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

ISUZU MOTORS LIMITED, JAPAN
1991 ISUZU STYLUS
4-DOOR SEDAN

NHTSA NUMBER: CM5704

CALSPAN TEST NUMBER: 7920-2

CALSPAN CORPORATION
ADVANCED TECHNOLOGY CENTER
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July 17, 1991



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.
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Washington, DC 20590

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16. Abstract A 30 mph vehicle safety compliance test was conducted on a 1991 Isuzu Stylus 4-Door Sedan. This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on July 17, 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 29.4 mph. The ambient temperature at the impact face was 83°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 a driver side air bag and a passenger 3-point manual belt safety restraint system. The driver side 3-point manual belt was not used for the 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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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	PURPOSE AND TEST PROCEDURE	1-1
2	SUMMARY OF FRONTAL BARRIER IMPACT TEST	2-1
3	OCCUPANT AND VEHICLE INFORMATION	3-1
4	SUMMARY OF RESULTS FOR: FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219 (Partial), "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"	4-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	VEHICLE AND DUMMY RESPONSE DATA	B-1
APPENDIX C	VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS	C-1

LIST OF FIGURES

<u>Figure No.</u>		<u>Page No.</u>
1	TEST VEHICLE INFORMATION	3-2
2	PART 572 DUMMY IN-VEHICLE POSITION	3-3
3	OCCUPANT CLEARANCE DIMENSIONS	3-4
4	DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSEMBLY REFERENCE DIMENSIONS	3-5
5	SEAT BELT POSITIONING DATA	3-6
6	VEHICLE ACCELEROMETER LOCATIONS	3-7
7	CAMERA POSITIONS FOR FRONTAL IMPACTS	3-9
8	VEHICLE TARGET LOCATIONS	3-11
9	TEST VEHICLE MEASUREMENTS	3-12
10	FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA SHEET	4-12
11	FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA SHEET	4-13

LIST OF TABLES

<u>Table No.</u>		<u>Page No.</u>
1	Crash Test Summary	2-2
2	General Test and Vehicle Parameter Data	2-3
3	Post-Impact Data	2-5
4	Vehicle Accelerometer Locations and Data Summary	3-8
5	High Speed Camera Locations	3-10
6	Vehicle Measurements	3-13
7	Dummy Injury Criteria Values	4-2
8	FMVSS No. 208 - Seat Belt Warning System Check	4-3
9	FMVSS No. 208 - Labeling and Driver's Manual Information	4-4
10	FMVSS No. 208 - Readiness Indicator	4-5
11	FMVSS No. 208 - Comfort and Convenience Test Summary	4-6
12	FMVSS No. 301 - "Fuel System Integrity" Post-Impact Test Data	4-14
13	FMVSS No. 301 - Static Rollover Data Sheet	4-15
14	Test Vehicle Noncompliance Notice	4-19

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 Isuzu Stylus 4-Door Sedan, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS No. 212, "Windshield Mounting"; FMVSS No. 219 (partial), "Windshield Zone Intrusion"; and FMVSS No. 301, "Fuel System Integrity". This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-208-08, dated September 8, 1989.

Section 2

SUMMARY OF TEST NUMBER CM5704

A frontal barrier was impacted by a 1991 Isuzu Stylus 4-Door Sedan at a velocity of 29.4 mph. The test was performed at the Calspan Corporation Advanced Technology Center on July 17, 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 572E, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and in the right front passenger seating positions according to dummy placement instructions specified in the OVSC Laboratory Test Procedure.

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

The 25 channels of data were recorded on two 14-channel FM tape recorders. Appendix B contains the vehicle and dummy response data traces. Accelerator #6, Left Brake Caliper X, experienced a cut wire approximately 43 milliseconds after impact.

The driver's HIC was 257. The maximum chest deceleration over 3 milliseconds was 43.5 g's with 2.80 inches of deflection. The maximum force on the driver's left femur was 930 pounds and 1177 pounds on the right femur.

The right front passenger's HIC was 622. The maximum chest deceleration over 3 milliseconds was 41.3 g's with 1.75 inches of deflection. Loads were 154 and 390 pounds on the left and right femurs respectively.

Table 1

CRASH TEST SUMMARY

Vehicle NHTSA No.: CM5704 Test Mode: 30 mph Frontal Barrier

Test Date.: July 17, 1991 Time: 13:40 Temperature: 83°F

Vehicle Make/Model/Body Style: 1991 Isuzu Stylus 4-Door Sedan

Vehicle Test Weight: 2650 lbs.

Vehicle/Barrier Impact Angle: 0

Impact Velocity: 29.4 mph

Maximum Static Crush: 16.5 inches

Vehicle Rebound: 16.2 inches

DUMMIES:

	<u>DRIVER</u>	<u>PASSENGER</u>
Type:	<u>Part 572E</u>	<u>Part 572E</u>
Restraint System:	<u>Air Bag</u>	<u>3-Point Manual Restraint System</u>

Number of Data Channels: 25

Number of Cameras: 1 Real Time
1 High Speed

DOOR OPENING DATA:

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

Front Seat(s) Data:

	<u>DRIVER</u>	<u>PASSENGER</u>
Seat Track Failure:	<u>0.0</u>	<u>0.0</u>
	inches of shift	
Seat Back Failure:	<u>None</u>	<u>None</u>

VISIBLE DUMMY CONTACT POINTS:

	<u>DRIVER</u>	<u>PASSENGER</u>
Head:	<u>Center of airbag, top of head with sunvisor</u>	<u>Chin with chest, rear of head with headrest</u>
Abdomen	<u>None</u>	<u>None</u>
Chest	<u>Air bag</u>	<u>None</u>
Knees	<u>Lower Instrument Panel</u>	<u>Glove Box</u>

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1991 Isuzu Stylus 4-Door Sedan
 NHTSA No. CM5704 ; VIN: JABRT5366M7406537 ; Color: White
 Engine Data: 4 cylinders; - CID; - Liters; 1588 cc
 Placement - Longitudinal or In-Line; ☒ Transverse or Lateral
 Transmission Data: 5 speeds; ☒ Manual; - Automatic; - Overdrive
 Final Drive: - Rear Wheel Drive; ☒ Front Wheel Drive; - Four Wheel Drive
 Major Options: - A/C; - Pwr. Strg.; ☒ Pwr. Brakes; - Pwr. Windows
- Power Door Locks
 Date Received: 6-26-91; Odometer Reading 434 miles
 Selling Dealer: Otto Isuzu
 & Address 1730 Central Avenue, Albany, NY 12205

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Isuzu Motors Limited, Japan
 Date of Manufacture: 8/90
 GVWR: 3242 lbs.; GAWR: 1774 lbs. FRONT; 1536 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 30 psi FRONT
30 psi REAR
 Recommended Tire Size: P175/70R13 82S Load Range: -
 Recommended Cold Tire Pressure: 30 psi FRONT; 30 psi REAR
 Size of Tires on Test Vehicle: P175/70R 82S ; Manufacturer: Yokohama
 Vehicle Capacity Data:
 Type of Front Seats: - Bench; ☒ Bucket; - Split Bench
 Number of Occupants: 2 Front; 3 Rear; 5 Total
 Vehicle Capacity Weight (VCW) = 827 lbs.
 No. of Occupants x 150 lbs. = 750 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 77 lbs. (Difference)

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

Right Front = 690 lbs. Right Rear = 410 lbs.
 Left Front = 700 lbs. Left Rear = 450 lbs.
 TOTAL FRONT = 1390 lbs. TOTAL REAR = 860 lbs.
 % of Total Vehicle Weight = 62 % of Total Weight = 48
 TOTAL DELIVERED WEIGHT = 2250 lbs.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 2250 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 77 lbs.
 Weight of 2 P.572 Dummies @ 167 ea. = 334 lbs.
 TARGET TEST WEIGHT = 2661 lbs. (sum)

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

Right Front = 700 lbs. Right Rear = 570 lbs.
 Left Front = 780 lbs. Left Rear = 600 lbs.
 TOTAL FRONT = 1480 lbs. TOTAL REAR = 1170 lbs.
 % of Total Weight = 56 % % of Total Weight = 44 %
 TOTAL TEST WEIGHT = 2650 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 25.3" LF 25.2" RR 25.5" LR 25.2"
 FULLY LOADED: RF 24.2" LF 24.2" RR 23.5" LR 23.3"
 AS TESTED: RF 25.3" LF 25.2" RR 24.5" LR 24.4"
 Vehicle's Wheel Base: 96.5 in.
 Location of Vehicle's C.G.: 42.5 inch from front wheel center

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 12.4 gallons
 Usable Capacity Figure Furnished by COTR = 12.4 gallons
 Test Volume Range (92 to 94% of Usable Capacity) = 11.4 to 11.7 gallons
 ACTUAL TEST VOLUME = 11.5 gallons (with entire fuel system filled)

Table 3

POST IMPACT DATATYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
 Test Date: July 17, 1991 Time: 13:40 Temperature: 83 °F
 Vehicle NHTSA No.: CM5704
 Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.4 mph; Trap No. 2 = 29.4 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 = 160.5 ; C/L = 165.1 ; Left = 160.3
 Post-Test Right = 145.3 ; C/L = 148.6 ; Left = 147.6
 Crush Right = 15.2 ; C/L = 16.5 ; Left = 12.7
 AVERAGE = 14.8 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

Right = 16.7 ; C/L = 15.0 ; Left = 16.9
 AVERAGE = 16.2 inches

DOOR OPENING:

	Left	Right
Front	<u>closed operable</u>	<u>closed operable</u>
Rear	<u>closed operable</u>	<u>closed operable</u>

SEAT MOVEMENT:

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

Table 3

POST IMPACT DATA (cont.)

GLAZING DAMAGE: Windshield sustained stress fractures but remained intact.

Section 3
OCCUPANT AND VEHICLE DATA

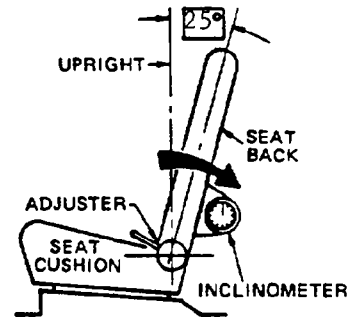
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1991 Vehicle Model: Isuzu Stylus Body Style: 4 Door Sedan

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



LEFT SIDE VIEW

Seat back angle for driver's seat 25°

Measurement instructions: Seat back was placed in 8th latch position from most upright position.

Seat back angle for passenger's seat: 25°

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 was placed in 11 detent (mid-position) from a total of 21 detents.

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 12.4 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.: CM5704 Vehicle: 1991 Isuzu Stylus 4-Door Sedan

SEAT TYPE:

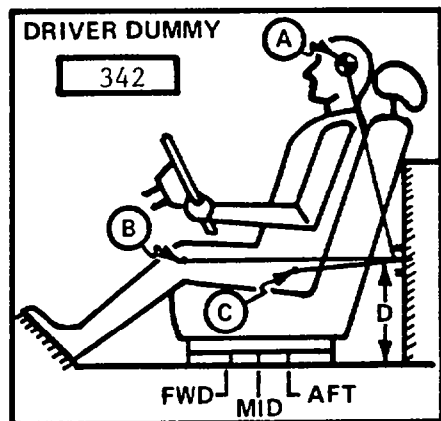
 Bench
 X Bucket
 Split Bench

ADJUSTER TYPE:

 X Manual
 Power

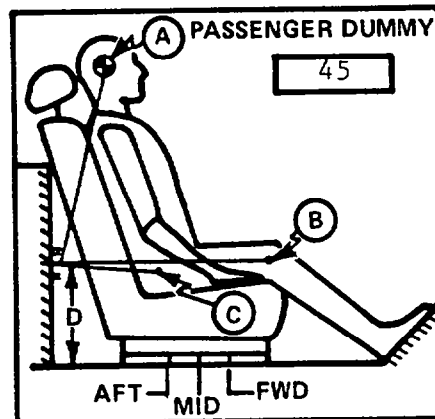
SEAT BACK TYPE:

 X Fixed
 Adjustable Reclining



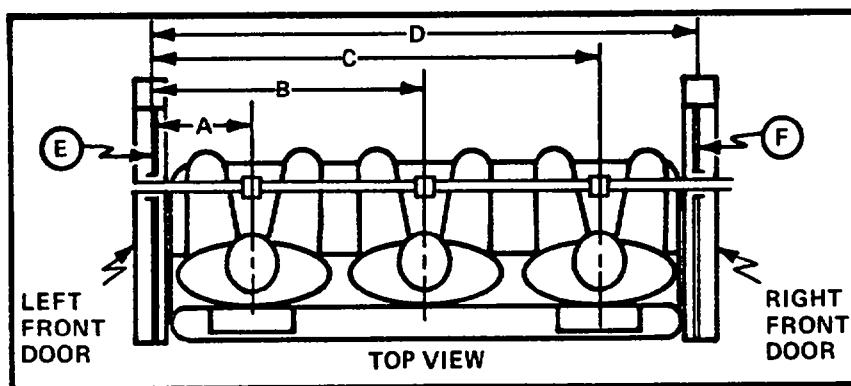
MEASUREMENT LOCATION

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



A = 21.2 in. 8 Degrees
 B = 23.0 in. 92 Degrees
 C = 9.0 in. 130 Degrees
 D = 12.8 in.

A = 20.8 in. 8 Degrees
 B = 23.3 in. 95 Degrees
 C = 9.2 in. 130 Degrees
 D = 12.8 in.



S/N 342

DUMMY ID

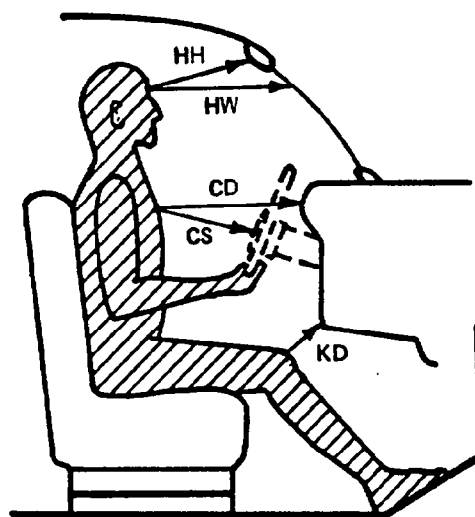
S/N 45

A = Left Door to Driver Centerline 13.7 in.
 B = Left Door to Center Passenger Centerline in.
 C = Left Door to Right Passenger Centerline 39.1 in.
 D = Left Door to Right Door 52.2 in.
 E, F = Window Glass Height (Right and Left Must Be Equal) 11.2 in.

Figure 3

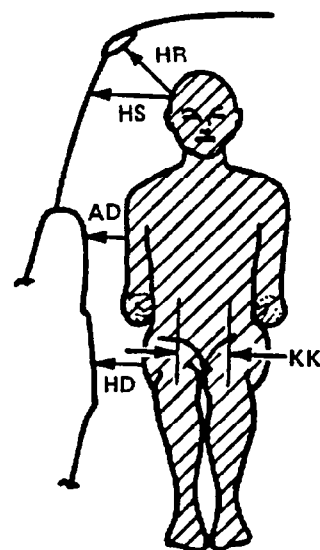
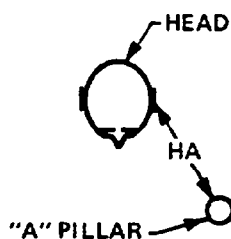
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	13.3	13.1
HW	23.0	24.0
CD	20.1	20.4
CS	10.3	-
KDL	4.3	4.2
KDR	4.0	4.3
SA	See Note	See Note
PA	25°	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
 PA = Pelvic 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



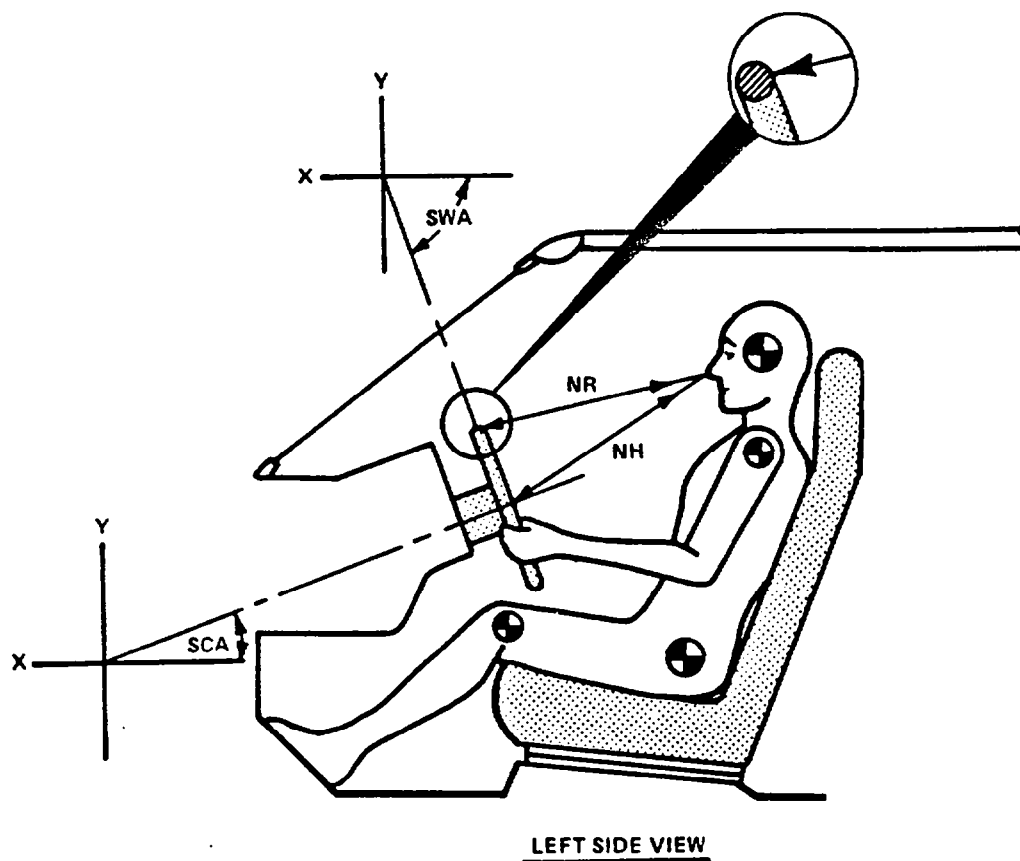
	DRIVER	PASSENGER
HR	6.9	6.8
HS	10.5	9.9
AD	4.4	4.6
HD	5.3*	4.8*
KK	8.3	8.0
HA	20.1	20.0

*To Door Compartment (pocket)

Note: Seat back was positioned as specified by manufacturer.

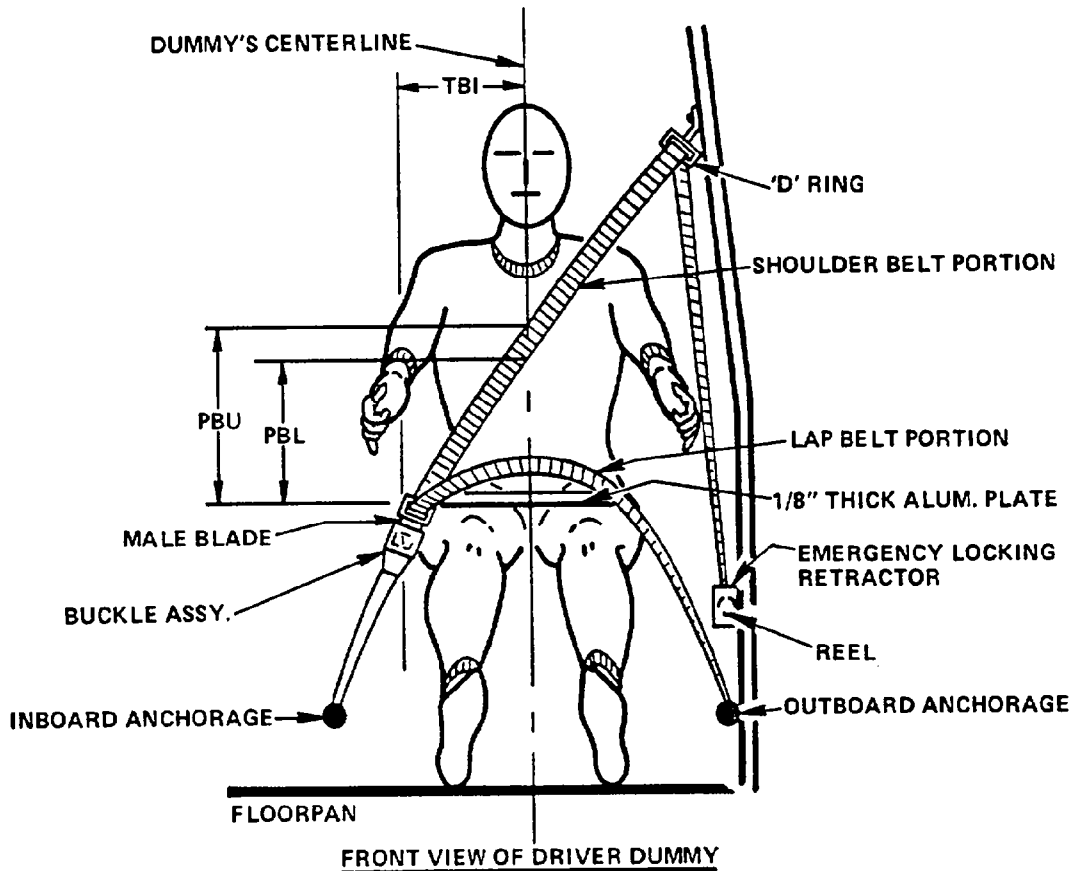
Figure 4

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	15.1	Inches
<u>NH</u>	-- Distance from tip of dummy's nose to center of steering wheel hub	15.2	Inches
<u>SCA</u>	-- Angle of steering column relative to the horizontal X axis	24	Degrees
<u>SWA</u>	-- Angle of steering wheel relative to the horizontal X axis	-66	Degrees

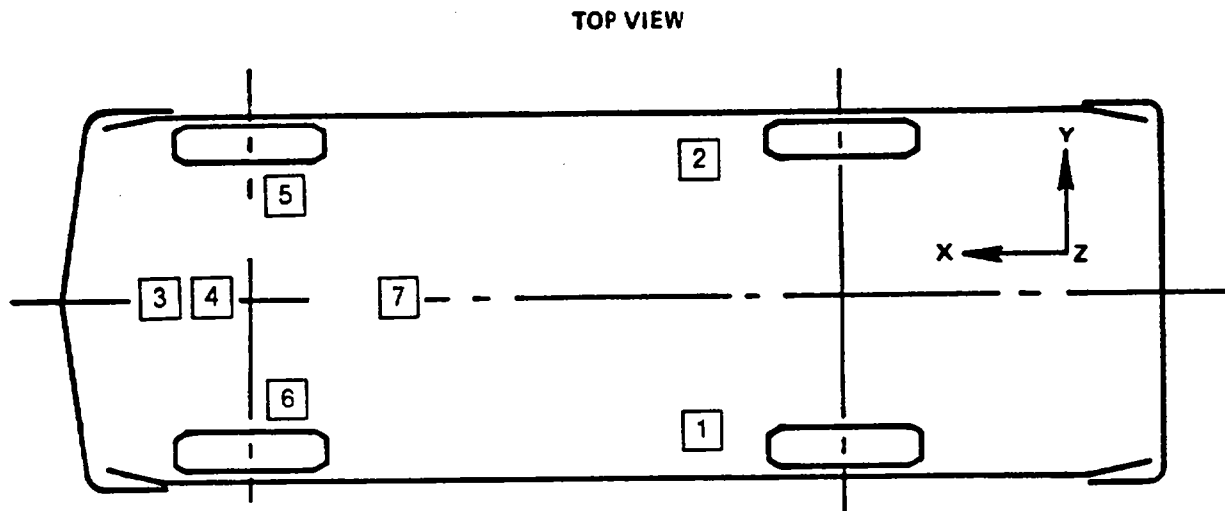
Figure 5
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	*	13.5
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	*	10.2
<u>TBI</u> -- Distance from torso centerline to buckle	*	7.8

*Vehicle was equipped with a driver side air bag.

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 PRE:	60.7	23.9	12.9				
	AT LEFT SIDE POST:	60.5	23.8	12.9				
	LONGITUDINAL ACCELERATION				4	92	-32	55
2	REAR SEAT X-MEMBER PRE:	60.7	-24.5	13.3				
	AT RIGHT SIDE POST:	60.6	-24.5	13.5				
	LONGITUDINAL ACCELERATION				4	90	-34	57
3	TOP OF ENGINE BLOCK PRE:	137.7	-3.5	30.0				
	POST:	133.1	-3.1	30.2				
	LONGITUDINAL ACCELERATION				26	44	-113	34
4	BOTTOM OF ENGINE PRE:	135.5	-2.2	9.4				
	POST:	132.4	-1.5	8.4				
	LONGITUDINAL ACCELERATION				17	48	-110	39
5	BRAKE CALIPER AT PRE:	129.5	-14.9	18.5				
	RIGHT SIDE POST:	130.2	-14.8	18.3				
	LONGITUDINAL ACCELERATION				6	74	-58	45
6	BRAKE CALIPER AT PRE:	129.9	15.2	18.5				
	LEFT SIDE POST:	127.8	15.5	18.1				
	LONGITUDINAL ACCELERATION				N/A	N/A	-51	36
7	DASH PANEL PRE:	102.3	1.2	26.4				
	POST:	102.9	1.2	26.7				
	LONGITUDINAL ACCELERATION				3	75	-38	52

*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.

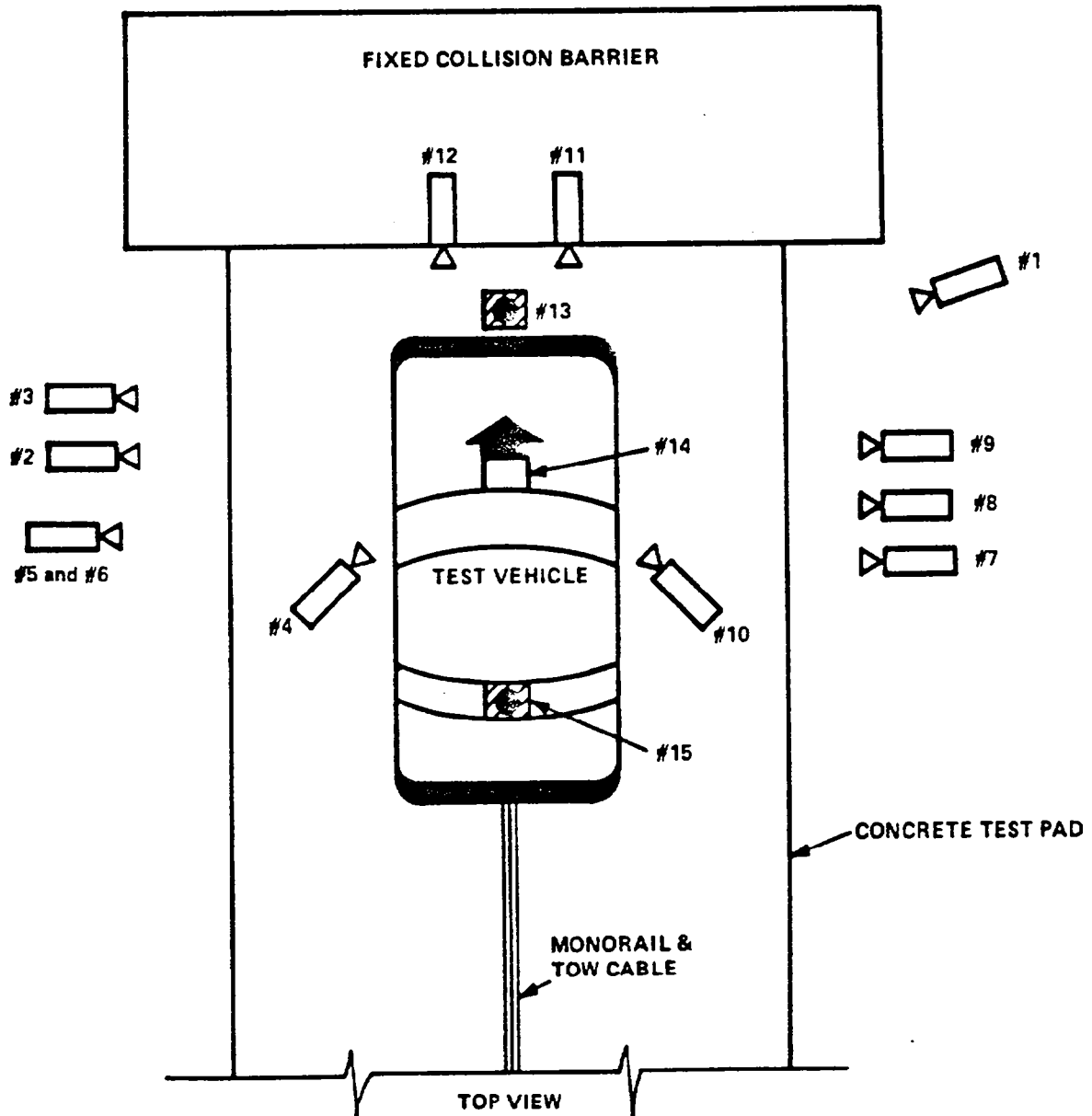


Table 5

HIGH-SPEED CAMERA LOCATIONS

Test No.		CM5704		Vehicle: 1991 Isuzu Stylus 4-Door Sedan					
CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)	
		X	Y	Z					
1	Real-Time Camera	-	-	-	-	-	-	24	
2	Overall Left Side	212	60	41	-3	196	13	540	
3	Left Side View	283	38	41	-1	267	25	560	
4	Driver and Interior View	103	99	68	-19	-	13	640	
5	Steering Column (Bottom)	254	73	46	-4	238	25	540	
6	Steering Column (Top)	253	73	70	-11	237	25	520	
7	Overall Right Side	215	69	42	-4	199	13	610	
8	Right Side View	274	49	41	-2	258	25	630	
9	Right Passenger View	273	67	54	-4	257	35	560	
10	Passenger and Interior View	98	95	68	-22	-	13	490	
11	Passenger Front View	23	18	75	-53	-	13	520	
12	Driver Front View	23	18	75	-49	-	13	520	
13	Windshield View	0	0	130	-45	-	13	540	
14	Pit View of Engine	0	24	-125	90	-	13	720	
15	Pit View of Fuel Tank	0	80	-125	90	-	13	860	

*X = film plane to monorail centerline

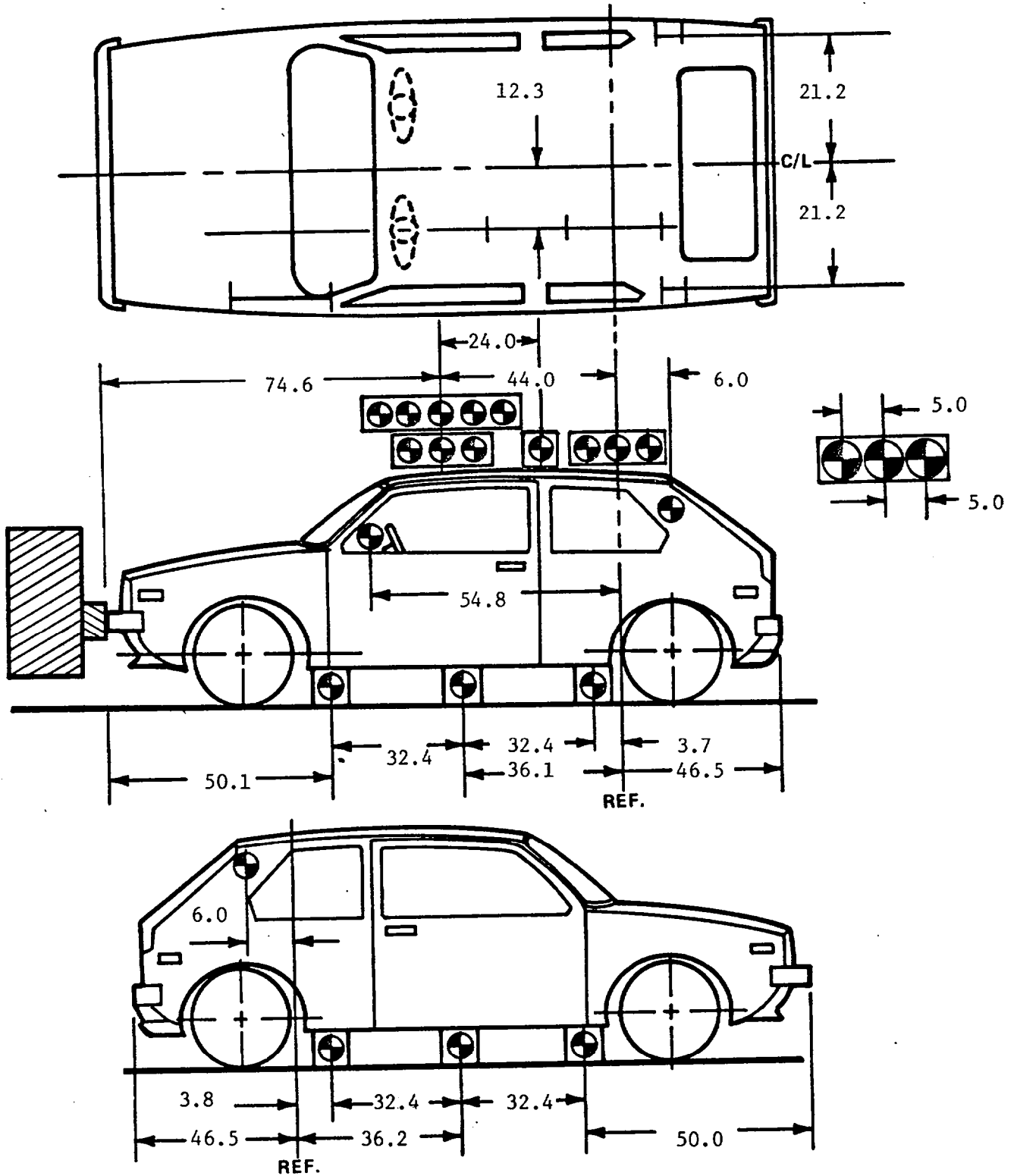
Y = film plane to impact location

Z = film plane to ground

** = referenced to horizontal plane

Figure 8

VEHICLE TARGET LOCATIONS



(DIMENSIONS IN INCHES)

Figure 9

TEST VEHICLE MEASUREMENTS

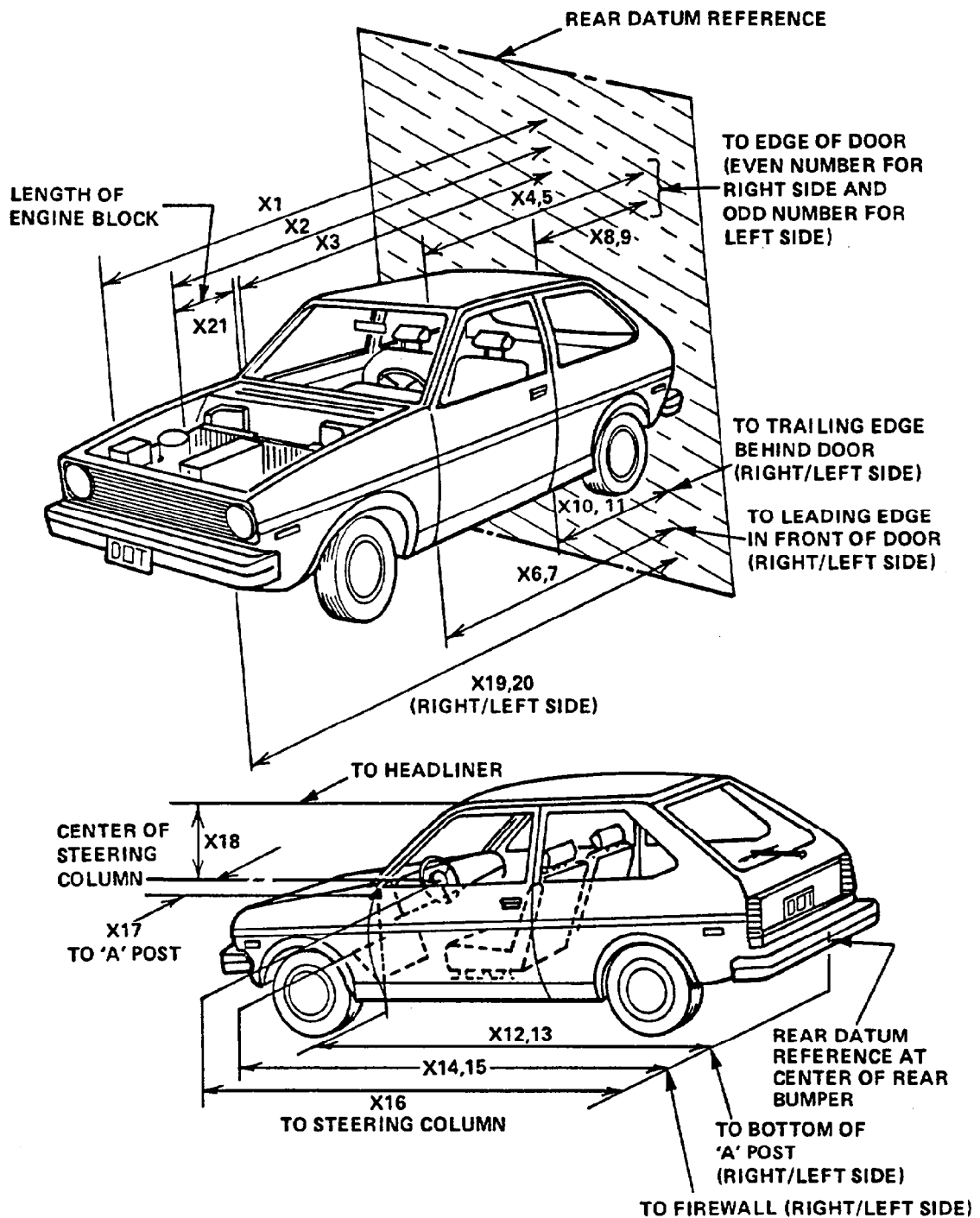


Table 6

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	165.1	148.6	16.5
X2	Rear Surface of Vehicle to Front of Engine	142.6	136.1	6.5
X3	Rear Surface of Vehicle to Firewall	127.0	127.2	-0.2
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	114.3	114.8	-0.5
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	114.2	113.3	0.9
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	113.3	113.1	0.2
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	113.3	112.4	0.9
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	72.5	72.2	0.3
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	72.5	71.7	0.8
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	72.9	72.5	0.4
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	73.0	71.8	1.2
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	113.1	113.0	0.1
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	113.0	112.1	0.9
X14	Rear Surface of Vehicle to Firewall, Right Side	124.8	123.0	1.8
X15	Rear Surface of Vehicle to Firewall, Left Side	124.6	124.3	0.3
X16	Rear Surface of Vehicle to Steering Column	94.0	93.7	0.3
X17	Center of Steering Column to "A" Post	17.4	16.9	0.5
X18	Center of Steering Column to Headliner	16.5	14.8	1.7
X19	Rear Surface of Vehicle to Right Side of Front Bumper	160.5	145.3	15.2
X20	Rear Surface of Vehicle to Left Side of Front Bumper	160.3	147.6	12.7
X21	Length of Engine Block	13.3	13.3	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.: CM5704 Vehicle: 1991 Isuzu Stylus 4-Door Sedan

	MAXIMUM ACCELERATION (g's)							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
Dummy (1)	-47.6	-9.6	15.4	49.4	-44.1	-4.6	-15.1	43.5
Dummy (2)	-44.1	2.8	58.2	63.8	-43.8	6.5	5.2	41.3

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	929.9	1176.6
Dummy (2)	154.4	390.0

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc. (g) t ₁ TO t ₂
		t ₁ (SEC)	t ₂ (SEC)	
Dummy (1)	256.6	.04536	.07944	35.5
Dummy (2)	622.2	.07080	.10668	49.8

*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: Driver's Sun Visor

The manufacturer states, "REGULAR MAINTENANCE OF THE SIR IS NOT REQUIRED."

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 corner 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.: CM5704

Make/Model: 1991 Isuzu Stylus

Date of Comfort/Convenience Check: 7/15/91

Technician Performing Check: DJT

GVWR: 3242 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 _____ 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 -

(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 _____ NO X

Check the option which applies to this test vehicle:

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

YES N/A NO N/A

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

YES N/A NO N/A

D2

WEBBING TENSION - RELIEVING DEVICE

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

YES _____ NO X

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

YES N/A NO N/A

(If NO, provide explanation.)

Check the option which applies to this test vehicle:

1. This vehicle is equipped with automatic seat belts and the tension relieving device is canceled 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 canceled 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 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.

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 N/A NO N/A

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 0.6" hard rubber trim covering the top and both sides of the windshield periphery. A 0.4" hard rubber trim, coupled with a plastic cowl, cover the bottom of the windshield.

