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REPORT NUMBER: 214-CAL-98-01

**SAFETY COMPLIANCE TESTING FOR FMVSS 214  
SIDE IMPACT PROTECTION - PASSENGER CARS**

FUJI HEAVY INDUSTRIES LTD.  
1998 SUBARU LEGACY  
4-DOOR SEDAN

NHTSA NUMBER: CW5500

CALSPAN SRL CORPORATION  
TRANSPORTATION SCIENCES CENTER  
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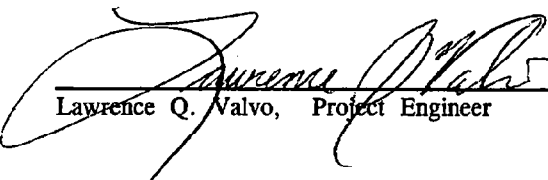
October 14, 1997

**FINAL REPORT**

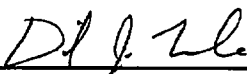
**U. S. DEPARTMENT OF TRANSPORTATION**  
National Highway Traffic Safety Administration  
Enforcement  
Office of Vehicle Compliance  
400 Seventh Street, SW  
Room 6115 (NSA-30)  
Washington, DC 20590

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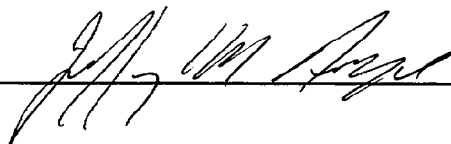
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| 1. Report No.<br>214-CAL-98-01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  | 2. Government Accession No.                         |                                                                                                                                                                                                                                                                                                    | 3. Recipient's Catalog No.                                          |  |  |                  |  |                 |  |                              |           |     |           |     |                              |           |     |           |     |                           |           |     |           |     |                              |           |     |           |     |                            |           |     |           |     |
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| 4. Title and Subtitle<br>Final Report of FMVSS 214 Compliance Side Impact Testing of a<br>1998 Subaru Legacy 4-Door Sedan<br>NHTSA No.: CW5500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |                                                     |                                                                                                                                                                                                                                                                                                    | 5. Report Date<br>October 14, 1997                                  |  |  |                  |  |                 |  |                              |           |     |           |     |                              |           |     |           |     |                           |           |     |           |     |                              |           |     |           |     |                            |           |     |           |     |
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| 9. Performing Organization Name and Address<br>Calspan Transportation Sciences Center<br>P.O. Box 400<br>Buffalo, New York 14225                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                  |                                                     |                                                                                                                                                                                                                                                                                                    | 10. Work Unit No.                                                   |  |  |                  |  |                 |  |                              |           |     |           |     |                              |           |     |           |     |                           |           |     |           |     |                              |           |     |           |     |                            |           |     |           |     |
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| 15. Supplementary Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |                                                     |                                                                                                                                                                                                                                                                                                    |                                                                     |  |  |                  |  |                 |  |                              |           |     |           |     |                              |           |     |           |     |                           |           |     |           |     |                              |           |     |           |     |                            |           |     |           |     |
| 16. Abstract<br><p>A 48/24 kph 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject 1998 Subaru Legacy 4-Door Sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-04 to determine FMVSS 214 Side Impact Protection compliance. This test was conducted at the Calspan SRL Corporation Crash Test Facility in Buffalo, New York, on October 14, 1997.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 53.6 kph, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.7°C. The target vehicle post-test maximum crush was 330 mm at level 3.</p> <p>The test or target vehicle's performance is given below:</p> <table border="0"> <thead> <tr> <th></th> <th align="center"><u>Front SID</u></th> <th></th> <th align="center"><u>Rear SID</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td> <td align="center"><u>63</u></td> <td align="center">g's</td> <td align="center"><u>58</u></td> <td align="center">g's</td> </tr> <tr> <td>Left Lower Rib Acceleration:</td> <td align="center"><u>52</u></td> <td align="center">g's</td> <td align="center"><u>62</u></td> <td align="center">g's</td> </tr> <tr> <td>Lower Spine Acceleration:</td> <td align="center"><u>75</u></td> <td align="center">g's</td> <td align="center"><u>51</u></td> <td align="center">g's</td> </tr> <tr> <td>Thoracic Trauma Index (TTI):</td> <td align="center"><u>69</u></td> <td align="center">g's</td> <td align="center"><u>57</u></td> <td align="center">g's</td> </tr> <tr> <td>Pelvis Acceleration (PEV):</td> <td align="center"><u>79</u></td> <td align="center">g's</td> <td align="center"><u>56</u></td> <td align="center">g's</td> </tr> </tbody> </table> <p>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 the side impact event.</p> |                  |                                                     |                                                                                                                                                                                                                                                                                                    |                                                                     |  |  | <u>Front SID</u> |  | <u>Rear SID</u> |  | Left Upper Rib Acceleration: | <u>63</u> | g's | <u>58</u> | g's | Left Lower Rib Acceleration: | <u>52</u> | g's | <u>62</u> | g's | Lower Spine Acceleration: | <u>75</u> | g's | <u>51</u> | g's | Thoracic Trauma Index (TTI): | <u>69</u> | g's | <u>57</u> | g's | Pelvis Acceleration (PEV): | <u>79</u> | g's | <u>56</u> | g's |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <u>Front SID</u> |                                                     | <u>Rear SID</u>                                                                                                                                                                                                                                                                                    |                                                                     |  |  |                  |  |                 |  |                              |           |     |           |     |                              |           |     |           |     |                           |           |     |           |     |                              |           |     |           |     |                            |           |     |           |     |
| Left Upper Rib Acceleration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <u>63</u>        | g's                                                 | <u>58</u>                                                                                                                                                                                                                                                                                          | g's                                                                 |  |  |                  |  |                 |  |                              |           |     |           |     |                              |           |     |           |     |                           |           |     |           |     |                              |           |     |           |     |                            |           |     |           |     |
| Left Lower Rib Acceleration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <u>52</u>        | g's                                                 | <u>62</u>                                                                                                                                                                                                                                                                                          | g's                                                                 |  |  |                  |  |                 |  |                              |           |     |           |     |                              |           |     |           |     |                           |           |     |           |     |                              |           |     |           |     |                            |           |     |           |     |
| Lower Spine Acceleration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <u>75</u>        | g's                                                 | <u>51</u>                                                                                                                                                                                                                                                                                          | g's                                                                 |  |  |                  |  |                 |  |                              |           |     |           |     |                              |           |     |           |     |                           |           |     |           |     |                              |           |     |           |     |                            |           |     |           |     |
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| Pelvis Acceleration (PEV):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <u>79</u>        | g's                                                 | <u>56</u>                                                                                                                                                                                                                                                                                          | g's                                                                 |  |  |                  |  |                 |  |                              |           |     |           |     |                              |           |     |           |     |                           |           |     |           |     |                              |           |     |           |     |                            |           |     |           |     |
| 17. Key Words<br>Compliance Testing<br>Side Impact Protection<br>FMVSS 214<br>Side Impact Dummy (SID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                                                     | 18. Distribution Statement<br><u>Copies of this report are available from:</u><br>National Highway Traffic Safety Administration<br>Technical Reference Division<br>Room 5108 (NAD-52)<br>400 Seventh St., S.W.<br>Washington, D.C. 20590<br>Telephone No. (202) 366-4946<br>ATTN: Robert Hornicle |                                                                     |  |  |                  |  |                 |  |                              |           |     |           |     |                              |           |     |           |     |                           |           |     |           |     |                              |           |     |           |     |                            |           |     |           |     |
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## **SECTION 1**

### **PURPOSE AND TEST PROCEDURE**

This side impact test is part of the FMVSS 214 Side Impact Protection Compliance Test Program sponsored by the National Highway Safety Administration (NHTSA) under Contract No. DTNH22-97-C-01033. The purpose of this test was to evaluate side impact protection in a 1998 Subaru Legacy 4-Door Sedan. The test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-04, dated September 1, 1995).

## SECTION 2

### SUMMARY OF SIDE IMPACT TEST

A 1998 Subaru Legacy 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 53.6 kph (33.3 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Calspan SRL Corporation Transportation Sciences Center in Buffalo, New York on October 14, 1997. Pre- and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SIDs) are included 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 the instructions specified in the OVSC Side Impact Laboratory Test Procedure (TP-214D-04, dated September 1, 1995). Both SIDs were certified prior to this test. The side impact test was documented by one real-time camera and 9 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The SIDs were instrumented with the following accelerometers:

1. Left Upper Rib (LUR) uniaxial and redundant accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial and redundant accelerometer (Y-direction)
3. Lower Thoracic Spine (T<sub>12</sub>) uniaxial and redundant accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial and redundant accelerometer (Y-direction)

A summary of the side impact dummy (SID) configuration and verification test data can be found in Appendix C. A total of 45 channels of data were recorded. Appendix B contains the vehicle, MDB and dummy response data traces.

The following table summarizes the results of the test.

| Injury Criteria | Front SID | Rear SID |
|-----------------|-----------|----------|
| TTI (g)         | 69        | 57       |
| PEV (g)         | 79        | 56       |

FMVSS 214D requires that the TTI not exceed 85 for 4 door vehicles and not exceed 90 for 2 door vehicles. Peak lateral pelvis acceleration shall not exceed 130 g's.

**SECTION 3**

**SUMMARY OF TEST RESULTS**

# DATA SHEET 1

## GENERAL TEST AND VEHICLE PARAMETER DATA

### TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1998 Subaru Legacy 4-Door Sedan  
 Vehicle Body Color: Silver VIN: 4S3BD4359W6200649  
 Vehicle NHTSA No.: CW5500 Month & Year of Manufacture: 06/97  
 Engine Data: 4 Cylinders; - CID; 2.2 Liters; - cc  
 Engine Placement: X Longitudinal; or - Lateral  
 Transmission: 5 Speed; X Manual; - Automatic; - Overdrive  
 Final Drive: - Rear Wheel Drive; - Front Wheel Drive; X Four Wheel  
 Odometer Reading 15 km  
 Options: X A/C; X Power Steering; X Pwr.Brakes; X Pwr. Windows

### DATA FROM TIRE PLACARD

Tire Pressure\* (at capacity); 220 kPa FRONT  
210 kPa REAR  
 Recommended Tire Size: P185/70R14 87S  
 Tires on Test Vehicle: P185/70R14 87S ; Manufacturer: Bridgestone  
 Vehicle Capacity Data:  
 Number of Occupants: 2 Front; 3 Rear; - 3rd Seat; 5 Total  
 Type of Front Seats: X Bucket; - Bench; - Split Bench  
 Type of Front Seat Back: - Fixed; X Adjustable with X Lever or - Knob  
 Vehicle Max Capacity Loading = 383.0 kg (A)  
 No. of Occupants x 68.04 kg. = 340.2 kg (B)  
 Vehicle Cargo Capacity = 42.8 kg (A-B)

### TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

|                   |   |                   |                   |   |                 |
|-------------------|---|-------------------|-------------------|---|-----------------|
| Left Front        | = | <u>367.5</u> kg   | Left Rear         | = | <u>301.0</u> kg |
| Right Front       | = | <u>357.5</u> kg   | Right Rear        | = | <u>297.0</u> kg |
| TOTAL FRONT       | = | <u>725.0</u> kg   | TOTAL REAR        | = | <u>598.0</u> kg |
| % of Total Weight | = | <u>54.8</u> %     | % of Total Weight | = | <u>45.2</u> %   |
| TOTAL WEIGHT      | = | <u>1,323.0</u> kg |                   |   |                 |

\* Tire pressure used in test.

# DATA SHEET 1 (continued)

## GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

### CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

|                                                                      |   |                |            |
|----------------------------------------------------------------------|---|----------------|------------|
| Total Test Vehicle Delivered Weight with Max. Fluids                 | = | <u>1323.0</u>  | kg (A)     |
| Maximum Cargo Carrying Capacity of Test Vehicle                      | = | <u>42.8</u>    | kg (B)     |
| Weight of instrumented Side Impact Dummies (1 or 2 X <u>81.2</u> kg) | = | <u>162.4</u>   | kg (C)     |
| TEST VEHICLE TARGET WEIGHT:                                          | = | <u>1,528.2</u> | kg (A+B+C) |

### FULLY LOADED TEST VEHICLE (UDVW + 1 or 2 SID(s) + CARGO):

|                   |   |                |    |                   |   |              |    |
|-------------------|---|----------------|----|-------------------|---|--------------|----|
| Left Front        | = | <u>416.5</u>   | kg | Left Rear         | = | <u>393.0</u> | kg |
| Right Front       | = | <u>363.0</u>   | kg | Right Rear        | = | <u>356.5</u> | kg |
| TOTAL FRONT       | = | <u>779.5</u>   | kg | TOTAL REAR        | = | <u>749.5</u> | kg |
| % of Total Weight | = | <u>51.0</u>    | %  | % of Total Weight | = | <u>49.0</u>  | %  |
| TOTAL TEST WEIGHT | = | <u>1,529.0</u> | kg |                   |   |              |    |

### AS TESTED WEIGHT OF TEST VEHICLE (1 OR 2 SID(s) + CARGO + EQUIPMENT & INSTRUMENTATION):

|                   |   |                |    |                   |   |              |    |
|-------------------|---|----------------|----|-------------------|---|--------------|----|
| Left Front        | = | <u>409.0</u>   | kg | Left Rear         | = | <u>385.5</u> | kg |
| Right Front       | = | <u>371.0</u>   | kg | Right Rear        | = | <u>354.5</u> | kg |
| TOTAL FRONT       | = | <u>780.0</u>   | kg | TOTAL REAR        | = | <u>740.0</u> | kg |
| % of Total Weight | = | <u>51.3</u>    | %  | % of Total Weight | = | <u>48.7</u>  | %  |
| TOTAL TEST WEIGHT | = | <u>1,520.0</u> | kg |                   |   |              |    |

### TEST VEHICLE ATTITUDE (all dimensions in millimeters):

#### AS DELIVERED:

|            |            |             |            |           |            |            |            |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>676</u> | Right Front | <u>674</u> | Left Rear | <u>665</u> | Right Rear | <u>661</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

#### FULLY LOADED:

|            |            |             |            |           |            |            |            |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>656</u> | Right Front | <u>663</u> | Left Rear | <u>622</u> | Right Rear | <u>634</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

#### READY FOR TEST:

|            |            |             |            |           |            |            |            |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>663</u> | Right Front | <u>671</u> | Left Rear | <u>628</u> | Right Rear | <u>636</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

Test Vehicle Wheelbase: 2639 millimeters

C.G. = 1,285 millimeters rearward of front wheel centerline

### TOTAL VEHICLE LENGTH:

|            |   |             |             |
|------------|---|-------------|-------------|
| Right Side | = | <u>4563</u> | millimeters |
| Left Side  | = | <u>4563</u> | millimeters |
| Centerline | = | <u>4619</u> | millimeters |

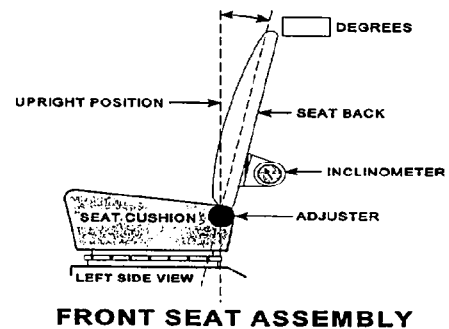
# DATA SHEET 1 (continued)

## GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



### FRONT SEAT CUSHION

Position in detent #10, where the forward most position is detent #1

Total Length of Adjustment Travel: 230 millimeters

Total Number of Adjustment Positions or Detents: 18

### FRONT SEAT BACK ADJUSTMENT POSITION:

Detent #4, where the most upright position is detent #1

Seat Back Torso Angle: 20 degrees

### SECOND POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: N/A millimeters

Seat Back Adjustment Position: N/A

### ADJUSTABLE STEERING COLUMN POSITION:

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:

60.0 liters (Fuel Tank Usable Capacity)

56.0 liters used in test (92%-94% of Fuel Tank Usable Capacity)

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

Wheelbase 2639 millimeters

Impact Point is 380 millimeters rearward of front axle centerline

(which is 940 millimeters forward of the wheelbase midpoint)

Actual Impact Point is 372 millimeters rearward of front axle centerline

## DATA SHEET 2

### TEST VEHICLE SUMMARY OF RESULTS

#### VEHICLE IDENTIFICATION:

Vehicle Year/Make/Model: 1998 Subaru Legacy

Body Style: 4-Door Sedan

VIN: 4S3BD4359W6200649

NHTSA No.: CW5500

Test Date: October 14, 1997

Overall Length = 4619 millimeters; Overall Width = 1695 millimeters

#### VEHICLE TEST WEIGHT (Pre-Test):

Left Front = 409.0 kg      Left Rear = 385.5 kg

Right Front = 371.0 kg      Right Rear = 354.5 kg

TOTAL FRONT = 780.0 kg      TOTAL REAR = 740.0 kg

TOTAL VEHICLE WEIGHT 1,520.0 kg

Wheelbase = 2639 millimeters

Longitudinal C.G. from Center of Front Axle = 1,285 millimeters

Impact Angle with Respect to Impactor = 90 degrees

#### ACTUAL IMPACT POINT

Actual Impact Point is 8 mm forward of nominal impact ref. line (Lateral)

Actual Impact Point is 0 mm abv or bel nominal impact point (Vertical)

#### MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 ( 227 mm above ground) = 130 millimeters

2. LEVEL 2 ( 461 mm above ground) = 329 millimeters

3. LEVEL 3 ( 574 mm above ground) = 330 millimeters

4. LEVEL 4 ( 849 mm above ground) = 227 millimeters

5. LEVEL 5 ( 1318 mm above ground) = 63 millimeters

Maximum Post-Test Intrusion = 330 millimeters

#### OCCUPANTS:

##### Front Passenger:

##### Rear Passenger:

Dummy Identification 268

027

Restraints Used 3-point active seat belt

3-point active seat belt

#### INSTRUMENTATION:

Number of Vehicle Data Channels: = 20

Number of Cameras: Onboard = 3

Offboard = 6

TOTAL = 9

### DATA SHEET 3

#### MOVING DEFORMABLE BARRIER (MDB) SUMMARY

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

MDB FACE MANUFACTURER AND SERIAL NUMBER:

Plascore Inc., 083A0697-4, 061A0697

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

|                                                     |   |             |             |
|-----------------------------------------------------|---|-------------|-------------|
| Overall Width of Framework Carriage                 | = | <u>1250</u> | millimeters |
| Overall Length of MDB (incl. honeycomb impact face) | = | <u>4120</u> | millimeters |
| Wheelbase of Framework Carriage                     | = | <u>2590</u> | millimeters |
| Tread of Framework Carriage (Front & Rear)          | = | <u>1875</u> | millimeters |
| C.G. Location Rearward of Front Axle                | = | <u>1104</u> | millimeters |

MDB WEIGHT:

|                                              |   |                |         |            |   |              |    |
|----------------------------------------------|---|----------------|---------|------------|---|--------------|----|
| Left Front                                   | = | <u>409.5</u>   | kg      | Left Rear  | = | <u>281.5</u> | kg |
| Right Front                                  | = | <u>372.5</u>   | kg      | Right Rear | = | <u>299.0</u> | kg |
| TOTAL FRONT                                  | = | <u>782.0</u>   | kg      | TOTAL REAR | = | <u>580.5</u> | kg |
| TOTAL MDB WEIGHT                             | = | <u>1,362.5</u> | kg      |            |   |              |    |
| Impact Angle (MDB C/L to Target Vehicle C/L) | = | <u>90</u>      | degrees |            |   |              |    |
| Impact Speed                                 | = | <u>53.6</u>    | kph     |            |   |              |    |

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

|                                    |   |            |             |
|------------------------------------|---|------------|-------------|
| 1. Row A at Center of Bumper Level | = | <u>94</u>  | millimeters |
| 2. Row B at Top of Bumper Level    | = | <u>47</u>  | millimeters |
| 3. Row C at Mid Level              | = | <u>94</u>  | millimeters |
| 4. Row D at Top of Stack Level     | = | <u>119</u> | millimeters |

INSTRUMENTATION:

|                             |   |          |
|-----------------------------|---|----------|
| Number of MDB Data Channels | = | <u>5</u> |
|-----------------------------|---|----------|



## DATA SHEET 4

### POST-TEST OBSERVATIONS

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

#### VISIBLE DUMMY CONTACT POINTS:

##### LEFT FRONT SID

Head: Back of head to D-ring  
Upper Torso: Shoulder to upper rear portion of door trim panel above arm rest  
Lower Torso: Left side of pelvis to rear portion of door pocket located on the lower door trim panel  
Left Knee: Knee to door trim panel forward of arm rest  
Right Knee: Left knee

##### LEFT REAR SID

Top of head to C-pillar trim  
Shoulder to upper rear portion of door trim panel above arm rest  
Left side of pelvis to left seat bolster  
Knee to door trim panel forward of arm rest  
Left knee

#### DOOR OPENING:

##### LEFT DOOR

Front: Closed / Inoperable  
Rear: Closed / Inoperable

##### RIGHT DOOR

Closed / Operable  
Closed / Operable

#### MDB DISTANCE FROM TARGET IMPACT POINT:

Vertical: 0 mm  
Horizontal: 8 mm forward of target

#### ARM REST LOCATIONS:

Front: 245 millimeters below the bottom of the window  
Rear: 255 millimeters below the bottom of the window

#### SEAT MOVEMENT:

Front: Driver seat was pushed inboard against center console  
Rear: Left seat bolster was pushed inboard and upward

#### GLAZING DAMAGE:

Windshield: Windshield cracked from the left side top and bottom corners  
Window: Left side front and rear door windows shattered at impact

#### PILLAR PERFORMANCE:

97 mm tear of lower rear B-pillar sheet metal rear of the seatbelt retractor

#### SILL SEPARATION:

None

#### OTHER NOTABLE IMPACT EFFECTS:

Vehicle airbags did not deploy during the impact

**SECTION 4**

**OCCUPANT AND VEHICLE INFORMATION**

# DATA SHEET 5

## SID INSTRUMENTATION DATA

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

|                              | Front Dummy ID# 268 |             |                |             | Rear Dummy ID# 027 |             |                |             |
|------------------------------|---------------------|-------------|----------------|-------------|--------------------|-------------|----------------|-------------|
|                              | Pos. Direction      |             | Neg. Direction |             | Pos. Direction     |             | Neg. Direction |             |
|                              | Max (g)             | Time (msec) | Max (g)        | Time (msec) | Max (g)            | Time (msec) | Max (g)        | Time (msec) |
| <b>RIB ACCELERATIONS:</b>    |                     |             |                |             |                    |             |                |             |
| Upper Rib Lateral . Y        | 62.8                | 29.4        | -20.2          | 75.0        | 58.4               | 44.4        | -5.0           | 91.9        |
| Upper Rib Lateral . Y(R)     | 58.9                | 29.4        | -19.9          | 75.0        | 63.2               | 43.7        | -4.5           | 91.9        |
| Lower Rib Lateral . Y        | 52.2                | 30.6        | -14.1          | 75.0        | 61.6               | 43.7        | -22.8          | 77.5        |
| Lower Rib Lateral . Y(R)     | 53.5                | 30.6        | -13.2          | 73.7        | 65.9               | 43.7        | -19.0          | 77.5        |
| <b>SPINE ACCELERATIONS:</b>  |                     |             |                |             |                    |             |                |             |
| Lower Lateral . . . . Y      | 75.3                | 35.0        | -16.9          | 67.5        | 51.4               | 48.1        | -31.1          | 71.9        |
| Lower Lateral . . . . Y(R)   | 73.3                | 34.4        | -17.8          | 66.9        | 49.9               | 53.7        | -53.1          | 69.4        |
| <b>PELVIC ACCELERATIONS:</b> |                     |             |                |             |                    |             |                |             |
| Lateral . . . . . Y          | 79.1                | 31.9        | -13.5          | 83.1        | 55.7               | 40.0        | -8.6           | 76.9        |
| Lateral . . . . . Y(R)       | 82.8                | 31.2        | -15.4          | 81.9        | 54.1               | 40.0        | -9.1           | 77.5        |

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

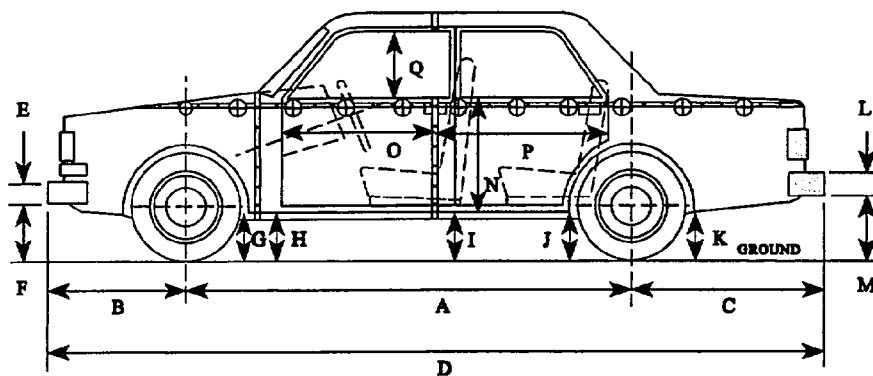
Note: Above data has been FIR filtered, Y(R) denotes redundant Y direction accelerometer.

# DATA SHEET 6

## VEHICLE SIDE MEASUREMENTS

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500



**LEFT SIDE VIEW**

NOTE: all dimensions are in millimeters with tolerance of  $\pm 3$  mm

|    | PRE-TEST<br>(as delivered) | PRE-TEST<br>(as tested) | POST-TEST<br>(as tested) | $\Delta$ CHANGE |
|----|----------------------------|-------------------------|--------------------------|-----------------|
| A  | 2639                       | -                       | 2654                     | 15              |
| B  | 955                        | -                       | 827                      | -128            |
| C  | 1025                       | -                       | 1107                     | 82              |
| D  | 4619                       | -                       | 4588                     | -31             |
| E  | 605                        | -                       | 585                      | -20             |
| F  | 420                        | 390                     | 390                      | 0               |
| G  | 192                        | 155                     | 200                      | 45              |
| H  | 193                        | 155                     | 200                      | 45              |
| I  | 194                        | 132                     | 160                      | 28              |
| J1 | 190                        | 135                     | 150                      | 15              |
| J2 | 297                        | 242                     | 285                      | 43              |
| K  | 260                        | 212                     | 215                      | 3               |
| L  | 580                        | -                       | 595                      | 15              |
| M  | 365                        | 340                     | 325                      | -15             |
| N  | 619                        | -                       | 522                      | -97             |
| O  | 738                        | -                       | 730                      | -8              |
| P  | 1306                       | -                       | 1210                     | -96             |
| Q  | 468                        | -                       | 476                      | 8               |
| R  | 4563                       | -                       | 4564                     | 1               |
| S  | 4563                       | -                       | 4524                     | -39             |
| T  | 1695                       | -                       | 1544                     | -151            |

D = Length at Centerline  
T = Width at B-Pillar

E&L = Bumper Thickness  
J1 = To Pinch Weld

R = Right Side Length  
J2 = To Sill

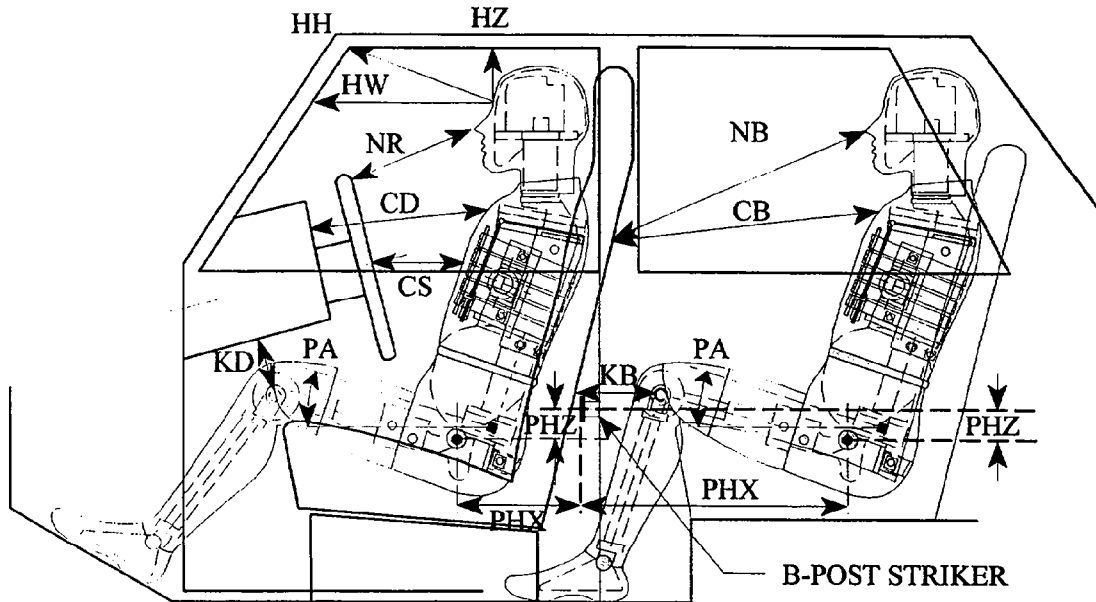
S = Left Side Length

# DATA SHEET 7

## SID LONGITUDINAL CLEARANCE DIMENSIONS

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500



### LEFT SIDE VIEW

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

NOTE: All dimensions are in millimeters with tolerance of  $\pm 3$  mm

|                     | DRIVER ID# 268 | LEFT REAR PASS. ID# 027 |
|---------------------|----------------|-------------------------|
| HH                  | 319            | N/A                     |
| HW                  | 595            | N/A                     |
| HZ                  | 189            | 165                     |
| NR/NB               | 478            | 637                     |
| CD/CB               | 540            | 497                     |
| CS                  | 281            | N/A                     |
| KDL(KDA°)/KBL(KDA°) | 202 / (20°)    | 222 / (25°)             |
| KDR(KBA°)/KBR(KBA°) | 202 / (22°)    | 228 / (25°)             |
| PA°                 | 24°            | 24°                     |
| PHX                 | 178            | 248                     |
| PHZ                 | 108            | 288                     |

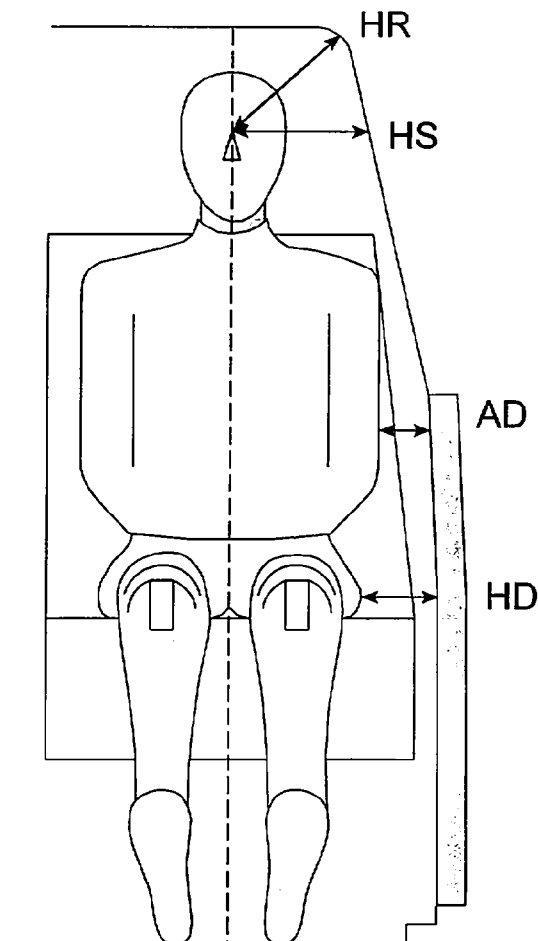
Note: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

# DATA SHEET 8

## SID LATERAL CLEARANCE DIMENSIONS

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500



NOTE: All dimensions are in millimeters with tolerance of  $\pm 3$  mm

|     | DRIVER ID # 268          | LEFT REAR PASS. ID # 027   |
|-----|--------------------------|----------------------------|
| HR  | 259                      | 224                        |
| HS  | 326                      | 310                        |
| AD* | LOWER: 98      UPPER: 96 | LOWER: 137      UPPER: 137 |
| HD  | 182                      | 218                        |

\* Lower measurement is taken laterally at center of the lower rib accelerometer height from the SID arm segment to the closest part of the vehicle side.

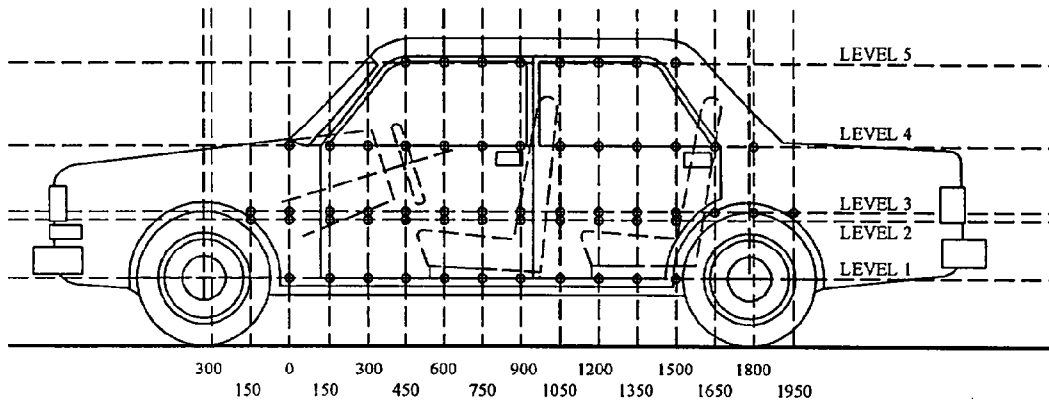
Upper measurement is taken laterally at center of the upper rib accelerometer height from the SID arm segment to the closest part of the vehicle side.

# DATA SHEET 9

## VEHICLE SIDE MEASUREMENTS

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500



**LEFT SIDE VIEW**

NOTE: All measurements are in millimeters (mm)

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 ARE TAKEN WHEN THE VEHICLE IS IN THE "AS TESTED" CONFIGURATION.

Measurements Along the Vertical 750 mm Line Shown Above:

|                                                          |   |             |             |
|----------------------------------------------------------|---|-------------|-------------|
| Level 5 @ Window Top                                     | = | <u>1318</u> | millimeters |
| Level 4 @ Window Sill                                    | = | <u>849</u>  | millimeters |
| Level 3 @ Mid Door                                       | = | <u>574</u>  | millimeters |
| Level 2 @ Occupant H-Point                               | = | <u>461</u>  | millimeters |
| Level 1 @ Axle Centerline Height<br>(or Sill Top Height) | = | <u>227</u>  | millimeters |

# DATA SHEET 10

## VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

NOTE: All dimensions are in millimeters with a tolerance of  $\pm 3$  mm

| DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT |                |       |      |      |      |      |      |      |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------------------------|----------------|-------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| LEVEL                                          | HEIGHT<br>(mm) |       | -900 | -750 | -600 | -450 | -300 | -150 | 0   | 150 | 300 | 450 | 600 | 750 | 900 | 1050 | 1200 | 1350 | 1500 | 1650 | 1800 | 1950 | 2100 | 2250 | 2400 | 2550 | 2700 | 2850 | 3000 |
| LEVEL 1<br>SIDE<br>SILL                        | 227            | PRE   | -    | -    | -    | -    | -    | -    | 193 | 196 | 199 | 200 | 201 | 202 | 204 | 203  | 204  | 204  | 205  | 198  | -    | -    | -    | -    | -    | -    | -    | -    | -    |
|                                                |                | POST  | -    | -    | -    | -    | -    | -    | 282 | 291 | 308 | 314 | 331 | 329 | 332 | 322  | 309  | 299  | 287  | 271  | -    | -    | -    | -    | -    | -    | -    | -    | -    |
|                                                |                | CRUSH | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | 89  | 95  | 109 | 114 | 130 | 127 | 128 | 119  | 105  | 95   | 82   | 74   | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  |
| LEVEL 2<br>H<br>POINT                          | 461            | PRE   | 168  | 151  | -    | -    | -    | -    | 158 | 153 | 153 | 158 | 157 | 160 | 160 | 160  | 159  | 163  | 165  | 165  | -    | -    | -    | -    | -    | -    | 191  | 210  | 223  |
|                                                |                | POST  | 151  | 146  | -    | -    | -    | -    | 388 | 428 | 455 | 462 | 473 | 476 | 471 | 475  | 483  | 492  | 474  | 416  | -    | -    | -    | -    | -    | -    | 207  | 207  | 227  |
|                                                |                | CRUSH | -17  | -6   | N/A  | N/A  | N/A  | N/A  | N/A | 230 | 275 | 301 | 303 | 316 | 317 | 310  | 315  | 324  | 329  | 309  | 251  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | 15   | -2   |
| LEVEL 3<br>MID<br>DOOR                         | 574            | PRE   | 189  | 162  | -    | -    | -    | -    | 154 | 154 | 155 | 154 | 155 | 158 | 158 | 158  | 158  | 160  | 162  | 164  | 160  | -    | -    | -    | -    | 177  | 195  | 219  | 250  |
|                                                |                | POST  | 174  | 151  | -    | -    | -    | -    | 353 | 381 | 402 | 412 | 422 | 431 | 440 | 466  | 479  | 490  | 483  | 425  | 303  | -    | -    | -    | -    | 194  | 206  | 234  | 247  |
|                                                |                | CRUSH | -15  | -11  | N/A  | N/A  | N/A  | N/A  | N/A | 198 | 227 | 247 | 258 | 267 | 274 | 282  | 307  | 321  | 330  | 321  | 261  | 143  | N/A  | N/A  | N/A  | 17   | 11   | 14   | -4   |
| LEVEL 4<br>WINDOW<br>SILL                      | 849            | PRE   | -    | -    | -    | -    | -    | 242  | 208 | 204 | 202 | 200 | 198 | 197 | 197 | 198  | 200  | 202  | 202  | 205  | 206  | 209  | 219  | 227  | 237  | 250  | 269  | 288  |      |
|                                                |                | POST  | -    | -    | -    | -    | -    | 243  | 265 | 312 | 346 | 357 | 372 | 377 | 394 | 420  | 420  | 427  | 430  | 369  | 289  | 240  | 240  | 240  | 244  | 263  | 269  | 289  |      |
|                                                |                | CRUSH | N/A  | N/A  | N/A  | N/A  | N/A  | 1    | 58  | 108 | 144 | 157 | 174 | 180 | 197 | 222  | 219  | 225  | 227  | 164  | 82   | 31   | 21   | 12   | 7    | 2    | 0    | 1    |      |
| LEVEL 5<br>WINDOW<br>TOP                       | 1318           | PRE   | -    | -    | -    | -    | -    | -    | -   | -   | -   | -   | -   | 435 | 444 | 444  | 448  | 453  | 455  | 457  | -    | -    | -    | -    | -    | -    | -    | -    | -    |
|                                                |                | POST  | -    | -    | -    | -    | -    | -    | -   | -   | -   | -   | -   | -   | 457 | 481  | 507  | 485  | 476  | 470  | 463  | -    | -    | -    | -    | -    | -    | -    | -    |
|                                                |                | CRUSH | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A | N/A | N/A | N/A | N/A | N/A | 22  | 37   | 63   | 37   | 23   | 15   | 6    | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  |



DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

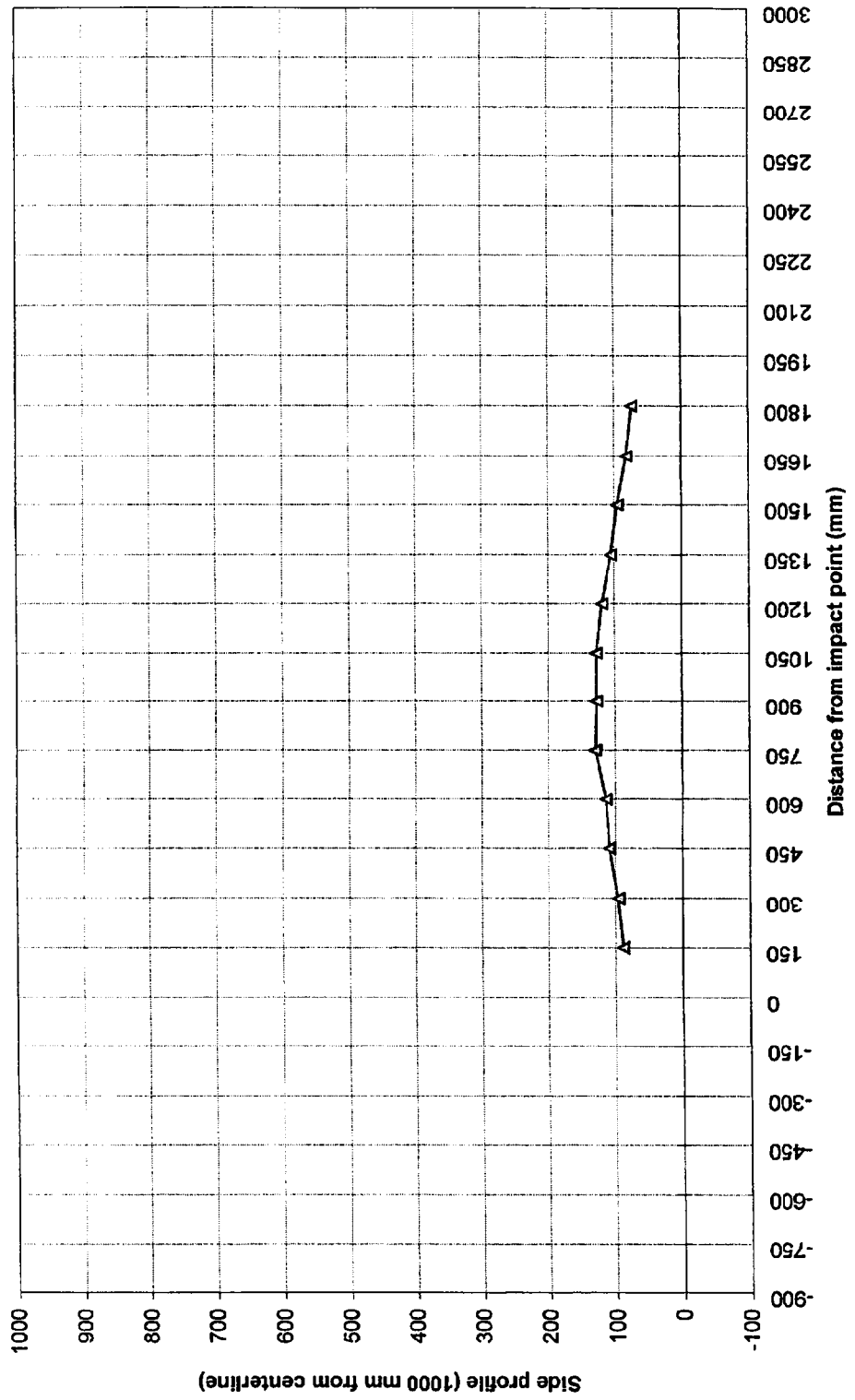
NHTSA No. CW5500

Vehicle: 1998 Subaru Legacy

—▲— CRUSH

SIDE PROFILE LEVEL 1

227 mm above ground



DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

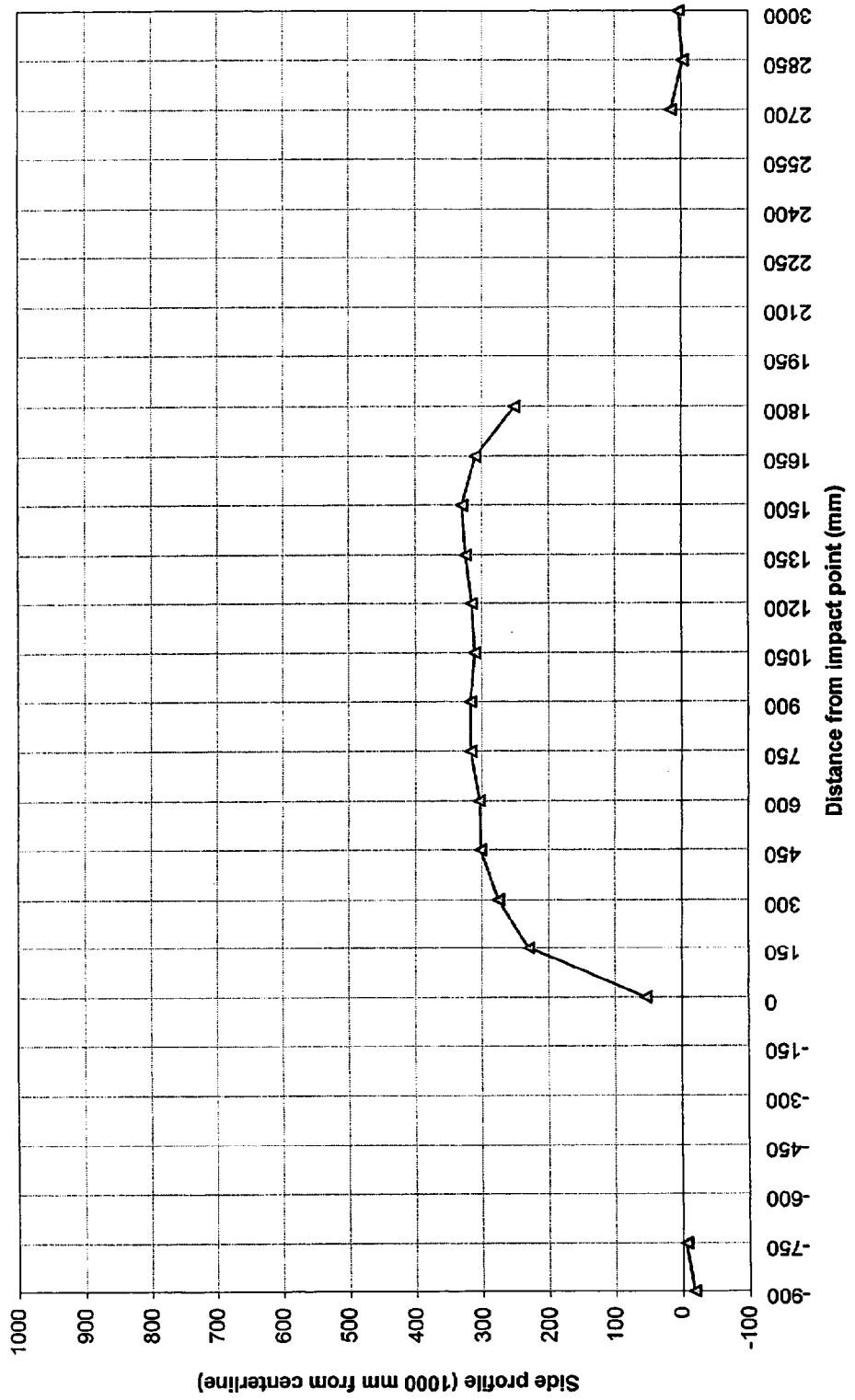
Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

SIDE PROFILE LEVEL 2

461 mm above ground

—▲— CRUSH



DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

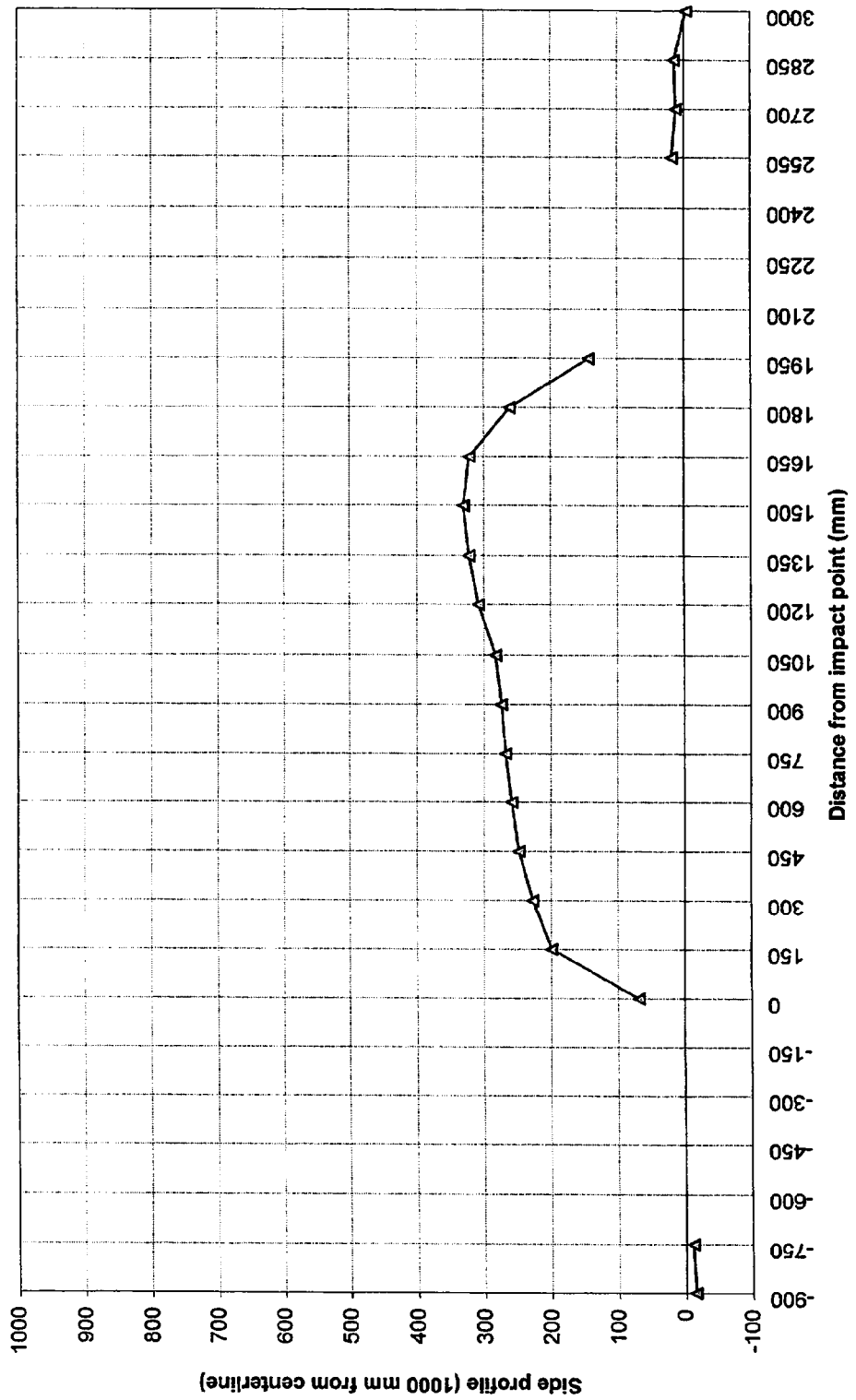
Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

SIDE PROFILE LEVEL 3

574 mm above ground

—△— CRUSH



DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

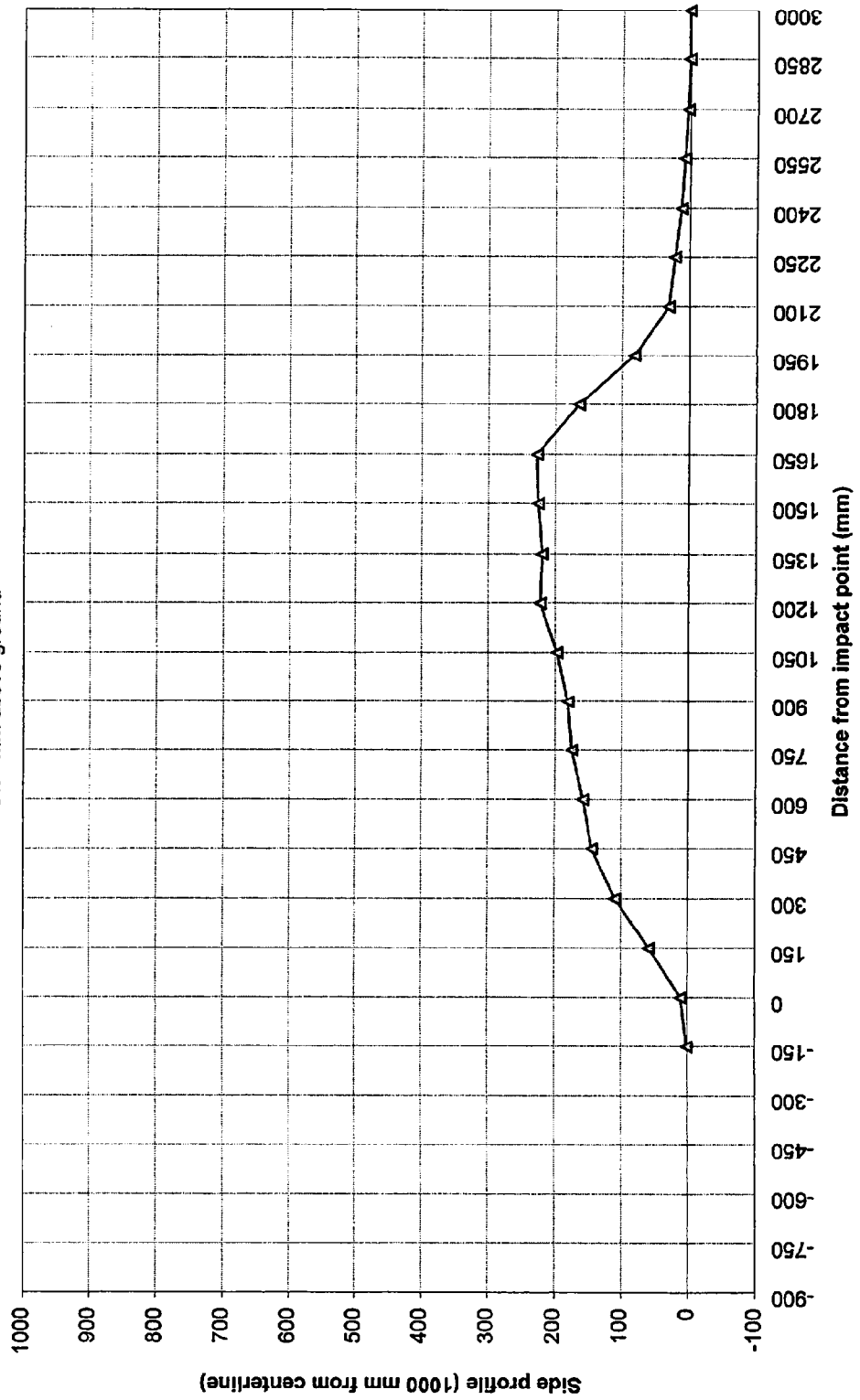
Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

SIDE PROFILE LEVEL 4

849 mm above ground

—△— CRUSH



DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

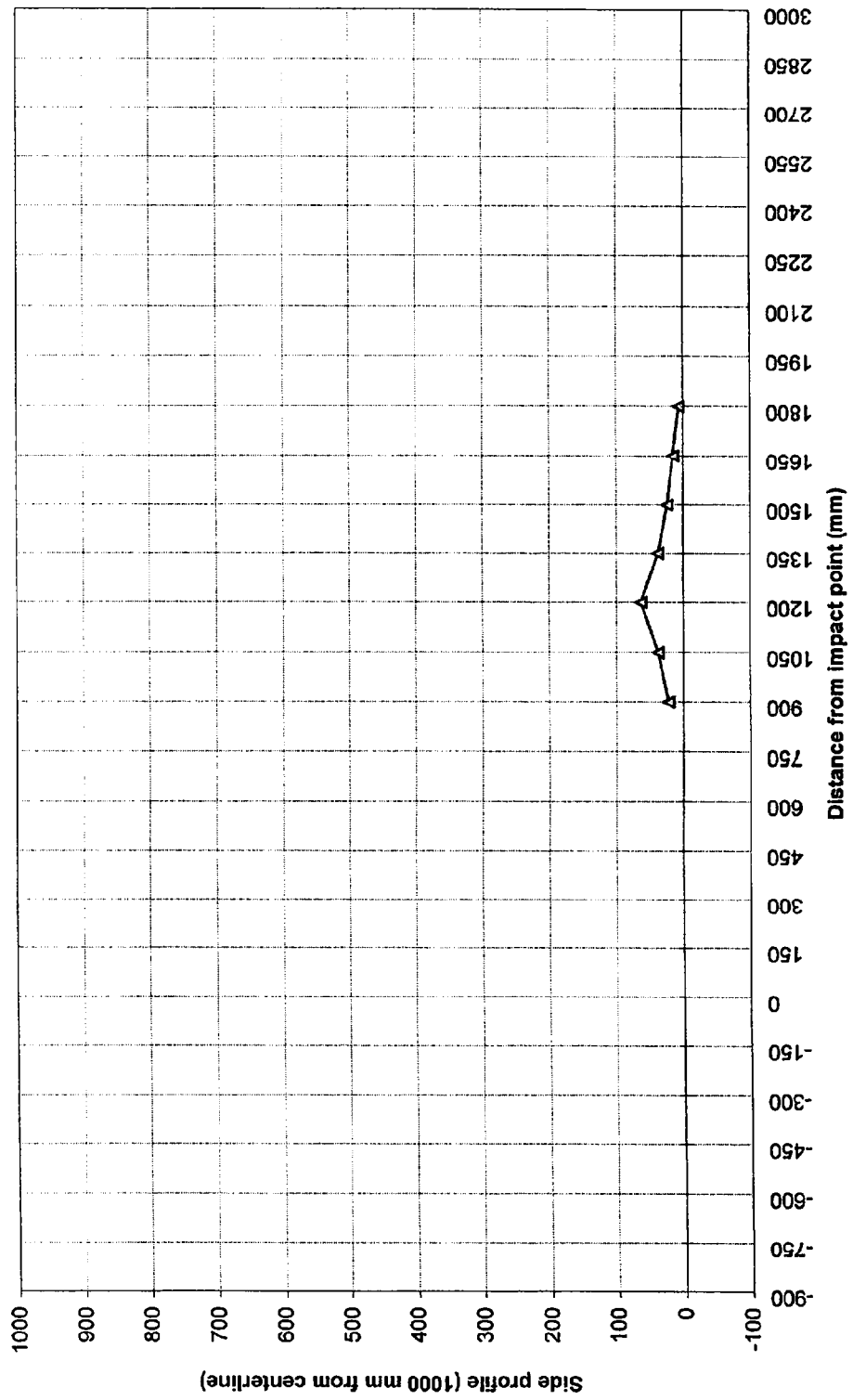
Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

SIDE PROFILE LEVEL 5

1318 mm above ground

▲ CRUSH

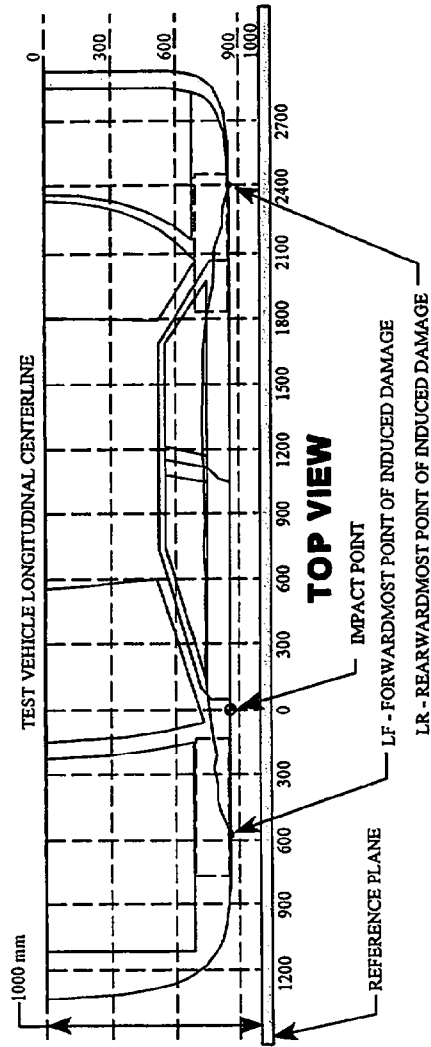


# DATA SHEET 11

## VEHICLE DAMAGE PROFILE DISTANCES

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500



### MEASUREMENT CONVENTIONS:

Forward of the impact point (towards front of vehicle) is considered negative (-).  
Rearward of the impact point (toward rearward of vehicle) is considered positive (+).

NOTE: All dimensions are in millimeters with tolerance of  $\pm 3$  mm.

| DPD MEASUREMENTS |                 | POST TEST (mm) | PRETEST (mm) | STATIC CRUSH (mm) |
|------------------|-----------------|----------------|--------------|-------------------|
| 1                | (LF = -102 mm)  | 236            | 233          | 3                 |
| 2                | 338             | 435            | 153          | 282               |
| 3                | 779             | 474            | 158          | 316               |
| 4                | 1219            | 476            | 160          | 316               |
| 5                | 1660            | 479            | 163          | 316               |
| 6                | (LR = -2100 mm) | 240            | 209          | 31                |

# DATA SHEET 12

## EXTERIOR STATIC CRUSH FOR IMPACTOR FACE (Grid as looking at MDB from front)

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

NOTE: All dimensions are in millimeters with a tolerance of  $\pm 3$  mm

|                          |                          | DISTANCE RIGHT OF CENTER (mm) |     |     |     |     |     |     |     | DISTANCE LEFT OF CENTER (mm) |     |     |     |     |     |     |     |     |
|--------------------------|--------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
|                          |                          | 800                           | 700 | 600 | 500 | 400 | 300 | 200 | 100 |                              | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 |
| LEVEL 4<br>TOP<br>STACK  | HEIGHT<br>AT CL<br>(mm)* |                               |     |     |     |     |     |     |     |                              |     |     |     |     |     |     |     |     |
|                          | PRE                      | 619                           | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619                          | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 |
|                          | POST                     | 652                           | 616 | 619 | 618 | 619 | 619 | 622 | 622 | 622                          | 622 | 627 | 627 | 631 | 637 | 664 | 700 | 737 |
| LEVEL 3<br>MID<br>LEVEL  | CRUSH                    | 33                            | -3  | 0   | 0   | 1   | 1   | 3   | 3   |                              |     | 7   | 8   | 9   | 13  | 19  | 45  | 81  |
|                          | PRE                      | 619                           | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619                          | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 |
|                          | POST                     | 623                           | 614 | 616 | 618 | 617 | 618 | 622 | 624 | 624                          | 624 | 620 | 621 | 621 | 622 | 627 | 666 | 713 |
| LEVEL 2<br>TOP<br>BUMPER | CRUSH                    | 5                             | -4  | -2  | -1  | -1  | 0   | 3   | 5   |                              |     | 3   | 2   | 2   | 3   | 4   | 8   | 47  |
|                          | PRE                      | 619                           | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619                          | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 |
|                          | POST                     | 666                           | 653 | 643 | 643 | 641 | 641 | 640 | 638 | 638                          | 638 | 639 | 640 | 638 | 638 | 642 | 648 | 662 |
| LEVEL 1<br>MID<br>BUMPER | CRUSH                    | 47                            | 35  | 25  | 25  | 23  | 22  | 21  | 20  |                              |     | 19  | 21  | 21  | 19  | 20  | 23  | 30  |
|                          | PRE                      | 535                           | 519 | 518 | 518 | 518 | 518 | 518 | 518 | 518                          | 518 | 518 | 518 | 518 | 518 | 518 | 519 | 535 |
|                          | POST                     | 628                           | 585 | 563 | 555 | 555 | 561 | 553 | 550 | 550                          | 550 | 551 | 550 | 551 | 548 | 551 | 567 | 600 |
|                          | CRUSH                    | 94                            | 66  | 45  | 37  | 36  | 43  | 35  | 32  |                              |     | 32  | 33  | 32  | 33  | 29  | 33  | 48  |
|                          | PRE                      |                               |     |     |     |     |     |     |     |                              |     |     |     |     |     |     |     |     |
|                          | POST                     |                               |     |     |     |     |     |     |     |                              |     |     |     |     |     |     |     |     |

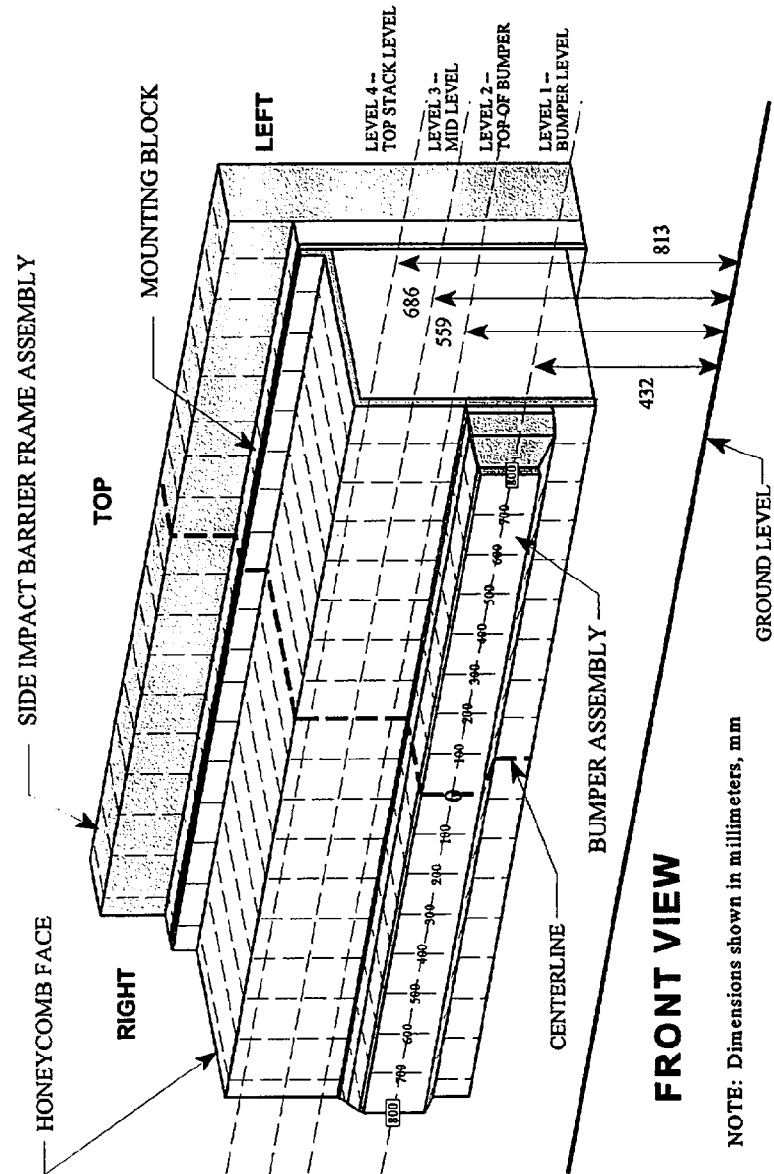
\*Heights measured above ground level.

DATA SHEET 12 (continued)

EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500



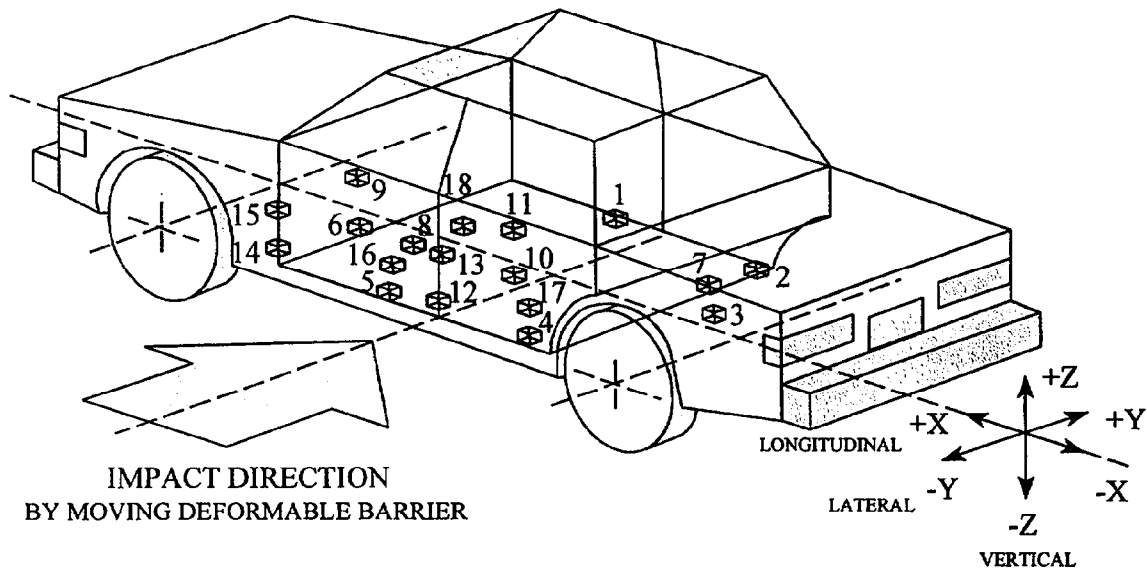


## DATA SHEET 13

### TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500



1-Right Side Sill @ Front Seat

2-Right Side Sill @ Rear Seat

3-Rear Floorpan Above Axle

4-Left Side Sill @ Rear Seat

5-Left Side Sill @ Front Seat

6-Left Front Door on Centerline

7-Right Rear Occupant Compartment

8-Midrear of Left Front Door

9-Left Front Door Upper Centerline

10-Midrear of Left Rear Door

11-Left Rear Door Upper Centerline

12-Left Lower B-Pillar

13-Left Middle B-Pillar

14-Left Lower A-Pillar

15-Left Middle A-Pillar

16-Front Seat Track

17-Rear Seat Track

18-Vehicle CG

DATA SHEET 13 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

| Accel. No. | Location                         | Coordinates (mm) ±3 |      |     | Long. (x) |             | Lat. (y)     |              | Vert. (z)     |             | Resultant    |              |
|------------|----------------------------------|---------------------|------|-----|-----------|-------------|--------------|--------------|---------------|-------------|--------------|--------------|
|            |                                  | X*                  | Y*   | Z*  | Max (g)   | Time (msec) | Max (g)      | Time (msec)  | Max (g)       | Time (msec) | Max (g)      | Time (msec)  |
| 1          | Right Side Sill at Front Seat    | 2652                | 819  | 249 | pos. neg. | 4.8<br>-5.5 | 49.6<br>8.0  | 26.0<br>-2.7 | 6.5<br>55.9   | 3.9<br>-5.5 | 102.8<br>6.5 | 27.0<br>6.5  |
| 2          | Right Side Sill at Rear Seat     | 1842                | 819  | 245 | pos. neg. | 5.4<br>-7.4 | 50.1<br>7.8  | 25.1<br>-2.2 | 6.2<br>146.0  | 3.3<br>-3.8 | 48.9<br>27.3 | 25.9<br>6.3  |
| 3          | Rear Floorpan Above Axle         | 990                 | 0    | 478 | pos. neg. | 1.3<br>-6.1 | 86.4<br>35.7 | 19.1<br>-1.5 | 32.5<br>142.9 | 5.7<br>-6.5 | 41.4<br>24.3 | 19.6<br>25.3 |
| 4          | Left Side Sill at Rear Seat      | 1842                | -662 | 245 | pos. neg. | -           | -            | 38.5<br>-7.9 | 16.3<br>31.5  | -           | -            | -            |
| 5          | Left Side Sill at Front Seat     | 2822                | -667 | 248 | pos. neg. | -           | -            | 35.2<br>-9.9 | 4.4<br>23.6   | -           | -            | -            |
| 6**        | Left Front Door on Centerline    | -                   | -    | -   | pos. neg. | -           | -            | -            | -             | -           | -            | -            |
| 7          | Right Rear Occupant Compartment  | 1832                | 334  | 235 | pos. neg. | -           | -            | 22.8<br>-2.9 | 5.9<br>126.0  | -           | -            | -            |
| 8**        | Midrear of Left Front Door       | -                   | -    | -   | pos. neg. | -           | -            | -            | -             | -           | -            | -            |
| 9**        | Left Front Door Upper Centerline | -                   | -    | -   | pos. neg. | -           | -            | -            | -             | -           | -            | -            |
| 10**       | Midrear of Left Rear Door        | -                   | -    | -   | pos. neg. | -           | -            | -            | -             | -           | -            | -            |
| 11**       | Left Rear Door Upper Centerline  | -                   | -    | -   | pos. neg. | -           | -            | -            | -             | -           | -            | -            |

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

\*\*Accelerometer was not requested by COTR.

DATA SHEET 13 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

NHTSA No. CW5500

Vehicle: 1998 Subaru Legacy

| Accel. No. | Location             | Coordinates (mm) ± 3 |      |     | Long. (x)    |               | Lat. (y)       |              | Vert. (z)     |              | Resultant |      |
|------------|----------------------|----------------------|------|-----|--------------|---------------|----------------|--------------|---------------|--------------|-----------|------|
|            |                      | X*                   | Y*   | Z*  |              |               |                |              |               |              |           |      |
| 12         | Left Lower B-Pillar  | 2182                 | -718 | 510 | pos.<br>neg. | -             | 203.3<br>-53.2 | 3.7<br>25.8  | -             | -            | -         | -    |
| 13         | Left Middle B-Pillar | 2160                 | -718 | 705 | pos.<br>neg. | -             | 161.7<br>-19.3 | 3.2<br>25.4  | -             | -            | -         | -    |
| 14         | Left Lower A-Pillar  | 3182                 | -663 | 460 | pos.<br>neg. | -             | 110.7<br>-27.0 | 2.5<br>18.9  | -             | -            | -         | -    |
| 15         | Left Middle A-Pillar | 3312                 | -792 | 865 | pos.<br>neg. | -             | 37.1<br>-6.5   | 5.1<br>0.6   | -             | -            | -         | -    |
| 16         | Front Seat Track     | 2204                 | -560 | 315 | pos.<br>neg. | -             | 91.9<br>-64.2  | 16.8<br>25.5 | -             | -            | -         | -    |
| 17**       | Rear Seat Track      | -                    | -    | -   | pos.<br>neg. | -             | -              | -            | -             | -            | -         | -    |
| 18         | Vehicle CG           | 2467                 | 0    | 330 | pos.<br>neg. | 31.5<br>-28.7 | 24.8<br>-5.2   | 6.0<br>86.5  | 11.3<br>-10.4 | 32.3<br>79.0 | 34.3      | 79.5 |

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

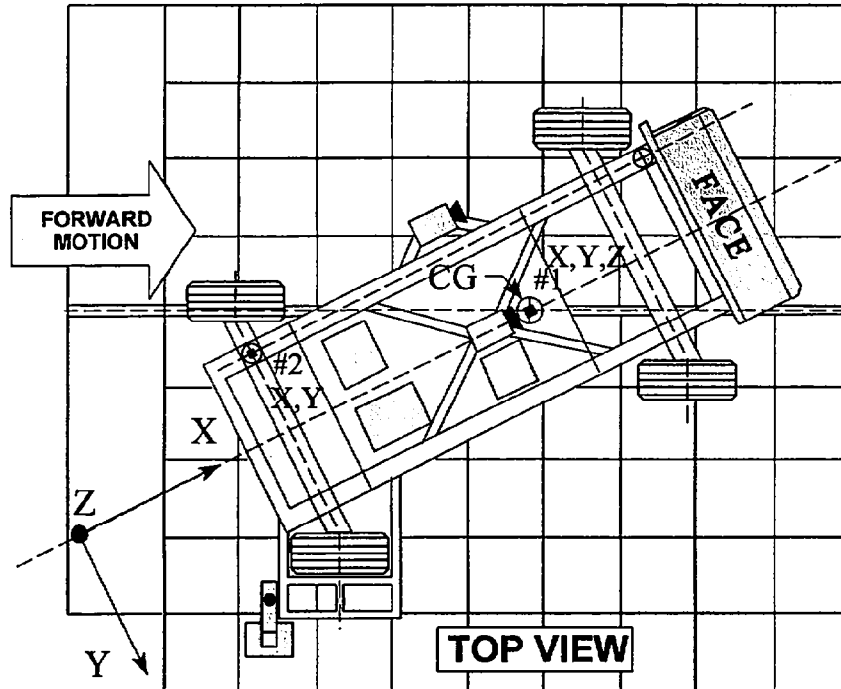
\*\*No accessible mounting location.

# DATA SHEET 14

## MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500



| Accel. No. | Location              | Coordinates (millimeters) |      |     | Pos. Direct. |             | Neg. Direct. |             |
|------------|-----------------------|---------------------------|------|-----|--------------|-------------|--------------|-------------|
|            |                       | X*                        | Y*   | Z*  | Max (g)      | Time (msec) | Max (g)      | Time (msec) |
| 1          | MDB Center of Gravity |                           |      |     |              |             |              |             |
|            | Longitudinal... X     |                           |      |     | 1.2          | 103.4       | -16.0        | 38.3        |
|            | Lateral..... Y        | 1859                      | 0    | 330 | 2.7          | 52.1        | -6.6         | 36.0        |
|            | Vertical..... Z       |                           |      |     | 11.7         | 17.6        | -13.2        | 28.8        |
|            | Resultant..... R      |                           |      |     | 34.3         | 79.5        | -            | -           |
| 2          | Rear Frame Member     |                           |      |     |              |             |              |             |
|            | Longitudinal... X     | 386                       | -660 | 660 | 1.3          | 178.1       | -20.9        | 38.6        |
|            | Lateral..... Y        |                           |      |     | 3.4          | 25.9        | -2.7         | 68.1        |

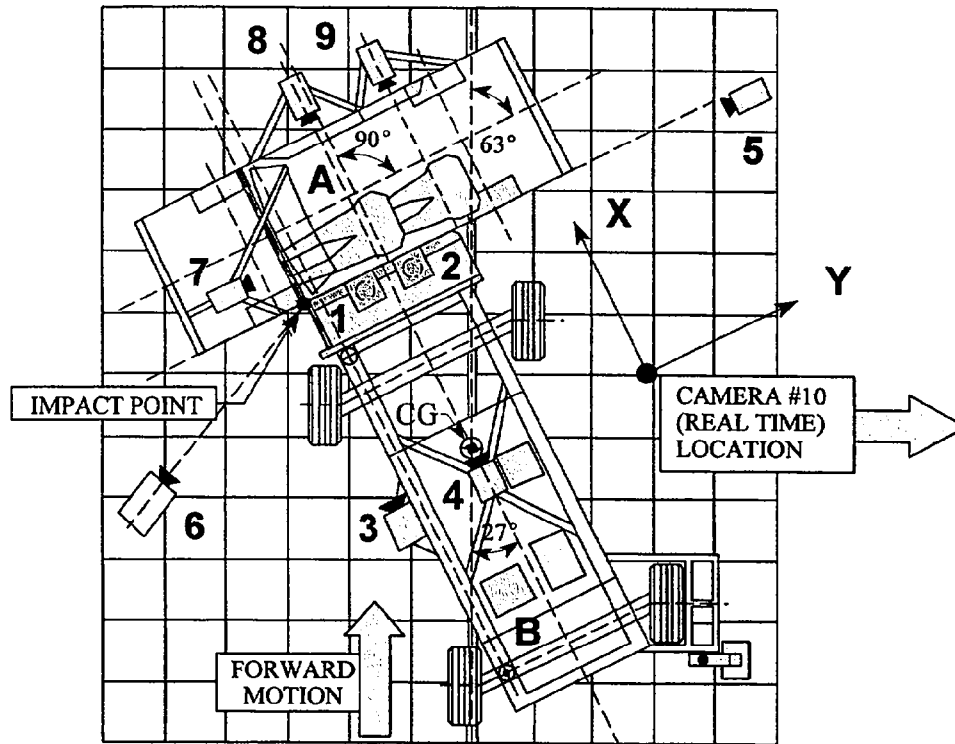
\*Reference: X = Rear Bumper (+ Forward)  
Y = Vehicle Centerline (+ To Right)  
Z = Ground Level (+ Up)  
All measurements accurate to within  $\pm 3$  mm.

# DATA SHEET 15

## HIGH SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500



| Camera No. | View                                     | Coordinates (millimeters) |       |      | Angle (deg.) | Lens (mm) | Film Speed (fps) |
|------------|------------------------------------------|---------------------------|-------|------|--------------|-----------|------------------|
|            |                                          | X*                        | Y*    | Z*   |              |           |                  |
| 1          | Overhead view of test vehicle            | 0                         | 780   | 4880 | -85          | 8         | 1000             |
| 2          | Overhead closeup view of impact plane    | 340                       | 975   | 4880 | -90          | 12.5      | 1000             |
| 3          | MDB onboard closeup view of impact point | 1470                      | 0     | 847  | 0            | 13        | 990              |
| 4          | MDB onboard view of driver dummy         | 1140                      | 838   | 1586 | -17          | 7.5       | 890              |
| 5          | Right side ground level overall view     | 389                       | 9093  | 1085 | -4           | 25        | 1000             |
| 6          | Left side ground level overall view      | -2238                     | -2971 | 1046 | -7           | 13        | 1000             |
| 7          | Test vehicle onboard driver front view   | 653                       | -494  | 1211 | -10          | 13        | no timing        |
| 8          | Test vehicle onboard driver side view    | 1580                      | 805   | 955  | -12.5        | 8         | no timing        |
| 9          | Test vehicle onboard passenger side view | 1575                      | 1675  | 976  | -10.5        | 8         | 1000             |
| 10         | Real time film coverage of test          | -                         | -     | -    | -            | -         | 24               |

\* Reference (from point of impact); all measurements accurate to within  $\pm 6$  mm.

+X = Forward

+Y = To Right

+Z = Upward

**SECTION 5**

**FUEL SYSTEM INTEGRITY**

# DATA SHEET 16

## FMVSS 301 FUEL SYSTEM INTEGRITY DATA

NHTSA No.: CW5500 TEST DATE: October 14, 1997

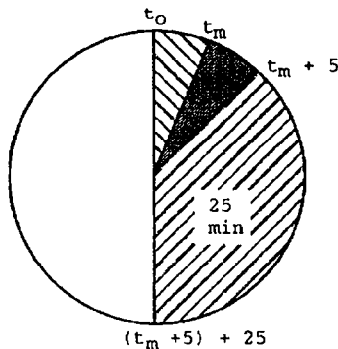
Vehicle Mfgr./Make/Model : 1998 Subaru Legacy 4-Door Sedan

\*\*\*\*\*

### TEST VEHICLE IMPACT TYPE :

- Frontal (48.28 kph)
- Oblique (48.28 kph) with - ° barrier face first  
contacting the - side  
(driver/passenger)
- Rear Moving Barrier (48.28 kph)
- Lateral Moving Barrier (32.19 kph)
- X Side Impact Moving Deformable Barrier (53.91 kph)  
contacting the driver side side  
(driver/passenger)

### FUEL SPILLAGE MEASUREMENT:



1. From impact until vehicle motion ceases
2. For five minute period after vehicle motion ceases
3. For next 25 minutes

| ACTUAL | MAX ALLOWED |
|--------|-------------|
| 0 g    | 28 g        |
| 0 g    | 142 g       |
| 0 g    | 28 g/1 min. |

### SOLVENT SPILLAGE DETAILS :

None

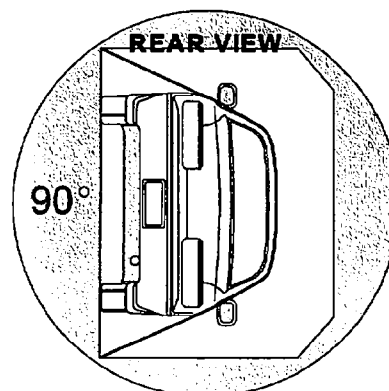
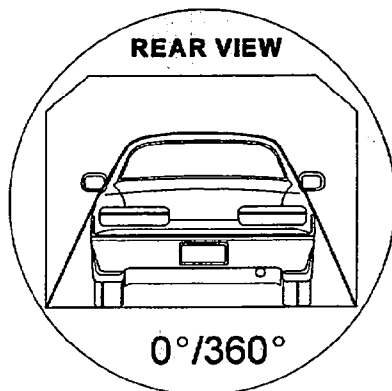
# DATA SHEET 17

## ROLLOVER DATA

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

0 - 90 Degrees



### I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

|                                    |                                   |
|------------------------------------|-----------------------------------|
| Rollover Fixture 90° Rotation Time | <u>1</u> minutes <u>9</u> seconds |
| (Spec. Range = 1 to 3 minutes)     |                                   |
| FMVSS 301 Position Hold Time +     | <u>5</u> minutes <u>0</u> seconds |
| <b>TOTAL</b>                       | <u>6</u> minutes <u>9</u> seconds |
| Next whole minute interval         | <u>7</u> minutes                  |

### II. FMVSS 301 REQUIREMENTS :

#### (1) Time Period

|                                        |          |          |                        |
|----------------------------------------|----------|----------|------------------------|
| First 5 minutes FROM onset of rotation | 6th min. | 7th min. | 8th min. (if required) |
|----------------------------------------|----------|----------|------------------------|

#### (2) Maximum Allowable Solvent Spillage

|       |      |      |      |
|-------|------|------|------|
| 142 g | 28 g | 28 g | 28 g |
|-------|------|------|------|

### III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

|     |     |     |     |
|-----|-----|-----|-----|
| 0 g | 0 g | 0 g | N/A |
|-----|-----|-----|-----|

Note: Record spillage for whole minute intervals only as determined above.

### IV. SOLVENT SPILLAGE LOCATION(S) :

None



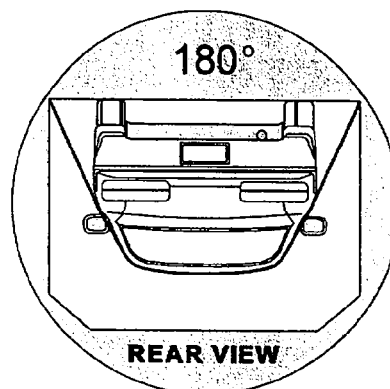
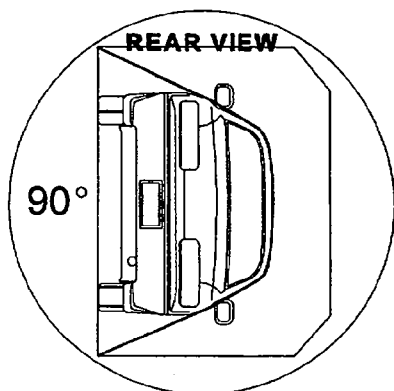
# DATA SHEET 17 (continued)

## ROLLOVER DATA

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

90 - 180 Degrees



### I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

|                                    |                                   |
|------------------------------------|-----------------------------------|
| Rollover Fixture 90° Rotation Time | <u>1</u> minutes <u>4</u> seconds |
| (Spec. Range = 1 to 3 minutes)     |                                   |
| FMVSS 301 Position Hold Time +     | <u>5</u> minutes <u>0</u> seconds |
| <b>TOTAL</b>                       | <u>6</u> minutes <u>4</u> seconds |
| Next whole minute interval         | <u>7</u> minutes                  |

### II. FMVSS 301 REQUIREMENTS :

#### (1) Time Period

| First 5 minutes FROM onset of rotation | 6th min. | 7th min. | 8th min. (if required) |
|----------------------------------------|----------|----------|------------------------|
|----------------------------------------|----------|----------|------------------------|

#### (2) Maximum Allowable Solvent Spillage

|       |      |      |      |
|-------|------|------|------|
| 142 g | 28 g | 28 g | 28 g |
|-------|------|------|------|

### III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

|     |     |     |     |
|-----|-----|-----|-----|
| 0 g | 0 g | 0 g | N/A |
|-----|-----|-----|-----|

Note: Record spillage for whole minute intervals only as determined above.

### IV. SOLVENT SPILLAGE LOCATION(S) :

None

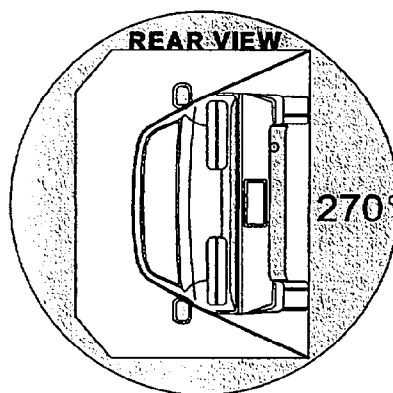
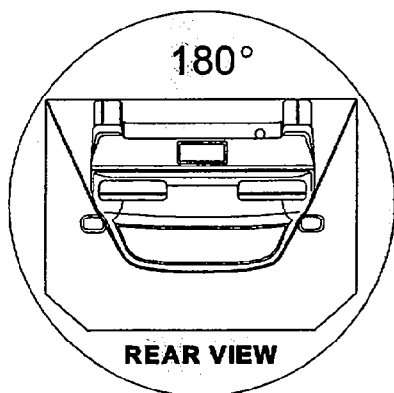
# DATA SHEET 17 (continued)

## ROLLOVER DATA

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

180 - 270 Degrees



### I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

|                                    |                                   |
|------------------------------------|-----------------------------------|
| Rollover Fixture 90° Rotation Time | <u>1</u> minutes <u>2</u> seconds |
| (Spec. Range = 1 to 3 minutes)     |                                   |
| FMVSS 301 Position Hold Time +     | <u>5</u> minutes <u>0</u> seconds |
| <b>TOTAL</b>                       | <u>6</u> minutes <u>2</u> seconds |
| Next whole minute interval         | <u>7</u> minutes                  |

### II. FMVSS 301 REQUIREMENTS :

(1) Time Period

| First 5 minutes FROM onset of rotation | 6th min. | 7th min. | 8th min. (if required) |
|----------------------------------------|----------|----------|------------------------|
|----------------------------------------|----------|----------|------------------------|

(2) Maximum Allowable Solvent Spillage

|       |      |      |      |
|-------|------|------|------|
| 142 g | 28 g | 28 g | 28 g |
|-------|------|------|------|

### III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

|     |     |     |     |
|-----|-----|-----|-----|
| 0 g | 0 g | 0 g | N/A |
|-----|-----|-----|-----|

Note: Record spillage for whole minute intervals only as determined above.

### IV. SOLVENT SPILLAGE LOCATION(S) :

None

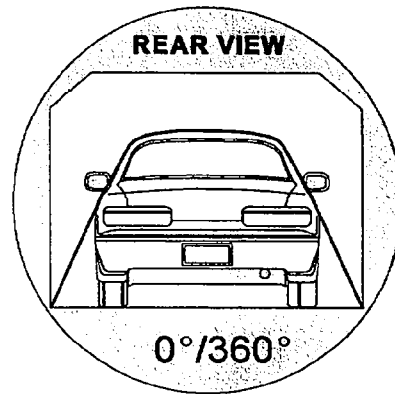
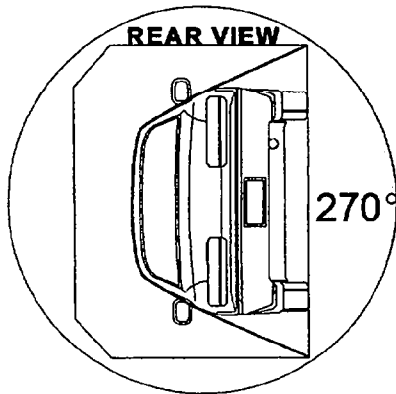
# DATA SHEET 17 (continued)

## ROLLOVER DATA

Vehicle: 1998 Subaru Legacy

NHTSA No. CW5500

270 - 360 Degrees



### I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

|                                    |          |         |          |         |
|------------------------------------|----------|---------|----------|---------|
| Rollover Fixture 90° Rotation Time | <u>1</u> | minutes | <u>1</u> | seconds |
| (Spec. Range = 1 to 3 minutes)     |          |         |          |         |
| FMVSS 301 Position Hold Time +     | <u>5</u> | minutes | <u>0</u> | seconds |
| <b>TOTAL</b>                       | <u>6</u> | minutes | <u>1</u> | seconds |
| Next whole minute interval         | <u>7</u> | minutes |          |         |

### II. FMVSS 301 REQUIREMENTS :

#### (1) Time Period

|                                        |          |          |                        |
|----------------------------------------|----------|----------|------------------------|
| First 5 minutes FROM onset of rotation | 6th min. | 7th min. | 8th min. (if required) |
|----------------------------------------|----------|----------|------------------------|

#### (2) Maximum Allowable Solvent Spillage

|       |      |      |      |
|-------|------|------|------|
| 142 g | 28 g | 28 g | 28 g |
|-------|------|------|------|

### III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

|     |     |     |     |
|-----|-----|-----|-----|
| 0 g | 0 g | 0 g | N/A |
|-----|-----|-----|-----|

Note: Record spillage for whole minute intervals only as determined above.

