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212-CAL-93-5  
301-CAL-93-5

VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT CRASH PROTECTION,  
WINDSHIELD MOUNTING, WINDSHIELD ZONE INTRUSION (PARTIAL)  
AND FUEL SYSTEM INTEGRITY

GENERAL MOTOR CORPORATION  
1993 BUICK REGAL  
4-DOOR SEDAN

NHTSA NUMBER: CP0102

CALSPAN TEST NUMBER: 8056-6

NOVEMBER 5, 1992

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FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation  
National Highway Traffic Safety Administration  
ENFORCEMENT  
Office of Vehicle Safety Compliance  
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Washington, DC 20590

*Rec'd  
12/9/92*

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*2/23/93*  
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# TECHNICAL REPORT STANDARD TITLE PAGE

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                      |                                                                                                                                                                                                                                         |                                                                                 |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|--|
| 1. Report No.<br>208-CAL-93-5<br>212-CAL-93-5<br>301-CAL-99-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | 2. Government Accession No.                          |                                                                                                                                                                                                                                         | 3. Recipient's Catalog No.                                                      |  |
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| <p>16. Abstract</p> <p>A 30 mph vehicle safety compliance test was conducted on a 1993 Buick Regal 4-door Sedan.</p> <p>This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on November 5, 1992. The purpose of this test was to determine compliance with the performance requirements of the following Federal Motor Vehicle Safety Standards:</p> <ol style="list-style-type: none"> <li>1. FMVSS No. 208, "Occupant Crash Protection"</li> <li>2. FMVSS No. 212, "Windshield Mounting"</li> <li>3. FMVSS No. 219 (partial), "Windshield Zone Intrusion"</li> <li>4. FMVSS No. 301, "Fuel System Integrity"</li> </ol> <p>The test mode was perpendicular (0°) and the impact velocity was 29.6 mph. The ambient temperature at the impact face was 34°F.</p> <p>The subject test vehicle appears to comply with the requirements of FMVSS Nos. 208, 212, 219 (partial) and 301.</p> <p><u>Type of Restraint System:</u> The test vehicle was equipped both driver and right front passenger automatic 3-point seat belt restraint system.</p> |  |                                                      |                                                                                                                                                                                                                                         |                                                                                 |  |
| 17. Key Words<br>30 mph Vehicle Safety Compliance Testing<br>FMVSS 208, "Occupant Crash Protection"<br>FMVSS 212, "Windshield Mounting"<br>FMVSS 219, "Windshield Zone Intrusion"<br>FMVSS 301, "Fuel System Integrity"<br>Frontal Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                      | 18. Distribution Statement<br>Copies of this report are available from:<br>Technical Reference Division<br>National Highway Traffic Safety Admin.<br>Nassif Building, Room 5108 (NAD-52)<br>400 Seventh St., S.W., Washington, DC 20590 |                                                                                 |  |
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## Section 1

### PURPOSE AND TEST PROCEDURE

This 30 mph frontal barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208, 212, 219 (partial) and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by Calspan Advanced Technology Center under Contract No. DTNH22-90-C-01003. The purpose of this test was to determine if the subject vehicle, a 1993 Buick Regal 4-door Sedan, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS No. 212, "Windshield Mounting"; FMVSS No. 219 (partial), "Windshield Zone Intrusion"; and FMVSS No. 301, "Fuel System Integrity". This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-208-08, dated September 8, 1989.

## Section 2

### SUMMARY OF TEST NUMBER CP0102

A frontal barrier was impacted by a 1993 Buick Regal 4-door Sedan at a velocity of 29.6 mph. The test was performed at the Calspan Corporation Advanced Technology Center on November 5, 1992. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by one real-time camera and 14 high-speed cameras. Camera locations and other pertinent camera information can be found in this report.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right front passenger seating positions according to dummy placement instructions specified in the OVSC Laboratory Test Procedure.

Both ATDs were fully instrumented with head and chest triaxial accelerometers, chest displacement potentiometers and left/right femur load cells. These ATDs had been certified prior to the test.

The 25 channels of data were recorded on two 14-channel FM tape recorders. Appendix B contains the vehicle and dummy response data traces.

The driver's HIC was 539. The maximum chest deceleration over 3 milliseconds was 46.6 g's with 2.0 inches of deflection. The maximum force on the driver's left femur was 978 pounds and 696 pounds on the right femur.

The right front passenger's HIC was 597. The maximum chest deceleration over 3 milliseconds was 39.9 g's with 1.8 inches of deflection. Loads of 583 and 731 pounds were recorded on the left and right femurs respectively.

Table 1  
CRASH TEST SUMMARY

Vehicle NHTSA No.: CP0102 Test Mode: 30 mph Frontal Barrier

Test Date: November 5, 1992 Time: 13:40 Temperature: 34°F

Vehicle Make/Model/Body Style: 1993 Buick Regal 4-door Sedan

Vehicle Test Weight: 3870 lbs.

Vehicle/Barrier Impact Angle: 0°

Impact Velocity: 29.6 mph

Maximum Static Crush: 16.5 inches

Vehicle Rebound: 42.0 inches

| <u>DUMMIES:</u>   | <u>DRIVER</u>                 | <u>PASSENGER</u>              |
|-------------------|-------------------------------|-------------------------------|
| Type:             | <u>Part 572E</u>              | <u>Part 572E</u>              |
| Restraint System: | <u>Automatic 3-point belt</u> | <u>Automatic 3-point belt</u> |

Number of Data Channels: 25

Number of Cameras: 1 Real Time  
14 High Speed

DOOR OPENING DATA: Closed-operable - Left Front  
Closed-operable - Right Front

| Front Seat(s) Data: | <u>DRIVER</u>   | <u>PASSENGER</u> |
|---------------------|-----------------|------------------|
| Seat Track Failure: | <u>0.0</u>      | <u>0.0</u>       |
|                     | inches of shift |                  |

|                    |             |             |
|--------------------|-------------|-------------|
| Seat Back Failure: | <u>None</u> | <u>None</u> |
|--------------------|-------------|-------------|

| <u>VISIBLE DUMMY CONTACT POINTS:</u> | <u>DRIVER</u>                                                                                | <u>PASSENGER</u>                                   |
|--------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------|
| Head:                                | <u>Right cheek with upper right side of steering wheel rim. Rear of head with head rest.</u> | <u>Chin with chest, rear of head with headrest</u> |
| Abdomen:                             | <u>Lower-steering wheel rim</u>                                                              | <u>-</u>                                           |
| Chest:                               | <u>-</u>                                                                                     | <u>-</u>                                           |
| Knees:                               | <u>Lower dash</u>                                                                            | <u>Glove box door</u>                              |

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1993 Buick Regal 4-Door Sedan  
 NHTSA No.: CP0102; VIN: 2G4WB54L3P1403406; Color: Blue  
 Engine Data: 6 cylinders; - CID; 3.8 Liters; - cc  
 Placement: - Longitudinal or In-Line; - Transverse or Lateral  
 Transmission Data: 4 speeds; - Manual; ✓ Automatic; ✓ Overdrive  
 Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive  
 Major Options: ✓ A/C; ✓ Pwr.Strg.; ✓ Pwr.Brakes  
✓ Pwr.Windows; ✓ Pwr.Door Locks; ✓ Tilt Wheel  
 Date Received: 9-14-92; Odometer Reading 11 miles  
 Selling Dealer: Paul Batt Buick  
 & Address 1717 Walden Ave., Buffalo, NY 14225

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: General Motors of Canada  
 Date of Manufacture: 08/92  
 GVWR: 4523 lbs.; GAWR: 2550 lbs. FRONT; 1973 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 30 psi FRONT  
30 psi REAR

Recommended Tire Size: P205/70R15

\* Recommended Cold Tire Pressure: 30 psi FRONT; 30 psi REAR

Size of Tires on Test Vehicle: P205/70R15; Manufacturer: Good Year

Vehicle Capacity Data:

Type of Front Seats: - Bench; - Bucket; X Split Bench  
 Number of Occupants: 3 Front; 3 Rear; 6 Total  
 Vehicle Capacity Weight (VCW) = 1058 lbs.  
 No. of Occupants x 150 lbs. = 900 lbs.  
 Rated Cargo/Luggage Weight (RCLW) = 158 lbs. (Difference)

\*Tire pressure used for test

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS) = UDW:

Right Front = 1100 lbs.      Right Rear = 580 lbs.  
 Left Front = 1130 lbs.      Left Rear = 580 lbs.  
 TOTAL FRONT = 2230 lbs.      TOTAL REAR = 1160 lbs.  
 % of Total Vehicle Weight = 65.8 % of Total Weight = 34.2 %  
 TOTAL DELIVERED WEIGHT = 3390 lbs.

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 3390 lbs.  
 Rated Cargo/Luggage Weight (RCLW) = 158 lbs.  
 Weight of 2 P.572 Dummies @ 167 ea. = 334 lbs.  
 TARGET TEST WEIGHT = 3882 lbs. (sum)

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 146 POUNDS OF CARGO WEIGHT:

Right Front = 1180 lbs.      Right Rear = 750 lbs.  
 Left Front = 1210 lbs.      Left Rear = 730 lbs.  
 TOTAL FRONT = 2390 lbs.      TOTAL REAR = 1480 lbs.  
 % of Total Weight = 61.8 %      % of Total Weight = 38.2 %  
 TOTAL TEST WEIGHT = 3870 lbs.

Weight of Ballast Secured in Vehicle Trunk Area = 0 lbs.

Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimensions in inches):

|               |                 |                 |                 |                 |
|---------------|-----------------|-----------------|-----------------|-----------------|
| AS DELIVERED: | RF <u>28.3"</u> | LF <u>28.0"</u> | RR <u>28.5"</u> | LR <u>28.2"</u> |
| FULLY LOADED: | RF <u>27.1"</u> | LF <u>27.0"</u> | RR <u>25.9"</u> | LR <u>25.7"</u> |
| AS TESTED:    | RF <u>28.1"</u> | LF <u>27.9"</u> | RR <u>27.2"</u> | LR <u>27.1"</u> |

Vehicle's Wheel Base: 107.5 in.

Location of Vehicle's C.G.: 41.1 inches rearward of front wheel center

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 16.5 gallons  
 Usable Capacity Figure Furnished by COTR = 16.0 gallons  
 Test Volume Range (92 to 94% of Usable Capacity) = 14.7 to 15.0 gallons  
 ACTUAL TEST VOLUME = 14.8 gallons (with entire fuel system filled)

Table 3  
POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°  
Test Date: November 5, 1992 Time: 13:40 Temperature: 34°F  
Vehicle NHTSA No.: CP0102  
Required Impact Velocity Range: 28.9 to 29.9 mph

BARRIER IMPACT VELOCITY: (Speed traps within 5 feet of impact plane.)

Trap No. 1 = 29.6 mph; Trap No. 2 = 29.6 mph  
Distance from vehicle to barrier: (1) entering trap = 52 inches  
(2) exiting trap = 12 inches

VEHICLE STATIC CRUSH: (For frontal and rear impacts only.)

Vehicle Length:

Pre-Test Right = 188.5; C/L = 194.2; Left = 188.5  
Post-Test Right = 176.4; C/L = 177.7; Left = 175.0  
Crush Right = 12.1; C/L = 16.5; Left = 13.5  
AVERAGE = 14.0 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

Right = 41.8; C/L = 40.7; Left = 43.5  
AVERAGE = 42.0 inches

DOOR OPENING:

|       | Left                   | Right                  |
|-------|------------------------|------------------------|
| Front | <u>Closed-operable</u> | <u>Closed-operable</u> |
| Rear  | <u>Closed-operable</u> | <u>Closed-operable</u> |

SEAT MOVEMENT:

|       | Seat Back Failure | Seat Shift  |
|-------|-------------------|-------------|
| Front | <u>None</u>       | <u>None</u> |
| Rear  | <u>N/A</u>        | <u>N/A</u>  |

Table 3  
POST IMPACT DATA (cont.)

GLAZING DAMAGE: None

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OTHER NOTABLE IMPACT FEATURES: Steering column dropped

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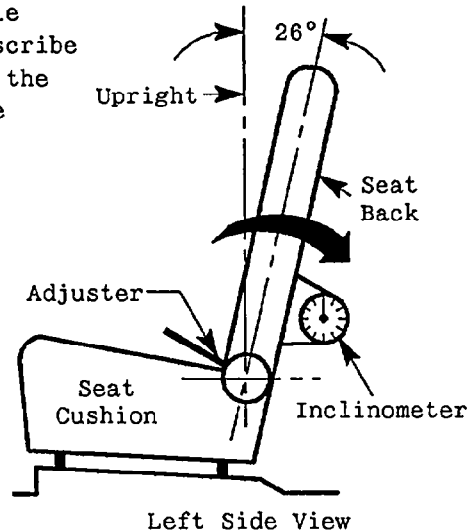
Section 3  
OCCUPANT AND VEHICLE DATA

Figure 1  
TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1993 Vehicle Model: Buick Regal Body Style: 4-door Sedan

1. 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.



Seat back angle for driver's seat: 26°

Measurement instructions: Press inclinometer along seat back frame and  
measure 26° from vertical plane

Seat back angle for passenger's seat: 26°

Measurement instructions: Same as driver

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Seat was placed in mid position of fore/aft  
travel (power seat)

Positioning of the passenger's seat (if applicable): Seat was placed in 11th  
detent (mid-position) from a total of 21 detents

3. Fuel Tank Capacity Data

A. "Usable Capacity" of the standard equipment fuel tank is 16.0 gallons

B. "Usable Capacity" of the optional equipment fuel tank is - gallons

Additional Instructions: None

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION

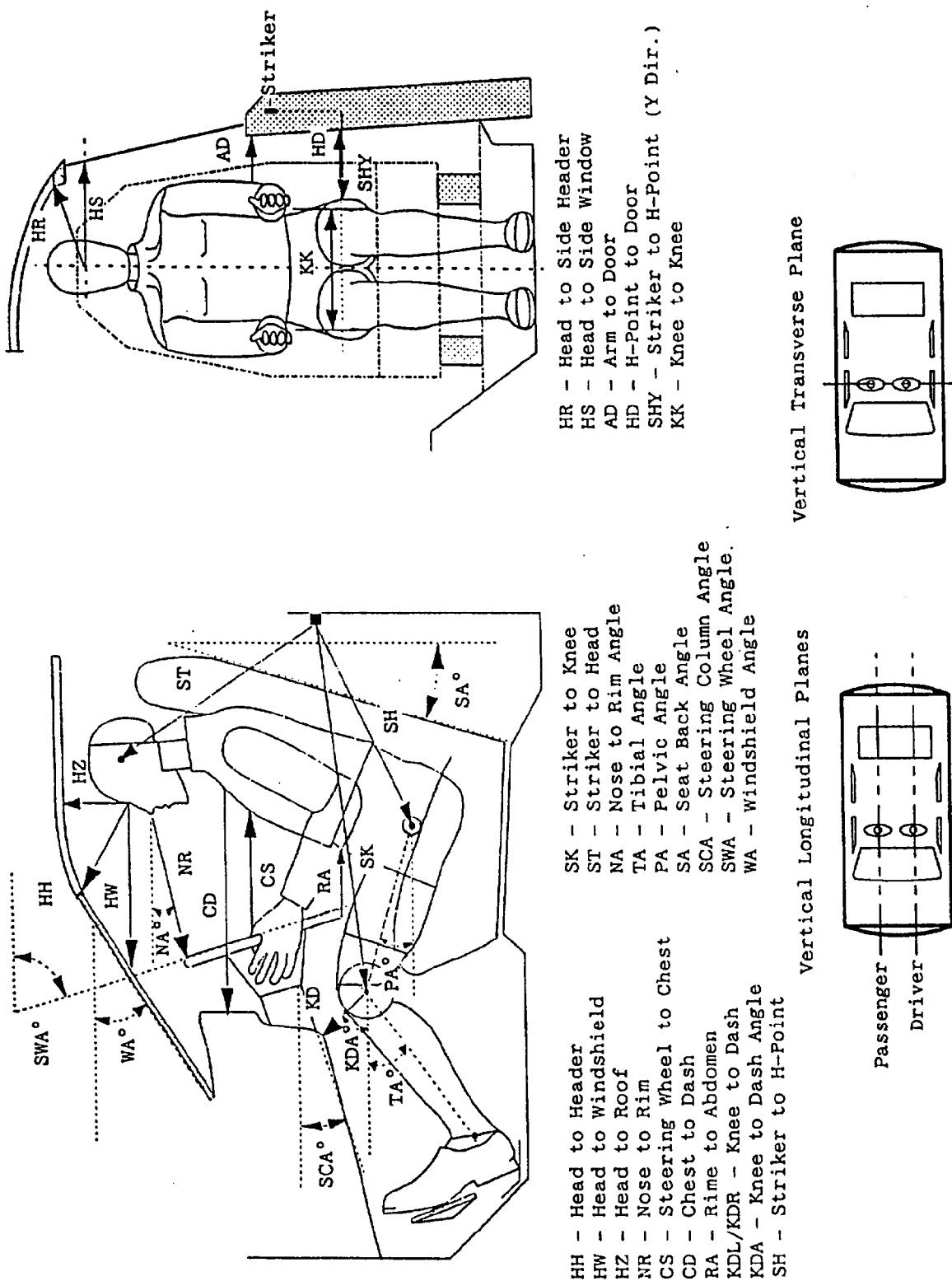


Table 4

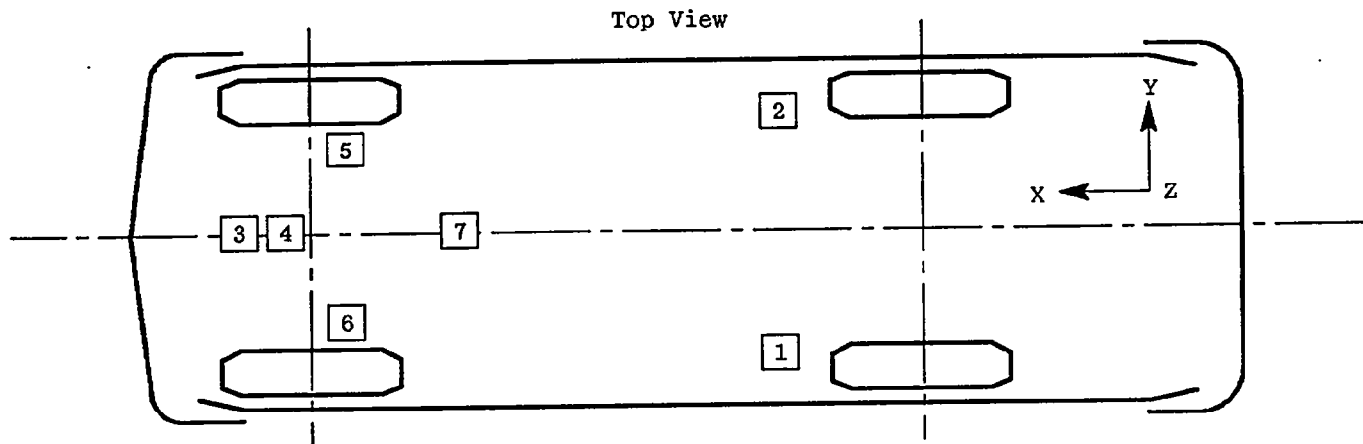
FRONT SEAT OCCUPANT MEASUREMENTS

(Dimensions in inches unless otherwise specified)

|      | DRIVER (Serial #290) | PASS (Serial #313)  |
|------|----------------------|---------------------|
| WA°  | 28°                  | -                   |
| SWA° | 68°                  | -                   |
| SCA° | 22°                  | -                   |
| SA°  | 26°                  | 26°                 |
| HZ   | 6.6                  | 5.7                 |
| HH   | 13.8                 | 12.7                |
| HW   | 22.6                 | 21.6                |
| HR   | 7.3                  | 7.3                 |
| NR   | 15.0 Angle (NA)      | 14°                 |
| CD   | 24.1                 | 21.8                |
| CS   | 13.3                 | N/A                 |
| RA   | 7.5                  | N/A                 |
| KDL  | 7.7 Angle (KDA) 39°  | 6.5                 |
| KDR  | 7.8                  | 7.2 Angle (KDA) 44° |
| PA°  | 23°                  | 24°                 |
| TA°  | 37°                  | 41°                 |
| KK   | 10.7                 | 8.7*                |
| ST   | 22.4 Angle 5°        | 22.9 Angle 7°       |
| SK   | 21.5 Angle 91°       | 22.6 Angle 92°      |
| SH   | 7.3 Angle 128°       | 7.4 Angle 118°      |
| SHY  | 10.5                 | 10.7                |
| HS   | 14.7                 | 14.8                |
| HD   | 5.2                  | 5.8                 |
| AD   | 5.1                  | 6.1                 |

\*Right foot moved inboard off wheel well projection at request of  
COTR and manufacturer's representative.

Figure 3  
VEHICLE ACCELEROMETER LOCATIONS



| ACCELEROMETER<br>NUMBER* | ACCELEROMETER LOCATION      | DIRECTION |   |   |
|--------------------------|-----------------------------|-----------|---|---|
|                          |                             | X         | Y | Z |
| 1                        | Left Rear Seat Crossmember  | X         |   |   |
| 2                        | Right Rear Seat Crossmember | X         |   |   |
| 3                        | Top of Engine               | X         |   |   |
| 4                        | Bottom of Engine            | X         |   |   |
| 5                        | Right Disc Brake Caliper    | X         |   |   |
| 6                        | Left Disc Brake Caliper     | X         |   |   |
| 7                        | Instrument Panel            | X         |   |   |

\*The accelerometer pack number can be correlated with the vehicle response data traces found in Appendix B.

Table 5  
VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

| NO. | LOCATION                            |       | X*    | Y*    | Z*   | POSITIVE<br>DIRECTION** |                | NEGATIVE<br>DIRECTION** |                |
|-----|-------------------------------------|-------|-------|-------|------|-------------------------|----------------|-------------------------|----------------|
|     |                                     |       |       |       |      | MAX<br>(g)              | TIME<br>(msec) | MAX<br>(g)              | TIME<br>(msec) |
| 1   | REAR SEAT X-MEMBER<br>AT LEFT SIDE  | PRE:  | 75.0  | 18.2  | 17.0 |                         |                |                         |                |
|     |                                     | POST: | 75.0  | 18.2  | 16.8 |                         |                |                         |                |
|     | LONGITUDINAL<br>ACCELERATION        |       |       |       |      | 3                       | 102            | -28                     | 32             |
| 2   | REAR SEAT X-MEMBER<br>AT RIGHT SIDE | PRE:  | 75.0  | -18.2 | 17.0 |                         |                |                         |                |
|     |                                     | POST: | 75.0  | -18.2 | 16.8 |                         |                |                         |                |
|     | LONGITUDINAL<br>ACCELERATION        |       |       |       |      | 2                       | 101            | -27                     | 22             |
| 3   | TOP OF ENGINE BLOCK                 | PRE:  | 159.0 | -2.0  | 35.0 |                         |                |                         |                |
|     |                                     | POST: | 151.1 | -2.0  | 31.8 |                         |                |                         |                |
|     | LONGITUDINAL<br>ACCELERATION        |       |       |       |      | 35                      | 62             | -96                     | 39             |
| 4   | BOTTOM OF ENGINE                    | PRE:  | 152.0 | -4.0  | 8.0  |                         |                |                         |                |
|     |                                     | POST: | 144.2 | -4.0  | 4.5  |                         |                |                         |                |
|     | LONGITUDINAL<br>ACCELERATION        |       |       |       |      | 6                       | 58             | -68                     | 32             |
| 5   | BRAKE CALIPER AT<br>RIGHT SIDE      | PRE:  | 148.0 | -22.7 | 17.5 |                         |                |                         |                |
|     |                                     | POST: | 146.4 | -22.7 | 17.5 |                         |                |                         |                |
|     | LONGITUDINAL<br>ACCELERATION        |       |       |       |      | 8                       | 112            | -51                     | 53             |
| 6   | BRAKE CALIPER AT<br>LEFT SIDE       | PRE:  | 148.0 | 22.7  | 17.5 |                         |                |                         |                |
|     |                                     | POST: | 147.1 | 22.7  | 17.5 |                         |                |                         |                |
|     | LONGITUDINAL<br>ACCELERATION        |       |       |       |      | 9                       | 48             | -47                     | 56             |
| 7   | DASH PANEL                          | PRE:  | 121.5 | 4.7   | 29.0 |                         |                |                         |                |
|     |                                     | POST: | 121.5 | 4.7   | 29.5 |                         |                |                         |                |
|     | LONGITUDINAL<br>ACCELERATION        |       |       |       |      | 23                      | 58             | -62                     | 66             |

|                                                                                                        |                                                                 |                                                                     |                                                                         |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------|
| <p>*X + Forward from rear bumper</p> <p>Y + Left from vehicle centerline</p> <p>Z + Up from ground</p> | <p>**</p> <p>LONGITUDINAL:</p> <p>LATERAL:</p> <p>VERTICAL:</p> | <p><u>POSITIVE</u></p> <p>FORWARD</p> <p>LEFTWARD</p> <p>UPWARD</p> | <p><u>NEGATIVE</u></p> <p>REARWARD</p> <p>RIGHTWARD</p> <p>DOWNWARD</p> |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------|

DISTANCE MEASUREMENTS IN INCHES

Figure 4  
CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5.

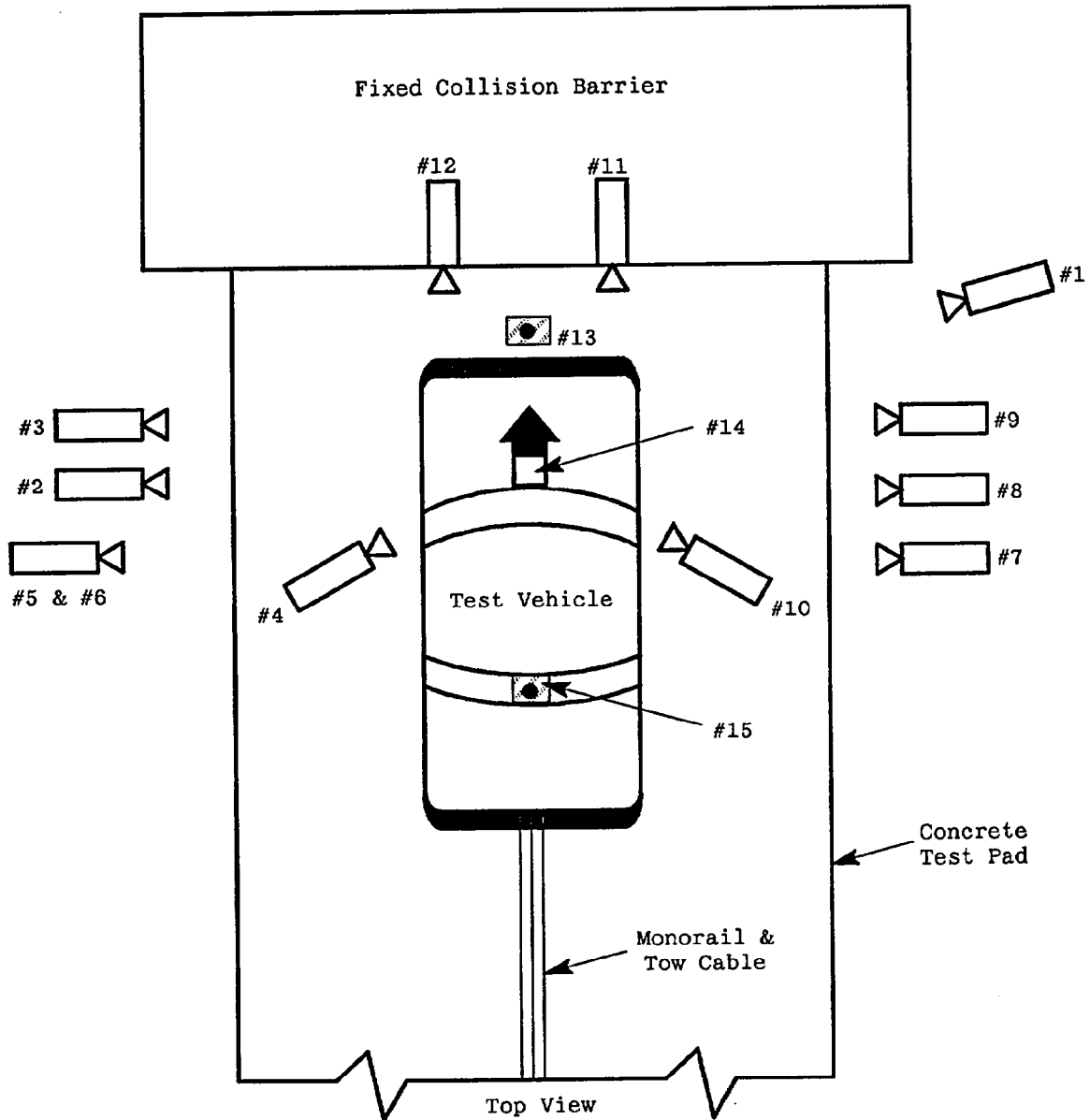


Table 6

## HIGH-SPEED CAMERA LOCATIONS

Vehicle: 1993 Buick Regal 4-door Sedan

| CAMERA NO. | VIEW                        | CAMERA POSITIONS (in)* |     |     | ANGLE** (deg) | FILM PLANE TO HEAD TARGET | LENS (mm) | SPEED (fps) |
|------------|-----------------------------|------------------------|-----|-----|---------------|---------------------------|-----------|-------------|
|            |                             | X                      | Y   | Z   |               |                           |           |             |
| 1          | Real-Time Camera            | -                      | -   | -   | -             | -                         | -         | 24          |
| 2          | Overall Left Side           | 257                    | 71  | 42  | -2            | 240.1                     | 13        | 550         |
| 3          | Left Side View              | 323                    | 44  | 43  | -4            | 306.1                     | 25        | 610         |
| 4          | Driver and Interior View    | 117                    | 111 | 68  | -16           | -                         | 13        | 575         |
| 5          | Steering Column (Bottom)    | 280                    | 78  | 46  | -5            | 263.1                     | 25        | 590         |
| 6          | Steering Column (Top)       | 280                    | 78  | 70  | -8            | 263.1                     | 25        | 570         |
| 7          | Overall Right Side          | 248                    | 81  | 42  | -15           | 231.1                     | 13        | 560         |
| 8          | Right Side View             | 314                    | 65  | 41  | -3            | 297.1                     | 25        | 570         |
| 9          | Right Passenger View        | 303                    | 78  | 57  | -1            | 286.1                     | 35        | 540         |
| 10         | Passenger and Interior View | 110                    | 112 | 65  | -4            | -                         | 13        | 575         |
| 11         | Passenger Front View        | 22                     | 21  | 76  | -43           | -                         | 13        | 630         |
| 12         | Driver Front View           | 22                     | 21  | 76  | -39           | -                         | 13        | 600         |
| 13         | Windshield View             | 0                      | 0   | 130 | -53           | -                         | 13        | 600         |
| 14         | Pit View of Engine          | 0                      | 30  | 78  | 90            | -                         | 13        | 700         |
| 15         | Pit View of Fuel Tank       | 0                      | 113 | 78  | 90            | -                         | 13        | 850         |

\*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

\*\* = referenced to horizontal plane

*(The following pages are blank)*

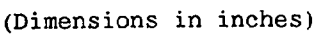


Table 7

VEHICLE MEASUREMENTS

| No. |                                                              | All Dimensions in Inches |           |             |
|-----|--------------------------------------------------------------|--------------------------|-----------|-------------|
|     |                                                              | Pre-Test                 | Post-Test | Differences |
| X1  | Total Length of Vehicle at Centerline                        | 194.2                    | 177.7     | 16.5        |
| X2  | Rear Surface of Vehicle to Front of Engine                   | 170.6                    | 164.5     | 6.1         |
| X3  | Rear Surface of Vehicle to Firewall                          | 148.0                    | 147.2     | 0.8         |
| X4  | Rear Surface of Vehicle to Upper Leading Edge of Right Door  | 130.5                    | 130.0     | 0.5         |
| X5  | Rear Surface of Vehicle to Upper Leading Edge of Left Door   | 130.4                    | 130.5     | -0.1        |
| X6  | Rear Surface of Vehicle to Lower Leading Edge of Right Door  | 129.8                    | 129.8     | 0.0         |
| X7  | Rear Surface of Vehicle to Lower Leading Edge of Left Door   | 129.5                    | 129.6     | -0.1        |
| X8  | Rear Surface of Vehicle to Upper Trailing Edge of Right Door | 90.3                     | 89.9      | 0.4         |
| X9  | Rear Surface of Vehicle to Upper Trailing Edge of Left Door  | 90.3                     | 89.8      | 0.5         |
| X10 | Rear Surface of Vehicle to Lower Trailing Edge of Right Door | 91.4                     | 91.4      | 0.0         |
| X11 | Rear Surface of Vehicle to Lower Trailing Edge of Left Door  | 91.2                     | 91.4      | -0.2        |
| X12 | Rear Surface of Vehicle to Bottom of "A" Post of Right Side  | 130.4                    | 130.6     | -0.2        |
| X13 | Rear Surface of Vehicle to Bottom of "A" Post of Left Side   | 130.5                    | 130.9     | -0.4        |
| X14 | Rear Surface of Vehicle to Firewall, Right Side              | 147.6                    | 146.8     | 0.8         |
| X15 | Rear Surface of Vehicle to Firewall, Left Side               | 148.2                    | 147.0     | 1.2         |
| X16 | Rear Surface of Vehicle to Steering Column                   | 113.0                    | 113.0     | 0.0         |
| X17 | Center of Steering Column to "A" Post                        | 16.6                     | 17.3      | -0.7        |
| X18 | Center of Steering Column to Headliner                       | 17.2                     | 19.0      | -1.8        |
| X19 | Rear Surface of Vehicle to Right Side of Front Bumper        | 188.5                    | 176.4     | 12.1        |
| X20 | Rear Surface of Vehicle to Left Side of Front Bumper         | 188.5                    | 175.0     | 13.5        |
| X21 | Length of Engine Block                                       | 20.5                     | 20.5      | 0.0         |

#### Section 4

#### SUMMARY OF RESULTS OF FMVSS NOS. 208, 212, 219 AND 301-75

- "Occupant Crash Protection," FMVSS No. 208 Data
- "Windshield Mounting," FMVSS No. 212 Data
- "Windshield Zone Intrusion," FMVSS No. 219 (Partial) Data
- "Fuel System Integrity," FMVSS No. 301-75

Table 8

DUMMY INJURY CRITERIA VALUESNHTSA No.: CP0102 Vehicle: 1993 Buick Regal 4-door Sedan

|           | MAXIMUM ACCELERATION (g's) |     |    |    |       |    |    |      |
|-----------|----------------------------|-----|----|----|-------|----|----|------|
|           | HEAD                       |     |    |    | CHEST |    |    |      |
|           | X                          | Y   | Z  | R  | X     | Y  | Z  | R*   |
| Dummy (1) | -47                        | -13 | 49 | 62 | -48   | 5  | 10 | 46.6 |
| Dummy (2) | -33                        | 7   | 60 | 64 | -41   | -7 | 10 | 39.9 |

|           | MAXIMUM FORCE - FEMUR LOAD (lbs.) |             |
|-----------|-----------------------------------|-------------|
|           | LEFT FEMUR                        | RIGHT FEMUR |
| Dummy (1) | 978                               | 696         |
| Dummy (2) | 583                               | 731         |

|           | HEAD INJURY CRITERIA** |                        |                       |                                  |
|-----------|------------------------|------------------------|-----------------------|----------------------------------|
|           | HIC                    | 36 millisecond Maximum |                       | Avg. Acc. (g)                    |
|           |                        | t <sub>1</sub> (msec)  | t <sub>2</sub> (msec) | t <sub>1</sub> TO t <sub>2</sub> |
| Dummy (1) | 539.15                 | 68.520                 | 103.920               | 47.11                            |
| Dummy (2) | 596.92                 | 69.840                 | 105.720               | 48.80                            |

\*Defined as exceeding 0.003 sec. duration

\*\*As defined in FMVSS No. 208

Table 9

FMVSS NO. 208 - SEAT BELT WARNING SYSTEM CHECK

With occupant in driver's position, the lap belt in stowed position, and ignition switch placed in "Start/On" position:

Log time duration of audible warning signal = 5 sec.