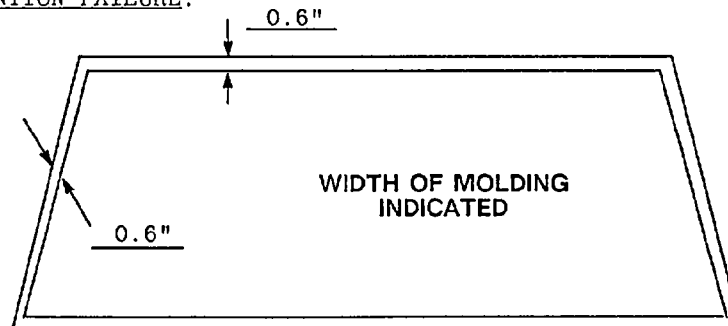
FMVSS 212 REQUIREMENTS:

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	83.4	83.4	100%
LEFT SIDE	83.4	83.4	100%
TOTAL	166.8	166.8	100%

AREA OF RETENTION FAILURE:



FRONT VIEW

FAILURE DETAILS:

NONE.

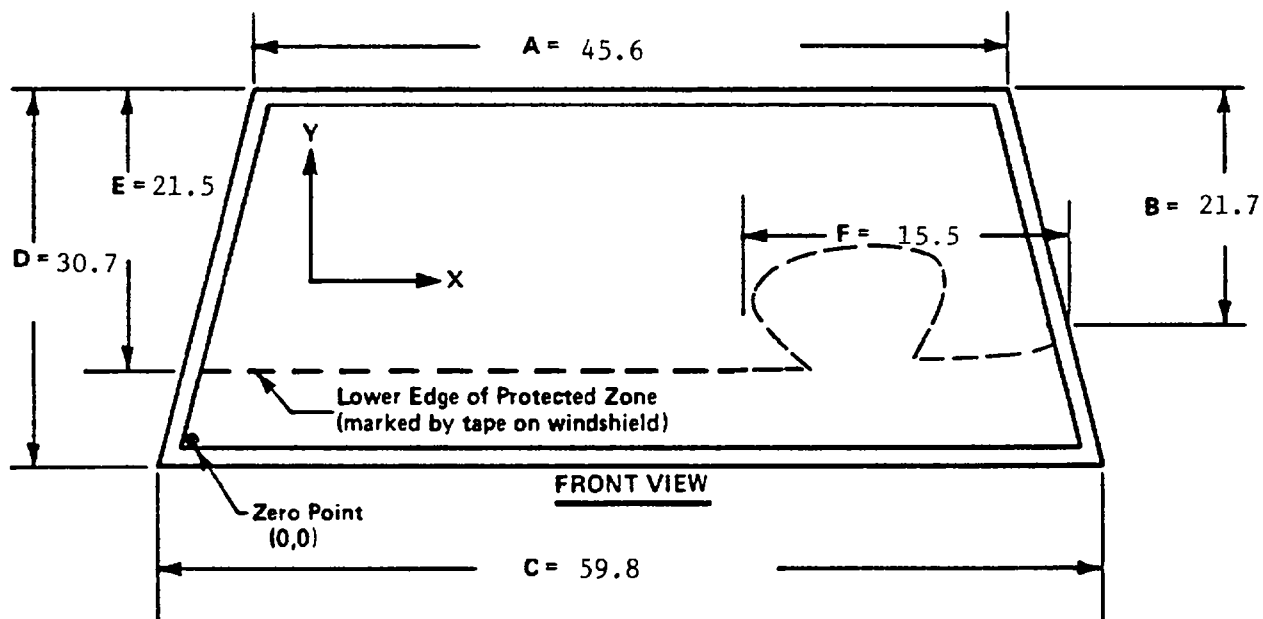
Figure 11

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

FMVSS NO. 301

TEST VEHICLE NHTSA NO.:

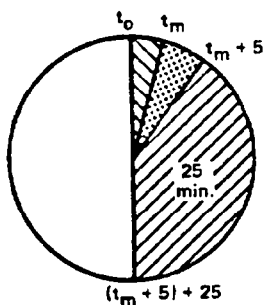
C	M	5	7	0	4
---	---	---	---	---	---

TEST DATE: July 17, 1991Vehicle Mfr./Make/Model: 1991 Isuzu Stylus 4-Door Sedan

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:

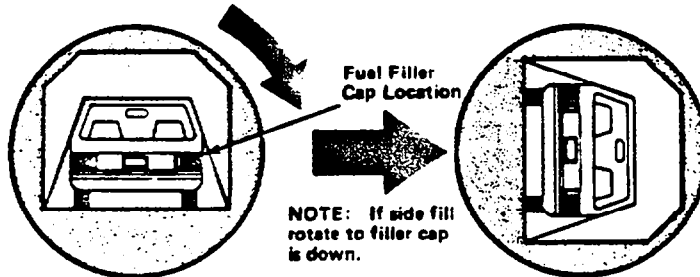
None

Table 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:

Vehicle NHTSA ID No.:

CM5704

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 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.)

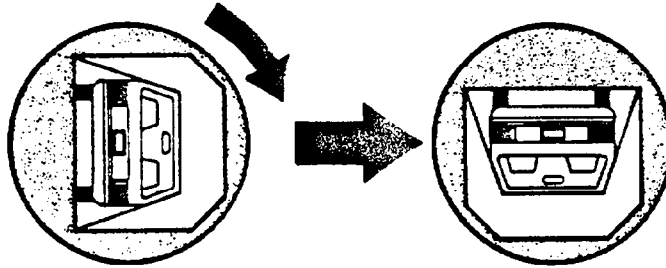
TEST PHASE:

90°

180°

Vehicle NHTSA ID No.:

CM5704



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):

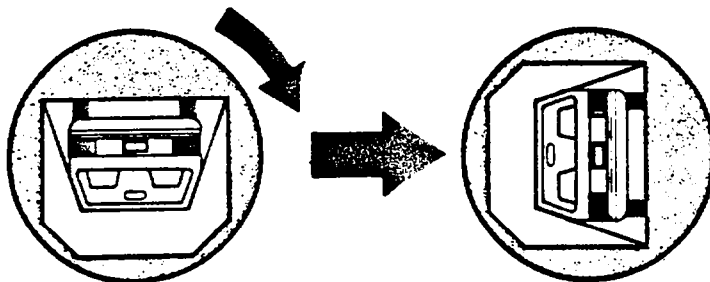
None

Table 13

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

Vehicle NHTSA ID No.:

CM5704

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 50 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL

7 minutes 50 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.)

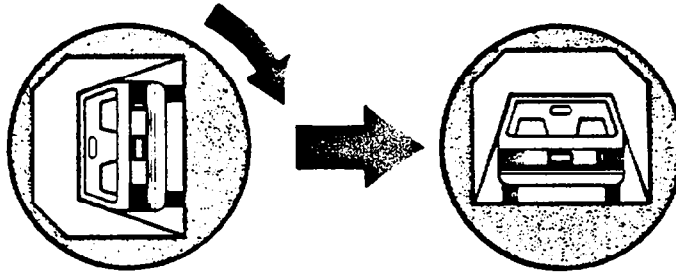
TEST PHASE:

270°

360°

Vehicle NHTSA ID No.:

CM5704



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

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: July 17, 1991 Vehicle NHTSA No.: CM5704

Vehicle Manufacturer: Isuzu Motors Limited, Japan

Model Year: 1991 VIN: JABRT5366M7406537

Body Style: 4 Door Sedan Build Date: August 1990

Dummy Stabilized Temperature at Time of Test: 70 °F (Spec. = 66-78°F)

Impact Velocity: 29.4 mph Time of Test: 13:40

Type of Automatic Restraint System: Driver - Airbag. Passenger - 3 point
manual restraint.

Failure Details:

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

Appendix A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

<u>Figure</u>	<u>Photograph Title</u>	<u>Page No.</u>
Figure A-1	PRE-TEST FRONT VIEW	A-3
Figure A-2	POST-TEST FRONT VIEW	A-4
Figure A-3	PRE-TEST LEFT SIDE VIEW	A-5
Figure A-4	POST-TEST LEFT SIDE VIEW	A-6
Figure A-5	PRE-TEST RIGHT SIDE VIEW	A-7
Figure A-6	POST-TEST RIGHT SIDE VIEW	A-8
Figure A-7	PRE-TEST RIGHT FRONT THREE-QUARTER VIEW	A-9
Figure A-8	POST-TEST RIGHT FRONT THREE-QUARTER VIEW	A-10
Figure A-9	PRE-TEST LEFT REAR THREE-QUARTER VIEW	A-11
Figure A-10	POST-TEST LEFT REAR THREE-QUARTER VIEW	A-12
Figure A-11	POST-TEST TOP VIEW	A-13
Figure A-12	PRE-TEST WINDSHIELD VIEW	A-14
Figure A-13	POST-TEST WINDSHIELD VIEW	A-15
Figure A-14	PRE-TEST ENGINE COMPARTMENT VIEW	A-16
Figure A-15	POST-TEST ENGINE COMPARTMENT VIEW	A-17
Figure A-16	PRE-TEST FUEL FILLER CAP PHOTO	A-18
Figure A-17	POST-TEST FUEL FILLER CAP PHOTO	A-19
Figure A-18	PRE-TEST FRONT UNDERBODY VIEW	A-20
Figure A-19	POST-TEST FRONT UNDERBODY VIEW	A-21
Figure A-20	PRE-TEST FRONT SIDE UNDERBODY VIEW	A-22
Figure A-21	POST-TEST FRONT SIDE UNDERBODY VIEW	A-23
Figure A-22	PRE-TEST REAR UNDERBODY VIEW	A-24
Figure A-23	POST-TEST REAR UNDERBODY VIEW	A-25
Figure A-24	CERTIFICATION LABEL AND TIRE PLACARD	A-26
Figure A-25	PRE-TEST DRIVER DUMMY POSITION	A-27
Figure A-26	POST-TEST DRIVER DUMMY POSITION	A-28
Figure A-27	PRE-TEST PASSENGER DUMMY POSITION	A-29
Figure A-28	POST-TEST PASSENGER DUMMY POSITION	A-30
Figure A-29	PRE-TEST DRIVER DUMMY AND INTERIOR VIEW	A-31
Figure A-30	POST-TEST DRIVER DUMMY AND INTERIOR VIEW	A-32
Figure A-31	PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW	A-33
Figure A-32	POST-TEST PASSENGER DUMMY AND INTERIOR VIEW	A-34
Figure A-33	POST-TEST DRIVER AIRBAG VIEW	A-35
Figure A-34	VEHICLE IMPACT	A-36



Figure A-1 PRE-TEST FRONT VIEW

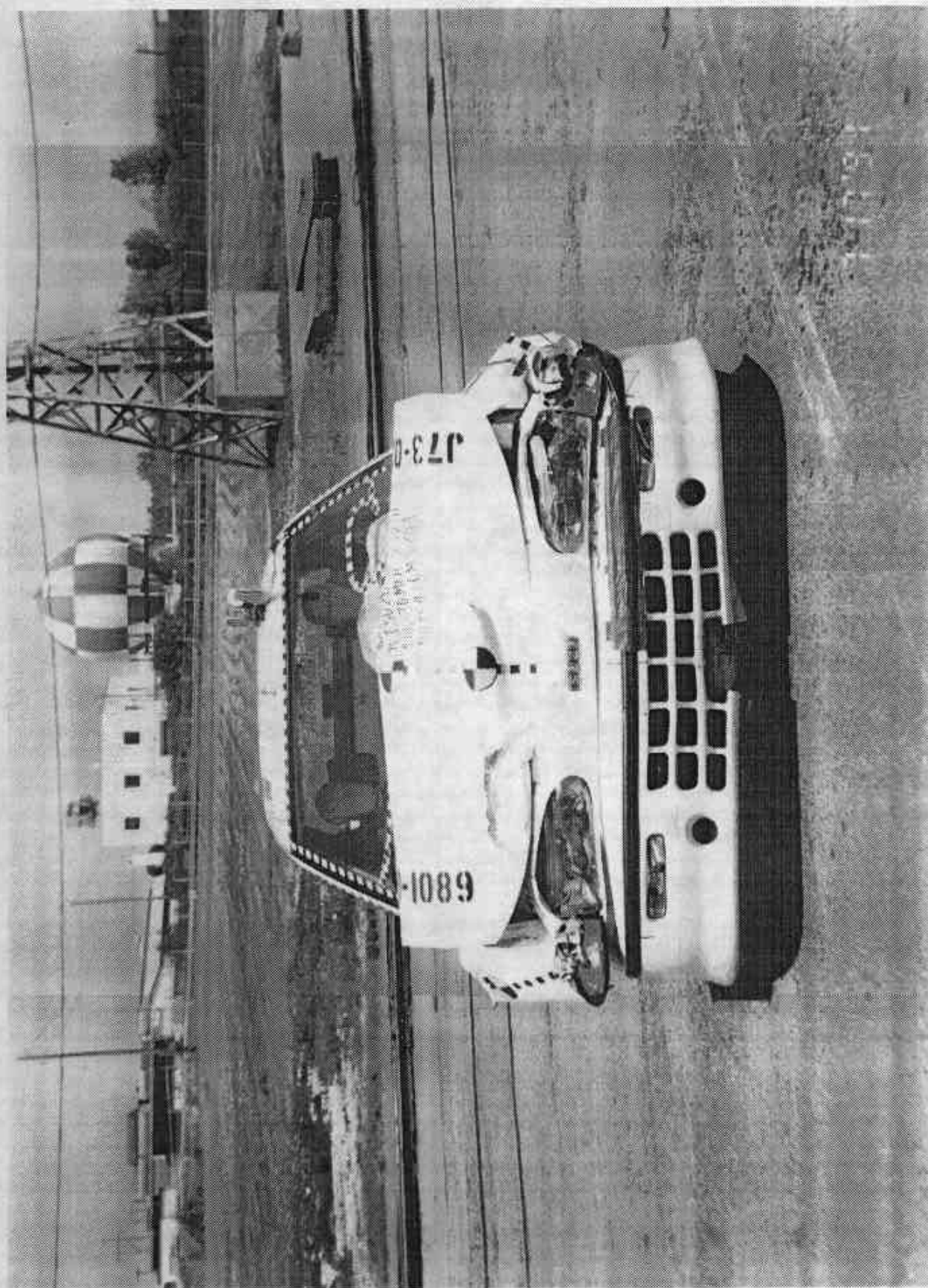
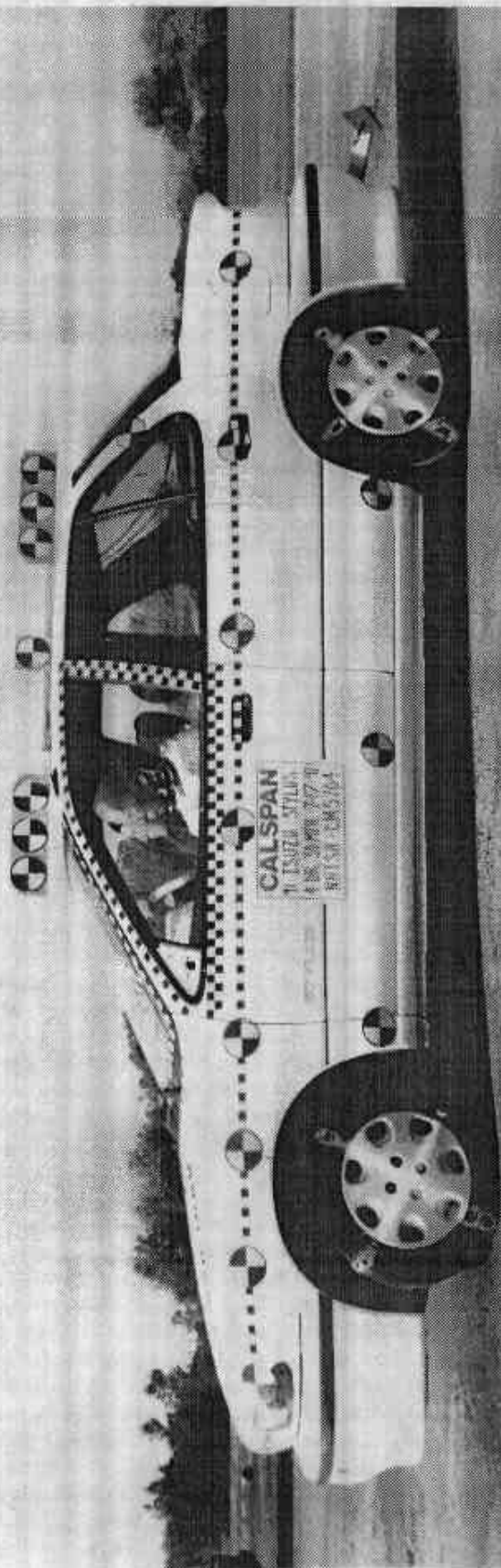


Figure A-2 POST-TEST FRONT VIEW



A-5

7920-2

FIGURE A-3 PPS-TEST LEFT SIDE VIEW

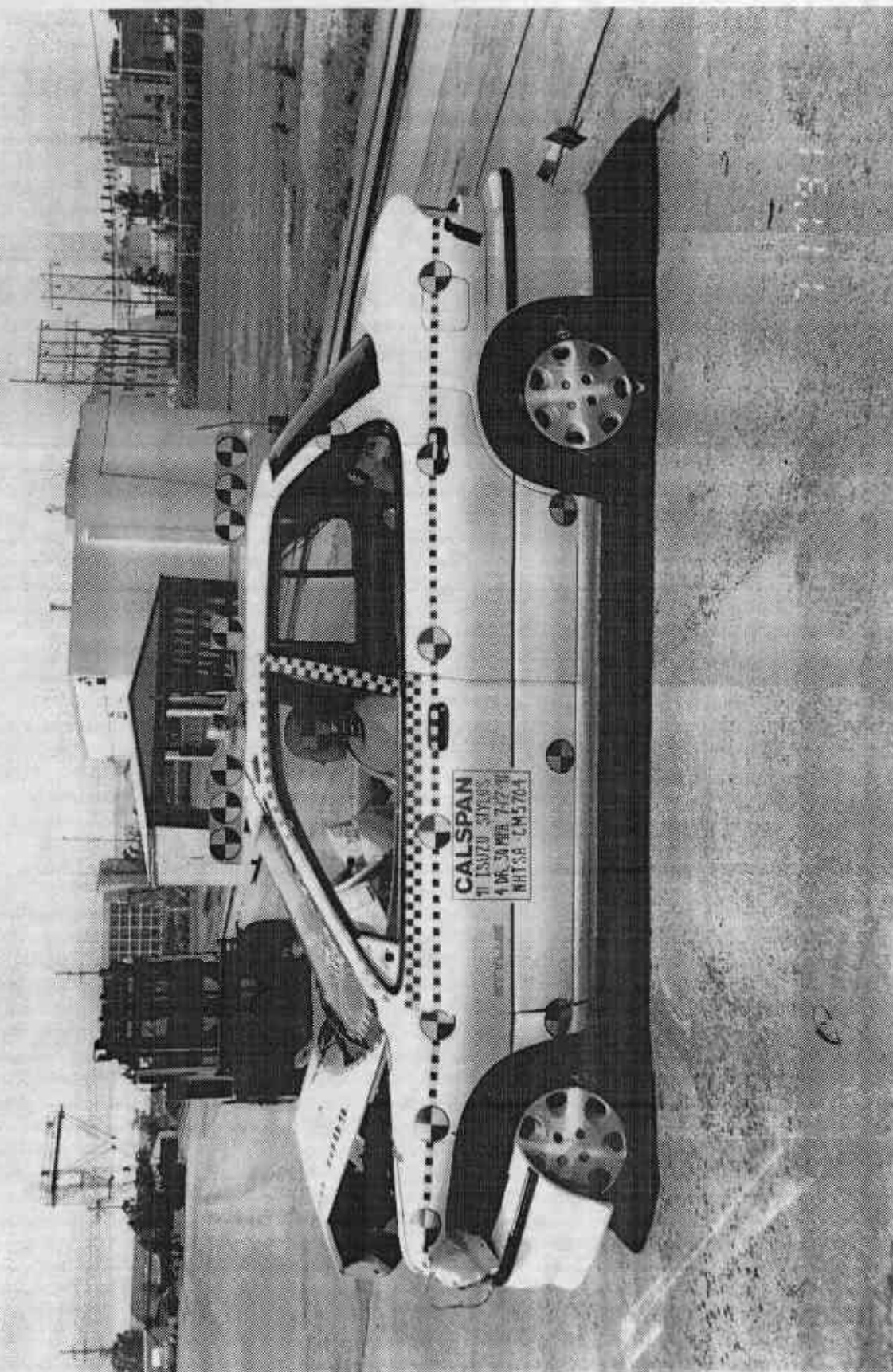


Figure A-4 POST-TEST LEFT SIDE VIEW

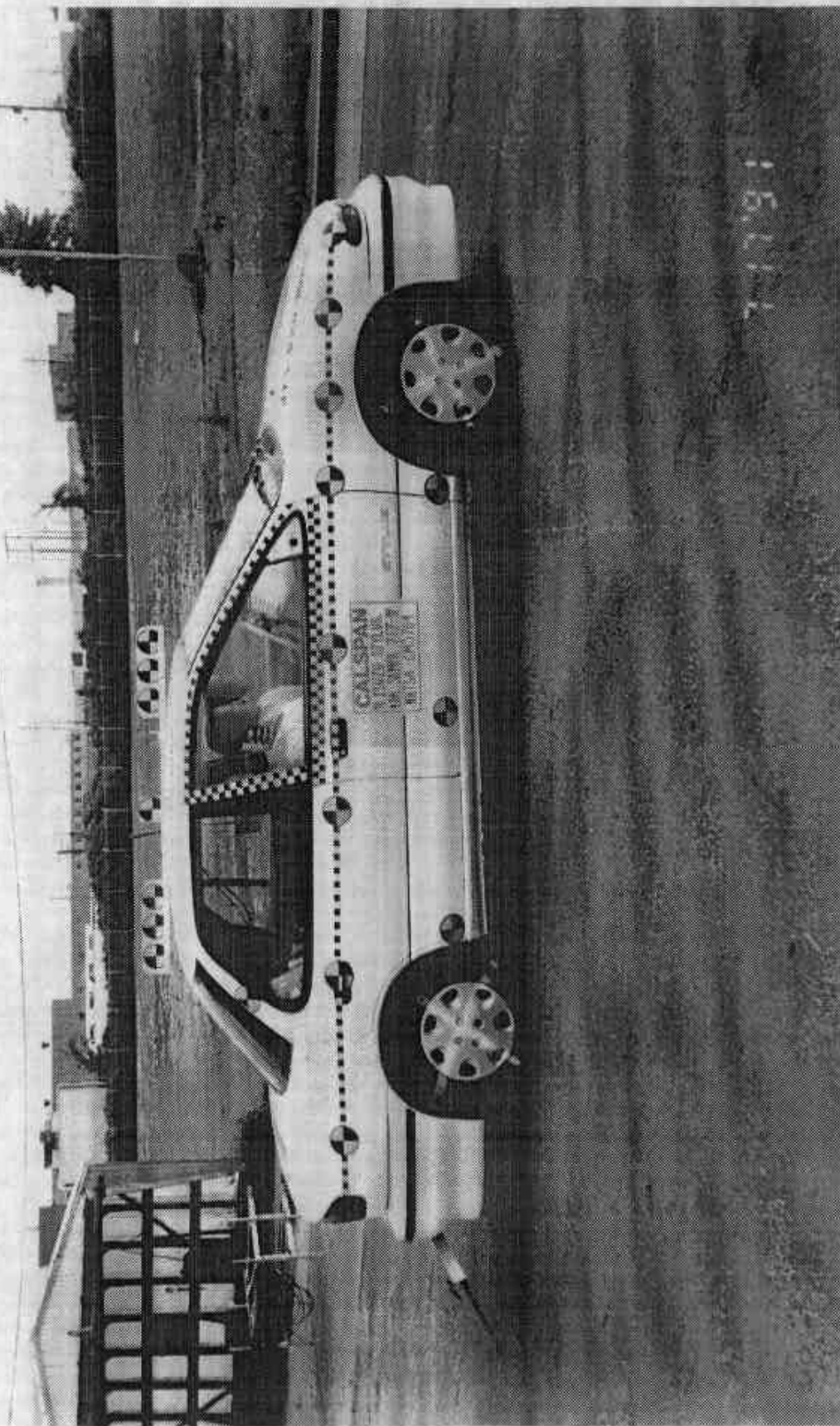


Figure A-5 PRE-TEST RIGHT SIDE VIEW

A-7

7920-2

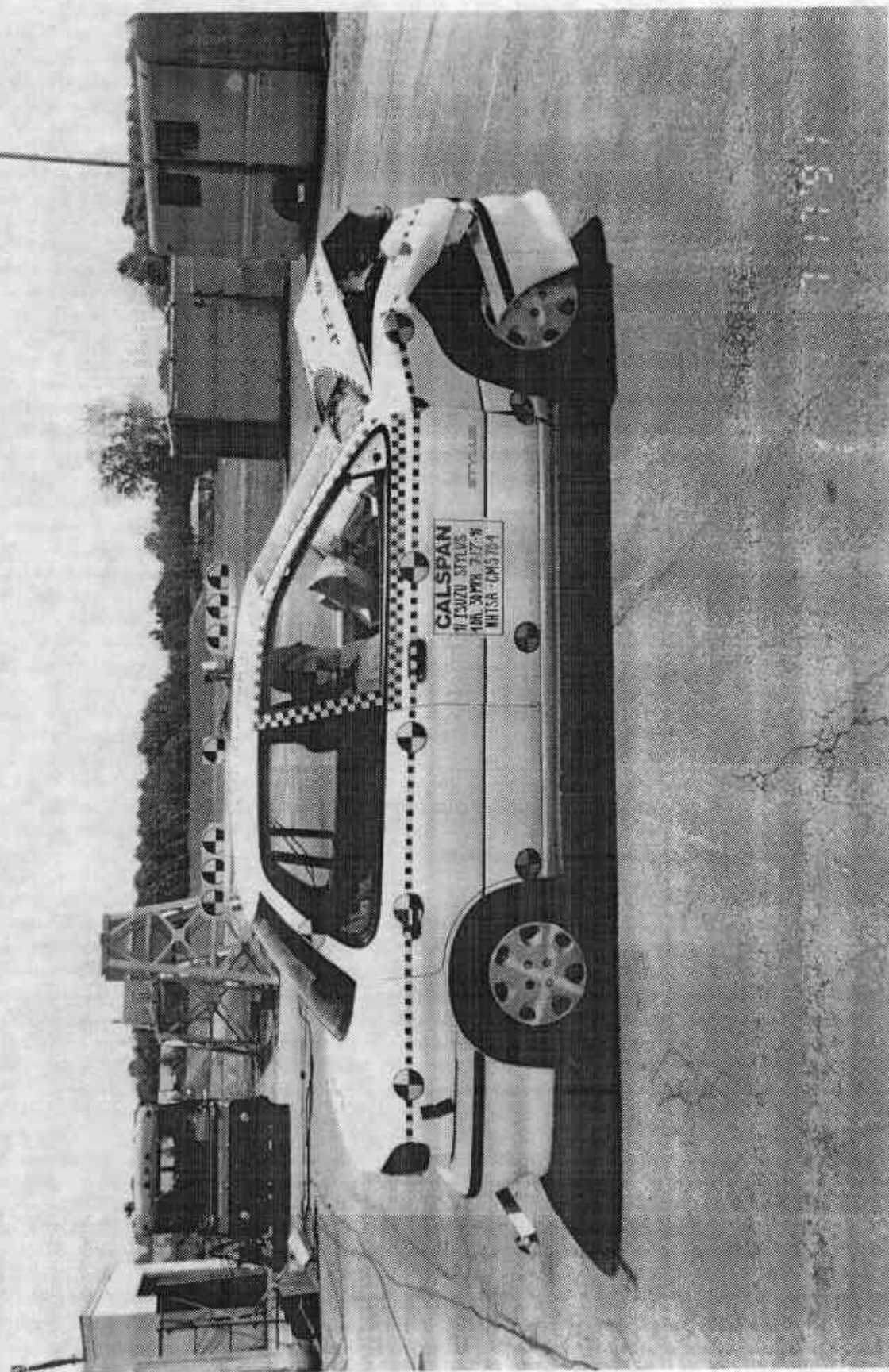


Figure A-6 POST-TEST RIGHT SIDE VIEW



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

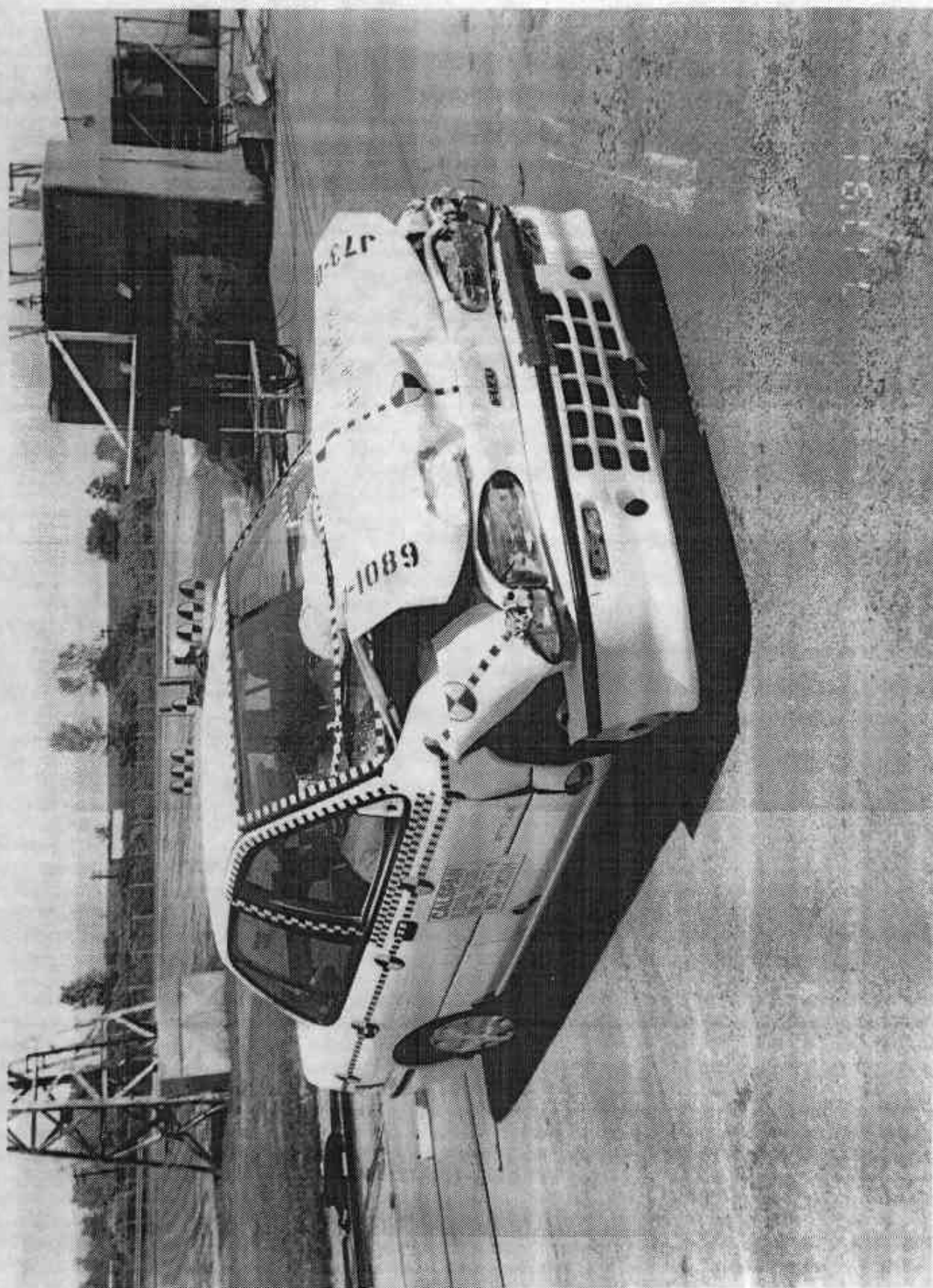


Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

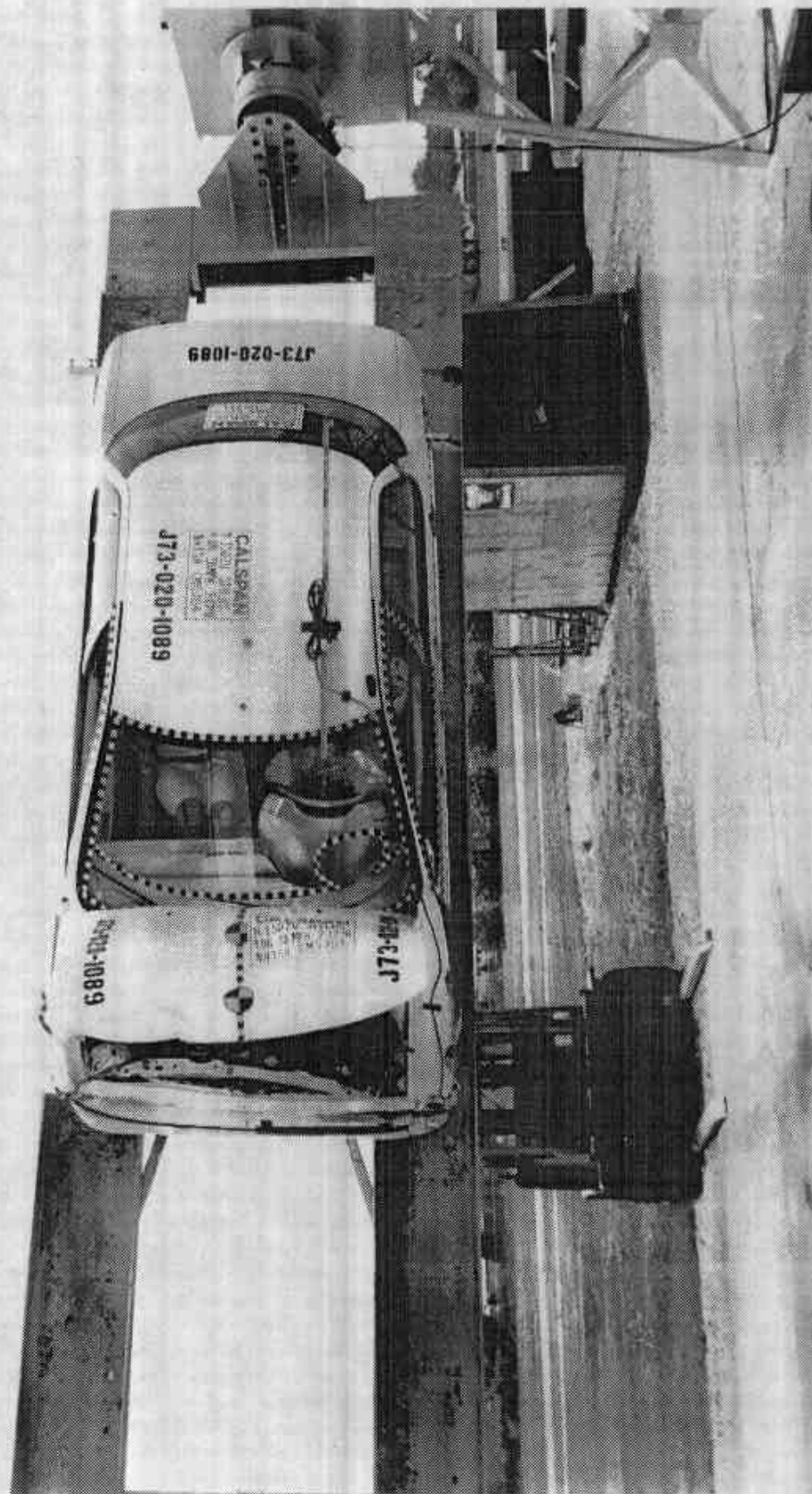


15111

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



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



MEVA POC TEST-TOP VIEW
TT-4 010314

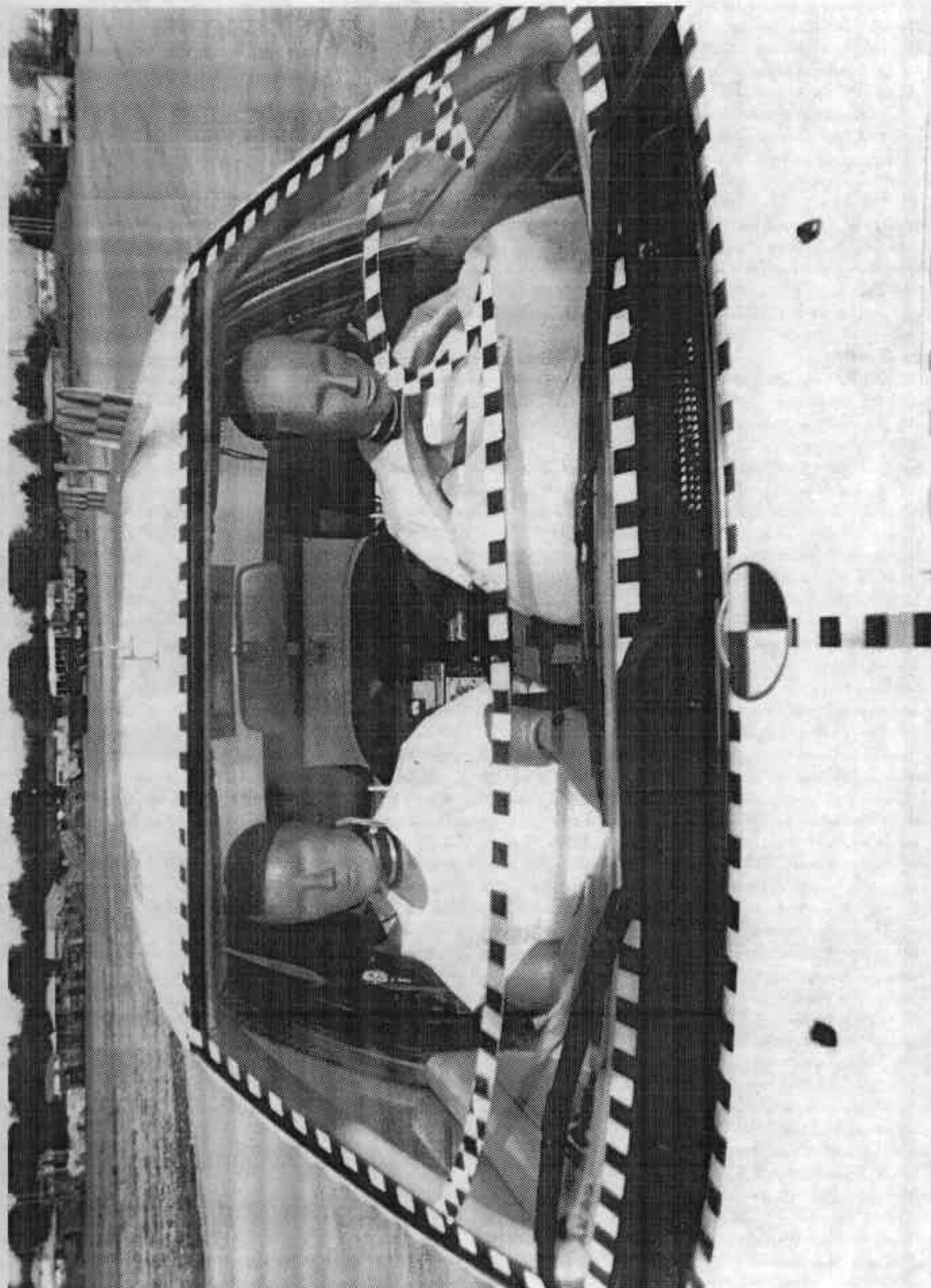
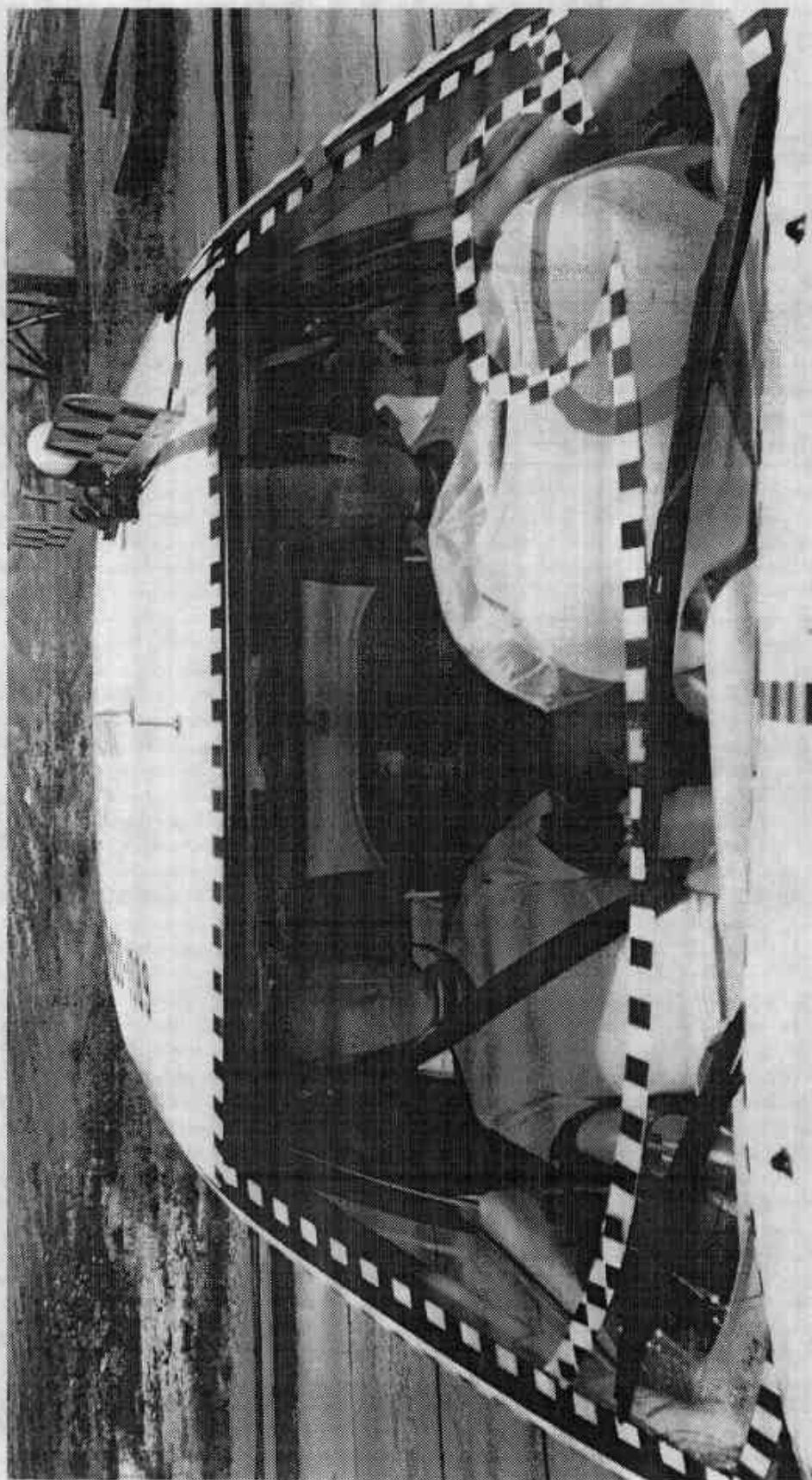


