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OFFICE OF MARKET INCENTIVES
SIDE IMPACT PROTECTION STUDY
PASSENGER CARS

1992 FORD CROWN VICTORIA
4-DOOR SEDAN

NHTSA NUMBER: MN0207

CALSPAN TEST NUMBER: 8017-1

CALSPAN CORPORATION
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FINAL REPORT

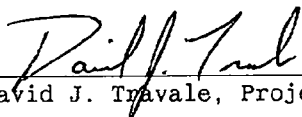
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| 15. Supplementary Notes | | | | | | | | | | | | | | | | | | | | | |
| 16. Abstract A 30/15 mph 90° Impact (Moving Deformable Barrier) Test was conducted on the subject 1992 Ford Crown Victoria 4-Door Sedan in accordance with the specifications of the Office of Market Incentives Test Procedure. The test was conducted at the Calspan Corporation Advanced Technology Center Crash Test Facility in Buffalo, New York, on April 29, 1992. The impact velocity of the Moving Deformable Barrier (MDB) was 33.2 mph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 56°F. The target vehicle post-test maximum crush was 12.4 inches at level 2. The test or target vehicle's performance is given below: <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Driver SID</u></th> <th style="width: 25%; text-align: center;"><u>Left Rear SID</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration</td> <td style="text-align: center;">38.7 g's</td> <td>Data channels</td> </tr> <tr> <td>Left Lower Rib Acceleration</td> <td style="text-align: center;">41.7 g's</td> <td>saturated</td> </tr> <tr> <td>Lower Spine Acceleration</td> <td style="text-align: center;">40.0 g's</td> <td>after</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">40.9 g's</td> <td>approximately</td> </tr> <tr> <td>Pelvis Acceleration</td> <td style="text-align: center;">56.4 g's</td> <td>18 msec.</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during side impact event. | | | | | <u>Driver SID</u> | <u>Left Rear SID</u> | Left Upper Rib Acceleration | 38.7 g's | Data channels | Left Lower Rib Acceleration | 41.7 g's | saturated | Lower Spine Acceleration | 40.0 g's | after | Thoracic Trauma Index (TTI) | 40.9 g's | approximately | Pelvis Acceleration | 56.4 g's | 18 msec. |
| | <u>Driver SID</u> | <u>Left Rear SID</u> | | | | | | | | | | | | | | | | | | | |
| Left Upper Rib Acceleration | 38.7 g's | Data channels | | | | | | | | | | | | | | | | | | | |
| Left Lower Rib Acceleration | 41.7 g's | saturated | | | | | | | | | | | | | | | | | | | |
| Lower Spine Acceleration | 40.0 g's | after | | | | | | | | | | | | | | | | | | | |
| Thoracic Trauma Index (TTI) | 40.9 g's | approximately | | | | | | | | | | | | | | | | | | | |
| Pelvis Acceleration | 56.4 g's | 18 msec. | | | | | | | | | | | | | | | | | | | |
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Section 1

PURPOSE AND TEST PROCEDURE

This side impact test is part of the Composite FY92 Side Impact Protection Study Program sponsored by the National Highway Traffic Safety Administration (NHTSA) through the Research and Special Programs Administration, Volpe National Transportation Systems Center under Contract No. DTRS57-90-C-00104. The purpose of this test was to evaluate side impact protection in a 1992 Ford Crown Victoria.

The side impact test was conducted in accordance with the Office of Market Incentive (OMI) Laboratory Indicant Draft Test Procedure.

Section 2

SUMMARY OF SIDE IMPACT TEST

A stationary 1992 Ford Crown Victoria 4-Door Sedan was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 33.2 mph on April 29, 1992. The orientation angle of the striking vehicle was 90° counterclockwise with respect to the longitudinal axis of the struck vehicle. Pre- and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SIDs) are shown in Appendix A.

Two restrained Side Impact Dummies (SIDs) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions according to instructions specified in the OMI Side Impact Protection Laboratory Draft Test Procedure which is dated December 1991. The side impact event was documented by ten high speed cameras. Camera locations and other pertinent camera information can be found in this report.

The SIDs were instrumented with the following accelerometers.

1. Left Upper Rib (LUR) uniaxial accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial accelerometer (Y-direction)
3. Lower Thoracic Spine (T₁₂) uniaxial accelerometer (Y-direction)
4. Head assembly triaxial accelerometer (X,Y,Z-directions)
5. Pelvic (PEV) section uniaxial accelerometer (Y-direction)

A summary of the side impact dummy (SID) configuration and performance verification test data can be found in Appendix C.

A total of 49 channels of data were recorded. Appendix B contains the vehicle and dummy response data traces. The left rear passenger SID transducers and six vehicle accelerometers (rear floor triaxial, left rear sill Y, left front sill Y, and the center rear floor Y) contained valid data only up to 18 milliseconds after impact. All affected data plots were removed from this report.

The driver's HIC was 43 and a Thoracic Trauma Index (TTI) of 41 g's. Maximum pelvic Y acceleration was 56.

Section 3

SUMMARY OF TEST RESULTS

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1992 Ford Crown Victoria 4-Door Sedan
 Vehicle NHTSA No.: MNO207 VIN: 2FACP73W3NX210155
 Vehicle Body Color: Tan Month & Year of Manufacture: -
 Engine Data: 8 cylinders; - CID; 4.6 Liters; - cc
 Placement Longitudinal; or Lateral
 Transmission: 4 speed; Manual; Automatic; Overdrive
 Final Drive: Rear Wheel Drive; Front Wheel Drive; Four Wheel Drive
 Odometer Reading 9.0 miles
 Options: A/C; Power Steering.; Pwr. Brakes; Pwr. Windows

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 30 psi FRONT
34 psi REAR
 Recommended Tire Size: P215/70R15
 Tires on Test Vehicle: P215/70R15; Manufacturer: Michelin

Vehicle Capacity Data:

Number of Occupants: 3 Front; 3 Rear; - 3rd Seat 6 Total
 Type of Front Seats: Bucket; Bench; Split Bench
 Type of Front Seat Back: Fixed; Adjustable with Lever
 Vehicle Maximum Capacity Loading = 1100 lbs. (A)
 No. of Occupants x 150 lbs. = 900 lbs. (B)
 Cargo Capacity (A-B) = 200 lbs.

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front = 1090 lbs. Right Rear = 870 lbs.
 Left Front = 1100 lbs. Left Rear = 870 lbs.
 TOTAL FRONT = 2190 lbs. TOTAL REAR = 1740 lbs.
 % of Total Vehicle Weight = 55.7 %; % of Total Weight = 44.3 %
 TOTAL WEIGHT = 3930 lbs.

Table 2

TEST VEHICLE DATA

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids = 3930 lbs.
Maximum Cargo Carrying Capacity of Test Vehicle = 200 lbs.
Weight of 2 Side Impact Dummies (2 x 168 lbs.) = 336 lbs.
TEST VEHICLE TARGET WEIGHT: = 4460 lbs.

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front = 1080 lbs. Right Rear = 1100 lbs.
Left Front = 1180 lbs. Left Rear = 1100 lbs.
TOTAL FRONT = 2260 lbs. TOTAL REAR = 2200 lbs.
% of Total Weight = 50.7 % % of Total Weight = 49.3 %
TOTAL TEST WEIGHT = 4460 lbs.

TEST VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED:

right front 28.5 left front 28.6 right rear 29.0 left rear 29.2

READY FOR TEST:

right front 28.5 left front 28.5 right rear 27.6 left rear 27.5

Test Vehicle Wheelbase: 114.5 inches

C.G. = 56.5 inches rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 207.6 inches

Left Side = 207.7 inches

Centerline = 212.0 inches

Figure 1
PRE-TEST CONDITIONS

VEHICLE IDENTIFICATION:

Vehicle: 1992 Ford Crown Victoria 4-Door Sedan

NHTSA No. MNO207

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

Total Length of Adjustment Travel: 9.1 inches

Total Number of Adjustment Positions or Detents: 19

FRONT SEAT BACK ADJUSTMENT POSITION: 1 latch position rearward of full upright

Seat Back Torso Angle = 23 degrees

SECOND POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: not adjustable inches

Seat Back Adjustment Position: not adjustable

ADJUSTABLE STEERING COLUMN POSITION:

Steering column was placed in mid-position

WINDOW POSITIONS: Left Front closed Left Rear closed

Right Front open Right Rear open

Note: Windows will be in closed position on struck side
of test vehicle and in open position on opposite side.

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

14 gallons

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

Wheelbase: = 114.5 inches

Impact Point is 20.3 inches rearward of front axle centerline
(which is 37 inches forward of the wheelbase midpoint)

Table 3

CRASH TEST SUMMARY FOR TEST VEHICLE

VEHICLE IDENTIFICATION:

Vehicle Year/Make/Model: 1992 Ford Crown Victoria

Body Style: 4-Door Sedan VIN: 2FACP73W3NX210155

NHTSA No.: MN0207 Test Date: April 29, 1992

Overall Length = 212.0 inches; Overall Width = 77.8 inches

TEST WEIGHT:

| | | | | | | | |
|-------------|---|-------------|------|------------|---|-------------|------|
| Left Front | = | <u>1180</u> | lbs. | Left Rear | = | <u>1100</u> | lbs. |
| Right Front | = | <u>1080</u> | lbs. | Right Rear | = | <u>1100</u> | lbs. |
| TOTAL FRONT | = | <u>2260</u> | lbs. | TOTAL REAR | = | <u>2200</u> | lbs. |

TOTAL VEHICLE WEIGHT 4460 lbs.

Wheelbase = 114.5 inches

Longitudinal C.G. from Center of Front Axle = 56.5 inches

Impact Angle with Respect to Impactor = 90 degrees

MAXIMUM EXTERIOR STATIC CRUSH:

| | | | | | |
|--------------|-------------|-------------------|---|-------------|--------|
| 1. LEVEL 1 (| <u>12.6</u> | in. above ground) | = | <u>9.0</u> | inches |
| 2. LEVEL 2 (| <u>22.4</u> | in. above ground) | = | <u>12.4</u> | inches |
| 3. LEVEL 3 (| <u>25.4</u> | in. above ground) | = | <u>12.2</u> | inches |
| 4. LEVEL 4 (| <u>38.4</u> | in. above ground) | = | <u>8.7</u> | inches |
| 5. LEVEL 5 (| <u>53.3</u> | in. above ground) | = | <u>3.4</u> | inches |

Maximum Post-Test Intrusion = 12.4 inches

OCCUPANTS:

Front Passenger

Rear Passenger

| | | |
|-----------------|---------------------------------|---------------------------------|
| Type of Dummy | <u>SID</u> | <u>SID</u> |
| Restraints Used | <u>3-Point Manual Seat Belt</u> | <u>3-Point Manual Seat Belt</u> |

INSTRUMENTATION:

| | | |
|----------------------------------|----------|-------------|
| Number of Vehicle Data Channels: | = | <u>49</u> |
| Number of Cameras: | Onboard | = <u>3</u> |
| | Offboard | = <u>7</u> |
| | TOTAL | = <u>10</u> |

Table 4

CRASH TEST SUMMARY FOR SIDE IMPACTOR

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

| | | | |
|---|---|--------------|--------|
| Overall Width of Framework Carriage | = | <u>49.25</u> | inches |
| Overall Length of MDB (incl. honeycomb impact face) | = | <u>162</u> | inches |
| Wheelbase of Framework Carriage | = | <u>102</u> | inches |
| Tread of Framework Carriage (Front & Rear) | = | <u>74</u> | inches |
| C.G. Location Rearward of Front Axle | = | <u>39.6</u> | inches |

MDB WEIGHT:

| | | | | | | | |
|------------------|---|-------------|------|------------|---|-------------|------|
| Left Front | = | <u>850</u> | lbs. | Left Rear | = | <u>640</u> | lbs. |
| Right Front | = | <u>960</u> | lbs. | Right Rear | = | <u>510</u> | lbs. |
| TOTAL FRONT | = | <u>1810</u> | lbs. | TOTAL REAR | = | <u>1150</u> | lbs. |
| TOTAL MDB WEIGHT | = | <u>2960</u> | lbs. | | | | |

Impact Angle (MDB C/L to Target Vehicle C/L) = 90° degrees

Impact Speed = 33.2 mph

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

| | | | |
|--------------------------------|---|------------|--------|
| 1. Row A at Bumper Level | = | <u>5.1</u> | inches |
| 2. Row B at Mid-Stack Level | = | <u>3.0</u> | inches |
| 3. Row C at Top of Stack Level | = | <u>3.6</u> | inches |

INSTRUMENTATION:

Number of MDB Data Channels = 5

Table 5

POST-TEST OBSERVATIONS

TEST VEHICLE: 1992 Ford Crown Victoria 4-Door Sedan NHTSA No. MNO207

VISIBLE DUMMY CONTACT POINTS:

| | <u>LEFT FRONT SID</u> | <u>LEFT REAR SID</u> |
|------------|---------------------------------------|--------------------------------|
| Head | <u>No contact</u> | <u>Left C-Pillar</u> |
| Chest | <u>Left front door and arm rest</u> | <u>Left rear door</u> |
| Abdomen | <u>Left front door below arm rest</u> | <u>Left rear door and seat</u> |
| Left Knee | <u>Left front door</u> | <u>Left rear door</u> |
| Right Knee | <u>No contact</u> | <u>No contact</u> |

DOOR OPENING:

| | <u>LEFT SIDE</u> | <u>RIGHT SIDE</u> |
|-------|----------------------------|------------------------|
| Front | <u>Closed-not operable</u> | <u>Closed-operable</u> |
| Rear | <u>Closed-not operable</u> | <u>Closed-operable</u> |

MDB DISTANCE FROM TARGET IMPACT POINT: 1.0" rearward of target

ARM REST LOCATIONS:

Front: -

Rear: -

SEAT MOVEMENT:

None

GLAZING DAMAGE:

Left side door windows and left side of windshield

PILLAR FAILURE:

None

SILL SEPARATION:

None

OTHER NOTABLE IMPACT EFFECTS:

D-ring on left side B-pillar was rearward of driver's head.

Section 4

OCCUPANT AND VEHICLE INFORMATION

Table 6

SIDE IMPACT DUMMY (SID) TEST DATA SUMMARY

Vehicle: 1992 Ford Crown Victoria 4-Door Sedan Test Date: April 29, 1992

| | Front Dummy ID #171 | | | | Rear Dummy ID #186 | | | |
|------------------------------|---------------------|-------------|--------------|-------------|--|-------------|--------------|-------------|
| | Pos. Direct. | | Neg. Direct. | | Pos. Direct. | | Neg. Direct. | |
| | Max (g) | Time (msec) | Max (g) | Time (msec) | Max (g) | Time (msec) | Max (g) | Time (msec) |
| HEAD ACCELERATIONS: | | | | | | | | |
| Longitudinal X | 8.3 | 248.2 | -11.1 | 87.0 | | | | |
| Lateral Y | 30.8 | 54.5 | -5.7 | 175.7 | | | | |
| Vertical Z | 18.3 | 66.0 | -2.4 | 248.6 | | | | |
| RESULTANT R | 33.9 | - | - | - | | | | |
| HIC | | | | | | | | |
| RIB ACCELERATIONS: | | | | | | | | |
| Upper Rib Lateral . . . Y | 38.7 | 41.9 | -5.6 | 83.8 | Rear Dummy Data valid only to 18 msec. | | | |
| Upper Rib Lateral . . Y(R) | 42.6 | 41.9 | -5.7 | 104.4 | | | | |
| Lower Rib Lateral . . . Y | 41.7 | 41.9 | -7.8 | 103.8 | | | | |
| Lower Rib Lateral . . Y(R) | 45.4 | 41.3 | -9.1 | 103.1 | | | | |
| SPINE ACCELERATIONS: | | | | | | | | |
| Lower Lateral Y | 40.0 | 35.6 | -10.2 | 105.6 | | | | |
| Lower Lateral Y(R) | 40.6 | 35.6 | -10.1 | 106.3 | | | | |
| PELVIC ACCELERATIONS: | | | | | | | | |
| Lateral Y | 11.4 | 103.8 | -56.4 | 39.4 | | | | |
| Lateral Y(R) | 58.4 | 38.1 | -19.8 | 110.0 | | | | |
| RIB DEFLECTION | | | | | | | | |
| | 1.7 | 72.0 | 0.0 | 183.7 | | | | |

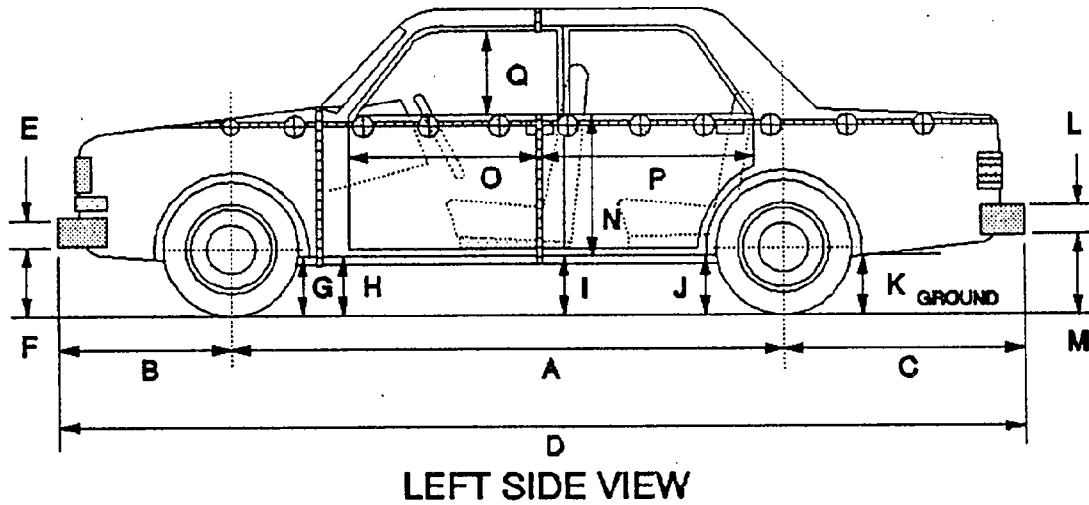
REFERENCE: Positive Direction - Longitudinal (X) = forward
 Lateral (Y) = to right
 Vertical (Z) = up

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

Note: Y(R) denotes redundant Y direction accelerometer.

Figure 2

PRE- AND POST-TEST MEASUREMENTS

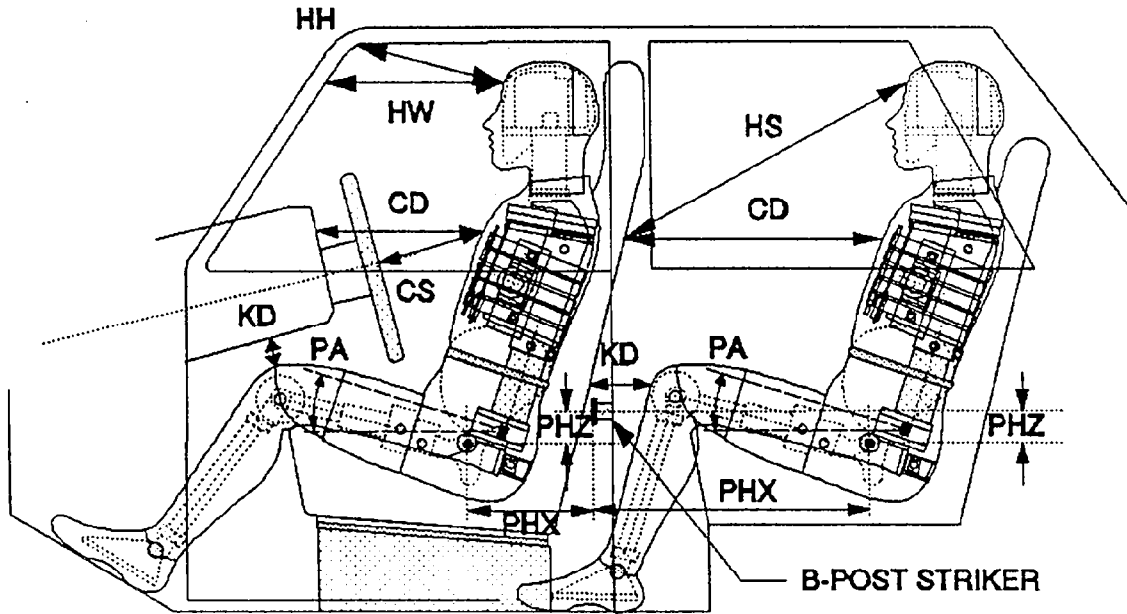


NOTE: All dimensions are in inches

| | PRE-TEST | POST-TEST | Δ CHANGE |
|---|----------|-----------|----------|
| A | 114.5 | 115.5 | 1.0 |
| B | 42.4 | 41.6 | 0.8 |
| C | 55.3 | 53.0 | 2.3 |
| D | 212.0 | 211.3 | 0.7 |
| E | 8.8 | 8.9 | -0.1 |
| F | 13.5 | 9.9 | 3.6 |
| G | 8.8 | 7.6 | 1.2 |
| H | 8.8 | 9.3 | -0.5 |
| I | 8.9 | 9.8 | -0.9 |
| J | 9.0 | 7.7 | 1.3 |
| K | 12.5 | 11.7 | 0.8 |
| L | 11.2 | 11.5 | -0.3 |
| M | 13.9 | 13.3 | 0.6 |
| N | 29.0 | 26.0 | 3.0 |
| O | 28.9 | 27.4 | 1.5 |
| P | 53.4 | 50.4 | 3.0 |
| Q | 28.8 | 17.2 | 11.6 |

Figure 3

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS



LEFT SIDE VIEW

| | H-Point from Target | |
|---------------------|---------------------|---------------|
| | Vertical | Horizontal |
| Driver | 0.25" above | 0.3" forward |
| Left Rear Passenger | 0.0" | 0.2" rearward |

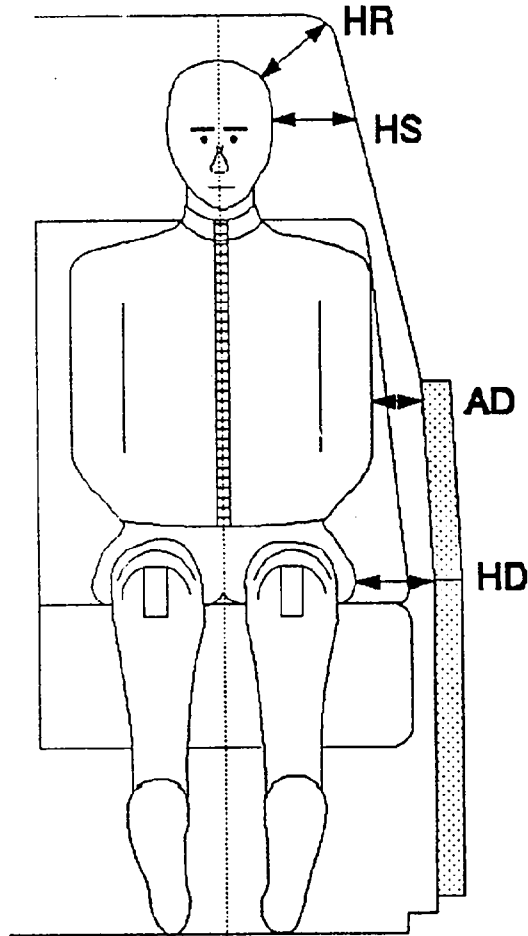
NOTE: All dimensions are in inches

| | DRIVER ID # <u>171</u> | LEFT REAR PASSENGER ID # <u>186</u> |
|-----|---------------------------|--|
| HH | 16.9 | - |
| HW | 23.8 | - |
| HS | - | 27.9 |
| CD | 23.0 | 19.6 |
| CS | 13.8 | - |
| KDL | 2.6 | 6.7 |
| KDR | 2.7 | 6.8 |
| PA | 22.5 | 23.0 |
| PHX | 8.1 | 8.1 |
| PHZ | 4.1 | 11.4 |

Note: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

Figure 4

SIDE IMPACT DUMMY (SID) LATERAL CLEARANCE DIMENSIONS

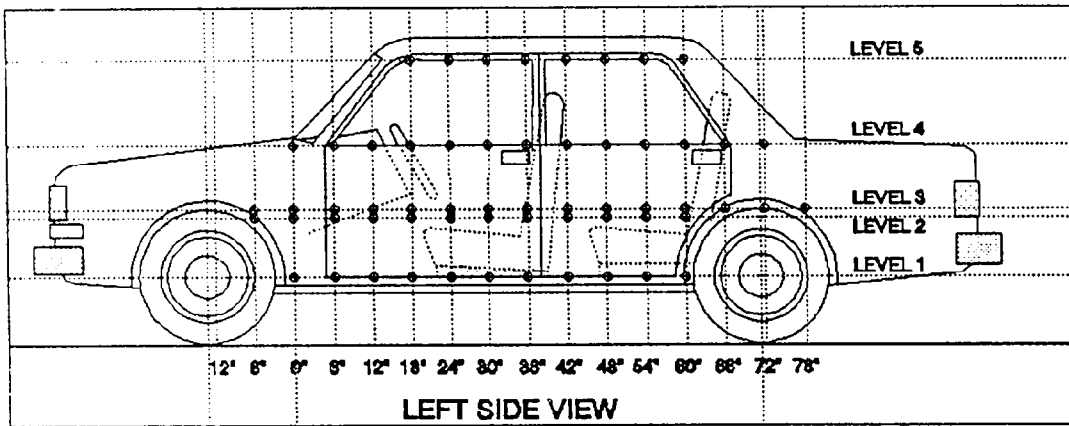


NOTE: All dimensions are in inches

| | DRIVER ID # <u>171</u> | LEFT REAR PASSENGER ID # <u>186</u> |
|----|---------------------------|--|
| HR | 6.5 | 5.7 |
| HS | 10.9 | 7.3 |
| AD | 4.6 | 4.5 |
| HD | 7.5 | 7.9 |

Figure 5

VEHICLE SIDE MEASUREMENT



Measurements Along the Vertical 30" Line Shown Above:

| | <u>Pre-Test Height*</u> |
|---|-------------------------|
| Level 5 @ Window Top | = <u>53.3</u> inches |
| Level 4 @ Window Sill | = <u>38.4</u> inches |
| Level 3 @ Mid Door | = <u>25.4</u> inches |
| Level 2 @ Occupant H-Point | = <u>22.4</u> inches |
| Level 1 @ Axle Centerline Height (or Sill Top Height | = <u>12.6</u> inches |

*Above Ground Level

Table 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE* AND STATIC CRUSH DATA

Test Date: April 29, 1992

Vehicle: 1992 Ford Crown Victoria 4-Door Sedan

| Location | Height (in) | Profiles/Crush | Impact Point | | | | | | | | | | | | | | |
|--------------|-------------|----------------|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | | | 6" | 0 | 6" | 12" | 18" | 24" | 30" | 36" | 42" | 48" | 54" | 60" | 66" | 72" | |
| 1. Side Sill | | Post-Test | N/A | 12.9 | 16.2 | 17.3 | 18.0 | 18.5 | 19.3 | 19.9 | 20.4 | 21.2 | 20.9 | 21.3 | 22.0 | 19.3 | |
| | 12.6 | Pre-Test | N/A | 12.6 | 12.6 | 12.5 | 12.5 | 12.4 | 12.4 | 12.3 | 12.3 | 12.2 | 12.4 | 12.4 | 12.4 | 12.5 | |
| | | Static Crush | N/A | 0.3 | 3.6 | 4.8 | 5.5 | 6.1 | 6.9 | 7.6 | 8.1 | 9.0 | 8.5 | 8.9 | 9.6 | 6.8 | |
| 2. H-Point | | Post-Test | 11.1 | 10.9 | 16.3 | 19.3 | 20.3 | 20.0 | 20.9 | 20.4 | 21.3 | 21.4 | 22.0 | 21.9 | 22.0 | 20.6 | |
| | 22.4 | Pre-Test | 10.5 | 10.4 | 10.3 | 10.2 | 9.9 | 9.8 | 9.6 | 9.6 | 9.5 | 9.5 | 9.6 | 9.6 | 9.9 | 10.0 | |
| | | Static Crush | 0.6 | 0.5 | 6.0 | 9.1 | 10.4 | 10.2 | 11.3 | 10.8 | 11.8 | 11.9 | 12.4 | 12.3 | 12.1 | 10.6 | |
| 3. Mid-Door | | Post-Test | 11.4 | 11.3 | 14.4 | 18.8 | 18.8 | 19.0 | 19.4 | 19.9 | 20.2 | 20.5 | 21.0 | 21.8 | 21.8 | 20.5 | |
| | 25.4 | Pre-Test | 10.9 | 10.5 | 10.5 | 10.4 | 10.2 | 10.0 | 9.9 | 9.8 | 9.8 | 9.8 | 9.7 | 9.6 | 9.7 | 9.8 | |
| | | Static Crush | 0.5 | 0.8 | 3.9 | 8.4 | 8.6 | 9.0 | 9.5 | 10.1 | 10.4 | 10.7 | 11.3 | 12.2 | 12.1 | 10.7 | |
| 4. Window | | Post-Test | N/A | N/A | 16.5 | 16.5 | 16.8 | 17.5 | 18.3 | 19.3 | 20.6 | 22.0 | 22.3 | 21.9 | 21.0 | 18.5 | |
| | 38.4 | Pre-Test | N/A | N/A | 14.9 | 14.2 | 14.1 | 13.9 | 13.9 | 13.8 | 13.6 | 13.5 | 13.6 | 13.6 | 13.5 | 13.0 | |
| | | Static Crush | N/A | N/A | 1.6 | 2.3 | 2.7 | 3.6 | 4.4 | 5.5 | 7.0 | 8.5 | 8.7 | 8.3 | 7.5 | 5.5 | |
| 5. Window | | Post-Test | N/A | N/A | N/A | N/A | N/A | N/A | 21.5 | N/A | N/A | N/A | 24.8 | N/A | N/A | N/A | |
| | 53.3 | Pre-Test | N/A | N/A | N/A | N/A | N/A | N/A | 21.2 | 21.4 | 21.4 | 21.3 | 21.4 | 21.5 | 21.4 | 21.4 | |
| | | Static Crush | N/A | N/A | N/A | N/A | N/A | N/A | 0.3 | N/A | N/A | N/A | 3.4 | N/A | N/A | N/A | |

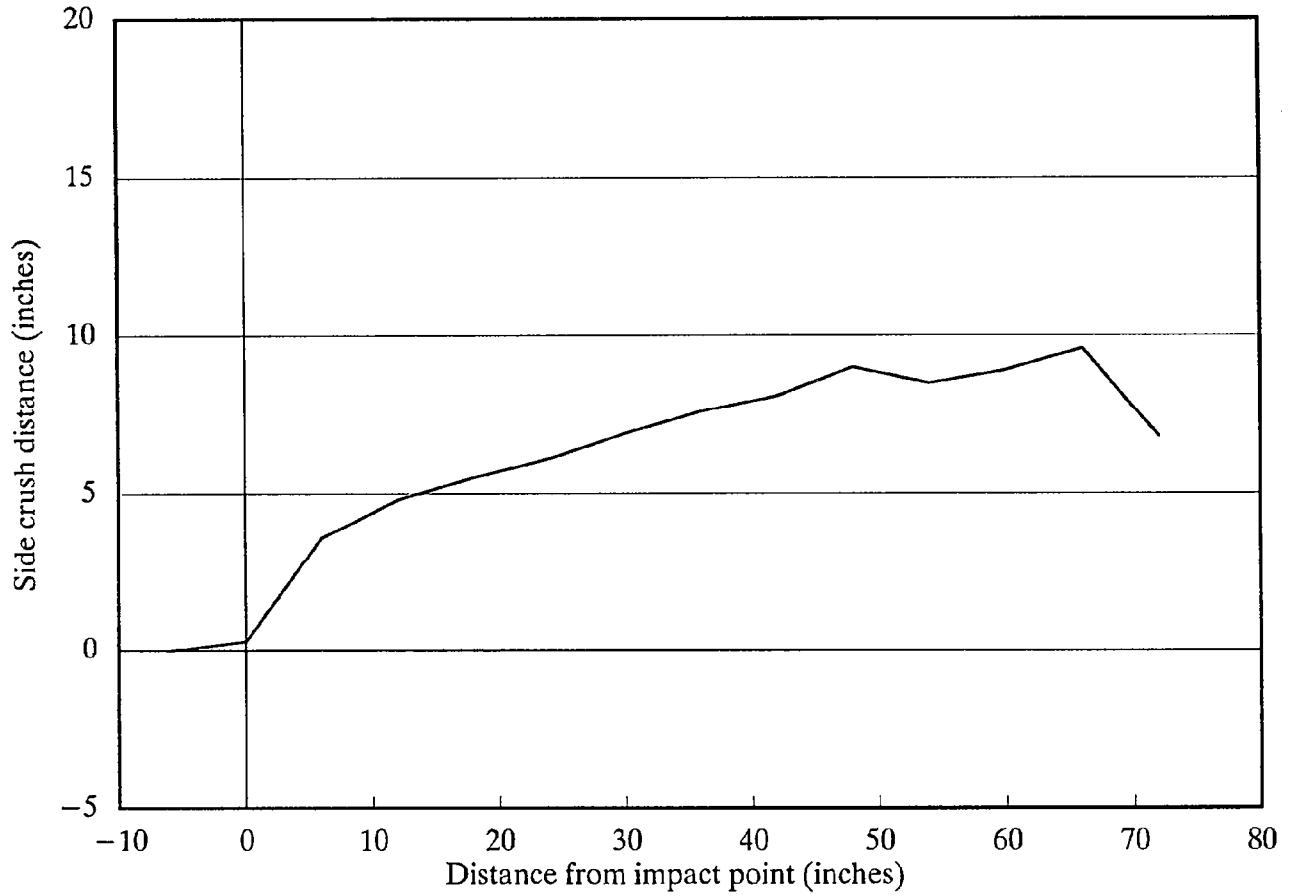
*Reference plane is parallel to and 48 inches from test vehicle longitudinal centerline
 Given Dimensions = Reference Plane to Car Body.

Figure 6

VEHICLE EXTERIOR STATIC CRUSH

12.6 inches above ground level

CRUSH PROFILE LEVEL 1



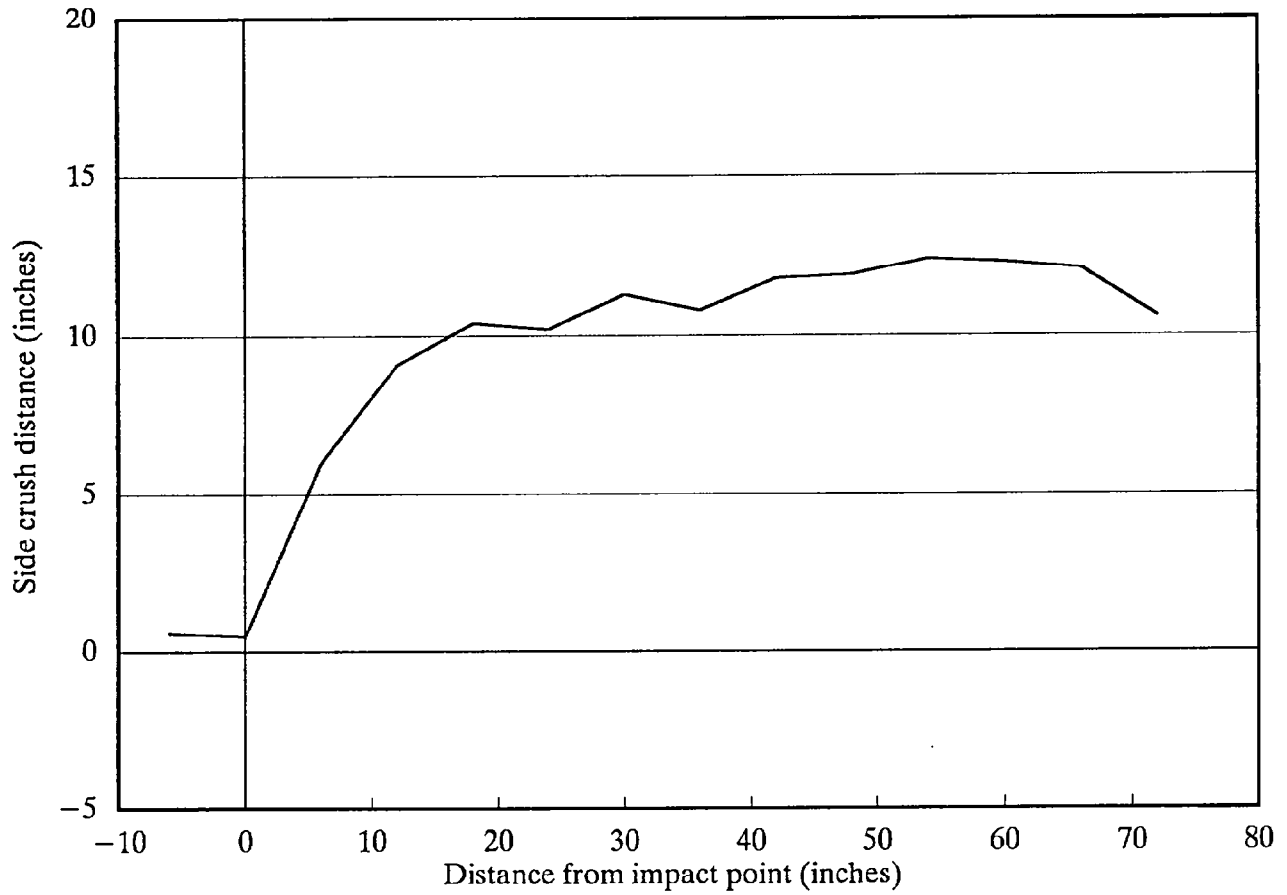
Note: All measurements in inches
Left side of vehicle only

Figure 6

VEHICLE EXTERIOR STATIC CRUSH (cont.)

22.4 inches above ground level

CRUSH PROFILE LEVEL 2



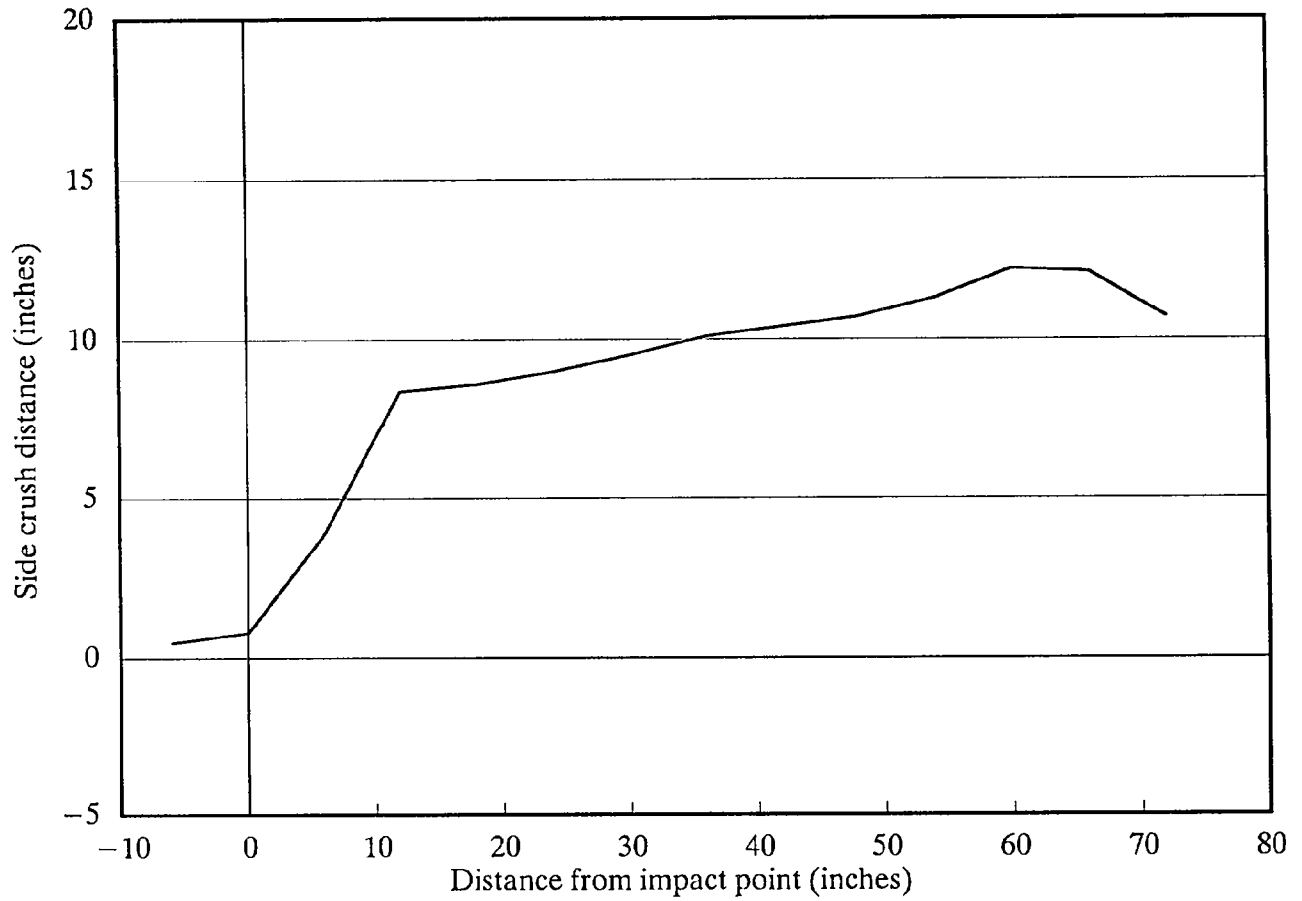
Note: All measurements in inches
Left side of vehicle only

Figure 6

VEHICLE EXTERIOR STATIC CRUSH (cont.)

25.4 inches above ground level

CRUSH PROFILE LEVEL 3



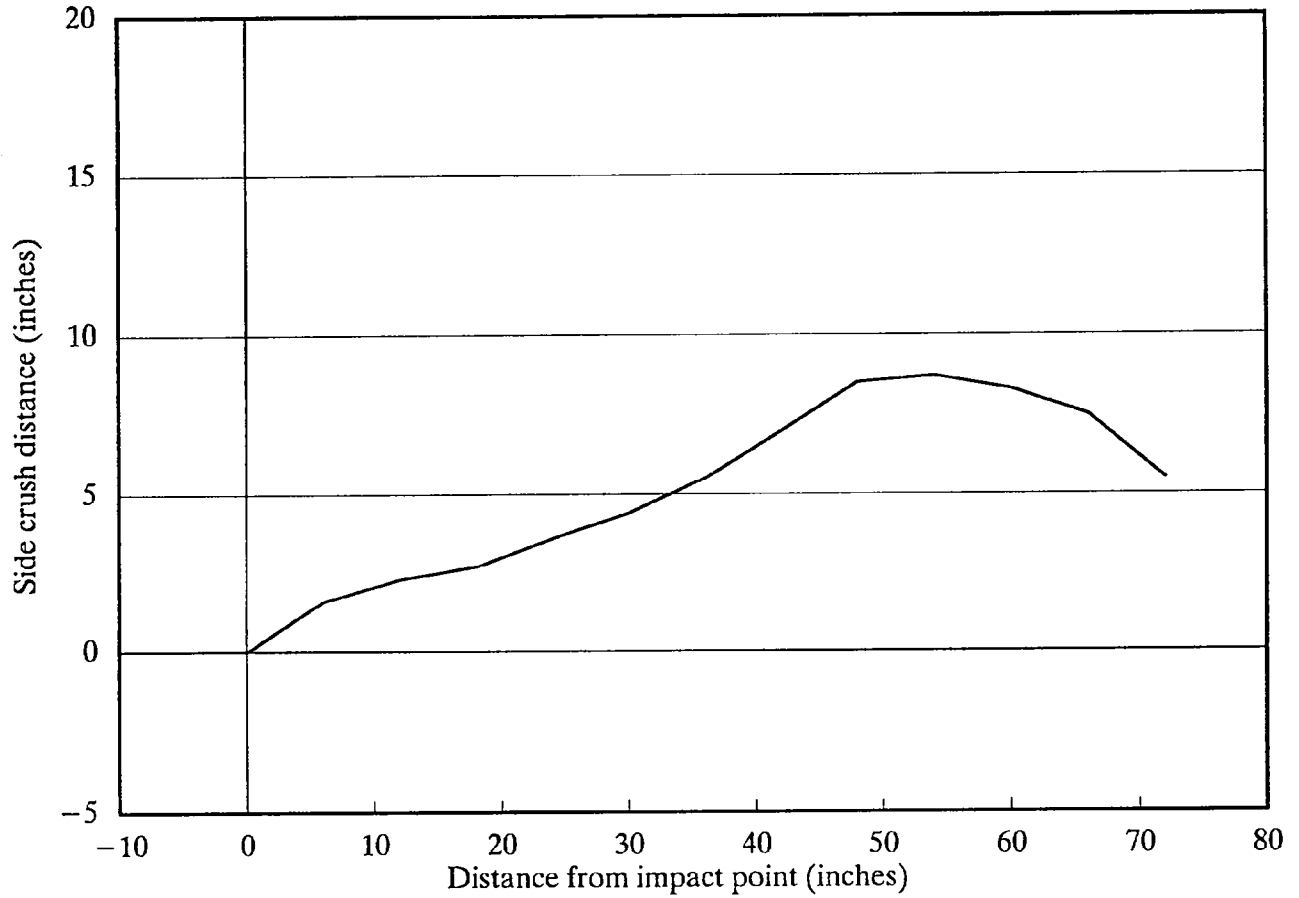
Note: All measurements in inches
Left side of vehicle only

Figure 6

VEHICLE EXTERIOR STATIC CRUSH (cont.)

38.4 inches above ground level

CRUSH PROFILE LEVEL 4



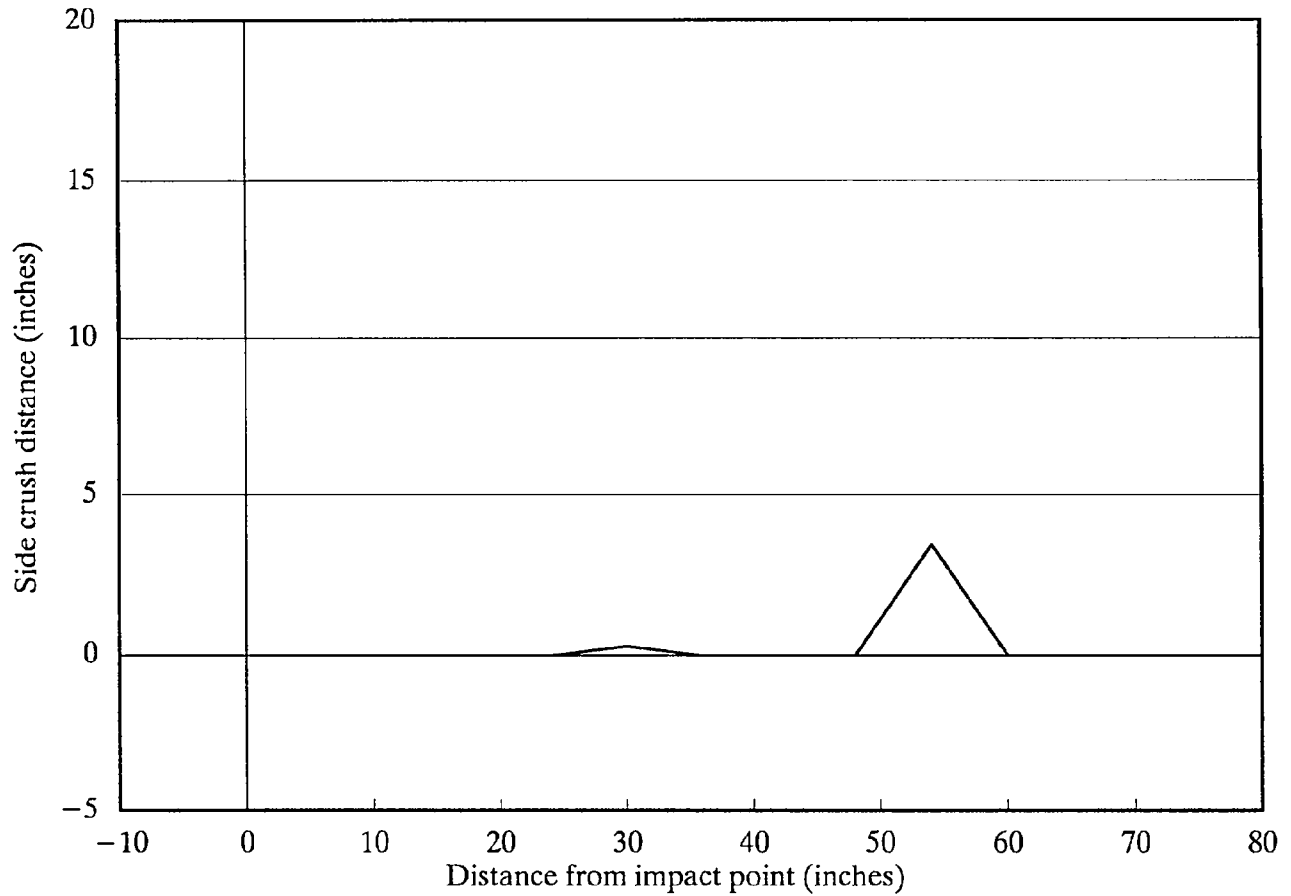
Note: All measurements in inches
Left side of vehicle only

Figure 6

VEHICLE EXTERIOR STATIC CRUSH (cont.)

