

REPORT NUMBERS: 208-CAL-91-13
212-CAL-91-13
301-CAL-91-13

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

FORD MOTOR COMPANY
1991 FORD MUSTANG LX
2-DOOR CONVERTIBLE

NHTSA NUMBER: CM0209

CALSPAN TEST NUMBER: 7920-1

JUNE 20, 1991

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ADVANCED TECHNOLOGY CENTER
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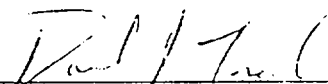


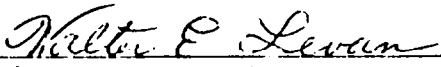
FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation
National Highway Traffic Safety Administration
ENFORCEMENT
Office of Vehicle Safety Compliance
400 Seventh Street, S.W.
Room No. 6115 (NEF-30)
Washington, DC 20590

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Contracting Office's Technical Representative
(COTR), NHTSA, Office of Vehicle Safety Compliance

Analysis of this test continued after report acceptance. See NCI 3210.

11/18/91
Date of Report Acceptance

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				6. Performing Organization Code CAL	
7. Author(s) Vincent M. Paolini, Engineer David J. Travale, Project Engineer Walter E. Levan, Program Manager				8. Performing Organization Report No. 7920-1	
9. Performing Organization Name and Address Calspan Advanced Technology Center P.O. Box 400 Buffalo, New York 14225				10. Work Unit No. J73-1-1086	
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				14. Sponsoring Agency Code DOT/NHTSA/NEF/OVSC	
15. Supplementary Notes					
16. Abstract A 30 mph vehicle safety compliance test was conducted on a 1991 Ford Mustang LX 2-door convertible. This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on June 20, 1991. The purpose of this test was to determine compliance with the performance requirements of the following Federal Motor Vehicle Safety Standards: 1. FMVSS No. 208, "Occupant Crash Protection" 2. FMVSS No. 212, "Windshield Mounting" 3. FMVSS No. 219 (partial), "Windshield Zone Intrusion" 4. FMVSS No. 301, "Fuel System Integrity" The test mode was perpendicular (0°) and the impact velocity was 29.2 mph. The ambient temperature at the impact face was 84°F. The driver dummy appeared to exceed the Head Injury criteria as specified by FMVSS 208. The subject test vehicle appears to comply with the requirements of FMVSS Nos. 212 and 219 (partial). FMVSS 301 static rollover was not performed. <u>Type of Restraint System:</u> The test vehicle was equipped with driver side airbag and passenger side manual 3-point belt. Driver side manual 3-point belt was not used for this test.					
17. Key Words 30 mph Vehicle Safety Compliance Testing FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219, "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity" Frontal Impact			18. Distribution Statement Copies of this report are available from: Technical Reference Division National Highway Traffic Safety Admin. Nassif Building, Room 5108 (NAD-52) 400 Seventh St., S.W., Washington, DC 20590		
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Section I

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 1991 Ford Mustang LX 2-Door Convertible, 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 CM0209

A frontal barrier was impacted by a 1991 Ford Mustang LX 2-door Convertible at a velocity of 29.2 mph. The test was performed at the Calspan Corporation Advanced Technology Center on June 20, 1991. 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 572B, 50th percentile male anthropomorphic test device (ATD's), were placed in the driver and 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 and left/right femur load cells. These ATDs had been certified prior to the test.

The 23 channels of data were recorded on two 14-channel FM tape recorders. Accelerometer #6(X) - Left Brake Caliper X accelerometer did not record correctly, therefore the velocity and displacement curves were not calculated for this channel.

The driver's HIC was 1440. The maximum chest deceleration over 3 milliseconds was 43.7 g's. The maximum force on the driver's left femur was 1405 pounds and 1755 pounds on the right femur.

The right front passenger's HIC was 121. The maximum chest deceleration over 3 milliseconds was 26.1 g's. The maximum force on the passenger's left femur was 483 pounds and 201 pounds on the right femur.

Table 1
CRASH TEST SUMMARY

Vehicle NHTSA No.: CM0209 Test Mode: 30 mph Frontal Barrier

Test Date: June 20, 1991 Time: 11:40 Temperature: 84°F

Vehicle Make/Model/Body Style: 1991 Ford Mustang LX 2-Door Convertible

Vehicle Test Weight: 3490 lbs.

Vehicle/Barrier Impact Angle: 0°

Impact Velocity: 29.2 mph

Maximum Static Crush: 19.5 inches

Vehicle Rebound: 14.1 inches

DUMMIES:

DRIVER

PASSENGER

Type: Part 572B Part 572B

Restraint System: Air Bag 3-Point Manual Seat Belt

Number of Data Channels: 23

Number of Cameras: 1 Real Time

14 High Speed

DOOR OPENING DATA: closed-operable - Left Front

closed-operable - Right Front

Front Seat(s) Data:

DRIVER

PASSENGER

Seat Track Failure: 0.0 0.0

inches of shift

Seat Back Failure: None None

VISIBLE DUMMY CONTACT POINTS:

DRIVER

PASSENGER

Head: Forehead and top of head with sunvisor. Face with airbag. Rear of head with headrest. Top center with sunvisor. Rear with headrest.

Abdomen: No Contact No Contact

Chest: Air Bag No Contact

Knees: Lower Dashboard Glovebox

Table 2
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1991 Ford Mustang LX 2-door Convertible
NHTSA No.: CM0209; VIN: 1FACP44M9MF159945; Color: Red
Engine Data: 4 cylinders; - CID; 2.3 Liters; - cc
Placement: X Longitudinal or In-Line; - Transverse or Lateral
Transmission Data: - speeds; - Manual; X Automatic; X Overdrive
Final Drive: X Rear Wheel Drive; - Front Wheel Drive; - Four Wheel Drive
Major Options: X A/C; X Pwr. Strg.; X Pwr. Brakes
X Power Windows; - Pwr. Door Locks
Date Received: 6-13-91; Odometer Reading 435 miles
Selling Dealer: Keats Motors Inc.
& Address Lawrenceville, N.J. 08648

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Ford Motor Co. U.S.A.
Date of Manufacture: 5/91
GVWR: 3892 lbs.; GAWR: 1997 lbs. FRONT; 1935 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 35 psi FRONT
35 psi REAR
Recommended Tire Size: P19576R14 Load Range: 635
Recommended Cold Tire Pressure: 35 psi FRONT; 35 psi REAR
Size of Tires on Test Vehicle: P19576R14; Manufacturer: Firestone
Vehicle Capacity Data:

Type of Front Seats: - Bench; X Bucket; - Split Bench
Number of Occupants: 2 Front; 2 Rear; 4 Total
Vehicle Capacity Weight (VCW) = 700 lbs.
No. of Occupants x 150 lbs. = 600 lbs.
Rated Cargo/Luggage Weight (RCLW) = 100 lbs. (Difference)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS) = UDW:

Right Front = 790 lbs. Right Rear = 700 lbs.
Left Front = 910 lbs. Left Rear = 680 lbs.
TOTAL FRONT = 1700 lbs. TOTAL REAR = 1380 lbs.
% of Total Vehicle Weight = 55 % of Total Weight = 45 %
TOTAL DELIVERED WEIGHT = 3080 lbs.

Table 2
GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 3080 lbs.
Rated Cargo/Luggage Weight (RCLW) = 100 lbs.
Weight of 2 P.572 Dummies @ 164 ea. = 328 lbs.
TARGET TEST WEIGHT = 3508 lbs. (sum)

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 0 POUNDS OF CARGO WEIGHT:

Right Front = 890 lbs. Right Rear = 850 lbs.
Left Front = 940 lbs. Left Rear = 810 lbs.
TOTAL FRONT = 1830 lbs. TOTAL REAR = 1660 lbs.
% of Total Weight = 52 % % of Total Weight = 48 %
TOTAL TEST WEIGHT = 3490 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 27.5" LF 27.2" RR 27.2" LR 27.2"
FULLY LOADED: RF 26.6" LF 26.3" RR 25.0" LR 24.8"
AS TESTED: RF 27.0" LF 26.9" RR 25.8" LR 26.0"
Vehicle's Wheel Base: 100.7 in.
Location of Vehicle's C.G.: 47.9 inches rearward of front wheel center

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 15.4 gallons
Usable Capacity Figure Furnished by COTR = 15.4 gallons
Test Volume Range (92 to 94% of Usable Capacity) = 14.2 to 14.5 gallons
ACTUAL TEST VOLUME = 14.3 gallons (with entire fuel system filled)

Table 3
POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
Test Date: June 20, 1991 Time: 11:40 Temperature: 84°F
Vehicle NHTSA No.: CM0205
Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.2 mph; Trap No. 2 = 29.1 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 = 176.1; C/L = 179.7; Left = 176.2
Post-Test Right = 157.8; C/L = 160.2; Left = 159.2
Crush Right = 18.3; C/L = 19.5; Left = 17.0
AVERAGE = 18.3 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

Right = 14.3; C/L = 13.1; Left = 15.0
AVERAGE = 14.1 inches

DOOR OPENING:

	Left	Right
Front	<u>closed-operable</u>	<u>closed-operable</u>
Rear	<u>N/A</u>	<u>N/A</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: Windshield cracked at lower edge near "A" pillar.

OTHER NOTABLE IMPACT FEATURES: Driver dummy struck sunvisor which contained
a mirror.

Section 3
OCCUPANT AND VEHICLE DATA

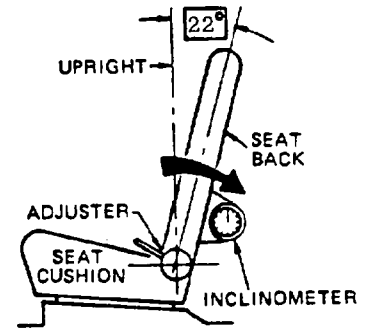
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1991 Vehicle Model: Mustang LX Body Style: 2-Door Convertible

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.



LEFT SIDE VIEW

Seat back angle for driver's seat: 22°

Measurement instructions: Place inclinometer 13 inches upward from seat back pivot point along seat back frame

Seat back angle for passenger's seat: 22°

Measurement instructions: Same as driver.

2. Seat Fore and Aft Positioning

Provide instructions for positioning the driver and front outboard passenger seat(s) in the center of fore and aft travel. For example, provide information to locate the detent in which the seat track is to be locked.

Positioning of the driver's seat: Seat placed in 8th detent (mid-position) from a total of 15 detents.

Positioning of the passenger's seat (if applicable): Seat placed in 6th detent (mid-position) from a total of 11 detents.

3. Fuel Tank Capacity Data

A. "Usable Capacity" of the standard equipment fuel tank is 15.4 gallons

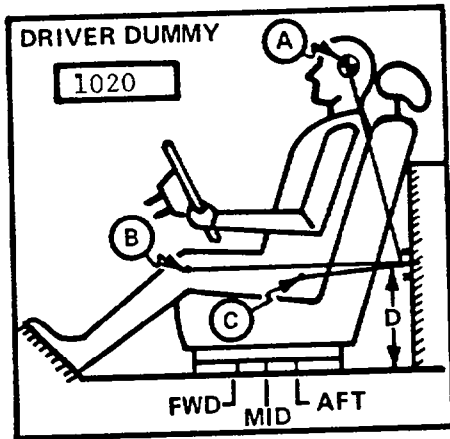
B. "Usable Capacity" of the optional equipment fuel tank is - gallons

Additional Instructions: None

Figure 2
PART 572 DUMMY IN-VEHICLE POSITION

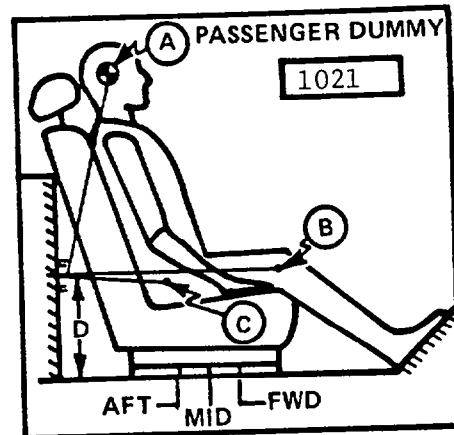
Test No.: CM0209 Vehicle: 1991 Ford Mustang LX 2-Door Convertible

<u>SEAT TYPE:</u>	<u>ADJUSTER TYPE:</u>	<u>SEAT BACK TYPE:</u>
<u>-</u> Bench	<u>X</u> Manual	<u>-</u> Fixed
<u>X</u> Bucket	<u>-</u> Power	<u>X</u> Adjustable Reclining
<u>-</u> Split Bench		



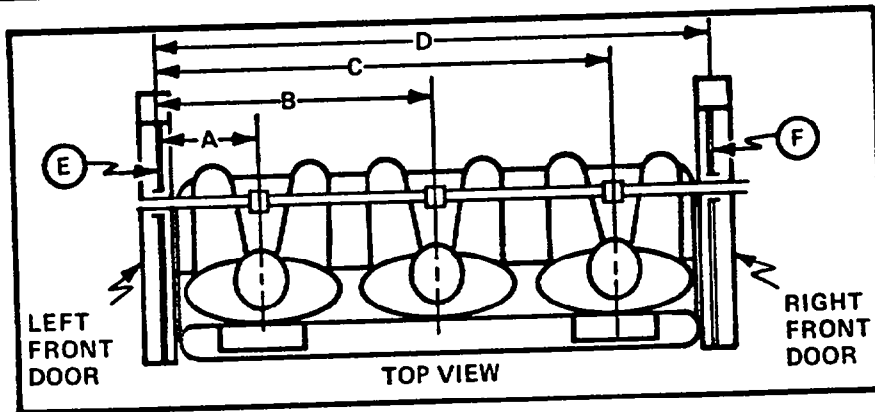
MEASUREMENT LOCATION

- A - Head Target
- B - Knee Joint
- C - Approximate 'H' Point
- D - Sill to Reference Point



A = 25.0 in. 34 Degrees
 B = 35.3 in. 90 Degrees
 C = 21.5 in. 108 Degrees
 D = 13.3 in.

A = 24.7 in. 33 Degrees
 B = 34.8 in. 94 Degrees
 C = 20.5 in. 109 Degrees
 D = 13.3 in.



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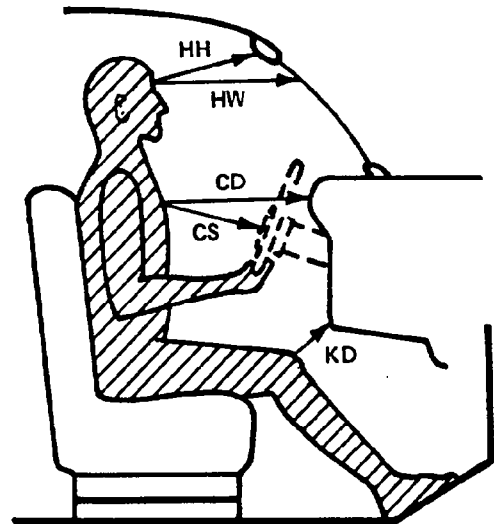
DUMMY ID

S/N 1021

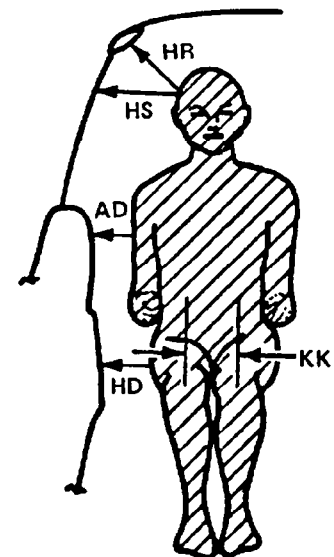
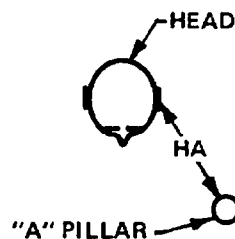
A = Left Door to Driver Centerline	<u>10.5</u> in.
B = Left Door to Center Passenger Centerline	<u>-</u> in.
C = Left Door to Right Passenger Centerline	<u>40.5</u> in.
D = Left Door to Right Door	<u>50.6</u> in.
E, F = Window Glass Height (Right and Left Must Be Equal)	<u>12.0</u> in.

Figure 3
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	15.2	14.6
HW	18.8	18.5
CD	21.1	22.3
CS	12.7	-
KDL	* 3.1	6.9
KDR	5.8	6.7
SA	22°	22°
TA	25°	24°



HH = Head to Windshield Header
 HW = Head to Windshield
 CD = Chest to Dash
 CS = Chest to Steering Wheel
 KD(L/R) = Knee to Dash (Left/Right)
 SA = Seat Back Angle
 TA = Torso Angle
 HA = Head Target to "A" Pillar
 HR = Head to Side Roof
 HS = Head to Side Window
 AD = Arm to Door
 HD = Hip to Door
 KK = Knee to Knee

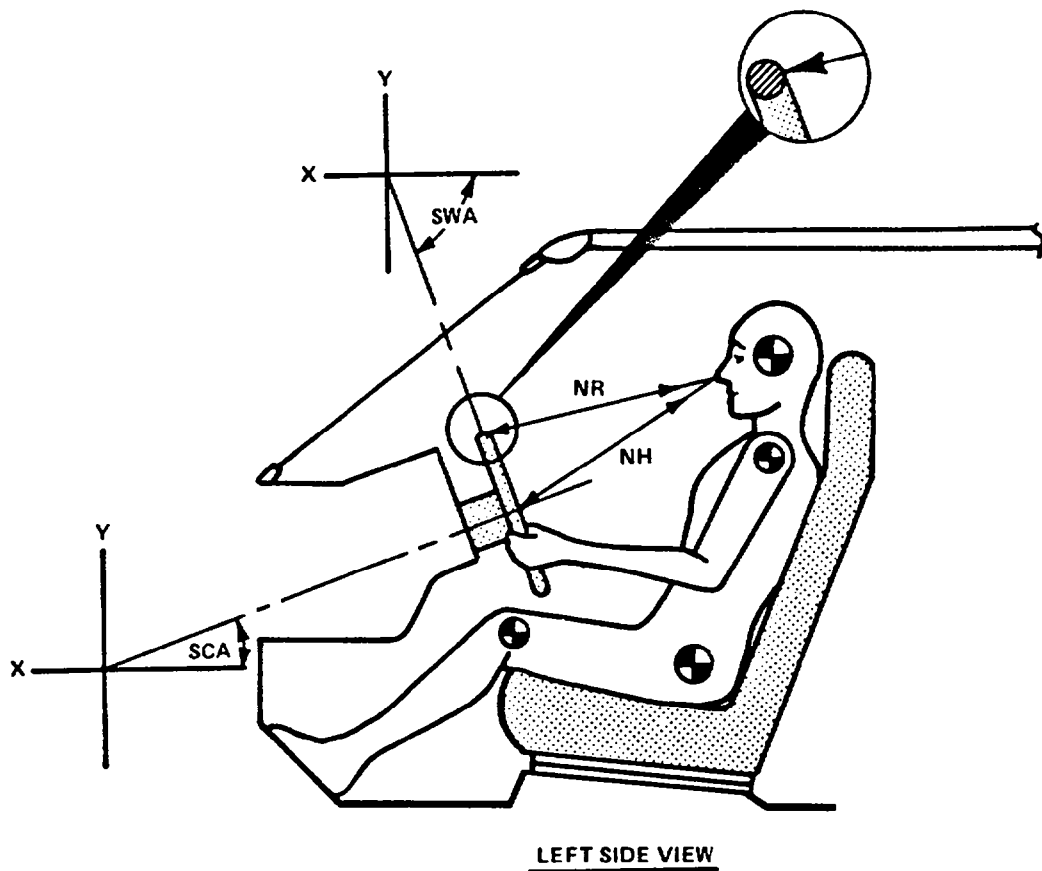


	DRIVER	PASSENGER
HR	4.2	4.2
HS	7.3	7.2
AD	2.3	2.8
HD	5.7	6.1
KK	9.6	7.0
HA	17.2	17.3

*Left foot placed on footrest.

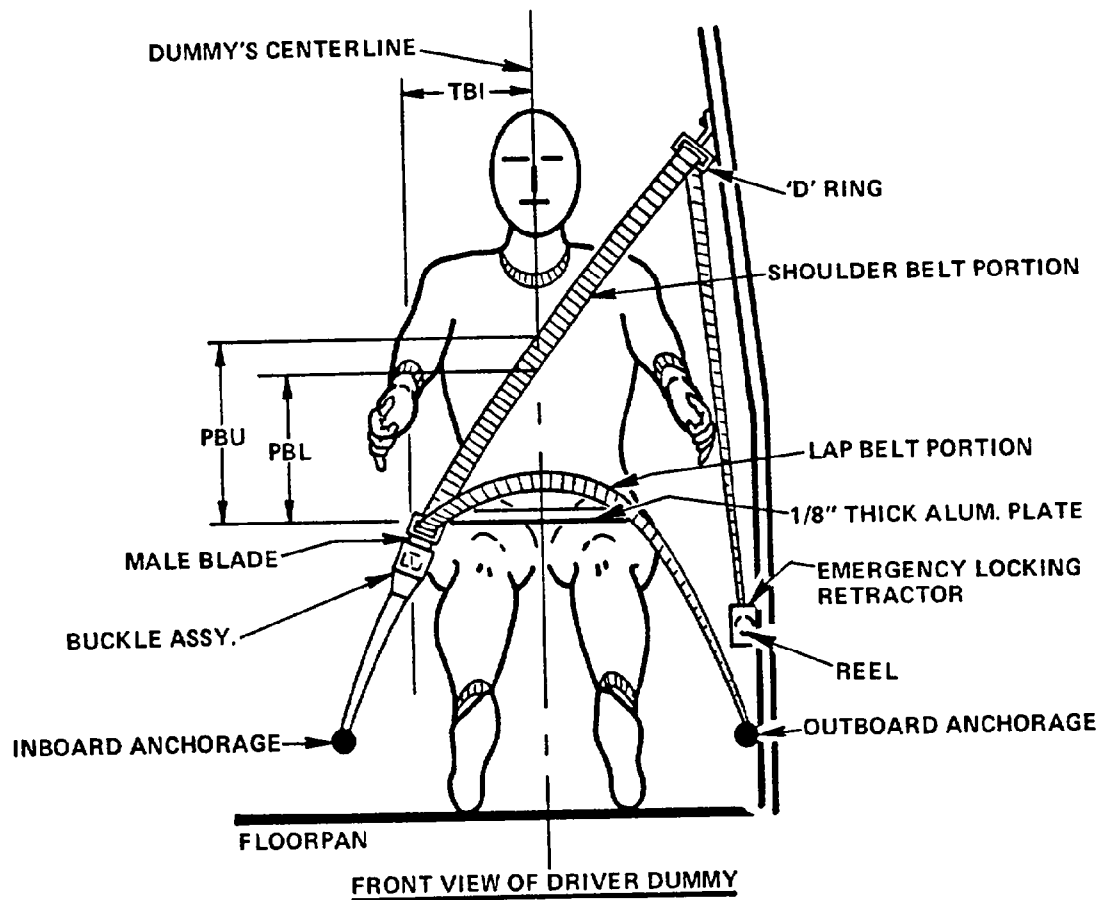
Figure 4

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



		MEASUREMENTS	
<u>NR</u>	-- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	16.9	Inches
<u>NH</u>	-- Distance from tip of dummy's nose to center of steering wheel hub	17.5	Inches
<u>SCA</u>	-- Angle of steering column relative to the horizontal X axis	22.5	Degrees
<u>SWA</u>	-- Angle of steering wheel relative to the horizontal X axis	-67.5	Degrees

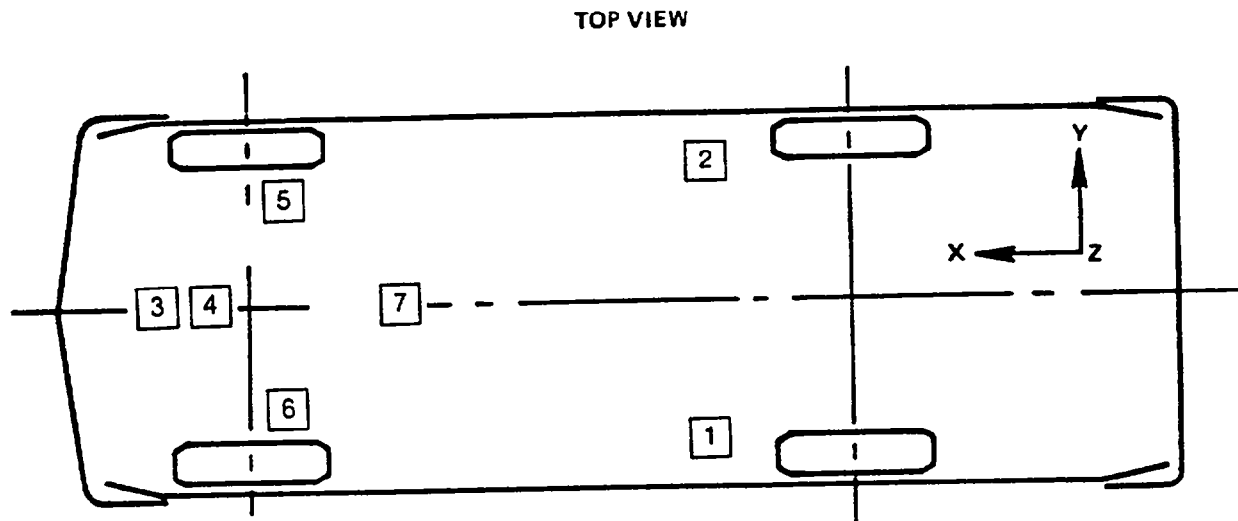
Figure 5
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	*	15.0
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	*	11.6
<u>TBI</u> -- Distance from torso centerline to buckle	*	8.8

*Driver side airbag, 3-point belt not used in this test.

Figure 6
VEHICLE ACCELEROMETER LOCATIONS



ACCELEROMETER 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 4
VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

NO.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION**		NEGATIVE DIRECTION**	
						MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	REAR SEAT X-MEMBER AT LEFT SIDE	PRE:	67.7	16.0	16.5				
		POST:	67.7	16.0	16.4				
	LONGITUDINAL ACCELERATION					1	176	-22	69
2	REAR SEAT X-MEMBER AT RIGHT SIDE	PRE:	67.1	-16.2	16.5				
		POST:	67.1	-16.2	16.4				
	LONGITUDINAL ACCELERATION					2	170	-21	68
3	TOP OF ENGINE BLOCK	PRE:	146.6	-0.9	34.3				
		POST:	141.6	-0.8	34.5				
	LONGITUDINAL ACCELERATION					19	71	-58	52
4	BOTTOM OF ENGINE	PRE:	131.5	0.0	7.5				
		POST:	127.1	0.0	7.6				
	LONGITUDINAL ACCELERATION					13	66	-35	52
5	BRAKE CALIPER AT RIGHT SIDE	PRE:	139.2	-22.9	21.7				
		POST:	133.9	-21.4	21.6				
	LONGITUDINAL ACCELERATION					8	98	-30	62
6	BRAKE CALIPER AT LEFT SIDE	PRE:	139.1	23.2	21.4	Accelerometer did not record correctly			
		POST:	134.7	22.2	21.4				
	LONGITUDINAL ACCELERATION					-	-	-	-
7	DASH PANEL	PRE:	108.5	-0.6	27.8				
		POST:	108.5	-0.6	27.8				
	LONGITUDINAL ACCELERATION					45	85	-42	53

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

Figure 7
CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5.

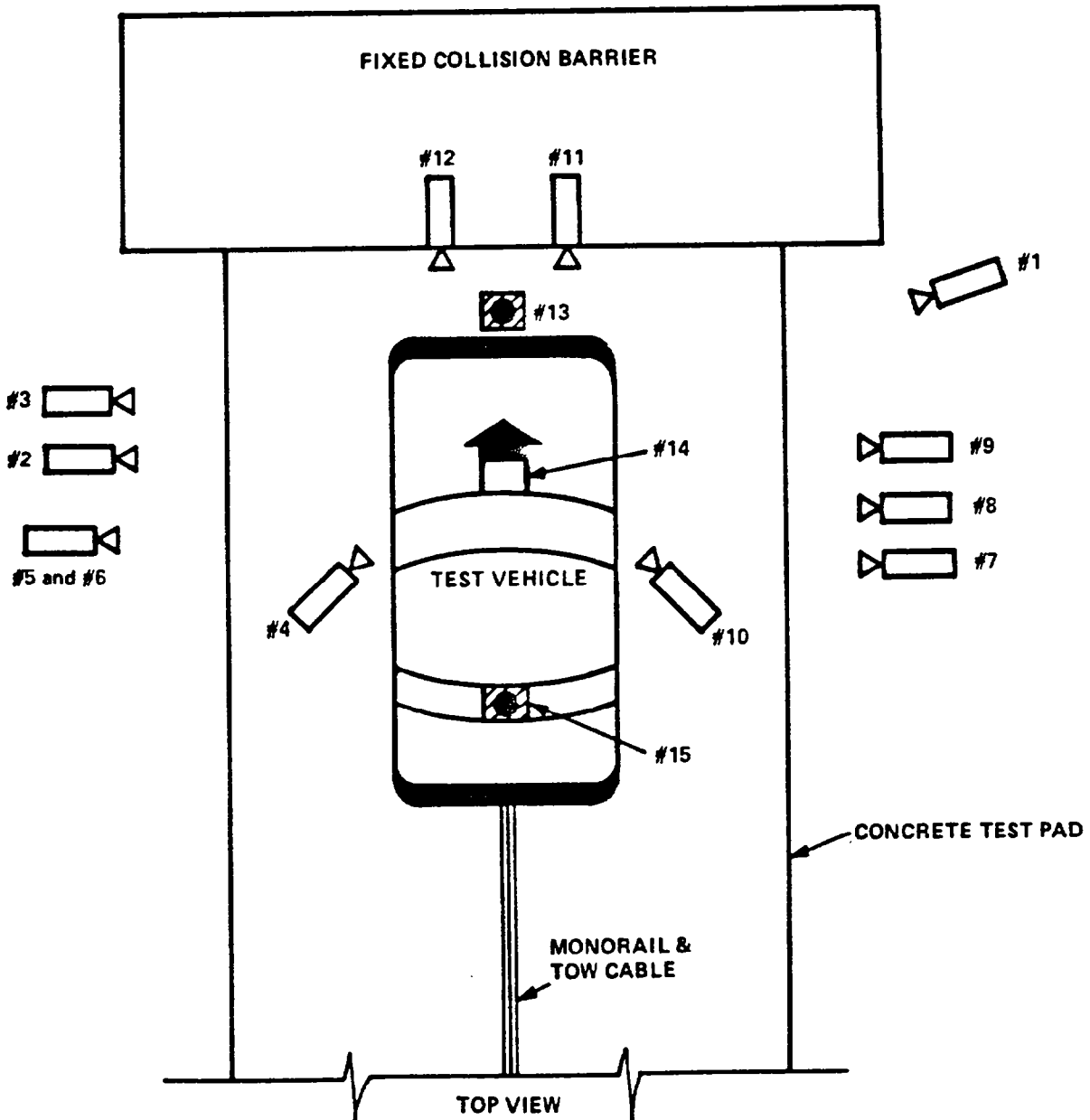


Table 5

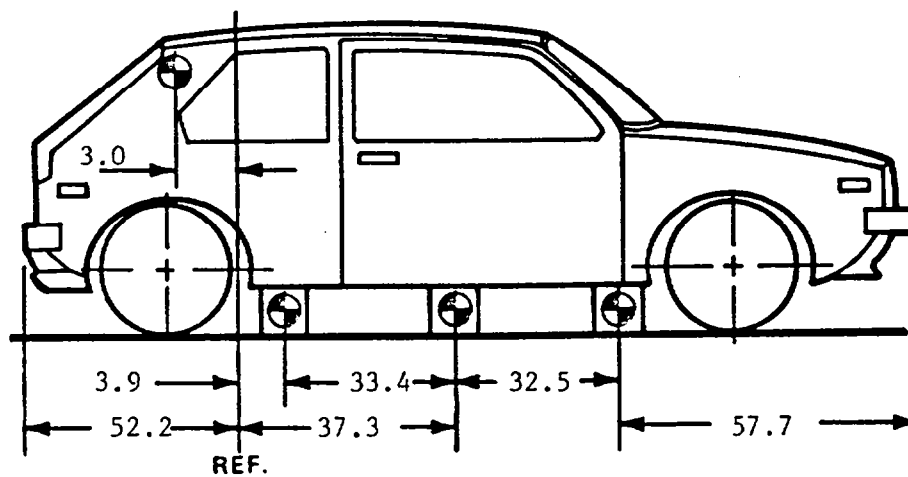
HIGH-SPEED CAMERA LOCATIONS

Vehicle: 1991 Ford Mustang LX 2-Door Convertible

Test No. CM0209

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	228	66	41	-2	210.2	13	540
3	Left Side View	312	43	41	-4	294.2	25	555
4	Driver and Interior View	110	103	68	-19	-	13	640
5	Steering Column (Bottom)	265	82	46	-3	247.2	25	540
6	Steering Column (Top)	265	82	70	-10	247.2	25	510
7	Overall Right Side	225	72	42	-3	207.2	13	635
8	Right Side View	308	48	41	-1	290.2	25	650
9	Right Passenger View	298	74	54	-3	280.2	35	575
10	Passenger and Interior View	114	109	67	-19	-	13	520
11	Passenger Front View	23	20	76	-44	-	13	530
12	Driver Front View	22	20	76	-43	-	13	500
13	Windshield View	0	0	130	-53	-	13	530
14	Pit View of Engine	0	36	-120	90	-	13	740
15	Pit View of Fuel Tank	0	140	-120	90	-	13	790

*X = film plane to monorail centerline
 Y = film plane to impact location
 Z = film plan to ground
 ** = referenced to horizontal plane



7920-1

Figure 9
TEST VEHICLE MEASUREMENTS

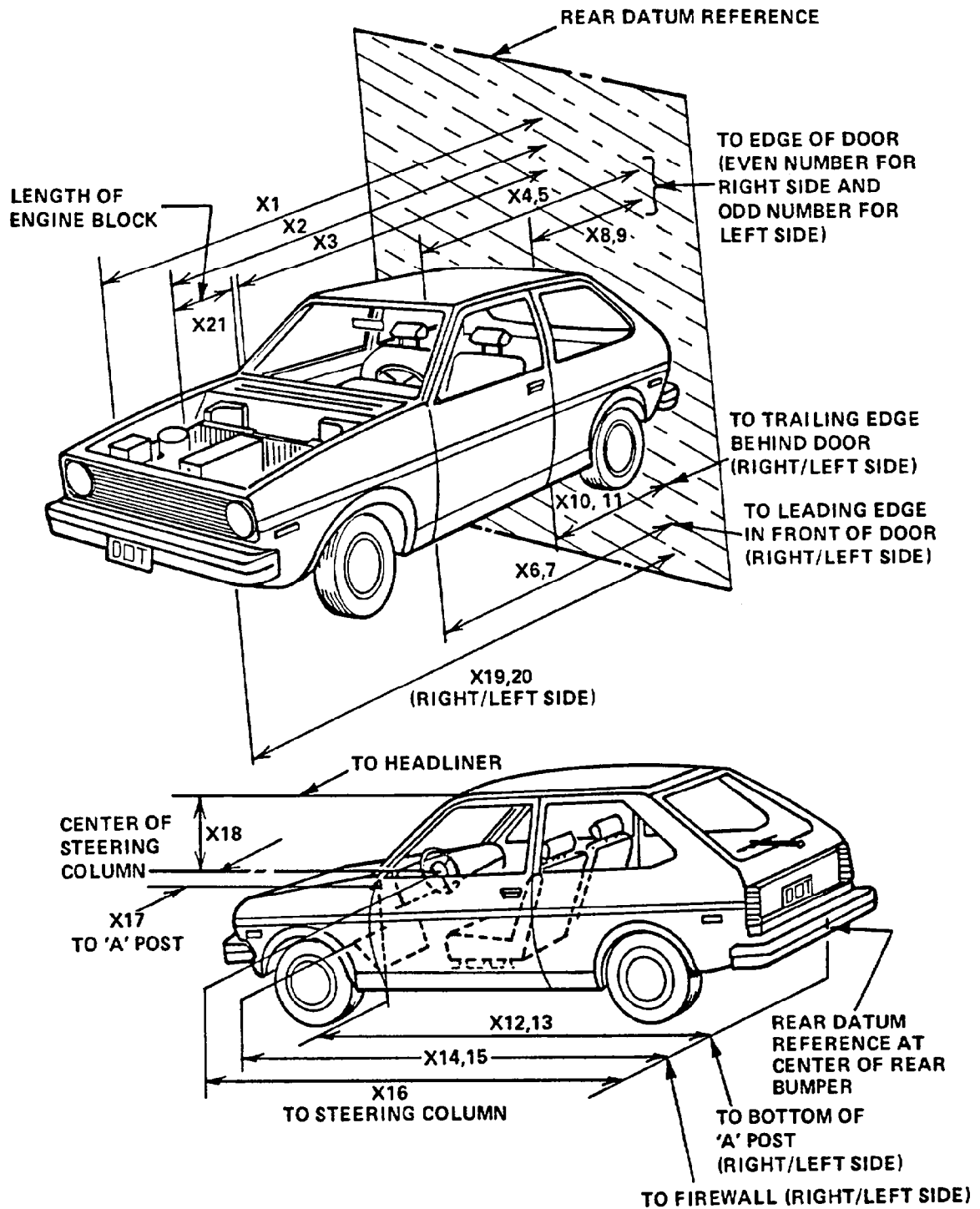


Table 6

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	179.7	160.2	19.5
X2	Rear Surface of Vehicle to Front of Engine	147.2	141.0	6.2
X3	Rear Surface of Vehicle to Firewall	127.4	126.3	1.1
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	112.3	112.4	-0.1
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	112.4	113.1	-0.7
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	115.4	114.8	0.6
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	115.3	114.9	0.4
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	65.6	65.3	0.3
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	65.2	65.2	0.0
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	65.1	64.3	0.8
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	64.8	64.4	0.4
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	114.8	114.2	0.6
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	114.7	114.3	0.4
X14	Rear Surface of Vehicle to Firewall, Right Side	127.3	126.0	1.3
X15	Rear Surface of Vehicle to Firewall, Left Side	127.7	126.5	1.2
X16	Rear Surface of Vehicle to Steering Column	98.6	99.8	-1.2
X17	Center of Steering Column to "A" Post	15.5	15.7	-0.2
X18	Center of Steering Column to Headliner	15.4	15.5	-0.1
X19	Rear Surface of Vehicle to Right Side of Front Bumper	176.1	157.8	18.3
X20	Rear Surface of Vehicle to Left Side of Front Bumper	176.2	159.2	17.0
X21	Length of Engine Block	17.8	17.8	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 7

DUMMY INJURY CRITERIA VALUESNHTSA No.: CM0209 Vehicle: 1991 Ford Mustang LX 2-Door Convertible

	MAXIMUM ACCELERATION (g's)							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
Dummy (1)	-119	-51	210	240	-38	-46	9	43.7
Dummy (2)	-21	10	25	32	-26	12	15	26.1

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	1405	1755
Dummy (2)	483	201

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc. (g) t ₁ TO t ₂
		t ₁ (SEC)	t ₂ (SEC)	
Dummy (1)	1440	.061320	.064320	187.28
Dummy (2)	121	.089040	.124920	25.75

*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No. 208

Table 8

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 = 6.0 sec.

Log time duration of reminder light operation = 6.0 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 = 0 sec.

(audible warning should not operate)

Log time duration of reminder light operation = 6.0 sec.