Figure A-12 PRE-TEST WINDSHIELD



CALIFORNIA
 91 ISUZU S14L
 A DR 30 MPH 7

FIGURE A-13 POST-TEST WINDSHIELD

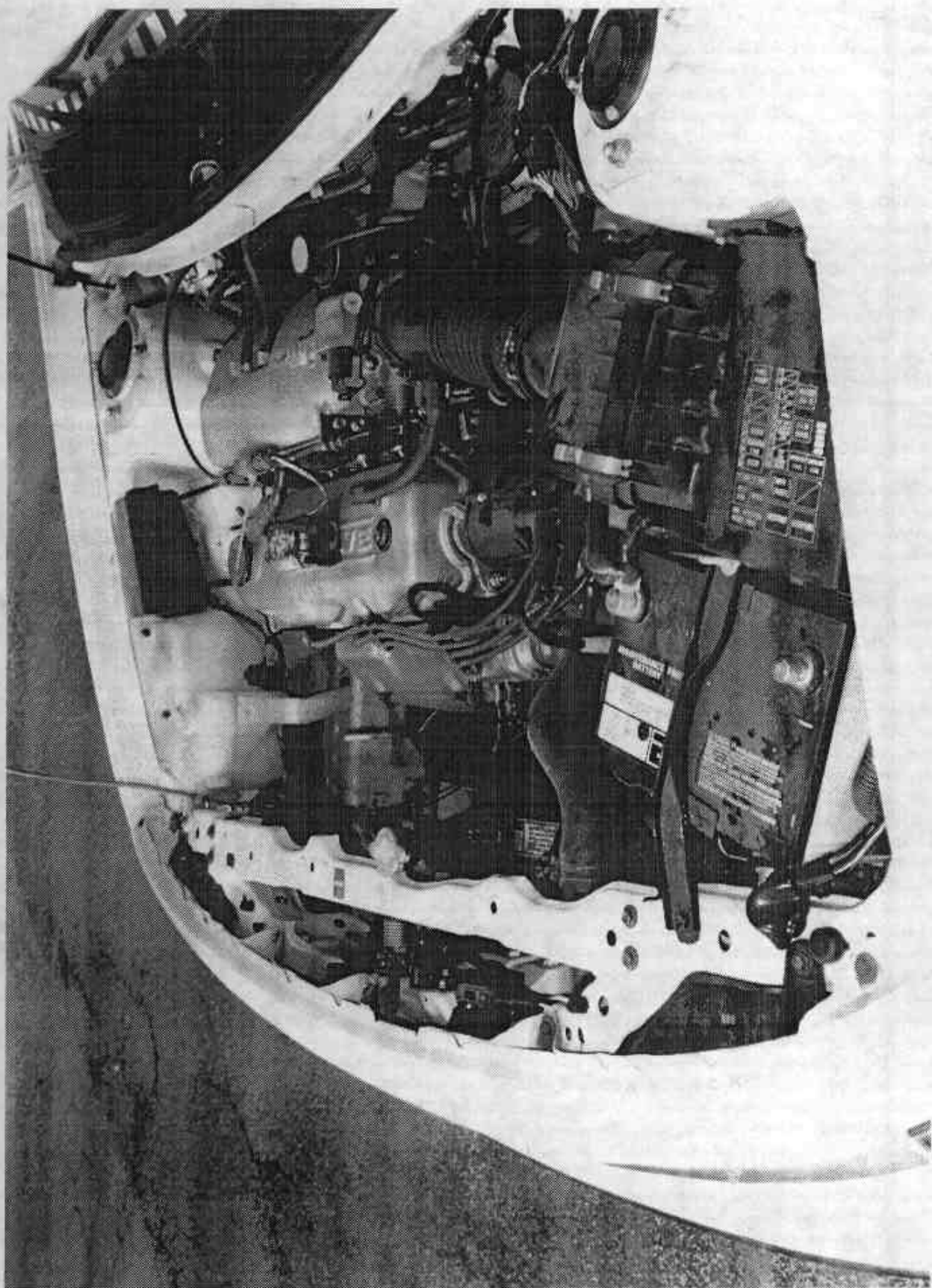


FIGURE 8-14 PRE-TEST ENGINE COMPARTMENT

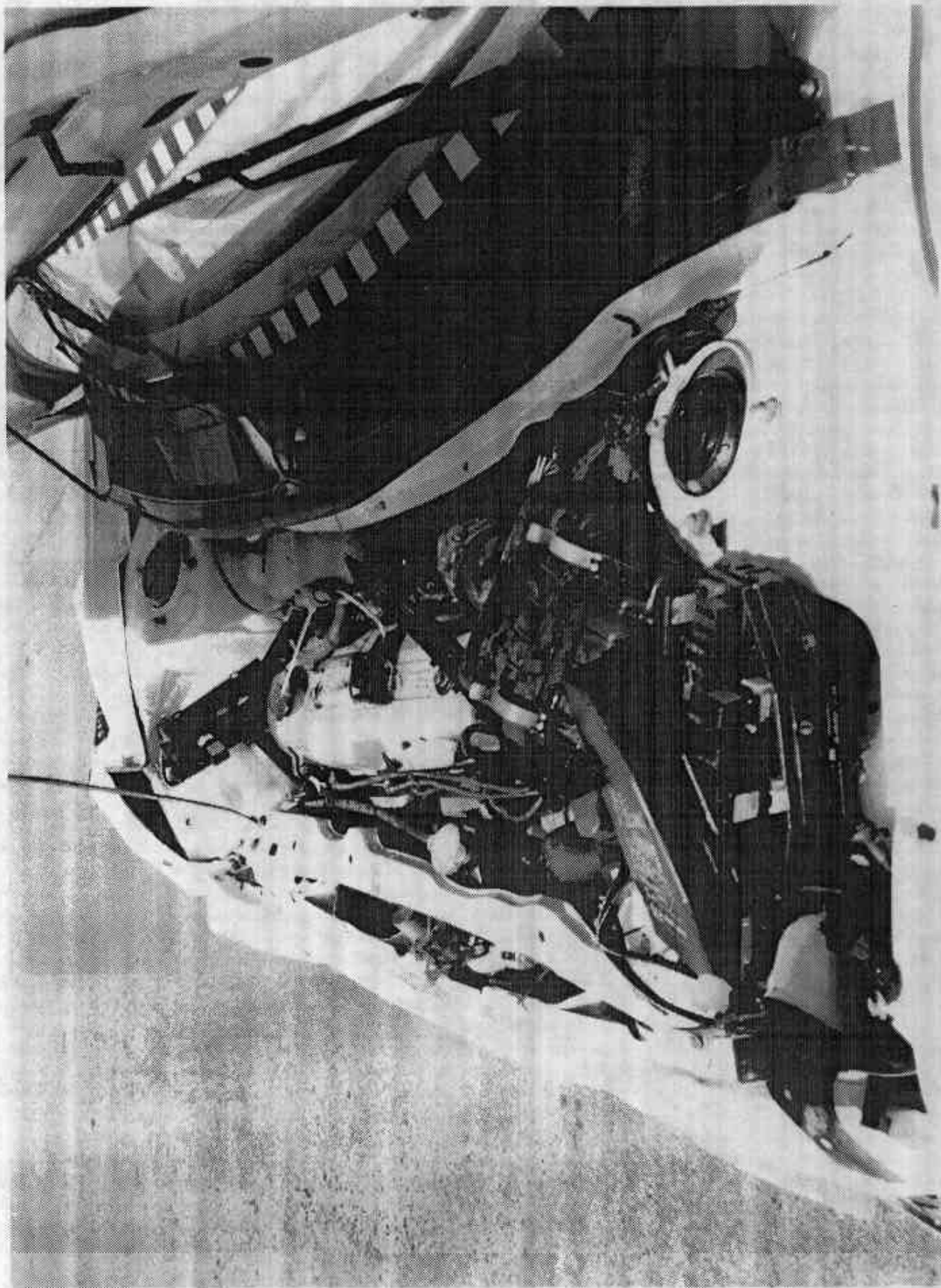


Figure A-15. POST-TEST ENGINE COMPARTMENT

11.5
10/1/05
test

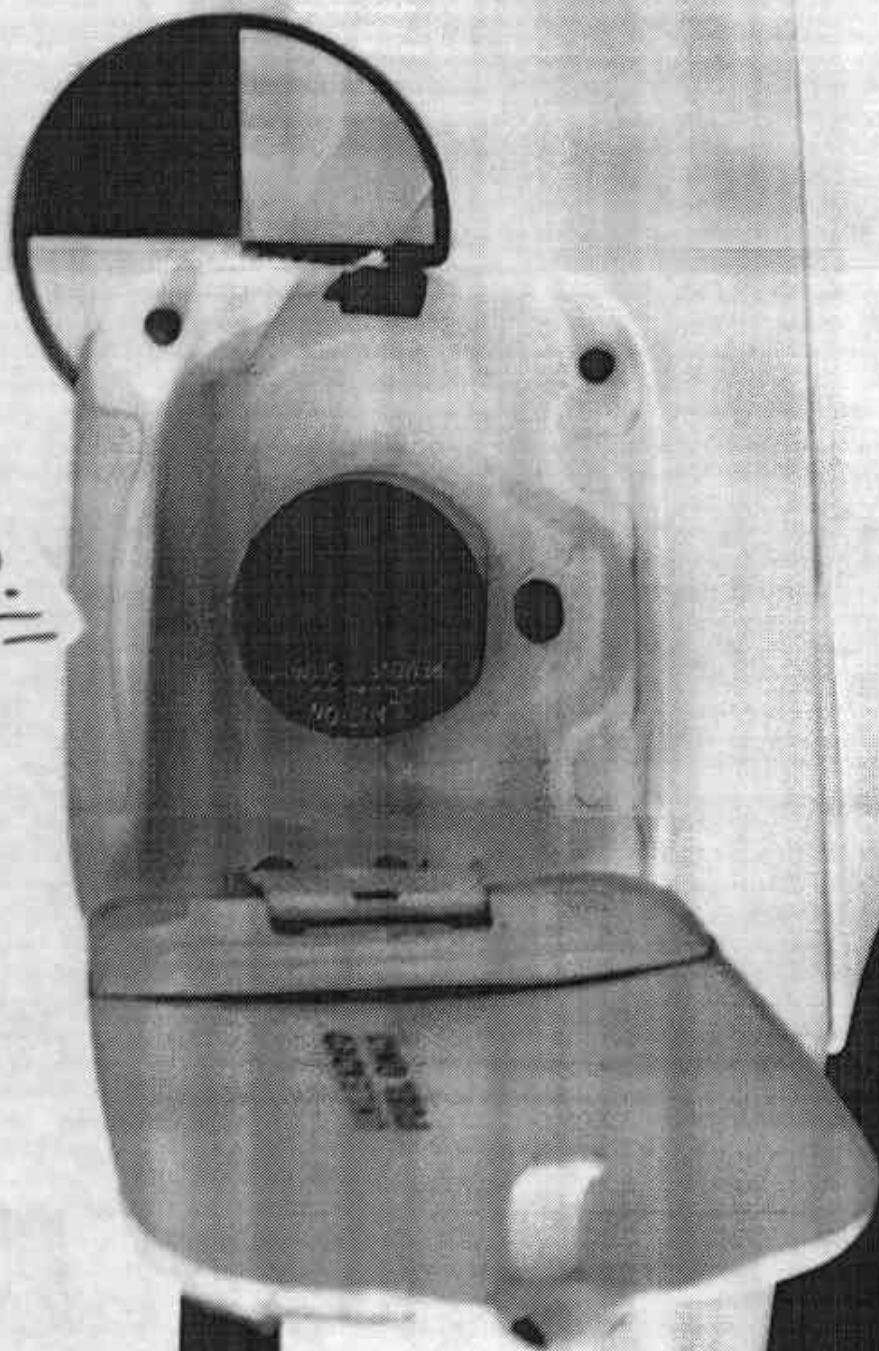


Figure A-18 PRE-TEST FUEL FILLER CAP

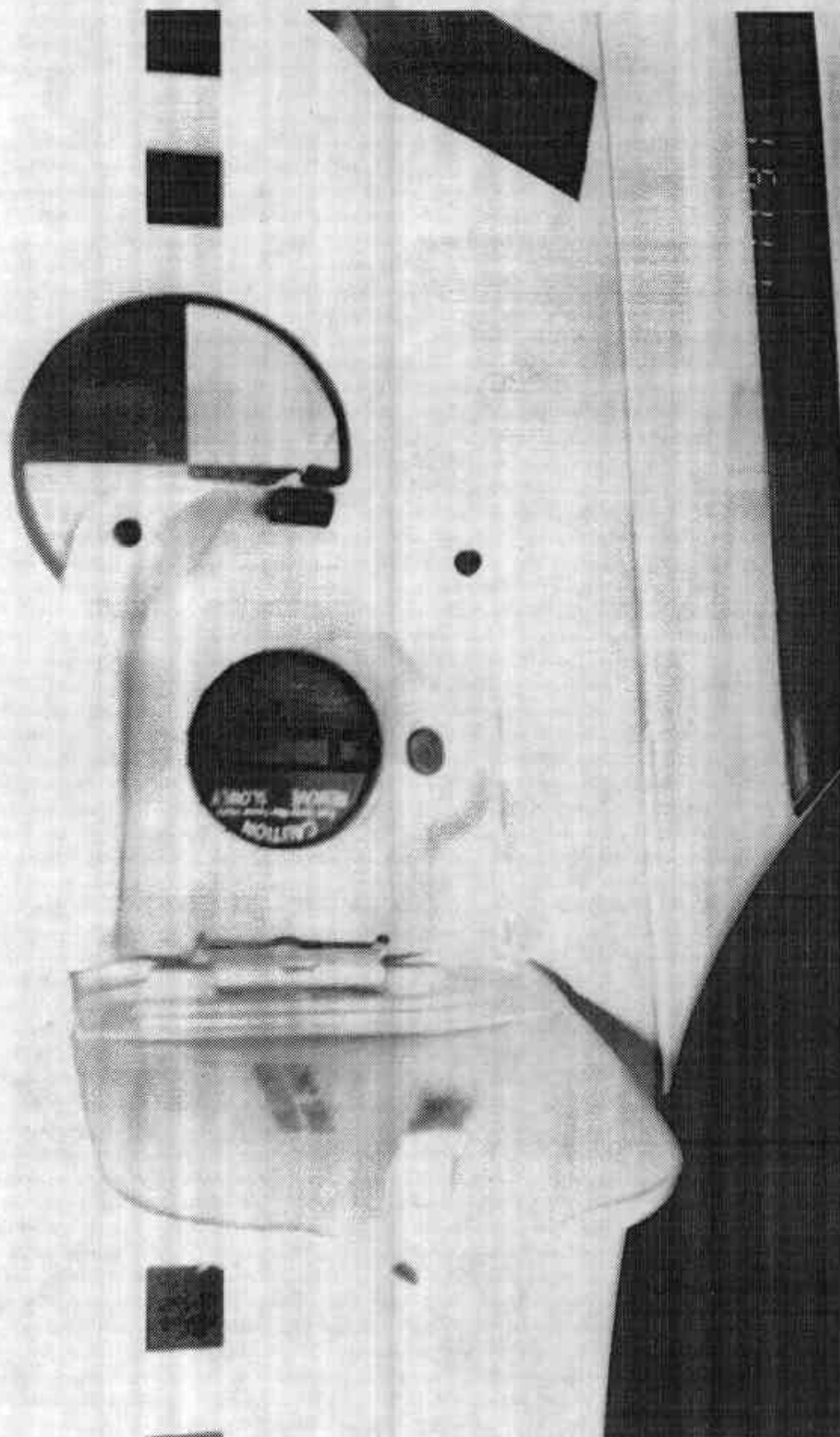


Figure A-17 POST-TEST FUEL FILLER CAP

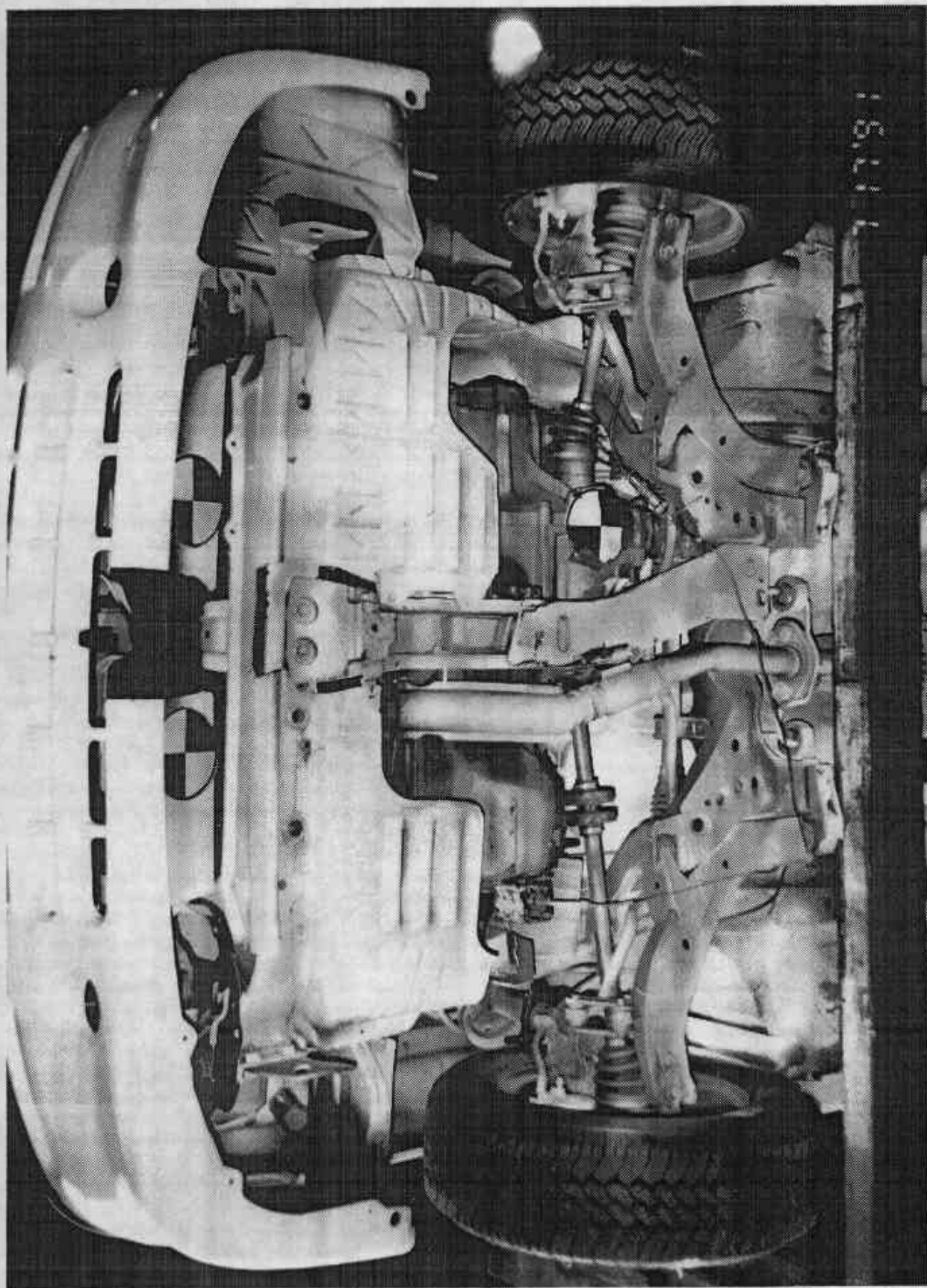


Figure A-18 PRE-TEST FRONT UNDERBODY

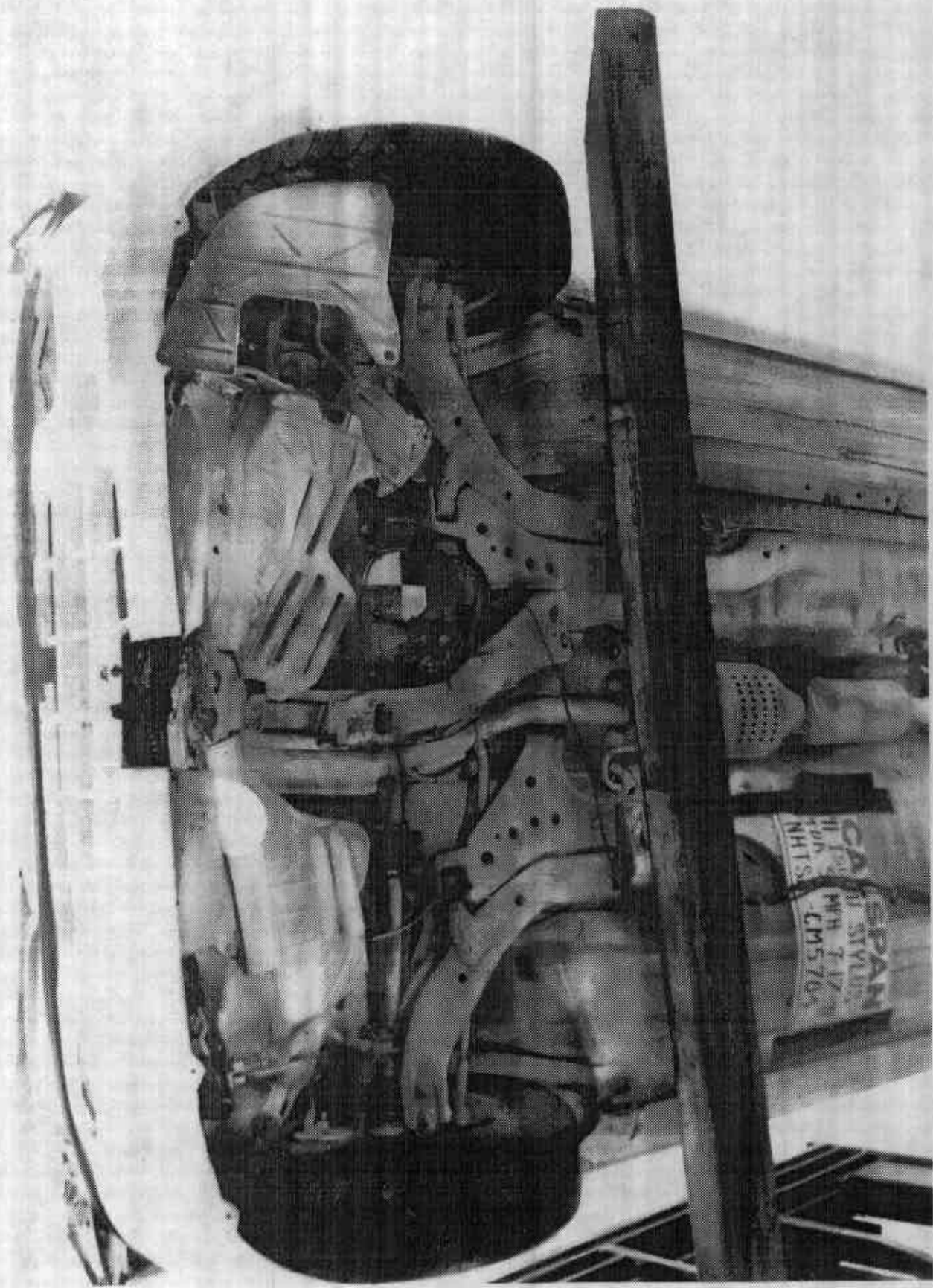


Figure A-19 POST-TEST FRONT UNDERBODY

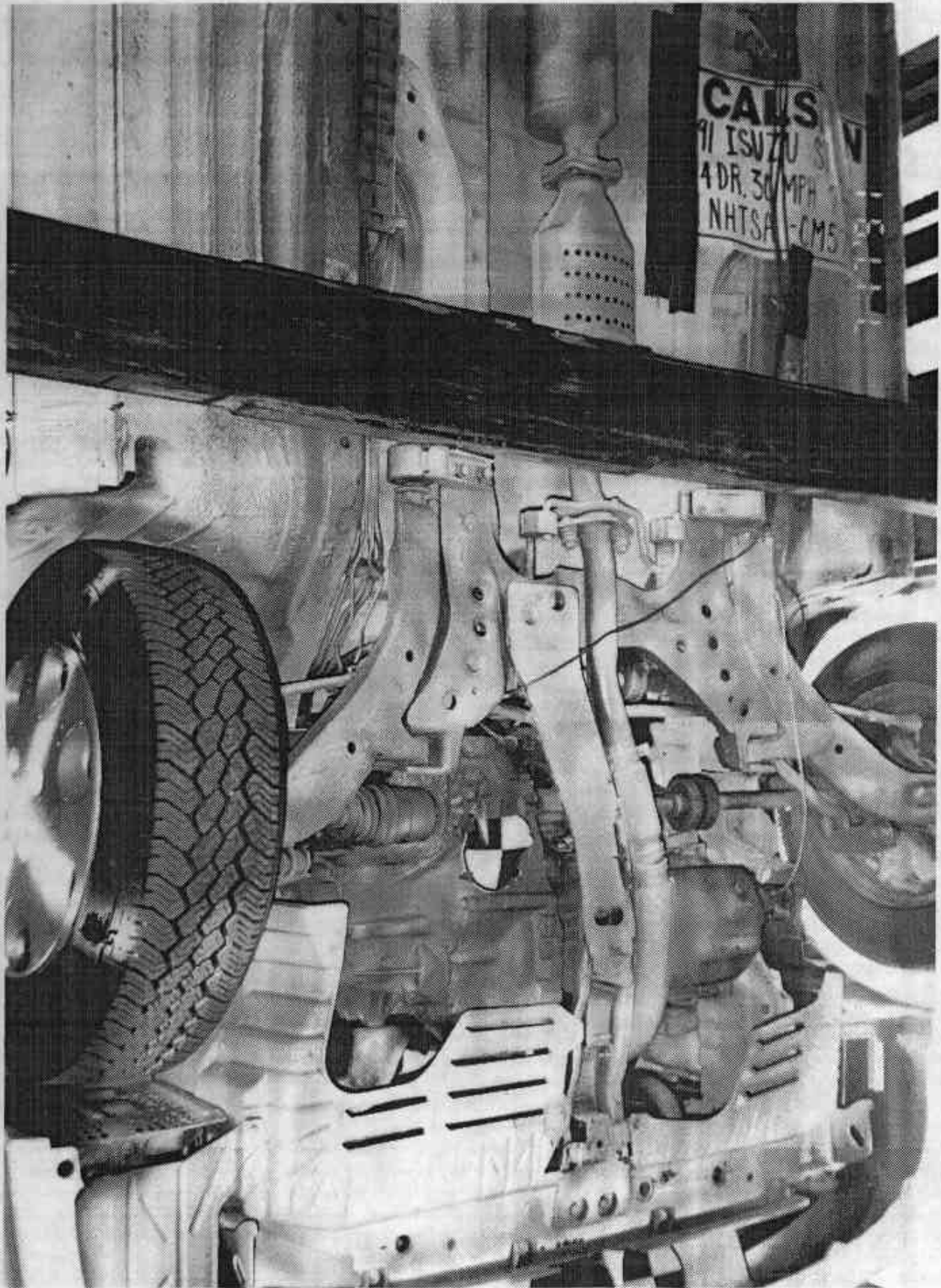


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

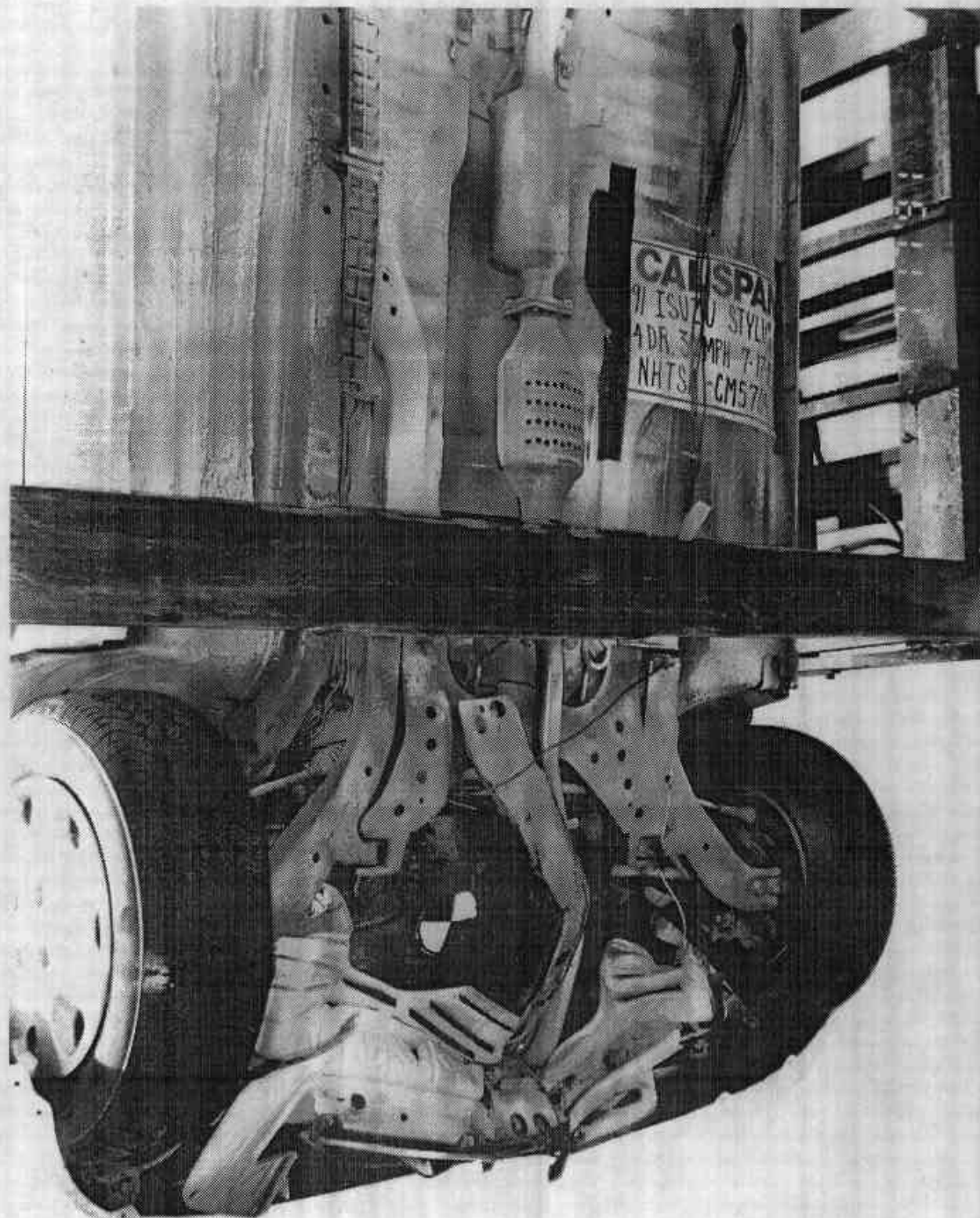


FIGURE A-21 POST-TEST FRONT SIDE UNDERBODY VIEW

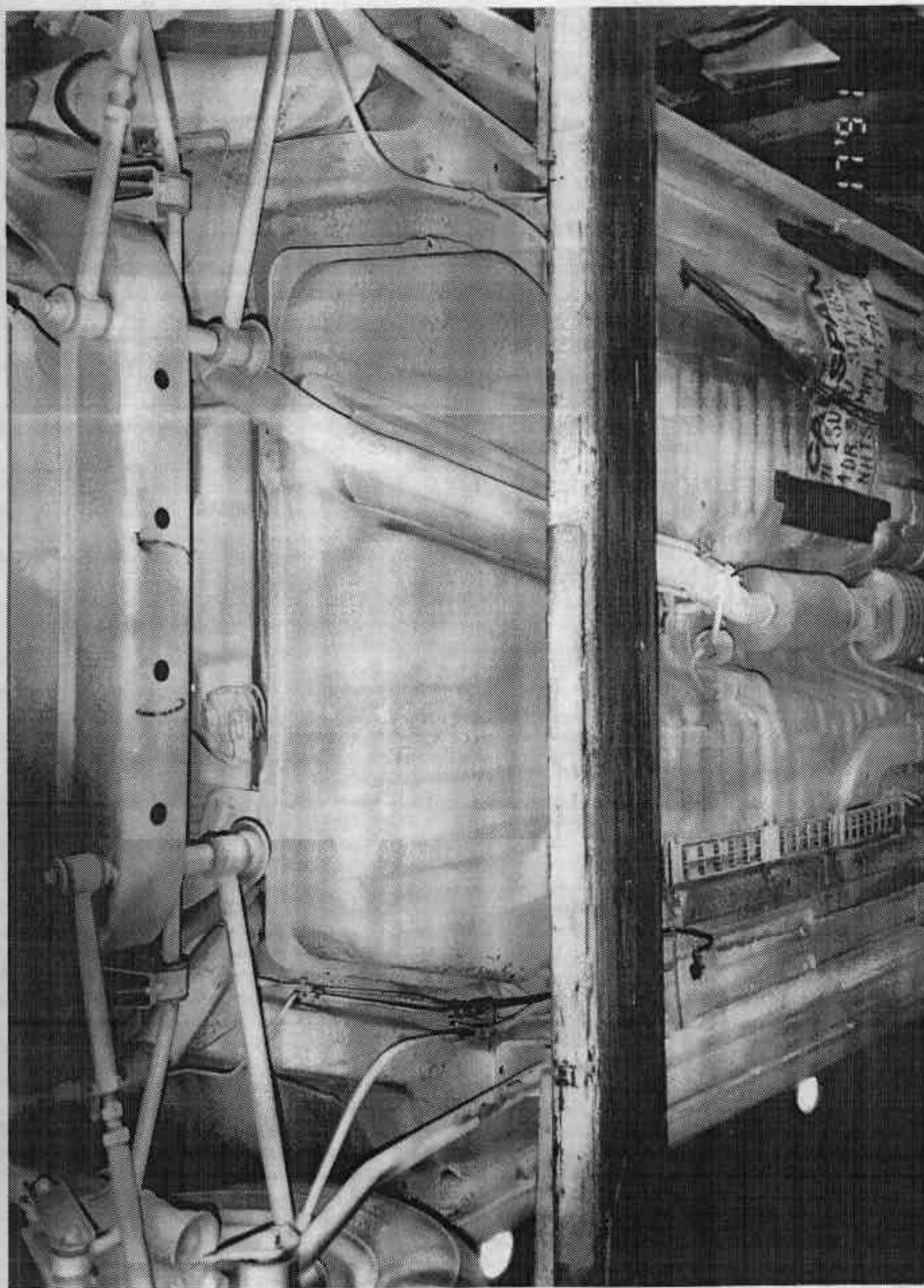


Figure A-22 PRE-TEST REAR UNDERBODY VIEW

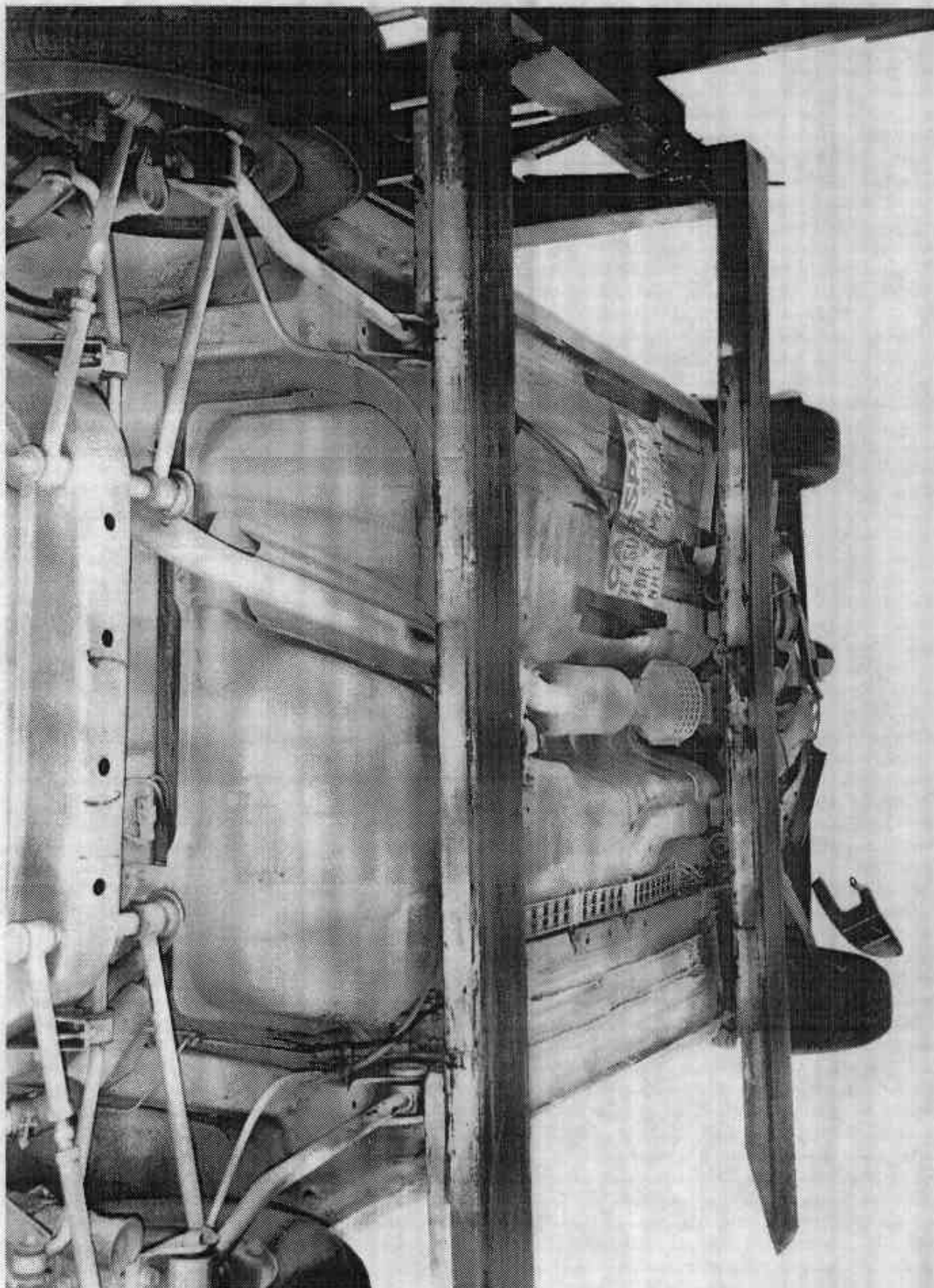


FIGURE A-23 POST-TEST REAR UNDERBODY VIEW

A-25

7920-2



Figure A-24 CERTIFICATION LABEL AND FIRE FLACARD

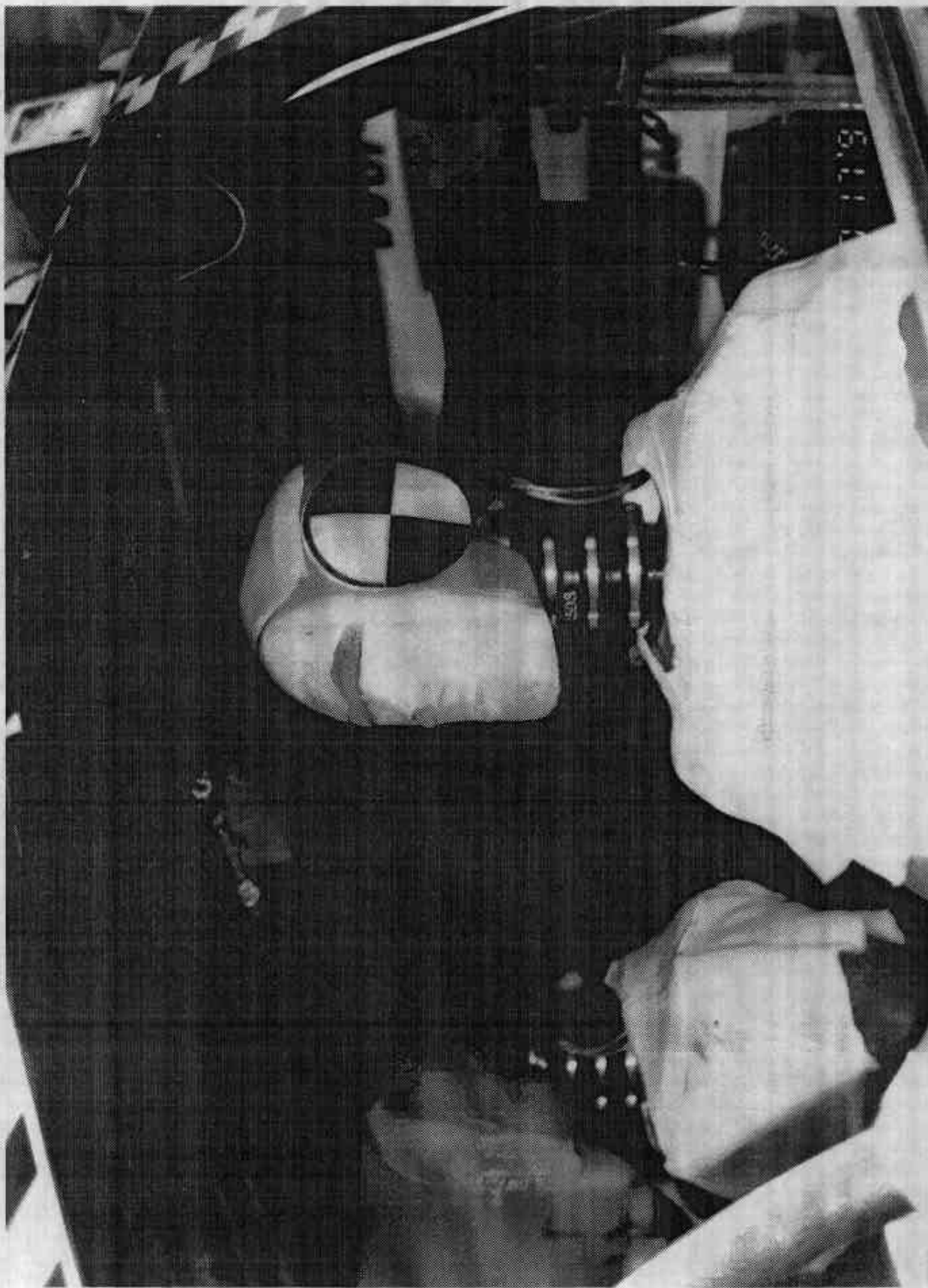


Figure A-26 PRE-TEST DRIVER DUMMY POSITION



Figure A-26 POST-TEST DRIVER DUMMY POSITION



FIGURE A-27 PRE-TEST PASSENGER DUMMY POSITION



Figure A-28 POST-TEST PASSENGER DUMMY POSITION

A-30

7920-2

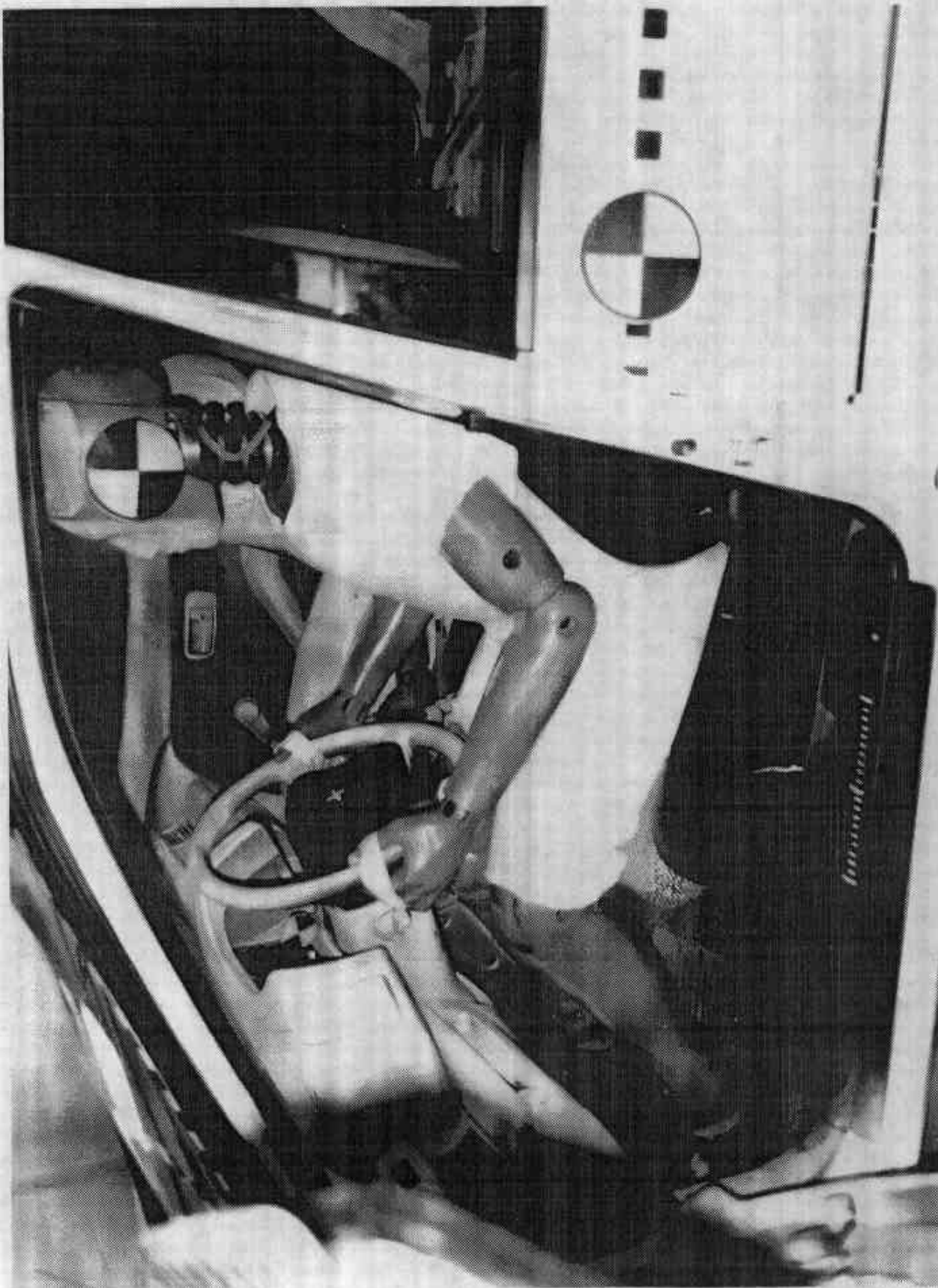


FIGURE A-20 PRE-TEST DRIVER DUMMY AND INTERIOR VIEW



