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212-CAL-91-06
301-CAL-91-06

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

**FORD MOTOR COMPANY
1991 FORD PROBE
2-DOOR HATCHBACK**

NHTSA NUMBER: CM0204

CALSPAN TEST NUMBER: 7853-8

March 8, 1991

CALSPAN CORPORATION
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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16. Abstract A 30 mph vehicle safety compliance test was conducted on a 1991 Ford Probe 2-Door Hatchback. This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on March 8, 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 29.5 mph. The ambient temperature at the impact face was 30°F. The subject test vehicle appears to comply with the requirements of FMVSS Nos. 208, 212, 219 (partial) and 301. <u>Type of Restraint System:</u> The test vehicle was equipped with an automatic torso belt restraint system for both driver and right front passenger. Manual lap belts were 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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FMVSS 219 (Partial), "Windshield Zone Intrusion"	
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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 Probe 2-Door Hatchback, 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 CM0204

A frontal barrier was impacted by a 1991 Ford Probe 2-Door Hatchback at a velocity of 29.5 mph. The test was performed at the Calspan Corporation Advanced Technology Center on March 8, 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 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 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. Appendix B contains the vehicle and dummy response data traces.

The driver's HIC was 270. The maximum chest deceleration over 3 milliseconds was 37.2 g's. The maximum force on the driver's left femur was 1485 pounds and 1451 pounds on the right femur.

The right front passenger's HIC was 173. The maximum chest deceleration over 3 milliseconds was 32.3 g's and loads were 973 and 944 on the left and right femurs respectively.

Table 1

CRASH TEST SUMMARYVehicle NHTSA No.: CM0204 Test Mode: 30 mph Frontal BarrierTest Date.: March 8, 1991 Time: 14:25 Temperature: 30°FVehicle Make/Model/Body Style: 1991 Ford Probe 2-Door HatchbackVehicle Test Weight: 3200 lbs.Vehicle/Barrier Impact Angle: 90°Impact Velocity: 29.5 mphMaximum Static Crush: 20.1 in.Vehicle Rebound: 15.1 in.DUMMIES:DRIVERPASSENGERType: Part 572 BPart 572 BRestraint System: Automatic Torso BeltAutomatic Torso BeltNumber of Data Channels: 23Number of Cameras: 1 Real Time14 High Speed

DOOR OPENING DATA: operable - Left Front

operable - Right Front

Front Seat(s) Data:DRIVERPASSENGER

Seat Track Failure: 0.0 0.0

inches of shift

Seat Back Failure: none none

VISIBLE DUMMY CONTACT POINTS:DRIVERPASSENGER

Head: rear of head with headrest, chin with chest chin with chest

Abdomen - -

Chest - -

Knees lower dash panel lower dash panel

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1991 Ford Probe 2-Door Hatchback
 NHTSA No. CM0204 ; VIN: 1ZVPT20CXM5112161 ; Color; Red
 Engine Data: 4 cylinders; - CID; 2.2 Litres; - cc
 Placement - Longitudinal or In-Line; X Transverse or Lateral
 Transmission Data: - speeds; - Manual; X Automatic; X Overdrive
 Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive
 Major Options: - A/C; X Pwr. Strg.; X Pwr. Brakes; - Pwr. Windows
- Power Door Locks
 Date Received: 01-04-91 ; Odometer Reading 18 miles
 Selling Dealer: Emerling Ford
 & Address 135 Hamburg, East Aurora, NY 14052

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Mazda Motor Manufacturing
 Date of Manufacture: 09-19-90
 GVWR: 3560 lbs.; GAWR: 2095 lbs. FRONT; 1740 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 32 psi FRONT
26 psi REAR
 Recommended Tire Size: P185/70R14 Load Range: -
 Recommended Cold Tire Pressure: 32 psi FRONT; 26 psi REAR
 Size of Tires on Test Vehicle: P185/70R14; 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) = 680 lbs.
 No. of Occupants x 150 lbs. = 600 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 80 lbs. (Difference)

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

Right Front =	<u>870</u> lbs.	Right Rear =	<u>480</u> lbs.
Left Front =	<u>920</u> lbs.	Left Rear =	<u>530</u> lbs.
TOTAL FRONT =	<u>1790</u> lbs.	TOTAL REAR =	<u>1010</u> lbs.
% of Total Vehicle Weight =	<u>63.9</u>	% of Total Weight =	<u>36.1</u>
TOTAL DELIVERED WEIGHT =	<u>2800</u>	lbs.	

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight	=	<u>2800</u>	lbs.
Rated Cargo/Luggage Weight (RCLW)	=	<u>80</u>	lbs.
Weight of 2 P.572 Dummies @ 164 ea.	=	<u>328</u>	lbs.
TARGET TEST WEIGHT	=	<u>3208</u>	lbs. (sum)

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

Right Front =	<u>910</u>	lbs.	Right Rear =	<u>660</u>	lbs.
Left Front =	<u>950</u>	lbs.	Left Rear =	<u>680</u>	lbs.
TOTAL FRONT =	<u>1860</u>	lbs.	TOTAL REAR =	<u>1340</u>	lbs.
% of Total Weight =	<u>58.1</u>	%	% of Total Weight =	<u>41.9</u>	%
TOTAL TEST WEIGHT =	<u>3200</u>	lbs.			
Weight of Ballast Secured in Vehicle Trunk Area =	<u>0</u>	lbs.			
Vehicle Components Removed for Weight Reduction	<u>None</u>				

VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED:	RF <u>26.8"</u>	LF <u>26.5"</u>	RR <u>26.0"</u>	LR <u>25.8"</u>
FULLY LOADED:	RF <u>25.8"</u>	LF <u>25.5"</u>	RR <u>23.8"</u>	LR <u>23.5"</u>
AS TESTED:	RF <u>26.5"</u>	LF <u>26.2"</u>	RR <u>24.5"</u>	LR <u>24.4"</u>
Vehicle's Wheel Base:	<u>99.1</u>	in.		
Location of Vehicle's C.G.:	<u>41.5 inches rearward of front wheel center.</u>			

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual =	<u>15.1</u>	gallons
Usable Capacity Figure Furnished by COTR =	<u>15.1</u>	gallons
Test Volume Range (92 to 94% of Usable Capacity) =	<u>13.9</u> to <u>14.2</u>	gallons
ACTUAL TEST VOLUME =	<u>14.0</u>	gallons (with entire fuel system filled)

Table 3
POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
 Test Date: March 8, 1991 Time: 14:25 Temperature: 30 °F
 Vehicle NHTSA No.: CM0204
 Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.5 mph; Trap No. 2 = 29.5 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	=	<u>173.4</u>	;	C/L =	<u>176.6</u>	;	Left =	<u>173.5</u>
Post-Test	Right	=	<u>159.9</u>	;	C/L =	<u>156.5</u>	;	Left =	<u>160.2</u>
Crush	Right	=	<u>13.5</u>	;	C/L =	<u>20.1</u>	;	Left =	<u>13.3</u>
AVERAGE		=	<u>15.6</u>	inches					

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

	Right	=	<u>13.6 "</u>	;	C/L =	<u>17.2 "</u>	;	Left =	<u>14.5 "</u>
AVERAGE		=	<u>15.1</u>	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>0.0</u>
Rear	<u>N/A</u>	<u>N/A</u>

Table 3

POST IMPACT DATA (cont.)

GLAZING DAMAGE: None.

OTHER NOTABLE IMPACT FEATURES: None.

Section 3
OCCUPANT AND VEHICLE DATA

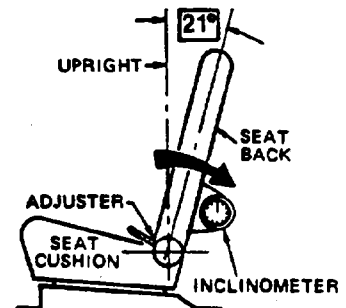
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1991 Vehicle Model: Ford Probe Body Style: 2-Door Hatchback

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 21°

Measurement instructions: Seat back placed in 5th position from full upright. Full upright position = 0.

Seat back angle for passenger's seat: 21°

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 12th detent from full forward. Full forward position = 0.

Positioning of the passenger's seat (if applicable): Same as driver

3. Fuel Tank Capacity Data

A. "Usable Capacity" of the standard equipment fuel tank is 15.6 gallons

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

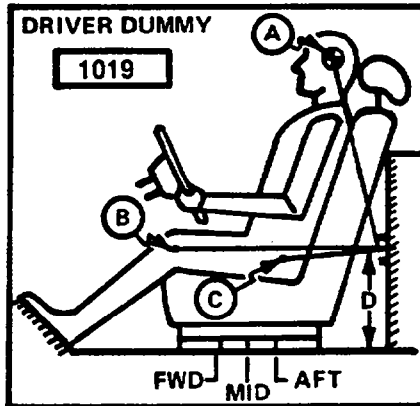
Additional Instructions: None.

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION

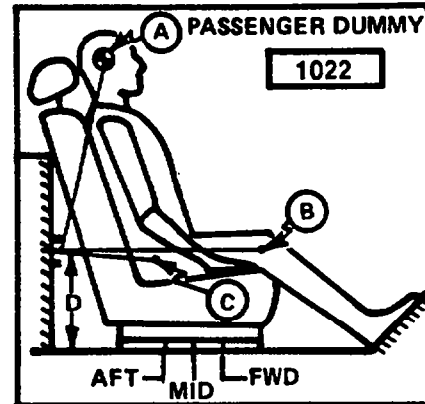
Test No.: CM0204 Vehicle: 1991 Ford Probe 2-Door Hatchback

SEAT TYPE: BENCH ADJUSTER TYPE: X Manual SEAT BACK TYPE: Fixed
 X Bucket Power X Adjustable Reclining
 Split Bench



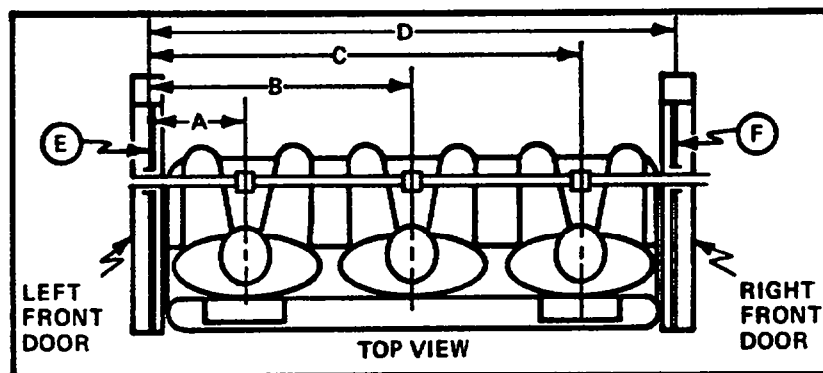
MEASUREMENT
LOCATION

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



A = 21.5 in. 34 Degrees
B = 34.0 in. 99 Degrees
C = 20.1 in. 117 Degrees
D = 15.5 in.

A = 22.1 in. 35 Degrees
B = 33.6 in. 97 Degrees
C = 20.2 in. 117 Degrees
D = 15.5 in.



S/N 1019

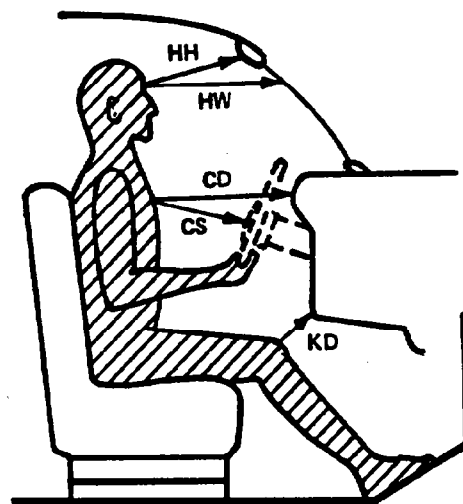
DUMMY ID

S/N 1022

A = Left Door to Driver Centerline 11.8 in.
B = Left Door to Center Passenger Centerline in.
C = Left Door to Right Passenger Centerline 39.2 in.
D = Left Door to Right Door 50.6 in.
E,F = Window Glass Height (Right and Left Must Be Equal) 11.0 in.

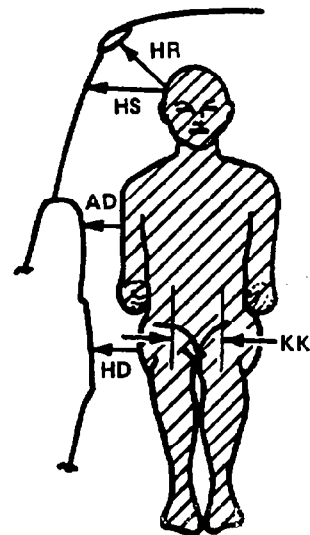
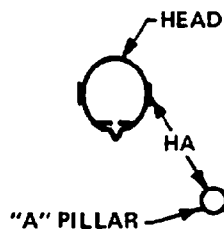
Figure 3
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	12.1	12.0
HW	17.5	17.2
CD	20.2	22.6
CS	14.0	-
KDL	5.0	6.0
KDR	5.8	5.8
SA	21°	21°
TA	23°	25°



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

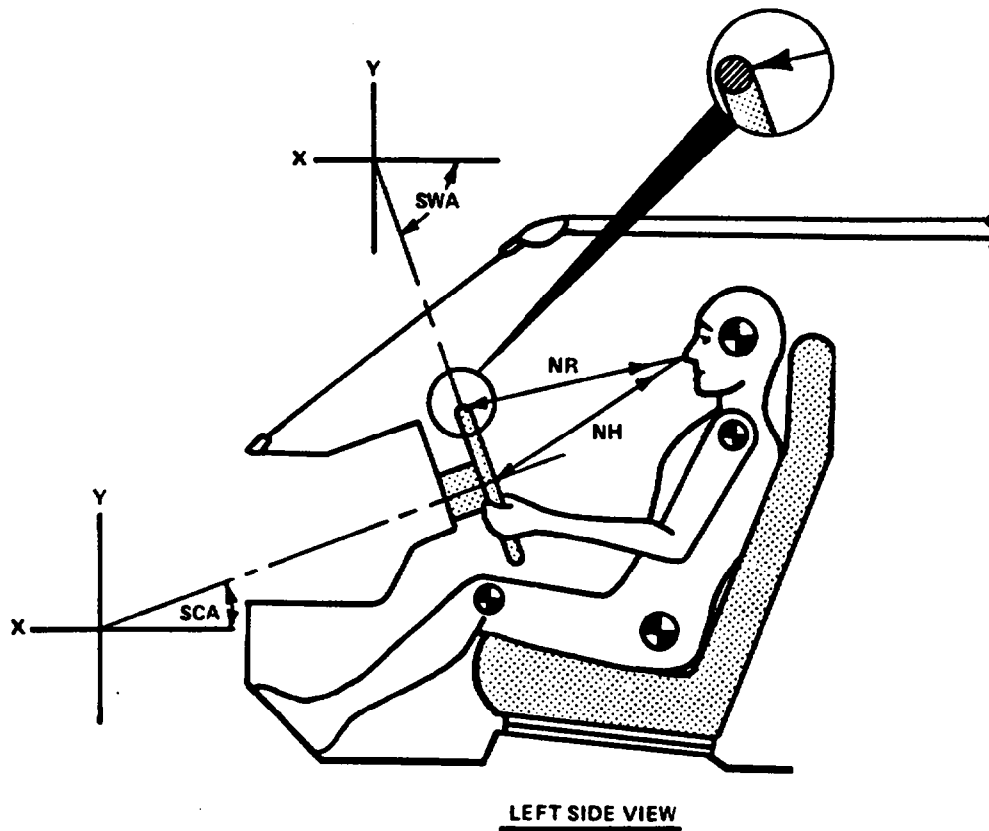
HA = Head Target to "A" Pillar
 HR = Head to Side Roof
 HS = Head to Side Window
 AD = Arm to Door
 HD = Hip to Door
 KK = Knee to Knee



	DRIVER	PASSENGER
HR	4.8	5.0
HS	8.0	8.3
AD	3.4	4.5
HD	6.7	7.3
KK	10.5	8.5
HA	15.7	15.5

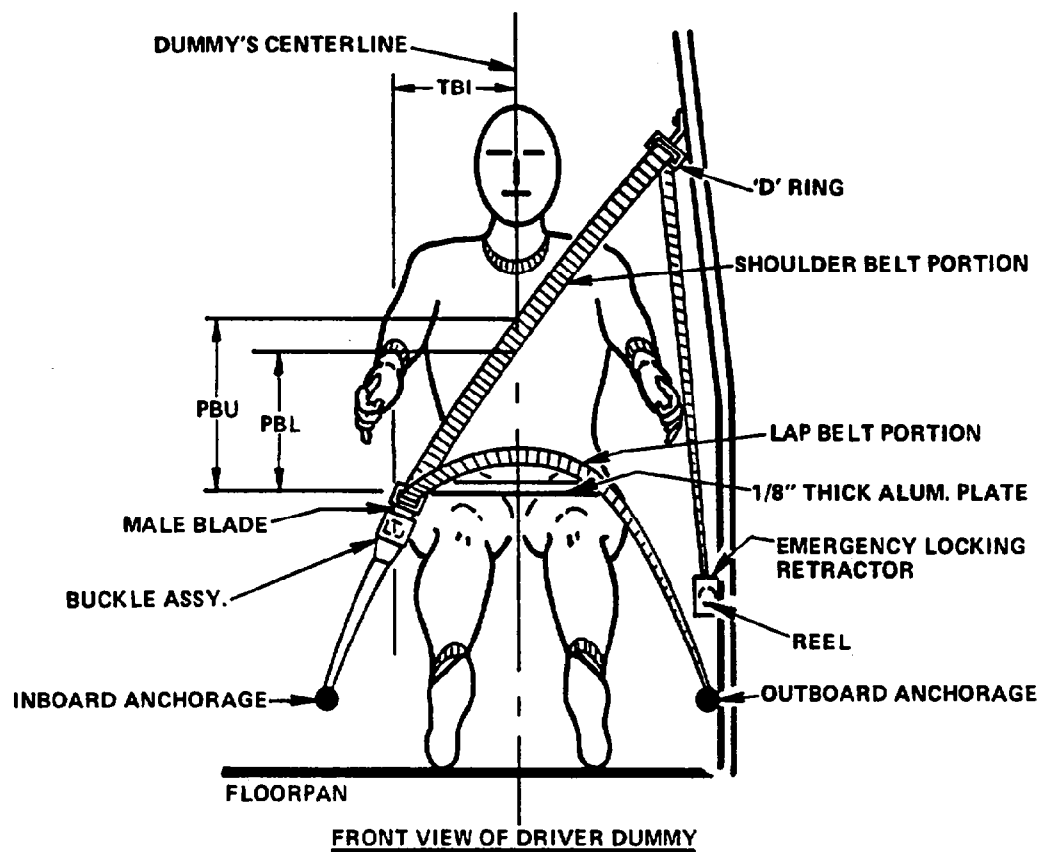
Figure 4

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	17.6	Inches
<u>NH</u>	-- Distance from tip of dummy's nose to center of steering wheel hub	18.7	Inches
<u>SCA</u>	-- Angle of steering column relative to the horizontal X axis	20	Degrees
<u>SWA</u>	-- Angle of steering wheel relative to the horizontal X axis	-70	Degrees

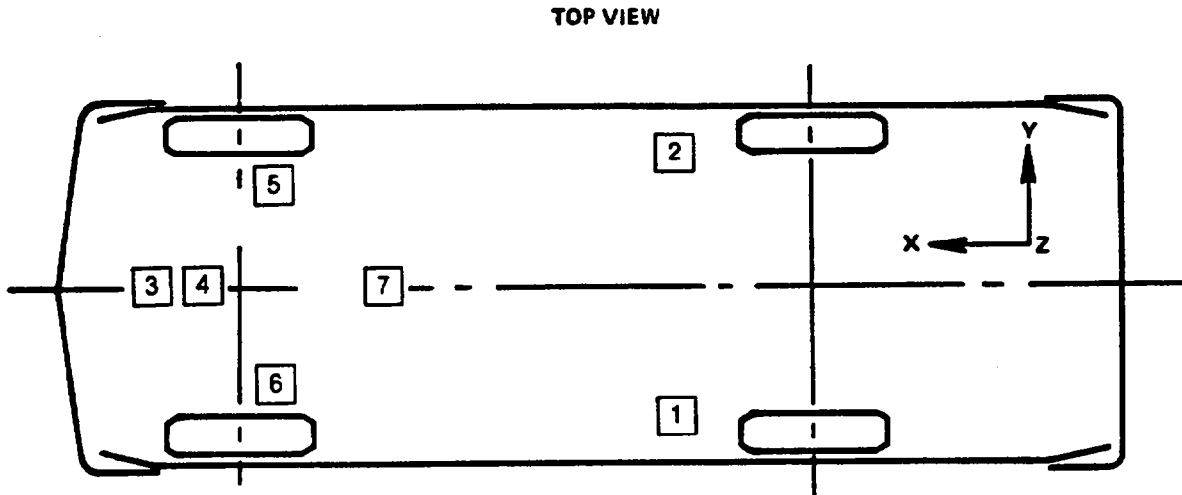
Figure 5
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	15.1	14.3
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	12.1	11.3
<u>TBI</u> -- Distance from torso centerline to buckle	*	*

*Automatic torso belt used for 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:	70.0	15.0	15.8				
		POST:	70.0	15.0	15.8				
	LONGITUDINAL ACCELERATION					4	130	-33	61
2	REAR SEAT X-MEMBER AT RIGHT SIDE	PRE:	70.0	-15.2	16.0				
		POST:	70.0	-15.2	15.9				
	LONGITUDINAL ACCELERATION					3	134	-29	67
3	TOP OF ENGINE BLOCK	PRE:	147.8	-6.2	33.1				
		POST:	142.3	-6.2	32.7				
	LONGITUDINAL ACCELERATION					45	49	-90	31
4	BOTTOM OF ENGINE	PRE:	143.6	-8.1	10.6	Data Questionable After 140 msec.			
		POST:	133.4	-8.0	10.5				
	LONGITUDINAL ACCELERATION					42	151	-109	35
5	BRAKE CALIPER AT RIGHT SIDE	PRE:	136.0	-22.7	20.6				
		POST:	130.9	-22.1	20.9				
	LONGITUDINAL ACCELERATION					20	51	-79	46
6	BRAKE CALIPER AT LEFT SIDE	PRE:	136.2	22.7	21.1				
		POST:	129.9	22.1	21.0				
	LONGITUDINAL ACCELERATION					17	96	-70	46
7	DASH PANEL	PRE:	110.9	-1.0	26.9				
		POST:	110.6	-1.0	27.0				
	LONGITUDINAL ACCELERATION					61	65	-70	70

*X + Forward from rear bumper
 Y + Left from vehicle centerline
 Z + Up from ground

**
 LONGITUDINAL:
 LATERAL:
 VERTICAL:

POSITIVE
 FORWARD
 LEFTWARD
 UPWARD

NEGATIVE
 REARWARD
 RIGHTWARD
 DOWNWARD

DISTANCE MEASUREMENTS IN INCHES

Figure 7
CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5.

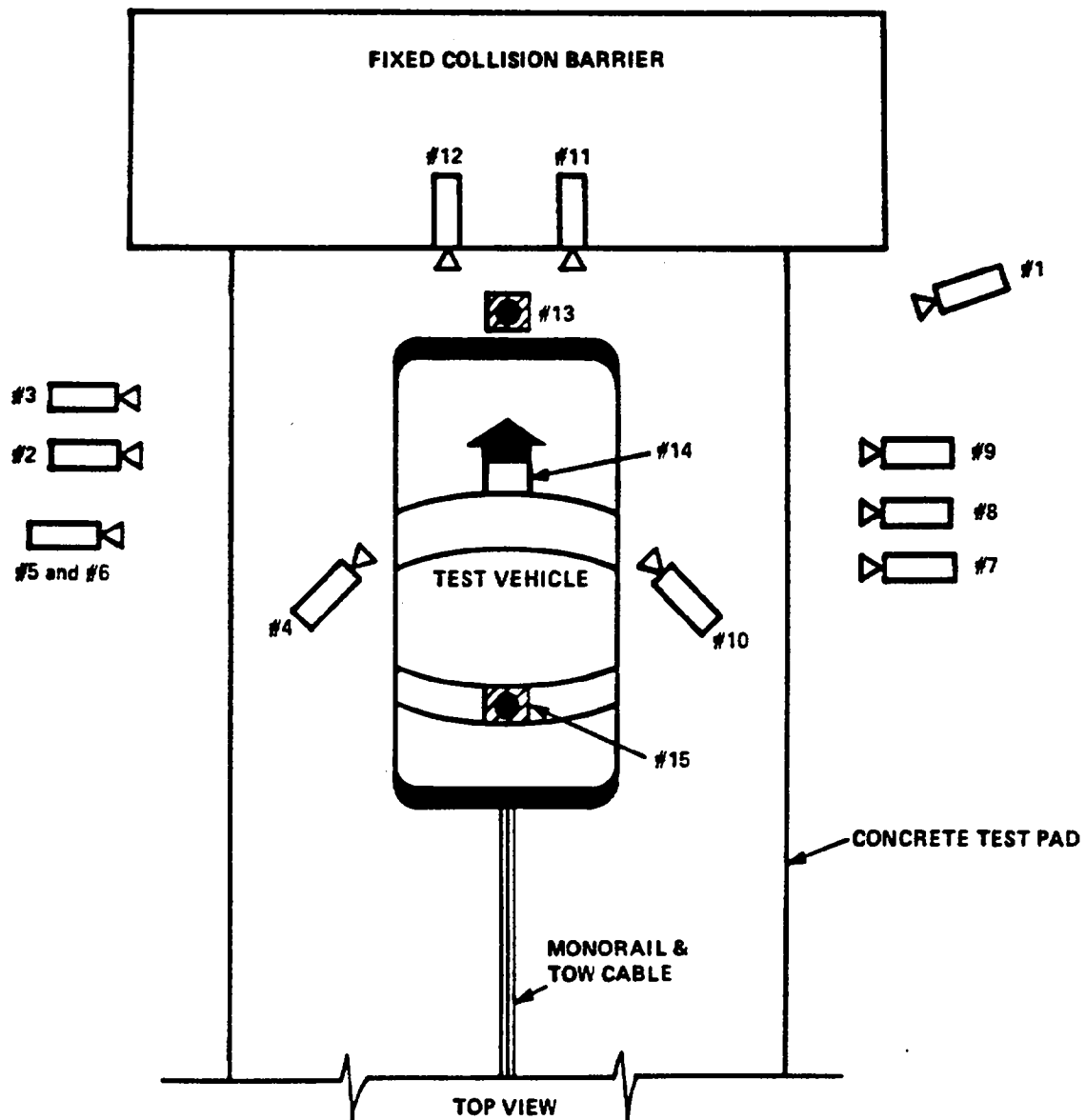


Table 5
HIGH-SPEED CAMERA LOCATIONS

Test No. CM0204 Vehicle: 1991 Ford Probe 2-Door Hatchback

CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	218	64	40	-5	234.5	13	545
3	Left Side View	308	37	41	-3	324.5	25	570
4	Driver and Interior View	99	114	67	-17	-	13	650
5	Steering Column (Bottom)	261	84	46	-4	277.5	25	555
6	Steering Column (Top)	261	84	70	-11	277.5	25	565
7	Overall Right Side	218	75	42	-2	234.5	13	a
8	Right Side View	295	55	40	-2	311.5	25	b
9	Right Passenger View	288	62	50	-3	304.5	35	b
10	Passenger and Interior View	99	110	64	-18	-	13	615
11	Passenger Front View	23	19	75	-44	-	13	540
12	Driver Front View	21	19	76	-43	-	13	535
13	Windshield View	0	0	130	-51	-	13	550
14	Pit View of Engine	0	26	-120	+90	-	13	b
15	Pit View of Fuel Tank	0	102	-120	+90	-	13	b

*X = film plane to monorail centerline
Y = film plane to impact location
Z = film plane to ground
** = referenced to horizontal plane
a = camera did not operate
b = timing marks not available

7853-8

Figure 9
TEST VEHICLE MEASUREMENTS

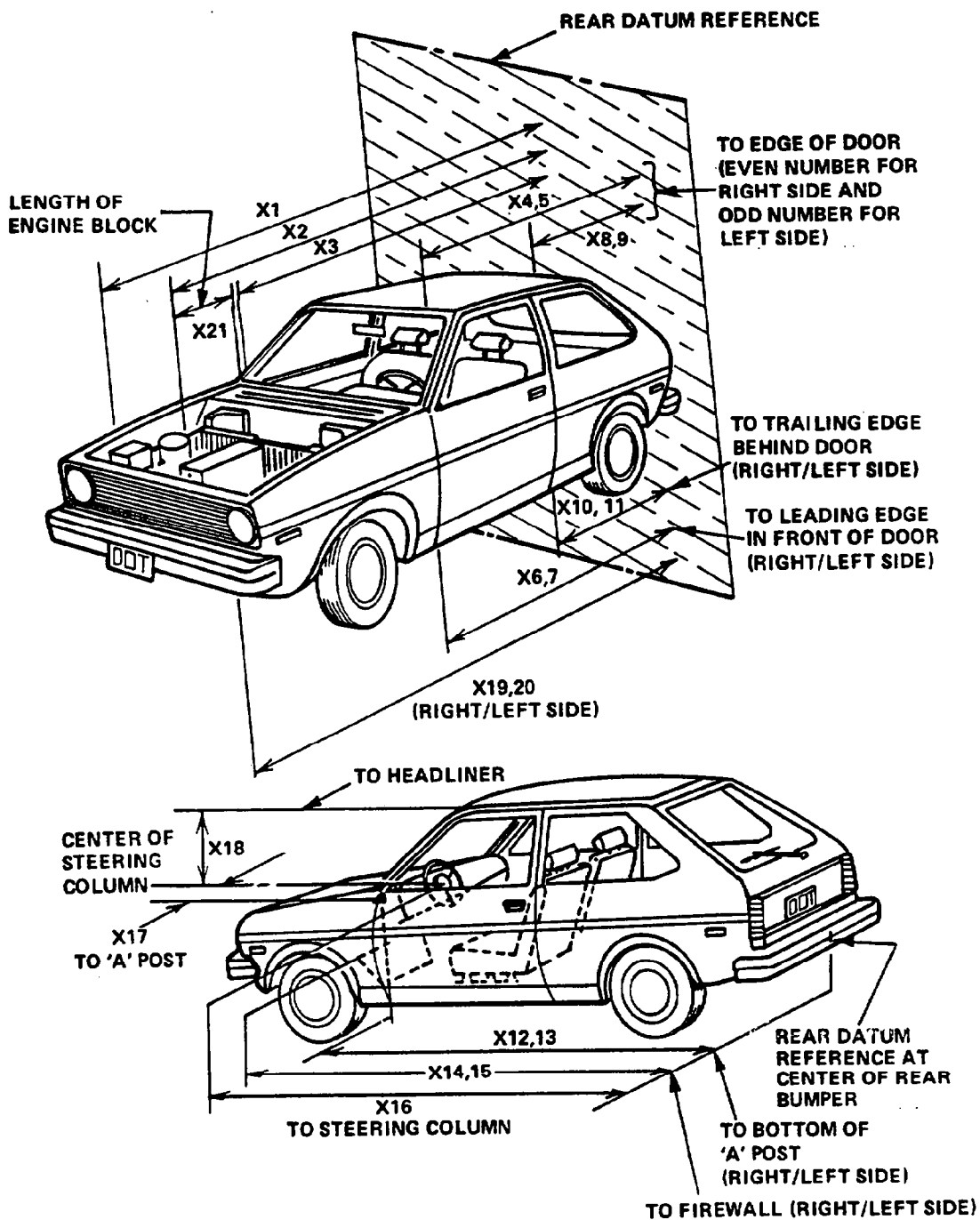


Table 6

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	176.6	156.5	20.1
X2	Rear Surface of Vehicle to Front of Engine	151.0	145.2	5.8
X3	Rear Surface of Vehicle to Firewall	129.6	129.0	0.6
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	117.9	117.8	0.1
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	117.8	117.8	0.0
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	117.4	117.8	-0.4
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	117.5	117.9	-0.4
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	68.2	68.1	0.1
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	68.2	68.1	0.1
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	71.0	71.4	-0.4
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	71.0	71.3	-0.3
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	117.6	117.8	-0.2
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	117.8	117.4	0.4
X14	Rear Surface of Vehicle to Firewall, Right Side	129.6	128.5	1.1
X15	Rear Surface of Vehicle to Firewall, Left Side	129.6	128.6	1.0
X16	Rear Surface of Vehicle to Steering Column	102.3	101.4	0.9
X17	Center of Steering Column to "A" Post	16.3	15.9	0.4
X18	Center of Steering Column to Headliner	15.5	14.5	1.0
X19	Rear Surface of Vehicle to Right Side of Front Bumper	173.4	159.9	13.5
X20	Rear Surface of Vehicle to Left Side of Front Bumper	173.5	160.2	13.3
X21	Length of Engine Block	16.0	16.0	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.: CM0204 Vehicle: 1991 Ford Probe 2-Door Hatchback

	MAXIMUM ACCELERATION (g's)							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
Dummy (1)	-29	6	35	42	-37	6	27	37.2
Dummy (2)	-17	14	36	38	-34	12	19	32.3

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	1485	1451
Dummy (2)	973	944

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc. (g) t ₁ TO t ₂
		t ₁ (SEC)	t ₂ (SEC)	
Dummy (1)	269.6	67.320	103.200	35.51
Dummy (2)	173.3	61.560	97.440	29.75

*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 = 0.0 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: Not applicable (N/A), vehicle uses automatic torso belt restraint 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.

*label states, "Regular maintenance of the SIR is not required."

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

Was a description of the functional operation of the system provided? YES N/A NO -

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

Was an owner's manual provided? YES N/A 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 N/A 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 X NO

Describe the location of the readiness indicator:

 N/A

Is the readiness indicator clearly visible to the driver?

YES - NO -

Is a list of the elements in the occupant restraint system, being monitored by the readiness indicator, provided?

YES - NO -

Table 11

FMVSS NO. 208 - COMFORT AND CONVENIENCE TEST SUMMARY

Test Vehicle NHTSA No.: CM0204
 Make/Model: 1991 FORD PROBE
 Date of Comfort/Convenience Check: 3/7/91
 Technician Performing Check: DJT
 GVWR: 3560 lbs.

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 -

(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 N/A 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 - NO -

(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 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 for is 0.5 pounds. Contact the COTR if the contact force exceeds 0.7 pounds.

Table 11 (cont.)

D4

LATCHPLATE ACCESS

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

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:

Automatic Belt Assembly used for this test.

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.

*Automatic seat belt YES * 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 0.5" rubber and plastic trim along top and side. A plastic shroud covers the lower portion of the windshield.

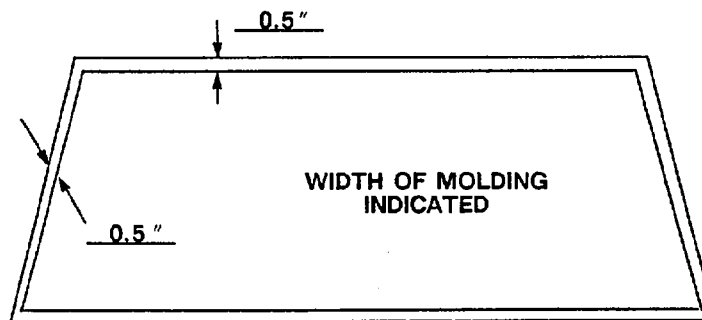
FMVSS 212 REQUIREMENTS:

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	81.15	81.15	100%
LEFT SIDE	81.15	81.15	100%
TOTAL	162.3	162.3	100%

AREA OF RETENTION FAILURE:



FRONT VIEW

FAILURE DETAILS:

None.

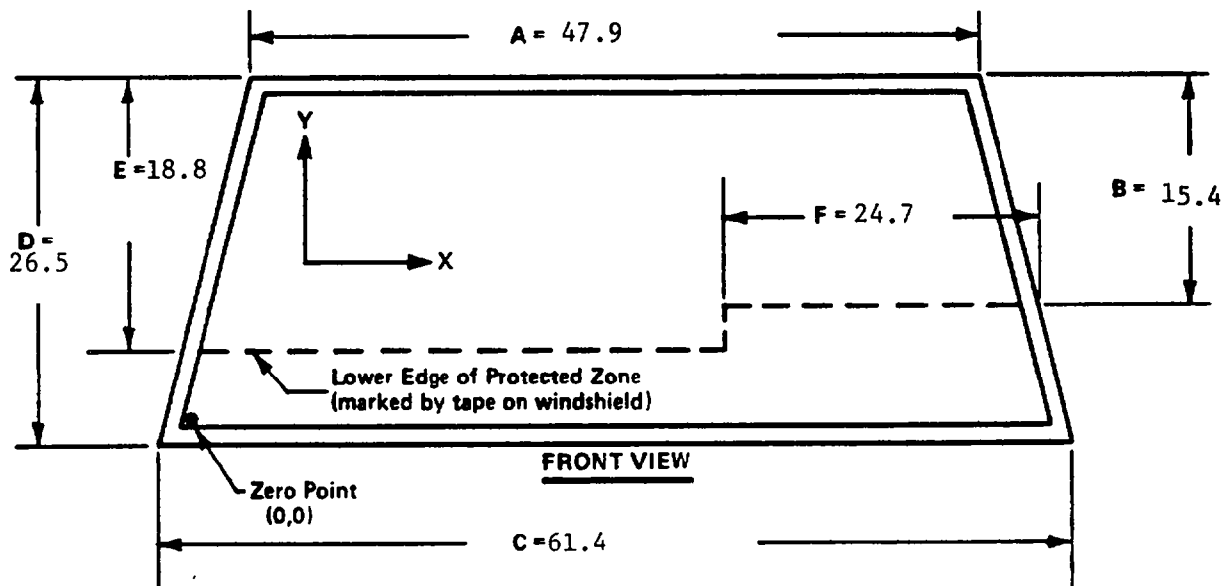
Figure 11

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.

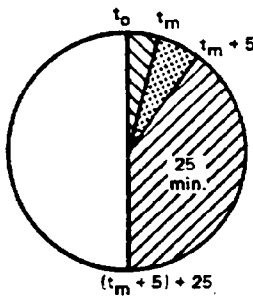
COORDINATES		
	X	Y
1.		
2.		
3.		
4.		

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

TEST VEHICLE NHTSA NO.: CM0204 TEST DATE: 3/8/91

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.

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.

None.

Table 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

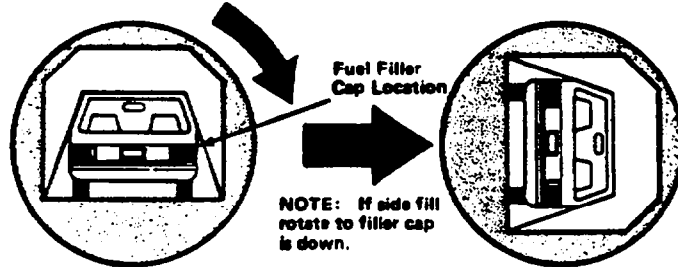
TEST PHASE:

0⁰

90⁰

Vehicle NHTSA ID No.:

CM0204



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 3 minutes 00 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL 8 minutes 00 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. 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.

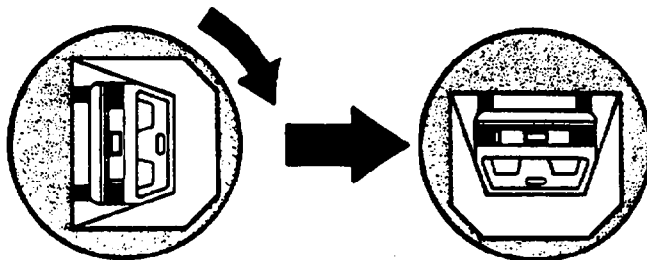
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)TEST PHASE:**90°****180°**

Vehicle NHTSA ID No.:

CM0204I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 3 minutes 00 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL

8 minutes 00 seconds

Next whole minute interval

8 minutesII. 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:

0	0	0	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S):

None.

