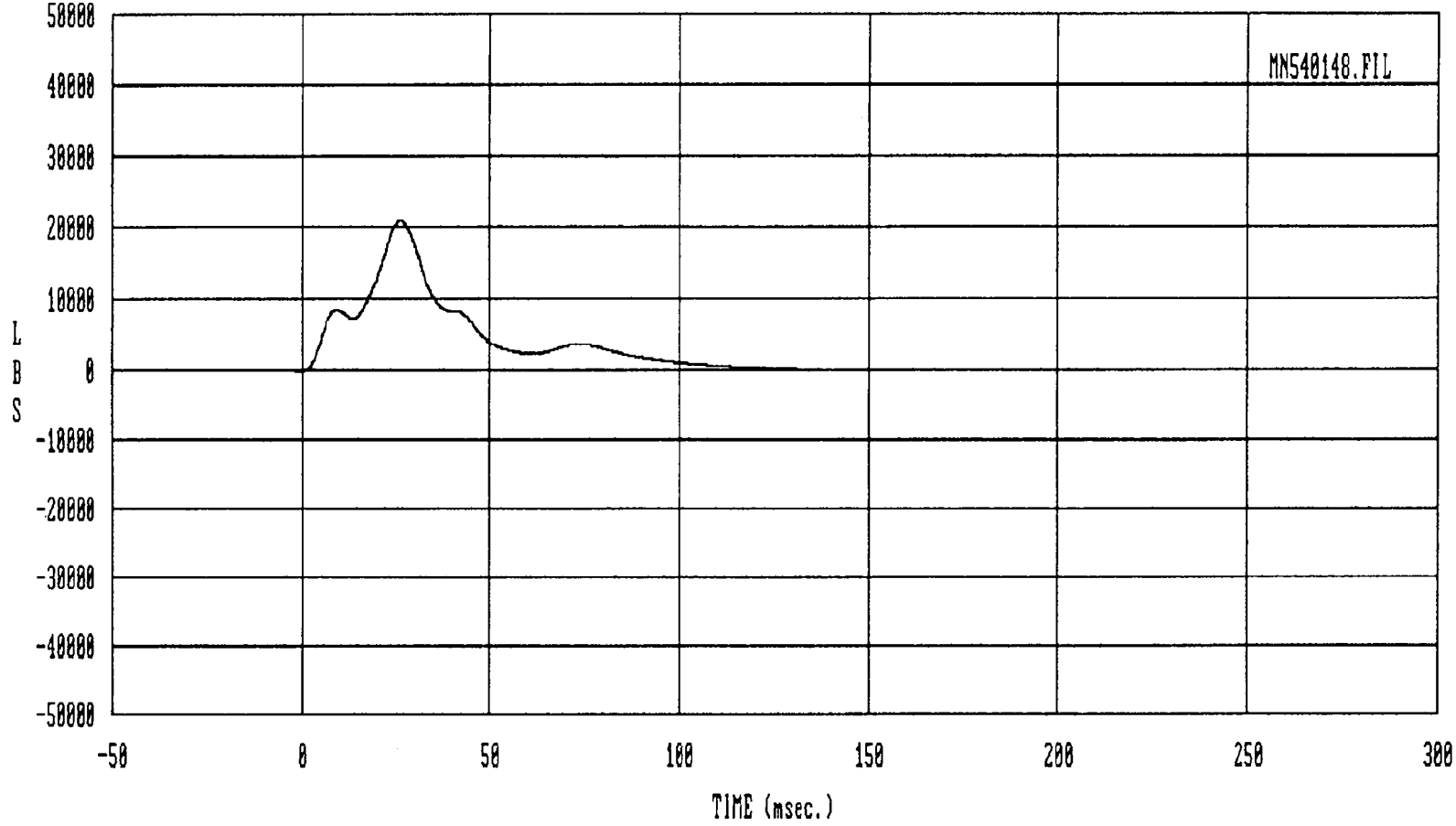

Curve: Force on Barrier load cell B4 Filter: SAE CLASS 60 Max = 13865. Min = -26.384

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



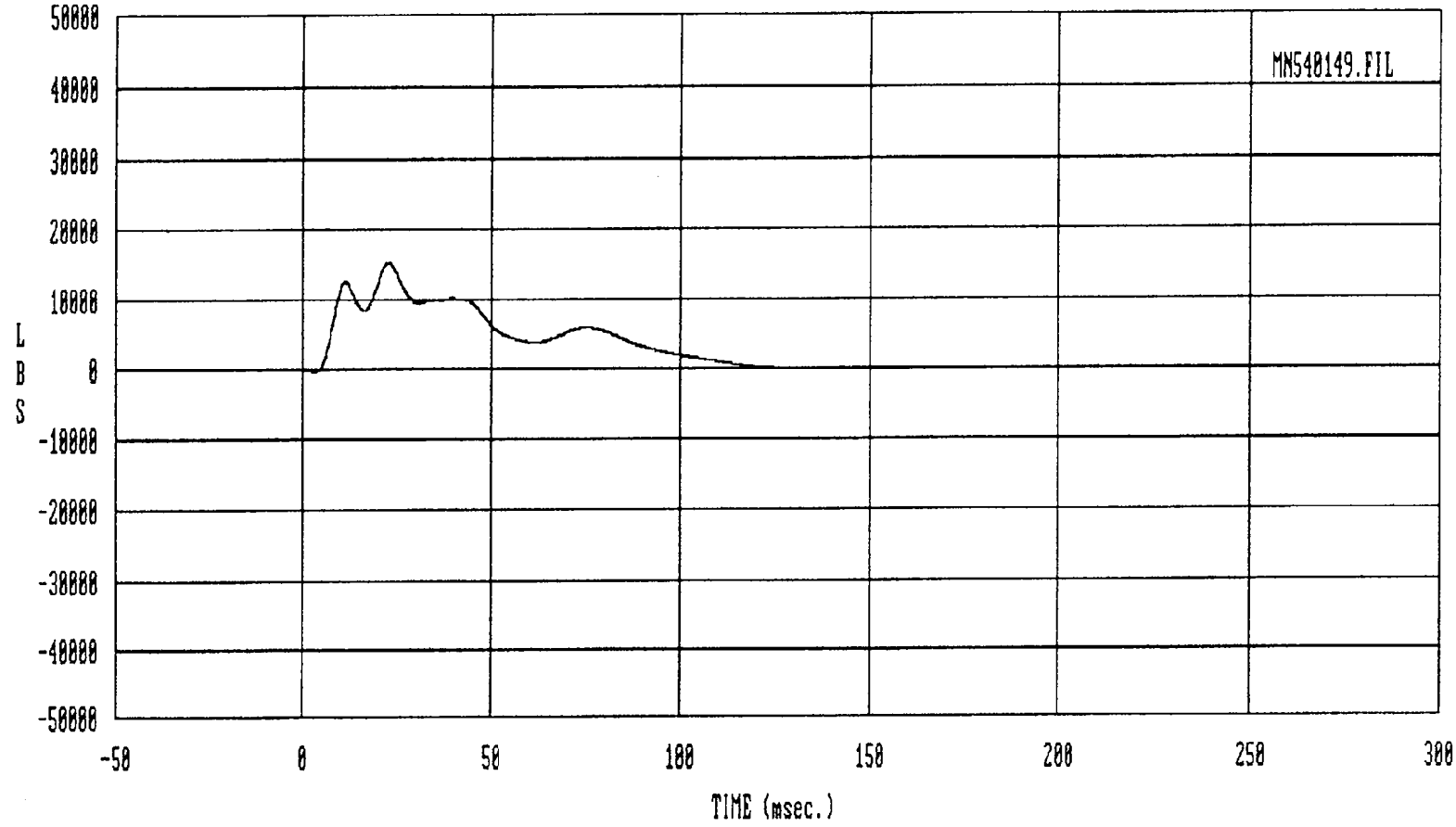

Curve: Force on Barrier load cell B5 Filter: SAE CLASS 60 Max = 18923. Min = 37.985

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



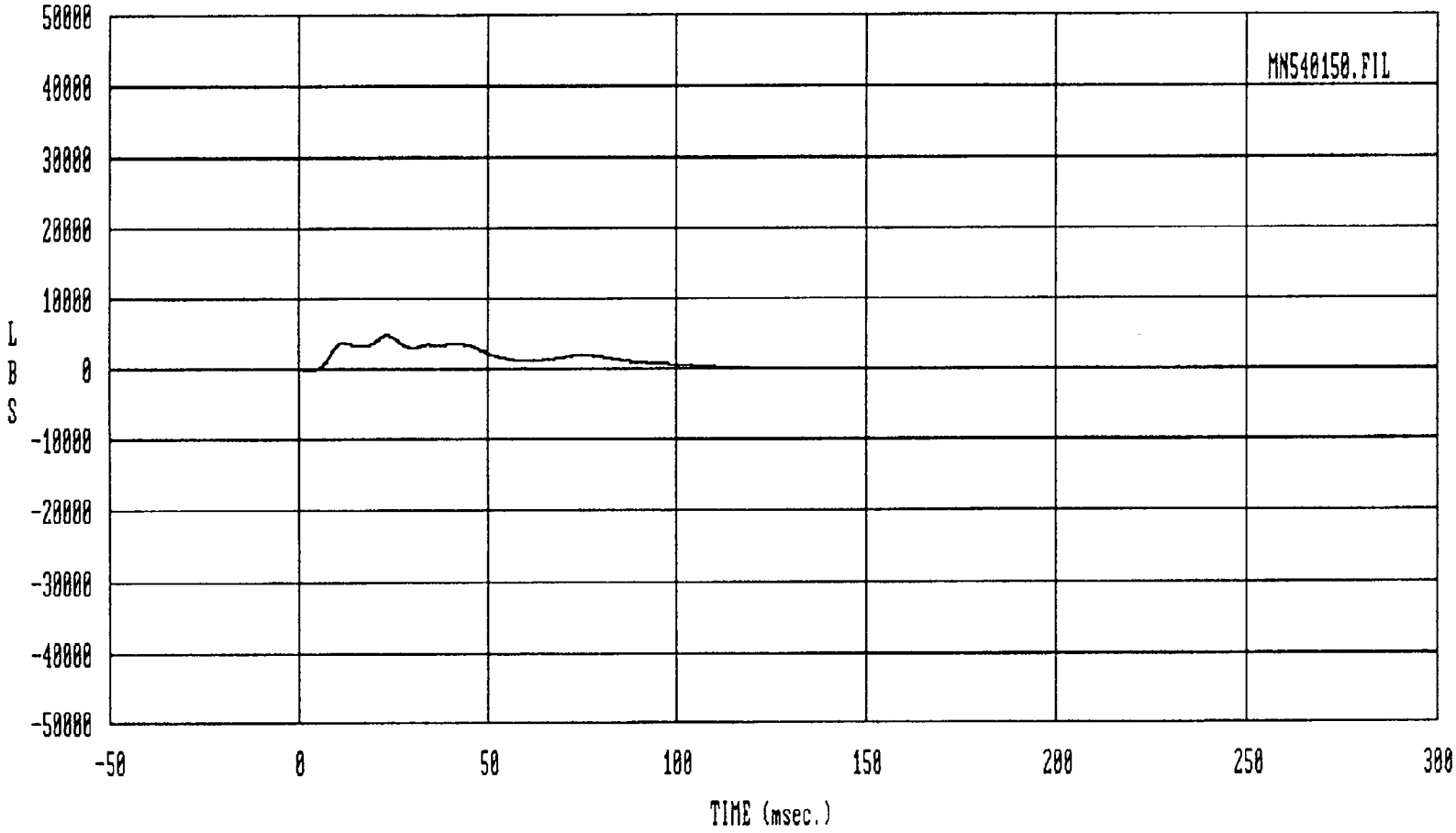

Curve: Force on Barrier load cell B6 Filter: SAE CLASS 60 Max = 21063. Min = -7.9919

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



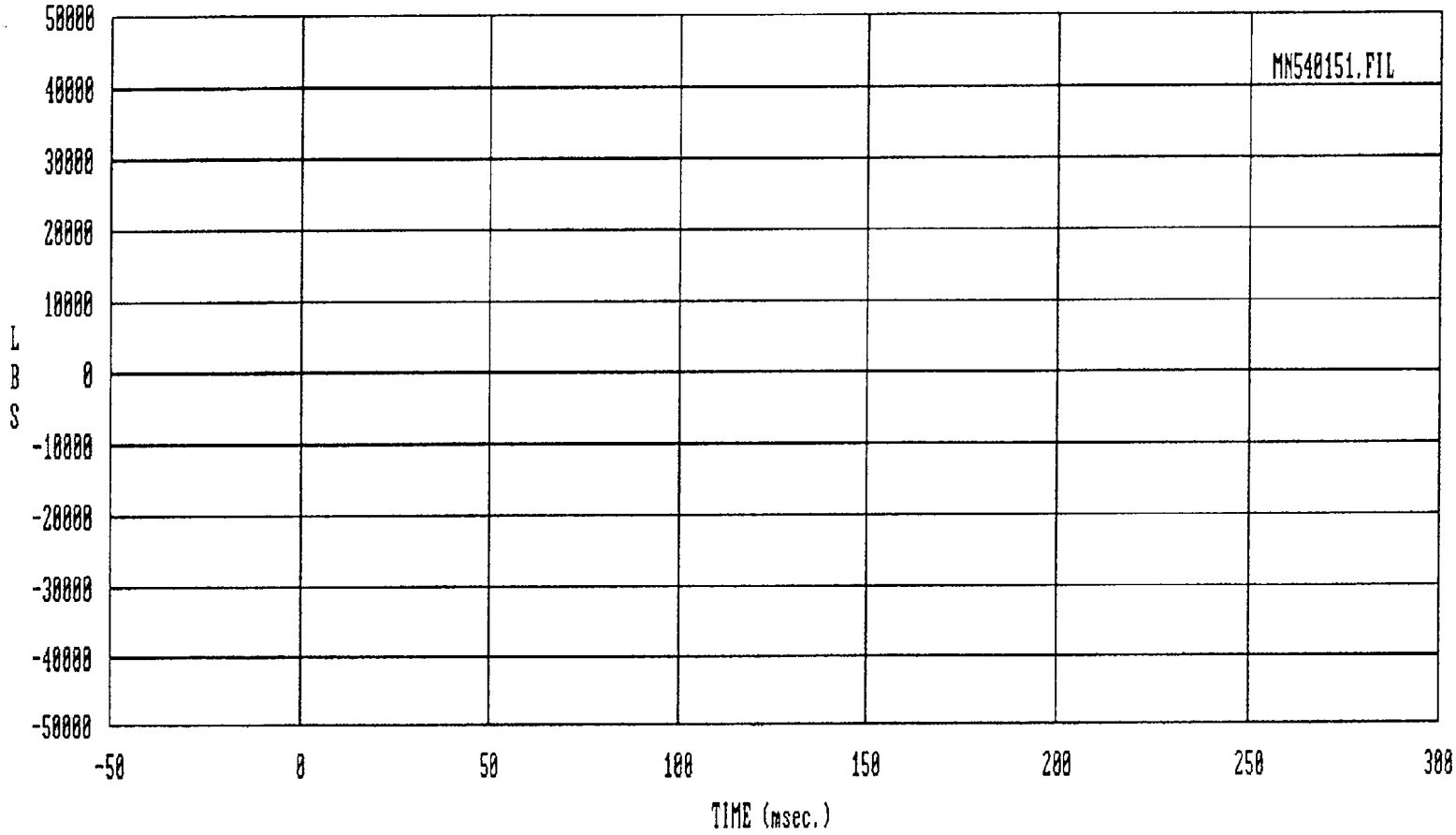

Curve: Force on Barrier load cell B7 Filter: SAE CLASS 60 Max = 15235. Min = -300.62