Figure A-20 POST-TEST DRIVER DUMMY AND INTERIOR VIEW



Figure A-31 PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW



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

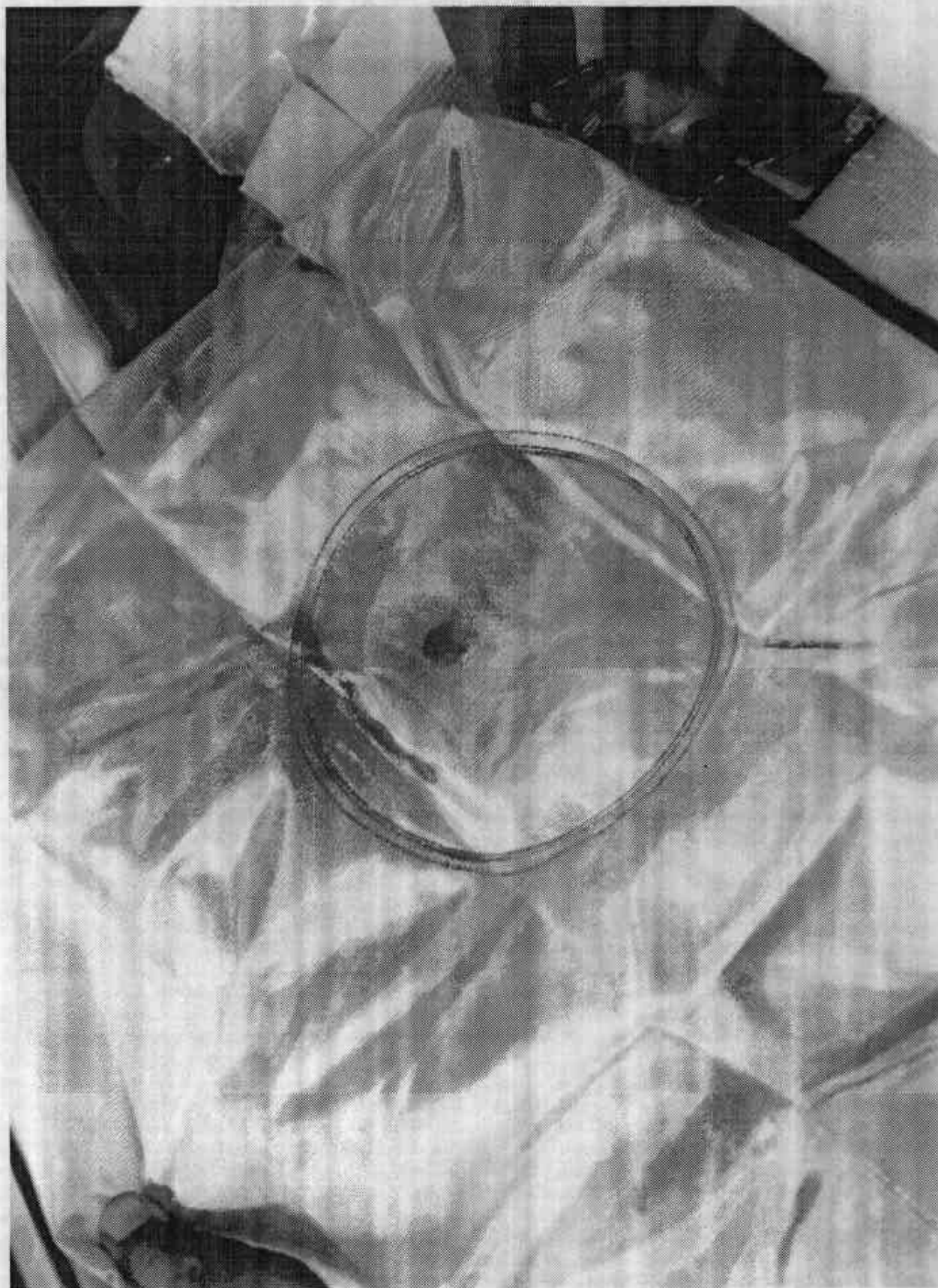


FIGURE A-33 POST-TEST DRIVER AIRBAG VIEW

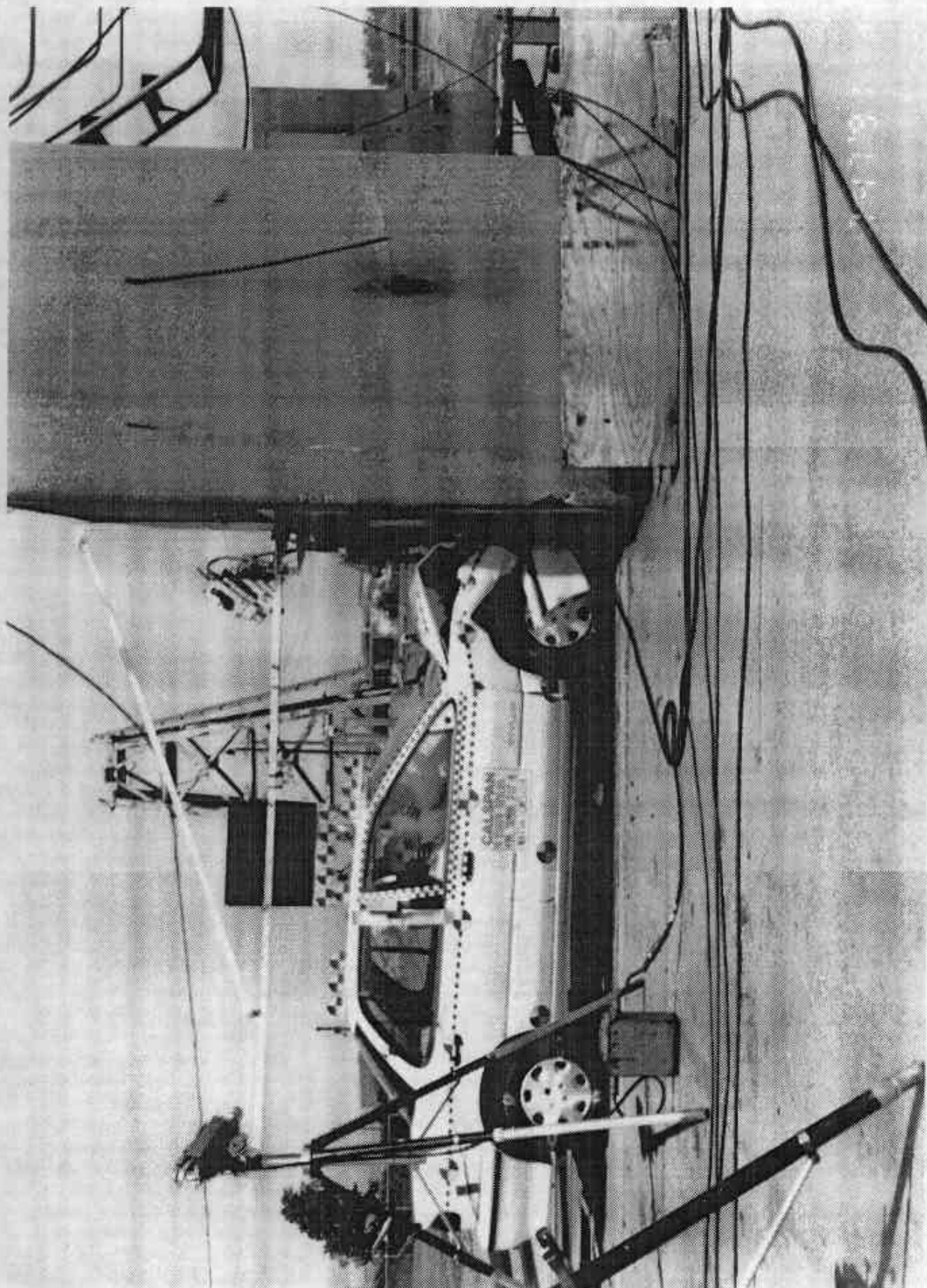


Figure A-34 VEHICLE IMPACT

A-36

7920-2

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CM5704

VEHICLE DATA

FILTER CHANNEL CLASS

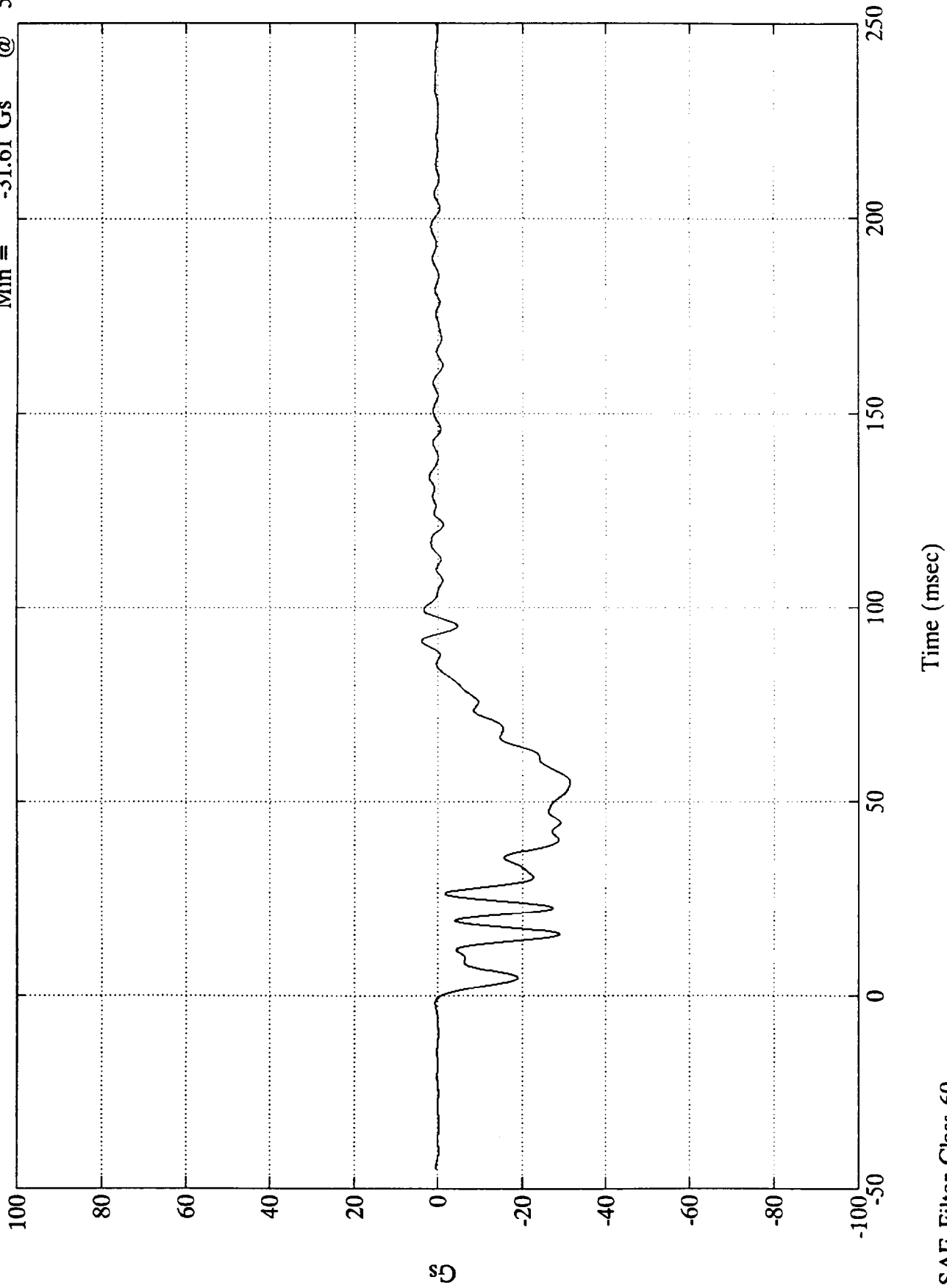
60

Test 1089

L. Rear X-member X (#1)

Max = 3.85 Gs
Min = -31.61 Gs

@ 91.55 msec
@ 55.08 msec



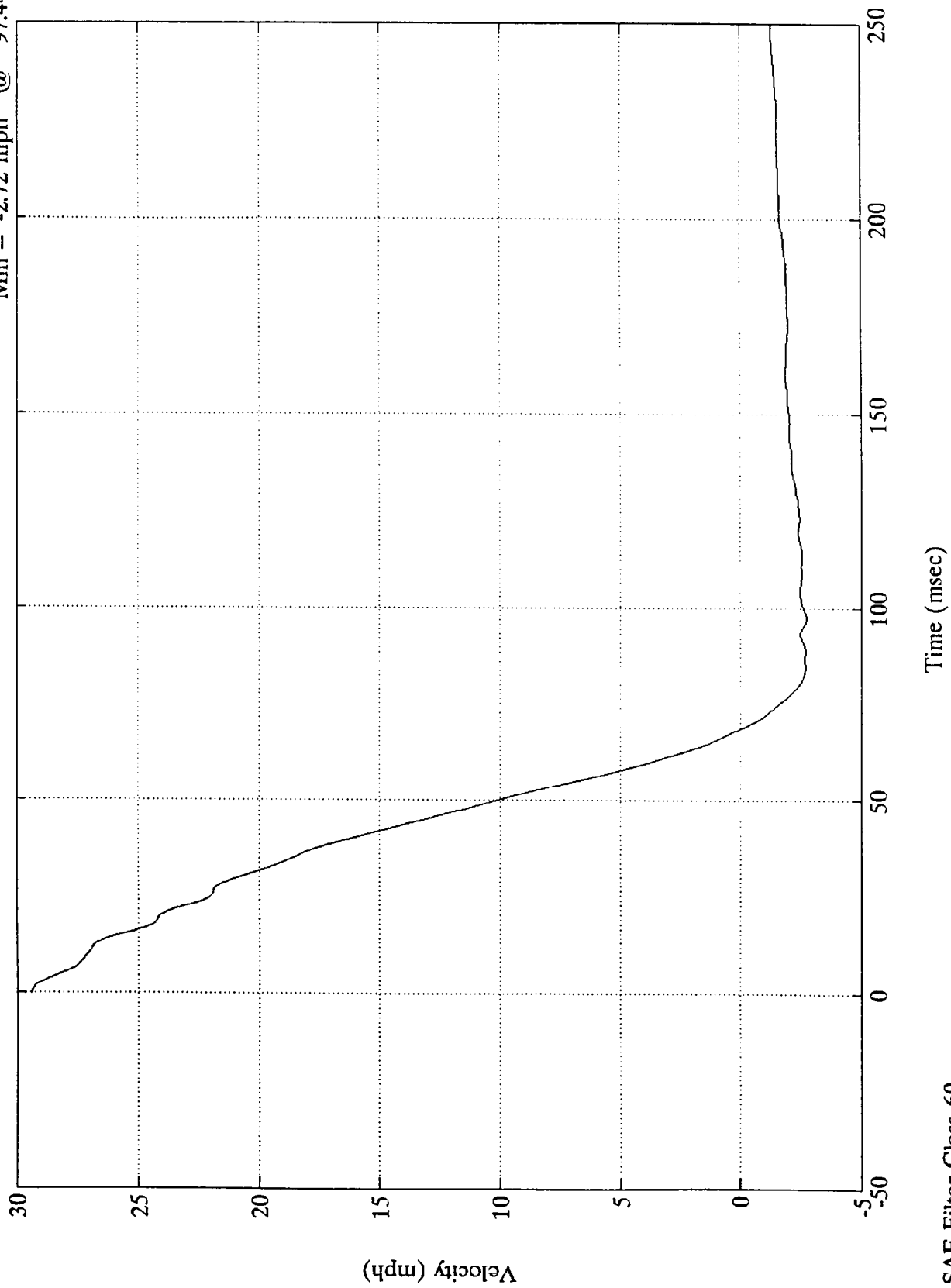
B-3

7920-2
SAE Filter Class 60

Test 1089

L. Rear X-member X (#1)

Max = 29.40 mph @ -0.00 msec
Min = -2.72 mph @ 97.44 msec



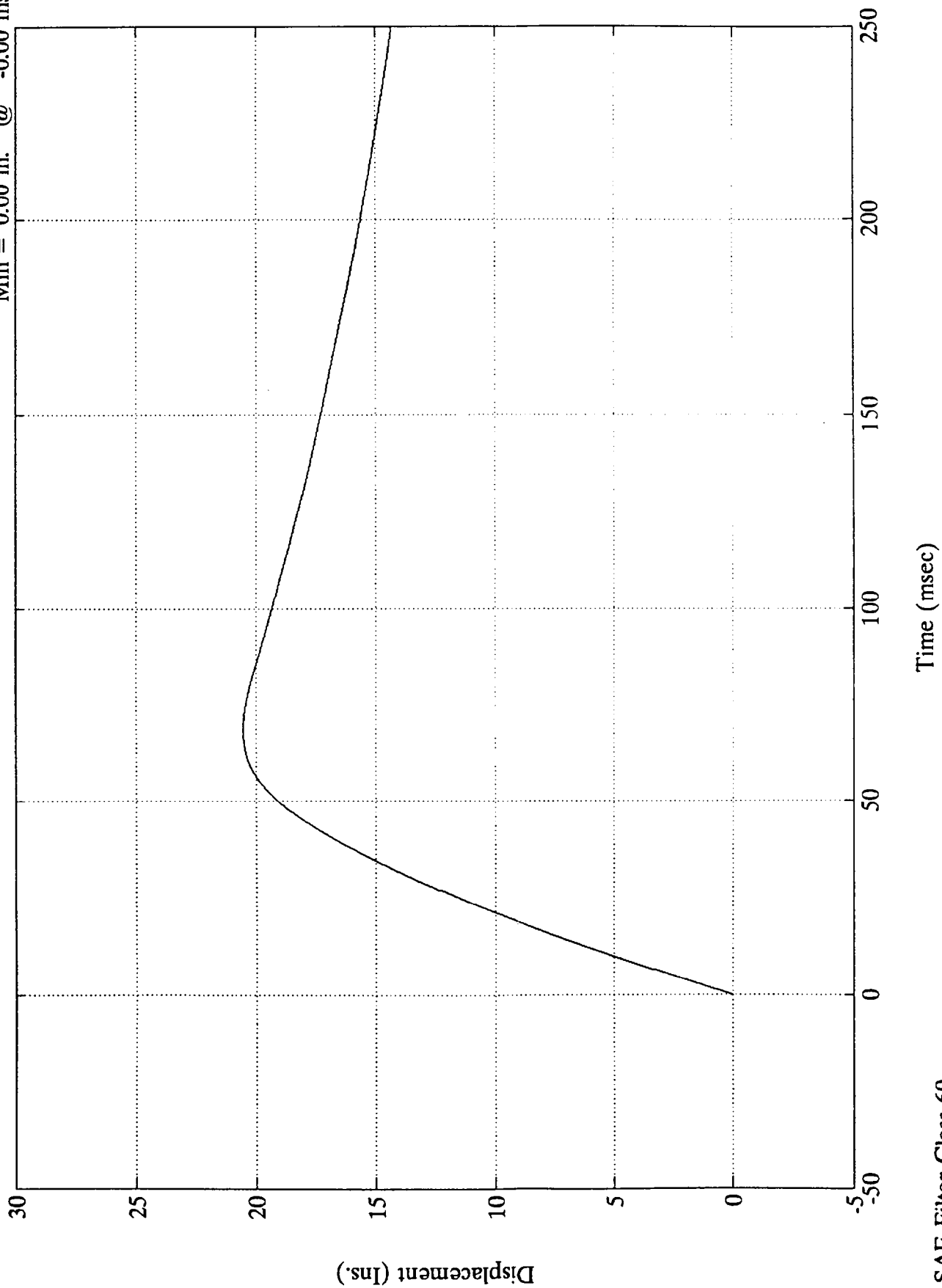
B-4

7920-2

SAE Filter Class 60

Max = 20.53 in. @ 70.08 msec
Min = 0.00 in. @ -0.00 msec

L. Rear X-member X (#1)

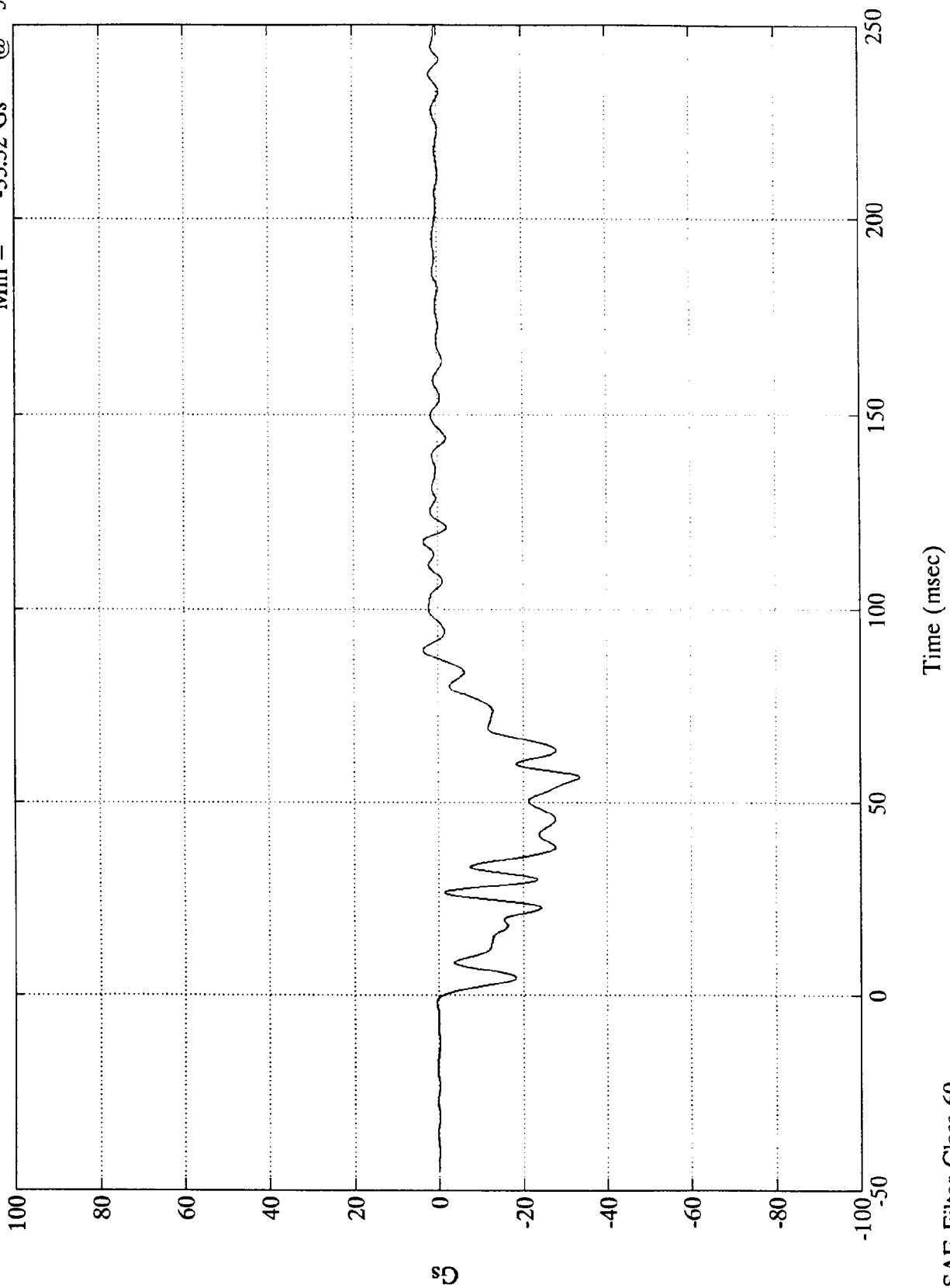


SAE Filter Class 60

Test 1089

R. Rear X-member X (#2)

Max = 3.50 Gs @ 89.63 msec
Min = -33.52 Gs @ 56.76 msec

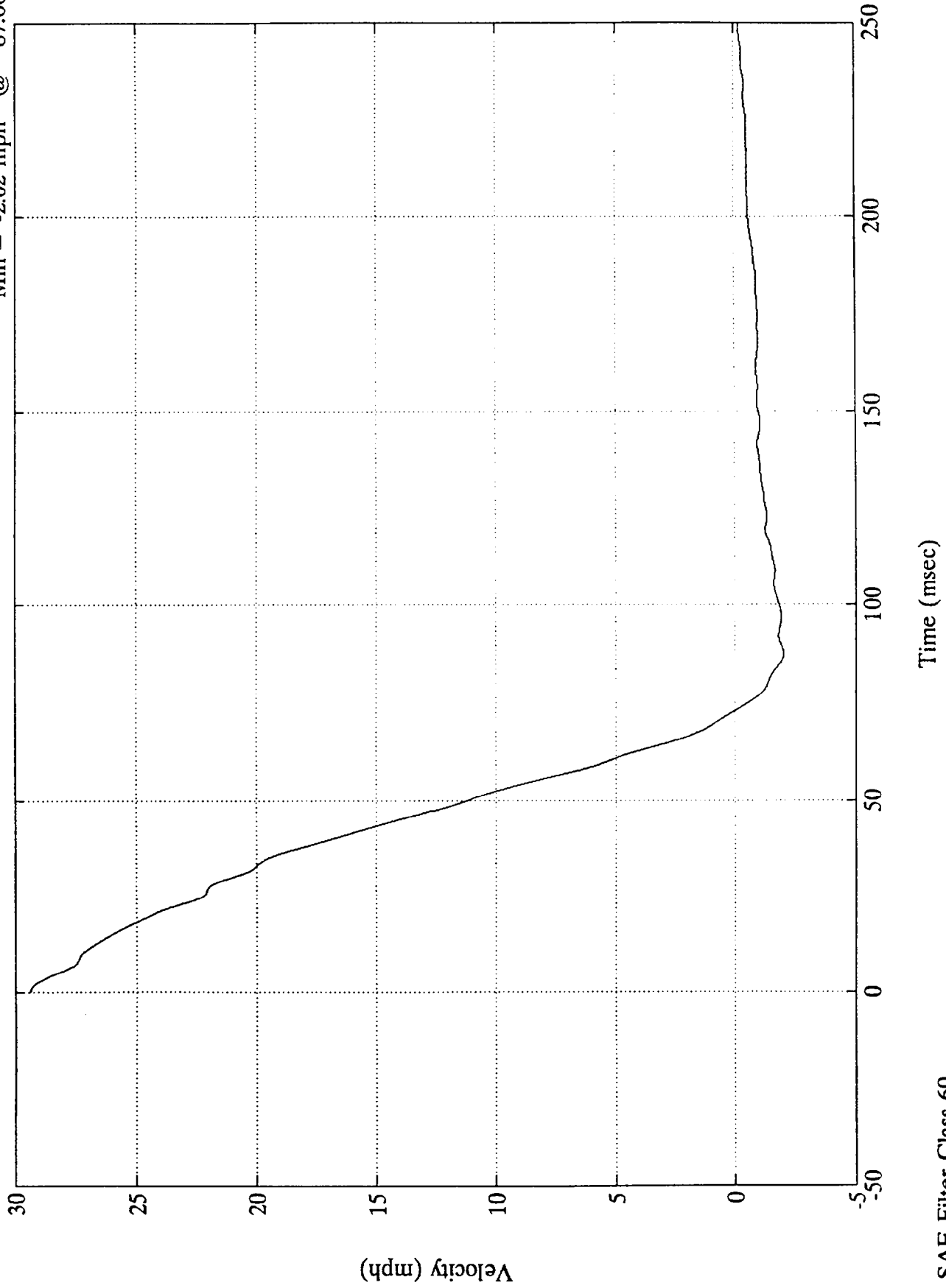


B-6

7920-2
SAE Filter Class 60

Max = 29.40 mph @ -0.00 msec
Min = -2.02 mph @ 87.60 msec

R. Rear X-member X (#2)

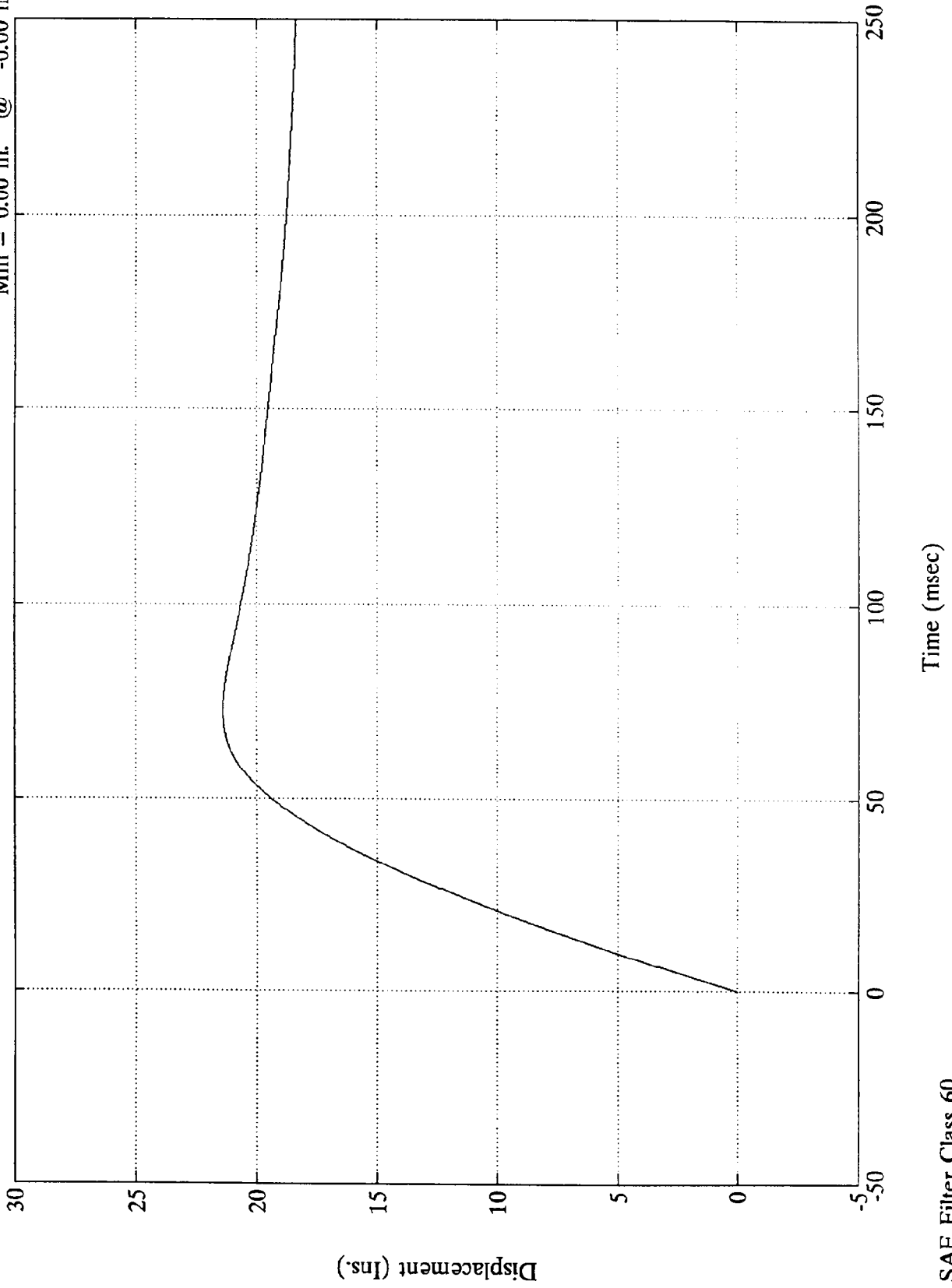


SAE Filter Class 60

Test 1089

R. Rear X-member X (#2)

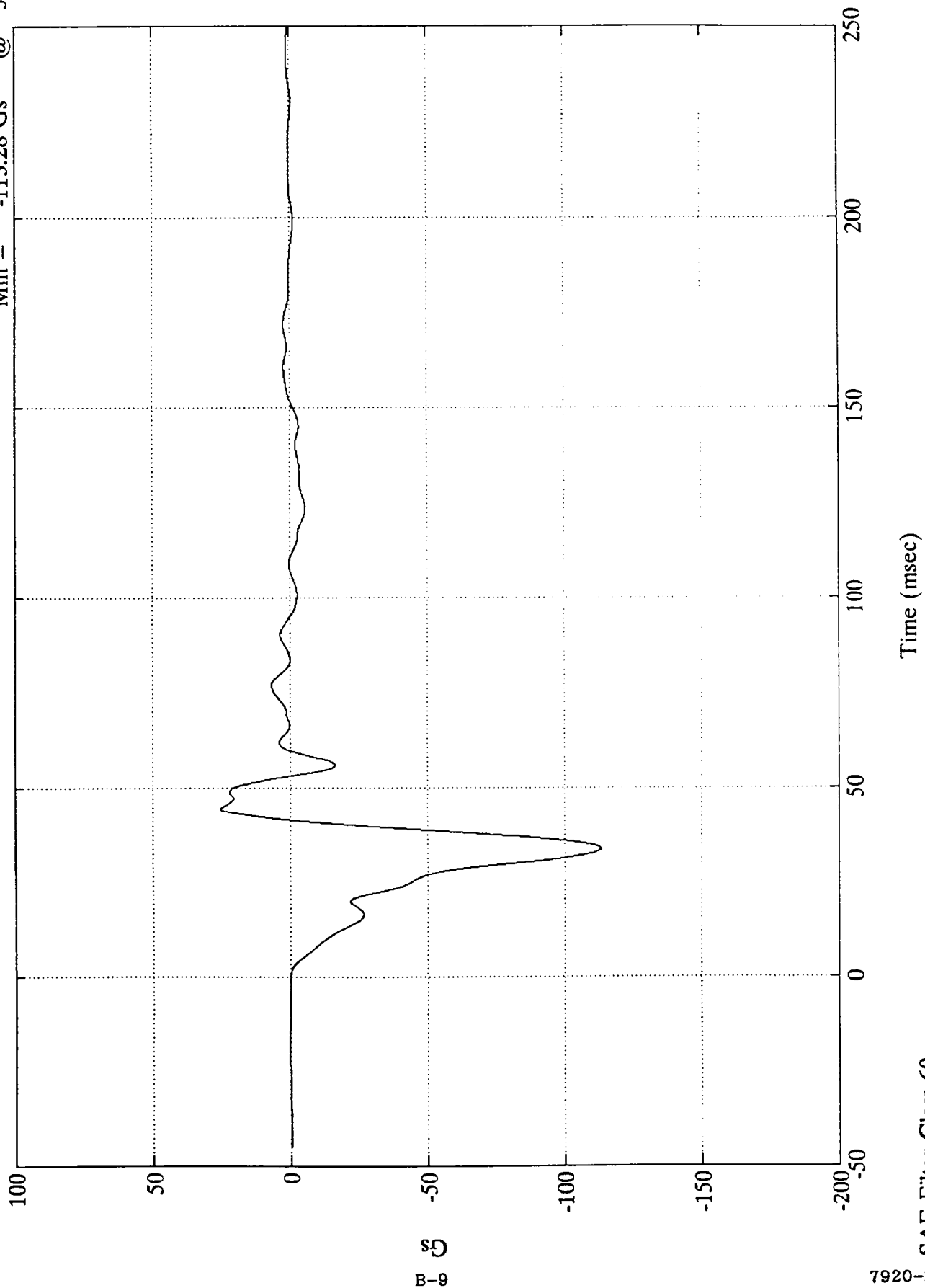
Max = 21.39 in. @ 74.40 msec
Min = 0.00 in. @ -0.00 msec