53.4 inches above ground level

CRUSH PROFILE LEVEL 5



Note: All measurements in inches
Left side of vehicle only

Figure 7

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 1992 Ford Crown Victoria 4-Door Sedan NHTSA No.: MN0207

Test Date: April 29, 1992

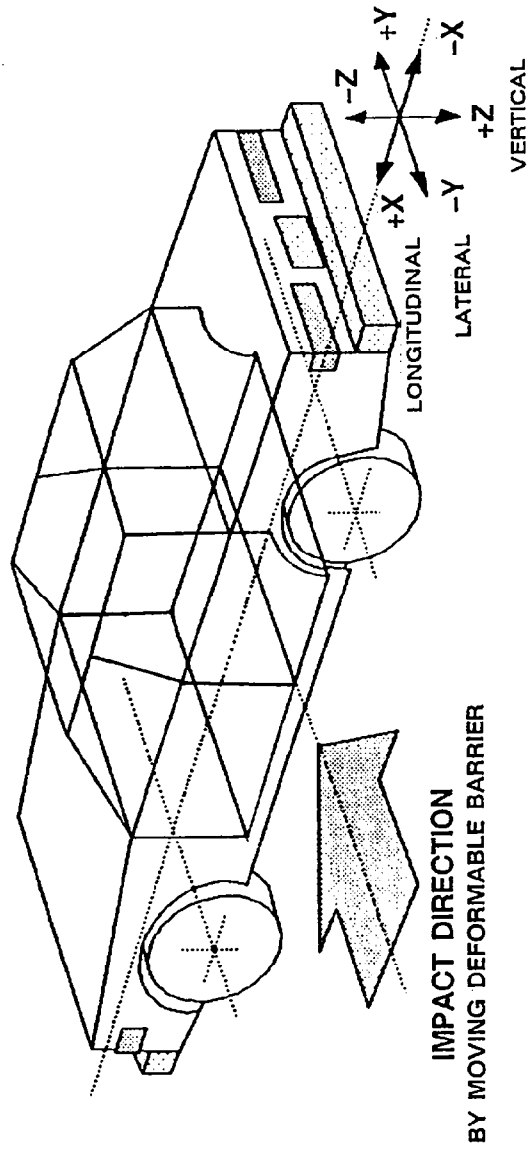


Table 8

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

(Grid as looking at MDB from front.)

Test Date: April 29, 1992 Vehicle: 1992 Ford Crown Victoria 4-Door Sedan

| Location | Height at C _L * | Distances Right of Center | | | | | | | | Distances Left of Center | | | | | | | | | |
|--------------------|----------------------------|---------------------------|------|------|------|-----|-----|-----|-----|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 32" | 28" | 24" | 20" | 16" | 12" | 8" | 4" | 0" | 4" | 8" | 12" | 16" | 20" | 24" | 28" | 32" | |
| Top of Stack Level | 32" | 0.6 | -0.6 | -0.1 | -0.1 | 0 | 0.3 | 0.4 | 0.3 | 0.3 | 0.2 | 0 | 0.2 | 0.3 | 0.4 | 0.6 | 0.9 | 1.3 | 3.6 |
| Mid-Stack Level | 22" | 0.6 | 0.3 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.8 | 0.9 | 1.2 | 1.4 | 2.3 | 3.0 |
| Bumper Level | 17" | 1.5 | 1.1 | 0.8 | 0.8 | 1.2 | 1.2 | 1.0 | 0.8 | 0.9 | 1.1 | 1.1 | 1.2 | 1.4 | 1.7 | 2.0 | 2.6 | 3.8 | 5.1 |

*Heights measured above ground level.

Table 9

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

| Accel. Time No. | Location | Coordinates (") | | | Long. (X) Pos./Neg. | | Lat. (Y) Pos./Neg. | | Vert. (Z) Pos./Neg. | | Resultant Pos./Neg. | |
|-----------------|----------------------------------|-----------------|-------|------|---------------------|--------------|--------------------|--------------|---------------------|--------------|---------------------|--------|
| | | X* | Y* | Z* | Max (g) | Time (msec) | Max (g) | Time (msec) | Max (g) | Time (msec) | Max (g) | (msec) |
| | | | | | | | | | | | | |
| 1 | Right Front Sill at Front Seat | 131.3 | 25.2 | 14.0 | 4.0 -13.0 | 37.9 25.4 | 23.6 -5.5 | 35.2 72.1 | 12.5 ** | 62.0 ** | ** | ** |
| 2 | Right Rear Sill at Rear Seat | 96.0 | 24.2 | 12.2 | 20.2 -26.4 | 34.7 20.3 | 54.9 -2.8 | 60.5 11.6 | 29.5 -39.6 | 14.0 19.8 | 55.2 | 60.5 |
| 3 | Rear Floorpan Above Axle | 51.3 | -0.8 | 28.7 | *** | *** | *** | *** | *** | *** | *** | *** |
| 4 | Left Side Sill at Rear Seat | 97.2 | -25.5 | 13.6 | *** | *** | - | - | - | - | - | - |
| 5 | Left Side Sill at Front Seat | 131.7 | -25.1 | 13.6 | *** | *** | - | - | - | - | - | - |
| 6 | Left Front Door on Centerline | 122.5 | -29.9 | 24.3 | - | - | 179.6 -101.5 | 7.7 16.0 | - | - | - | - |
| 7 | Right Rear Occupant Compartment | 96.0 | 13.0 | 9.5 | *** | *** | - | - | - | - | - | - |
| 8 | Midrear of Left Front Door | 118.0 | -30.6 | 31.9 | - | - | 127.3 -101.5 | 10.9 27.4 | - | - | - | - |
| 9 | Left Front Door Upper Centerline | 122.5 | -30.2 | 35.7 | - | - | 100.8 -52.2 | 15.4 28.8 | - | - | - | - |
| 10 | Midrear of Left Rear Door | 86.8 | -30.0 | 21.2 | - | - | 202.3 -100.1 | 11.0 17.2 | - | - | - | - |
| 11 | Left Rear Door Upper Centerline | 86.0 | -30.5 | 36.1 | - | - | 72.5 -85.1 | 12.1 34.8 | - | - | - | - |

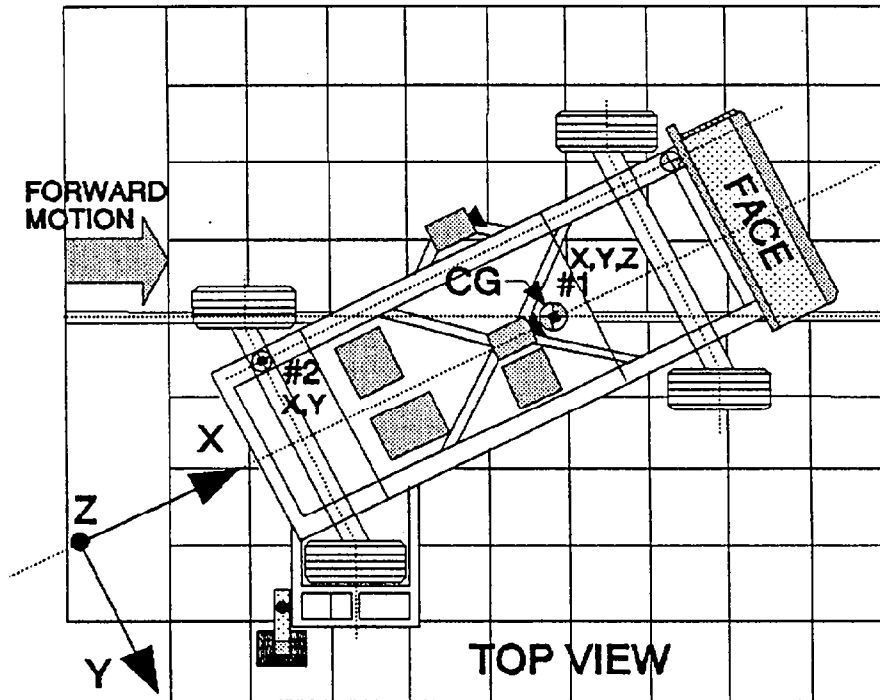
*Reference: X - Rear Bumper (+ Forward)
 Y - Vehicle Centerline (+ To right)
 Z - Ground Level (+ Up)

**Questionable data after approximately 150 msec.
 ***Data valid up to 18 msec after impact.

Figure 8

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS

Test Vehicle: 1992 Ford Crown Victoria 4-D Sedan Test Date: April 29, 1992

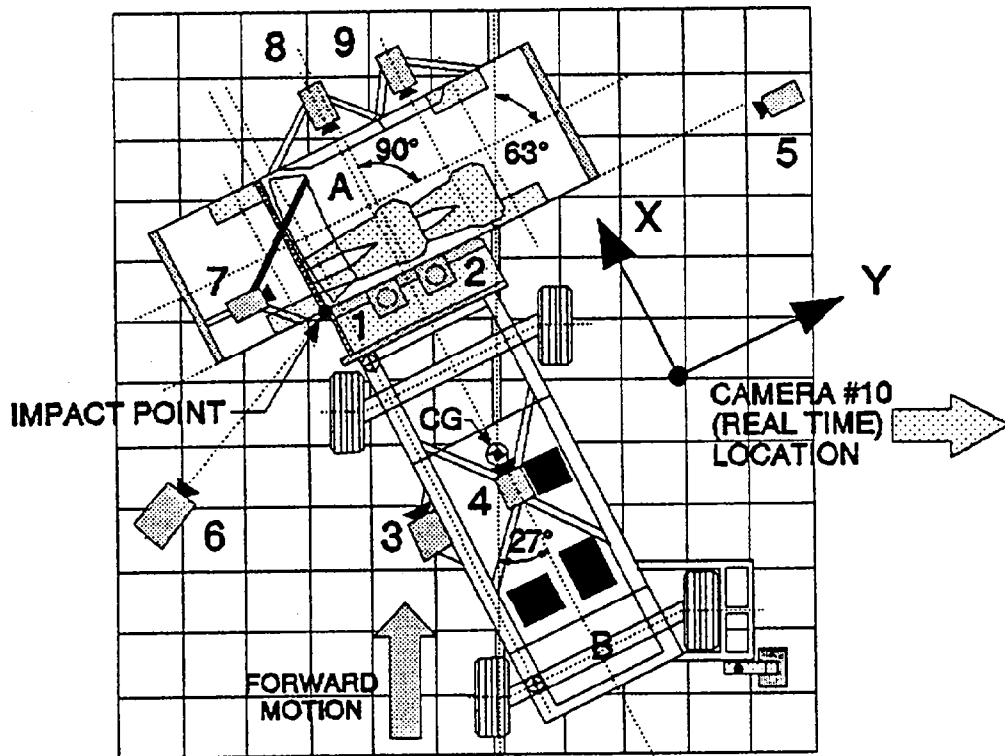


| Accel. No. | Location | Coordinates (in.) | | | Pos. Direct. | | Neg. Direct. | |
|------------|-----------------------|-------------------|-------|------|--------------|-------------|--------------|-------------|
| | | X* | Y* | Z* | Max (g) | Time (msec) | Max (g) | Time (msec) |
| 1 | MDB Center of Gravity | | | | | | | |
| | Longitudinal ... X | | | | 2.1 | 181.2 | -17.0 | 40.7 |
| | Lateral Y | 73.7 | 0.8 | 13.2 | 7.0 | 22.4 | -1.2 | 247.6 |
| | Vertical Z | | | | 14.7 | 40.4 | -18.3 | 22.4 |
| | Resultant R | | | | 25.1 | 22.2 | - | - |
| 2 | Rear Frame Member | | | | | | | |
| | Lateral X | 15.1 | -26.0 | 25.1 | 1.9 | 137.2 | -19.2 | 25.0 |
| | Vertical Y | | | | 5.3 | 25.8 | -2.4 | 83.9 |

*Reference: X = Rear Bumper (+Forward)
 Y = Vehicle Centerline (+ To Right)
 Z = Ground Level (+ Up)

Figure 9

HIGH SPEED CAMERA LOCATIONS AND DATA



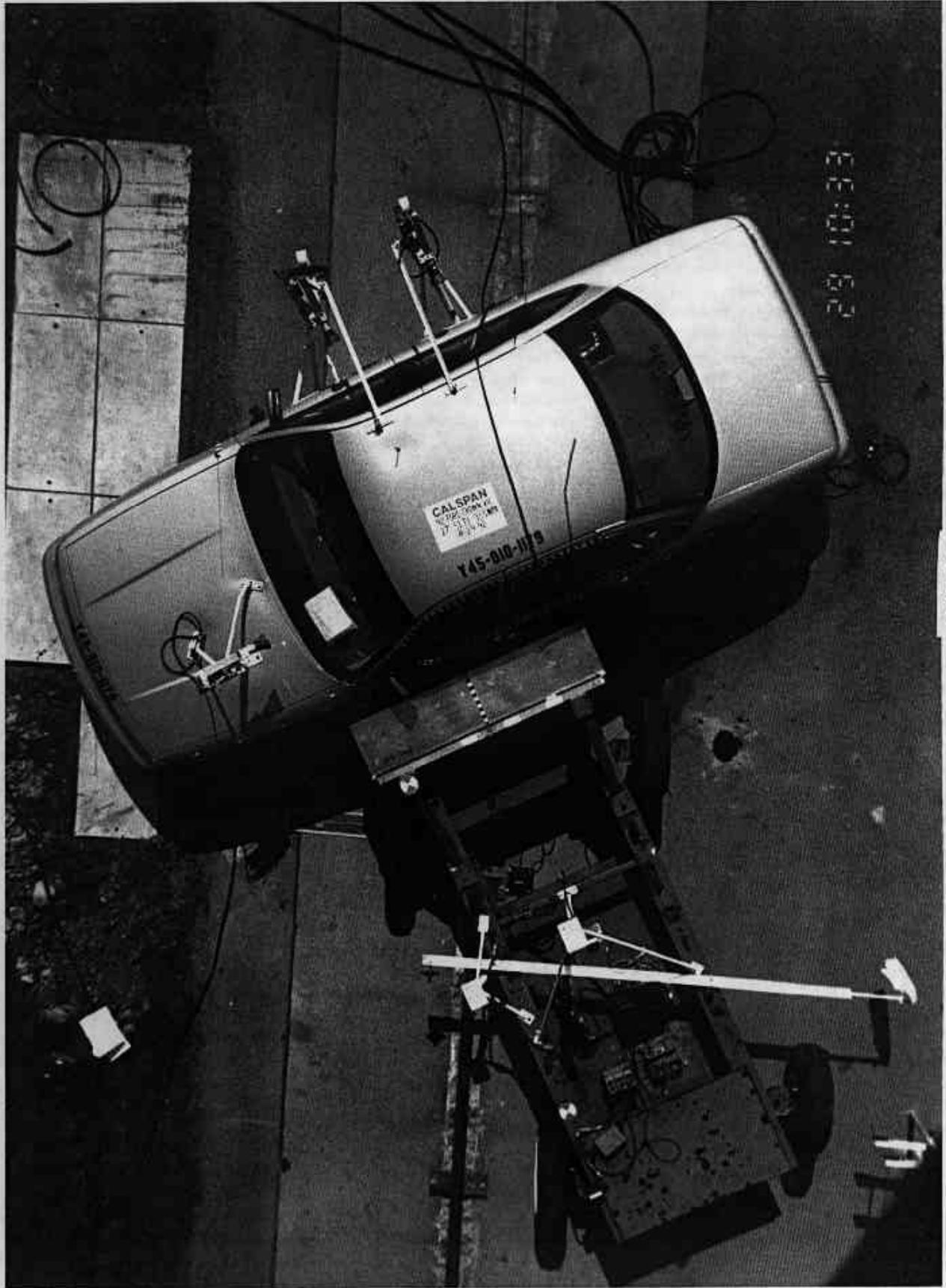
| Camera No. | View | Coordinates (mm) | | | Angle | Lens (mm) | Film Speed (fps) |
|------------|--|------------------|------|-----|-------|-----------|------------------|
| | | X* | Y* | Z* | | | |
| 1 | Overhead Overall View | 0 | 37 | 386 | -90° | 13 | 500 |
| 2 | Overhead Closeup View of Impact | 12 | 37 | 386 | -90° | 25 | 490 |
| 3 | MDB Onboard Closeup of Impact | - | - | - | - | 13 | 420 |
| 4 | MDB Onboard View of Dummy | - | - | - | - | 8 | No Timing |
| 5 | Right Side Ground Overall View | 23 | 347 | 41 | -1° | 13 | 540 |
| 6 | Left Side Ground Overall View | -132 | -350 | 40 | -2° | 25 | 570 |
| 7 | Test Vehicle Onboard Driver Front View | - | - | - | - | 8 | 500 |
| 8 | Test Vehicle Onboard Driver Side View | - | - | - | - | 8 | 600 |
| 9 | Test Vehicle Onboard Passenger Side View | - | - | - | - | 8 | 540 |
| 10 | Real Time | - | - | - | - | - | 24 |

*Reference: (from point of impact)
 +X = Forward
 +Y = To Right
 +Z = Upward

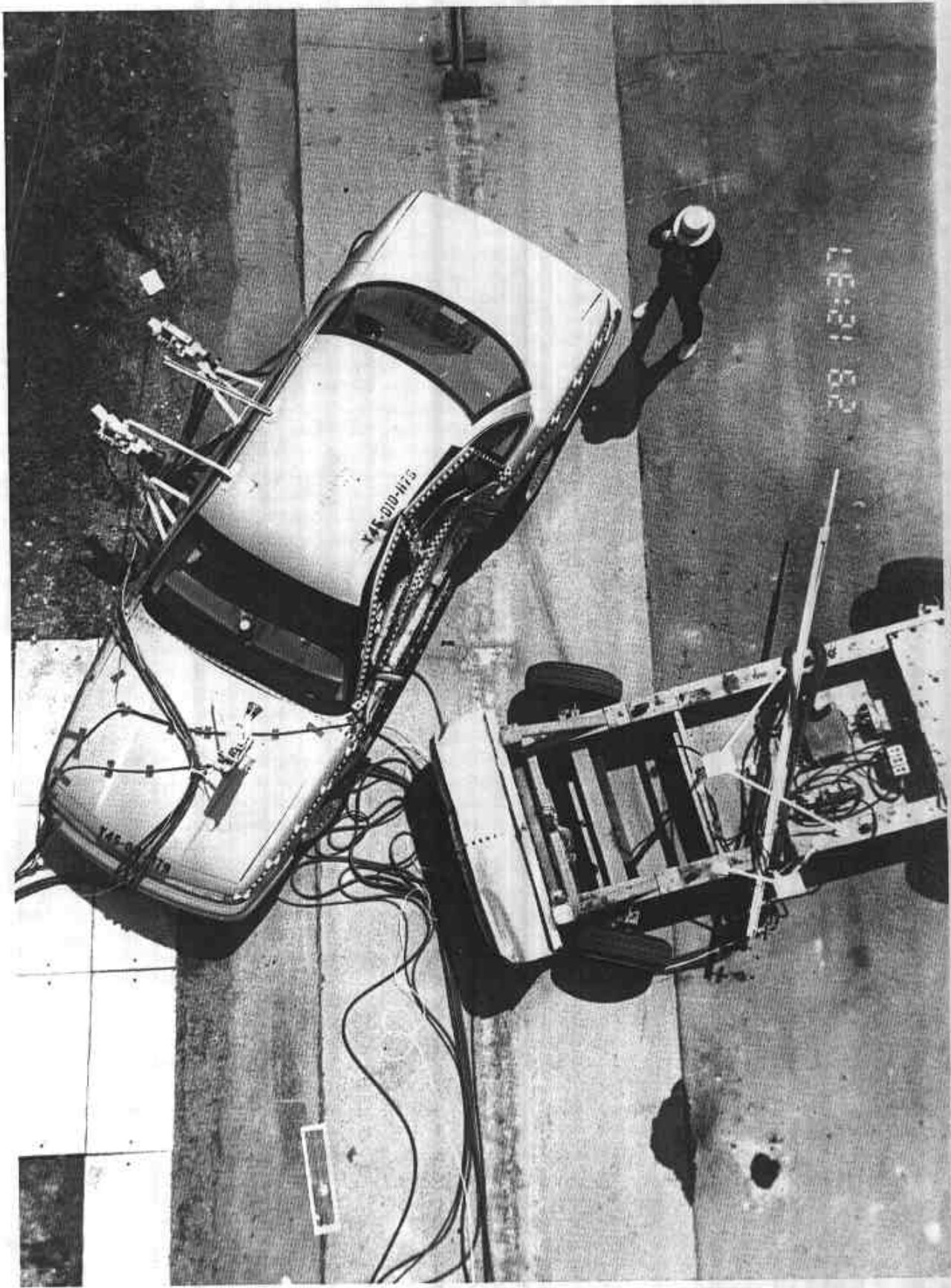
Appendix A
PHOTOGRAPHS

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NHTSA No. MN0207
Figure A-1 PRE-TEST OVERHEAD VIEW OF TEST VEHICLE



NHTSA No. MN0207

Figure A-2 POST-TEST OVERHEAD VIEW OF TEST VEHICLE



NHTSA No. MN0207

Figure A-3 PRE-TEST FRONT VIEW OF TEST VEHICLE

Figure A-4 POST-TEST FRONT VIEW OF TEST VEHICLE

(Photograph is not available)