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



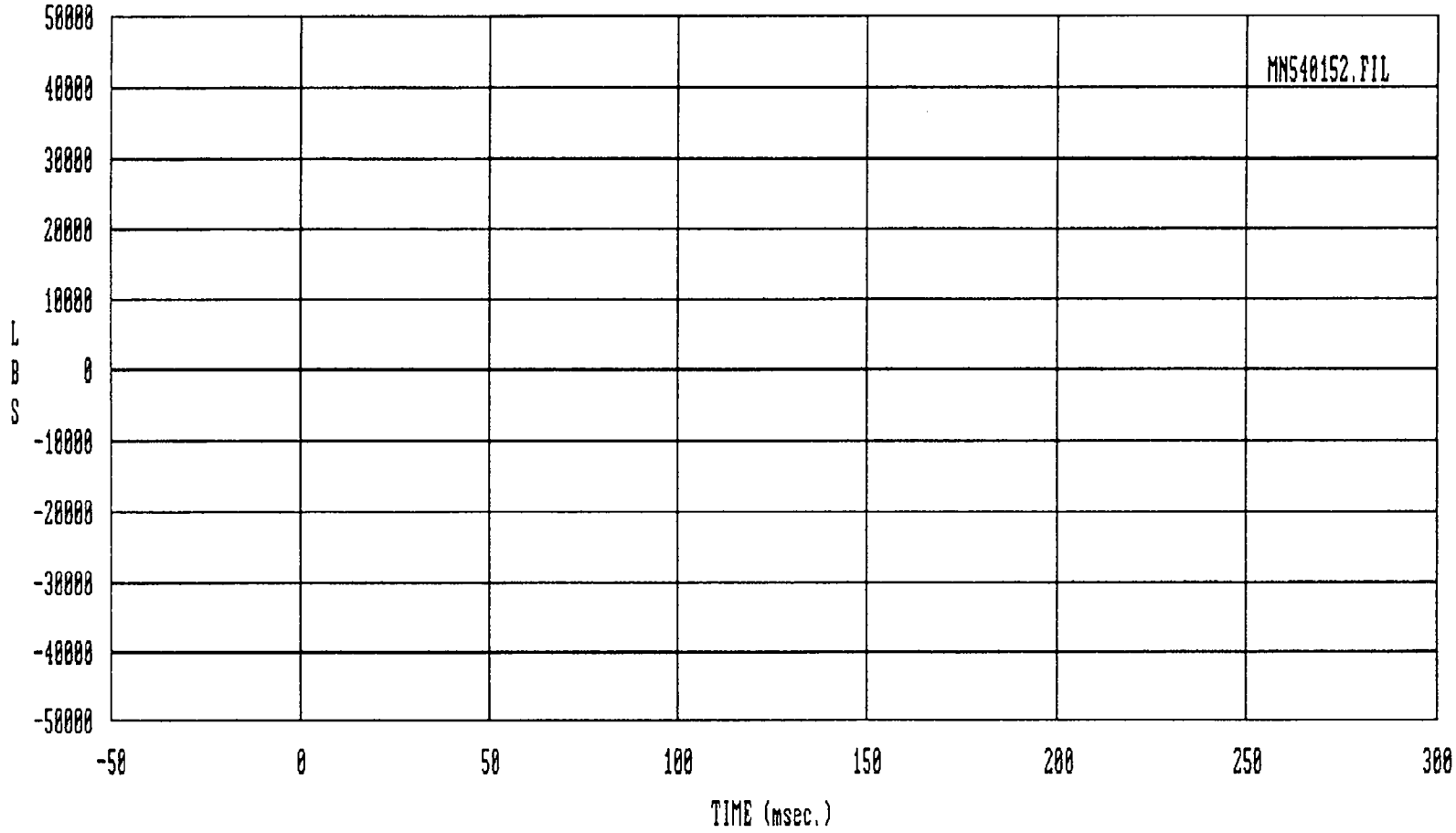

Curve: Force on Barrier load cell B8 Filter: SAE CLASS 60 Max = 4741.0 Min = -147.93

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



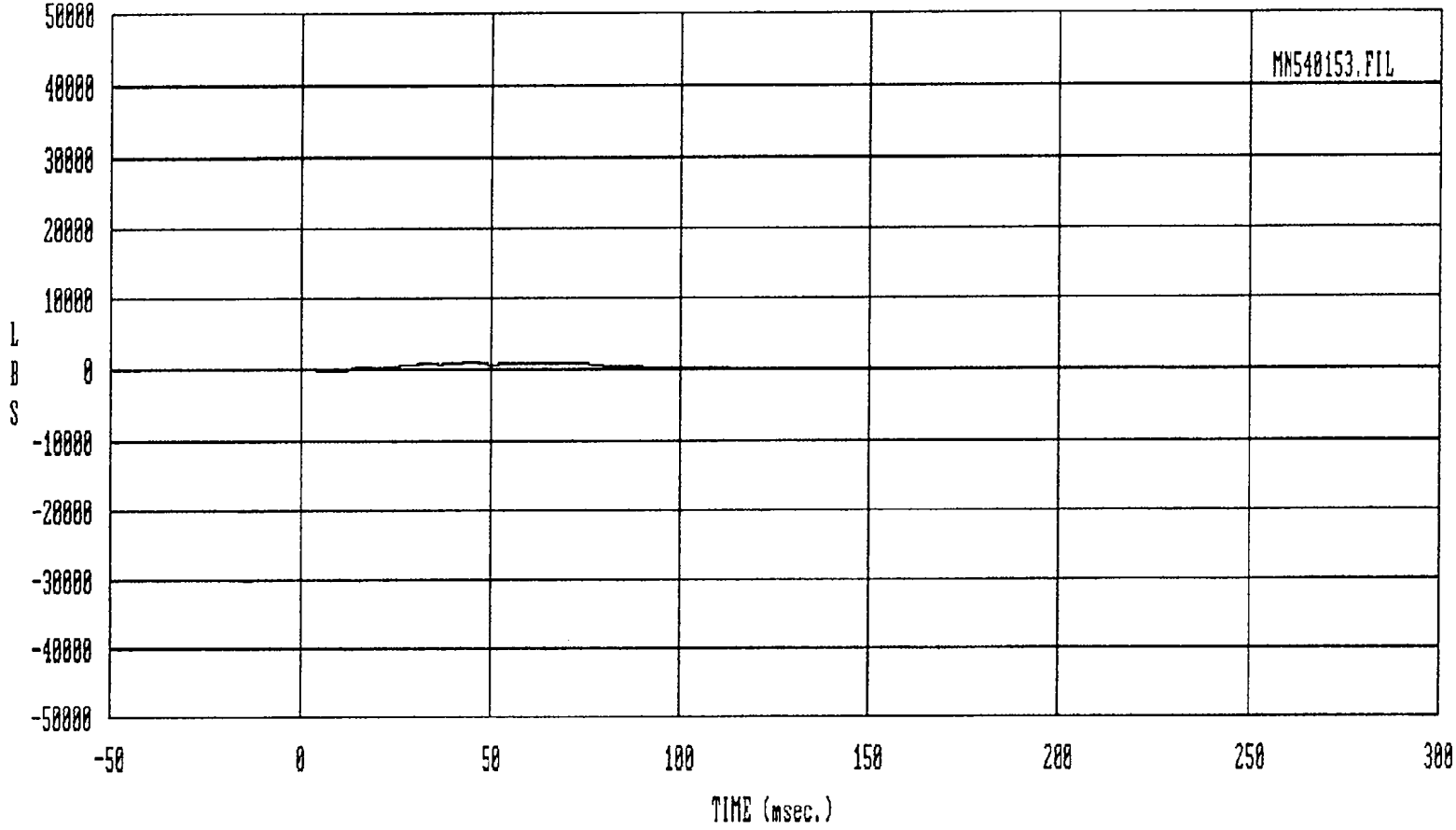

Curve: Force on Barrier load cell B9 Filter: SAE CLASS 60 Max = .00000 Min = .00000

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



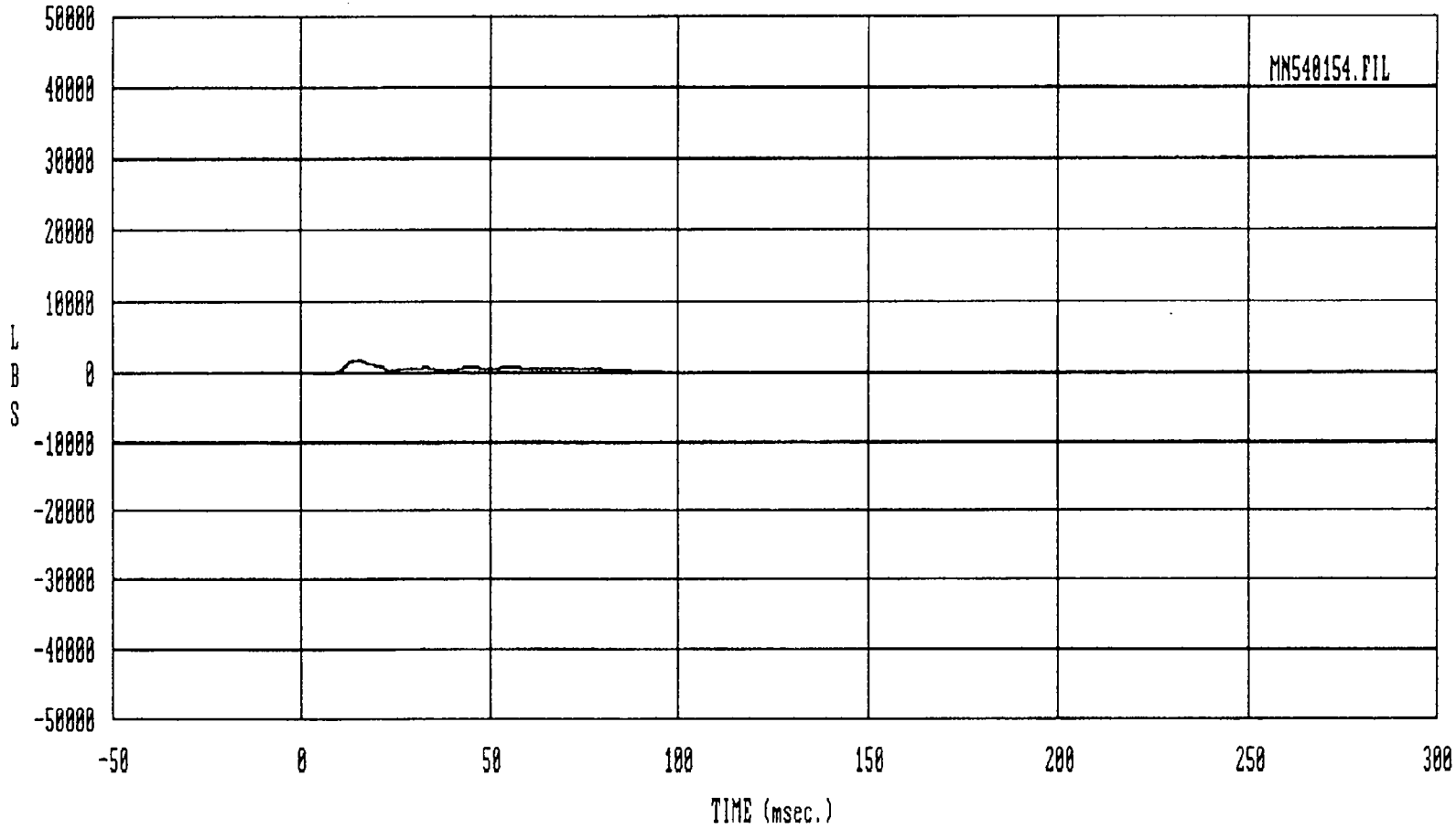

Curve: Force on Barrier load cell C1 Filter: SAE CLASS 60 Max = .00000 Min = .00000

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



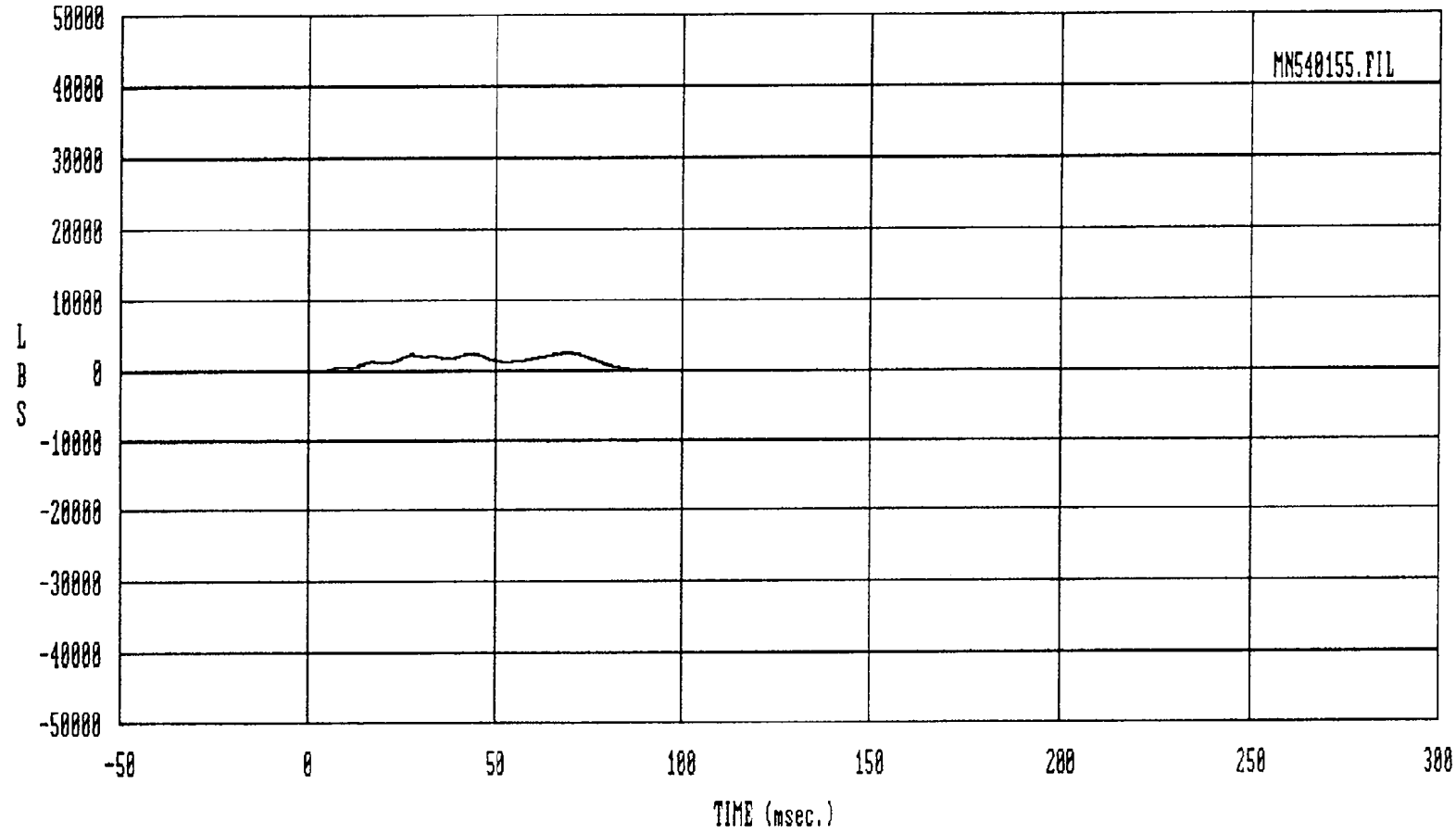

Curve: Force on Barrier load cell C2 Filter: SAE CLASS 60 Max = 997.88 Min = -158.89