Test 1089

Engine Top X (#3)

Max = 25.57 Gs @ 44.27 msec
Min = -113.28 Gs @ 33.72 msec



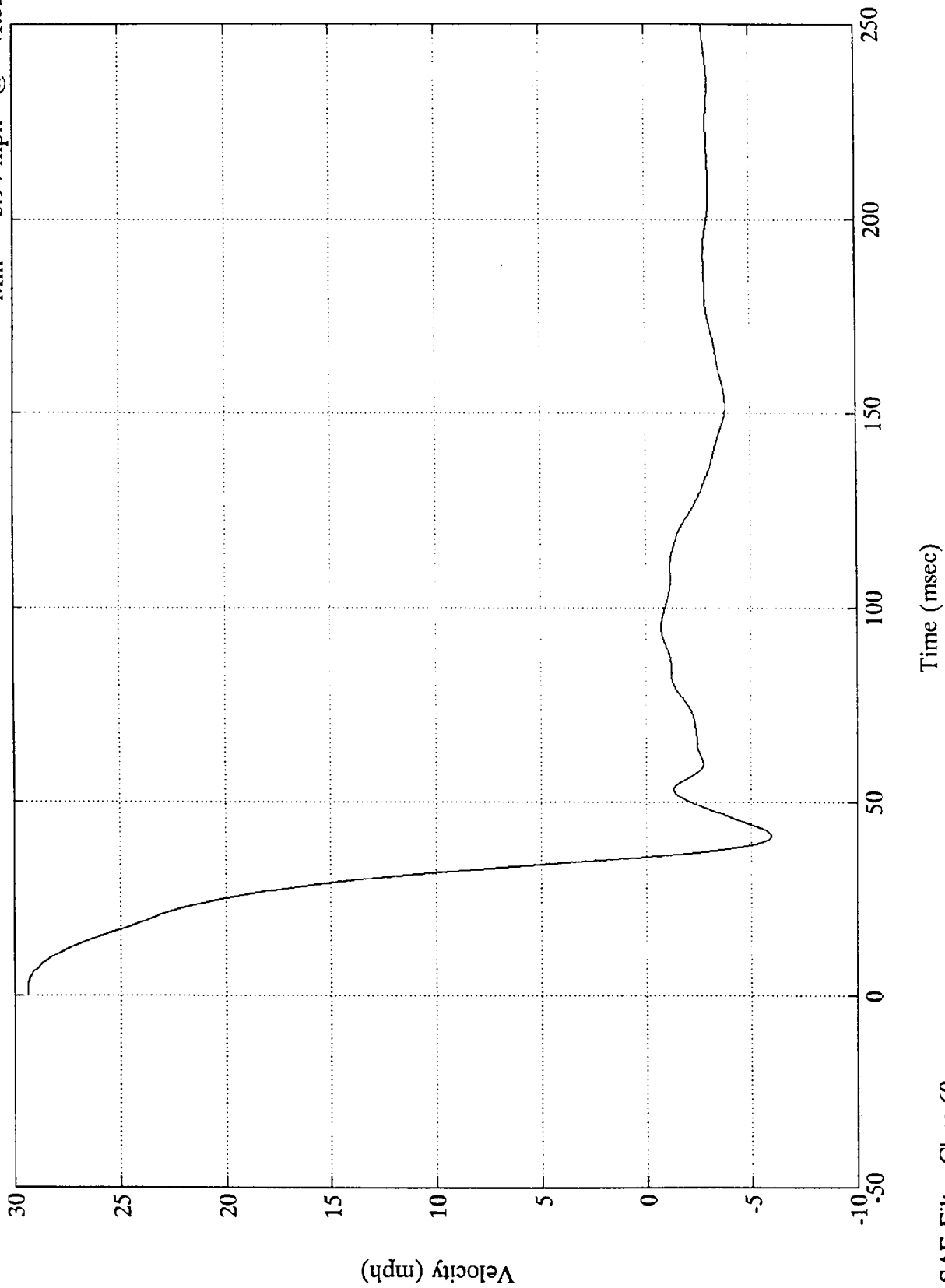
B-9

7920-2 SAE Filter Class 60

Test 1089

Engine Top X (#3)

Max = 29.40 mph @ 1.20 msec
Min = -5.94 mph @ 41.52 msec

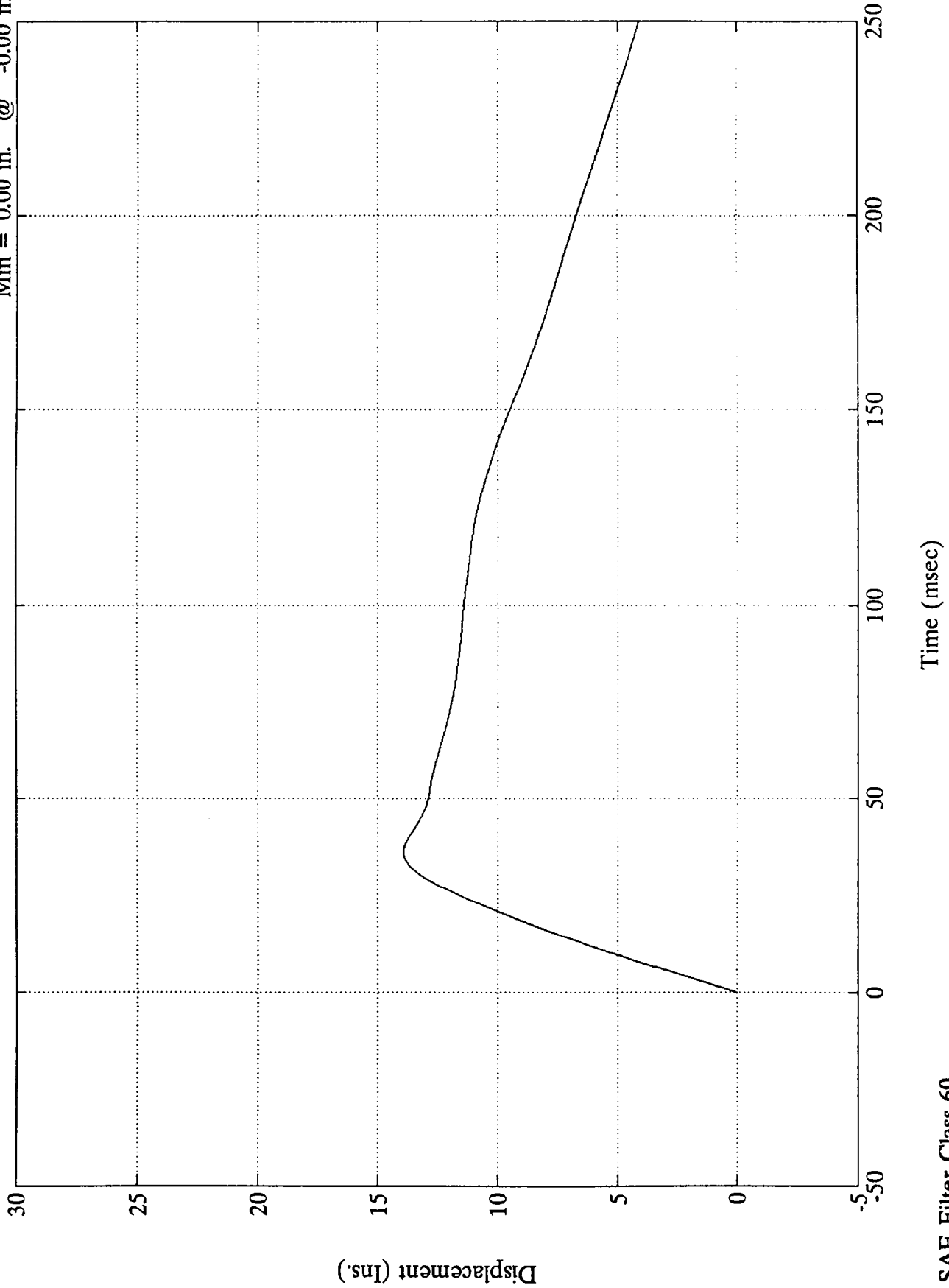


B-10

7920-2
SAE Filter Class 60

Engine Top X (#3)

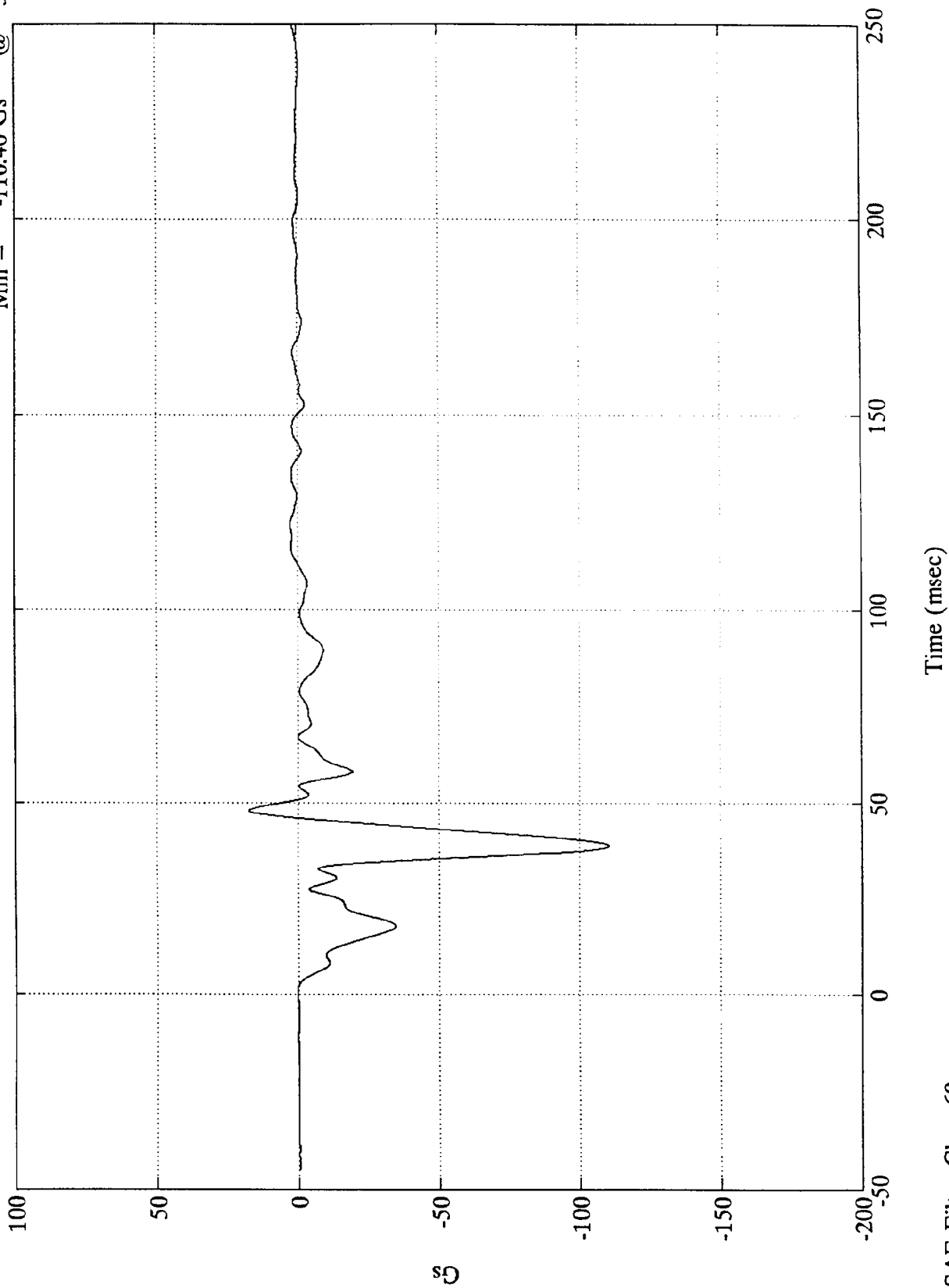
Max = 13.91 in. @ 36.00 msec
Min = 0.00 in. @ -0.00 msec



Test 1089

Engine Bottom X (#4)

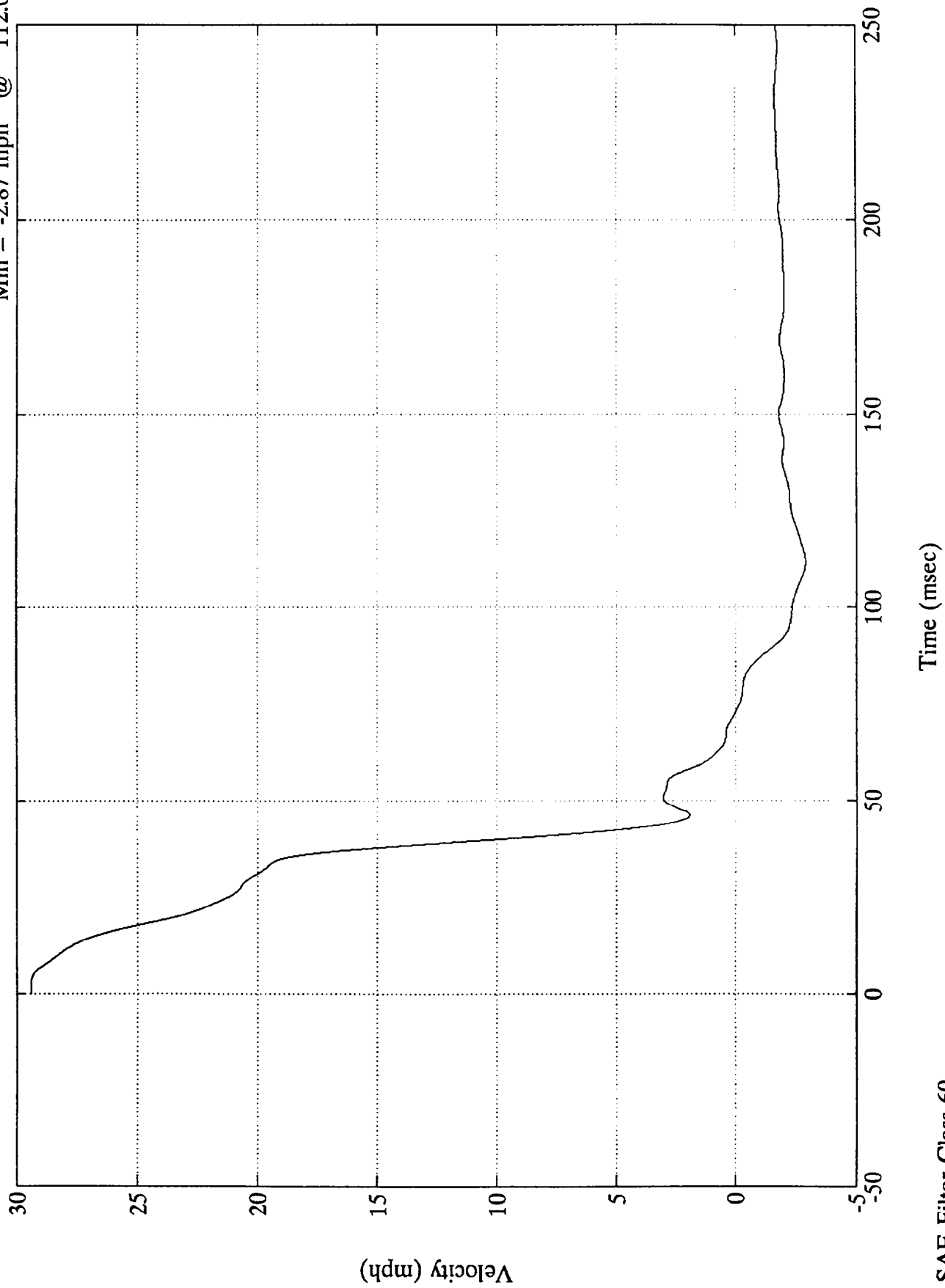
Max = 17.43 Gs @ 48.11 msec
Min = -110.46 Gs @ 39.11 msec



B-12

Max = 29.41 mph @ 3.12 msec
Min = -2.87 mph @ 112.08 msec

Engine Bottom X (#4)

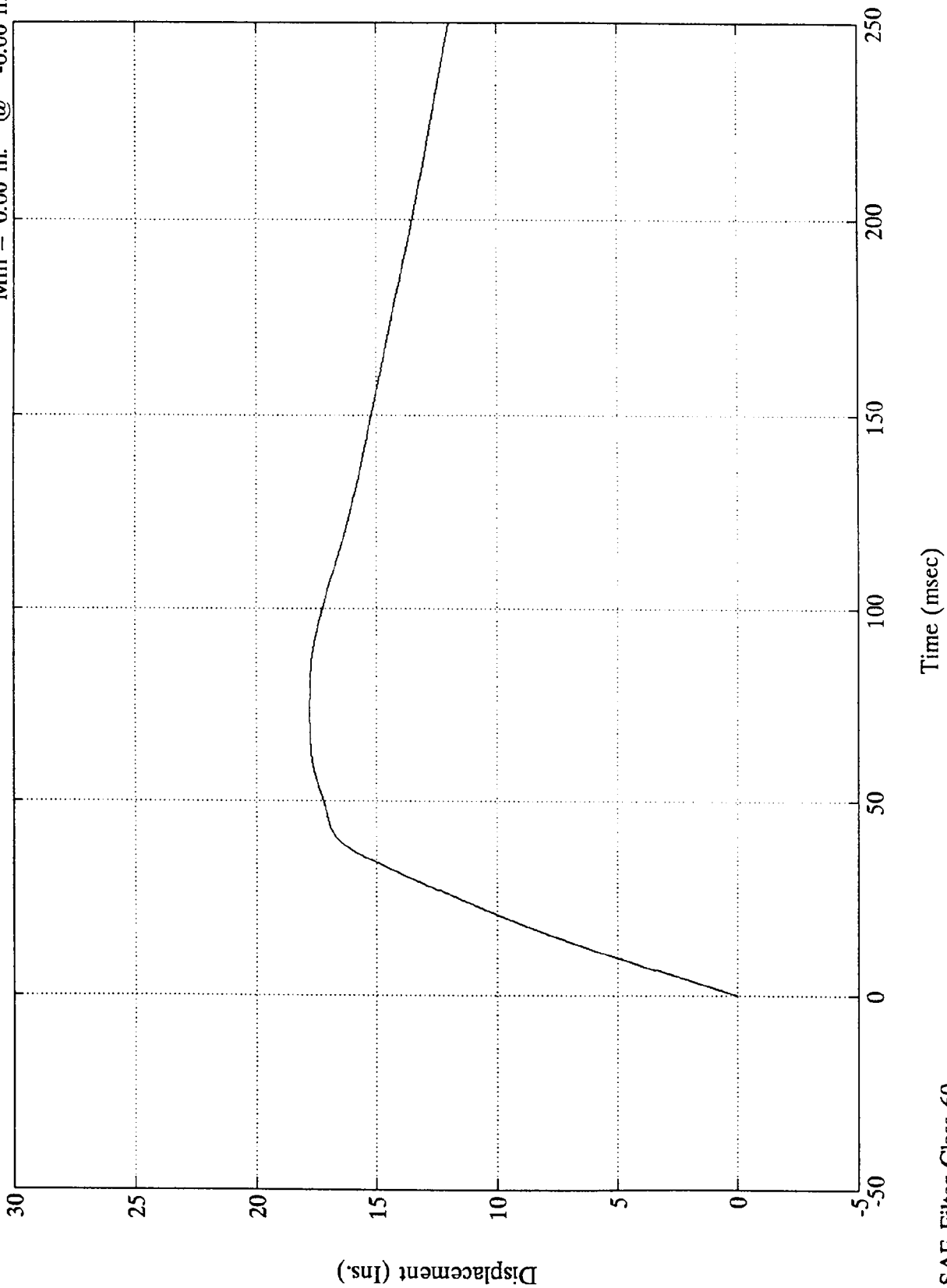


SAE Filter Class 60

Test 1089

Engine Bottom X (#4)

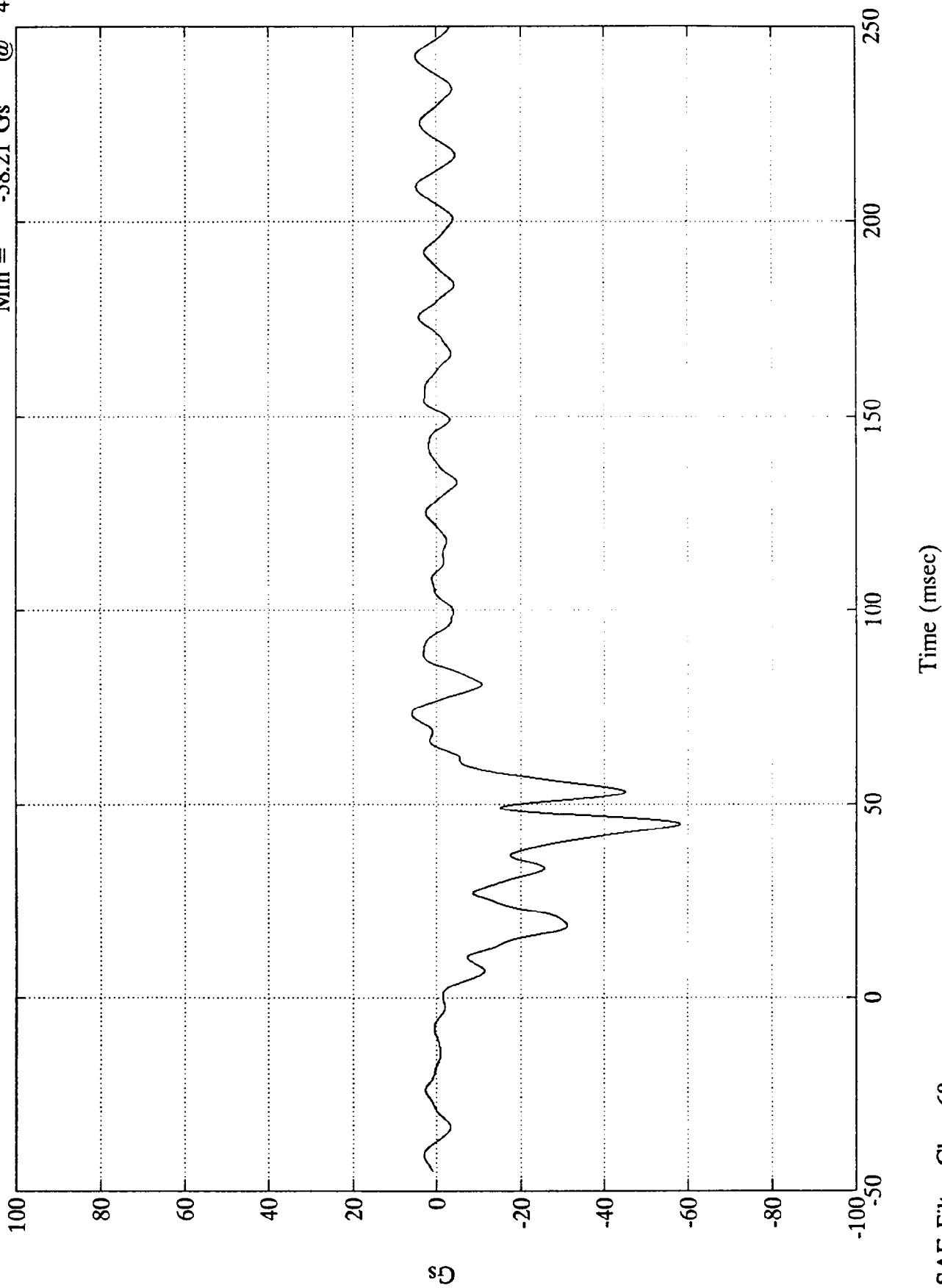
Max = 17.78 in. @ 76.32 msec
Min = 0.00 in. @ -0.00 msec



B-14

7920-2

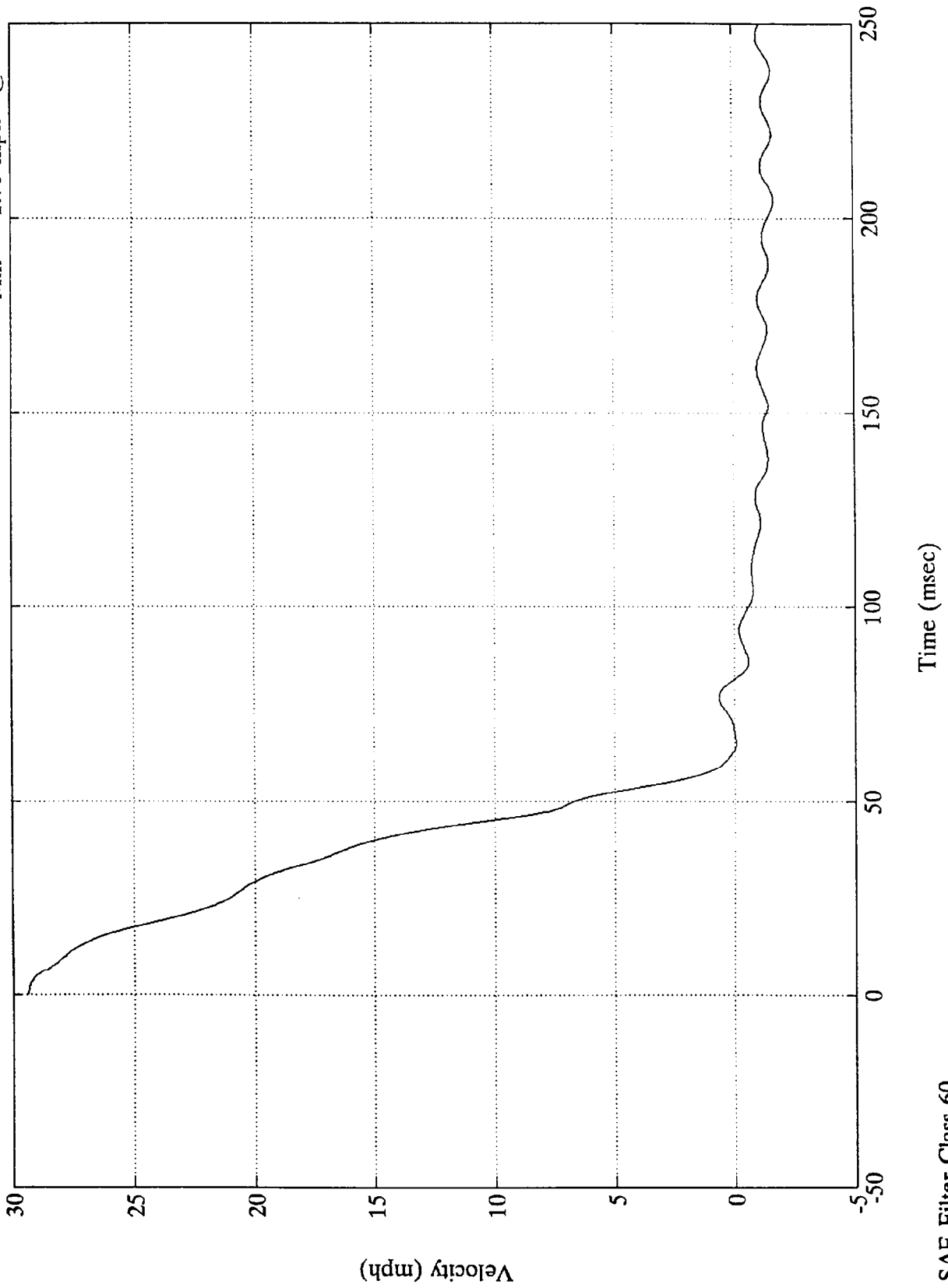
SAE Filter Class 60



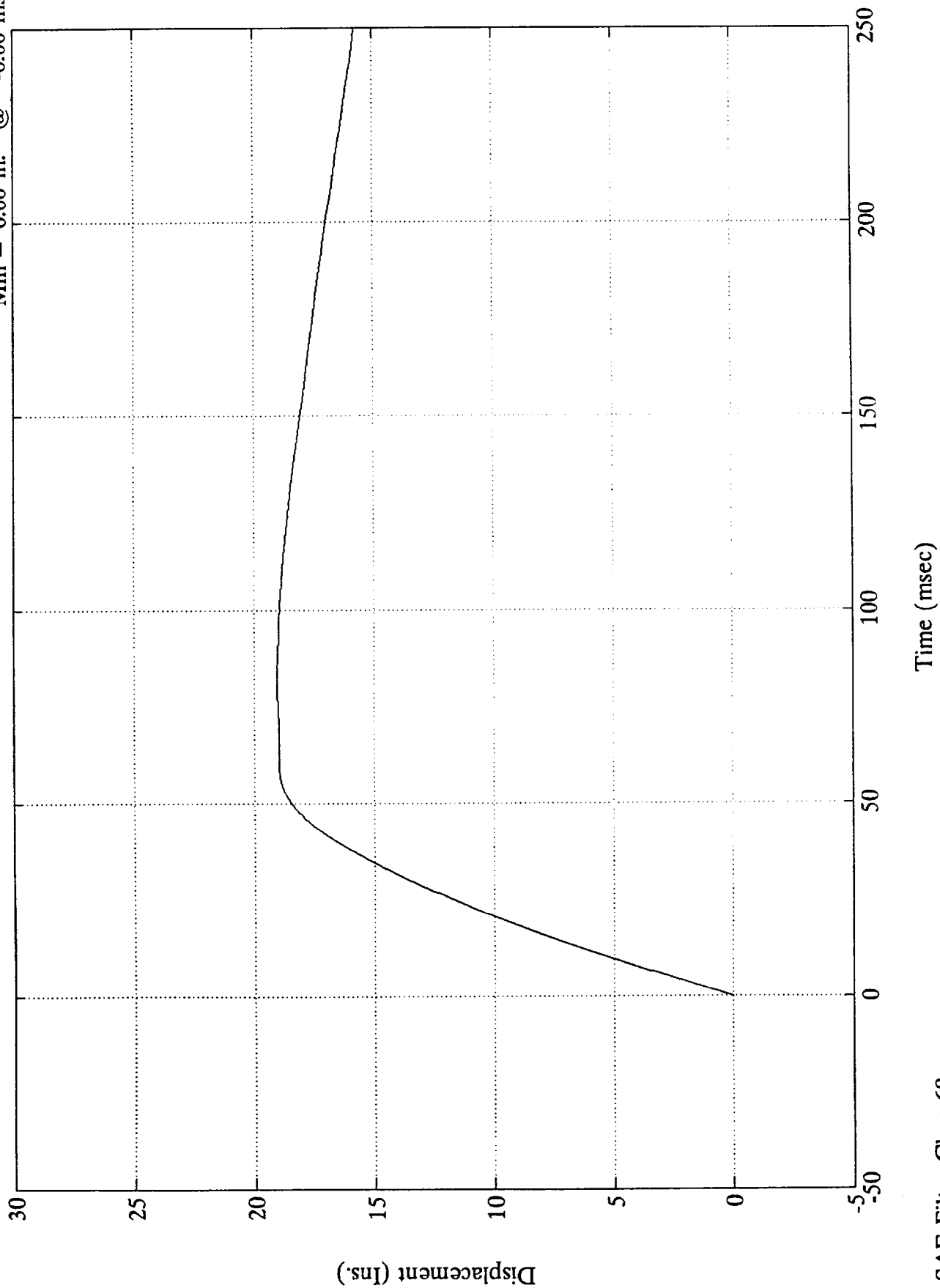
Test 1089

R. Brake Caliper X (#5)

Max = 29.40 mph @ -0.00 msec
Min = -1.70 mph @ 204.48 msec



R. Brake Caliper X (#5) Max = 19.06 in. @ 82.56 msec
Min = 0.00 in. @ -0.00 msec

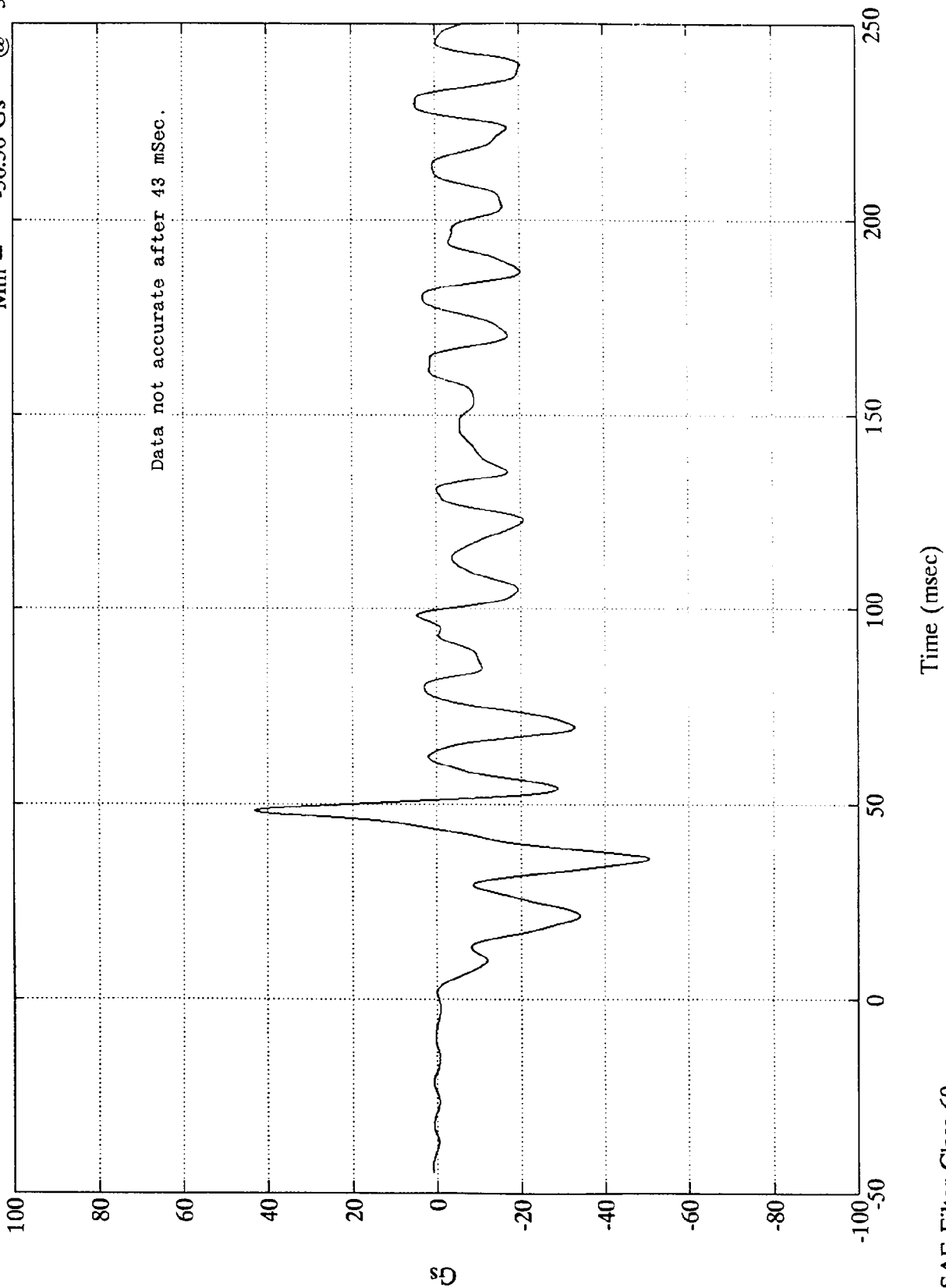


SAE Filter Class 60

Test 1089

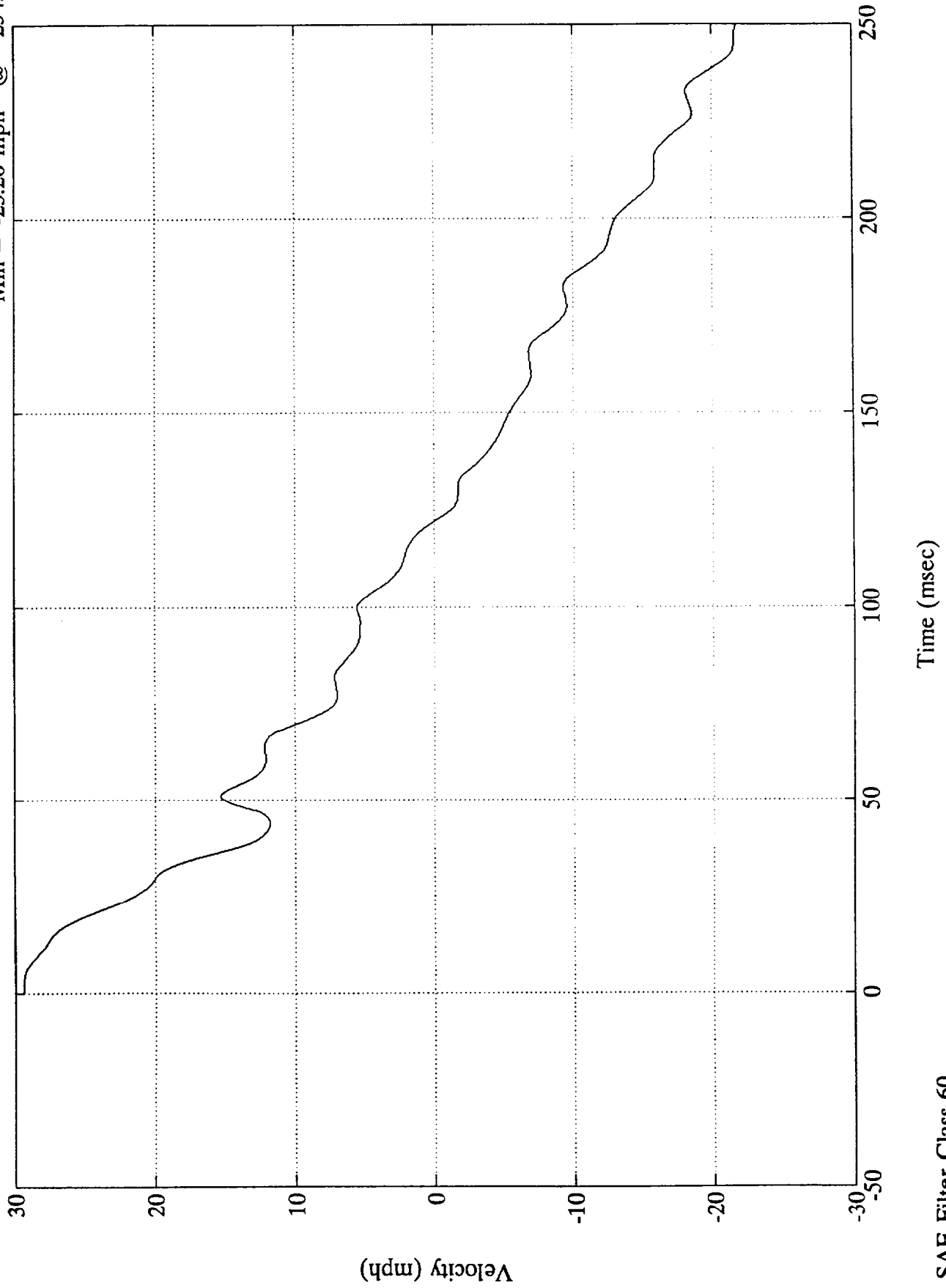
L Brake Caliper X (#6)

