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VEHICLE-TO-VEHICLE FRONTAL 60% OVERLAP
35 MPH IMPACT OF A 1991 ISUZU STYLUS
AND A 1991 HONDA ACCORD DX
4-DOOR SEDANS

CALSPAN TEST NUMBER:
Y42-1-1025

DECEMBER 20, 1990

CALSPAN CORPORATION
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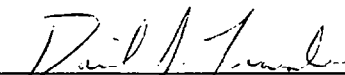
FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation
Research and Special Programs Administration
Transportation Systems Center
Kendall Square
Cambridge, MA 02142

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16. Abstract A vehicle-to-vehicle frontal 35 mph test containing a 60% overlapped 1991 Isuzu Stylus 4-Door Sedan into a 58.4% overlapped 1991 Honda Accord DX 4-Door Sedan was performed at the Calspan Corporation Advanced Technology Center Crash Test Facility in Buffalo, New York on December 20, 1990. Impact speed was 35.8 mph for each vehicle and the ambient temperature at the time of impact was 43°F. Vehicle number one, a 1991 Isuzu Stylus, contained one Hybrid III dummy in the driver seating position. The dummy was restrained using the vehicle's 3-point seat belt restraint system along with an airbag. The driver's HIC was 483.3 and 3 millisecond clipped chest g's were 48.6. The left femur load was 1062.6 lbs. and right femur load was 772.3 lbs. Vehicle number two, a 1991 Honda Accord DX 4-Door Sedan, contained one Hybrid III dummy in the driver seating position. The dummy was restrained using the vehicle's manual lap belt and automatic torso belt. The driver's HIC was 875.5. The 3 millisecond clipped chest g's were 52.1 and femur loads of 1753.6 and 1542.0 lbs. on the left and right femur, respectively.					
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Section 1

PURPOSE AND TEST PROCEDURE

This 35 mph offset frontal vehicle-to-vehicle impact test is part of the Crashworthiness Testing and Analysis Program sponsored by the Research and Special Programs Administration under Contract No. DTRS57-87-C-00047. The purpose of this Technical Task Directive (TTD) is to obtain responses from vehicles and restrained Hybrid III dummies during car-to-car overlapped frontal crashes.

This test was performed using a 1991 Isuzu Stylus and 1991 Honda Accord DX. The vehicles were each traveling at a 35 mph target speed. The offset was arranged such that 60% of the target vehicle's maximum width (1991 Isuzu Stylus) was engaged by the 1991 Honda Accord.

Vehicle number one, a 1991 Isuzu Stylus, contained one Hybrid III dummy in the driver seating position. The dummy was restrained using the vehicle's 3-point seat belt restraint system and driver side airbag.

Vehicle number two, a 1991 Honda Accord, contained one Hybrid III dummy in the driver seating position. The dummy was restrained using the vehicle's manual lap belt and automatic torso belt.

Section 2
SUMMARY OF TEST

A 1991 Isuzu Stylus 4-Door Sedan and a 1991 Honda Accord DX 4-Door Sedan were impacted into each other with each vehicle traveling 35.8 mph. The 1991 Isuzu Stylus was offset such that 60% of the maximum vehicle width was engaged with the 1991 Honda Accord. Figure 1 of this report contains a sketch of the test layout. The test was performed at the Calspan Corporation Advanced Technology Center on December 20, 1990. Pre- and post-test photographs of both vehicles and dummies can be found in Appendix A of this report.

The vehicle-to-vehicle test was documented by one real-time camera and 15 high-speed cameras. Film analysis indicated the vehicles struck 1.0 inch from the target point in such a way as to create slightly more overlap. Camera locations and other pertinent camera information can be found in Table 8 and Figure 12 of this report.

Vehicle 1 (1991 Isuzu Stylus) contained one Hybrid III 50th percentile male anthropomorphic test device (ATD) in the driver seat position. Vehicle 2 (1991 Honda Accord DX) contained one Hybrid III 50th percentile male ATD in the driver seating seat position. The ATDs were restrained using the vehicle's restraint system after being placed in the vehicle following the dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were instrumented with head and chest triaxial accelerometers, chest potentiometer, left/right femur load cells, neck transducers, and upper and lower tibia transducers.

The 77 channels of data were recorded on seven 14-channel FM tape recorders. Appendix B contains the vehicle and dummy response data traces.

The driver's head in Vehicle 1 had a HIC value of 483.3. The maximum chest deceleration over 3 milliseconds was 48.6 g's. The femur loads were 1062.6 lbs. on the left and 772.3 lbs. on the right. The Vehicle 1 torso belt load was 774.3 lbs.

The driver's head in Vehicle 2 had a HIC value of 875.5. The maximum chest deceleration over 3 milliseconds was 52.1 g's. The left femur load was 1753.6 lbs. and 1542.0 lbs. on the right femur load. The Vehicle 2 torso belt load was 1942.2.

TEST ANOMALIES

Vehicle 1 Toe Pan X accelerometer contained questionable data between approximately 116 and 148 msec.

Vehicle 1, position #1 Chest Displacement did not record correctly.

Vehicle, 1 position #1 Upper Neck Force Z transducer became saturated at approximately 38.2 msec.

Vehicle 1, position #1 Left Lower Tibia Force Z transducer did not record.

Vehicle 2, position #1 Upper Neck Moment Z contained intermittent data for the entire data trace.

Vehicle 2, position #1 Left Lower Tibia Moment X contained intermittent data for the entire data trace.

Vehicle 2, position #1 Left Lower Tibia Force Z contained intermittent data for the entire data trace.

Section 3

VEHICLE AND OCCUPANT INFORMATION

Figure 1

VEHICLE-TO-VEHICLE OVERLAP LAYOUT

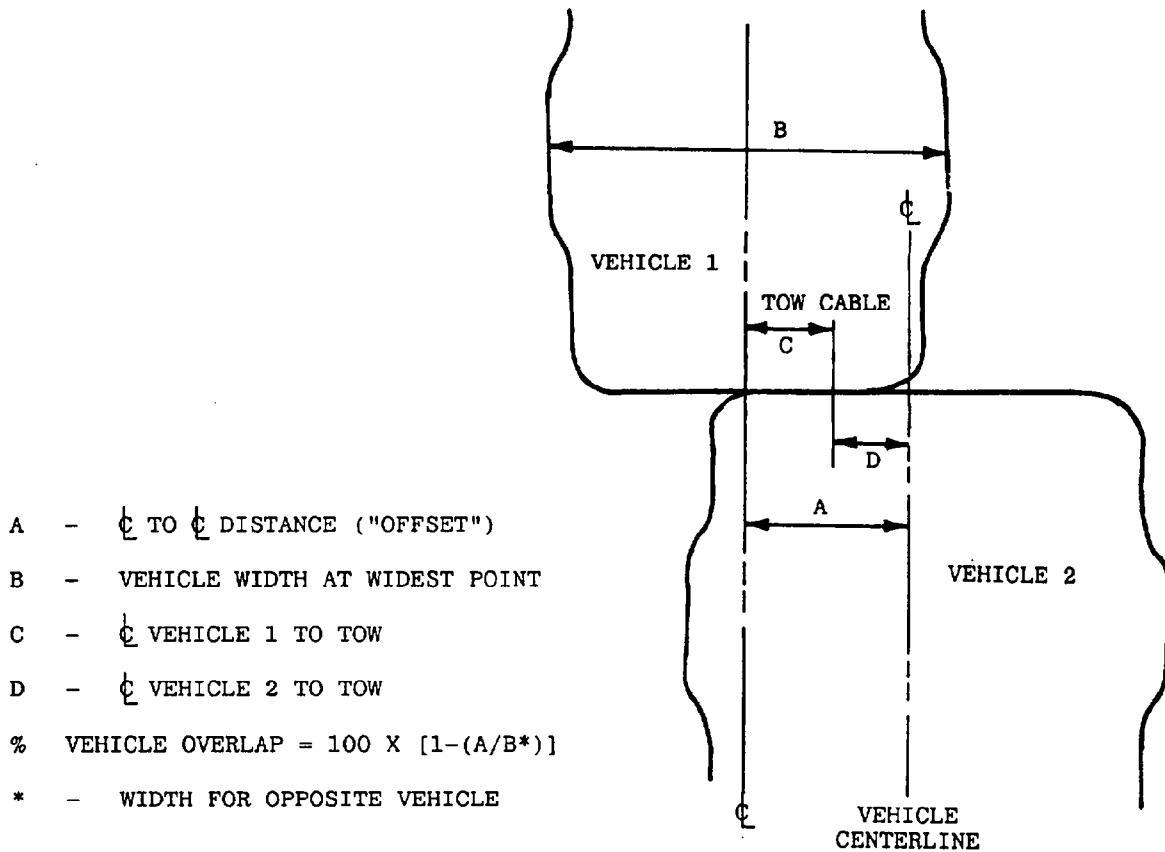


Table 1
Vehicle-to-Vehicle Overlap Measurements (in.)

Measurement Code	Vehicle 1	Vehicle 2
A	-	27.34
B	66.1	67.9
C	13.67	-
D	-	13.67
% Vehicle Overlap	60.0%	58.4%

VEHICLE ONE DATA

Table 2

GENERAL TEST AND VEHICLE 1 PARAMETER DATA

Vehicle Year/Make/Model/Body Style: 1991 Isuzu 4-DoorTest No.: Y42-1-1025 VIN.: JABRT5366M7404156Body Color: Blue Date Of Manufacture: 07/90Engine: 4 Cylinders; - C.I.D.; - Liters; 1588 CCX Gas; - Diesel; - Turbocharged- Longitudinal; X TransverseTransmission: 5 Speed; X Manual; - Automatic; - OverdriveFinal Drive: X Front Wheel; - Rear Wheel; - Four Wheel- A/C; X P/S; X P/B; - P/wdo.; - Tilt Wheel- P/seats; - Cruise ControlType of Occupant Restraint: Driver side airbag and 3-point continuous
restraint systemDATA RECORDED FROM VEHICLE'S TIRE PLACARD:Tire Pressure (at capacity): Front 30 psi, Rear 30 psiRecommended Tire Size: P175/70R13Recommended Cold Tire Pressure: Front 30 psi, Rear 30 psiTires on Vehicle: 175/70R13; Manufacturer: Yokohama - All SeasonNumber of Occupants: 2 Front; 3 Rear; - 3rd Seat; 5 TOTALType of Front Seats: X Bucket; - Bench; - Split BenchType of Front Seat Back: - Fixed; X Adj. With X Level - Rot. KnobVehicle Capacity Weight (VCW) = 827 lbs. (A)No. of Occupants x 150 lbs. = 750 lbs. (B)

Rated Cargo and Luggage

Weight (RCLW) A-B = 77 lbs.GVWR 3242 lbs. GAWR: Front 1774 lbs. Rear 1536 lbs.

Table 2

GENERAL TEST AND VEHICLE 1 PARAMETER DATA (cont'd)

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

Right Front = 690 lbs. Right Rear = 430 lbs.
 Left Front = 710 lbs. Left Rear = 430 lbs.
 TOTAL FRONT WEIGHT = 1400 lbs. (62 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 860 lbs. (38 % of Total Vehicle Weight)
 TOTAL DELIVERY WEIGHT = 2260 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMY:

Right Front = 720 lbs. Right Rear = 530 lbs.
 Left Front = 790 lbs. Left Rear = 620 lbs.
 TOTAL FRONT WEIGHT = 1510 lbs. (57 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 1150 lbs. (43 % of Total Vehicle Weight)
 TOTAL TEST WEIGHT = 2660 lbs.
 Weight of ballast secured in vehicle trunk area = 0 lbs.

TEST VEHICLE ATTITUDE: (all dimensions in inches)

AS DELIVIERED	RF	<u>26</u>	;	LF	<u>25.9</u>	;	RR	<u>26.1</u>	;	LR	<u>26</u>
AS TESTED	RF	<u>25.8</u>	;	LF	<u>25.7</u>	;	RR	<u>25.3</u>	;	LR	<u>24.6</u>

Vehicle's Wheelbase = 96.7 inches

Location of Vehicle's C.G. = 41.8 inches from front wheel center

Table 2

GENERAL TEST AND VEHICLE 1 PARAMETER DATA (cont'd)

POST-IMPACT DATA:

Type of Test: VTV Frontal Impact Angle: 0°
 Date of Test: December 20, 1990 Time of Test: 15:00
 Ambient Temperature: 43 °F at impact area
 Temperature in Occupant Compartment: 69 °F
 Windshield Molding Temperature: 70 °F
 Required Impact Velocity Range: 34.9 to 35.9 mph
 Impact Velocity: primary = 35.8 mph, secondary = 35.8 mph
 Distance From Front Bumper to Impact Point When
 Entering Speed Trap: 52 inches
 Exiting Speed Trap: 12 inches

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>
Head	<u>Airbag</u>
Chest	<u>Airbag, Steering Wheel</u>
Abdomen	<u>-</u>
Left Knee	<u>Dash</u>
Right Knee	<u>Dash</u>

Table 2

GENERAL TEST AND VEHICLE 1 PARAMETER DATA (cont'd)

	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
	<u>operable</u>	<u>operable</u>	<u>operable</u>	<u>operable</u>
Door Opening				

<u>Seat Movement</u>	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
	<u>None</u>	<u>-</u>	<u>-</u>	<u>-</u>
Seat Back Failure				
Seat Shift (in.)	<u>0.0</u>	<u>-</u>	<u>-</u>	<u>-</u>

Table 3
VEHICLE 1 DUMMY INJURY CRITERIA VALUES

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DUMMY (1)	-71.6	-18.6	-20.9	72.4	-52.7	17.9	18.8	48.6
DUMMY (2)	-	-	-	-	-	-	-	-
DUMMY (3)								
DUMMY (4)								

	MAXIMUM FORCE FEMUR LOAD (LBS.)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	772.3	1062.6
DUMMY (2)	-	-
DUMMY (3)		
DUMMY (4)		

	MAXIMUM FORCE SEAT BELT LOADS (LBS.)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)	774.3	N/M	N/M
DUMMY (2)	-	-	-
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA (HIC)			
	HIC	t ₁ (SEC)	t ₂ (SEC)	Average Acceleration t ₁ TO t ₂
DUMMY (1)	483.3	.04992	.07176	54.7
DUMMY (2)	-	-	-	-
DUMMY (3)				
DUMMY (4)				

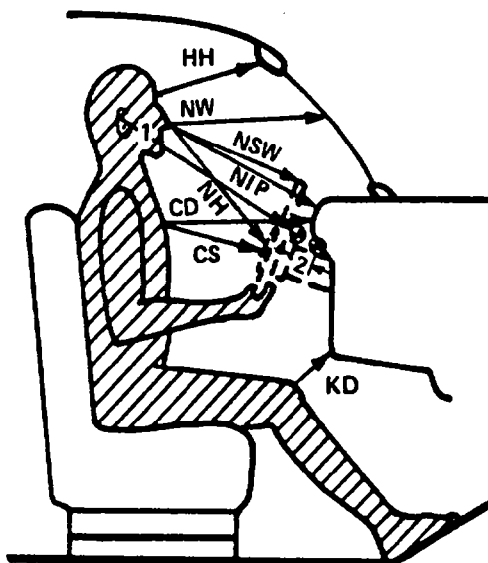
*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No. 208

Figure 2

VEHICLE 1 OCCUPANT CLEARANCE DIMENSIONS

	DRIVER
HH	12.7
NW	27.3
NSW	13.7
NIP	19.9
NH	14.0
CD	19.8
CS	9.9
KDL	4.6
KDR	4.8
1	21.5
2	2.0
SA	25°
TA	23°
ULA	112°
LLA	225°



H-Point from Target Position:

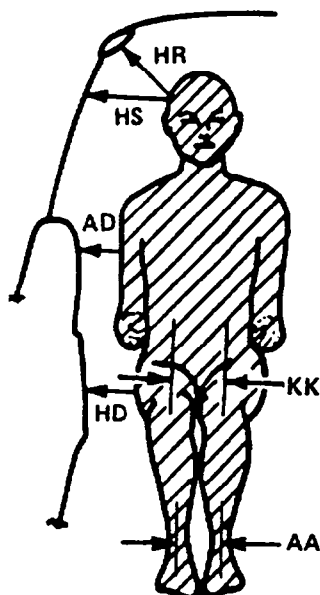
Longitudinal 0.2" rearward of target
Vertical 0.0" from target

Angles taken relative to vertical

SA = Seat Back Angle
TA = Torso Angle
ULA = Upper Leg Angle
LLA = Lower Leg Angle

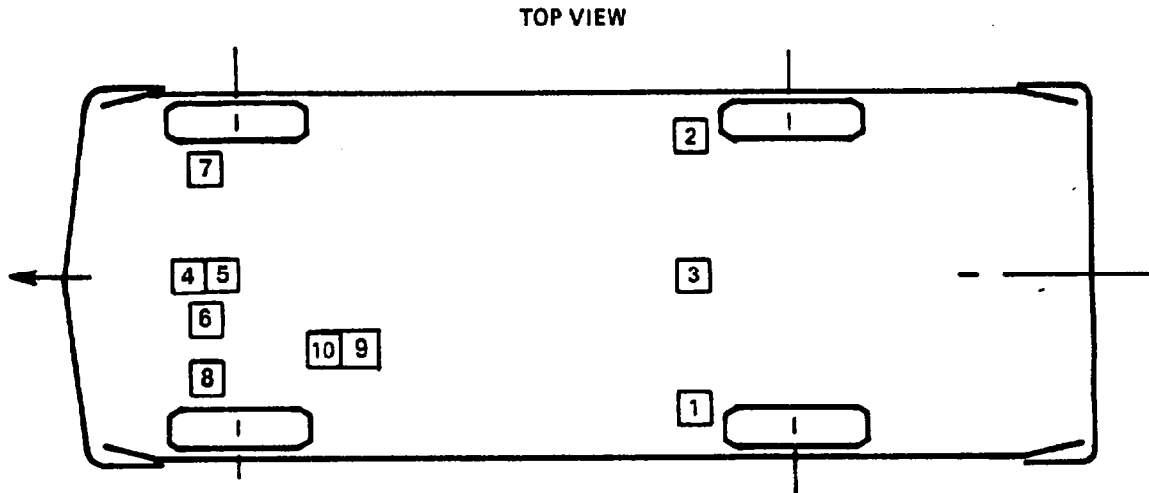
HH = Head to Windshield Header
NW = Nose to Windshield
NSW = Nose to Steering Wheel
NIP = Nose to Instrument Panel
NH = Nose to Steering Wheel Hub
CD = Chest to Dash
CS = Chest to Steering Wheel Hub
KDL = Knee to Dash Left
KDR = Knee to Dash Right
1 = Head Target to Steering Column Target
2 = Distance between Steering Column Targets

HR = Head to Side Roof
HS = Head to Side Window
AD = Arm to Door
HD = Hip to Door
KK = Knee to Knee
AA = Ankle to Ankle
DT = Dummy Temperature °F



	DRIVER
HR	6.2
HS	9.6
AD	4.5
HD	5.5
KK	11.2
AA	12.9
DT	70°

Figure 3
SUMMARY OF VEHICLE 1 ACCELEROMETER DATA



Vehicle: 1991 Isuzu Stylus 4-Door Sedan

Loc. No.	Description	Axis	Maximum Value (g's)*	
			"-"	"+"
1	Rear seat crossmember left side	x	-42.0	3.1
2	Rear seat crossmember right side	x	-46.6	1.4
3	Rear seat crossmember centerline, X	x	-48.5	2.8
3	Rear seat crossmember centerline, Y	y	-6.4	15.1
3	Rear seat crossmember centerline, Z	z	-23.7	42.4
4	Top of engine block	x	-140.4	14.8
4	Top of engine block	z	-6.9	22.1
5	Bottom of engine block	x	-70.3	21.3
6	Front suspension crossmember	x	-51.2	10.0
6	Front suspension crossmember	z	-17.7	18.3
7	Right front brake caliper	x	-71.3	7.3
8	Left front brake caliper	x	-176.0	53.1
9	Brake pedal	x	-191.8	123.4
9	Brake pedal	z	-59.4	77.5
10	Toe pan	x	-175.5	10.3

*Values filtered using SAE class 60 filter.

Figure 4

VEHICLE 1 PRE- AND POST-TEST POSITION OF TEST VEHICLE
ACCELEROMETER MOUNTING LOCATIONS

Test Description: 35 mph Offset Frontal Vehicle-to-Vehicle Impact

Test Vehicle: 1991 Isuzu Stylus 4-Door Sedan

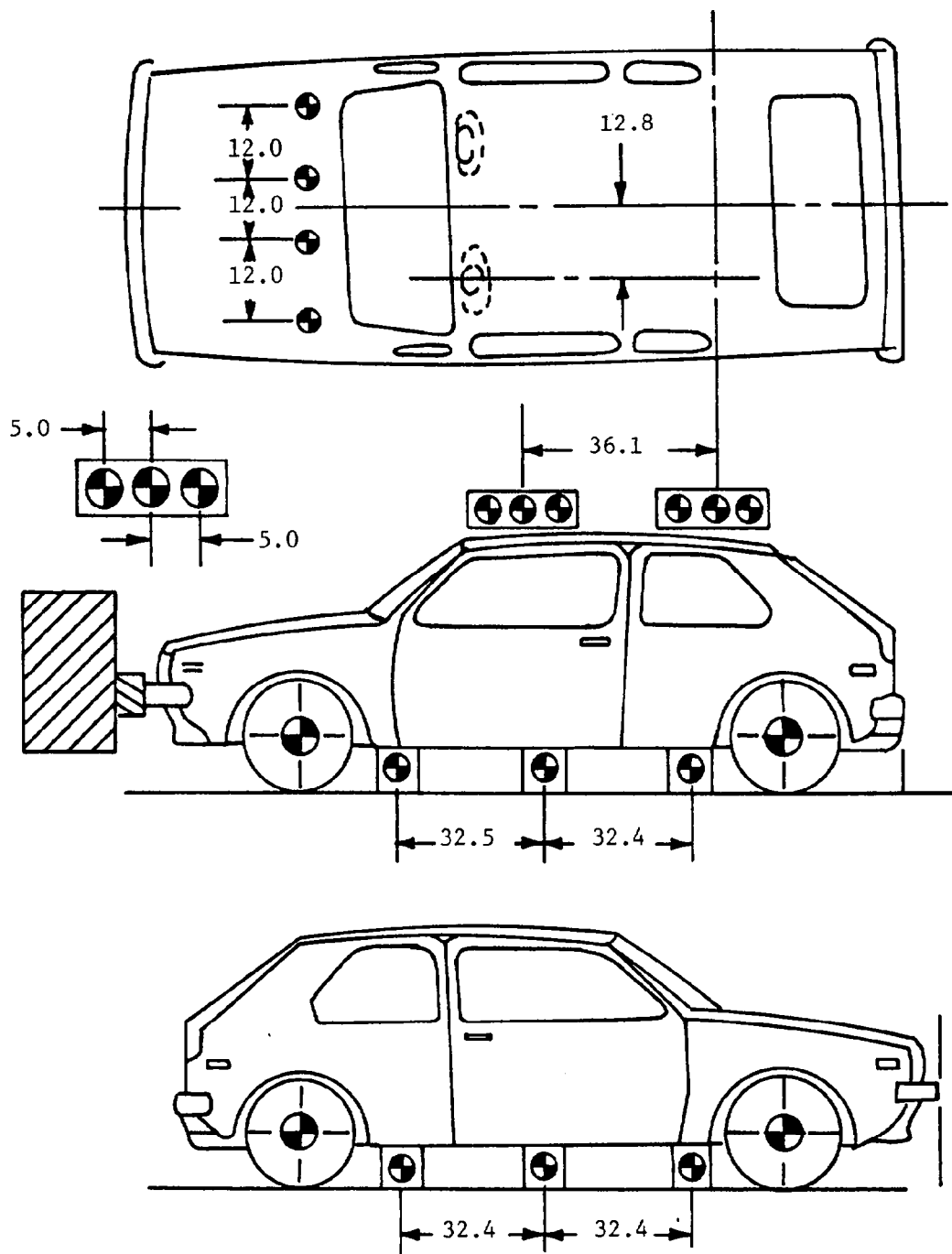
Reference Plane: Vehicle plane at rear bumper

Accelerometer Description	LONGITUDINAL LOCATION		
	Pre-Test	Post-Test	Change
Rear seat crossmember left side	60.5	60.3	0.2
Rear seat crossmember right side	60.5	60.3	0.2
Rear seat crossmember centerline	61.5	61.5	0.0
Top of engine block	140.5	126.0	14.5
Bottom of engine block	138.2	122.3	15.9
Front suspension crossmember	119.1	114.1	5.0
Right front brake caliper	129.1	127.5	1.6
Left front brake caliper	129.1	113.0	16.1
Brake pedal	112.6	102.1	10.5
Toe pan	115.3	109.7	5.6

All Dimensions in Inches

Figure 5
VEHICLE 1 TARGET LOCATIONS

All Dimensions in Inches



VEHICLE 1 MEASUREMENT POINTS

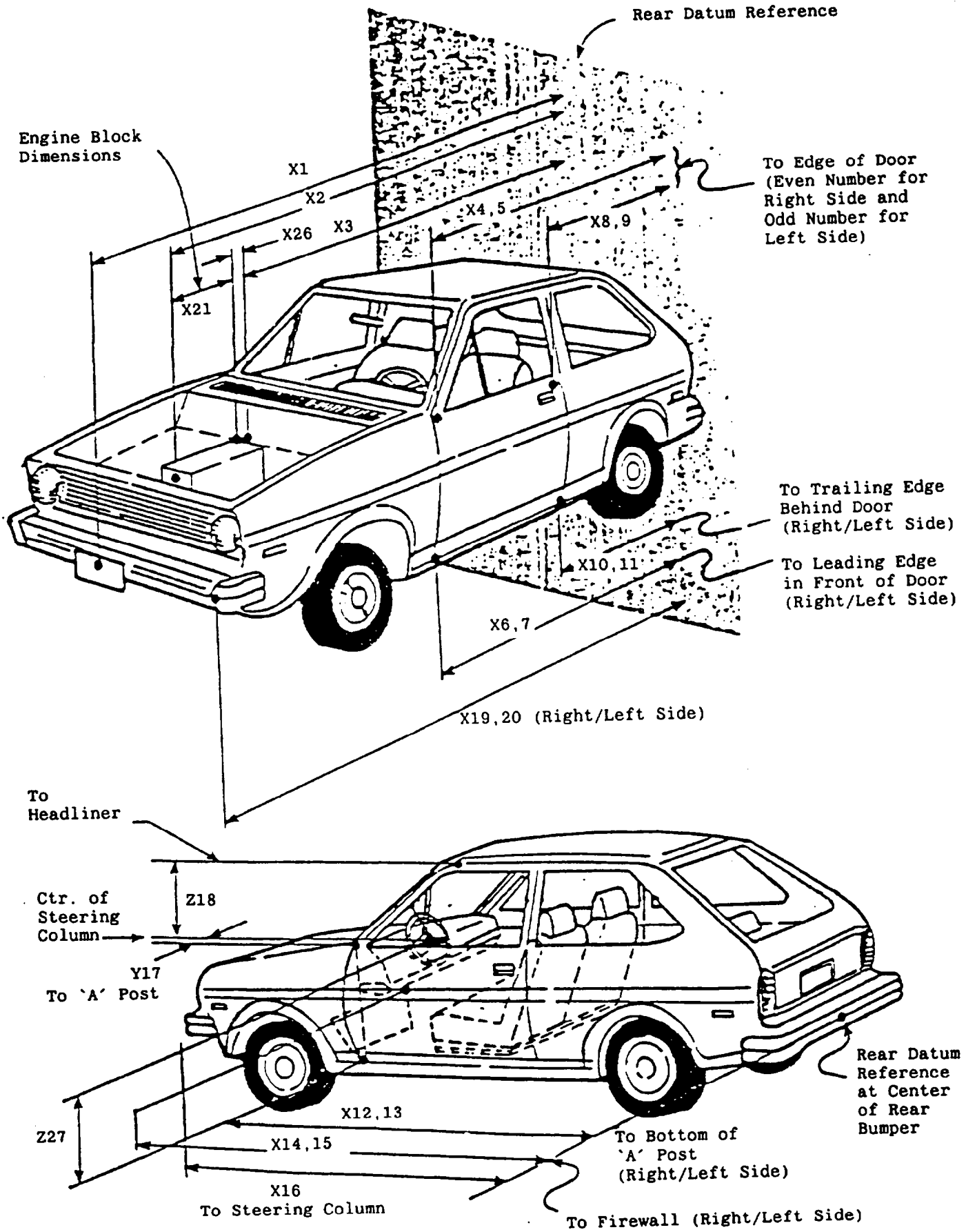


Figure 6
VEHICLE 1 MEASUREMENT POINTS (continued)

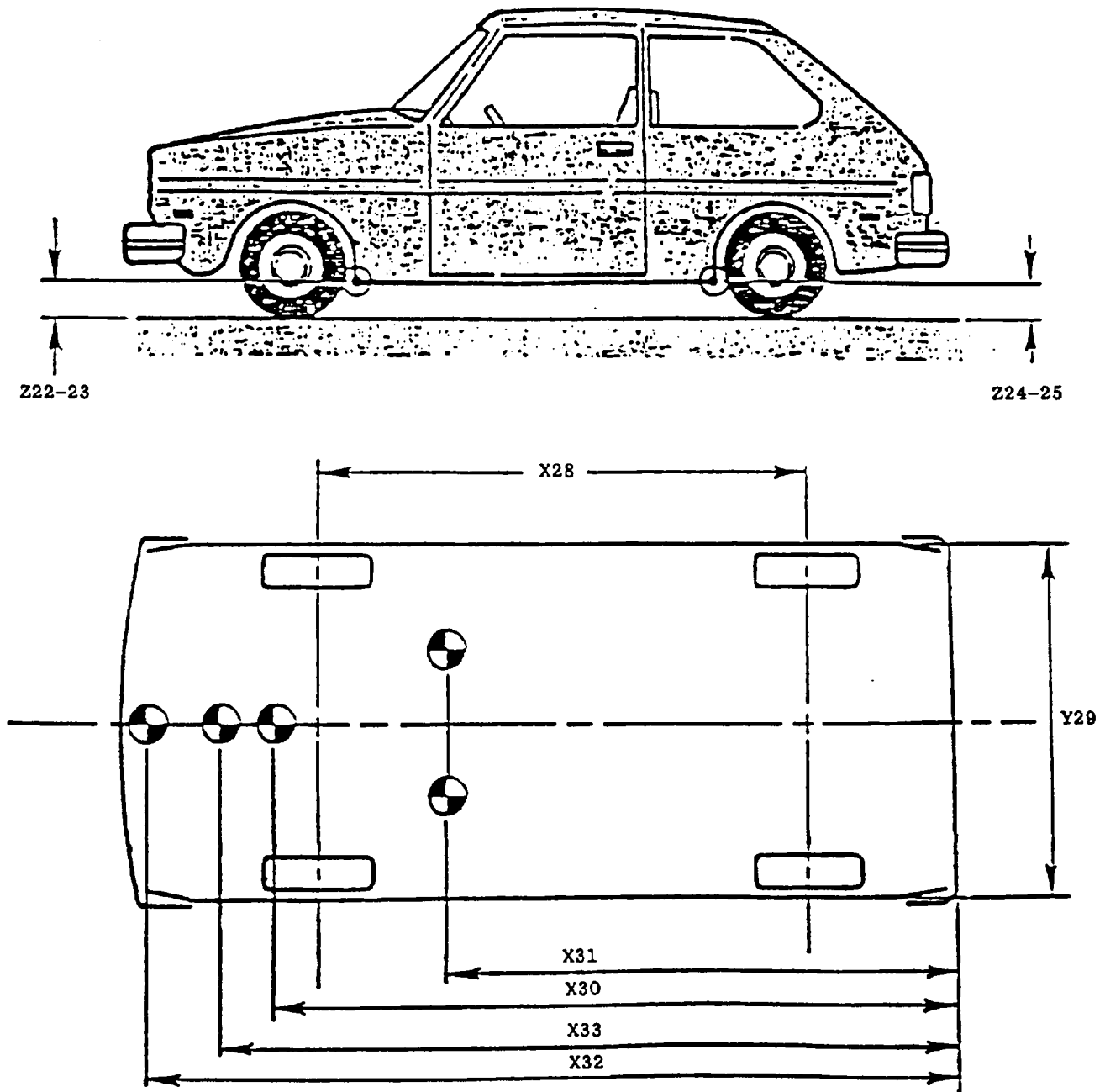


Table 4
VEHICLE 1 MEASUREMENTS

No.	TYPE OF MEASUREMENT	All Dimensions in Inches	
		Pre-Test	Post-Test
X1	Total Length of Vehicle at Centerline	164.6	139.1
X2	Rear Surface of Vehicle to Front of Engine	142.1	130.6
X3	Rear Surface of Vehicle to Firewall	127.6	119.6
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	112.3	113.4
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	113.1	109.3
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	112.6	113.2
X7	Rear Surface of vehicle to Lower Leading Edge of Left Door	113.2	105.8
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	71.5	72.2
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	72.2	69.5
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	72.0	72.2
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	72.5	69.5
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	112.5	113.1
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	112.9	106.5
X14	Rear Surface of Vehicle to Firewall - Right Side	124.3	124.1
X15	Rear Surface of Vehicle to Firewall - Left Side	125.0	121.8
X16	Rear Surface of Vehicle to Steering Wheel Center	90.8	89.0
Y17	Steering Column to "A" Post	18.1	19.5

Table 4

VEHICLE 1 MEASUREMENTS (continued)

No.	TYPE OF MEASUREMENT	All Dimensions in Inches	
		Pre-Test	Post-Test
Z18	Rear of Windshield Header to Steering Wheel Column	16.8	15.8
X19	Rear Surface of Vehicle to Right Side of Front Bumper	160.5	160.6
X20	Rear Surface of Vehicle to Left Side of Front Bumper	161.0	129.6
X21	Width of Engine Block	11.0	11.0
Z22	Right Front Sill to Ground Plane	7.9	8.0
Z23	Left Front Sill to Ground Plane	8.1	4.0
Z24	Right Rear Sill to Ground Plane	8.2	7.8
Z25	Left Rear Sill to Ground Plane	8.1	6.7
X26	Firewall to Engine or Transaxle	8.5	0.0
Z27	Vertical Dim. from Door Sill to Centerline of Steering Column	21.5	24.8
X28	Wheelbase of Vehicle	96.4	Left - 81.3 Right - 100.0
Y29	Width of Vehicle at Maximum Width Point	65.5	73.5
X30	Rear Surface of Vehicle to Engine Target	138.1	135.9
X31	Rear Surface of Vehicle to Compartment Target	72.2	71.5
X32	Rear Surface of Vehicle to Bumper Target	159.1	142.6
X33	Rear Surface of Vehicle to Frame Crossmember	117.3	113.6
	Instrument Panel Target	Left - 98.0 Right - 95.0	Left - 93.5 Right - 94.3