Note wording of visual warning:

Fasten Seat Belt -

Fasten Belt -

Symbol 101-80 X

Table 9
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:

Inside glove compartment door.

The manufacturer recommends that no maintenance is needed unless:

1. "AIR BAG" lamp does not light when key is turned on.
2. "AIR BAG" lamp flashes or stays lit.
3. Groups of five "beeps" are heard.
4. An air bag has inflated.

Were appropriate instructions concerning maintenance and/or replacement of this system provided? YES X NO -

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

YES X NO -

Is there a reference to the instructions and description of the system on the label? YES X NO -

Was an owner's manual provided? YES X 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 X NO -

Table 10
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 - NO X

Describe the location of the readiness indicator:

Lower left of instrument cluster

Is the readiness indicator clearly visible to the driver?
YES X NO -

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

Table 11

FMVSS NO. 208 - COMFORT AND CONVENIENCE TEST SUMMARY

Test Vehicle NHTSA No.:	<u>CM0209</u>
Make/Model:	<u>1991 Ford Mustang LX Convertible</u>
Date of Comfort/Convenience Check:	<u>June 19, 1991</u>
Technician Performing Check:	<u>VMP</u>
GVWR:	<u>3892 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 - NO X

If yes, go to requirements D1, D2 and D3

2. Manual seat belts* YES X NO -

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 11 (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 X NO -

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 X NO -

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 X NO -

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 11 (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 0.3 pounds. Contact the COTR if the contact force exceeds 0.7 pounds.

Table 11 (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 11 (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 11 (cont.)

3. The buckle and latchplate do not pass through the guides or conduits provided and 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:

1. Whose components are accessible to a seated occupant in both the stowed and operational positions.

YES X 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 X NO -

3. That releases at a single point by a push button action.

YES X NO -

Figure 10
FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA SHEET

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

Windshield is bonded in place with a 0.3" rubber and 1.0" plastic trim covering the top of windshield. A 0.3" rubber and 1.5" plastic trim covers both sides of windshield. A plastic shroud covers bottom of windshield.

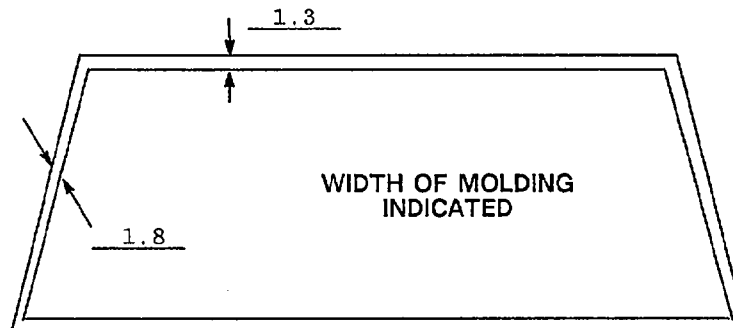
FMVSS 212 REQUIREMENTS:

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	78.5	78.5	100%
LEFT SIDE	78.5	78.5	100%
TOTAL	157.0	157.0	100%

AREA OF RETENTION FAILURE:



FRONT VIEW

FAILURE DETAILS:

None.

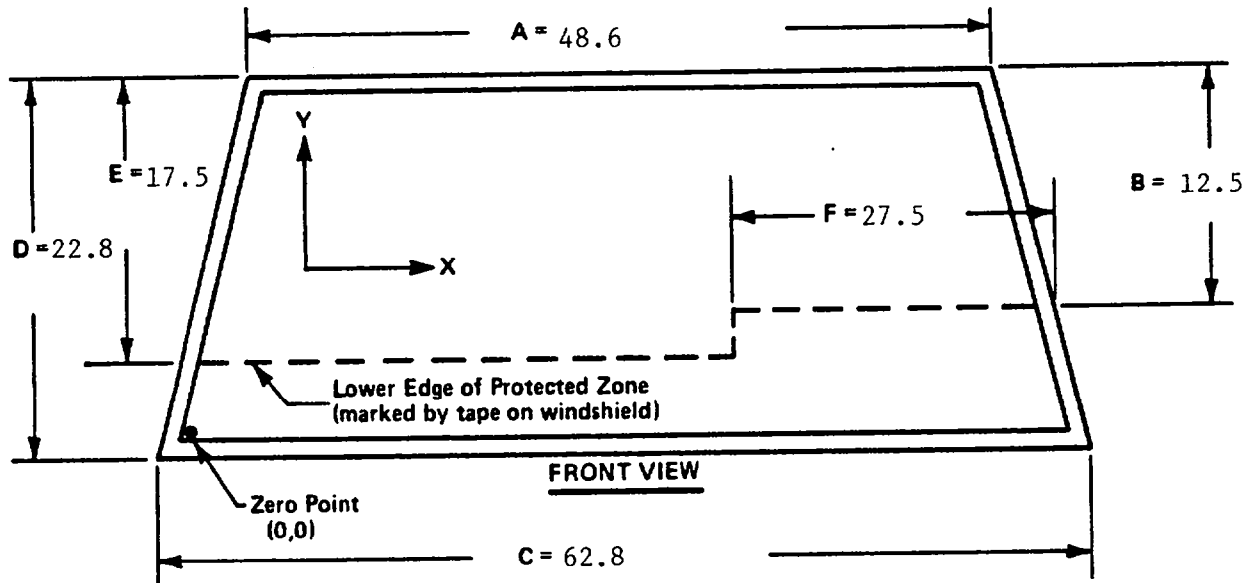
Figure 11

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)

None.

COORDINATES		
	X	Y
1.		
2.		
3.		
4.		

Table 12

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

C	M	0	2	0	9
---	---	---	---	---	---

TEST DATE: June 20, 1991

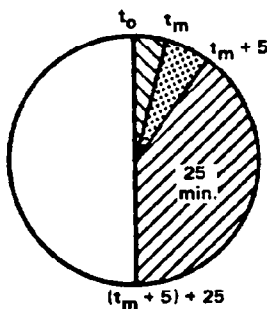
Vehicle Mfgr./Make/Model: 1991 Ford Mustang LX 2-Door Convertible

Test vehicle fuel tank filled to 92% to 94% of manufacturer's "usable" capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE:

- X Frontal (30 mph)
- Oblique (30 mph) with ____° barrier face first contacting _____
(driver/passenger) side
- Rear Moving Barrier (30 mph)
- Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT:



1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

ACTUAL	MAX ALLOWED
0	1 oz.
0	5 oz.
0	1 oz./1 min.

SOLVENT SPILLAGE DETAILS:

None .

Table 13

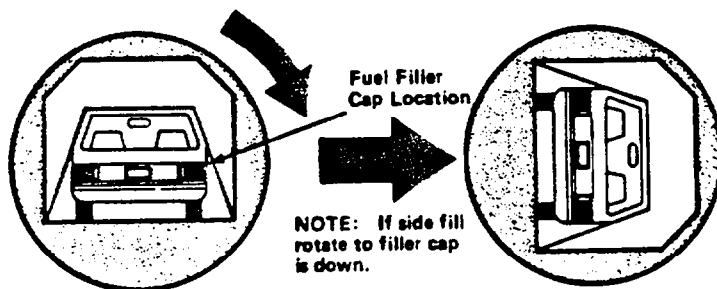
FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:

0°

90°

Vehicle NHTSA ID No.:

CM0209

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + _____ * _____ minutes _____ seconds

TOTAL _____ minutes _____ seconds

Next whole minute interval _____ * _____ minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
------------------------------------	----------	----------	----------------------

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

--	--	--	--

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

IV. SOLVENT SPILLAGE LOCATION(S):

*The vehicle was not subjected to the FMVSS 301 static rollover.

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

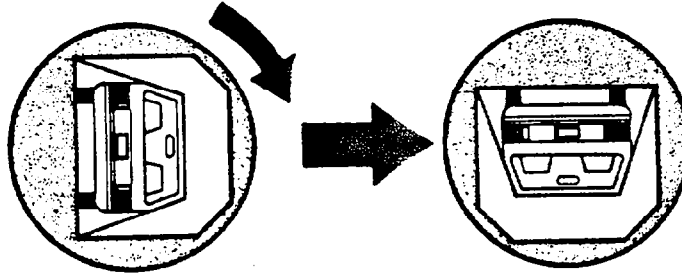
TEST PHASE:

90°

180°

Vehicle NHTSA ID No.:

CM0209



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + _____ * _____ minutes _____ seconds

TOTAL _____ minutes _____ seconds

Next whole minute interval _____ * _____ minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
------------------------------------	----------	----------	----------------------

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

--	--	--	--

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

IV. SOLVENT SPILLAGE LOCATION(S):

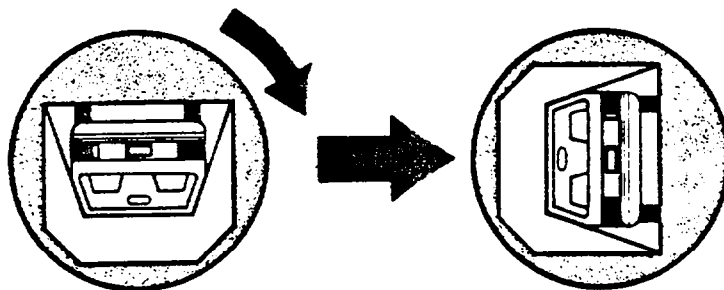
*The vehicle was not subjected to the FMVSS 301 static rollover.

Table 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)TEST PHASE:**180°****270°**

Vehicle NHTSA ID No.:

CM0209

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90° Rotation Time
(Spec. Range = 1 to 3 minutes)

_____ * _____ minutes _____ seconds

FMVSS 301 Position Hold Time +

_____ * _____ minutes _____ seconds

TOTAL

_____ minutes _____ seconds

Next whole minute interval

_____ * _____ minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
------------------------------------	----------	----------	----------------------

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

--	--	--	--

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

IV. SOLVENT SPILLAGE LOCATION(S):

*The vehicle was not subjected to the FMVSS 301 static rollover.

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

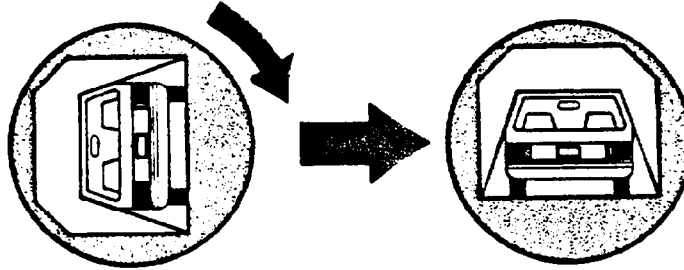
TEST PHASE:

270°

360°

Vehicle NHTSA ID No.:

CM0209



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + _____ * _____ minutes _____ seconds

TOTAL _____ minutes _____ seconds

Next whole minute interval _____ * _____ minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
------------------------------------	----------	----------	----------------------

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

--	--	--	--

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

IV. SOLVENT SPILLAGE LOCATION(S):

*The vehicle was not subjected to the FMVSS 301 static rollover.

Table 14

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: June 20, 1991 Vehicle NHTSA No.: CM0209
Vehicle Manufacturer: Ford Motor Company
Model Year: 1991 VIN: 1FACP44M9MF159945
Body Style: 2-Door Convertible Build Date: 5/91
Dummy Stabilized Temperature at Time of Test: 71 °F (Spec. = 66-78°F)
Impact Velocity: 29.2 mph Time of Test: 11:40
Type of Automatic Restraint System: Driver side airbag and passenger side manual
3-point seat belt were used for test.

Failure Details:

The driver dummy appears to exceed the maximum Head Injury Criterion (HIC)
level as specified by FMVSS 208.

Appendix A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

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NOTE: Certain post-test photos were not taken to avoid disturbing the vehicle.

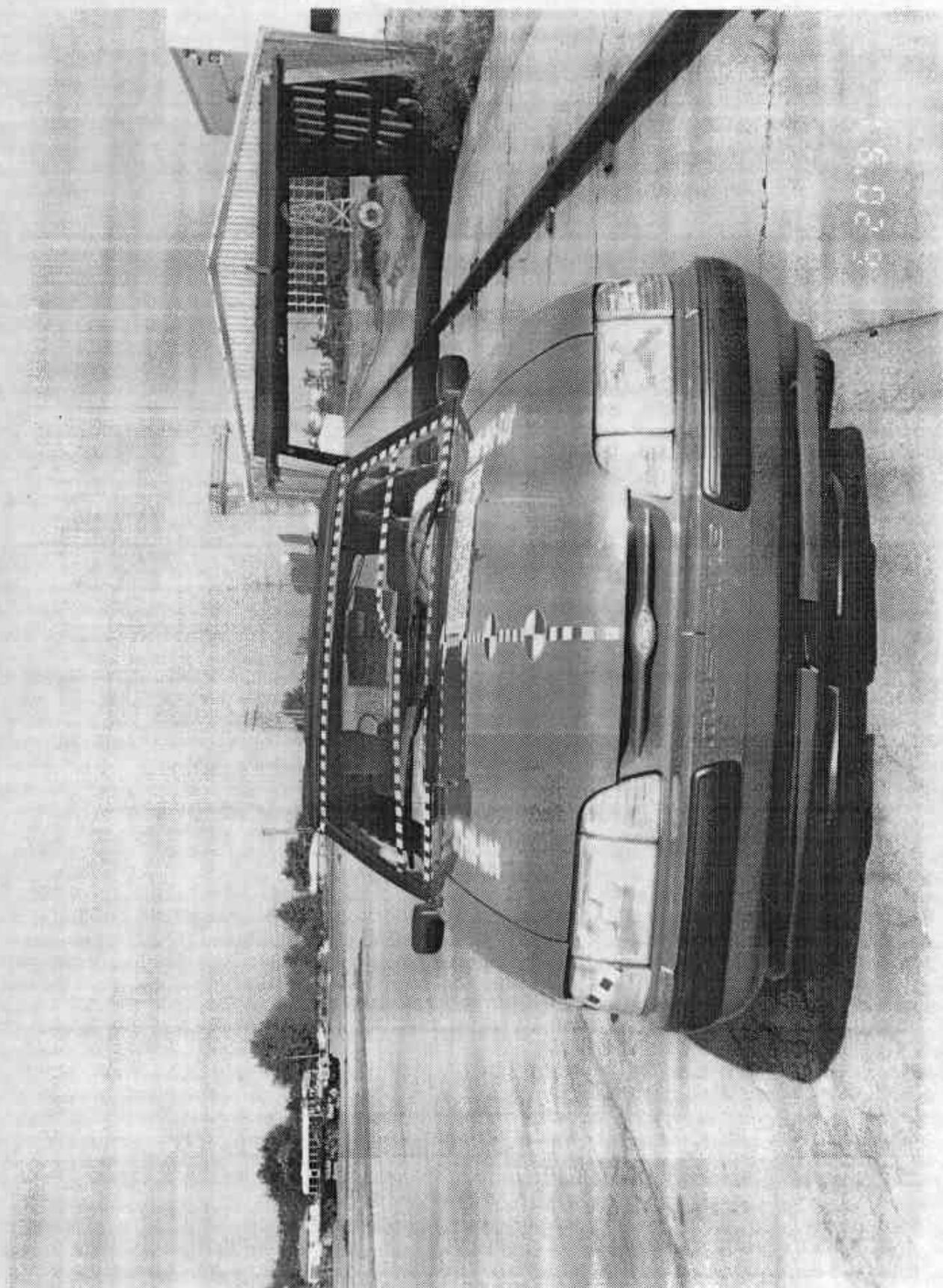


Figure A-1 PRE-TEST FRONT VIEW

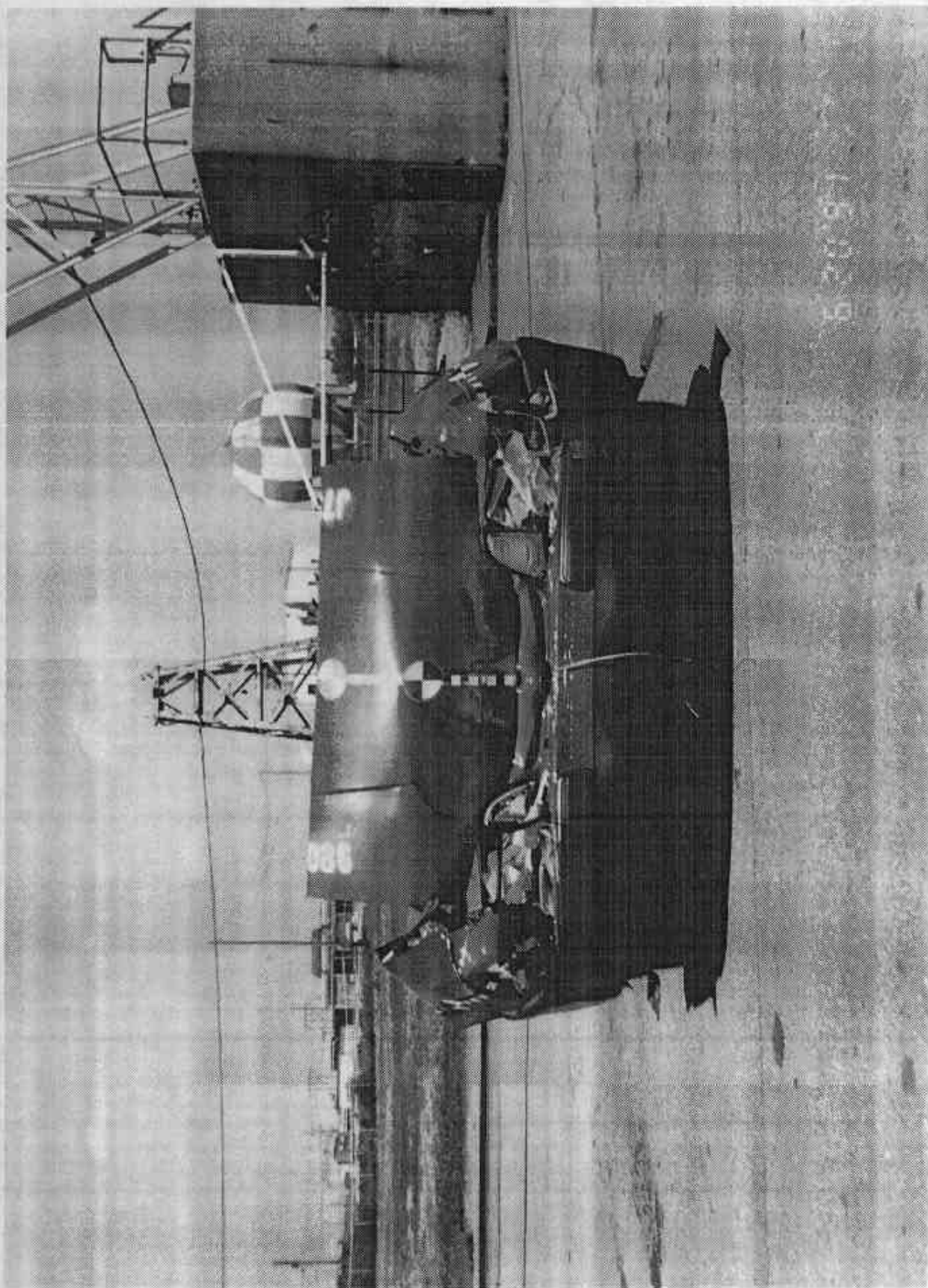


Figure A-2 POST-TEST FRONT VIEW

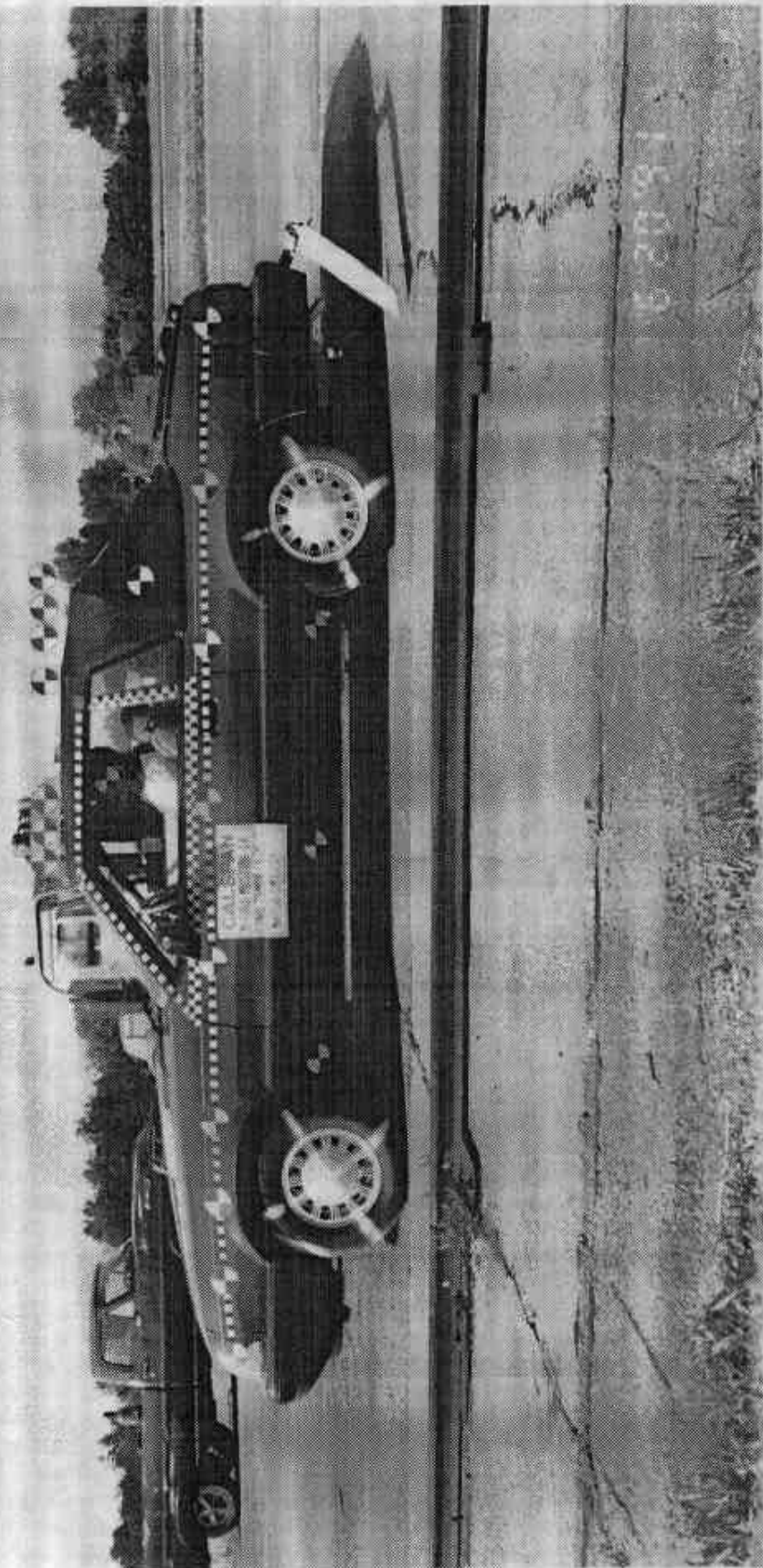
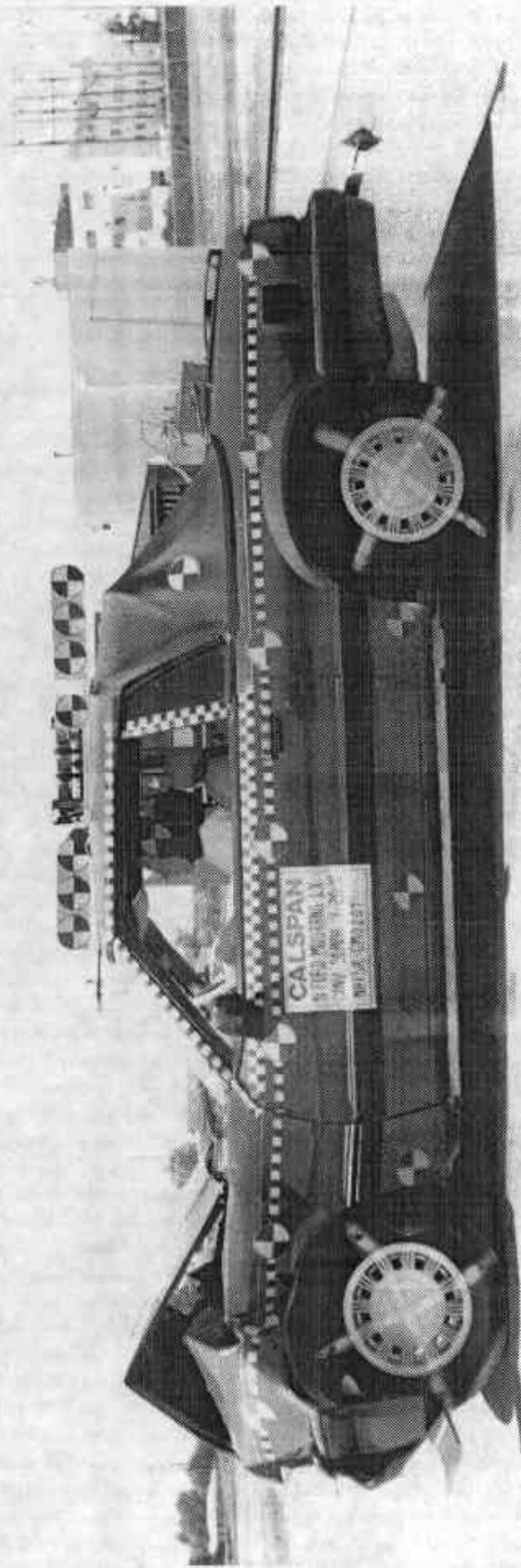