Max = 43.09 Gs @ 48.47 msec
Min = -50.56 Gs @ 36.24 msec



SAE Filter Class 60

L. Brake Caliper X (#6)
Max = 29.40 mph @ 0.24 msec
Min = -23.26 mph @ 254.88 msec

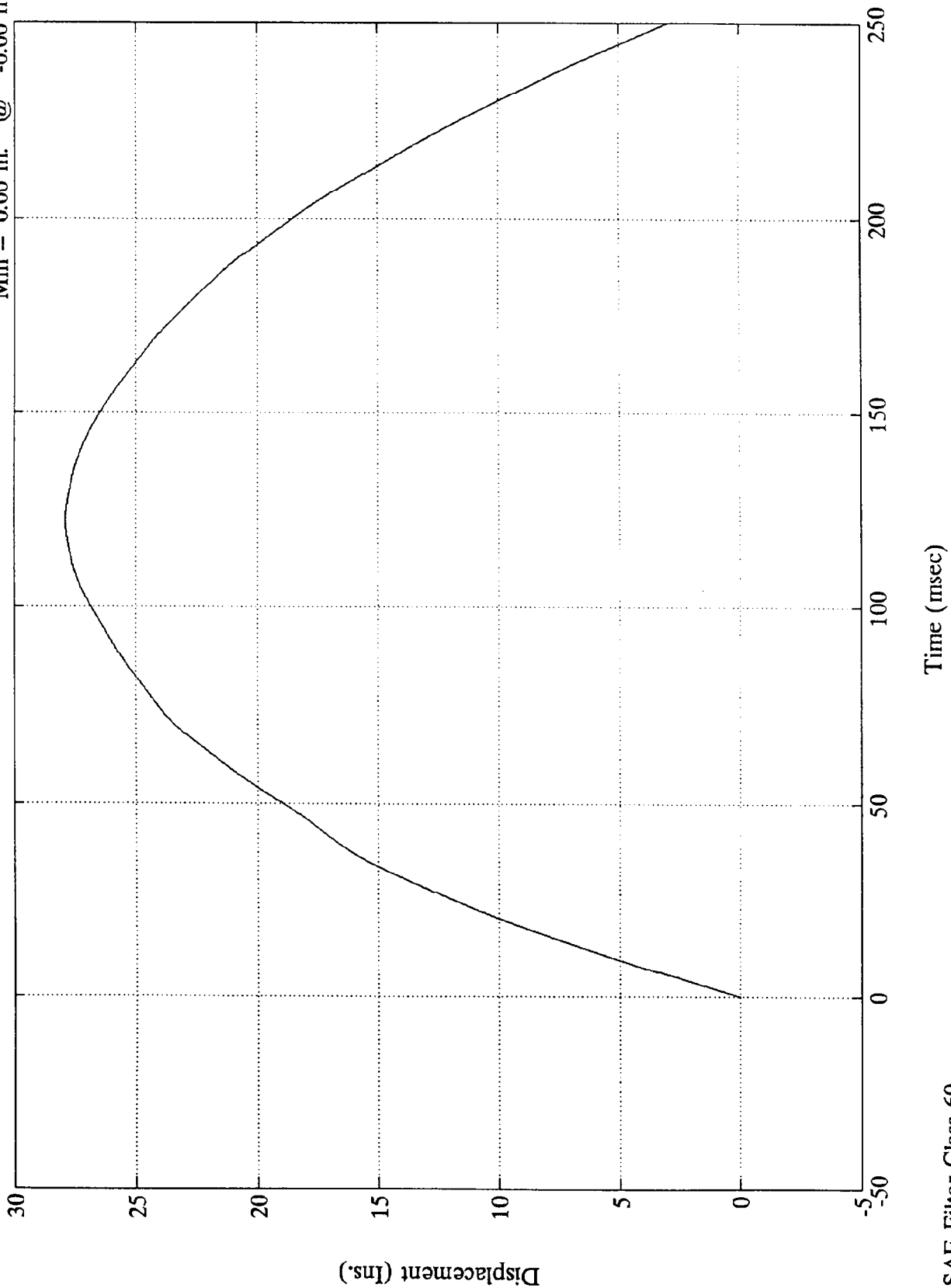


SAE Filter Class 60

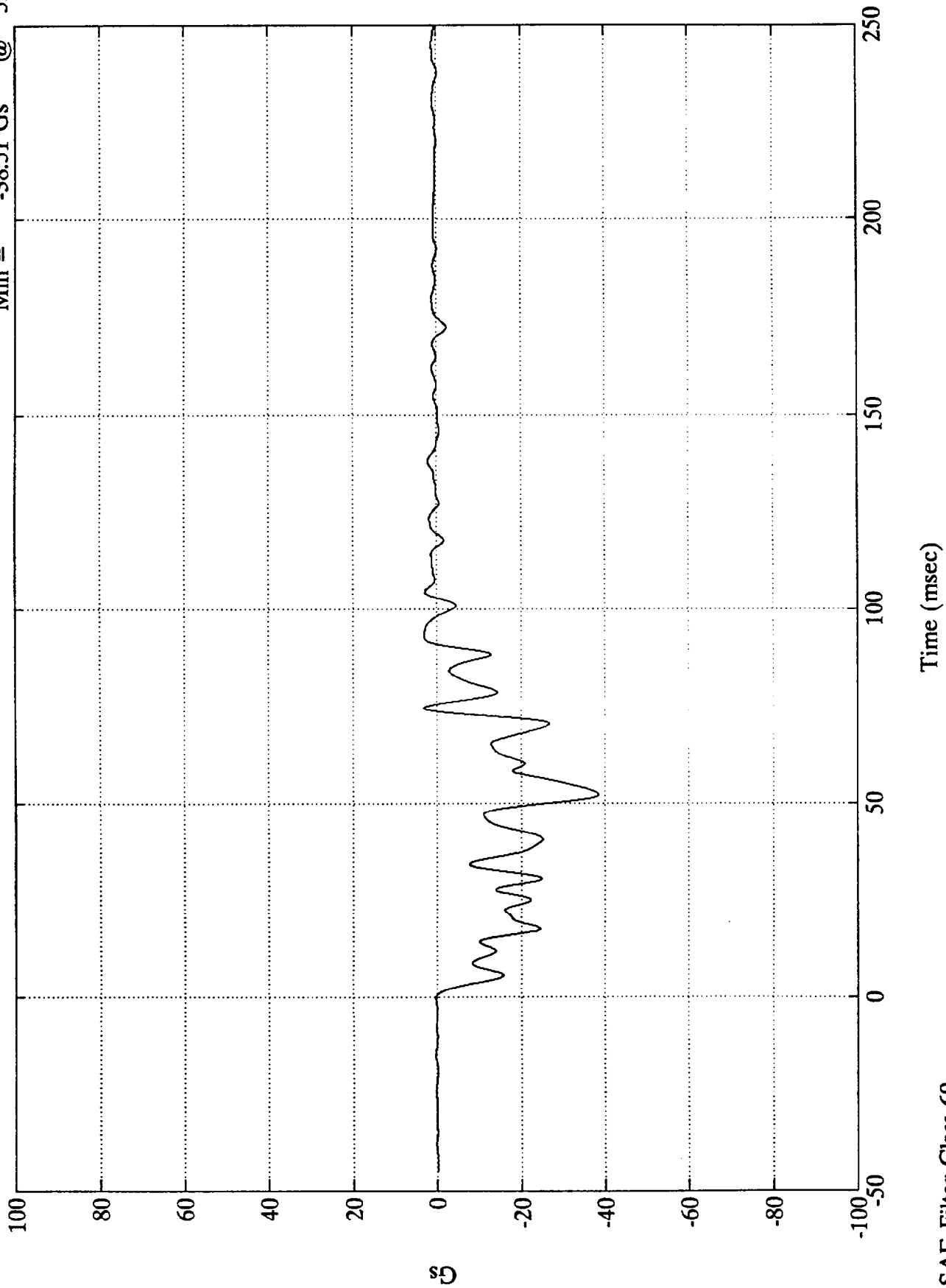
Test 1089

L. Brake Caliper X (#6)

Max = 27.90 in. @ 122.88 msec
Min = 0.00 in. @ -0.00 msec



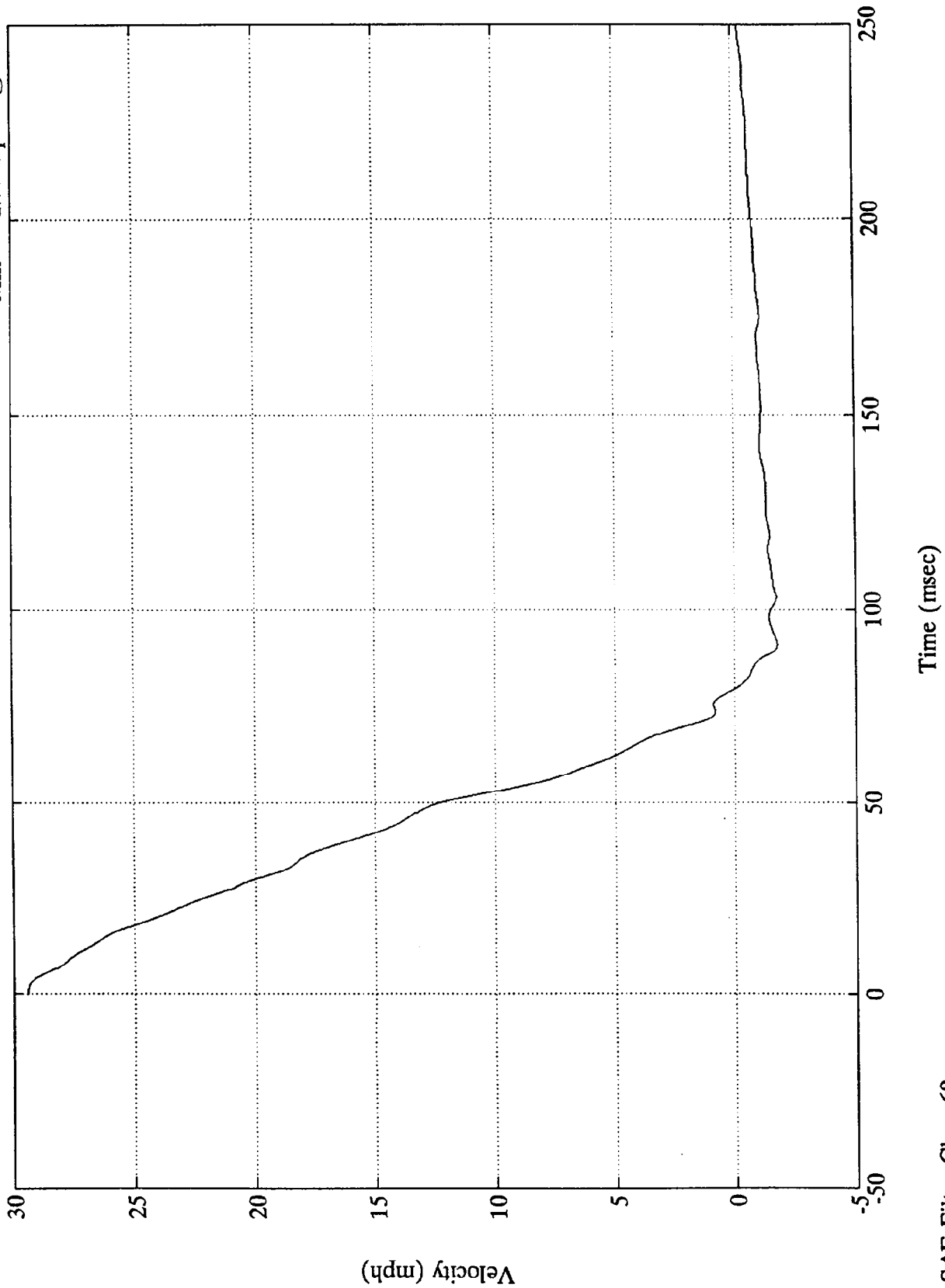
Instrument Panel X (#7)
Max = 3.08 Gs @ 74.63 msec
Min = -38.51 Gs @ 52.31 msec



Test 1089

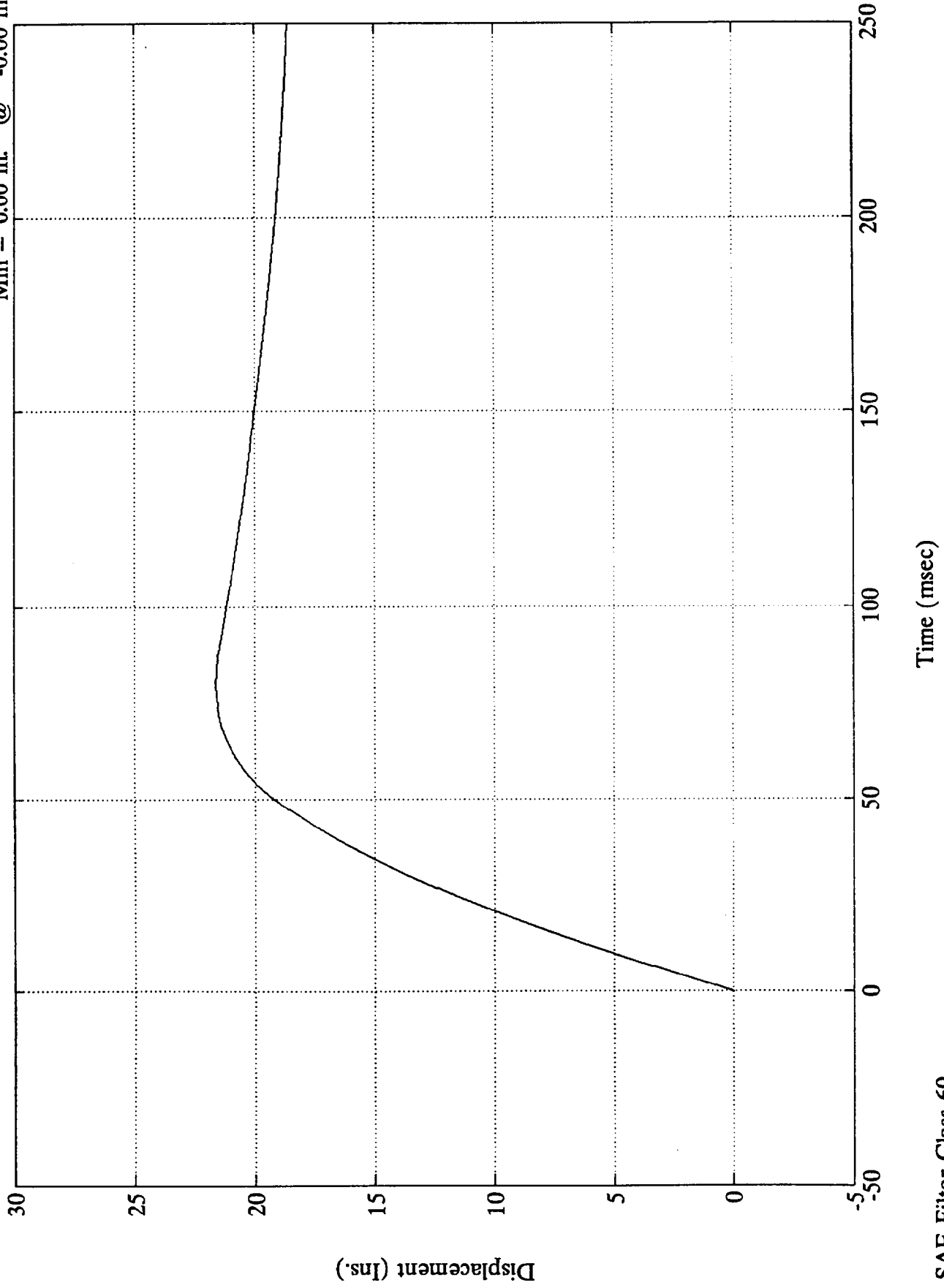
Instrument Panel X (#7)

Max = 29.40 mph @ 1.20 msec
Min = -1.77 mph @ 91.20 msec



Max = 21.61 in. @ 81.12 msec
Min = 0.00 in. @ -0.00 msec

Instrument Panel X (#7)



SAE Filter Class 60

TEST NO. CM5704

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

PRECEDENCE: HIGH
RUN #: 1089
SERIES #: 14

TEST DATE: 12-22-77
TEST TIME: 12:22:22
BOARD: a

TITLE: NHTSA 208 TEST #14 ISUZU STYLUS

HIC SUMMARY: Pos. 1 Head Resultant

hic: 256.60
t1 = 45.360 msec
t2 = 79.440 msec
Average G's Over Hic Duration = 35.54

CLIP SUMMARY: Pos. 1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 43.370 G's
Tstart = 70.8000 ms
Tend = 73.9200 ms
CSI = 289.281

HIC SUMMARY: Pos. 2 Head Resultant

hic: 622.18
t1 = 70.800 msec
t2 = 106.680 msec
Average G's Over Hic Duration = 49.62

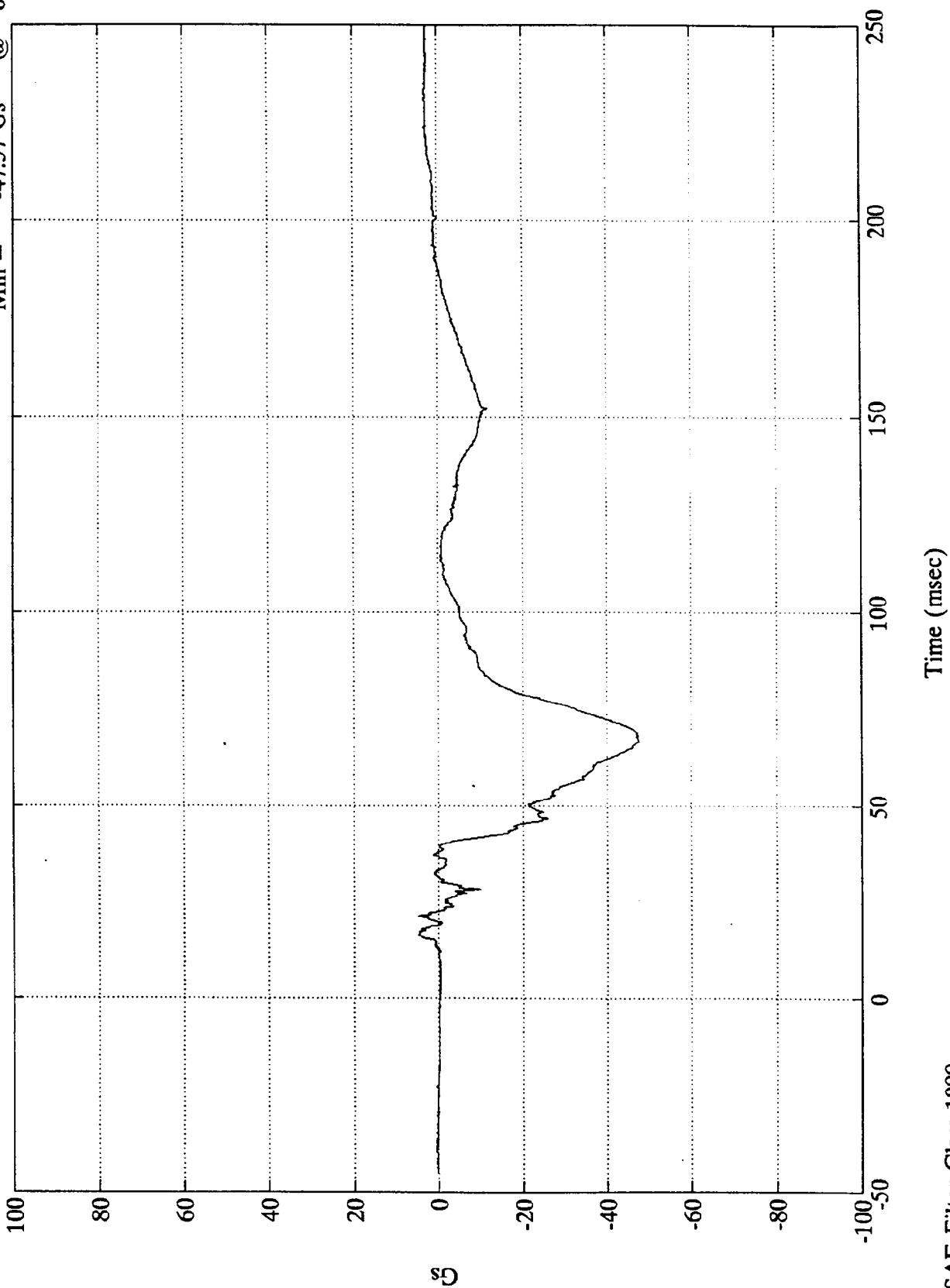
CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 41.166 G's
Tstart = 70.5600 ms
Tend = 73.6800 ms
CSI = 308.933

Test 1089

Pos. 1 Head X

Max = 4.81 Gs @ 21.23 msec
Min = -47.57 Gs @ 66.84 msec



B-26

7920-2

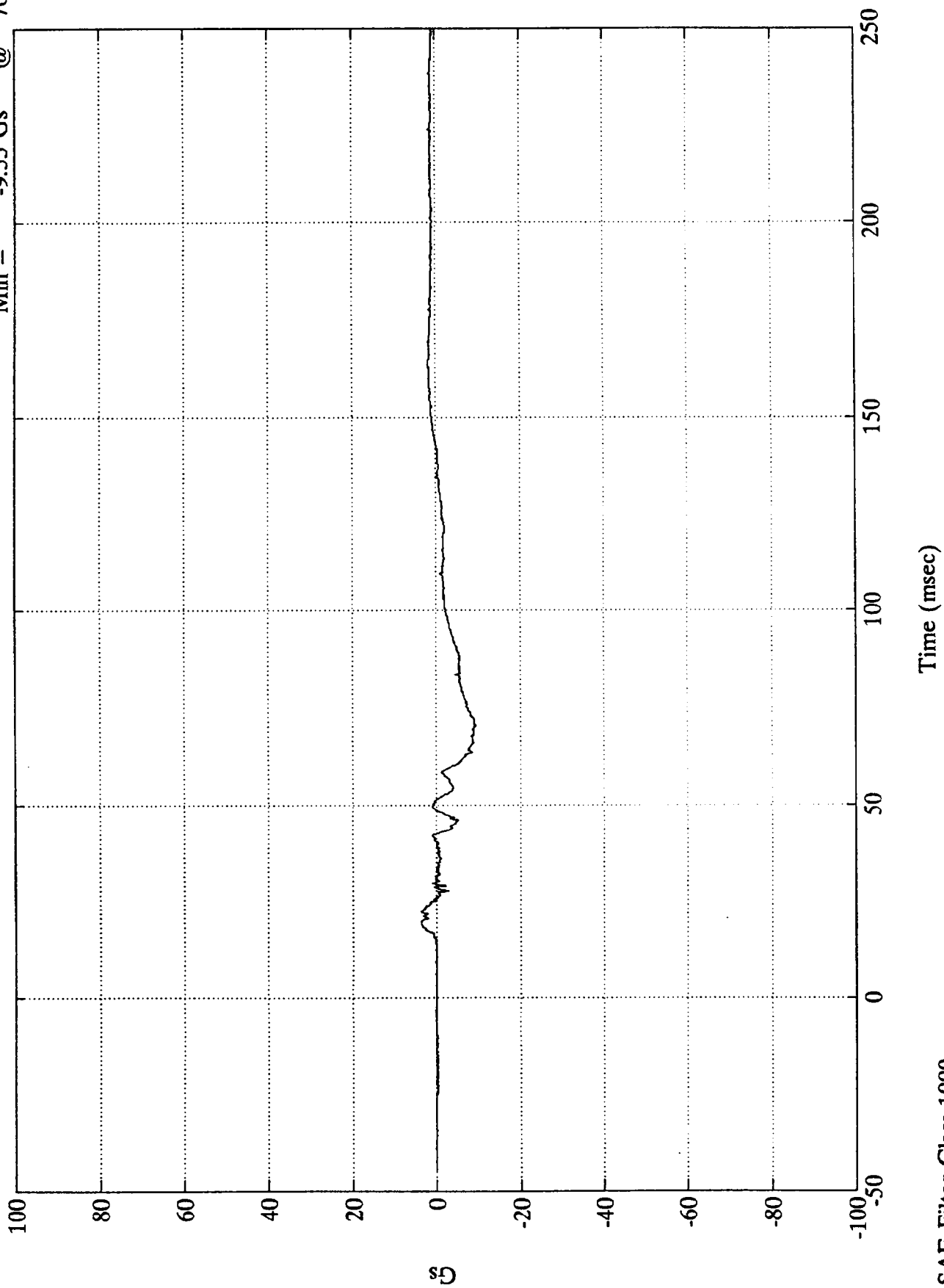
SAE Filter Class 1000

Test 1089

B-27

7920-2

Pos. 1 Head Y
Max = 3.71 Gs @ 18.84 msec
Min = -9.55 Gs @ 70.55 msec

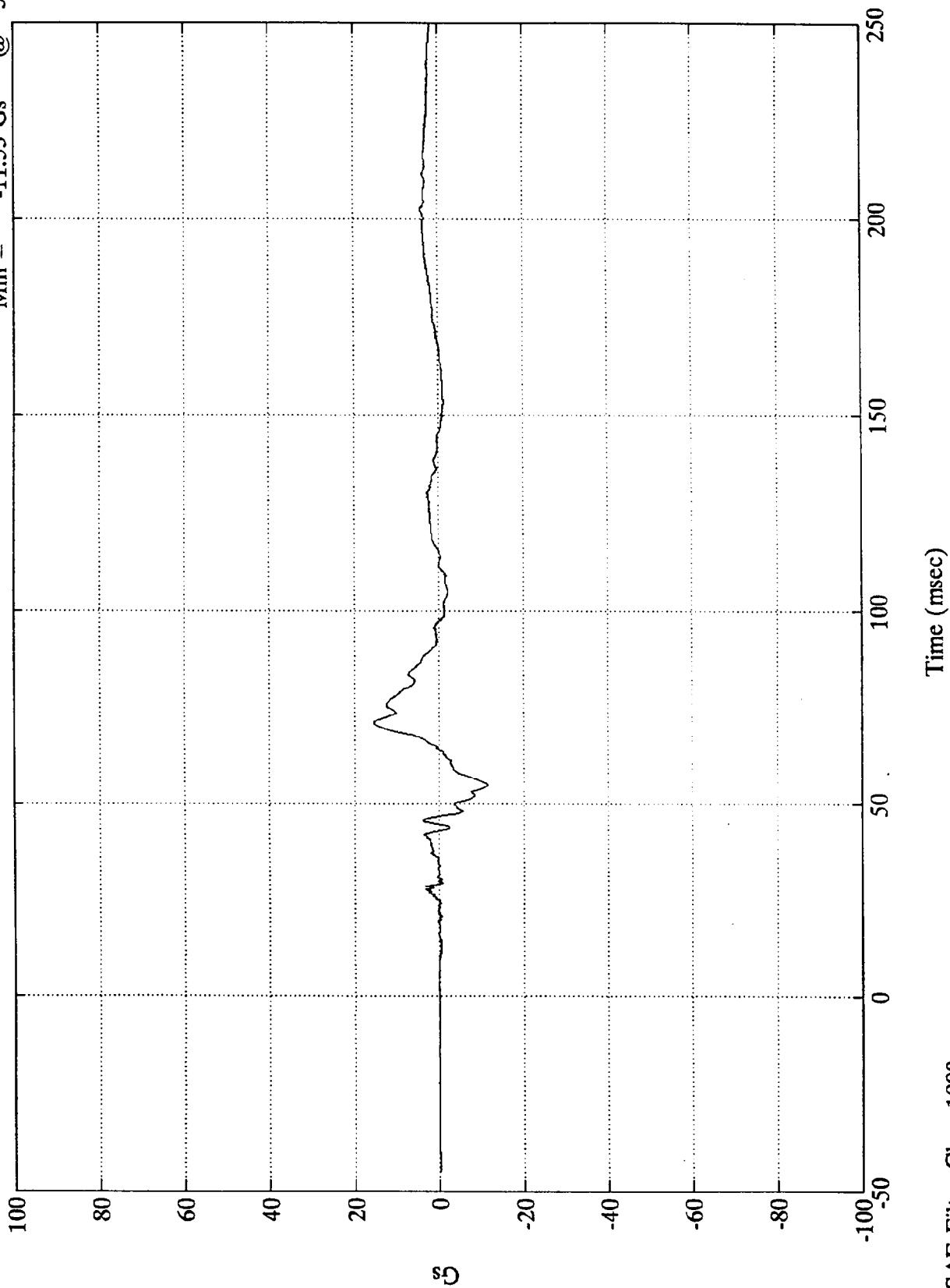


SAE Filter Class 1000

Test 1089

Pos. 1 Head Z

Max = 15.35 Gs @ 70.91 msec
Min = -11.53 Gs @ 54.96 msec



B-28

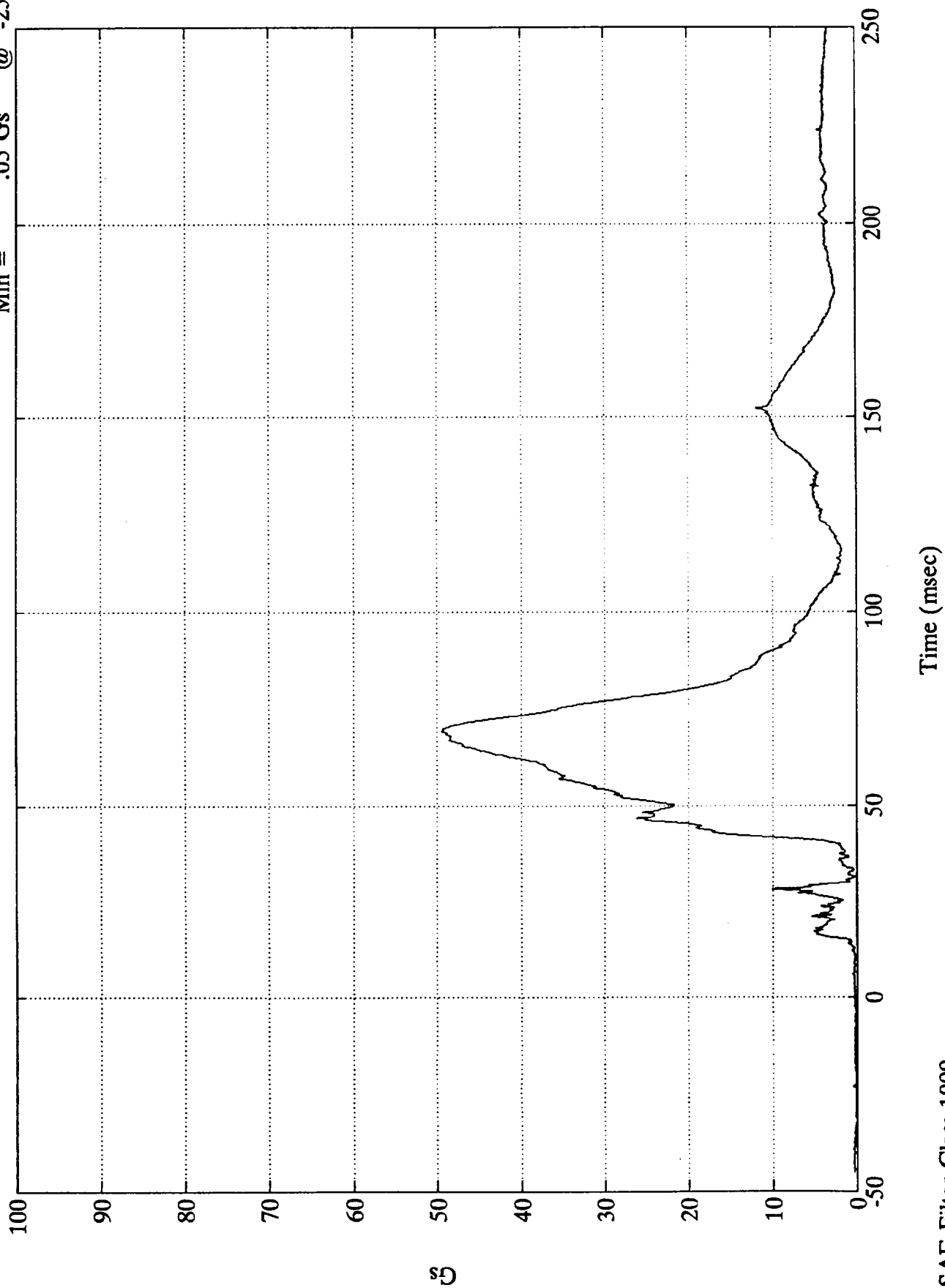
7920-2

SAE Filter Class 1000

Test 1089

Pos. 1 Head Resultant

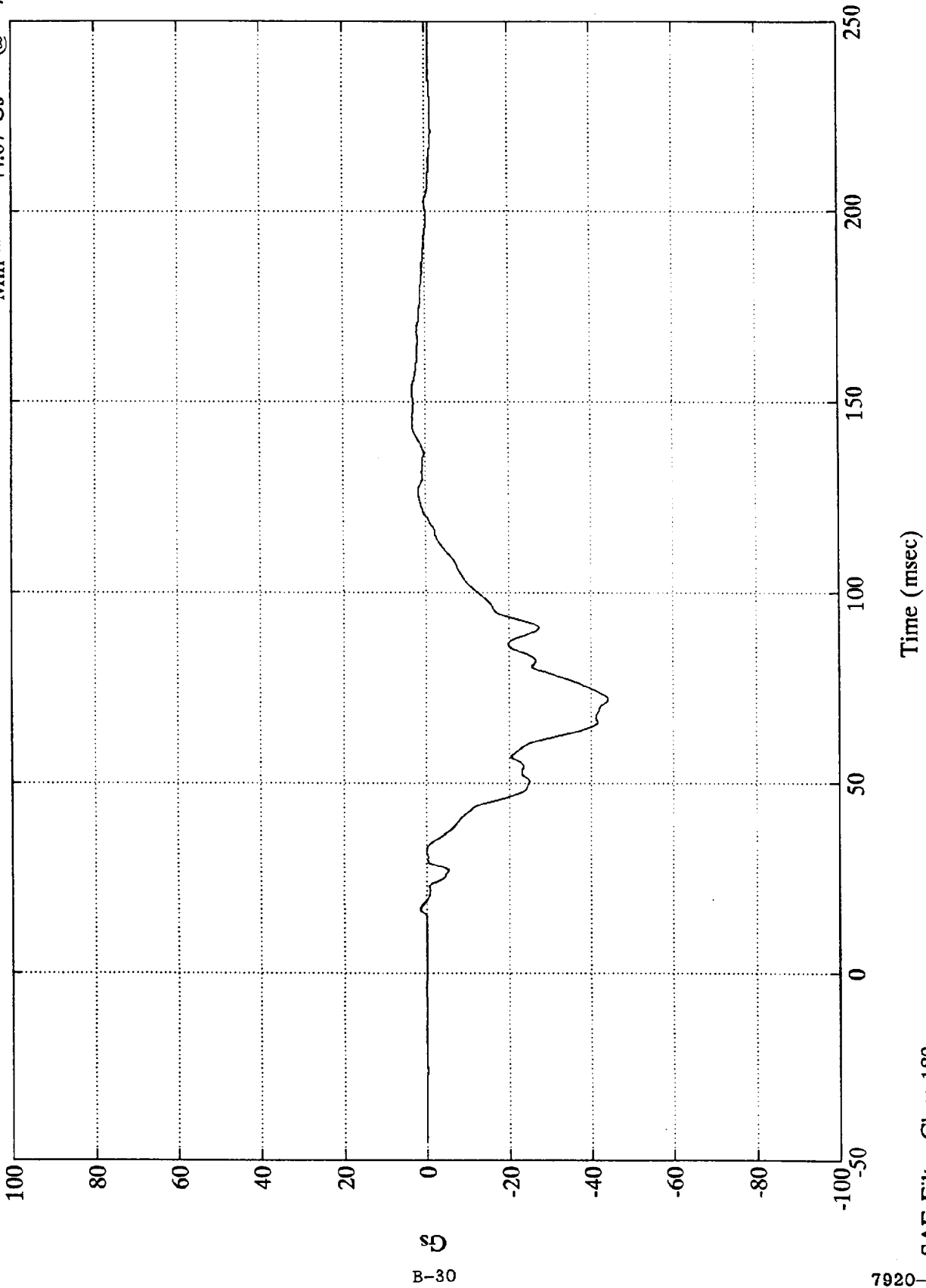
Max = 49.41 Gs @ 69.24 msec
Min = .05 Gs @ -25.92 msec