NHTSA No. MNO207

Figure A-5 PRE-TEST REAR VIEW OF TEST VEHICLE

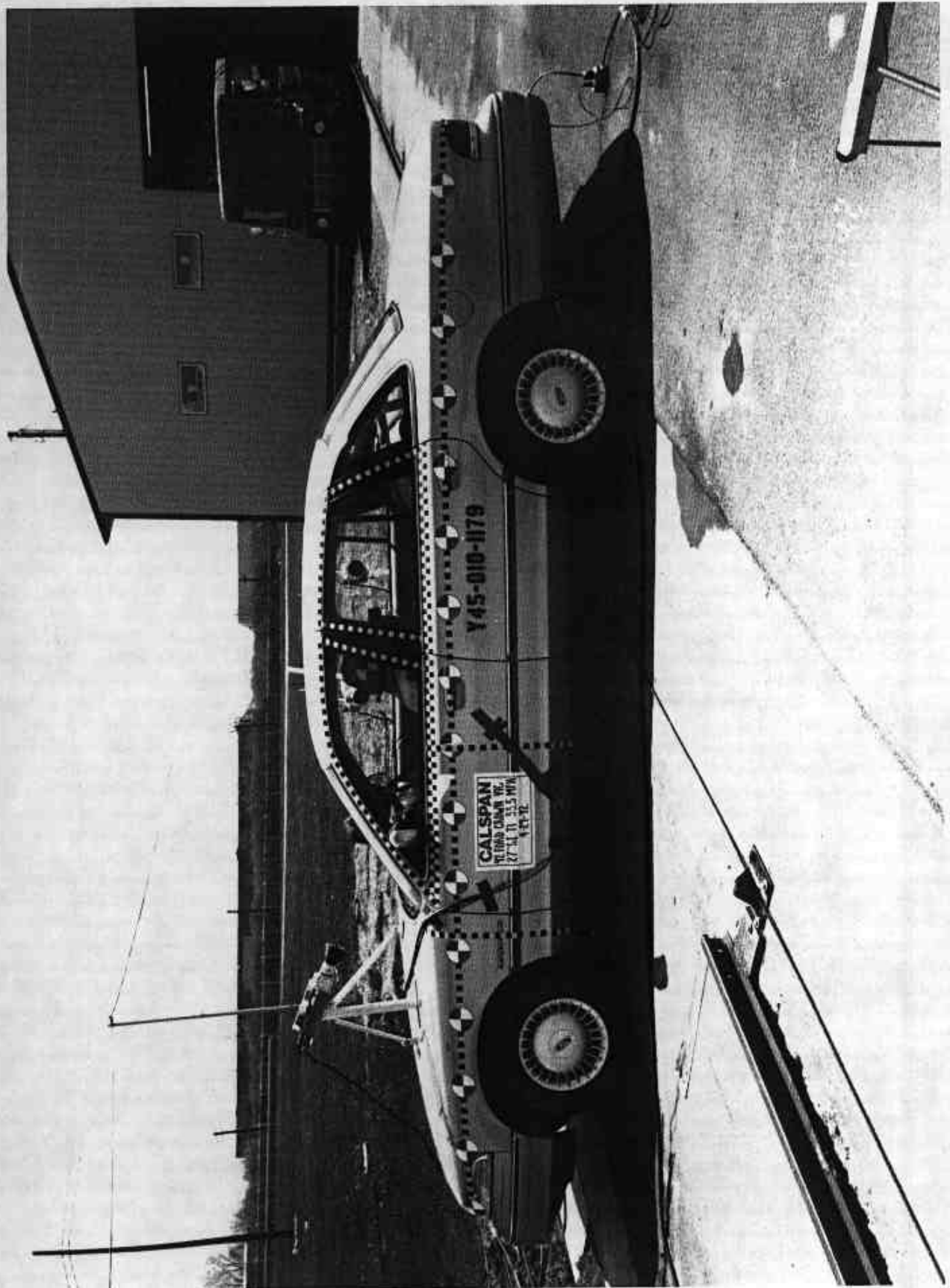


NHTSA No. MN0207

Figure A-6 POST-TEST REAR VIEW OF TEST VEHICLE

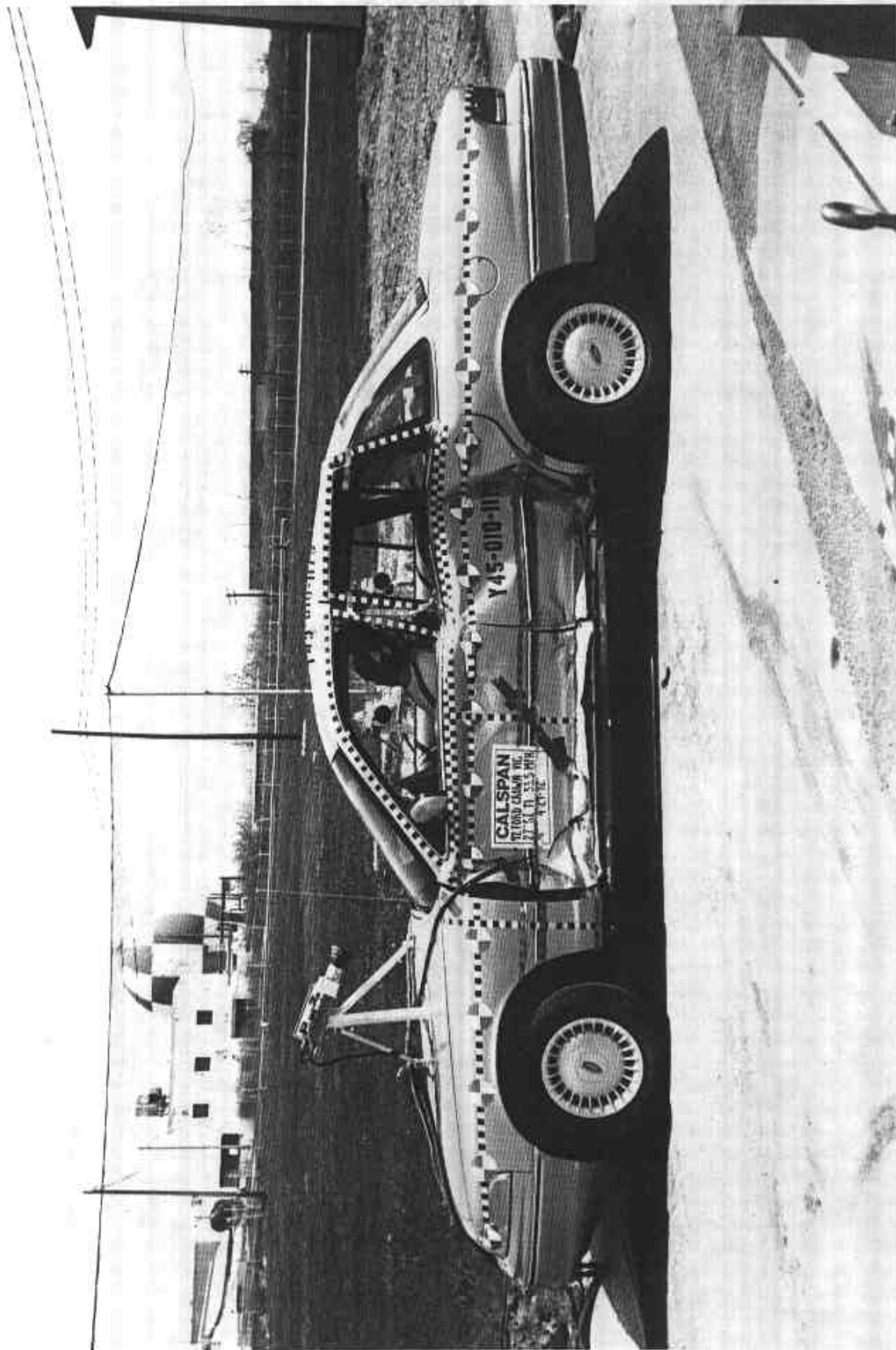
A-8

8017-1



NHTSA No. MN0207

Figure A-7 PRE-TEST LEFT SIDE VIEW OF TEST VEHICLE



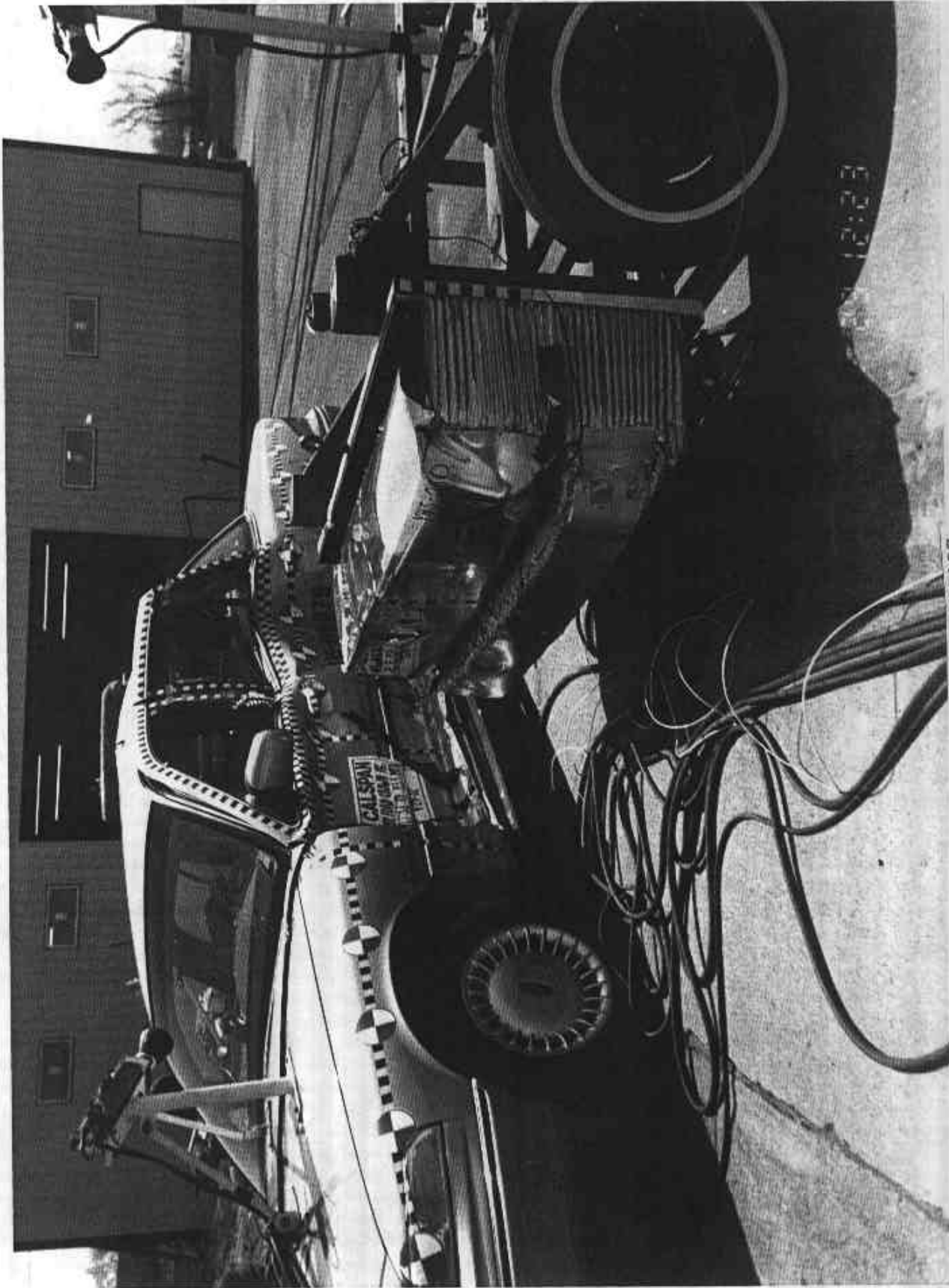
NHTSA No. MN0207

Figure A-8 POST-TEST LEFT SIDE VIEW OF TEST VEHICLE



NHTSA No. MN0207

Figure A-9 PRE-TEST MDB AND VEHICLE LEFT SIDE FRONT VIEW

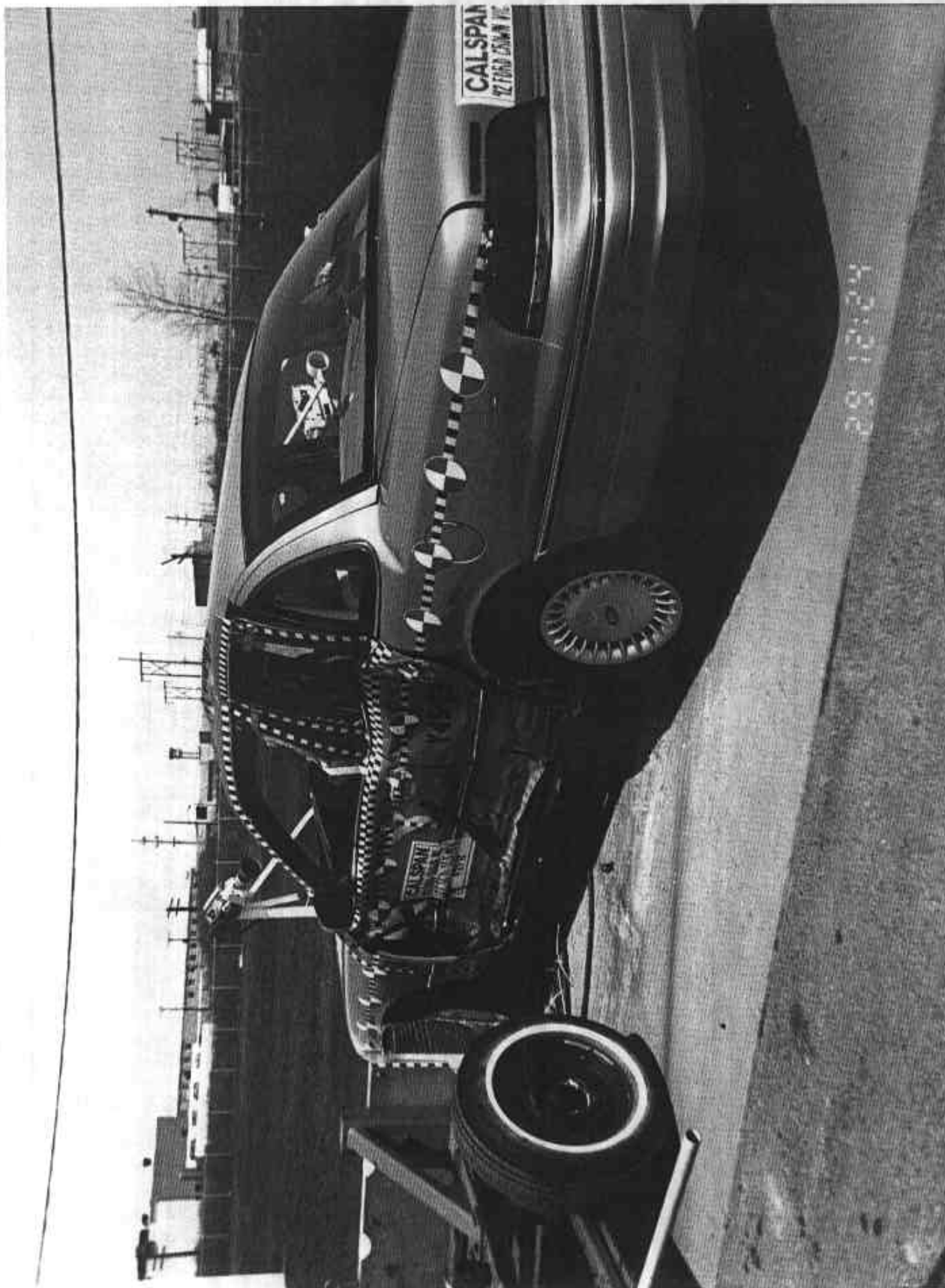


NHTSA No. MN0207

Figure A-10 POST-TEST MDB AND VEHICLE LEFT SIDE FRONT VIEW

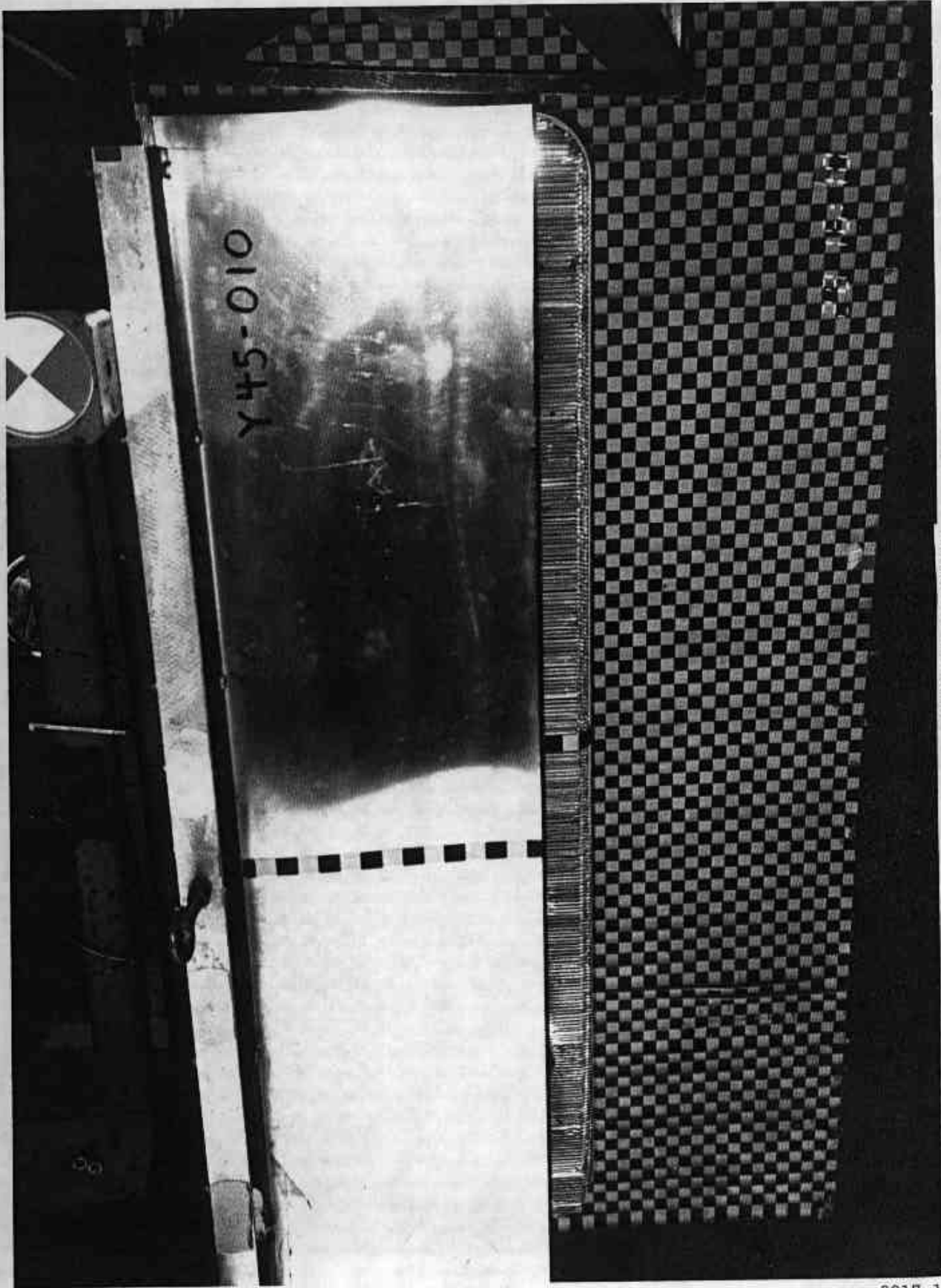


NHTSA No. MN0207
Figure A-11 PRE-TEST MDB AND VEHICLE LEFT SIDE REAR VIEW



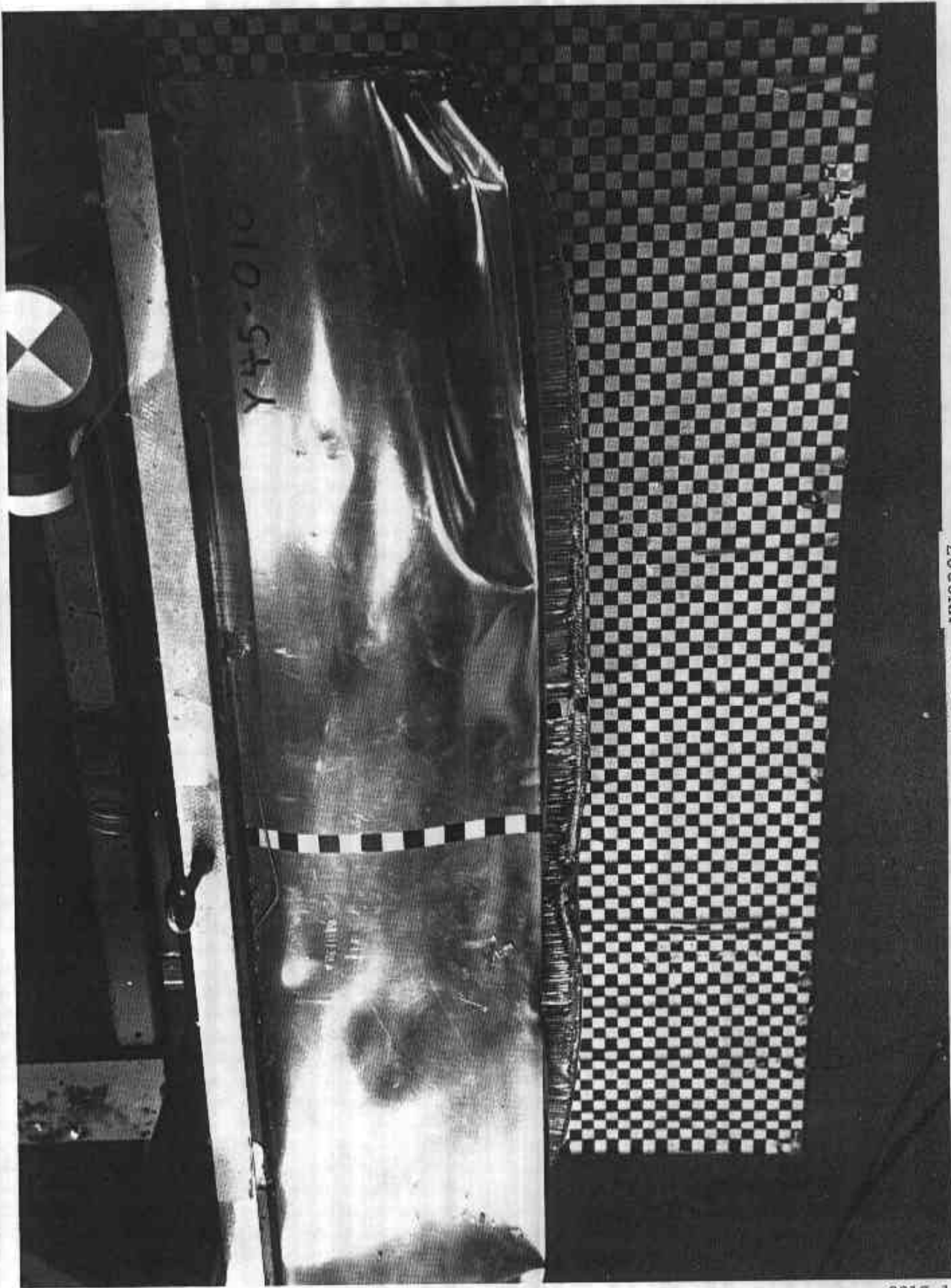
NHTSA No. MN0207

Figure A-12 POST-TEST MDB AND VEHICLE LEFT SIDE REAR VIEW



NHTSA No. MN0207

Figure A-13 PRE-TEST MDB TOP VIEW

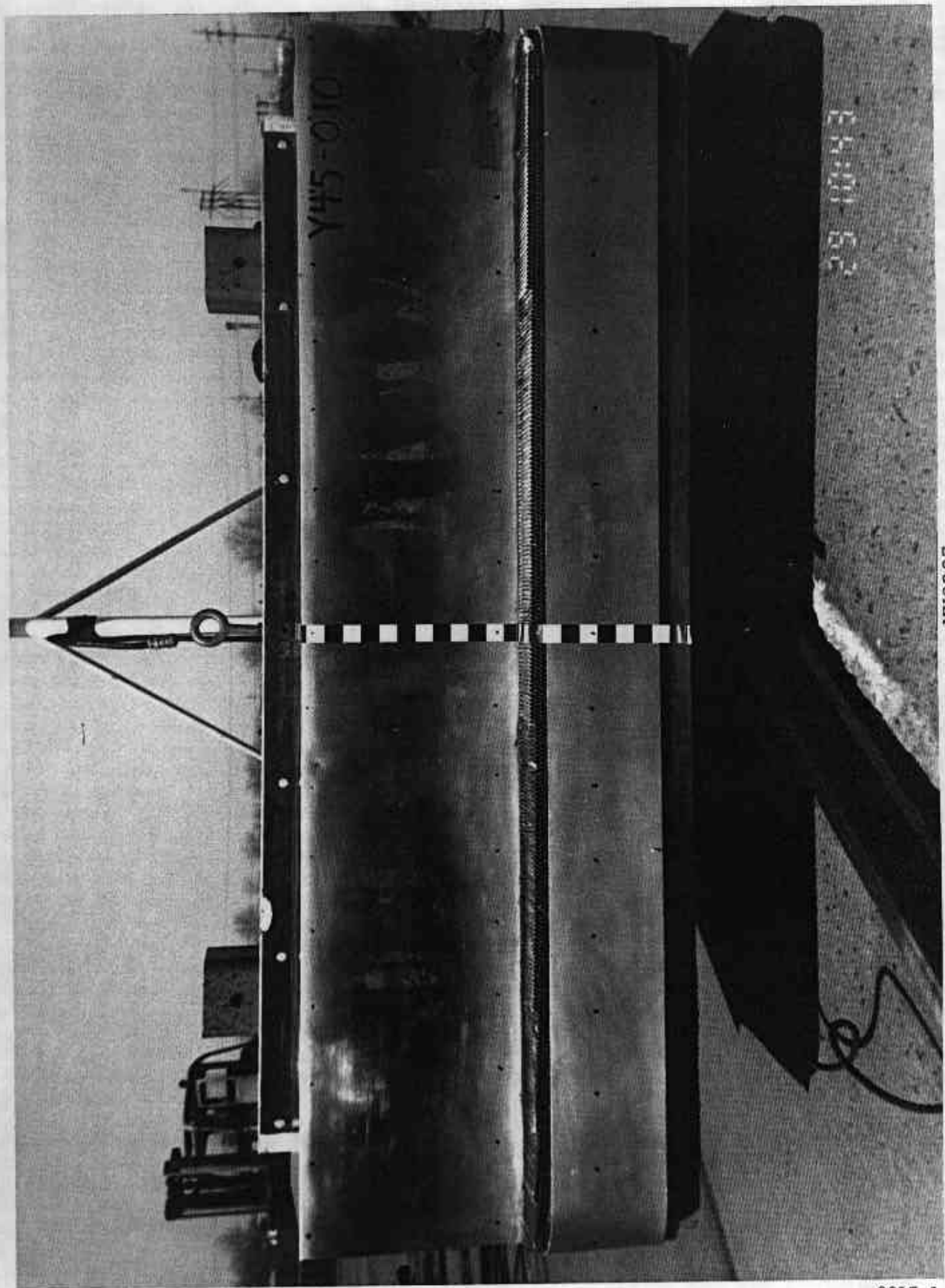


Y45-010

NHTSA No. MN0207
Figure A-14 POST-TEST MDB TOP VIEW

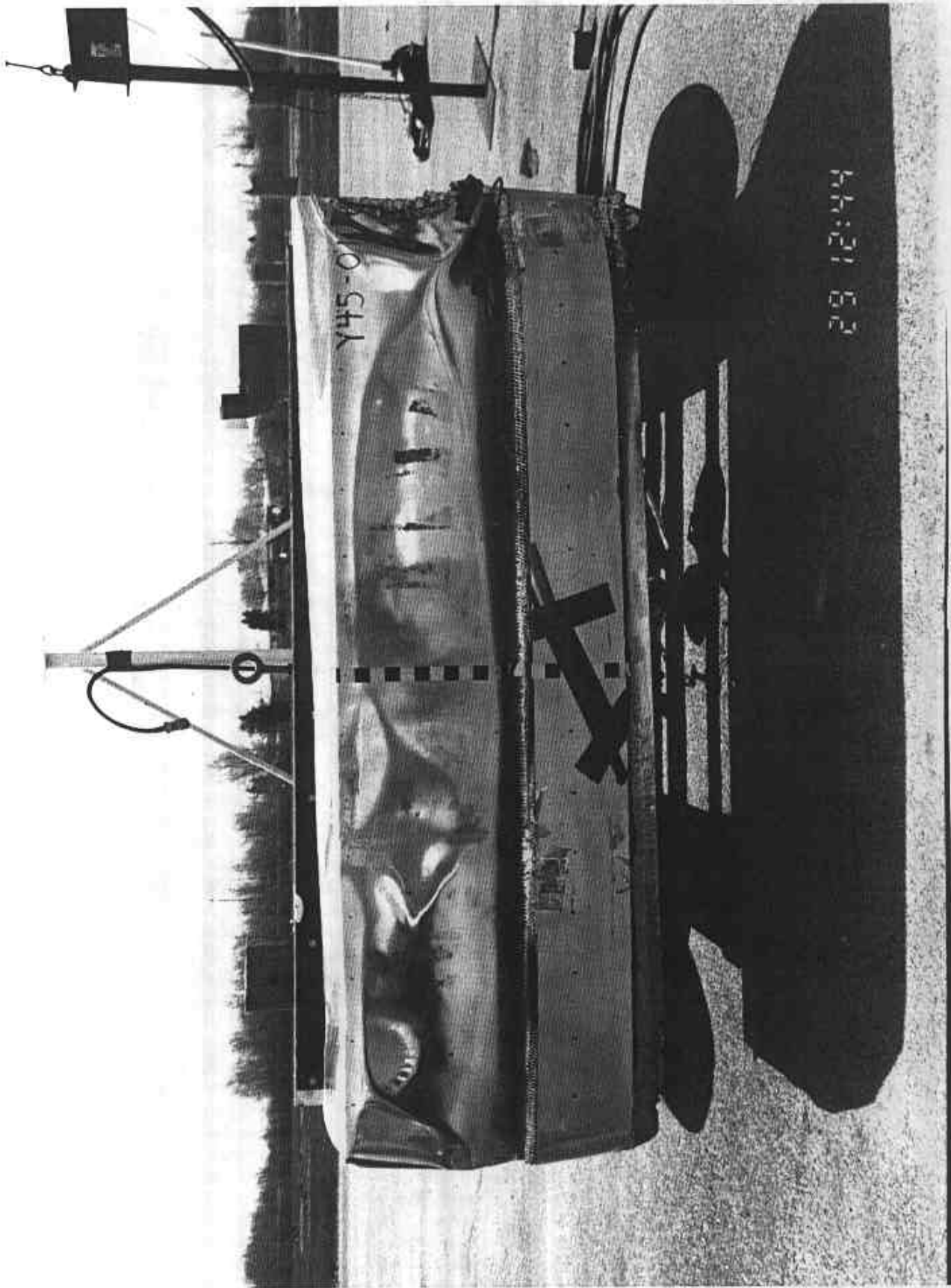
A-16

8017-1



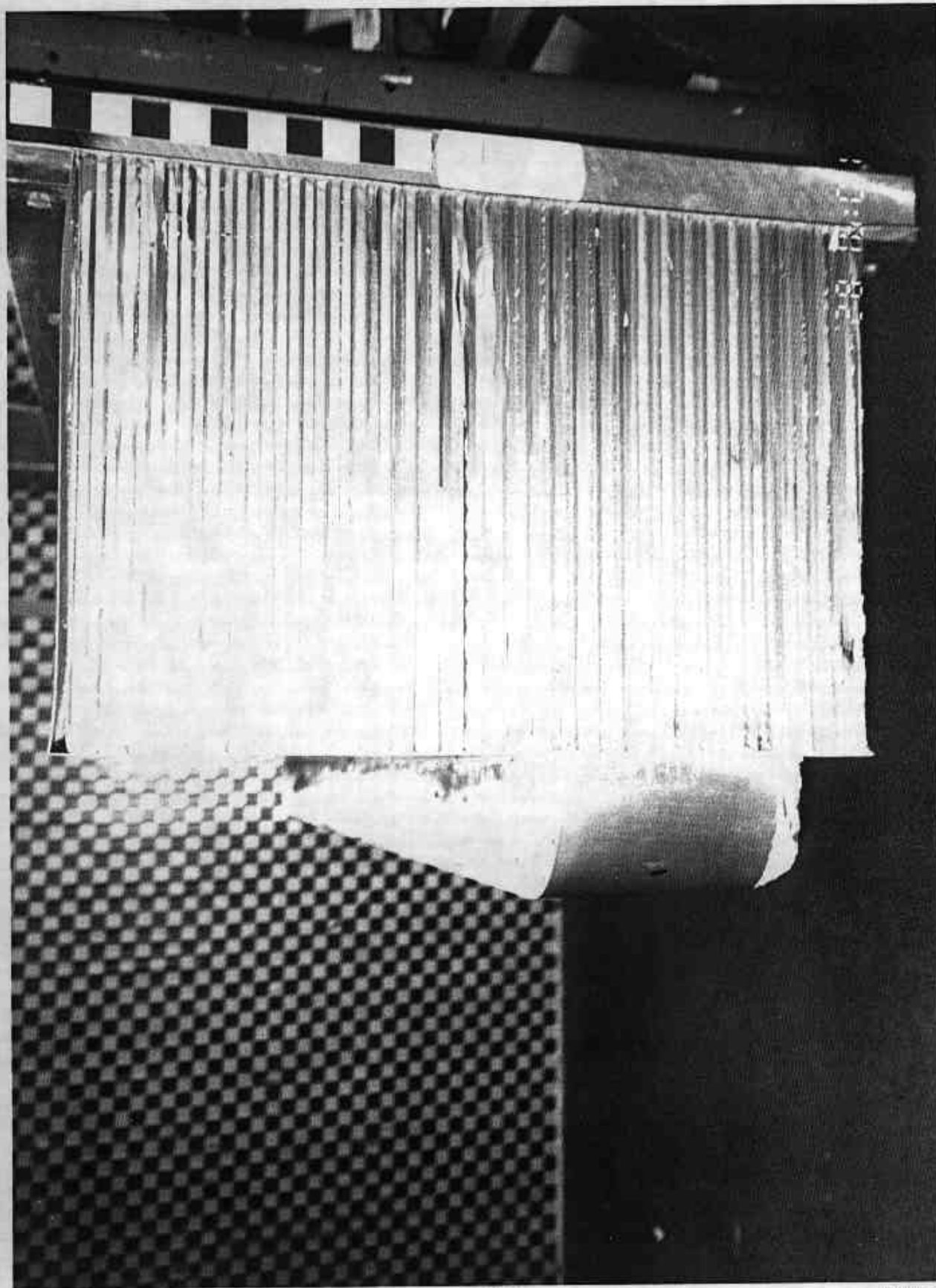
NHTSA No. MN0207

Figure A-15 PRE-TEST MDB FRONT VIEW



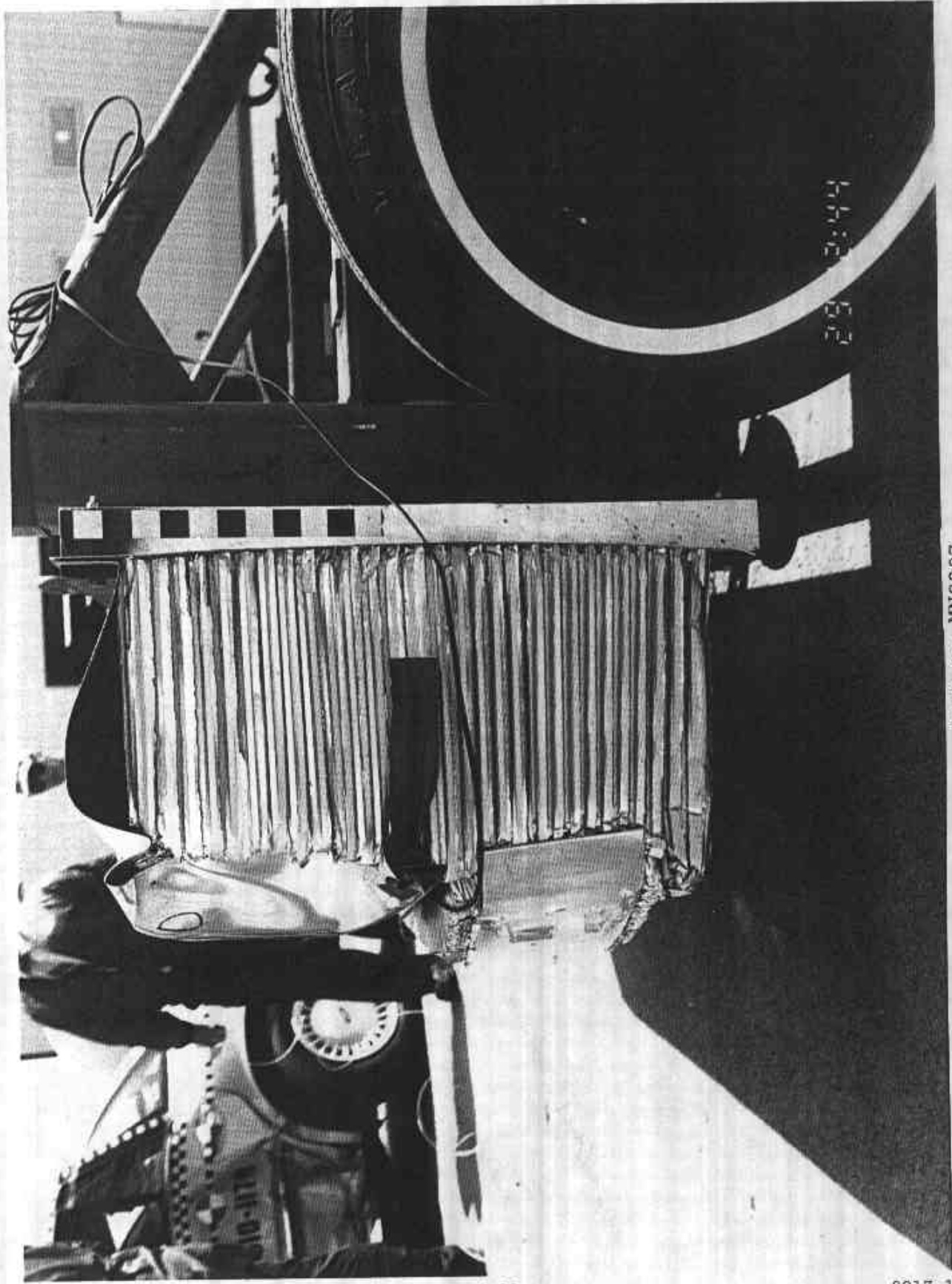
NHTSA No. MN0207

Figure A-16 POST-TEST MDB FRONT VIEW



NHTSA No. MN0207

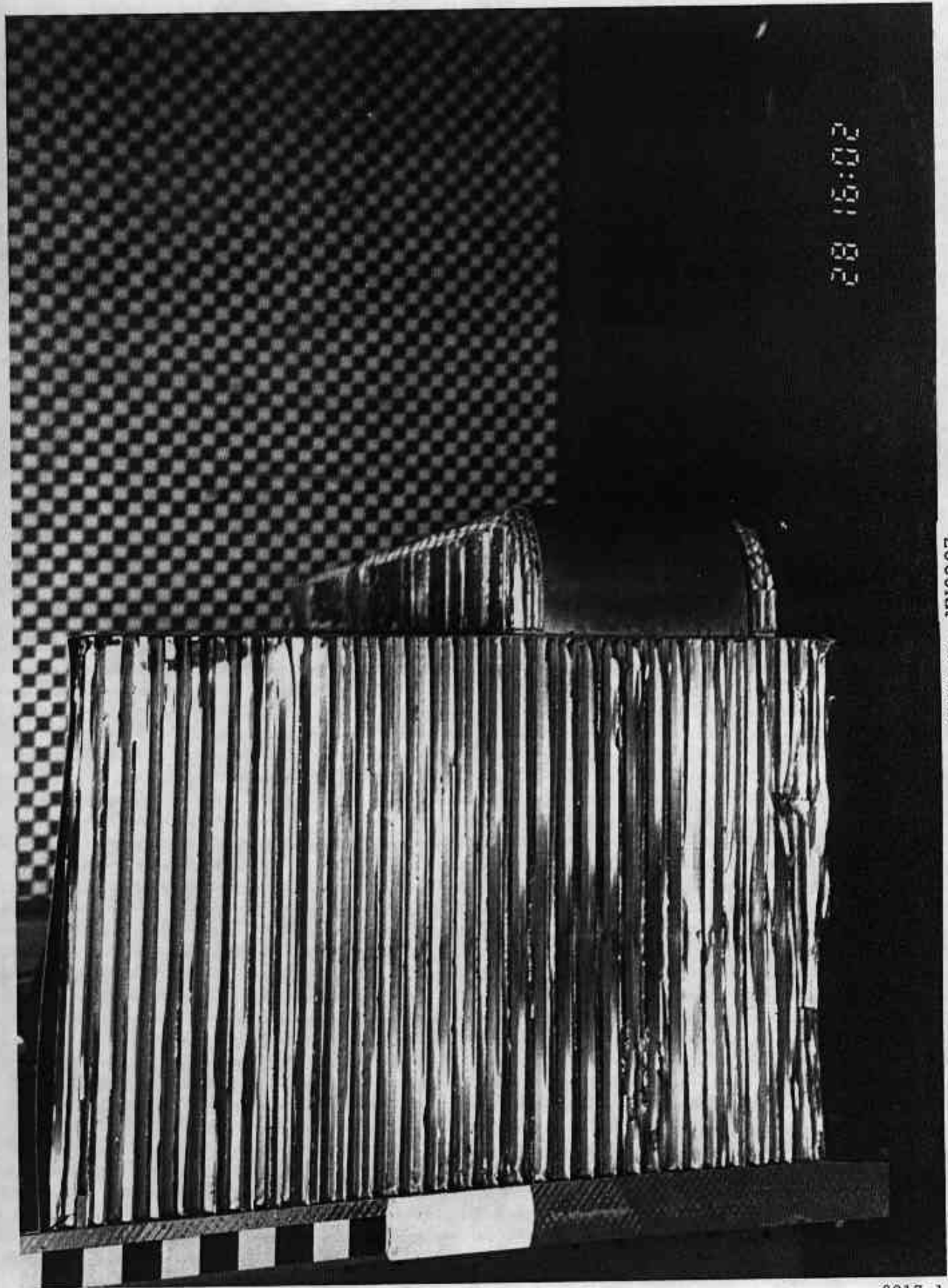
Figure A-17 PRE-TEST MDB LEFT SIDE VIEW



NHTSA No. MN0207
Figure A-18 POST-TEST MDB LEFT SIDE VIEW

A-20

8017-1

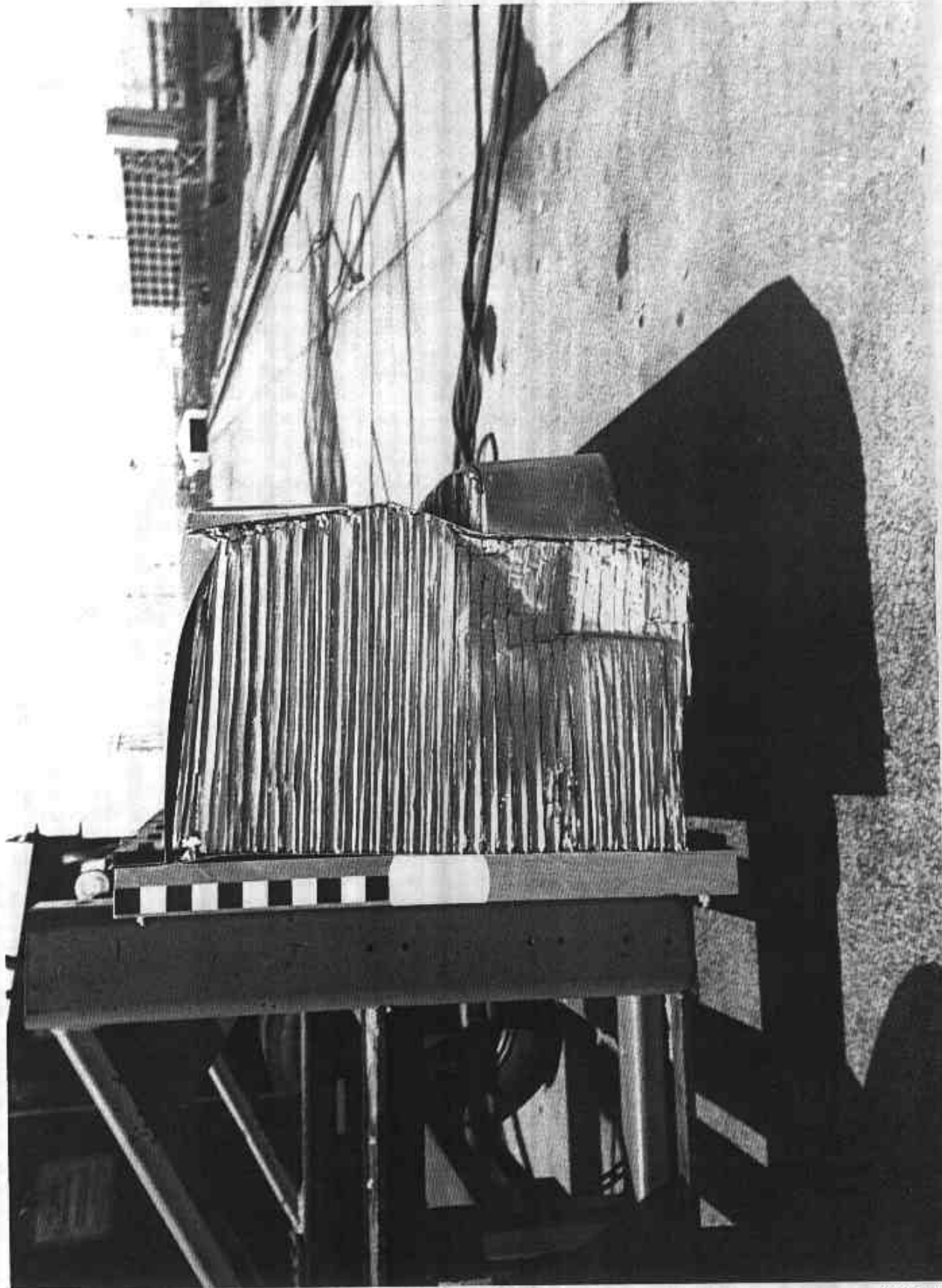


28 16:02

NHTSA No. MN0207
Figure A-19 PRE-TEST MDB RIGHT SIDE VIEW

A-21

8017-1



NHTSA No. MN0207

Figure A-20 POST-TEST MDB RIGHT SIDE VIEW



NHTSA No. MN0207

Figure A-21 PRE-TEST POS. #1 DUMMY RIGHT SIDE VIEW



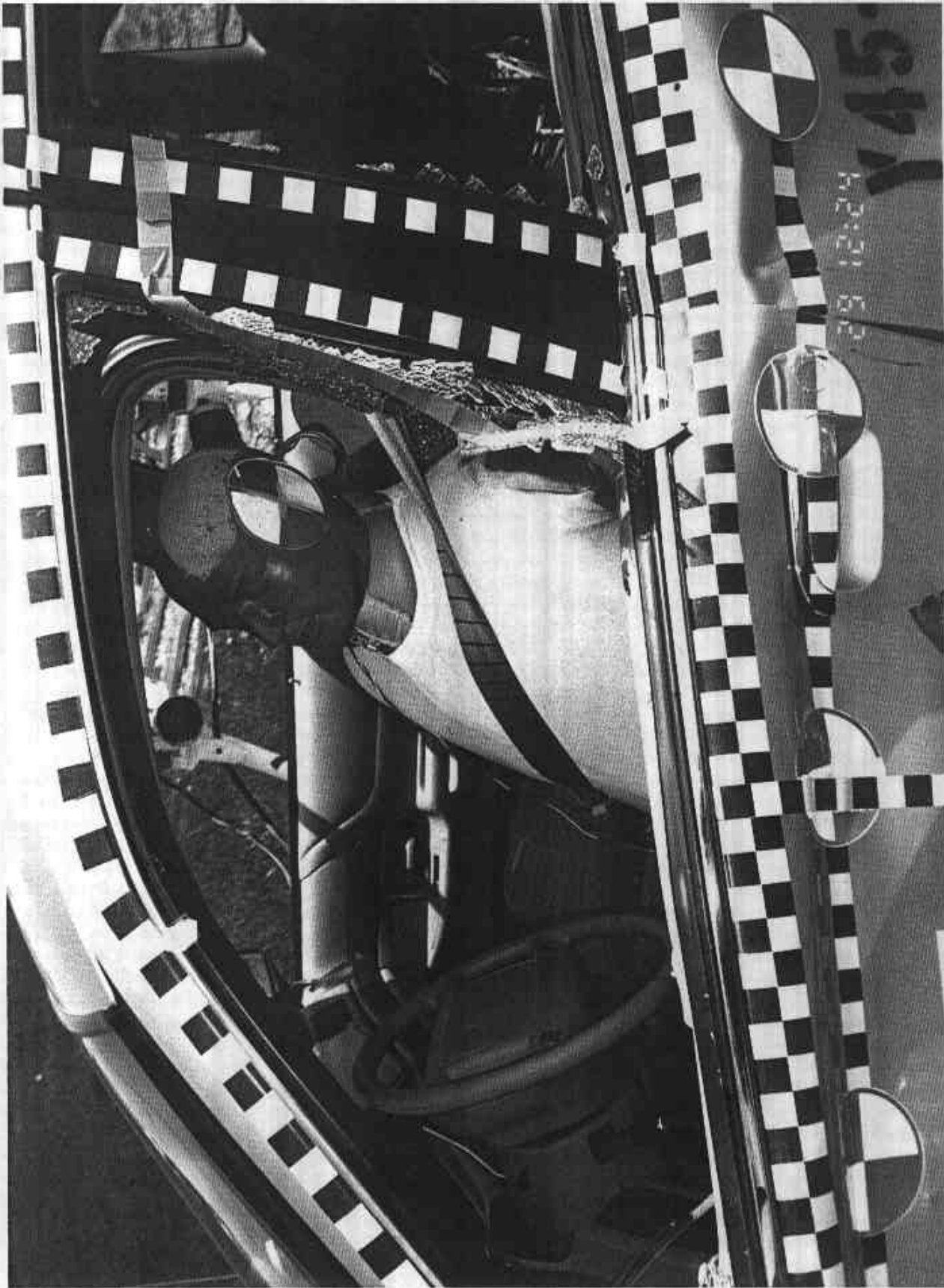
NHTSA No. MN0207

Figure A-22 POST-TEST POS. #1 DUMMY RIGHT SIDE VIEW



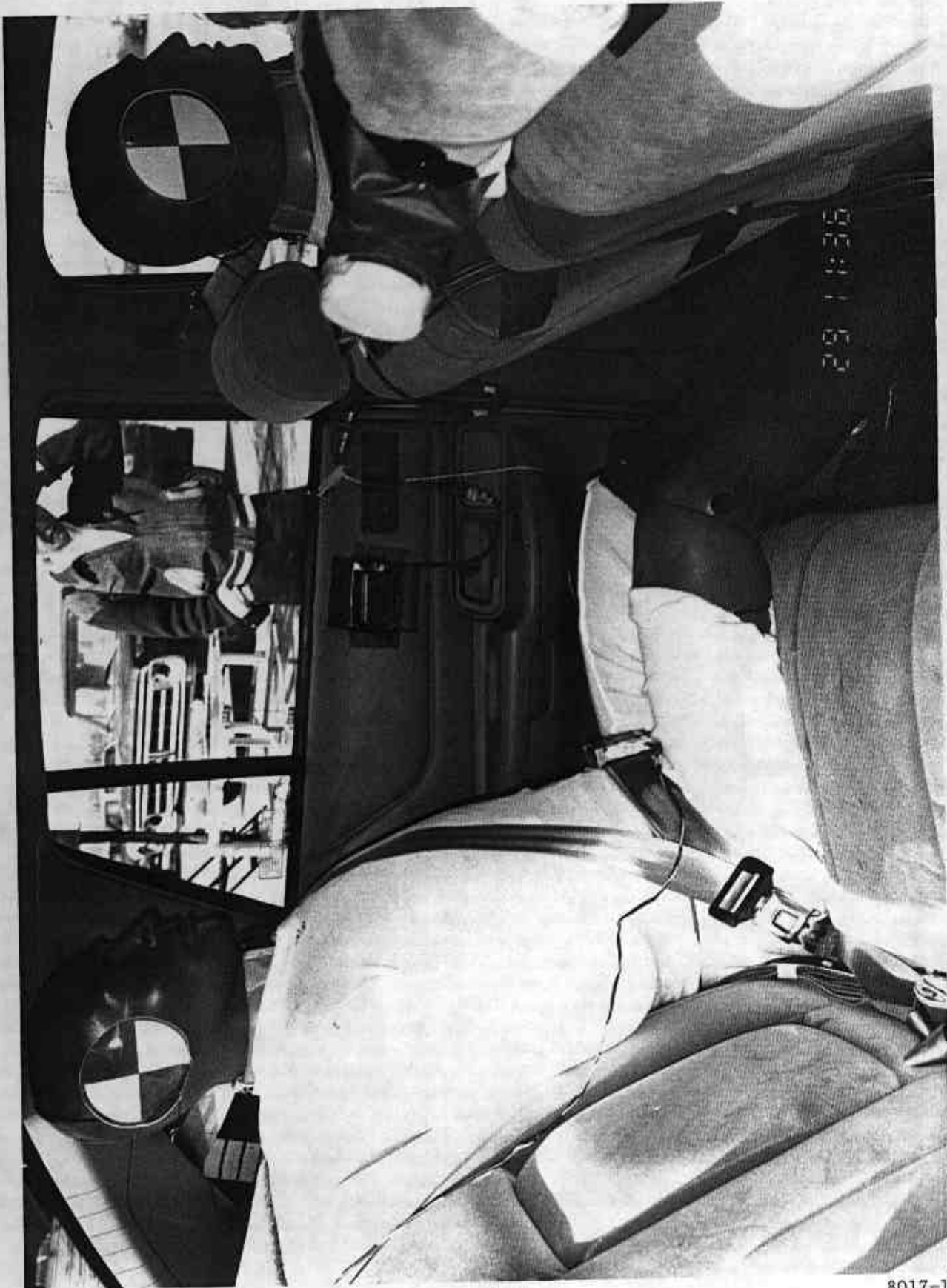
29 11:19

NHTSA No. MN0207
Figure A-23 PRE-TEST POS. #1 DUMMY LEFT SIDE VIEW



NHTSA No. MN0207

Figure A-24 POST-TEST POS. #1 DUMMY LEFT SIDE VIEW



NHTSA No. MN0207
Figure A-25 PRE-TEST POS. #4 DUMMY RIGHT SIDE VIEW



NHTSA No. MN0207

Figure A-26 POST-TEST POS. #4 DUMMY RIGHT SIDE VIEW



NHTSA No. MNO207

Figure A-27 PRE-TEST POS. #4 DUMMY LEFT SIDE VIEW



NHTSA No. MN0207

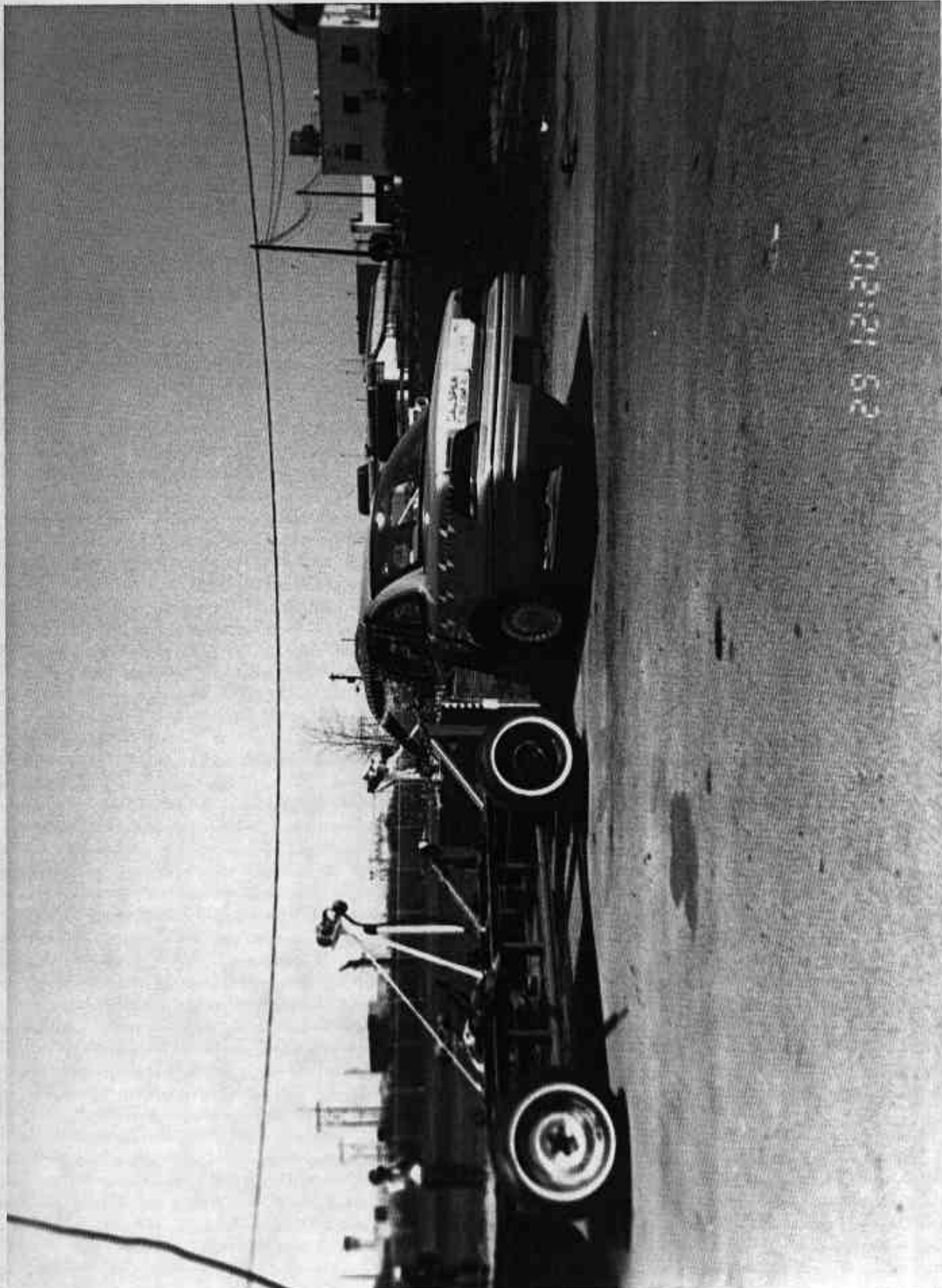
Figure A-28 POST-TEST POS. #4 DUMMY LEFT SIDE VIEW



NHTSA No. MN0207
Figure A-29 TEST VEHICLE'S CERTIFICATION LABEL



NHTSA No. MN0207
Figure A-30 TEST VEHICLE'S TIRE PLACARD



NHTSA No. MN0207
Figure A-31 IMPACT PHOTO

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8017-1

Appendix B

DATA PLOTS

All vehicle data and dummy head and chest deflection data were filtered following SAE J211b. Data from the Side Impact Dummies' thorax and pelvis were filtered in the following manner:

- a. Filter the data with a 300 Hz SAE Class 180 filter;
- b. Subsample the data to a 1600 Hz sampling rate; and
- c. Filter the data with a Finite Impulse Response (FIR) filter having the following characteristics:
 1. Passband frequency 100 Hz
 2. Stopband frequency 189 Hz
 3. Stopband gain -50 dB
 4. Passband ripple 0.0225 dB

FIR filtered data is so noted in this appendix.

DUMMY DATA

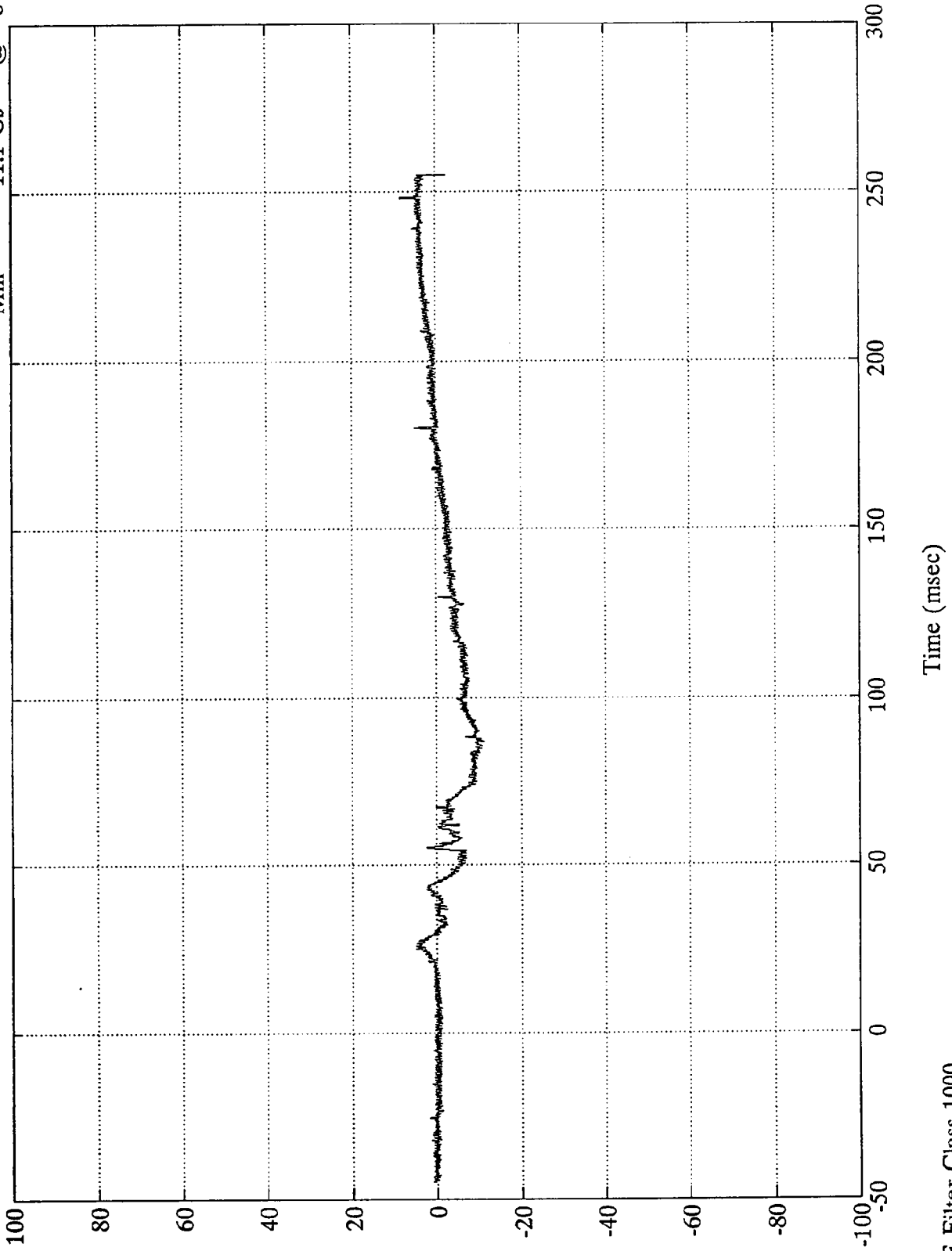
P1 - DRIVER

P4 - LEFT REAR PASSENGER

NCAP Side Impact Test #1

Max = 8.3 Gs @ 248.16 msec
Min = -11.1 Gs @ 87.00 msec

P1 Head X

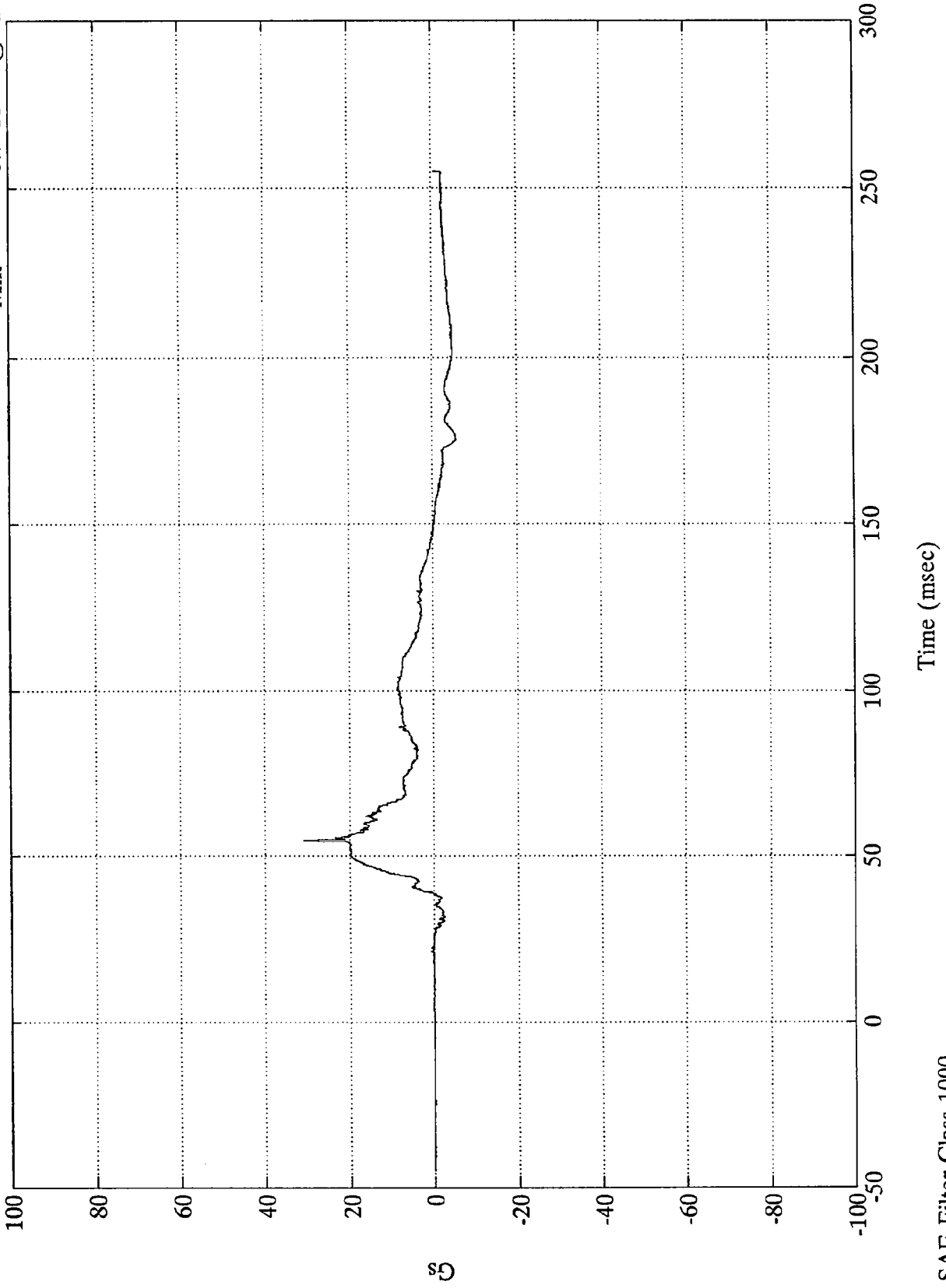


SAE Filter Class 1000

NCAP Side Impact Test #1

P1 Head Y

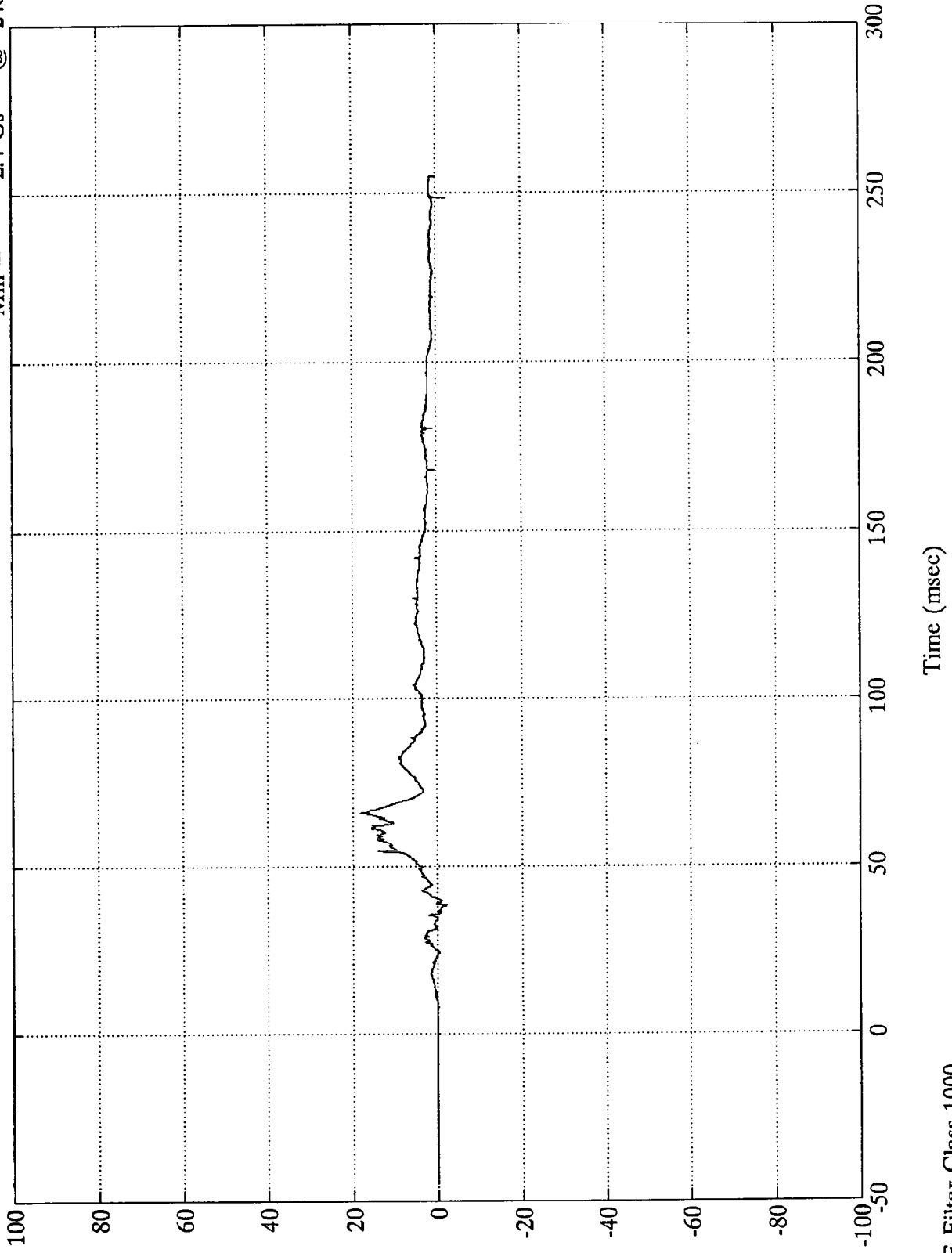
Max = 30.8 Gs @ 54.47 msec
Min = -5.7 Gs @ 175.68 msec



NCAP Side Impact Test #1

Max = 18.3 Gs @ 66.00 msec
Min = -2.4 Gs @ 248.63 msec

P1 Head Z

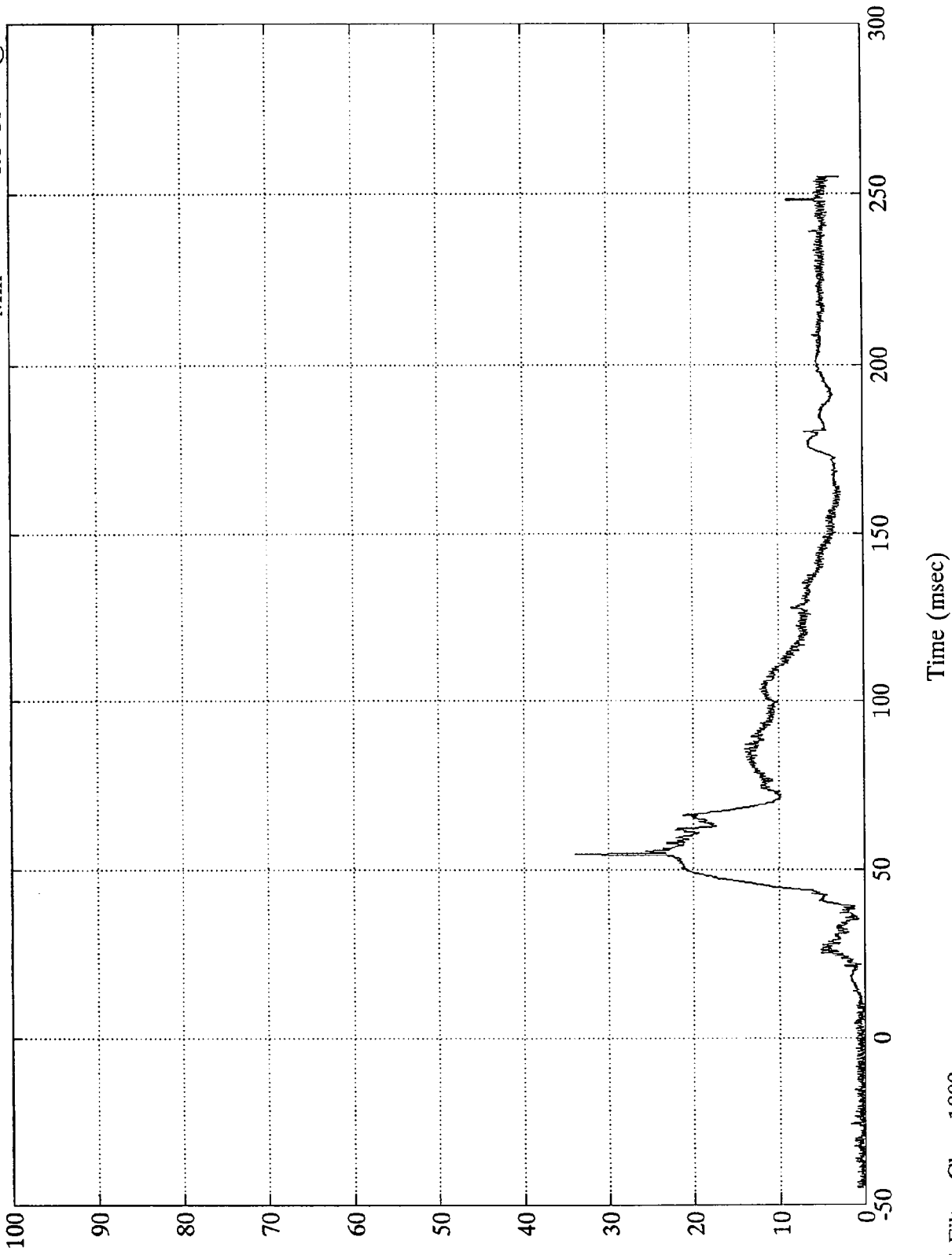


B-5

NCAP Side Impact Test #1

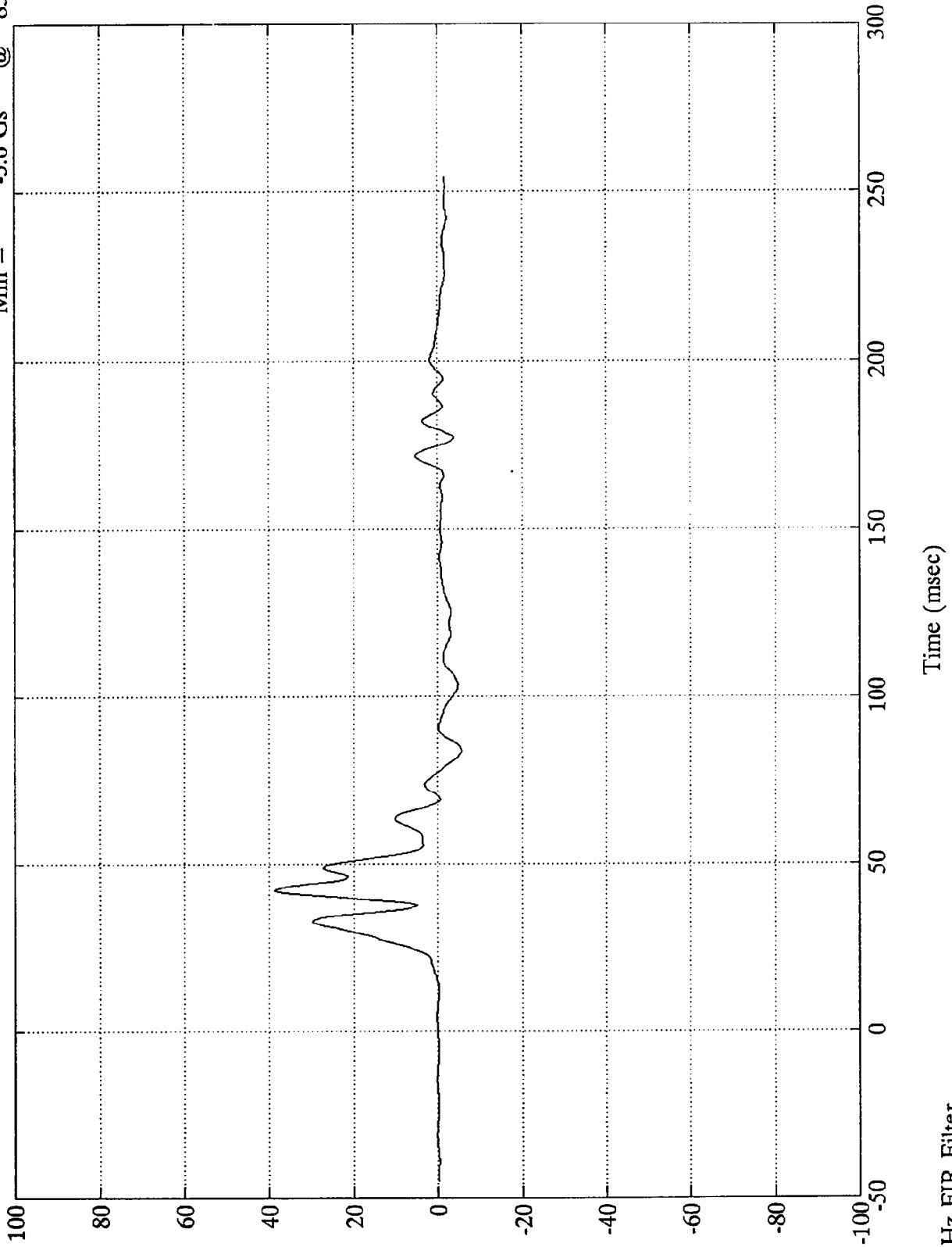
Max = 33.9 Gs @ 54.47 msec
Min = 0.0 Gs @ -0.84 msec