### IV. SOLVENT SPILLAGE LOCATION(S) :

None

**APPENDIX A**

**PHOTOGRAPHS**

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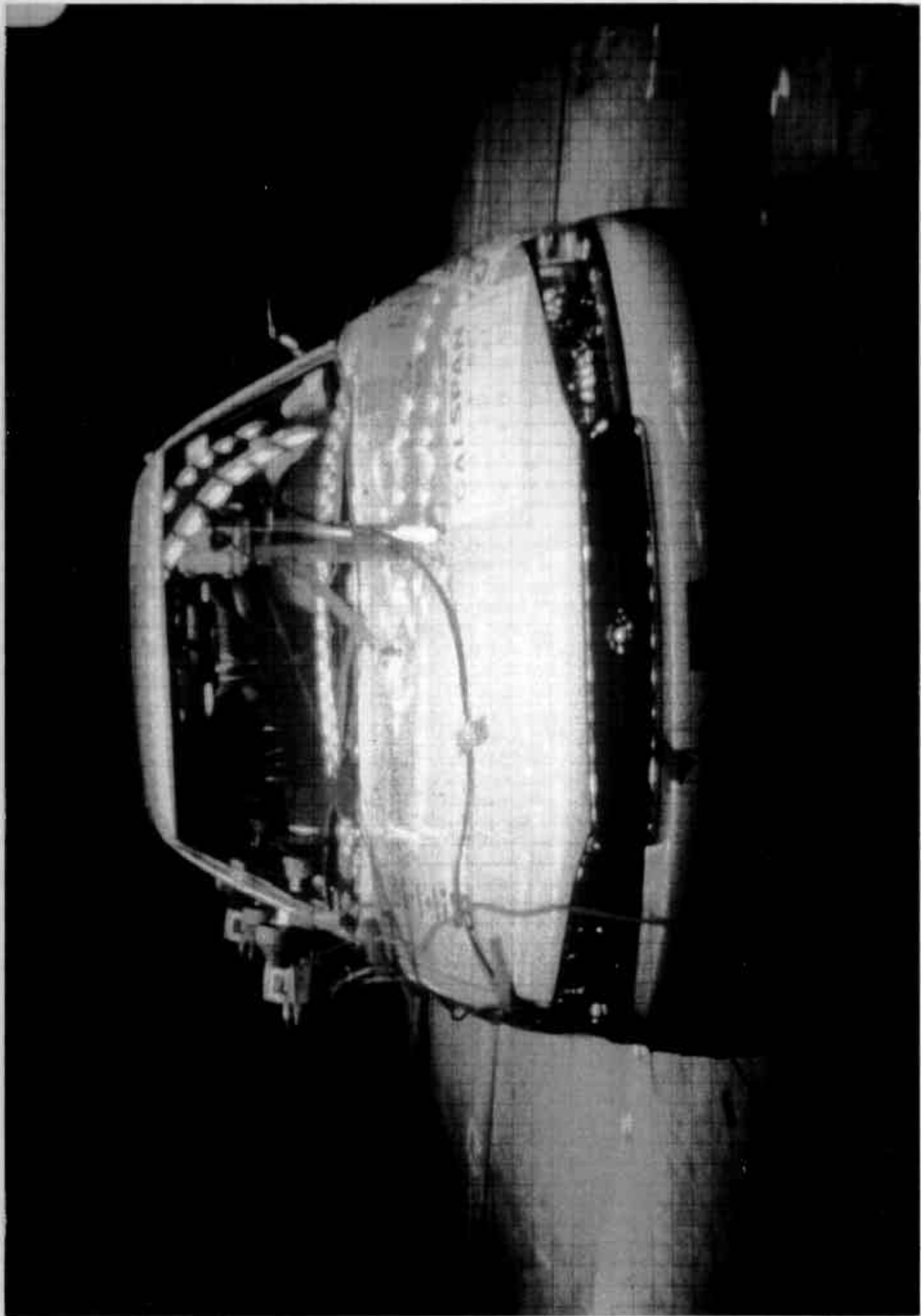


Figure A-1 PRE-TEST FRONTAL VIEW OF TEST VEHICLE

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

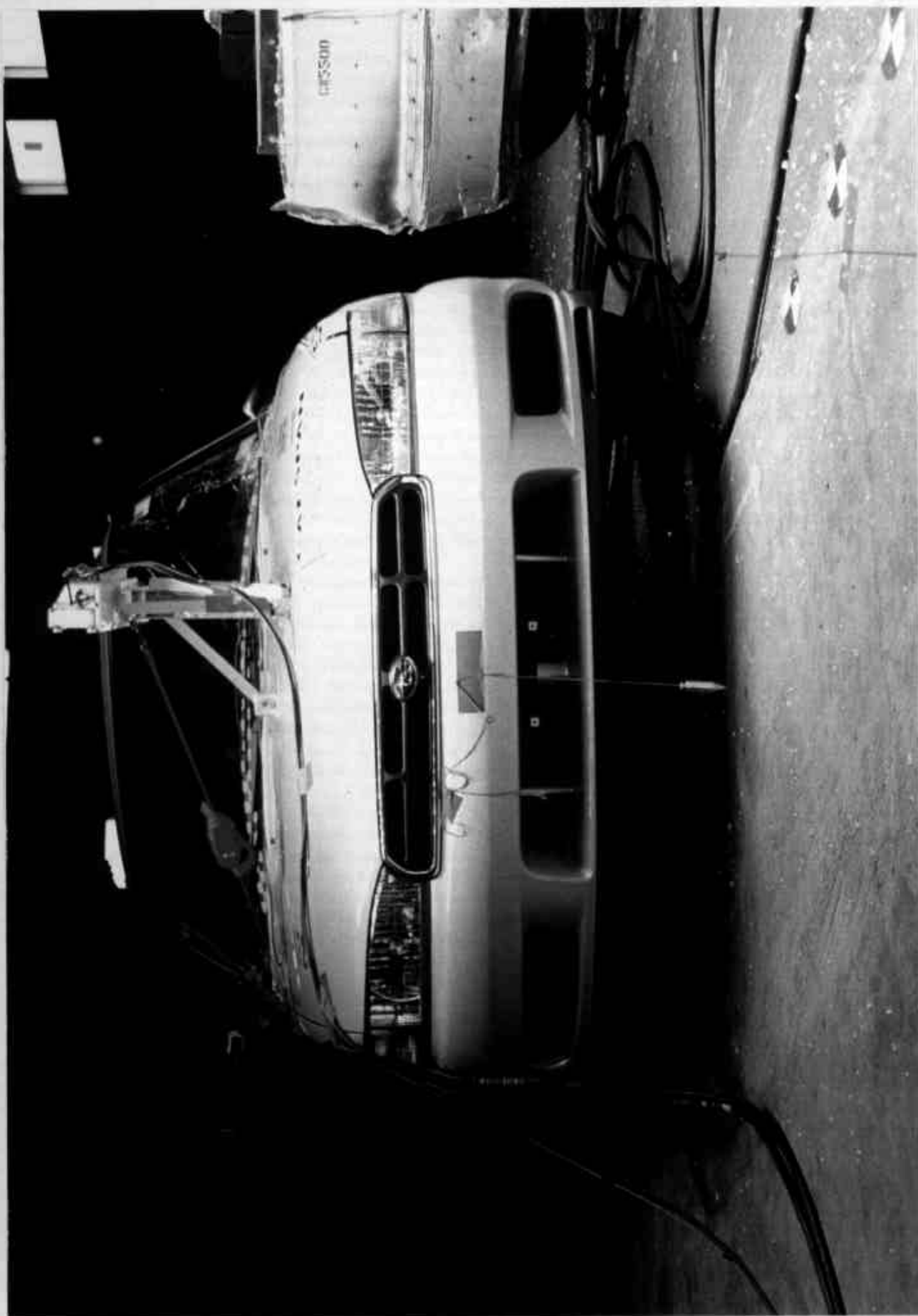




Figure A-3 PRE-TEST REAR VIEW OF TEST VEHICLE





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

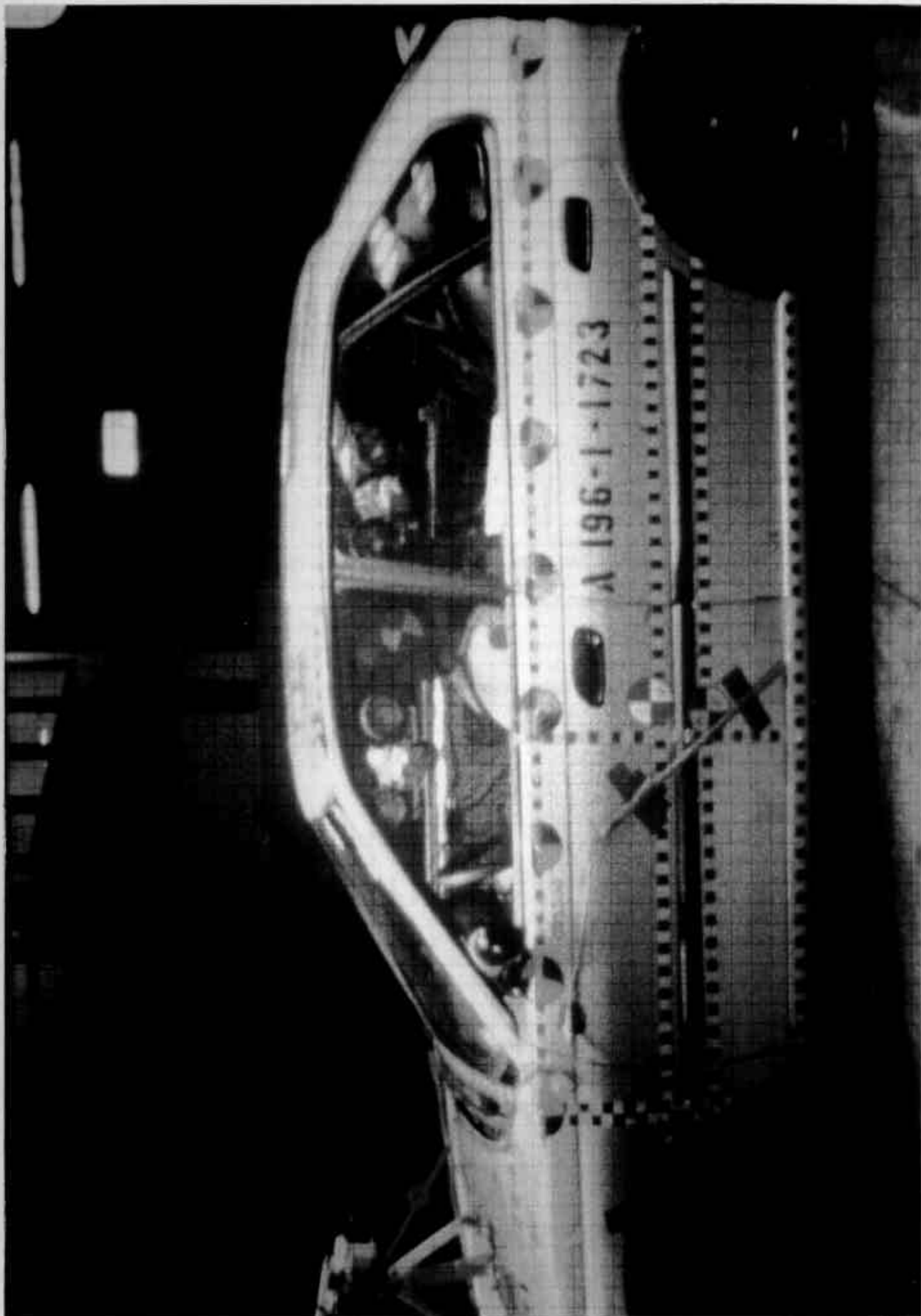


Figure A-5 PRE-TEST IMPACTED SIDE VIEW OF TEST VEHICLE



Figure A-6 POST-TEST IMPACTED SIDE VIEW OF TEST VEHICLE

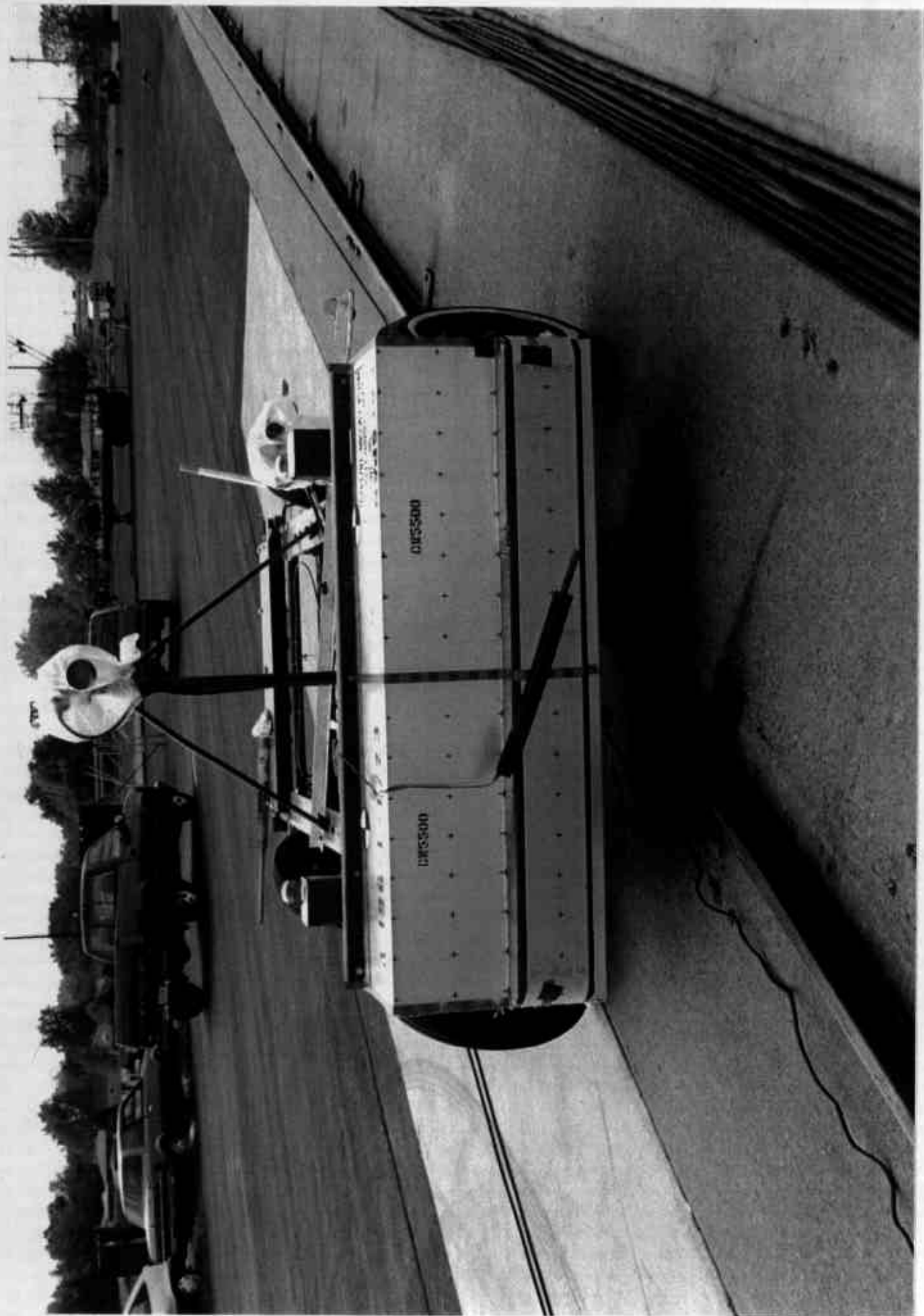


Figure A-7 PRE-TEST FRONTAL VIEW OF IMPACTOR FACE

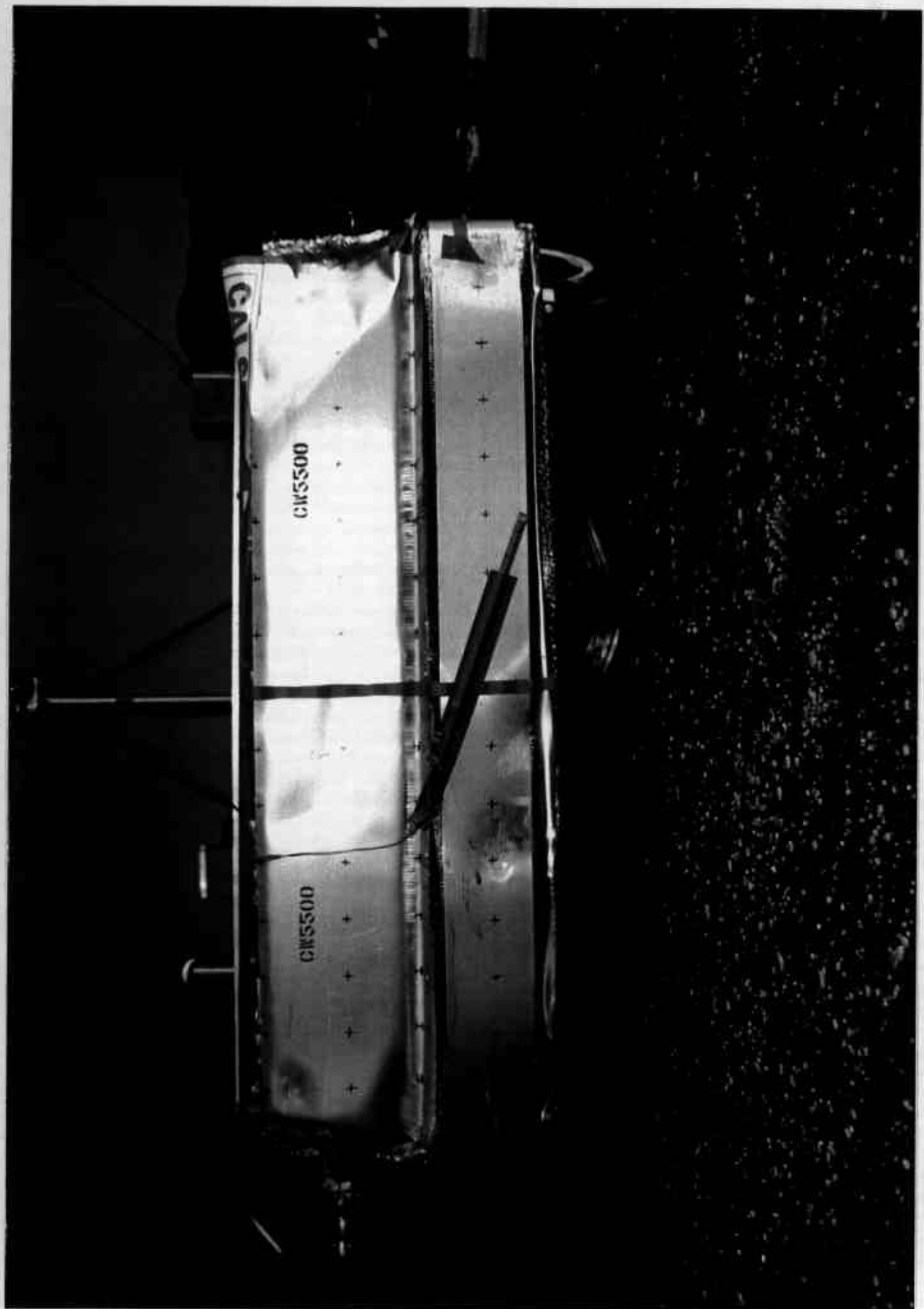


Figure A-8 POST-TEST FRONTAL VIEW OF IMPACTOR FACE

Figure A-9 PRE-TEST LEFT SIDE VIEW OF IMPACTOR FACE







Figure A-10 POST-TEST LEFT SIDE VIEW OF IMPACTOR FACE

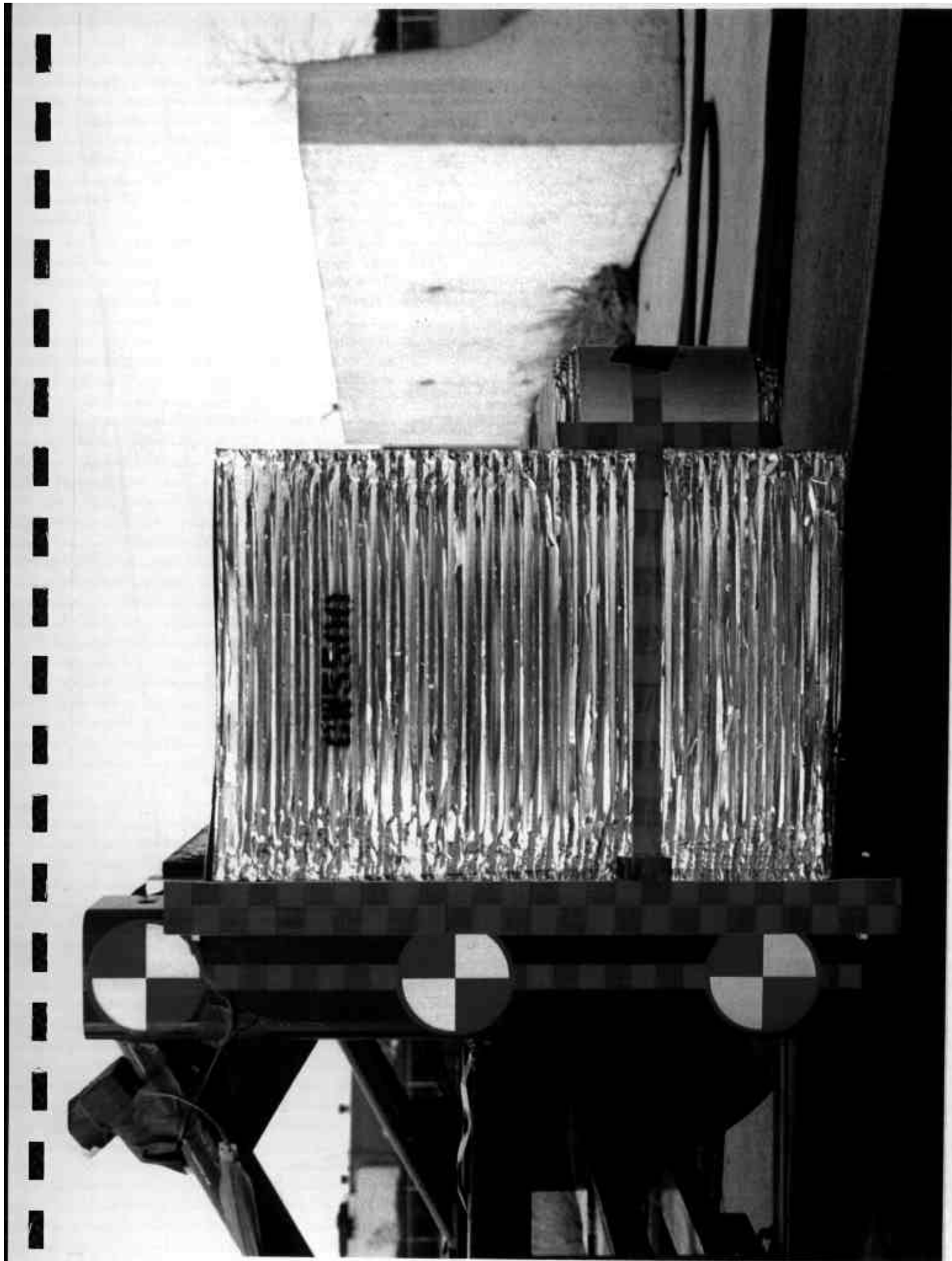


Figure A-11 PRE-TEST RIGHT SIDE VIEW OF IMPACTOR FACE





Figure A-12 POST-TEST RIGHT SIDE VIEW OF IMPACTOR FACE



Figure A-13 PRE-TEST TOP VIEW OF IMPACTOR FACE



Figure A-14 POST-TEST TOP VIEW OF IMPACTOR FACE



Figure A-15 PRE-TEST OVERHEAD VIEW OF ALIGNED MDB AND VEHICLE

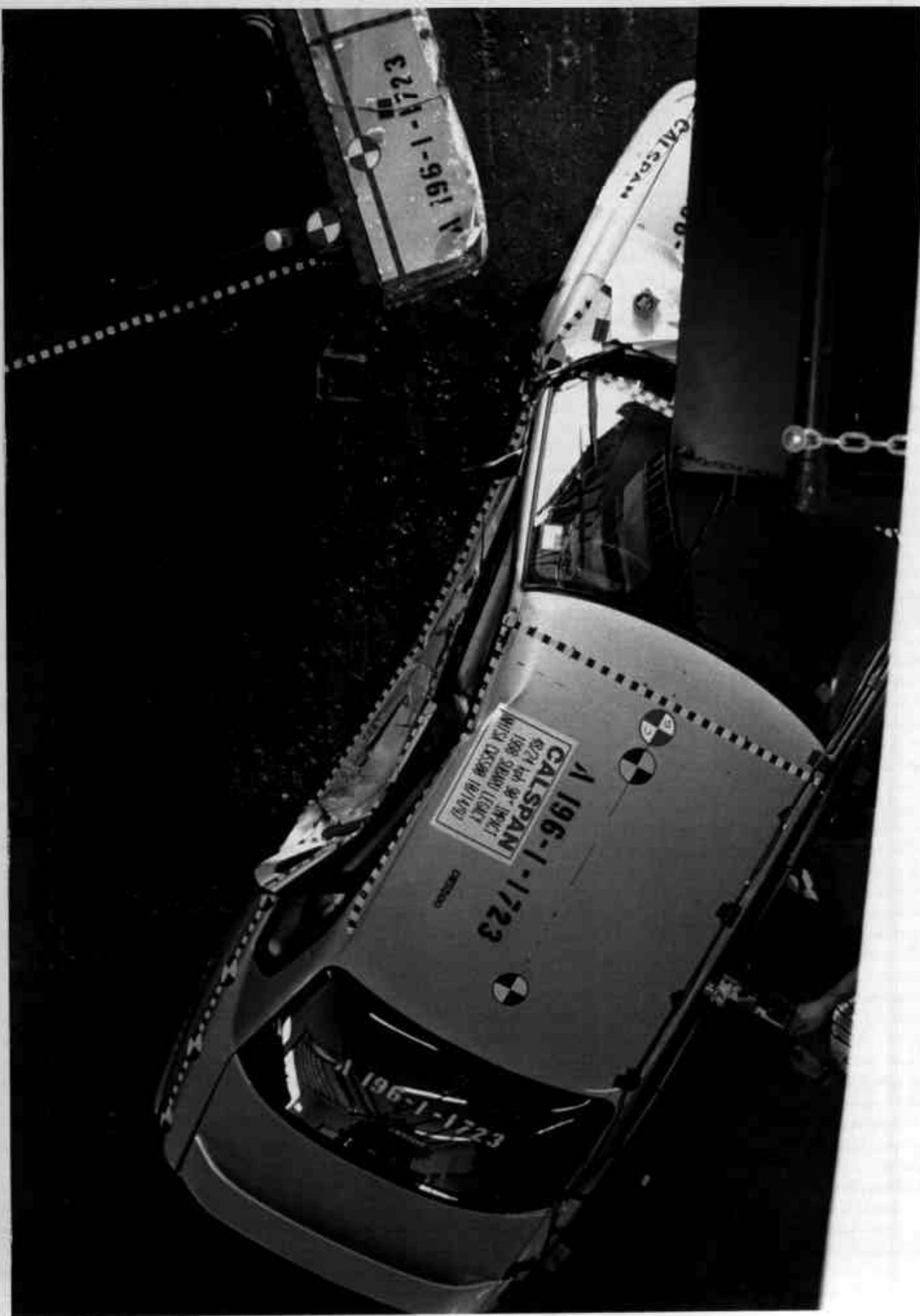


Figure A-16 POST-TEST OVERHEAD VIEW OF MDB AND VEHICLE

Figure A-17 PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID



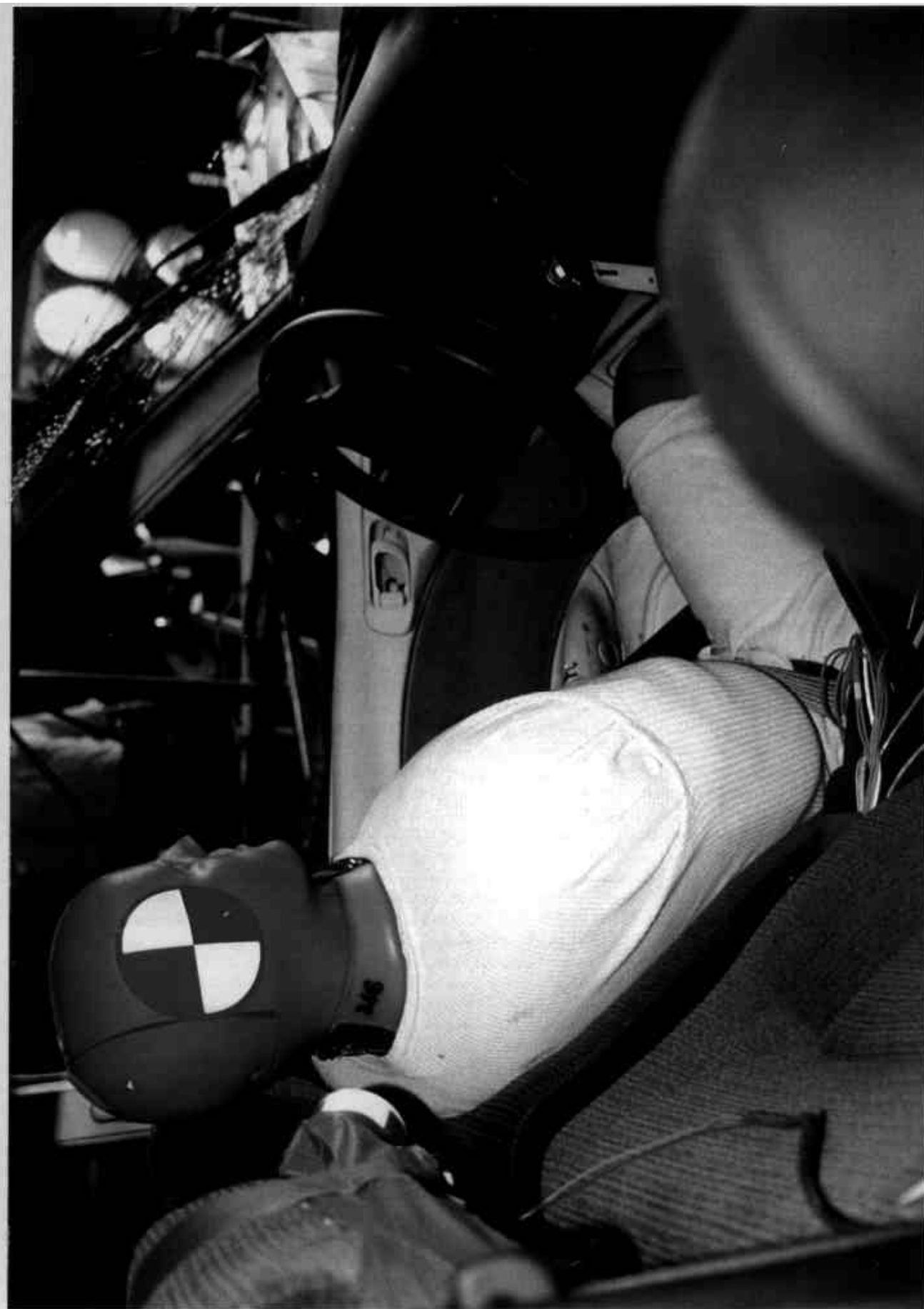


Figure A-18 POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID





Figure A-19 PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID





Figure A-20 POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID



Figure A-21 PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID

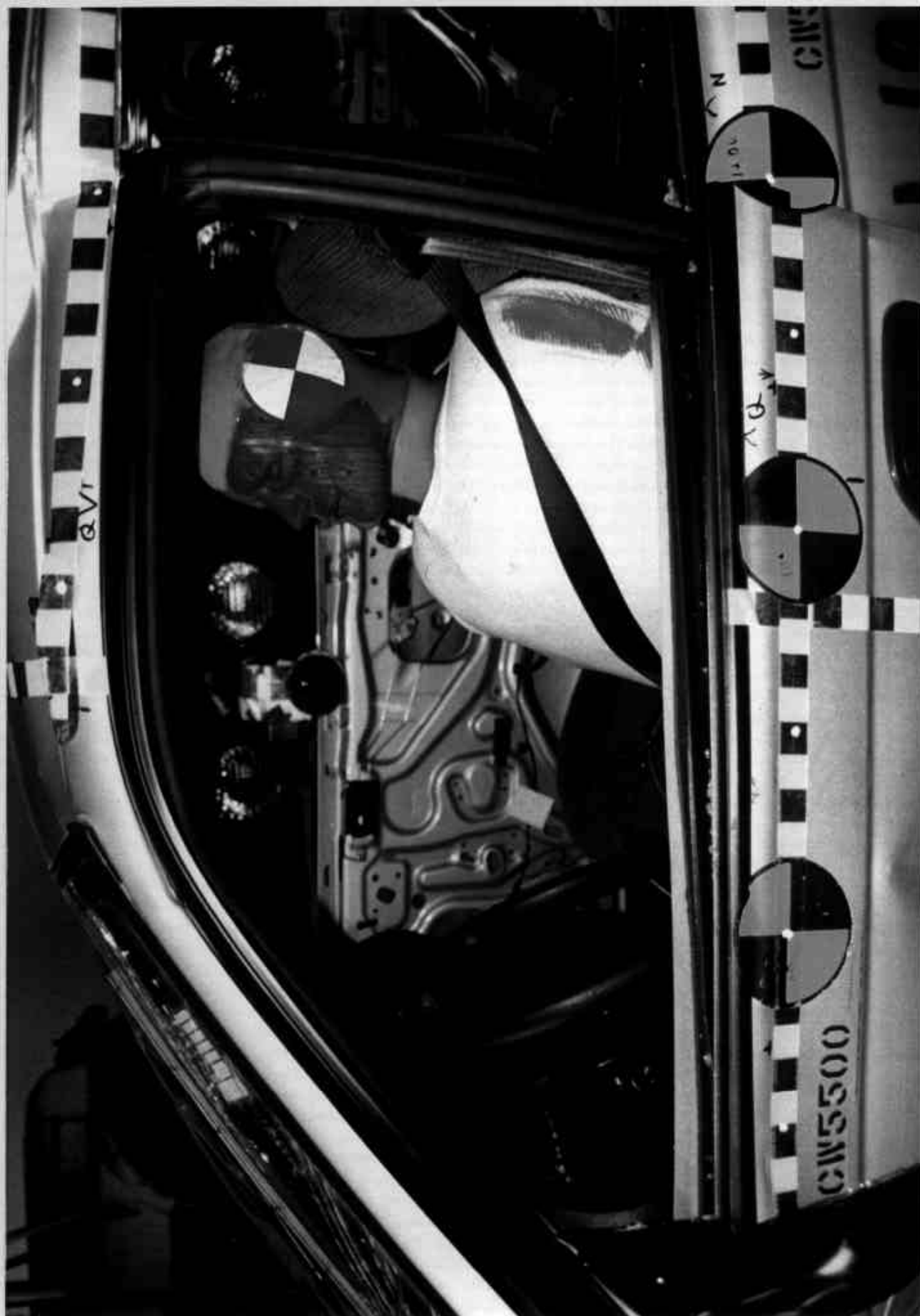


Figure A-22 POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID



Figure A-23 PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID



Figure A-24 POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID



Figure A-25 PRE-TEST INTERIOR OF FRONT DOOR





Figure A-26 POST-TEST INTERIOR OF FRONT DOOR SHOWING SID IMPACT LOCATIONS

Figure A-27 PRE-TEST INTERIOR OF REAR DOOR

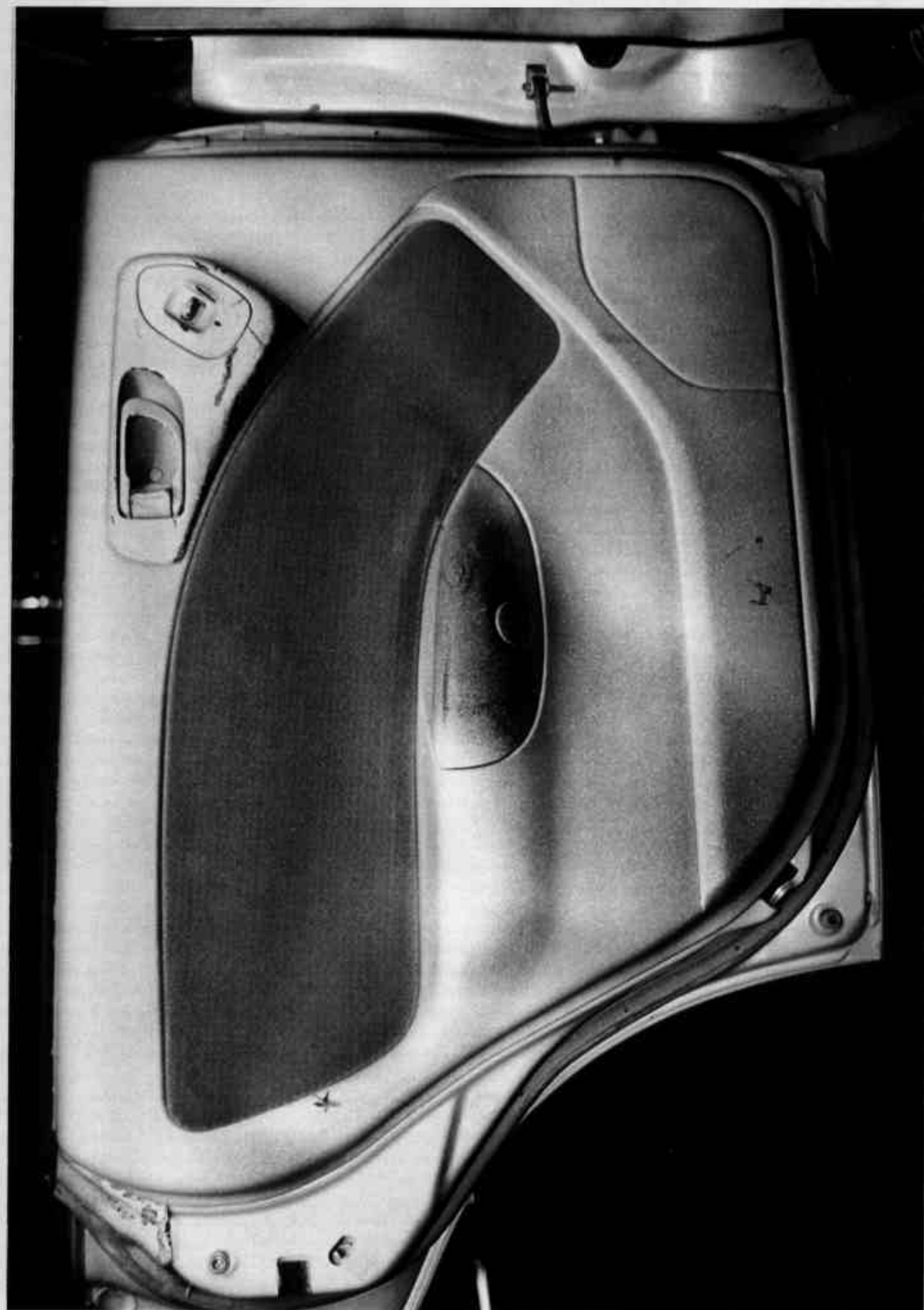




Figure A-28 POST-TEST INTERIOR OF REAR DOOR SHOWING SID IMPACT LOCATIONS





Figure A-29 PRE-TEST LEFT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION

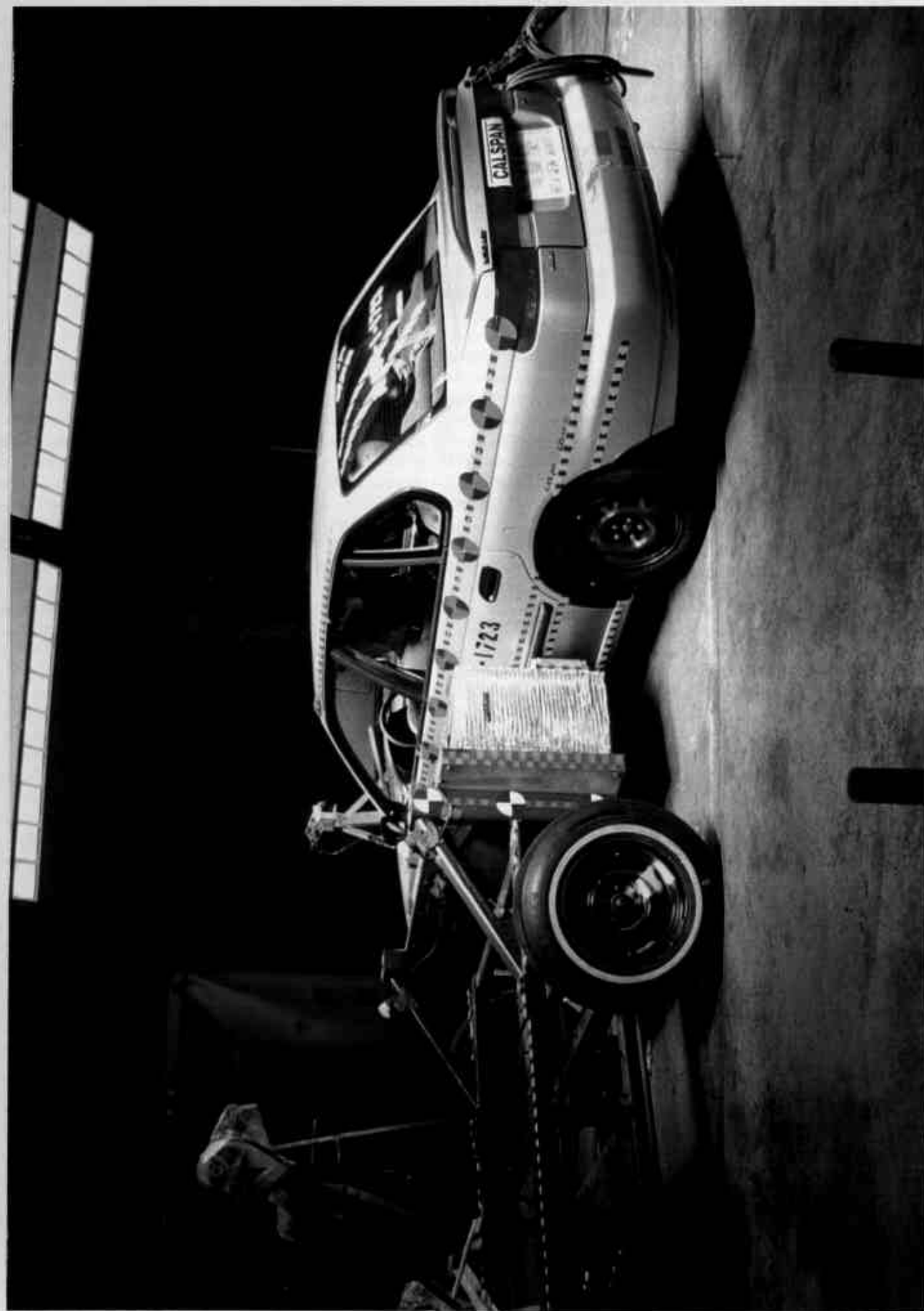


Figure A-30 PRE-TEST RIGHT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION

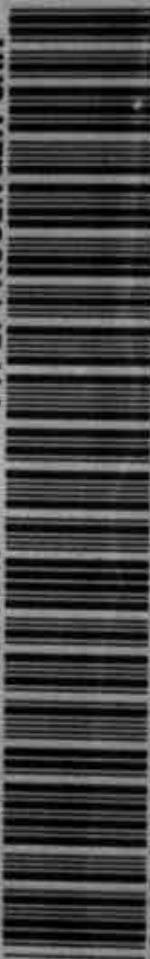


Figure A-31 POST-TEST CLOSE-UP VIEW OF IMPACT POINT TARGET

MFD BY FUJI HEAVY INDUSTRIES LTD. DATE: 06/97  
GVWR: 4110LB(1864KG) GAWR: F 2095LB( 950KG) R 2015LB( 914KG)  
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE  
SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS IN EFFECT ON  
THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: 4S38D4359W6200649

TYPE: PASSENGER CAR



ASSEMBLED BY SUBARU - ISUZU AUTOMOTIVE INC. MADE IN U.S.A.

Figure A-32 CLOSE-UP VIEW OF VEHICLE'S CERTIFICATION LABEL



Figure A-33 CLOSE-UP VIEW OF VEHICLE'S TIRE PLACARD LABEL  
A-35



Figure A-34 IMPACT PHOTO

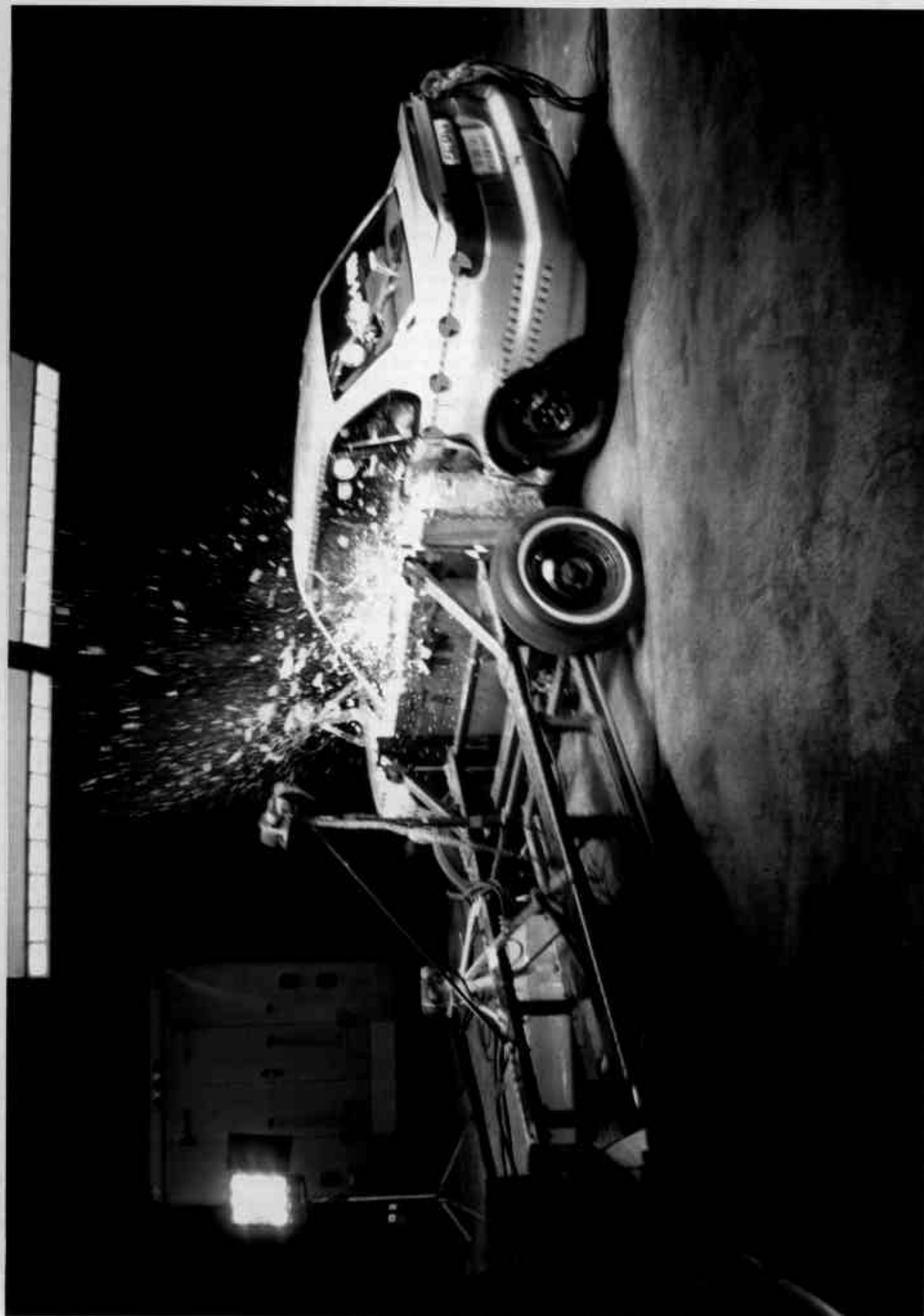




Figure A-35 POST-TEST LOWER B-PILLAR



Figure A-36 POST-TEST CLOSEUP OF LOWER B-PILLAR



**APPENDIX B**

**VEHICLE, MDB AND SID RESPONSE DATA**

## TABLE OF DATA PLOTS

### DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS

ACCELERATION DATA - FILTER CLASS 180

INTEGRATION DATA - FILTER CLASS 180

| <u>Plot No.</u> | <u>Data Plot Title</u>                         | <u>Page</u> |
|-----------------|------------------------------------------------|-------------|
| 1               | DRIVER UPPER RIB (Y) ACCELERATION VS TIME      | B- 6        |
| 2               | DRIVER UPPER RIB (Y) VELOCITY VS TIME          | B- 7        |
| 3               | DRIVER LOWER RIB (Y) ACCELERATION VS TIME      | B- 8        |
| 4               | DRIVER LOWER RIB (Y) VELOCITY VS TIME          | B- 9        |
| 5               | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME    | B- 10       |
| 6               | DRIVER LOWER SPINE (Y) VELOCITY VS TIME        | B- 11       |
| 7               | DRIVER PELVIC (Y) ACCELERATION VS TIME         | B- 12       |
| 8               | DRIVER PELVIC (Y) VELOCITY VS TIME             | B- 13       |
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| 11              | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME   | B- 16       |
| 12              | PASSENGER LOWER RIB (Y) VELOCITY VS TIME       | B- 17       |
| 13              | PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME | B- 18       |
| 14              | PASSENGER LOWER SPINE (Y) VELOCITY VS TIME     | B- 19       |
| 15              | PASSENGER PELVIC (Y) ACCELERATION VS TIME      | B- 20       |
| 16              | PASSENGER PELVIC (Y) VELOCITY VS TIME          | B- 21       |

### TEST VEHICLE INSTRUMENTATION PLOTS

ACCELERATION DATA - FILTER CLASS 60

INTEGRATION DATA - FILTER CLASS 180

| <u>Plot No.</u> | <u>Data Plot Title</u>                                       | <u>Page</u> |
|-----------------|--------------------------------------------------------------|-------------|
| 17              | RIGHT SIDE SILL AT FRONT SEAT (X) ACCELERATION VS TIME       | B- 23       |
| 18              | RIGHT SIDE SILL AT FRONT SEAT (X) VELOCITY VS TIME           | B- 24       |
| 19              | RIGHT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME       | B- 25       |
| 20              | RIGHT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME           | B- 26       |
| 21              | RIGHT SIDE SILL AT FRONT SEAT (Z) ACCELERATION VS TIME       | B- 27       |
| 22              | RIGHT SIDE SILL AT FRONT SEAT (Z) VELOCITY VS TIME           | B- 28       |
| 23              | RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION VS TIME | B- 29       |
| 24              | RIGHT SIDE SILL AT REAR SEAT (X) ACCELERATION VS TIME        | B- 30       |
| 25              | RIGHT SIDE SILL AT REAR SEAT (X) VELOCITY VS TIME            | B- 31       |
| 26              | RIGHT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME        | B- 32       |
| 27              | RIGHT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME            | B- 33       |
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| 32              | REAR FLOORPAN ABOVE AXLE (X) VELOCITY VS TIME                | B- 38       |
| 33              | REAR FLOORPAN ABOVE AXLE (Y) ACCELERATION VS TIME            | B- 39       |
| 34              | REAR FLOORPAN ABOVE AXLE (Y) VELOCITY VS TIME                | B- 40       |
| 35              | REAR FLOORPAN ABOVE AXLE (Z) ACCELERATION VS TIME            | B- 41       |

|    |                                                             |       |
|----|-------------------------------------------------------------|-------|
| 36 | REAR FLOORPAN ABOVE AXLE (Z) VELOCITY VS TIME               | B- 42 |
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| 40 | LEFT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME       | B- 46 |
| 41 | LEFT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME           | B- 47 |
| 42 | RIGHT REAR OCCUPANT COMPARTMENT (Y) ACCELERATION VS TIME    | B- 48 |
| 43 | RIGHT REAR OCCUPANT COMPARTMENT (Y) VELOCITY VS TIME        | B- 49 |
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| 45 | LOWER B-POST (Y) VELOCITY VS TIME                           | B- 51 |
| 46 | UPPER B-POST (Y) ACCELERATION VS TIME                       | B- 52 |
| 47 | UPPER B-POST (Y) VELOCITY VS TIME                           | B- 53 |
| 48 | LOWER A-POST (Y) ACCELERATION VS TIME                       | B- 54 |
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| 50 | UPPER A-POST (Y) ACCELERATION VS TIME                       | B- 56 |
| 51 | UPPER A-POST (Y) VELOCITY VS TIME                           | B- 57 |
| 52 | FRONT SEAT TRACK (Y) ACCELERATION VS TIME                   | B- 58 |
| 53 | FRONT SEAT TRACK (Y) VELOCITY VS TIME                       | B- 59 |
| 54 | REAR SEAT TRACK (Y) ACCELERATION VS TIME                    | B- 60 |
| 55 | REAR SEAT TRACK (Y) VELOCITY VS TIME                        | B- 61 |
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| 59 | VEHICLE CENTER OF GRAVITY (Y) VELOCITY ACCELERATION VS TIME | B- 65 |
| 60 | VEHICLE CENTER OF GRAVITY (Z) ACCELERATION VS TIME          | B- 66 |
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**MDB INSTRUMENTATION PLOTS**  
**ACCELERATION DATA - FILTER CLASS 60**  
**INTEGRATION DATA - FILTER CLASS 180**

| <u>Plot No.</u> | <u>Data Plot Title</u>                               | <u>Page</u> |
|-----------------|------------------------------------------------------|-------------|
| 63              | MDB CENTER OF GRAVITY (X) ACCELERATION VS TIME       | B- 70       |
| 64              | MDB CENTER OF GRAVITY (X) VELOCITY VS TIME           | B- 71       |
| 65              | MDB CENTER OF GRAVITY (Y) ACCELERATION VS TIME       | B- 72       |
| 66              | MDB CENTER OF GRAVITY (Y) VELOCITY VS TIME           | B- 73       |
| 67              | MDB CENTER OF GRAVITY (Z) ACCELERATION VS TIME       | B- 74       |
| 68              | MDB CENTER OF GRAVITY (Z) VELOCITY VS TIME           | B- 75       |
| 69              | MDB CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME | B- 76       |
| 70              | MDB REAR (X) ACCELERATION VS TIME                    | B- 77       |
| 71              | MDB REAR (X) VELOCITY VS TIME                        | B- 78       |
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| 73              | MDB REAR (Y) VELOCITY VS TIME                        | B- 80       |

**DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (Redundant)**  
**ACCELERATION DATA - FILTER CLASS 180**  
**INTEGRATION DATA - FILTER CLASS 180**

| <u>Plot No.</u> | <u>Data Plot Title</u>                         | <u>Page</u> |
|-----------------|------------------------------------------------|-------------|
| 74              | DRIVER UPPER RIB (Y) ACCELERATION VS TIME      | B- 82       |
| 75              | DRIVER UPPER RIB (Y) VELOCITY VS TIME          | B- 83       |
| 76              | DRIVER LOWER RIB (Y) ACCELERATION VS TIME      | B- 84       |
| 77              | DRIVER LOWER RIB (Y) VELOCITY VS TIME          | B- 85       |
| 78              | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME    | B- 86       |
| 79              | DRIVER LOWER SPINE (Y) VELOCITY VS TIME        | B- 87       |
| 80              | DRIVER PELVIC (Y) ACCELERATION VS TIME         | B- 88       |
| 81              | DRIVER PELVIC (Y) VELOCITY VS TIME             | B- 89       |
| 82              | PASSENGER UPPER RIB (Y) ACCELERATION VS TIME   | B- 90       |
| 83              | PASSENGER UPPER RIB (Y) VELOCITY VS TIME       | B- 91       |
| 84              | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME   | B- 92       |
| 85              | PASSENGER LOWER RIB (Y) VELOCITY VS TIME       | B- 93       |
| 86              | PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME | B- 94       |
| 87              | PASSENGER LOWER SPINE (Y) VELOCITY VS TIME     | B- 95       |
| 88              | PASSENGER PELVIC (Y) ACCELERATION VS TIME      | B- 96       |
| 89              | PASSENGER PELVIC (Y) VELOCITY VS TIME          | B- 97       |

**DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS**  
**ACCELERATION DATA - FIR FILTERED**

| <u>Plot No.</u> | <u>Data Plot Title</u>                         | <u>Page</u> |
|-----------------|------------------------------------------------|-------------|
| 90              | DRIVER UPPER RIB (Y) ACCELERATION VS TIME      | B- 99       |
| 91              | DRIVER LOWER RIB (Y) ACCELERATION VS TIME      | B- 100      |
| 92              | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME    | B- 101      |
| 93              | DRIVER PELVIC (Y) ACCELERATION VS TIME         | B- 102      |
| 94              | PASSENGER UPPER RIB (Y) ACCELERATION VS TIME   | B- 103      |
| 95              | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME   | B- 104      |
| 96              | PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME | B- 105      |
| 97              | PASSENGER PELVIC (Y) ACCELERATION VS TIME      | B- 106      |

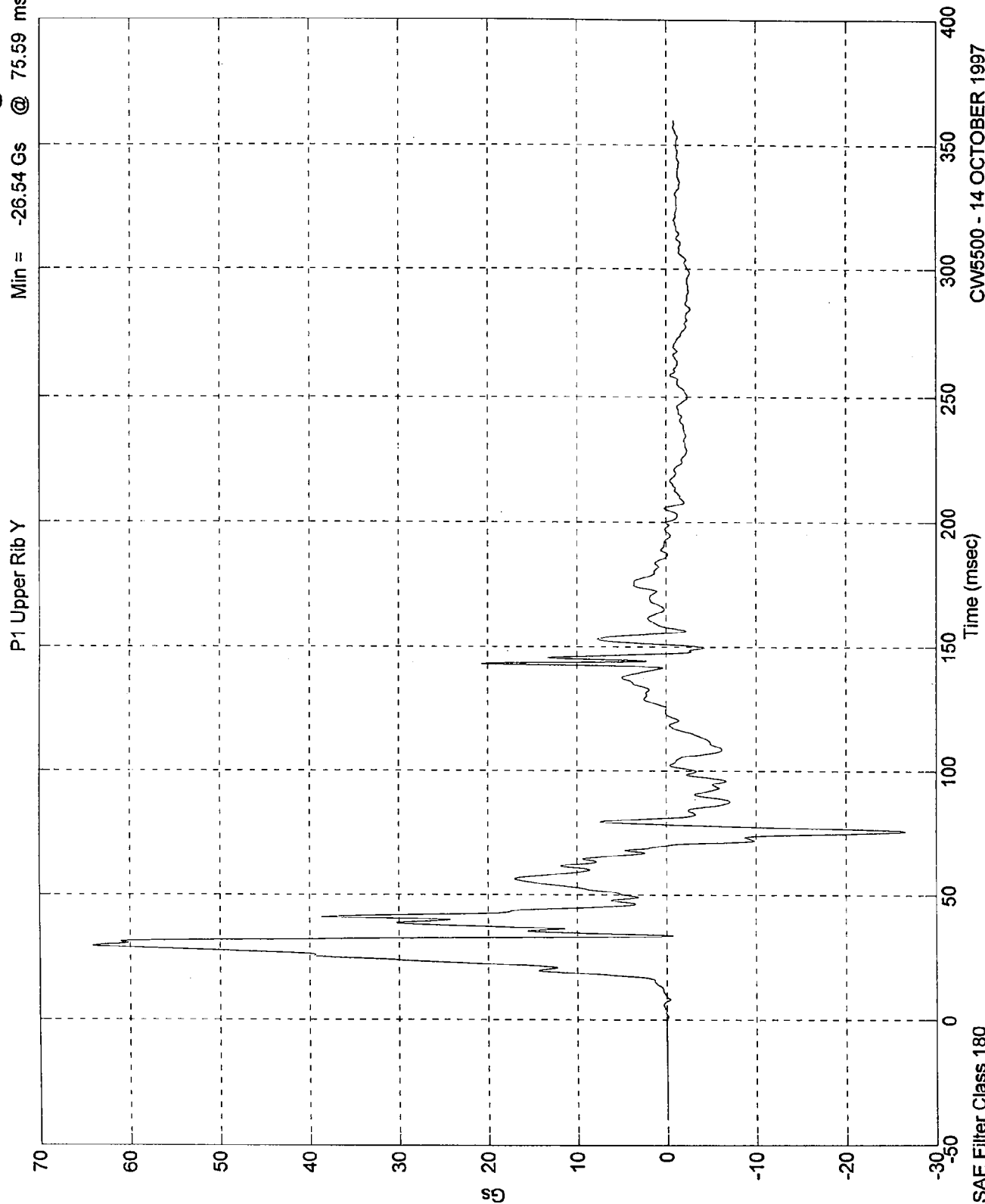
**DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (redundant)**  
**ACCELERATION DATA - FIR FILTERED**

| <u>Plot No.</u> | <u>Data Plot Title</u>                         | <u>Page</u> |
|-----------------|------------------------------------------------|-------------|
| 98              | DRIVER UPPER RIB (Y) ACCELERATION VS TIME      | B- 108      |
| 99              | DRIVER LOWER RIB (Y) ACCELERATION VS TIME      | B- 109      |
| 100             | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME    | B- 110      |
| 101             | DRIVER PELVIC (Y) ACCELERATION VS TIME         | B- 111      |
| 102             | PASSENGER UPPER RIB (Y) ACCELERATION VS TIME   | B- 112      |
| 103             | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME   | B- 113      |
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| 105             | PASSENGER PELVIC (Y) ACCELERATION VS TIME      | B- 115      |

**DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS**  
**ACCELERATION DATA - FILTER CLASS 180**  
**INTEGRATION DATA - FILTER CLASS 180**

NHTSA Side Impact - 1998 Subaru Legacy

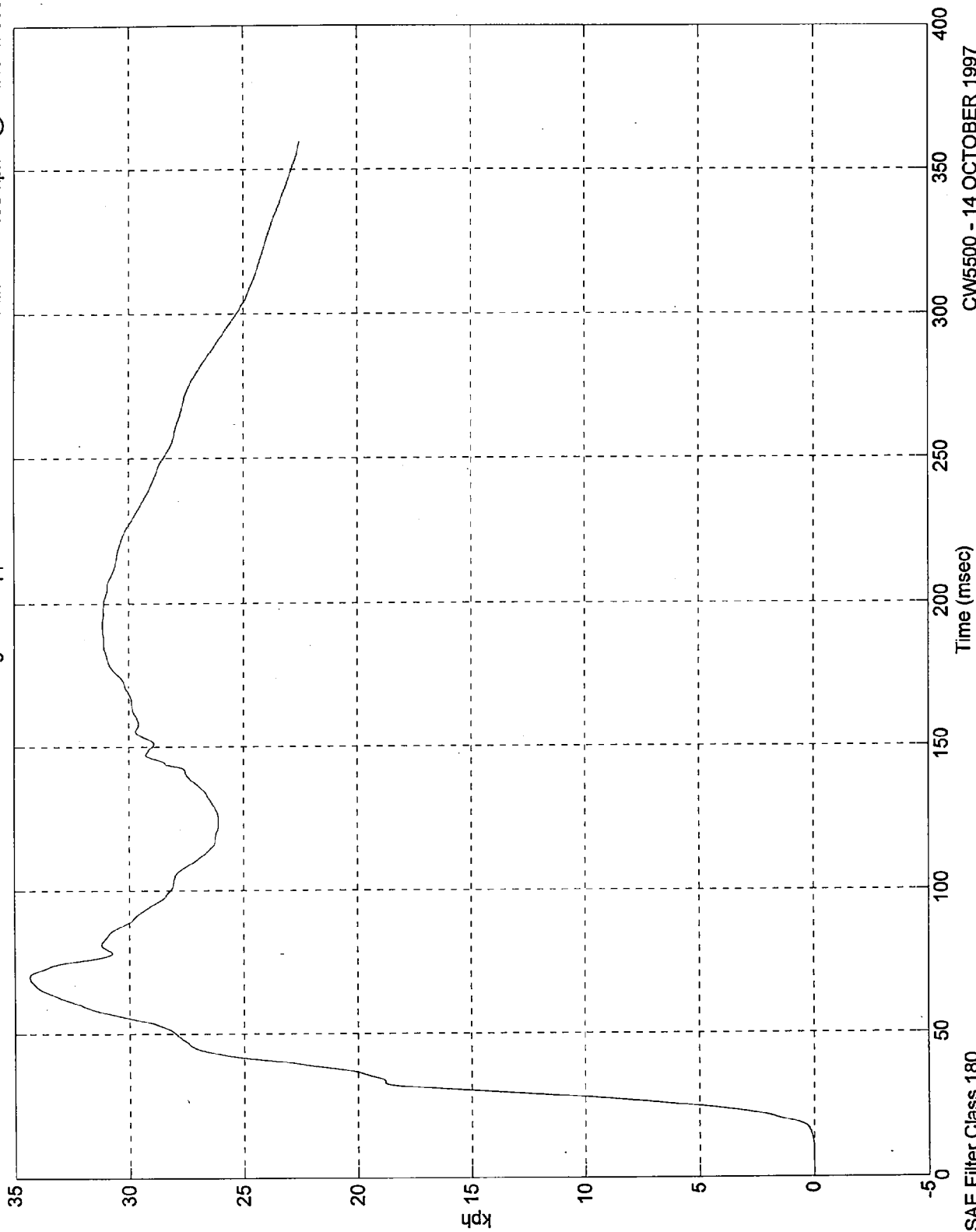
Max = 64.12 Gs @ 29.39 msec  
Min = -26.54 Gs @ 75.59 msec



NHTSA Side Impact - 1998 Subaru Legacy

Max = 34.33 kph @ 69.80 msec  
Min = -.00 kph @ 2.10 msec

1st Integral P1 Upper Rib Y



SAE Filter Class 180

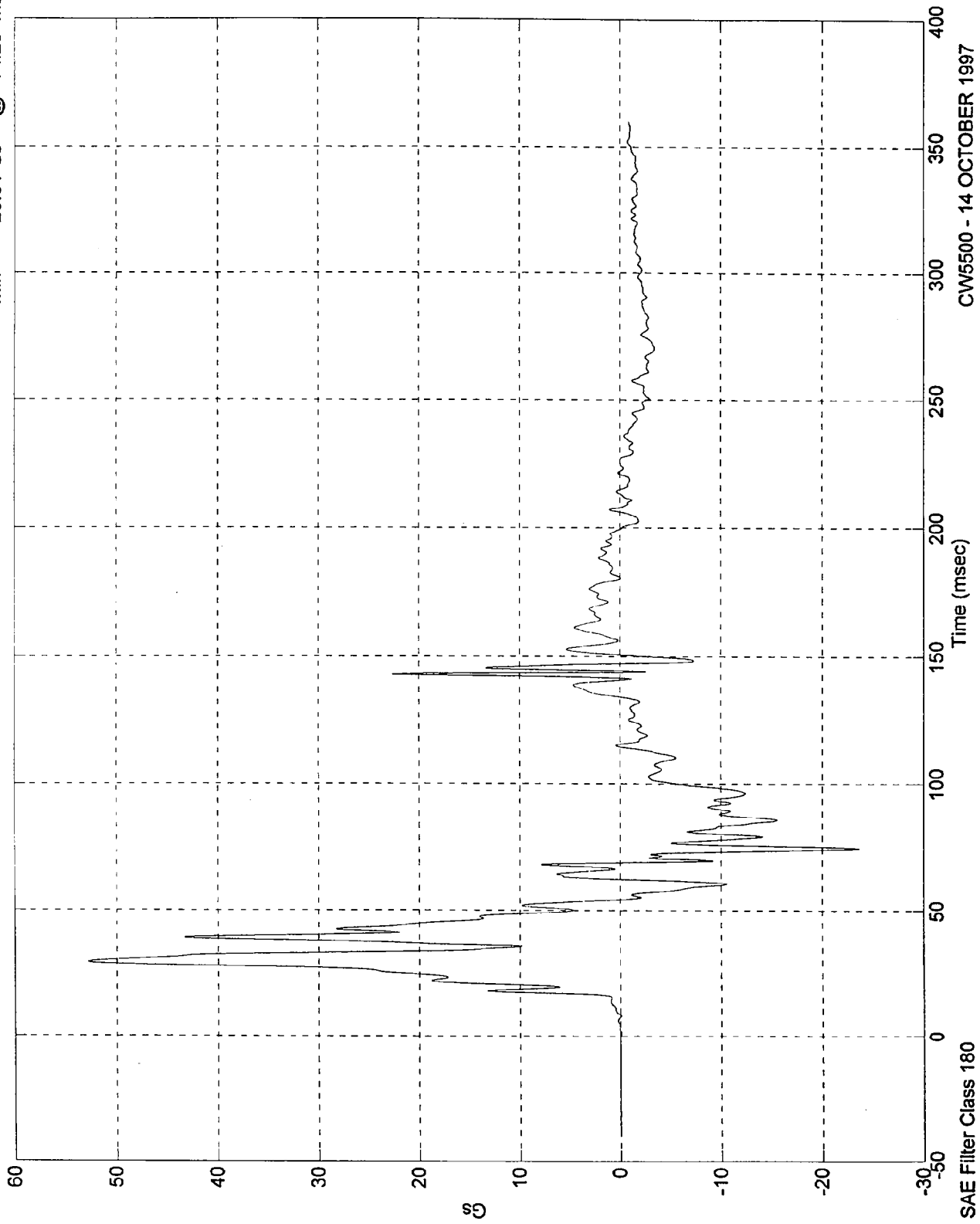
CW5500 - 14 OCTOBER 1997



# NHTSA Side Impact - 1998 Subaru Legacy

Max = 52.85 Gs @ 29.49 msec  
 Min = -23.61 Gs @ 74.29 msec

P1 Lower Rib Y

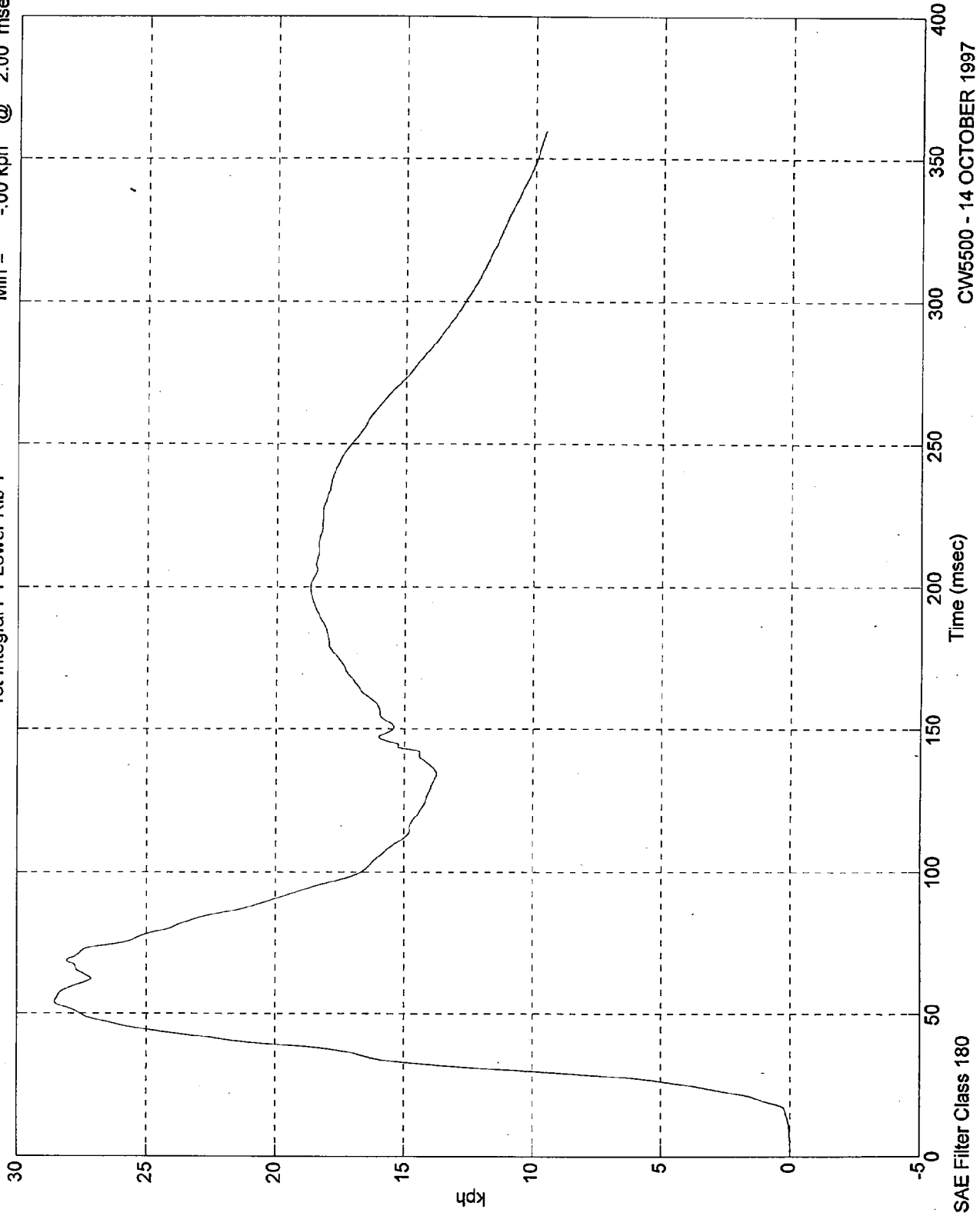


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 28.53 kph @ 54.40 msec  
Min = -0.00 kph @ 2.00 msec

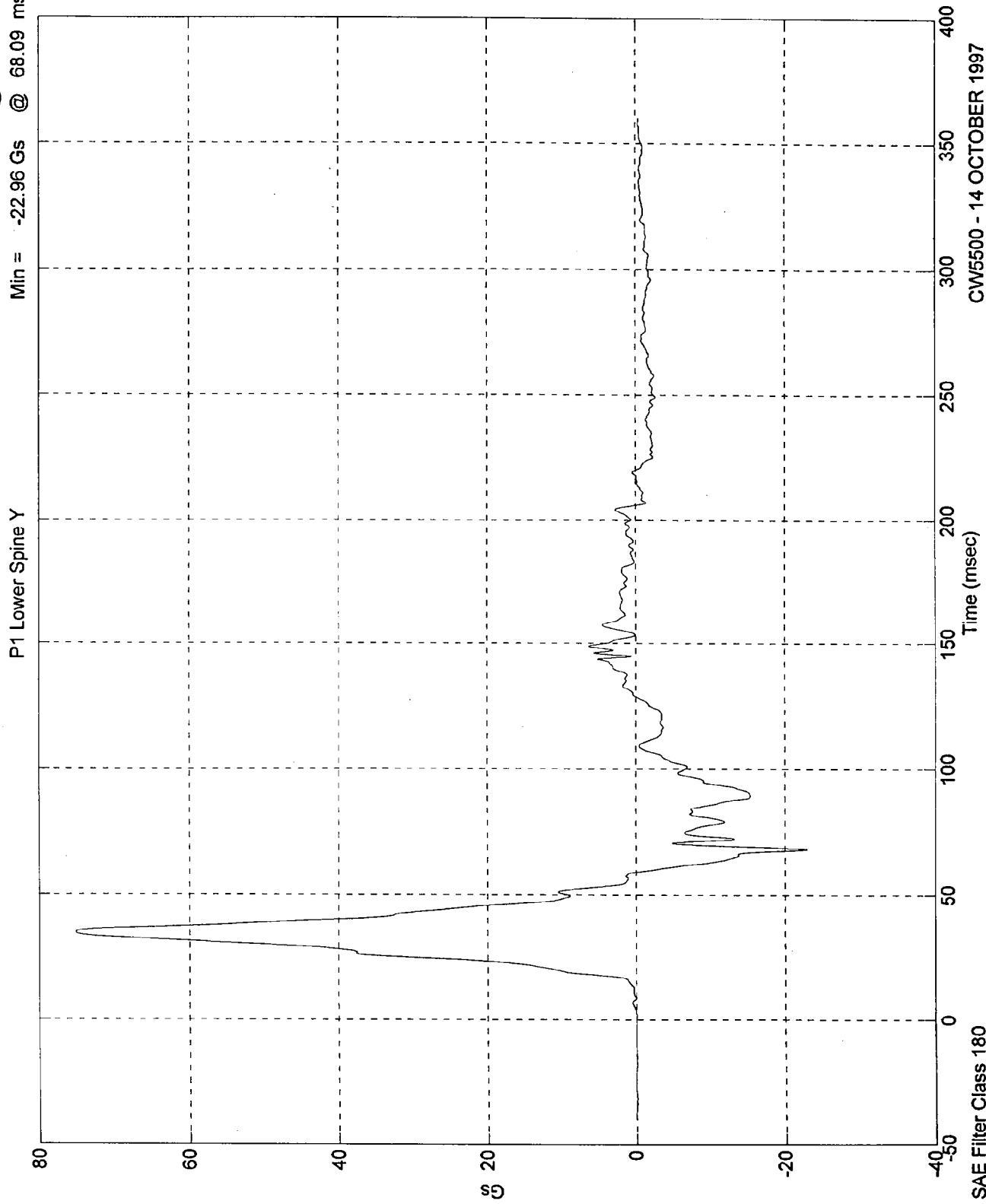
1st Integral P1 Lower Rib Y



CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

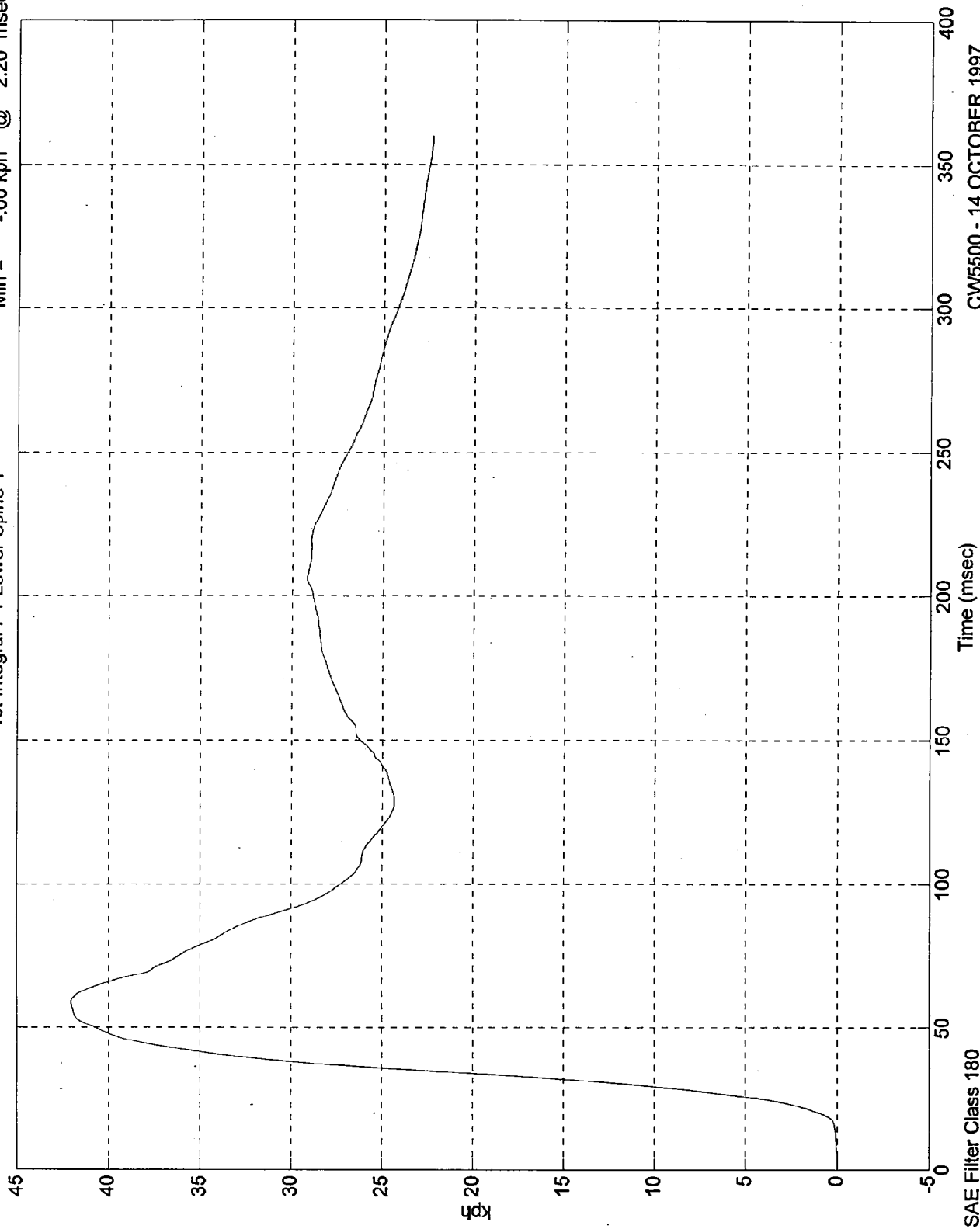
Max = 75.11 Gs @ 34.69 msec  
Min = -22.96 Gs @ 68.09 msec



# NHTSA Side Impact - 1998 Subaru Legacy

Max = 42.03 kph @ 59.00 msec  
 Min = -0.00 kph @ 2.20 msec

1st Integral P1 Lower Spine Y

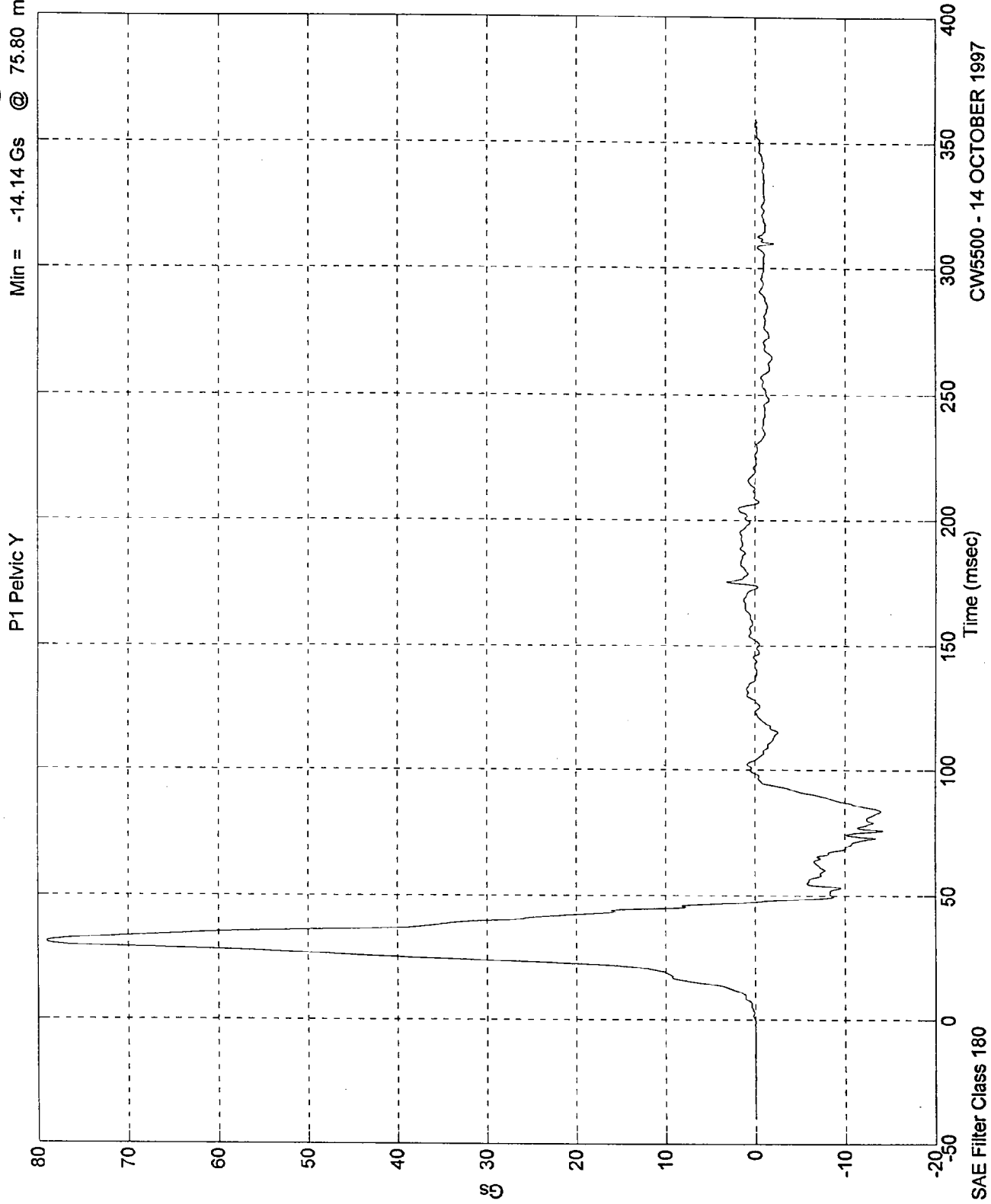


CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Subaru Legacy

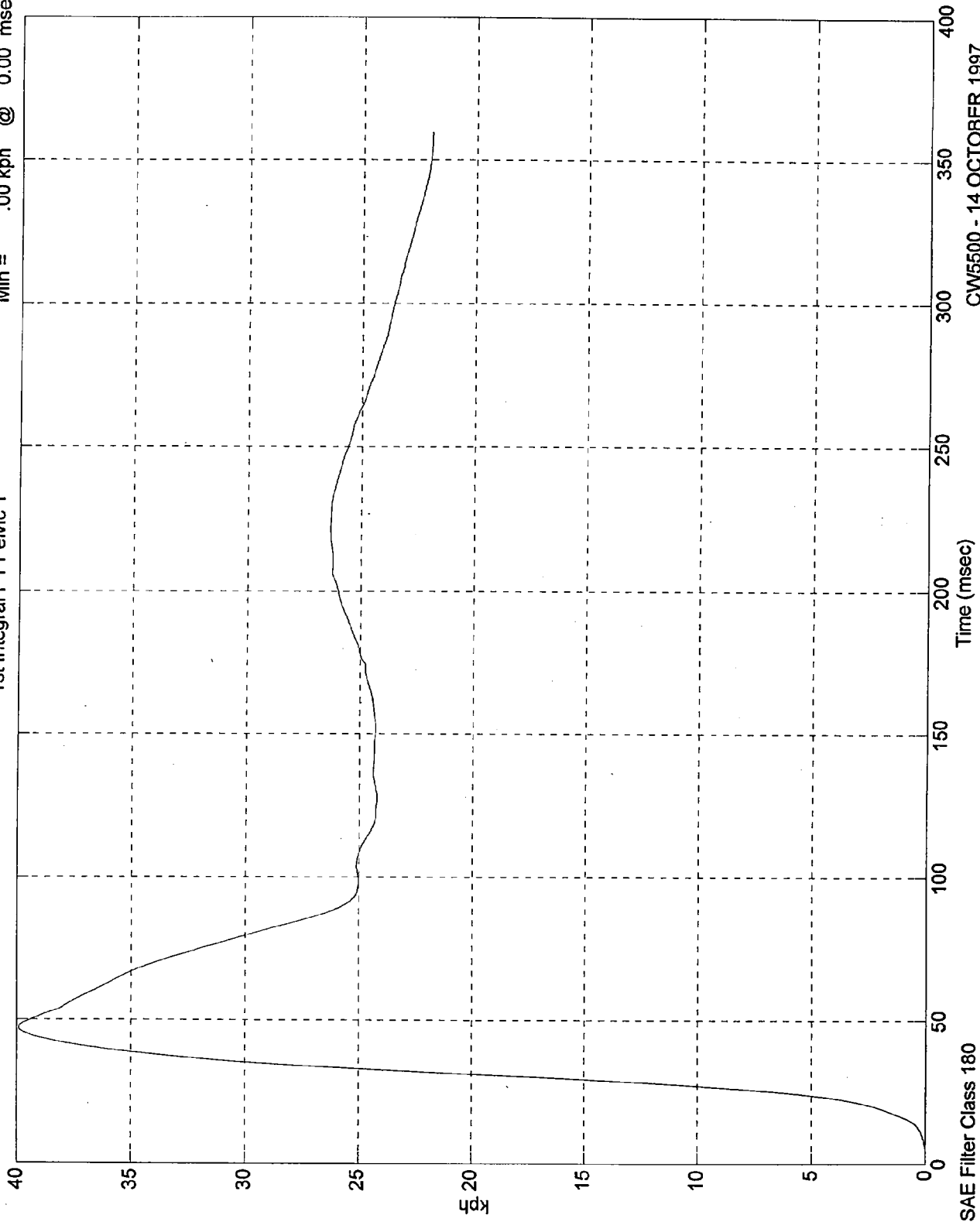
Max = 79.00 Gs @ 31.00 msec  
Min = -14.14 Gs @ 75.80 msec



NHTSA Side Impact - 1998 Subaru Legacy

Max = 39.91 kph @ 47.20 msec  
Min = .00 kph @ 0.00 msec

1st Integral P1 Pelvic Y

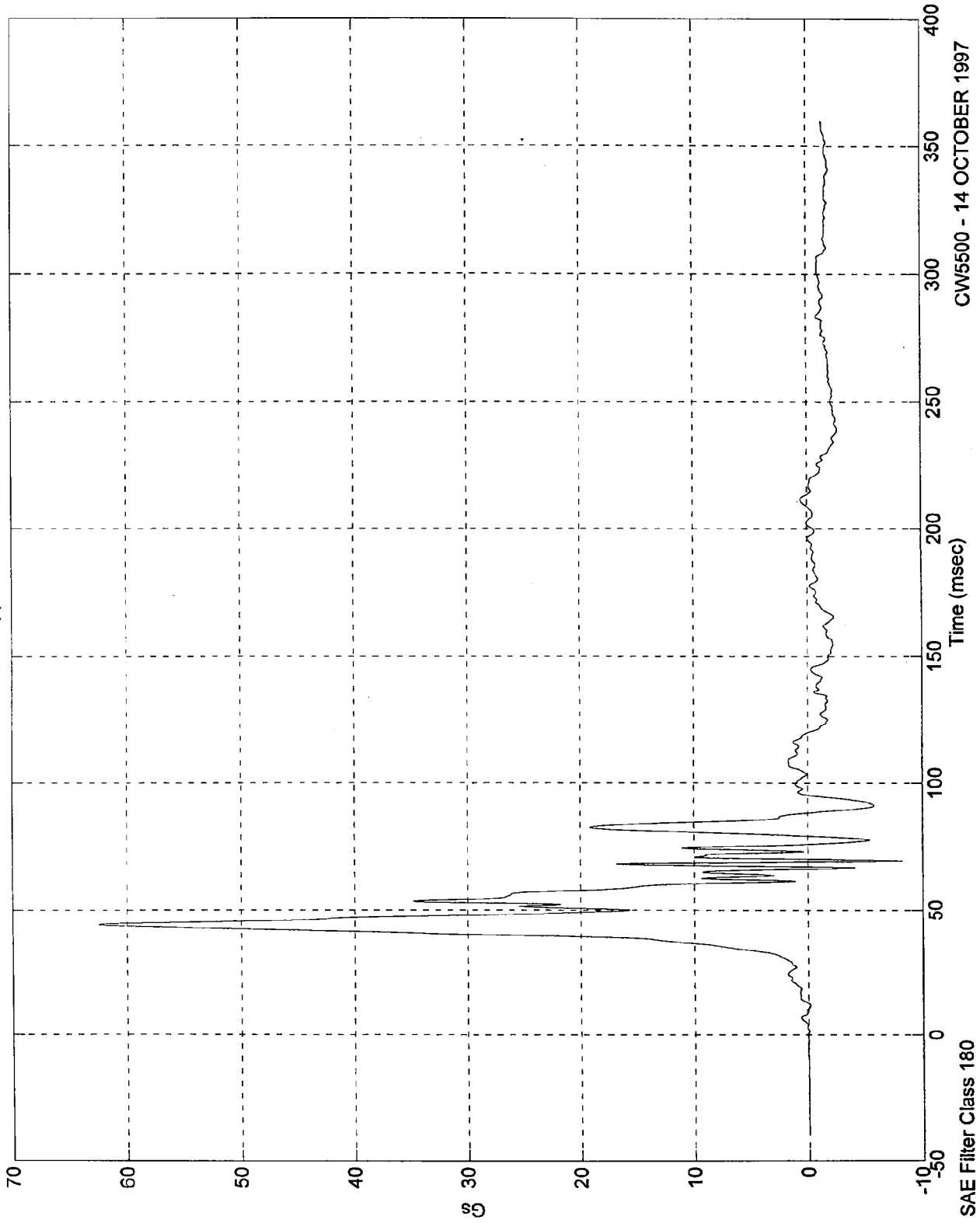


CW5500 - 14 OCTOBER 1997

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 62.48 Gs @ 43.89 msec  
 Min = -8.21 Gs @ 69.39 msec