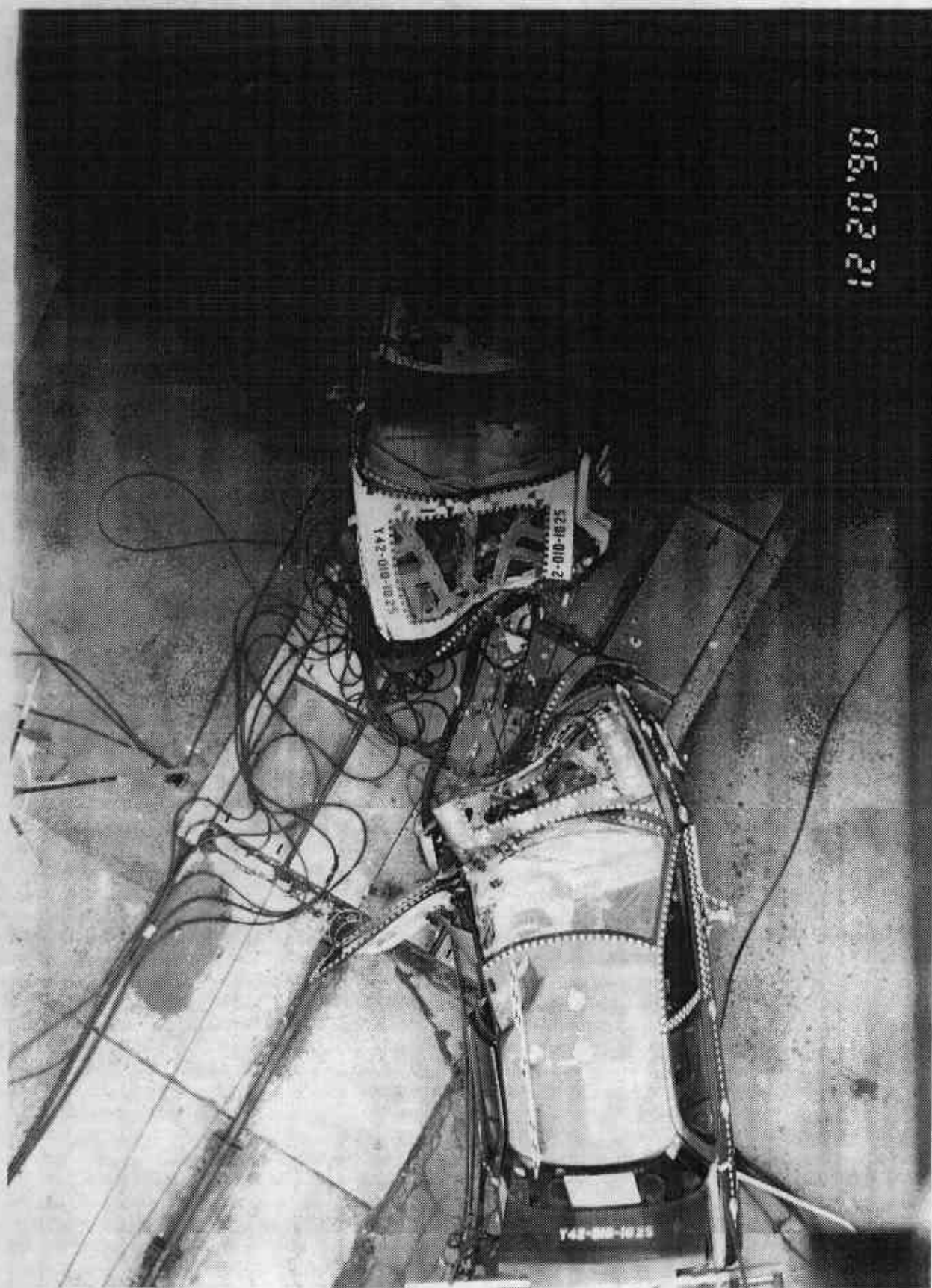


Figure A-2 POST-TEST OVERHEAD VIEW

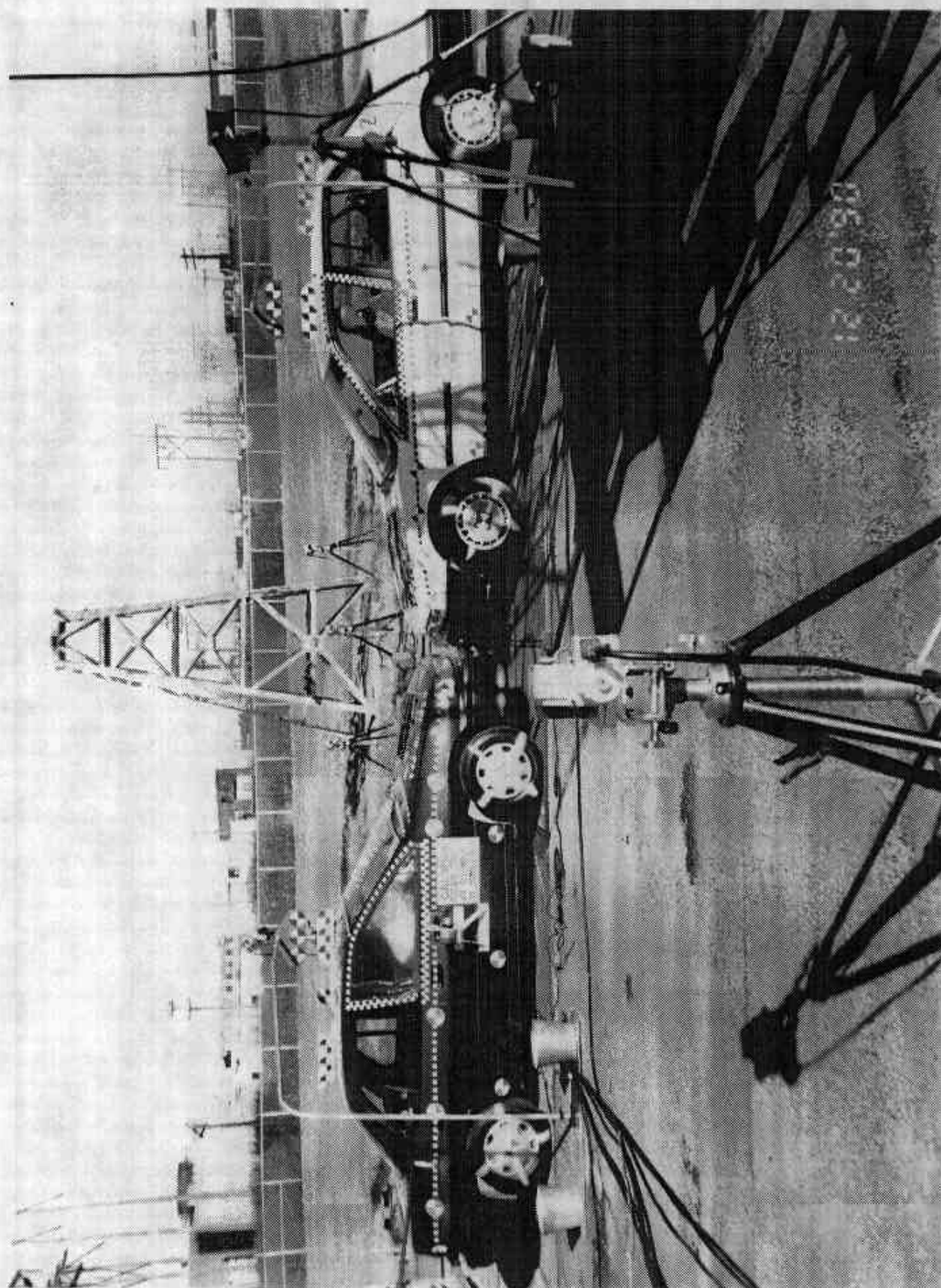


Figure A-3 PRE-TEST OVERALL SIDE VIEW

A-5

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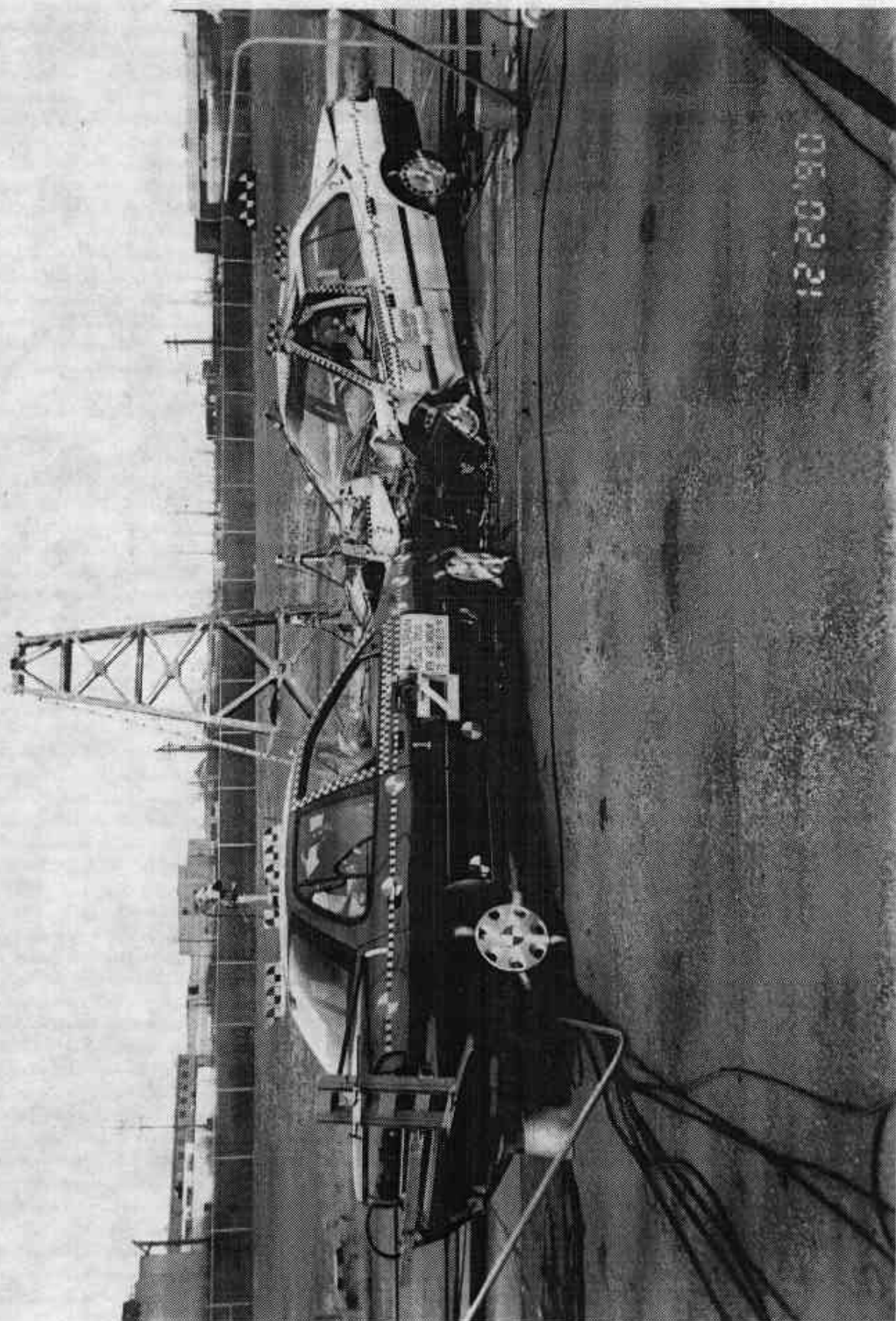
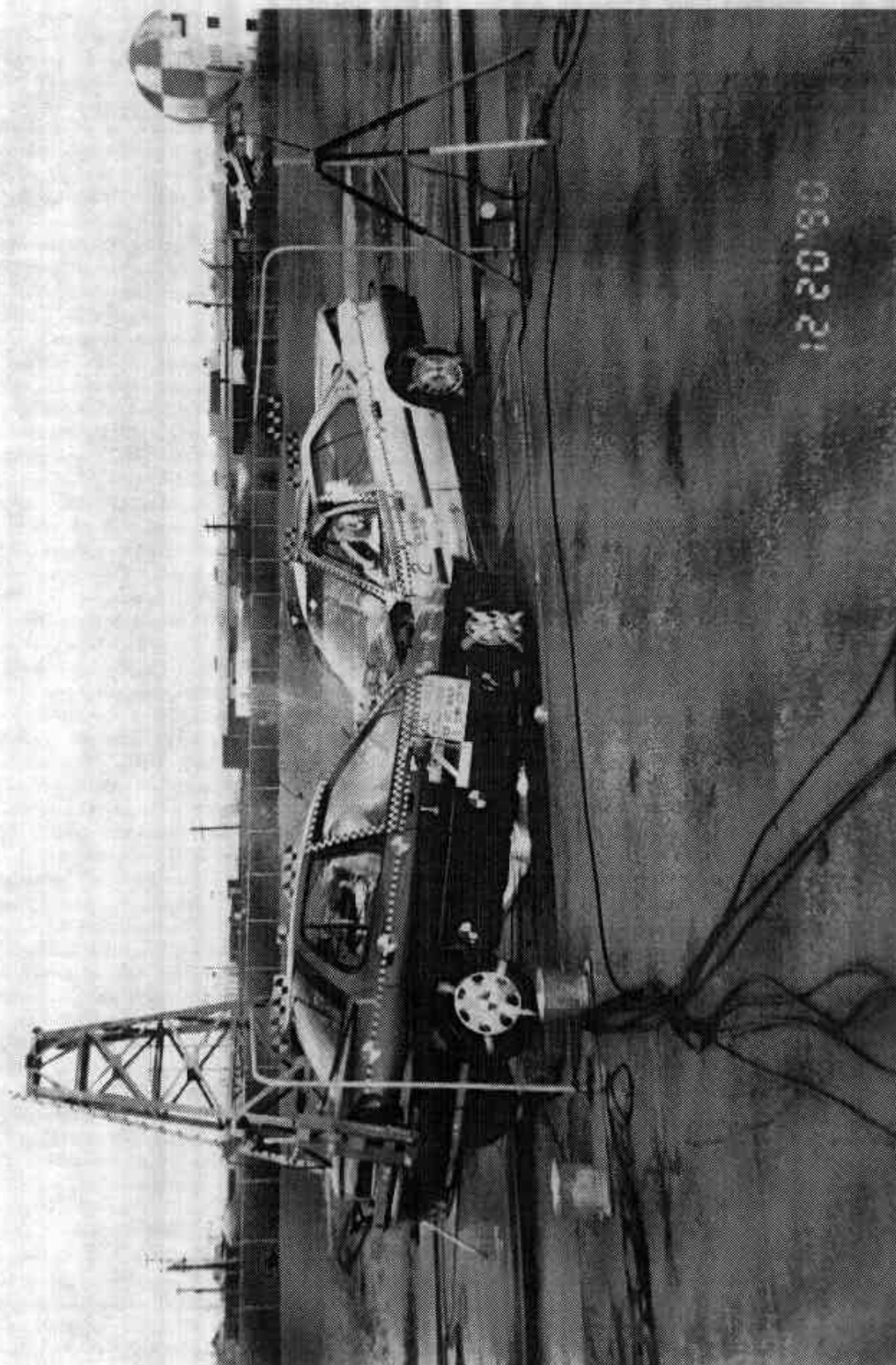


FIGURE A-4 POST-TEST OVERALL SIDE VIEW

A-6

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FIGURE A-5 IMPACT PHOTO

A-7

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VEHICLE 1 PHOTOGRAPHS

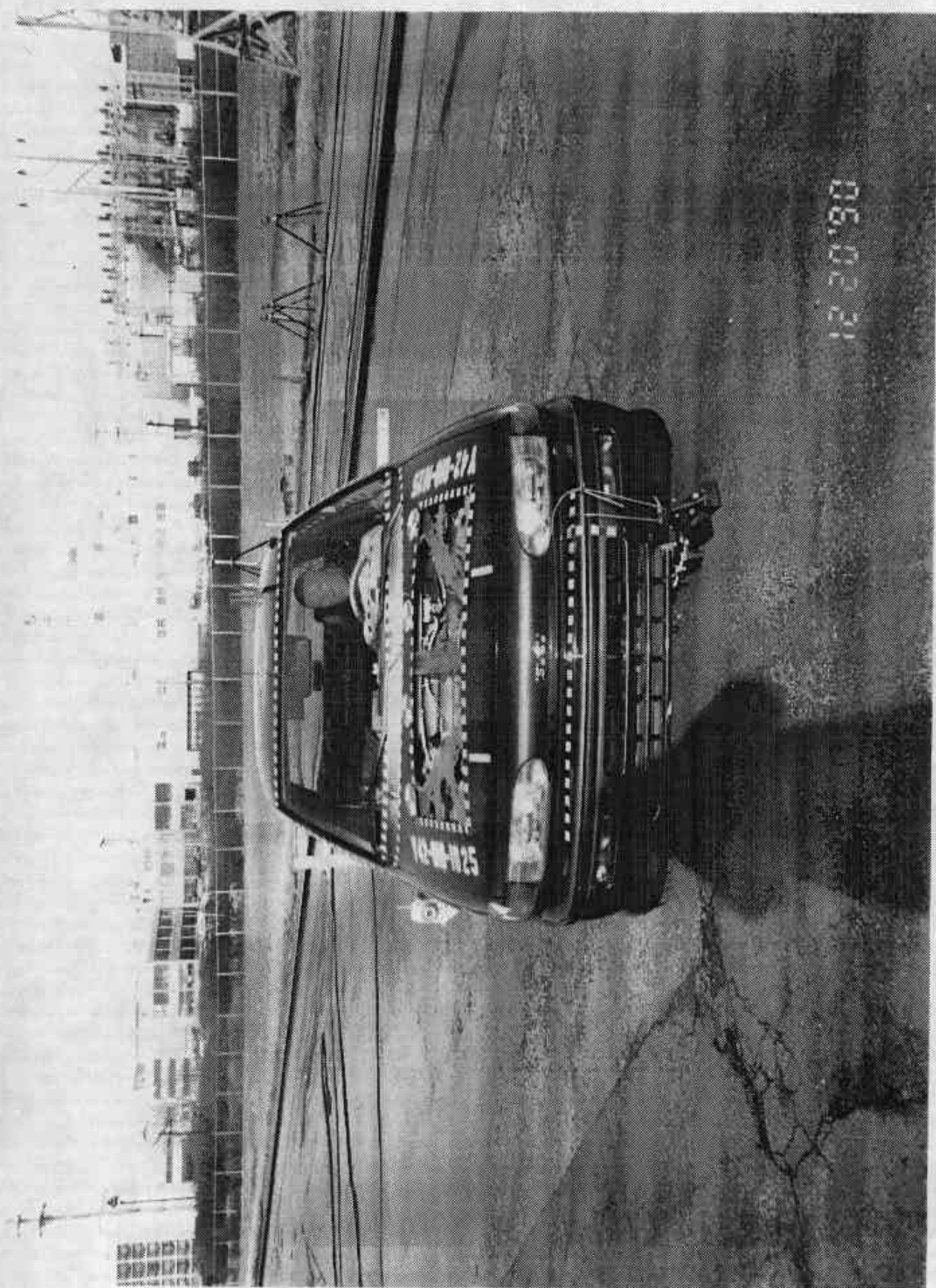


FIGURE A-6 VEHICLE 1 PRE-TEST FRONT VIEW

A-0

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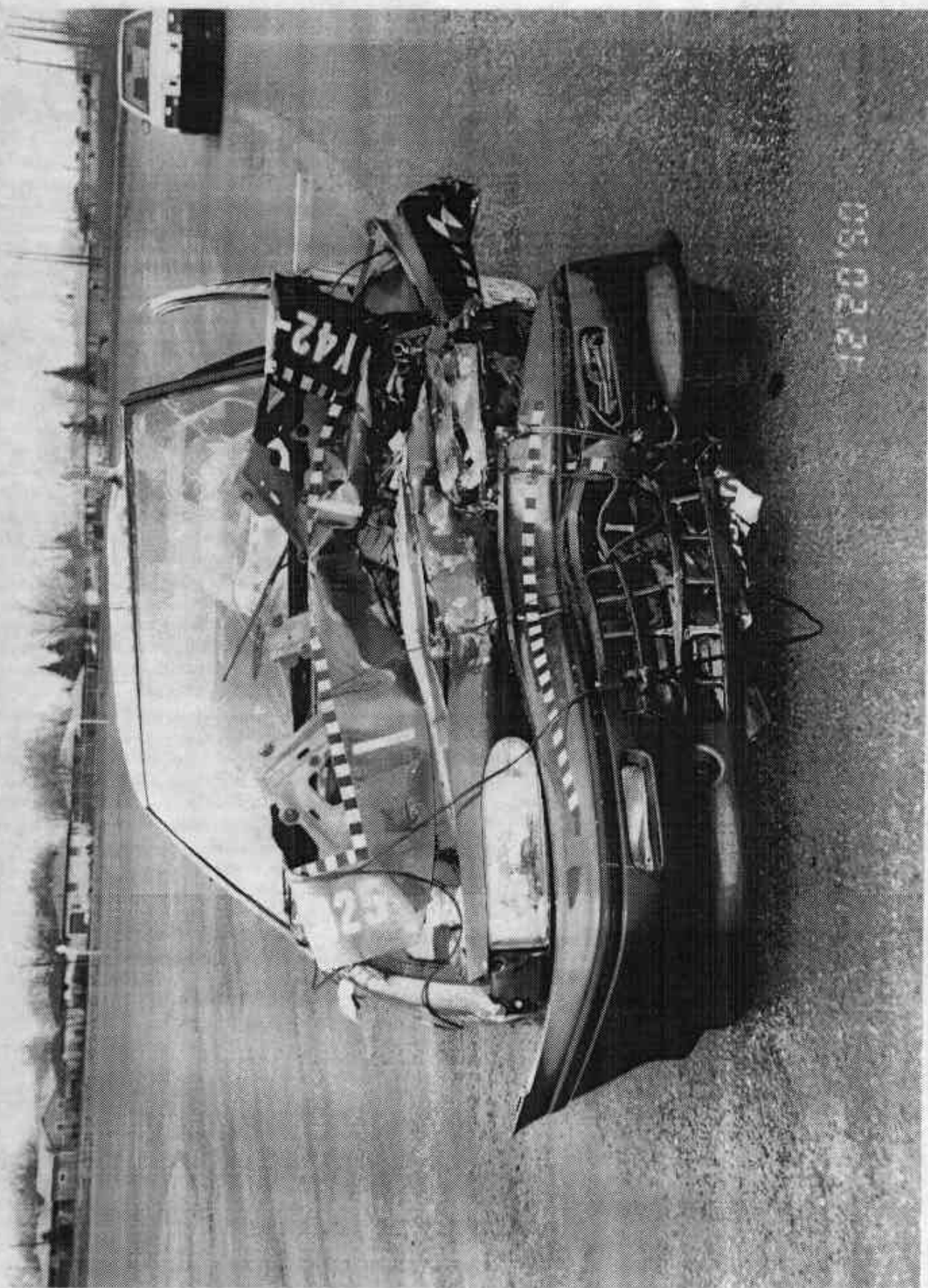


FIGURE A-7 VEHICLE 1 POST-TEST FRONT VIEW

A-10

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Figure A-8 VEHICLE 1 PRE-TEST FRONT RIGHT THREE QUARTER VIEW

A-11

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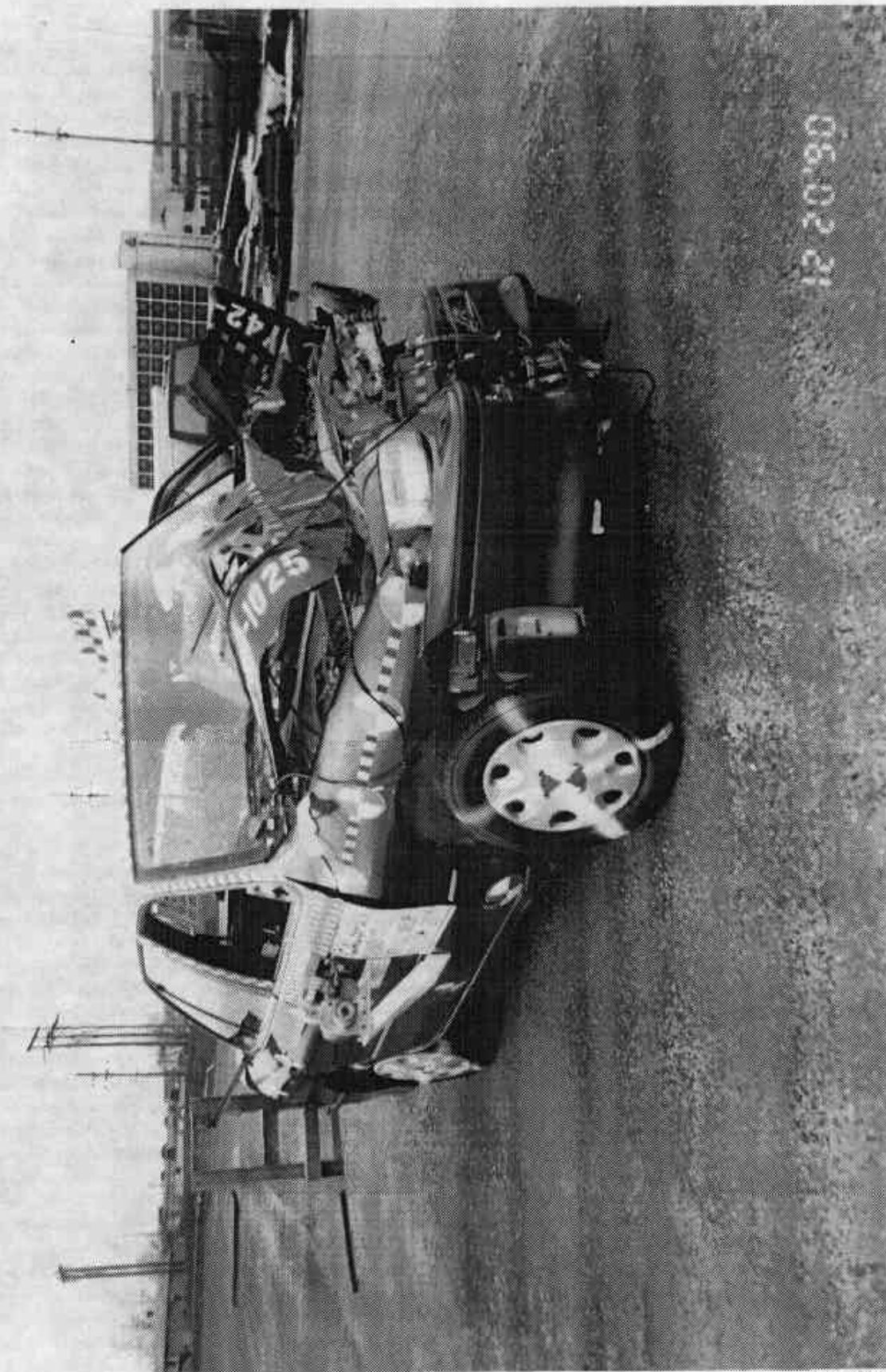


Figure A-9 VEHICLE 1 POST-TEST FRONT RIGHT THREE QUARTER VIEW

A-12

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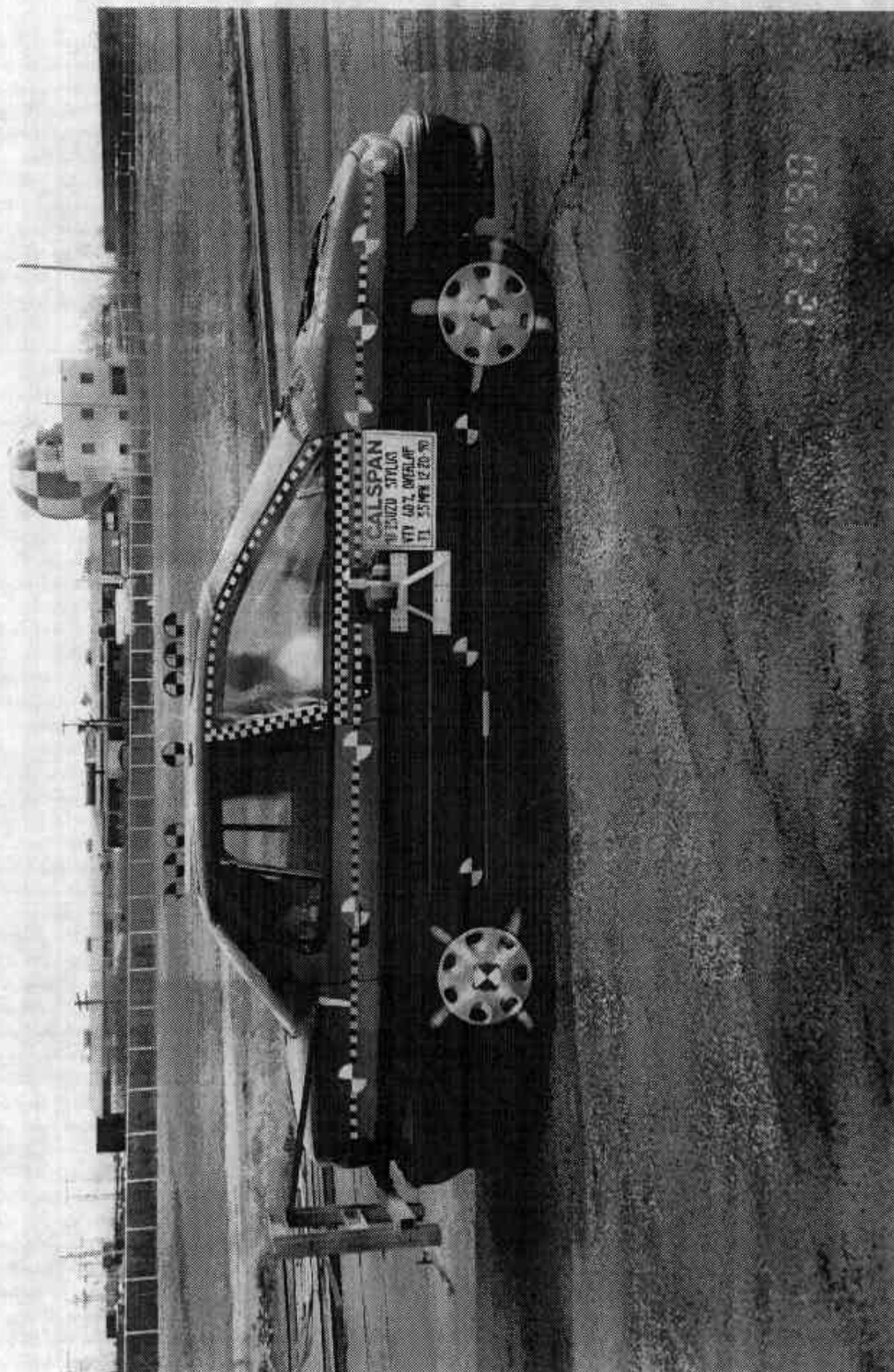


