

**SIDE IMPACT PROTECTION STUDY  
IN PRODUCTION VEHICLES  
MDB-TO-VEHICLE SIDE IMPACT TEST OF  
A 27° CRABBED MOVING DEFORMABLE BARRIER  
TO A 1989 ISUZU TROOPER, 4 WHEEL DRIVE  
AT 33.0 MPH**

**NHTSA NO.: RK0505**

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



09 OCTOBER 1992

FINAL REPORT

Prepared Under Contract No. DTNH22-87-C-07168, D.O. #3

For

**U.S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Office of Crashworthiness Research  
400 Seventh Street, S.W.  
Washington, DC 20590**

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by: Mr. Jerry Kratzke/Mr. Pat Puzzuto/  
Mr. Brian O'Keefe

Approved by:   
Dr. Anil V. Khadilkar

Date: 09 October 1992

Report Accepted by OCR:

Accepted by: \_\_\_\_\_

Acceptance Date: \_\_\_\_\_

| 1. Report No.<br><b>MSE-92-06 -TR1086-06</b>   |        | 2. Government Accession No.                                 |  | 3. Recipient's Catalog No.  |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
|--|--------|---|--|---|-----------|--|--------|------|--------------------------------|------|------|--------------------------------|------|------|----------------------------|-------|------|--|------|------|------------------------|------|------|
| 4. Title and Subtitle<br><b>FINAL REPORT<br/>SIDE IMPACT PROTECTION TESTING OF<br/>1989 ISUZU TROOPER, 4 WHEEL DRIVE<br/>NHTSA NO. RK0505</b>  |        |   |  | 5. Report Date<br><b>09 OCTOBER 1992</b>                          |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
|  |        |   |  | 6. Performing Organization Code<br><b>MSE</b>                     |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
| 7. Author's<br><b>DR. ANIL V. KHADILKAR/MR. JERRY KRATZKE/<br/>MR. BRIAN O'KEEFE/MR. PAT PUZZUTO</b>   |        |   |  | 8. Performing Organization Report No.<br><b>R1086-06</b>          |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
| 9. Performing Organization Name and Address<br><b>MOBILITY SYSTEMS AND EQUIPMENT COMPANY<br/>9920 LA CIENEGA BOULEVARD, SUITE 708<br/>INGLEWOOD, CALIFORNIA 90301</b>  |        |   |  | 10. Work Unit No. :TRAI51   |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
|  |        |   |  | 11. Contract or Grant No.<br><b>DINH22-87-C-07168, D.O. # 3</b>   |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
| 12. Sponsoring Agency Name and Address<br><b>U.S. DEPARTMENT OF TRANSPORTATION<br/>NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION<br/>OFFICE OF CRASHWORTHINESS RESEARCH<br/>400 SEVENTH STREET, S.W. WASHINGTON DC 20590</b>  |        |   |  | 13. Type of Report and Period Covered<br><b>FINAL TEST REPORT</b> |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
|  |        |   |  | 14. Sponsoring Agency Code<br><b>NRD-11</b>                       |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
| 15. Supplementary Notes  |        |   |  |   |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
| 16. Abstract<br><p>A 30/15 mph 90° Impact (Moving Deformable Barrier) Test was conducted on the subject 1989 Isuzu Trooper, 4 wheel drive in accordance with the specifications of the Office of Market Incentives "Side Impact Protection Study" Test Procedure. The test was conducted at the MSE facility in San Bernardino, on September 09, 1992.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 33.02 mph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 92 °F. The target vehicle post test maximum crush was 23.6 inches at levels 2 and 3. The test vehicle's performance follows:</p> <table border="1"> <thead> <tr> <th></th> <th>DRIVER</th> <th>PASS</th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td>95.0</td> <td>67.7</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td>97.1</td> <td>93.9</td> </tr> <tr> <td>Lower Spine (T ) Accel., g</td> <td>101.6</td> <td>70.1</td> </tr> <tr> <td>12<br/>Thoracic Trauma Index (TTI)<br/>d</td> <td>99.4</td> <td>82.0</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td>88.2</td> <td>77.7</td> </tr> </tbody> </table> <p>The door on the struck side of the vehicle did not separate from the body at the hinges or latch and the opposite door did not open during side impact event.</p> |        |   |  |   |           |  | DRIVER | PASS | Left Upper Rib (LUR) Accel., g | 95.0 | 67.7 | Left Lower Rib (LLR) Accel., g | 97.1 | 93.9 | Lower Spine (T ) Accel., g | 101.6 | 70.1 | 12<br>Thoracic Trauma Index (TTI)<br>d | 99.4 | 82.0 | Pelvis (PEV) Accel., g | 88.2 | 77.7 |
|  | DRIVER | PASS  |  |   |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
| Left Upper Rib (LUR) Accel., g   | 95.0   | 67.7  |  |   |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
| Left Lower Rib (LLR) Accel., g   | 97.1   | 93.9  |  |   |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
| Lower Spine (T ) Accel., g   | 101.6  | 70.1  |  |   |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
| 12<br>Thoracic Trauma Index (TTI)<br>d   | 99.4   | 82.0  |  |   |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
| Pelvis (PEV) Accel., g   | 88.2   | 77.7  |  |   |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
| 17. Key Words<br><b>OCCUPANT RESPONSE, MDB,<br/>SIDE IMPACT, TTI, SIDE IMPACT<br/>DUMMY (SID) MOVING BARRIER CRASH TESTING<br/>1989 ISUZU TROOPER, 4 WHEEL DRIVE</b>   |        |   | 18. Distribution Statement<br><b>COPIES OF THIS REPORT ARE AVAILABLE FROM:</b><br><br><b>DEPARTMENT OF TRANSPORTATION<br/>National Highway Traffic Safety Administration<br/>Technical Reference Division, Room 5108<br/>400 Seventh Street, SW<br/>Washington, DC 20590</b> |   |           |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |
| 19. Security Classif. (of this report)<br><b>UNCLASSIFIED</b>  |        | 20. Security Classif. (of this page)<br><b>UNCLASSIFIED</b> |  | 21. No. of Pages<br><b>183</b>                                    | 22. Price |  |        |      |                                |      |      |                                |      |      |                            |       |      |  |      |      |                        |      |      |

# METRIC CONVERSION FACTORS

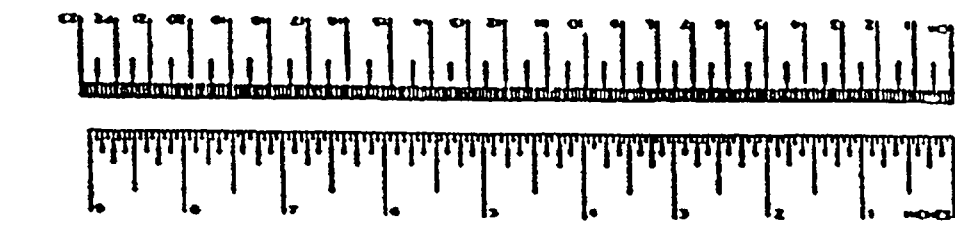
## APPROXIMATE CONVERSIONS FROM METRIC MEASURES

## APPROXIMATE CONVERSIONS FROM METRIC MEASURES

SYMBOL WHEN YOU KNOW MULTIPLY BY TO FIND SYMBOL

SYMBOL WHEN YOU KNOW MULTIPLY BY TO FIND SYMBOL

| LENGTH              |                                 | LENGTH              |               |
|---------------------|---------------------------------|---------------------|---------------|
| mm                  | millimeters                     | 0.04                | inches        |
| cm                  | centimeters                     | 0.4                 | inches        |
| m                   | meters                          | 3.3                 | feet          |
| km                  | kilometers                      | 1.1                 | yards         |
|                     |                                 | 0.6                 | miles         |
| AREA                |                                 | AREA                |               |
| cm <sup>2</sup>     | square centimeters              | 0.16                | square inches |
| m <sup>2</sup>      | square meters                   | 1.2                 | square yards  |
| km <sup>2</sup>     | square kilometers               | 0.4                 | square miles  |
| ha                  | hectare (10,000m <sup>2</sup> ) | 2.5                 | acres         |
| MASS (weight)       |                                 | MASS (weight)       |               |
| g                   | grams                           | 0.035               | ounces        |
| kg                  | kilograms                       | 2.2                 | pounds        |
| t                   | tonnes (1000kg)                 | 1.1                 | short tons    |
| VOLUME              |                                 | VOLUME              |               |
| ml                  | milliliters                     | 0.03                | fluid ounces  |
| l                   | liters                          | 3.1                 | pints         |
|                     |                                 | 1.06                | quarts        |
|                     |                                 | 0.26                | gallons       |
| m <sup>3</sup>      | cubic meters                    | 36                  | cubic feet    |
| m <sup>3</sup>      | cubic meters                    | 1.3                 | cubic yards   |
| TEMPERATURE (exact) |                                 | TEMPERATURE (exact) |               |
| °C                  | Celsius                         | 9/5 (F-32)          | Fahrenheit    |
|                     | temperature                     | 5/9 (F-32)          | temperature   |



| LENGTH              |                      | LENGTH                     |                    |
|---------------------|----------------------|----------------------------|--------------------|
| in                  | inches               | 2.5                        | centimeters        |
| ft                  | feet                 | 30                         | centimeters        |
| yd                  | yards                | 0.9                        | meters             |
| mi                  | miles                | 1.6                        | kilometers         |
| AREA                |                      | AREA                       |                    |
| sq in               | square inches        | 6.5                        | square centimeters |
| sq ft               | square feet          | 0.09                       | square meters      |
| sq yd               | square yards         | 0.8                        | square meters      |
| sq mi               | square miles         | 2.6                        | square kilometers  |
|                     | acres                | 0.4                        | hectares           |
| MASS (weight)       |                      | MASS (weight)              |                    |
| oz                  | ounces               | 28                         | grams              |
| lb                  | pounds               | 0.45                       | kilograms          |
|                     | short tons (2000 lb) | 0.9                        | tonnes             |
| VOLUME              |                      | VOLUME                     |                    |
| fl oz               | fluid ounces         | 30                         | milliliters        |
| pt                  | pints                | 16                         | milliliters        |
| qt                  | quarts               | 947                        | milliliters        |
| gal                 | gallons              | 3.8                        | liters             |
| cu ft               | cubic feet           | 0.03                       | cubic meters       |
| cu yd               | cubic yards          | 0.76                       | cubic meters       |
| TEMPERATURE (exact) |                      | TEMPERATURE (exact)        |                    |
| °F                  | Fahrenheit           | 5/9 (after subtracting 32) | Celsius            |
|                     | temperature          | 9/5                        | temperature        |

\* 1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13,10:286

TABLE OF CONTENTS

| <u>SECTIONS</u> |   | <u>PAGES</u> |
|-----------------|---|--------------|
| 1               | Purpose of Test                                     | 1            |
| 2               | Data Summary  | 2            |
| 3               | Side Impact Dummy (SID) and Vehicle Test Data       | 8            |
| 4               | Test Equipment List and Calibration Information     | 37           |
| 5               | Photographs   | 53           |
| 6               | Vehicle and SID Response Data                       | 85           |
| 7               | SID Configuration and Performance Verification Data | 181          |

## SECTION 1

### PURPOSE AND INTRODUCTION

This testing program is a part of an investigation and evaluation of side impact protection in production light trucks and vans. The test is specifically intended to simulate a 90 deg. intersection collision with the striking vehicle moving at 30 mph. This is accomplished by towing a Moving Deformable Barrier (MDB) crabbed at a 27° angle into the struck test vehicle which is placed in a stationary position. The velocity of the MDB is to be 33.0 ±0.5 mph.

The subject vehicle for this test was a 1989 Isuzu Trooper, 4 wheel drive. The test was performed on 09 September 1992 at an actual impact speed of 36.50 mph. The leading left-hand edge of the MDB contacted the test vehicle 18.0 inches rearward of the front axle centerline.

Section 2 contains a general test summary and vehicle information data sheets. Section 3 contains the test results. Section 4 contains the test equipment list and calibration information. Section 5 contains pretest and posttest vehicle and dummy photographs. Section 6 contains SID, vehicle and MDB response data plots. Section 7 contains the pretest SID configuration and performance verification data.

## SECTION 2

### TEST SUMMARY AND VEHICLE INFORMATION

The 1989 Isuzu Trooper, 4 wheel drive, was tested on 09 September 1992. General test vehicle information and pretest conditions are given in Data Sheet No. 1. A crash test summary is shown in Data Sheet No. 1. The vehicle was instrumented with 10 accelerometer channels and two onboard high-speed movie cameras. Accelerometer locations and peak values are shown in Data Sheet No. 8. All pretest measurements were made detailing the left side vehicle profile. The impact point was marked on the vehicle 37 inches rearward of the front axle.

One side impact anthropomorphic dummies (SID) were placed in the vehicle and positioned using the side impact dummy seating procedure specified in the OMI side impact protection study laboratory test procedure, dated December, 1991. SID position measurements are shown in Data Sheet No. 3 and 4. The SID were instrumented with 12 accelerometers. A summary of the SID accelerometer data is given in Data Sheet No. 1. Lap and shoulder seat belts were equipped with load cells for the SID. Colored chalk was applied to the SID's head, left shoulder, left hip and his knees to help determine dummy contact points during the test.

The MDB was crabbed at 27° and instrumented with five (5) accelerometers and two (2) high-speed movie cameras. Accelerometer locations with peak values for the MDB are shown in Data Sheet No. 9.

Additional film coverage of the test was also provided by two (2) overhead and two (2) ground high-speed movie cameras and one real-time camera. Camera locations are given in Data Sheet No. 10. A total of 50 channels of information was recorded on two (2) FM data tape recorders and two (2) direct analog to digital acquisition unit and data acquisition computer.

**DATA SHEET NO. 1**

**SUMMARY OF RESULTS**

VEH. MOD.YR/MAKE/MODEL: 1989 ISUZU TROOPER, 4 WHEEL DRIVE

VEH. BODY STYLE: MPV VIN: JACCH58E8K8908508

VEH. NHTSA NO.: RK0505 VEH. BUILD DATE: 12/88

TEST DATE: 09/09/92 TEST LAB.: MOBILITY SYSTEMS AND EQUIPMENT COMPANY

**TEST RESULTS:**

Vehicle Overall Length = 172.0 inches; Vehicle Overall Width 65.0 inches

Vehicle Test Weight: 1101.0 lbs. Left Front 1033.0 lbs. Left Rear  
975.0 lbs. Right Front 1040.0 lbs. Right Rear  
2076.0 lbs. TOTAL FRONT 2073.0 lbs. TOTAL REAR

Wheelbase = 104.5 inches

Longitudinal C.G. from center of front axle = 52.3 inches

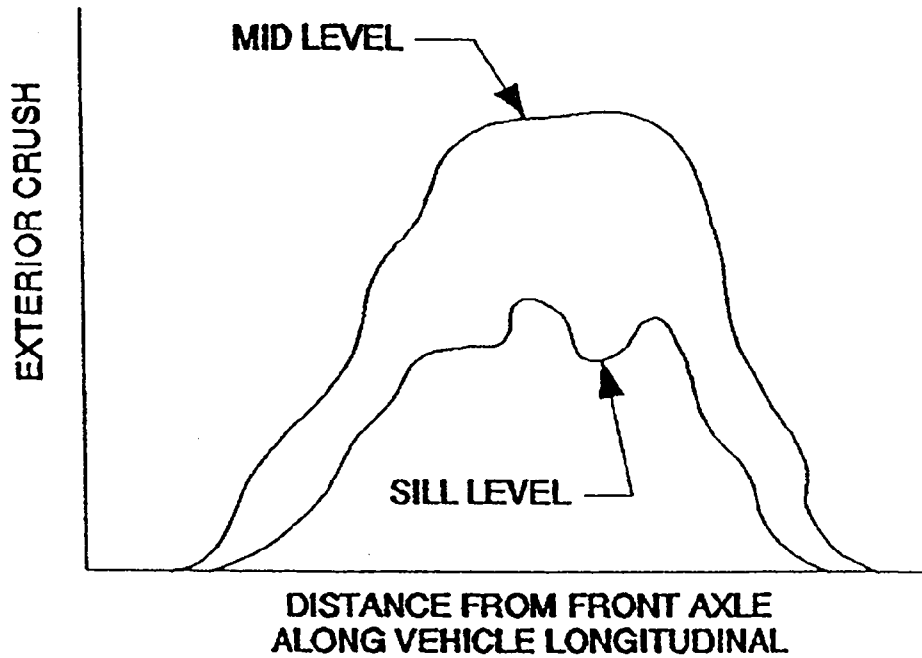
Impact Angle with respect to impactor = 90 degrees

Maximum Exterior Static Crush (provide External Damage Profile on next page):

1. LEVEL 1 (16.0 inches above ground) = 3.1 inches
2. LEVEL 2 (31.8 inches above ground) = 12.9 inches
3. LEVEL 3 (32.3 inches above ground) = 12.9 inches
4. LEVEL 4 (45.6 inches above ground) = 9.8 inches
5. LEVEL 5 (65.0 inches above ground) = -7.9 inches

Maximum Post Test Intrusion = 12.9 inches

External Lateral Damage Profile (sample shown below)



|                           |  |  |
|---------------------------|--|--|
| Occupants:                | <u>DRIVER</u>  | <u>PASS. (LEFT REAR)</u>                       |
| Dummy Identification      | SID # <u>136</u>                                       | SID # <u>137</u>                               |
| Restraint Used            | 3-point continuous webbing active belt system.         | 3-point continuous webbing active belt system. |
| Instrumentation:          |  |  |
| Number of Data Channels = | <u>50</u>  |  |
| Number of Cameras:        | Onboard = <u>3</u> HIGH SPEED                          |  |
|                           | Offboard = <u>6</u> HIGH SPEED (2 on MDB), 1 Real Time |  |
| Door Opening:             | <u>LEFT SIDE</u>                                       | <u>RIGHT SIDE</u>                              |
| FRONT --                  | NO   | NO   |
| REAR --                   | NO   | NO   |
| Arm Rest Location:        | Front -- <u>N/A</u>                                    |  |
|                           | Rear -- <u>N/A</u>                                     |  |

Front Seat Cushion Movement: Rear moved to the right

Front Seat Back Movement: To the right

Glazing Breakage: All impact side door windows shattered, windshield cracked but remain intact.

Pillar Failure: None

Sill Separation: None

Other Notable Impact Effect: None

**MOVING DEFORMABLE BARRIER (MDB) RESULTS:**

Overall Width of Framework Carriage = 52.5 inches

Overall Length of MDB = 162.0 inches (including honey comb impact face)

Wheelbase of Frame work Carriage (front and Rear) = 102.0 inches

C.G. Location of Rearward of Front Axle = 44.5 inches

|             |                              |                        |
|-------------|------------------------------|------------------------|
| MDB Weight: | <u>835</u> lbs. Left Front   | <u>645</u> Left Rear   |
|             | <u>835</u> lbs. Right Front  | <u>645</u> Right Rear  |
|             | <u>1670</u> lbs. TOTAL FRONT | <u>1290</u> TOTAL REAR |

TOTAL WEIGHT OF MDB = 2960 lbs.

Impact Angle (MDB Centerline to Target Vehicle Centerline) = 27 degrees

Impact Speed = 32.02 mph

**Maximum Static Crush of Honeycomb Impact Face:**

1. ROW A at bumper level = 7.1 inches
2. ROW B at midstack level = 3.2 inches
3. ROW C at top of stack level = 4.1 inches

**Instrumentation:**

Number of MDB Data Channels = 5

**SIDE IMPACT DUMMY (SID) RESULTS**

**Location of B-Post Upper Anchorage Bolt or Side Rail (Auto. Belts) for Head Contact Analysis:**

Seat belt upper anchorage bolt is on the B-pillar, 25.4 inches above the

B-post striker.

Visible Dummy Contact Points--

|            | <u>FRONT SID</u>             | <u>REAR SID</u>  |
|------------|------------------------------|--|
| HEAD       | Seat belt anchor on B-pillar | Vertical brace between moving & stationary door windows. |
| SHOULDER   | B-Pillar                     | Door, vertical brace in window.                          |
| HIP        | Door                         | Door   |
| LEFT KNEE  | Door, right knee             | Door, front seat, right knee front seat, left knee       |
| RIGHT KNEE | Left knee                    | Front seat, left knee.                                   |

|                       | <u>FRONT SID # 136</u>   |                         | <u>REAR SID # 137</u>   |                          |
|-----------------------|--------------------------|-------------------------|-------------------------|--------------------------|
|                       | <u>+DIRECT</u>           | <u>-DIRECT</u>          | <u>+DIRECT</u>          | <u>-DIRECT</u>           |
|                       | <u>MaxG ms</u>           | <u>MaxG ms</u>          | <u>MaxG ms</u>          | <u>MaxG ms</u>           |
| RIB ACCELERATIONS:    |                          |                         |                         |                          |
| Upper Rib Lateral Y   | <u>95.0</u> <u>22.9</u>  | <u>27.4</u> <u>45.6</u> | <u>67.7</u> <u>39.2</u> | <u>11.2</u> <u>76.0</u>  |
| Lower Rib Lateral Y   | <u>97.1</u> <u>21.9</u>  | <u>20.2</u> <u>25.4</u> | <u>93.9</u> <u>36.2</u> | <u>20.6</u> <u>73.0</u>  |
| SPINE ACCELERATIONS:  |                          |                         |                         |                          |
| Lower Lateral Y       | <u>101.6</u> <u>24.5</u> | <u>13.7</u> <u>77.3</u> | <u>70.1</u> <u>42.7</u> | <u>37.3</u> <u>69.2</u>  |
| PELVIS ACCELERATIONS: |                          |                         |                         |                          |
| Lateral Y             | <u>88.2</u> <u>25.5</u>  | <u>25.8</u> <u>81.0</u> | <u>77.7</u> <u>40.1</u> | <u>15.8</u> <u>102.2</u> |

REFERENCE: (+) DIRECTION Lateral Y = to the right  
 (-) DIRECTION Lateral Y = to the left

REMARKS:

RECORDED BY: Mr. Brian O'Keefe

DATE: 09/14/92

APPROVED BY: *[Signature]*

DATE: 10-09-92

SIDE IMPACT DUMMY (SID) TEST DATA SUMMARY  
1989 ISUZU TROOPER, NHTSA NO. RK0505

TEST DATE: 09/09/92

|  | FRONT DUMMY -- ID # 136      |                |            |                | REAR DUMMY -- ID # 137      |                |            |                |
|--|------------------------------|----------------|------------|----------------|-----------------------------|----------------|------------|----------------|
|  | POS.                         | DIRECT         | NEG.       | DIRECT         | POS.                        | DIRECT         | NEG.       | DIRECT         |
|  | MAX<br>(g)                   | TIME<br>(msec) | MAX<br>(g) | TIME<br>(msec) | MAX<br>(g)                  | TIME<br>(msec) | MAX<br>(g) | TIME<br>(msec) |
| <b>HEAD ACCELERATIONS:</b>                       |                              |                |            |                |                             |                |            |                |
| Longitudinal --- X                               | 34.1                         | 44.3           | 11.9       | 53.9           | 21.5                        | 138.4          | 35.3       | 131.2          |
| Lateral ----- Y                                  | 177.8                        | 44.7           | 8.2        | 26.6           | 47.5                        | 130.6          | 62.6       | 131.1          |
| Vertical ----- Z                                 | 52.2                         | 44.1           | 32.2       | 51.6           | 59.4                        | 77.6           | 19.5       | 133.1          |
| RESULTANT ----- R                                | 184.2                        | 44.3           | 0.0        | 0.0            | 80.0                        | 77.6           | 0.0        | 0.0            |
| HIC -----<br>(TIME INTERVAL, SEC.)               | 1002.5<br>(0.0435 TO 0.0471) |                |            |                | 178.4<br>(0.0610 TO 0.0937) |                |            |                |
| <b>RIB ACCELERATIONS:</b>                        |                              |                |            |                |                             |                |            |                |
| 1.Upper Rib Lateral Y                            | 95.0                         | 22.9           | 27.4       | 45.6           | 67.7                        | 39.2           | 11.2       | 76.0           |
| 2.Upper Rib Lateral Y                            | 90.5                         | 22.5           | 26.0       | 45.4           | 63.6                        | 38.8           | 5.5        | 76.3           |
| 1.Lower Rib Lateral Y                            | 97.1                         | 21.9           | 20.2       | 25.4           | 93.9                        | 36.2           | 20.6       | 73.0           |
| 2.Lower Rib Lateral Y                            | 79.5                         | 21.9           | 14.8       | 26.9           | 95.1                        | 36.2           | 22.4       | 73.2           |
| <b>SPINE ACCELERATIONS:</b>                      |                              |                |            |                |                             |                |            |                |
| 1.Upper Spine Lateral Y                          | 86.6                         | 36.0           | 23.9       | 64.6           | 68.2                        | 50.8           | 42.4       | 69.7           |
| 2.Upper Spine Lateral Y                          | 85.1                         | 35.9           | 22.0       | 64.4           | 0.0                         | 0.0            | 0.0        | 0.0            |
| 1.Lower Spine Lateral Y                          | 101.6                        | 24.5           | 13.7       | 77.3           | 70.1                        | 42.7           | 37.3       | 69.2           |
| 2.Lower Spine Lateral Y                          | 99.4                         | 24.4           | 14.6       | 75.9           | 70.5                        | 43.8           | 27.0       | 68.8           |
| <b>PELVIS ACCELERATIONS:</b>                     |                              |                |            |                |                             |                |            |                |
| Lateral Y  | 88.2                         | 25.5           | 25.8       | 81.0           | 77.7                        | 40.1           | 15.8       | 102.2          |
| <b>RIB DEFLECTION:</b>                           |                              |                |            |                |                             |                |            |                |
|  | N/A                          | N/A            | N/A        | N/A            | N/A                         | N/A            | N/A        | N/A            |
| <b>THORACIC TRAUMA INDEX (TTI ), G's<br/>(d)</b> |                              |                |            |                |                             |                |            |                |
|  | 99.4                         |                |            |                | 82.0                        |                |            |                |

REFERENCE: Positive Direction -- Longitudinal (X) = forward  
Lateral (Y) = to right  
Vertical (Z) = down

Negative Direction -- Longitudinal (X) = rearward  
Lateral (Y) = to left  
Vertical (Z) = up

### SECTION 3

#### TEST RESULTS

The 1989 Isuzu Trooper, 4 wheel drive was impacted at 33.02 mph by the 27° crabbed MDB on 09 September 1992. The MDB's left edge contacted the test vehicle 0.5 inches rearward of the impact line. The test vehicle spun around counterclockwise and pushed back due to impact with barrier. The vehicle driver side door was crushed inwards a maximum of 12.9 inches. Pretest and posttest vehicle dimensions are shown in Data Sheets 5 and 6.

The MDB impacted the 1989 Isuzu Trooper, 4 wheel drive at a height that was above the sill. The impact face was mounted on the sled such that the bottom of the face was 22.0 inches above ground level. As a result, the MDB created extensive deformation to the left side door and "B" pillar. The door contacted the SIDs at the lower and mid torso before the SID began to move. The contact to the lower and mid torso, started the SIDs heads to rotate in the counterclockwise direction. The front SIDs head impacted the "B" pillar. The passenger SIDs head impacted the vertical metal brace between the two side windows. Both SID's then rebounded in a rotating clock wise motion. The seat belts halted any further motion. Both SIDs ended up sitting in an upright position and facing forward.

The MDB impacted the test vehicle and was stopped by the remote brake system to prevent a second impact. The aluminum deformable barrier received more damage than usual due to contact with the rear wall of the cab and front wall of the bed. The maximum crush was 7.3 inches on the right side of the bumper.

DATA SHEETS NO. 2

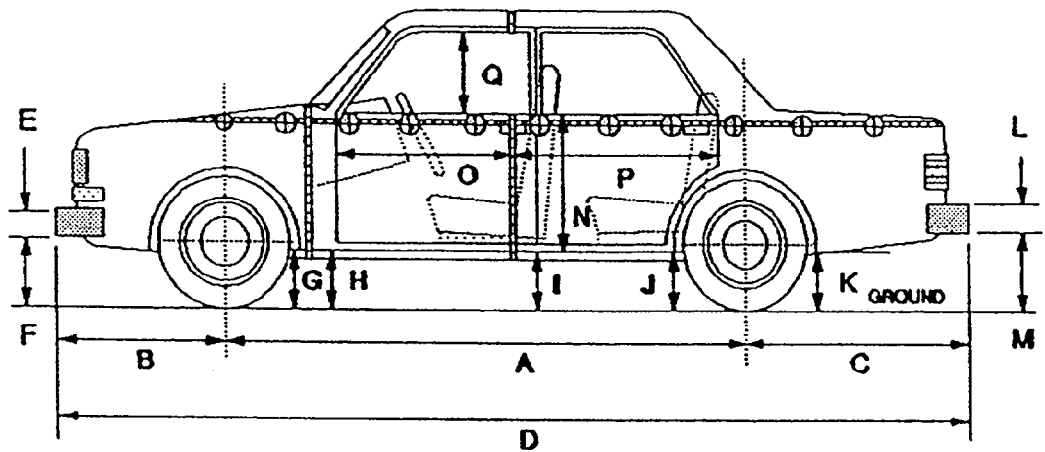
PRETEST AND POST TEST MEASUREMENTS

VEH. MOD.YR/MAKE/MODEL: 1989 ISUZU TROOPER, 4 WHEEL DRIVE

VEH. BODY STYLE: MPV VIN: JACCH58E8K8908508

VEH. NHTSA NO.: RK0505 VEH. BUILD DATE: 12/88

TEST DATE: 09/09/92 TEST LAB.: MOBILITY SYSTEMS AND EQUIPMENT COMPANY



LEFT SIDE VIEW

|   | <u>Pretest</u><br><u>(inches)</u> | <u>Post Test</u><br><u>(inches)</u> | <u>Change</u> |   | <u>Pretest</u><br><u>(inches)</u> | <u>Post Test</u><br><u>(inches)</u> | <u>Change</u> |
|---|-----------------------------------|-------------------------------------|---------------|---|-----------------------------------|-------------------------------------|---------------|
| A | <u>104.5</u>                      | <u>104.3</u>                        | <u>0.2</u>    | J | <u>15.2</u>                       | <u>15.0</u>                         | <u>0.2</u>    |
| B | <u>30.7</u>                       | <u>30.8</u>                         | <u>0.1</u>    | K | <u>18.5</u>                       | <u>18.6</u>                         | <u>0.1</u>    |
| C | <u>37.7</u>                       | <u>37.8</u>                         | <u>0.1</u>    | L | <u>5.0</u>                        | <u>5.0</u>                          | <u>0.0</u>    |
| D | <u>172.0</u>                      | <u>172.0</u>                        | <u>0.0</u>    | M | <u>20.8</u>                       | <u>21.2</u>                         | <u>0.4</u>    |
| E | <u>8.6</u>                        | <u>8.6</u>                          | <u>0.0</u>    | N | <u>28.8</u>                       | <u>24.5</u>                         | <u>4.3</u>    |
| F | <u>16.8</u>                       | <u>17.0</u>                         | <u>0.2</u>    | O | <u>25.7</u>                       | <u>25.5</u>                         | <u>0.2</u>    |
| G | <u>13.4</u>                       | <u>16.1</u>                         | <u>2.7</u>    | P | <u>45.5</u>                       | <u>42.5</u>                         | <u>3.0</u>    |
| H | <u>13.4</u>                       | <u>16.2</u>                         | <u>2.8</u>    | Q | <u>19.3</u>                       | <u>19.0</u>                         | <u>0.3</u>    |
| I | <u>14.7</u>                       | <u>16.4</u>                         | <u>1.7</u>    |   |                                   |                                     |               |

DATA SHEET NO. 3

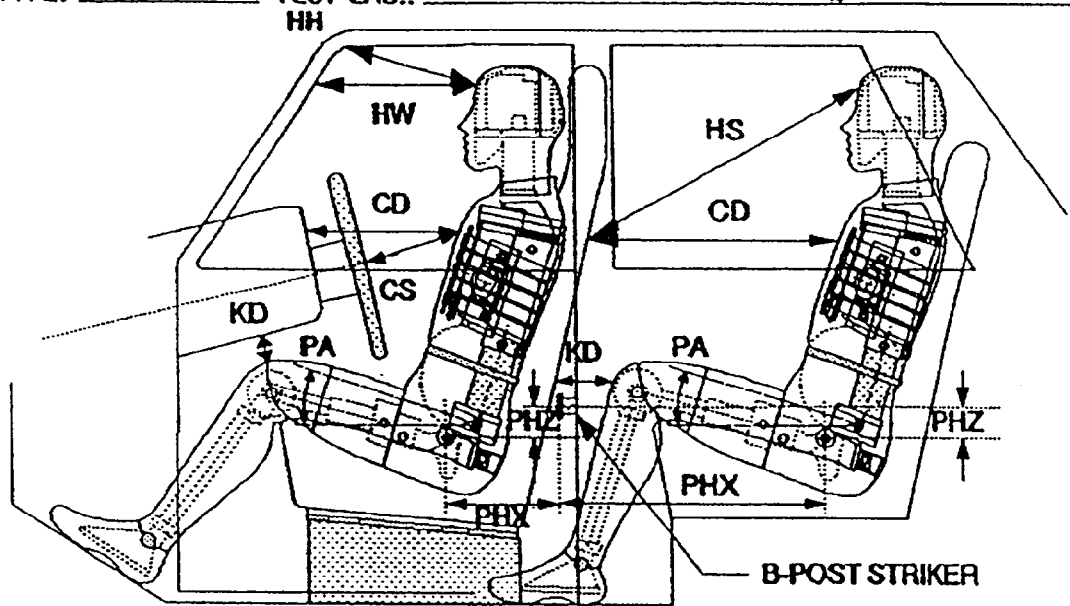
SID LONGITUDINAL CLEARANCE DIMENSIONS

VEH. MOD.YR/MAKE/MODEL: 1989 ISUZU TROOPER, 4 WHEEL DRIVE

VEH. BODY STYLE: MPV VIN: JACCH58E8K8908508

VEH. NHTSA NO.: RK0505 VEH. BUILD DATE: 12/88

TEST DATE: 09/09/92 TEST LAB.: MOBILITY SYSTEMS AND EQUIPMENT COMPANY



LEFT SIDE VIEW

NOTE: 2-DOOR VEHICLE SHOWN.  
REAR DUMMY PHZ & PHX  
MEASUREMENTS FOR A 4-DOOR  
VEHICLE WOULD USE THE C-POST  
STRIKER AS A REFERENCE POINT

DRIVER SID ID# 136

REAR SID ID# 137

|     |             |         |
|-----|-------------|---------|
| HH  | <u>23.4</u> | inches  |
| HW  | <u>28.0</u> | inches  |
| HS  | <u>24.0</u> | inches  |
| CD  | <u>23.2</u> | inches  |
| CS  | <u>16.8</u> | inches  |
| KDL | <u>5.0</u>  | inches  |
| KDR | <u>4.1</u>  | inches  |
| PA  | <u>23.0</u> | degrees |
| PHX | <u>5.8</u>  | inches  |
| PHY | <u>2.4</u>  | inches  |

|  |             |         |
|--|-------------|---------|
|  | <u>N/A</u>  | inches  |
|  | <u>N/A</u>  | inches  |
|  | <u>19.0</u> | inches  |
|  | <u>13.7</u> | inches  |
|  | <u>N/A</u>  | inches  |
|  | <u>0.6</u>  | inches  |
|  | <u>0.5</u>  | inches  |
|  | <u>24.0</u> | degrees |
|  | <u>10.1</u> | inches  |
|  | <u>6.0</u>  | inches  |

DATA SHEET NO. 4

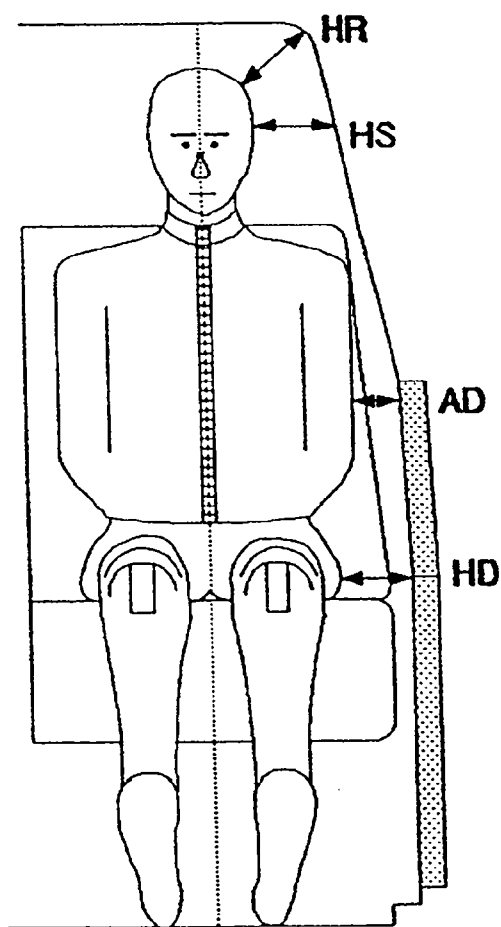
SID LATERAL CLEARANCE DIMENSIONS

VEH. MOD.YR/MAKE/MODEL: 1989 ISUZU TROOPER, 4 WHEEL DRIVE

VEH. BODY STYLE: MPV VIN: JACCH58E8K8908508

VEH. NHTSA NO.: RK0505 VEH. BUILD DATE: 12/88

TEST DATE: 09/09/92 TEST LAB.: MOBILITY SYSTEMS AND EQUIPMENT COMPANY



DRIVER SID ID# 136

REAR SID ID# 137

|    |            |        |
|----|------------|--------|
| HR | <u>9.0</u> | inches |
| HS | <u>8.0</u> | inches |
| AD | <u>2.7</u> | inches |
| HD | <u>5.0</u> | inches |

|            |        |
|------------|--------|
| <u>7.2</u> | inches |
| <u>8.5</u> | inches |
| <u>4.5</u> | inches |
| <u>7.5</u> | inches |

DATA SHEET NO. 5

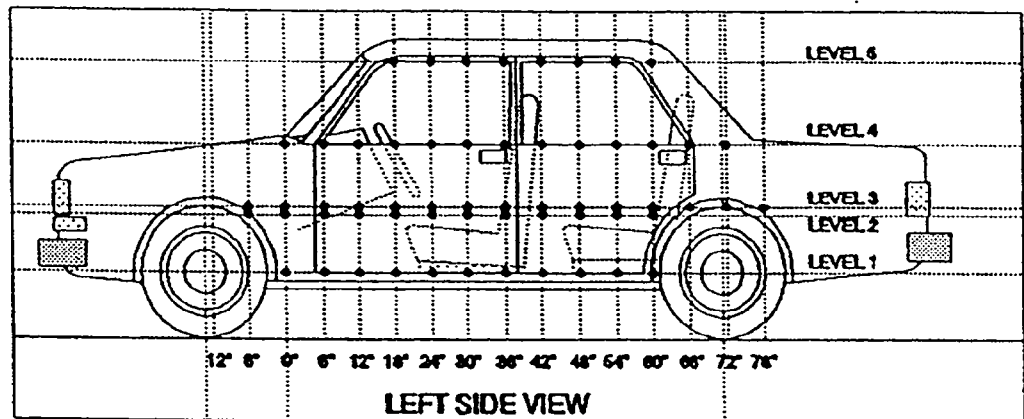
VEHICLE SIDE MEASUREMENT

VEH. MOD.YR/MAKE/MODEL: 1989 ISUZU TROOPER, 4 WHEEL DRIVE

VEH. BODY STYLE: MPV VIN: JACCH58E8K8908508

VEH. NHTSA NO.: RK0505 VEH. BUILD DATE: 12/88

TEST DATE: 09/09/92 TEST LAB.: MOBILITY SYSTEMS AND EQUIPMENT COMPANY



- LEVEL 5 - WINDOW TOP
- LEVEL 4 - WINDOW SILL
- LEVEL 3 - MID-DOOR
- LEVEL 2 - OCCUPANT H-POINT
- LEVEL 1 - AXLE CENTERLINE HEIGHT or SILL TOP HEIGHT

MEASUREMENTS ALONG THE VERTICAL 30" LINE SHOWN ABOVE:

LEVEL 5 @ Window Top = 65.0 inches

LEVEL 4 @ Window Sill = 45.6 inches

LEVEL 3 @ Mid Door = 32.3 inches

LEVEL 2 @ Occupant H-Point = 31.8 inches

LEVEL 1 @ Axle Centerline Height = 16.0 inches  
(or Sill Top Height)

DATA SHEET NO. 6A

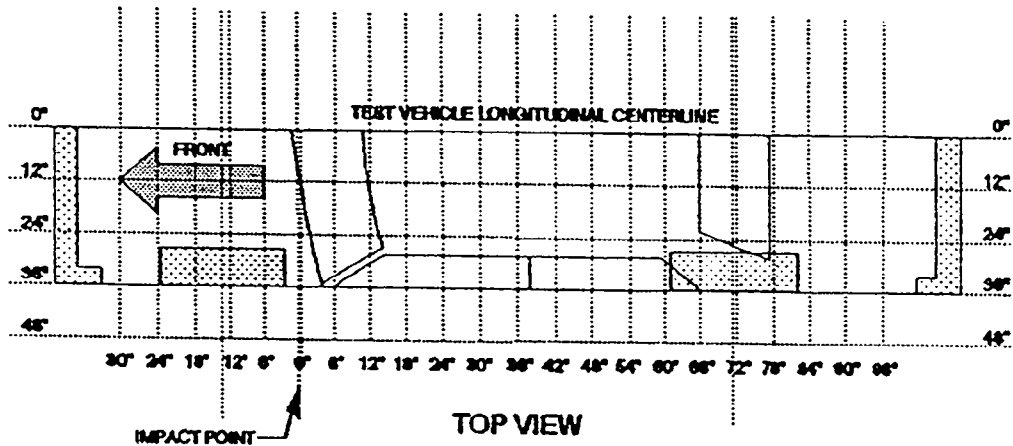
PRETEST AND POST TEST VEHICLE EXTERIOR PROFILES

VEH. MOD.YR/MAKE/MODEL: 1989 ISUZU TROOPER, 4 WHEEL DRIVE

VEH. BODY STYLE: MPV VIN: JACCH58E8K8908508

VEH. NHTSA NO.: RK0505 VEH. BUILD DATE: 12/88

TEST DATE: 09/09/92 TEST LAB.: MOBILITY SYSTEMS AND EQUIPMENT COMPANY



Profile information follows on the following 10 pages for each of the five levels from Data Sheet No. 5.

NOTE: ALL TEST VEHICLE EXTERIOR PROFILES TAKEN FROM REFERENCE PLANE WHICH IS PARALLEL TO AND 48 INCHES FROM TEST VEHICLE LONGITUDINAL CENTERLINE

LEVEL 1 AT AXLE CENTERLINE

| INCHES FROM IMPACT POINT | POSTTEST<br>(Inches) | PRETEST<br>(Inches) | STATIC CRUSH<br>(Inches) |
|--------------------------|----------------------|---------------------|--------------------------|
| -6 Inches                | <u>0.0</u>           | <u>0.0</u>          | <u>0.0</u>               |
| 0 (Impact Point)         | <u>0.0</u>           | <u>0.0</u>          | <u>0.0</u>               |
| 6 Inches                 | <u>20.6</u>          | <u>19.0</u>         | <u>1.6</u>               |
| 12 Inches                | <u>21.0</u>          | <u>19.1</u>         | <u>1.9</u>               |
| 18 Inches                | <u>21.1</u>          | <u>19.1</u>         | <u>2.0</u>               |
| 24 Inches                | <u>21.4</u>          | <u>19.1</u>         | <u>2.3</u>               |
| 30 Inches                | <u>21.7</u>          | <u>19.1</u>         | <u>2.6</u>               |
| 36 Inches                | <u>22.1</u>          | <u>19.2</u>         | <u>2.9</u>               |
| 42 Inches                | <u>22.3</u>          | <u>19.2</u>         | <u>3.1</u>               |
| 48 Inches                | <u>21.4</u>          | <u>19.2</u>         | <u>2.2</u>               |
| 54 Inches                | <u>20.9</u>          | <u>19.3</u>         | <u>1.6</u>               |
| 60 Inches                | <u>20.3</u>          | <u>19.3</u>         | <u>1.0</u>               |
| 66 Inches                | <u>19.8</u>          | <u>19.3</u>         | <u>0.5</u>               |
| 72 Inches                | <u>0.0</u>           | <u>0.0</u>          | <u>0.0</u>               |

REMARKS: N/A

RECORDED BY: Brian O'Keefe

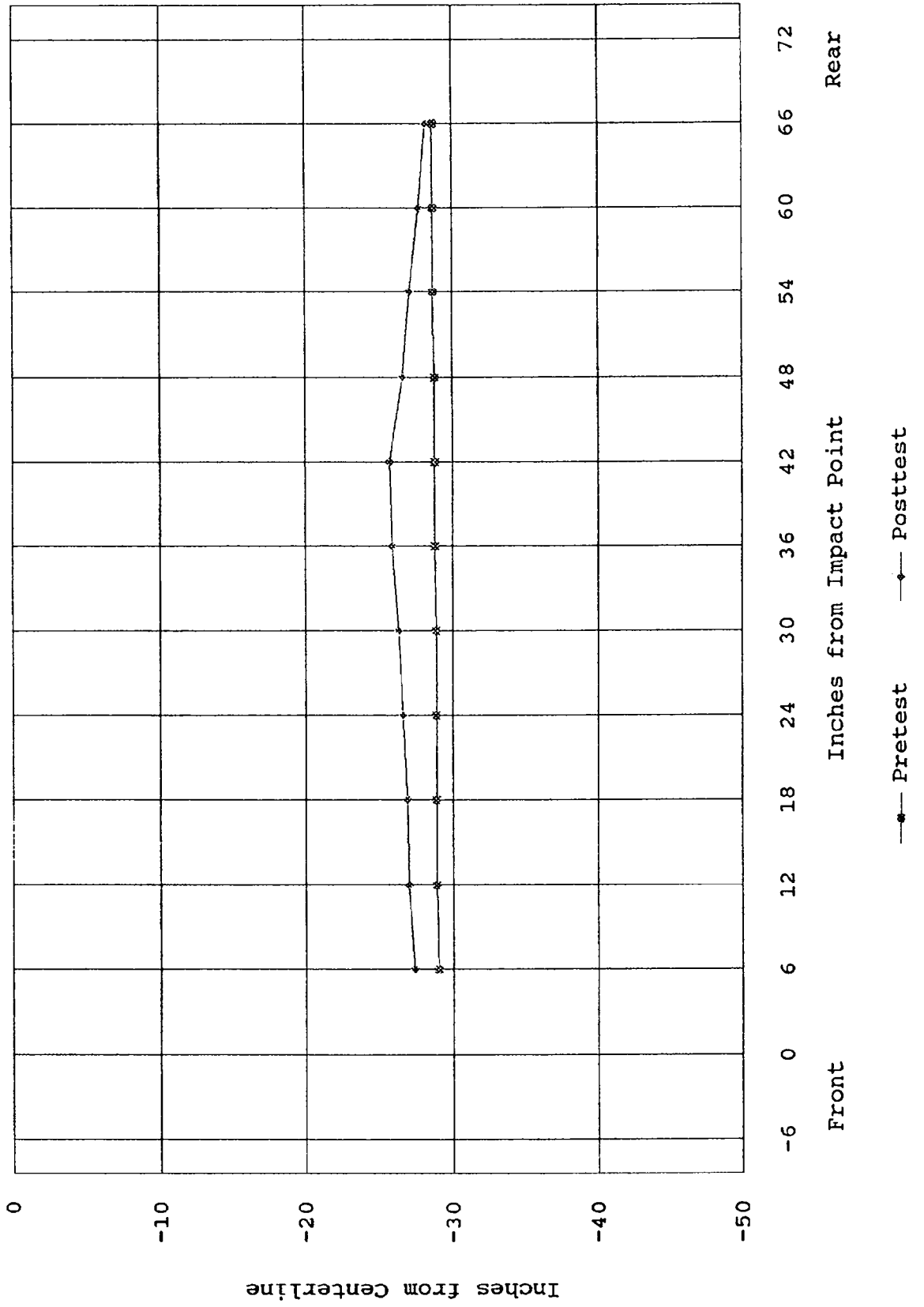
DATE: 09/09/92

APPROVED BY: *anne*

DATE: 10/09/92

Pretest and Posttest Exterior Profile

Level 1 - Sill Top Height - 16.0" Above Ground Level



LEVEL 2 AT OCCUPANT H-POINT

| INCHES FROM IMPACT POINT | POSTTEST<br>(Inches) | PRETEST<br>(Inches) | STATIC CRUSH<br>(Inches) |
|--------------------------|----------------------|---------------------|--------------------------|
| -6 Inches                | <u>0.0</u>           | <u>0.0</u>          | <u>0.0</u>               |
| 0 (Impact Point)         | <u>23.9</u>          | <u>16.9</u>         | <u>7.0</u>               |
| 6 Inches                 | <u>26.9</u>          | <u>16.9</u>         | <u>10.0</u>              |
| 12 Inches                | <u>28.4</u>          | <u>16.9</u>         | <u>11.5</u>              |
| 18 Inches                | <u>28.9</u>          | <u>16.9</u>         | <u>12.0</u>              |
| 24 Inches                | <u>29.1</u>          | <u>16.9</u>         | <u>12.2</u>              |
| 30 Inches                | <u>29.4</u>          | <u>16.9</u>         | <u>12.5</u>              |
| 36 Inches                | <u>29.4</u>          | <u>16.9</u>         | <u>12.5</u>              |
| 42 Inches                | <u>29.5</u>          | <u>16.9</u>         | <u>12.6</u>              |
| 48 Inches                | <u>29.8</u>          | <u>16.9</u>         | <u>12.9</u>              |
| 54 Inches                | <u>29.4</u>          | <u>16.9</u>         | <u>12.5</u>              |
| 60 Inches                | <u>28.9</u>          | <u>16.9</u>         | <u>12.0</u>              |
| 66 Inches                | <u>28.0</u>          | <u>16.9</u>         | <u>11.1</u>              |
| 72 Inches                | <u>24.6</u>          | <u>16.9</u>         | <u>7.7</u>               |

REMARKS: N/A

RECORDED BY: Brian O'Keefe

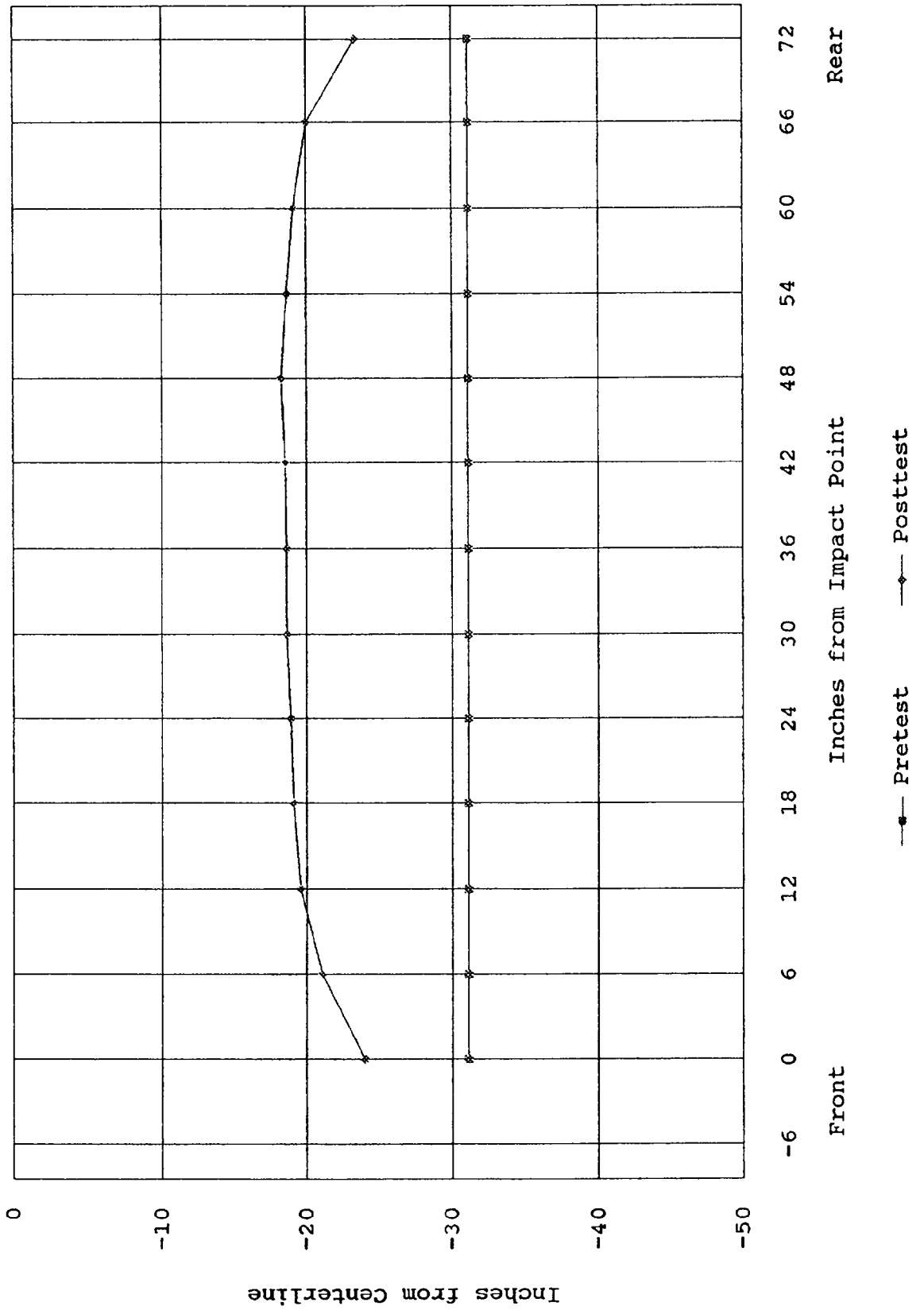
DATE: 09/09/92

APPROVED BY: 

DATE: 10/09/92

Pretest and Posttest Exterior Profile

Level 2 - Occupant H-point - 31.8" Above Ground Level



LEVEL 3 AT MID-DOOR

| INCHES FROM IMPACT POINT | POSTTEST<br>(Inches) | PRETEST<br>(Inches) | STATIC CRUSH<br>(Inches) |
|--------------------------|----------------------|---------------------|--------------------------|
| -6 Inches                | <u>0.0</u>           | <u>0.0</u>          | <u>0.0</u>               |
| 0 (Impact Point)         | <u>23.8</u>          | <u>16.9</u>         | <u>6.9</u>               |
| 6 Inches                 | <u>26.9</u>          | <u>16.9</u>         | <u>10.0</u>              |
| 12 Inches                | <u>28.4</u>          | <u>16.9</u>         | <u>11.5</u>              |
| 18 Inches                | <u>28.9</u>          | <u>16.9</u>         | <u>12.0</u>              |
| 24 Inches                | <u>29.1</u>          | <u>16.9</u>         | <u>12.2</u>              |
| 30 Inches                | <u>29.4</u>          | <u>16.9</u>         | <u>12.5</u>              |
| 36 Inches                | <u>29.4</u>          | <u>16.9</u>         | <u>12.5</u>              |
| 42 Inches                | <u>29.5</u>          | <u>16.9</u>         | <u>12.6</u>              |
| 48 Inches                | <u>29.8</u>          | <u>16.9</u>         | <u>12.9</u>              |
| 54 Inches                | <u>29.5</u>          | <u>16.9</u>         | <u>12.6</u>              |
| 60 Inches                | <u>29.0</u>          | <u>16.9</u>         | <u>12.1</u>              |
| 66 Inches                | <u>28.1</u>          | <u>16.9</u>         | <u>11.2</u>              |
| 72 Inches                | <u>24.7</u>          | <u>16.9</u>         | <u>7.8</u>               |

REMARKS: N/A

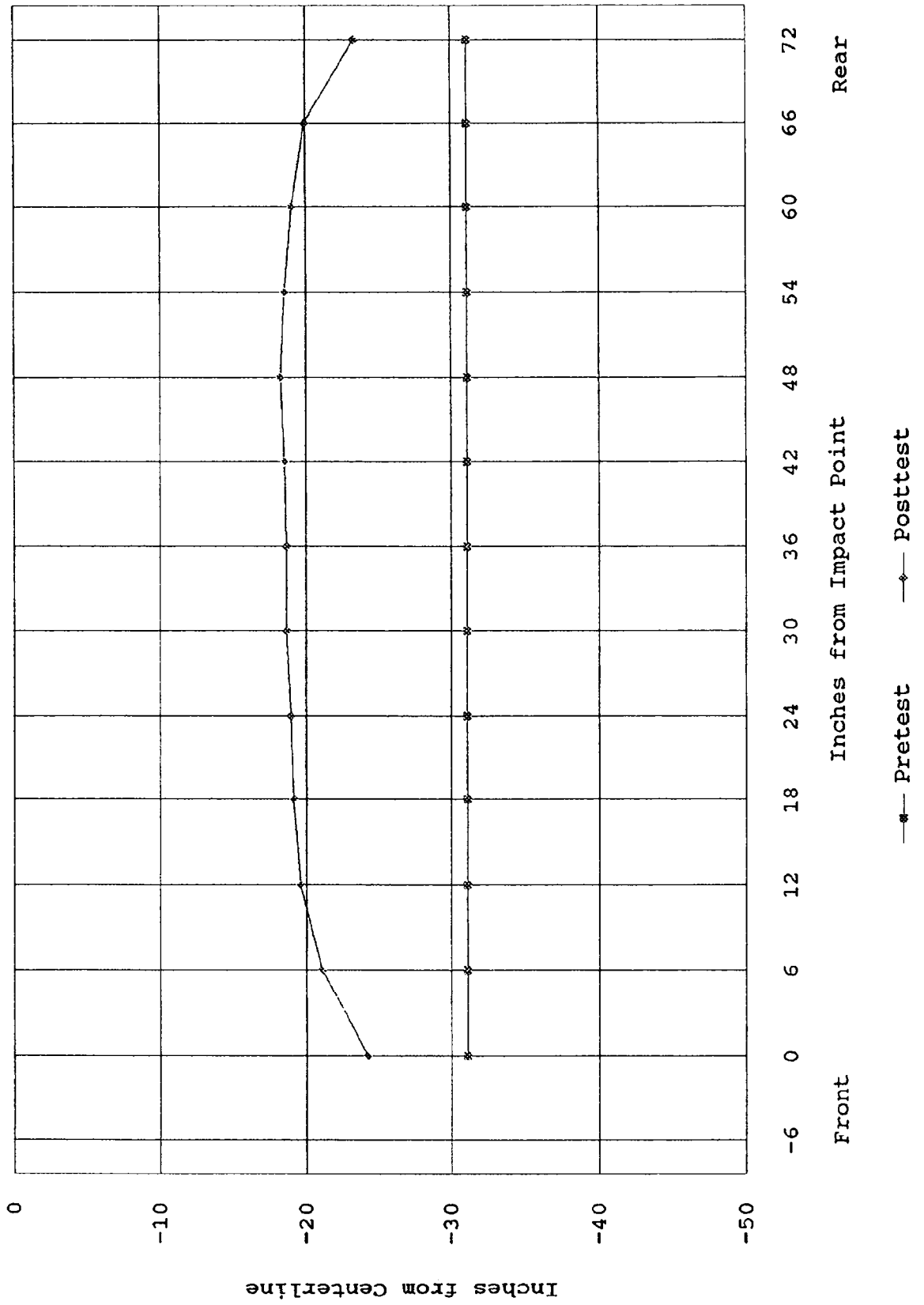
RECORDED BY: Brian O'Keefe

DATE: 09/09/92

APPROVED BY: *Amu*

DATE: 10/09/92

Pretest and Posttest Exterior Profile  
 Level 3 - Mid-door - 32.3" Above Ground Level



LEVEL 4 AT WINDOW SILL

| INCHES FROM IMPACT POINT | POSTTEST<br>(Inches) | PRETEST<br>(Inches) | STATIC CRUSH<br>(Inches) |
|--------------------------|----------------------|---------------------|--------------------------|
| -6 Inches                | <u>0.0</u>           | <u>0.0</u>          | <u>0.0</u>               |
| 0 (Impact Point)         | <u>0.0</u>           | <u>0.0</u>          | <u>0.0</u>               |
| 6 Inches                 | <u>21.9</u>          | <u>19.1</u>         | <u>2.8</u>               |
| 12 Inches                | <u>25.3</u>          | <u>19.4</u>         | <u>5.9</u>               |
| 18 Inches                | <u>26.3</u>          | <u>19.3</u>         | <u>7.0</u>               |
| 24 Inches                | <u>27.4</u>          | <u>18.9</u>         | <u>8.5</u>               |
| 30 Inches                | <u>27.4</u>          | <u>18.7</u>         | <u>8.7</u>               |
| 36 Inches                | <u>27.6</u>          | <u>18.7</u>         | <u>8.9</u>               |
| 42 Inches                | <u>27.7</u>          | <u>18.6</u>         | <u>9.1</u>               |
| 48 Inches                | <u>28.3</u>          | <u>18.6</u>         | <u>9.7</u>               |
| 54 Inches                | <u>28.1</u>          | <u>18.5</u>         | <u>9.6</u>               |
| 60 Inches                | <u>28.2</u>          | <u>18.4</u>         | <u>9.8</u>               |
| 66 Inches                | <u>26.5</u>          | <u>18.4</u>         | <u>8.1</u>               |
| 72 Inches                | <u>22.5</u>          | <u>18.4</u>         | <u>4.1</u>               |

REMARKS: N/A

RECORDED BY: Brian O'Keefe

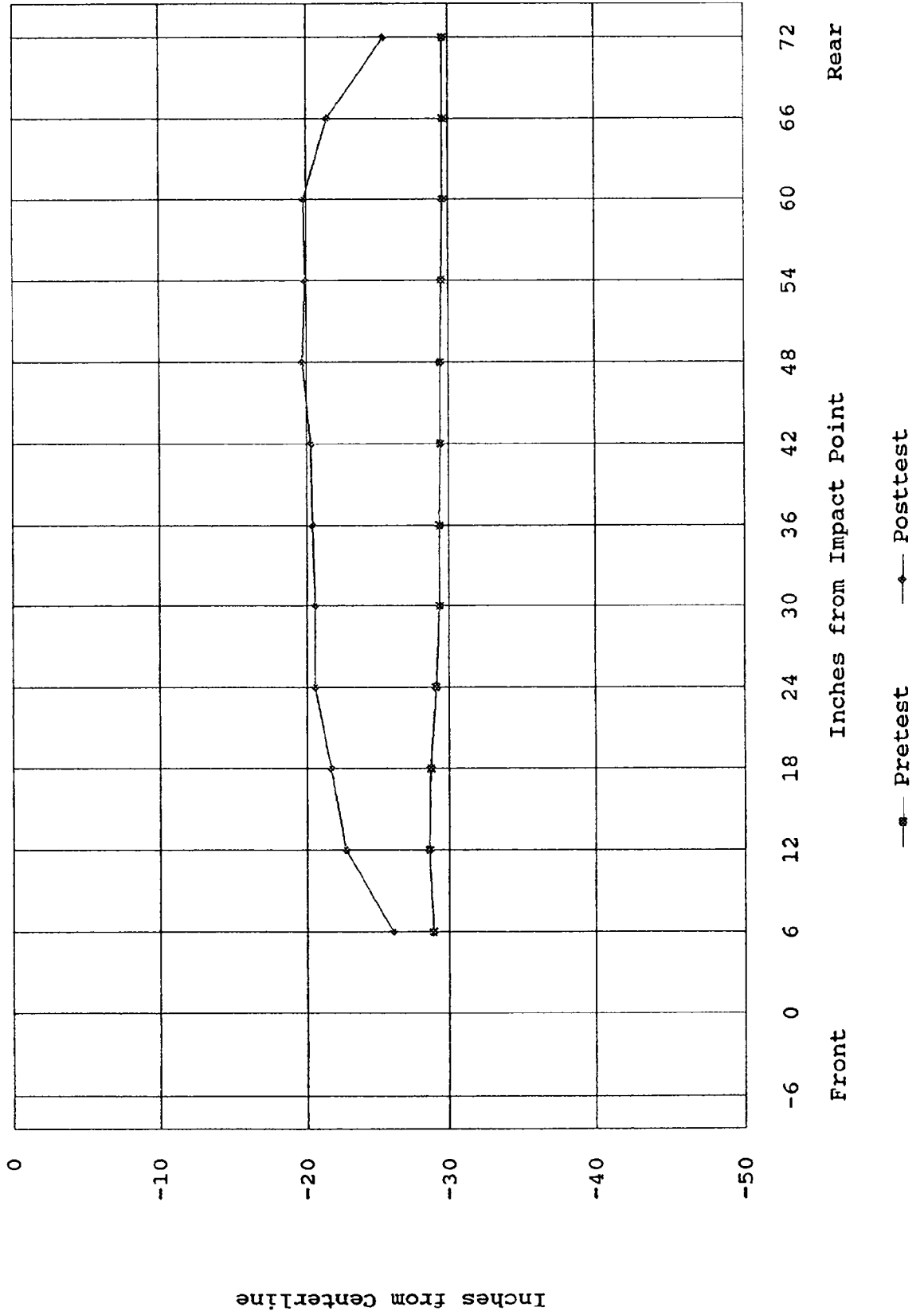
DATE: 09/09/92

APPROVED BY: *auh*

DATE: 10/09/92

Pretest and Posttest Exterior Profile

Level 4 - Window Sill - 45.6" Above Ground Level



LEVEL 5 AT TOP OF WINDOW

| INCHES FROM IMPACT POINT | POSTTEST<br>(Inches) | PRETEST<br>(Inches) | STATIC CRUSH<br>(Inches) |
|--------------------------|----------------------|---------------------|--------------------------|
| -6 Inches                | <u>0.0</u>           | <u>0.0</u>          | <u>0.0</u>               |
| 0 (Impact Point)         | <u>0.0</u>           | <u>0.0</u>          | <u>0.0</u>               |
| 6 Inches                 | <u>0.0</u>           | <u>0.0</u>          | <u>0.0</u>               |
| 12 Inches                | <u>0.0</u>           | <u>0.0</u>          | <u>0.0</u>               |
| 18 Inches                | <u>0.0</u>           | <u>0.0</u>          | <u>0.0</u>               |
| 24 Inches                | <u>17.9</u>          | <u>22.9</u>         | <u>-5.0</u>              |
| 30 Inches                | <u>19.2</u>          | <u>22.9</u>         | <u>-3.7</u>              |
| 36 Inches                | <u>20.5</u>          | <u>23.0</u>         | <u>-2.5</u>              |
| 42 Inches                | <u>22.0</u>          | <u>23.0</u>         | <u>-1.0</u>              |
| 48 Inches                | <u>22.6</u>          | <u>23.0</u>         | <u>-0.4</u>              |
| 54 Inches                | <u>20.7</u>          | <u>23.0</u>         | <u>-2.3</u>              |
| 60 Inches                | <u>18.8</u>          | <u>23.0</u>         | <u>-4.2</u>              |
| 66 Inches                | <u>17.0</u>          | <u>23.0</u>         | <u>-6.0</u>              |
| 72 Inches                | <u>15.1</u>          | <u>23.0</u>         | <u>-7.9</u>              |

REMARKS: N/A

RECORDED BY: Brian O'Keefe

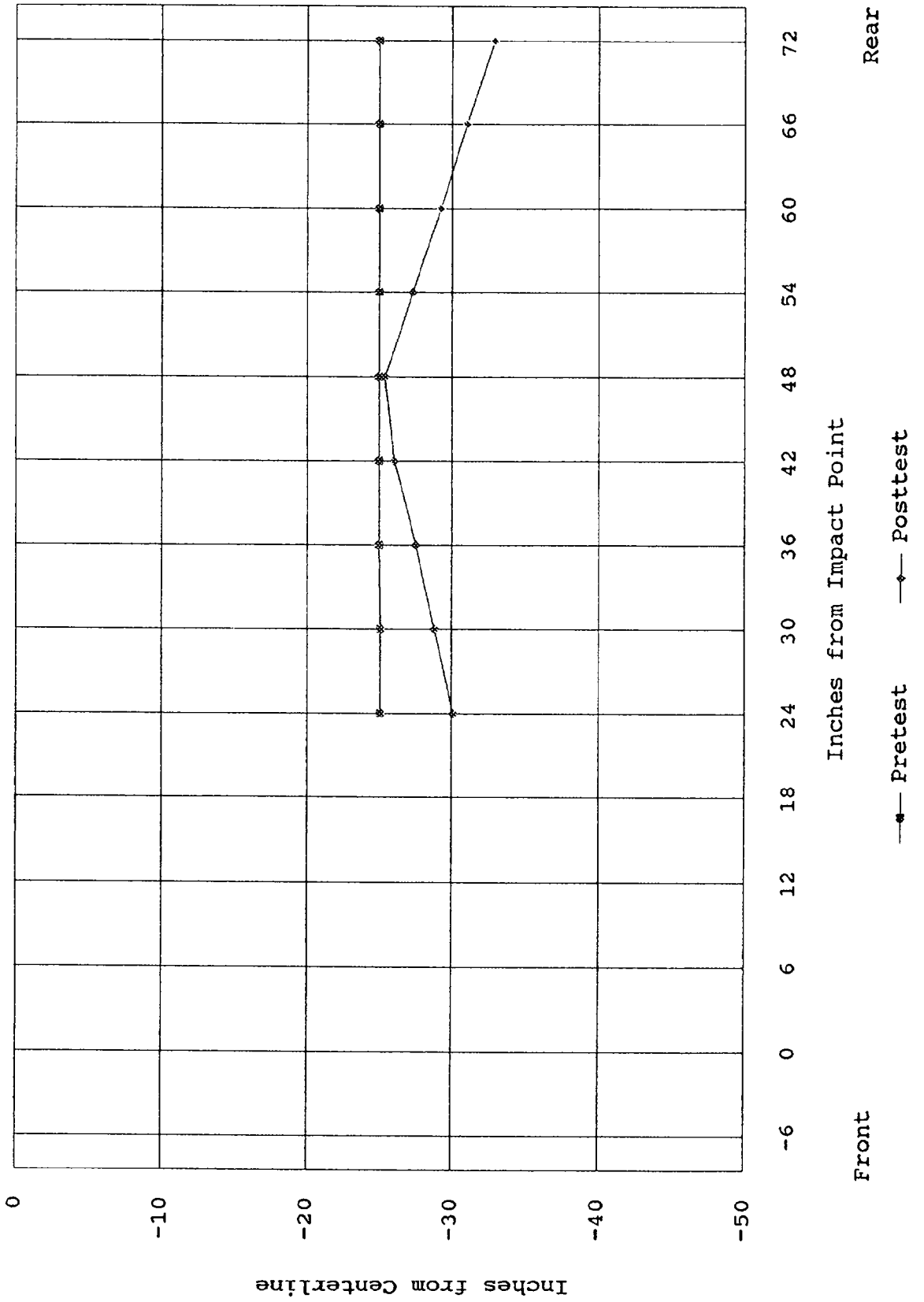
DATE: 09/09/92

APPROVED BY: *Awli*

DATE: 10/09/92

Pretest and Posttest Exterior Profile

Level 5 - Window Top - 65.0" Above Ground Level



DATA SHEET NO. 6F

SUMMARY OF VEHICLE EXTERIOR PROFILE STATIC CRUSH

VEH. MOD YR/MAKE/MODEL/BODY: 1989 Isuzu Trooper 4 WD

VEH. NHTSA NO.: RK0505 VIN: JACCH58E8K8908508

TEST DATE: 09/09/92 TEST LAB: Mobility Systems and Equipment Co.