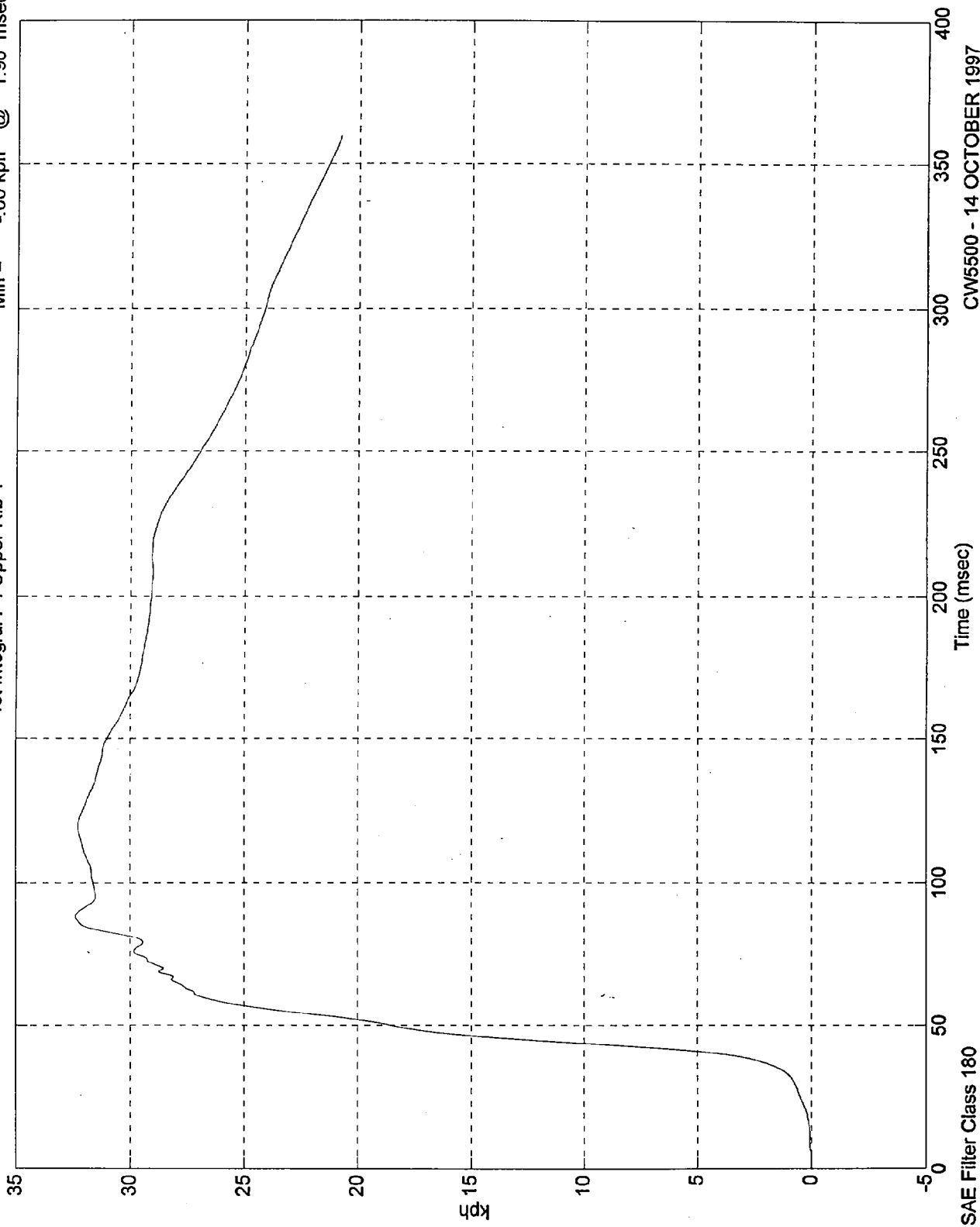
P4 Upper Rib Y



NHTSA Side Impact - 1998 Subaru Legacy

Max = 32.37 kph @ 88.39 msec  
Min = -.00 kph @ 1.90 msec

1st Integral P4 Upper Rib Y



CW5500 - 14 OCTOBER 1997

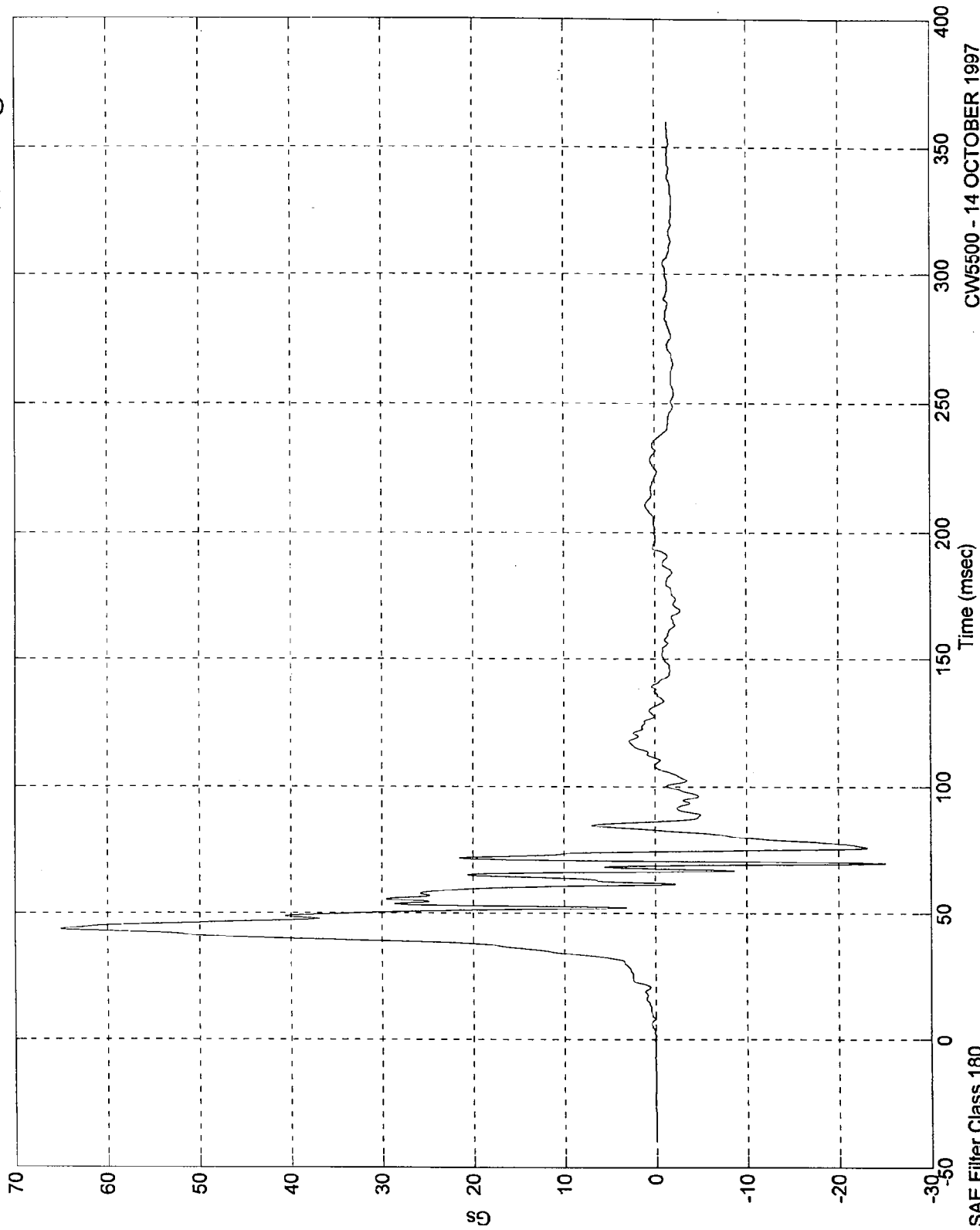
SAE Filter Class 180



NHTSA Side Impact - 1998 Subaru Legacy

Max = 65.11 Gs @ 43.60 msec  
Min = -25.07 Gs @ 69.59 msec

P4 Lower Rib Y

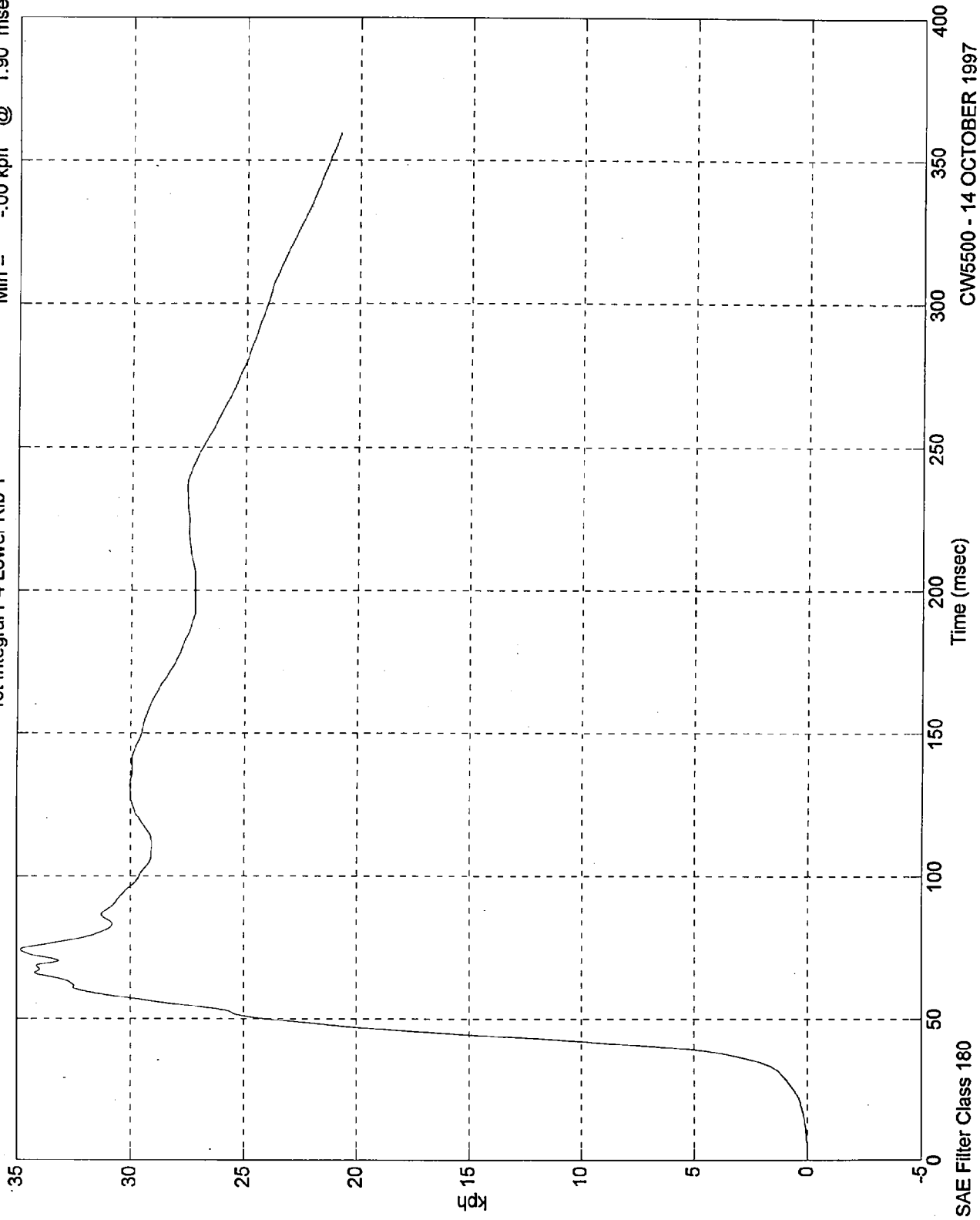


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 34.83 kph @ 74.20 msec  
Min = -.00 kph @ 1.90 msec

1st Integral P4 Lower Rib Y

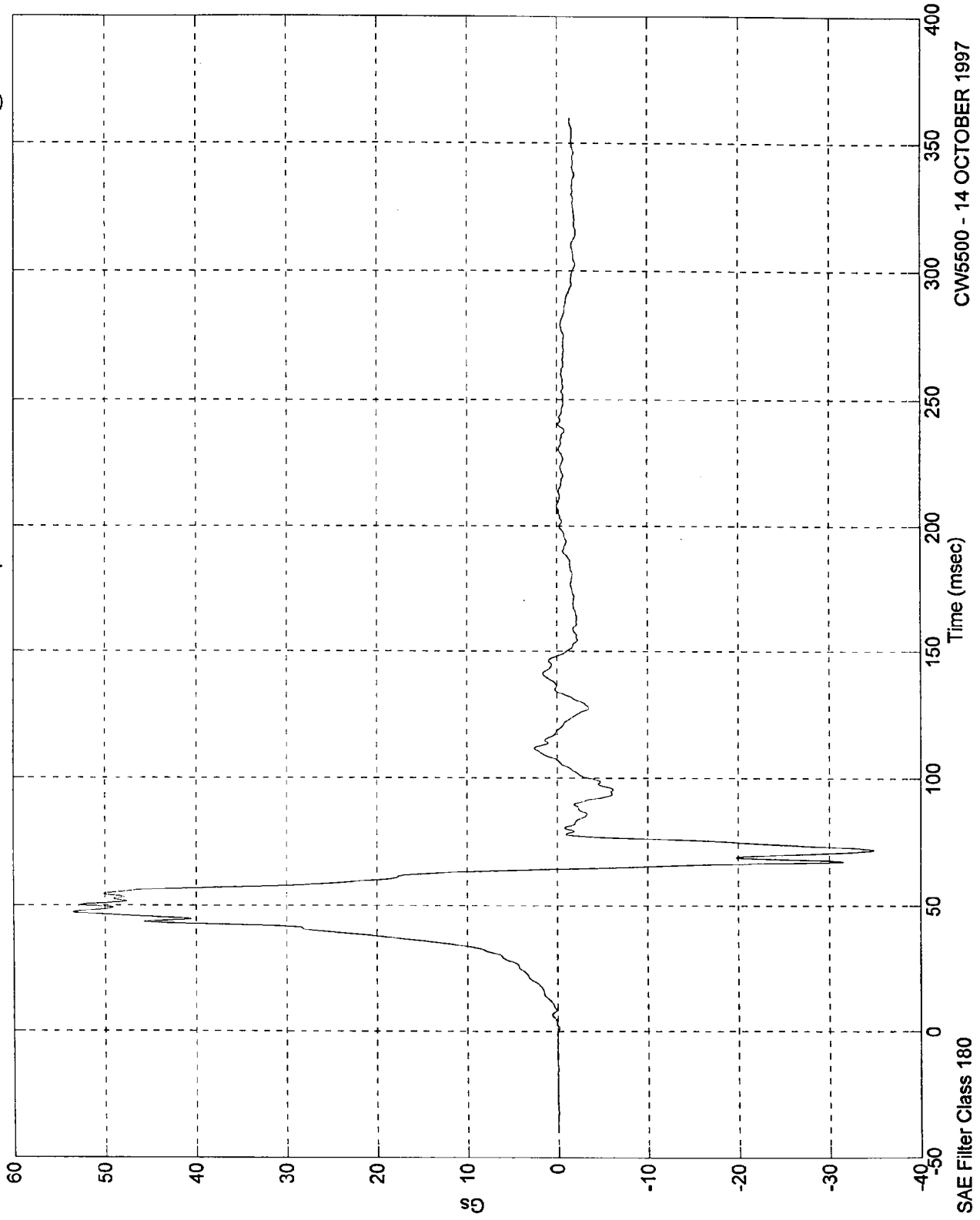


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 53.48 Gs @ 47.00 msec  
Min = -34.89 Gs @ 71.59 msec

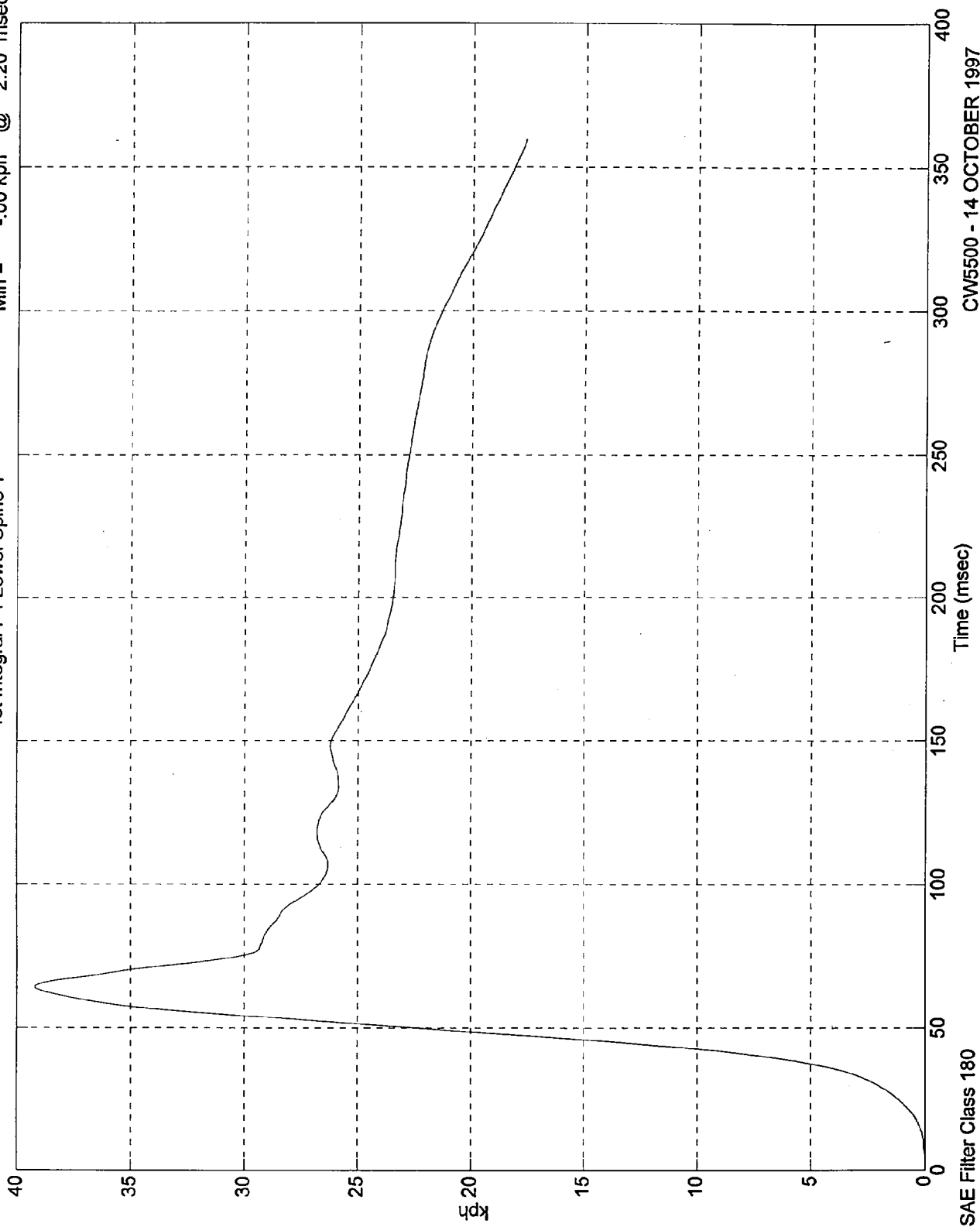
P4 Lower Spine Y



# NHTSA Side Impact - 1998 Subaru Legacy

Max = 39.18 kph @ 64.19 msec  
 Min = -.00 kph @ 2.20 msec

1st Integral P4 Lower Spine Y



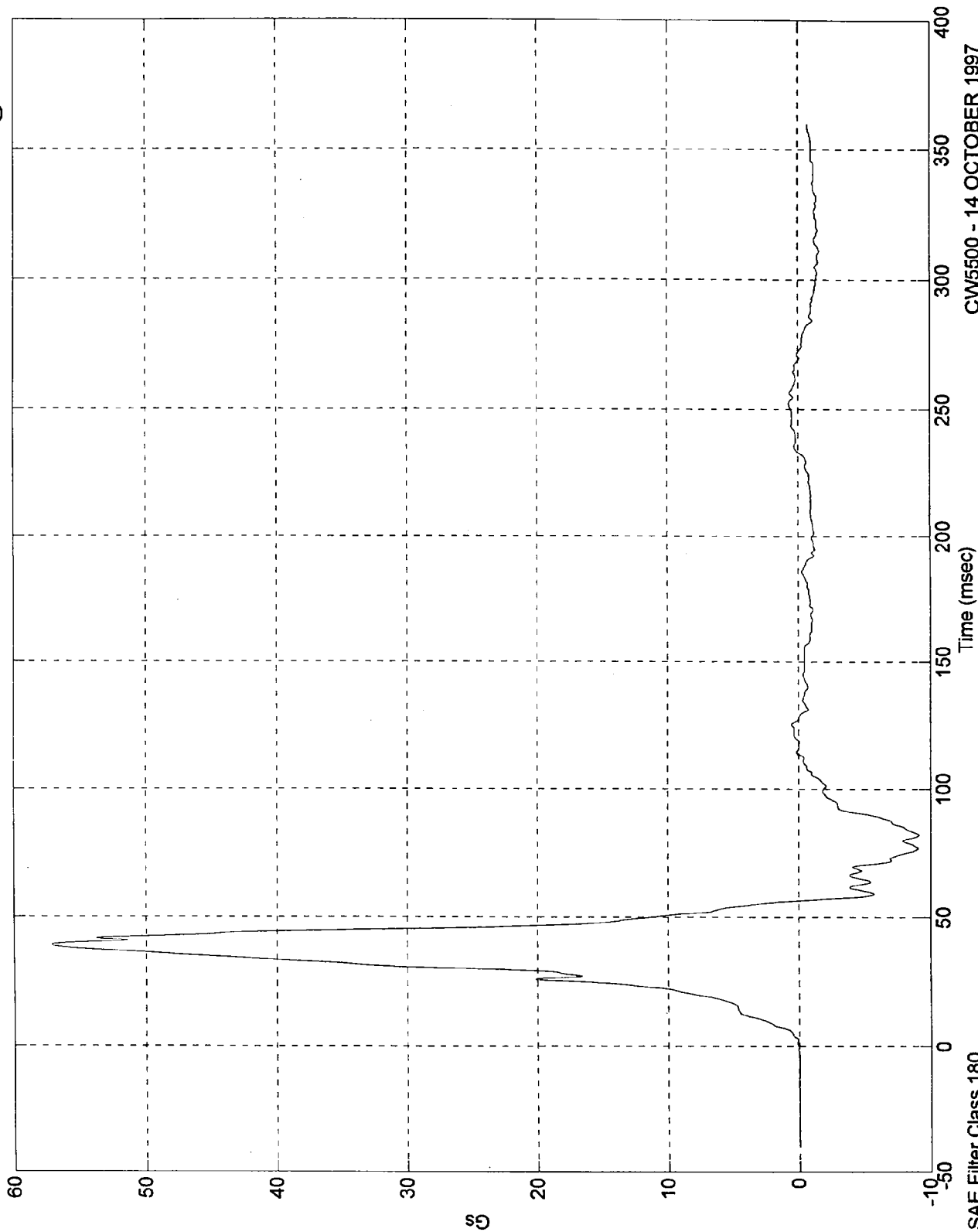
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Subaru Legacy

P4 Pelvic Y

Max = 57.14 Gs @ 38.89 msec  
Min = -9.13 Gs @ 82.30 msec



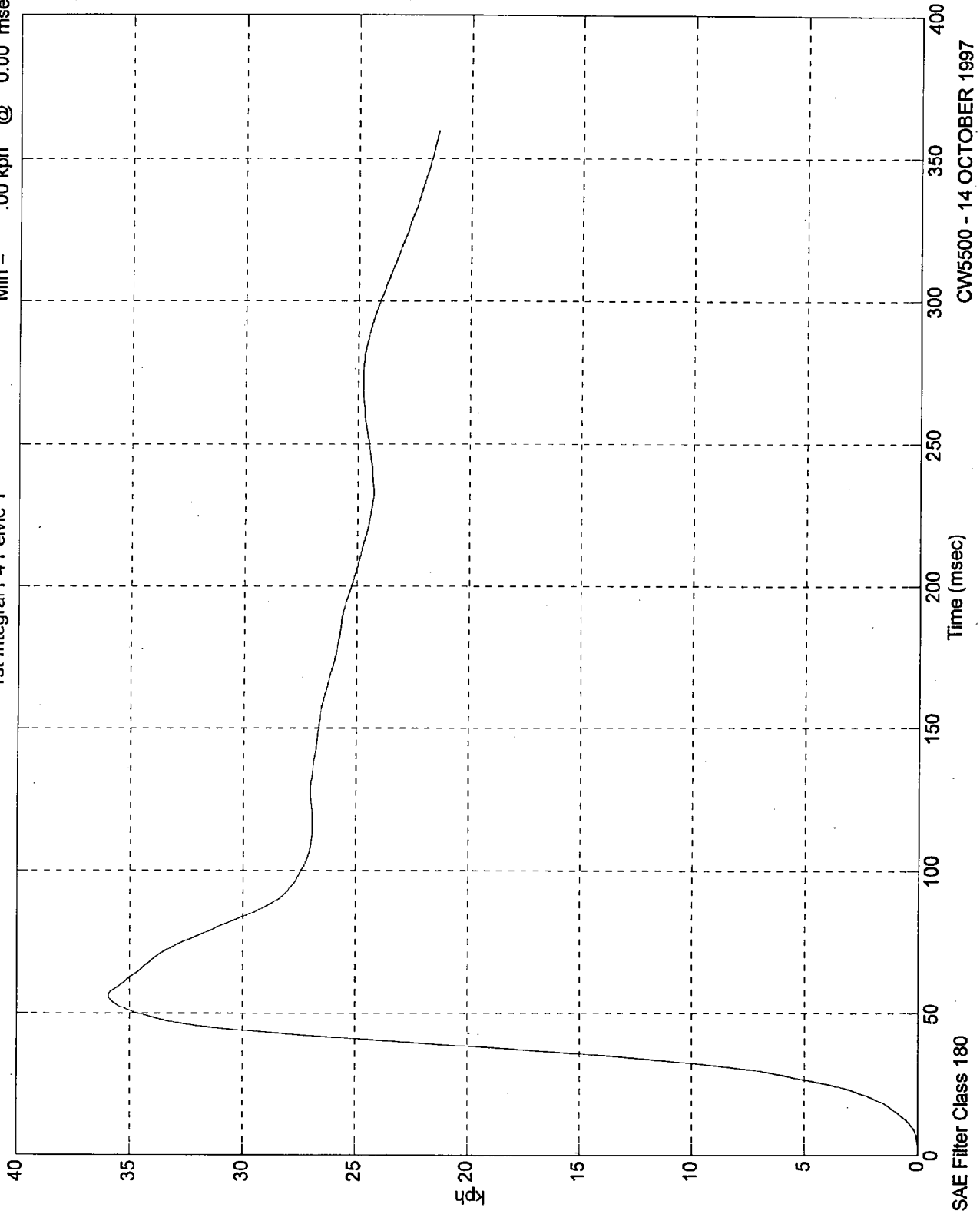
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Subaru Legacy

Max = 35.95 kph @ 56.40 msec  
Min = .00 kph @ 0.00 msec

1st Integral P4 Pelvic Y



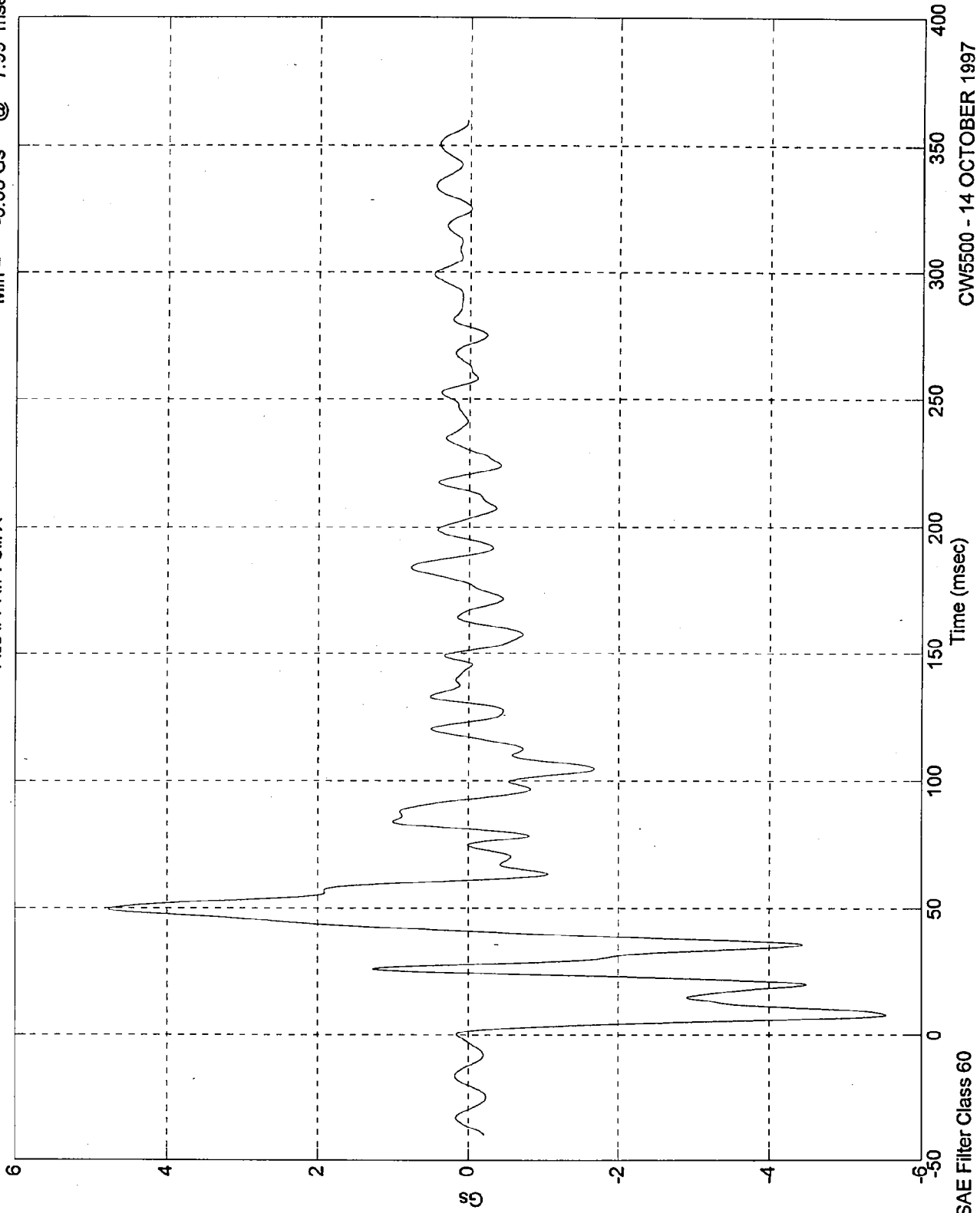
CW5500 - 14 OCTOBER 1997

**TEST VEHICLE INSTRUMENTATION PLOTS**  
**ACCELERATION DATA - FILTER CLASS 60**  
**INTEGRATION DATA - FILTER CLASS 180**

NHTSA Side Impact - 1998 Subaru Legacy

Max = 4.76 Gs @ 49.59 msec  
Min = -5.53 Gs @ 7.99 msec

Acc #1 R.F. Sill X



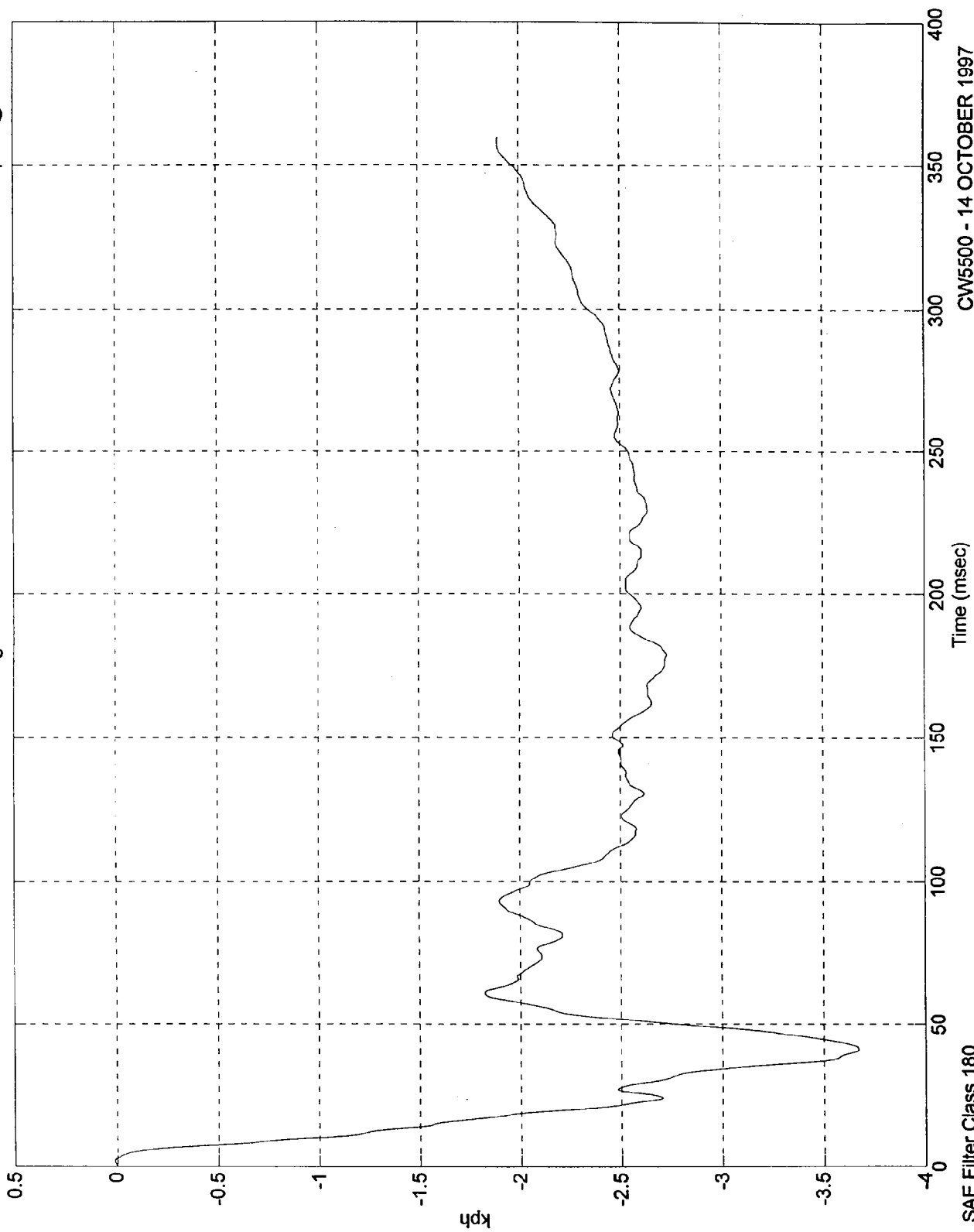
CW5500 - 14 OCTOBER 1997



NHTSA Side Impact - 1998 Subaru Legacy

Max = .01 kph @ 1.90 msec  
Min = -3.67 kph @ 41.00 msec

1st Integral Acc #1 R.F. Sill X



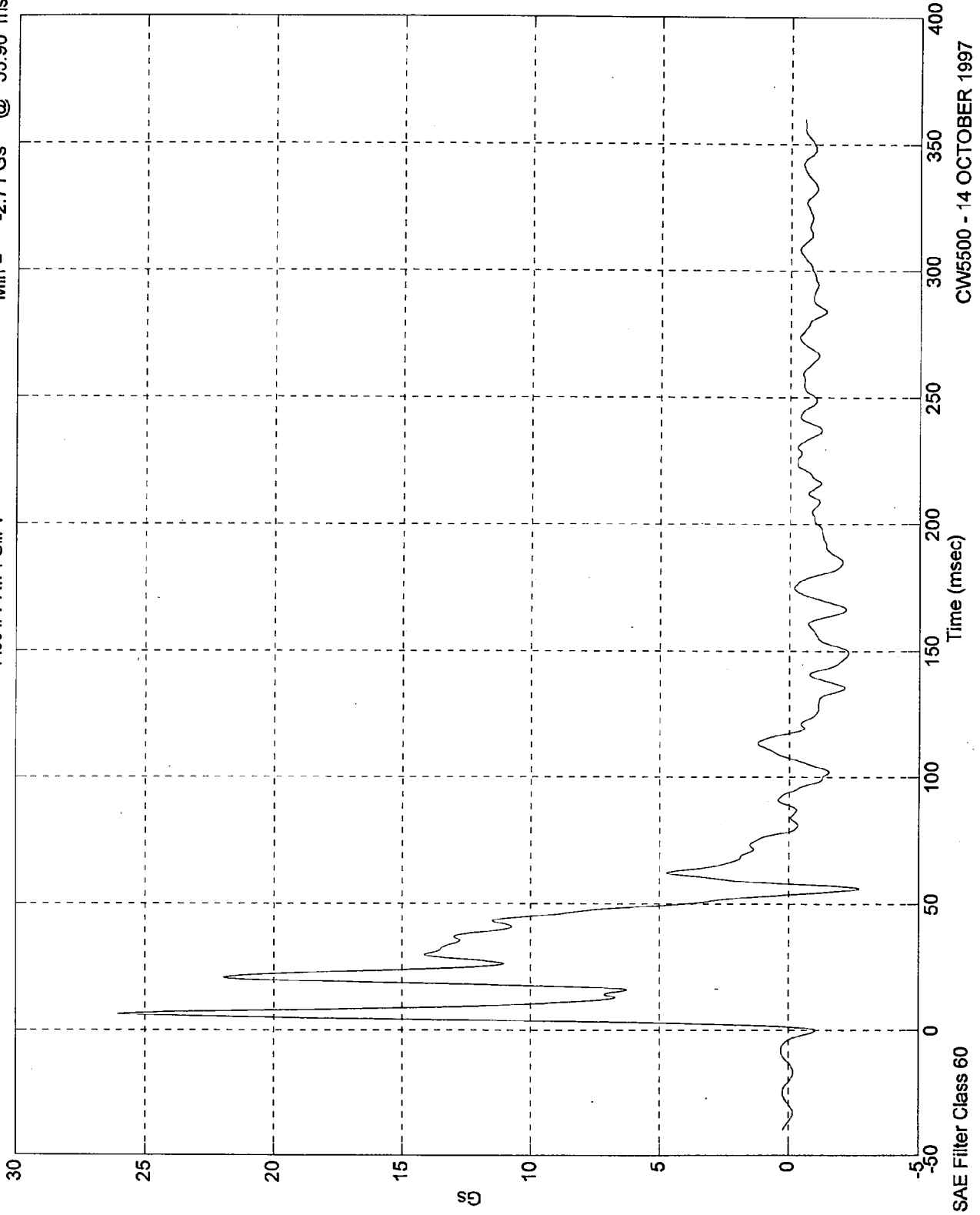
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 26.03 Gs @ 6.49 msec  
Min = -2.71 Gs @ 55.90 msec

Acc #1 R.F. Sill Y

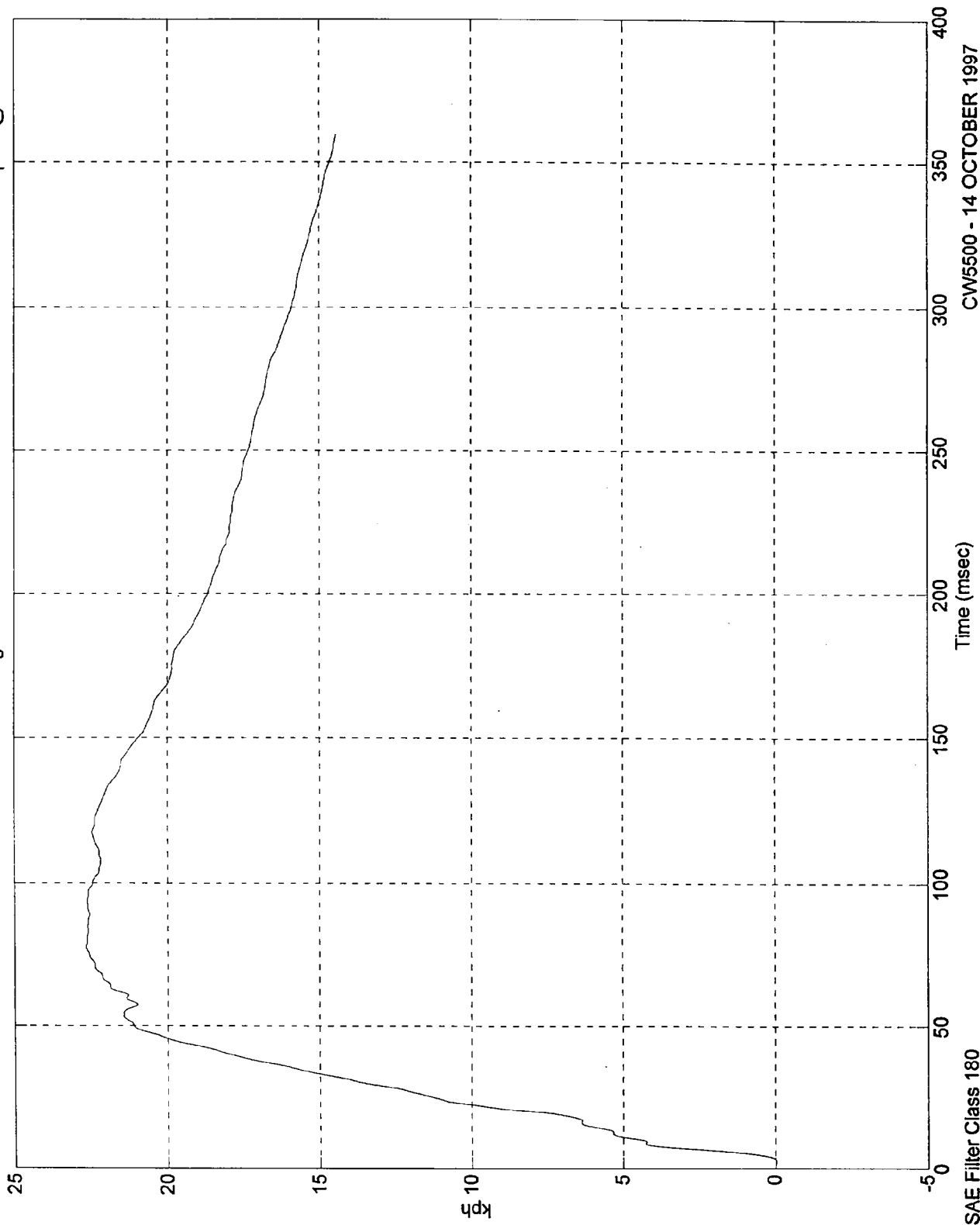


CW5500 - 14 OCTOBER 1997

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 22.67 kph @ 77.39 msec  
 Min = -0.04 kph @ 2.60 msec

1st Integral Acc #1 R.F. Sill Y



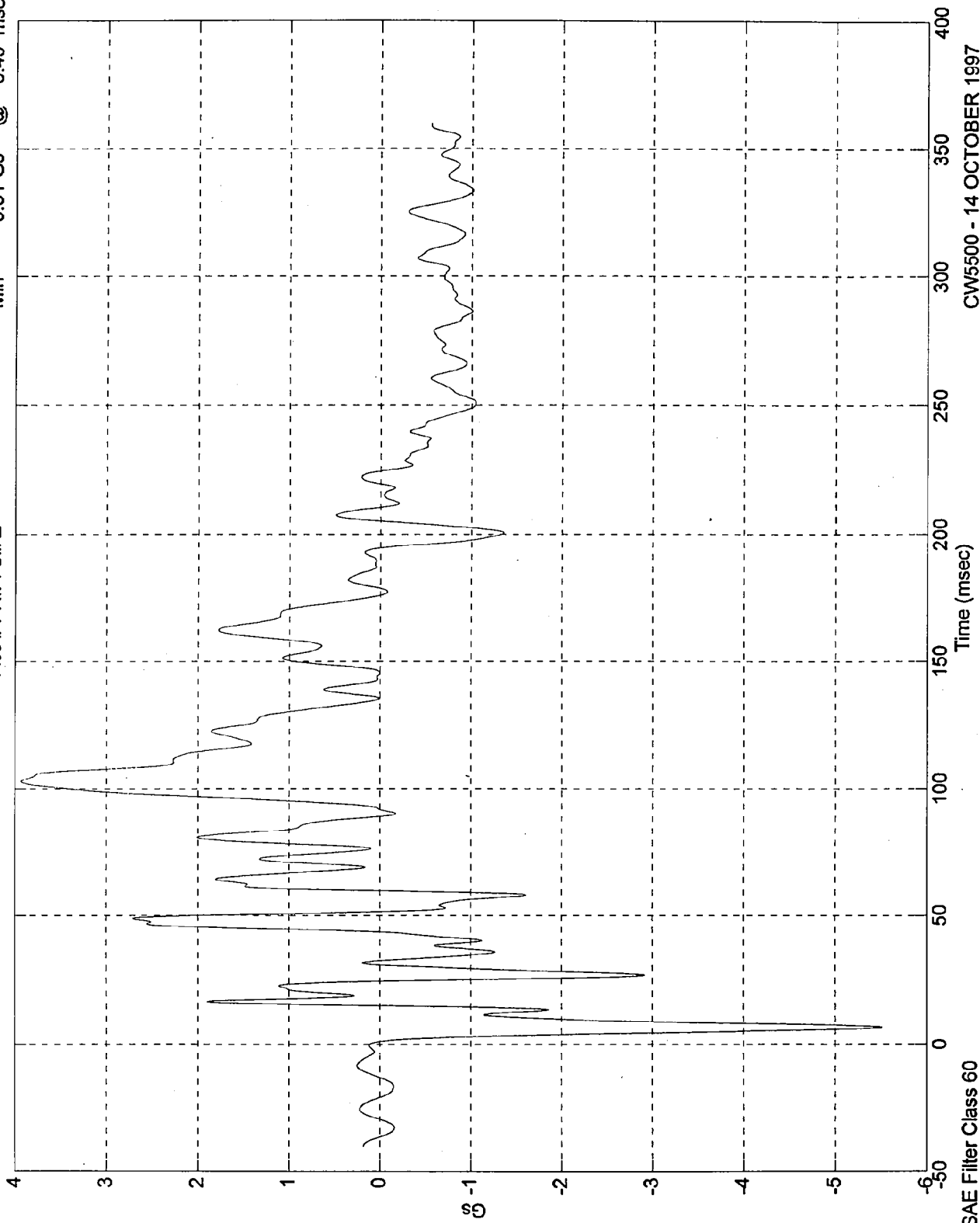
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 3.93 Gs @ 102.79 msec  
Min = -5.51 Gs @ 6.49 msec

Acc #1 R.F. Sill Z

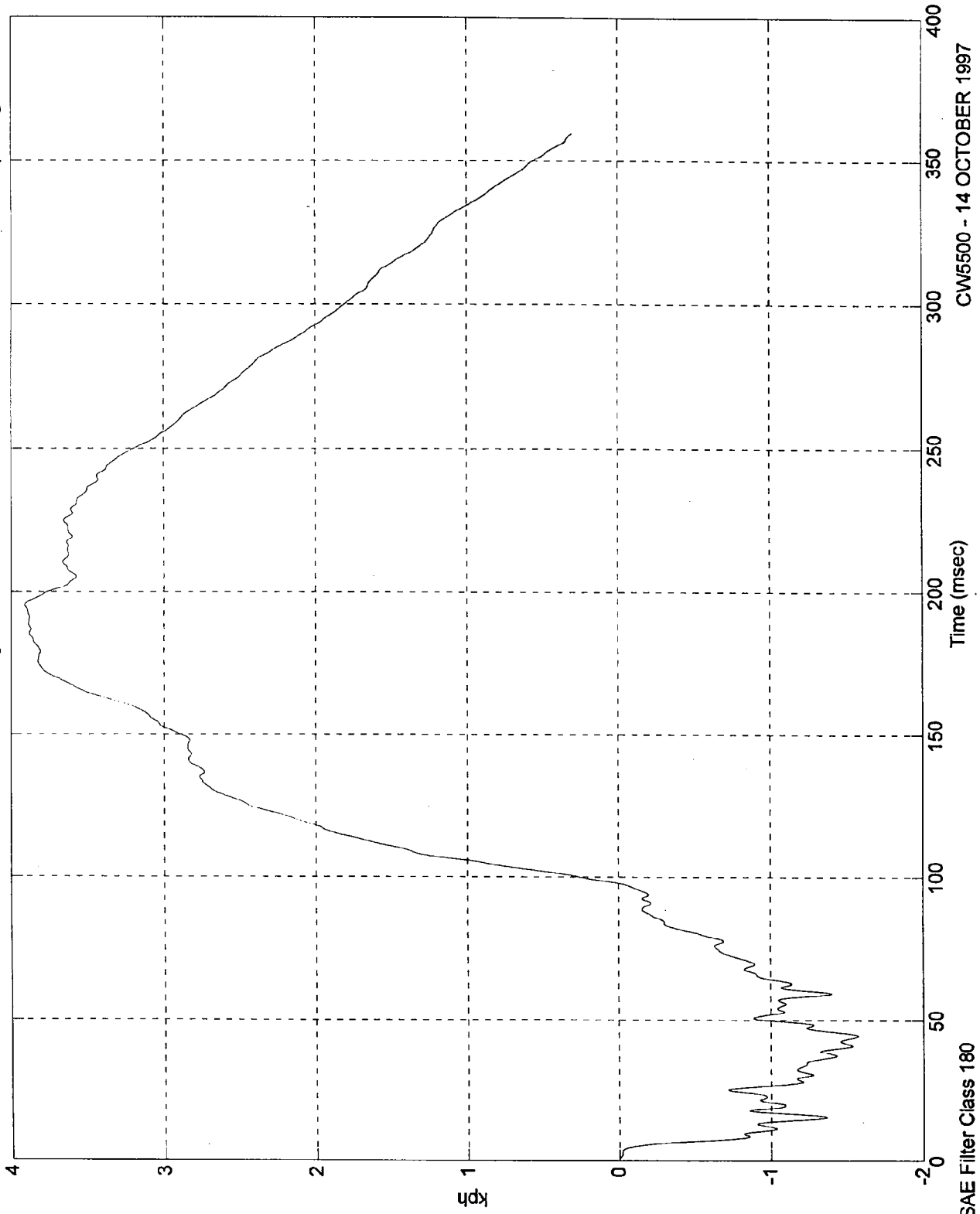


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 3.91 kph @ 195.39 msec  
Min = -1.57 kph @ 44.39 msec

1st Integral Acc #1 R.F. Sill Z



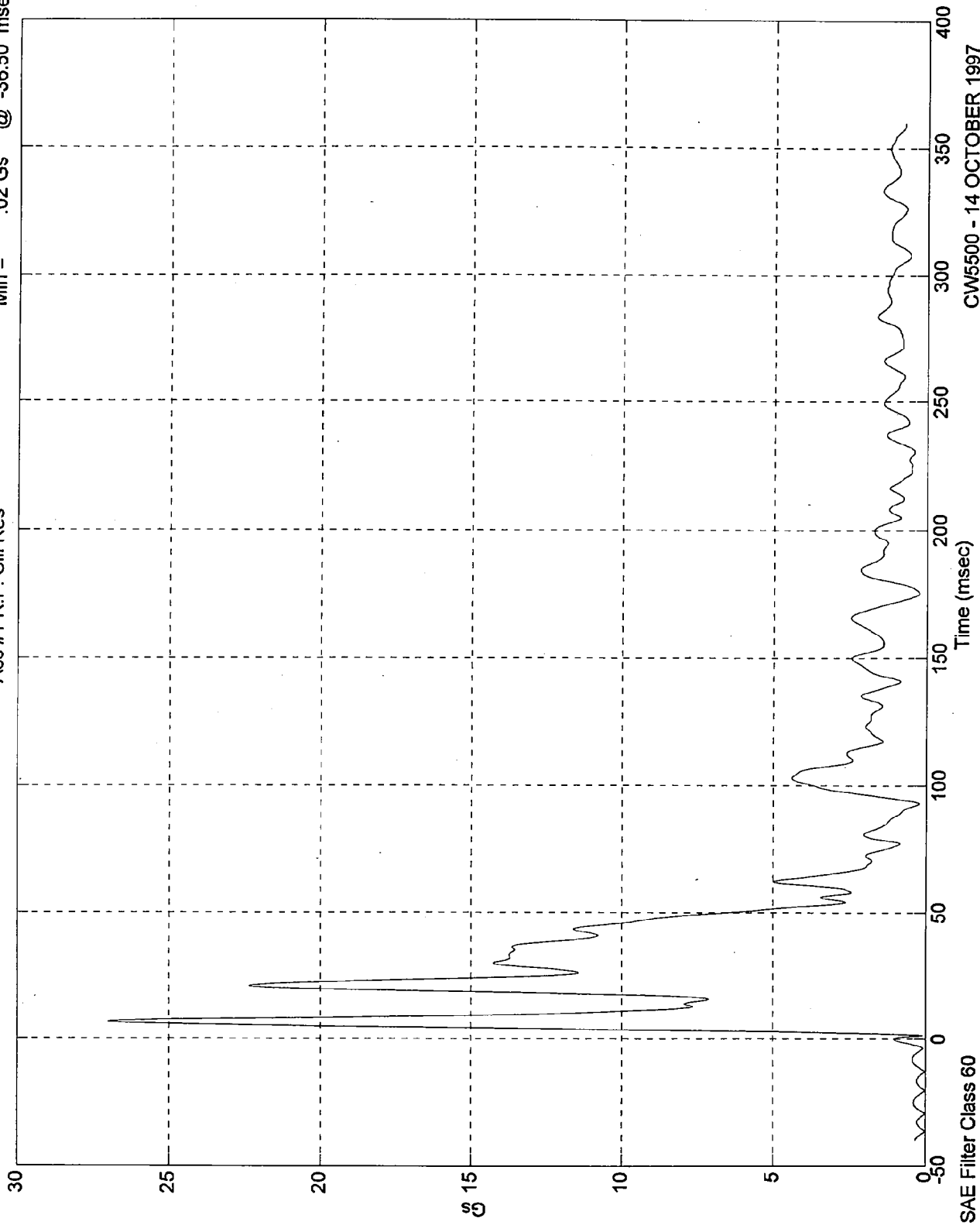
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 27.01 Gs @ 6.49 msec  
 Min = .02 Gs @ -36.50 msec

Acc #1 R.F. Sill Res

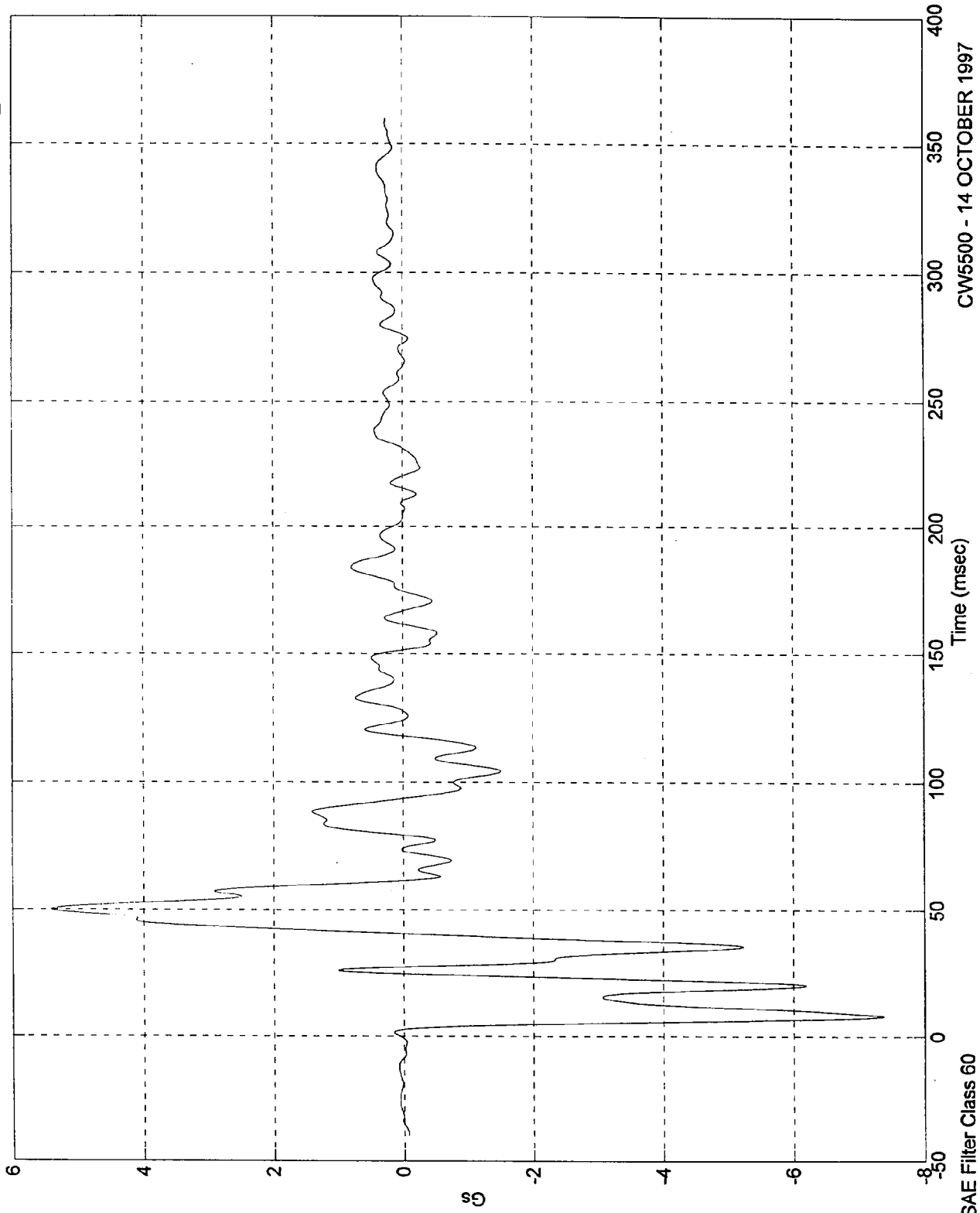


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 5.41 Gs @ 50.09 msec  
Min = -7.36 Gs @ 7.79 msec

Acc #2 R.R. Sill X



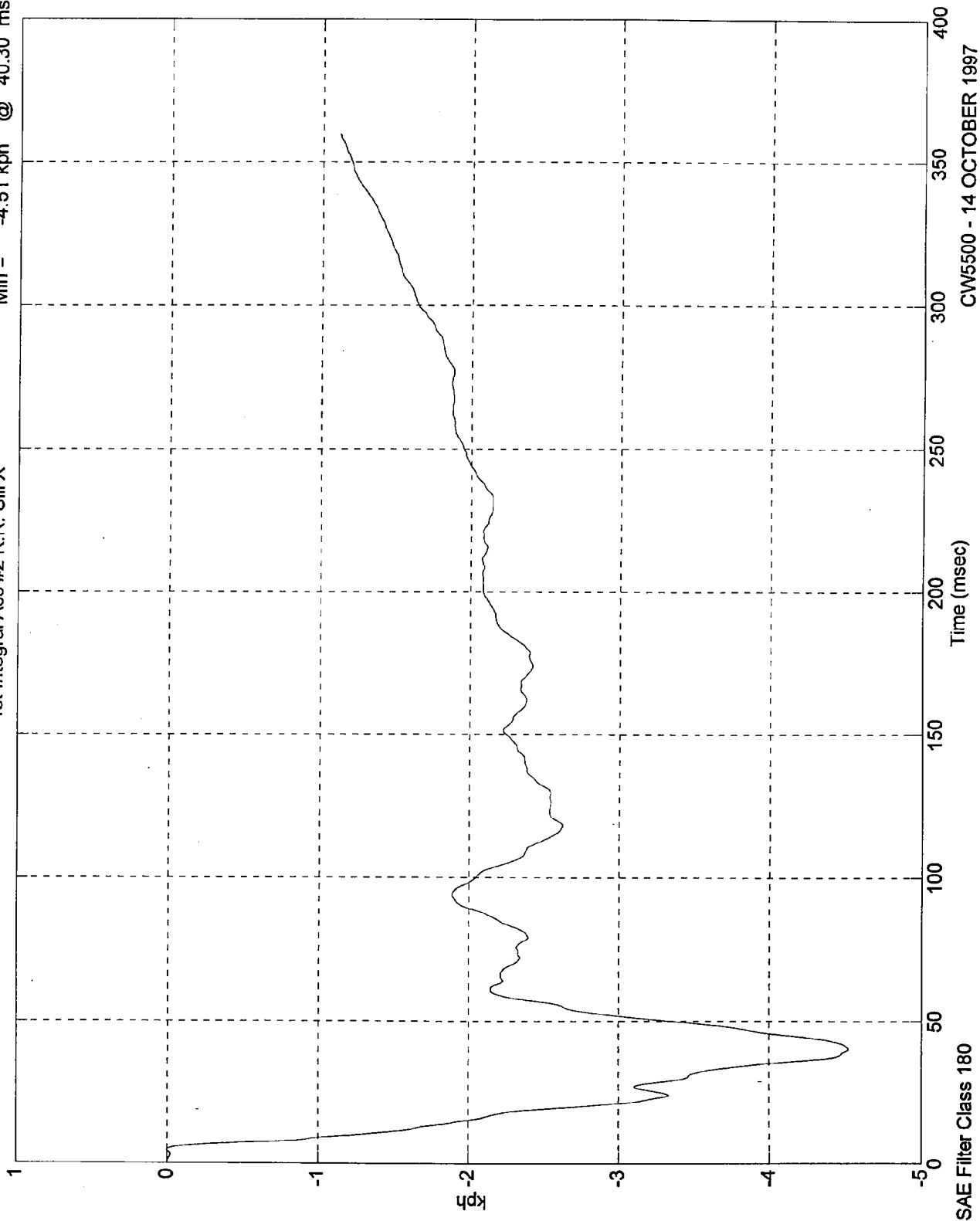
SAE Filter Class 60

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = .00 kph @ 4.50 msec  
Min = -4.51 kph @ 40.30 msec

1st Integral Acc #2 R.R. Sill X



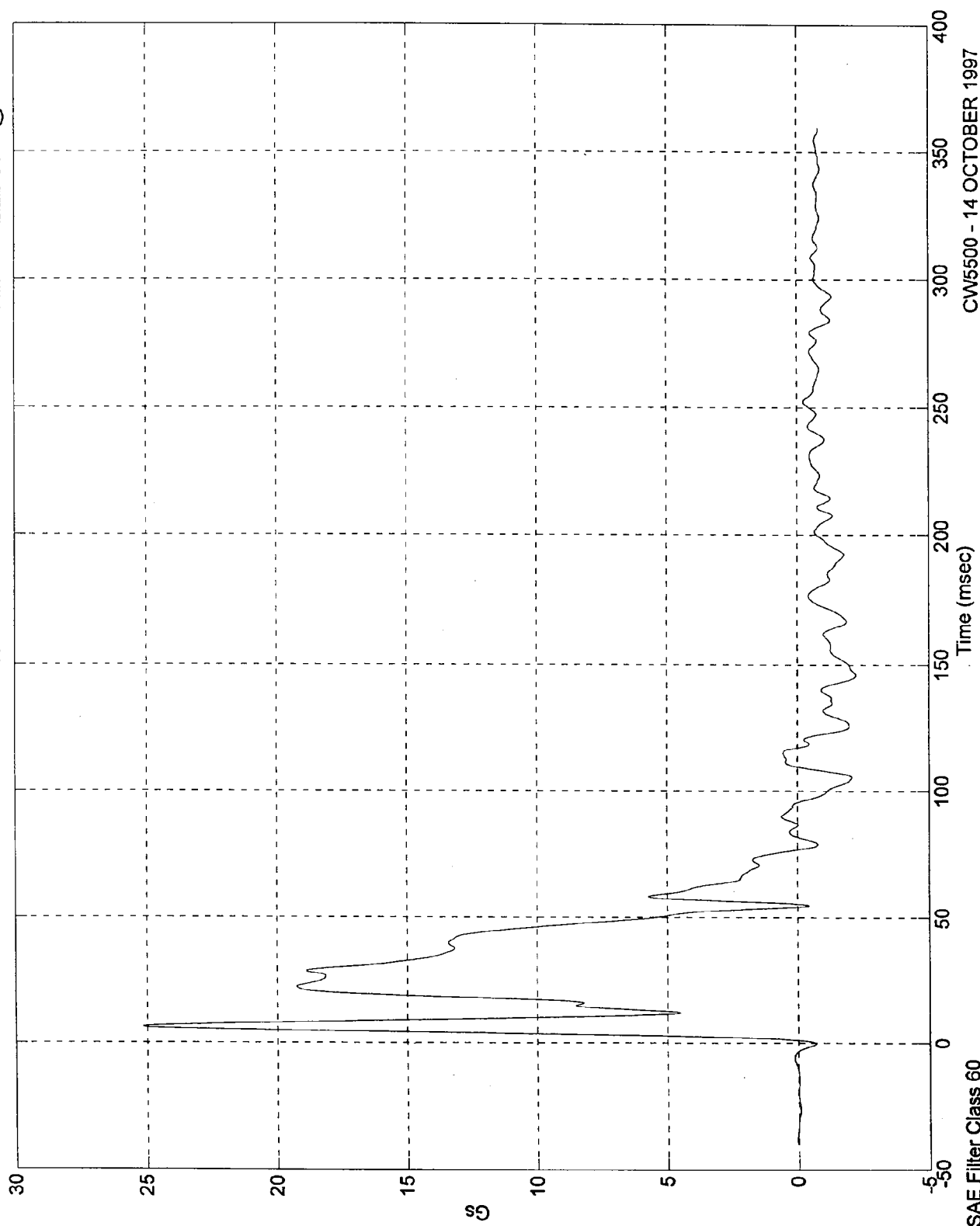
CW5500 - 14 OCTOBER 1997



# NHTSA Side Impact - 1998 Subaru Legacy

Max = 25.14 Gs @ 6.19 msec  
 Min = -2.22 Gs @ 146.00 msec

Acc #2 R.R. Sill Y

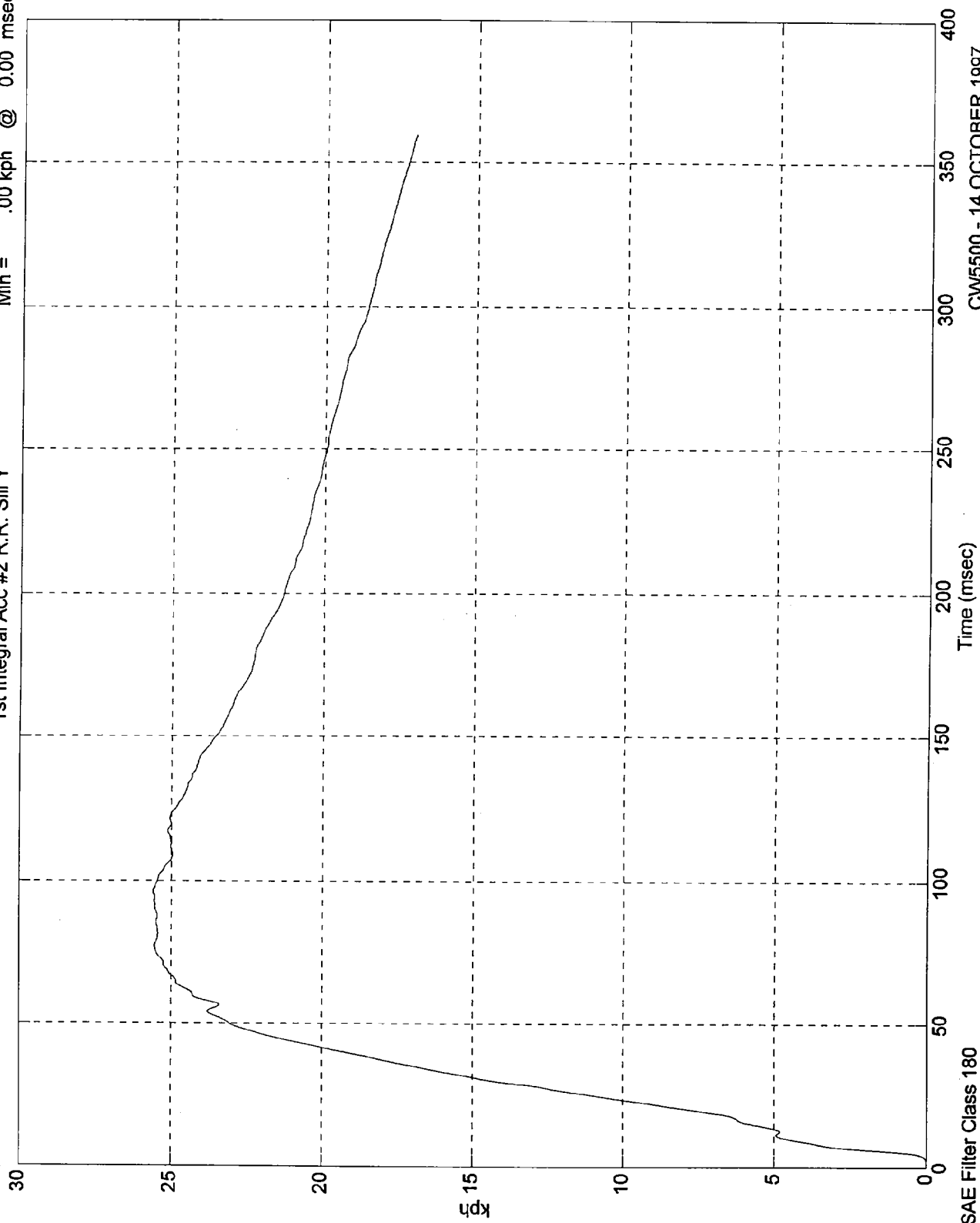


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 25.60 kph @ 96.20 msec  
Min = .00 kph @ 0.00 msec

1st Integral Acc #2 R.R. Sill Y

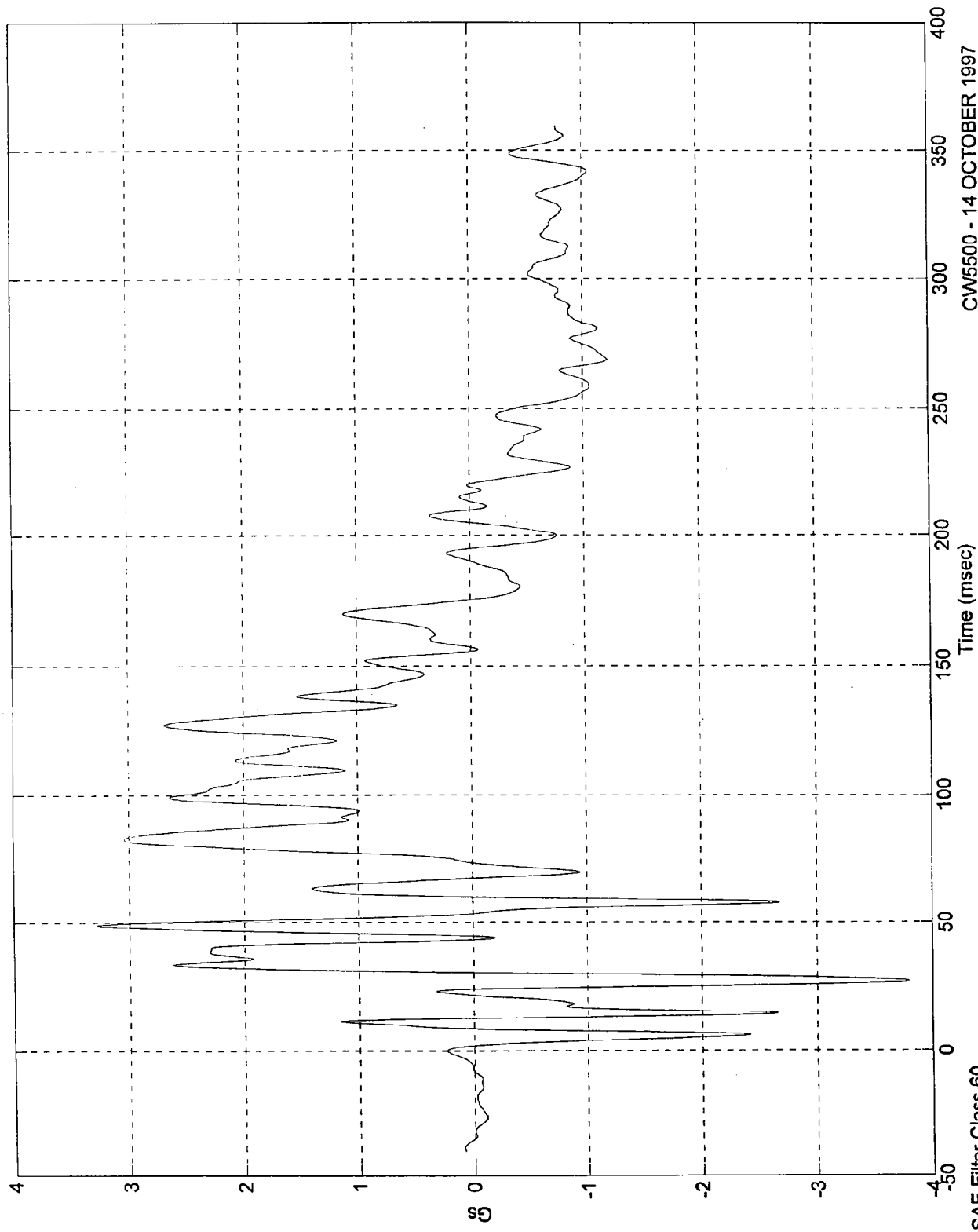


CW5500 - 14 OCTOBER 1997

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 3.27 Gs @ 48.89 msec  
Min = -3.79 Gs @ 27.29 msec

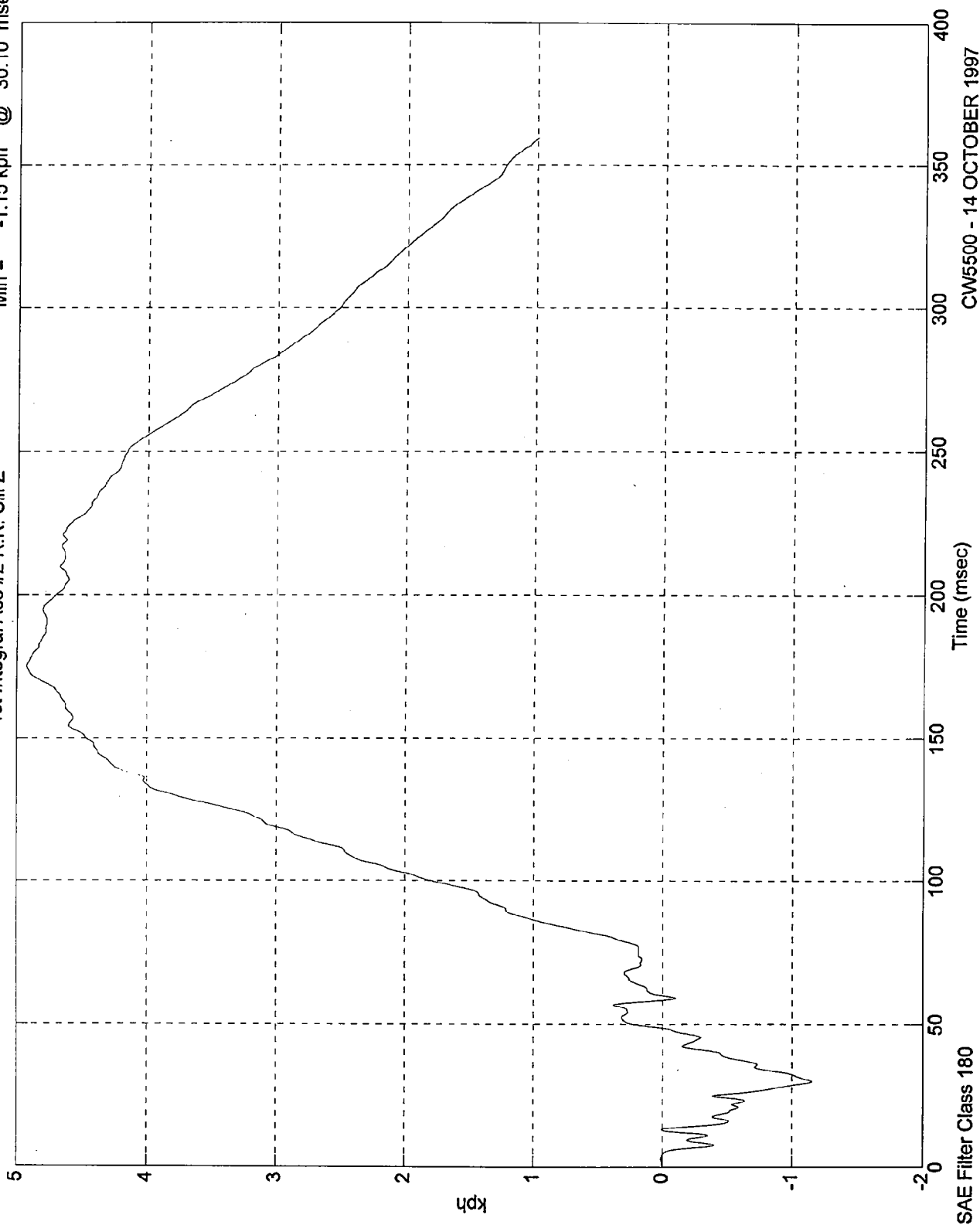
Acc #2 R.R. Sill Z



NHTSA Side Impact - 1998 Subaru Legacy

Max = 4.92 kph @ 175.09 msec  
Min = -1.15 kph @ 30.10 msec

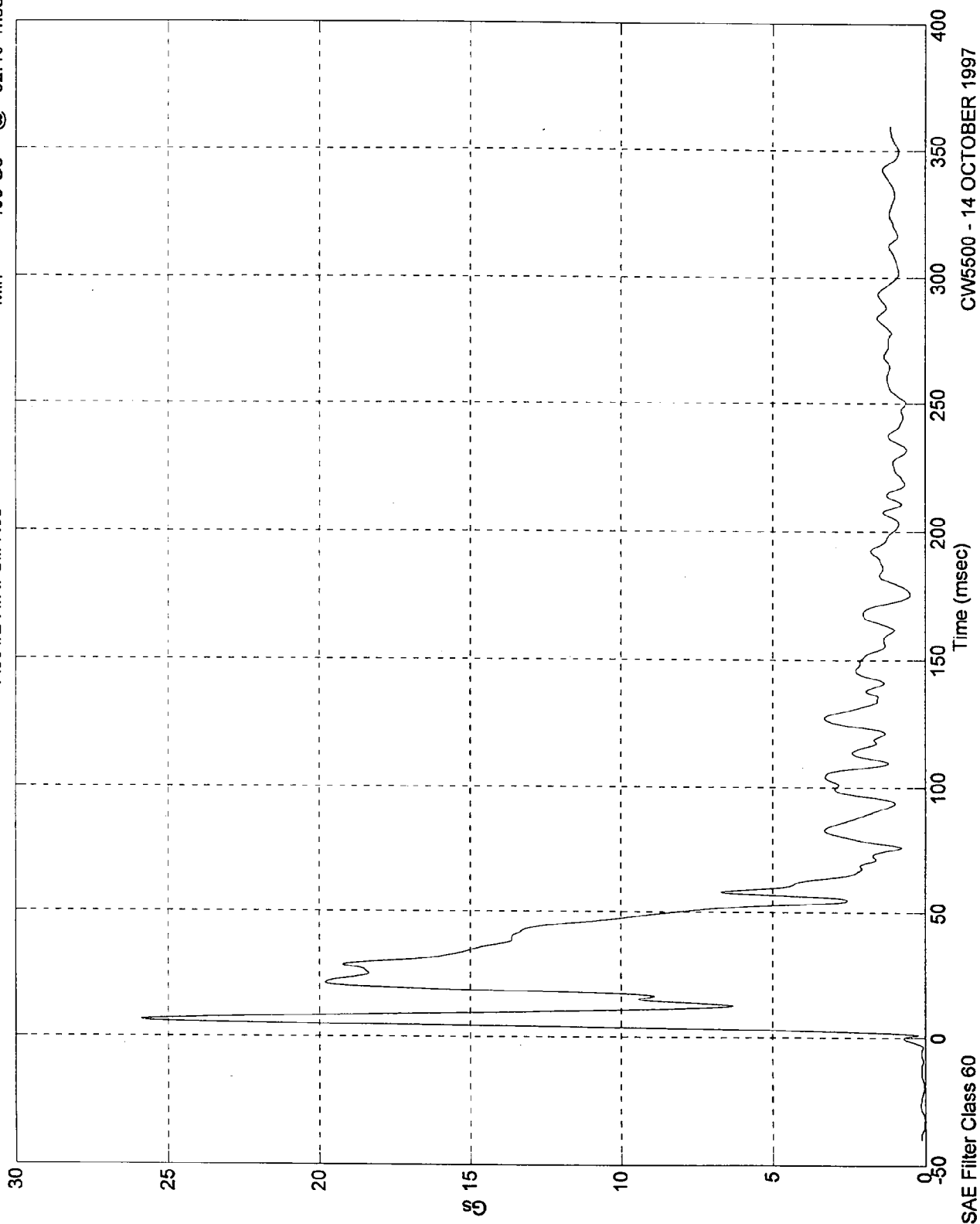
1st Integral Acc #2 R.R. Sill Z



# NHTSA Side Impact - 1998 Subaru Legacy

Max = 25.89 Gs @ 6.29 msec  
 Min = .00 Gs @ -32.19 msec

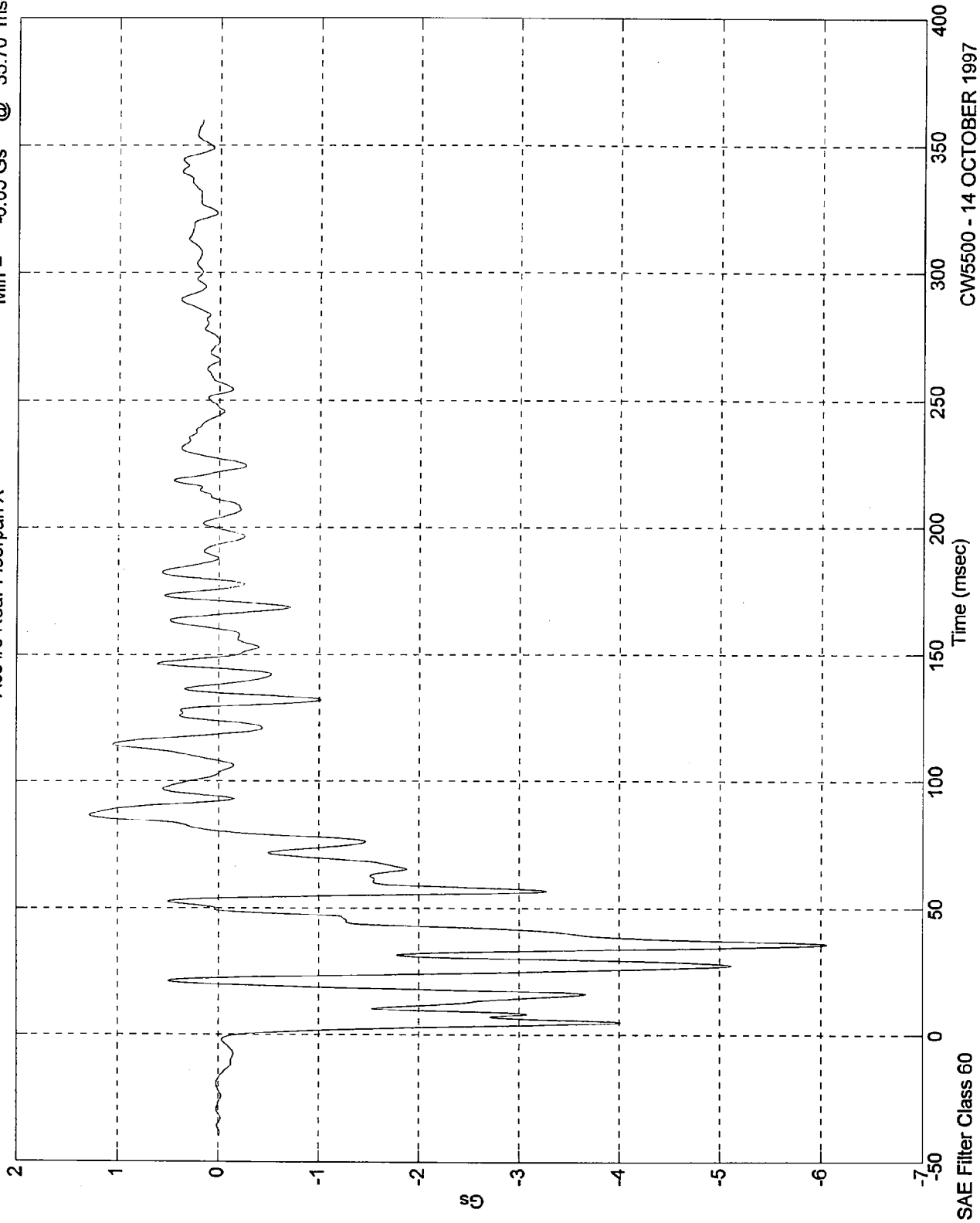
Acc #2 R.R. Sill Res



NHTSA Side Impact - 1998 Subaru Legacy

Max = 1.27 Gs @ 86.39 msec  
Min = -6.05 Gs @ 35.70 msec

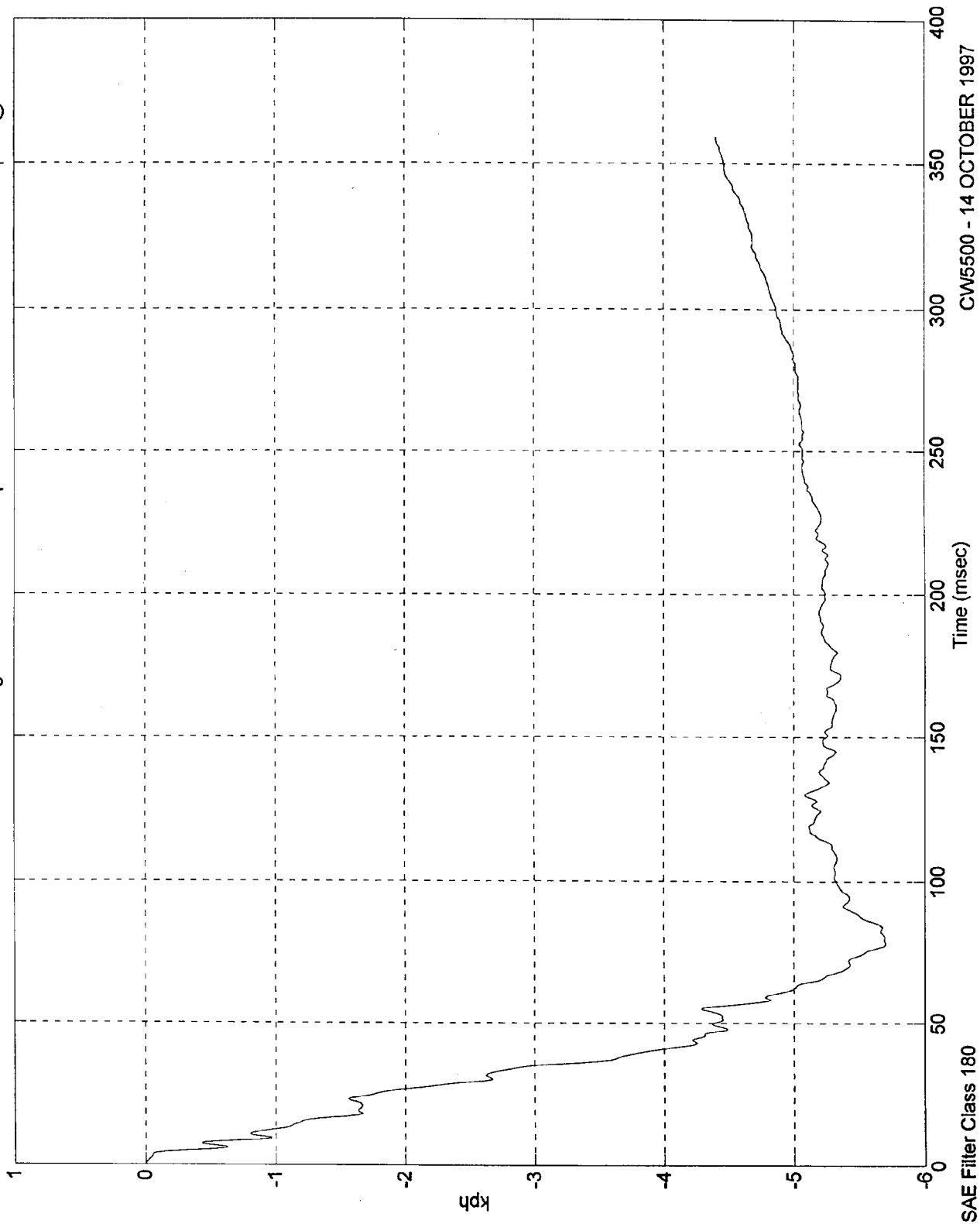
Acc #3 Rear Floorpan X



# NHTSA Side Impact - 1998 Subaru Legacy

Max = .00 kph @ 0.00 msec  
 Min = -5.70 kph @ 78.10 msec

1st Integral Acc #3 Rear Floorpan X

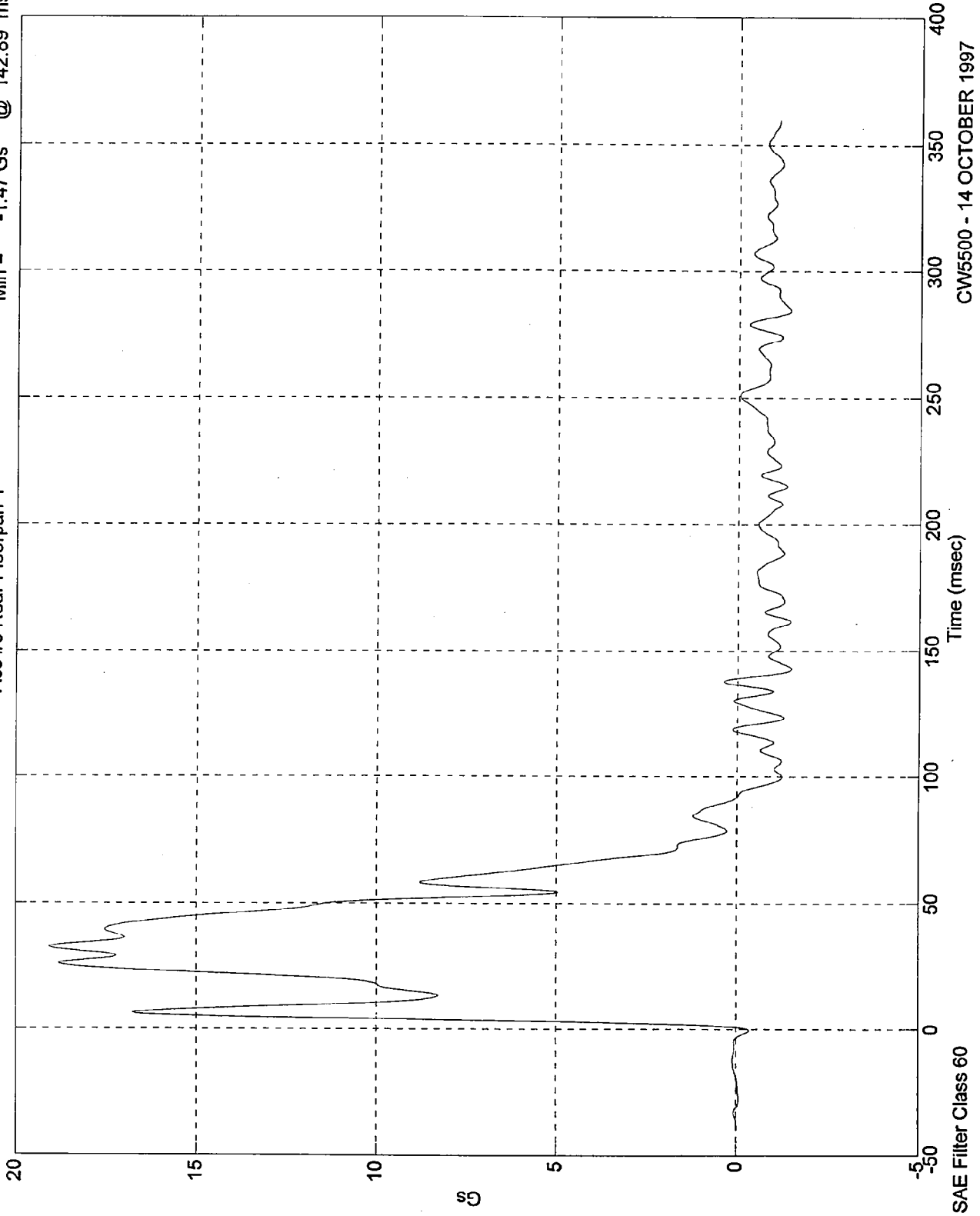


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 19.06 Gs @ 32.50 msec  
Min = -1.47 Gs @ 142.89 msec

Acc #3 Rear Floorpan Y



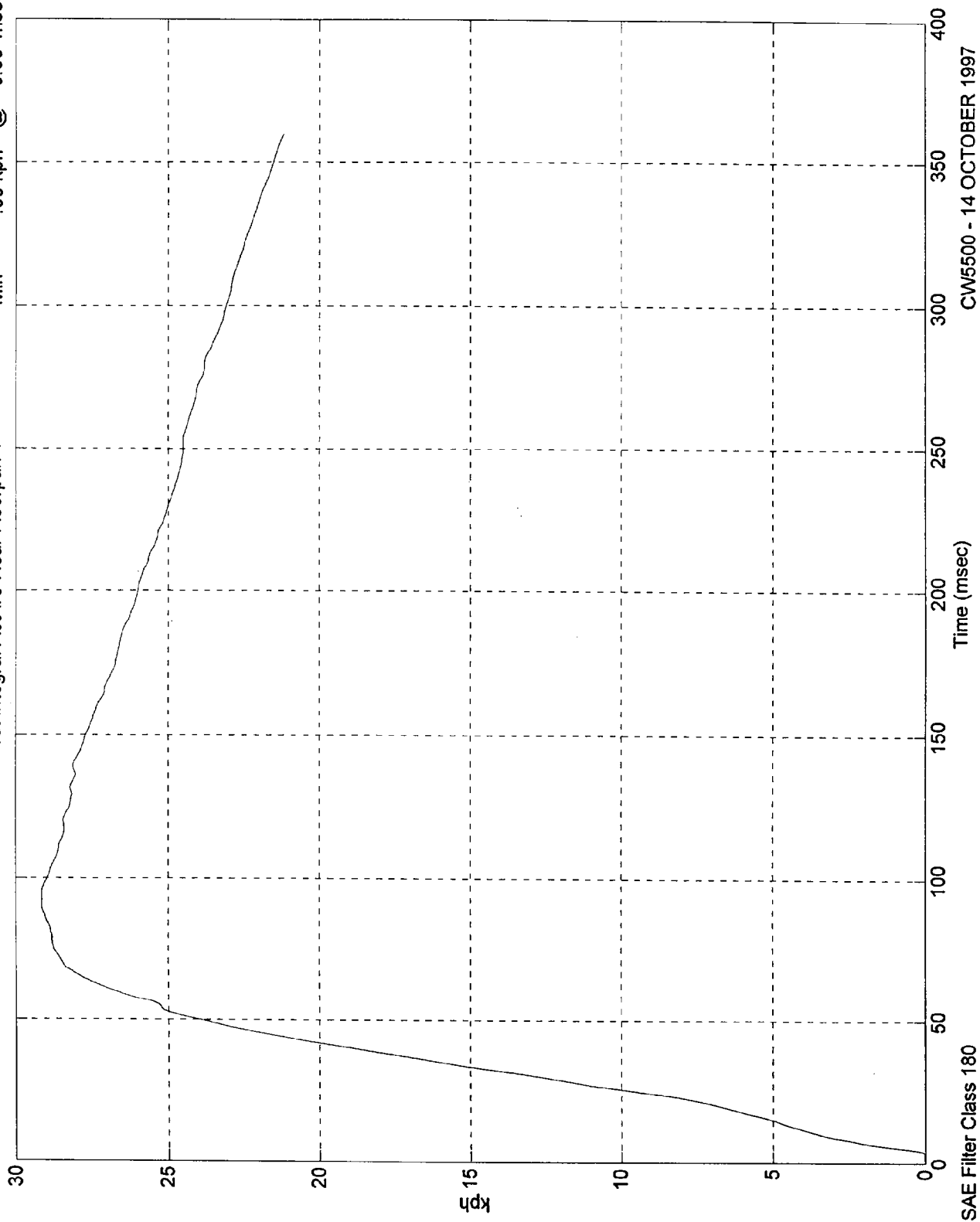
CW5500 - 14 OCTOBER 1997



NHTSA Side Impact - 1998 Subaru Legacy

Max = 29.14 kph @ 90.00 msec  
Min = .00 kph @ 0.00 msec

1st Integral Acc #3 Rear Floorpan Y



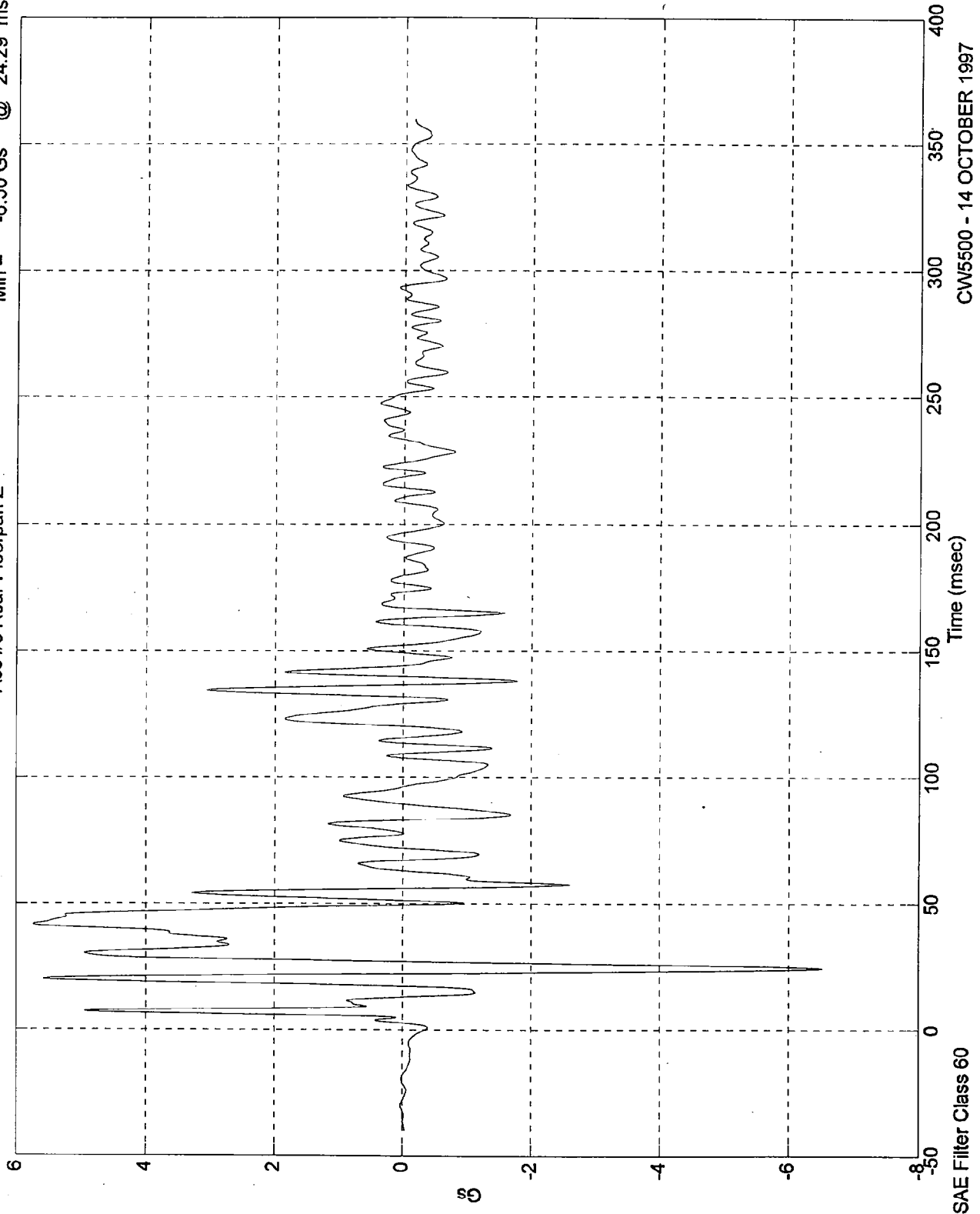
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Subaru Legacy