P1 Head Resultant



NCAP Side Impact Test #1

P1 Upper Rib Y
Max = 38.7 Gs @ 41.875 msec
Min = -5.6 Gs @ 83.75 msec



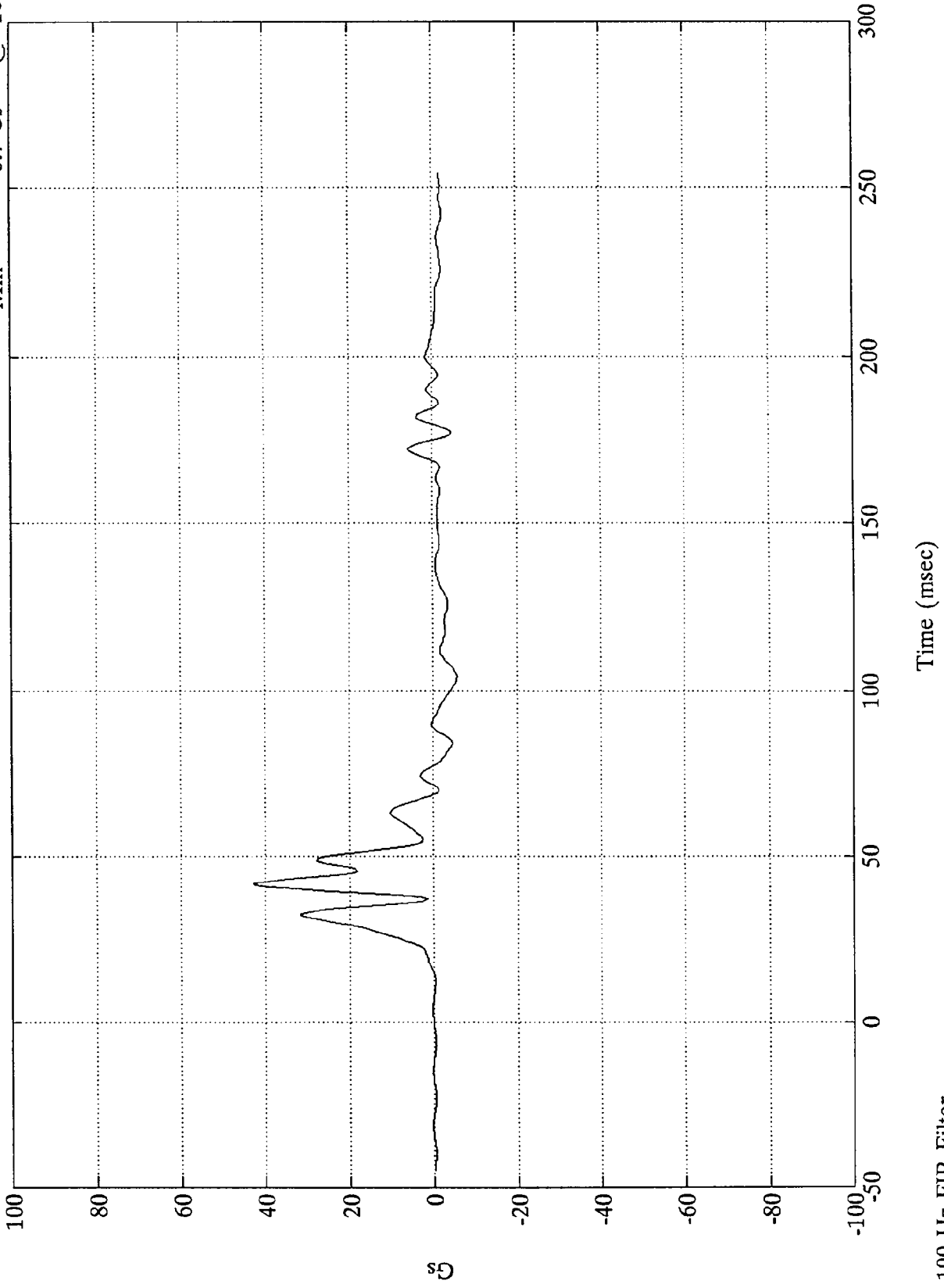
B-7

8017-1 100 Hz FIR Filter

NCAP Side Impact Test #1

P1 Upper Rib Y(R)

Max = 42.6 Gs @ 41.875 msec
Min = -5.7 Gs @ 104.37 msec

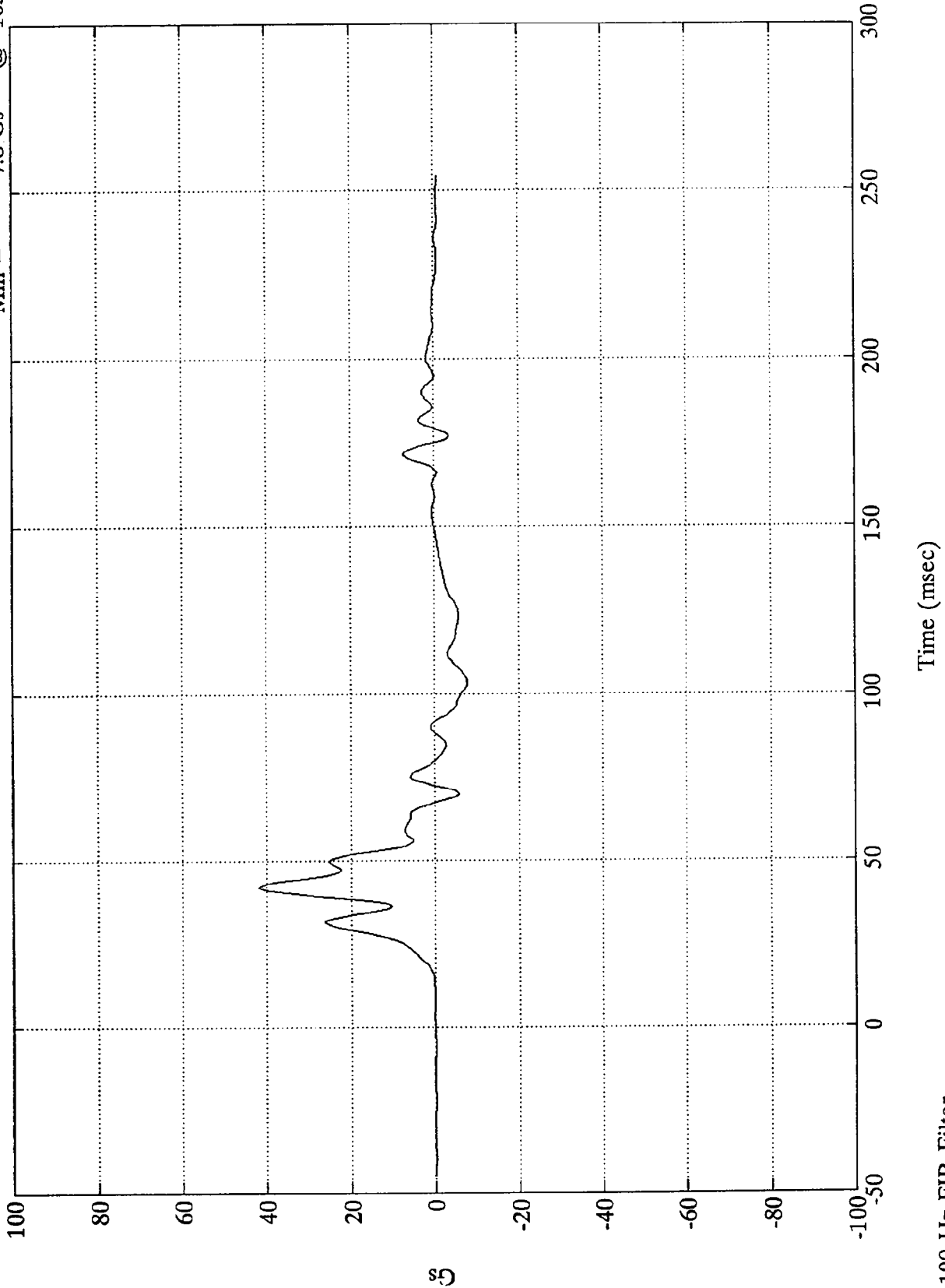


B-8

NCAP Side Impact Test #1

Max = 41.7 Gs @ 41.875 msec
Min = -7.8 Gs @ 103.75 msec

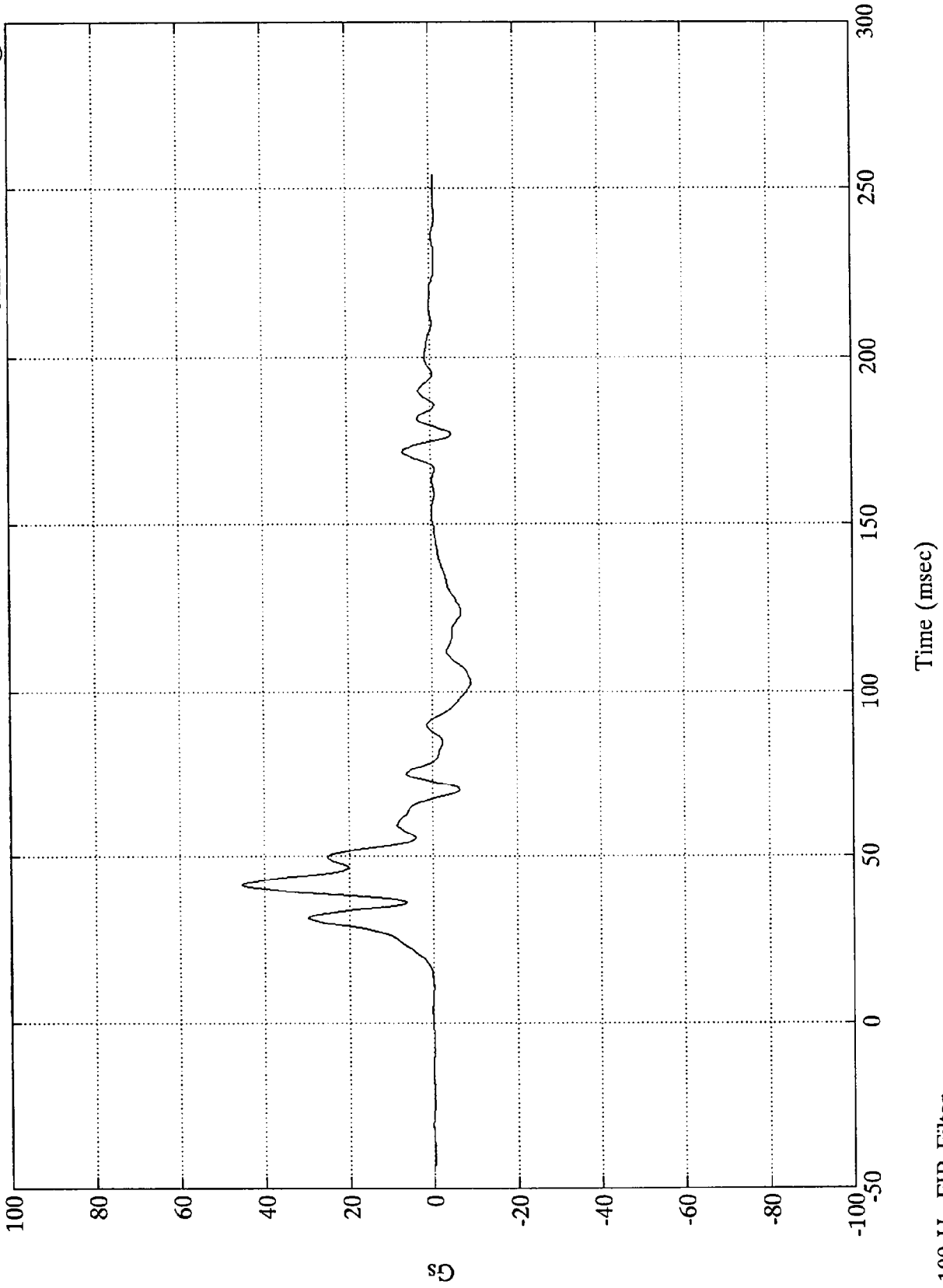
P1 Lower Rib Y



NCAP Side Impact Test #1

Max = 45.4 Gs @ 41.250 msec
Min = -9.1 Gs @ 103.12 msec

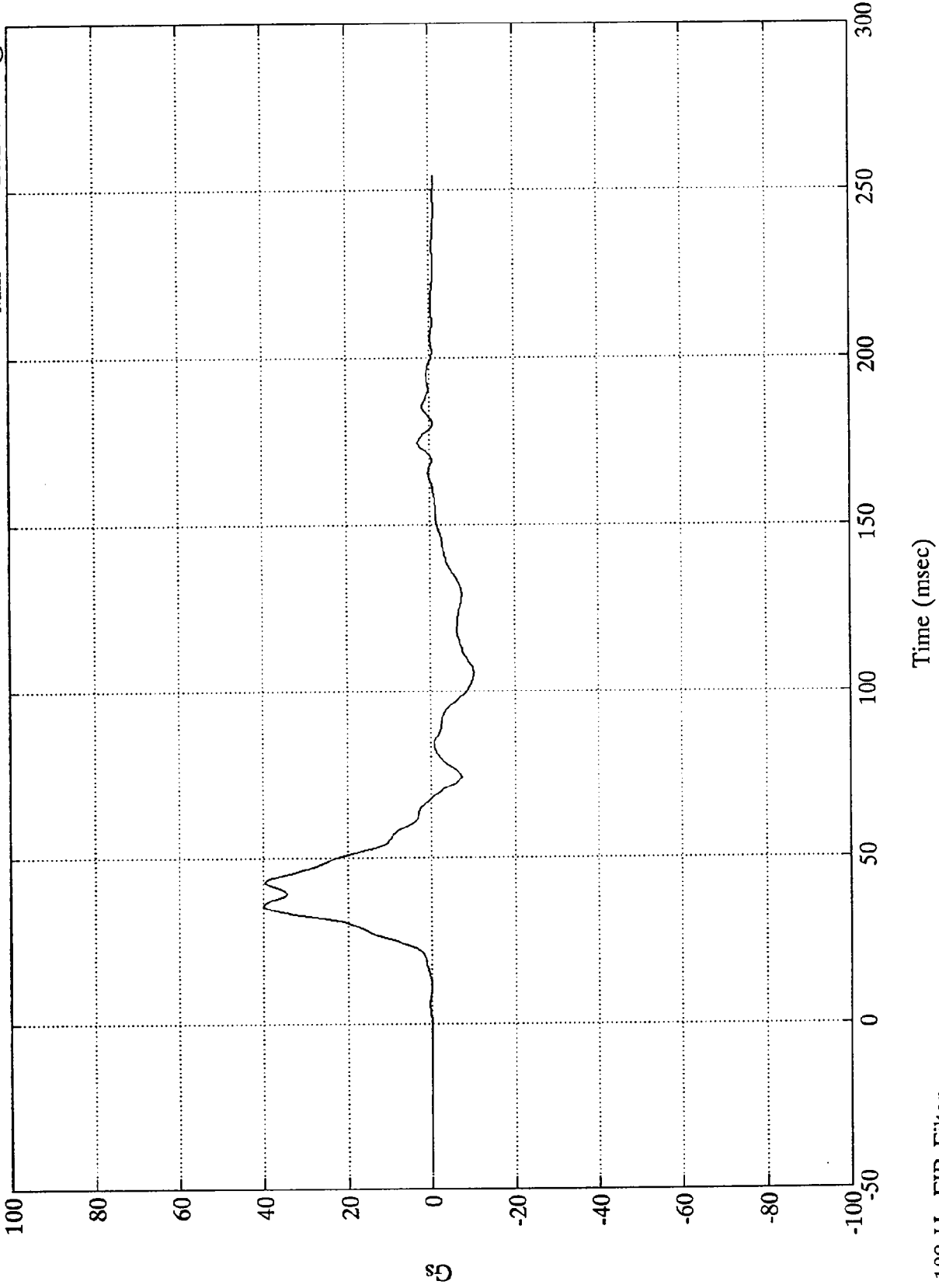
P1 Lower Rib Y(R)



NCAP Side Impact Test #1

P1 Lower Spine Y

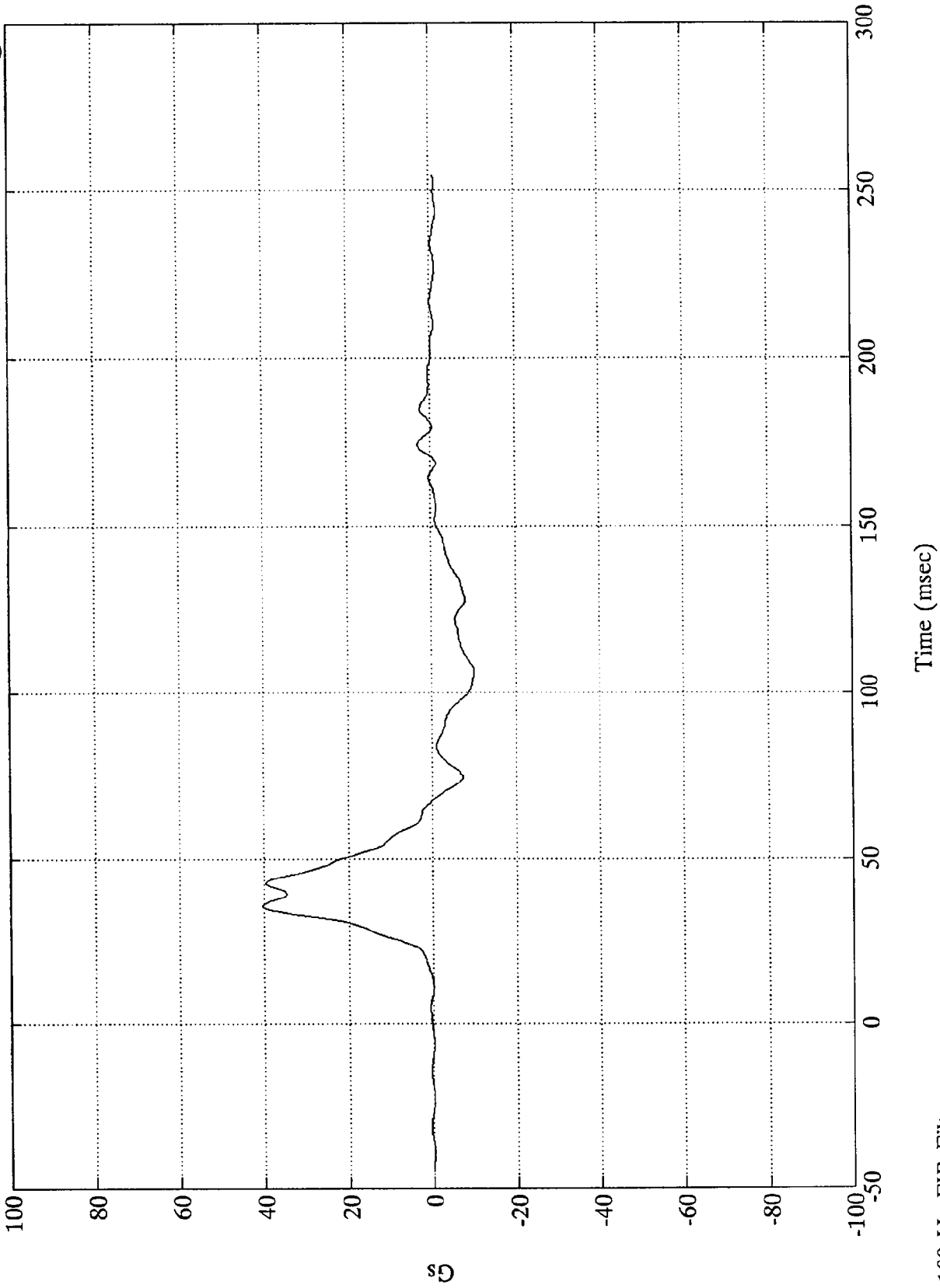
Max = 40.0 Gs @ 35.625 msec
Min = -10.2 Gs @ 105.62 msec



NCAP Side Impact Test #1

Max = 40.6 Gs @ 35.625 msec
Min = -10.1 Gs @ 106.25 msec

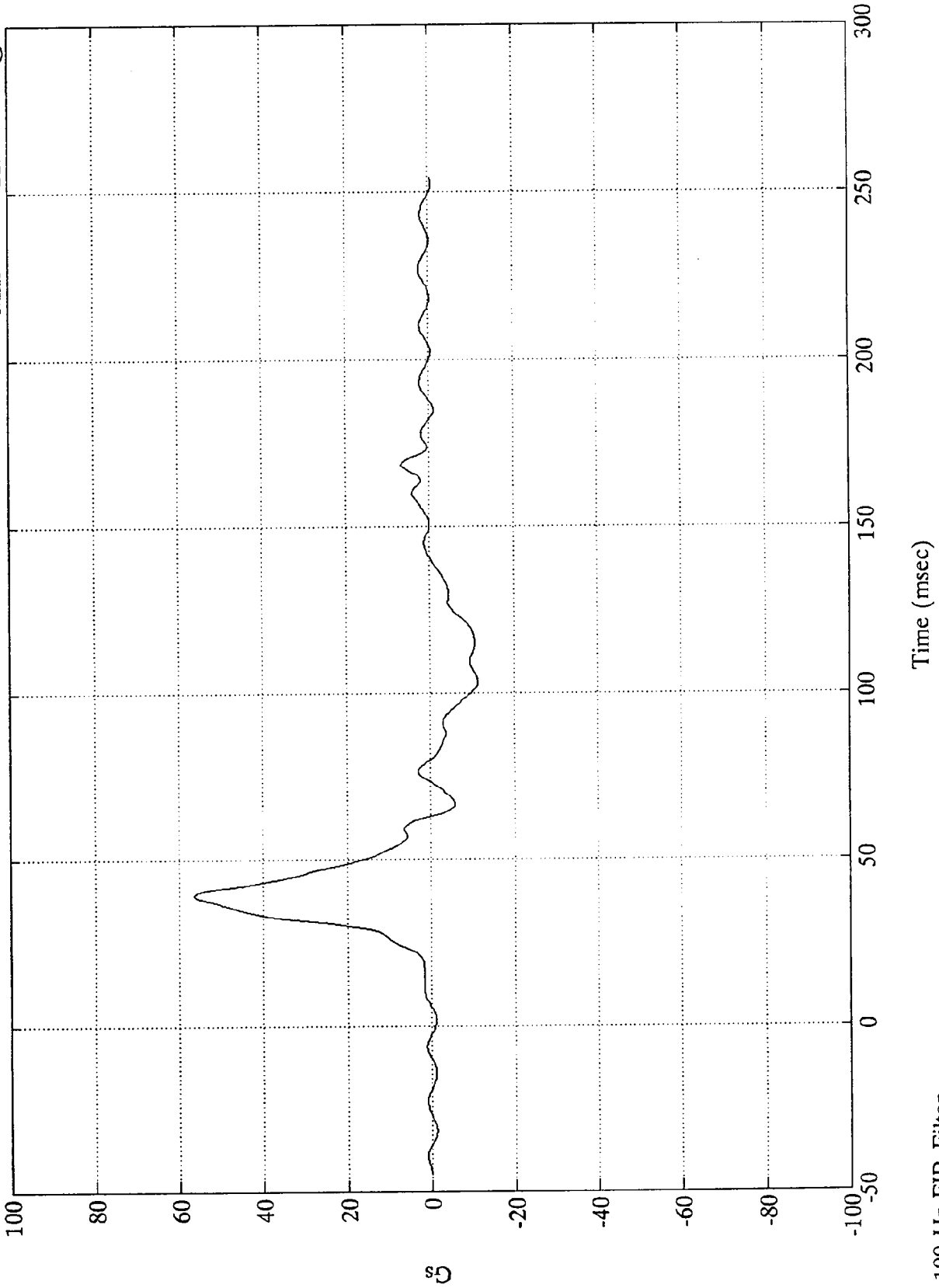
P1 Lower Spine Y(R)



NCAP Side Impact Test #1

Max = 56.4 Gs @ 39.375 msec
Min = -11.4 Gs @ 103.75 msec

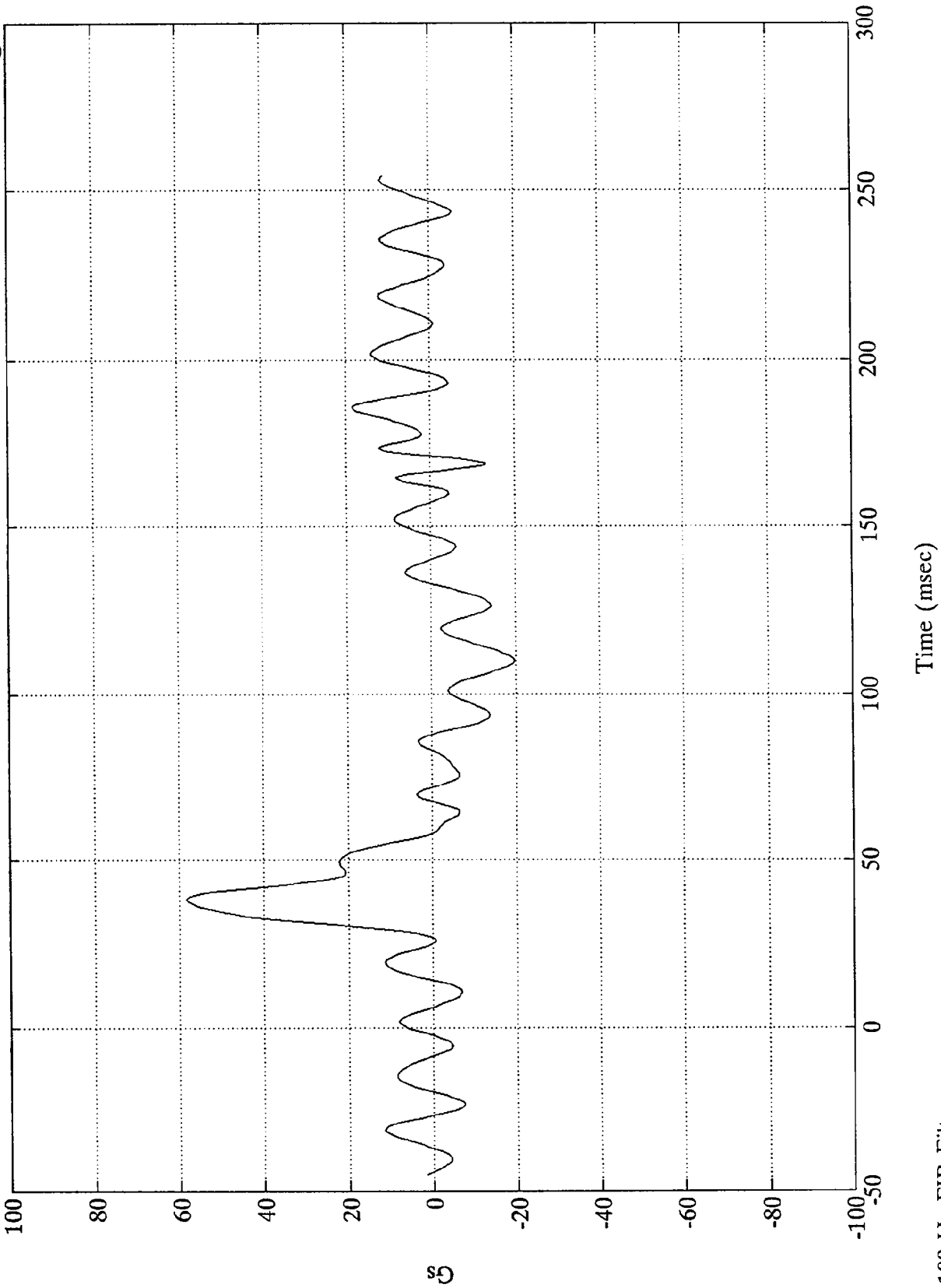
P1 Pelvic Y



NCAP Side Impact Test #1

Max = 58.4 Gs @ 38.125 msec
Min = -19.8 Gs @ 110.00 msec

P1 Pelvic Y(R)

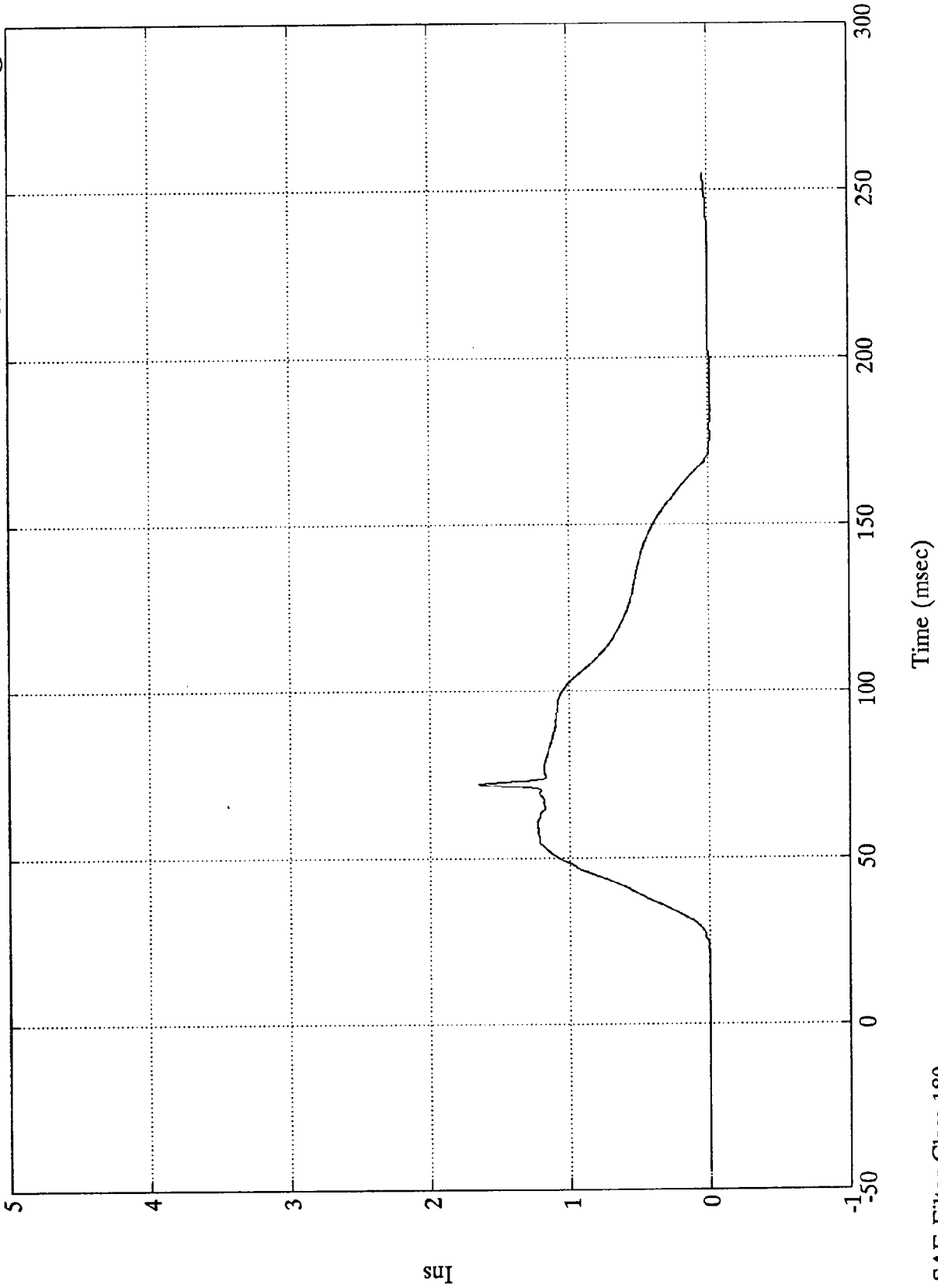


100 Hz FIR Filter

NCAP Side Impact Test #1

P1 Chest Deflection

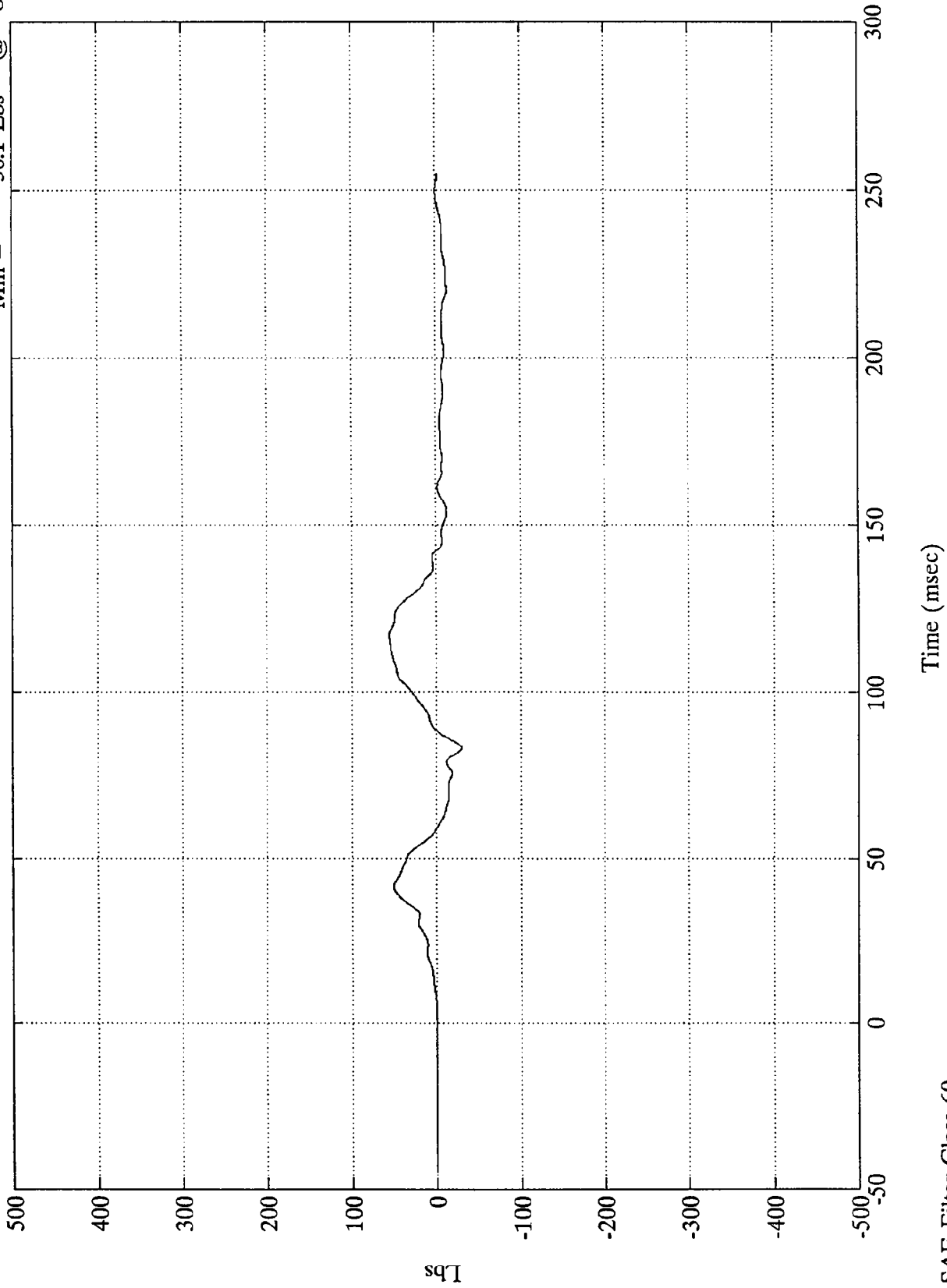
Max = 1.6 Ins @ 72.00 msec
Min = -0.0 Ins @ 183.72 msec



NCAP Side Impact Test #1

P1 Lap Belt

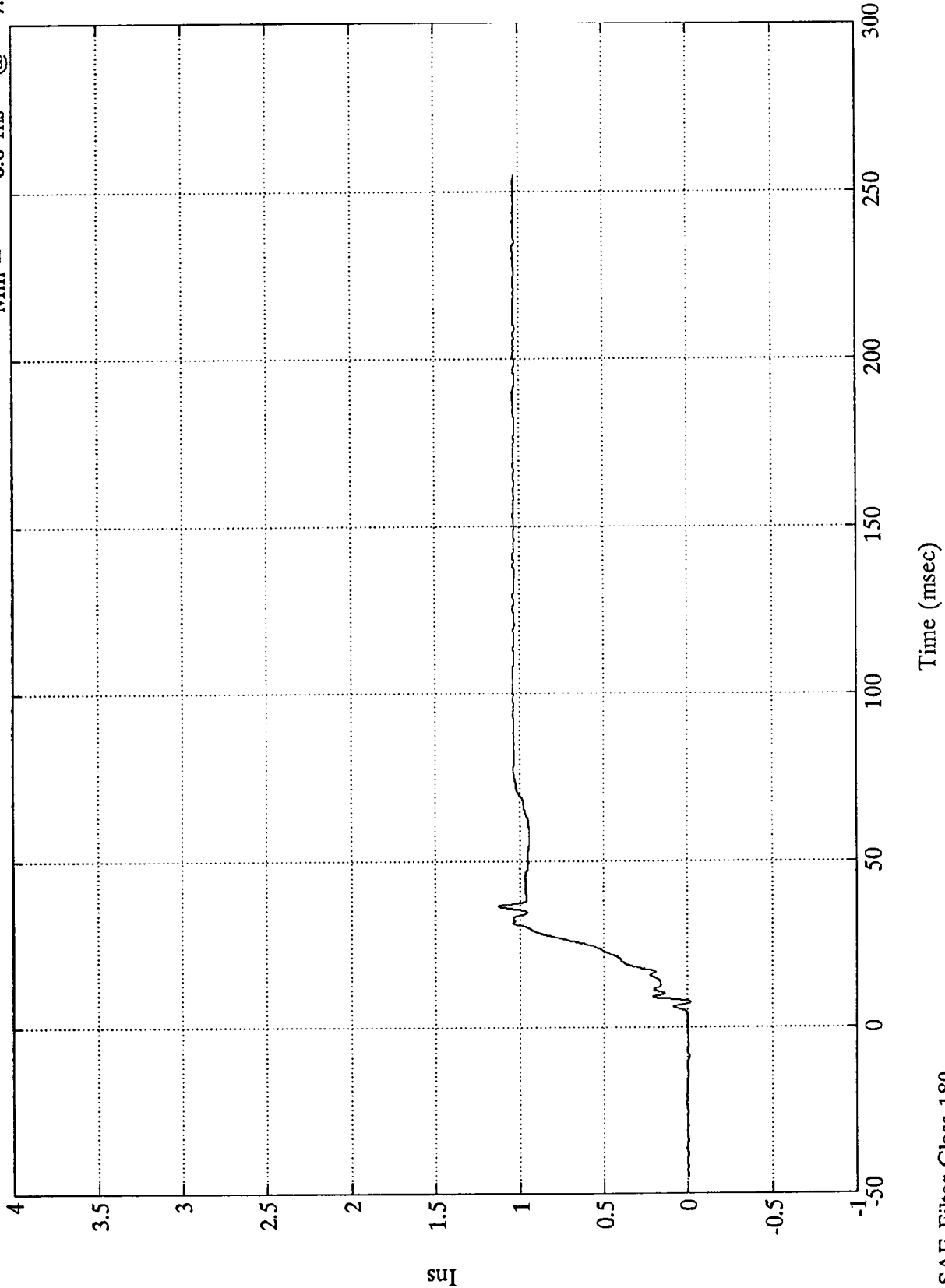
Max = 56.1 Lbs @ 117.00 msec
Min = -30.1 Lbs @ 83.28 msec



NCAP Side Impact Test #1

Max = 1.1 Ins @ 36.24 msec
Min = -0.0 Ins @ 7.31 msec

P1 Spool Out



VEHICLE AND MDB DATA

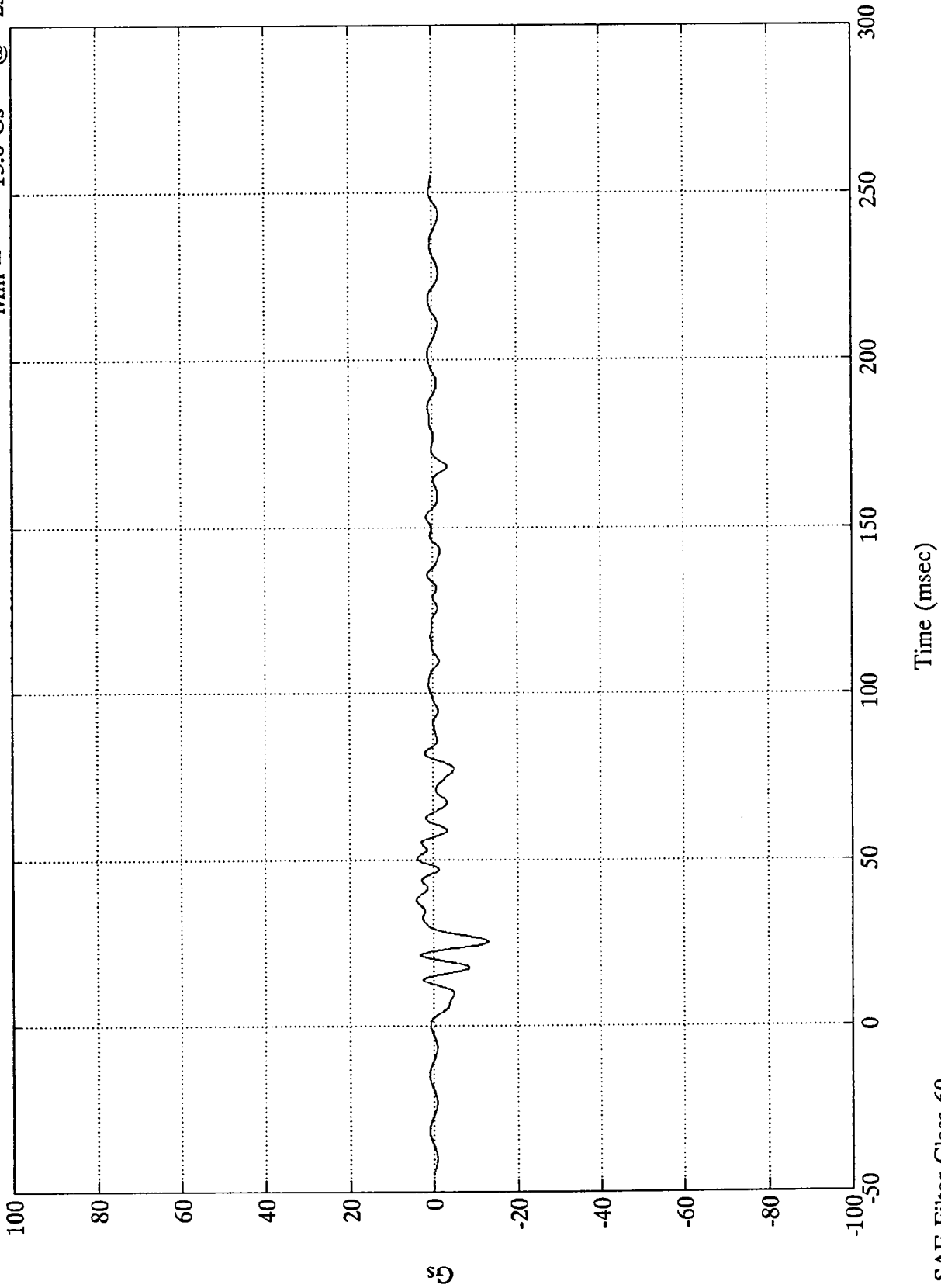
V1 - 1992 FORD CROWN VICTORIA

V2 - MDB

NCAP Side Impact Test #1

Max = 4.0 Gs @ 37.92 msec
Min = -13.0 Gs @ 25.44 msec

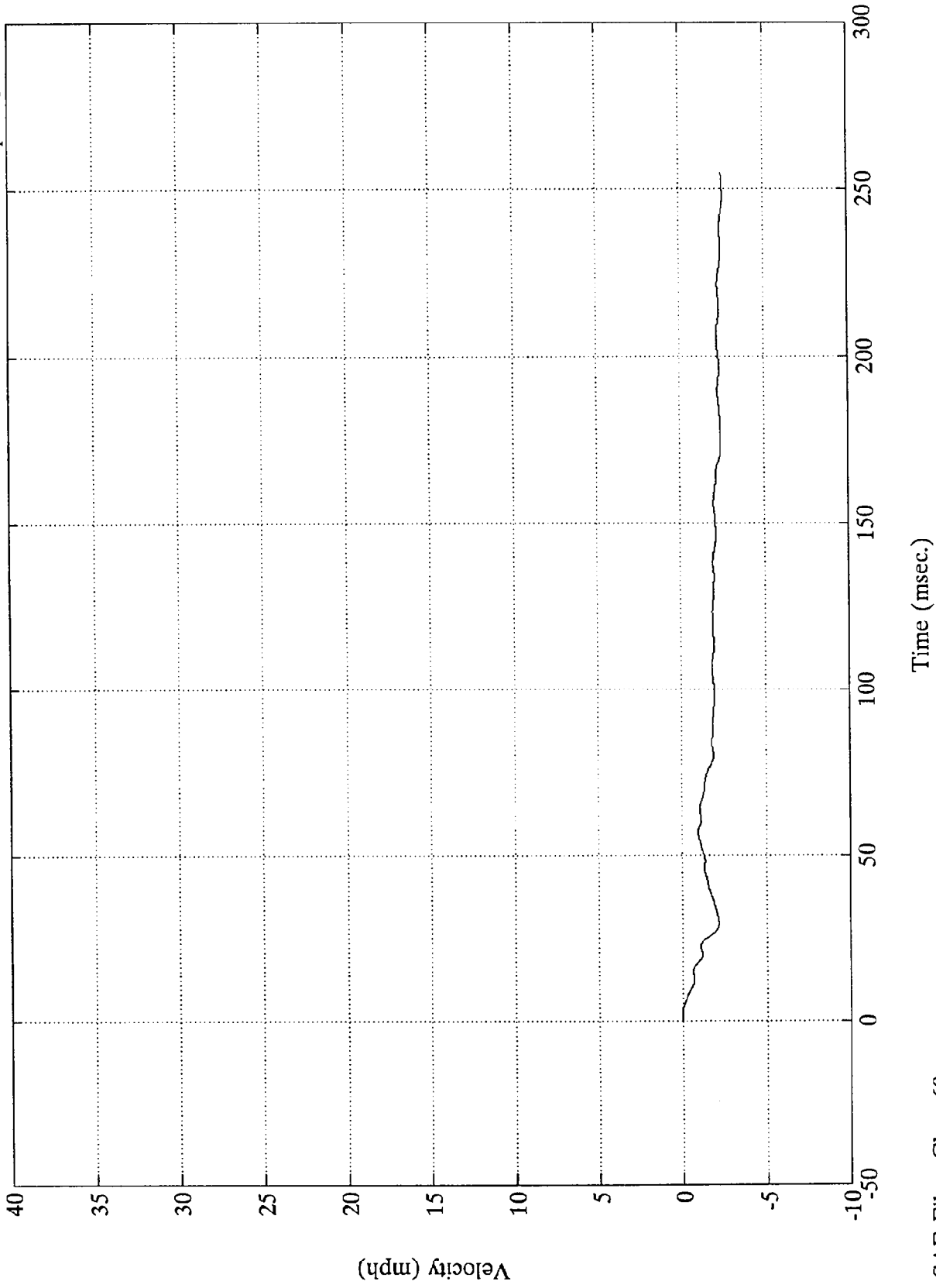
V1 Right Front Sill X



NCAP Side Impact Test #1

V1 Right Front Sill X

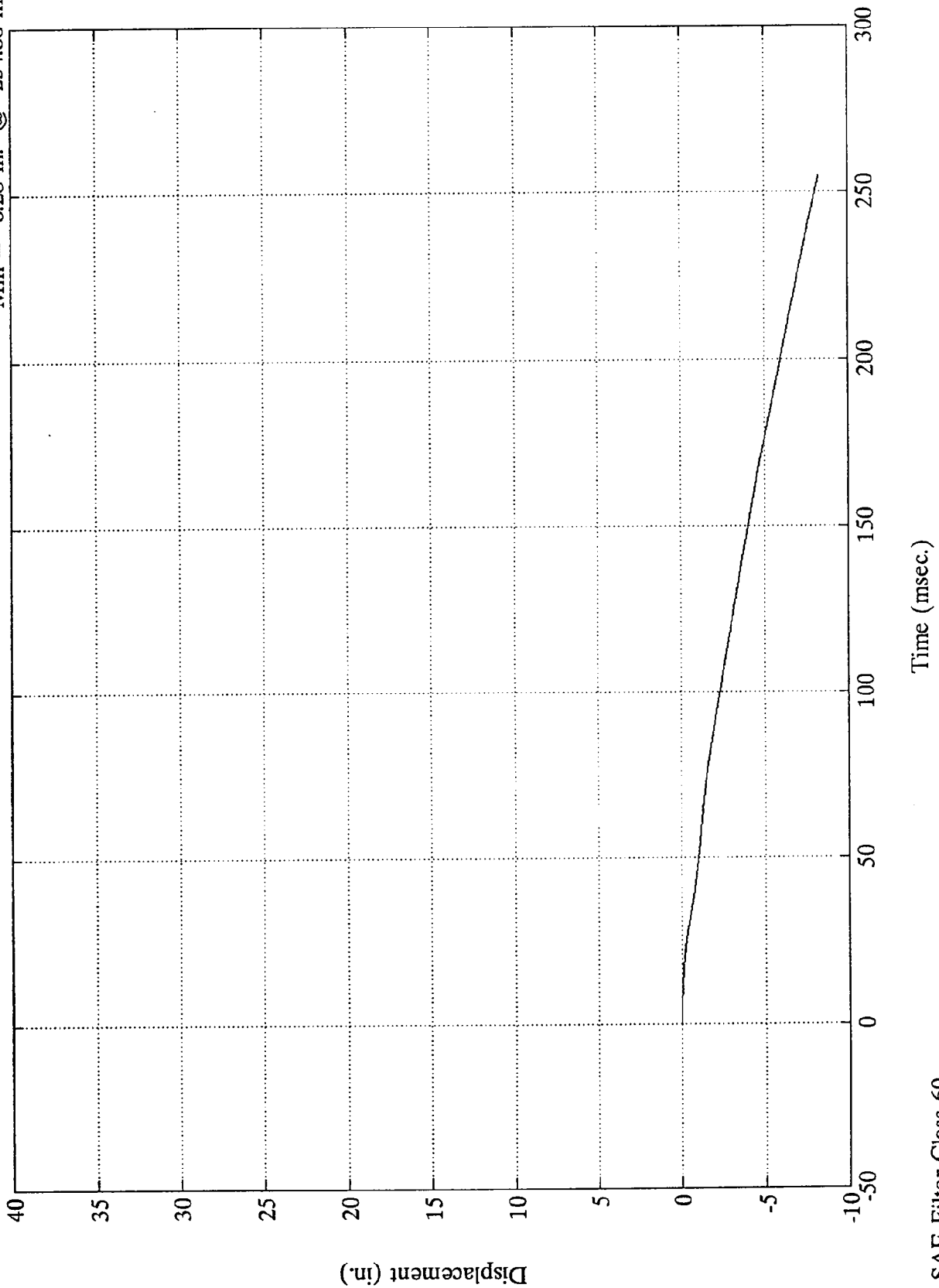
Max = 0.03 mph @ 2.16 msec
Min = -2.60 mph @ 247.68 msec