Figure A-3 PRE-TEST LEFT SIDE VIEW

A-5

7920-1



A-6

Figure A-4 POST-TEST LEFT SIDE VIEW

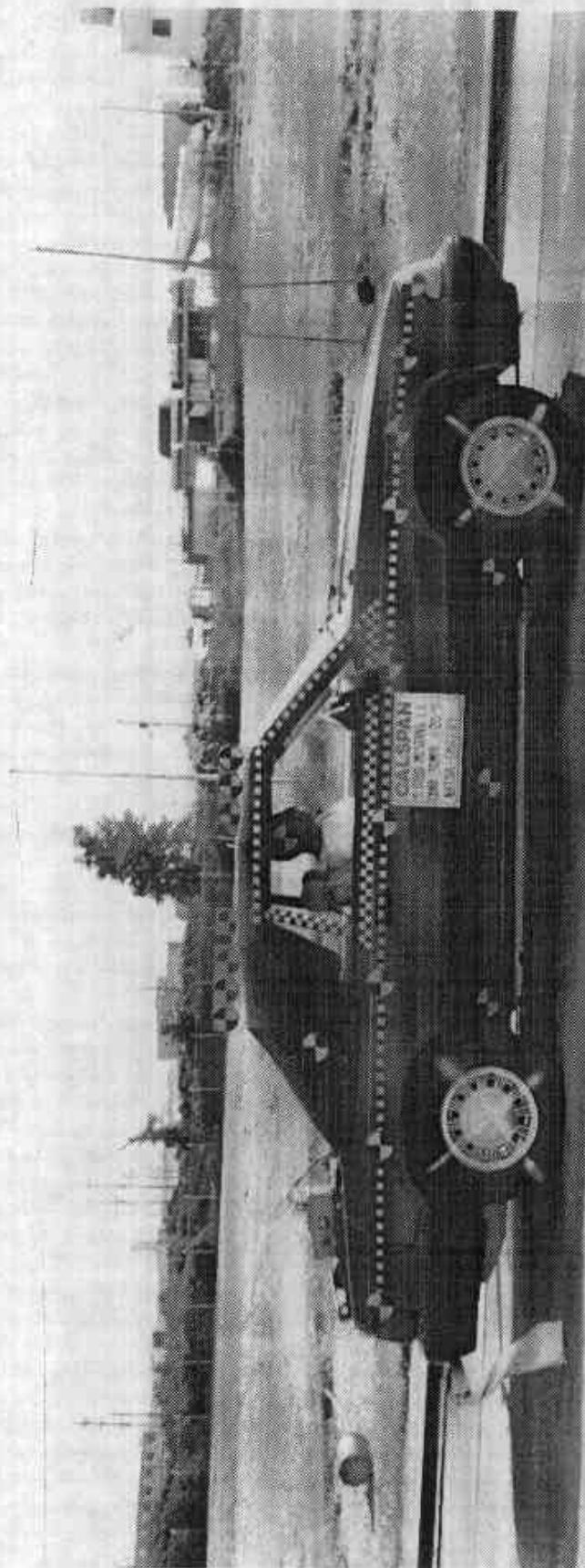


Figure A-5 PRE-TEST RIGHT SIDE VIEW

A-7

7920-1

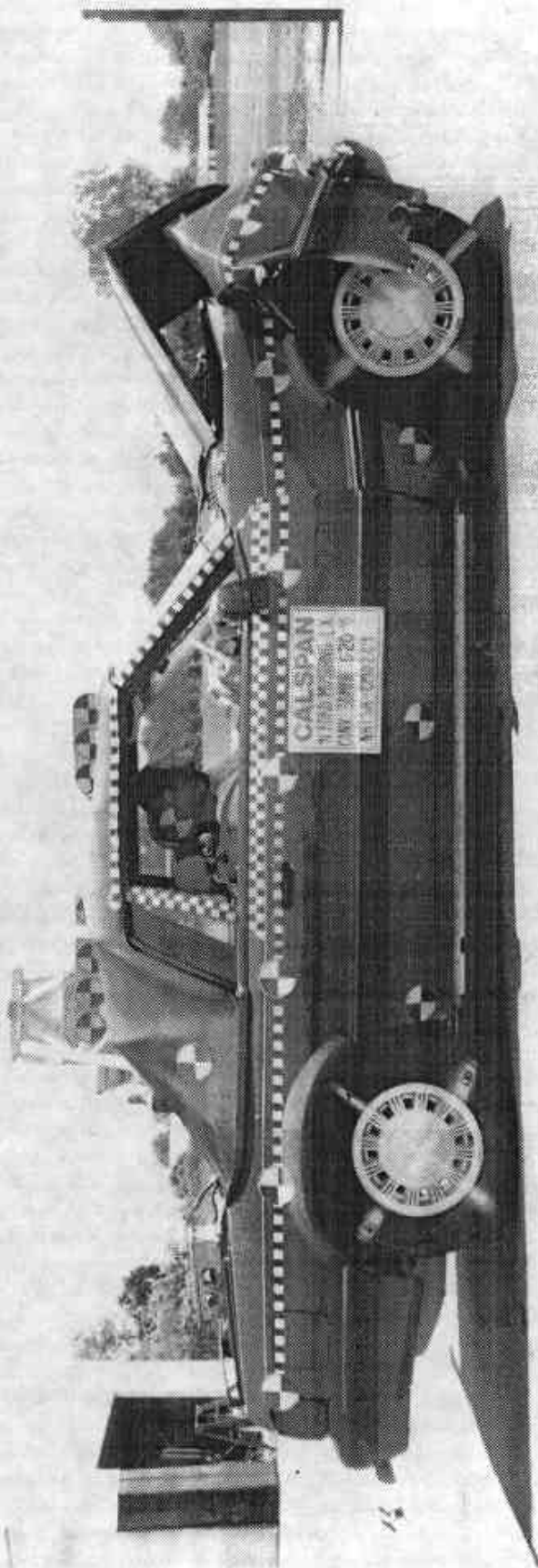


Figure A-6 POST-TEST RIGHT SIDE VIEW

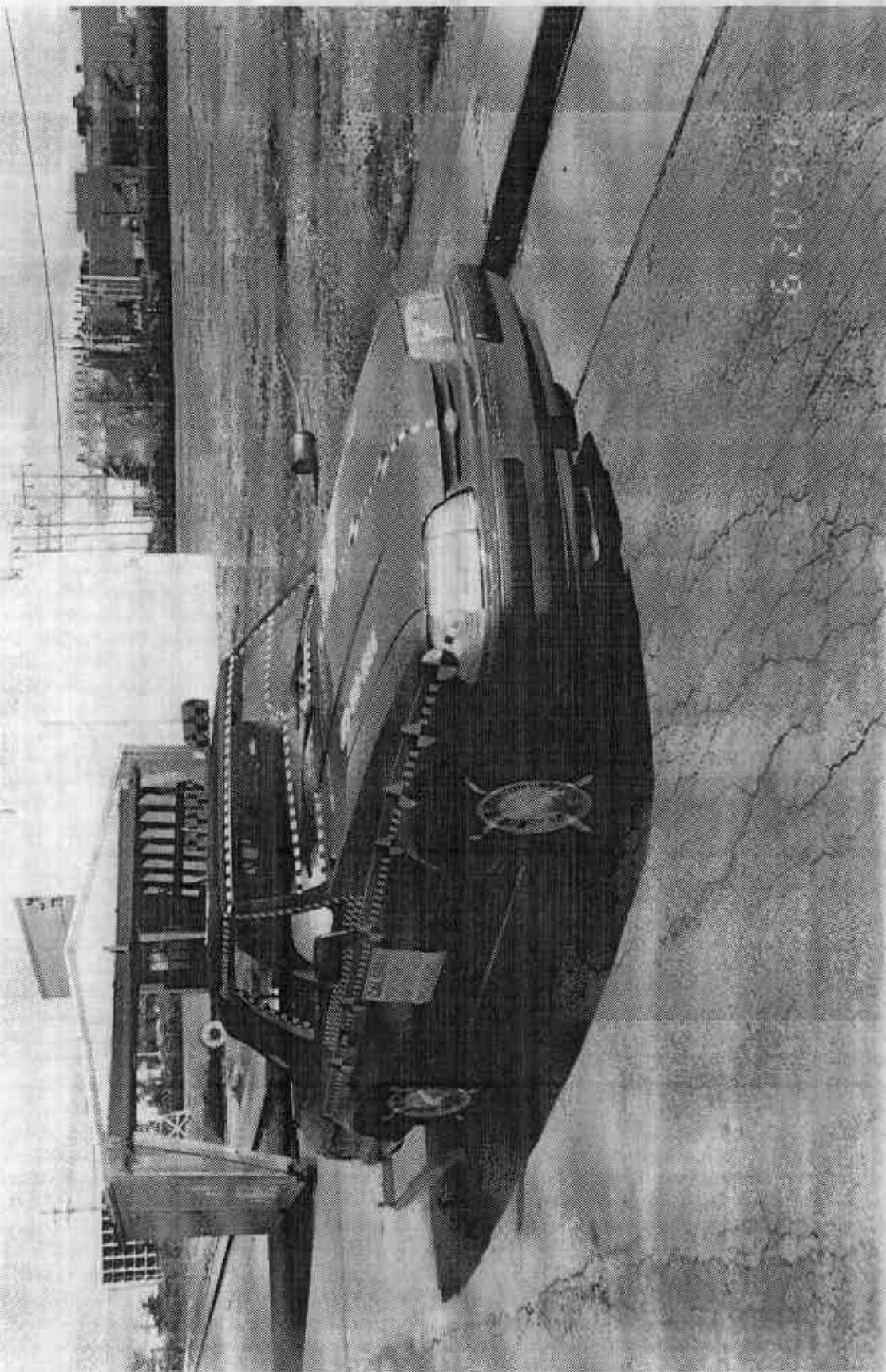


FIGURE A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

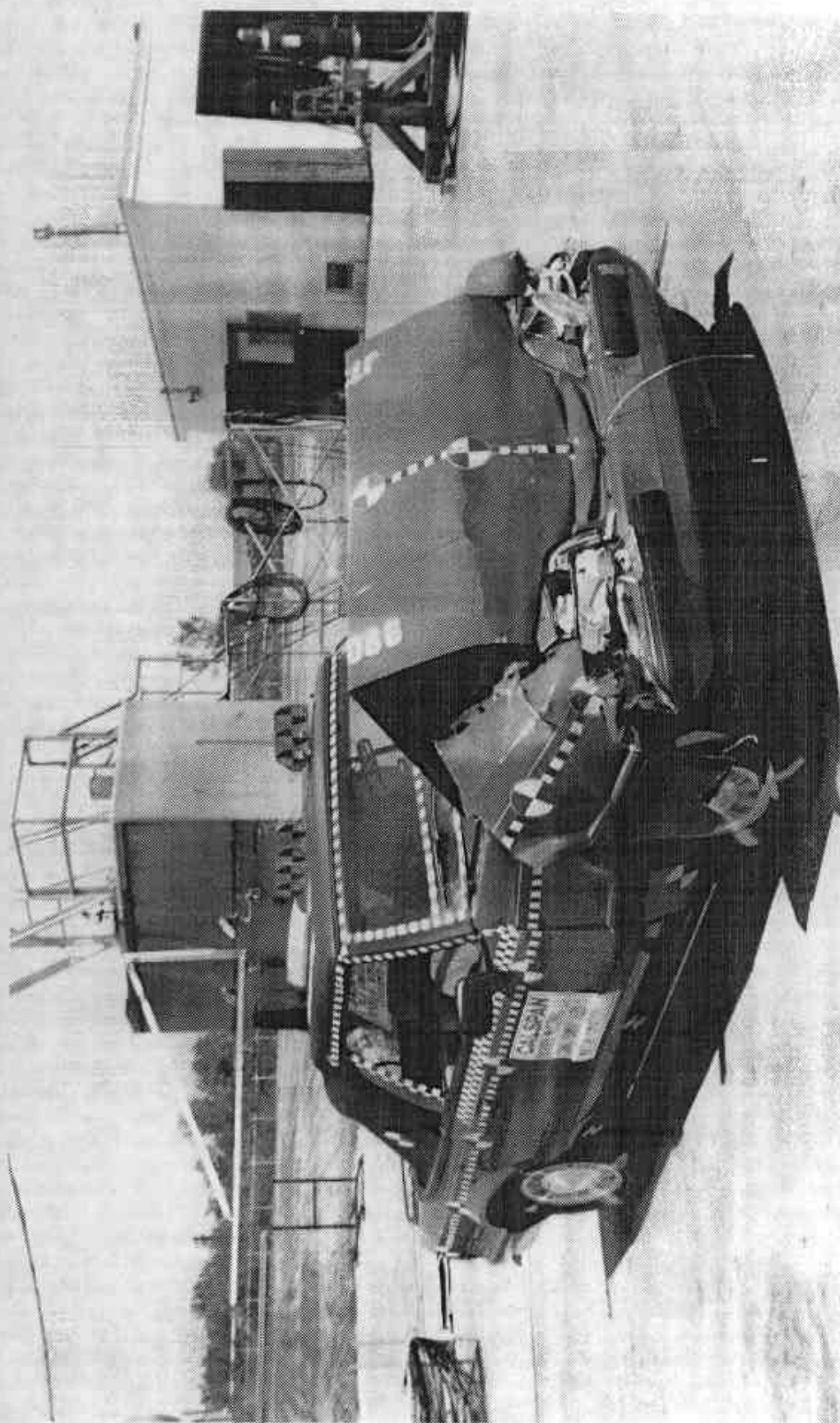


Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

7920-1

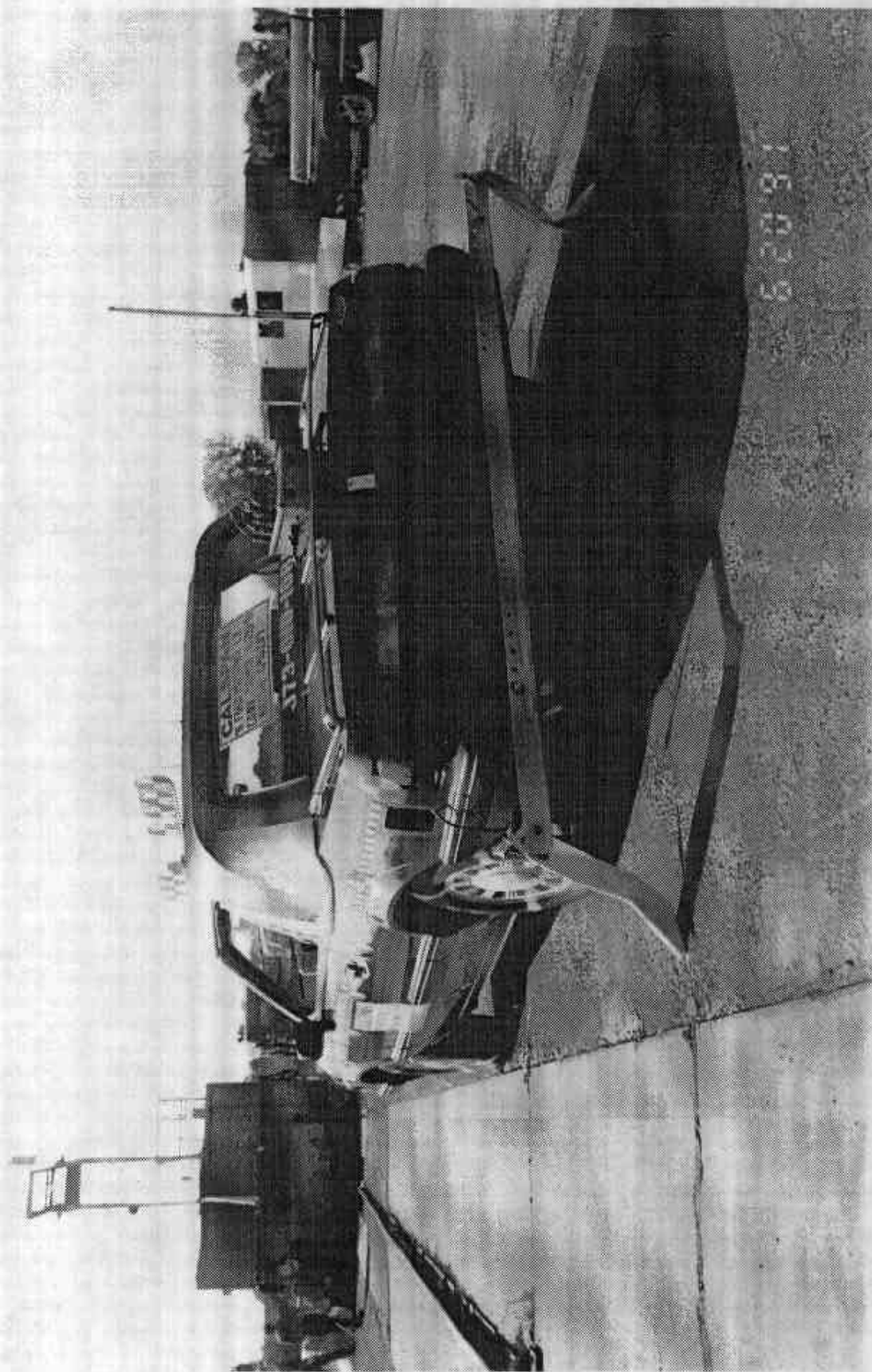


Figure A-9 PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-11

7920-1

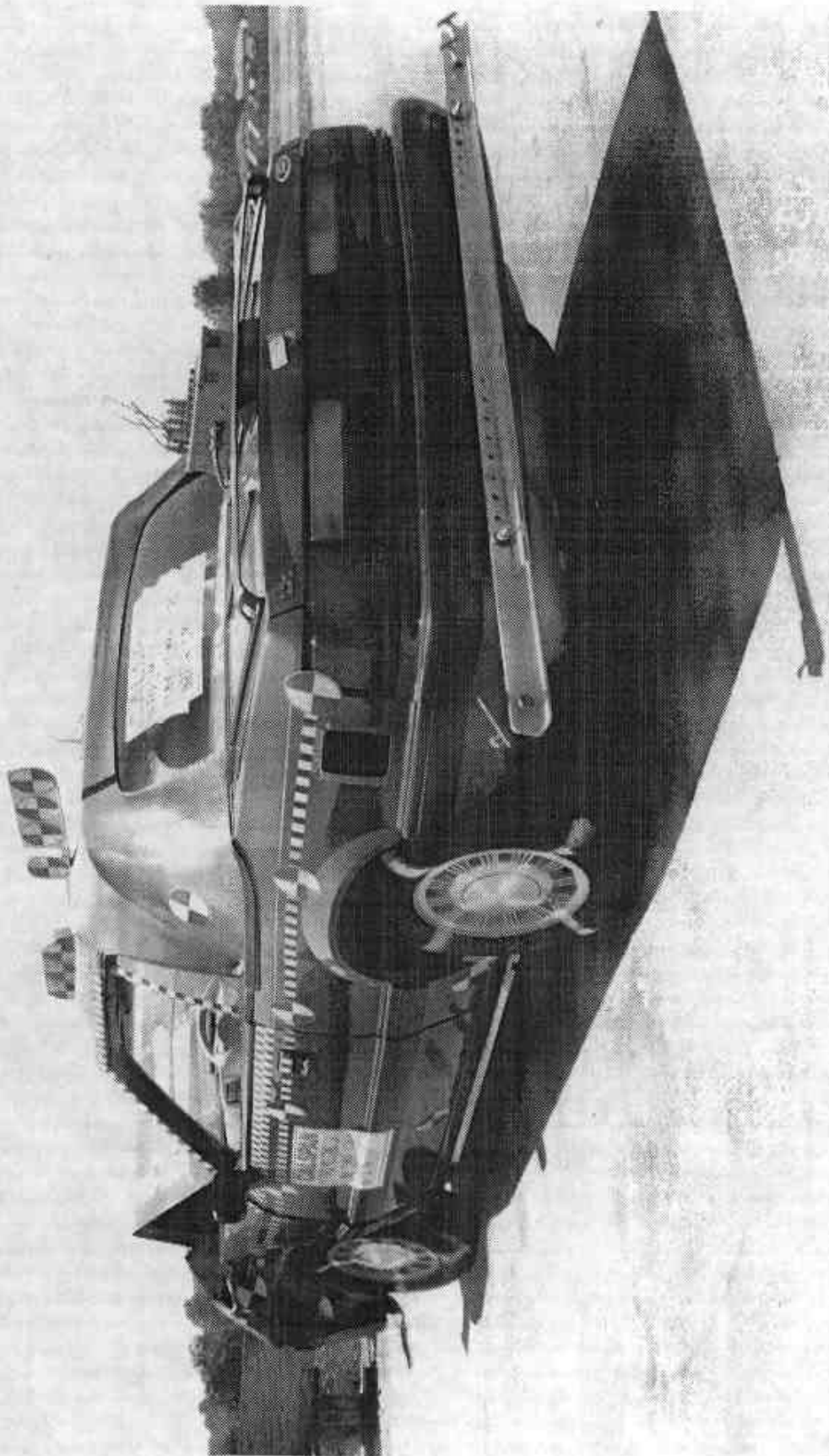


FIGURE A-10 POST-TEST LEFT REAR THREE-QUARTER VIEW

A-12

7920-1



FIGURE A-11 PRE-TEST WINDSHIELD VIEW

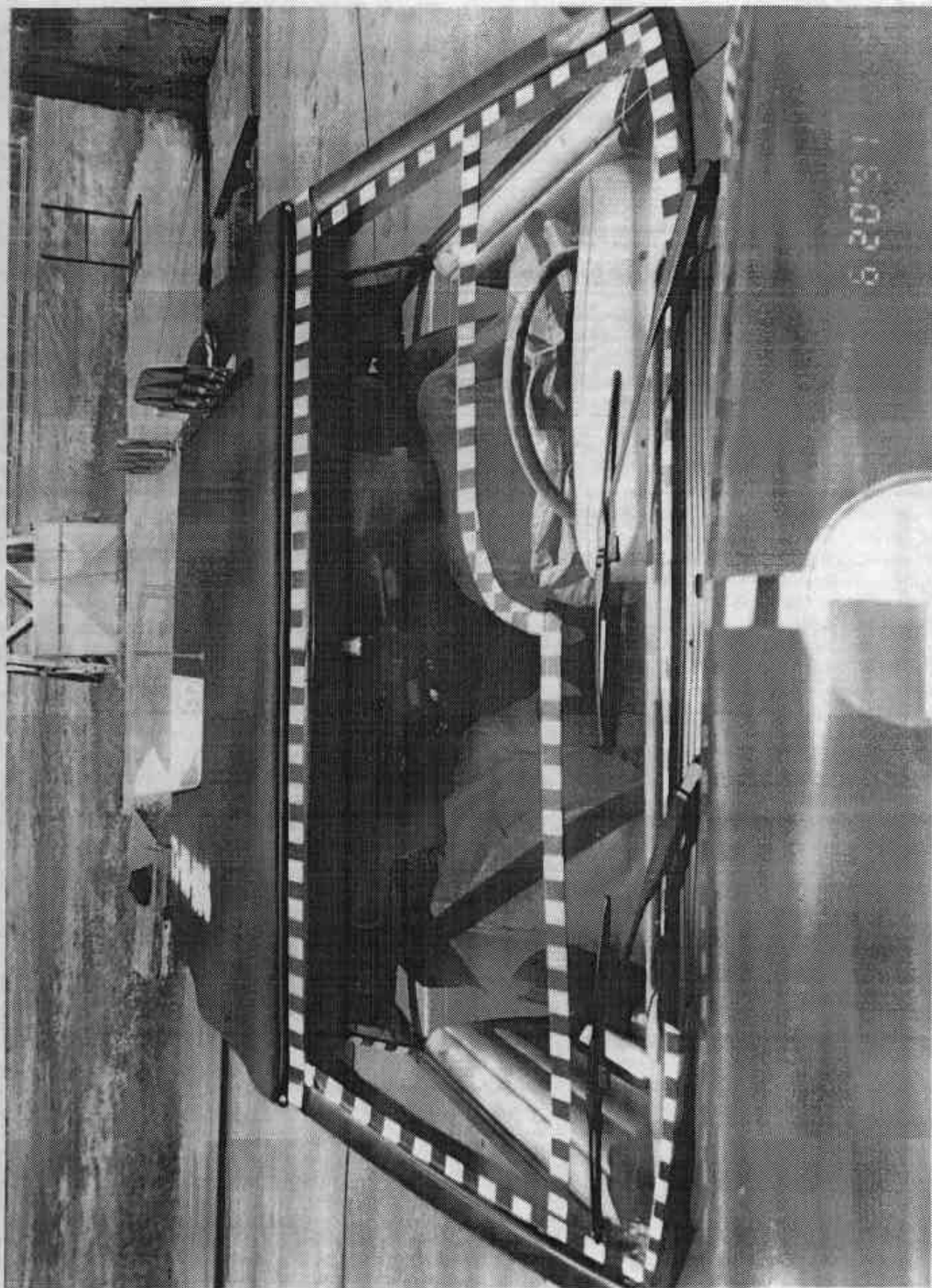


Figure A-12. POST-TEST WINDSHIELD VIEW

A-14

7920-1

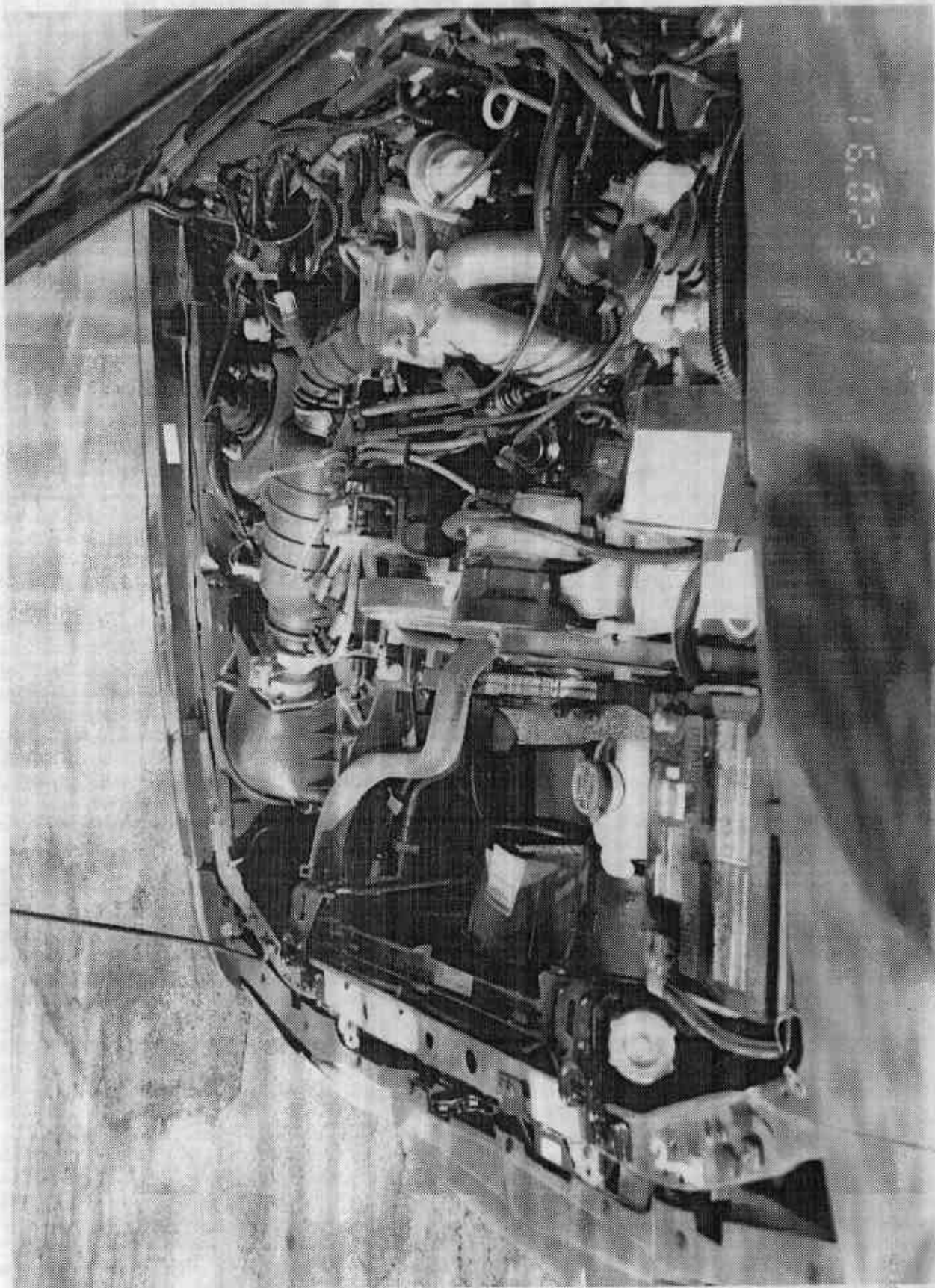


Figure A-13 PRE-TEST ENGINE COMPARTMENT VIEW

A-15

7920 1

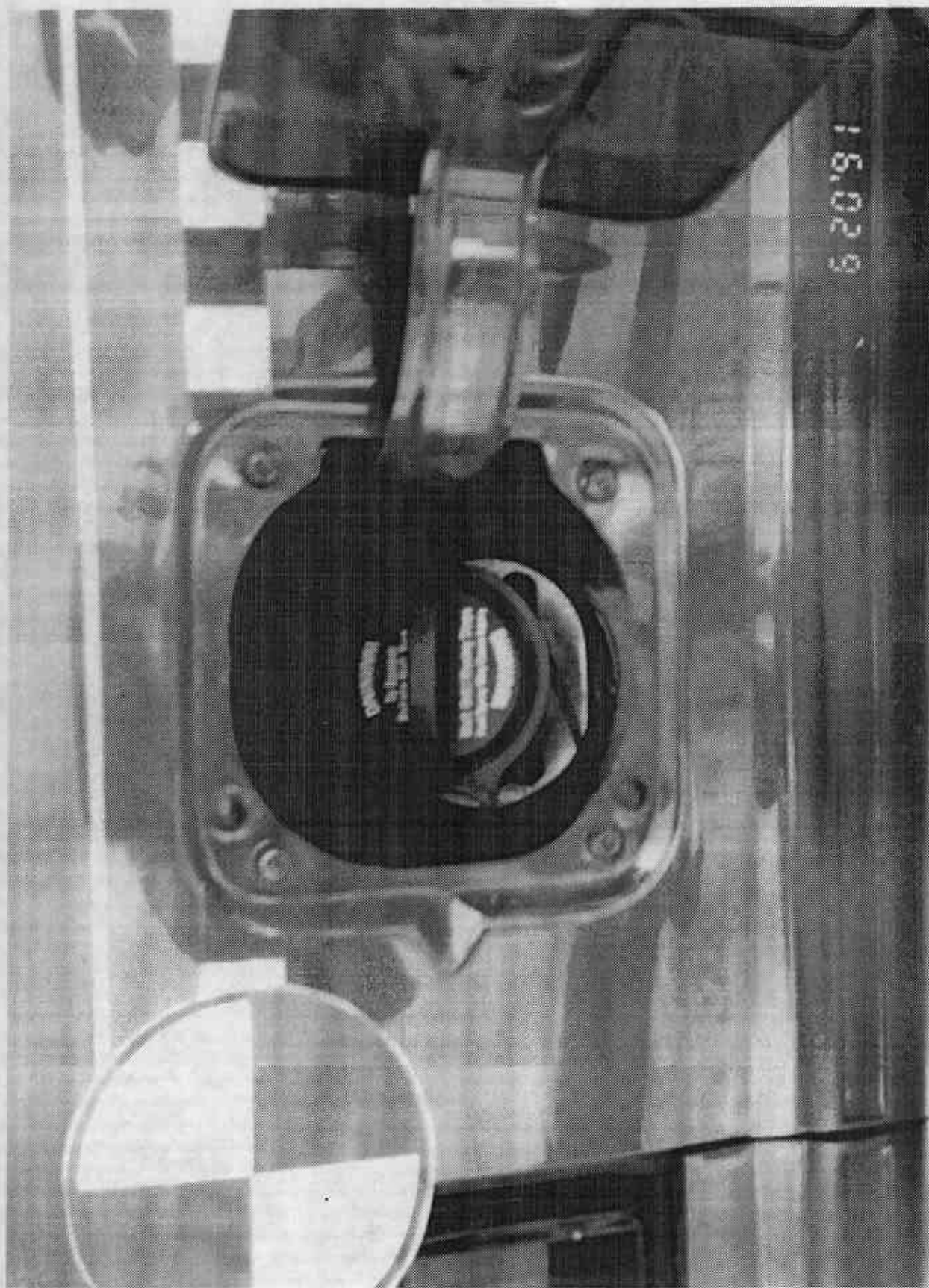


FIGURE A-14 PRE-TEST FUEL FILLER CAP PHOTO

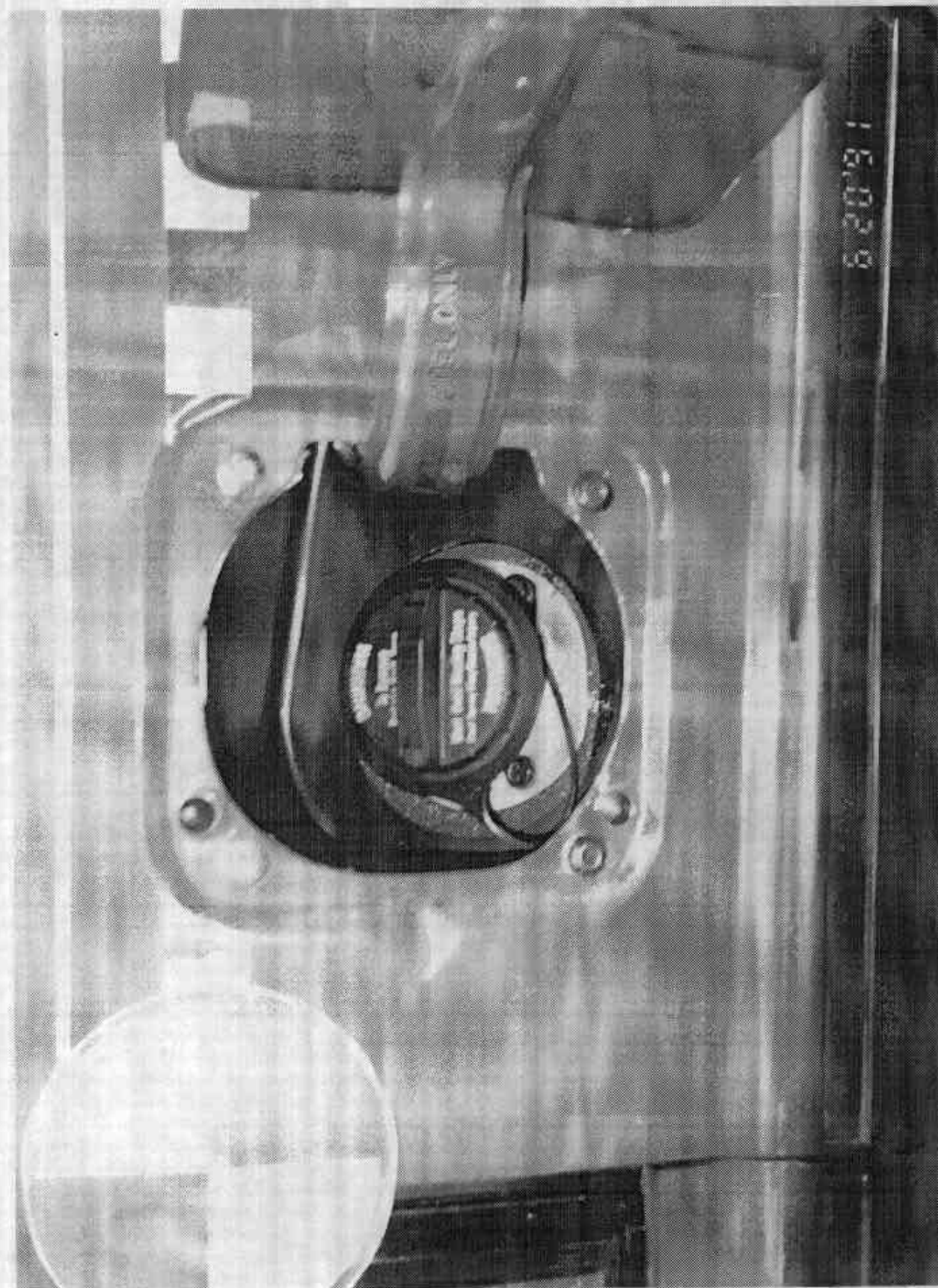


Figure A-15 POST-TEST FUEL FILLER CAP PHOTO

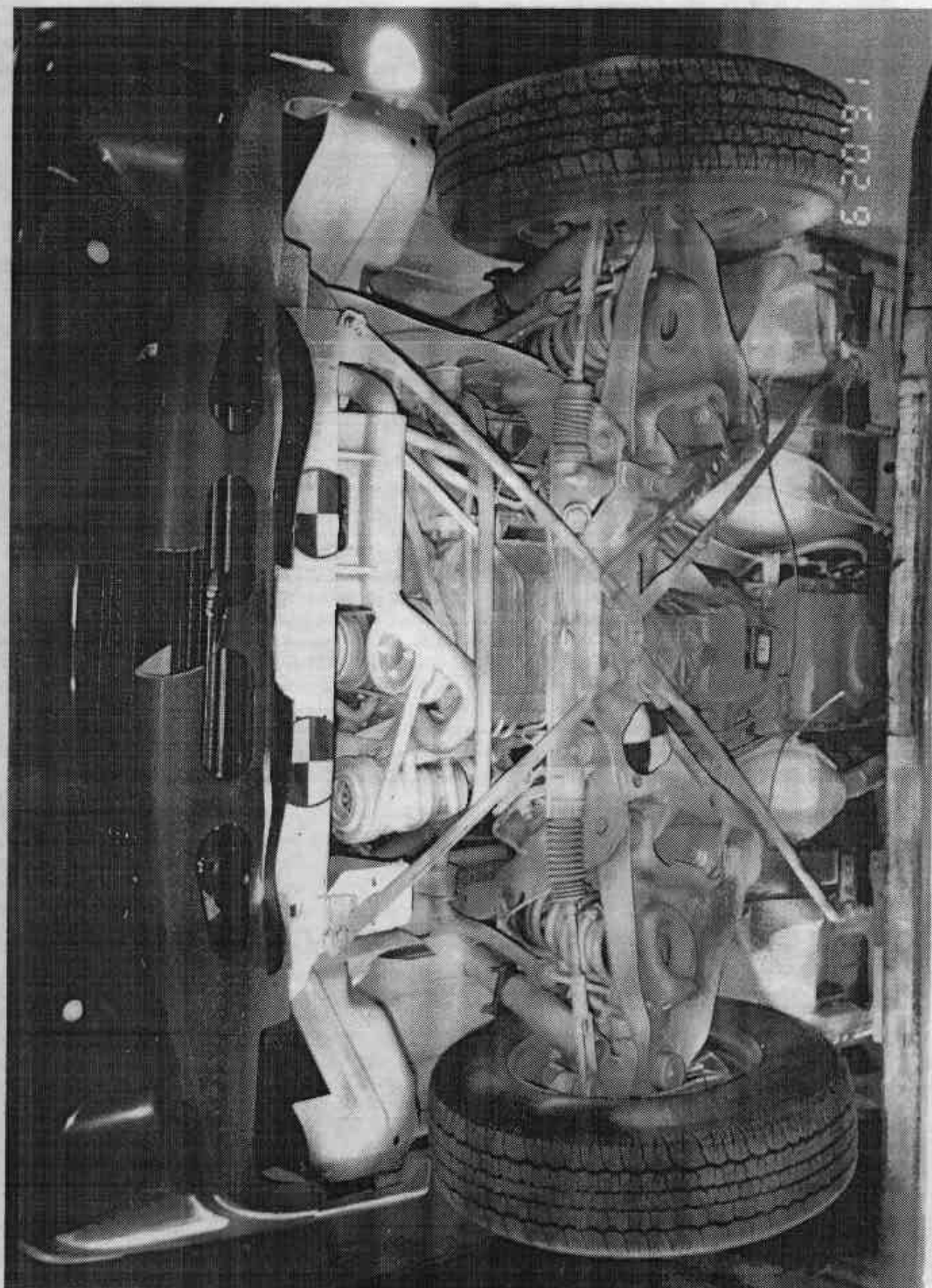


Figure A-16 PRE-TEST FRONT UNDERBODY VIEW

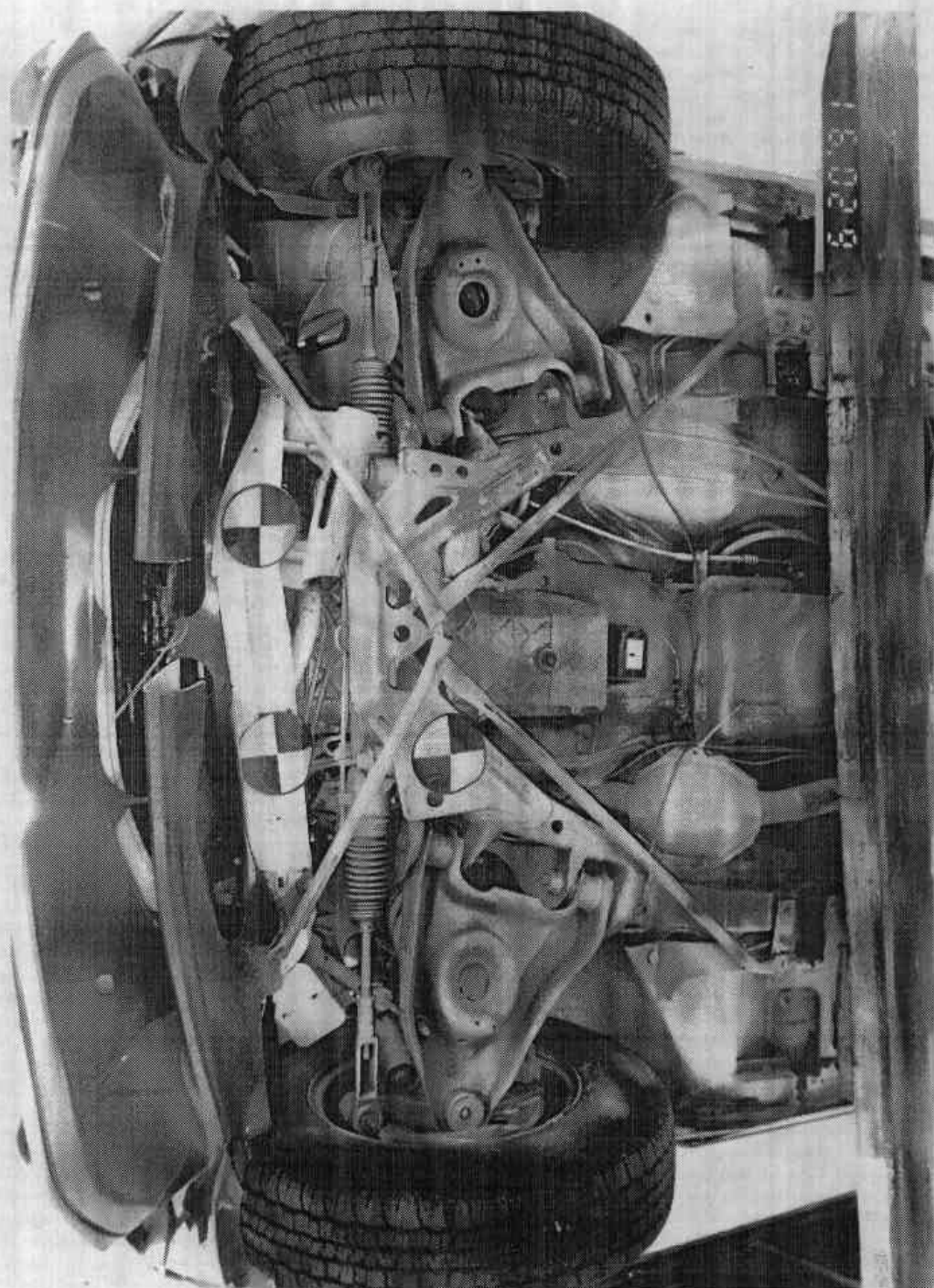


FIGURE A-17 POST-TEST FRONT UNDERBODY VIEW

A-19

7920-1

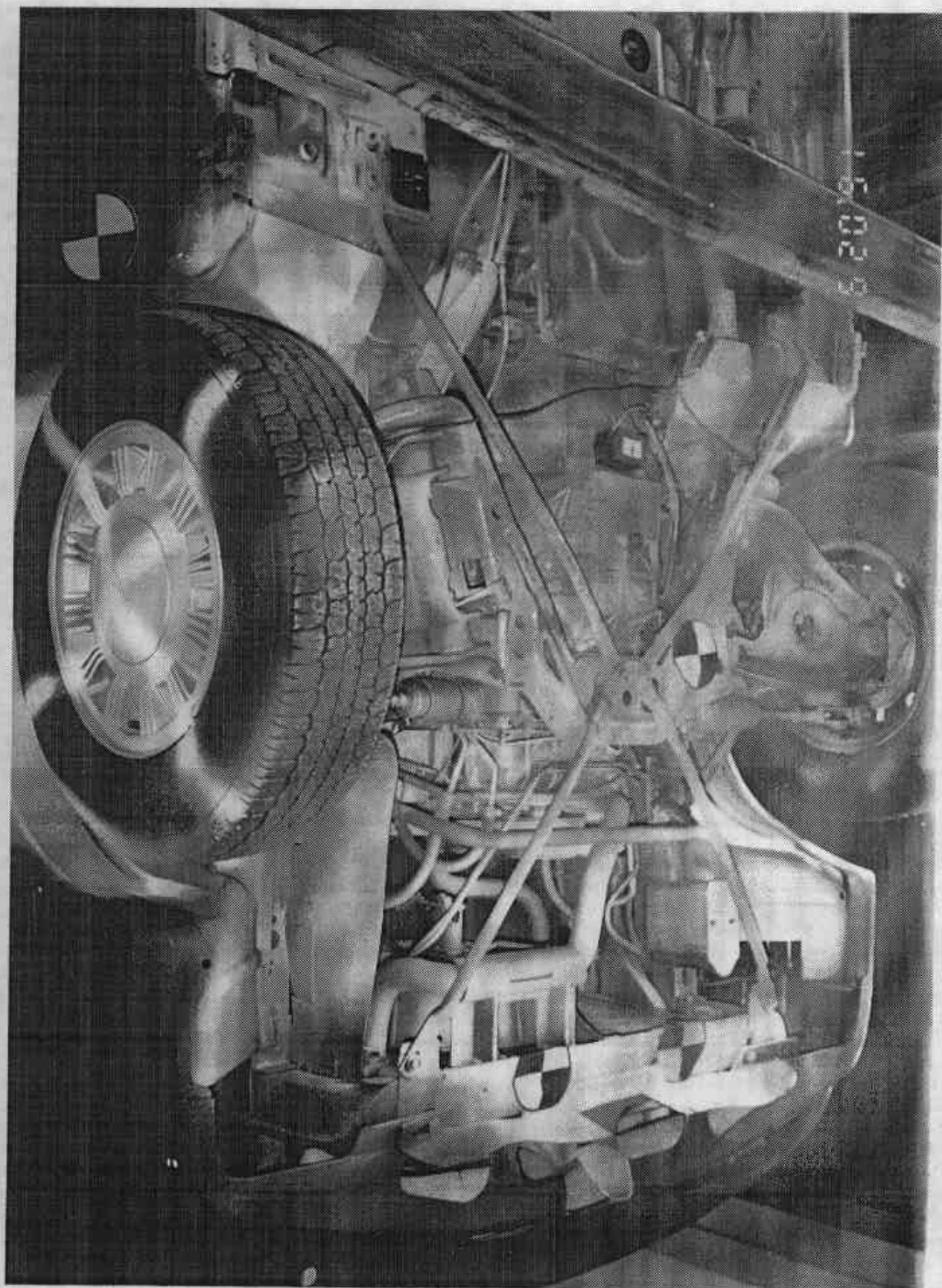


FIGURE A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

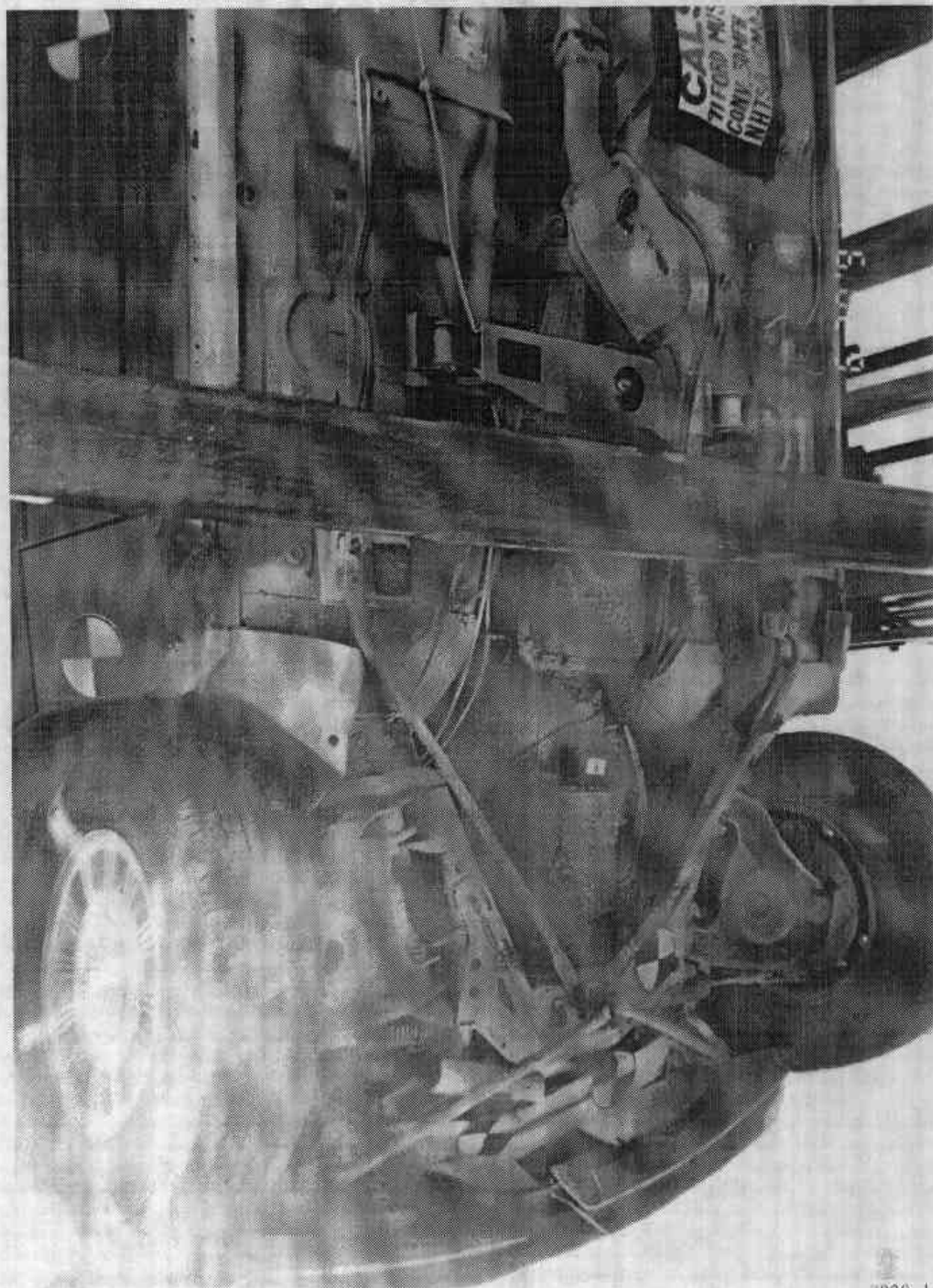


Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