Test 1089

Pos. 1 Chest X

Max = 3.25 Gs @ 144.83 msec
Min = -44.07 Gs @ 72.36 msec

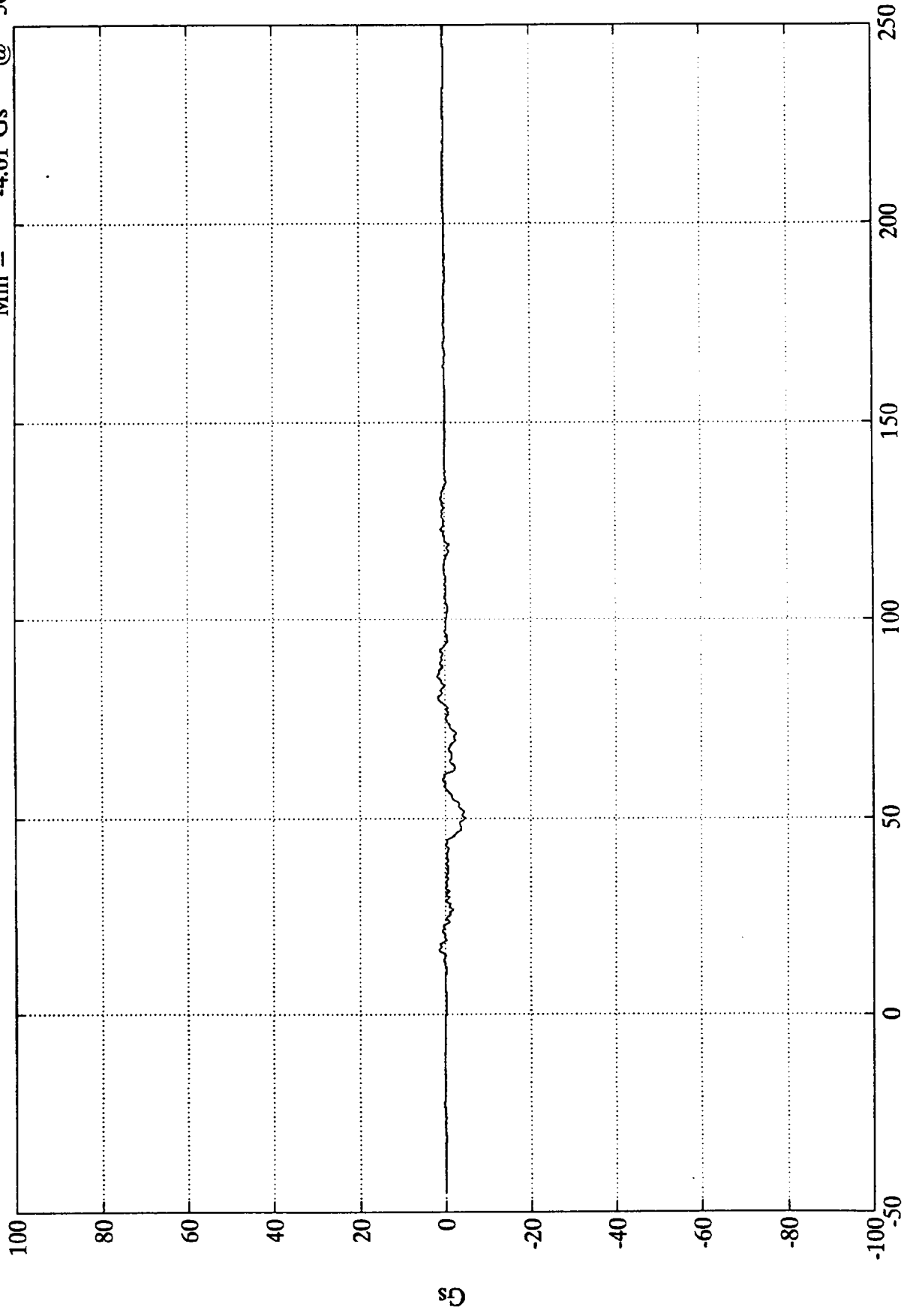


B-30

7920-2 SAE Filter Class 180

Test 1089

Pos. 1 Chest Y
Max = 1.81 Gs @ 85.68 msec
Min = -4.61 Gs @ 50.16 msec



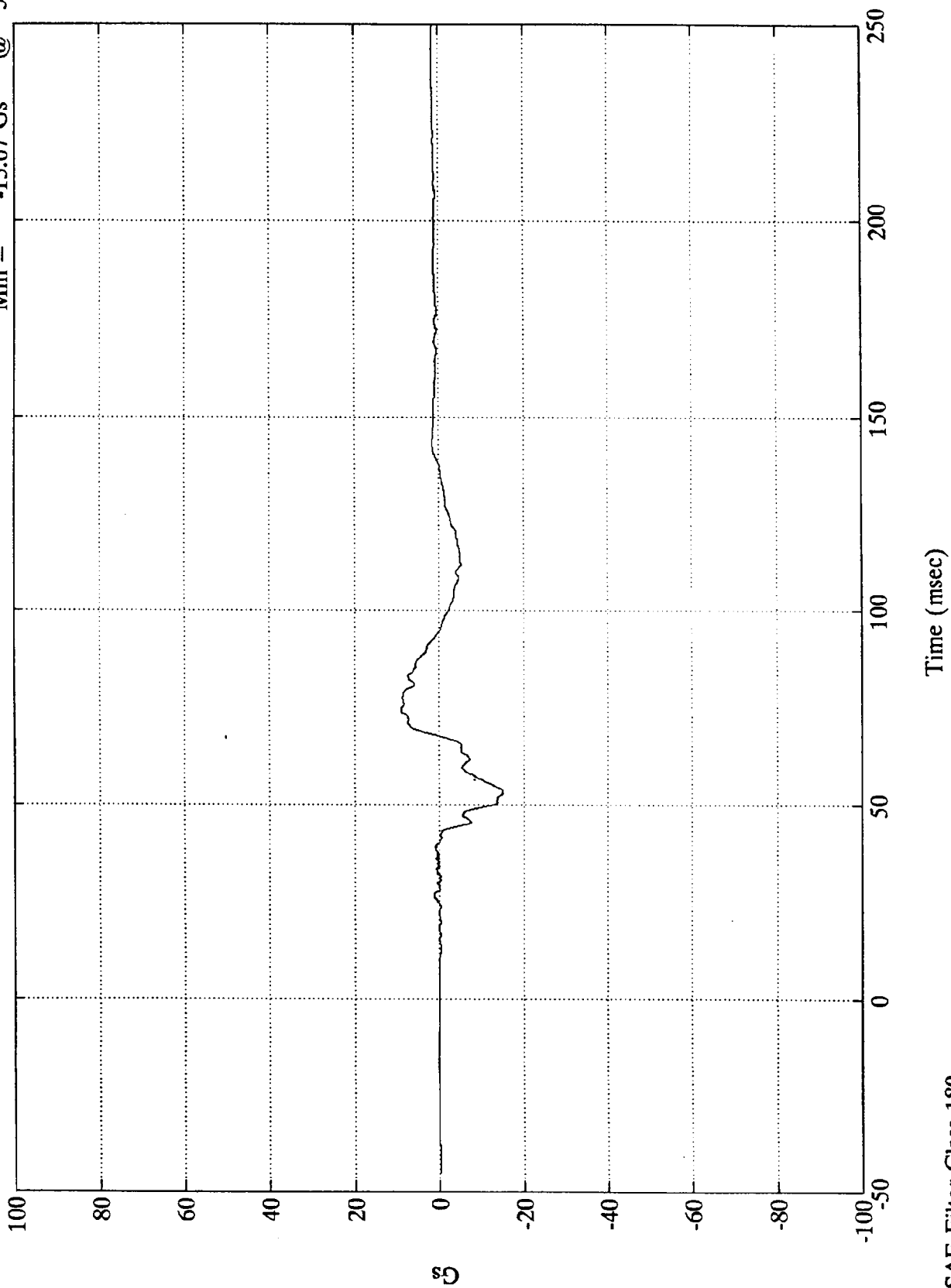
Time (msec)

B-31

Test 1089

Pos. 1 Chest Z

Max = 9.07 Gs @ 73.92 msec
Min = -15.07 Gs @ 53.04 msec



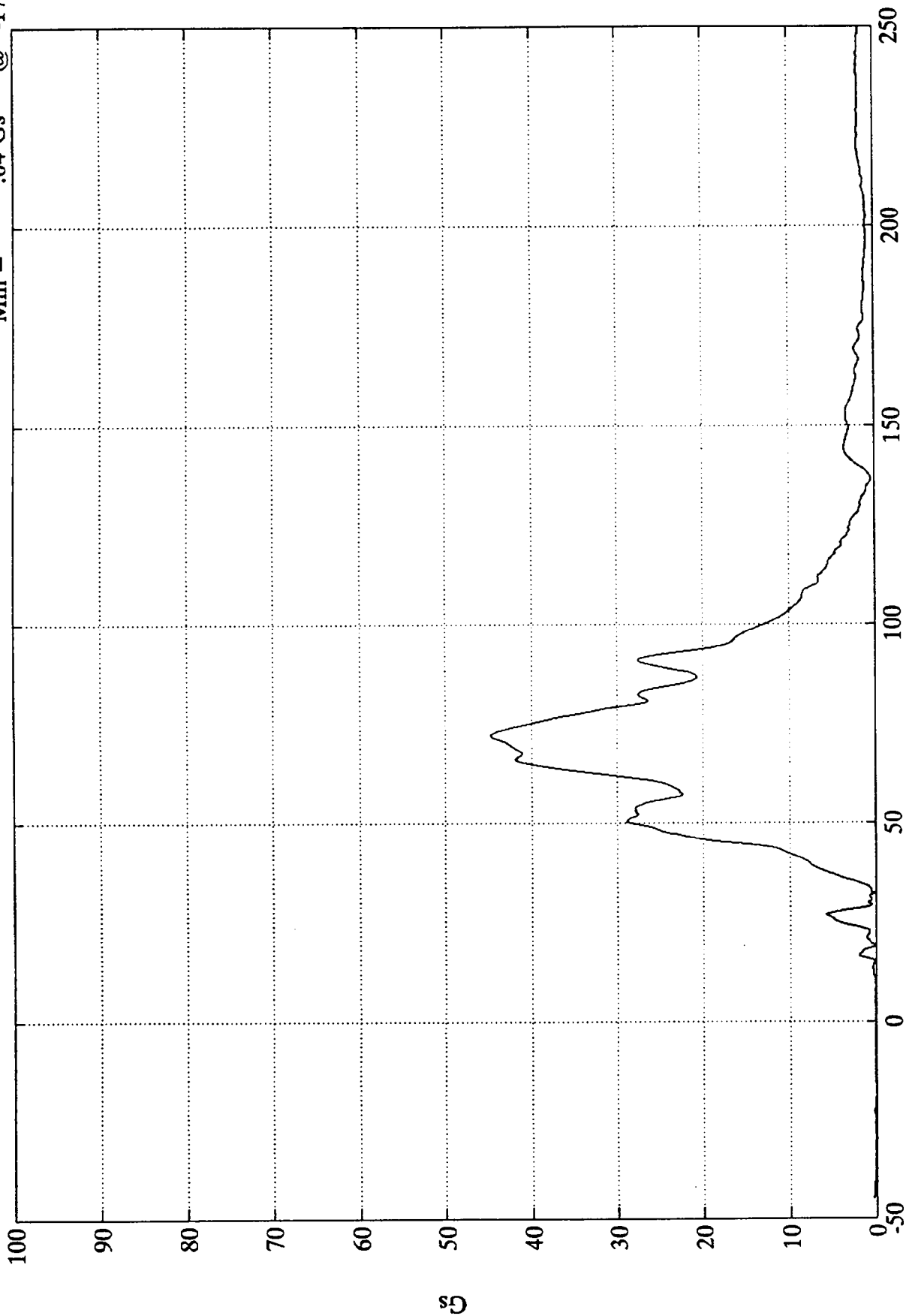
B-32

7920-2

SAE Filter Class 180

Test 1089

Pos. 1 Chest Resultant
Max = 44.70 Gs @ 72.36 msec
Min = .04 Gs @ -17.16 msec



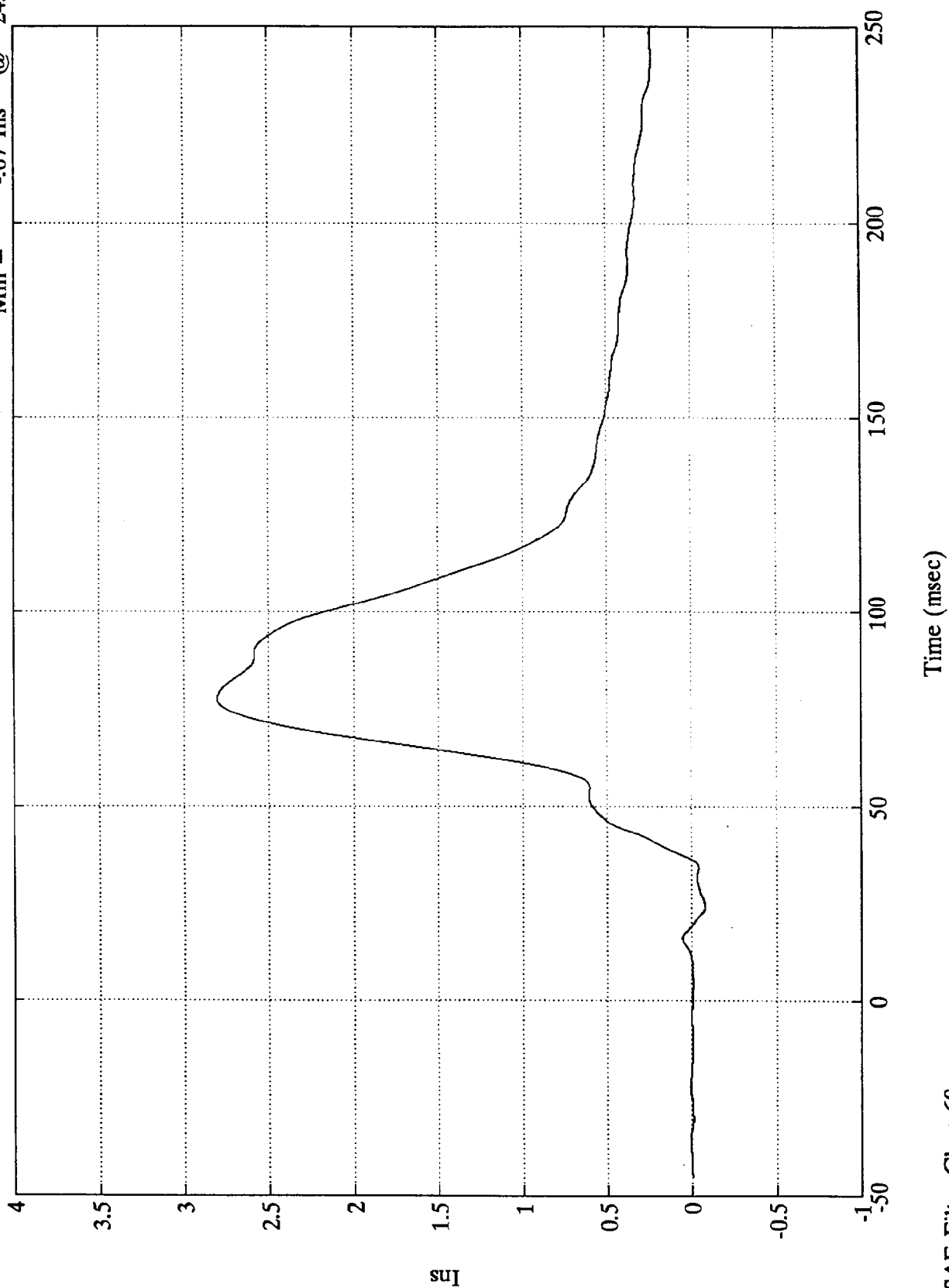
Time (msec)

SAE Filter Class 180

Test 1089

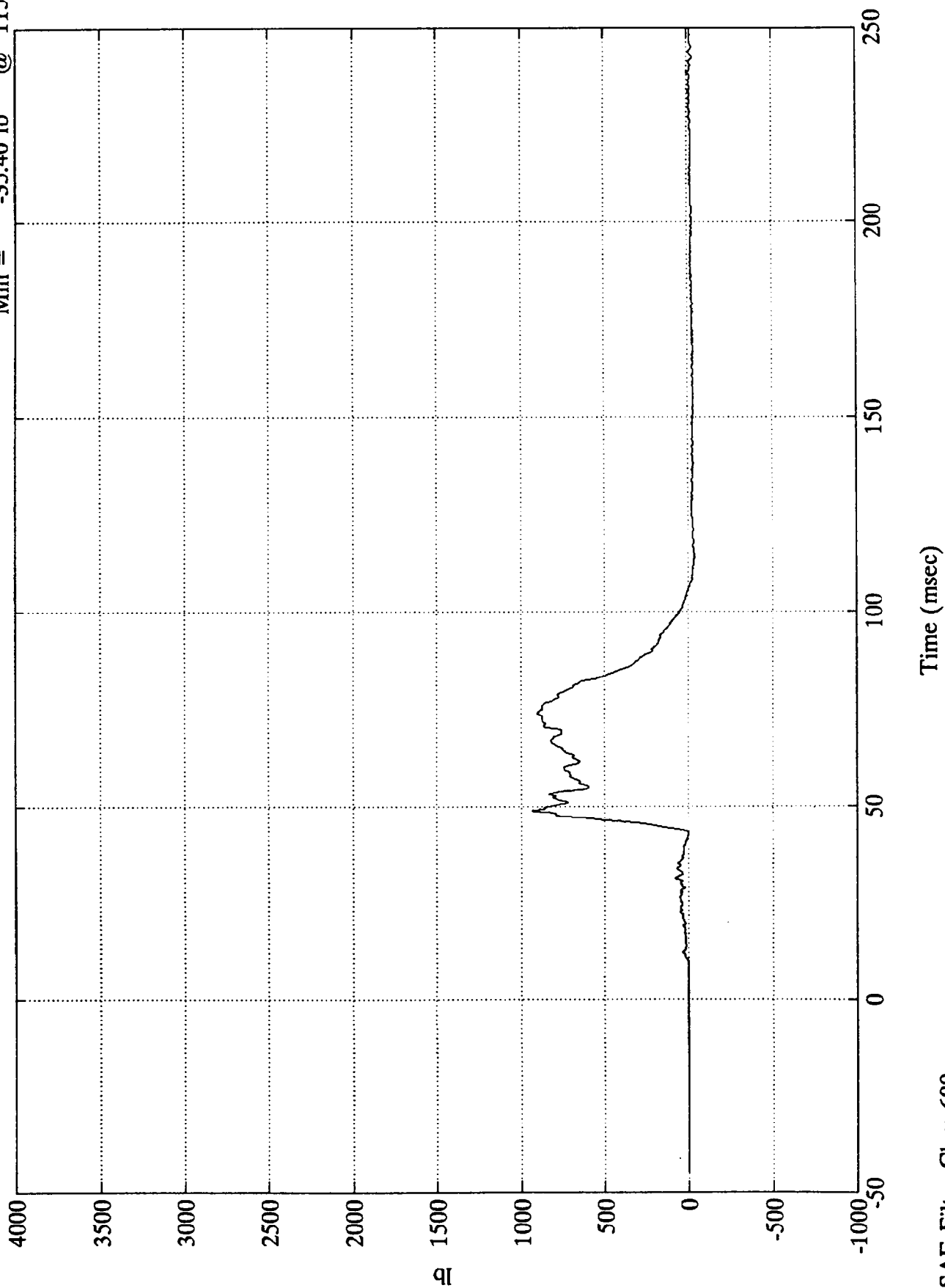
Pos. #1 Chest Disp.

Max = 2.80 Ins @ 77.27 msec
Min = -.07 Ins @ 24.47 msec



Test 1089

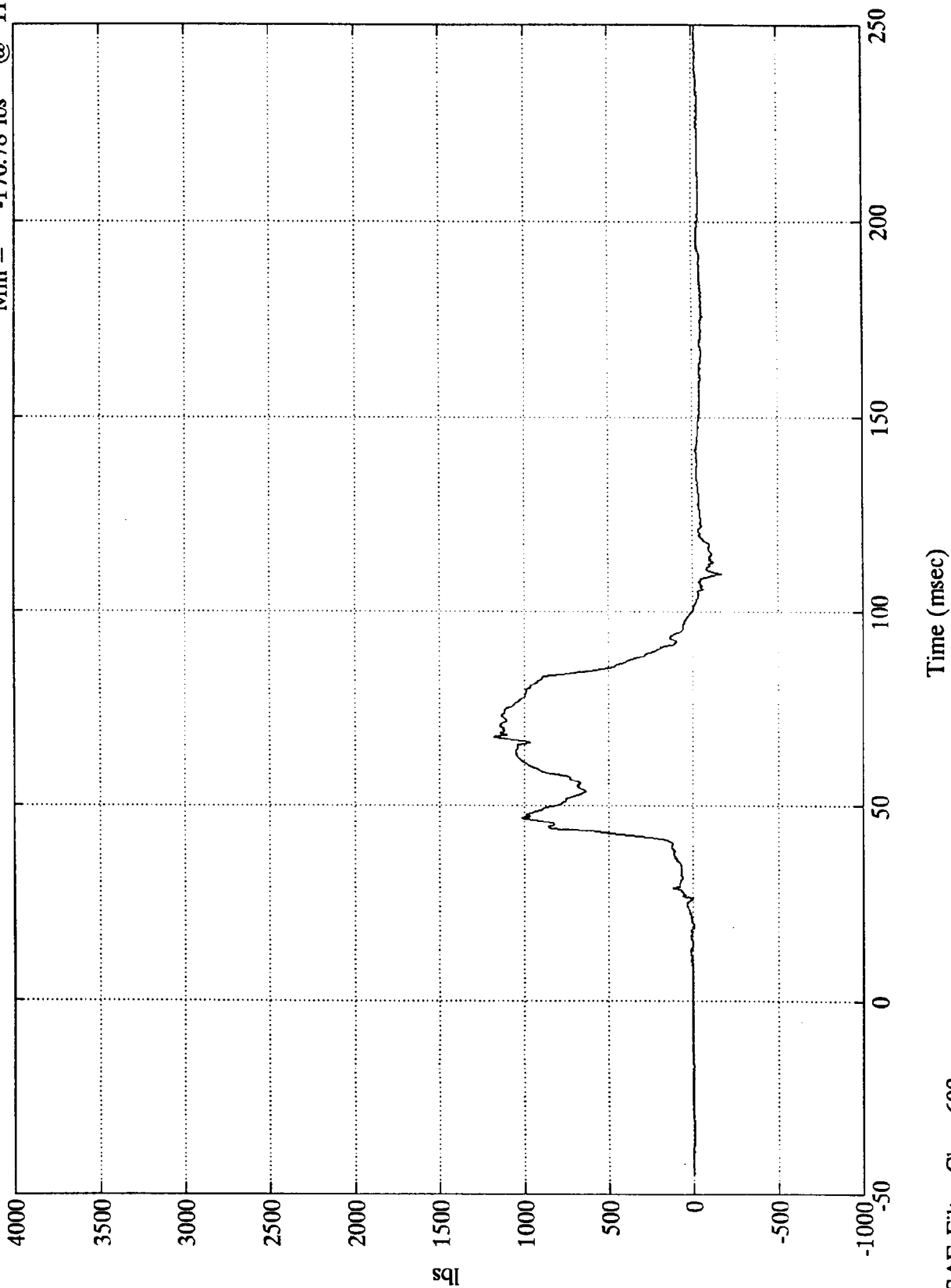
Pos. 1 Left Femur
Max = 929.85 lb @ 48.95 msec
Min = -35.40 lb @ 115.08 msec



Test 1089

Pos. 1 Right Femur

Max = 1176.55 lbs @ 67.56 msec
Min = -170.78 lbs @ 110.04 msec



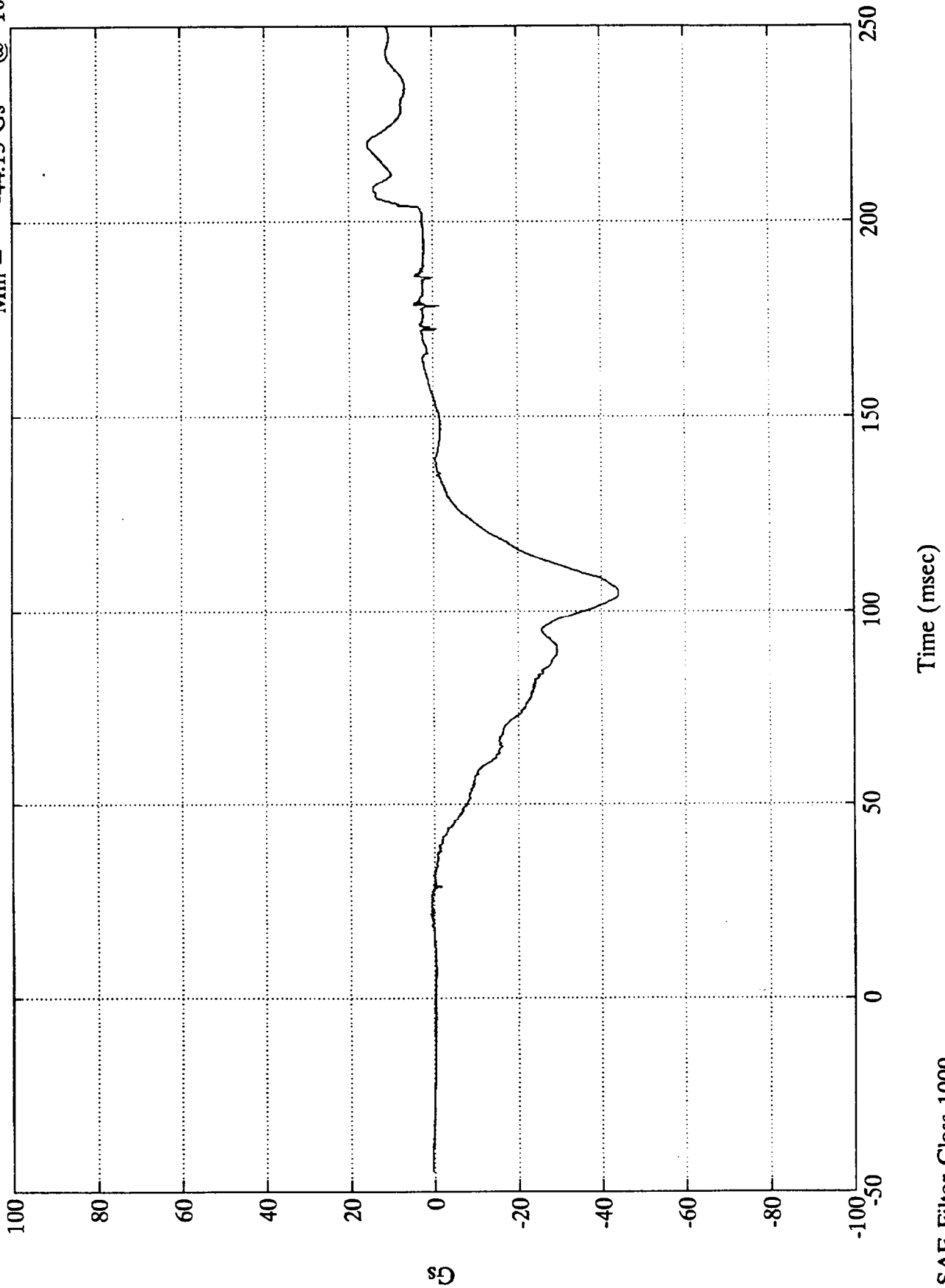
B-36

7920-2

SAE Filter Class 600

Pos. 2 Head X

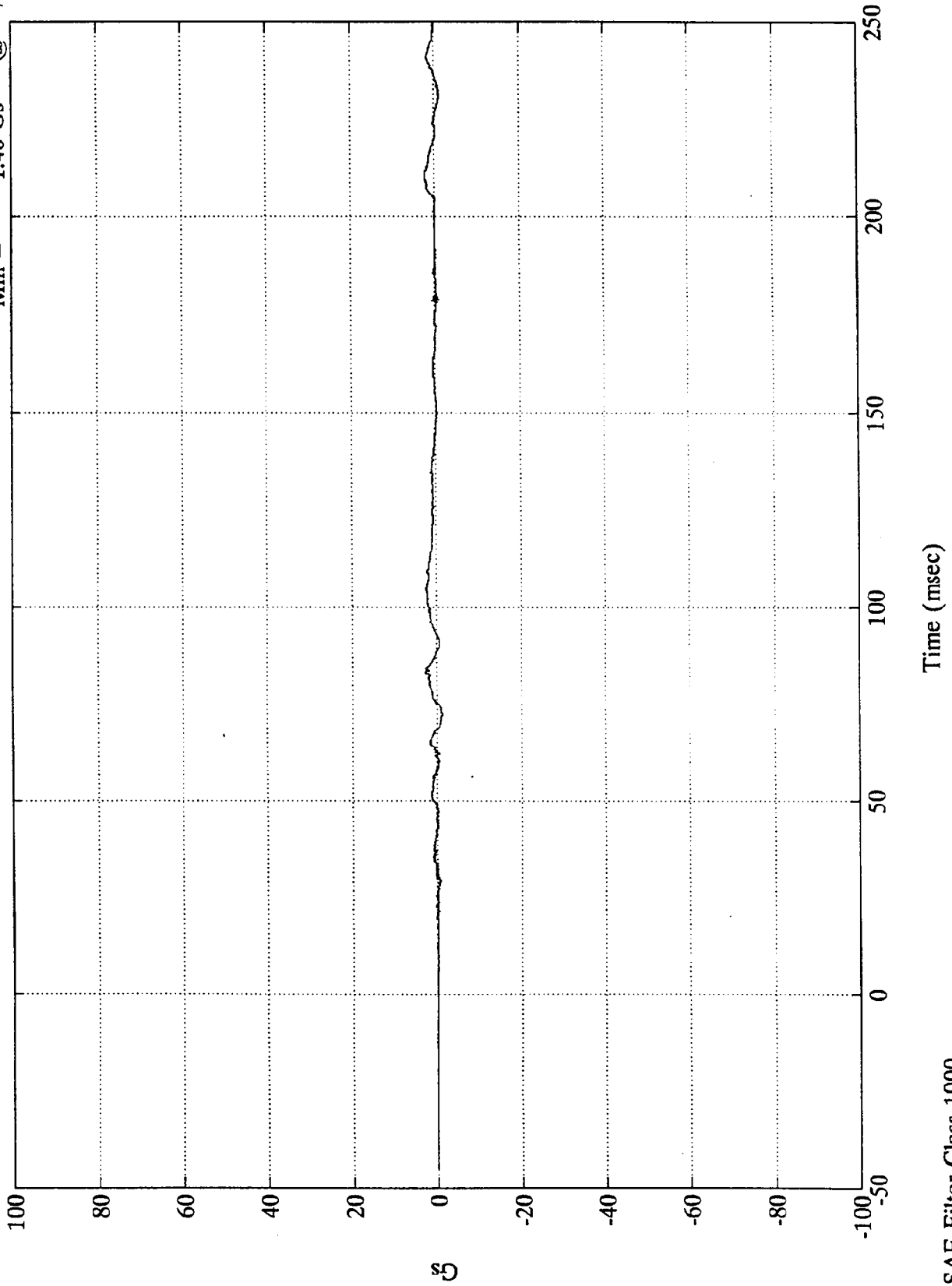
Max = 15.50 Gs @ 219.84 ms
Min = -44.13 Gs @ 105.12 ms



Test 1089

Pos. 2 Head Y

Max = 2.78 Gs @ 83.63 msec
Min = -1.40 Gs @ 72.72 msec



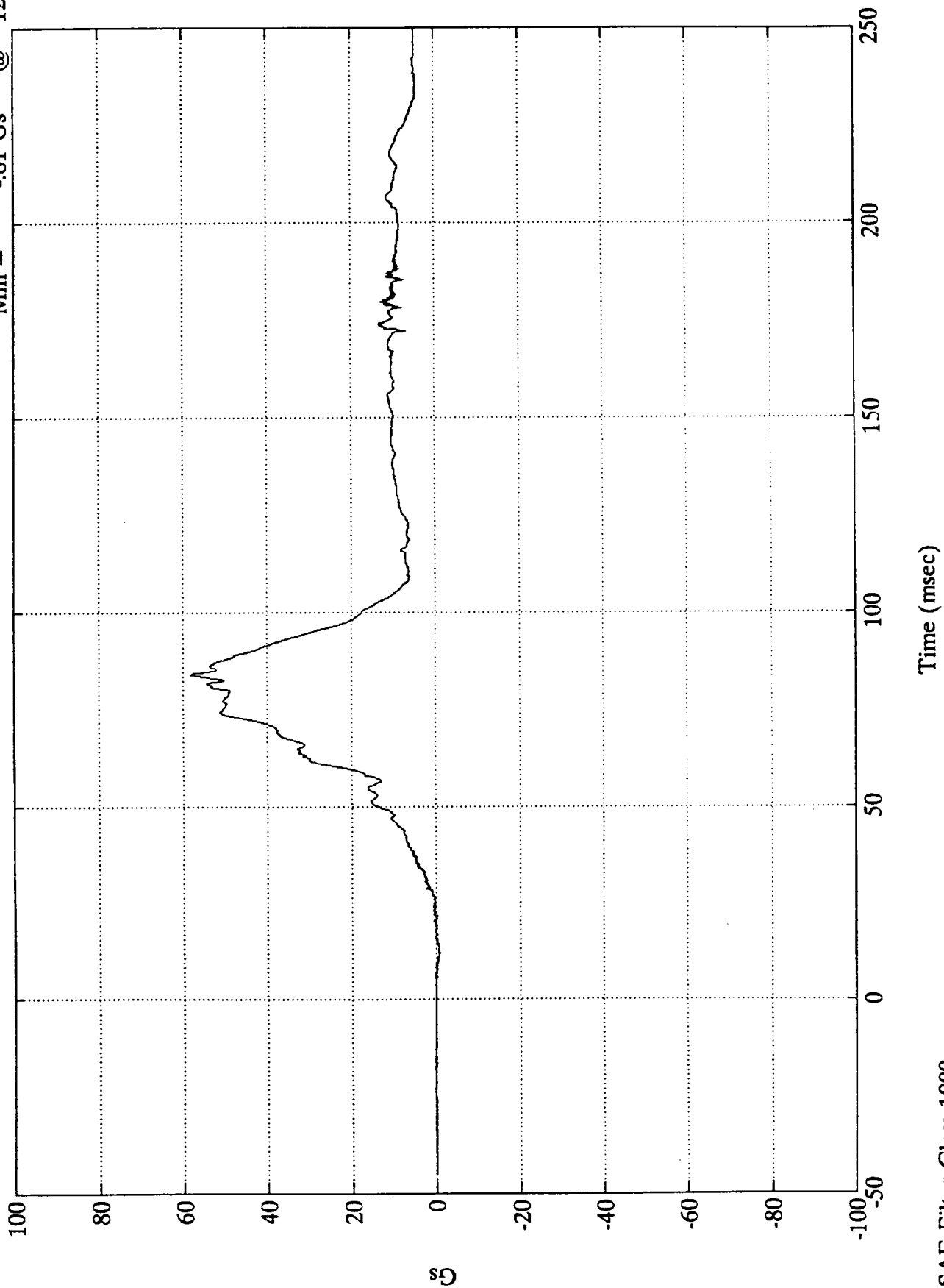
B-38

7920-2

SAE Filter Class 1000

Test 1089

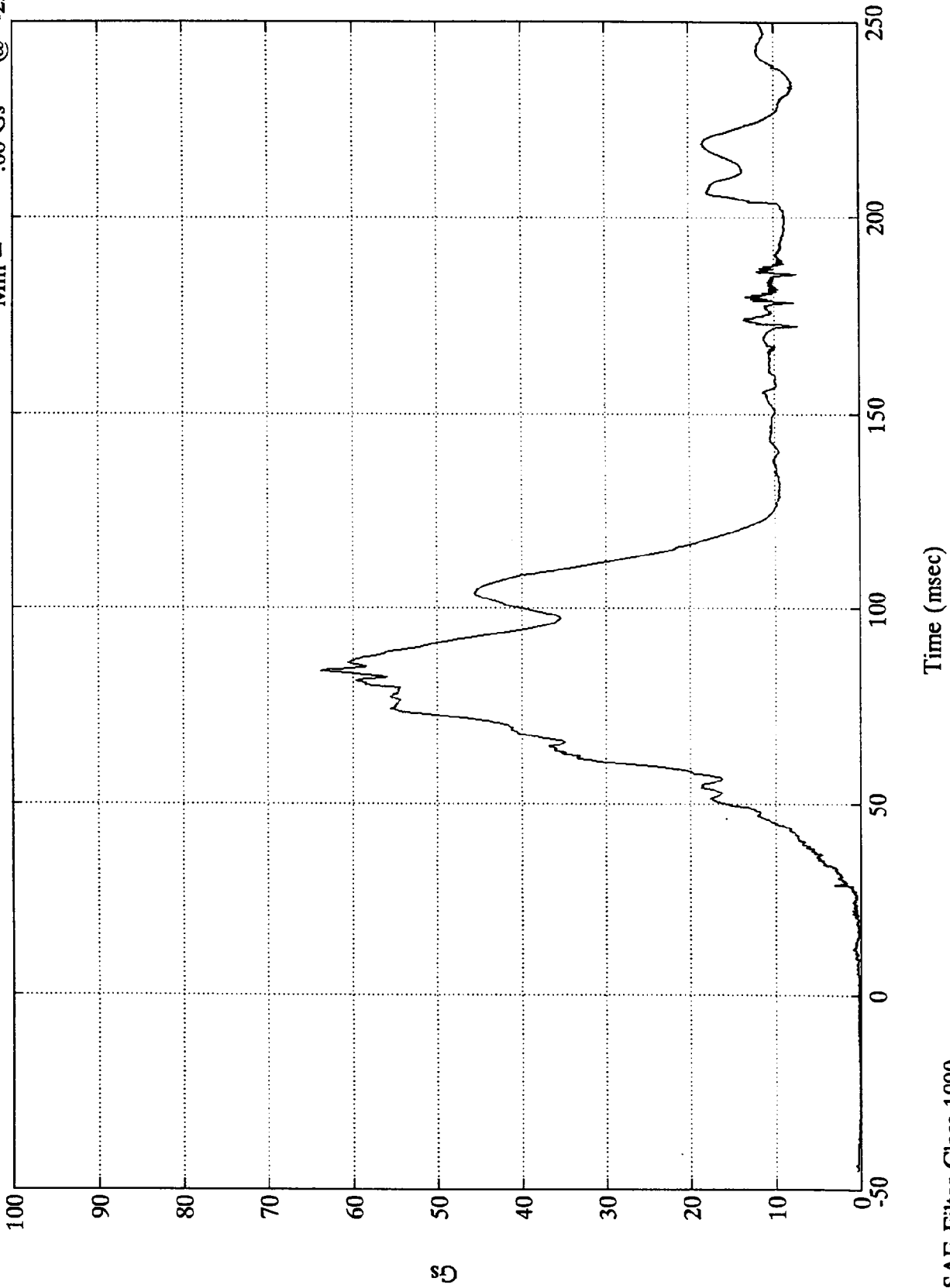
Pos. 2 Head Z
Max = 58.19 Gs @ 84.12 msec
Min = -81 Gs @ 12.11 msec



Test 1089

Pos. 2 Head Resultant

Max = 63.79 Gs @ 84.12 msec
Min = .06 Gs @ -22.92 msec



B-40

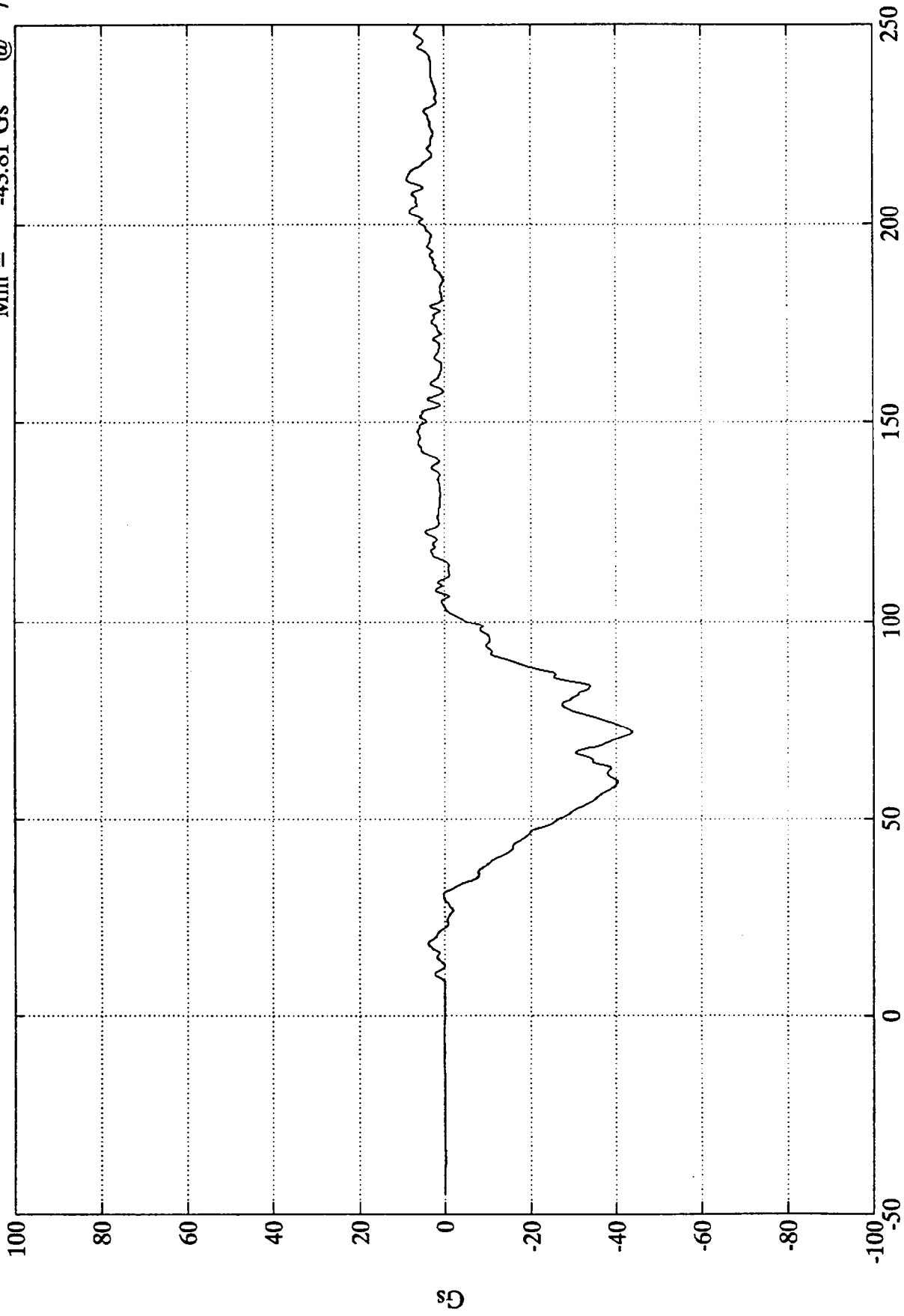
7920-2

SAE Filter Class 1000

Test 1089

Pos. 2 Chest X

Max = 8.76 Gs @ 211.32 msec
Min = -43.81 Gs @ 71.87 msec



Time (msec)