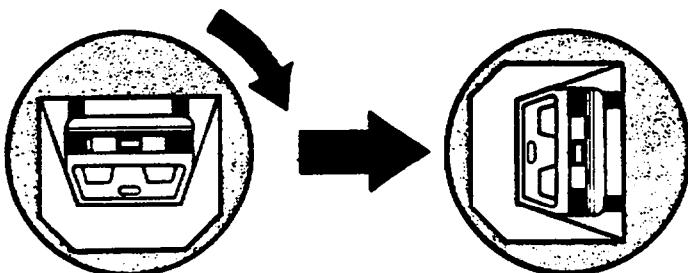
Table 13

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

TEST PHASE:

180°**270°**

Vehicle NHTSA ID No.:

CM0204I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 3 minutes 00 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL

8 minutes 0 seconds

Next whole minute interval

8 minutesII. 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:

0	0	0	0
---	---	---	---

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

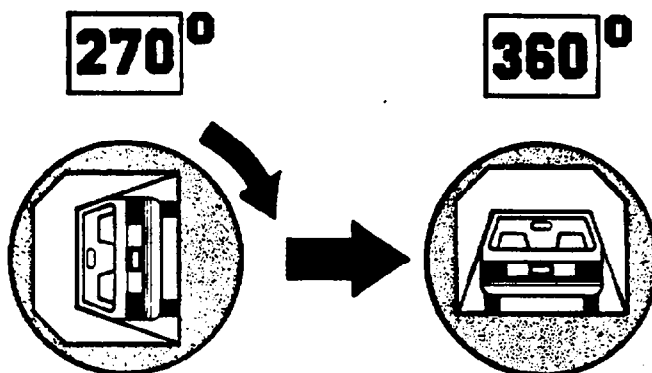
IV. SOLVENT SPILLAGE LOCATION(S):

None.

Table 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)TEST PHASE:

Vehicle NHTSA ID No.:

CM0204I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 3 minutes 00 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL

8 minutes 00 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. 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 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: March 8, 1991 Vehicle NHTSA No.: CM0204

Vehicle Manufacturer: Mazda Motor Manufacturing

Model Year: 1991 VIN: 1ZVPT2OCXM5112161

Body Style: 2-Door Hatchback Build Date: September 19, 1990

Dummy Stabilized Temperature at Time of Test: 70 °F (Spec. = 69-72°F)

Impact Velocity: 29.5 mph Time of Test: 14:25

*Type of Automatic Restraint System: Driver and passenger automatic torso belt
restraint system. Manual lap belts not used for this test.

Failure Details:

Vehicle appears to comply with the requirements of FMVSS Nos. 208, 212, 219
(Partial), and 301.

Appendix A

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A-3

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FIGURE A-1 PRE-TEST FRONT VIEW

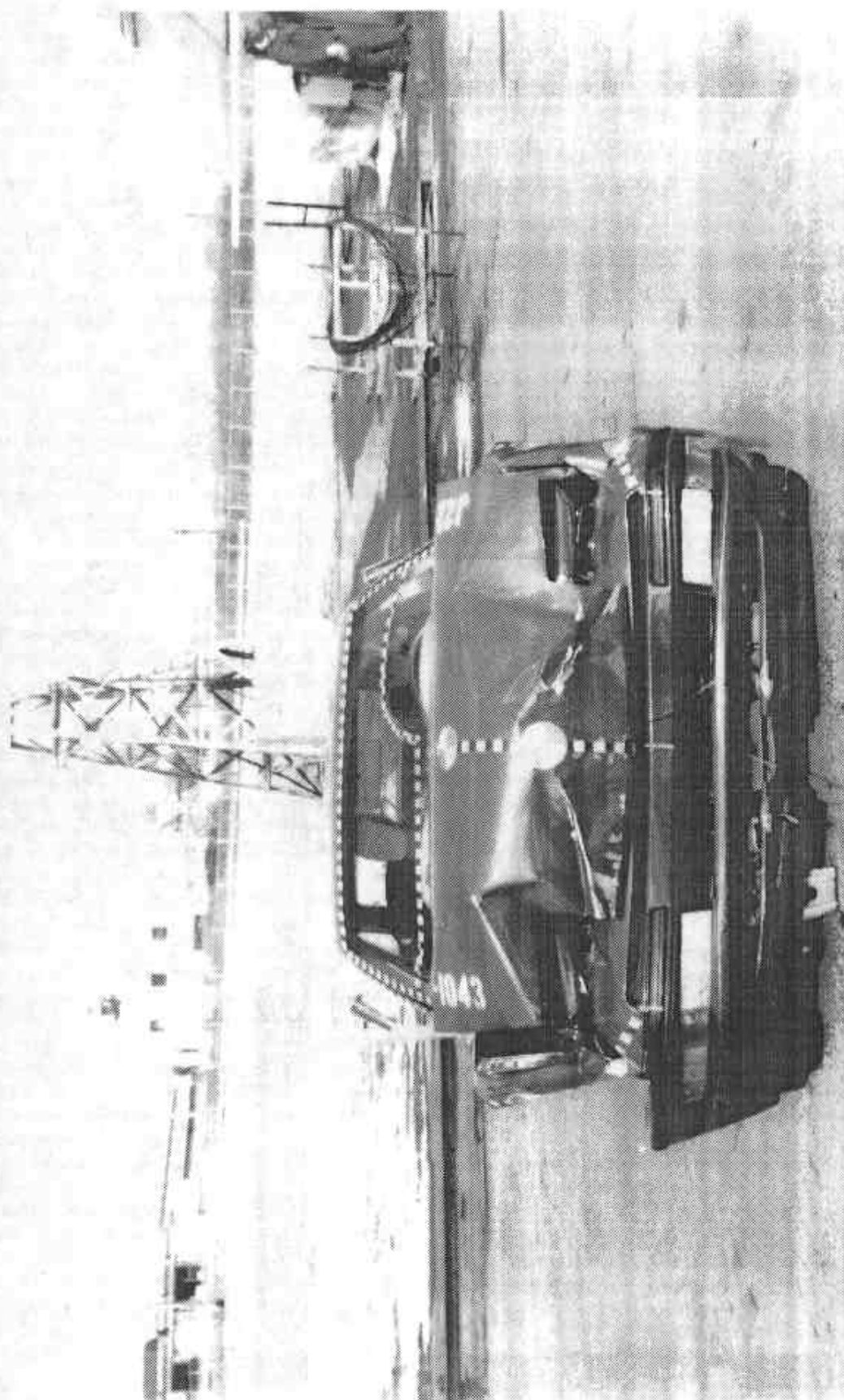


FIGURE A-2 POST TEST FRONT VIEW

A-4

7853-8

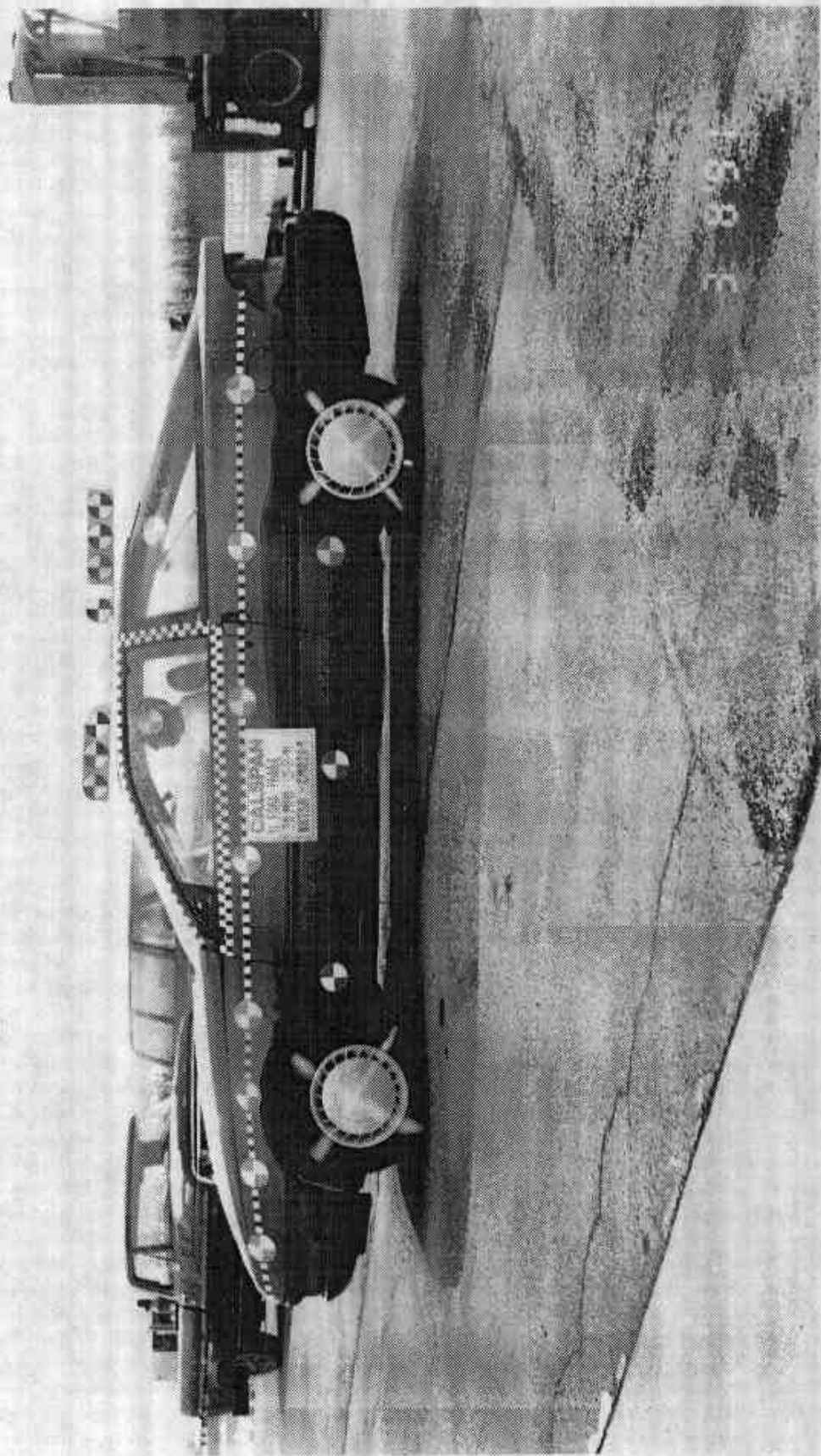


FIGURE A-3 PRE-TEST LEFT SIDE VIEW

A-5

7853-8

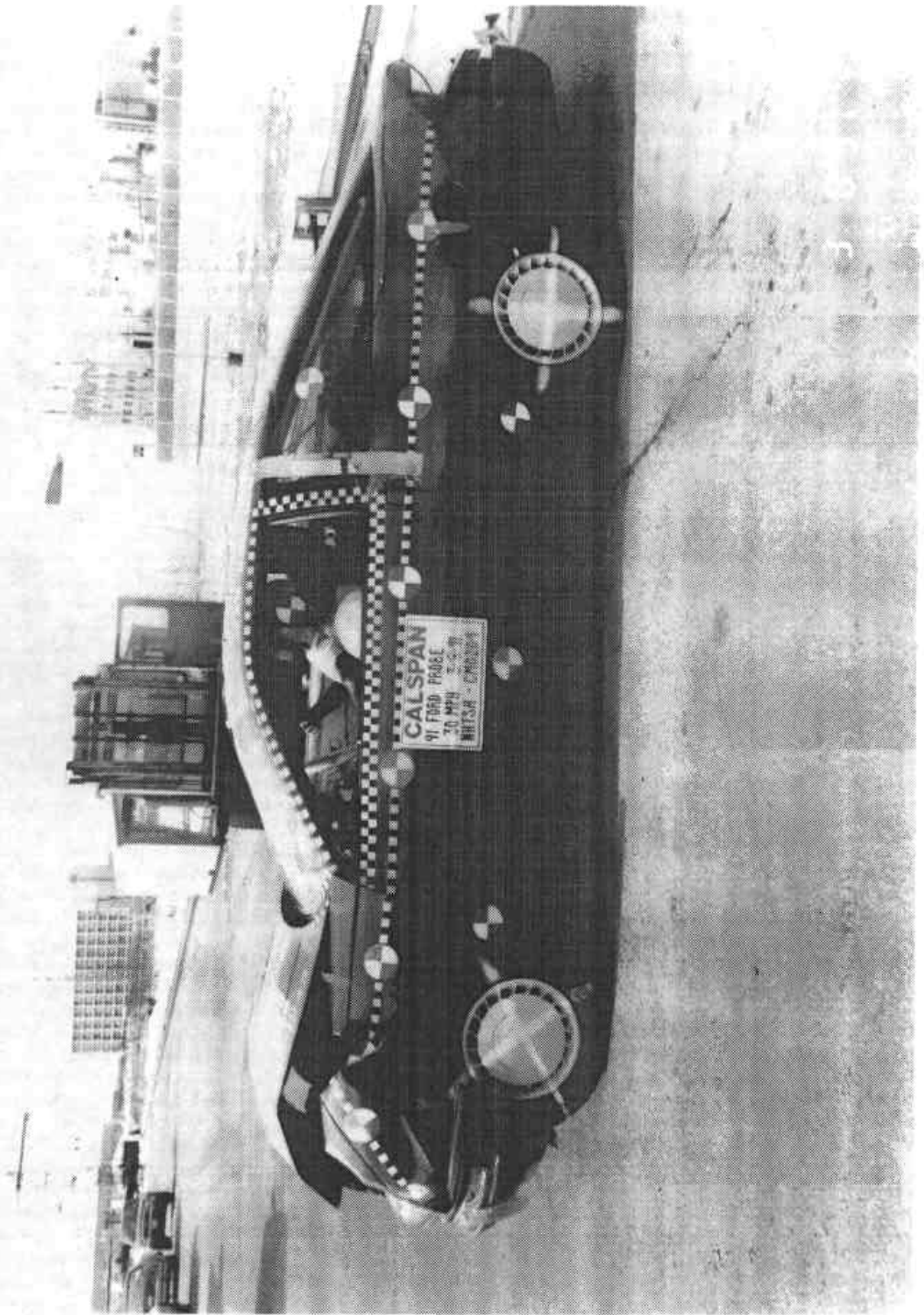
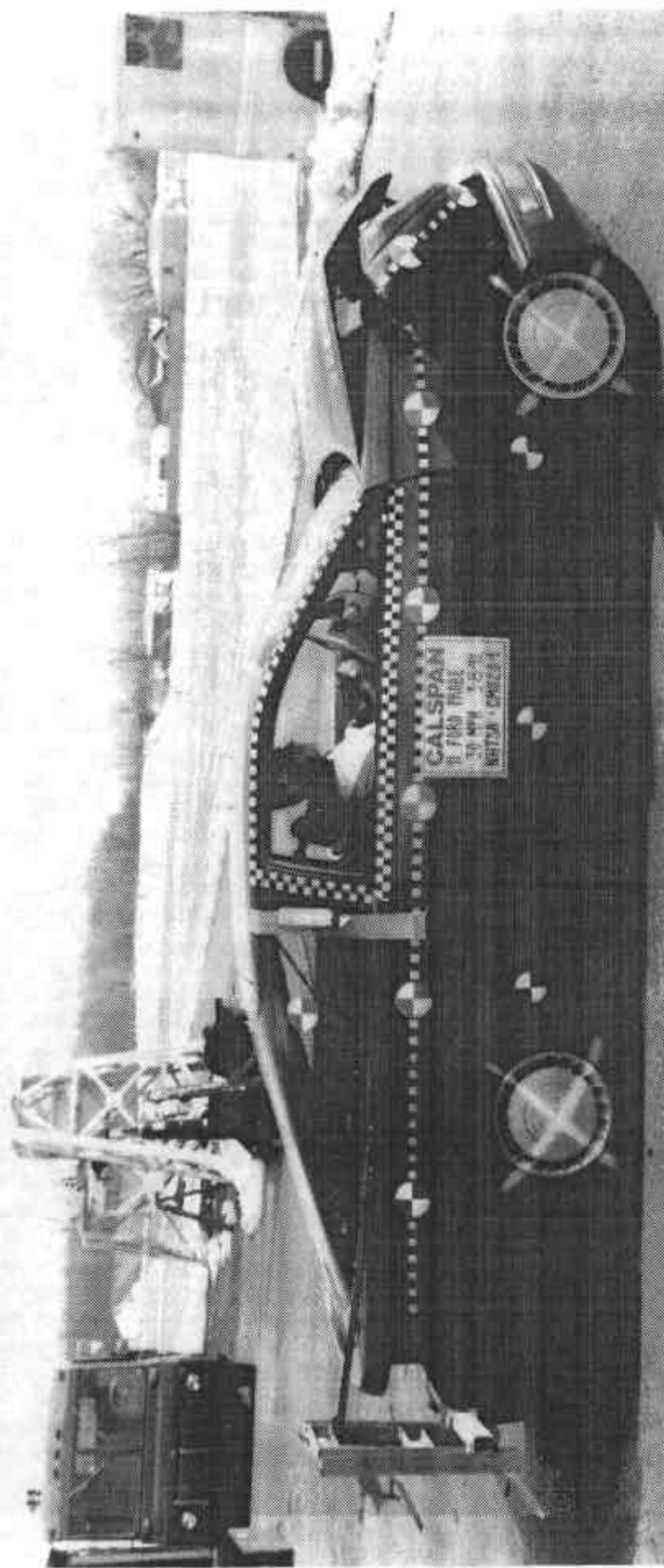