A-21

7920-1

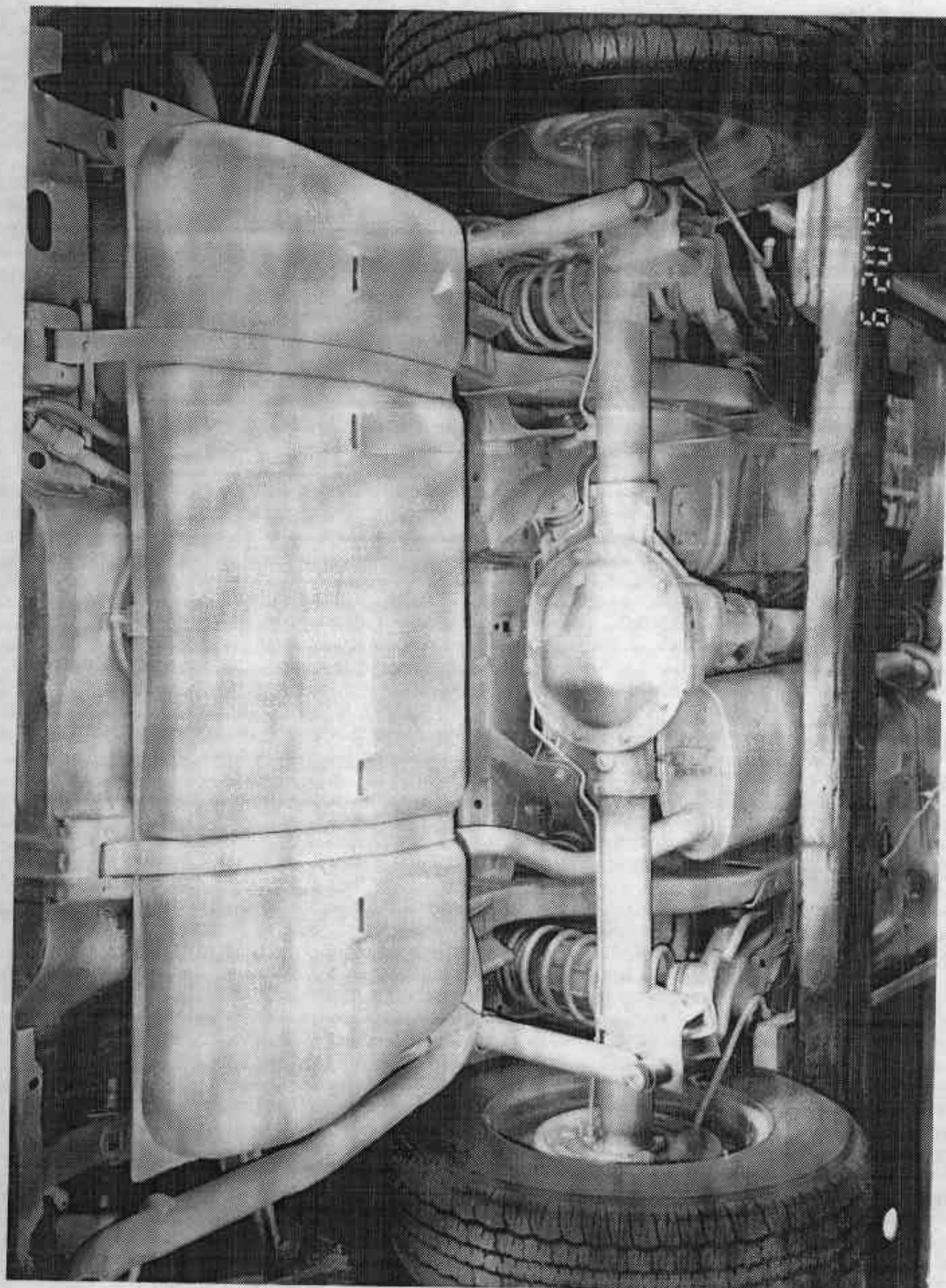


Figure A-20. PRE-TEST REAR UNDERBODY VIEW

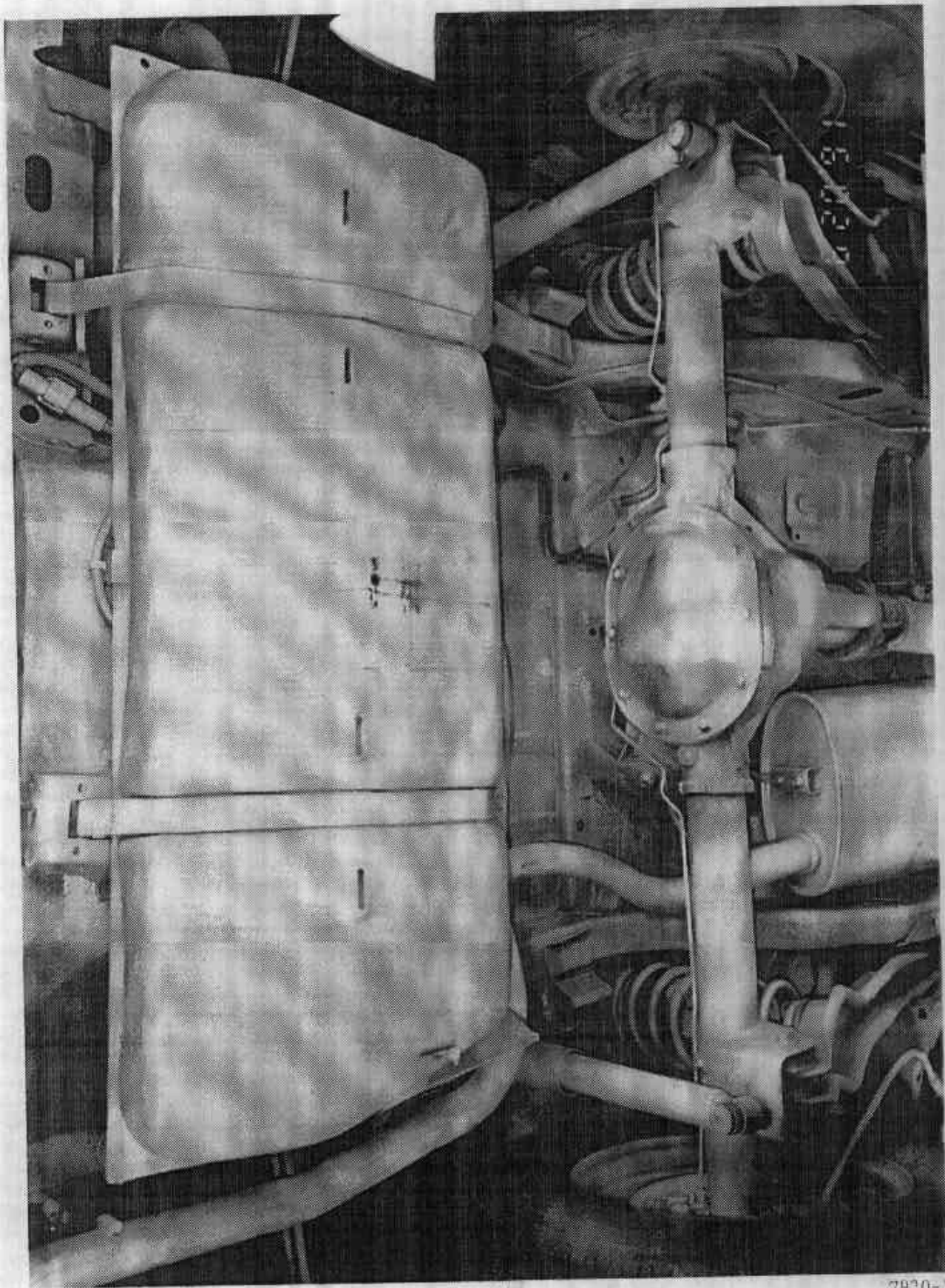


Figure A-21 POST-TEST REAR UNDERBODY VIEW



Figure A-22 CERTIFICATION LABEL

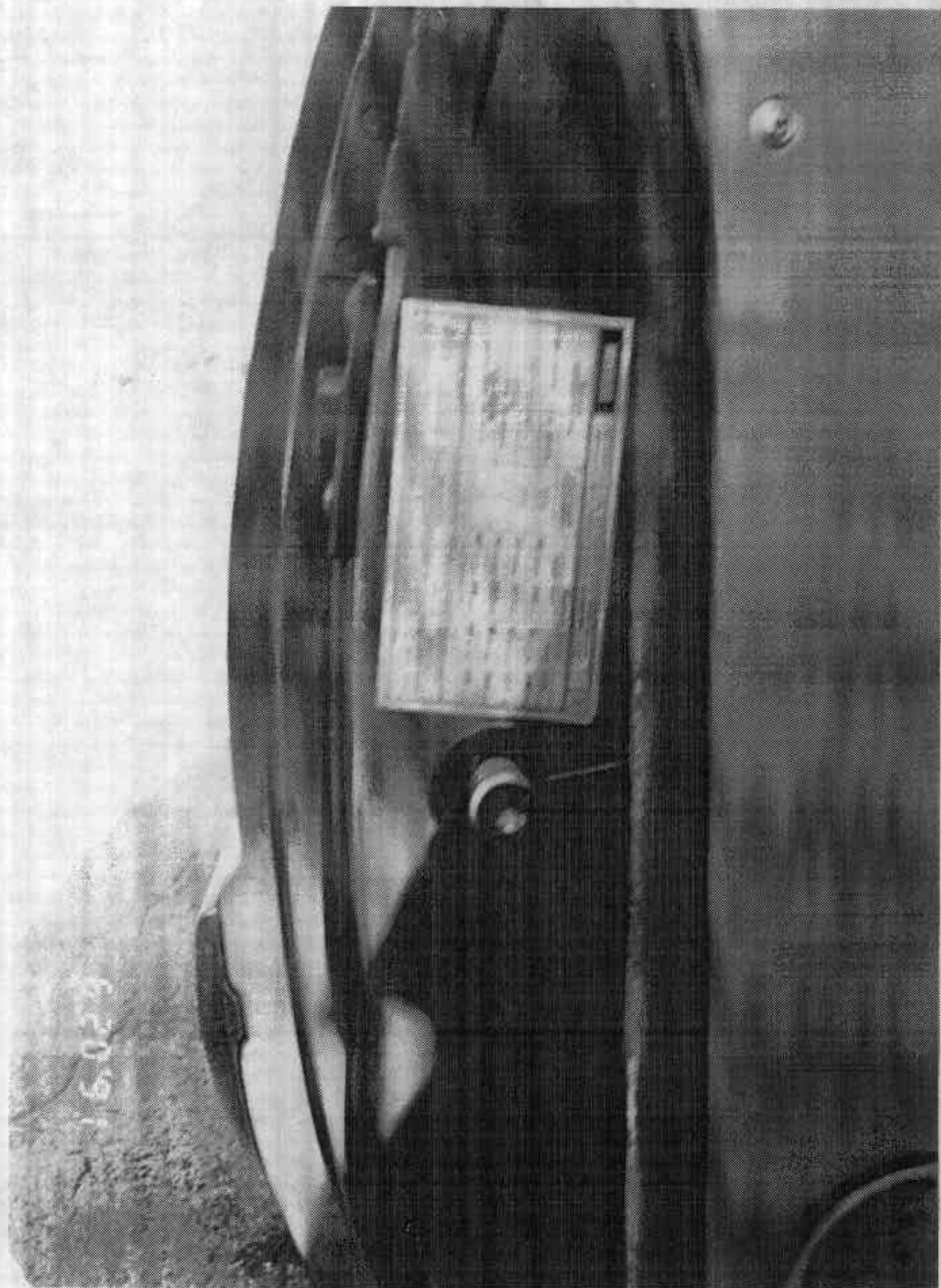


Figure A-23 TIRE PLACARD



FIGURE A-24 PRE-TEST DRIVER DUMMY POSITION

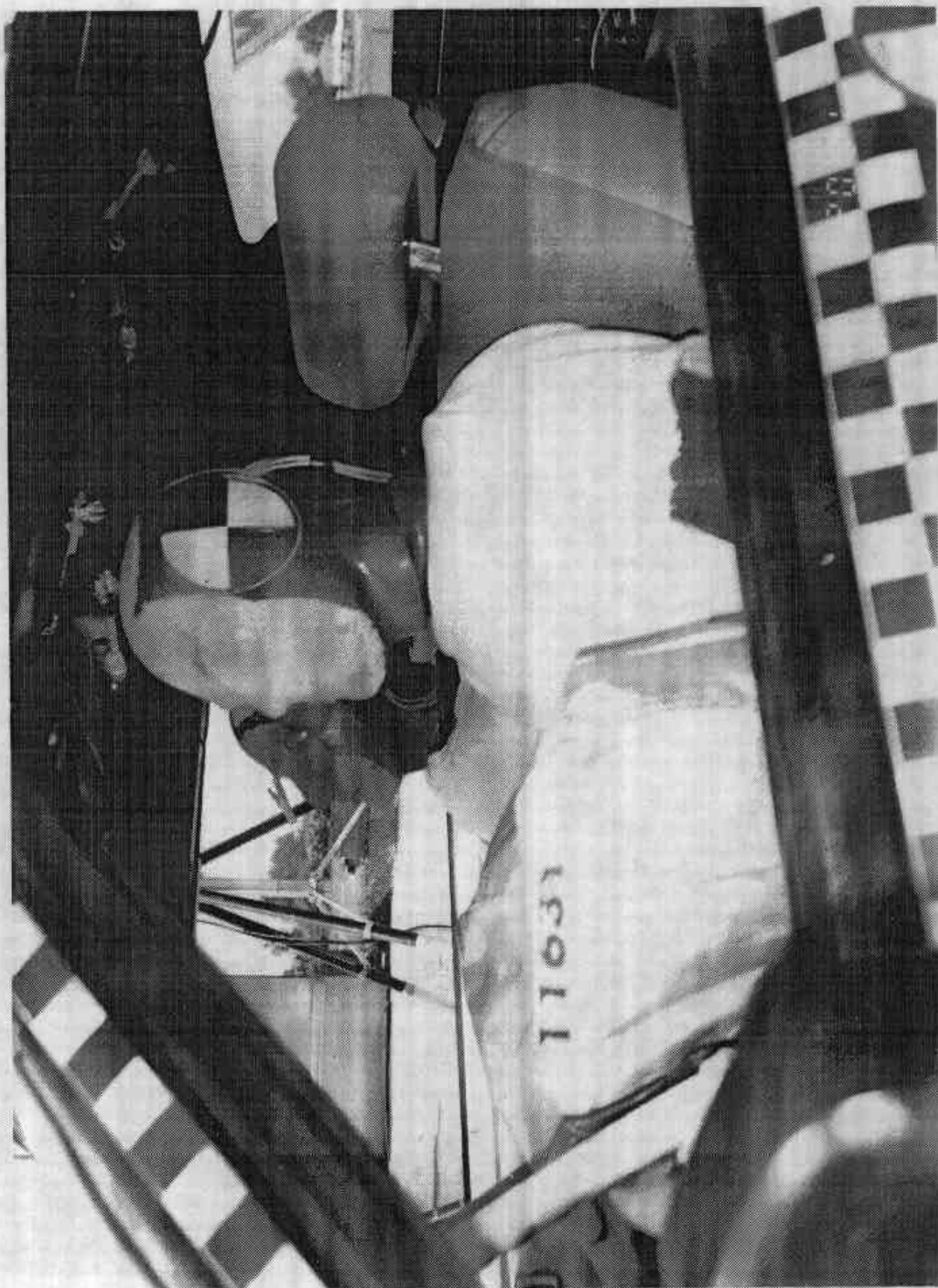


FIGURE A-25 POST-TEST DRIVER DUMMY POSITION



Figure A-26 PRE-TEST PASSENGER DUMMY POSITION

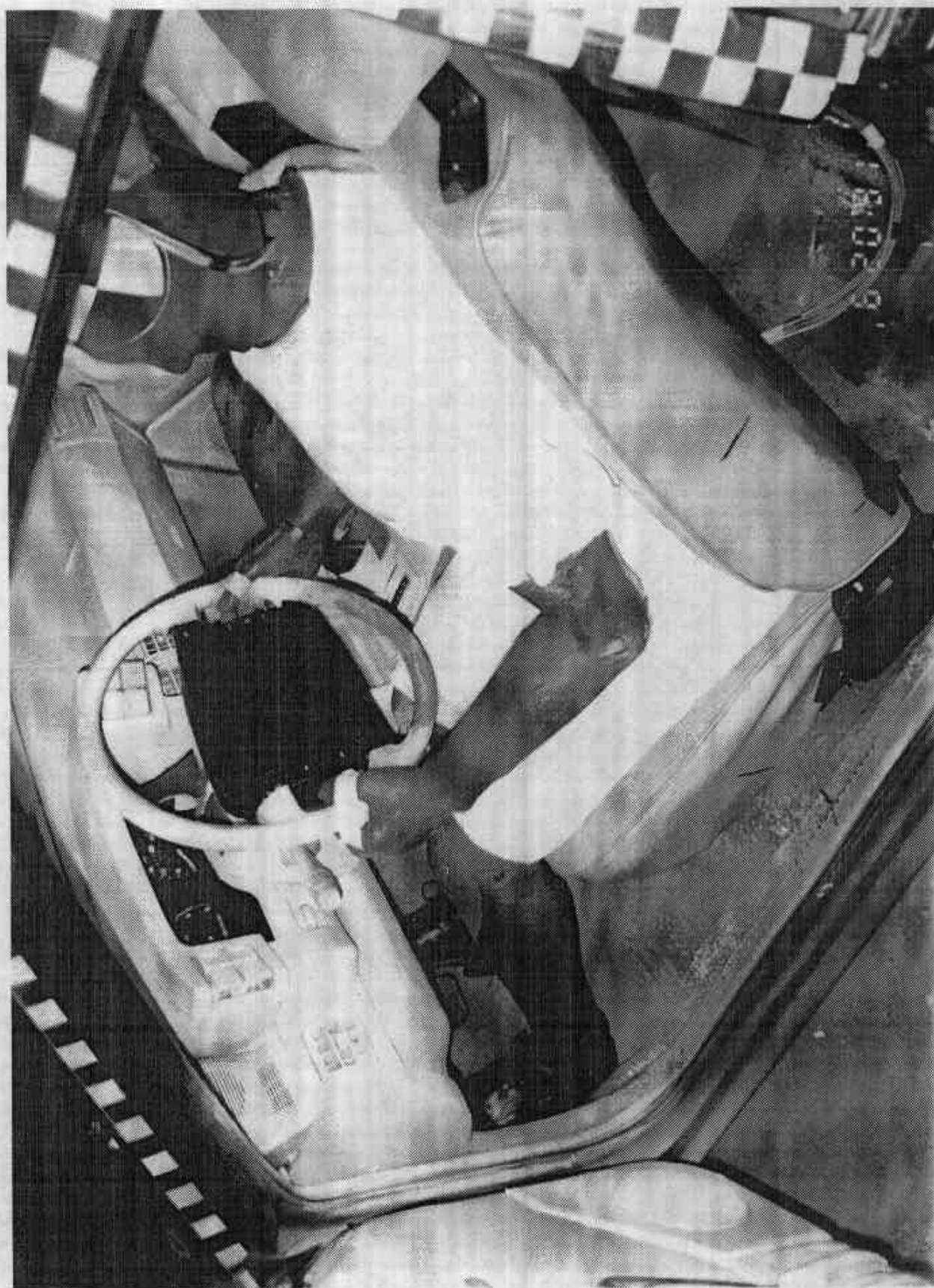


FIGURE A-27 PRE-TEST DRIVER DUMMY AND INTERIOR VIEW



Figure A-28 PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW

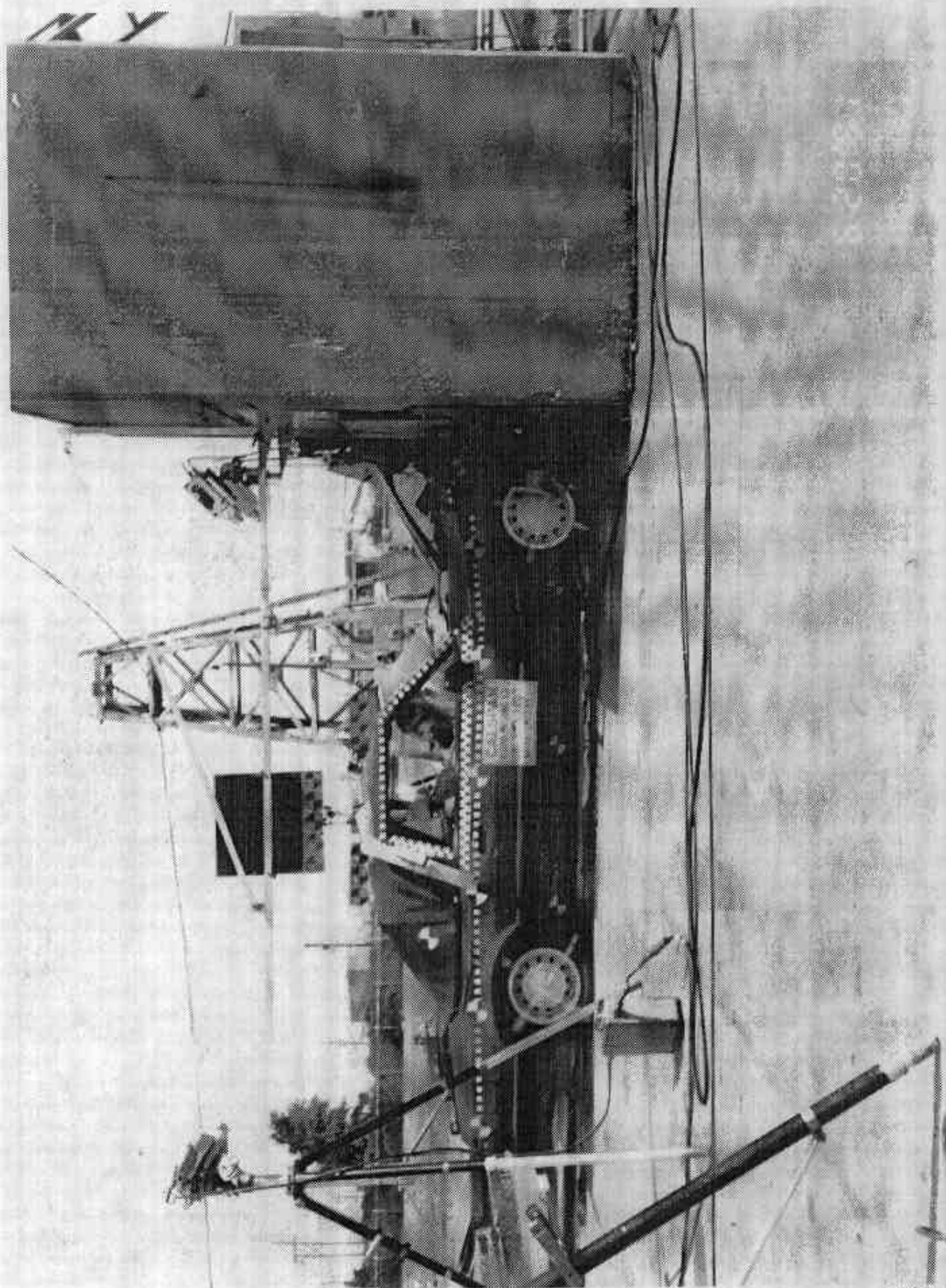


Figure A-29 VEHICLE IMPACT

A-31

7920-1



Figure A-30 POST-TEST VEHICLE AIRBAG

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CM0209

VEHICLE DATA

FILTER CHANNEL CLASS

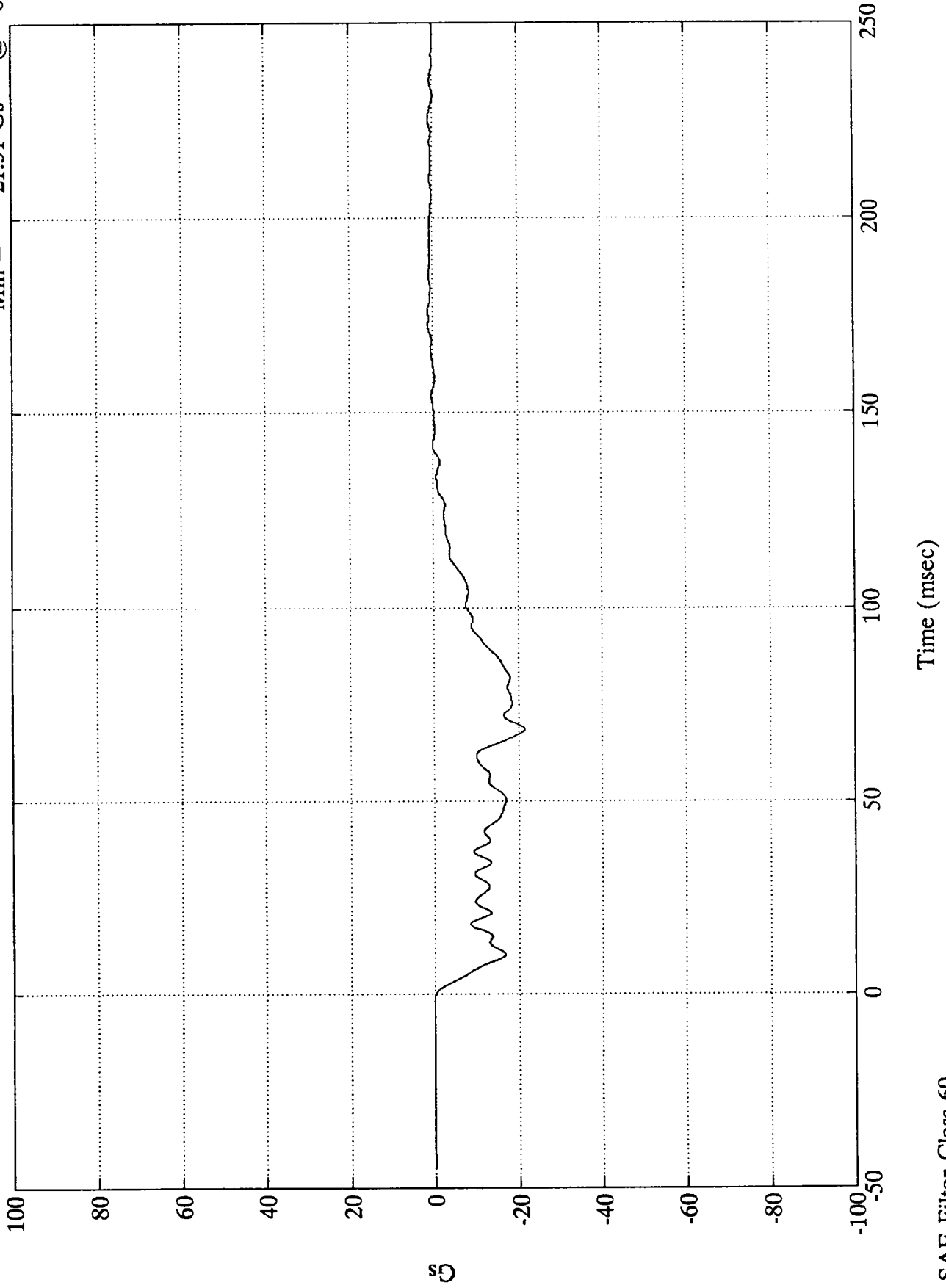
60

L. Rear X-member X (#1)

Max =
Min =

1.11 Gs
-21.51 Gs

@ 176.04 msec
@ 68.52 msec

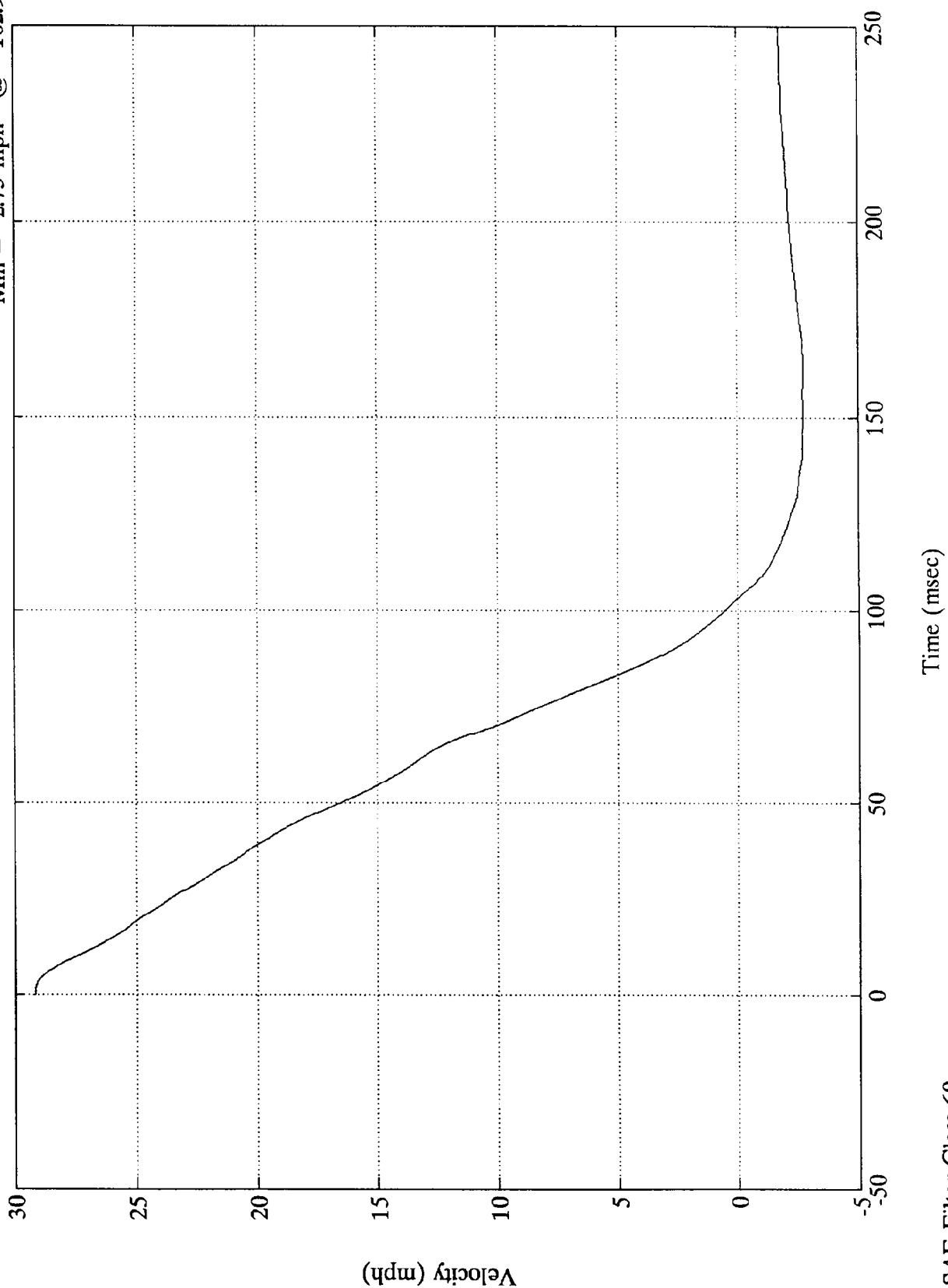


Gs

Test 1086

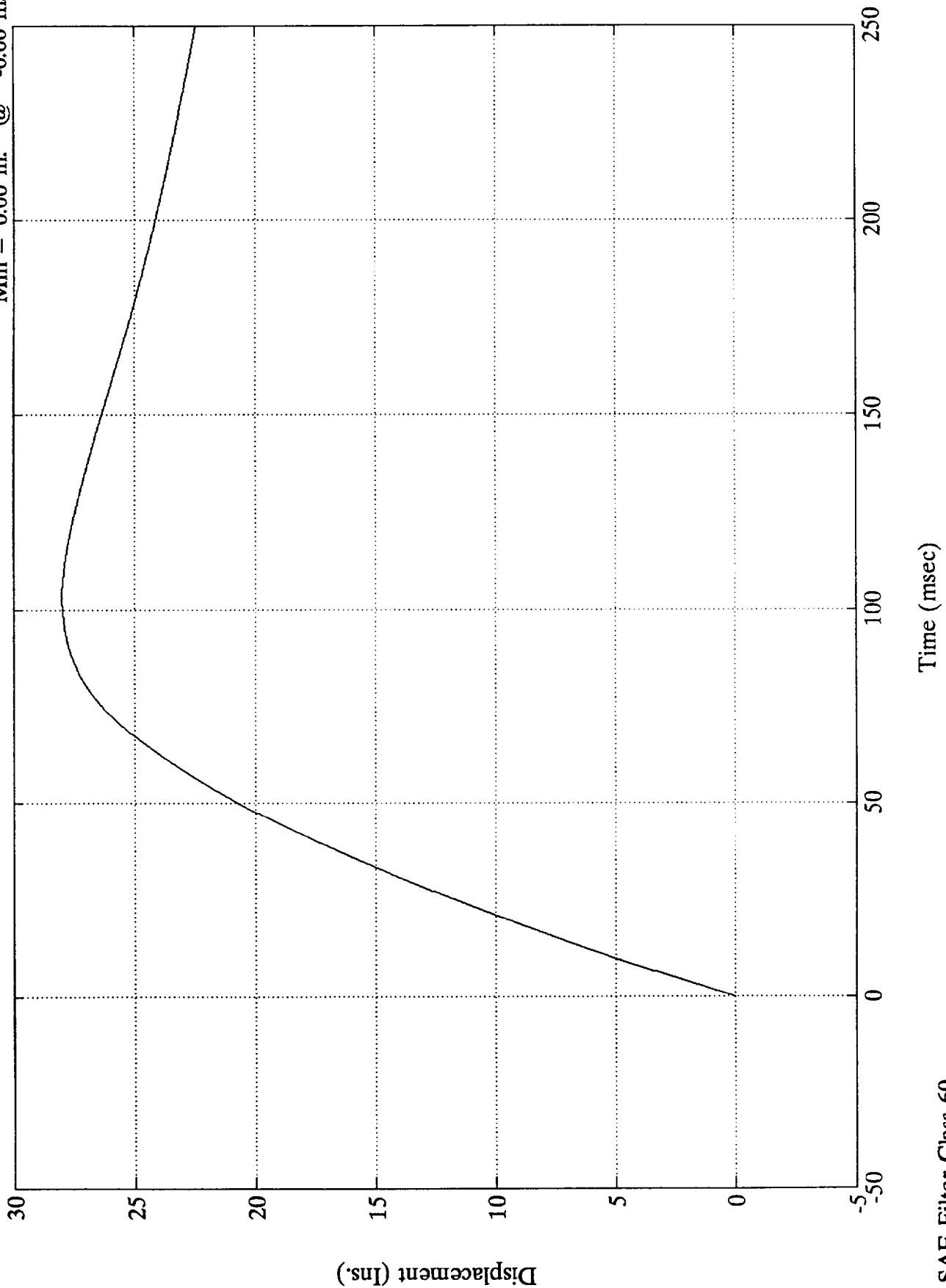
L. Rear X-member X (#1)

Max = 29.20 mph @ -0.00 msec
Min = -2.73 mph @ 162.96 msec



SAE Filter Class 60

L. Rear X-member X (#1)
Max = 27.99 in. @ 105.60 msec
Min = 0.00 in. @ -0.00 msec

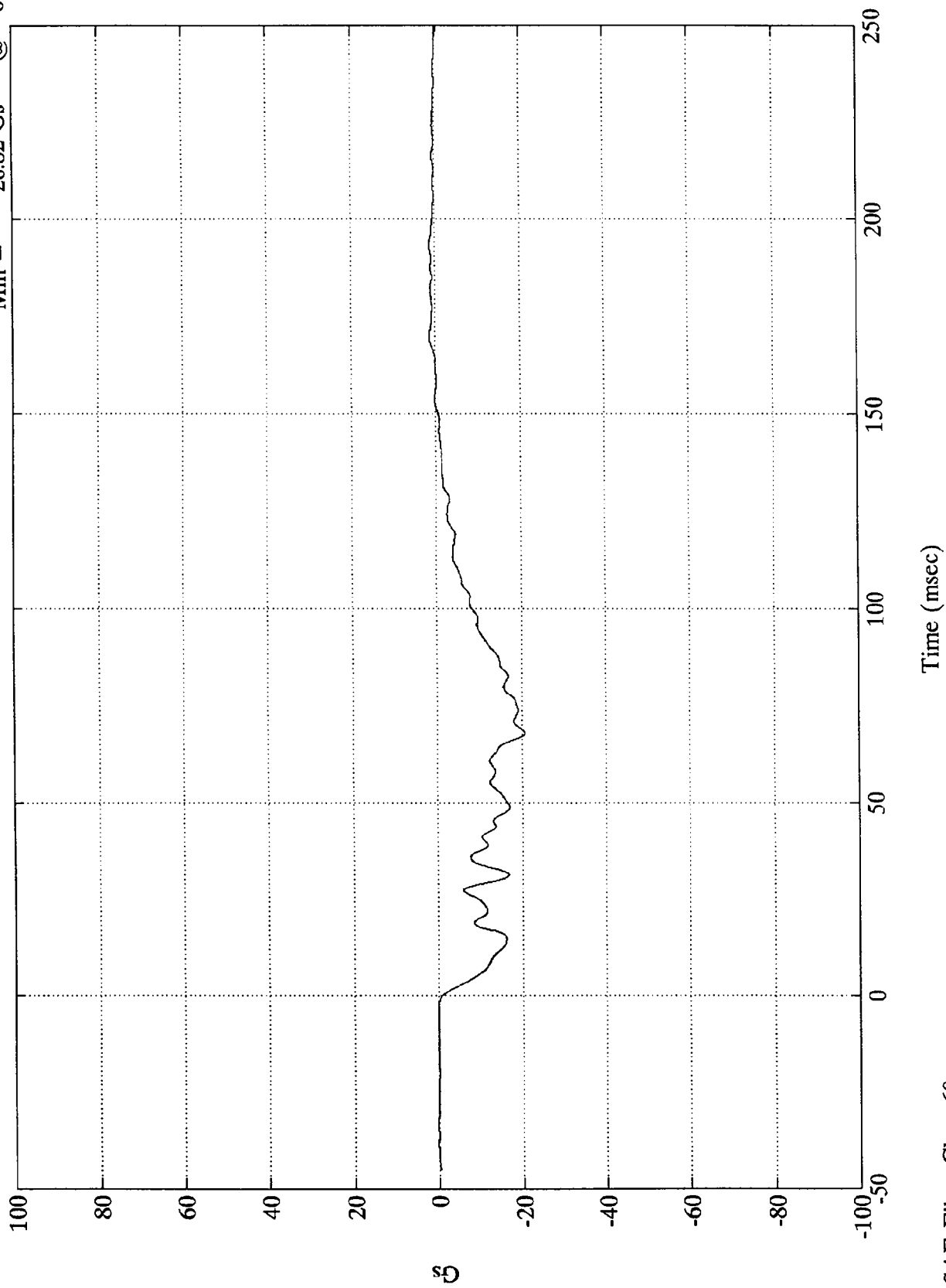


SAE Filter Class 60

Test 1086

R. Rear X-member X (#2)

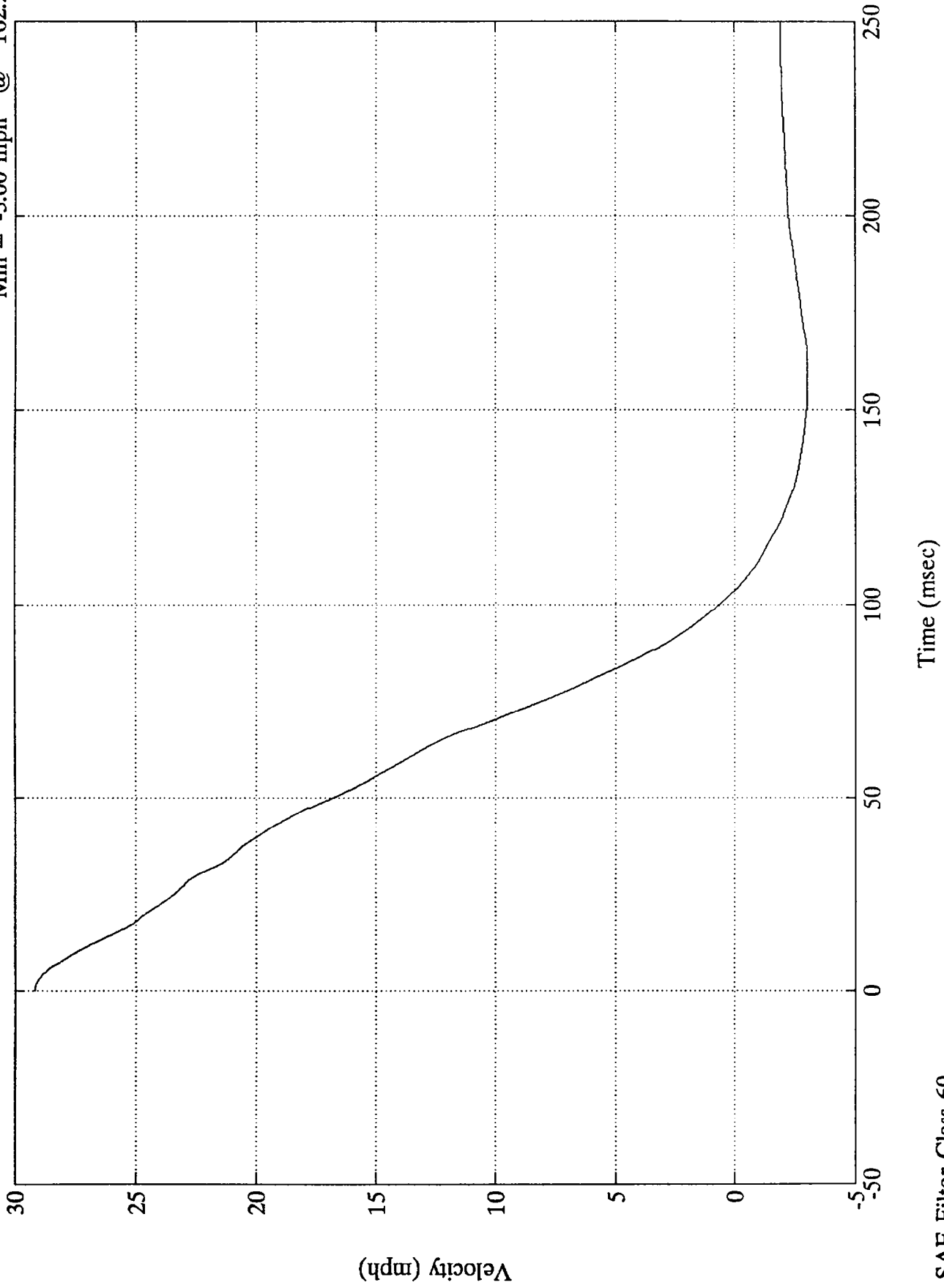
Max = 1.47 Gs @ 169.67 msec
Min = -20.82 Gs @ 68.16 msec