Max = 5.73 Gs @ 41.40 msec  
Min = -6.50 Gs @ 24.29 msec

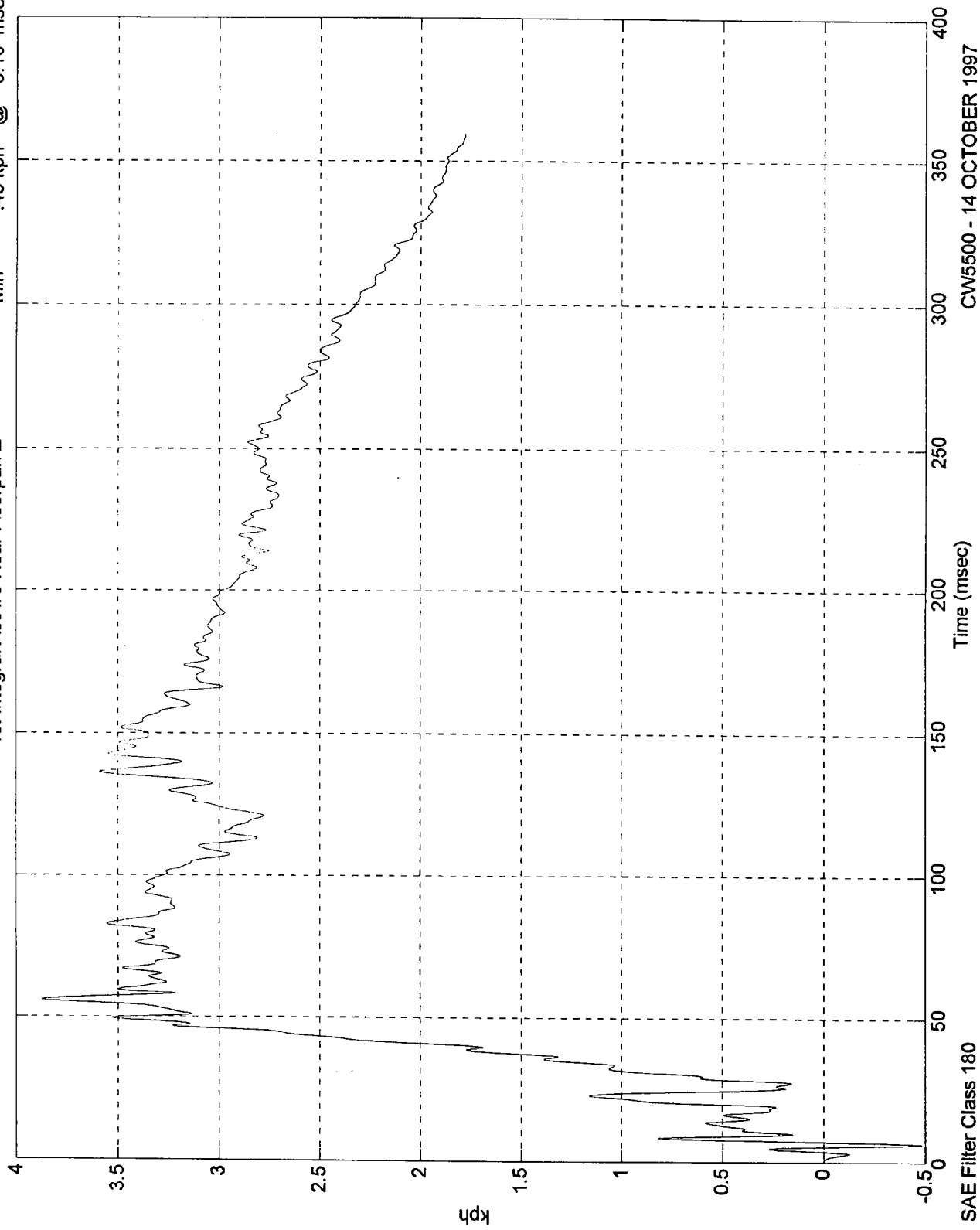
Acc #3 Rear Floorpan Z



# NHTSA Side Impact - 1998 Subaru Legacy

Max = 3.87 kph @ 55.90 msec  
Min = -.48 kph @ 6.10 msec

1st Integral Acc #3 Rear Floorpan Z



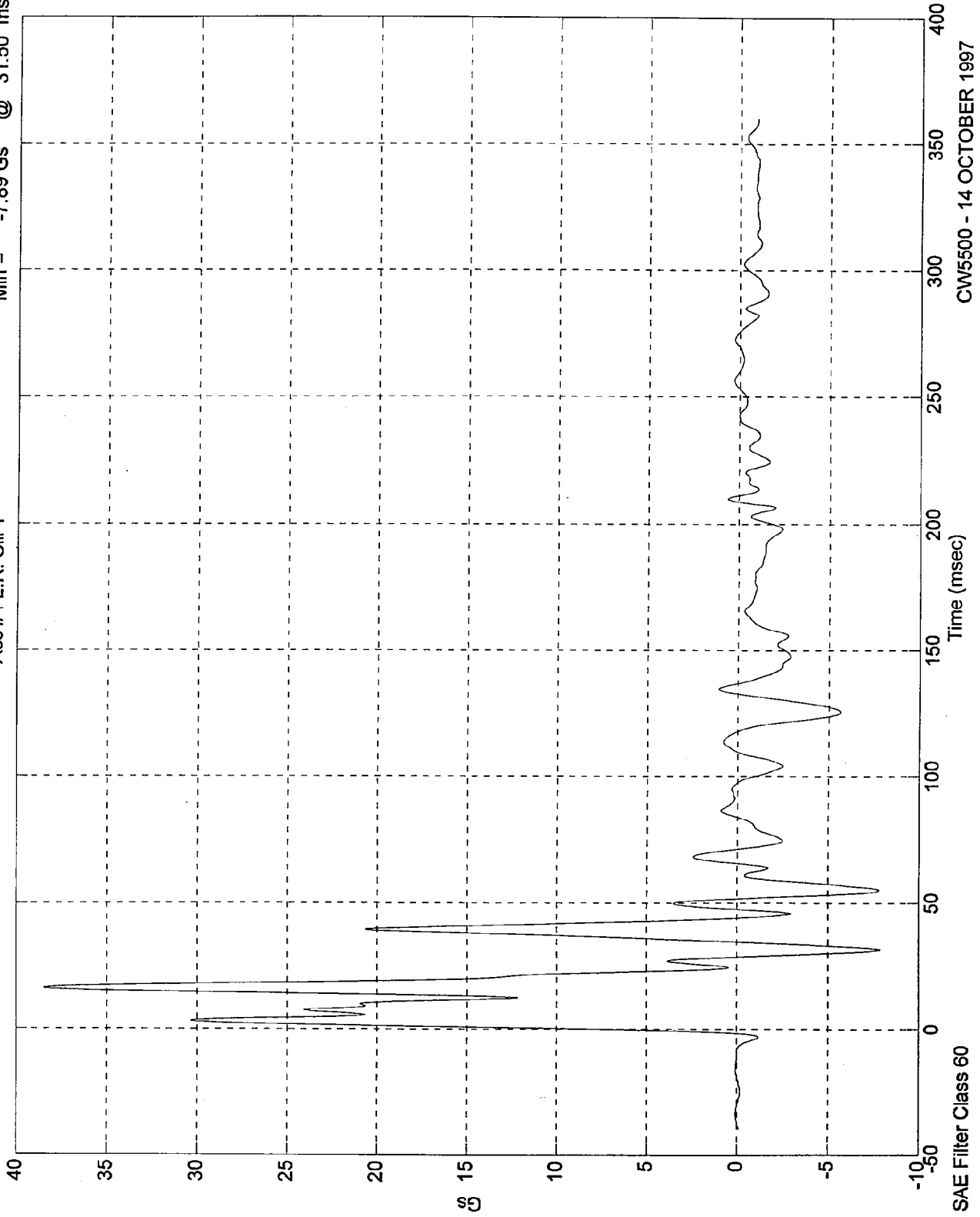
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 38.48 Gs @ 16.30 msec  
 Min = -7.89 Gs @ 31.50 msec

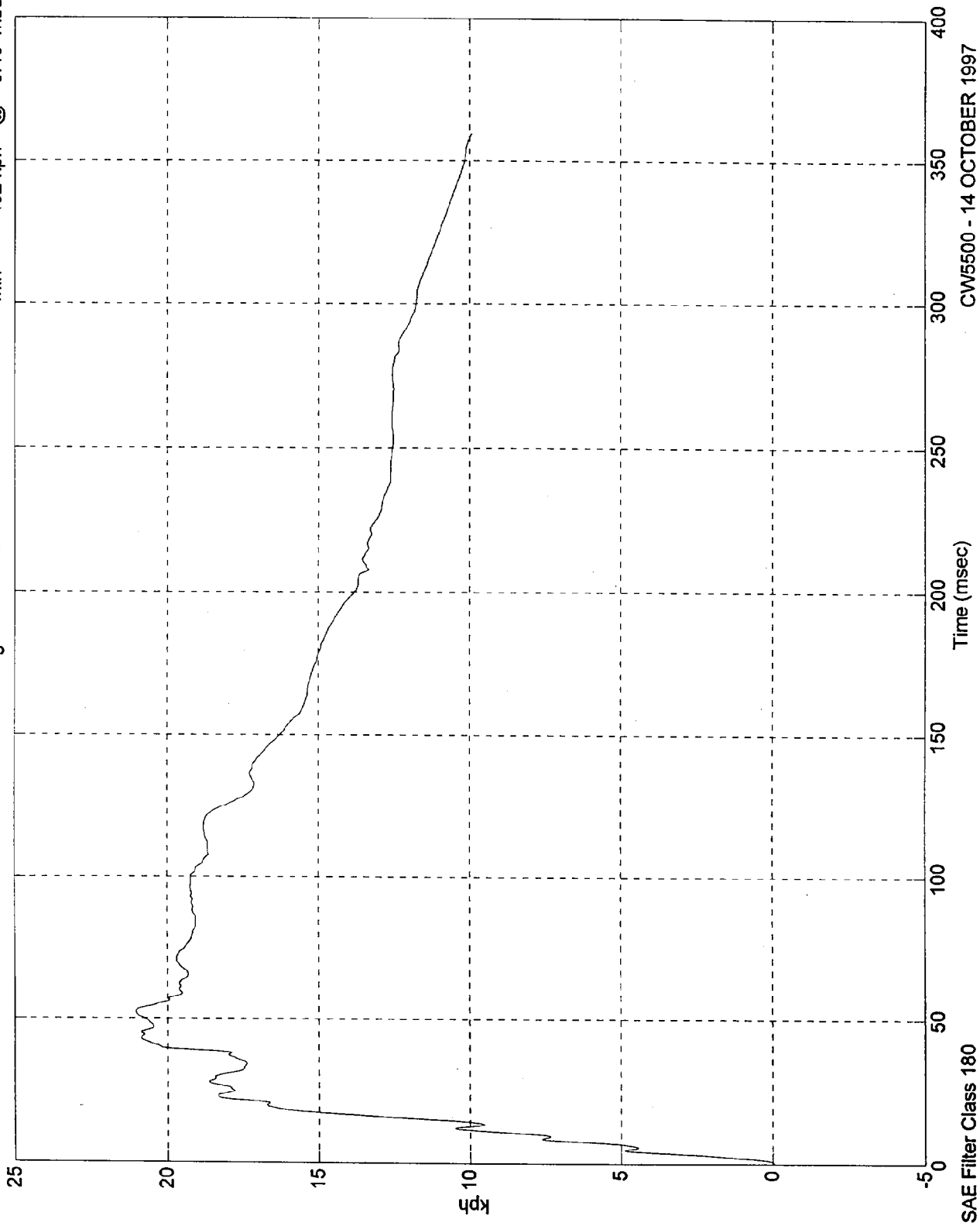
Acc #4 L.R. Sill Y



NHTSA Side Impact - 1998 Subaru Legacy

Max = 21.04 kph @ 52.30 msec  
Min = -02 kph @ 0.40 msec

1st Integral Acc #4 L.R. Sill Y



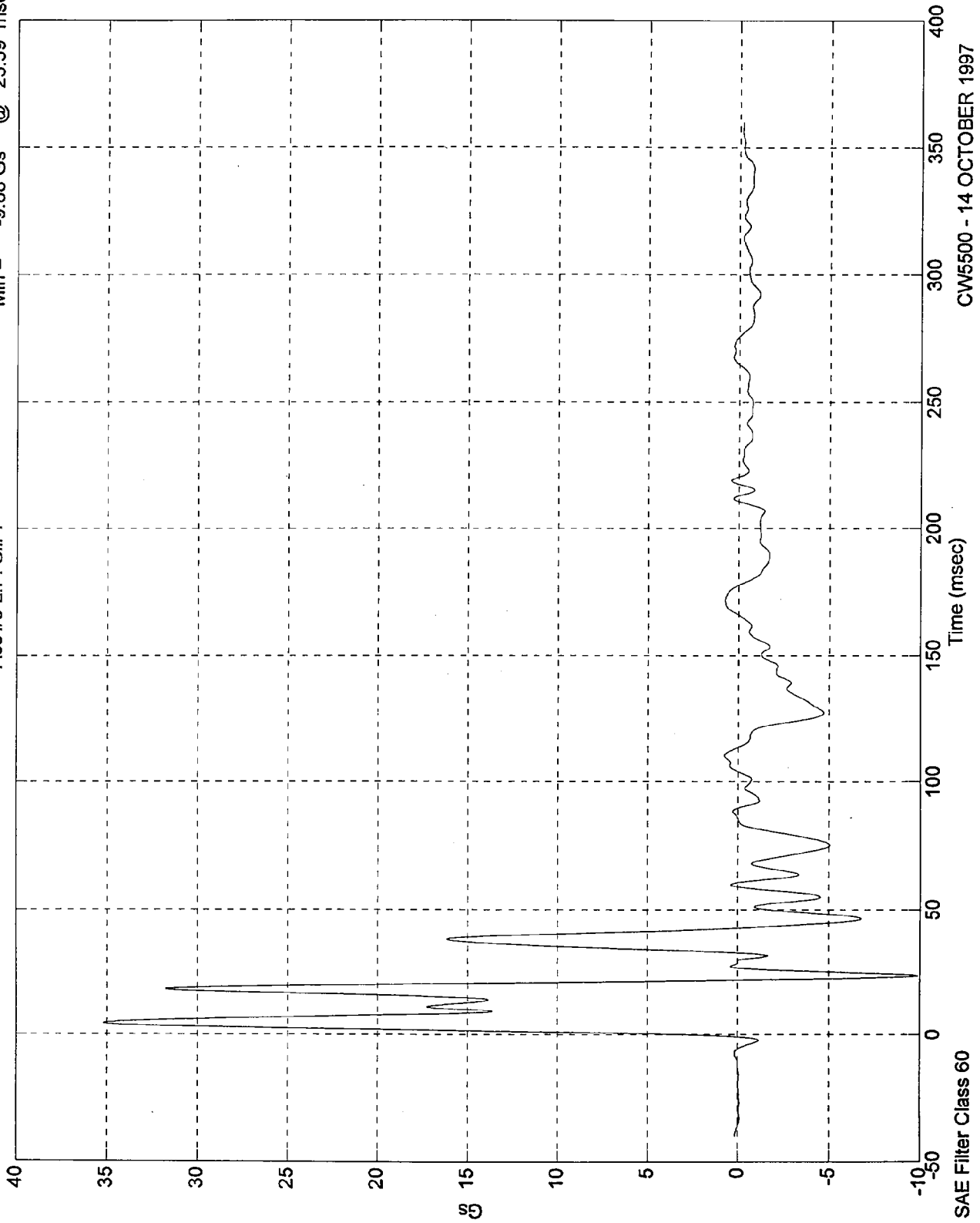
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 35.18 Gs @ 4.40 msec  
 Min = -9.88 Gs @ 23.59 msec

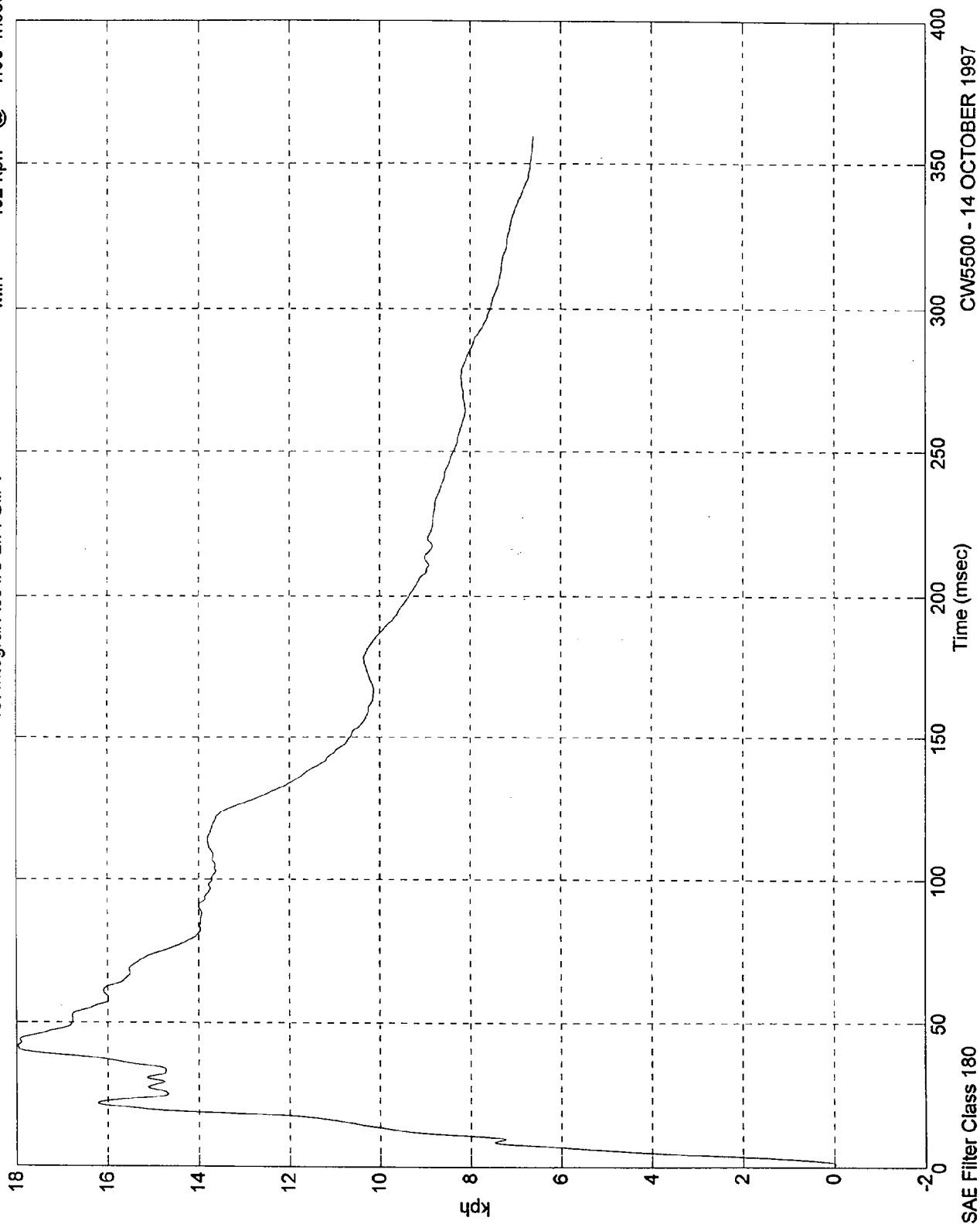
Acc #5 L.F. Sill Y



NHTSA Side Impact - 1998 Subaru Legacy

Max = 17.96 kph @ 41.60 msec  
Min = -0.02 kph @ 1.00 msec

1st Integral Acc #5 L.F. Sill Y



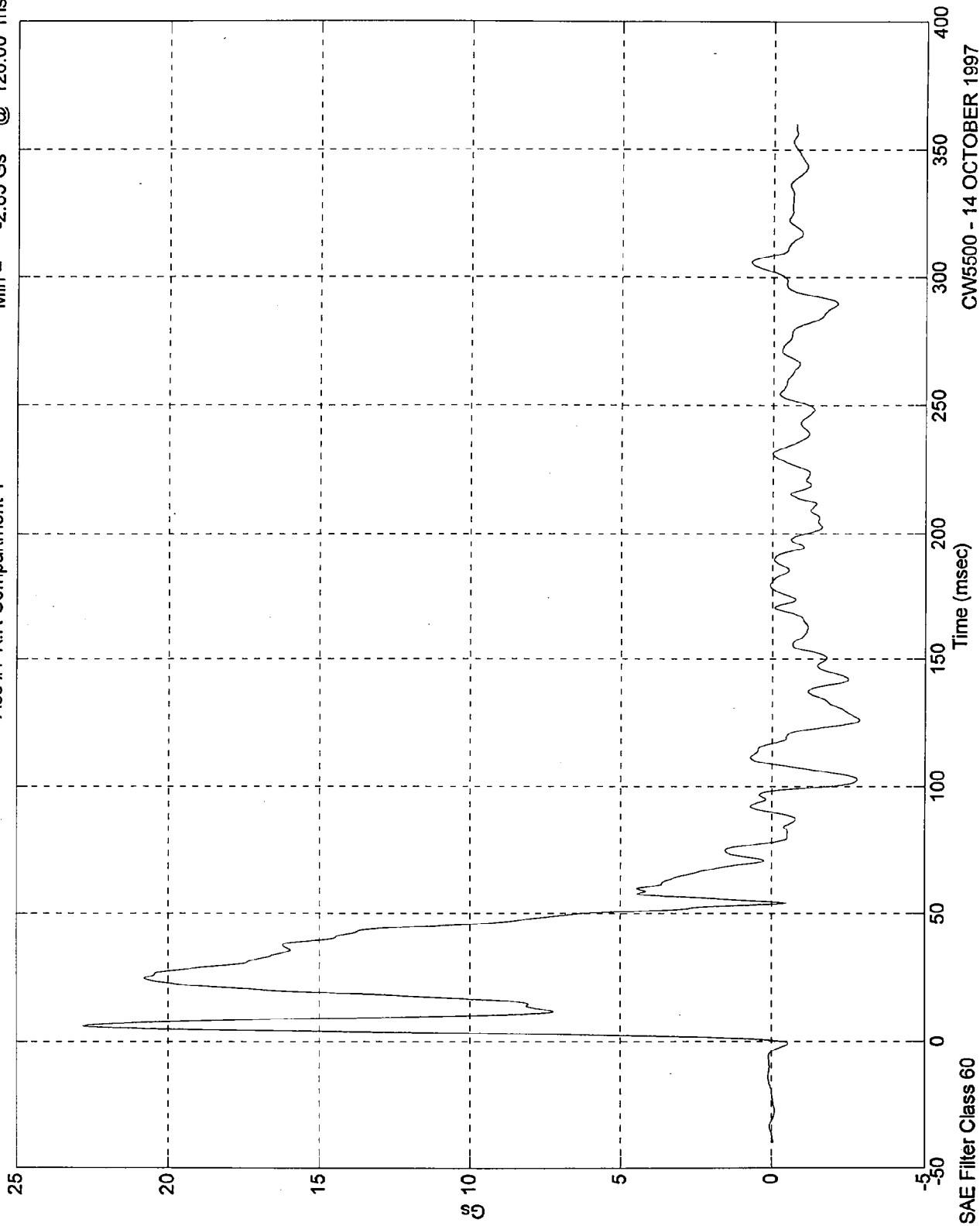
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Subaru Legacy

Acc #7 R.R Compartment Y

Max = 22.80 Gs @ 5.89 msec  
Min = -2.85 Gs @ 126.00 msec



CW5500 - 14 OCTOBER 1997

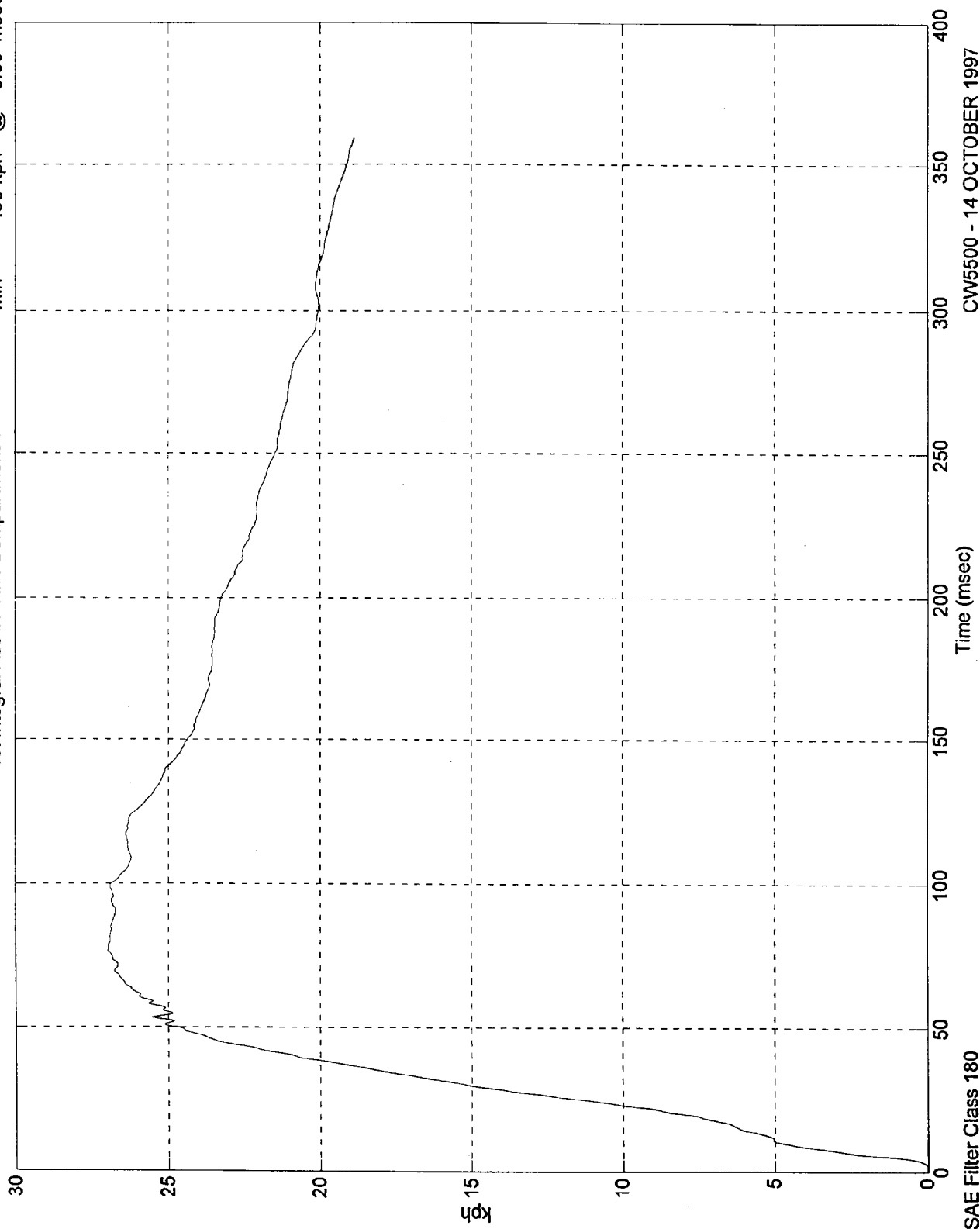
SAE Filter Class 60



# NHTSA Side Impact - 1998 Subaru Legacy

1st Integral Acc #7 R.R. Compartment Y

Max = 26.99 kph @ 76.40 msec  
Min = .00 kph @ 0.00 msec



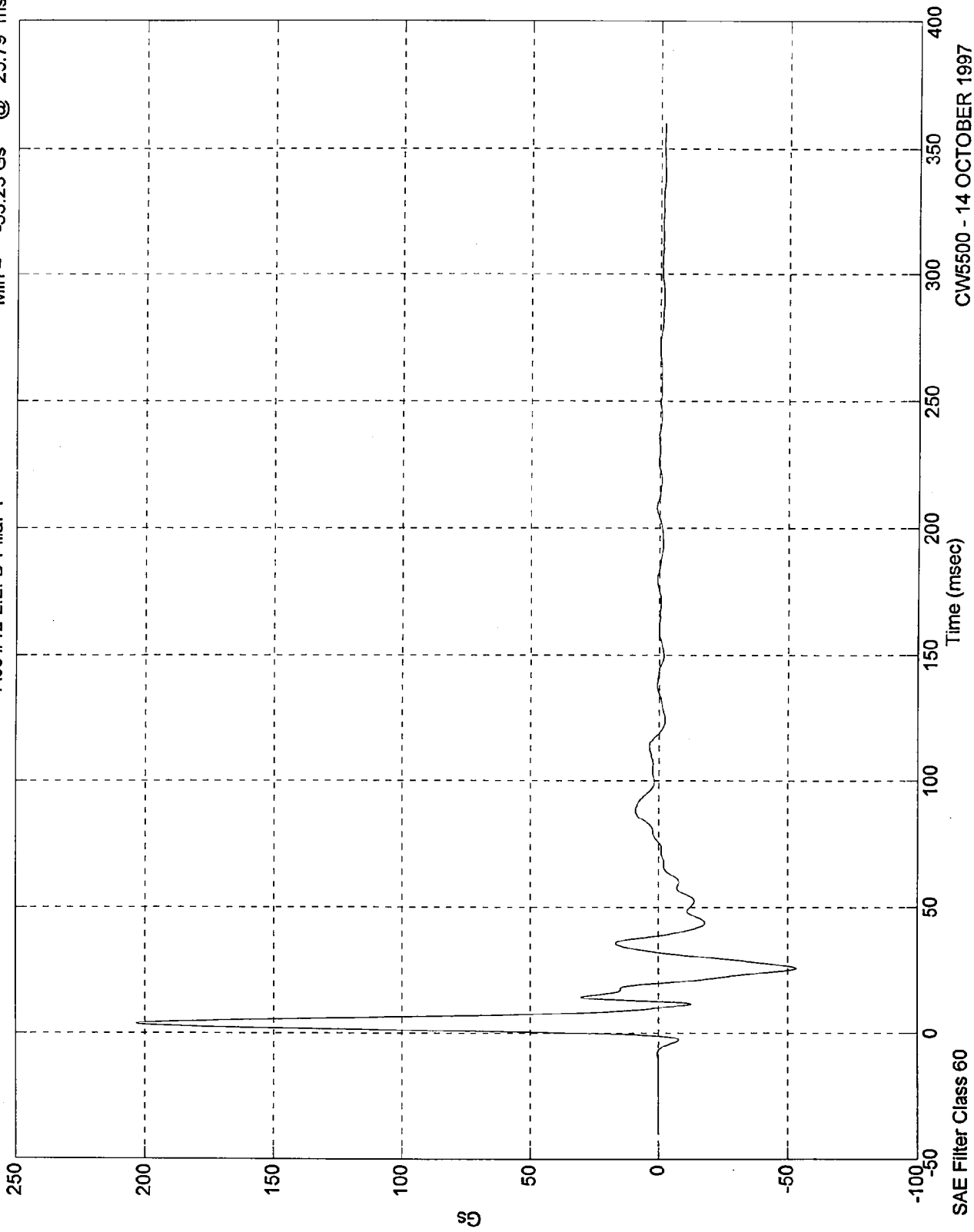
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Subaru Legacy

Max = 203.31 Gs @ 3.69 msec  
Min = -53.23 Gs @ 25.79 msec

Acc #12 L.L. B-Pillar Y



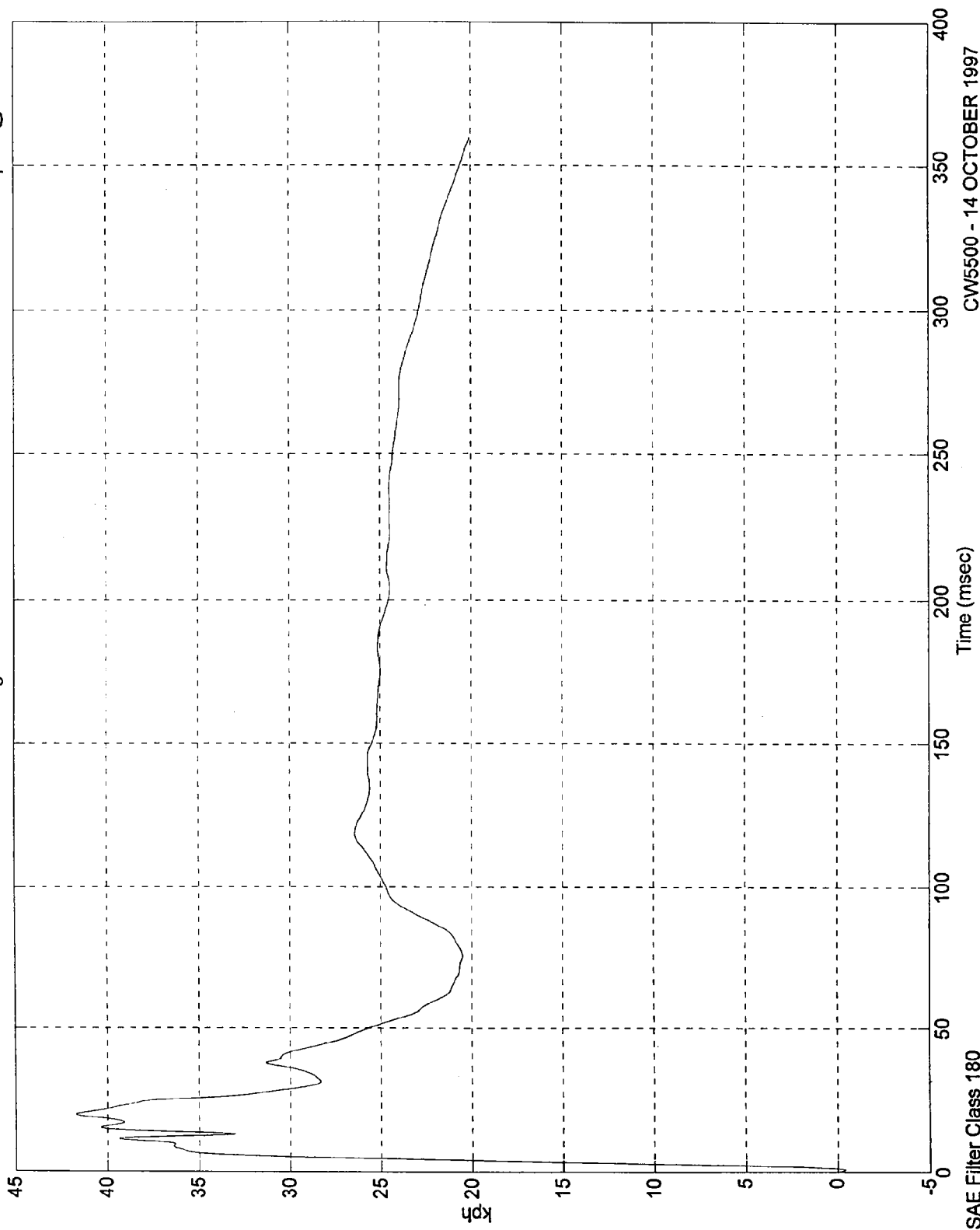
CW5500 - 14 OCTOBER 1997

SAE Filter Class 60

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 41.69 kph @ 19.70 msec  
Min = -41 kph @ 0.70 msec

1st Integral Acc #12 L.L. B-Pillar Y



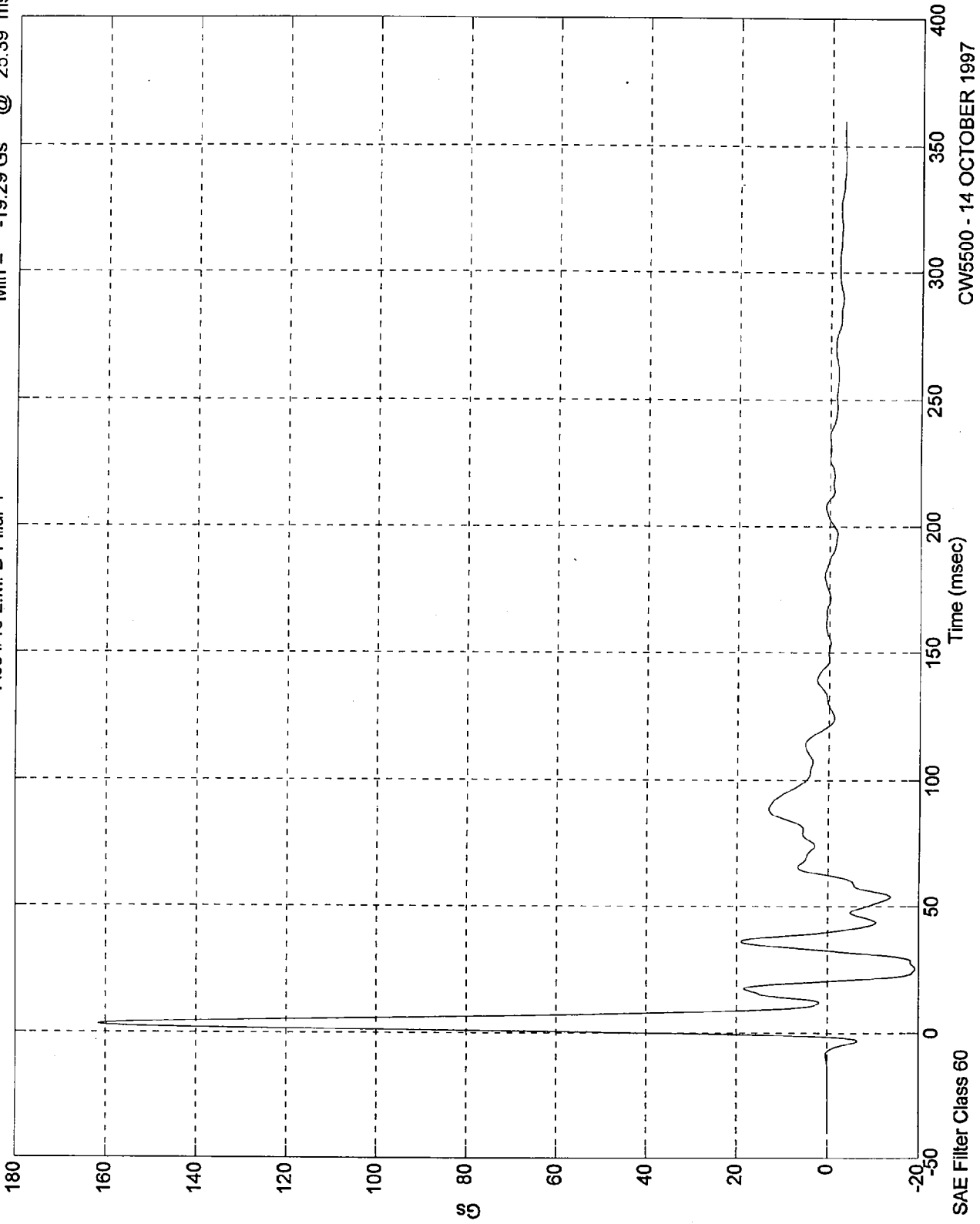
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 161.67 Gs @ 3.19 msec  
Min = -19.29 Gs @ 25.39 msec

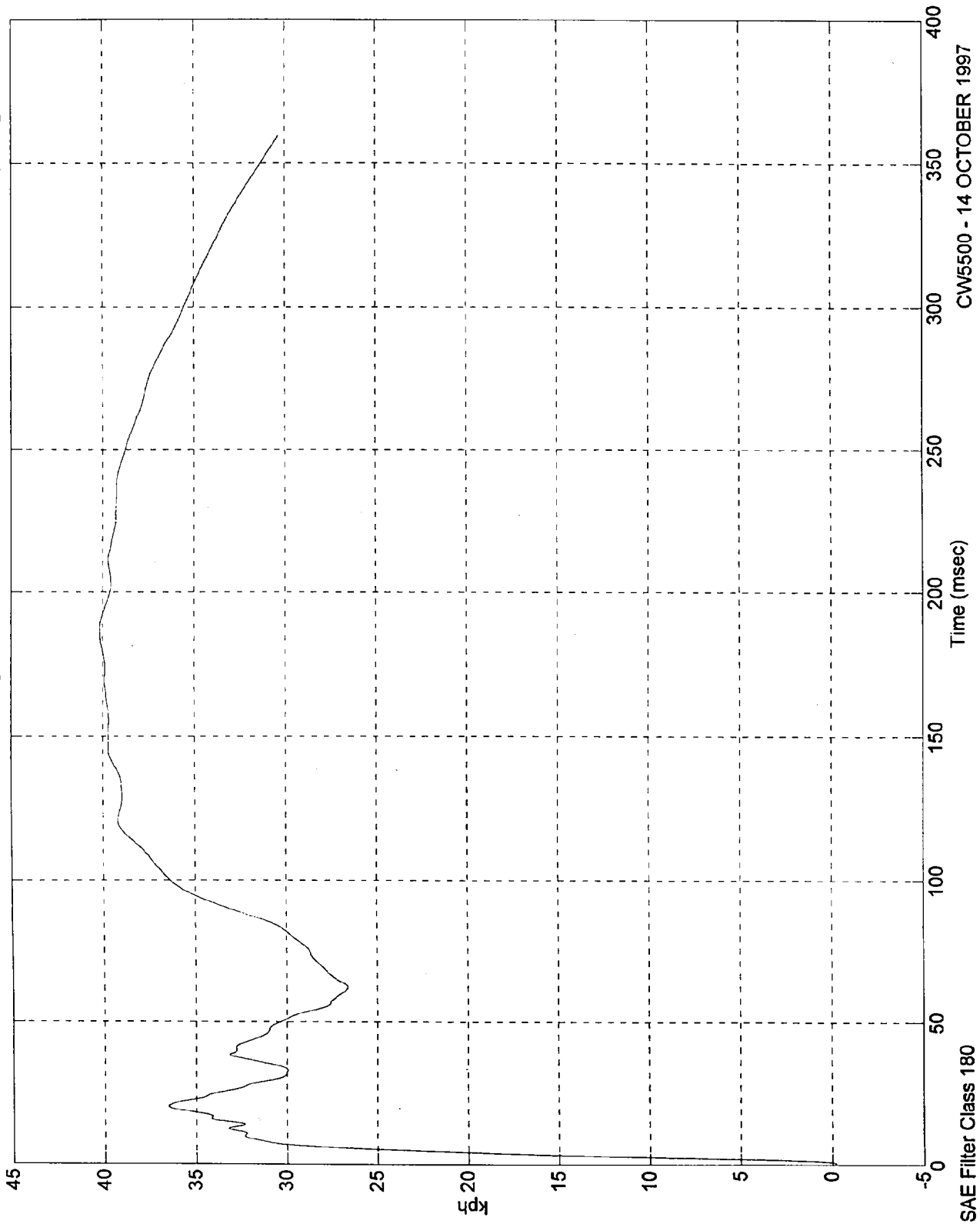
Acc #13 L.M. B-Pillar Y



NHTSA Side Impact - 1998 Subaru Legacy

Max = 40.14 kph @ 187.60 msec  
Min = -22 kph @ 0.50 msec

1st Integral Acc #13 L.M. B-Pillar Y



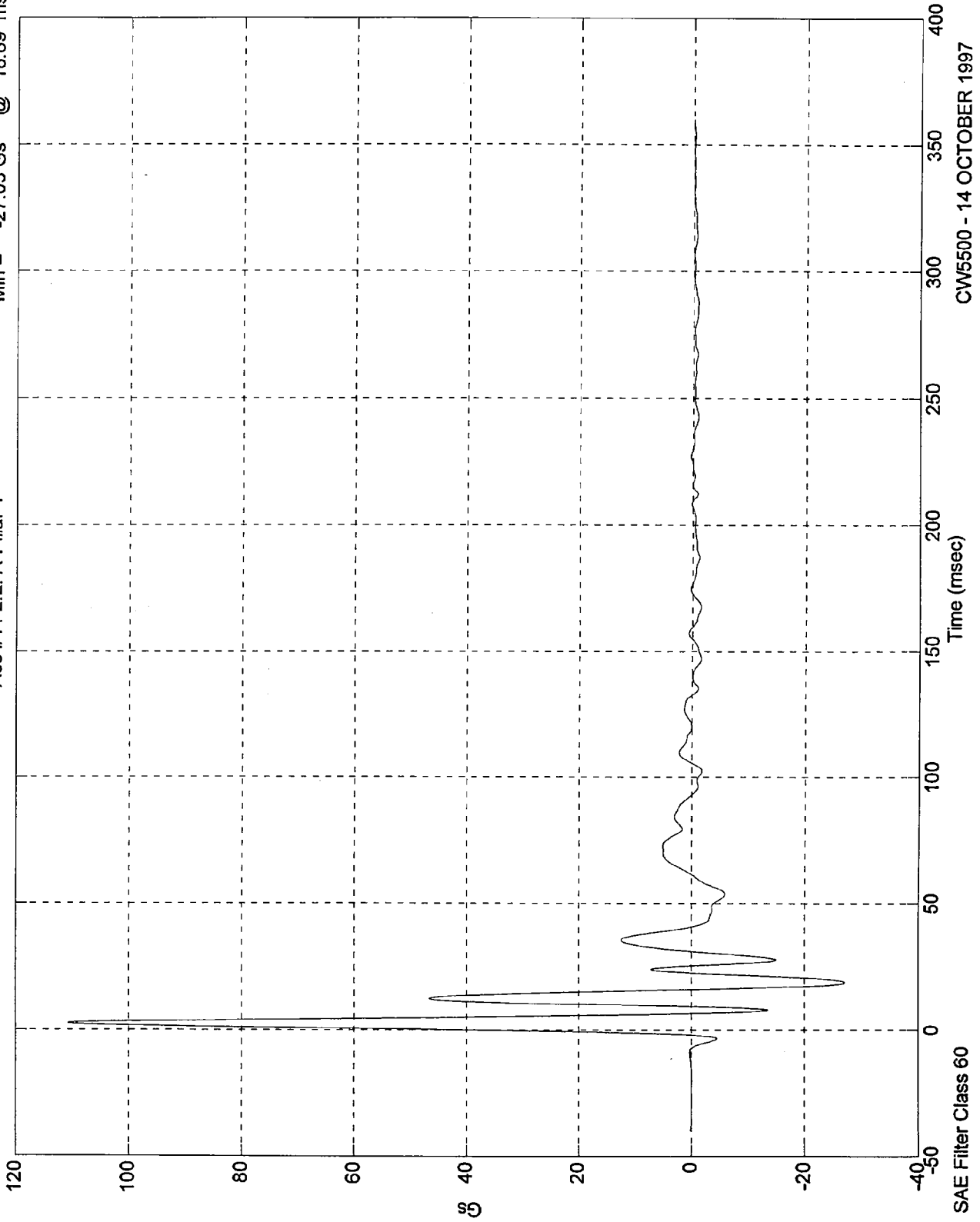
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Subaru Legacy

Max = 110.70 Gs @ 2.49 msec  
Min = -27.03 Gs @ 18.89 msec

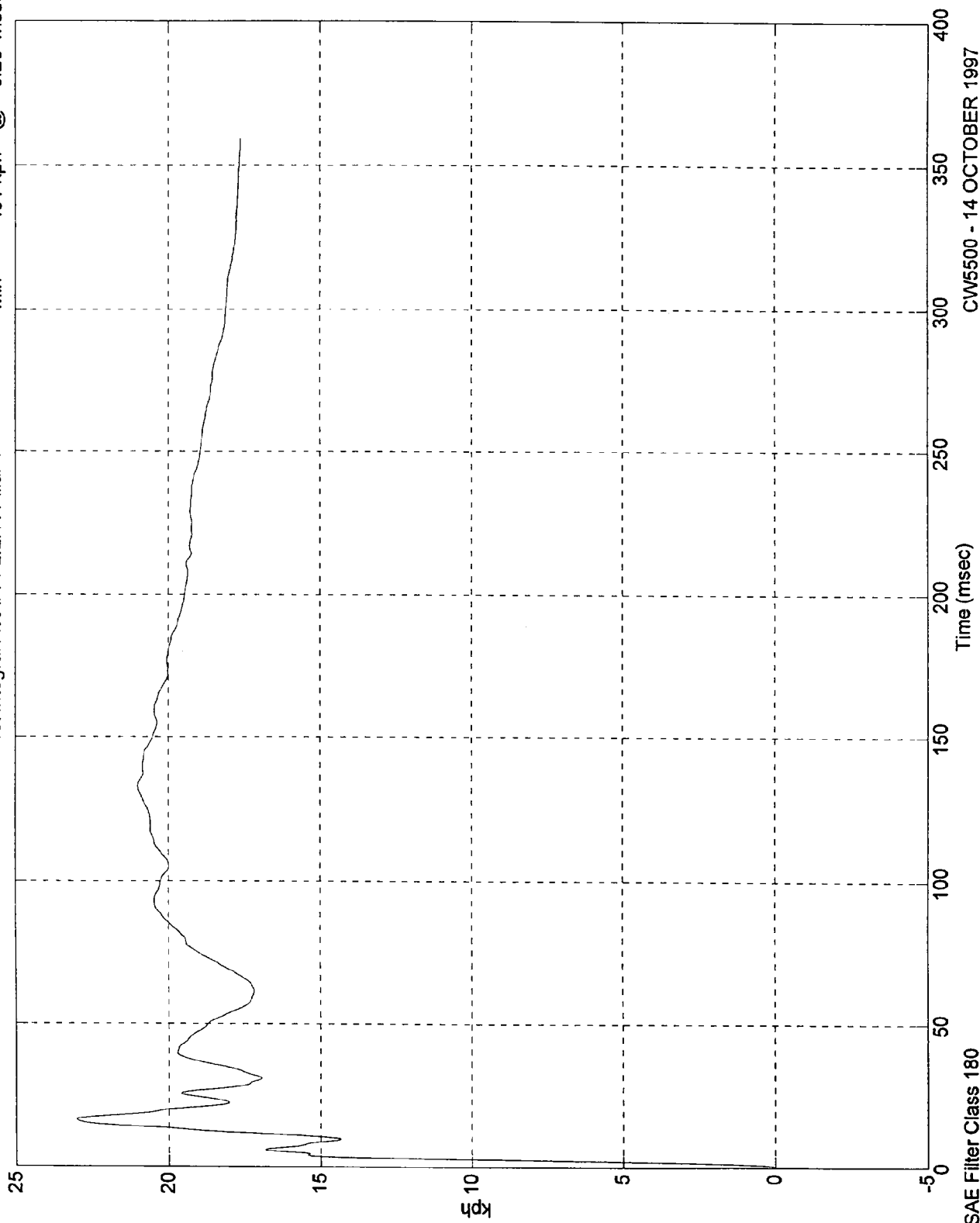
Acc #14 L.L. A-Pillar Y



# NHTSA Side Impact - 1998 Subaru Legacy

Max = 23.00 kph @ 16.20 msec  
 Min = -0.01 kph @ 0.20 msec

1st Integral Acc #14 L.L. A-Pillar Y



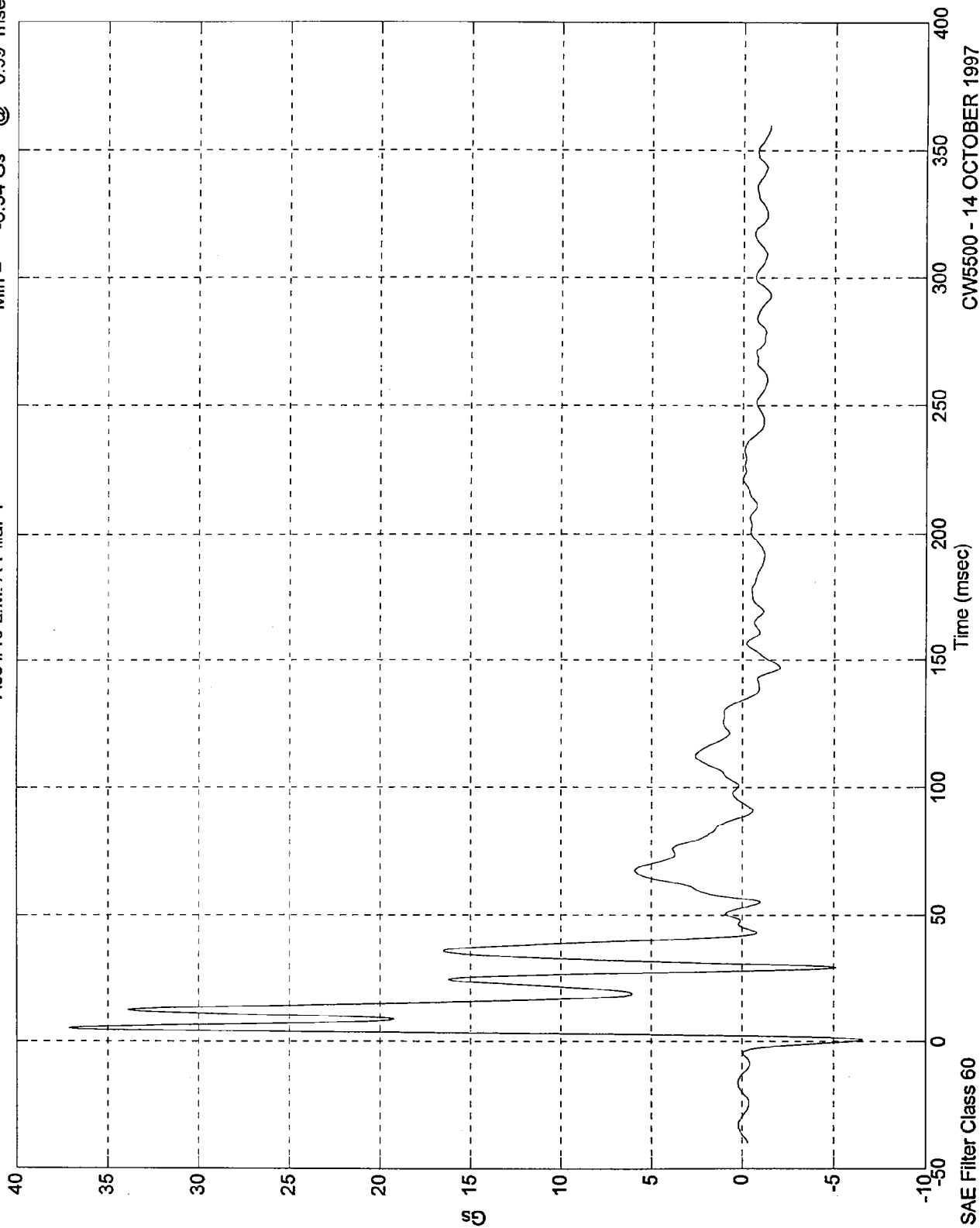
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Subaru Legacy

Max = 37.10 Gs @ 5.09 msec  
Min = -6.54 Gs @ 0.59 msec

Acc #15 L.M. A-Pillar Y



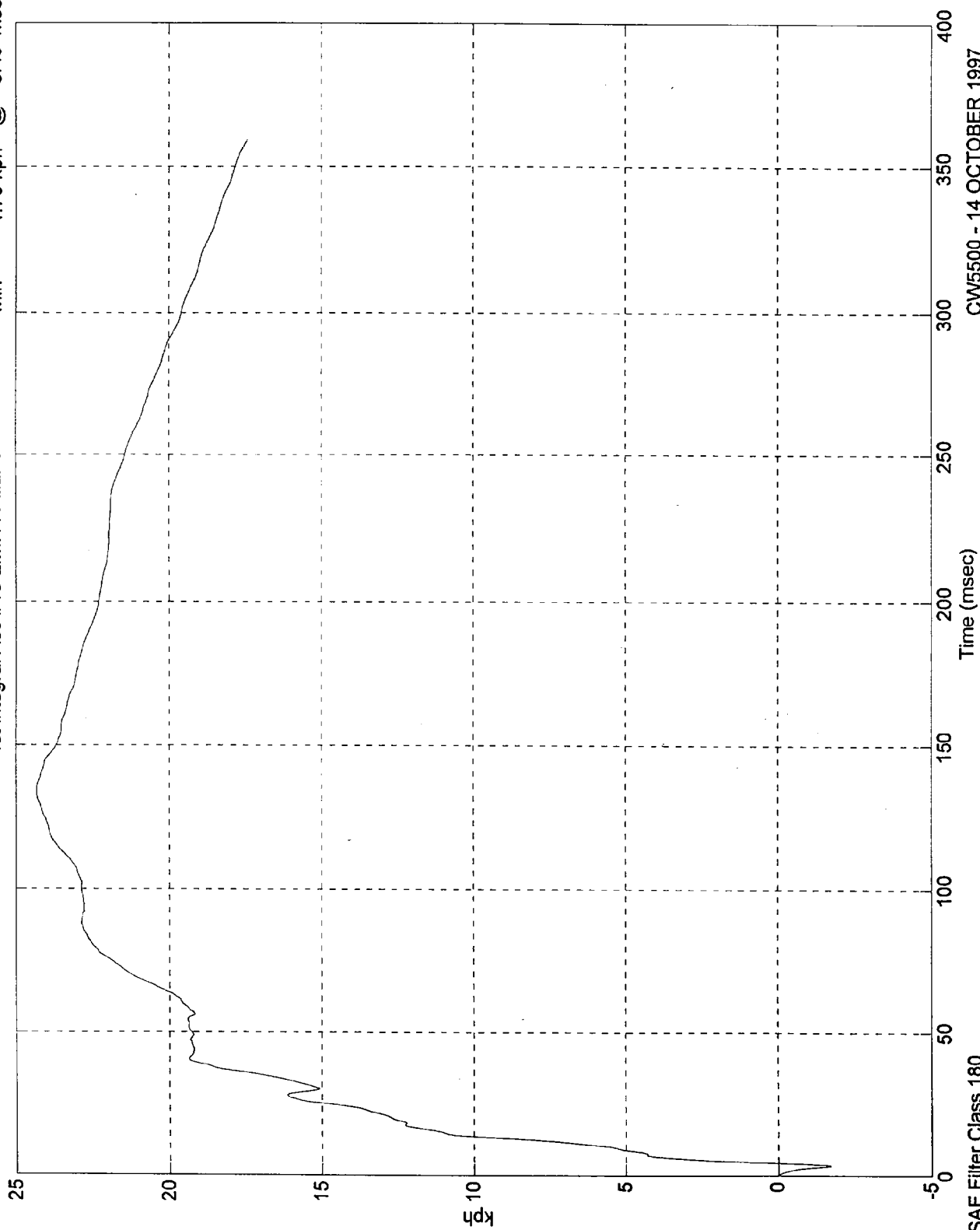
CW5500 - 14 OCTOBER 1997



NHTSA Side Impact - 1998 Subaru Legacy

Max = 24.32 kph @ 134.20 msec  
Min = -1.70 kph @ 3.40 msec

1st Integral Acc #15 L.M. A-Pillar Y



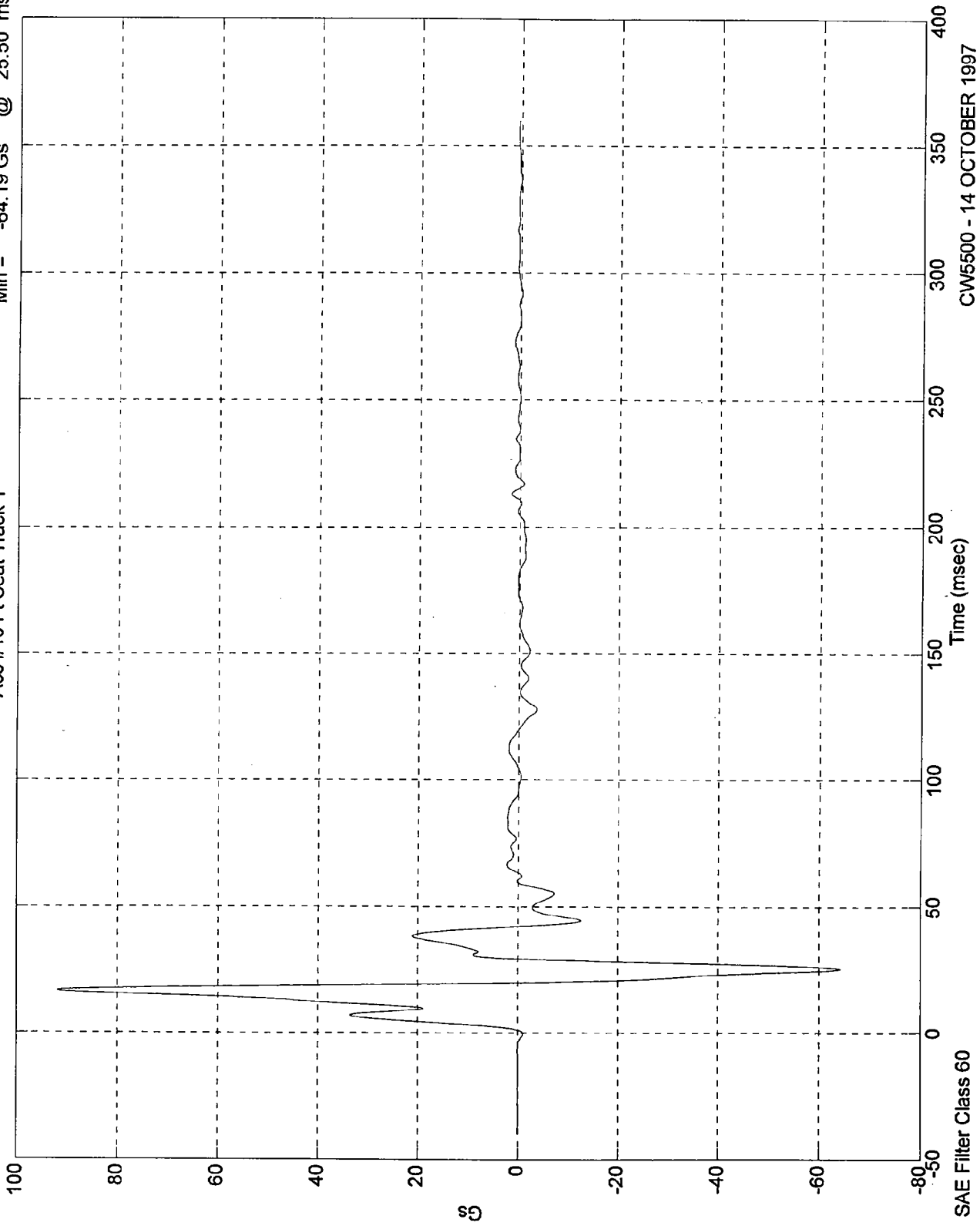
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Subaru Legacy

Max = 91.87 Gs @ 16.79 msec  
Min = -64.19 Gs @ 25.50 msec

Acc #16 Ft Seat Track Y

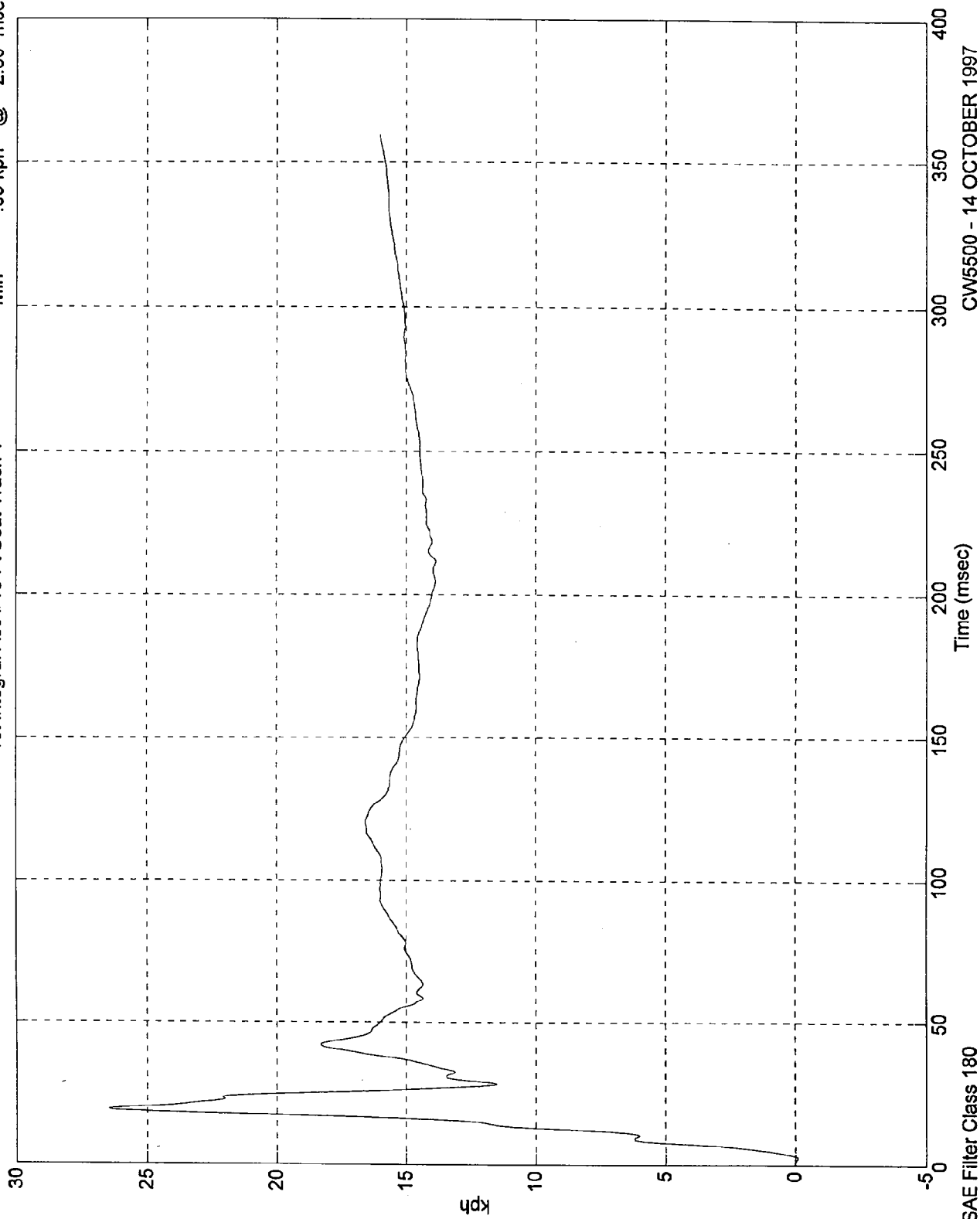


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 26.47 kph @ 19.10 msec  
Min = -0.09 kph @ 2.60 msec

1st Integral Acc #16 Ft Seat Track Y



SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

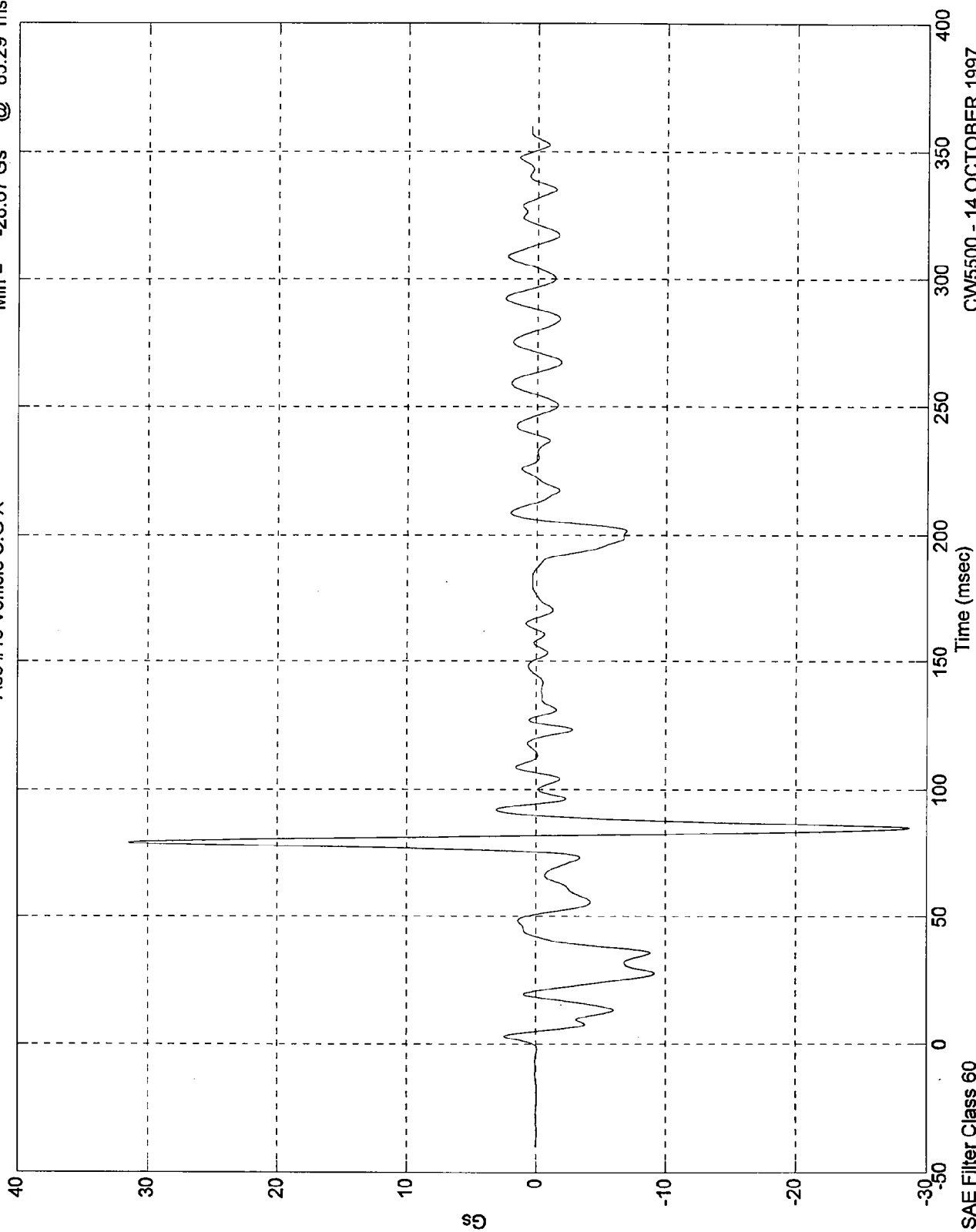
REAR SEAT TRACK ACCELEROMETER #17 WAS NOT INSTALLED  
(no accessible mounting location)

REAR SEAT TRACK ACCELEROMETER #17 WAS NOT INSTALLED  
(no accessible mounting location)

NHTSA Side Impact - 1998 Subaru Legacy

Max = 31.47 Gs @ 79.50 msec  
Min = -28.67 Gs @ 85.29 msec

Acc #18 Vehicle C.G X

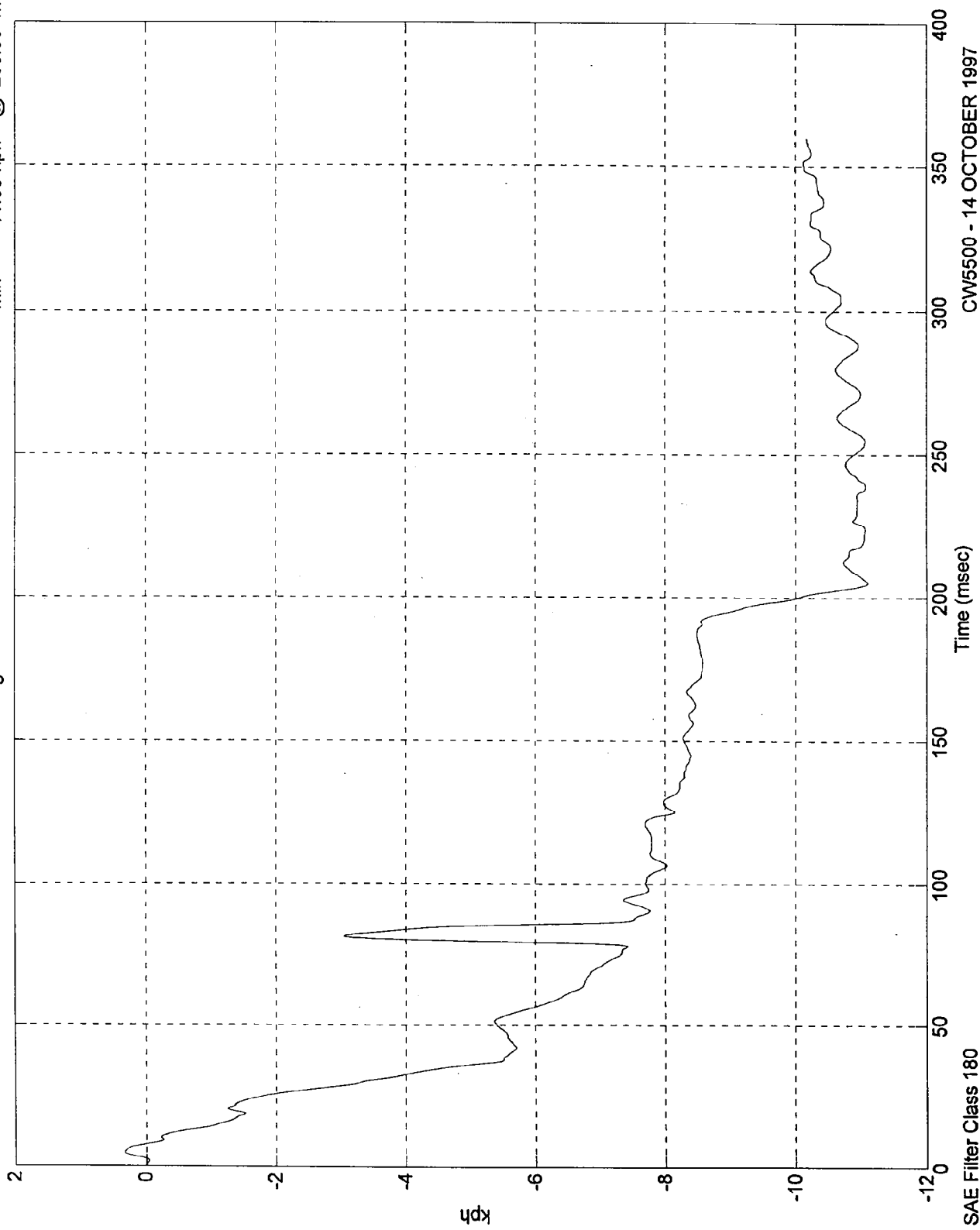


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

1st Integral Acc #18 Vehicle C.G X

Max = .33 kph @ 4.70 msec  
Min = -11.09 kph @ 205.09 msec



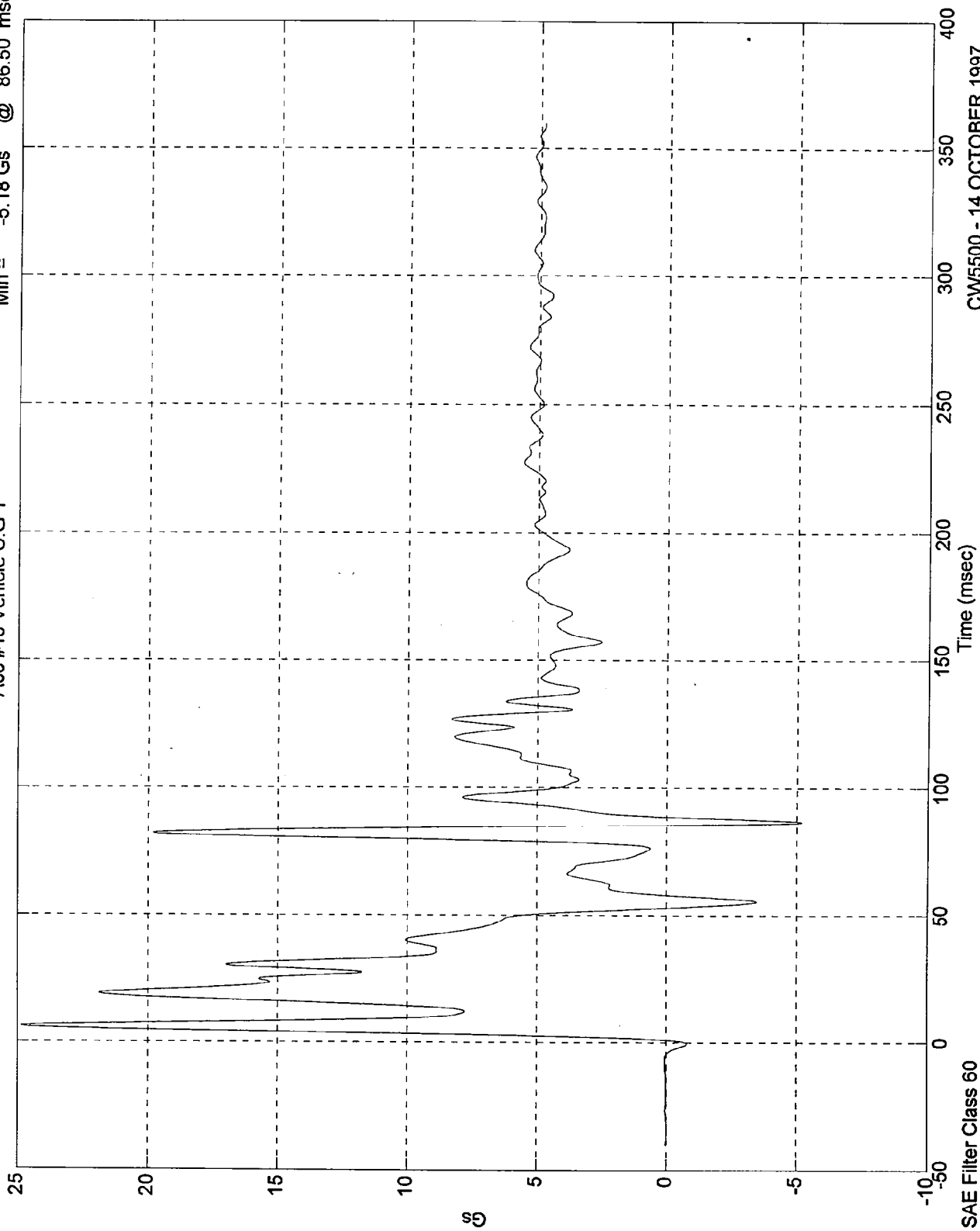
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Subaru Legacy

Max = 24.84 Gs @ 5.99 msec  
Min = -5.18 Gs @ 86.50 msec

Acc #18 Vehicle C.G. Y



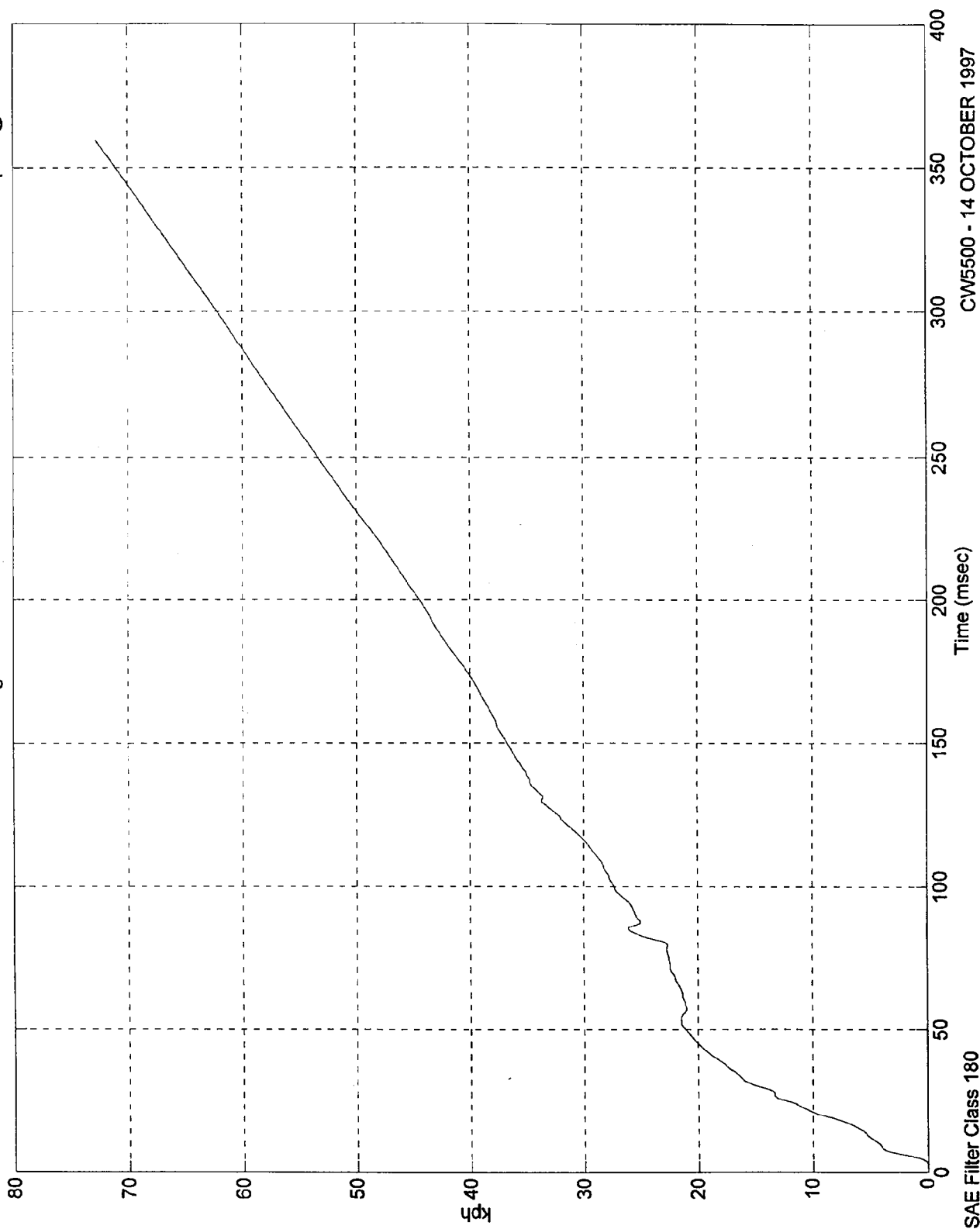
CW5500 - 14 OCTOBER 1997



# NHTSA Side Impact - 1998 Subaru Legacy

Max = 72.74 kph @ 359.89 msec  
 Min = .00 kph @ 0.00 msec

1st Integral Acc #18 Vehicle C.G. Y



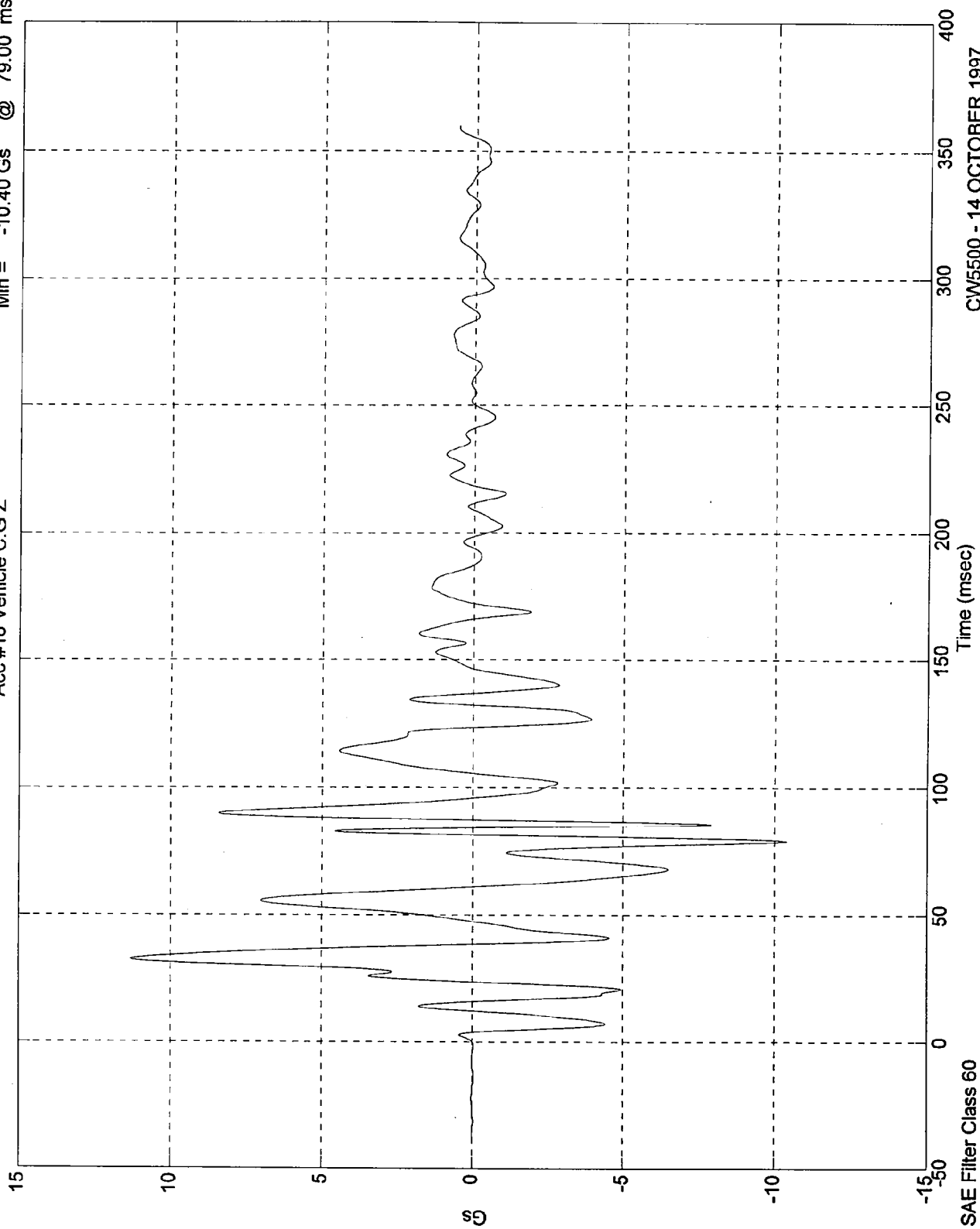
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 11.31 Gs @ 32.29 msec  
Min = -10.40 Gs @ 79.00 msec

Acc #18 Vehicle C.G.Z

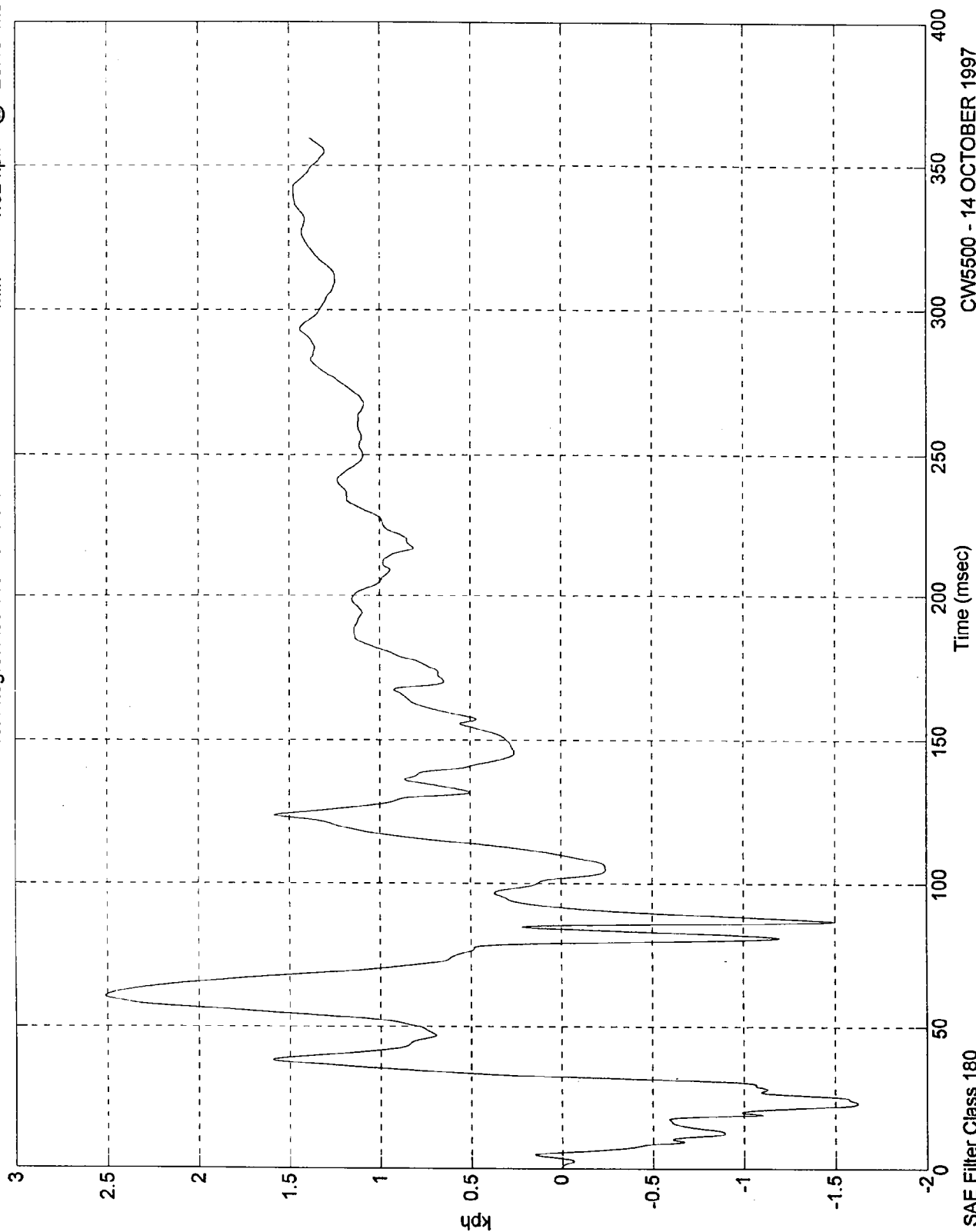


CW5500 - 14 OCTOBER 1997

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 2.51 kph @ 60.80 msec  
 Min = -1.62 kph @ 23.10 msec