FIGURE A-4 POST TEST LEFT SIDE VIEW

A-8

7853-8



1583

Figure A-6 POST-TEST RIGHT SIDE VIEW



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

A 9

7853-8



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

A-10

7853-8



A-11

7853-5

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

16.8 E



16.8 E

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

A-12

7853-8

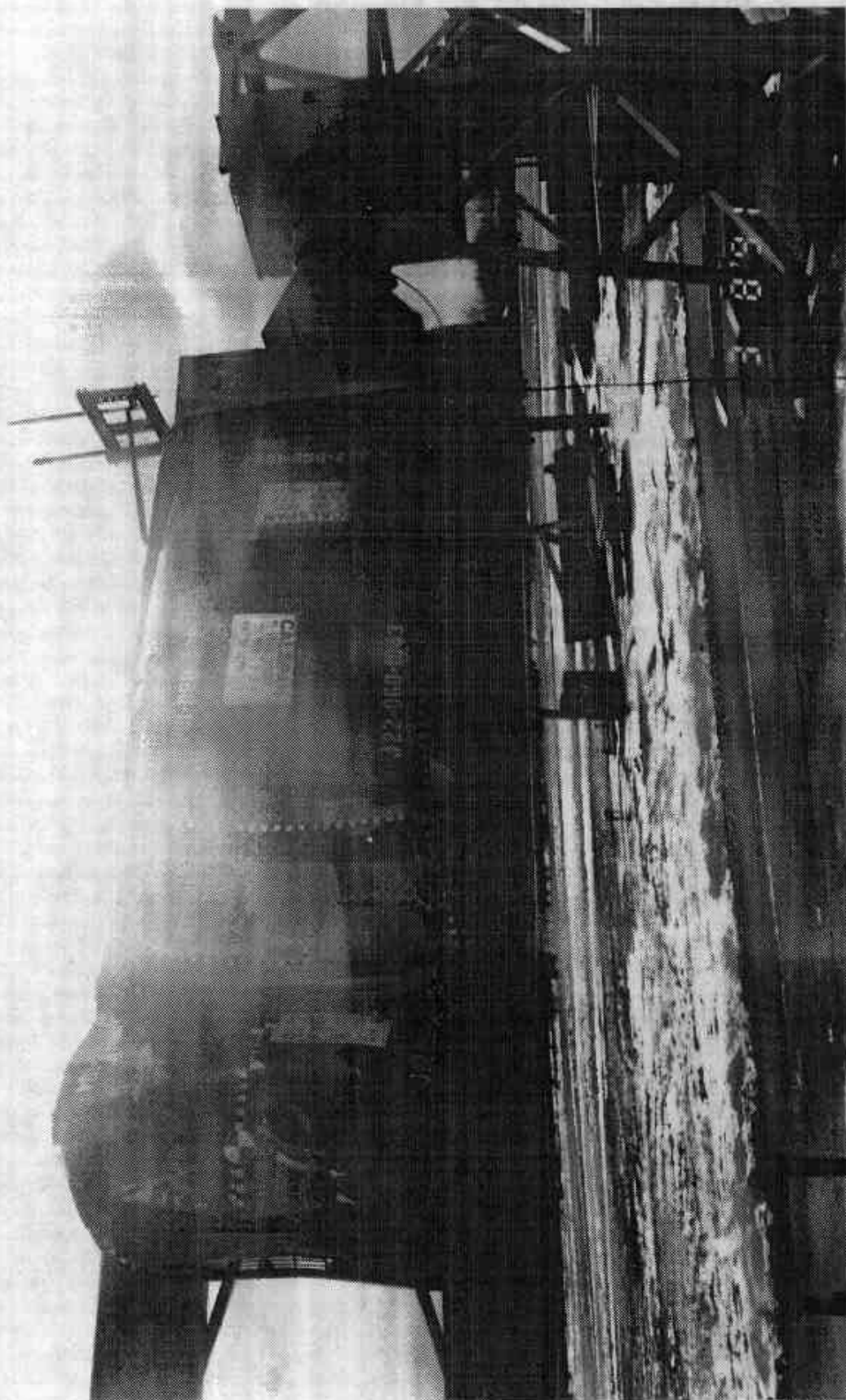


Figure A-11 POST TEST TOP VIEW

A-13

7853-8

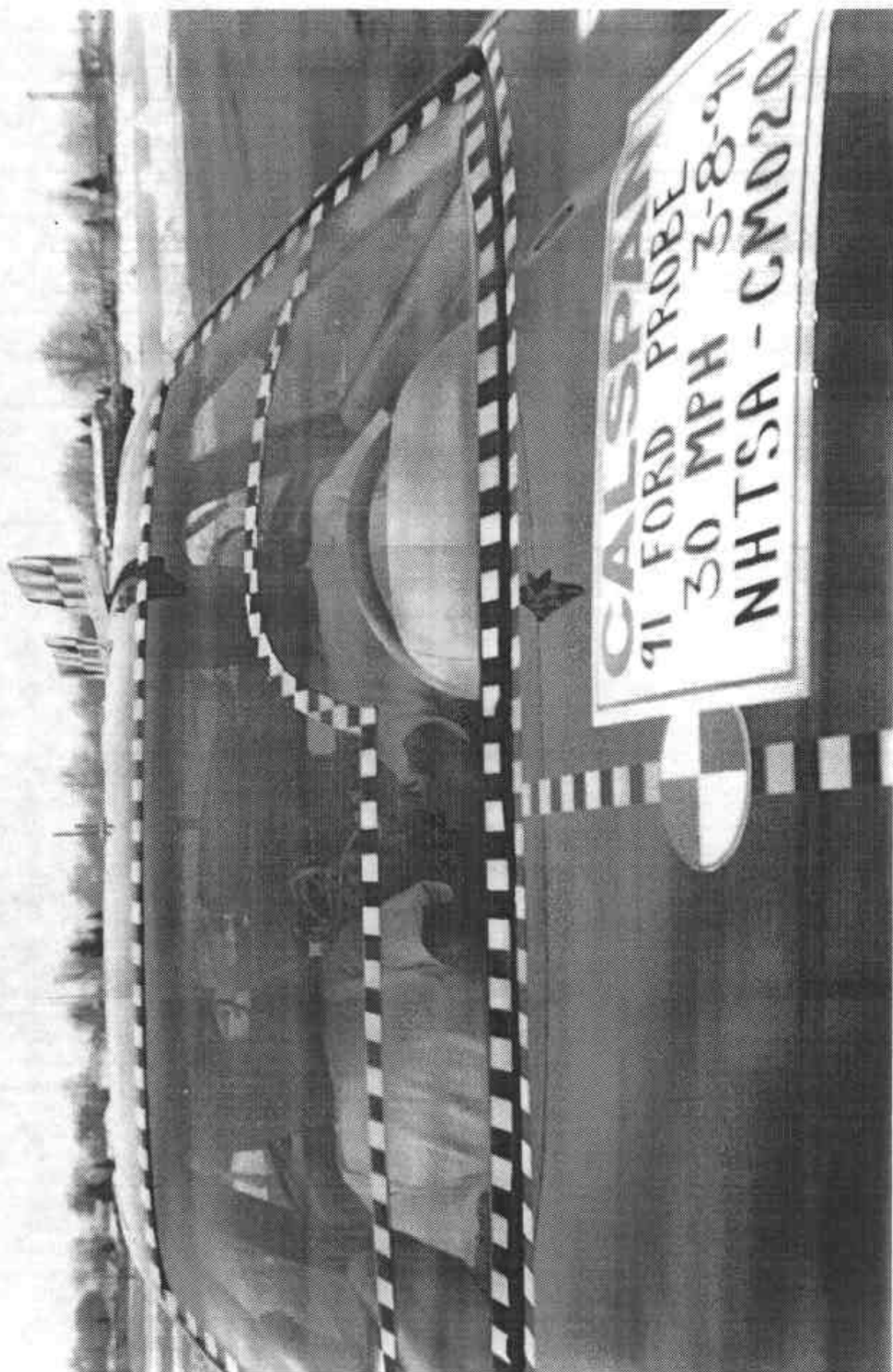


Figure A-12. PRE-TEST WINDSHIELD VIEW

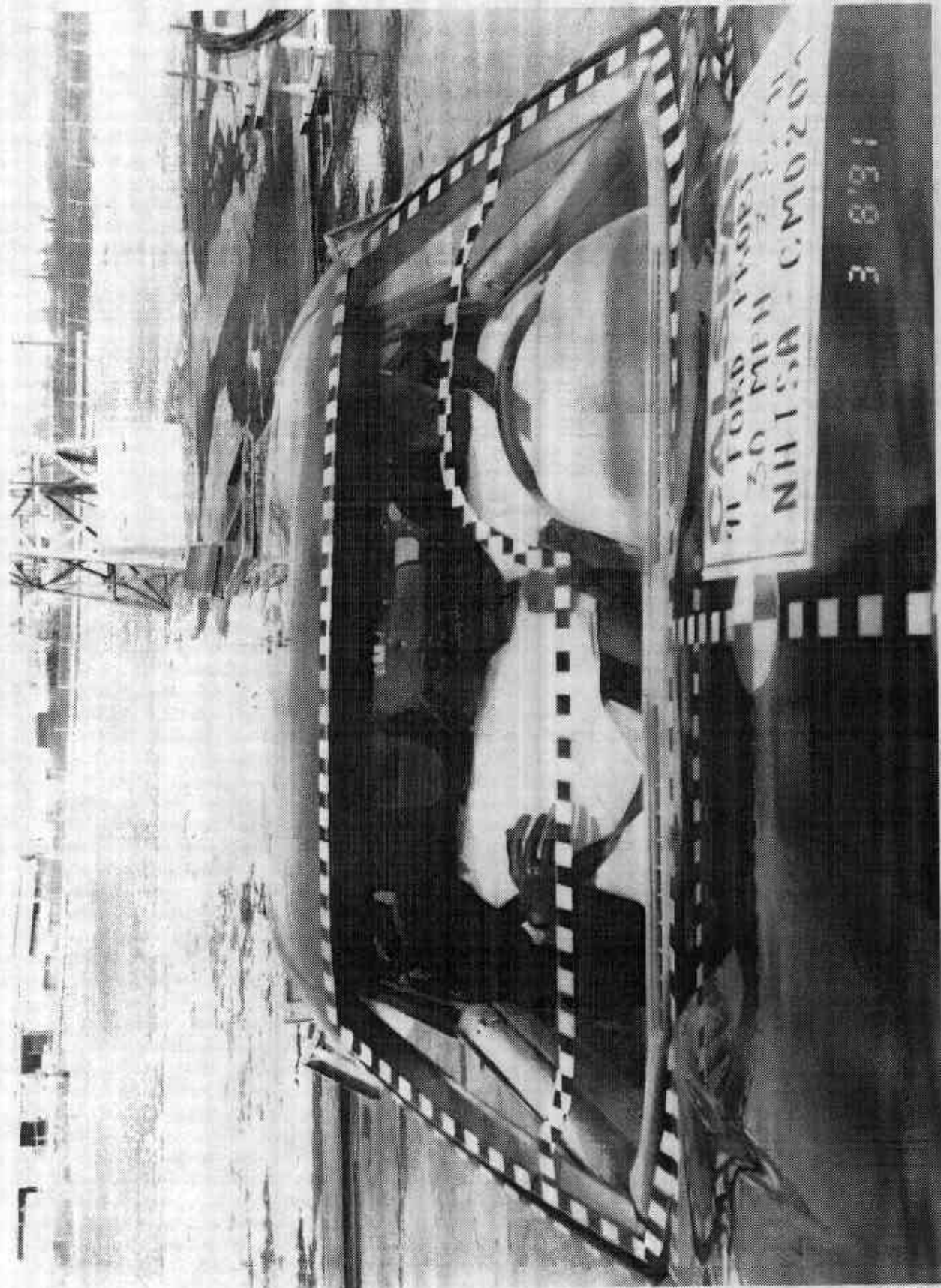


Figure A-13 POST-TEST WINDSHIELD VIEW

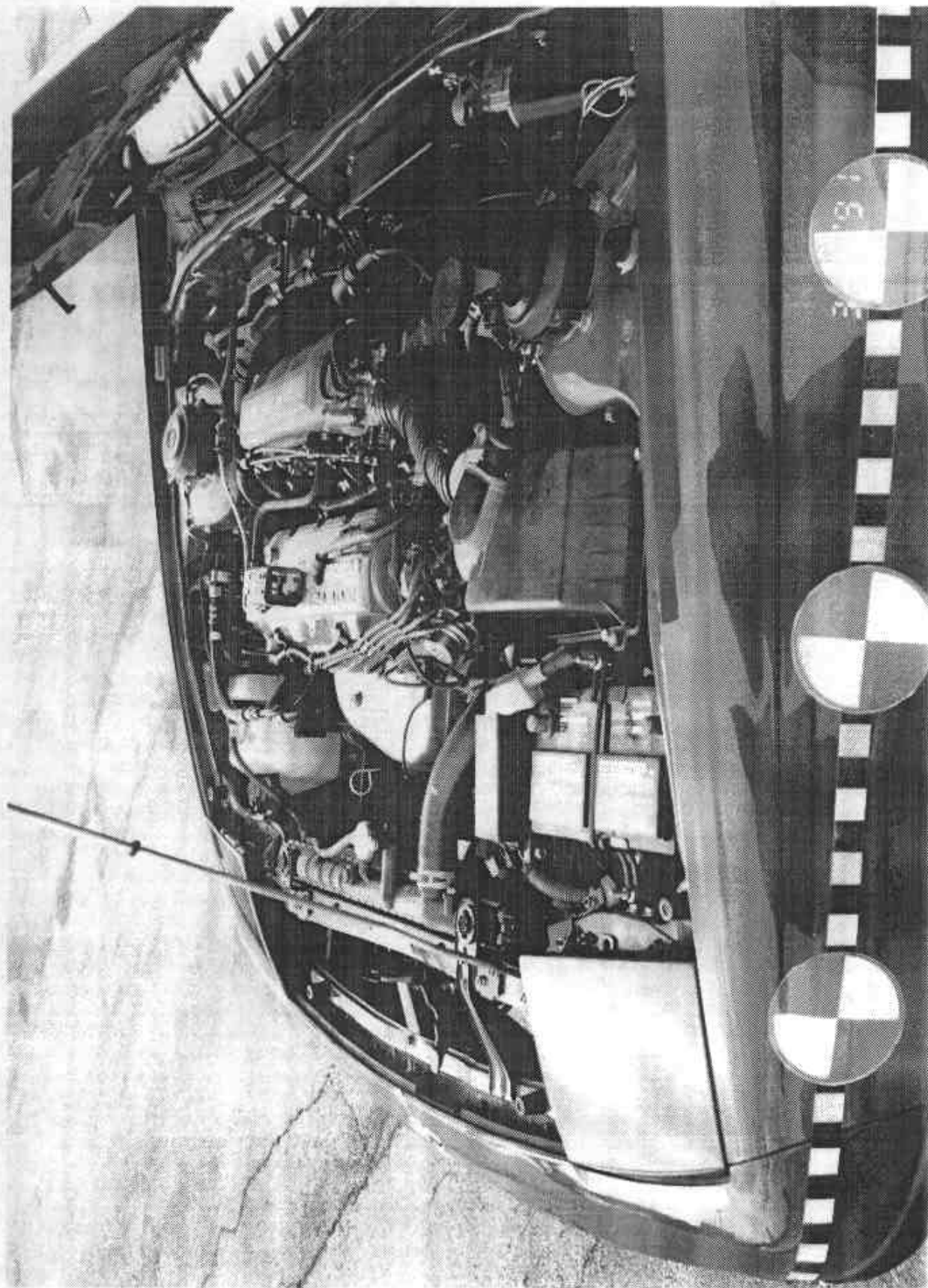


FIGURE A-14 PRE-TEST ENGINE COMPARTMENT VIEW

A-16

7853-8

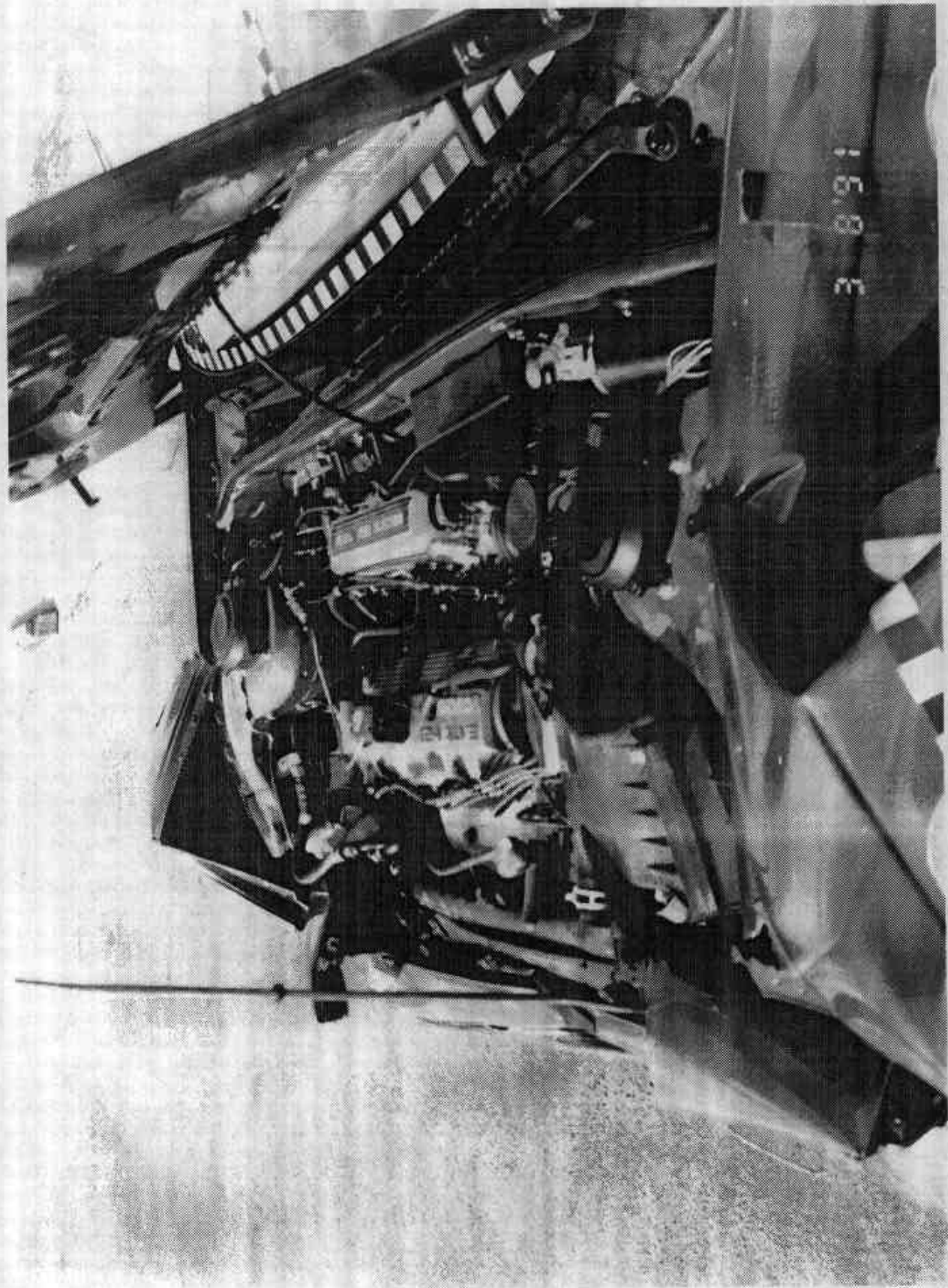


FIGURE A-15 POST-TEST ENGINE COMPARTMENT VIEW

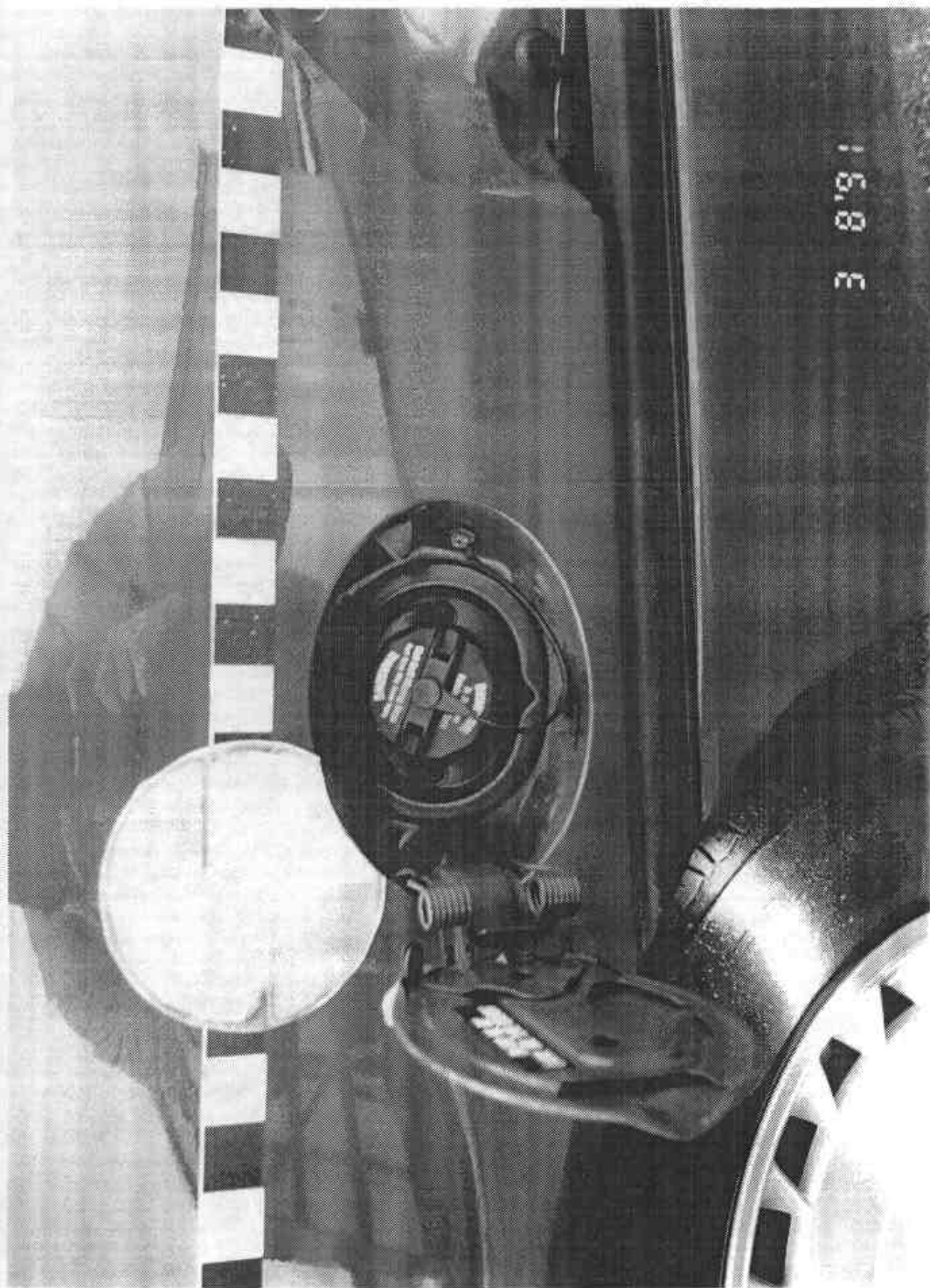


FIGURE A-16 PRE-TEST FUEL FILLER CAP PHOTO

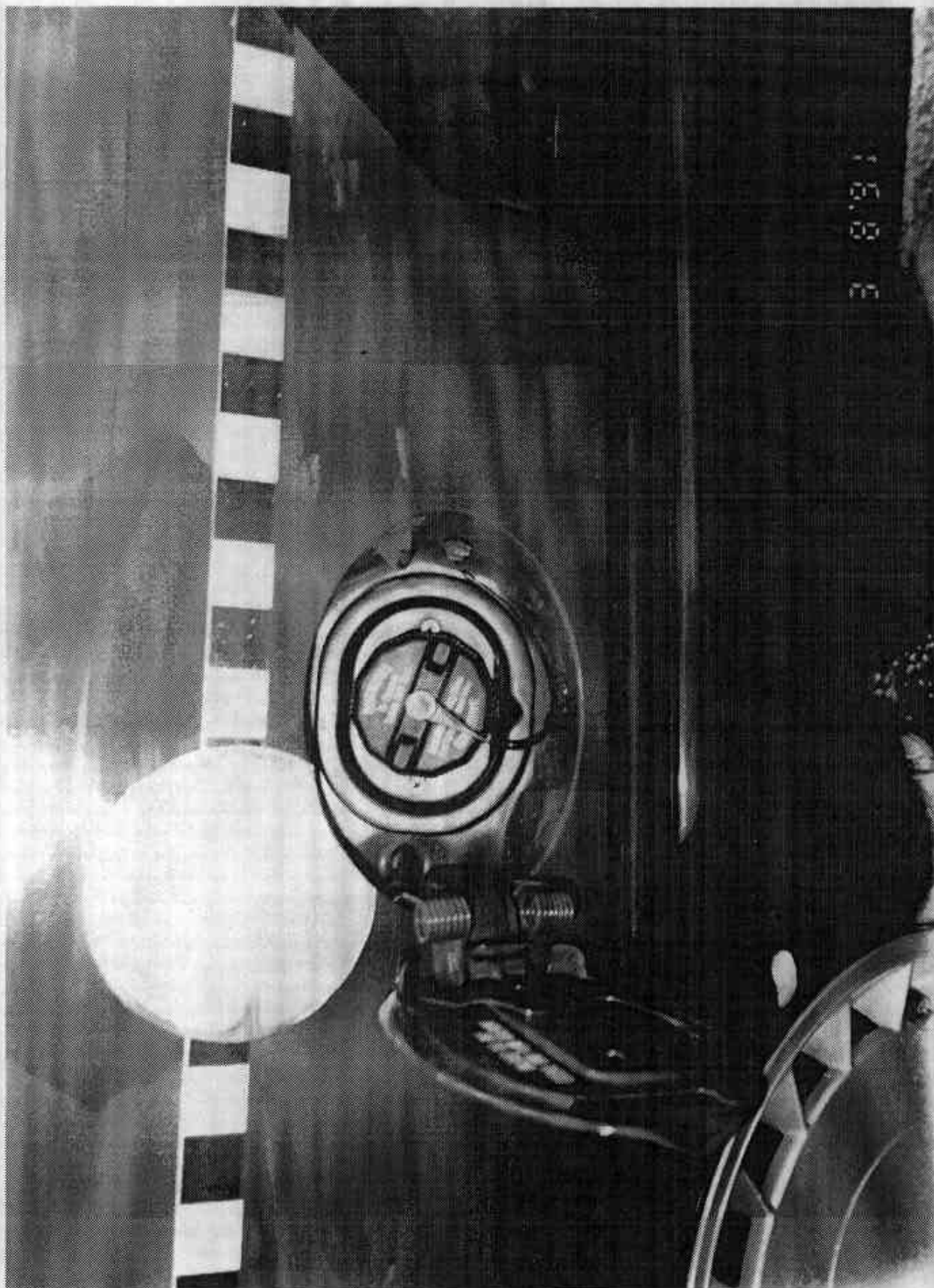


Figure A-17 POST-TEST FUEL FILLER CAP PHOTO

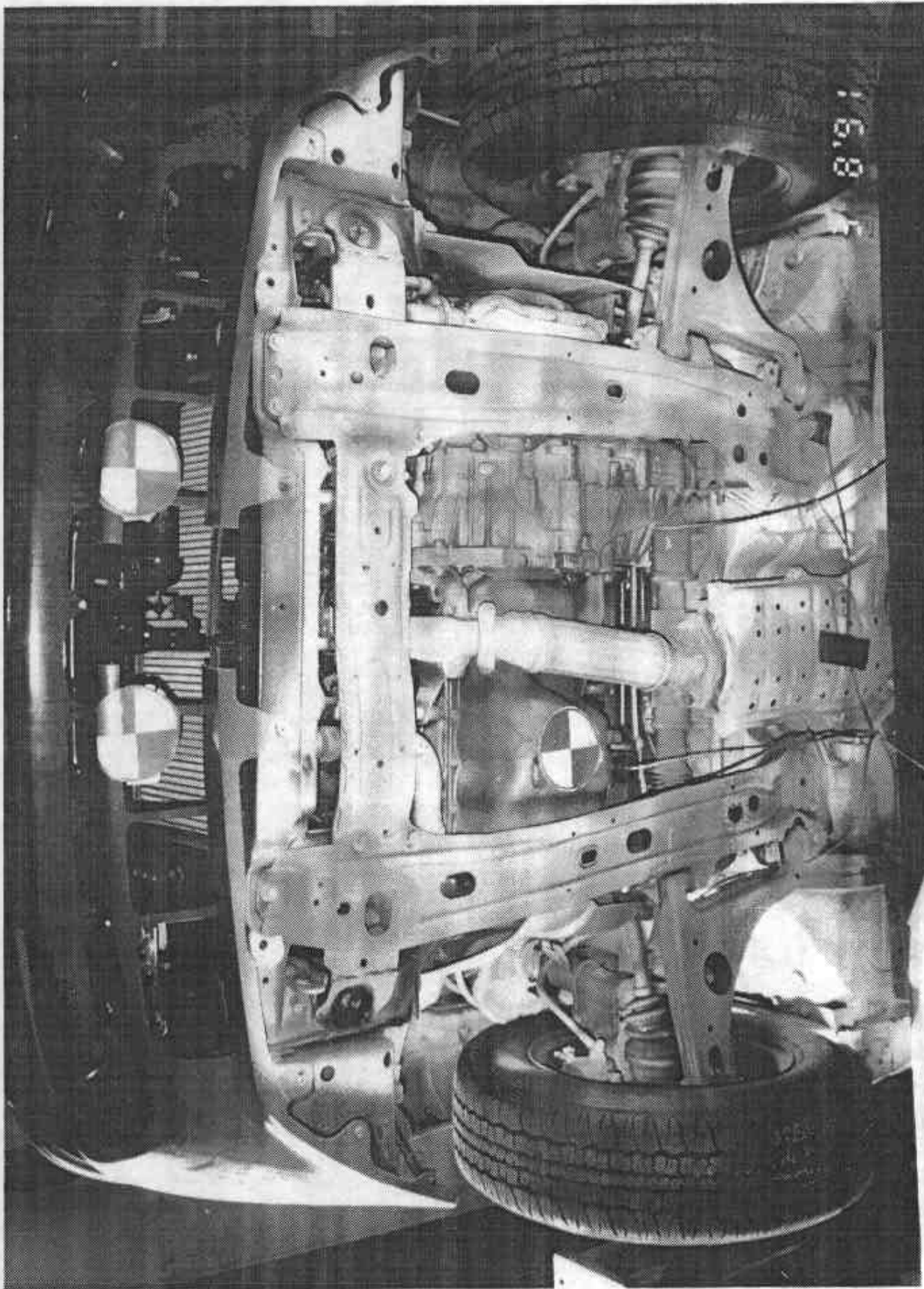


Figure A-18 PRE-TEST FRONT UNDERBODY VIEW

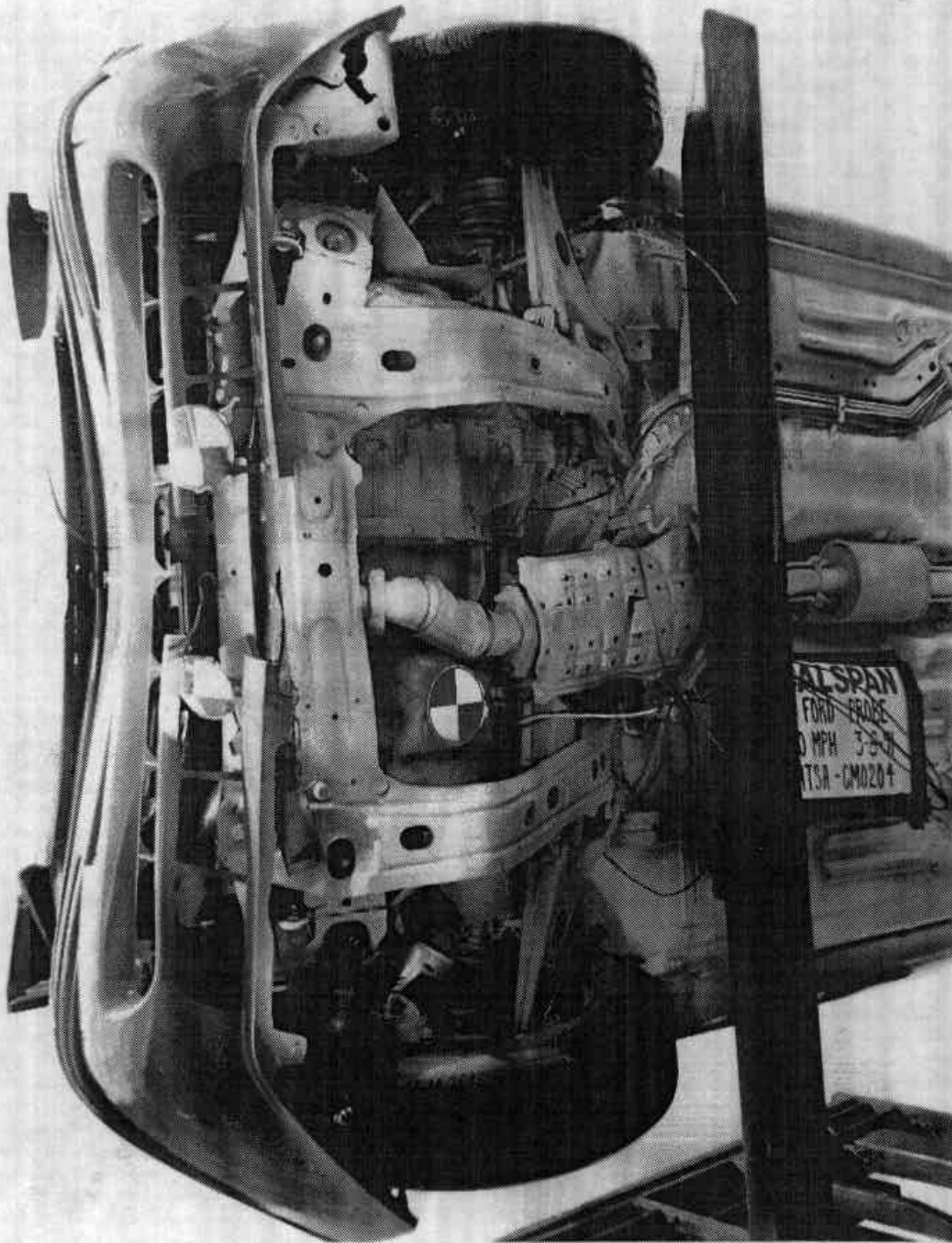


Figure A-19 POST-TEST FRONT UNDERBODY VIEW

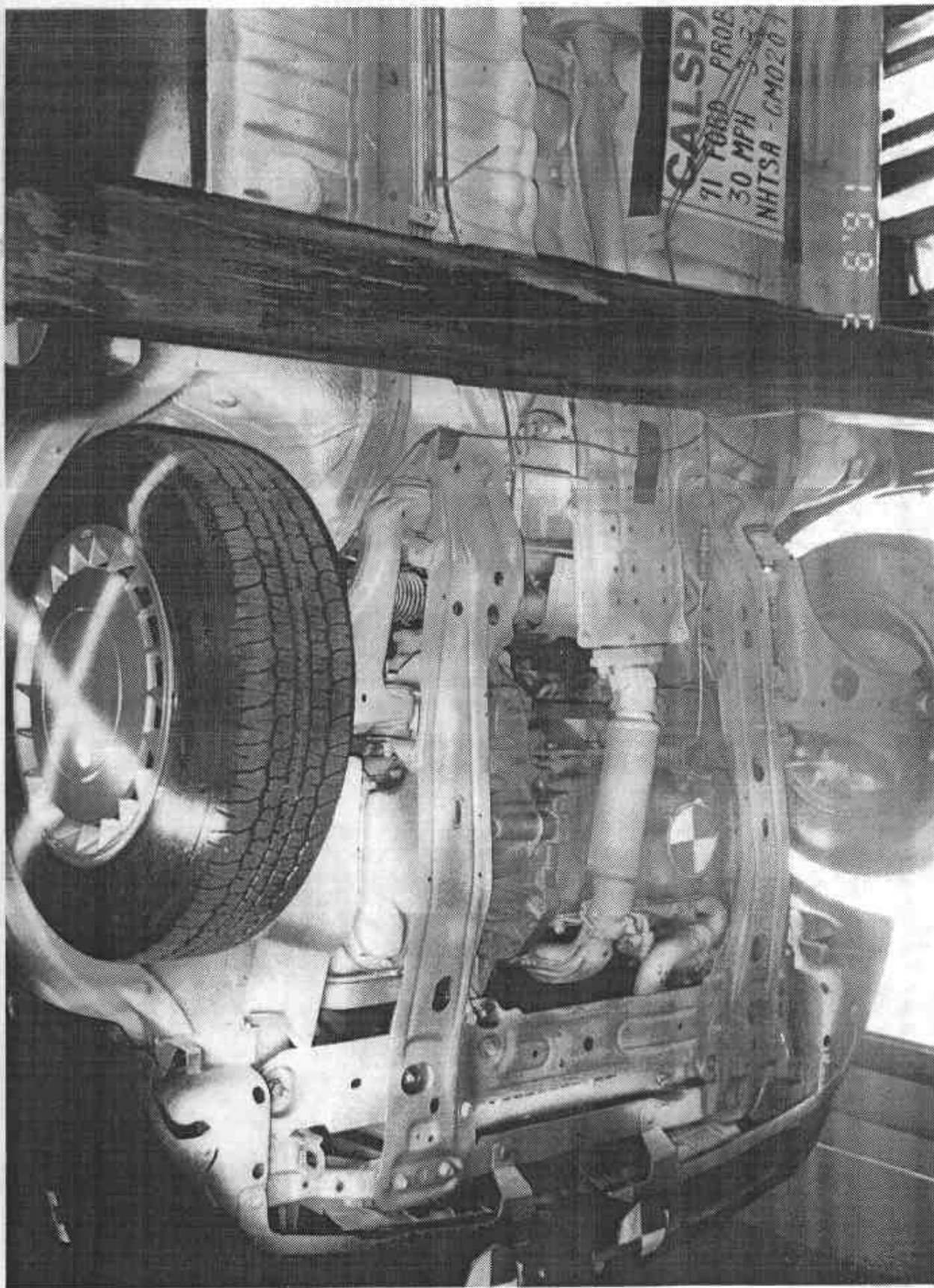


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

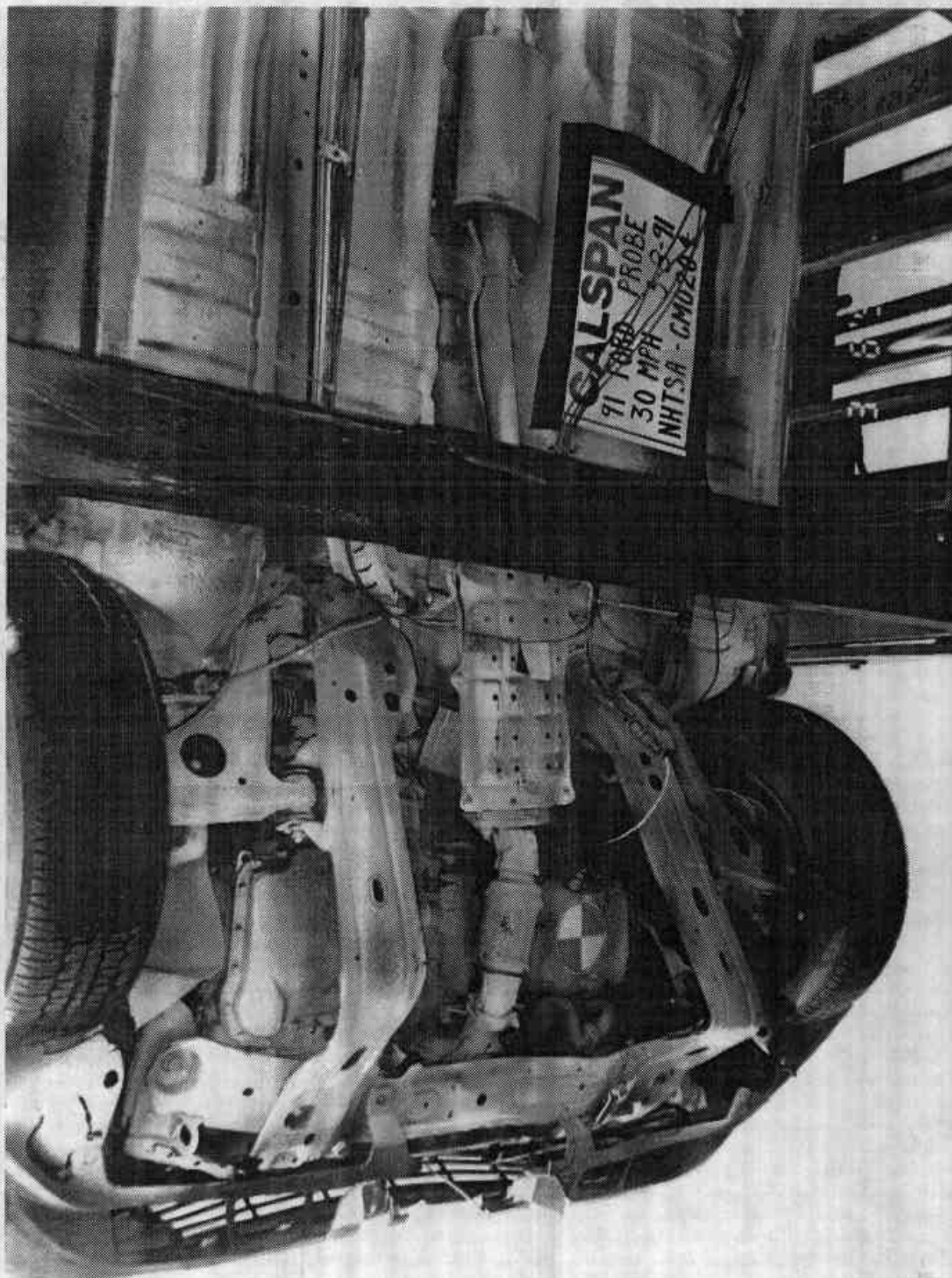


Figure A-21 POST-TEST FRONT SIDE UNDERSIDE VIEW

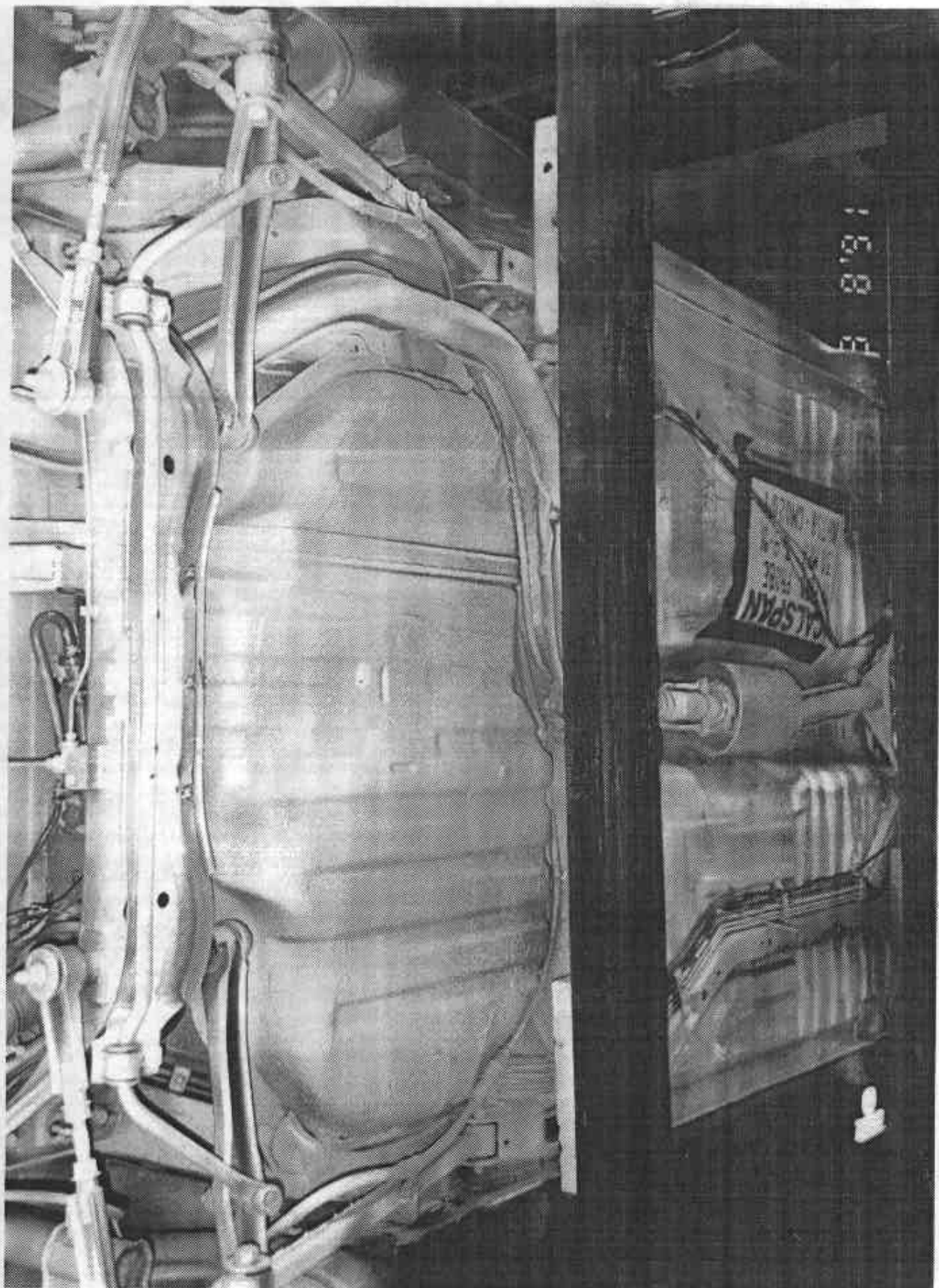


Figure A-22 PRE-TEST REAR UNDERBODY VIEW

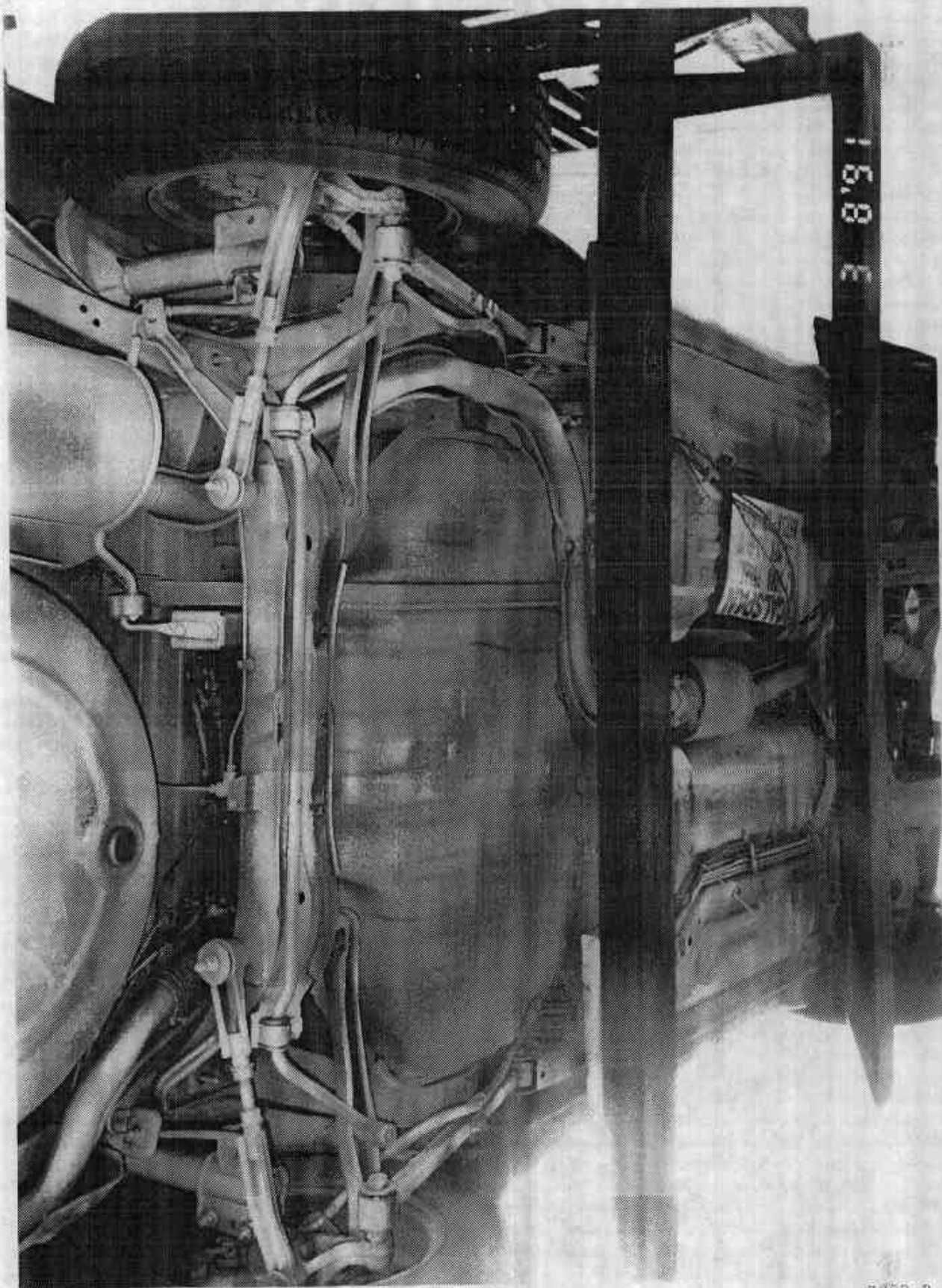


Figure A-23 POST-TEST REAR UNDERBODY VIEW

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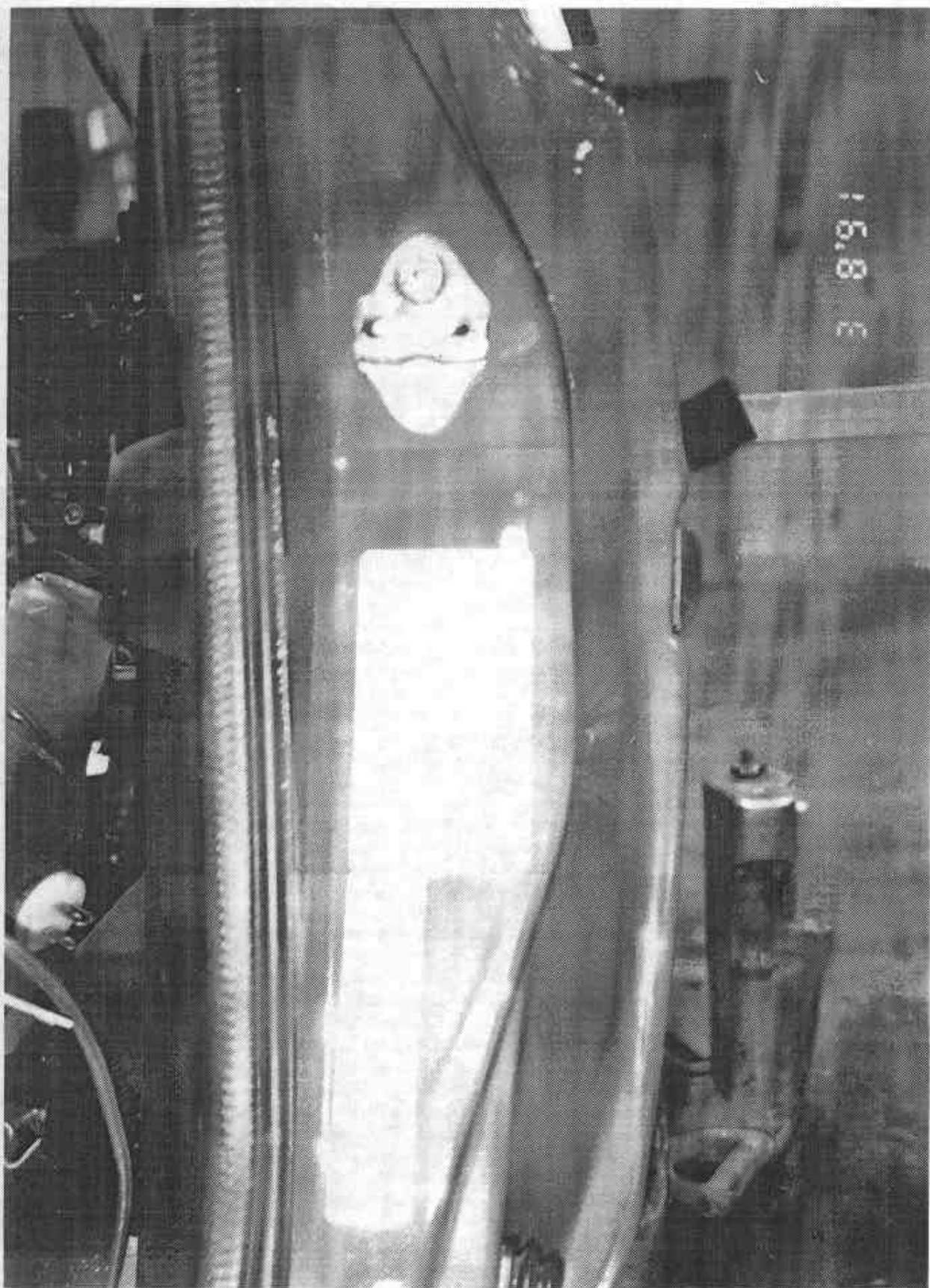