FIGURE A-10 VEHICLE 1 PRE-TEST RIGHT SIDE VIEW

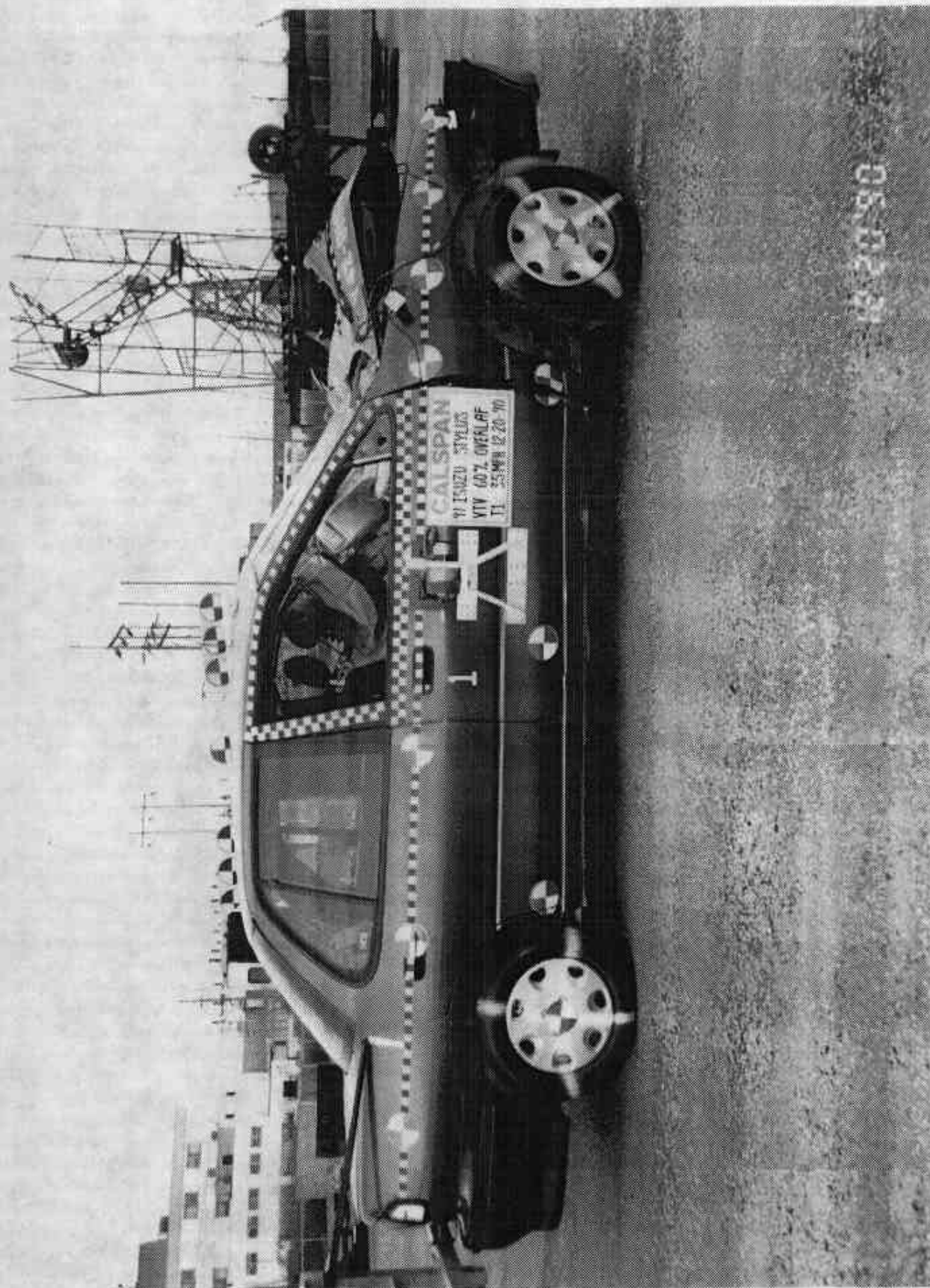


Figure A-11 VEHICLE 1 POST-TEST RIGHT SIDE VIEW



Figure A-12 VEHICLE 1 PRE-TEST REAR RIGHT THREE QUARTER VIEW

A-15

7883-1

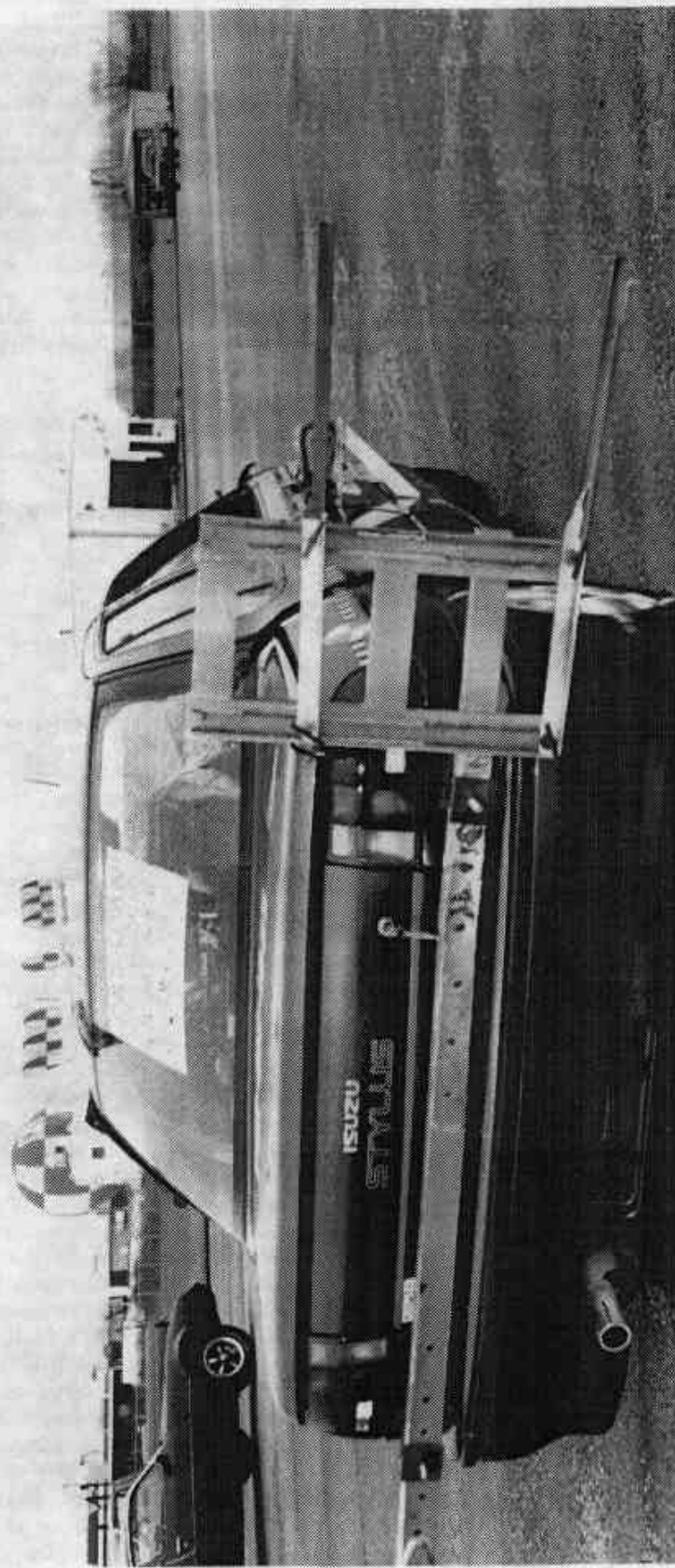


FIGURE A-13 VEHICLE 1 POST-TEST REAR RIGHT THREE QUARTER VIEW

A-16

7883-1



Figure A-14 VEHICLE 1 PRE-TEST REAR VIEW

A-17

7883-1



05.02.90

Figure A-15 VEHICLE 1 POST-TEST REAR VIEW

A-18

7883-1



Figure A-16 VEHICLE 1 PRE-TEST REAR LEFT THREE QUARTER VIEW

A-19

7883-1



Figure A-17 VEHICLE 1 POST-TEST REAR LEFT THREE QUARTER VIEW

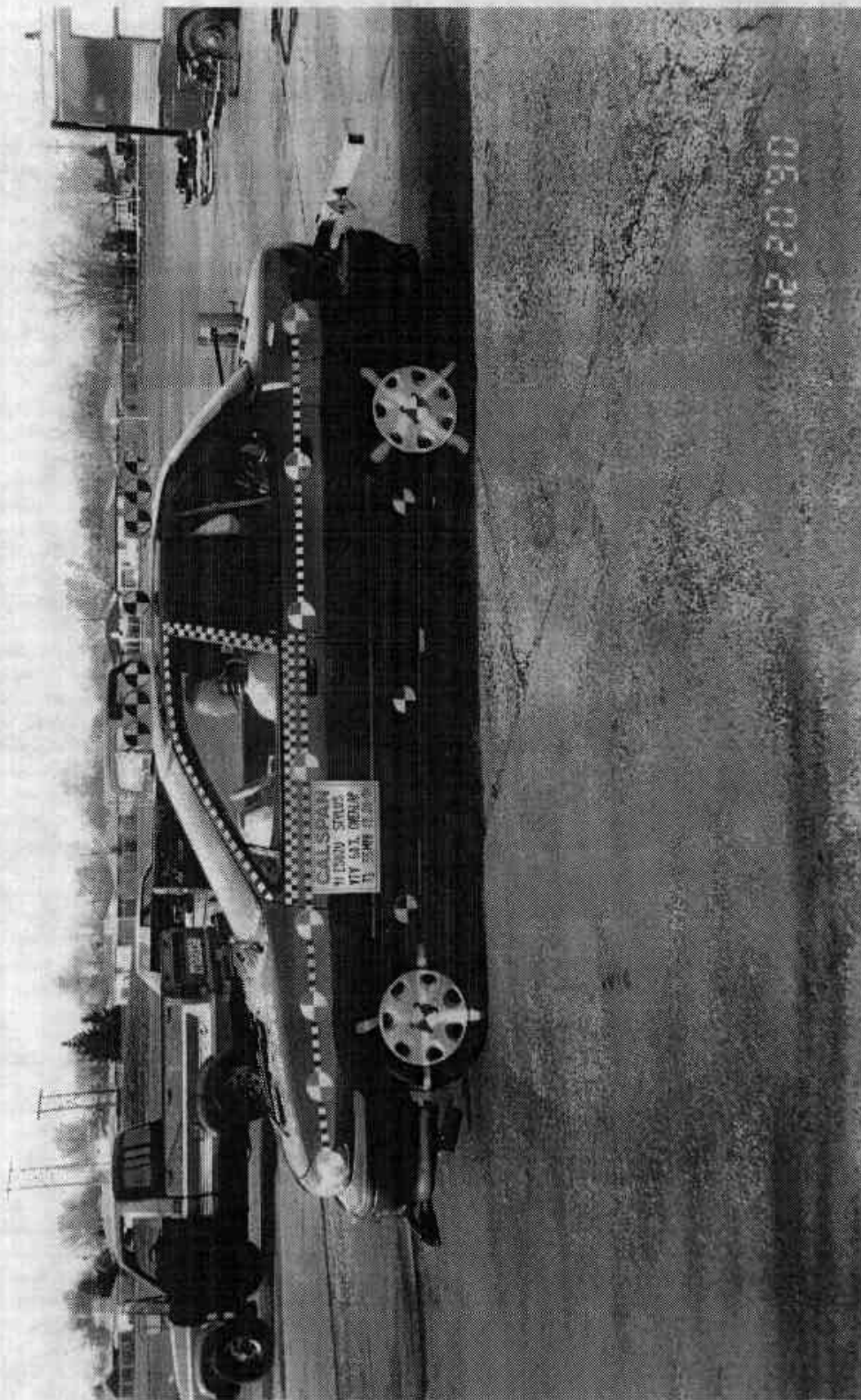


Figure A-18 VEHICLE 1 PRE-TEST LEFT SIDE VIEW

A-21

7883-1

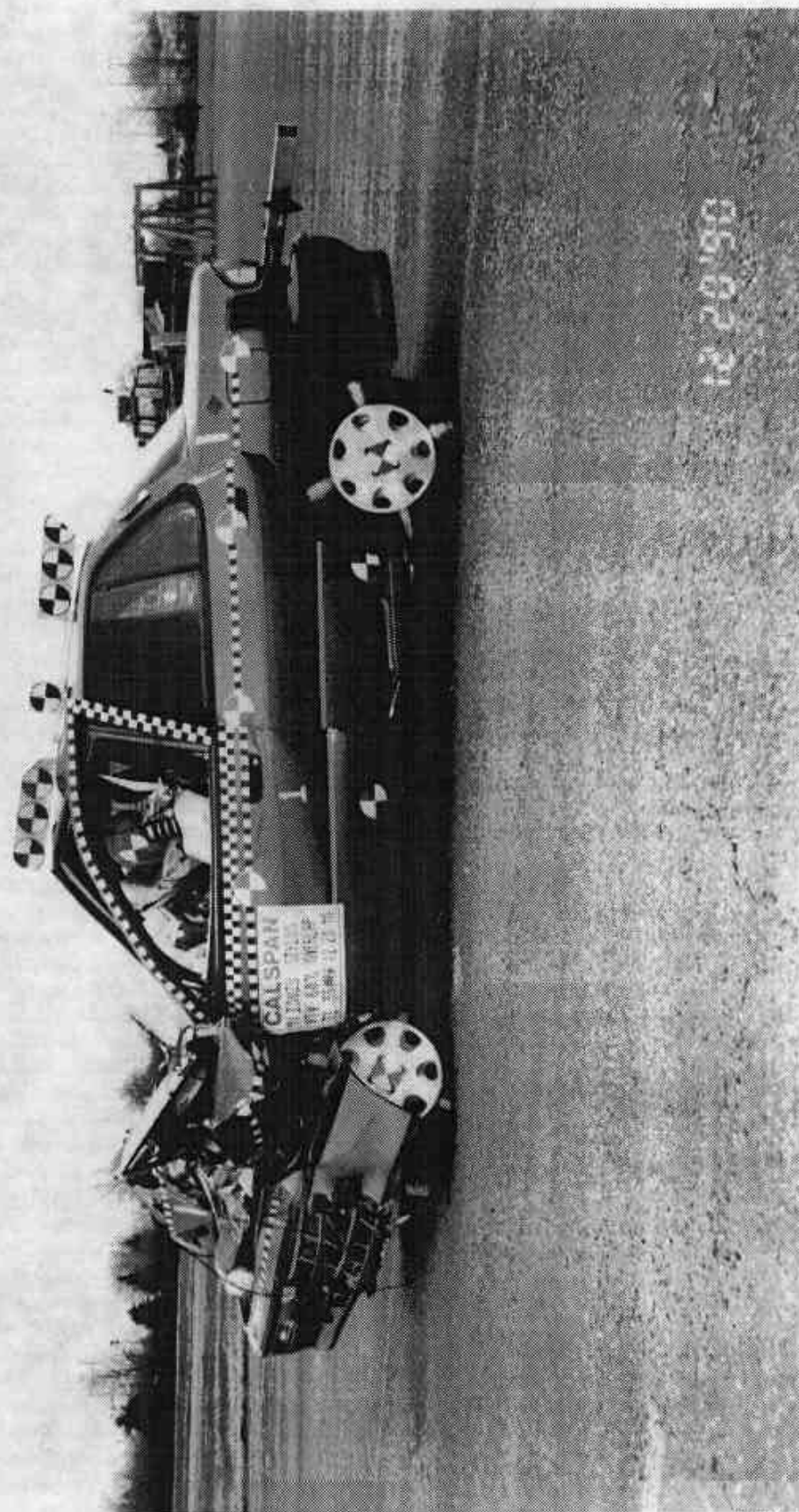


Figure A-19 VEHICLE 1 POST-TEST LEFT SIDE VIEW



05.02.21
12.20.30

Figure A-20 VEHICLE 1 PRE-TEST FRONT LEFT THREE QUARTER VIEW

A-23

7883-1

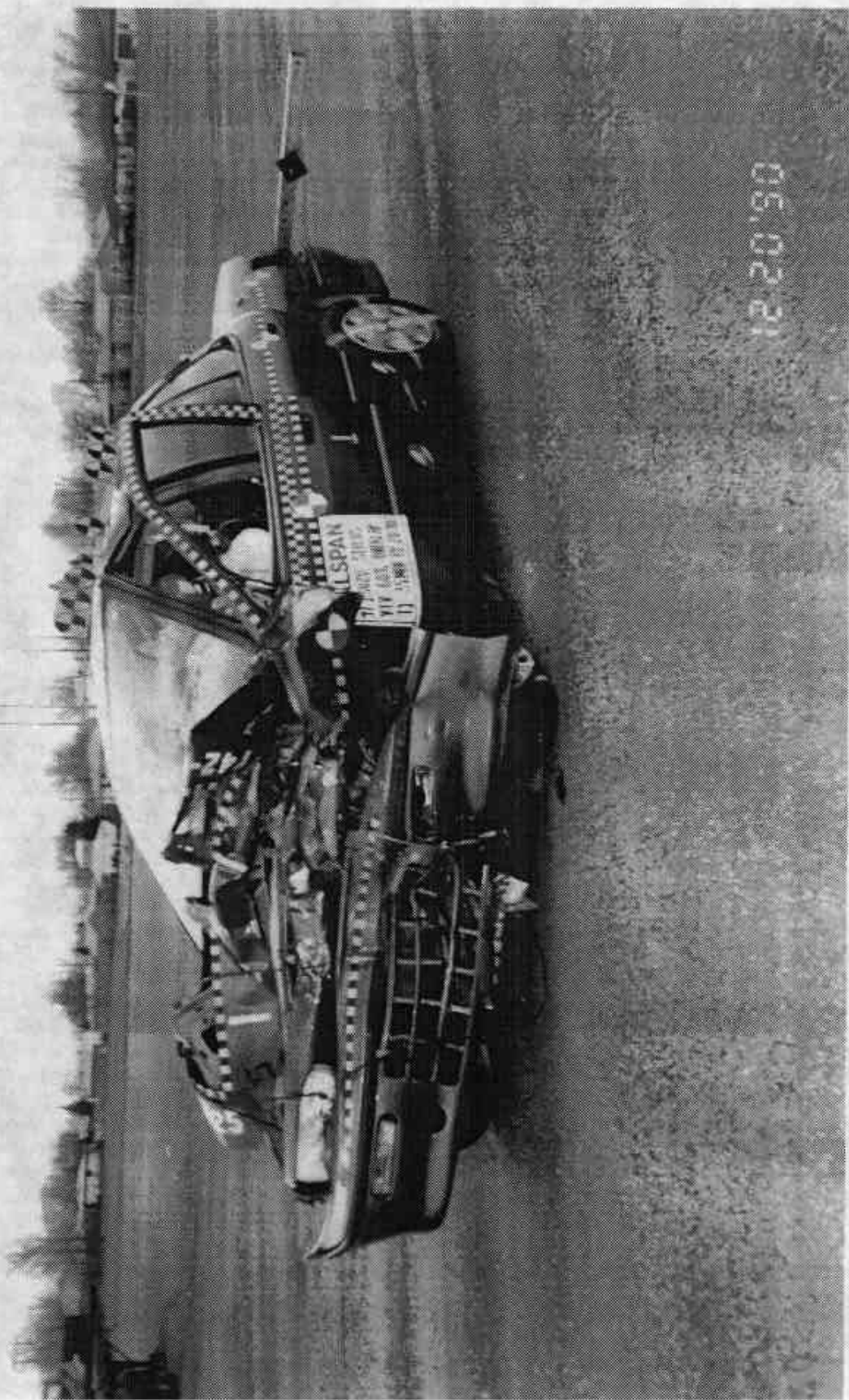


Figure A-21 VEHICLE 1 POST-TEST FRONT LEFT THREE QUARTER VIEW

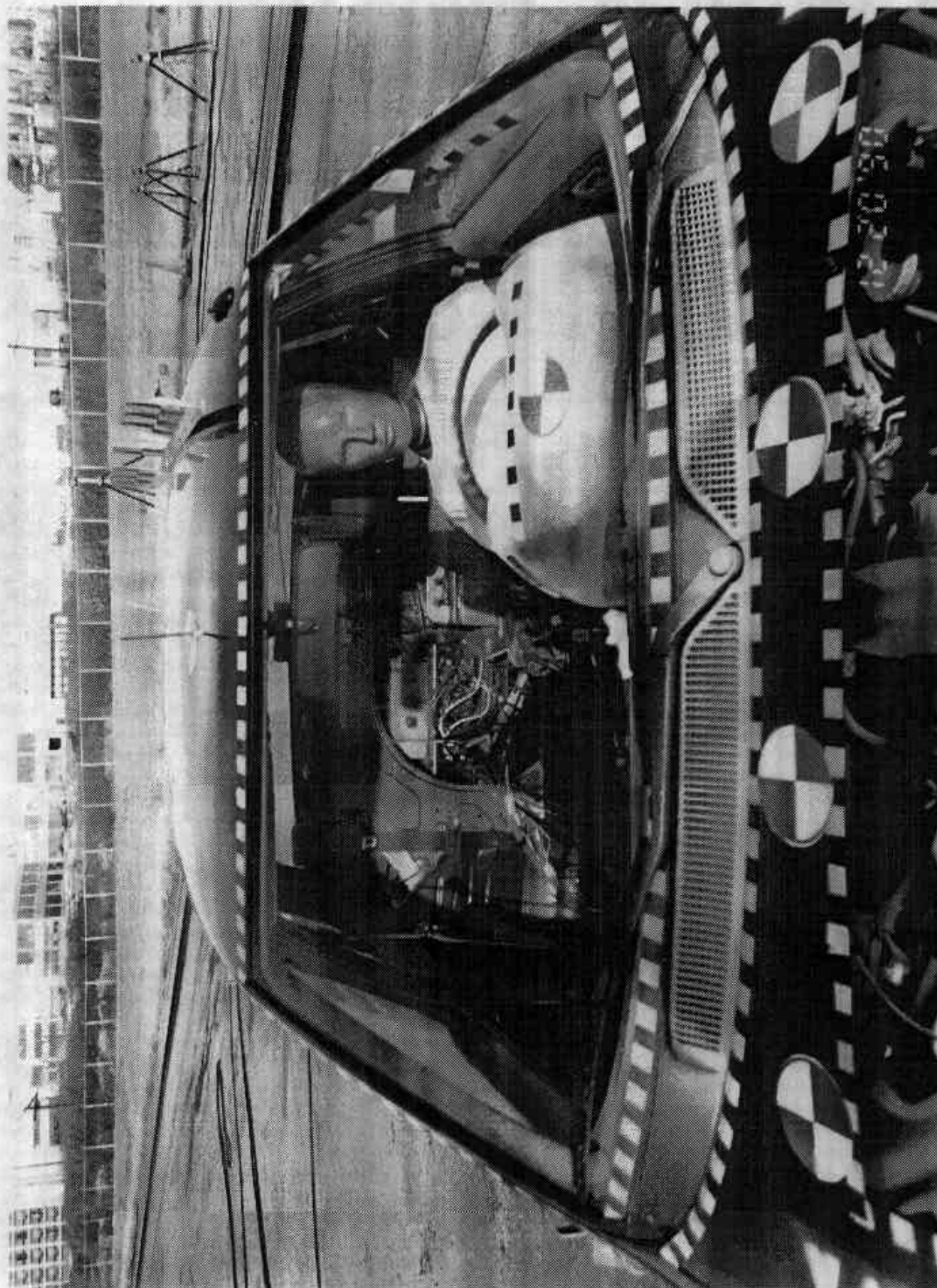


FIGURE A-22 VEHICLE 1 PRE-TEST WINDSHIELD VIEW

A-25

7883-1

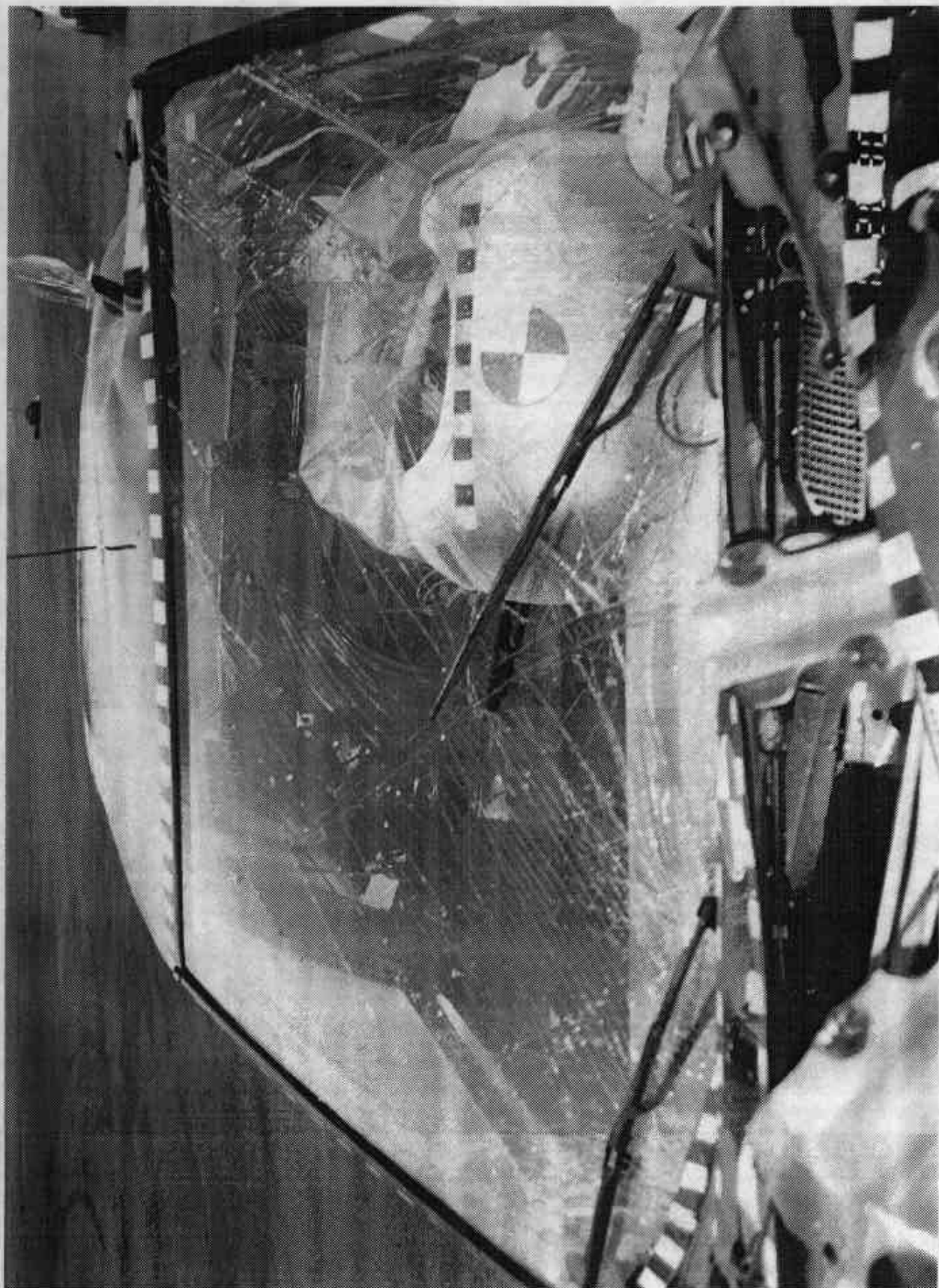


Figure A-23 VEHICLE 1 POST-TEST WINDSHIELD VIEW

A-26

7883-1



FIGURE A-24 VEHICLE 1 PRE-TEST OVERHEAD ENGINE COMPARTMENT VIEW

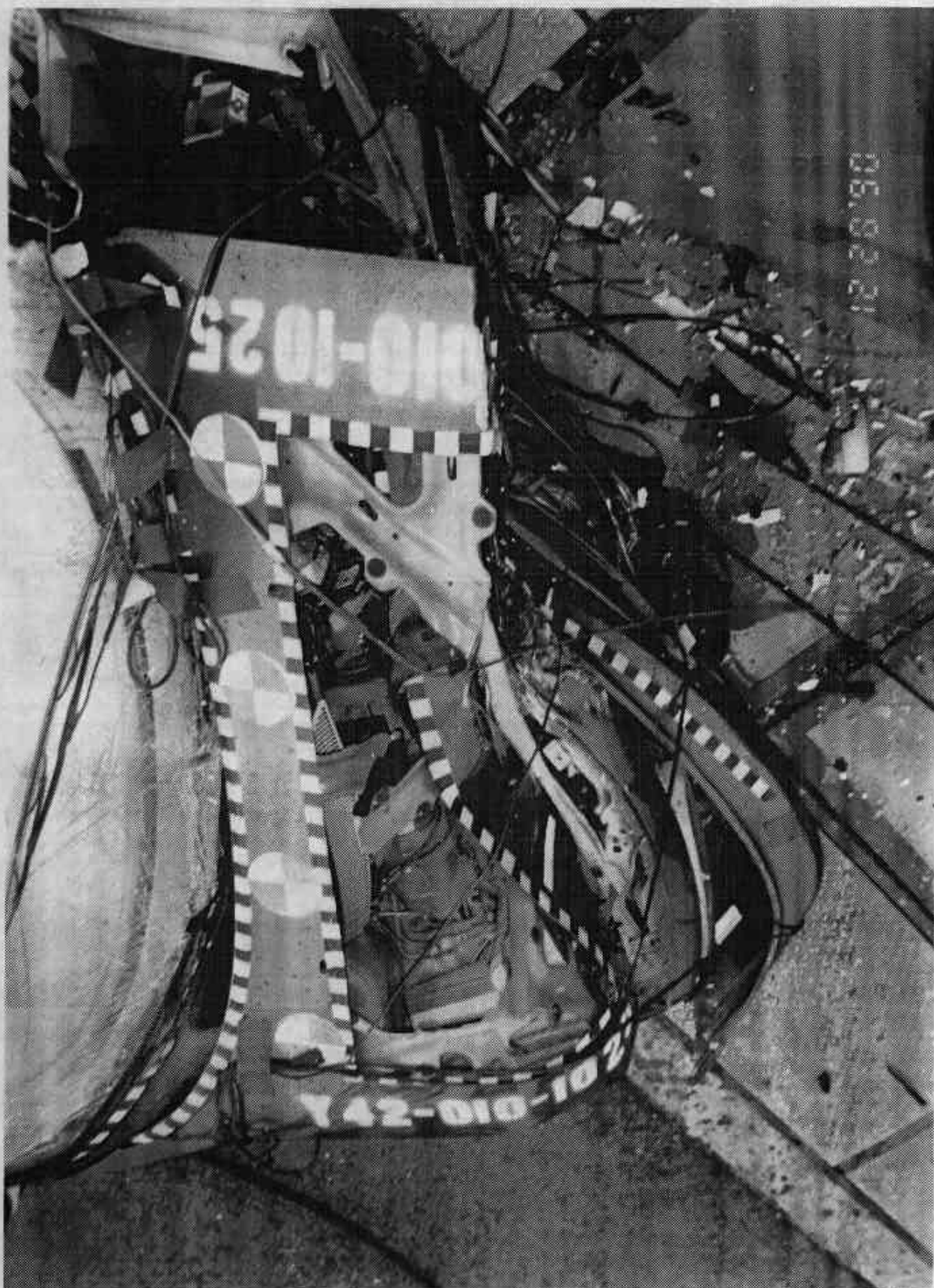


Figure A-25 VEHICLE 1 POST-TEST OVERHEAD ENGINE COMPARTMENT VIEW

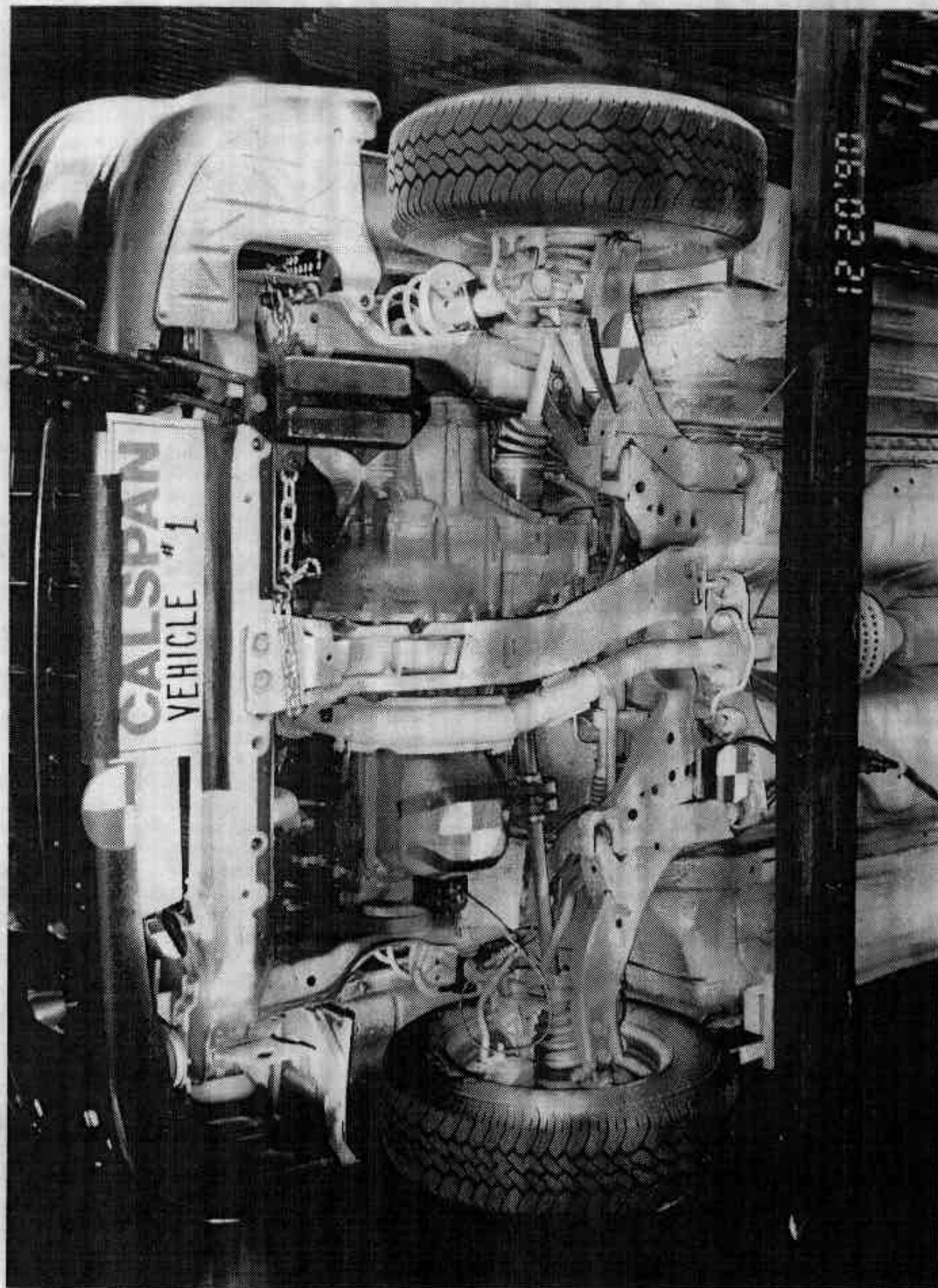


Figure A-26 VEHICLE 1 PRE-TEST UNDERBODY FRONT VIEW



Figure A-27 VEHICLE 1 POST-TEST UNDERBODY FRONT VIEW

A-30

7883-1

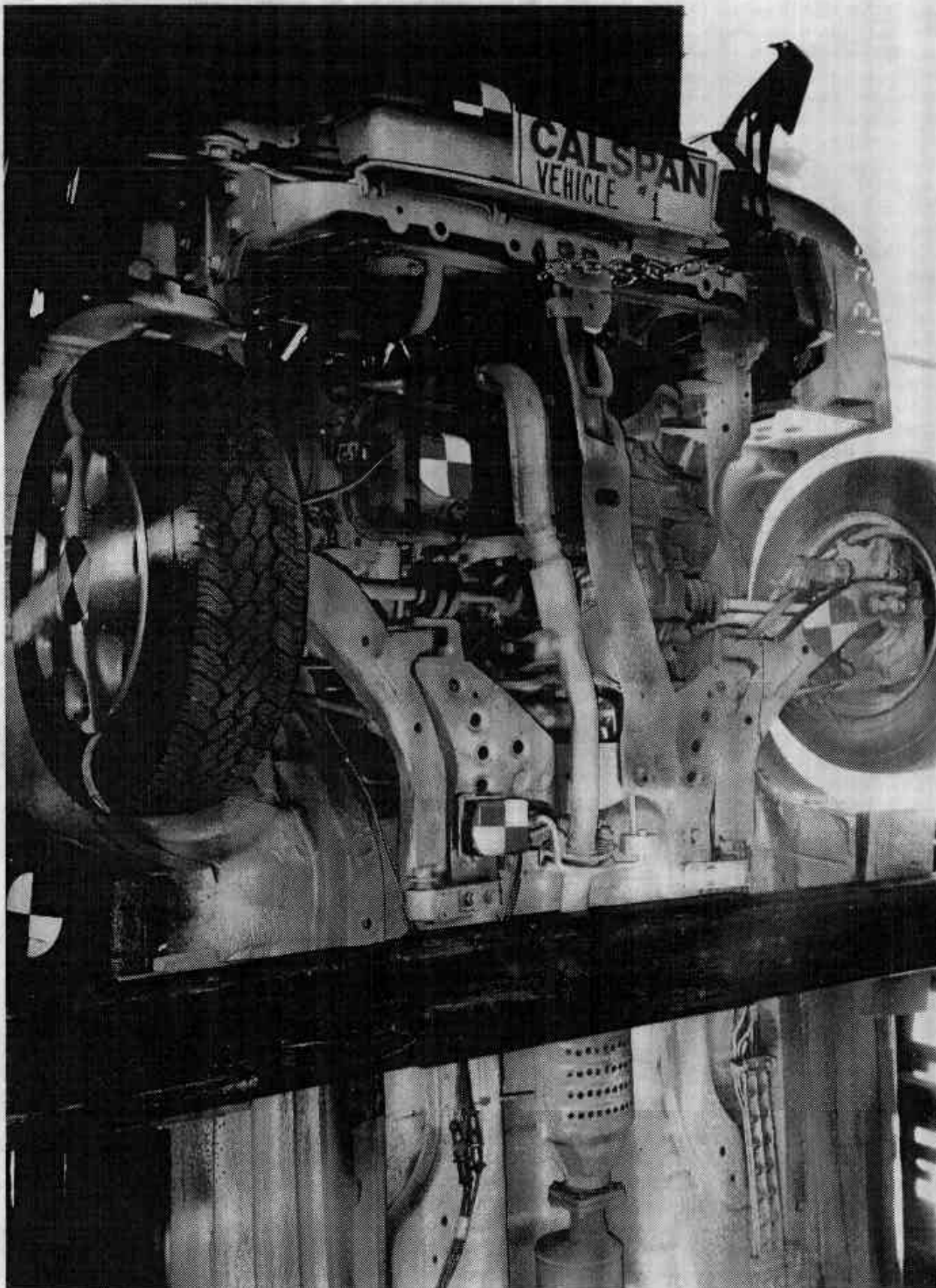


FIGURE A-28 VEHICLE 1 PRE-TEST UNDERBODY FRONT SIDE VIEW