SAE Filter Class 60

R. Rear X-member X (#2)

Max = 29.20 mph @ -0.00 msec
Min = -3.00 mph @ 162.24 msec

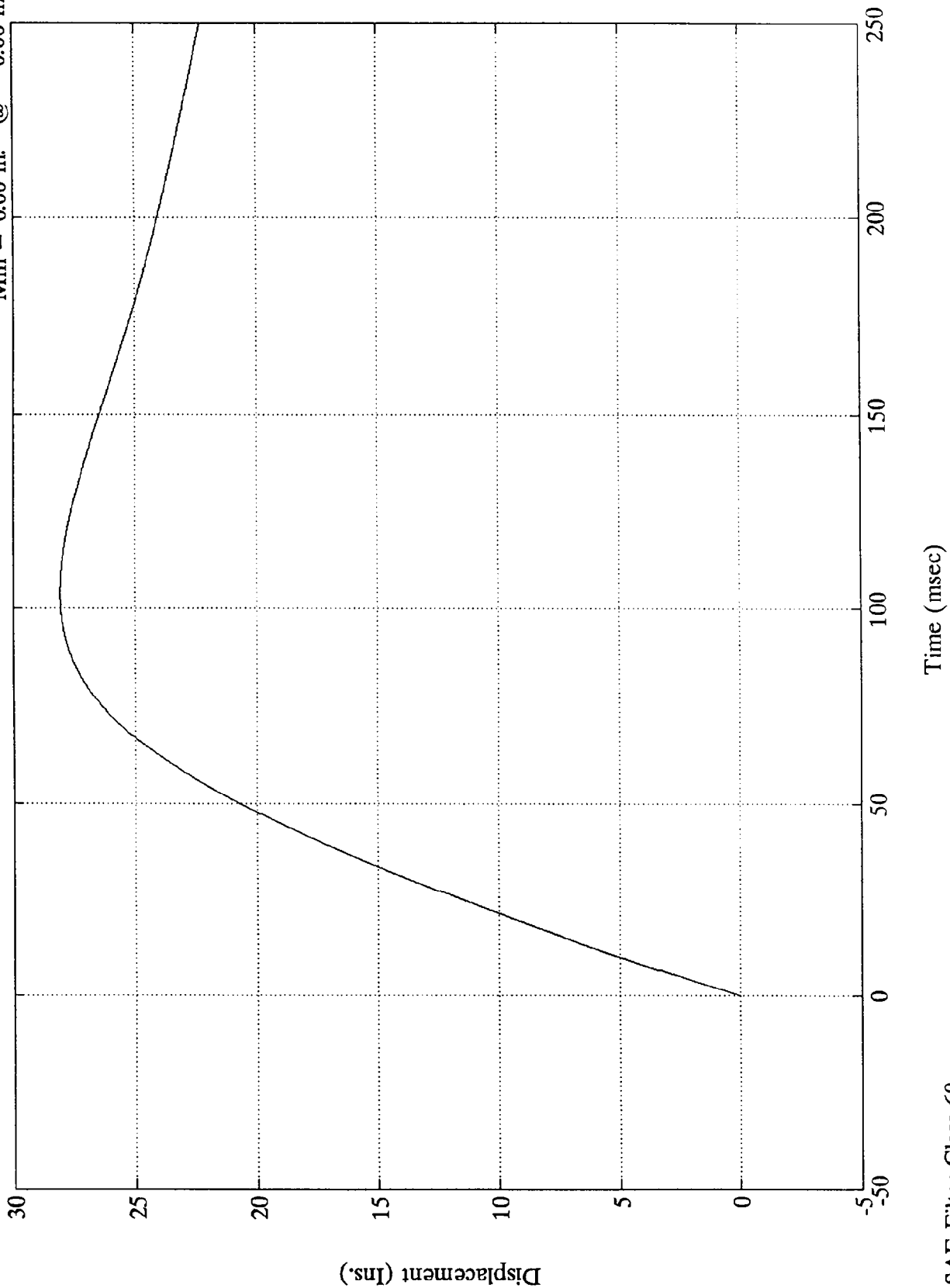


SAE Filter Class 60

Test 1086

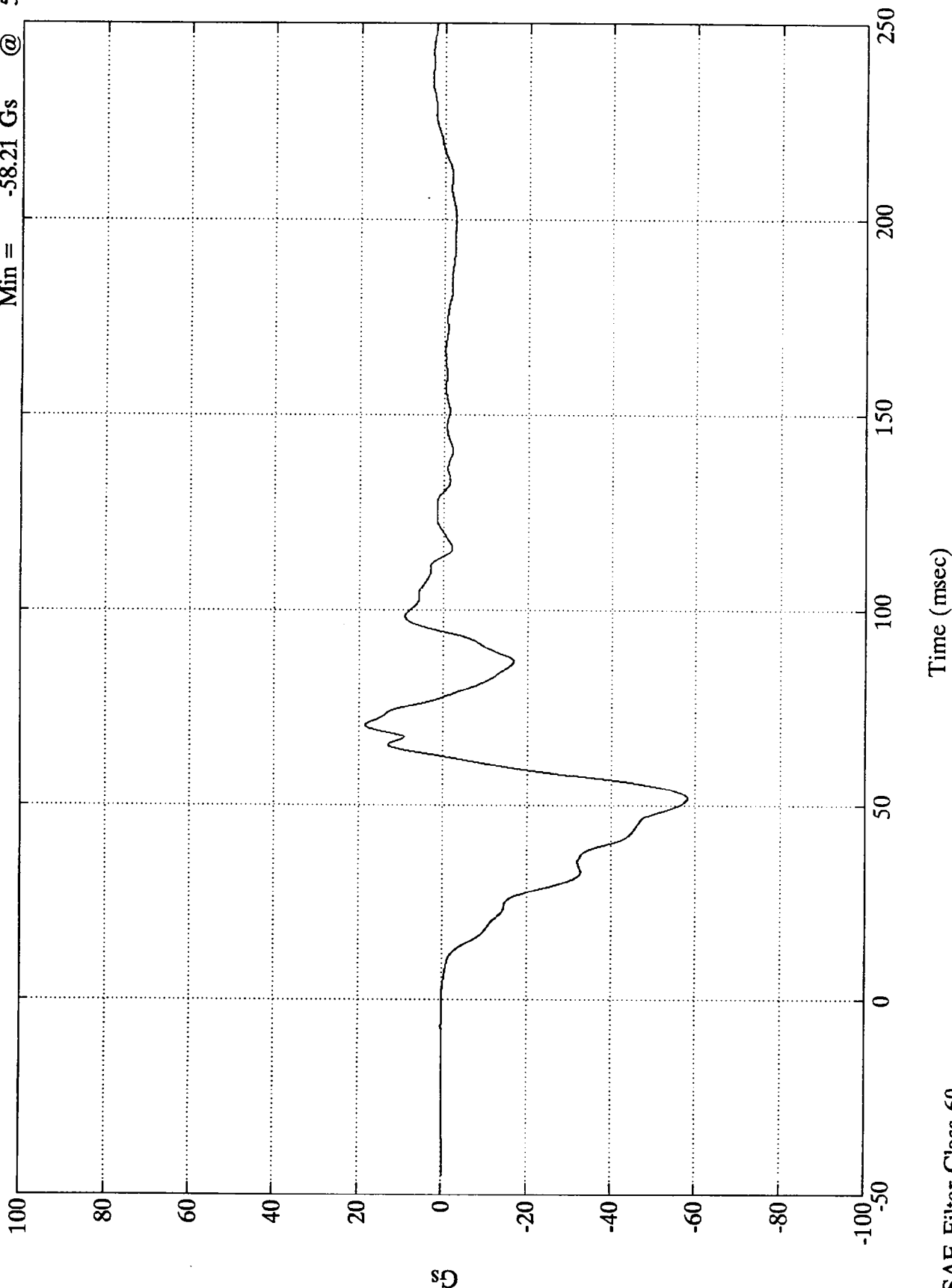
R. Rear X-member X (#2)

Max = 28.07 in. @ 105.36 msec
Min = 0.00 in. @ -0.00 msec



Engine Top X (#3)

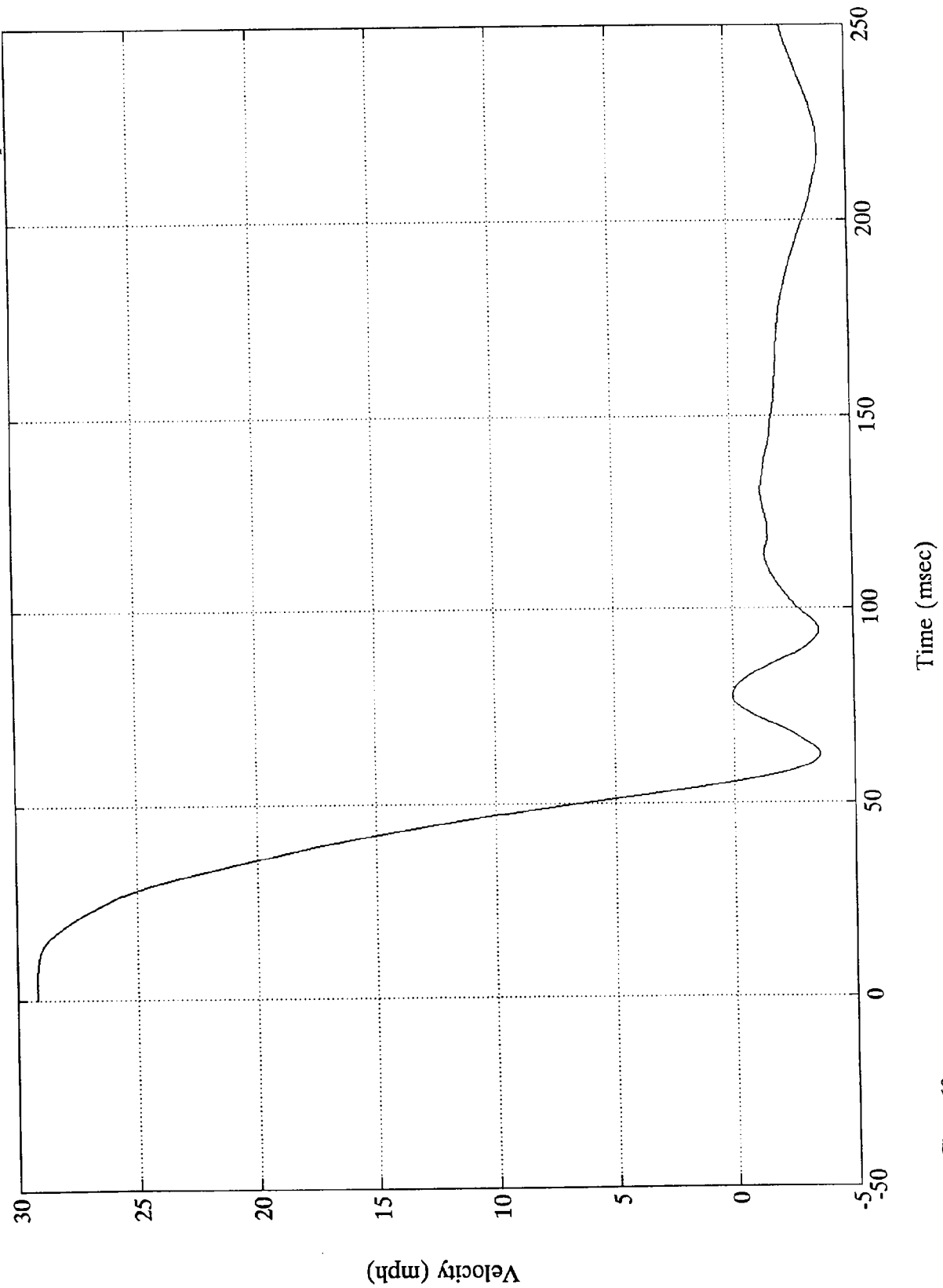
Max = 18.47 Gs @ 70.55 msec
Min = -58.21 Gs @ 51.95 msec



Test 1086

Engine Top X (#3)

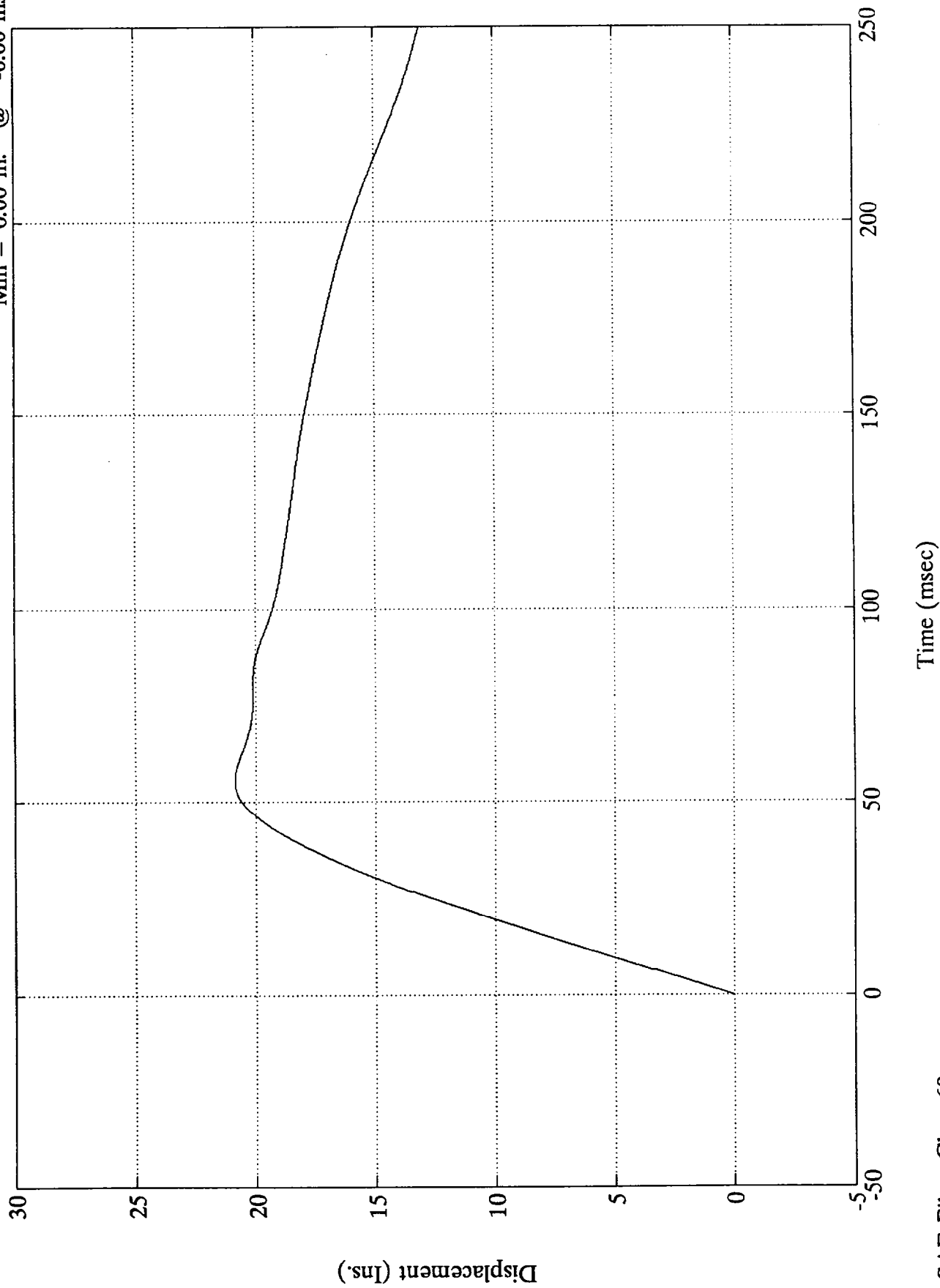
Max = 29.20 mph @ 3.12 msec
Min = -3.81 mph @ 217.68 msec



SAE Filter Class 60

Max = 20.86 in. @ 56.40 msec
Min = 0.00 in. @ -0.00 msec

Engine Top X (#3)

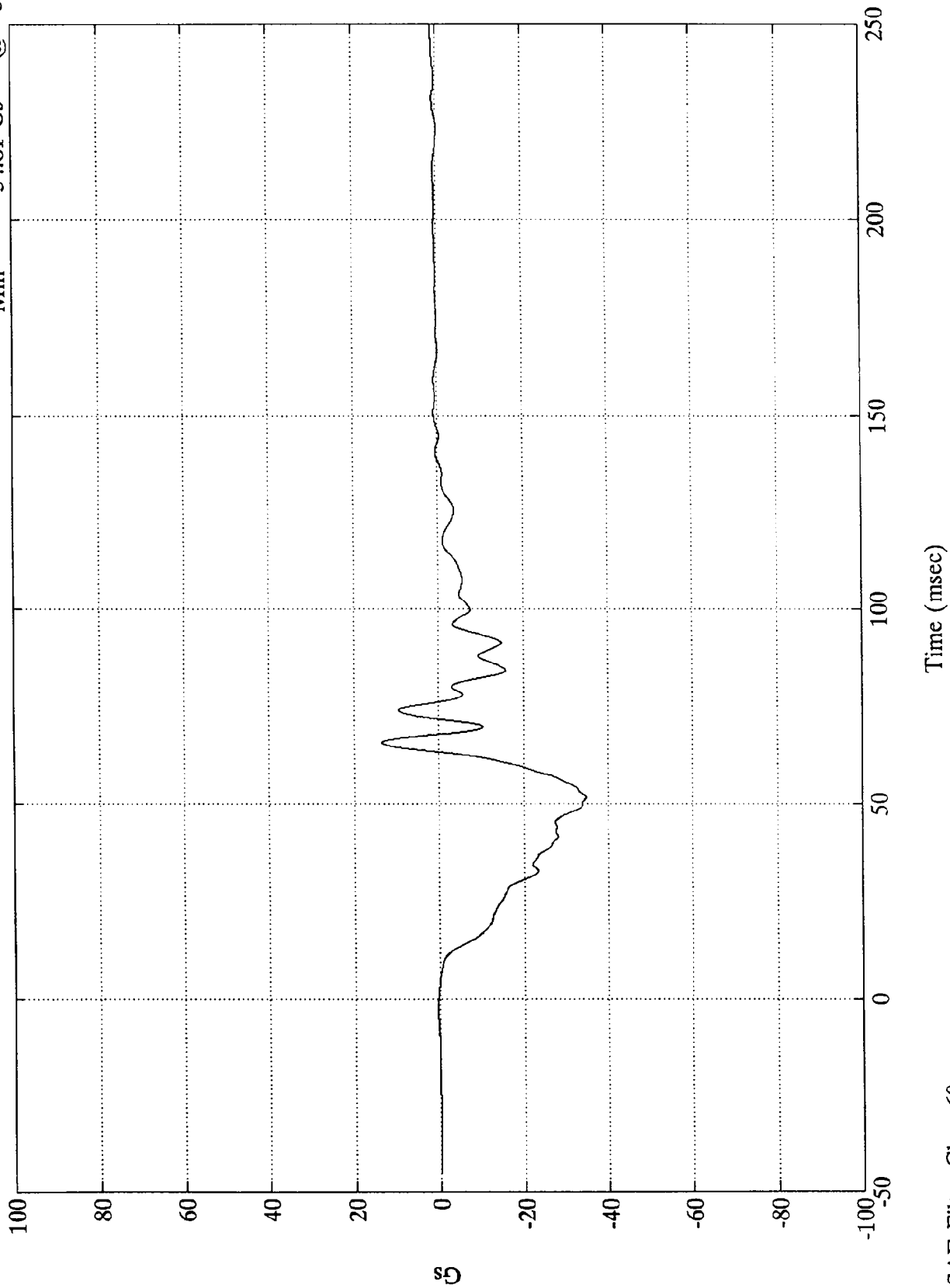


SAE Filter Class 60

Test 1086

Engine Bottom X (#4)

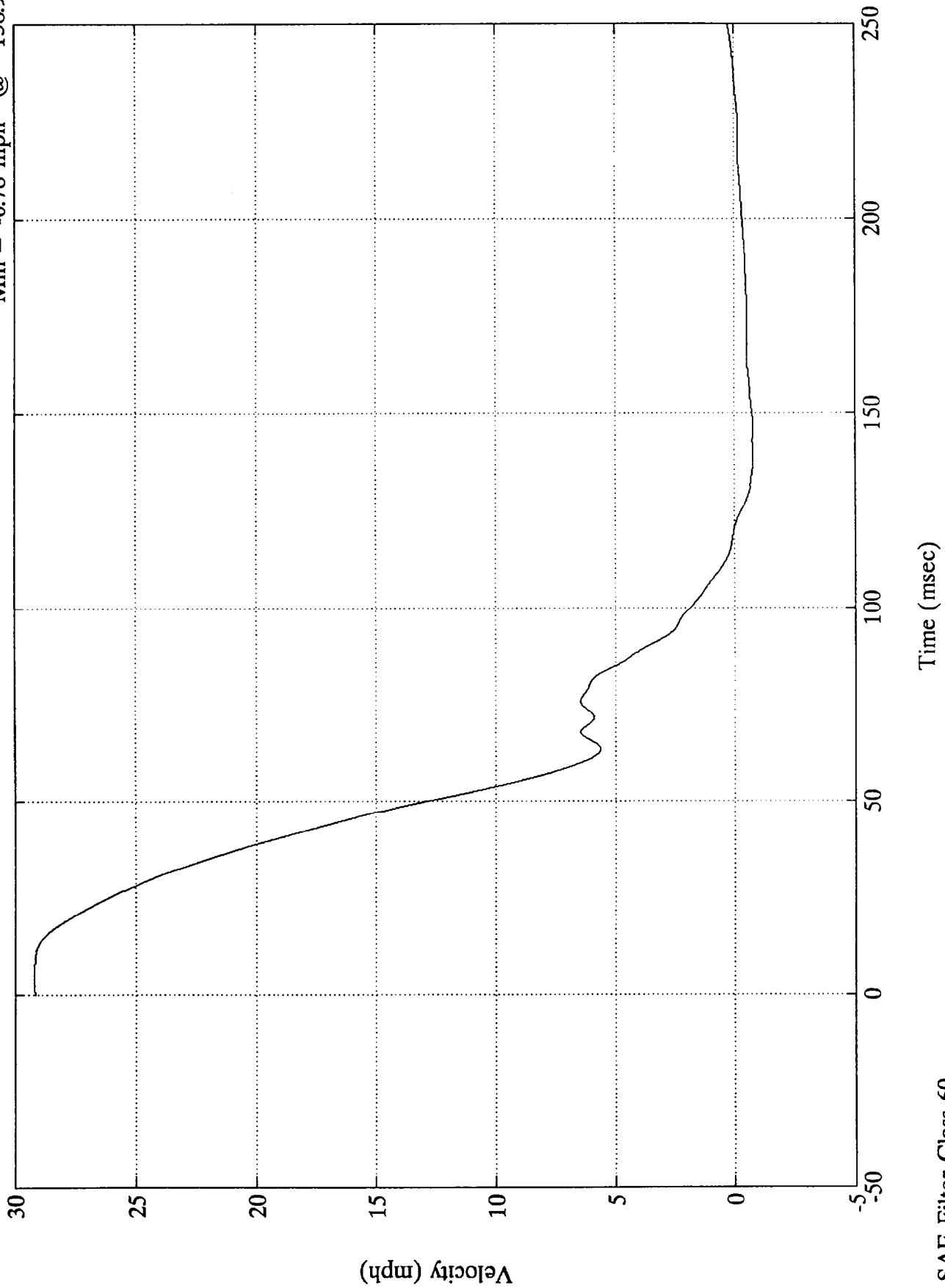
Max = 13.40 Gs @ 65.76 msec
Min = -34.81 Gs @ 51.84 msec



SAE Filter Class 60

Engine Bottom X (#4)

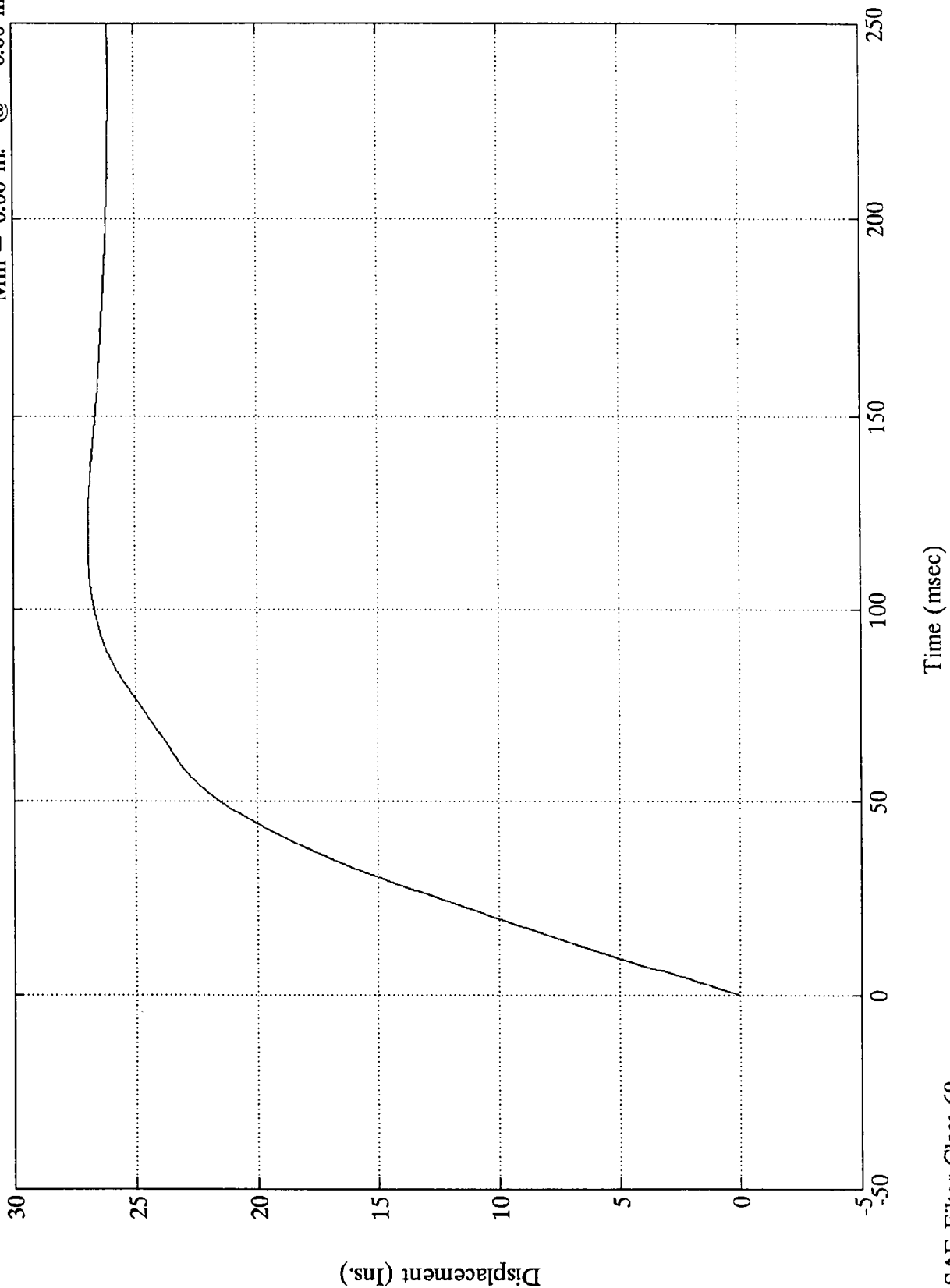
Max = 29.22 mph @ 5.76 msec
Min = -0.78 mph @ 138.96 msec



Test 1086

Engine Bottom X (#4)

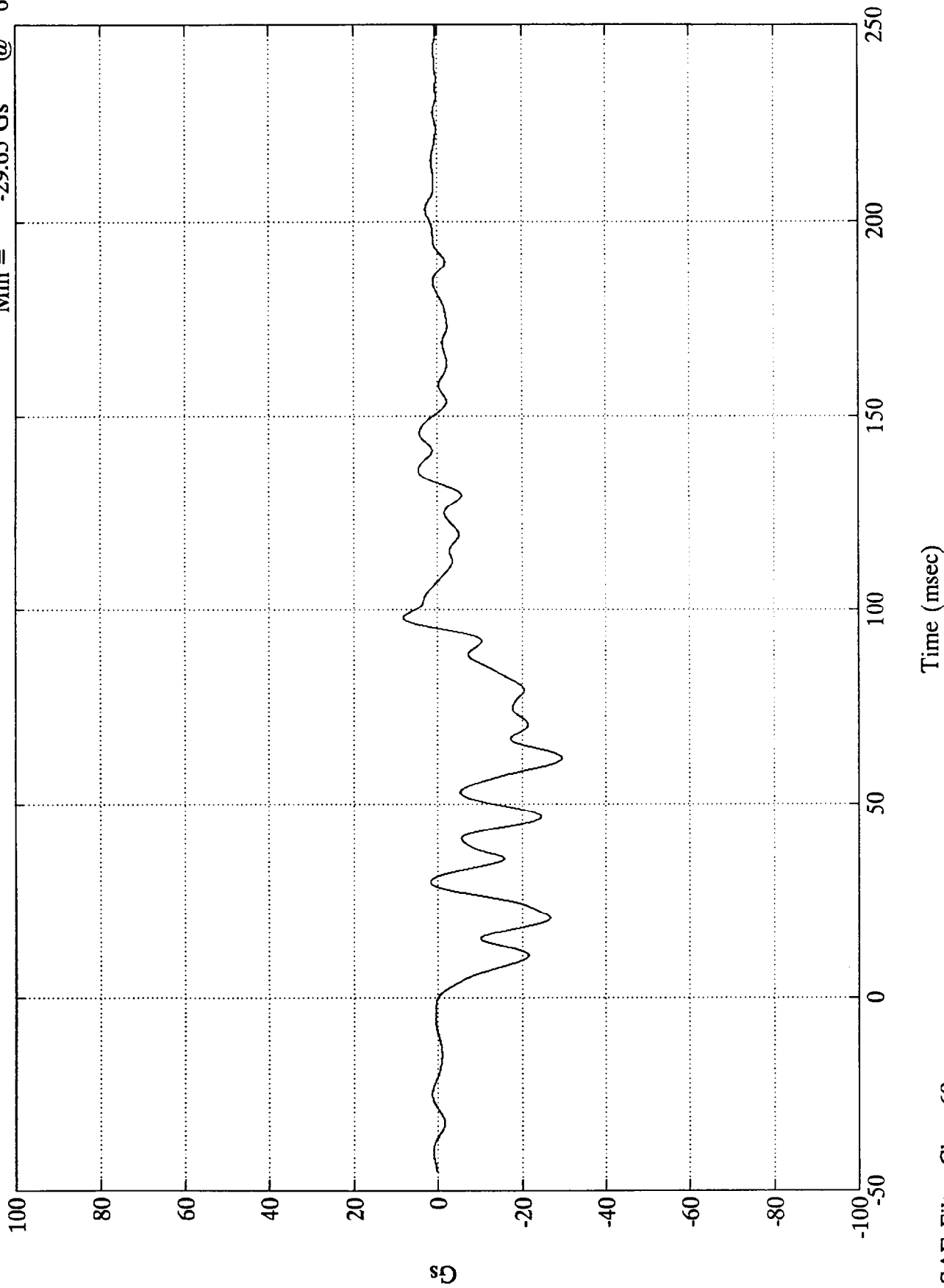
Max = 26.93 in. @ 121.68 msec
Min = 0.00 in. @ -0.00 msec



SAE Filter Class 60

R. Brake Caliper X (#5)

Max = 8.09 Gs @ 98.04 msec
 Min = -29.65 Gs @ 61.92 msec

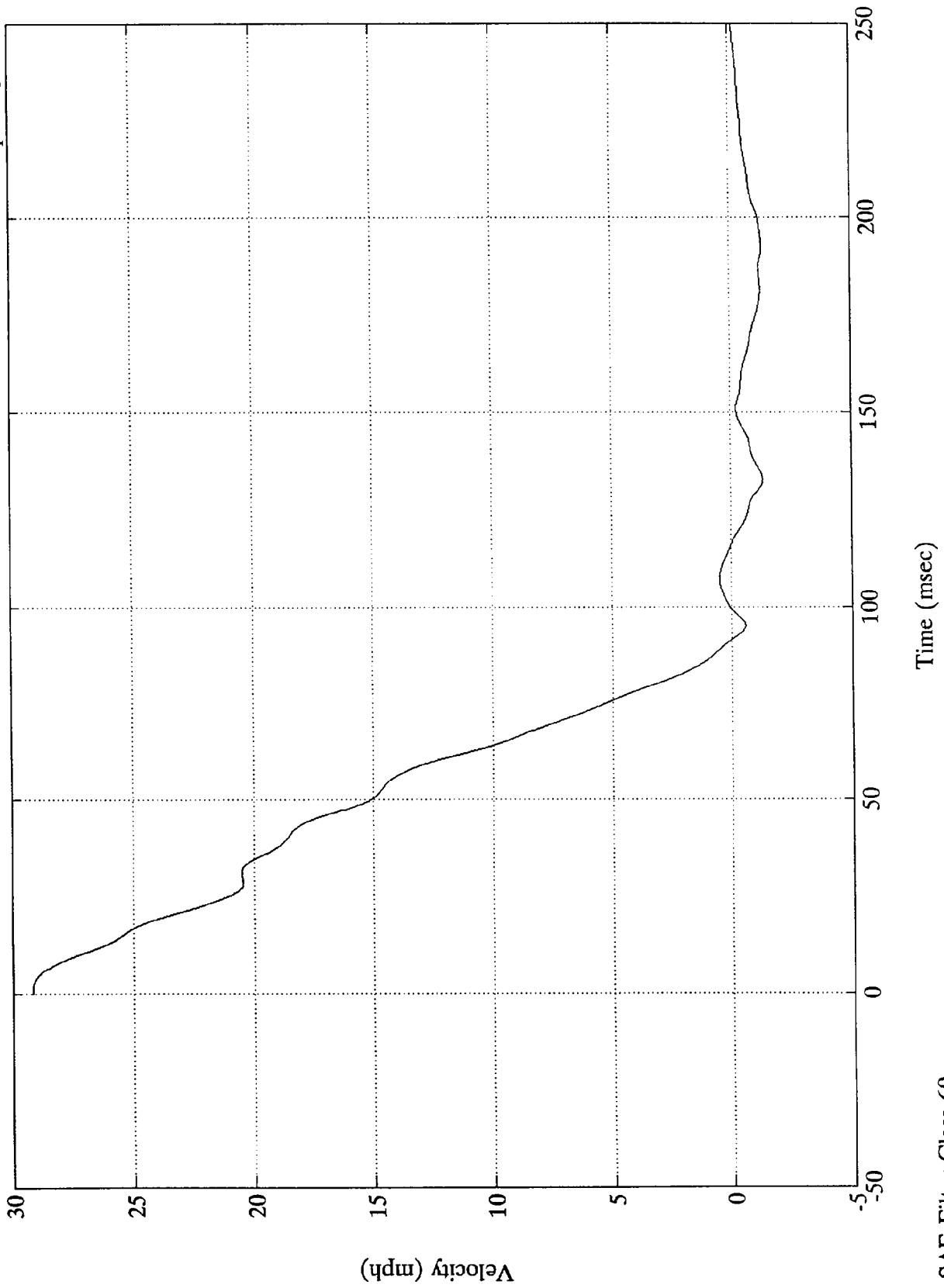


Gs

Test 1086

R. Brake Caliper X (#5)

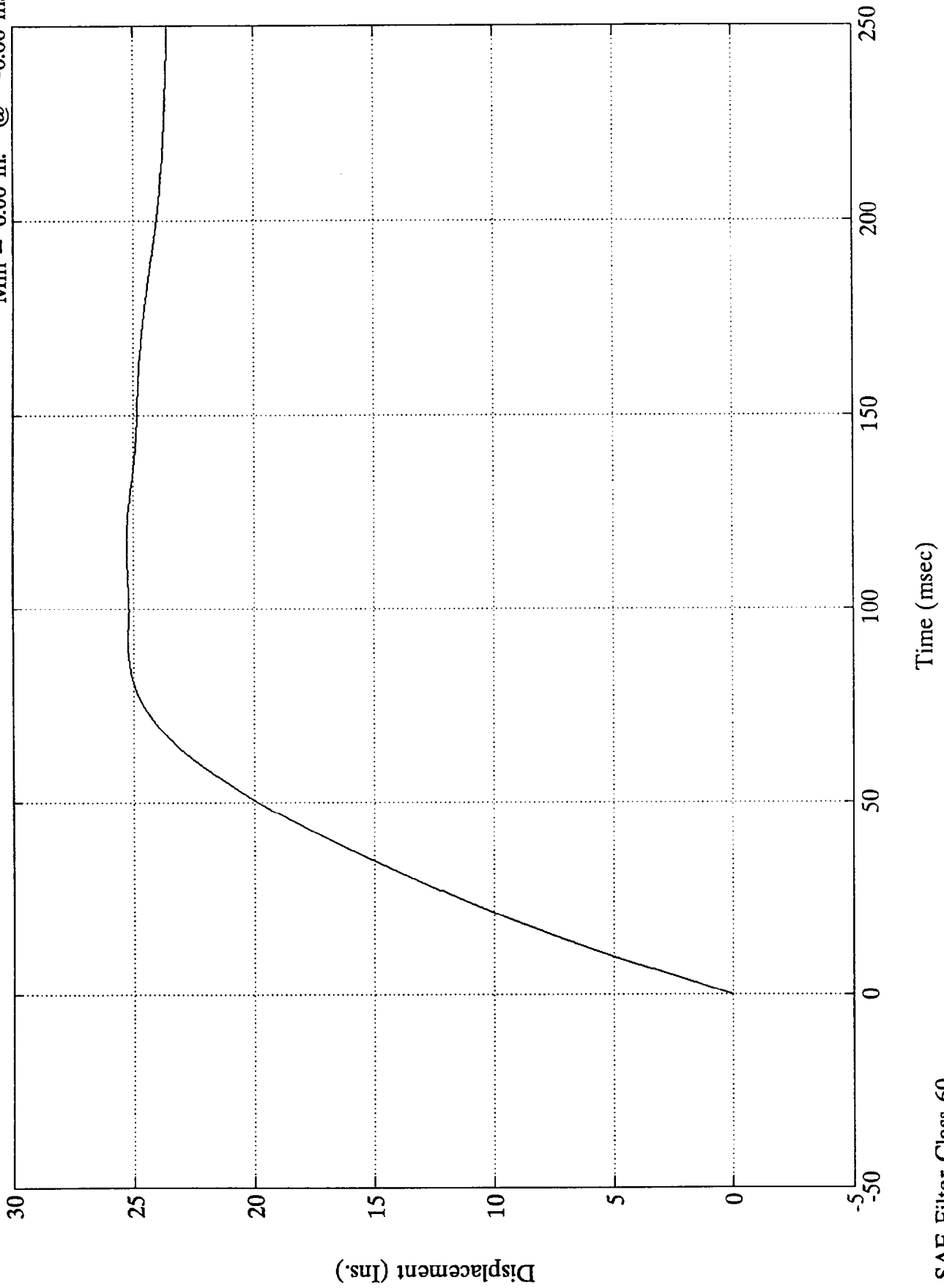
Max = 29.20 mph @ 0.24 msec
Min = -1.33 mph @ 192.48 msec