Figure A-24 CERTIFICATION LABEL AND TIRE PLACARD

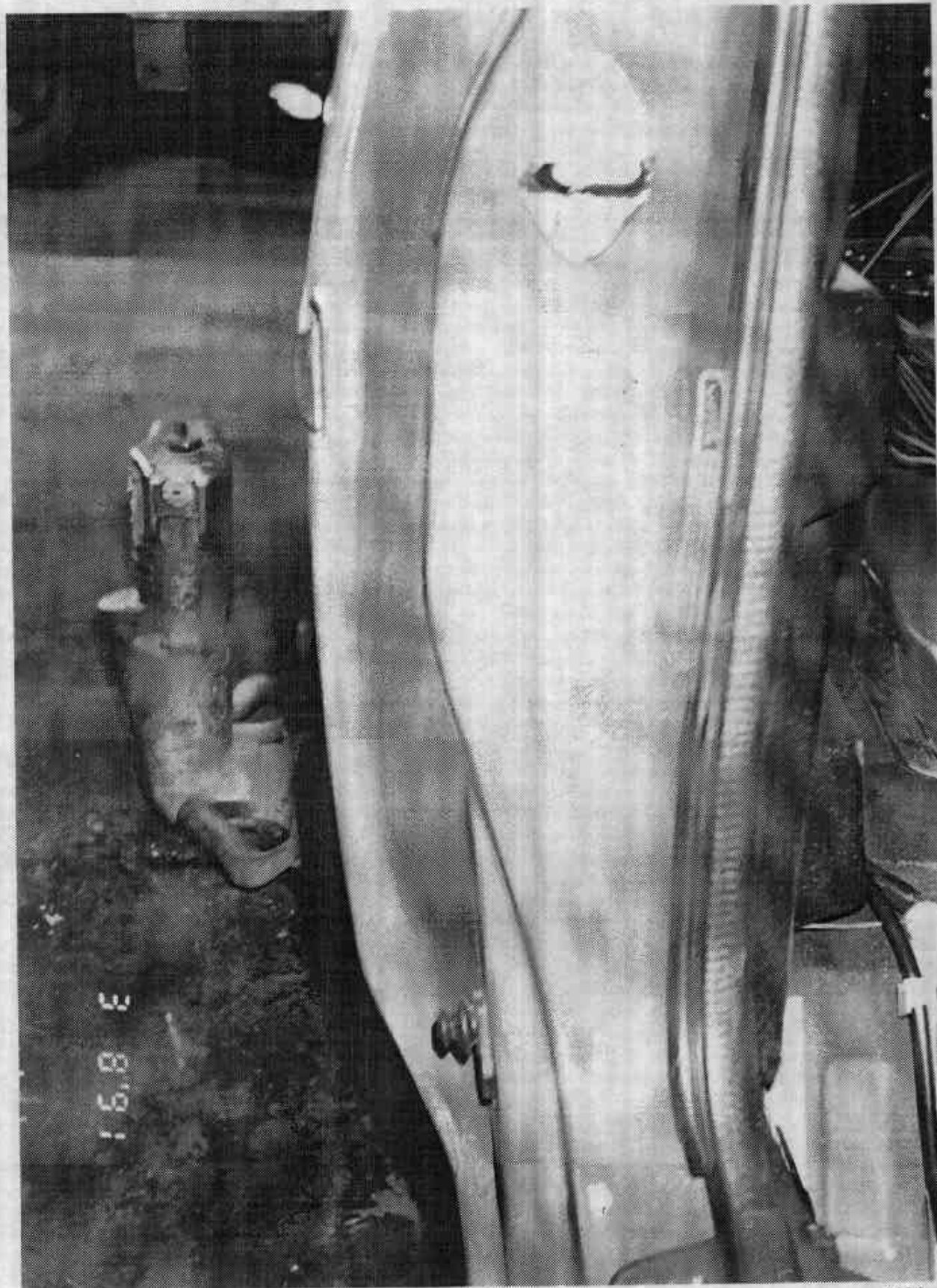


FIGURE A-25 TIRE PLACARD

A-27

7853-8

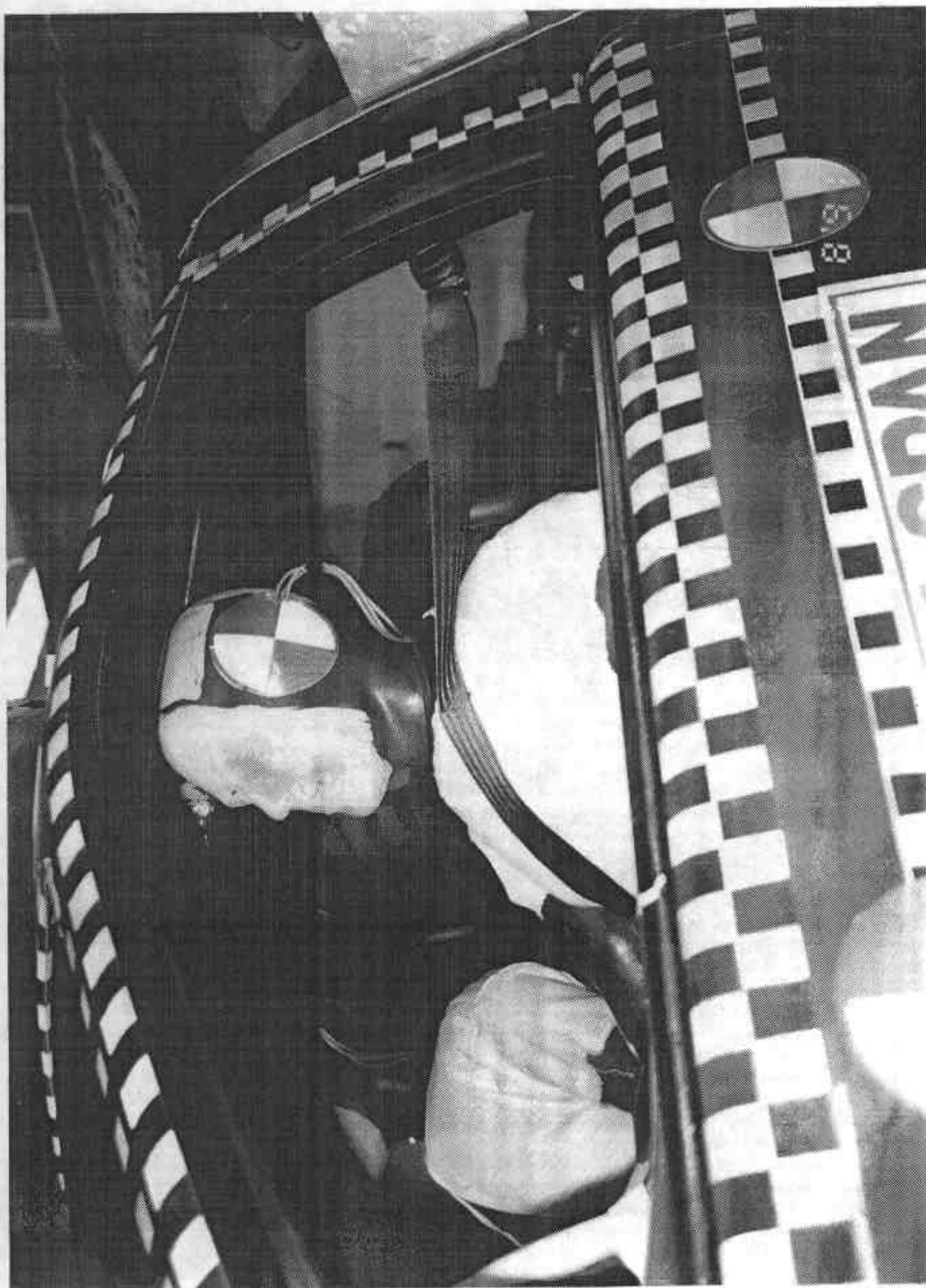


Figure A-26 PRE-TEST DRIVER DUMMY POSITION



A-29

7853-8

Figure A-27 POST-TEST DRIVER DUMMY POSITION



Figure A-28 PRE-TEST PASSENGER DUMMY POSITION

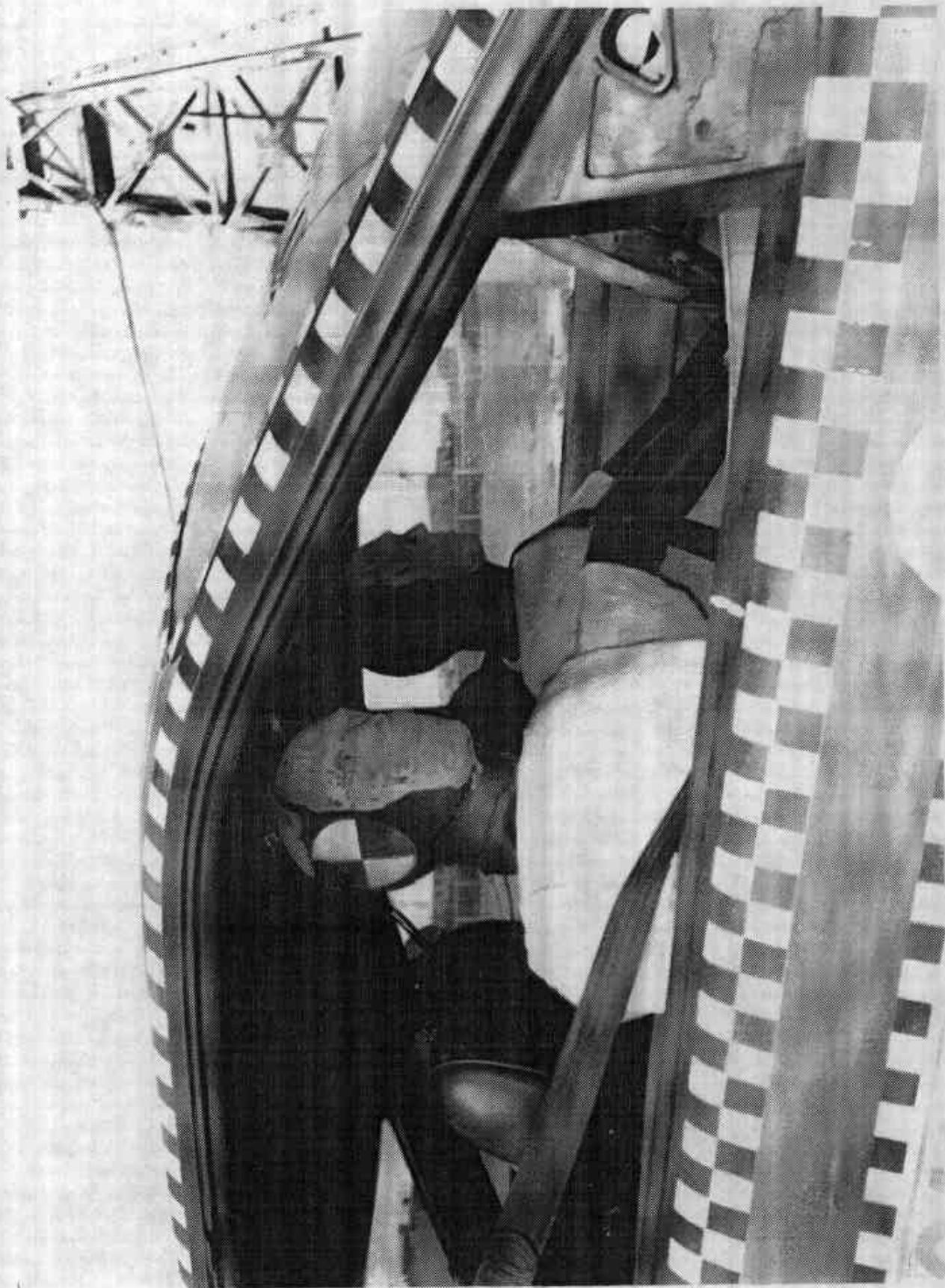


FIGURE A-29 POST-TEST PASSENGER DUMMY POSITION



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



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

A-33

7853-8

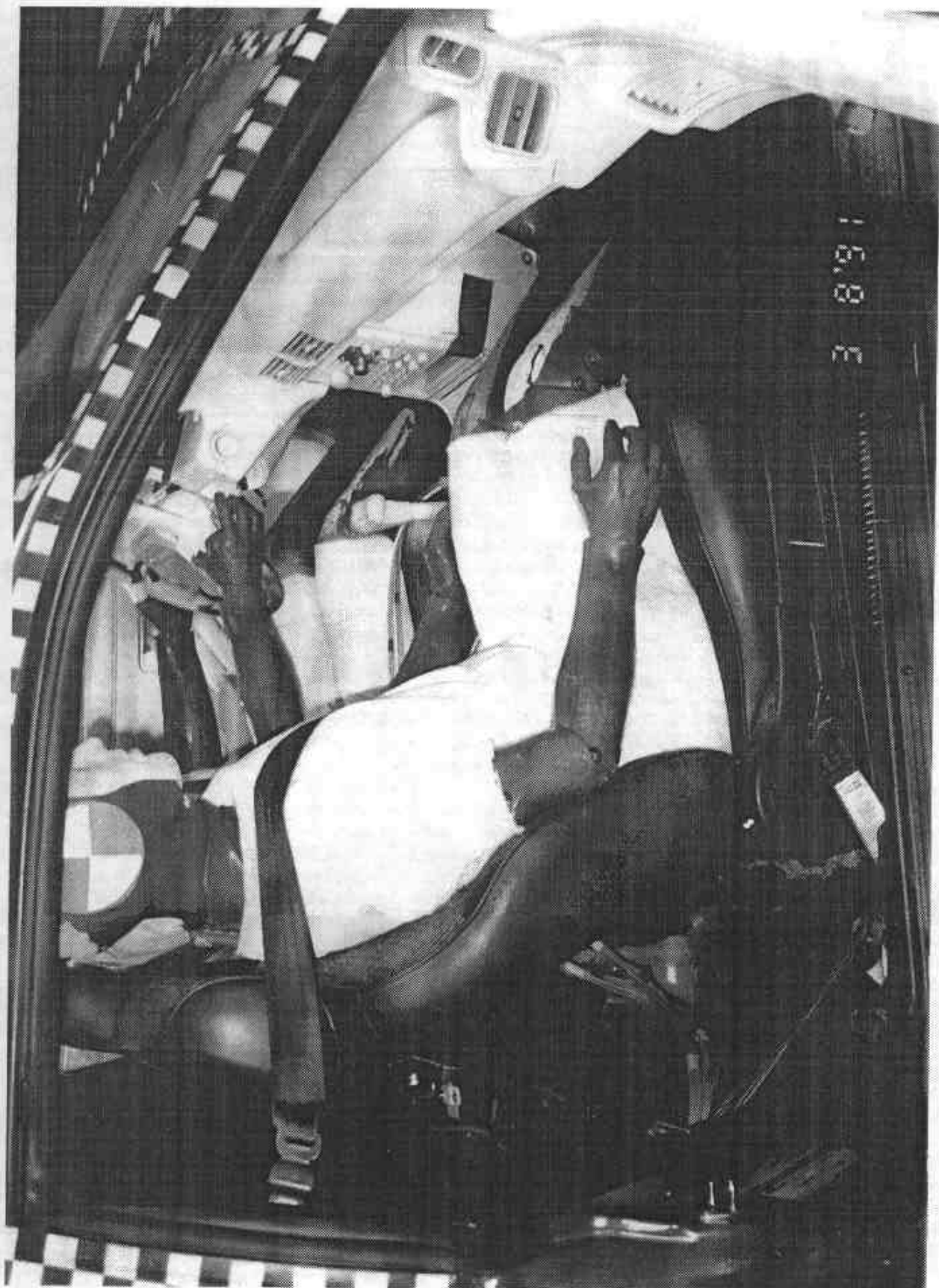


Figure A-32 PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW

A-34

7853-8

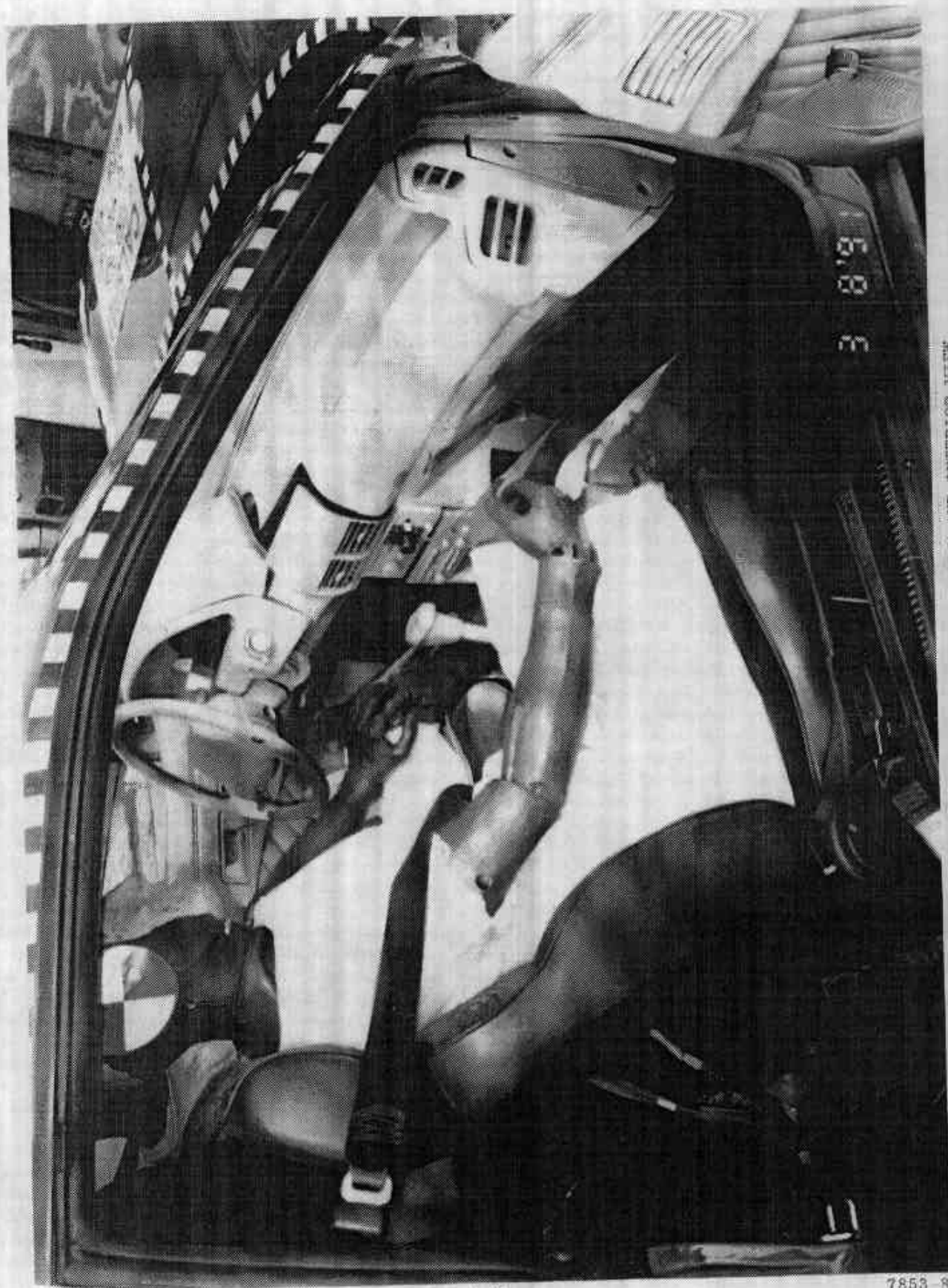
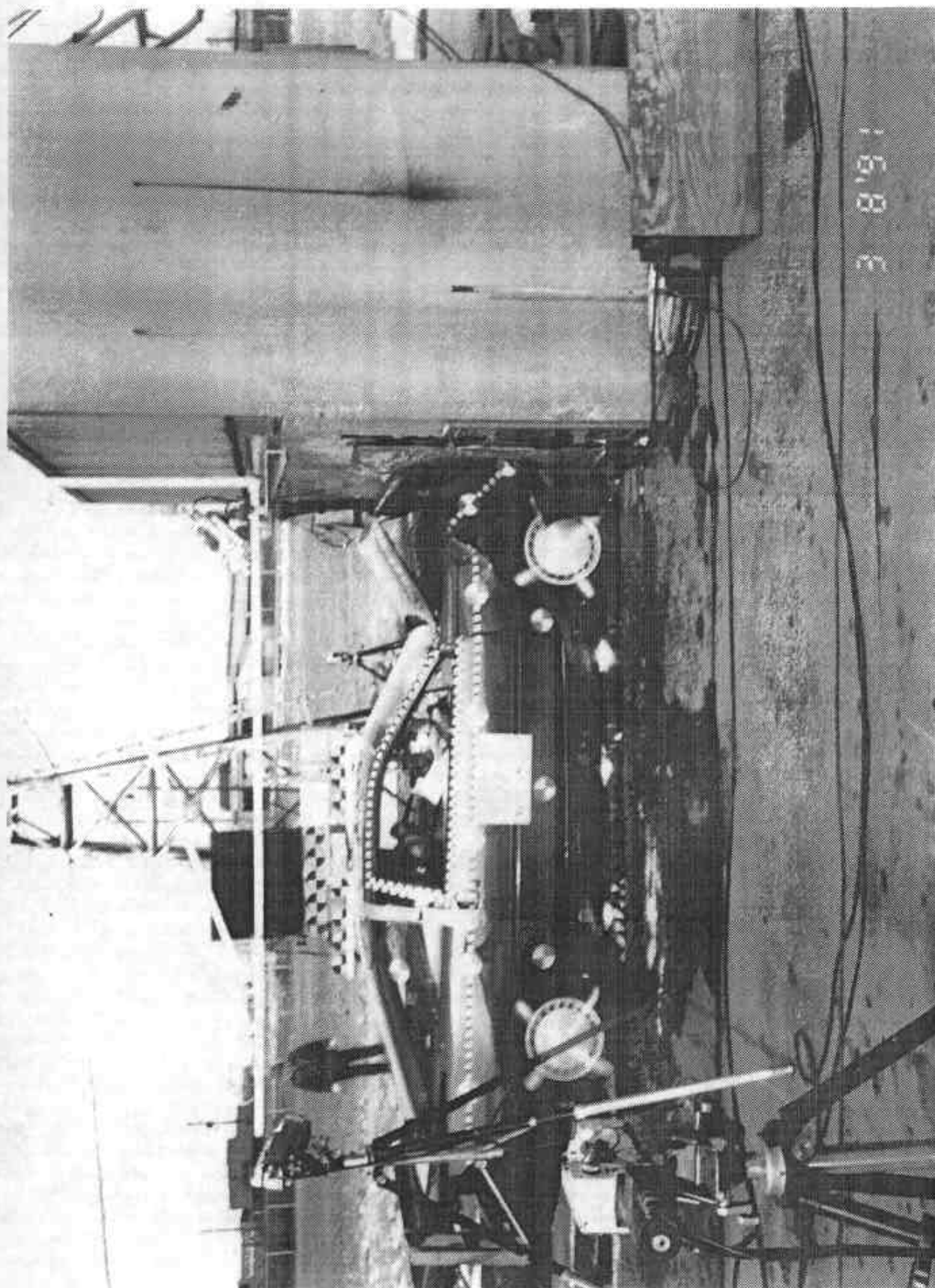


FIGURE A-33 POST-TEST PASSENGER DUMMY AND INTERIOR VIEW



3 8'91

Figure A-34 VEHICLE IMPACT

7853-8

A-35

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CM0204

VEHICLE DATA

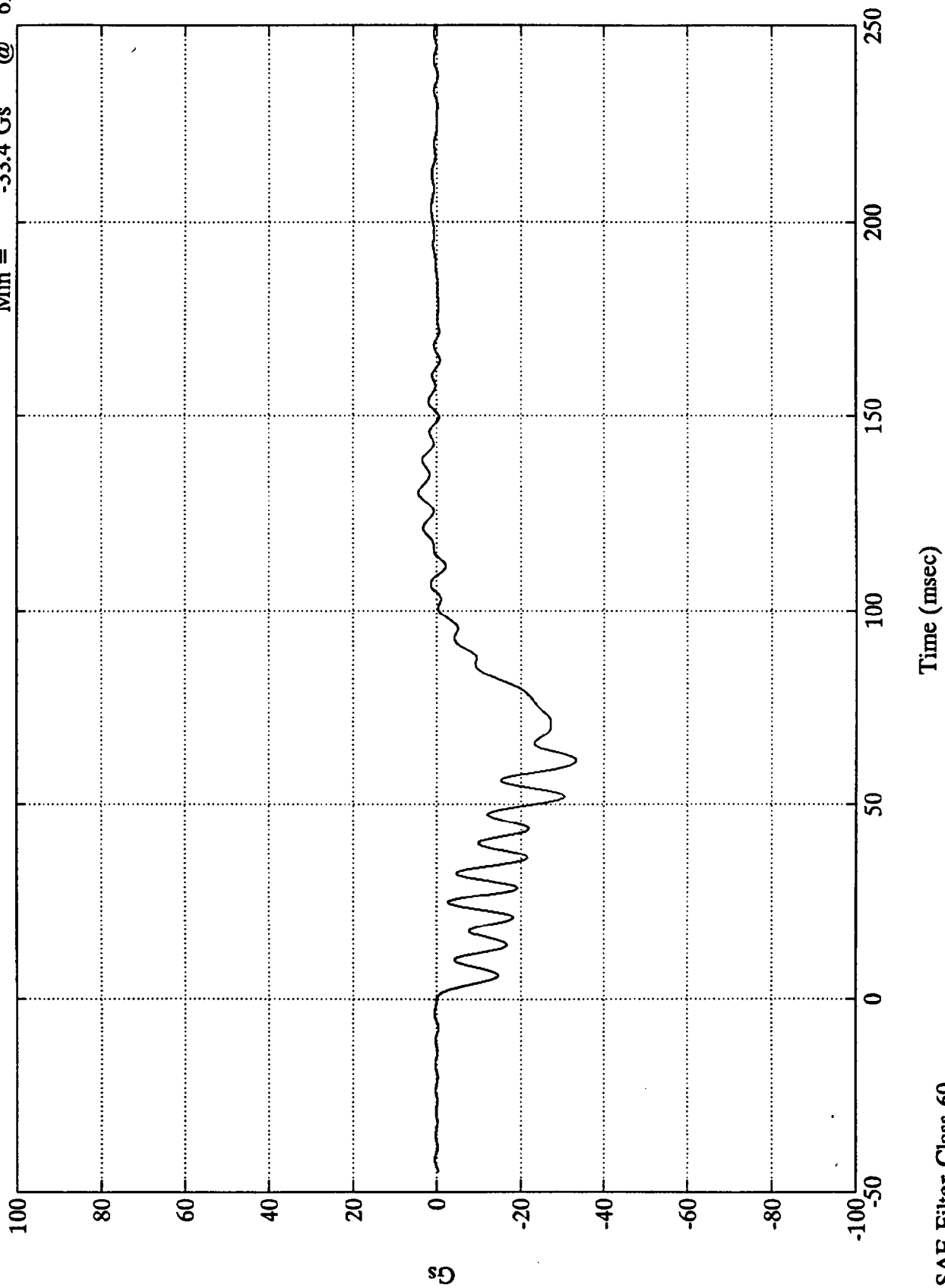
FILTER CHANNEL CLASS

60

Test 1043

L. Rear X-member X (#1)

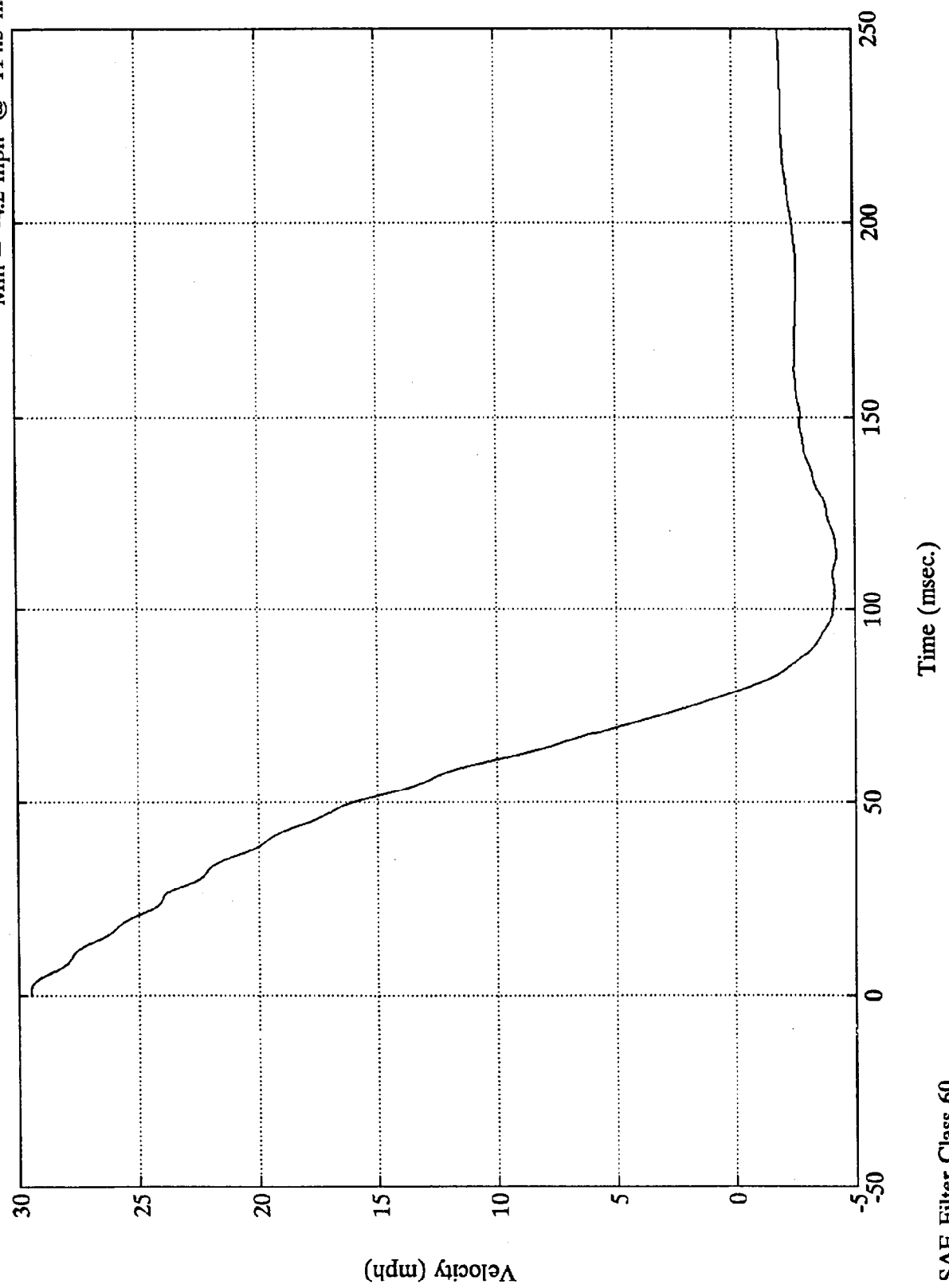
Max = 4.3 Gs @ 130.44 msec
Min = -33.4 Gs @ 61.44 msec



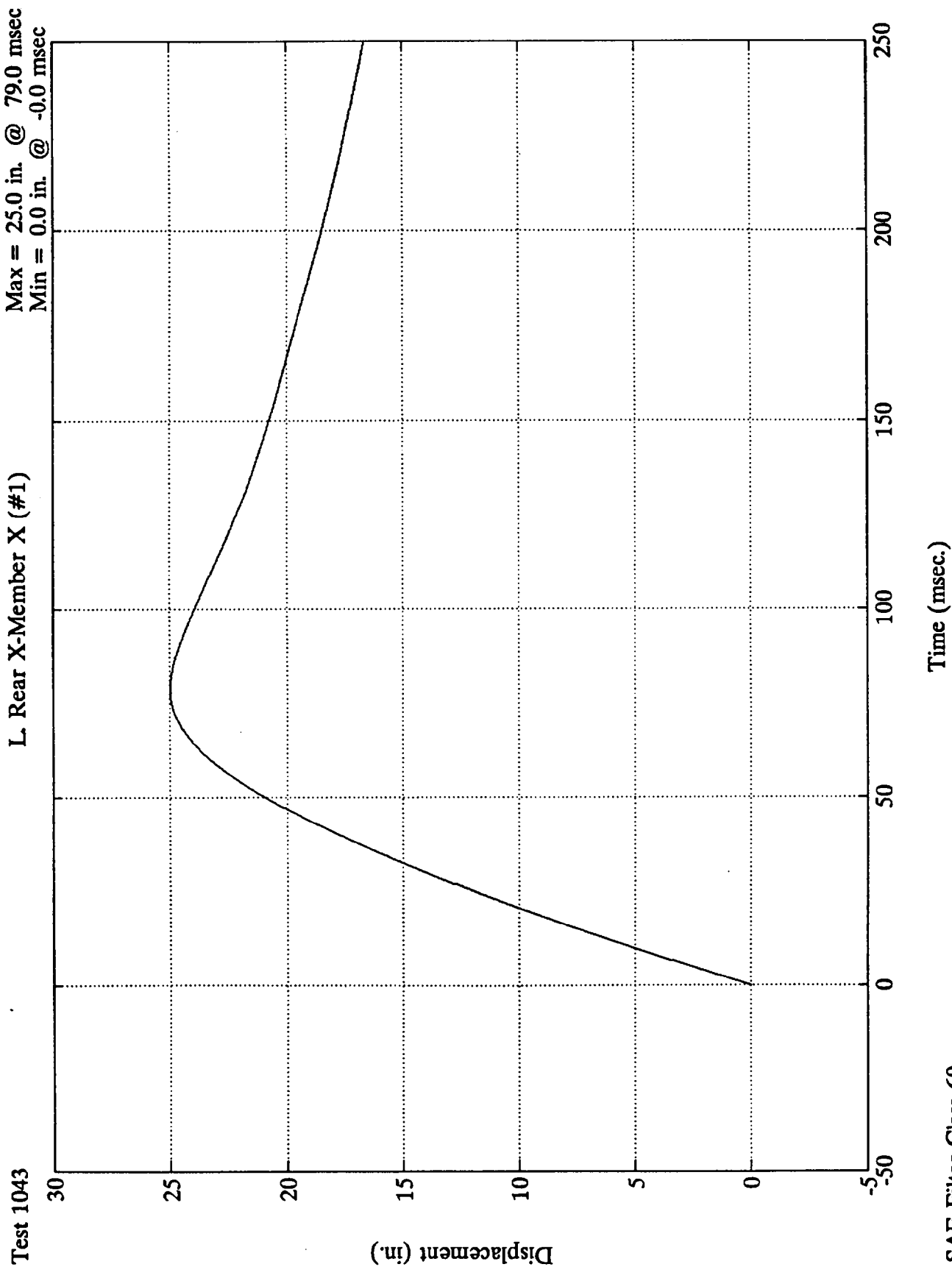
Max = 29.5 mph @ 1.0 msec
Min = -4.2 mph @ 114.5 msec

L. Rear X-Member X (#1)

Test 1043



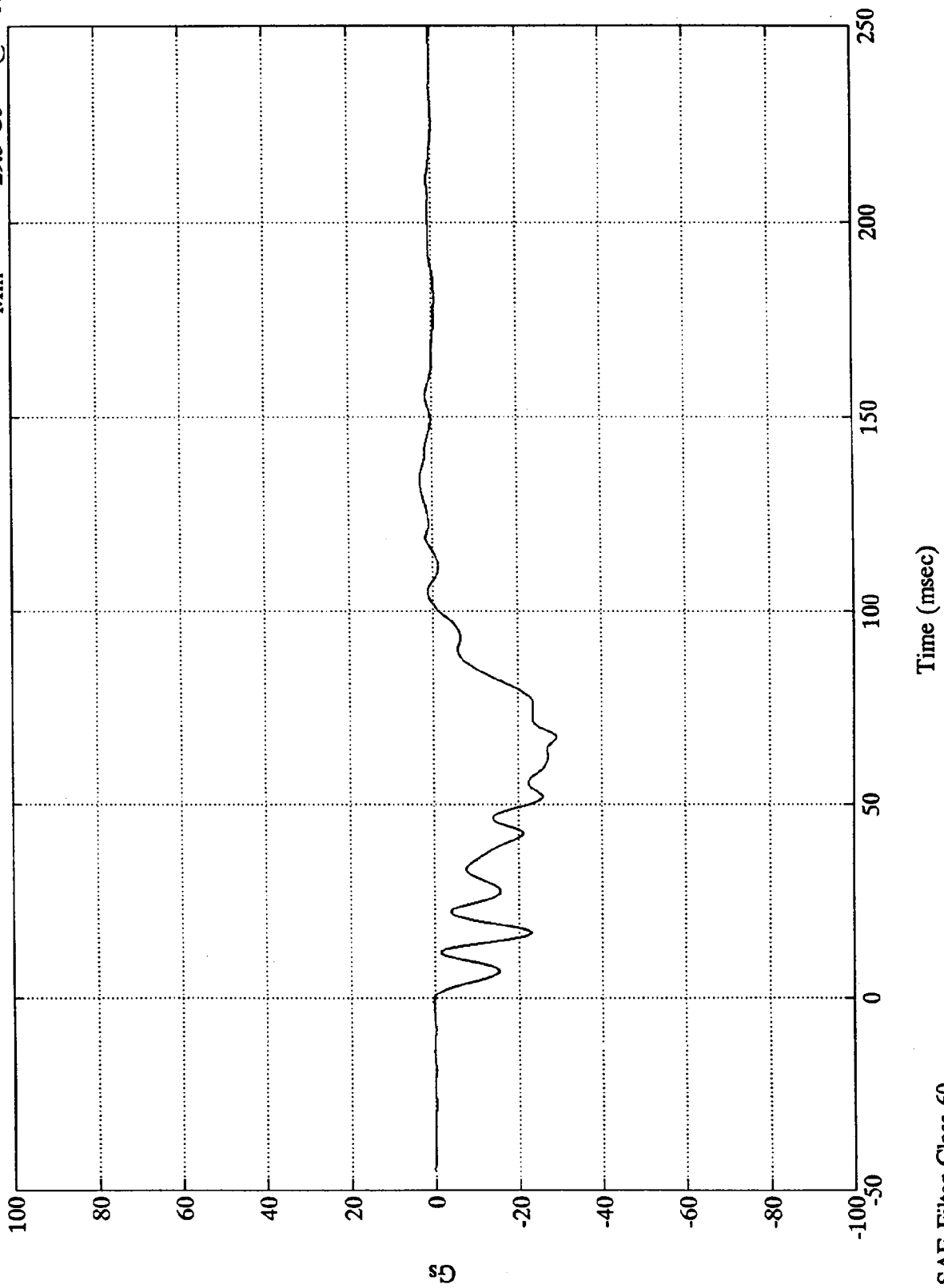
SAE Filter Class 60



Test 1043

R. Rear X-member X (#2)

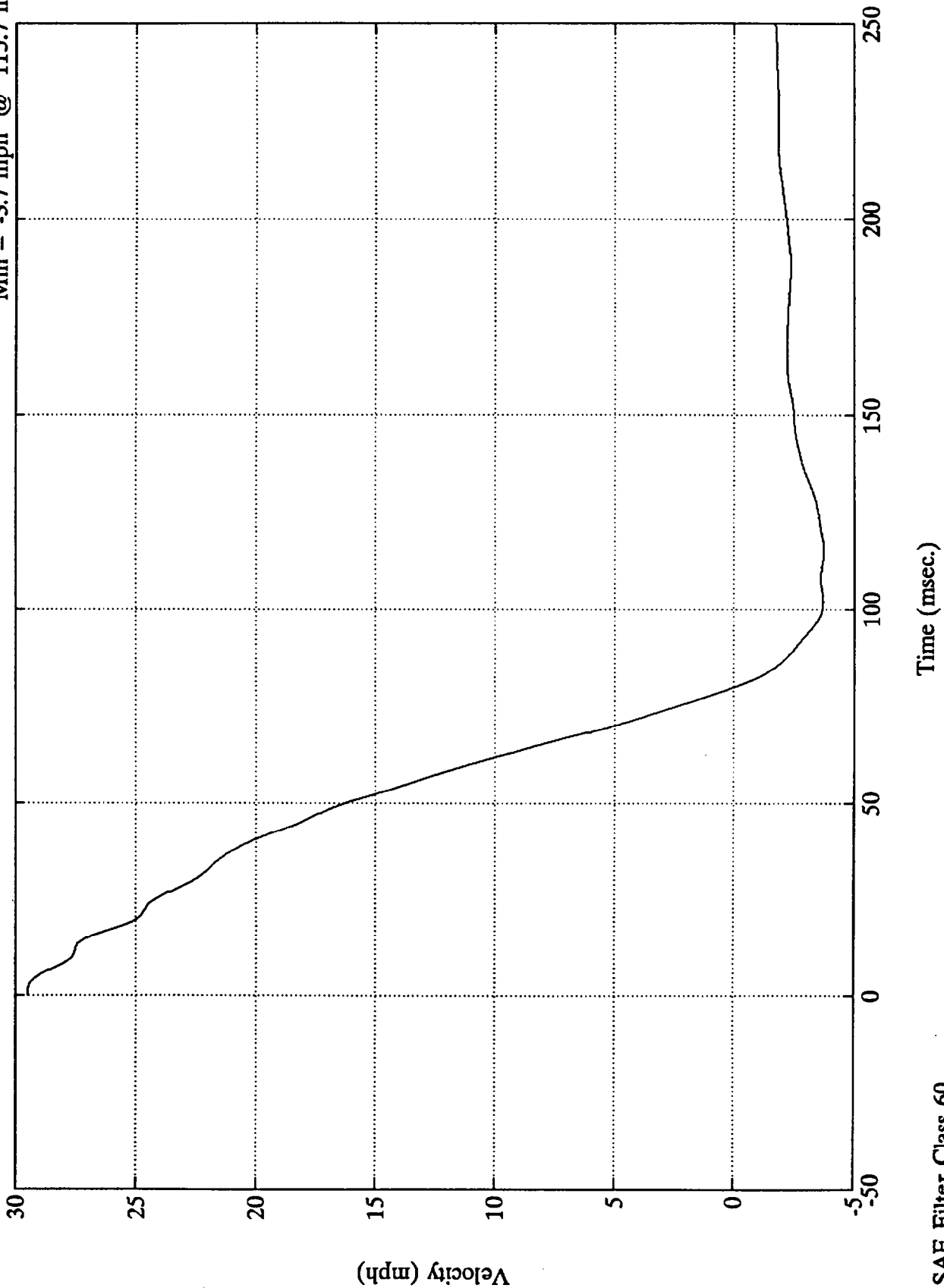
Max = 3.0 Gs @ 133.80 msec
Min = -29.3 Gs @ 67.32 msec



Test 1043

R. Rear X-Member X (#2)

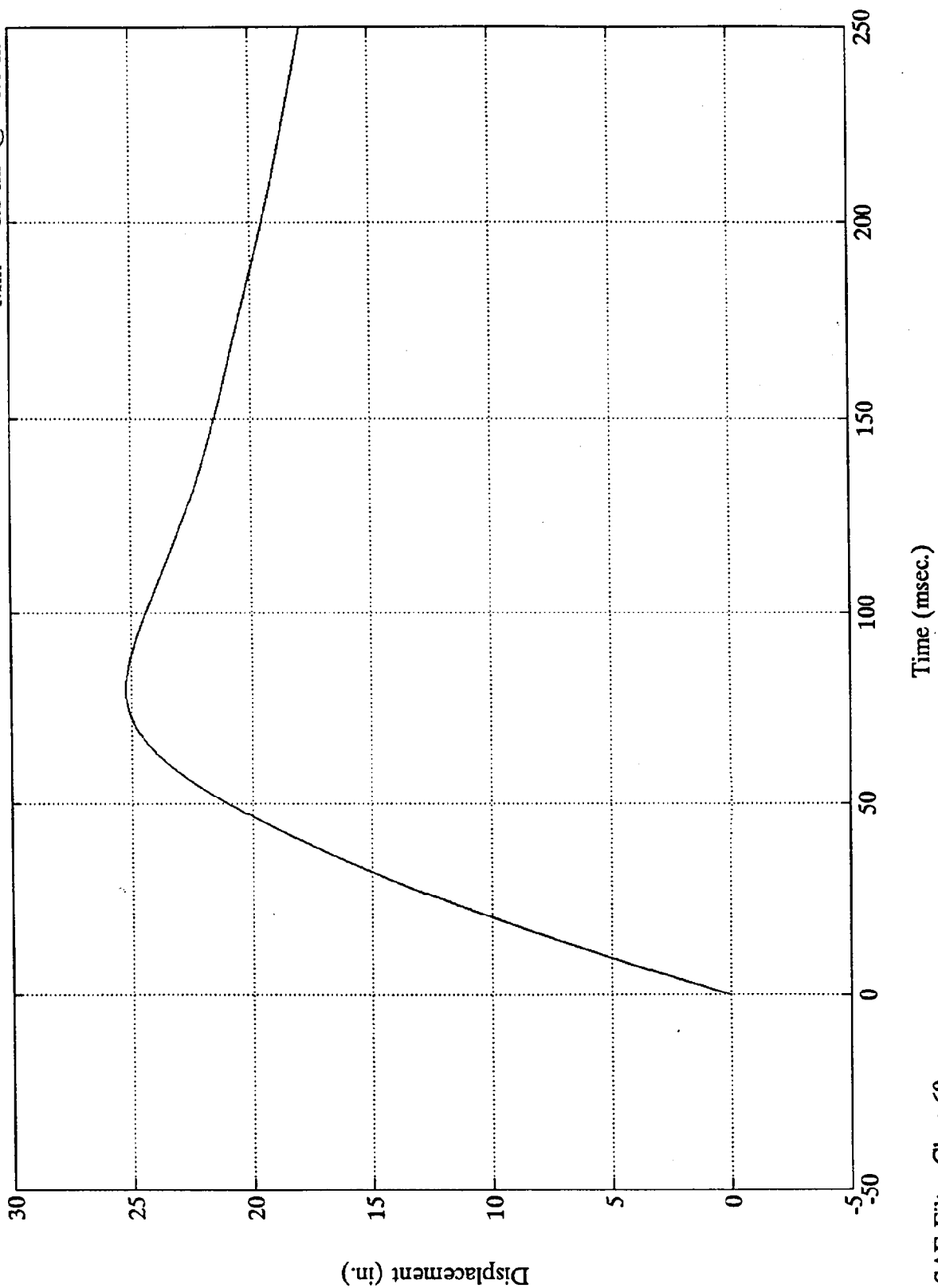
Max = 29.5 mph @ 1.2 msec
Min = -3.7 mph @ 115.7 msec