| POSITION       | LEVEL 1<br>(Inches) | LEVEL 2<br>(Inches) | LEVEL 3<br>(Inches) | LEVEL 4<br>(Inches) | LEVEL 5<br>(Inches) |
|----------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| -6 Inches      | <u>0.0</u>          | <u>0.0</u>          | <u>0.0</u>          | <u>0.0</u>          | <u>0.0</u>          |
| 0 (Impact Pt.) | <u>0.0</u>          | <u>7.0</u>          | <u>6.9</u>          | <u>0.0</u>          | <u>0.0</u>          |
| 6 Inches       | <u>1.6</u>          | <u>10.0</u>         | <u>10.0</u>         | <u>2.8</u>          | <u>0.0</u>          |
| 12 Inches      | <u>1.9</u>          | <u>11.5</u>         | <u>11.5</u>         | <u>5.9</u>          | <u>0.0</u>          |
| 18 Inches      | <u>2.0</u>          | <u>12.0</u>         | <u>12.0</u>         | <u>7.0</u>          | <u>0.0</u>          |
| 24 Inches      | <u>2.3</u>          | <u>12.2</u>         | <u>12.2</u>         | <u>8.5</u>          | <u>-5.0</u>         |
| 30 Inches      | <u>2.6</u>          | <u>12.5</u>         | <u>12.5</u>         | <u>8.7</u>          | <u>-3.7</u>         |
| 36 Inches      | <u>2.9</u>          | <u>12.5</u>         | <u>12.5</u>         | <u>8.9</u>          | <u>-2.5</u>         |
| 42 Inches      | <u>3.1</u>          | <u>12.6</u>         | <u>12.6</u>         | <u>9.1</u>          | <u>-1.0</u>         |
| 48 Inches      | <u>2.2</u>          | <u>12.9</u>         | <u>12.9</u>         | <u>9.7</u>          | <u>-0.4</u>         |
| 54 Inches      | <u>1.6</u>          | <u>12.5</u>         | <u>12.6</u>         | <u>9.6</u>          | <u>-2.3</u>         |
| 60 Inches      | <u>1.0</u>          | <u>12.0</u>         | <u>12.1</u>         | <u>9.8</u>          | <u>-4.2</u>         |
| 66 Inches      | <u>0.5</u>          | <u>11.1</u>         | <u>11.2</u>         | <u>8.1</u>          | <u>-6.0</u>         |
| 72 Inches      | <u>0.0</u>          | <u>7.7</u>          | <u>7.8</u>          | <u>4.1</u>          | <u>-7.9</u>         |

RECORDED BY: Brian O'Keefe

DATE: 09/09/92

APPROVED BY: *[Signature]*

DATE: 10/09/92

**DATA SHEET NO. 7**

**EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR**

VEH. MOD.YR/MAKE/MODEL: 1989 ISUZU TROOPER, 4 WHEEL DRIVE

VEH. BODY STYLE: MPV VIN: JACCH58E8K8908508

VEH. NHTSA NO.: RK0505 VEH. BUILD DATE: 12/88

TEST DATE: 09/09/92 TEST LAB.: MOBILITY SYSTEMS AND EQUIPMENT COMPANY

| LOCATION                          | TOP OF<br>STACK<br>LEVEL | MID-<br>STACK<br>LEVEL | BUMPER<br>LEVEL |
|-----------------------------------|--------------------------|------------------------|-----------------|
| HEIGHT AT<br>CENTERLINE*          | 43 inches                | 33 inches              | 28 inches       |
| DISTANCES<br>RIGHT OF<br>CENTER** | (inches)                 | (inches)               | (inches)        |
| 32 inches                         | <u>4.1</u>               | <u>0.5</u>             | <u>1.5</u>      |
| 28 inches                         | <u>2.1</u>               | <u>0.0</u>             | <u>1.5</u>      |
| 24 inches                         | <u>0.4</u>               | <u>-0.2</u>            | <u>1.4</u>      |
| 20 inches                         | <u>-0.1</u>              | <u>-0.2</u>            | <u>1.5</u>      |
| 16 inches                         | <u>-0.2</u>              | <u>-0.2</u>            | <u>1.8</u>      |
| 12 inches                         | <u>0.0</u>               | <u>-0.1</u>            | <u>2.0</u>      |
| 8 inches                          | <u>-0.4</u>              | <u>0.0</u>             | <u>2.1</u>      |
| 4 inches                          | <u>-0.5</u>              | <u>0.0</u>             | <u>2.4</u>      |
| 0 inches                          | <u>-0.6</u>              | <u>0.1</u>             | <u>2.6</u>      |

DATA SHEET NO. 7 (Cont.)

| LOCATION                         | TOP OF<br>STACK<br>LEVEL | MID-<br>STACK<br>LEVEL | BUMPER<br>LEVEL |
|----------------------------------|--------------------------|------------------------|-----------------|
| HEIGHT AT<br>CENTERLINE*         | 43 inches                | 33 inches              | 28 inches       |
| DISTANCES<br>LEFT OF<br>CENTER** | (inches)                 | (inches)               | (inches)        |
| 4 inches                         | <u>-0.3</u>              | <u>0.3</u>             | <u>2.9</u>      |
| 8 inches                         | <u>-0.5</u>              | <u>0.5</u>             | <u>3.2</u>      |
| 12 inches                        | <u>-0.8</u>              | <u>0.6</u>             | <u>3.5</u>      |
| 16 inches                        | <u>-0.9</u>              | <u>0.8</u>             | <u>3.9</u>      |
| 20 inches                        | <u>-0.8</u>              | <u>1.0</u>             | <u>4.7</u>      |
| 24 inches                        | <u>-0.7</u>              | <u>1.5</u>             | <u>5.6</u>      |
| 28 inches                        | <u>0.8</u>               | <u>2.3</u>             | <u>6.7</u>      |
| 32 inches                        | <u>3.1</u>               | <u>3.2</u>             | <u>7.1</u>      |

\* Heights, in inches, measured above ground level

\*\* Impact side

REMARKS: N/A

RECORDED BY: Mr. Brian O'Keefe

DATE: 09/10/92

APPROVED BY: *[Signature]*

DATE: 10/09/92

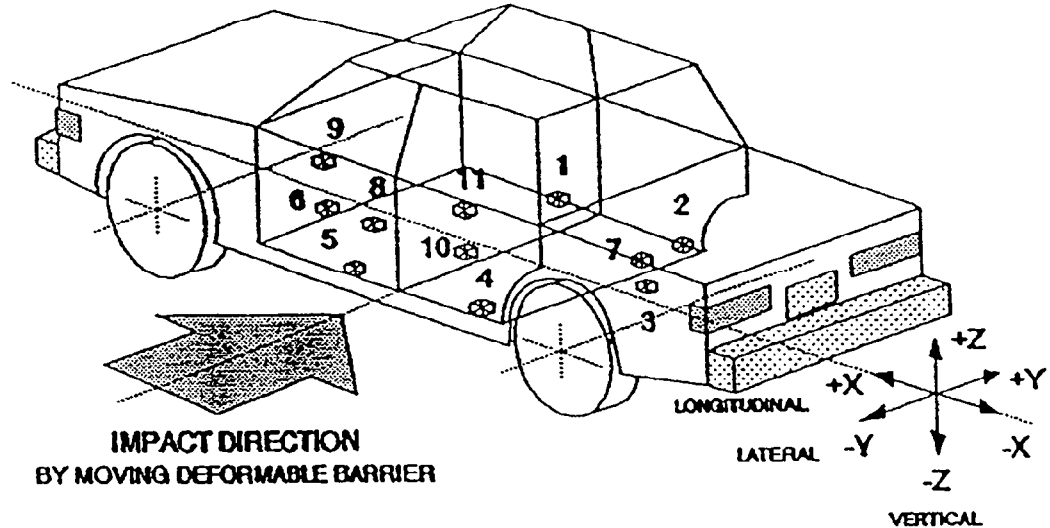
DATA SHEET NO. 8

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

VEH. MOD.YR/MAKE/MODEL: 1989 ISUZU TROOPER, 4 WHEEL DRIVE

VEH. NHTSA NO.: RK0505 VEH. BUILD DATE: 12/88

TEST DATE: 09/09/92 TEST LAB.: MOBILITY SYSTEMS AND EQUIPMENT COMPANY



- 1-Rt. Side Sill @ Frt Seat
- 2-Rt. Side Sill @ Rr. Seat
- 3-Frt. Floorpan Above Axle
- 4-Left Side Sill @ Rr. Seat
- 5-Left Side Sill @ Frt. Seat
- 6-Left Frt. Door On Centerline
- 7-Rt. Frt. Occ. Compartment
- 8-Midrear of Left Frt. Door
- 9-Left Frt. Door Upper Centerline
- 10-Midrear of Left Rear Door
- 11-Left Rear Door Upper Centerline

DATA SHEET NO. 8 (Cont.)

| NO. | COORDINATES |          |          | LONG. X(+/-) |      | LAT. Y(+/-) |      | VERT. Z(+/-) |      | RES. R(+/-) |      |
|-----|-------------|----------|----------|--------------|------|-------------|------|--------------|------|-------------|------|
|     | X<br>in.    | Y<br>in. | Z<br>in. | MaxG         | ms   | MaxG        | ms   | MaxG         | ms   | MaxG        | ms   |
| 1   | 109         | 22       | 18       | -9.1         | 19.7 | 20.1        | 10.3 | 11.5         | 48.0 | 20.6        | 10.3 |
| 2   | 71          | 23       | 20       | -9.2         | 8.1  | 22.3        | 15.0 | -7.2         | 34.5 | 22.6        | 15.0 |
| 3   | 37          | 0        | 30       | -7.4         | 18.6 | 15.8        | 50.9 | -13.0        | 70.6 | 16.1        | 50.6 |
| 4   | 71          | -23      | 20       |              |      | 26.2        | 3.2  |              |      |             |      |
| 5   | 106         | -24      | 19       |              |      | 46.3        | 4.0  |              |      |             |      |
| 6   | 103         | -27      | 32       |              |      | 182.9       | 3.5  |              |      |             |      |
| 7   | 77          | 10       | 20       | -10.0        | 19.8 |             |      |              |      |             |      |
| 8   | 89          | -27      | 31       |              |      | 124.6       | 11.6 |              |      |             |      |
| 9   | 102         | -27      | 42       |              |      | 119.3       | 5.6  |              |      |             |      |
| 10  | 57          | -27      | 34       |              |      | 157.5       | 8.7  |              |      |             |      |
| 11  | 67          | -27      | 39       |              |      | 171.8       | 11.4 |              |      |             |      |

REFERENCE: X - Rear Bumper (+ = Forward)  
 Y - Vehicle Centerline (+ = To the Right)  
 Z - Ground Level (+ = Upward)

REMARKS: N/A

RECORDED BY: Brian O'Keefe DATE: 09/14/92

APPROVED BY: *amb* DATE: 10/09/92

DATA SHEET NO. 9

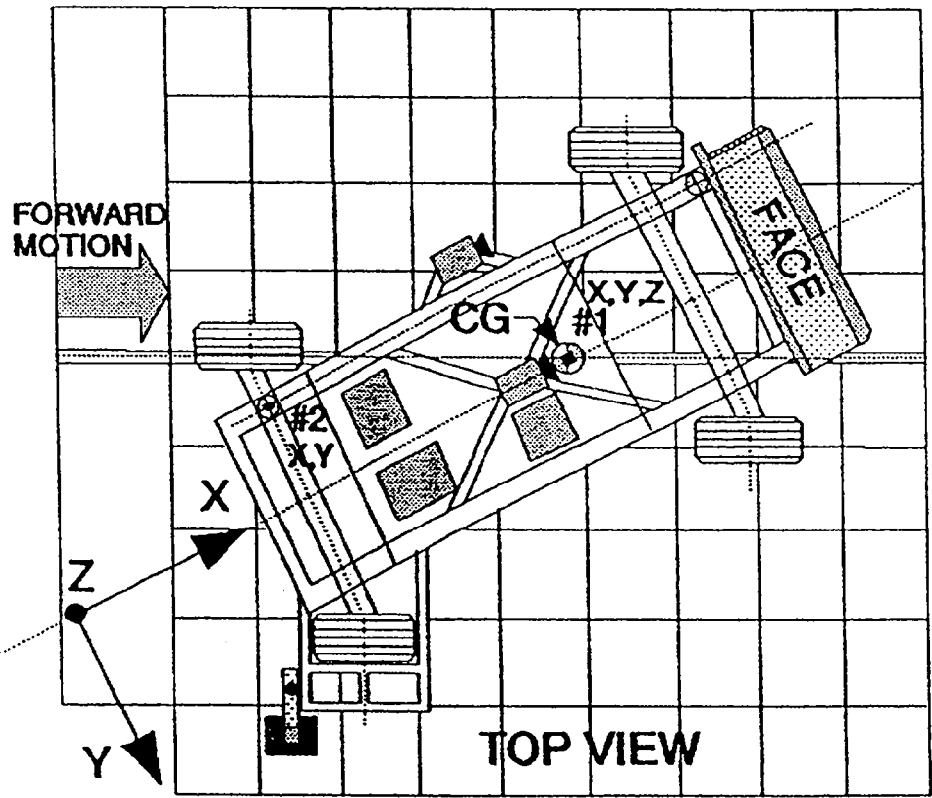
MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS  
AND SAMPLE DATA SUMMARY

VEH. MOD.YR/MAKE/MODEL: 1989 ISUZU TROOPER, 4 WHEEL DRIVE

VEH. BODY STYLE: MPV VIN: JACCH58E8K8908508

VEH. NHTSA NO.: RK0505 VEH. BUILD DATE: 12/88

TEST DATE: 09/09/92 TEST LAB.: MOBILITY SYSTEMS AND EQUIPMENT COMPANY



ACCELEROMETER LOCATIONS:

- 1 - MDB Center of Gravity (CG)
- 2 - Rear Frame Member

DATA SHEET NO. 9 (Cont.)

| NO.              | COORDINATES |            |            | POS. DIRECTION |       | NEG. DIRECTION |      |
|------------------|-------------|------------|------------|----------------|-------|----------------|------|
|                  | X<br>(in.)  | Y<br>(in.) | Z<br>(in.) | MaxG           | ms    | MaxG           | ms   |
| 1 Longitudinal X | 73          | 0          | 12         | 3.8            | 103.0 | 19.5           | 35.8 |
| 1 Lateral Y      | 73          | 0          | 12         | 10.6           | 23.6  | 2.4            | 51.8 |
| 1 Vertical Z     | 73          | 0          | 12         | 32.5           | 94.3  | 30.1           | 24.5 |
| 1 Resultant R    | 73          | 0          | 12         | 34.7           | 24.4  | N/A            | N/A  |
| 2 Longitudinal X | 12          | -19        | 17         | 2.6            | 113.5 | 16.2           | 36.6 |
| 2 Lateral Y      | 12          | -19        | 17         | 4.2            | 76.3  | 5.2            | 21.2 |

REFERENCE: X - Rear Bumper (+ = Forward)  
 Y - Vehicle Centerline (+ = To the Right)  
 Z - Ground Level (+ = Upward)

REMARKS: N/A

RECORDED BY: Brian O'Keefe DATE: 09/14/92

APPROVED BY: *Curt* DATE: 10/09/92

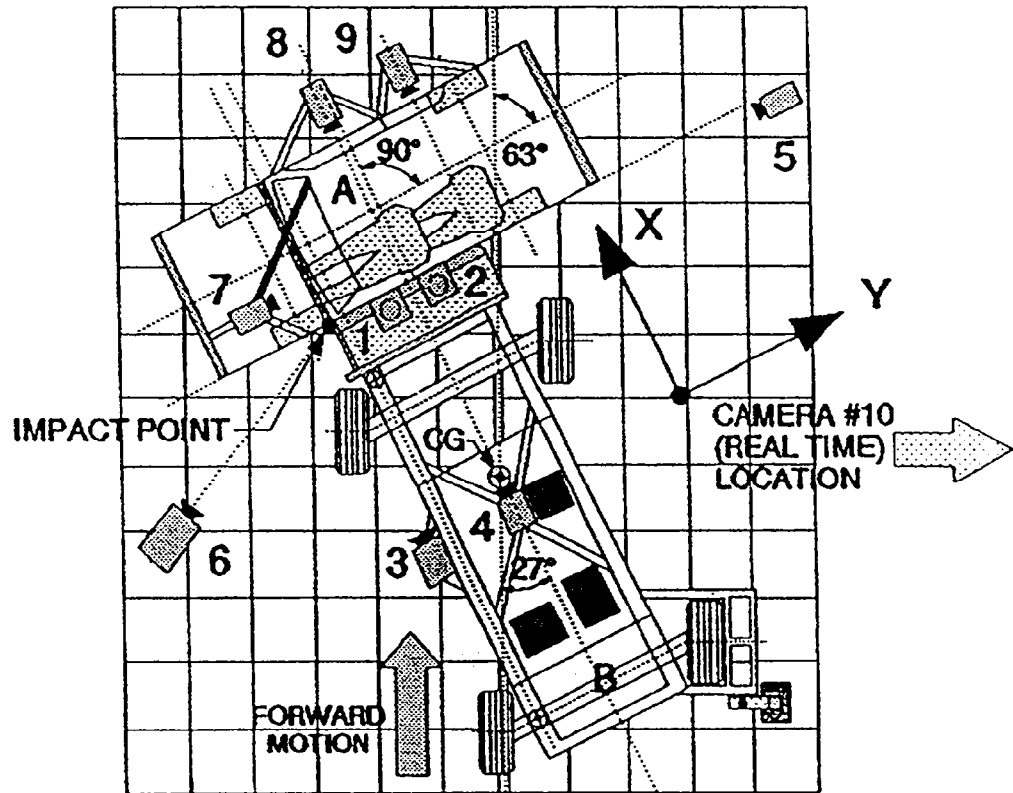
**DATA SHEET NO. 10**

**HIGH SPEED CAMERA LOCATIONS AND DATA**

VEH. MOD.YR/MAKE/MODEL: 1989 ISUZU TROOPER, 4 WHEEL DRIVE

VEH. NHTSA NO.: RK0505 VIN: JACCH58E8K8908508

TEST DATE: 09/09/92 TEST LAB.: MOBILITY SYSTEMS AND EQUIPMENT COMPANY



**CAMERA LOCATIONS:**

- No. 1 Overhead view of test vehicle
- No. 2 Overhead closeup view of impact plane
- No. 3 MDB onboard closeup view of impact point
- No. 4 MDB onboard view of driver dummy kinematics
- No. 5 Right side ground level -- overall view
- No. 6 Left side ground level -- overall view
- No. 7 Test vehicle onboard driver dummy front view kinematics
- No. 8 Test vehicle onboard driver dummy side view kinematics
- No. 9 Test vehicle onboard passenger side view kinematics
- No. 10 Real time (24 fps) film coverage of pretest, test and post test events

DATA SHEET NO. 10 (Cont.)

| NO. | TYPE       | LENS SIZE<br>(mm) | FILM SPEED<br>(fps) | * COORDINATES |      |     |
|-----|------------|-------------------|---------------------|---------------|------|-----|
|     |            |                   |                     | X             | Y    | Z   |
| 1   | Fastax II  | 16                | 610                 | 12            | 12   | 236 |
| 2   | Fastax II  | 28                | 600                 | -12           | 12   | 236 |
| 3   | Himac      | 28                | 750                 | -121          | -37  | 50  |
| 4   | Himac      | 16                | 750                 | -151          | 0    | 72  |
| 5   | Photosonic | 13                | 590                 | -190          | 552  | 48  |
| 6   | Fastax II  | 28                | 600                 | -68           | -516 | 48  |
| 7   | Fastax II  | 16                | 600                 | 19            | -45  | 55  |
| 8   | Fastax II  | 16                | 500                 | 68            | 30   | 49  |
| 9   | Fastax II  | 16                | 600                 | 68            | 64   | 49  |
| 10  | Arriflex   | 15-70 Zoom        | 24                  | -             | -    | -   |

\* REFERENCE (from point of impact)

+X = Forward

+Y = To the right

+Z = Upward

REMARKS: N/A

RECORDED BY: Brian O'Keefe

DATE: 09/22/92

APPROVED BY: *aku*

DATE: 10/09/92

DATA SHEET NO. 11

TEST VEHICLE DATA

VEH. MOD.YR/MAKE/MODEL: 1989 ISUZU TROOPER, 4 WHEEL DRIVE

VEH. NHTSA NO.: RK0505 VIN.: JACCH58E8K8908508

VEH. BUILD DATE: 12/88 TEST DATE: 09/09/92

TEST LABORATORY: MOBILITY SYSTEMS AND EQUIPMENT COMPANY

OBSERVERS: NONE

Upon receipt, the vehicle will be examined visually for completeness, function, and damage. The roof and supporting structures such as the doors and windows should be checked for proper operation and any discrepancies which may influence the testing. The vehicle will be weighed.

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

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

Recommended Tire Size: P235/75 R15

Size of Tires Installed on Test Vehicle: P235/75 R15

Tire Manufacturer: Goodyear

Number of Occupants: 2 Front; 3 Rear; 5 TOTAL

Type of Front Seat(s):  Buckets;  Bench;  Split Bench

Type of Front Seat Back:  Fixed;  Adjustable with  Lever or  Knob

Vehicle Maximum Capacity Loading = - lbs. (A)

Number of Occupants x 150 lbs. = - lbs. (B)

Vehicle Cargo Capacity = 300 lbs. (A - B)

DATA SHEET NO. 11 (Cont.)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Front: Right = 917 lbs.; Left = 985 lbs.; Front Total = 1902 lbs.

( 54 % of TOTAL shown below)

Rear: Right = 835 lbs.; Left = 790 lbs.; Rear Total = 1625 lbs.

( 46 % of TOTAL shown below)

Front Total + Rear Total = TOTAL DELV. = 3527 lbs.

CALCULATION OF TEST VEHICLE TARGET WEIGHT:

Total Test Vehicle Delivered Weight With Maximum Fluids = 3527 lbs. (A)

Maximum Cargo Carry Capacity of Test Vehicle = 300 lbs. (B)

Weight of Two Side Impact Dummies (2 X 164 lbs.) = 328 lbs. (C)

Test Vehicle Target Weight = 4155 (A + B + C)

ACTUAL WEIGHT OF TEST VEHICLE WITH TWO SIDs AND CARGO:

Front: Right = 971 lbs.; Left = 1101 lbs.; Front Total = 2076 lbs.

( 50 % of TOTAL shown below)

Rear: Right = 1040 lbs.; Left = 1033 lbs.; Rear Total = 2073 lbs.

( 50 % of TOTAL shown below)

Front Total + Rear Total = TOTAL ACTUAL = 4149 lbs. (which includes -  
lbs. of cargo ballast  
weight)

TEST VEHICLE ATTITUDE:

As Delivered

Ready For Test

34.0 inches Right Front

33.1 inches Right Front

34.0 inches Left Front

33.3 inches Left Front

34.5 inches Right Rear

33.6 inches Right Rear

34.5 inches Left Rear

33.2 inches Left Rear

DATA SHEET NO. 11 (Cont.)

Test Vehicle Wheelbase = 104.5 inches

C.G. = 52.3 inches Rearward of Front Wheel Centerline

Total Vehicle Length: 171.0 inches Right Side

171.0 inches Left Side

172.0 inches Centerline

Arm Rest Location: N/A

---

---

---

Seat Belt Upper Anchorage Location: On the B-pillar, 25.4 inches

above the B-pillar striker.

FRONT SEAT CUSHION PLACEMENT: mid-point of fore/aft travel

Total Length of Seat Adjustment Travel = 7.0 inches

Total Number of Seat Adjustment Positions or Detents = 10

Front Seat Back Adjustment Position: 26°

Front Seat Back Torso Angle = 26 degrees

Front Seat Cushion Vertical Position: full down

DATA SHEET NO. 11 (Cont.)

ADJUSTABLE STEERING COLUMN POSITION: N/A  
(using data supplied by the vehicle manufacturer)

WINDOW POSITIONS: Closed Left Front Closed Left Rear  
Open Right Front Open Right Rear

Windows shall be in CLOSED position on the STRUCK side of the vehicle and in the OPEN position on the OPPOSITE side of the vehicle.

AMOUNT OF STODDARD SOLVENT IN FUEL TANK: 19.8 gallons (92-94% of UC)  
(Usable Capacity (UC) supplied by the vehicle manufacturer)

LOCATION OF IMPACT POINT ON TEST VEHICLE SIDE TO BE IMPACTED:

Wheelbase = 104.5 inches

Impact Point 15.3 inches rearward of front axle centerline (which is 37" forward of the wheelbase midpoint)

REMARKS: Actual impact point is 15.8 inches rearward of front axle.

RECORDED BY: Mr. Brian O'Keefe

DATE:

09/09/92

APPROVED BY:

*auh*

DATA:

10/09/92

SECTION 4

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

This section shows full list of Test Equipment and the calibration dates.

General Test Information

VERSNO: V2                    TGID: 1  
TITLE: 1992 SIDE IMPACT -- MOVING DEFORMABLE BARRIER INTO VEHICLE  
TSTOBJ: ACQUIRE SIDE IMPACT DATA USING INSTRUMENTED SIDE IMPACT DUMMIES  
TSTDAT: 09/09/92            TSTPRF: MSE                    CONNO: DTNH22-87-C-07168  
TSTREF: RK0505              TSTTYP: DEV                    TSTCFN: ITV  
TKSURF: CON                 TKCOND: DRY                    TEMP: 91                      RECTYP: FMT  
LINK: UMB                    CLSSPD: 33.0                  IMPANG: 270                    OFFSET: 9999.9  
IMPPNT: 3.0                 MEASUR: ENG                    TOTCRV: 50  
TSTCOM: NO COMMENTS



Vehicle Information

VGID: 2 VEHNO: 2 MAKE: 42 MODEL: 04 YEAR: 89 BODY: 5H  
VIN: JACCH58E8K8908508 ENGINE: 4CIF ENGDSP: 2.6 LITERS TRANSM: M4  
VEHTWT: 4149 WHLBAS: 104.5 VEHLLEN: 172.0 VEHWID: 65.0  
VEHCG: 52.3 STRSEP: NA COLMEC: NAP MODIND: P  
MODDSC: UNMODIFIED  
BX

- 1:9999.9
- 2:9999.9
- 3:9999.9
- 4:9999.9
- 5:9999.9
- 6:9999.9
- 7:9999.9
- 8:9999.9
- 9:9999.9
- 10:9999.9
- 11:9999.9
- 12:9999.9
- 13:9999.9
- 14:9999.9
- 15:9999.9
- 16:9999.9
- 17:9999.9
- 18:9999.9
- 19:9999.9
- 20:9999.9
- 21:9999.9

VEHSPD: 0.0 CRBANG: 0 PDOF: 270 BMPENG: NA  
SILENG: NO APLENG: DE

- DPD
- 1: 0.0
  - 2: 4.0
  - 3: 12.0
  - 4: 12.6
  - 5: 9.5
  - 6: 0.0

VDI: 09LPAW3 LENCNT: 130.0 DAMDST: 6.3 CRHDST: 12.9  
AX

- 1:9999.9
- 2:9999.9
- 3:9999.9
- 4:9999.9
- 5:9999.9
- 6:9999.9
- 7:9999.9
- 8:9999.9
- 9:9999.9
- 10:9999.9
- 11:9999.9
- 12:9999.9
- 13:9999.9
- 14:9999.9
- 15:9999.9
- 16:9999.9
- 17:9999.9
- 18:9999.9
- 19:9999.9
- 20:9999.9
- 21:9999.9

CARANG: 999 VEHOR: 999  
VEHCOM: NO COMMENT





Instrumentation Information

Inst. Group ID: 5    VEHNO: 2    CURNO: 1  
SENTYP: AC    SENLOC: 01    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: 17    INIVEL: 0.0  
NFP: -300    NLP: 2999    DELT: 100    DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5    VEHNO: 2    CURNO: 2  
SENTYP: AC    SENLOC: 01    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: 88    INIVEL: 0.0  
NFP: -300    NLP: 2999    DELT: 100    DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5    VEHNO: 2    CURNO: 3  
SENTYP: AC    SENLOC: 01    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: 26    INIVEL: 0.0  
NFP: -300    NLP: 2999    DELT: 100    DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5    VEHNO: 2    CURNO: 4  
SENTYP: AC    SENLOC: 01    SENATT: SPNU  
AXIS: YL    UNITS: G'S    PREFIL: 1650  
INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: BF59J  
CALDAT: 02/JAN/92    INSRAT: 2000    CHLMAX: 5    INIVEL: 0.0  
NFP: -300    NLP: 2999    DELT: 100    DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5    VEHNO: 2    CURNO: 5  
SENTYP: AC    SENLOC: 01    SENATT: SPNU  
AXIS: YL    UNITS: G'S    PREFIL: 1650  
INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: AN93  
CALDAT: 02/JAN/92    INSRAT: 2000    CHLMAX: 5    INIVEL: 0.0  
NFP: -300    NLP: 2999    DELT: 100    DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

|                       |                   |              |             |
|-----------------------|-------------------|--------------|-------------|
| Inst. Group ID: 5     | VEHNO: 2          | CURNO: 6     |             |
| SENTYP: AC            | SENLOC: 01        | SENATT: RBLU |             |
| AXIS: YL              | UNITS: G'S        | PREFIL: 1650 |             |
| INSMAN: MFG: ENDEVCO, | MODEL: 7264-2000, | S/N: AB97    |             |
| CALDAT: 02/JAN/92     | INSRAT: 2000      | CHLMAX: 5    | INIVEL: 0.0 |
| NFP: -300             | NLP: 2999         | DELT: 100    | DASTAT: AM  |
| INSCOM: NO COMMENT    |                   |              |             |

Instrumentation Information

|                       |                   |              |             |
|-----------------------|-------------------|--------------|-------------|
| Inst. Group ID: 5     | VEHNO: 2          | CURNO: 7     |             |
| SENTYP: AC            | SENLOC: 01        | SENATT: RBLU |             |
| AXIS: YL              | UNITS: G'S        | PREFIL: 1650 |             |
| INSMAN: MFG: ENDEVCO, | MODEL: 7264-2000, | S/N: BE33J   |             |
| CALDAT: 02/JAN/92     | INSRAT: 2000      | CHLMAX: 6    | INIVEL: 0.0 |
| NFP: -300             | NLP: 2999         | DELT: 100    | DASTAT: AM  |
| INSCOM: NO COMMENT    |                   |              |             |

Instrumentation Information

|                       |                   |              |             |
|-----------------------|-------------------|--------------|-------------|
| Inst. Group ID: 5     | VEHNO: 2          | CURNO: 8     |             |
| SENTYP: AC            | SENLOC: 01        | SENATT: RBLL |             |
| AXIS: YL              | UNITS: G'S        | PREFIL: 1650 |             |
| INSMAN: MFG: ENDEVCO, | MODEL: 7264-2000, | S/N: BY89H   |             |
| CALDAT: 02/JAN/92     | INSRAT: 2000      | CHLMAX: 6    | INIVEL: 0.0 |
| NFP: -300             | NLP: 2999         | DELT: 100    | DASTAT: AM  |
| INSCOM: NO COMMENT    |                   |              |             |

Instrumentation Information

|                       |                   |              |             |
|-----------------------|-------------------|--------------|-------------|
| Inst. Group ID: 5     | VEHNO: 2          | CURNO: 9     |             |
| SENTYP: AC            | SENLOC: 01        | SENATT: RBLL |             |
| AXIS: YL              | UNITS: G'S        | PREFIL: 1650 |             |
| INSMAN: MFG: ENDEVCO, | MODEL: 7264-2000, | S/N: BL93H   |             |
| CALDAT: 02/JAN/92     | INSRAT: 2000      | CHLMAX: 5    | INIVEL: 0.0 |
| NFP: -300             | NLP: 2999         | DELT: 100    | DASTAT: AM  |
| INSCOM: NO COMMENT    |                   |              |             |

Instrumentation Information

|                       |                   |              |             |
|-----------------------|-------------------|--------------|-------------|
| Inst. Group ID: 5     | VEHNO: 2          | CURNO: 10    |             |
| SENTYP: AC            | SENLOC: 01        | SENATT: SPNL |             |
| AXIS: YL              | UNITS: G'S        | PREFIL: 1650 |             |
| INSMAN: MFG: ENDEVCO, | MODEL: 7264-2000, | S/N: BF50J   |             |
| CALDAT: 02/JAN/92     | INSRAT: 2000      | CHLMAX: 5    | INIVEL: 0.0 |
| NFP: -300             | NLP: 2999         | DELT: 100    | DASTAT: AM  |
| INSCOM: NO COMMENT    |                   |              |             |

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 11  
SENTYP: AC      SENLOC: 01      SENATT: SPNL  
AXIS: YL      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: BH69J  
CALDAT: 02/JAN/92      INSRAT: 2000      CHLMAX: 5      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 12  
SENTYP: AC      SENLOC: 01      SENATT: PVCN  
AXIS: YL      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: BM73J  
CALDAT: 02/JAN/92      INSRAT: 2000      CHLMAX: 4      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 13  
SENTYP: LC      SENLOC: 01      SENATT: LPBO  
AXIS: NA      UNITS: LBS      PREFIL: 1650  
INSMAN: MFG: LEBOW, MODEL: 3371, S/N: 333  
CALDAT: 09/APR/92      INSRAT: 3500      CHLMAX: 22      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 14  
SENTYP: LC      SENLOC: 01      SENATT: SHBT  
AXIS: NA      UNITS: LBS      PREFIL: 1650  
INSMAN: MFG: LEBOW, MODEL: 3371, S/N: 327  
CALDAT: 09/APR/92      INSRAT: 3500      CHLMAX: 23      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 15  
SENTYP: AC      SENLOC: 04      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: 17      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

|   |             |              |             |
|---|-------------|--------------|-------------|
| Inst. Group ID: 5                                 | VEHNO: 2    | CURNO: 16    |             |
| SENTYP: AC  | SENLOC: 04  | 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: 31   | INIVEL: 0.0 |
| NFP: -300   | NLP: 2999   | DELT: 100    | DASTAT: AM  |
| INSCOM: NO COMMENT                                |             |              |             |

Instrumentation Information

|  |             |              |             |
|--|-------------|--------------|-------------|
| Inst. Group ID: 5                                | VEHNO: 2    | CURNO: 17    |             |
| SENTYP: AC                                       | SENLOC: 04  | 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: 29   | INIVEL: 0.0 |
| NFP: -300  | NLP: 2999   | DELT: 100    | DASTAT: AM  |
| INSCOM: NO COMMENT                               |             |              |             |

Instrumentation Information

|  |              |              |             |
|--|--------------|--------------|-------------|
| Inst. Group ID: 5                                  | VEHNO: 2     | CURNO: 18    |             |
| SENTYP: AC   | SENLOC: 04   | SENATT: SPNU |             |
| AXIS: YL   | UNITS: G'S   | PREFIL: 1650 |             |
| INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: BY98H |              |              |             |
| CALDAT: 02/JAN/92                                  | INSRAT: 2000 | CHLMAX: 3    | INIVEL: 0.0 |
| NFP: -300  | NLP: 2999    | DELT: 100    | DASTAT: AM  |
| INSCOM: NO COMMENT                                 |              |              |             |

Instrumentation Information

|   |              |              |             |
|---|--------------|--------------|-------------|
| Inst. Group ID: 5                                   | VEHNO: 2     | CURNO: 19    |             |
| SENTYP: AC  | SENLOC: 04   | SENATT: SPNU |             |
| AXIS: YL  | UNITS: G'S   | PREFIL: 1650 |             |
| INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: BH27J  |              |              |             |
| CALDAT: 02/JAN/92                                   | INSRAT: 2000 | CHLMAX: 0    | INIVEL: 0.0 |
| NFP: -300   | NLP: 2999    | DELT: 100    | DASTAT: MN  |
| INSCOM: NO DATA COLLECTED ON THIS REDUNDANT CHANNEL |              |              |             |

Instrumentation Information

|   |              |              |             |
|---|--------------|--------------|-------------|
| Inst. Group ID: 5                                 | VEHNO: 2     | CURNO: 20    |             |
| SENTYP: AC  | SENLOC: 04   | SENATT: RBLU |             |
| AXIS: YL  | UNITS: G'S   | PREFIL: 1650 |             |
| INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: AN03 |              |              |             |
| CALDAT: 02/JAN/92                                 | INSRAT: 2000 | CHLMAX: 4    | INIVEL: 0.0 |
| NFP: -300   | NLP: 2999    | DELT: 100    | DASTAT: AM  |
| INSCOM: NO COMMENT                                |              |              |             |

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2                      CURNO: 21  
SENTYP: AC              SENLOC: 04                      SENATT: RBLU  
AXIS: YL                      UNITS: G'S                      PREFIL: 1650  
INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: AR17  
CALDAT: 02/JAN/92      INSRAT: 2000                      CHLMAX: 4                      INIVEL: 0.0  
NFP: -300                      NLP: 2999                      DELT: 100                      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2                      CURNO: 22  
SENTYP: AC              SENLOC: 04                      SENATT: RBLU  
AXIS: YL                      UNITS: G'S                      PREFIL: 1650  
INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: AK29  
CALDAT: 02/JAN/92      INSRAT: 2000                      CHLMAX: 5                      INIVEL: 0.0  
NFP: -300                      NLP: 2999                      DELT: 100                      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2                      CURNO: 23  
SENTYP: AC              SENLOC: 04                      SENATT: RBLU  
AXIS: YL                      UNITS: G'S                      PREFIL: 1650  
INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: BA93  
CALDAT: 02/JAN/92      INSRAT: 2000                      CHLMAX: 5                      INIVEL: 0.0  
NFP: -300                      NLP: 2999                      DELT: 100                      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2                      CURNO: 24  
SENTYP: AC              SENLOC: 04                      SENATT: SPNL  
AXIS: YL                      UNITS: G'S                      PREFIL: 1650  
INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: BD12J  
CALDAT: 02/JAN/92      INSRAT: 2000                      CHLMAX: 3                      INIVEL: 0.0  
NFP: -300                      NLP: 2999                      DELT: 100                      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2                      CURNO: 25  
SENTYP: AC              SENLOC: 04                      SENATT: SPNL  
AXIS: YL                      UNITS: G'S                      PREFIL: 1650  
INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: BE91J  
CALDAT: 02/JAN/92      INSRAT: 2000                      CHLMAX: 3                      INIVEL: 0.0  
NFP: -300                      NLP: 2999                      DELT: 100                      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 26  
 SENTYP: AC      SENLOC: 04      SENATT: PVCN  
 AXIS: YL      UNITS: G'S      PREFIL: 1650  
 INSMAN: MFG: ENDEVCO, MODEL: 7264-2000, S/N: BC98J  
 CALDAT: 02/JAN/92      INSRAT: 2000      CHLMAX: 4      INIVEL: 0.0  
 NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
 INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 27  
 SENTYP: LC      SENLOC: 04      SENATT: LPBO  
 AXIS: NA      UNITS: LBS      PREFIL: 1650  
 INSMAN: MFG: LEBOW, MODEL: 3371, S/N: 330  
 CALDAT: 09/APR/92      INSRAT: 3500      CHLMAX: 13      INIVEL: 0.0  
 NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
 INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 28  
 SENTYP: LC      SENLOC: 04      SENATT: SHBT  
 AXIS: NA      UNITS: LBS      PREFIL: 1650  
 INSMAN: MFG: LEBOW, MODEL: 3371, S/N: 308  
 CALDAT: 09/APR/92      INSRAT: 3500      CHLMAX: 8      INIVEL: 0.0  
 NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
 INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 29  
 SENTYP: AC      SENLOC: 02      SENATT: DSRF  
 AXIS: XG      UNITS: G'S      PREFIL: 1650  
 INSMAN: MFG: BELL & HOWELL, MODEL: 4-202-0001, S/N: 21051  
 CALDAT: 10/APR/92      INSRAT: 250      CHLMAX: 13      INIVEL: 0.0  
 NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
 INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 30  
 SENTYP: AC      SENLOC: 02      SENATT: DSRF  
 AXIS: YG      UNITS: G'S      PREFIL: 1650  
 INSMAN: MFG: BELL & HOWELL, MODEL: 4-202-0001, S/N: 20839  
 CALDAT: 10/APR/92      INSRAT: 250      CHLMAX: 13      INIVEL: 0.0  
 NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
 INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 31  
SENTYP: AC      SENLOC: 02      SENATT: DSRF  
AXIS: ZG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: BELL & HOWELL, MODEL: 4-202-0001, S/N: 19428  
CALDAT: 10/APR/92      INSRAT: 250      CHLMAX: 11      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 32  
SENTYP: AC      SENLOC: 03      SENATT: DSRR  
AXIS: XG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 1X-200  
CALDAT: 10/APR/92      INSRAT: 200      CHLMAX: 16      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 33  
SENTYP: AC      SENLOC: 03      SENATT: DSRR  
AXIS: YG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 1Y-200  
CALDAT: 10/APR/92      INSRAT: 200      CHLMAX: 28      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 34  
SENTYP: AC      SENLOC: 03      SENATT: DSRR  
AXIS: ZG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 1Z-200  
CALDAT: 10/APR/92      INSRAT: 200      CHLMAX: 44      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 35  
SENTYP: AC      SENLOC: 03      SENATT: FLRR  
AXIS: XG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 2X-200  
CALDAT: 10/APR/92      INSRAT: 200      CHLMAX: 26      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2                      CURNO: 36  
SENTYP: AC              SENLOC: 03                      SENATT: FLRR  
AXIS: YG                UNITS: G'S                      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 2Y-200  
CALDAT: 10/APR/92      INSRAT: 200                      CHLMAX: 31  
NFP: -300                NLP: 2999                        DELT: 100  
INSCOM: NO COMMENT  
INIVEL: 0.0  
DASTAT: AM

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2                      CURNO: 37  
SENTYP: AC              SENLOC: 03                      SENATT: FLRR  
AXIS: ZG                UNITS: G'S                      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 2Z-200  
CALDAT: 10/APR/92      INSRAT: 200                      CHLMAX: 23  
NFP: -300                NLP: 2999                        DELT: 100  
INSCOM: NO COMMENT  
INIVEL: 0.0  
DASTAT: AM

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2                      CURNO: 38  
SENTYP: AC              SENLOC: 04                      SENATT: DSLR  
AXIS: YG                UNITS: G'S                      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 20-200  
CALDAT: 10/APR/92      INSRAT: 200                      CHLMAX: 57  
NFP: -300                NLP: 2999                        DELT: 100  
INSCOM: NO COMMENT  
INIVEL: 0.0  
DASTAT: AM

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2                      CURNO: 39  
SENTYP: AC              SENLOC: 01                      SENATT: DSLF  
AXIS: YG                UNITS: G'S                      PREFIL: 1650  
INSMAN: MFG: I.C. SENSOR, MODEL: 3031-200, S/N: 24-200  
CALDAT: 10/APR/92      INSRAT: 200                      CHLMAX: 62  
NFP: -300                NLP: 2999                        DELT: 100  
INSCOM: NO COMMENT  
INIVEL: 0.0  
DASTAT: AM

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2                      CURNO: 40  
SENTYP: AC              SENLOC: 01                      SENATT: DRLF  
AXIS: YG                UNITS: G'S                      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 27-200  
CALDAT: 10/APR/92      INSRAT: 200                      CHLMAX: 156  
NFP: -300                NLP: 2999                        DELT: 100  
INSCOM: NO COMMENT  
INIVEL: 0.0  
DASTAT: AM

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 41  
SENTYP: AC      SENLOC: OT      SENATT: FLRR  
AXIS: XG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 22-200  
CALDAT: 10/APR/92      INSRAT: 250      CHLMAX: 9      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 42  
SENTYP: AC      SENLOC: OT      SENATT: DRLF  
AXIS: YG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 30-200  
CALDAT: 10/APR/92      INSRAT: 200      CHLMAX: 131      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 43  
SENTYP: AC      SENLOC: NA      SENATT: DRLF  
AXIS: YG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 26-200  
CALDAT: 10/APR/92      INSRAT: 200      CHLMAX: 100      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 44  
SENTYP: AC      SENLOC: NA      SENATT: DRLR  
AXIS: YG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 29-200  
CALDAT: 10/APR/92      INSRAT: 200      CHLMAX: 207      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: CF  
INSCOM: CHANNEL FAILED AT 15.3 MSEC

Instrumentation Information

Inst. Group ID: 5      VEHNO: 2      CURNO: 45  
SENTYP: AC      SENLOC: NA      SENATT: DRLR  
AXIS: YG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 23-200  
CALDAT: 10/APR/92      INSRAT: 200      CHLMAX: 151      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: CF  
INSCOM: CHANNEL FAILED AT 17.0 MSEC

Instrumentation Information

Inst. Group ID: 5      VEHNO: 1      CURNO: 46  
SENTYP: AC      SENLOC: OT      SENATT: IMCG  
AXIS: XG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 28-200  
CALDAT: 10/APR/92      INSRAT: 200      CHLMAX: 22      INIVEL: 29.4  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 1      CURNO: 47  
SENTYP: AC      SENLOC: OT      SENATT: IMCG  
AXIS: YG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 31-200  
CALDAT: 10/APR/92      INSRAT: 200      CHLMAX: 10      INIVEL: 15.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 1      CURNO: 48  
SENTYP: AC      SENLOC: NA      SENATT: IMCG  
AXIS: ZG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-200, S/N: 32-200  
CALDAT: 10/APR/92      INSRAT: 200      CHLMAX: 26      INIVEL: 0.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 1      CURNO: 49  
SENTYP: AC      SENLOC: NA      SENATT: IMCR  
AXIS: XG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-100, S/N: 7Z-100  
CALDAT: 10/APR/92      INSRAT: 100      CHLMAX: 73      INIVEL: 29.4  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

Instrumentation Information

Inst. Group ID: 5      VEHNO: 1      CURNO: 50  
SENTYP: AC      SENLOC: NA      SENATT: IMCR  
AXIS: YG      UNITS: G'S      PREFIL: 1650  
INSMAN: MFG: I.C. SENSORS, MODEL: 3031-100, S/N: 7X-100  
CALDAT: 10/APR/92      INSRAT: 100      CHLMAX: 28      INIVEL: 15.0  
NFP: -300      NLP: 2999      DELT: 100      DASTAT: AM  
INSCOM: NO COMMENT

## SECTION 5

### PHOTOGRAPHS

The photographs listed on this page are included in this section.

1. Pretest Frontal View of Test Vehicle (Target Vehicle)
2. Posttest Frontal View of Test Vehicle
3. Pretest Rear View of Test Vehicle
4. Posttest Rear View of Test Vehicle
5. Pretest Struck Side View of Test Vehicle
6. Posttest Struck Side View of Test Vehicle
7. Pretest Frontal View of MDB Impact Face
8. Posttest Frontal View of MDB Impact Face
9. Pretest Left Side view of MDB Impact Face
10. Posttest Left Side View of MDB Impact Face
11. Pretest Right Side View of MDB Impact Face
12. Posttest Right Side View of MDB Impact Face
13. Pretest Top View of MDB Impact Face
14. Posttest Top View of MDB Impact Face
15. Pretest Overhead View of MDB Positioned Against Struck Side of Test Vehicle at Impact Locations
16. Posttest Overhead View of MDB Positioned Against Struck Side of Test Vehicle at Impact Locations
17. Pretest Occupant Compartment Left Side Showing Driver SID
18. Pretest Occupant Compartment Right Side Showing Driver SID
19. Posttest Occupant Compartment Showing Driver SID
20. Pretest Occupant Compartment Left Side Showing Passenger SID
21. Pretest Occupant Compartment Right Side Showing Passenger SID
22. Posttest Occupant Compartment Showing Passenger SID
23. Pretest Right Side View of MDB with Impact Face in Position
24. Pretest Left Side View of MDB with Impact Face in Position
25. Test Vehicle Tire Placard and Manufacturer's Certification Label
26. Driver Door Accelerometer Locations
27. Pretest Driver Door Interior View
28. Posttest Driver Door Interior View
29. Pretest Passenger Interior Showing Accelerometer Locations
30. Pretest Passenger Door Interior View
31. Posttest Passenger Door Interior View

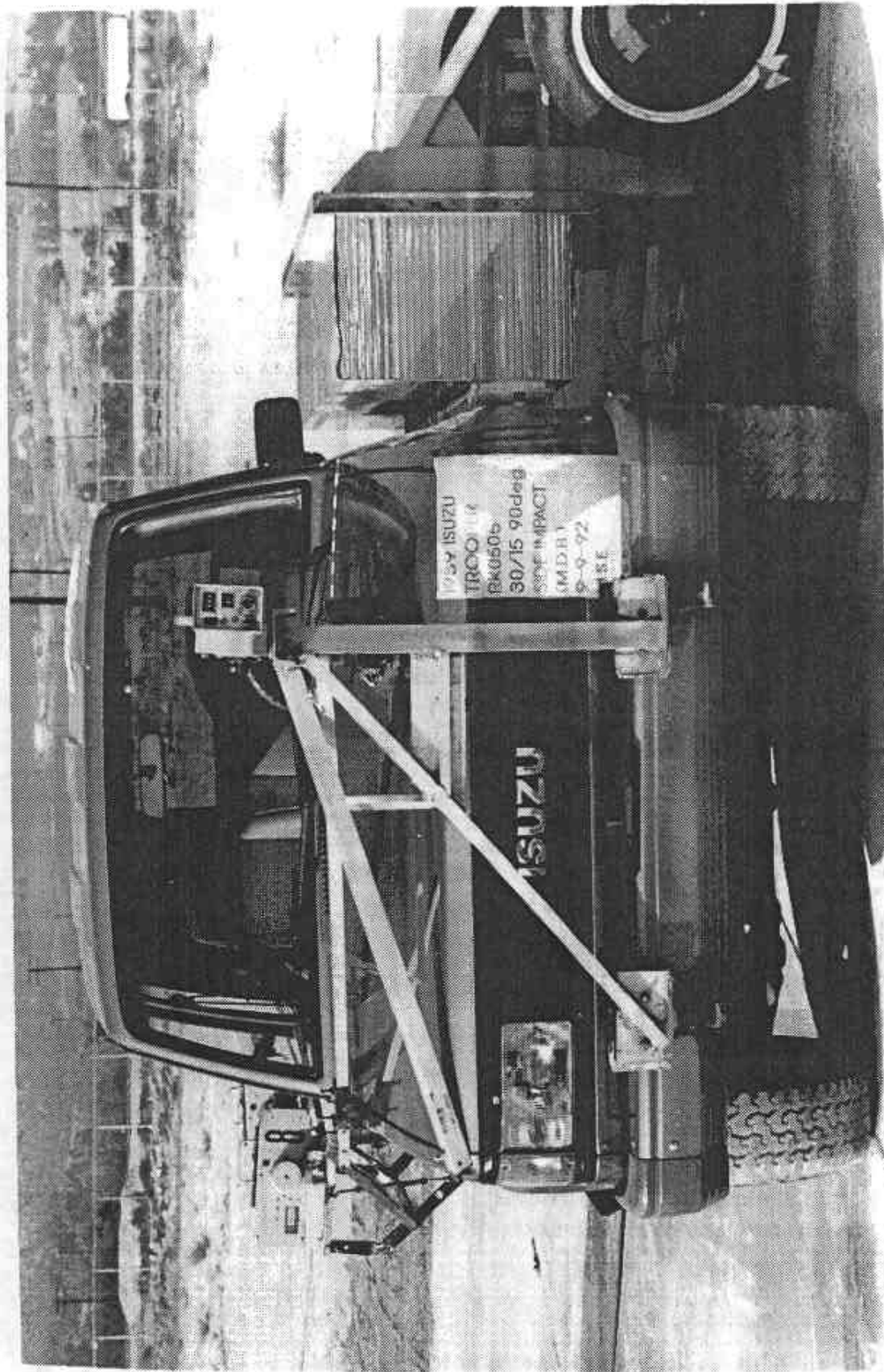


FIGURE 5-1 PRETEST FRONTAL VIEW OF TEST VEHICLE (TARGET VEHICLE)