SAE Filter Class 60

R. Brake Caliper X (#5)

Max = 25.27 in. @ 118.08 msec
Min = 0.00 in. @ -0.00 msec

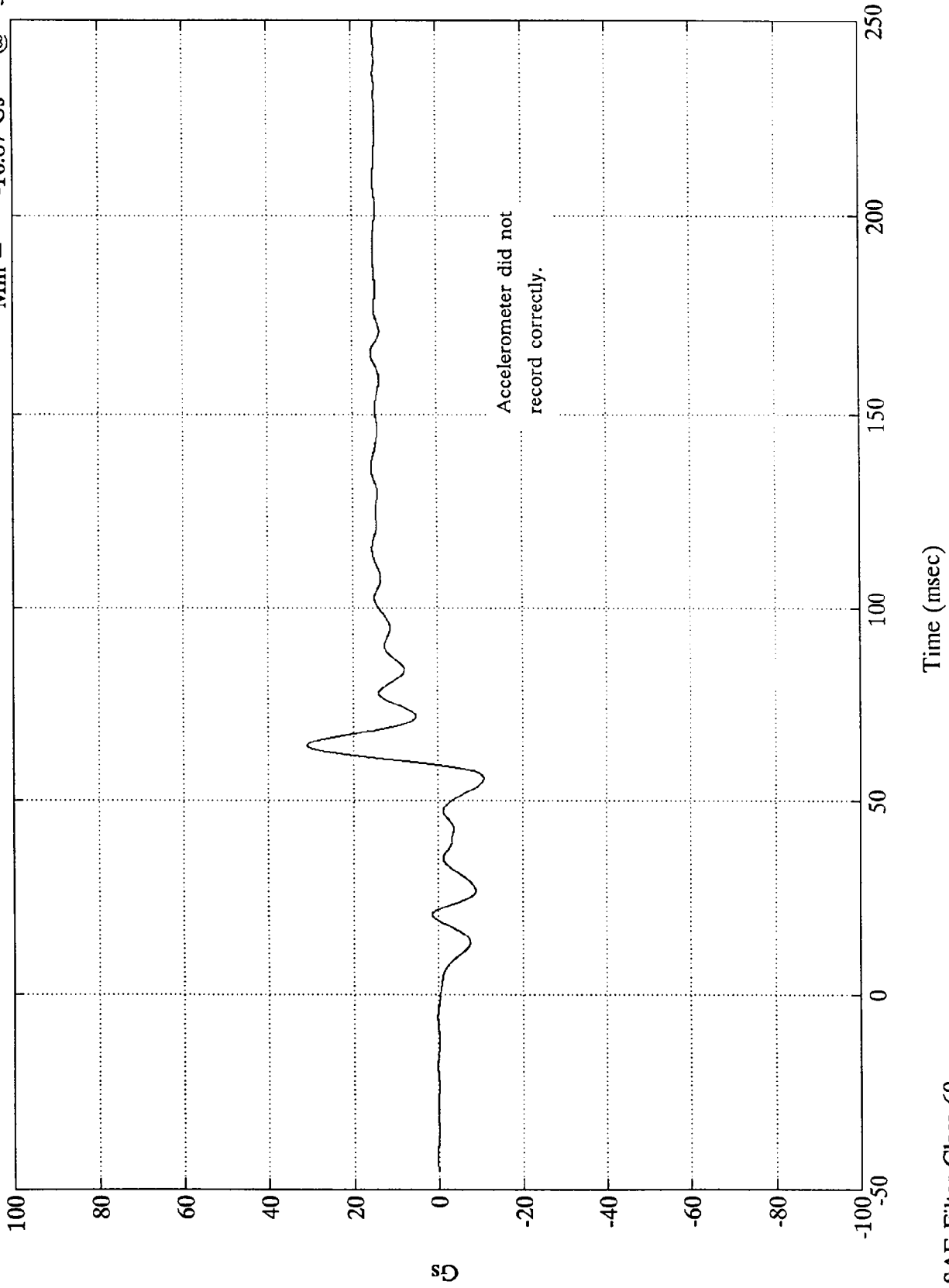


SAE Filter Class 60

Test 1086

L. Brake Caliper X (#6)

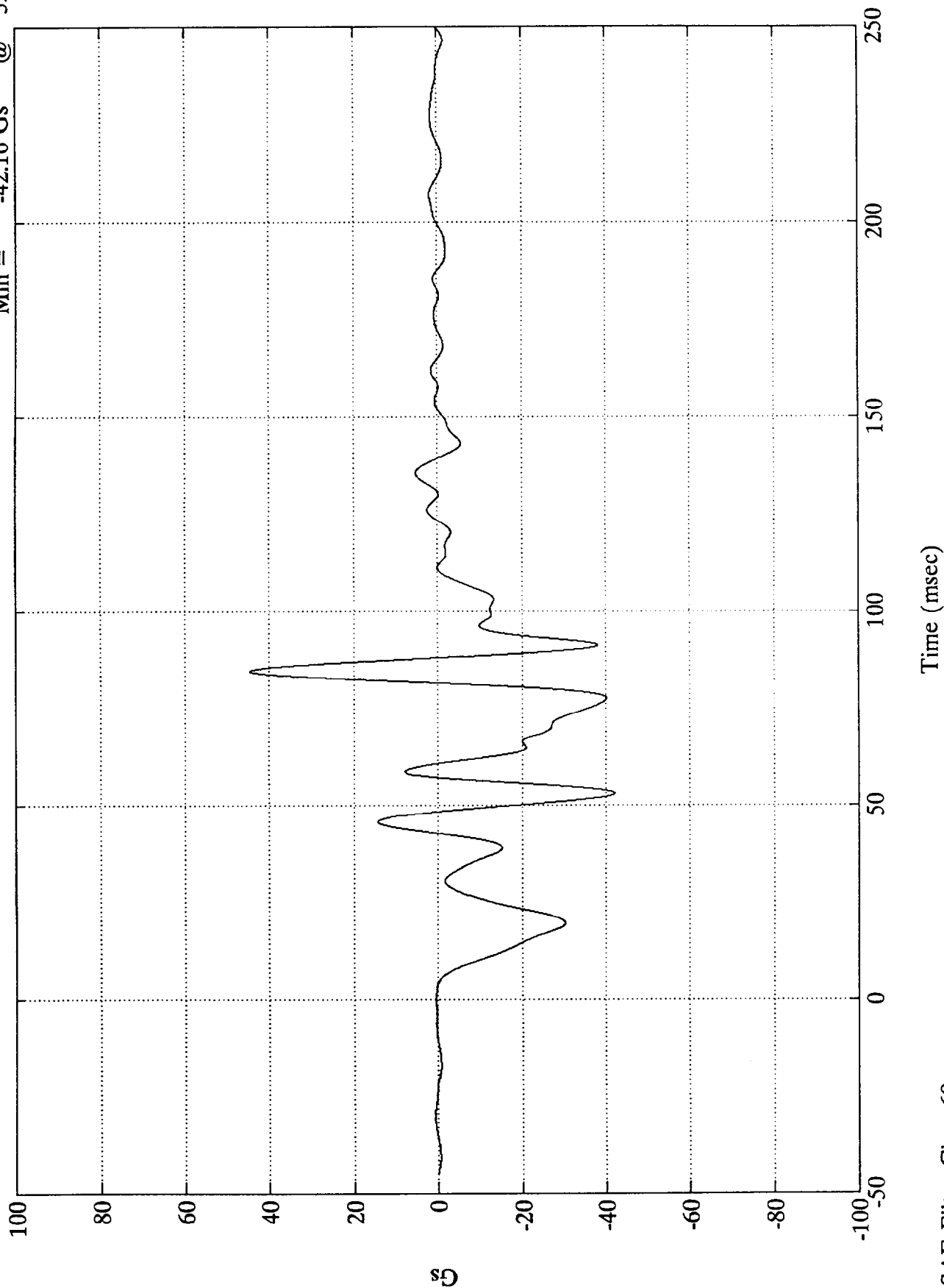
Max = 30.82 Gs @ 64.31 msec
Min = -10.87 Gs @ 55.92 msec



SAE Filter Class 60

Instrument Panel X (#7)

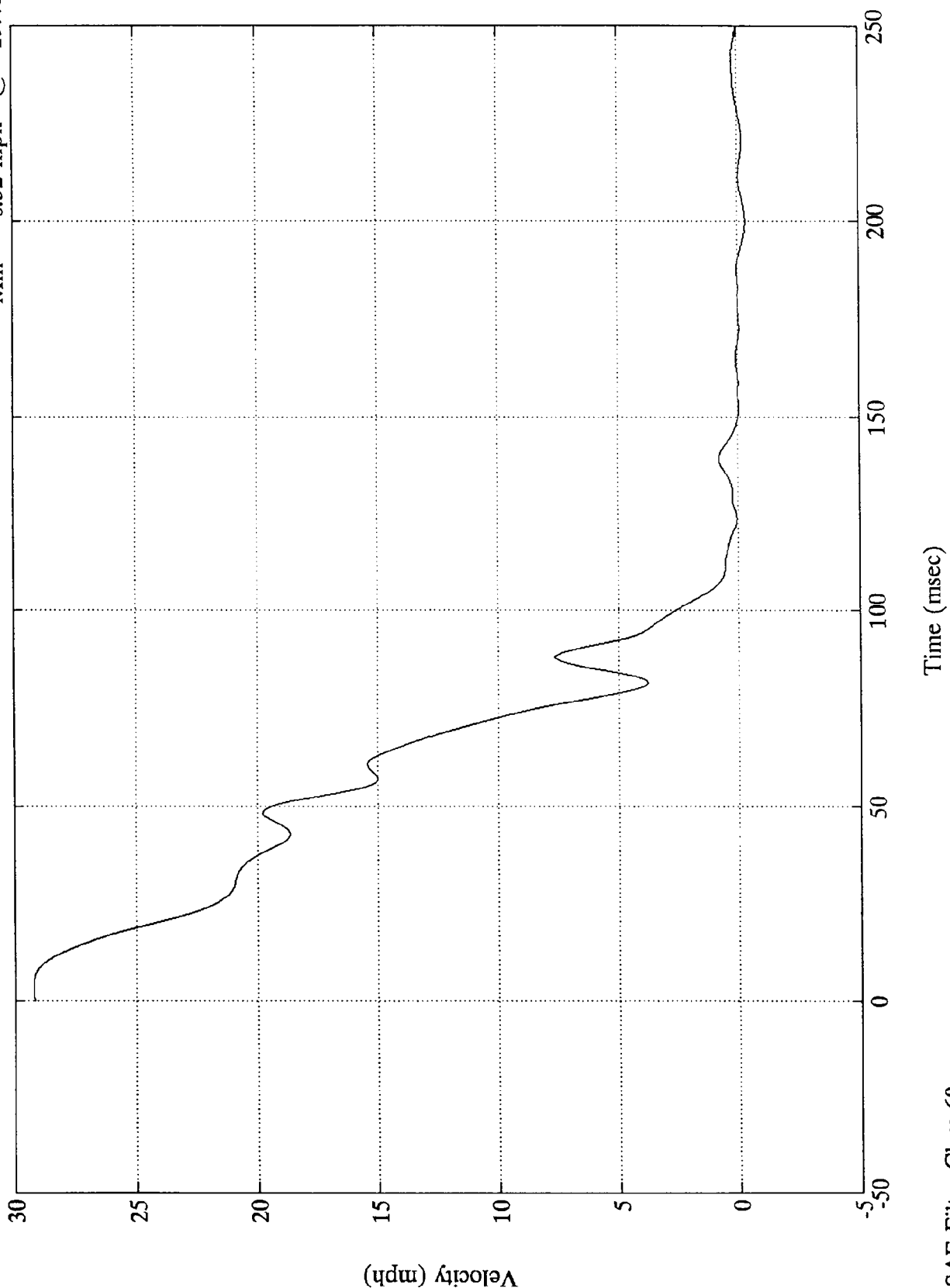
Max = 44.54 Gs @ 84.72 msec
 Min = -42.16 Gs @ 53.15 msec

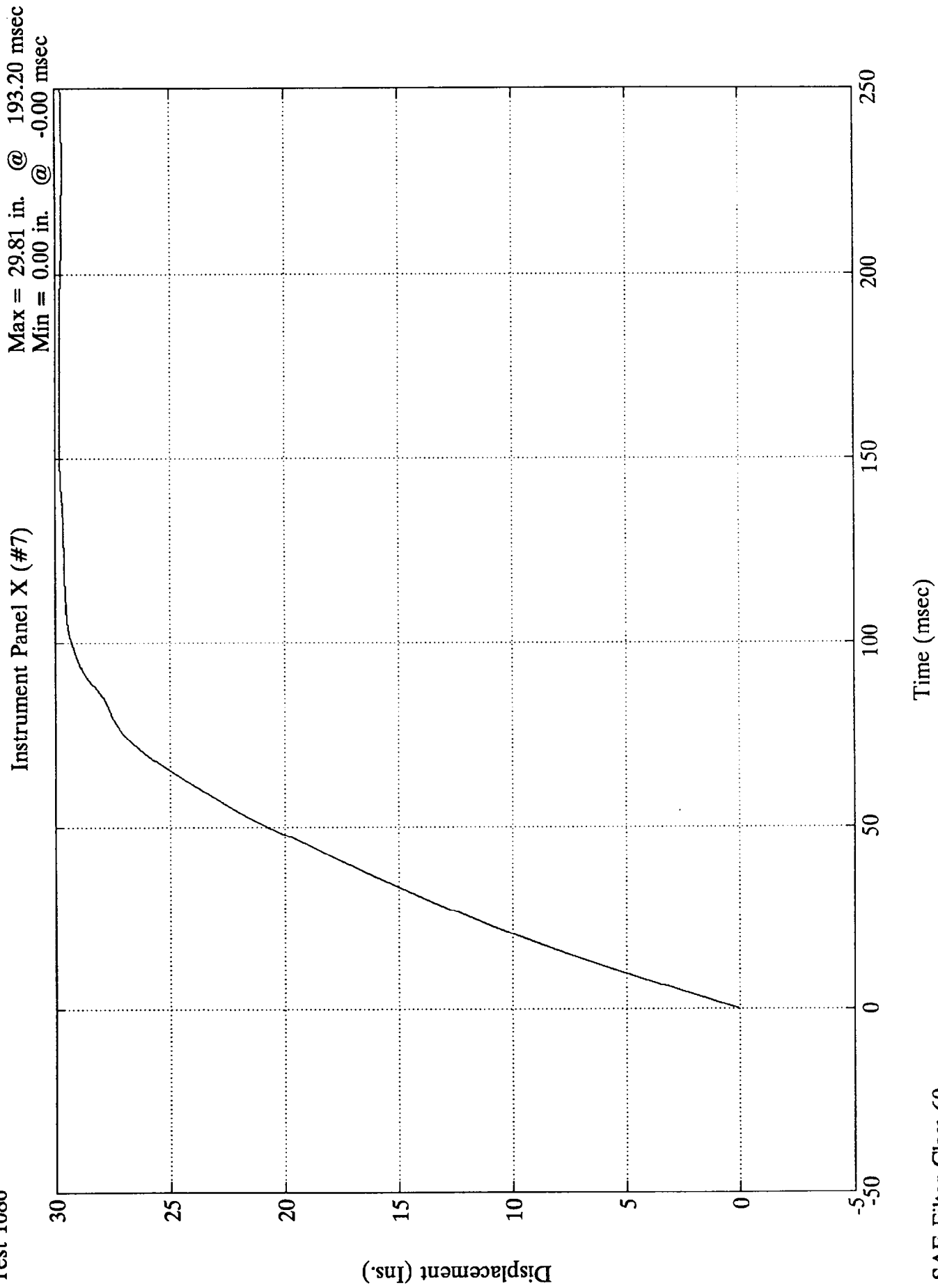


Test 1086

Instrument Panel X (#7)

Max = 29.23 mph @ 4.32 msec
Min = -0.32 mph @ 199.68 msec





TEST NO. CM0209

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

FACILITY: TRACK TEST DATE: 20 Jun 1991
RUN #: 1086 TEST TIME: 10:40:52
SERIES #: 13 BOARD: a

CLIP SUMMARY: Pos. 1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 43.697 G's
Tstart = 32.8800 ms
Tend = 35.8800 ms
CSI = 371.588

CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 26.145 G's
Tstart = 87.3600 ms
Tend = 90.4800 ms
CSI = 150.838

HIC SUMMARY: Pos. 1 Head Resultant

hic: 1439.94
t1 = 61.320 msec
t2 = 64.320 msec
Average G's Over Hic Duration = 187.28

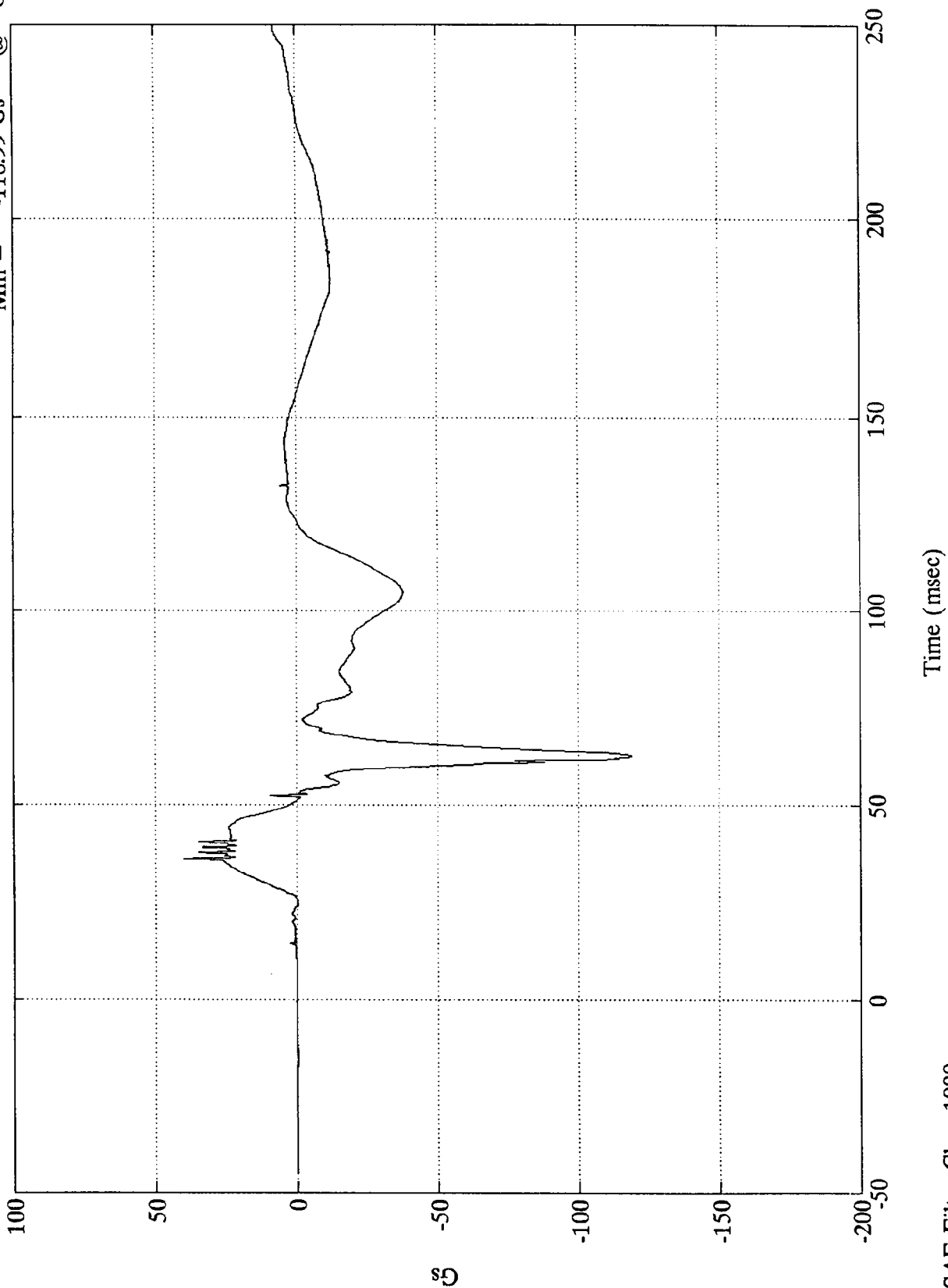
HIC SUMMARY: Pos. 2 Head Resultant

hic: 120.78
t1 = 89.040 msec
t2 = 124.920 msec
Average G's Over Hic Duration = 25.75

Test 1086

Pos. 1 Head X

Max = 39.93 Gs @ 36.24 msec
Min = -118.99 Gs @ 62.76 msec

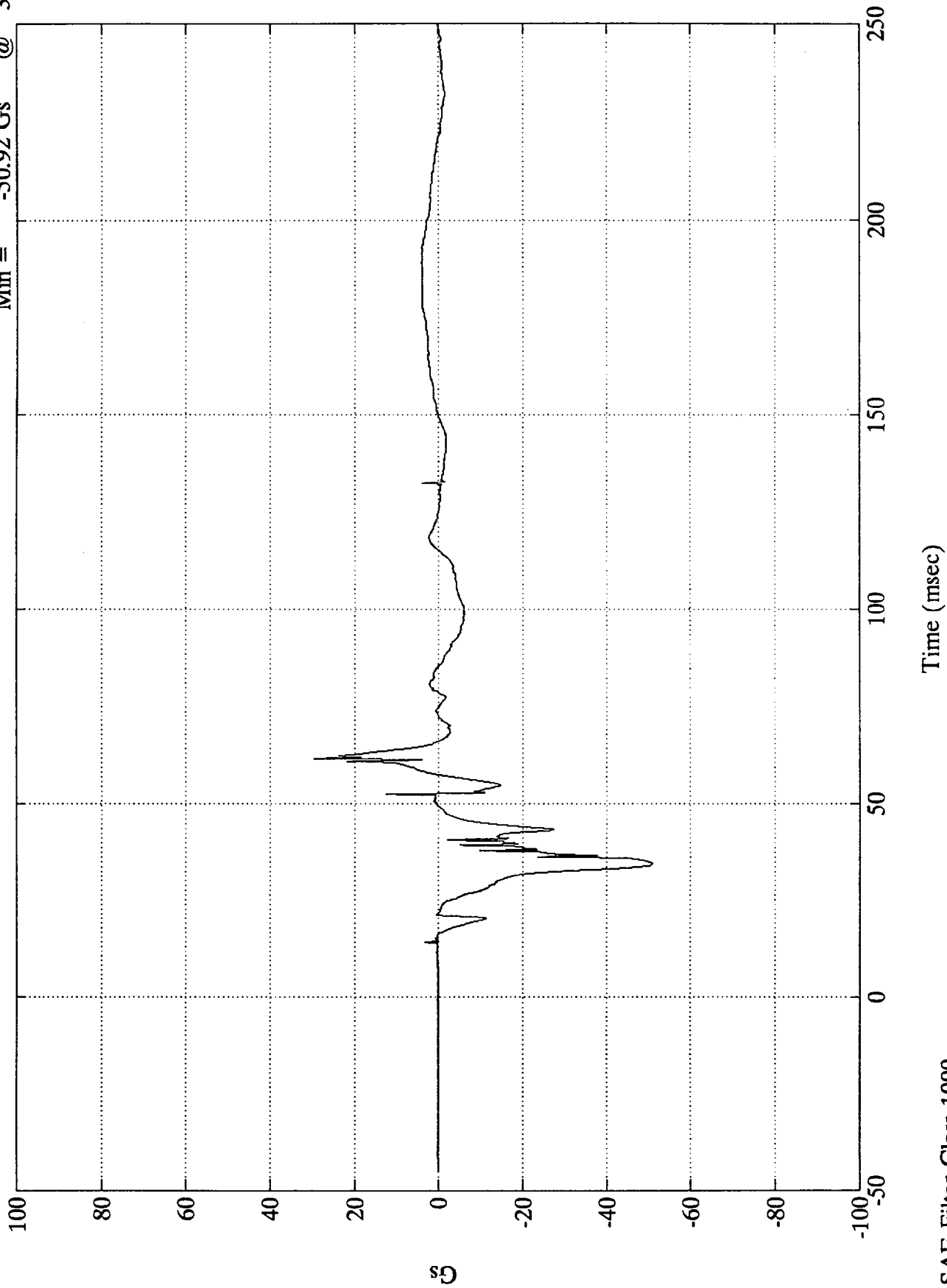


SAE Filter Class 1000

Test 1086

Pos. 1 Head Y

Max = 29.46 Gs @ 61.56 msec
Min = -50.92 Gs @ 34.68 msec



Gs

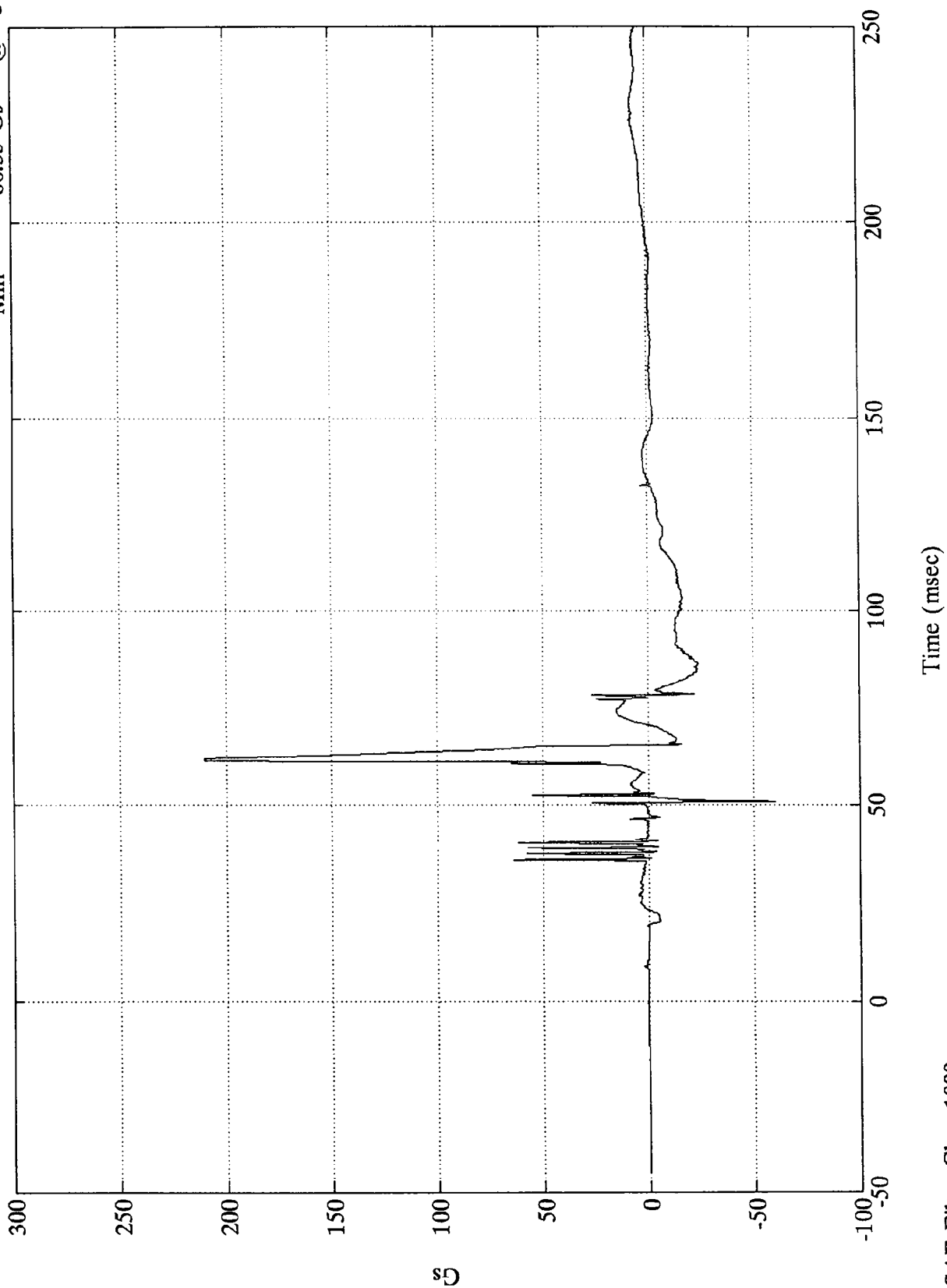
Time (msec)

SAE Filter Class 1000

Test 1086

Pos. 1 Head Z

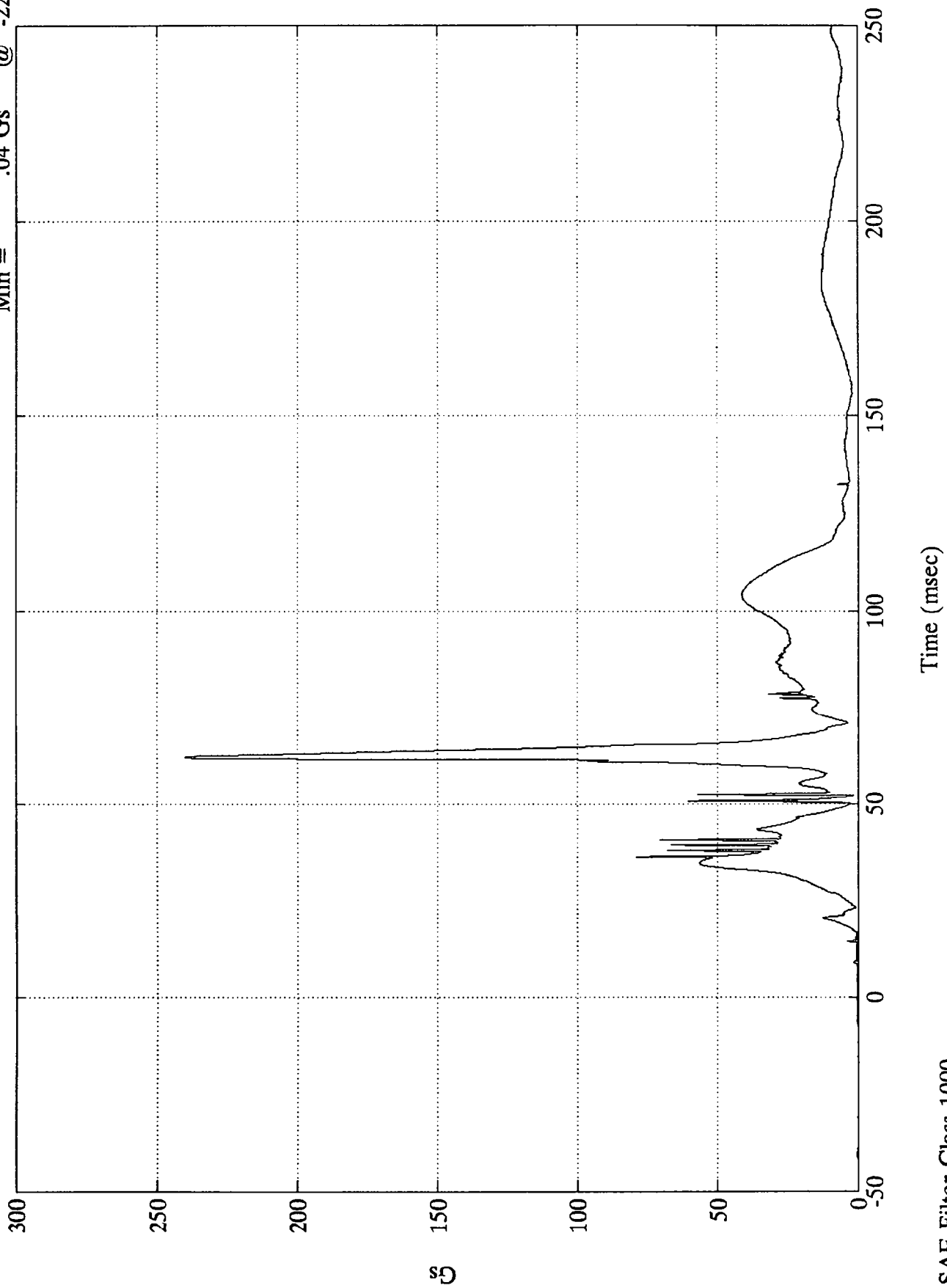
Max = 209.93 Gs @ 62.27 msec
Min = -60.35 Gs @ 50.88 msec