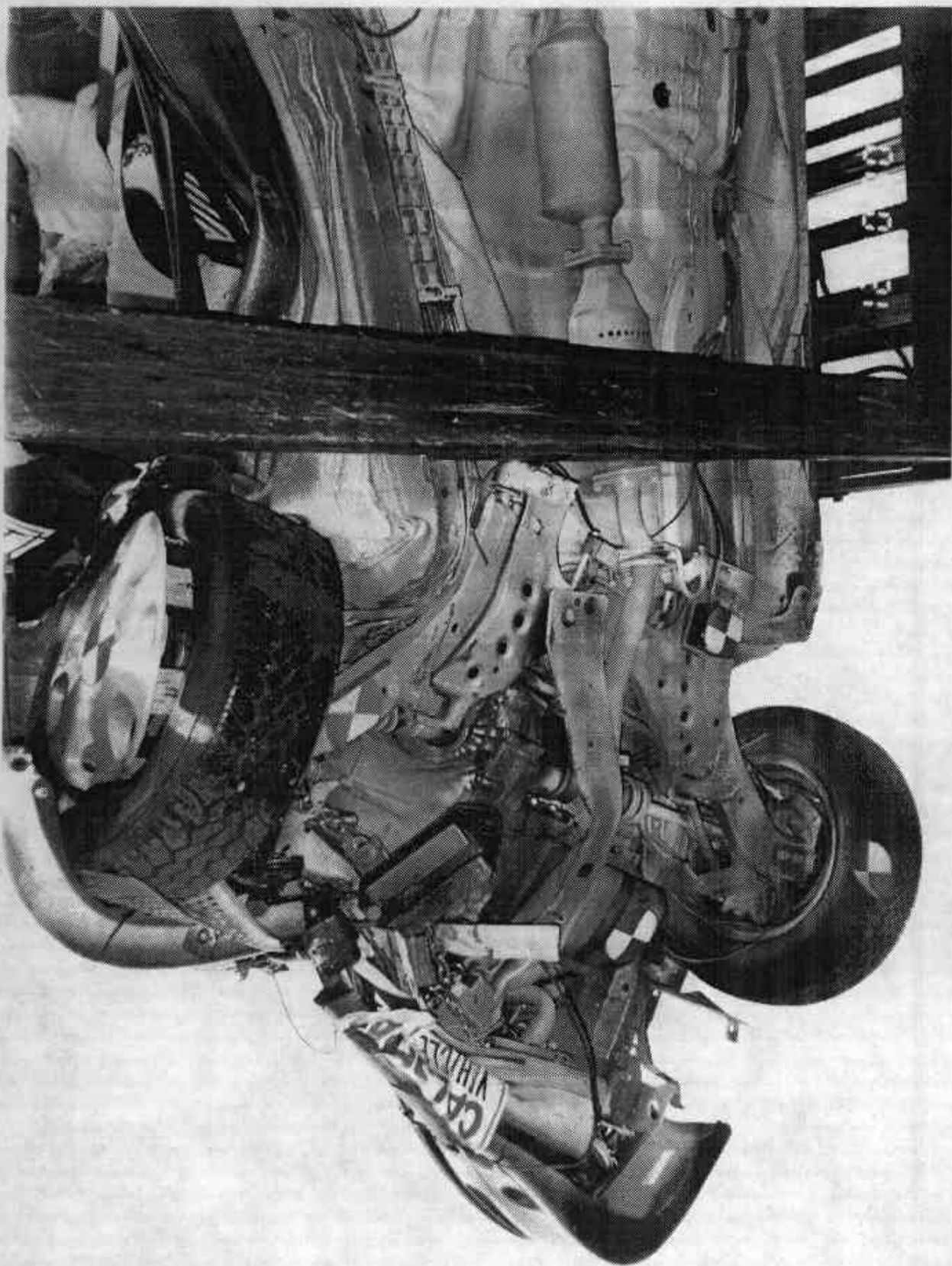


Figure A-29 VEHICLE 1 POST-TEST UNDERBODY FRONT SIDE VIEW

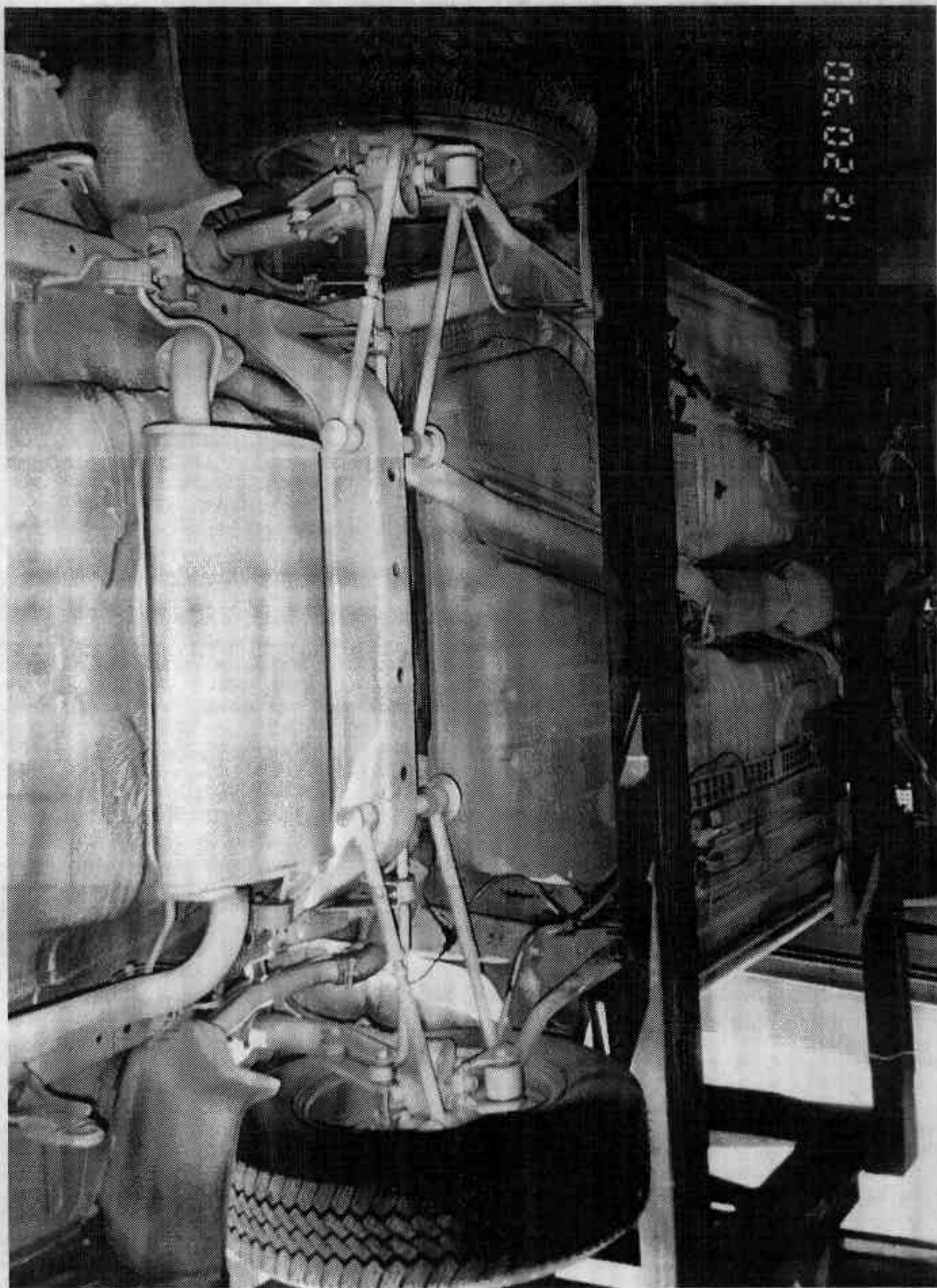


Figure A-30 VEHICLE I PRE-TEST UNDERBODY REAR VIEW

A-33

7883-1

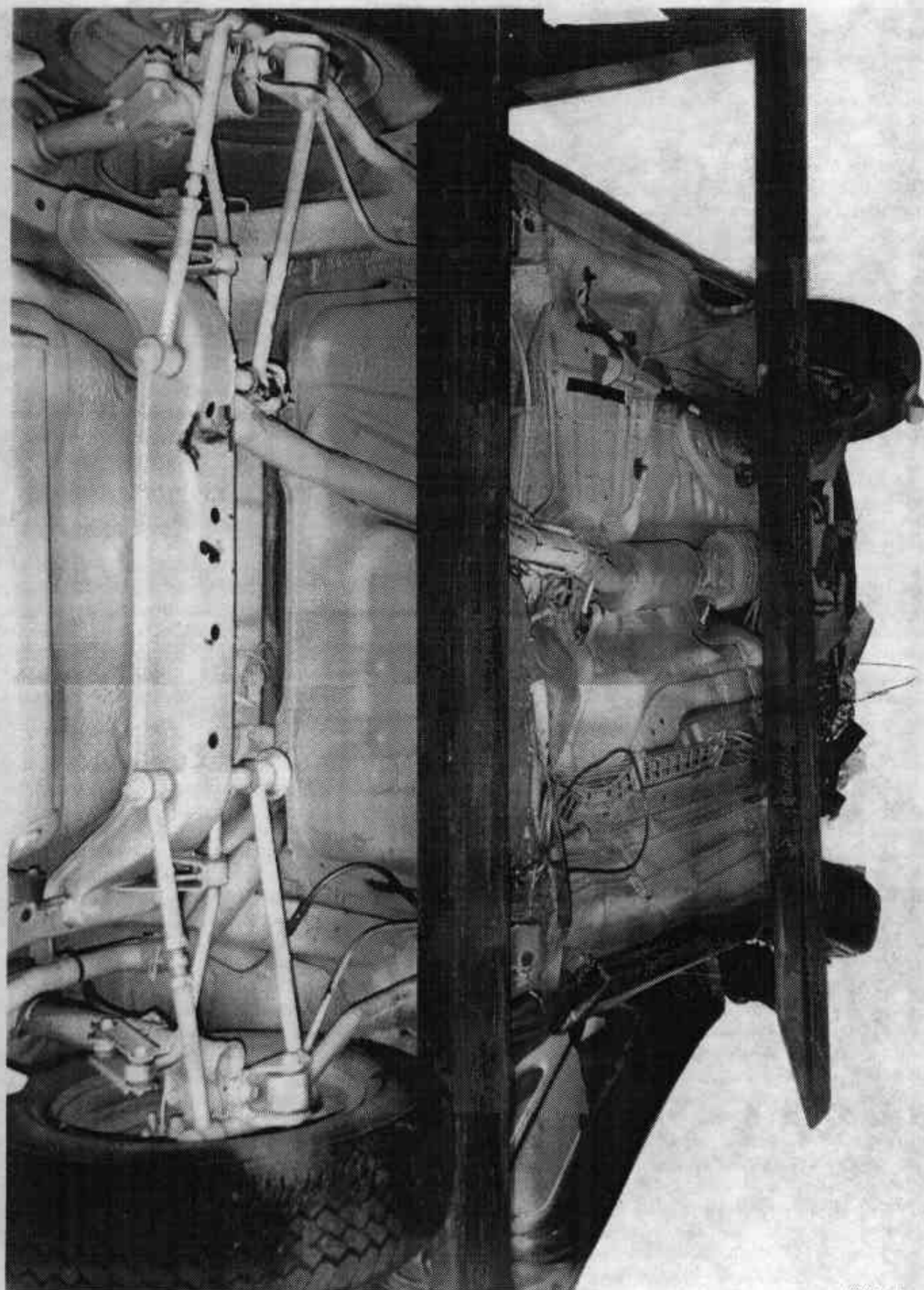


Figure A-31 VEHICLE 1 POST-TEST UNDERBODY REAR VIEW

A-34

7883-1

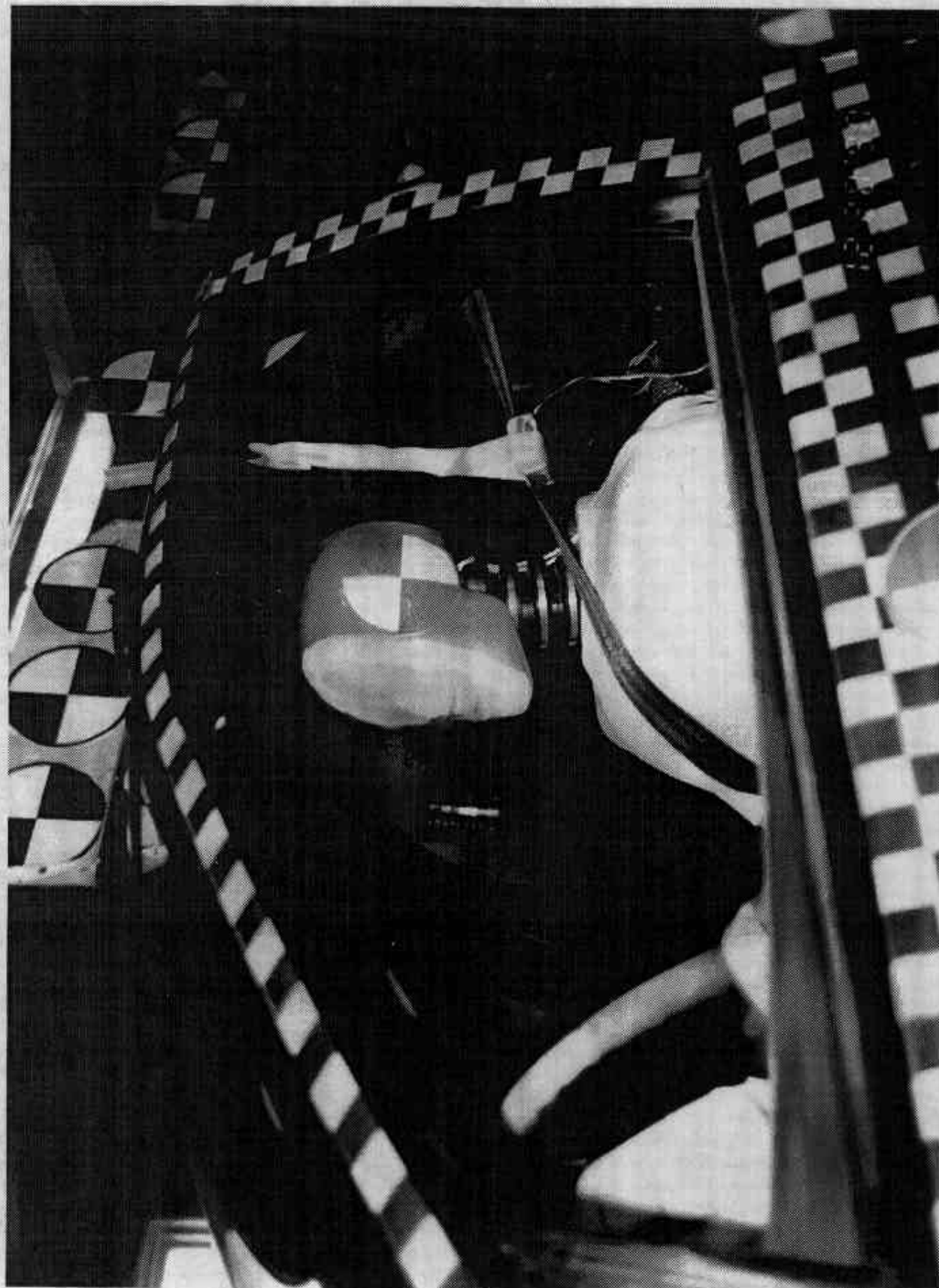


FIGURE A-32 VEHICLE 1 PRE-TEST DRIVER POSITION VIEW

A-35

7883-1

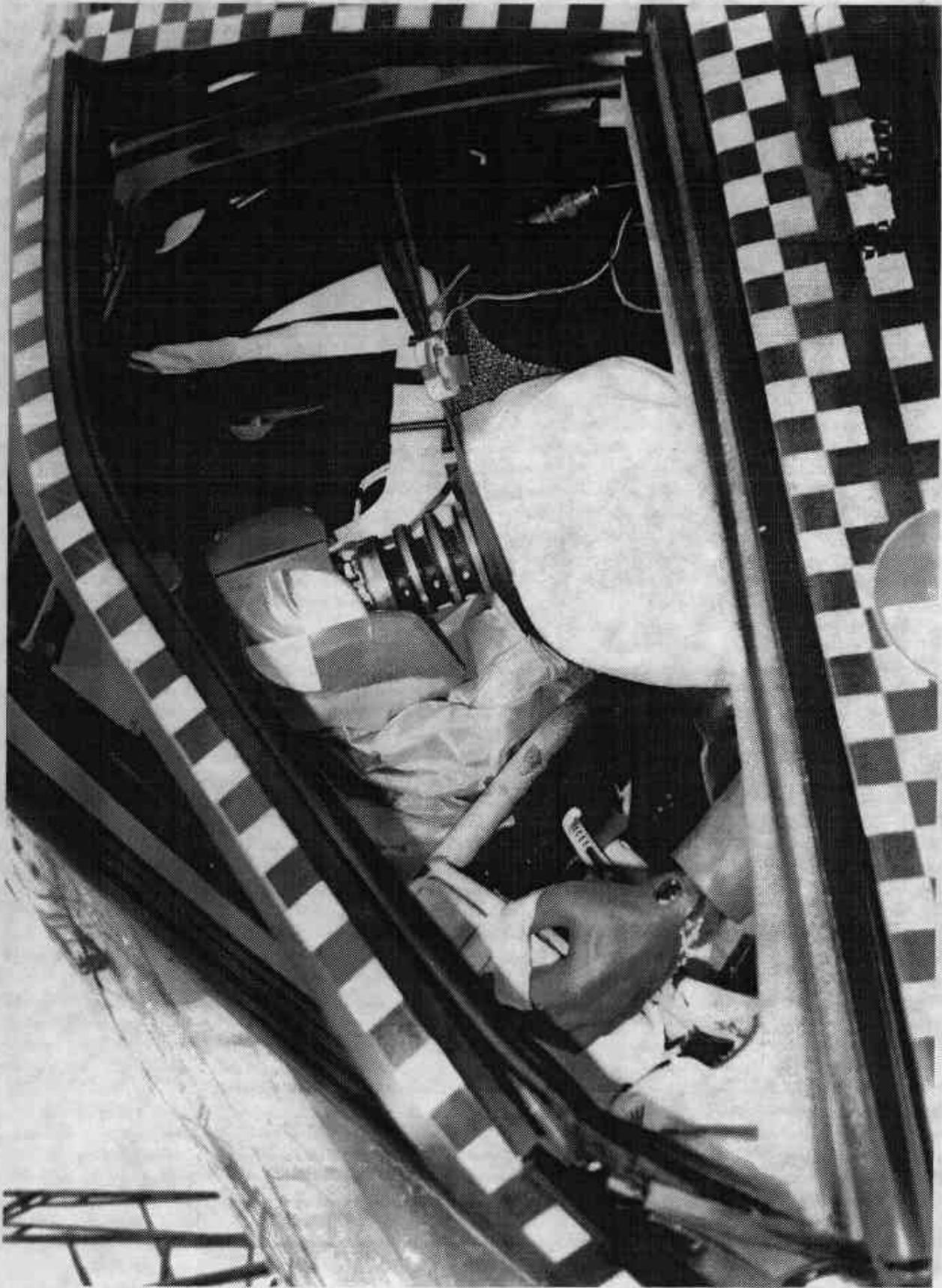


FIGURE A-33 VEHICLE 1 POST-TEST DRIVER POSITION VIEW

A-36

7883-1

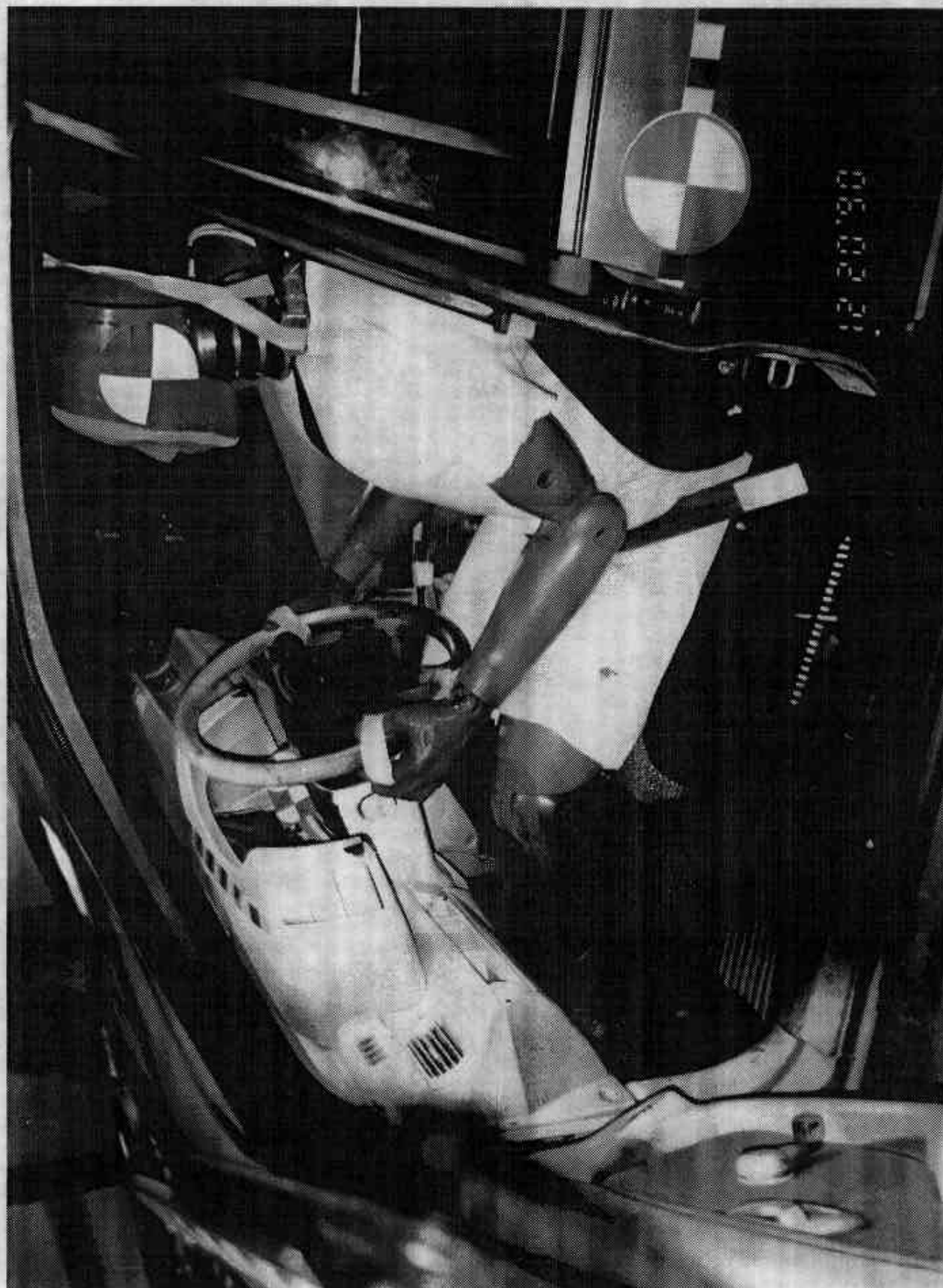


Figure A-34 VEHICLE 1 PRE-TEST DRIVER AND OCCUPANT COMPARTMENT VIEW

Figure A-35

VEHICLE 1
POST-TEST DRIVER AND OCCUPANT
COMPARTMENT VIEW
(Photograph is not available.)

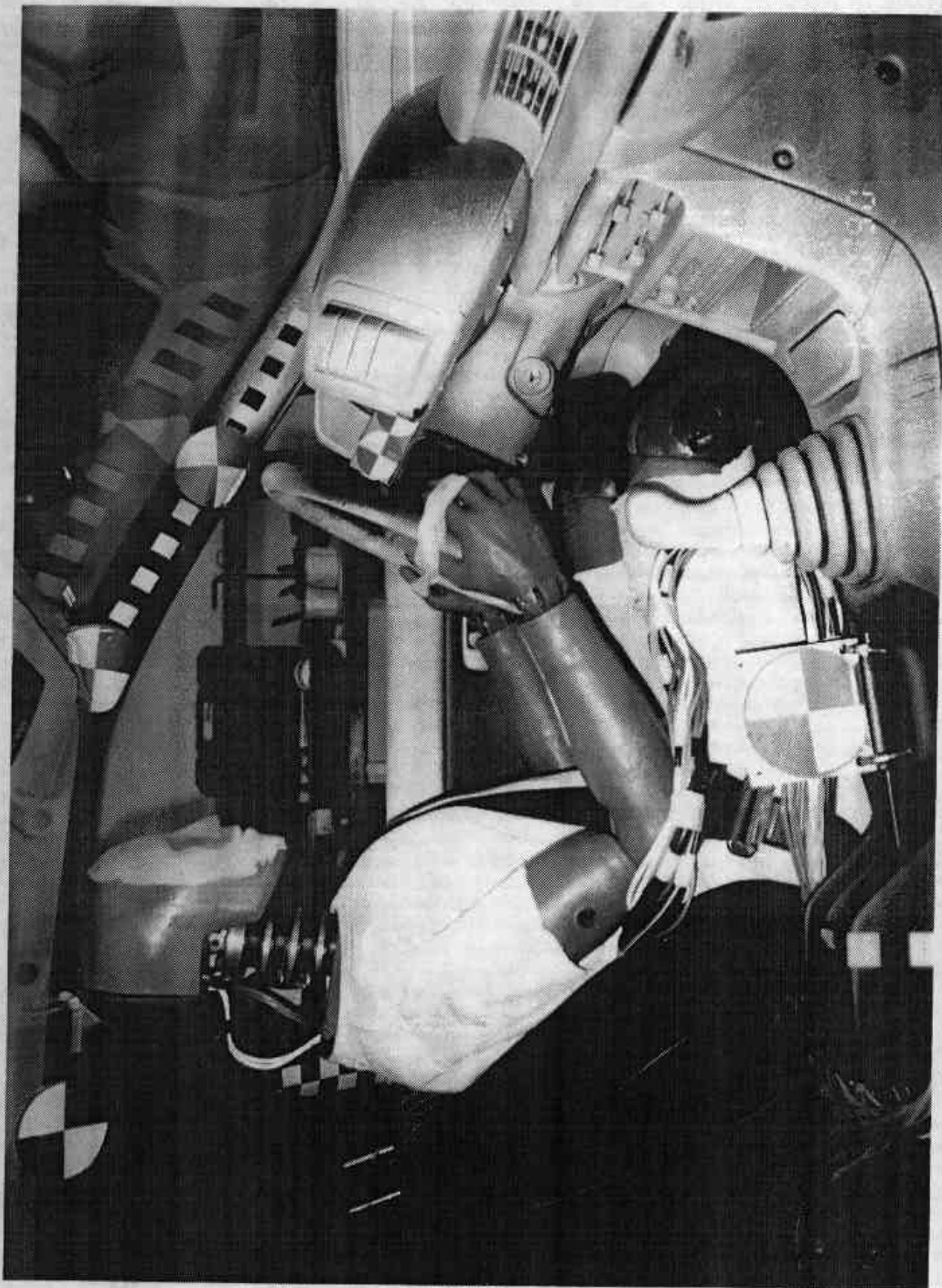


Figure A-35 VEHICLE 1 PRE-TEST DRIVER AND OCCUPANT COMPARTMENT RIGHT SIDE VIEW



Figure A-37 VEHICLE 1 POST-TEST DRIVER AND OCCUPANT COMPARTMENT RIGHT SIDE VIEW

VEHICLE 2 PHOTOGRAPHS



Figure A-38 VEHICLE 2 PRE-TEST FRONT VIEW



Figure A-39 VEHICLE 2 POST-TEST FRONT VIEW

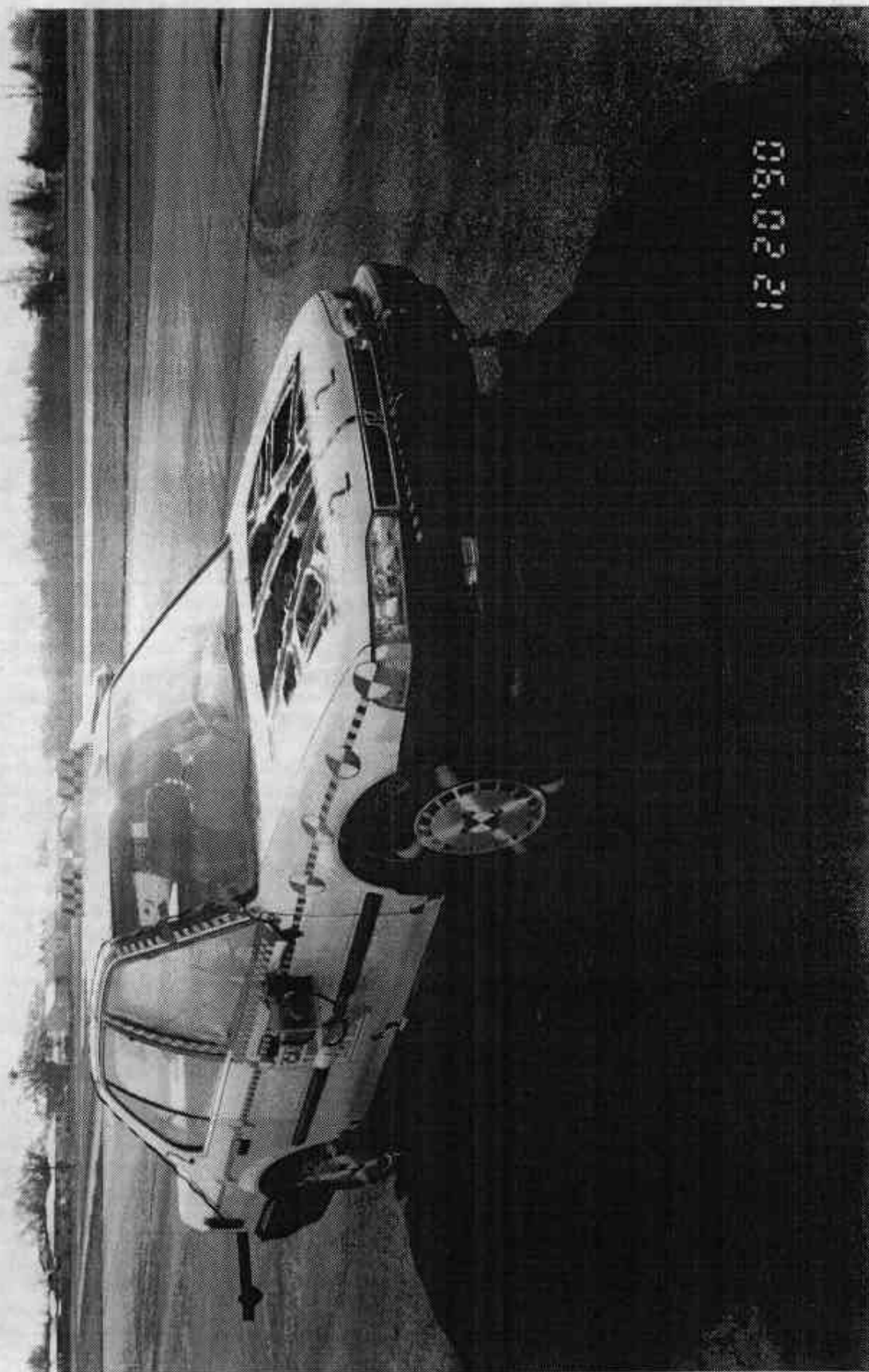


Figure A-40 VEHICLE 2 PRE-TEST FRONT RIGHT THREE QUARTER VIEW

A-44

7883-1

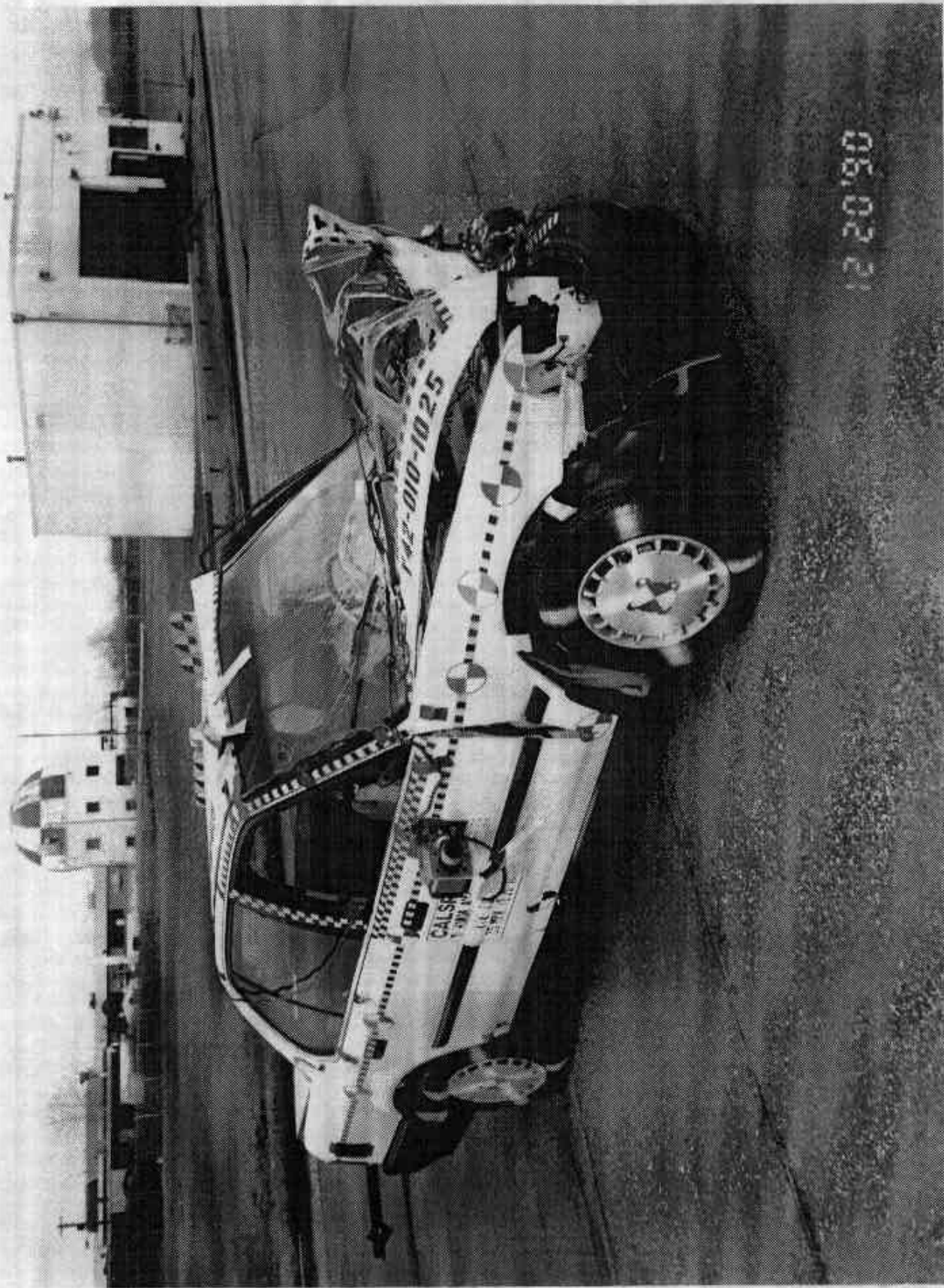
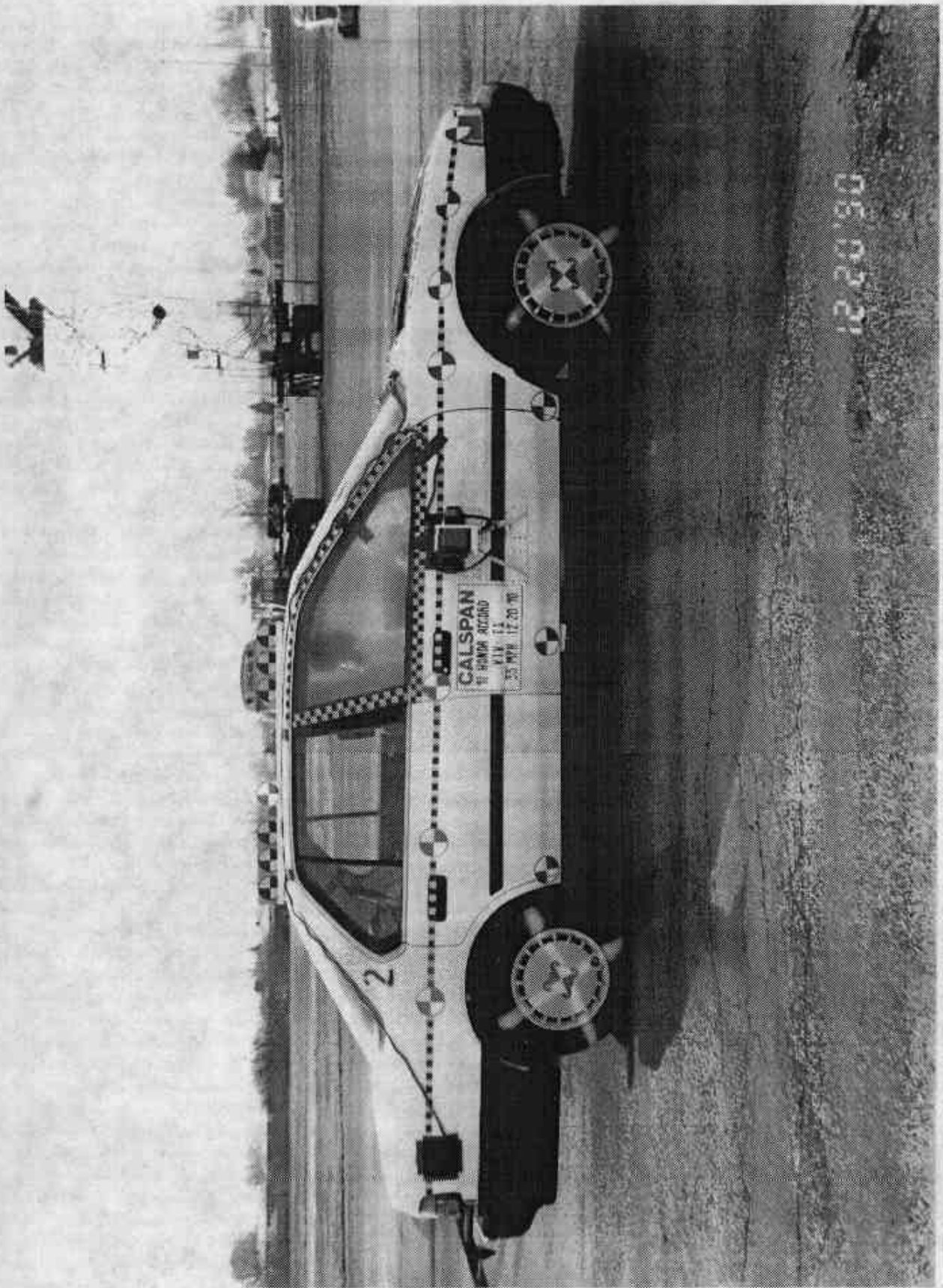


Figure A-41 VEHICLE 2 POST-TEST FRONT RIGHT THREE QUARTER VIEW

A-45

7883-1



A-46

7883-1

Figure A-42 VEHICLE 2 PRE-TEST RIGHT SIDE VIEW

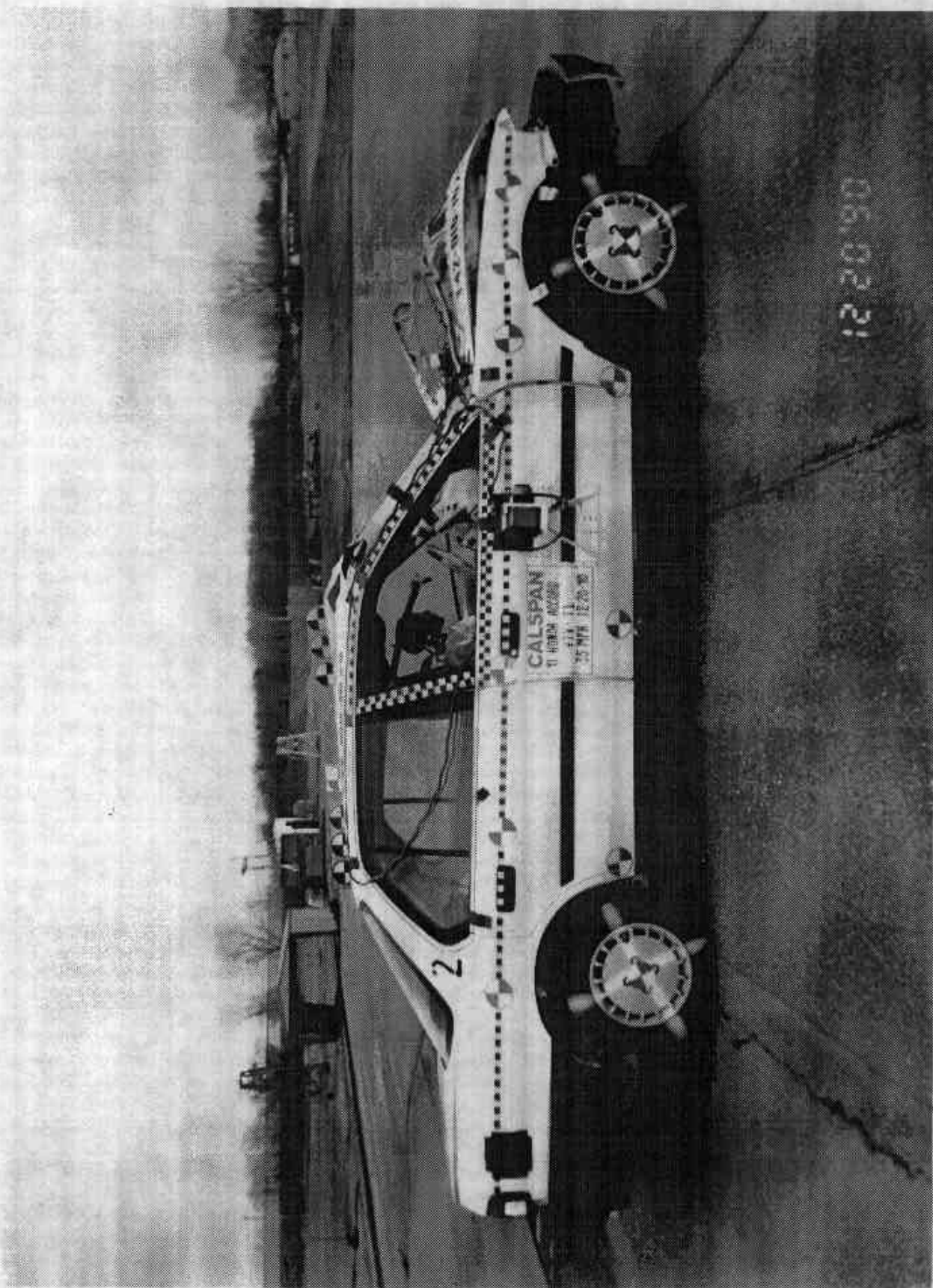


Figure A-43 VEHICLE 2 POST-TEST RIGHT SIDE VIEW



FIGURE A-44 VEHICLE 2 PRE-TEST REAR RIGHT THREE QUARTER VIEW

A-48

7883-1

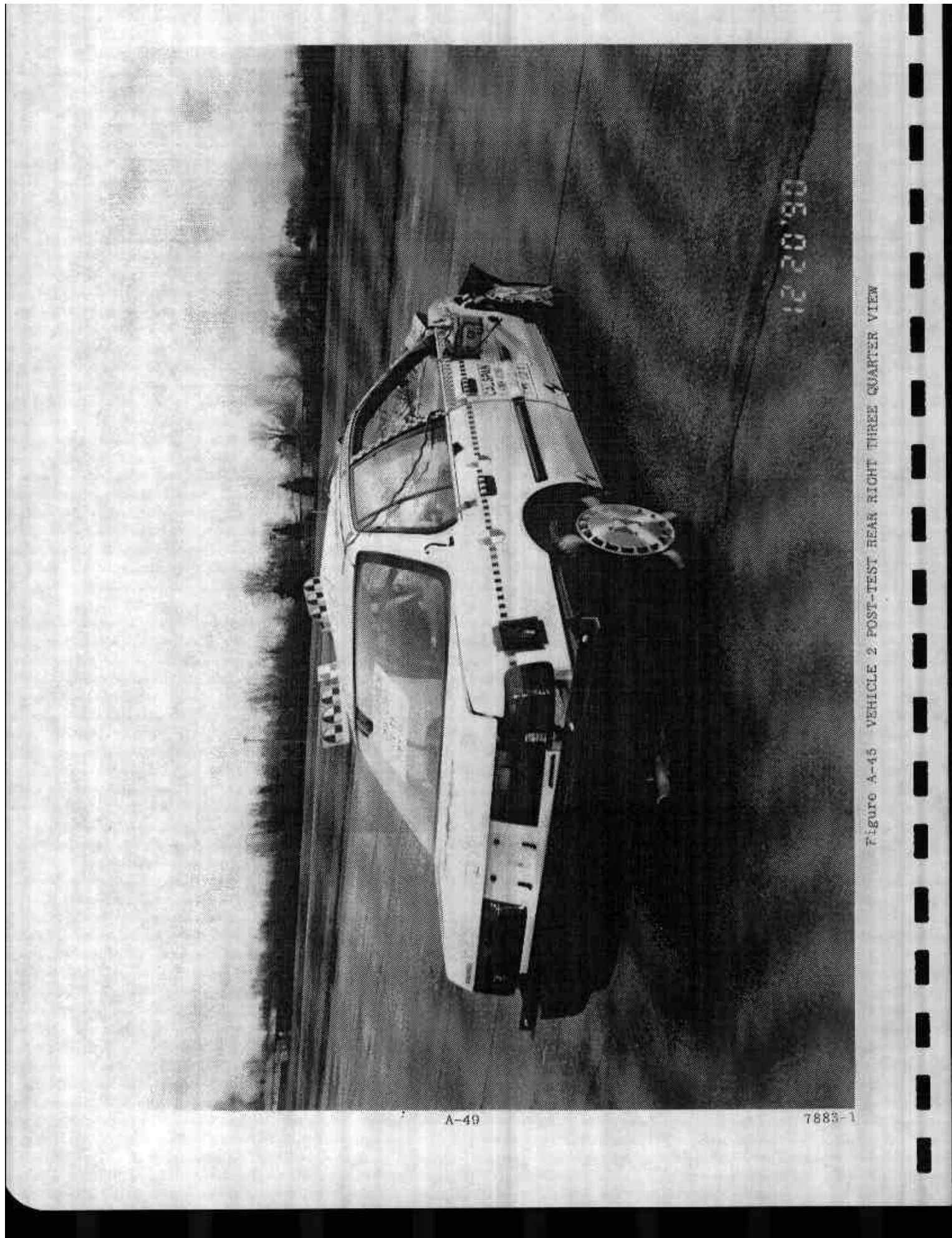
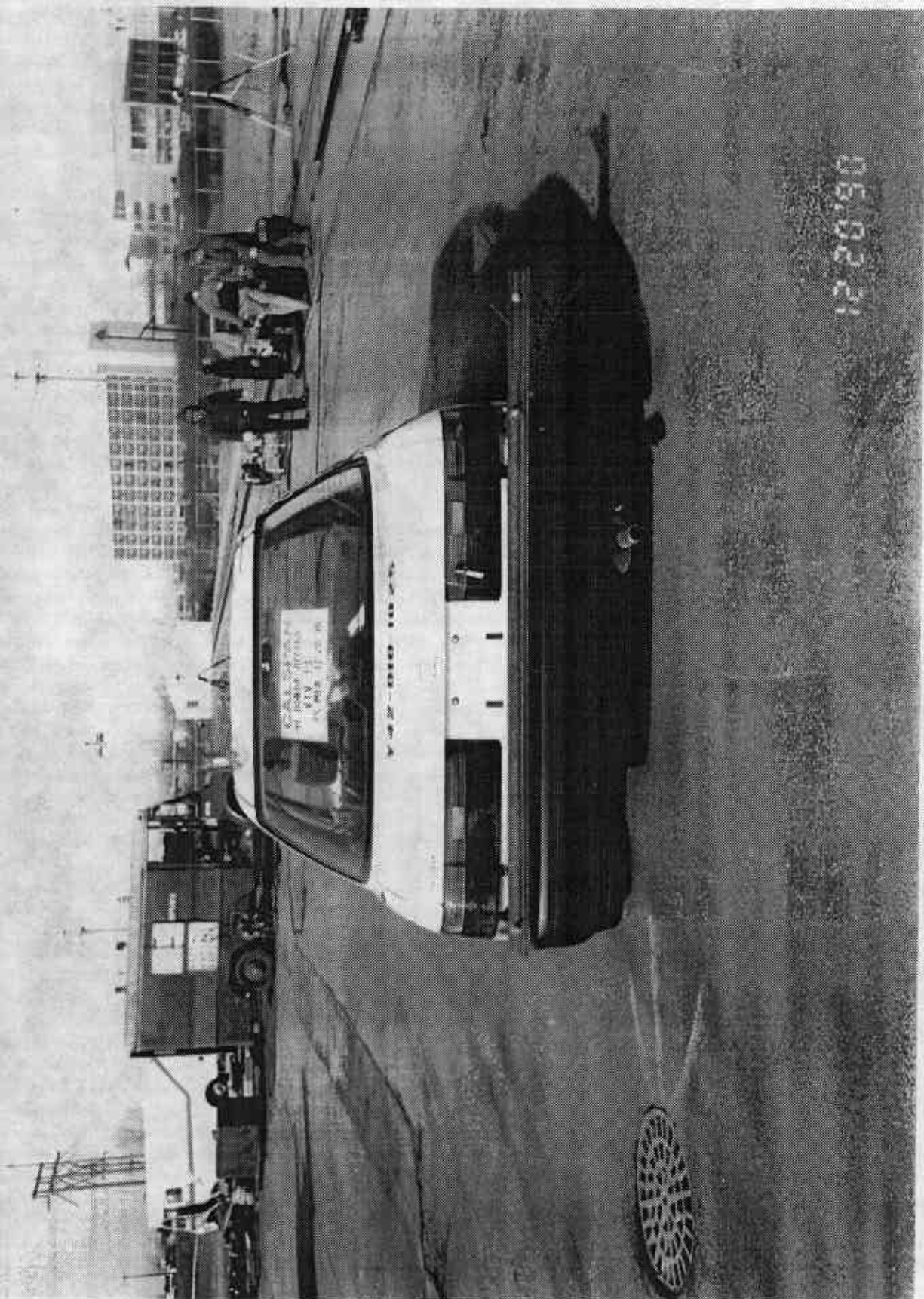