NCAP Side Impact Test #1

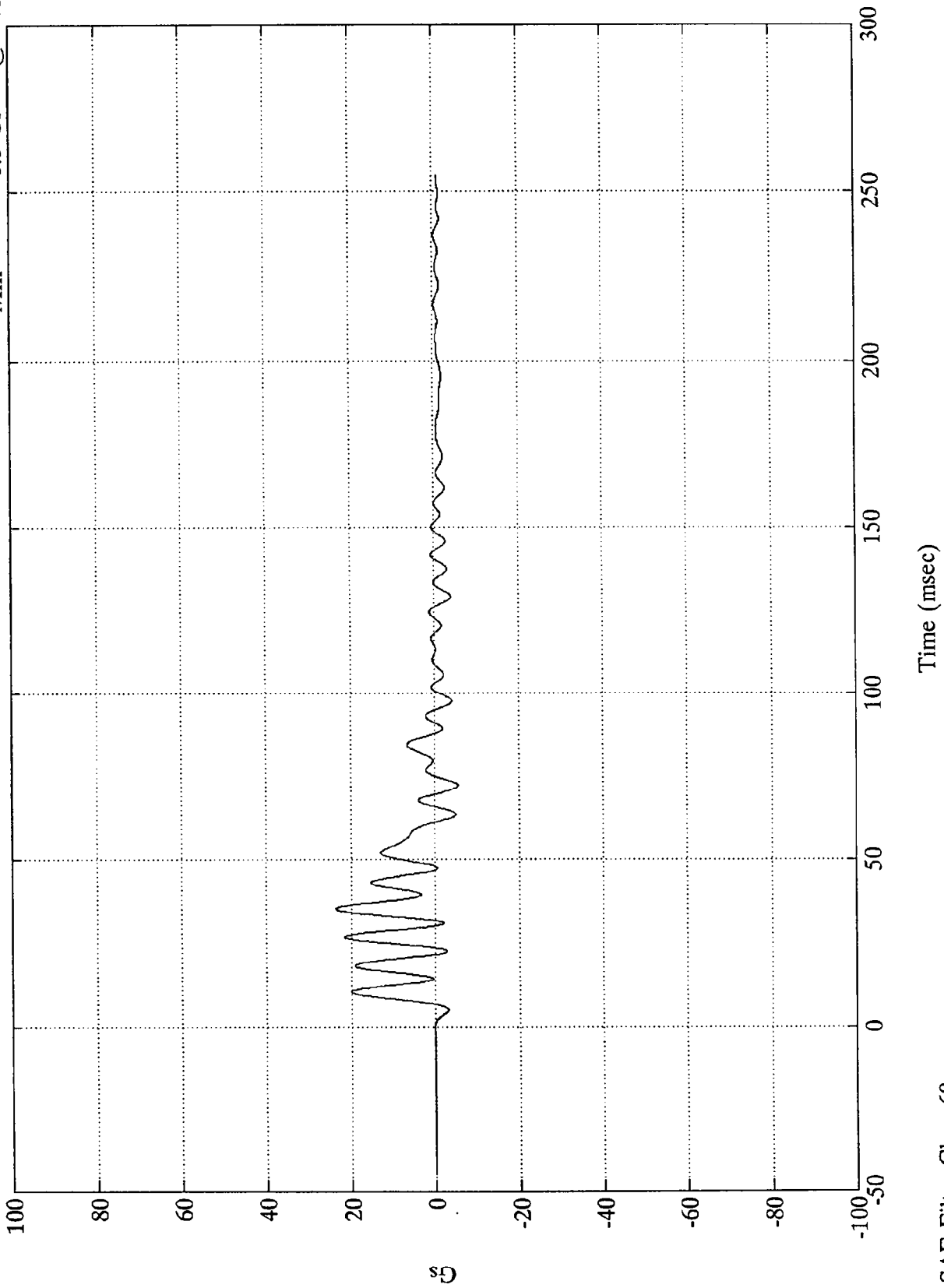
V1 Right Front Sill X

Max = 0.00 in. @ 3.84 msec
Min = -8.28 in. @ 254.88 msec



NCAP Side Impact Test #1

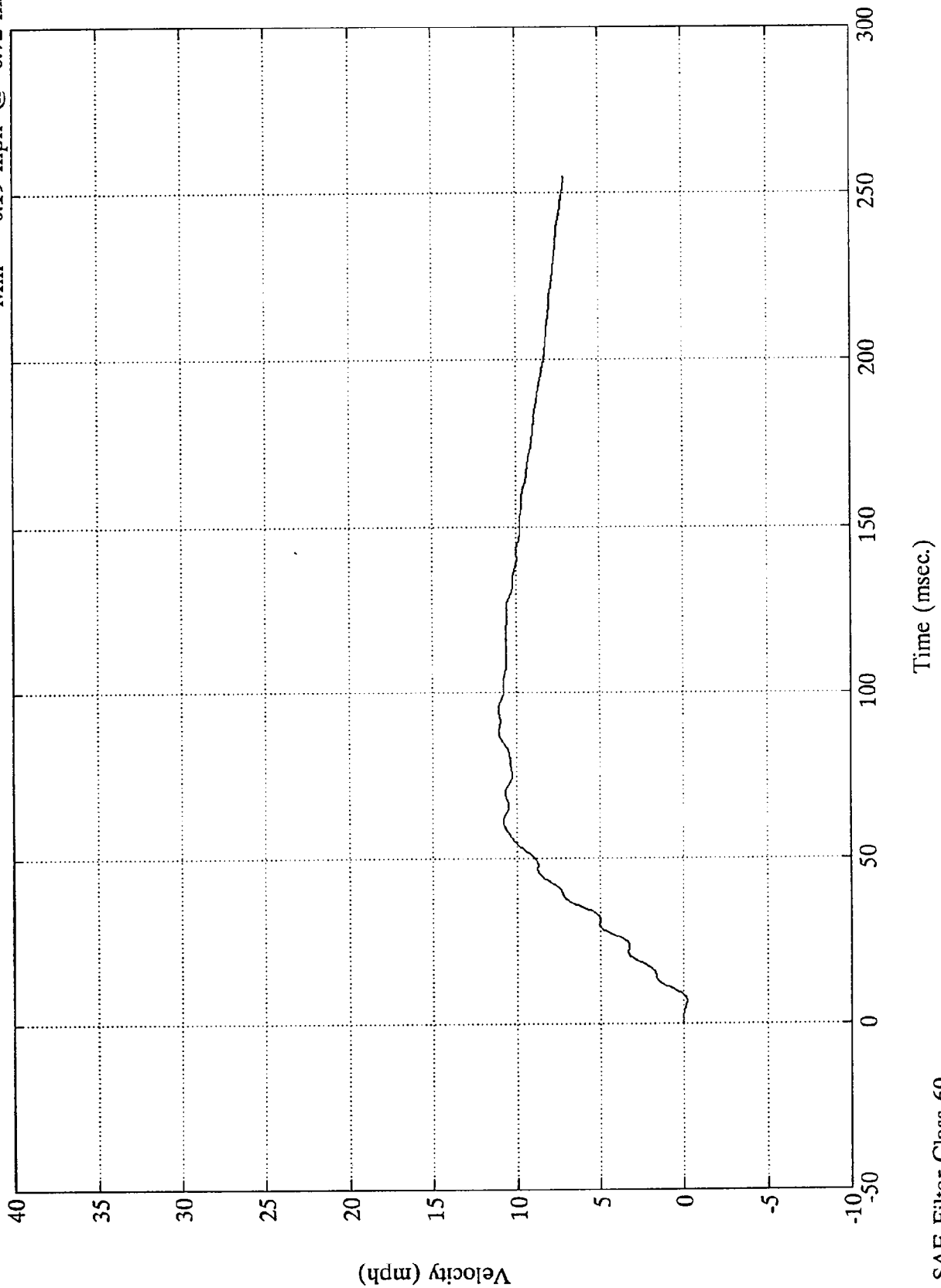
V1 Right Front Sill Y
Max = 23.6 Gs @ 35.15 msec
Min = -5.5 Gs @ 72.12 msec



NCAP Side Impact Test #1

V1 Right Front Sill Y

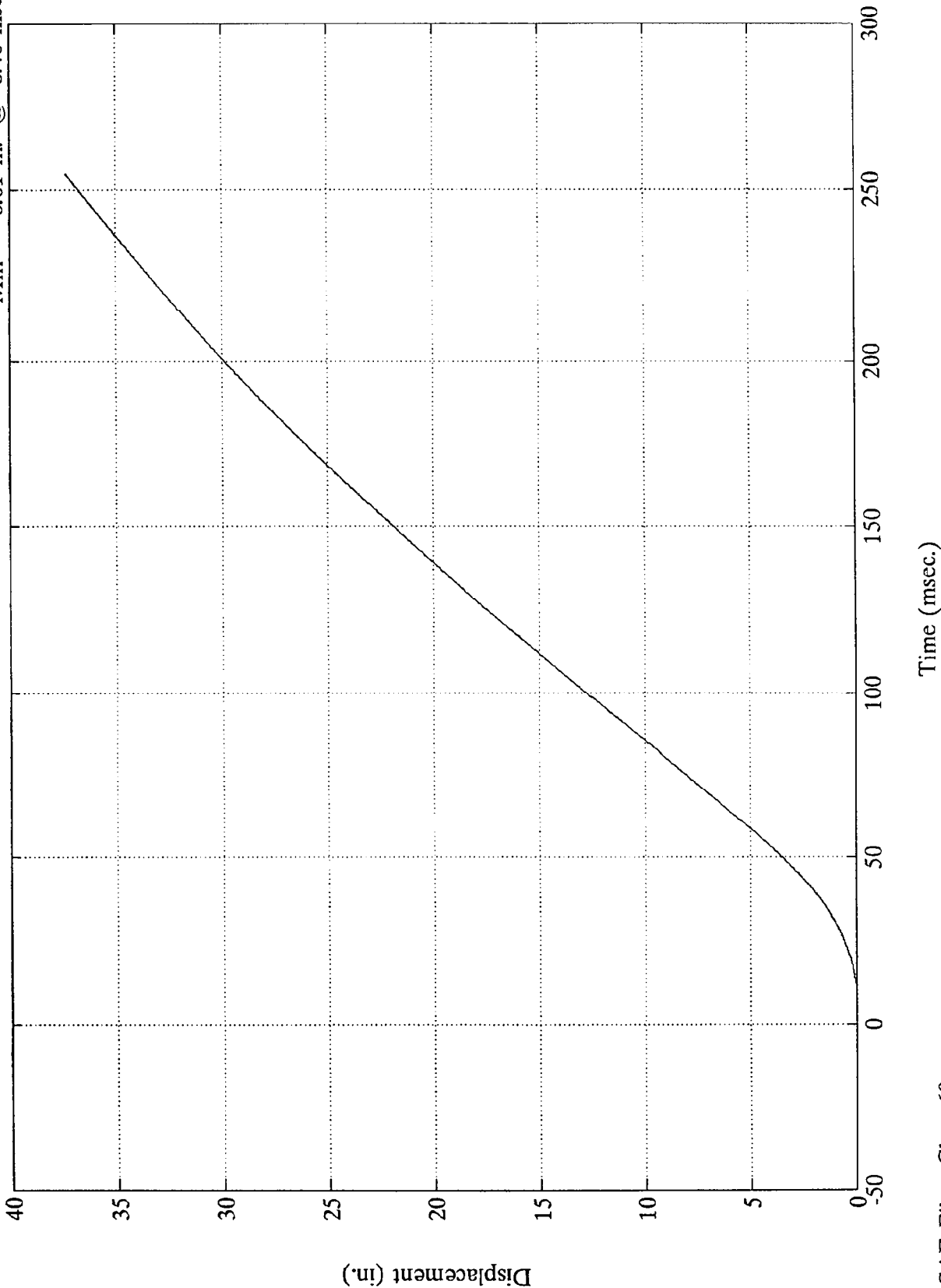
Max = 11.05 mph @ 95.28 msec
Min = -0.19 mph @ 6.72 msec



NCAP Side Impact Test #1

V1 Right Front Sill Y

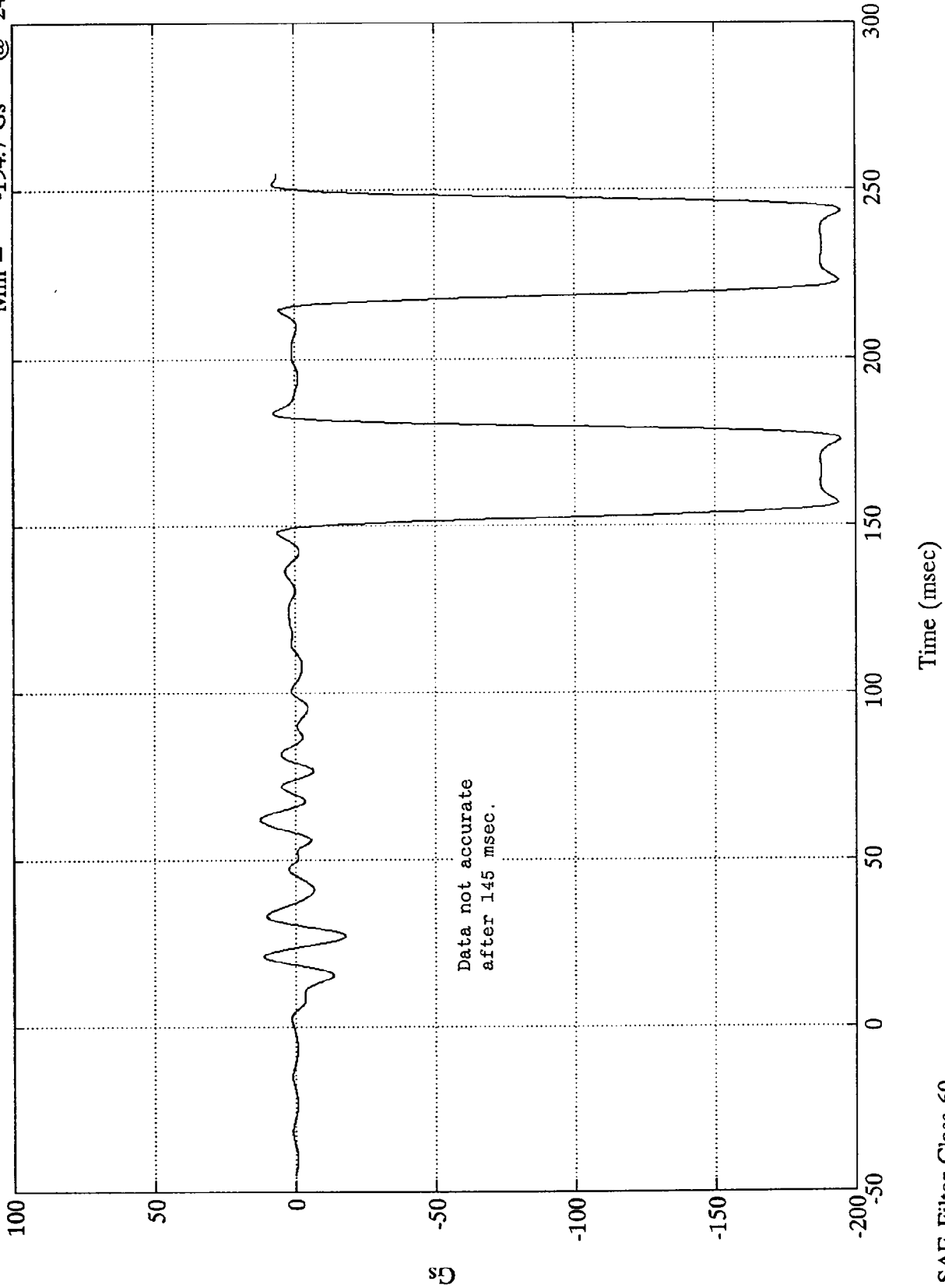
Max = 37.34 in. @ 254.88 msec
Min = -0.01 in. @ 8.40 msec



NCAP Side Impact Test #1

V1 Right Front Sill Z

Max = 12.5 Gs @ 62.04 msec
Min = -194.7 Gs @ 243.60 msec



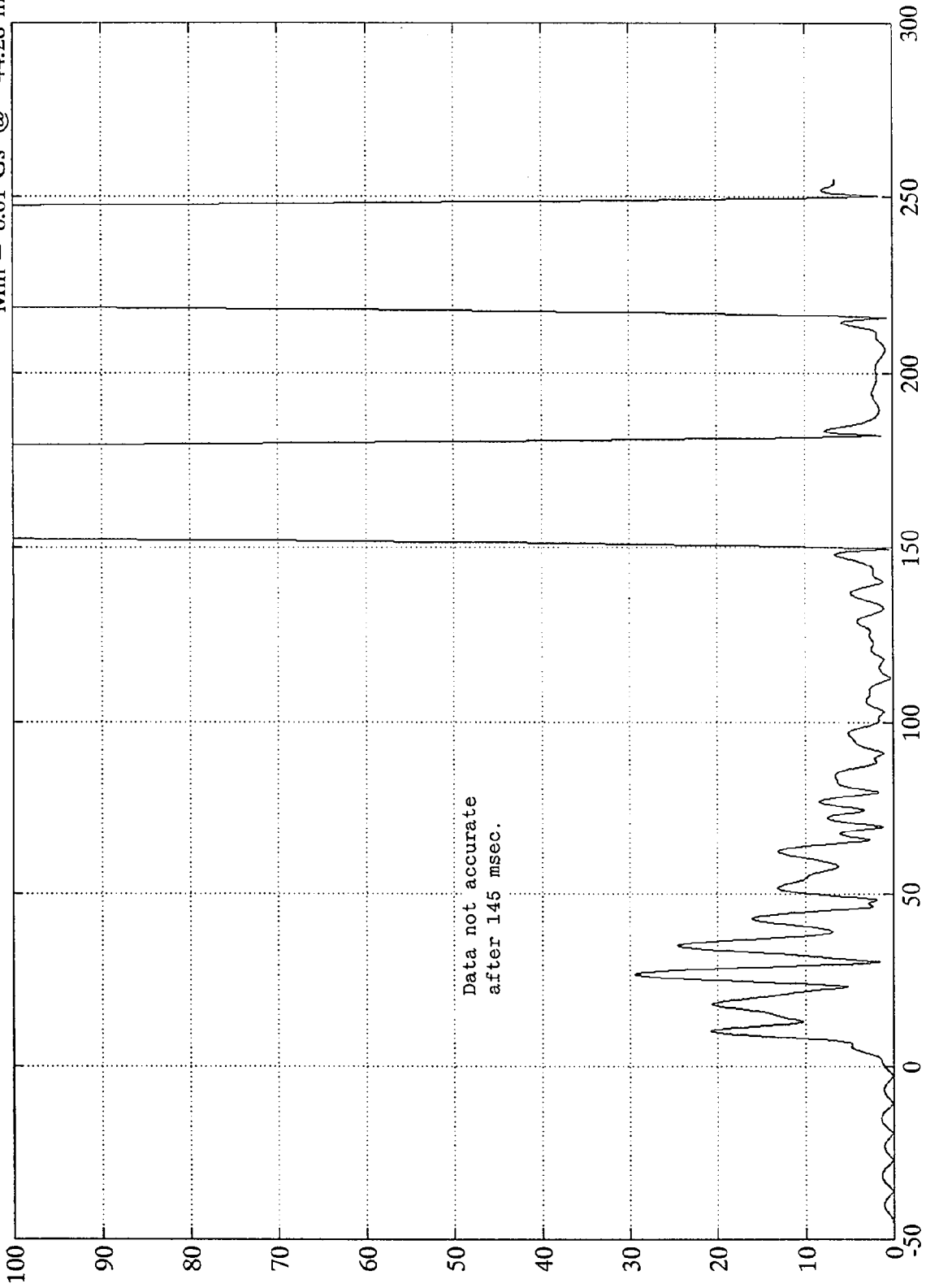
B-25

8017-1
SAE Filter Class 60

NCAP Side Impact Test #1

V1 Right Front Sill Resultant

Max = 194.71 Gs @ 243.60 msec
Min = 0.01 Gs @ -44.28 msec



Time (msec.)

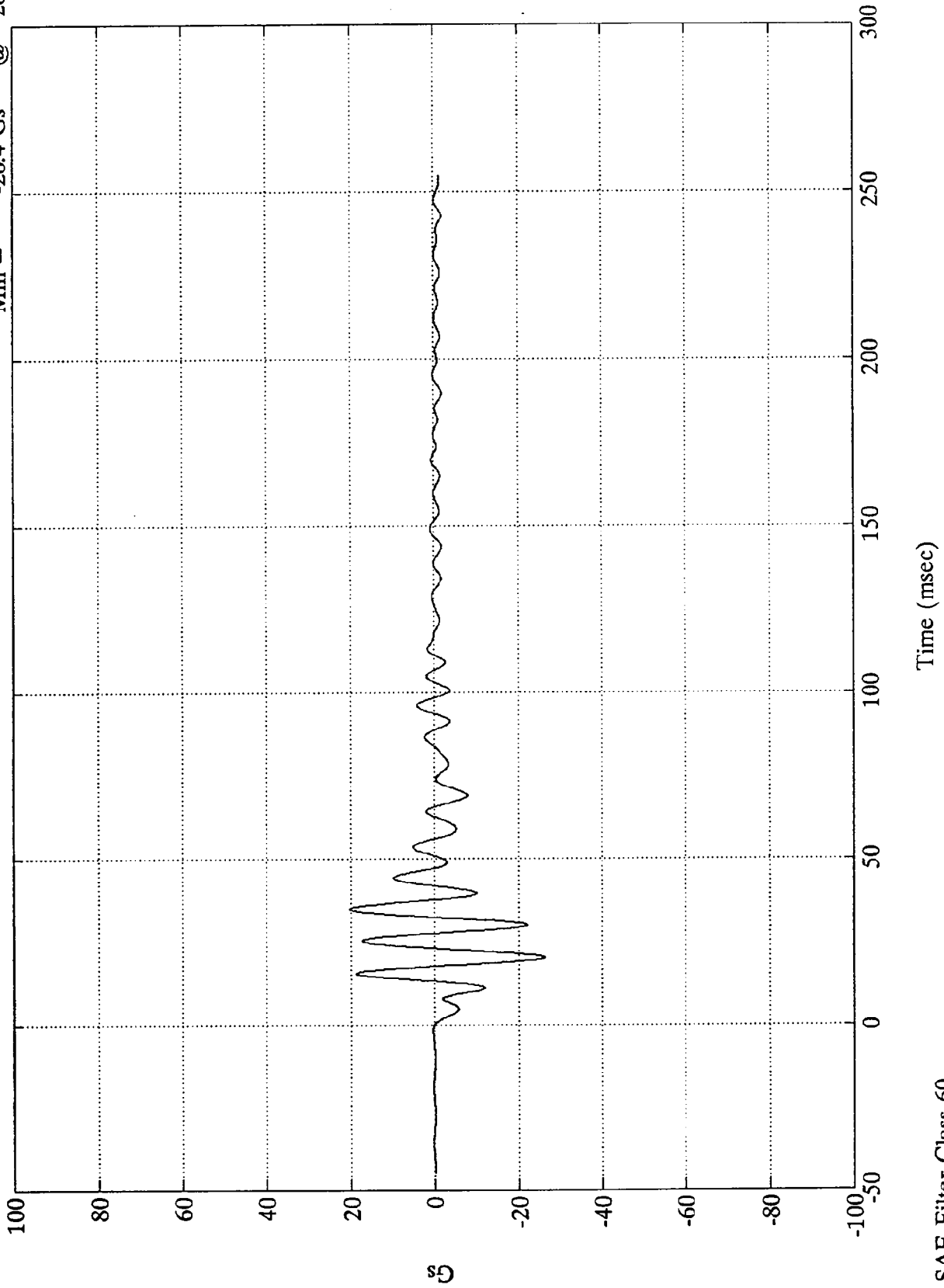
SAE Filter Class 60

8017-1

NCAP Side Impact Test #1

Max = 20.2 Gs @ 34.68 msec
Min = -26.4 Gs @ 20.28 msec

V1 Right Rear Sill X



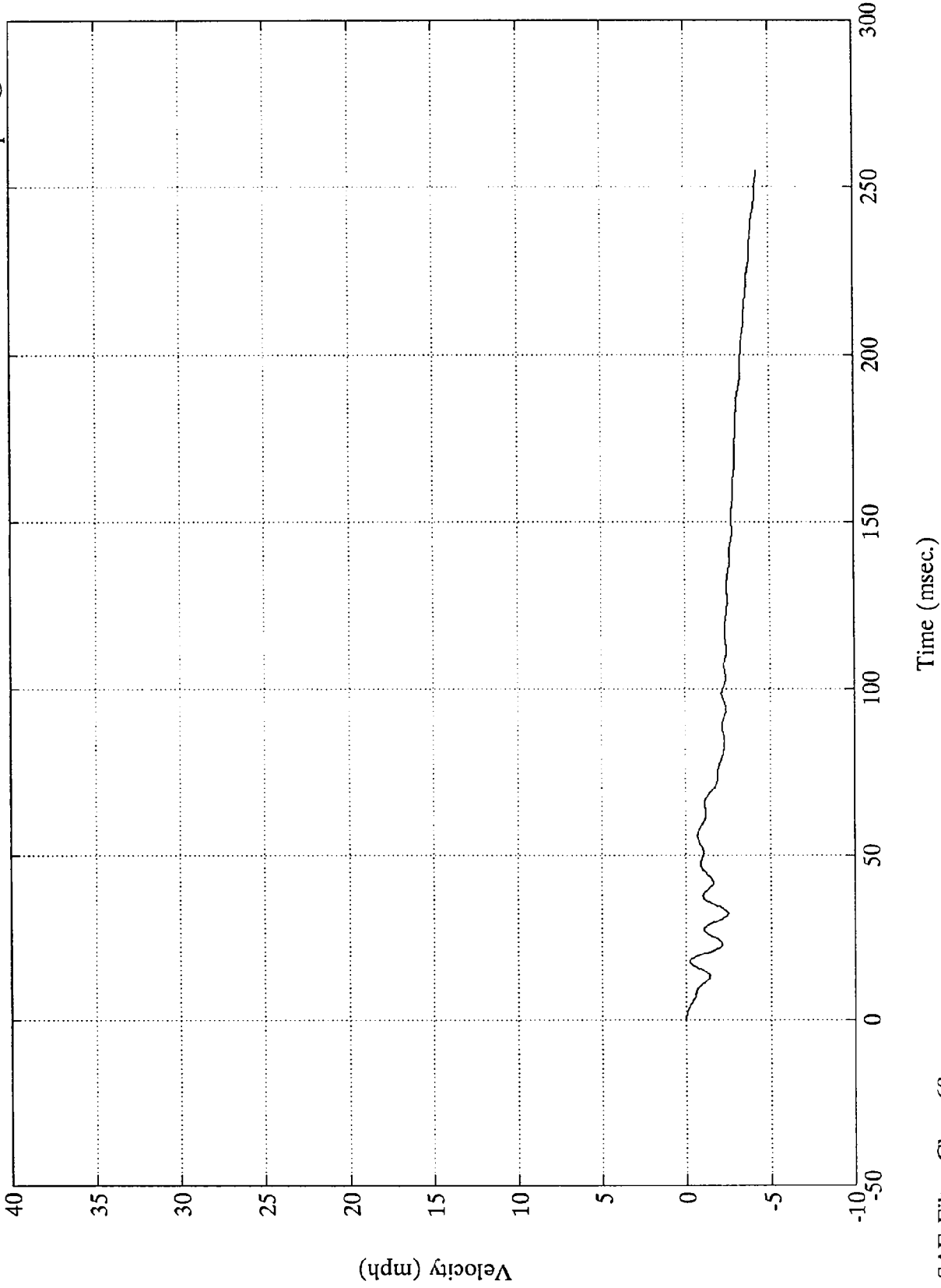
B-27

8017-1
SAE Filter Class 60

NCAP Side Impact Test #1

V1 Right Rear Sill X

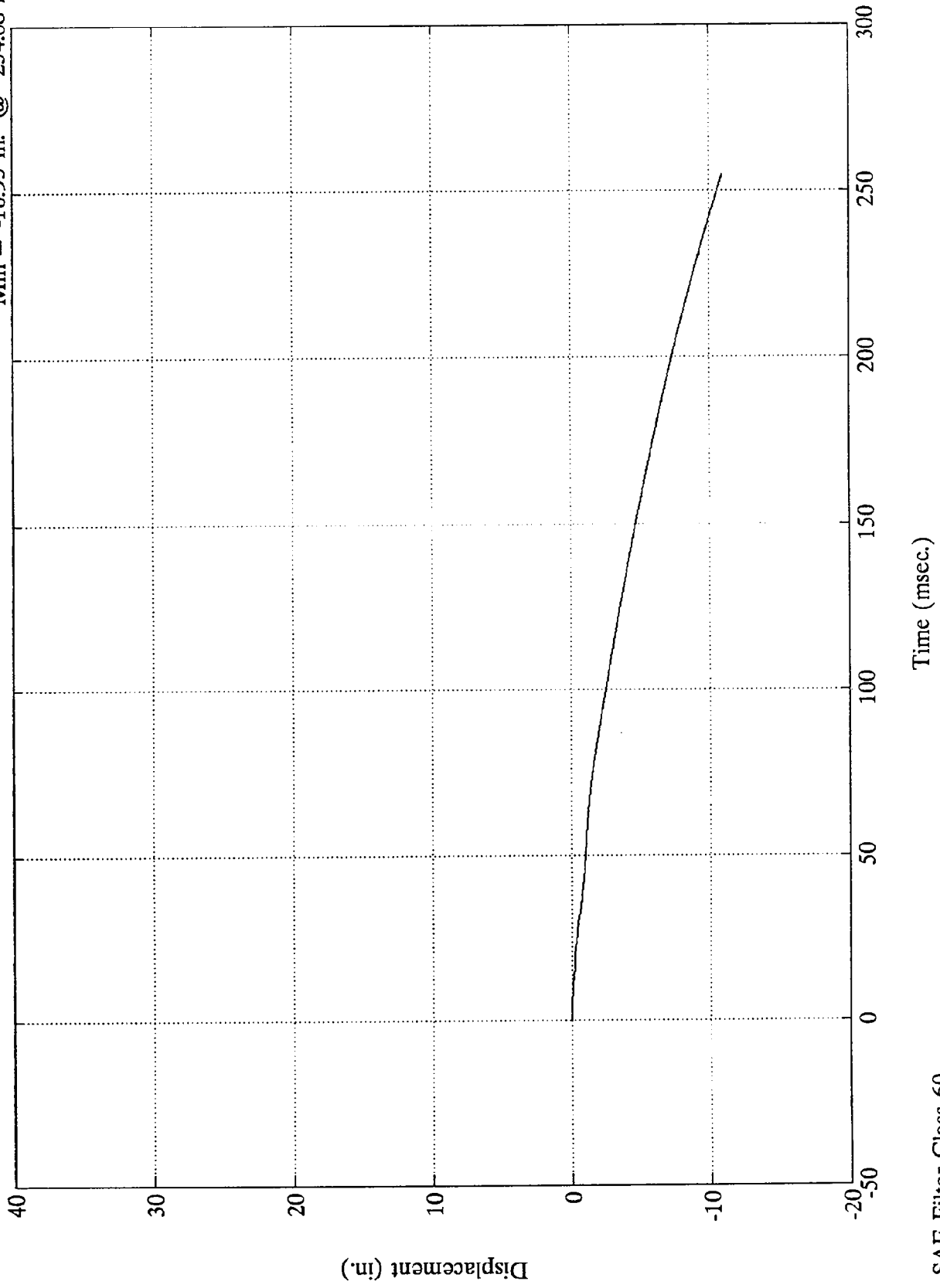
Max = 0.00 mph @ -0.00 msec
Min = -4.31 mph @ 254.88 msec



NCAP Side Impact Test #1

V1 Right Rear Sill X

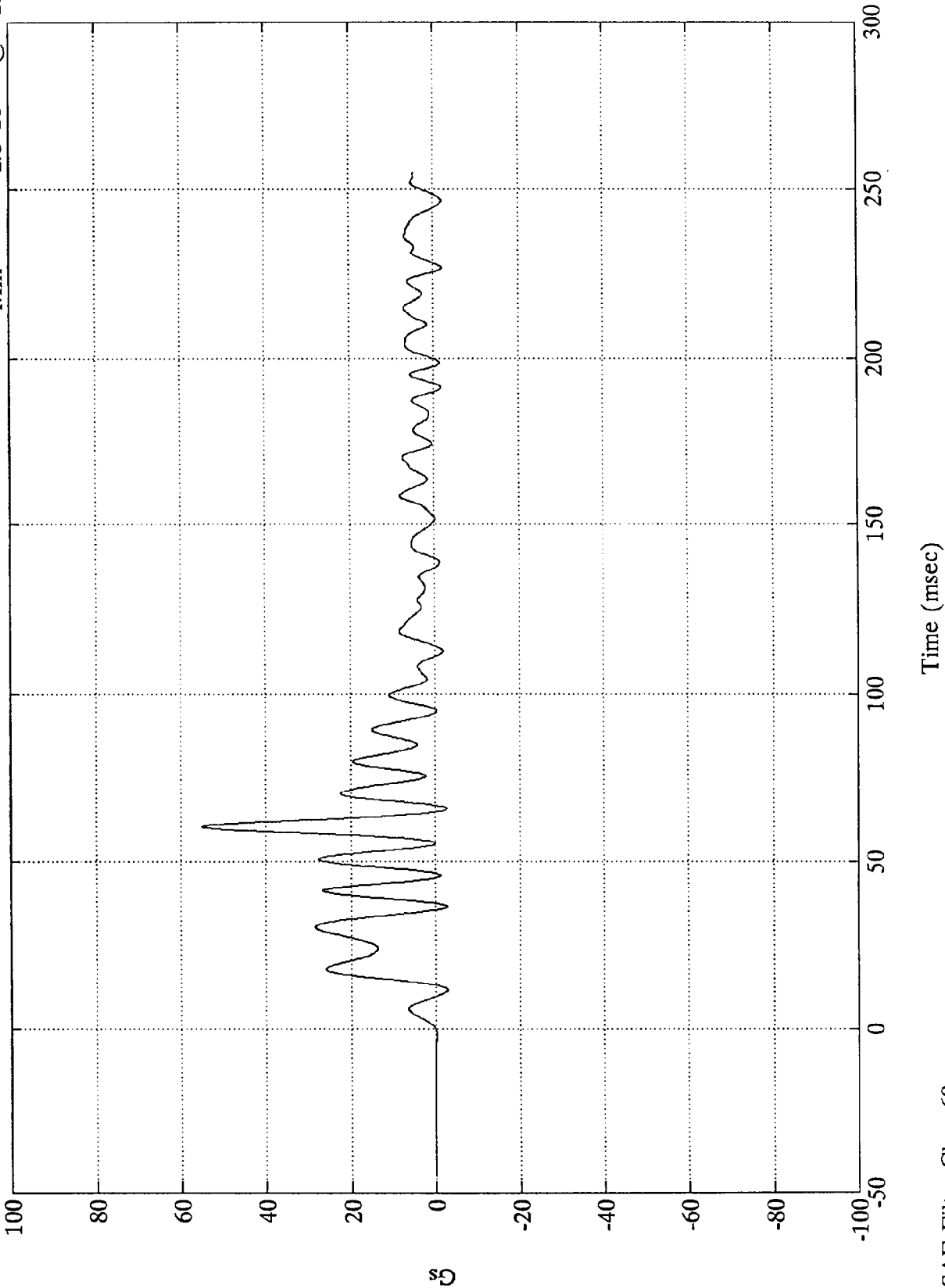
Max = 0.00 in. @ -0.00 msec
Min = -10.95 in. @ 254.88 msec



NCAP Side Impact Test #1

V1 Right Rear Sill Y

Max = 54.9 Gs @ 60.48 msec
Min = -2.8 Gs @ 11.63 msec



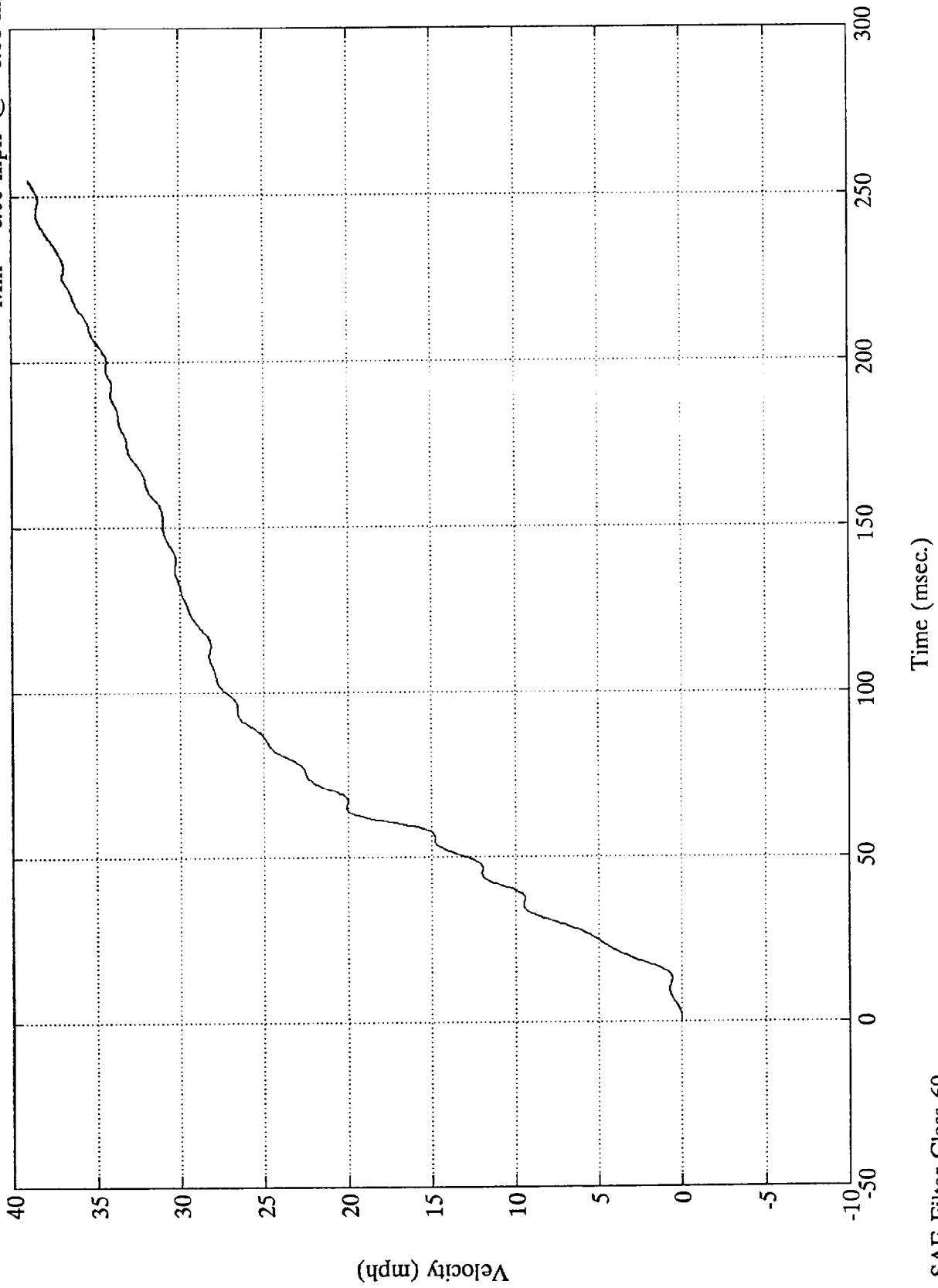
B-30

8017-1
SAE Filter Class 60

NCAP Side Impact Test #1

V1 Right Rear Sill Y

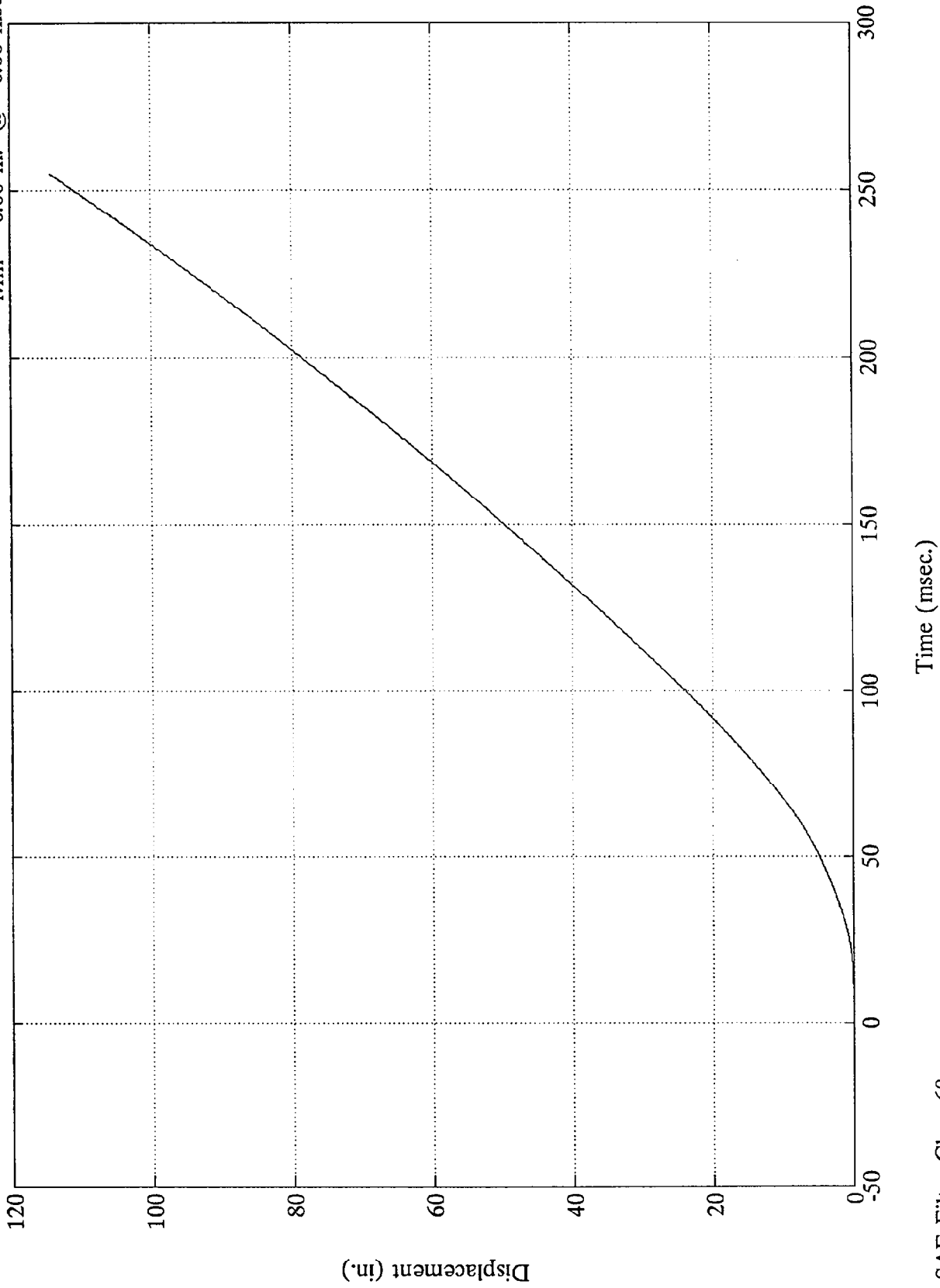
Max = 38.95 mph @ 254.88 msec
Min = 0.00 mph @ -0.00 msec