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



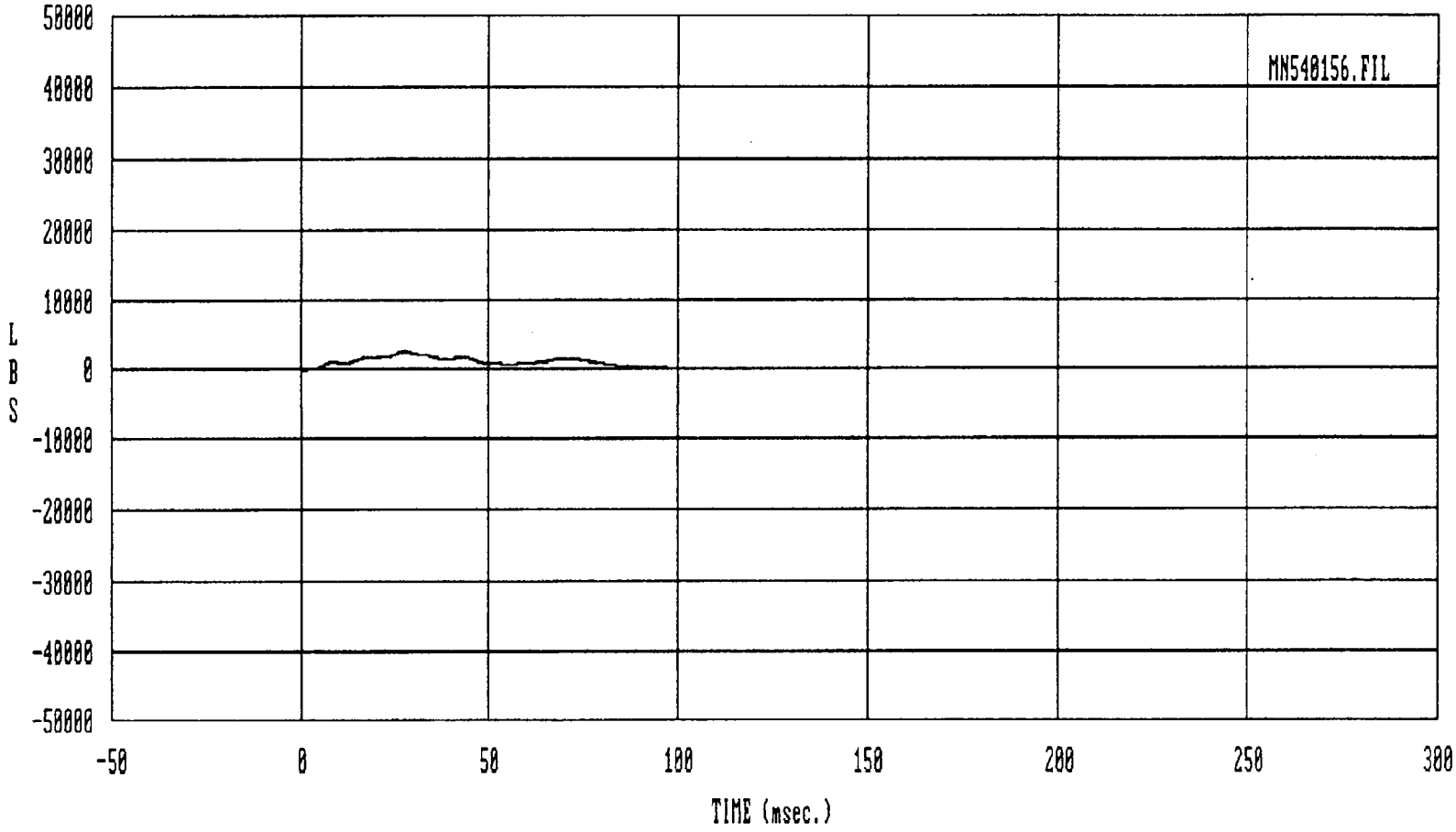

Curve: Force on Barrier load cell C3 Filter: SAE CLASS 60 Max = 1833.4 Min = -200.02

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



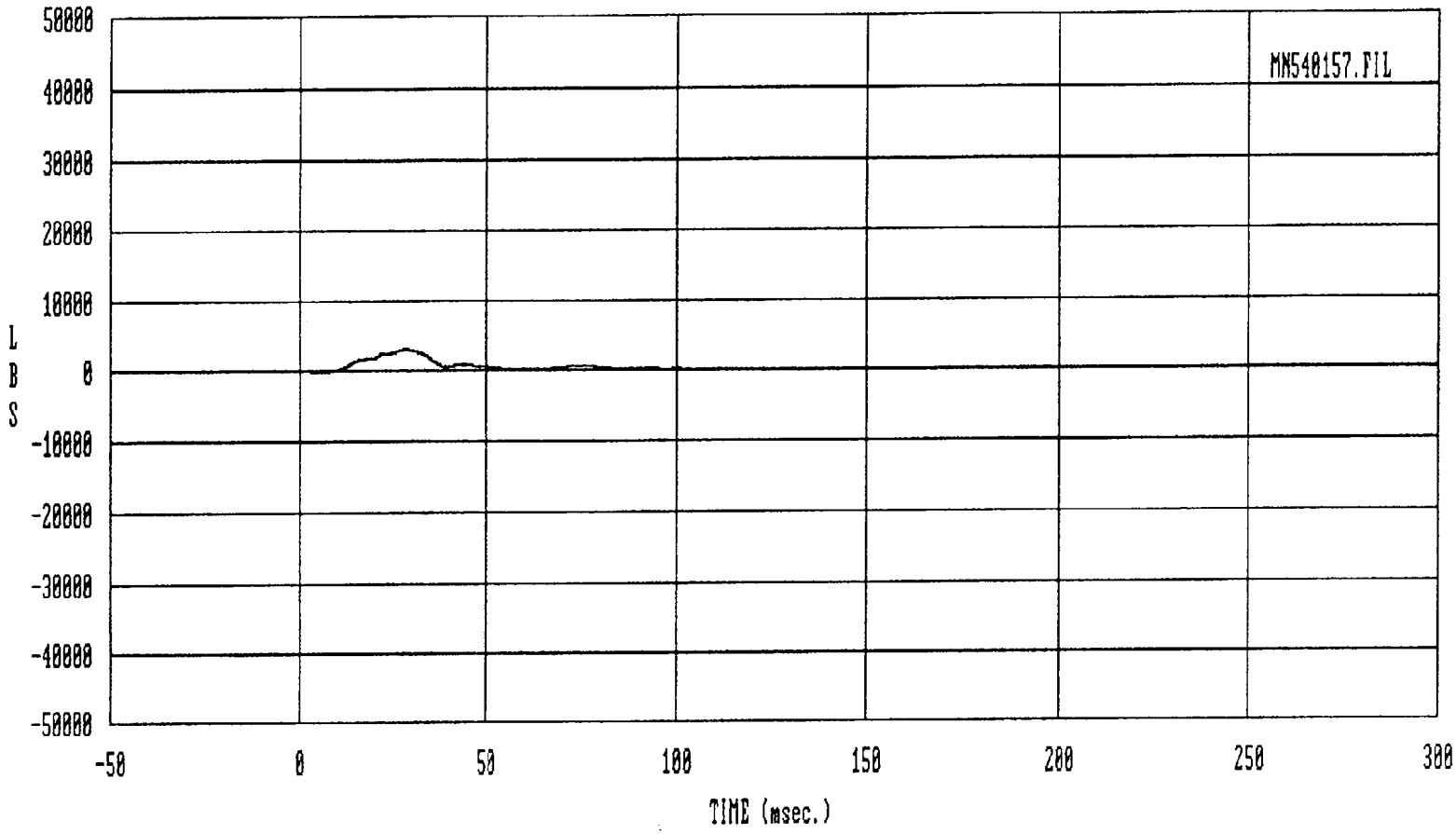

Curve: Force on Barrier load cell C4 Filter: SAE CLASS 60 Max = 2515.3 Min = -72.439

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



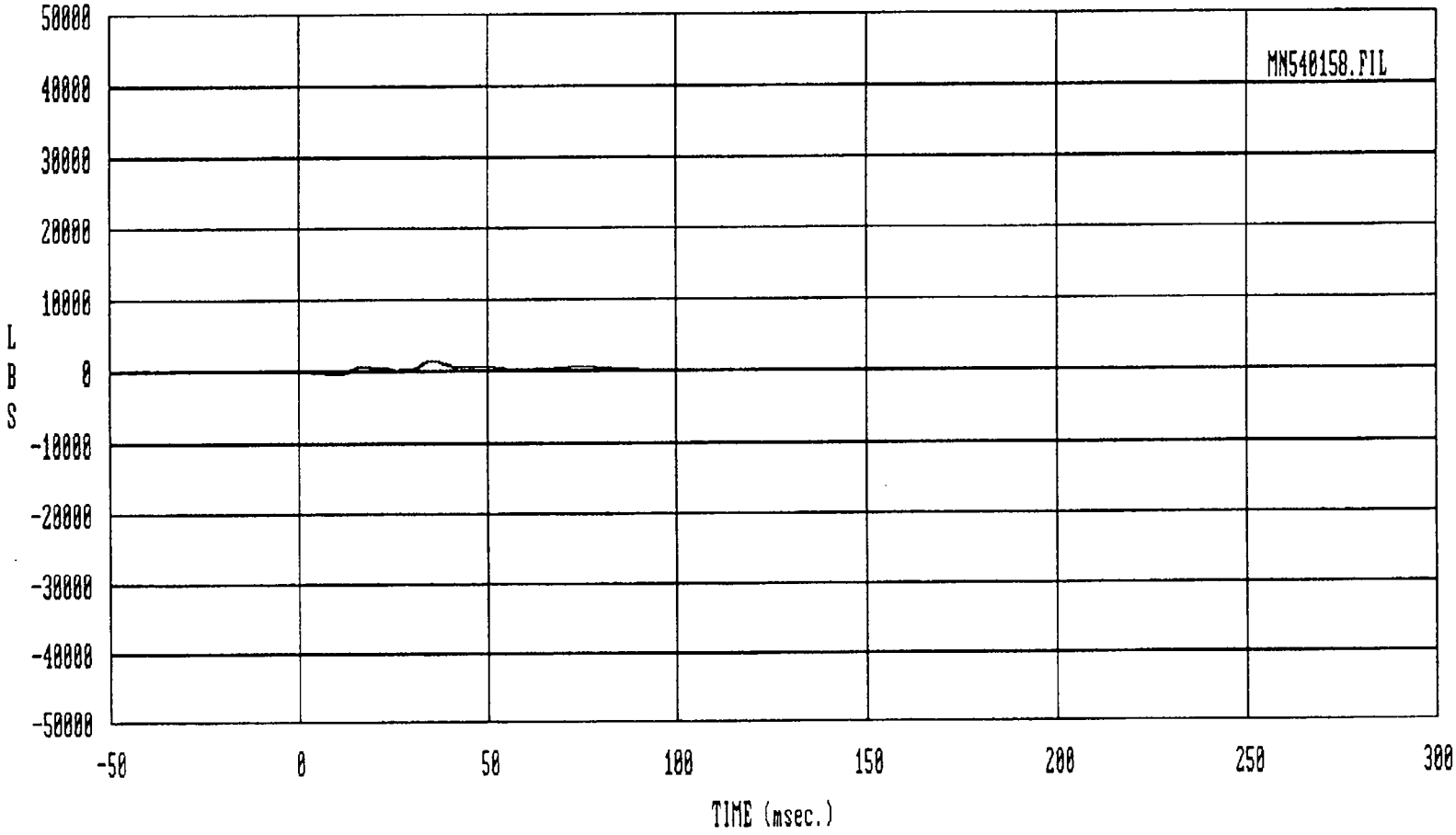

Curve: Force on Barrier load cell C5 Filter: SAE CLASS 60 Max = 2485.8 Min = -87.281

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



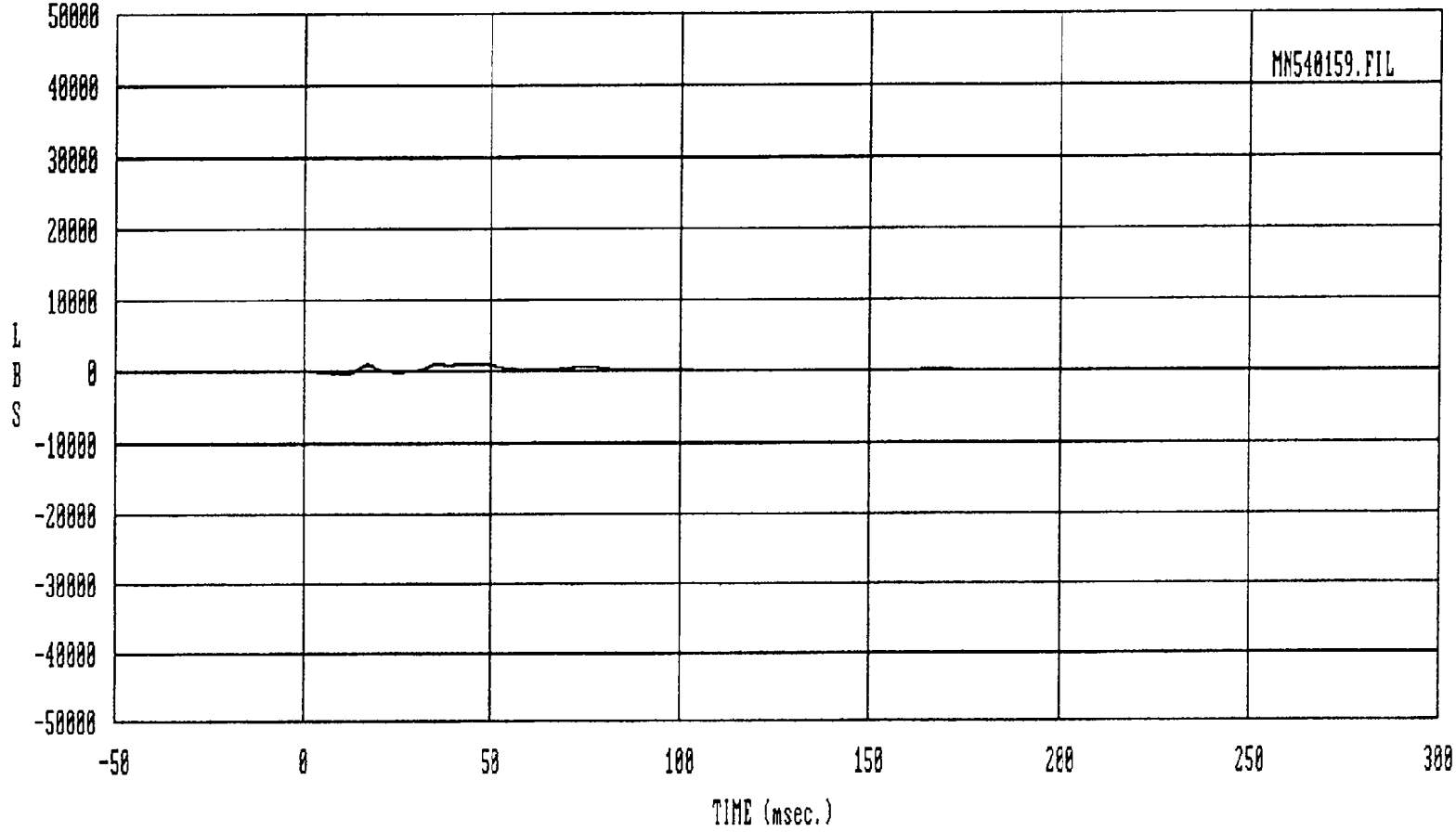

Curve: Force on Barrier load cell C6 Filter: SAE CLASS 60 Max = 3118.7 Min = -182.35