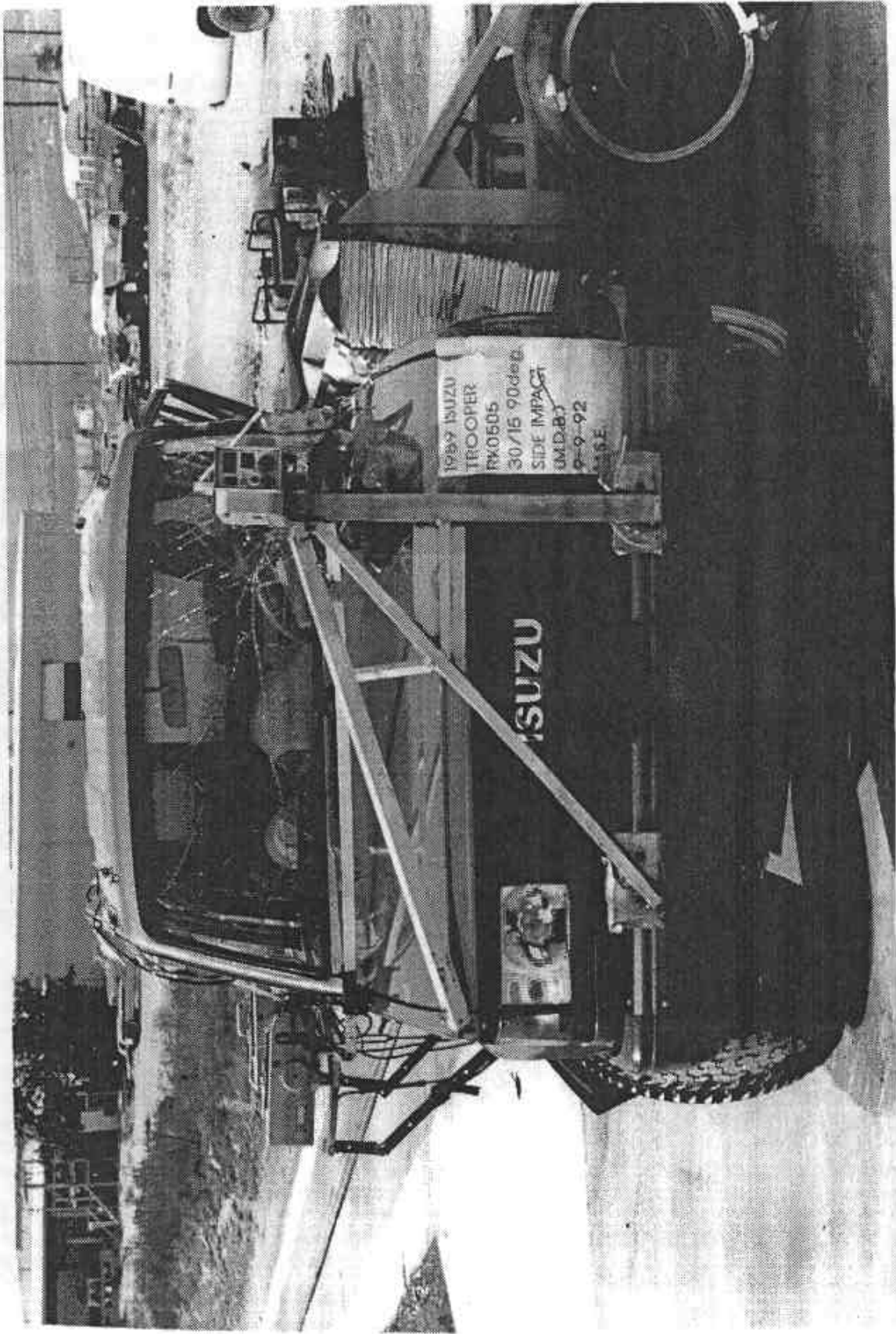


FIGURE 5-2 POSTTEST FRONTAL VIEW OF TEST VEHICLE

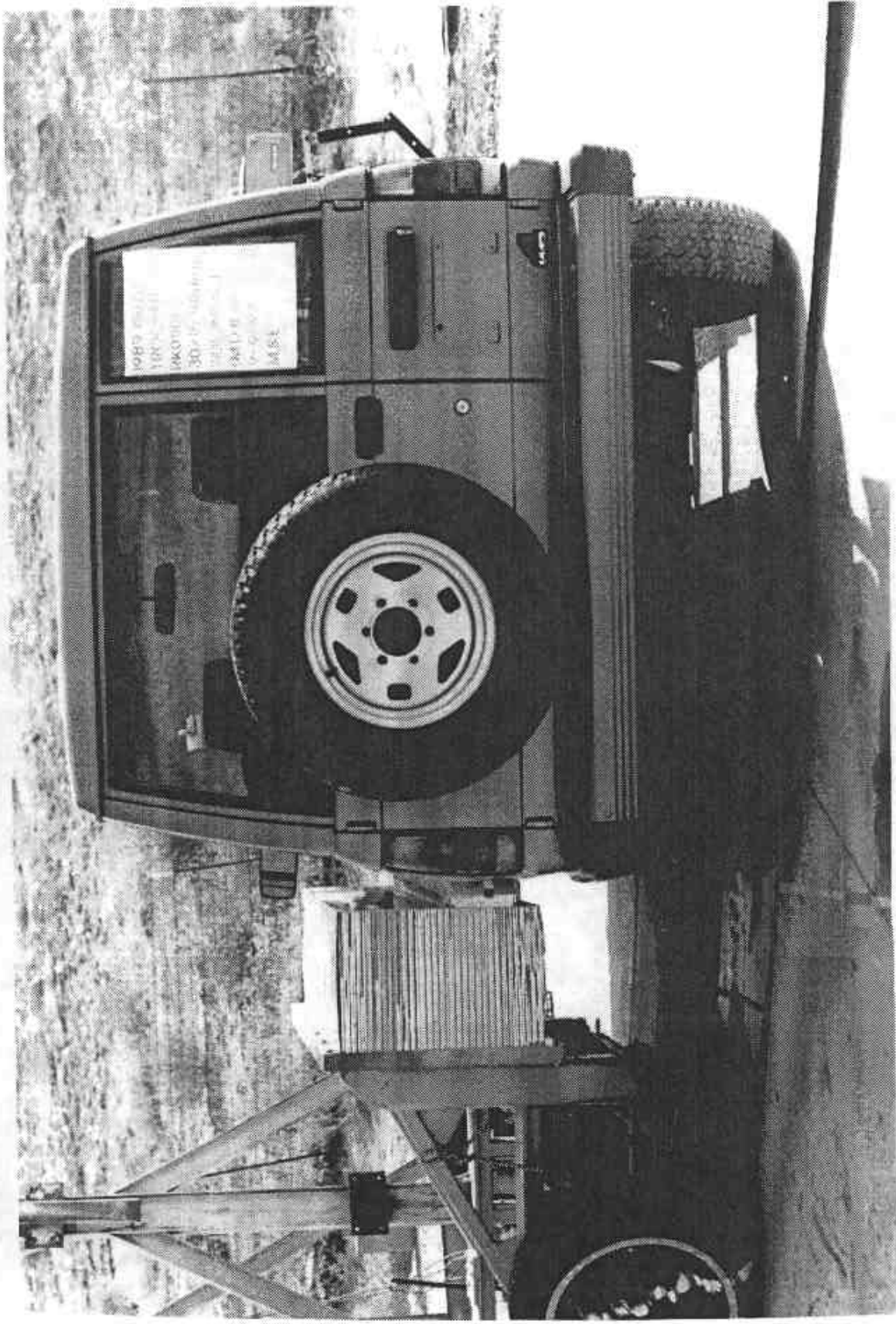


FIGURE 5-3 PRETEST REAR VIEW OF TEST VEHICLE

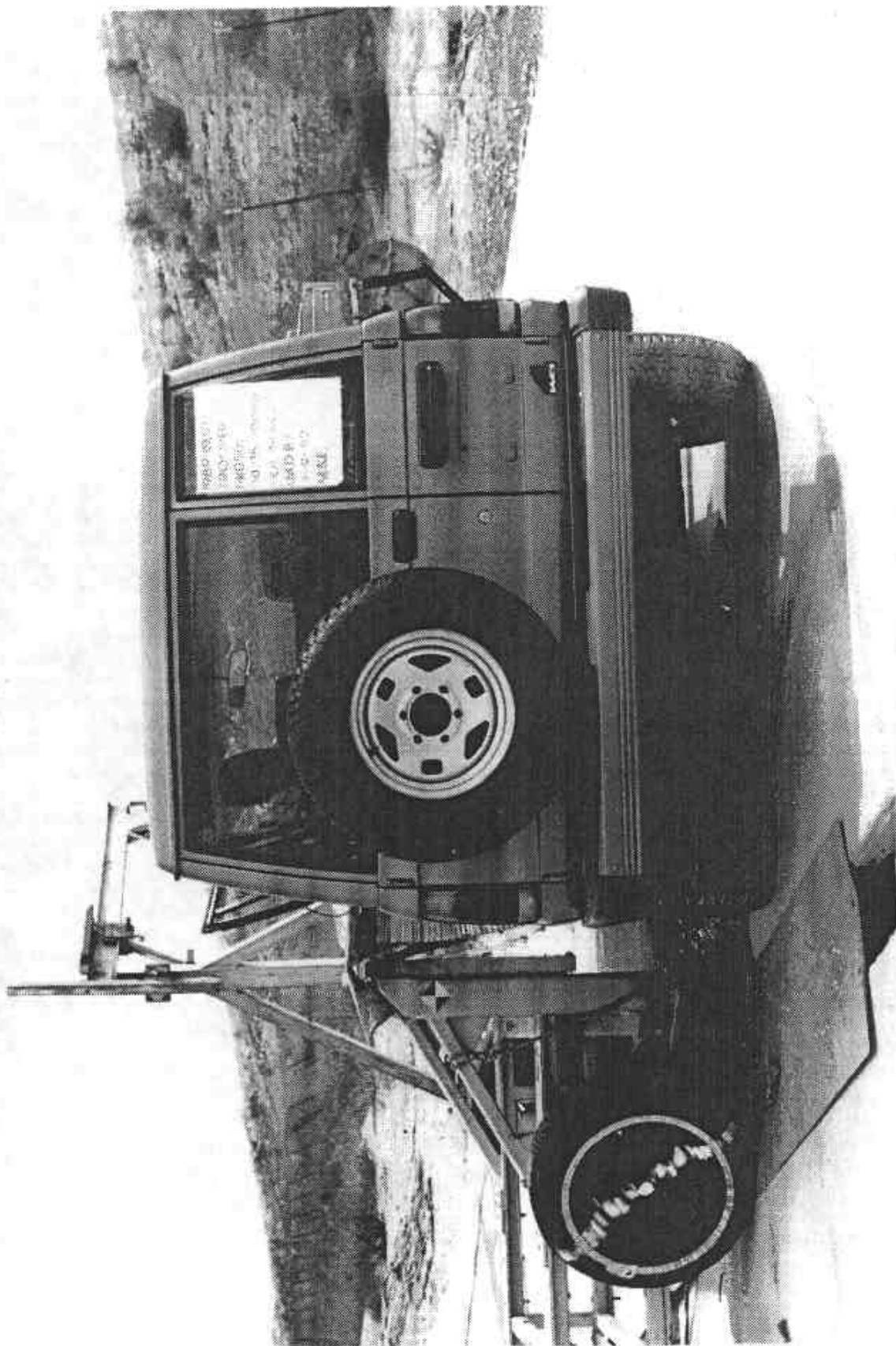


FIGURE 5-4 POSTTEST REAR VIEW OF TEST VEHICLE

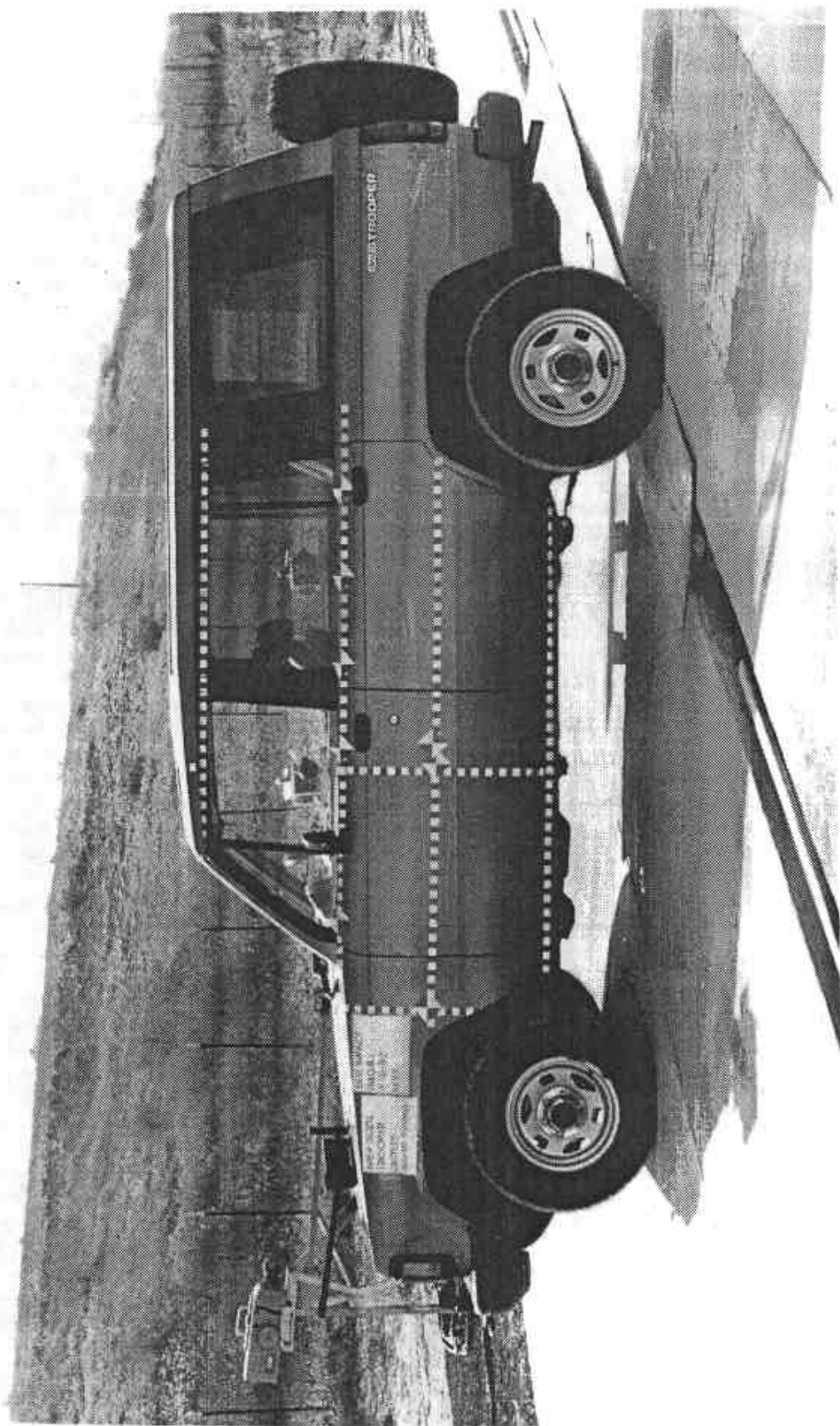


FIGURE 5-5 PRETEST STRUCK SIDE VIEW OF TEST VEHICLE

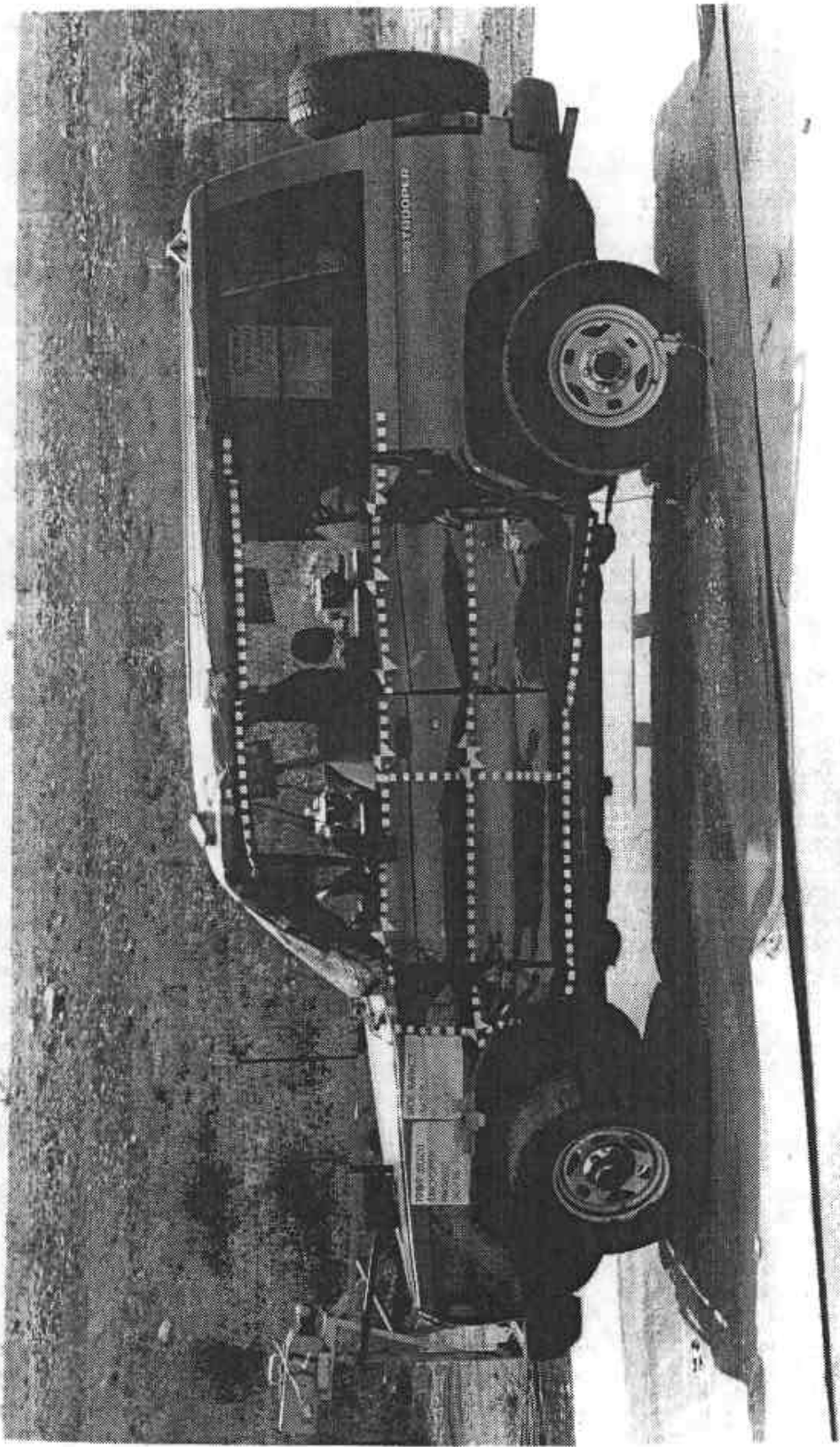


FIGURE 5-6 POSTTEST STRUCK SIDE VIEW OF TEST VEHICLE

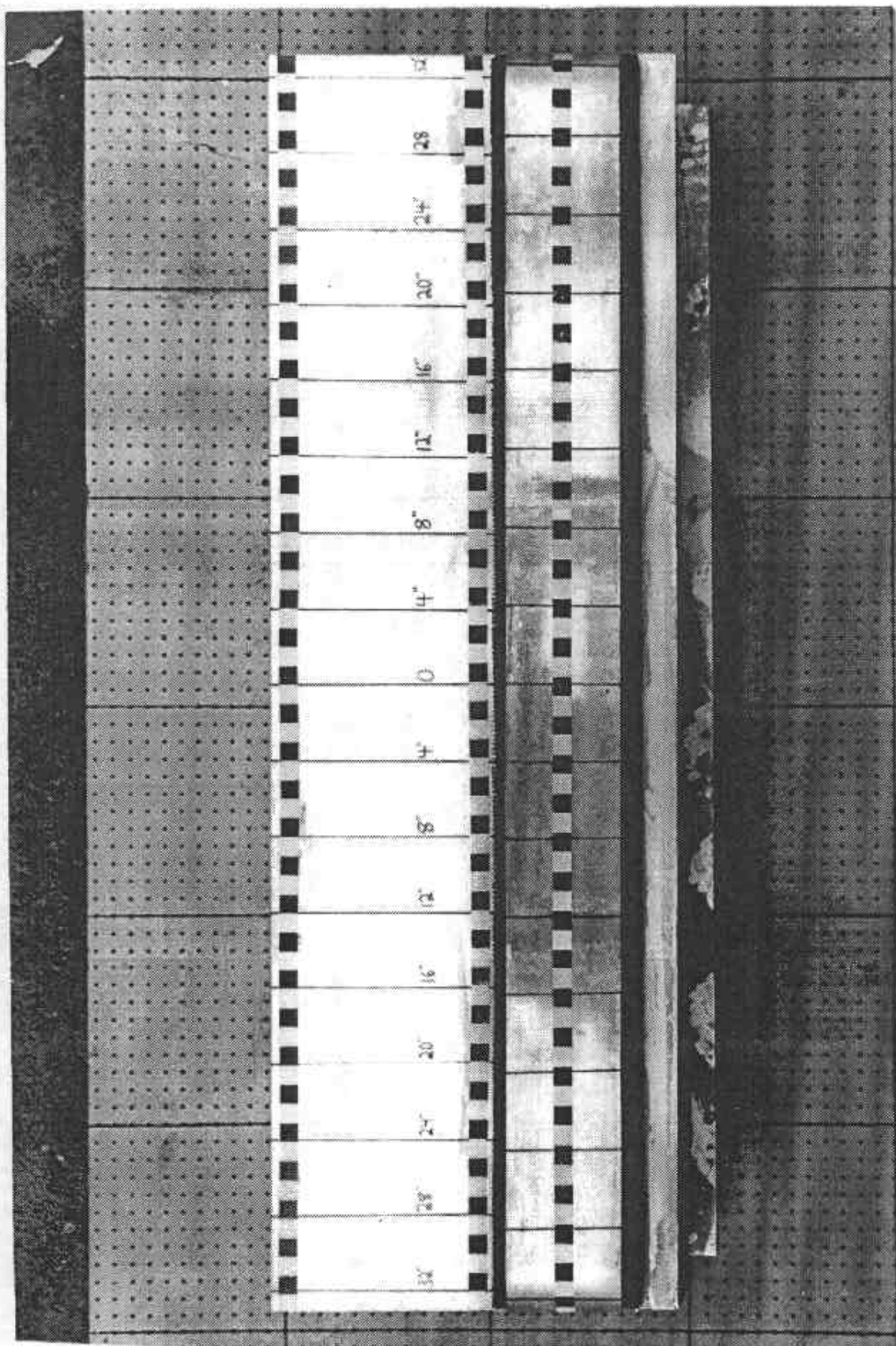


FIGURE 5-7 PRETEST FRONTAL VIEW OF MDB IMPACT FACE

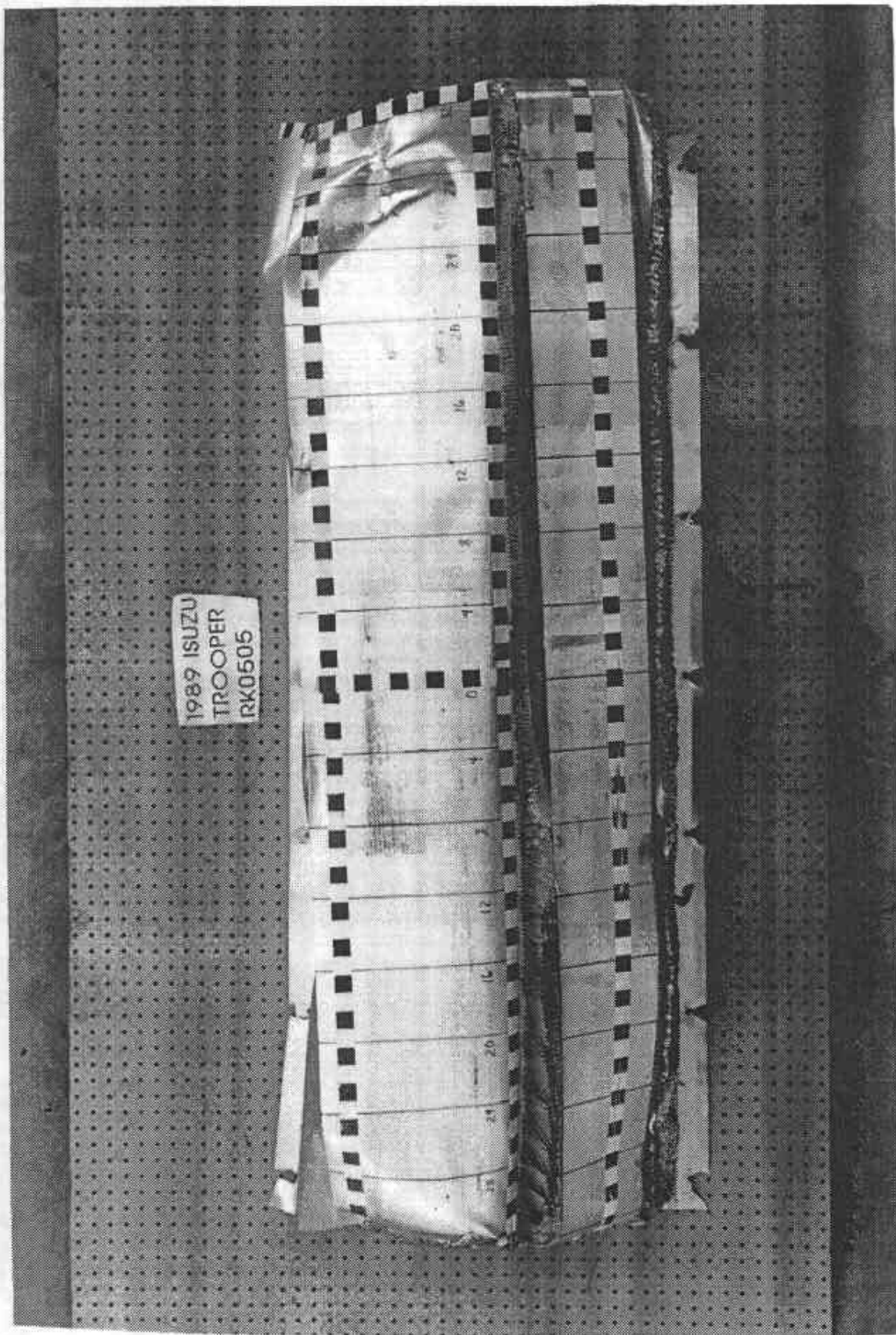


FIGURE 5-8 POSTTEST FRONTAL VIEW OF MDB IMPACT FACE

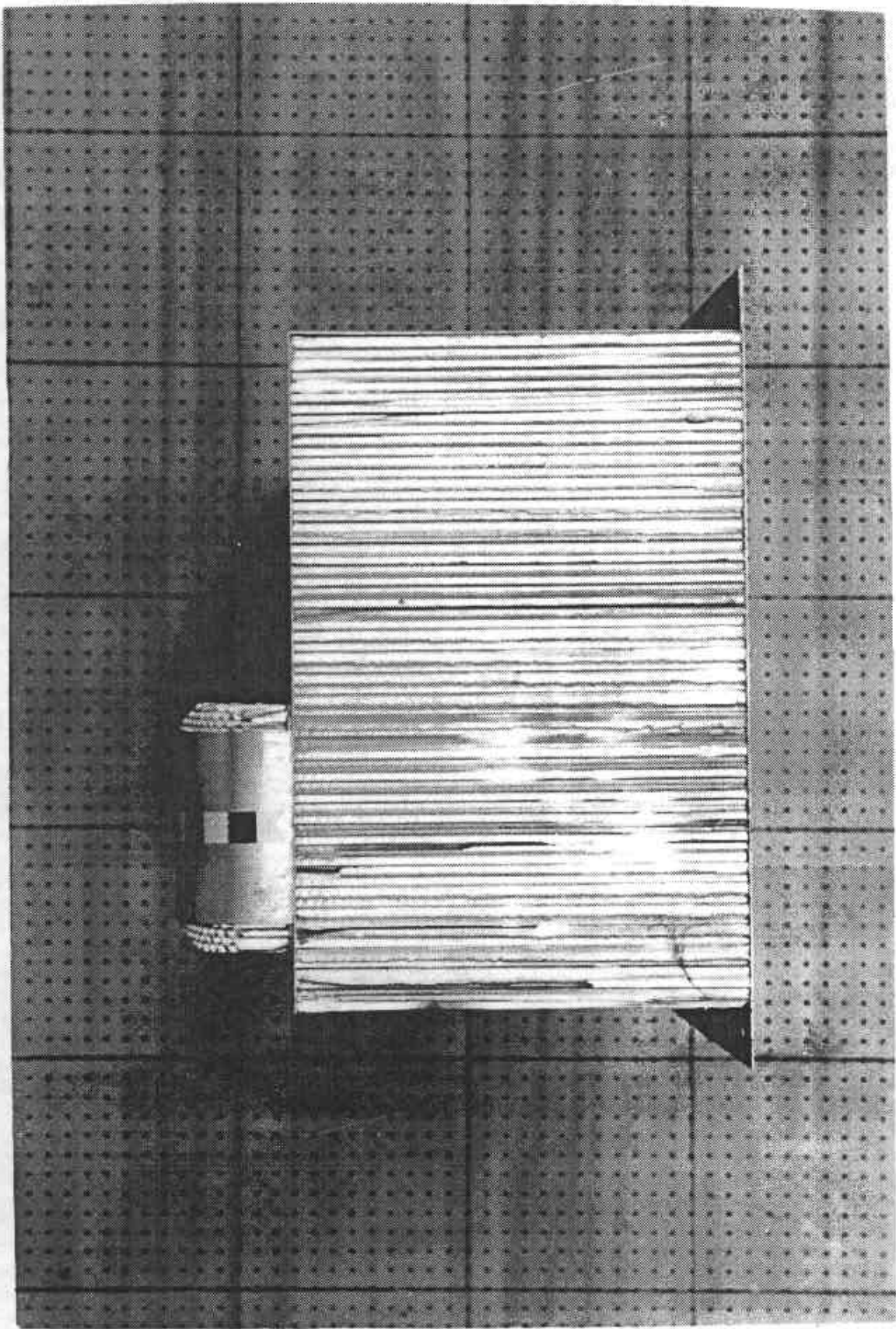


FIGURE 5-9 PRETEST LEFT SIDE VIEW OF MDB IMPACT FACE

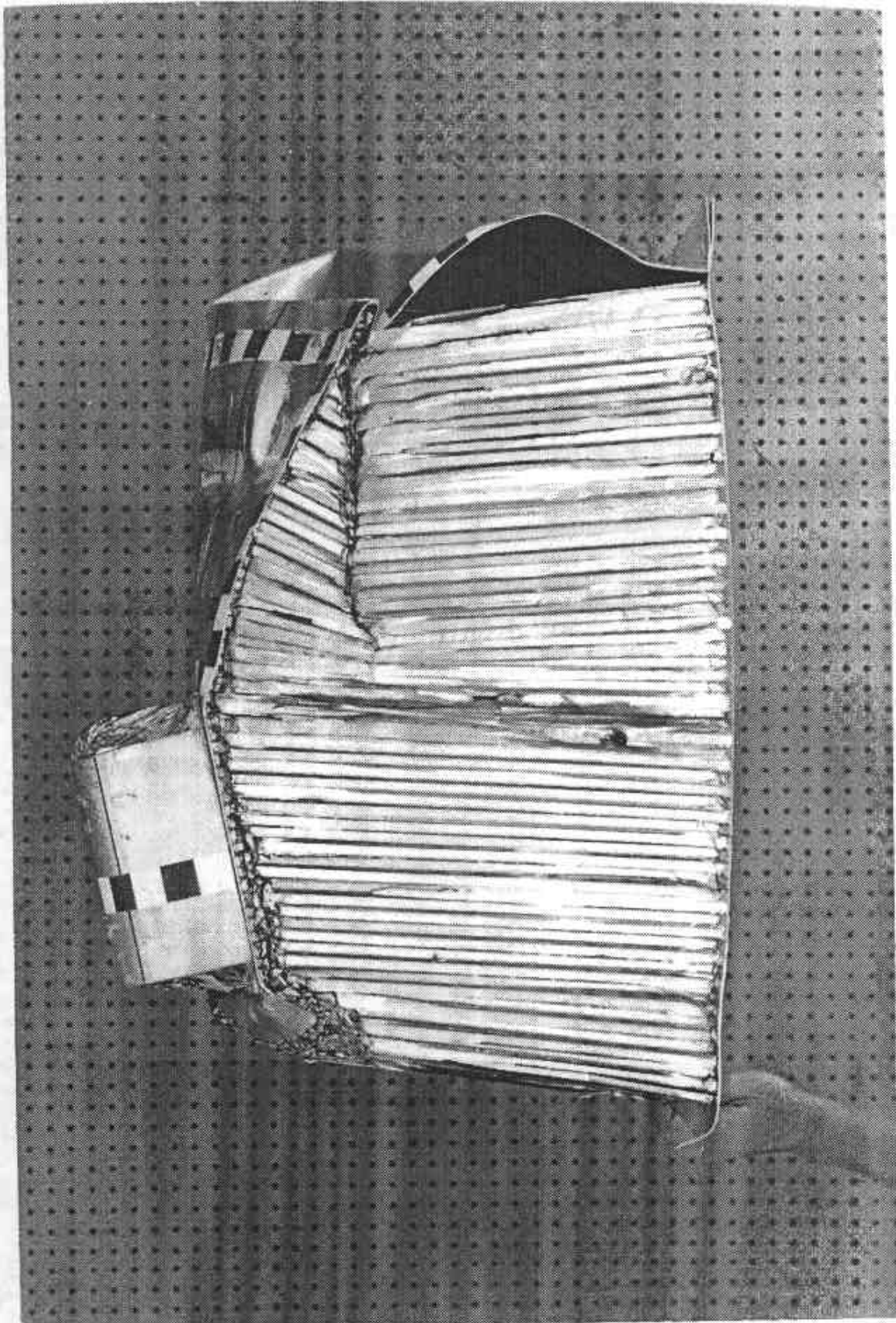


FIGURE 5-10 POSTTEST LEFT SIDE VIEW OF MDB IMPACT FACE

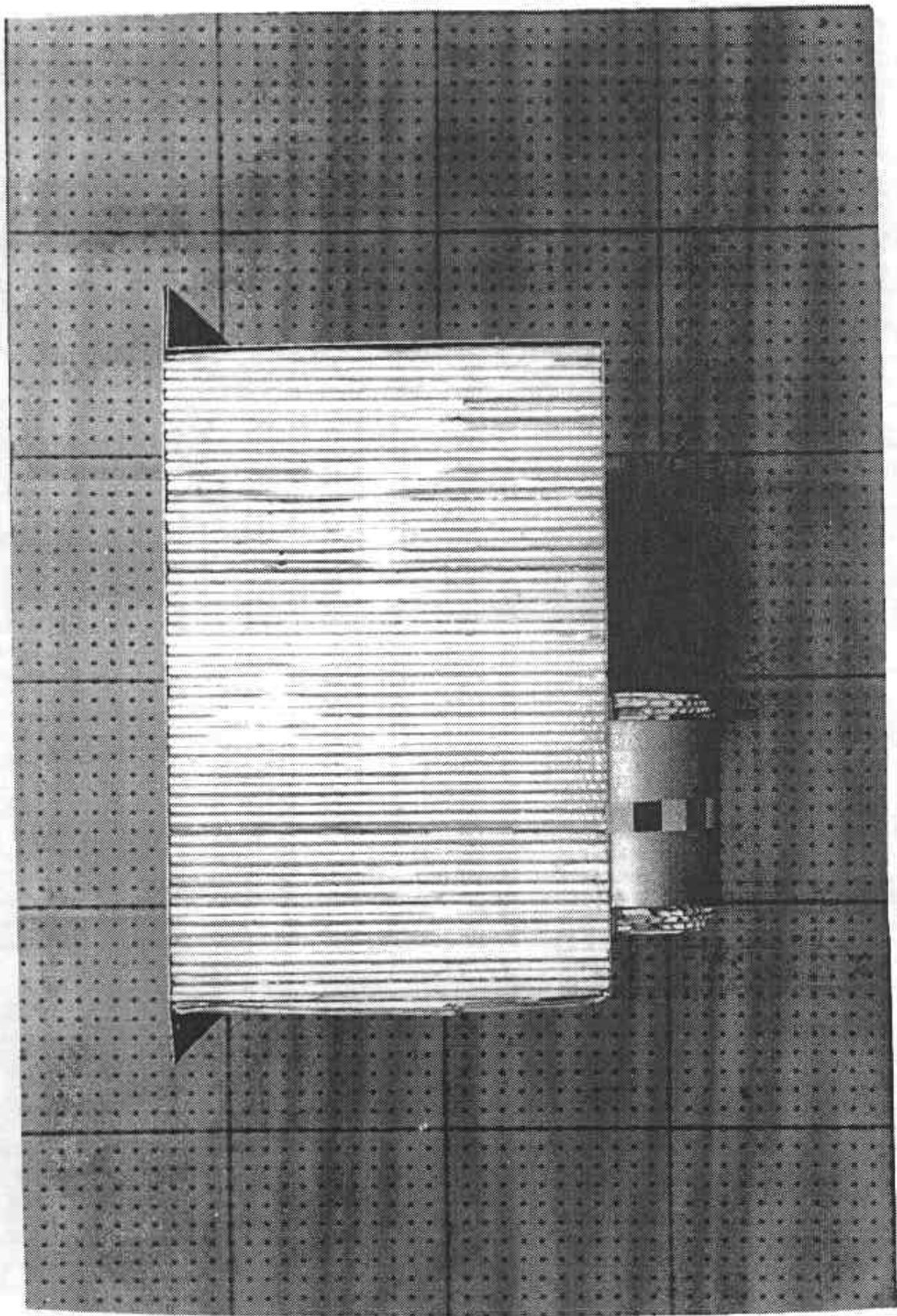


FIGURE 5-11 PRETEST RIGHT SIDE VIEW OF MDB IMPACT FACE

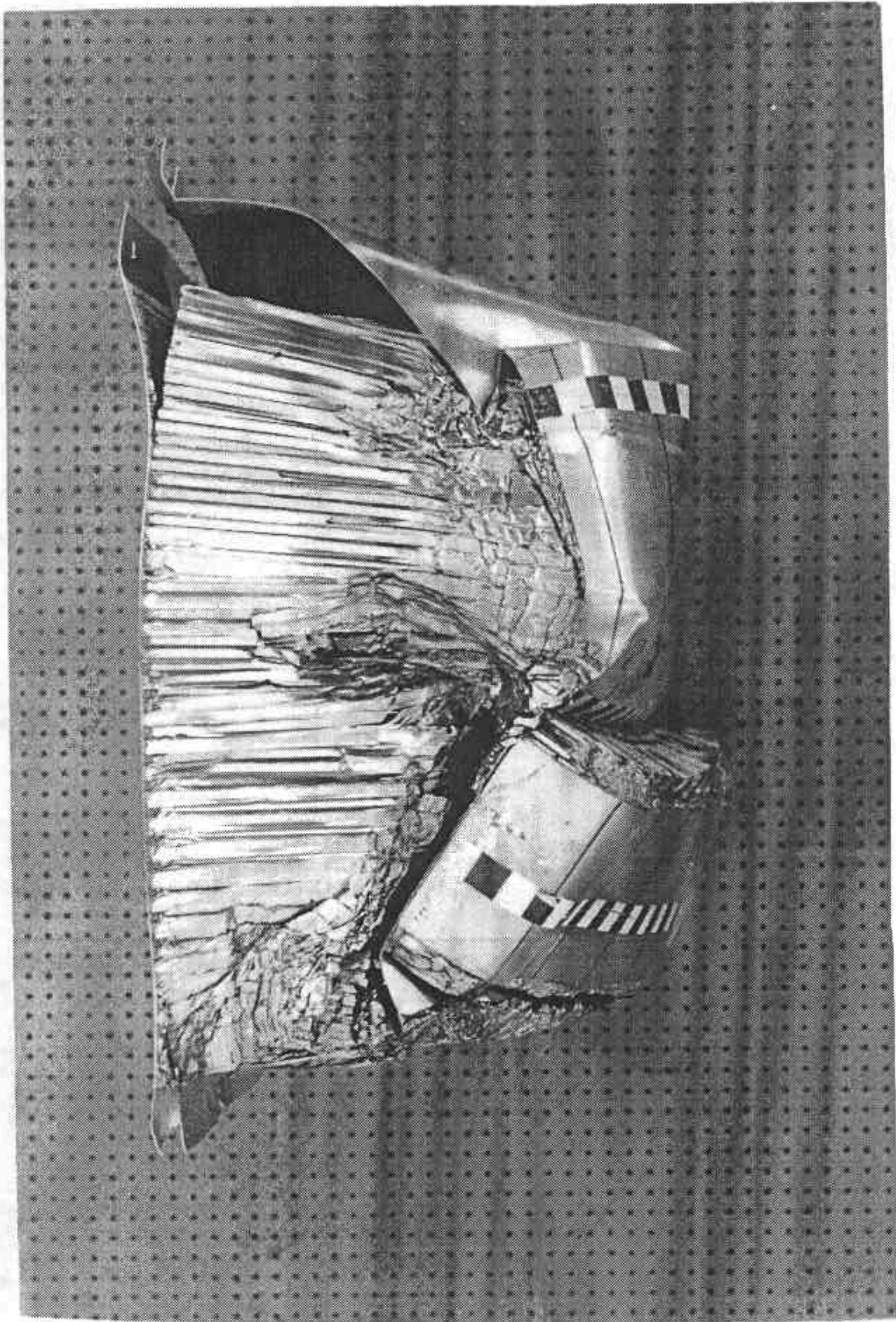


FIGURE 5-12 POSTTEST RIGHT SIDE VIEW OF MDB IMPACT FACE

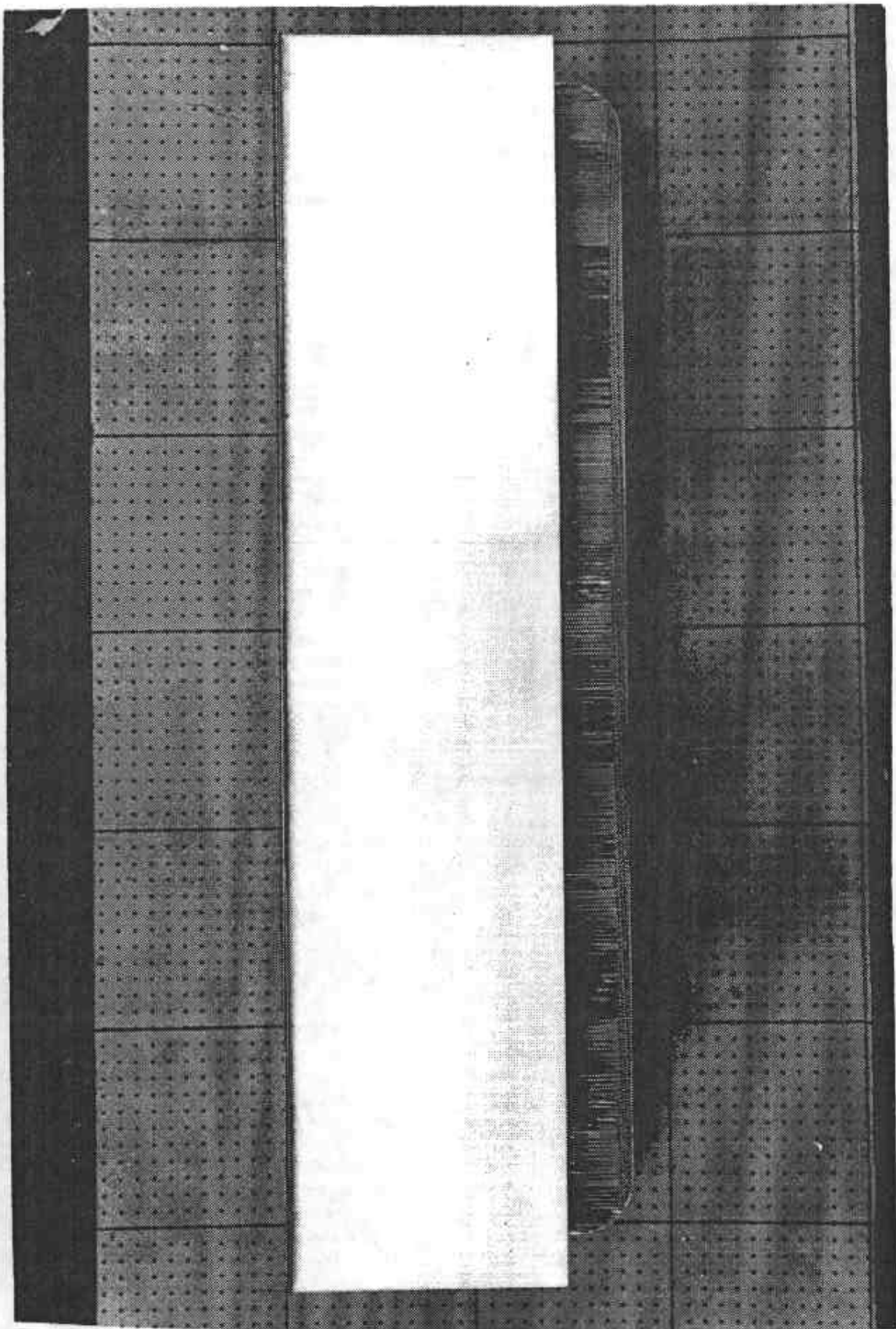


FIGURE 5-13 PRETEST TOP VIEW OF MDB IMPACT FACE

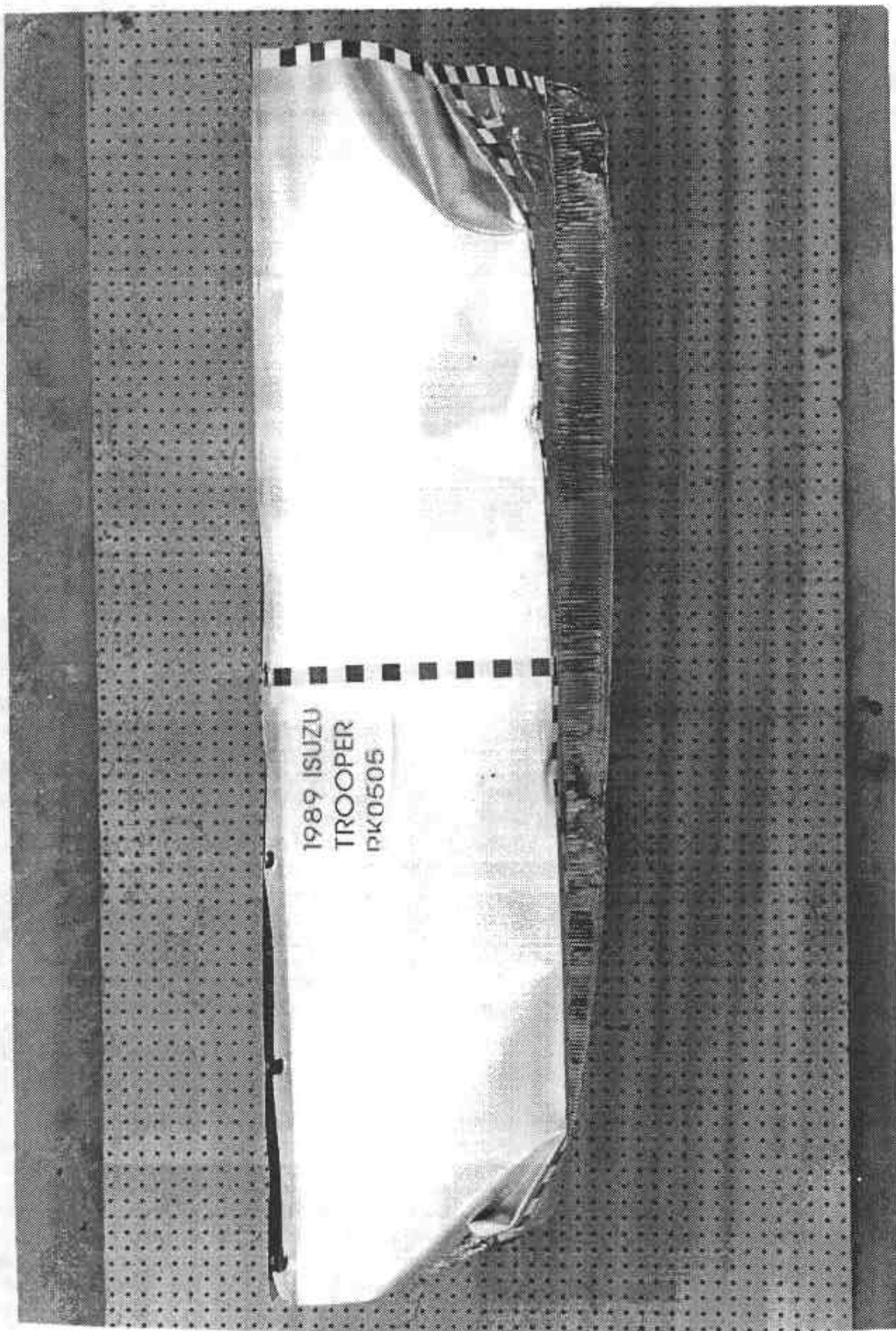


FIGURE 5-14 POSTTEST TOP VIEW OF MDB IMPACT FACE

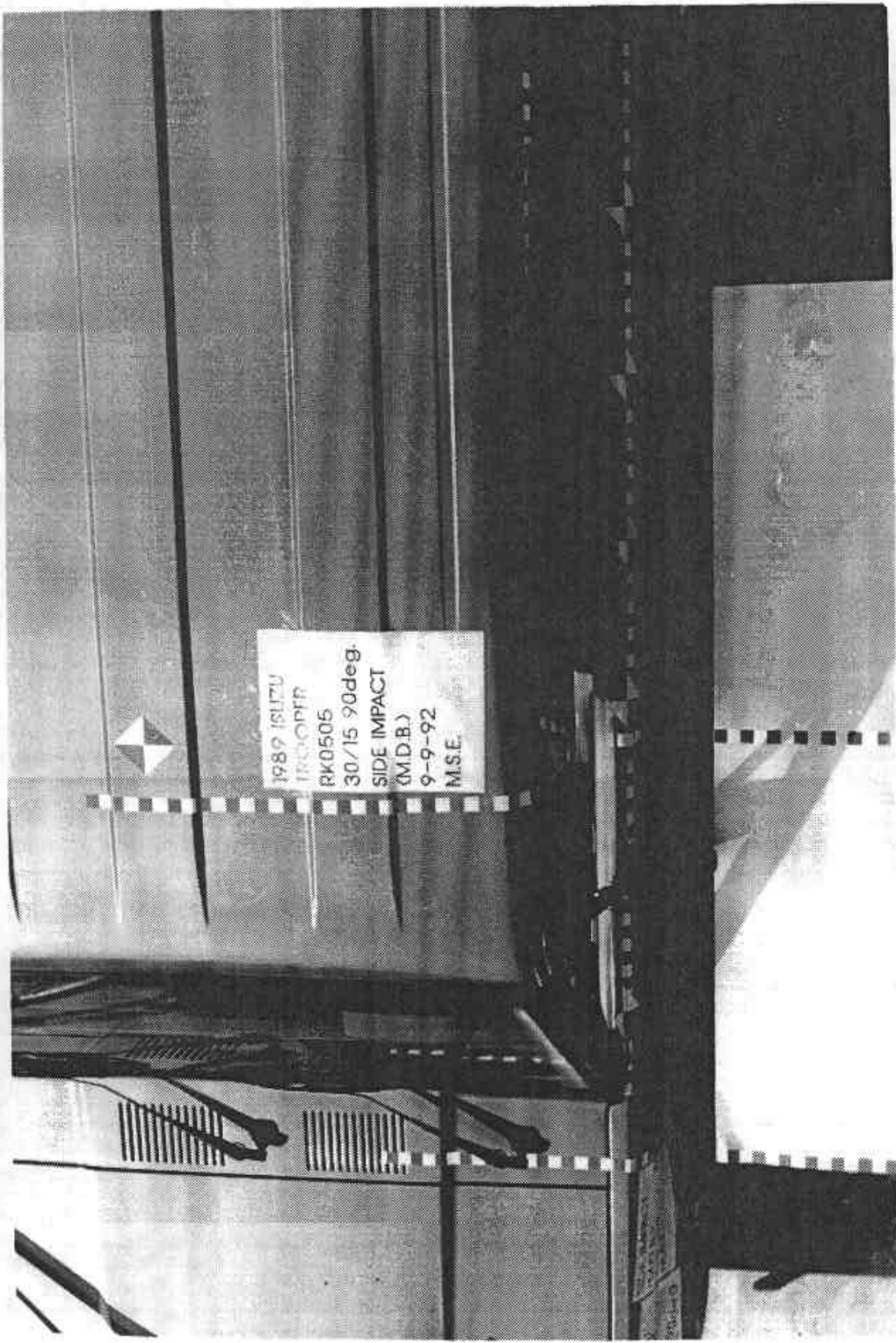


FIGURE 5-15 PRETEST OVERHEAD VIEW OF MDB POSITIONED AGAINST STRUCK SIDE OF TEST VEHICLE AT IMPACT LOCATION

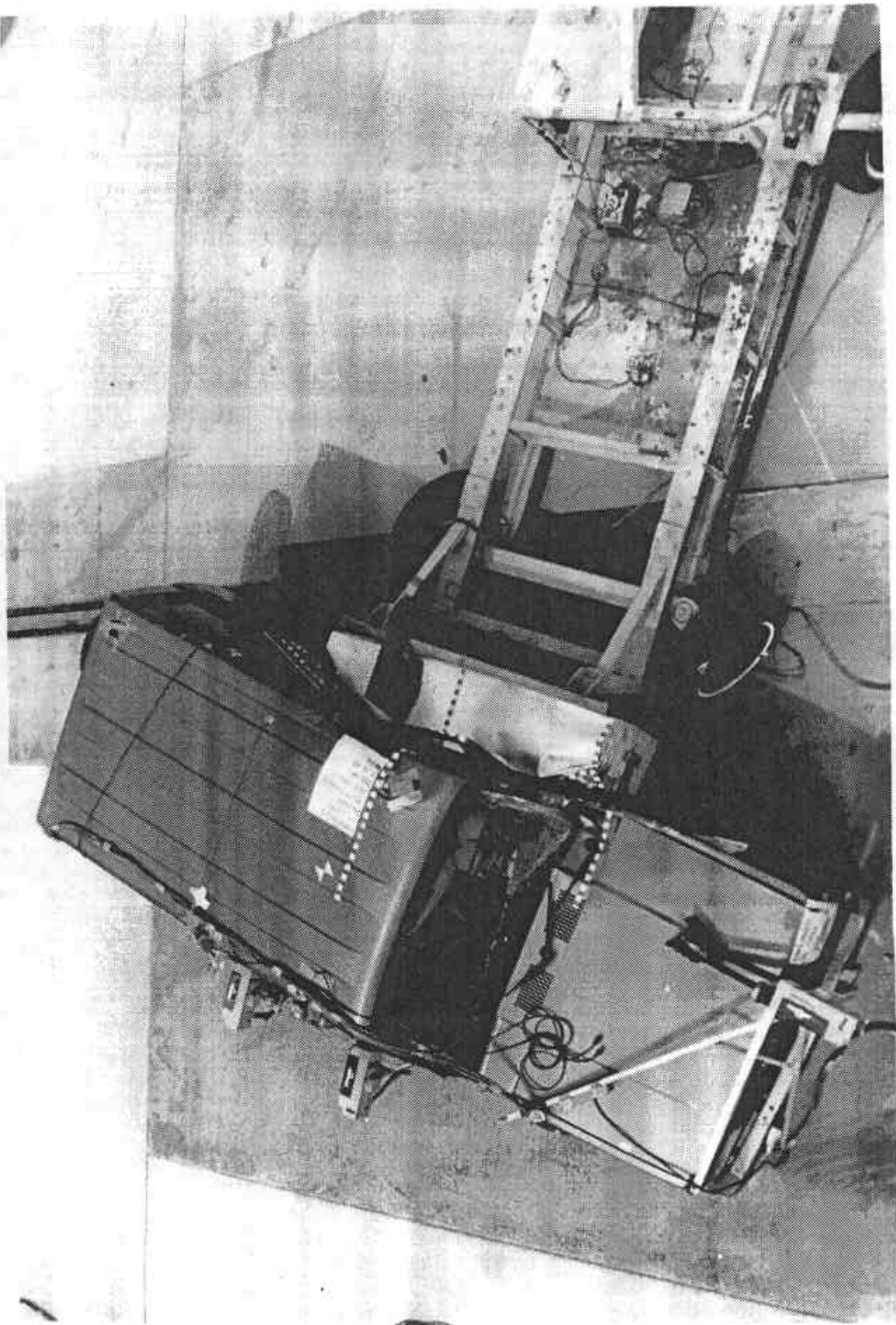


FIGURE 5-16 POSTTEST OVERHEAD VIEW OF MDB POSITIONED AGAINST STRUCK SIDE OF TEST VEHICLE AT IMPACT LOCATION



FIGURE 5-17 PRETEST OCCUPANT COMPARTMENT LEFT SIDE SHOWING DRIVER STD

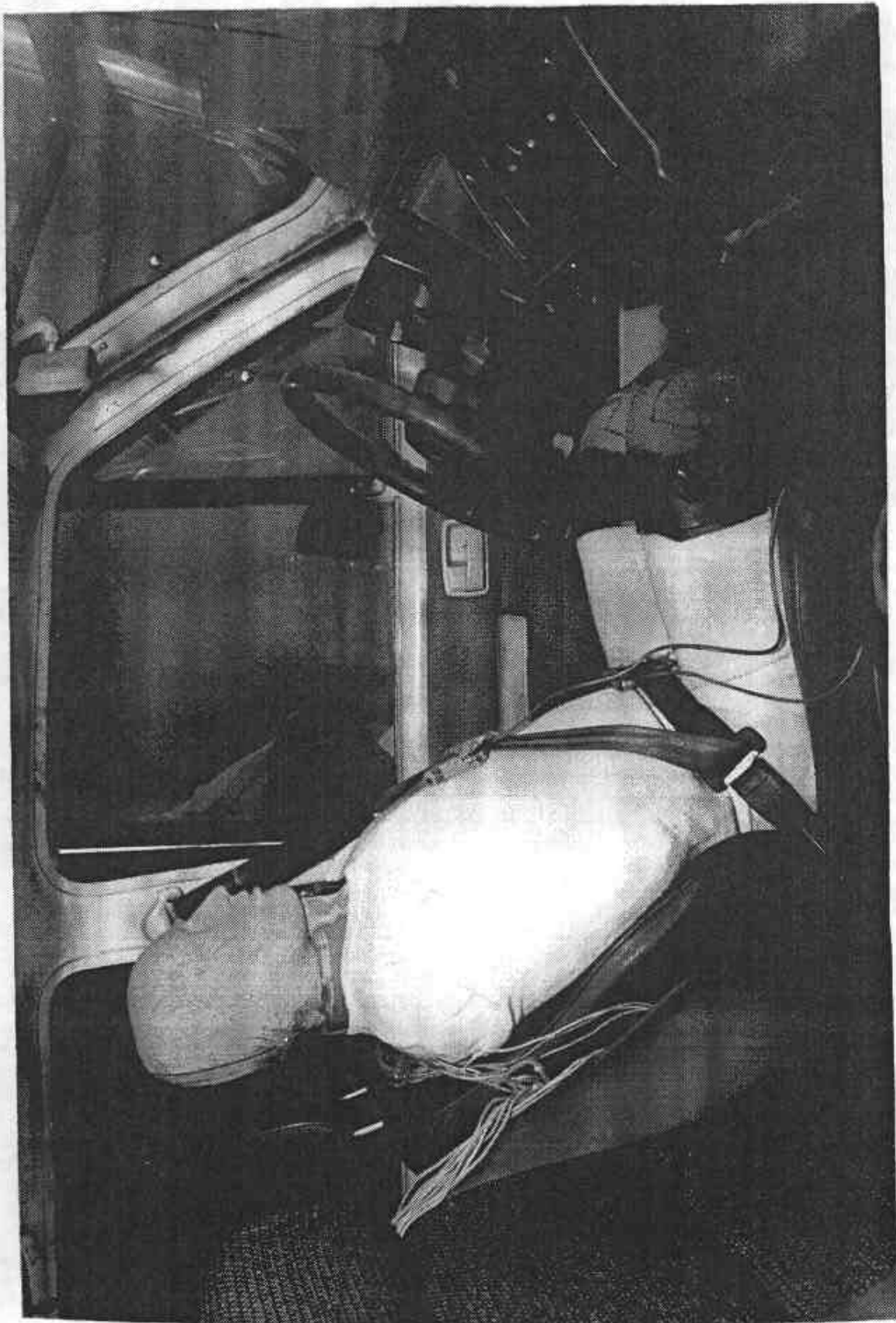


FIGURE 5-18 PRETEST OCCUPANT COMPARTMENT RIGHT SIDE SHOWING DRIVER SID

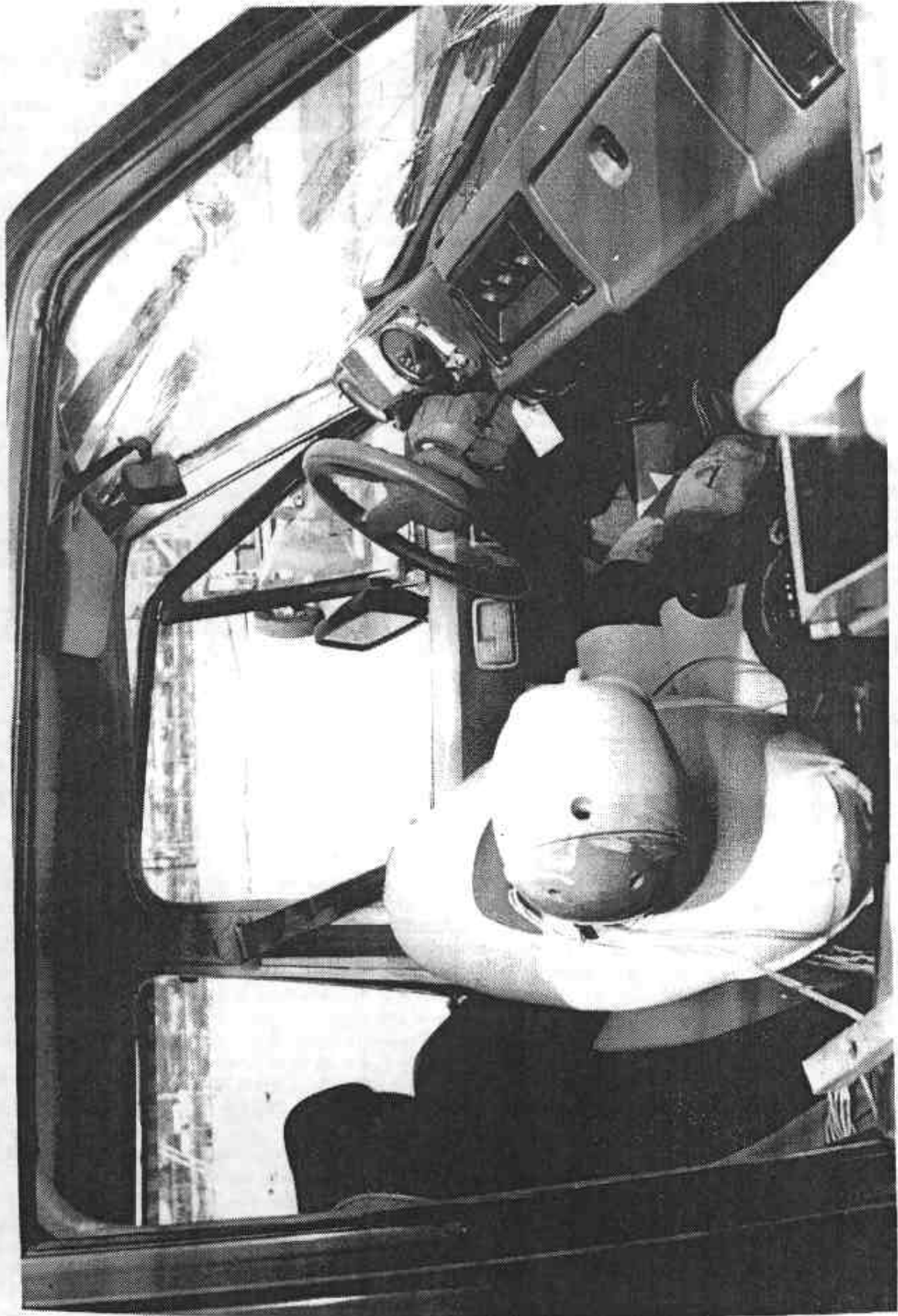


FIGURE 5-19 POSTTEST OCCUPANT COMPARTMENT SHOWING DRIVER SID

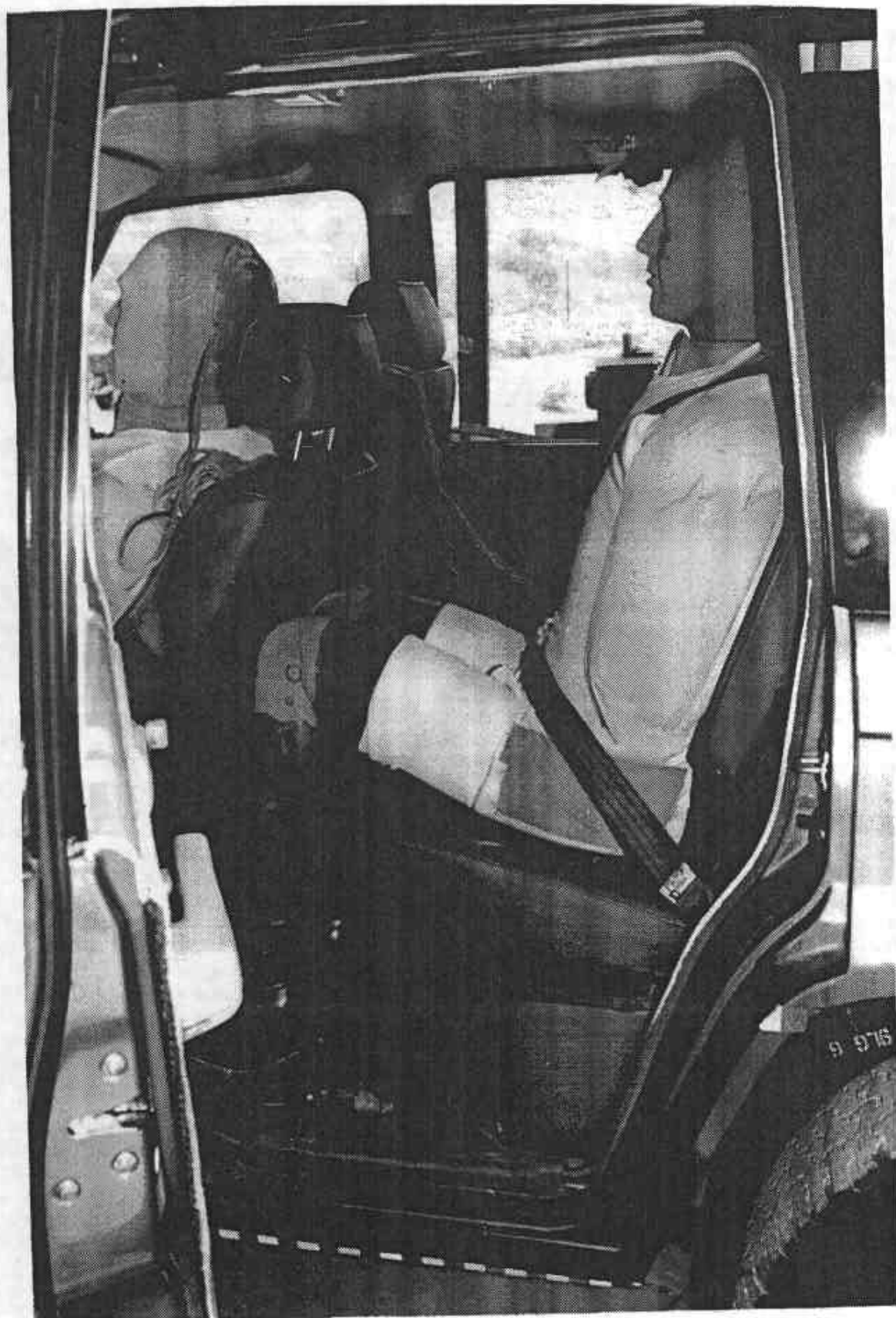


FIGURE 5-20 PRETEST OCCUPANT COMPARTMENT LEFT SIDE SHOWING PASSENGER SID 73

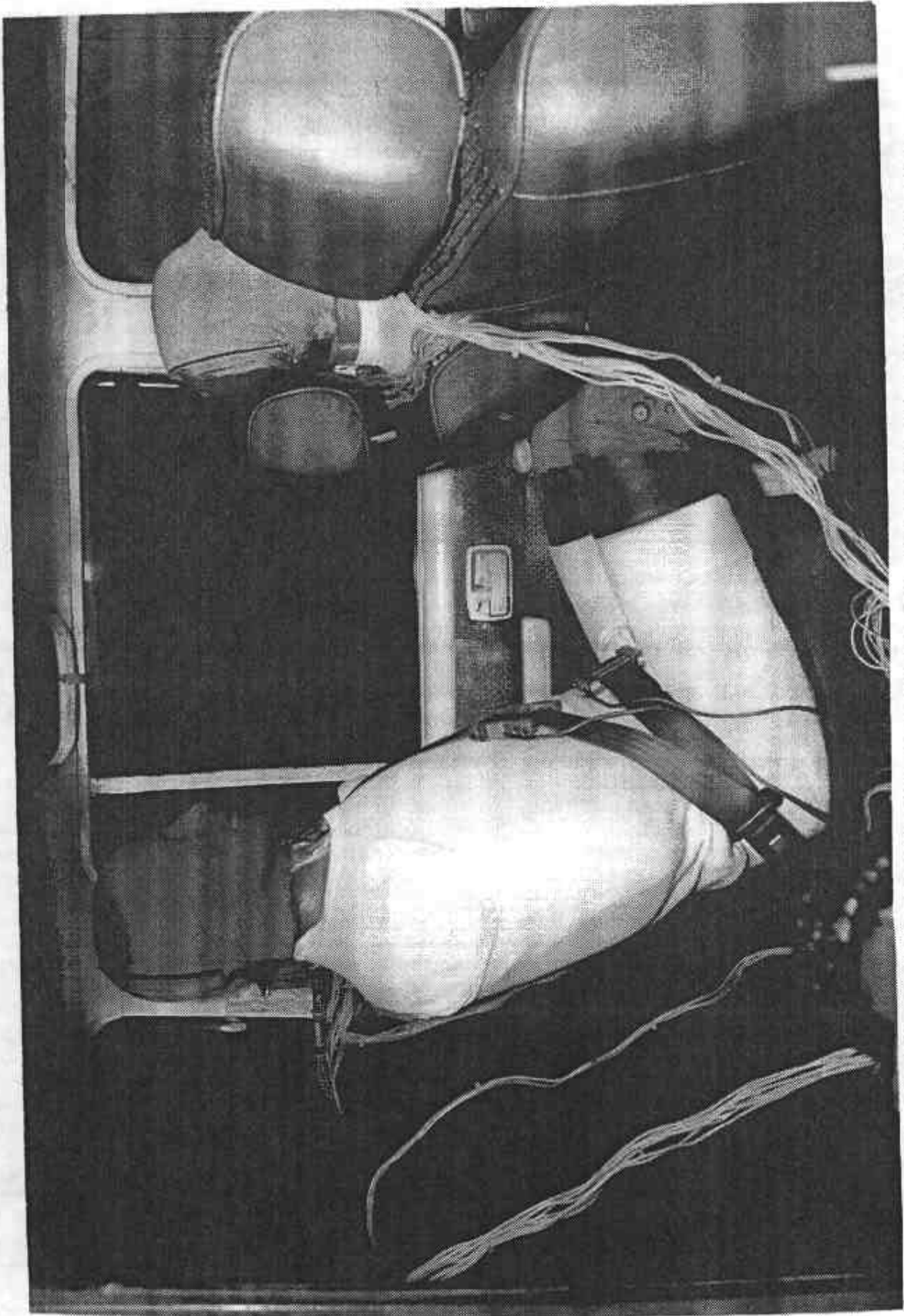


FIGURE 5-21 PRETEST OCCUPANT COMPARTMENT RIGHT SIDE SHOWING PASSENGER SID

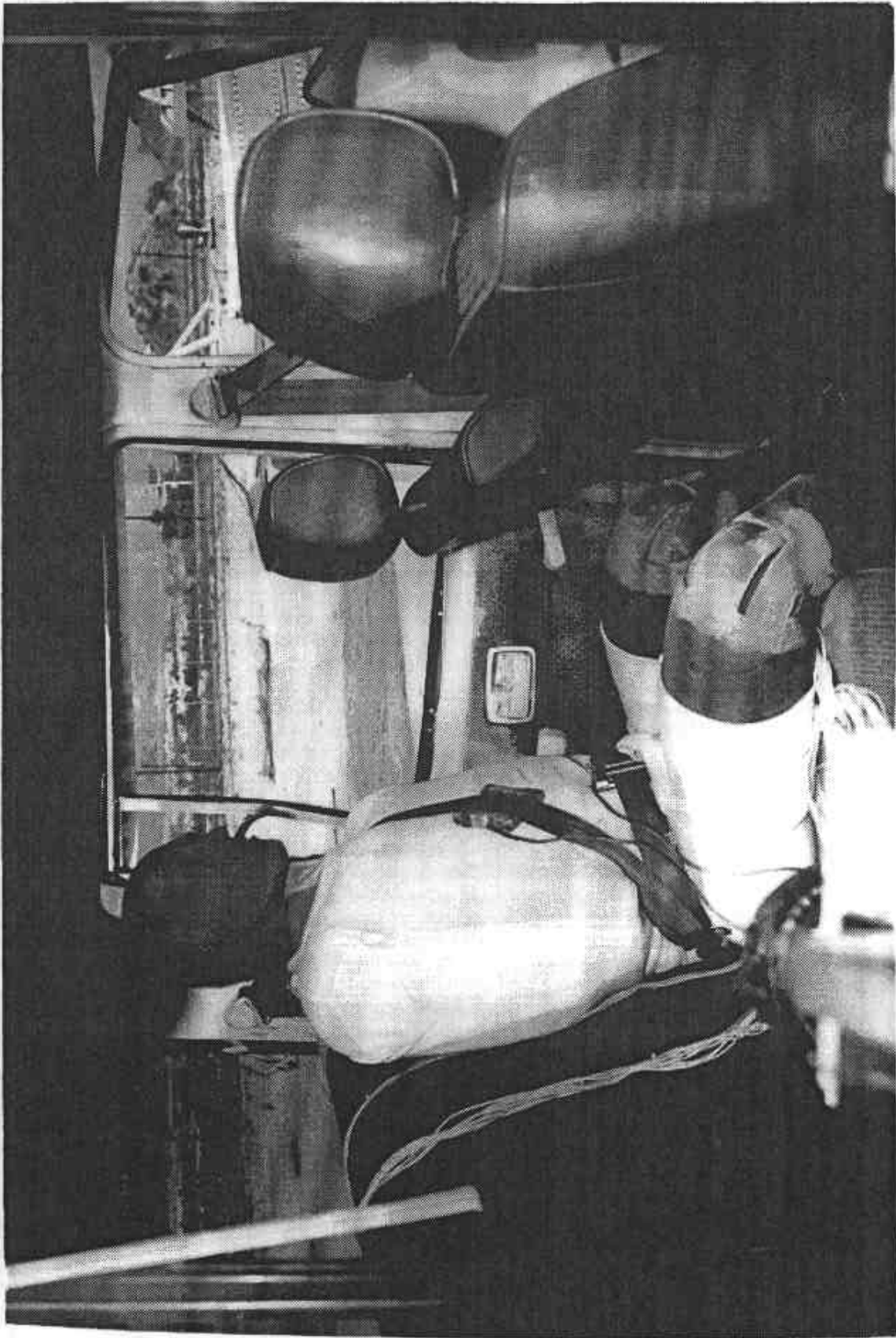


FIGURE 5-22 POSTTEST OCCUPANT COMPARTMENT SHOWING PASSENGER SID

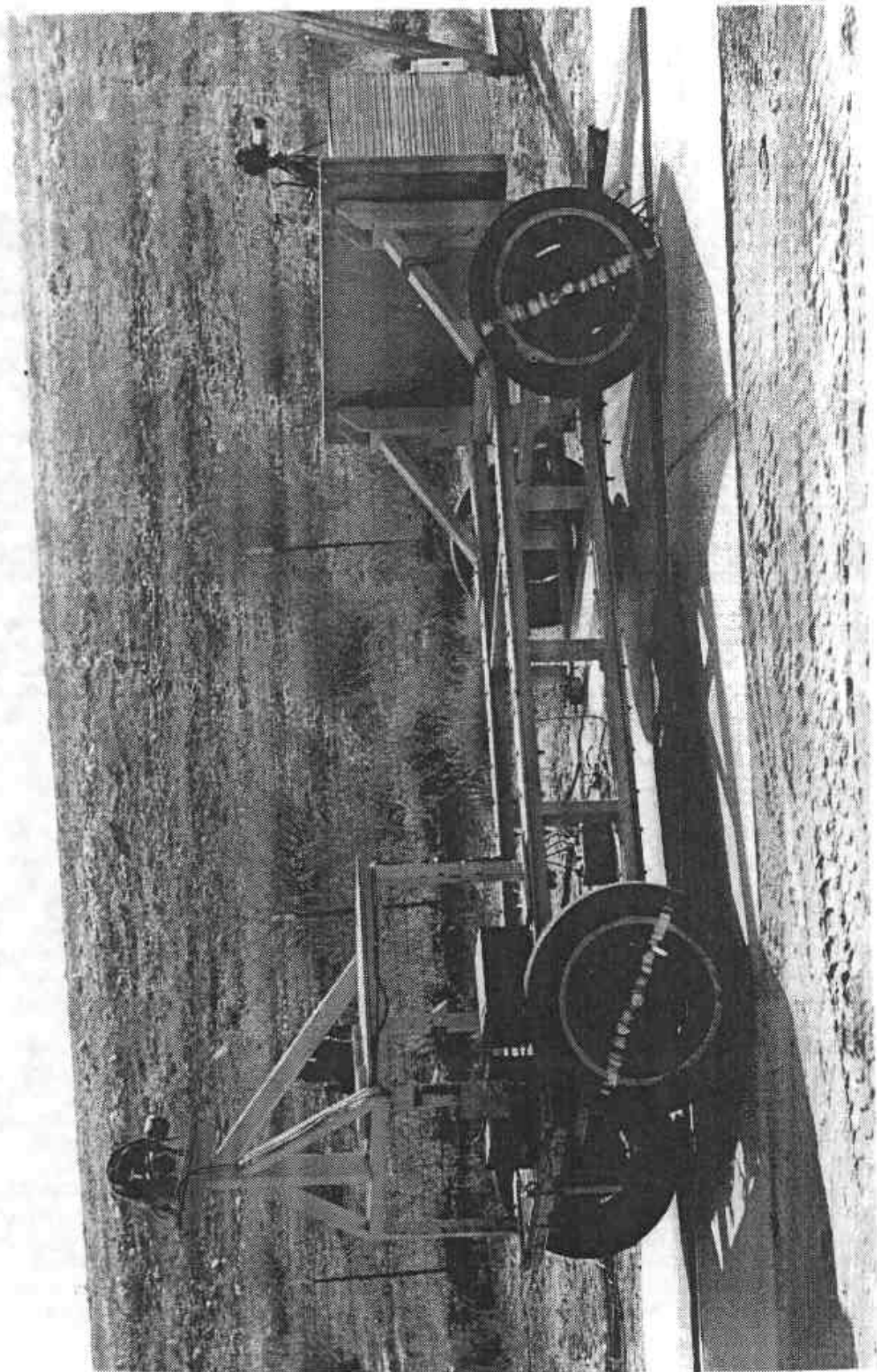


FIGURE 5-23 PRETEST RIGHT SIDE VIEW OF MDB WITH IMPACT FACE IN POSITION

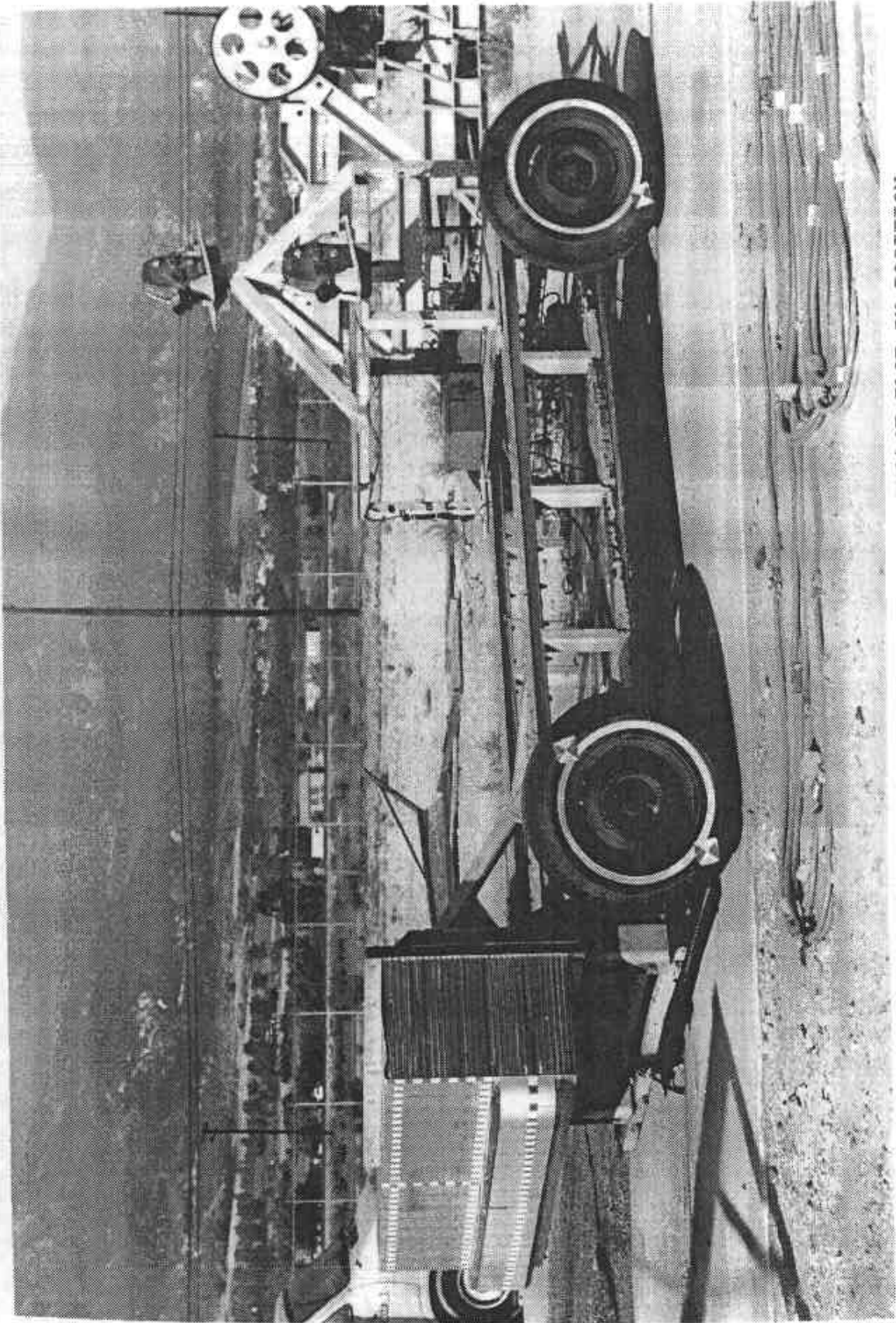
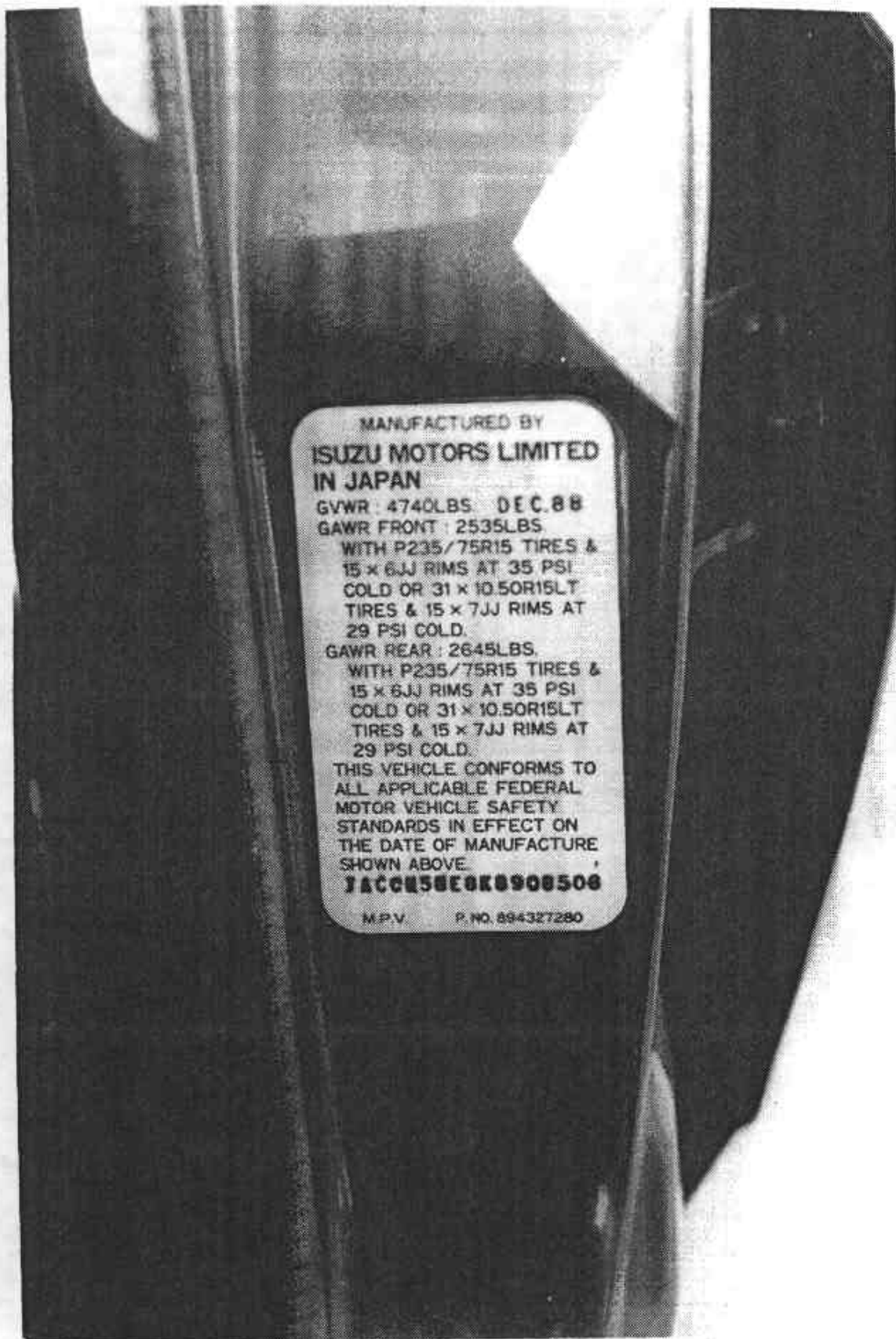


FIGURE 5-24 PRETEST LEFT SIDE VIEW OF MDB WITH IMPACT FACE IN POSITION



MANUFACTURED BY  
**ISUZU MOTORS LIMITED  
IN JAPAN**

GVWR : 4740LBS. DEC 88  
GAWR FRONT : 2535LBS

WITH P235/75R15 TIRES &  
15 x 6JJ RIMS AT 35 PSI  
COLD OR 31 x 10.50R15LT  
TIRES & 15 x 7JJ RIMS AT  
29 PSI COLD.

GAWR REAR : 2645LBS.

WITH P235/75R15 TIRES &  
15 x 6JJ RIMS AT 35 PSI  
COLD OR 31 x 10.50R15LT  
TIRES & 15 x 7JJ RIMS AT  
29 PSI COLD.

THIS VEHICLE CONFORMS TO  
ALL APPLICABLE FEDERAL  
MOTOR VEHICLE SAFETY  
STANDARDS IN EFFECT ON  
THE DATE OF MANUFACTURE  
SHOWN ABOVE.

**JACCM58E0K0908508**

M.P.V.