1st Integral Acc #18 Vehicle C.G.Z



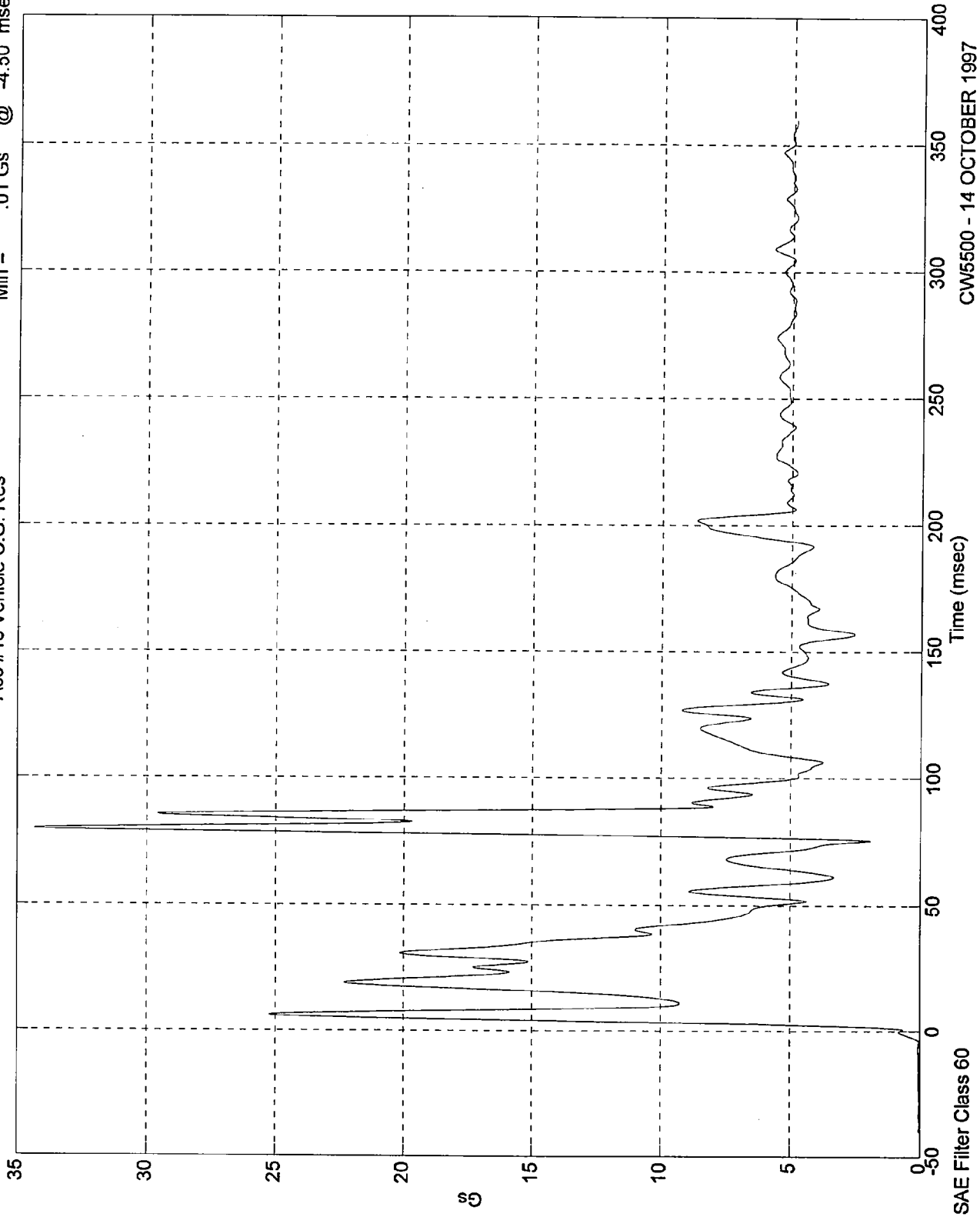
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 34.32 Gs @ 79.50 msec  
Min = .01 Gs @ -4.50 msec

Acc #18 Vehicle C.G. Res



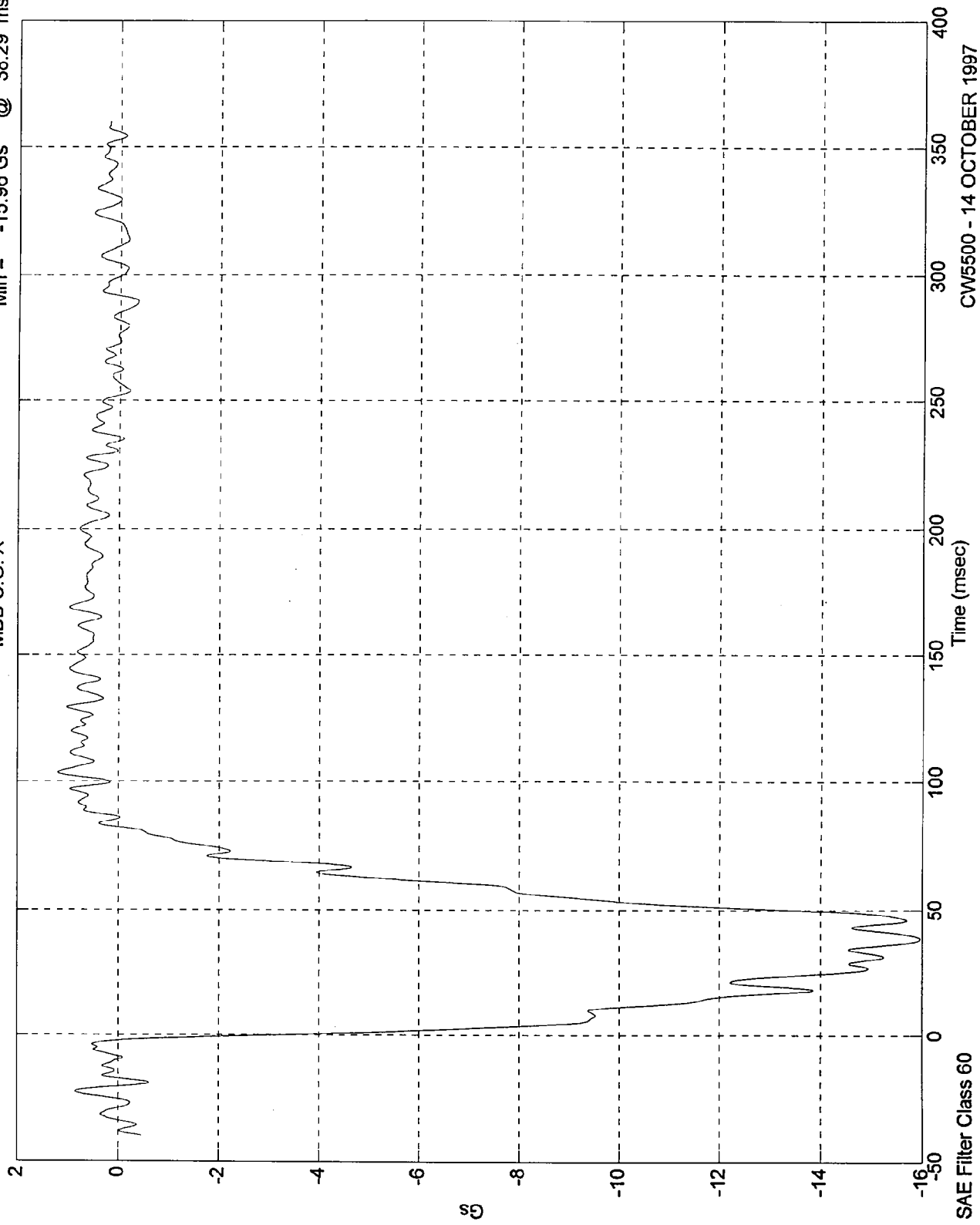
CW5500 - 14 OCTOBER 1997

**MDB INSTRUMENTATION PLOTS**  
**ACCELERATION DATA - FILTER CLASS 60**  
**INTEGRATION DATA - FILTER CLASS 180**

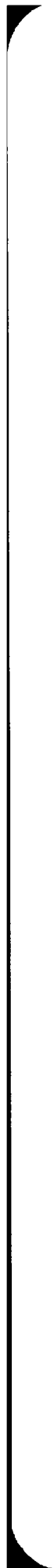
NHTSA Side Impact - 1998 Subaru Legacy

Max = 1.19 Gs @ 103.40 msec  
Min = -15.96 Gs @ 38.29 msec

MDB C.G. X



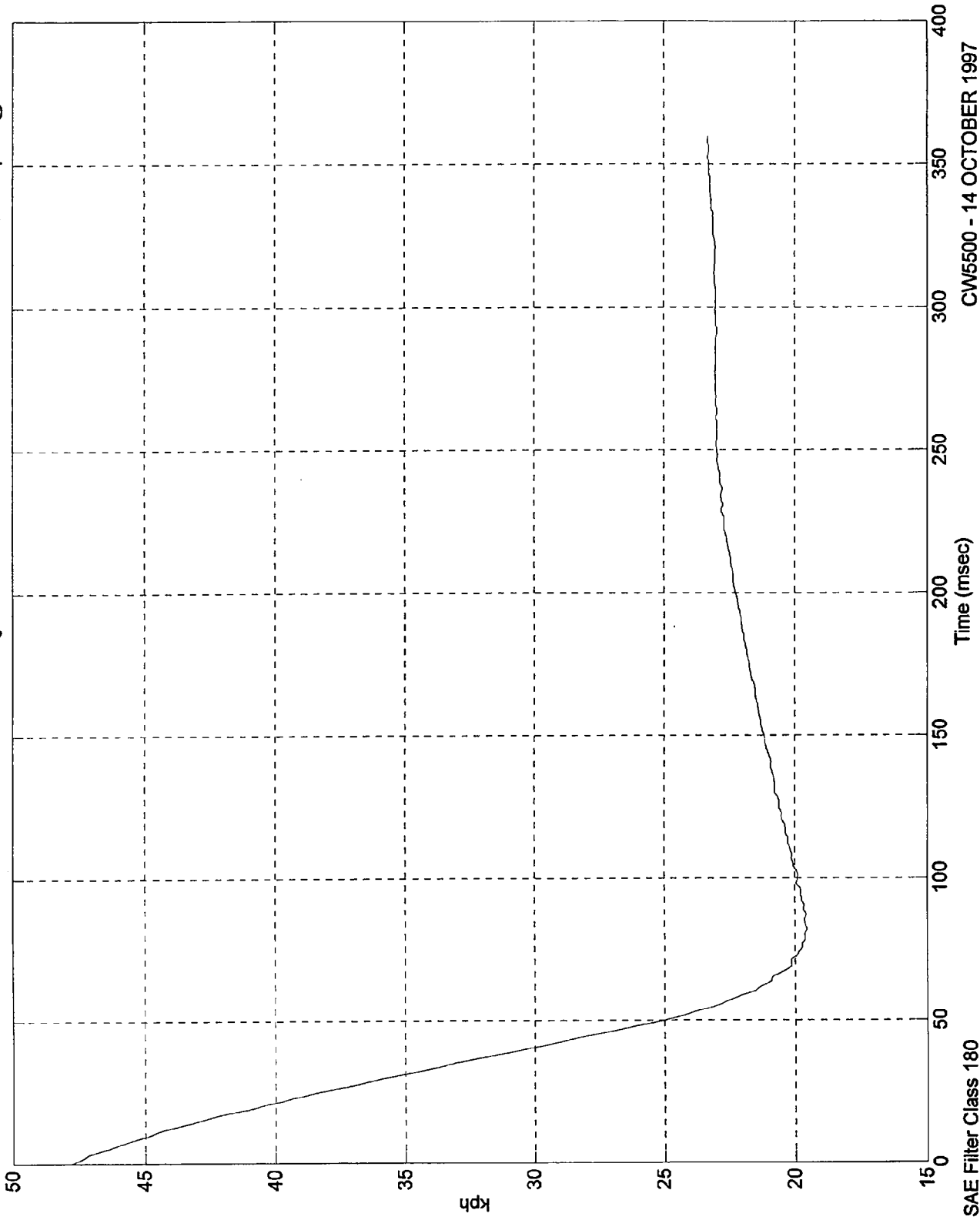
CW5500 - 14 OCTOBER 1997



NHTSA Side Impact - 1998 Subaru Legacy

Max = 47.74 kph @ 0.00 msec  
Min = 19.54 kph @ 81.90 msec

1st Integral MDB C.G. X



CW5500 - 14 OCTOBER 1997

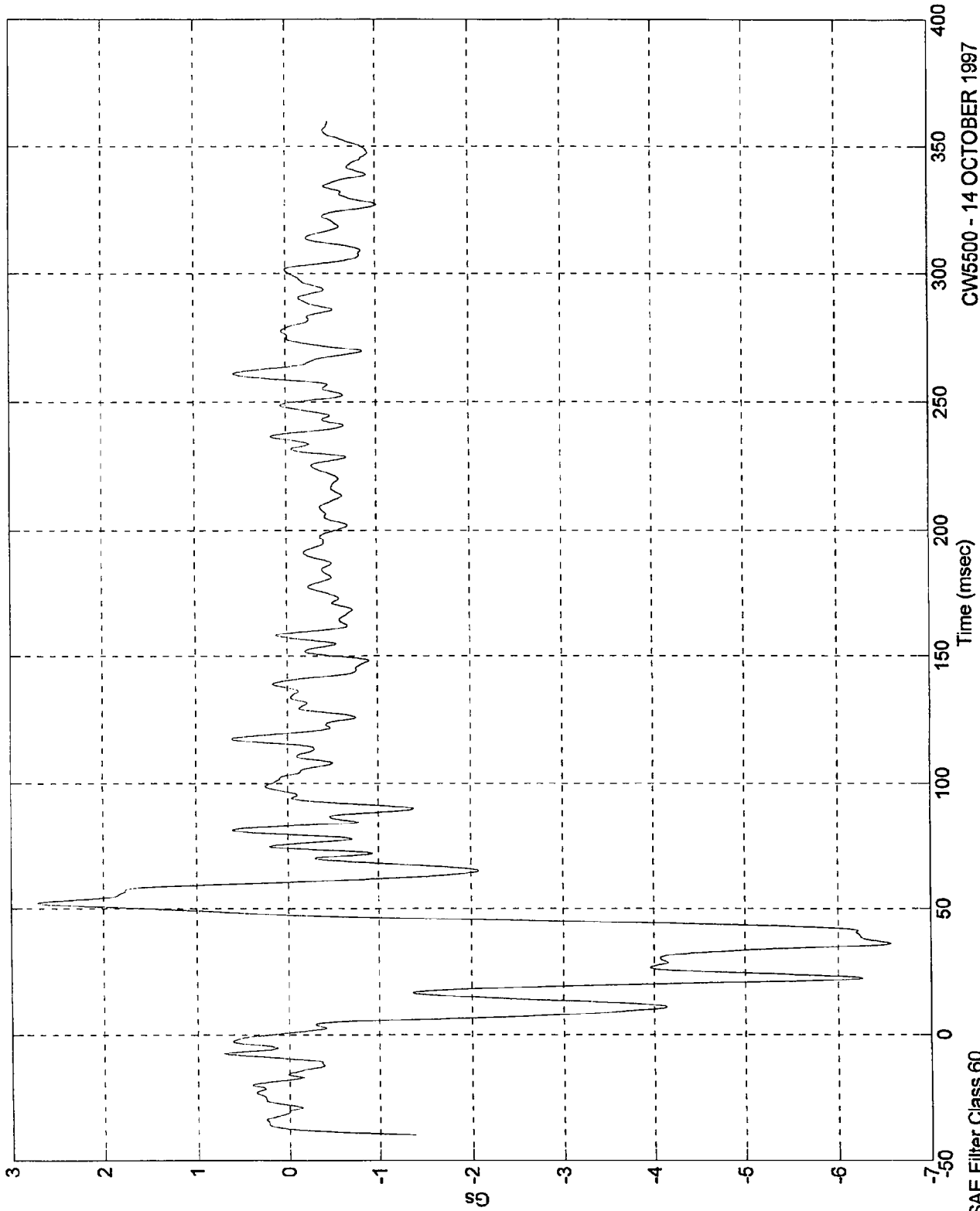
SAE Filter Class 180



# NHTSA Side Impact - 1998 Subaru Legacy

Max = 2.71 Gs @ 52.09 msec  
 Min = -6.56 Gs @ 36.00 msec

MDB C.G. Y



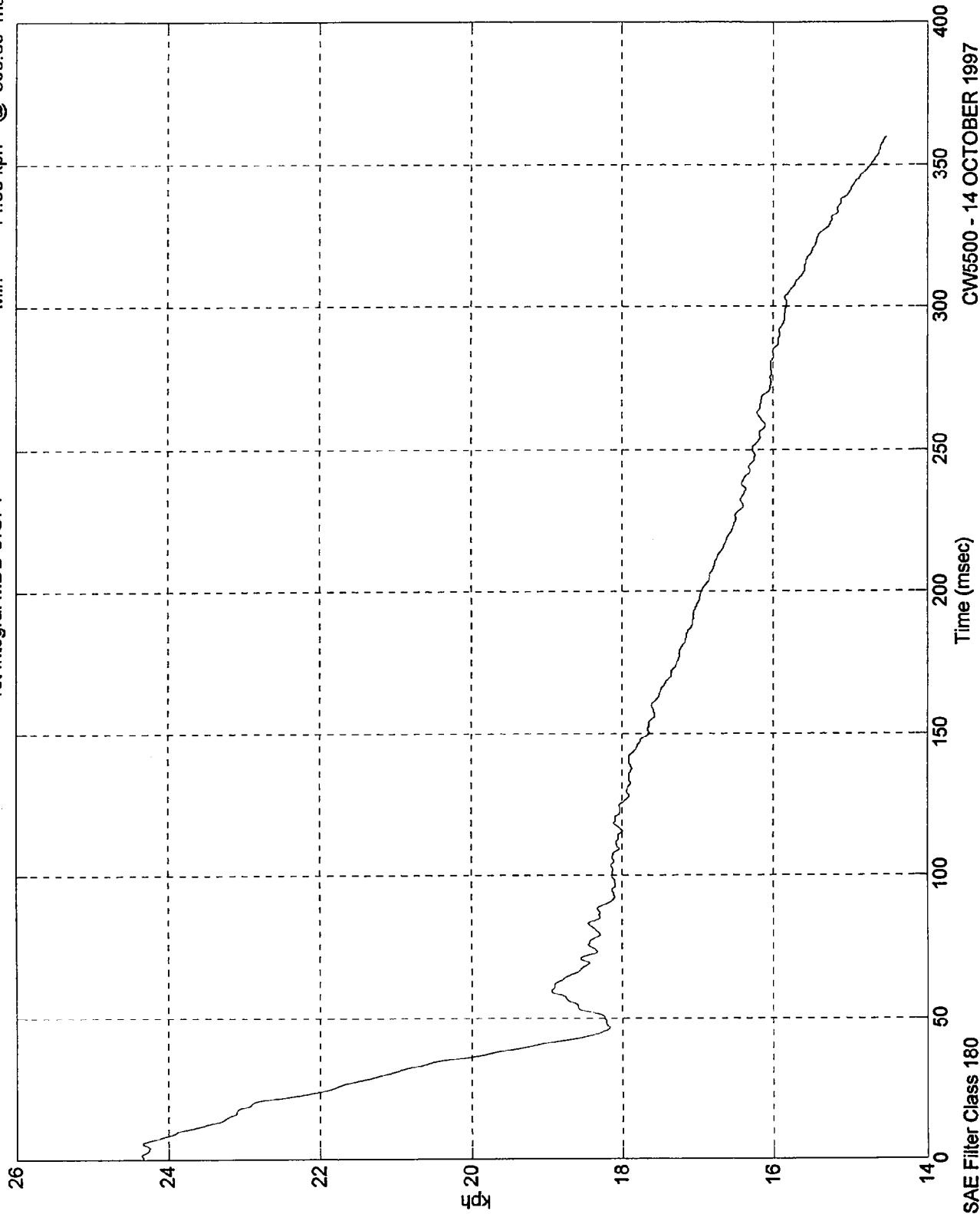
SAE Filter Class 60

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 24.34 kph @ 1.50 msec  
Min = 14.53 kph @ 359.89 msec

1st Integral MDB C.G. Y



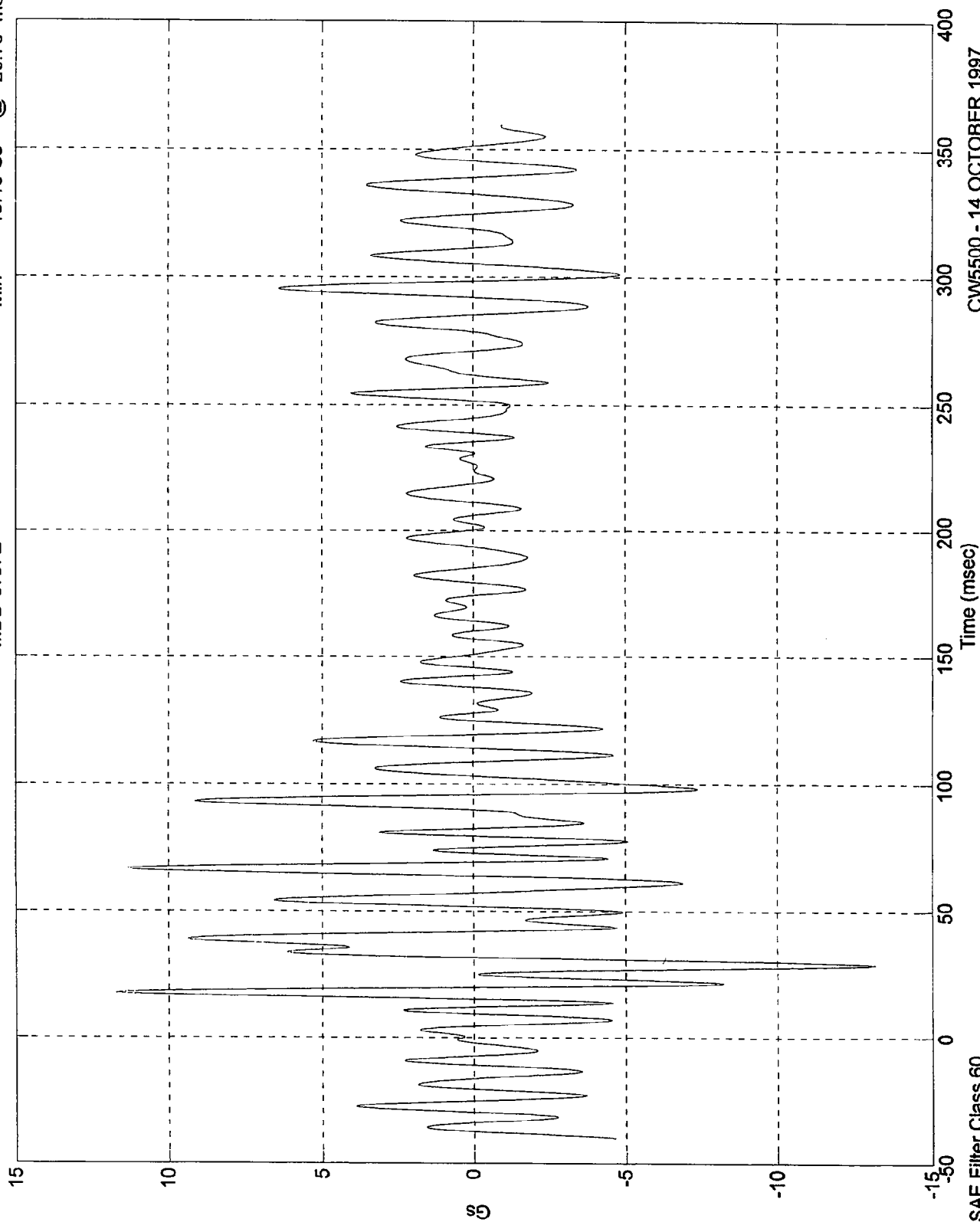
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 11.73 Gs @ 17.60 msec  
Min = -13.15 Gs @ 28.79 msec

MDB C.G. Z



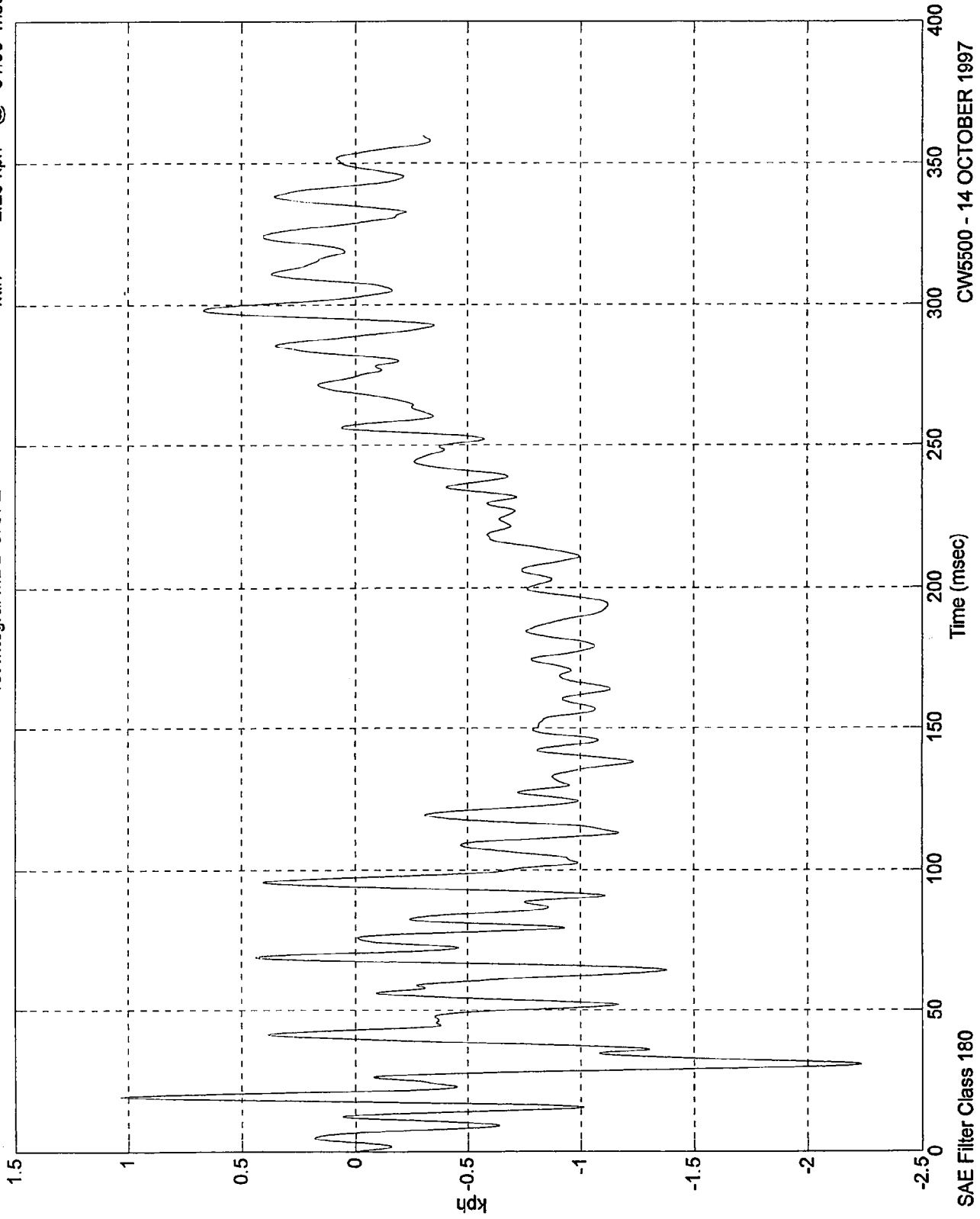
SAE Filter Class 60

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 1.03 kph @ 19.70 msec  
Min = -2.23 kph @ 31.00 msec

1st Integral MDB C.G. Z



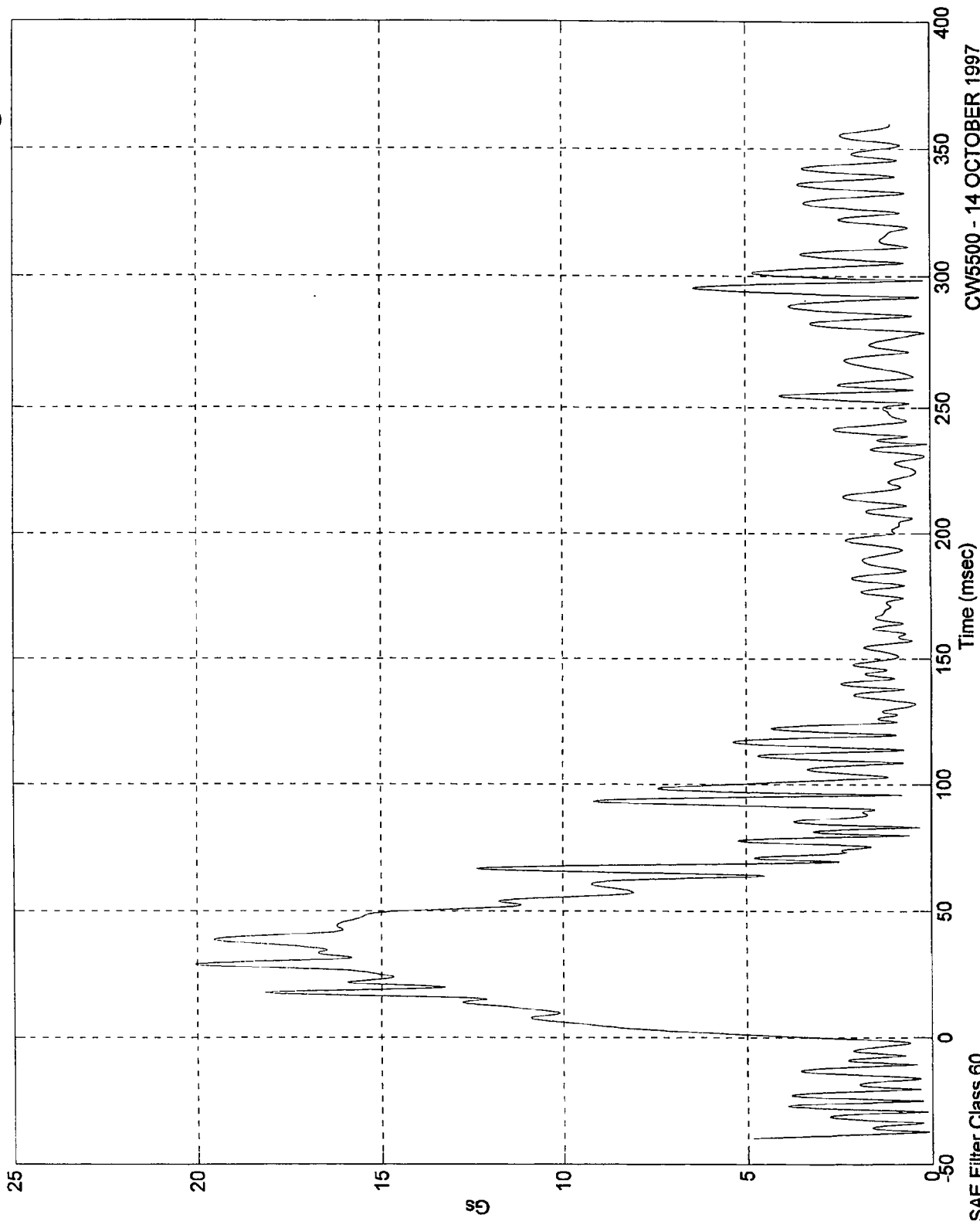
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 20.06 Gs @ 28.79 msec  
 Min = .08 Gs @ 235.50 msec

MDB C.G.Res

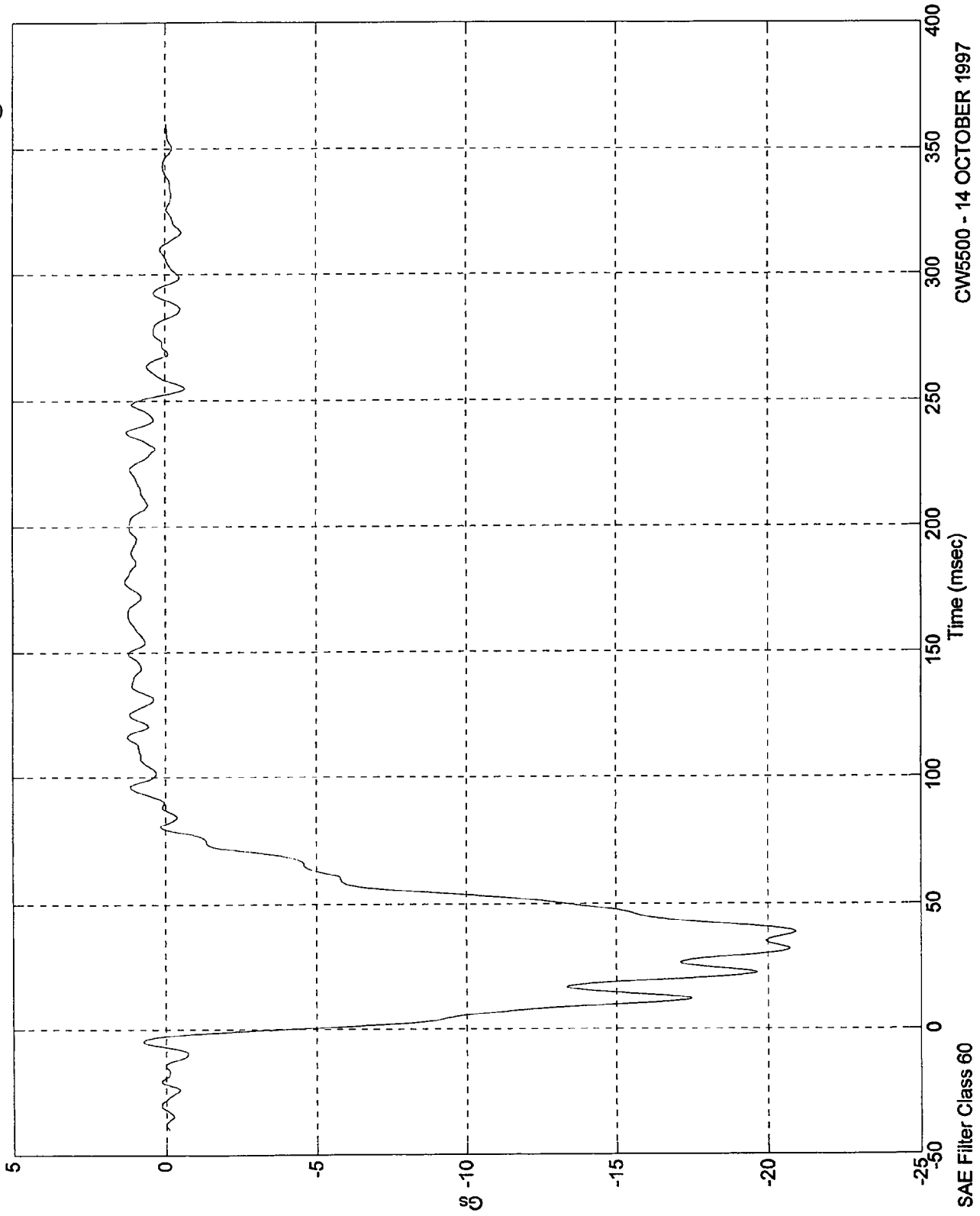


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 1.32 Gs @ 178.09 msec  
Min = -20.91 Gs @ 38.59 msec

MDB Left Rear X



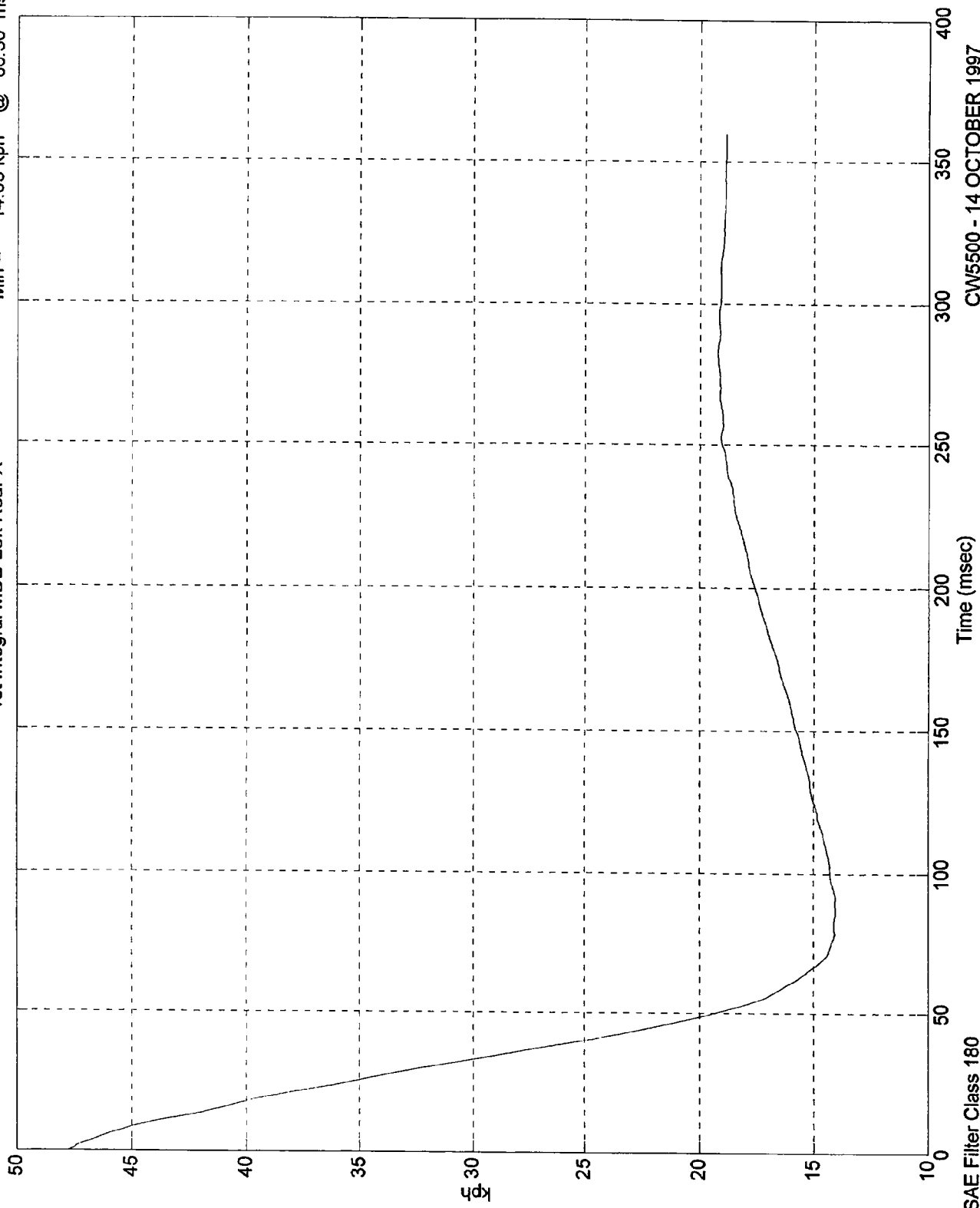
CW5500 - 14 OCTOBER 1997

SAE Filter Class 60

NHTSA Side Impact - 1998 Subaru Legacy

Max = 47.74 kph @ 0.00 msec  
Min = 14.03 kph @ 86.30 msec

1st Integral MDB Left Rear X

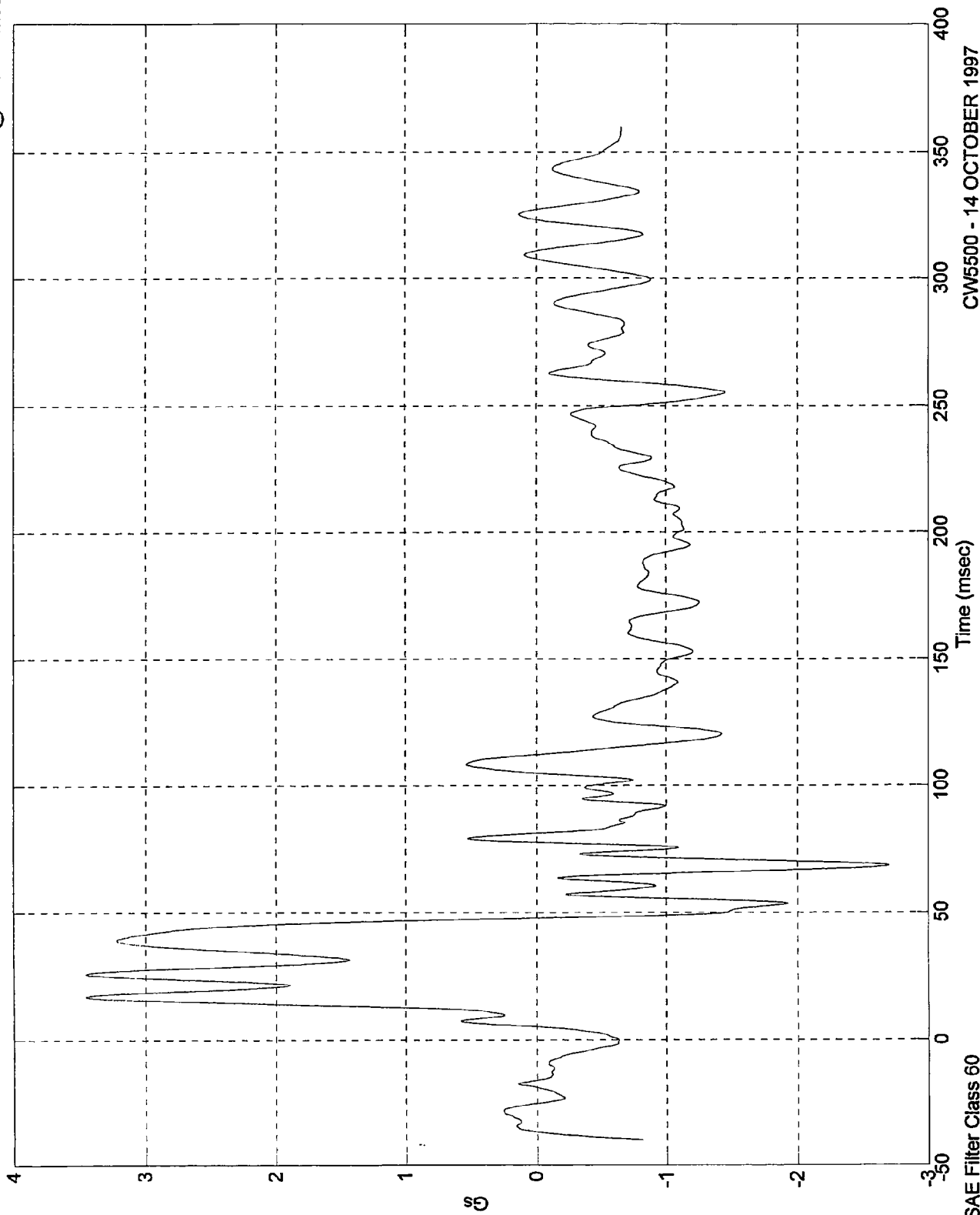


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 3.44 Gs @ 25.89 msec  
Min = -2.69 Gs @ 68.09 msec

MDB Left Rear Y



CW5500 - 14 OCTOBER 1997

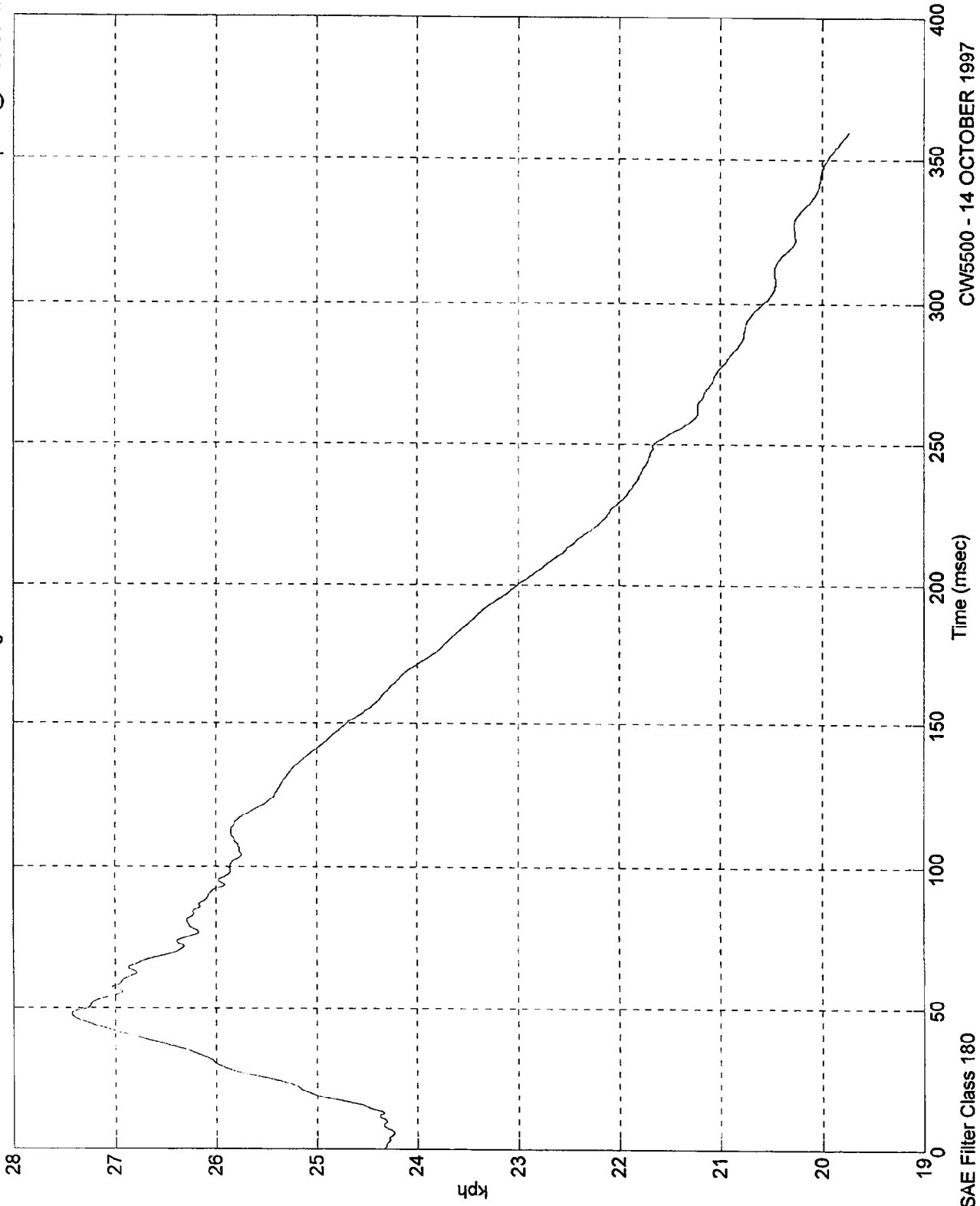
SAE Filter Class 60



NHTSA Side Impact - 1998 Subaru Legacy

Max = 27.41 kph @ 47.90 msec  
Min = 19.73 kph @ 359.89 msec

1st Integral MDB Left Rear Y



SAE Filter Class 180

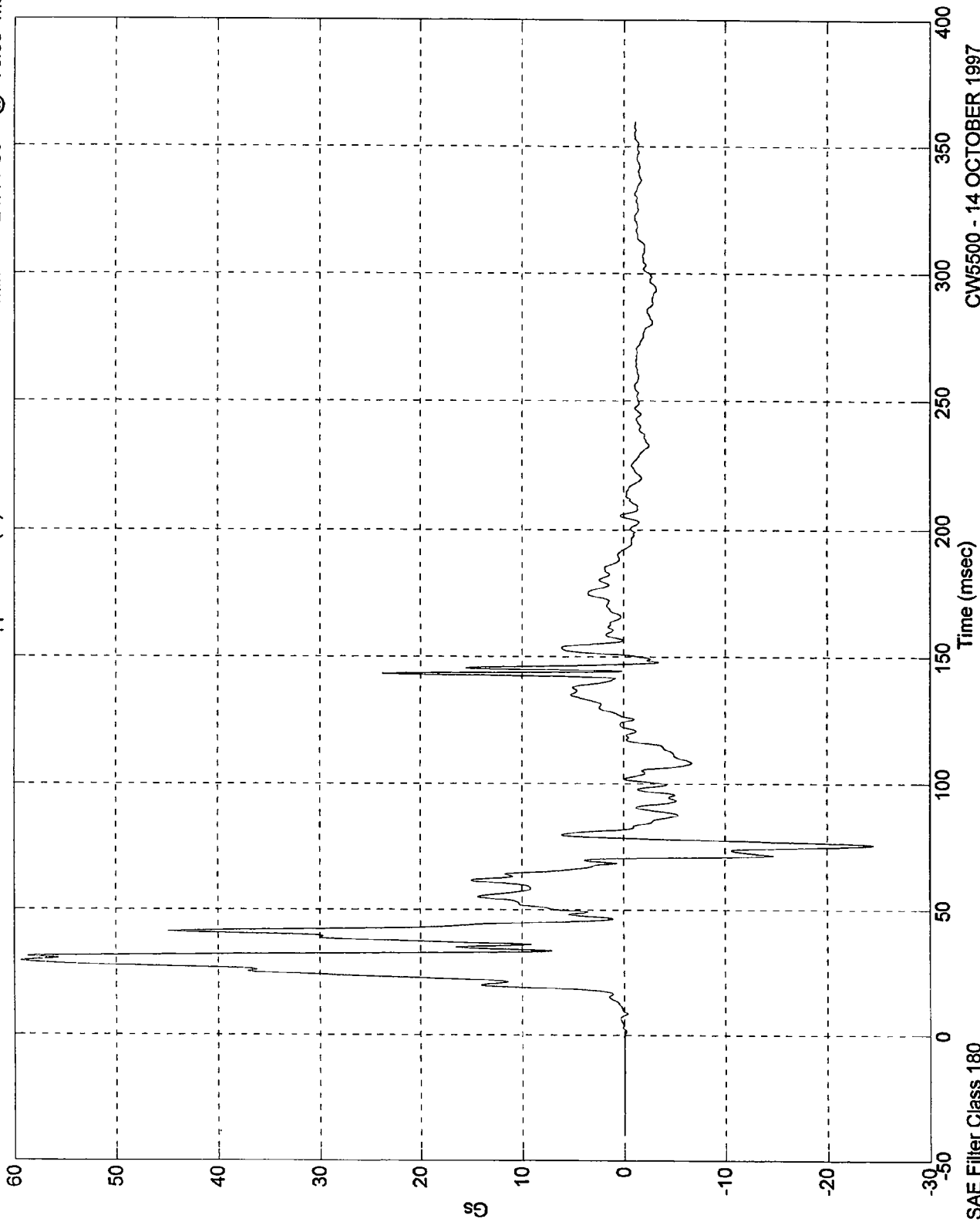
CW5500 - 14 OCTOBER 1997

**DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (Redundant)**  
**ACCELERATION DATA - FILTER CLASS 180**  
**INTEGRATION DATA - FILTER CLASS 180**

NHTSA Side Impact - 1998 Subaru Legacy

Max = 59.37 Gs @ 29.29 msec  
Min = -24.44 Gs @ 75.69 msec

P1 Upper Rib Y(R)

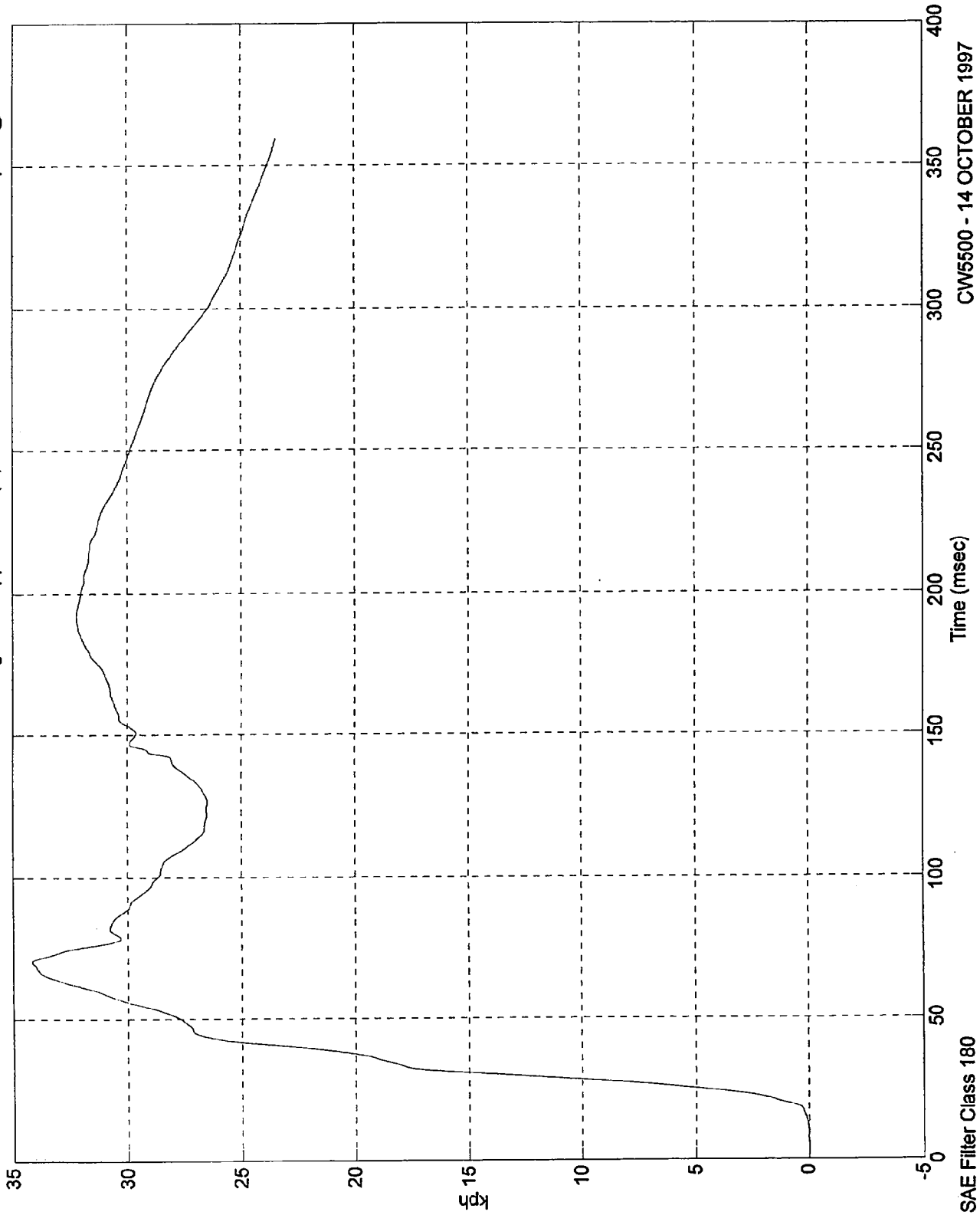


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 34.16 kph @ 70.29 msec  
Min = -.00 kph @ 2.20 msec

1st Integral P1 Upper Rib Y(R)



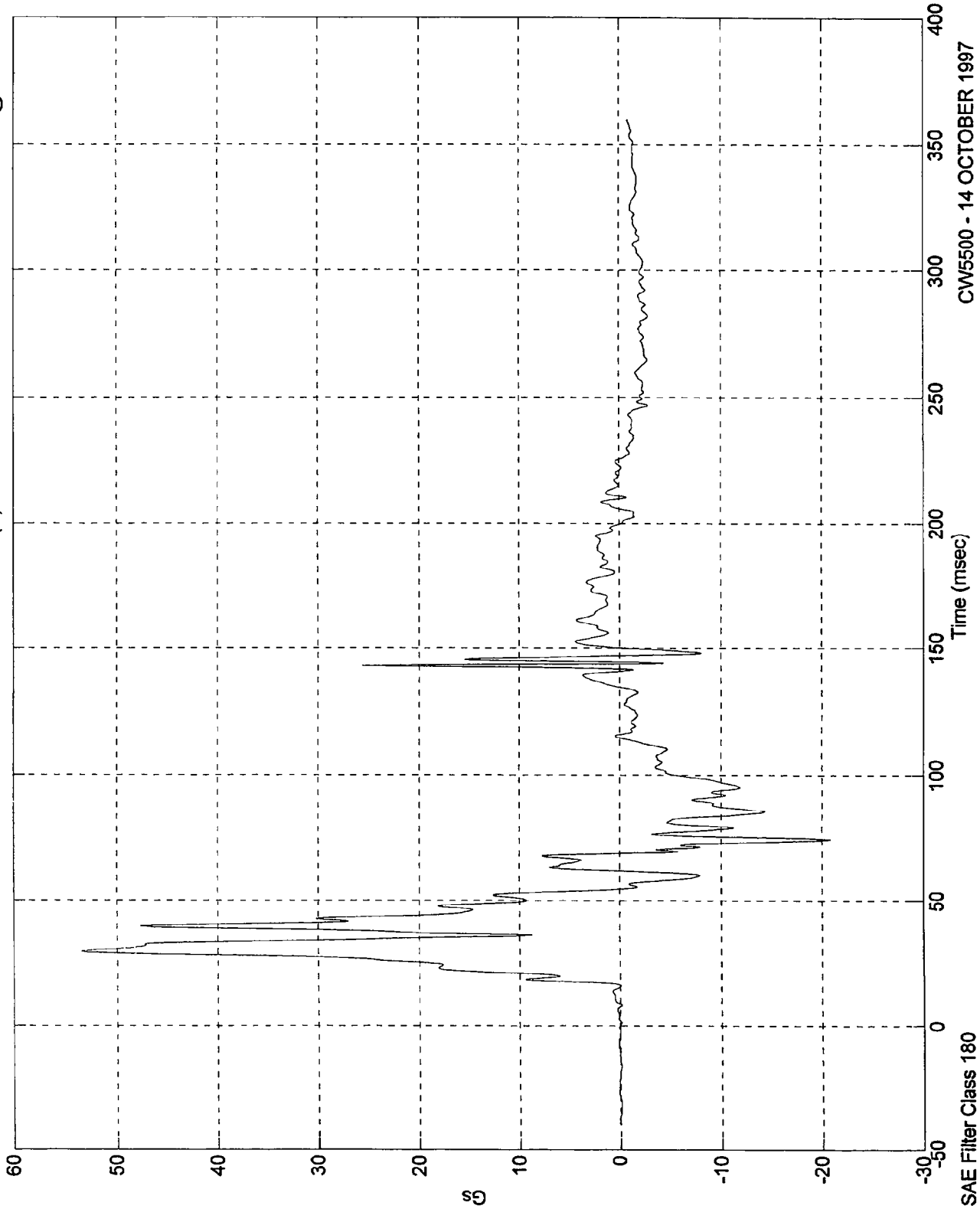
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Subaru Legacy

Max = 53.43 Gs @ 29.29 msec  
Min = -20.82 Gs @ 74.29 msec

P1 Lower Rib Y(R)



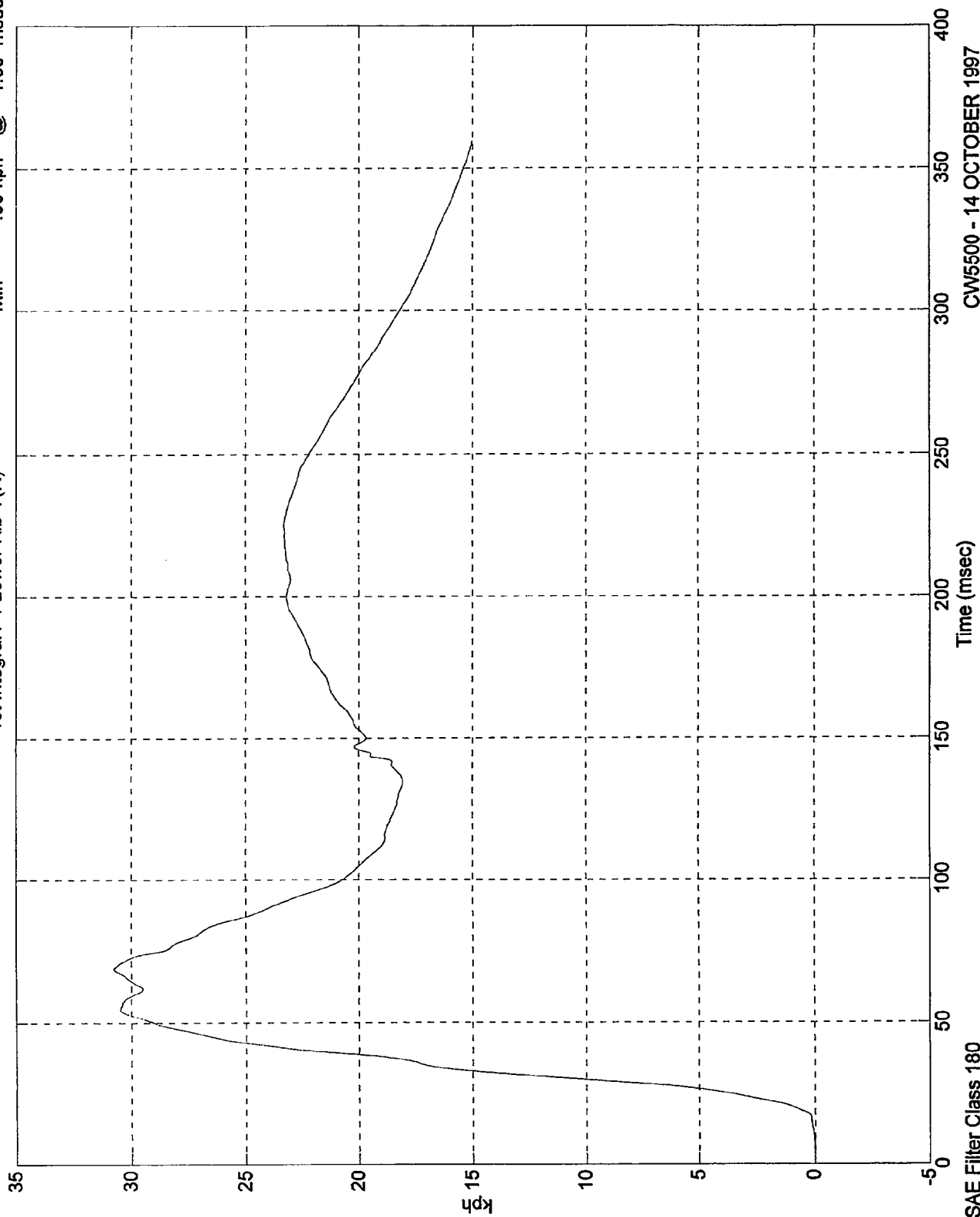
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 30.76 kph @ 68.80 msec  
Min = -0.00 kph @ 1.90 msec

1st Integral P1 Lower Rib Y(R)



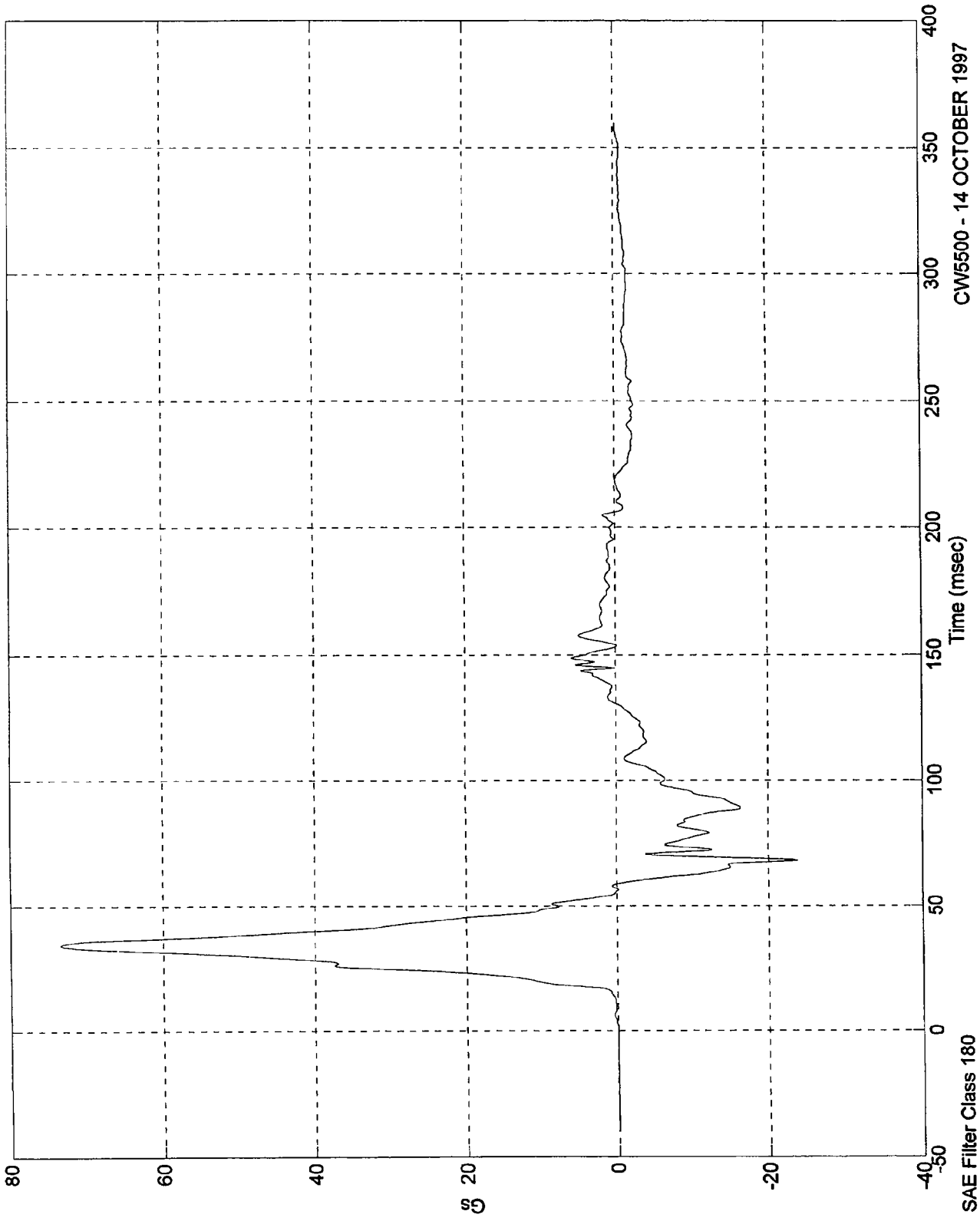
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 73.38 Gs @ 34.19 msec  
Min = -23.73 Gs @ 68.09 msec

P1 Lower Spine Y(R)



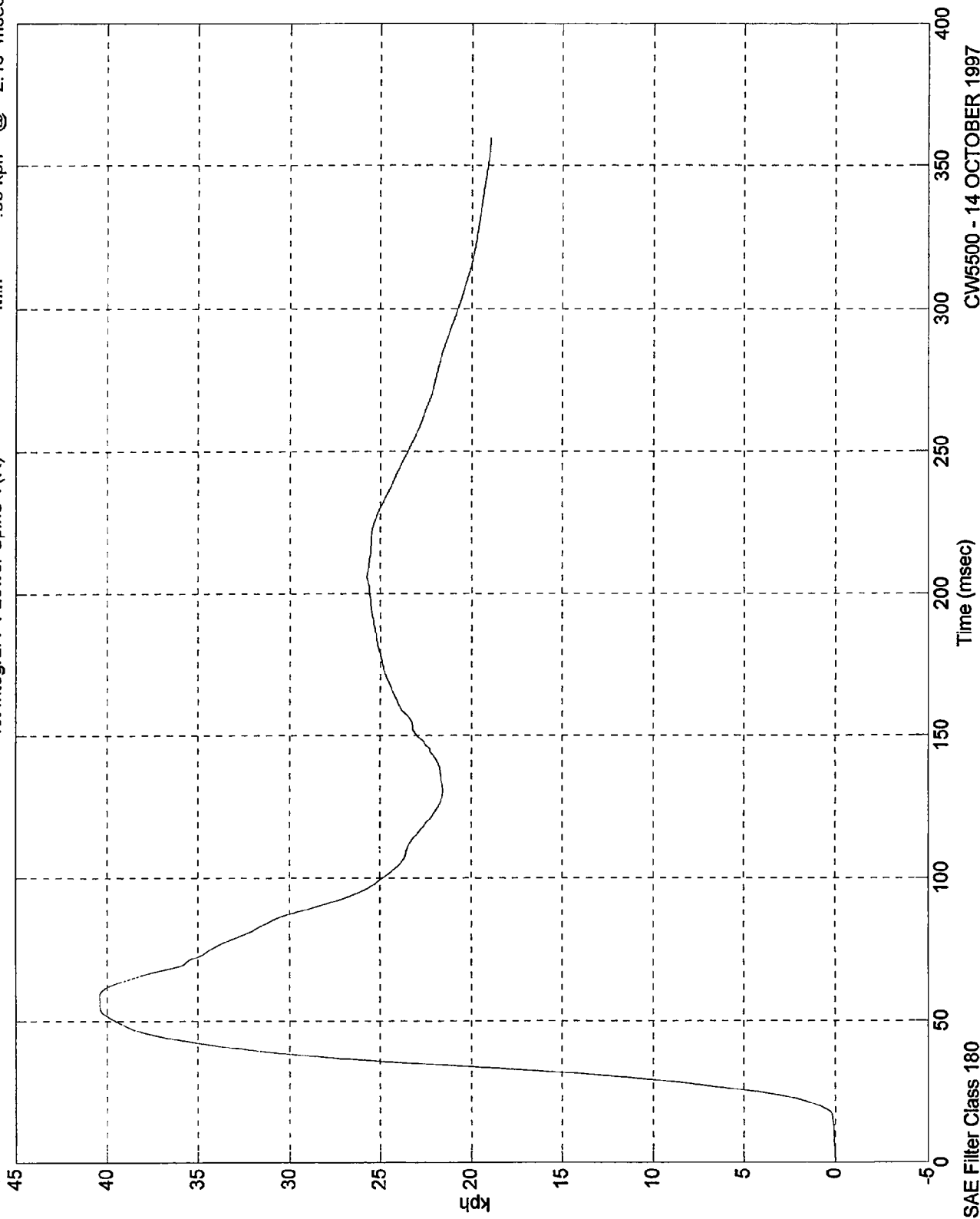
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 40.41 kph @ 58.80 msec  
 Min = -.00 kph @ 2.10 msec

1st Integral P1 Lower Spine Y(R)

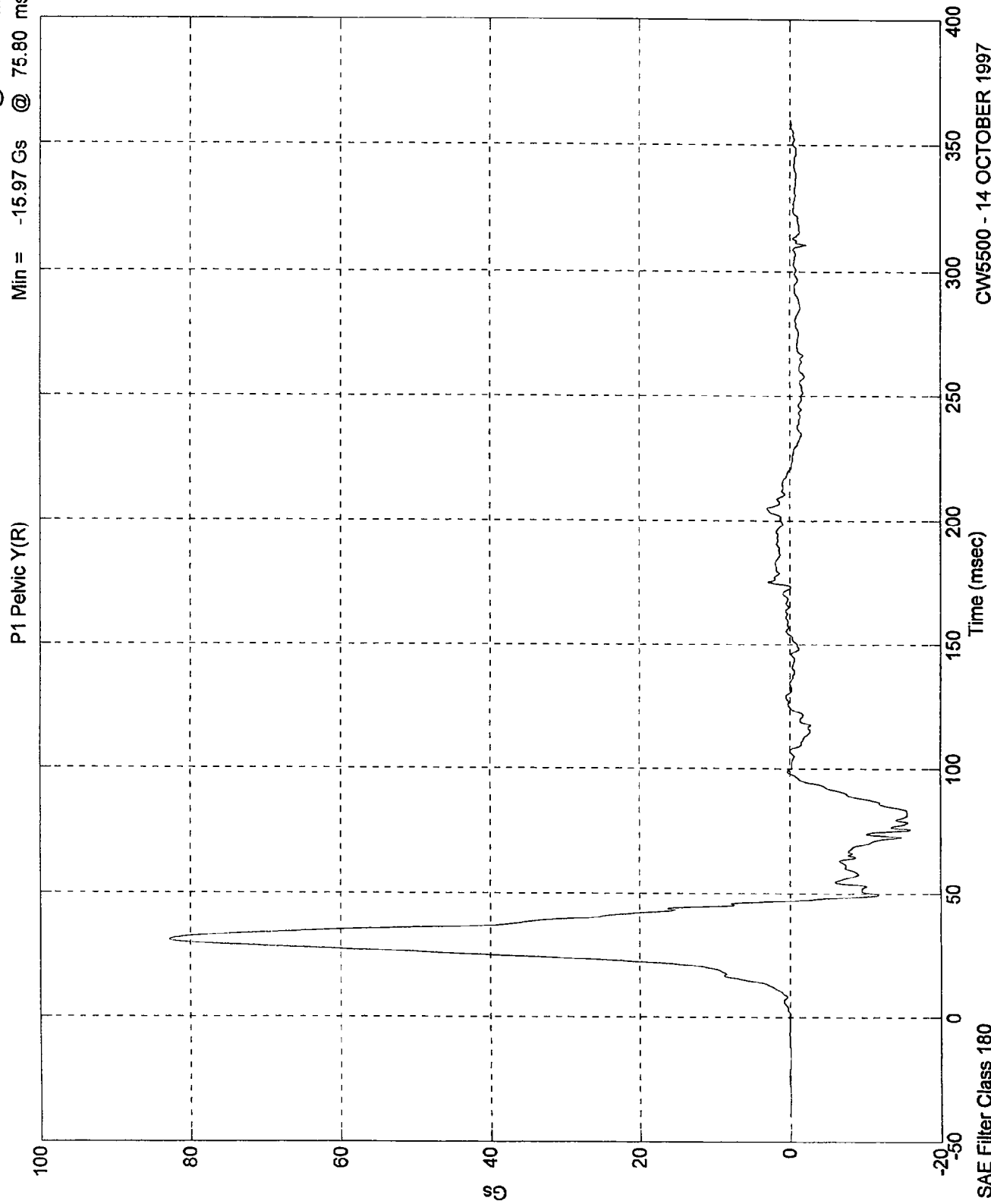


CW5500 - 14 OCTOBER 1997



NHTSA Side Impact - 1998 Subaru Legacy

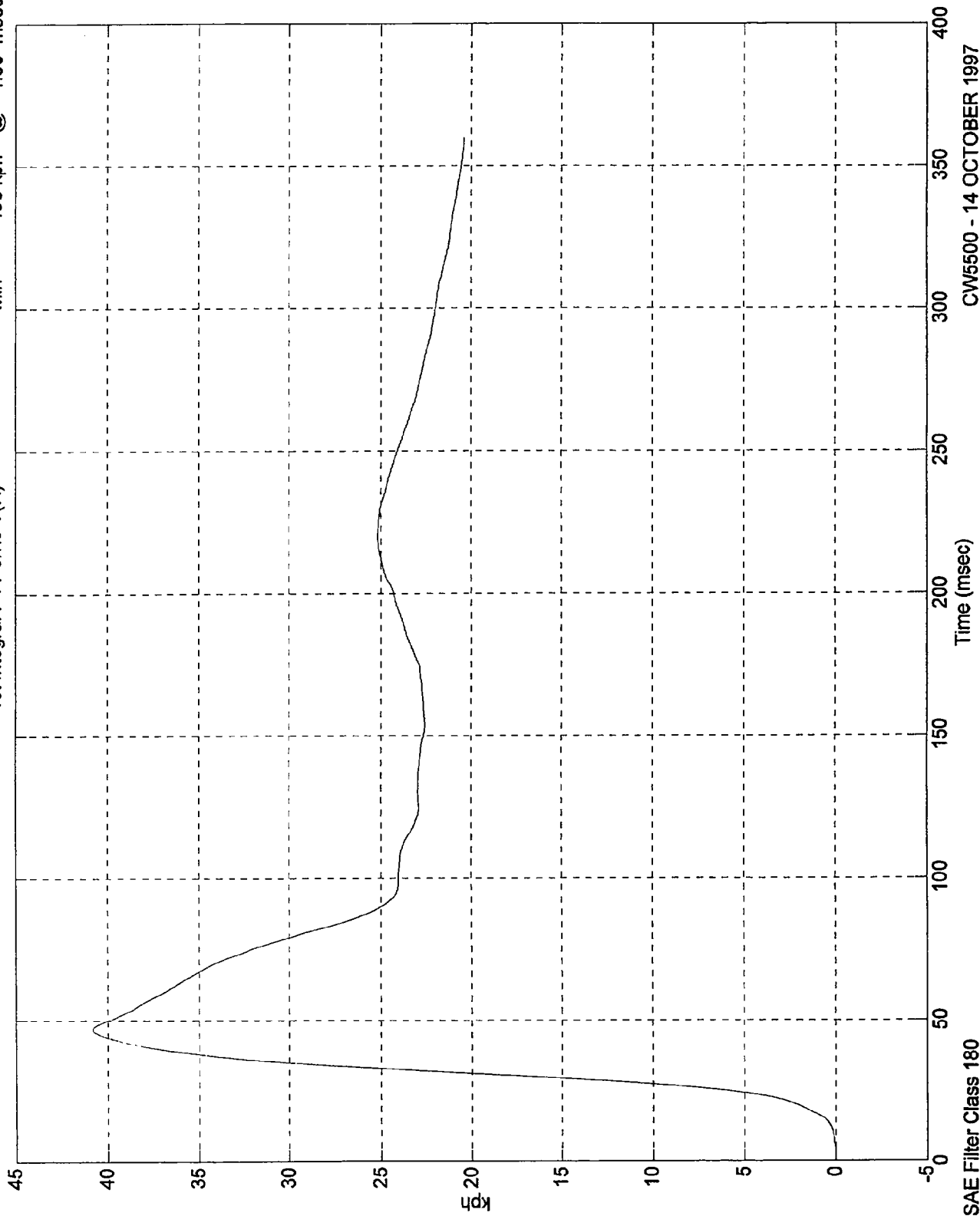
Max = 82.85 Gs @ 30.89 msec  
Min = -15.97 Gs @ 75.80 msec



NHTSA Side Impact - 1998 Subaru Legacy

Max = 40.80 kph @ 46.70 msec  
Min = -0.00 kph @ 1.60 msec

1st Integral P1 Pelvic Y(R)

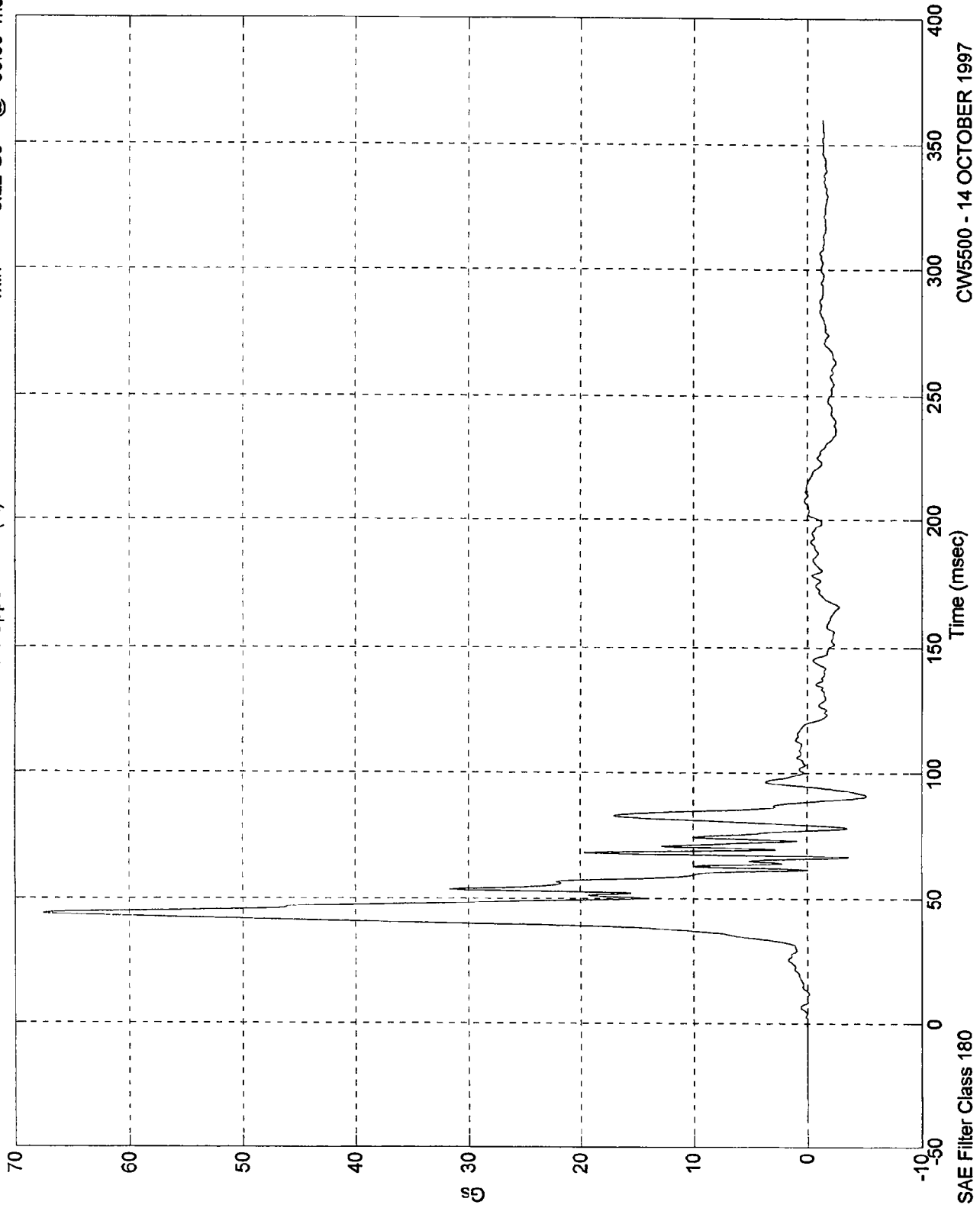


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 67.48 Gs @ 43.69 msec  
Min = -5.22 Gs @ 90.89 msec

P4 Upper Rib Y(R)



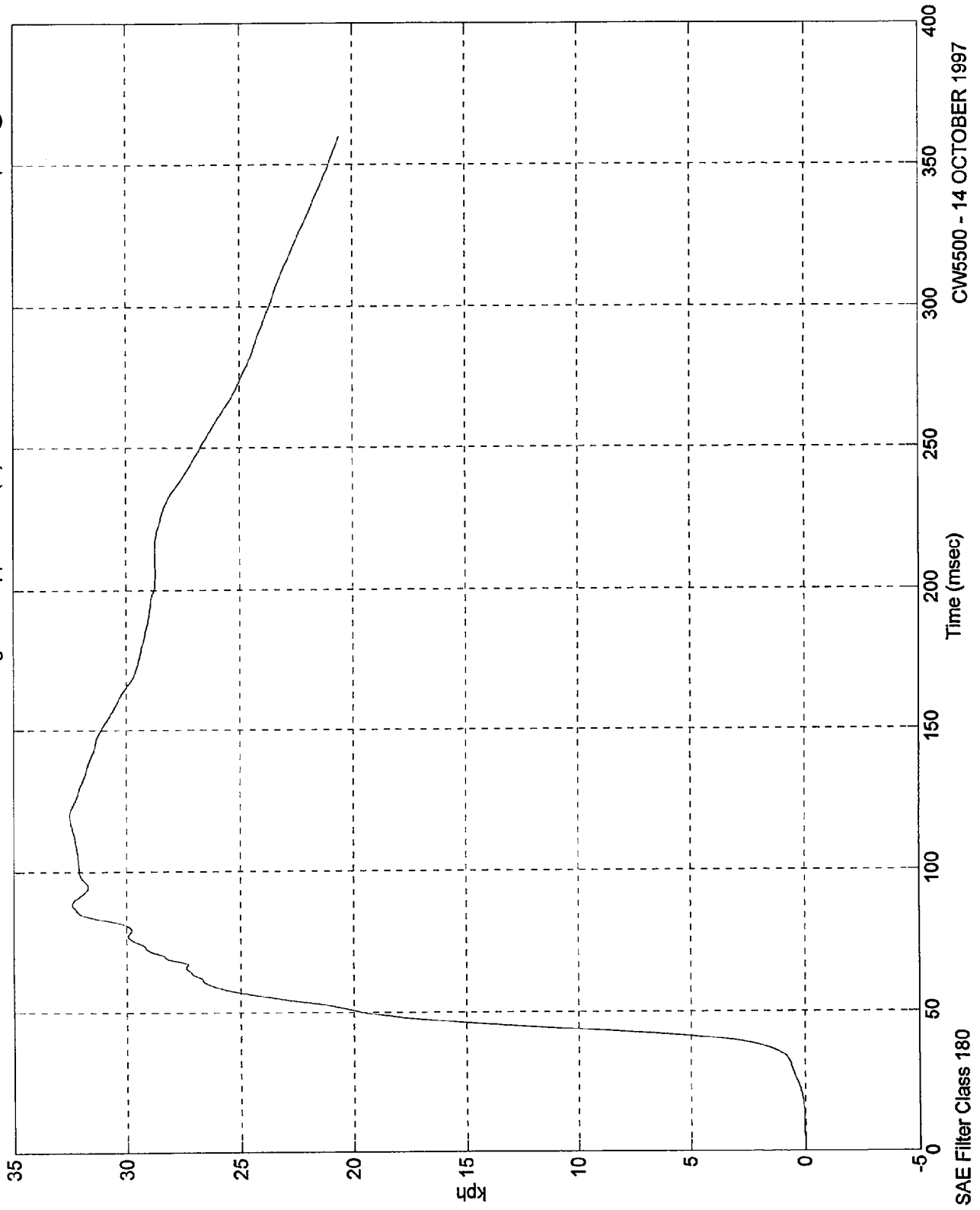
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 32.48 kph @ 119.99 msec  
Min = -00 kph @ 1.80 msec

1st Integral P4 Upper Rib Y(R)



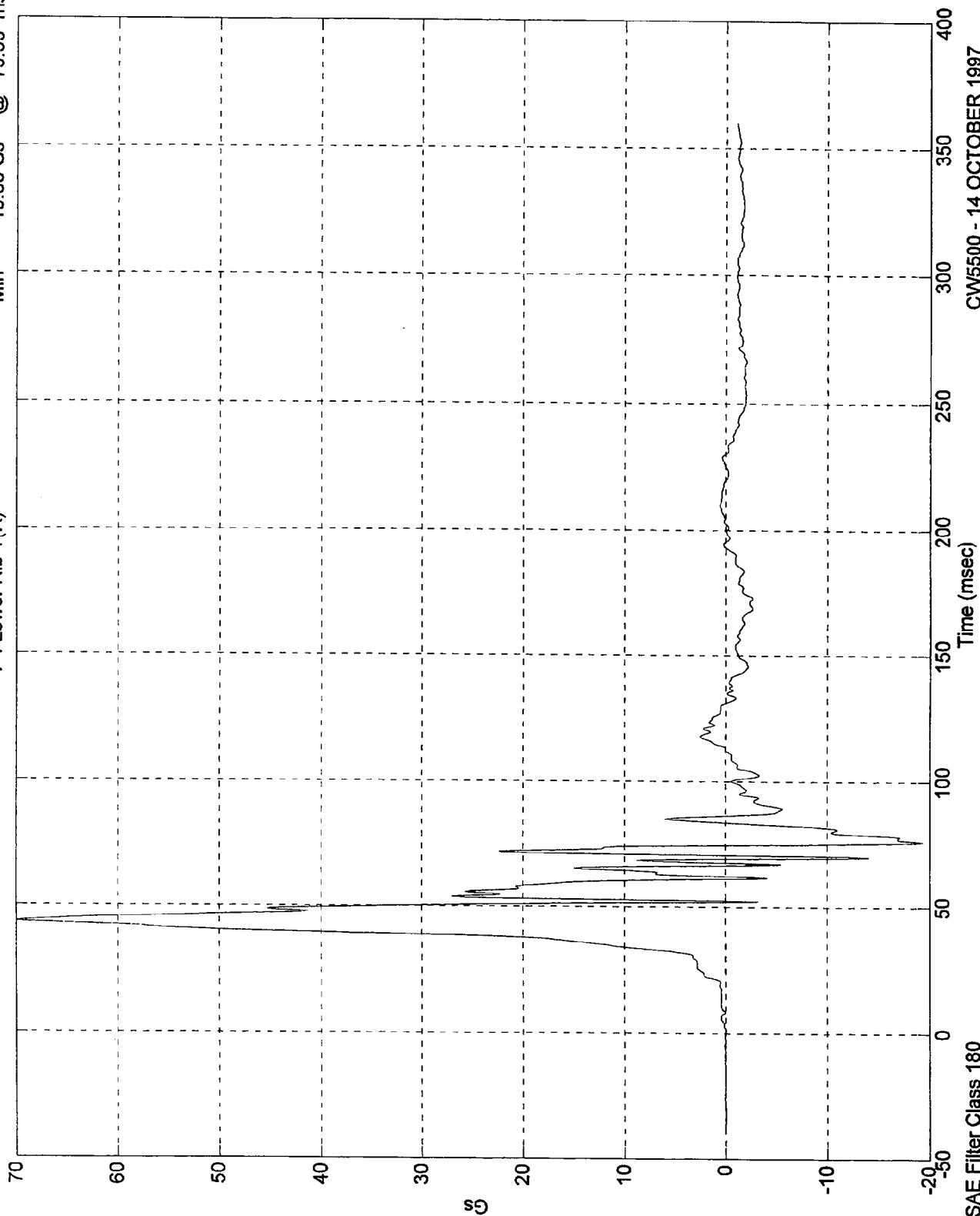
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 69.87 Gs @ 43.39 msec  
 Min = -19.33 Gs @ 75.59 msec

P4 Lower Rib Y(R)

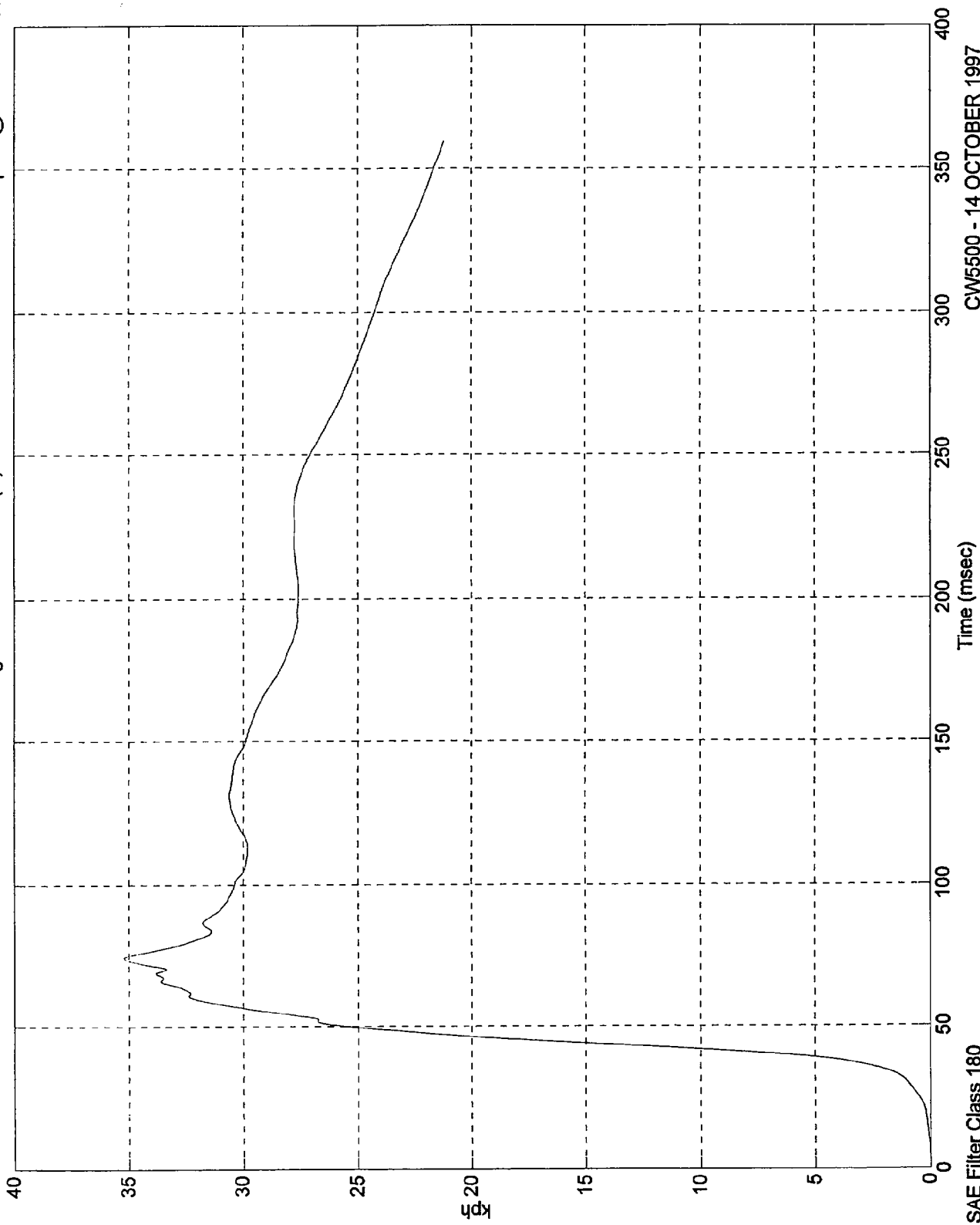


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 35.19 kph @ 74.20 msec  
Min = -.00 kph @ 1.80 msec

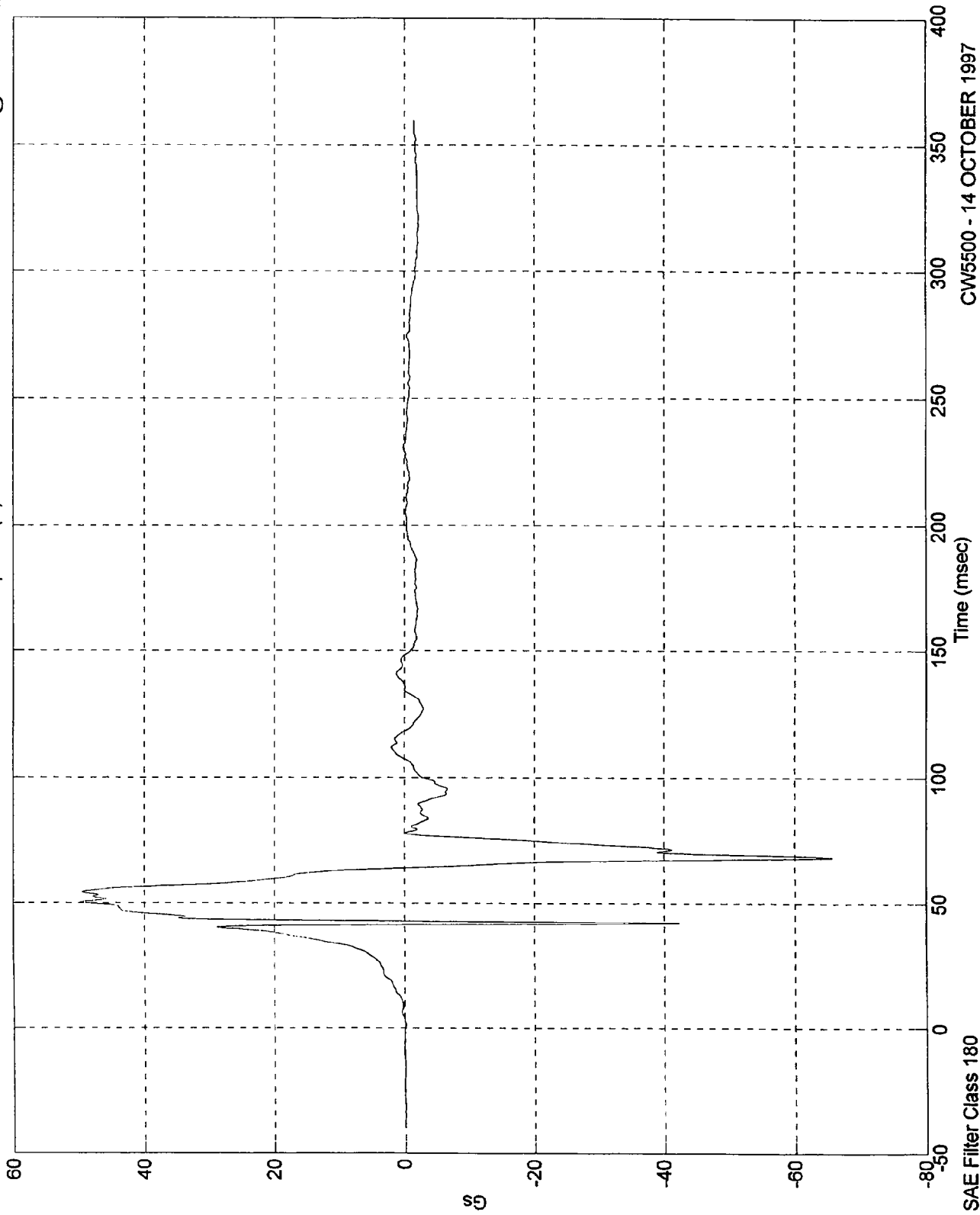
1st Integral P4 Lower Rib Y(R)