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



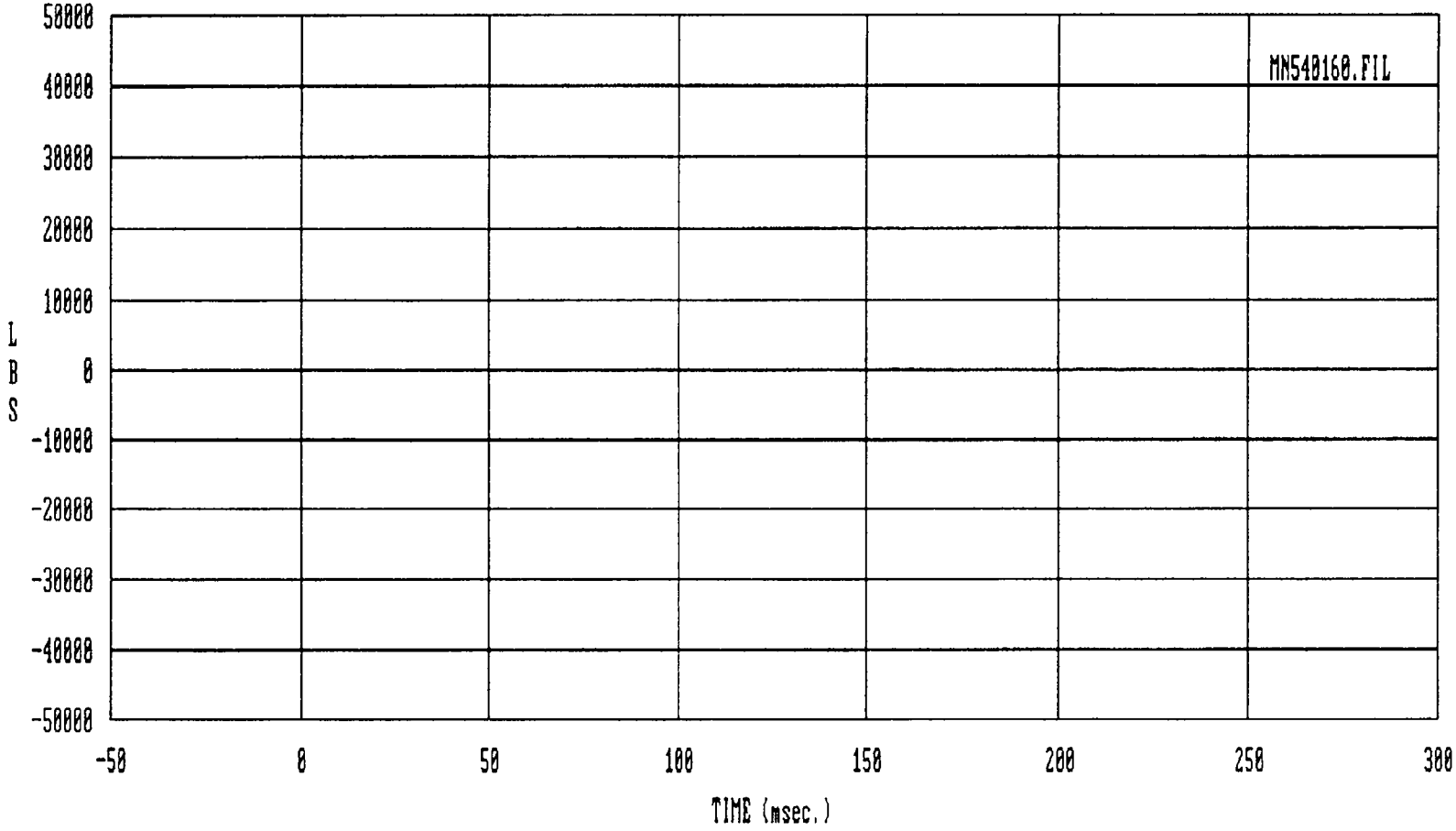

Curve: Force on Barrier load cell C7 Filter: SAE CLASS 60 Max = 1477.5 Min = -370.04

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



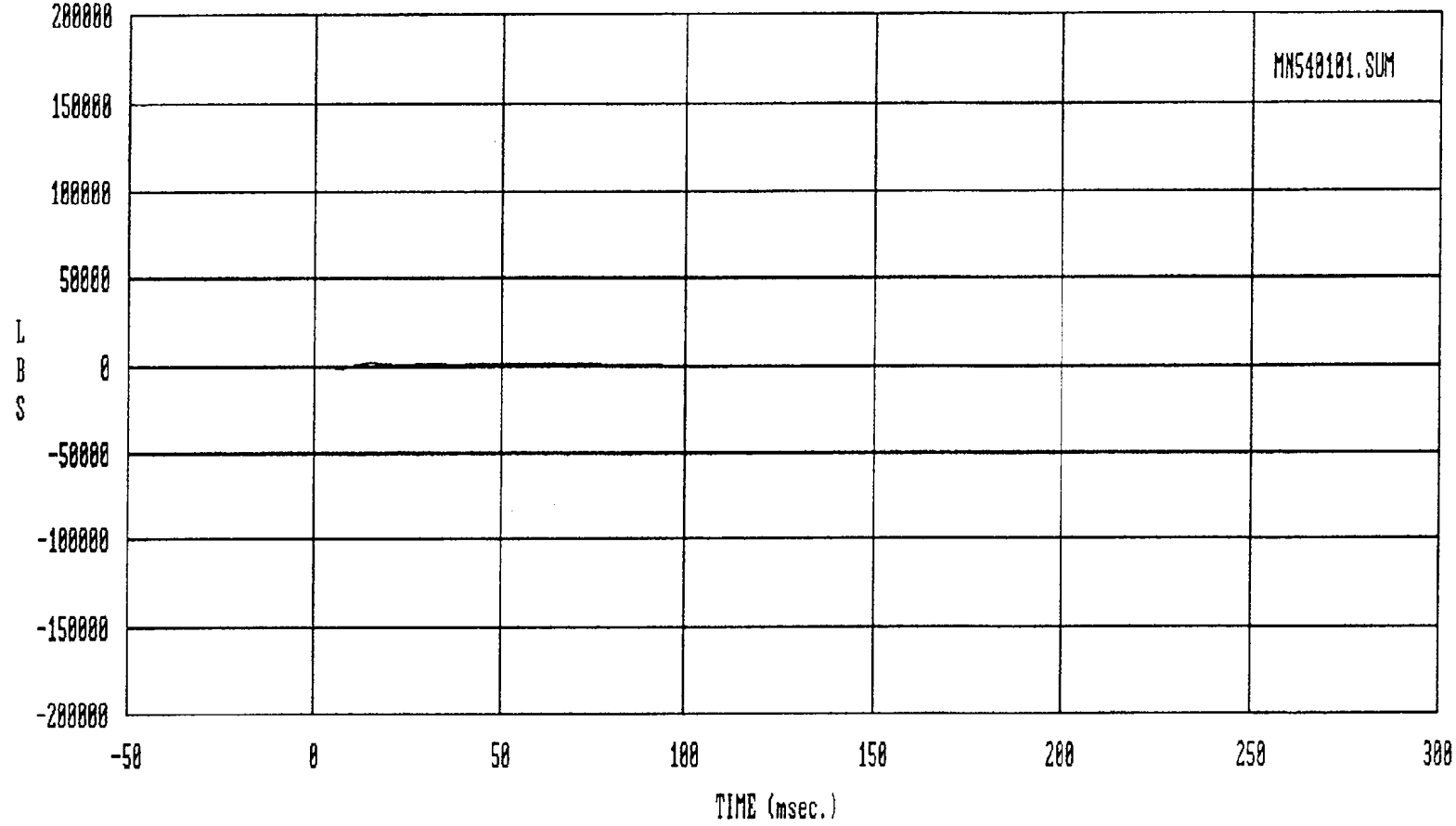

Curve: Force on Barrier load cell C8 Filter: SAE CLASS 60 Max = 1093.5 Min = -431.69

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



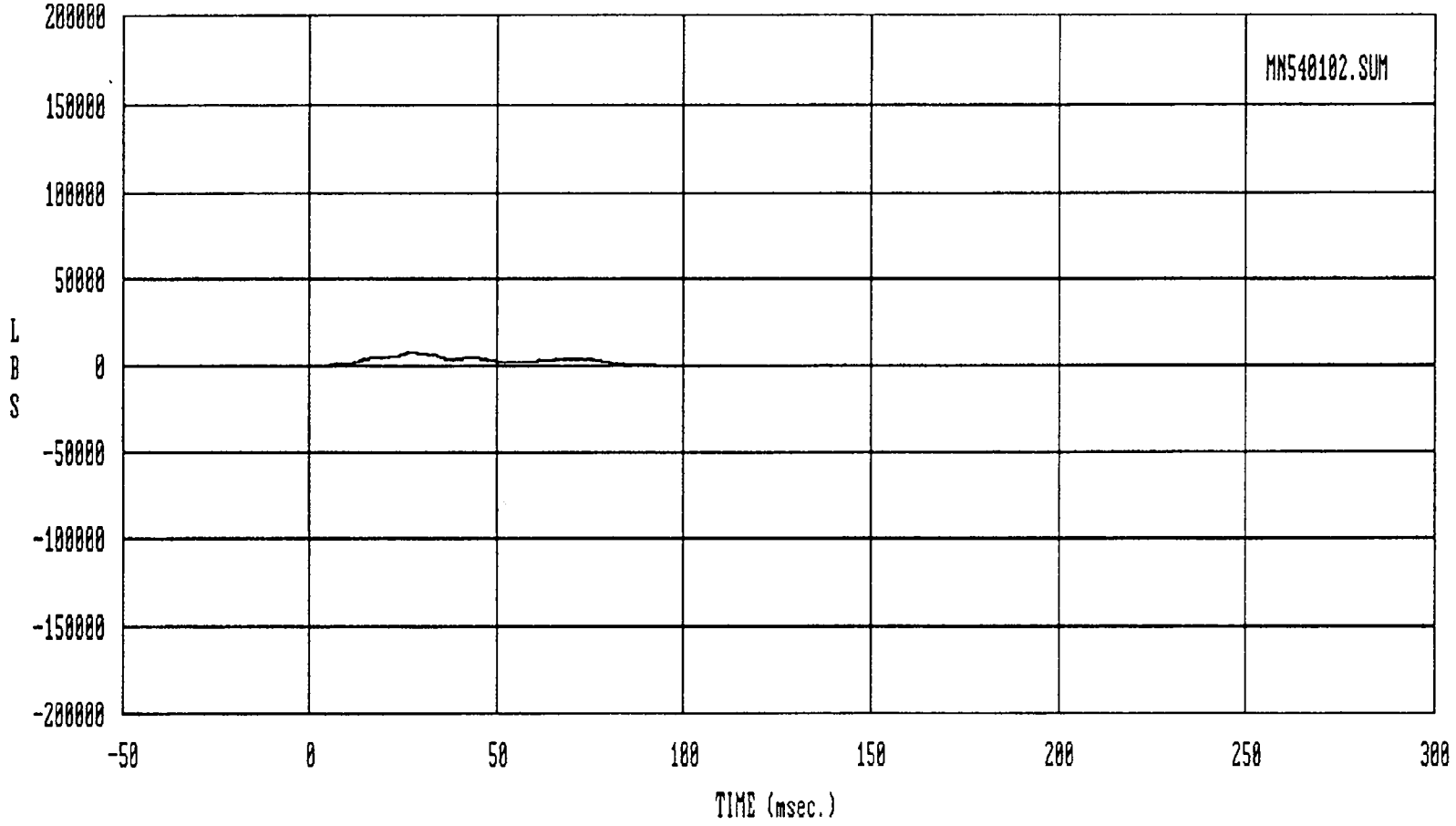

Curve: Force on Barrier load cell C9 Filter: SAE CLASS 60 Max = .00000 Min = .00000

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



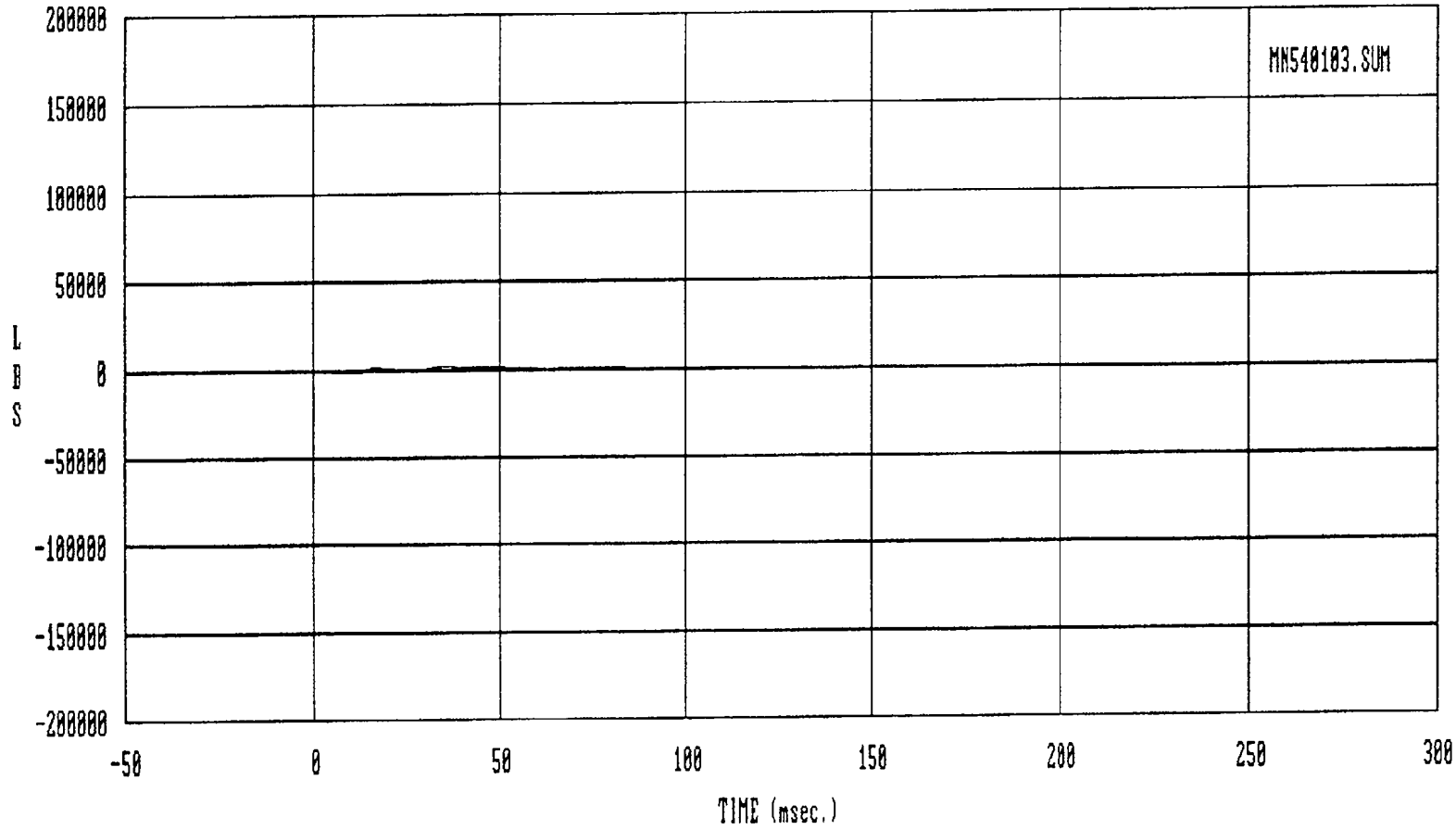

Curve: LCB sum force C1,C2,C3 -- Group 1 Filter: SAE CLASS 60 Max = 2256.7 Min = -358.53