P. NO. 894327280

FIGURE 5-25 TEST VEHICLE TIRE PLACARD AND MANUFACTURER'S CERTIFICATION LABEL

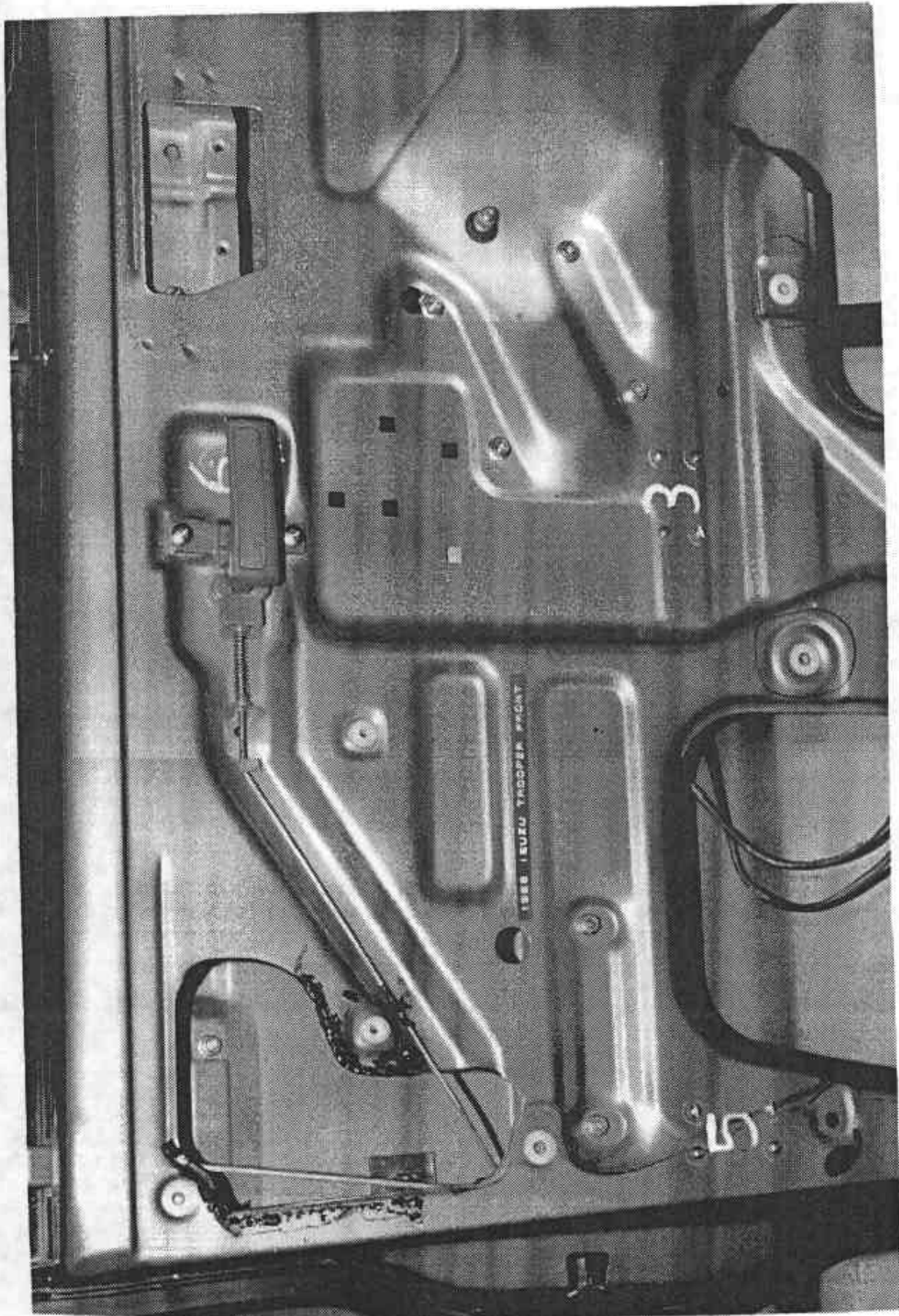


FIGURE 5-26 DRIVER DOOR ACCELEROMETER LOCATIONS



FIGURE 5-27 PRETEST DRIVER DOOR INTERIOR VIEW

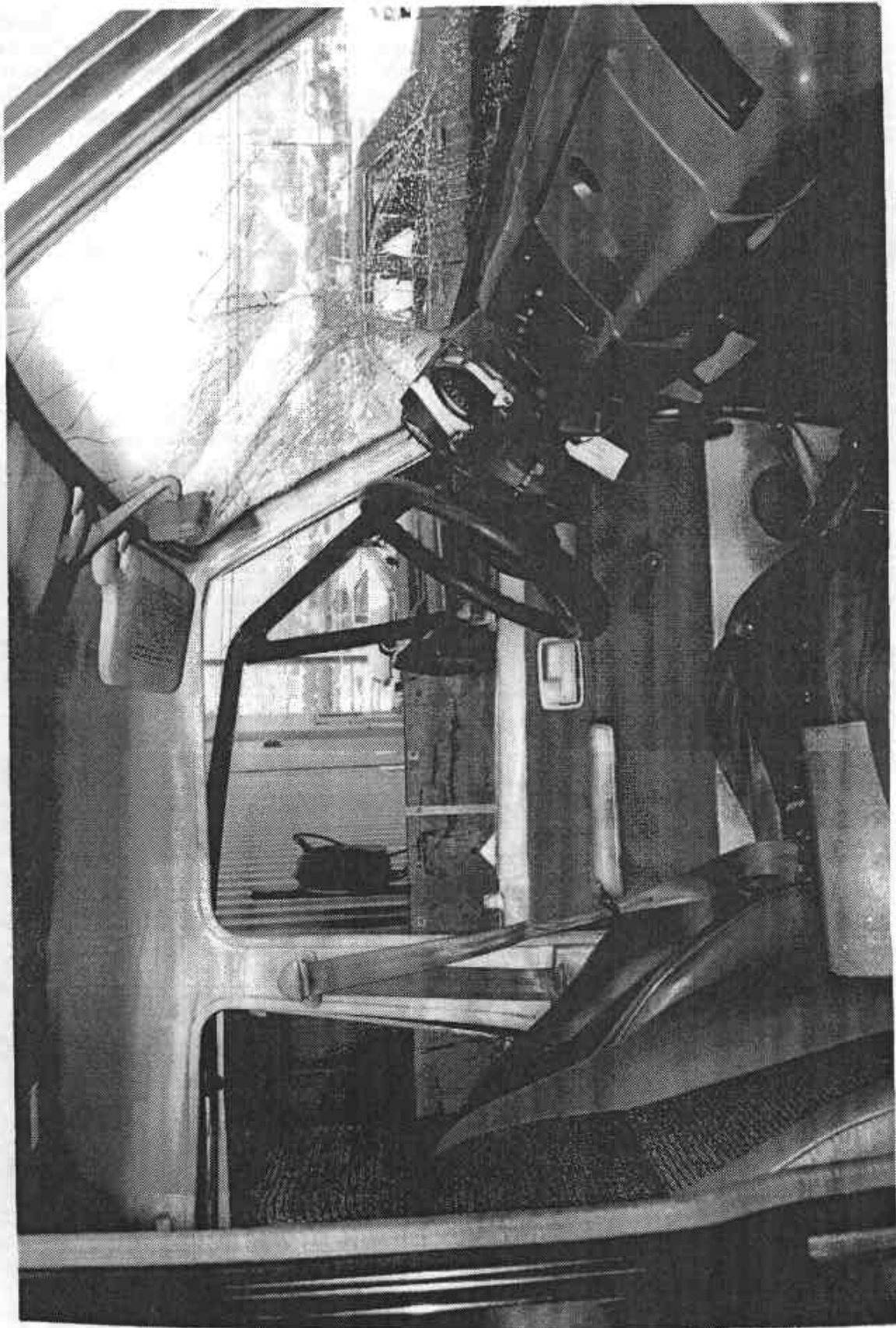


FIGURE 5-28 . POSTTEST DRIVER DOOR INTERIOR VIEW

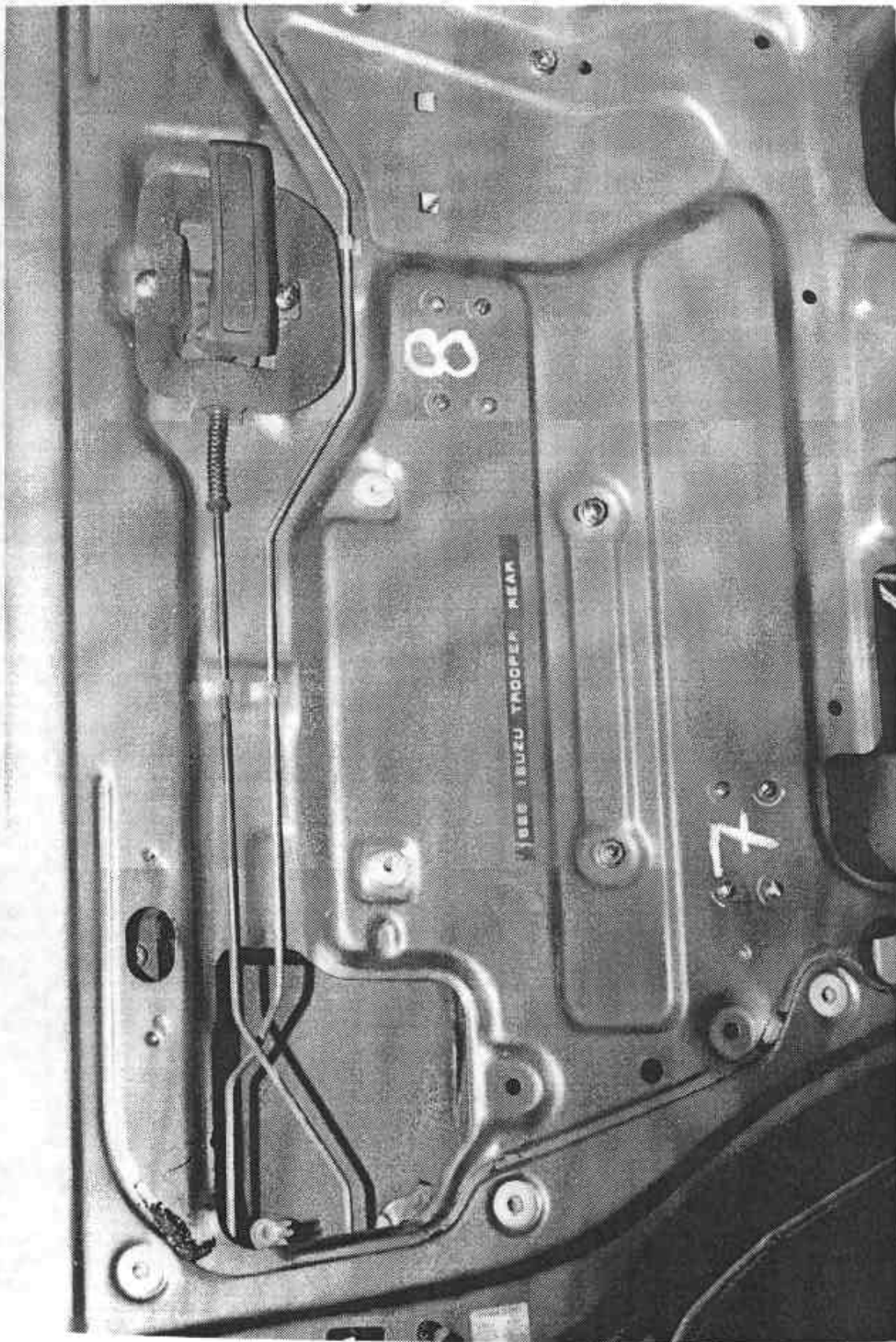


FIGURE 5-29 PRETEST PASSENGER DOOR INTERIOR SHOWING ACCELEROMETER LOCATIONS



FIGURE 5-30 PRETEST PASSENGER DOOR INTERIOR VIEW



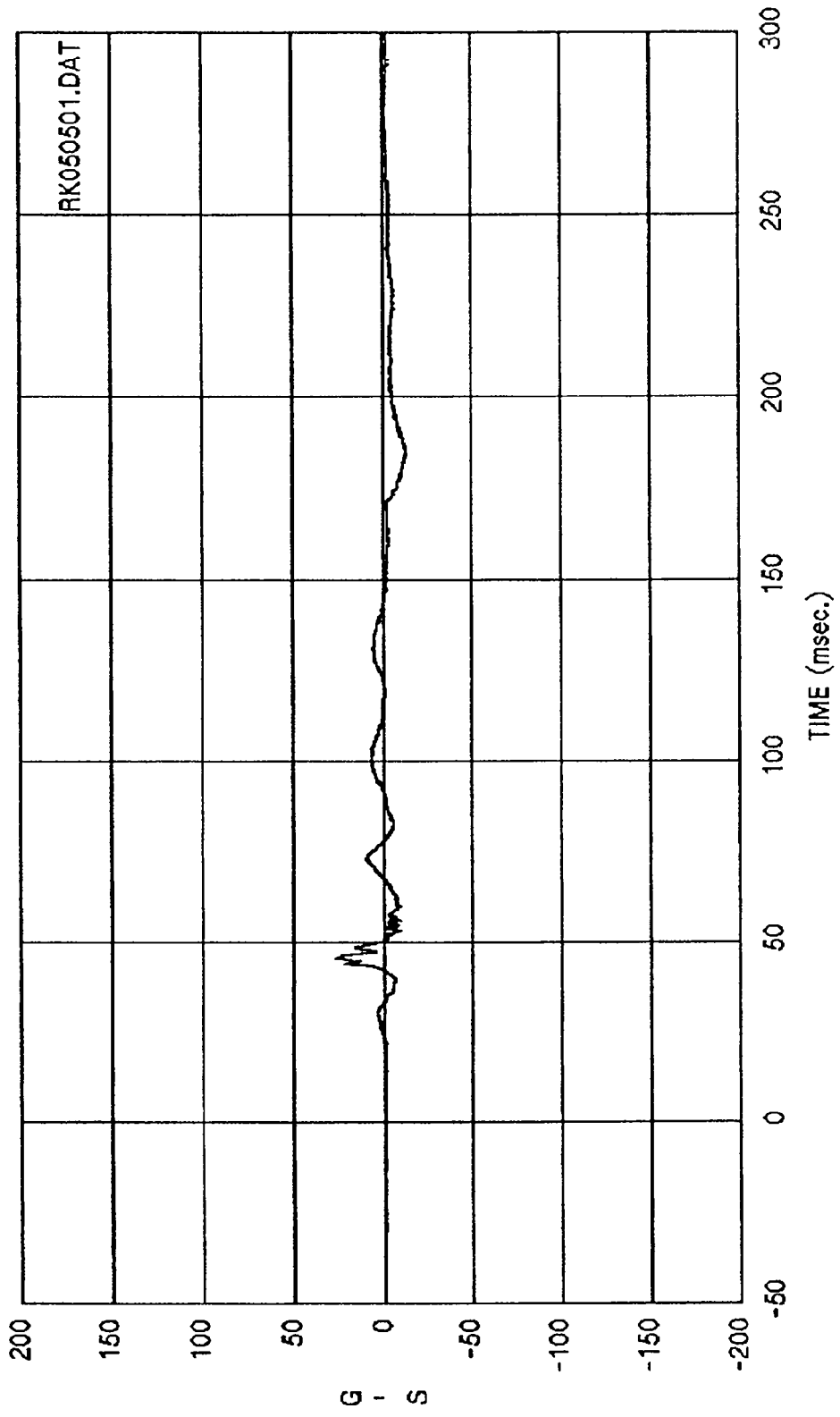
FIGURE 5-31 POSTTEST PASSENGER DOOR INTERIOR VIEW

SECTION 6

VEHICLE AND SID RESPONSE DATA

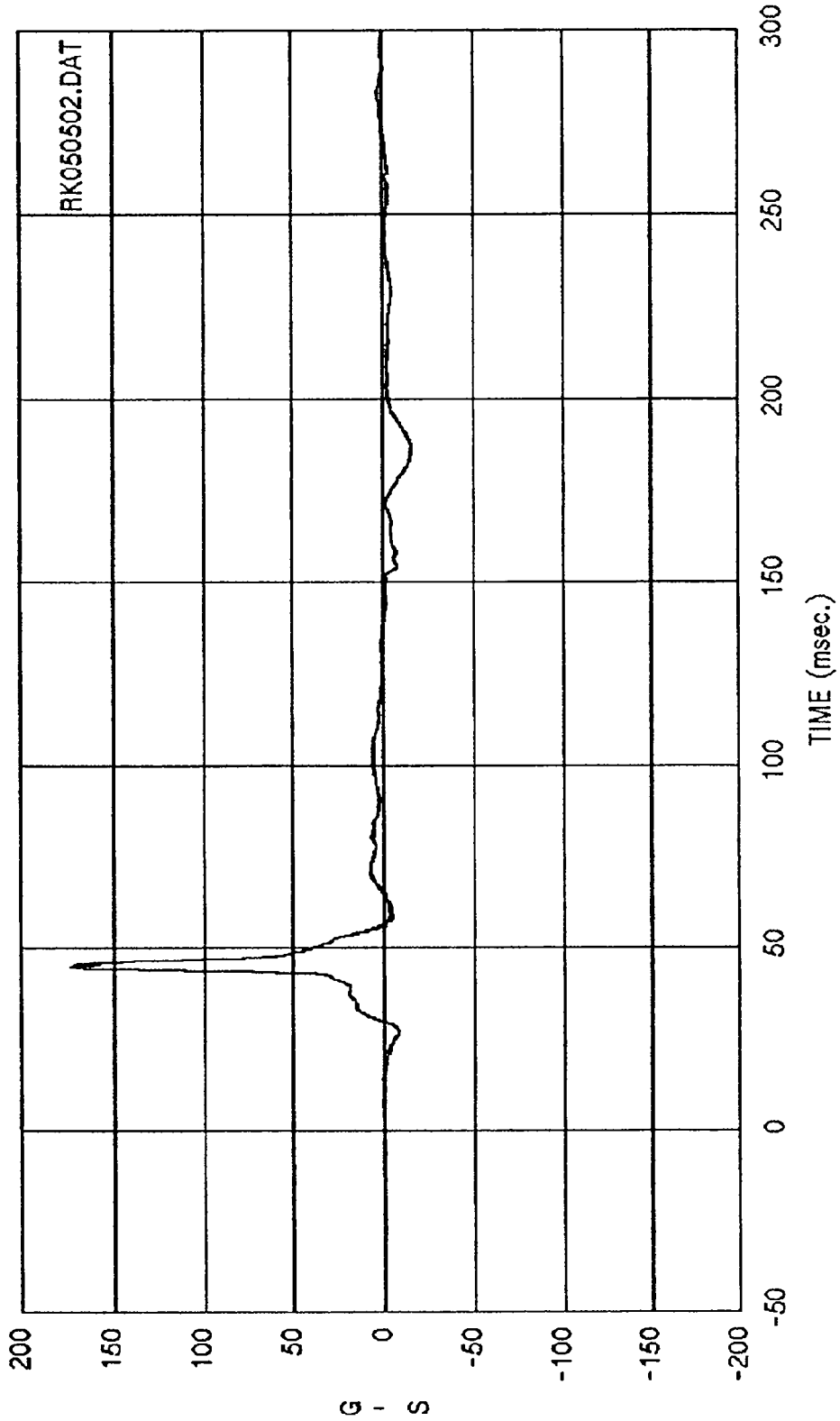
The dataplots from the side impact test are presented in this section.

SID DATA



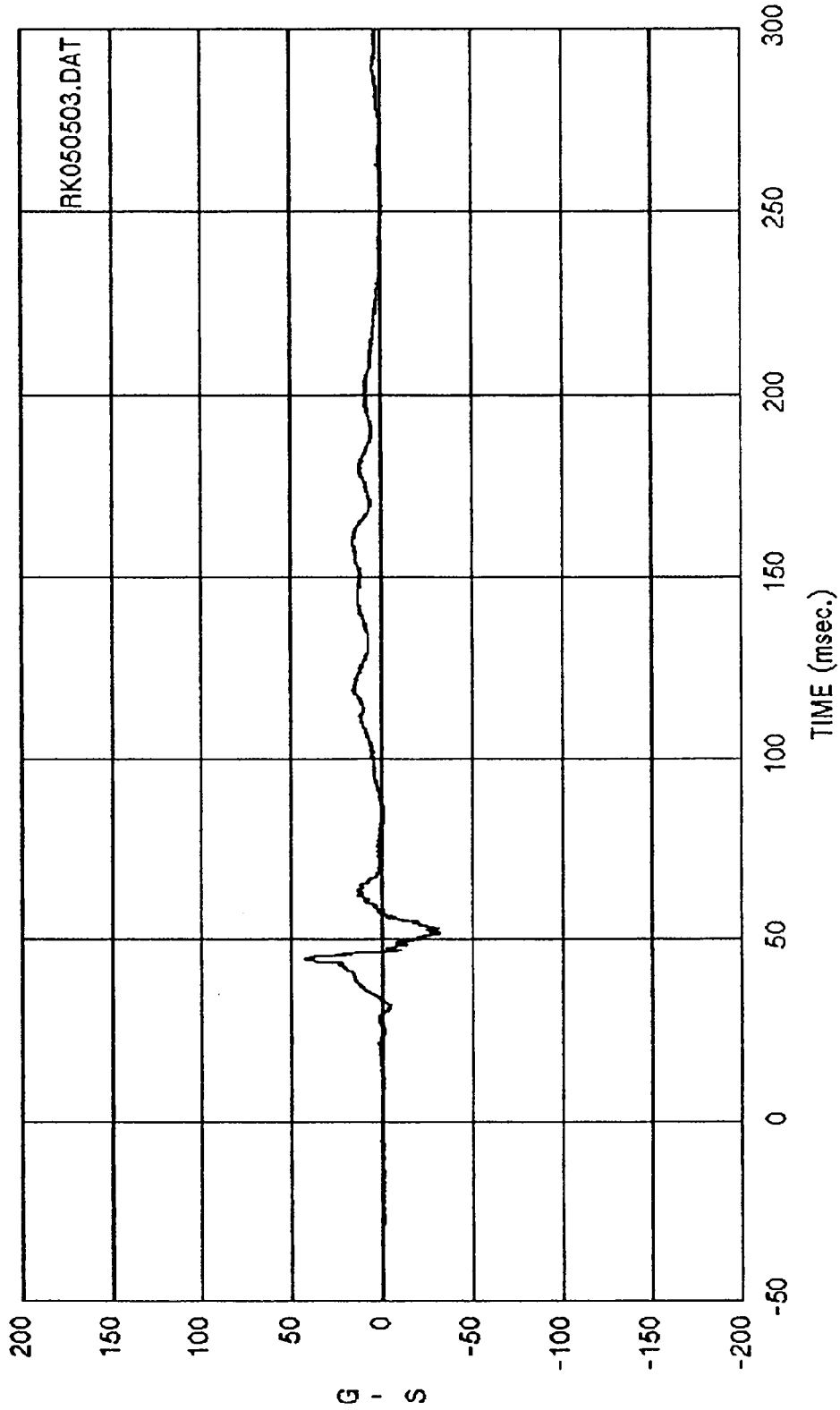
Curve: Driver Head acceleration -- X axis Filter: SAE CLASS 1000 Max = 34.065 Min = -12.893

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



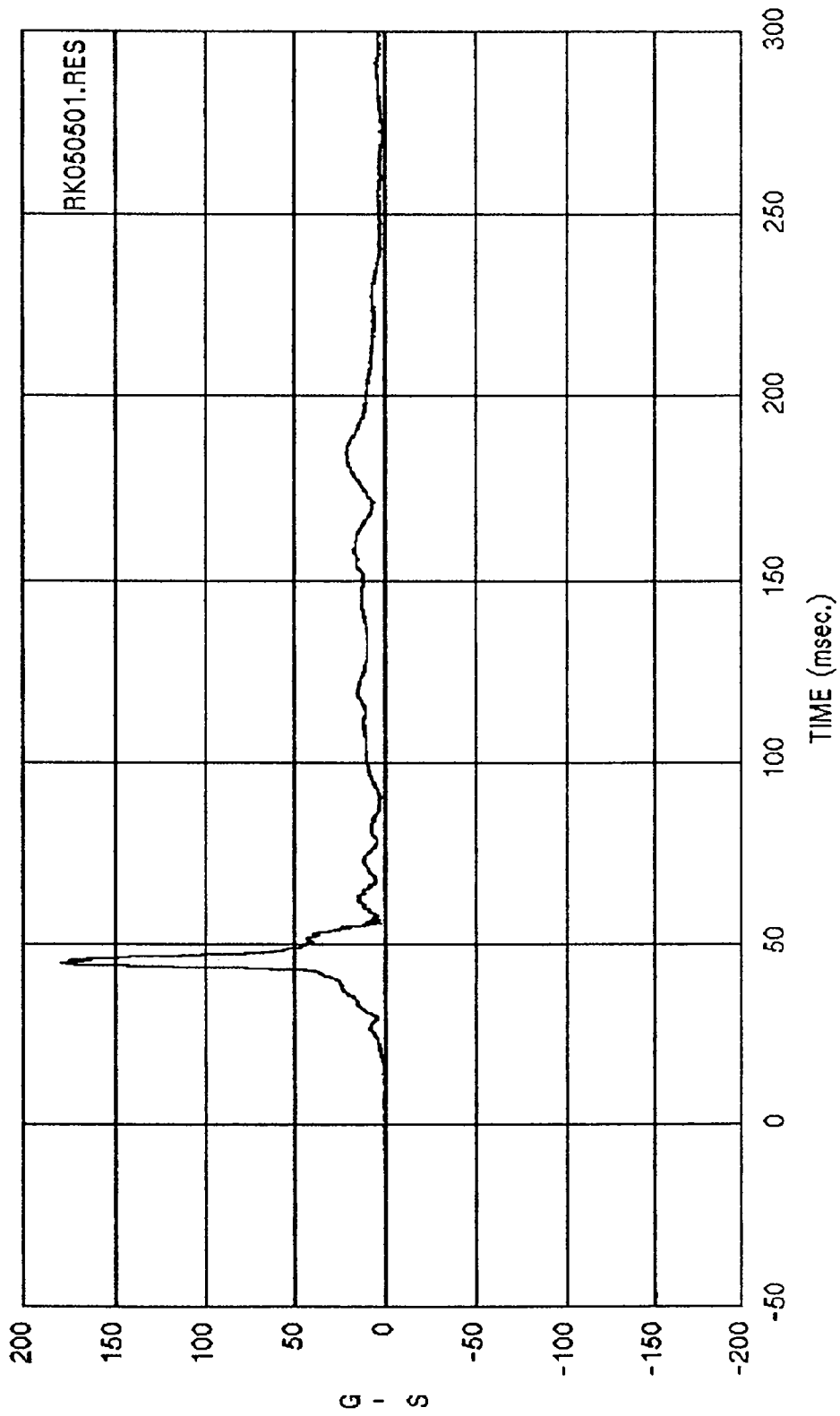
Curve: Driver Head acceleration -- Y axis Filter: SAE CLASS 1000 Max = 177.80 Min = -15.393

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



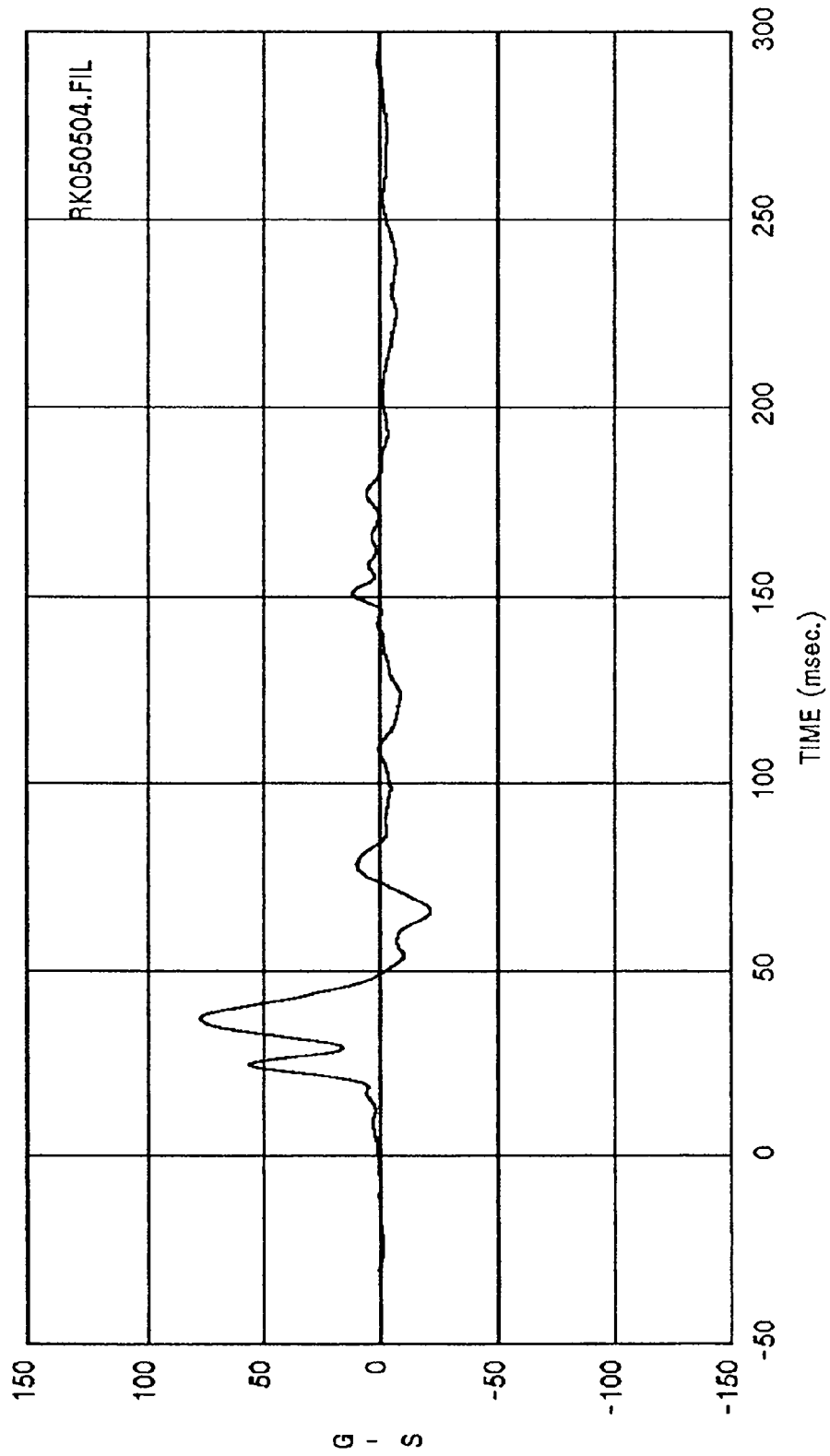
Curve: Driver Head acceleration -- Z axis Filter: SAE CLASS 1000 Max = 52.231 Min = -32.230

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



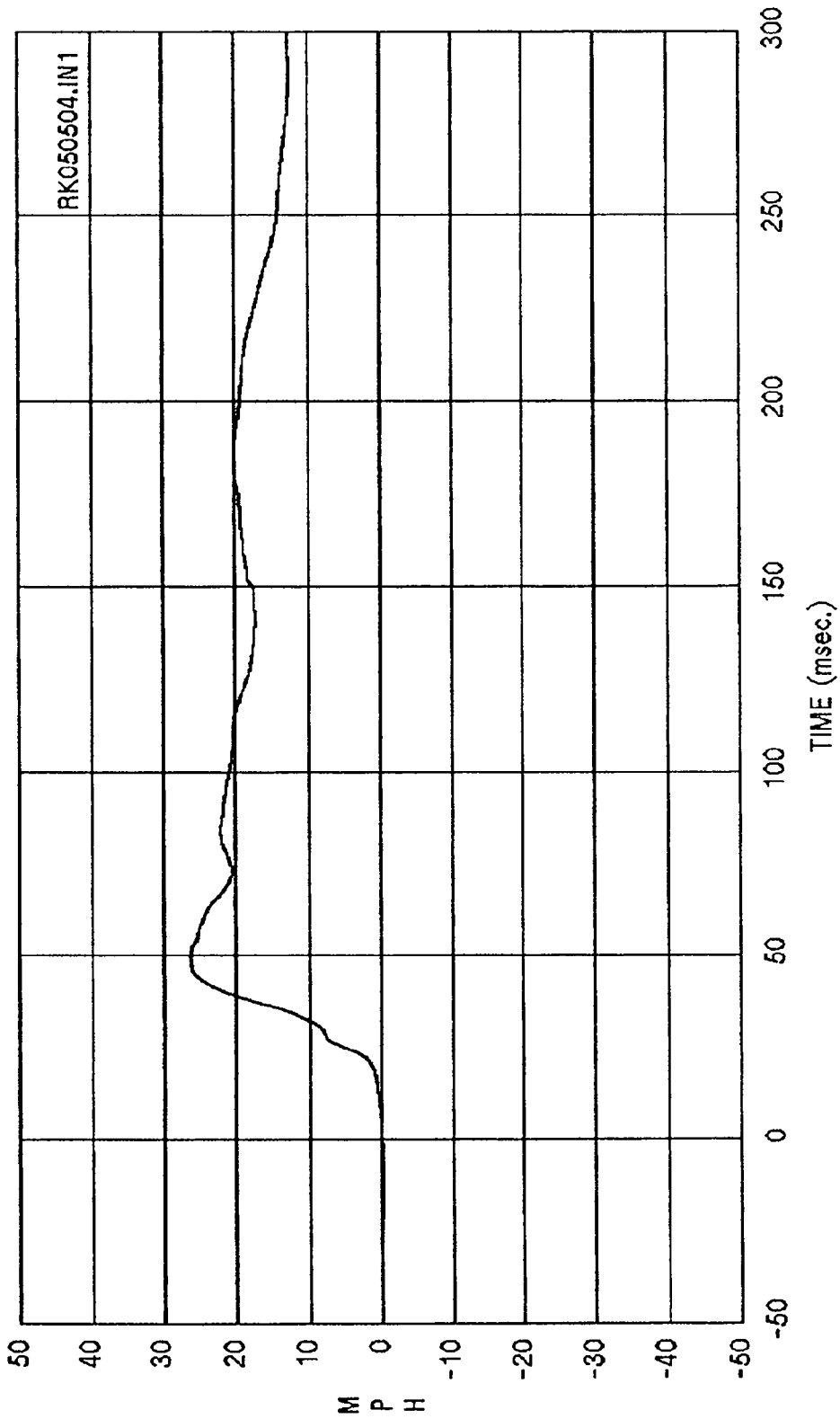
Curve: Driver head resultant acceleration Filter: SAE CLASS 1000 Max = 184.18 Min = .11429

MISE Date: 09/09/92 Program: Side Impact 30/15 90 Deg. Vehicle: 1989 Isuzu Trooper 4x4

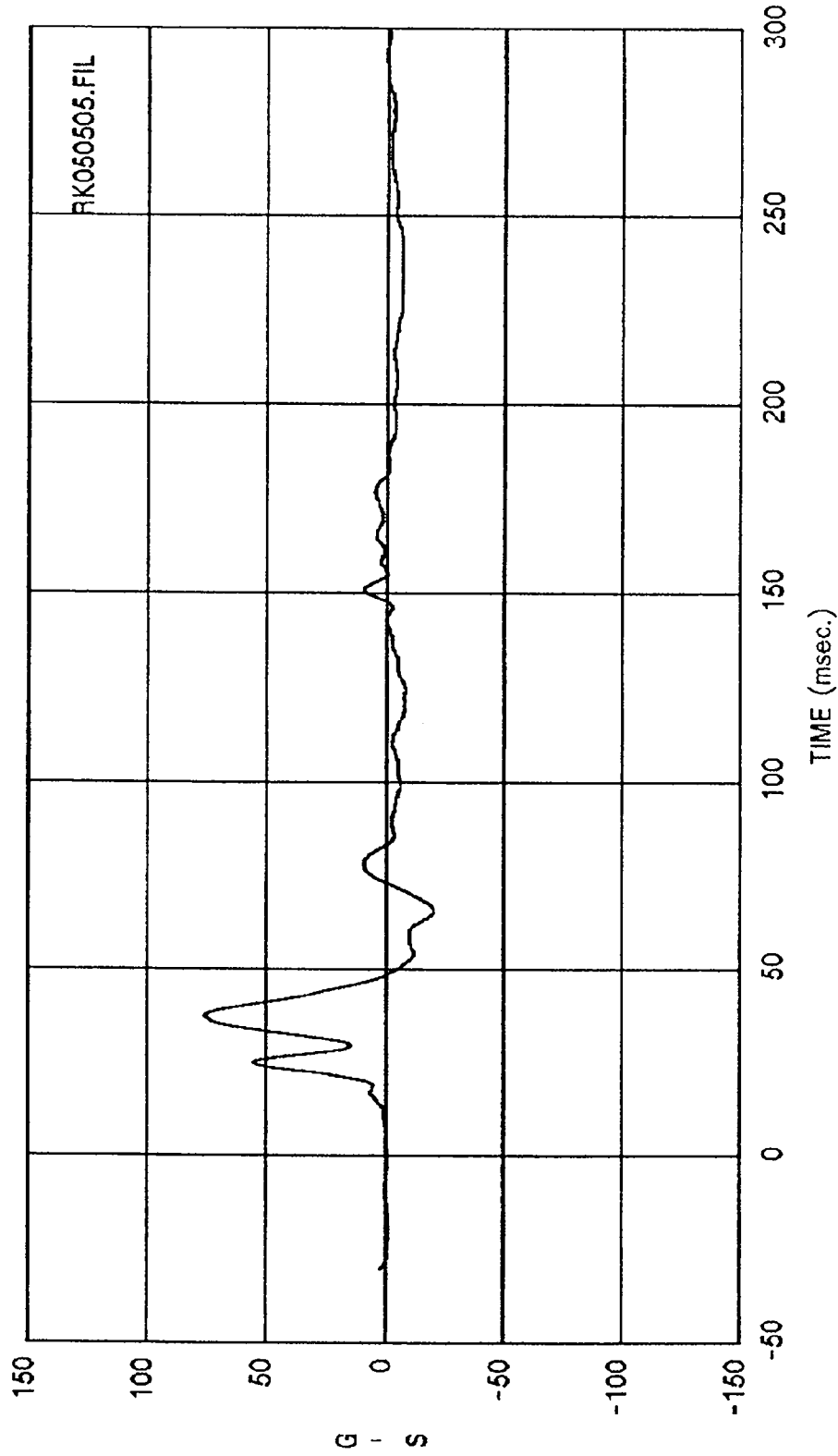


Curve: Driver upper spine acceleration -- Primary Filter: FIR 100 Max = 78.441 Min = -21.528

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4

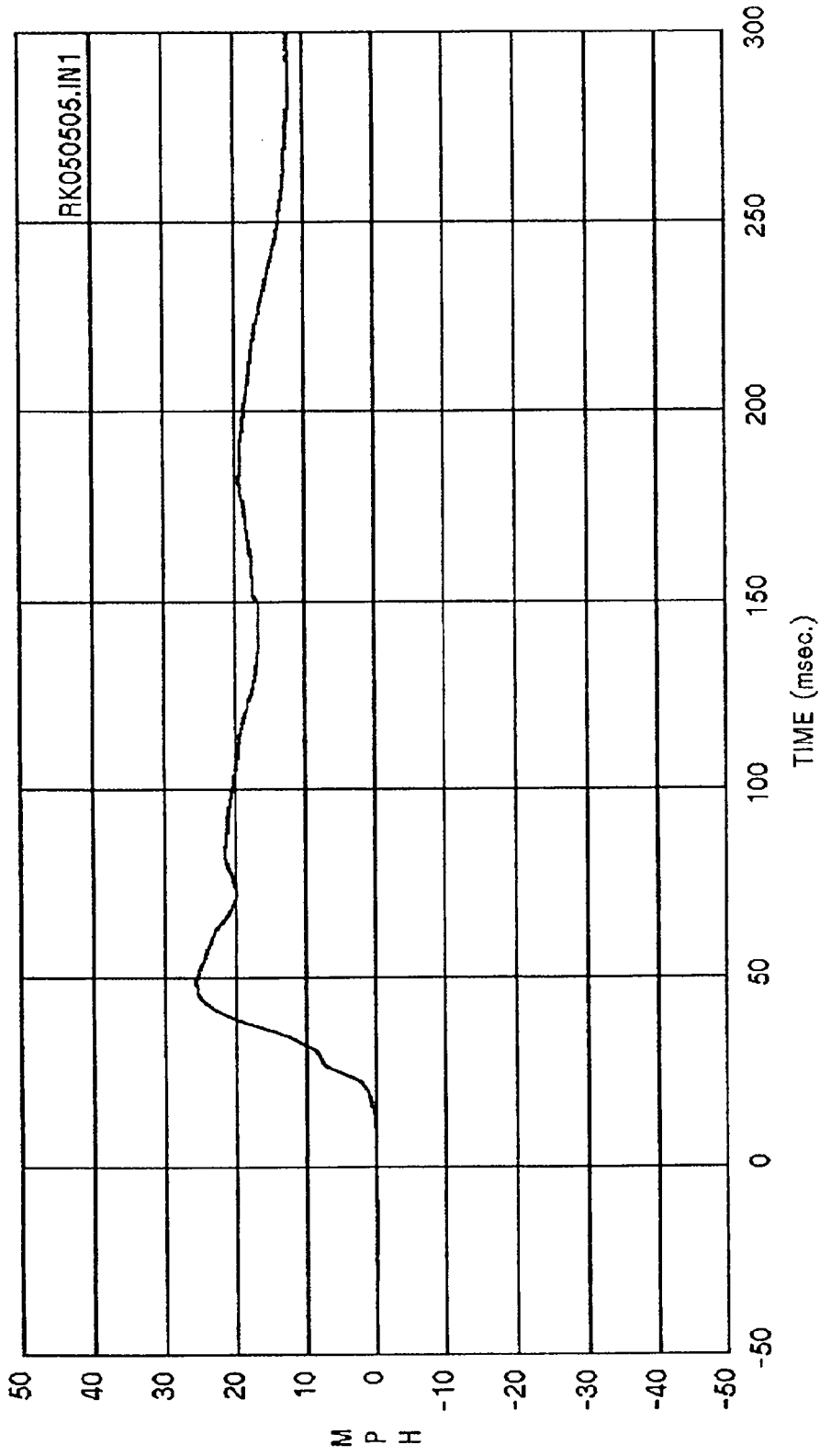


Curve: Driver upper spine delta V -- Primary Filter: SAE CLASS 180 Max = 26.368 Min = 12.613  
 MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



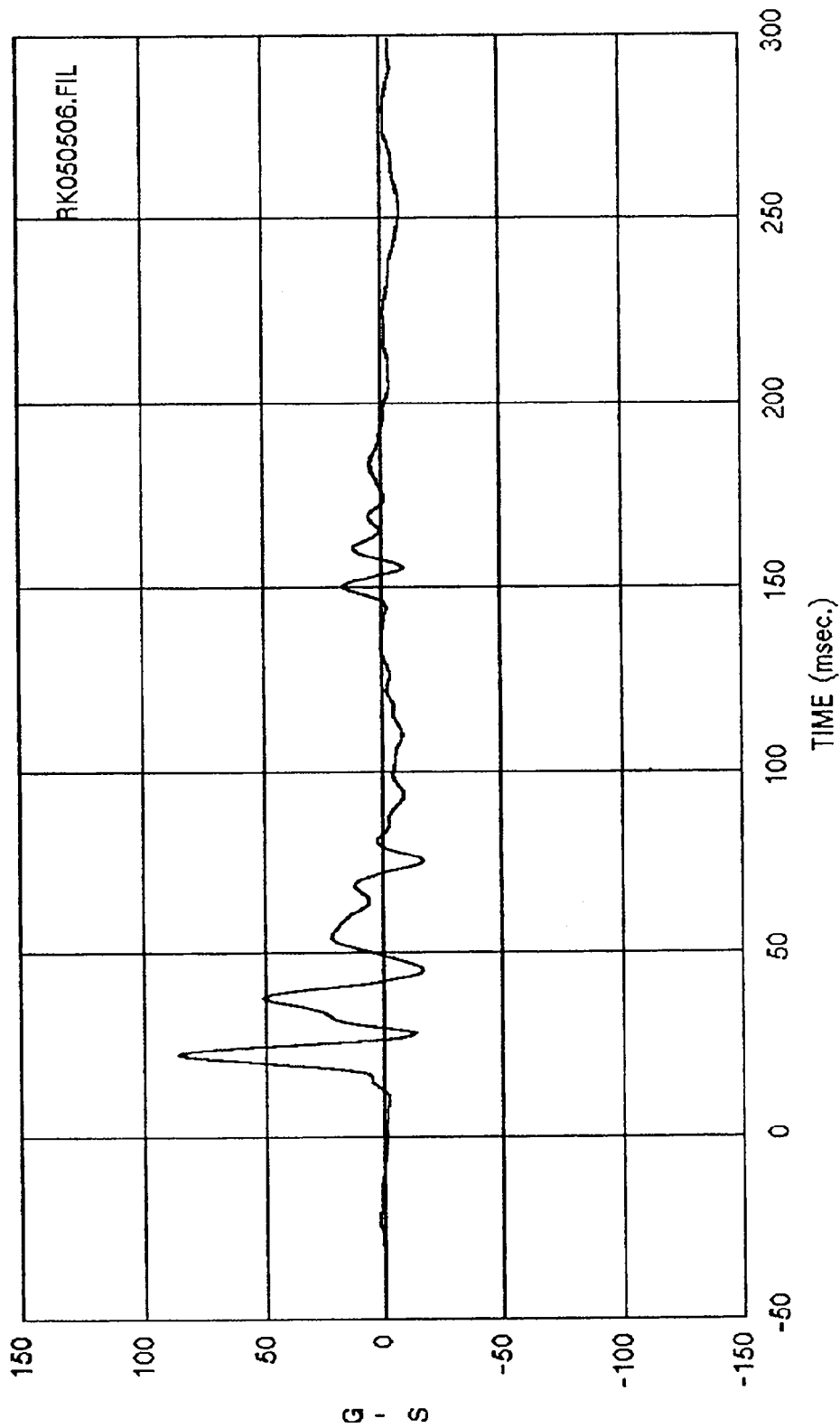
Curve: Driver upper spine acceleration -- Redundant Filter: FIR 100 Max = 75.851 Min = -19.960

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



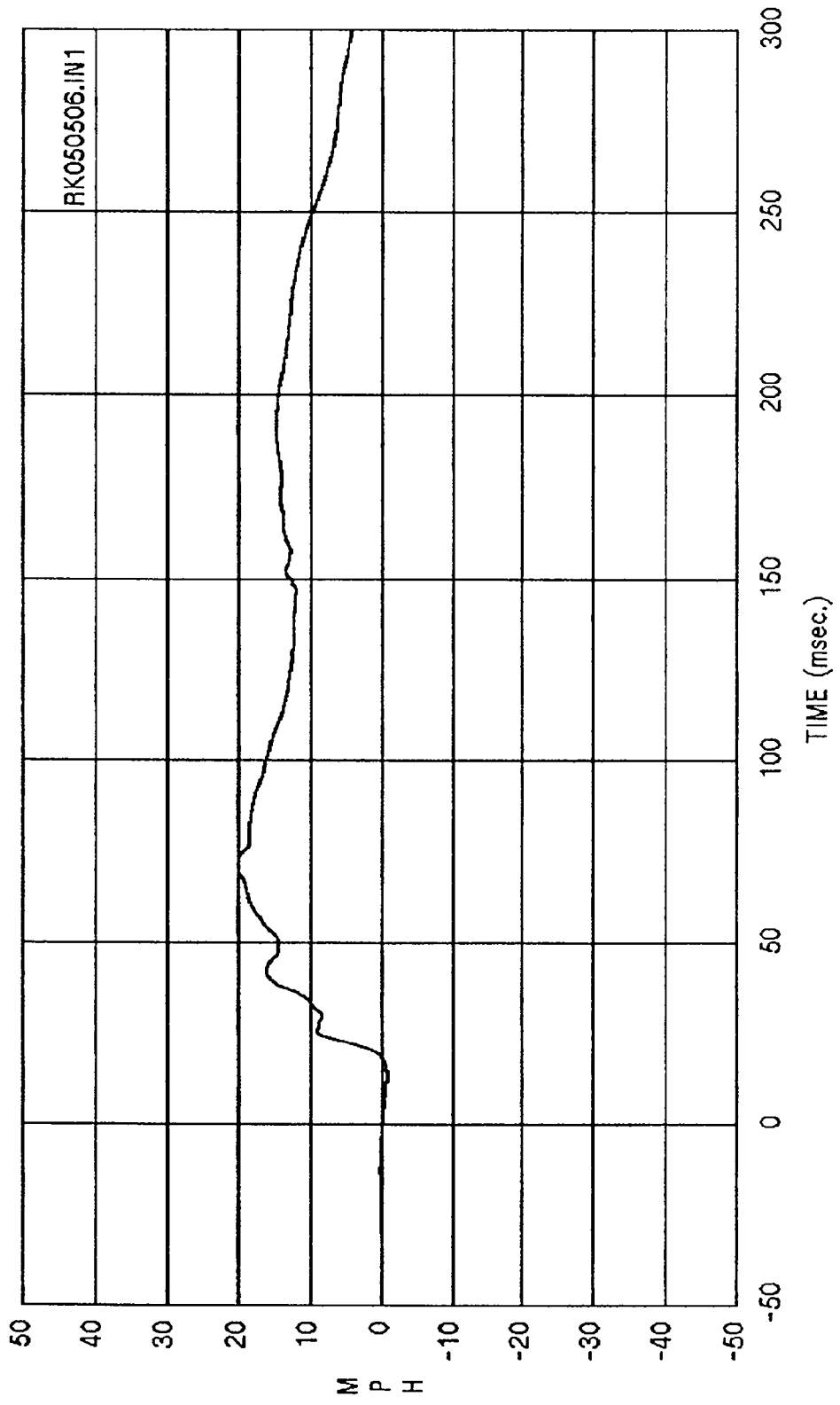
Curve: Driver upper spine delta V -- Redundant Filter: SAE CLASS 180 Max = 25.632 Min = -.92914  
01

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



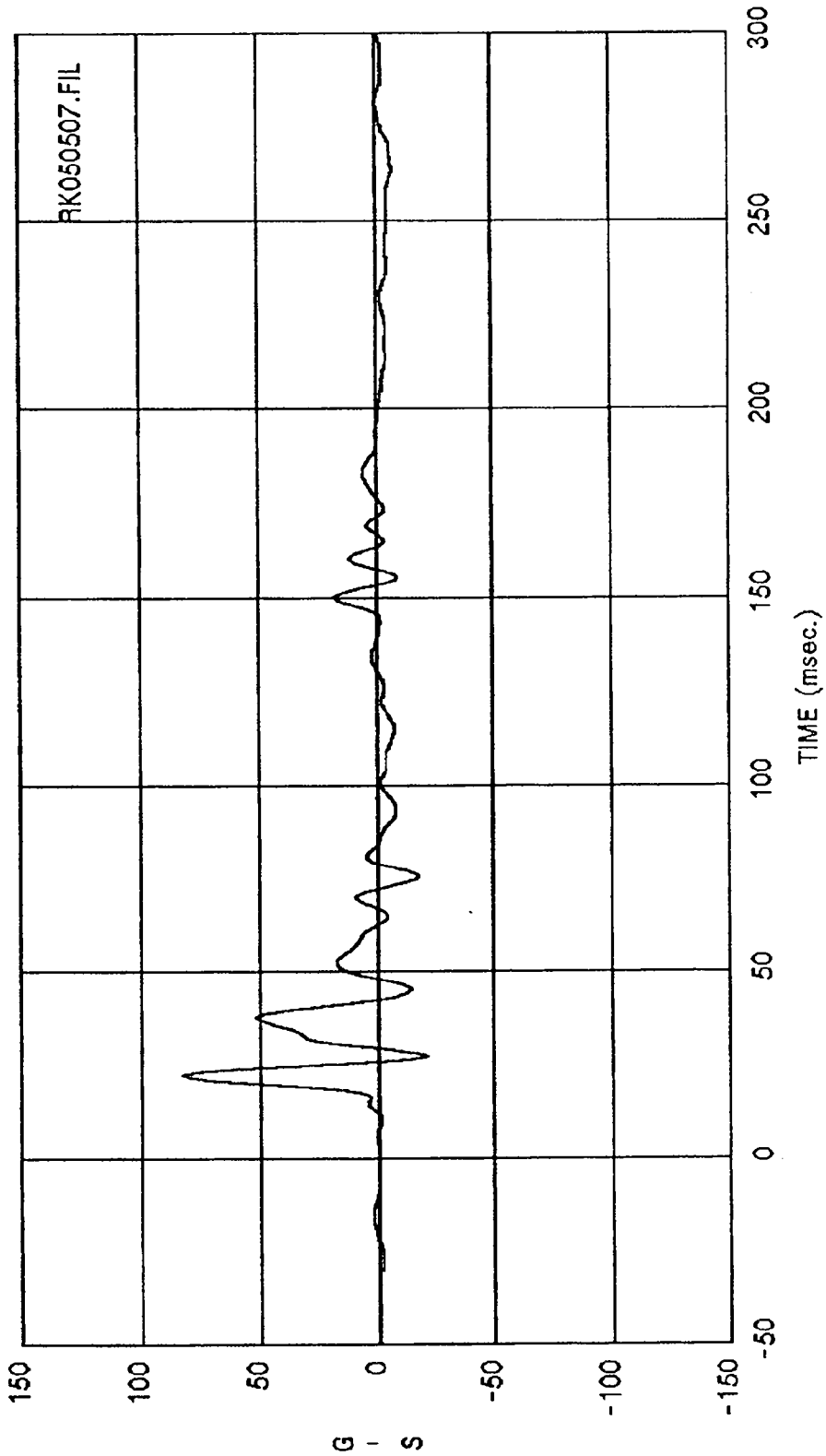
Curve: Driver upper rib acceleration -- Primary Filter: FIR 100 Max = 86.938 Min = -16.920

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



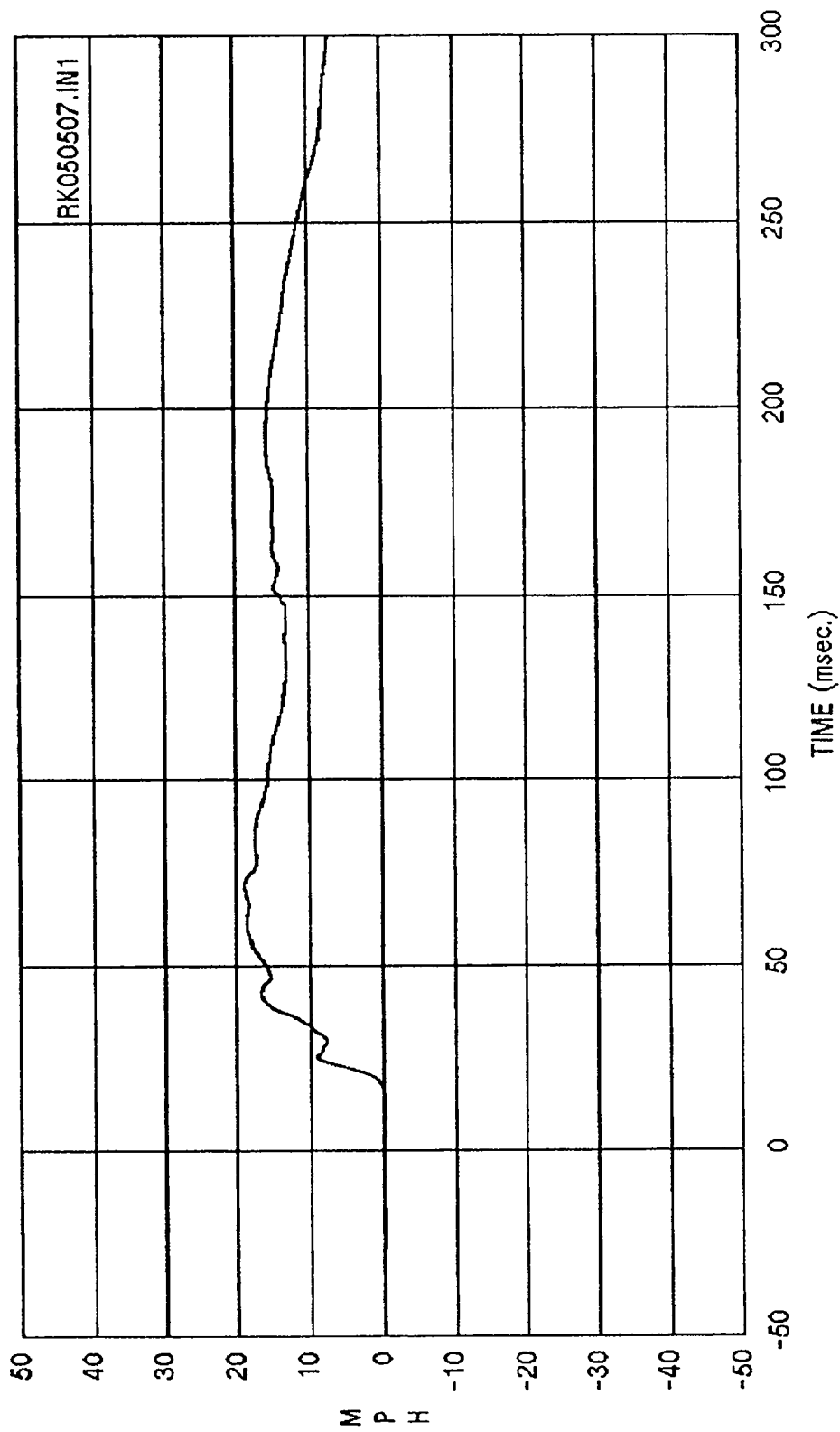
Curve: Driver upper rib delta V -- Primary Filter: SAE CLASS 180 Max = 20.172 Min = -.64904

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



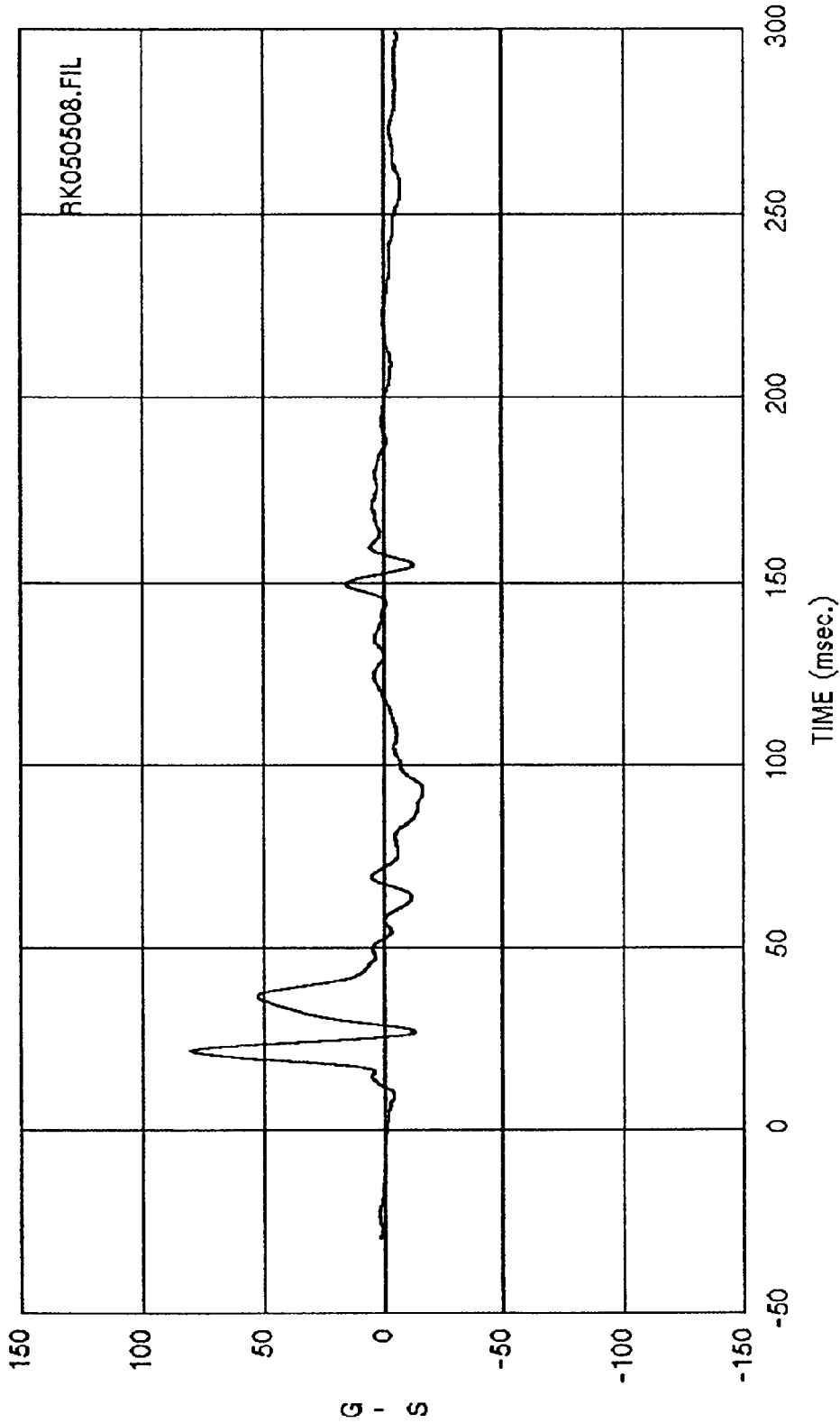
Curve: Driver upper rib acceleration -- Redundant Filter: FIR 100 Max = 82.784 Min = -21.276

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



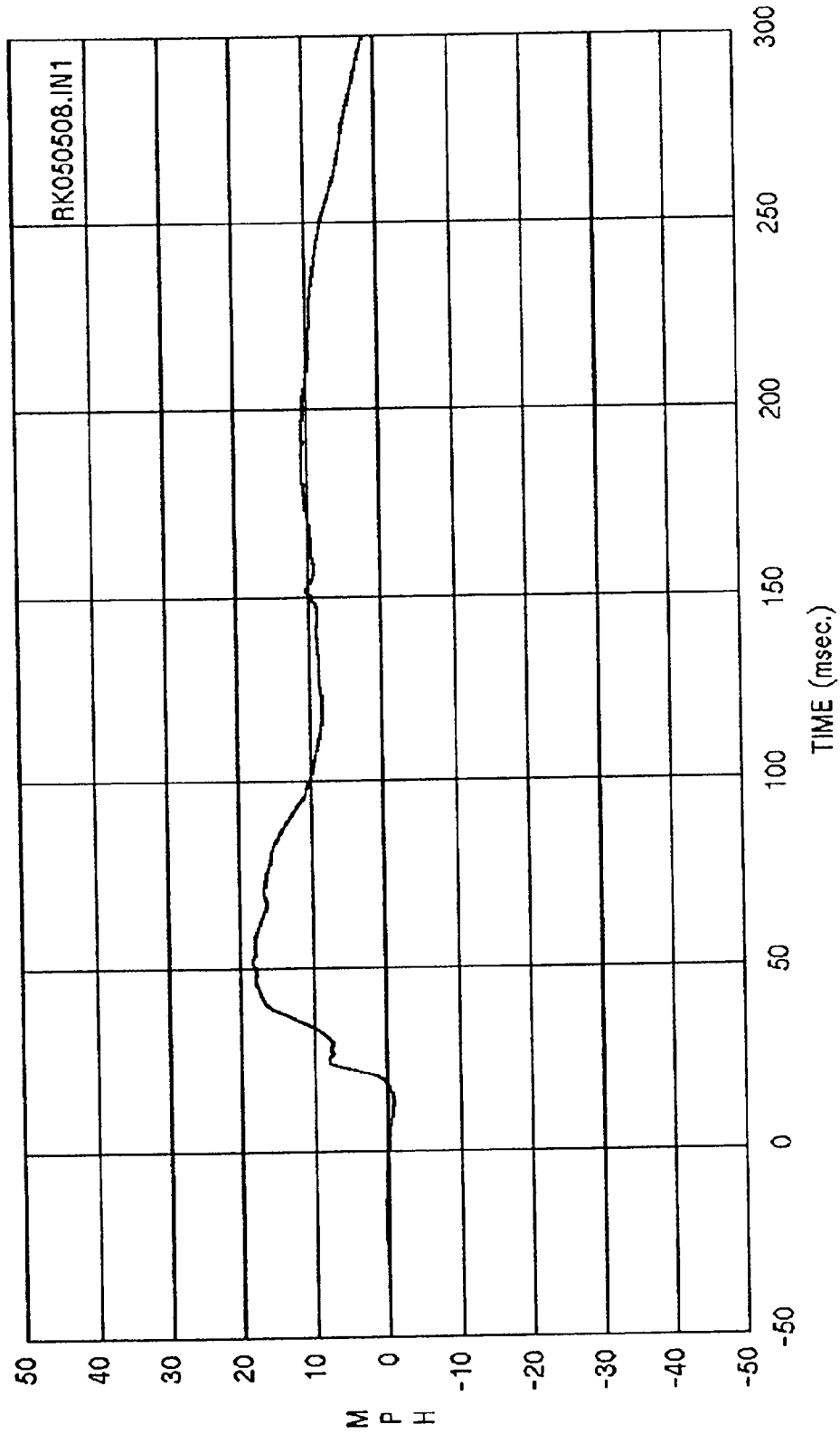
Curve: Driver upper rib delta V -- Redundant Filter: SAE CLASS 180 Max = 18.929 Min = -.99698E  
01

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



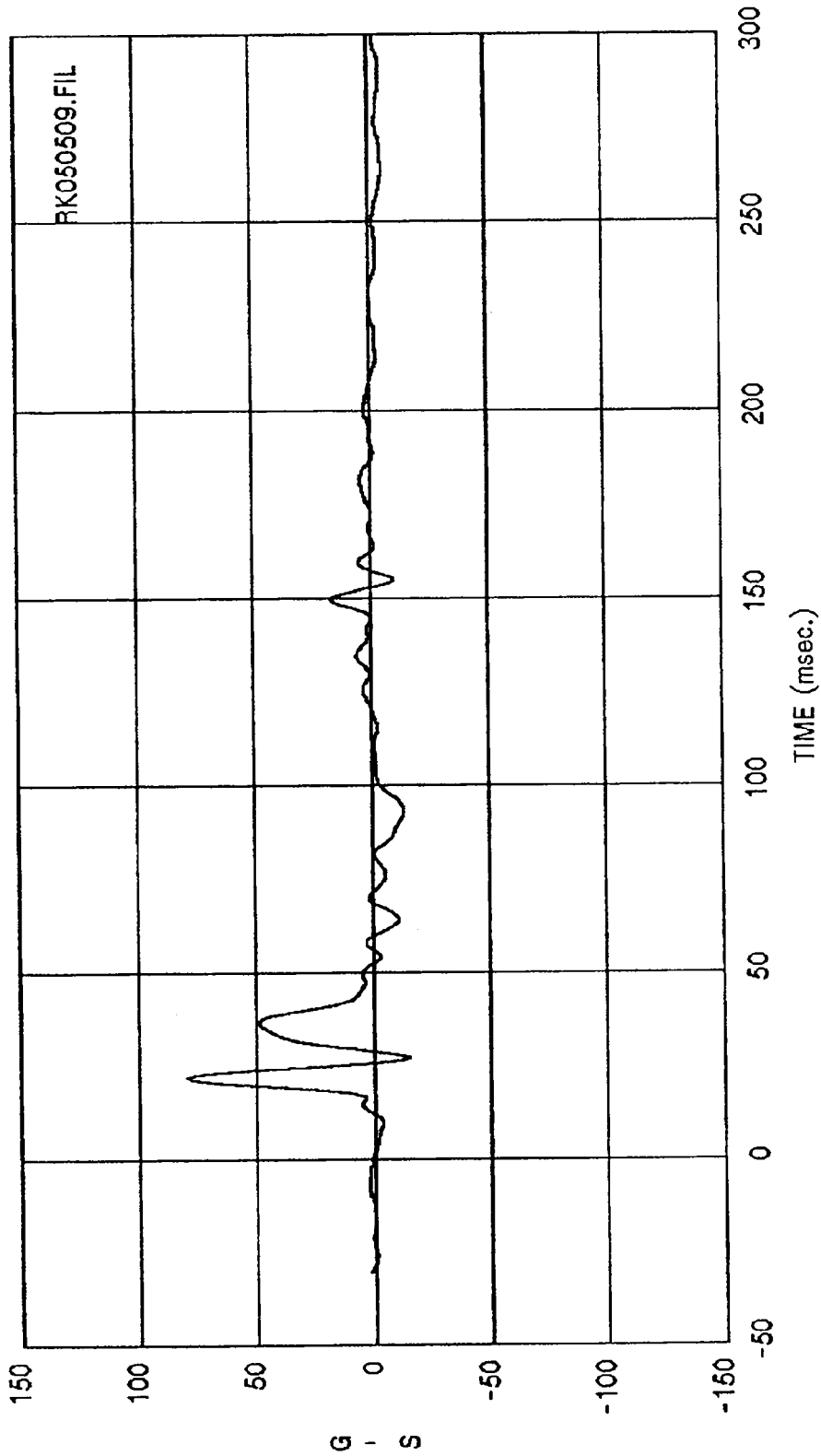
Curve: Driver lower rib acceleration -- Primary Filter: FIR 100 Max = 80.707 Min = -16.237

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



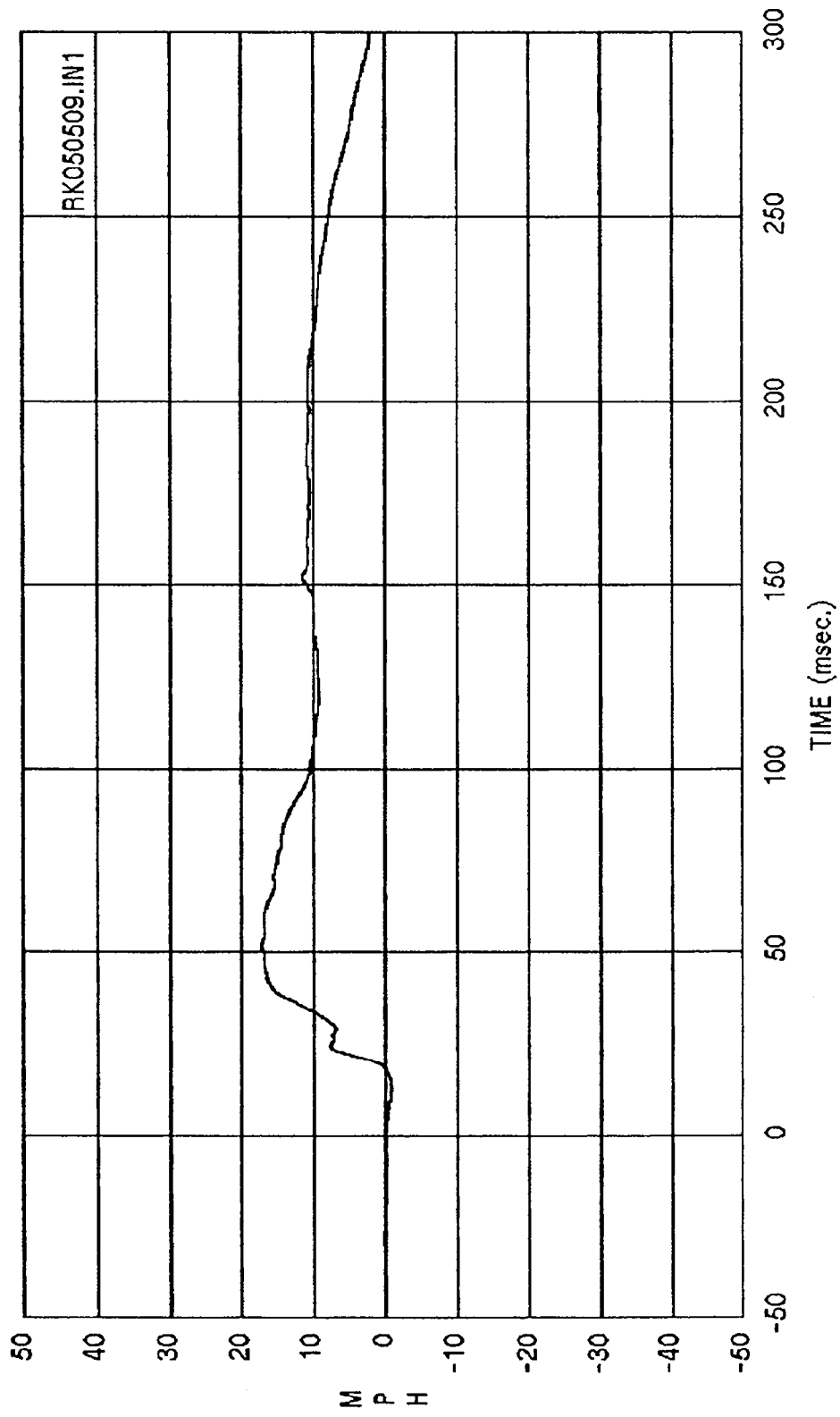
Curve: Driver lower rib delta V -- Primary Filter: SAE CLASS 180 Max = 18.399 Min = -8.1114

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



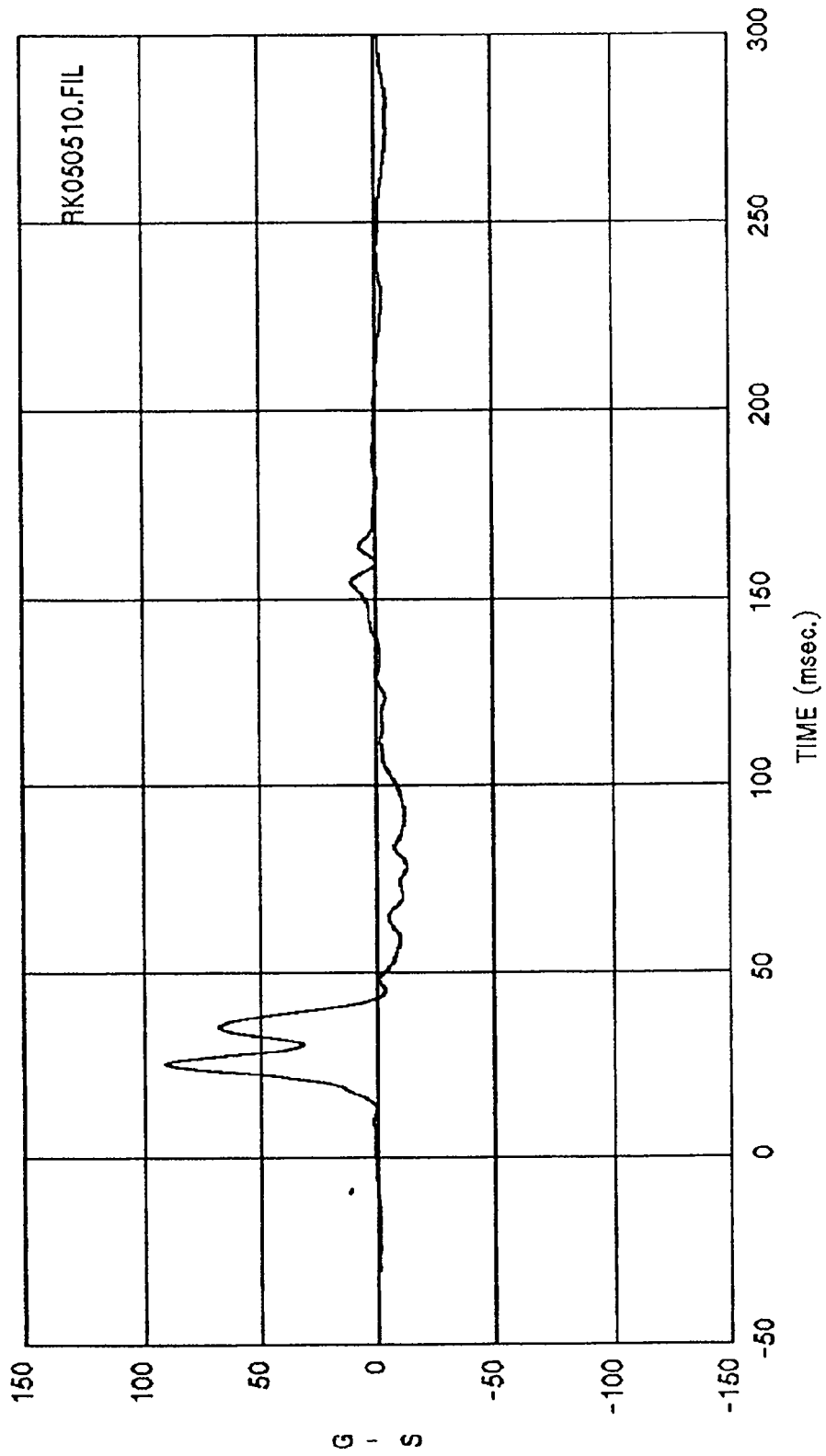
Curve: Driver lower rib acceleration -- Redundant Filter: FIR 100 Max = 79.535 Min = -14.823