Log time duration of reminder light operation = \* sec.

With occupant in driver's position, lap belt in use, and the ignition switch placed in "Start/On" position:

Log time duration of audible warning signal = - sec.  
(audible warning should not operate)

Log time duration of reminder light operation = \* sec.

Note wording of visual warning:

Fasten Seat Belt -

Fasten Belt -

Symbol 101-80 X

\*According to manufacturer owner's manual "The safety belt light will also come on and stay on until the driver's belt is buckled."

Table 10

FMVSS NO. 208 - LABELING AND DRIVER'S MANUAL INFORMATION

Locate label which describes manufacturers maintenance or replacement schedule for crash-deployed occupant protection system.

Describe location: Vehicle does not employ a crash-deployed occupant protection system.

The manufacturers recommended schedule is to replace \_\_\_\_ or repair \_\_\_\_ this system:

- a. by \_\_\_\_ month, \_\_\_\_ year
- b. by \_\_\_\_ miles
- c. or after a time interval of \_\_\_\_ months or \_\_\_\_ years.

Were appropriate instructions concerning maintenance and/or replacement of this system provided?

YES \_\_\_\_ NO \_\_\_\_

Was a description of the functional operation of the system provided?

YES \_\_\_\_ NO \_\_\_\_

Is there a reference to the instructions and description of the system on the label?

YES \_\_\_\_ NO \_\_\_\_

Was an owner's manual provided?

YES \_\_\_\_ NO \_\_\_\_

Did the owner's manual contain appropriate information concerning maintenance and/or replacement and a description of the functional operation of the systems?

YES \_\_\_\_ NO \_\_\_\_

Table 11

FMVSS NO. 208 - READINESS INDICATOR

An occupant restraint system that deploys in the event of a crash shall have a monitoring system with a readiness indicator. A totally mechanical system is exempt from this requirement.

Is the system totally mechanical? YES   X   NO   -  

Describe the location of the readiness indicator:

Is the readiness indicator clearly visible to the driver?  
YES   N/A   NO   N/A  

Is a list of the elements in the occupant restraint system, being monitored by the readiness indicator, provided?  
YES   N/A   NO   N/A

Table 12

FMVSS NO. 208 - COMFORT AND CONVENIENCE TEST SUMMARY

|                                    |                         |
|------------------------------------|-------------------------|
| Test Vehicle NHTSA No.:            | <u>CP0102</u>           |
| Make/Model:                        | <u>1992 Buick Regal</u> |
| Date of Comfort/Convenience Check: | <u>11/4/92</u>          |
| Technician Performing Check:       | <u>MJK</u>              |
| GVWR:                              | <u>4523 lbs</u>         |

Seat belt comfort and convenience requirements cover vehicles manufactured on or after September 1, 1986, which have a gross vehicle weight rating of 10,000 pounds or less. Exemptions to this rule are belts installed in a walk-in, van-type vehicle and manual Type 2 belt systems installed in the front outboard seating positions of passenger automobiles. On or after September 1, 1989, the exemption of the type 2 manual seat belts installed in the front outboard seating positions of passenger automobiles will change depending on the states' enactment of mandatory usage laws.

Was vehicle built after or on September 1, 1986, and is it equipped with:

1. Automatic seat belts YES X NO -

If yes, go to requirements D1, D2 and D3

2. Manual seat belts\* YES - NO X

a. The seat belts, other than Type 2 lap/shoulder belts, are located in the front outboard seating positions of a passenger automobile.

YES - NO X

(Go to requirements D3, D4, D5, and D6)

b. The seat belt system is Type 2 lap/shoulder belt in the front outboard seating positions or the seat belts are located in a walk-in van.

STOP

\*If the seat belts are voluntarily installed by the manufacturer they do not have to comply.

Table 12 (cont.)

D1

CONVENIENCE HOOKS

A convenience hook or other device is provided to stow seat belt webbing to facilitate entering or exiting the vehicle.

YES — NO X

Check the option which applies to this test vehicle:

1. A convenience hook or other device automatically releases the webbing when the automatic belt system is operational and remains in the released mode as long as the vehicle's ignition switch is moved to the "on" or "start" position and the vehicle's drivetrain is engaged.

YES N/A NO N/A

2. A convenience hook or other device automatically releases the webbing when the automatic belt system is operational and remains in the released mode as long as the vehicle's ignition switch is moved to the "on" or "start" position and the vehicle's parking brake is in the released mode (nonengaged).

YES N/A NO N/A

D2

WEBBING TENSION - RELIEVING DEVICE

The seat belt assembly installed in the outboard designated seating position has either manual or automatic tension relieving devices permitting the introduction of slack in the webbing of the shoulder belt ("comfort clips" or "window shade" devices).

YES — NO X

Check the owner's manual and determine the maximum amount of slack recommended by the manufacturer in inches. The recommended slack is \_\_\_\_\_ inches. Introduce this slack into the shoulder belt before testing the vehicle to comply with the requirements of FMVSS 208 S5.1. A warning is included in the owner's manual that introducing slack beyond the amount specified can significantly reduce the effectiveness of the shoulder belt.

YES N/A NO N/A

(If NO, provide explanation.)

Check the option which applies to this test vehicle:

1. This vehicle is equipped with automatic seat belts and the tension relieving device is cancelled each time the adjacent door is opened.

YES N/A NO N/A

(If NO, provide explanation.)

Table 12 (cont.)

2. This vehicle is equipped with manual belts, required to meet FMVSS 208 S4.6, and the tension relieving device is cancelled each time one of the following options occurs:
- a. The adjacent door is opened. YES   N/A   NO   N/A
- b. The latch plate is released from the buckle. YES   N/A   NO   N/A
3. This is an open-body vehicle, without doors. Does the manual mean to cancel any shoulder belt slack introduced by a tension relieving device to operate properly?
- YES   N/A   NO   N/A

(If NO, provide explanation.)

D3

BELT CONTACT FORCE

1. Do not measure the belt contact force if the manual or automatic seat belt assemblies in this vehicle incorporate a webbing tension relieving device. Does the vehicle incorporate a tension relieving device?
- YES   -   NO   X
2. Seats are adjusted according to instructions in Appendix B.
- YES   X   NO   -
3. The test dummies are positioned according to dummy position placement instructions in Appendix B and Appendix C.
- YES   X   NO   -
4. Close the vehicle's adjacent door, pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest, then fasten the latch. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point, pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest. Measure the contact force exerted by the belt webbing on the dummy's chest. The contact force is 0.4 pounds. Contact the COTR if the contact force exceeds 0.7 pounds.

Table 12 (cont.)

D4

LATCHPLATE ACCESSIBILITY

1. Position the test dummy in the driver's seat or passenger's seat in its forward most adjustment position.  
YES   X   NO   -
2. Attach the inboard and outboard reach string.  
YES   X   NO   -
3. Extend each line backward and outboard to generate arcs of the reach envelope of the test dummy's arms. With the latchplate in the normal stowed position, check to assure that the latchplates are within the reach envelope.  
YES   X   NO   -
4. Using the clearance test block, determine if there is sufficient clearance between the vehicle seat and the side of vehicle interior to allow the test block to move unhindered to the latchplate or buckle.  
YES   X   NO   -

D5

RETRACTION

1. Seats and seat backs are adjusted according to instructions in Appendix B "General Test Conditions" in TP-208-8.  
YES   X   NO   -
2. Use anthropomorphic test dummies whose arms have been removed and position the dummies in the front outboard designated seating positions according to instructions in Appendix B and restrain the dummies, using the belt systems for the positions being tested.  
YES   X   NO   -
3. Outboard armrests which are capable of being stowed on vehicle seats shall be placed in their stowed positions.  
YES   N/A   NO   N/A
4. Check the option which applies to this test vehicle:
  - a. The torso and lap belt webbing of the seat belt system automatically retract to a stowed position when the adjacent vehicle door is in an open position and the seat belt latch plate is released.  
YES   X   NO   -

Table 12 (cont.)

- b. The torso and lap belt webbing of the seat belt system automatically retract when the seat belt latch plate is released.

YES   X   NO   -  

5. With the webbing and hardware in the stowed position, close the door to assure that the webbing and hardware are prevented from being pinched.

YES   X   NO   -  

6. If this test vehicle has an open body (without doors) and has a belt system with a tension-relieving device, check to assure that the belt system fully retracts when the tension-relief device is manually deactivated.

YES   N/A   NO   N/A  

D6

ACCESSIBILITY

The requirements for accessibility do not apply to:

1. Seats whose seat cushions are removable so that the seat back serves a function other than seating;
2. Seats which are removable;
3. Seats which are movable so that the space formerly occupied by the seat can be used for a secondary function.

If the seats in this vehicle are different than the criteria above, then determine if:

1. Each manual seat belt assembly whose webbing is designed to pass through the seat cushion or between the seat cushion and seat back has one of the following three parts (the seat belt latchplate, the buckle, or the seat belt webbing) on top of or above the seat cushion under normal conditions (i.e., conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant).

YES   X   NO   -  

2. The remaining two seat belt parts are accessible under normal conditions.

YES   X   NO   -

Table 12 (cont.)

3. The buckle and latchplate pass through the guides or conduits provided and do not fall behind the seat when the following events occur in order:
- a. The belt is completely retracted or, if the belt is nonretractable, the belt is unattached.  
YES       -       NO       X
  - b. The seat is moved to any position to which it is designed to be adjusted.  
YES       -       NO       X
  - c. The seat back, if foldable, is folded forward as far as possible and then moved backward into positions.  
YES       -       NO       X
4. Is the inboard receptacle end of the seat belt assembly which is installed in the outboard designated seating position accessible with the center arm rest in any position to which it can be adjusted without moving the armrest?  
YES       X       NO       -

D7

LATCH MECHANISM

A seat belt assembly installed in a passenger car, except an automatic belt assembly, shall have a latch mechanism: Automatic belts used in vehicle.

- 1. Whose components are accessible to a seated occupant in both the stowed and operational positions.  
YES       -       NO       -
- 2. That releases both the upper torso restraint and the lap belt simultaneously, if the assembly has a lap belt and an upper torso restraint that require unlatching for release of the occupant.  
YES       -       NO       -
- 3. That releases at a single point by a push button action.  
YES       -       NO       -

Figure 7

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA SHEET

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

Windshield is bonded in place with 0.5" plastic trim covering the upper portion of windshield. A 0.8" hard plastic trim covers both sides of windshield and a plastic shroud covers the bottom of windshield.

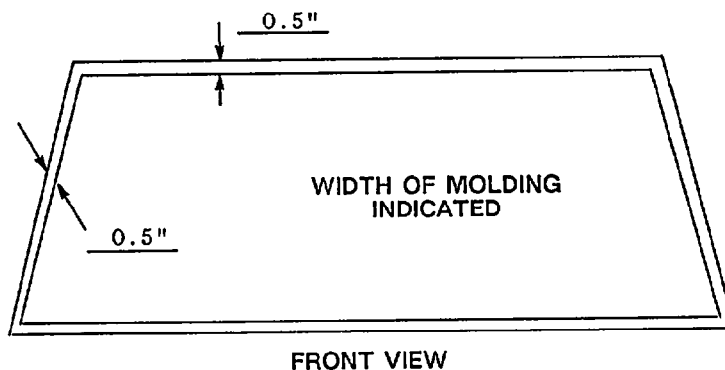
FMVSS 212 REQUIREMENTS:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

FMVSS 212 TEST DATA:

|            | WINDSHIELD PERIPHERY |                 | PERCENT RETENTION |
|------------|----------------------|-----------------|-------------------|
|            | PRE-TEST (in.)       | POST-TEST (in.) |                   |
| RIGHT SIDE | 91.1                 | 91.1            | 100%              |
| LEFT SIDE  | 91.1                 | 91.1            | 100%              |
| TOTAL      | 182.2                | 182.2           | 100%              |

AREA OF RETENTION FAILURE:



FAILURE DETAILS:

None

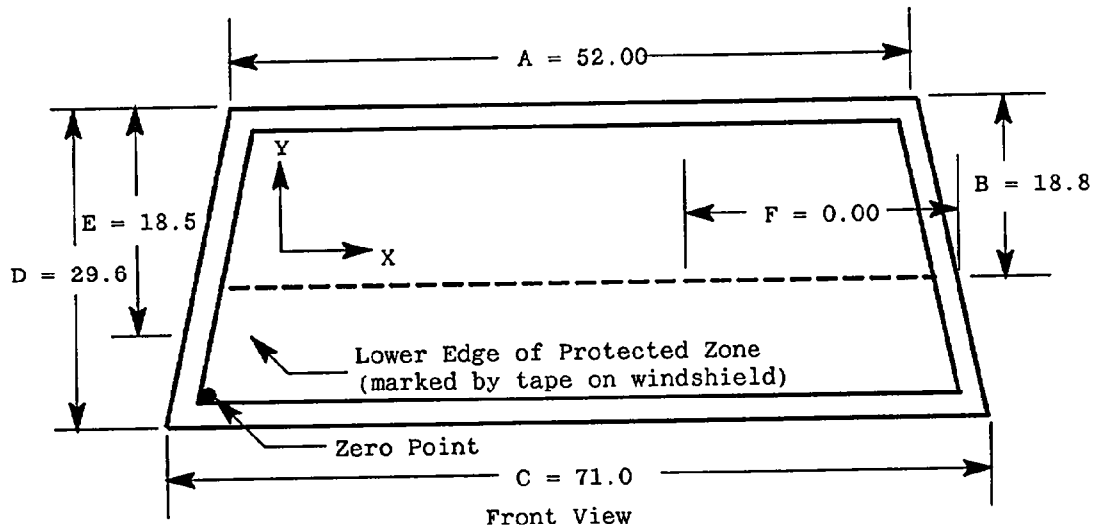
Figure 8

FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA SHEET

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5" dia. rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. The locus of points is drawn on the inner surface of the windshield contacted by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 1/2" distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection of this line onto the outer surface of the windshield.

FMVSS 219 TEST DATA: (Dimensions in inches.)



DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 1/4":

(Show location of penetration on above sketch)

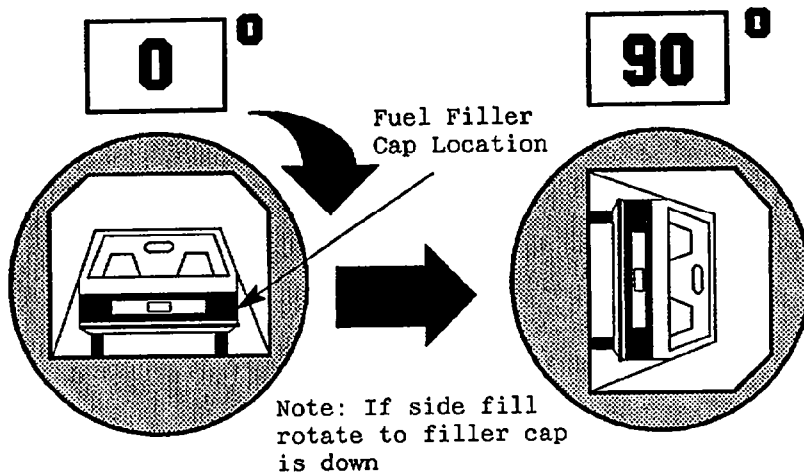
|    | COORDINATES |   |
|----|-------------|---|
|    | X           | Y |
| 1. |             |   |
| 2. |             |   |
| 3. |             |   |
| 4. |             |   |

FMVSS NO. 301

Table 14  
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

Vehicle NHTSA ID No.:



CP0102

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes) 1 minutes 59 seconds

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL 6 minutes 59 seconds

Next whole minute interval 7 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

|                                    |          |          |                      |
|------------------------------------|----------|----------|----------------------|
| First 5 min FROM onset of rotation | 6th min. | 7th min. | 8th min.<br>if reqd. |
|------------------------------------|----------|----------|----------------------|

(2) Maximum Allowable Solvent Spillage

|          |         |         |         |
|----------|---------|---------|---------|
| 5 ounces | 1 ounce | 1 ounce | 1 ounce |
|----------|---------|---------|---------|

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S):

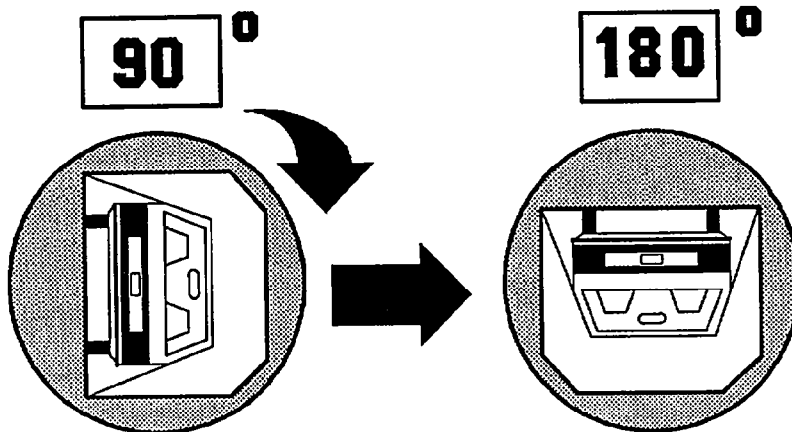
None

Table 13  
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Vehicle NHTSA ID No.:

CP0102



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time \_\_\_\_\_ 1 \_\_\_\_\_ minutes \_\_\_\_\_ 56 \_\_\_\_\_ seconds  
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + \_\_\_\_\_ 5 \_\_\_\_\_ minutes \_\_\_\_\_ 00 \_\_\_\_\_ seconds

TOTAL \_\_\_\_\_ 6 \_\_\_\_\_ minutes \_\_\_\_\_ 56 \_\_\_\_\_ seconds

Next whole minute interval \_\_\_\_\_ 7 \_\_\_\_\_ minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

|                                    |          |          |                      |
|------------------------------------|----------|----------|----------------------|
| First 5 min FROM onset of rotation | 6th min. | 7th min. | 8th min.<br>if reqd. |
|------------------------------------|----------|----------|----------------------|

(2) Maximum Allowable Solvent Spillage

|          |         |         |         |
|----------|---------|---------|---------|
| 5 ounces | 1 ounce | 1 ounce | 1 ounce |
|----------|---------|---------|---------|

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

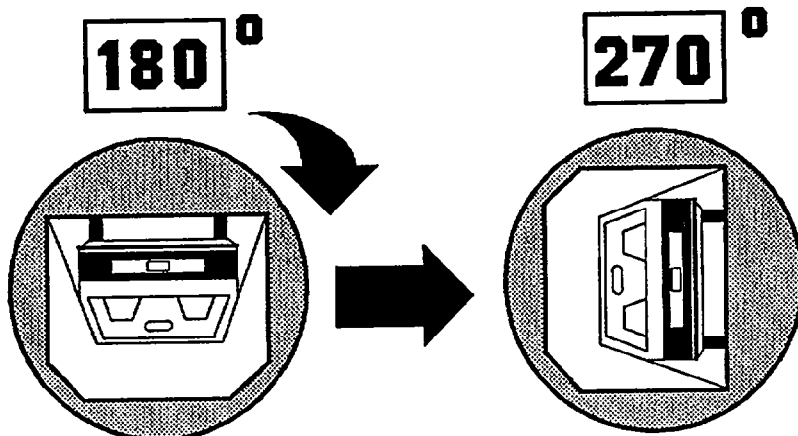
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 13  
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Vehicle NHTSA ID No.:



CP0102

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

|                                                                      |                      |
|----------------------------------------------------------------------|----------------------|
| Rollover Fixture 90° Rotation Time<br>(Spec. Range = 1 to 3 minutes) | 2 minutes 00 seconds |
| FMVSS 301 Position Hold Time +                                       | 5 minutes 00 seconds |
| TOTAL                                                                | 7 minutes 00 seconds |
| Next whole minute interval                                           | 7 minutes            |

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

|                                    |          |          |                      |
|------------------------------------|----------|----------|----------------------|
| First 5 min FROM onset of rotation | 6th min. | 7th min. | 8th min.<br>if reqd. |
|------------------------------------|----------|----------|----------------------|

(2) Maximum Allowable Solvent Spillage

|          |         |         |         |
|----------|---------|---------|---------|
| 5 ounces | 1 ounce | 1 ounce | 1 ounce |
|----------|---------|---------|---------|

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S):

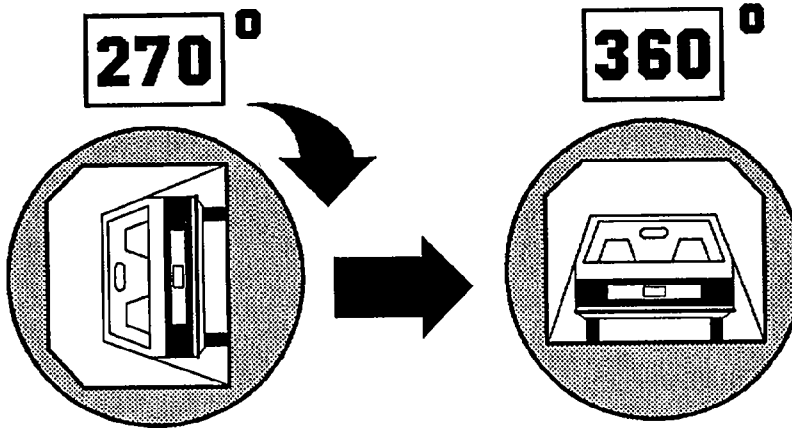
None

Table 13  
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Vehicle NHTSA ID No.:

CP0102



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time \_\_\_\_\_ 2 \_\_\_\_\_ minutes \_\_\_\_\_ 10 \_\_\_\_\_ seconds  
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + \_\_\_\_\_ 5 \_\_\_\_\_ minutes \_\_\_\_\_ 00 \_\_\_\_\_ seconds

TOTAL \_\_\_\_\_ 7 \_\_\_\_\_ minutes \_\_\_\_\_ 10 \_\_\_\_\_ seconds

Next whole minute interval \_\_\_\_\_ 8 \_\_\_\_\_ minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

|                                    |          |          |                      |
|------------------------------------|----------|----------|----------------------|
| First 5 min FROM onset of rotation | 6th min. | 7th min. | 8th min.<br>if reqd. |
|------------------------------------|----------|----------|----------------------|

(2) Maximum Allowable Solvent Spillage

|          |         |         |         |
|----------|---------|---------|---------|
| 5 ounces | 1 ounce | 1 ounce | 1 ounce |
|----------|---------|---------|---------|

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

|   |   |   |   |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
|---|---|---|---|

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

IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 15

TEST VEHICLE NONCOMPLIANCE NOTICE

NHTSA Contract Lab: Calspan Advanced Technology Center  
Lab Project Manager & Telephone No.: Walter E. Levan (716) 632-7500  
Date of Test: November 5, 1992 Vehicle NHTSA No.: CP0102  
Vehicle Manufacturer: General Motors of Canada  
Model Year: 1993 VIN: 2G4WB54L3P1403406  
Model: Buick Regal Body Style: 4-door Sedan Build Date: 8/92  
Dummy Stabilized Temperature at Time of Test: 70 °F (Spec. = 69-72°F)  
Impact Velocity: 29.6 mph Time of Test: 13:40  
Type of Automatic Restraint System: Driver and right front passenger automatic  
3 point seat belt restraint systems  
Failure Details:  
The vehicle as tested appears to comply with the requirements of FMVSS  
Nos. 208, 212, 219 (Partial), and 301.

Appendix A

PHOTOGRAPHS

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Figure A-1 PRE-TEST FRONT VIEW