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3



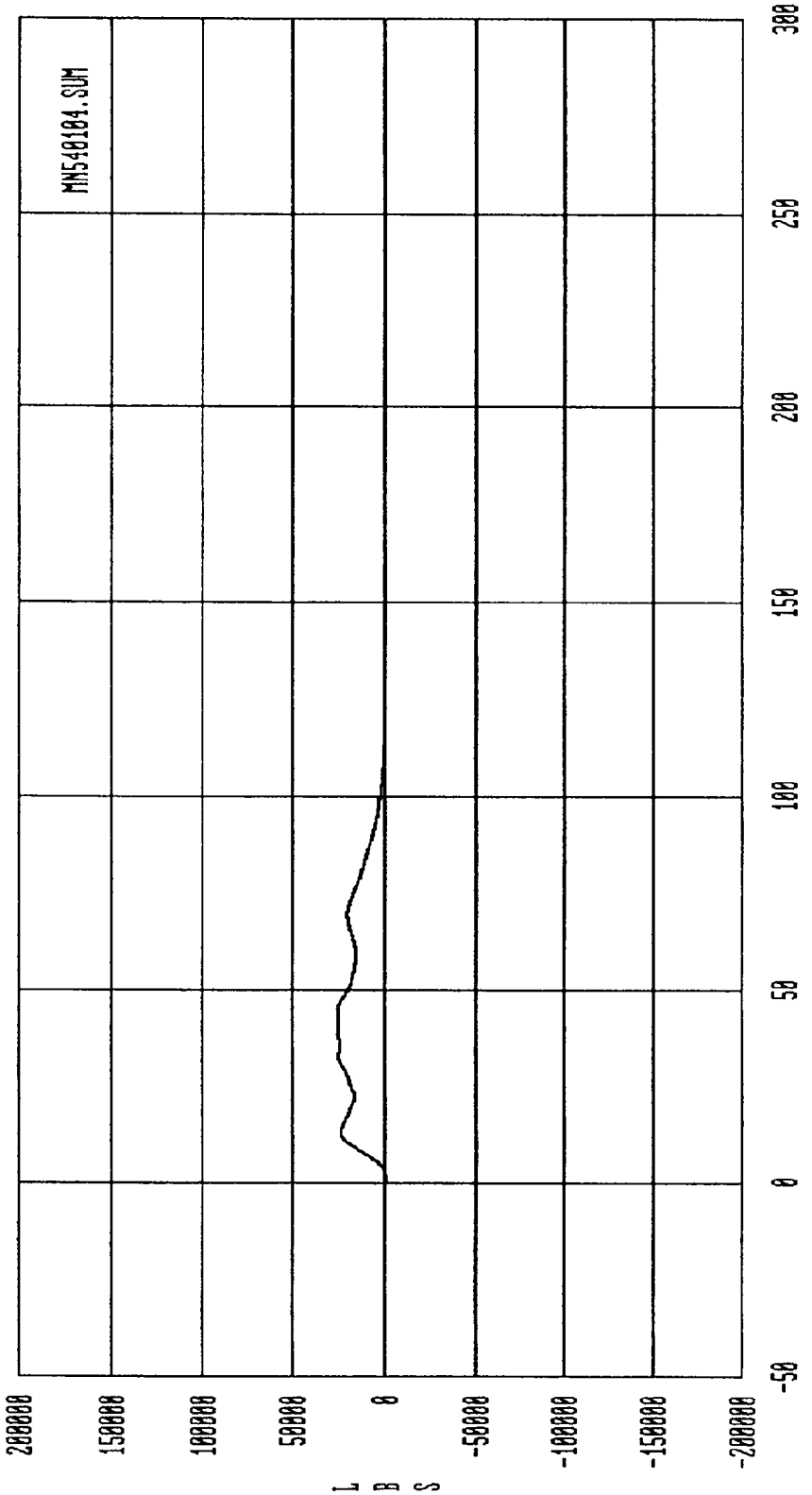

Curve: LCB sum force C4,C5,C6 -- Group 2 Filter: SAE CLASS 60 Max = 7875.5 Min = -225.10

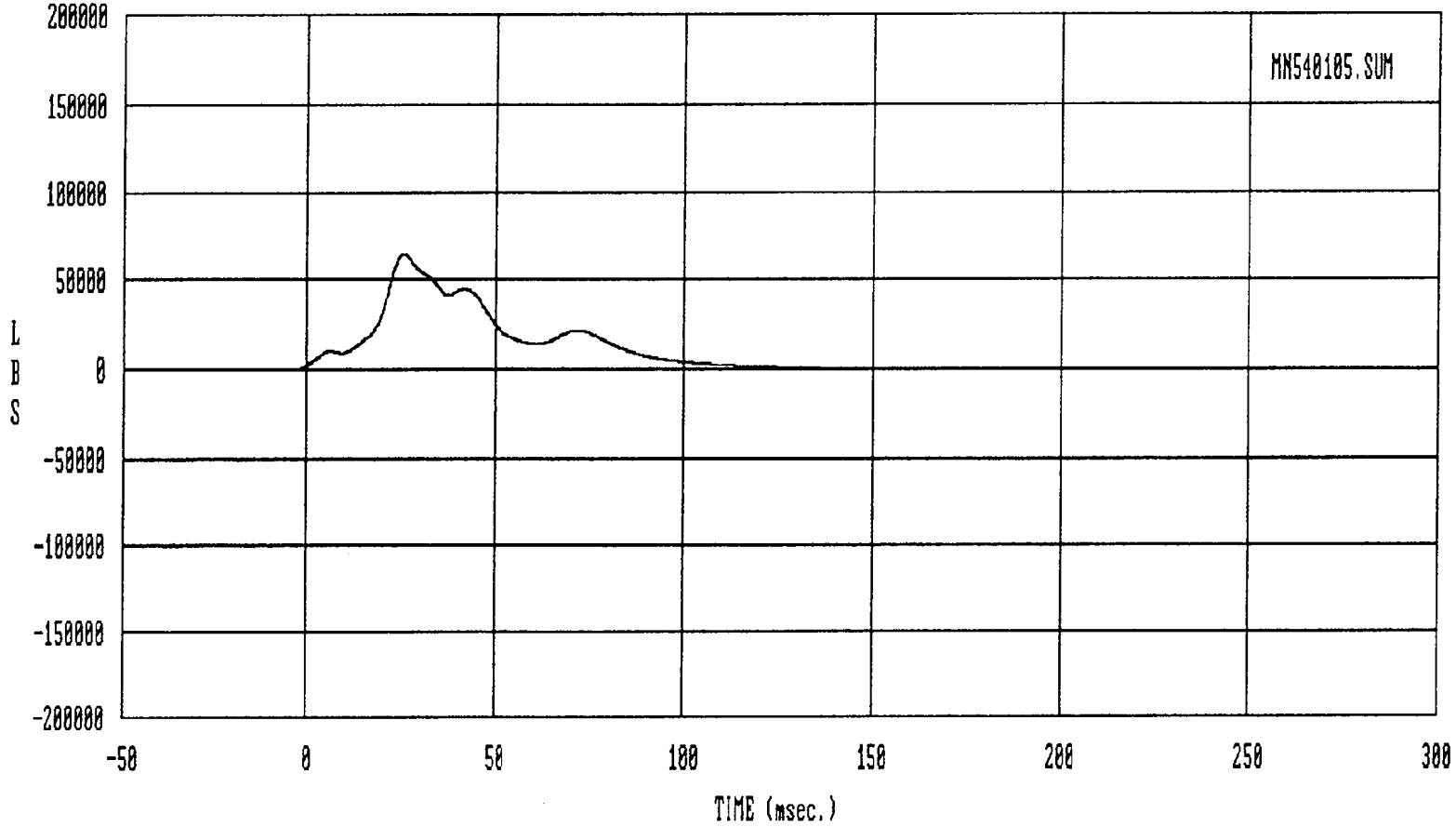
MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3




Curve: LCB sum force C7,C8,C9 -- Group 3 Filter: SAE CLASS 60 Max = 2448.1 Min = -798.50

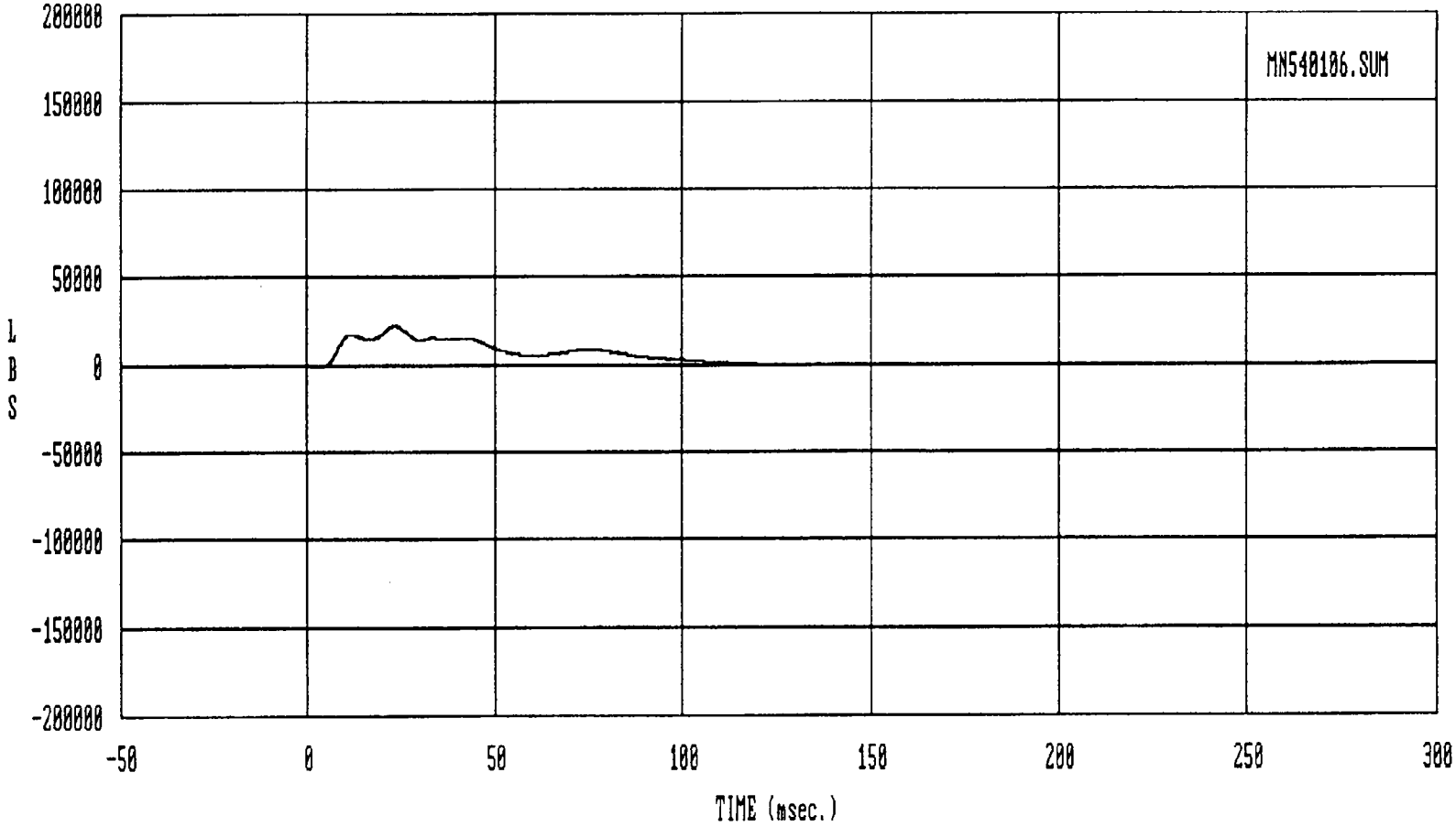
MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3


MN540104.SUM
200000
150000
100000
50000
0
-50000
-100000
-150000
-200000
LBS
-50
0
50
100
150
200
250
300
TIME (msec.)
Curve: ICB sum force A1,A2,A3,B1,B2,B3 -- Group 4
Filter: SAE CLASS 60
Max = 25547.
Min = -441.60
MSE
Date: 06/05/92
Program: 1992 NCAP - #6
Vehicle: 1992 Mazda MX3



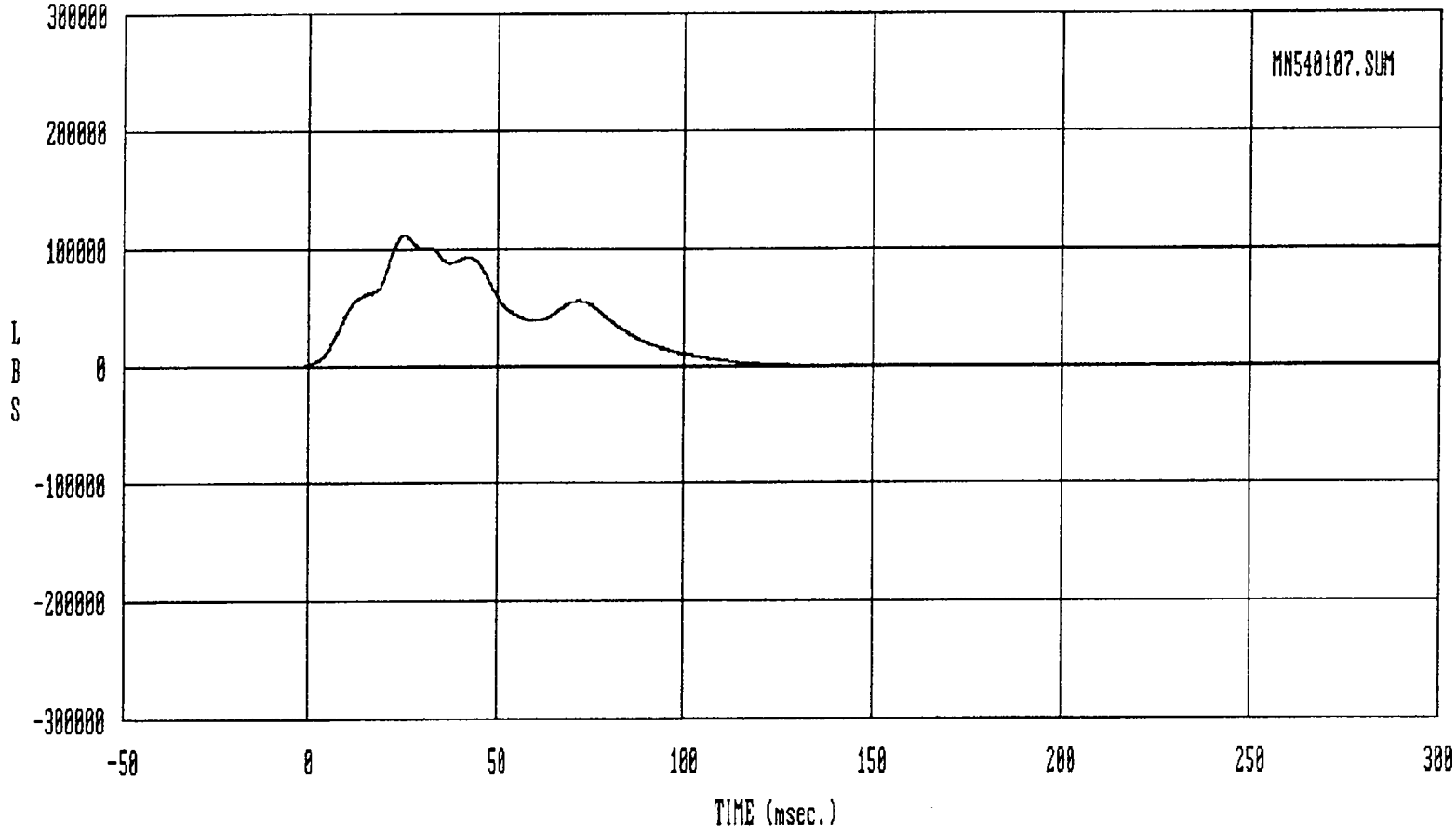

Curve: LCB sum force A4,A5,A6,B4,B5,B6 -- Group 5 Filter: SAE CLASS 60 Max = 64860. Min = -9.2783

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3




Curve: LCB sum force A7,A8,A9,B7,B8,B9 -- Group 6  Filter: SAE CLASS 60  Max = 22755.  Min = -641.29

MSE  Date: 06/05/92  Program: 1992 NCAP - #6  Vehicle: 1992 Mazda MX3




Curve: Load Cell Barrier total force* Filter: SAE CLASS 60 Max = .11194E+06 Min = -449.50

MSE Date: 06/05/92 Program: 1992 NCAP - #6 Vehicle: 1992 Mazda MX3

* ROW D (LOAD CELLS $D_1$ TO $D_9$ ) IS NOT INCLUDED IN THE SUMMATION.