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



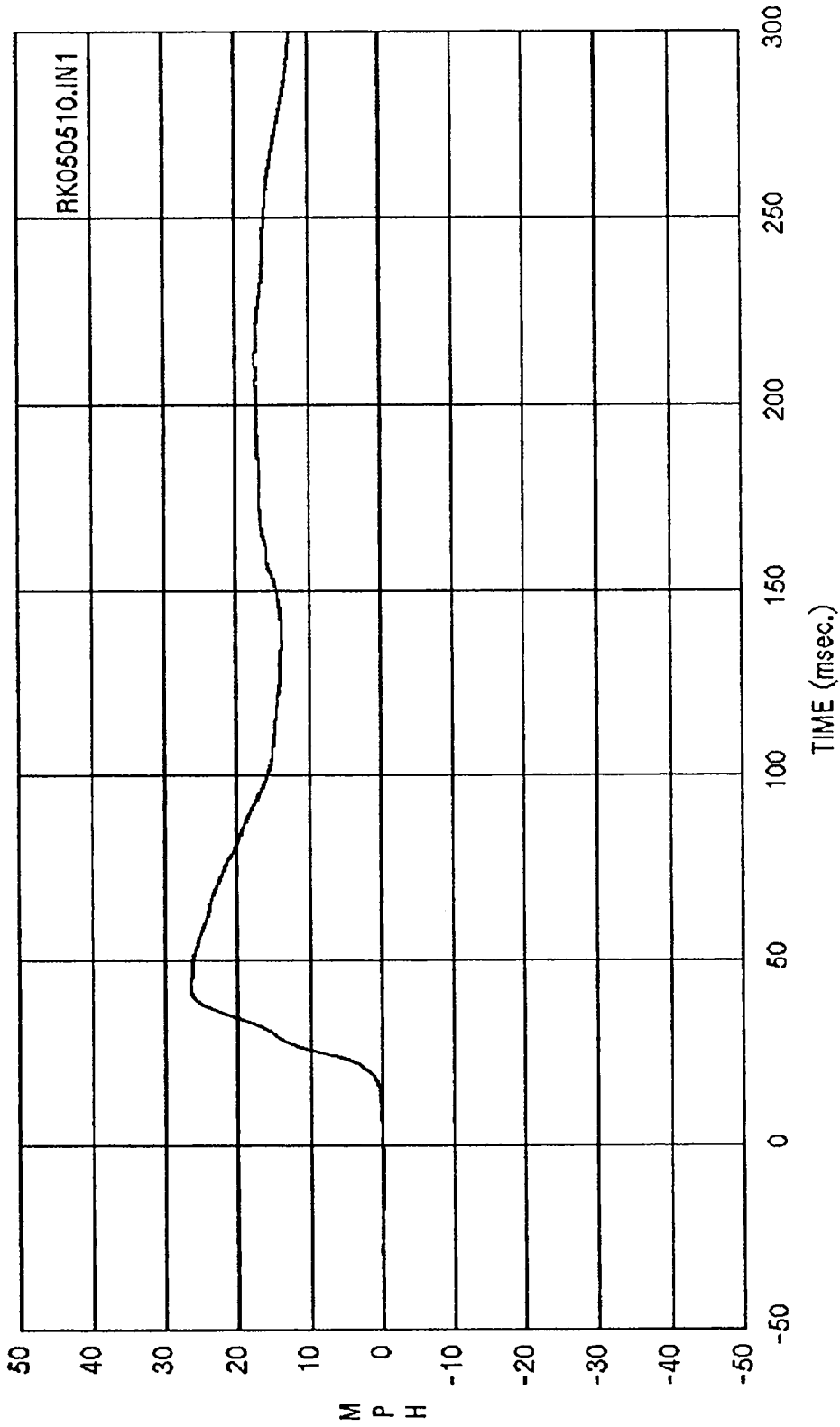
Curve: Driver lower rib delta V -- Redundant Filter: SAE CLASS 180 Max = 17.332 Min = -7.8310

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



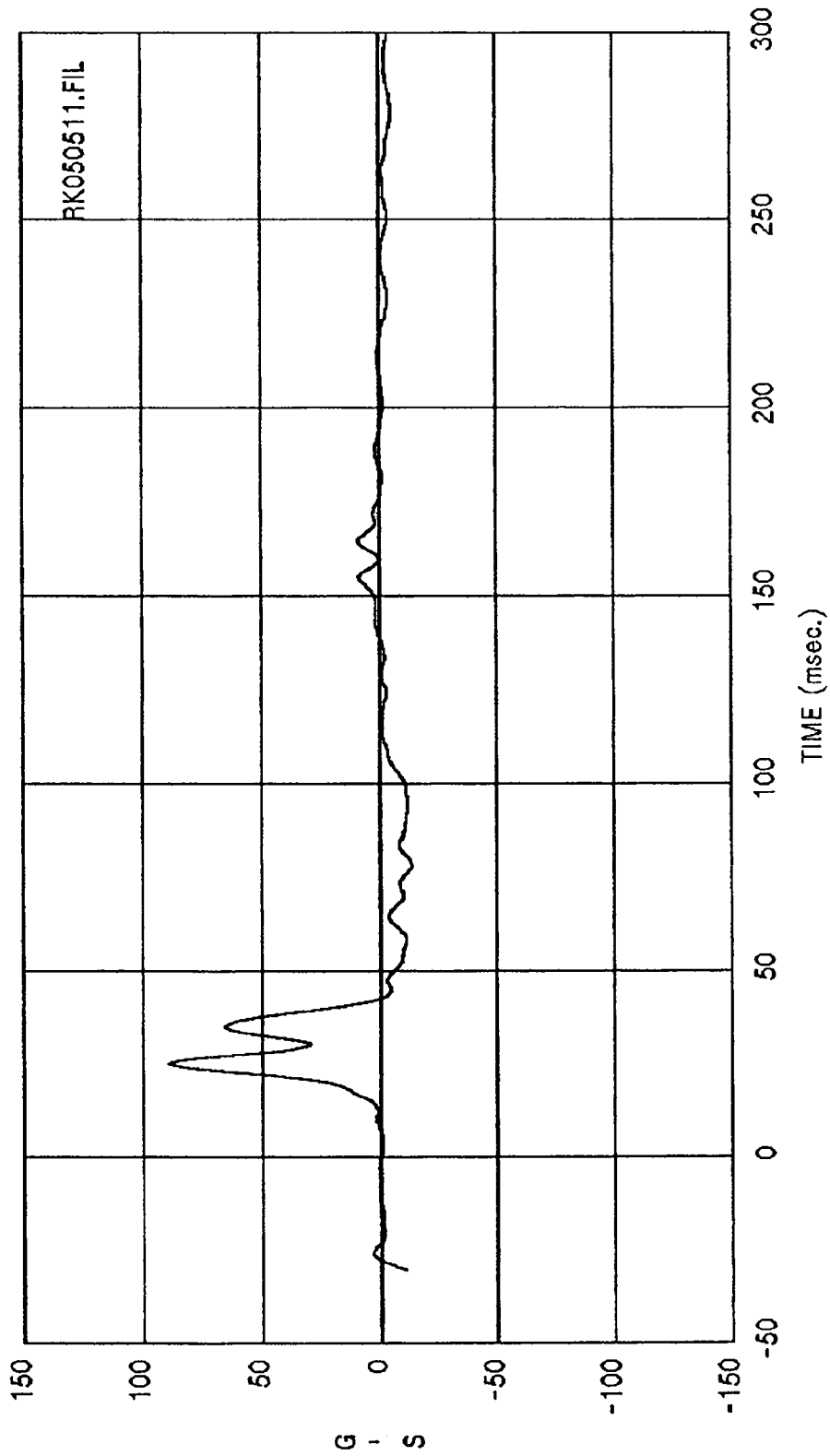
Curve: Driver lower spine acceleration -- Primary Filter: FIR 100 Max = 91.187 Min = -13.261

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



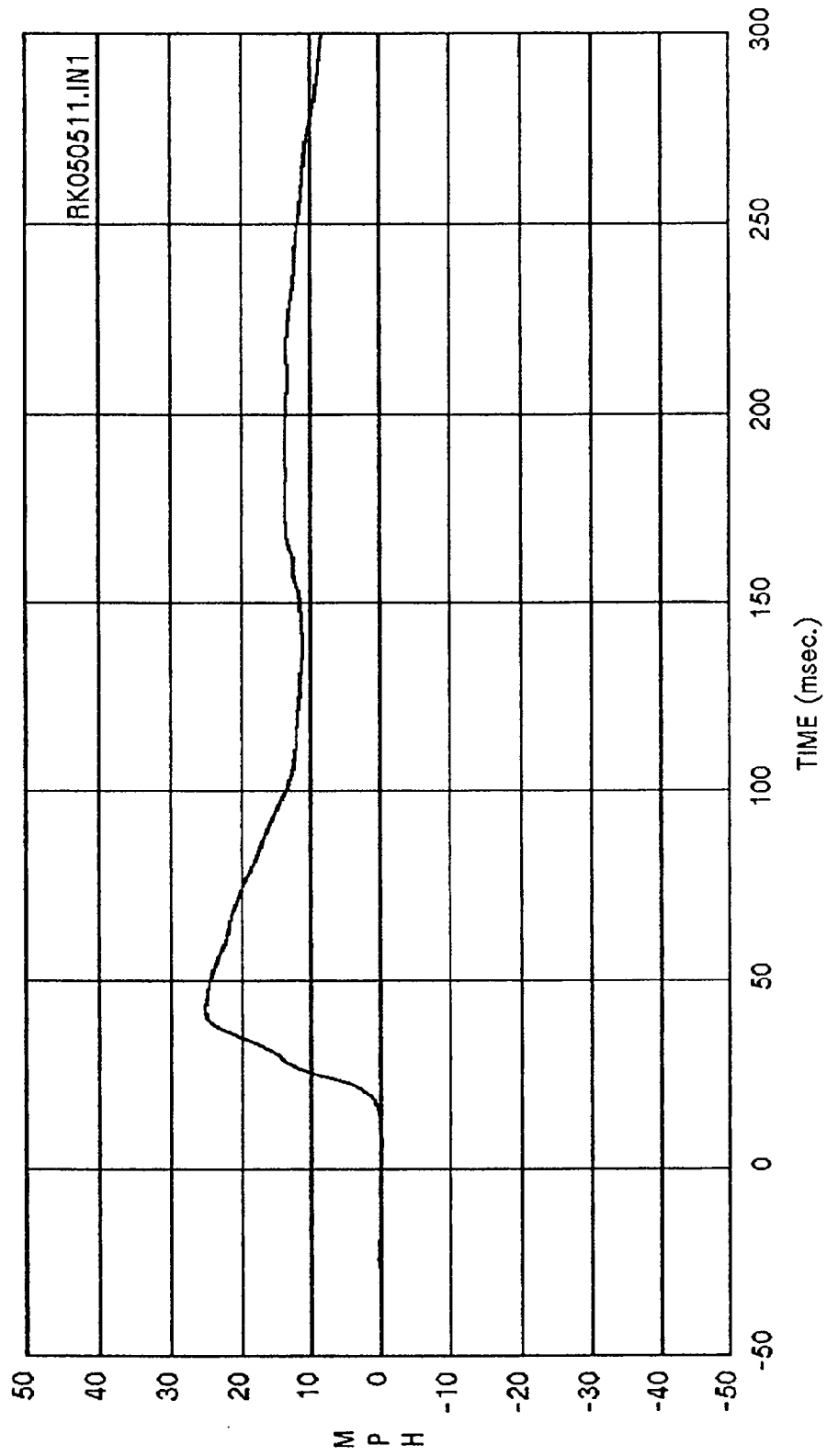
Curve: Driver lower spine delta V -- Primary Filter: SAE CLASS 180 Max = 26.497 Min = 12.630

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



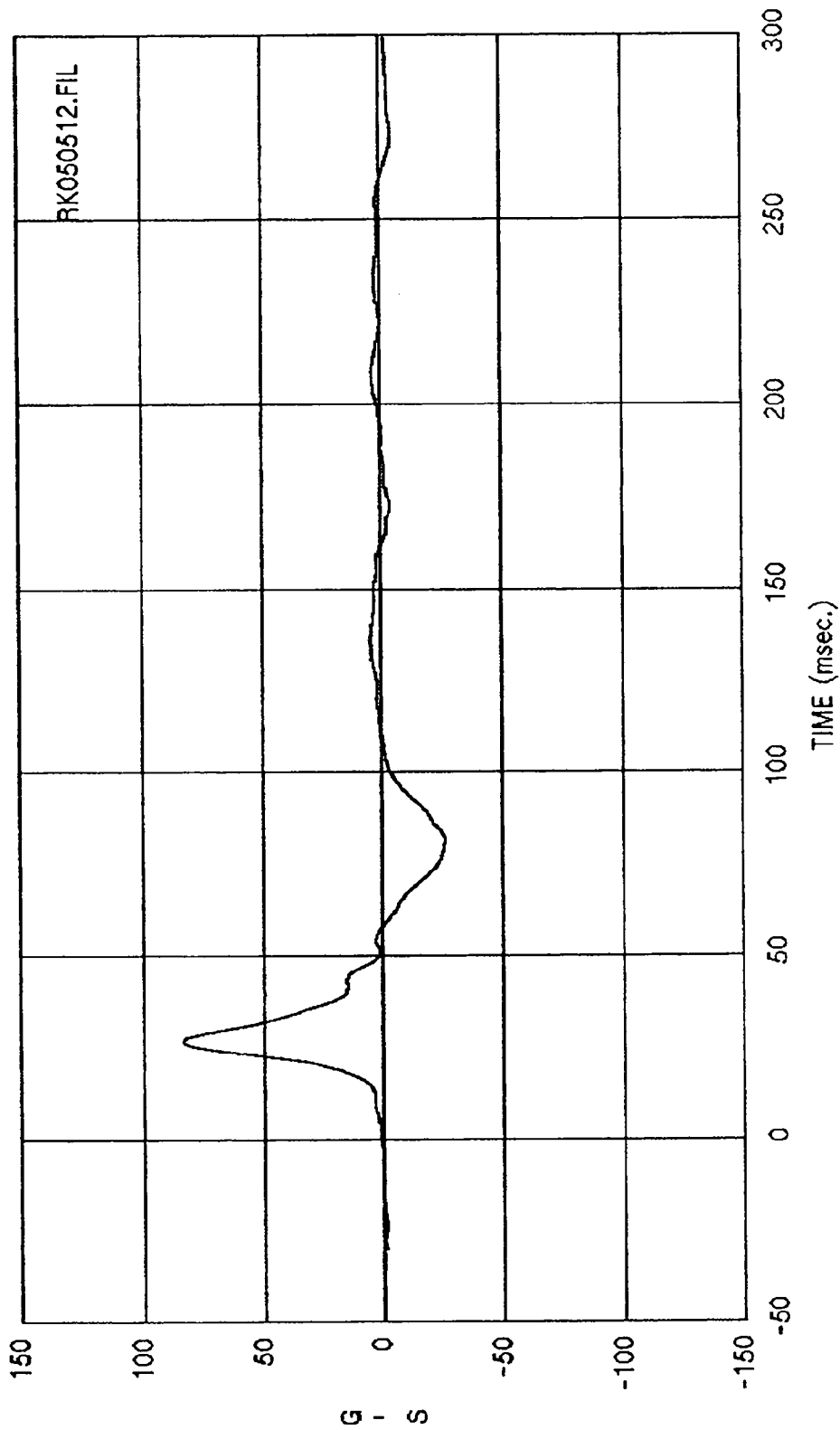
Curve: Driver lower spine acceleration -- Redundant Filter: FIR 100 Max = 88.735 Min = -13.687

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



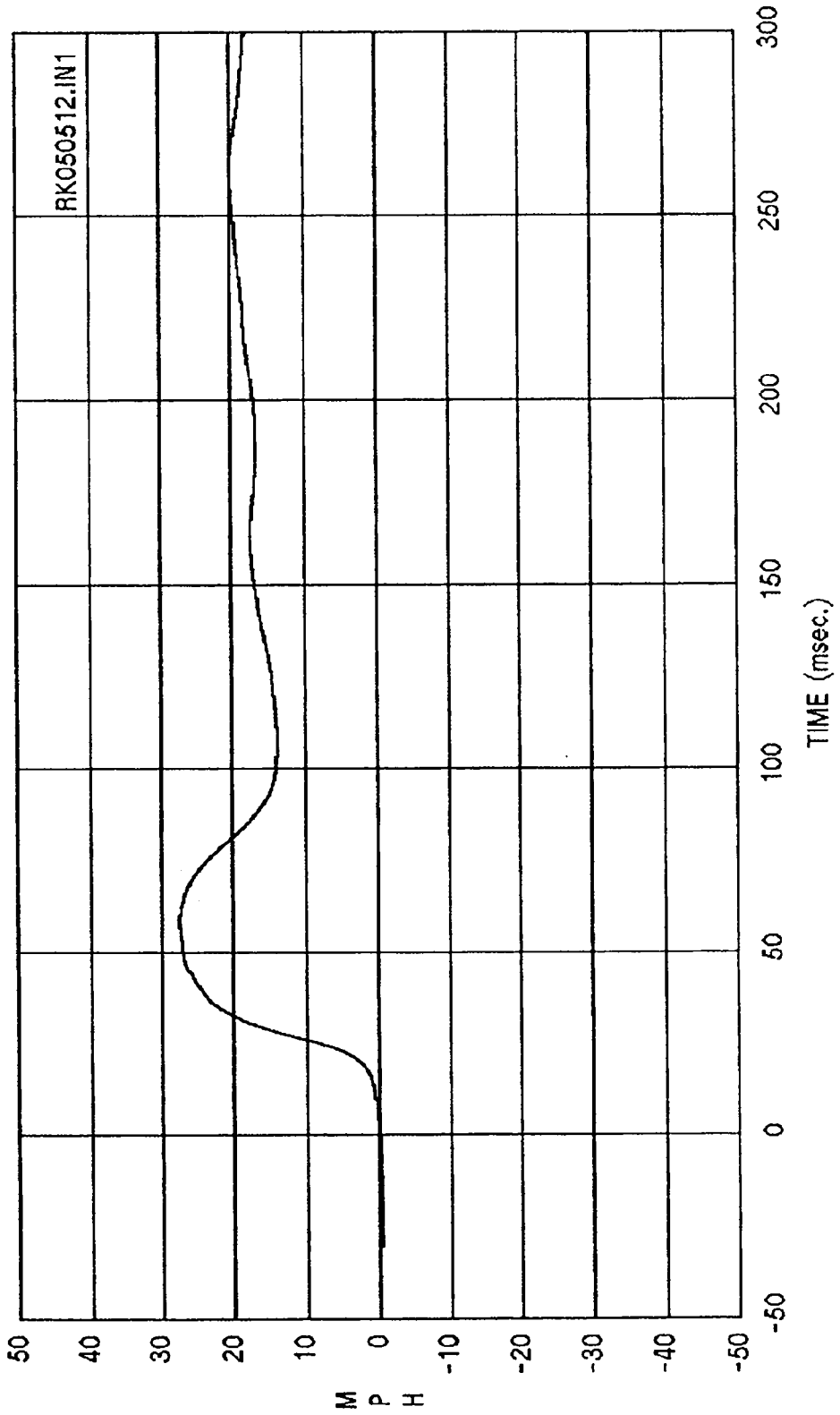
Curve: Driver lower spine delta V -- Redundant Filter: SAE CLASS 180 Max = 25.228 Min = -.14440

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



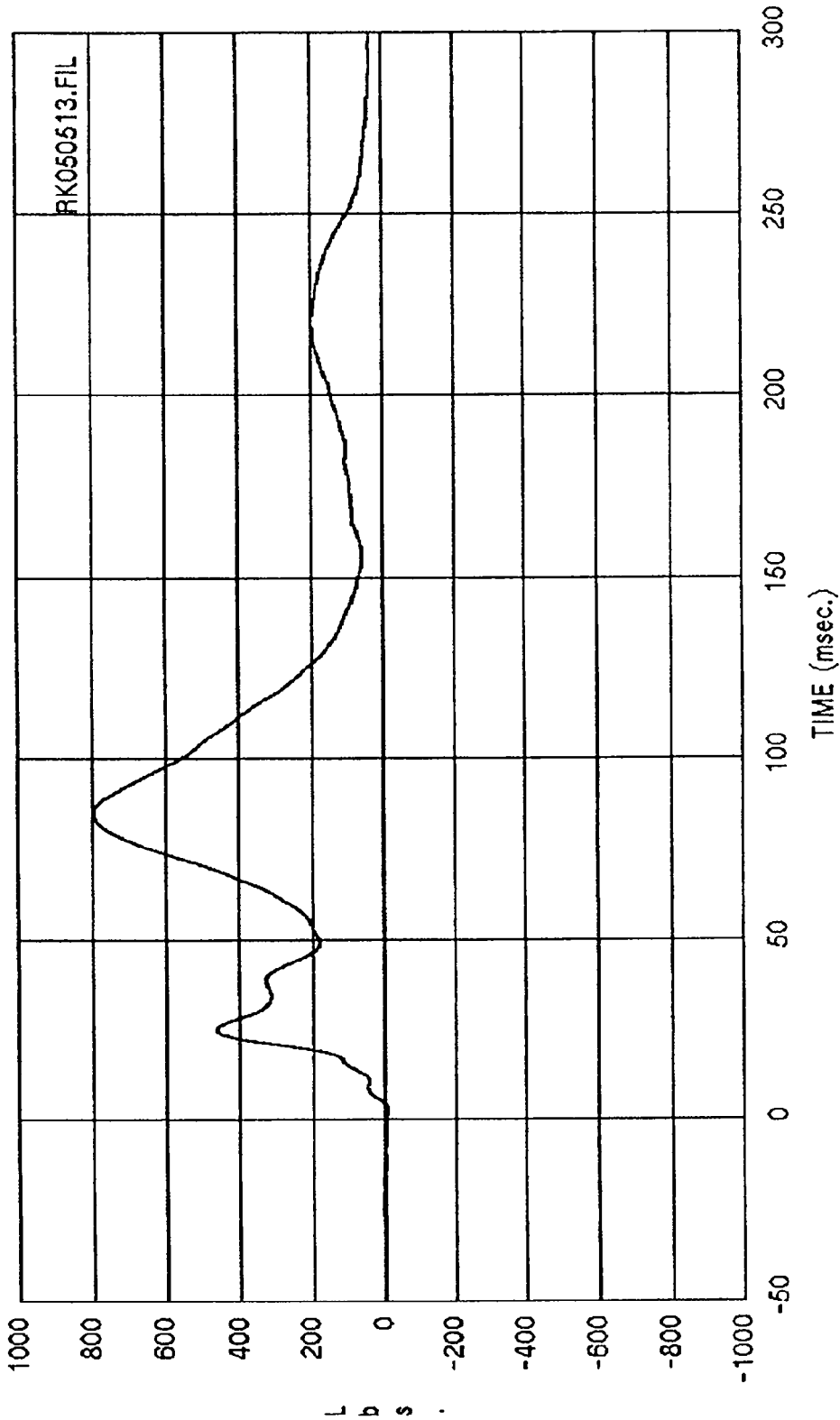
Curve: Driver pelvis acceleration Filter: FIR 100 Max = 84.521 Min = -26.109

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



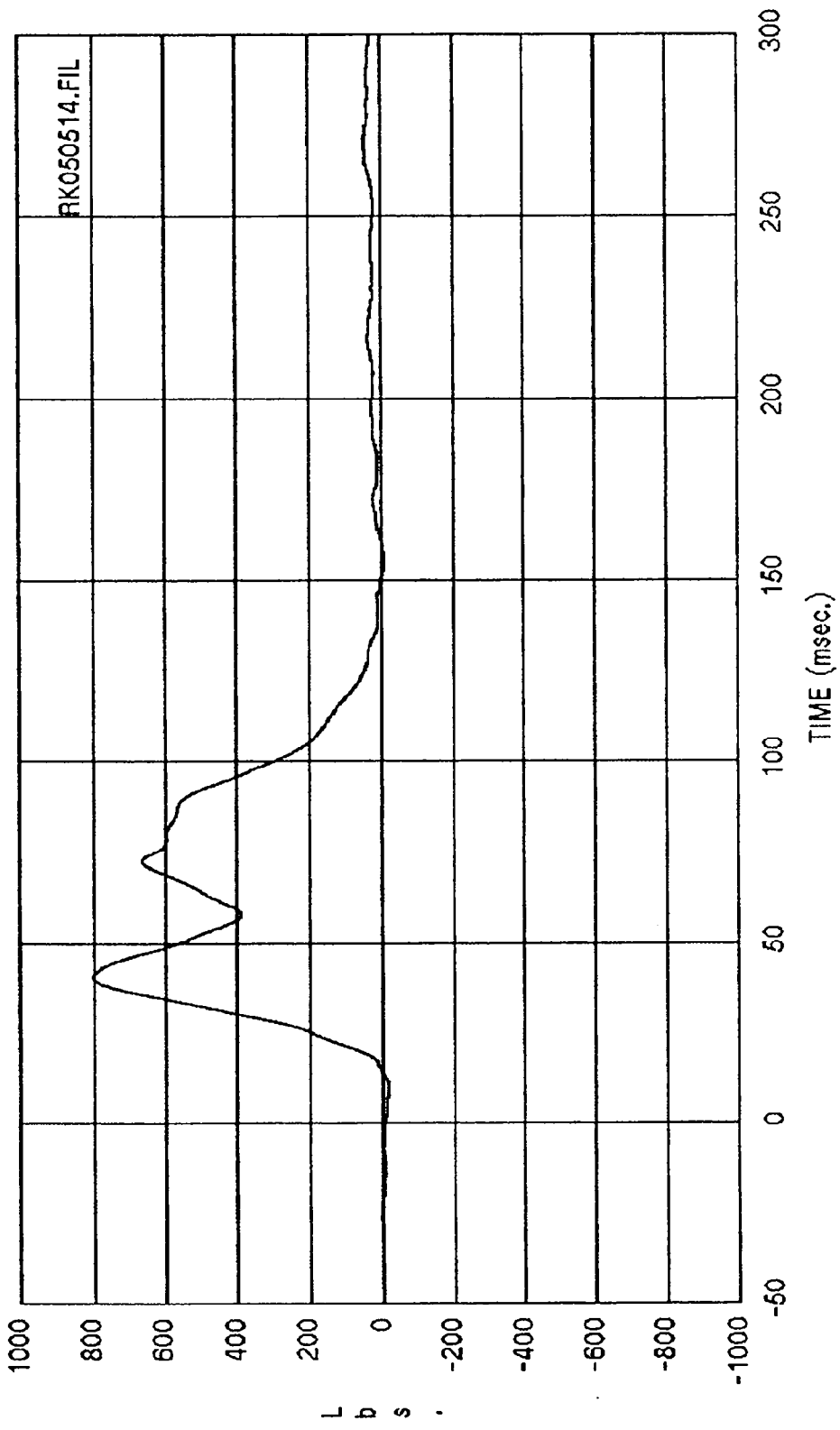
Curve: Driver pelvis delta V Filter: SAE CLASS 180 Max = 27.541 Min = 13.970

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



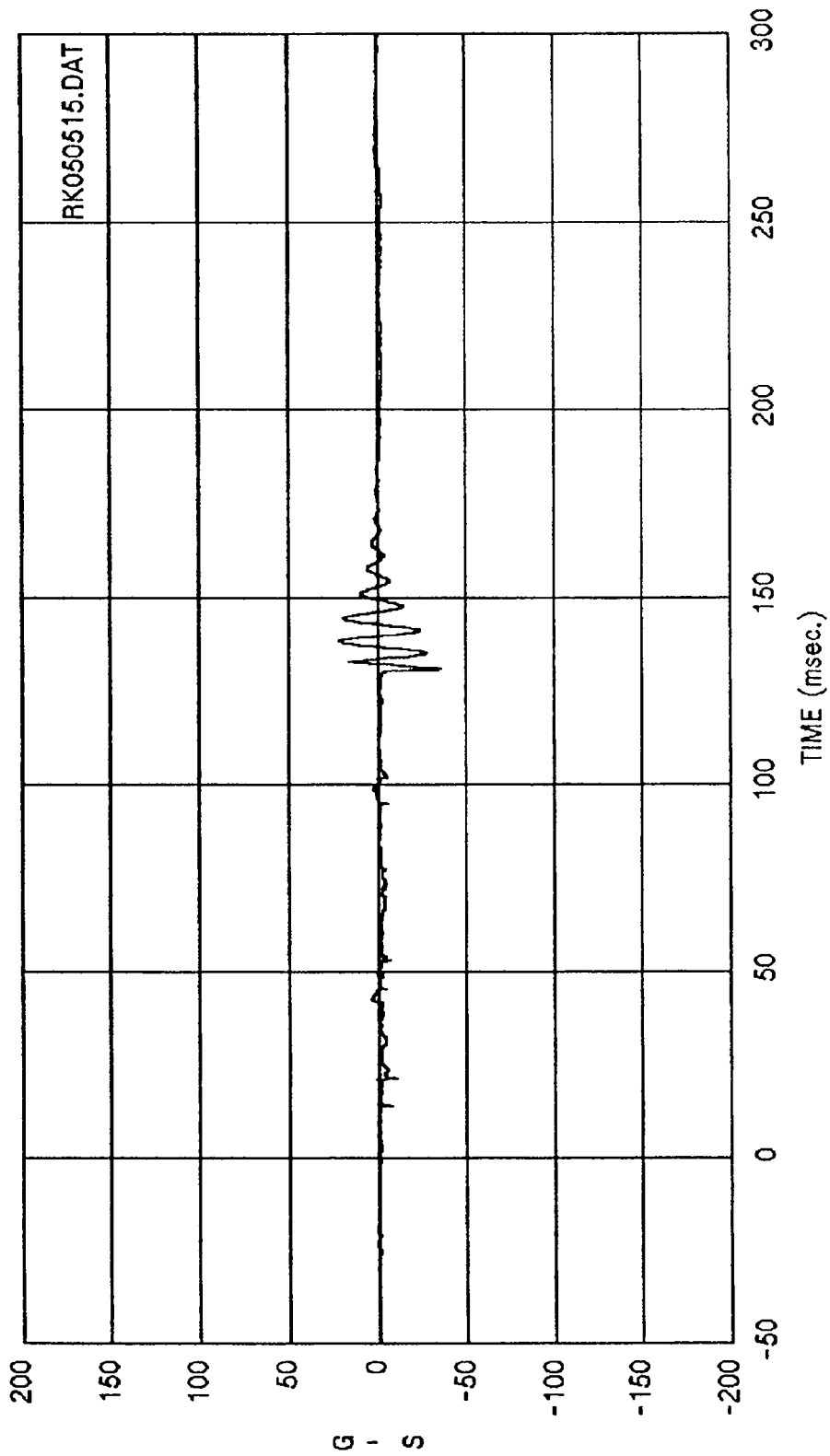
Curve: Driver lap belt load Filter: SAE CLASS 60 Max = 796.43 Min = -6.0073

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



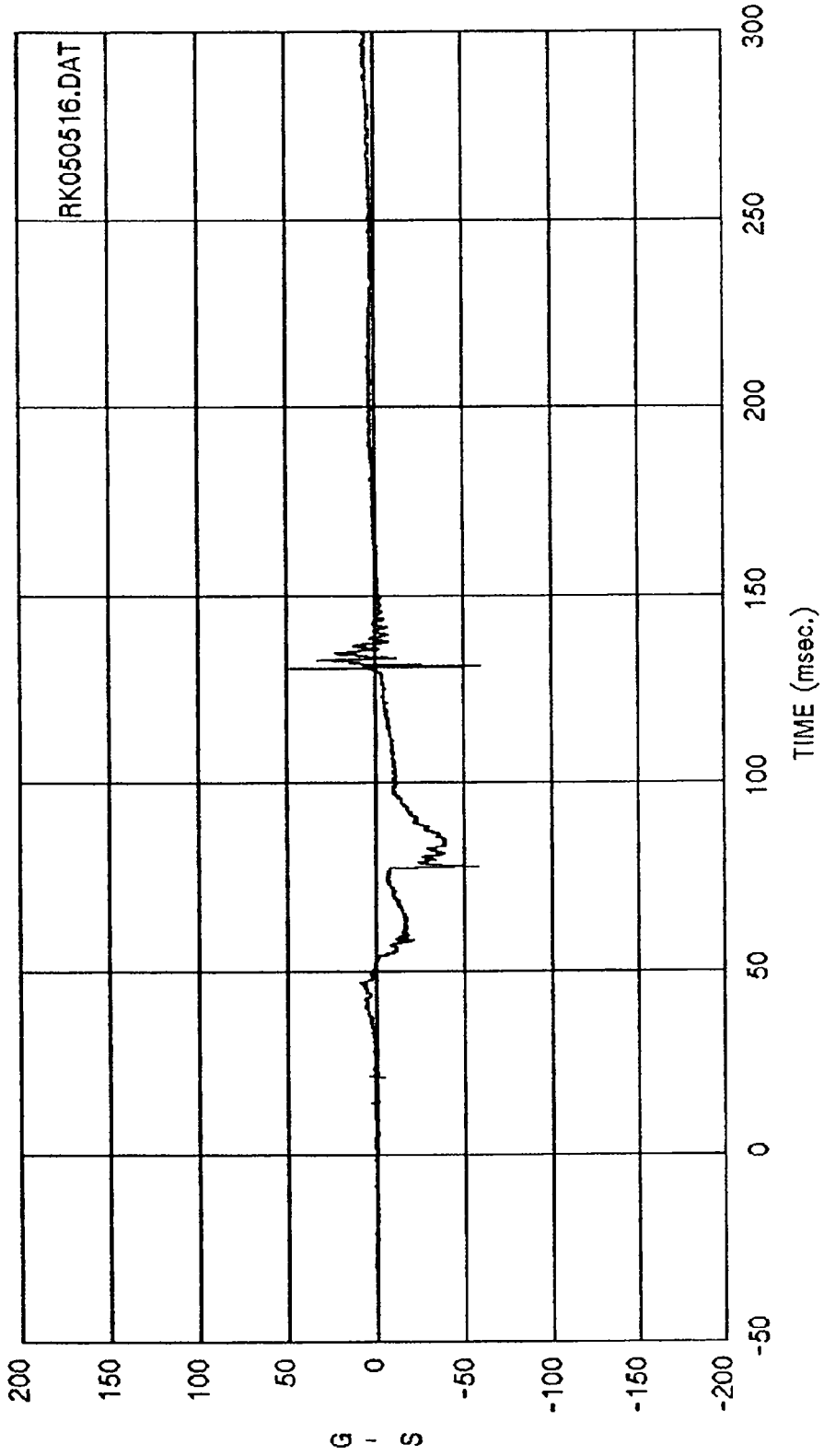
Curve: Driver shoulder belt load Filter: SAE CLASS 60 Max = 802.53 Min = -14.394

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



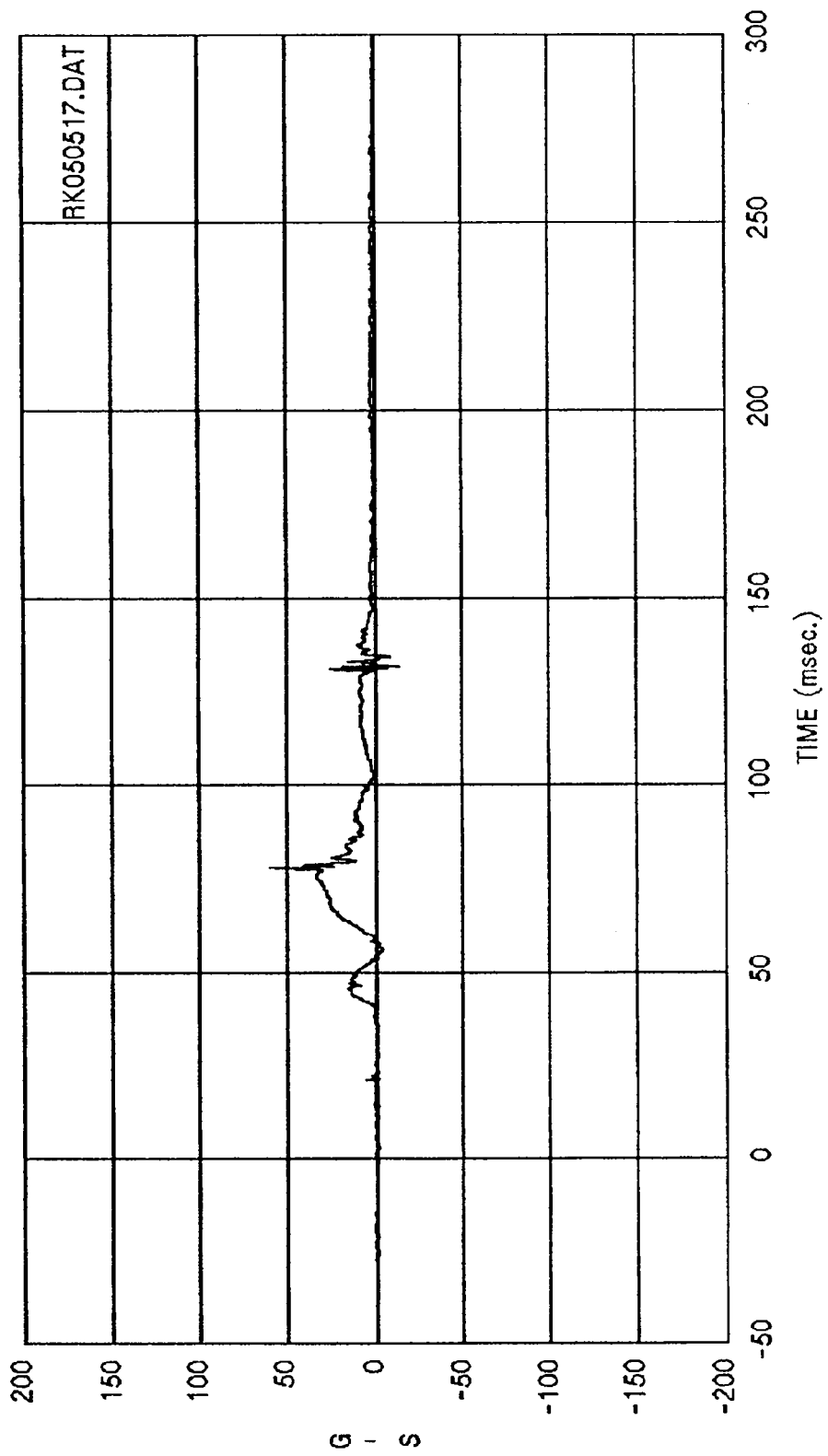
Curve: Passenger Head acceleration -- X axis Filter: SAE CLASS 1000 Max = 21.483 Min = -35.325

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



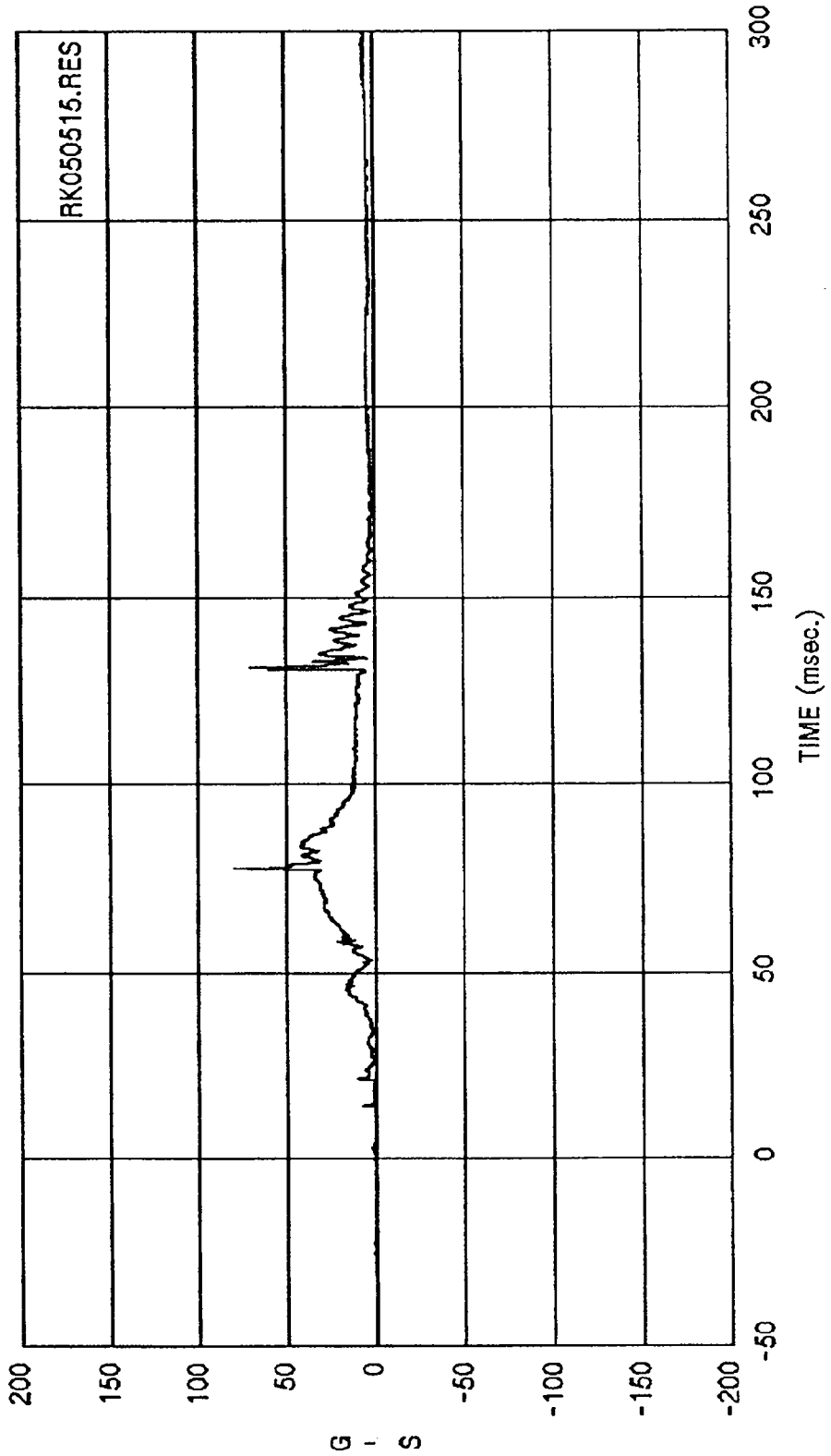
Curve: Passenger Head acceleration -- Y axis Filter: SAE CLASS 1000 Max = 47.454 Min = -62.644

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



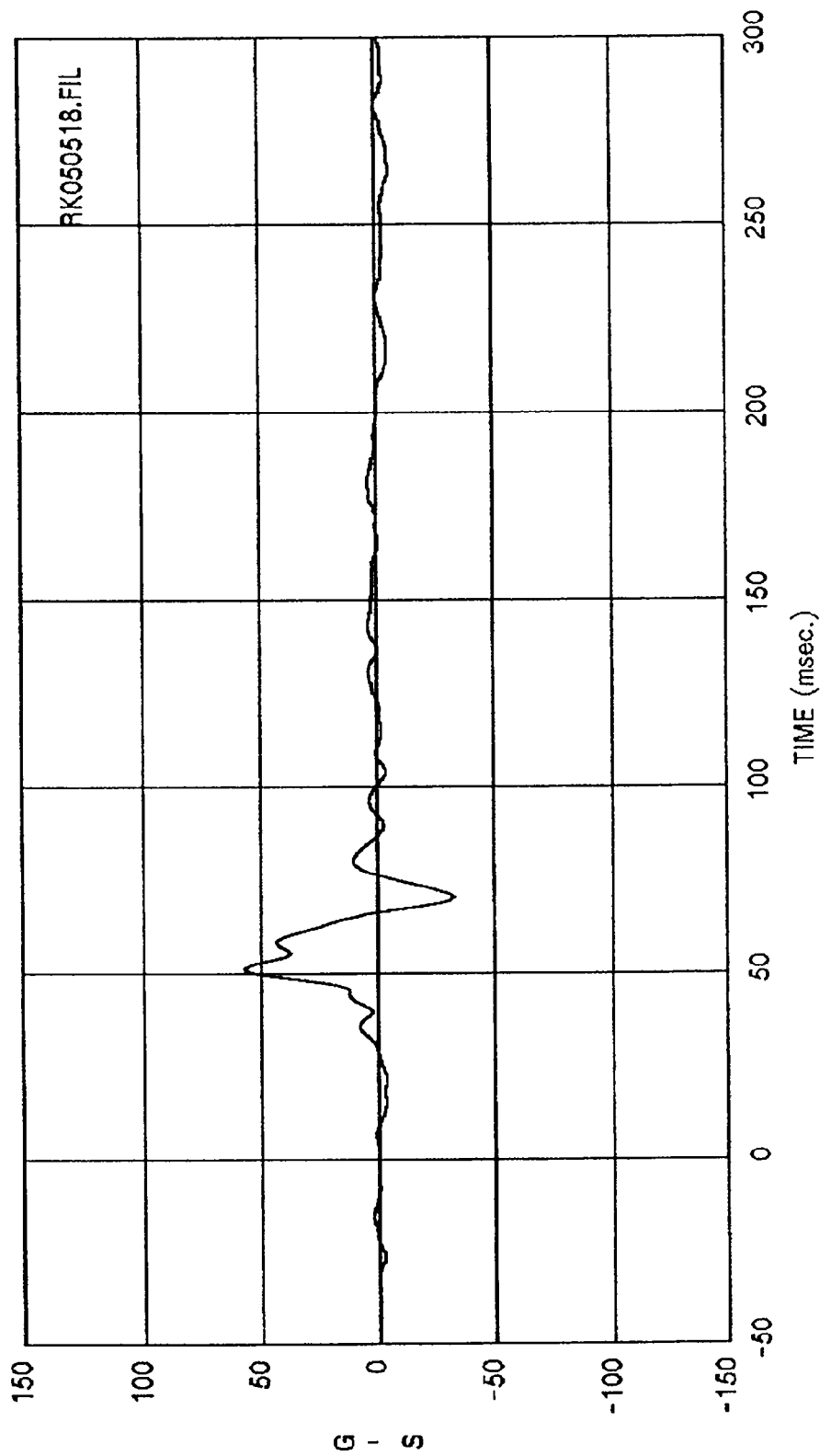
Curve: Passenger Head acceleration -- Z axis Filter: SAE CLASS 1000 Max = 59.359 Min = -19.52

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



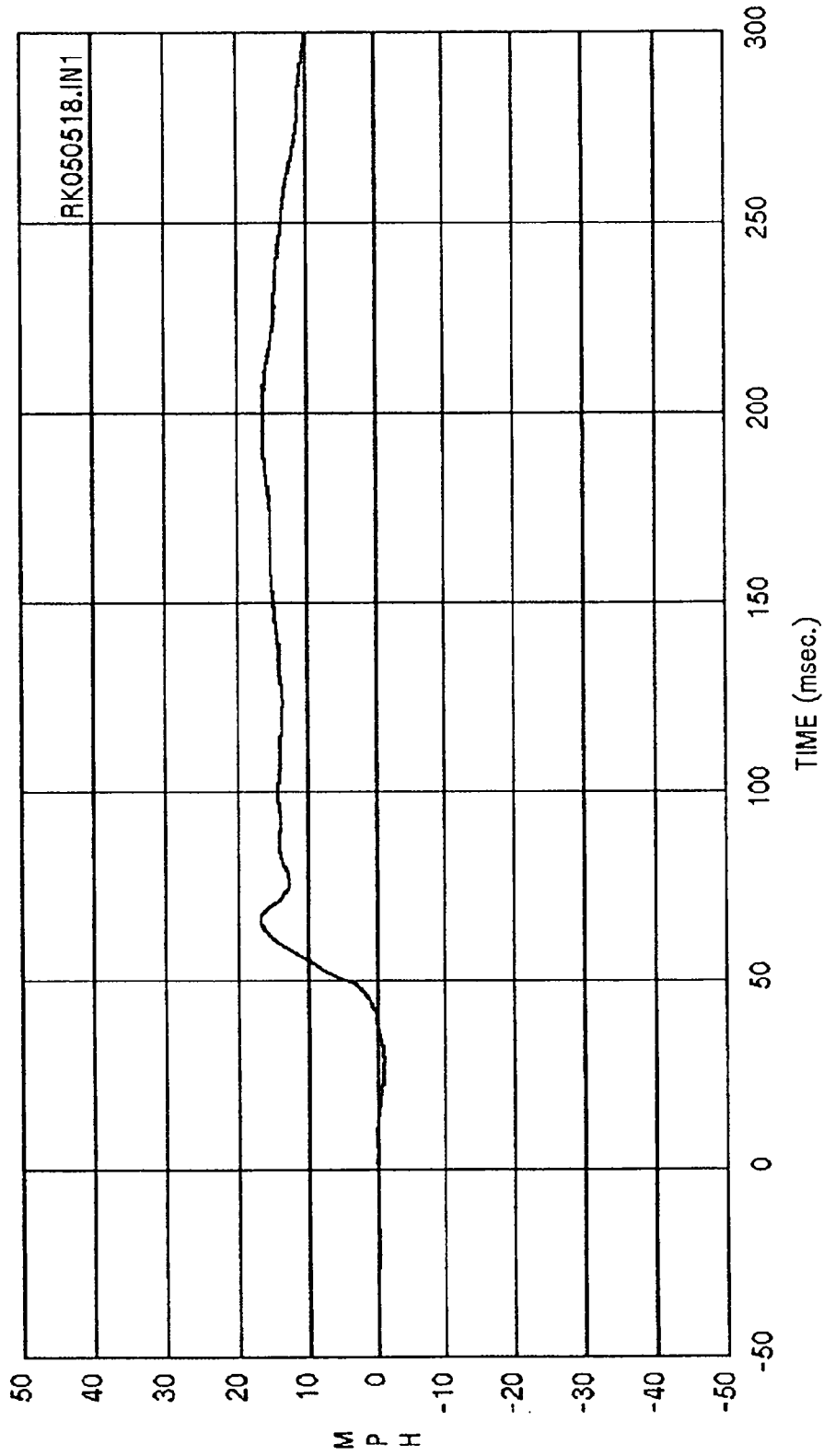
Curve: Passenger head resultant acceleration Filter: SAE CLASS 1000 Max = 80.037 Min = .97049  
01

MSE Date: 09/09/92 Program: Side Impact 30/15 90 Deg. Vehicle: 1989 Isuzu Trooper 4x4



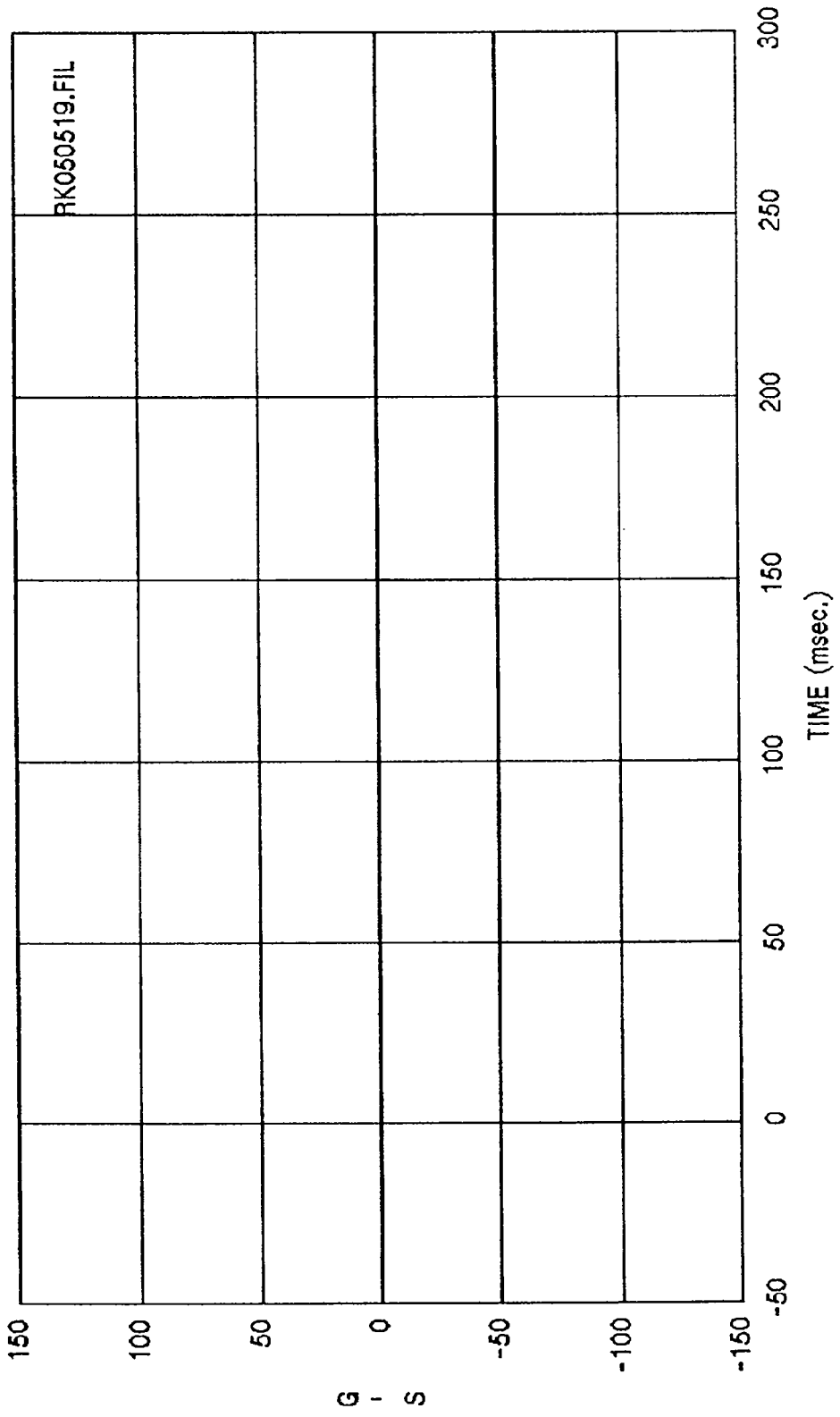
Curve: Passenger upper spine acceleration -- Primary Filter: FIR 100 Max = 56.732 Min = -32.947

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



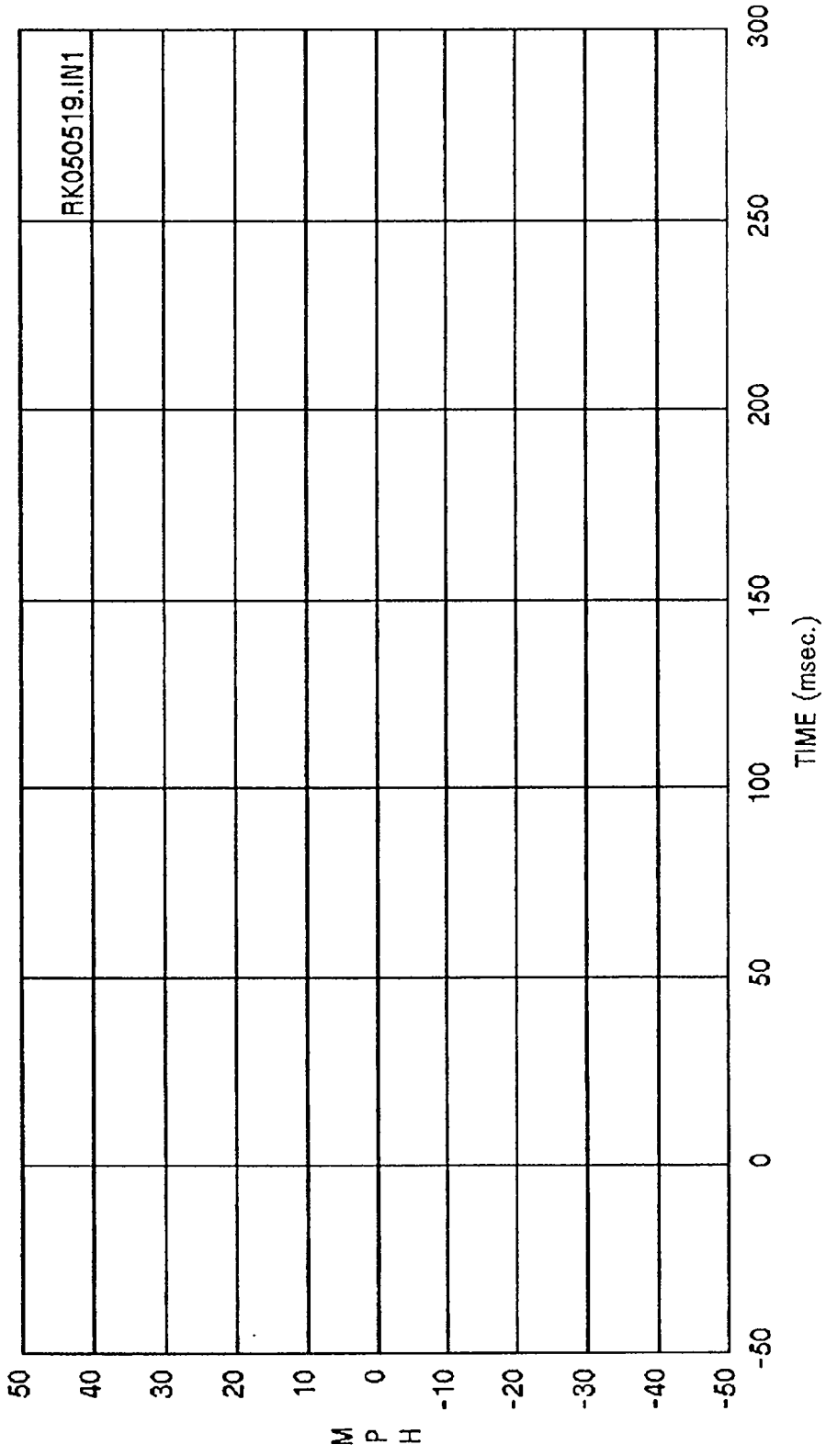
Curve: Passenger upper spine delta V -- Primary Filter: SAE CLASS 180 Max = 16.875 Min = -.92343

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



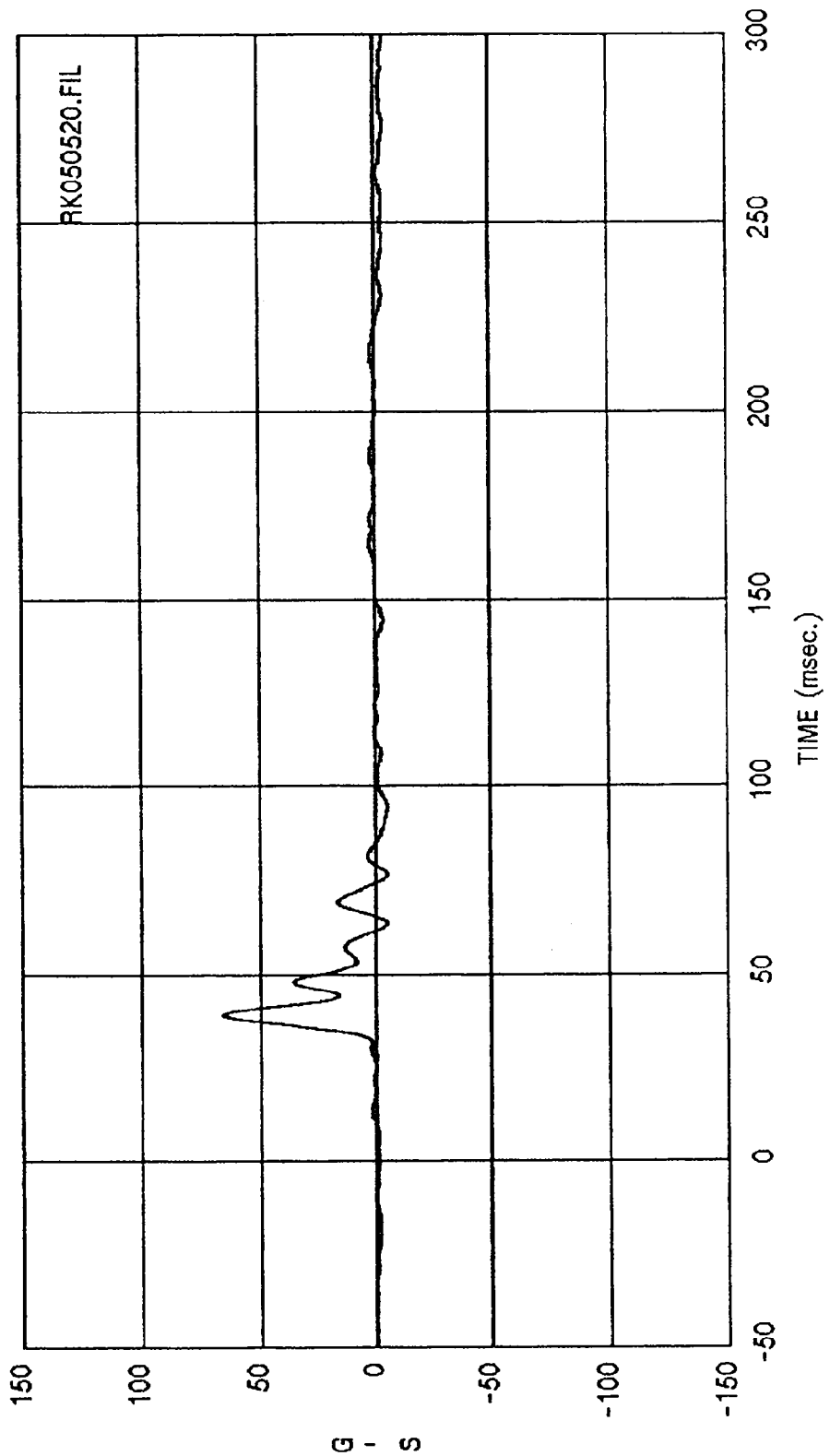
Curve: Passenger upper spine acceleration -- Redundant Filter: FIR 100 Max = .00000 Min = .00000

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



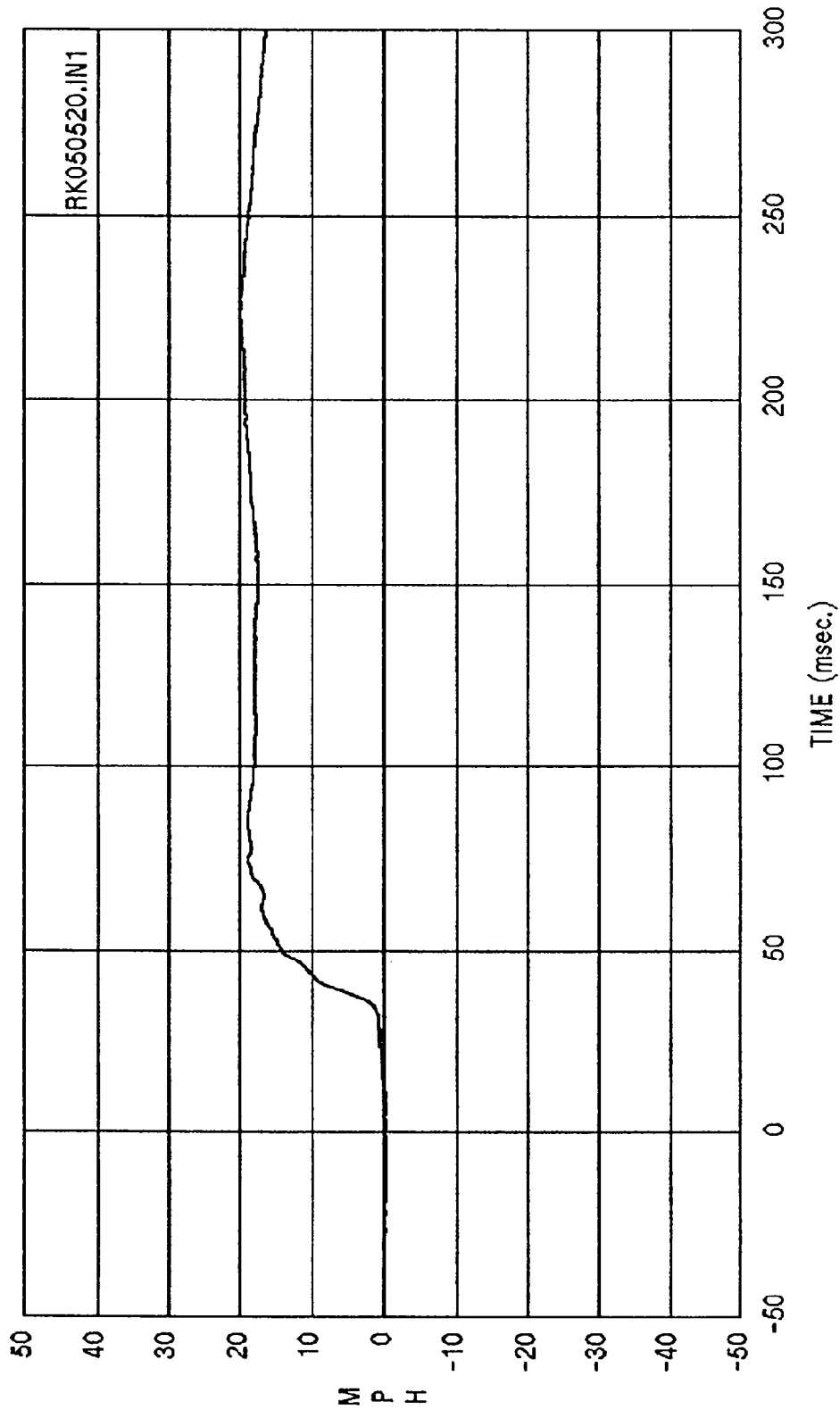
Curve: Passenger upper spine delta V -- Redundant Filter: SAE CLASS 180 Max = .00000 Min = .00000

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



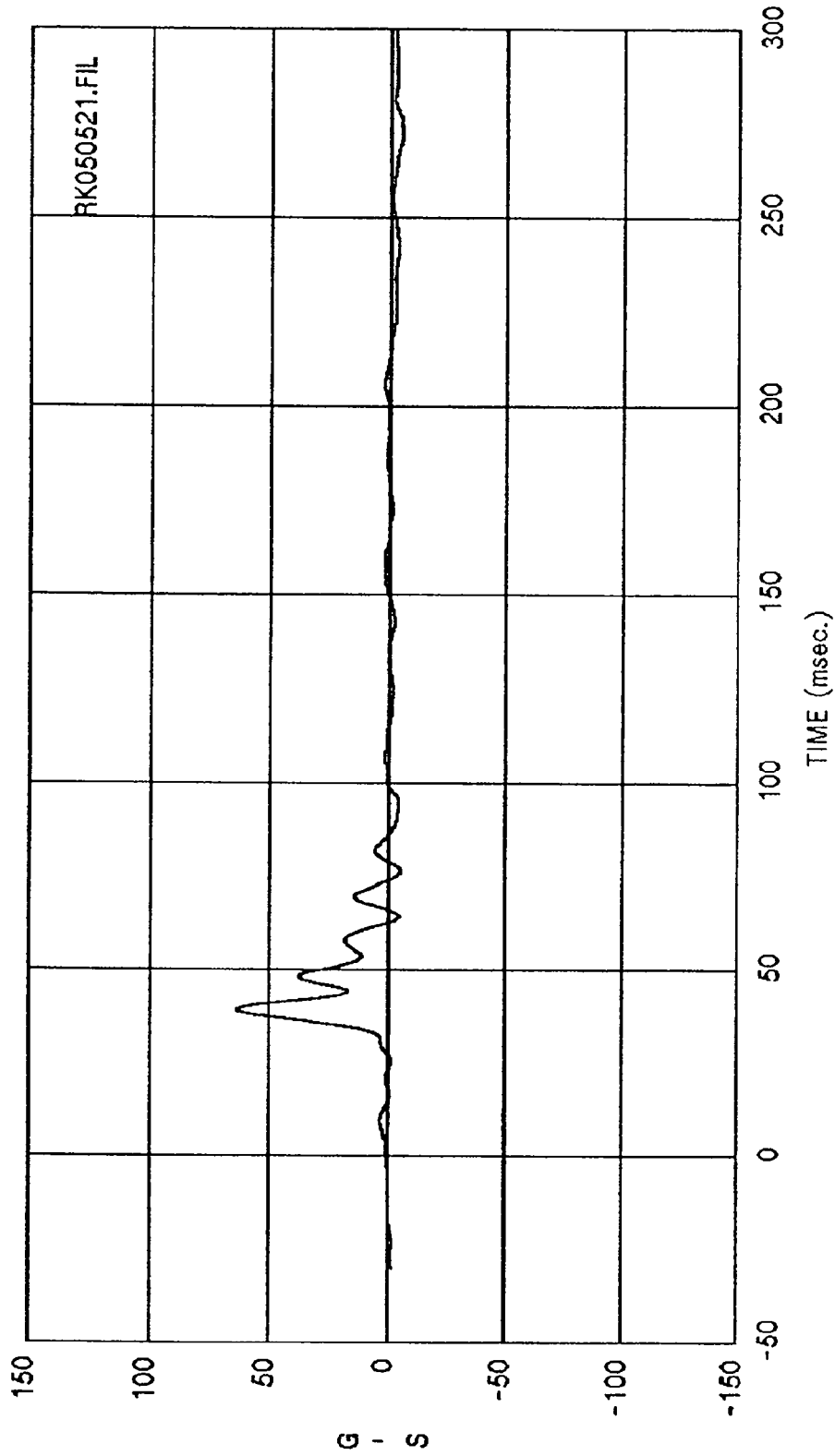
Curve: Passenger upper rib acceleration -- Primary Filter: FIR 100 Max = 65.785 Min = -5.3381

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



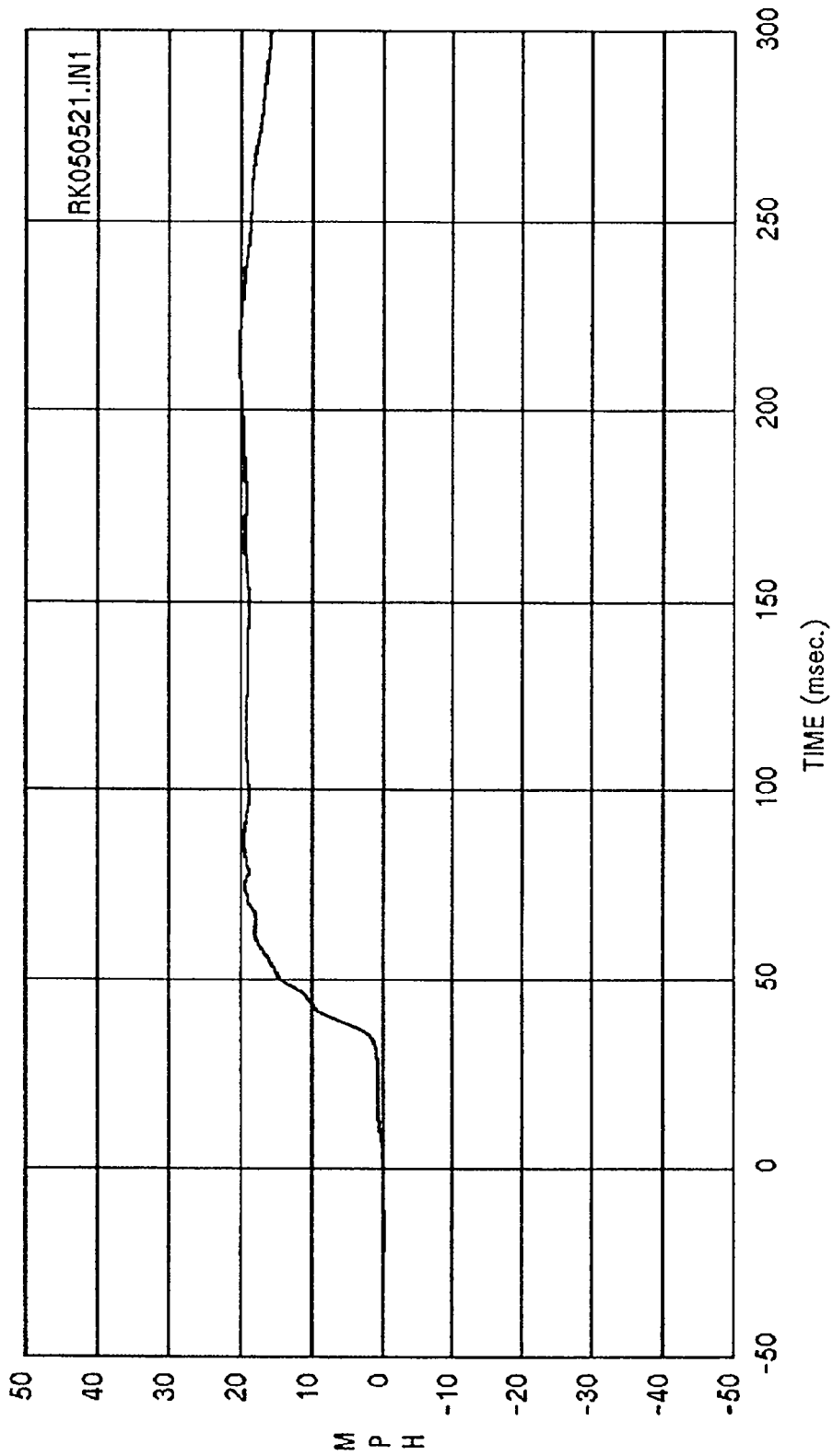
Curve: Passenger upper rib delta V -- Primary Filter: SAE CLASS 180 Max = 20.085 Min = -.13701