SAE Filter Class 1000

Pos. 1 Head Resultant

Max = 240.01 Gs @ 62.04 msec
Min = .04 Gs @ -22.44 msec

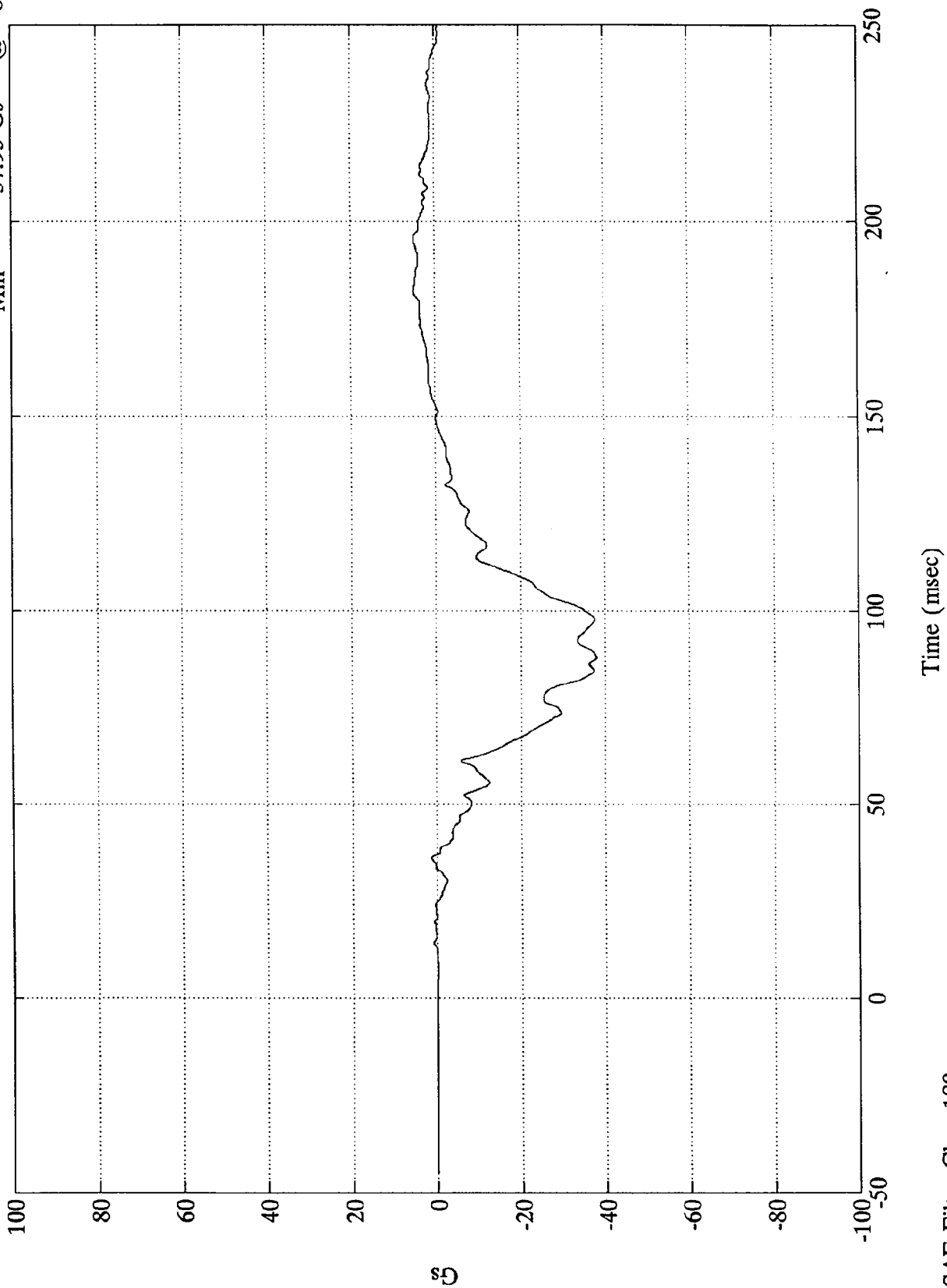


SAE Filter Class 1000

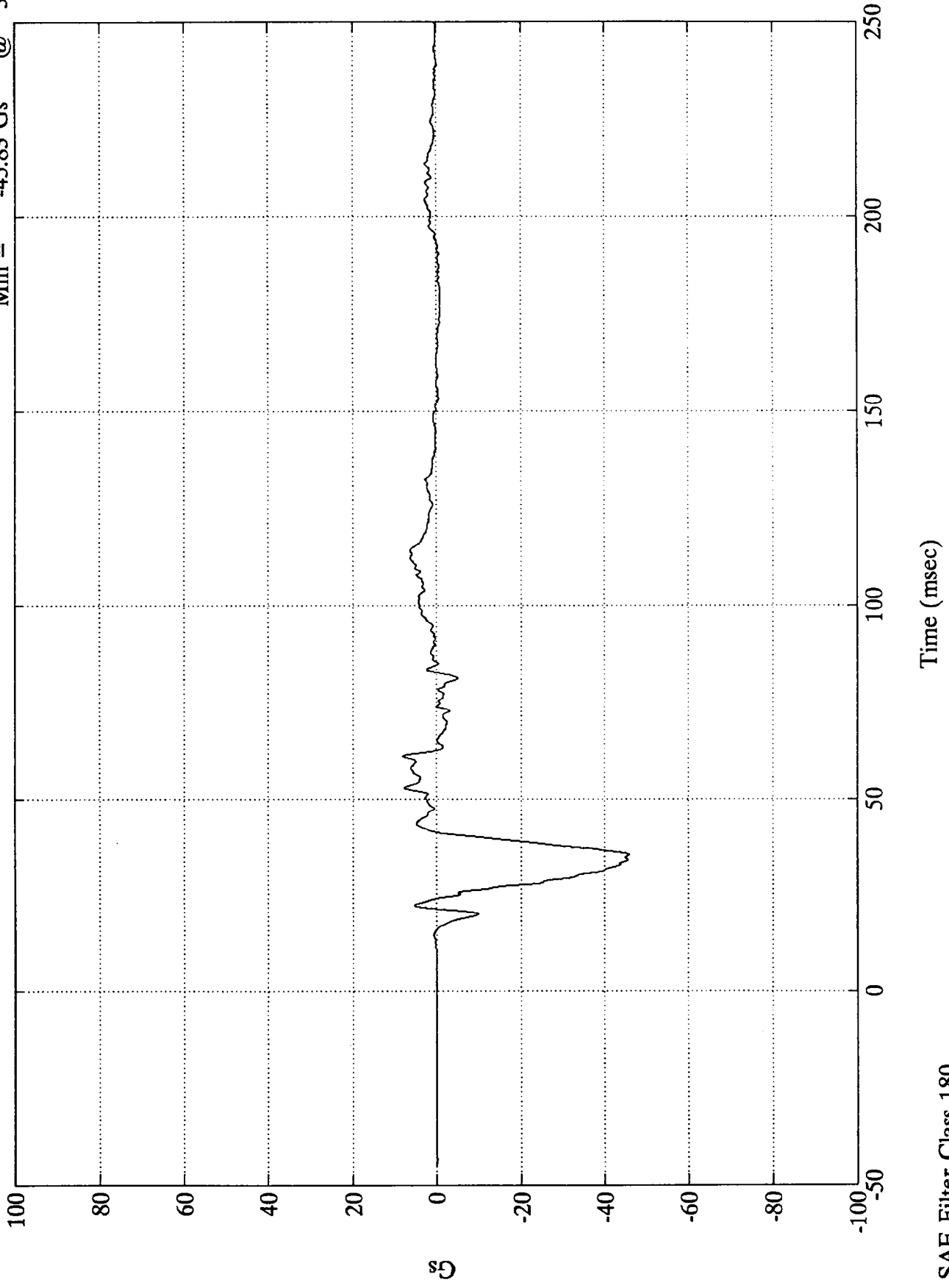
Test 1086

Pos. 1 Chest X

Max = 5.06 Gs @ 182.27 msec
Min = -37.93 Gs @ 88.20 msec



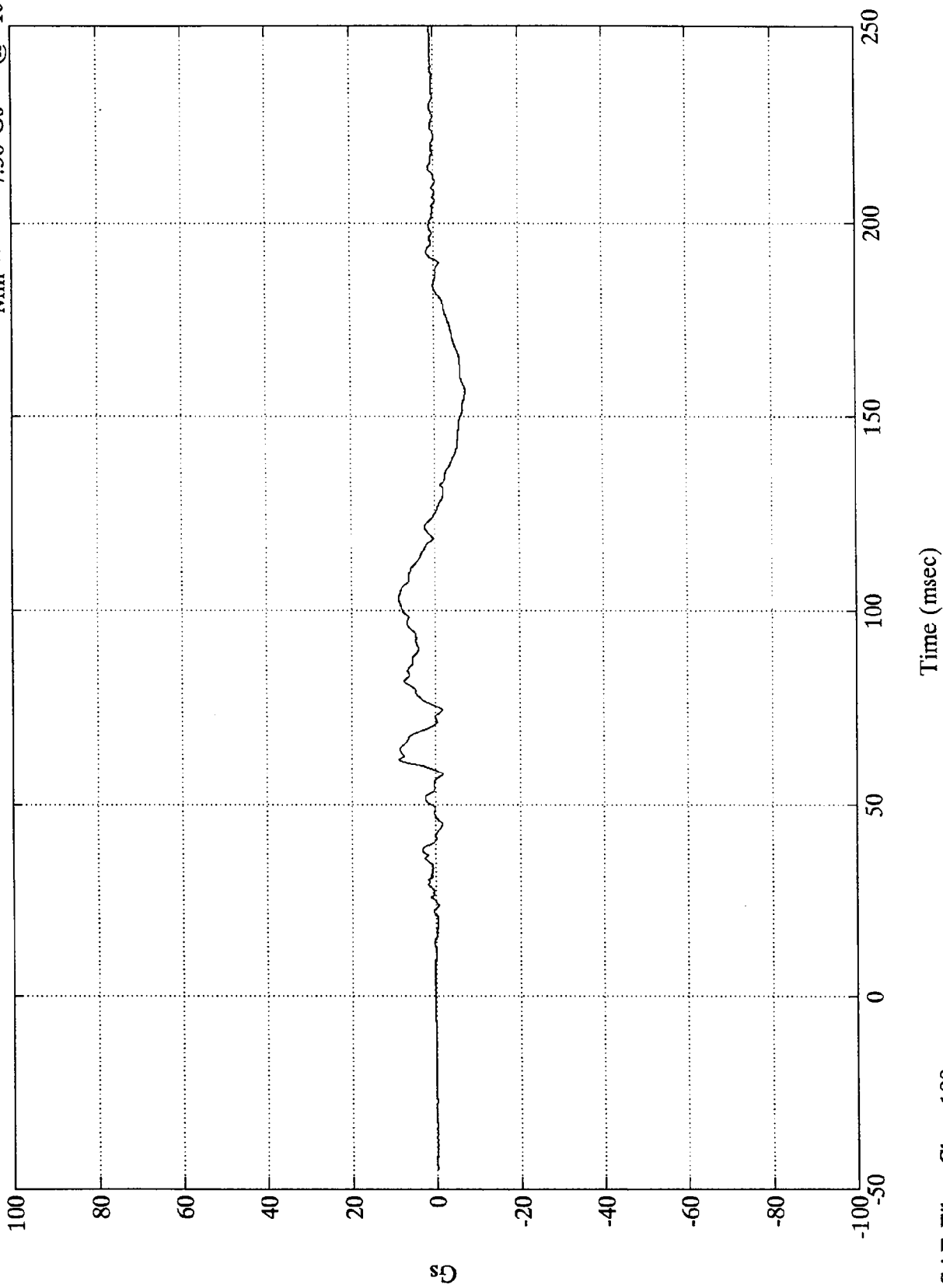
SAE Filter Class 180



Test 1086

Pos. 1 Chest Z

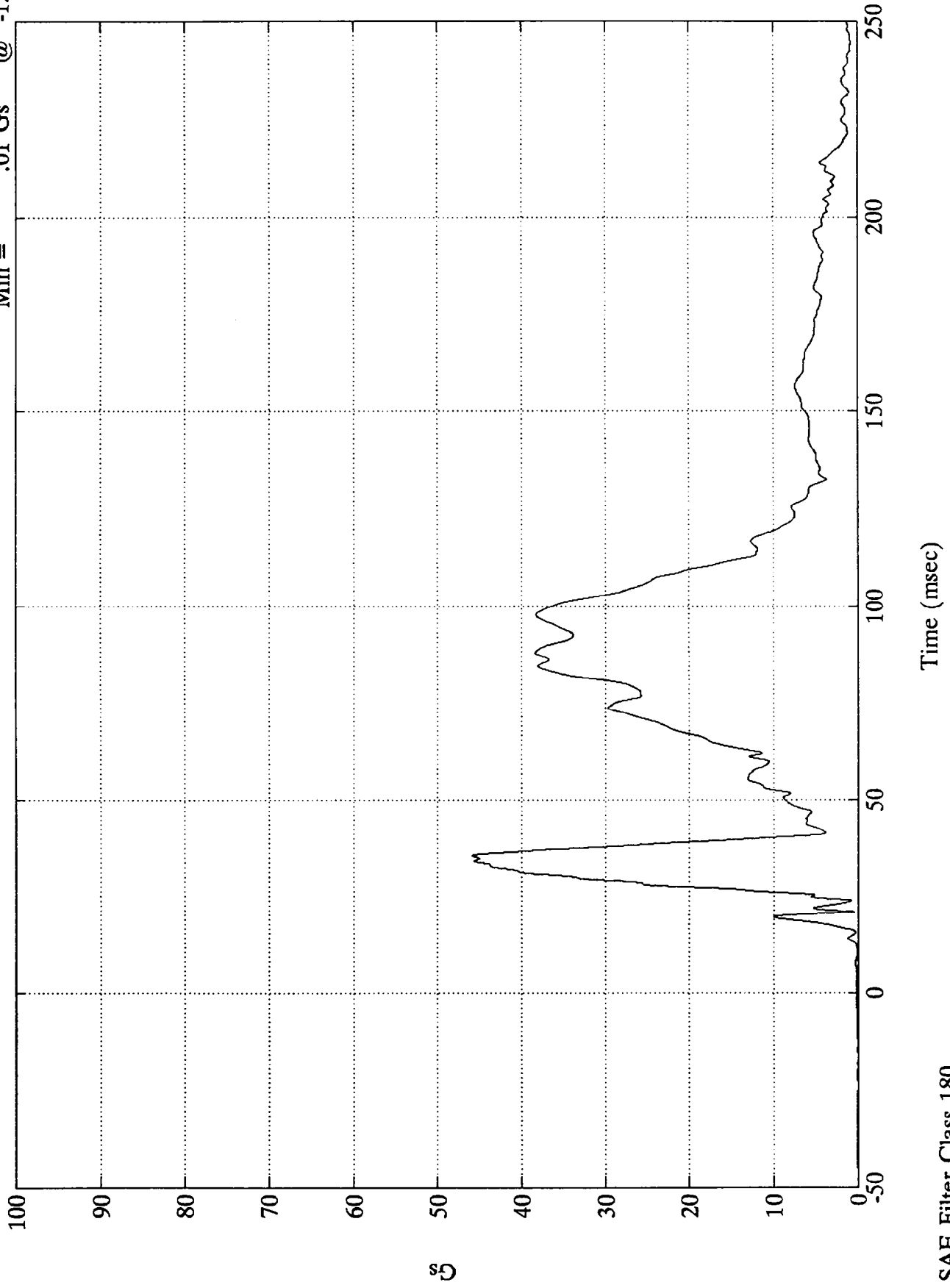
Max = 8.84 Gs @ 103.31 msec
Min = -7.30 Gs @ 155.88 msec



SAE Filter Class 180

Pos. 1 Chest Resultant

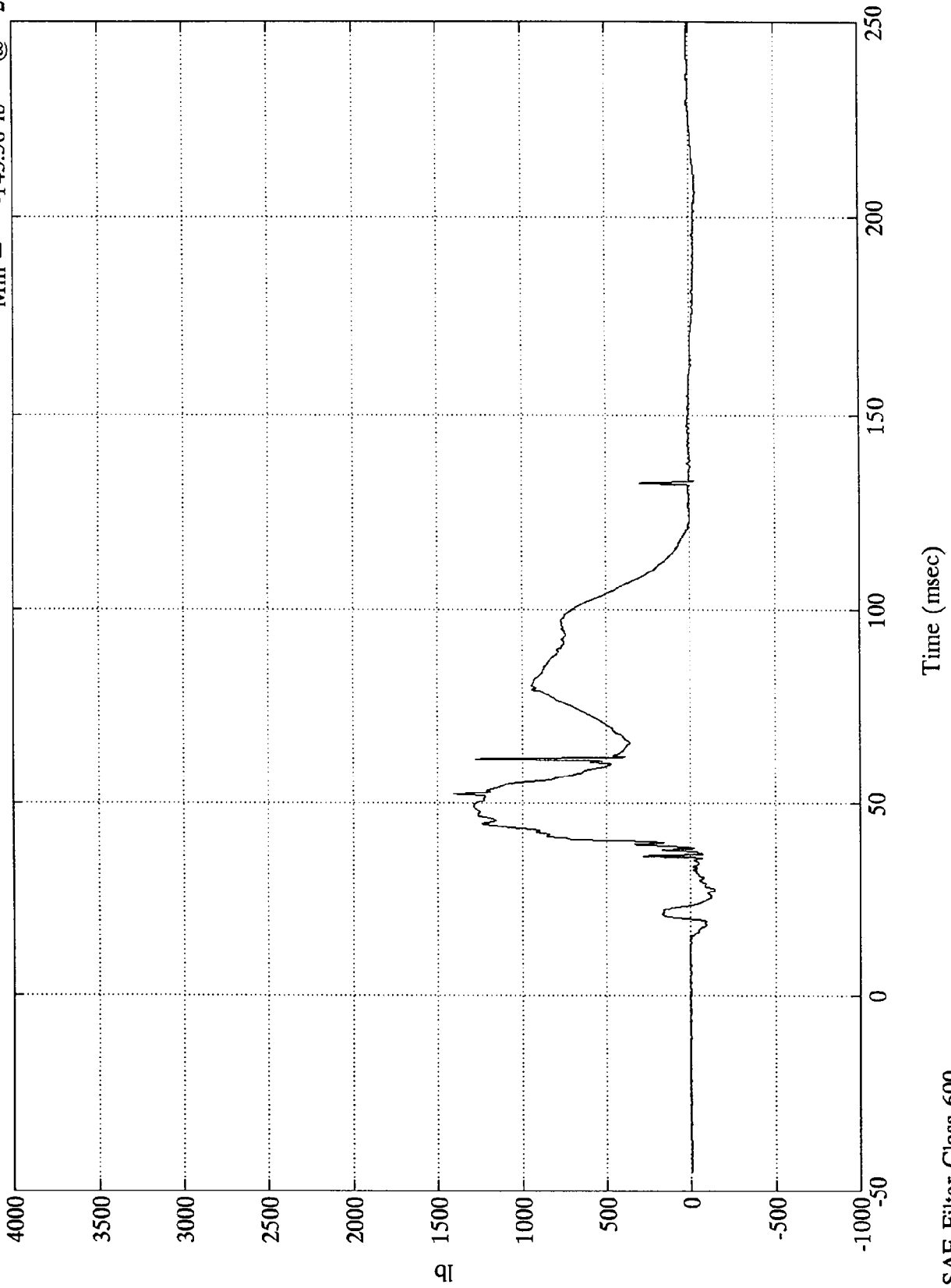
Max = 45.88 Gs @ 35.51 msec
 Min = .01 Gs @ -12.96 msec



50

Test 1086

Pos. 1 Left Femur
Max = 1405.32 lb @ 52.44 msec
Min = -143.50 lb @ 27.36 msec

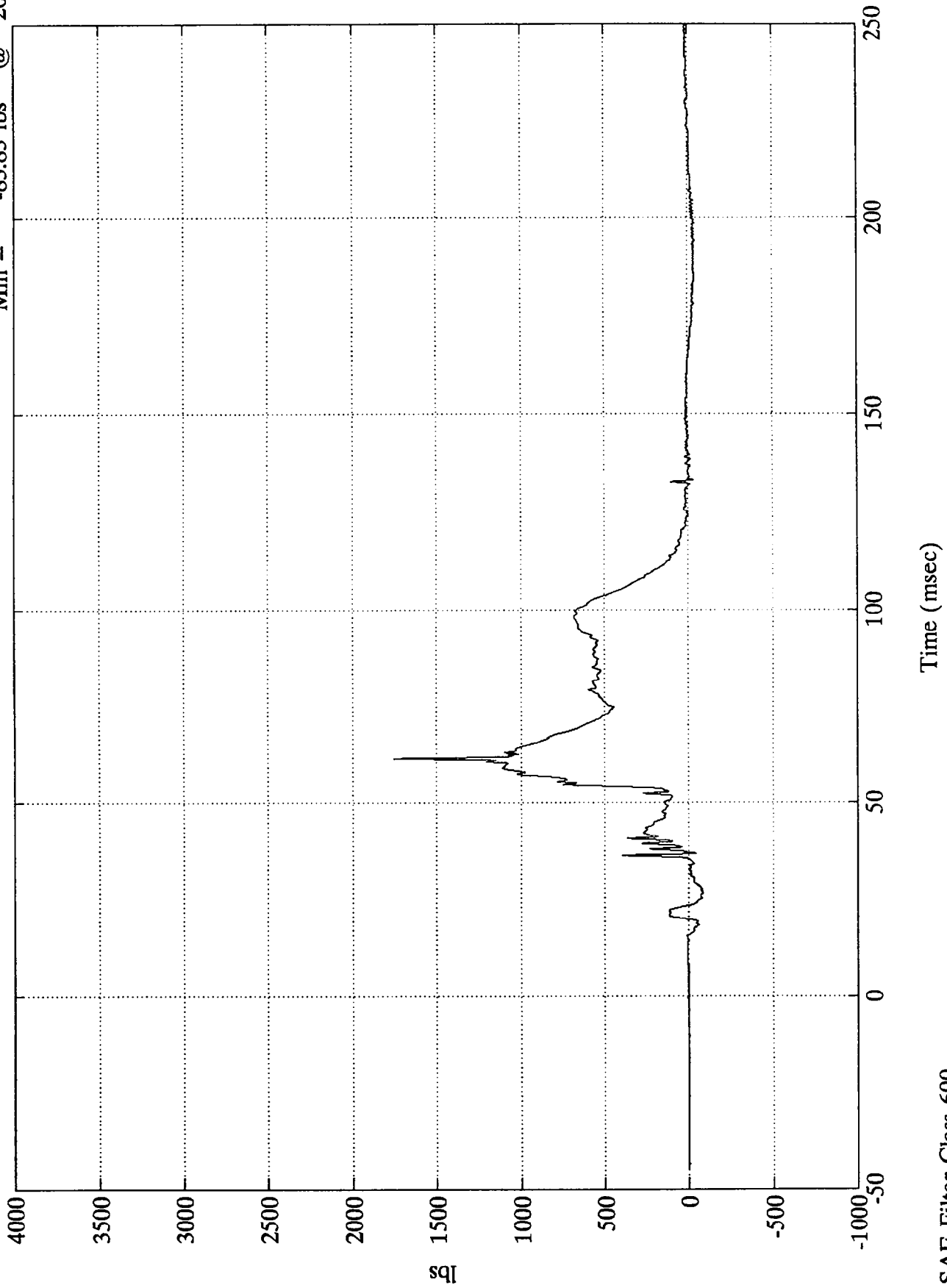


SAE Filter Class 600

Test 1086

Pos. 1 Right Femur

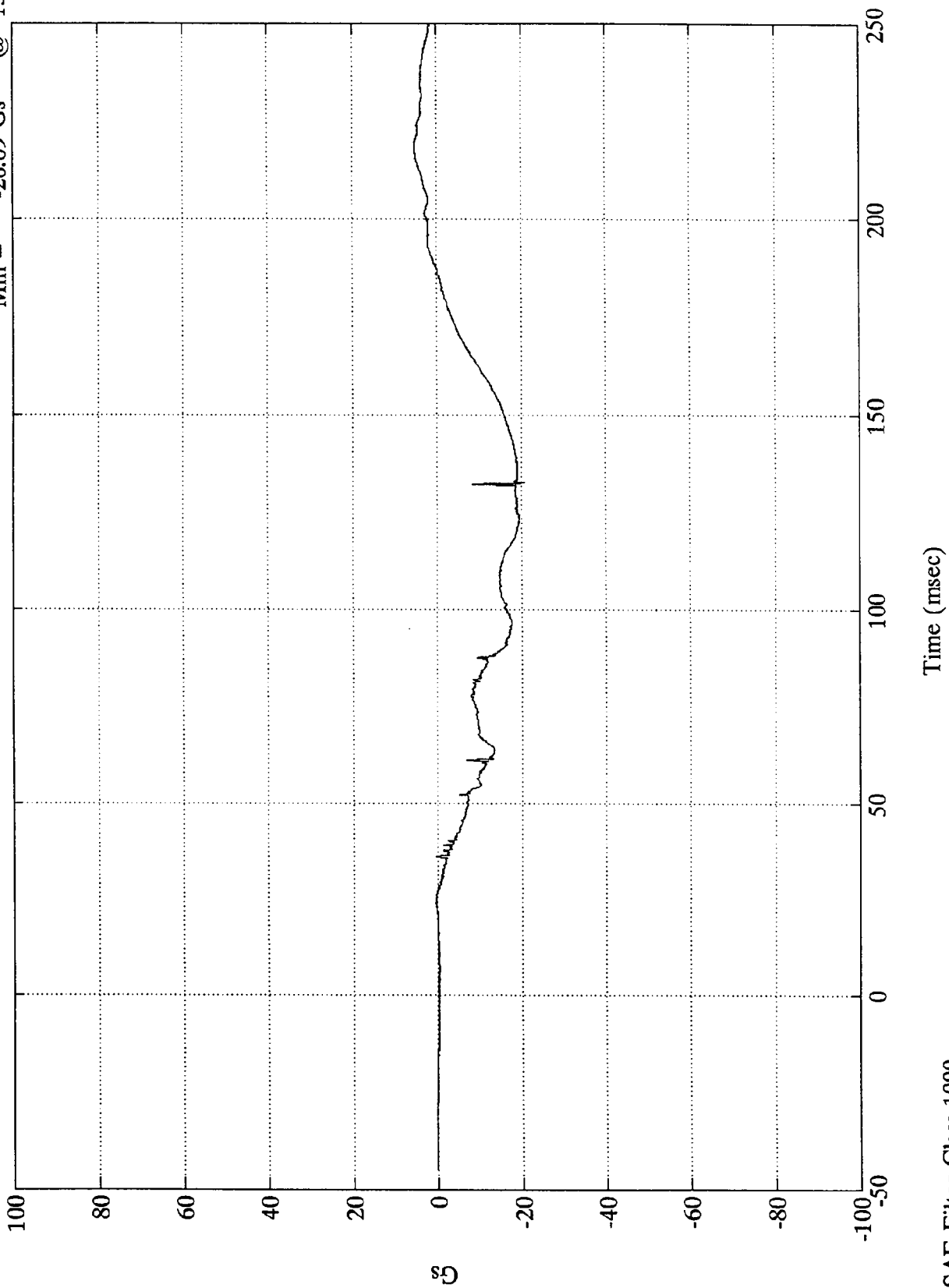
Max = 1754.47 lbs @ 61.56 msec
Min = -83.83 lbs @ 26.39 msec



Test 1086

Pos. 2 Head X

Max = 5.19 Gs @ 219.24 msec
Min = -20.69 Gs @ 133.08 msec

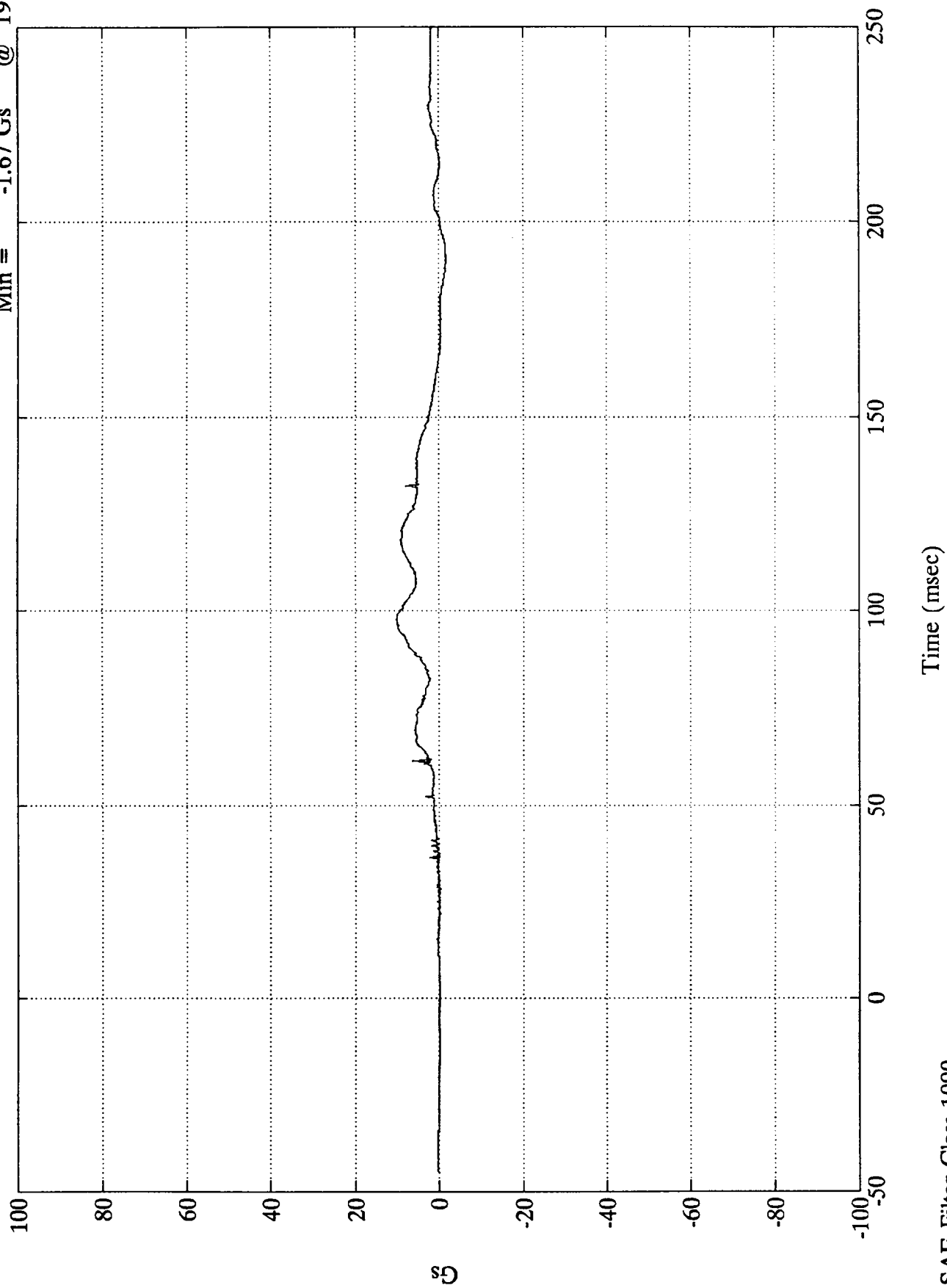


SAE Filter Class 1000

Test 1086

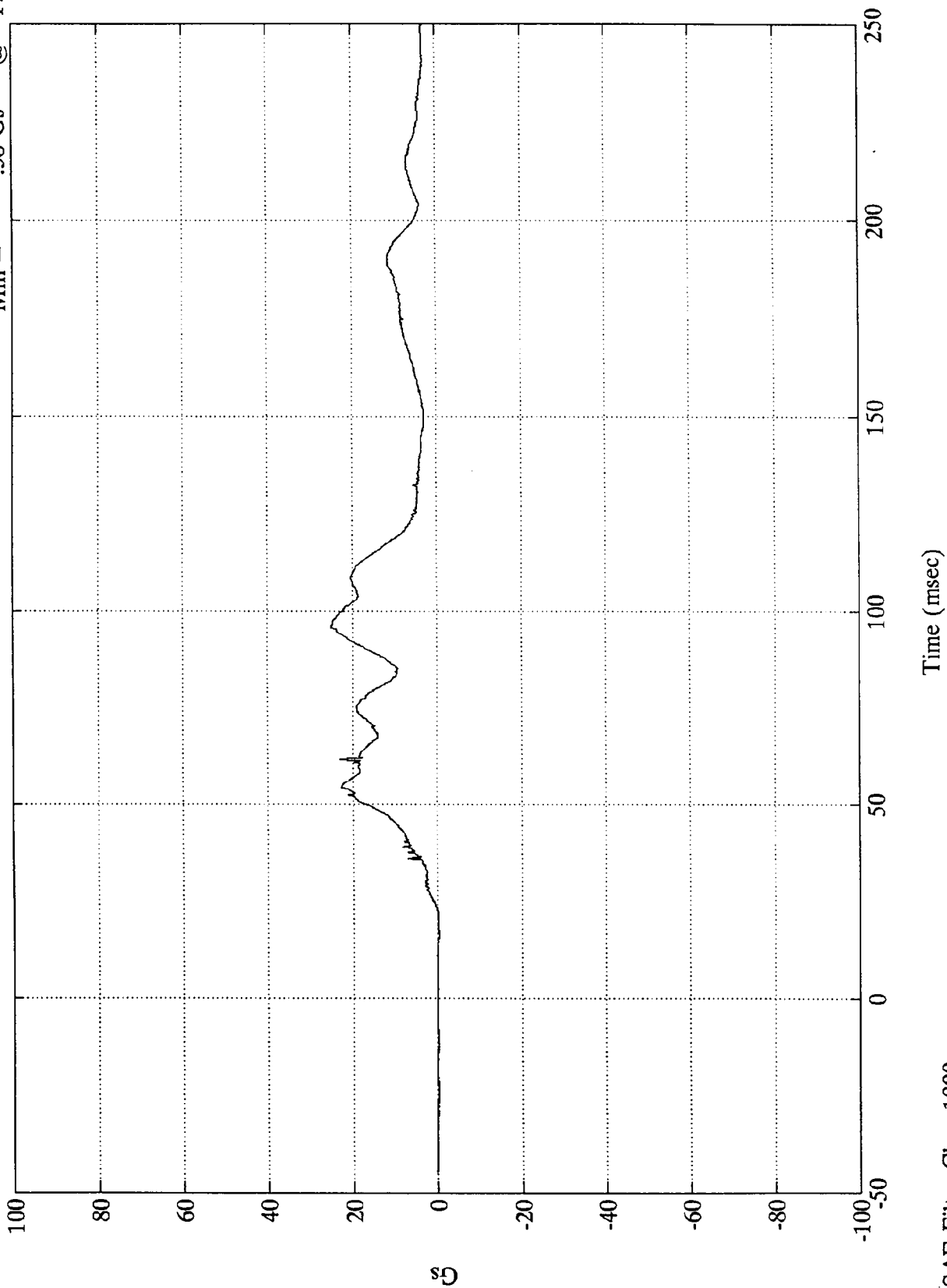
Pos. 2 Head Y

Max = 10.31 Gs @ 97.68 msec
Min = -1.67 Gs @ 191.40 msec



Test 1086

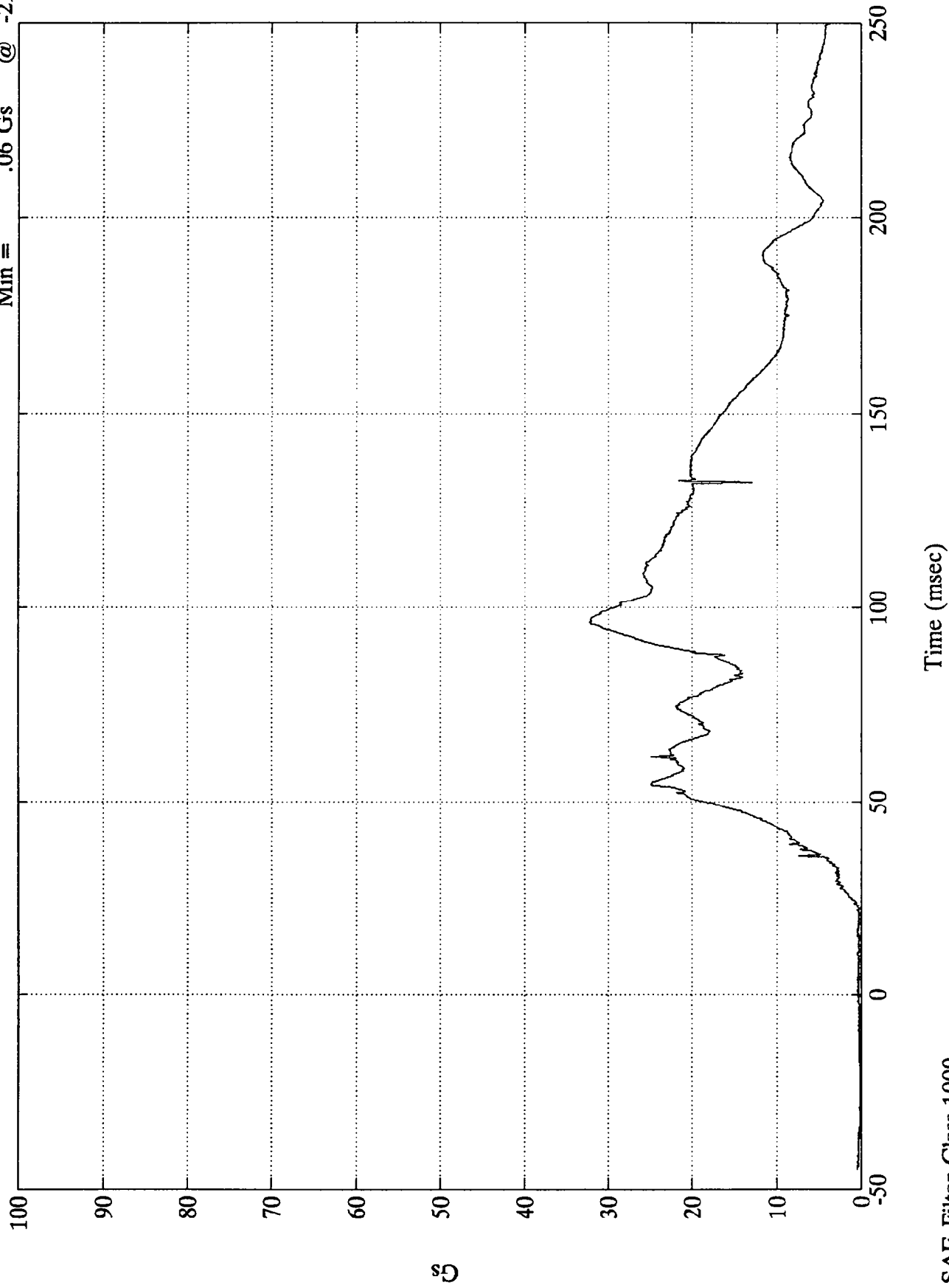
Pos. 2 Head Z
Max = 25.11 Gs @ 95.76 msec
Min = -38 Gs @ 17.51 msec