NCAP Side Impact Test #1

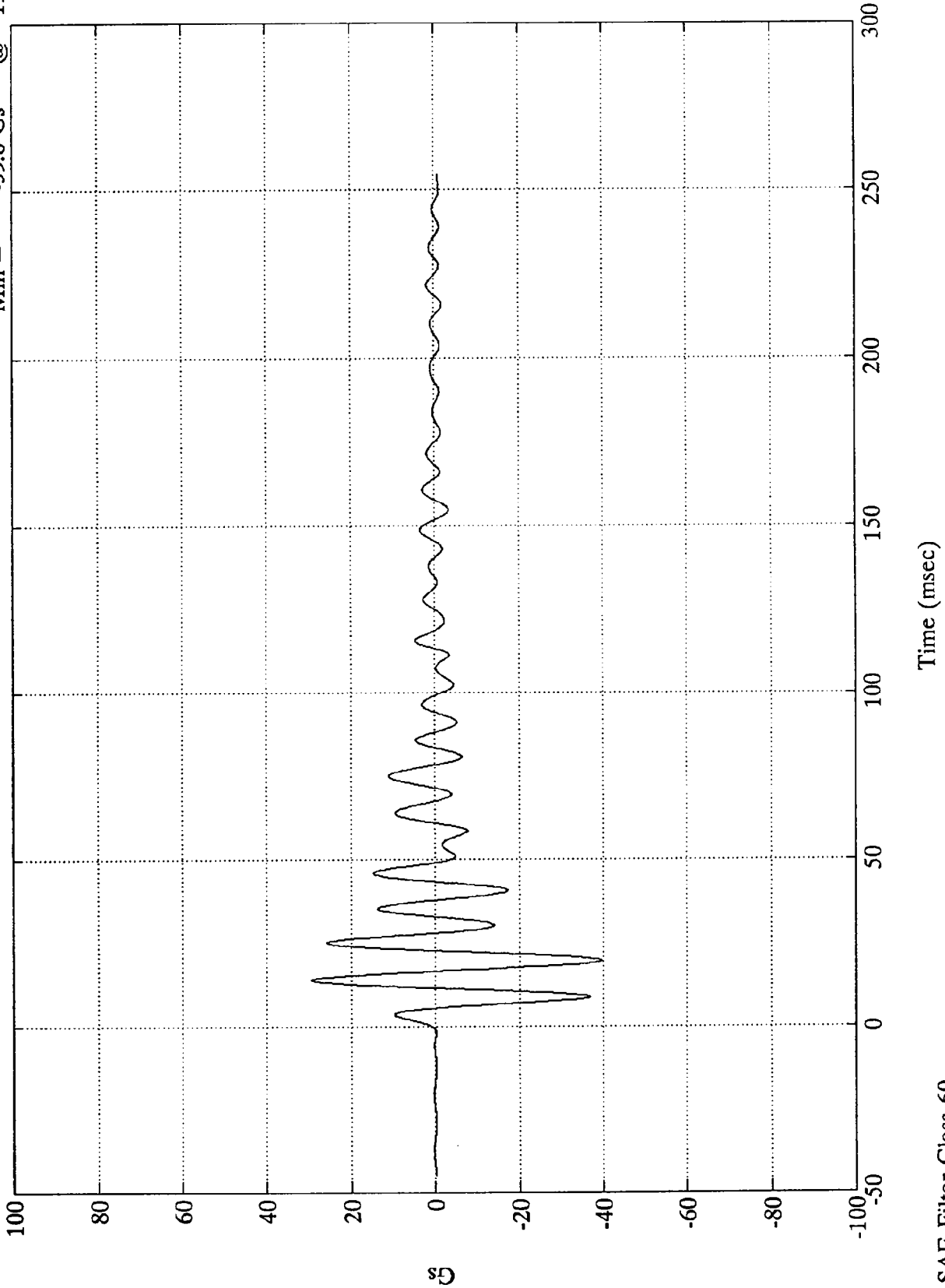
V1 Right Rear Sill Y

Max = 114.20 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



NCAP Side Impact Test #1

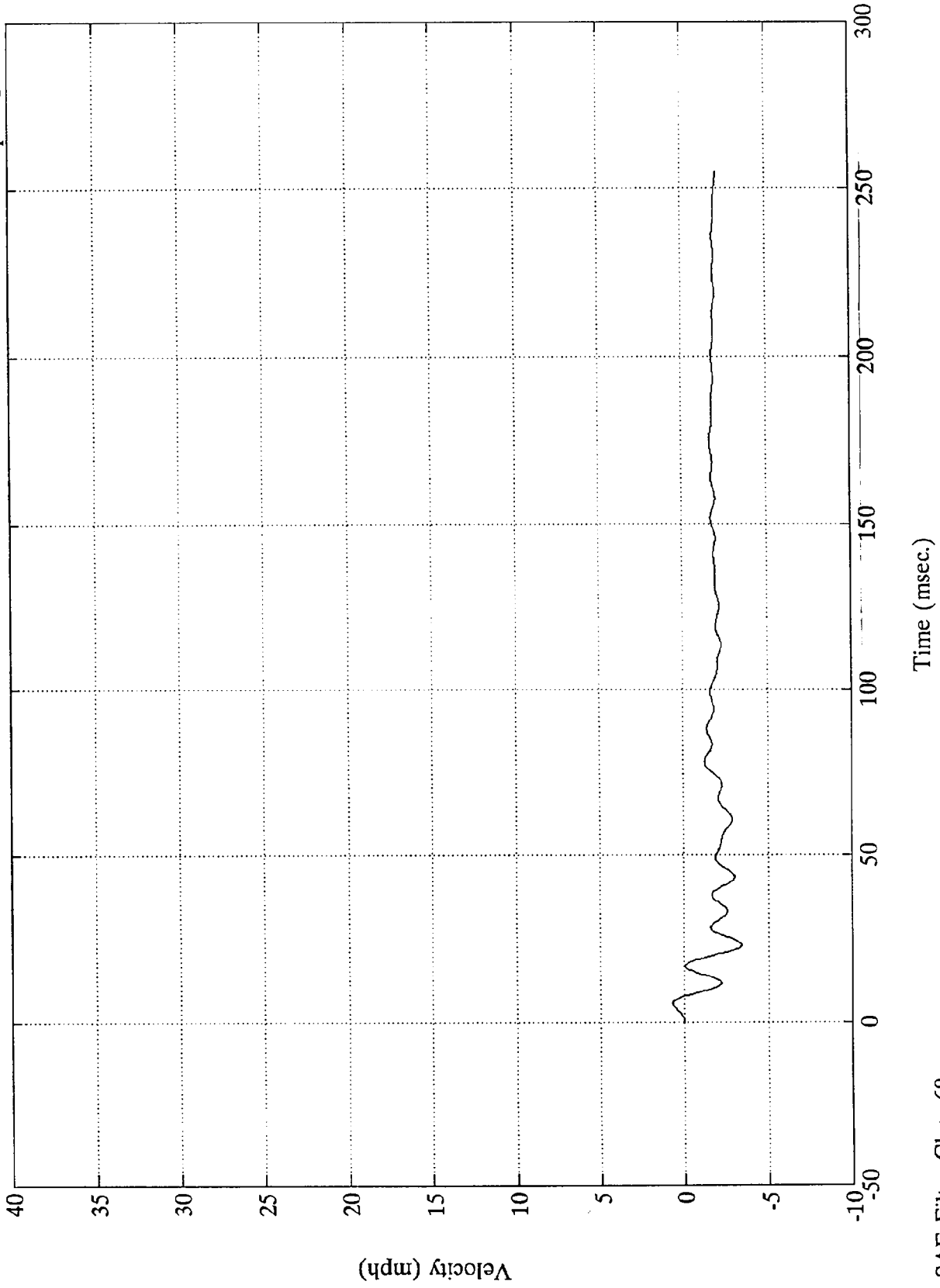
V1 Right Rear Sill Z
Max = 29.5 Gs @ 14.03 msec
Min = -39.6 Gs @ 19.79 msec



NCAP Side Impact Test #1

Max = 0.70 mph @ 5.52 msec
Min = -3.40 mph @ 22.80 msec

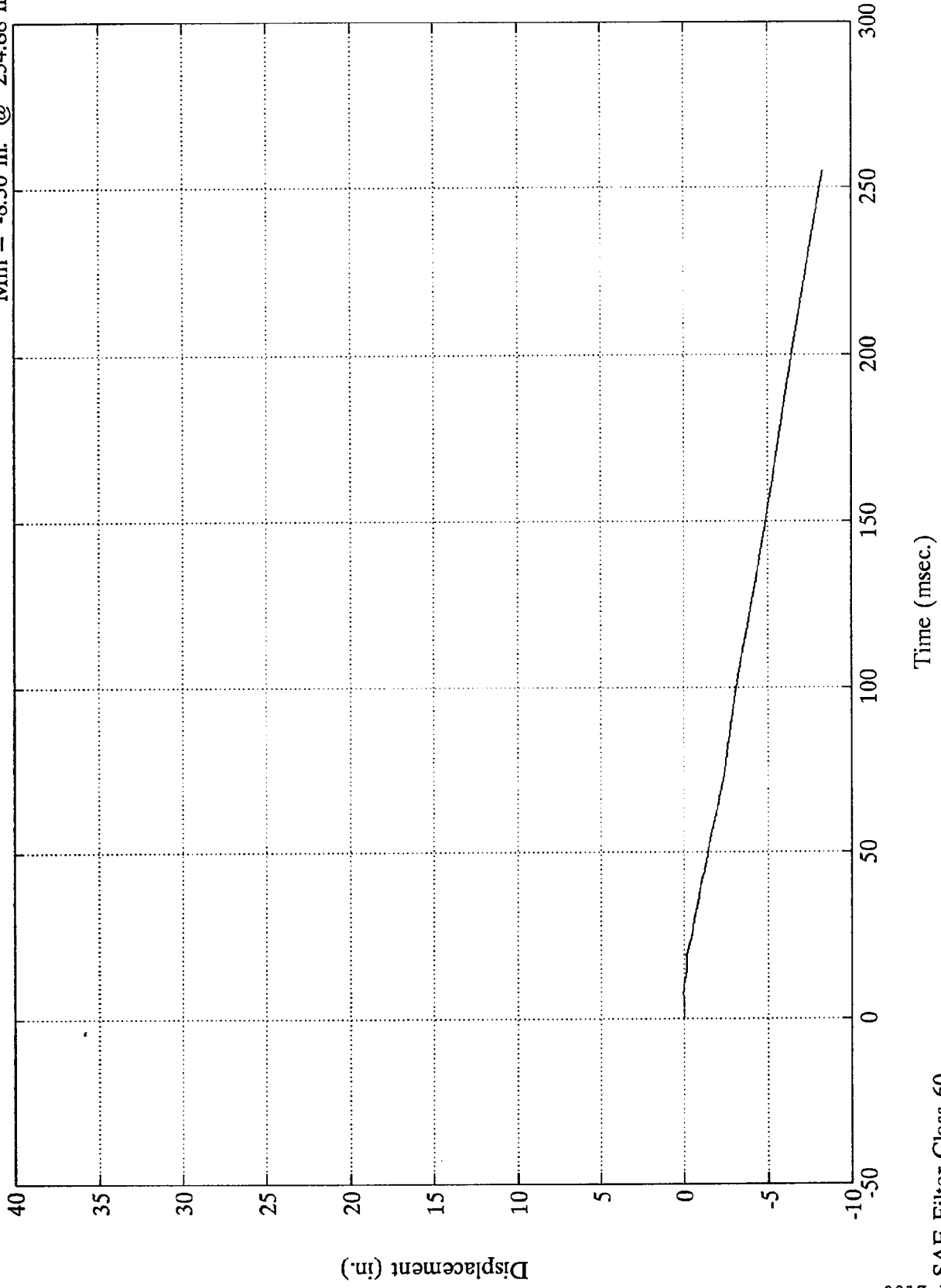
V1 Right Rear Sill Z



NCAP Side Impact Test #1

V1 Right Rear Sill Z

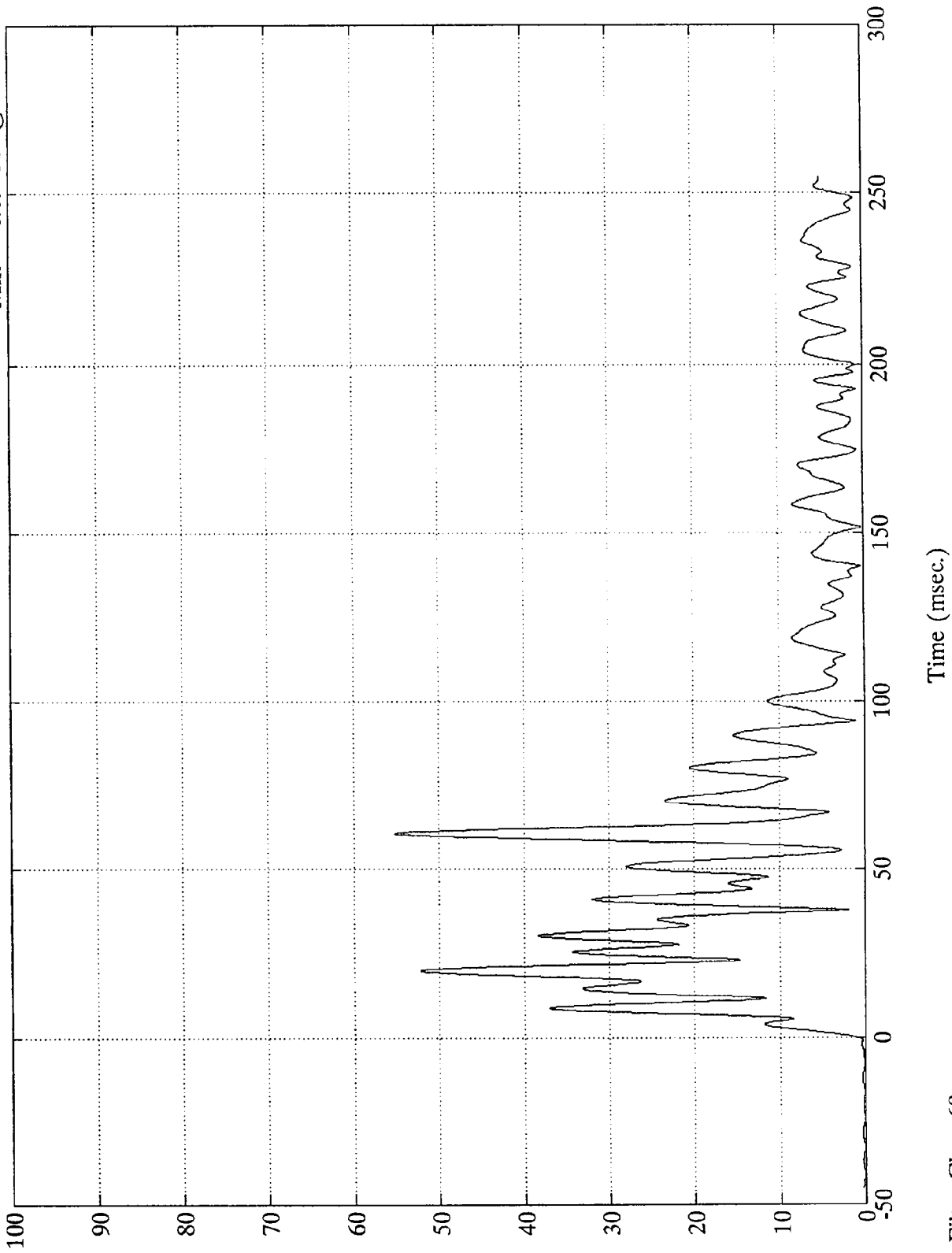
Max = 0.05 in. @ 7.68 msec
Min = -8.30 in. @ 254.88 msec



NCAP Side Impact Test #1

V1 Right Rear Sill Resultant

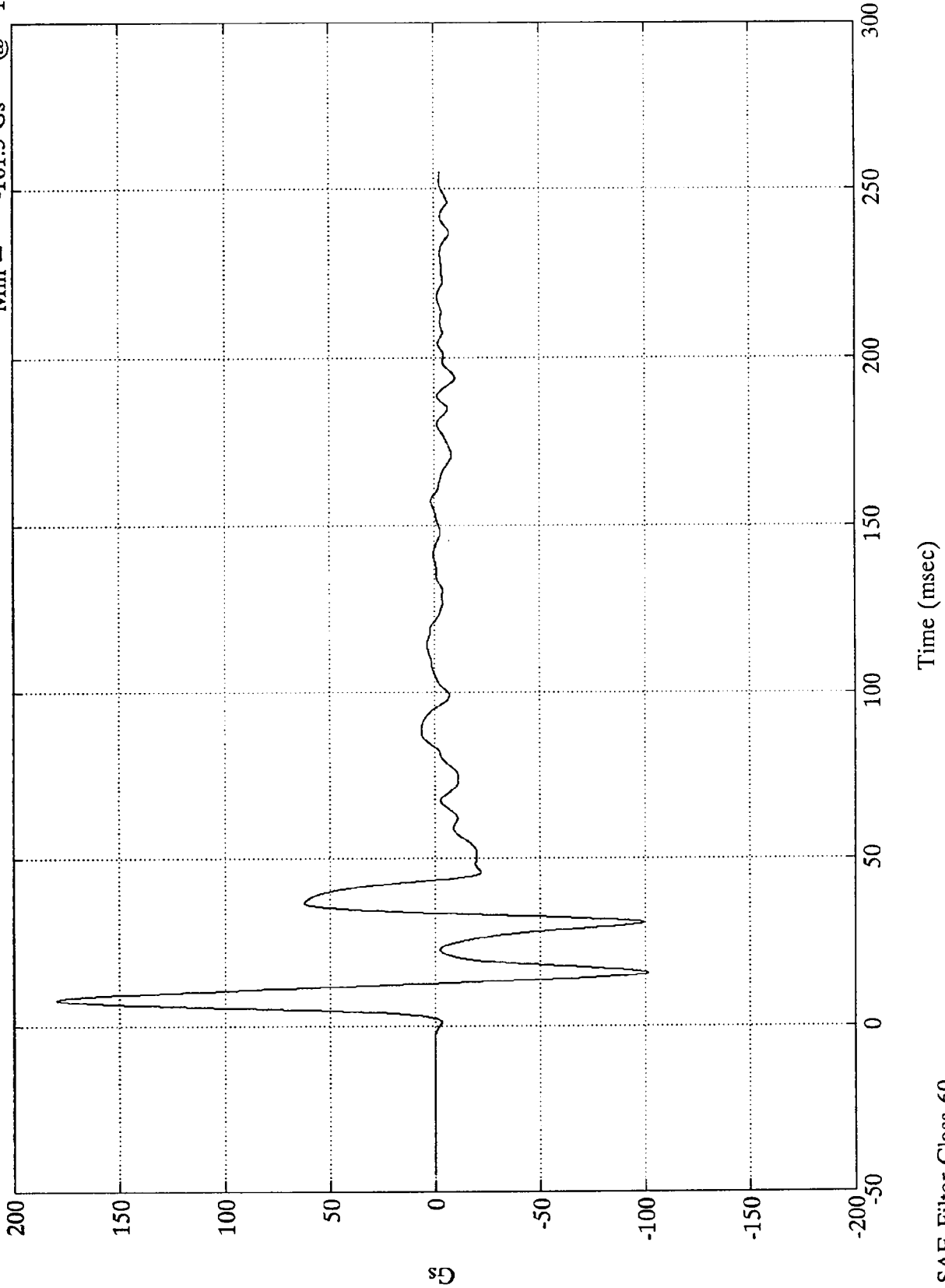
Max = 55.17 Gs @ 60.48 msec
Min = 0.09 Gs @ -24.24 msec



NCAP Side Impact Test #1

Max = 179.6 Gs @ 7.67 msec
Min = -101.5 Gs @ 15.95 msec

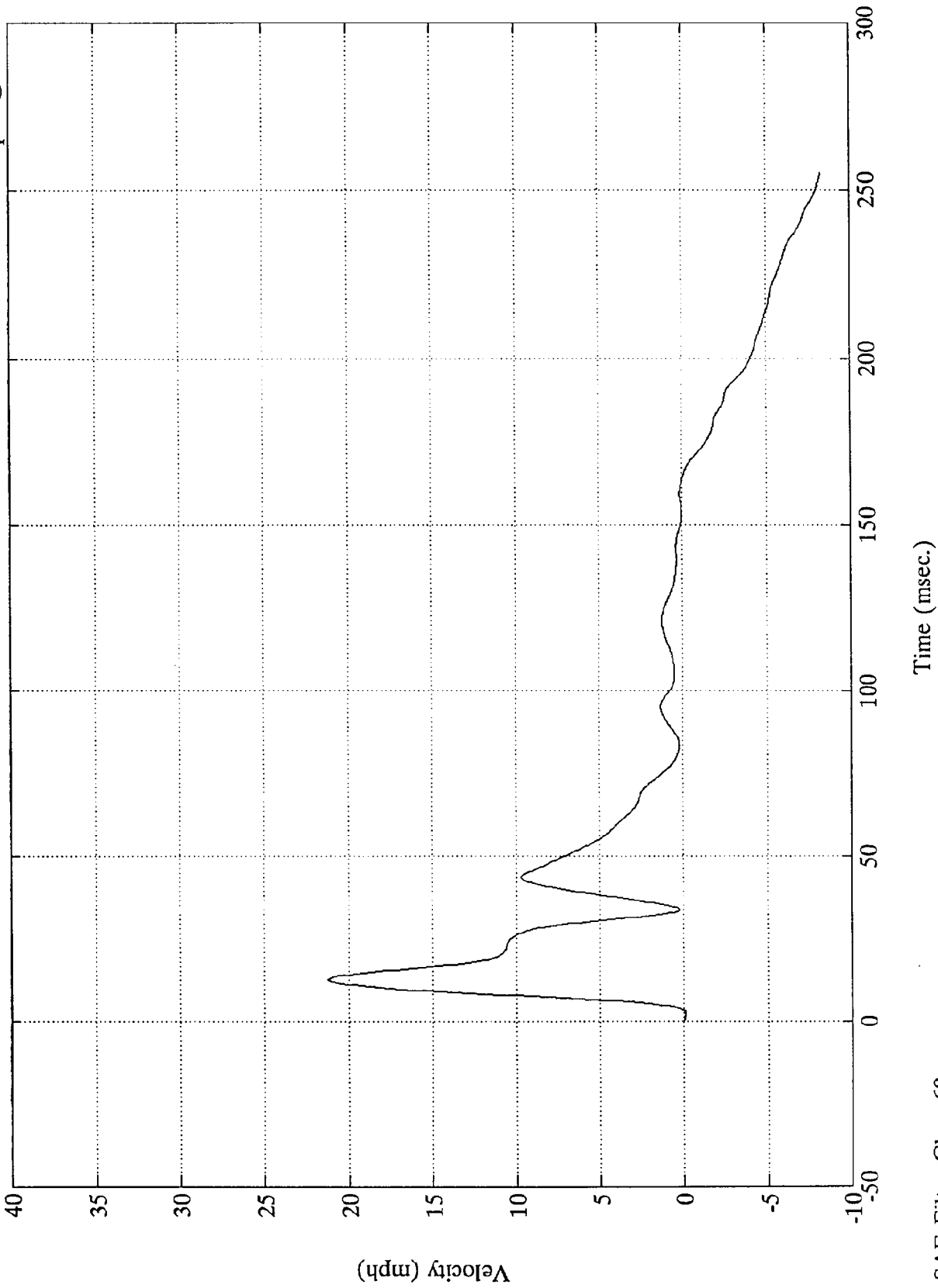
V1 L. Front Door Center Y



NCAP Side Impact Test #1

V1 L. Front Door Center Y

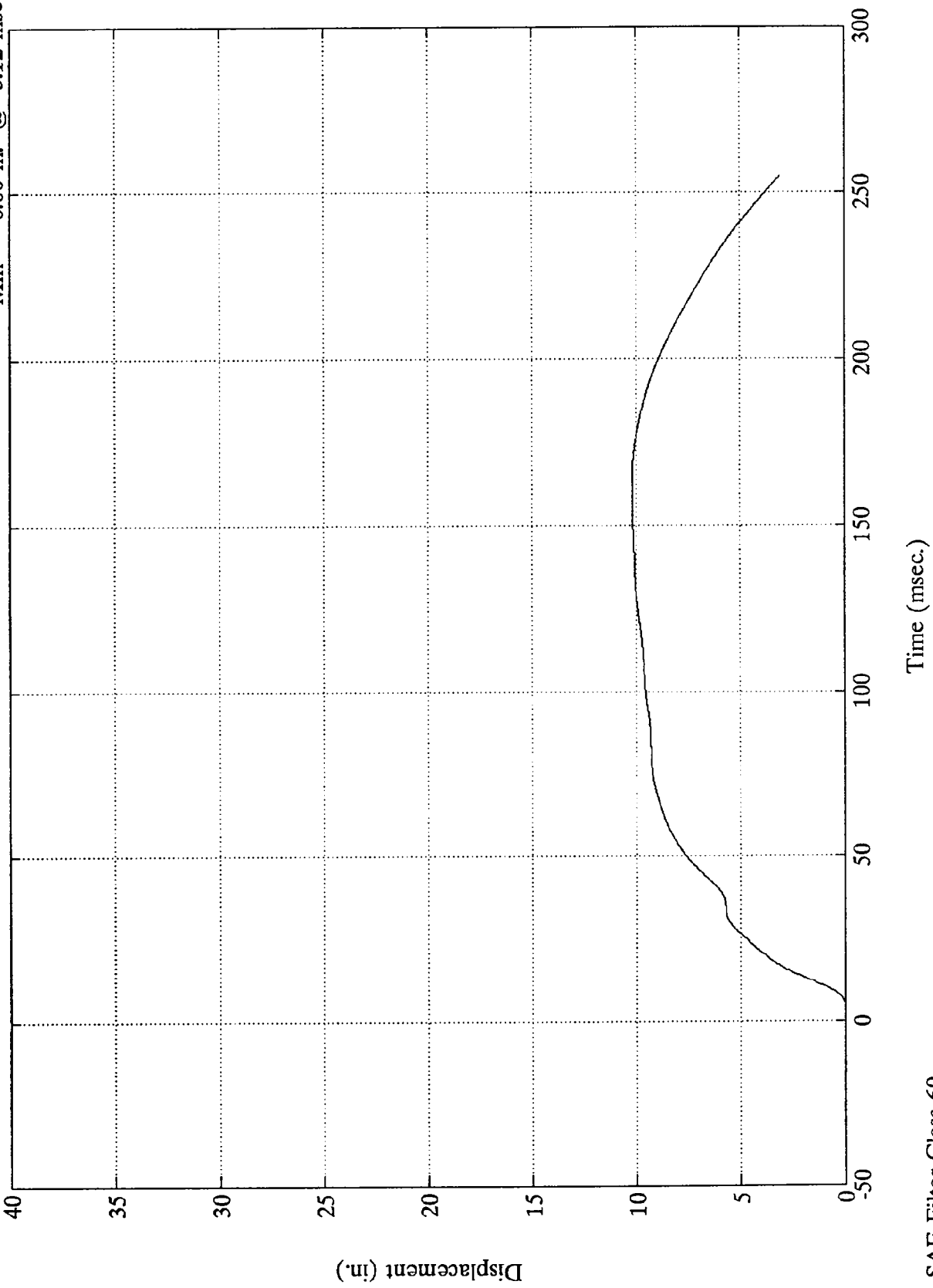
Max = 21.21 mph @ 12.48 msec
Min = -8.27 mph @ 254.88 msec



NCAP Side Impact Test #1

V1 L Front Door Center Y

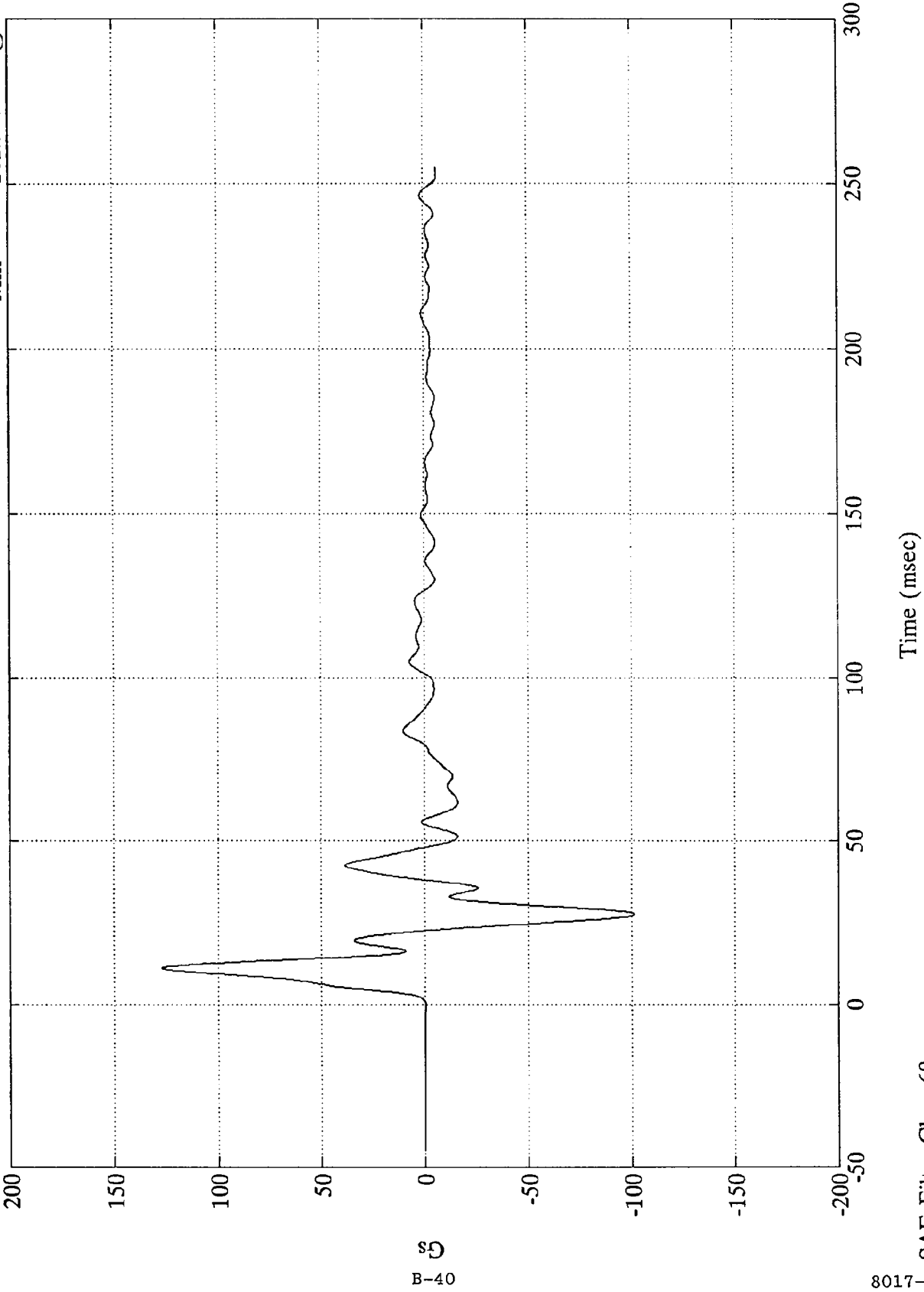
Max = 10.16 in. @ 166.80 msec
Min = -0.00 in. @ 3.12 msec



NCAP Side Impact Test #1

Max = 127.3 Gs @ 10.91 msec
Min = -101.5 Gs @ 27.36 msec

V1 L. Front Door Mid Y

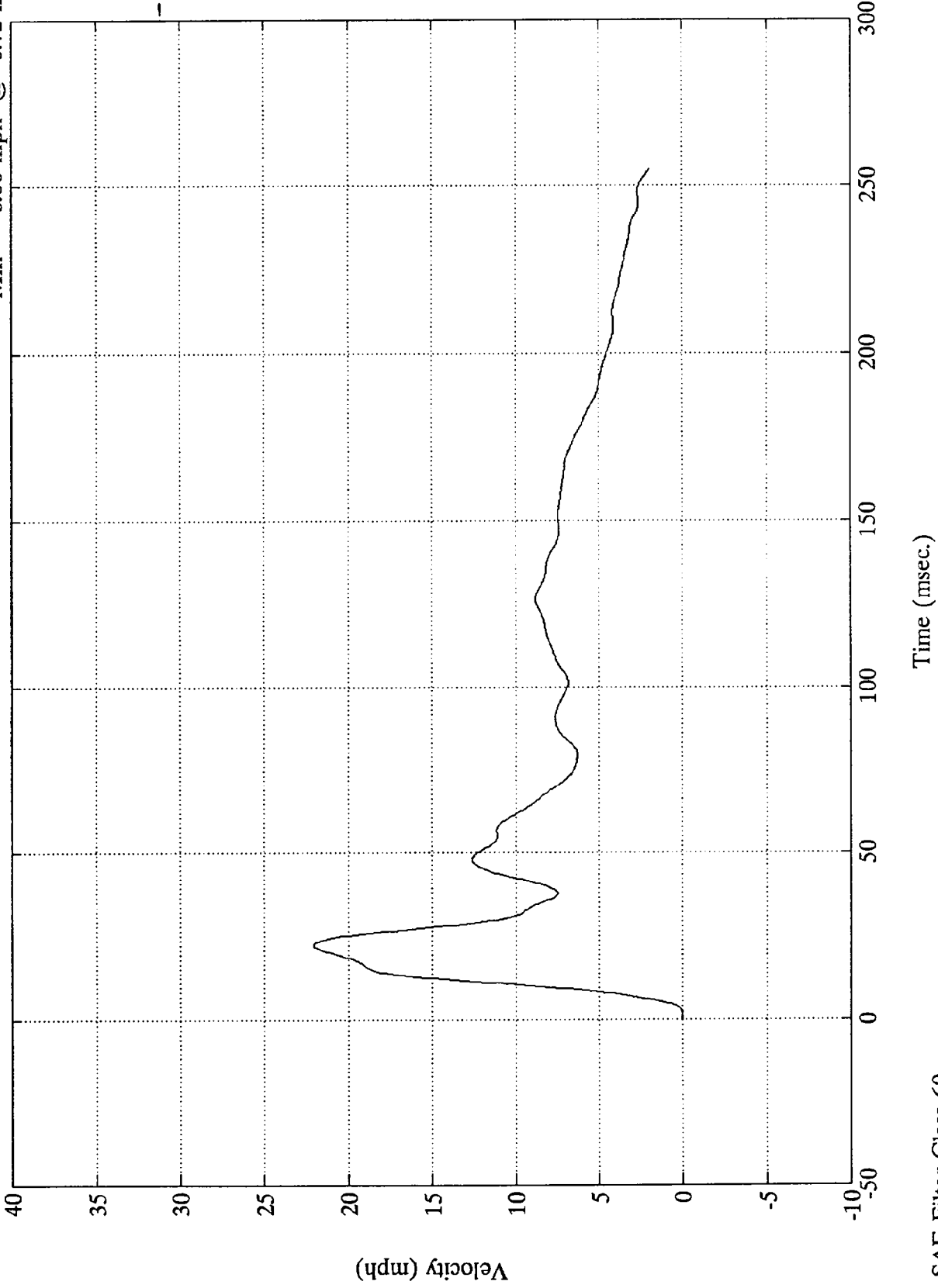


B-40

NCAP Side Impact Test #1

V1 L. Front Door Mid Y

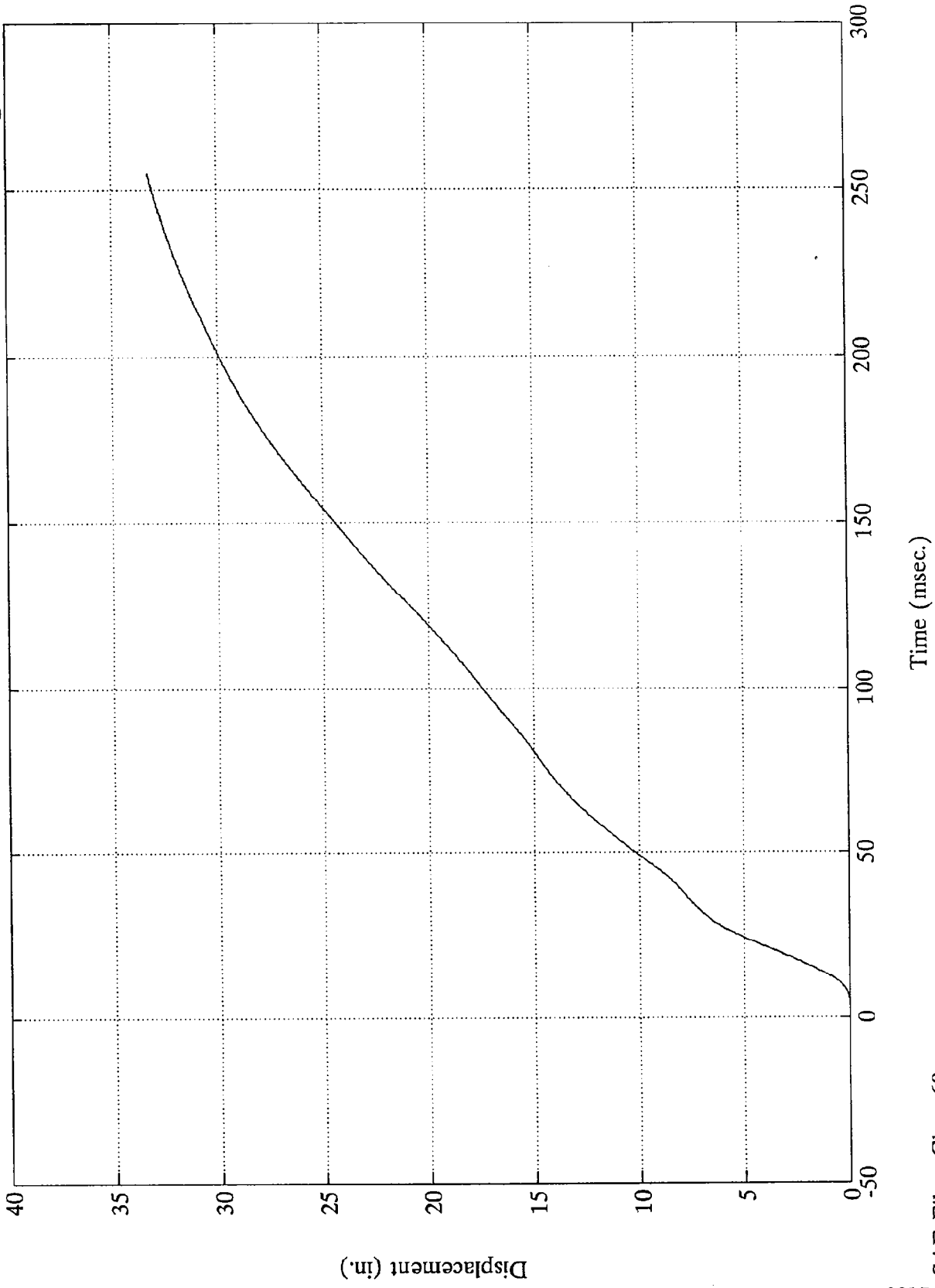
Max = 22.08 mph @ 22.56 msec
Min = -0.00 mph @ 0.72 msec



NCAP Side Impact Test #1

V1 L Front Door Mid Y

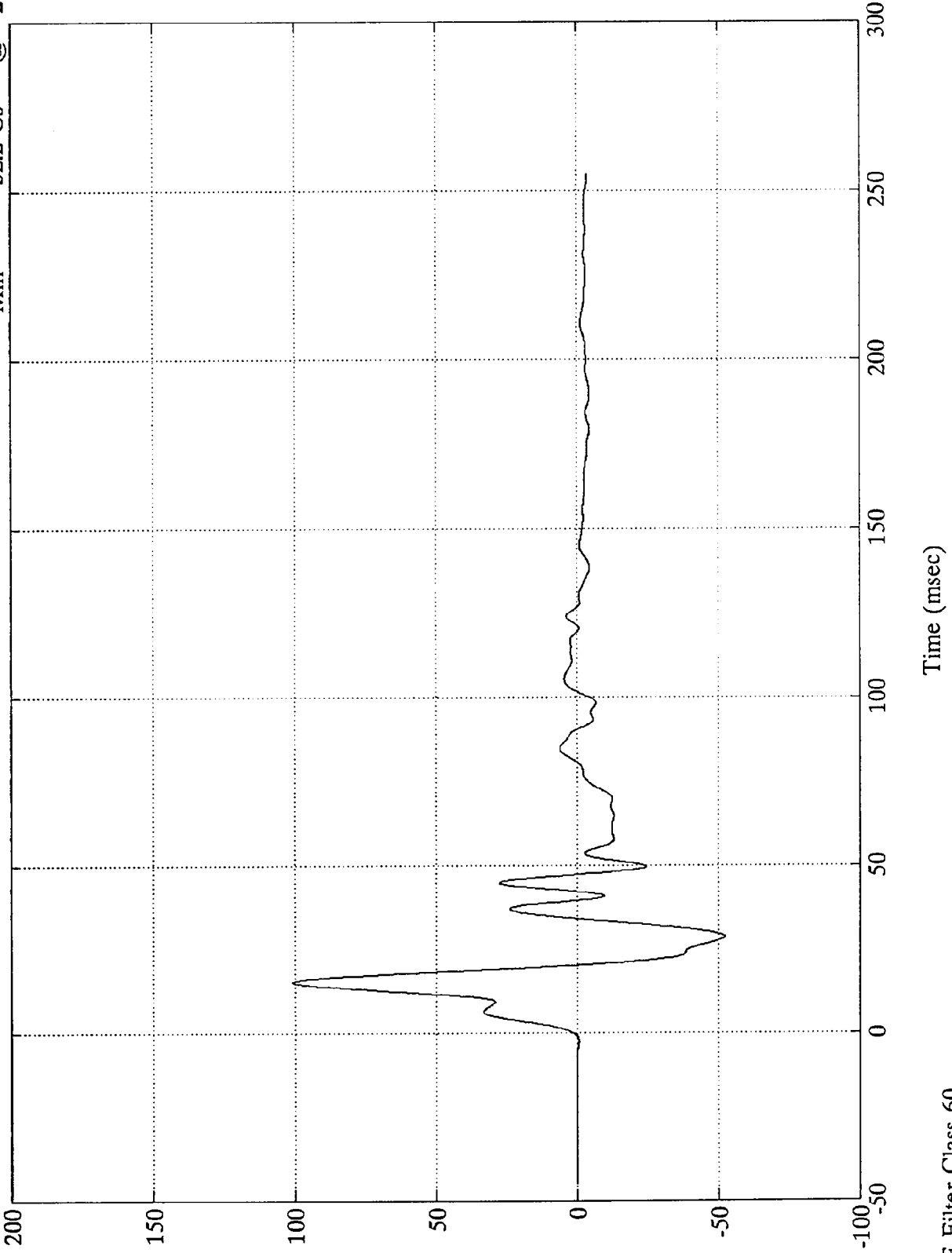
Max = 33.25 in. @ 254.88 msec
Min = -0.00 in. @ 1.20 msec



NCAP Side Impact Test #1

V1 L Front Door Upper Y

Max = 100.8 Gs @ 15.35 msec
Min = -52.2 Gs @ 28.79 msec

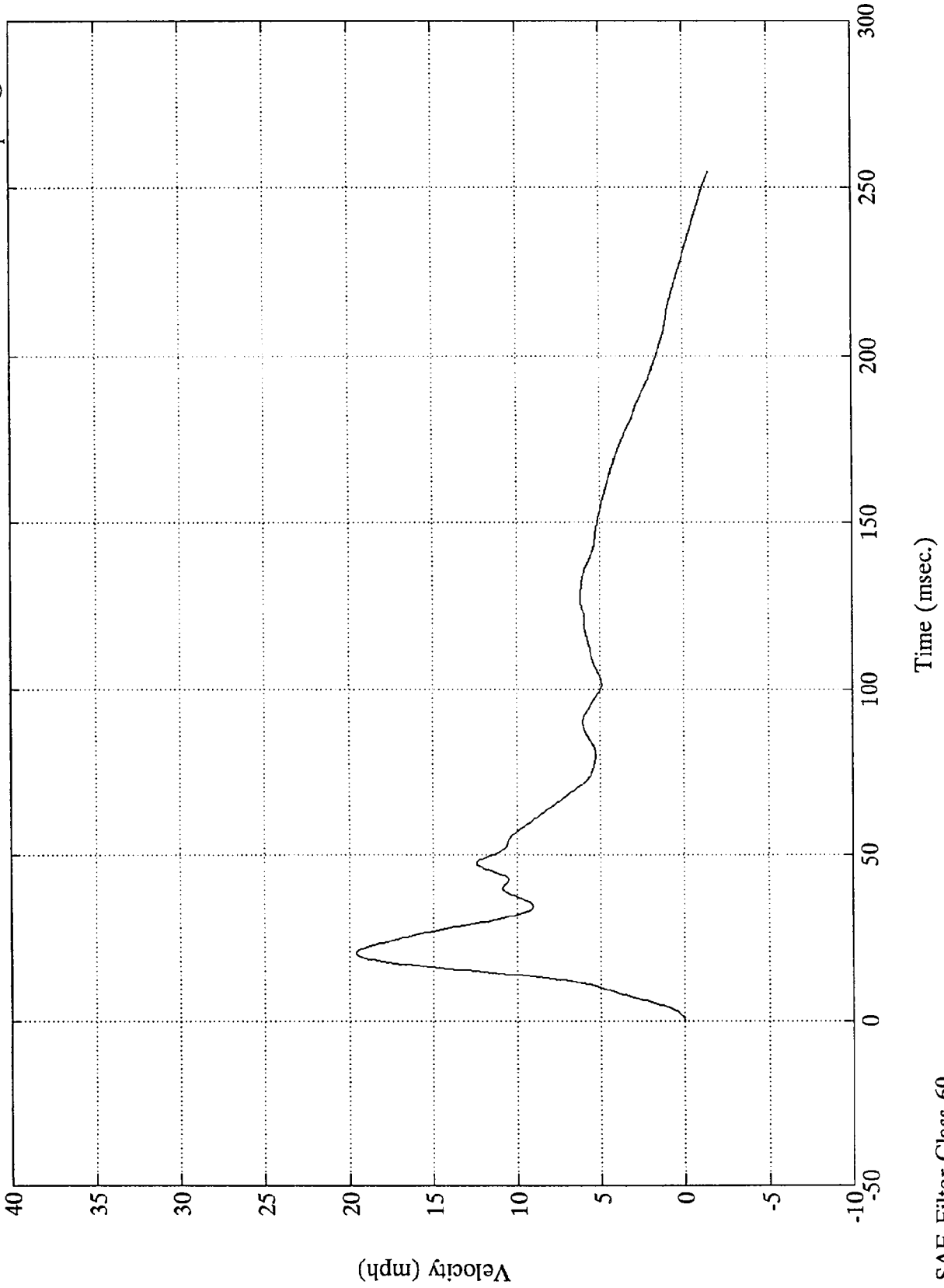


B-43

NCAP Side Impact Test #1

V1 L. Front Door Upper Y

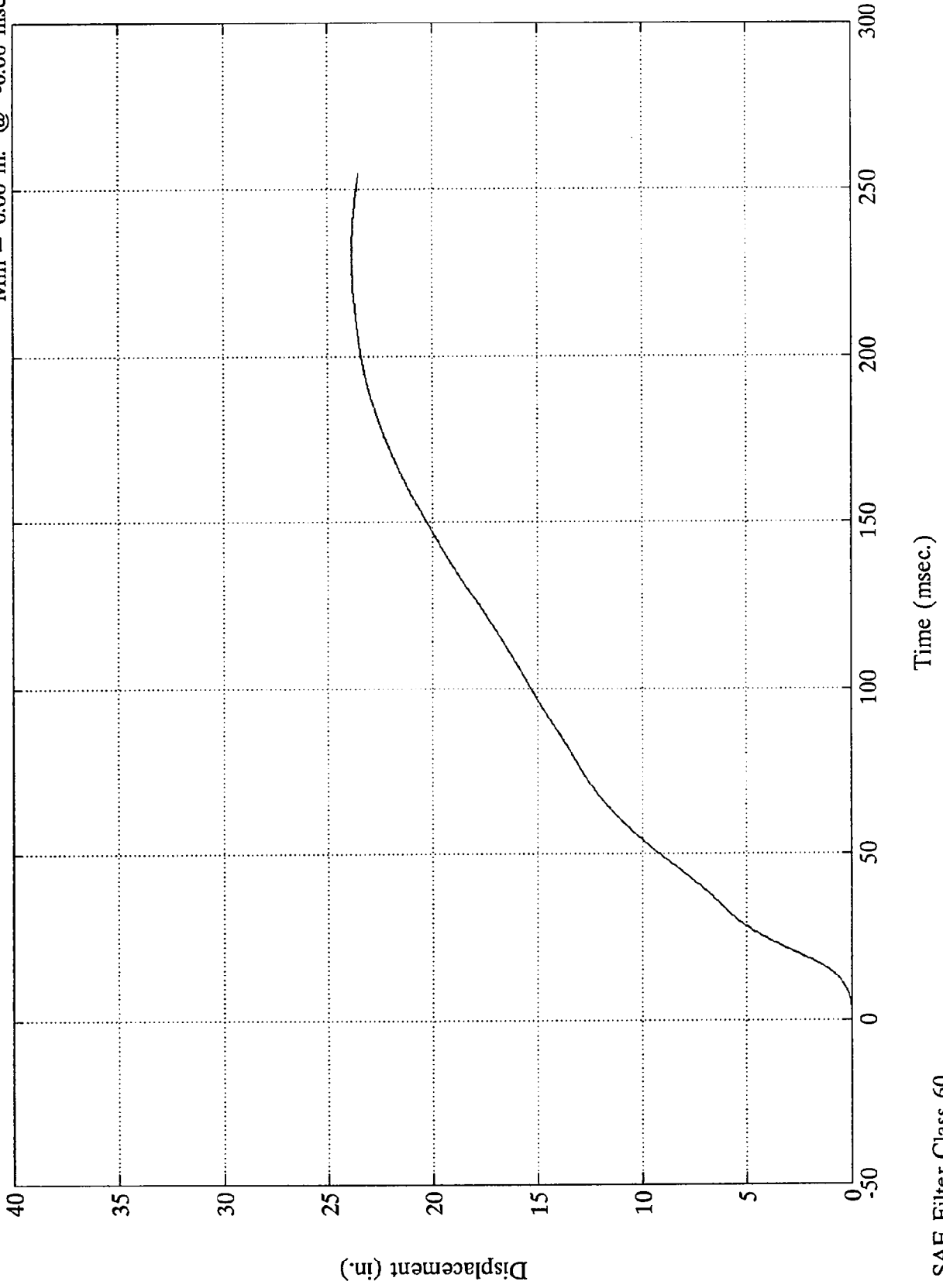
Max = 19.60 mph @ 20.40 msec
Min = -1.55 mph @ 254.88 msec