Figure A-2 POST-TEST FRONT VIEW



A-5

8056-6

Figure A-3 PRE-TEST LEFT SIDE VIEW



Figure A-4 POST-TEST LEFT SIDE VIEW

A-6

8056-6

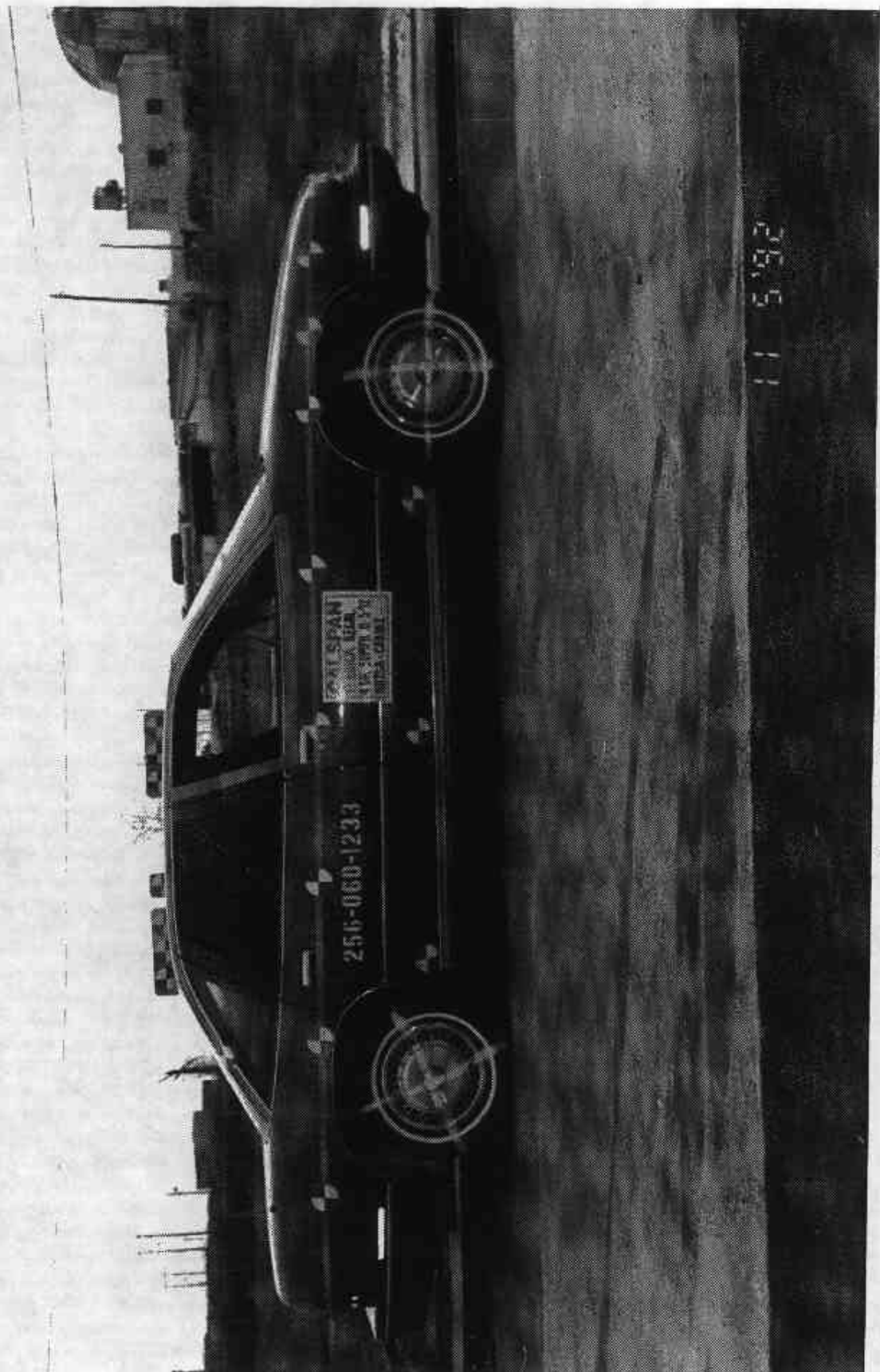


Figure A-5 PRE-TEST RIGHT SIDE VIEW

A-7

8056-6

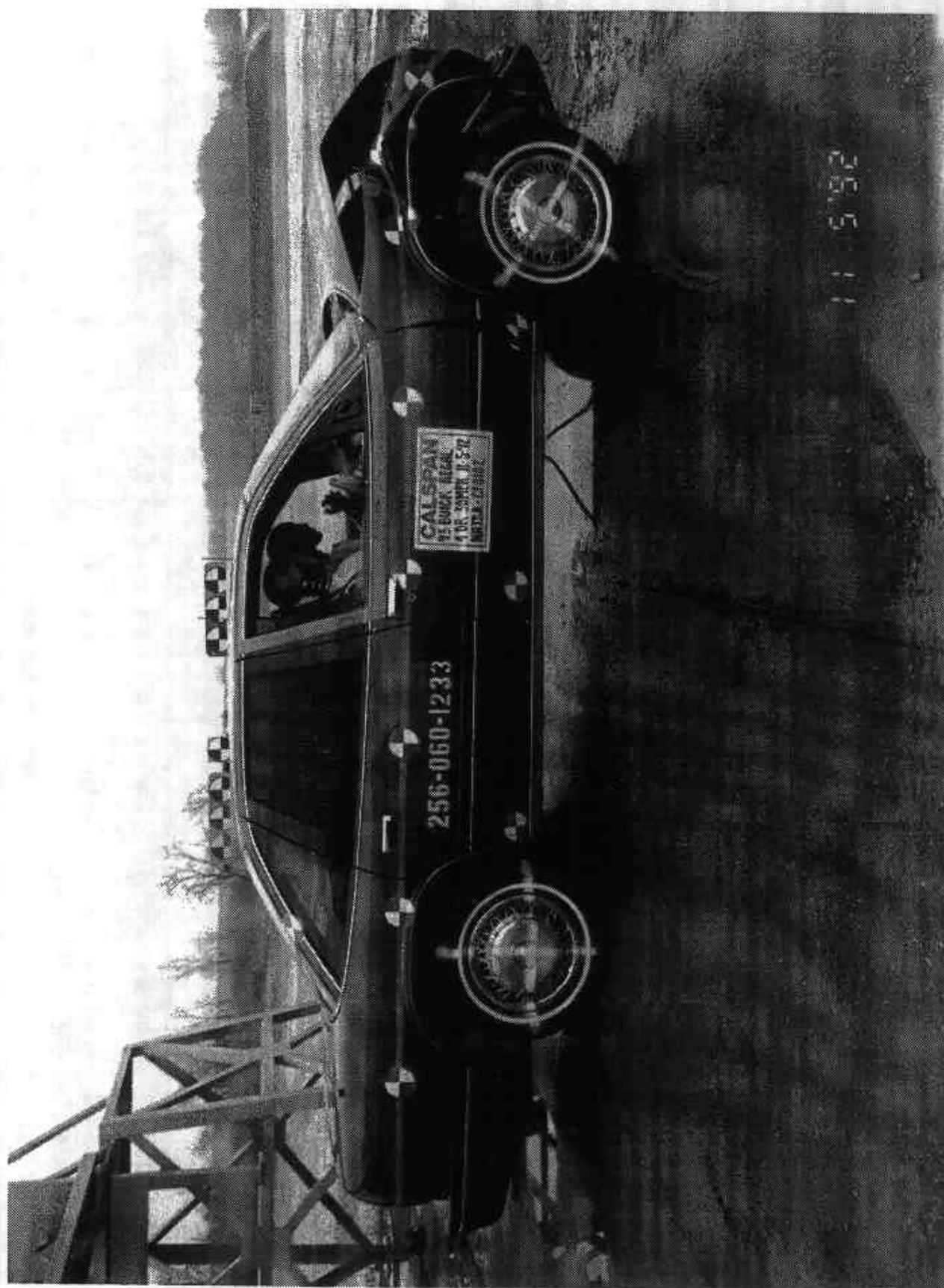


Figure A-6 POST-TEST RIGHT SIDE VIEW

A-8

8056-6

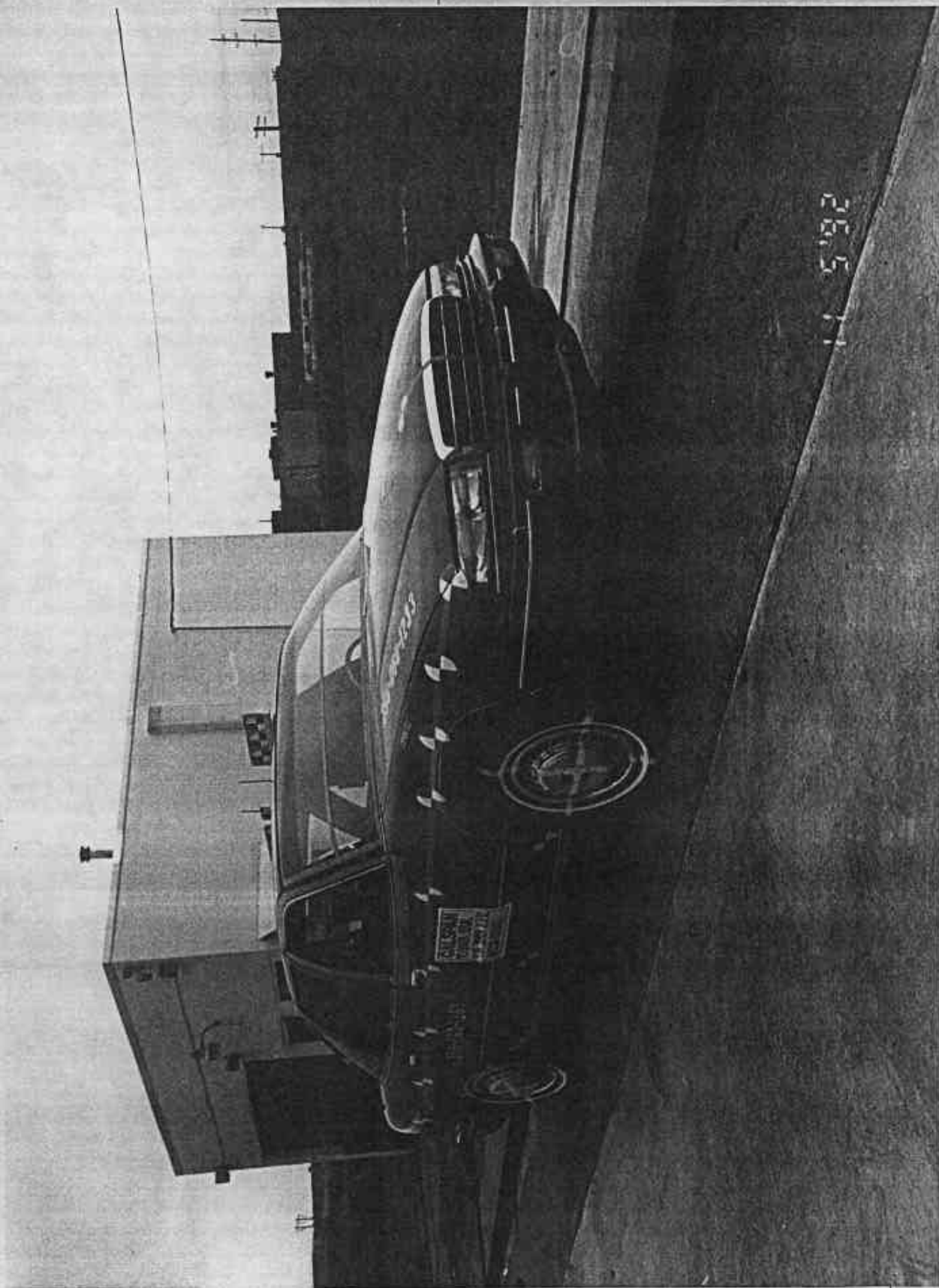


Figure A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-9

8056-6

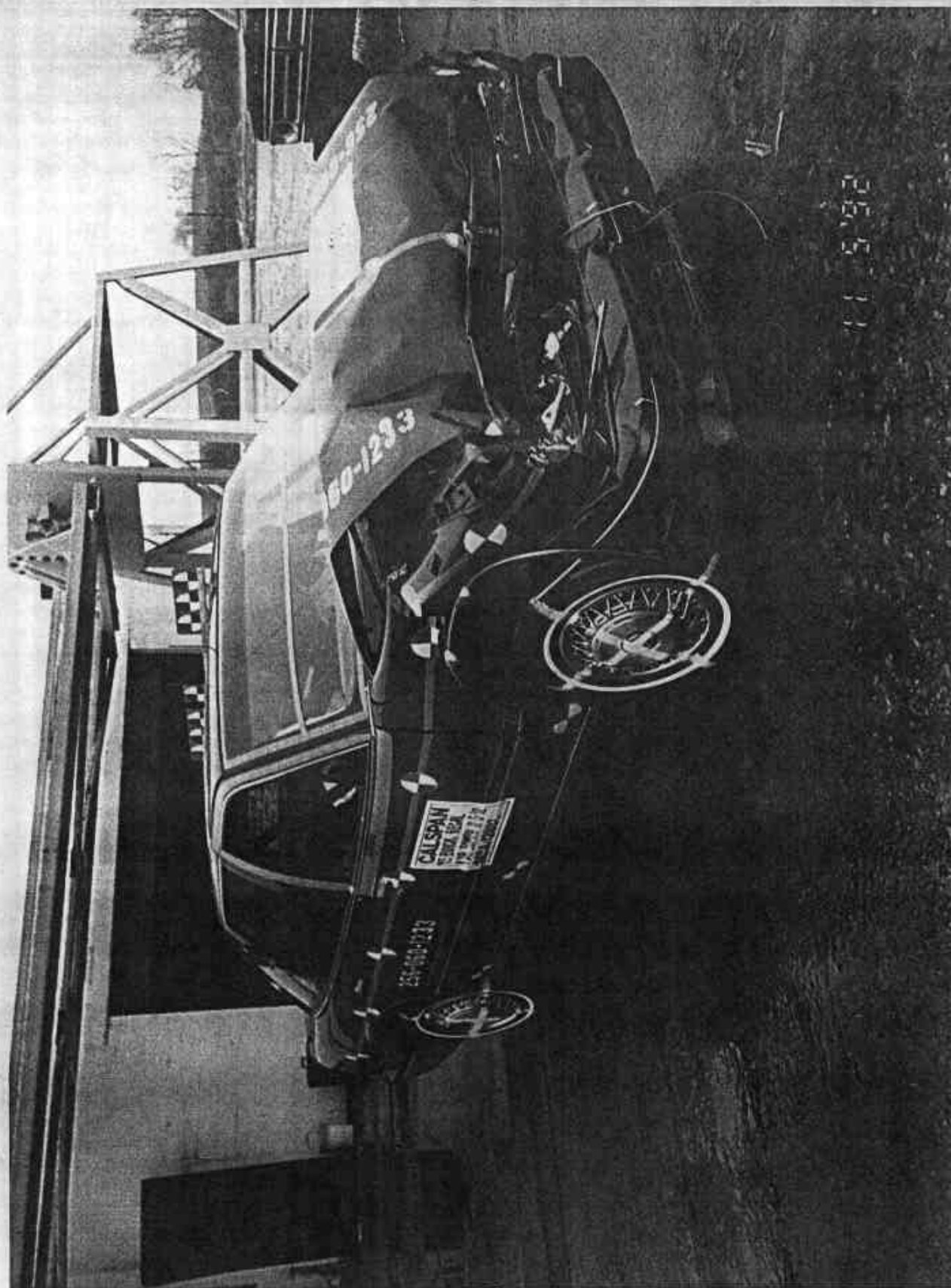


Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

8056-6

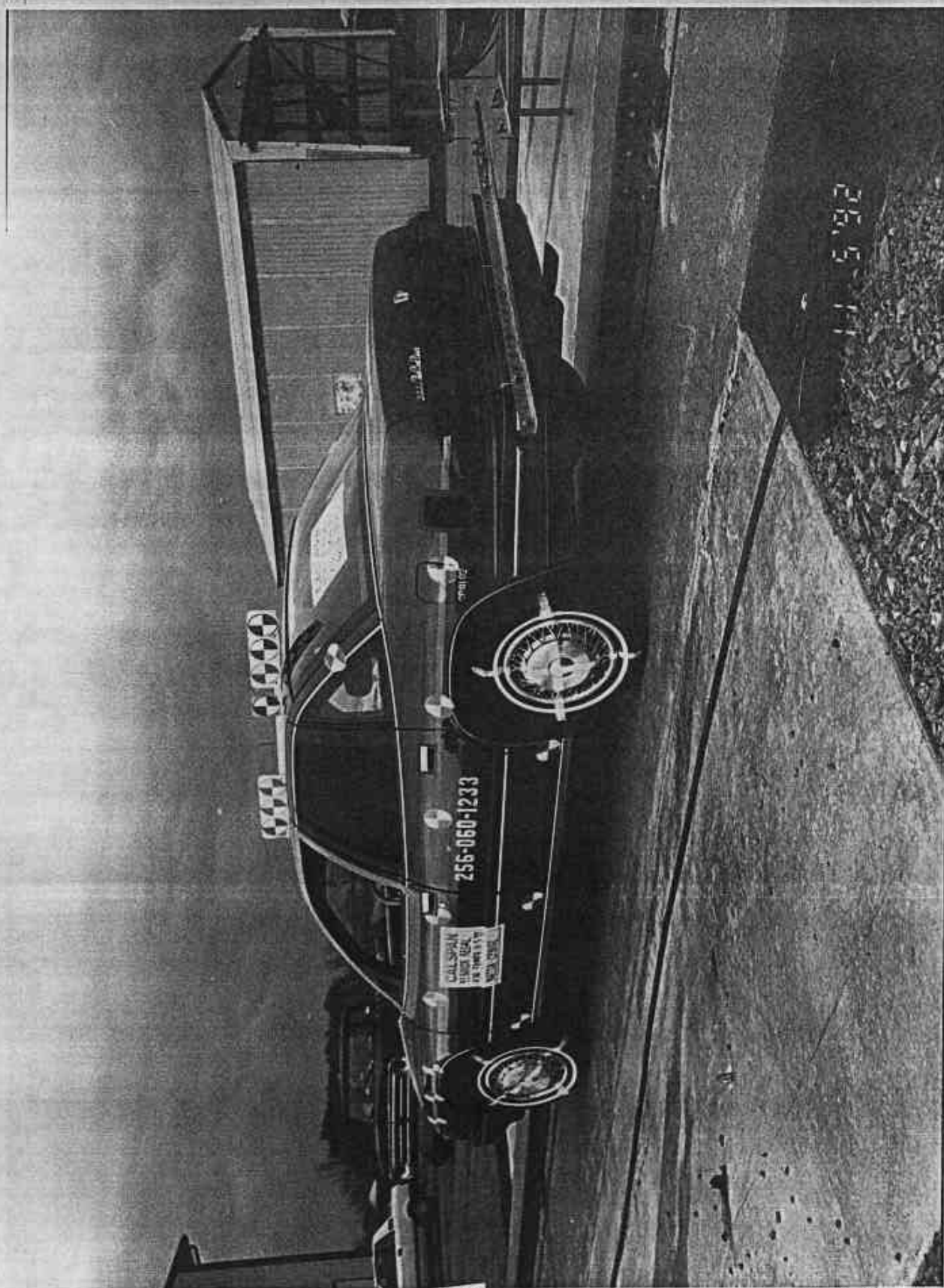


Figure A-9 PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-11

8056-6

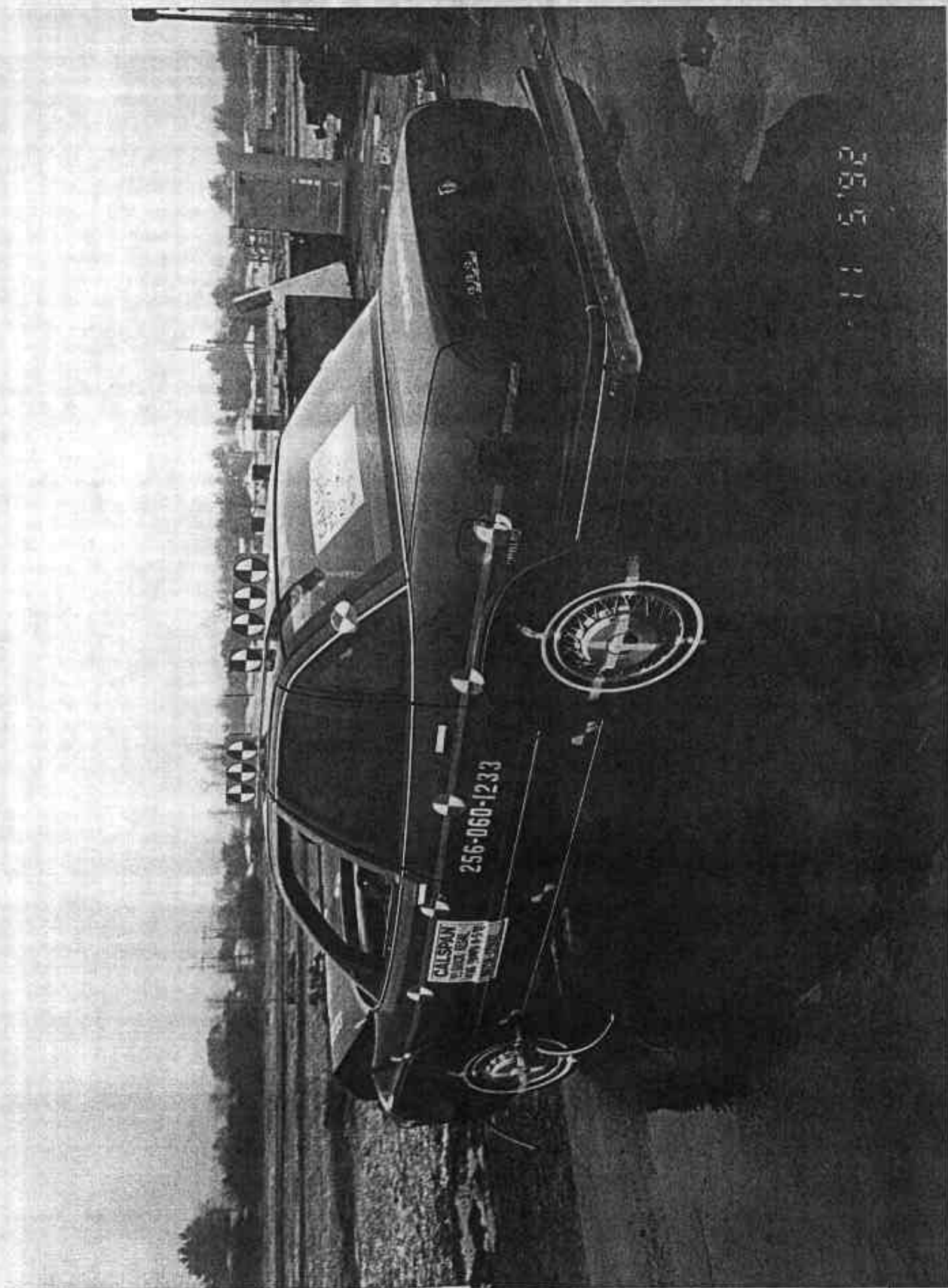


Figure A-10 POST-TEST LEFT REAR THREE-QUARTER VIEW

A-12

8058-6

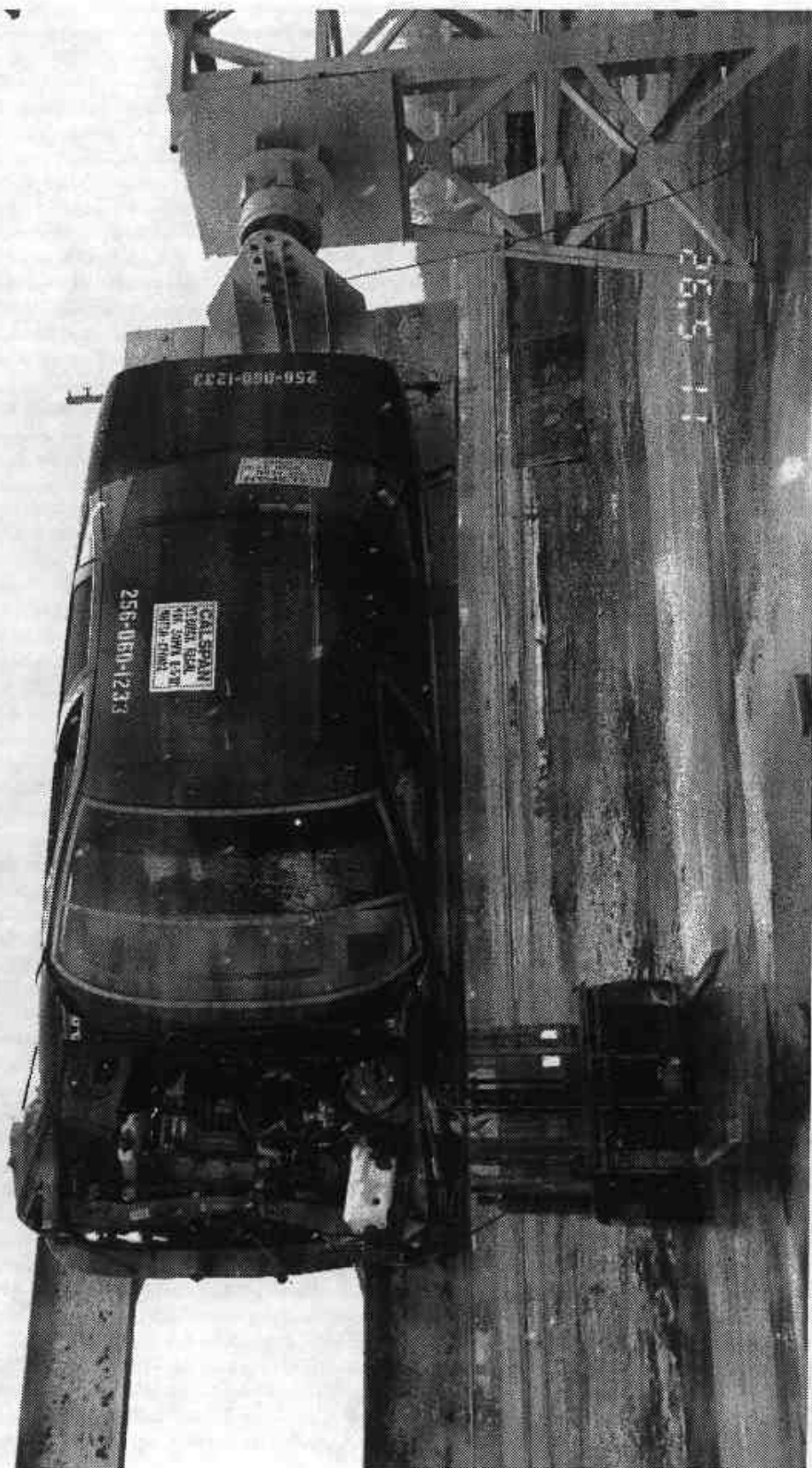


Figure A-11 POST-TEST TOP VIEW

A-13

8056-6



Figure A-12 PRE-TEST WINDSHIELD VIEW



Figure A-13 POST-TEST WINDSHIELD VIEW



Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-15 POST-TEST ENGINE COMPARTMENT VIEW



11 9'92

20100-10

Figure A-16 PRE-TEST FUEL FILLER CAP PHOTO



Figure A-17 POST-TEST FUEL FILLER CAP PHOTO

A-19

8056-6

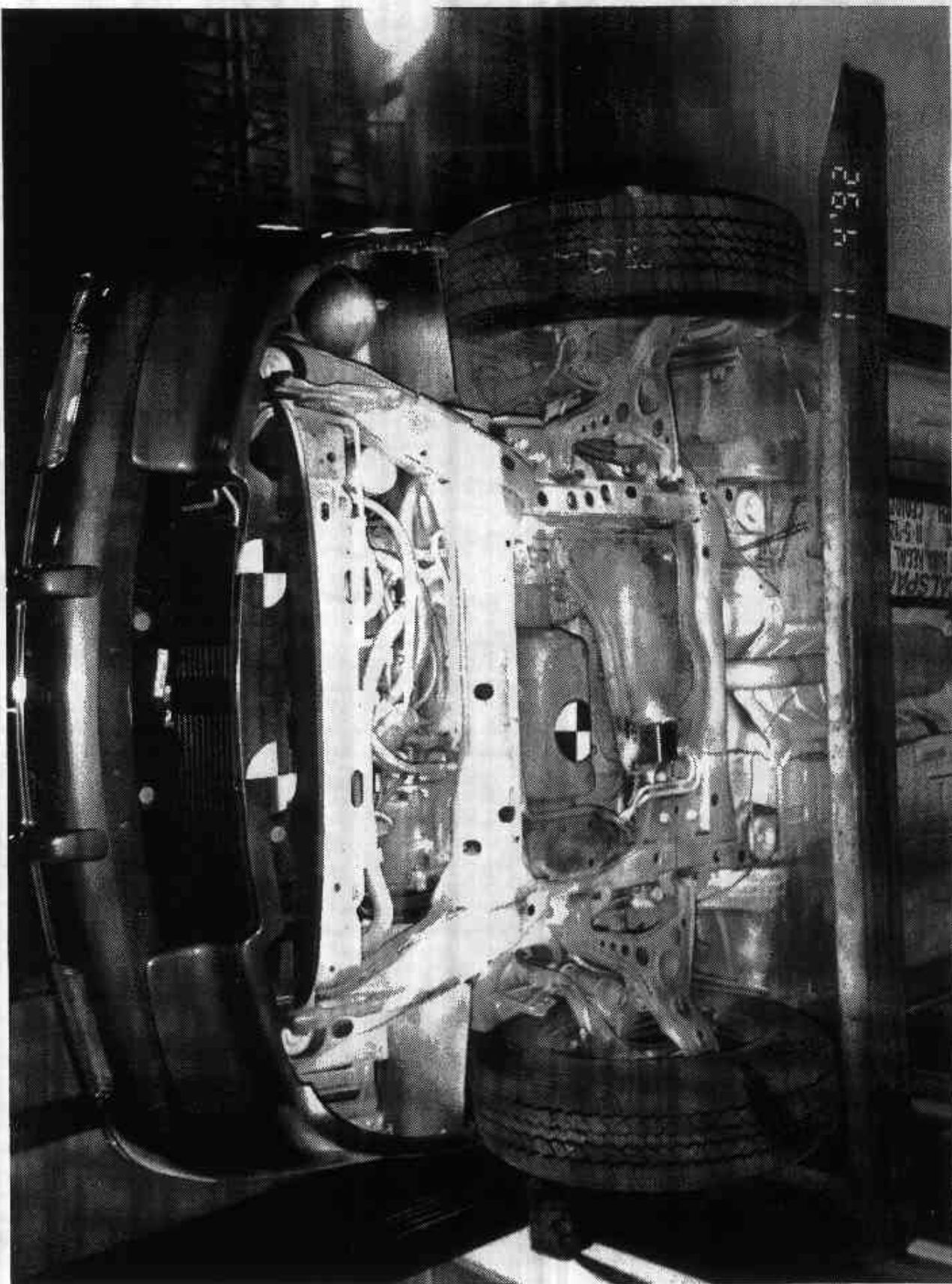


Figure A-18 PRE-TEST FRONT UNDERBODY VIEW

A-20

8056-6



Figure A-19 POST-TEST FRONT UNDERBODY VIEW

A-21

8056-6

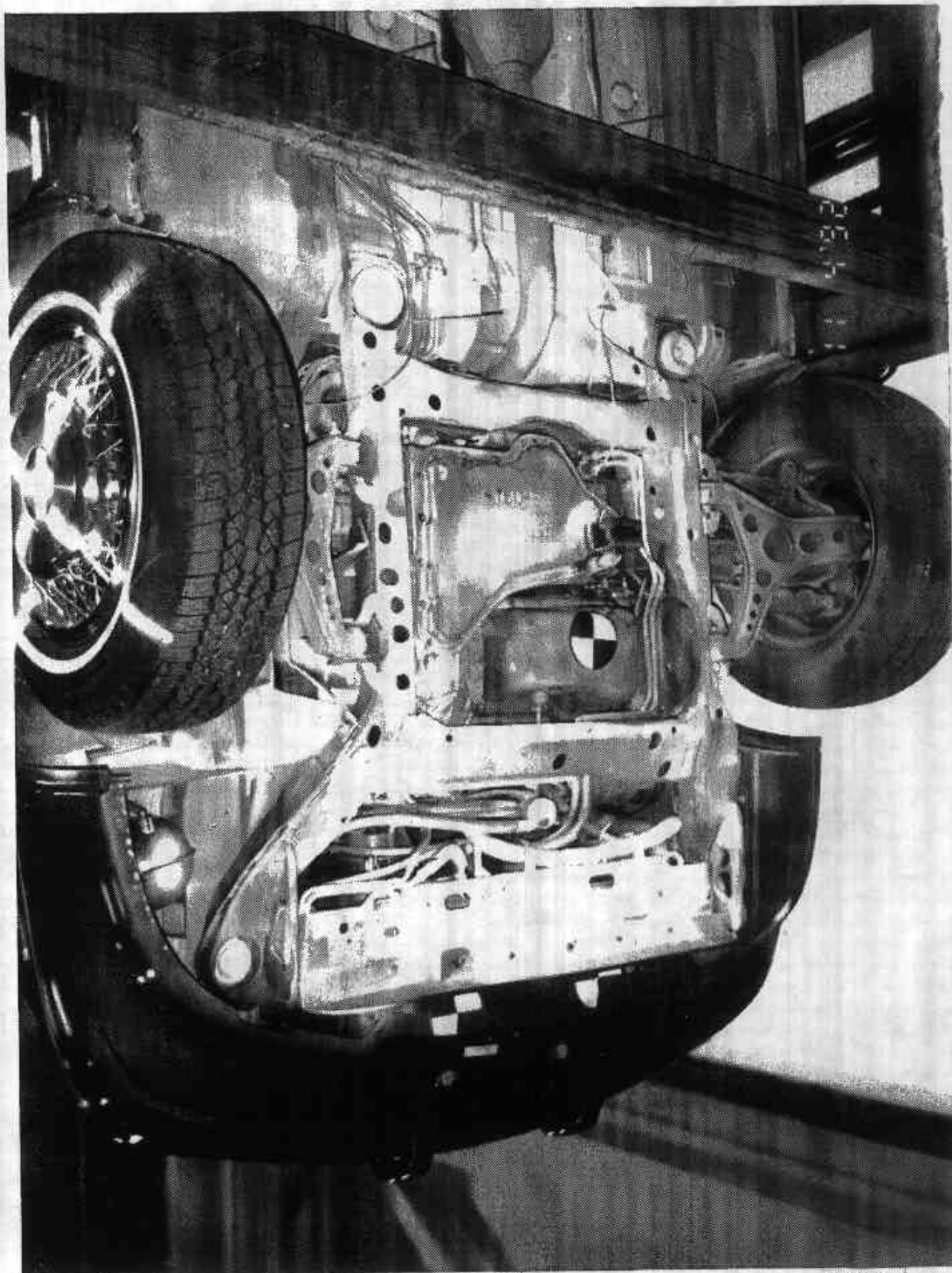


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

A-22

8056-6

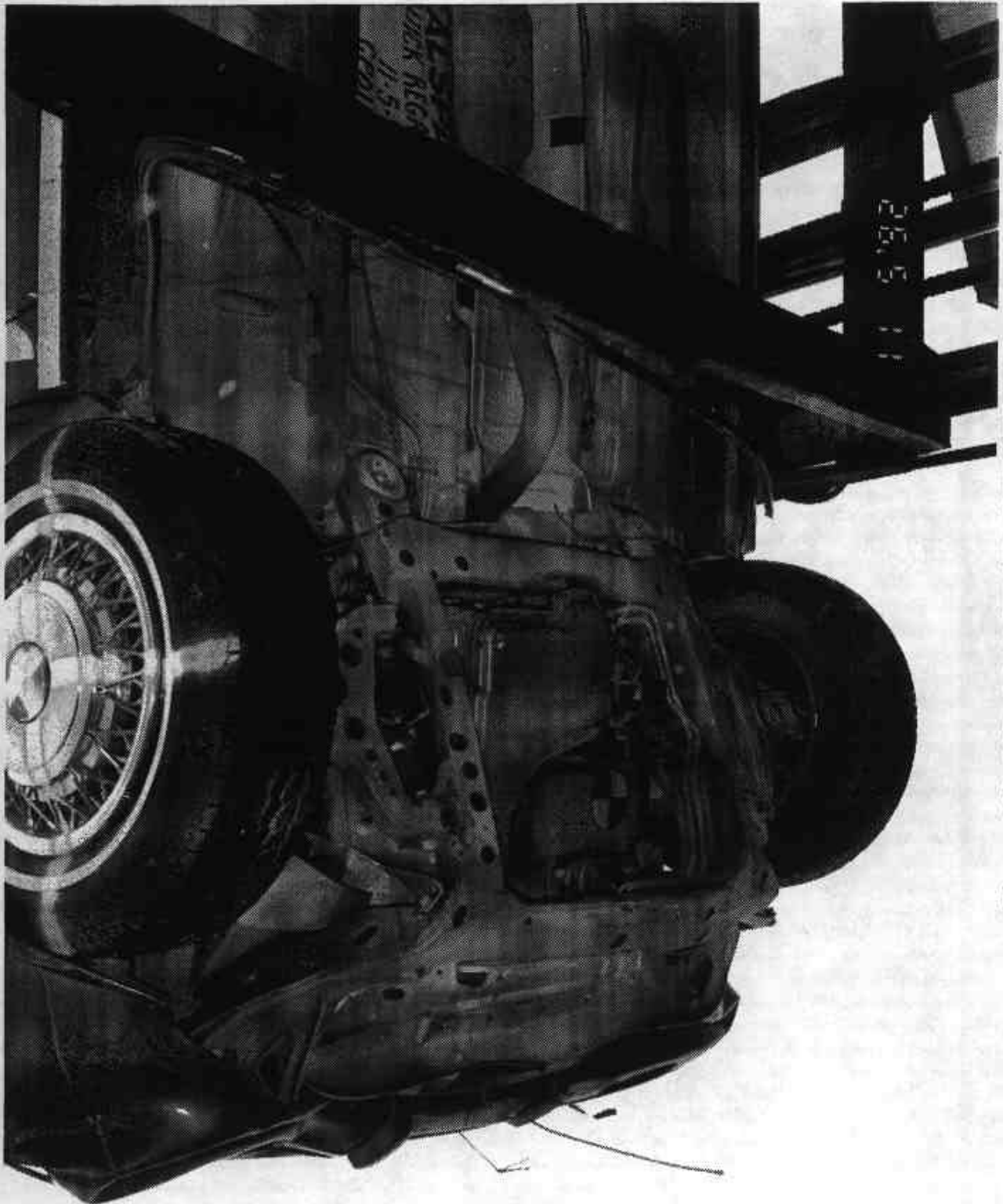


Figure A-21 POST-TEST FRONT SIDE UNDERBODY VIEW

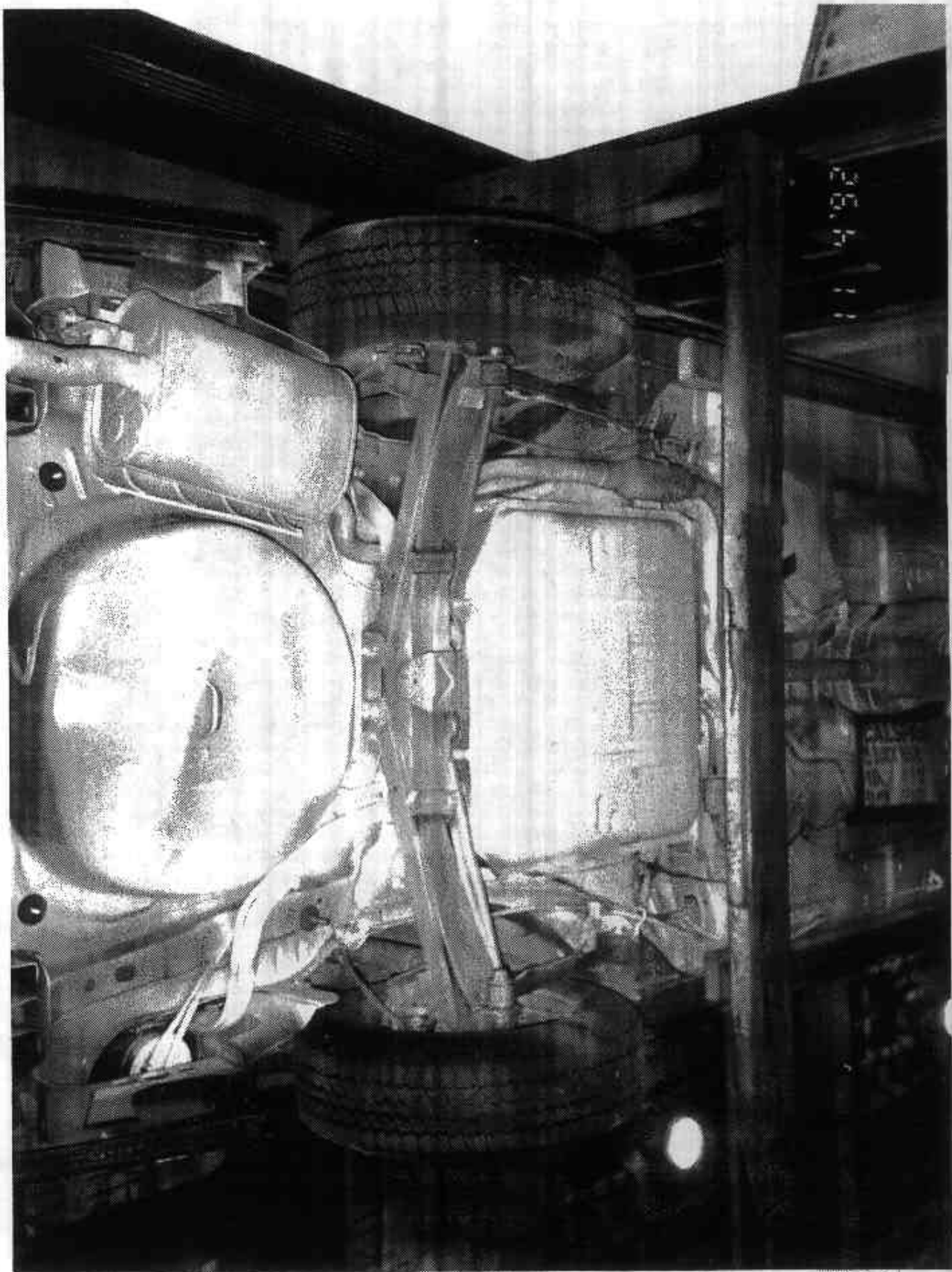


Figure A-22 PRE-TEST REAR UNDERBODY VIEW

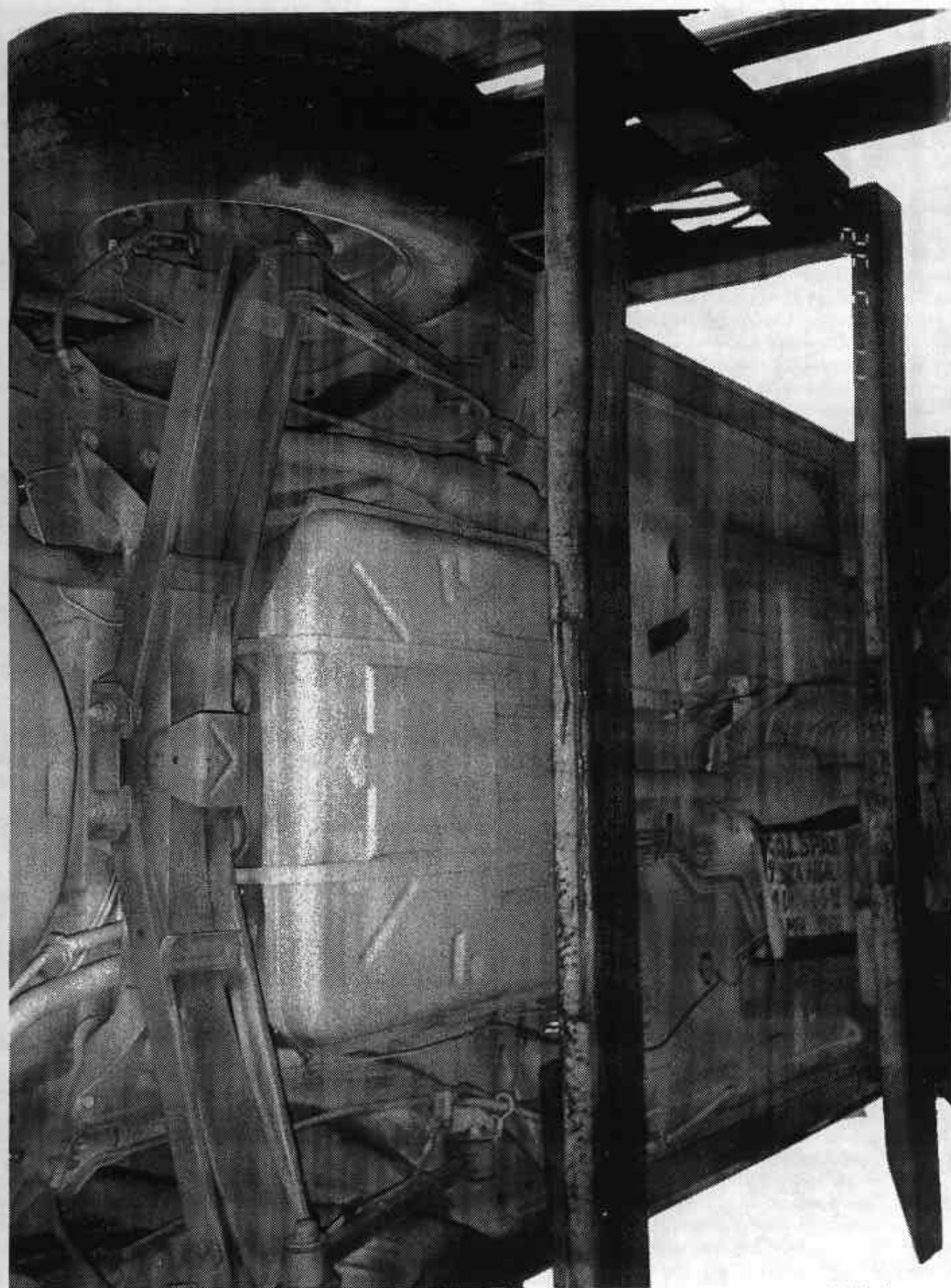


Figure A-23 POST-TEST REAR UNDERBODY VIEW

A-25

8056-6


 GMPT BY GENERAL MOTORS OF CANADA  
 LTD  
 DATE 1973  
 GVWR 4500LB GVWR FRT 2550LB GVWR RR 1973LB  
 2052KG 1157KG 899KG  
 THIS VEHICLE CONFORMS TO ALL APPLIC-  
 ABLE U.S. FEDERAL MOTOR VEHICLE  
 SAFETY, BUMPER AND THEFT PREVENTION  
 STANDARDS IN EFFECT ON THE DATE OF  
 MANUFACTURE SHOWN ABOVE.  
 254MB54L3P1402406 PASS CAR