NHTSA Side Impact - 1998 Subaru Legacy

Max = 49.80 Gs @ 50.29 msec  
Min = -65.72 Gs @ 68.39 msec

P4 Lower Spine Y(R)



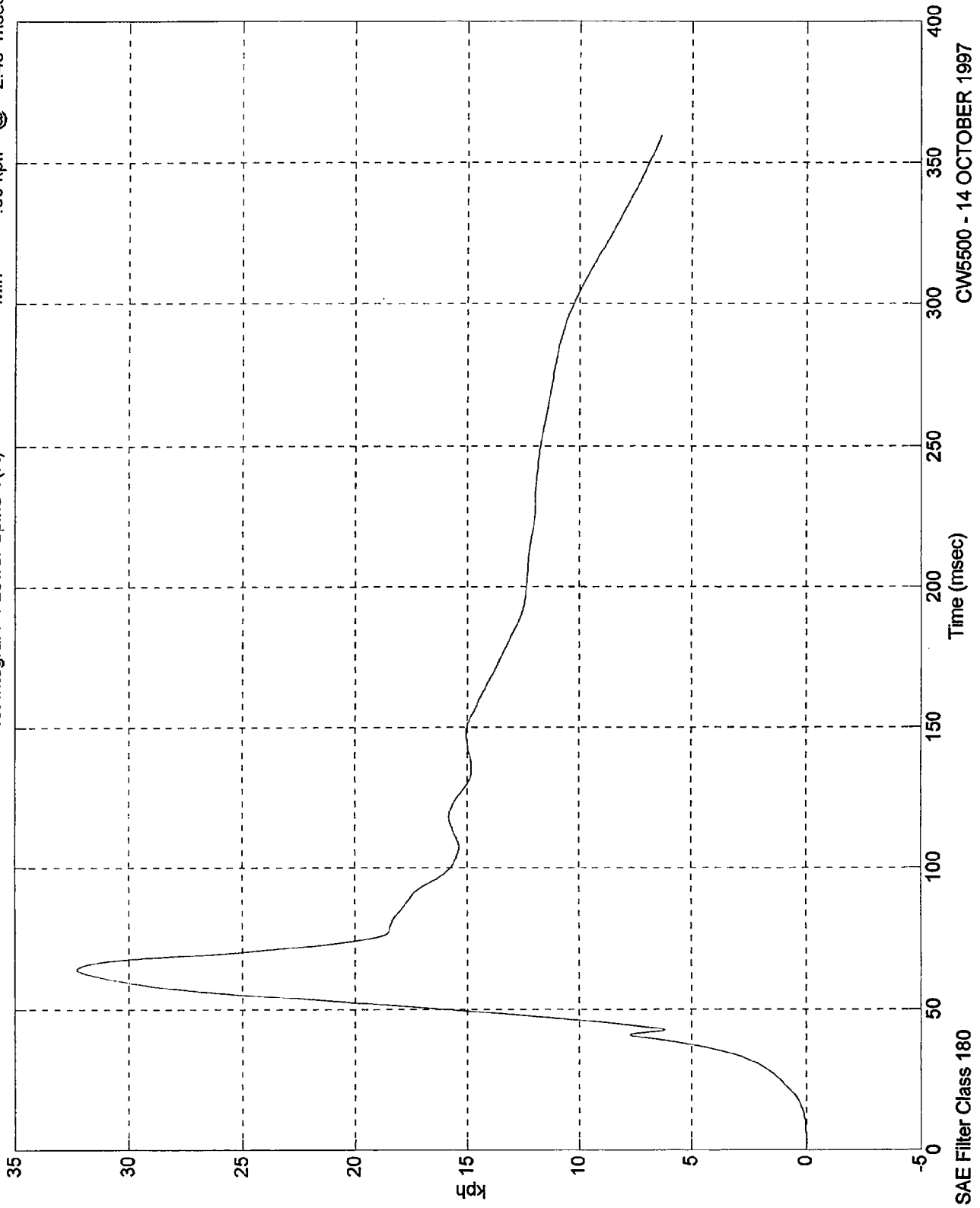
SAE Filter Class 180

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 32.27 kph @ 64.09 msec  
Min = -.00 kph @ 2.40 msec

1st Integral P4 Lower Spine Y(R)



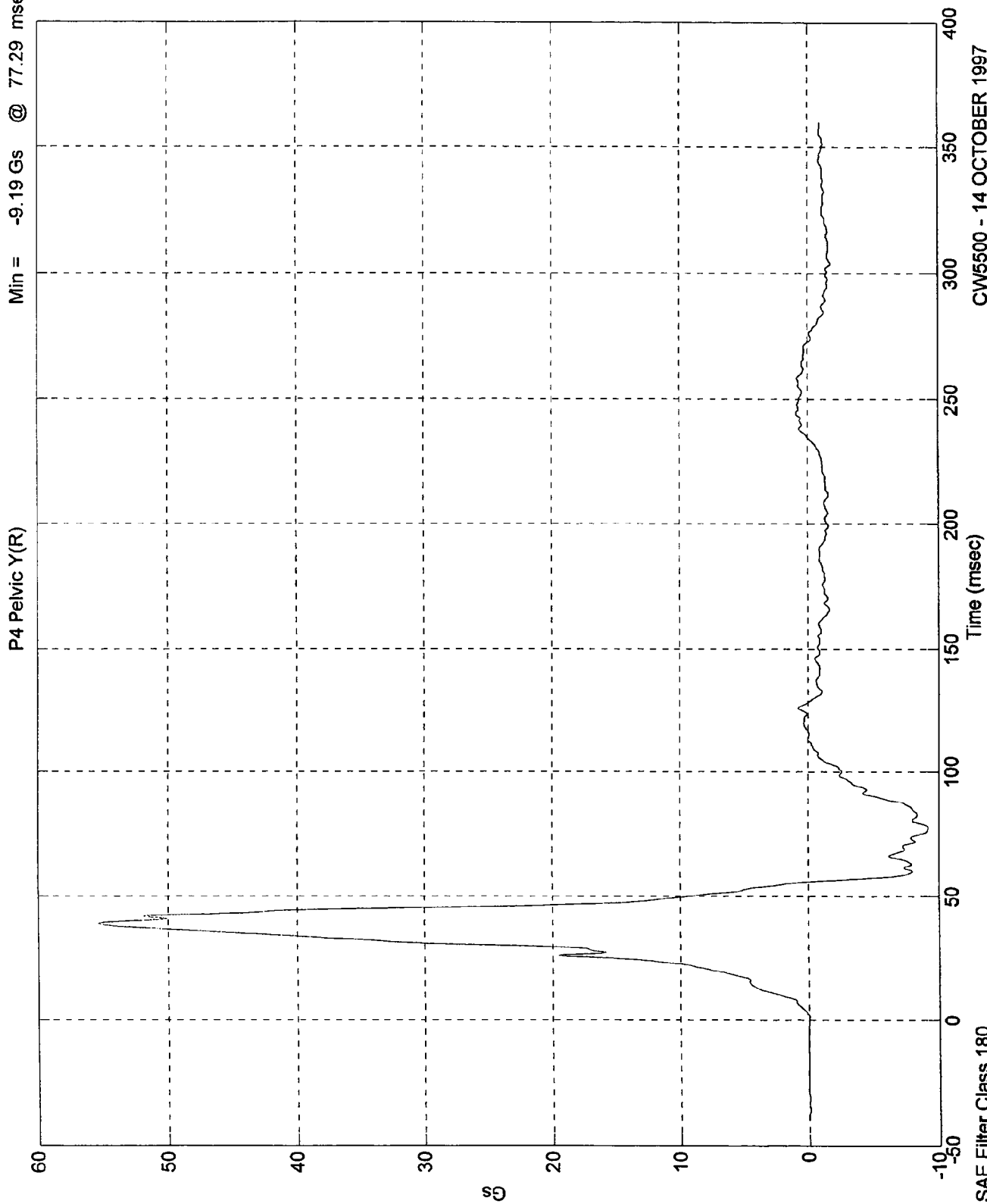
CW5500 - 14 OCTOBER 1997

SAE Filter Class 180



NHTSA Side Impact - 1998 Subaru Legacy

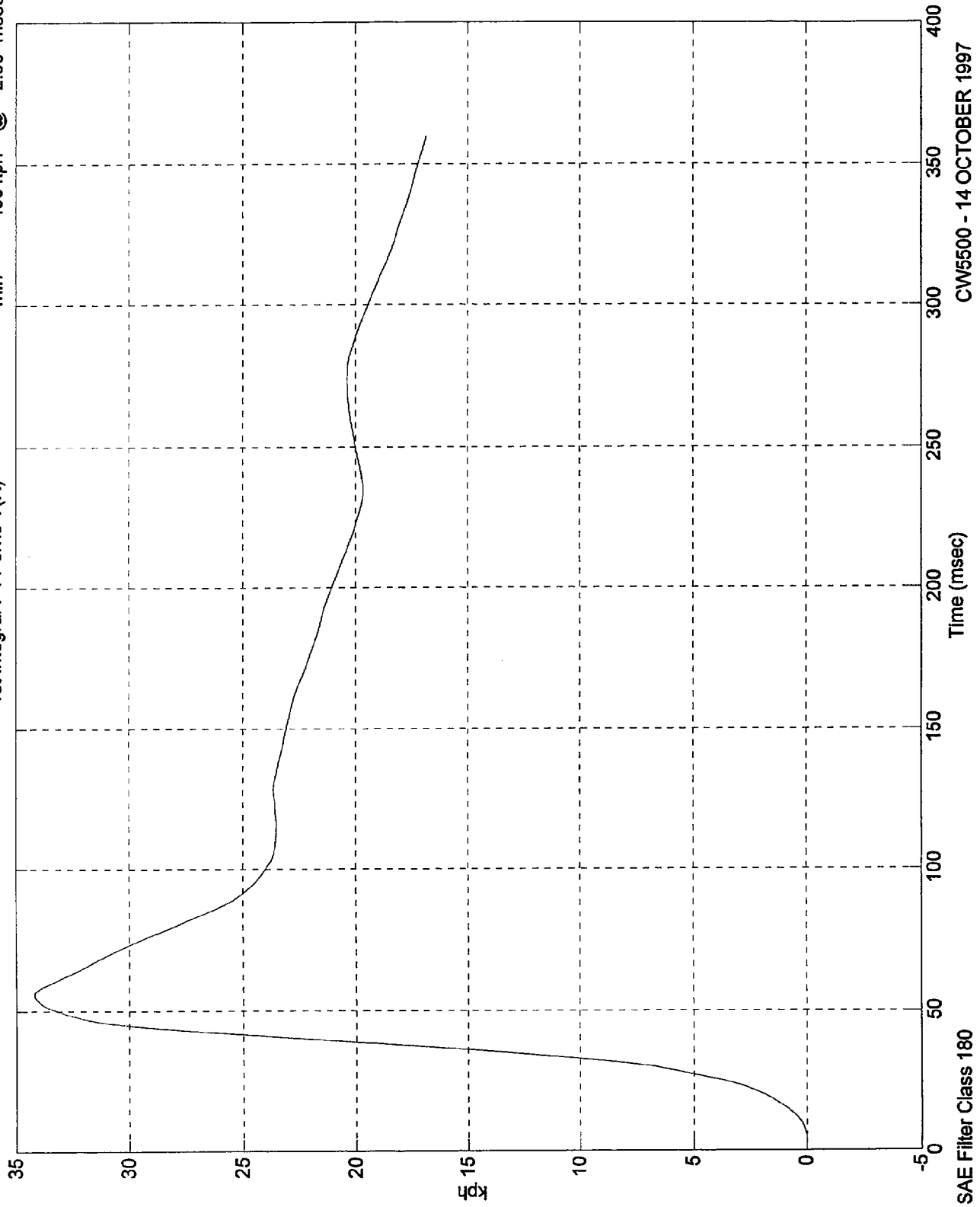
Max = 55.31 Gs @ 38.89 msec  
Min = -9.19 Gs @ 77.29 msec



NHTSA Side Impact - 1998 Subaru Legacy

Max = 34.18 kph @ 56.00 msec  
Min = -.00 kph @ 2.00 msec

1st Integral P4 Pelvic Y(R)



SAE Filter Class 180

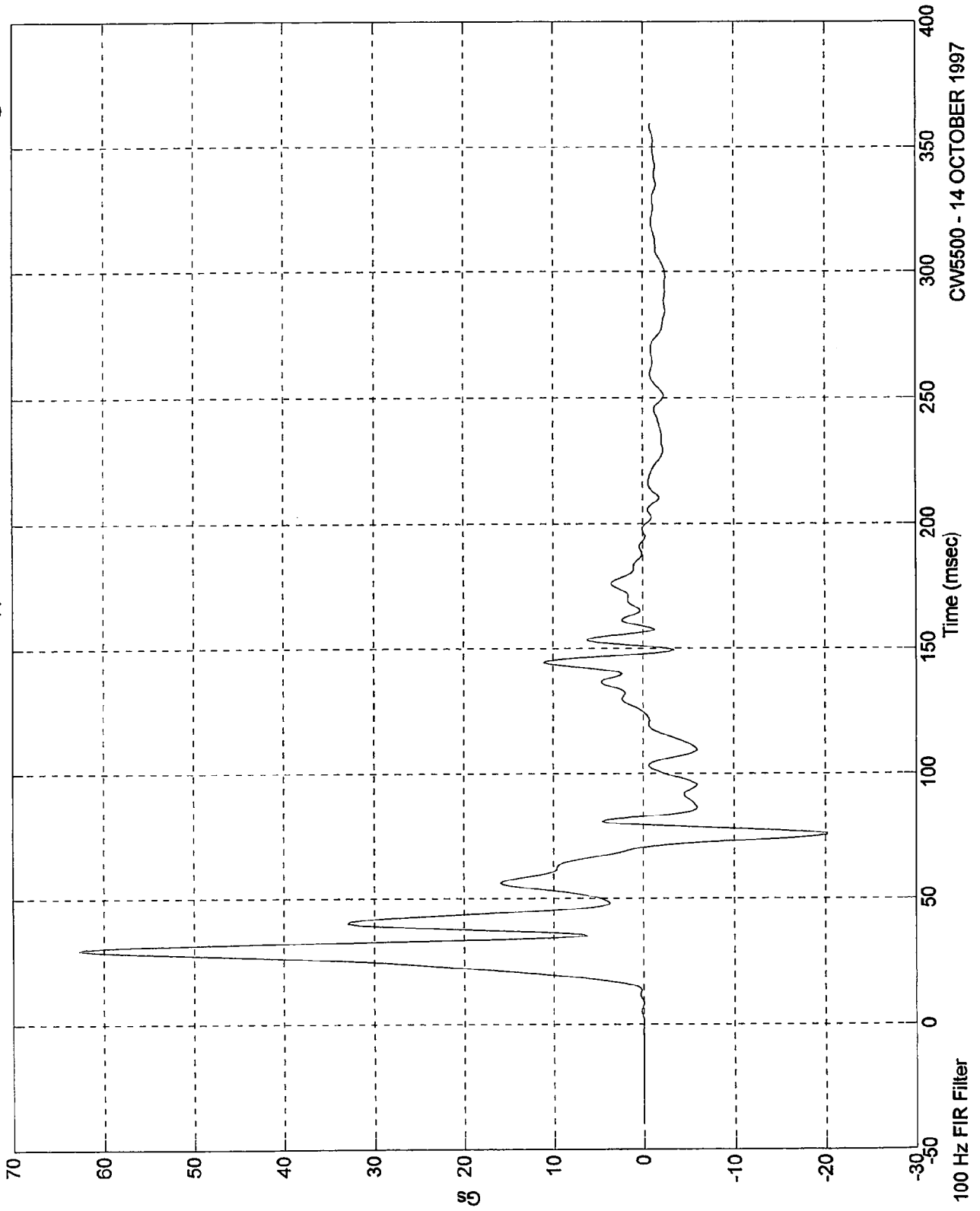
CW5500 - 14 OCTOBER 1997

**DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS**  
**ACCELERATION DATA - FIR FILTERED**

NHTSA Side Impact - 1998 Subaru Legacy

Max = 62.82 Gs @ 29.374 msec  
Min = -20.24 Gs @ 74.99 msec

P1 Upper Rib Y

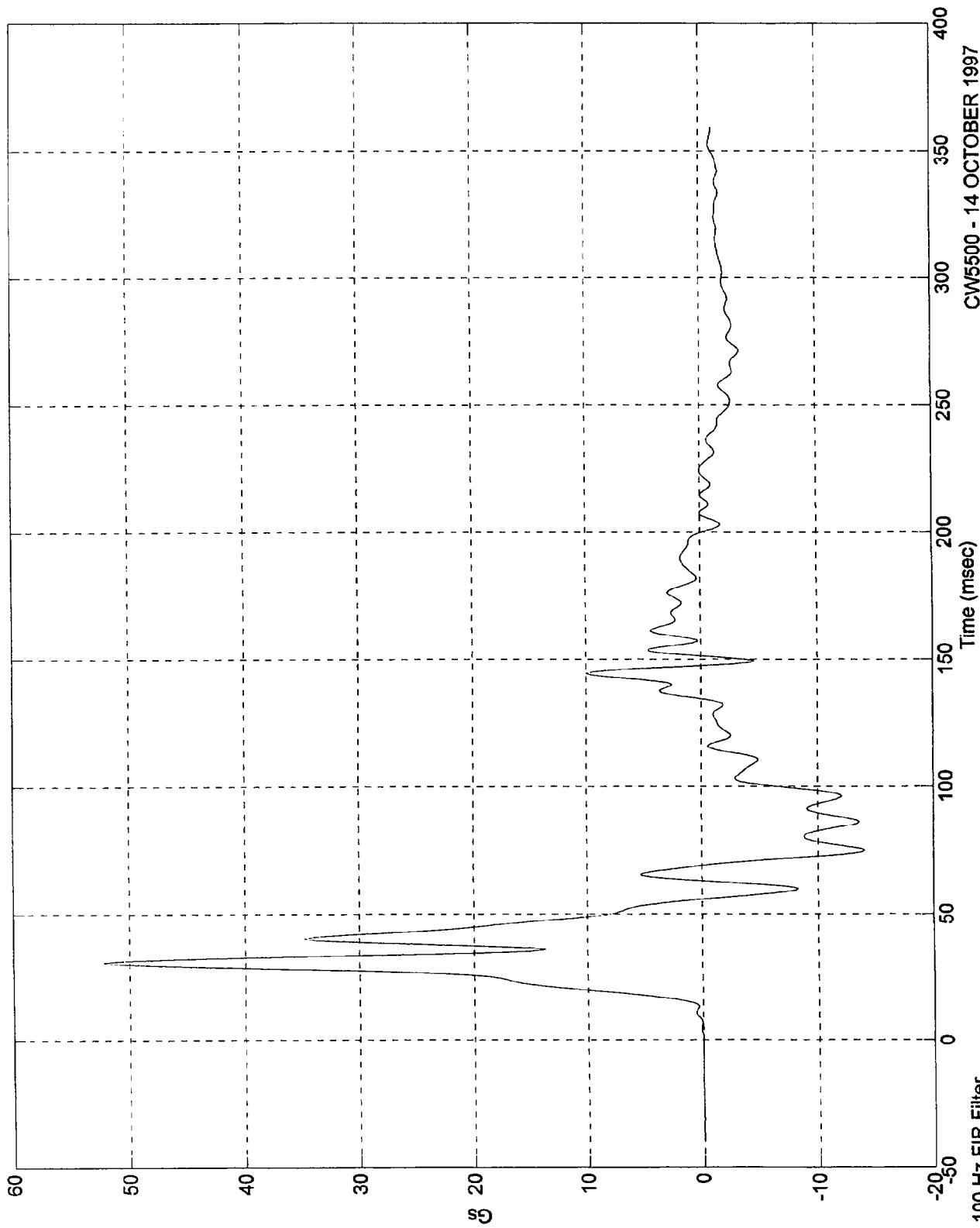


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 52.19 Gs @ 30.624 msec  
Min = -14.07 Gs @ 74.99 msec

P1 Lower Rib Y



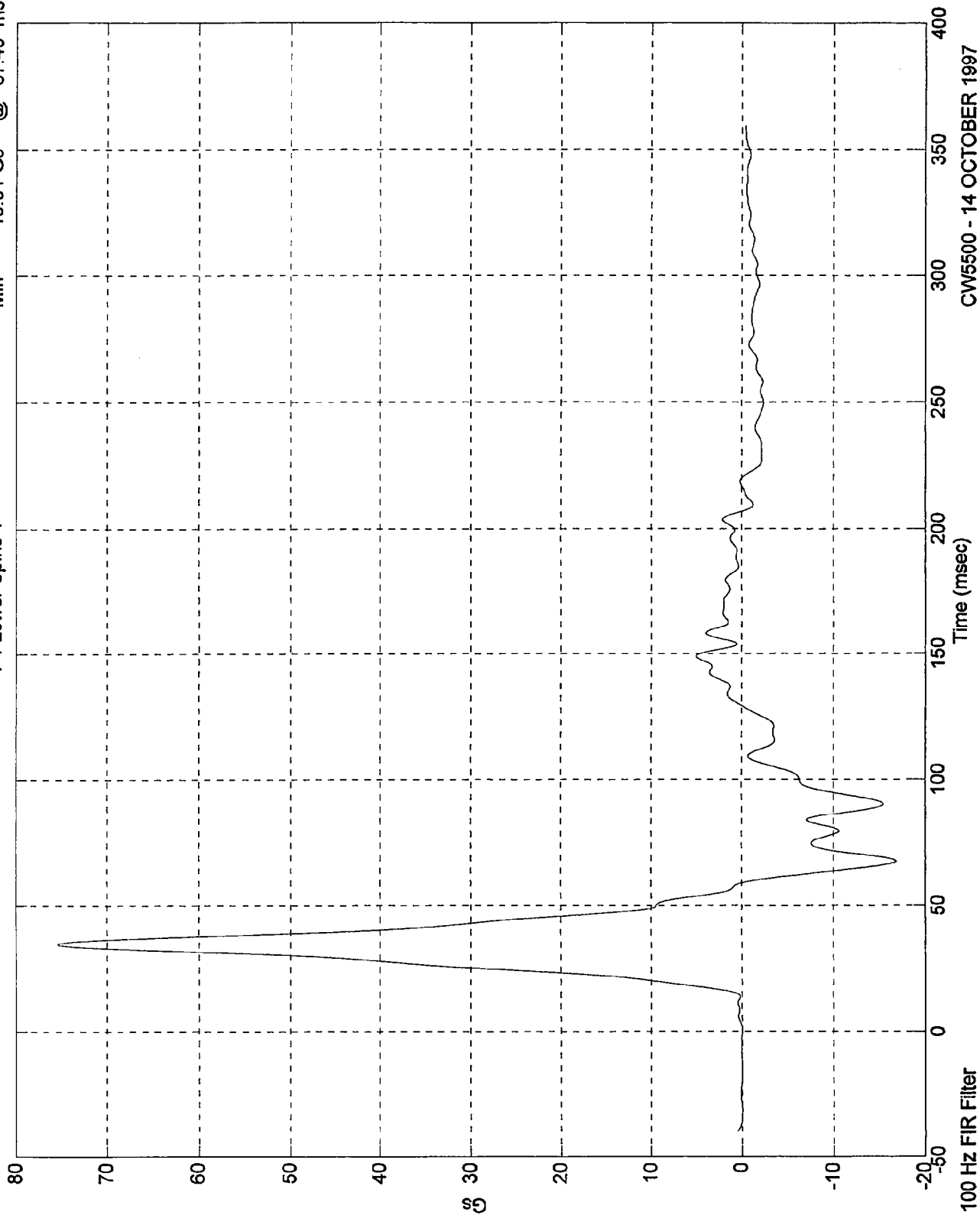
CW5500 - 14 OCTOBER 1997

100 Hz FIR Filter

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 75.31 Gs @ 34.999 msec  
 Min = -16.91 Gs @ 67.49 msec

P1 Lower Spine Y

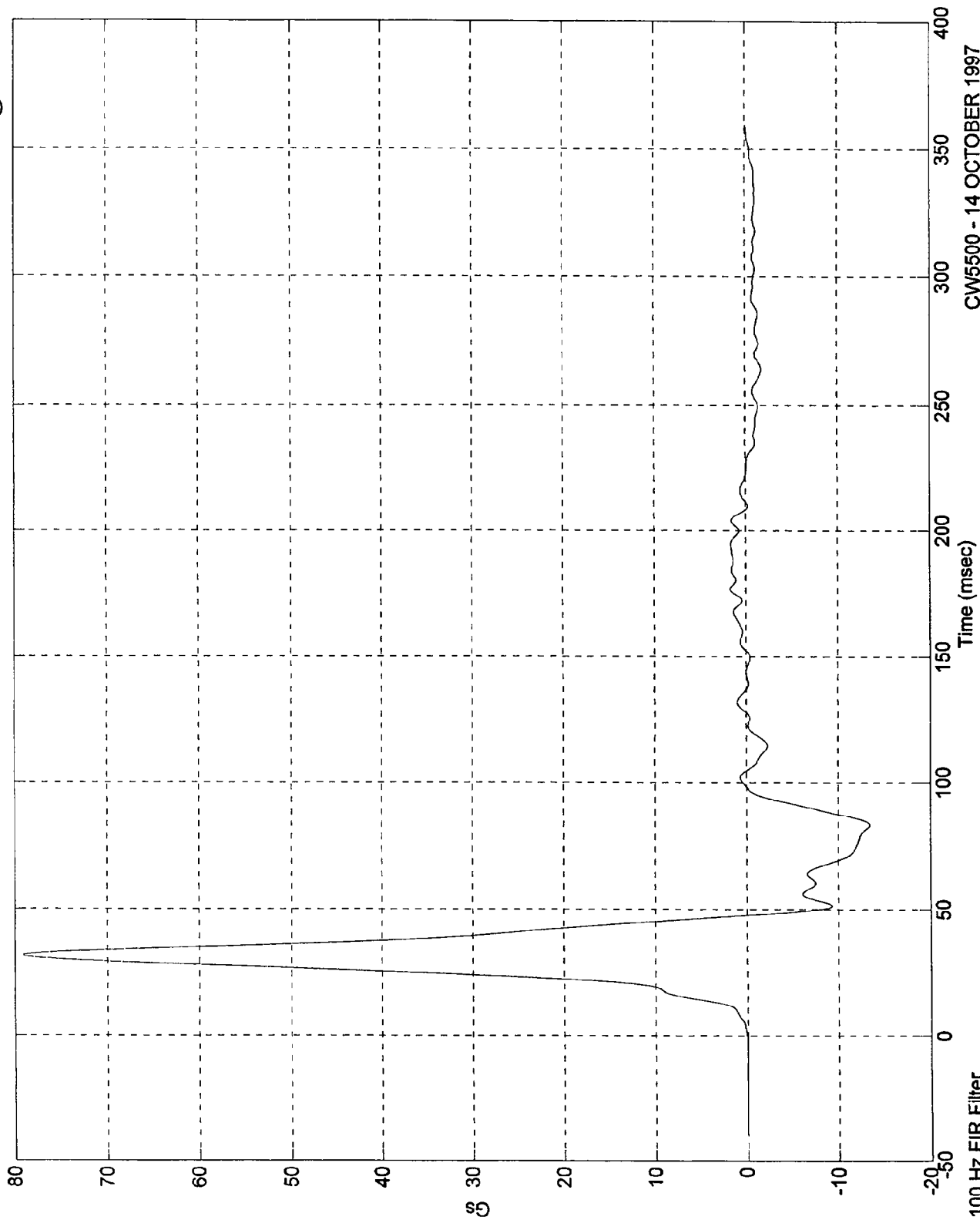


CW5500 - 14 OCTOBER 1997

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 79.07 Gs @ 31.874 msec  
 Min = -13.45 Gs @ 83.12 msec

P1 Pelvic Y



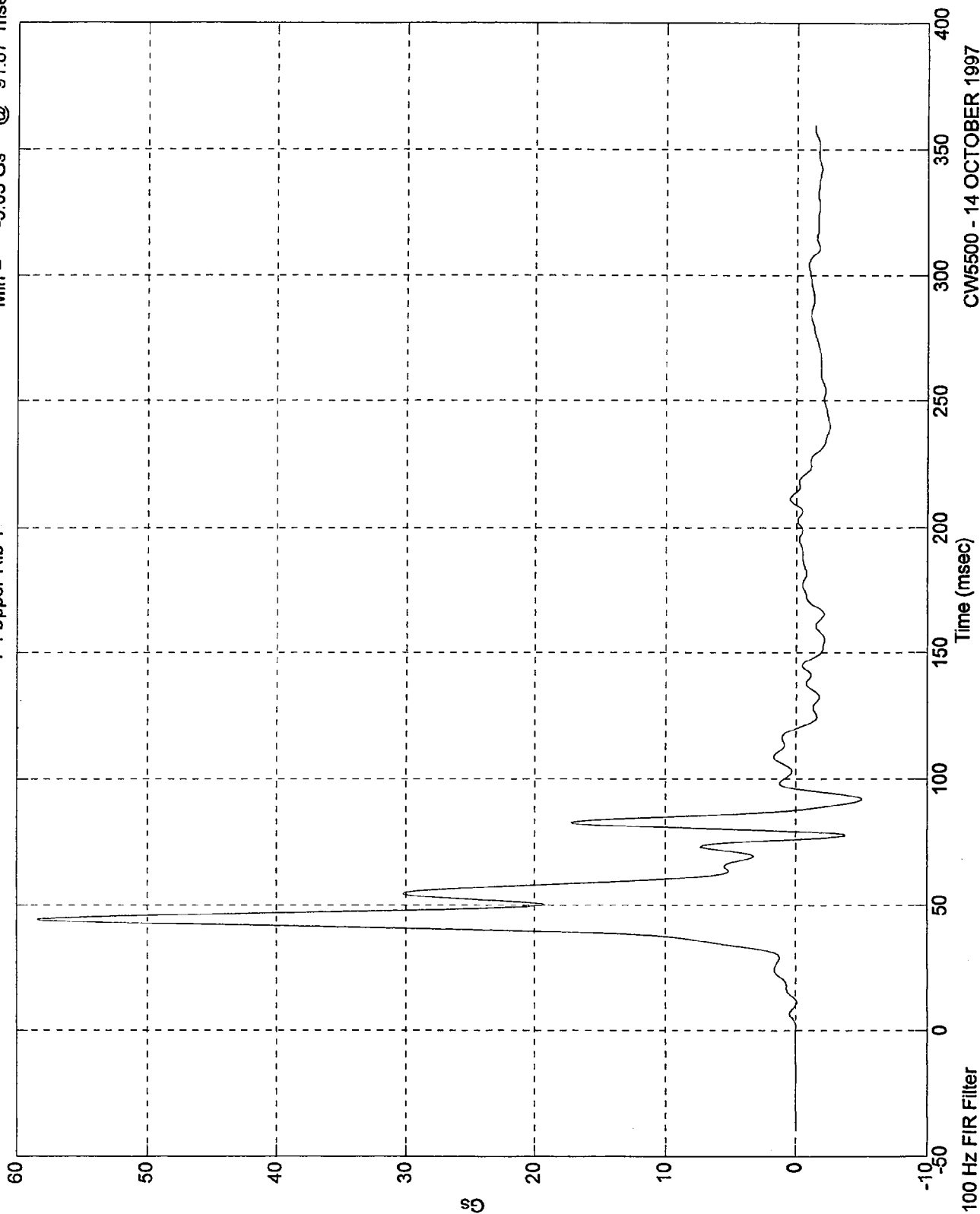
100 Hz FIR Filter

CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

P4 Upper Rib Y

Max = 58.38 Gs @ 44.374 msec  
Min = -5.03 Gs @ 91.87 msec

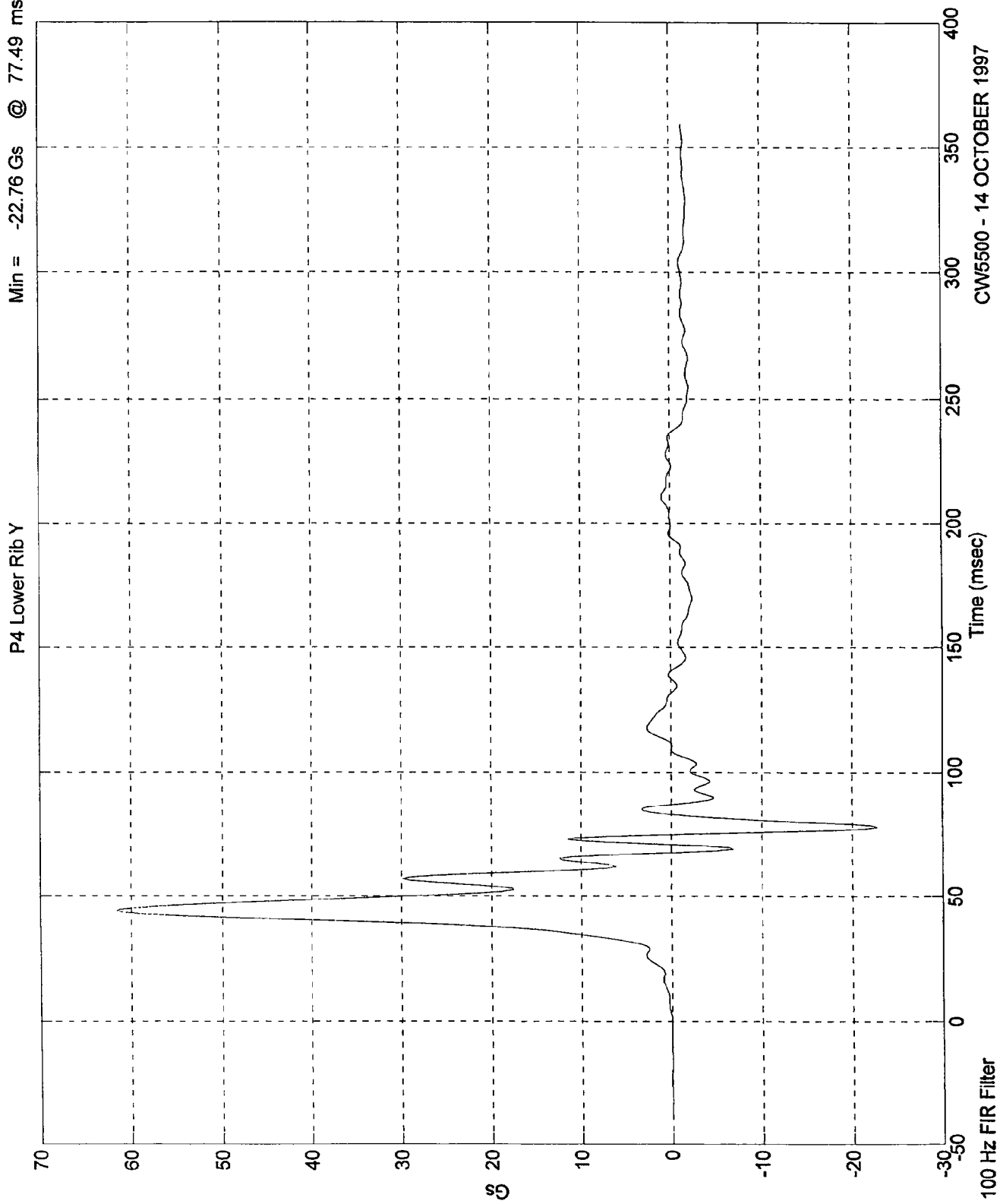


CW5500 - 14 OCTOBER 1997



NHTSA Side Impact - 1998 Subaru Legacy

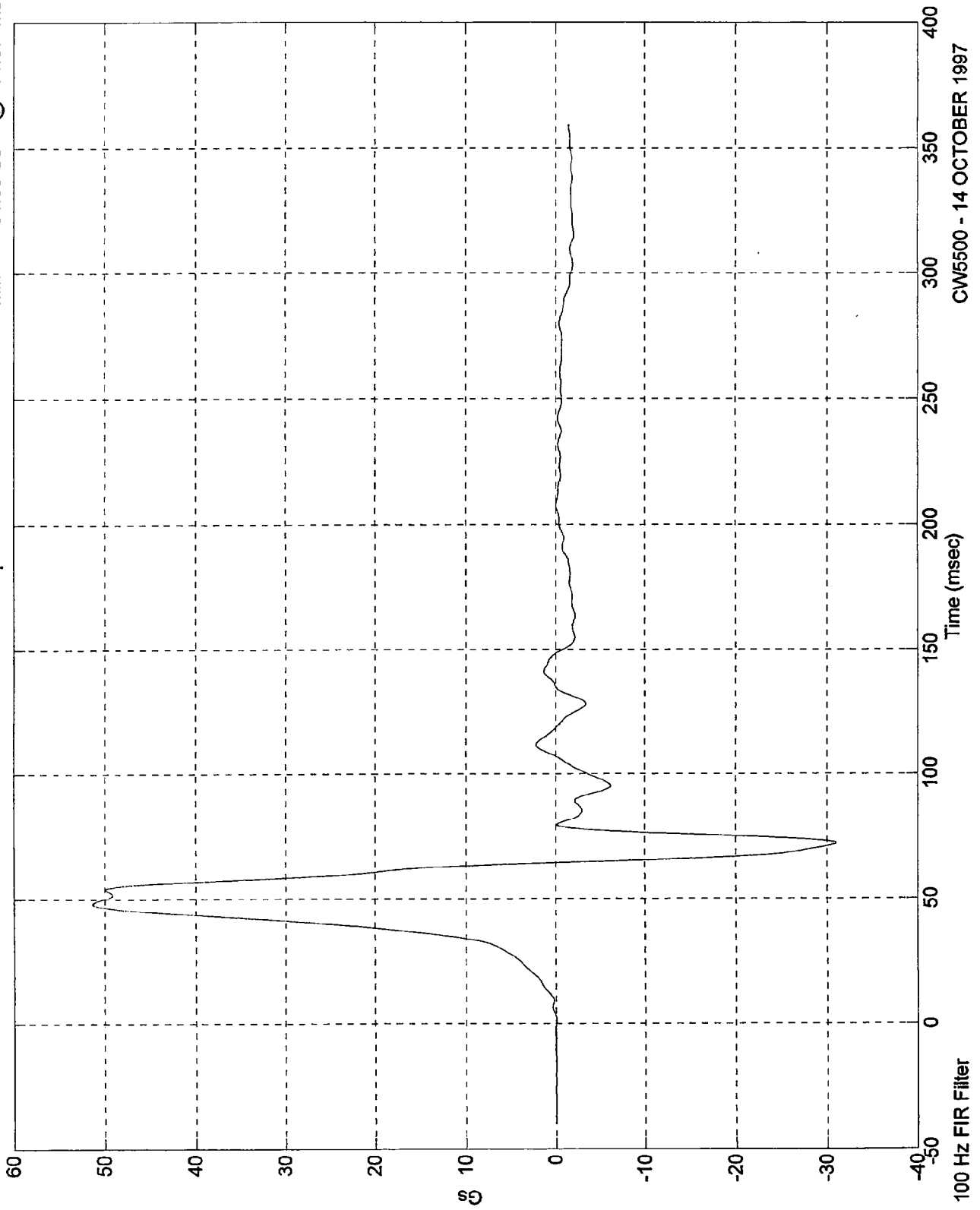
Max = 61.62 Gs @ 43.749 msec  
Min = -22.76 Gs @ 77.49 msec



NHTSA Side Impact - 1998 Subaru Legacy

Max = 51.39 Gs @ 48.124 msec  
Min = -31.06 Gs @ 71.87 msec

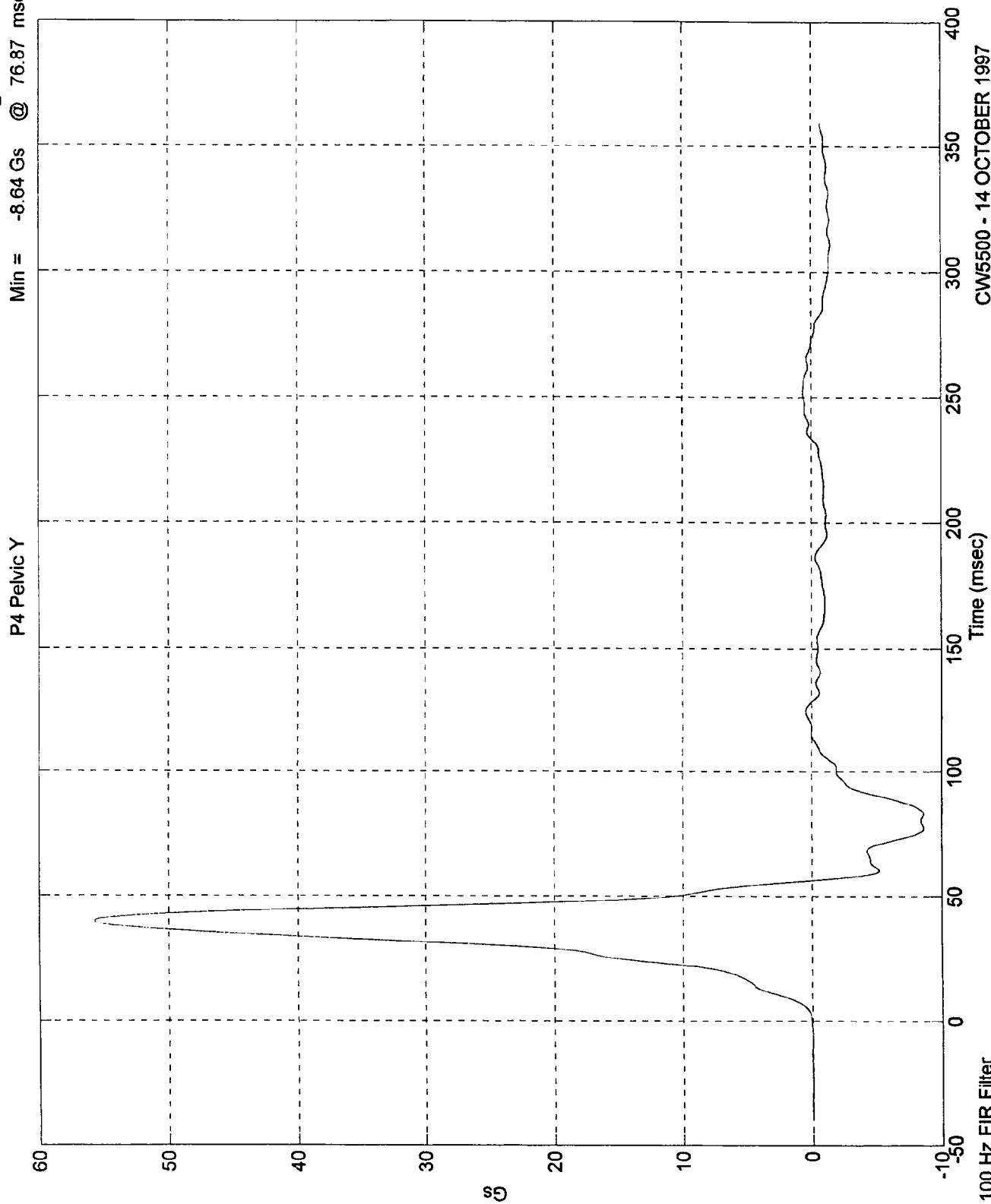
P4 Lower Spine Y



CW5500 - 14 OCTOBER 1997

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 55.71 Gs @ 39.999 msec  
 Min = -8.64 Gs @ 76.87 msec

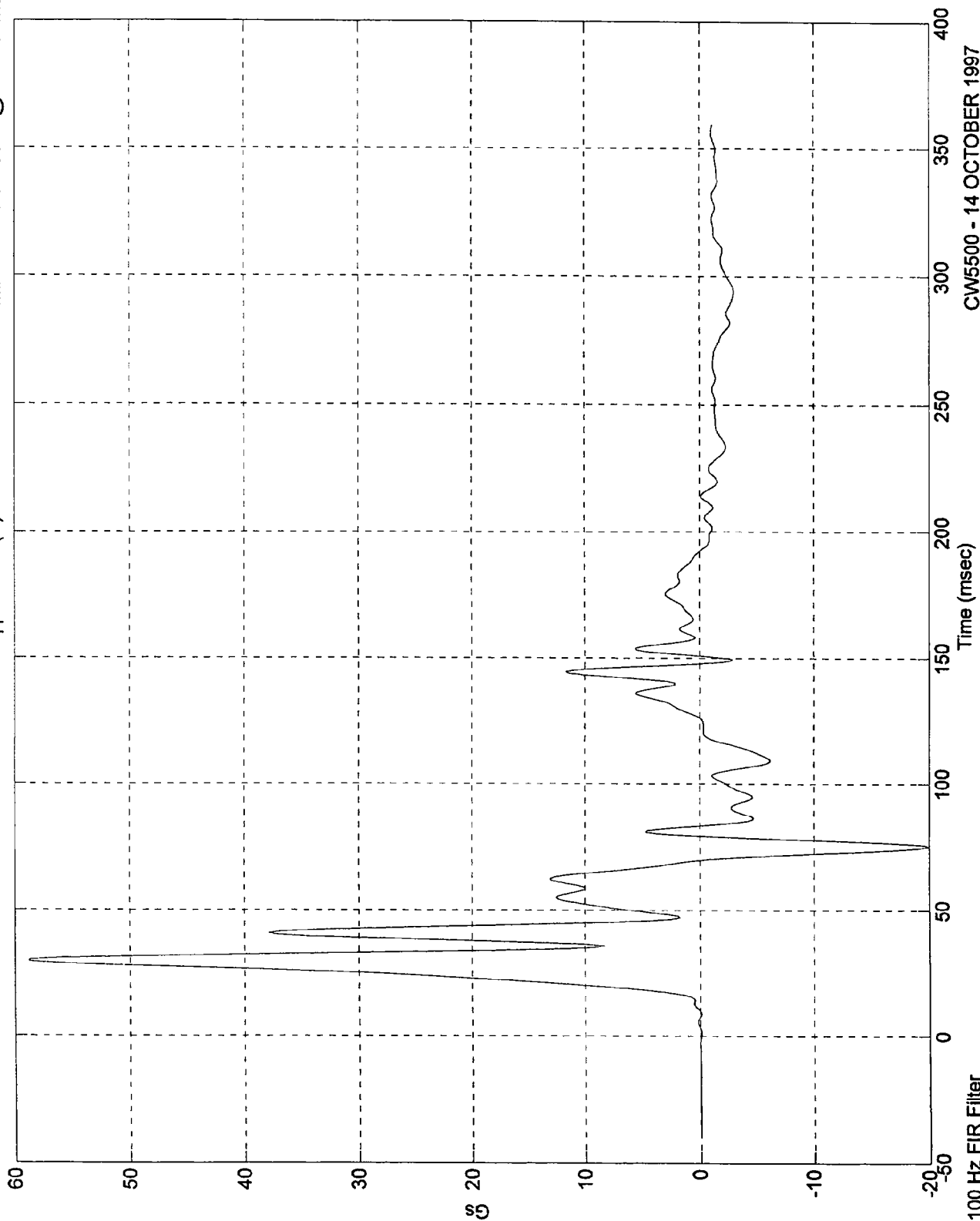


**DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (redundant)**  
**ACCELERATION DATA - FIR FILTERED**

# NHTSA Side Impact - 1998 Subaru Legacy

Max = 58.86 Gs @ 29.374 msec  
 Min = -19.93 Gs @ 74.99 msec

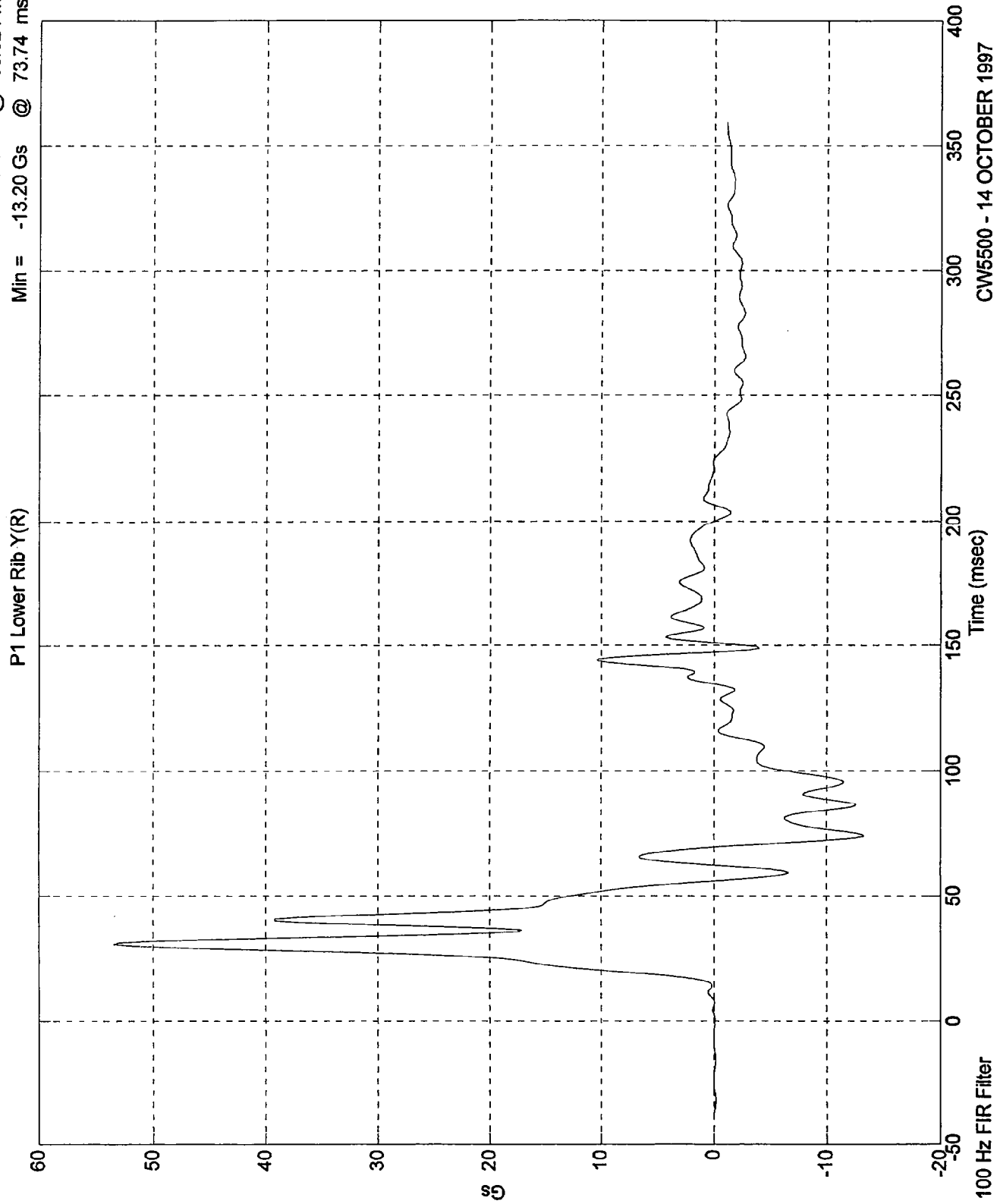
P1 Upper Rib Y(R)



CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

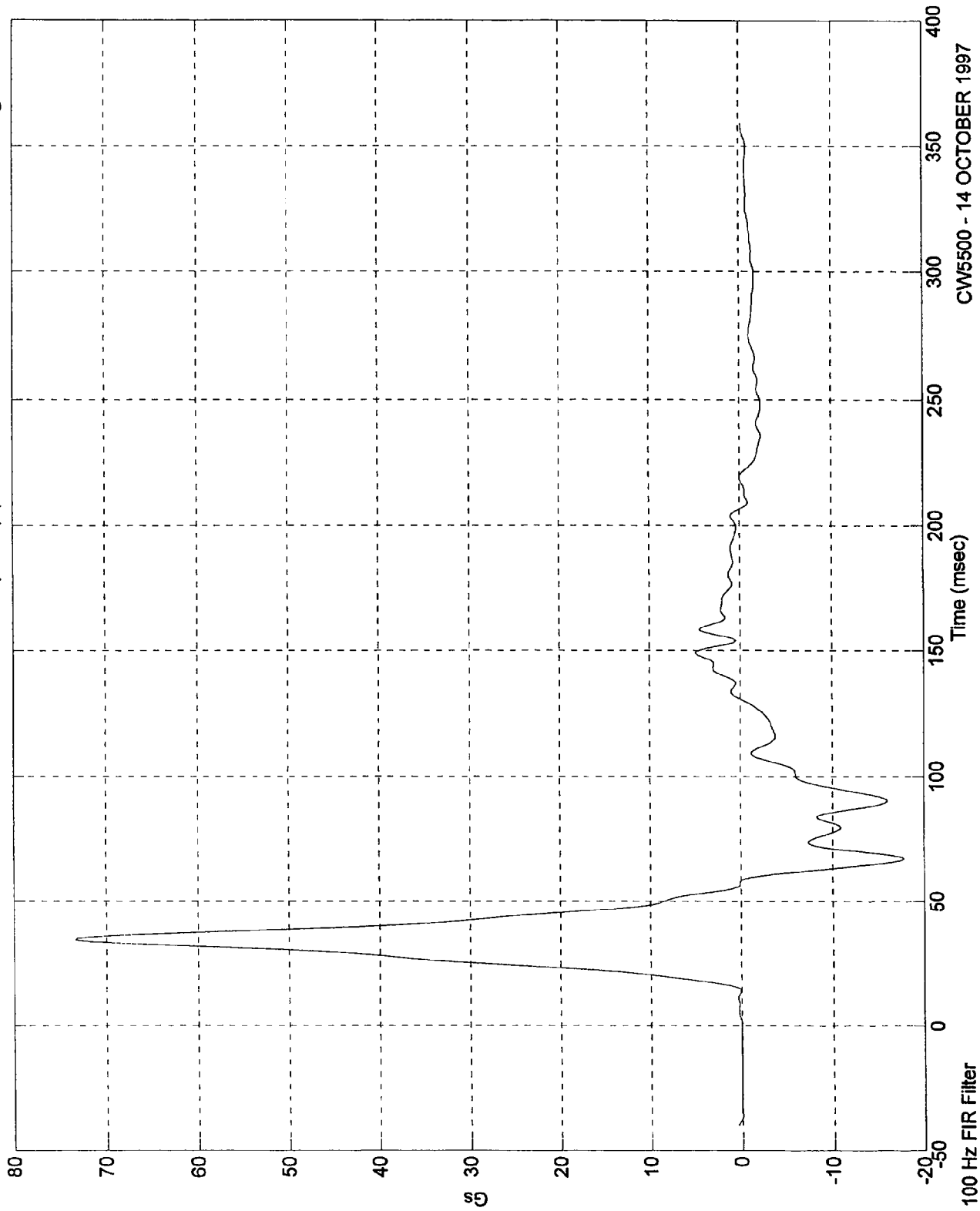
Max = 53.48 Gs @ 30.624 msec  
Min = -13.20 Gs @ 73.74 msec



NHTSA Side Impact - 1998 Subaru Legacy

Max = 73.27 Gs @ 34.374 msec  
Min = -17.80 Gs @ 66.87 msec

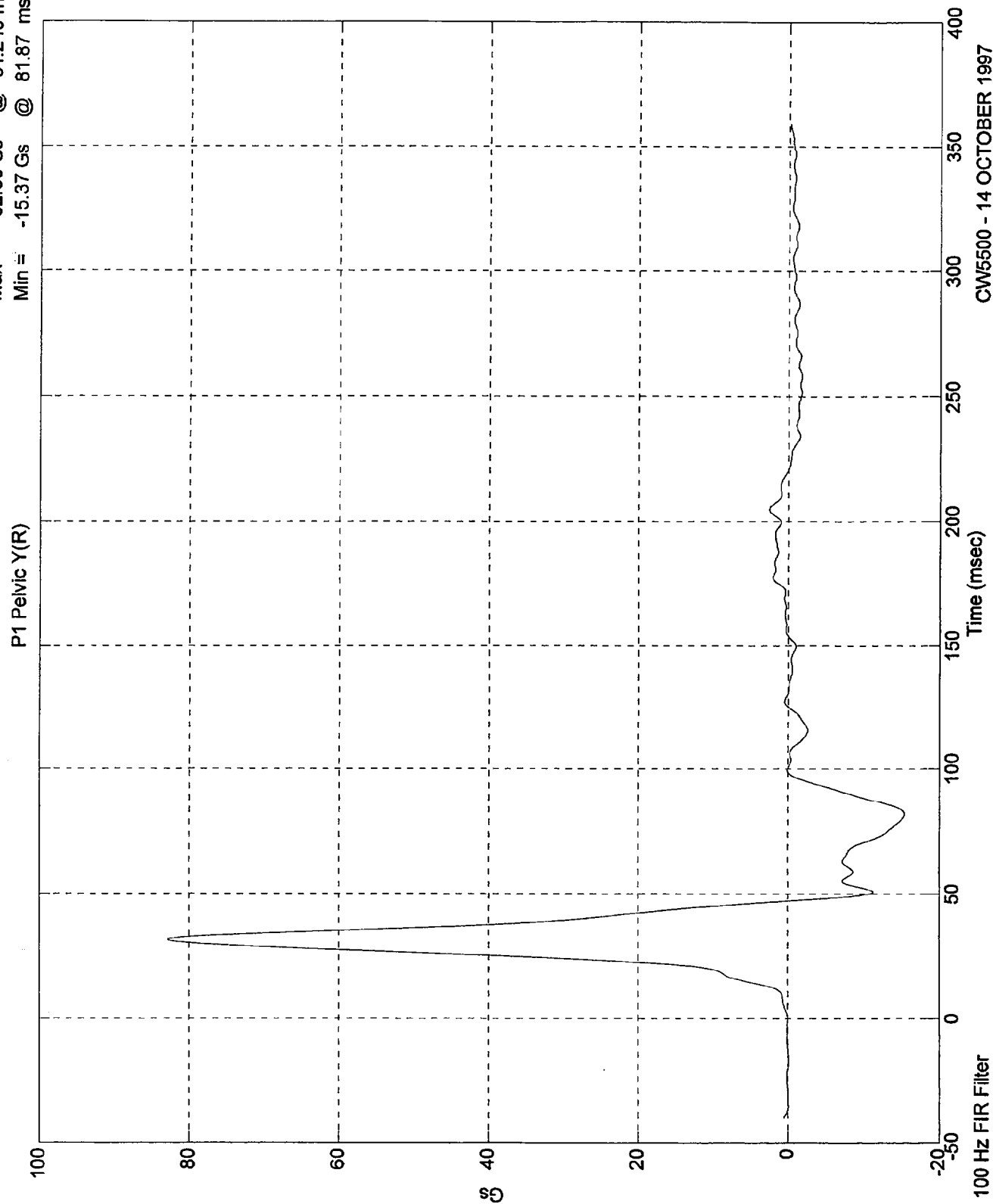
P1 Lower Spine Y(R)



CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 82.80 Gs @ 31.249 msec  
Min = -15.37 Gs @ 81.87 msec

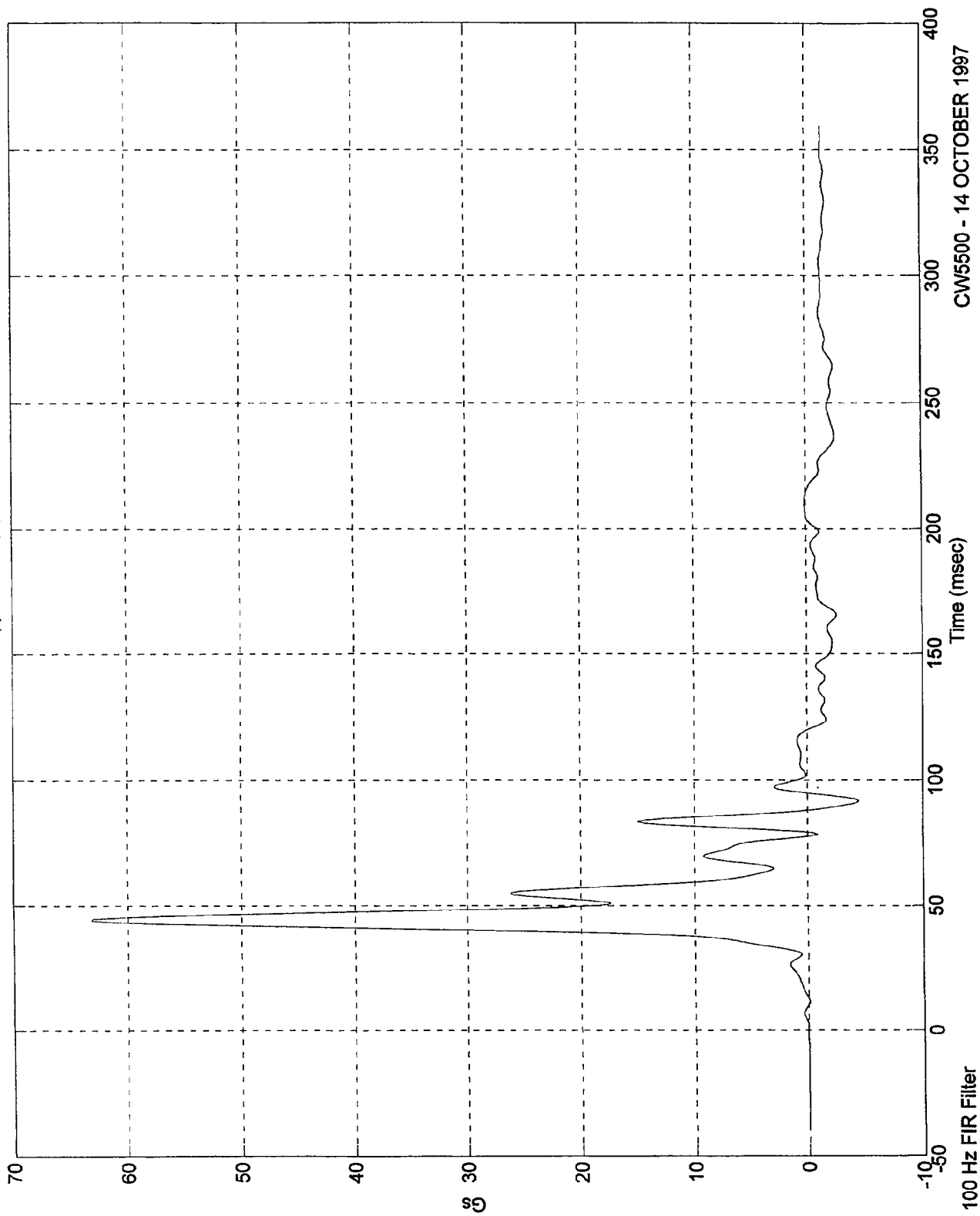




NHTSA Side Impact - 1998 Subaru Legacy

Max = 63.20 Gs @ 43.749 msec  
Min = -4.46 Gs @ 91.87 msec

P4 Upper Rib Y(R)

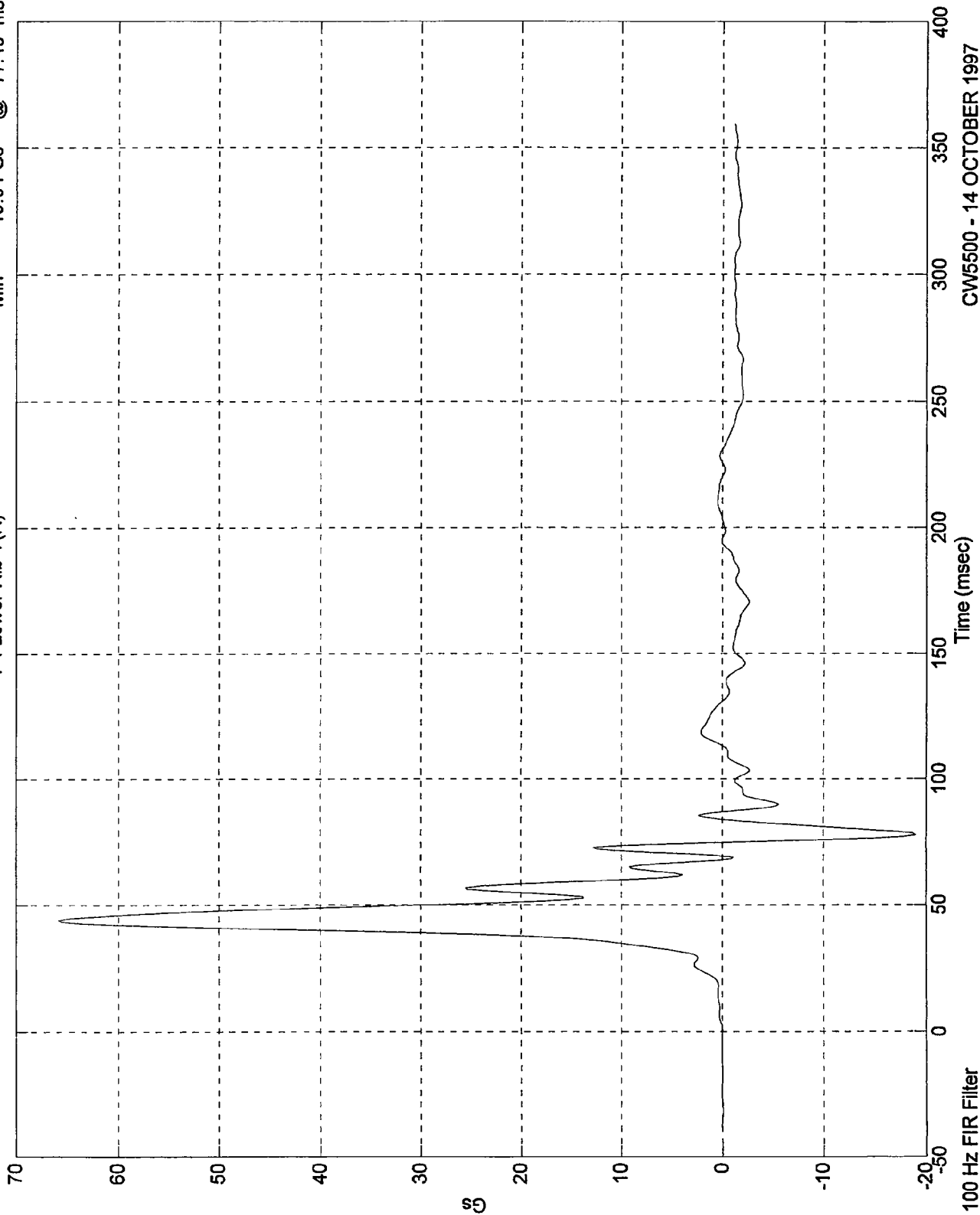


CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 65.90 Gs @ 43.749 msec  
Min = -19.04 Gs @ 77.49 msec

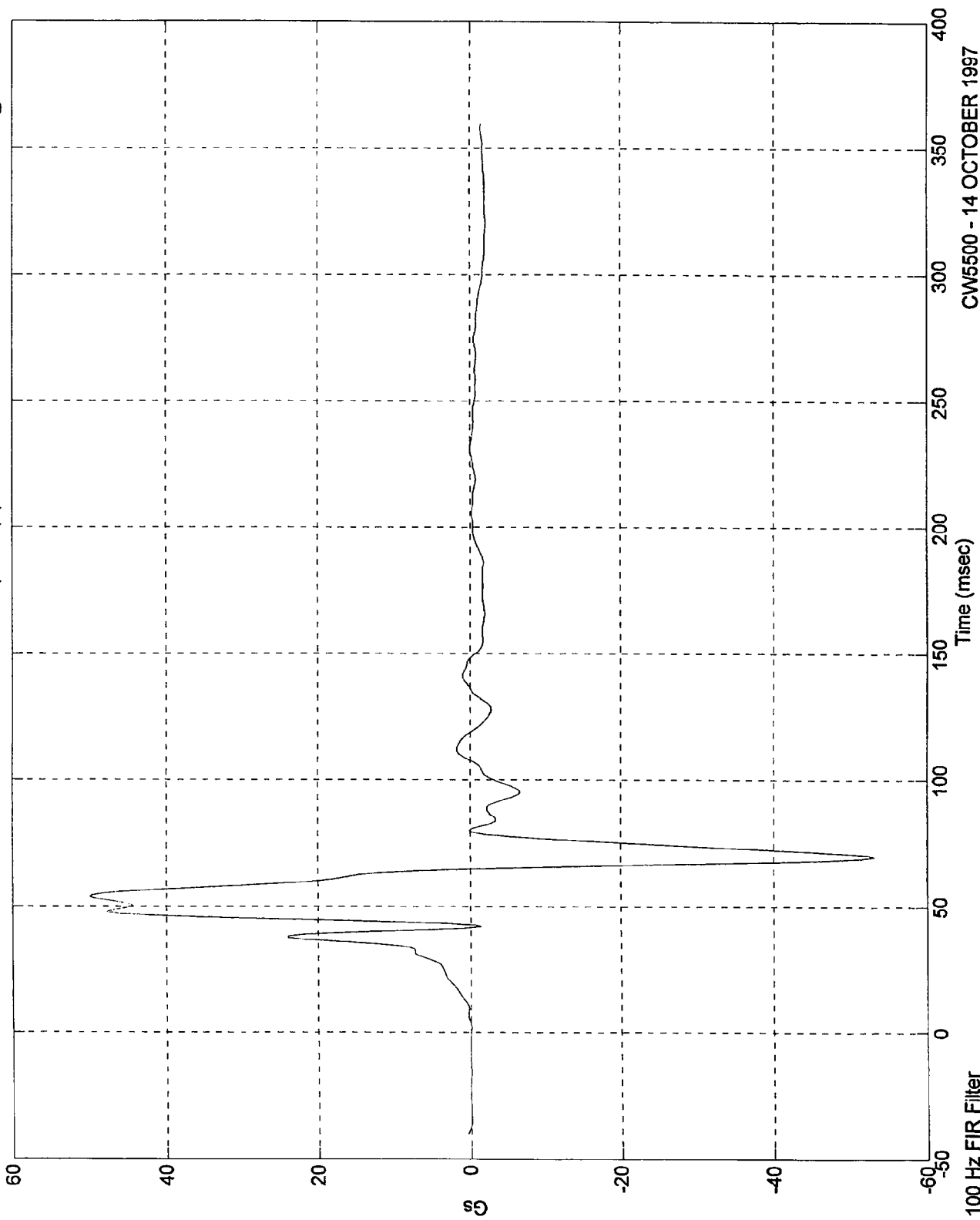
P4 Lower Rib Y(R)



NHTSA Side Impact - 1998 Subaru Legacy

Max = 49.88 Gs @ 53.749 msec  
Min = -53.11 Gs @ 69.37 msec

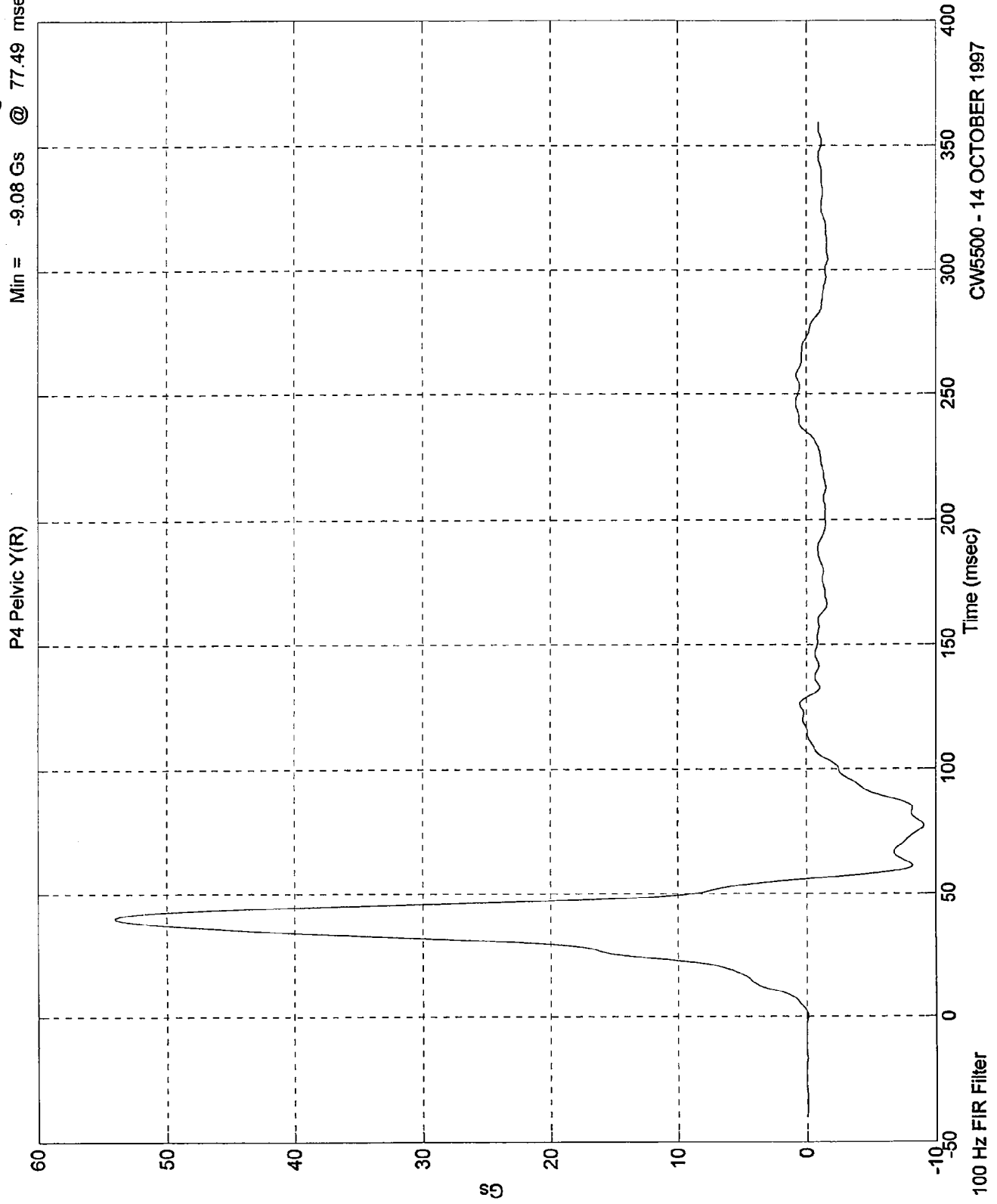
P4 Lower Spine Y(R)



CW5500 - 14 OCTOBER 1997

NHTSA Side Impact - 1998 Subaru Legacy

Max = 54.05 Gs @ 39.999 msec  
Min = -9.08 Gs @ 77.49 msec



CW5500 - 14 OCTOBER 1997

**APPENDIX C**

**SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA**

**SUMMARY**  
**SID PRE & POST TEST CALIBRATION**

**CONFIGURED FOR LEFT SIDE IMPACT**

Date: 10/10/97, 10/16/97

Calspan Sequential Test Number: 1

Laboratory Technician:

B. Swiecicki, G. Serbinowski

| TEST PARAMETER                     | SPECIFICATION | SID NO.: 268 |           | SID NO.: 027 |           |
|------------------------------------|---------------|--------------|-----------|--------------|-----------|
|                                    |               | PRE TEST     | POST TEST | PRE TEST     | POST TEST |
| SH- Seated Height (mm)             | 889 - 909     | 899          | 899       | 909          | 909       |
| RH- Rib Height (mm)                | 501 - 521     | 516          | 516       | 514          | 514       |
| HP- Hip Pivot Height (mm)          | 99 ref.       | 99           | 99        | 99           | 99        |
| RD- Rib from Back Line (mm)        | 229 - 241     | 230          | 230       | 235          | 235       |
| KV- Knee Pivot from Back Line (mm) | 511 - 526     | 521          | 521       | 514          | 514       |
| SW- Knee Pivot to Floor (mm)       | 490 - 505     | 495          | 495       | 491          | 491       |
| HW- Hip Width (mm)                 | 356 - 391     | 370          | 370       | 364          | 364       |
| <b>THORAX IMPACTS</b>              |               |              |           |              |           |
| TEMPERATURE (°C)                   | 18.9 - 25.5   | 21.7         | 21.1      | 21.7         | 21.1      |
| RELATIVE HUMIDITY (%)              | 10 - 70       | 38           | 31        | 38           | 31        |
| PROBE SPEED (m/s)                  | 4.27 - 4.33   | 4.32         | 4.31      | 4.31         | 4.32      |
| UPPER RIB (g's)                    | 37 - 46       | 40.3         | 42.4      | 40.4         | 42.1      |
| LOWER RIB (g's)                    | 37 - 46       | 39.3         | 40.2      | 42.9         | 43.2      |
| LOWER SPINE (g's)                  | 15 - 22       | 19.1         | 20.6      | 20.7         | 21.8      |
| <b>PELVIS IMPACT</b>               |               |              |           |              |           |
| TEMPERATURE (°C)                   | 18.9 - 25.5   | 21.7         | 21.1      | 21.7         | 21.1      |
| RELATIVE HUMIDITY (%)              | 10 - 70       | 38           | 31        | 38           | 31        |
| PROBE SPEED (m/s)                  | 4.27 - 4.33   | 4.31         | 4.30      | 4.30         | 4.32      |
| PELVIS (g's)                       | 40 - 60       | 56.1         | 41.7      | 51.8         | 50.9      |

REMARKS: None

**CALIBRATION TEST RESULTS  
PRE-TEST**

**SID NO.: 268**

**CONFIGURED FOR LEFT SIDE IMPACT**

# CALIBRATION TEST RESULTS SUMMARY

## CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268  
Date: 10/10/97

Calspan Sequential Test Number: 1  
Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST                         | COMMENTS                 |
|------------------------------|--------------------------|
| EXTERNAL DIMENSIONS          | Passed all requirements. |
| THORACIC SHOCK ABSORBER TEST | Passed all requirements. |
| LATERAL THORAX IMPACT TEST   | Passed all requirements. |
| LATERAL PELVIS IMPACT TEST   | Passed all requirements. |
| ABDOMINAL COMPRESSION TEST*  | Passed all requirements. |
| LUMBAR FLEXION TEST*         | Passed all requirements. |

\* Test not required for SID certification.

REMARKS: None



# EXTERNAL DIMENSIONS

## CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268  
Date: 10/09/97

Calspan Sequential Test Number: 1  
Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER                     | SPECIFICATION | TEST RESULTS |
|------------------------------------|---------------|--------------|
| SH- Seated Height (mm)             | 889 - 909     | 899          |
| RH- Rib Height (mm)                | 502 - 520     | 516          |
| HP- Hip Pivot Height (mm)          | 99 ref.       | 99           |
| RD- Rib from Back Line (mm)        | 229 - 241     | 230          |
| KH- Knee Pivot from Back Line (mm) | 511 - 526     | 521          |
| KV- Knee Pivot to Floor (mm)       | 490 - 505     | 495          |
| HW- Hip Width (mm)                 | 356 - 391     | 370          |

REMARKS: None

# THORACIC SHOCK ABSORBER TESTS

## CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268  
Date: 10/09/97

Calspan Sequential Test Number: 1  
Laboratory Technician: B. Swiecicki, G. Serbinowski

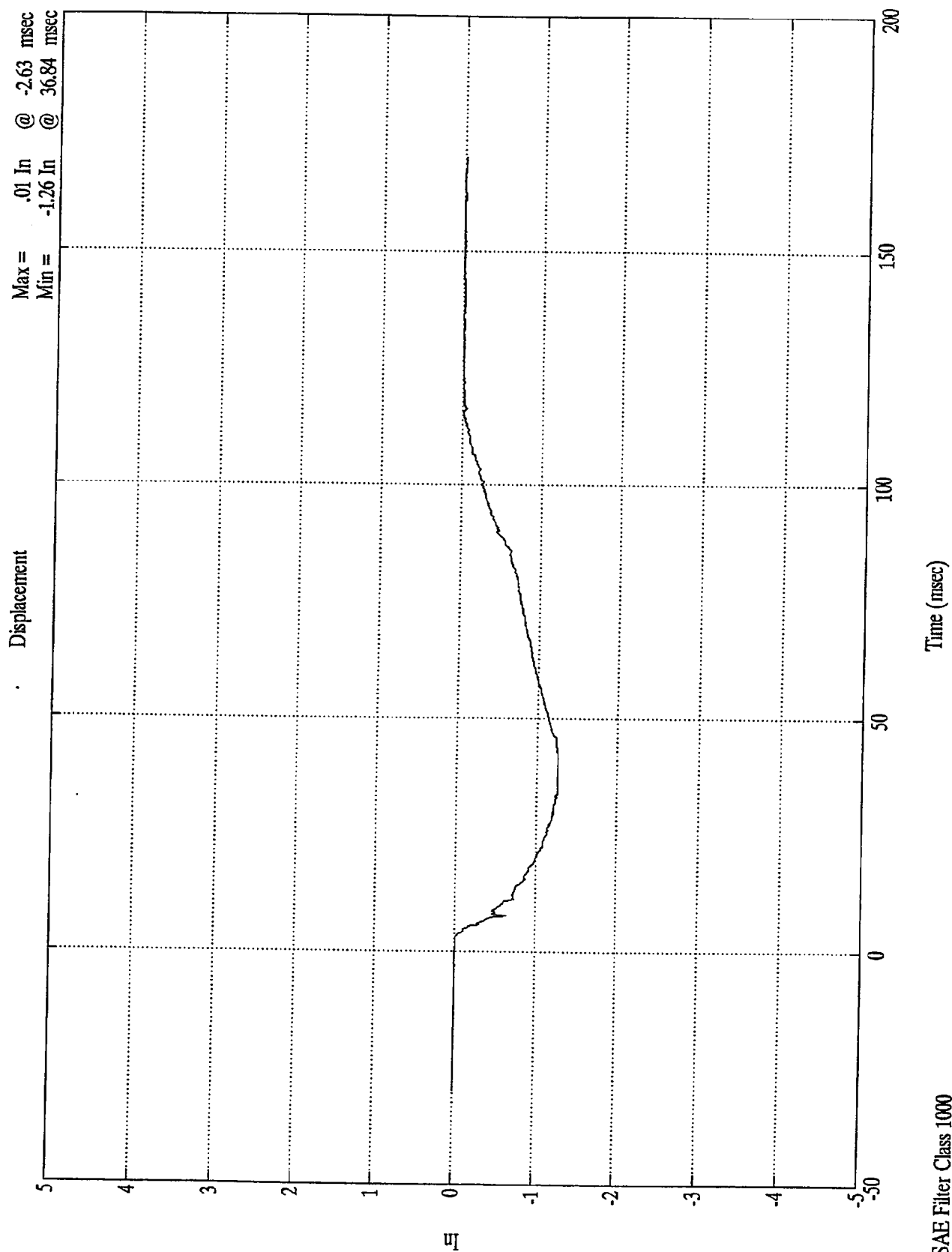
DAMPER IDENTIFICATION: 268

| TEST PARAMETER        |                   | SPECIFICATION | TEST RESULTS |
|-----------------------|-------------------|---------------|--------------|
| TEMPERATURE (°C)      |                   | 18.9 - 25.5   | 21.7         |
| RELATIVE HUMIDITY (%) |                   | 10 - 70       | 38           |
| VELOCITY<br>3.05 m/s  | FORCE (N)         | 836 - 1125    | 928          |
|                       | DISPLACEMENT (mm) | 30 - 35       | 32           |
| VELOCITY<br>4.27 m/s  | FORCE (N)         | 1730 - 2099   | 1898         |
|                       | DISPLACEMENT (mm) | 32 - 37       | 32           |
| VELOCITY<br>6.10 m/s  | FORCE (N)         | 3741 - 4448   | 3963         |
|                       | DISPLACEMENT (mm) | 33 - 40       | 36           |

DAMPER SETTING: 5

REMARKS: None

SID Shock Absorber Impact Test 268 @ 9.95 fps

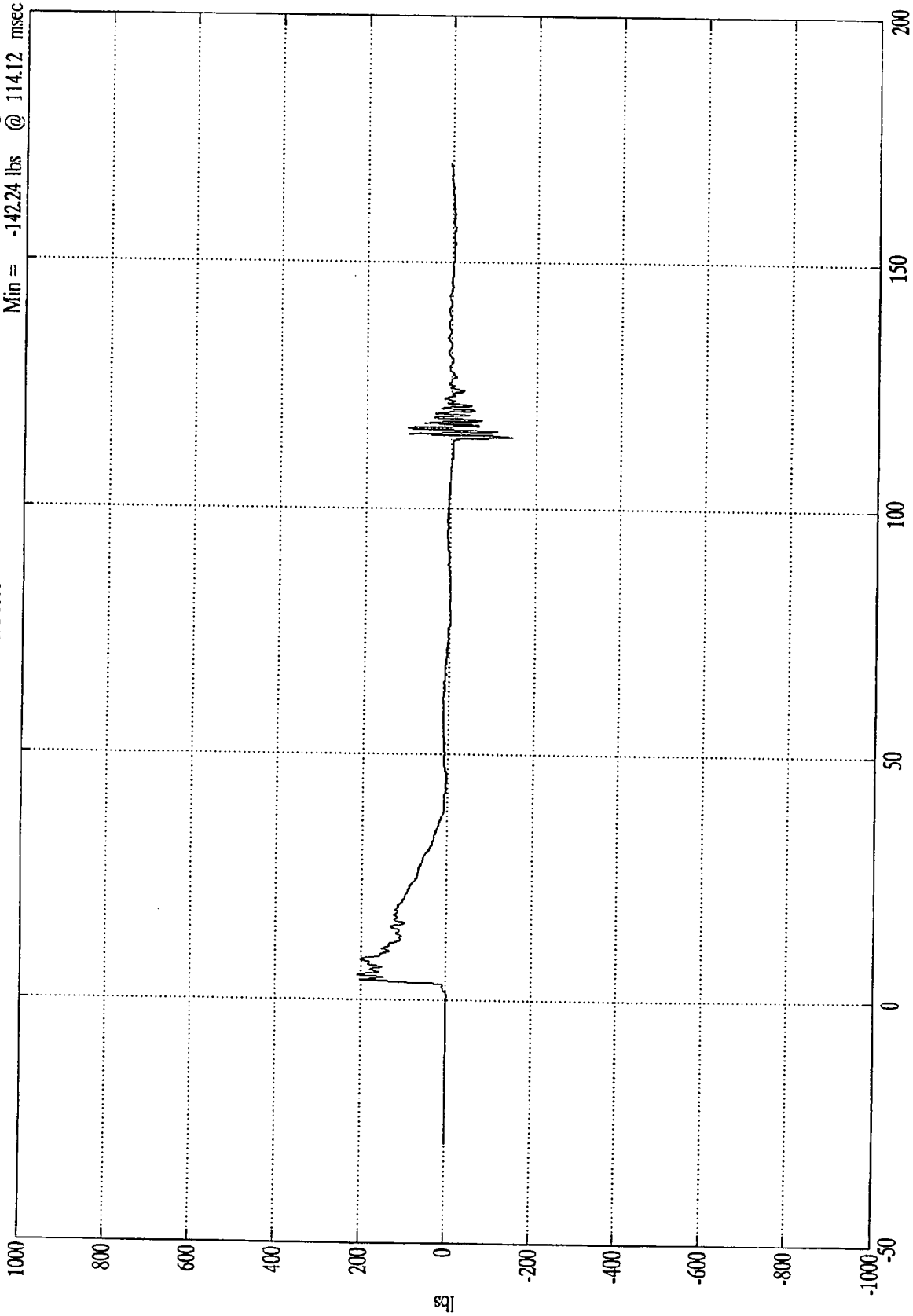


SAE Filter Class 1000

SID Shock Absorber Impact Test 268 @ 9.95 fps

Max = 208.52 lbs @ 5.16 msec  
Min = -142.24 lbs @ 114.12 msec

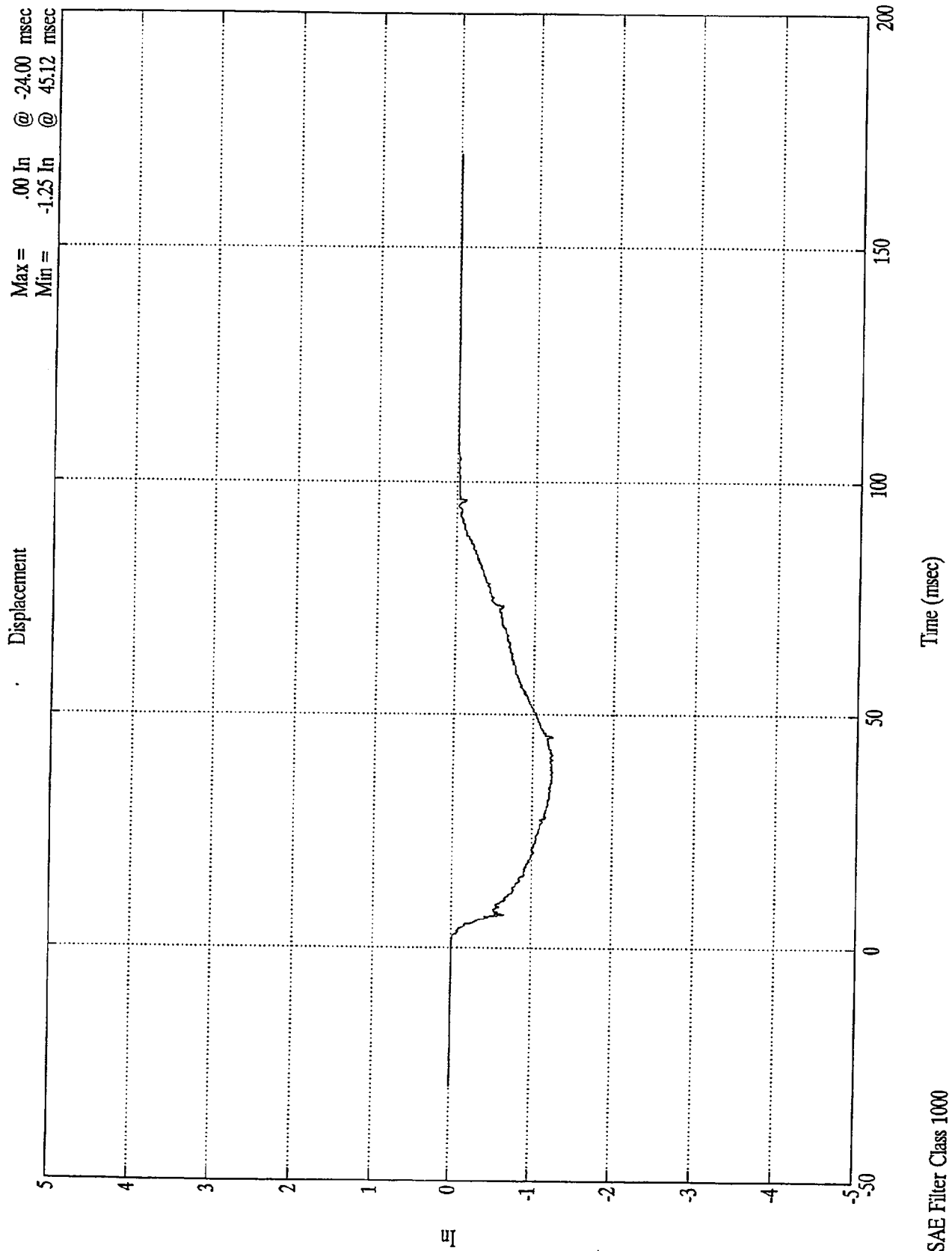
Shock Force



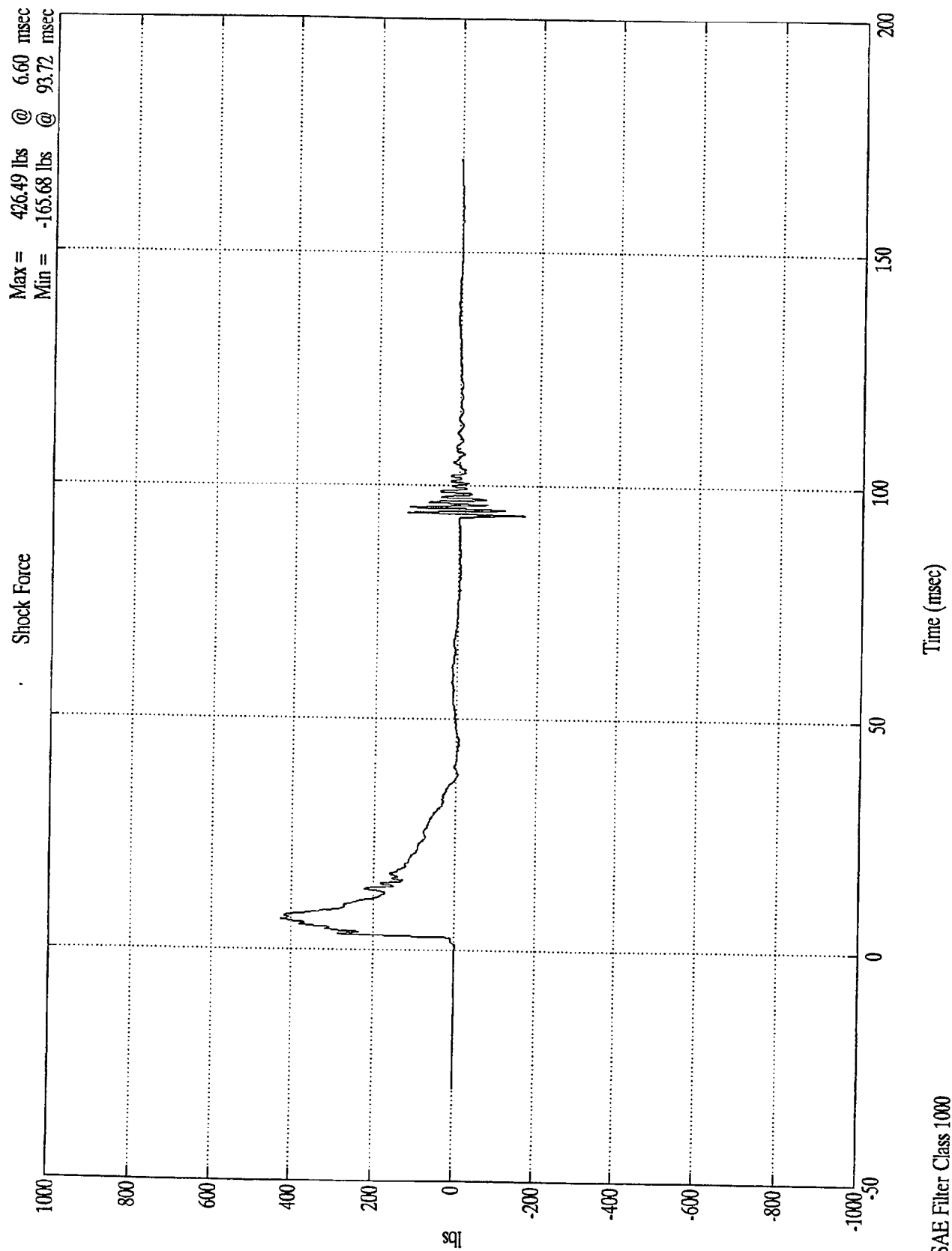
Time (msec)