Test 1043

R. Rear X-Member X (#2)

Max = 25.2 in. @ 80.6 msec
Min = 0.0 in. @ -0.0 msec

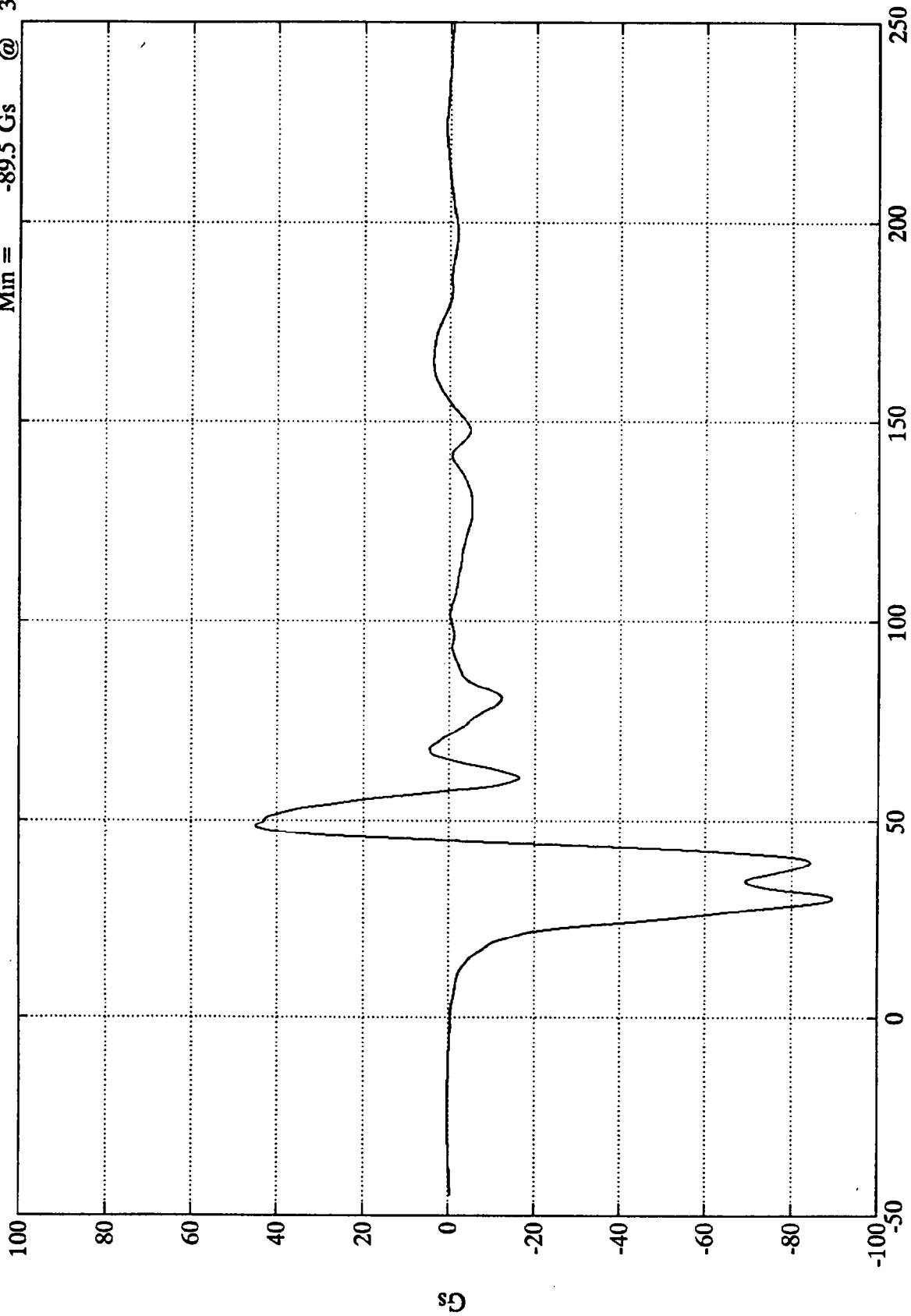


SAE Filter Class 60

Test 1043

Engine Top X (#3)

Max = 45.0 Gs @ 48.59 msec
Min = -89.5 Gs @ 30.47 msec



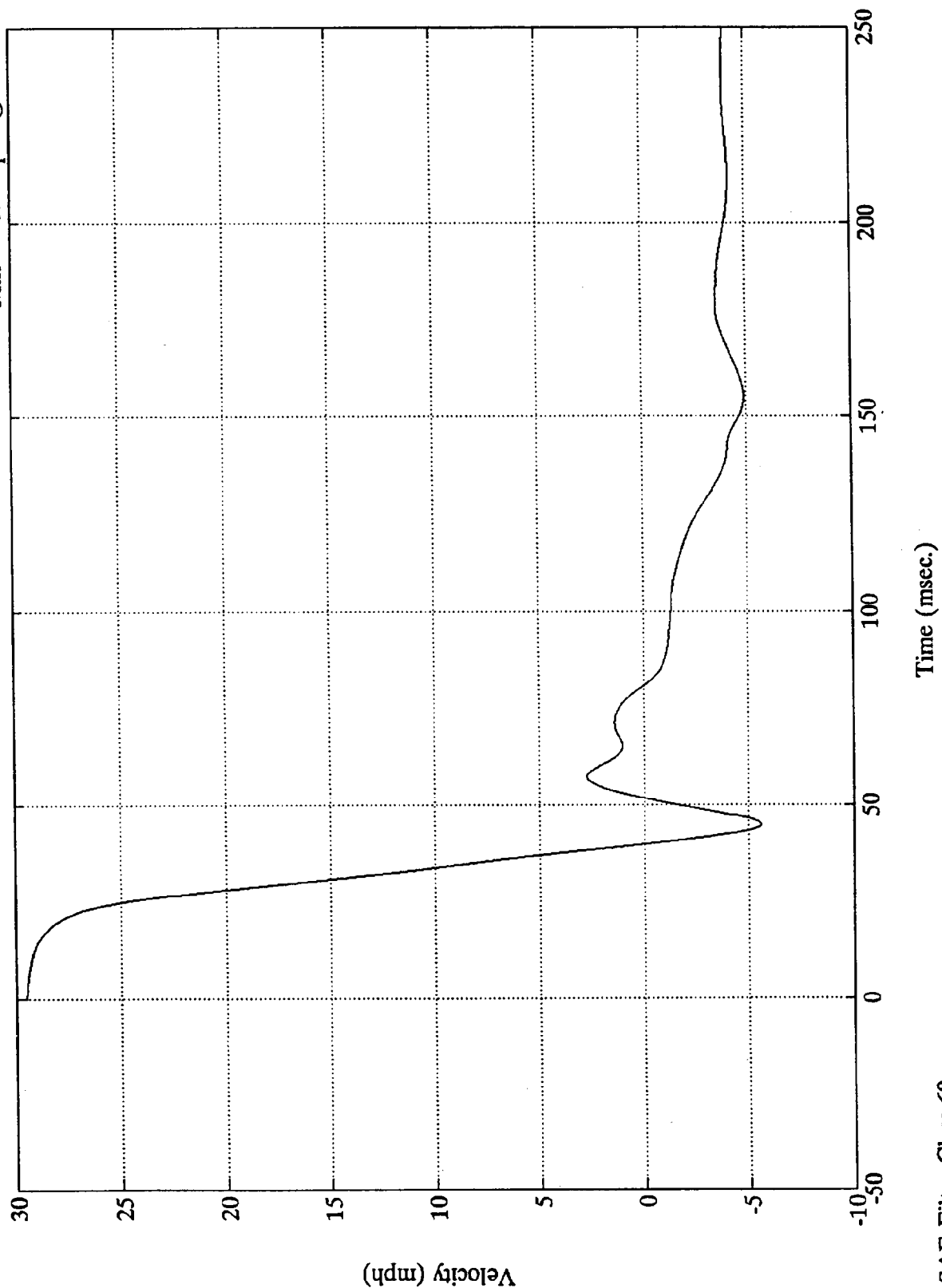
Time (msec)

SAE Filter Class 60

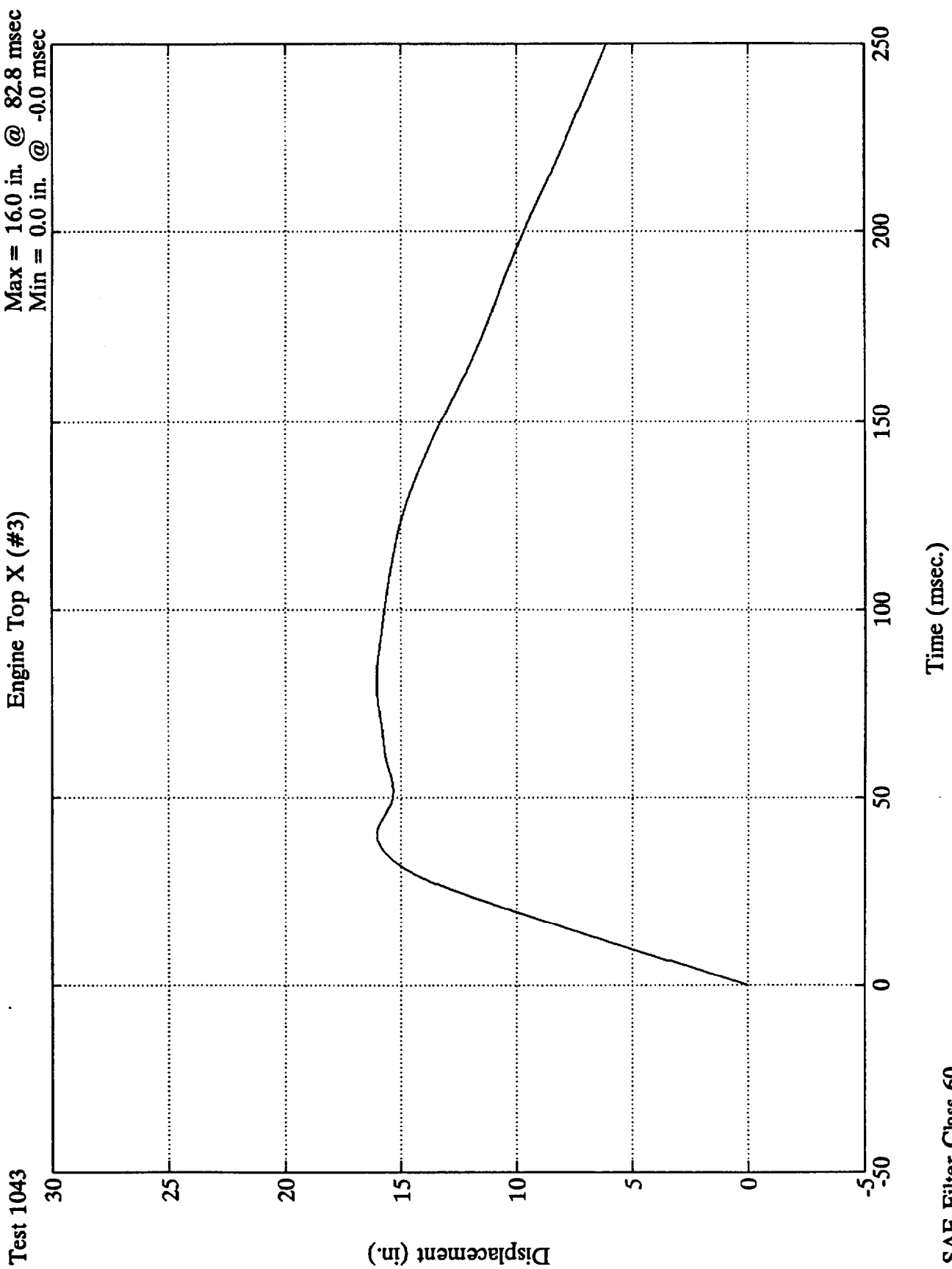
Max = 29.5 mph @ 0.2 msec
Min = -5.6 mph @ 44.9 msec

Engine Top X (#3)

Test 1043



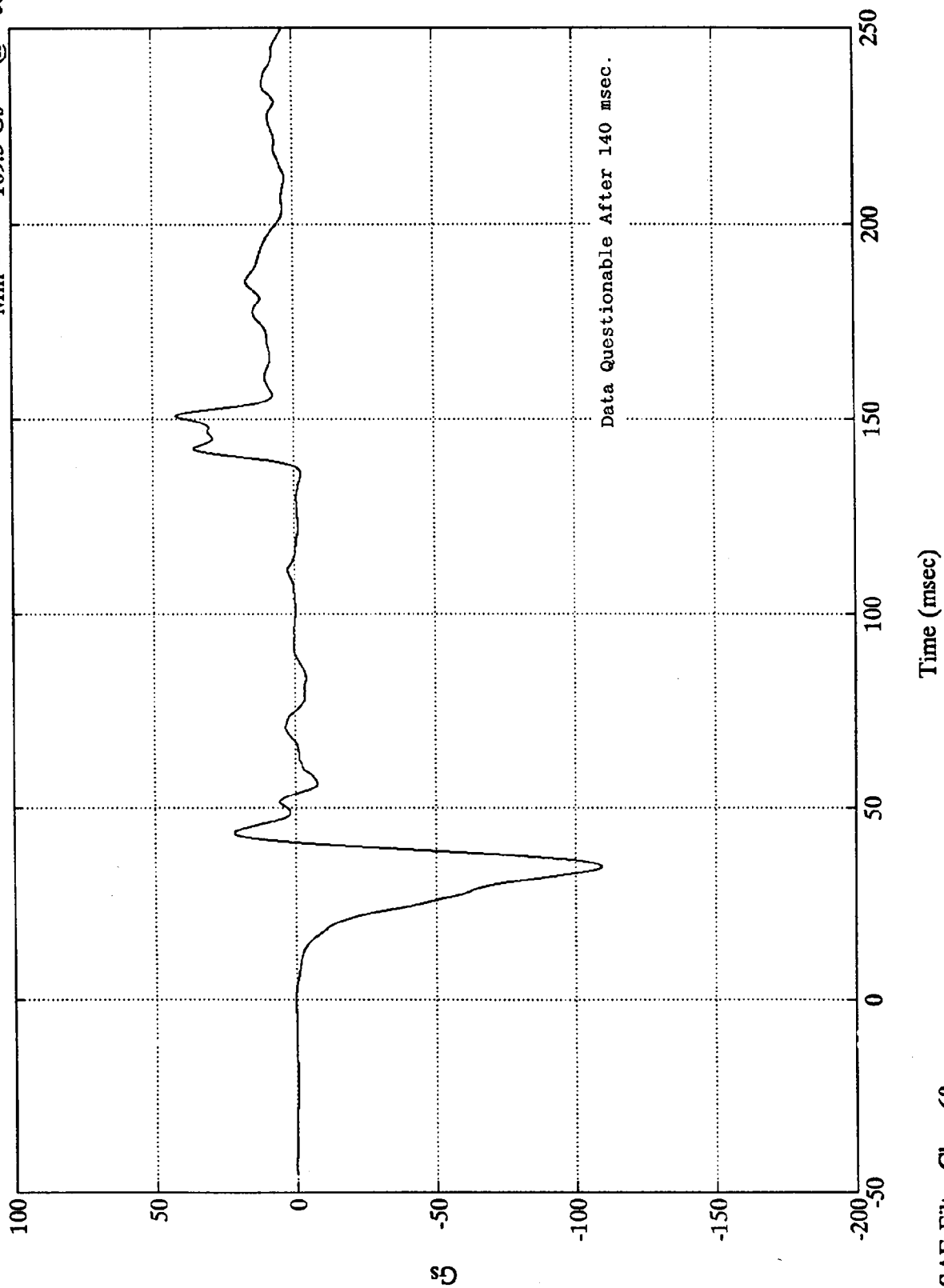
SAE Filter Class 60



Test 1043

Engine Bottom X (#4)

Max = 41.8 Gs @ 150.72 msec
Min = -109.3 Gs @ 35.15 msec



Max = 29.5 mph @ 4.6 msec
Min = -0.2 mph @ 41.3 msec

Engine Bottom X (#4)

Test 1043



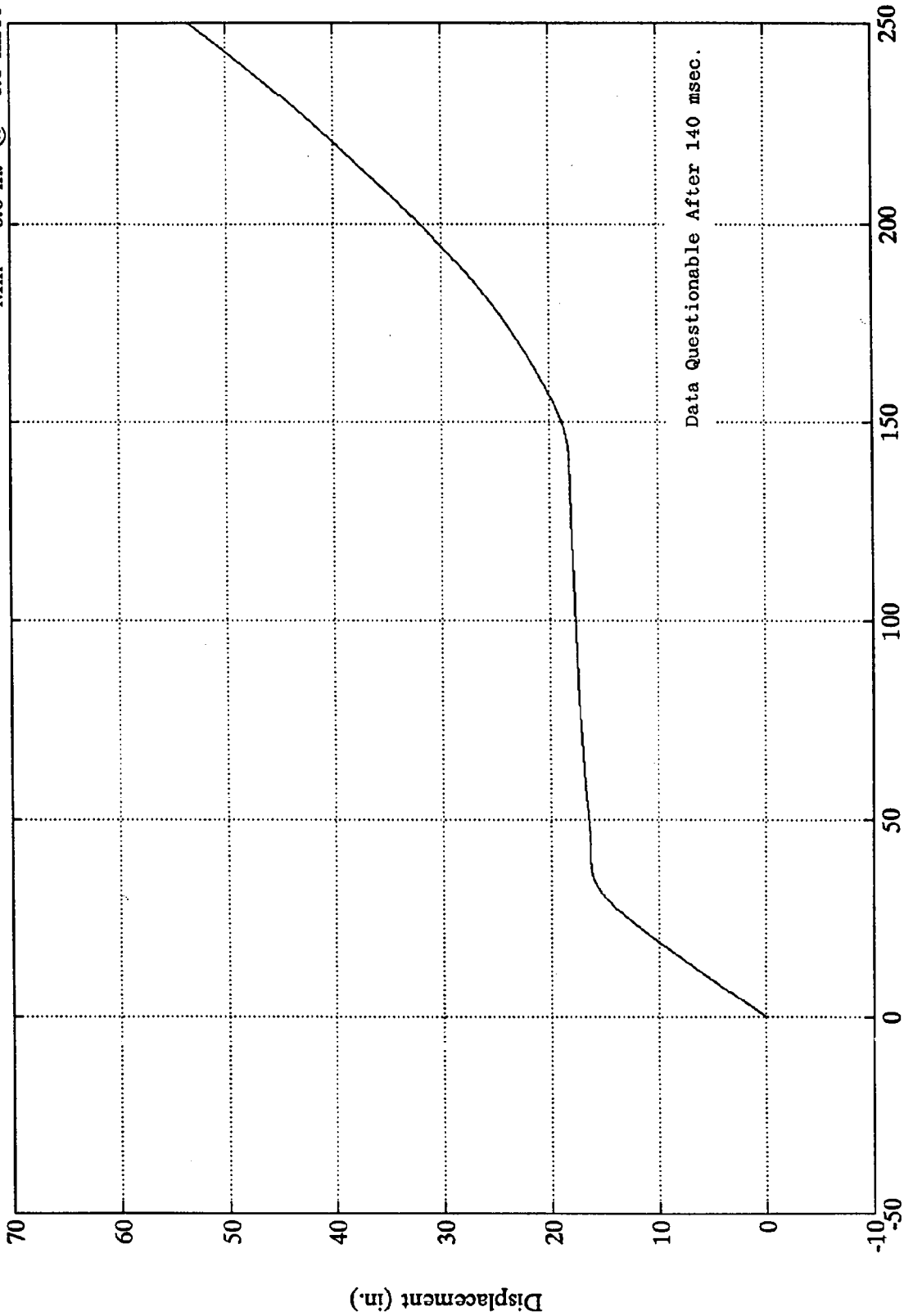
Data Questionable After 140 msec.

SAE Filter Class 60

Test 1043

Engine Bottom X (#4)

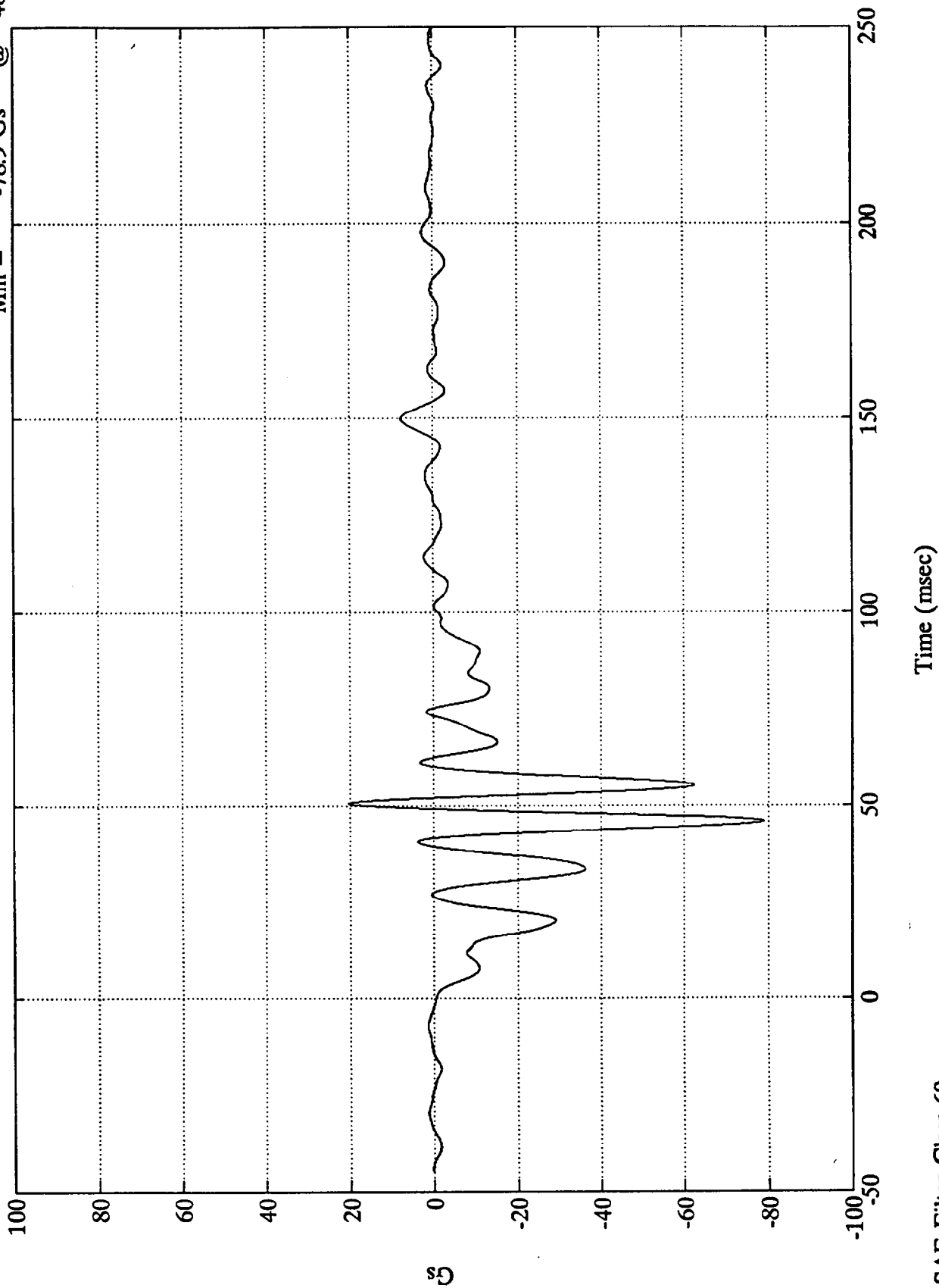
Max = 56.0 in. @ 254.9 msec
Min = 0.0 in. @ -0.0 msec



SAE Filter Class 60

R. Brake Caliper X (#5)

Max = 20.3 Gs @ 50.76 msec
 Min = -78.9 Gs @ 46.08 msec

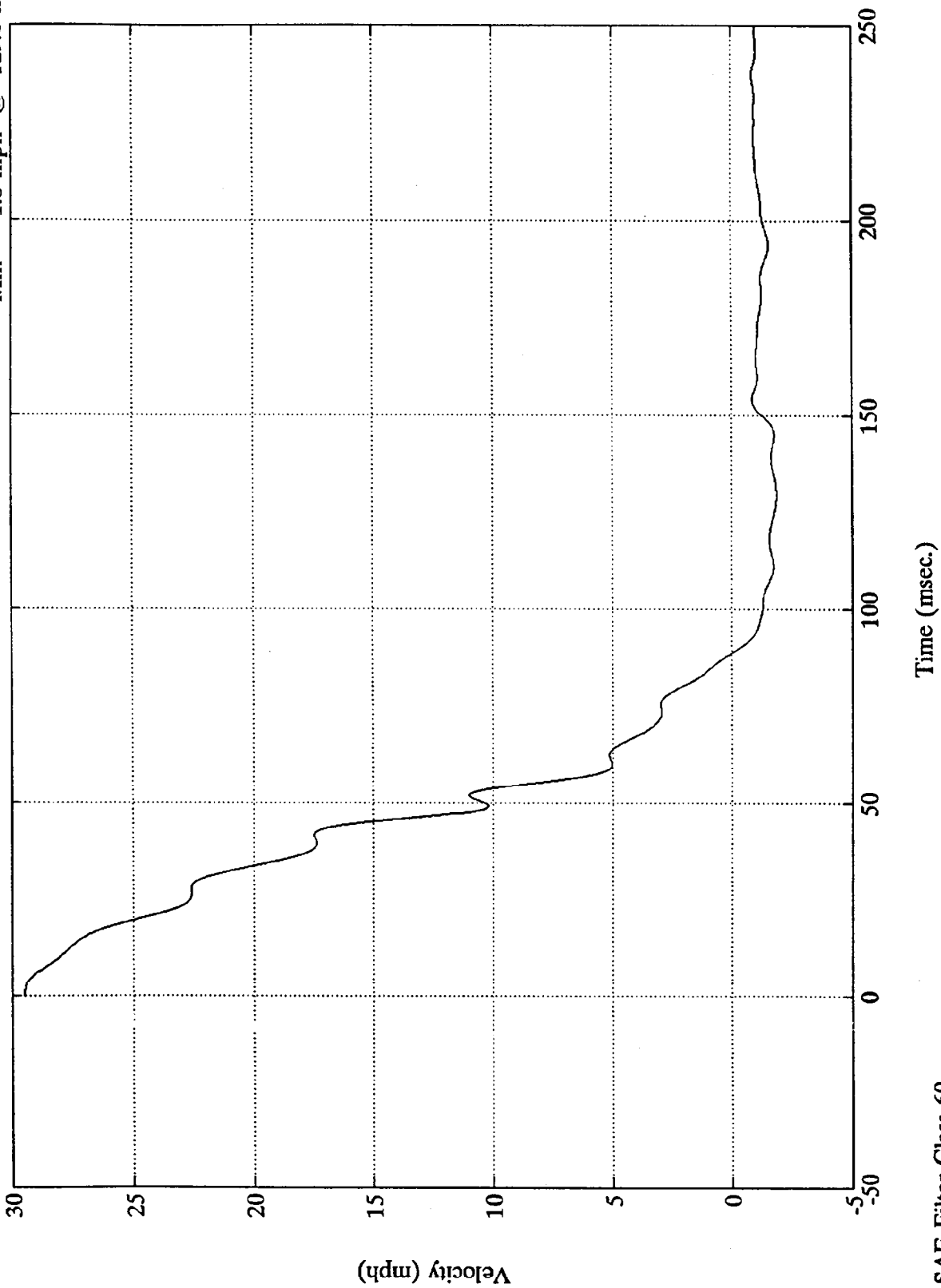


SAE Filter Class 60

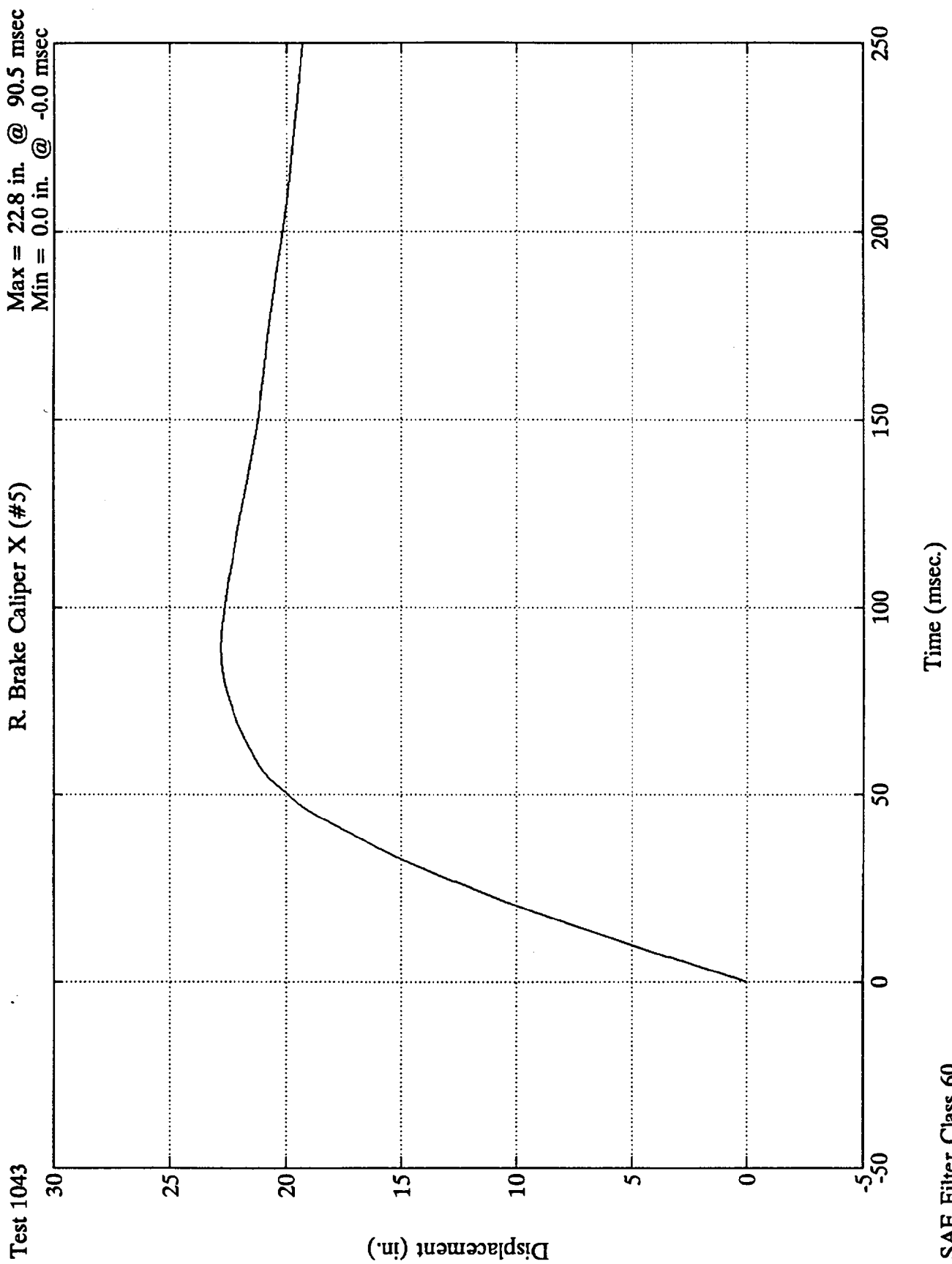
Test 1043

R. Brake Caliper X (#5)

Max = 29.5 mph @ 0.2 msec
Min = -1.8 mph @ 129.6 msec



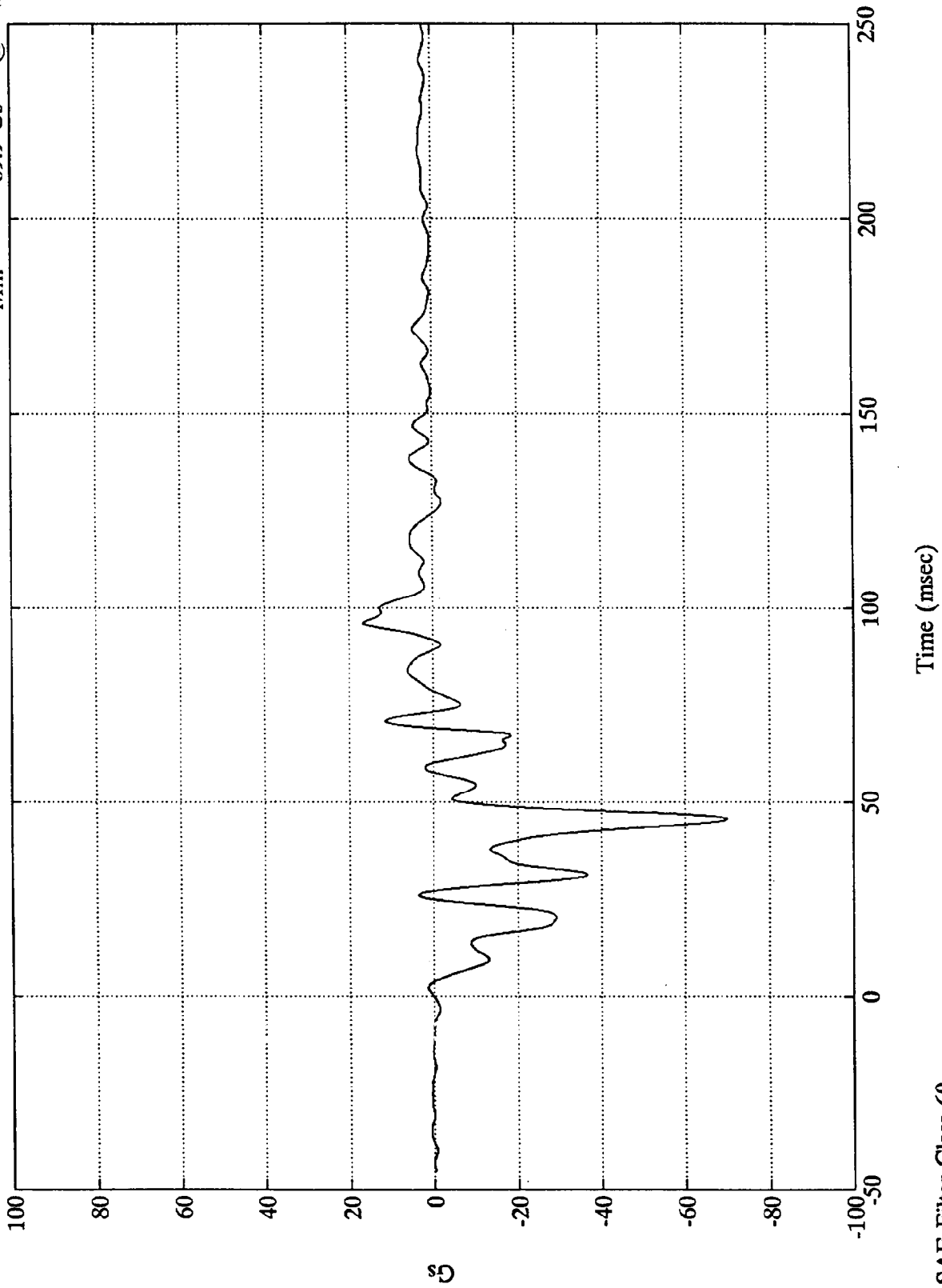
SAE Filter Class 60



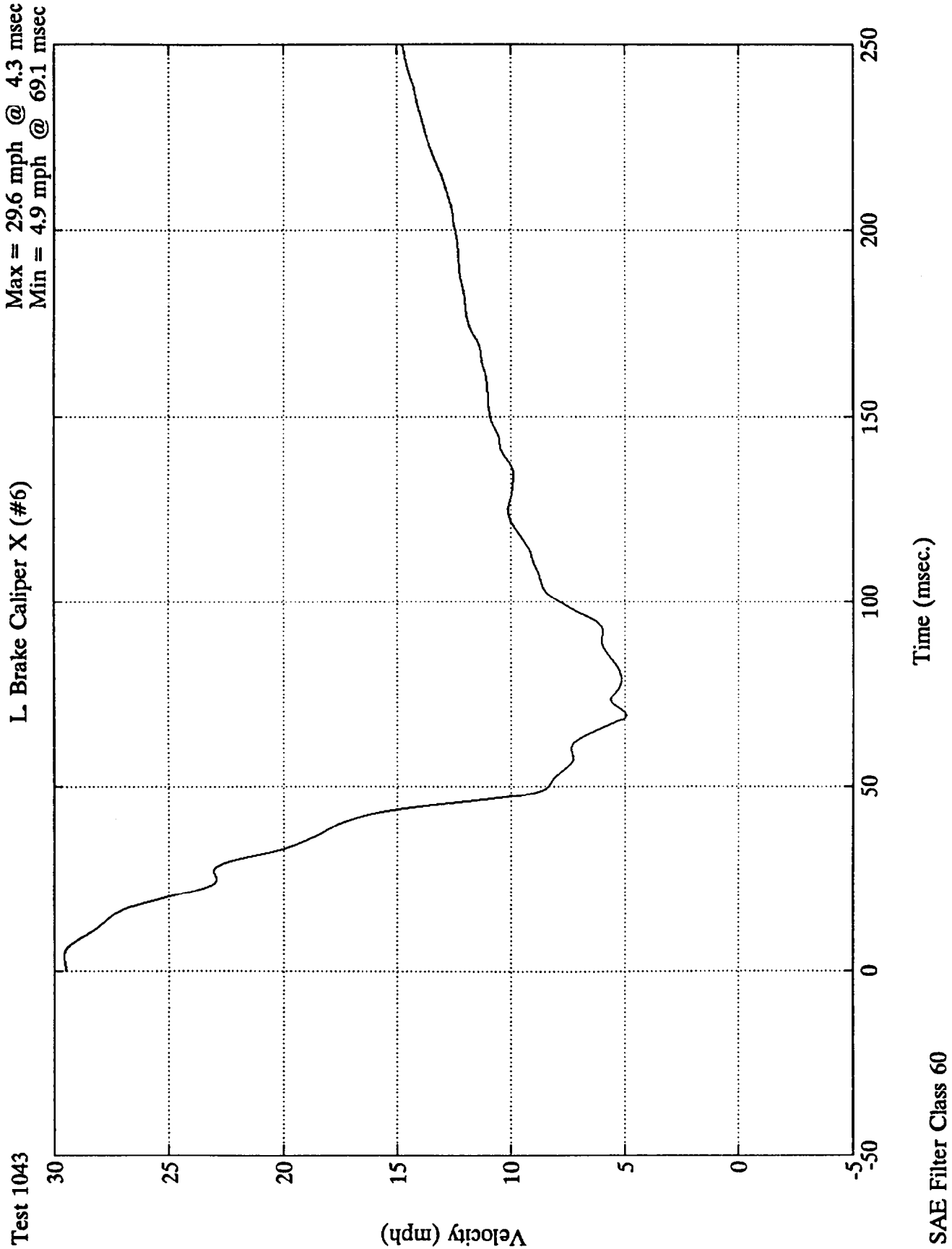
Test 1043

L Brake Caliper X (#6)