GENERAL

Figure A-24 CERTIFICATION LABEL

| TIRE-LOADING INFORMATION                      |       |                  |           |
|-----------------------------------------------|-------|------------------|-----------|
| OCCUPANTS                                     |       | VEHICLE CAP. WT. |           |
| FRT. CTR. RR.                                 | TOTAL | LBS              | KG        |
| 3 0 3                                         | 6     | 1058             | 480       |
| MAX. LOADING @ GVWR SAME AS VEHICLE           |       |                  |           |
| CAPACITY WEIGHT.                              |       | WAF              | COLD TIRE |
| MODEL WM19                                    |       | SPEED            | PRESSURE  |
| TIRE SIZE                                     |       | RTG              | PSI/KPA   |
| FRT P205/70R15                                |       | S                | 30/210    |
| RR P205/70R15                                 |       | S                | 30/210    |
| SPA T125/70D15                                |       | M                | 60/420    |
| IF TIRES ARE HOT, ADD 4PSI/28KPA              |       |                  |           |
| SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION |       |                  |           |

Figure A-25 TIRE PLACARD



Figure A-26 PRE-TEST DRIVER DUMMY POSITION

A-28

8056-6



Figure A-27 POST-TEST DRIVER DUMMY POSITION



Figure A-28 PRE-TEST PASSENGER DUMMY POSITION

A-30

8056-6



Figure A-29 POST-TEST PASSENGER DUMMY POSITION



Figure A-30 PRE-TEST DRIVER DUMMY AND INTERIOR VIEW



Figure A-31 POST-TEST DRIVER DUMMY AND INTERIOR VIEW

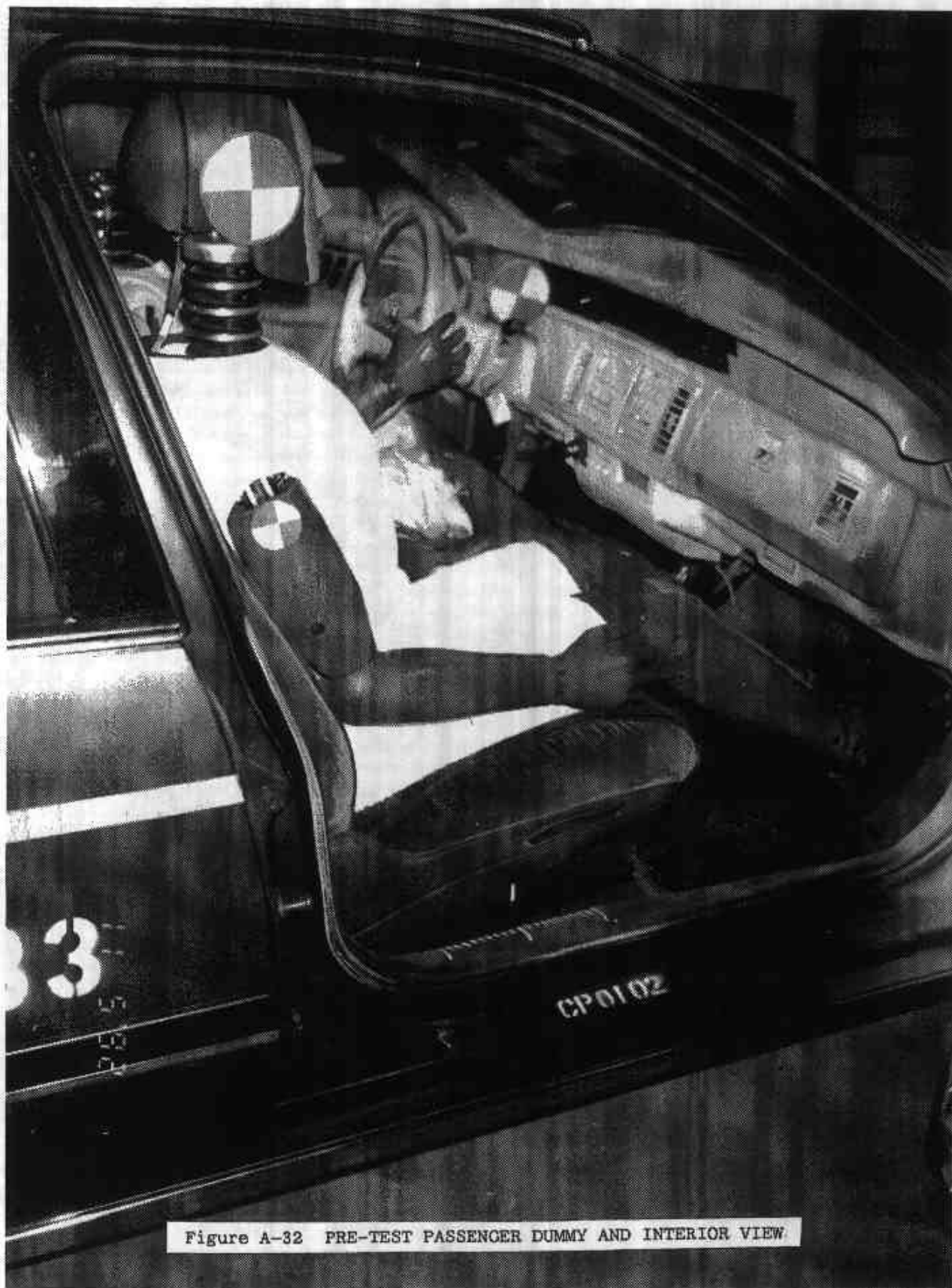
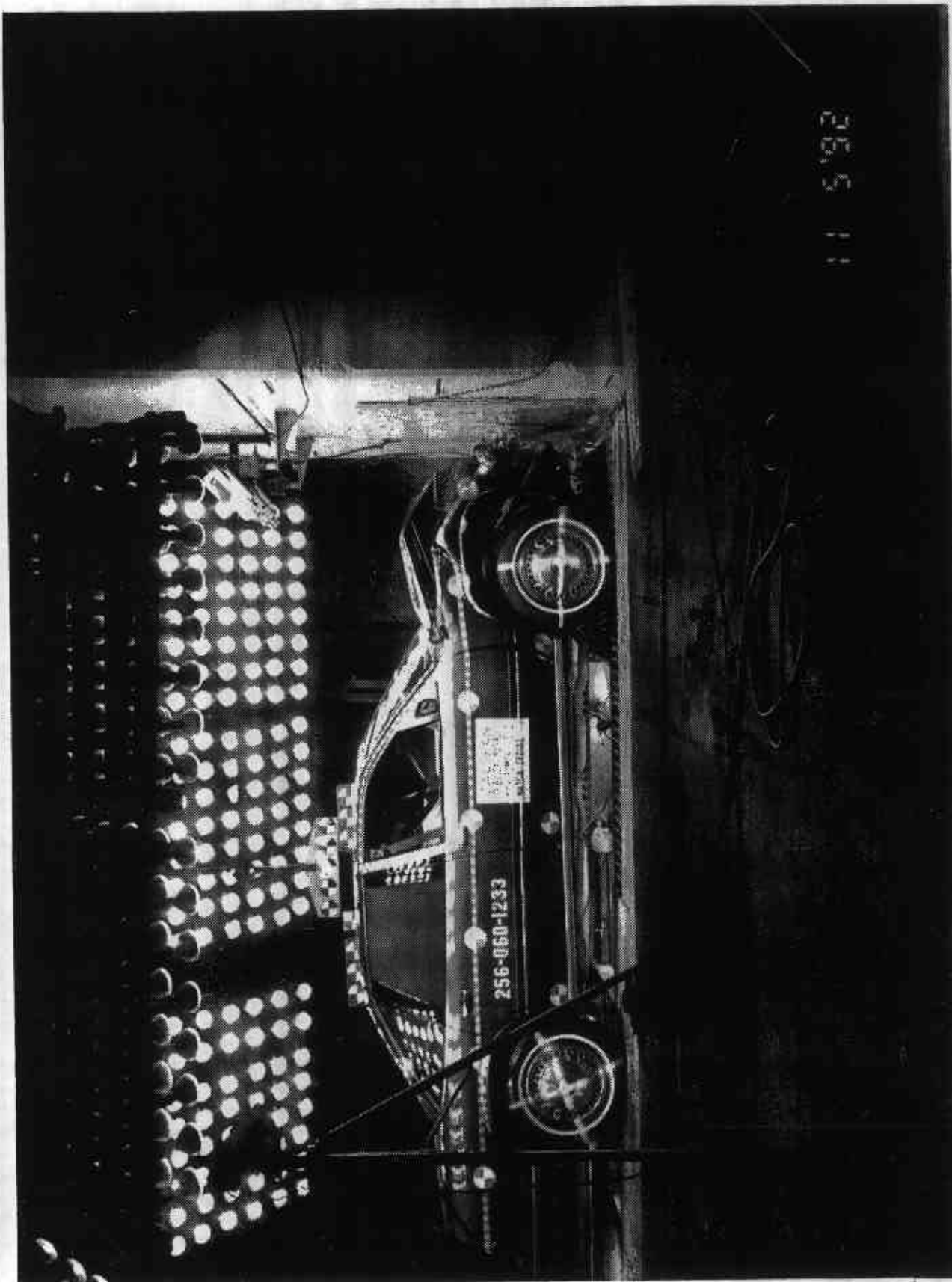


Figure A-32 PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW.



Figure A-33 POST-TEST PASSENGER DUMMY AND INTERIOR VIEW



11 5'92

FIGURE A-34 VEHICLE IMPACT

A-36

8056-6

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CP0102

VEHICLE DATA

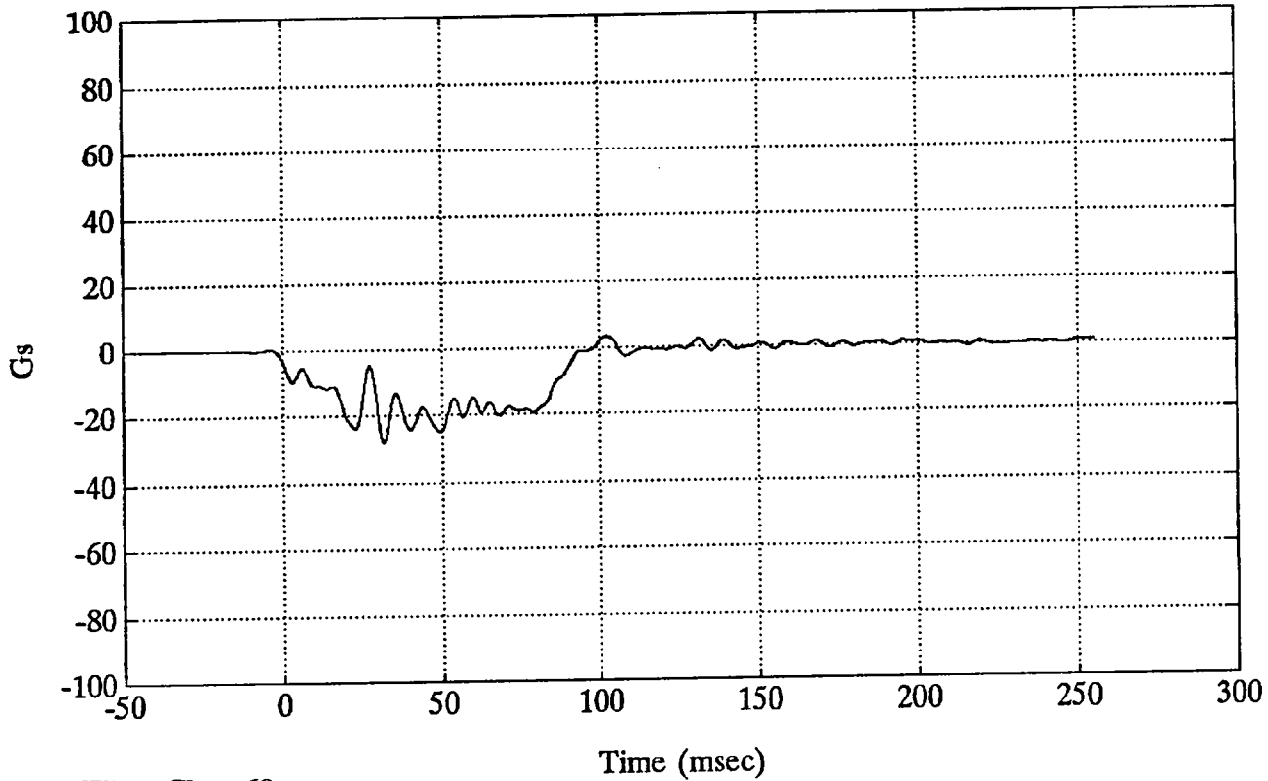
SAE FILTER CHANNEL CLASS

60

FMVSS 208 - 1993 BUICK REGAL

L. Rear X-member X (#1)

Max = 3.18 Gs @ 102.12 msec  
Min = -27.86 Gs @ 31.92 msec

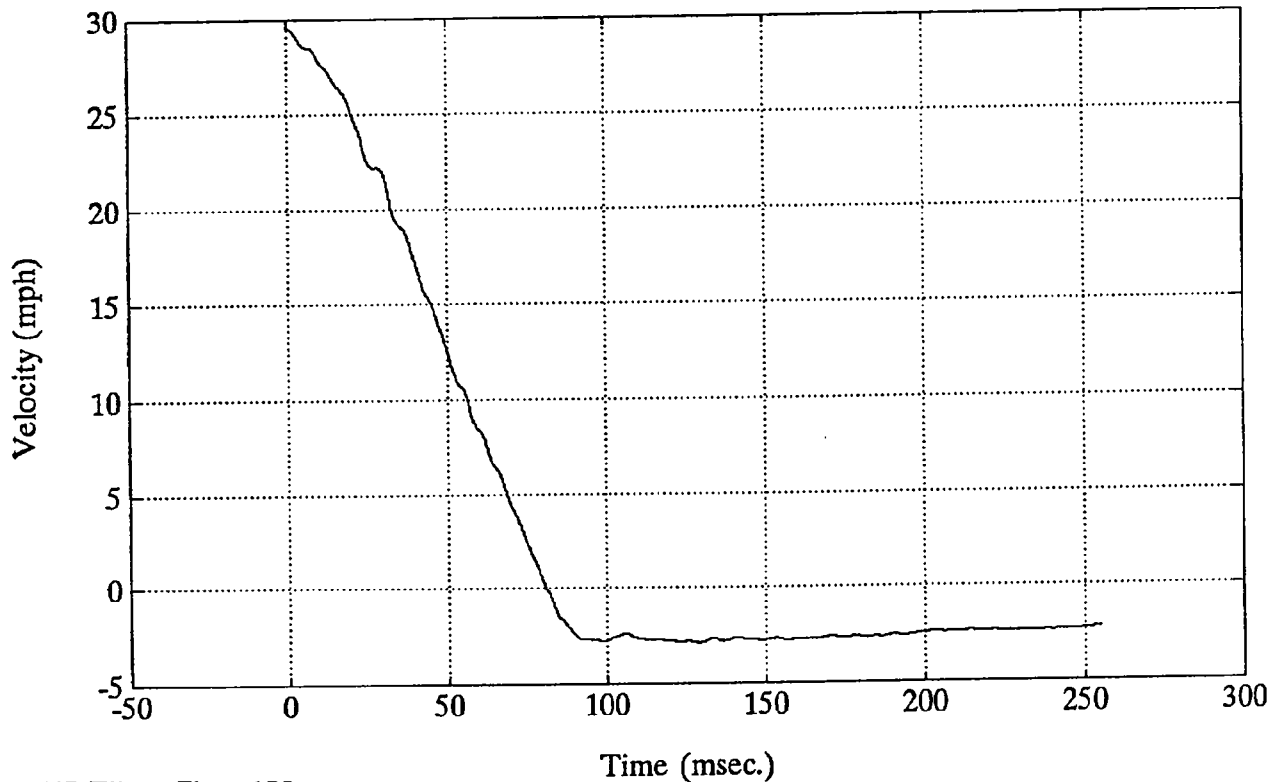


SAE Filter Class 60

FMVSS 208 - 1993 BUICK REGAL

L. Rear X-member X (#1)

Max = 29.60 mph @ -0.00 msec  
Min = -2.92 mph @ 128.88 msec

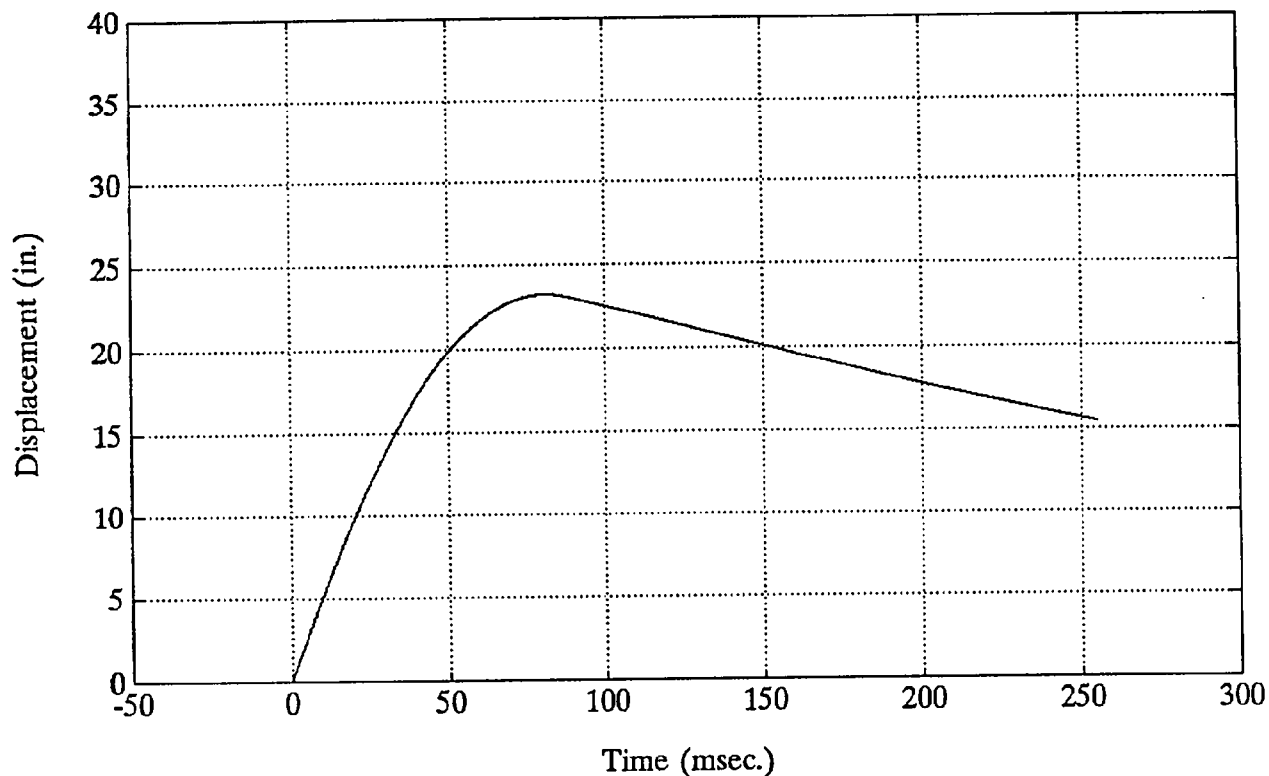


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

L. Rear X-member X (#1)

Max = 23.24 in. @ 82.56 msec  
Min = 0.00 in. @ -0.00 msec

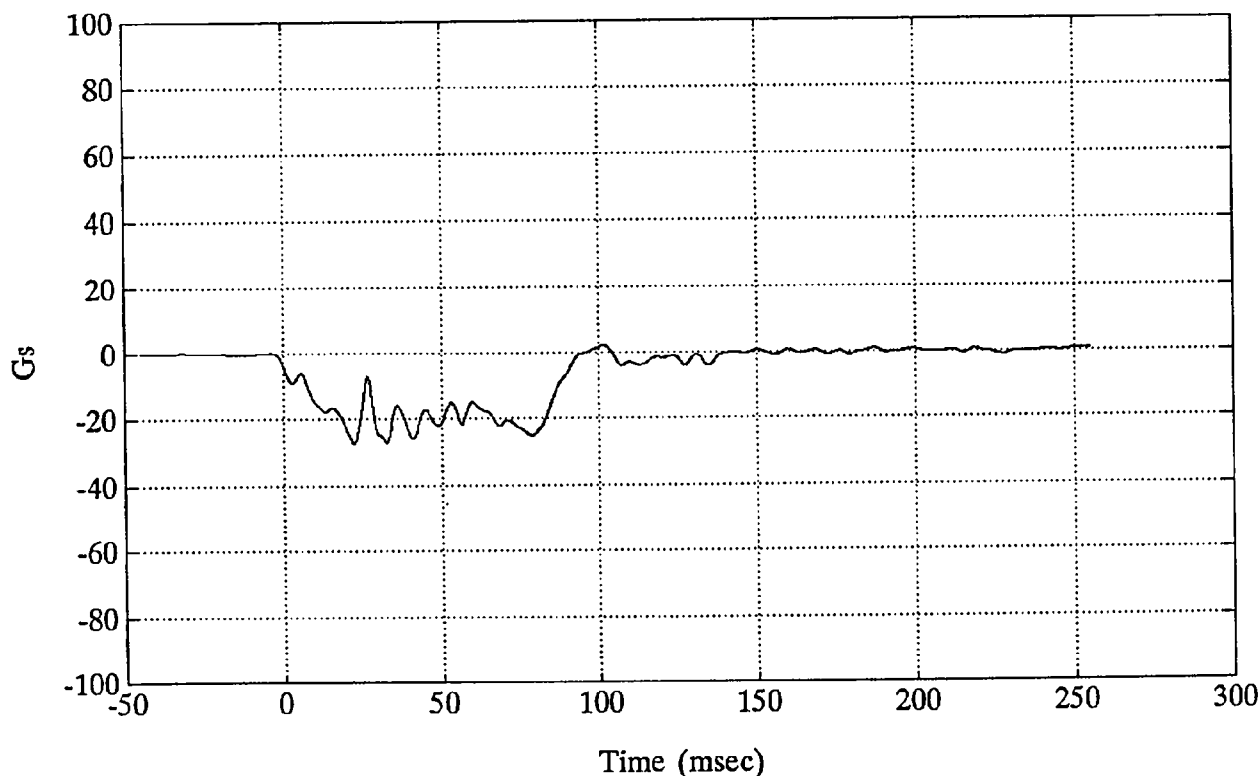


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

R. Rear X-member X (#2)

Max = 2.32 Gs @ 101.28 msec  
Min = -27.13 Gs @ 22.32 msec

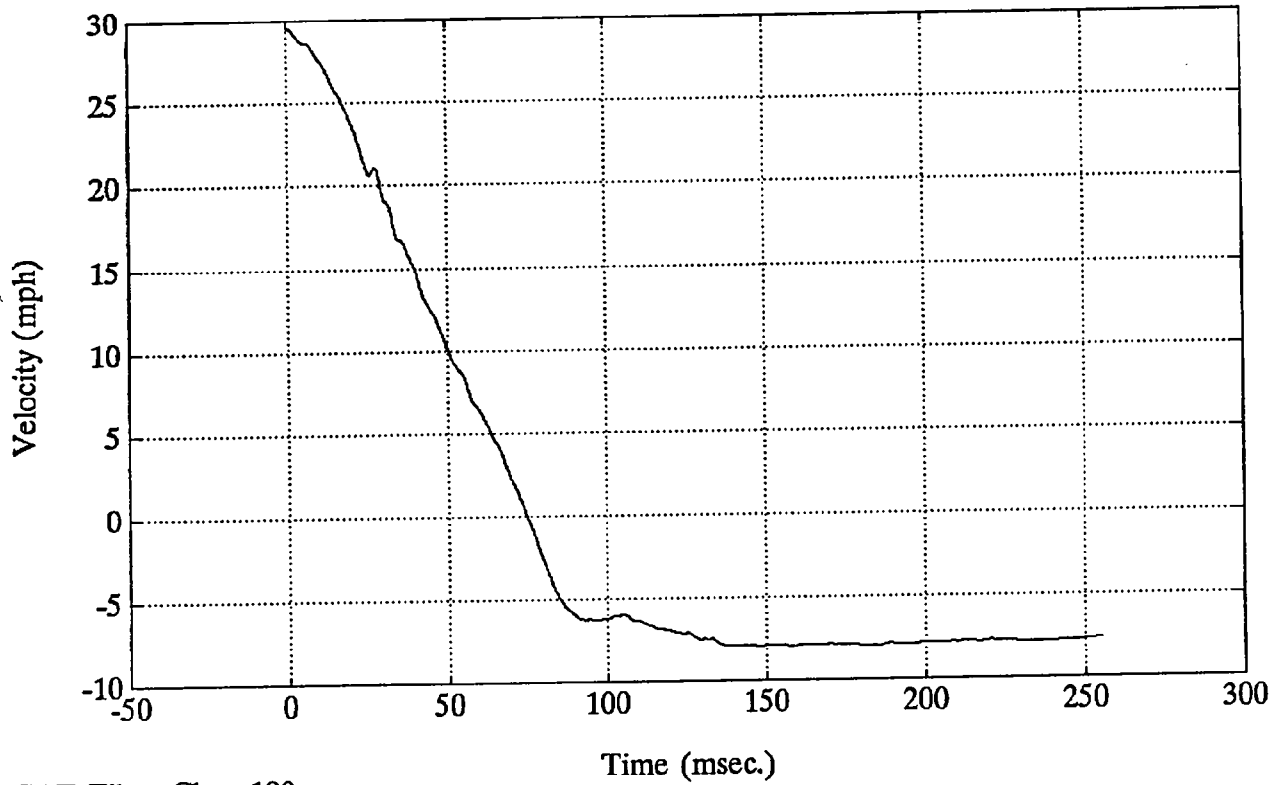


SAE Filter Class 60

FMVSS 208 - 1993 BUICK REGAL

R. Rear X-member X (#2)

Max = 29.60 mph @ -0.00 msec  
Min = -7.96 mph @ 180.24 msec

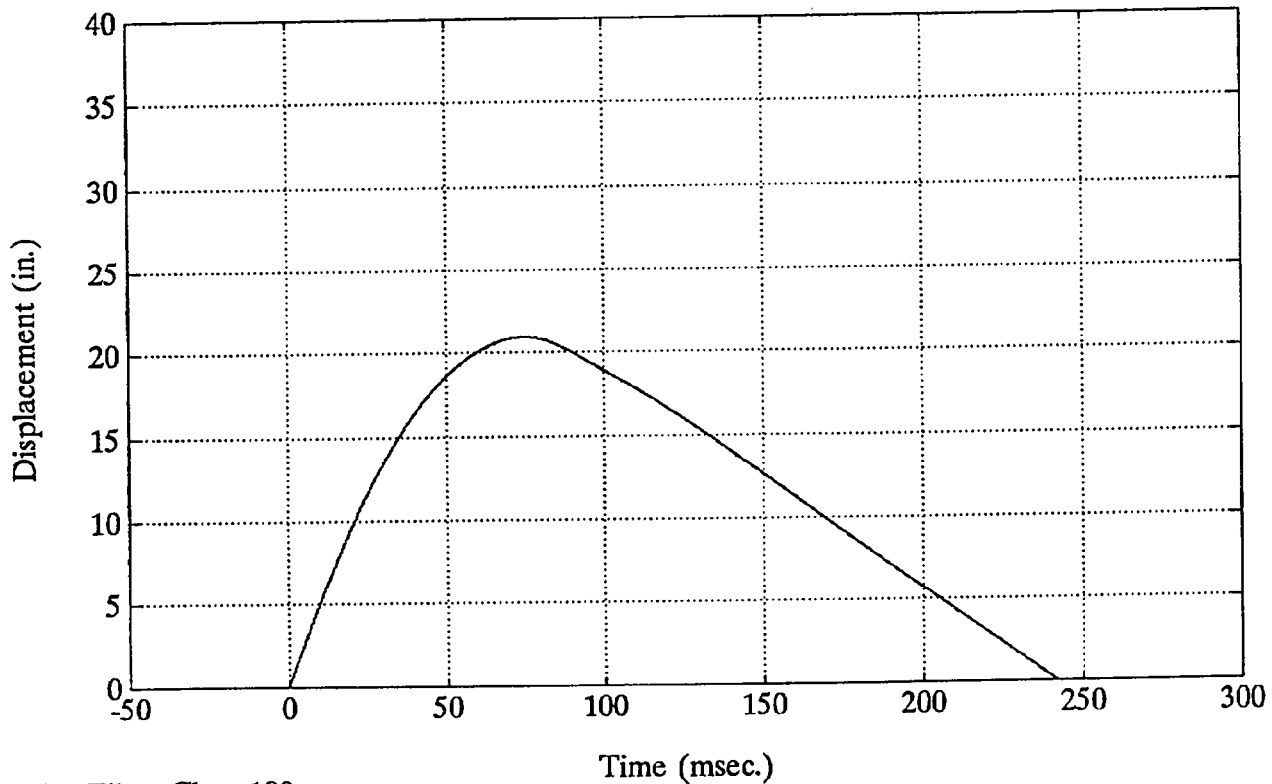


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

R. Rear X-member X (#2)

Max = 20.94 in. @ 75.60 msec  
Min = -1.79 in. @ 254.88 msec

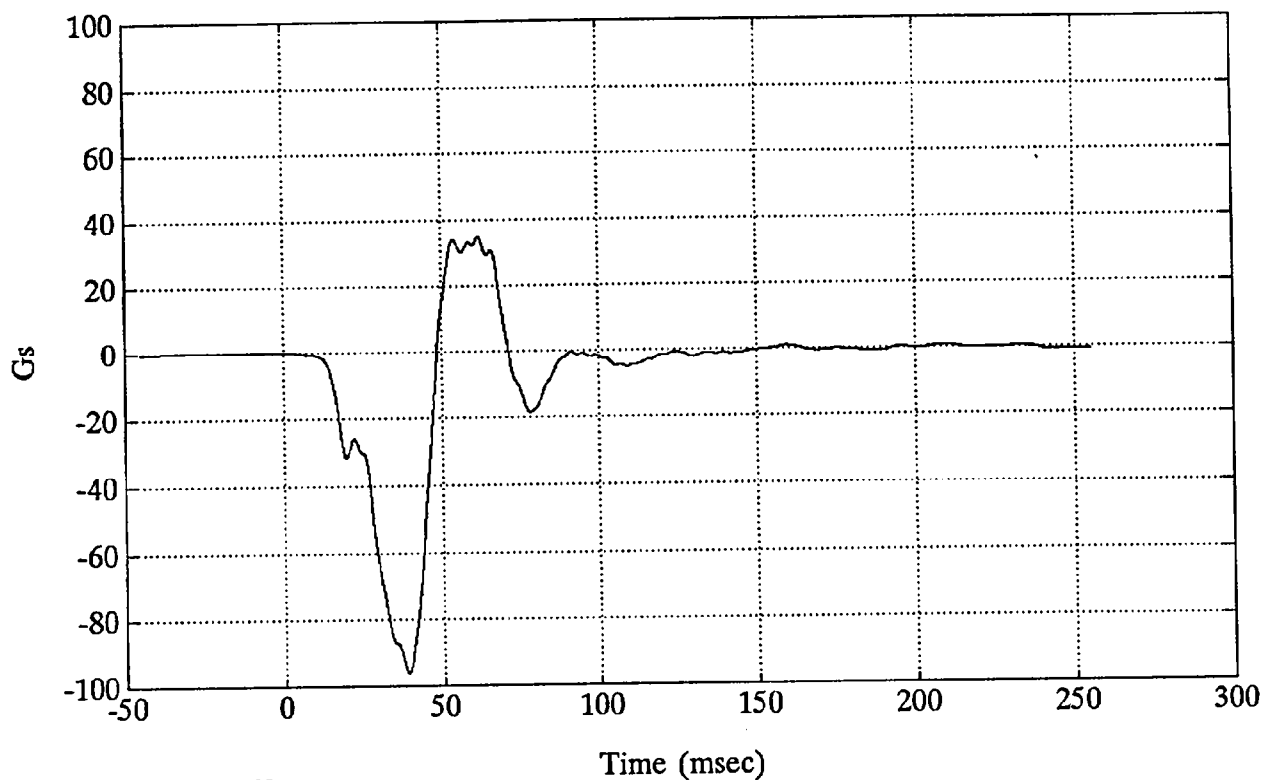


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Engine Top X (#3)