NCAP Side Impact Test #1

V1 L. Front Door Upper Y

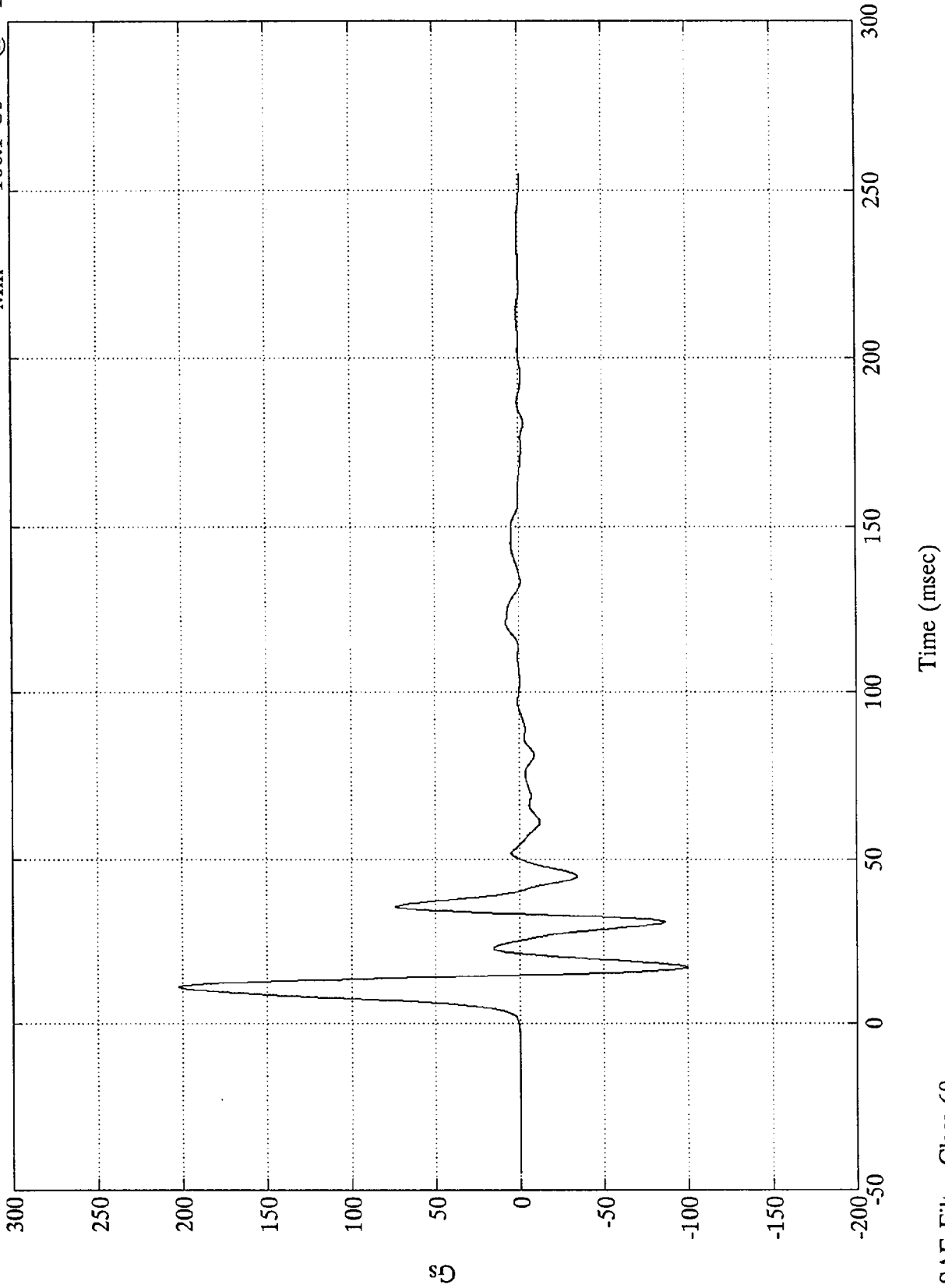
Max = 23.85 in. @ 234.00 msec
Min = 0.00 in. @ -0.00 msec



NCAP Side Impact Test #1

Max = 202.3 Gs @ 11.03 msec
Min = -100.1 Gs @ 17.15 msec

V1 L Rear Door Midrear Y



B-46

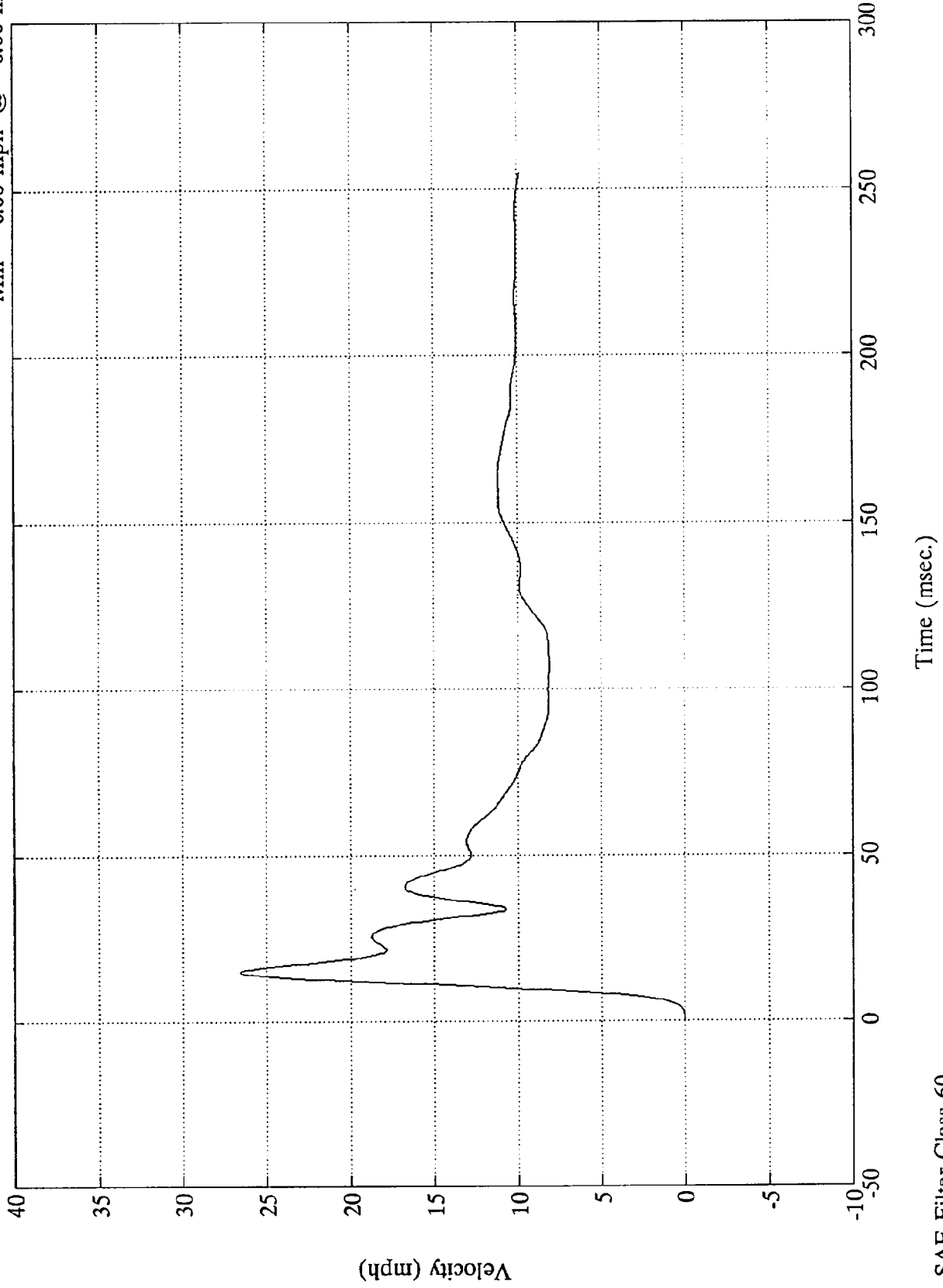
SAE Filter Class 60

8017-1

NCAP Side Impact Test #1

Max = 26.58 mph @ 14.64 msec
Min = 0.00 mph @ -0.00 msec

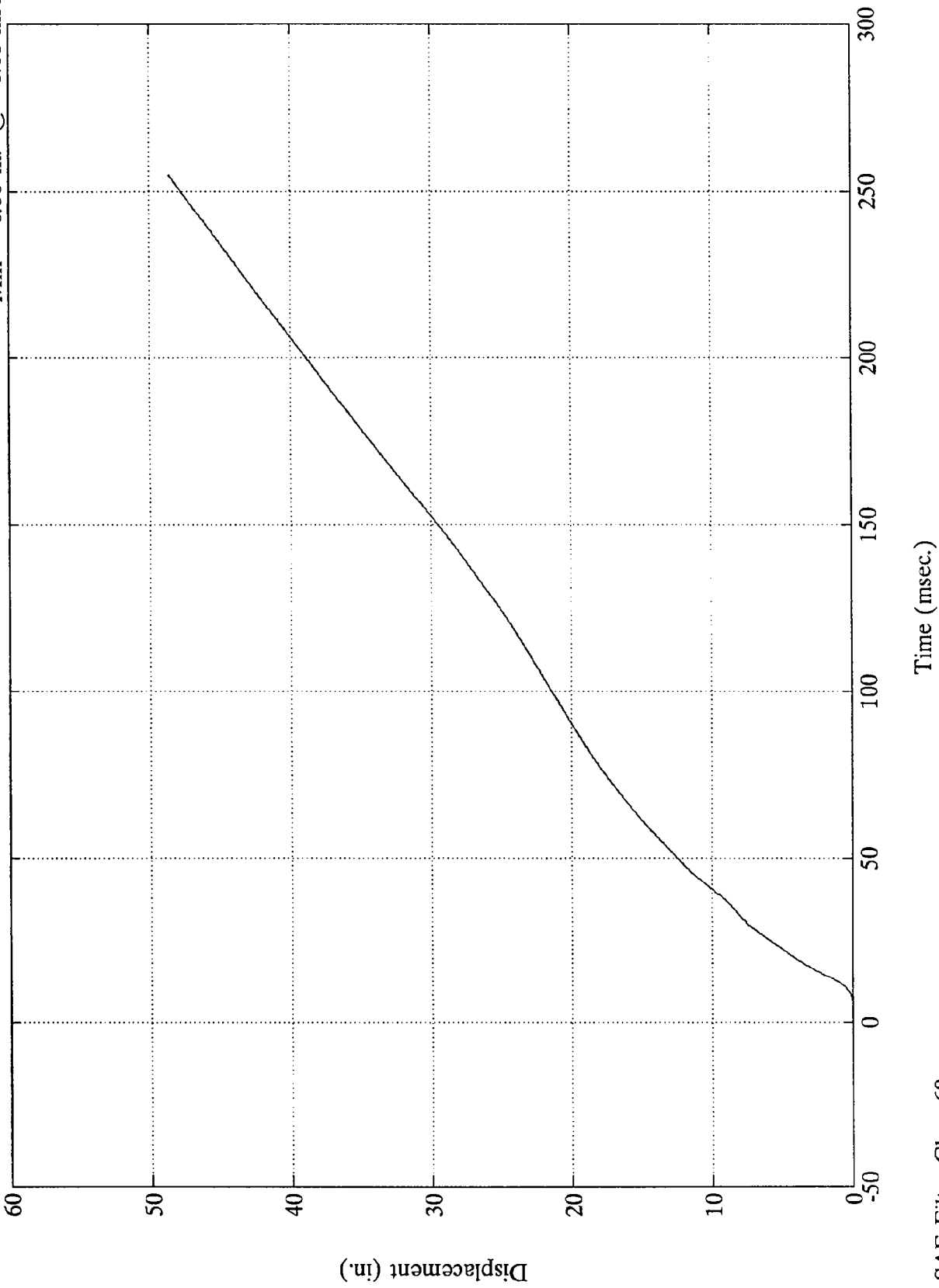
V1 L. Rear Door Midrear Y



NCAP Side Impact Test #1

L. Rear Door Midrear Y

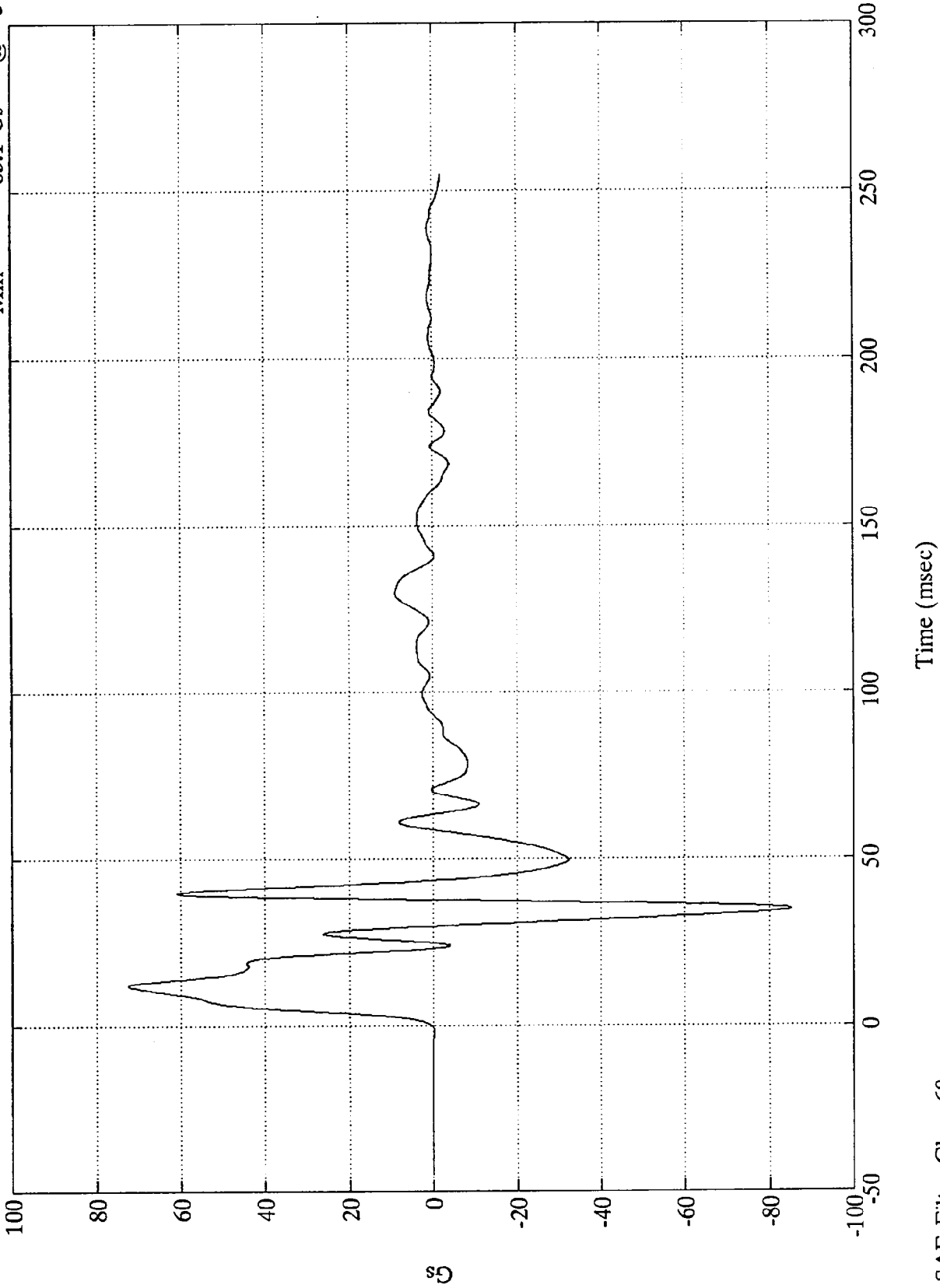
Max = 48.61 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



NCAP Side Impact Test #1

V1 L. Rear Door Upper Y

Max = 72.5 Gs @ 12.11 msec
Min = -85.1 Gs @ 34.79 msec

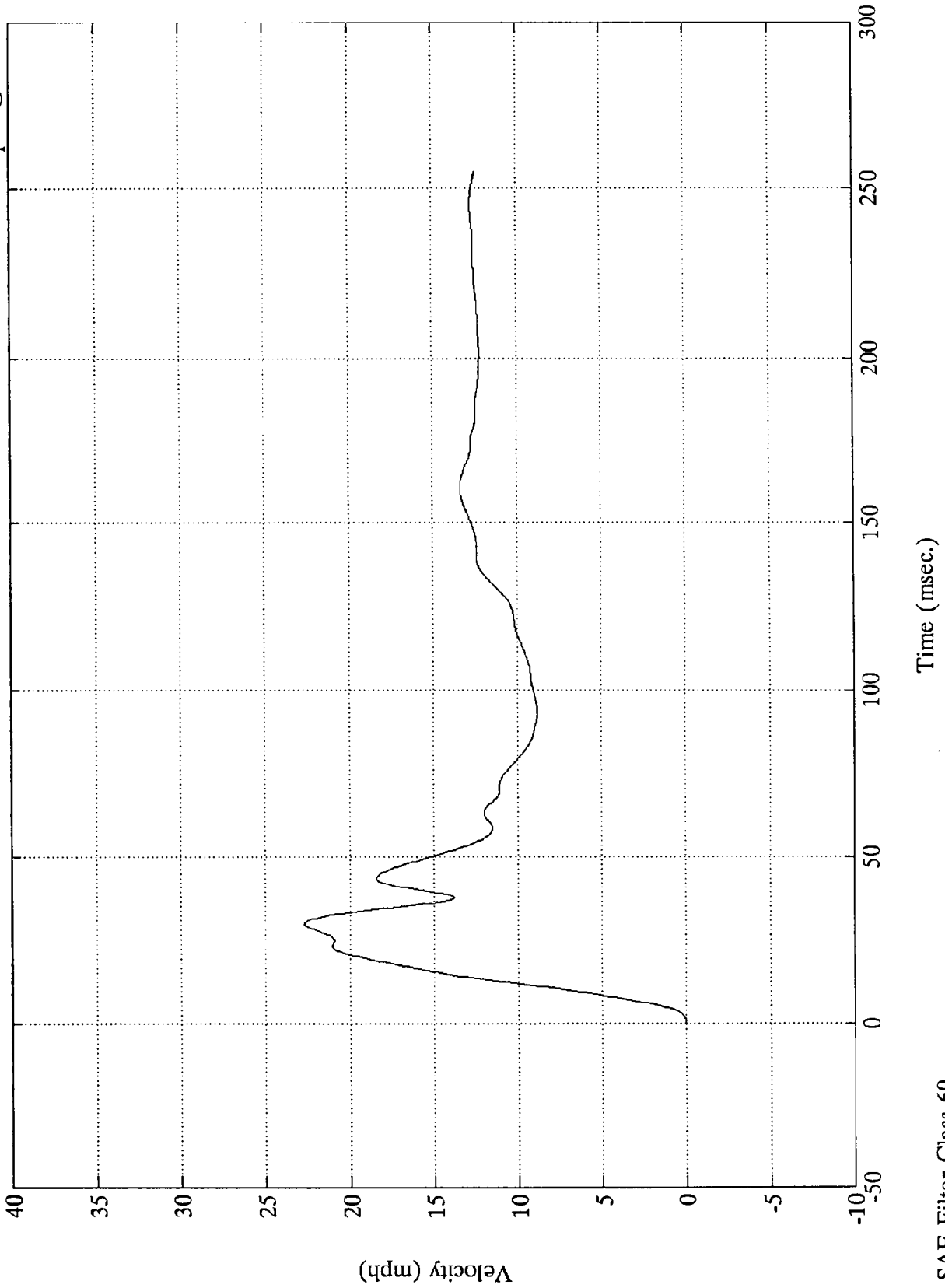


B-49

NCAP Side Impact Test #1

V1 L. Rear Door Upper Y

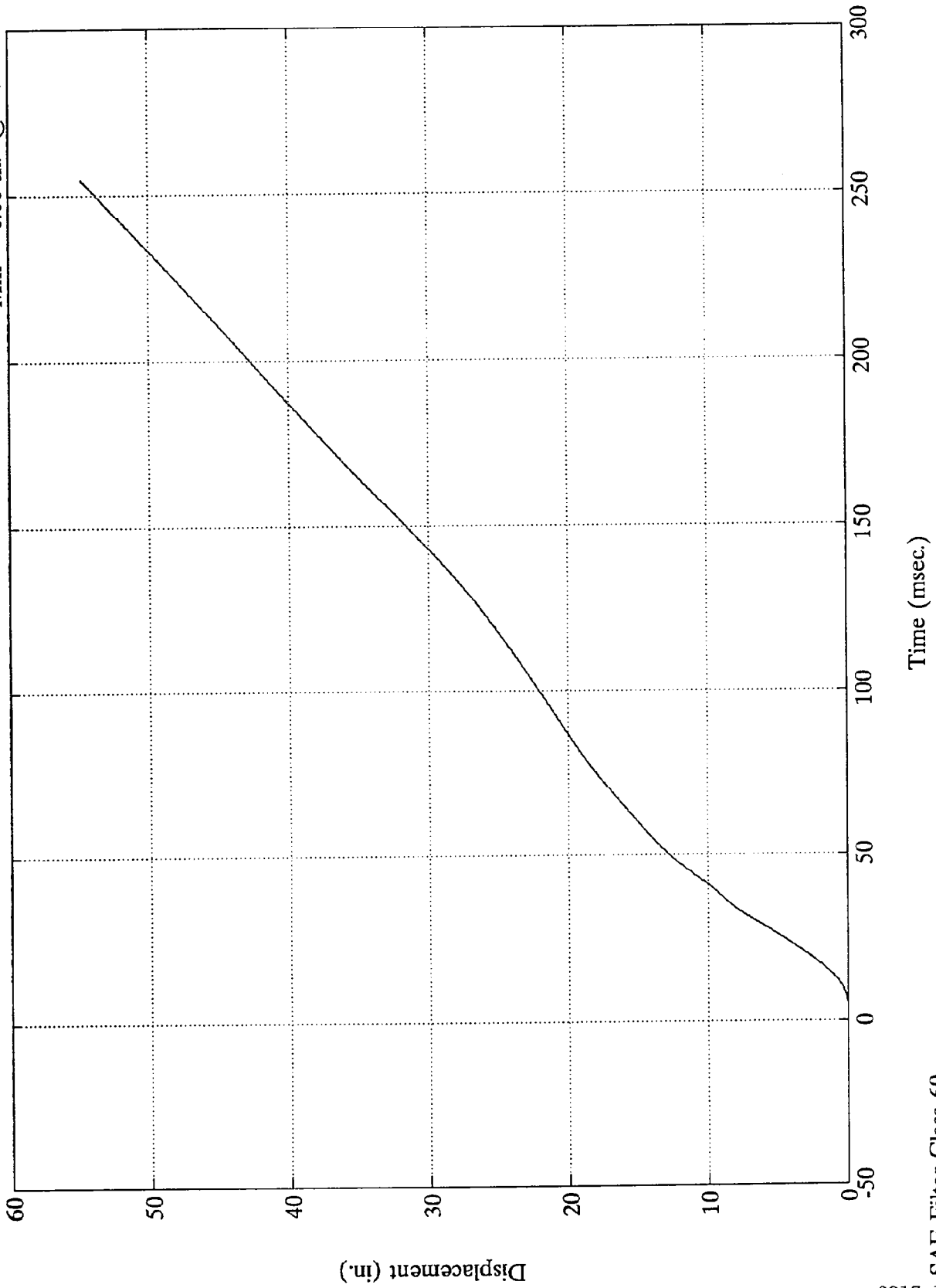
Max = 22.70 mph @ 29.76 msec
Min = 0.00 mph @ -0.00 msec



NCAP Side Impact Test #1

L. Rear Door Upper Y

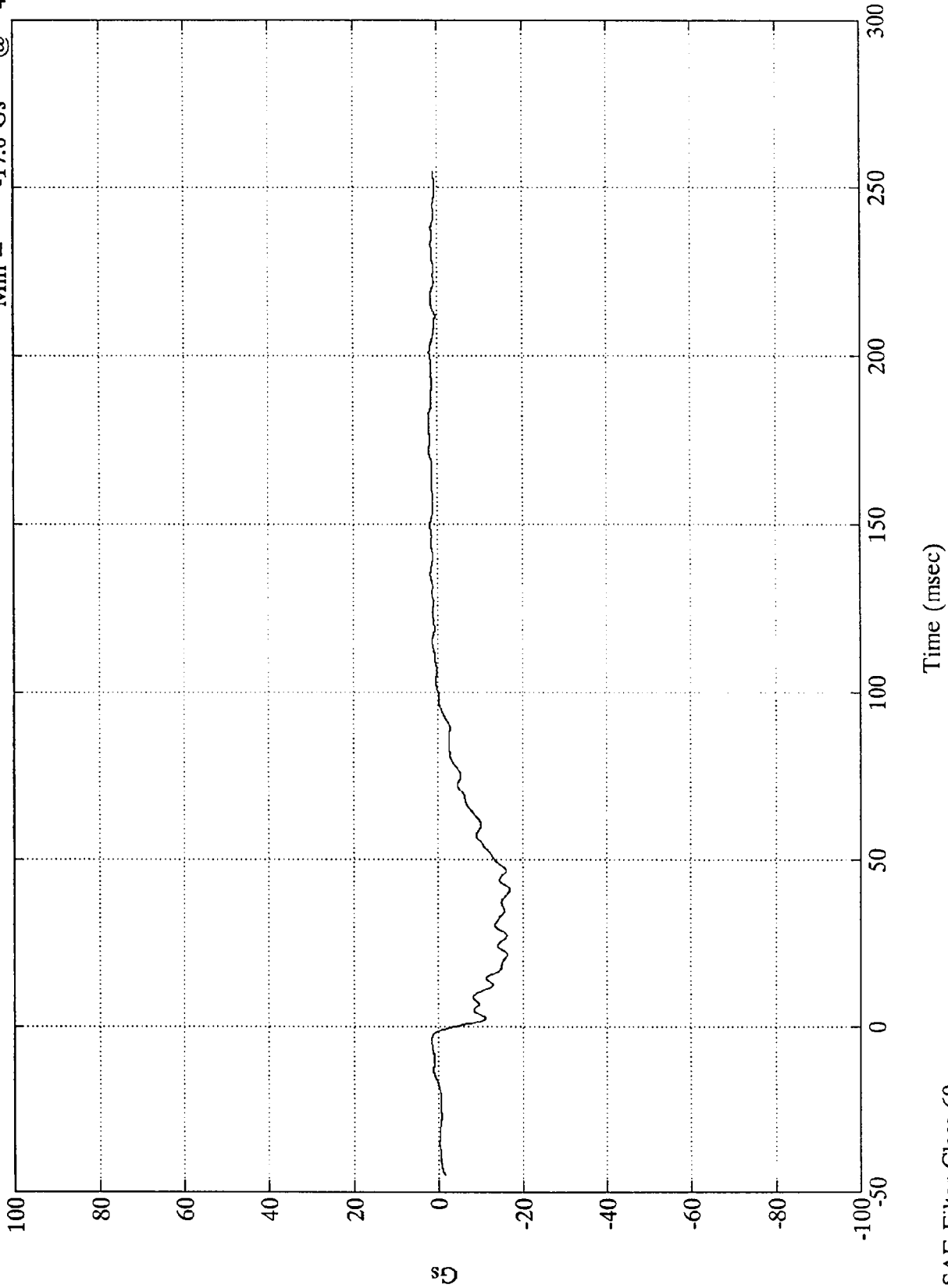
Max = 54.80 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



NCAP Side Impact Test #1

V2 C.G. X

Max = 2.1 Gs @ 181.20 msec
Min = -17.0 Gs @ 40.68 msec



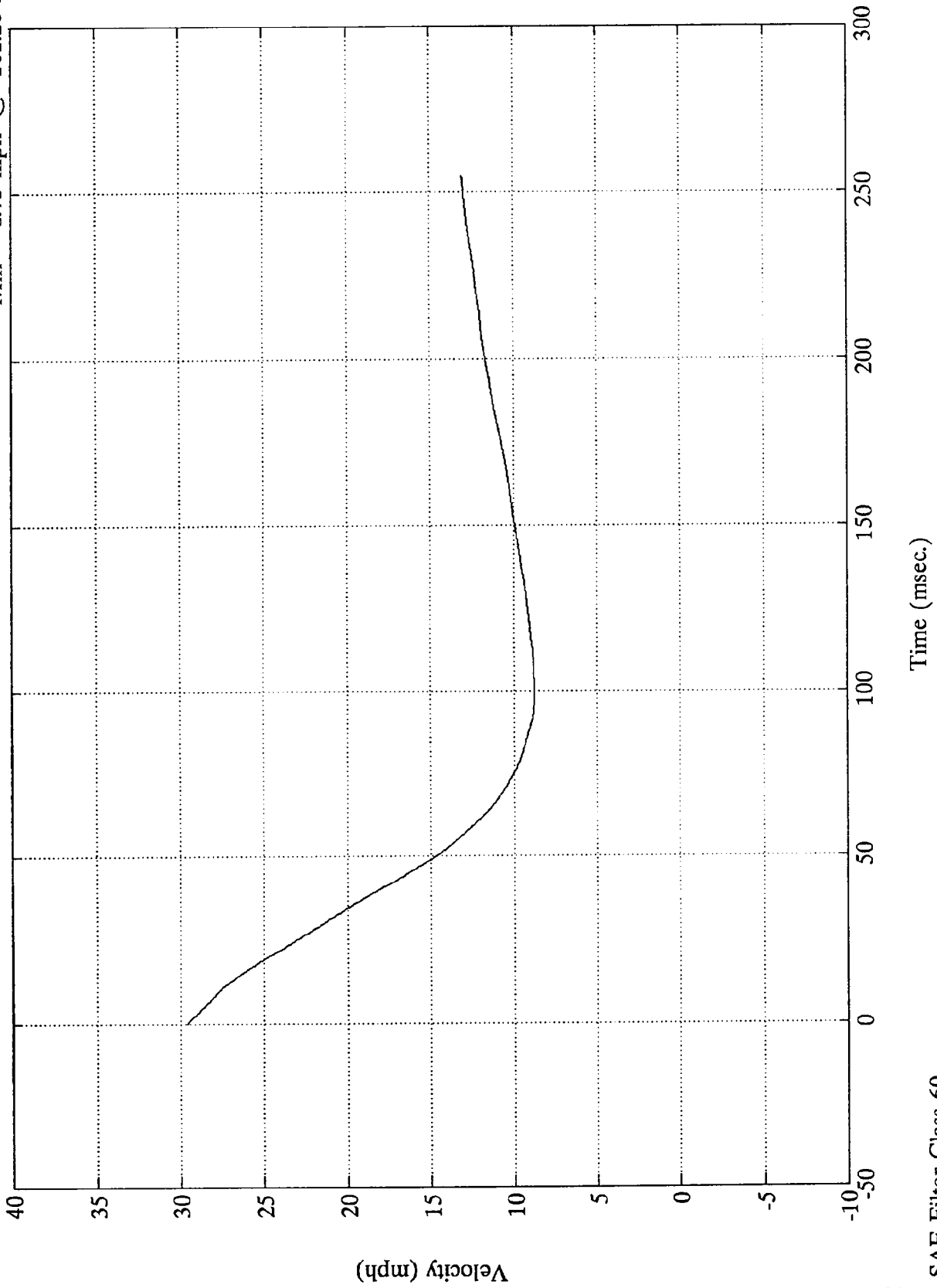
B-52
Gs

8017-1
SAE Filter Class 60

NCAP Side Impact Test #1

Max = 29.58 mph @ -0.00 msec
Min = 8.75 mph @ 101.28 msec

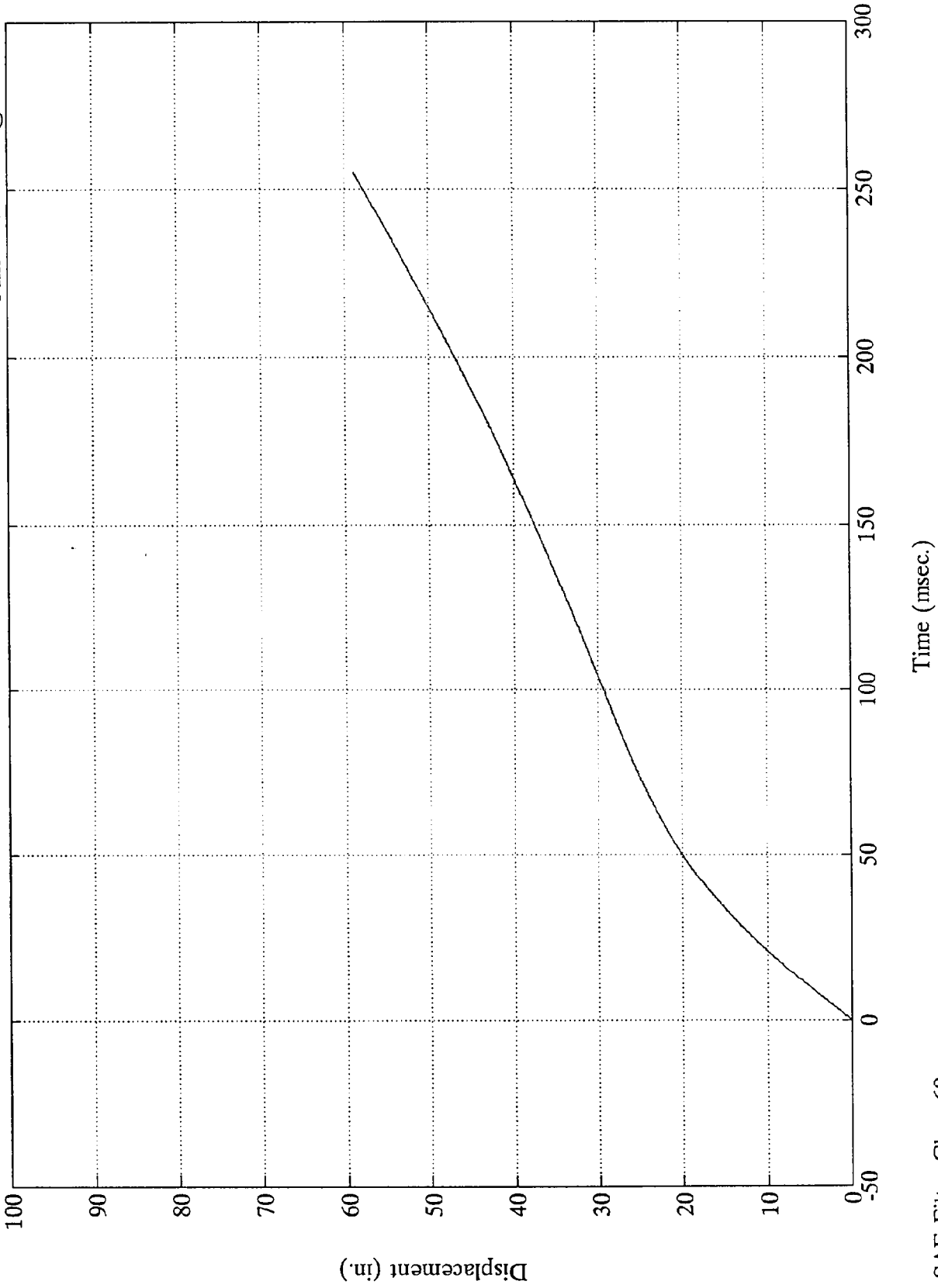
V2 C.G. X



NCAP Side Impact Test #1

V2 C.G. X

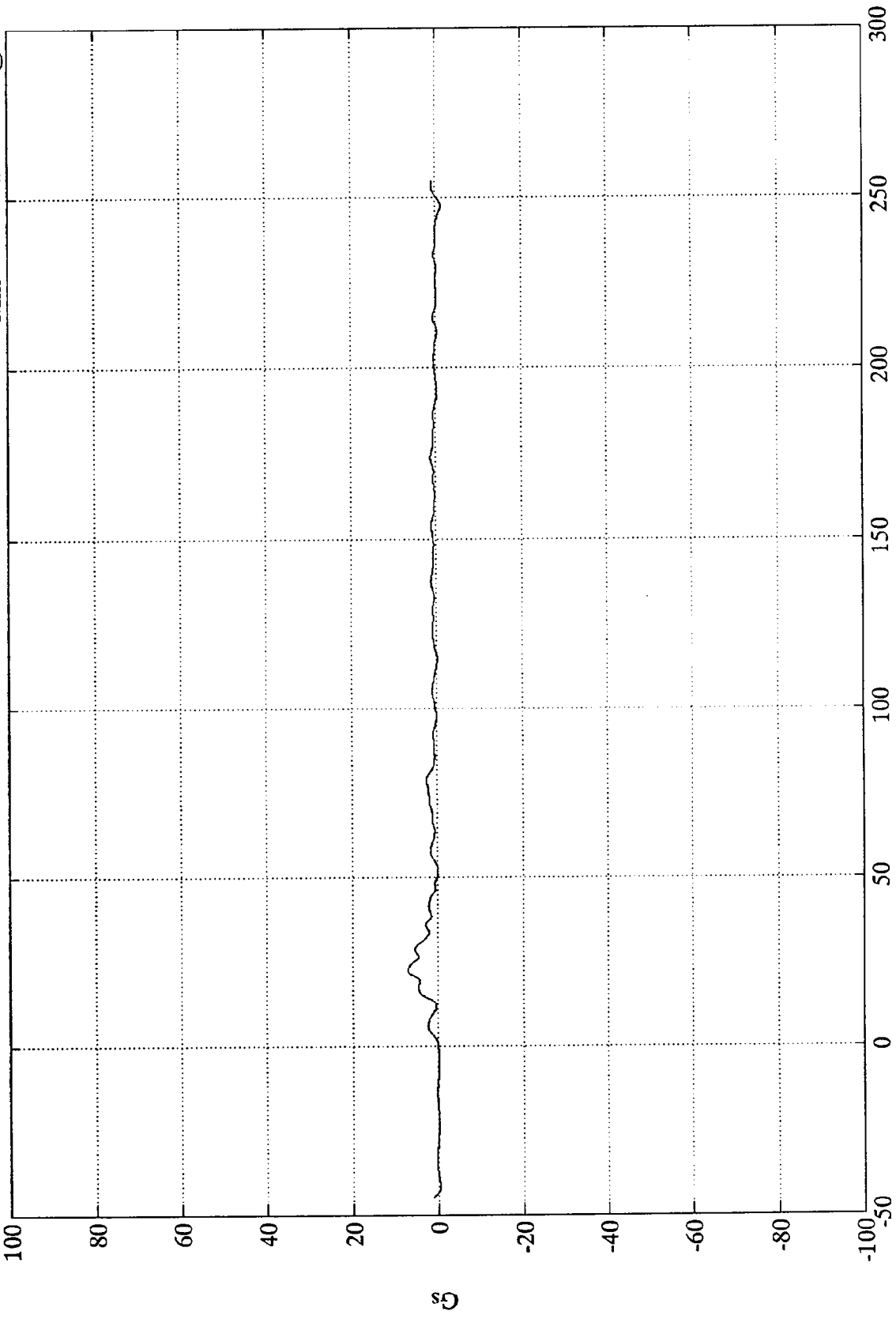
Max = 58.88 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



NCAP Side Impact Test #1

Max = 7.0 Gs @ 22.43 msec
Min = -1.2 Gs @ 247.56 msec

V2 C.G. Y



B-55

8017-1

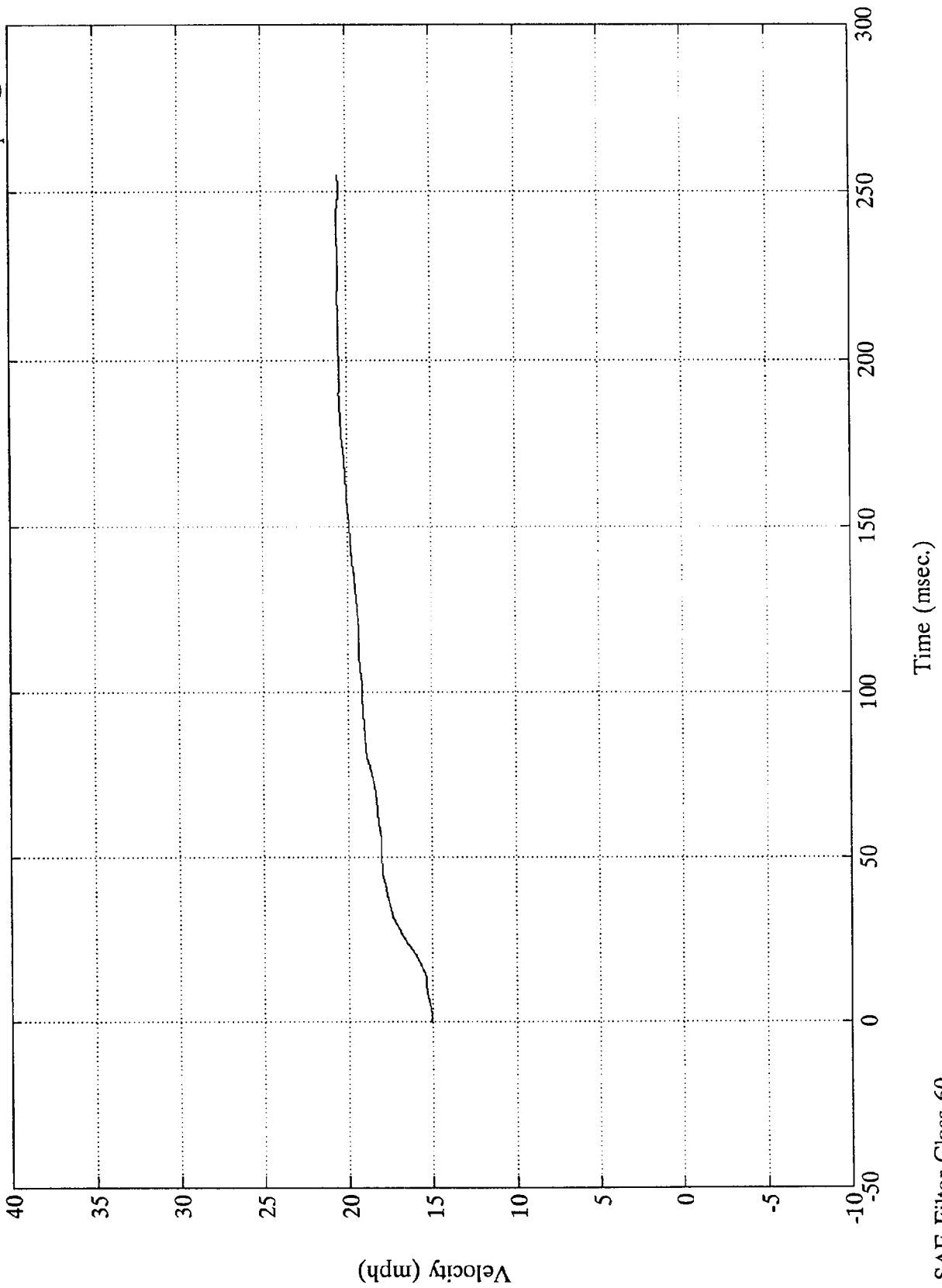
SAE Filter Class 60

Time (msec)

NCAP Side Impact Test #1

V2 C.G. Y

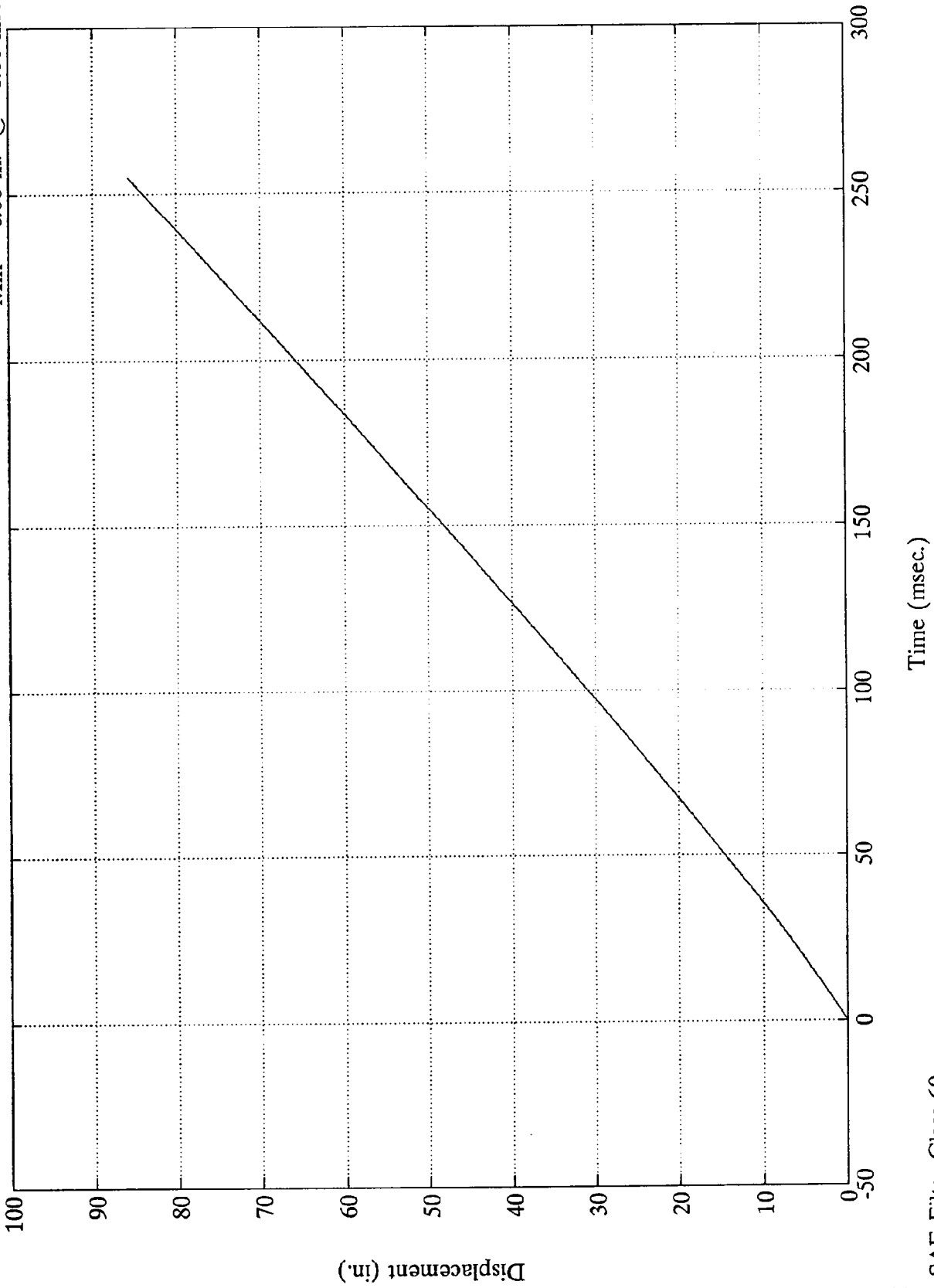
Max = 20.54 mph @ 243.36 msec
Min = 15.07 mph @ 1.20 msec