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



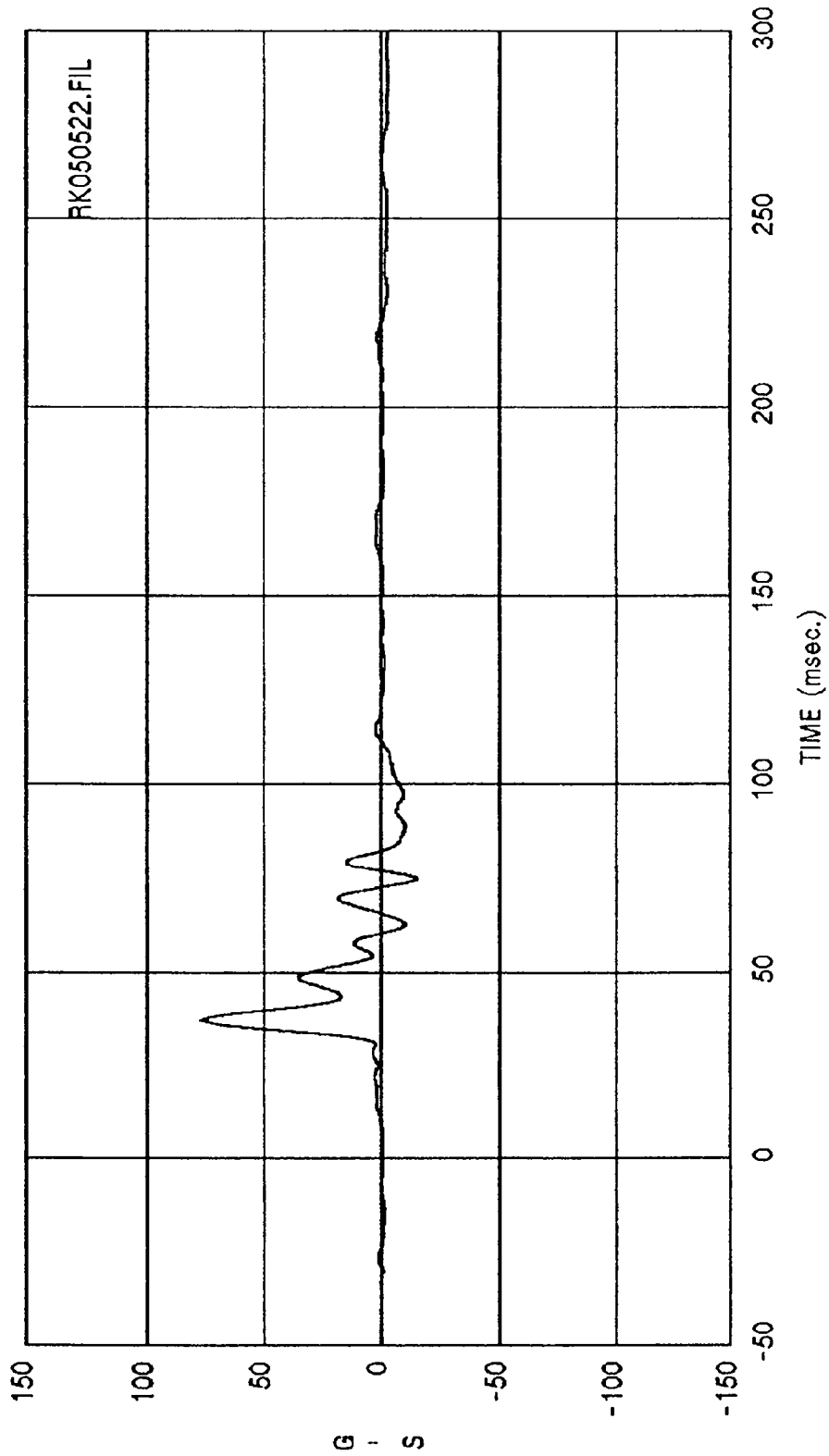
Curve: Passenger upper rib acceleration -- Redundant Filter: FIR 100 Max = 63.587 Min = -5.4936

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



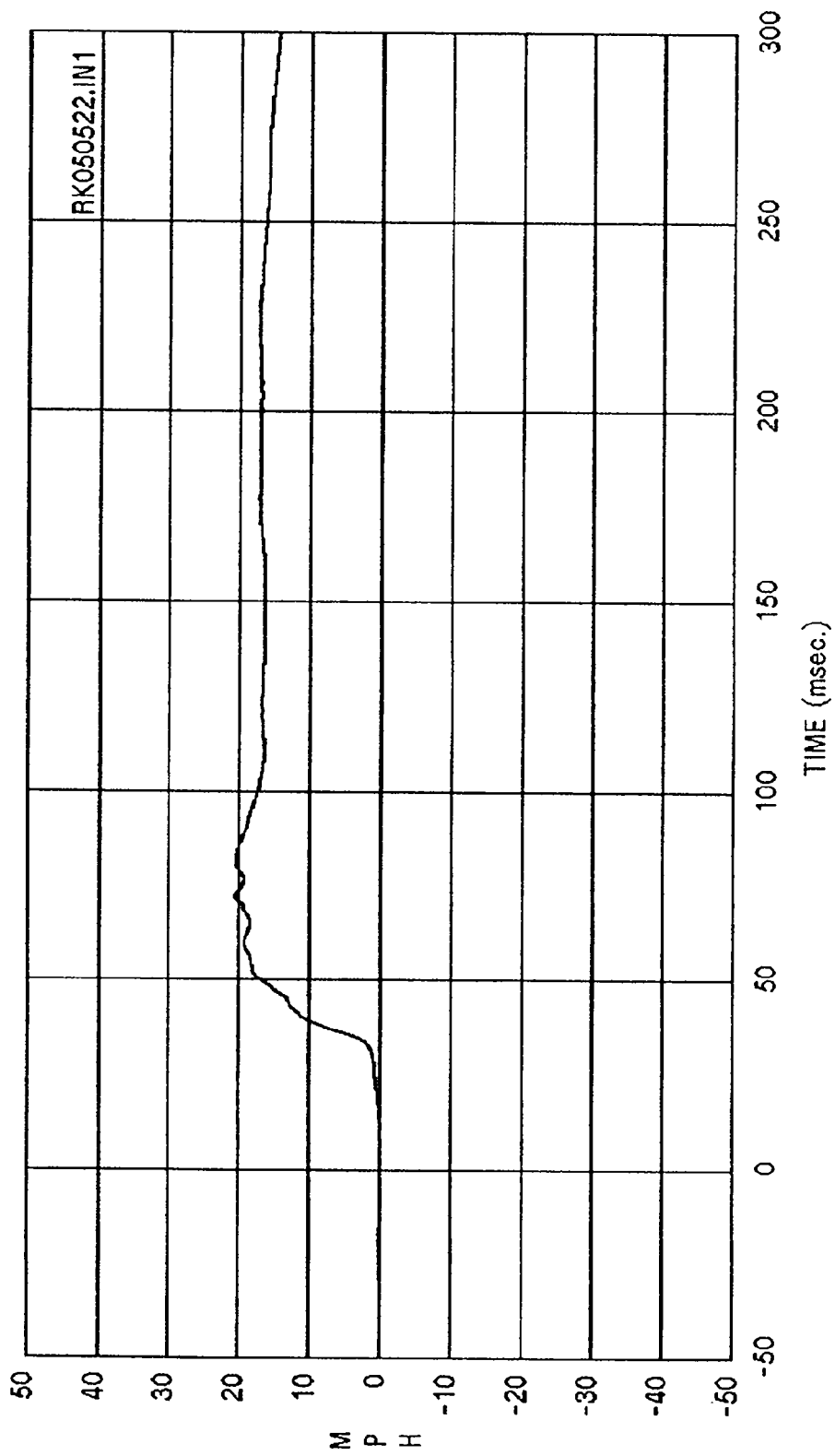
Curve: Passenger upper rib delta V -- Redundant Filter: SAE CLASS 180 Max = 20.181 Min = .68839

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



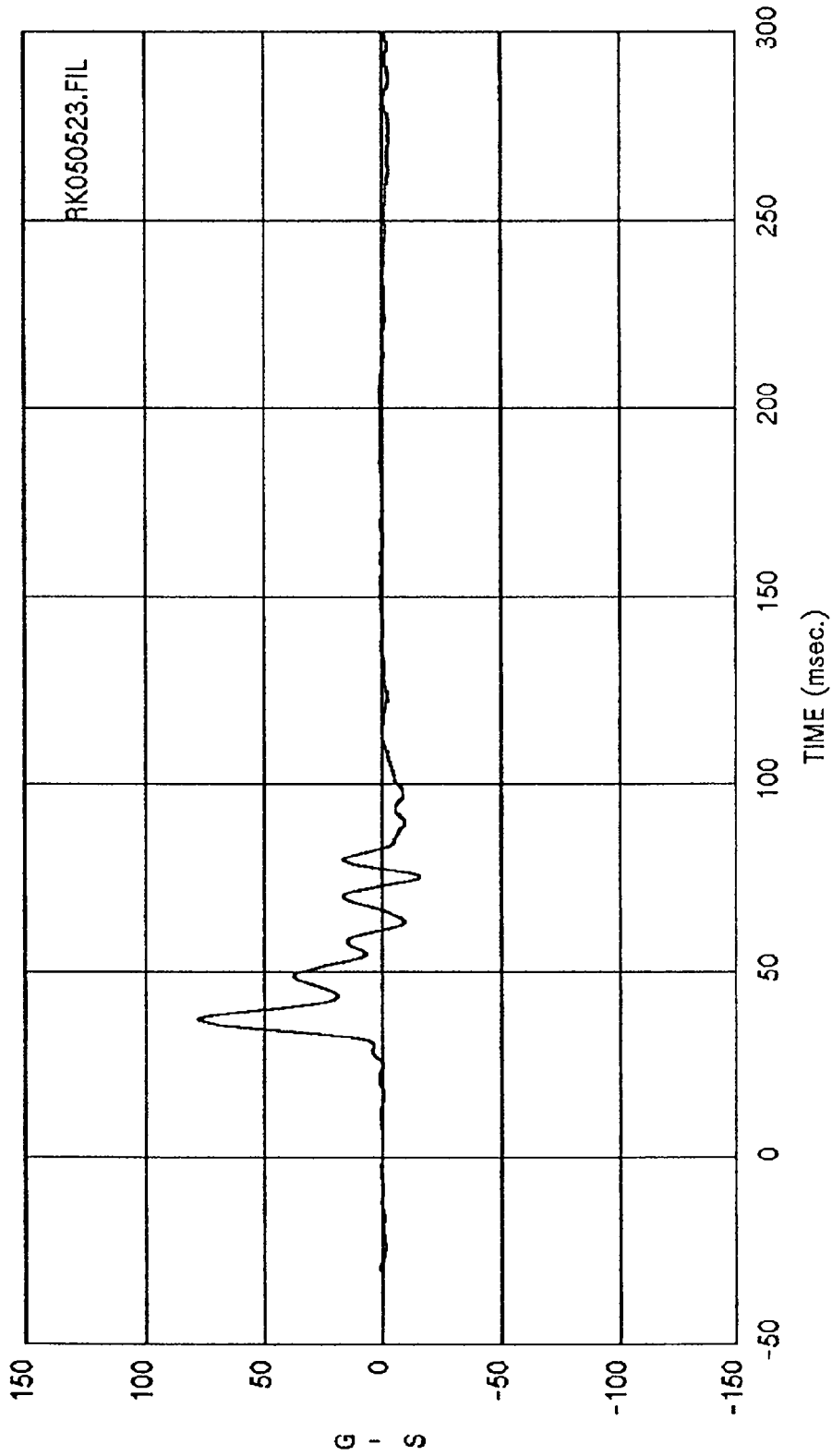
Curve: Passenger lower rib acceleration -- Primary Filter: FIR 100 Max = 76.720 Min = -15.221

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4

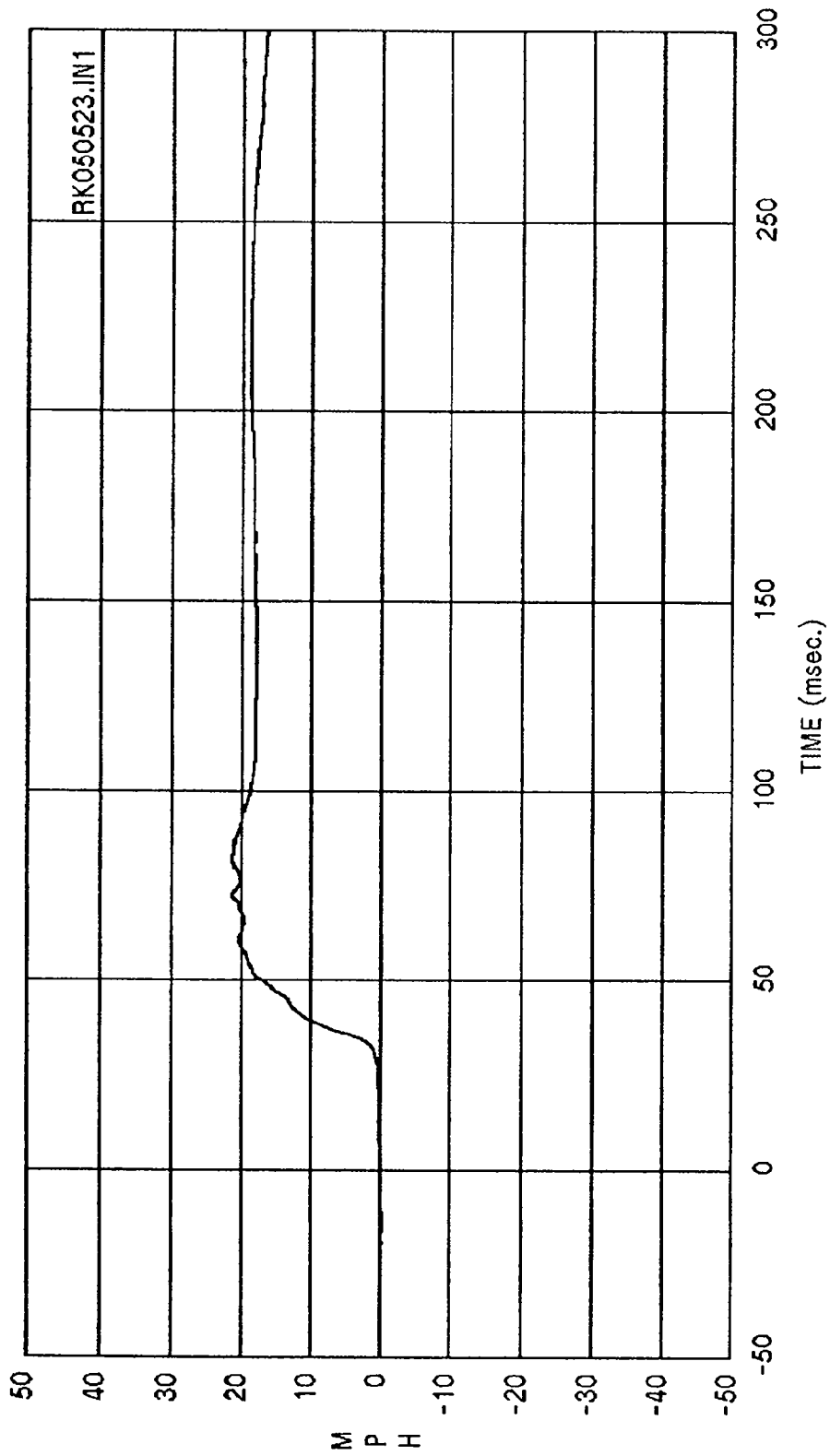


Curve: Passenger lower rib delta V -- Primary Filter: SAE CLASS 180 Max = 20.542 Min = -.55689I  
01

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4

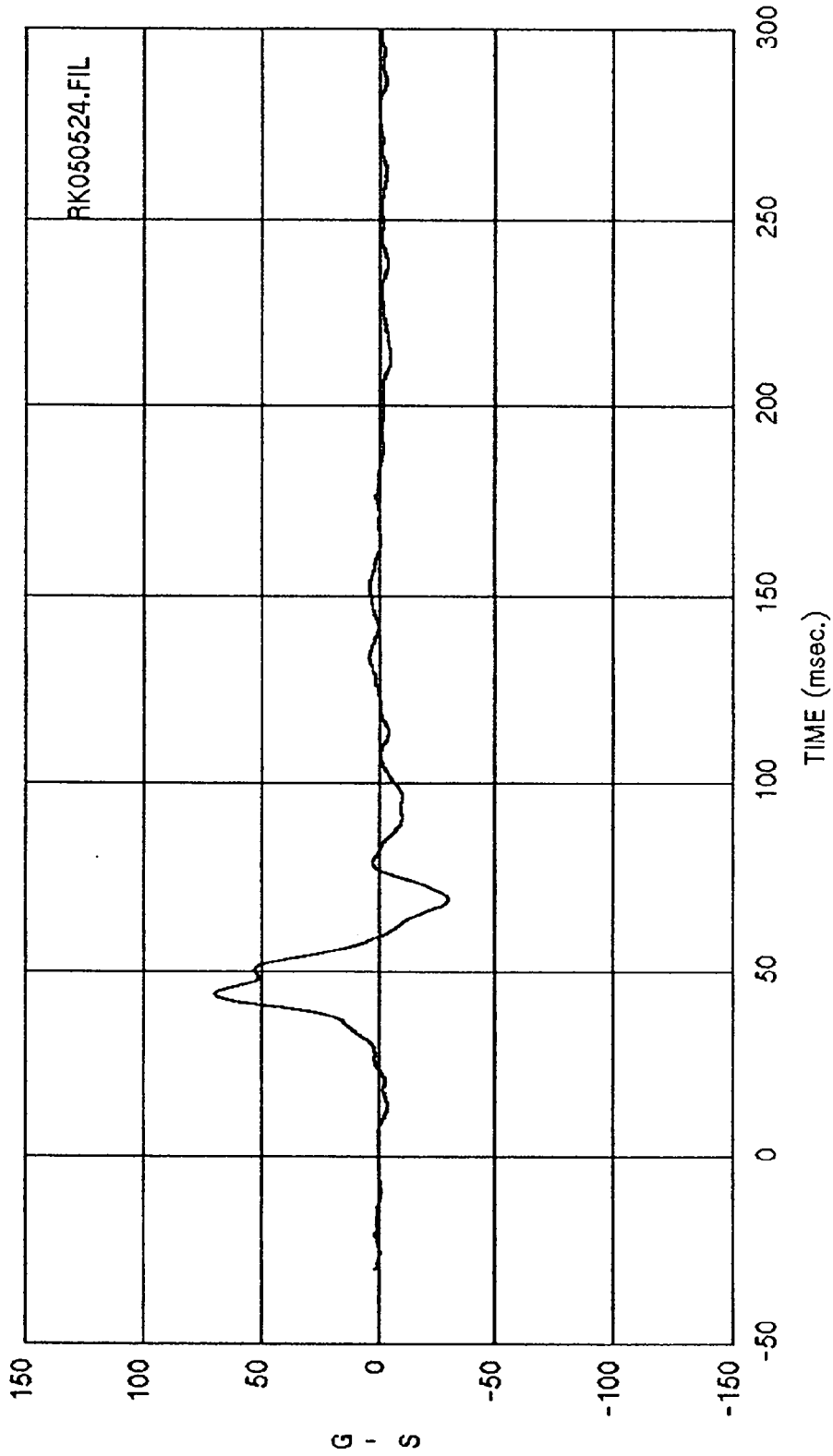


Curve: Passenger lower rib acceleration -- Redundant Filter: FIR 100 Max = 78.364 Min = -16.081  
 MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



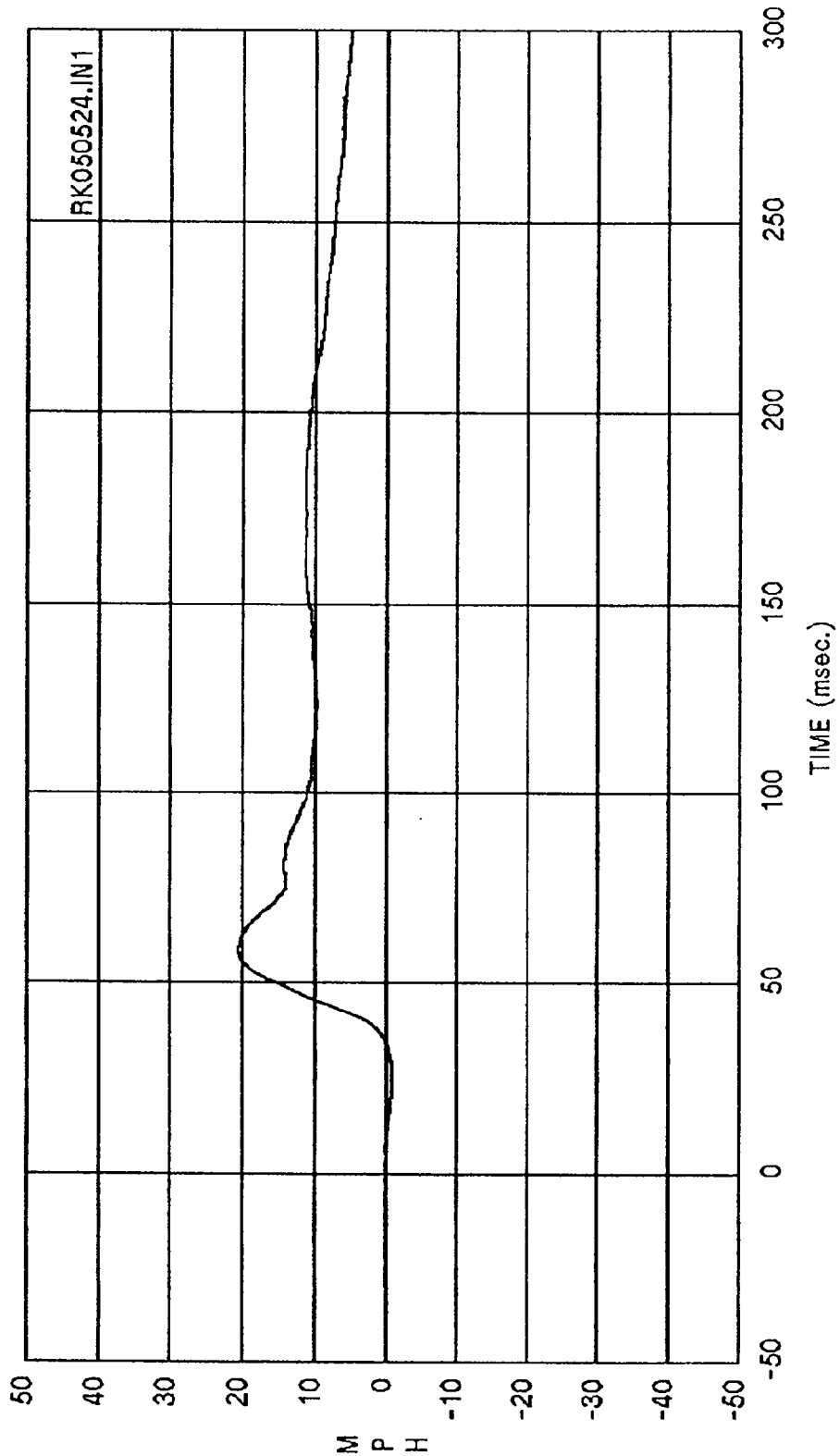
Curve: Passenger lower rib delta V -- Redundant Filter: SAE CLASS 180 Max = 21.415 Min = -.19289  
02

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



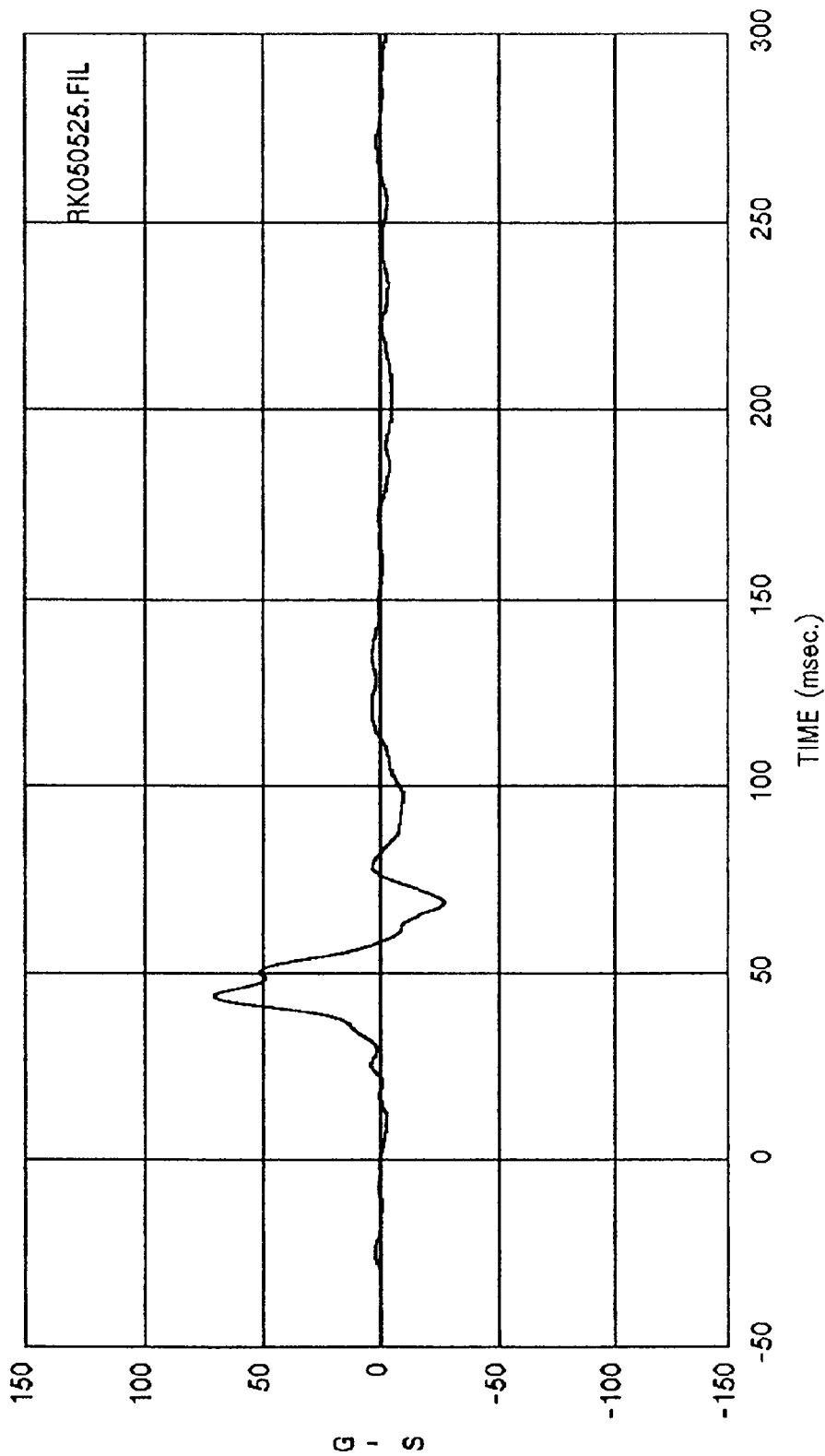
Curve: Passenger lower spine acceleration -- Primary Filter: FIR 100 Max = 69.663 Min = -29.947

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



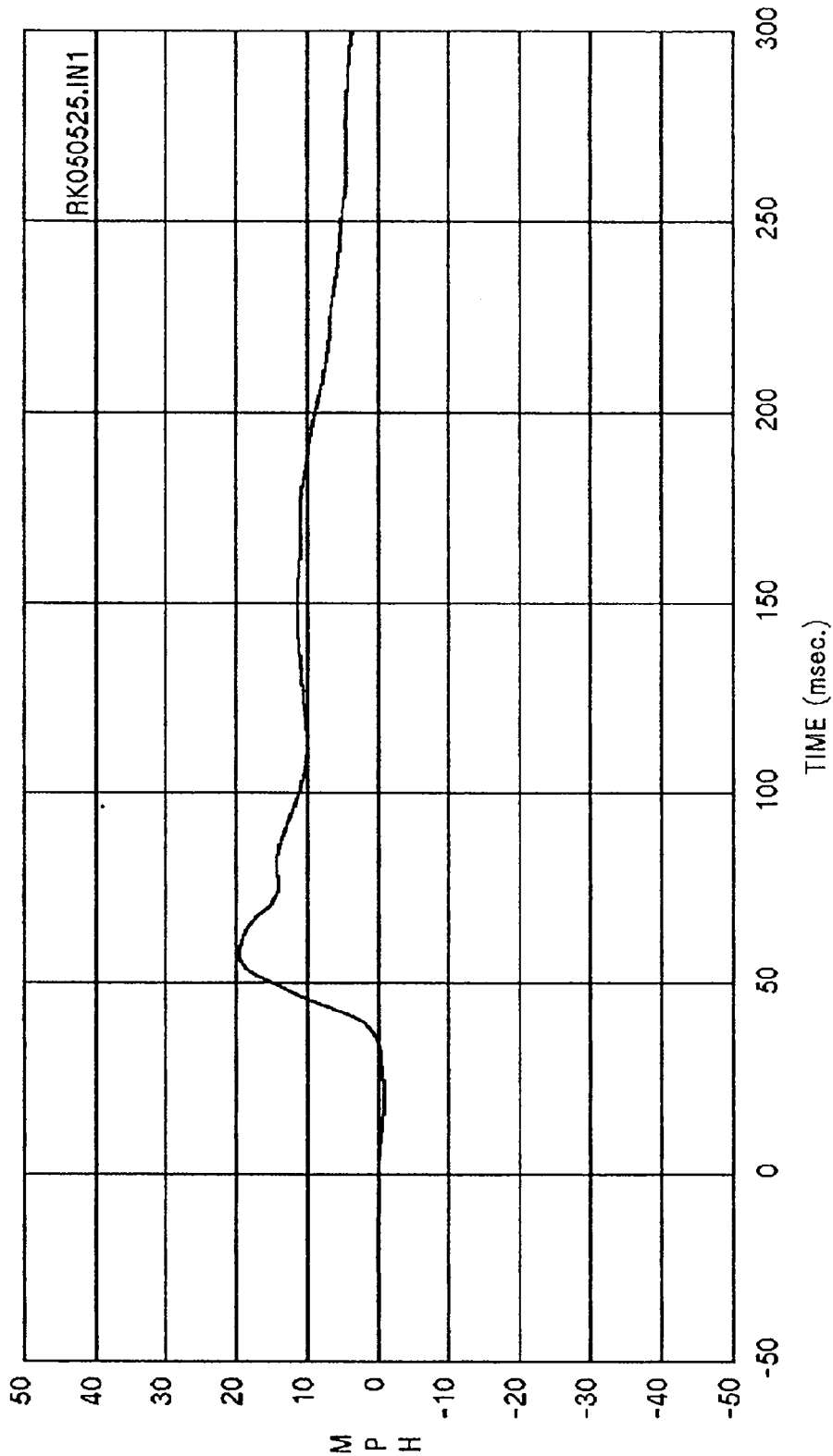
Curve: Passenger lower spine delta V -- Primary Filter: SAE CLASS 180 Max = 20.507 Min = -9.0238

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



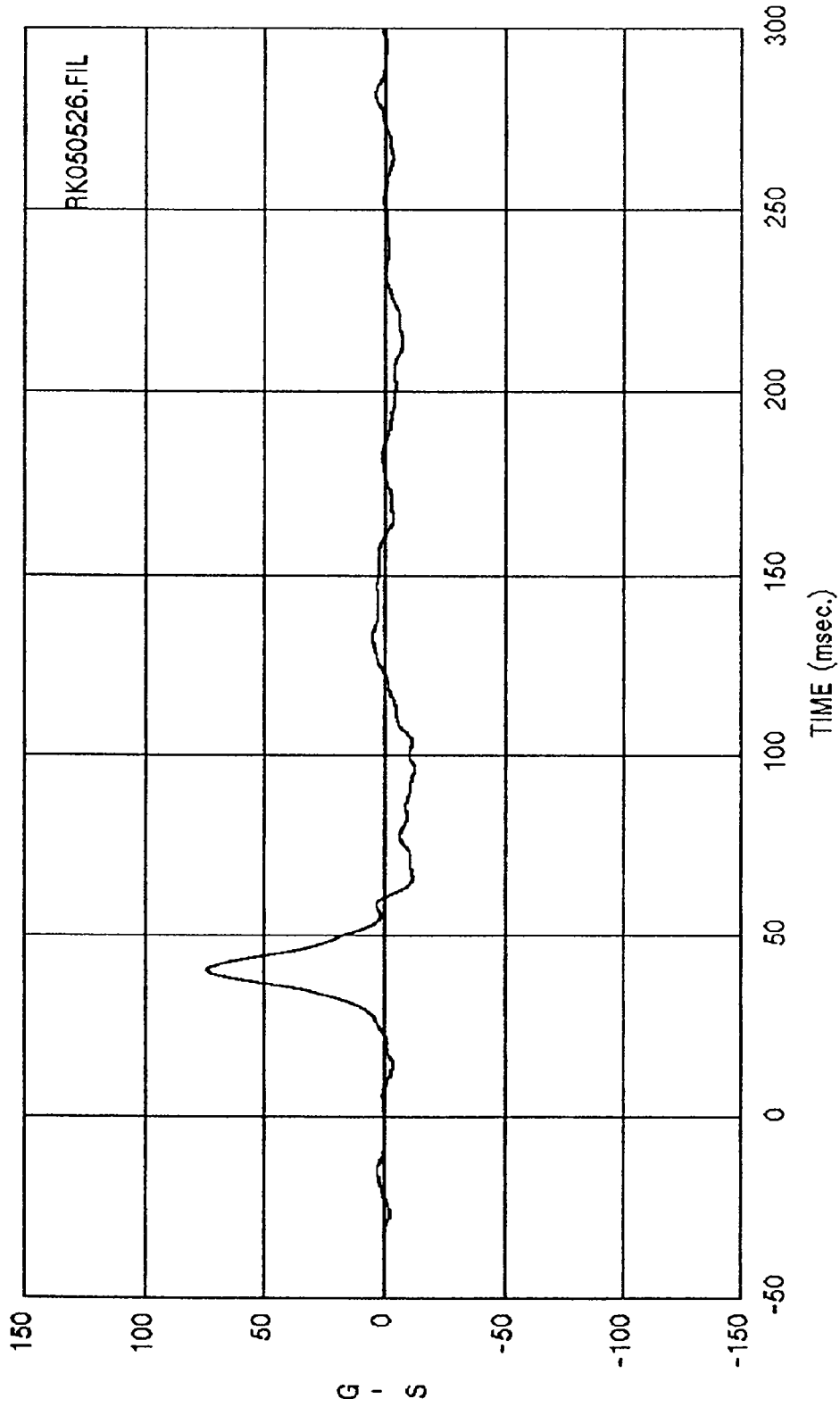
Curve: Passenger lower spine acceleration -- Redundant Filter: FIR 100 Max = 70.478 Min = -26.989

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



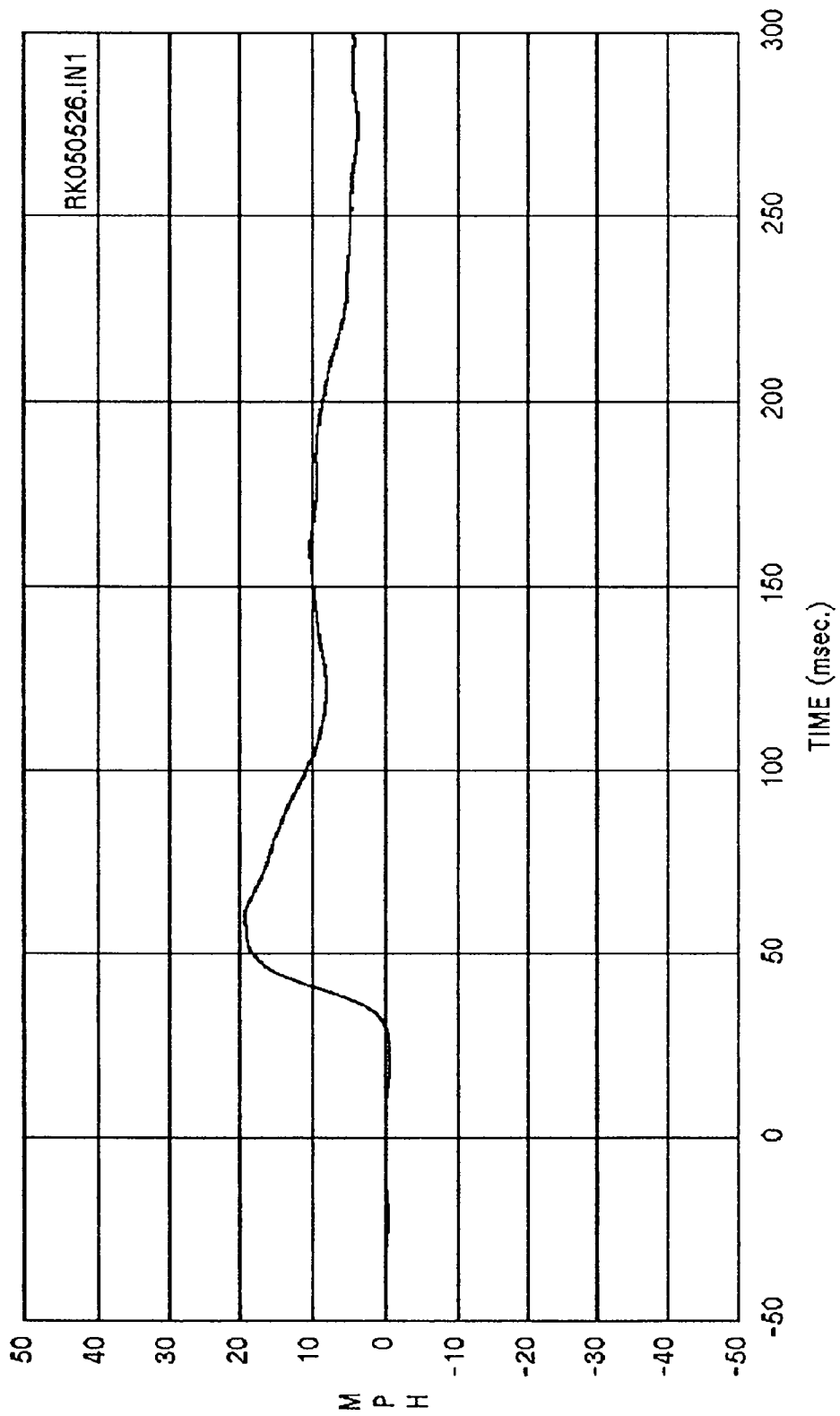
Curve: Passenger lower spine delta V -- Redundant Filter: SAE CLASS 180 Max = 19.654 Min = -.844

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



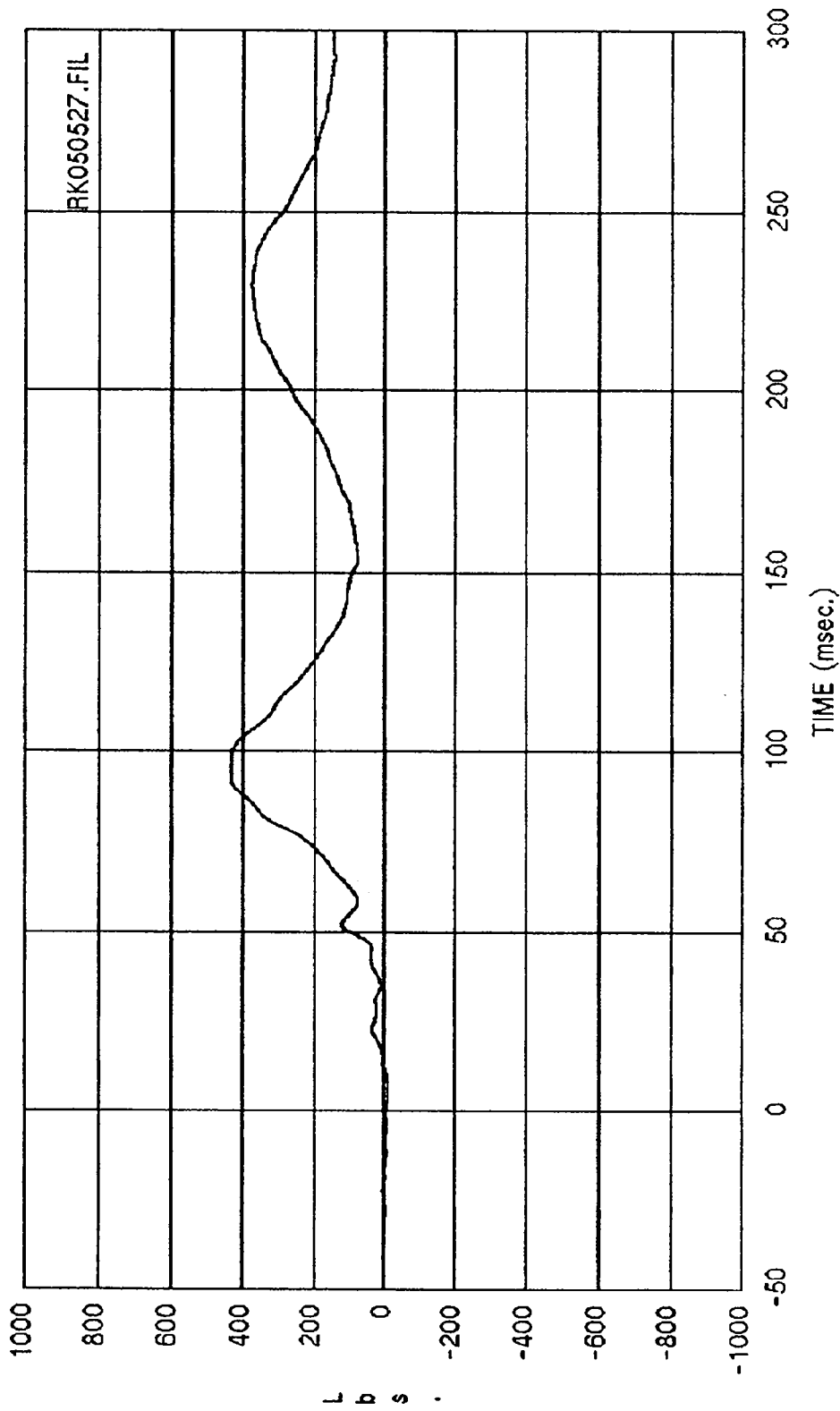
Curve: Passenger pelvis acceleration Filter: FIR 100 Max = 74.396 Min = -12.407

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



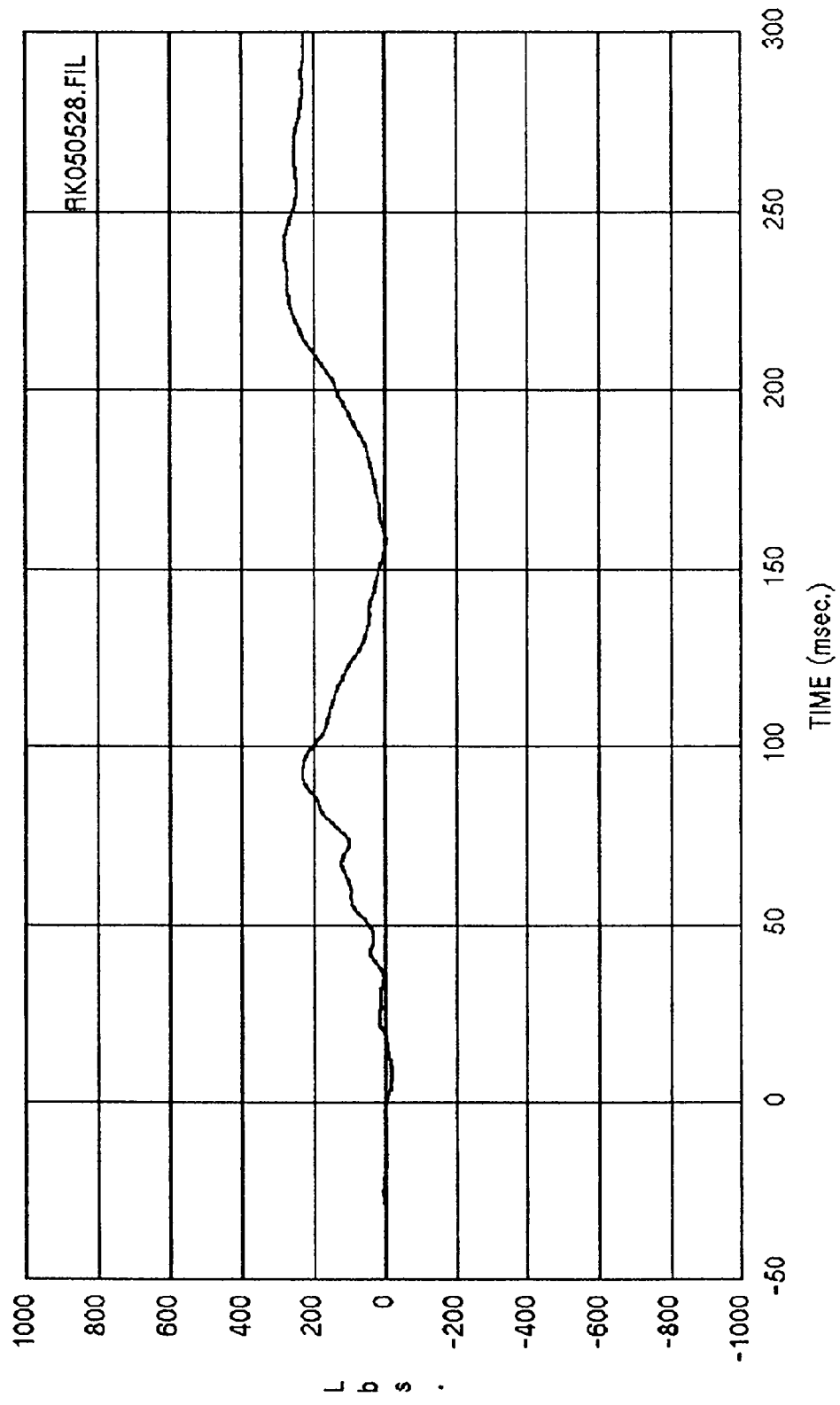
Curve: Passenger pelvis delta V Filter: SAE CLASS 180 Max = 19.394 Min = -.56393

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



Curve: Passenger lap belt load Filter: SAE CLASS 60 Max = 436.97 Min = -10.573

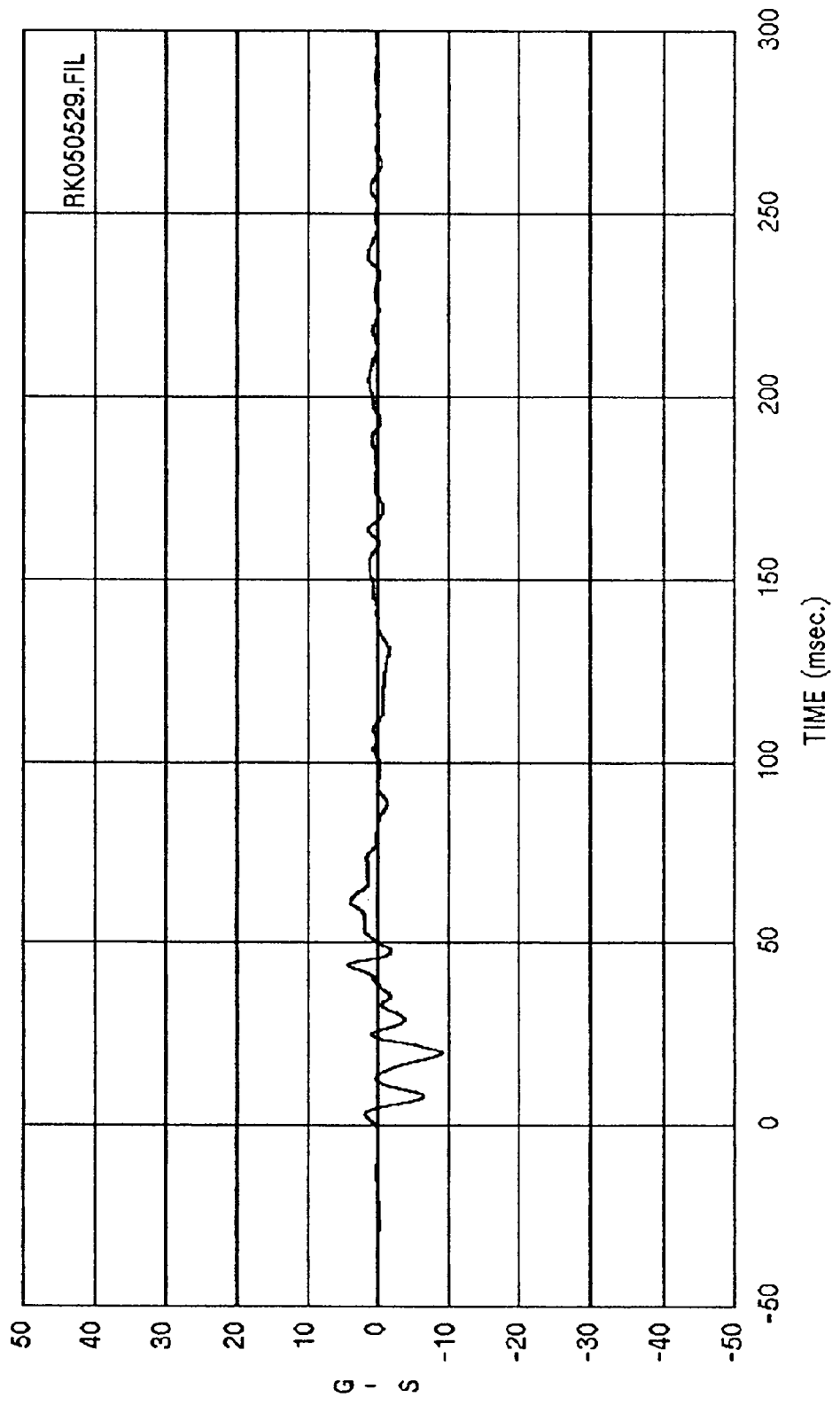
MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



Curve: Passenger shoulder belt load Filter: SAE CLASS 60 Max = 283.24 Min = -16.443

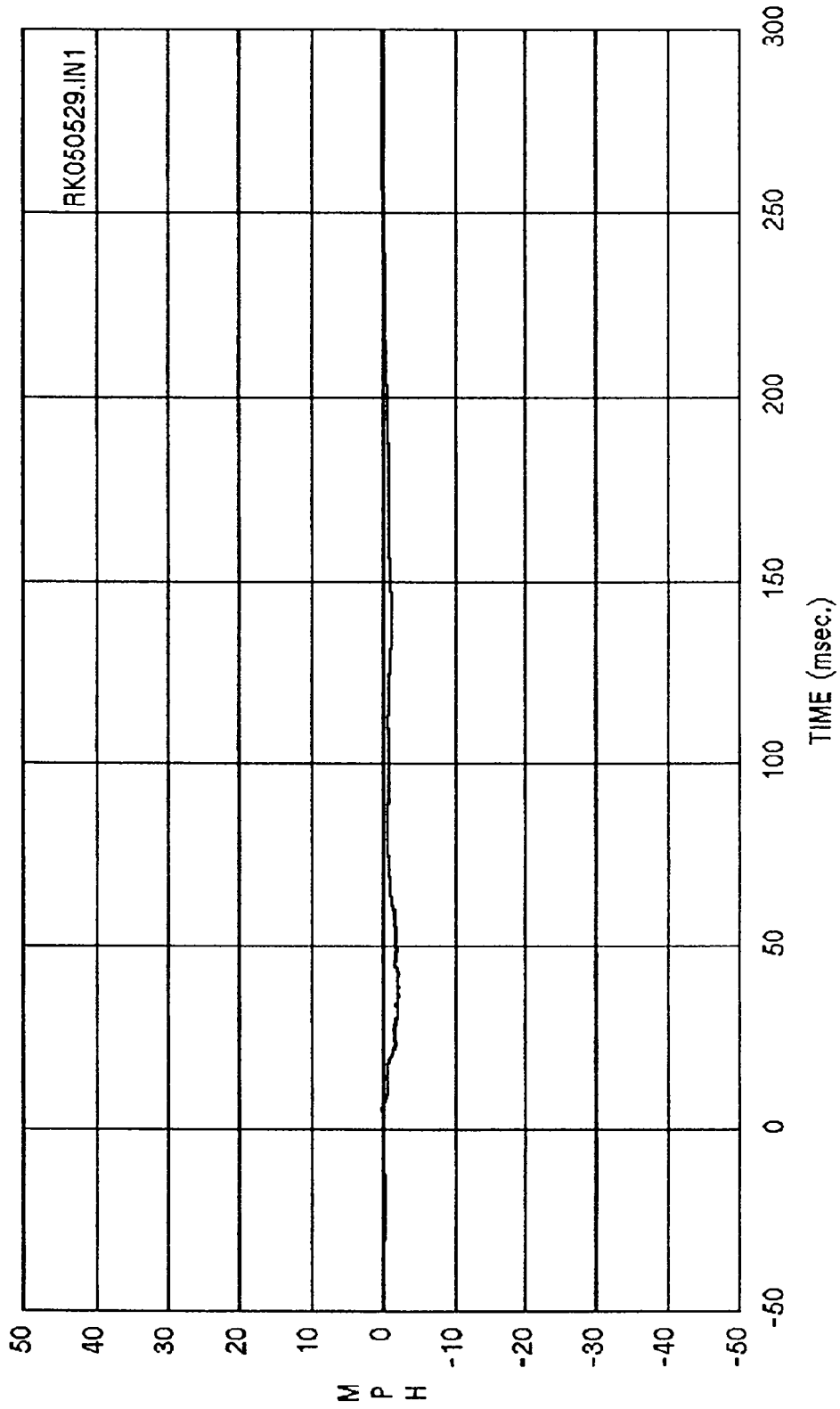
MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4

VEHICLE ACCELEROMETER DATA



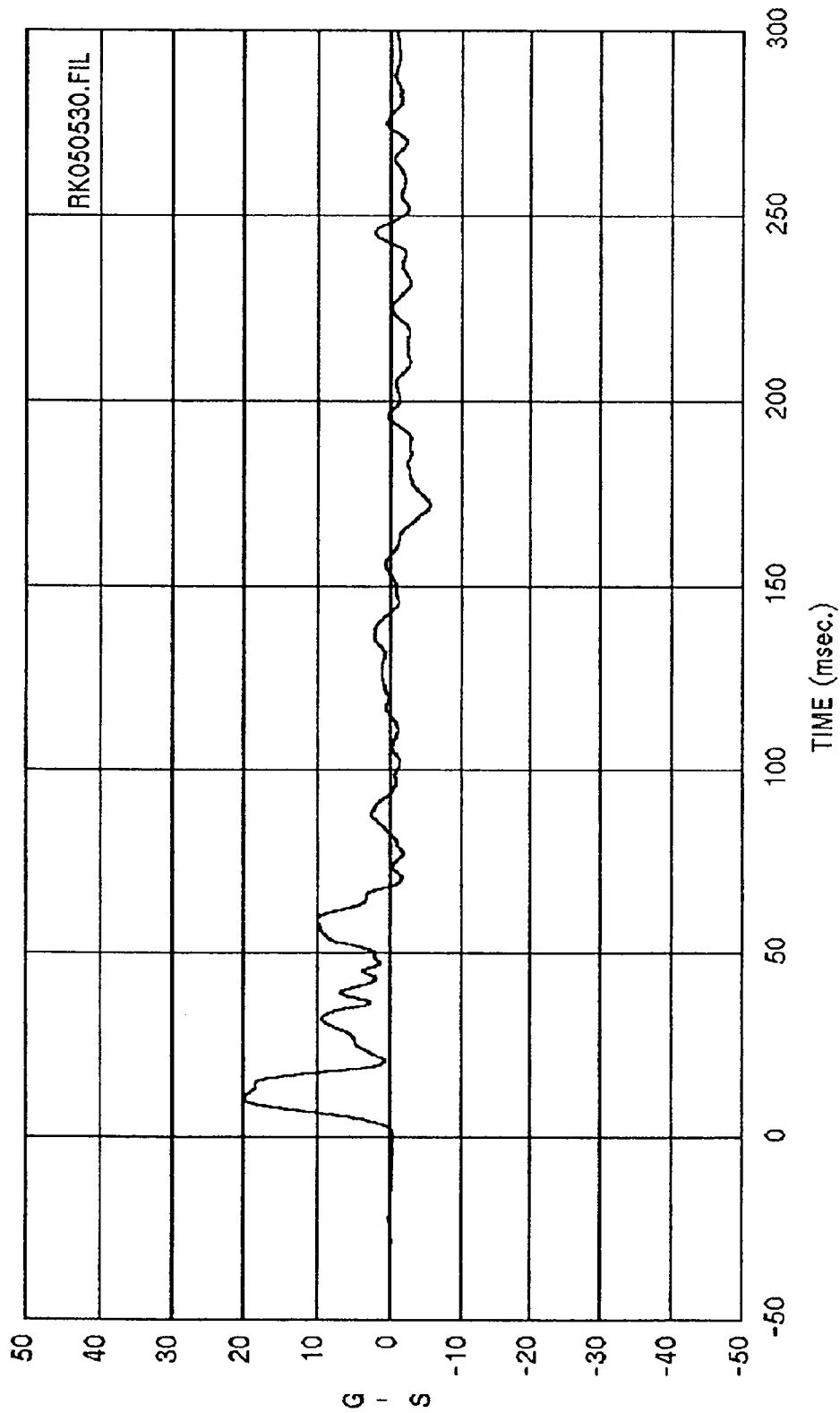
Curve: Front seat right sill acceleration -- X axis Filter: SAE CLASS 60 Max = 4.3797 Min = -9.0793

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



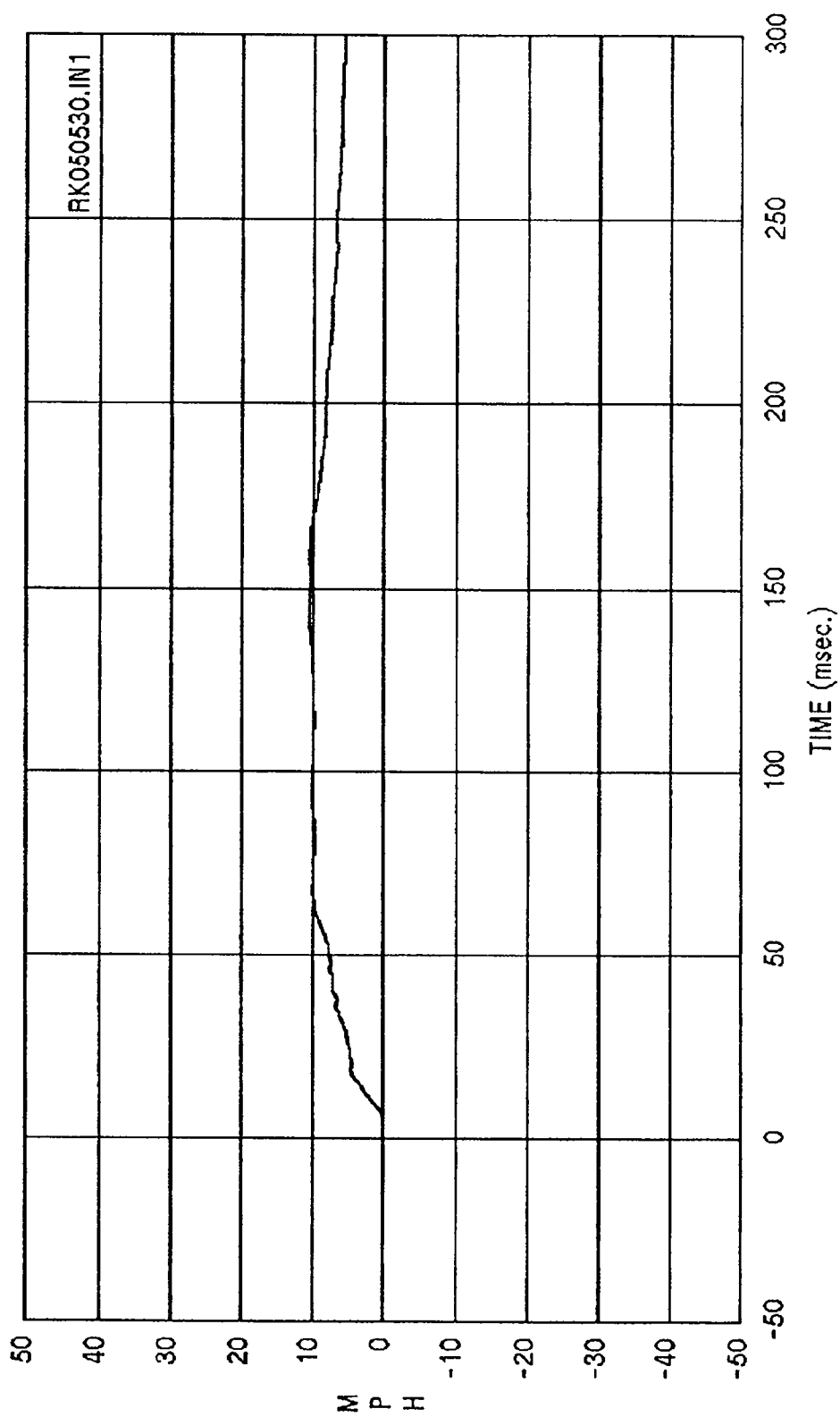
Curve: Front seat right sill delta V -- X axis Filter: SAE CLASS 180 Max = .34836 Min = -1.9111

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



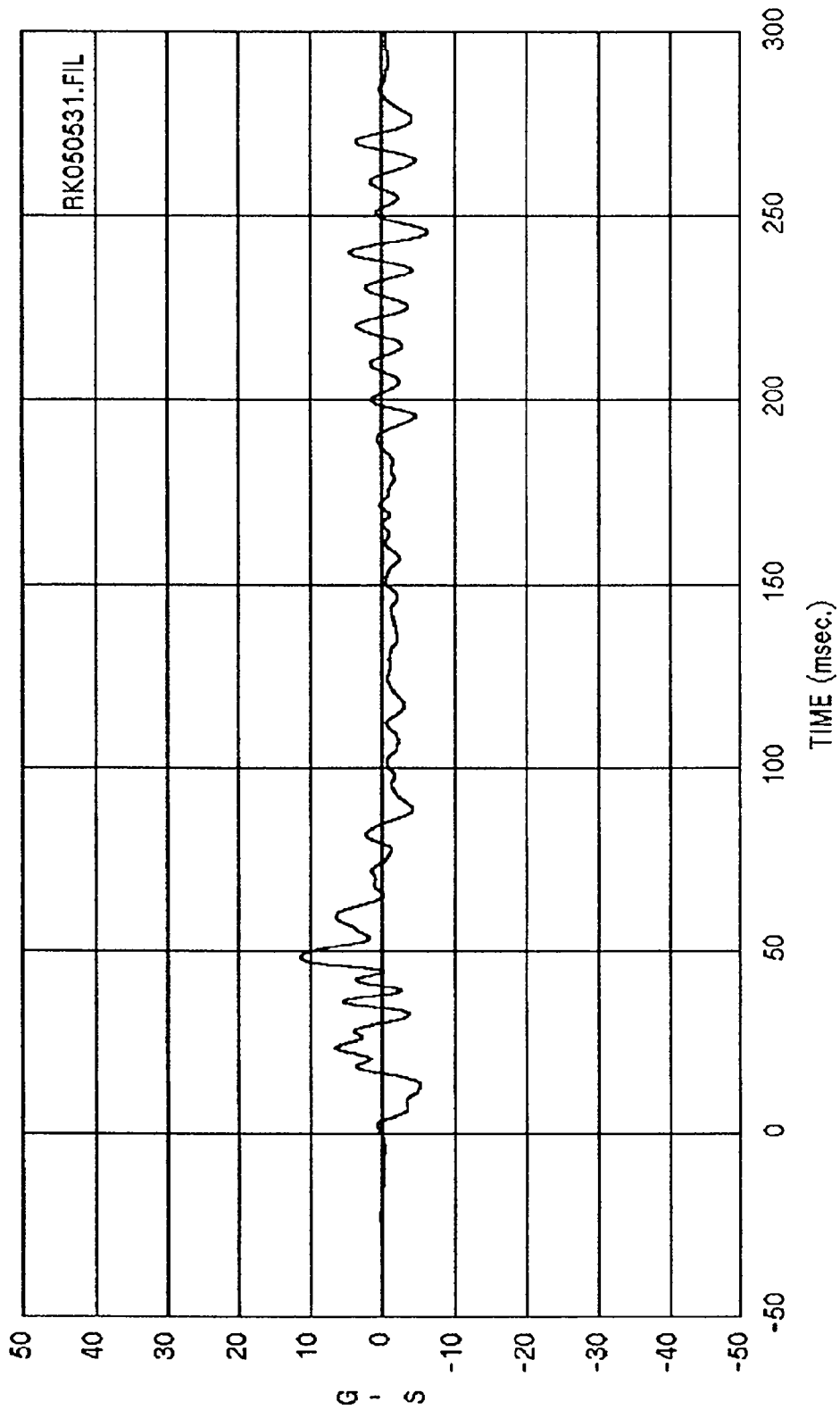
Curve: Front seat right sill acceleration -- Y axis Filter: SAE CLASS 60 Max = 20.053 Min = -5.6825

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



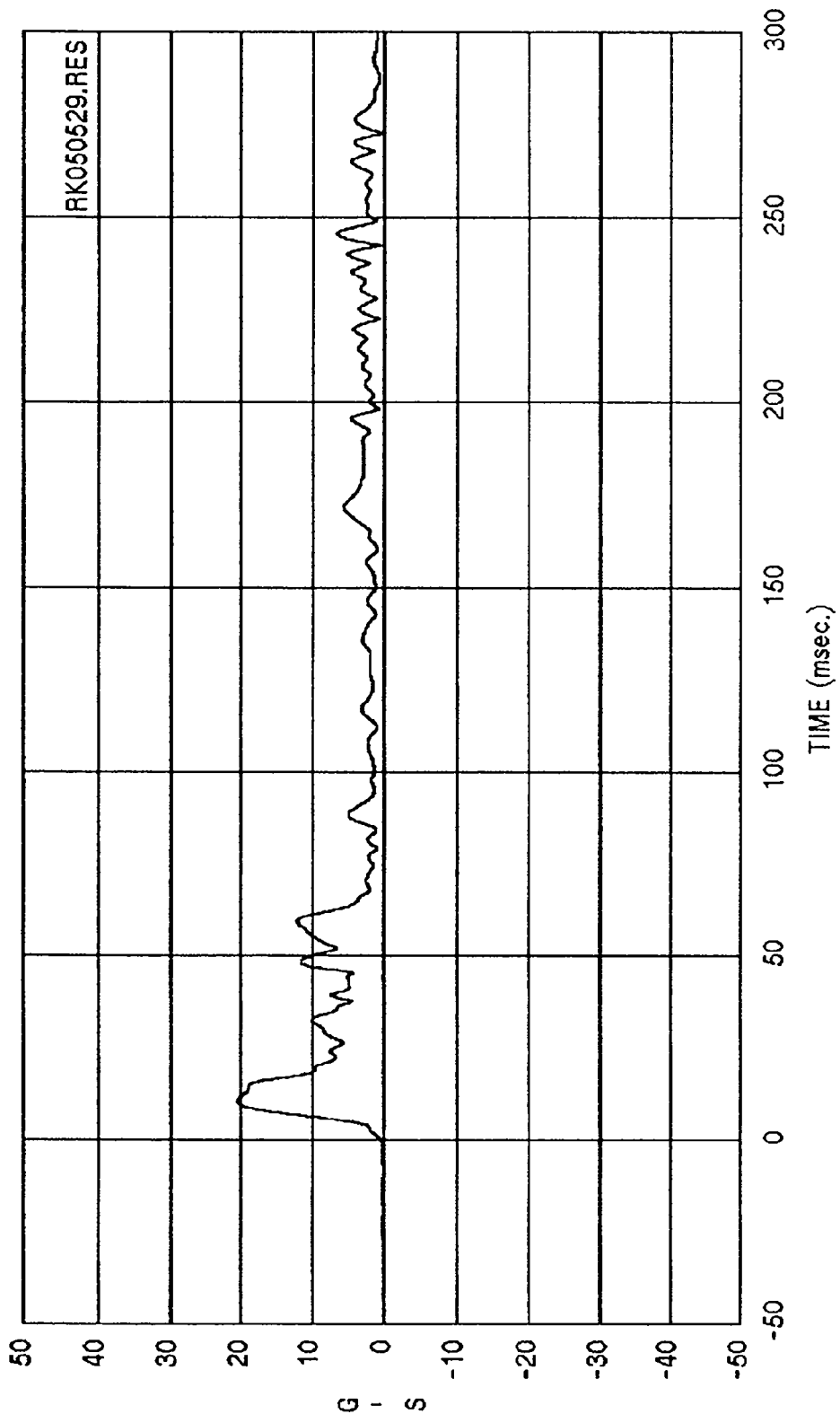
Curve: Front seat right sill delta Y -- Y axis Filter: SAE CLASS 180 Max = 10.563 Min = -.87740E-01

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



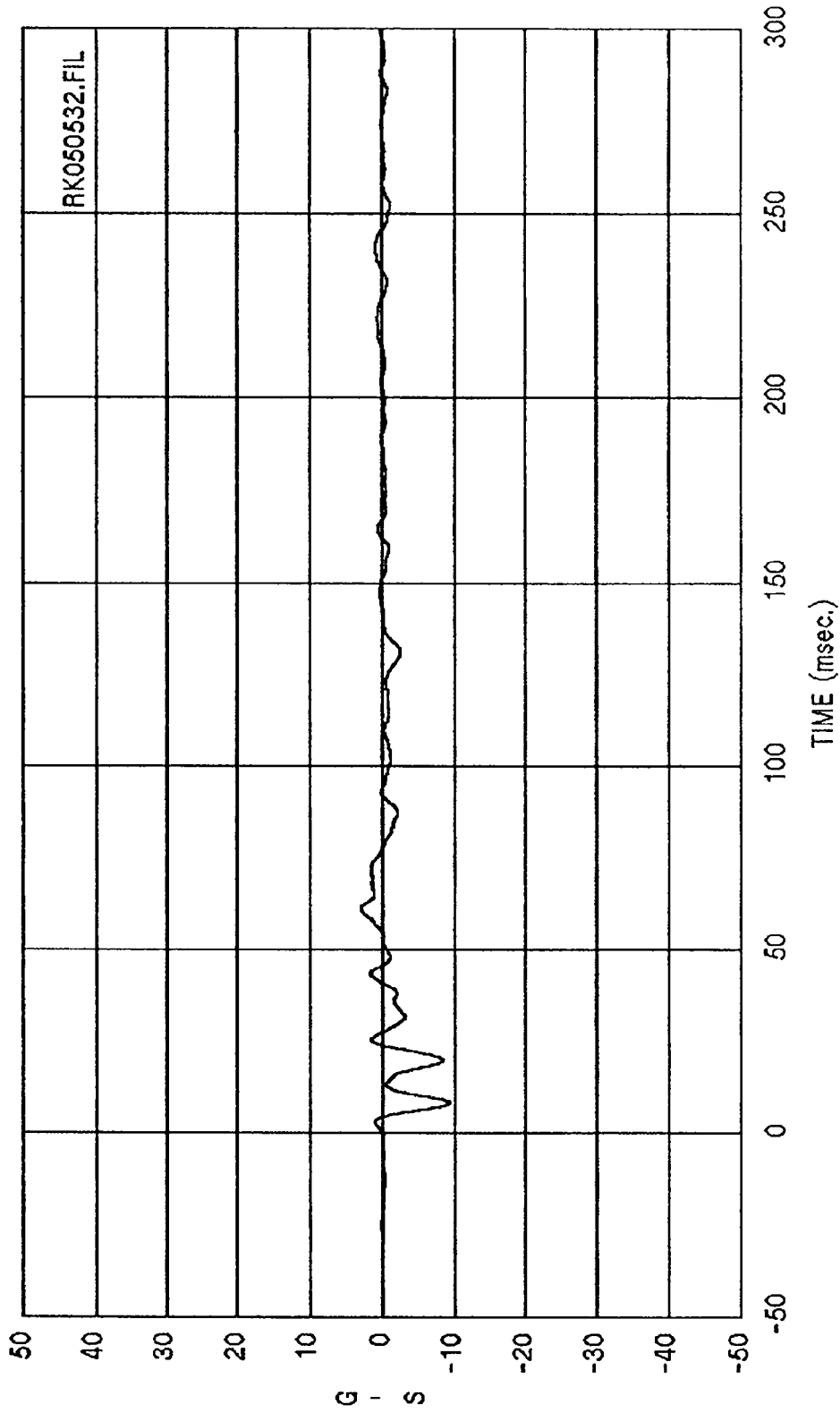
Curve: Front seat right sill acceleration -- Z axis Filter: SAE CLASS 60 Max = 11.485 Min = -6.3101