SAE Filter Class 1000

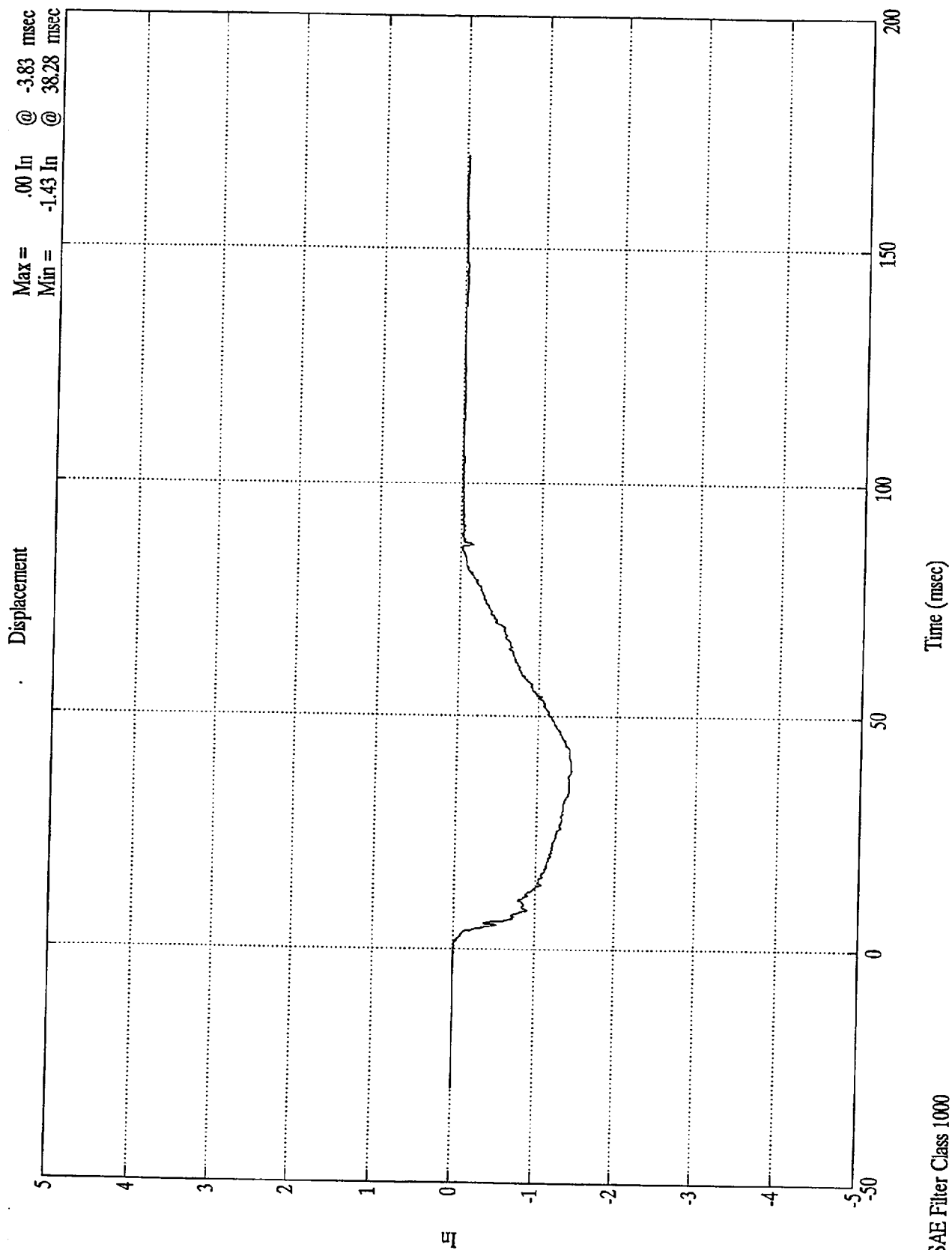
SID Shock Absorber Impact Test 268 @ 14.04 fps



STD Shock Absorber Impact Test 268 @ 14.04 fps



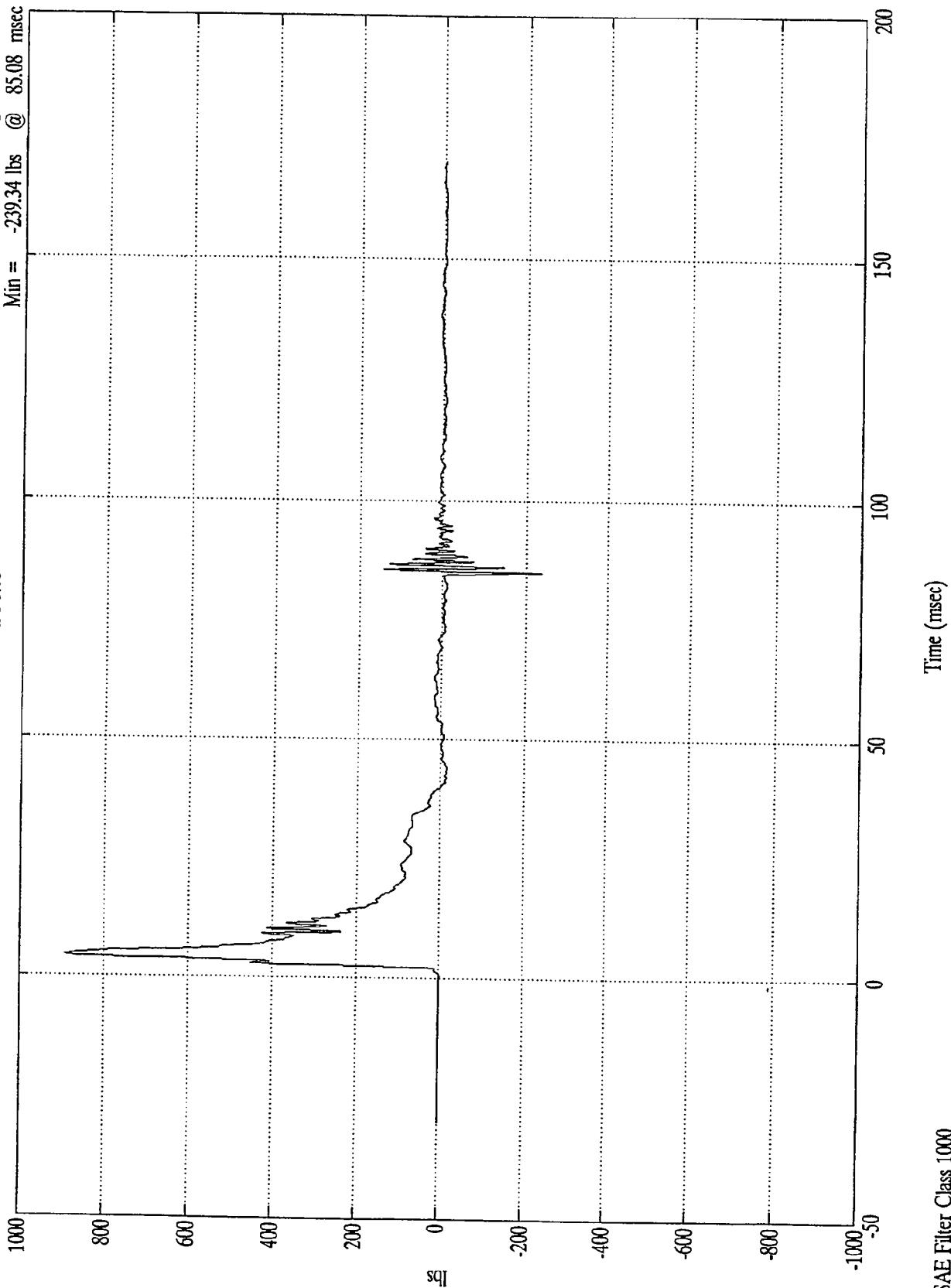
SID Shock Absorber Impact Test 268 @ 19.95 fps



SID Shock Absorber Impact Test 268 @ 19.95 fps

Max = 890.56 lbs @ 4.44 msec  
Min = -239.34 lbs @ 85.08 msec

Shock Force



SAE Filter Class 1000



# LATERAL THORAX IMPACT TEST

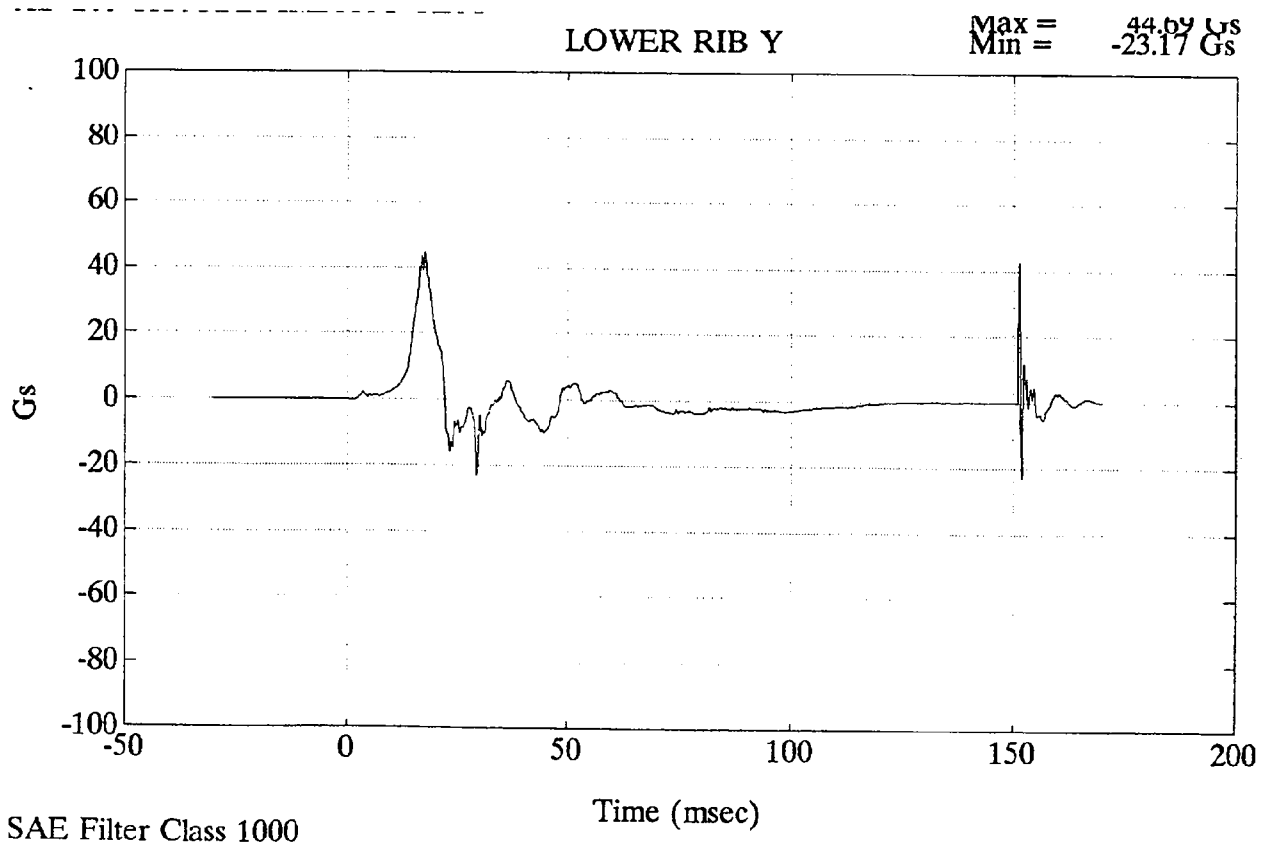
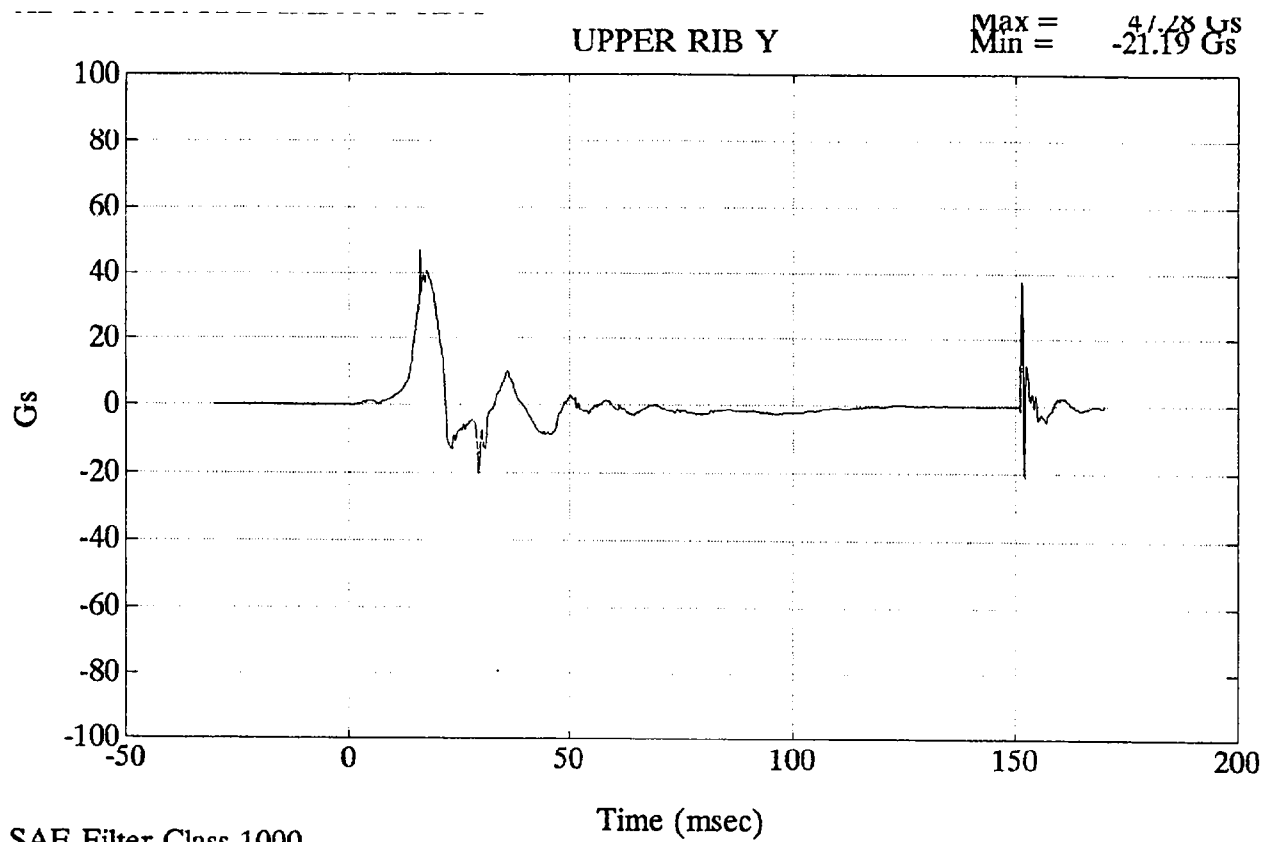
## CONFIGURED FOR LEFT SIDE IMPACT

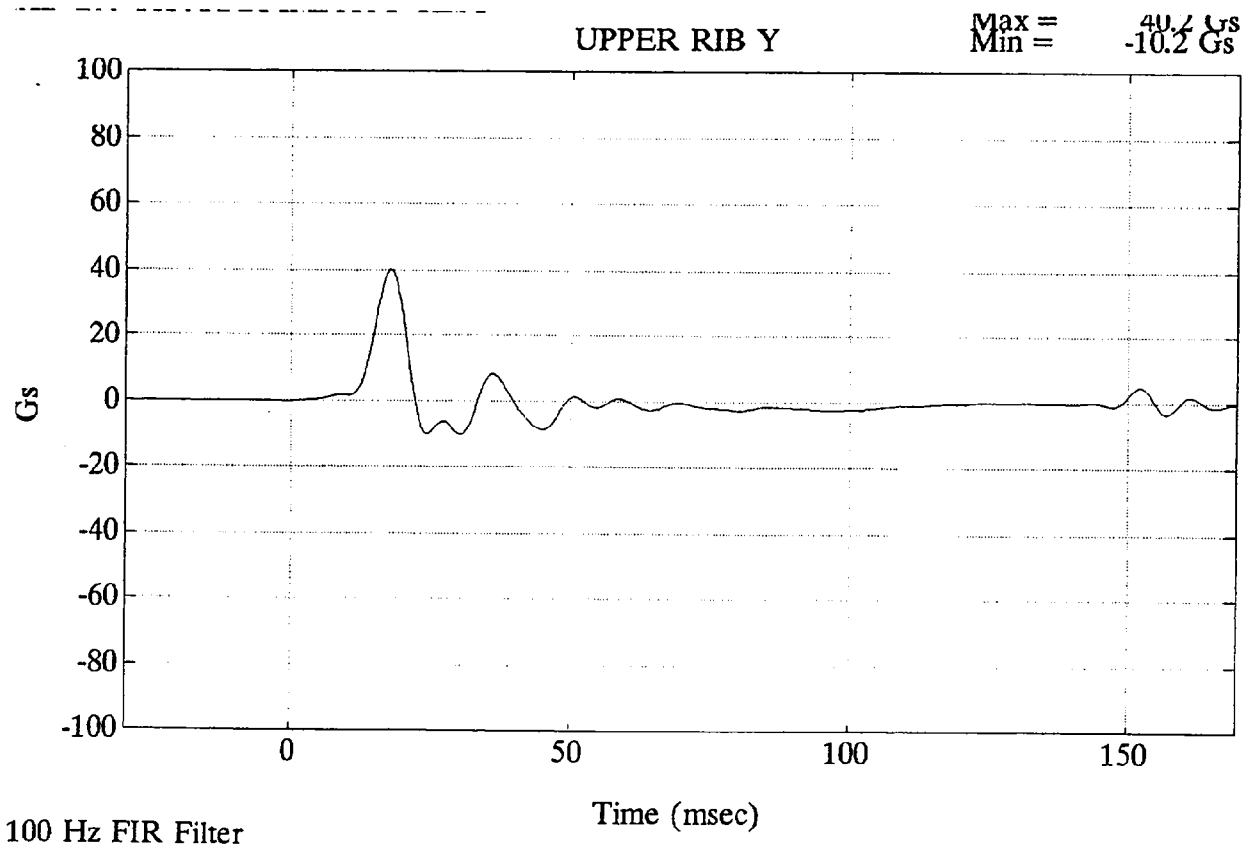
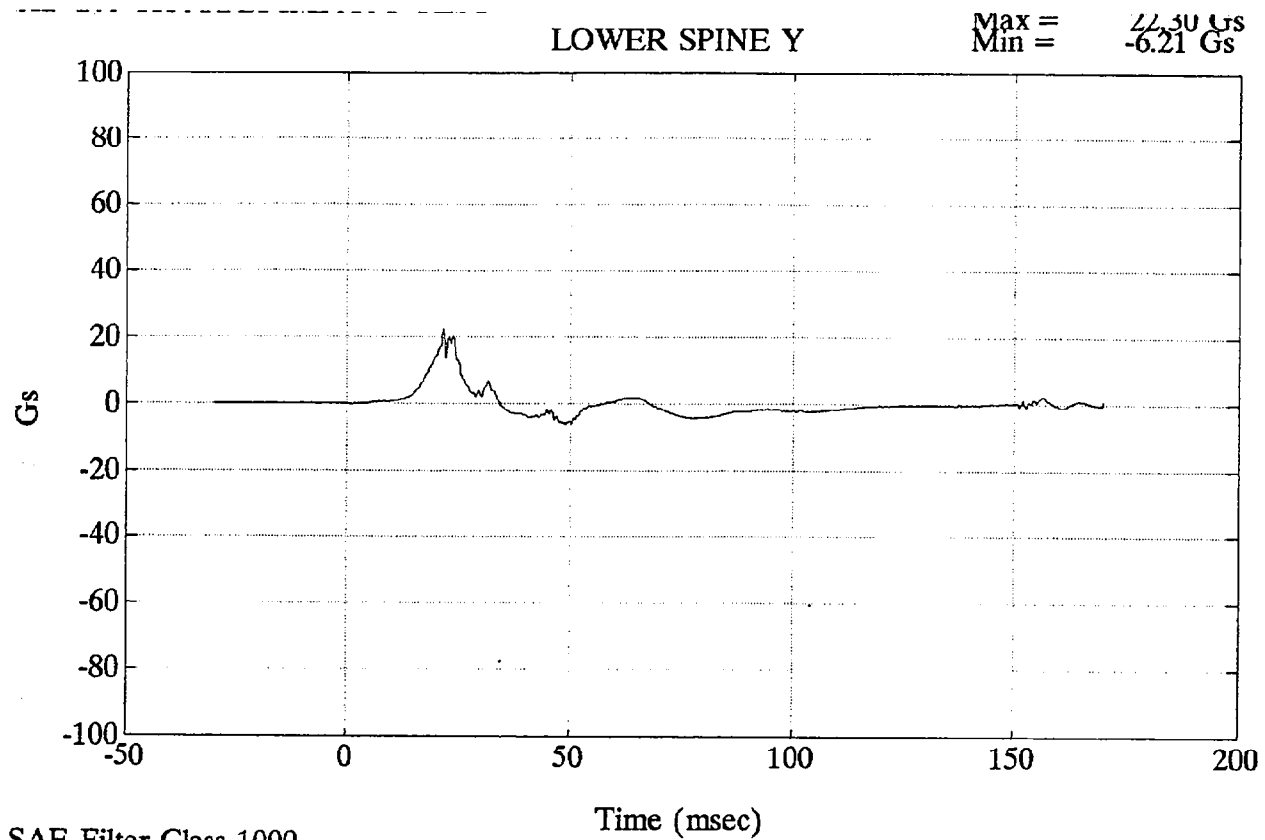
SID Serial No.: 268  
Date: 10/09/97

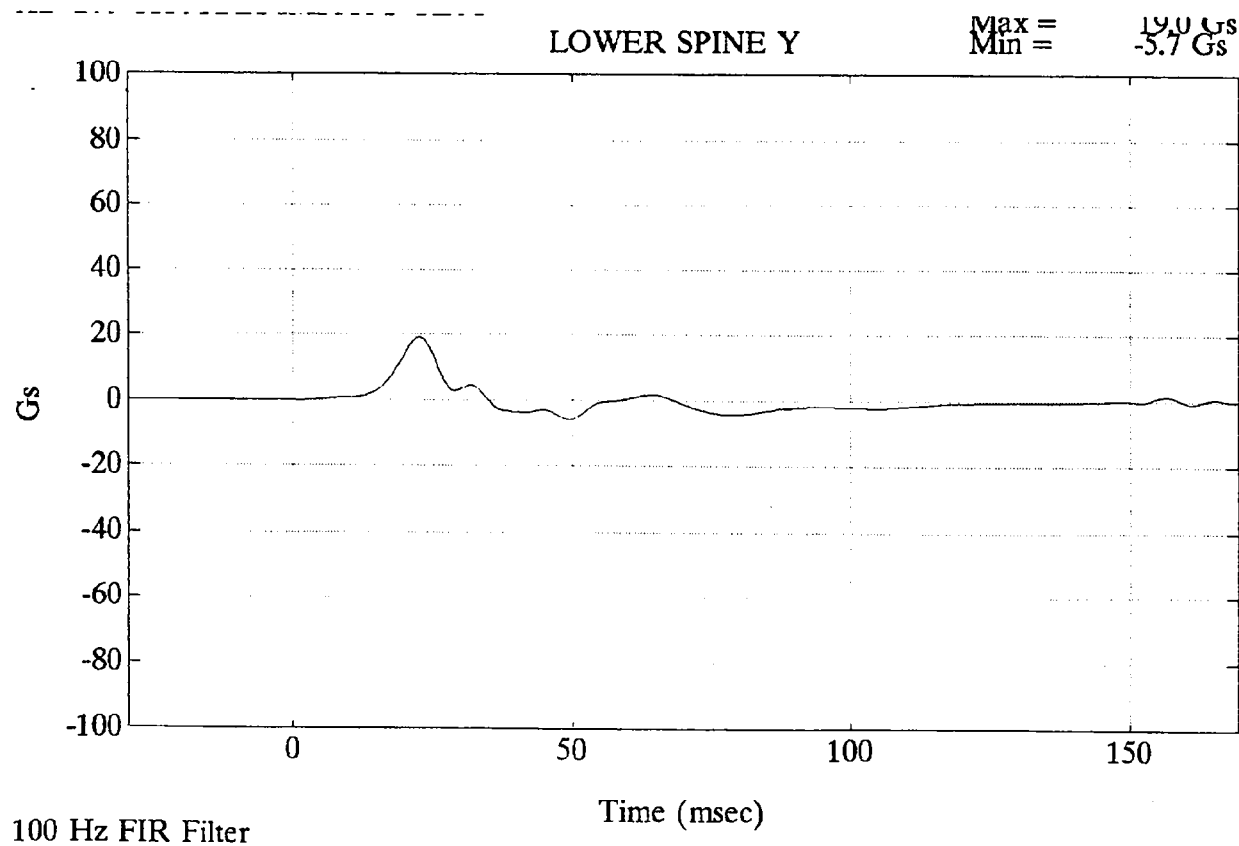
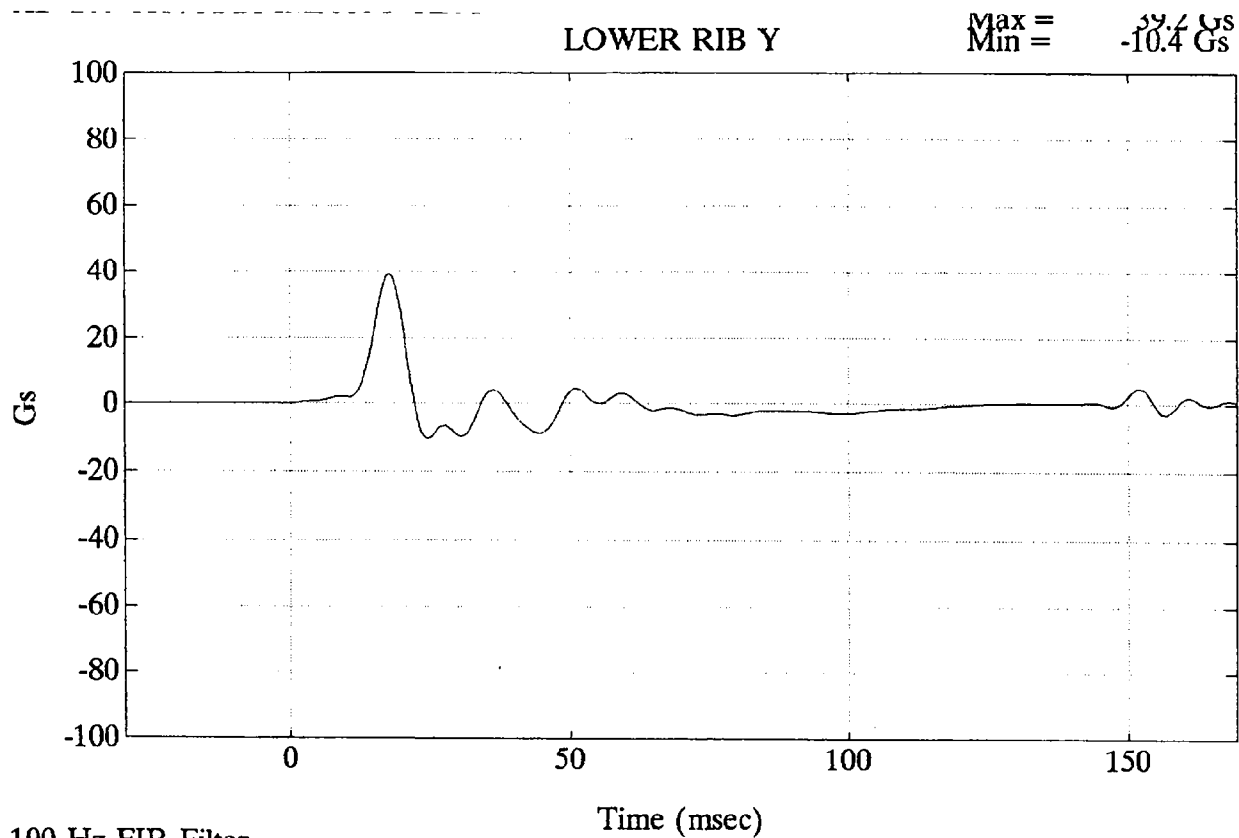
Calspan Sequential Test Number: 1  
Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.7         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 38           |
| PROBE SPEED (m/s)     | 4.27 - 4.33   | 4.32         |
| UPPER RIB (g's)       | 37 - 46       | 40.3         |
| LOWER RIB (g's)       | 37 - 46       | 39.3         |
| LOWER SPINE (g's)     | 15 - 22       | 19.1         |

REMARKS: None







# LATERAL PELVIS IMPACT TEST

## CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268

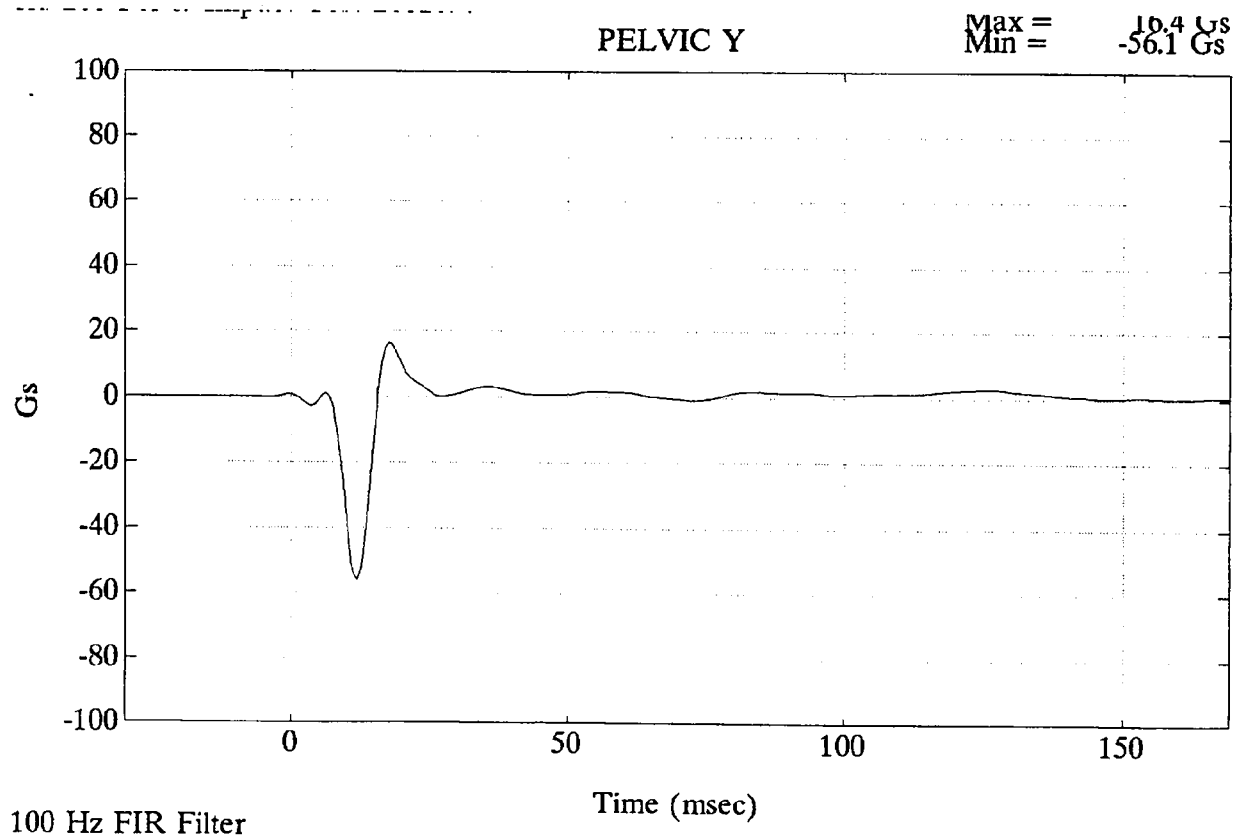
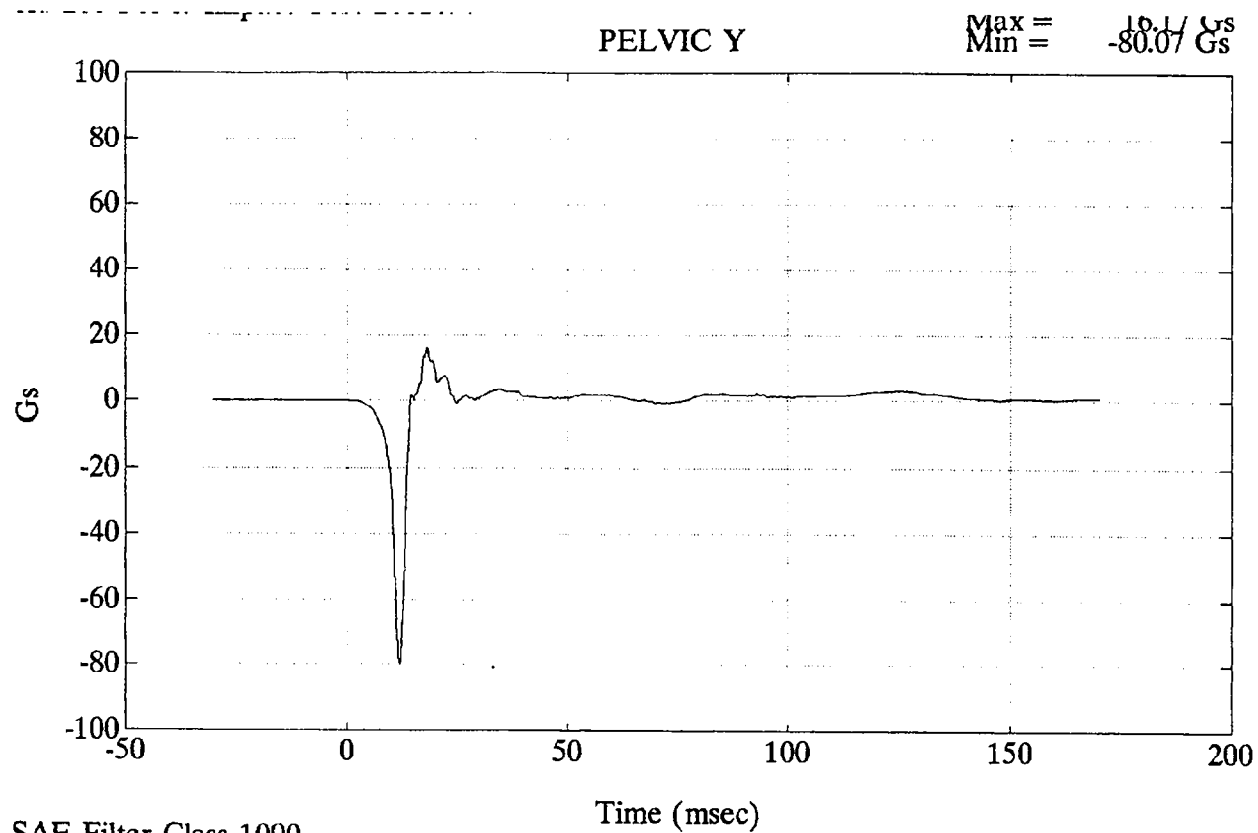
Calspan Sequential Test Number: 1

Date: 10/09/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER            | SPECIFICATION | TEST RESULTS |
|---------------------------|---------------|--------------|
| TEMPERATURE (°C)          | 18.9 - 25.5   | 21.7         |
| RELATIVE HUMIDITY (%)     | 10 - 70       | 38           |
| PROBE SPEED (m/s)         | 4.27 - 4.33   | 4.31         |
| PELVIS ACCELERATION (g's) | 40 - 60       | 56.1         |

REMARKS: None



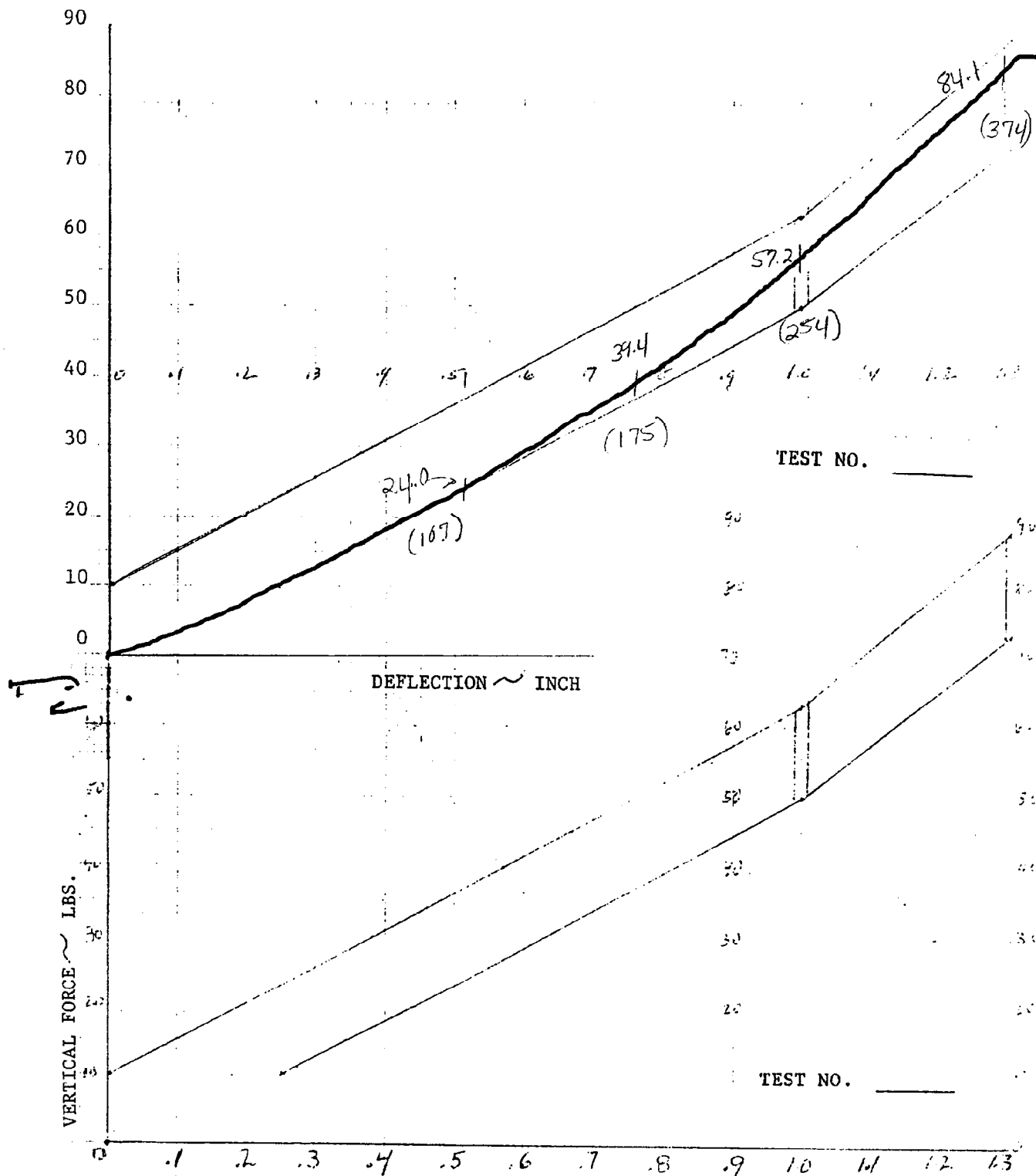
**ABDOMINAL COMPRESSION TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**SID Serial No.: 268Calspan Sequential Test Number: 1Date: 10/10/97Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.7         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 38           |
| FORCE @ 13 mm (N)     | 104 - 162     | 107          |
| FORCE @ 19 mm (N)     | 163 - 221     | 175          |
| FORCE @ 25 mm (N)     | 222 - 280     | 254          |
| FORCE @ 33 mm (N)     | 325 - 391     | 374          |

**REMARKS:** None



DUMMY S/N 268  
 DATE 10/10/97  
 CONTRACT AUTHORIZATION \_\_\_\_\_  
 TEMP. 71° HUMIDITY 30%  
 PERFORMED BY 6/85

PART 572  
 ABDOMEN STATIC PRESS  
 DOT - 13 DEC. '77  
 C-20

8455-1



**LUMBAR FLEXION TEST**  
(Test not required for SID certification)

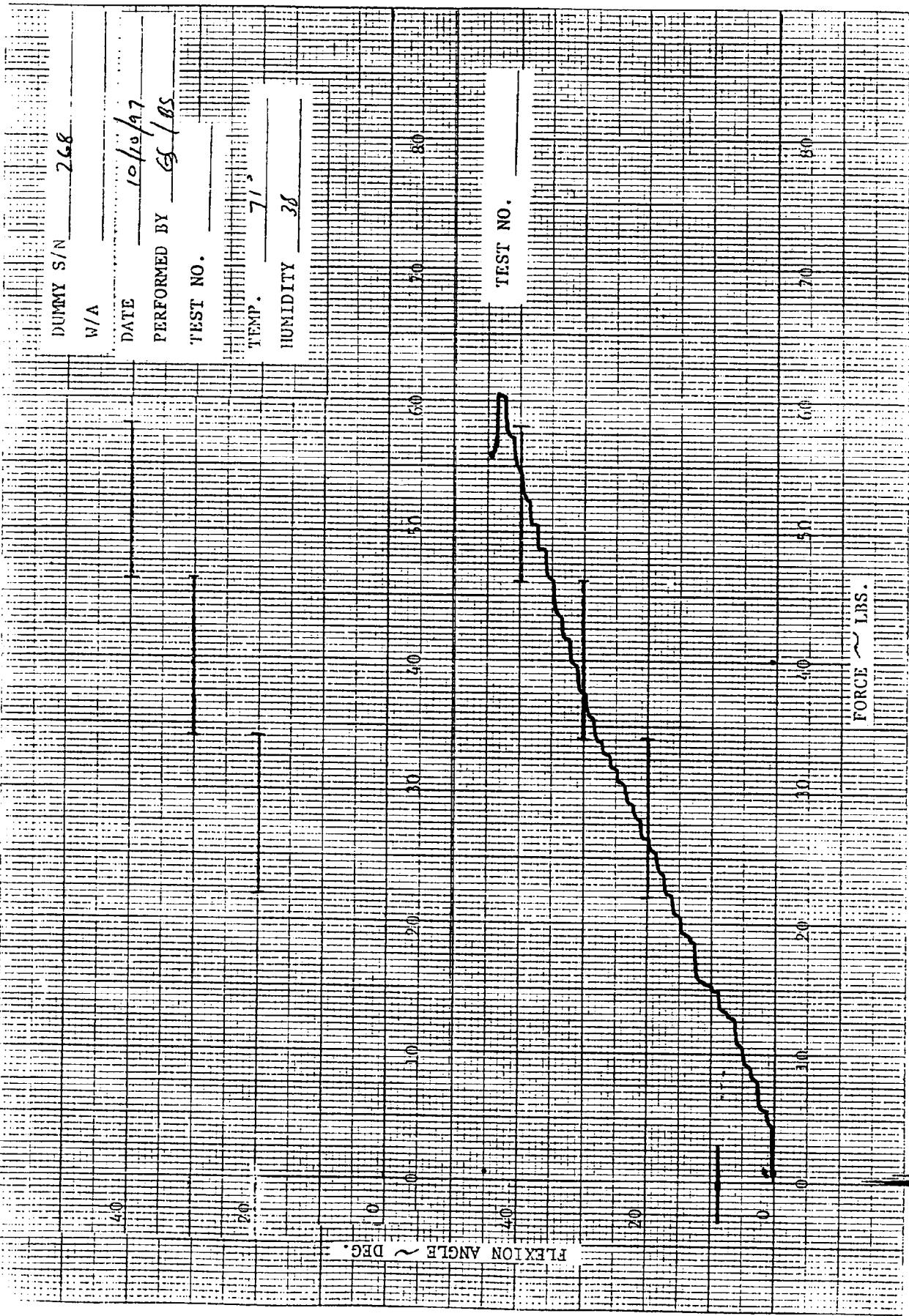
**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 268  
Date: 10/10/97

Calspan Sequential Test Number: 1  
Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.7         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 38           |
| FORCE @ 0° (N)        | 0 - 26.7      | 0            |
| FORCE @ 20° (N)       | 97.8 - 151.2  | 118          |
| FORCE @ 30° (N)       | 151.2 - 204.6 | 167          |
| FORCE @ 40° (N)       | 204.6 - 258   | 242          |
| RETURN ANGLE          | 12° max.      | 8.8          |

**REMARKS:** None



**PRE-TEST DUMMY INSPECTION LIST**  
**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 268  
Date: 10/10/97

Calspan Sequential Test Number: 1  
Laboratory Technician: B. Swiecicki, G. Serbinowski

| PART         | ITEMS CHECKED                                  | COMMENTS |
|--------------|------------------------------------------------|----------|
| SKIN         | VISUAL INSPECTION                              | OK       |
| HEAD         | VISUAL, BALLAST, ACCELEROMETER MOUNT           | OK       |
| NECK         | VISUAL, CABLE TORQUE                           | OK       |
| SPINE BOX    | VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT | OK       |
| RIB CAGE     | VISUAL, MEASURE, STIFFENERS                    | OK       |
| STERNUM      | VISUAL                                         | OK       |
| LUMBAR SPINE | VISUAL                                         | OK       |
| ABDOMEN      | VISUAL                                         | OK       |
| PELVIS       | VISUAL, PALPATE, ACCELEROMETER MOUNT           | OK       |
| UPPER LEGS   | VISUAL                                         | OK       |
| KNEES        | VISUAL, STOPS, INSERTS                         | OK       |
| LOWER LEGS   | VISUAL, RANGE OF MOTION                        | OK       |
| ANKLES       | VISUAL, RANGE OF MOTION                        | OK       |
| FEET         | VISUAL, RANGE OF MOTION                        | OK       |
| JOINTS       | 1 TO 2 g RANGE                                 | OK       |
| OTHER        | NONE                                           | -        |

REMARKS: None

**CALIBRATION TEST RESULTS  
PRE-TEST**

**SID NO.: 027**

**CONFIGURED FOR LEFT SIDE IMPACT**

# CALIBRATION TEST RESULTS SUMMARY

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 027

Calspan Sequential Test Number: 1

Date: 10/10/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST                         | COMMENTS                 |
|------------------------------|--------------------------|
| EXTERNAL DIMENSIONS          | Passed all requirements. |
| THORACIC SHOCK ABSORBER TEST | Passed all requirements. |
| LATERAL THORAX IMPACT TEST   | Passed all requirements. |
| LATERAL PELVIS IMPACT TEST   | Passed all requirements. |
| ABDOMINAL COMPRESSION TEST*  | Passed all requirements. |
| LUMBAR FLEXION TEST*         | Passed all requirements. |

\* Test not required for SID certification.

REMARKS: None

# EXTERNAL DIMENSIONS

## CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 027

Calspan Sequential Test Number: 1

Date: 10/09/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER                     | SPECIFICATION | TEST RESULTS |
|------------------------------------|---------------|--------------|
| SH- Seated Height (mm)             | 889 - 909     | 909          |
| RH- Rib Height (mm)                | 502 - 520     | 514          |
| HP- Hip Pivot Height (mm)          | 99 ref.       | 99           |
| RD- Rib from Back Line (mm)        | 229 - 241     | 235          |
| KH- Knee Pivot from Back Line (mm) | 511 - 526     | 514          |
| KV- Knee Pivot to Floor (mm)       | 490 - 505     | 491          |
| HW- Hip Width (mm)                 | 356 - 391     | 364          |

REMARKS: None

# THORACIC SHOCK ABSORBER TESTS

## CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 027

Calspan Sequential Test Number: 1

Date: 10/09/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

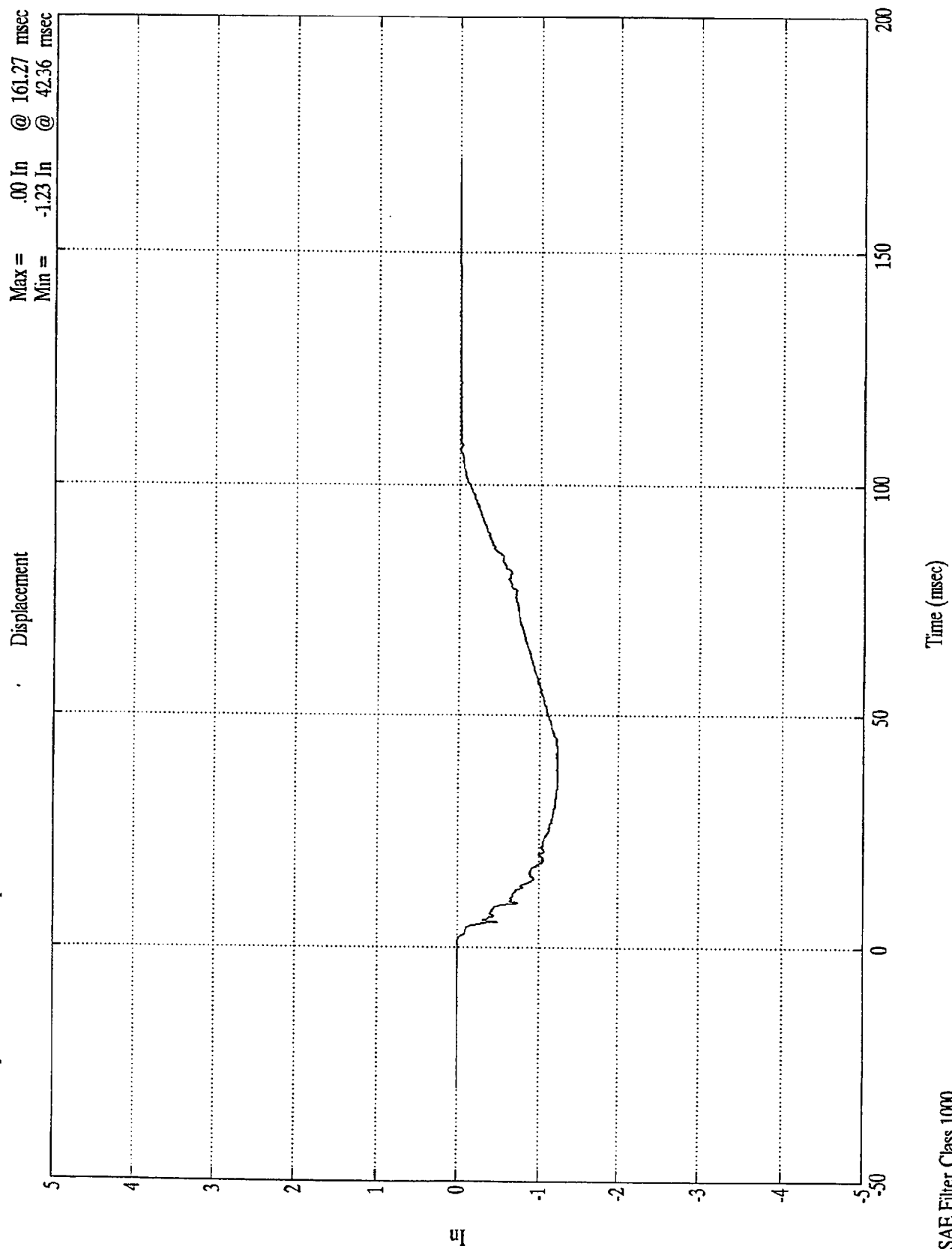
DAMPER IDENTIFICATION: 027

| TEST PARAMETER        |                   | SPECIFICATION | TEST RESULTS |
|-----------------------|-------------------|---------------|--------------|
| TEMPERATURE (°C)      |                   | 18.9 - 25.5   | 21.7         |
| RELATIVE HUMIDITY (%) |                   | 10 - 70       | 38           |
| VELOCITY<br>3.05 m/s  | FORCE (N)         | 836 - 1125    | 987          |
|                       | DISPLACEMENT (mm) | 30 - 35       | 31           |
| VELOCITY<br>4.27 m/s  | FORCE (N)         | 1730 - 2099   | 1851         |
|                       | DISPLACEMENT (mm) | 32 - 37       | 32           |
| VELOCITY<br>6.10 m/s  | FORCE (N)         | 3741 - 4448   | 3879         |
|                       | DISPLACEMENT (mm) | 33 - 40       | 38           |

DAMPER SETTING: 5

REMARKS: None

# SID Shock Absorber Impact Test 027 @ 9.95 fps

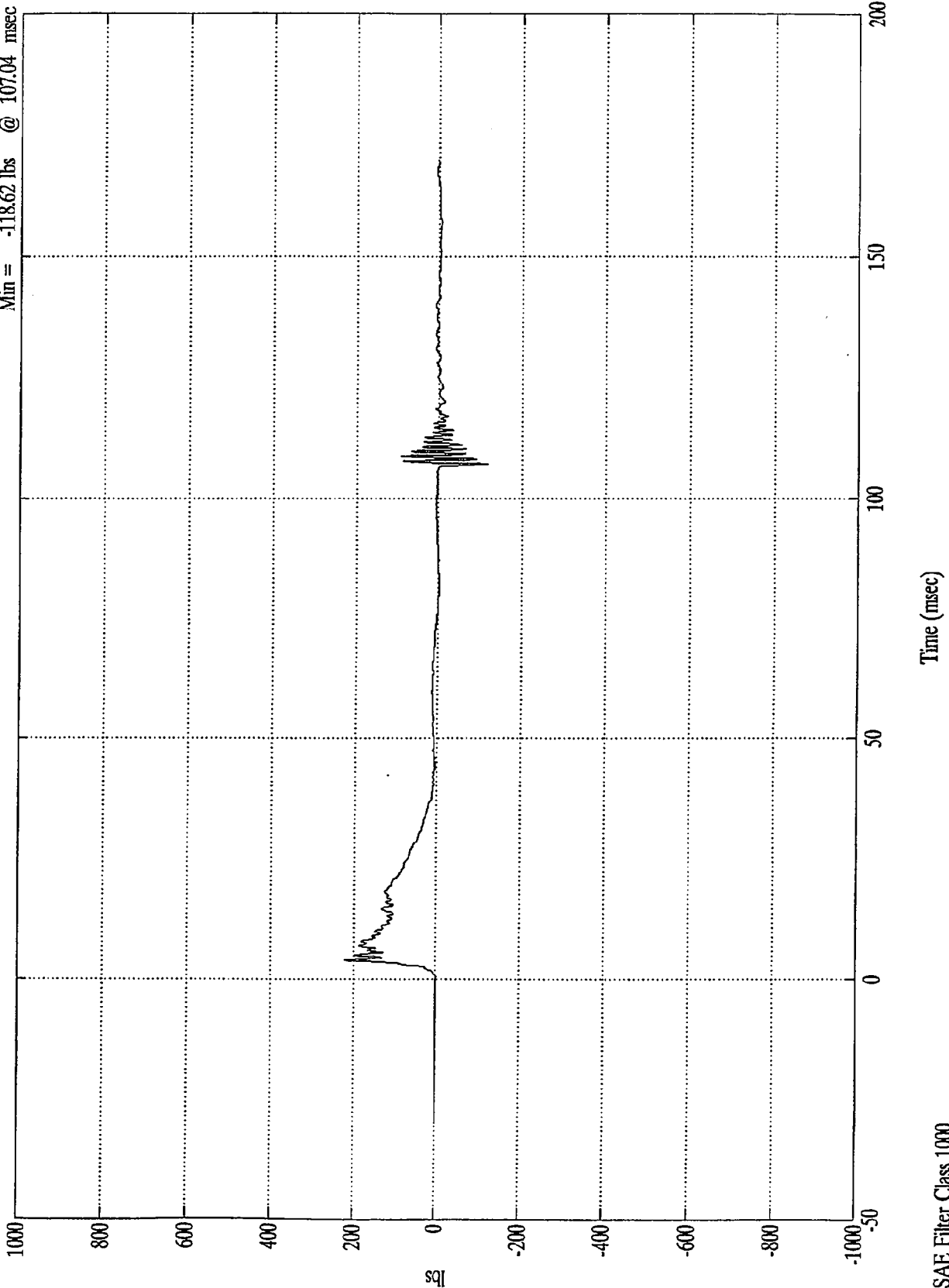




SID Shock Absorber Impact Test 027 @ 9.95 fps

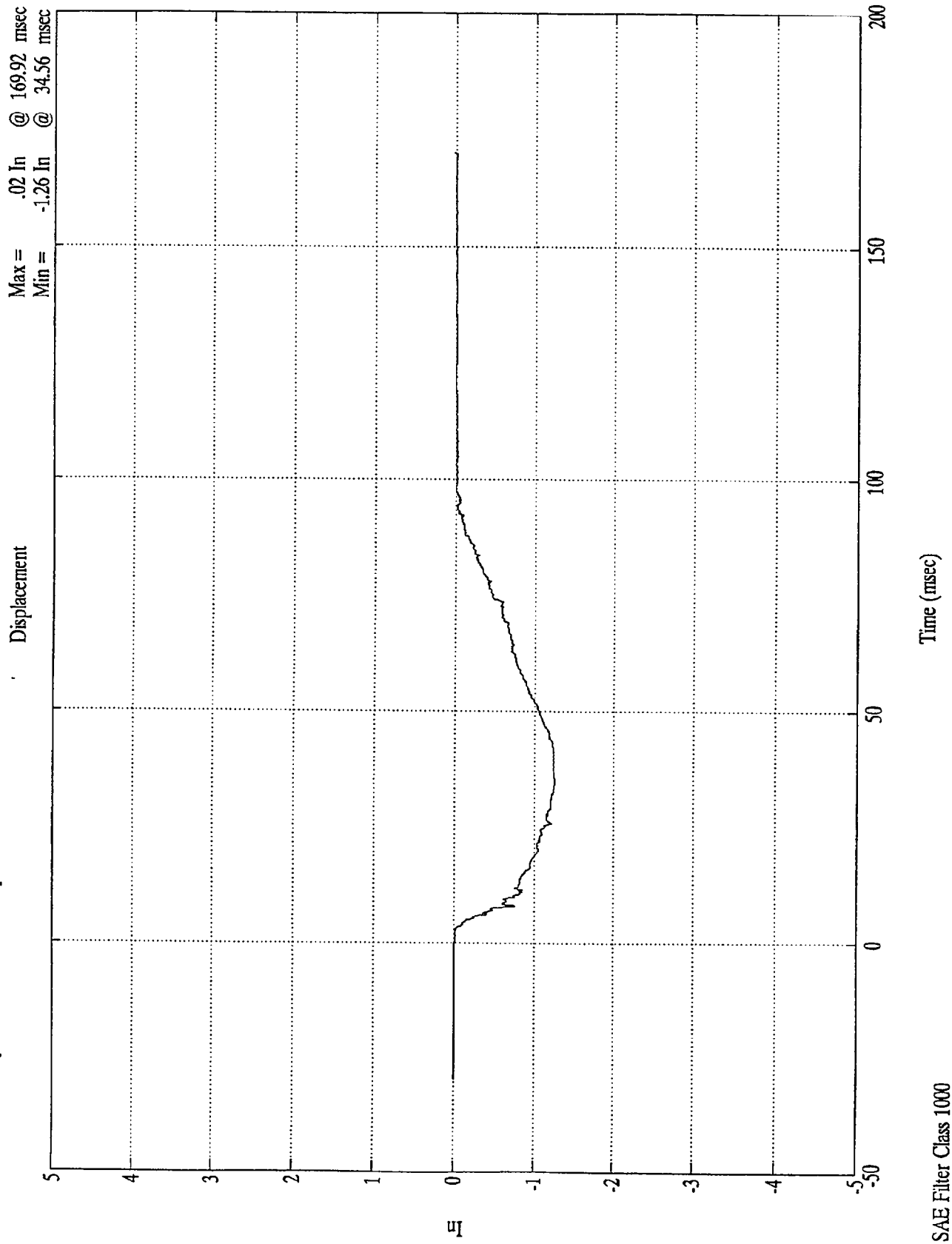
Max = 221.87 lbs @ 4.08 msec  
Min = -118.62 lbs @ 107.04 msec

Shock Force



SAE Filter Class 1000

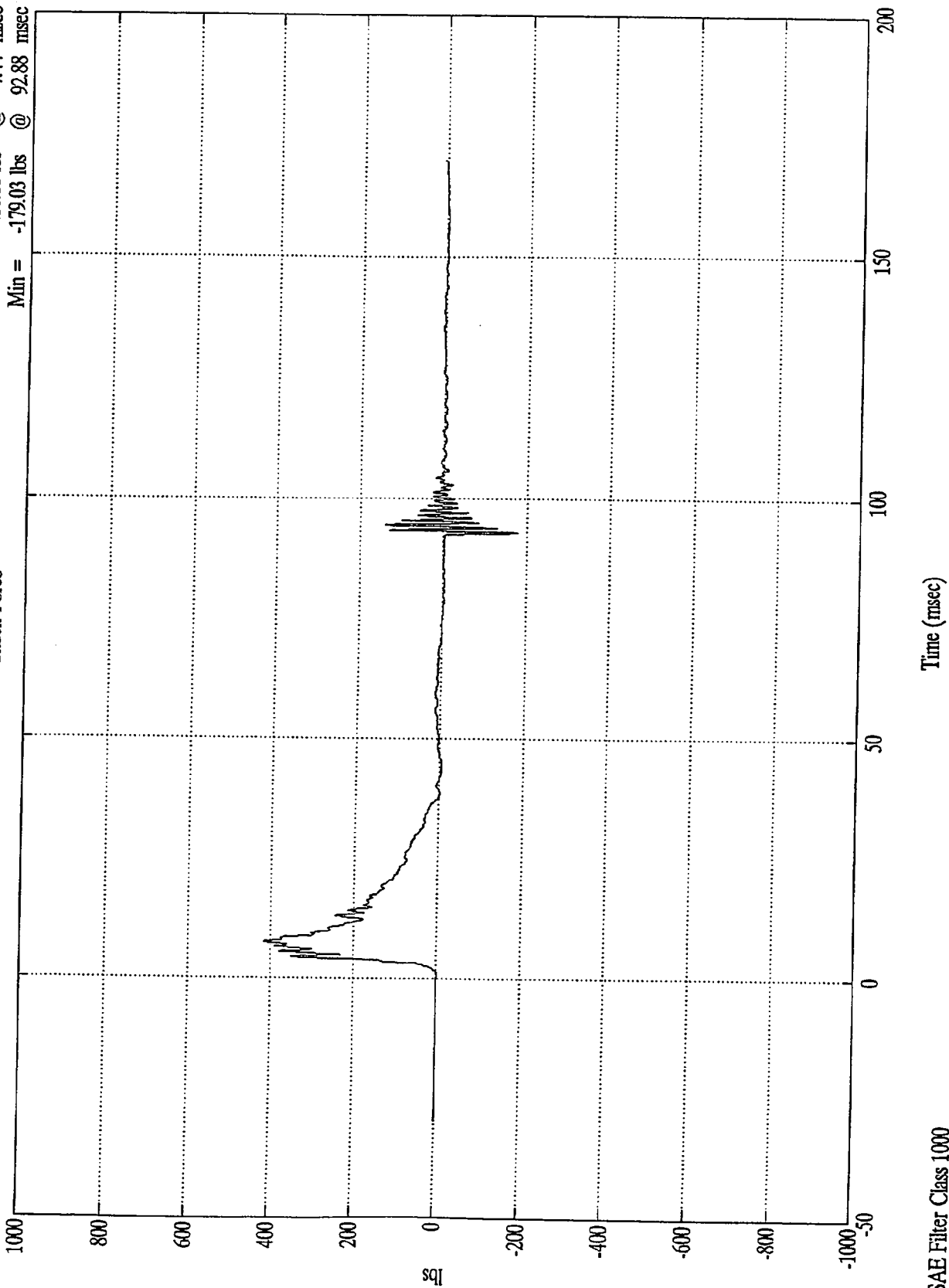
STD Shock Absorber Impact Test 027 @ 14.05 fps



SID Shock Absorber Impact Test 027 @ 14.05 fps

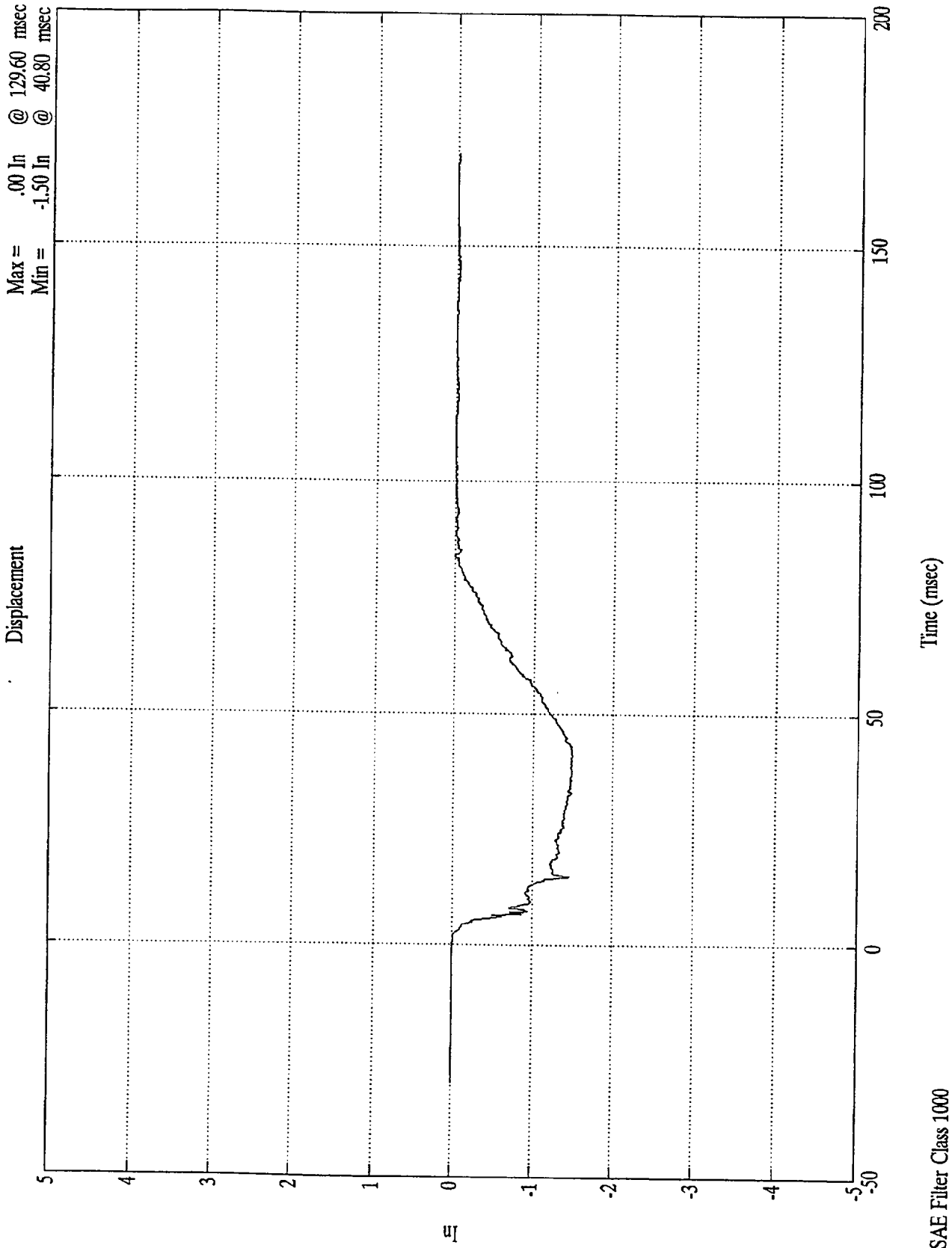
Max = 416.06 lbs @ 7.44 msec  
Min = -179.03 lbs @ 92.88 msec

Shock Force



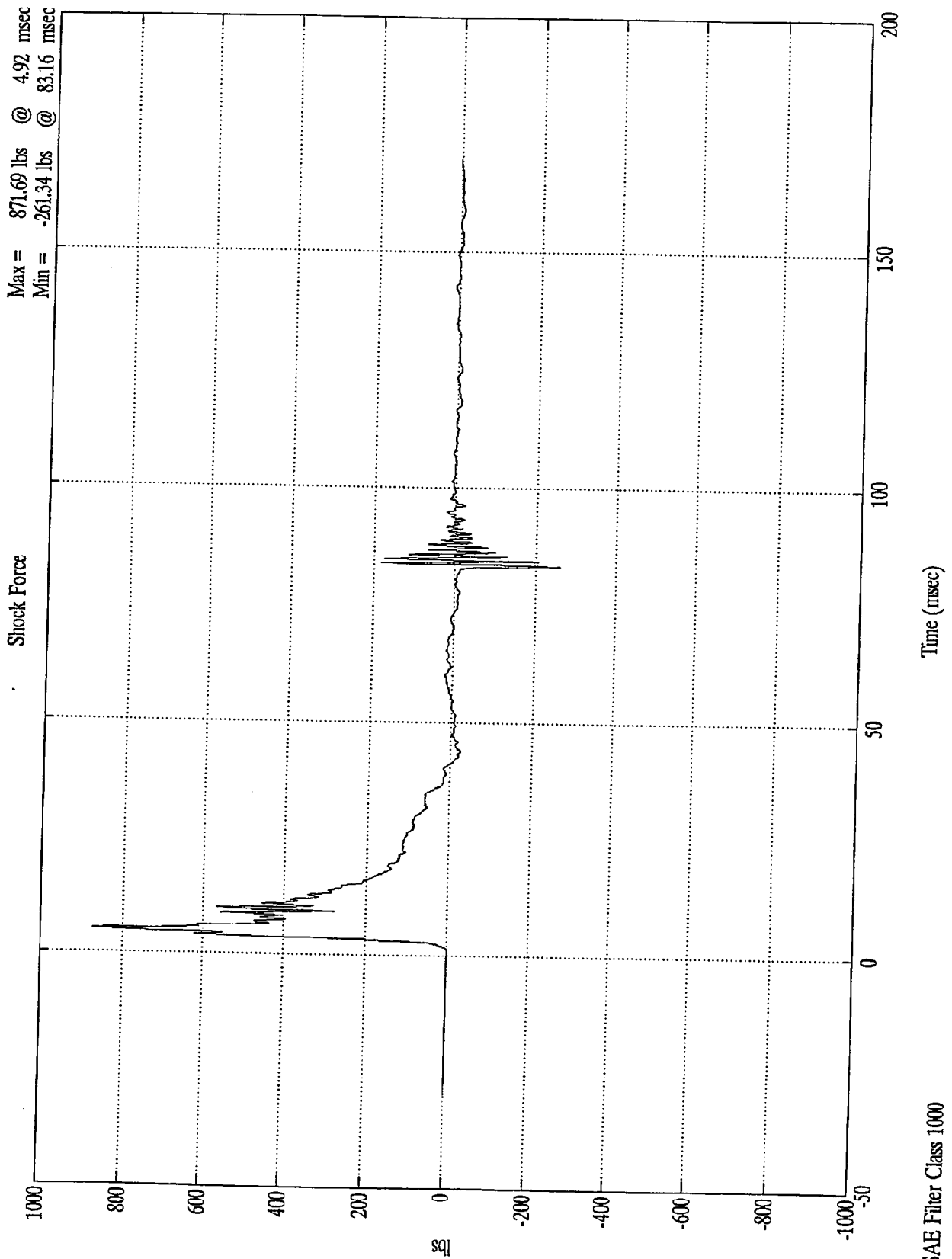
SAE Filter Class 1000

SID Shock Absorber Impact Test 027 @ 20.16 fps



SAE Filter Class 1000

SID Shock Absorber Impact Test 027 @ 20.16 fps



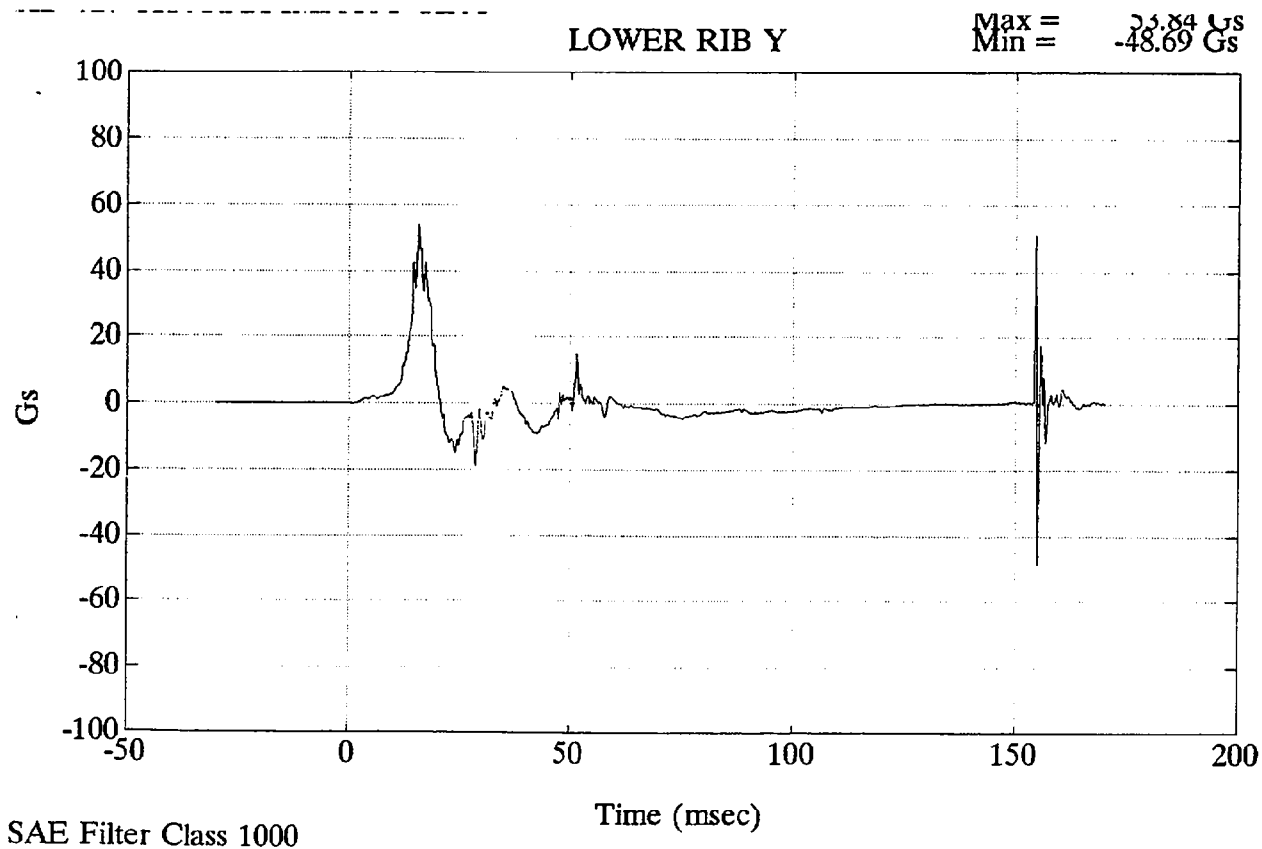
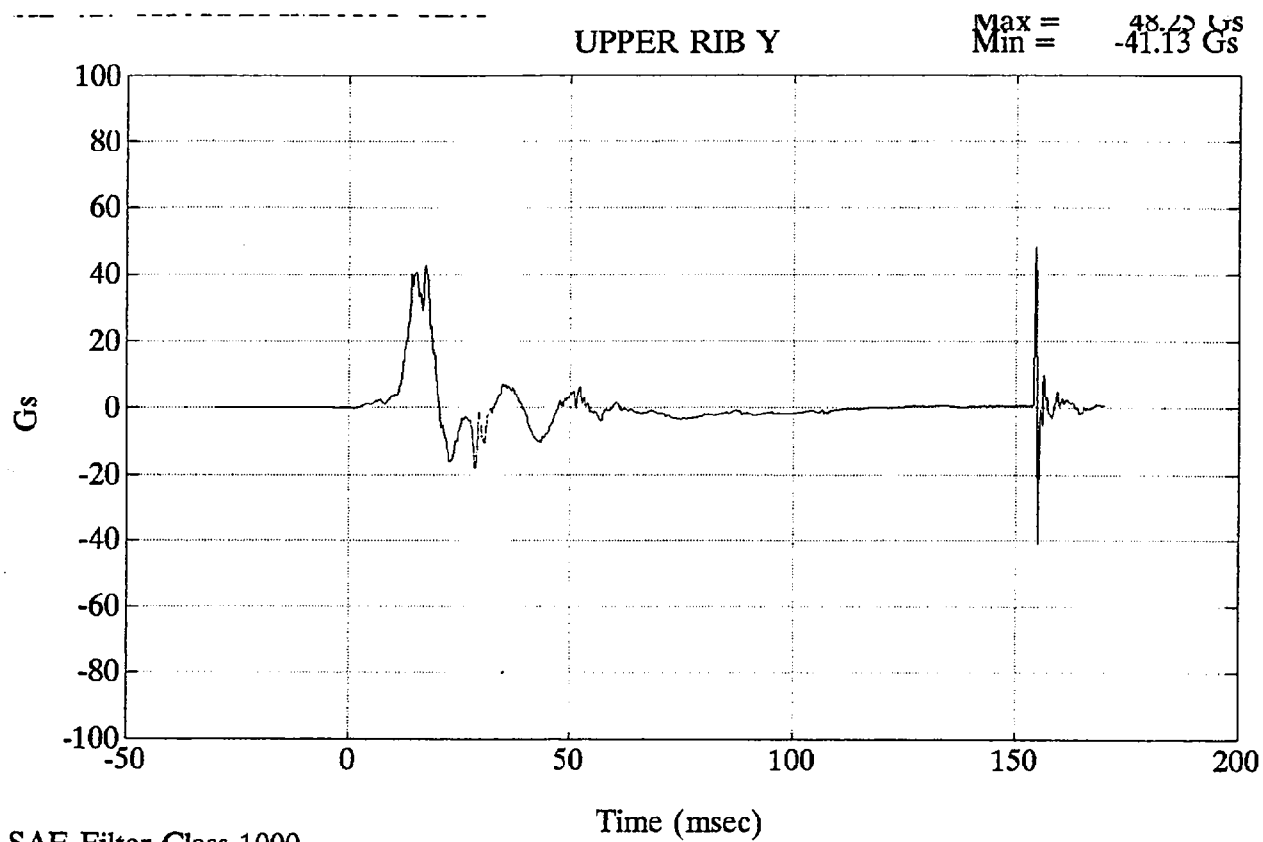
# LATERAL THORAX IMPACT TEST

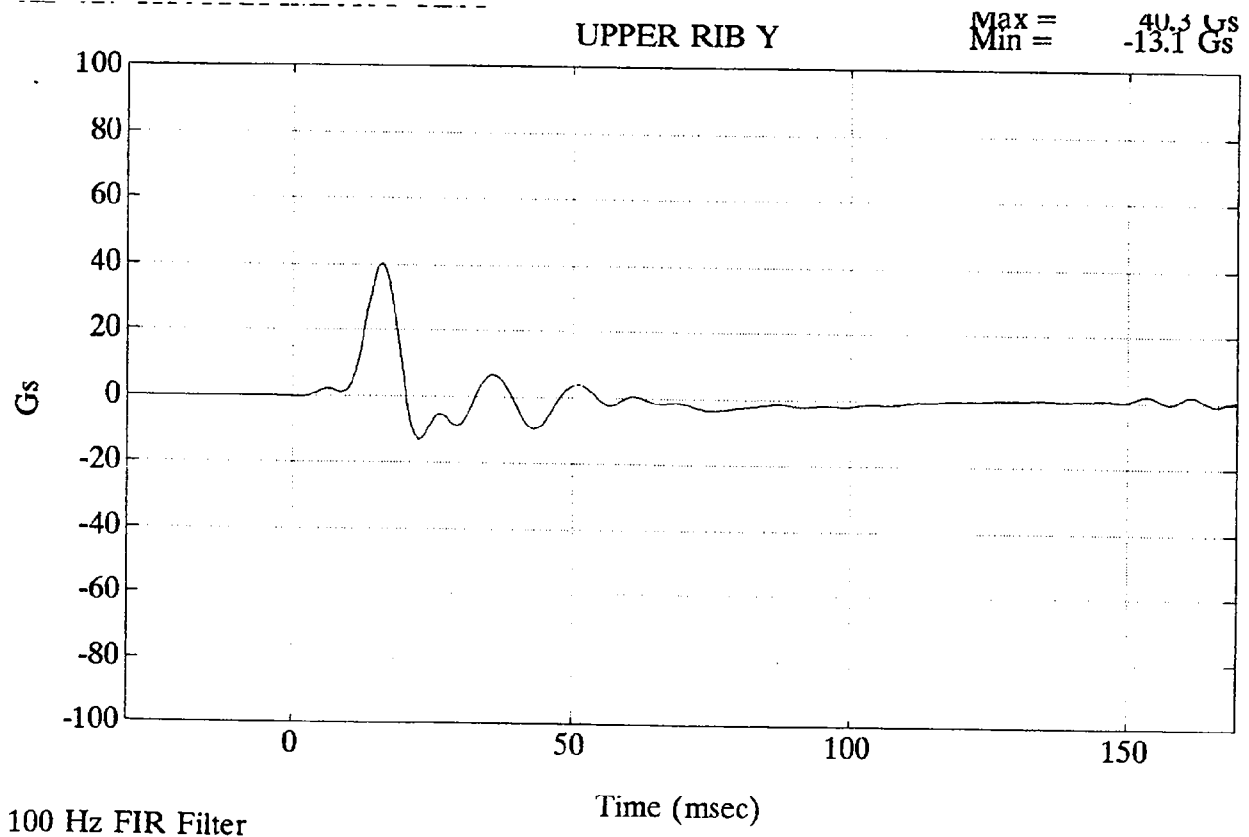
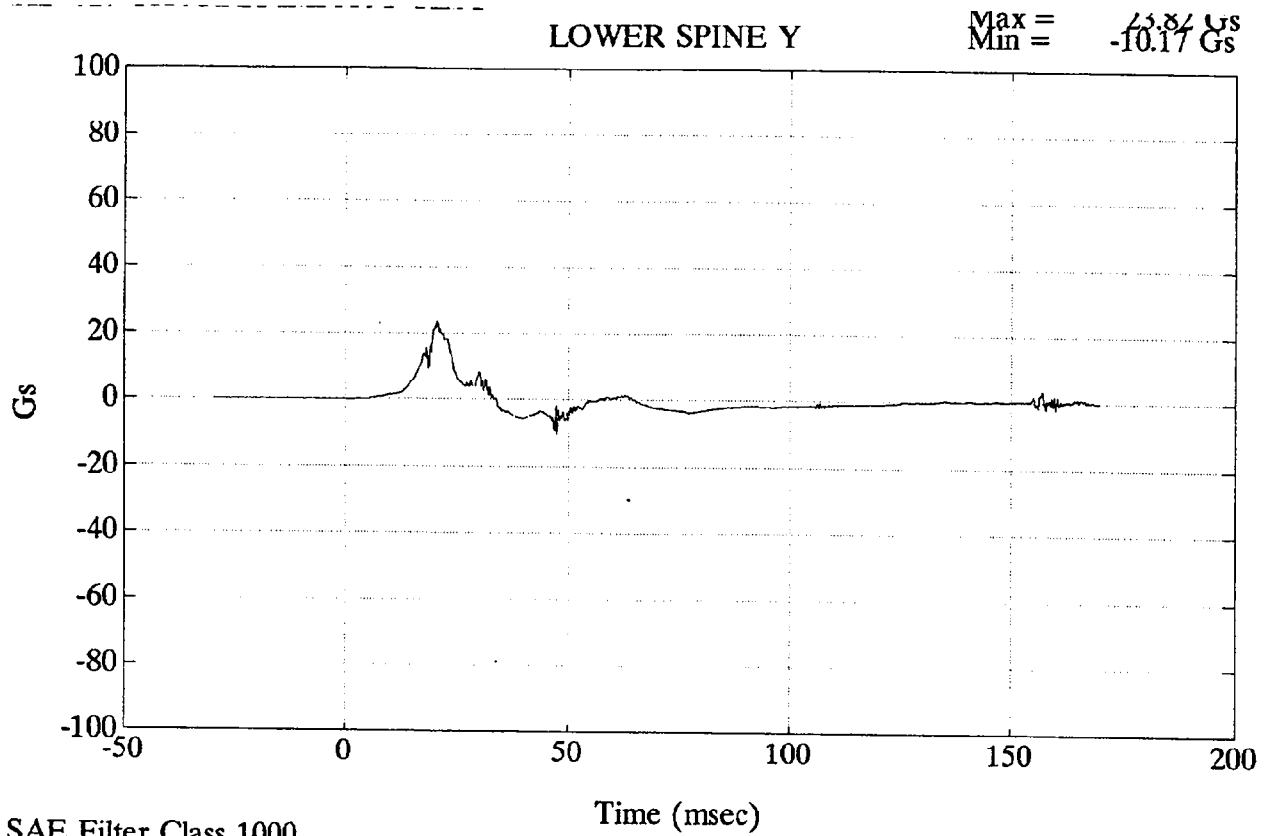
## CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 027 Calspan Sequential Test Number: 1  
Date: 10/09/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

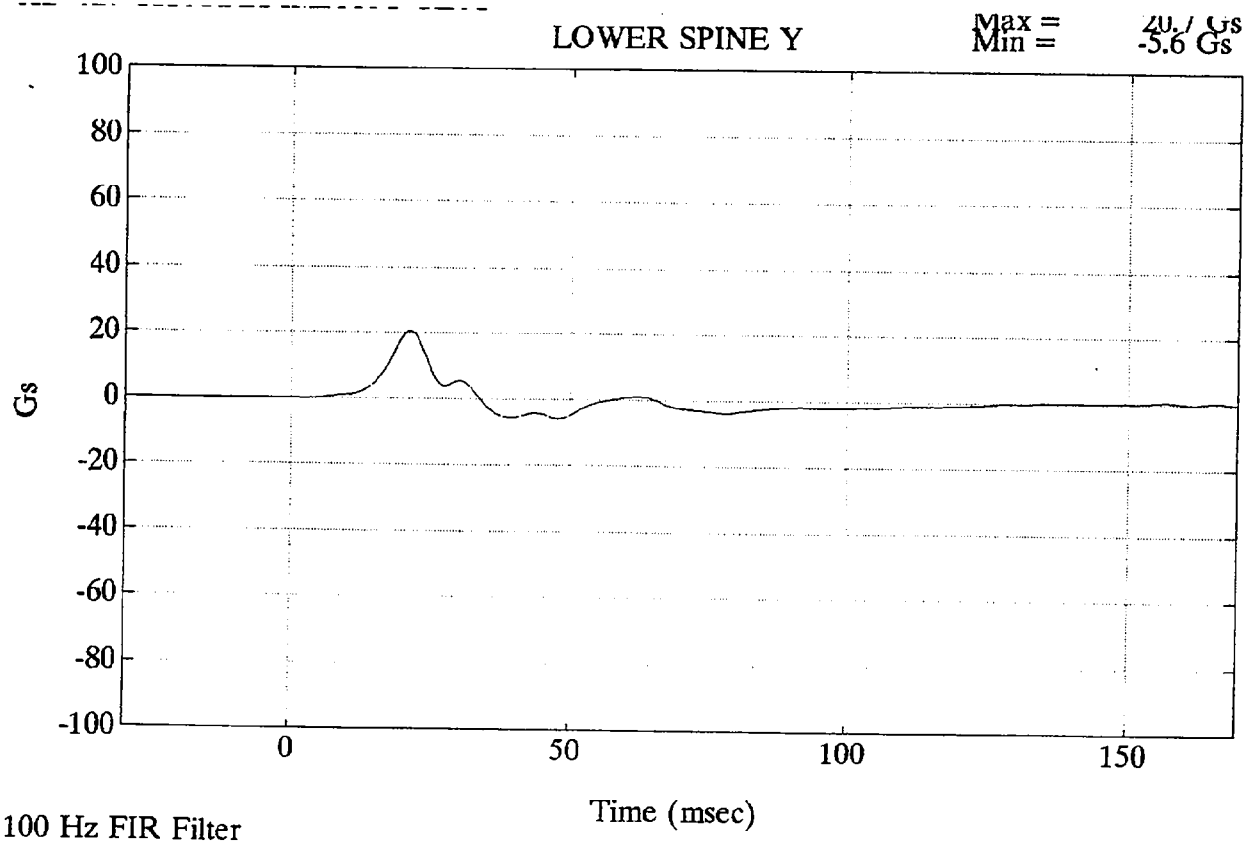
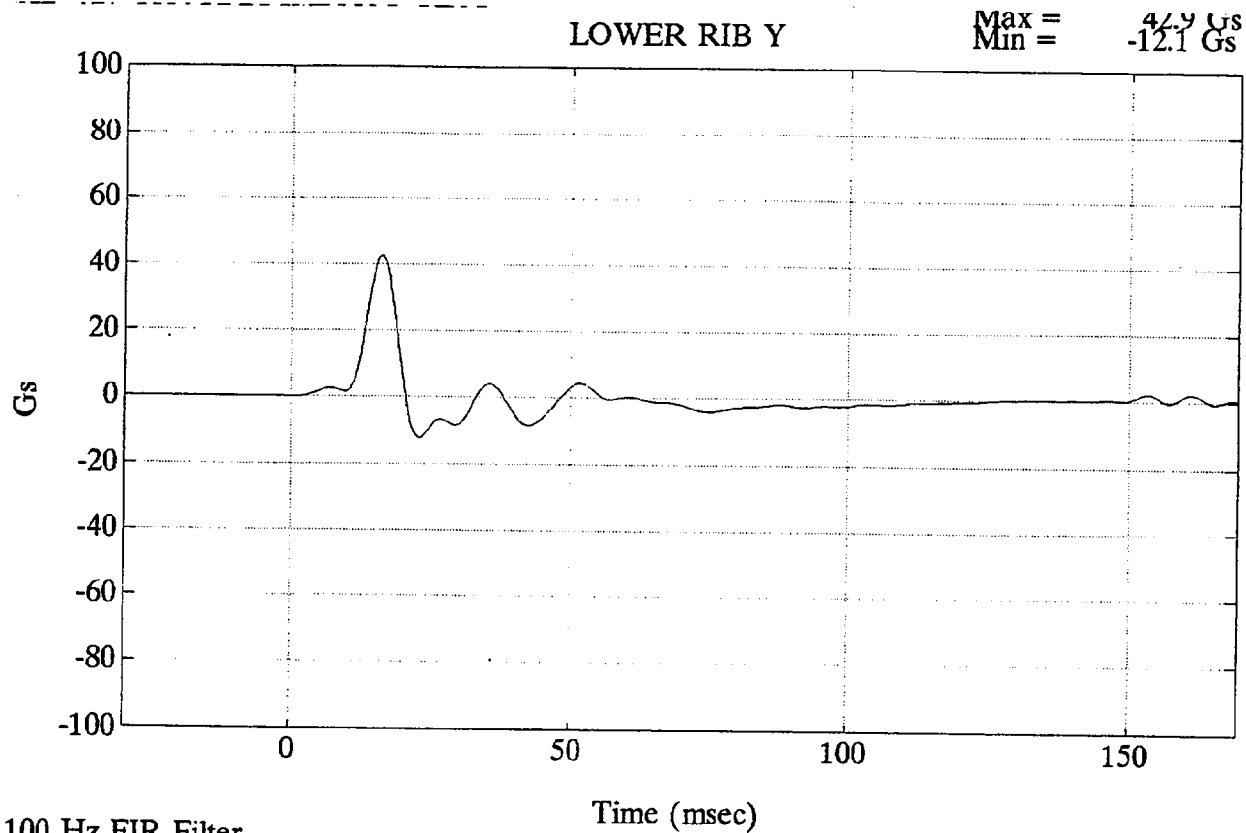
| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.7         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 38           |
| PROBE SPEED (m/s)     | 4.27 - 4.33   | 4.31         |
| UPPER RIB (g's)       | 37 - 46       | 40.4         |
| LOWER RIB (g's)       | 37 - 46       | 42.9         |
| LOWER SPINE (g's)     | 15 - 22       | 20.7         |

REMARKS: None









# LATERAL PELVIS IMPACT TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 027

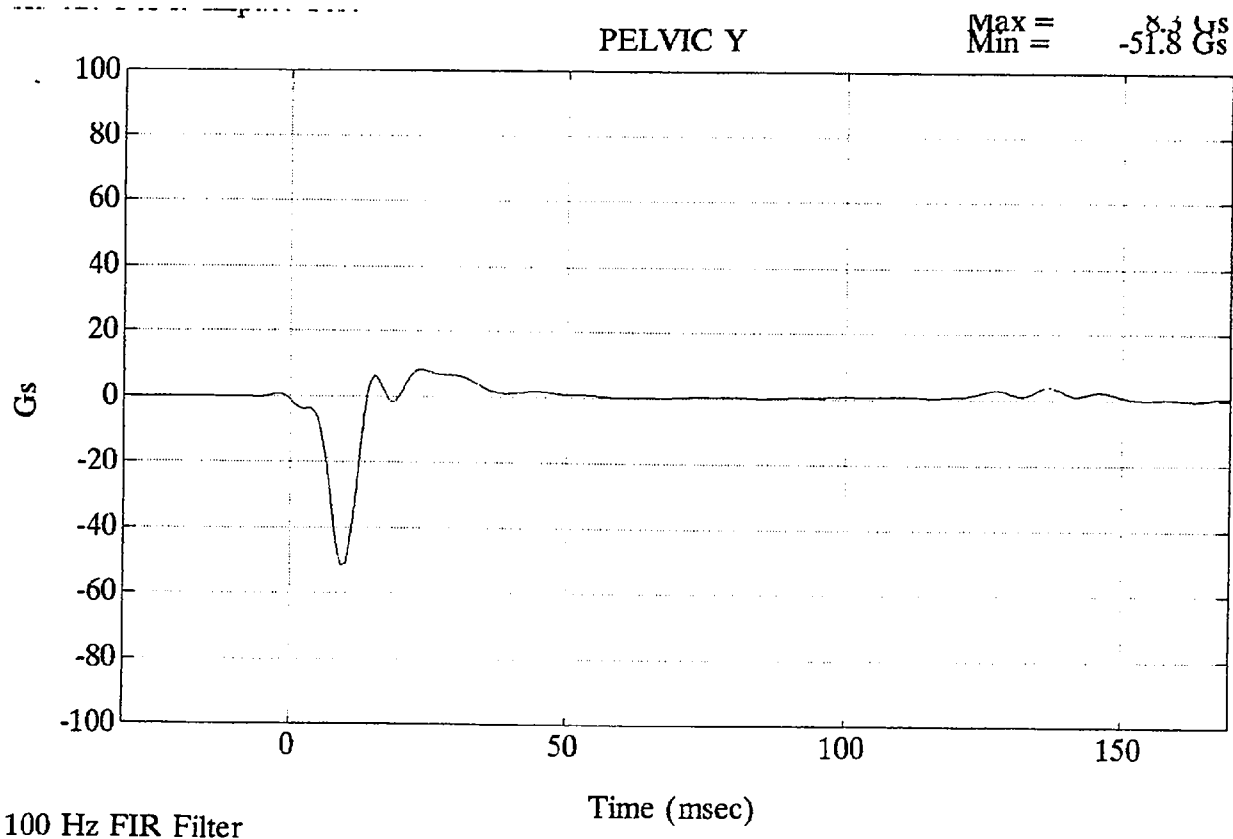
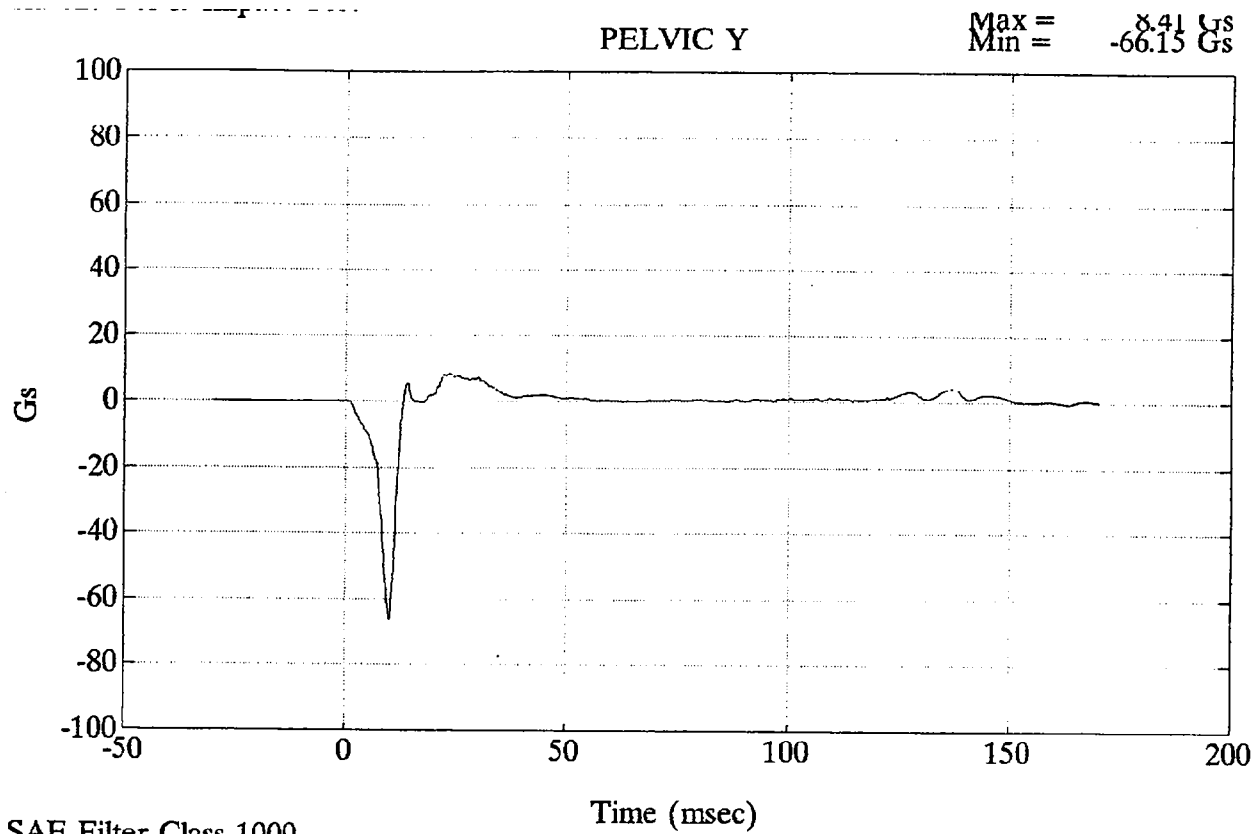
Calspan Sequential Test Number: 1

Date: 10/09/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER            | SPECIFICATION | TEST RESULTS |
|---------------------------|---------------|--------------|
| TEMPERATURE (°C)          | 18.9 - 25.5   | 21.7         |
| RELATIVE HUMIDITY (%)     | 10 - 70       | 38           |
| PROBE SPEED (m/s)         | 4.27 - 4.33   | 4.30         |
| PELVIS ACCELERATION (g's) | 40 - 60       | 51.8         |

REMARKS: None



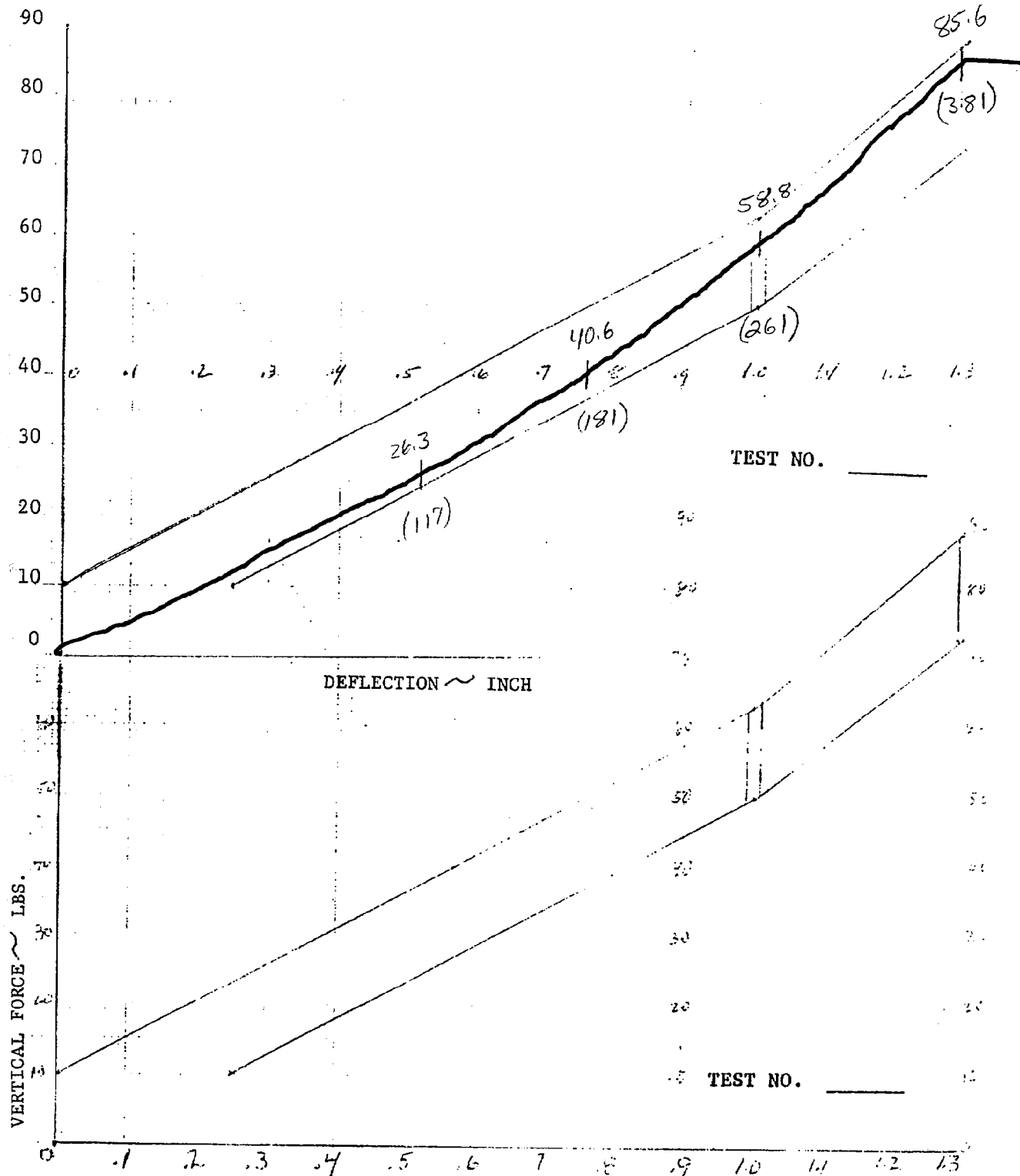
**ABDOMINAL COMPRESSION TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**SID Serial No.: 027Calspan Sequential Test Number: 1Date: 10/10/97Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.7         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 38           |
| FORCE @ 13 mm (N)     | 104 - 162     | 117          |
| FORCE @ 19 mm (N)     | 163 - 221     | 181          |
| FORCE @ 25 mm (N)     | 222 - 280     | 261          |
| FORCE @ 33 mm (N)     | 325 - 391     | 381          |

**REMARKS:** None



DUMMY S/N 027

DATE 10/10/97

CONTRACT AUTHORIZATION \_\_\_\_\_

TEMP. 71° HUMIDITY 38%

PERFORMED BY CS/BS

PART 572  
 ABDOMEN STATIC PRESS  
 DOT - 13 DEC. '77  
 C-41

**LUMBAR FLEXION TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 027 Calspan Sequential Test Number: 1  
Date: 10/10/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.7         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 38           |
| FORCE @ 0° (N)        | 0 - 26.7      | 0            |
| FORCE @ 20° (N)       | 97.8 - 151.2  | 131          |
| FORCE @ 30° (N)       | 151.2 - 204.6 | 185          |
| FORCE @ 40° (N)       | 204.6 - 258   | 252          |
| RETURN ANGLE          | 12° max.      | 8.8          |

**REMARKS:** None

DUMMY S/N 027

W/A

DATE 10/10/97

PERFORMED BY GS/ES

TEST NO.