Max = 34.82 Gs @ 61.92 msec  
Min = -96.30 Gs @ 38.76 msec

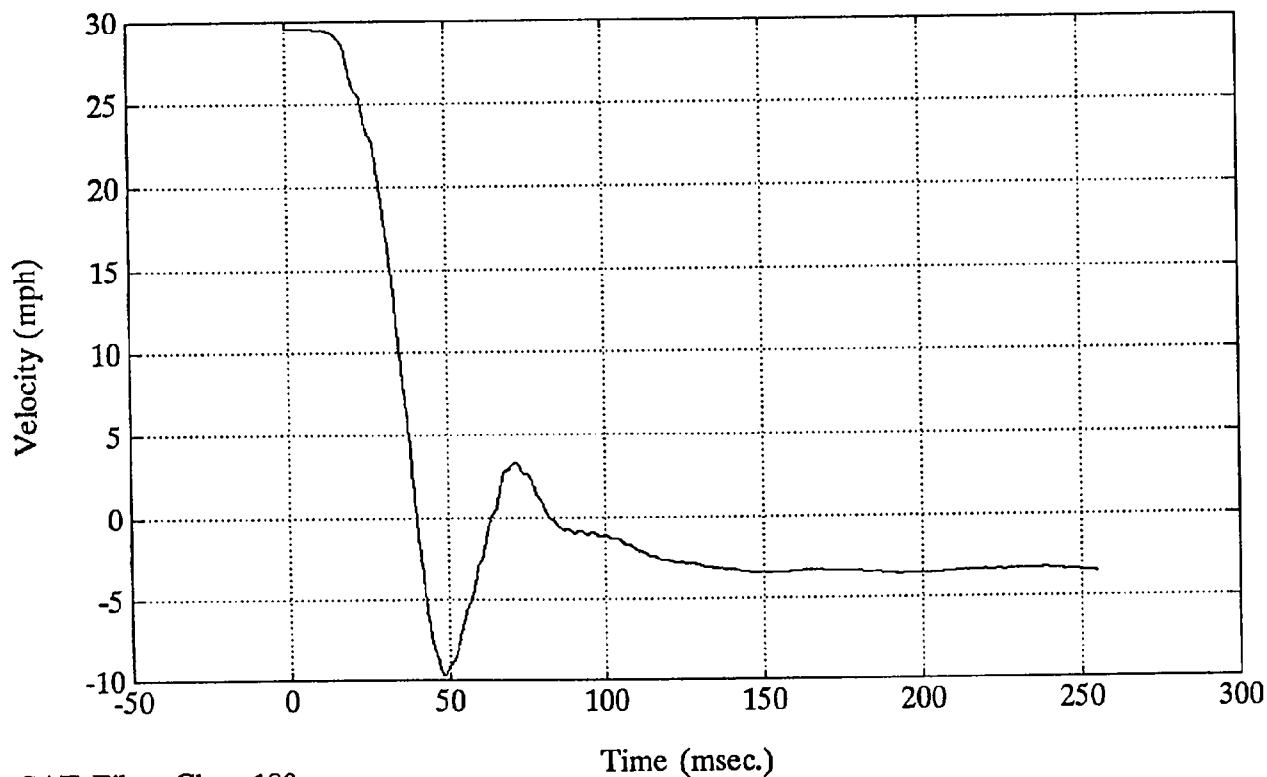


SAE Filter Class 60

FMVSS 208 - 1993 BUICK REGAL

Engine Top X (#3)

Max = 29.60 mph @ 4.56 msec  
Min = -9.75 mph @ 48.48 msec

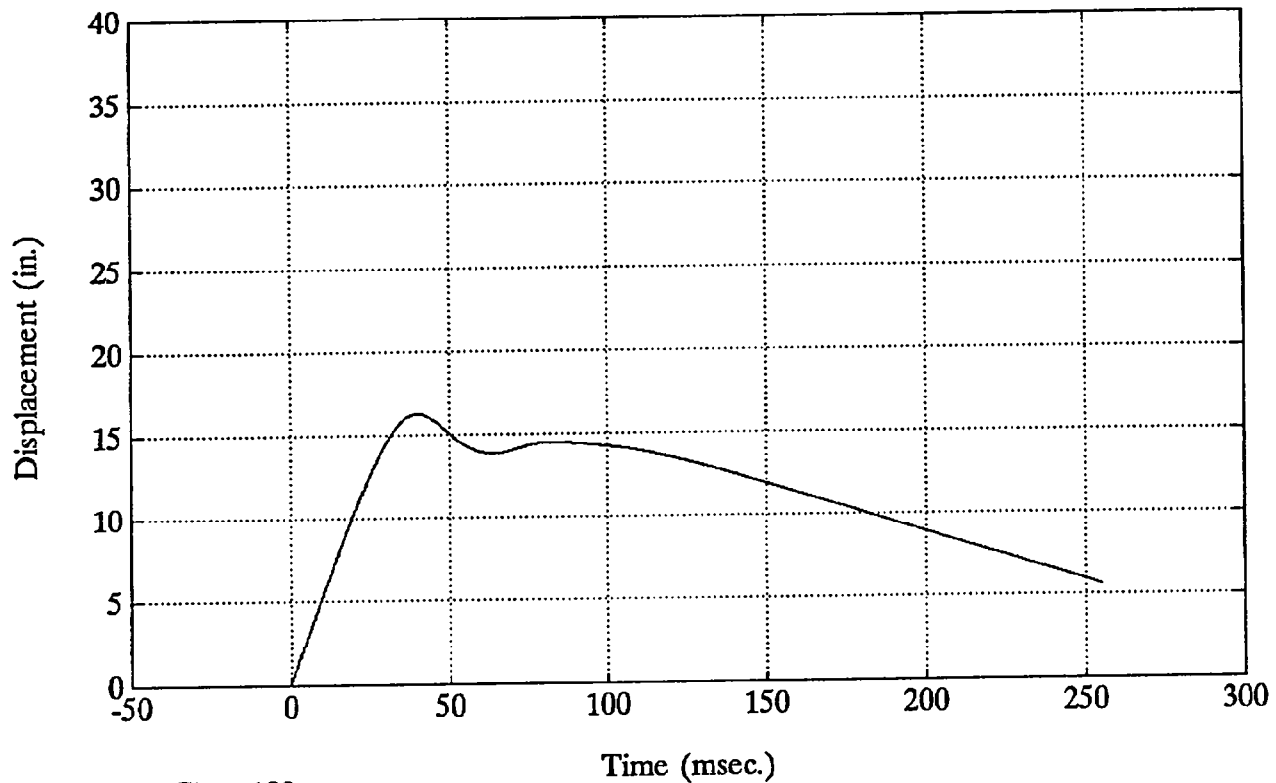


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Engine Top X (#3)

Max = 16.27 in. @ 40.32 msec  
Min = 0.00 in. @ -0.00 msec

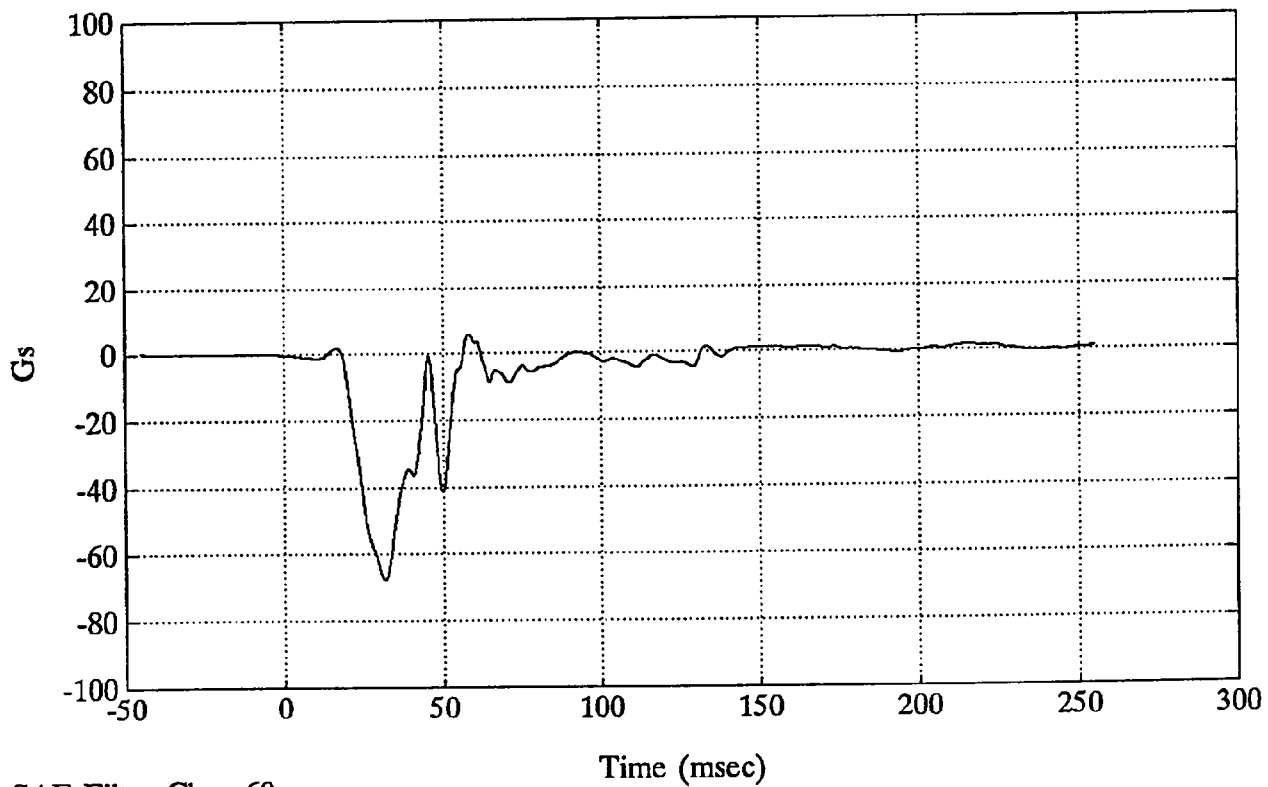


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Engine Bottom X (#4)

Max = 5.71 Gs @ 58.32 msec  
Min = -67.72 Gs @ 31.68 msec

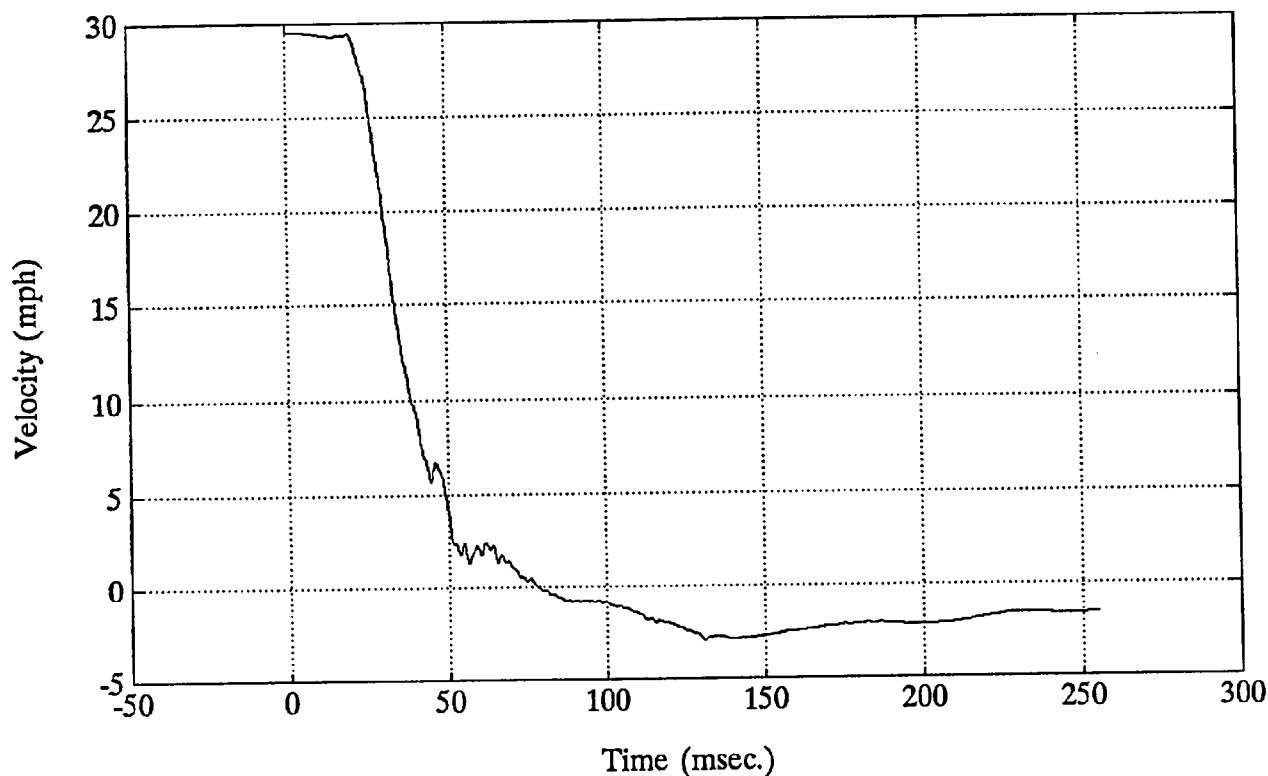


SAE Filter Class 60

FMVSS 208 - 1993 BUICK REGAL

Engine Bottom X (#4)

Max = 29.60 mph @ 1.20 msec  
Min = -2.98 mph @ 130.80 msec

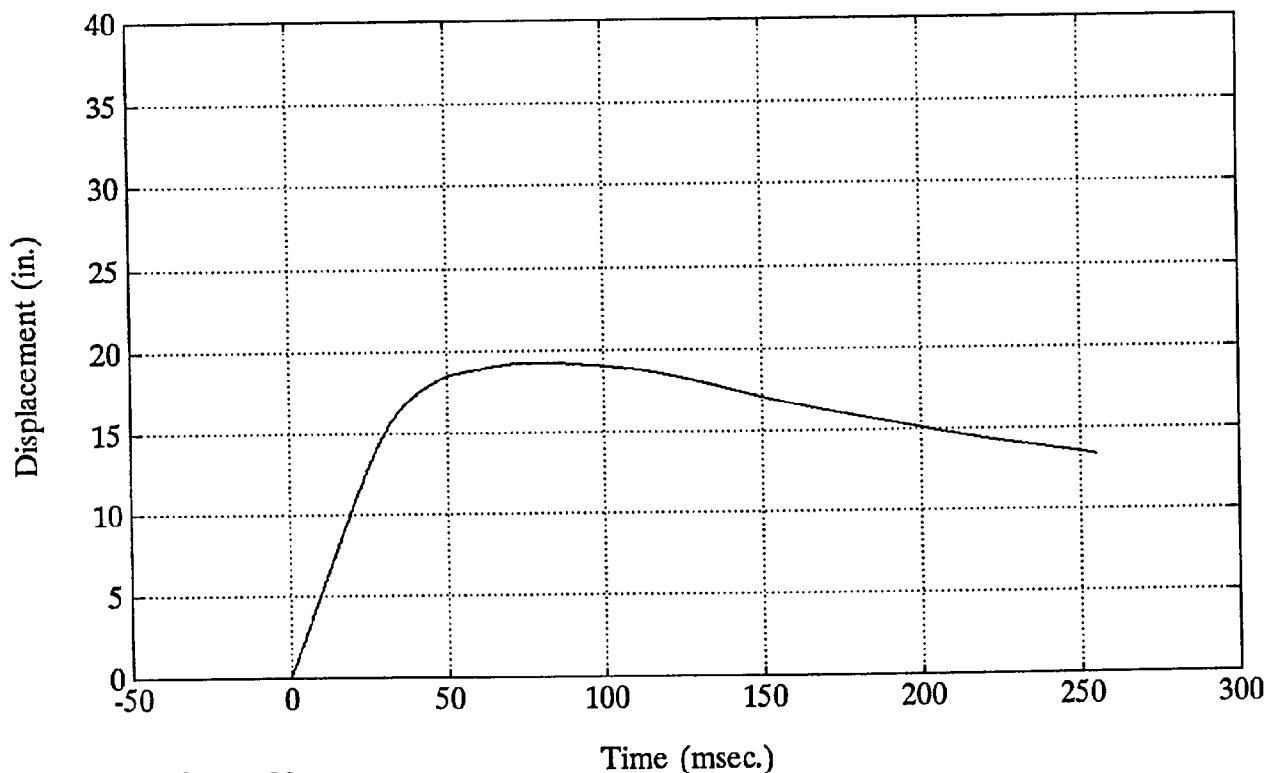


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Engine Bottom X (#4)