# APPENDIX C

## PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION TESTS

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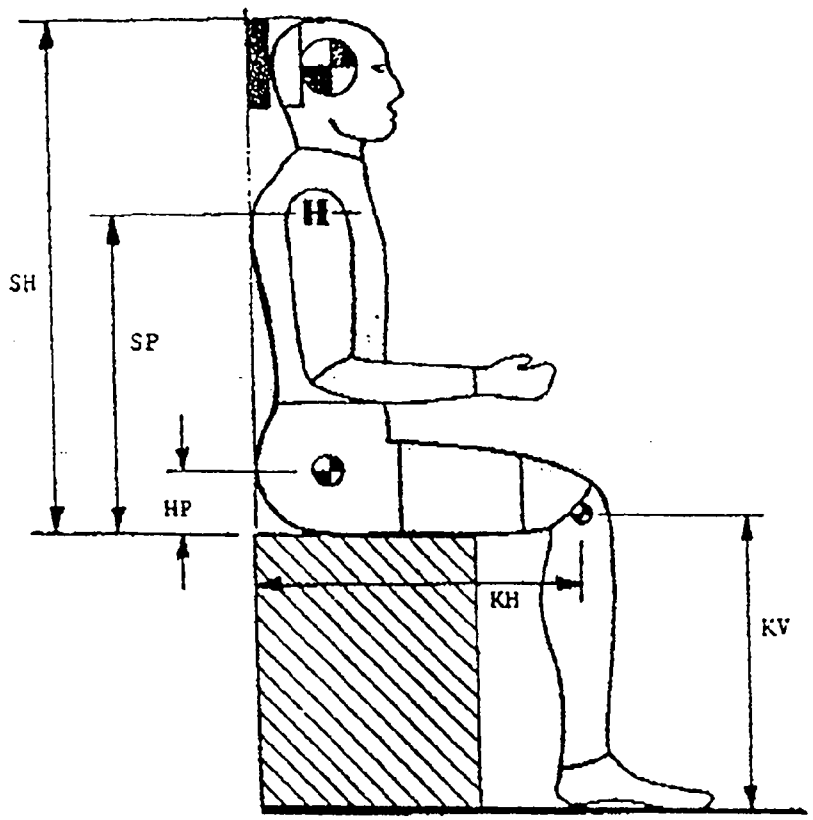
PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.: | 8 | 1 | 4 |

I. CONFIGURATION VERIFICATION DATA:




| | P. 572 SPECIFICATION | PRE-TEST (if required) | POST-TEST (if required) |
|---|---|---|---|
| DATE OF CONFIGURATION VERIFICATION | //////////// | 05/17/92 | |
| | //////////// | | |
| VERIFICATION NUMBER FOR DUMMY* --- | //////////// | 02 | |
| 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" | 19.4 | |
| SW - Shoulder Width - - - - - - - - | 17.8 to 18.4" | 18.1 | |
| HW - Hip Width- - - - - - - - - - - | 14.0 to 15.4" | 14.5 | |

TECHNICIAN'S NAME: MR. MARK WALKER

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

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

II. PERFORMANCE VERIFICATION DATA: NHTSA DUMMY I.D. NO.: | 8 | 1 | 4 |

TECHNICIAN NAME: MR. MARK WALKER

| | | PRE-TEST (if required) | POST-TEST (if required) |
|---|---|---|---|
| DATE OF PERFORMANCE VERIFICATION---------- | | 05/17/92 | |
| SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*----- | | 02 | |
| VERIF. LAB. TEMPERATURE (66 to 78 F Range)---- | | 68-78 F | F |
| VERIF. LAB. HUMIDITY (10 to 70% Range--------- | | 30-65 % | % |
| TEST PARAMETER | SPECIFICATION | | |
| 1. HEAD DROP TEST-- | | | |
| a. Peak Resultant Accel. | 210 to 260G | 225.0 | |
| b. Peak Lateral Accel.- | <10G | 3.5 | |
| c. Time above 100G - - - | 0.9 to 1.5 ms | 1.3 | |
| 2. NECK BENDING TEST-- | | | |
| a. Pendulum Speed- - - - | 21.5 to 22.5 fps | 22.3 | |
| b. Pend. Avg. Decel. over ($t_3 - t_2$) | 20 to 24G | 24.0 | |
| c. Peak Resultant Head Acceleration - - - - | 26G max. | 23.0 | |
| d. Pendulum Decel.($t_2 - t_1$) | <3 ms | 2.8 | |
| e. Pendulum Decel.($t_3 - t_2$) | 25 to 30 ms | 28.0 | |
| f. Pendulum Decel.($t_4 - t_3$) | <10 ms | 9.5 | |
| g. Max. Head Rotation - | 63 to 73 | 66.0 | |
| h. Chordal Displacement-Head Rotation Angle- | | | |
| $0^o$ Time- - | -2 to 2 ms | 0.0 | |
| Displ.- | -.5 to .5" | 0.0 | |
| $30^o$ Time- - | 22.6 to 34 ms | 31.0 | |
| Displ.- | 2.1 to 3.1" | 2.9 | |
| $60^o$ Time- - | 40.3 to 51.7ms | 48.0 | |
| Displ.- | 4.3 to 5.3" | 5.2 | |
| Maximum ($66.0^o$) Time- - | 53.2 to 66.8ms | 61.0 | |
| Displ.- | 5.0 to 6.0" | 5.9 | |

*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.: | 8 | 1 | 4 |

TECHNICIAN NAME: MR. MARK WALKER

| TEST PARAMETER | | SPECIFICATION | PRE-TEST (if required) | POST-TEST (if required) |
|---|---|---|---|---|
| 2. NECK BENDING TEST---- Continued: | | | | |
| h. Chordal Displacement-Head Rotation Angle- | | | | |
| 60° | Time- - | 67.0 to 83.0 ms | 75.0 | |
| | Displ.- | 4.3 to 5.3 in. | 4.8 | |
| 30° | Time- - | 85.4 to 104.6 ms | 89.0 | |
| | Displ.- | 2.1 to 3.1 in. | 2.3 | |
| 0° | Time- - | 101.0 to 123.0 ms | 101.0 | |
| | Displ.- | -.5 to 0.5 in. | 0.2 | |
| 3. ABDOMINAL COMPRESSION TEST: (Preload=10 pounds) | | | | |
| a. Force @ .5" - - - - | | 23 to 36 lbs. | 30.5 | |
| b. Force @ .75" - - - - | | 36 to 50 lbs. | 42.0 | |
| c. Force @ 1.0"- - - - - | | 50 to 63 lbs. | 55.0 | |
| d. Force @ 1.3"- - - - - | | 73 to 88 lbs. | 81.0 | |
| 4. LUMBAR FLEXION TEST: | | | | |
| a. Force @ 20° - - - - - | | 22 to 34 lbs. | 27.0 | |
| b. Force @ 30° - - - - - | | 34 to 46 lbs. | 37.0 | |
| c. Force @ 40° - - - - - | | 46 to 58 lbs. | 53.0 | |
| d. Return Angle- - - - - | | 12° maximum | 10.0 | |
| 5. CHEST IMPACT TESTS: | | | | |
| a. High Speed | | | | |
| (1) Probe Speed - - - | | 21.78-22.22 fps | 22.22 | |
| (2) Peak Deflection - | | 1.7" maximum | 1.7 | |
| (3) Peak Resistive Force - - - - - - | | 2250 lbs.maximum | 2231.9 | |
| (4) Internal Hysteresis | | 50 to 70% | 65.0 | |
| b. Low Speed | | | | |
| (1) Probe Speed - - - | | 13.86-14.14 fps | 14.1 | |
| (2) Peak Deflection - | | 1.1" maximum | 9.0 | |
| (3) Peak Resistive Force - - - - - - | | 1450 lbs.maximum | 1175.6 | |
| (4) Internal Hysteresis | | 50 to 70% | 60.0 | |

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

II. PERFORMANCE VERIFICATION DATA: NHTSA DUMMY I.D. NO.: | 8 | 1 | 4 |

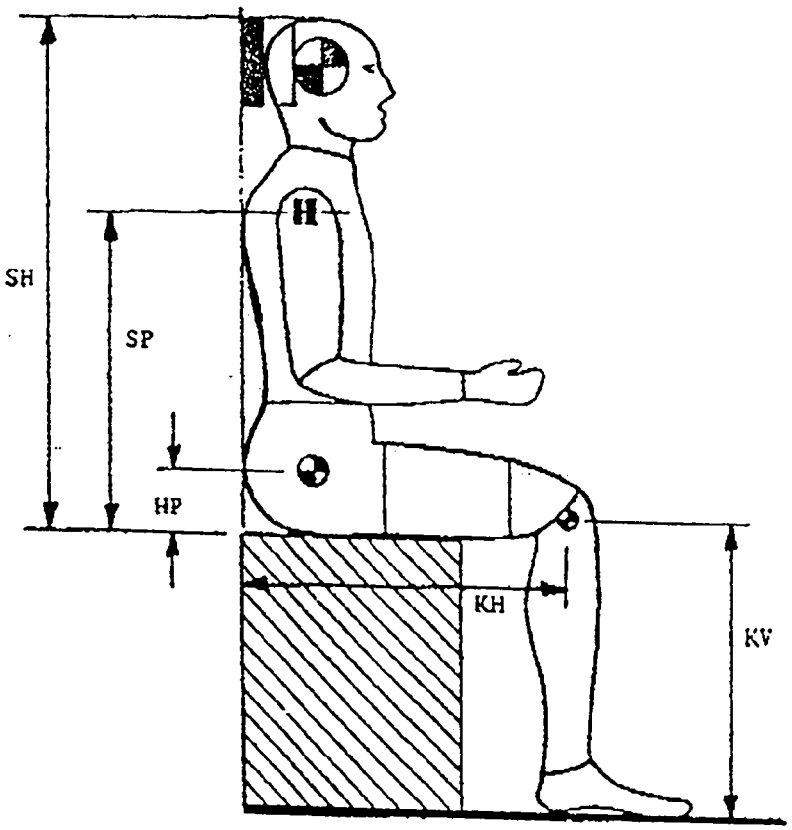
TECHNICIAN NAME: MR. MARK WALKER

| 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 | 6.9 | |
| (2) Maximum Force - - | 1850 to 2500 lbs | 2027.7 | |
| (3) Time Above 1000#- | 1.7 ms minimum | 1.9 | |
| b. Left Side-- | | | |
| (1) Probe Speed - - - | 6.76 to 7.04 fps | 6.9 | |
| (2) Maximum Force - - | 1850 to 2500 lbs | 2033.9 | |
| (3) Time Above 1000#- | 1.7 ms minimum | 1.9 | |

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NO.: | 1 | 8 | 3 |

I. CONFIGURATION VERIFICATION DATA:




| | P. 572 SPECIFICATION | PRE-TEST (if required) | POST-TEST (if required) |
|---|---|---|---|
| DATE OF CONFIGURATION VERIFICATION | //////////// | 05/17/92 | |
| | //////////// | | |
| VERIFICATION NUMBER FOR DUMMY* --- | //////////// | 01 | |
| SH - Seated Height- - - - - - - - - | 35.6 to 35.8" | 35.6 | |
| SP - Shoulder Pivot Height- - - - | 21.8 to 22.4" | 22.1 | |
| HP - Hip Pivot Height - - - - - - | 3.9 ref. | 3.9 | |
| KH - Knee Pivot from back line- - | 20.1 to 20.7" | 20.5 | |
| KV - Knee Pivot from floor- - - - | 19.3 to 19.9" | 19.7 | |
| SW - Shoulder Width - - - - - - - - | 17.8 to 18.4" | 18.1 | |
| HW - Hip Width- - - - - - - - - - - | 14.0 to 15.4" | 14.8 | |

TECHNICIAN'S NAME: MR. MARK WALKER

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

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

II. PERFORMANCE VERIFICATION DATA: NHTSA DUMMY I.D. NO.: | 1 | 8 | 3 |

TECHNICIAN NAME: MR. MARK WALKER

| | | PRE-TEST (if required) | POST-TEST (if required) |
|---|---|---|---|
| DATE OF PERFORMANCE VERIFICATION---------- | | 05/17/92 | |
| SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*----- | | 01 | |
| VERIF. LAB. TEMPERATURE (66 to 78 F Range)---- | | 68-78 F | F |
| VERIF. LAB. HUMIDITY (10 to 70% Range--------- | | 30-65 % | % |
| TEST PARAMETER | SPECIFICATION | | |
| 1. HEAD DROP TEST-- | | | |
| a. Peak Resultant Accel. | 210 to 260G | 248.0 | |
| b. Peak Lateral Accel.- | <10G | 3.2 | |
| c. Time above 100G - - - | 0.9 to 1.5 ms | 1.3 | |
| 2. NECK BENDING TEST-- | | | |
| a. Pendulum Speed- - - - | 21.5 to 22.5 fps | 22.3 | |
| b. Pend. Avg. Decel. over ($t_3 - t_2$) | 20 to 24G | 23.6 | |
| c. Peak Resultant Head Acceleration - - - - | 26G max. | 23.5 | |
| d. Pendulum Decel.($t_2 - t_1$) | <3 ms | 3.0 | |
| e. Pendulum Decel.($t_3 - t_2$) | 25 to 30 ms | 28.5 | |
| f. Pendulum Decel.($t_4 - t_3$) | <10 ms | 9.8 | |
| g. Max. Head Rotation - | 63 to 73 | 69.0 | |
| h. Chordal Displacement-Head Rotation Angle- | | | |
| 0° Time- - | -2 to 2 ms | 0.0 | |
| 0° Displ.- | -.5 to .5" | 0.0 | |
| 30° Time- - | 22.6 to 34 ms | 31.0 | |
| 30° Displ.- | 2.1 to 3.1" | 2.3 | |
| 60° Time- - | 40.3 to 51.7ms | 46.0 | |
| 60° Displ.- | 4.3 to 5.3" | 4.9 | |
| Maximum Time- - | 53.2 to 66.8ms | 59.0 | |
| (69.0°) Displ.- | 5.0 to 6.0" | 5.6 | |

*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.: | 1 | 8 | 3 |

TECHNICIAN NAME: MR. MARK WALKER

| TEST PARAMETER | | SPECIFICATION | PRE-TEST (if required) | POST-TEST (if required) |
|---|---|---|---|---|
| 2. NECK BENDING TEST---- Continued: | | | | |
| h. Chordal Displacement-Head Rotation Angle- | | | | |
| 60° | Time- - | 67.0 to 83.0 ms | 74.0 | |
| | Displ.- | 4.3 to 5.3 in. | 5.1 | |
| 30° | Time- - | 85.4 to 104.6 ms | 95.0 | |
| | Displ.- | 2.1 to 3.1 in. | 2.5 | |
| 0° | Time- - | 101.0 to 123.0 ms | 103.0 | |
| | Displ.- | -.5 to 0.5 in. | 0.1 | |
| 3. ABDOMINAL COMPRESSION TEST: (Preload=10 pounds) | | | | |
| a. Force @ .5" - - - - | | 23 to 36 lbs. | 31.0 | |
| b. Force @ .75" - - - - | | 36 to 50 lbs. | 44.0 | |
| c. Force @ 1.0"- - - - - | | 50 to 63 lbs. | 56.5 | |
| d. Force @ 1.3"- - - - - | | 73 to 88 lbs. | 83.0 | |
| 4. LUMBAR FLEXION TEST: | | | | |
| a. Force @ 20° - - - - - | | 22 to 34 lbs. | 26.0 | |
| b. Force @ 30° - - - - - | | 34 to 46 lbs. | 36.0 | |
| c. Force @ 40° - - - - - | | 46 to 58 lbs. | 52.0 | |
| d. Return Angle- - - - - | | 12° maximum | 10.0 | |
| 5. CHEST IMPACT TESTS: | | | | |
| a. High Speed | | | | |
| (1) Probe Speed - - - | | 21.78-22.22 fps | 22.2 | |
| (2) Peak Deflection - | | 1.7" maximum | 1.6 | |
| (3) Peak Resistive Force - - - - - - | | 2250 lbs.maximum | 2154.8 | |
| (4) Internal Hysteresis | | 50 to 70% | 64.0 | |
| b. Low Speed | | | | |
| (1) Probe Speed - - - | | 13.86-14.14 fps | 14.0 | |
| (2) Peak Deflection - | | 1.1" maximum | 1.1 | |
| (3) Peak Resistive Force - - - - - - | | 1450 lbs.maximum | 1297.3 | |
| (4) Internal Hysteresis | | 50 to 70% | 60.0 | |

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

II. PERFORMANCE VERIFICATION DATA: NHTSA DUMMY I.D. NO.: | 1 | 8 | 3 |

TECHNICIAN NAME: MR. MARK WALKER

| 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 | 6.9 | |
| (2) Maximum Force - - | 1850 to 2500 lbs | 2384.4 | |
| (3) Time Above 1000#- | 1.7 ms minimum | 1.8 | |
| b. Left Side-- | | | |
| (1) Probe Speed - - - | 6.76 to 7.04 fps | 6.9 | |
| (2) Maximum Force - - | 1850 to 2500 lbs | 2183.0 | |
| (3) Time Above 1000#- | 1.7 ms minimum | 1.8 | |

# APPENDIX D

## VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

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## Seat Belt System

Seat belts help decrease the possibility or severity of injury during accidents and sudden stops. Mazda recommends that the driver and passengers wear seat belts at all times.