FIGURE A-45 VEHICLE 2 POST-TEST REAR RIGHT THREE QUARTER VIEW

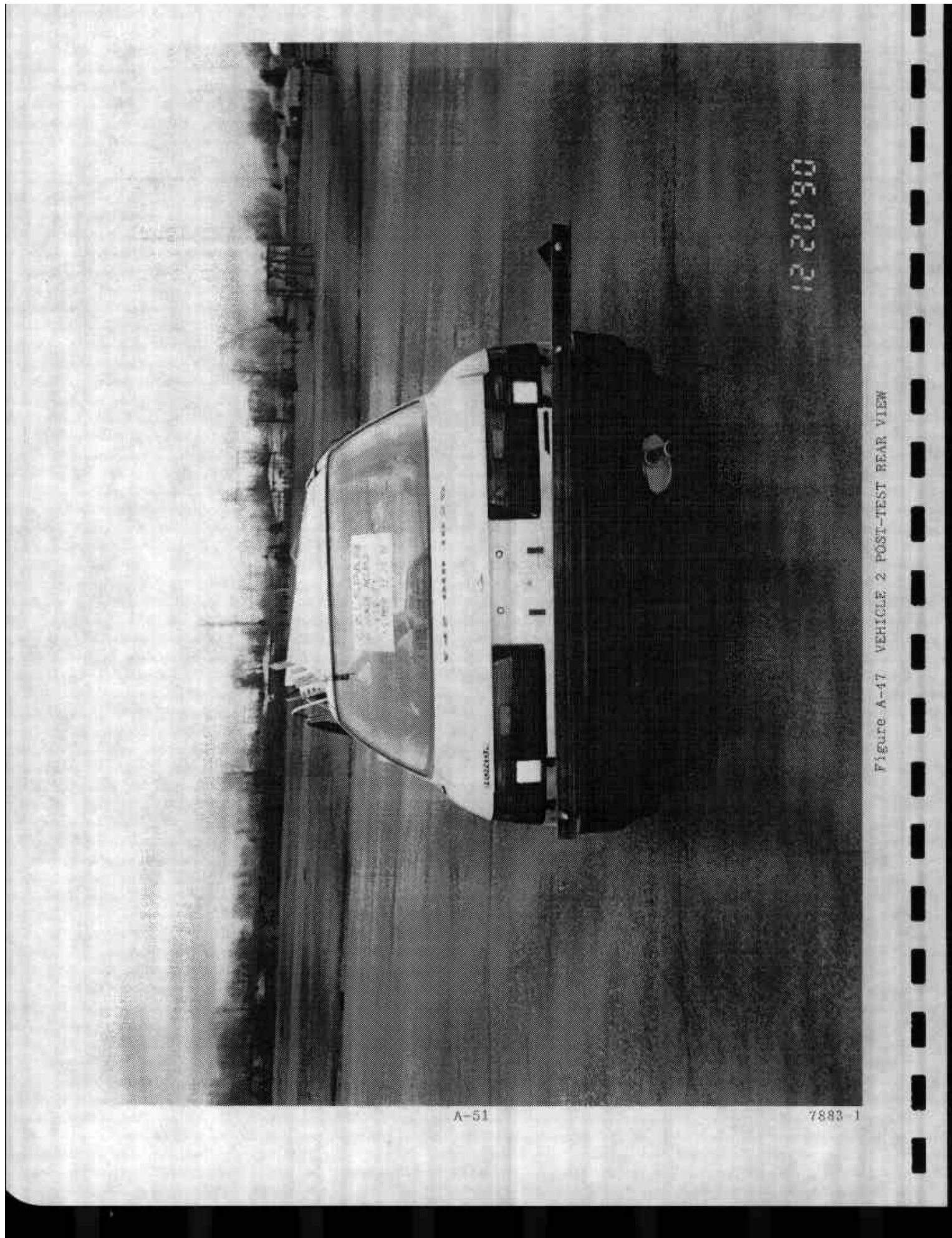
A-49

7883-1



12-20-90

FIGURE A-46. VEHICLE 2 PRE-TEST REAR VIEW



12 20 '90

FIGURE A-47 VEHICLE 2 POST-TEST REAR VIEW



Figure A-48 VEHICLE 2 PRE-TEST REAR LEFT THREE QUARTER VIEW



Figure A-49 VEHICLE 2 POST-TEST REAR LEFT THREE QUARTER VIEW

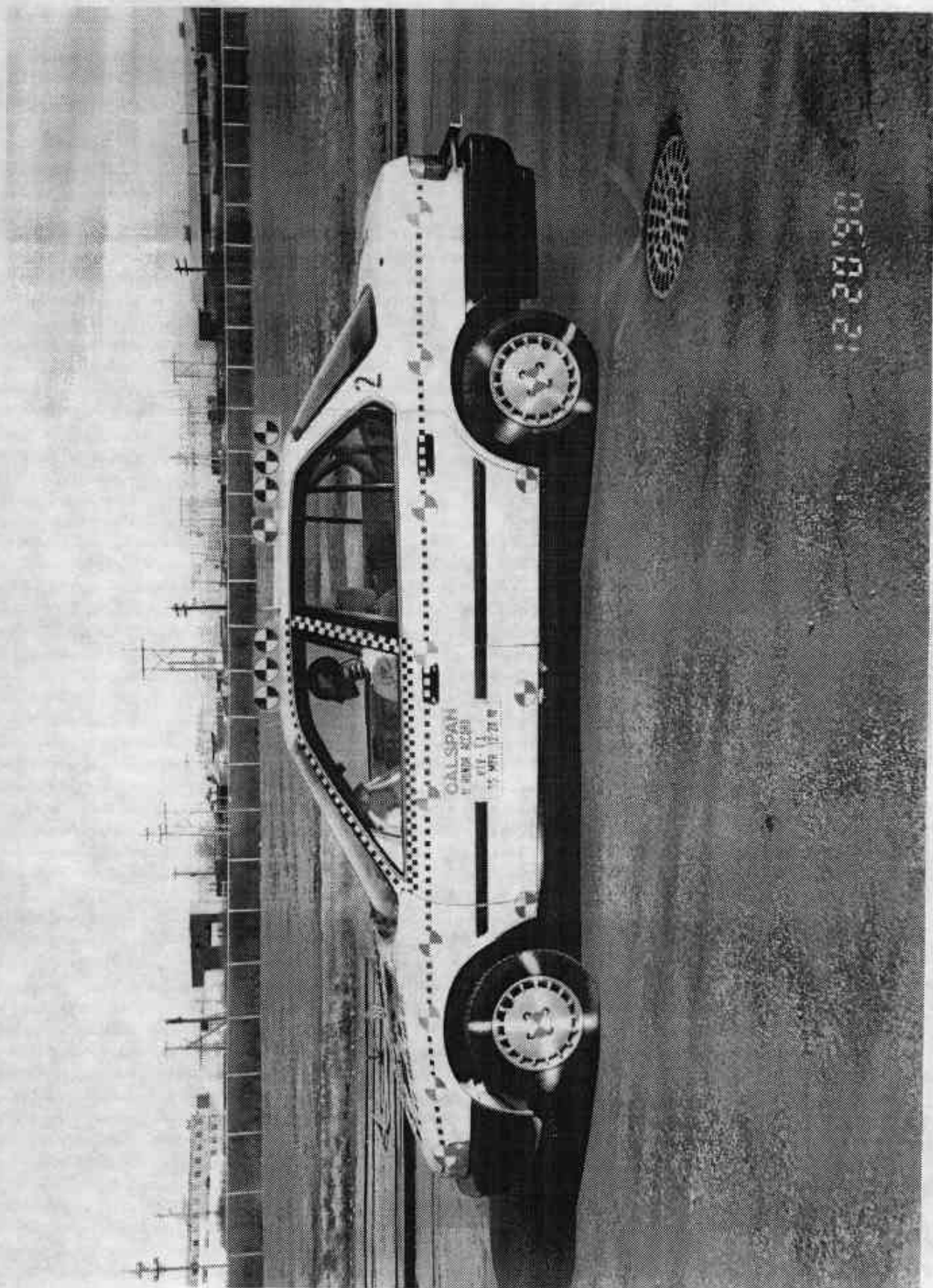


Figure A-50 VEHICLE 2 PRE-TEST LEFT SIDE VIEW

A-54

7883-1

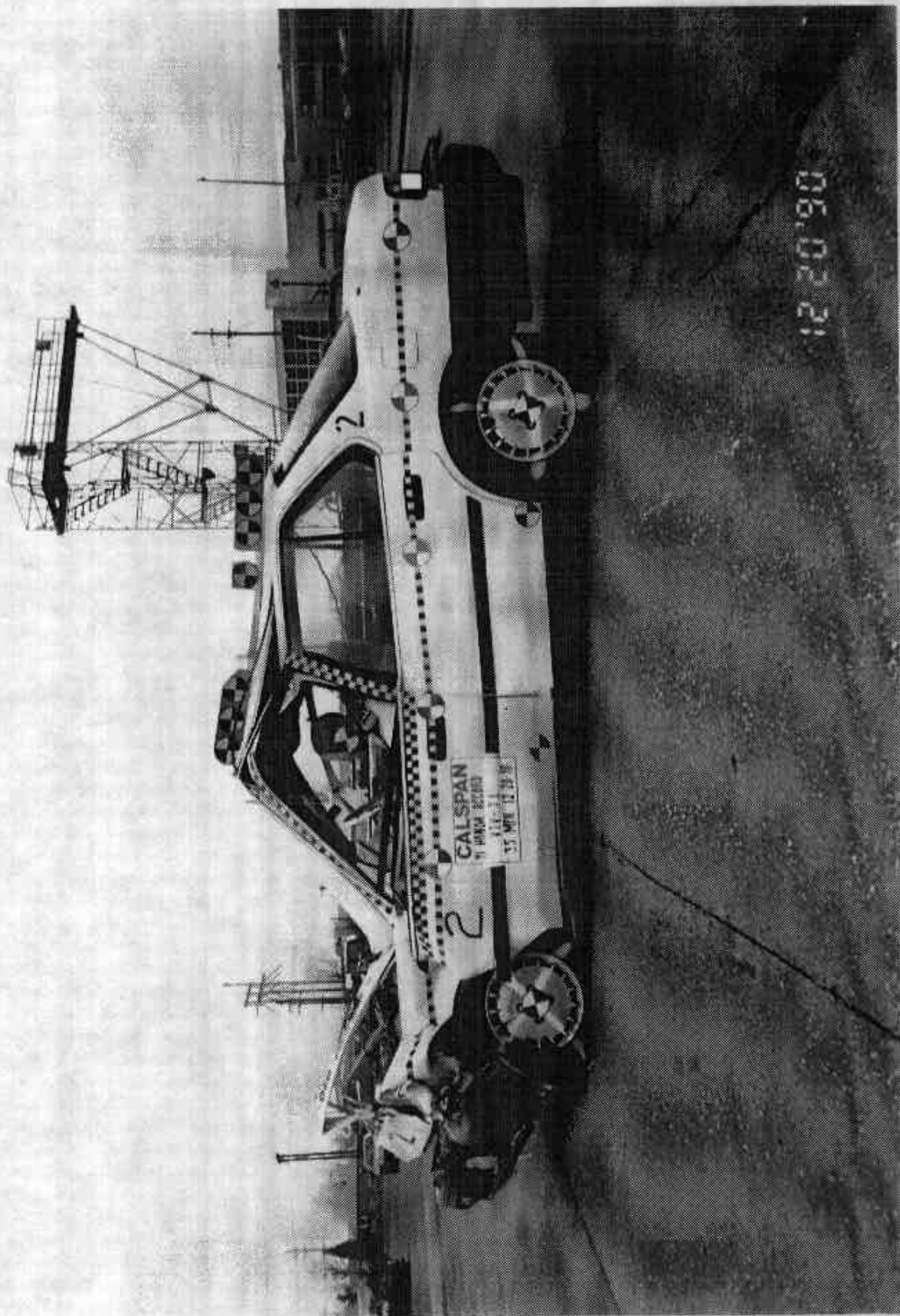


Figure A-31 VEHICLE 2 POST-TEST LEFT SIDE VIEW



FIGURE A-52 VEHICLE 2 PRE-TEST FRONT LEFT THREE QUARTER VIEW

Figure A-53

VEHICLE 2

POST-TEST FRONT LEFT

THREE-QUARTER VIEW

(Photograph is not available.)