Max = 19.30 in. @ 81.60 msec  
Min = 0.00 in. @ -0.00 msec

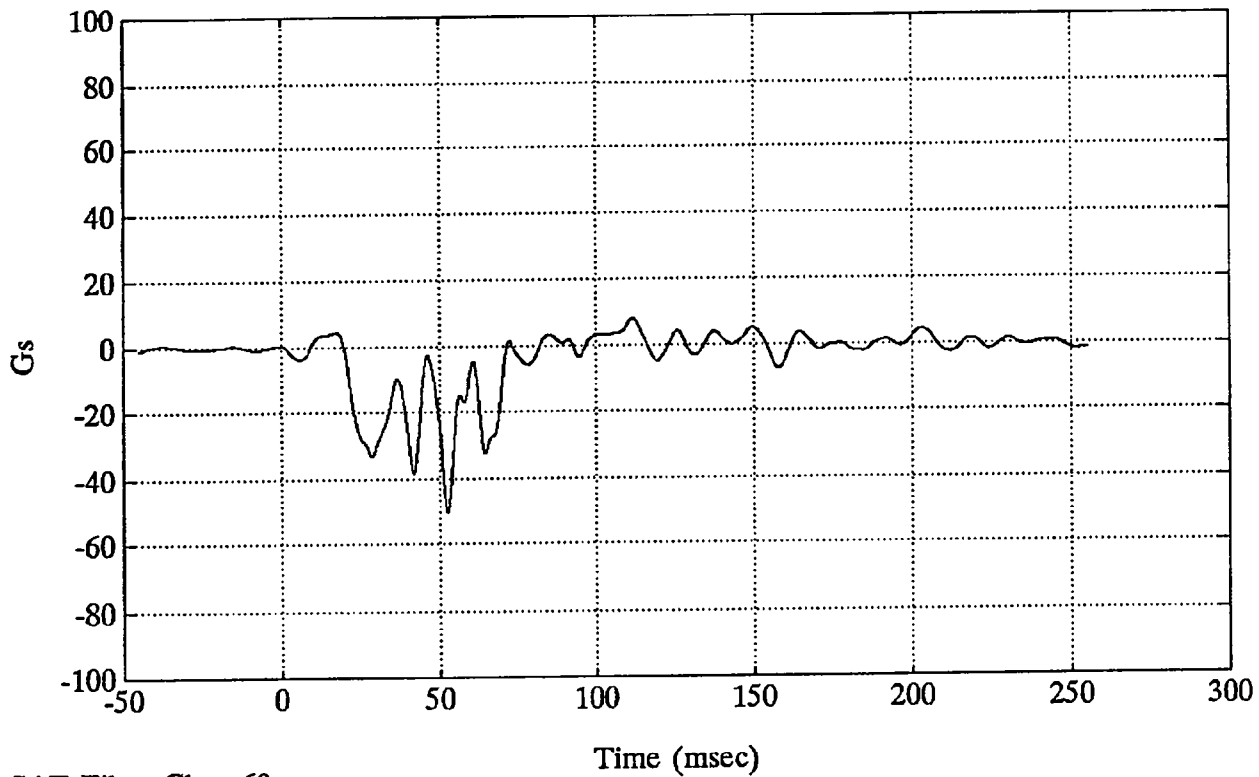


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

R. Brake Caliper X (#5)

Max = 7.99 Gs @ 111.48 msec  
Min = -50.48 Gs @ 52.68 msec

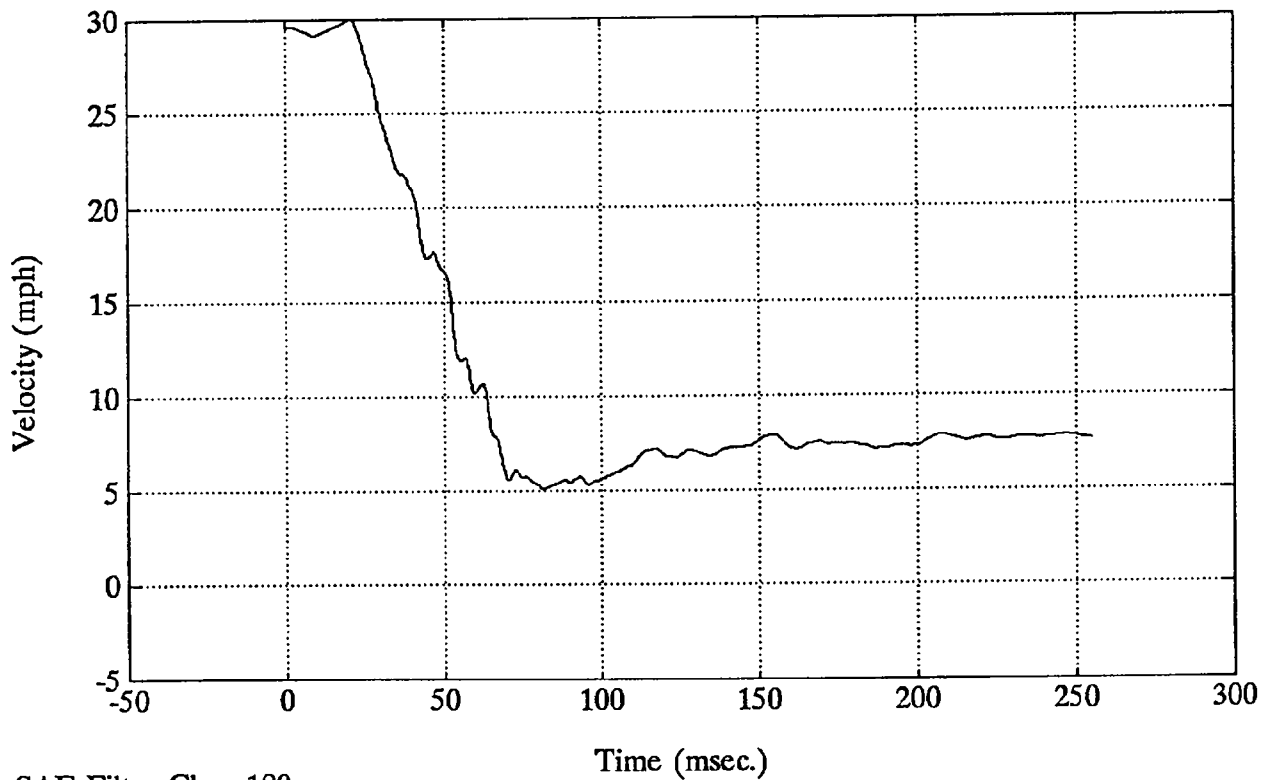


SAE Filter Class 60

FMVSS 208 - 1993 BUICK REGAL

R. Brake Caliper X (#5)

Max = 30.06 mph @ 20.88 msec  
Min = 5.08 mph @ 81.36 msec

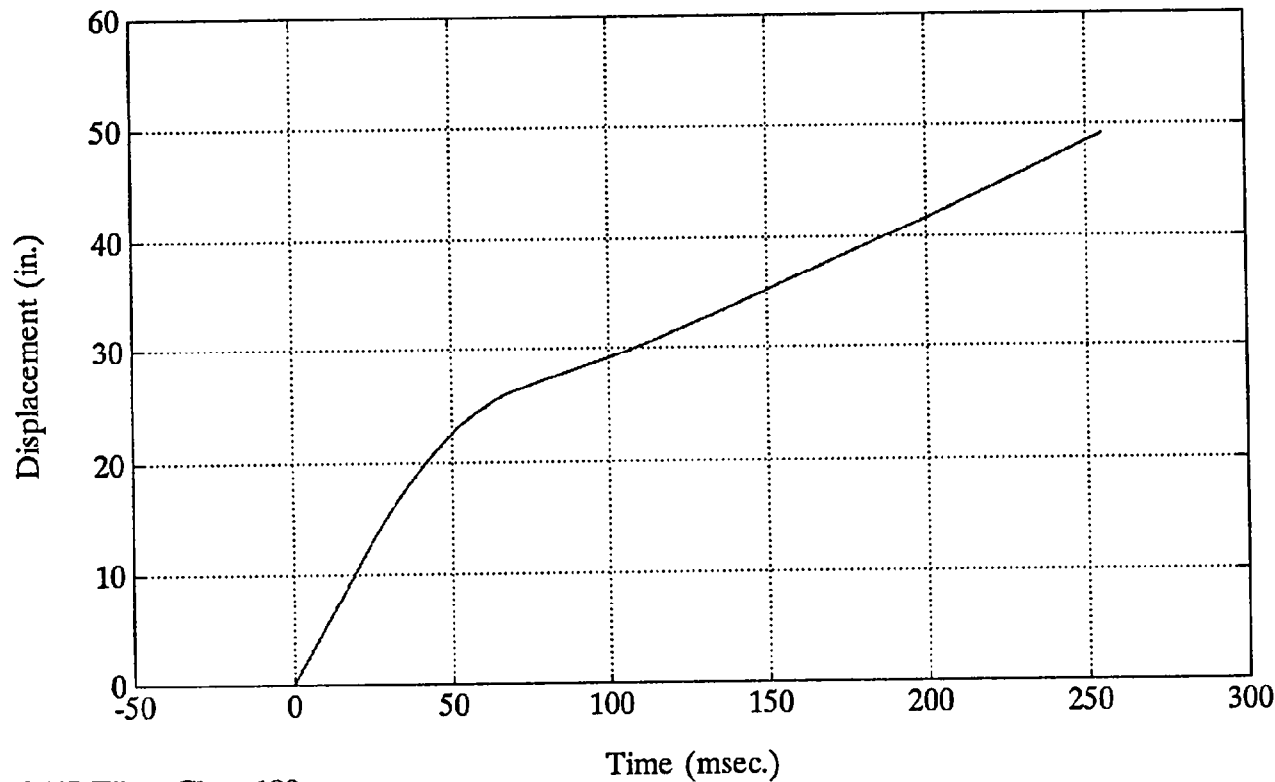


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

R. Brake Caliper X (#5)

Max = 49.08 in. @ 254.88 msec  
Min = 0.00 in. @ -0.00 msec

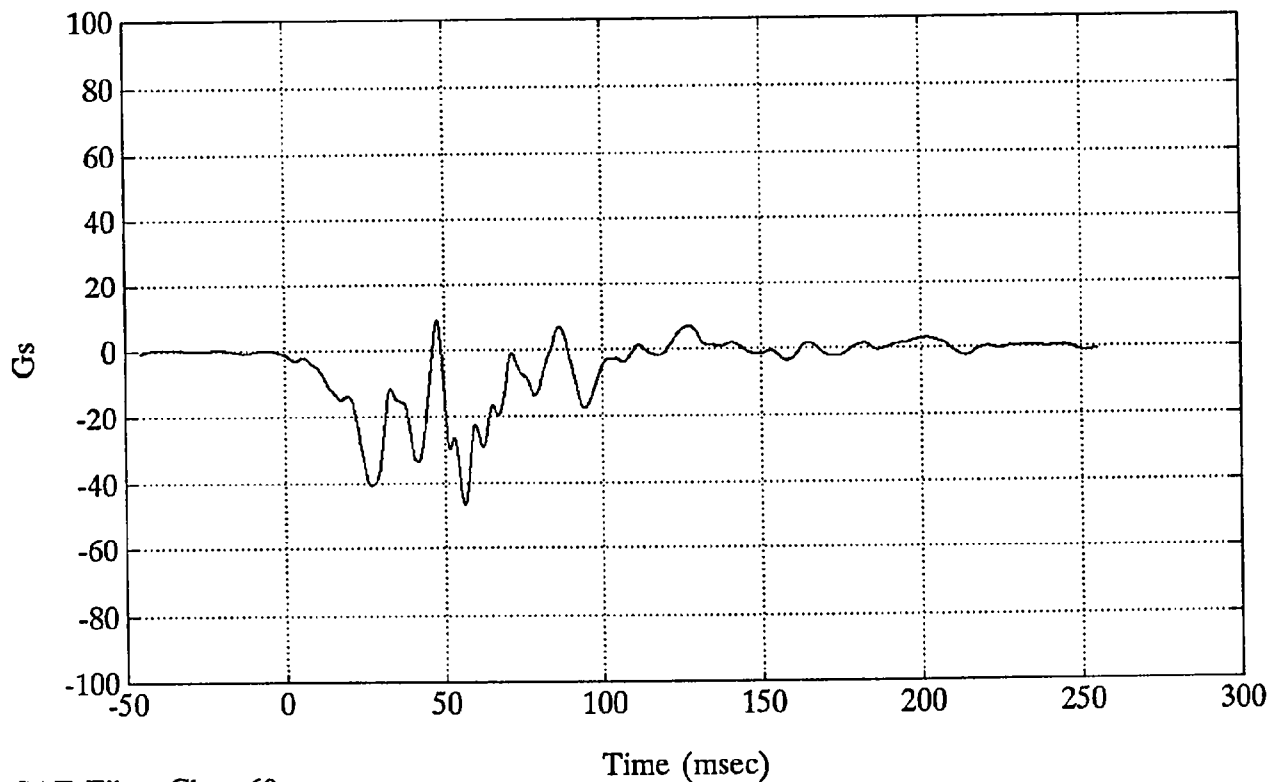


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

L. Brake Caliper X (#6)

Max = 8.74 Gs @ 47.88 msec  
Min = -46.51 Gs @ 56.40 msec

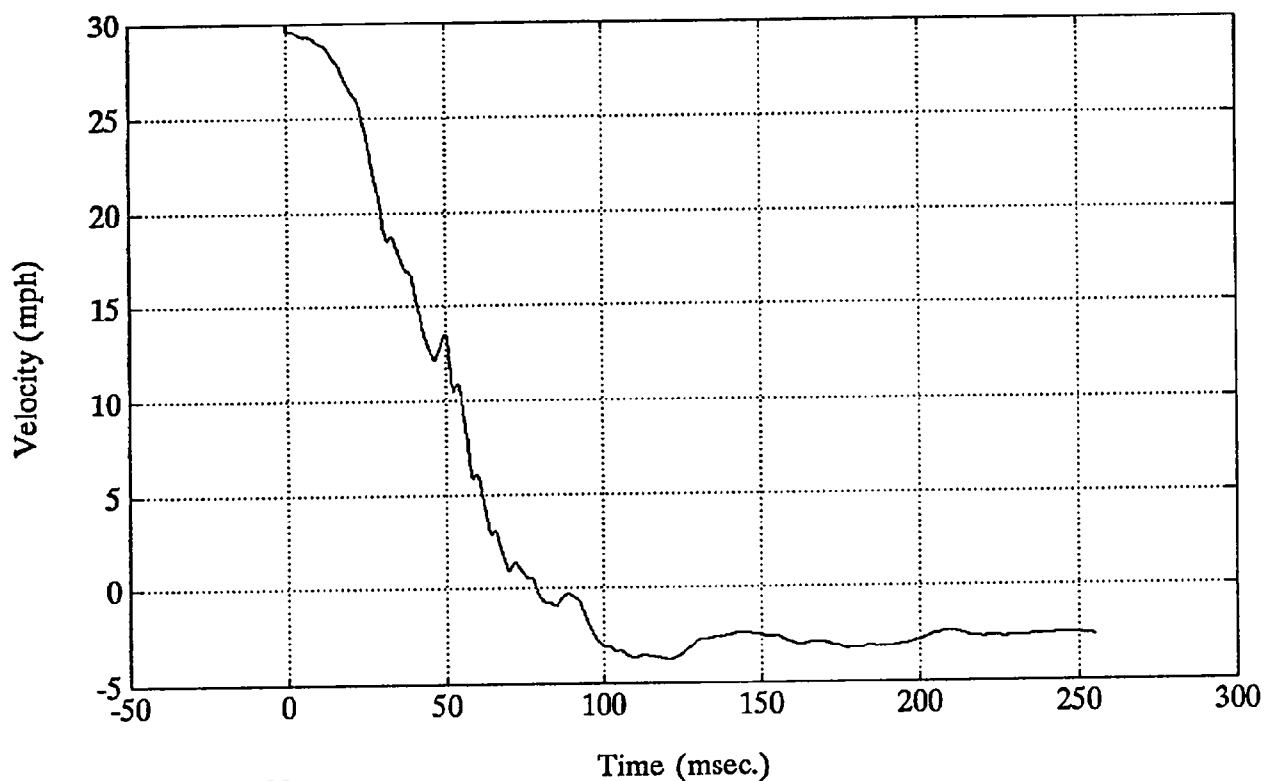


SAE Filter Class 60

FMVSS 208 - 1993 BUICK REGAL

L. Brake Caliper X (#6)

Max = 29.60 mph @ 0.48 msec  
Min = -3.78 mph @ 120.48 msec

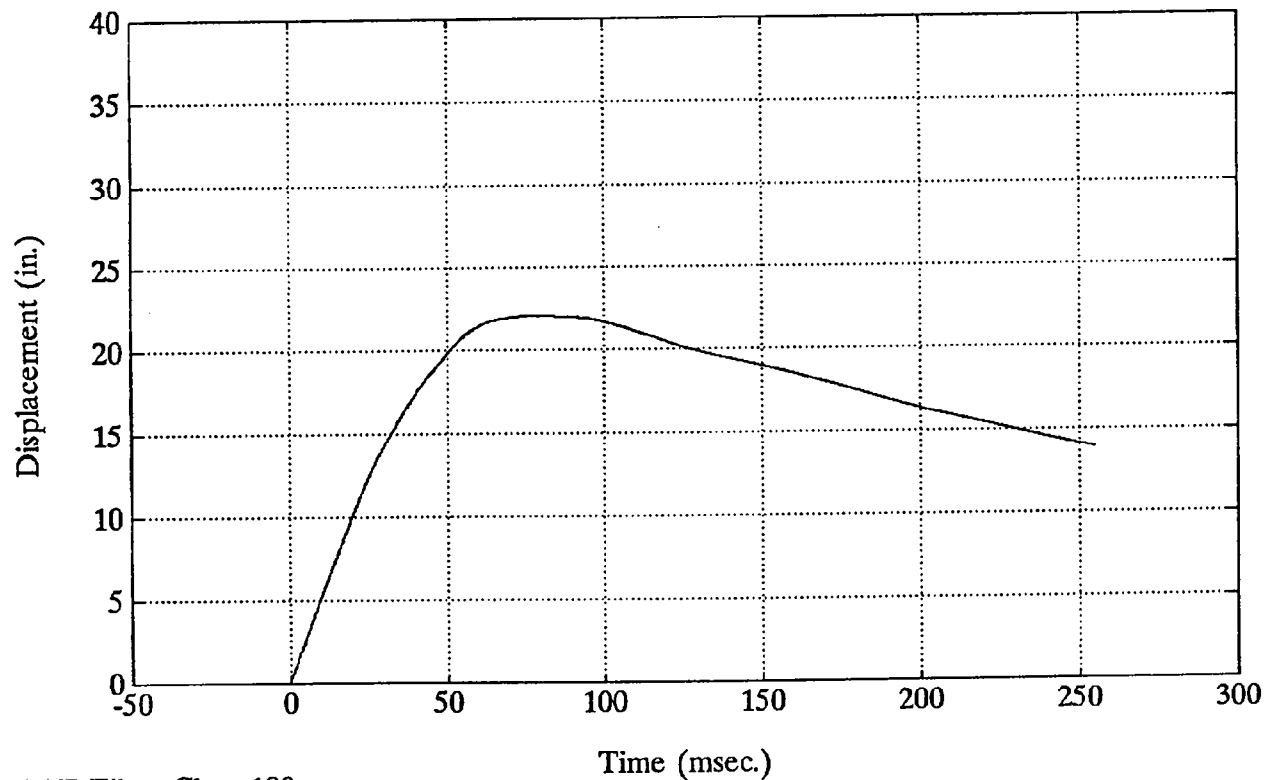


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

L. Brake Caliper X (#6)

Max = 22.10 in. @ 79.44 msec  
Min = 0.00 in. @ -0.00 msec

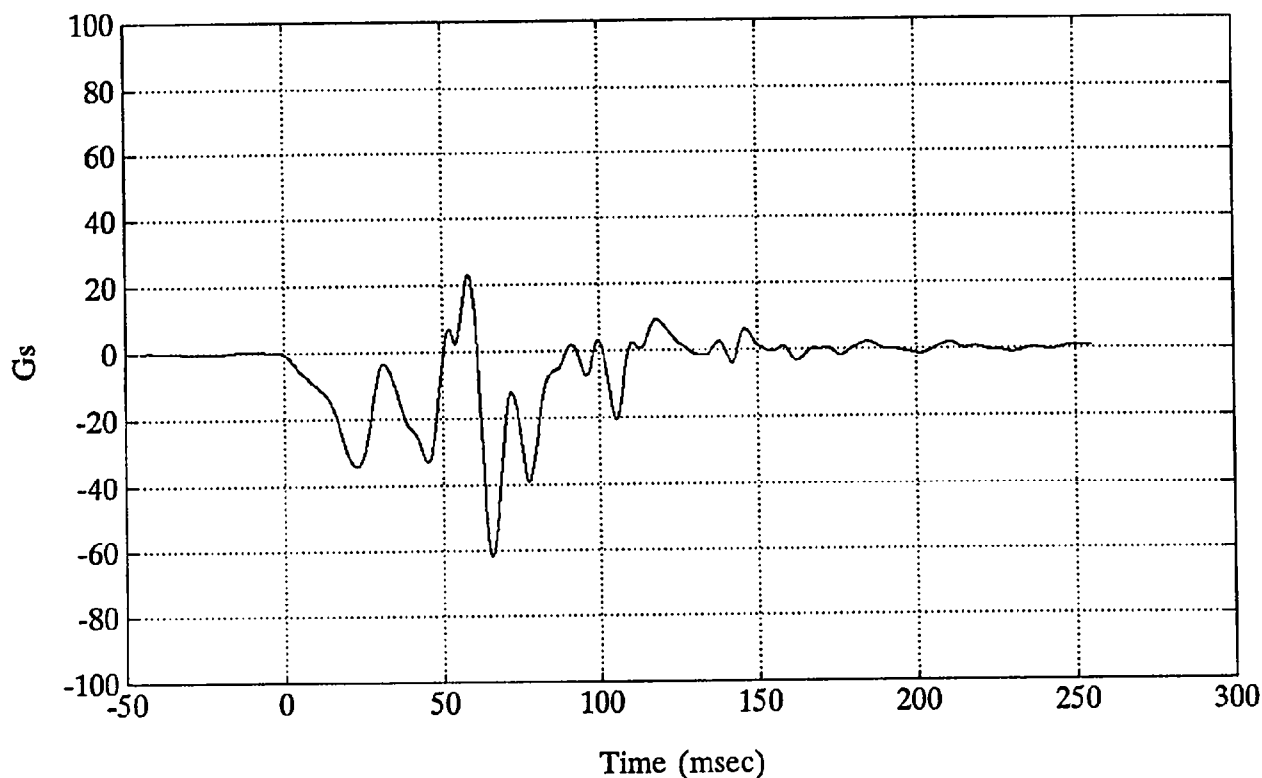


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Instrument Panel X (#7)

Max = 22.92 Gs @ 58.44 msec  
Min = -61.68 Gs @ 65.52 msec

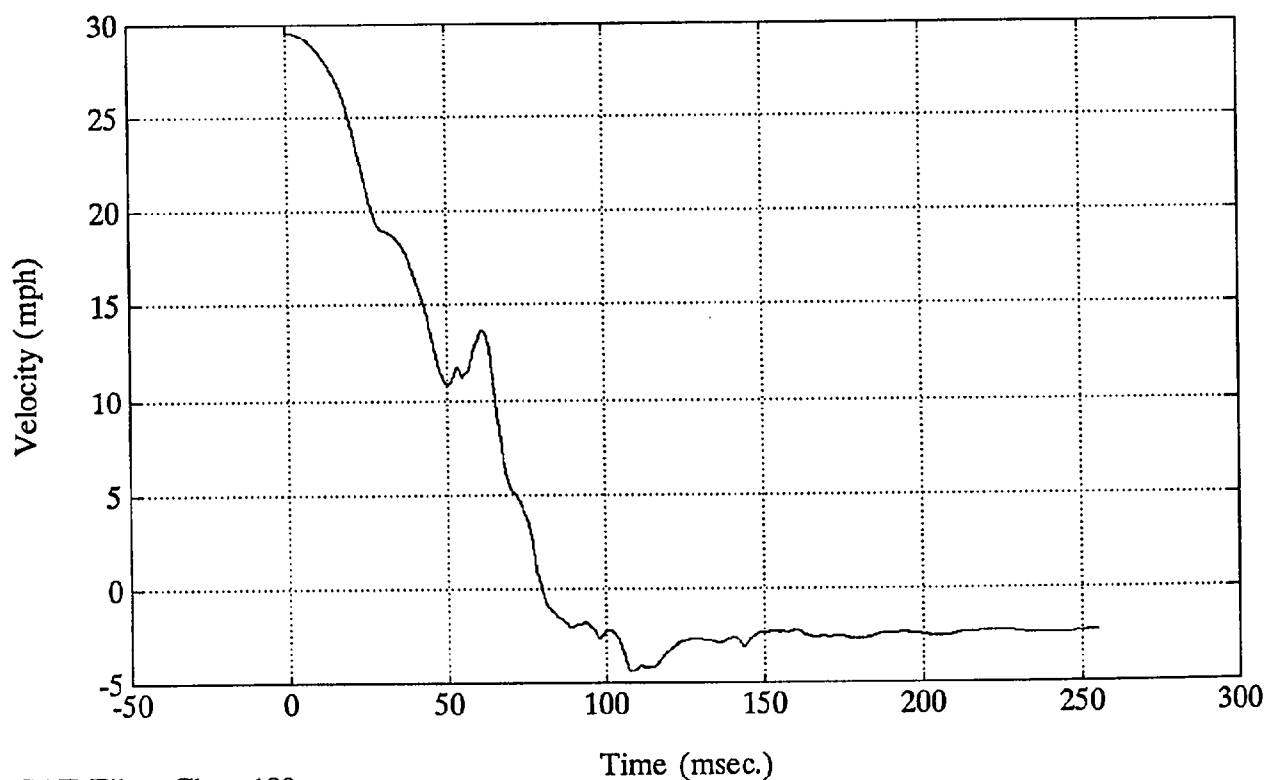


SAE Filter Class 60

FMVSS 208 - 1993 BUICK REGAL

Instrument Panel X (#7)

Max = 29.60 mph @ 0.96 msec  
Min = -4.37 mph @ 107.76 msec

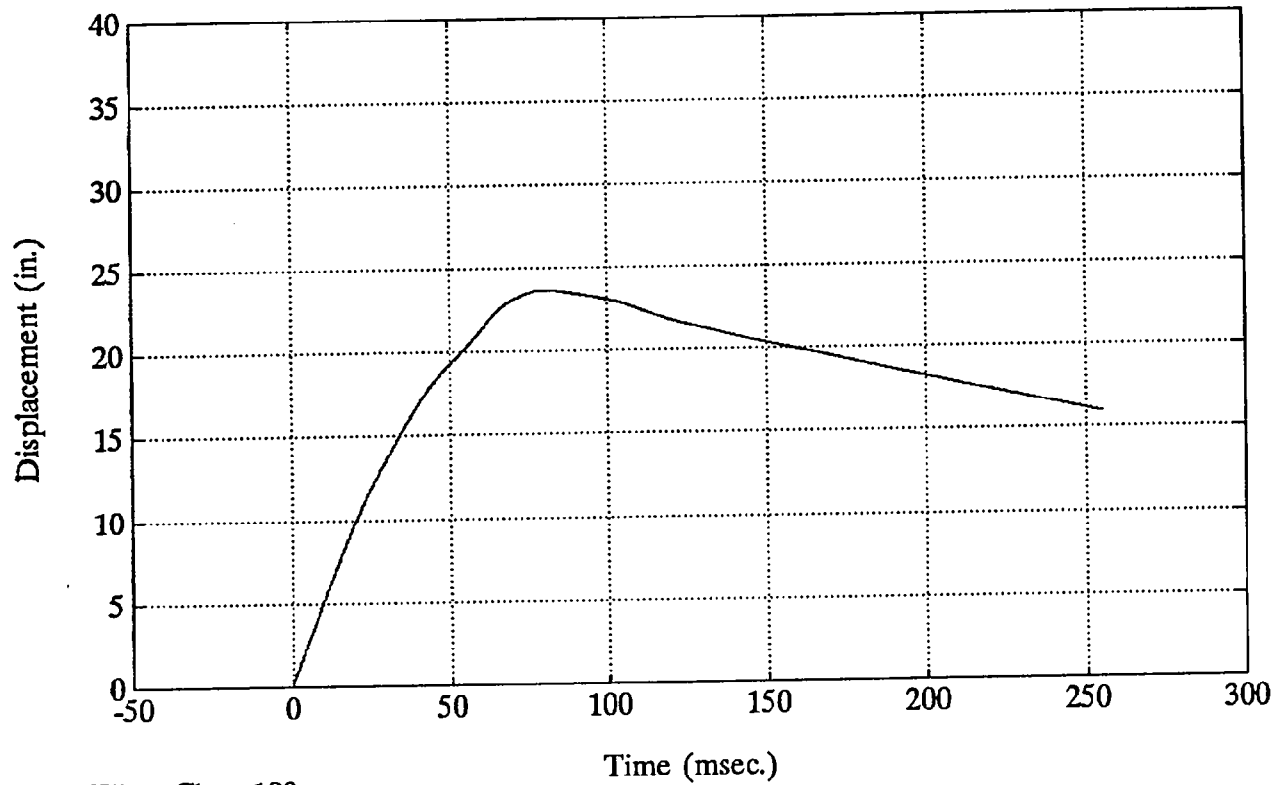


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Instrument Panel X (#7)

Max = 23.63 in. @ 80.88 msec  
Min = 0.00 in. @ -0.00 msec



SAE Filter Class 180

TEST NO. CP0102

| DUMMY DATA          | SAE FILTER CHANNEL CLASS |
|---------------------|--------------------------|
| Head Accelerations  | 1000                     |
| Chest Accelerations | 180                      |
| Femur Forces        | 600                      |

FACILITY: TRACK

TEST DATE: 05 Nov 1992

RUN #: 1233

TEST TIME: 13:28:55

SERIES #: 6

BOARD: a

TITLE: NHTSA "208" TEST #6 - 1993 BUICK REGAL

| CHANNEL<br>NUMBER | DESCRIPTION            | ENGR<br>UNIT | MAXIMUM |       | MINIMUM |       |
|-------------------|------------------------|--------------|---------|-------|---------|-------|
|                   |                        |              | AMP     | msec  | AMP     | msec  |
| 1                 | Pos. 1 Head X          | Gs           | 7.2     | 194.8 | -46.5   | 69.4  |
| 2                 | Pos. 1 Head Y          | Gs           | 3.1     | 138.2 | -13.0   | 101.9 |
| 3                 | Pos. 1 Head Z          | Gs           | 48.9    | 82.3  | -2.7    | 254.9 |
| 4                 | Pos. 1 Left Femur      | lbs          | 105.8   | 121.2 | -977.5  | 78.2  |
| 5                 | Pos. 1 Chest X         | Gs           | 2.6     | 208.6 | -47.9   | 78.2  |
| 6                 | Pos. 1 Chest Y         | Gs           | 4.8     | 72.6  | -2.5    | 89.9  |
| 7                 | Pos. 1 Chest Z         | Gs           | 9.7     | 83.2  | -6.1    | 71.4  |
| 8                 | Pos. 1 Right Femur     | lbs          | 83.4    | 97.0  | -695.9  | 66.4  |
| 9                 | Pos. 2 Head X          | Gs           | 3.9     | 194.6 | -32.8   | 101.5 |
| 10                | Pos. 2 Head Y          | Gs           | 7.3     | 100.6 | -3.8    | 86.0  |
| 11                | Pos. 2 Head Z          | Gs           | 60.1    | 95.3  | -1.2    | 30.5  |
| 12                | Pos. 2 Left Femur      | lbs          | 75.4    | 126.1 | -583.1  | 57.4  |
| 13                | Pos. 2 Chest X         | Gs           | 4.6     | 254.2 | -40.9   | 68.9  |
| 14                | Pos. 2 Chest Y         | Gs           | 5.8     | 77.5  | -6.7    | 105.4 |
| 15                | Pos. 2 Chest Z         | Gs           | 10.1    | 114.6 | -4.2    | 50.4  |
| 16                | Pos. 2 Right Femur     | lbs          | 128.8   | 118.0 | -730.6  | 59.5  |
| 17                | Pos. 1 Head Resultant  | Gs           | 62.4    | 84.1  | .0      | 8.3   |
| 18                | Pos. 1 Chest Resultant | Gs           | 48.0    | 78.2  | .0      | -34.2 |
| 19                | Pos. 2 Head Resultant  | Gs           | 64.1    | 95.2  | .1      | -10.4 |
| 20                | Pos. 2 Chest Resultant | Gs           | 40.9    | 68.9  | .0      | -22.8 |

HIC SUMMARY: Pos. 1 Head Resultant

hic: 539.15

t1 = 68.520 msec

t2 = 103.920 msec

Average G's Over Hic Duration = 47.11

HIC SUMMARY: Pos. 2 Head Resultant

hic: 596.92

t1 = 69.840 msec

t2 = 105.720 msec

Average G's Over Hic Duration = 48.80

CLIP SUMMARY: Pos. 1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 46.632 G's