NCAP Side Impact Test #1

V2 C.G. Y

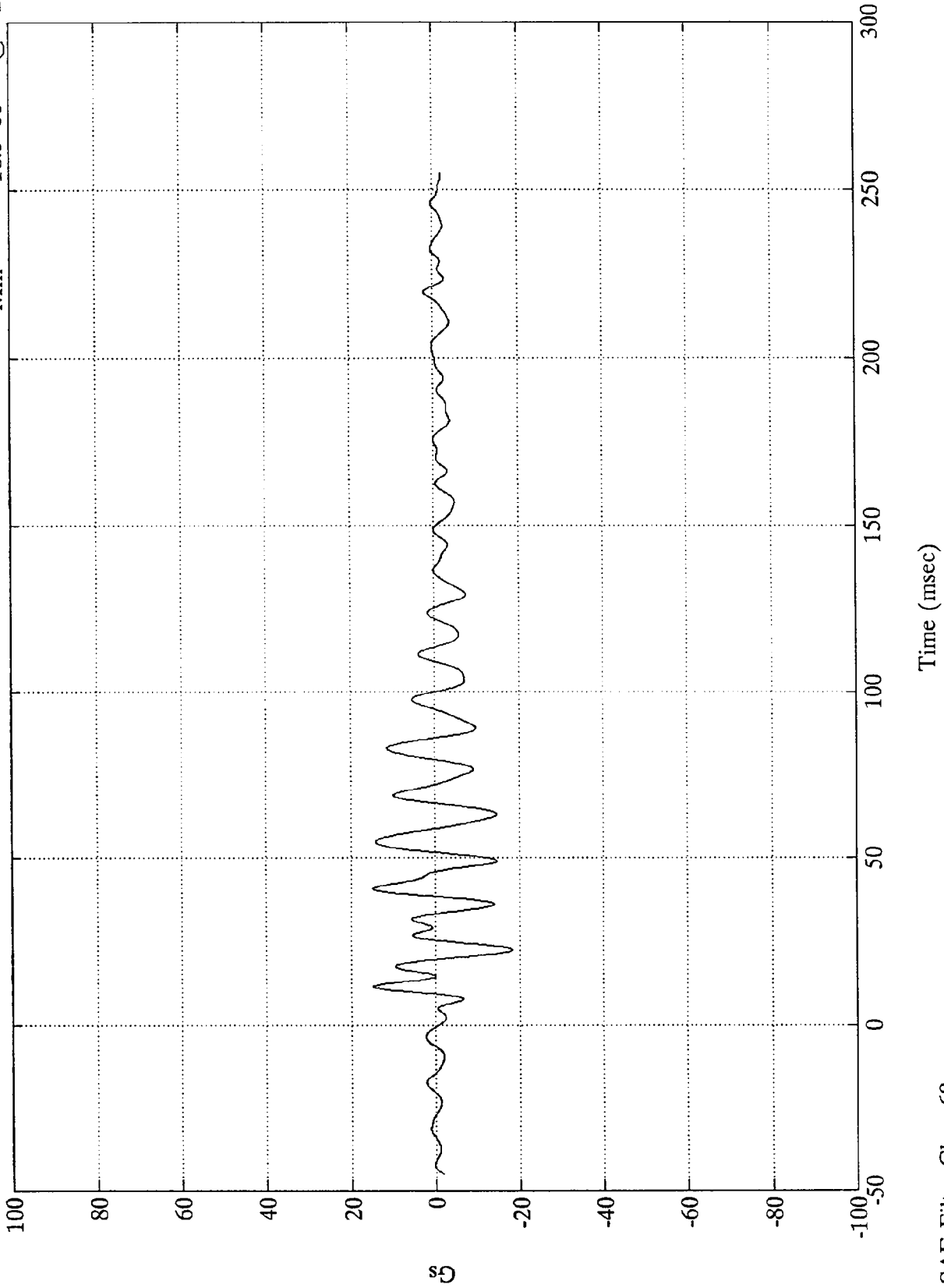
Max = 85.67 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



NCAP Side Impact Test #1

Max = 14.7 Gs @ 40.44 msec
Min = -18.3 Gs @ 22.43 msec

V2 C.G. Z



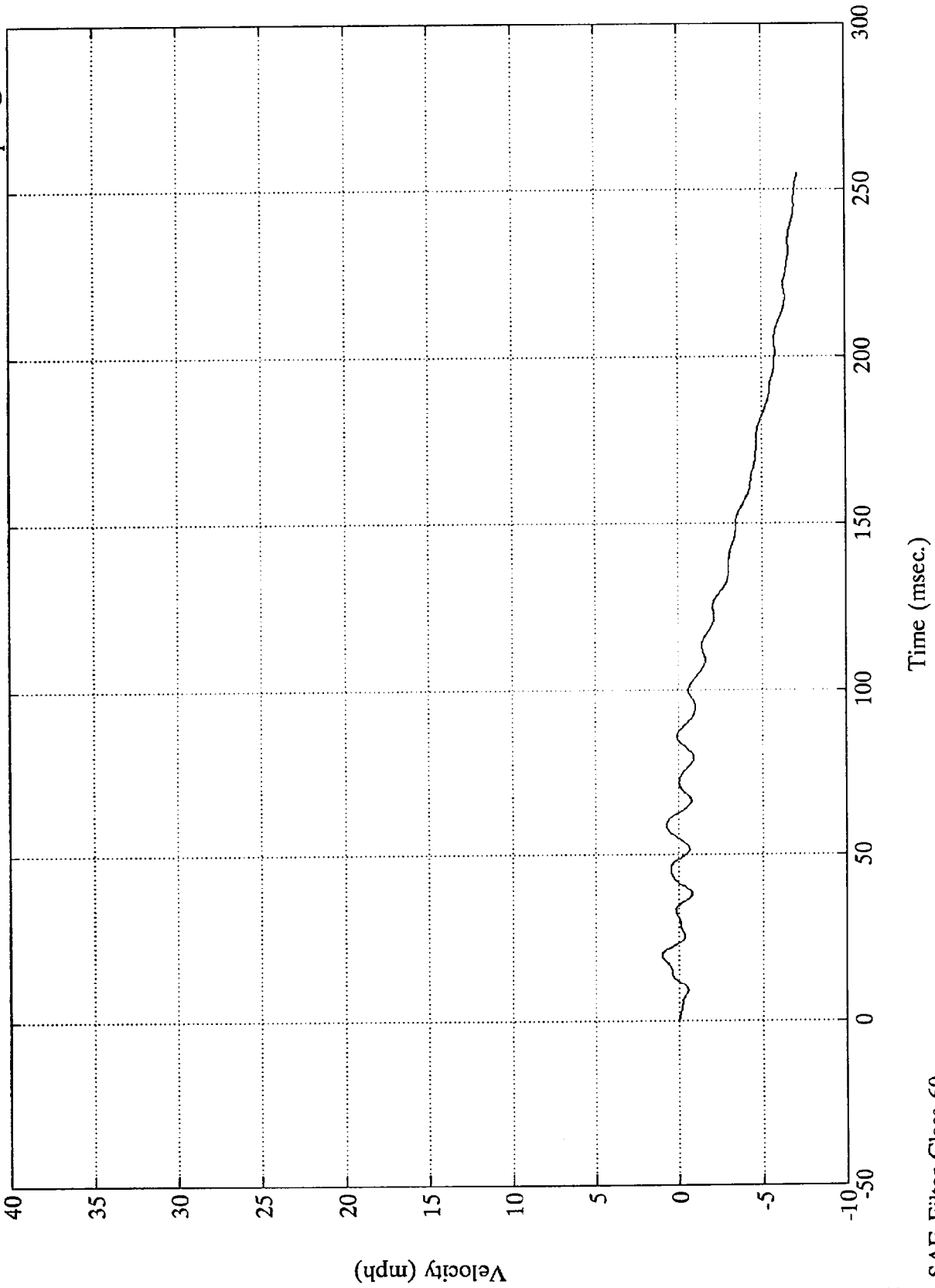
B-58

8017-1
SAE Filter Class 60

NCAP Side Impact Test #1

V2 C.G. Z

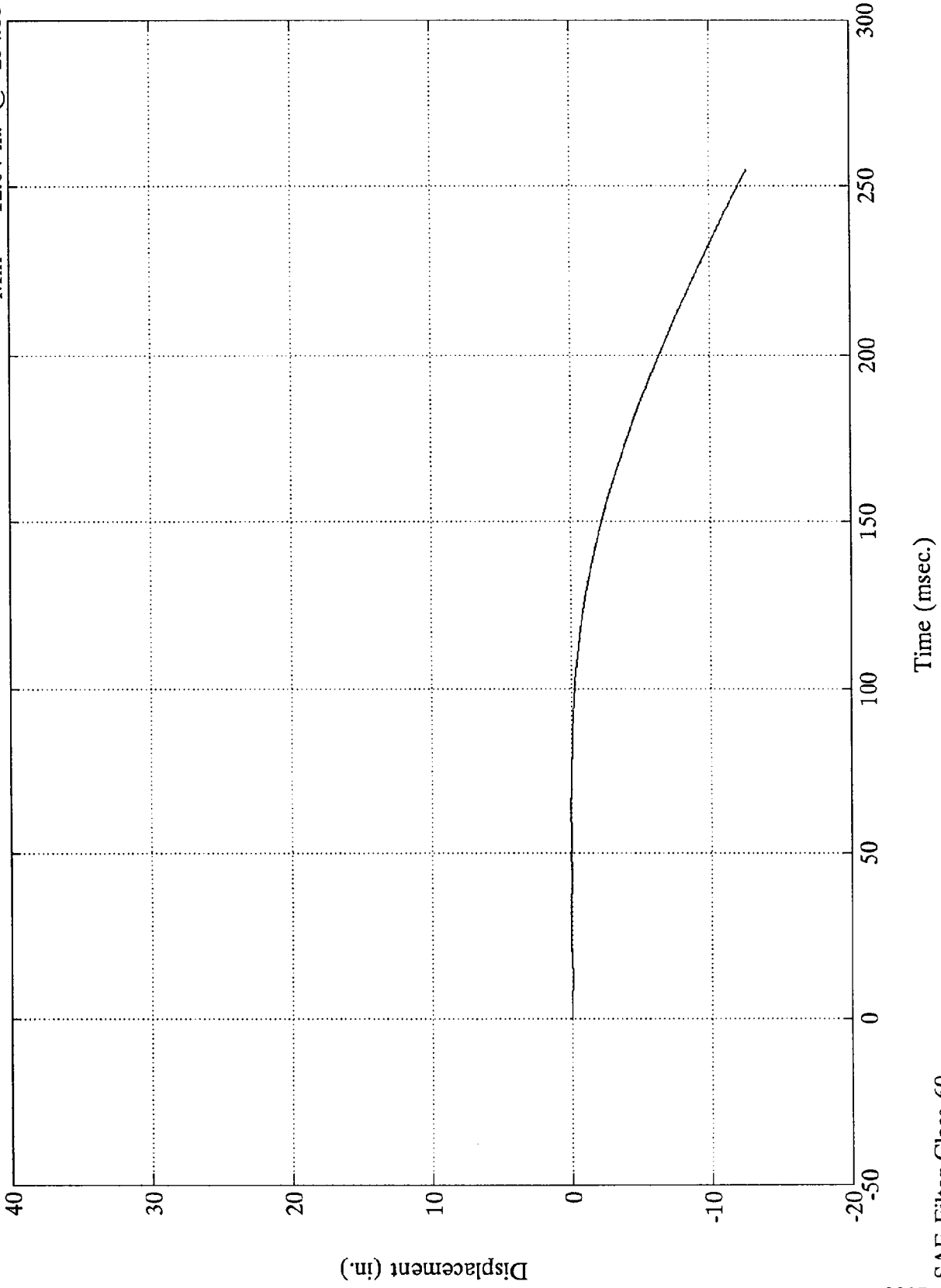
Max = 1.03 mph @ 19.68 msec
Min = -7.17 mph @ 254.88 msec



NCAP Side Impact Test #1

V2 C.G. Z

Max = 0.07 in. @ 62.88 msec
Min = -12.64 in. @ 254.88 msec

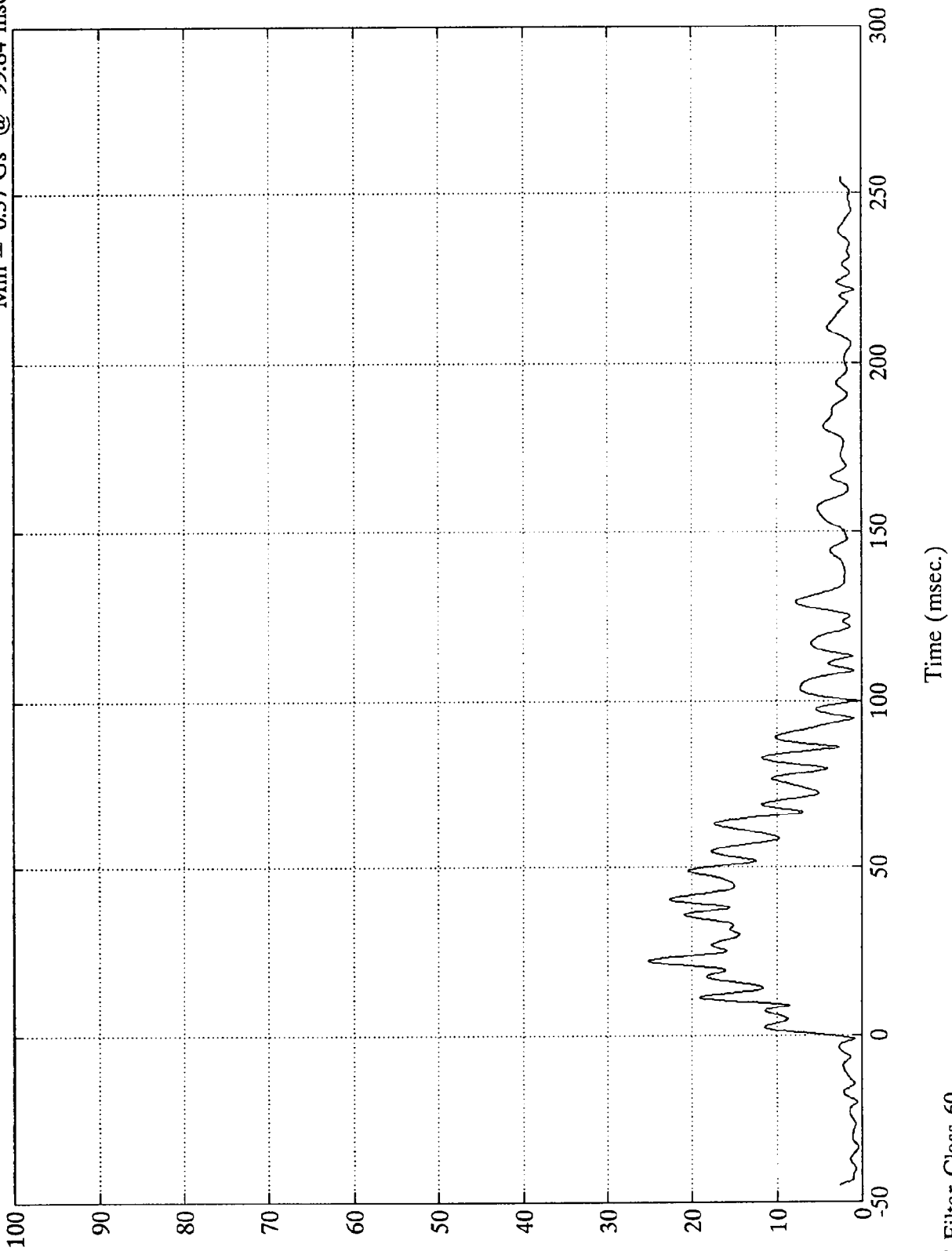


09-B

NCAP Side Impact Test #1

V2 C.G. Resultant

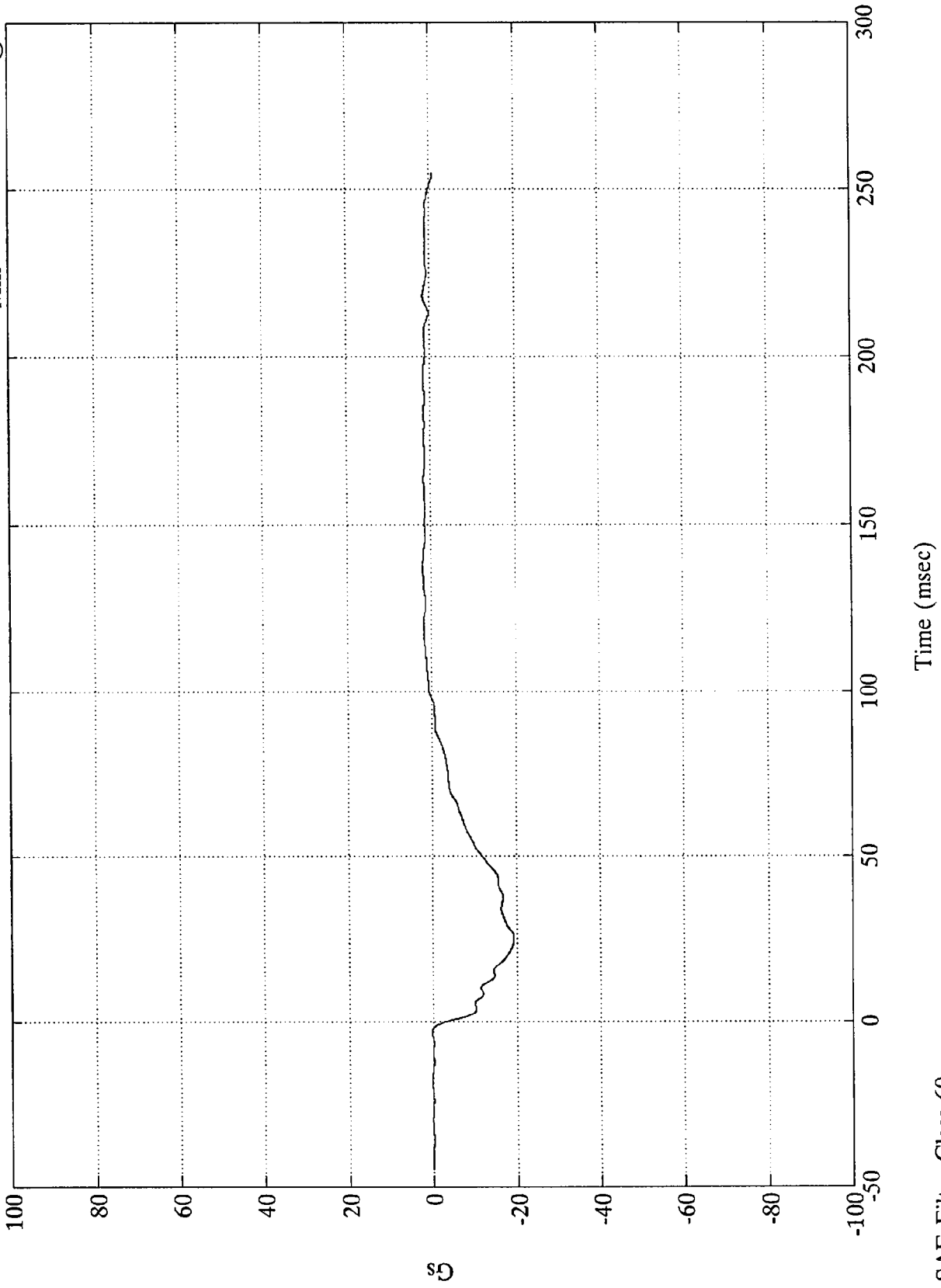
Max = 25.13 Gs @ 22.20 msec
Min = 0.37 Gs @ 99.84 msec



NCAP Side Impact Test #1

Max = 1.9 Gs @ 137.16 msec
Min = -19.2 Gs @ 24.96 msec

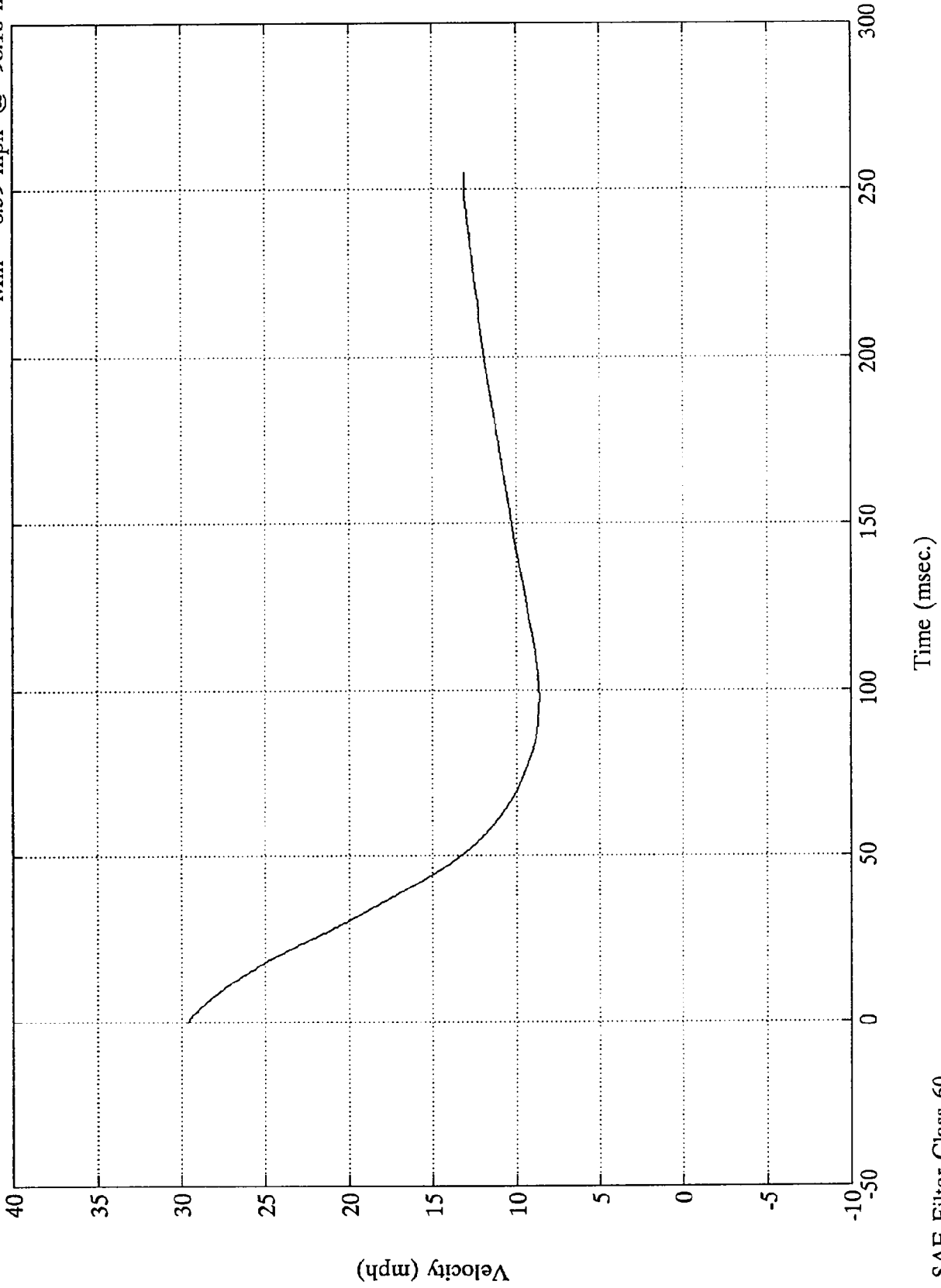
V2 Left Rear Rail X



NCAP Side Impact Test #1

V2 Left Rear Rail X

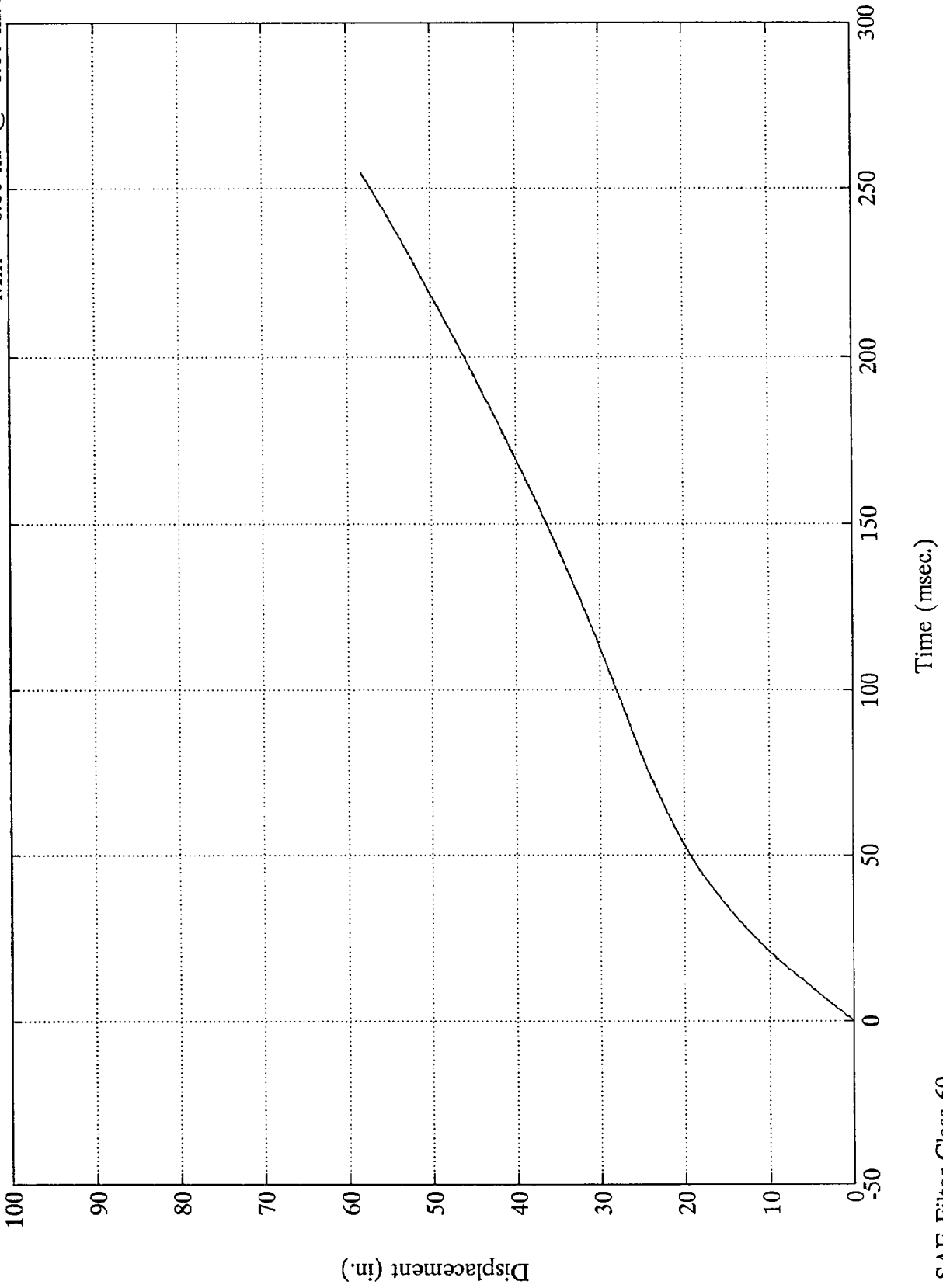
Max = 29.58 mph @ -0.00 msec
Min = 8.59 mph @ 98.16 msec



NCAP Side Impact Test #1

V2 Left Rear Rail X

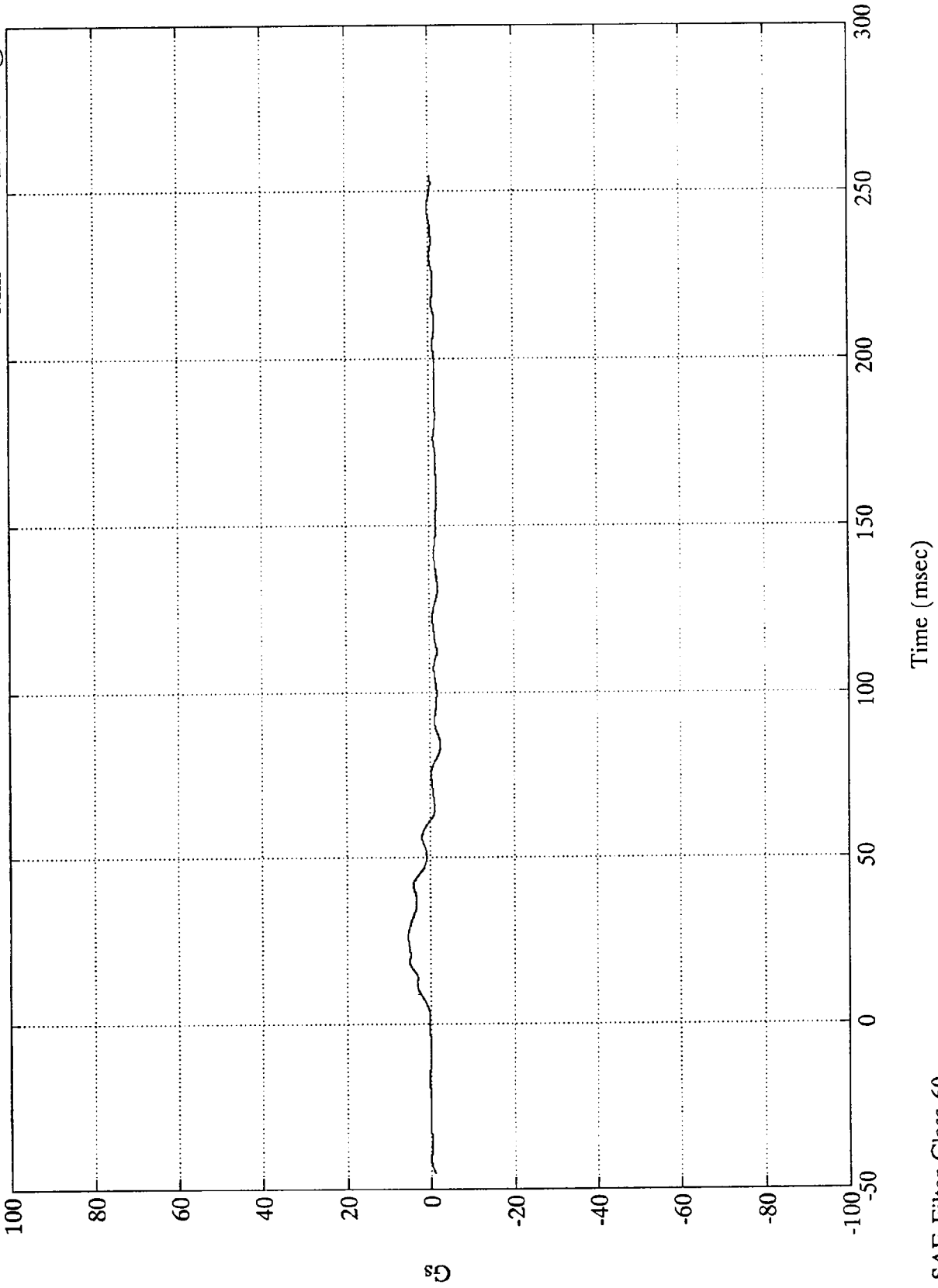
Max = 58.18 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



NCAP Side Impact Test #1

Max = 5.3 Gs @ 25.79 msec
Min = -2.4 Gs @ 83.87 msec

V2 Left Rear Rail Y



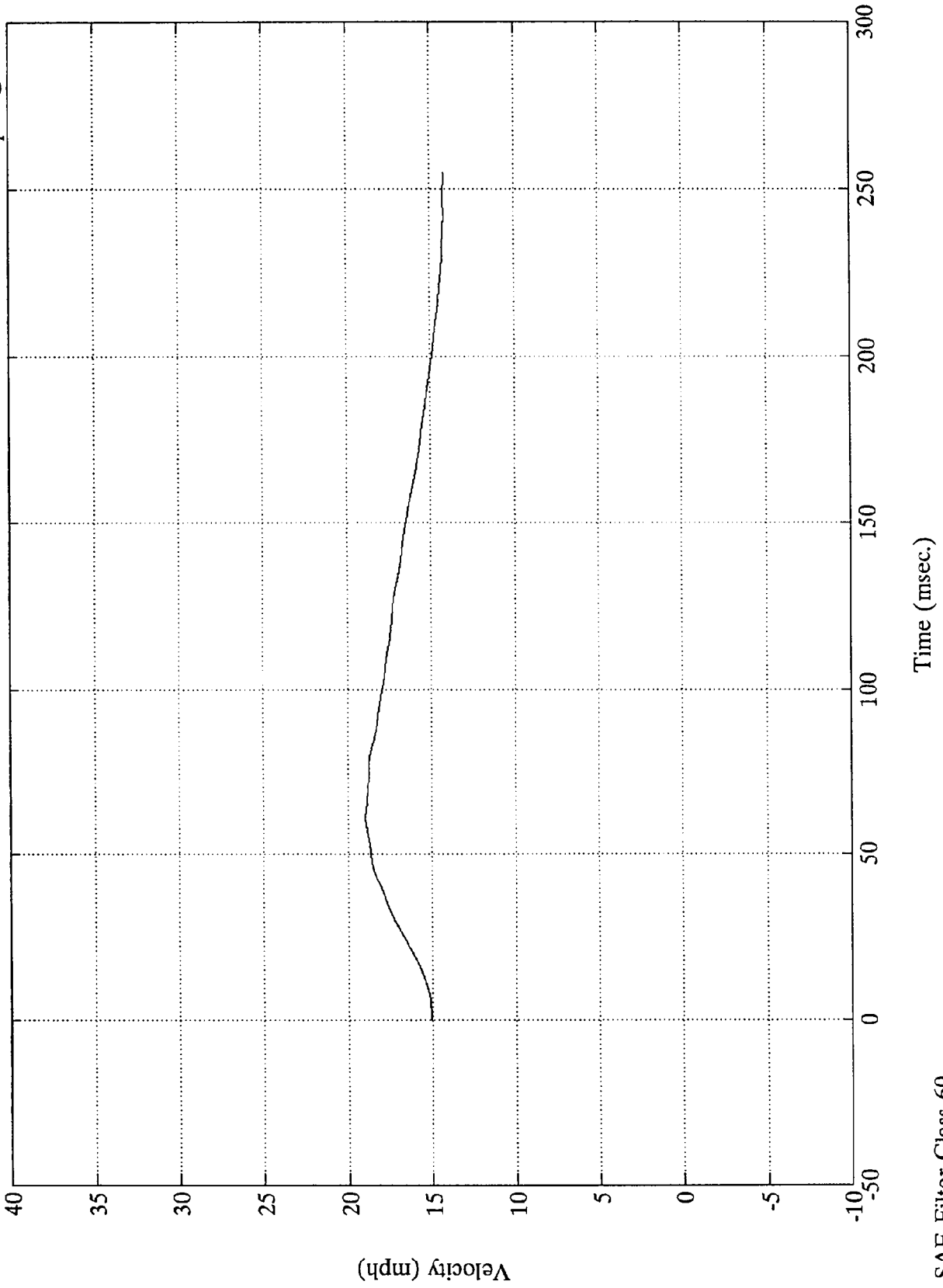
B-65

8017-1 SAE Filter Class 60

NCAP Side Impact Test #1

V2 Left Rear Rail Y

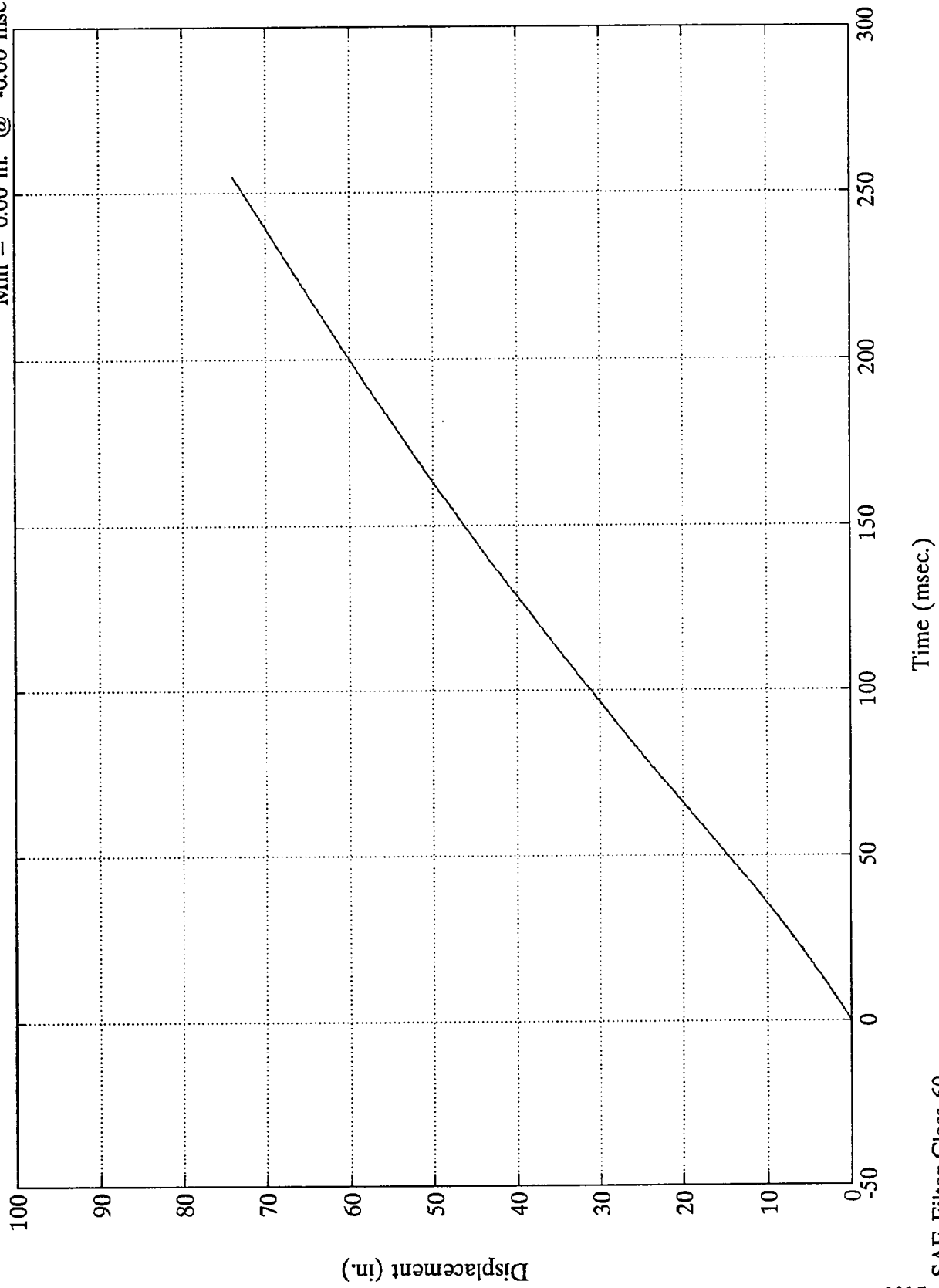
Max = 18.96 mph @ 61.44 msec
Min = 14.15 mph @ 254.88 msec



NCAP Side Impact Test #1

V2 Left Rear Rail Y

Max = 73.93 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec

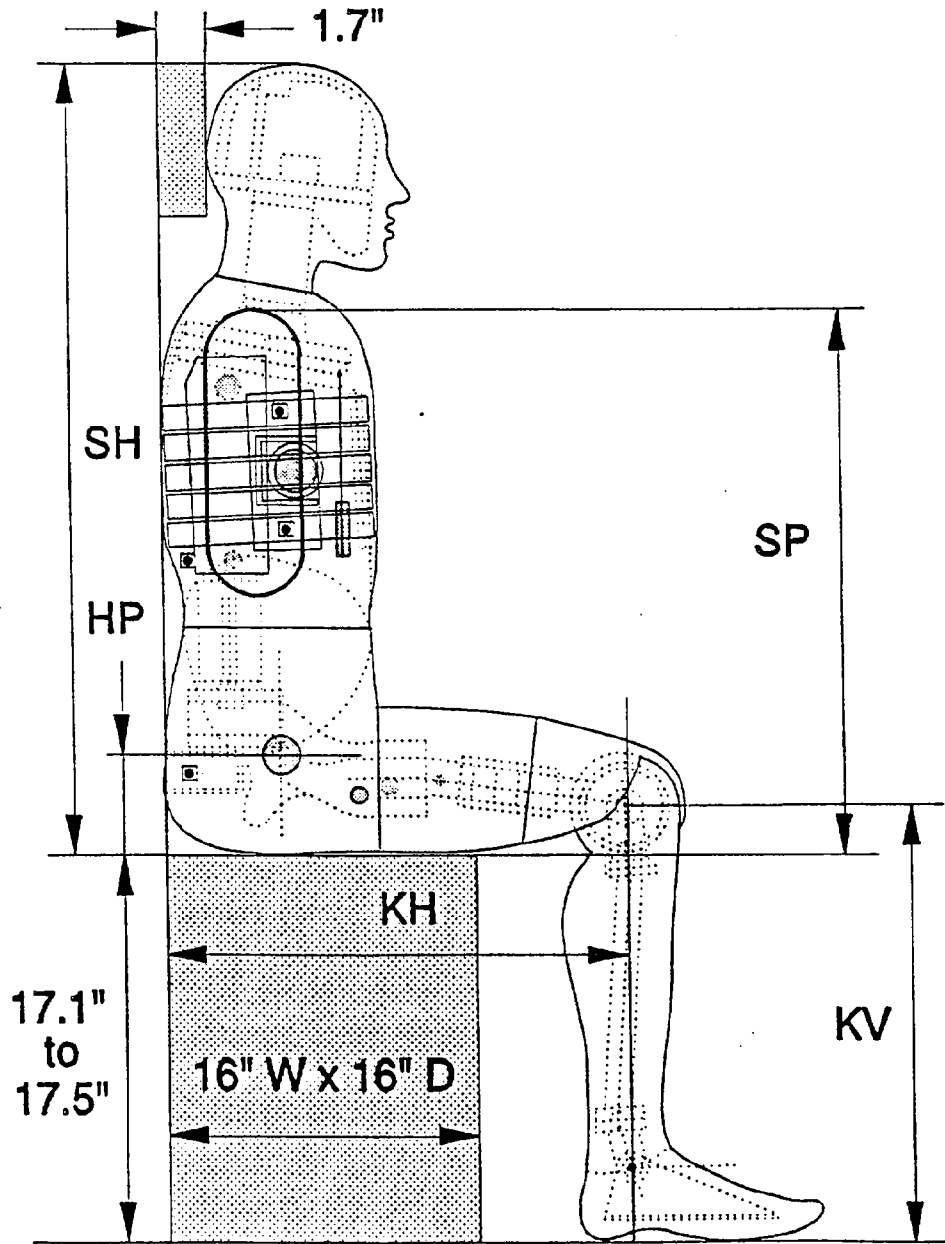


Appendix C

SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Figure 10

DUMMY CONFIGURATION DIMENSIONS



SID CONFIGURATION VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER: 171

| | PART 572F SPECIFICATION | PRE-TEST if required | POST-TEST if required |
|--|----------------------------|-------------------------|--------------------------|
| DATE OF CONFIGURATION VERIFICATION | | 4-21-92 | |
| VERIFICATION NUMBER FOR DUMMY (*) | XXXXXXXXXXXXXXXX | | |
| SH - Seated Height | 35.0 to 35.8" | 35.6 " | " |
| SP - Shoulder Height with Chest Flesh Installed | " | " | " |
| SP - Shoulder Height with Chest Flesh Removed | " | " | " |
| HP - Hip Pivot Height | 3.9" ref. | 3.9 " | " |
| KH - Knee Pivot from Back Line | 20.1 to 20.7" | 20.7 " | " |
| KV - Knee Pivot to Floor | 19.3 to 19.9" | 19.5 " | " |
| SW - Shoulder Width | " | " | " |
| HW - Hip Width | 14.0 to 15.4" | 14.5 " | " |
| OW - Overall External Width (At Widest Point) | " | " | " |

SEQUENTIAL VERIFICATION NUMBER FOR DUMMY: 1

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

TECHNICIAN'S NAME: Ivan Minkewicz

SID PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER: 171

| | | PRE-TEST (if required) | POST-TEST (if required) |
|--|---------------|---------------------------|----------------------------|
| DATE OF PERFORMANCE VERIFICATION | | XXXXXXXXXXXX | |
| SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*) | | XXXXXXXXXXXX | |
| VERIFICATION LAB TEMPERATURE (66 to 78 deg.) | | 70 deg | deg |
| VERIFICATION LAB HUMIDITY (10 TO 70 %) | | 43 % | % |
| TEST PARAMETER | SPECIFICATION | | |
| 1. <u>PELVIC IMPACT TEST</u> | Date: | 4-22-92 | |
| a. Pendulum Velocity (ft/s) | 13.8 to 14.2 | 13.9 | |
| b. Pelvic Y acceleration | 40 to 60 G's | 54.8 G's | G's |
| 2. <u>THORAX IMPACT TEST</u> | Date: | 4-21-92 | |
| a. Pendulum Velocity (ft/s) | 13.8 to 14.2 | 13.8 | |
| b. Upper Rib Y Accel. | 37 to 46 G's | 38.1 G's | G's |
| c. Lower Rib Y Accel. | 37 to 46 G's | 39.6 G's | G's |
| b. Lower Spine Y Accel. | 15 to 22 G's | 19.2 G's | G's |

TECHNICIAN'S NAME: Ivan Minkewicz

SID CONFIGURATION VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER: 186

| | PART 572F SPECIFICATION | PRE-TEST if required | POST-TEST if required |
|--|----------------------------|-------------------------|--------------------------|
| DATE OF CONFIGURATION VERIFICATION | | 4-22-92 | |
| VERIFICATION NUMBER FOR DUMMY (*) | XXXXXXXXXXXXXXXX | | |
| SH - Seated Height | 35.0 to 35.8" | 35.6 " | " |
| SP - Shoulder Height with Chest Flesh Installed | " | " | " |
| SP - Shoulder Height with Chest Flesh Removed | " | " | " |
| HP - Hip Pivot Height | 3.9" ref. | 3.9 " | " |
| KH - Knee Pivot from Back Line | 20.1 to 20.7" | 20.5 " | " |
| KV - Knee Pivot to Floor | 19.3 to 19.9" | 19.4 " | " |
| SW - Shoulder Width | " | " | " |
| HW - Hip Width | 14.0 to 15.4" | 14.5 " | " |
| OW - Overall External Width (At Widest Point) | " | " | " |

SEQUENTIAL VERIFICATION NUMBER FOR DUMMY: 1

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

TECHNICIAN'S NAME: Ivan Minkewicz

SID PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER: 186

| | | PRE-TEST (if required) | POST-TEST (if required) |
|--|---------------|---------------------------|----------------------------|
| DATE OF PERFORMANCE VERIFICATION | | XXXXXXXXXXXXX | |
| SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*) | | XXXXXXXXXXXXX | |
| VERIFICATION LAB TEMPERATURE (66 to 78 deg.) | | 70 deg | deg |
| VERIFICATION LAB HUMIDITY (10 TO 70 %) | | 43 % | % |
| TEST PARAMETER | SPECIFICATION | | |
| 1. <u>PELVIC IMPACT TEST</u> | Date: | 4-22-92 | |
| a. Pendulum Velocity (ft/s) | 13.8 to 14.2 | 13.8 | |
| b. Pelvic Y acceleration | 40 to 60 G's | 56.7 G's | G's |
| 2. <u>THORAX IMPACT TEST</u> | Date: | 4-22-92 | |
| a. Pendulum Velocity (ft/s) | 13.8 to 14.2 | 14.1 | |
| b. Upper Rib Y Accel. | 37 to 46 G's | 38.3 G's | G's |
| c. Lower Rib Y Accel. | 37 to 46 G's | 38.1 G's | G's |
| b. Lower Spine Y Accel. | 15 to 22 G's | 19.8 G's | G's |

TECHNICIAN'S NAME: Ivan Minkewicz