B-41

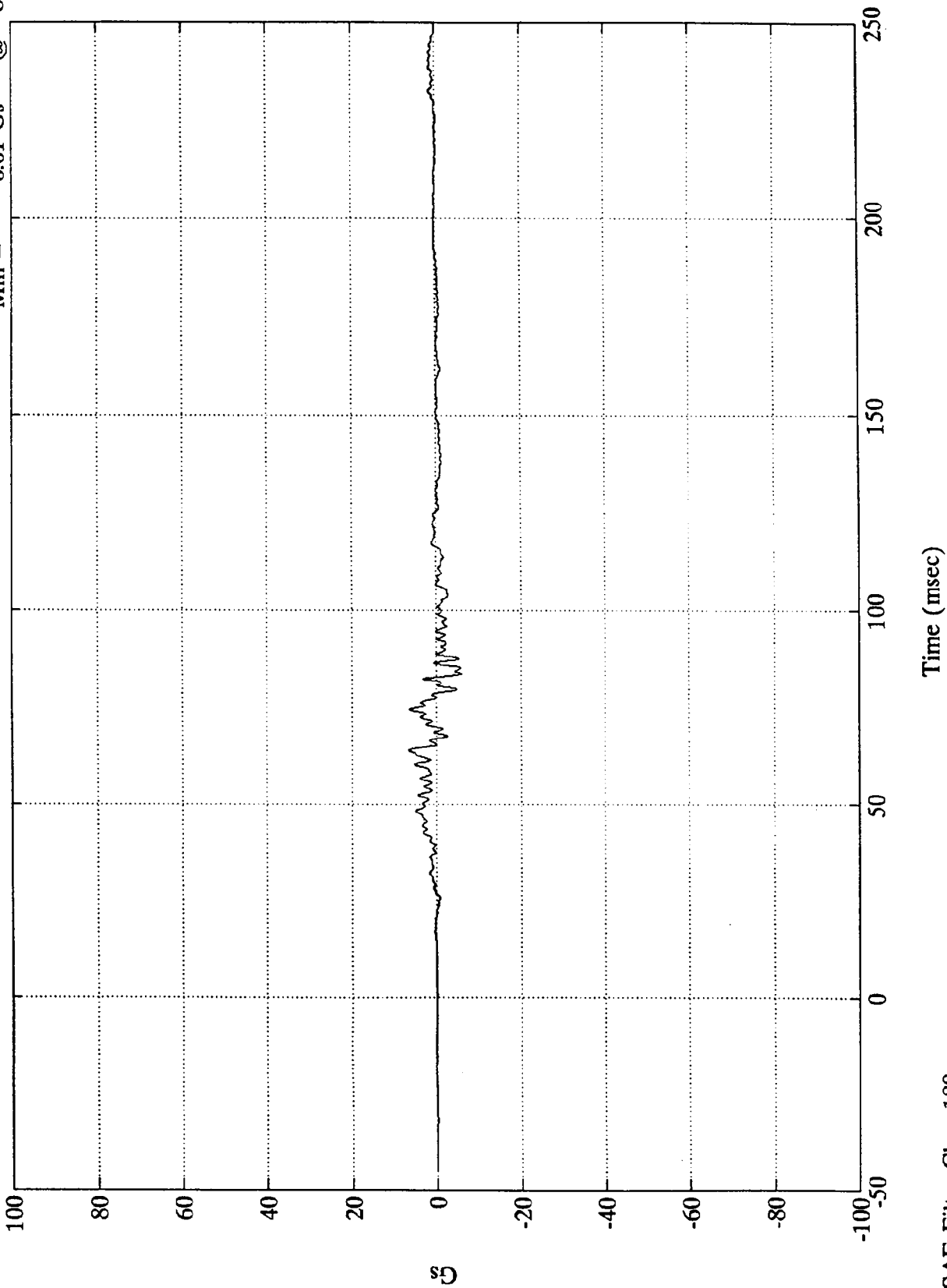
7920-2

SAE Filter Class 180

Test 1089

Pos. 2 Chest Y

Max = 6.51 Gs @ 64.19 msec
Min = -6.01 Gs @ 84.00 msec



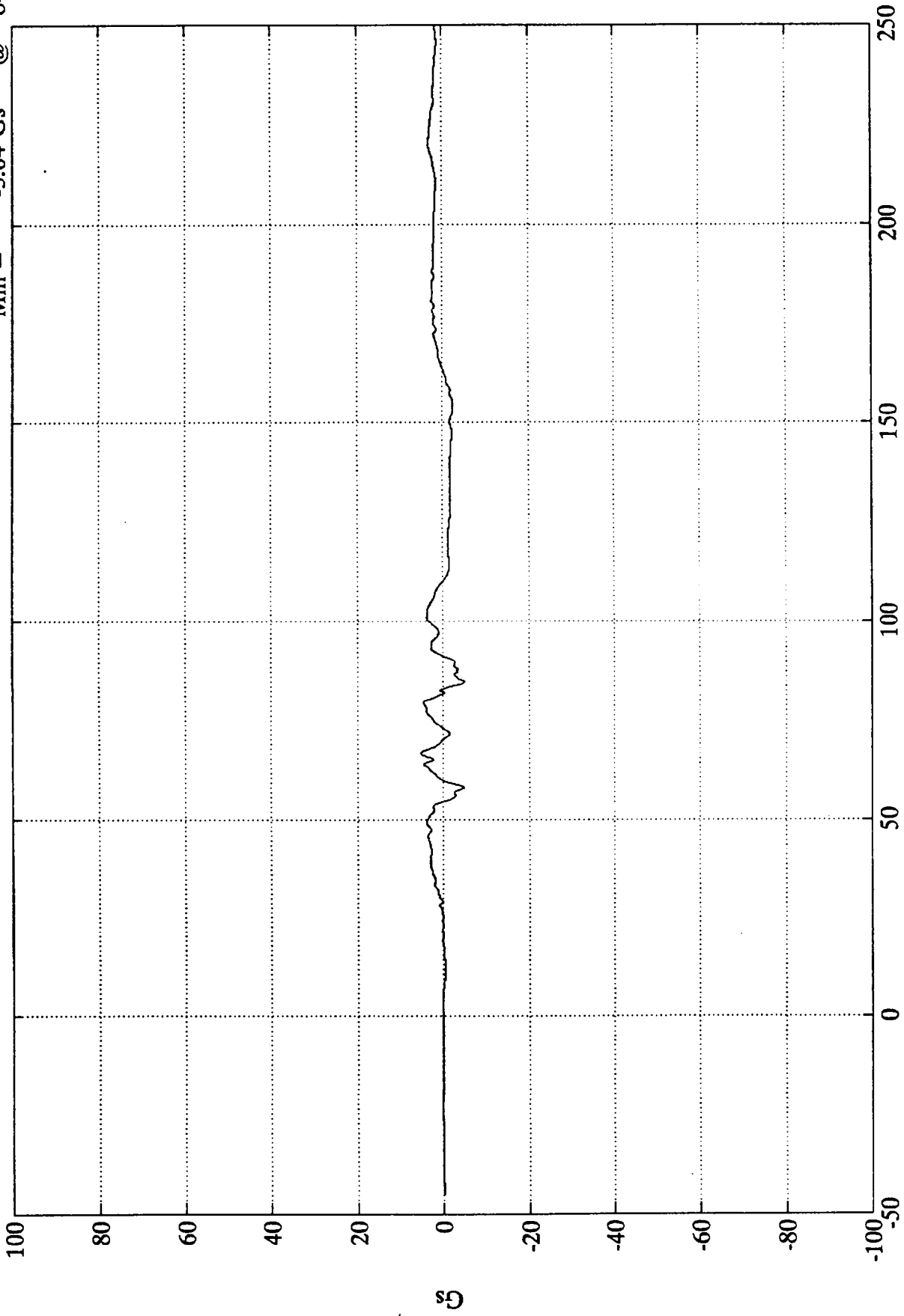
Test 1089

B-43

7920-2

Max = 5.17 Gs @ 66.60 msec
Min = -5.04 Gs @ 84.72 msec

Pos. 2 Chest Z



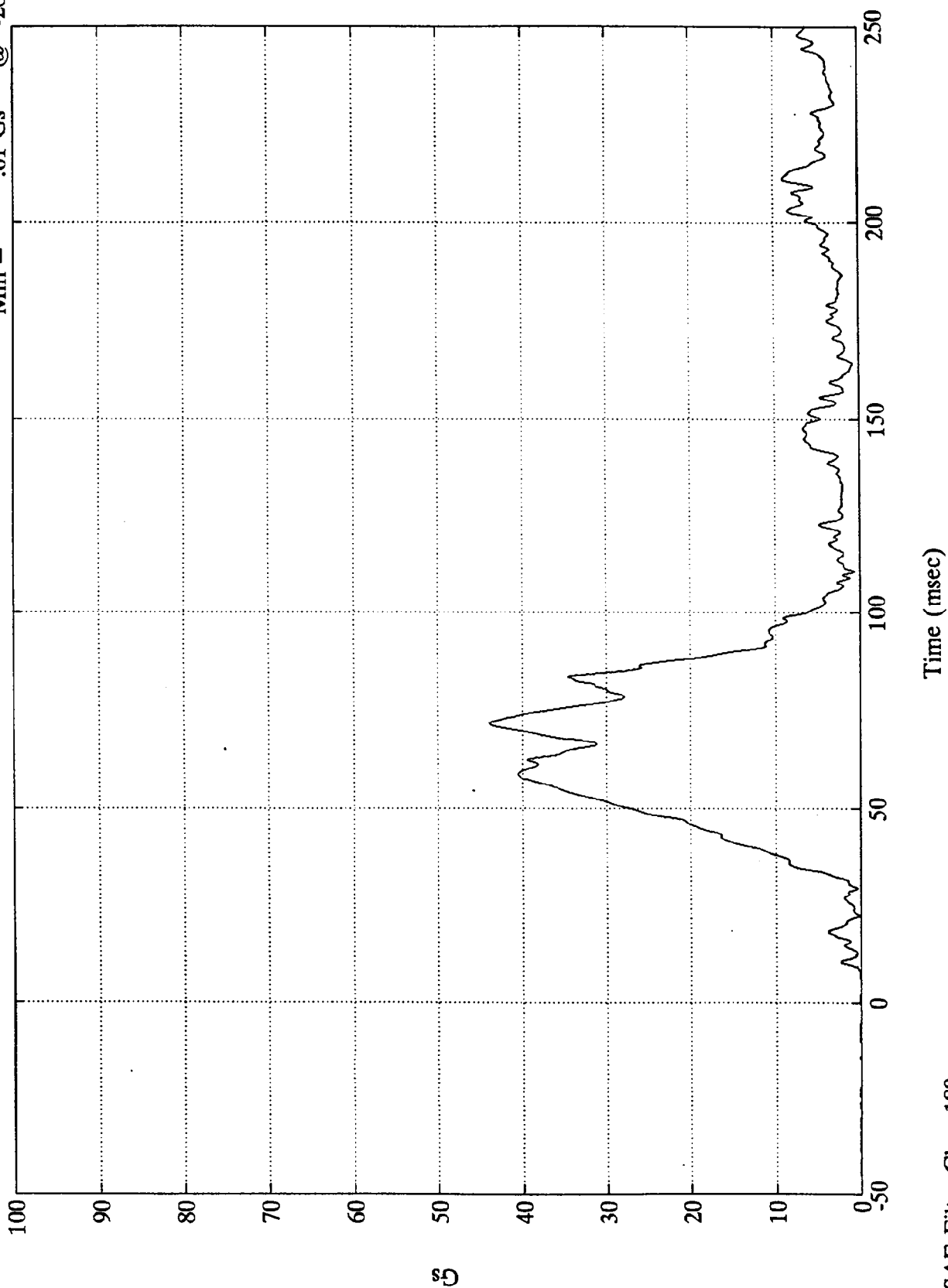
Time (msec)

SAE Filter Class 180

Test 1089

Pos. 2 Chest Resultant

Max = 43.87 Gs @ 72.00 msec
Min = .01 Gs @ -28.92 msec



B-44

7920-2

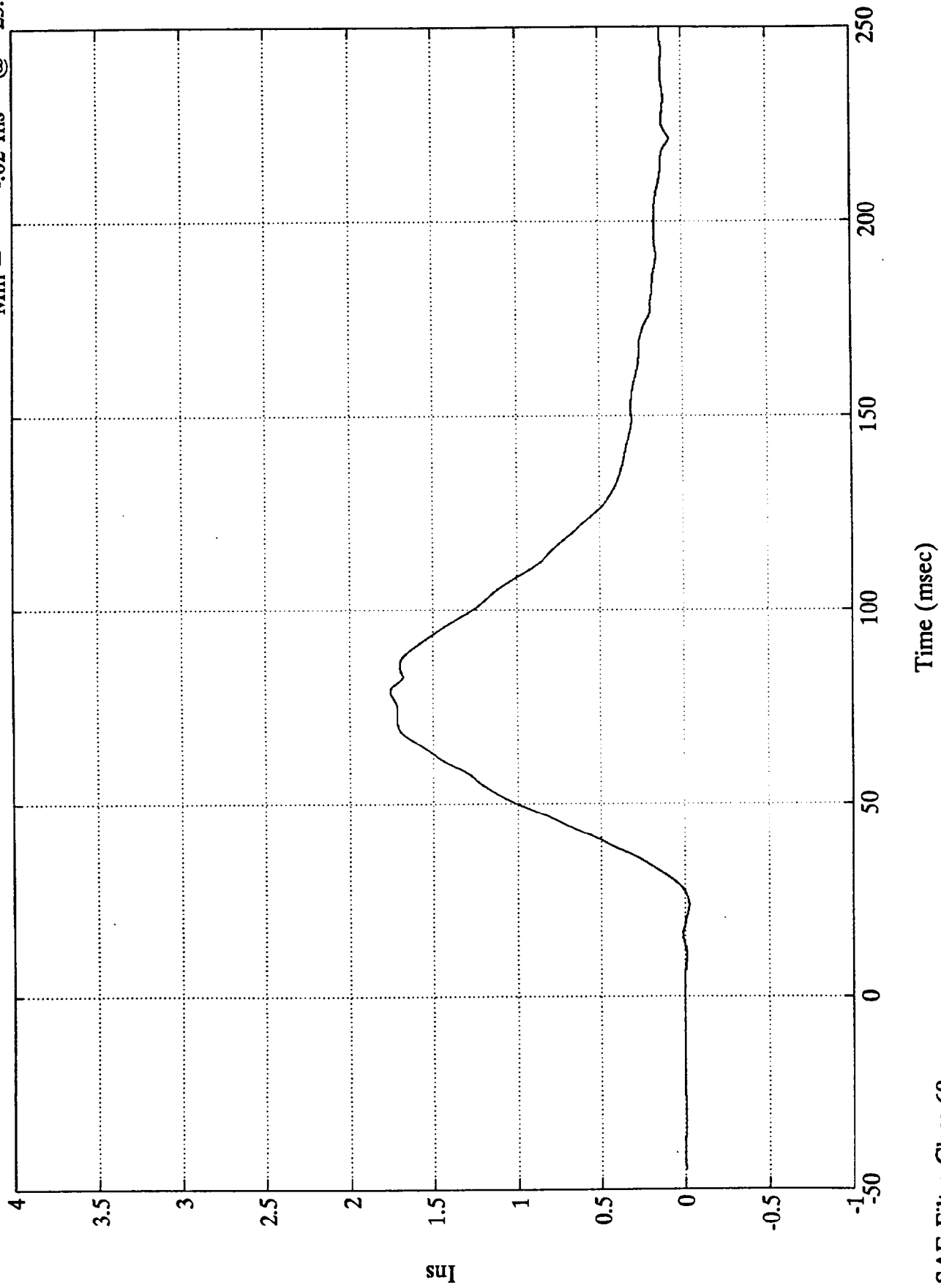
SAE Filter Class 180

Test 1089

B-45

7920-2

Pos. #2 Chest Disp. Max = 1.75 Ins @ 79.19 msec
Min = -.02 Ins @ 23.63 msec

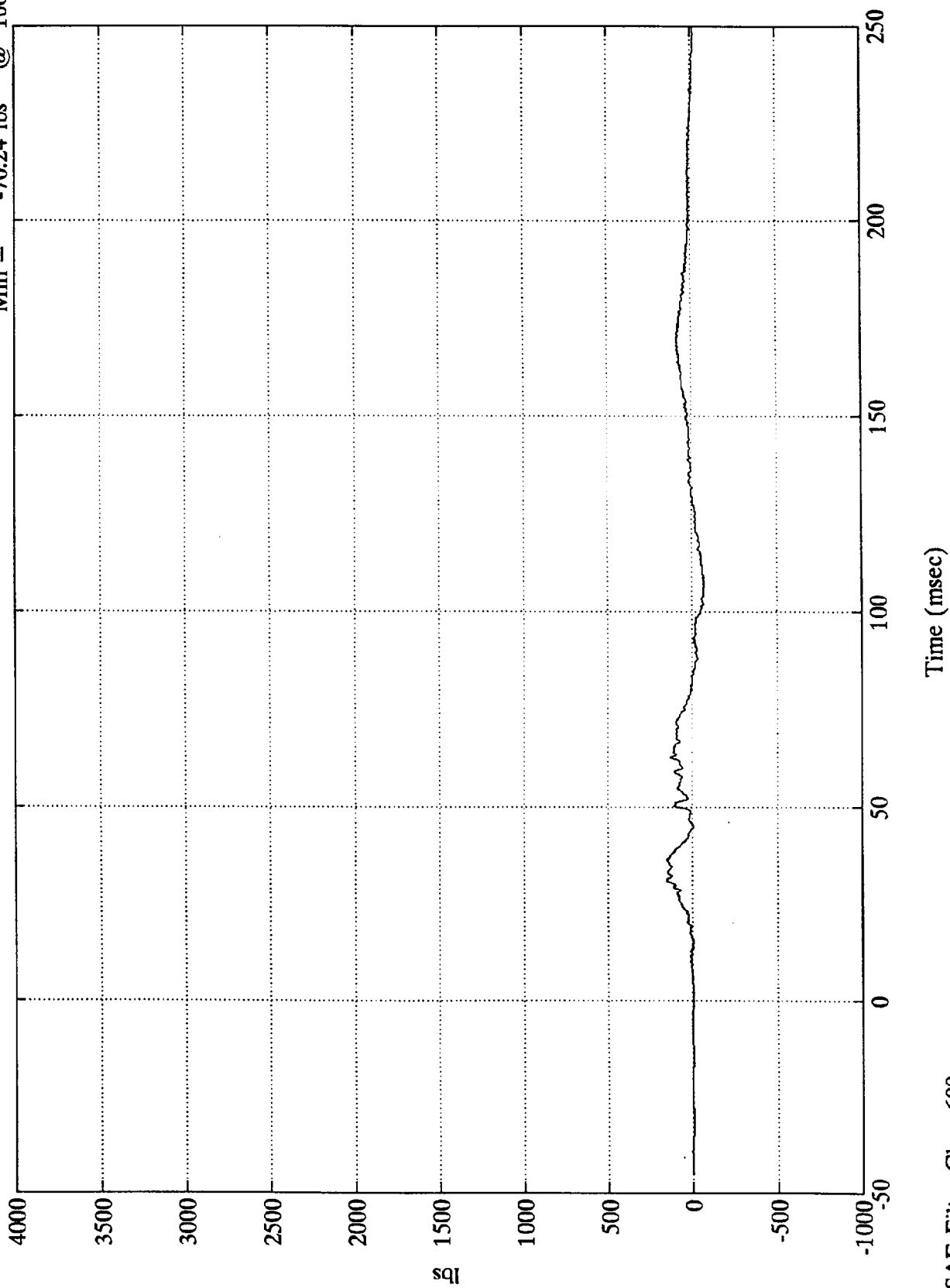


SAE Filter Class 60

Test 1089

Pos. 2 Left Femur

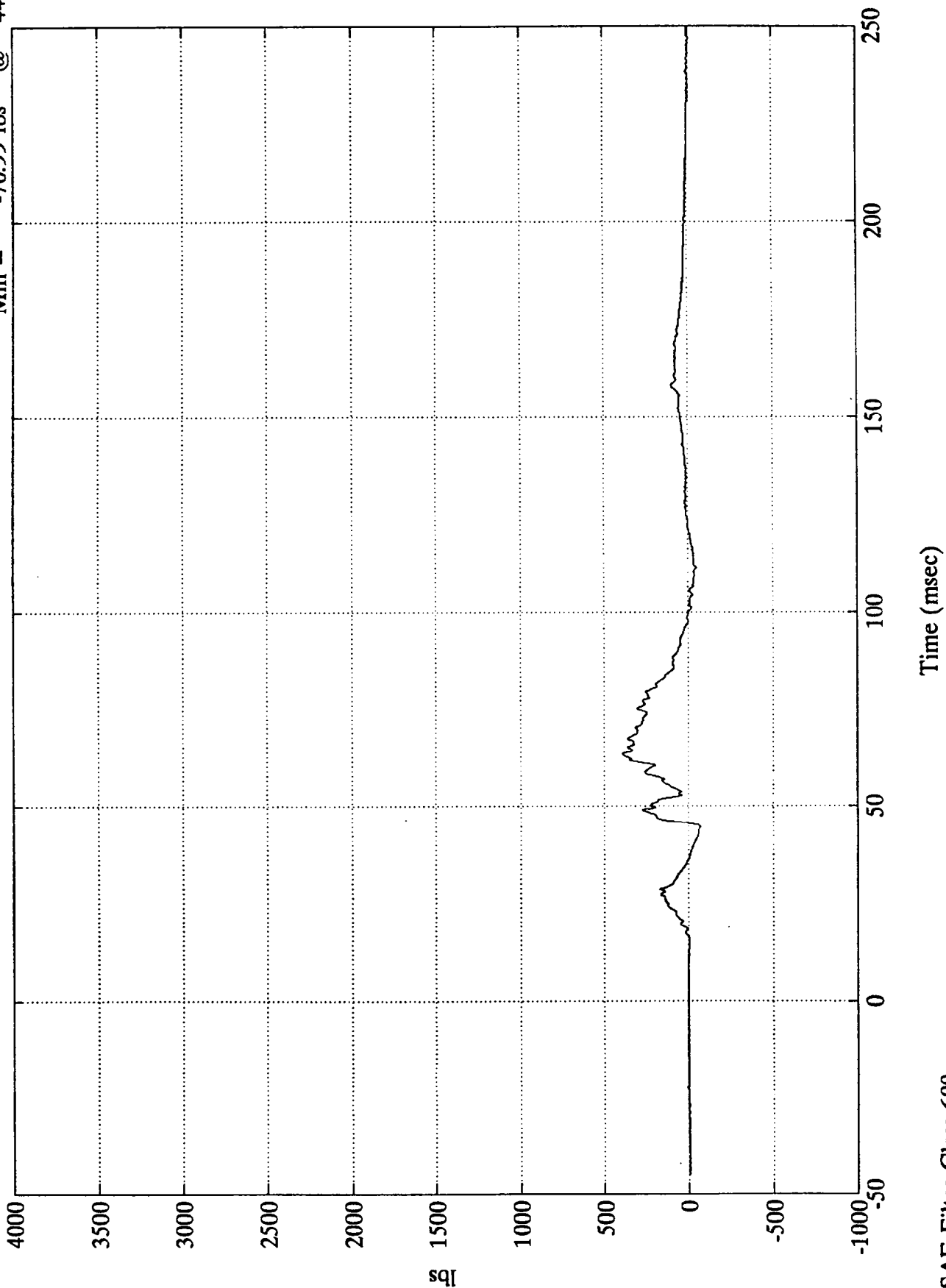
Max = 154.37 lbs @ 31.31 msec
Min = -70.24 lbs @ 106.55 msec



Test 1089

Pos. 2 Right Femur

Max = 389.96 lbs @ 63.60 msec
Min = -70.99 lbs @ 44.63 msec



B-47

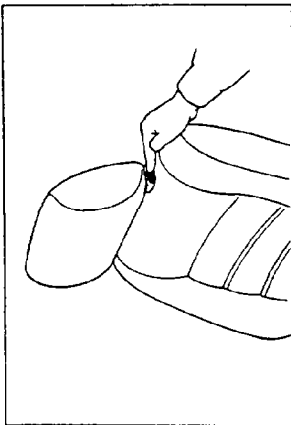
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SAE Filter Class 600

Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

□ HEAD RESTRAINT

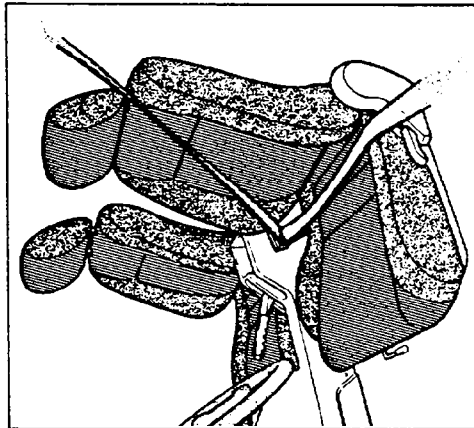


Head restraints are designed to help reduce the risk of neck injuries. Choose the position which places the top of the head restraint closest to the top of your ears. Push the lock knob to unlock the head restraint. Move the restraint up or down as required.

WARNING

- Do not attempt to adjust the driver's head restraint while the car is in motion, because it could cause a loss of control of the vehicle.
- Do not operate the car with the head restraint removed, since it will increase the risk of neck injury in the event of an accident.

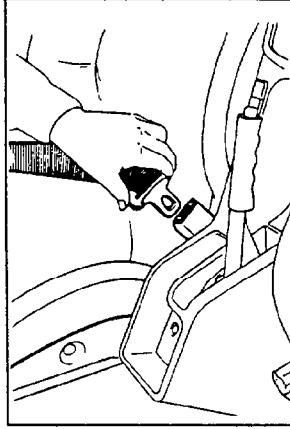
□ FRONT SEAT LAP/SHOULDER BELT



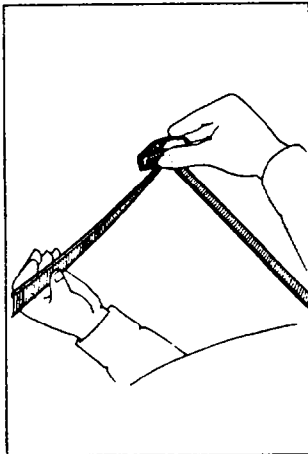
To help lessen the chance of injury in accidents or sudden stops, we urge that people riding in the car be properly restrained at all times, using the seat belts provided. This includes children and pregnant women. See the following pages for use of restraints by children and pregnant women.

To Fasten the Front Seat Lap/Shoulder Belt

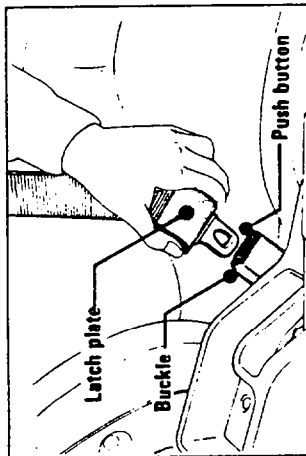
1. Adjust the front seat as needed. Sit up straight and well back in the seat.
2. Grasp the latch plate and:
 - Pull the lap-shoulder belt webbing across the body.
 - At the same time, slide the latch plate along the belt until it reaches the buckle.
 - Push the latch plate into the buckle until it clicks.



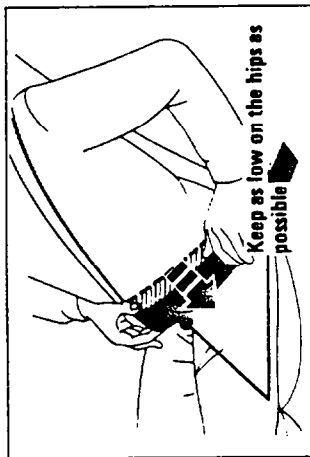
- (For passenger's seat)
- Take hold of the latch plate at an angle to the webbing and slide it toward the front of the car.



- Then pull it slowly across your lap and push the latch plate into the buckle until it clicks.



3. Position the "lap" portion of the belt across the lap as **LOW ON THE HIPS** as possible.



Then, adjust to a **SNUG FIT** by holding the "shoulder" portion of the front seat belt and pulling it **UPWARD** through the "latch" plate until the lap portion is snug across the lap. This reduces the risk of sliding under the belt during an accident.

4. To unfasten the belt, push in the button on the buckle. The belt should retract when the buckle is unlatched but hold the latch plate as it does so, to keep it from hitting people or nearby objects. To help prevent damage to the safety belt and interior trim, before closing the door be sure the belt is fully retracted and the latch plate is out of the way.

3-5

WARNING

- A snug fit with the lap belt positioned low on the hips is necessary to lessen the chance of injury and/or the degree of injury in an accident. This spreads the force of the lap belt over the hip bone instead of across the abdomen.
- Never use the same seat belt for more than one person at a time. A seat belt worn by more than one person will not provide adequate protection in the event of a collision.
- Never wear twisted seat belts.
- Be very careful not to damage seat belts or seat belt buckles by pinching them in the seat or the door.
- Too much slack could increase the amount of injury because the belt would not be able to properly restrain you in an accident. **DO NOT** wear shoulder belt under the arm or out of position. Such use could increase the chance of injury and/or the degree of injury in an accident.
- According to accident statistics, children are safer when properly restrained in the rear seating positions than in the front seating positions.
- It is advisable to have children seated in the rear center seat and restrained with the vehicle's safety belt.

Children who have outgrown child restraint systems should use the vehicle's safety belts and sit in the rear seat. If the child's seating position has a shoulder belt which is on or very close to the face or neck, position the child so that the belt is properly positioned.

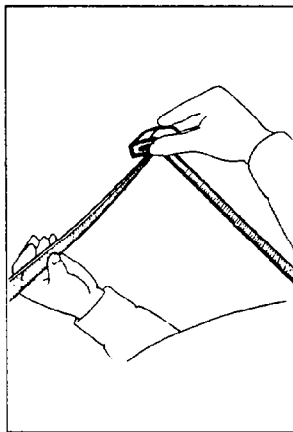
- NOTE**
- The retractor will lock the belt only during a sudden stop or on impact.
 - At other times you can move around freely.

SEAT BELT REMINDER

When the key is turned to "ON" position, a light will come on for four to eight seconds to remind people to fasten their safety belts. Unless the driver's safety belt is buckled, a buzzer will sound at the same time.

REAR OUTBOARD SEAT LAP-SHOULDER BELT

1. Sit up straight and well back in the seat.
2. Take hold of the latch plate at an angle to the webbing and slide it toward the front of car.

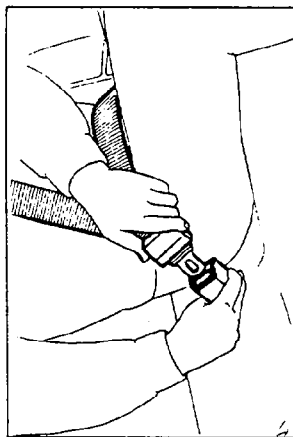


Then pull it slowly across your lap and push the latch plate into the buckle until it clicks.

3. Position the "lap" portion of the belt across the lap as **LOW ON THE HIPS** as possible. Then, adjust to **SNUG FIT** by holding the "shoulder" portion of the rear seat belt and pulling it **UPWARD** through the latch plate until the "lap" portion is snug across the lap. This reduces the risk

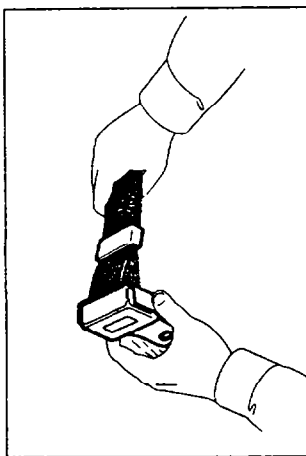
of sliding under the belt during an accident.

4. To unfasten the belt, push in the button on the buckle. The belt should retract when the buckle is unlatched but hold the latch plate as it does so, to keep it from hitting people or nearby objects. To help prevent damage to the safety belt and interior trim, before closing the door be sure the belt is fully retracted and the latch plate is out of the way.



REAR CENTER SEAT LAP BELT

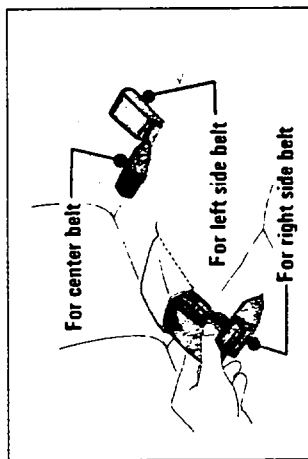
1. Sit up straight and well back in the seat.
2. Take hold of the latch plate at an angle to the webbing and slide it toward the front of car.



Then pull it slowly across your lap and push the latch plate into the buckle until it clicks.

3. Position the lap belt across the lap as LOW ON THE HIPS as possible. Then, adjust to SNUG FIT by holding the free end of the webbing and pulling it through the latch plate until the lap belt snug across the lap. This reduces the risk of sliding under the belt during an accident.

4. To unfasten the belt, push in the button on the buckle.
5. Bundle the seat belt to avoid twisting and fix it as shown in illustration in order to prevent seat belt from being damaged when it is not used.



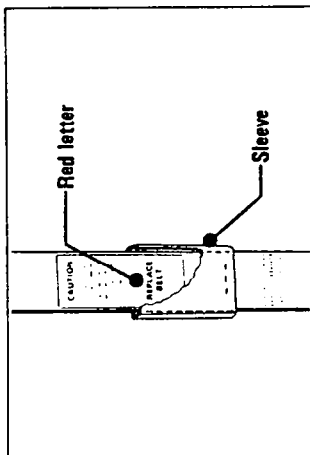
SEAT BELT REPLACEMENT LABEL (if so equipped)

The front seat safety belts have a loop of webbing under the sleeve for effectiveness of the entire restraint system.

WARNING

- Replace the front seat safety belt when the loop has been pulled out and a red letter of "REPLACE BELT" is visible at the top edge of the sleeve.

3-7



SEAT BELT INSPECTION

- Occasionally check that the belts, buckles, latch plates, retractors, reminder systems, guide loops, and anchors work properly. Also check for damage that could keep the restraint system from doing its job.
- Keep sharp edges and damaging objects away from the belts and other parts of the restraint system.
- Replace belts if cut, weakened, or frayed. Also, have belts replaced if they have been worn in a collision.
- If there is any doubt have all related parts including belts replaced.
- Keep belts clean and dry.
- Clean only with mild soap and lukewarm water.

- Do not bleach or dye belts since this may badly weaken them.

CHILD RESTRAINT

Children in cars should be restrained to help lessen the chance and/or severity of injury in accidents or sudden stops. Never let a child of any age stand or kneel on any seat. Use of infant or child restraint systems which conform to Federal motor vehicle safety standards and which are installed according to their instructions is the surest way of minimizing the risk of injury to young passengers. Older children should be placed on a seat and restrained with the seat belts provided with your car. Both lap and shoulder belts should be used. The use of infant or child restraint systems may be required by the laws of your state. You should check with the appropriate state authorities to ensure that you are in compliance with these laws.

WARNING

- For effective protection in automobile accidents and sudden stops, children should not be transported unrestrained. The preferred restraint for small children is a child restraint system. If this is not avail-

- able, children should be placed in the rear seat and restrained with the vehicle's safety belt if they are old enough to sit alone.
- Holding a child in your arms is dangerous. In an accident, a child held in a person's arms can be struck or crushed by any unrestrained occupant. An unrestrained child may also be injured by striking the interior, or by being ejected from the car during a sudden maneuver or impact.
- All child restraint systems are designed to be secured in car seats by the lap belt or lap portion of a lap-shoulder belt.
- Children could be endangered in a crash if the child restraint is not properly secured in your car.
- According to accident statistics, children are safer when properly restrained in the rear seating positions than in the front seating positions.
- It is recommended that children or infants be restrained in an appropriate child or infant restraint secured in the center rear seating position.
- It is recommended that an adult be seated adjacent to an infant who is in a rear-facing infant restraint. If the driver is the only adult in the vehicle, the infant may be placed in an infant restraint on the front seat and properly restrained.

3-8

INSTRUCTIONS FOR CHILD RESTRAINT INSTALLATION

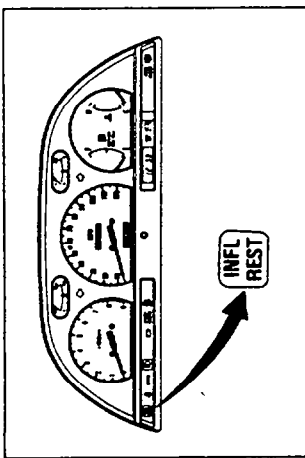
- Secure the child restraint with the lap belt or the lap portion of lap-shoulder belt in accordance with the restraint manufacturer's instructions.
- Push and pull the child restraint in all directions to be sure it is secure.
- If the child restraint is not secure, use a different seating position in the vehicle.
- Secure the child in the restraint in accordance with the manufacturer's instructions.

RESTRAINT OF PREGNANT WOMEN

It is recommended that pregnant women use seat belts. Check with your doctor for specific recommendations. The lap belt should be snug and positioned as low as possible around the hips. Do not position the lap belt around the waist. This can be very dangerous in the event of an accident or sudden stop.

SUPPLEMENTAL INFLATABLE RESTRAINT SYSTEM (SIR system)

Your car has a Supplemental Inflatable Restraint System (hereinafter referred to as SIR system for the driver's seat only.) An "INFL REST" readiness indicator light on the instrument panel is designed to blink 7 to 9 times when the ignition key is turned to "ON". If it does not, or if it continues blinking, or if it comes on while driving, the system is not working properly and you should take your vehicle to your Isuzu dealer for service.

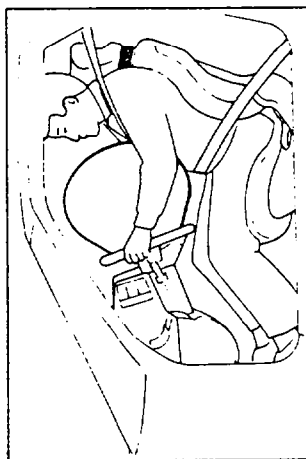


WARNING

- All occupants should wear their safety belts at all times. The SIR system is a supplement to the driver's lap shoulder belt and is designed to provide additional protection only in certain frontal and near frontal collisions. Proper use of the safety belts is necessary to reduce the risk of injury for everyone in the car, in all types of collisions.

If the readiness indicator light does not blink 7 to 9 times at start up, and then go out, or if it illuminates at other times, the system is not working properly and you should have it repaired.

WHAT THE SYSTEM DOES



The "air bag" part of the SIR is installed in the middle of the steering wheel. It is designed to inflate to help protect the driver's upper body in a head-on or near head-on collision.

Crash sensors measure the force of the collision and, if necessary, send a signal to the inflator. It then inflates in a fraction of a second to cushion the driver, and then deflates.

WHAT THE SYSTEM DOES NOT DO

The SIR is not designed to inflate during rear or side impacts, or rollovers, or during low speed frontal collisions. It helps protect the driver's upper body in certain frontal accidents, but it cannot eliminate the risk of all injuries in all types of collisions.

WHAT YOU MUST DO

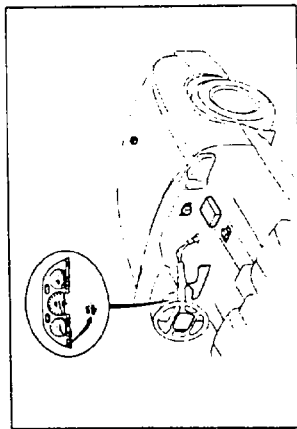
- Wear your safety belts properly.
- If the "INFL REST" indicator light does not blink 7 to 9 times during start up, or if it comes on at other times, take the vehicle to your Isuzu Dealer to have the system serviced.

WARNING

- Do not attach any object to the steering wheel pad. Such objects may become dislodged and cause injury if the SIR deploys.

- If the SIR inflates, it must be replaced to work again. The SIR is designed to inflate only once.

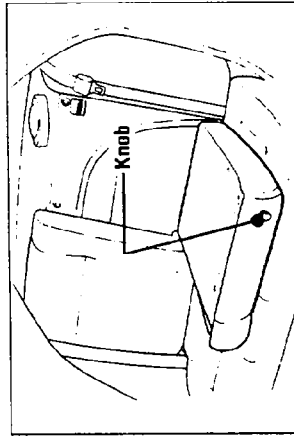
VEHICLE MAINTENANCE



Before doing any maintenance under the hood or inside the car, be sure the ignition key is turned to "LOCK" or "OFF". Inform anyone doing maintenance on the vehicle that the car has a SIR system. There are SIR system components under the hood, in the instrument panel, and of course in the steering column and steering wheel hub. If work is required on other parts of electrical systems, requiring the ignition to be on, the SIR system should be disabled by removing the fuse from the passenger compartment fuse box. The SIR-2 fuse (C-23) should be removed during vehicle maintenance.

Until it is serviced, the system may not inflate in the event of the type of collision that would normally activate it. The readiness indicator system monitors itself and the electrical system that connects the sensors and various electronic components and power sources. Your Isuzu Dealer is best qualified to check and repair the system if needed.

SPLIT FOLD-DOWN REAR SEATBACKS (If so equipped)



The rear seat is split and either or both seatbacks may be folded down to increase luggage space. Pulling the rear seatback knobs on the right or left side allows either side to be folded down.

ance. (See Fuses in the Technical Data section). Be sure the fuse is reinstalled afterward. Any maintenance performed on or near the SIR system components must be performed only by qualified Isuzu technicians. For advice on SIR maintenance, and disposal procedures contact your Isuzu Dealer and/or refer to the 1991 Stylus Workshop Manual. Maintenance of the SIR system on a periodic basis is not required.

WARNING

- You can be injured if you are close to an air bag and it inflates. The air bag still can inflate for up to 10 minutes after the ignition key is turned off and the battery is disconnected.

SYSTEM MONITORING

The "INFL REST" indicator light is located on the left side of the instrument cluster in front of the driver and indicates the readiness of the SIR system by blinking 7 to 9 times when the ignition key is turned to "ON".

If the indicator light illuminates at any other time, or the indicator fails to perform properly when you start the engine, the SIR system needs repair.