Max = 16.6 Gs @ 96.23 msec
Min = -69.9 Gs @ 45.60 msec



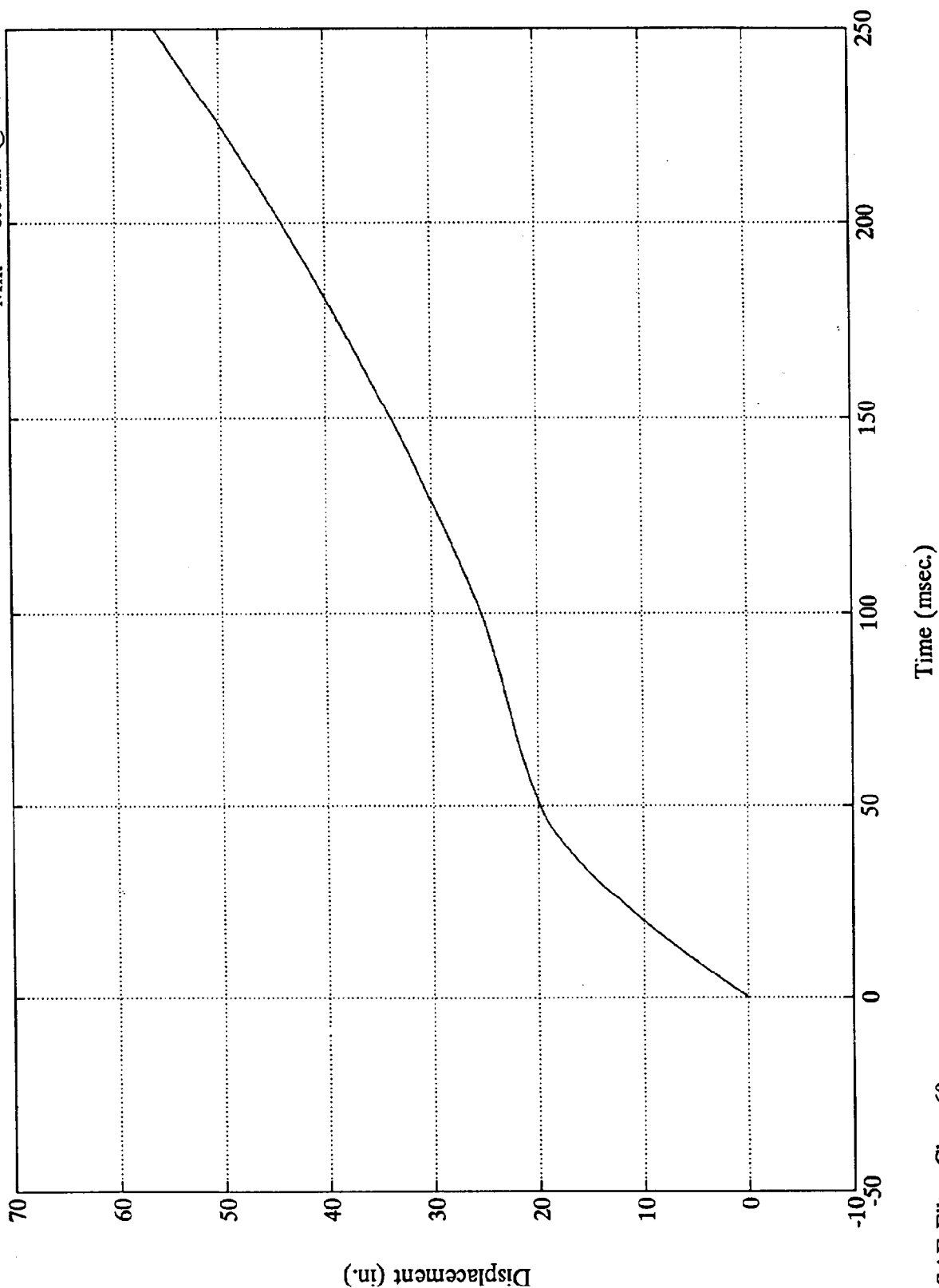
SAE Filter Class 60



Test 1043

L. Brake Caliper X (#6)

Max = 57.4 in. @ 254.9 msec
Min = 0.0 in. @ -0.0 msec

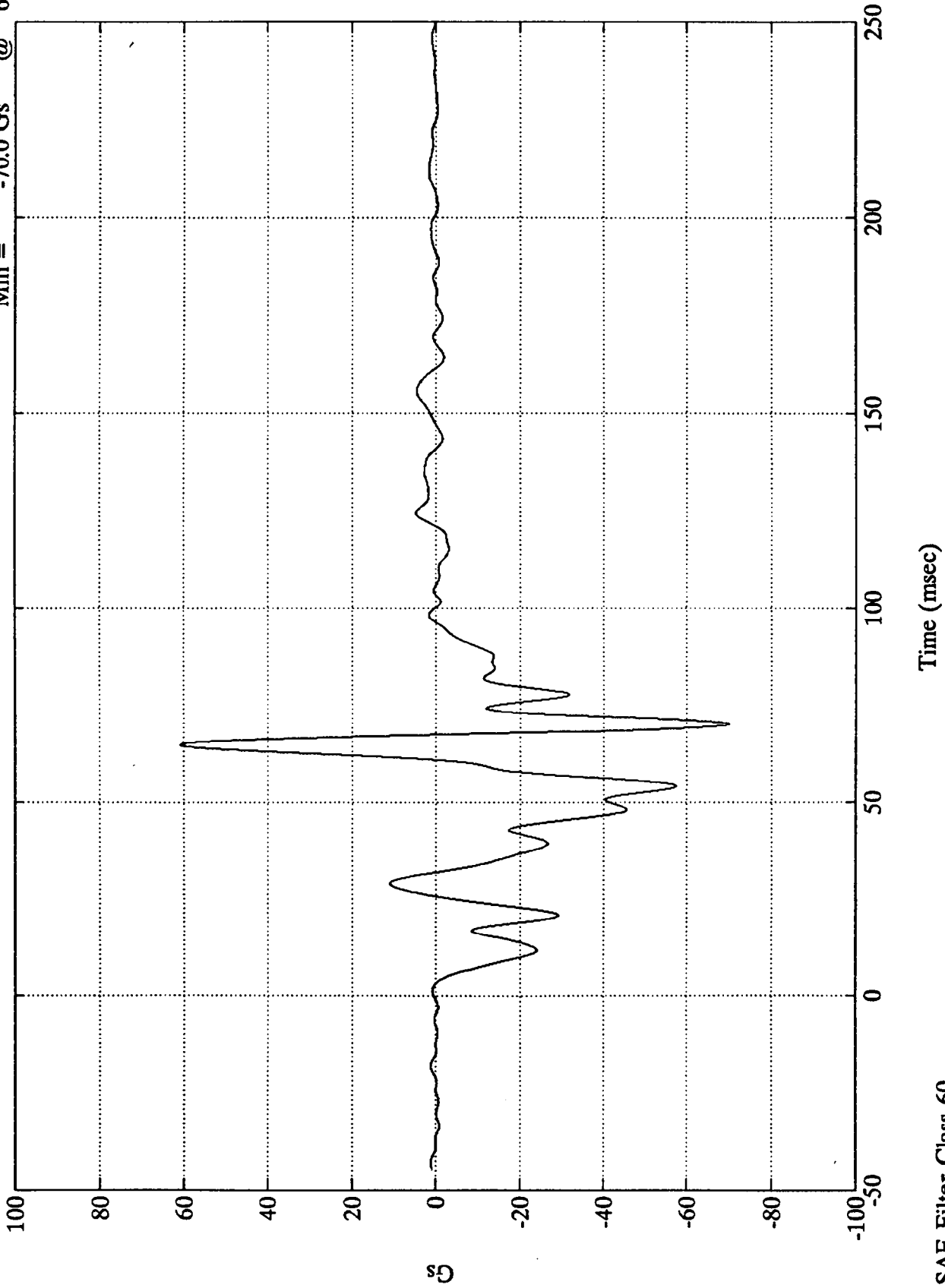


SAE Filter Class 60

Test 1043

Instrument Panel X (#7)

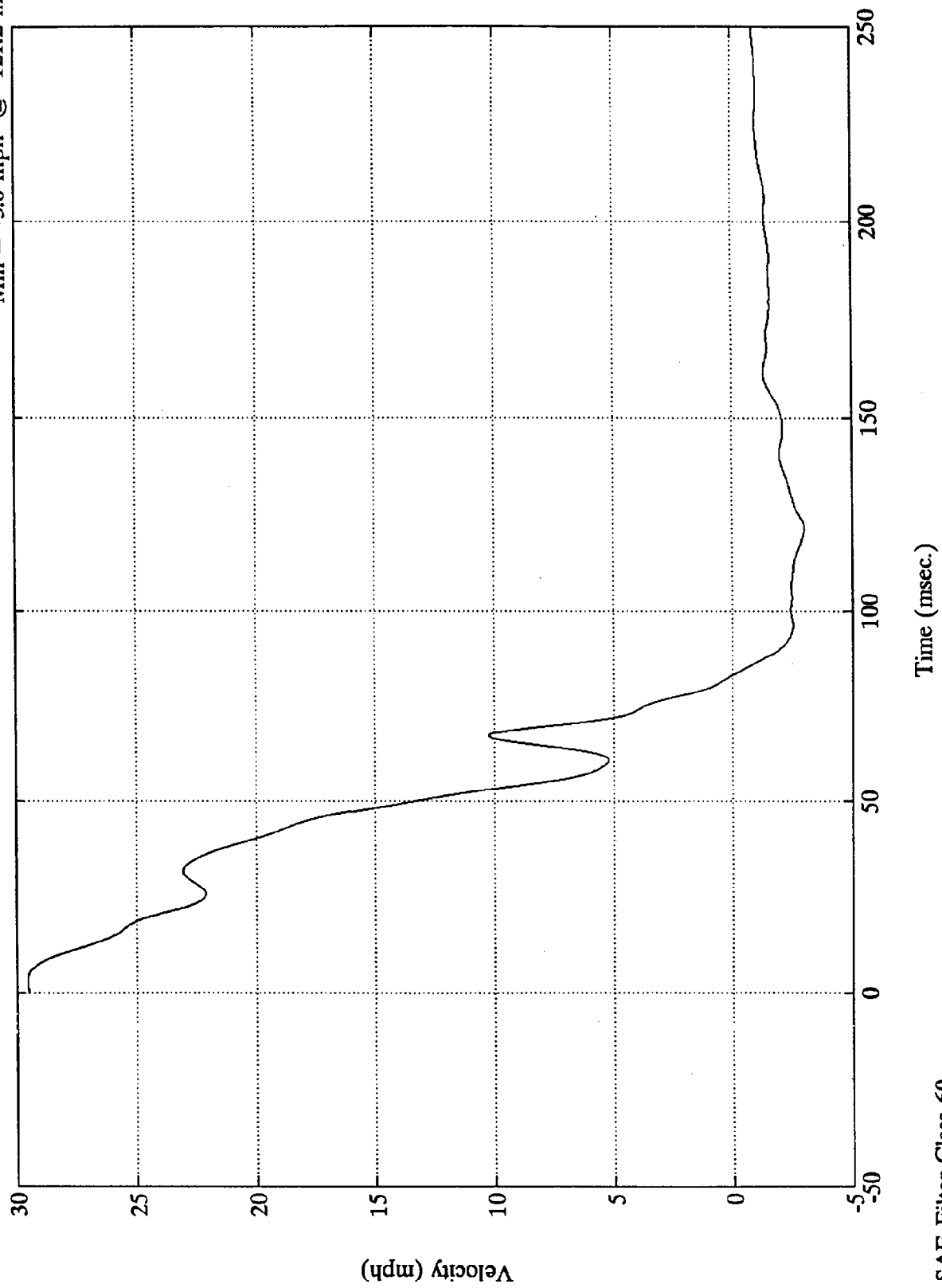
Max = 60.8 Gs @ 64.56 msec
Min = -70.0 Gs @ 69.95 msec



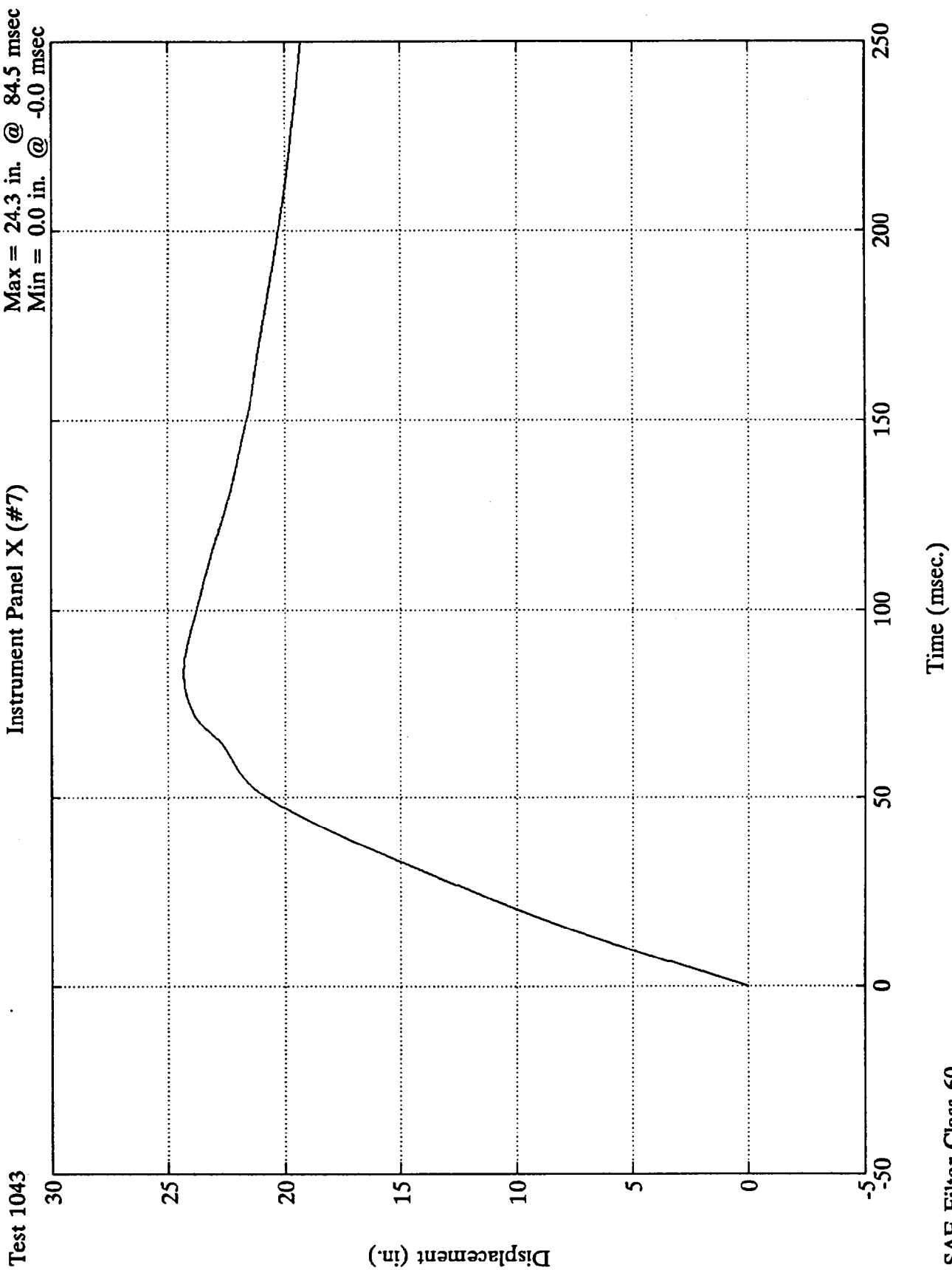
Max = 29.5 mph @ 3.6 msec
Min = -3.0 mph @ 121.2 msec

Instrument Panel X (#7)

Test 1043



SAE Filter Class 60



TEST NO. CM0204

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

HIC SUMMARY: Pos. 1 Head Resultant

hic: 269.64
t1 = 67.320 msec
t2 = 103.200 msec
Average G's Over Hic Duration = 35.51

HIC SUMMARY: Pos. 2 Head Resultant

hic: 173.26
t1 = 61.560 msec
t2 = 97.440 msec
Average G's Over Hic Duration = 29.75

CLIP SUMMARY: Pos. 1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 37.166 G's
Tstart = 76.5600 ms
Tend = 79.5600 ms
CSI = 279.455

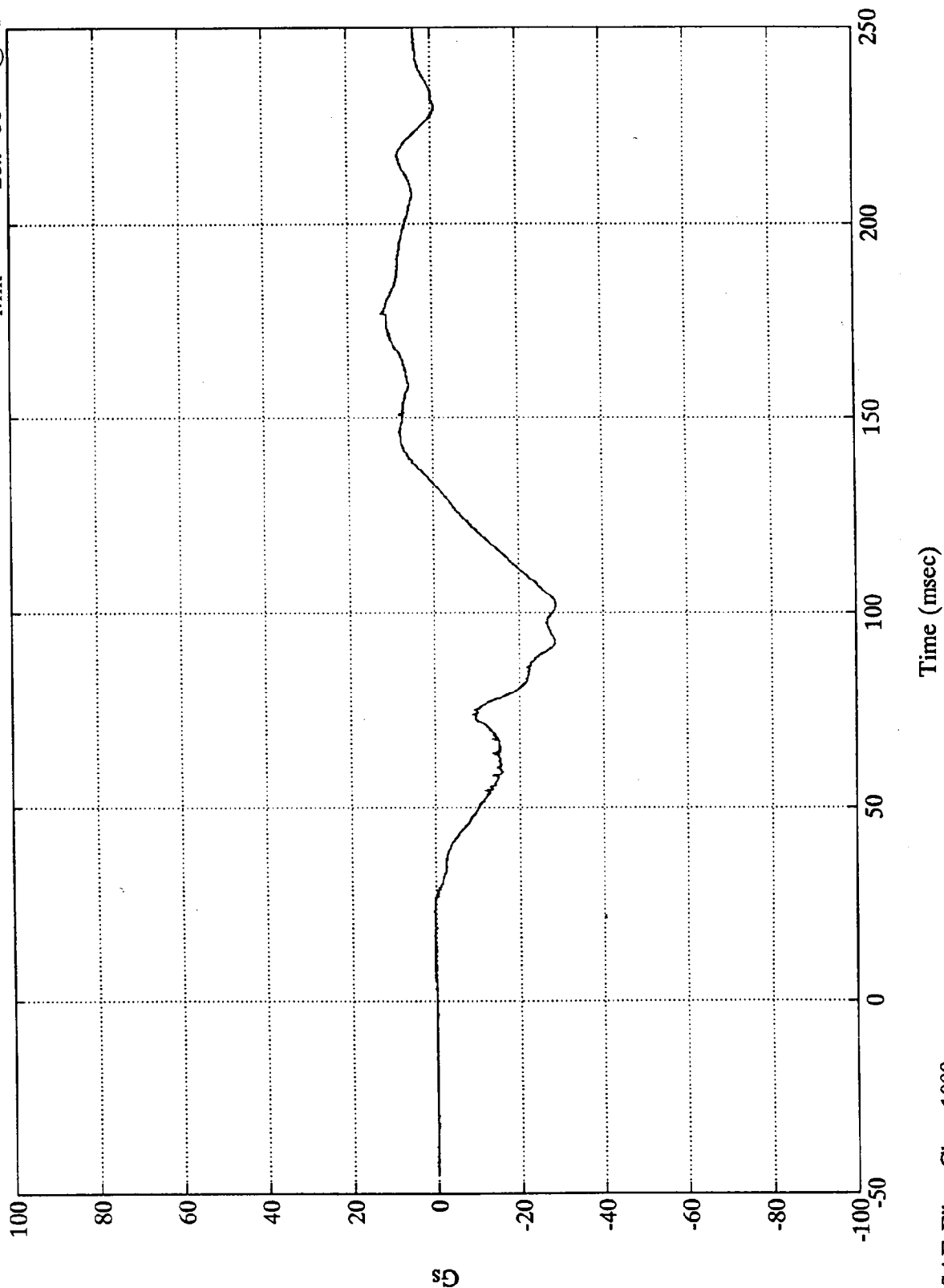
CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 32.300 G's
Tstart = 60.0000 ms
Tend = 63.0000 ms
CSI = 193.095

Test 1043

Pos. 1 Head X

Max = 12.1 Gs @ 176.88 msec
Min = -28.9 Gs @ 102.24 msec

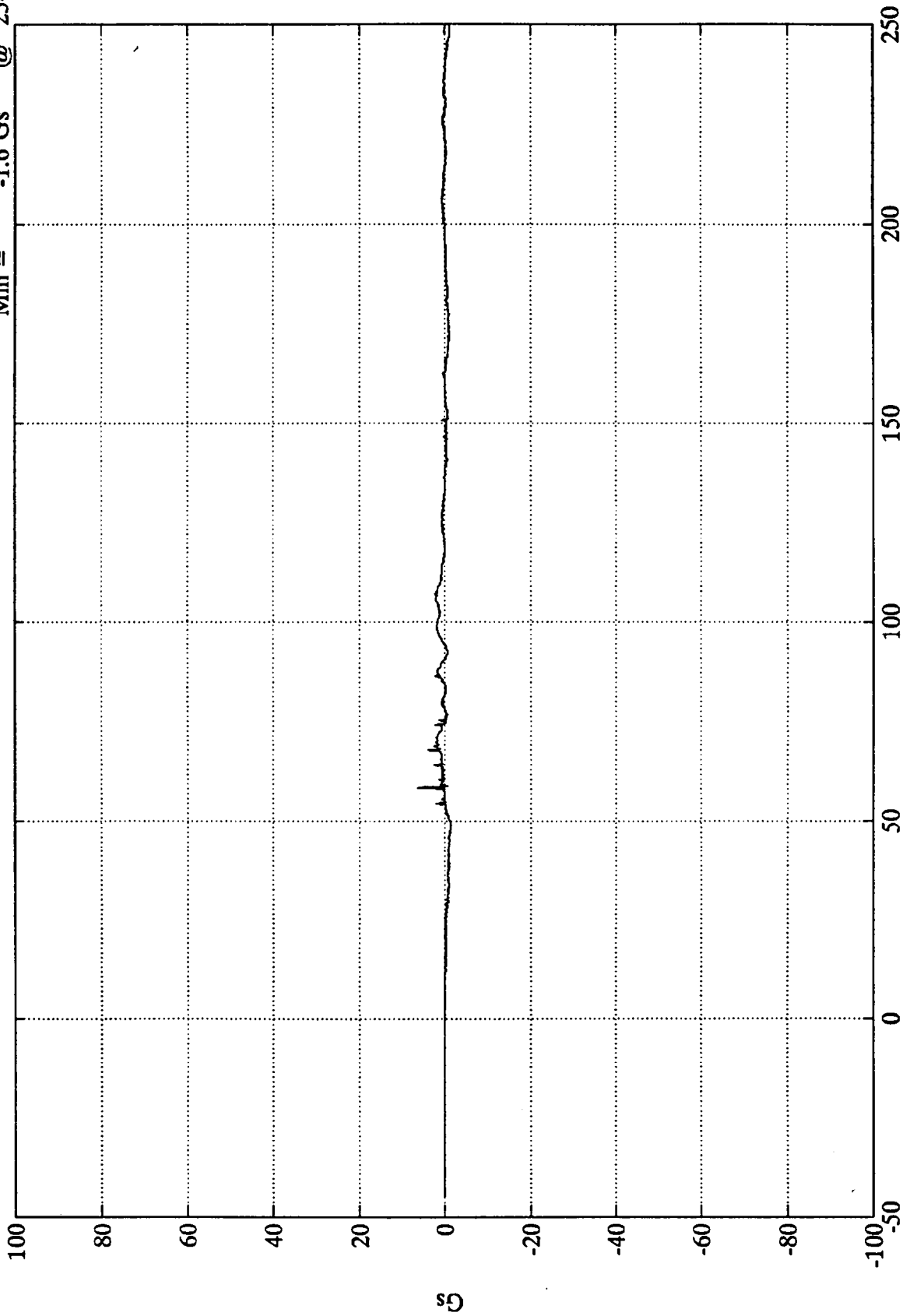


SAE Filter Class 1000

Test 1043

Pos. 1 Head Y

Max = 6.1 Gs @ 58.43 msec
Min = -1.6 Gs @ 254.75 msec



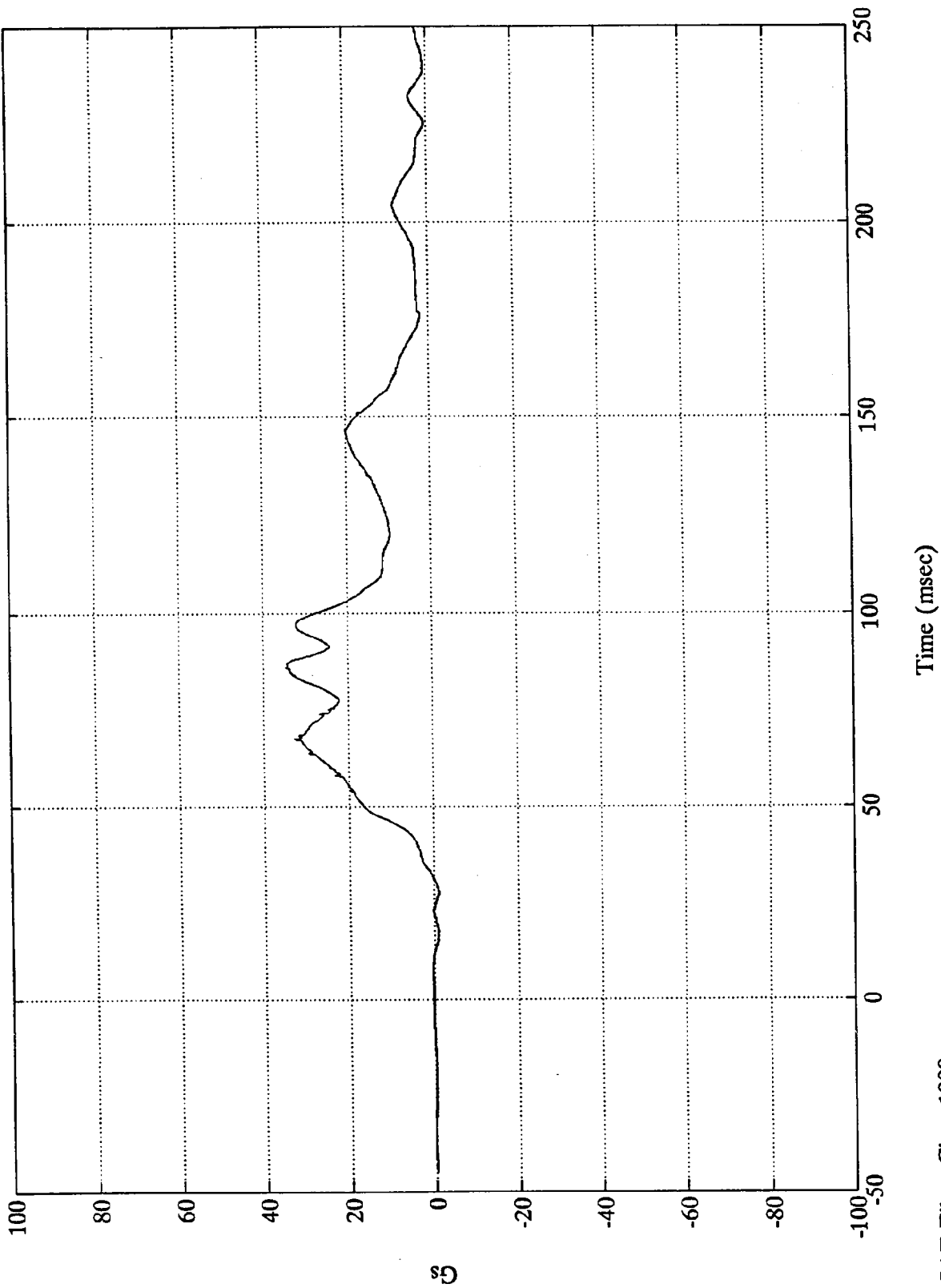
Time (msec)

SAE Filter Class 1000

Test 1043

Pos. 1 Head Z

Max = 34.6 Gs @ 86.28 msec
Min = -1.6 Gs @ 254.88 msec

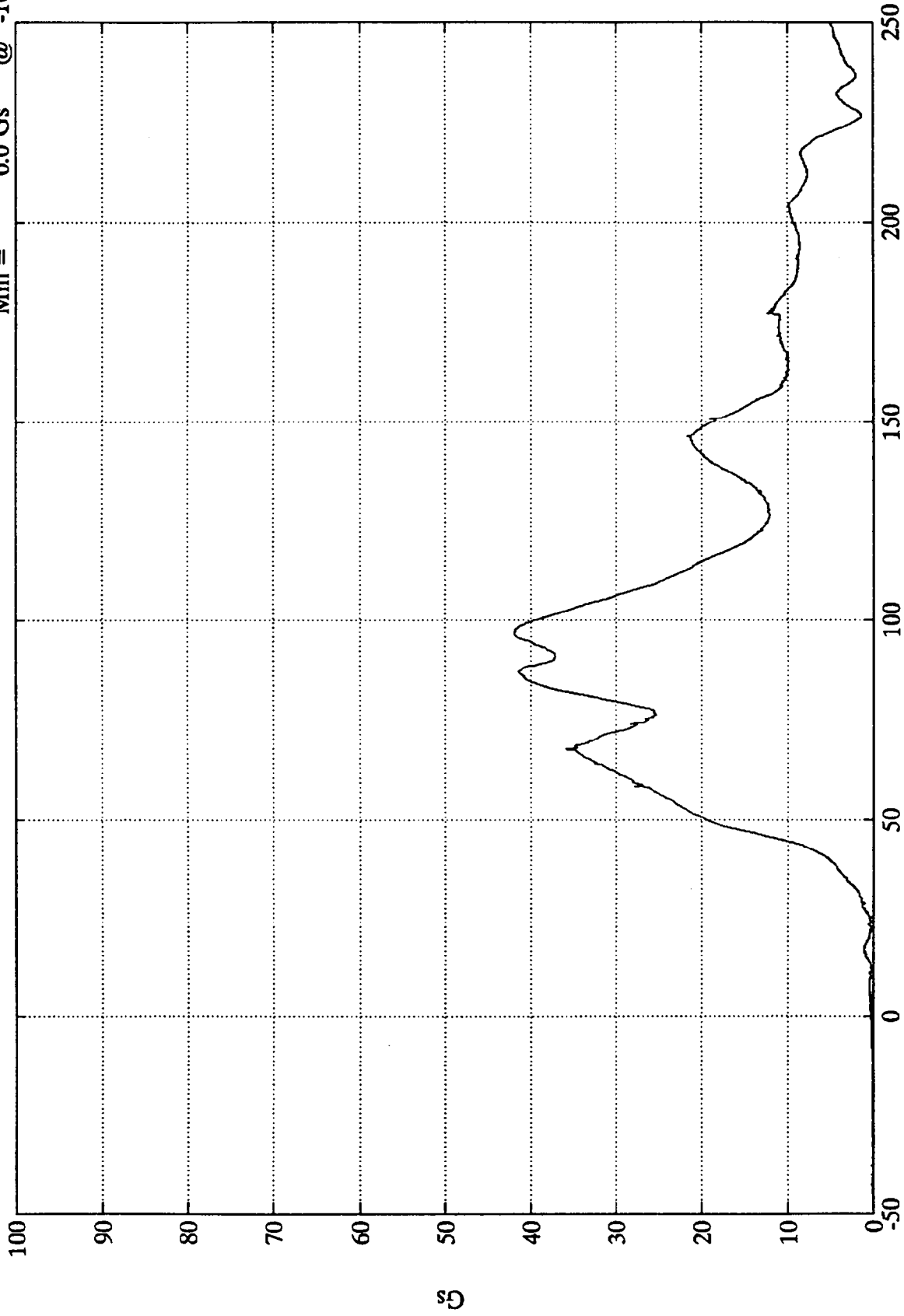


SAE Filter Class 1000

Test 1043

Pos. 1 Head Resultant

Max = 41.9 Gs @ 96.12 msec
Min = 0.0 Gs @ -10.20 msec



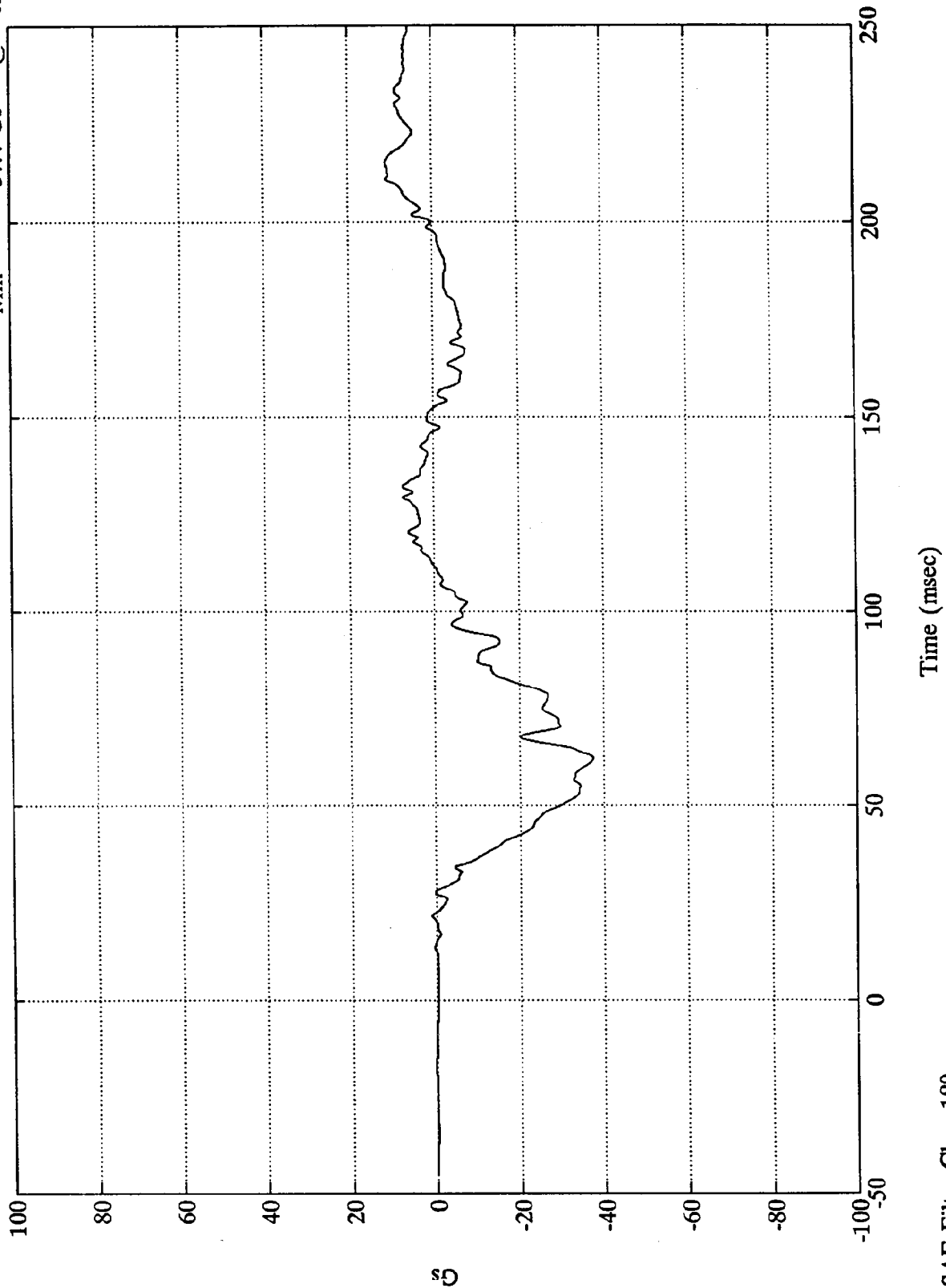
Time (msec)

SAE Filter Class 1000

Test 1043

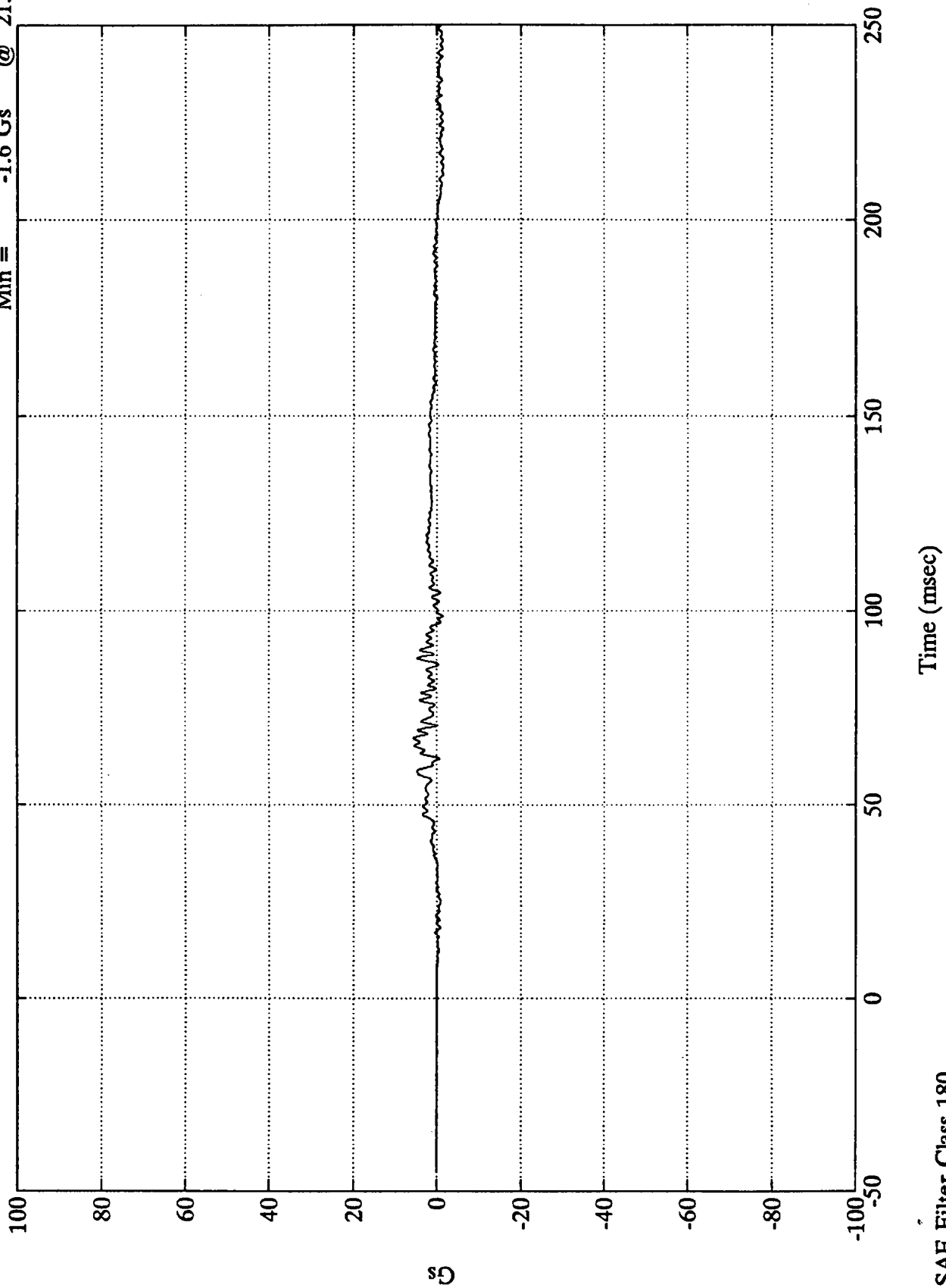
Pos. 1 Chest X

Max = 11.0 Gs @ 214.91 msec
Min = -37.4 Gs @ 62.51 msec



Test 1043

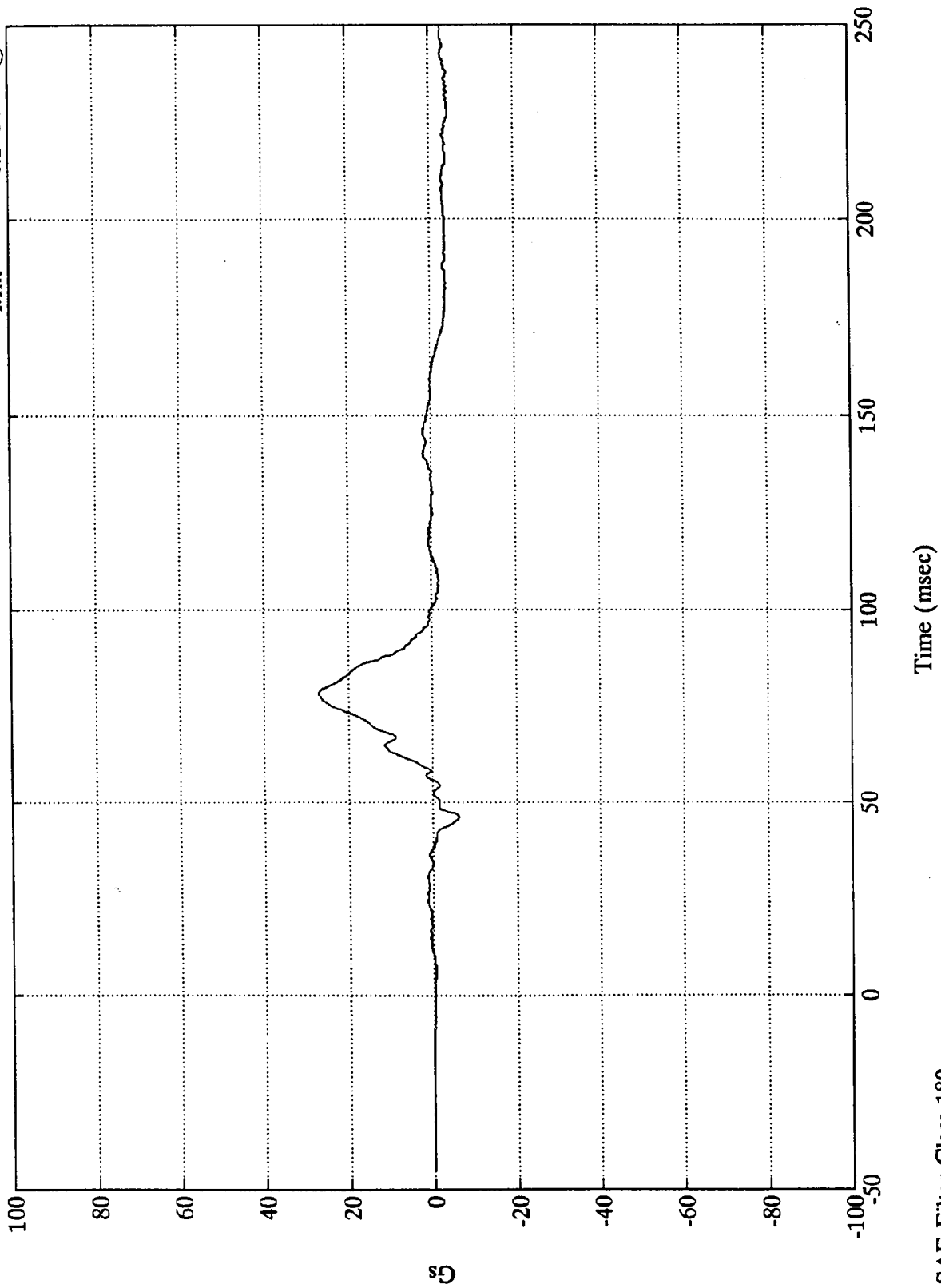
Pos. 1 Chest Y
Max = 5.6 Gs @ 66.95 msec
Min = -1.6 Gs @ 213.60 msec