SAE Filter Class 1000

Pos. 2 Head Resultant

Max = 32.18 Gs @ 96.23 msec
Min = .06 Gs @ -21.60 msec



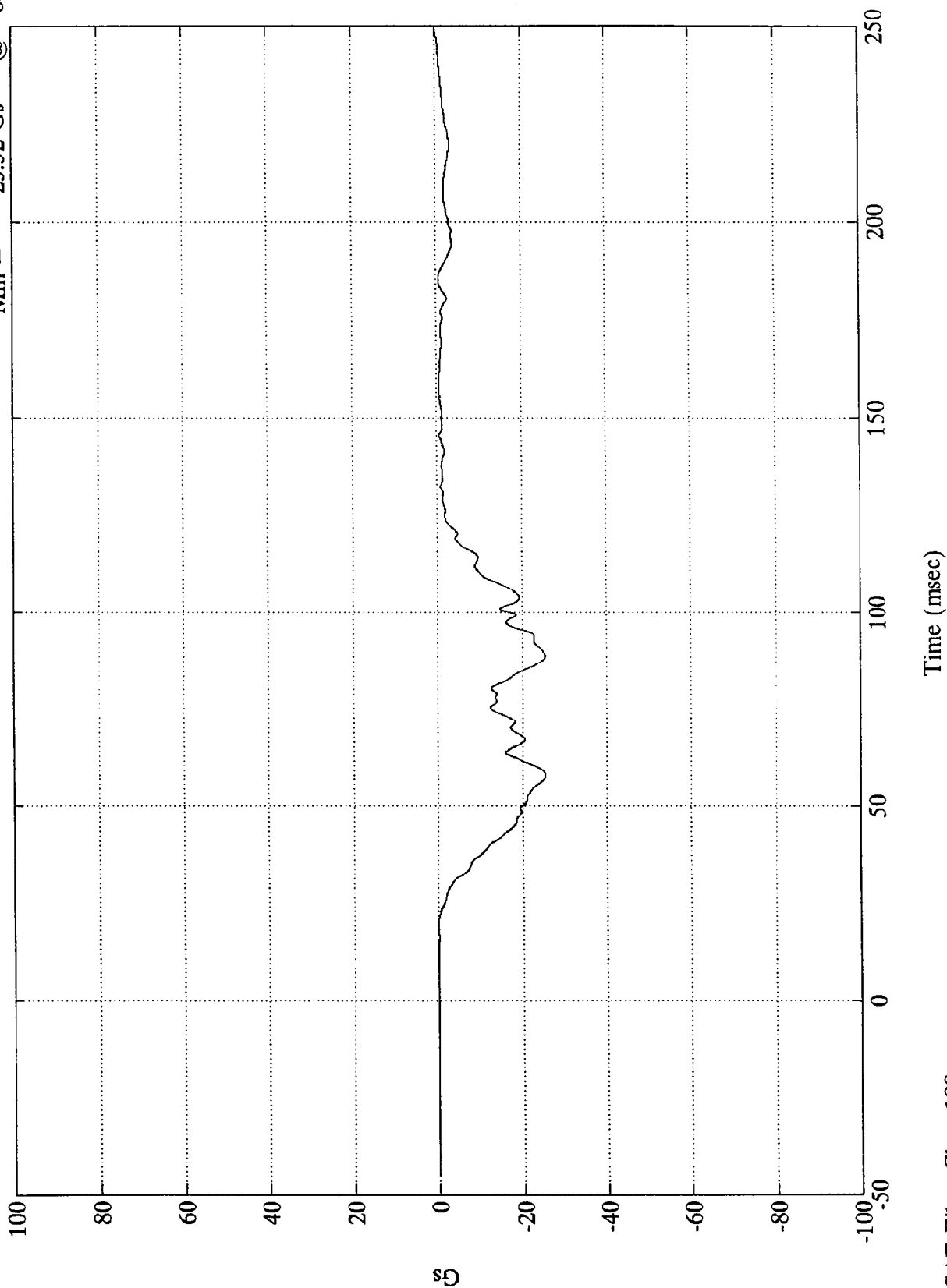
Gs

SAE Filter Class 1000

Test 1086

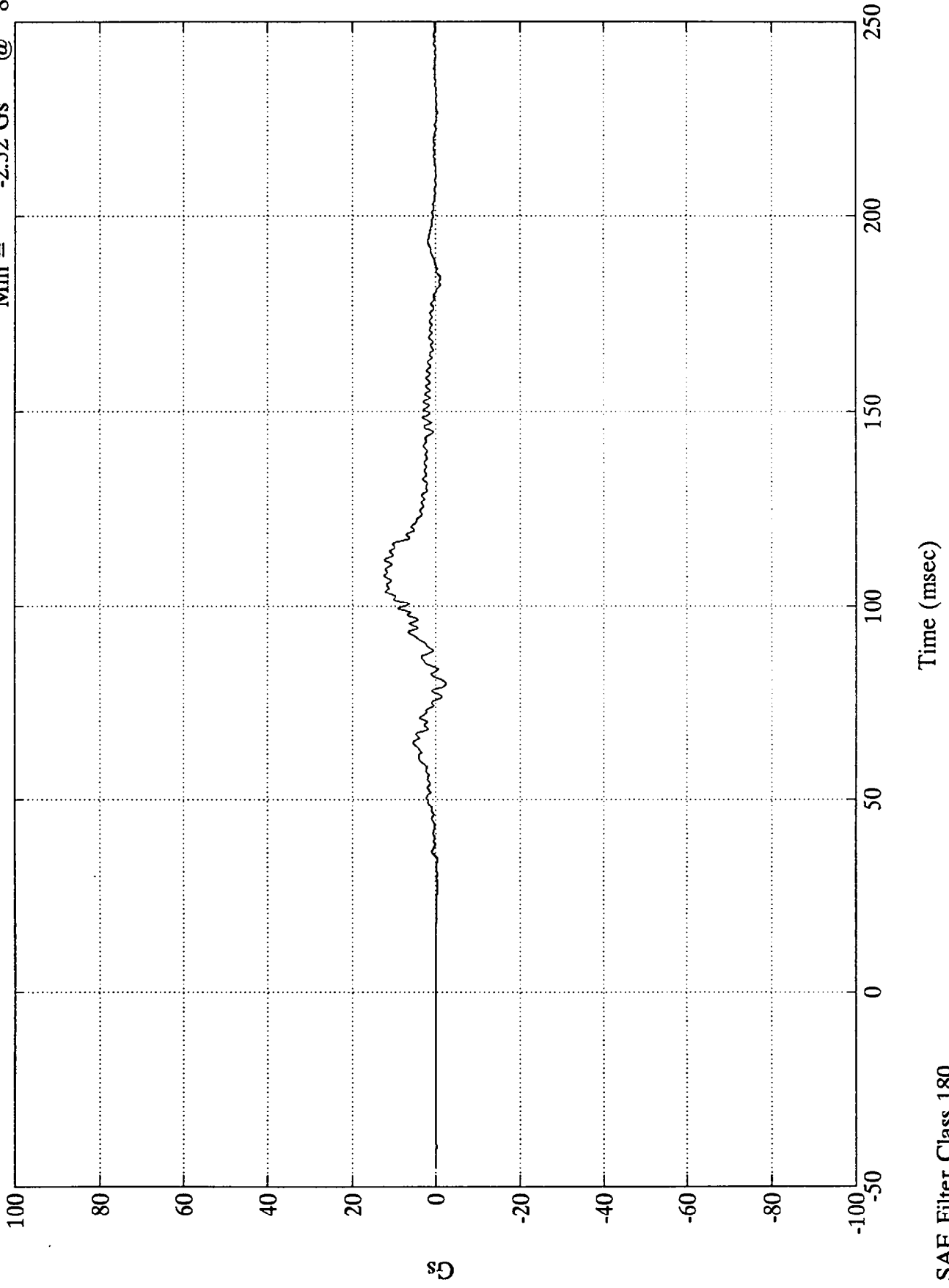
Pos. 2 Chest X

Max = .21 Gs @ 254.16 msec
Min = -25.52 Gs @ 88.55 msec



SAE Filter Class 180

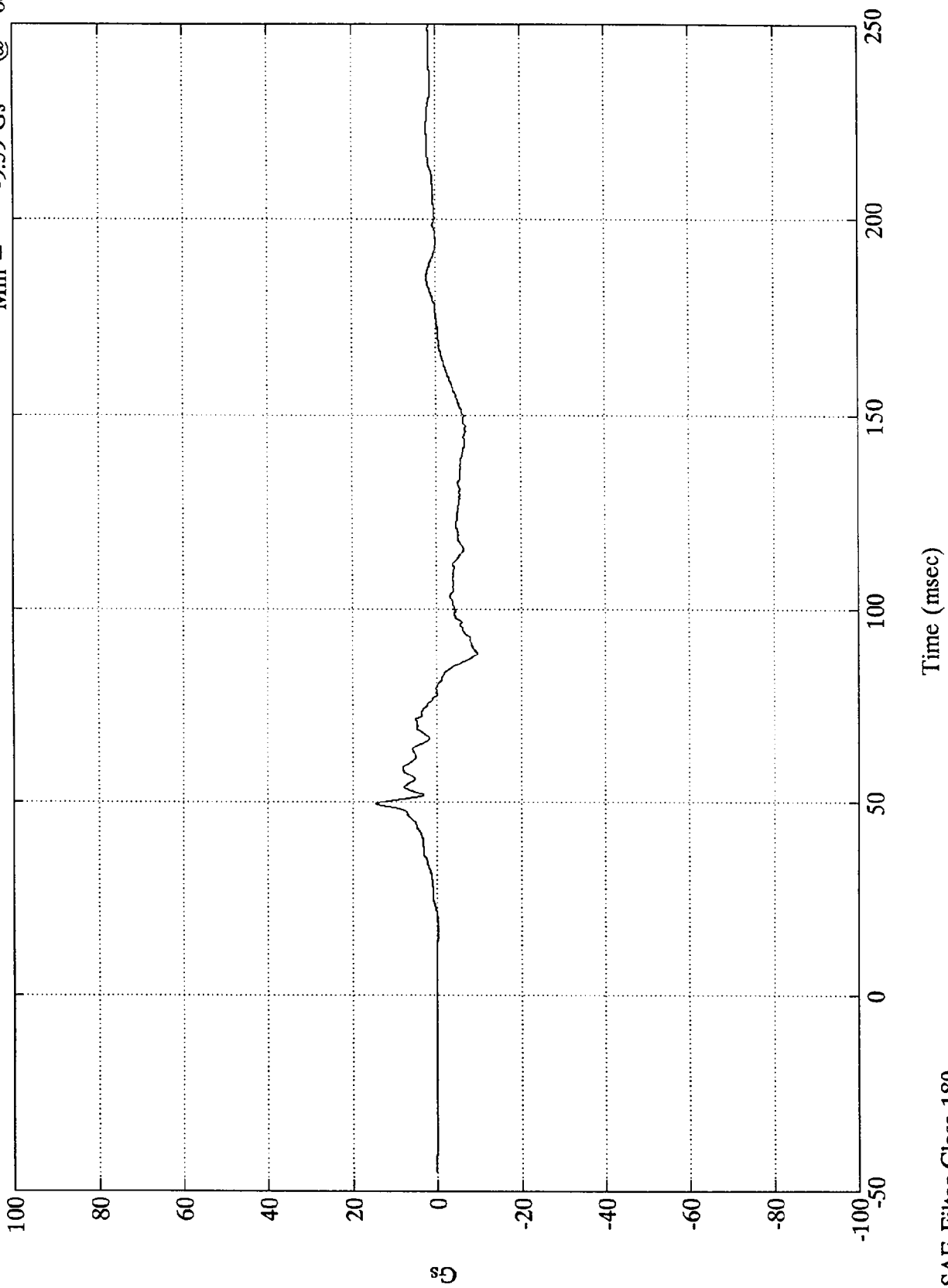
Pos. 2 Chest Y
Max = 12.32 Gs @ 108.00 msec
Min = -2.52 Gs @ 80.27 msec



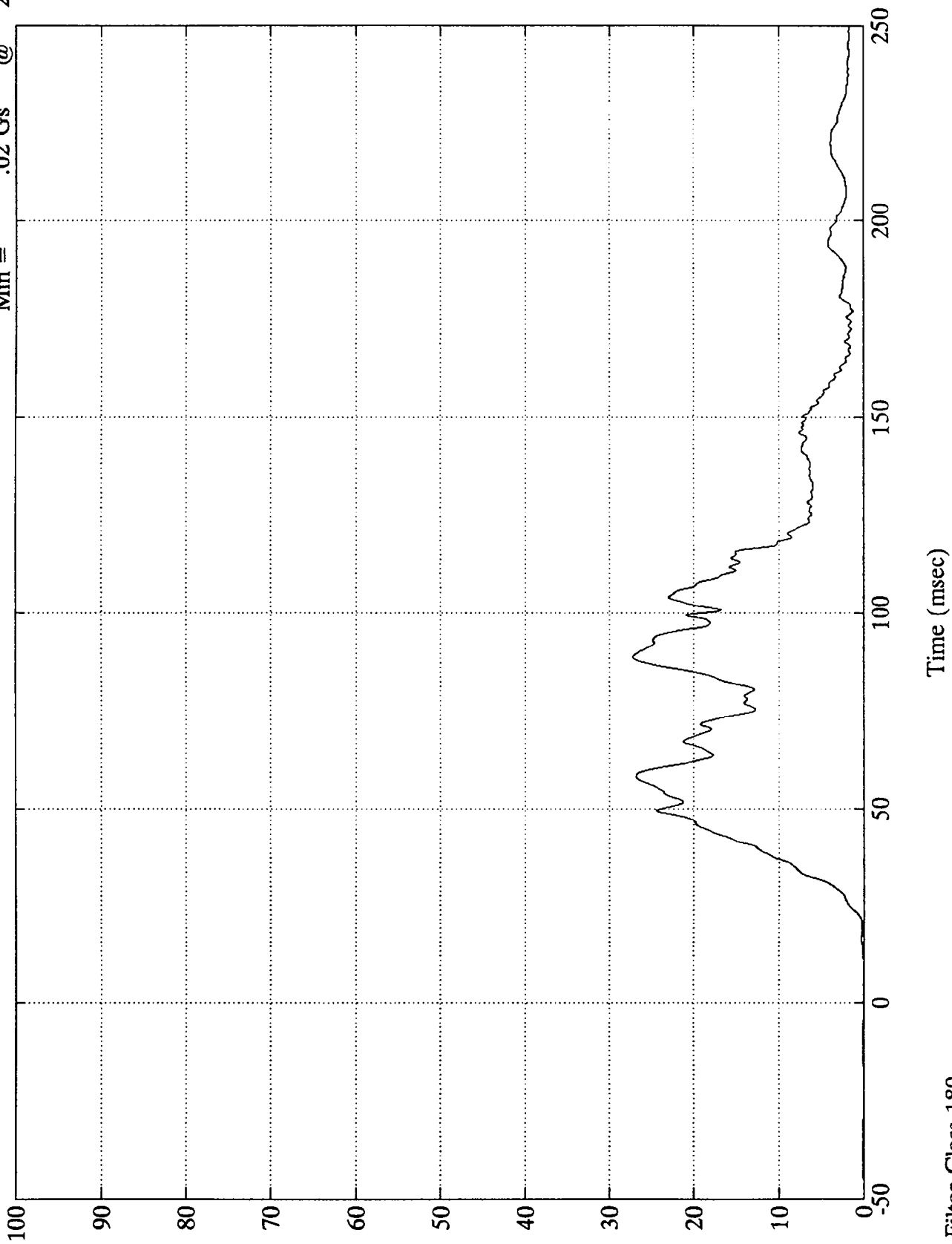
Test 1086

Pos. 2 Chest Z

Max =	14.56 Gs	@	49.68 msec
Min =	-9.59 Gs	@	88.92 msec



Pos. 2 Chest Resultant
Max = 27.24 Gs @ 88.68 msec
Min = .02 Gs @ 2.87 msec

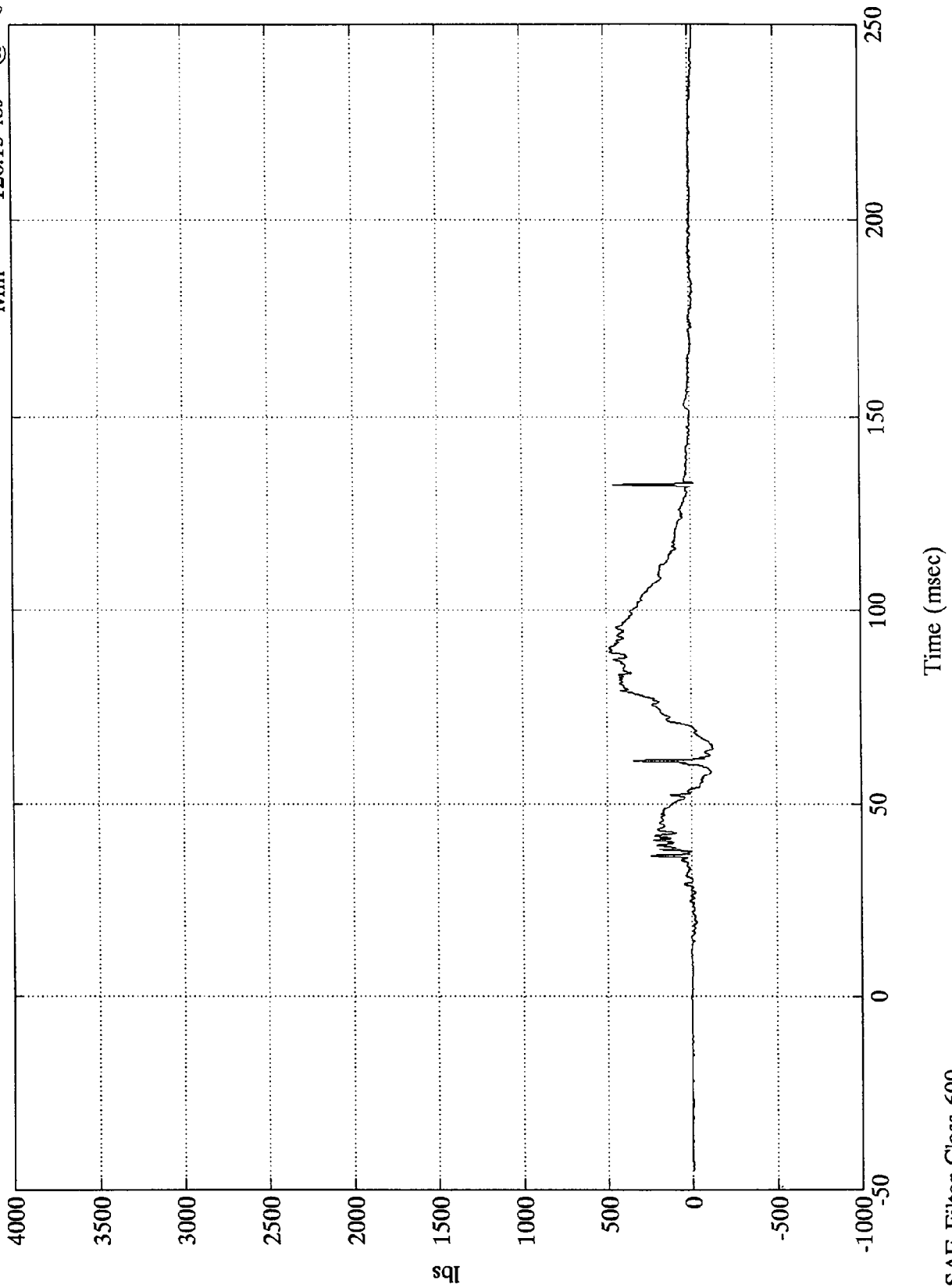


SAE Filter Class 180

Test 1086

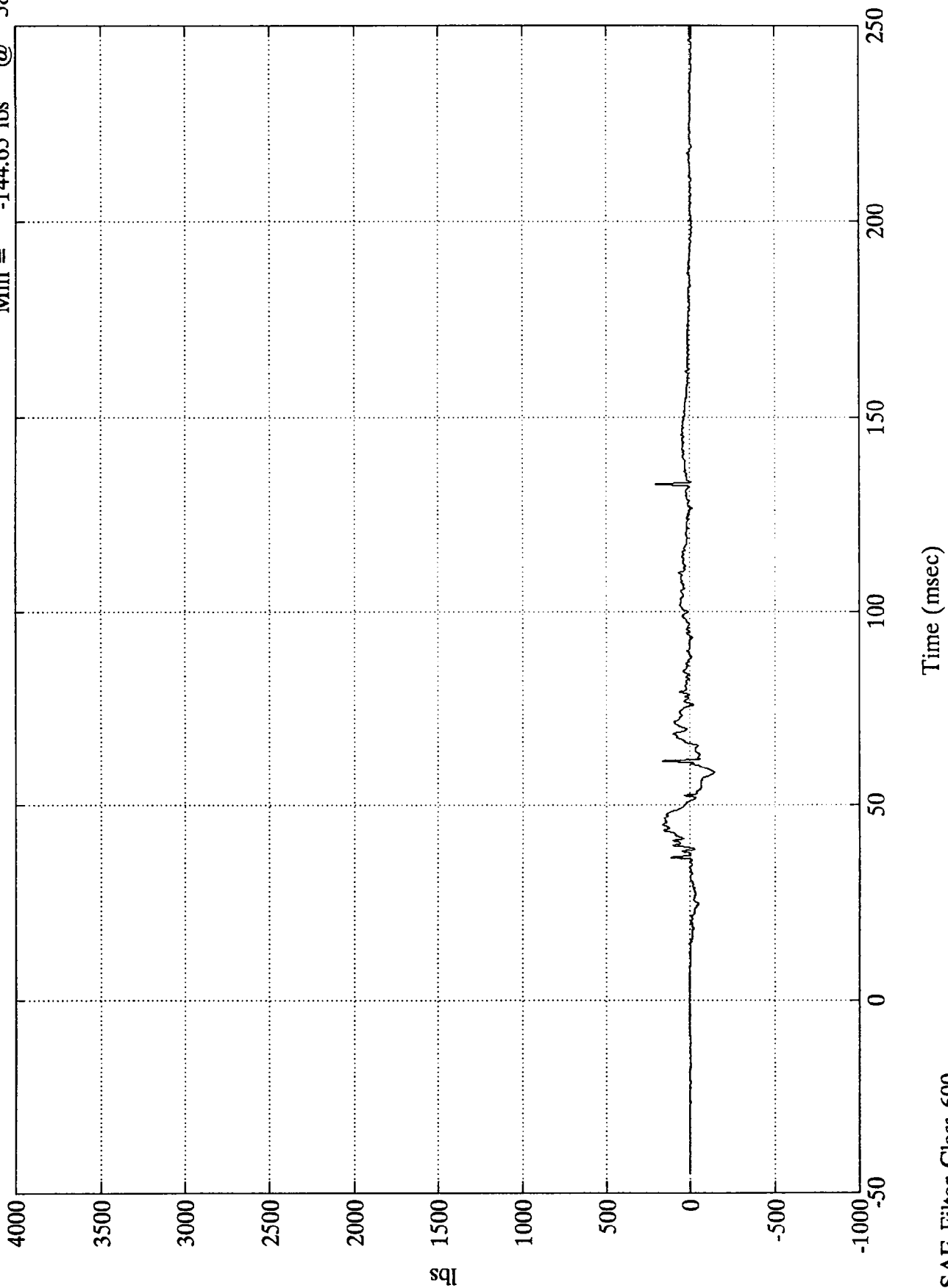
Pos. 2 Left Femur

Max = 482.60 lbs @ 90.59 msec
Min = -126.13 lbs @ 64.56 msec



SAE Filter Class 600

Pos. 2 Right Femur
Max = 201.17 lbs @ 132.72 msec
Min = -144.65 lbs @ 58.43 msec



SAE Filter Class 600

Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

6. Check all vehicle warning lights before driving vehicle.

Pushing

Vehicles with automatic transmissions cannot be started by pushing. Vehicles with manual transmissions should not be push started due to possible catalytic converter damage. Follow the directions under *If Your Vehicle Needs a Jump-Start*.

Using Safety Restraints Properly

Safety Belts

The use of safety belts helps to restrain you and your passengers in case of a collision. In most states, the law requires their use. We strongly recommend that you use them every time you travel in your vehicle.

Warning: Always drive and ride with your seat back upright and the lap belt snug across the hips to reduce the risk of serious injury to the abdomen or neck that could be caused by sliding under the safety belts in a collision.

Safety belts provide best restraint when:

- ☐ the seat back is upright
- ☐ the occupant is sitting upright (not slouched)
- ☐ the lap belt is snug and low on the hips
- ☐ the shoulder belt is snug against the chest
- ☐ the knees are straight forward

For your safety, your vehicle has:

- ☐ Lap and shoulder belts for all occupants

See the following sections for directions on how to properly use these safety belts. Also see *Safety restraints for children* in this chapter for special instructions about using safety belts for children.

Warning:

Make sure that you and your passengers, including pregnant women, wear safety belts. Be sure that lap belts fit snugly and as low as possible around the hips. If safety belts are not used properly, the risk of you or your passengers being injured in a collision greatly increases.

Warning:

Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around the neck over the inside shoulder. Never use a single belt for more than one person. Failure to follow these precautions could increase the risk and/or severity of injury in an accident.

Do not allow any people to ride in the cargo area of your vehicle. People who are not riding in seats with their safety belts fastened are much more likely to be injured in a collision.

Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

Warning:

Children should always ride with the seat back in the fully upright position. When the seat back is not fully upright, there is a greater risk that the child will slide under the safety belt and be seriously injured in a collision.

Never use a single belt for more than one person or across seating positions. This greatly increases the risk that one or both of the people will be injured in a collision. Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue. Each assembly is designed to be used as a pair.

Warning:

Be sure to lock all doors before you drive away. This will lessen your risk of being thrown from the vehicle in a collision.

Safety Belt Maintenance

Check the safety belt systems periodically to make sure that they work properly and are not damaged.

Warning:

All safety belt assemblies including retractors and attaching hardware should be inspected after any collision. Ford recommends that all safety belt assemblies used during a collision be replaced unless the technician finds that the belts do not show damage and continue to operate properly. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

Front and Rear Seat Combination Lap and Shoulder Belts

While your vehicle is in motion, the front and rear combination lap and shoulder belts will allow the occupant freedom of movement. However, if you brake hard, corner hard or if your vehicle receives an impact of 5 mph (8 km/h) or more, the lap and shoulder belt locks and helps prevent you from moving.

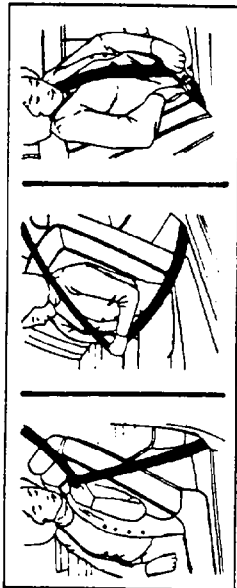
On sedans and hatchbacks, the front belts will also lock when pulled out quickly.

After you get into your vehicle, close the door and lock it. Then adjust the seat to the position that suits you best.

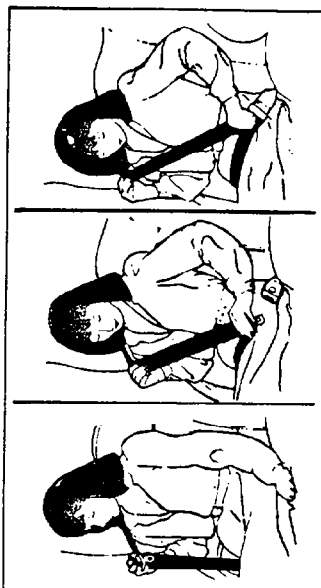
Convertible only – before fastening the front seat belt, make sure the shoulder belt passes through the belt guide loop on the top of the seat back.

To fasten the belt, find the long strap of the belt near your shoulder, pull it across your shoulder and chest, and insert the tongue into the proper buckle on your seat until you hear a snap and feel it lock. Be sure to use the correct buckle

and check to make sure the buckle is securely fastened.



Fastening the front seat lap and shoulder belt



Fastening the rear seat lap and shoulder belt

Warning:

Make sure that the lap belt is as low around your hips as possible. Do not wear the lap belt around your waist. If you do not use the lap belts properly, the risk of being injured in a collision greatly increases.

Warning:

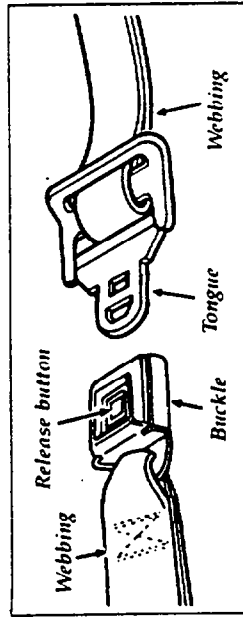
Front and rear seat occupants (including pregnant women) should wear both lap and shoulder belts, for optimum protection in an accident.

Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around your neck over the inside shoulder. Never use a single belt for more than one person. Failure to follow these precautions could increase the risk and/or severity of injury in an accident.

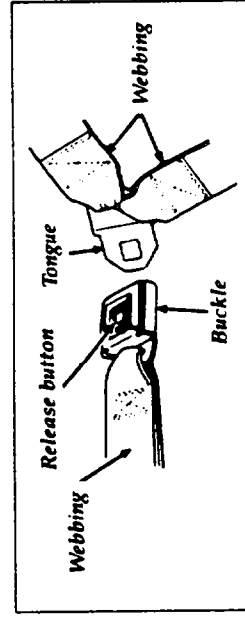
To adjust the lap part of the belt, pull up on the shoulder belt until the lap belt fits snugly low on your hips.

To unfasten the belt:

1. Push the release button in the center of the buckle. This allows the tongue to unlatch from the buckle.



Unfastening the front (on sedans) and rear outboard lap/shoulder belts



Unfastening the Mustang convertible front outboard lap/shoulder belts

2. While the belt retracts, guide the tongue to its original position. If you do not guide the tongue, it may strike you or part of the vehicle.
3. (Mustang convertible only) Place the belt in the belt holder at the top of the seat back. The retracted belt should be stored on this holder when not in use, except when a passenger is entering or leaving the rear seat area of the vehicle.

Warning: The shoulder belt must always be in the belt holder when the belt is in use.

Front Passenger Lap Belt Retractor (Convertible Only)

Dual Locking Mode Passenger Seat Lap Belt Retractor

Your convertible is equipped with a dual locking mode retractor on the lap belt part of the lap/shoulder belt for the front seat passenger. The retractor modes function as follows:

Vehicle Sensitive (Emergency) Locking Mode

In this operating mode, the lap belt retractor will allow the occupant freedom of movement, locking tight only on hard braking, hard cornering or impacts of approximately 5 mph (8 km/h) or more. The lap belt retractor cannot be made to lock by jerking on the belt.

Automatic Locking Mode

In this operating mode, the lap belt retractor will remain locked and does not allow the occupant freedom of movement. This mode provides the following:

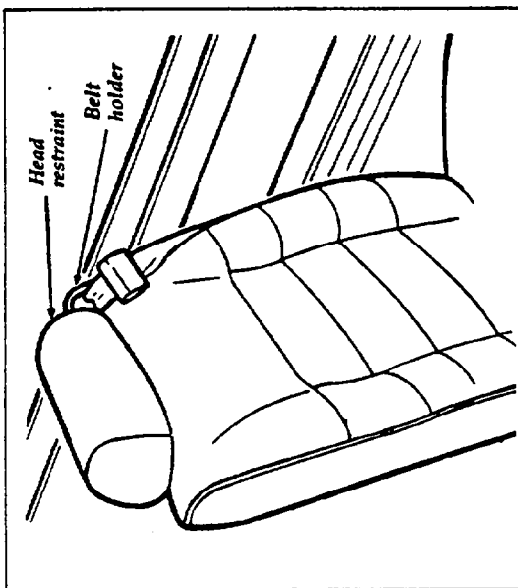
☐ A tight lap belt on the hips.

☐ Child seat or infant carrier installation.

This mode must be used when installing a child seat or infant carrier on the front passenger seat. To switch the retractor from the emergency locking mode to the automatic locking mode, perform the following steps:

1. Buckle the lap/shoulder belt.
2. Grasp the lap part of the belt below the child seat instruction label and pull upward until all of the stored belt is out and a click is heard.
3. Allow the belt to retract. A clicking sound will be heard as the belt retracts. This indicates that the retractor is in the automatic locking mode.
4. Pull down on the belt to remove slack in the belt.

NOTE: When the lap/shoulder belt is unbuckled and allowed to retract completely, the retractor will switch to the vehicle sensitive (emergency) locking mode.



Guide loop location — convertible only

To Untwist or Unjam a Safety Belt

If you should jam the belt retractor by allowing the belt to retract when it is twisted, you can free the webbing with this procedure:

1. Pull on the belt with both hands to tighten it on the retractor spool.
2. Feed the belt back into the retractor until it is completely retracted. Repeat previous step if necessary.
3. Pull the belt out of its holder as far as it will go and untwist the belt or remove the object that is jamming the belt. Let the belt retract.
4. Then, pull the belt out and let it retract several times to be sure that the belt works properly.

Safety Belt Extension Assembly

A safety belt that is too short even when fully extended can be lengthened. Available from your dealer is a safety belt extension assembly (611C22). This assembly will add approximately eight inches (20 cm) to the length of the belt.

Warning: To ensure that the safety belt extension assembly will hold in the event of a collision, only safety belt extensions manufactured by the same supplier as the safety belt should be used. Manufacturer identification is located at the end of the webbing on a label.

Supplemental Air Bag Restraint System (SRS)

Driver Side Only

The air bag is a supplemental restraint system. It is designed to be used in addition to the safety belt to help protect against head and chest injuries in certain moderate to severe frontal collisions.

Warning: Safety belts must be worn by all vehicle occupants to be properly restrained and help reduce the risk of injury in an accident.

The Importance of Wearing Safety Belts

There are four very important reasons to use safety belts even with an air bag system. Use your safety belts to:

- ☐ help keep you in the proper position when the air bag inflates
- ☐ reduce the risk of harm in rollover, side or rear impact accidents, since an air bag is not designed to inflate in such situations

- ☐ reduce the risk of harm in frontal collisions that are not severe enough to activate the air bag

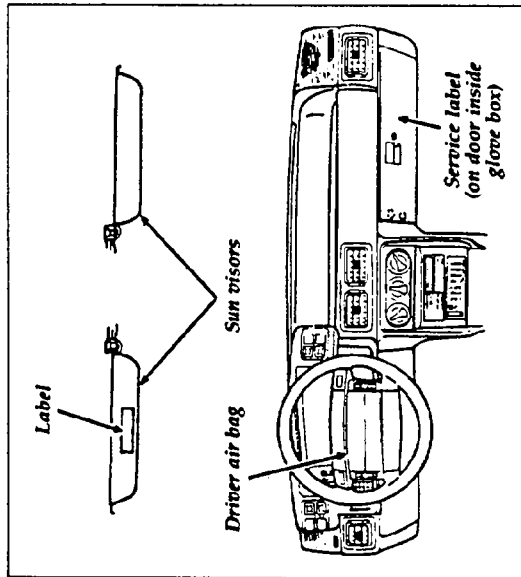
- ☐ reduce the risk of being thrown from your car

The Importance of Proper Seated Position

In an accident, the air bag must inflate extremely fast to help provide additional protection for you. In order to do this, the air bag must inflate with considerable force. If you are not seated in a normal riding position with your back against the seat back, the air bag may not protect you properly and could possibly hurt you as it inflates.

How the Supplemental Air Bag System Operates

The supplemental air bag system has two main parts. One part is the air bag system with the driver air bag and inflator. The second part is the electrical system, which has impact sensors, a diagnostic module, and backup power supply. The diagnostic module monitors its own internal circuits and the supplemental air bag electrical system readiness, including the crash sensors, the system wiring, the air bag system readiness light, air bag power, and the supplemental air bag. The driver air bag is in the center of the steering wheel.



The location of the air bag and warning labels

The air bag system uses a readiness light and a tone to indicate the condition of the system. The readiness light is in the instrument cluster. When you turn the ignition key to ON, this light will illuminate up for six (6) seconds and then turn off. This indicates that the system is operating normally. **NOTE:** Regularly scheduled maintenance of the air bag system is not required.

If there is a problem with the system, two things may happen: the readiness light will either flash or stay lit up, or you will hear a beeping sound. If either of these things happen, have the air bag system serviced at your Ford or Lincoln-Mercury dealer immediately.

Tone Generator

The air bag readiness light indicates the air bag system condition. However, a series of five sets

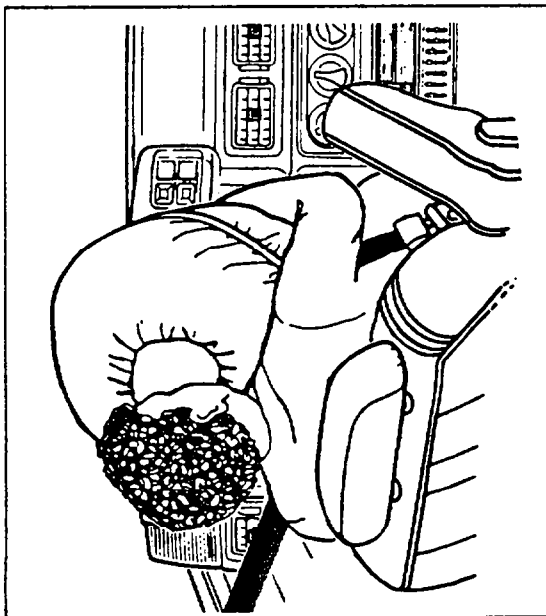
of five beeps will be heard only if the readiness light doesn't work and there is a problem with the air bag system. This also means that the Supplemental Air Bag Restraint System (SRS) is in need of service. The tone pattern will repeat (five sets of five beeps) periodically until the problem and light are repaired. Unless serviced, the Supplemental Air Bag Restraint System may not function properly in the event of an accident.

Warning: Do not attempt to service, repair, or modify the Supplemental Air Bag Restraint System; tampering could cause activation of the system and increase the risk of personal injury. For servicing of the Supplemental Air Bag Restraint System, see your Ford or Lincoln-Mercury dealer.

The air bag system is designed to stay out of sight until it is activated. The air bag system only operates in frontal and front-angled collisions more severe than hitting a parked car of similar size and weight head-on at about 28 mph (45 km/h). After receiving a signal from the crash sensors, the air bag system inflates in about 45 milliseconds.

If you are in such an accident, your forward motion will be restrained by both the air bag and your safety belt. The air bag then deflates. When used together, the air bag and your safety belt can help reduce the risk of injury to your head and chest. **NOTE:** Several air bag system components get hot after inflation. Do not try to touch them after inflation.

The air bag may not inflate in minor frontal collisions, even though the vehicle may be badly damaged. The fact that your air bag did not inflate in such a collision does not necessarily mean that something is wrong with the air bag system.



The driver side supplemental air bag inflated

Report Air Bag Inflation

If an air bag inflates during a collision or for any other reason, Ford Motor Company wants to know. Please report the inflation to the Accident Investigation Team by calling "collect" (313) 337-8040.

The Accident Investigation Team reviews the information you provide. An investigator may contact you for more information. In some cases, the investigator may want to examine your car, and if an accident occurred, to get an accident report.

Warning:

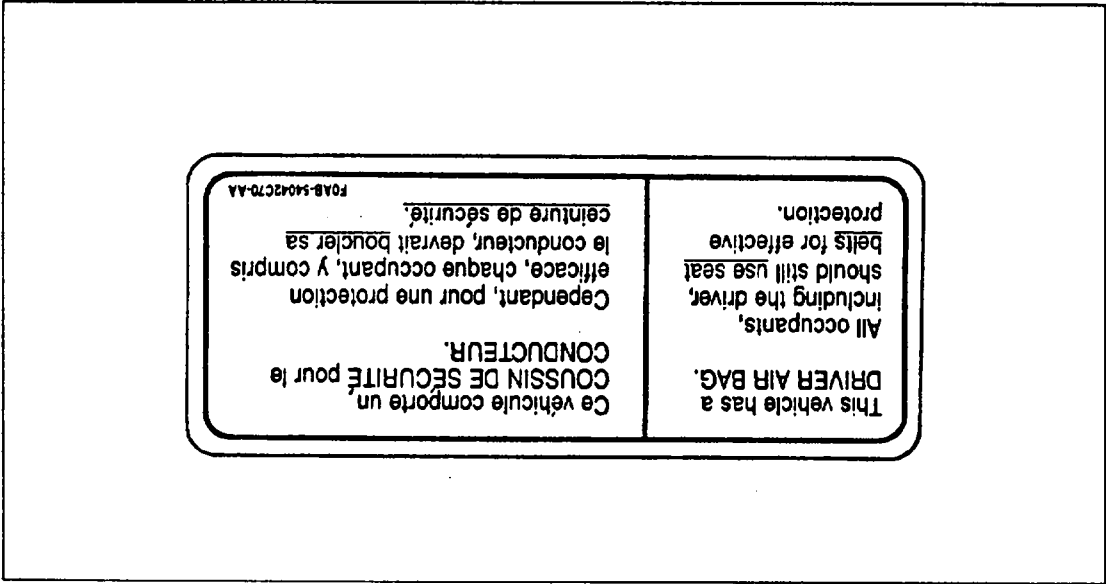
The air bag will inflate only once. The system is designed to function on a one-time-only basis. If the air bag is inflated, **THE AIR BAG WILL NOT FUNCTION AGAIN AND MUST BE REPLACED IMMEDIATELY.** If the air bag is not replaced, the unrepaired area will increase the risk of injury in a collision.

Disposal of Air Bag Equipped Vehicles

For disposal of air bags or air bag equipped vehicles, refer to the procedures in the 1991 Ford Shop Manual. Information on how to order a shop manual is available at an authorized Ford or Lincoln-Mercury Dealer. You can also order a shop manual using the order form in the back of your Owner's Guide.

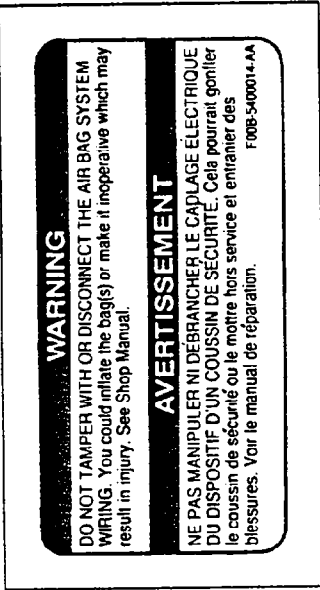
Service and Information Labels

Service and information labels are attached inside the glove compartment, on the sun visor, and on the radiator support in the engine compartment.



Label on the driver sun visor in the down position

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Label on radiator support in the engine compartment

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Safety Restraints for Children

In most states, you are required by law to use safety restraints for children. If small children ride in your vehicle — this generally includes children who are four years old or younger and who weigh 40 pounds (18 kg) or less — you must put them in safety seats that are made specially for children. Safety belts alone do not provide maximum protection for these children. Check your local and state laws for specific requirements.

Warning: Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

Warning: Never let children ride in the cargo area of your vehicle. Make sure that they sit where they can be properly restrained. If they are not restrained their risk of being injured in a collision greatly increases.

When possible, put children in the rear seat of your vehicle. Accident statistics suggest that children are safer when properly restrained in the rear seating positions than in the front seating positions.

Warning: When using any infant or child restraint system, it is important that you follow the instructions and warnings provided by the manufacturer concerning its installation and use. Failure to follow each of the restraint manufacturer's instructions could increase the risk or severity of an injury in the event of a collision or sudden stop.

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COUSSIN DE SECURITE

Le dispositif du coussin de sécurité est en bon état si le témoin marqué "AIR BAG" s'allume momentanément quand le commutateur d'allumage est en position de contact.

AUCUNE INTERVENTION NE S'IMPOSE sauf si:

1. Le témoin "AIR BAG" ne s'allume pas quand le commutateur d'allumage est en position de contact.
2. Le témoin "AIR BAG" clignote ou reste allumé.
3. Des successions de cinq «bips» se font entendre.
4. Un coussin de sécurité s'est déployé (gonflé).

BOUCLEZ VOTRE CEINTURE MEME SI VOUS BENEFICIEZ D'UN COUSSIN DE SECURITE.

LE GUIDE DU PROPRIETAIRE VOUS DONNE DE PLUS AMPLES RENSEIGNEMENTS SUR LES COUSSINS DE SECURITE.

AIR BAG INFORMATION

Air Bag System is normal if "AIR BAG" lamp lights briefly when ignition key is turned on.

NO MAINTENANCE IS NEEDED unless:

1. "AIR BAG" lamp does not light when key is turned on.
2. "AIR BAG" lamp flashes or stays lit.
3. Groups of five "beeps" are heard.
4. An air bag has inflated.

USE SEAT BELTS EVEN IF YOU HAVE AN AIR BAG.

SEE OWNER GUIDE FOR MORE INFORMATION ABOUT AIR BAGS.

△ F008-5406099-AB

Label located in the glove compartment

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