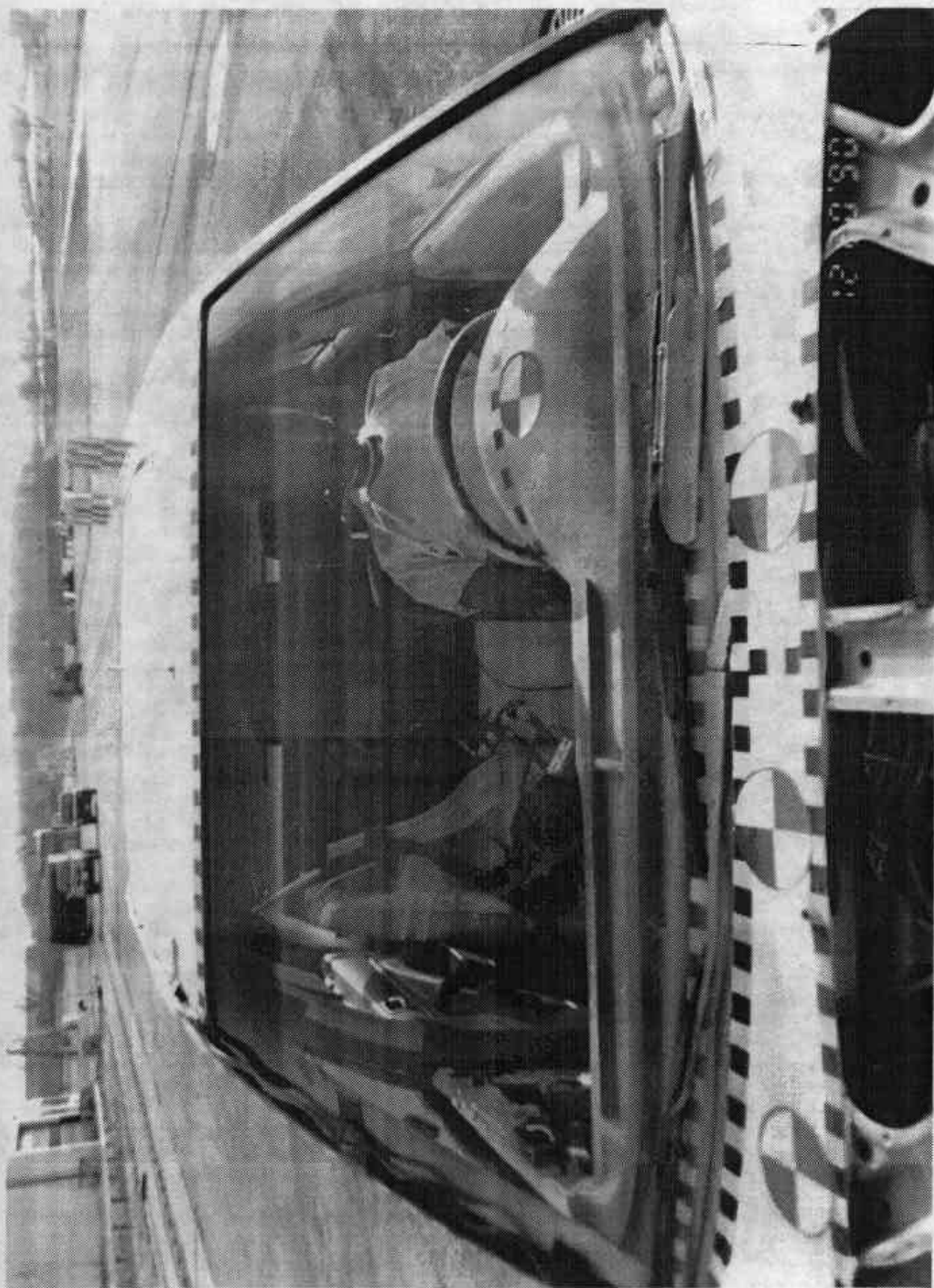


Figure A-54 VEHICLE 2 PRE-TEST WINDSHIELD VIEW

A-58

7883-1

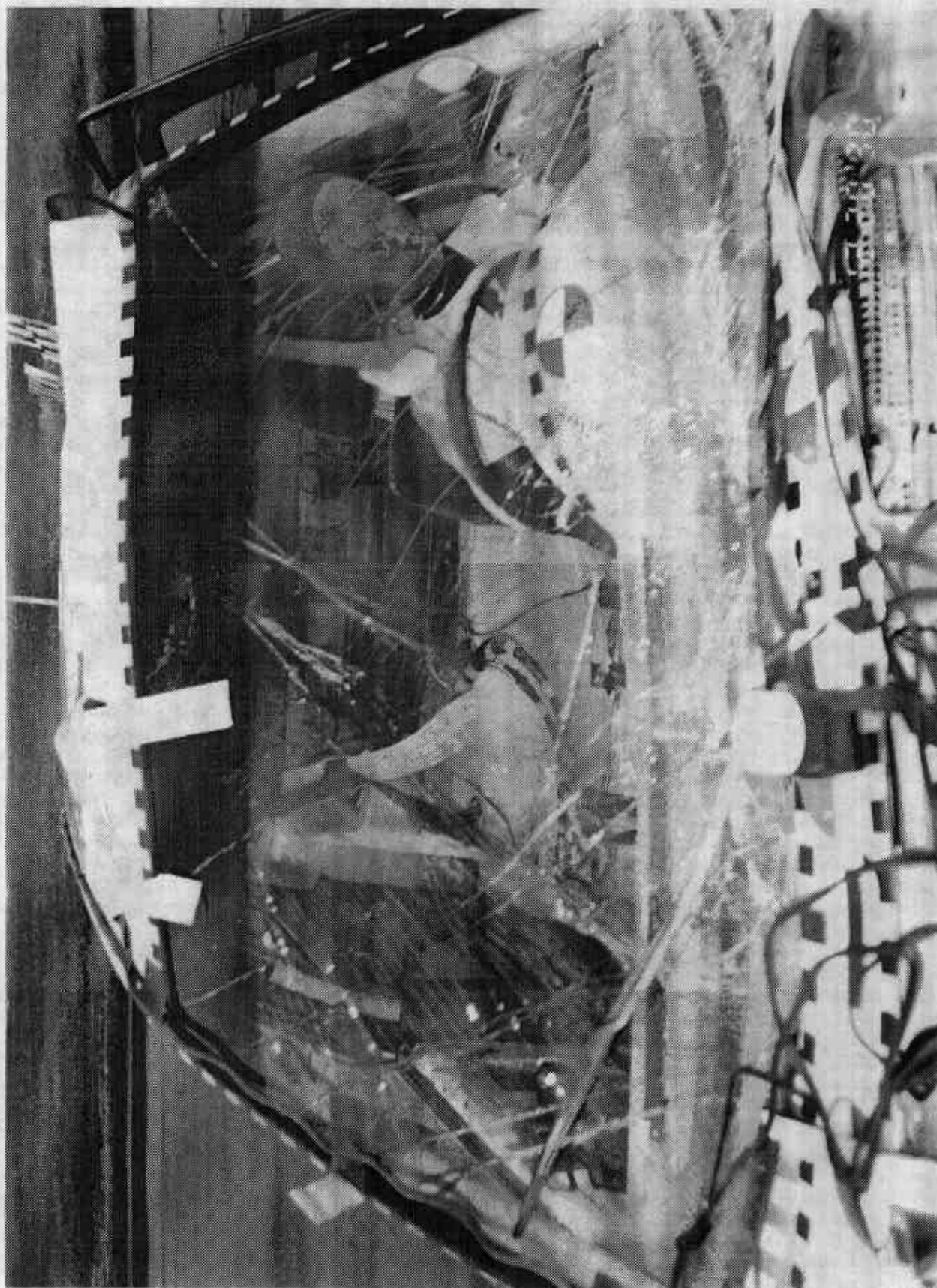


Figure A-55 VEHICLE 2 POST-TEST WINDSHIELD VIEW



Figure A-56 VEHICLE 2 PRE-TEST OVERHEAD ENGINE COMPARTMENT VIEW



Figure A-57 VEHICLE 2 POST-TEST OVERHEAD ENGINE COMPARTMENT VIEW

A-61

7883-1

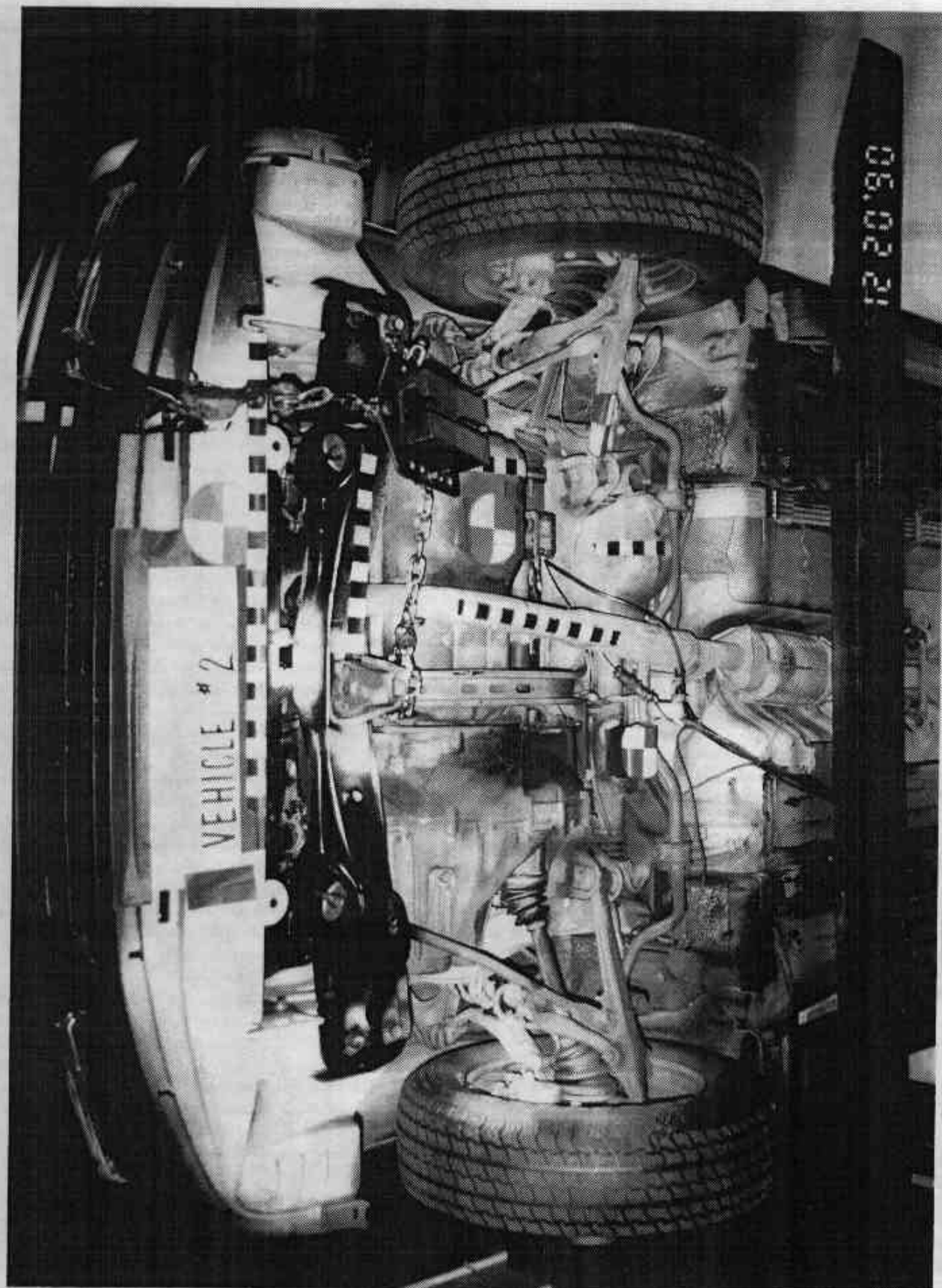


Figure A-58 VEHICLE 2 PRE-TEST UNDERBODY FRONT VIEW

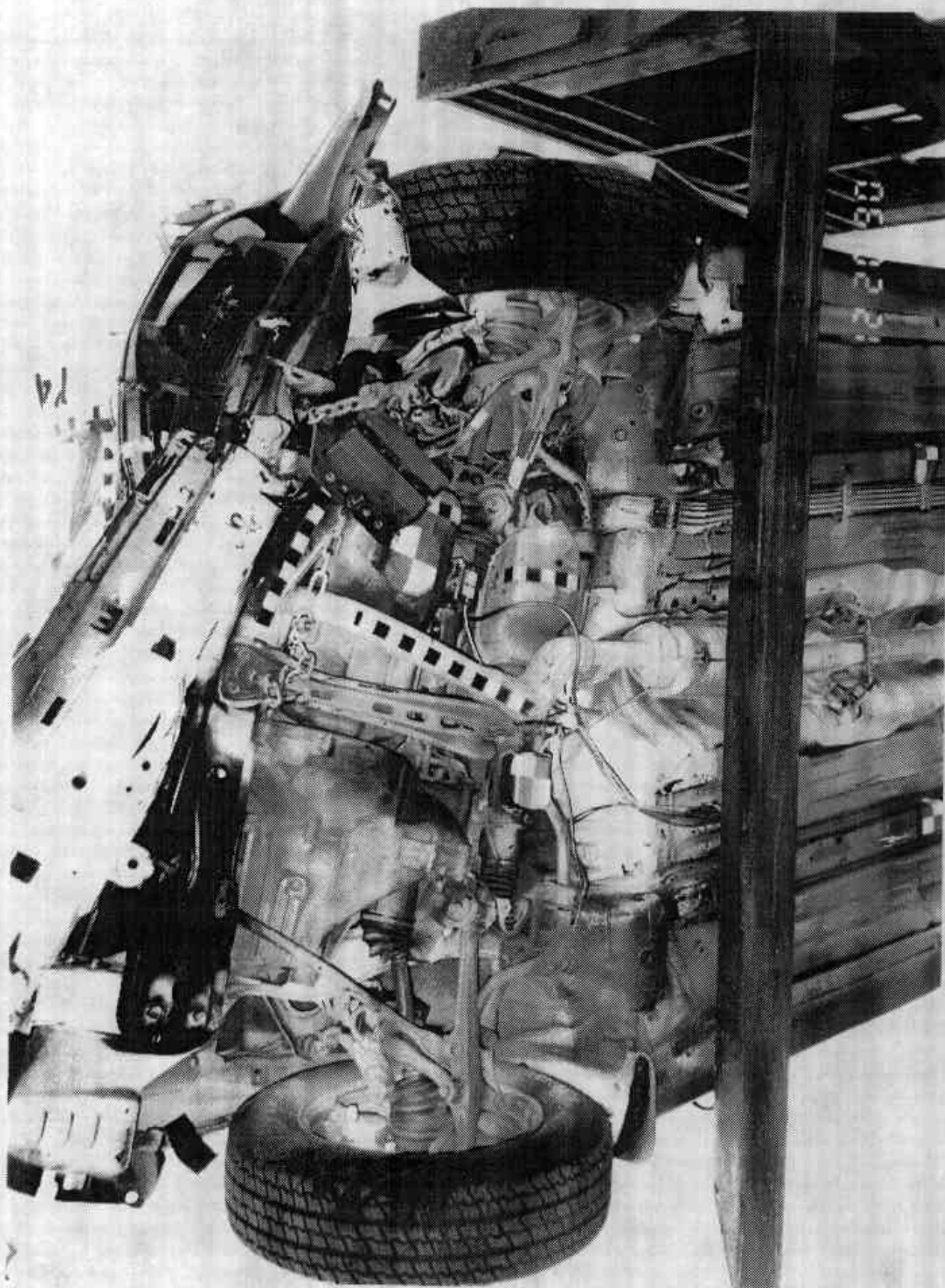


Figure A-59 VEHICLE 2 POST-TEST UNDERBODY FRONT VIEW

A-63

7883-1

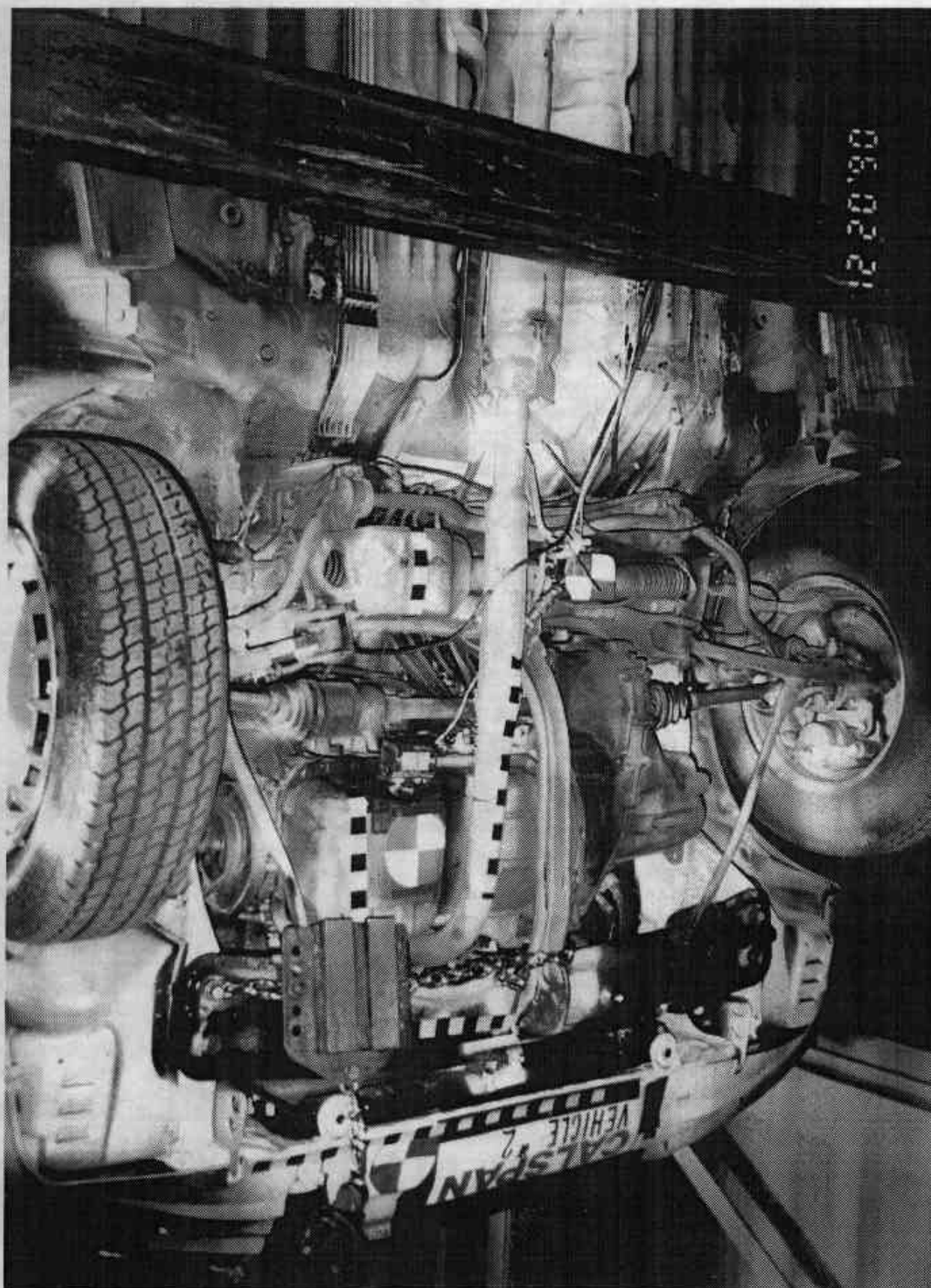


Figure A-60 VEHICLE 2 PRE-TEST UNDERBODY FRONT SIDE VIEW

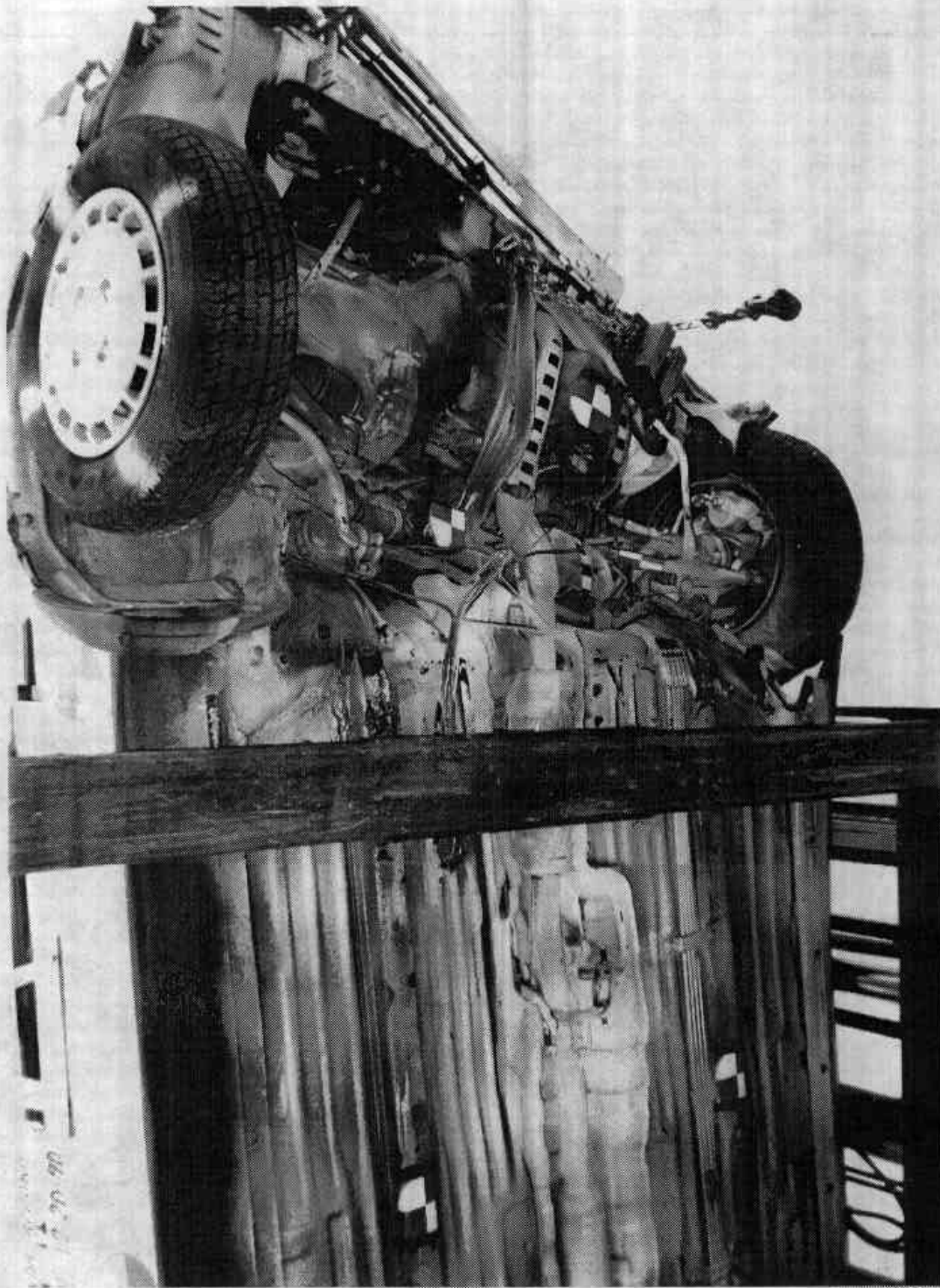


Figure A-61. VEHICLE 2 POST-TEST UNDERBODY FRONT SIDE VIEW

A-65

7883-1

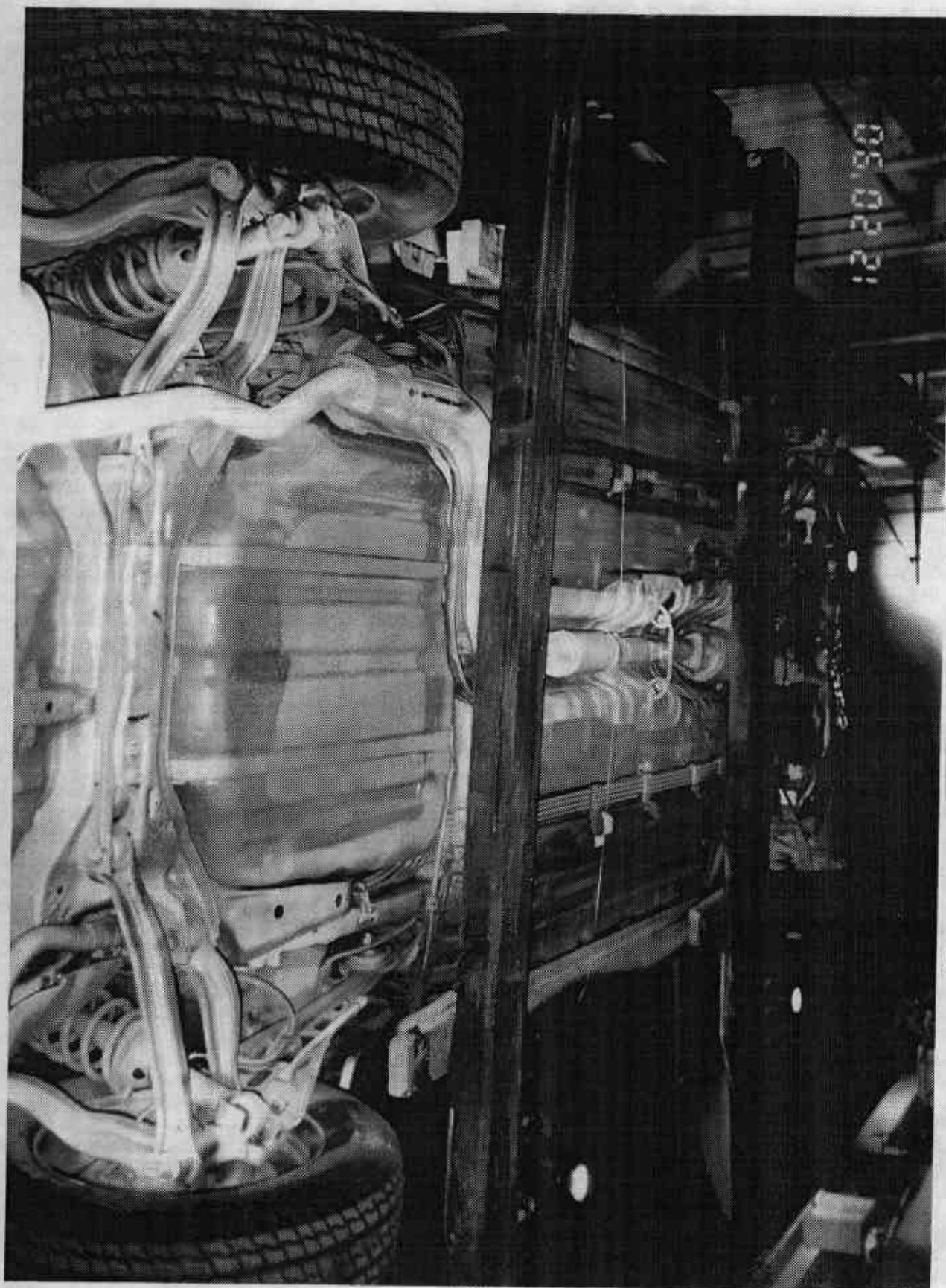


Figure A-62 VEHICLE 2 PRE-TEST UNDERBODY REAR VIEW

A-66

7883-1

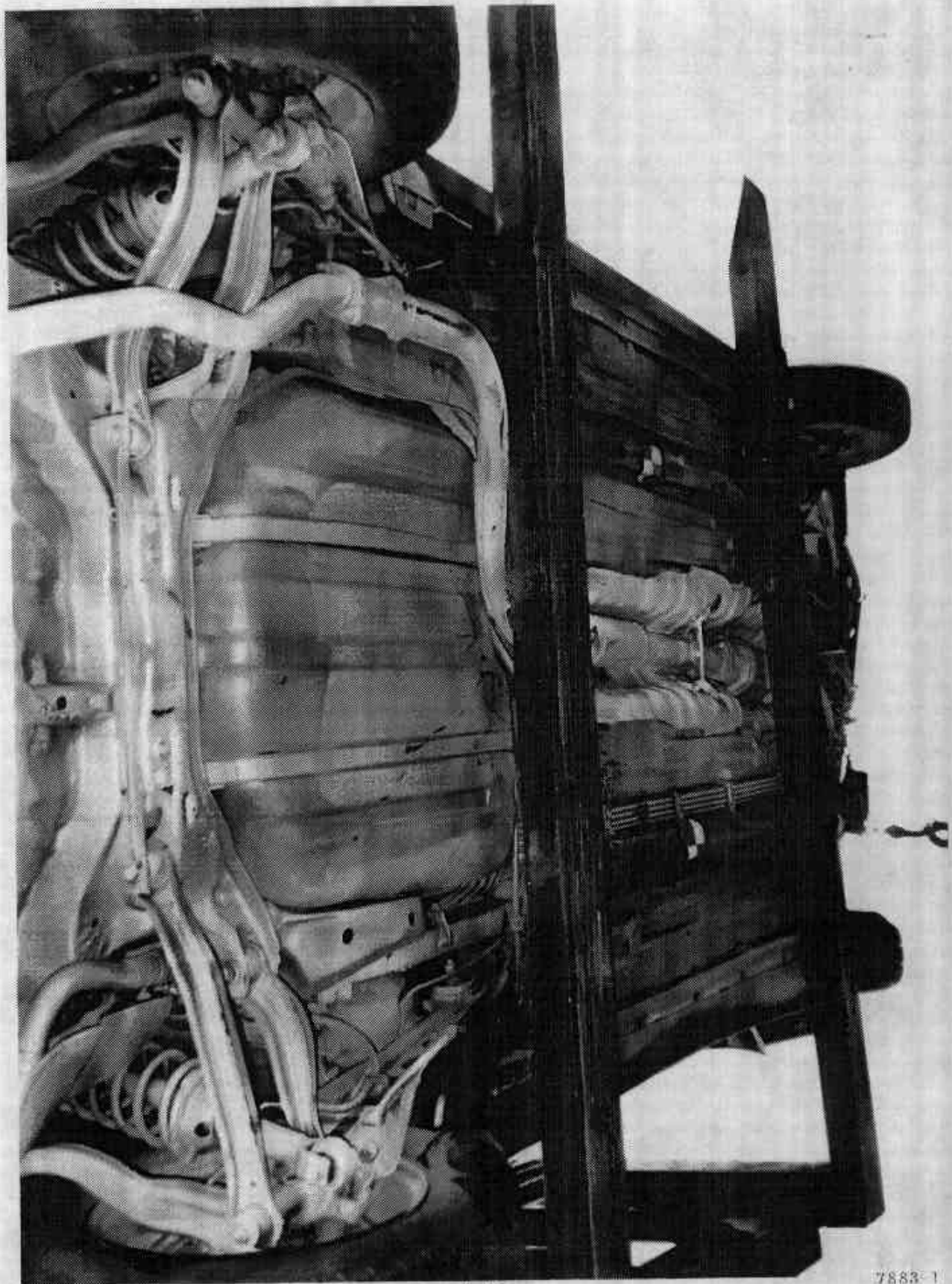


FIGURE A-63. VEHICLE 2 POST-TEST UNDERBODY REAR VIEW

A-67

7883-1

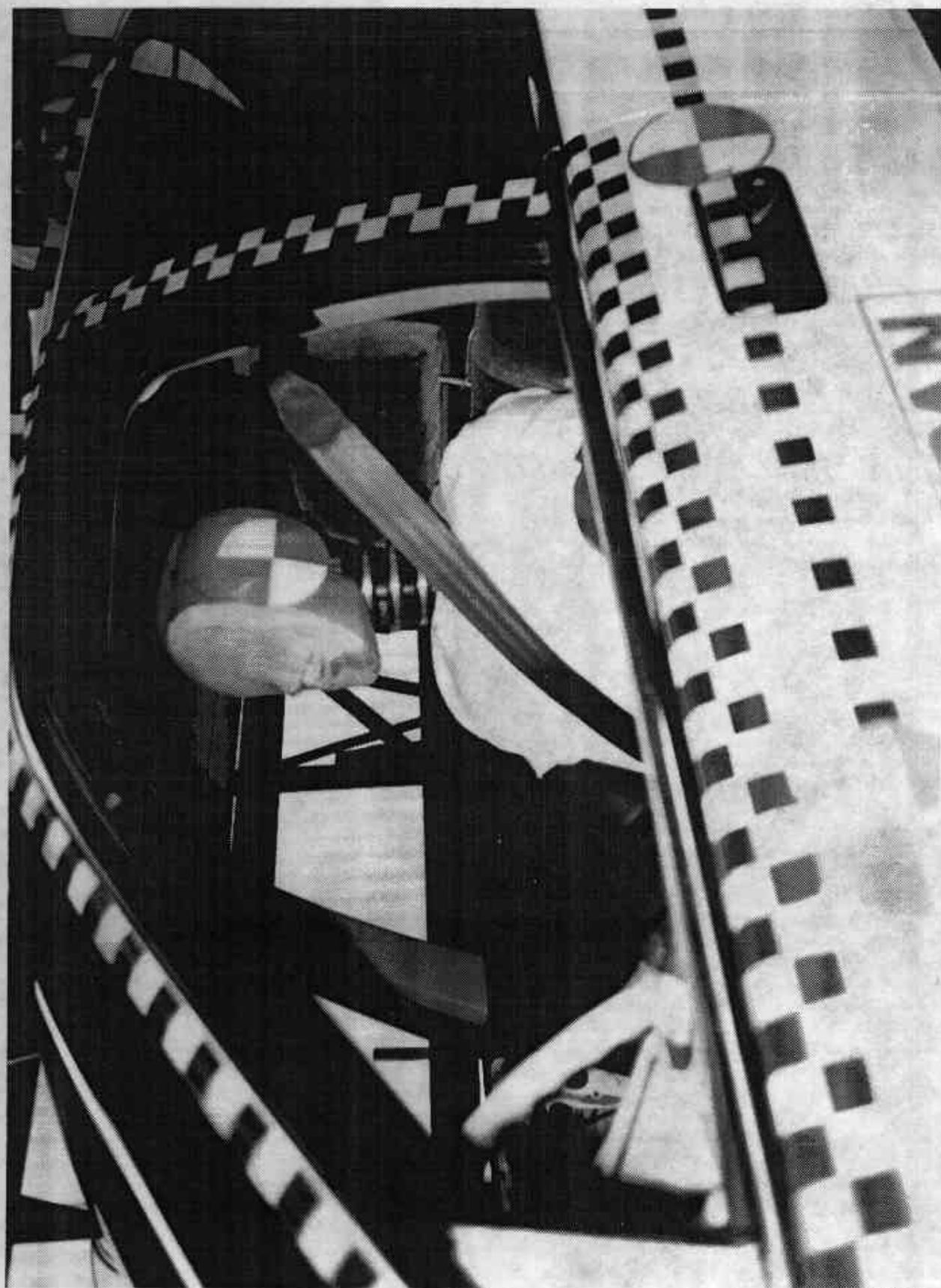


Figure A-64 VEHICLE 2 PRE-TEST DRIVER POSITION VIEW

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7883-1



Figure A-65 VEHICLE 2 POST-TEST DRIVER POSITION VIEW

A-69

7883-1

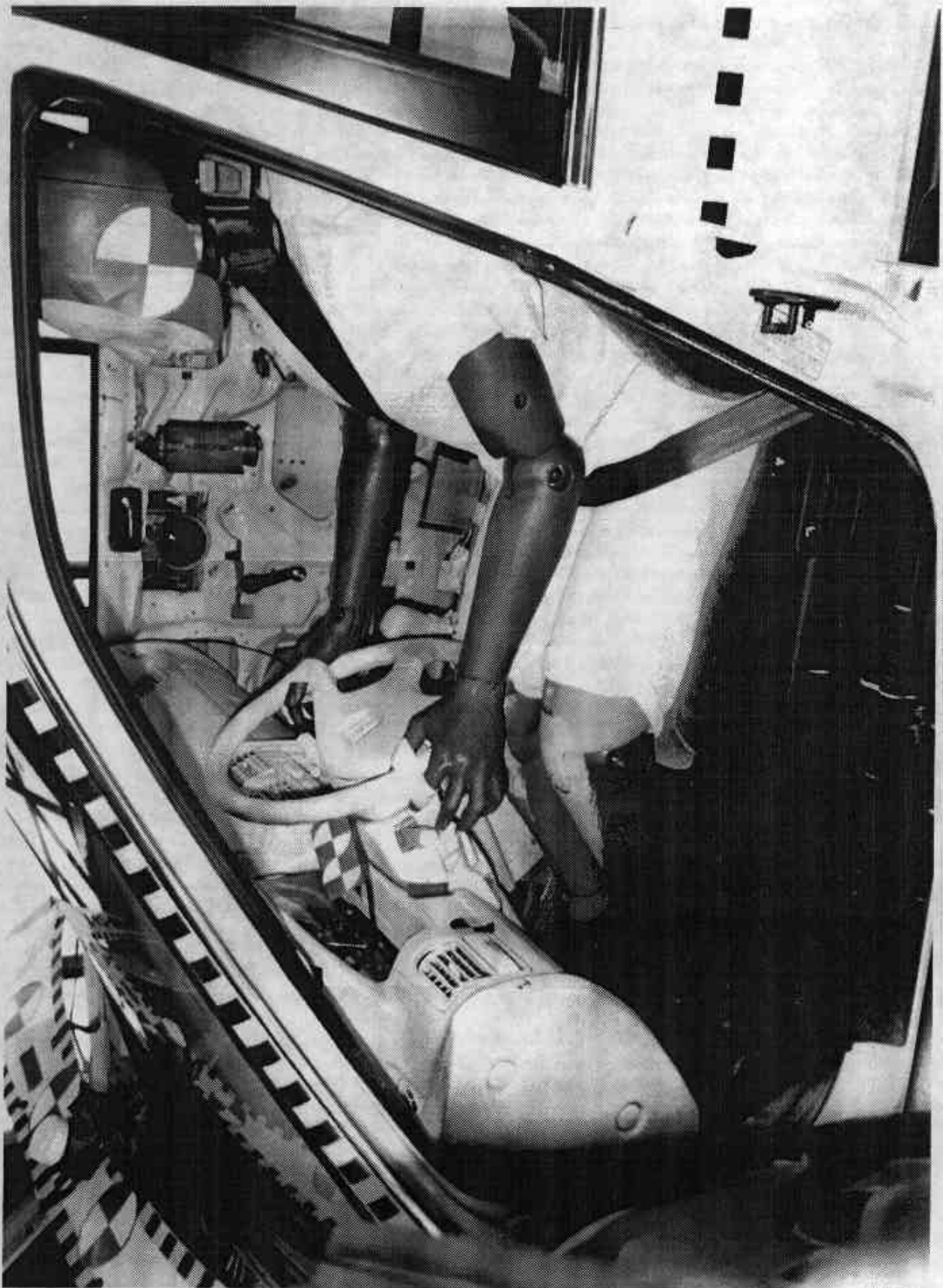


Figure A-66 VEHICLE 2 PRE-TEST DRIVER AND OCCUPANT COMPARTMENT VIEW

A-70

7883-1



Figure A-67 VEHICLE 2 POST-TEST DRIVER AND OCCUPANT COMPARTMENT VIEW

A-71

7883-1

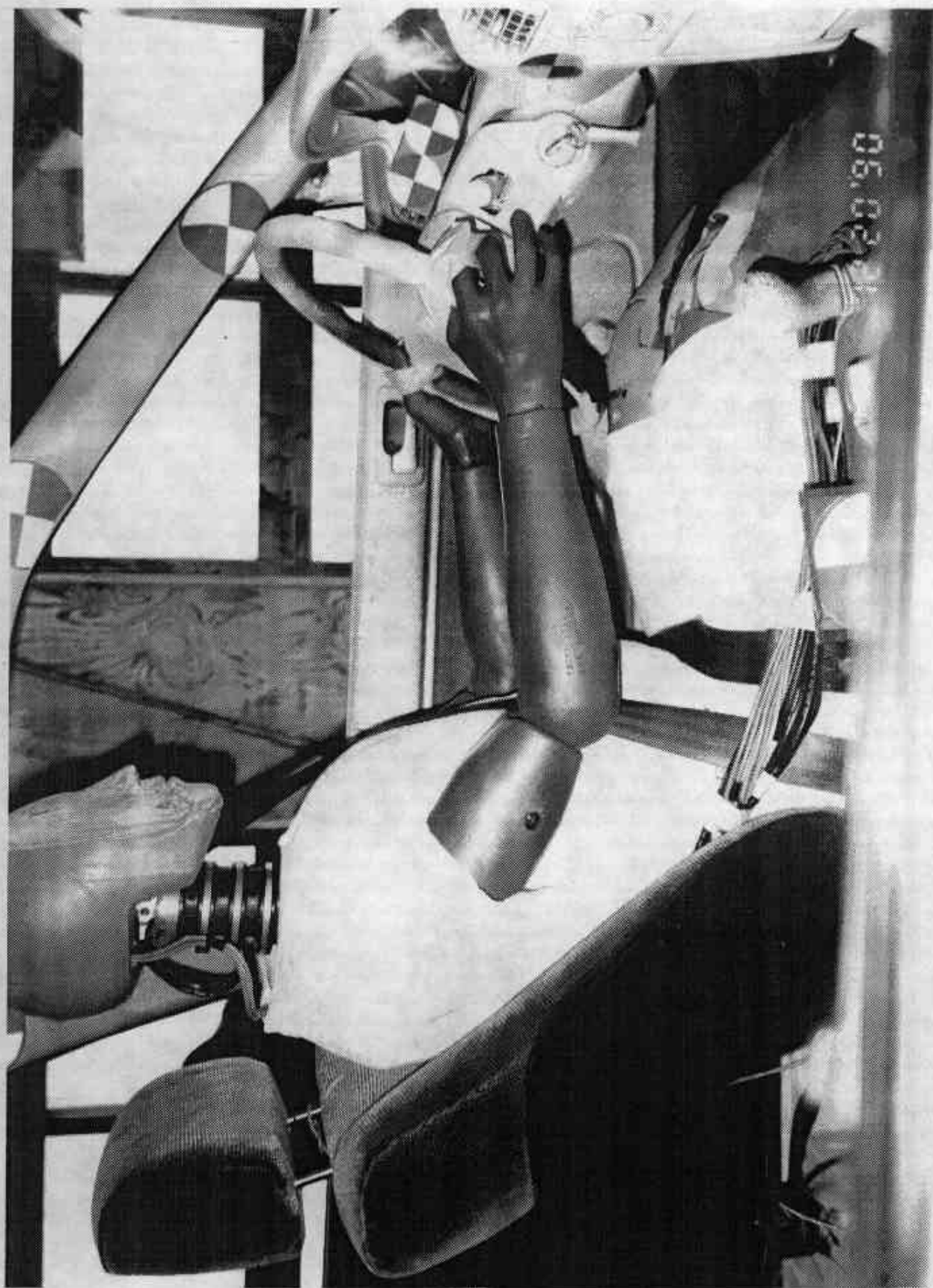


FIGURE A-58 VEHICLE 2 PRE-TEST DRIVER AND OCCUPANT COMPARTMENT RIGHT SIDE VIEW



Figure A-69 VEHICLE 2 POST-TEST DRIVER AND OCCUPANT COMPARTMENT RIGHT SIDE VIEW

A-73

7883-1

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

Key: V1 - Vehicle 1
V2 - Vehicle 2

VEHICLE ONE DATA
1991 ISUZU STYLUS

TEST NO. Y42-1-1025

VEHICLE DATA

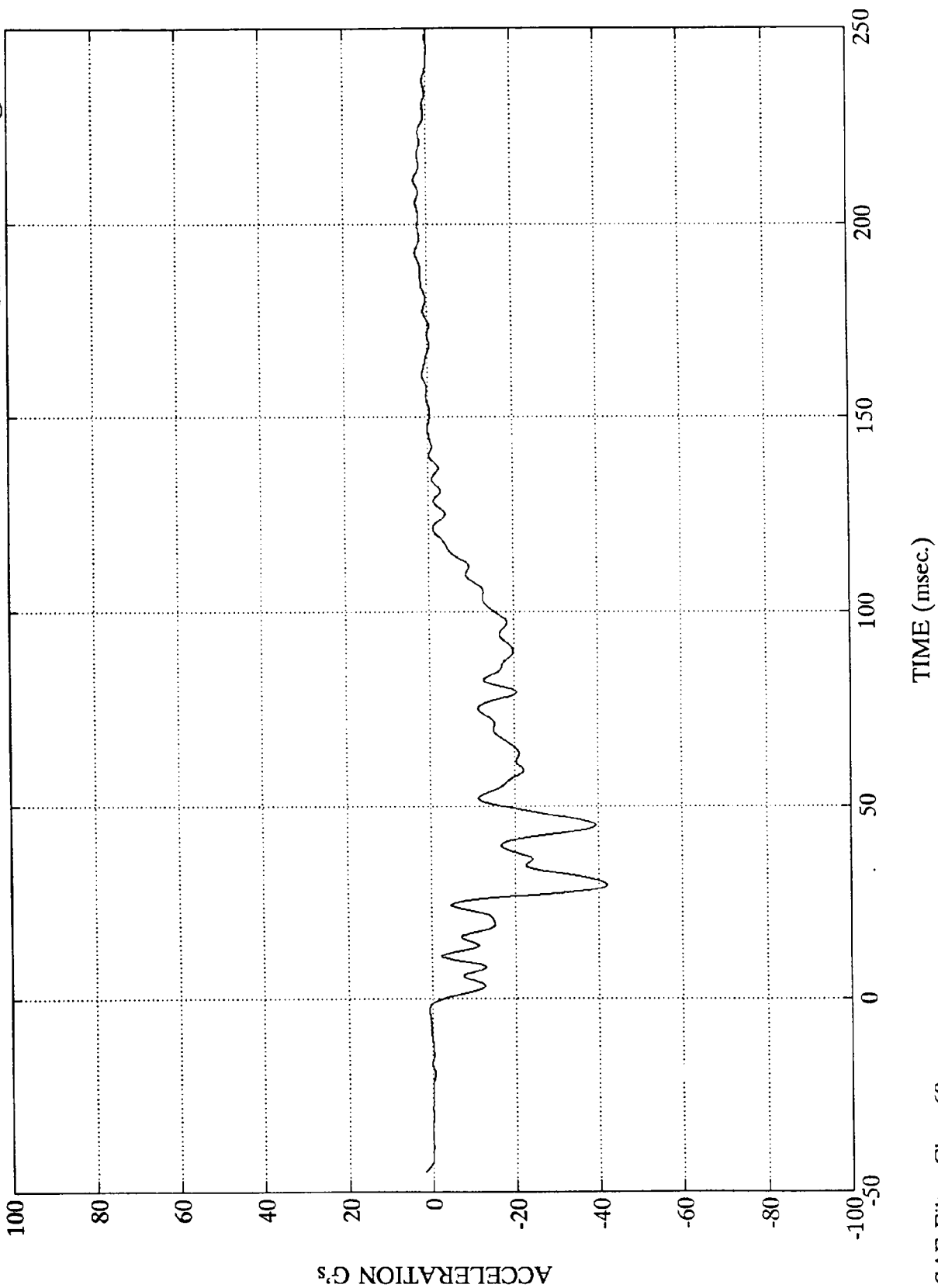
FILTER CHANNEL CLASS

60

Test 1025

V1 L REAR SEAT X-MEMBER (X)

Max = 3.1 G's @ 211.6 msec
Min = -42.0 G's @ 29.8 msec

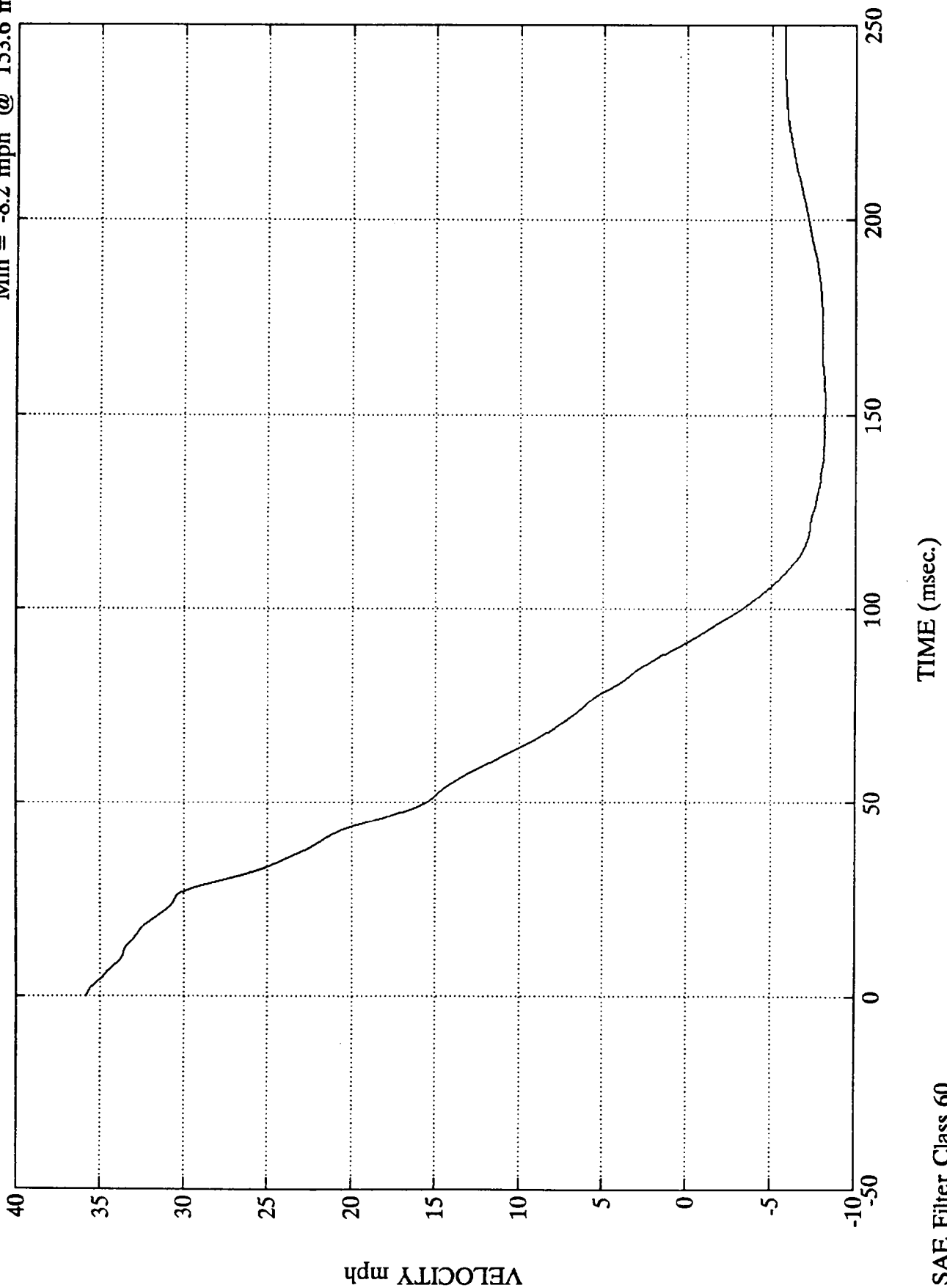


SAE Filter Class 60

Test 1025

V1 L REAR SEAT X-MEMBER (X)

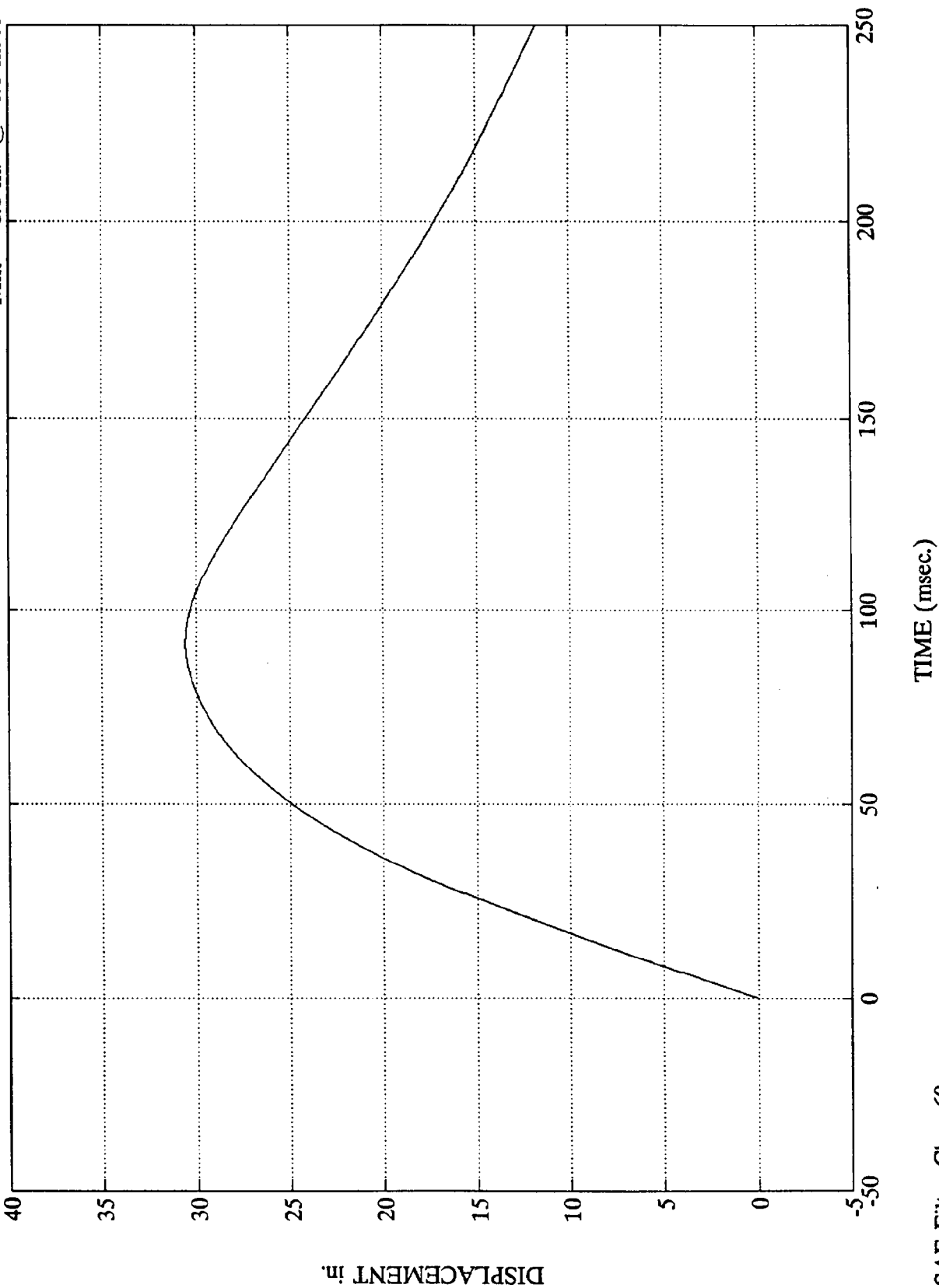
Max = 35.8 mph @ 0.0 msec
Min = -8.2 mph @ 153.6 msec



Test 1025

V1 L REAR SEAT X-MEMBER (X)

Max = 30.6 in. @ 92.6 msec
Min = 0.0 in. @ 0.0 msec



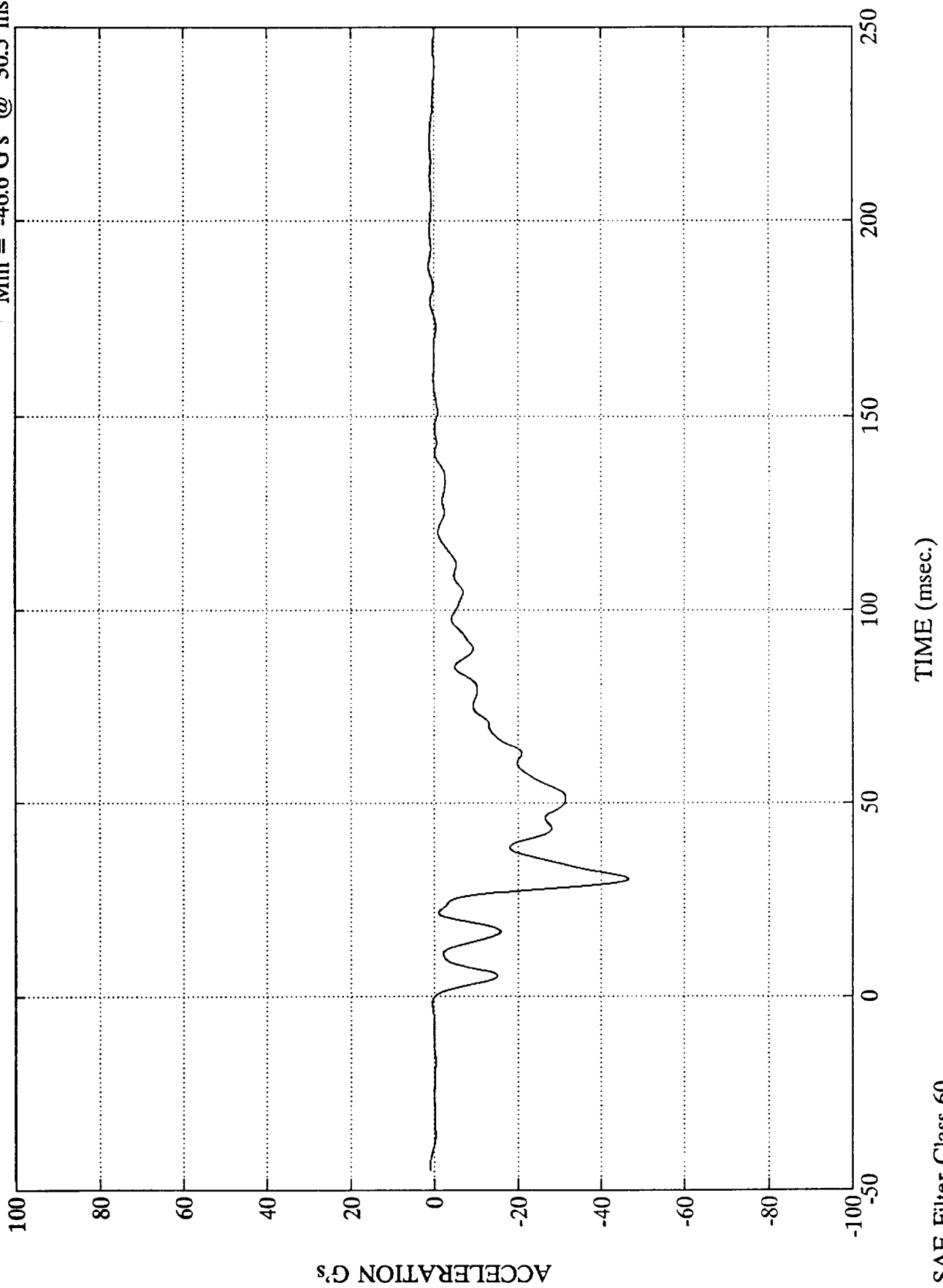
SAE Filter Class 60

7883-1

Test 1025

V1 R. REAR SEAT X-MEMBER (X)

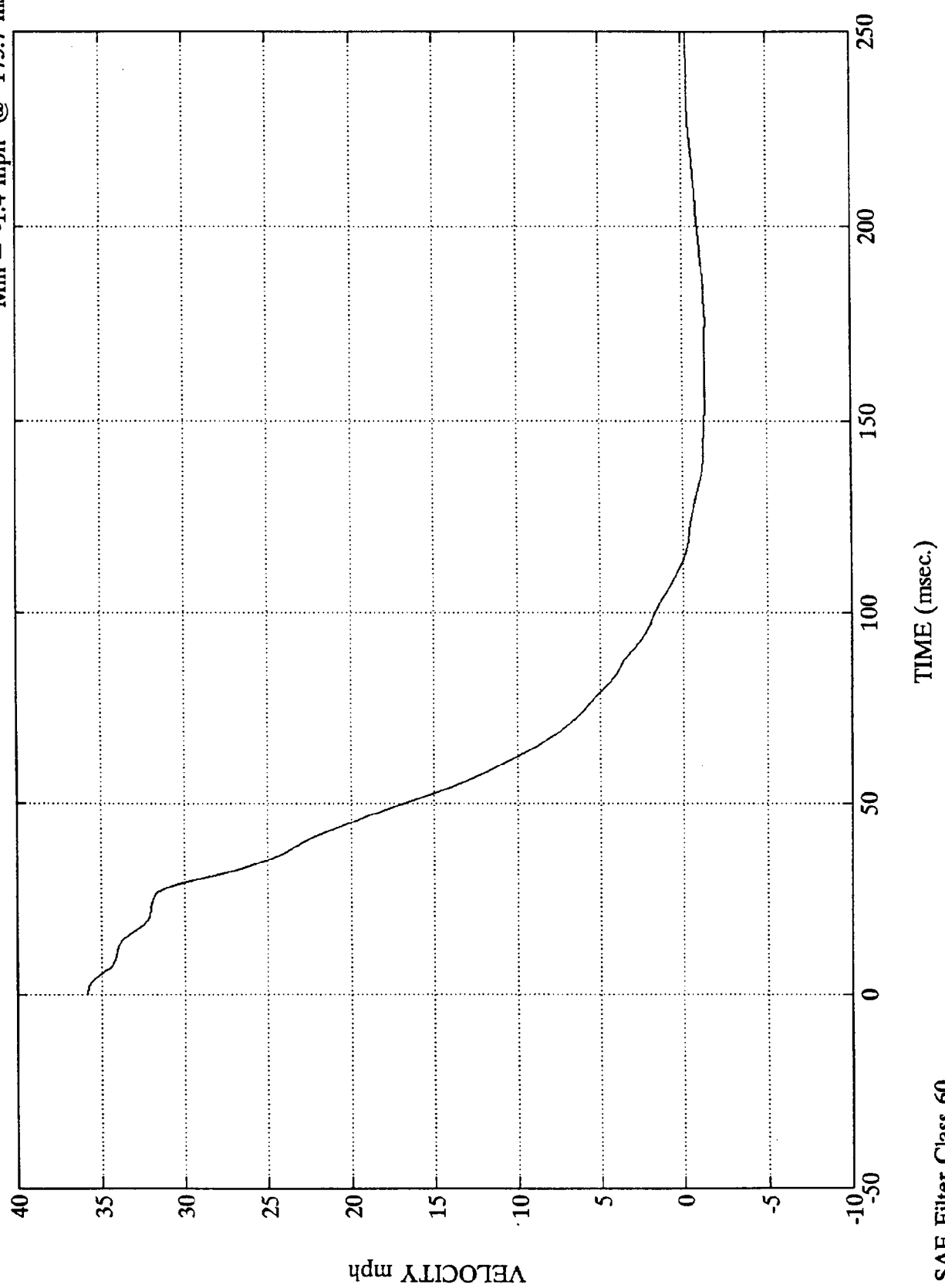
Max = 1.4 G's @ 188.3 msec
Min = -46.6 G's @ 30.5 msec



Test 1025

V1 R. REAR SEAT X-MEMBER (X)