Test 1043

Pos. 1 Chest Z

Max = 27.1 Gs @ 78.60 msec
Min = -6.1 Gs @ 46.20 msec

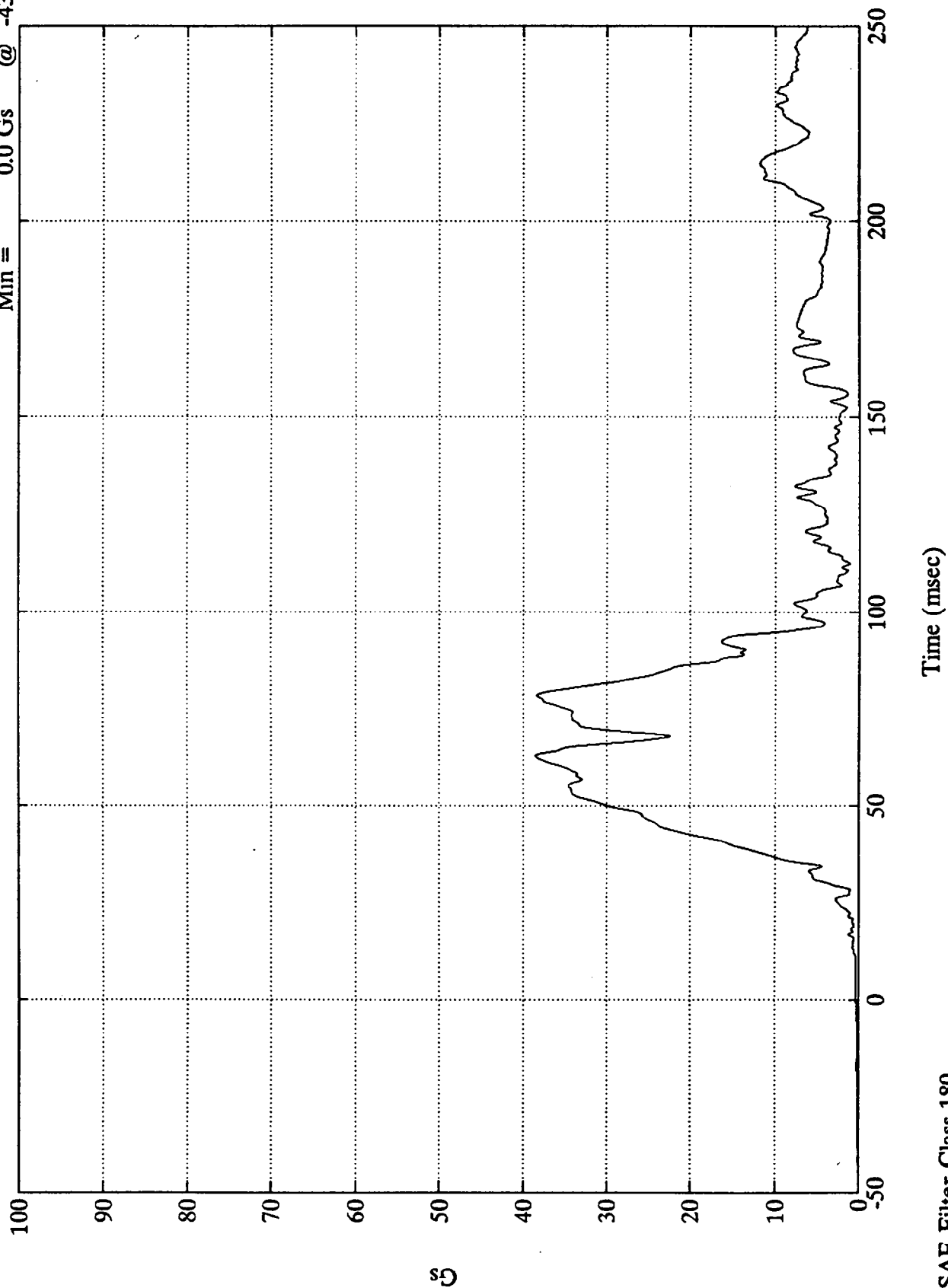


SAE Filter Class 180

Test 1043

Pos. 1 Chest Resultant

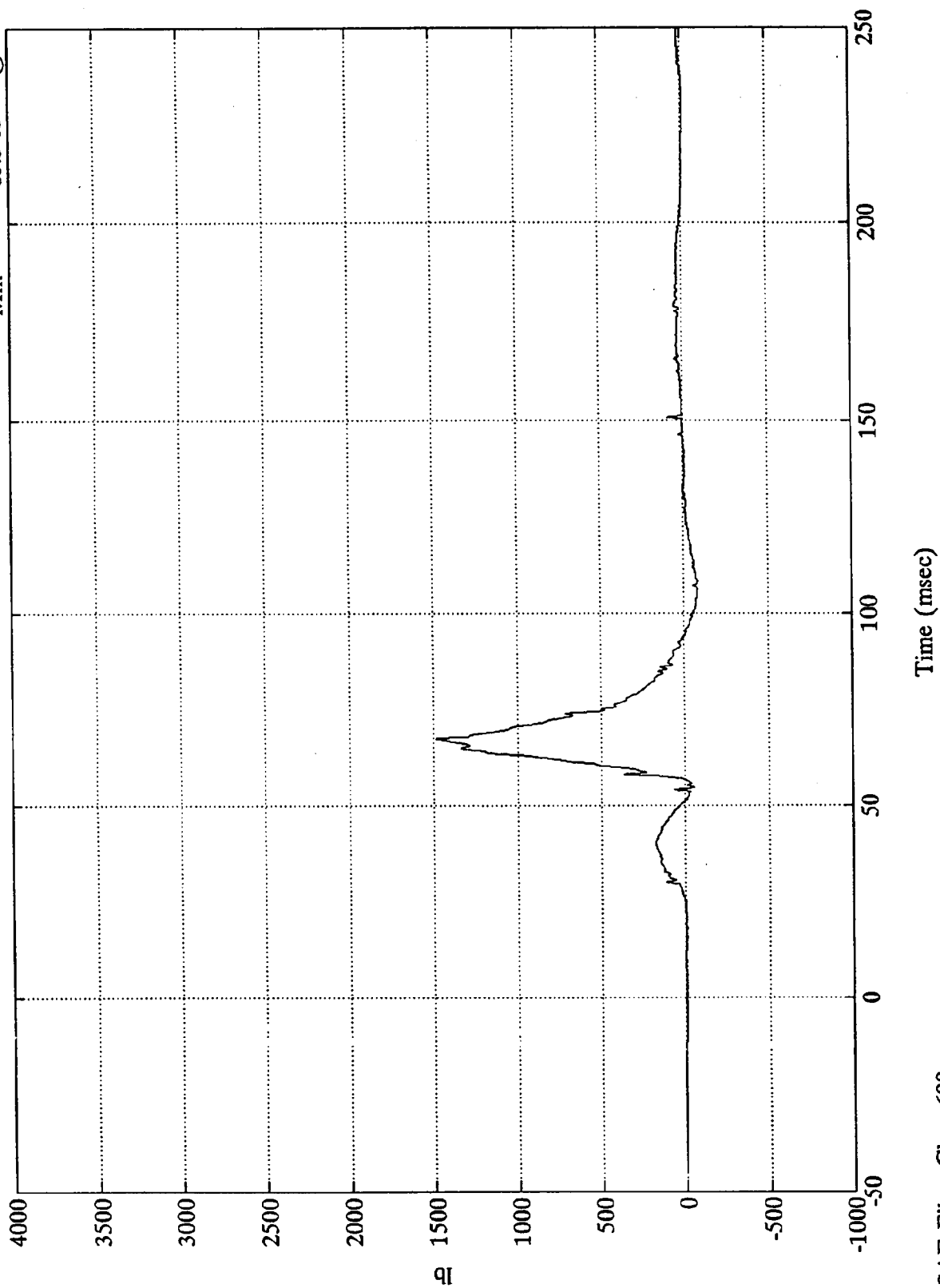
Max = 38.4 Gs @ 62.76 msec
Min = 0.0 Gs @ -43.80 msec



50

Test 1043

Pos. 1 Left Femur
Max = 1484.5 lb @ 67.56 msec
Min = -85.5 lb @ 108.36 msec

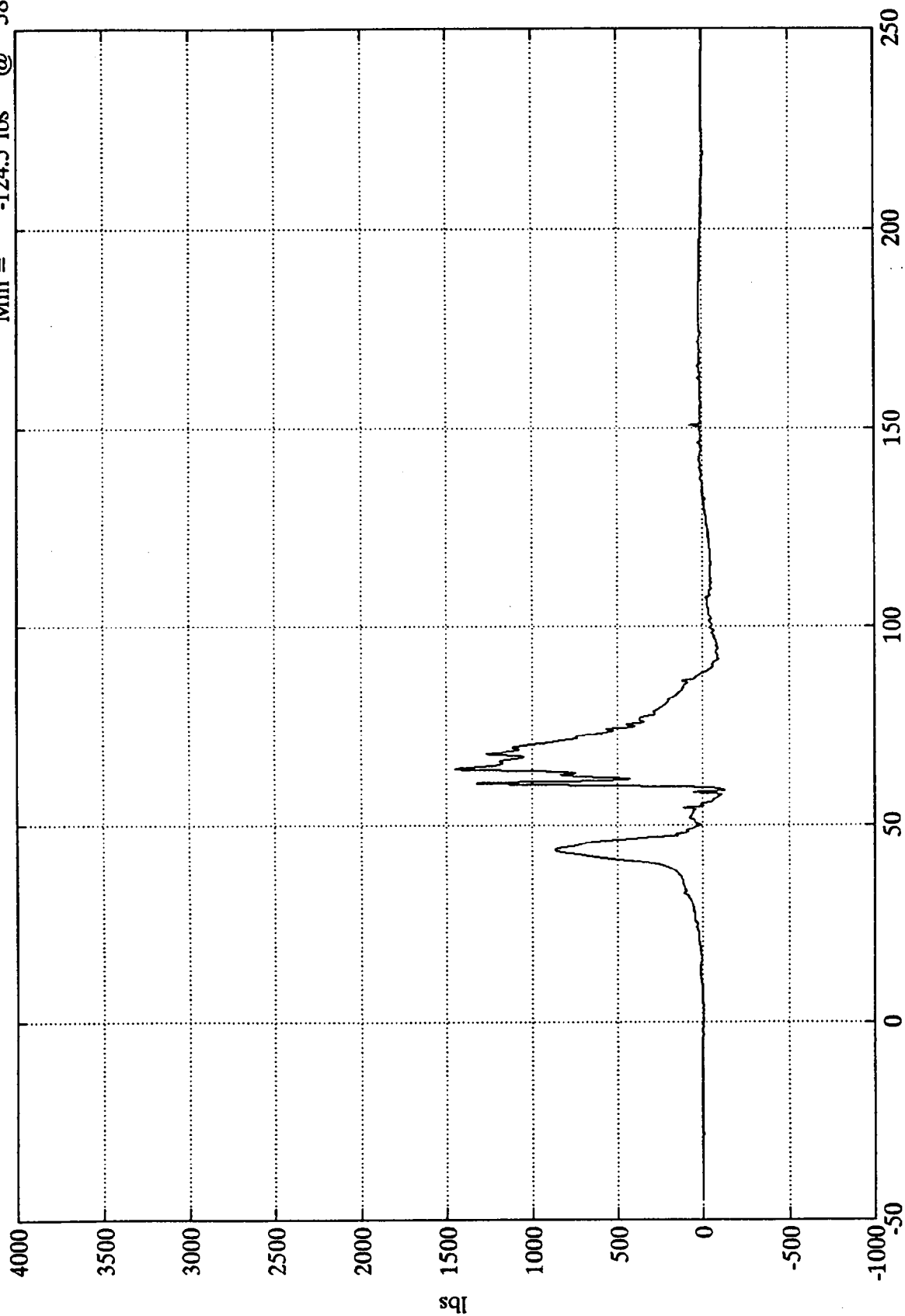


SAE Filter Class 600

Test 1043

Pos. 1 Right Femur

Max = 1451.3 lbs @ 64.08 msec
Min = -124.5 lbs @ 58.91 msec

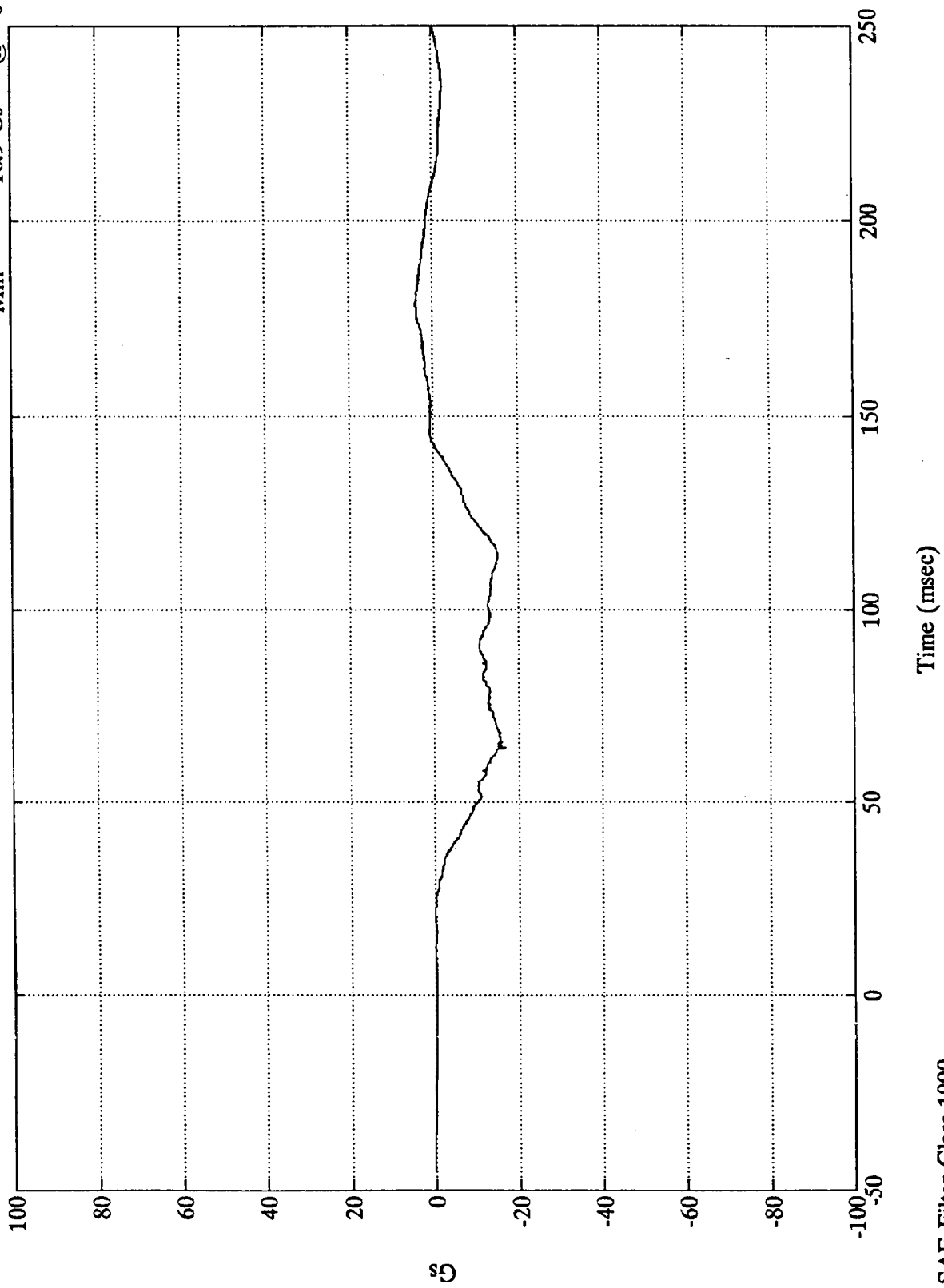


Time (msec)

SAE Filter Class 600

Test 1043

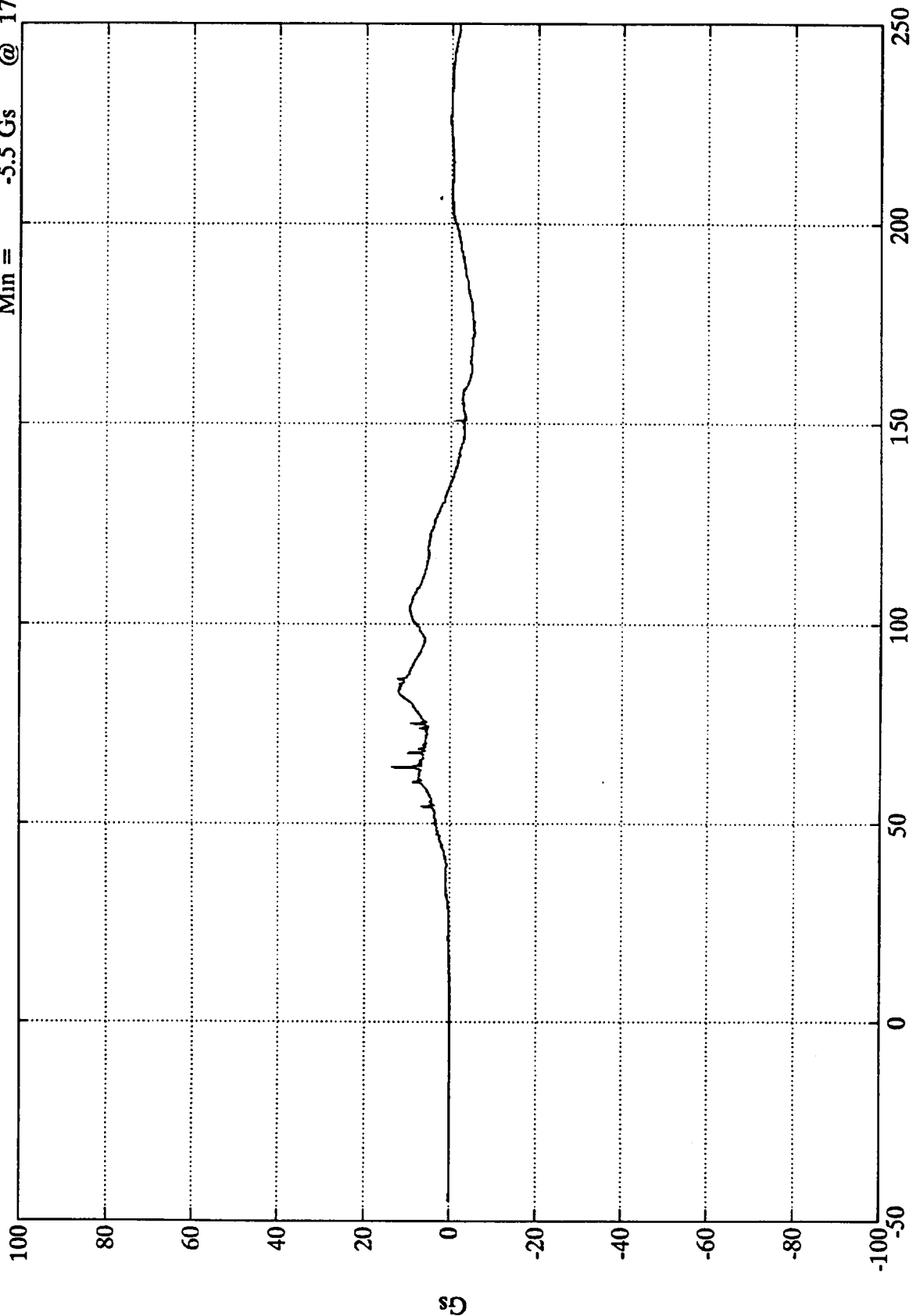
Pos. 2 Head X
Max = 4.1 Gs @ 178.55 msec
Min = -16.9 Gs @ 64.08 msec



SAE Filter Class 1000

Test 1043

Pos. 2 Head Y
Max = 13.5 Gs @ 64.08 msec
Min = -5.5 Gs @ 175.31 msec



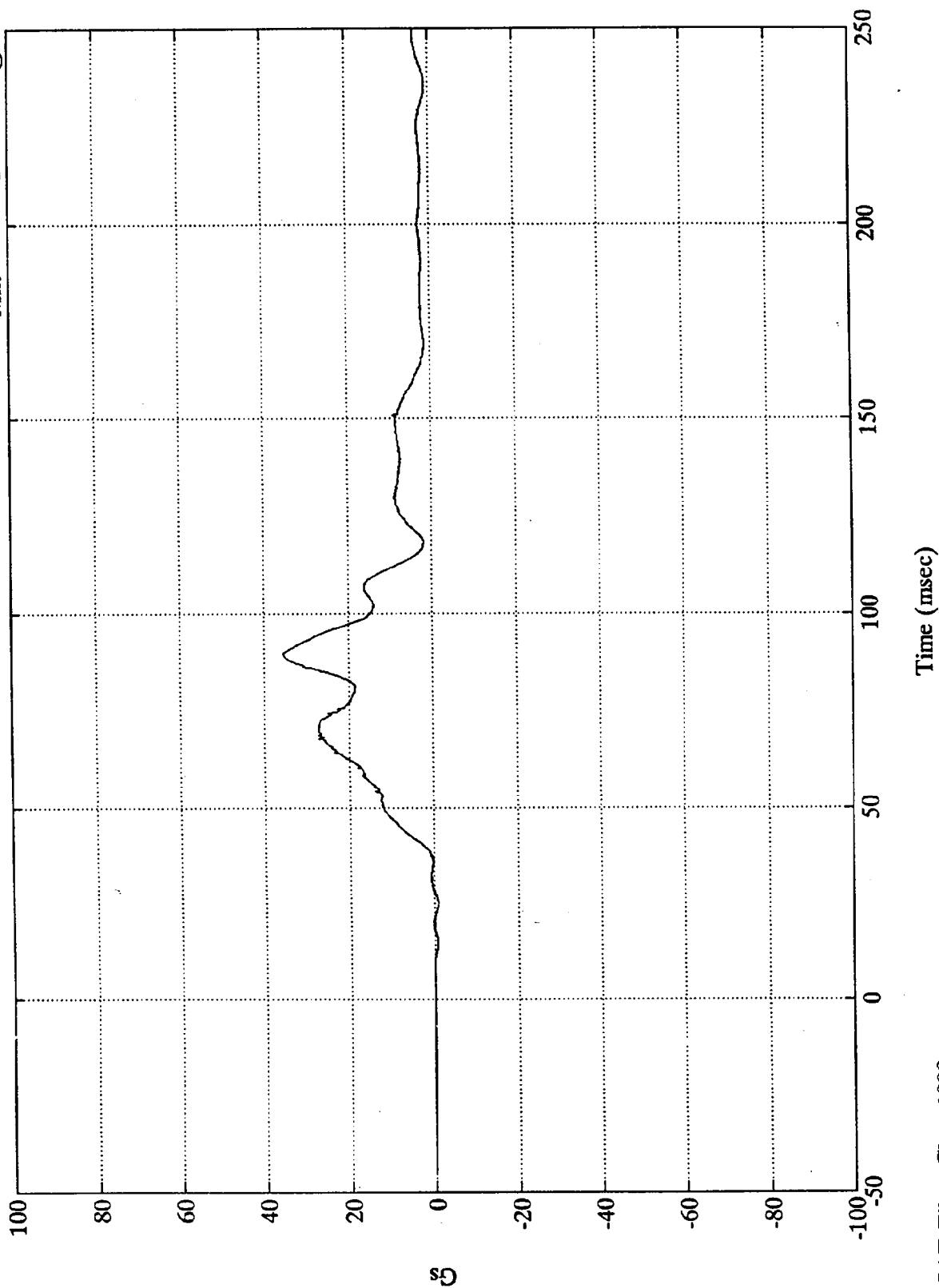
Time (msec)

SAE Filter Class 1000

Test 1043

Max = 35.5 Gs @ 89.76 msec
Min = -1.1 Gs @ 254.88 msec

Pos. 2 Head Z

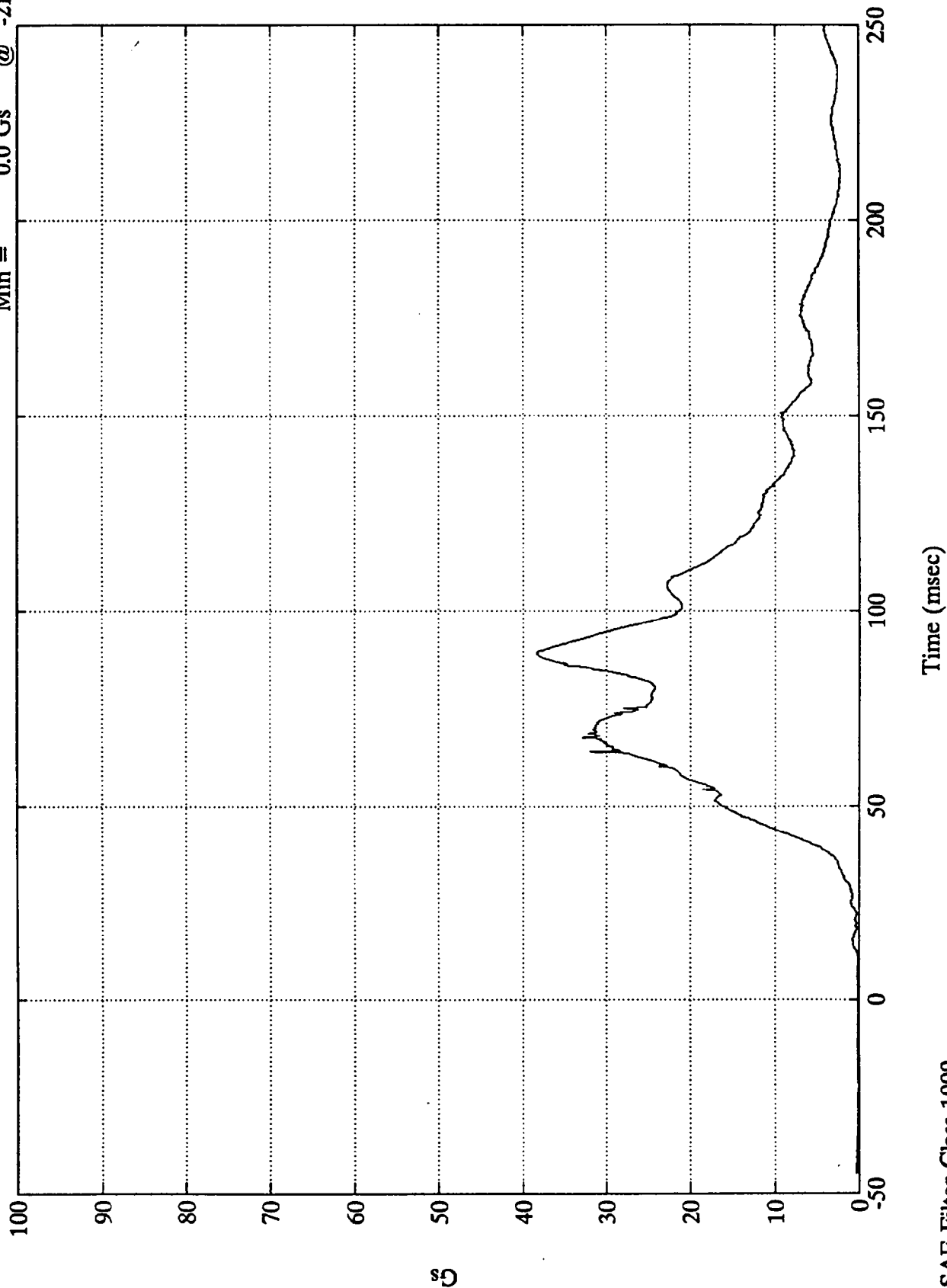


SAE Filter Class 1000

Test 1043

Pos. 2 Head Resultant

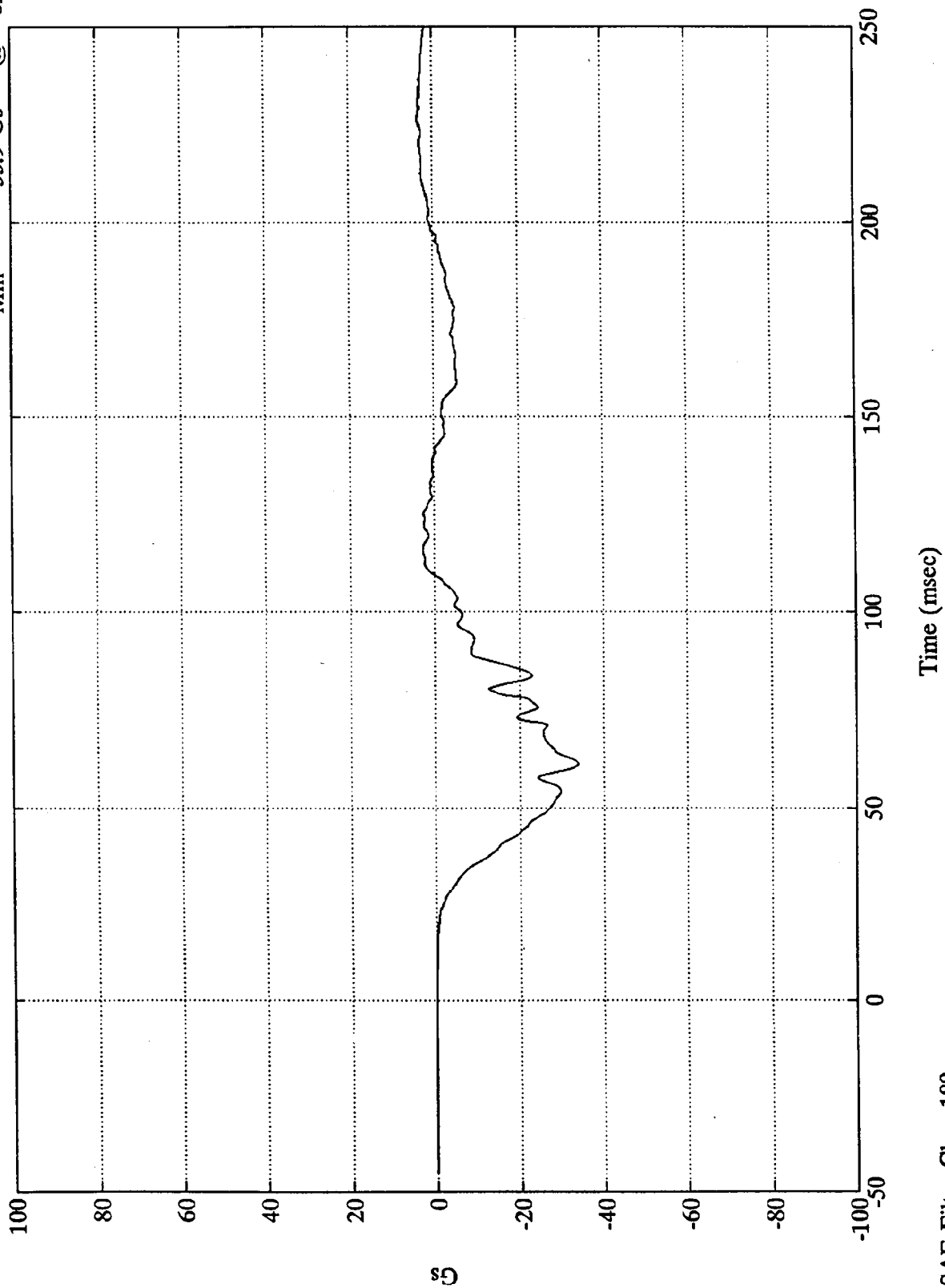
Max = 38.2 Gs @ 89.40 msec
Min = 0.0 Gs @ -21.72 msec