Tstart = 77.1600 ms

Tend = 80.2800 ms

CSI = 313.311

CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 39.901 G's

Tstart = 67.4400 ms

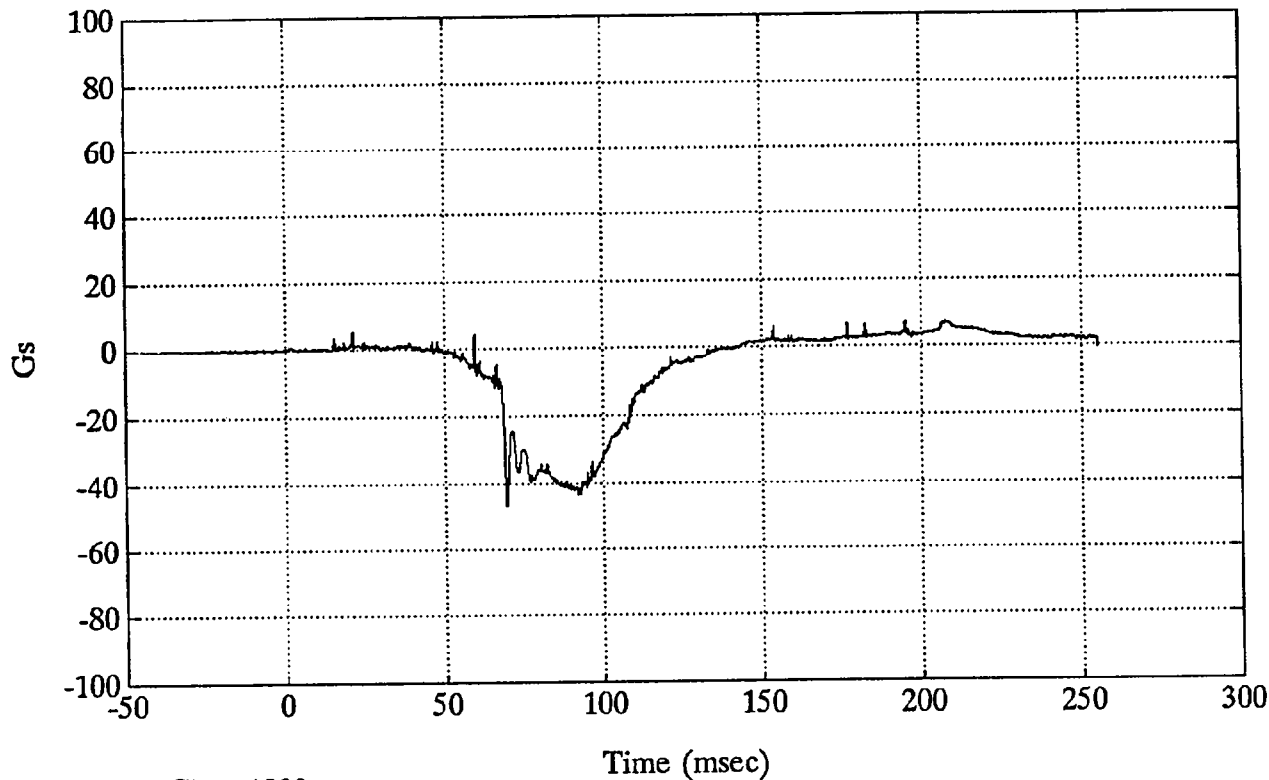
Tend = 70.5600 ms

CSI = 305.217

FMVSS 208 - 1993 BUICK REGAL

Pos. 1 Head X

Max = 7.22 Gs @ 194.76 msec  
Min = -46.52 Gs @ 69.36 msec

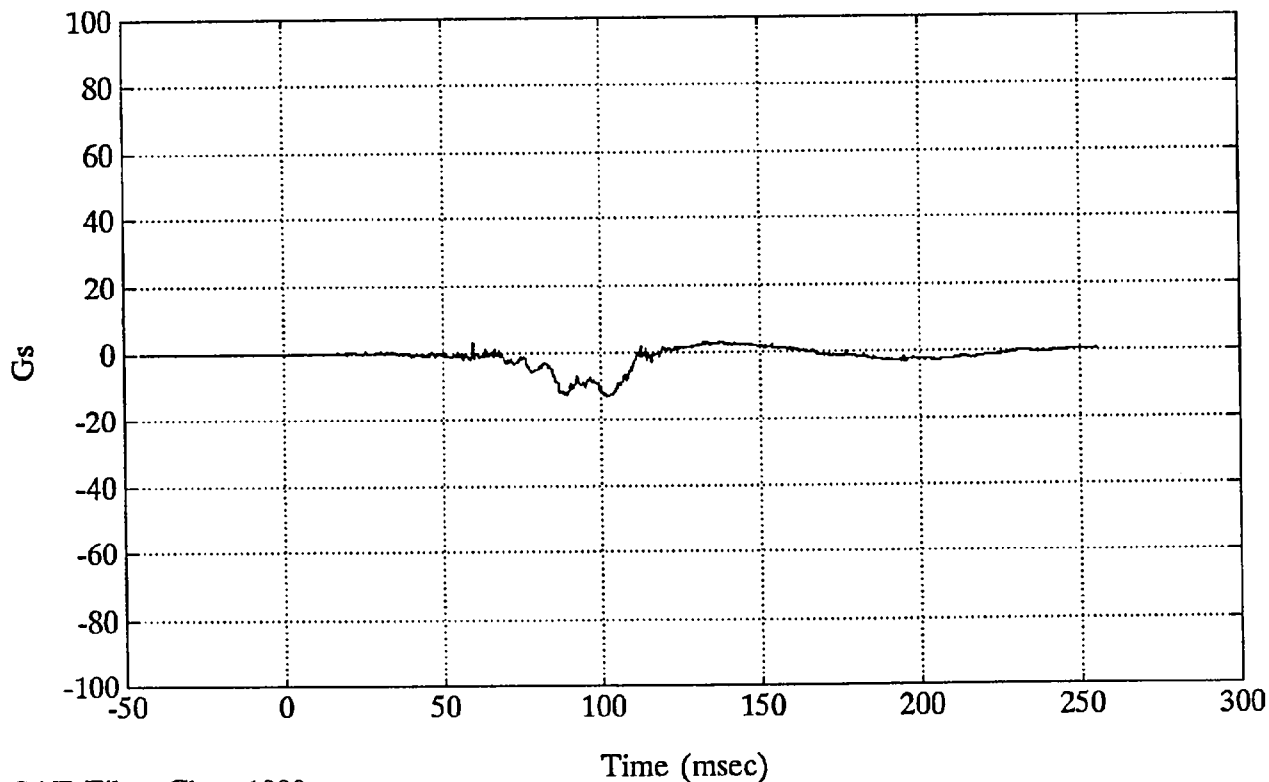


SAE Filter Class 1000

FMVSS 208 - 1993 BUICK REGAL

Pos. 1 Head Y

Max = 3.12 Gs @ 138.24 msec  
Min = -12.99 Gs @ 101.88 msec

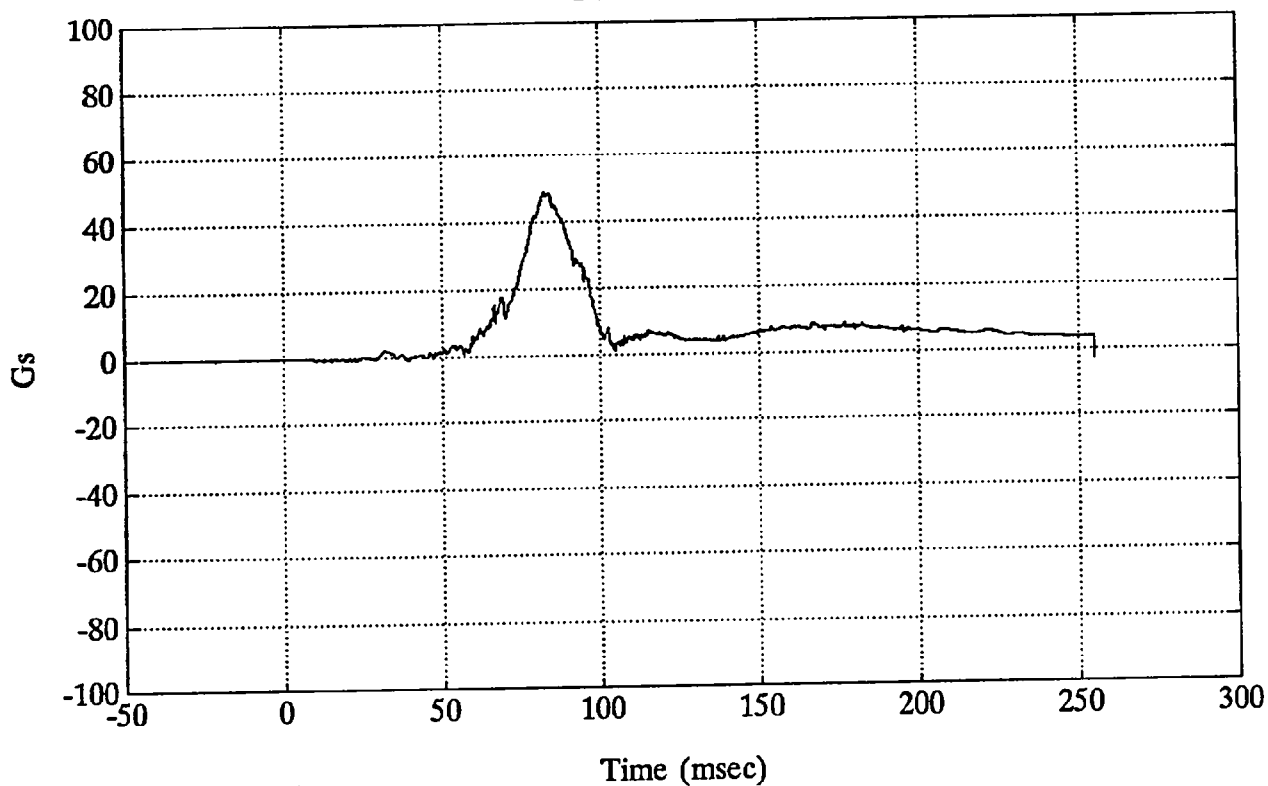


SAE Filter Class 1000

FMVSS 208 - 1993 BUICK REGAL

Pos. 1 Head Z

Max = 48.93 Gs @ 82.32 msec  
Min = -2.72 Gs @ 254.88 msec

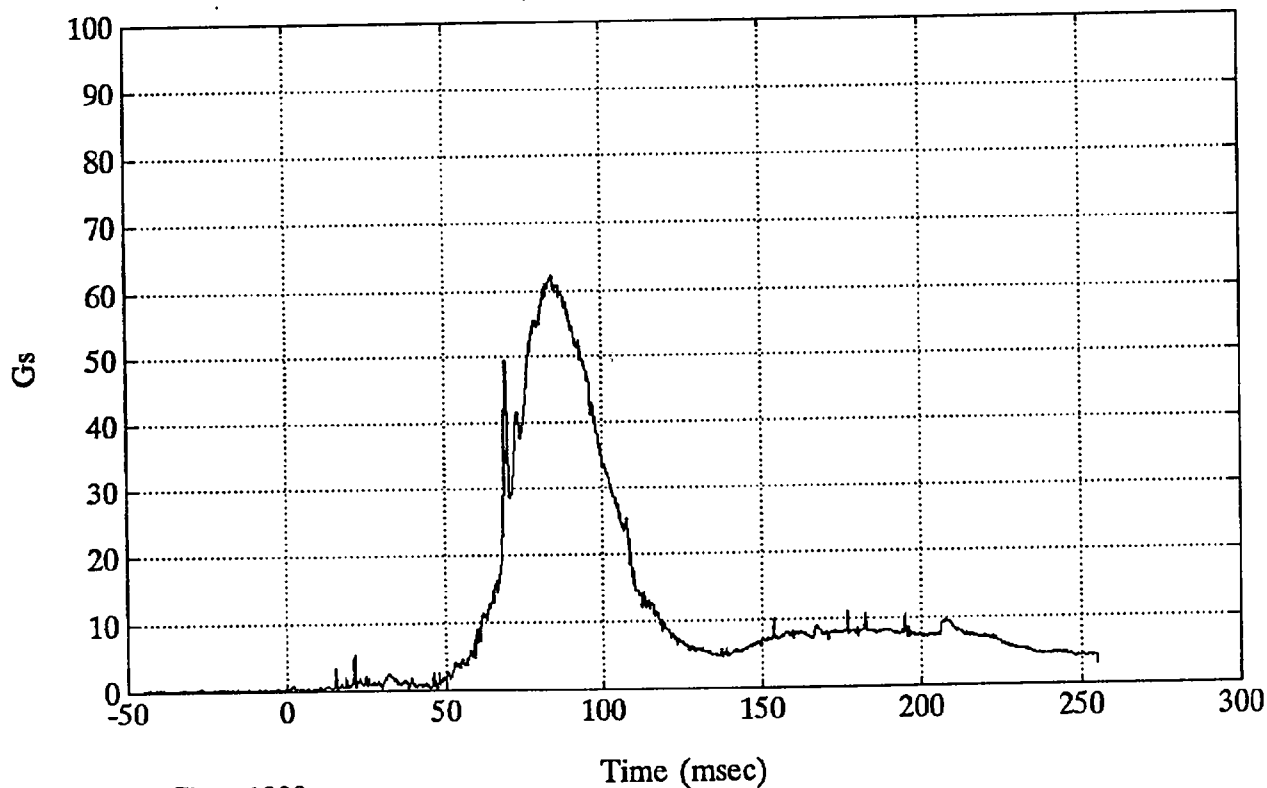


SAE Filter Class 1000

FMVSS 208 - 1993 BUICK REGAL

Pos. 1 Head Resultant

Max = 62.40 Gs @ 84.12 msec  
Min = 0.04 Gs @ 8.28 msec

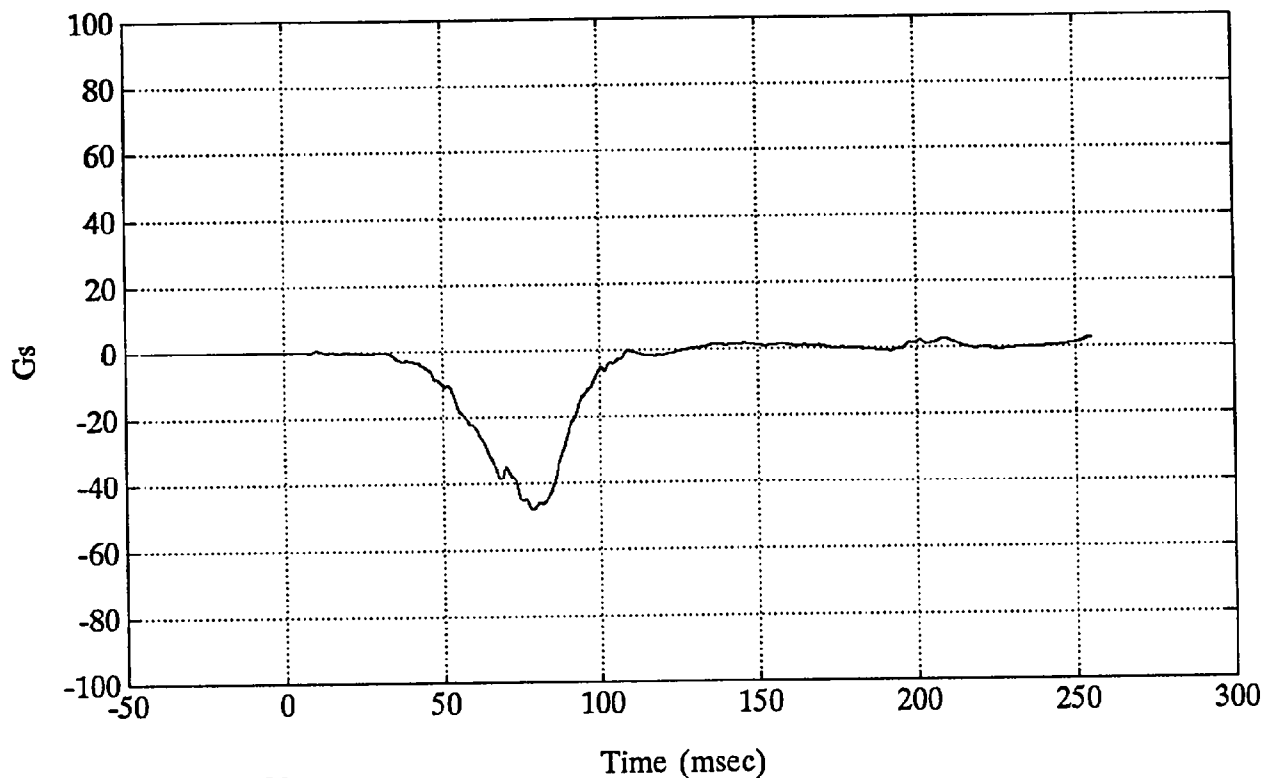


SAE Filter Class 1000

FMVSS 208 - 1993 BUICK REGAL

Pos. 1 Chest X

Max = 2.64 Gs @ 208.56 msec  
Min = -47.90 Gs @ 78.24 msec

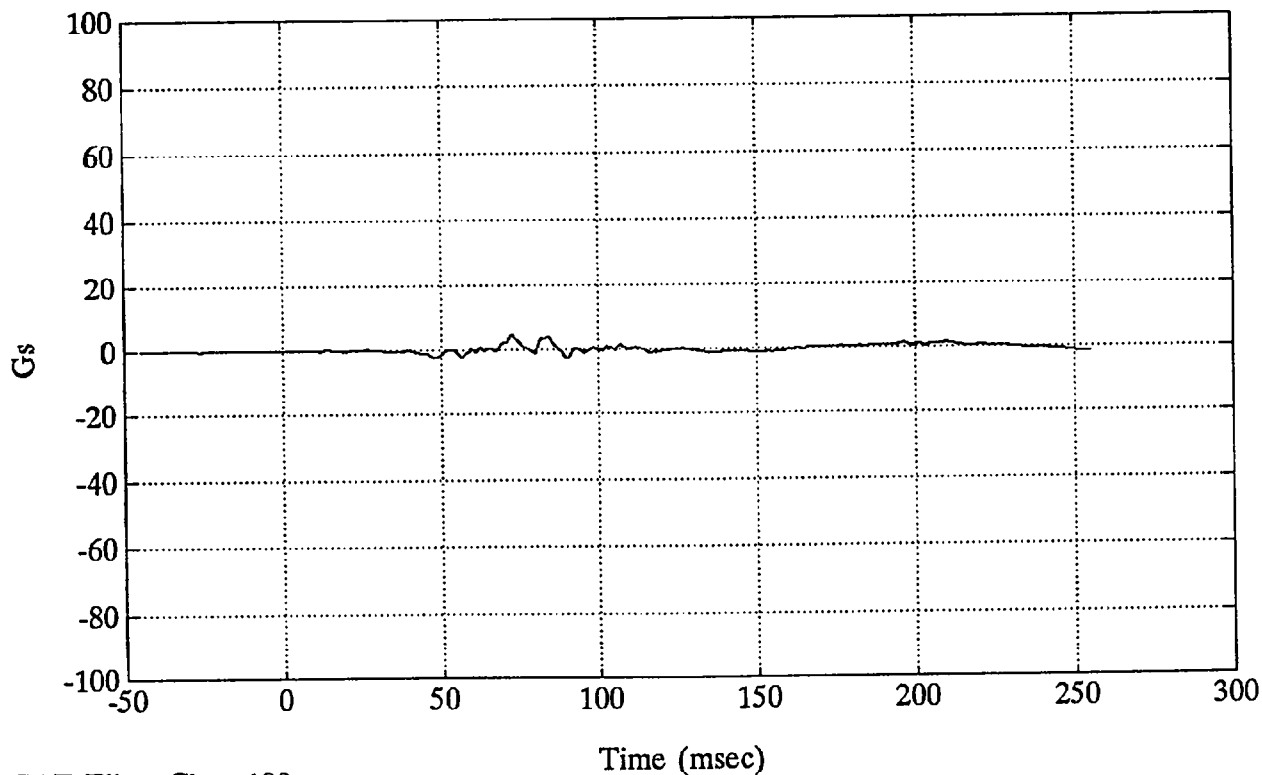


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Pos. 1 Chest Y

Max = 4.78 Gs @ 72.60 msec  
Min = -2.54 Gs @ 89.88 msec

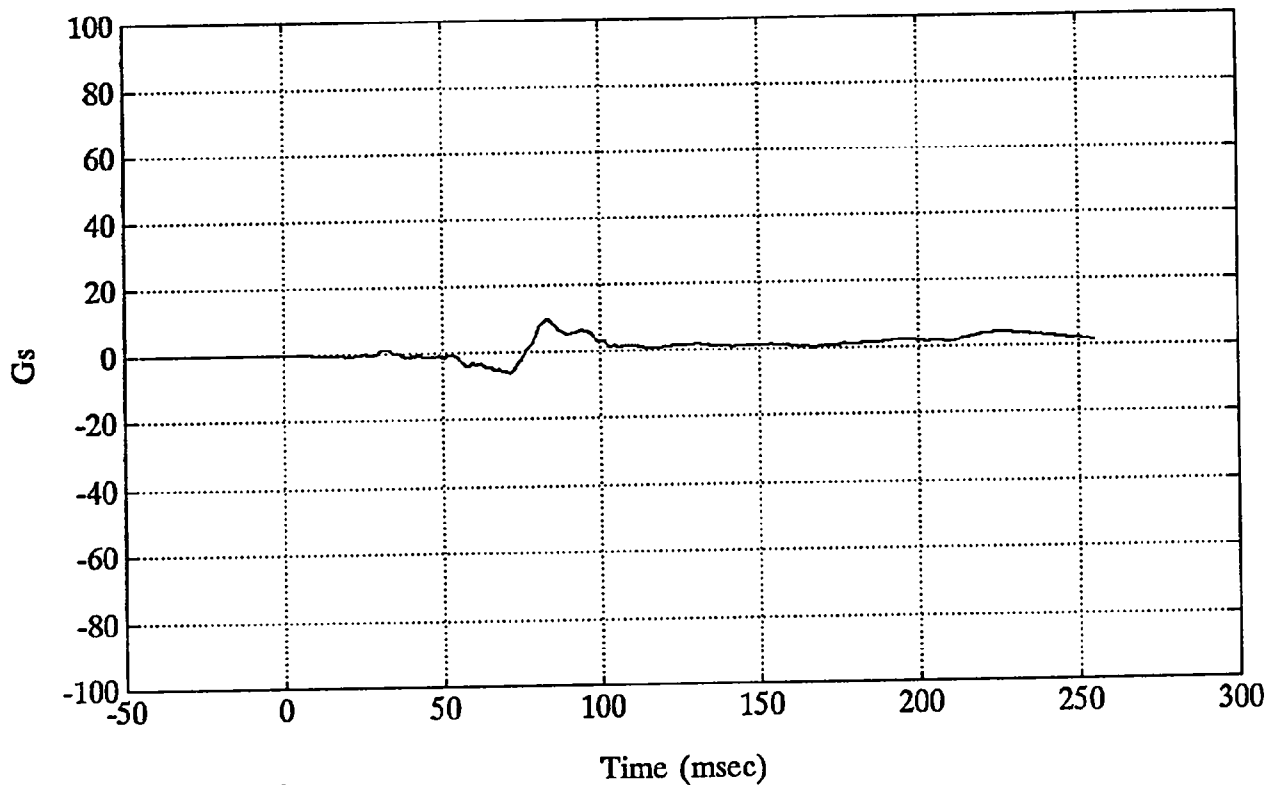


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Pos. 1 Chest Z

Max = 9.75 Gs @ 83.16 msec  
Min = -6.14 Gs @ 71.40 msec

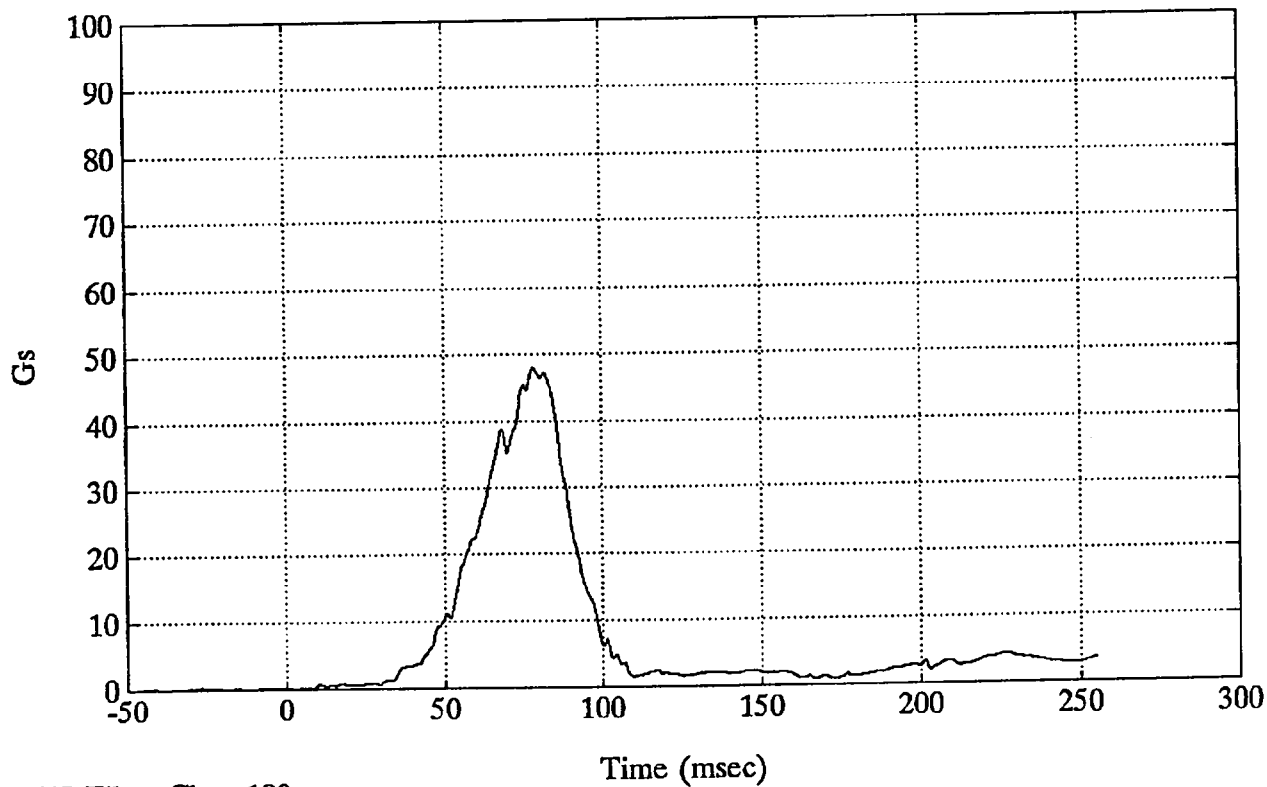


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Pos. 1 Chest Resultant

Max = 47.96 Gs @ 78.24 msec  
Min = 0.01 Gs @ -34.20 msec

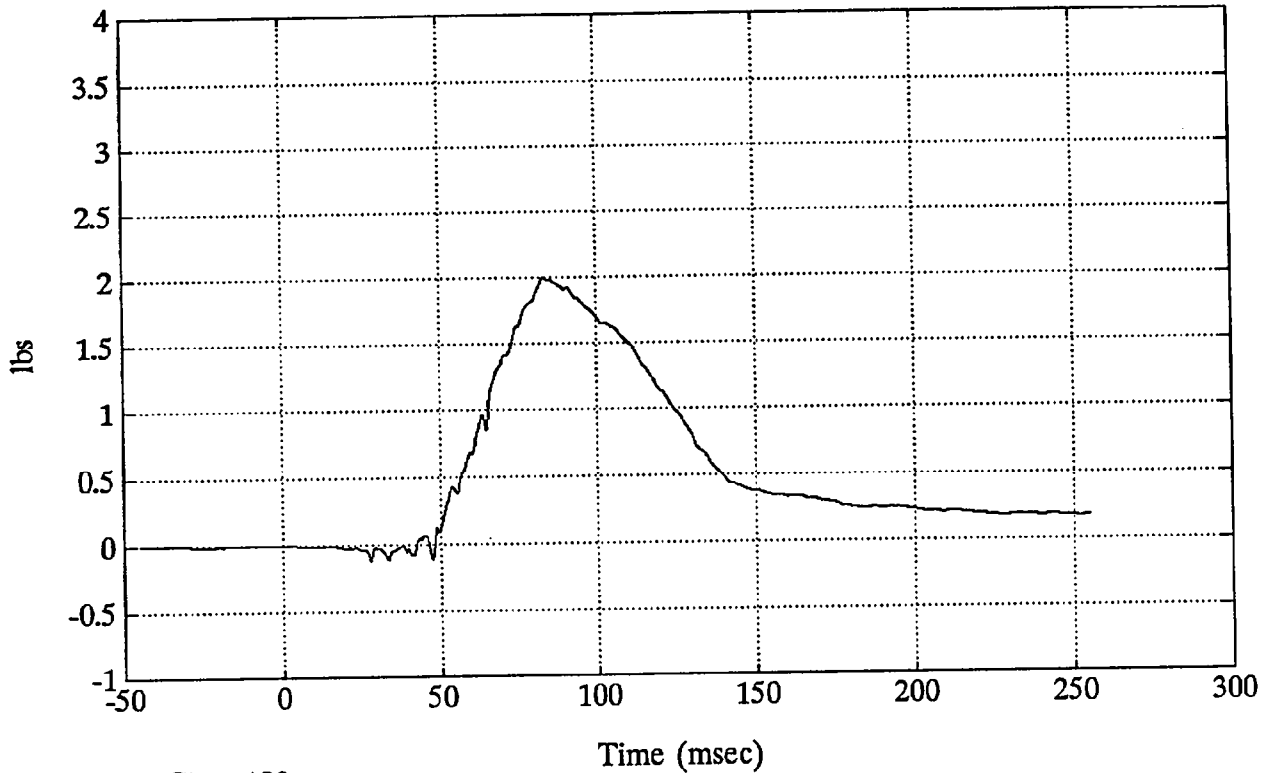


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Pos. 1 Chest Disp.