Max = 35.8 mph @ 0.2 msec
Min = -1.4 mph @ 175.7 msec

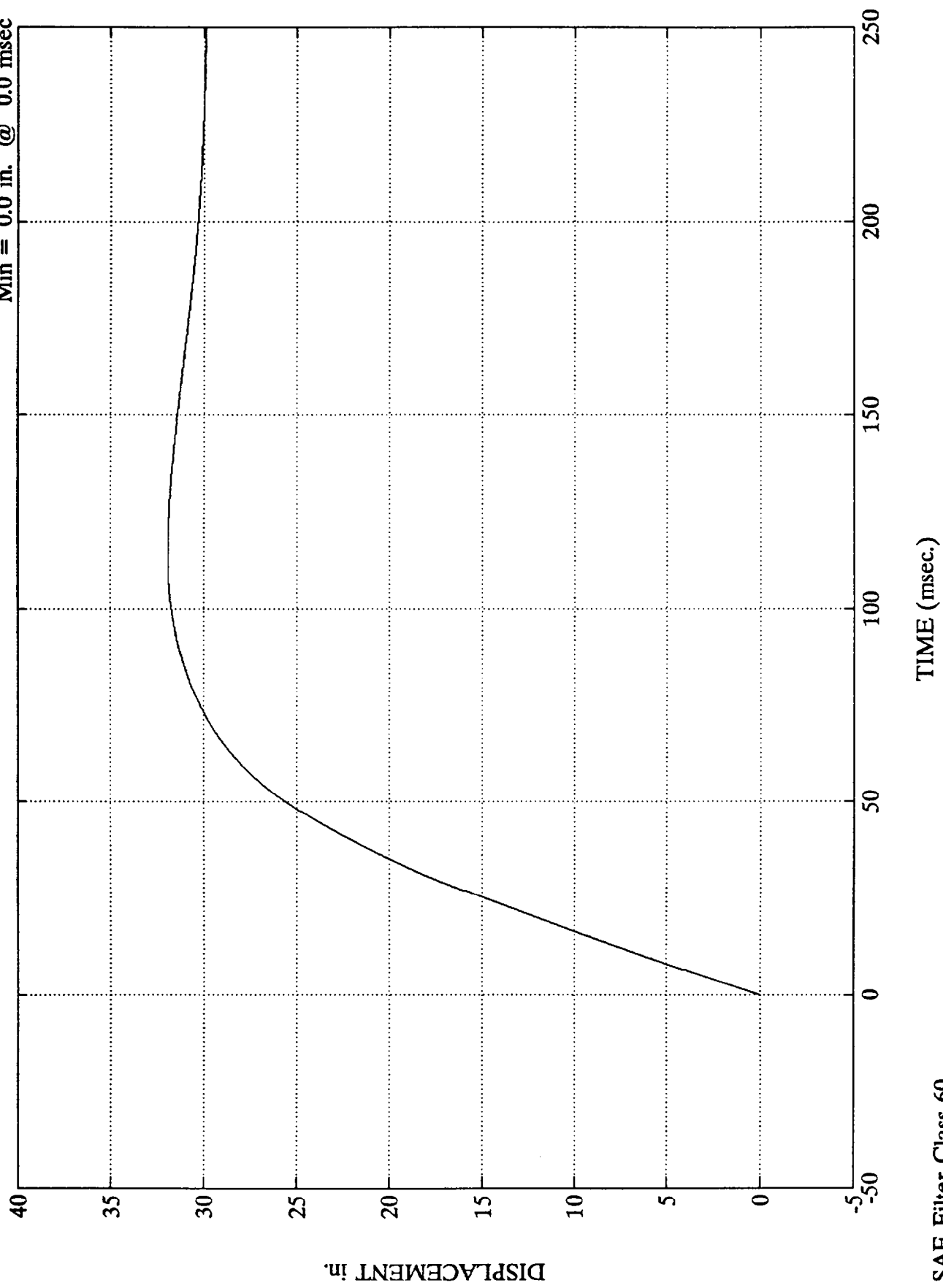


SAE Filter Class 60

Test 1025

V1 R. REAR SEAT X-MEMBER (X)

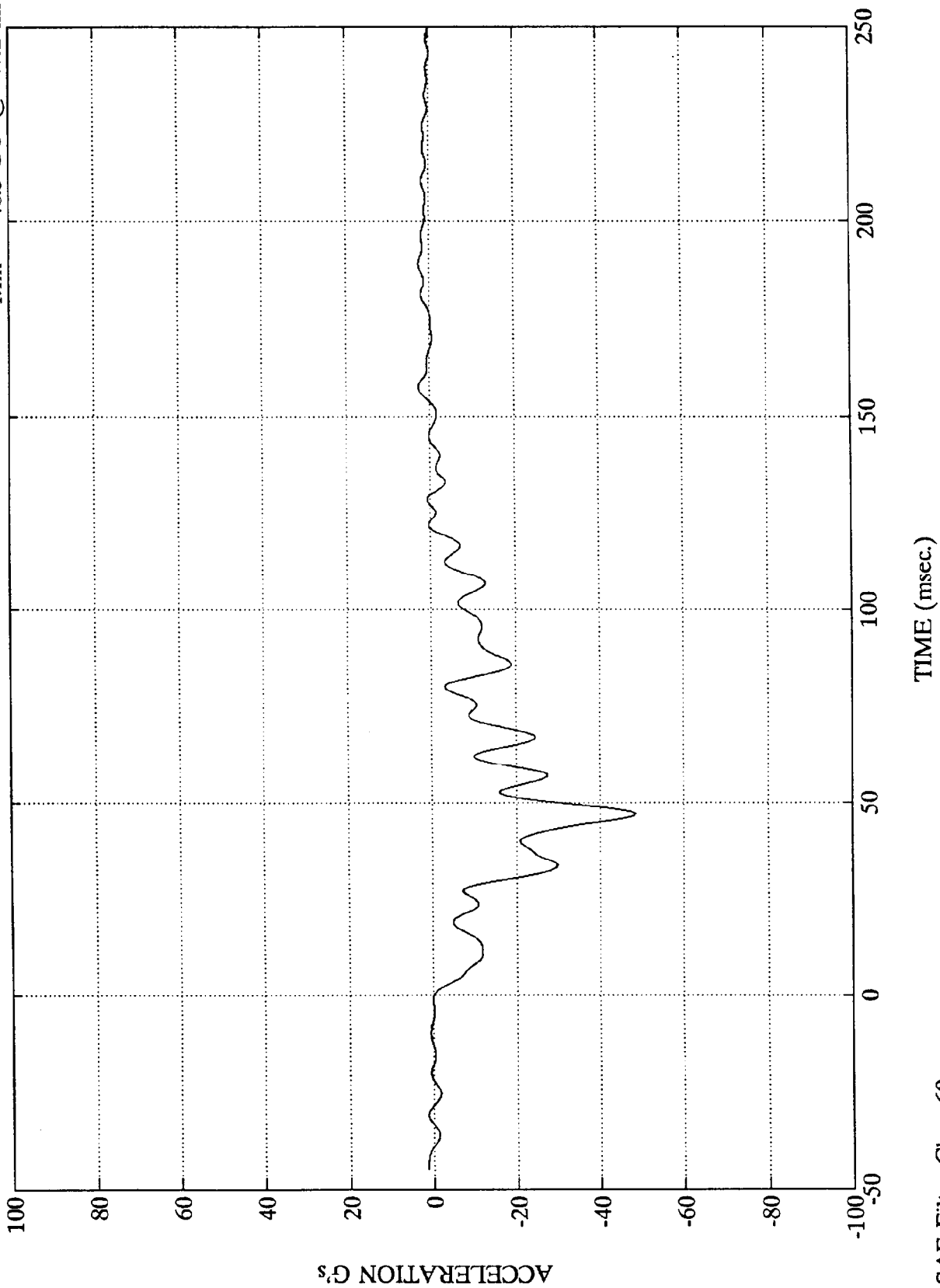
Max = 31.9 in. @ 117.1 msec
Min = 0.0 in. @ 0.0 msec



Test 1025

V1 C/L REAR SEAT X-MEMBER (X)

Max = 2.8 G's @ 157.3 msec
Min = -48.5 G's @ 47.2 msec



SAE Filter Class 60

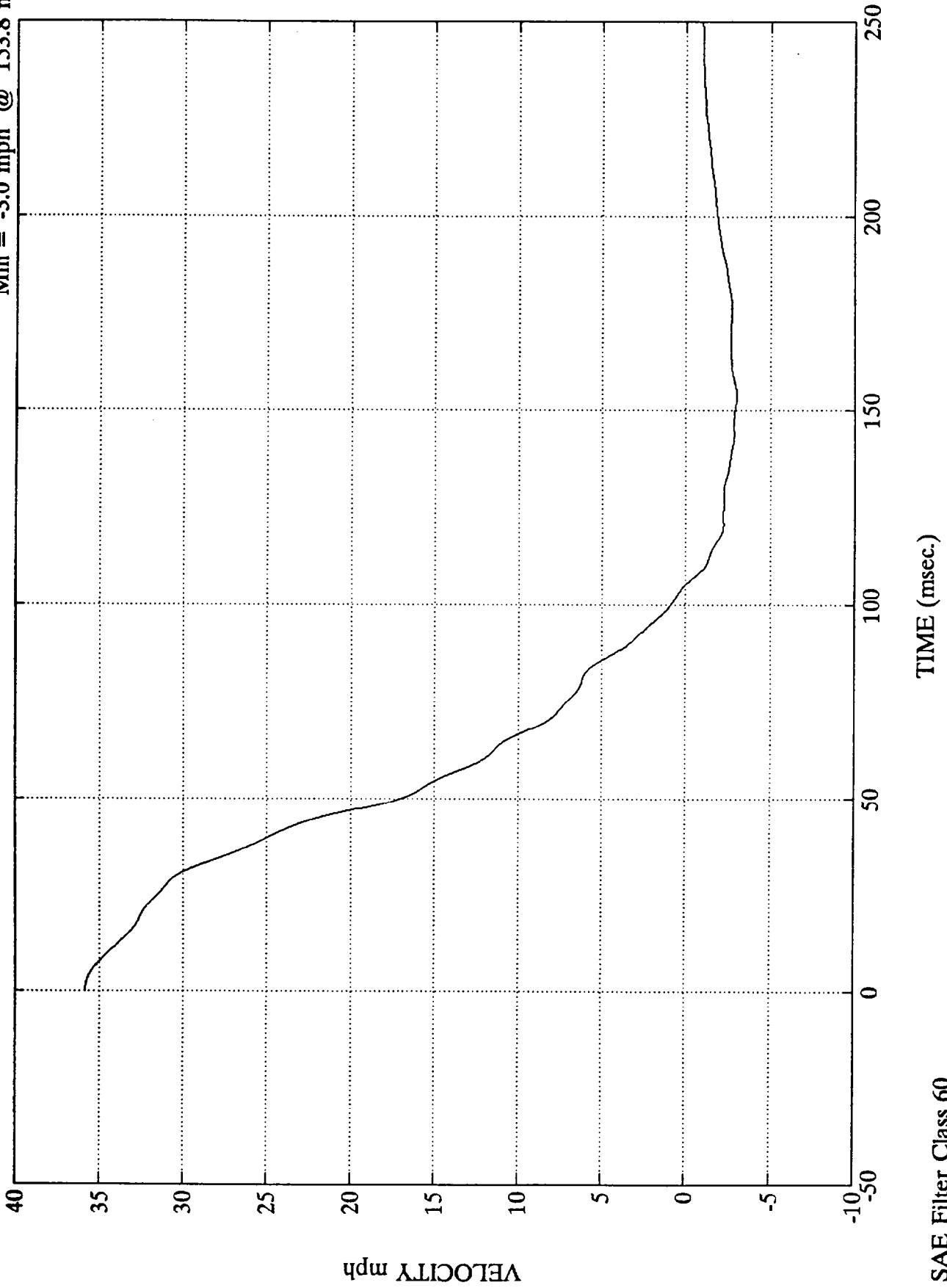
7883-1

B-10

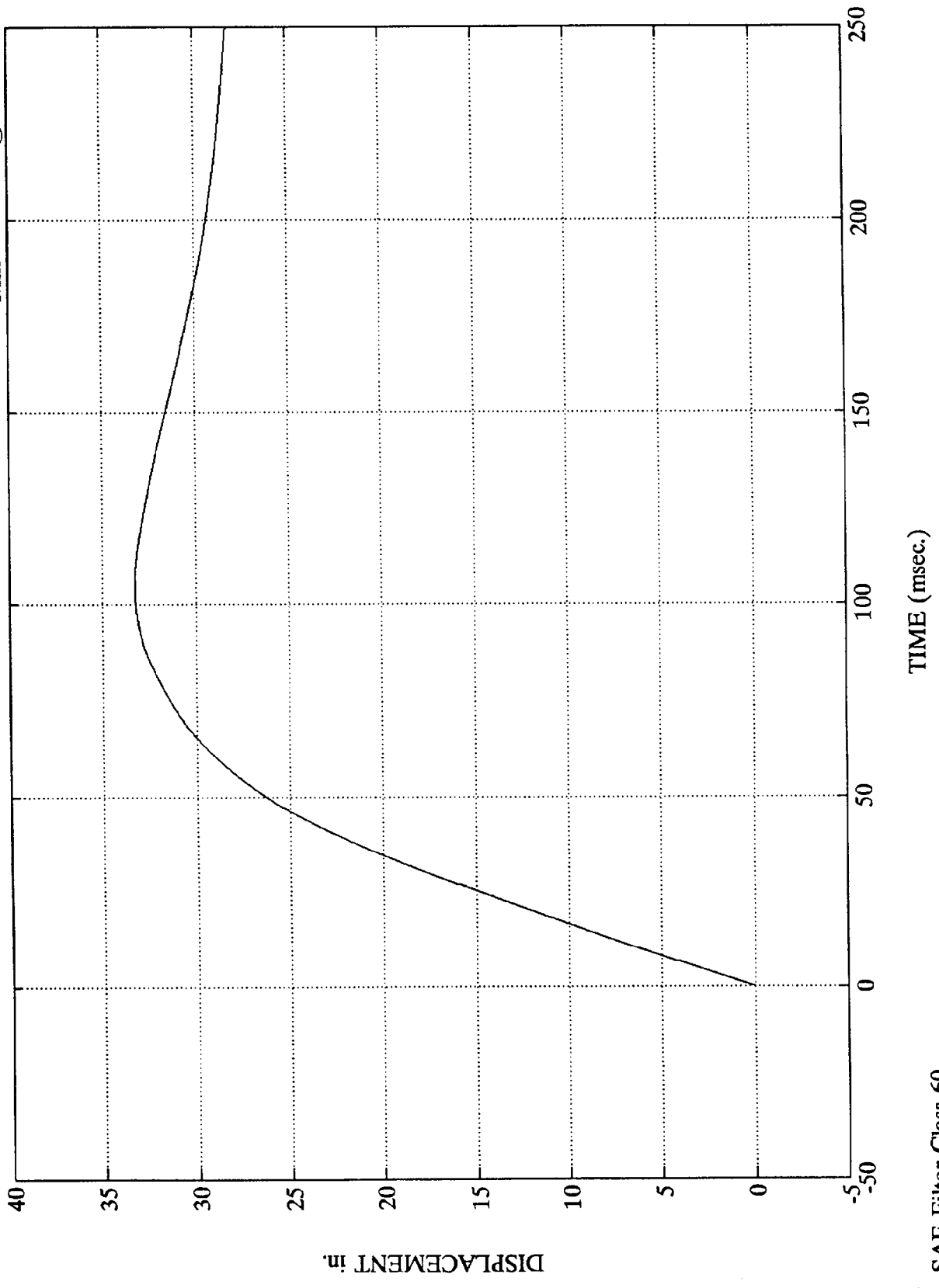
Test 1025

V1 C/L REAR SEAT X-MEMBER (X)

Max = 35.8 mph @ 0.2 msec
Min = -3.0 mph @ 153.8 msec



Test 1025
V1 C/L REAR SEAT X-MEMBER (X)
Max = 33.3 in. @ 107.3 msec
Min = 0.0 in. @ 0.0 msec



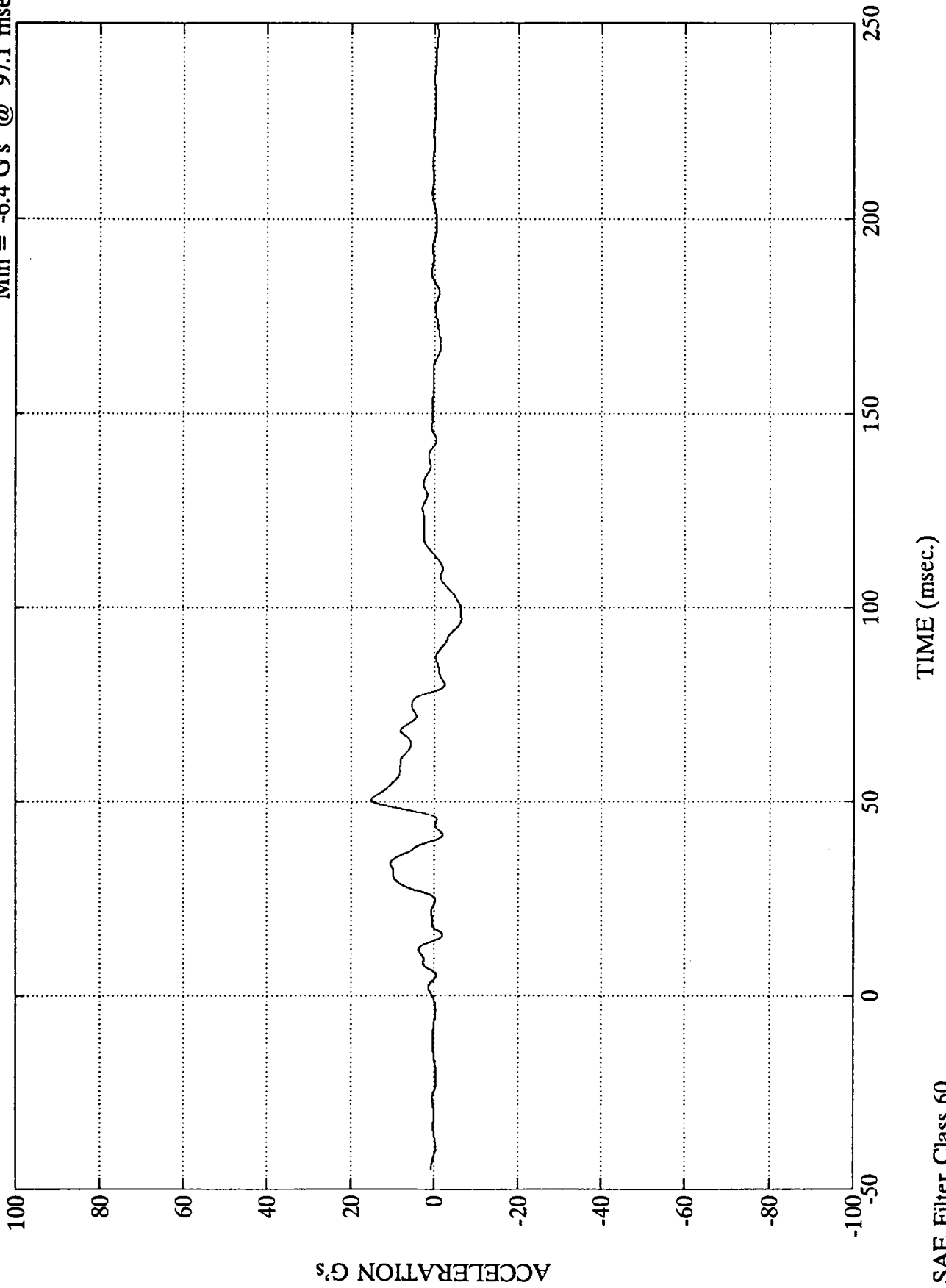
SAE Filter Class 60

7883-1

Test 1025

V1 C/L REAR SEAT X-MEMBER (Y)

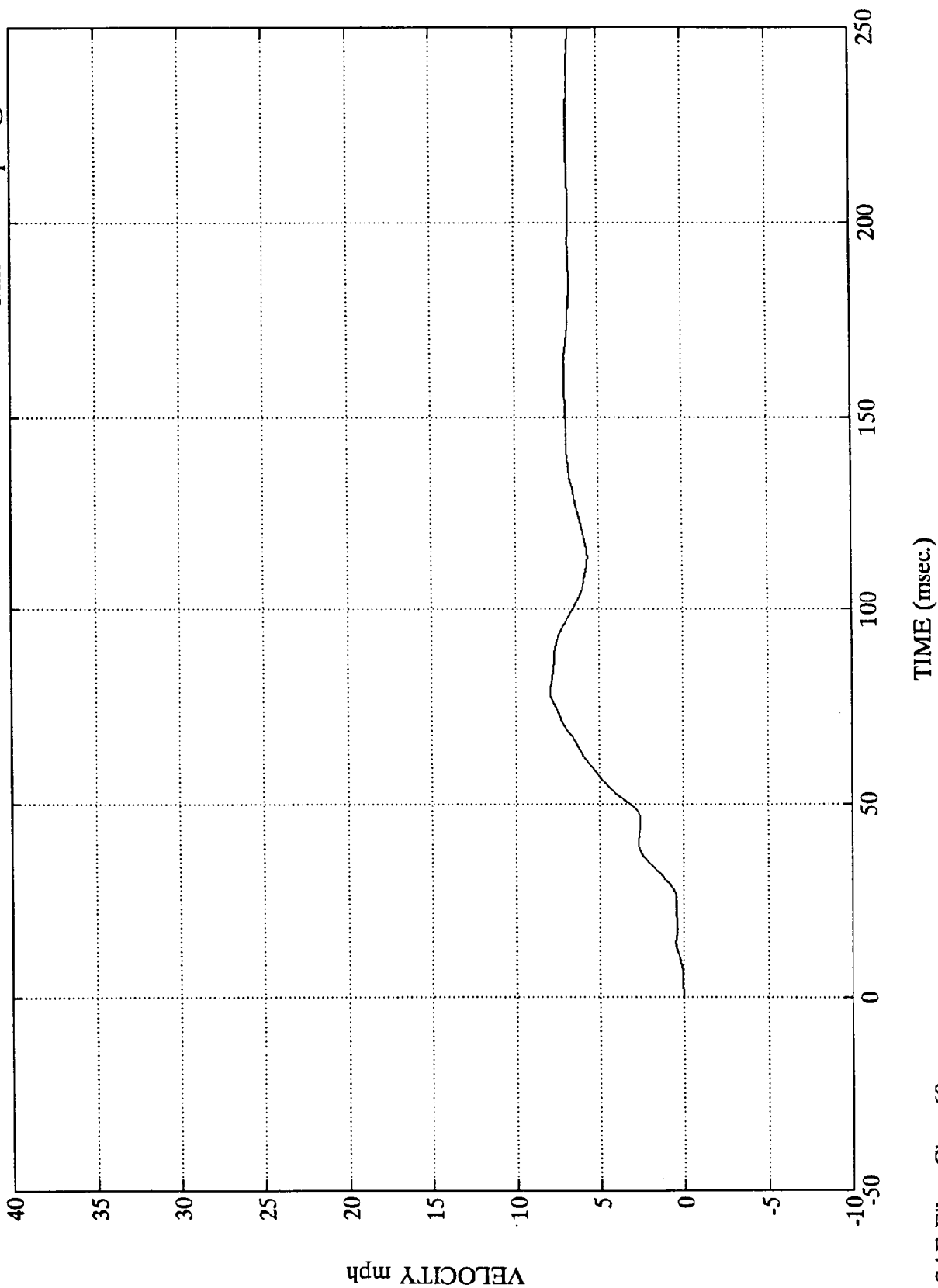
Max = 15.1 G's @ 50.6 msec
Min = -6.4 G's @ 97.1 msec



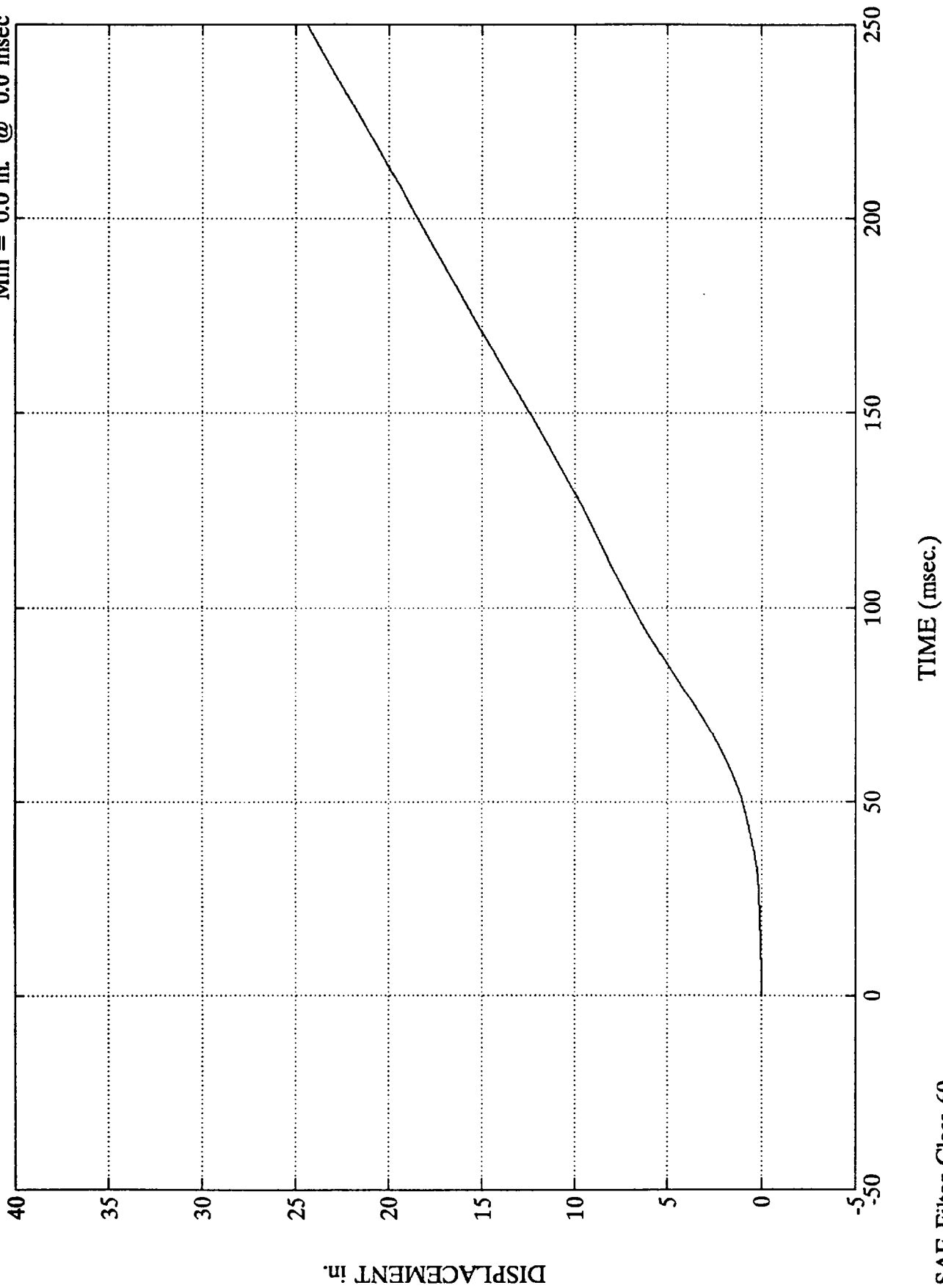
Test 1025

Max = 7.9 mph @ 79.0 msec
Min = 0.0 mph @ 0.0 msec

V1 C/L REAR SEAT X-MEMBER (Y)



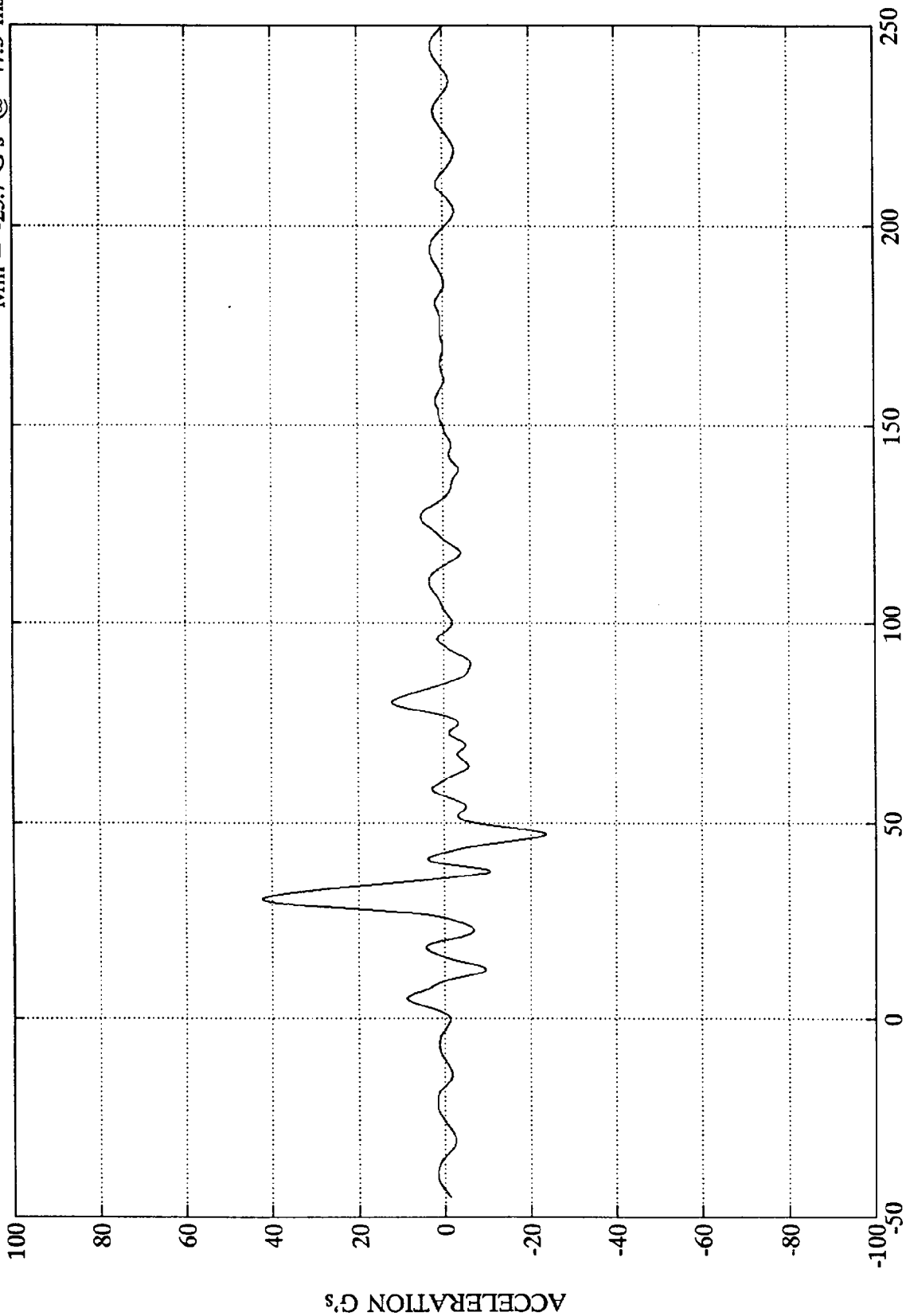
Test 1025 V1 C/L REAR SEAT X-MEMBER (Y) Max = 25.0 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec



Test 1025

V1 C/L REAR SEAT X-MEMBER (Z)

Max = 42.4 G's @ 30.4 msec
Min = -23.7 G's @ 47.3 msec



TIME (msec.)

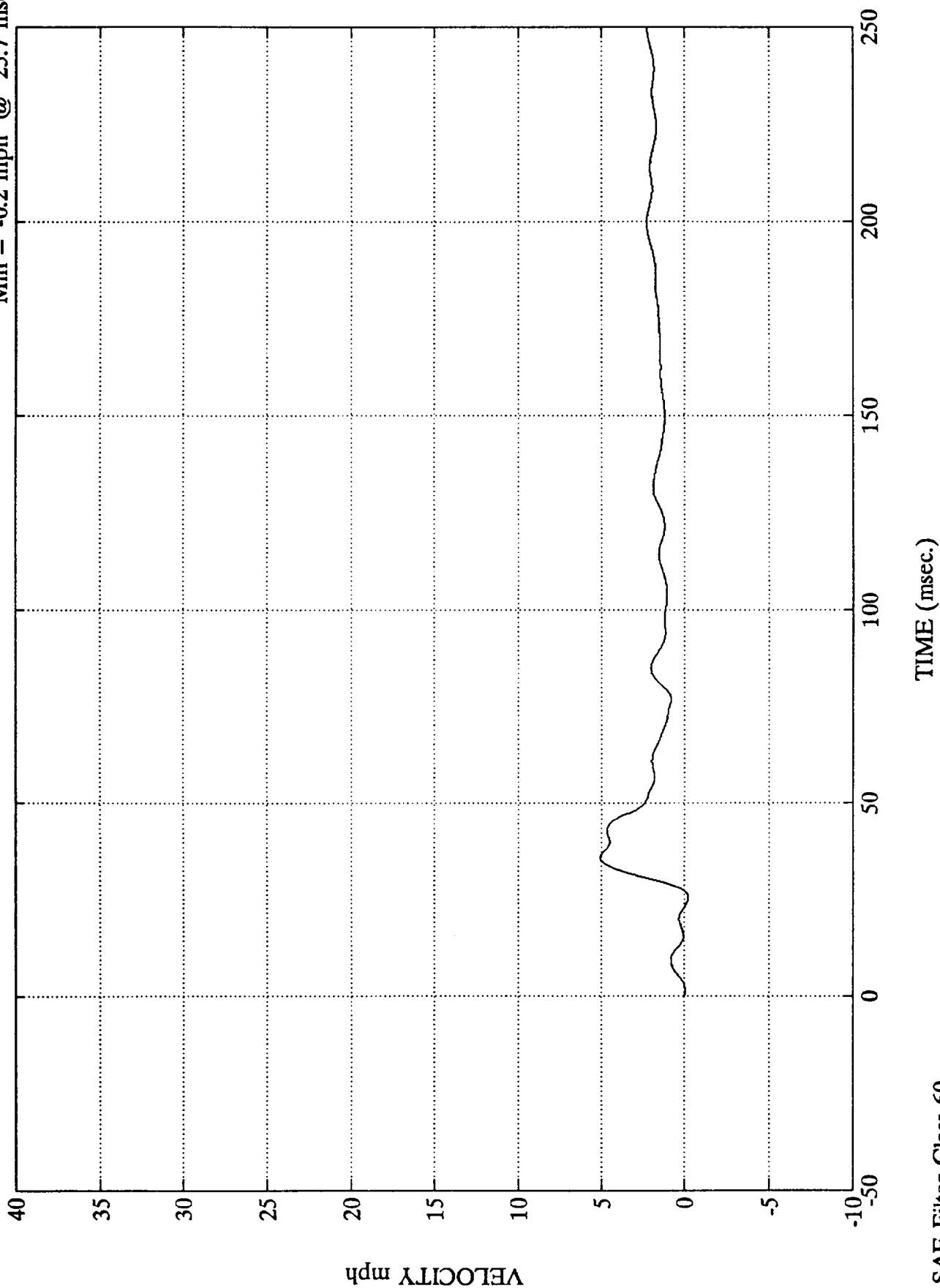
SAE Filter Class 60

7883-1

Test 1025

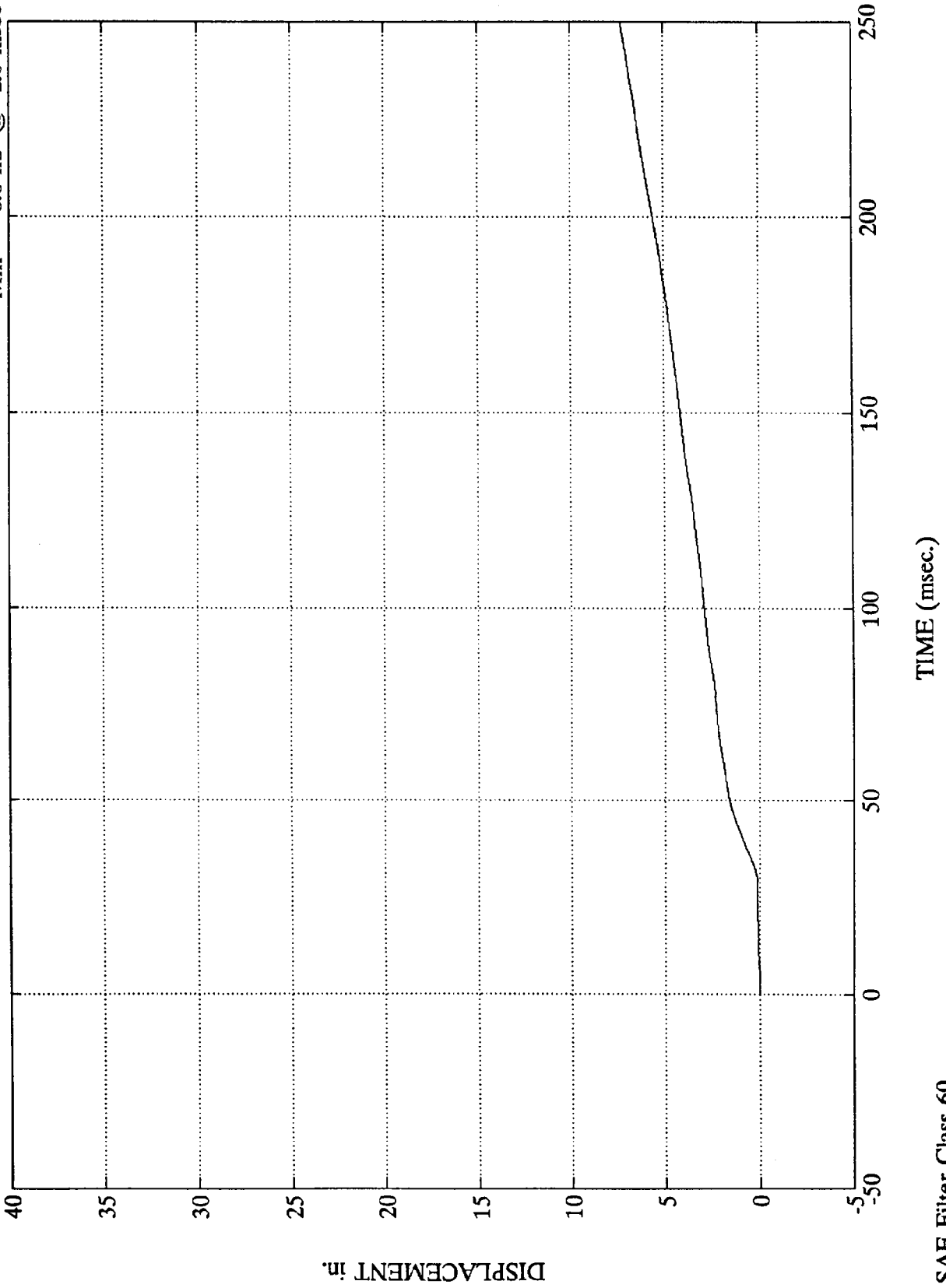
V1 C/L REAR SEAT X-MEMBER (Z)