SAE Filter Class 1000

Test 1043

Pos. 2 Chest X
Max = 3.5 Gs @ 226.19 msec
Min = -33.9 Gs @ 61.44 msec



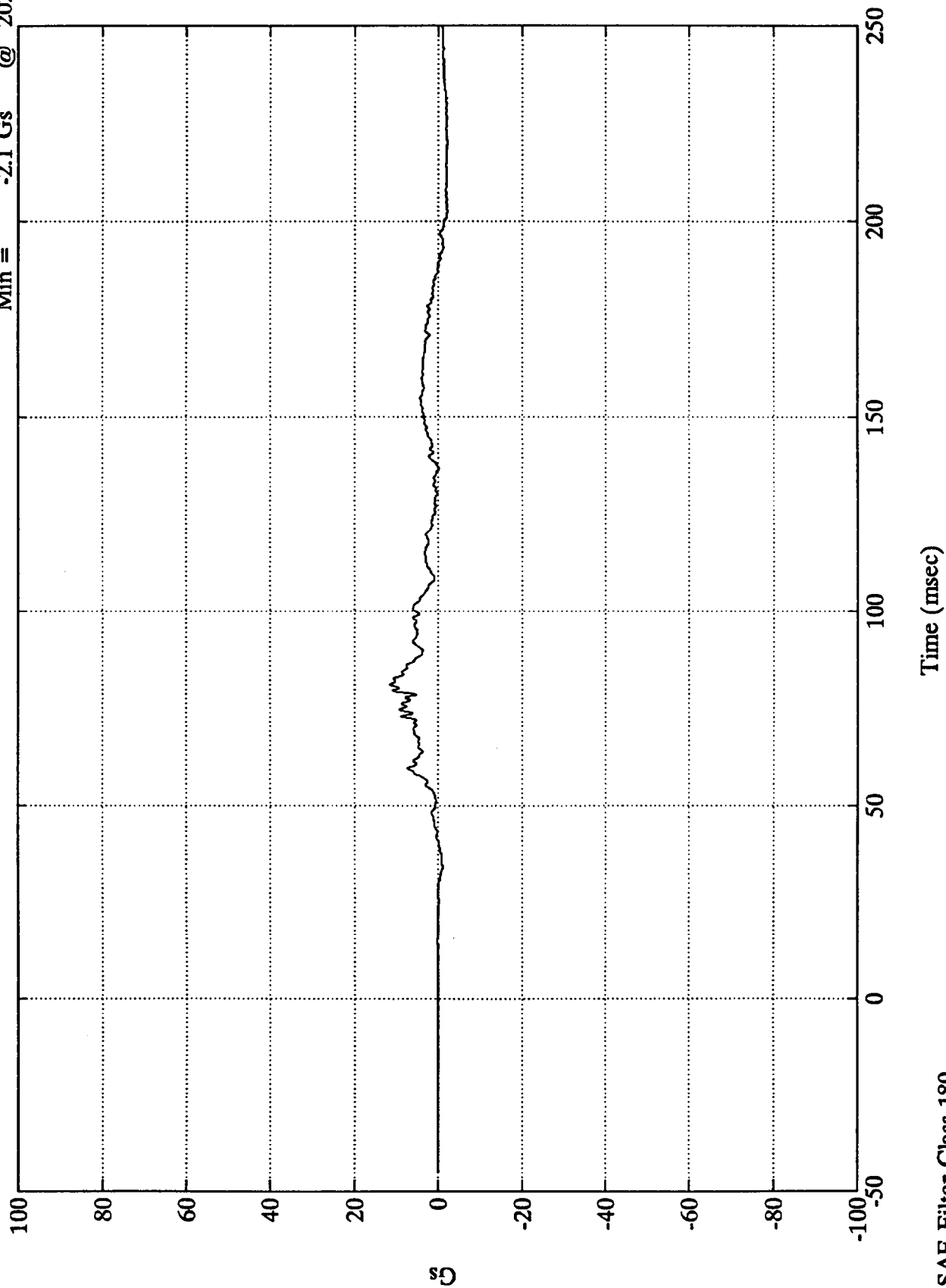
SAE Filter Class 180

Test 1043

Pos. 2 Chest Y

Max = 11.5 Gs
Min = -2.1 Gs

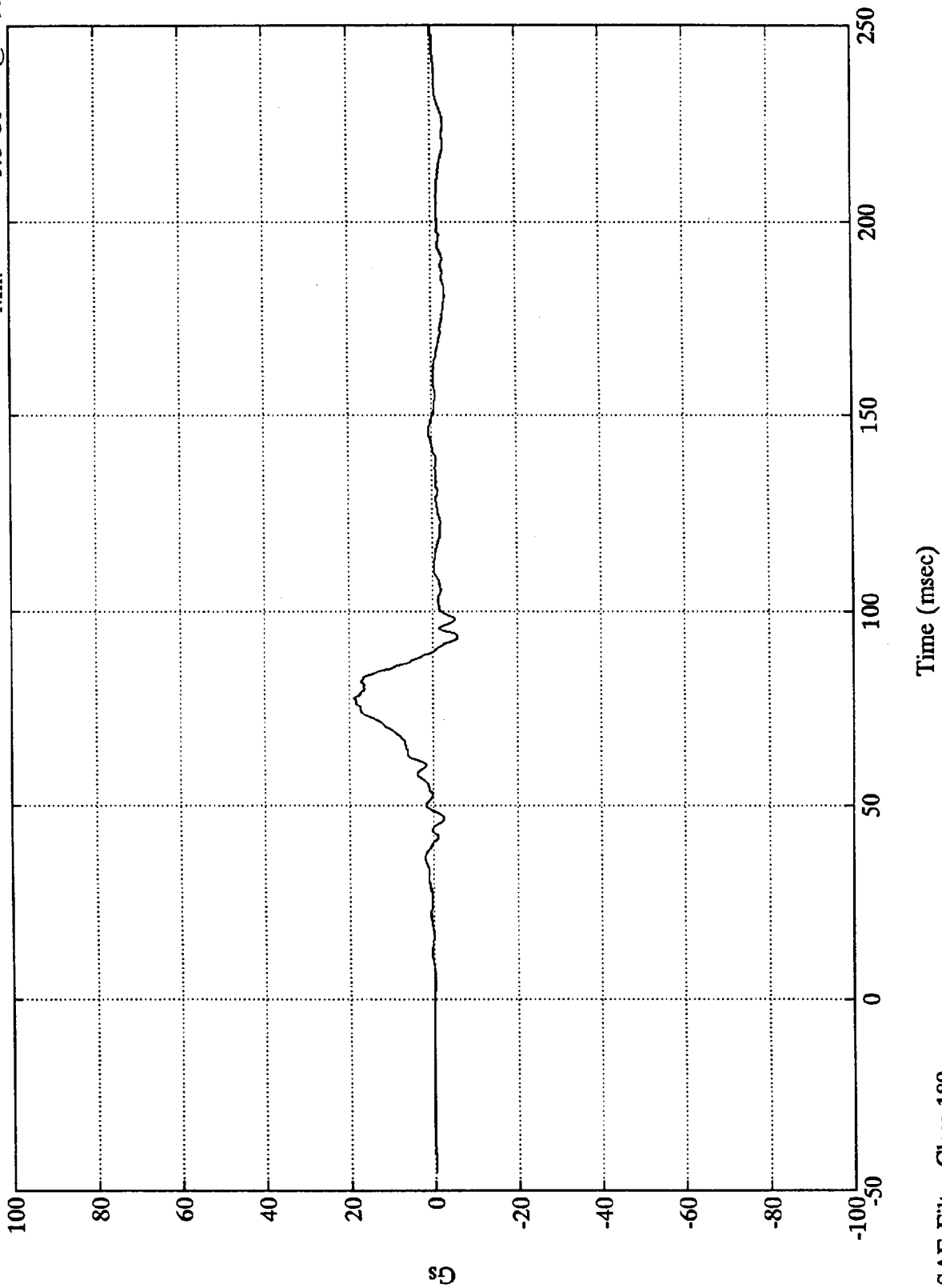
@ 81.23 msec
@ 202.44 msec



SAE Filter Class 180

Test 1043

Pos. 2 Chest Z Max = 18.7 Gs @ 77.51 msec
Min = -5.8 Gs @ 93.72 msec

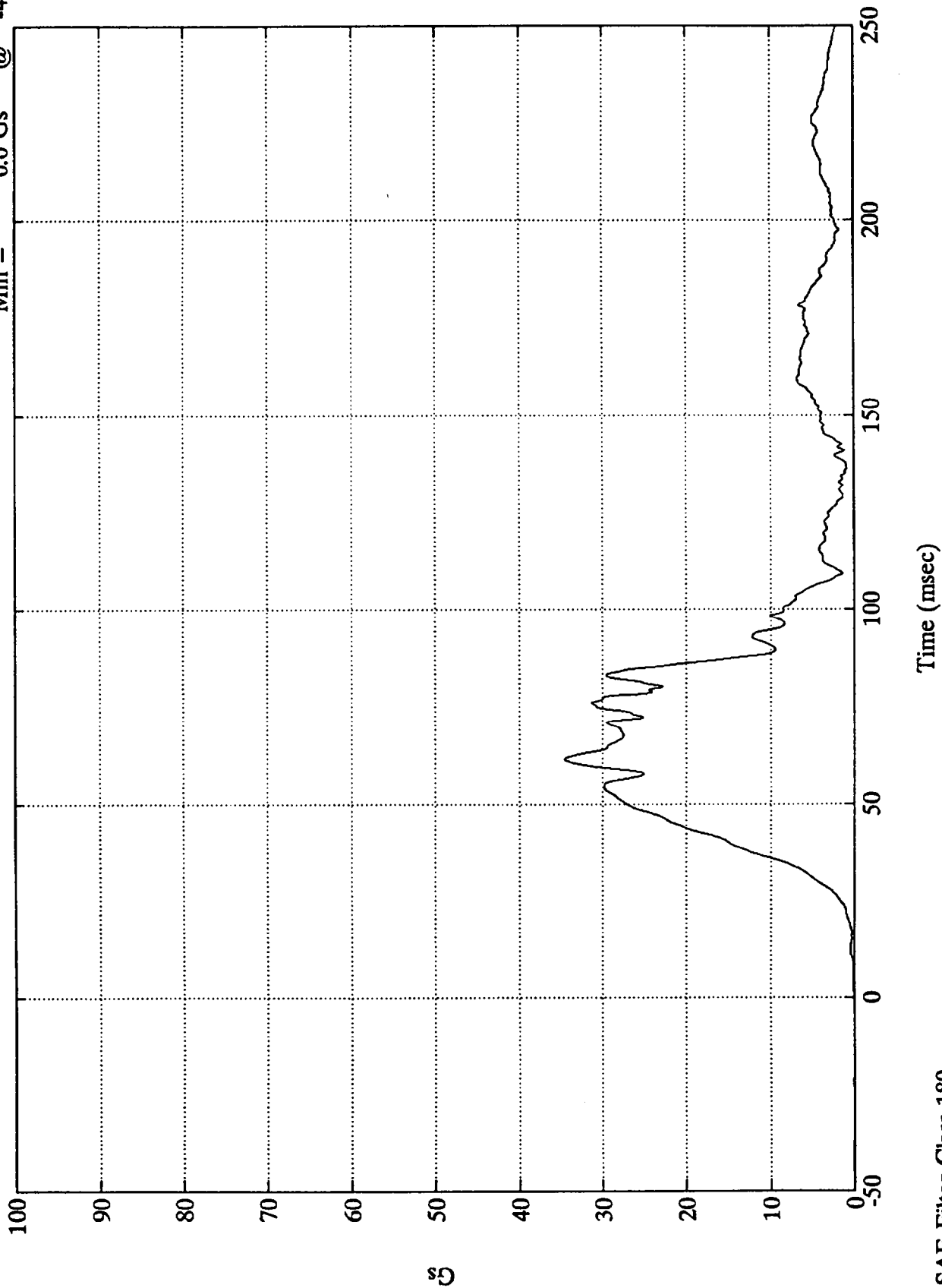


SAE Filter Class 180

Max = 61.56 msec
Min = -4.32 msec

34.5 Gs @
0.0 Gs @

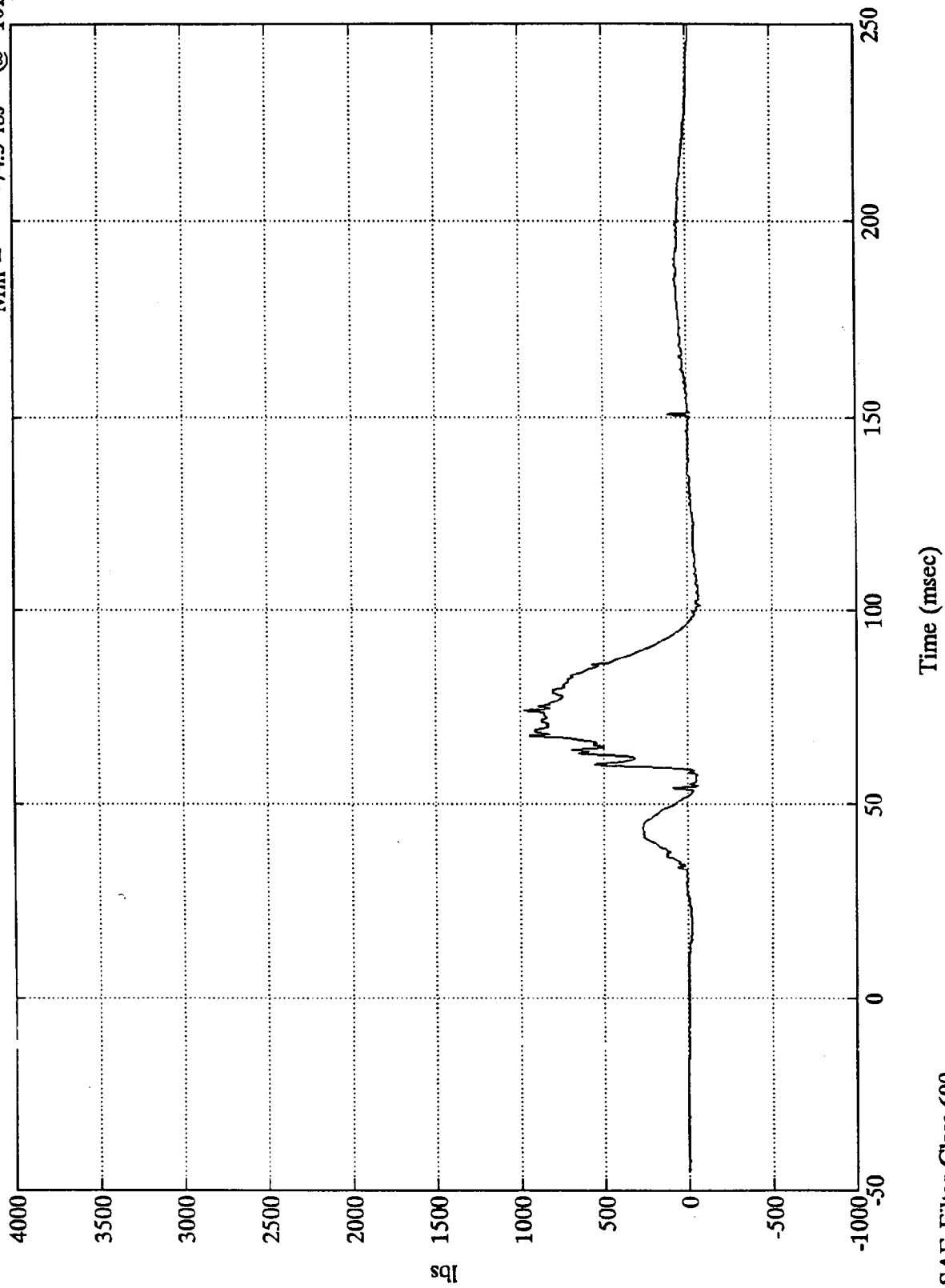
Pos. 2 Chest Resultant



SAE Filter Class 180

Test 1043

Pos. 2 Left Femur
Max = 973.2 lbs @ 74.04 msec
Min = -74.5 lbs @ 101.52 msec

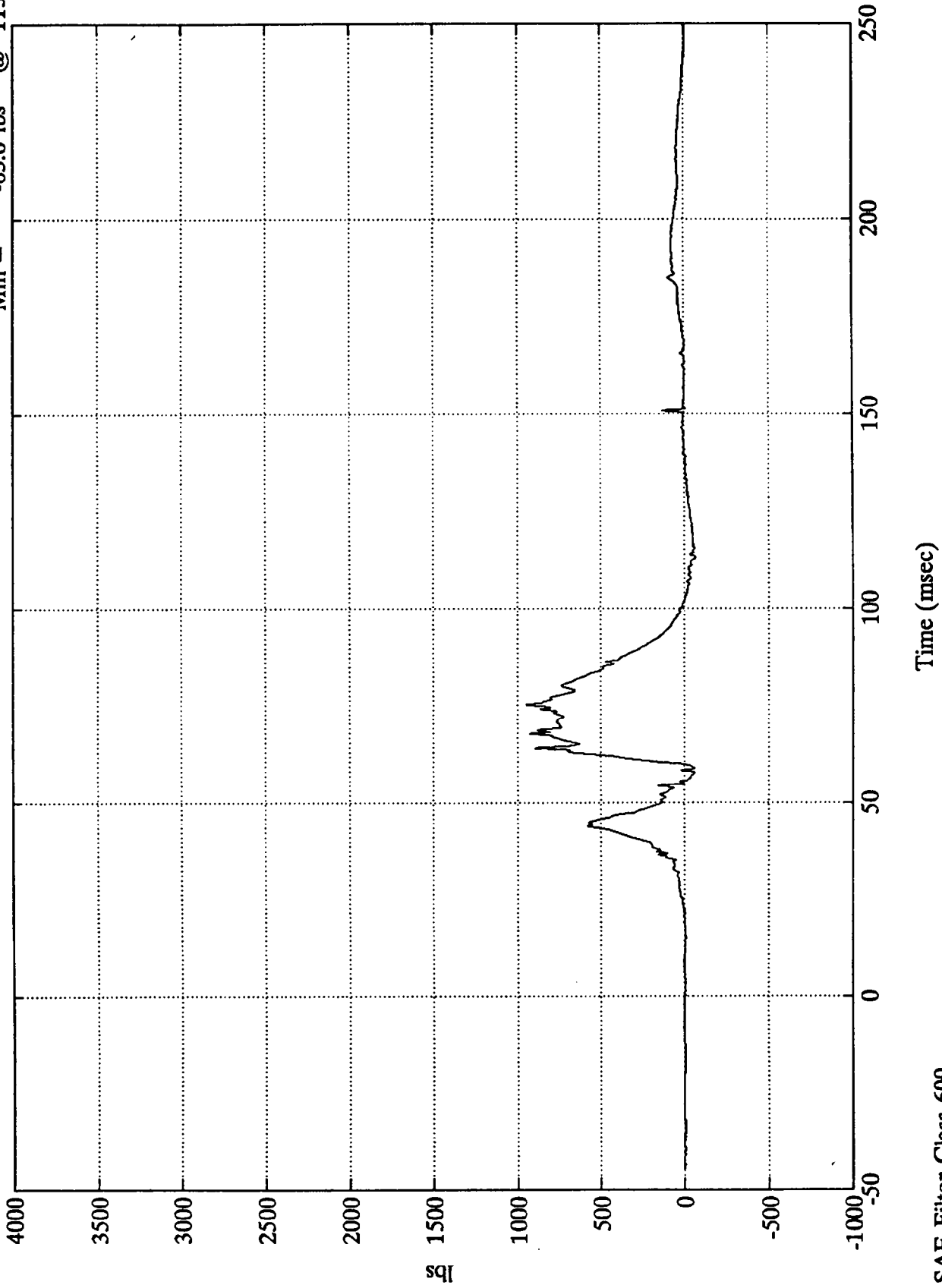


SAE Filter Class 600

Test 1043

Pos. 2 Right Femur

Max = 944.3 lbs @ 75.23 msec
Min = -63.6 lbs @ 113.28 msec



SAE Filter Class 600

Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

3. If you do not see or smell fuel, push the red reset button on the fuel pump shut off switch down.
4. Turn the ignition key ON for a few seconds, then turn it OFF.
5. Check under the vehicle again for leaking fuel. If you see or smell fuel, do not start your vehicle again. If there is no fuel, you can start your vehicle.

Using Safety Restraints Properly

Safety Belts

The use of safety belts helps to protect 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.

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.

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.

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.

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 your being thrown from the vehicle in a collision.

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.

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.

Safety Belt Maintenance

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

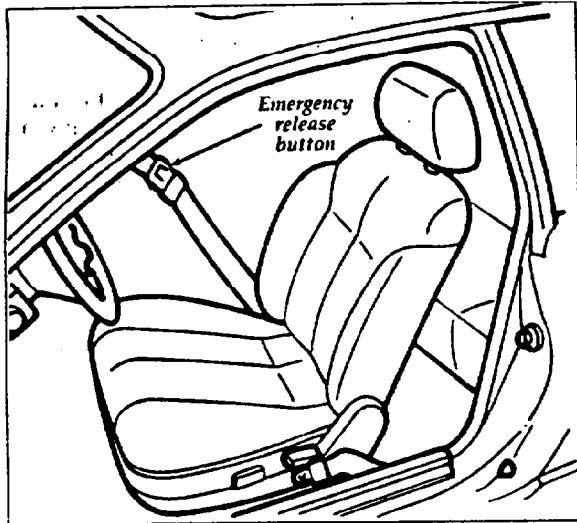
Warning: All safety belt assemblies including retractors and attaching hardware should be inspected after any collision. Ford recommends that all safety belt assemblies used during a collision be replaced unless the collision was minor and a qualified technician finds that the belts do not show damage 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.

Motorized Passive Shoulder Belt Restraint System (Front Seat)

The passive shoulder belt restraint system operates electrically. The automatic shoulder belt, the manual lap belt, and knee bolsters, provide restraint for the front seat occupants.

Warning: The lap safety belt is to be manually buckled by the driver/passenger and should always be worn with the shoulder belt. Be sure the lap belt is on your hips as low as possible.

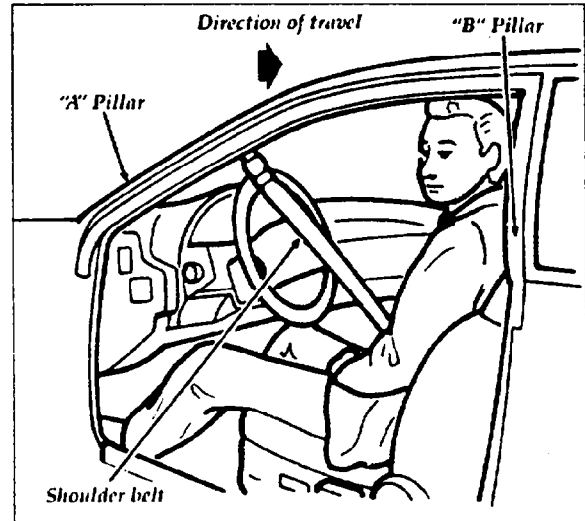
After entering the vehicle and closing the door, check to ensure the shoulder belt is latched to the emergency release buckle. The shoulder belt should remain latched to the release buckle at all times except for emergency situations.



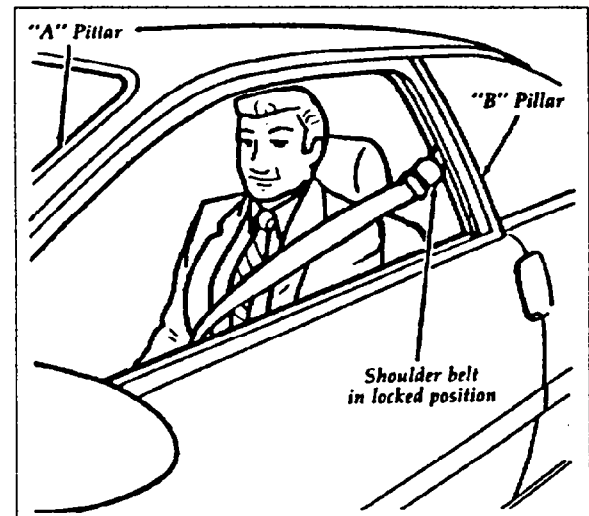
Fastening the shoulder belt to the emergency release buckle

To latch the shoulder belt to the emergency release buckle at the "A" pillar, pull the shoulder belt from the retractor between the seat and console, and buckle it to the emergency release buckle.

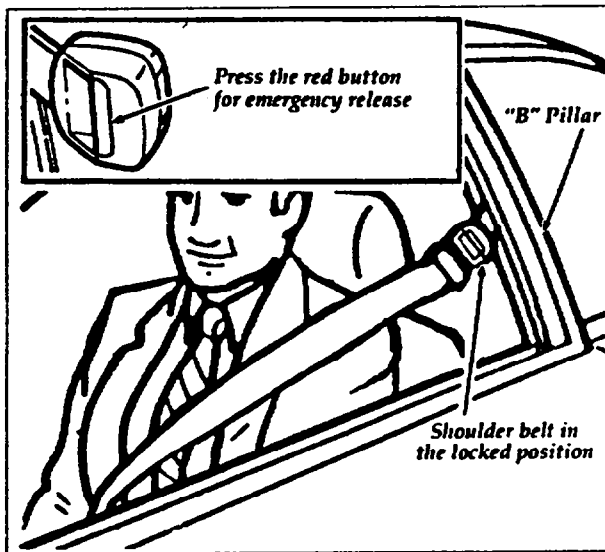
Close your door. Insert the ignition key and turn it to the ON position. A motor will slide the shoulder belt along its track starting at the front "A" pillar and moving rearward to its locked position on the "B" pillar.



Shoulder belt movement (when door is closed)



Shoulder belt in locked position



If either driver or passenger shoulder belt or driver's lap belt is not buckled, when the ignition switch is turned to the ON position, the reminder buzzer will sound for 4 to 8 seconds, and the warning lamp will illuminate until both shoulder belts are buckled.

When the ignition switch is in the ON position and the shoulder belt is moving, the warning lamp will illuminate. When the shoulder belt comes to rest (in the rear position), the warning lamp will go out.

The shoulder belt will automatically adjust itself to allow for comfortable wear and freedom of movement by the occupant. It will lock tight only on extremely hard braking, or hard cornering or impacts of approximately 5 mph (8 km/h) or more.

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 chance and/or severity of injury in an accident. When the ignition is in any position and the door is opened, the shoulder belt will move forward to the "A" pillar. This will allow ample room for exit from the vehicle by the driver or passenger. **DO NOT** use the belt as an assist handle when entering or exiting the vehicle.

To reduce the risk of sliding under the lap belt during a collision, always drive and ride with seat backs in the upright position. If the lap belt slips above the hip-bone during a collision and applies force directly to the soft areas of the abdomen, it will increase the risk of serious injury. The seat backs and the belts provide best restraint when the seat is upright, the occupant is sitting upright in the seat (not slouching), the lap belt is snug and low on the hips, the shoulder belt is snug against the chest and the knees are straight forward.

Children should always ride with the seat 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.

Be sure to keep the sun visors away from the side windows when the shoulder belts move along their tracks, to prevent possible damage to the sun visors or shoulder belt system.

Important For Your Safety

Before driving the vehicle, read the label on the back of the sun visor.

IMPORTANT

Before driving, read the label on the other side of the visor.

IMPORTANT FOR YOUR SAFETY

Following these instructions will greatly improve your chances of avoiding severe injury in case of an accident:

- Always wear your lap belt when the car is moving.
- Be sure the shoulder belt buckle is engaged.
- If the symbol () stays lit for more than 8 seconds, consult your Owner's Guide before driving this vehicle.

See section entitled "Occupant Restraints" in your Owner's Guide for more information.

Figure 5

Labels located on the driver's sun visor

IMPORTANT

Before riding, read the label on the other side of the visor.

IMPORTANT FOR YOUR SAFETY

Following these instructions will greatly improve your chances of avoiding severe injury in case of an accident:

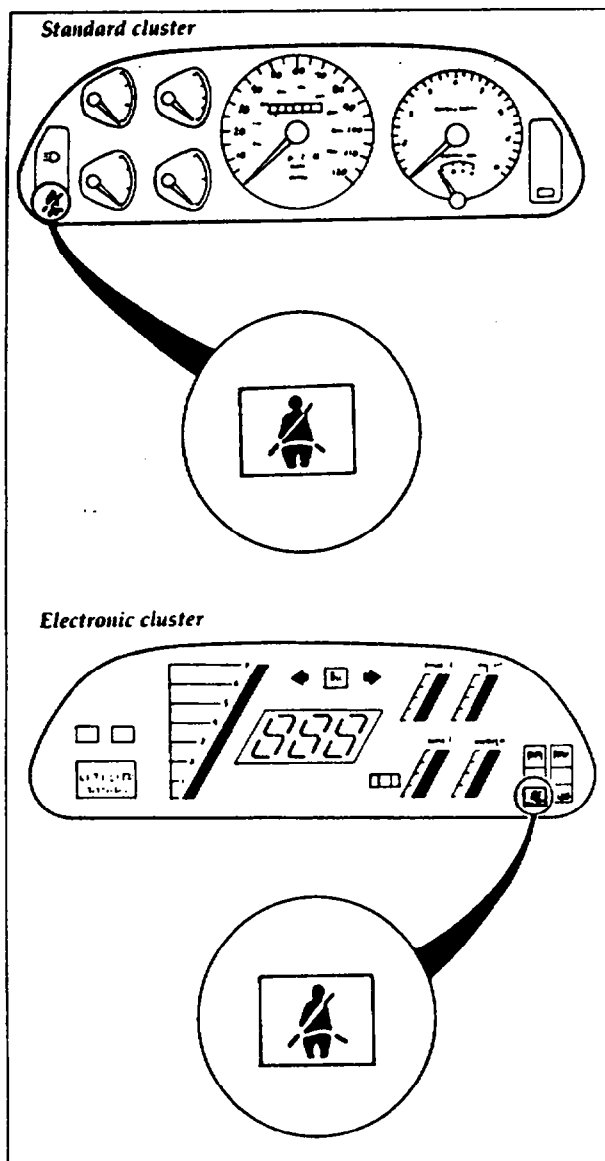
- Be sure the shoulder belt buckle is engaged.
- Always wear your lap belt when the car is moving. If a lap belt cannot be worn, you should move the seat forward so your knees are as close to the instrument panel as possible.

Before using CHILD SEAT in front, read label on passenger lap belt.

See section entitled "Occupant Restraints" in your Owner's Guide for more information.

Figure 6

Labels located on the passenger's sun visor



Indicator light locations

Warning: The vehicle should not be driven unless the doors are fully closed and the shoulder belts are in the locked position on the "B" pillar.

In the event of an accident, the shoulder belt retractor is designed to lock in order to protect the occupants and may remain locked after the accident. If this occurs, unbuckle the shoulder belt at the "B" pillar by pressing the RED emergency release button on the buckle for the occupant to exit the vehicle.

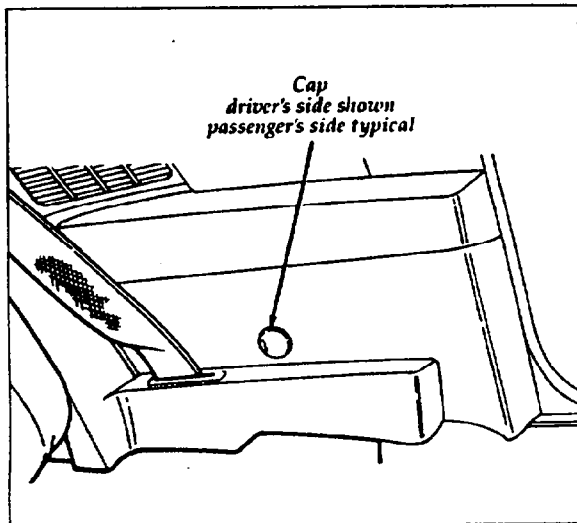
After an accident, refer to seat belt maintenance in this section.

Manual Override System — Important For Your Safety

If the shoulder belt does not move rearward, or stops before reaching the "B" pillar position, perform the following steps before driving the vehicle:

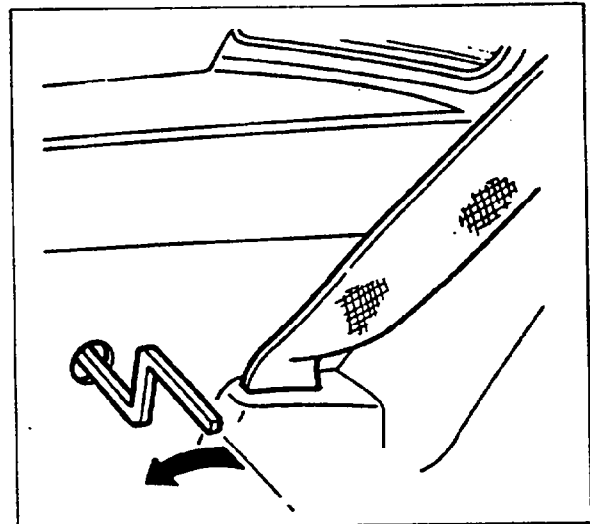
1. Turn the ignition key to the OFF position.
2. Open and close door(s). Make sure all doors are fully closed.
3. If the shoulder belt will not move forward to the "A" pillar position, press the RED emergency release button on the buckle to exit the vehicle. Then check to see if the automatic fuel pump shutoff switch has been tripped. Refer to *Fuel Pump Shut-Off Switch* in the Index.
4. Turn the ignition key to the ON position.
5. If the belt still does not move to the "B" pillar, turn the ignition key to the OFF position. Unbuckle the shoulder belt by pressing the red emergency release button on the buckle.

6. Using a screwdriver, remove cap located in the rear trim panel.



Shoulder belt override location

7. Fit the emergency handle, located in the glove compartment, into the internal hex-nut.



Emergency handle installation

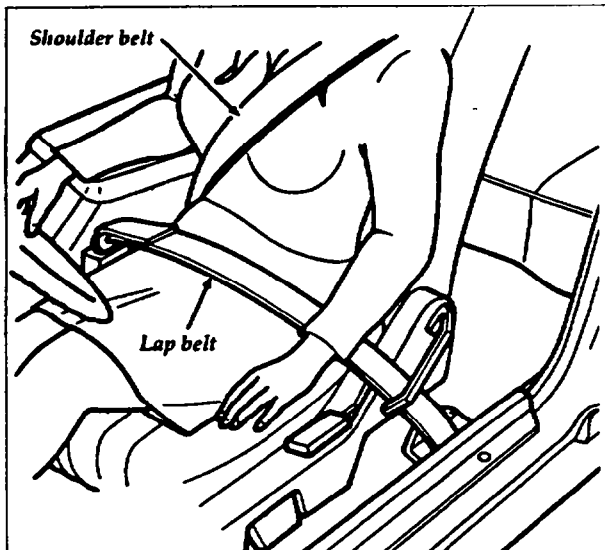
8. Turn the emergency handle to move the buckle rearward (for the left side turn clockwise; for the right side, turn counterclockwise). Move the buckle rearward, to its locked position in the "B" pillar until an audible click is heard.
9. After sitting on the seat, insert the tongue of the shoulder belt into the buckle until an audible click is heard.

NOTE: The fuel pump shutoff switch shuts off power to the fuel pump and the passive restraint system.

Warning: If the fuel pump shut-off switch is not the cause for the shoulder belt not moving, have the system serviced by a qualified technician as soon as possible.

Manual Front Lap Belts

After the shoulder belt has moved rearward, pull the lap belt out of the retractor with a steady motion. Route the lap belt forward of the shoulder belt. Insert the tongue into the buckle until you hear a snap and feel the latch engage. Ensure the lap belt is not trapped under the shoulder belt.



The lap belt and shoulder belt engaged

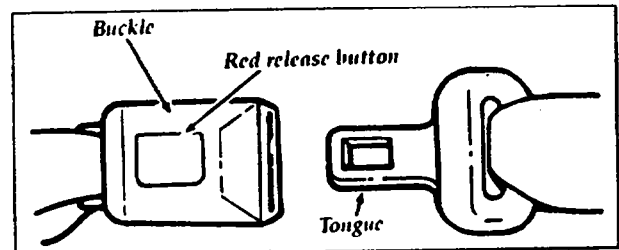
As a reminder to the driver to fasten the lap belt, the warning lamp will illuminate for about four to eight seconds each time the ignition switch is turned to the ON position.

If the driver's lap belt is not connected, the warning buzzer will sound for four (4) to eight (8) seconds, when the ignition is turned to the ON position.

Warning: Be sure the lap belt is fitted snugly and as low as possible around the hips, not around the waist. Failure to do so may increase the chance of injury in the event of a collision.

To unfasten the belt:

1. Push the red release button on end of the buckle. This allows the tongue to unlatch from the buckle.



Unfastening safety 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.

To Untwist or Unjam a Safety Belt:

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

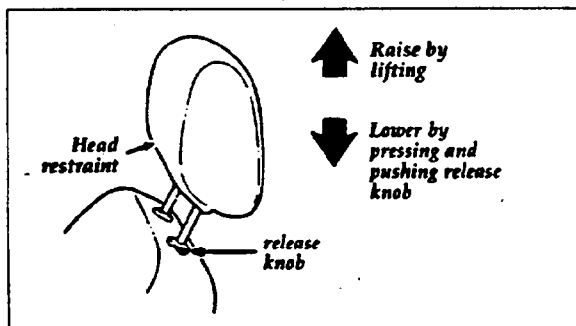
1. Work the belt slowly out of its retractor as far as it will go and untwist the belt or remove the object that is jamming the belt. Let the belt retract.

2. Then, pull the belt out and let it retract several times to make sure that the belt works properly.

Head Restraints

Head restraints are intended to help protect your head and neck in a collision if you use them properly.

Warning: A head restraint helps protect you best if you position it behind your head and not behind your neck.



Standard Head Restraint

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.

Make sure children sit where they can be properly restrained. If they are not restrained, their chance of being injured in a collision greatly increases.

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.

Safety belts and seats can become hot in a vehicle that has been closed up in sunny weather; they could burn a small child. Check seat covers and buckles before you place a child anywhere near them.

Warning: Never leave a child unattended in your vehicle. Always remove the key from the ignition and take it with you.

Safety Belts for Children

Children who are too large for child safety seats should always wear safety belts. (See instructions with your child seat, or contact its manufacturer, to determine maximum size of child.)

Warning: If safety belts are not properly worn and adjusted as described below, the risk of serious injury to the child in a collision will be much greater.

If the shoulder belt portion of one of the lap and shoulder belts can be positioned so that it does not cross or rest in front of the child's face or neck, the child should wear the lap and shoulder belt. Moving the child closer to the center of the vehicle may help provide a good shoulder belt fit.

Lap belts and the lap belt portion of lap and shoulder belts should always be worn snugly and below the hips, touching the child's thighs.

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.

Safety Seats for Children

If a child requires a safety seat, use a seat that is appropriate for the size of the child.

Warning: All safety seats for children are designed to be secured to the seat of your vehicle by lap belts or by the lap portion of a lap and shoulder belt. If you do not properly secure the safety seat to the vehicle, the risk is greater that a child, occupying the seat during a collision or sudden stop, will be injured. An unsecured safety seat could also injure other passengers in the vehicle.

Warning: Carefully follow all of the manufacturer's instructions that come with the safety seat that you put in your vehicle. Make sure that the shoulder belt (if provided at the seating position where the safety seat is being used) does not cross or rest in front of the child's face or neck. If you do not install and use the safety seat properly, the child may be injured in a sudden stop or collision.

Warning: If a child safety seat is positioned in the right front passenger seat of a car equipped with motorized front shoulder belts, the child seat must be secured with the lap belt which is also provided in this seating position. Do not use the motorized shoulder belt. Use the lap belt to secure the child seat.

Warning: Once you have attached the safety seat, test the seat before you place the child in it. Tilt the seat from side to side. Also try to tug the seat forward. Check to see if the belt holds the seat in place. If the lap belt is too loose, tighten it by moving the locking clip (see Locking Clip Installation), or put the safety seat in another seat and test it again. If the safety seat is not anchored properly, the risk of a child being injured in a collision or sudden stop greatly increases. Reclining seat backs should be in the most upright position for use with child safety seats.

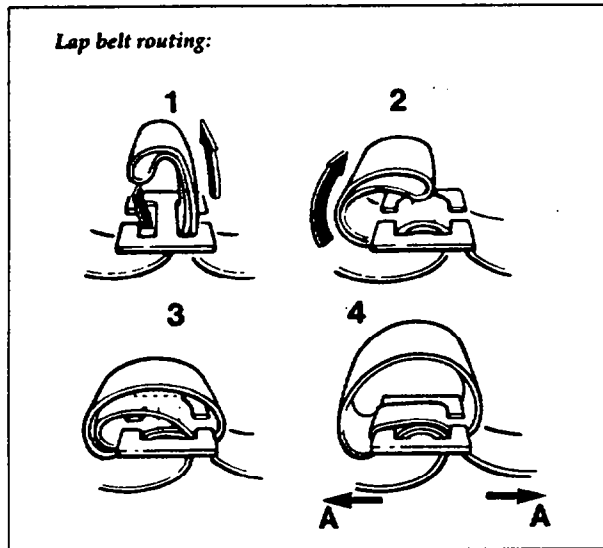
Installation on the front seat

The automatic shoulder belt cannot be used to secure a child restraint system.

To install a child safety seat, a safety belt locking clip is required. Secure the child safety seat with the lap belt per the instructions provided with the child safety seat.

To prevent looseness of the lap belt, use a genuine Ford locking clip included with your new car. Replacements are available through your local Ford dealer.

1. Disconnect the shoulder belt from the emergency release buckle by pressing the red emergency release button.
2. Slide the seat to the rearmost position.
3. Fasten the child safety seat with the lap belt.
4. Pull the lap belt out fully from the retractor.
5. At any convenient point in the lap belt, remove any slack from the lap belt with the locking clip as shown in the illustration. Make the outer loop as big as possible to remove any slack and tighten the locking clip on the belt webbing.
6. After installing the locking clip pull on the belt in the direction marked A in the illustration to make sure that it does not slip.
7. Slide the seat forward to remove any remaining slack.



How to install the locking clip

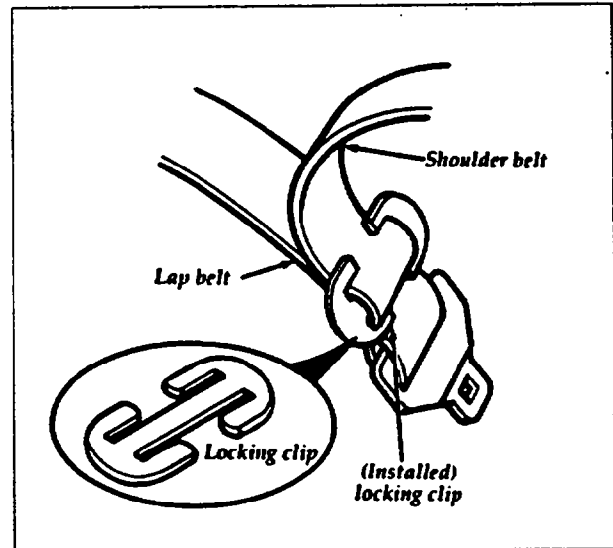
Installation on rear seat

To install a child safety seat, a safety locking clip is required. Secure the safety seat with the lap portion of the safety belt.

To prevent looseness in the safety belt, use a genuine Ford Locking Clip.

1. Fasten the child safety seat with the lap and shoulder belts as shown in the instructions provided with the safety seat.
2. Tighten the lap belt by pulling up on the shoulder belt.
3. To install the locking clip, insert the lap and shoulder webbing through the recesses of the locking clip near the seat belt latch as shown in the illustration.

When the child safety seat is not installed, the locking clip should be stored in the glove box to prevent it from being lost.



Locking Clip Installed

Attaching Safety Seats with Tether Straps

Some manufacturers make safety seats with a tether strap that goes over the back of the vehicle seat and attaches to an anchoring point.

You can attach the tether anchor bracket to one of the two 0.3 inch (8 mm) weld nuts on the rear of the cargo area below the opening for the liftgate.

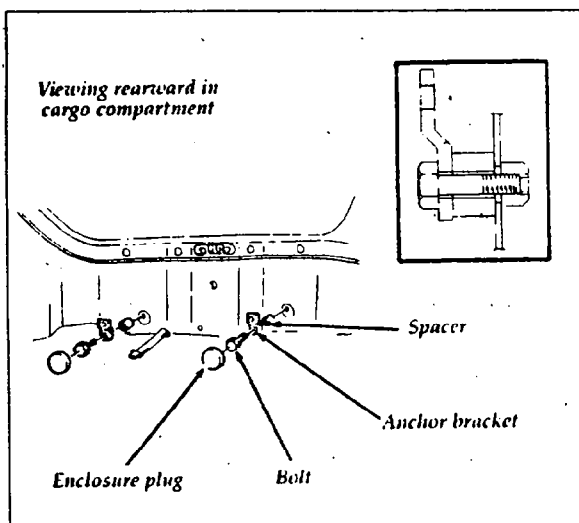
Tether Anchor hardware

A tether safety seat should not be installed in the front seat because the tether cannot be properly secured to the rear belts of your car.

All vehicles built for sale in Canada include a tether anchor hardware kit for use with Canadian child safety seats.

Installing the Anchor Bracket

1. Open the liftgate and take out the cargo cover (if equipped).
2. Fold back the trunk carpet and remove the enclosure plugs.
3. Next, insert a 0.4 inch (10mm) spacer between the anchor bracket and the rear wall panel of cargo area. Next, install the 8mm retaining bolt, making sure at least five full threads are engaged.



Installing the Anchor Bracket

Warning: The threaded holes have an 8 mm metric locking thread. A wrench will be needed to screw an 8 mm bolt into the locking thread. Some child restraints supply a non-metric bolt with a different thread. Do not use a non-metric bolt as it may be impossible to screw it all the way into the hole, resulting in inadequate retention of the child restraint. If you need a metric bolt or assistance, any Ford or Lincoln-Mercury dealer will be happy to assist you.

Warning: If the anchor bolt(s) are ever removed, the hole(s) in the floor must be sealed to prevent the possibility of exhaust fumes entering the passenger compartment.