The front seats have an automatic (passive) shoulder belt and a manual lap belt. These belts have retractors with inertia locks that keep them out of the way when not in use. The locks allow the belts to remain comfortable on users, but they'll lock in position during a collision.

The rear seat has lap/shoulder belts that have retractors with inertia locks.

**⚠WARNING**

*Seat Belts:*
*Passengers not wearing seat belts during a collision can be injured much worse than those wearing seat belts. They can hit things inside the vehicle or even be thrown from it. They can be seriously injured or killed. In the same collision, passengers wearing seat belts might be much safer.*

**⚠WARNING**

*Damaged Seat Belts:*
*An accident can damage a seat belt in use. The belt webbing can be weakened and retractors and anchors can be bent or broken. Therefore a damaged seat belt may not provide adequate protection in a collision. Have a professional inspect all seat belt systems in use during an accident before they are used again.*

**⚠WARNING**

*Twisted Seat Belts:*
*Twisted seat belts can cause injury. In a collision, the full width of the belt isn't available to absorb the impact. This puts more force on the bones beneath the belt, which could break them or cause other serious injury. Don't wear twisted seat belts.*

**⚠WARNING**

*One Belt, One Passenger:*
*Using one seat belt for more than one person at a time is dangerous. A seat belt used in this way can't spread the impact forces properly and the two passengers could be crushed together and seriously injured. Never use one belt for more than one person at a time.*



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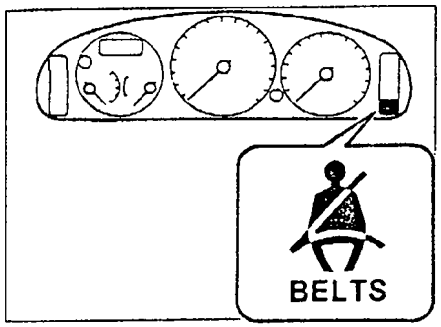
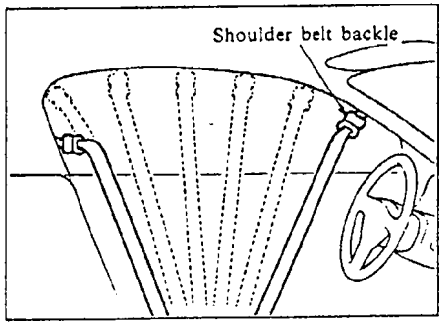



### Seat Belt Warning Light/Beep

When you turn on the ignition before fastening your seat belt, a warning light will come on and a beep will sound (warnings and indicators, page 4-25).

### Front Seat Belts

Your Mazda has shoulder belts in the front that automatically move into position. The lap belts are operated manually. Always use the lap belt.




▼ Shoulder belt

Turn on the ignition; the buckle moves from front to rear.

**⚠CAUTION**

To protect the sunvisor, make sure it's in the original position when the shoulder belt buckle moves.



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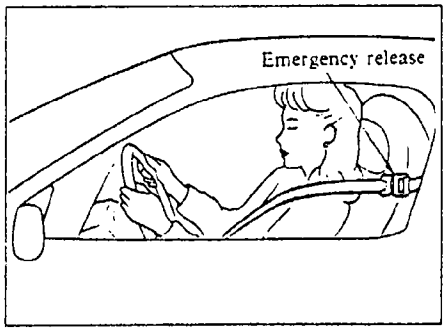
## ⚠WARNING

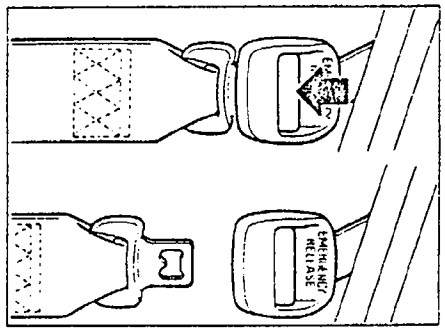
*Wearing the Shoulder Belt:*
***An improperly worn shoulder belt can be dangerous. In a collision, a shoulder belt worn under the arm will transfer the full force of impact to the ribs and cause serious injury. A shoulder belt worn behind the neck and over the inside shoulder provides no protection. Never wear a shoulder belt under the arm or place it behind the neck and over the inside shoulder.***




▼ Shoulder belt emergency release

In an emergency, press the emergency release on the shoulder belt buckle. This frees the tongue.

To buckle the belt, insert the tongue until you hear a click.



## ⚠WARNING

*Emergency Release:*
***Pushing the emergency release unfastens the shoulder belt. The user will then have no belt protection and in a collision can be thrown around in the cabin or thrown out. Always make sure the belt is connected to the buckle.***



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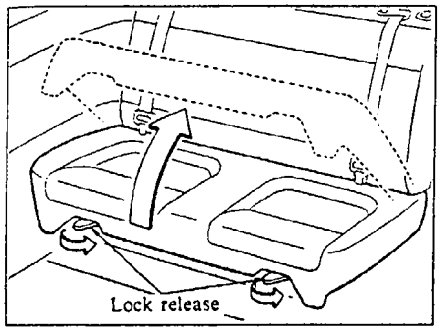


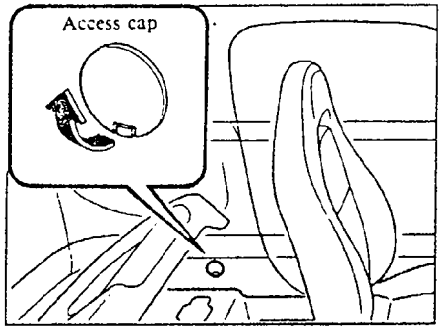


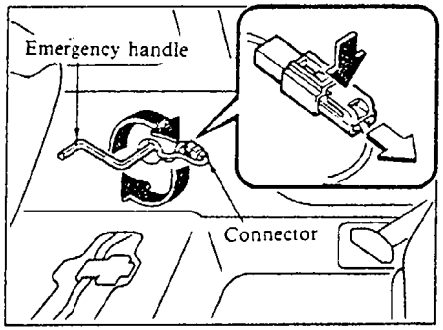


▼ **Shoulder belt manual override**

If the shoulder belt doesn't operate correctly, consult an Authorized Mazda Dealer as soon as possible.

**If it fails to move to the rearmost position:**

1. Turn off the ignition.
2. Use the emergency release to free the belt.
3. Remove the rear seat cushion. (Push the cushion lock releases to the right and pull up on the cushion.)
4. Remove the access cap.
5. Pull the wiring harness through the access hole and disconnect the connector.

| NOTE |
| --- |
| Pull on the connector housing, not the wiring, when separating connectors. |

6. Fit the emergency handle (provided in the glove box) into the hex nut.
7. Turn the handle (driver's side, clockwise; passenger's side, counterclockwise) until you hear a click.
8. Install the rear seat cushion.
9. Sit on the front seat and insert the tongue into the buckle until you hear a click.



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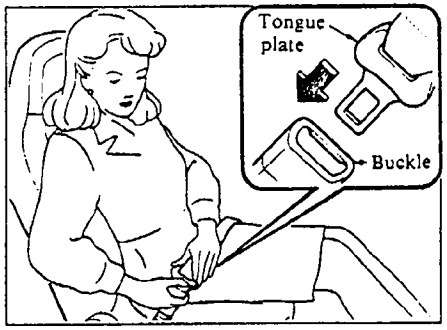
## ⚠CAUTION

To prevent the buckle from accidentally moving, and protect the electrical system, don't reconnect the connector. See an Authorized Mazda Dealer as soon as possible.




▼ Lap belt

**To fasten:**

1. Pull the tongue to the desired length.
2. Insert it into the buckle until you hear a click.
3. Adjust the belt by pulling it down toward the retractor.

## ⚠*WARNING*

*Crossed Belts:*
***If the lap belt is fastened before the automatic shoulder belt has moved completely to the rear, the belts will cross. If this happens, in a collision they will not spread the force of impact properly across the body and can cause serious injury. Make sure the shoulder belt has moved completely to the rear before fastening the lap belt.***



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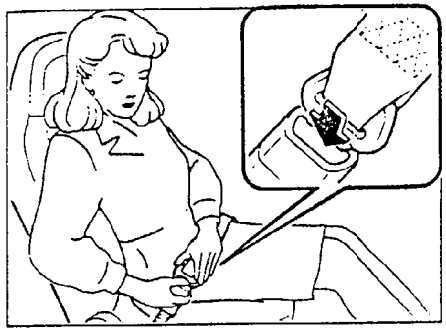
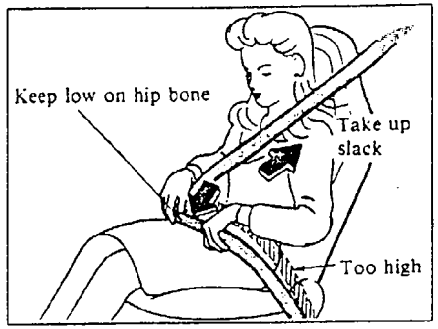


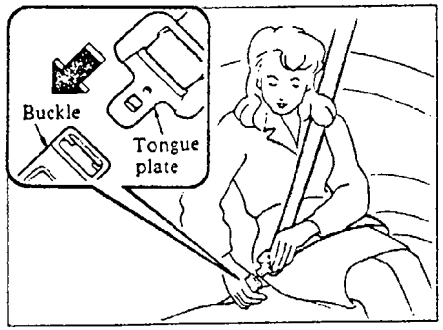
**To unfasten:**

Depress the button on the buckle.




**⚠WARNING**

***Wearing the Lap Belt:***
***A lap belt worn too high can be dangerous. In a collision, this would concentrate the impact force directly on the abdominal area, causing serious injury. Wear the lap belt snugly and as low as possible.***




## ■ Rear Seat Belts

**To fasten:**

1. Grasp the tongue plate and pull it to the desired length.
2. Insert this plate into the buckle until you hear a click.

The retractor will take up excess belt and maintain tension.



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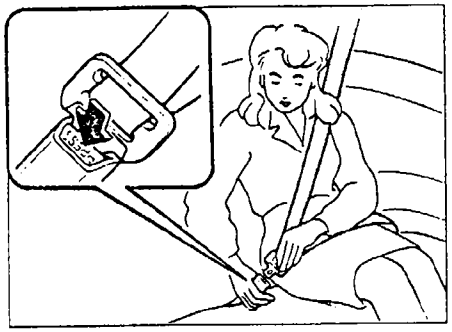


To unfasten:

Depress the button on the buckle.

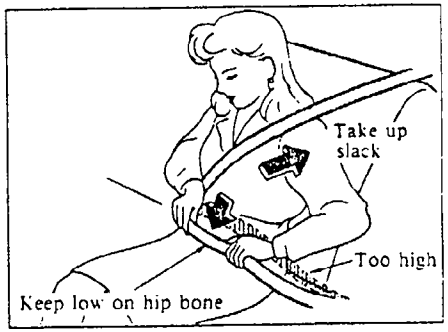
**NOTE**

If a belt does not fully retract, inspect it for kinks and twists.

## ⚠WARNING

***Wearing the Shoulder Belt:***

***An improperly worn shoulder belt can be dangerous. In a collision, a shoulder belt worn under the arm will transfer the full force of impact to the ribs and cause serious injury. A shoulder belt worn behind the neck and over the inside shoulder provides no protection. Never wear a shoulder belt under the arm or place it behind the neck and over the inside shoulder.***




## ⚠WARNING

***Wearing the Lap Belt:***

***A lap belt worn too high can be dangerous. In a collision, this would concentrate the impact force directly on the abdominal area, causing serious injury. Wear the lap belt snugly and as low as possible.***



MSE-92-R92027-N06

### Pregnant Women

Pregnant women should wear seat belt assemblies as recommended by their doctors. The lap belt should be worn SNUGLY AND AS LOW AS POSSIBLE.

### Child-Restraint System

Small children should be protected by a child-restraint system that meets the Federal Motor Vehicle Safety Standard (FMVSS).

It should fit the seat and the child.

| NOTE |
| --- |
| Every child-restraint system is designed for use with a lap belt or the lap-belt portion of a lap/shoulder belt. |

Follow all instructions when installing a child-restraint system, which should be in the rear seat and secured with the lap portion of a lap/shoulder belt. Accident statistics indicate that children are safer in rear-seat restraint systems.

**⚠WARNING**

*Unsecured Restraint System:*
***A child restraint system that is not securely fastened down can be dangerous. In a sudden stop or collision, it can become a projectile and hit someone, causing serious injury. When not in use, remove it from the vehicle or fasten it with a seat belt.***

**⚠WARNING**

*Holding a Child:*
***A child should never be held on the lap or in the arms of a passenger in a moving vehicle. No matter how strong a person may be, he or she cannot hold a child during an accident. The child may thus be injured by hitting parts of the vehicle or by being crushed by an unrestrained passenger.***



MSE-92-R92027-N06

**⚠WARNING**

*Unattended Children:*
***Leaving children unattended in a vehicle can be dangerous. In hot weather, temperatures inside a parked vehicle can become hot enough to cause brain damage or even death. Never leave children or animals unattended in the vehicle.***

**⚠WARNING**

*Child-Restraint Anchor:*
***Your Mazda has no child-restraint anchor. Therefore, using a child-restraint system that requires an anchor can be dangerous. In a collision, it would not be properly secured; thus it could move around in the cabin and seriously injure someone. Use only a system designed for use without an anchor.***

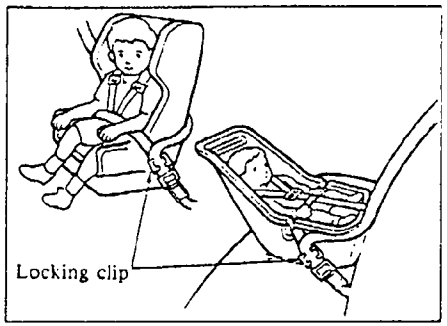
## ■ Installing a Child-Restraint System

The installation of a child-restraint system requires seat belt locking clips. Use Mazda locking clips (part No. FA55 57 999), available at Authorized Mazda Dealers, or an equivalent.

***We recommend that the child-restraint system always be installed in the rear seat and secured with the lap portion of a lap/shoulder belt.***

**⚠WARNING**

*Improperly Secured System:*
***An improperly secured child restraint may move in a sudden stop or collision and injure the child or someone else. You can properly secure it by following the child-restraint installation instructions in this manual.***




▼ **Rear door-side positions**

1. Secure the system with the lap portion of the lap/shoulder belts.
2. Tighten the lap belt by pulling on the shoulder belt.