TEMP. 71°

HUMIDITY 38

TEST NO.

FLEXION ANGLE ~ DEG.

FORCE ~ LBS.

# PRE-TEST DUMMY INSPECTION LIST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 027  
Date: 10/10/97

Calspan Sequential Test Number: 1  
Laboratory Technician: B. Swiecicki, G. Serbinowski

| PART         | ITEMS CHECKED                                  | COMMENTS |
|--------------|------------------------------------------------|----------|
| SKIN         | VISUAL INSPECTION                              | OK       |
| HEAD         | VISUAL, BALLAST, ACCELEROMETER MOUNT           | OK       |
| NECK         | VISUAL, CABLE TORQUE                           | OK       |
| SPINE BOX    | VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT | OK       |
| RIB CAGE     | VISUAL, MEASURE, STIFFENERS                    | OK       |
| STERNUM      | VISUAL                                         | OK       |
| LUMBAR SPINE | VISUAL                                         | OK       |
| ABDOMEN      | VISUAL                                         | OK       |
| PELVIS       | VISUAL, PALPATE, ACCELEROMETER MOUNT           | OK       |
| UPPER LEGS   | VISUAL                                         | OK       |
| KNEES        | VISUAL, STOPS, INSERTS                         | OK       |
| LOWER LEGS   | VISUAL, RANGE OF MOTION                        | OK       |
| ANKLES       | VISUAL, RANGE OF MOTION                        | OK       |
| FEET         | VISUAL, RANGE OF MOTION                        | OK       |
| JOINTS       | 1 TO 2 g RANGE                                 | OK       |
| OTHER        | NONE                                           | -        |

REMARKS: None



**CALIBRATION TEST RESULTS  
POST TEST**

**SID NO.: 268**

**CONFIGURED FOR LEFT SIDE IMPACT**

# **CALIBRATION TEST RESULTS SUMMARY**

## **CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 268

Calspan Sequential Test Number: 2

Date: 10/17/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST                        | COMMENTS                 |
|-----------------------------|--------------------------|
| EXTERNAL DIMENSIONS         | Passed all requirements. |
| LATERAL THORAX IMPACT TEST  | Passed all requirements. |
| LATERAL PELVIS IMPACT TEST  | Passed all requirements. |
| ABDOMINAL COMPRESSION TEST* | Passed all requirements. |
| LUMBAR FLEXION TEST*        | Passed all requirements. |

\* Test not required for SID certification.

**REMARKS:** None

# EXTERNAL DIMENSIONS

## CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268

Calspan Sequential Test Number: 2

Date: 10/16/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER                     | SPECIFICATION | TEST RESULTS |
|------------------------------------|---------------|--------------|
| SH- Seated Height (mm)             | 889 - 909     | 899          |
| RH- Rib Height (mm)                | 502 - 520     | 516          |
| HP- Hip Pivot Height (mm)          | 99 ref.       | 99           |
| RD- Rib from Back Line (mm)        | 229 - 241     | 230          |
| KH- Knee Pivot from Back Line (mm) | 511 - 526     | 521          |
| KV- Knee Pivot to Floor (mm)       | 490 - 505     | 495          |
| HW- Hip Width (mm)                 | 356 - 391     | 370          |

REMARKS: None

# LATERAL THORAX IMPACT TEST

## CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268

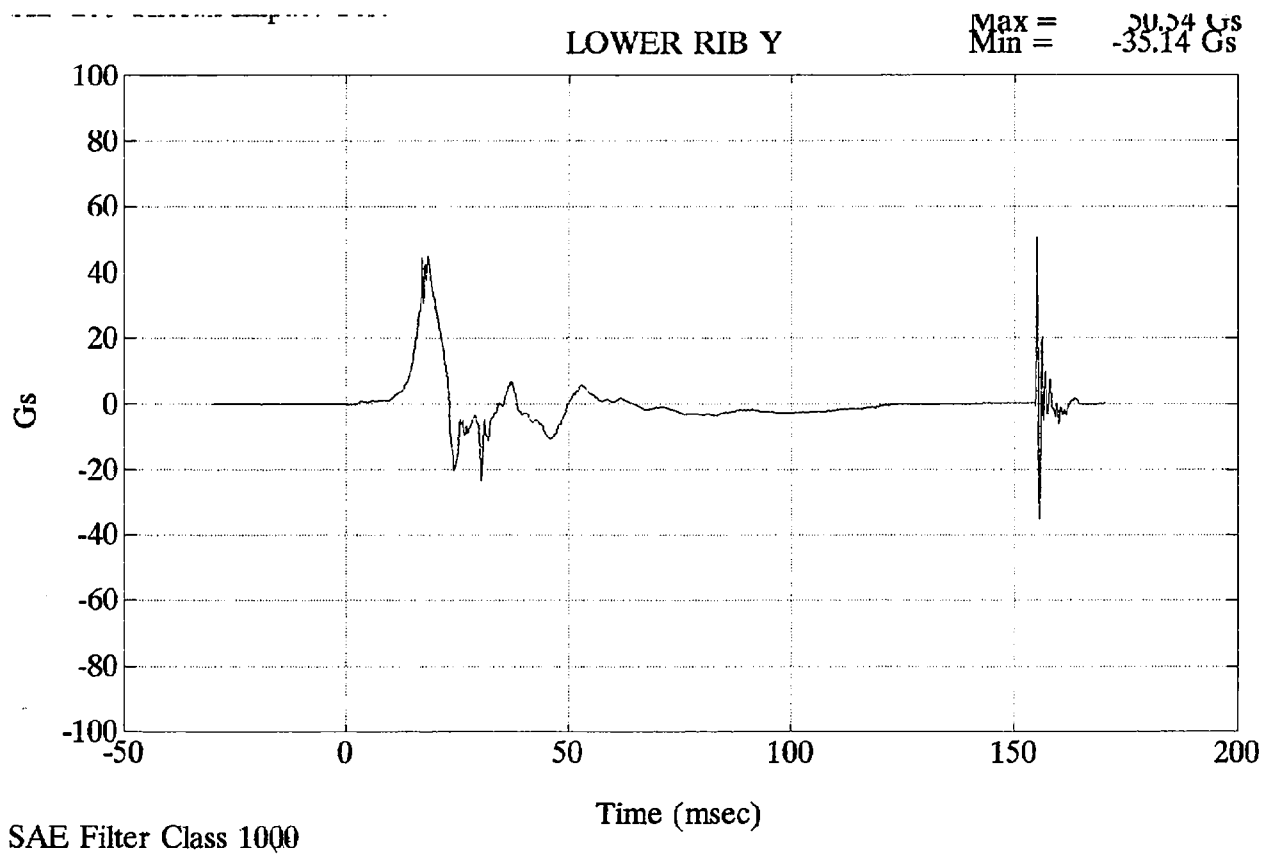
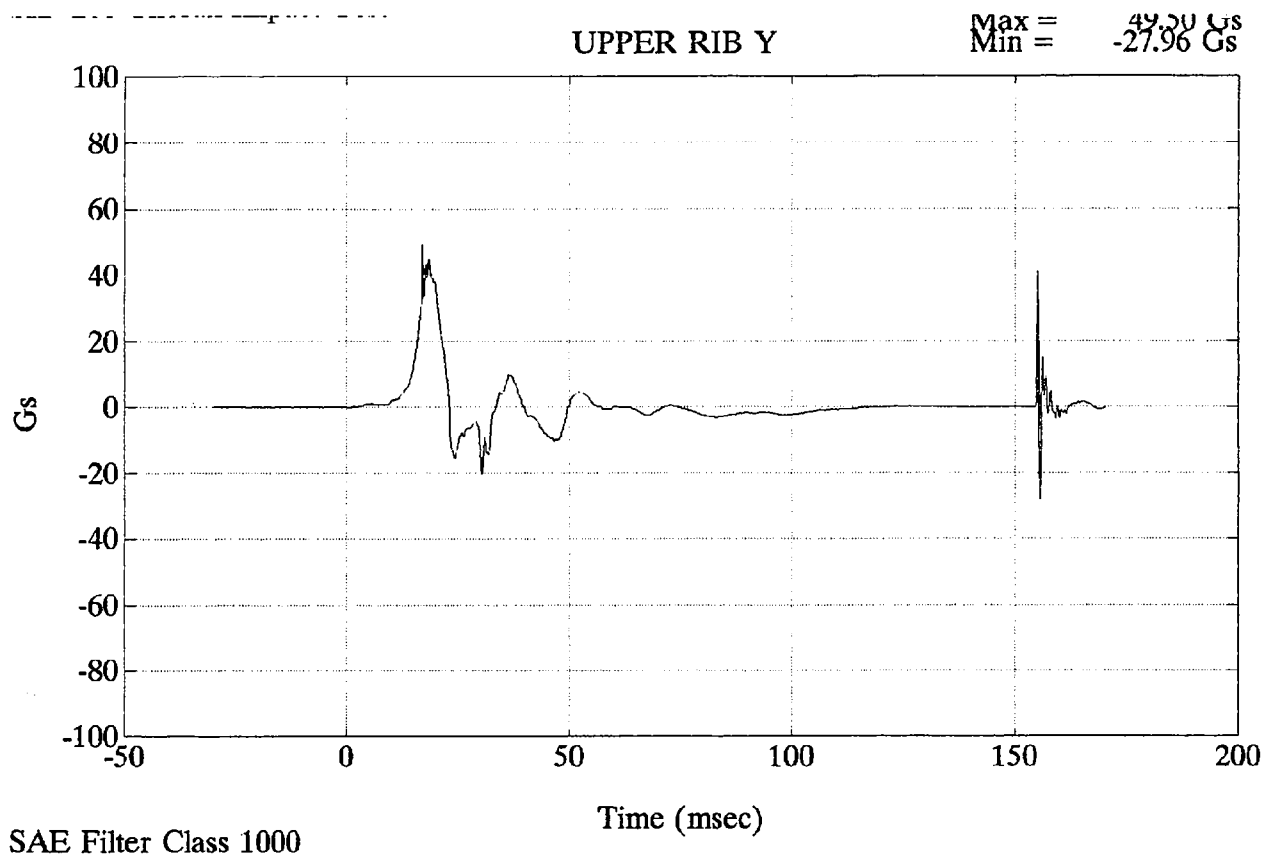
Calspan Sequential Test Number: 2

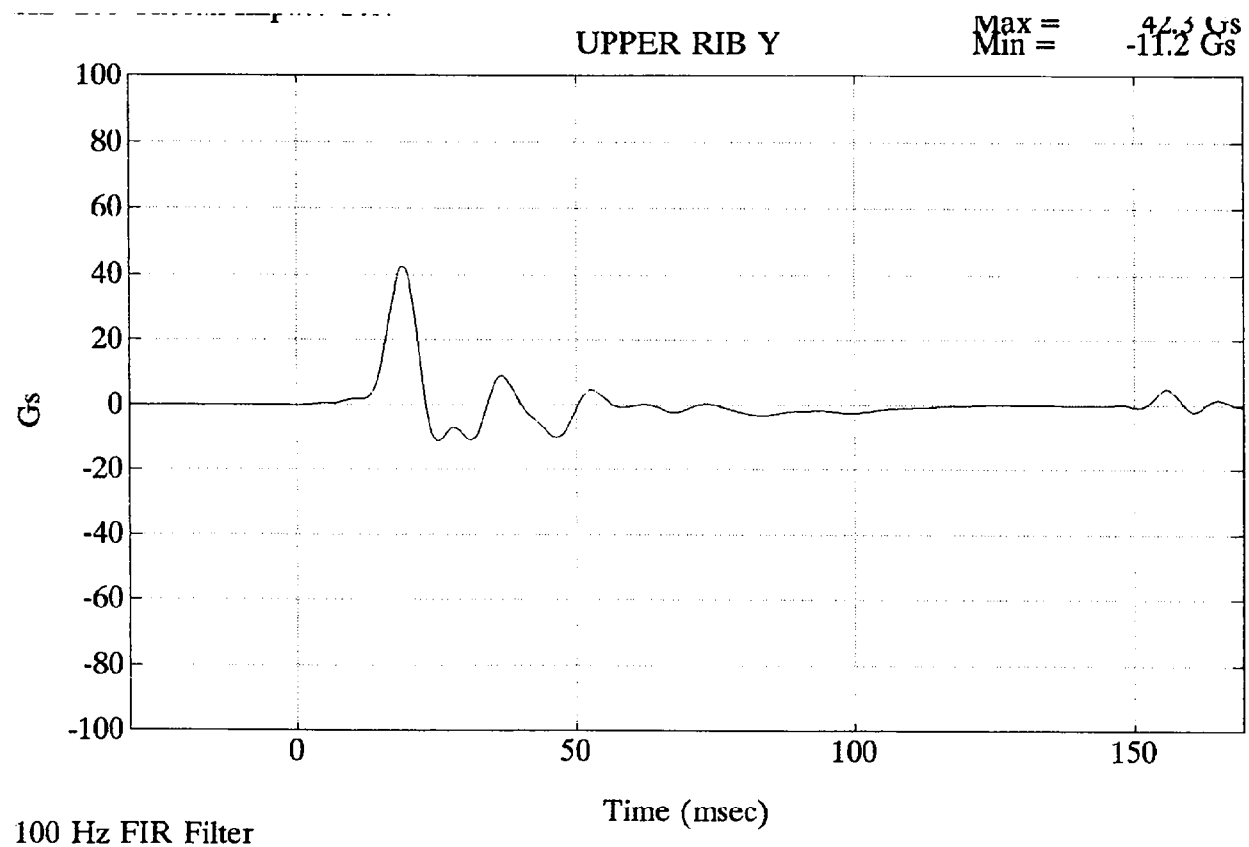
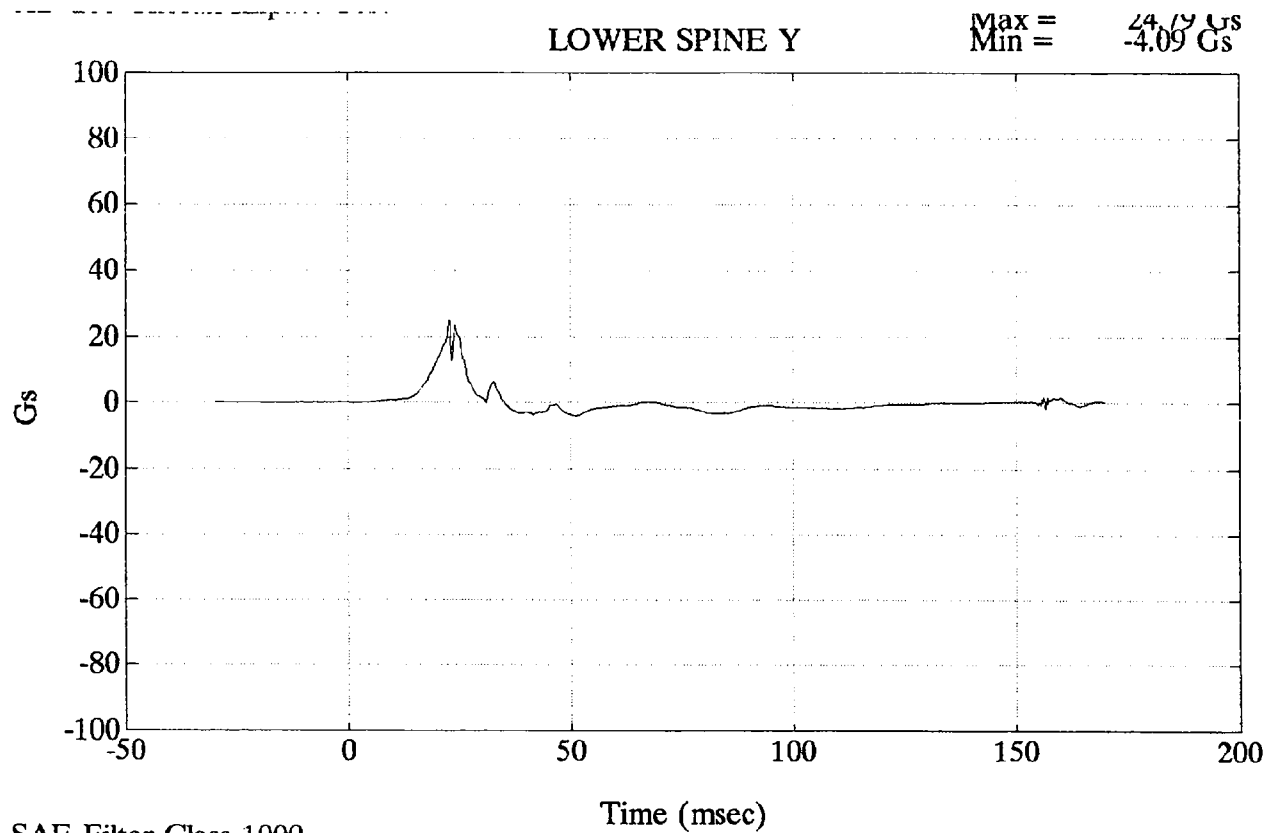
Date: 10/15/97

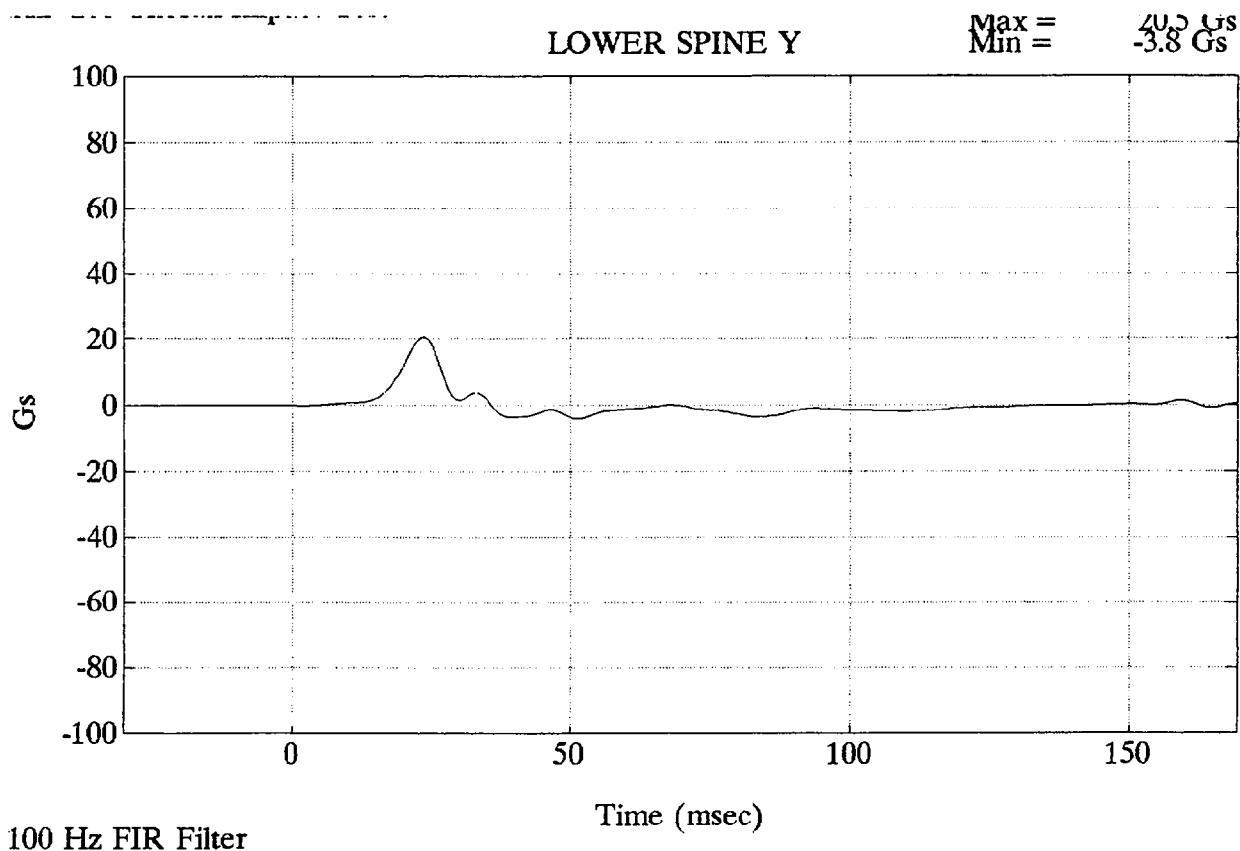
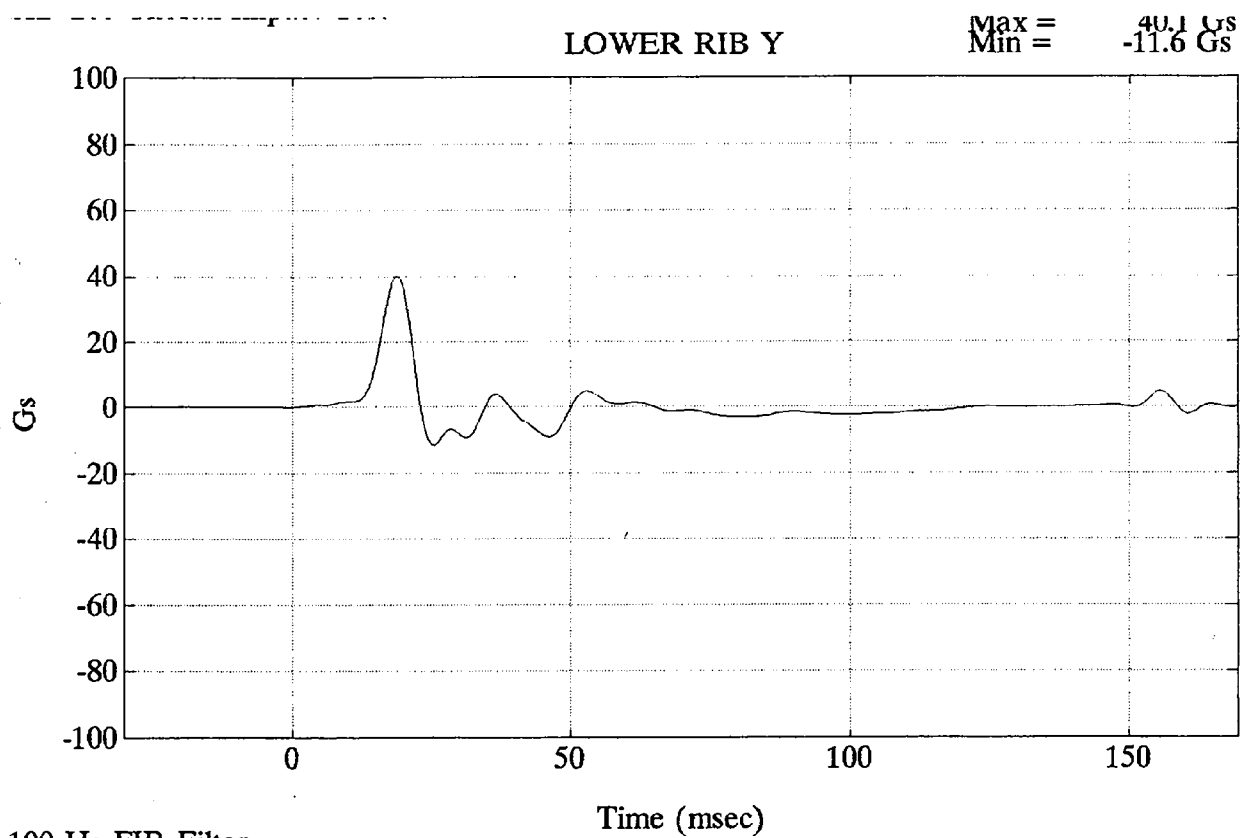
Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 31           |
| PROBE SPEED (m/s)     | 4.27 - 4.33   | 4.31         |
| UPPER RIB (g's)       | 37 - 46       | 42.4         |
| LOWER RIB (g's)       | 37 - 46       | 40.2         |
| LOWER SPINE (g's)     | 15 - 22       | 20.6         |

REMARKS: None







# LATERAL PELVIS IMPACT TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268

Calspan Sequential Test Number: 2

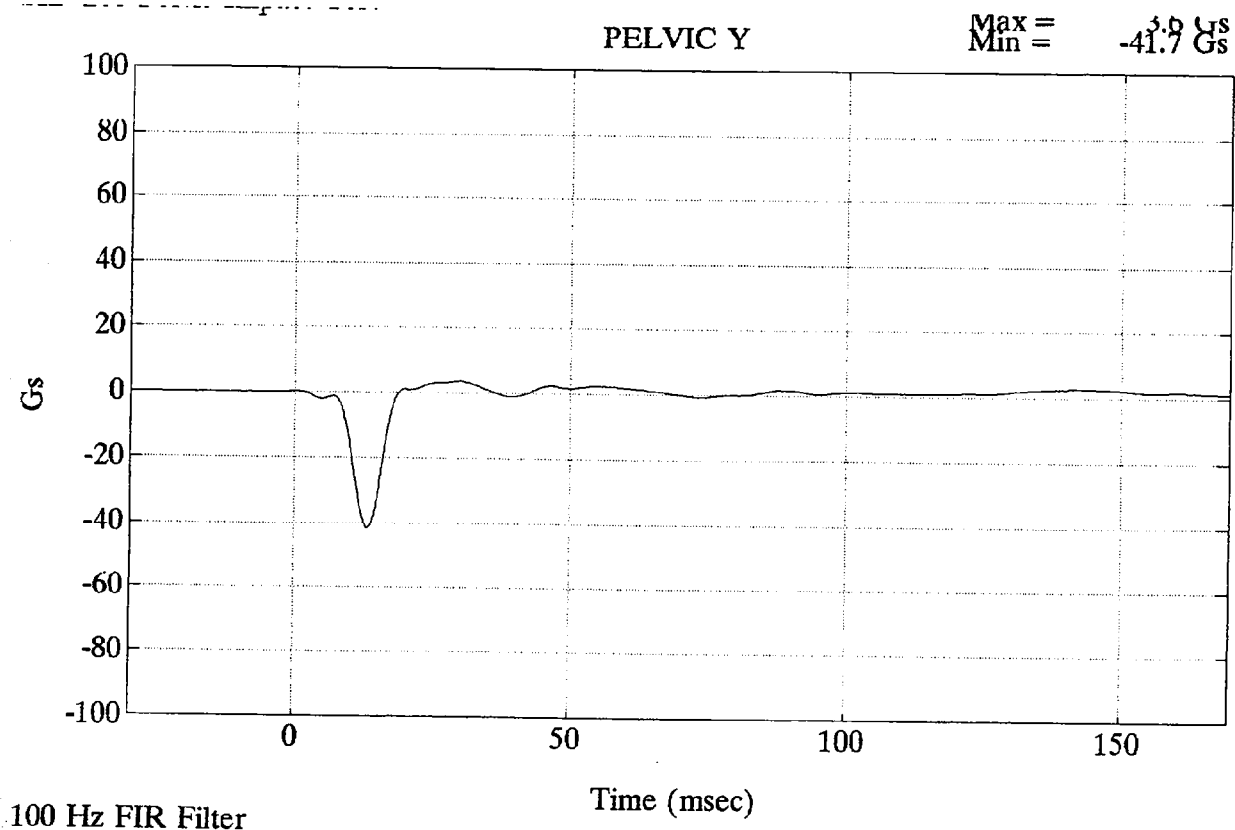
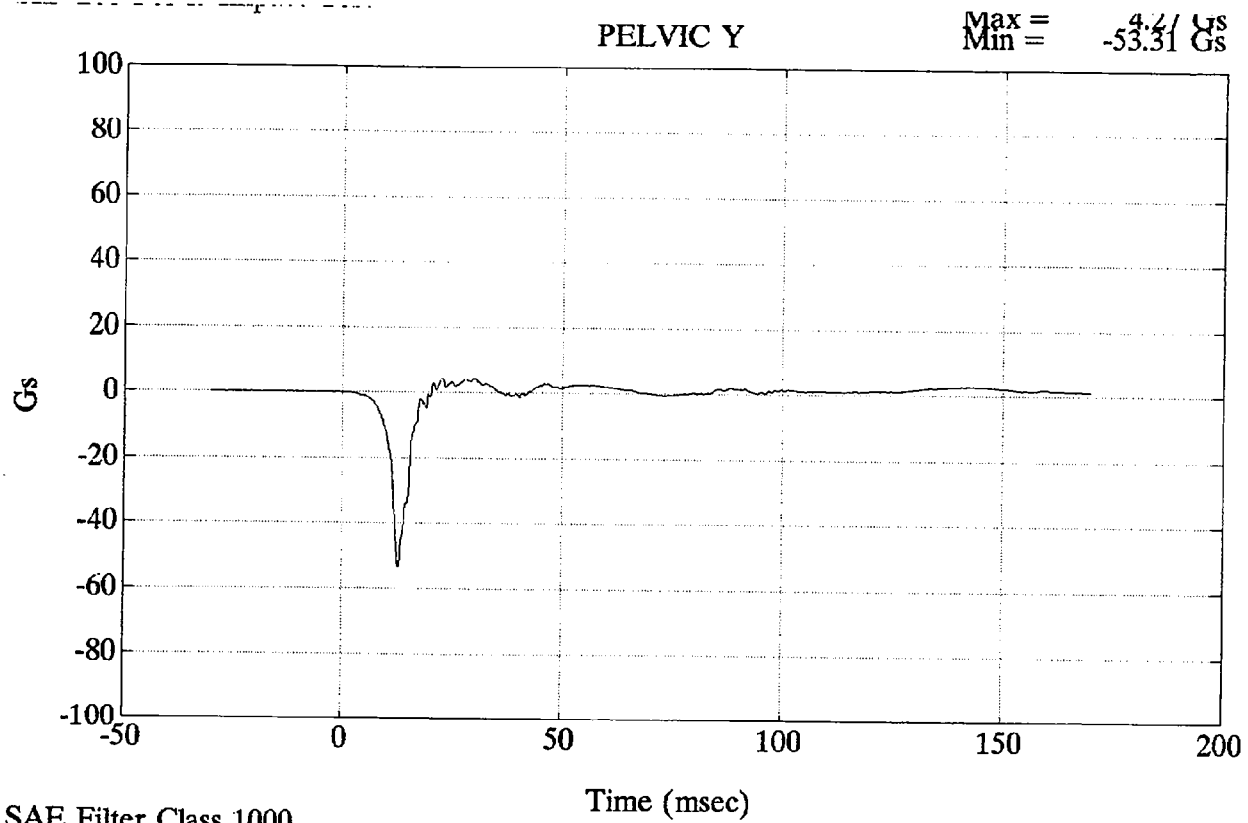
Date: 10/16/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER            | SPECIFICATION | TEST RESULTS |
|---------------------------|---------------|--------------|
| TEMPERATURE (°C)          | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%)     | 10 - 70       | 31           |
| PROBE SPEED (m/s)         | 4.27 - 4.33   | 4.30         |
| PELVIS ACCELERATION (g's) | 40 - 60       | 41.7         |

REMARKS: None





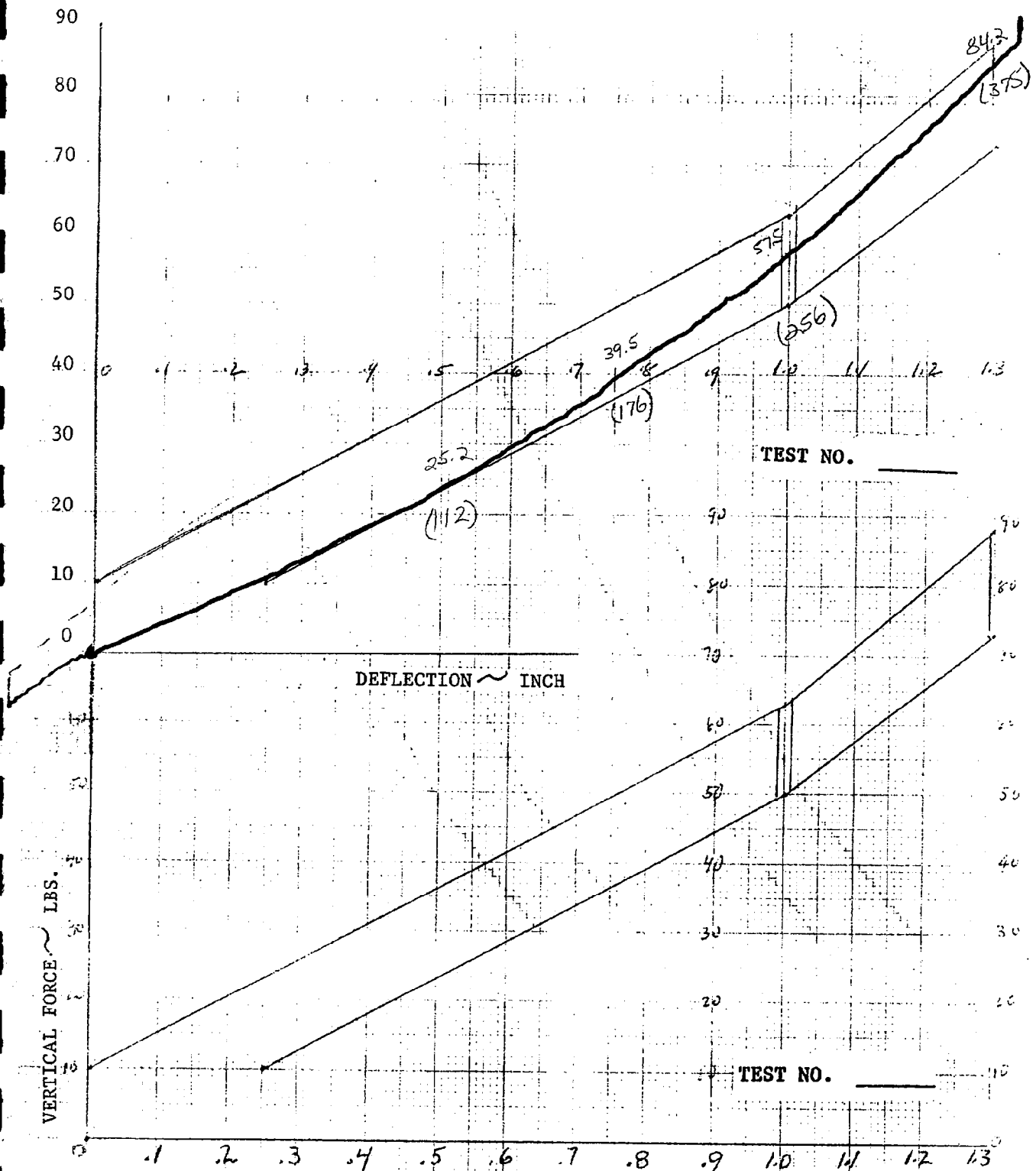
**ABDOMINAL COMPRESSION TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**SID Serial No.: 268Calspan Sequential Test Number: 2Date: 10/17/97Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 31           |
| FORCE @ 13 mm (N)     | 104 - 162     | 112          |
| FORCE @ 19 mm (N)     | 163 - 221     | 176          |
| FORCE @ 25 mm (N)     | 222 - 280     | 256          |
| FORCE @ 33 mm (N)     | 325 - 391     | 375          |

**REMARKS:** None



DUMMY S/N 268  
 DATE 10-17-97  
 CONTRACT AUTHORIZATION \_\_\_\_\_  
 TEMP. 70 HUMIDITY 31  
 PERFORMED BY [Signature]

PART 572  
 ABDOMEN STATIC PRESS  
 DOT - 13 DEC. '77

**LUMBAR FLEXION TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 268

Calspan Sequential Test Number: 2

Date: 10/17/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 31           |
| FORCE @ 0° (N)        | 0 - 26.7      | 0            |
| FORCE @ 20° (N)       | 97.8 - 151.2  | 129          |
| FORCE @ 30° (N)       | 151.2 - 204.6 | 186          |
| FORCE @ 40° (N)       | 204.6 - 258   | 245          |
| RETURN ANGLE          | 12° max.      | 10.3         |

**REMARKS:** None

DUNN S/A 268

W/A

DATE 10-17-77

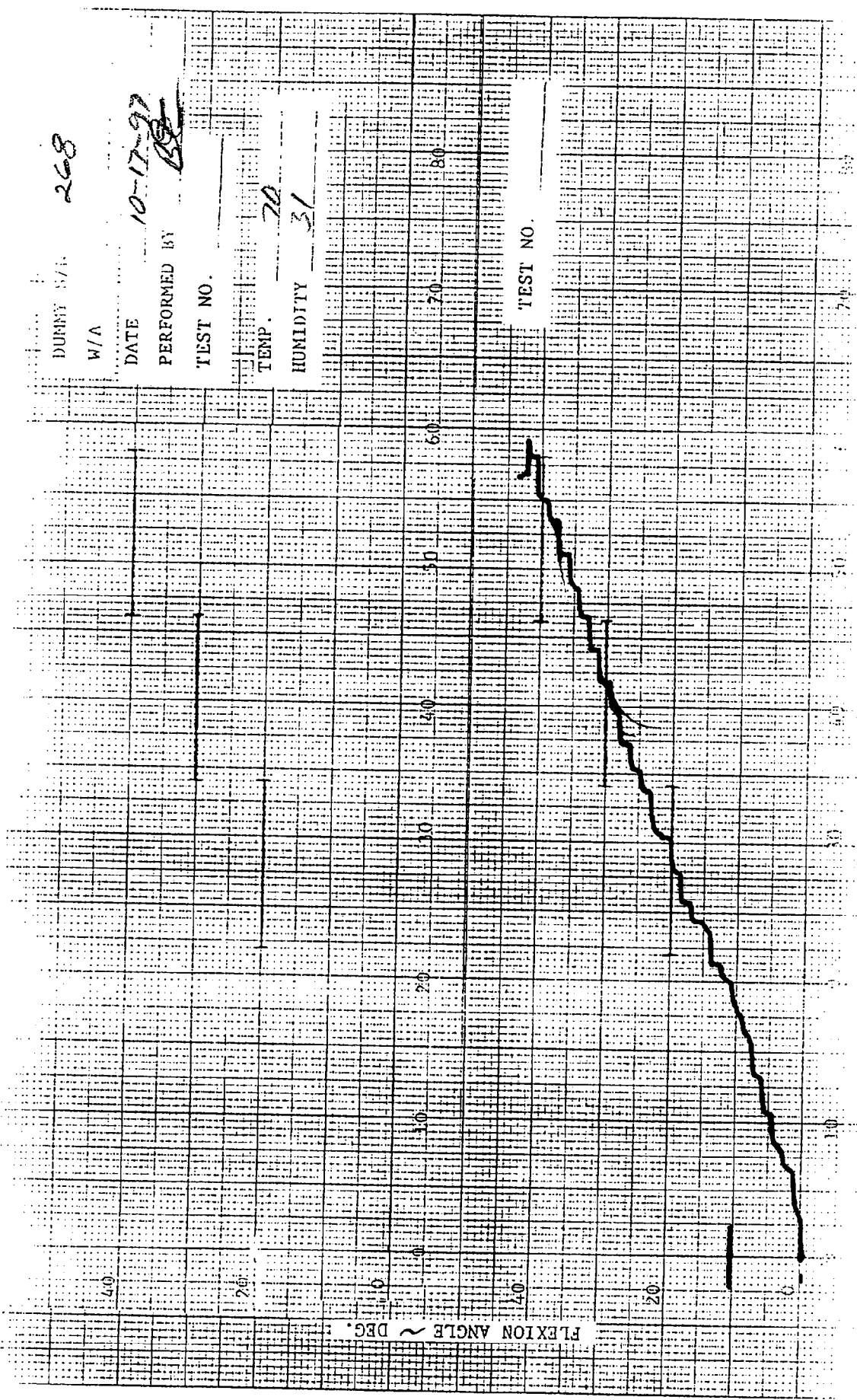
PERFORMED BY BE

TEST NO.

TEMP. 70

HUMIDITY 31

TEST NO.



# POST TEST DUMMY INSPECTION LIST

## CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268

Calspan Sequential Test Number: 2

Date: 10/17/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

| PART         | ITEMS CHECKED                                  | COMMENTS |
|--------------|------------------------------------------------|----------|
| SKIN         | VISUAL INSPECTION                              | OK       |
| HEAD         | VISUAL, BALLAST, ACCELEROMETER MOUNT           | OK       |
| NECK         | VISUAL, CABLE TORQUE                           | OK       |
| SPINE BOX    | VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT | OK       |
| RIB CAGE     | VISUAL, MEASURE, STIFFENERS                    | OK       |
| STERNUM      | VISUAL                                         | OK       |
| LUMBAR SPINE | VISUAL                                         | OK       |
| ABDOMEN      | VISUAL                                         | OK       |
| PELVIS       | VISUAL, PALPATE, ACCELEROMETER MOUNT           | OK       |
| UPPER LEGS   | VISUAL                                         | OK       |
| KNEES        | VISUAL, STOPS, INSERTS                         | OK       |
| LOWER LEGS   | VISUAL, RANGE OF MOTION                        | OK       |
| ANKLES       | VISUAL, RANGE OF MOTION                        | OK       |
| FEET         | VISUAL, RANGE OF MOTION                        | OK       |
| JOINTS       | 1 TO 2 g RANGE                                 | OK       |
| OTHER        | NONE                                           | -        |

REMARKS: None

**CALIBRATION TEST RESULTS  
POST TEST**

**SID NO.: 027**

**CONFIGURED FOR LEFT SIDE IMPACT**

# CALIBRATION TEST RESULTS SUMMARY

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 027  
Date: 10/17/97

Calspan Sequential Test Number: 2  
Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST                        | COMMENTS                 |
|-----------------------------|--------------------------|
| EXTERNAL DIMENSIONS         | Passed all requirements. |
| LATERAL THORAX IMPACT TEST  | Passed all requirements. |
| LATERAL PELVIS IMPACT TEST  | Passed all requirements. |
| ABDOMINAL COMPRESSION TEST* | Passed all requirements. |
| LUMBAR FLEXION TEST*        | Passed all requirements. |

\* Test not required for SID certification.

REMARKS: None



## EXTERNAL DIMENSIONS

### CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 027

Calspan Sequential Test Number: 2

Date: 10/16/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER                     | SPECIFICATION | TEST RESULTS |
|------------------------------------|---------------|--------------|
| SH- Seated Height (mm)             | 889 - 909     | 909          |
| RH- Rib Height (mm)                | 502 - 520     | 514          |
| HP- Hip Pivot Height (mm)          | 99 ref.       | 99           |
| RD- Rib from Back Line (mm)        | 229 - 241     | 235          |
| KH- Knee Pivot from Back Line (mm) | 511 - 526     | 514          |
| KV- Knee Pivot to Floor (mm)       | 490 - 505     | 491          |
| HW- Hip Width (mm)                 | 356 - 391     | 364          |

REMARKS: None

# LATERAL THORAX IMPACT TEST

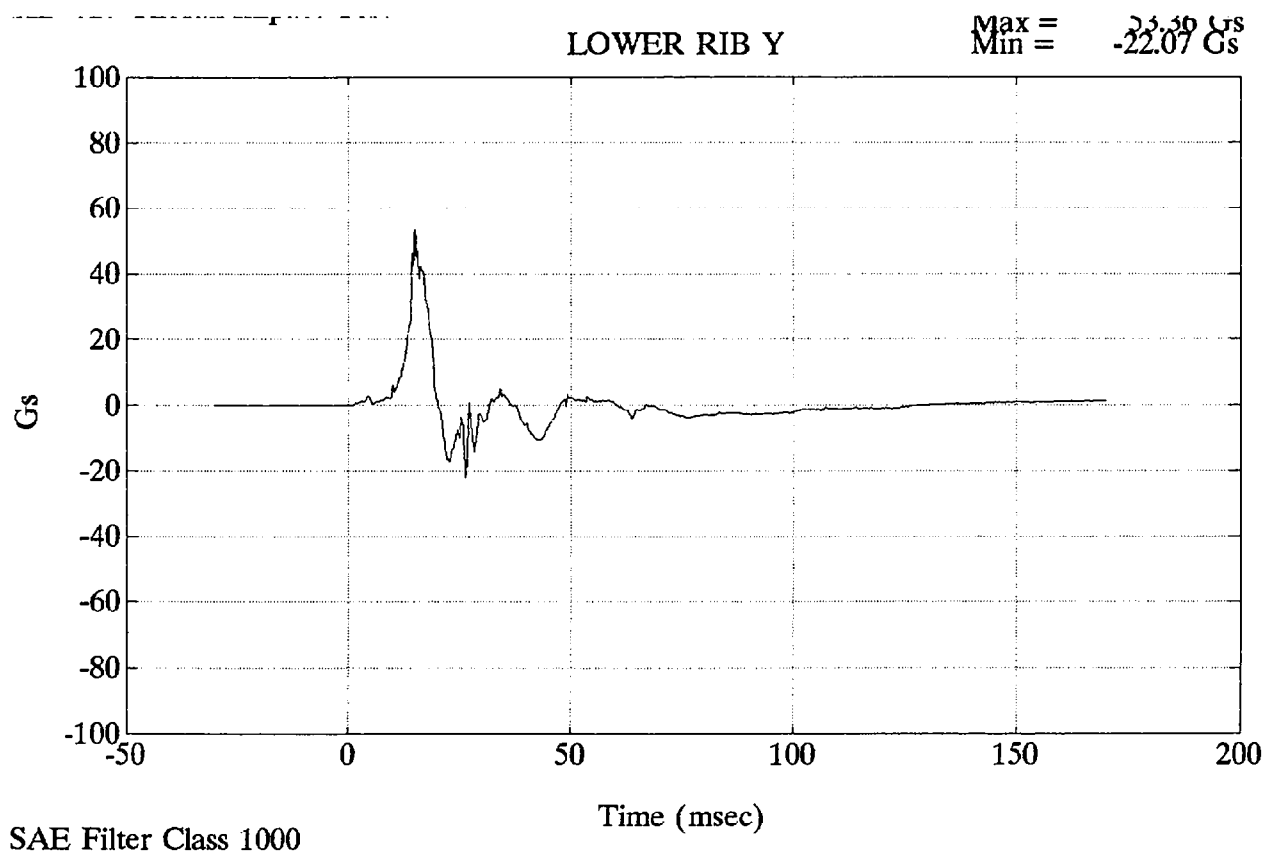
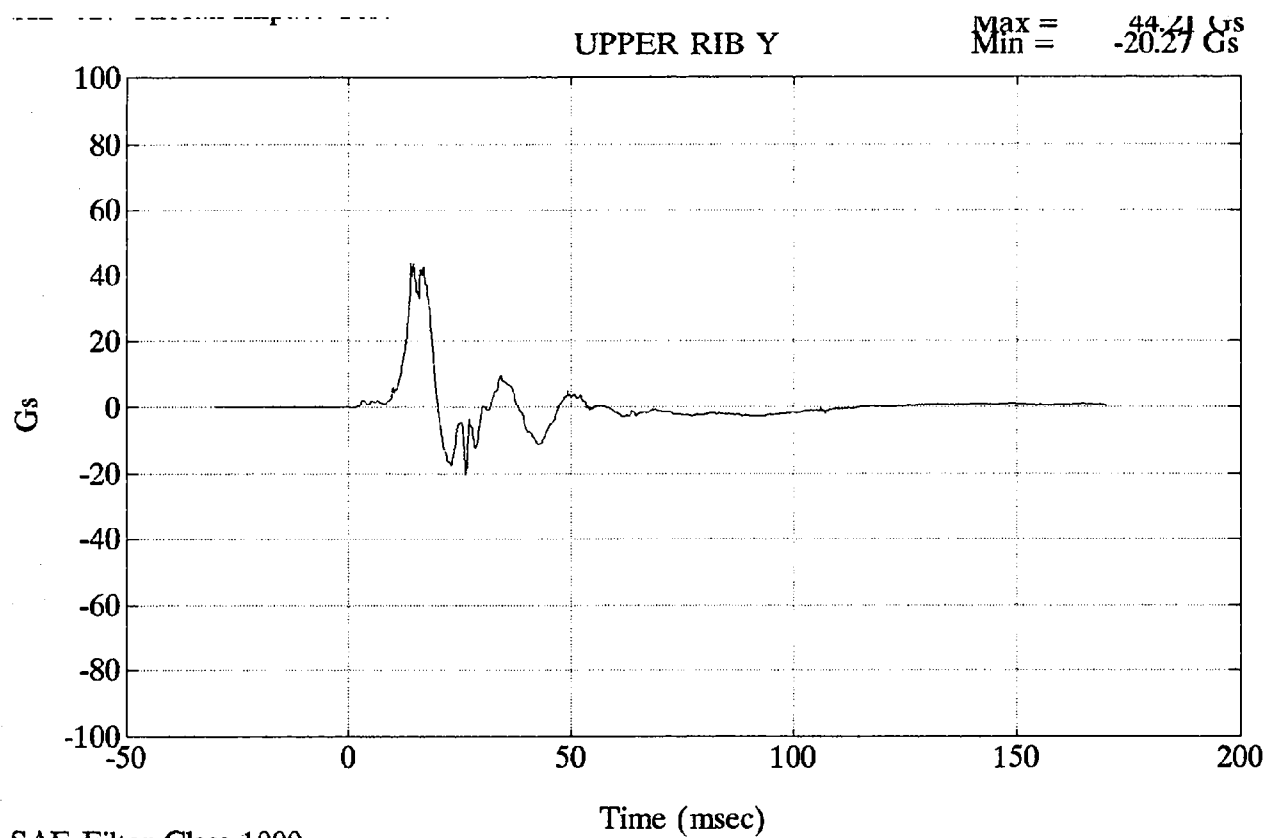
CONFIGURED FOR LEFT SIDE IMPACT

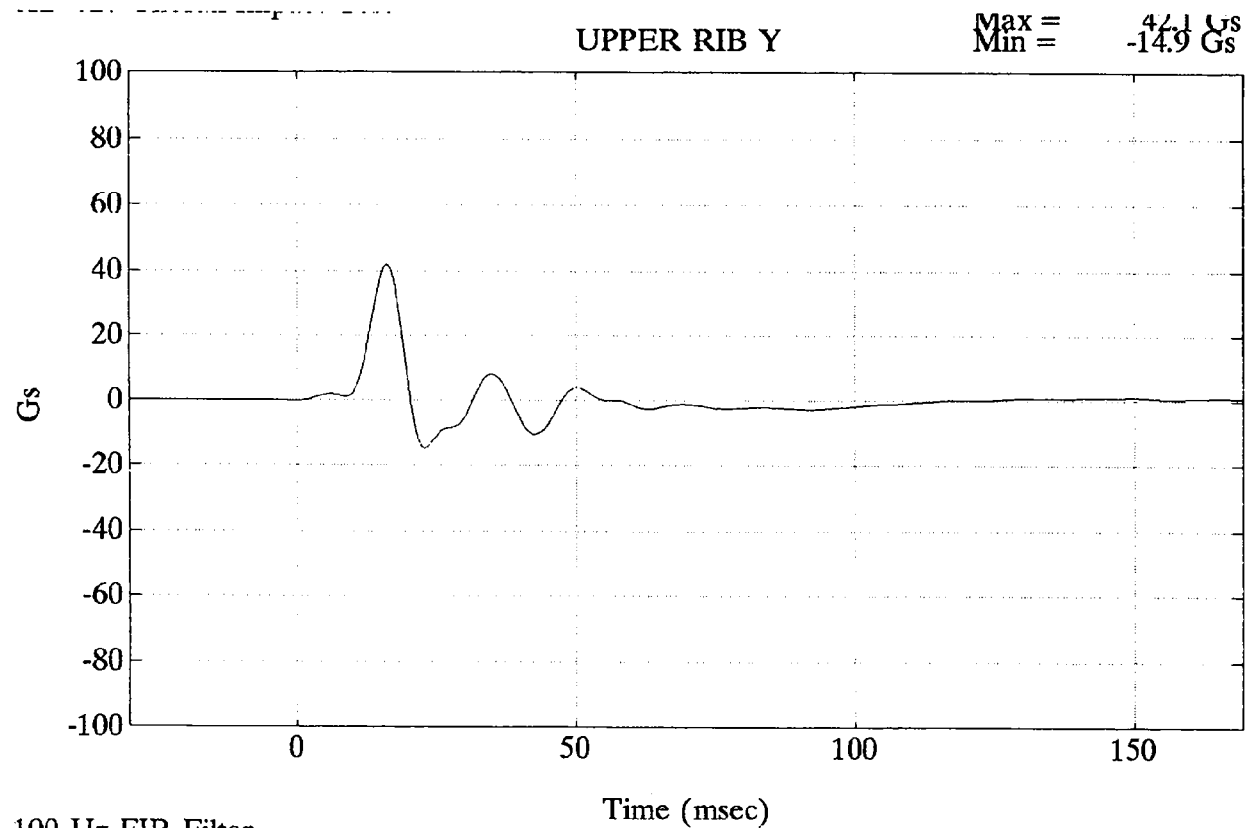
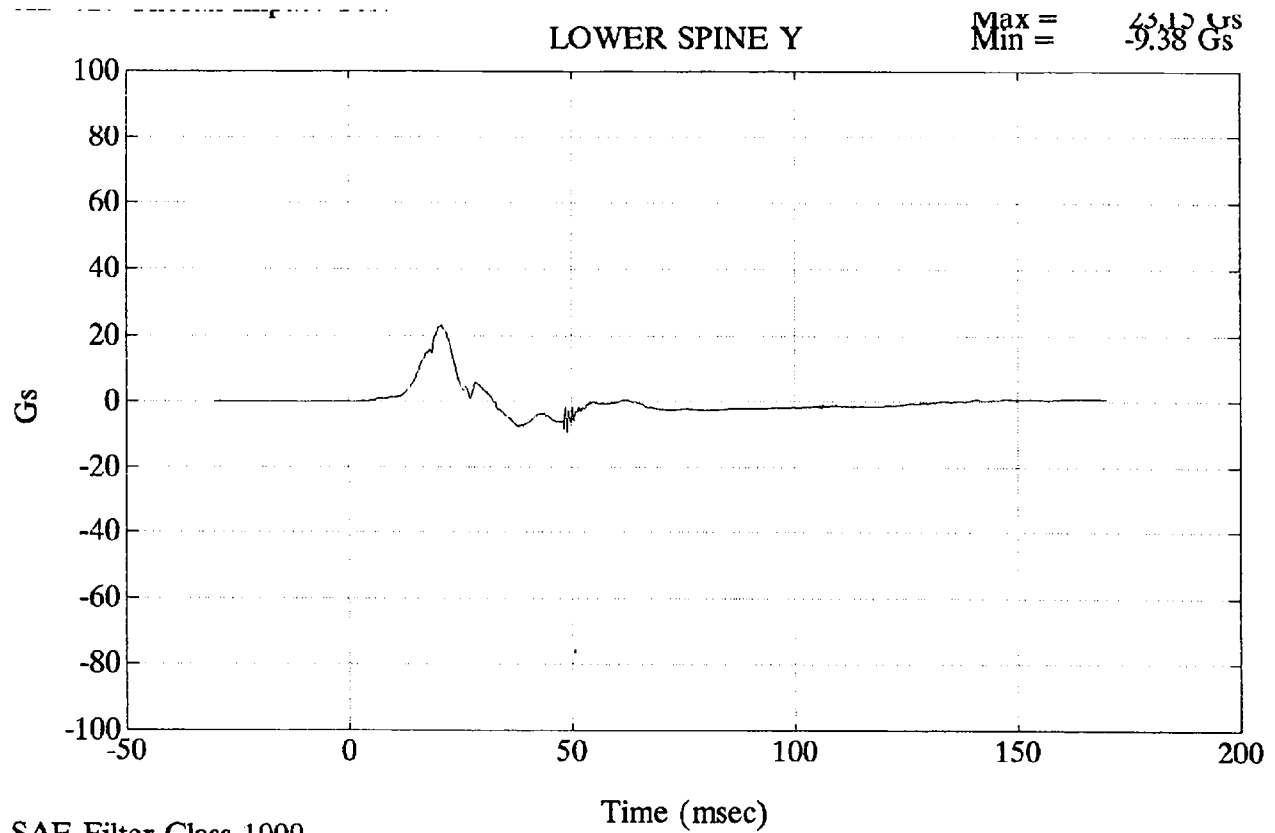
SID Serial No.: 027  
Date: 10/16/97

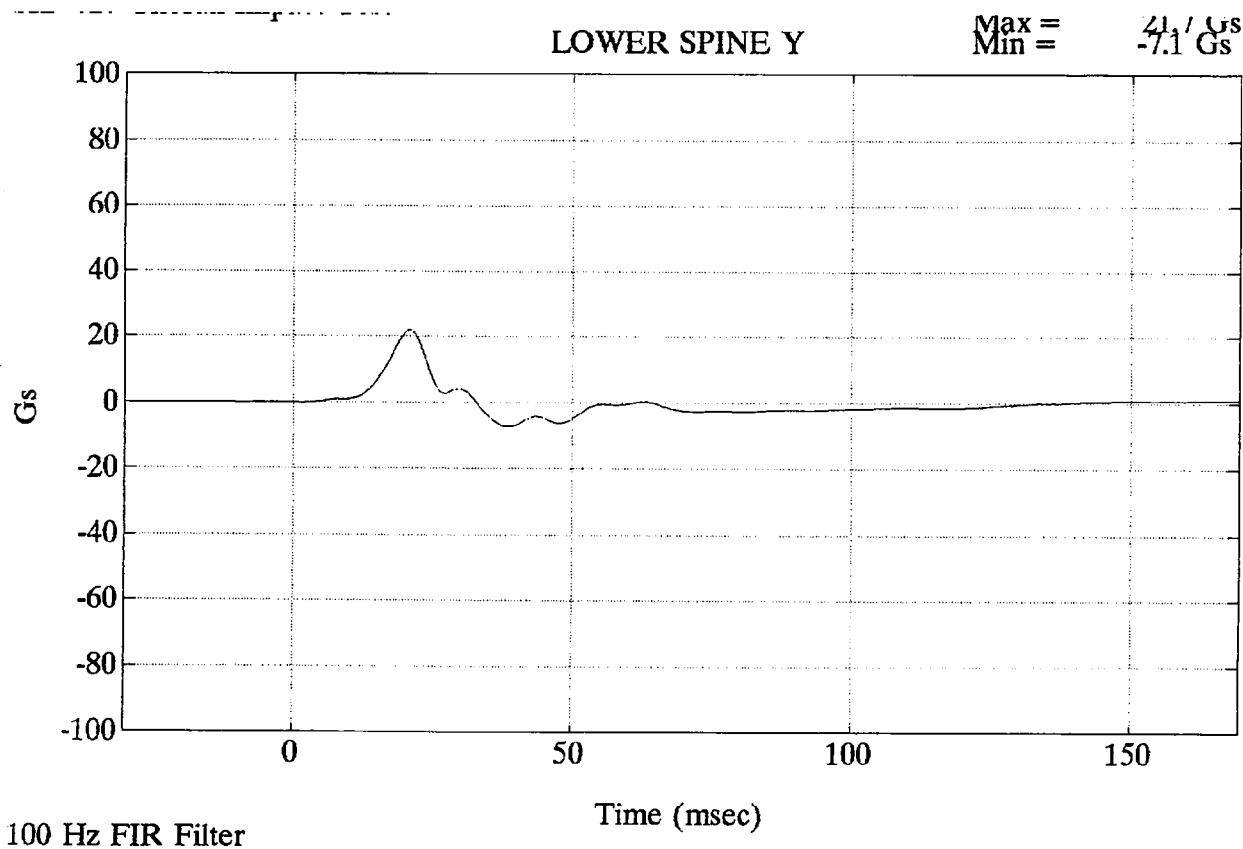
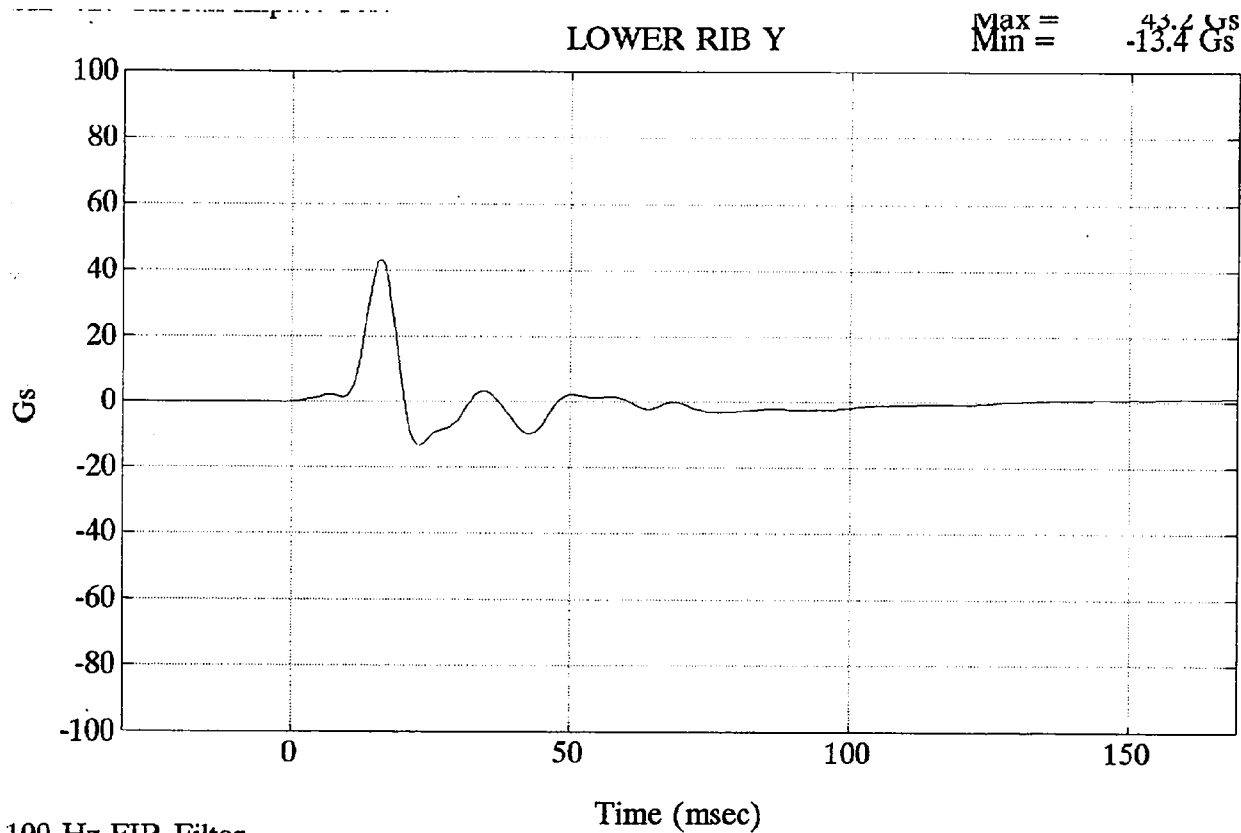
Calspan Sequential Test Number: 2  
Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 31           |
| PROBE SPEED (m/s)     | 4.27 - 4.33   | 4.32         |
| UPPER RIB (g's)       | 37 - 46       | 42.1         |
| LOWER RIB (g's)       | 37 - 46       | 43.2         |
| LOWER SPINE (g's)     | 15 - 22       | 21.8         |

REMARKS: None







# LATERAL PELVIS IMPACT TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 027

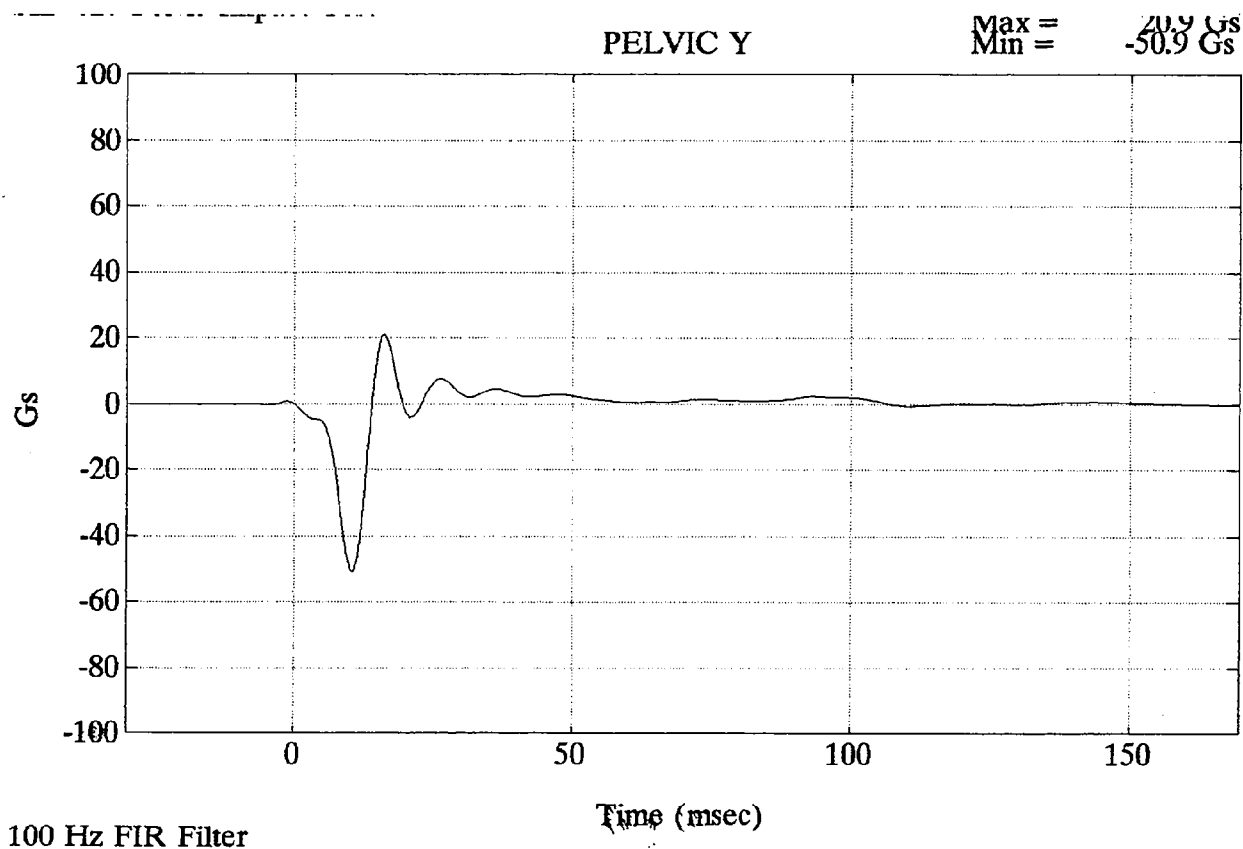
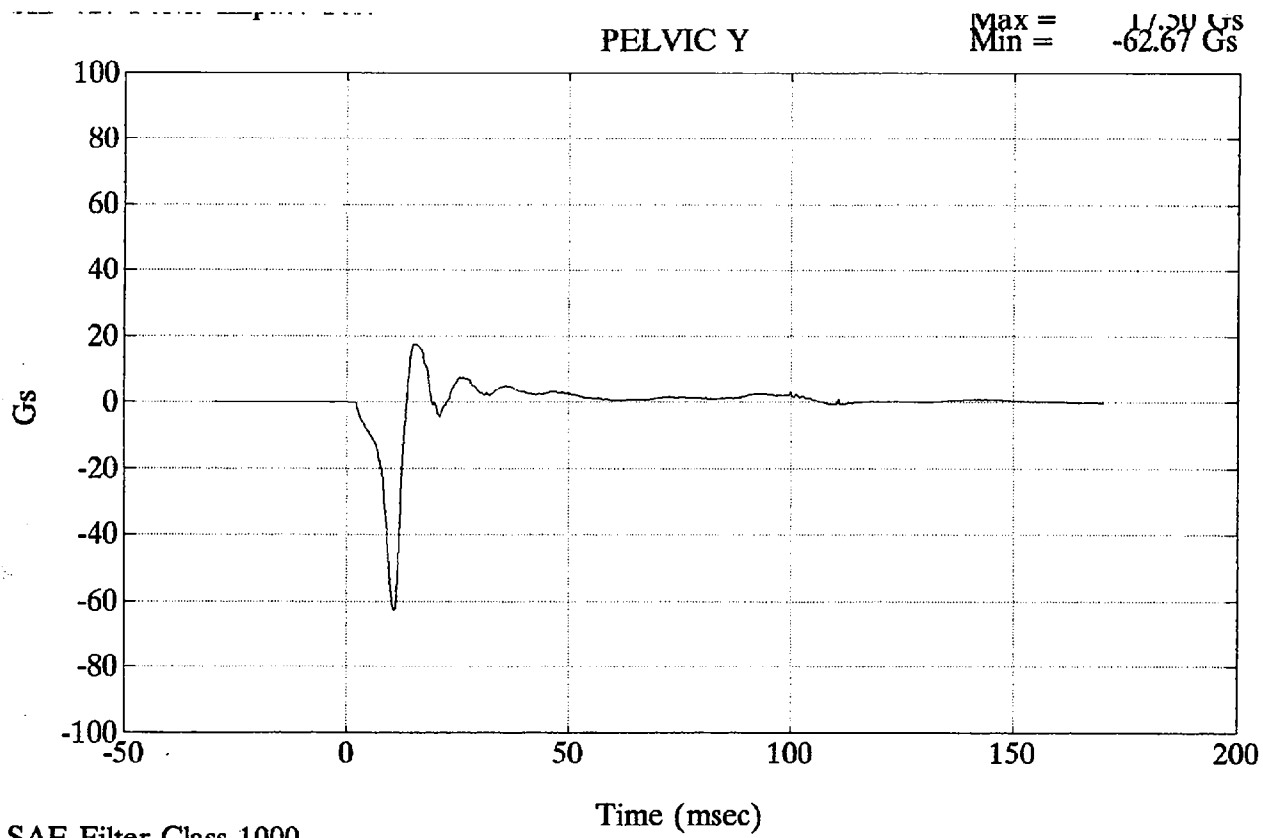
Calspan Sequential Test Number: 2

Date: 10/15/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER            | SPECIFICATION | TEST RESULTS |
|---------------------------|---------------|--------------|
| TEMPERATURE (°C)          | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%)     | 10 - 70       | 31           |
| PROBE SPEED (m/s)         | 4.27 - 4.33   | 4.32         |
| PELVIS ACCELERATION (g's) | 40 - 60       | 50.9         |

REMARKS: None



**ABDOMINAL COMPRESSION TEST**

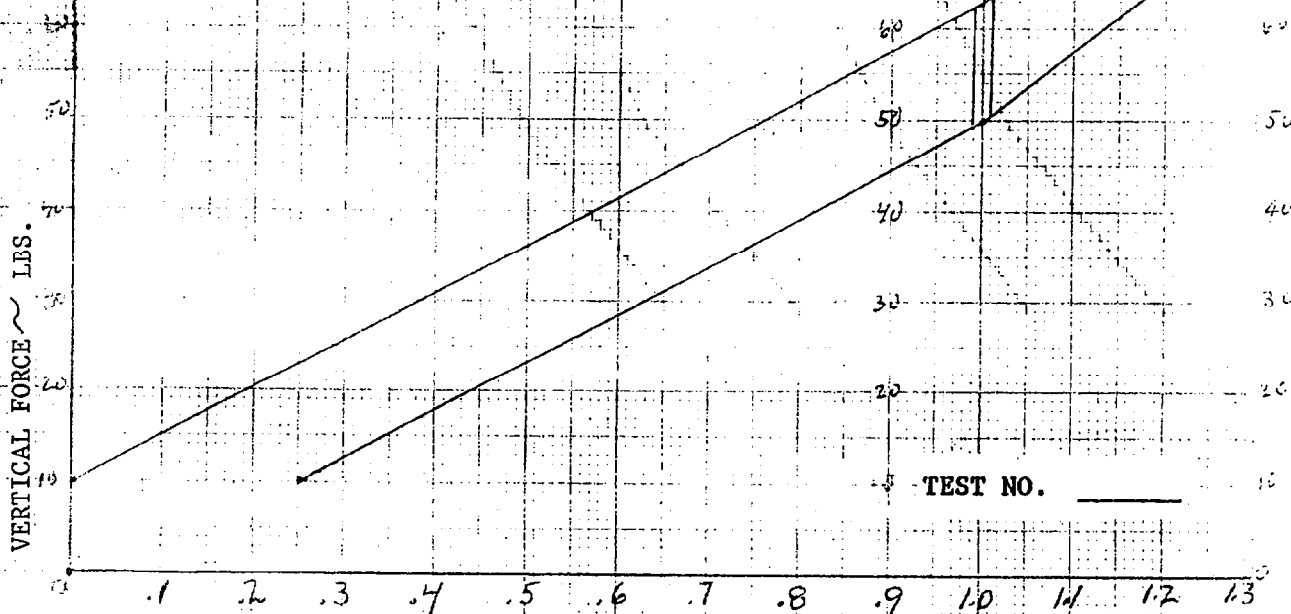
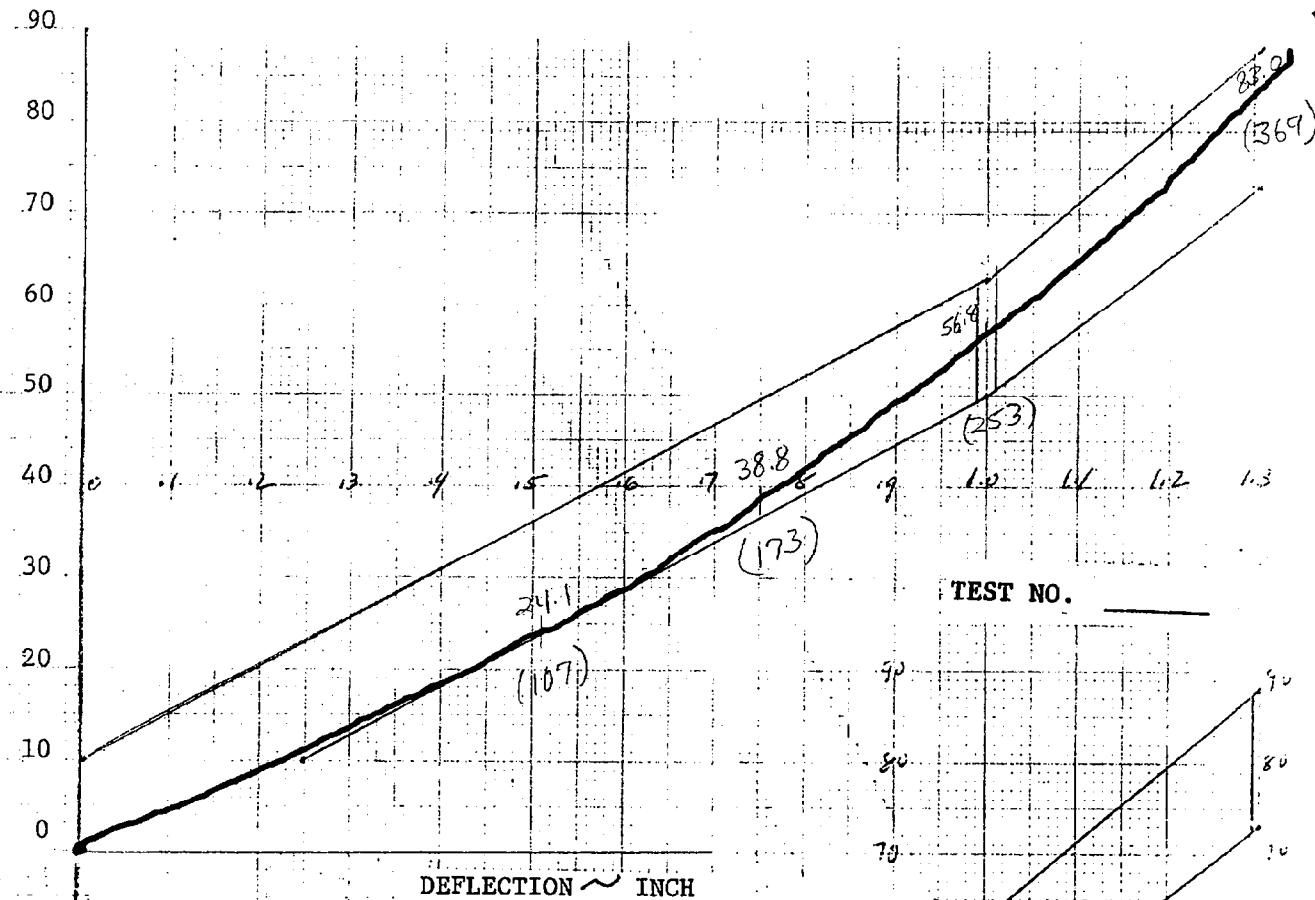
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**SID Serial No.: 027Calspan Sequential Test Number: 2Date: 10/17/97Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 31           |
| FORCE @ 13 mm (N)     | 104 - 162     | 107          |
| FORCE @ 19 mm (N)     | 163 - 221     | 173          |
| FORCE @ 25 mm (N)     | 222 - 280     | 253          |
| FORCE @ 33 mm (N)     | 325 - 391     | 369          |

**REMARKS:** None





DUMMY S/N 027  
 DATE 10-17-97  
 CONTRACT AUTHORIZATION \_\_\_\_\_  
 TEMP. 70 HUMIDITY 31  
 PERFORMED BY BOD

PART 572  
 ABDOMEN STATIC PRESS  
 DOT - 13 DEC. '77

**LUMBAR FLEXION TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 027 Calspan Sequential Test Number: 2  
Date: 10/17/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 31           |
| FORCE @ 0° (N)        | 0 - 26.7      | 0            |
| FORCE @ 20° (N)       | 97.8 - 151.2  | 142          |
| FORCE @ 30° (N)       | 151.2 - 204.6 | 201          |
| FORCE @ 40° (N)       | 204.6 - 258   | 254          |
| RETURN ANGLE          | 12° max.      | 9.4          |

REMARKS: None

027

DUNN S/R

W/A

DATE

10-17-97

PERFORMED BY

BS

TEST NO.

TEMP.

70

HUMIDITY

31

TEST NO.

FLEXION ANGLE ~ DEG.

# POST TEST DUMMY INSPECTION LIST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 027  
Date: 10/17/97

Calspan Sequential Test Number: 2  
Laboratory Technician: B. Swiecicki, G. Serbinowski

| PART         | ITEMS CHECKED                                  | COMMENTS |
|--------------|------------------------------------------------|----------|
| SKIN         | VISUAL INSPECTION                              | OK       |
| HEAD         | VISUAL, BALLAST, ACCELEROMETER MOUNT           | OK       |
| NECK         | VISUAL, CABLE TORQUE                           | OK       |
| SPINE BOX    | VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT | OK       |
| RIB CAGE     | VISUAL, MEASURE, STIFFENERS                    | OK       |
| STERNUM      | VISUAL                                         | OK       |
| LUMBAR SPINE | VISUAL                                         | OK       |
| ABDOMEN      | VISUAL                                         | OK       |
| PELVIS       | VISUAL, PALPATE, ACCELEROMETER MOUNT           | OK       |
| UPPER LEGS   | VISUAL                                         | OK       |
| KNEES        | VISUAL, STOPS, INSERTS                         | OK       |
| LOWER LEGS   | VISUAL, RANGE OF MOTION                        | OK       |
| ANKLES       | VISUAL, RANGE OF MOTION                        | OK       |
| FEET         | VISUAL, RANGE OF MOTION                        | OK       |
| JOINTS       | 1 TO 2 g RANGE                                 | OK       |
| OTHER        | NONE                                           | -        |

REMARKS: None

**APPENDIX D**

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

# TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

## SID INSTRUMENTATION

|                       | FRONT SID NO.: 268 |              |                  |
|-----------------------|--------------------|--------------|------------------|
|                       | SERIAL NUMBER      | MANUFACTURER | CALIBRATION DATE |
| UPPER RIB             | A13564             | ENDEVCO      | 9/97             |
| LOWER RIB             | A11584             | ENDEVCO      | 9/97             |
| LOWER SPINE           | A13012             | ENDEVCO      | 9/97             |
| PELVIS                | A13492             | ENDEVCO      | 9/97             |
| UPPER RIB REDUNDANT   | A13850             | ENDEVCO      | 9/97             |
| LOWER RIB REDUNDANT   | A12607             | ENDEVCO      | 9/97             |
| LOWER SPINE REDUNDANT | B11351             | ENDEVCO      | 6/97             |
| PELVIS REDUNDANT      | A13498             | ENDEVCO      | 9/97             |

|                       | REAR SID NO.: 027 |              |                  |
|-----------------------|-------------------|--------------|------------------|
|                       | SERIAL NUMBER     | MANUFACTURER | CALIBRATION DATE |
| UPPER RIB             | A12480            | ENDEVCO      | 9/97             |
| LOWER RIB             | A12776            | ENDEVCO      | 9/97             |
| LOWER SPINE           | A14173            | ENDEVCO      | 9/97             |
| PELVIS                | A13568            | ENDEVCO      | 9/97             |
| UPPER RIB REDUNDANT   | A13565            | ENDEVCO      | 9/97             |
| LOWER RIB REDUNDANT   | A13990            | ENDEVCO      | 9/97             |
| LOWER SPINE REDUNDANT | B11118            | ENDEVCO      | 6/97             |
| PELVIS REDUNDANT      | A13599            | ENDEVCO      | 9/97             |

REMARKS: None

# TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

## VEHICLE AND MDB INSTRUMENTATION

|                                    | VEHICLE AND MDB INSTRUMENTS |              |                  |
|------------------------------------|-----------------------------|--------------|------------------|
|                                    | SERIAL NUMBER               | MANUFACTURER | CALIBRATION DATE |
| RIGHT FRONT SILL (X)               | AP065                       | ENDEVCO      | 10/97            |
| RIGHT FRONT SILL (Y)               | APA29                       | ENDEVCO      | 10/97            |
| RIGHT FRONT SILL (Z)               | AP1B6                       | ENDEVCO      | 10/97            |
| RIGHT REAR SILL (X)                | MB19                        | ENTRAN       | 10/97            |
| RIGHT REAR SILL (Y)                | MB10                        | ENTRAN       | 10/97            |
| RIGHT REAR SILL (Z)                | MB08                        | ENTRAN       | 10/97            |
| REAR FLOORPAN ABOVE AXLE (X)       | MB12                        | ENTRAN       | 10/97            |
| REAR FLOORPAN ABOVE AXLE (Y)       | D12                         | ENTRAN       | 10/97            |
| REAR FLOORPAN ABOVE AXLE (Z)       | D03                         | ENTRAN       | 10/97            |
| LEFT REAR SILL (Y)                 | BB14                        | ENDEVCO      | 10/97            |
| LEFT FRONT SILL (Y)                | AY03                        | ENDEVCO      | 8/97             |
| RIGHT REAR SEAT OCCUPANT COMP. (Y) | Y95                         | ICS          | 10/97            |
| LOWER LEFT B- PILLAR (Y)           | AF42                        | ENDEVCO      | 8/97             |
| MIDDLE LEFT B-PILLAR (Y)           | BA65                        | ENDEVCO      | 10/97            |
| LOWER LEFT A-PILLAR (Y)            | AN25                        | ENDEVCO      | 8/97             |
| UPPER LEFT A-PILLAR (Y)            | AA35                        | ENDEVCO      | 8/97             |
| FRONT SEAT TRACK (Y)               | BC48                        | ENDEVCO      | 8/97             |
| REAR SEAT TRACK (Y)                | -                           | -            | -                |
| VEHICLE CG (X)                     | AC814                       | ENDEVCO      | 10/97            |
| VEHICLE CG (Y)                     | AC7Y3                       | ENDEVCO      | 10/97            |
| VEHICLE CG (Z)                     | MB18                        | ENTRAN       | 5/97             |
| MDB CG (X)                         | CL60                        | ENDEVCO      | 9/97             |
| MDB CG (Y)                         | CJ54                        | ENDEVCO      | 9/97             |
| MDB CG (Z)                         | CH35                        | ENDEVCO      | 9/97             |
| MDB REAR FRAME MEMBER (X)          | FL04                        | ENDEVCO      | 9/97             |
| MDB REAR FRAME MEMBER (Y)          | GL77                        | ENDEVCO      | 9/97             |

REMARKS: None