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



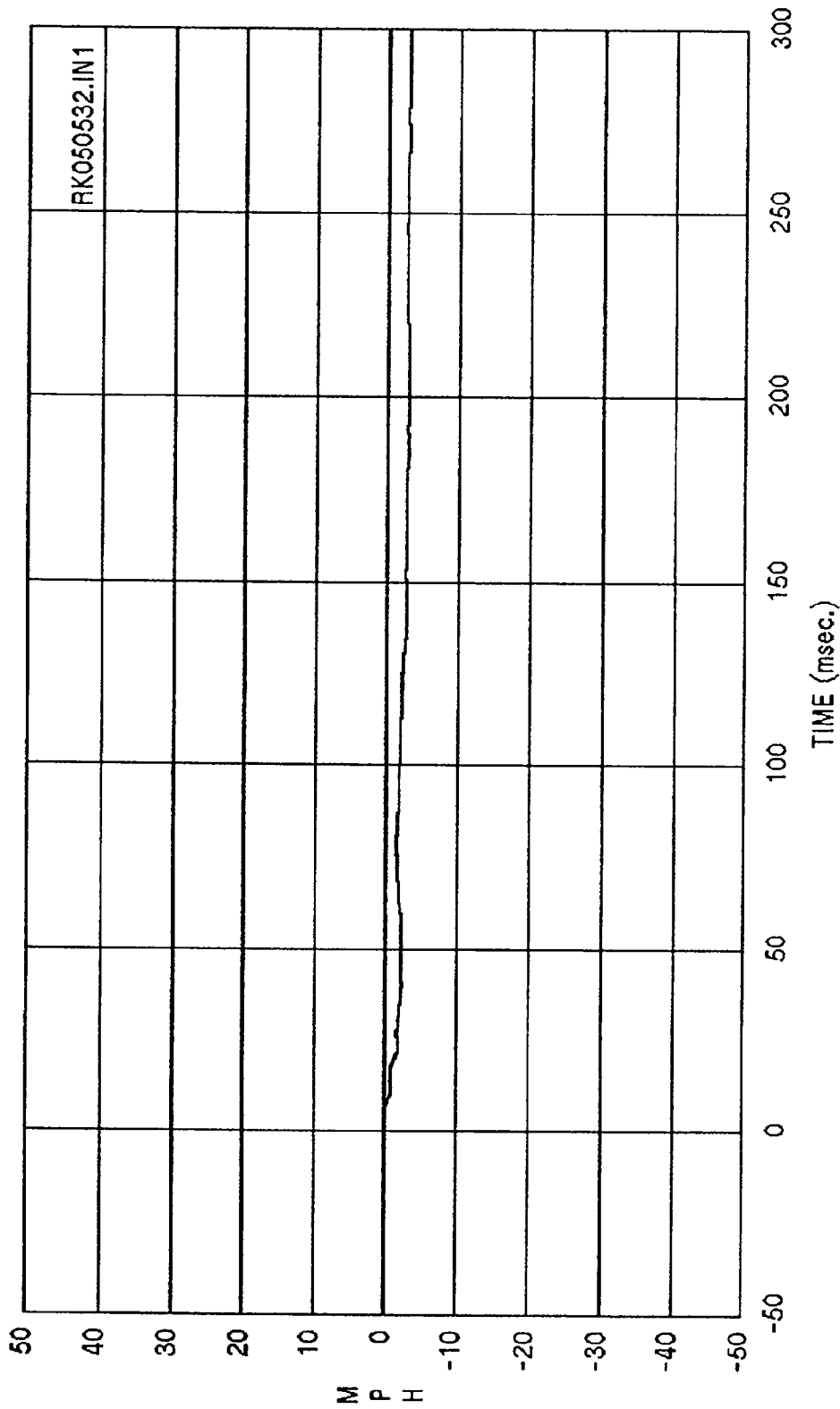
Curve: Front seat right sill resultant acceleration    Filter: SAE CLASS 60    Max = 20.602    Min = .26684

MSE    Date: 09/09/92    Program: Side Impact 30/15 90 Deg.    Vehicle: 1989 Isuzu Trooper 4x4



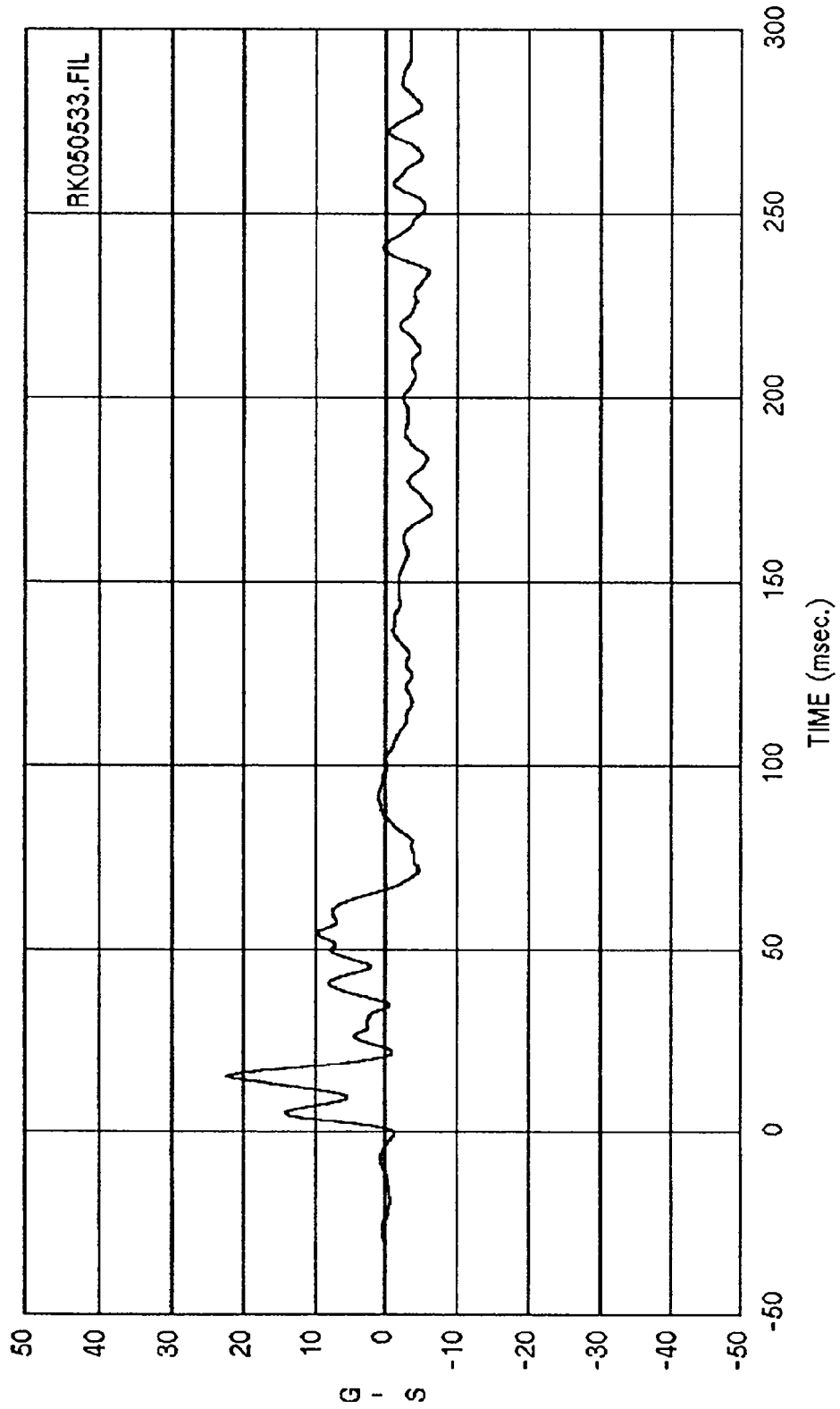
Curve: Rear seat right sill acceleration -- X axis Filter: SAE CLASS 60 Max = 2.9685 Min = -9.2152

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



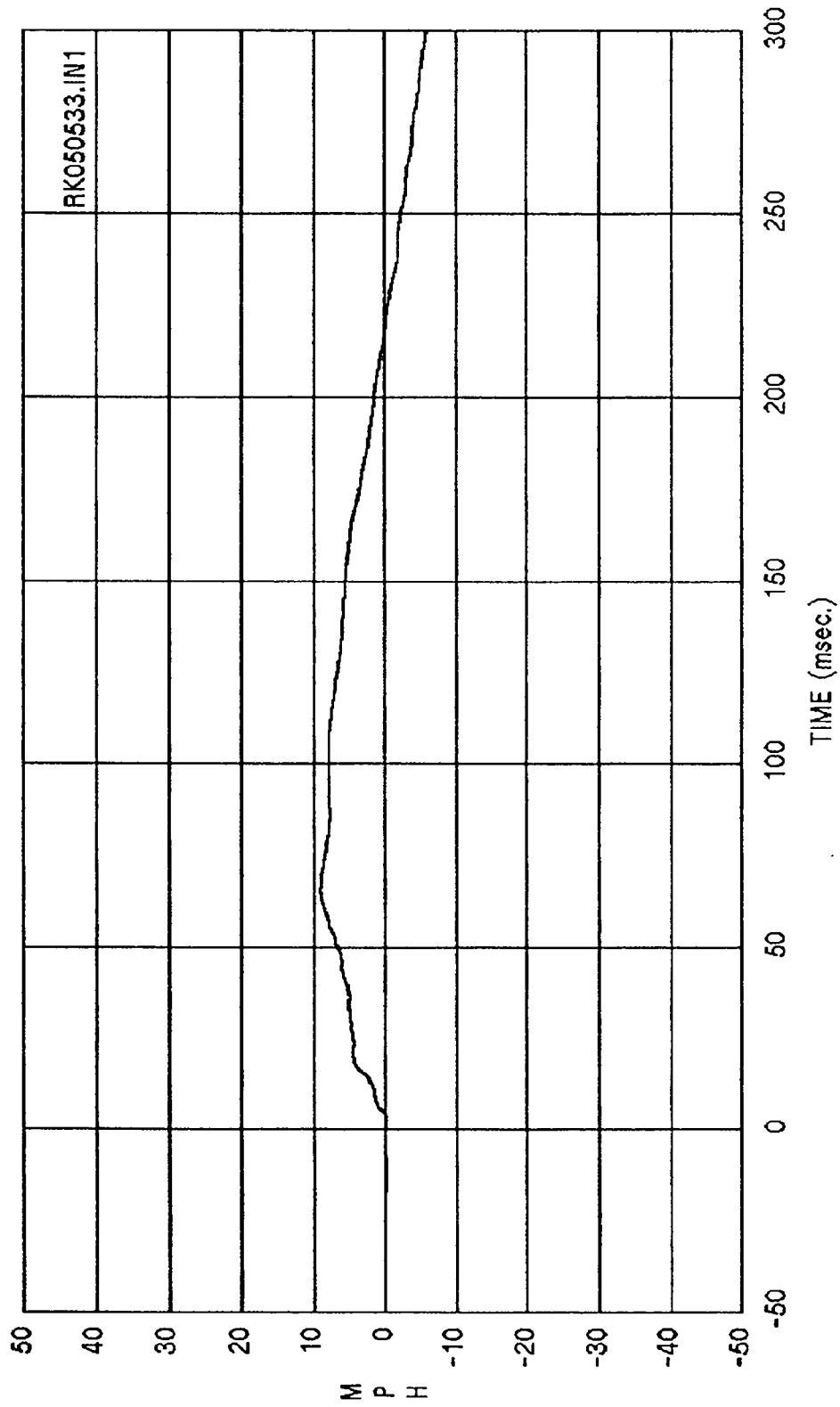
Curve: Rear seat right sill delta V -- X axis Filter: SAE CLASS 180 Max = .12035 Min = -2.9208

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



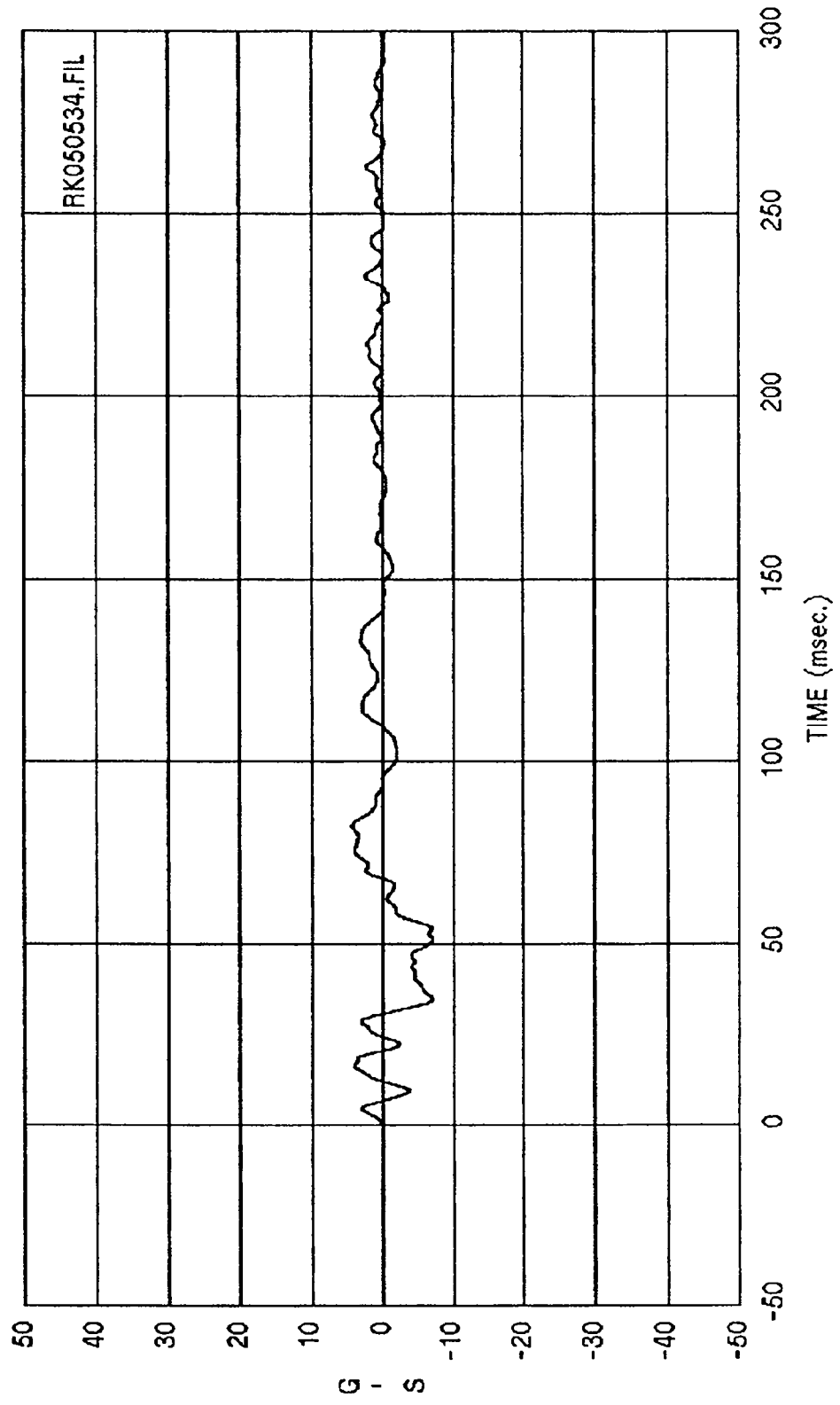
Curve: Rear seat right sill acceleration -- Y axis Filter: SAE CLASS 60 Max = 22.294 Min = -6.5479

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



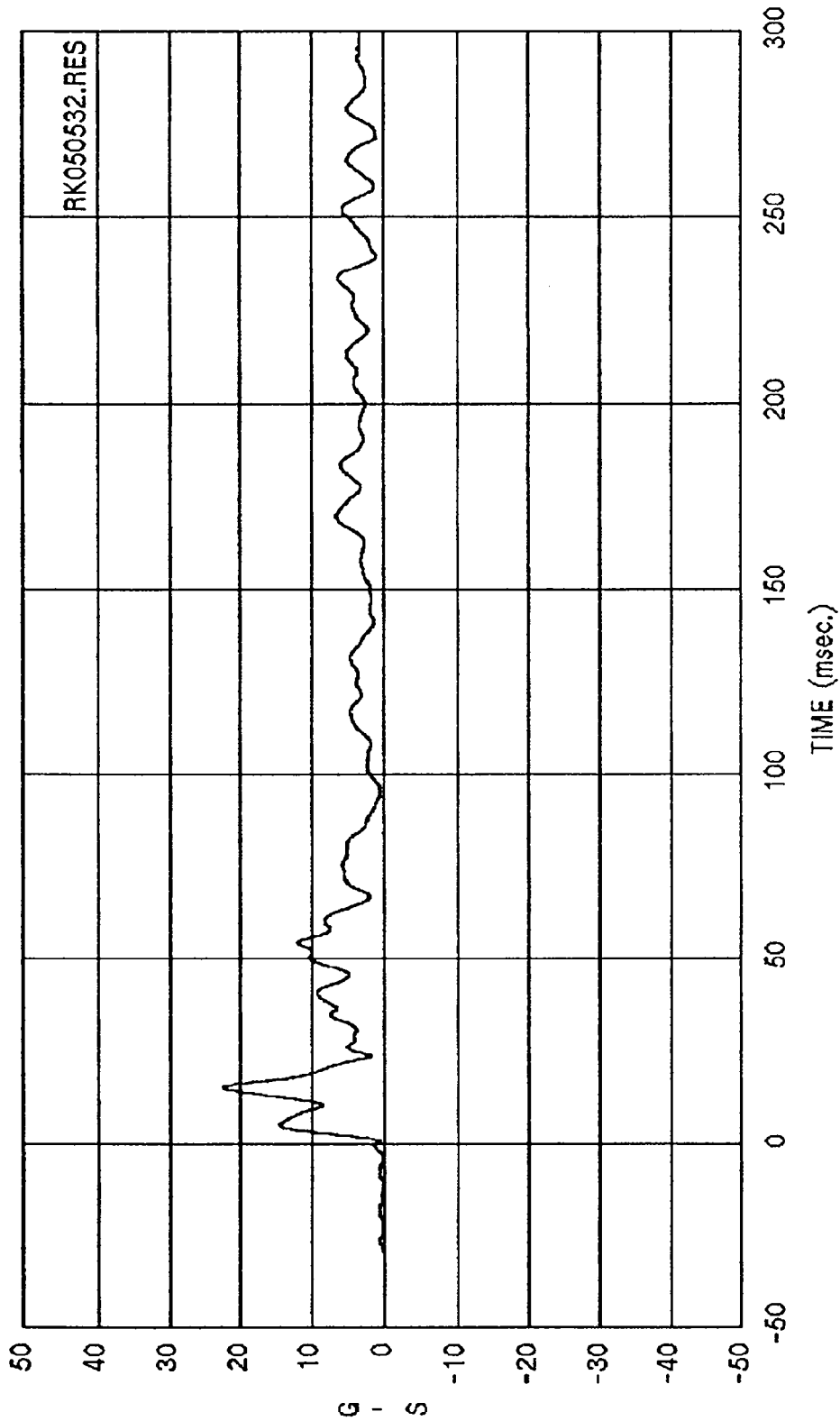
Curve: Rear seat right sill delta V -- Y axis Filter: SAE CLASS 180 Max = 9.1638 Min = -5.8462

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



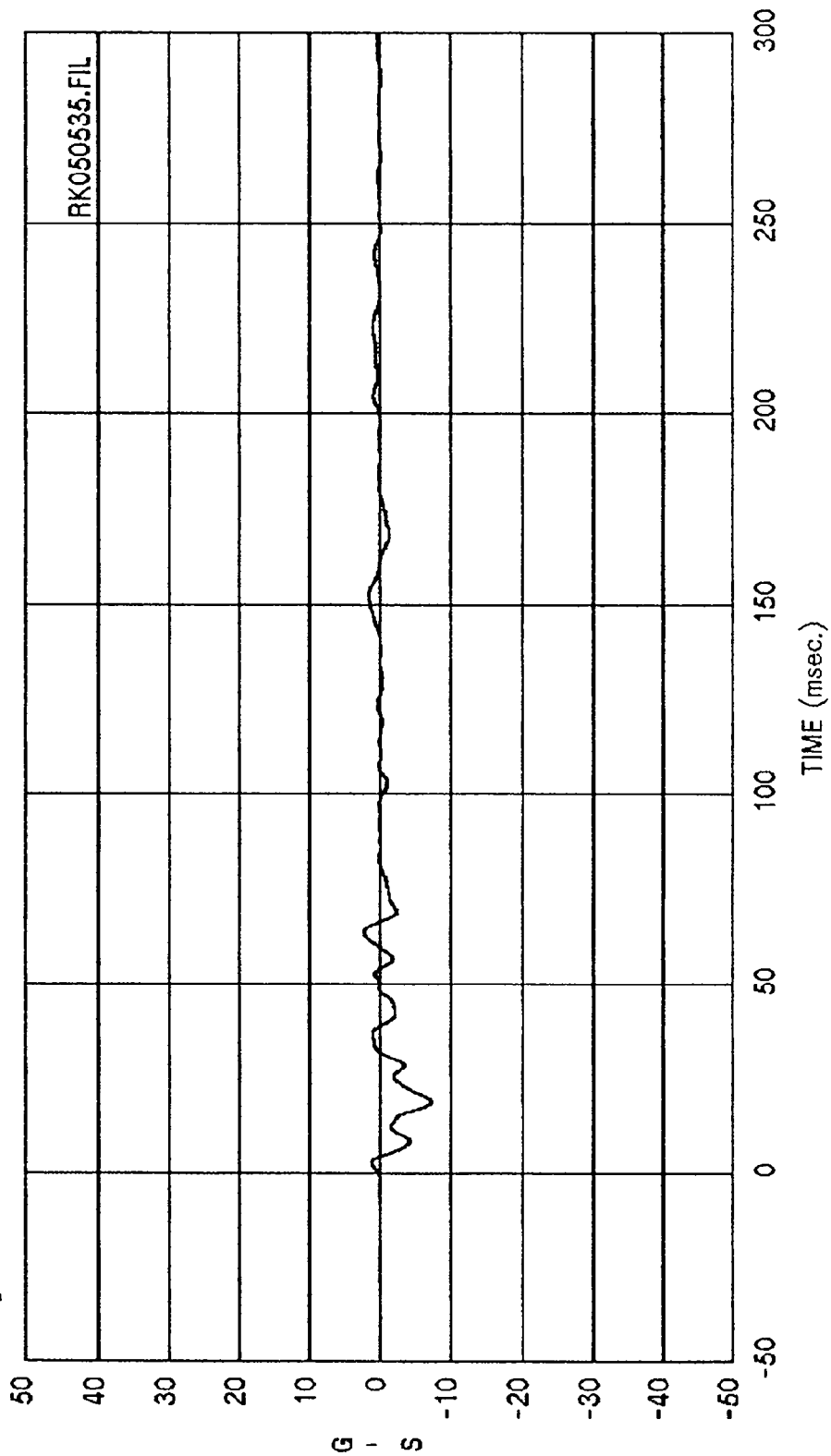
Curve: Rear seat right sill acceleration -- Z axis Filter: SAE CLASS 60 Max = 4.3120 Min = -7.1852

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



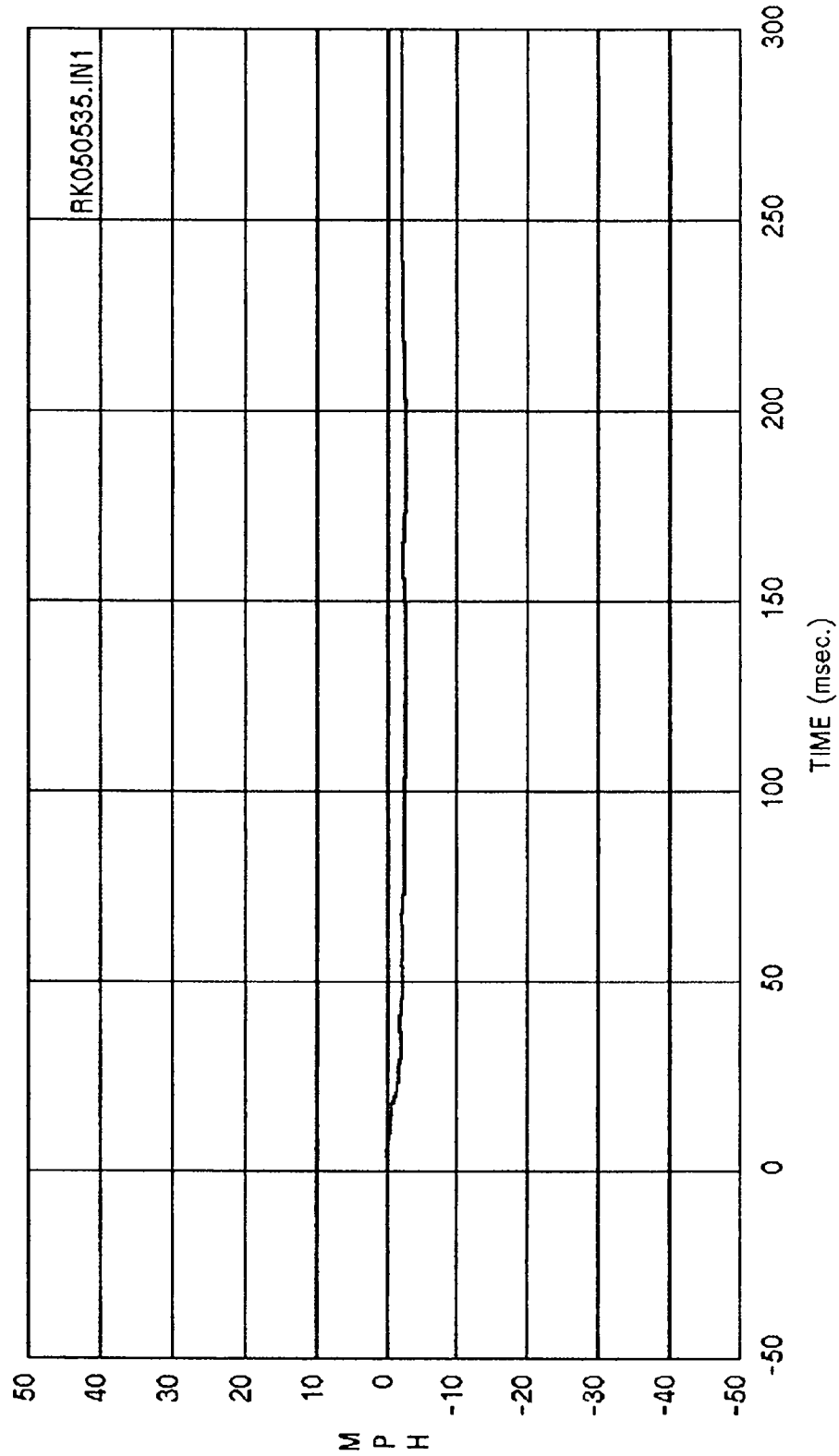
Curve: Rear seat right sill resultant acceleration Filter: SAE CLASS 60 Max = 22.610 Min = .56673

MSE Date: 09/09/92 Program: Side Impact 30/15 90 Deg. Vehicle: 1989 Isuzu Trooper 4x4



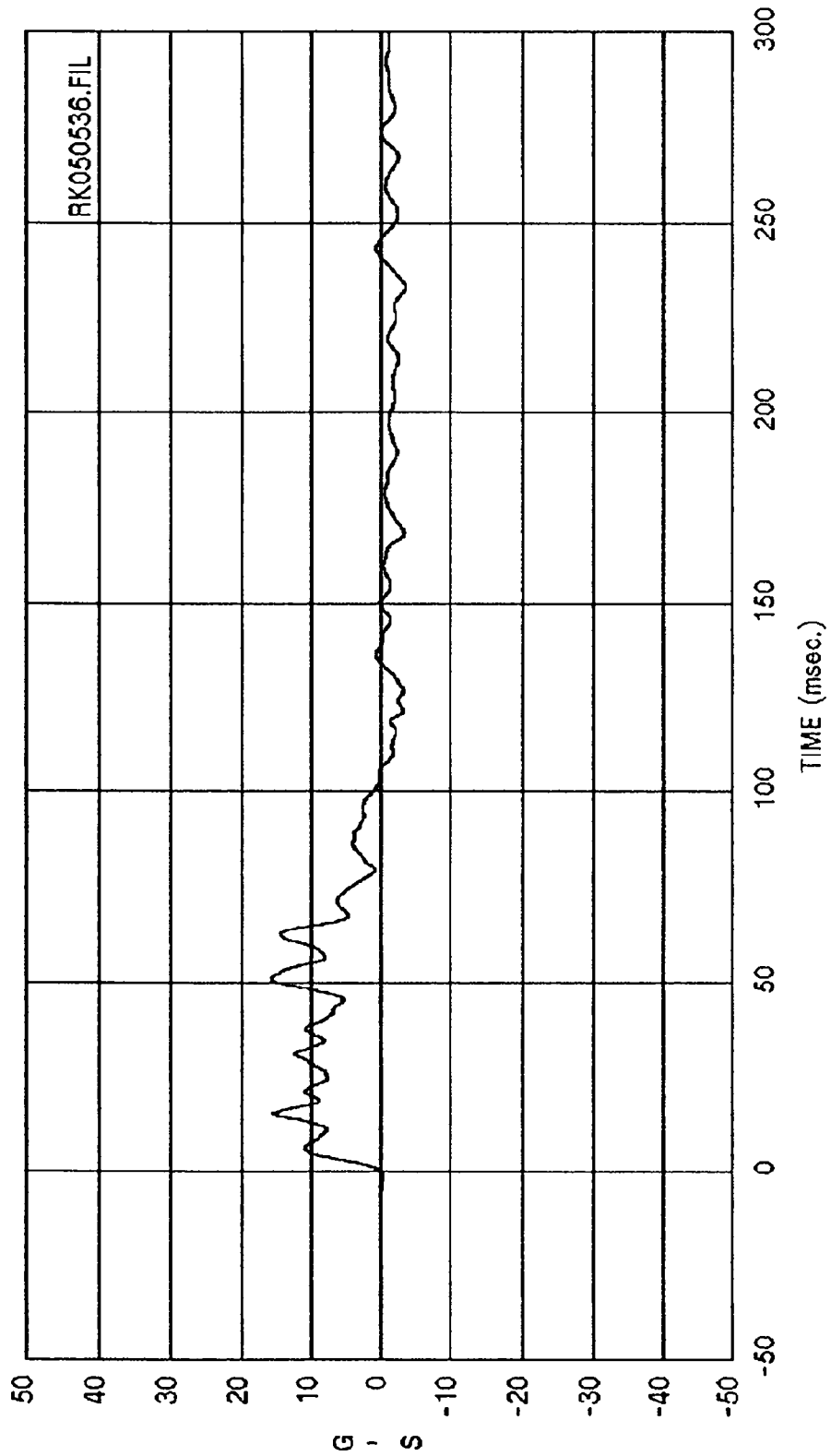
Curve: Rear floor above axle acceleration -- X axis Filter: SAE CLASS 60 Max = 2.1250 Min = -7.3766

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



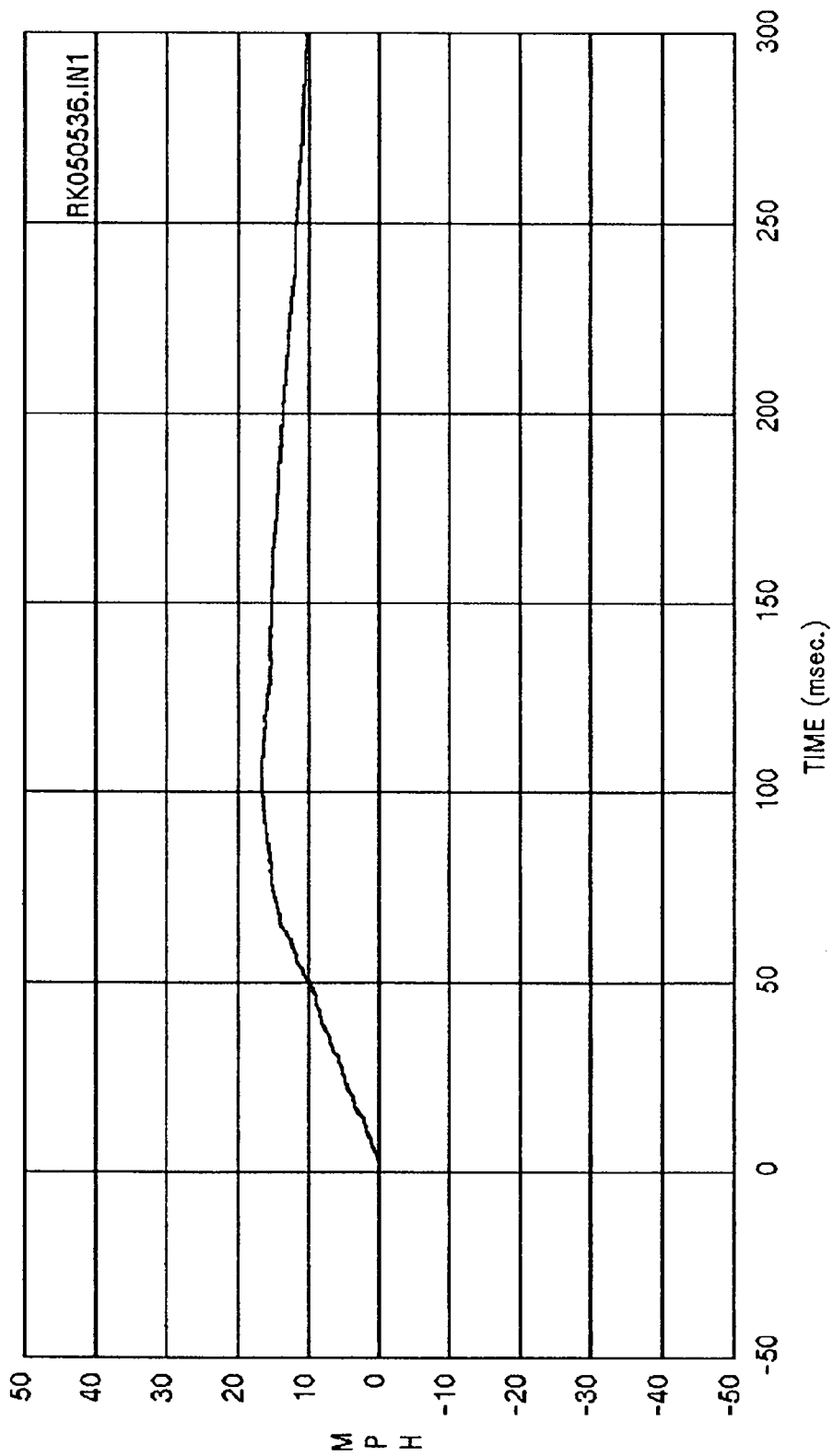
Curve: Rear floor above axle delta V -- X axis Filter: SAE CLASS 180 Max = .12482 Min = -2.5896

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



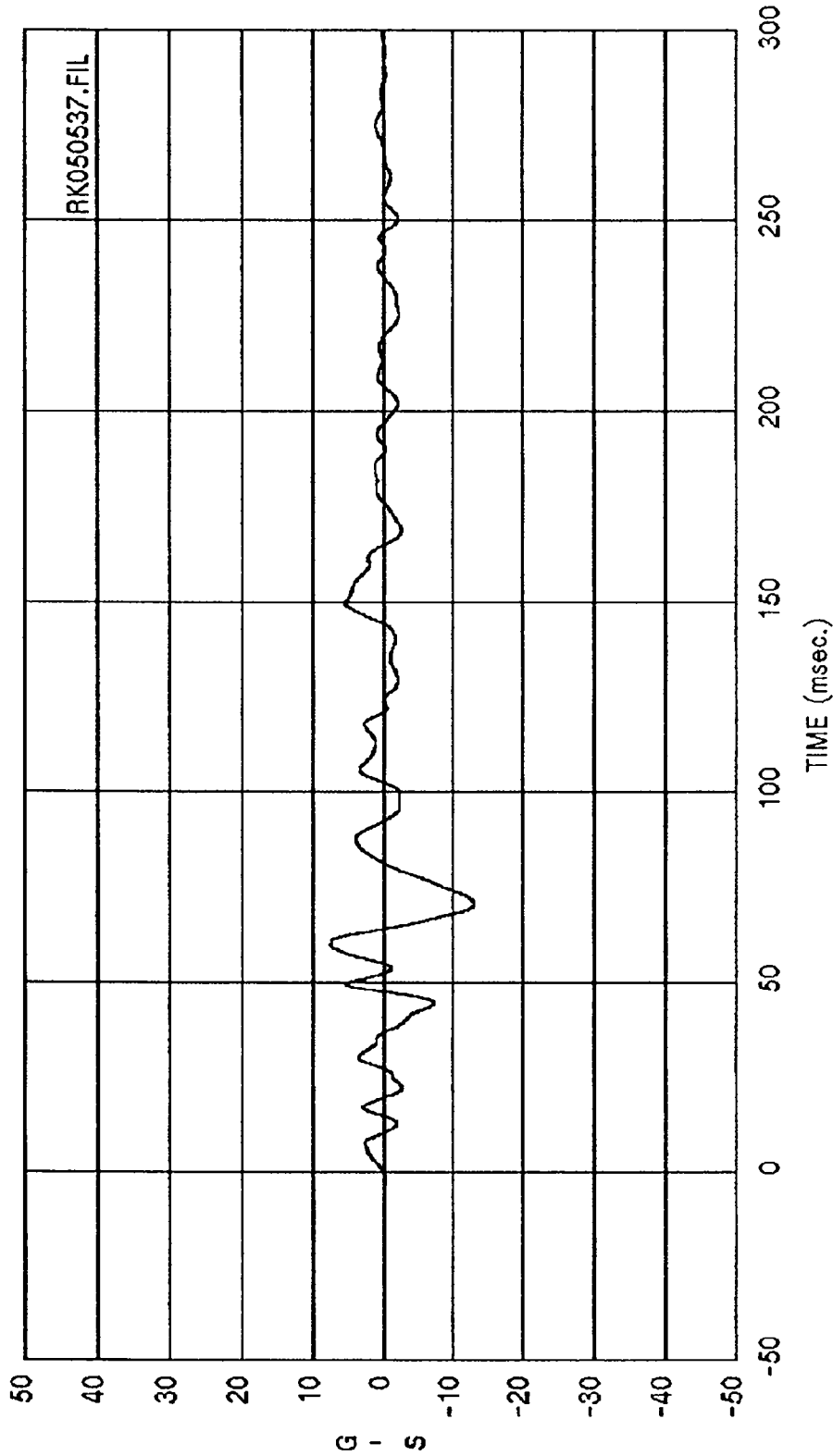
Curve: Rear floor above axle acceleration -- Y axis Filter: SAE CLASS 60 Max = 15.761 Min = -3.5358

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



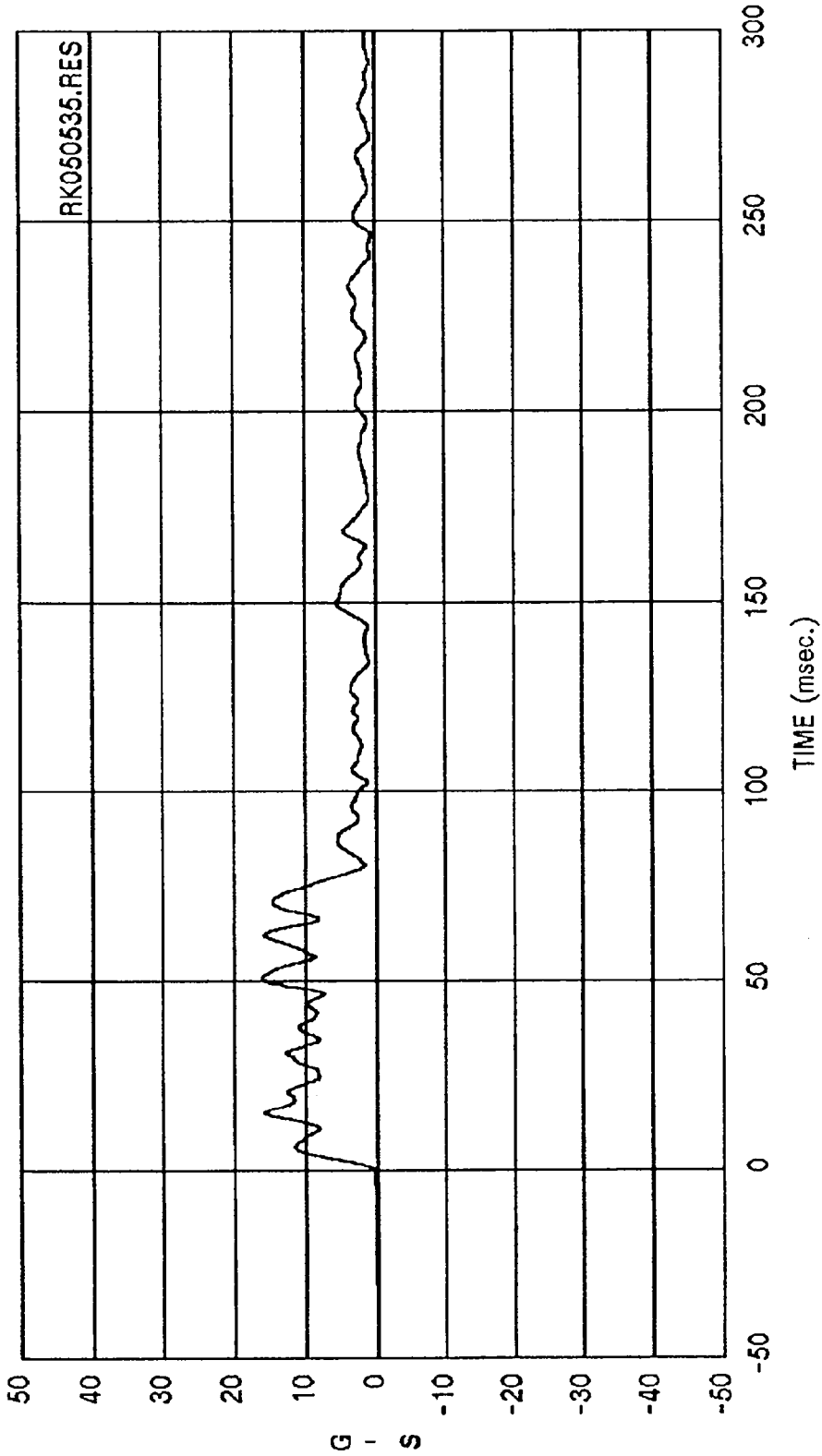
Curve: Rear floor above axle delta V -- Y axis Filter: SAE CLASS 180 Max = 16.634 Min = -.17427  
02

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4X4



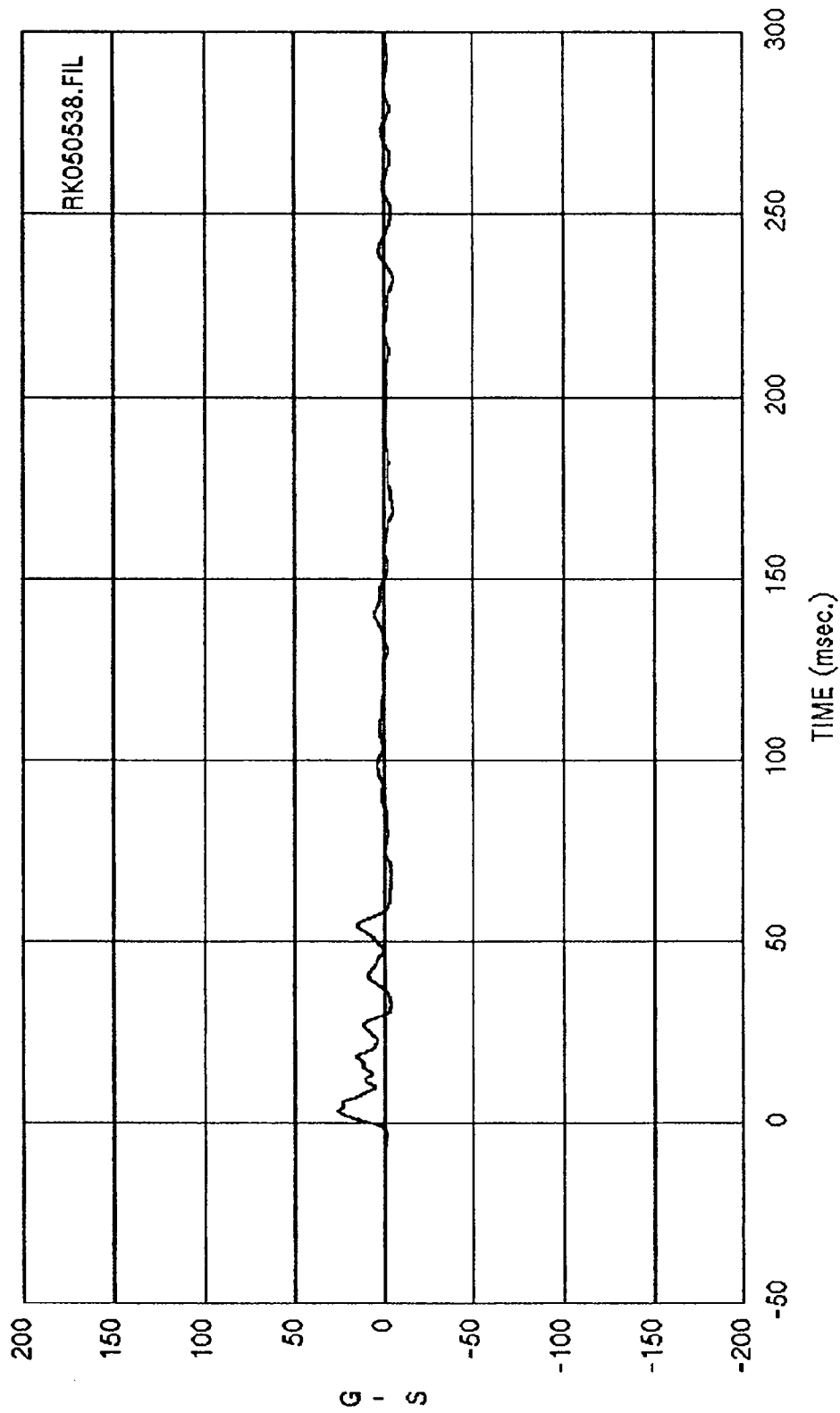
Curve: Rear floor above axle acceleration -- Z axis Filter: SAE CLASS 60 Max = 7.5506 Min = -12.951

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



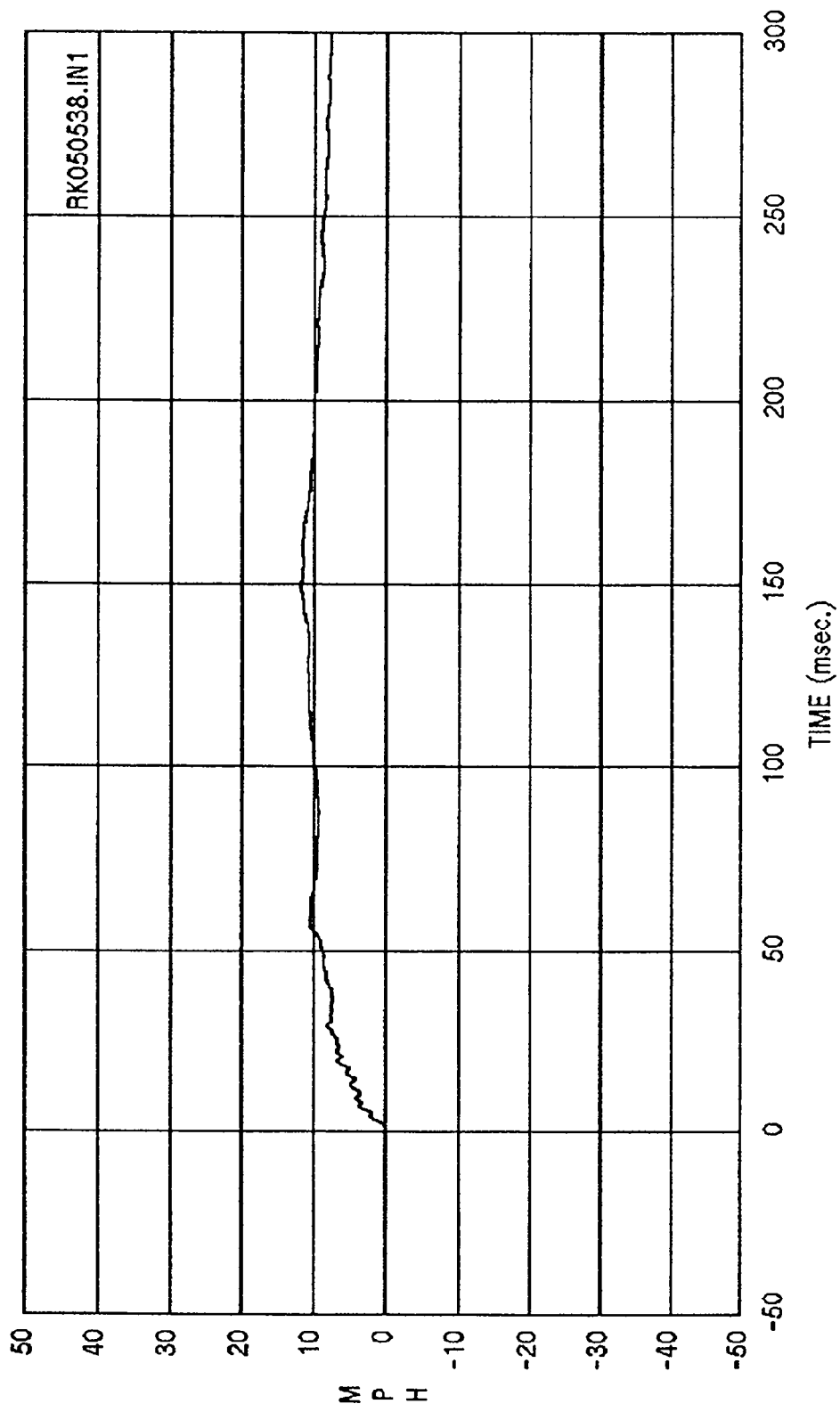
Curve: Rear floor above axle resultant acceleration Filter: SAE CLASS 60 Max = 16.095 Min = .40299

MSE Date: 09/09/92 Program: Side Impact 30/15 90 Deg. Vehicle: 1989 Isuzu Trooper 4x4



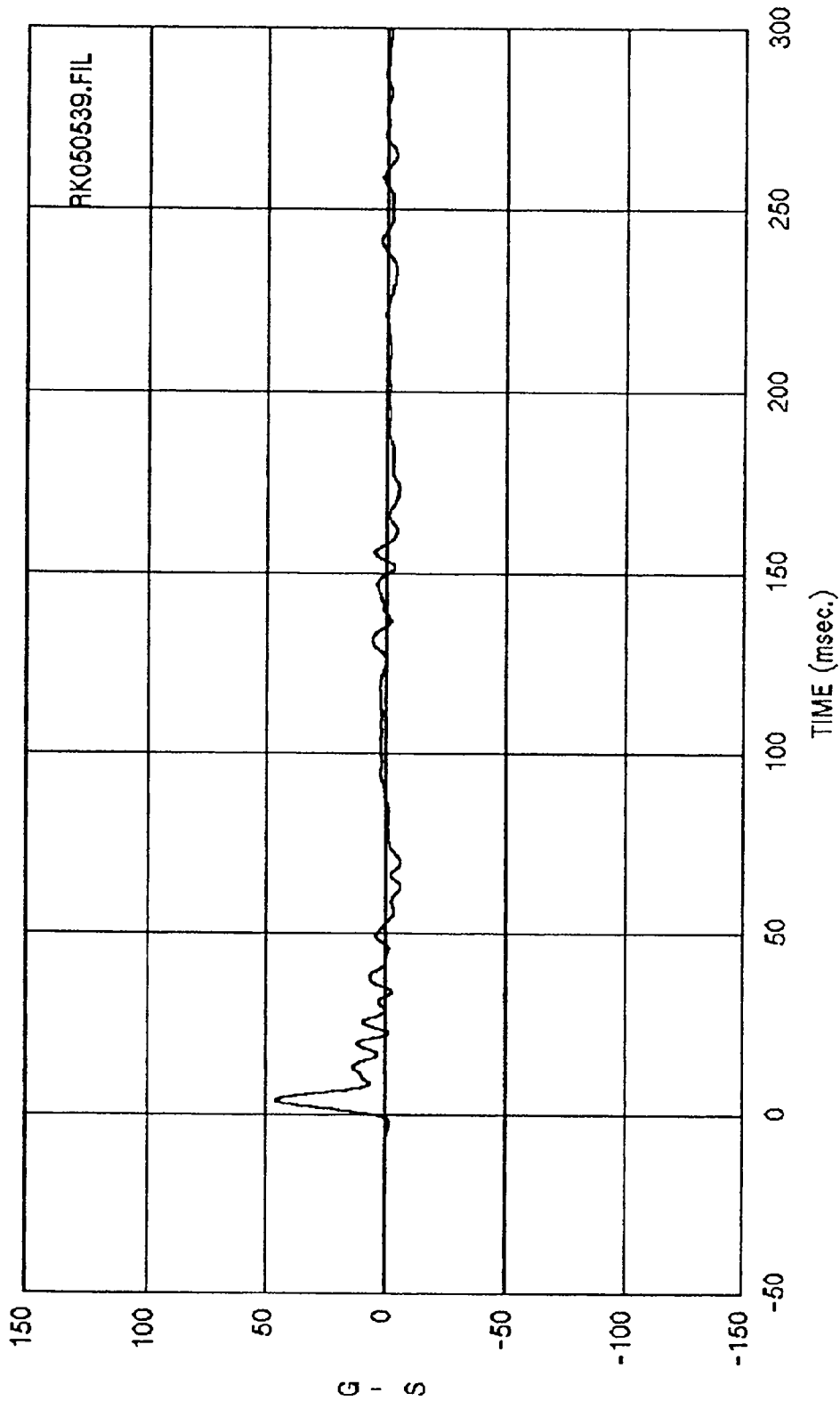
Curve: Rear seat left sill acceleration -- Y axis Filter: SAE CLASS 60 Max = 26.203 Min = -4.7949

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



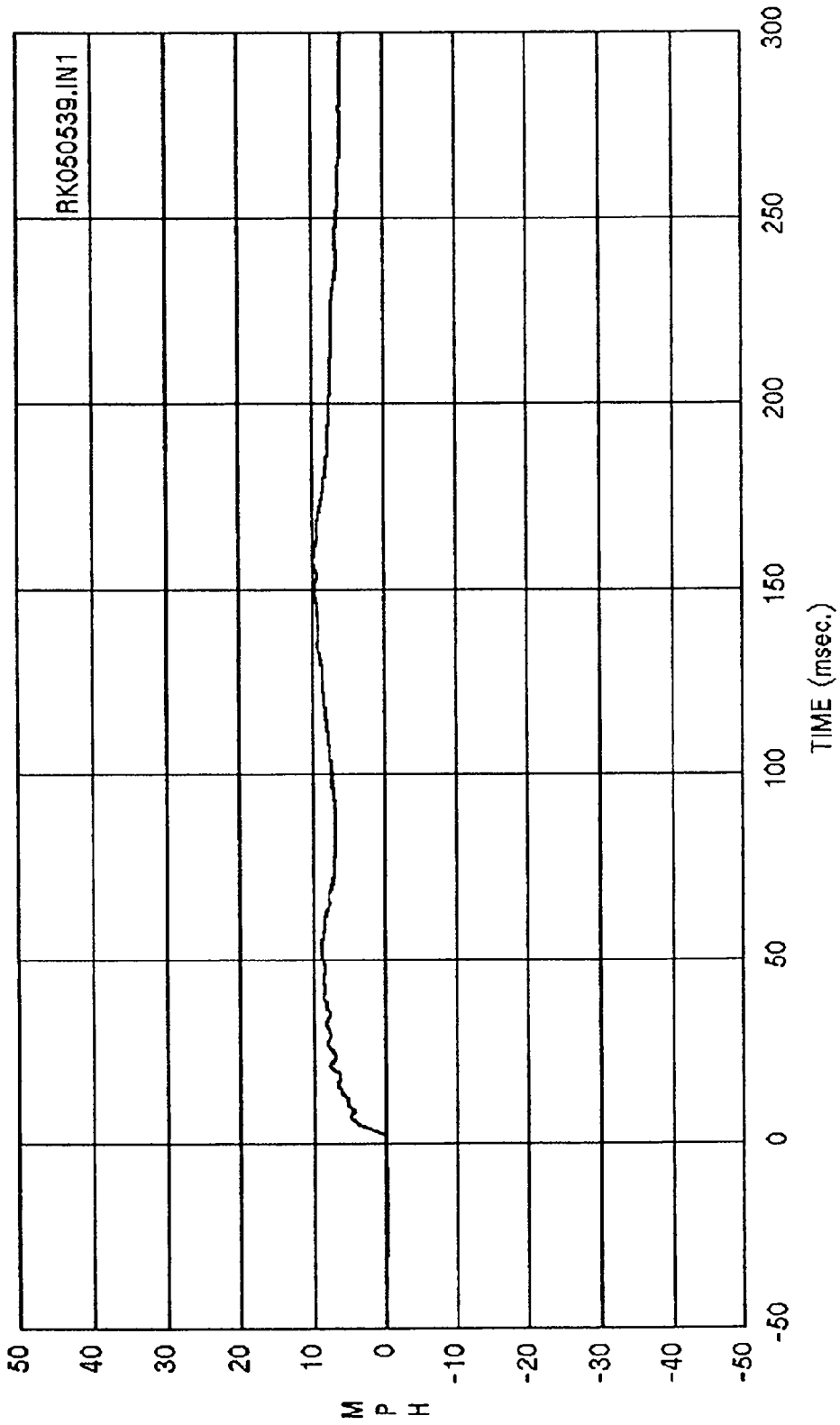
Curve: Rear seat left sill delta V -- Y axis Filter: SAE CLASS 180 Max = 11.784 Min = 1.8774

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



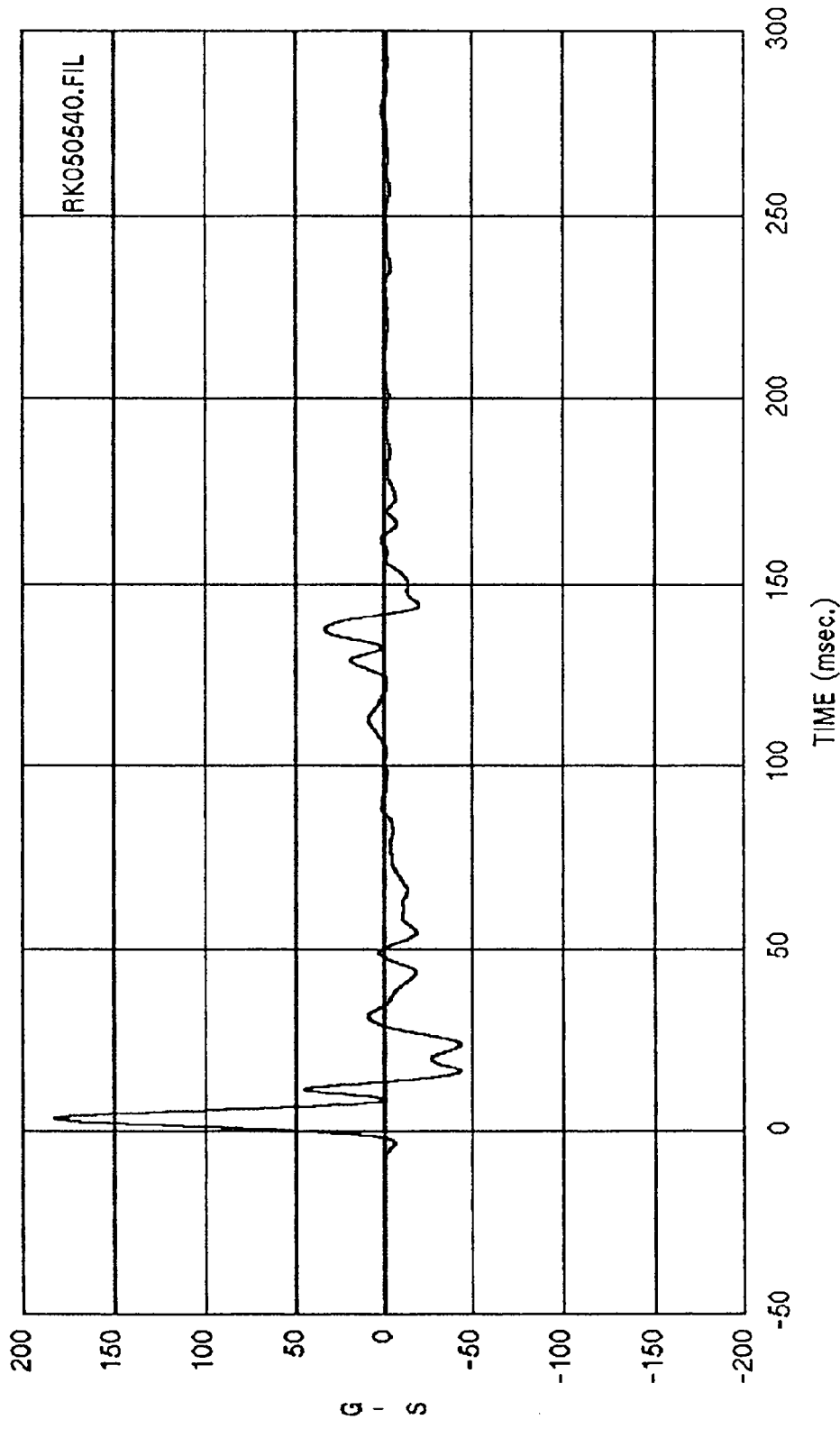
Curve: Front seat left SIII acceleration -- Y axis Filter: SAE CLASS 60 Max = 46.293 Min = -6.1773

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



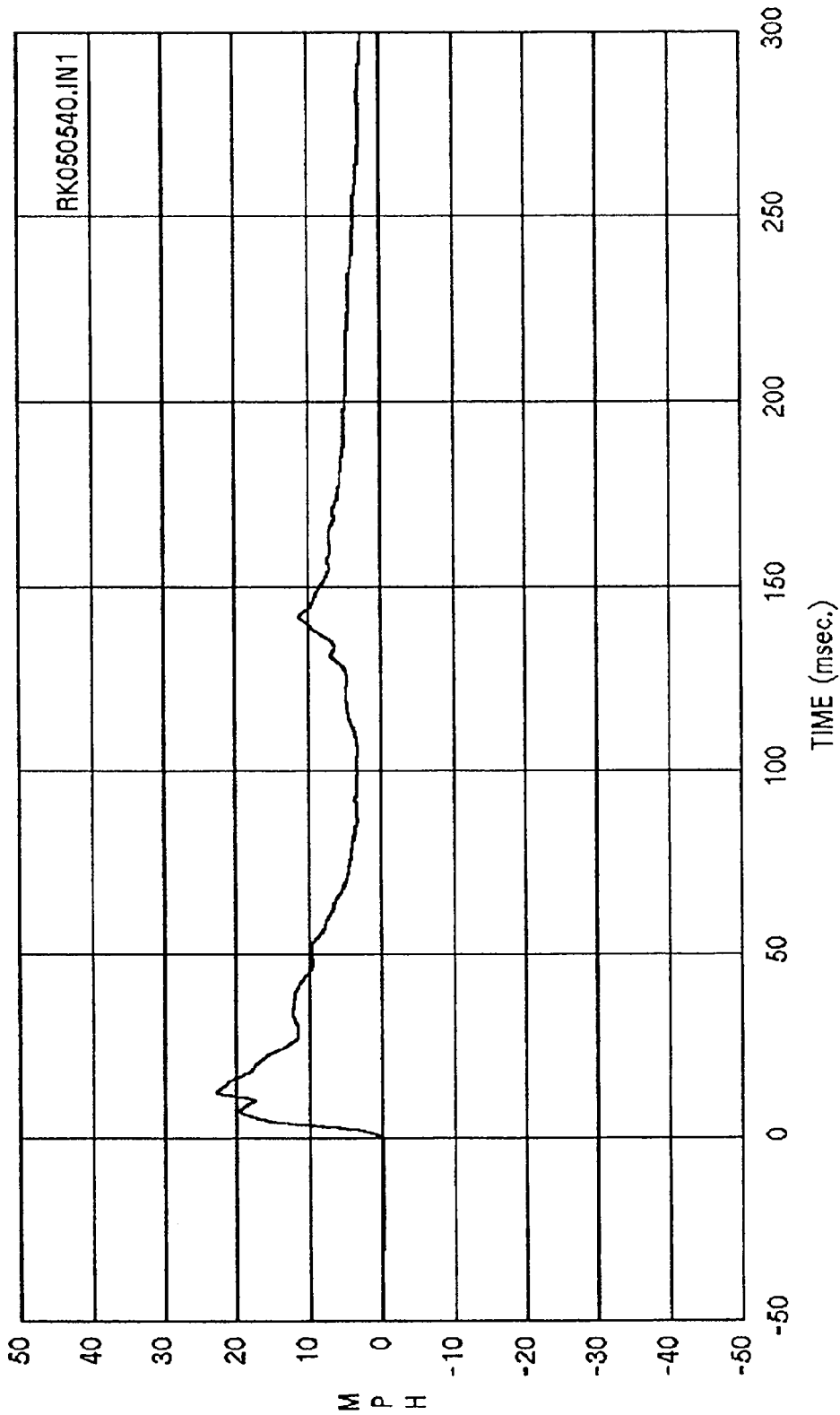
Curve: Front seat left SIII delta V -- Y axis Filter: SAE CLASS 180 Max = 10.030 Min = -.12660E-1

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



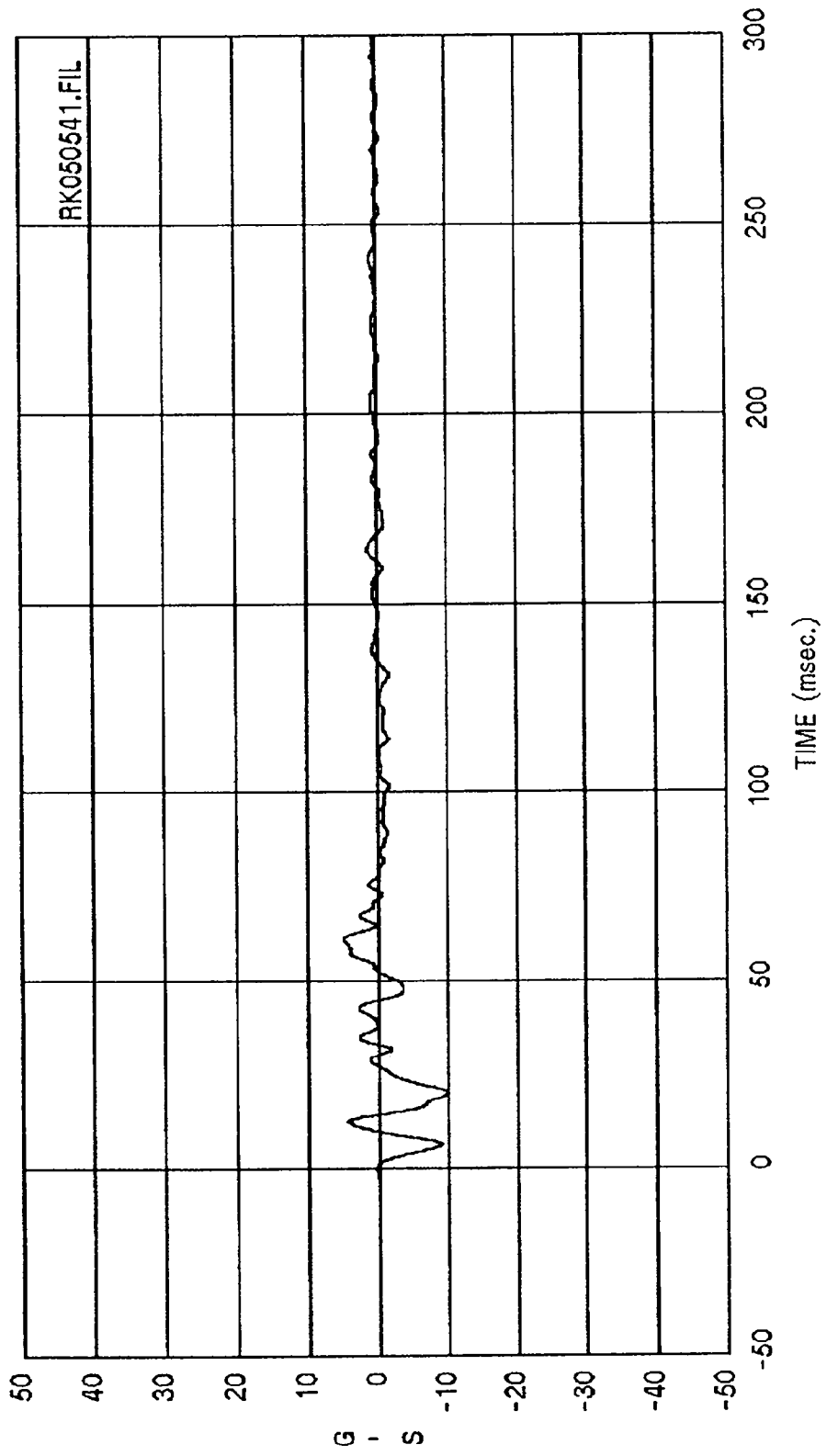
Curve: Left front door at centerline -- Y axis Filter: SAE CLASS 60 Max = 182.85 Min = -43.287

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4

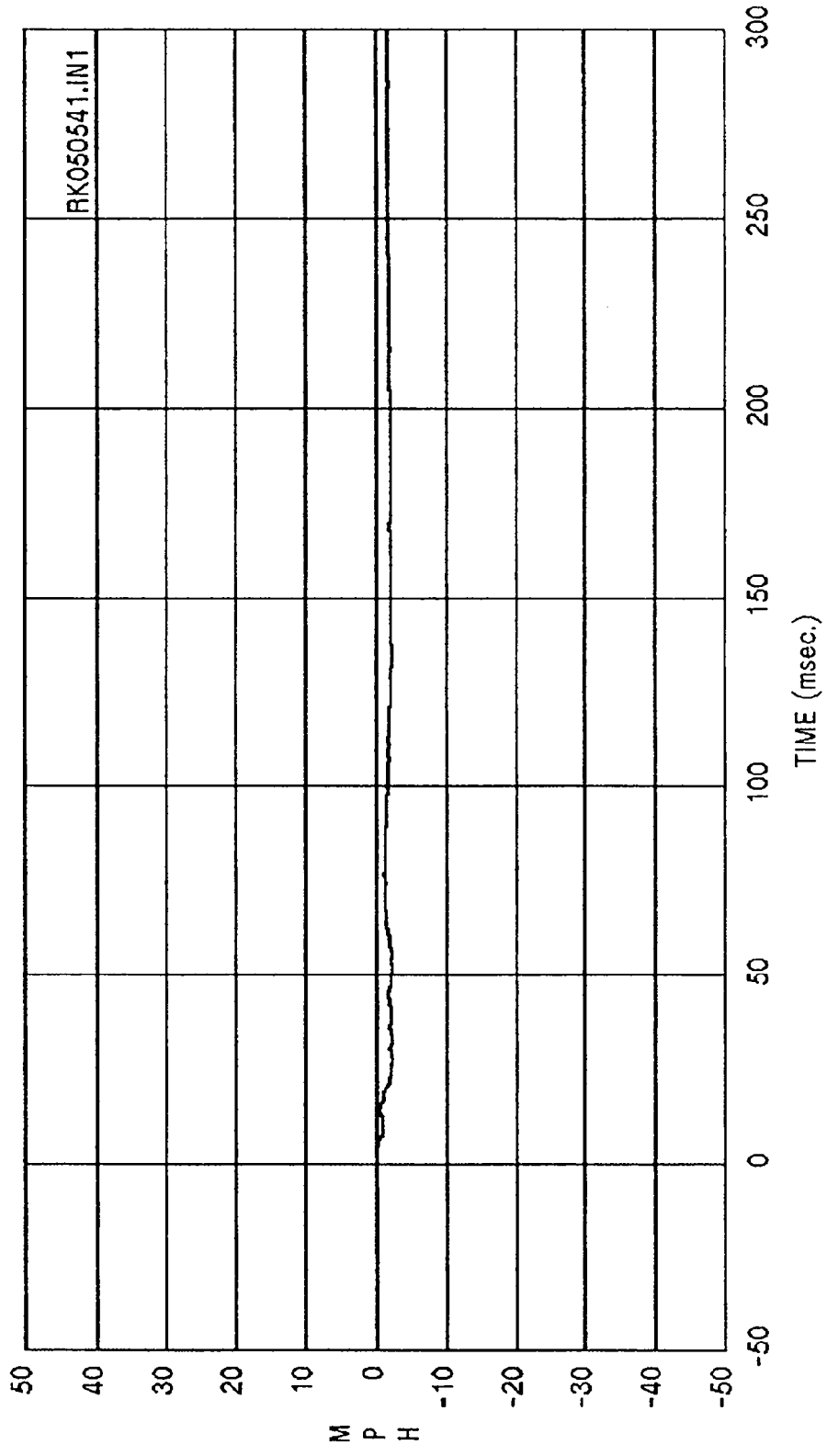


Curve: Left front door at centerline -- Y axis Filter: SAE CLASS 180 Max = 22.988 Min = 2.5298