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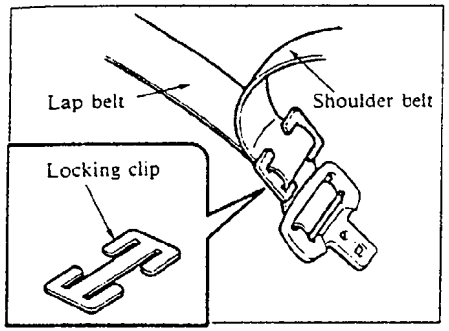
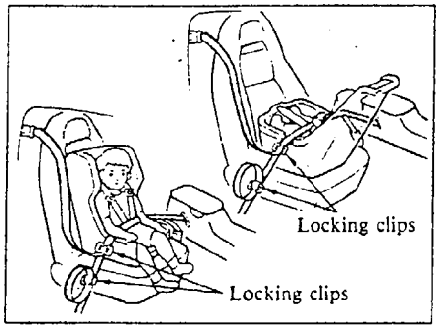



3. Insert the lap and shoulder belt webbings through the locking clip near the seat belt tongue plate.

4. Tuck the shoulder portion of the belt between the system's seat and the rear seat back.




**▼ Front seat passenger position**

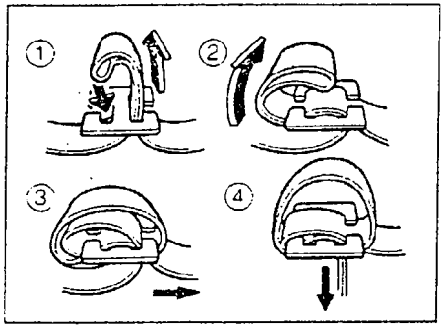
The automatic shoulder belt must not be used to secure the child-restraint system.

If for some reason the system must be installed on the front seat, follow these procedures, which require two locking clips.

1. Slide the seat as far back as possible.

2. Fasten the system with the lap belt.

3. Pull the lap belt out fully.




4. Remove slack in the belt with a locking clip at any convenient point along the belt. Make the loop as large as possible.

5. Then pull on the belt to make sure it doesn't slip.

6. Slide the seat forward to remove remaining slack.

7. Pull the shoulder belt all the way out from the retractor, overlap the lap belt, and pass the shoulder belt through the restraint seat.



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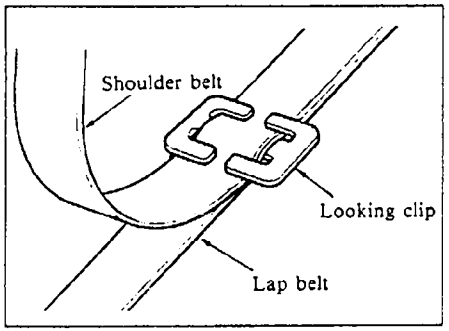



8. Then secure it and the lap belt at the door side of the seat with the second locking clip.

### Older Children

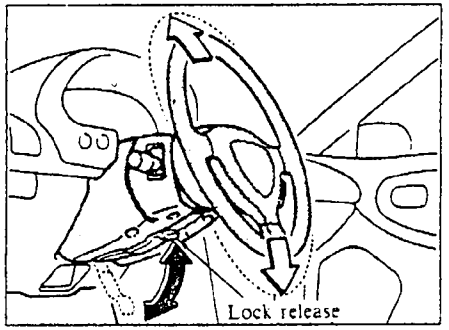
A child who has outgrown child-restraint systems should sit in the rear and use seat belts, both lap and shoulder. If the shoulder belt crosses the neck or face, move the child closer to the center.

Accident statistics reveal that a child is safer in the rear seat.

**⚠CAUTION**

A seat belt or child restraint can become very hot in a closed vehicle during warm weather. To avoid burning yourself or a child, inspect either before using.

## Steering Wheel




### Tilt Wheel

To change the angle of the steering wheel, pull down the lock release under the steering column, adjust the wheel, and push up the release lever to lock the column.

After adjusting, push the wheel up and down to be certain it's locked.



MSE-92-R92027-N06

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# APPENDIX E

## INSTRUMENTATION AND CALIBRATION DATA

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General Test Information

VERSNO: V2 TGID: 1
TITLE: 1992 35 MPH NCAP FRONTAL BARRIER IMPACT
TSTOBJ: ACQUIRE NCAP DATA USING TWO INSTR. DUMMIES AND LOAD CELL BARRIER

| | | | |
|---|---|---|---|
| TSTDAT: 05/JUN/92 | TSTPRF: MSE | CONNO: DTNH22-90-D-32121 | |
| TSTREF: MN5401 | TSTTYP: NCA | TSTCFN: VTB | |
| TKSURF: CON | TKCOND: DRY | TEMP: 80 | RECTYP: FMT |
| LINK: UMB | CLSSPD: 35.2 | IMPANG: 0 | OFFSET: 0.0 |
| IMPPNT: 9999.9 | MEASUR: ENG | TOTCRV: 60 | |

TSTCOM: NO COMMENTS

Vehicle Information

VGID: 2 VEHNO: 1 MAKE: 18 MODEL: 99 YEAR: 92 BODY: 3H
VIN: JMIEC4324N0130131 ENGINE: 4CTF ENGDSP: 1.8 LITERS TRANSM: AF
VEHTWT: 3053 WHLBAS: 96.7 VEHLEN: 160.0 VEHWID: 66.7
VEHCG: 37.3 STRSEP: NO COLMEC: CYL MODIND: P
MODDSC: UNMODIFIED
BX
1: 160.0
2: 143.0
3: 116.0
4: 80.3
5: 80.6
6: 102.4
7: 102.9
8: 53.0
9: 53.5
10: 59.0
11: 59.4
12: 104.5
13: 105.0
14: 113.8
15: 114.5
16: 85.5
17: 17.5
18: 16.0
19: 151.7
20: 151.7
21: 9.0
VEHSPD: 35.2 CRBANG: 0 PDOF: 0 BMPENG: NA
SILENG: NA APLENG: NA
DPD
1: 16.4
2: 20.5
3: 21.0
4: 21.7
5: 20.4
6: 17.4
VDI: 12FCAW9 LENCNT: 55.0 DAMDST: 0.0 CRHDST: 21.7
AX
1: 139.1
2: 133.5
3: 108.1
4: 79.0
5: 79.9
6: 101.0
7: 102.0
8: 51.6
9: 52.8
10: 57.8
11: 58.6
12: 102.6
13: 104.0
14: 109.5
15: 112.0
16: 83.0
17: 18.5
18: 16.0
19: 134.8
20: 137.0
21: 9.0
CARANG: 999 VEHOR: 999
VEHCOM: MODEL IS MAZDA MX3.

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: 814
DUMMOD: UNMODIFIED
DUMDSC: NO COMMENTS
HH: 14.0 HW: 17.3 HR: 2.5 HS: 5.9 CD: 21.5 CS: 14.0 AD: 3.5 HD: 7.0
KD: 6.1 HB:999.9 NB:999.9 CB:999.9 KB:999.9
RESTR1: PS2 RESTR2: SWE
RESTXT: NO COMMENTS
SEPOSN: CN AIRDEP: NA
CNTRH1: SW CNTRH2: SR CNTRC1: SR CNTRC2: NO CNTRL1: DP CNTRL2: NO
HIC: 921. T1: 69.500 T2: 99.400
CLIP3M: 53.8 LFEM: 701. RFEM: 540. CSI: 516. LBELT: 1098. SBELT: 1060.
OCCCOM:

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: 183
DUMMOD: UNMODIFIED
DUMDSC: NO COMMENTS
HH: 14.0 HW: 18.3 HR: 3.0 HS: 5.8 CD: 21.5 CS:999.9 AD: 3.5 HD: 7.0
KD: 6.0 HB:999.9 NB:999.9 CB:999.9 KB:999.9
RESTR1: 3PT RESTR2: NON
RESTXT: NO COMMENTS
SEPOSN: CN AIRDEP: NA
CNTRH1: NO CNTRH2: NO CNTRC1: NO CNTRC2: NO CNTRL1: DP CNTRL2: OT
HIC: 807. T1: 74.200 T2: 110.200
CLIP3M: 51.4 LFEM: 894. RFEM: 1098. CSI: 538. LBELT: 1041. SBELT: 1886.
OCCCOM:

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: BJ28H
CALDAT: 26/MAR/92 INSRAT: 200 CHLMAX: 39 INIVEL: 35.2
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: BT28H
CALDAT: 26/MAR/92 INSRAT: 200 CHLMAX: 14 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: AE29
CALDAT: 26/MAR/92 INSRAT: 200 CHLMAX: 44 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: BI14H
CALDAT: 26/MAR/92 INSRAT: 200 CHLMAX: 26 INIVEL: 35.2
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: BI19H
CALDAT: 26/MAR/92 INSRAT: 200 CHLMAX: 17 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: BI92H
CALDAT: 26/MAR/92 INSRAT: 200 CHLMAX: 16 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: 559
CALDAT: 07/APR/92 INSRAT: 3000 CHLMAX: 27 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: XL UNITS: LBS PREFIL: 1650
INSMAN: MFG: GSE INC, MODEL: 2430, S/N: 710
CALDAT: 07/APR/92 INSRAT: 3000 CHLMAX: 20 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: BJ27H
CALDAT: 26/MAR/92 INSRAT: 200 CHLMAX: 24 INIVEL: 35.2
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: BG78H
CALDAT: 26/MAR/92 INSRAT: 200 CHLMAX: 6 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: HDCG
AXIS: ZL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: AR39
CALDAT: 26/MAR/92 INSRAT: 200 CHLMAX: 34 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: BF83H
CALDAT: 26/MAR/92 INSRAT: 200 CHLMAX: 27 INIVEL: 35.2
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: BJ15H
CALDAT: 26/MAR/92 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: 014
SENTYP: AC SENLOC: 02 SENATT: CHST
AXIS: ZL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: BG29H
CALDAT: 26/MAR/92 INSRAT: 200 CHLMAX: 14 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: 634
CALDAT: 07/APR/92 INSRAT: 3000 CHLMAX: 30 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: 550
CALDAT: 07/APR/92 INSRAT: 3000 CHLMAX: 37 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: CF
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 017
SENTYP: LC SENLOC: 01 SENATT: LPBO
AXIS: OT UNITS: LBS PREFIL: 1650
INSMAN: MFG: LEBOW, MODEL: 3371, S/N: 333
CALDAT: 09/APR/92 INSRAT: 3500 CHLMAX: 31 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: 09/APR/92 INSRAT: 3500 CHLMAX: 55 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: LPBO
AXIS: OT UNITS: LBS PREFIL: 1650
INSMAN: MFG: LEBOW, MODEL: 3371, S/N: 330
CALDAT: 09/APR/92 INSRAT: 3500 CHLMAX: 31 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: 09/APR/92 INSRAT: 3500 CHLMAX: 55 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: SHBT
AXIS: OT UNITS: OTH PREFIL: 1650
INSMAN: MFG: ETI, MODEL: LCP12A-12, S/N: 1
CALDAT: 05/JUN/92 INSRAT: 25 CHLMAX: 0 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM: SEAT BELT ELONGATION, UNITS ARE IN./IN.

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 022
SENTYP: DS SENLOC: 02 SENATT: SHBT
AXIS: OT UNITS: OTH PREFIL: 1650
INSMAN: MFG: ETI, MODEL: LCP12A-12, S/N: 2
CALDAT: 05/JUN/92 INSRAT: 25 CHLMAX: 0 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM: SEAT BELT ELONGATION, UNITS ARE IN./IN.

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 023
SENTYP: DS SENLOC: 01 SENATT: SHBE
AXIS: OT UNITS: INS PREFIL: 1650
INSMAN: MFG: CELESCO, MODEL: 20 IN., S/N: NA
CALDAT: 05/JUN/92 INSRAT: 20 CHLMAX: 0 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: NO
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 024
SENTYP: DS SENLOC: 02 SENATT: SHBE
AXIS: OT UNITS: INS PREFIL: 1650
INSMAN: MFG: MSE, MODEL: 24 IN. LIN., S/N: 112
CALDAT: 05/JUN/92 INSRAT: 24 CHLMAX: 0 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: NO
INSCOM:

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: I.C. SENSOR, MODEL: 3031-200, S/N: 25-200
CALDAT: 10/APR/92 INSRAT: 200 CHLMAX: 180 INIVEL: 35.2
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: I.C. SENSOR, MODEL: 3031-200, S/N: 21-200
CALDAT: 10/APR/92 INSRAT: 200 CHLMAX: 133 INIVEL: 35.2
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: I.C. SENSOR, MODEL: 3031-200, S/N: 30-200
CALDAT: 10/APR/92 INSRAT: 200 CHLMAX: 186 INIVEL: 35.2
NFP: -300 NLP: 2999 DELT: 100 DASTAT: CF
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: I.C. SENSOR, MODEL: 3031-200, S/N: 20-200
CALDAT: 10/APR/92 INSRAT: 200 CHLMAX: 87 INIVEL: 35.2
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: I.C. SENSOR, MODEL: 3031-200, S/N: 22-200
CALDAT: 10/APR/92 INSRAT: 200 CHLMAX: 94 INIVEL: 35.2
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: I.C. SENSOR, MODEL: 3031-200, S/N: 27-200
CALDAT: 10/APR/92 INSRAT: 200 CHLMAX: 28 INIVEL: 35.2
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: I.C. SENSOR, MODEL: 3031-200, S/N: 24-200
CALDAT: 10/APR/92 INSRAT: 200 CHLMAX: 27 INIVEL: 35.2
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 032
SENTYP: AC SENLOC: NA SENATT: OTHR
AXIS: XG UNITS: G'S PREFIL: 1650
INSMAN: MFG: I.C. SENSOR, MODEL: 3031-200, S/N: 26-200
CALDAT: 10/APR/92 INSRAT: 200 CHLMAX: 19 INIVEL: 35.2
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 033
SENTYP: AC SENLOC: NA SENATT: TRFC
AXIS: XG UNITS: G'S PREFIL: 1650
INSMAN: MFG: I.C. SENSOR, MODEL: 3031-200, S/N: 29-200
CALDAT: 10/APR/92 INSRAT: 200 CHLMAX: 27 INIVEL: 35.2
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 034
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: 0 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 035
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: 4 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 036
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: 14 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 037
SENTYP: LC SENLOC: NA SENATT: LCA3
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19263
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 27 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 038
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: 10 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 039
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: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 040
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: 9 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 041
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: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 042
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: 0 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 043
SENTYP: LC SENLOC: NA SENATT: LCB1
AXIS: XG UNITS: PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19273
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 0 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 044
SENTYP: LC SENLOC: NA SENATT: LCB1
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19276
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 33 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 045
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: 20 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 046
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: 27 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 047
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: 39 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 048
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: 45 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 049
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: 33 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 050
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: 12 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 051
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: 0 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 052
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: 0 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 053
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: 4 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 054
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: 5 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 055
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: 6 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 056
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: 7 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 057
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: 8 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 058
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: 5 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 059
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: 4 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 060
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: 0 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 120 DASTAT: AM
INSCOM:

CALIBRATION DATA FOR INSTRUMENTATION USED IN DUMMY CALIBRATION

| DUMMY INSTRUMENTS | MFR | MODEL | S/N | CAL DATE | CAL DUE DATE |
|---|---|---|---|---|---|
| CHEST DEFLECTION POT | BECKMAN | 5311 | N/A | EACH USE | EACH USE |
| CHEST IMPACTOR ACCEL | ENTRAN | EGV-1 | 14N3N-V13-1 | 03/17/92 | 09/17/92 |
| NECK PENDULUM ACCEL | " | " | " | " | " |
| NECK ROTATION NO. 1 | BECKMAN | 5311 | N/A | EACH USE | EACH USE |
| NECK ROTATION NO. 2 | BECKMAN | 5311 | N/A | EACH USE | EACH USE |
| NECK EXTENSION POT | BOURNS | 80294-20518-1840202 | 1684-067 | EACH USE | EACH USE |
| ABDOMINAL COMPRESSION LOAD | LEBOW/EATON | 3167 | 1573 | 03/17/92 | 09/17/92 |
| LUMBAR FLEXION LOAD | " | " | " | " | " |
| LUMBAR ROTATION | BOURNS | 3590S-2-102 | N/A | EACH USE | EACH USE |
| ABDOMINAL DISPLACEMENT | CELESCO | PT-101-15B | 0786551 | EACH USE | EACH USE |
| TIMER | MSE | MSE TIM | #1 | 02/18/92 | 08/18/92 |
| TIME TRAP | MSE | 1" | #1 | 02/18/92 | 08/18/92 |