Max = 2.00 ins. @ 83.28 msec  
Min = -0.12 ins. @ 27.84 msec

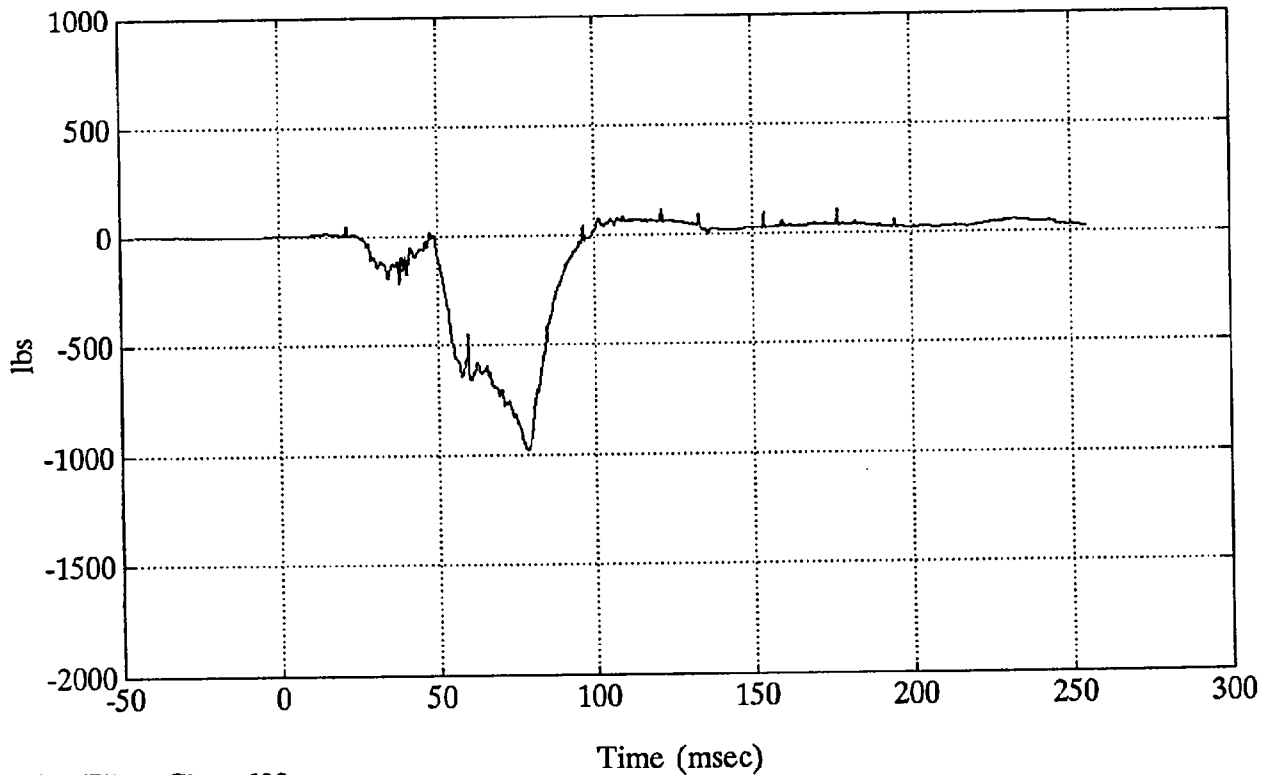


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Pos. 1 Left Femur

Max = 105.80 lbs @ 121.20 msec  
Min = -977.49 lbs @ 78.24 msec

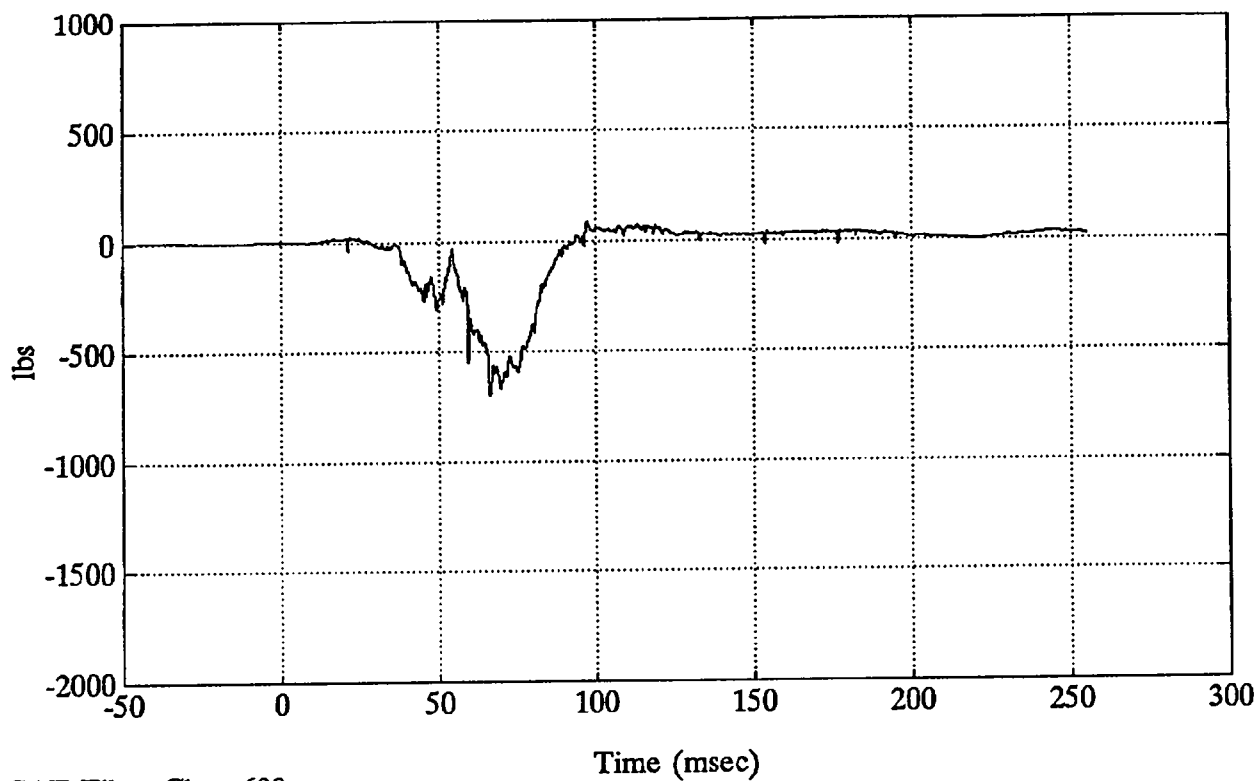


SAE Filter Class 600

FMVSS 208 - 1993 BUICK REGAL

Pos. 1 Right Femur

Max = 83.44 lbs @ 96.96 msec  
Min = -695.88 lbs @ 66.36 msec

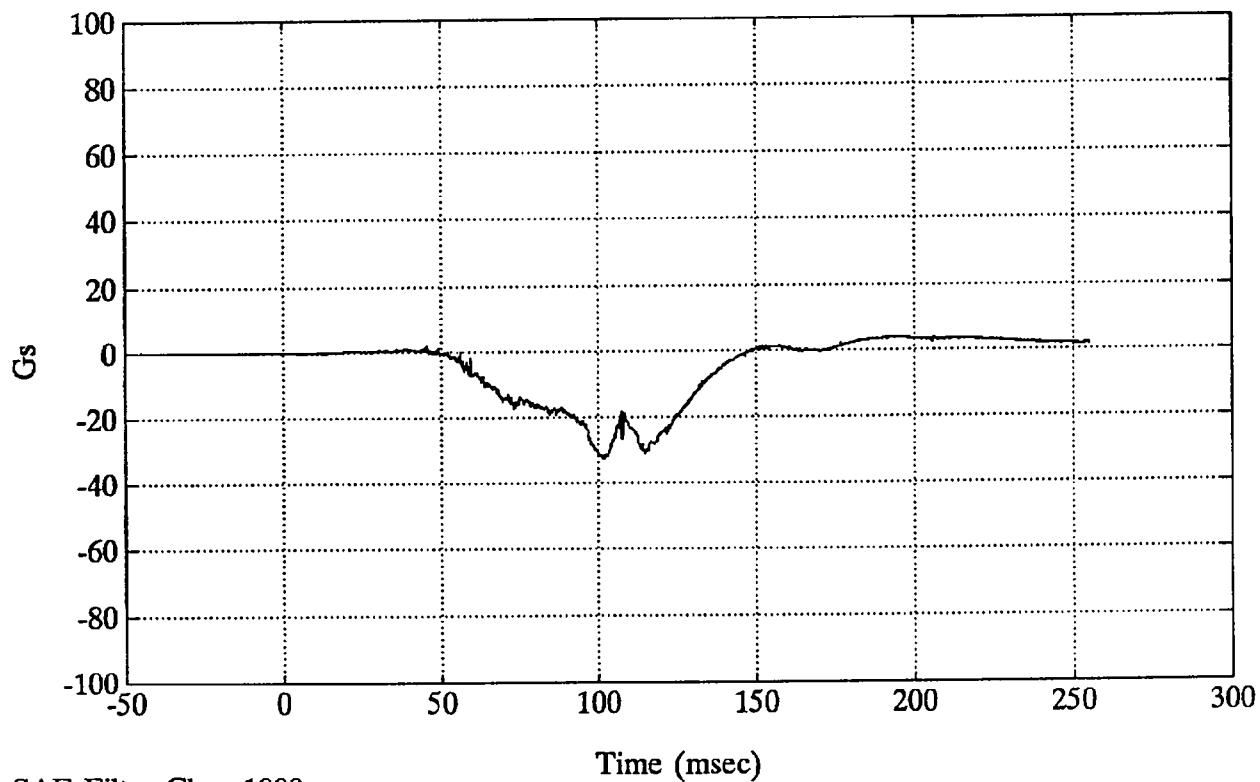


SAE Filter Class 600

FMVSS 208 - 1993 BUICK REGAL

Pos. 2 Head X

Max = 3.89 Gs @ 194.64 msec  
Min = -32.81 Gs @ 101.52 msec

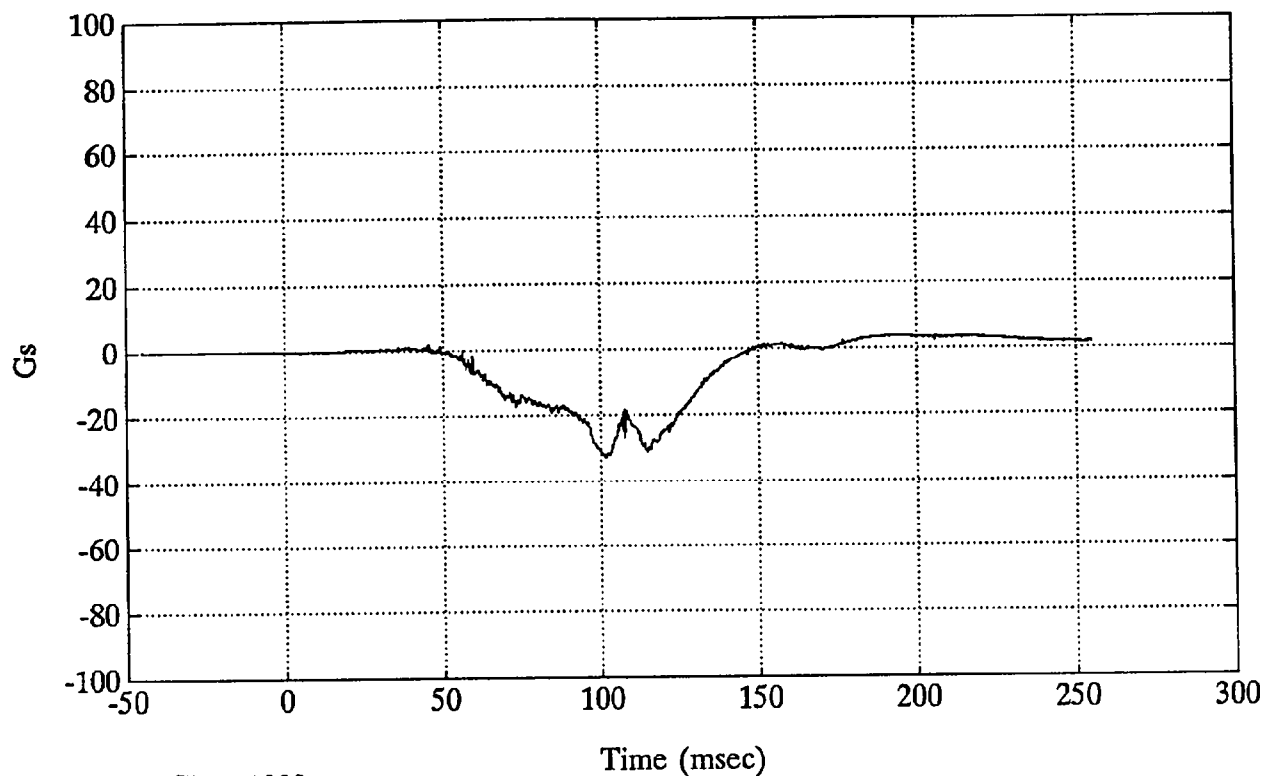


SAE Filter Class 1000

FMVSS 208 - 1993 BUICK REGAL

Pos. 2 Head Y

Max = 3.89 Gs @ 194.64 msec  
Min = -32.81 Gs @ 101.52 msec

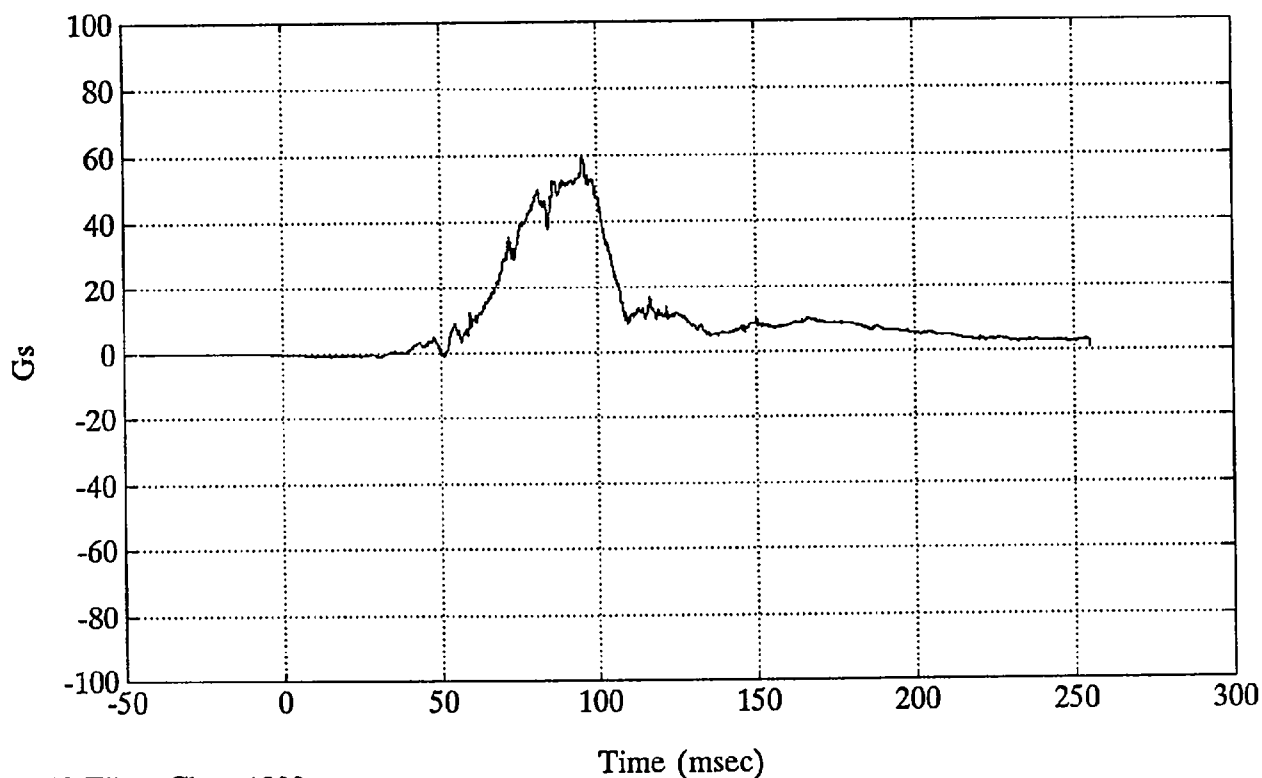


SAE Filter Class 1000

FMVSS 208 - 1993 BUICK REGAL

Pos. 2 Head Z

Max = 60.11 Gs @ 95.28 msec  
Min = -1.23 Gs @ 30.48 msec

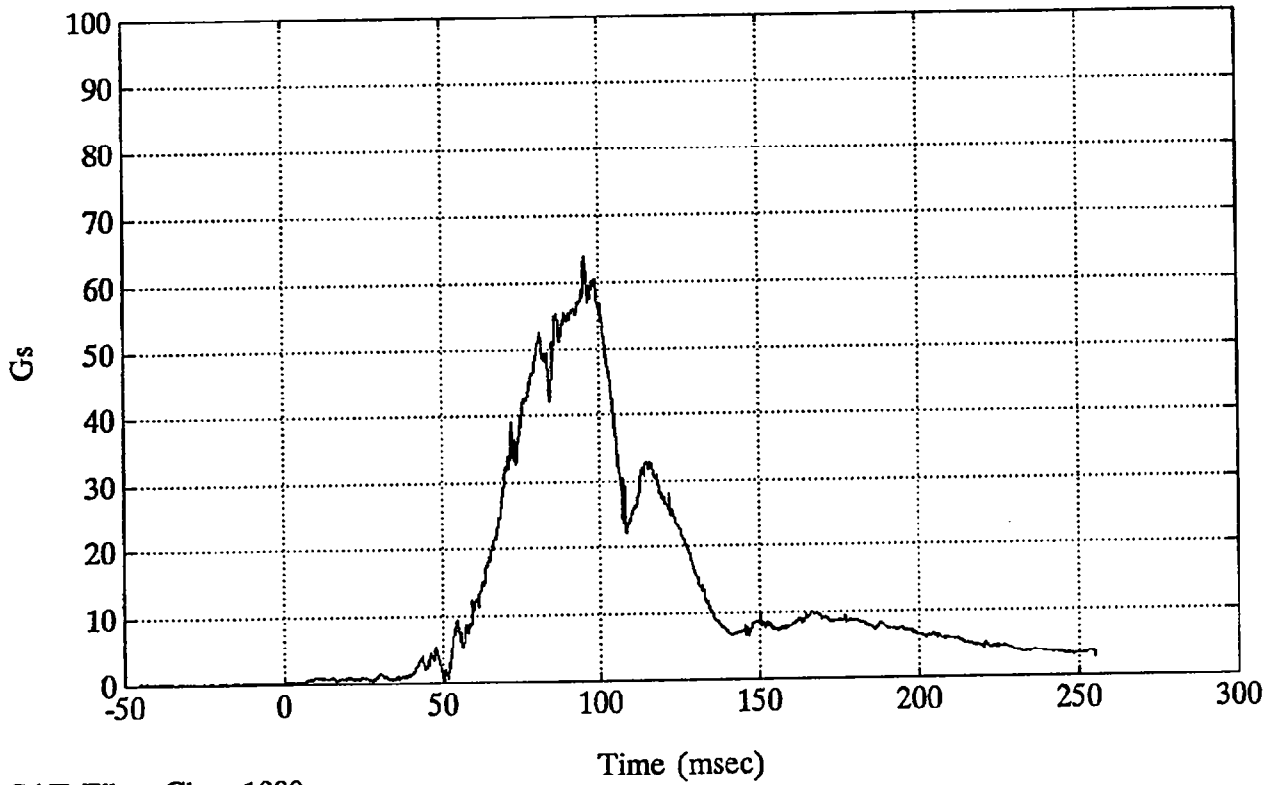


SAE Filter Class 1000

FMVSS 208 - 1993 BUICK REGAL

Pos. 2 Head Resultant

Max = 64.09 Gs @ 95.16 msec  
Min = 0.05 Gs @ -10.44 msec

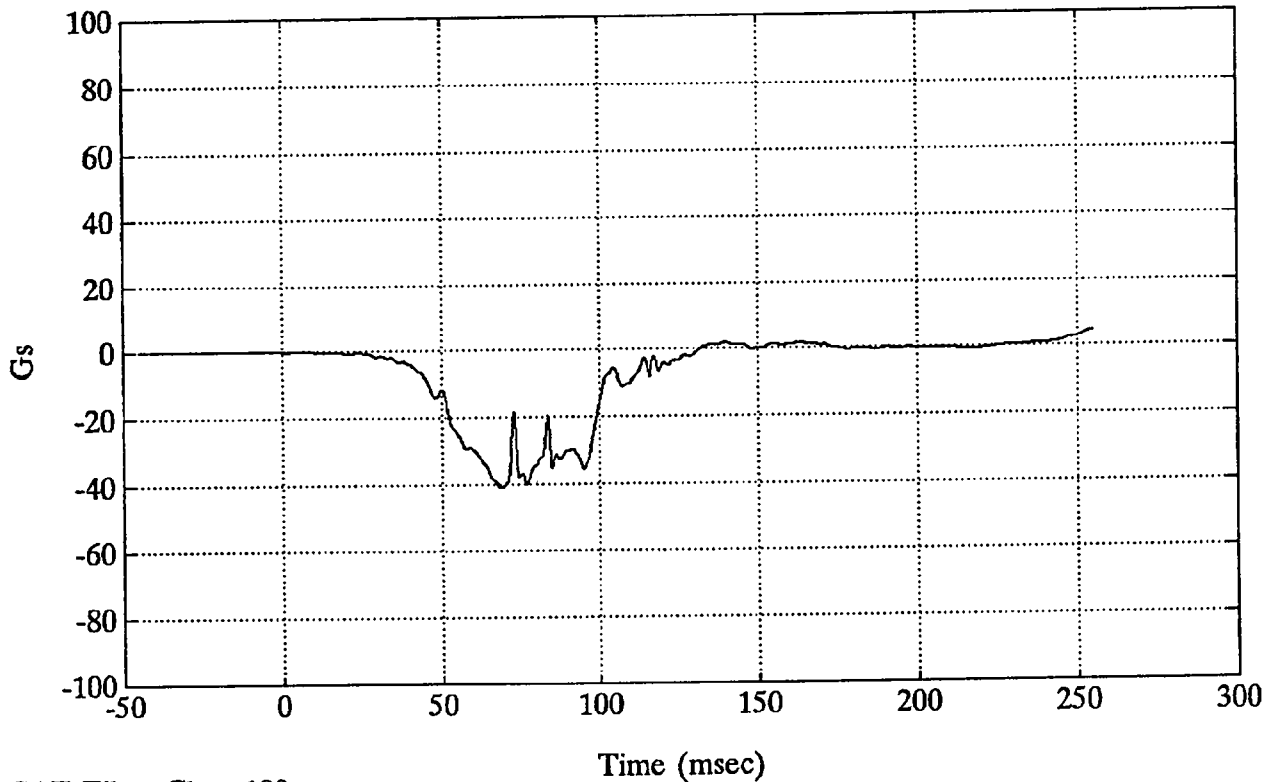


SAE Filter Class 1000

FMVSS 208 - 1993 BUICK REGAL

Pos. 2 Chest X

Max = 4.60 Gs @ 254.16 msec  
Min = -40.85 Gs @ 68.88 msec

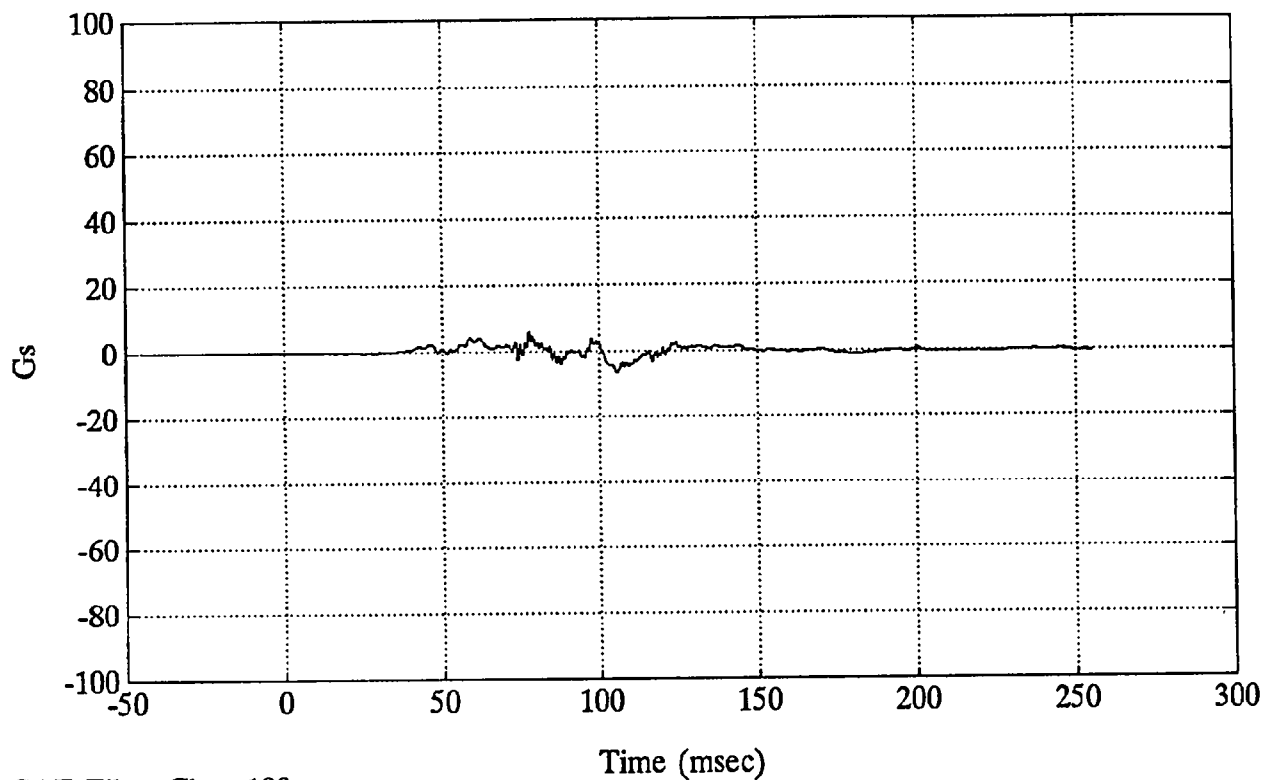


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Pos. 2 Chest Y

Max = 5.76 Gs @ 77.52 msec  
Min = -6.68 Gs @ 105.36 msec

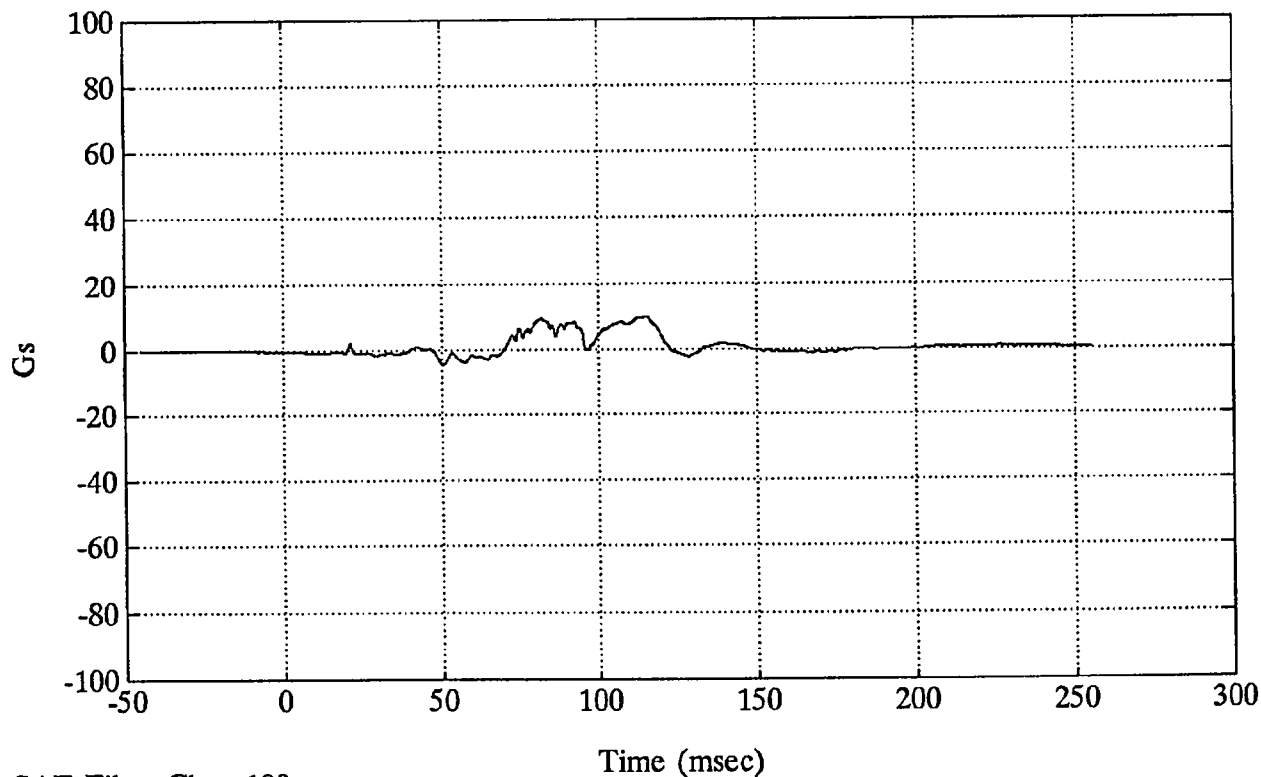


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Pos. 2 Chest Z

Max = 10.12 Gs @ 114.72 msec  
Min = -4.22 Gs @ 50.40 msec

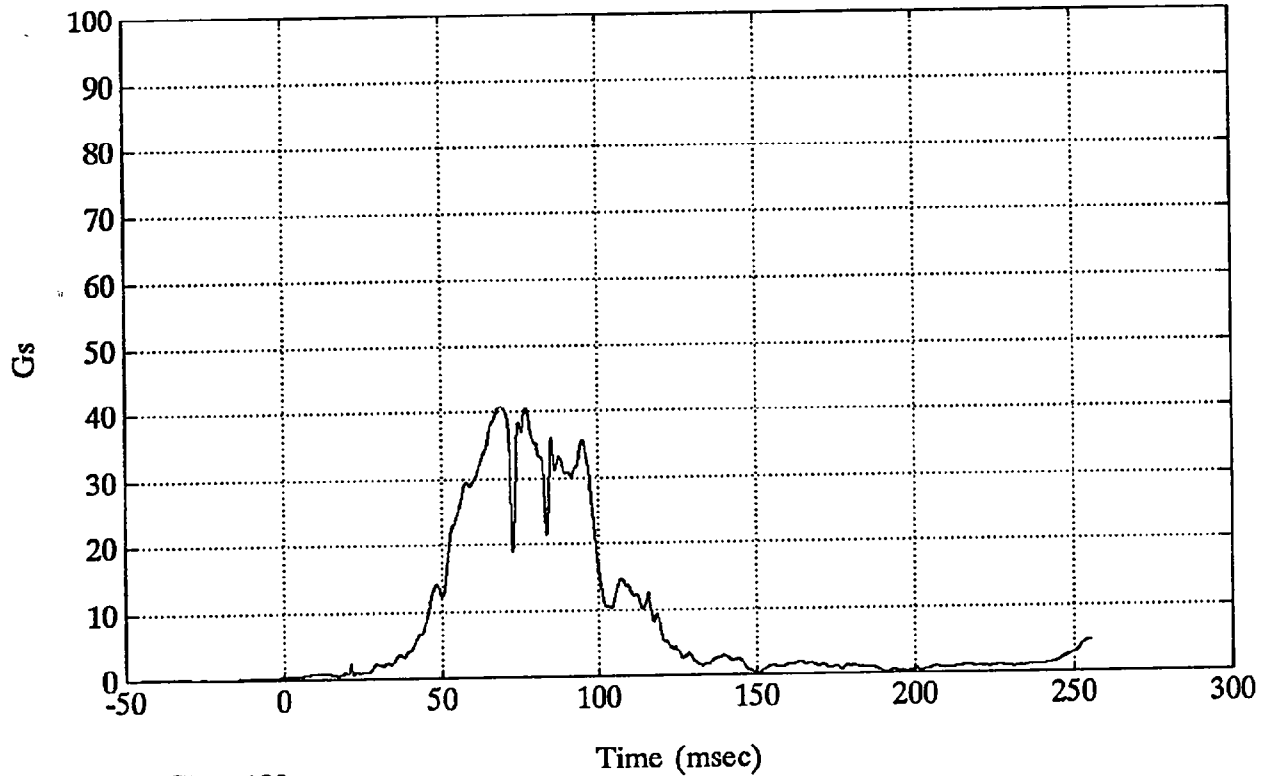


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Pos. 2 Chest Resultant

Max = 40.89 Gs @ 68.88 msec  
Min = 0.03 Gs @ -22.80 msec

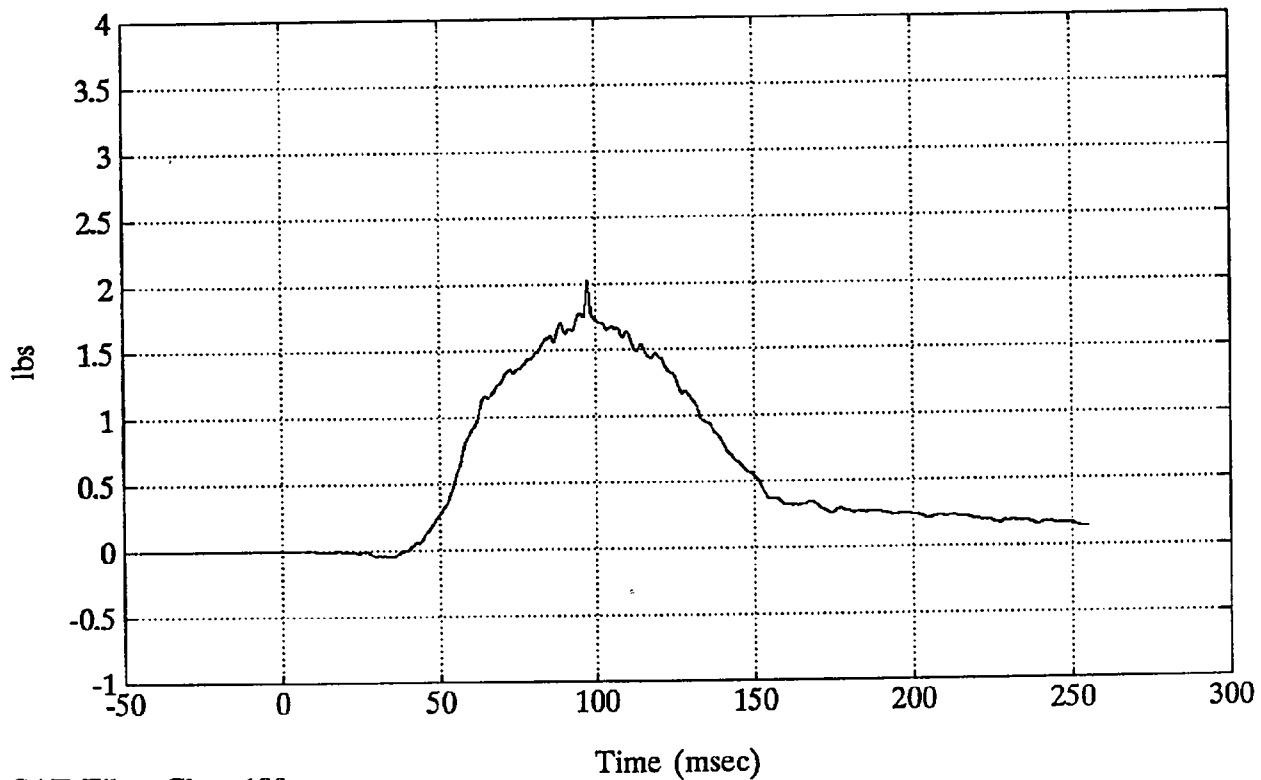


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Pos. 2 Chest Disp.

Max = 2.03 ins. @ 97.32 msec  
Min = -0.05 ins. @ 35.28 msec

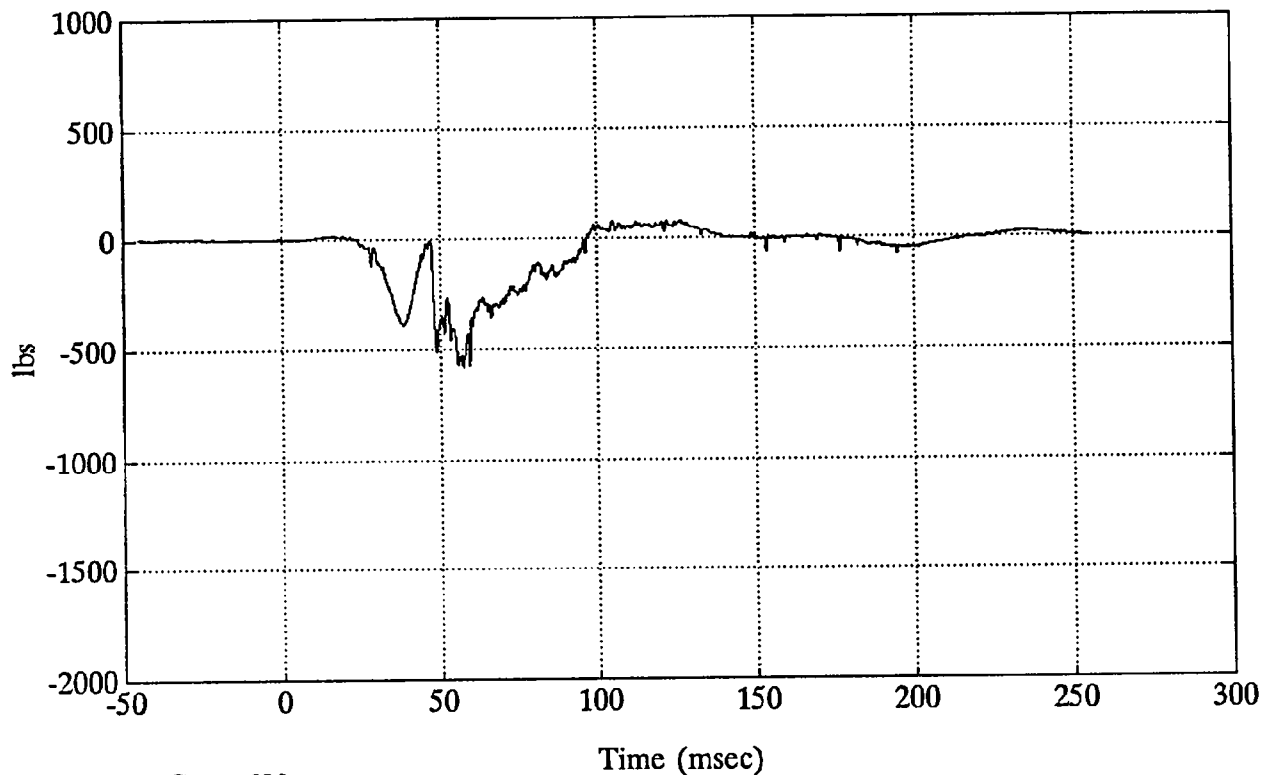


SAE Filter Class 180

FMVSS 208 - 1993 BUICK REGAL

Pos. 2 Left Femur

Max = 75.35 lbs @ 126.12 msec  
Min = -583.06 lbs @ 57.36 msec

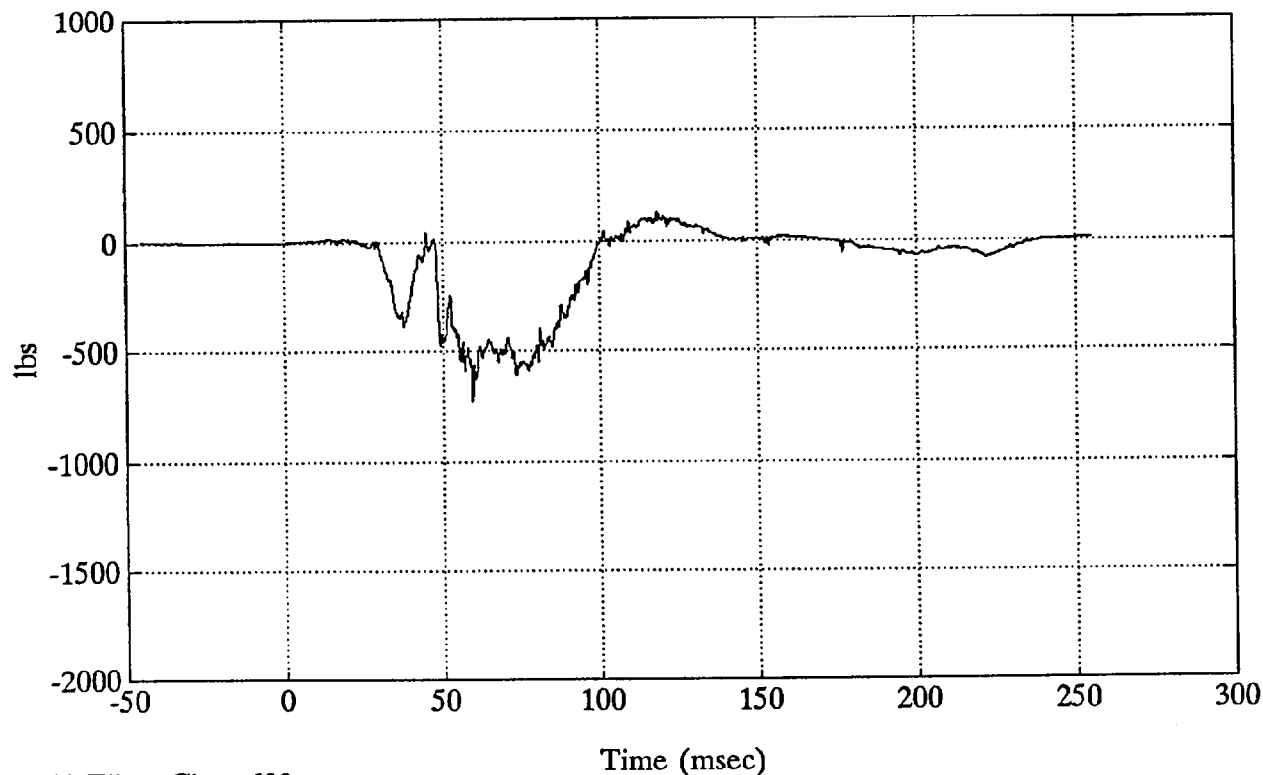


SAE Filter Class 600

FMVSS 208 - 1993 BUICK REGAL

Pos. 2 Right Femur

Max = 128.81 lbs @ 117.96 msec  
Min = -730.56 lbs @ 59.52 msec



SAE Filter Class 600

Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

## Safety Belts: They're For Everyone

This part of the manual tells you how to use safety belts properly. It also tells you some things you should not do with safety belts.



### CAUTION:

Don't let anyone ride where they can't wear a safety belt properly. If you are in a crash and you're not wearing a safety belt, your injuries can be **much** worse. You can hit things inside the vehicle or be ejected from it. You can be seriously injured or killed. In the same crash, you might not be if you are buckled up. Always fasten your safety belt, and check that your passengers' belts are fastened properly too.



This figure lights up when you turn the key to "Run" or "Start" when your safety belt isn't buckled, and you'll hear a tone, too. It's the reminder to buckle up.

In many states and Canadian provinces, the law says to wear safety belts. Here's why: They work.

You never know if you'll be in a crash. If you do have a crash, you don't know if it will be a bad one.

A few crashes are very mild. In them, you won't get hurt even if you're not buckled up. And some crashes can be so serious, like being hit by a train, that even buckled up a person wouldn't survive. But most crashes are in between. In many of them, people who buckle up can survive and sometimes walk away. Without belts they could be badly hurt or killed.

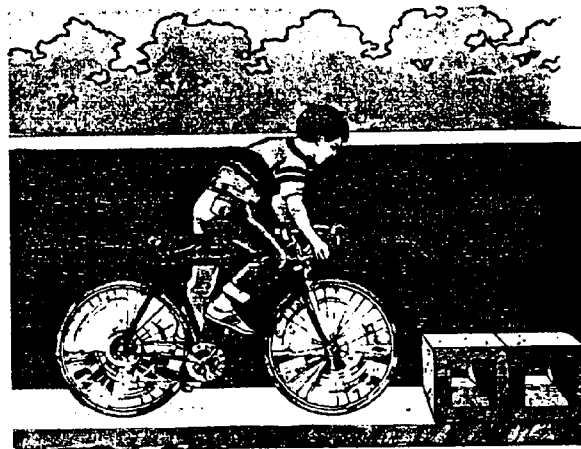
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After 25 years of safety belts in vehicles, the facts are clear. In most crashes buckling up does matter ... a lot!



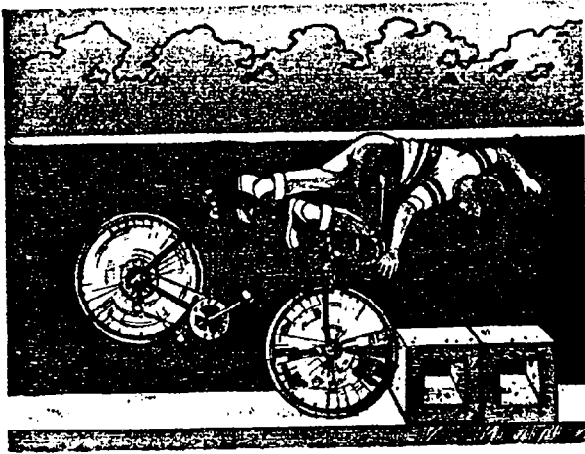
## Why Safety Belts Work

When you ride in or on anything, you go as fast as it goes.

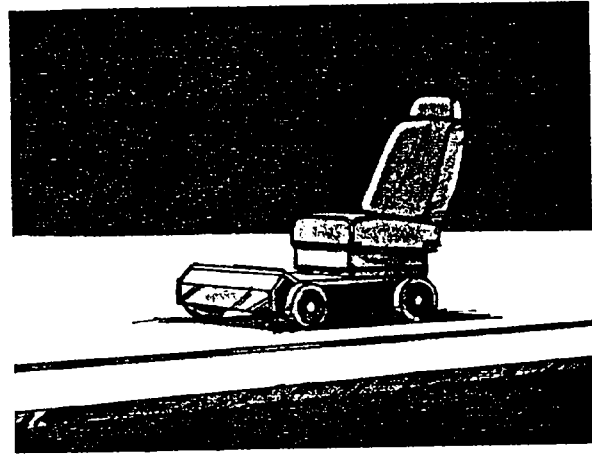


For example, if the bike is going 10 mph (16 km/h), so is the child.

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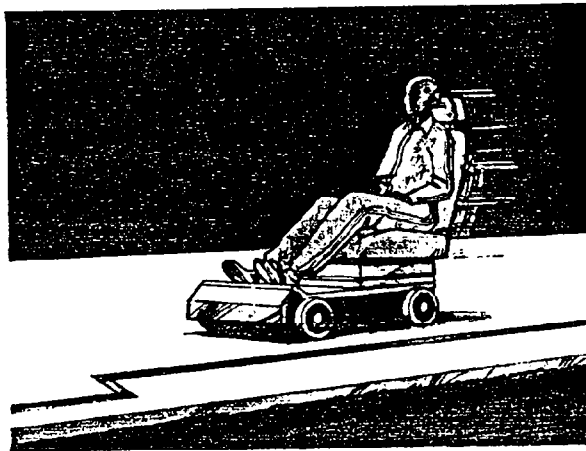


When the bike hits the block, it stops. But the child keeps going!

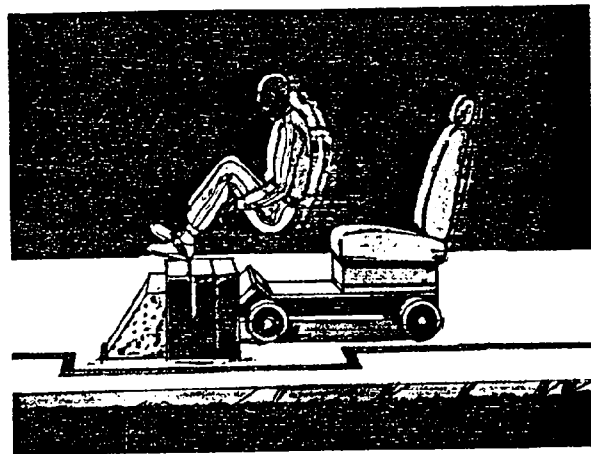


Take the simplest "vehicle." Suppose it's just a seat on wheels.

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Put someone on it.

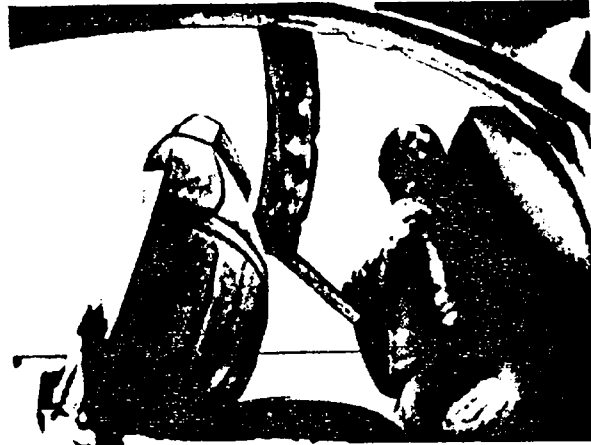


Get it up to speed. Then stop the "car." The rider doesn't stop.

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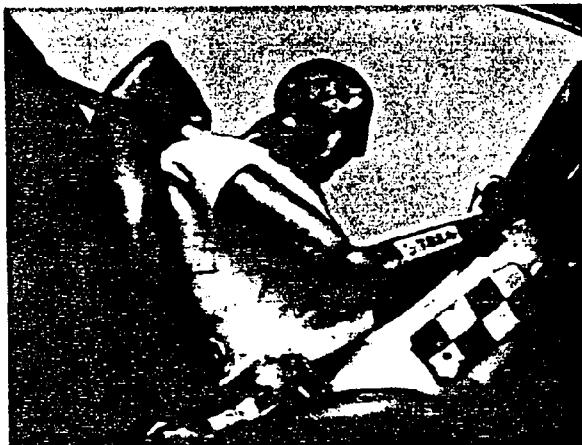


The person keeps going until stopped by something.  
In a real vehicle, it could be the windshield ...



or the instrument panel ...

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or the safety belts!

With safety belts, you slow down as the vehicle does. You get more time to stop. You stop over more distance, and your strongest bones take the forces. That's why safety belts make such good sense.

## Here Are Questions Many People Ask About Safety Belts -- and the Answers

**Q:** Won't I be trapped in the vehicle after an accident if I'm wearing a safety belt?

**A:** You could be -- whether you're wearing a safety belt or not. But you can easily unbuckle a safety belt, even if you're upside down. And your chance of being conscious during and after an accident, so you can unbuckle and get out, is much greater if you are belted.

**Q:** Why don't they just put in air bags so people won't have to wear safety belts?

**A:** "Air bags," or Supplemental Inflatable Restraint systems, are in some vehicles today and will be in more of them in the future. But they are supplemental systems only -- so they work with safety belts, not instead of them. Every "air bag" system ever offered for sale has required the use of safety belts. Even if you're in a vehicle that has "air bags," you still have to buckle up to get the

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collisions, but especially in side and other collisions.

**Q:** If I'm a good driver, and I never drive far from home, why should I wear safety belts?

**A:** You may be an excellent driver, but if you're in an accident -- even one that isn't your fault -- you and your passengers can be hurt. Being a good driver doesn't protect you from things beyond your control, such as bad drivers.

Most accidents occur within 25 miles (40 km) of home. And the greatest number of serious injuries and deaths occur at speeds of less than 40 mph (65 km/h).

Safety belts are for everyone.



When the key is turned to "Run" or "Start," a tone will come on for about eight seconds to remind people to fasten their safety belts, unless the driver's safety belt is buckled. The safety belt light will also come on and stay on until the driver's belt is buckled.



### CAUTION:

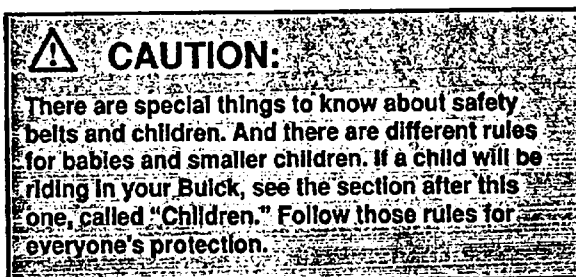
If your safety belt light ever comes on or stays on after the front doors are closed and the driver's belt is buckled, have your vehicle fixed. If you don't, you might not have the protection you'd need in a crash.

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## How To Wear Safety Belts Properly

### Adults

This section is only for people of adult size.



First, you'll want to know which restraint systems your vehicle has.

We'll start with the driver position.

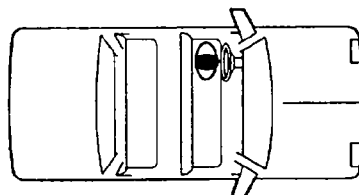
## Cars First Sold In Canada

Was your Buick first sold, when new, in Canada? (If it was, a sticker on the driver's door will say "conforms to all applicable Canada motor vehicle..." etc.) If so, then the rest of Part 1 does not apply to your vehicle.

To learn how to use your safety belts, please read the Owner's Manual Safety Belt Supplement. It comes with every new Buick first sold in Canada.

## Driver Position

This section describes the driver's restraint system.



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## Automatic Lap-Shoulder Belt

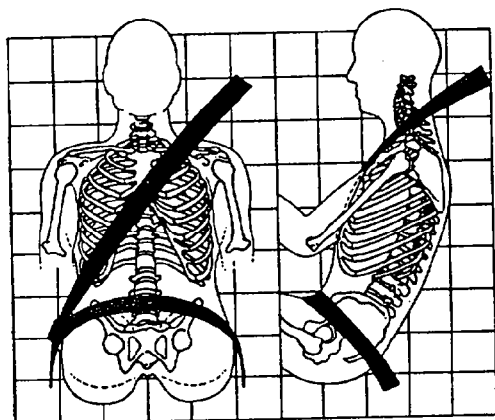


This safety belt is called "automatic" because you don't have to buckle up when you get into your vehicle.



And you don't have to unbuckle when you get out.

Just get into your vehicle. Then close and lock the door. Adjust the seat (to see how, see "Seats" in the Index) so you can sit up straight.



The lap belt should be worn as low on the hips as possible. In a crash, this applies force to the strong

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pelvic bones. And you'd be less likely to slide under the lap belt. If you slid under it, the belt would apply force at your abdomen. This could cause serious or even fatal injuries. The shoulder belt should go over the shoulder and across the chest. These parts of the body are best able to take belt restraining forces.

The safety belt locks if there's a sudden stop or a crash.

It's possible that an automatic belt could keep you from fully opening a door. That can happen if the door was slammed shut very hard. Just close the door all the way, then slowly open it. If that doesn't fix it, then your Buick needs service.

We hope you'll always keep your automatic belt buckled. However, you may need to unbuckle it in an emergency. And you would need to unbuckle it to let someone get into the center front seat position, if your

vehicle has one. To unbuckle the automatic belt, just push the button on the buckle.



To reattach the automatic belt:

1. Close and lock the door.
2. Adjust the seat (to see how, see "Seats" in the Index) so you can sit up straight.



3. Pick up the latch plate and pull the belt across you. Don't let it get twisted.
4. Push the latch plate into the buckle until it clicks.