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4

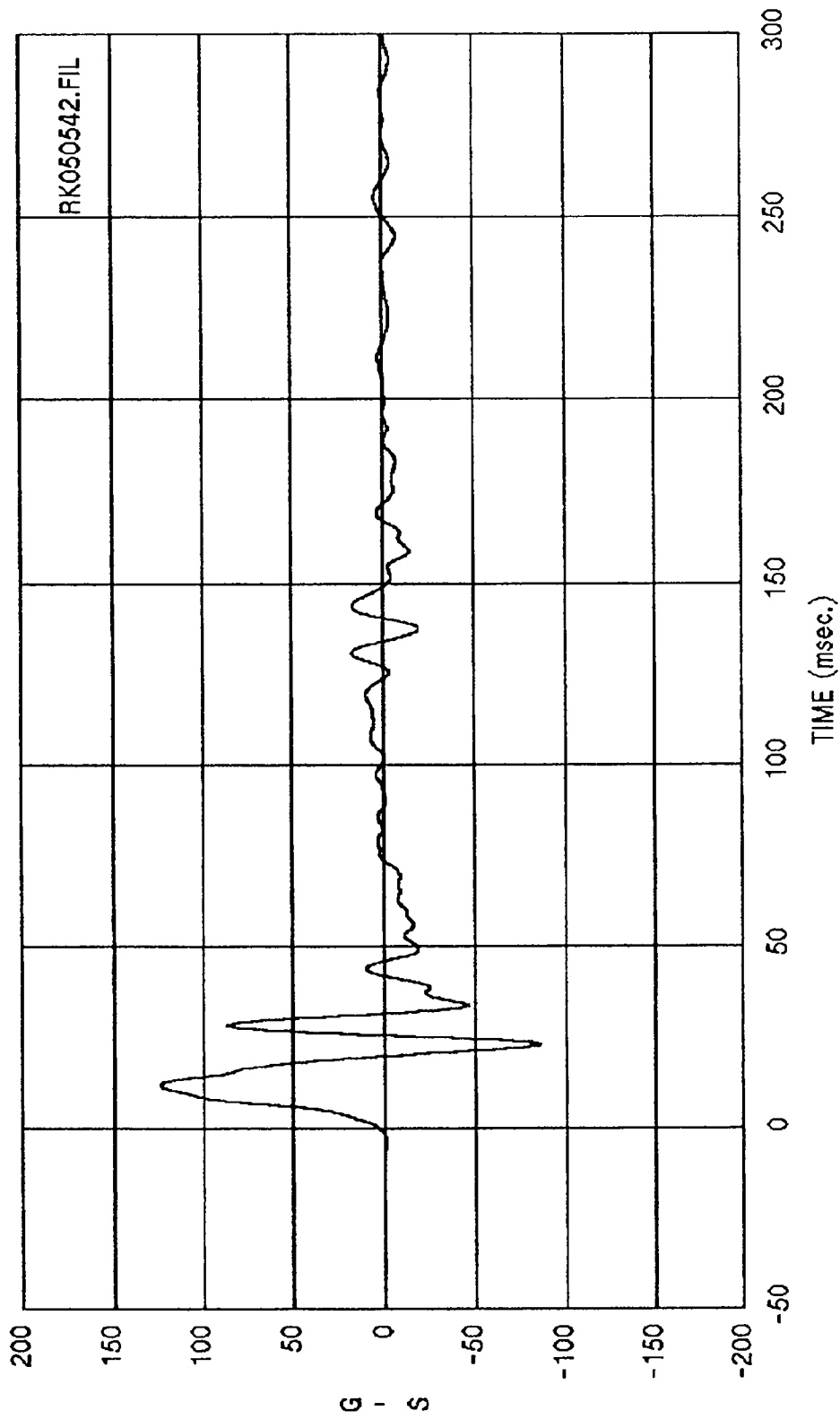


Curve: Right rear occupant compartment -- X axis Filter: SAE CLASS 60 Max = 4.8733 Min = -10.033  
 MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



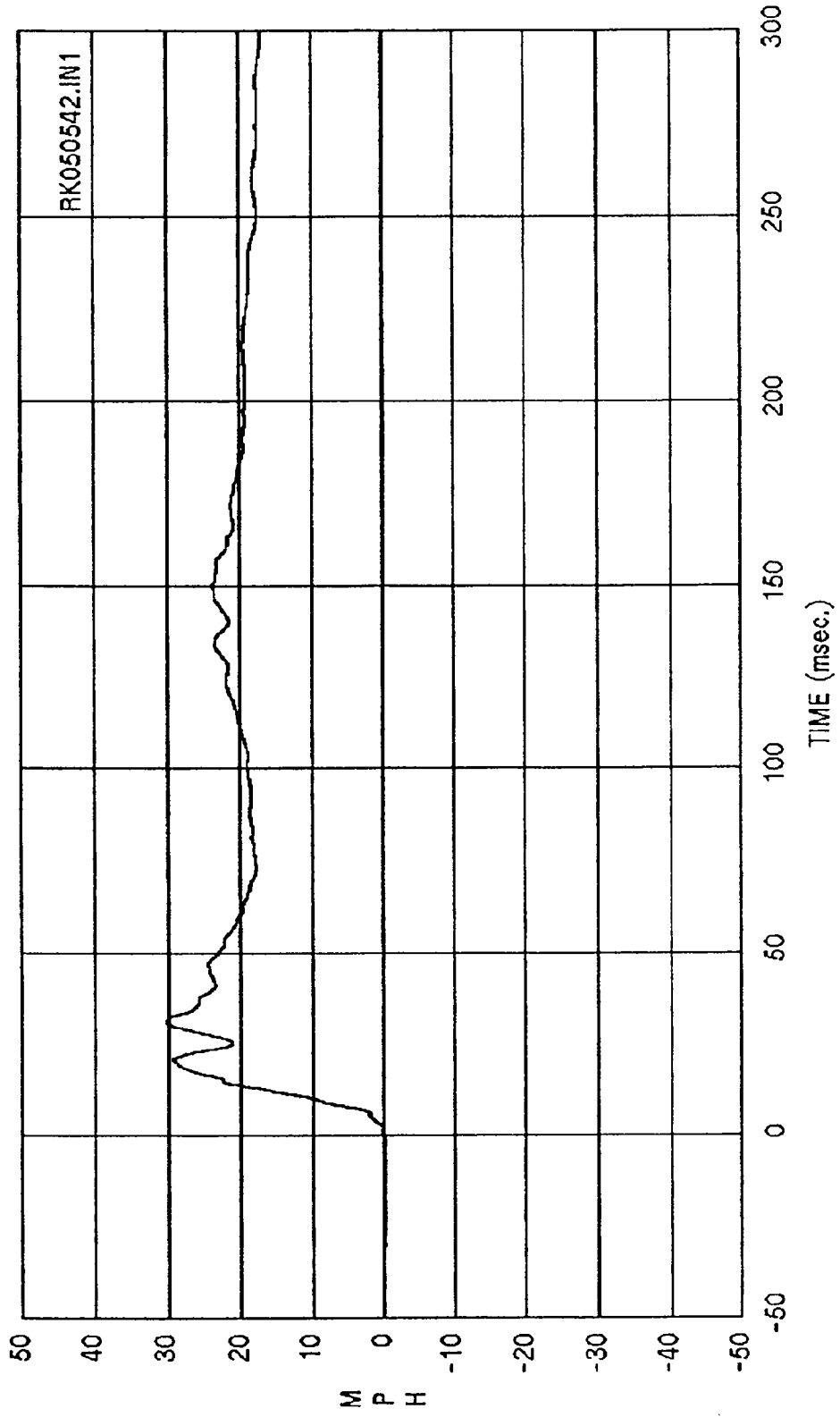
Curve: Right rear occupant compartment -- X axis Filter: SAE CLASS 180 Max = .10895E-01 Min = -2.23

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



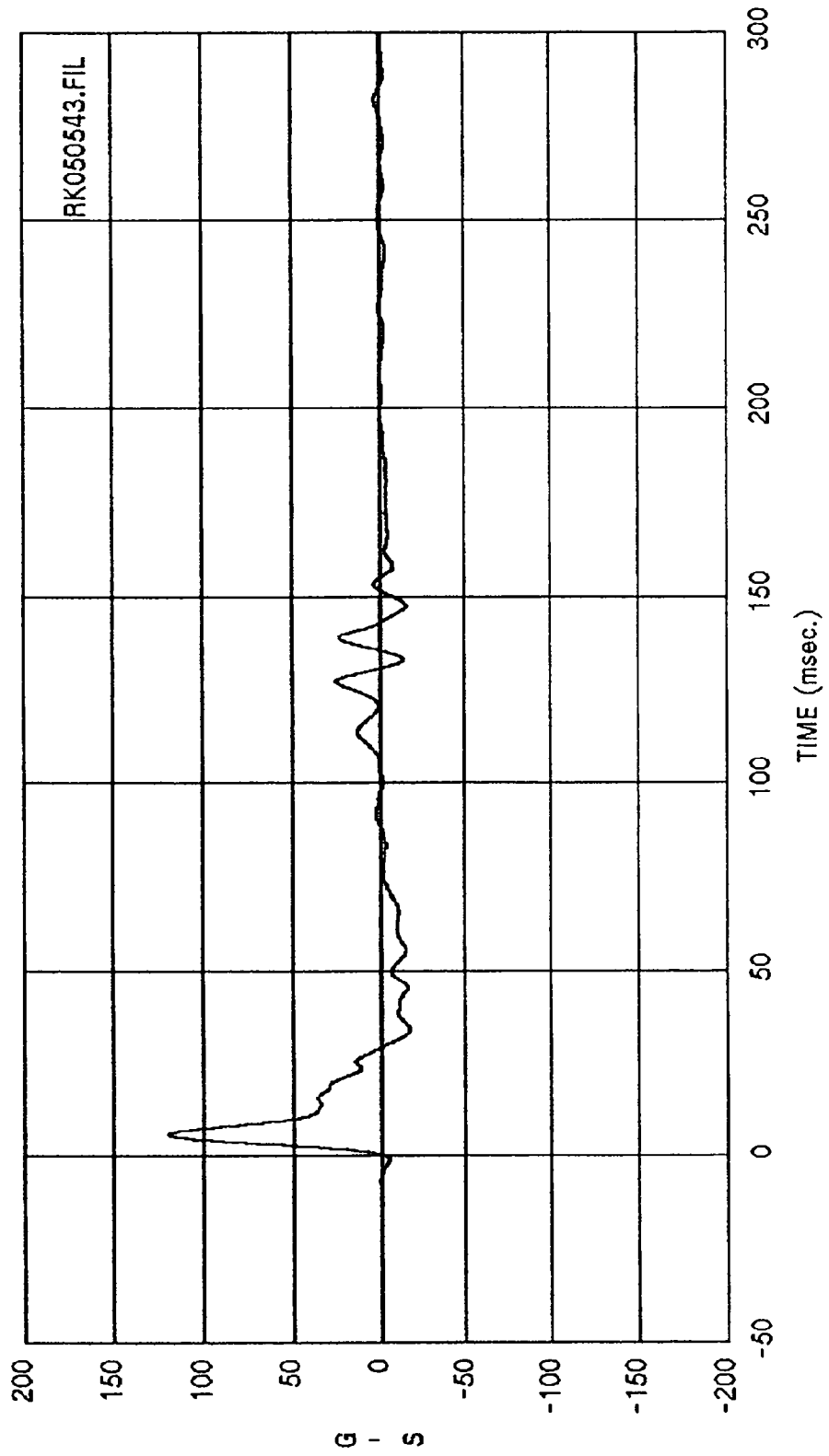
Curve: Left front door at mid-rear -- Y axis Filter: SAE CLASS 60 Max = 124.64 Min = -86.053

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



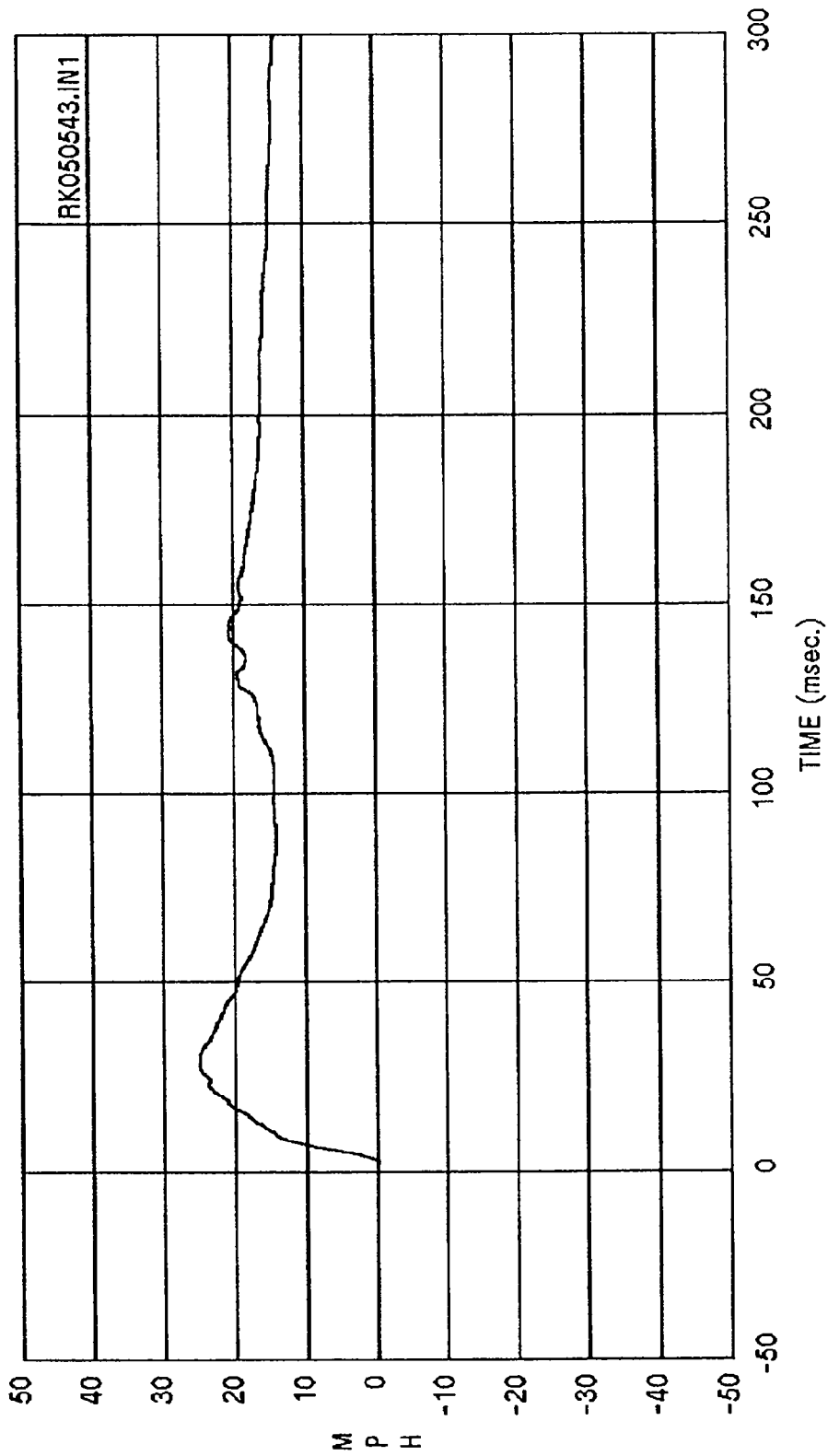
Curve: Left front door at mid-rear -- Y axis Filter: SAE CLASS 180 Max = 30.224 Min = .93993E-

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



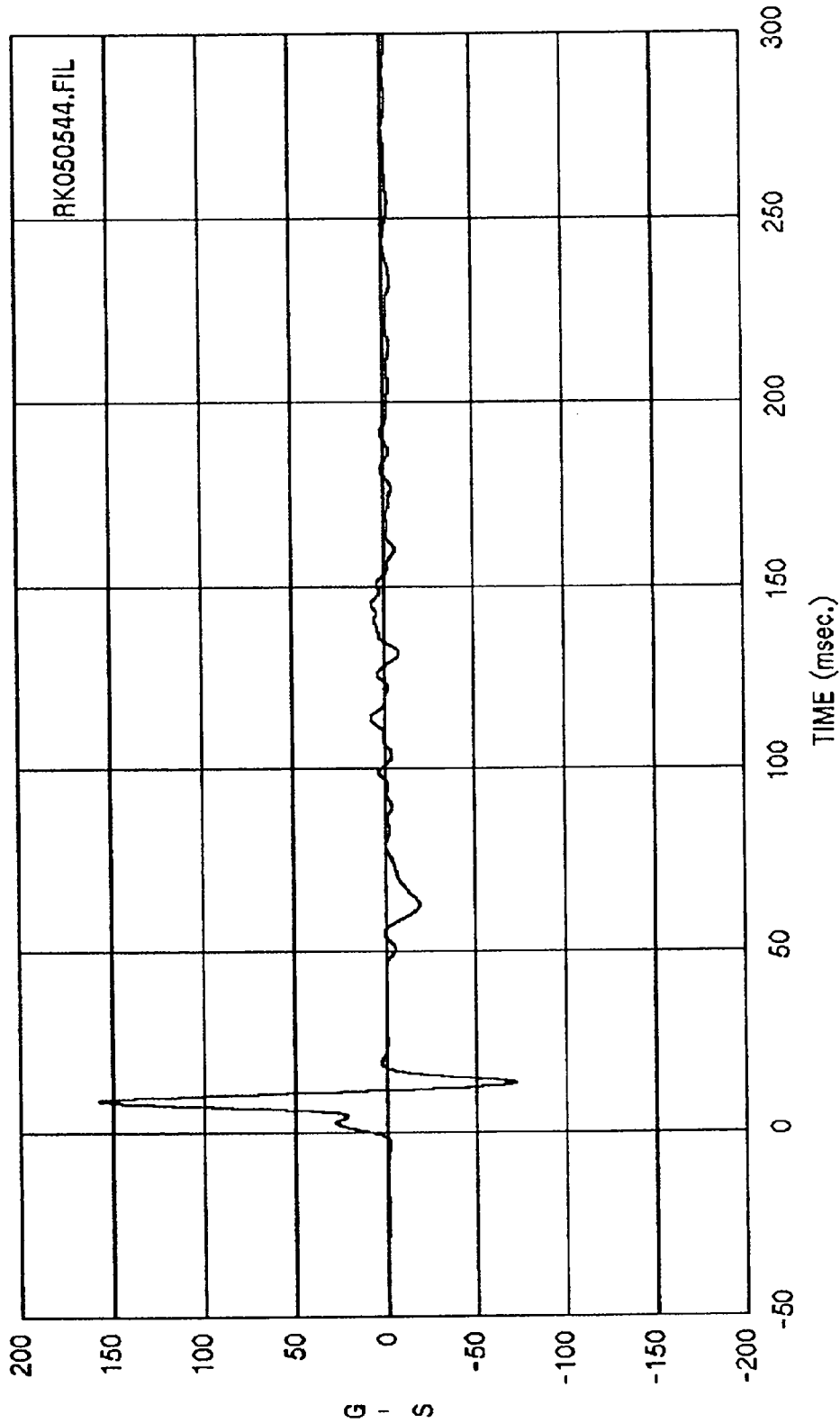
Curve: Left front door at upper centerline -- Y axis Filter: SAE CLASS 60 Max = 119.33 Min = -17.167

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



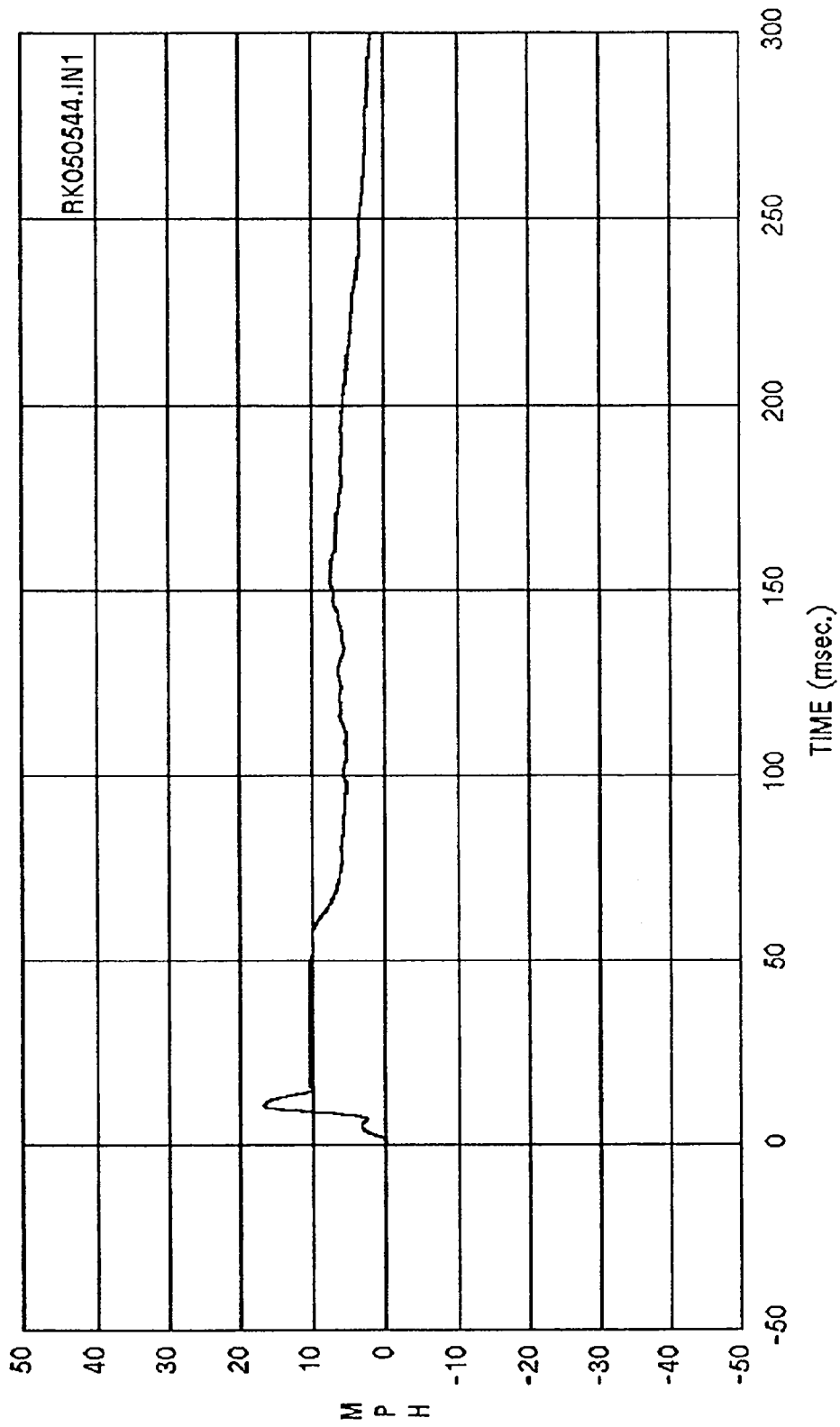
Curve: Left front door at upper centerline -- Y axis Filter: SAE CLASS 180 Max = 24,922 Min = -.29350

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



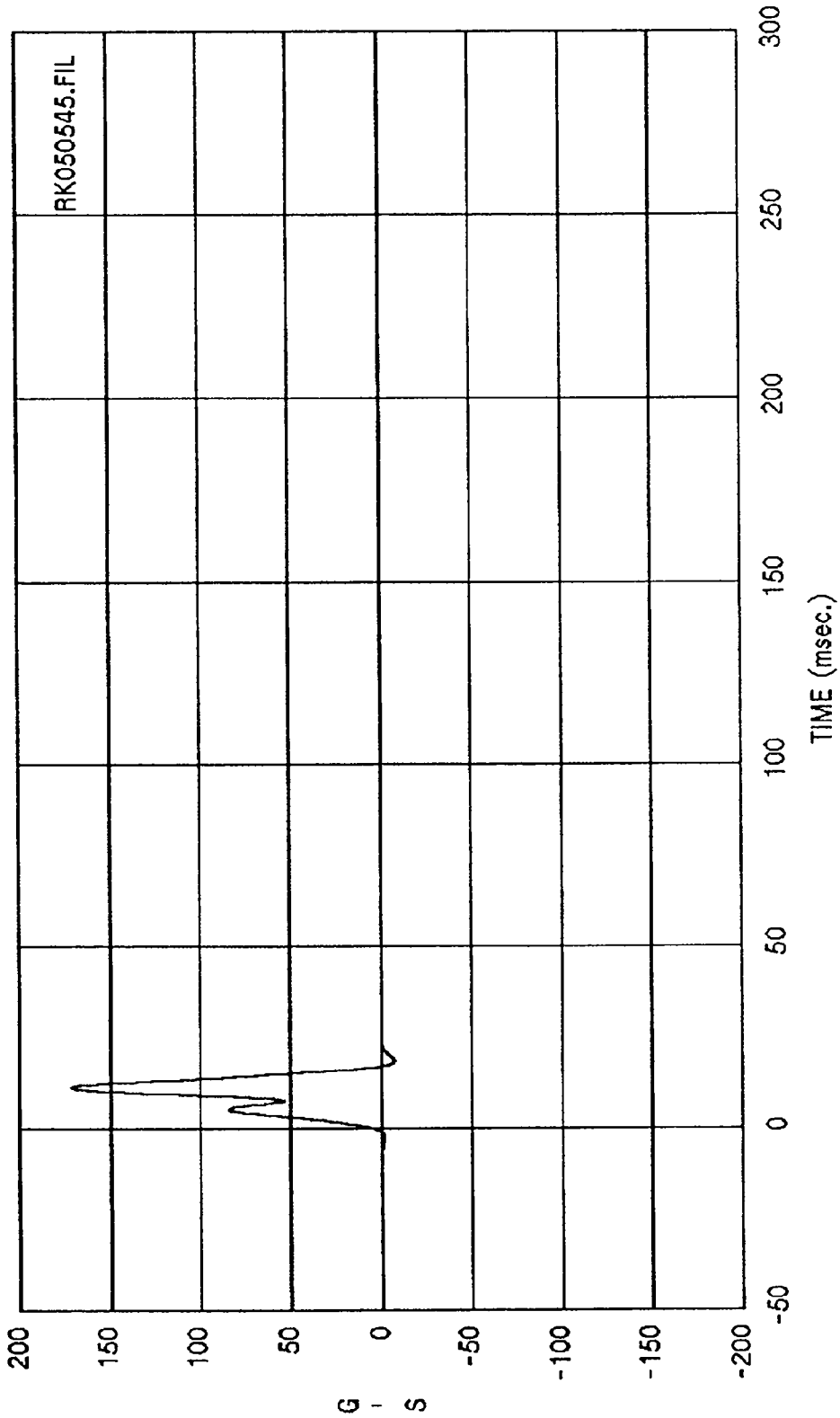
Curve: Left rear door at mid-rear -- Y axis Filter: SAE CLASS 60 Max = 157.64 Min = -72.065

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4

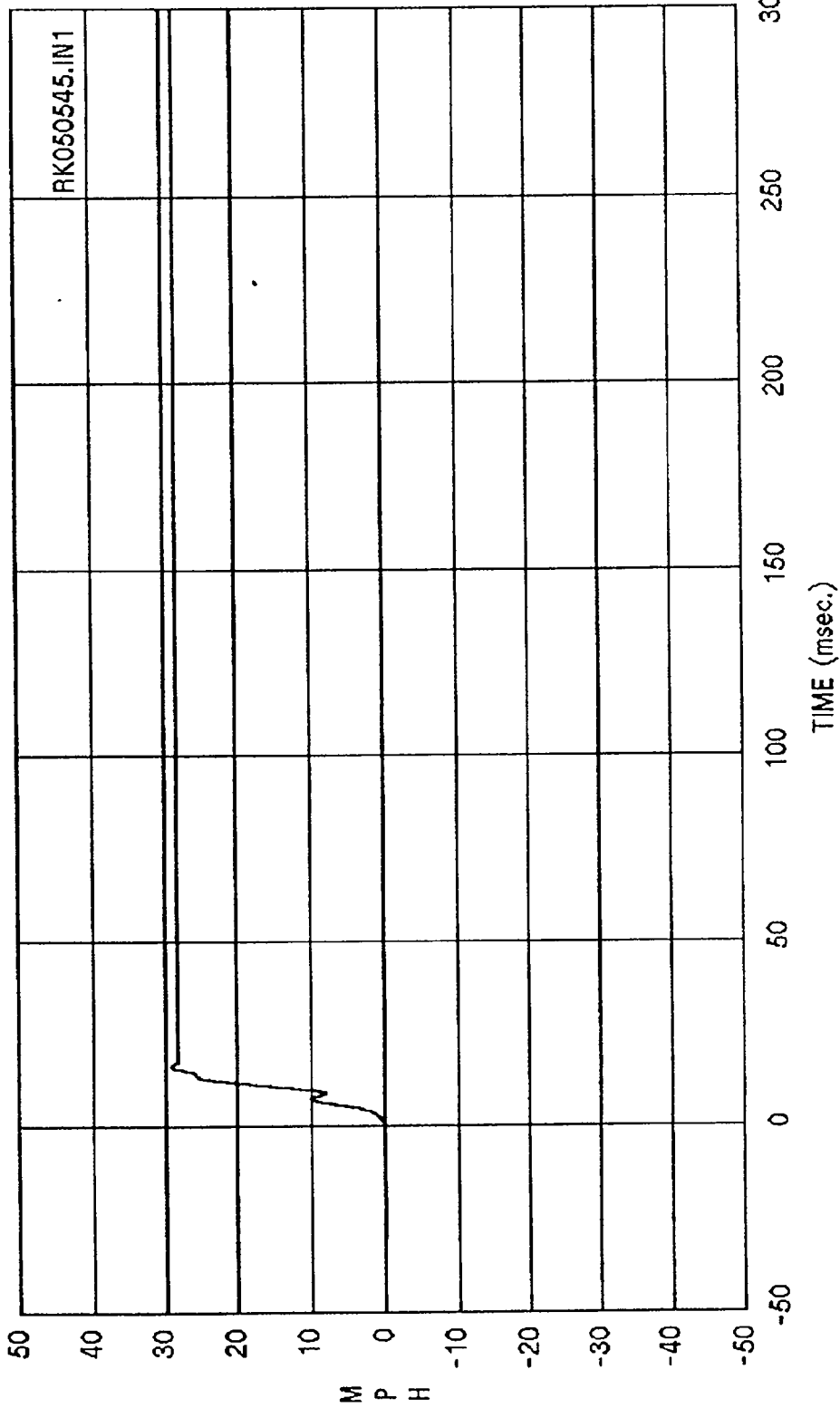


Curve: Left rear door at mid-rear -- Y axis Filter: SAE CLASS 180 Max = 16.880 Min = -.39798E-

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



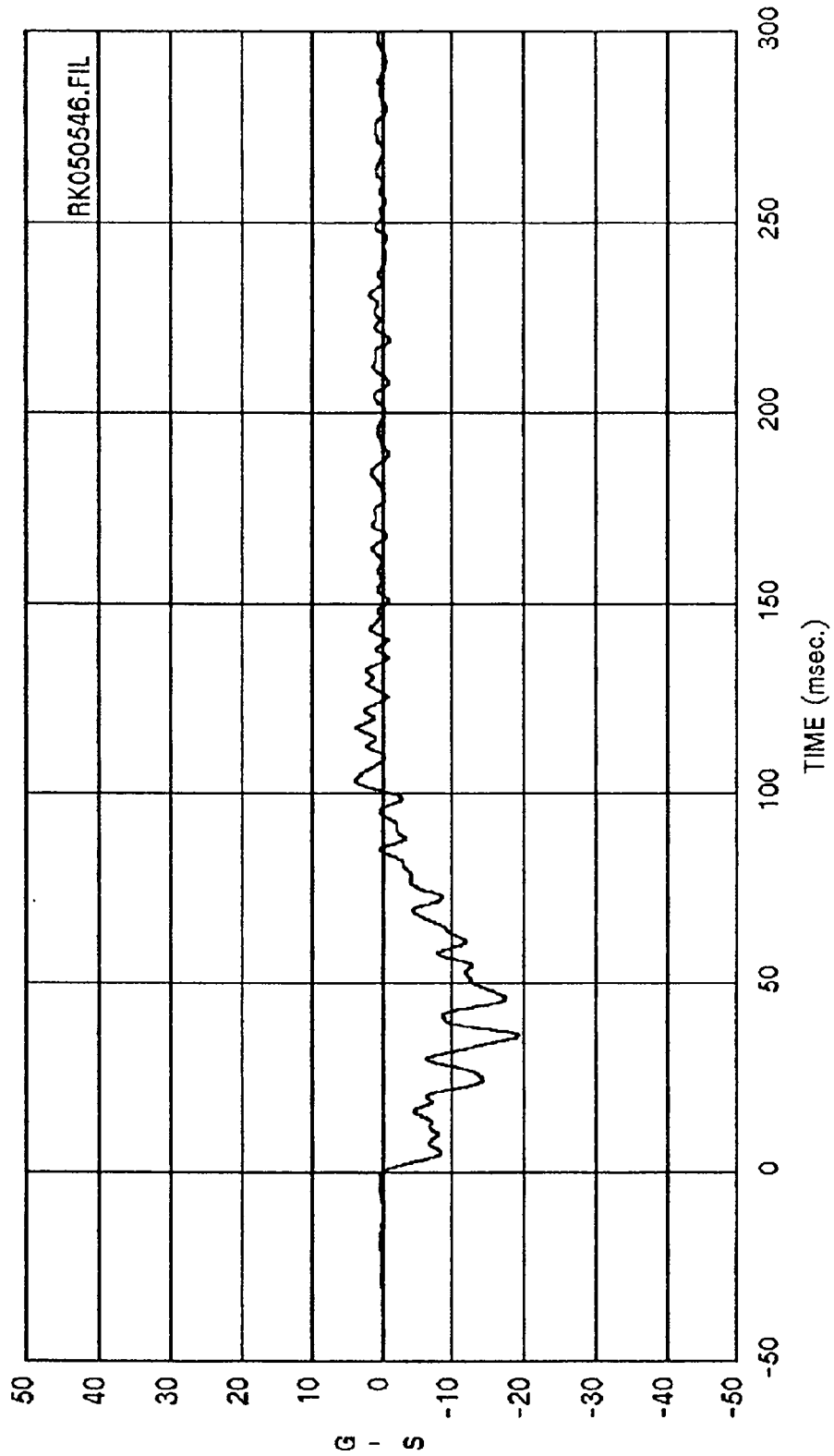
Curve: Left rear door at upper centerline -- Y axis Filter: SAE CLASS 60 Max = 171.76 Min = -6.9151  
 MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



Curve: Left rear door at upper centerline -- Y axis Filter: SAE CLASS 180 Max = 29.211 Min = 8.0448

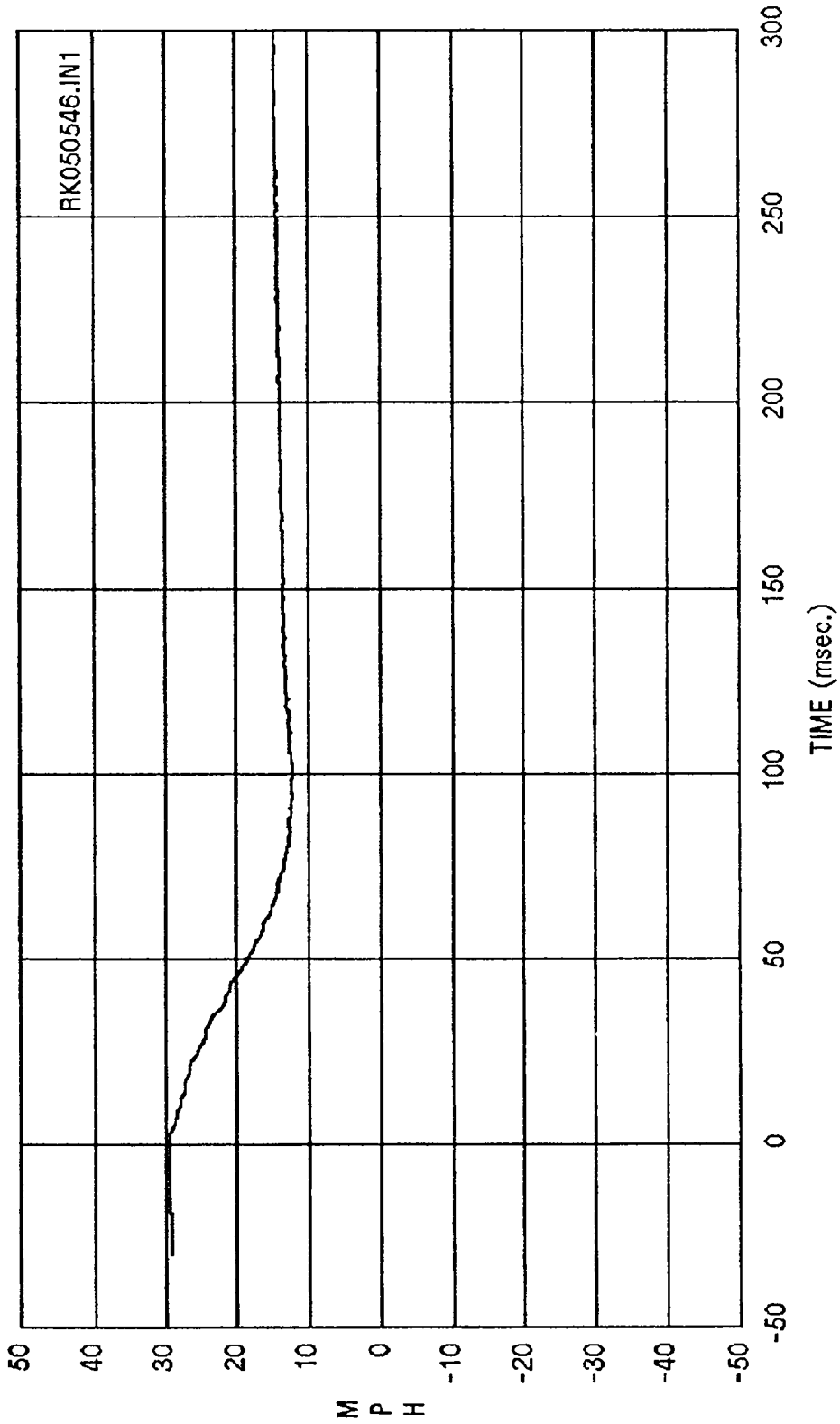
MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4

MDB ACCELEROMETER DATA



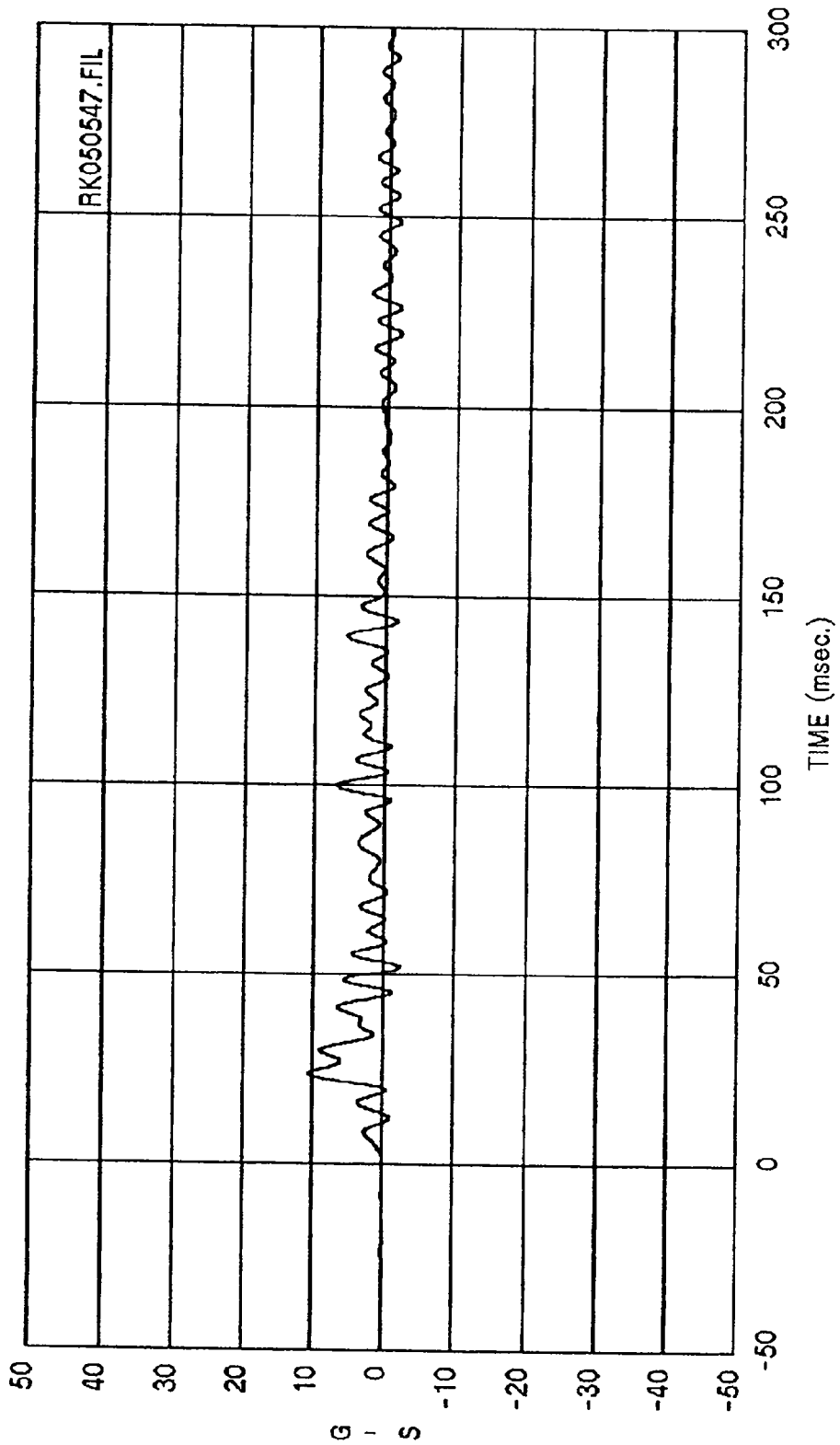
Curve: M.D.B. C/G acceleration -- X axis Filter: SAE CLASS 60 Max = 3.8082 Min = -19.475

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



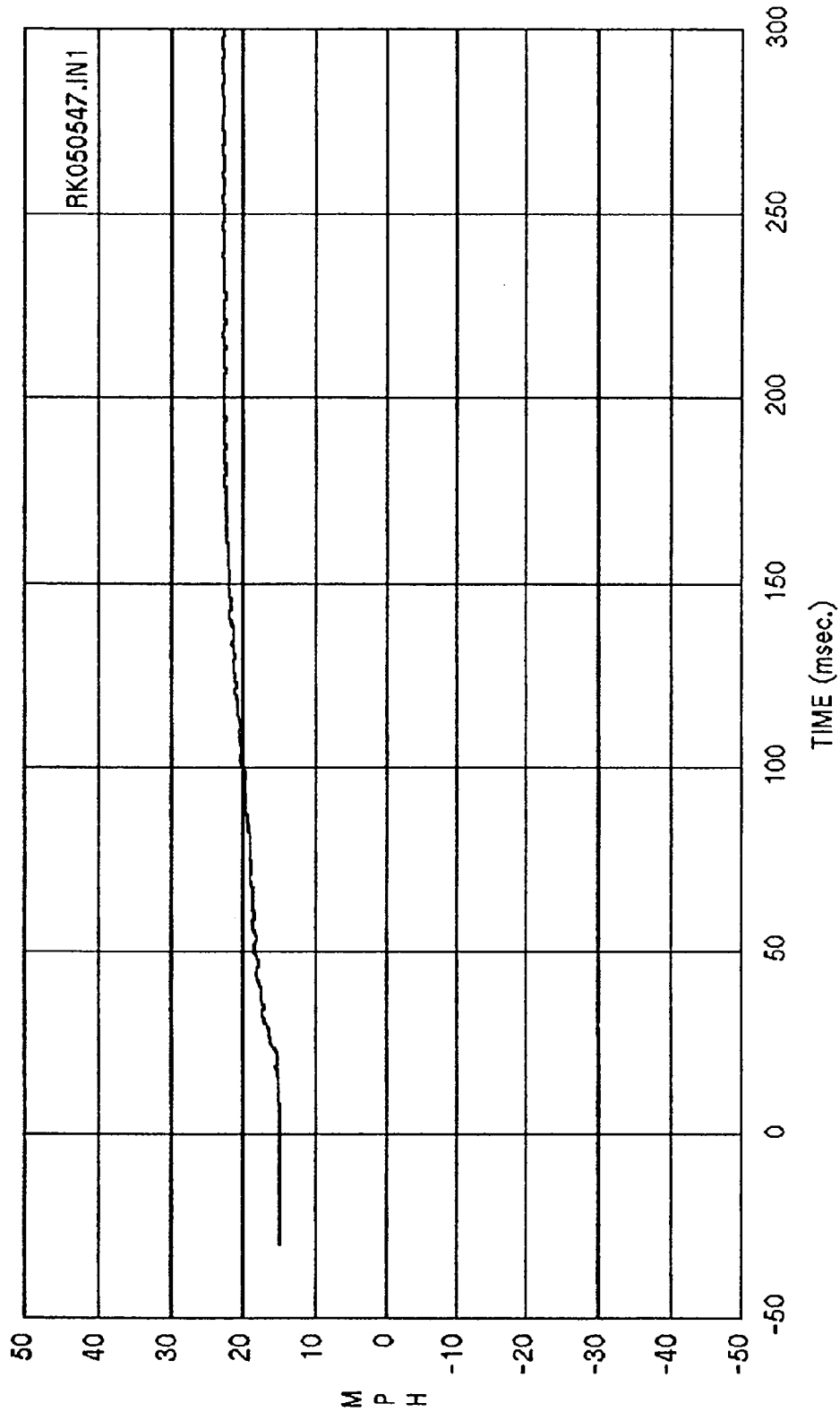
Curve: M.D.B. C/G delta V -- X axis Filter: SAE CLASS 180 Max = 29.421 Min = 12.153

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



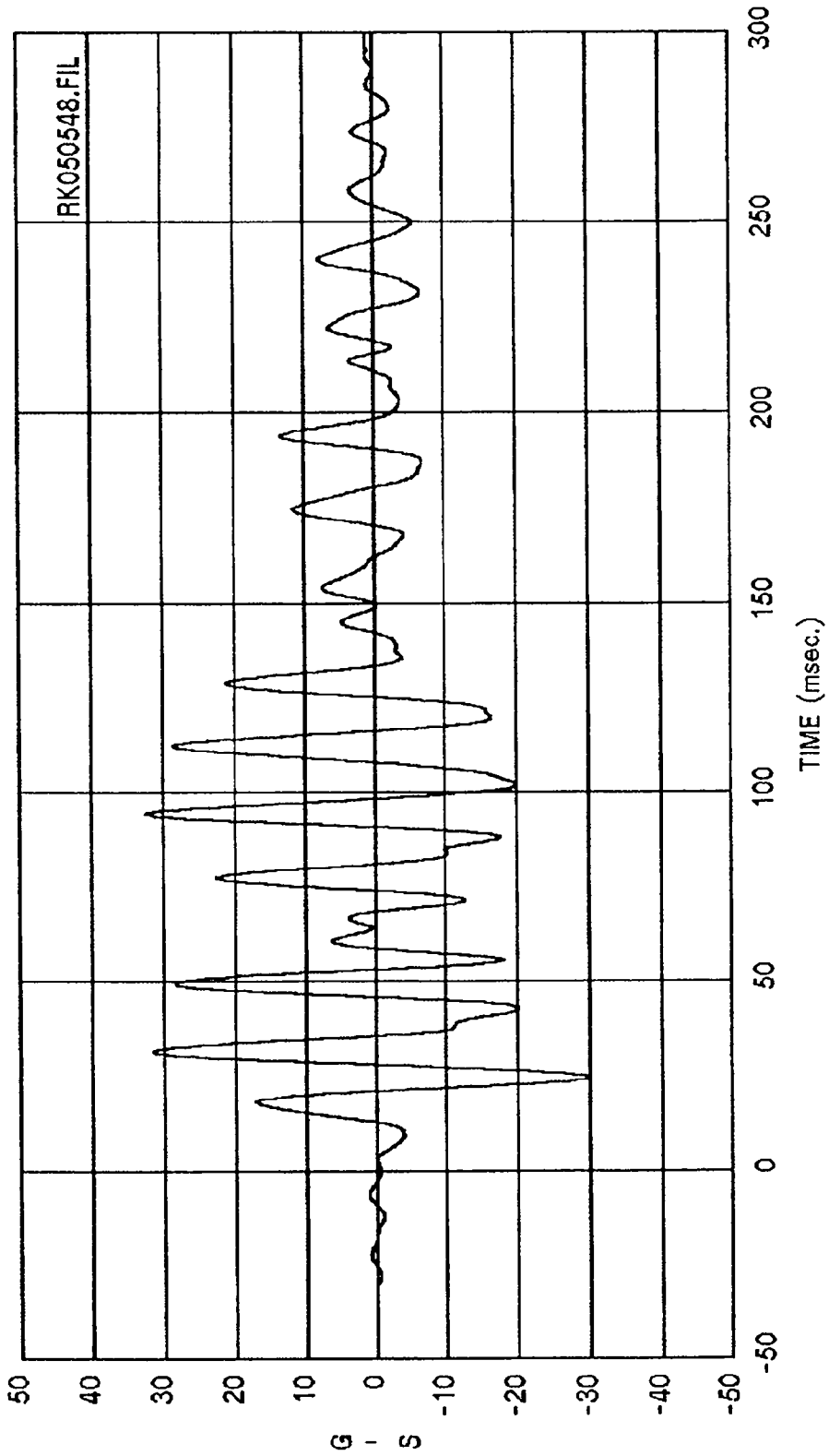
Curve: M.D.B. C/G acceleration -- Y axis Filter: SAE CLASS 60 Max = 10.649 Min = -2.3811

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



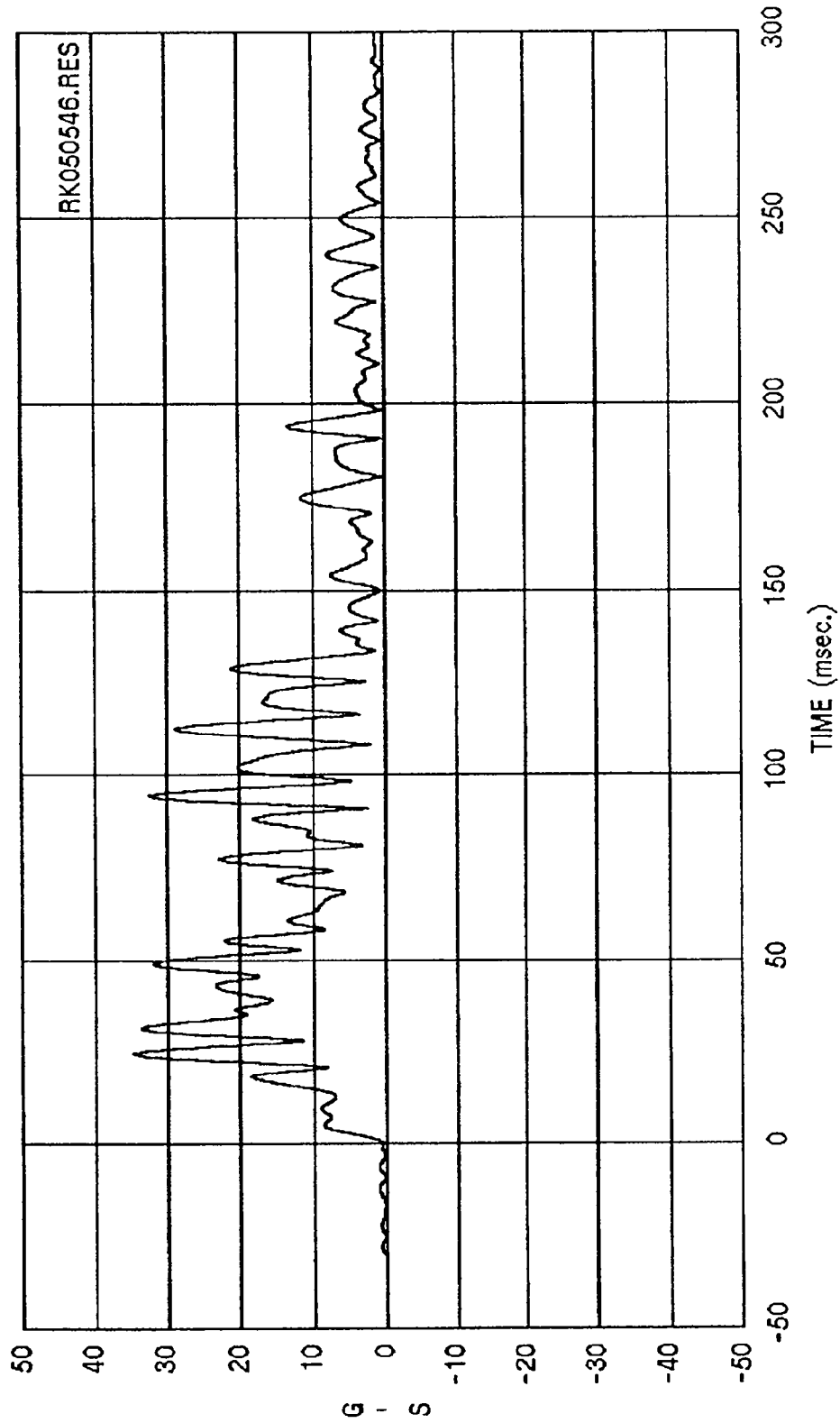
Curve: M.D.B. C/G delta V -- Y axis Filter: SAE CLASS 180 Max = 22.912 Min = 14.980

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



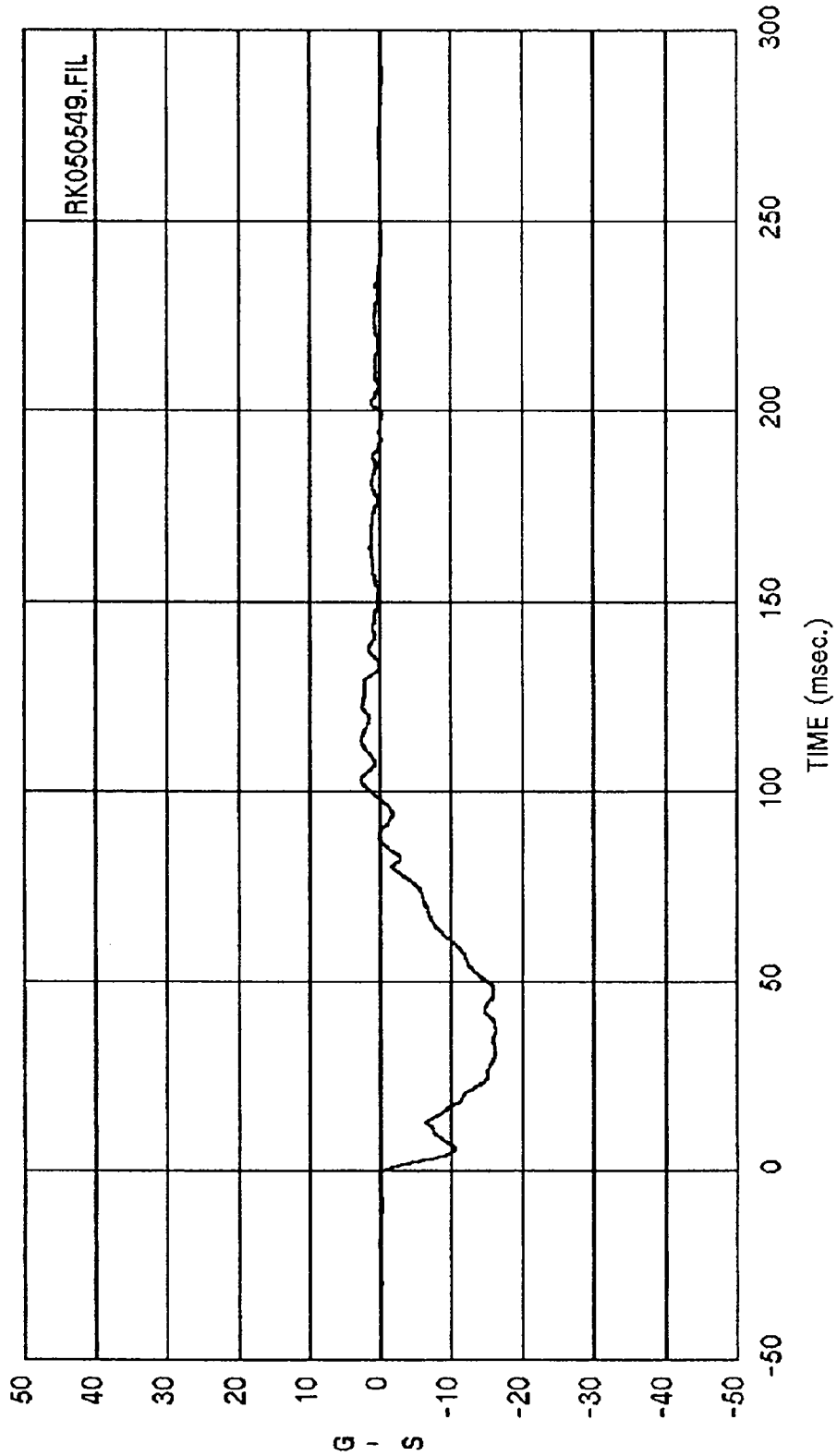
Curve: M.D.B. C/G acceleration -- Z axis Filter: SAE CLASS 60 Max = 32.543 Min = -30.054

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



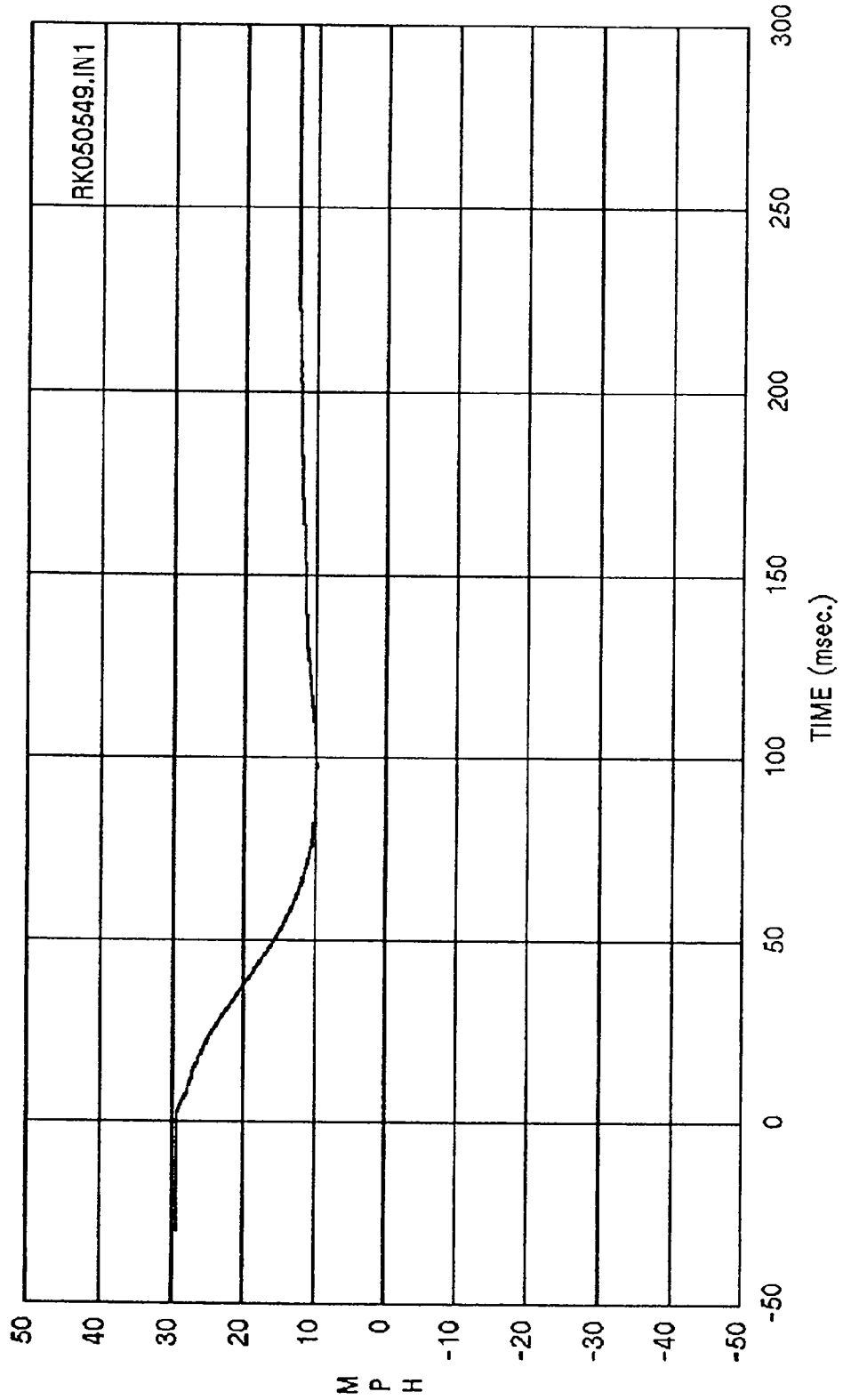
Curve: M.D.B. C/G resultant acceleration Filter: SAE CLASS 60 Max = 34.669 Min = .18272

MSE Date: 09/09/92 Program: Side Impact 30/15 90 Deg. Vehicle: 1989 Isuzu Trooper 4x4



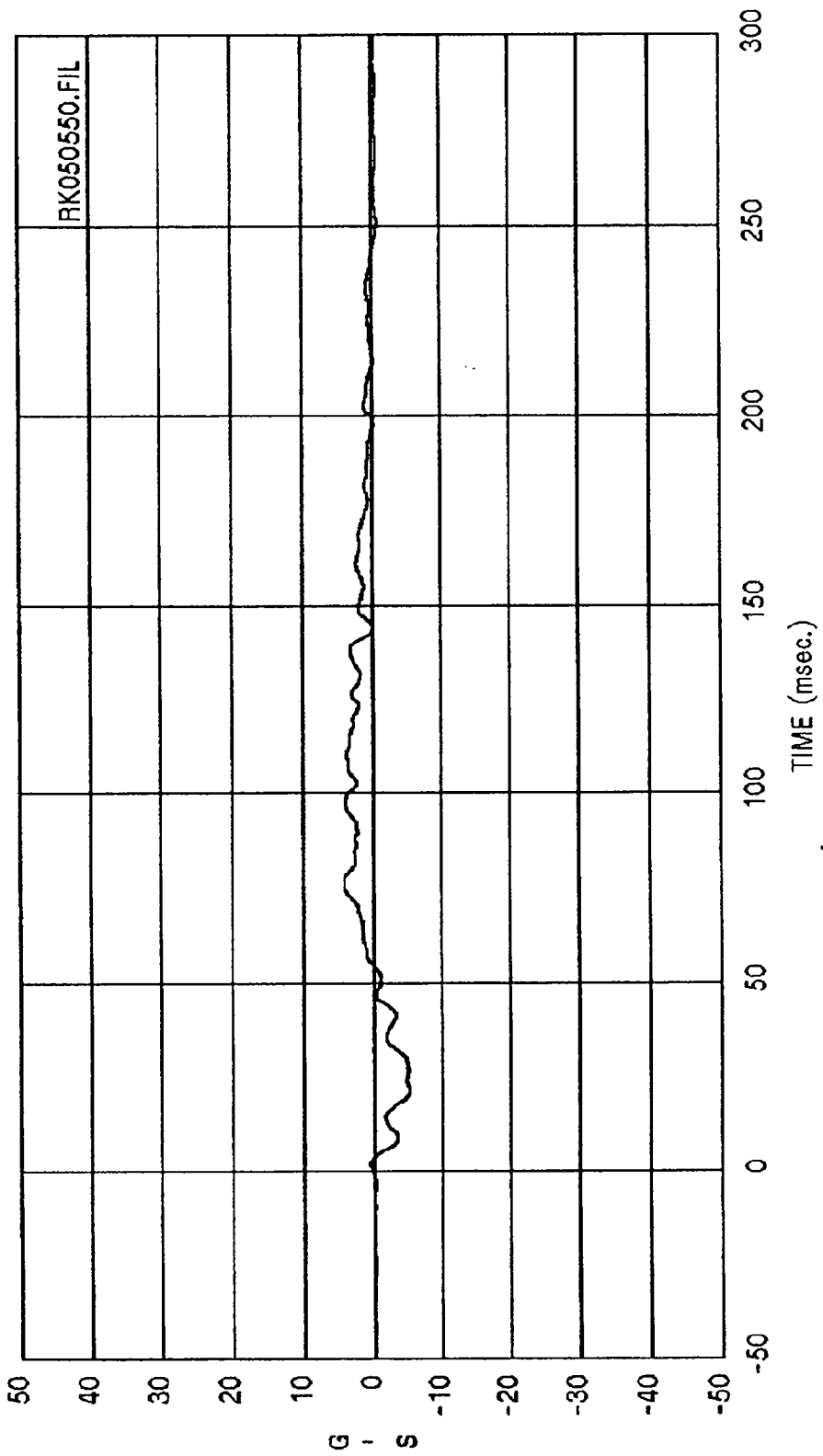
Curve: M.D.B. rear C/G acceleration -- X axis Filter: SAE CLASS 60 Max = 2.6266 Min = -16.243

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



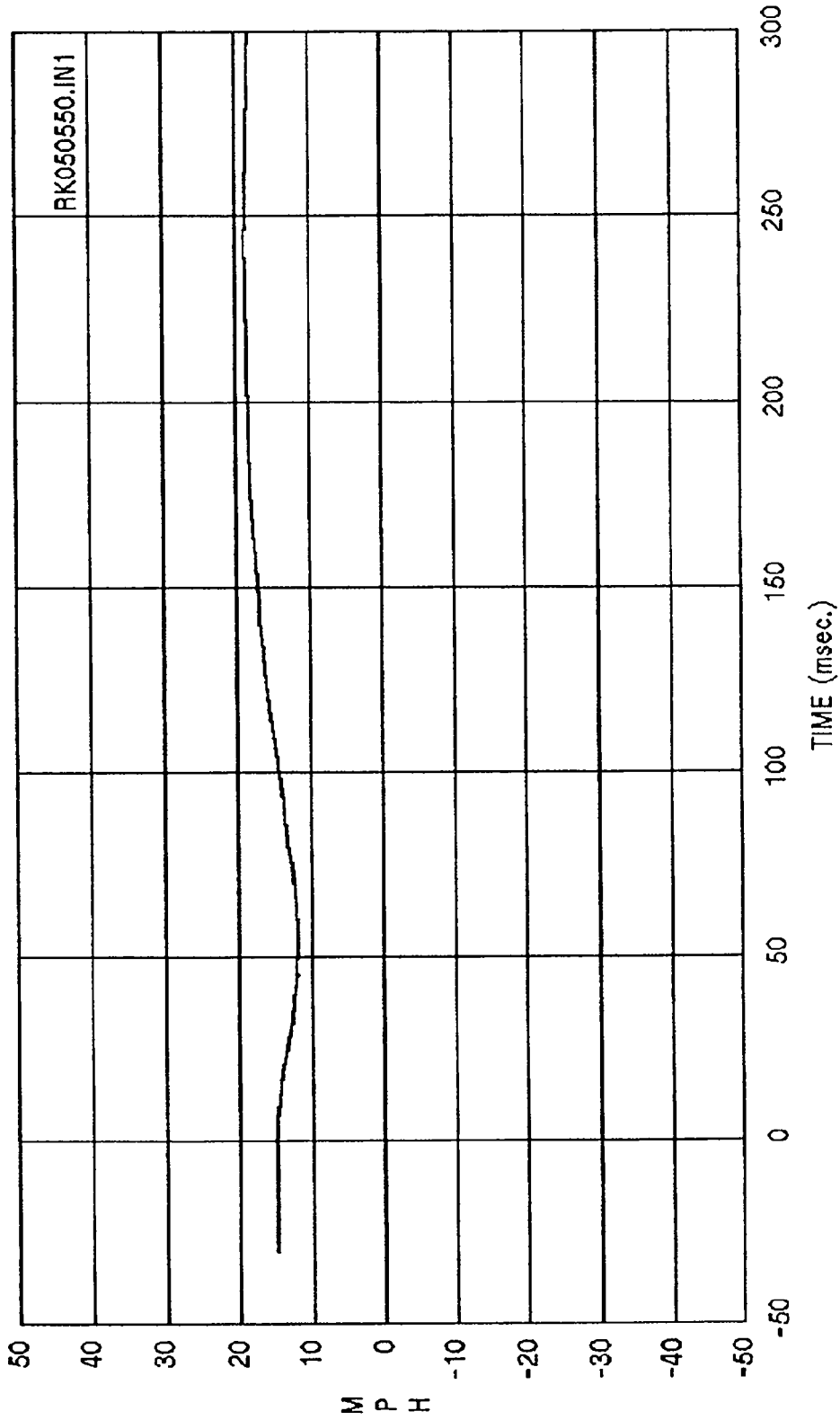
Curve: M.D.B. rear C/G delta V -- X axis Filter: SAE CLASS 180 Max = 29.423 Min = 9.8955

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



Curve: M.D.B. rear C/G acceleration -- Y axis Filter: SAE CLASS 60 Max = 4.1723 Min = -5.1862

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4



Curve: M.D.B. rear C/G delta V -- Y axis Filter: SAE CLASS 180 Max = 18.898 Min = 12.035

MSE Date: 09/09/92 Program: Side Impact, 30/15, 90 deg. Vehicle: 1989 Isuzu Trooper 4x4

SECTION 7

SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Two SID's were used during the test. They were:

DRIVER POSITION: SID, SERIAL NO. 136

LEFT REAR PASSENGER

POSITION: SID, SERIAL NO. 137

The pretest SID calibration data are shown in this section.

SID IMPACT CALIBRATION SUMMARY SHEET

S.I.D. I.D. No.: 136

| TEST PARAMETER                | REQUIREMENT | VELOCITY    | PRETEST CAL. |
|-------------------------------|-------------|-------------|--------------|
| THORAX IMPACT TEST:           |             | 14.1 ft/sec |              |
| A. Upper Rib Accel. Primary   | 37 - 46 g's |             | 43.9 g's     |
| Secondary                     | 37 - 46 g's |             | 44.2 g's     |
| B. Lower Rib Accel. Primary   | 37 - 46 g's |             | 42.0 g's     |
| Secondary                     | 37 - 46 g's |             | 42.9 g's     |
| C. Lower Spine Accel. Primary | 15 - 22 g's |             | 21.7 g's     |
| Secondary                     | 15 - 22 g's |             | 21.9 g's     |
| PELVIC IMPACT TEST:           |             | 14.0 ft/sec |              |
| Pelvic Accel.                 | 40 - 60 g's |             | 49.9 g's     |

SID IMPACT CALIBRATION SUMMARY SHEET

S.I.D. I.D. No.: 137

| TEST PARAMETER                | REQUIREMENT | VELOCITY    | PRETEST CAL. |
|-------------------------------|-------------|-------------|--------------|
| THORAX IMPACT TEST:           |             | 14.1 ft/sec |              |
| A. Upper Rib Accel. Primary   | 37 - 46 g's |             | 44.7 g's     |
| Secondary                     | 37 - 46 g's |             | 45.7 g's     |
| B. Lower Rib Accel. Primary   | 37 - 46 g's |             | 41.8 g's     |
| Secondary                     | 37 - 46 g's |             | 43.1 g's     |
| C. Lower Spine Accel. Primary | 15 - 22 g's |             | 21.6 g's     |
| Secondary                     | 15 - 22 g's |             | 21.8 g's     |
| PELVIC IMPACT TEST:           |             | 13.9 ft/sec |              |
| Pelvic Accel.                 | 40 - 60 g's |             | 42.9 g's     |