Max = 5.1 mph @ 36.0 msec
Min = -0.2 mph @ 25.7 msec



Test 1025
Max = 7.5 in. @ 254.9 msec
Min = -0.0 in. @ 2.6 msec

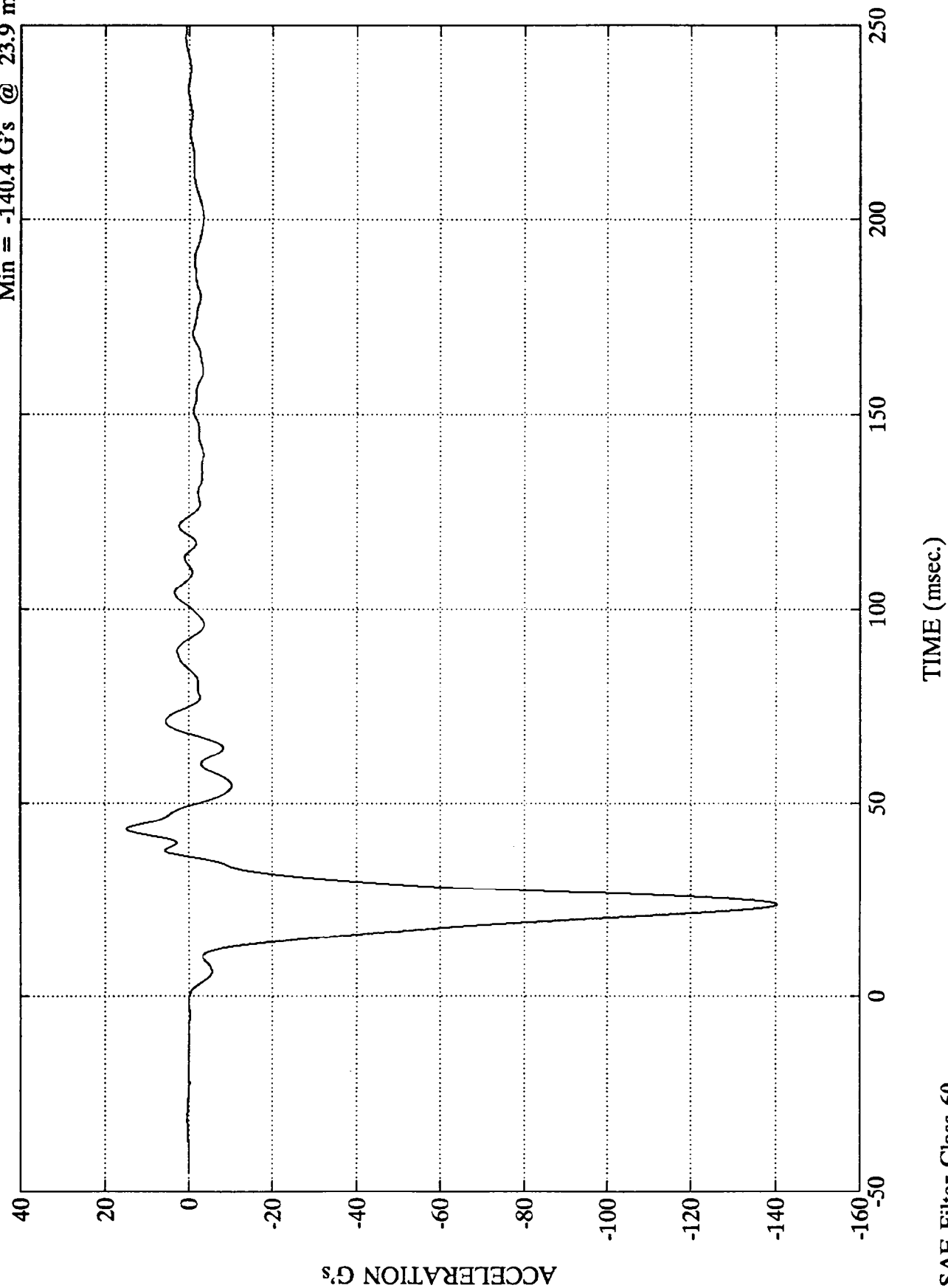
V1 C/L REAR SEAT X-MEMBER (Z)



SAE Filter Class 60

Test 1025
Max = 14.8 G's @ 43.3 msec
Min = -140.4 G's @ 23.9 msec

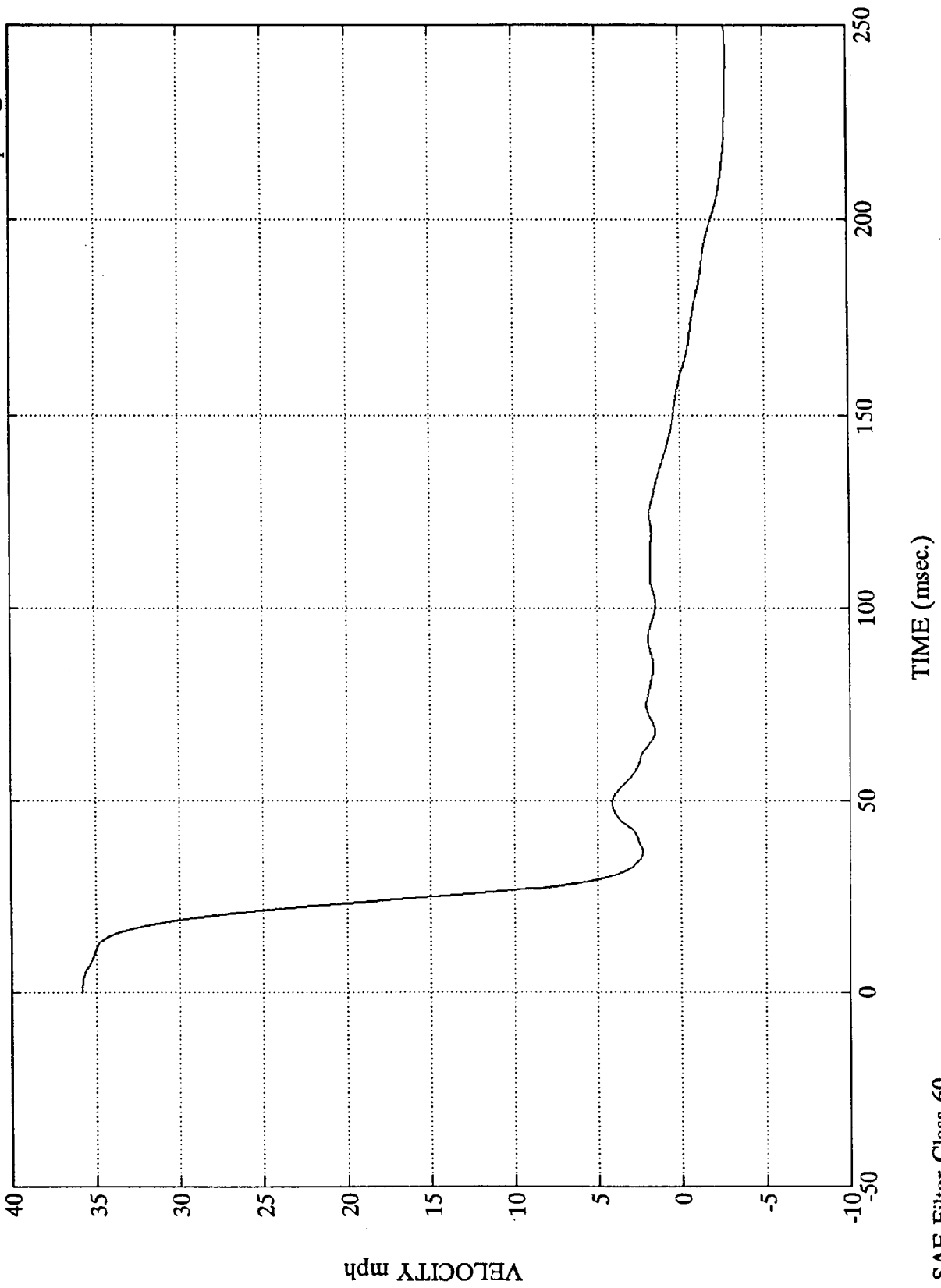
V1 ENGINE TOP (X)



Max = 35.8 mph @ 0.2 msec
Min = -2.8 mph @ 242.4 msec

V1 ENGINE TOP (X)

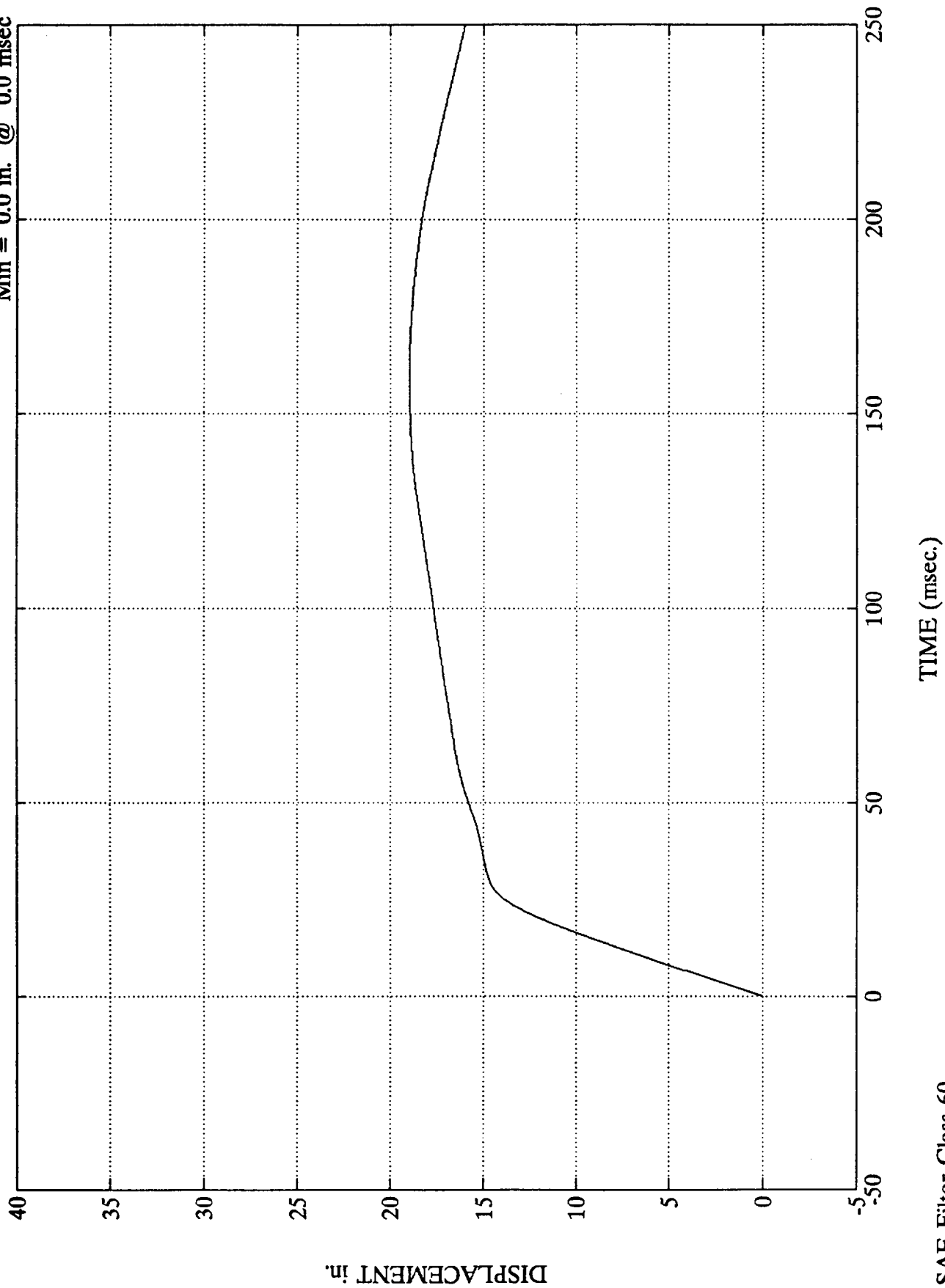
Test 1025



Test 1025

V1 ENGINE TOP (X)

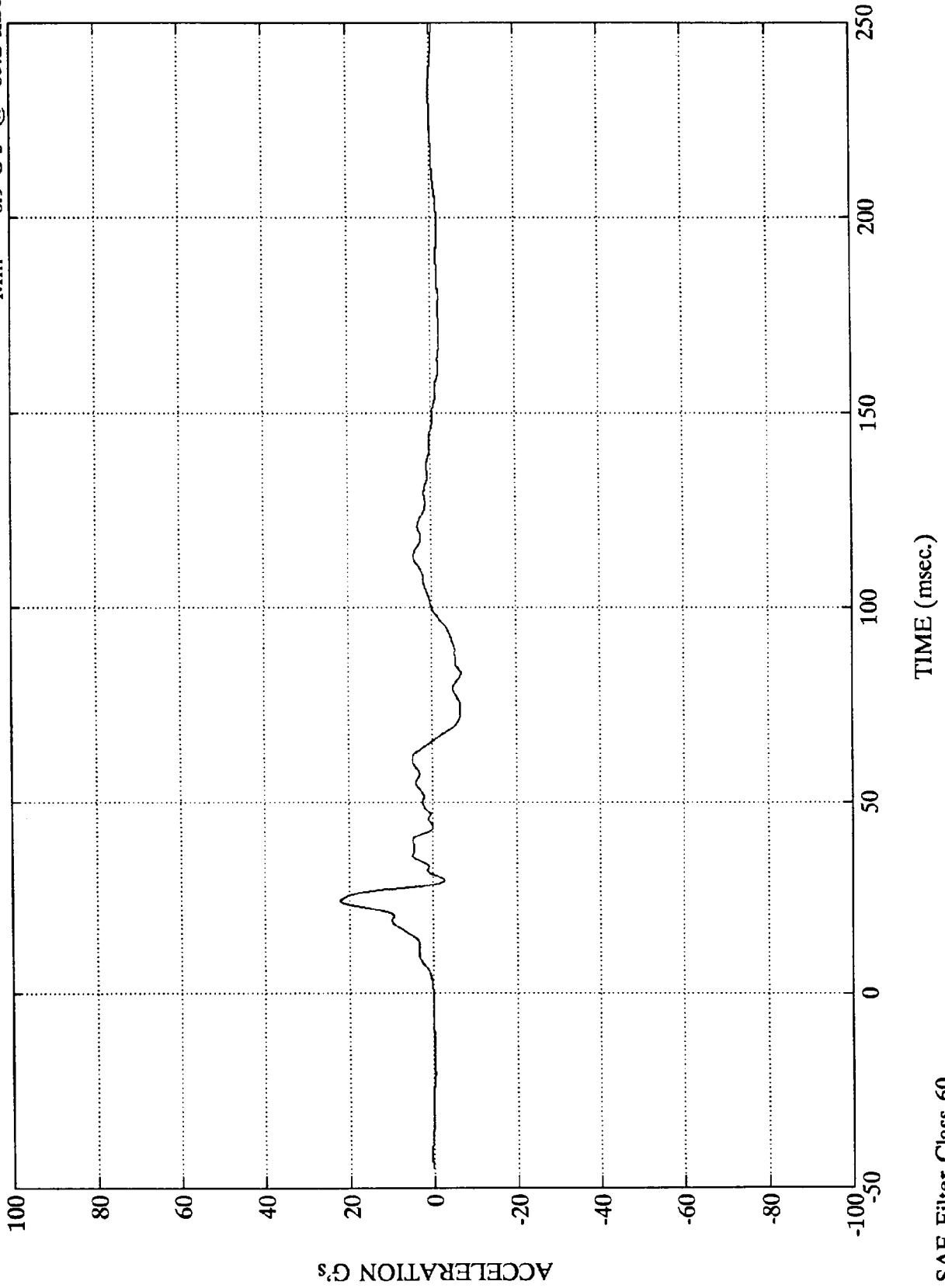
Max = 19.0 in. @ 161.0 msec
Min = 0.0 in. @ 0.0 msec



Test 1025

V1 ENGINE TOP (Z)

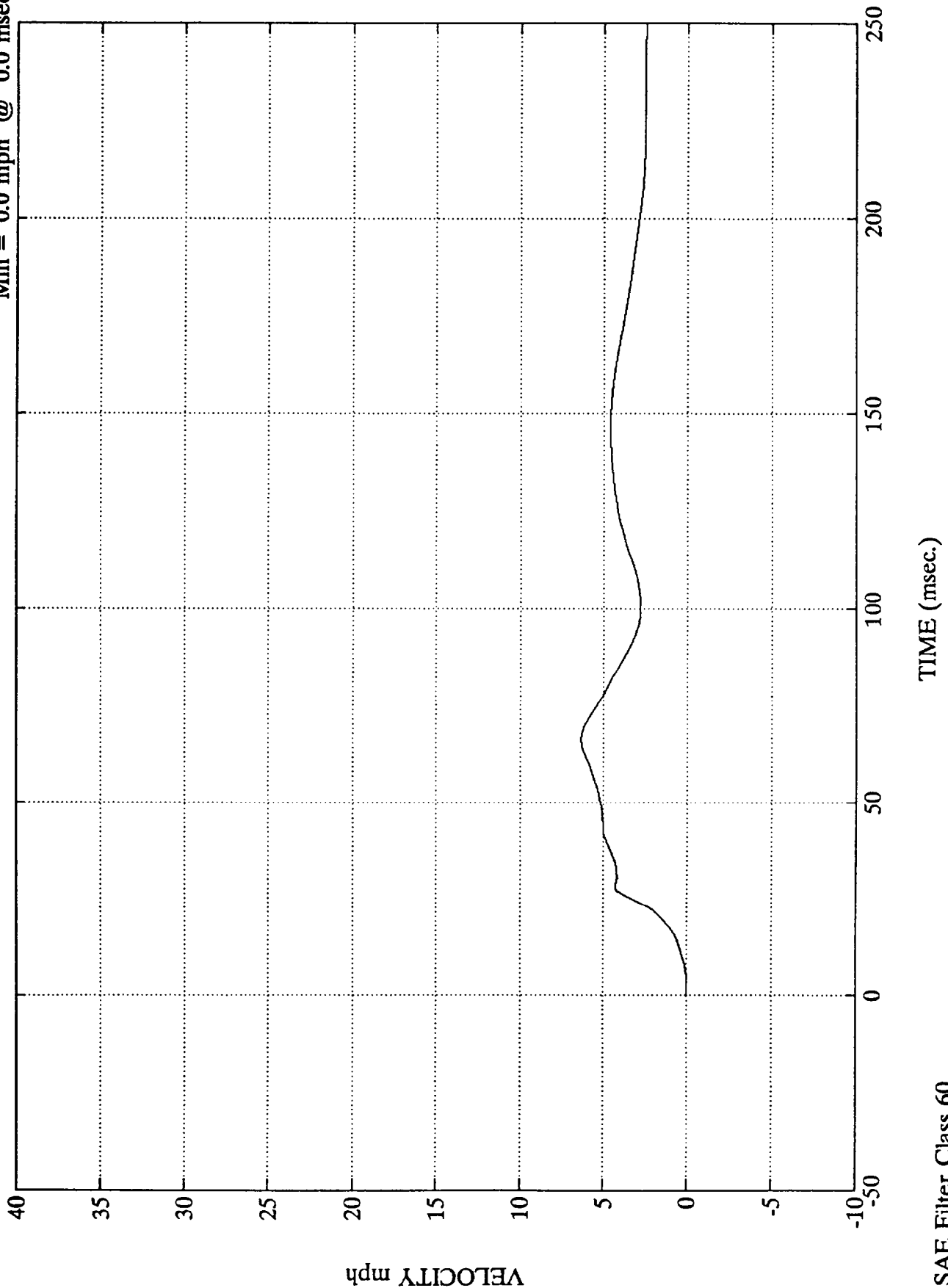
Max = 22.1 G's @ 23.9 msec
Min = -6.9 G's @ 83.2 msec



Test 1025

V1 ENGINE TOP (Z)

Max = 6.3 mph @ 66.2 msec
Min = 0.0 mph @ 0.0 msec

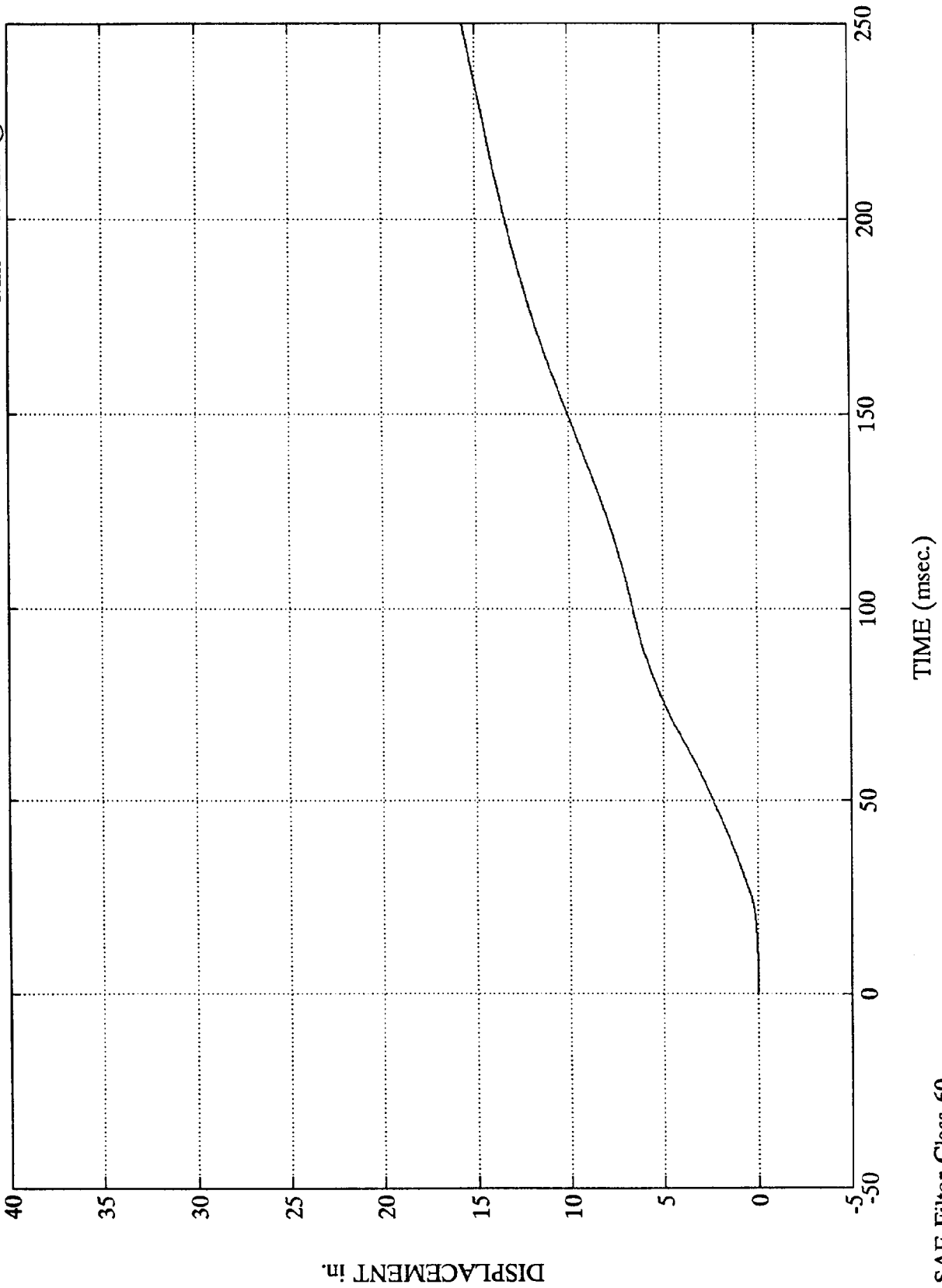


Test 1025

V1 ENGINE TOP (Z)

Max = 15.9 in. @ 254.9 msec

Min = 0.0 in. @ 0.0 msec

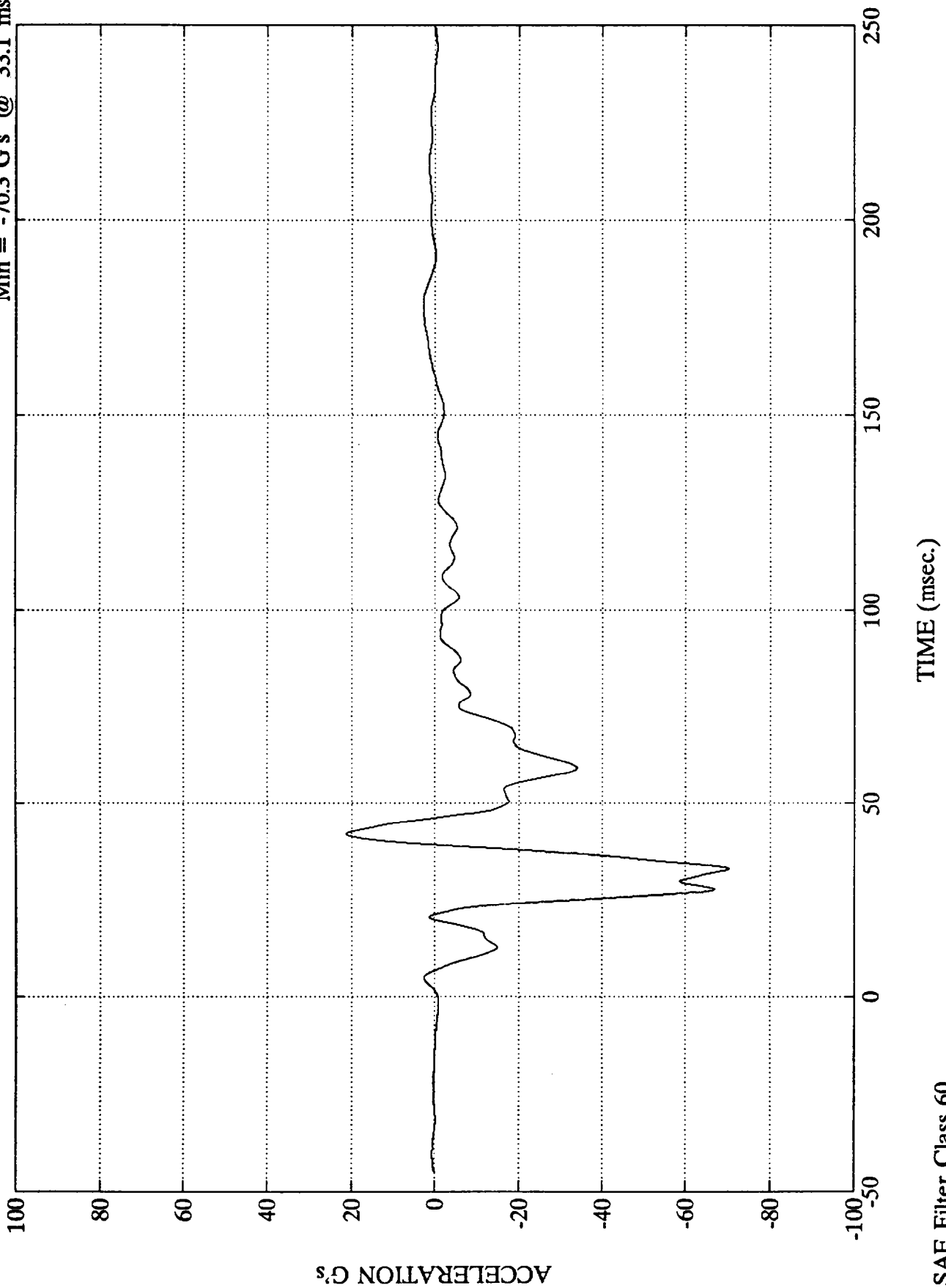


7883-1 SAE Filter Class 60

Test 1025

V1 ENGINE BOTTOM (X)

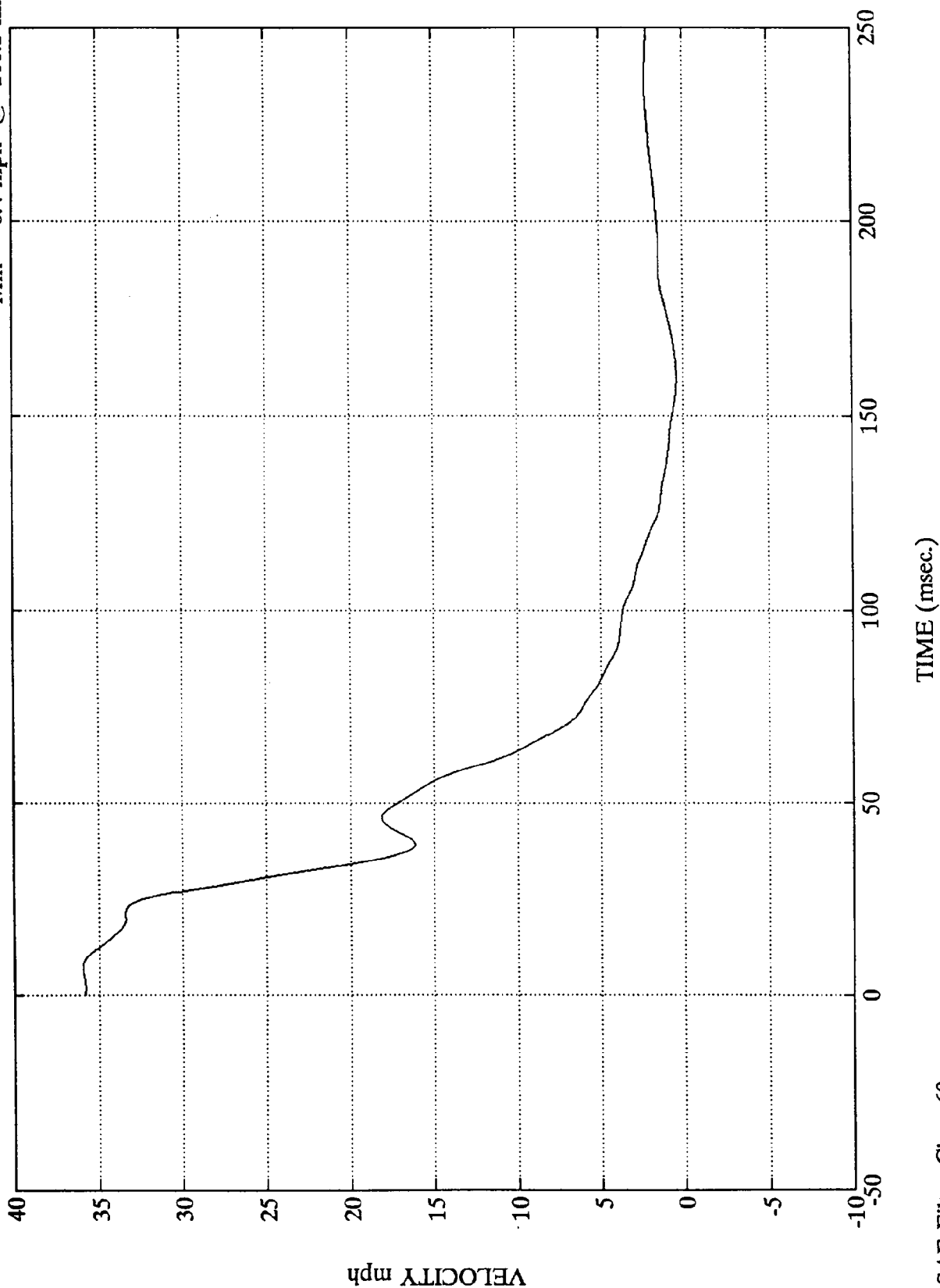
Max = 21.3 G's @ 42.1 msec
Min = -70.3 G's @ 33.1 msec



Test 1025

V1 ENGINE BOTTOM (X)

Max = 36.0 mph @ 7.0 msec
Min = 0.4 mph @ 160.1 msec



SAE Filter Class 60

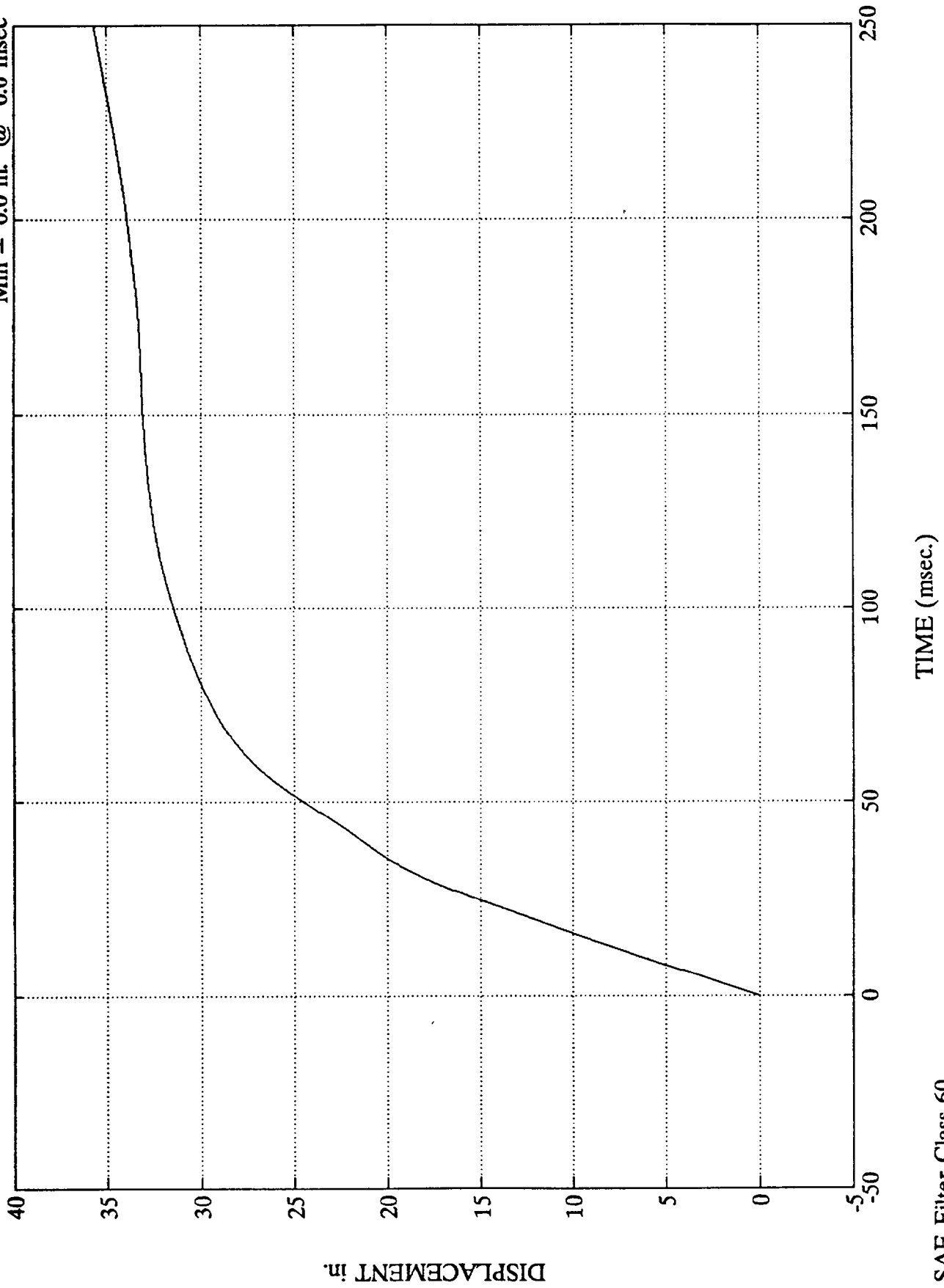
7883-1

B-26

Test 1025

V1 ENGINE BOTTOM (X)

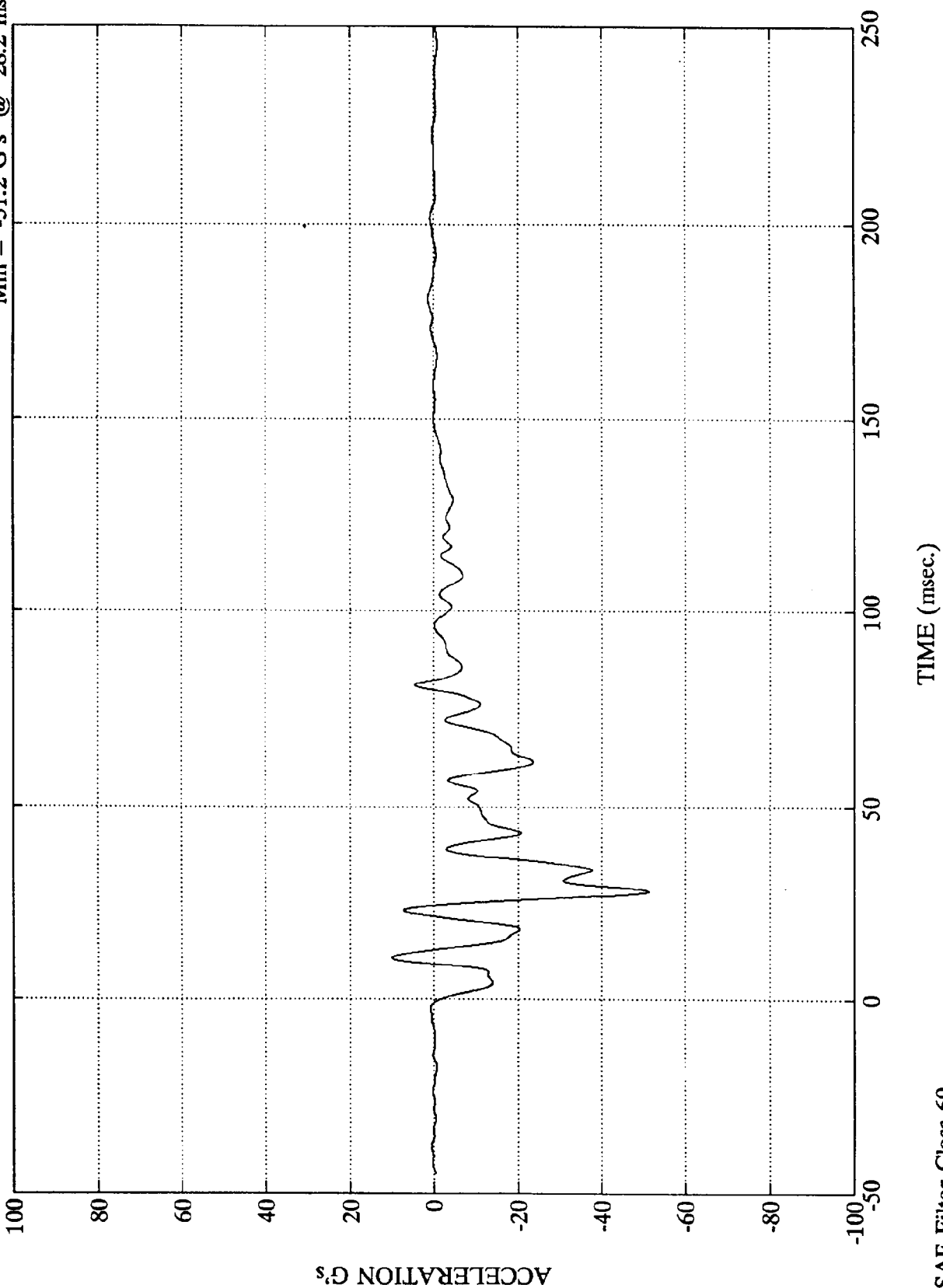
Max = 35.9 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec



Test 1025

V1 FRONT X-MEMBER (X)

Max = 10.0 G's @ 10.8 msec
Min = -51.2 G's @ 28.2 msec

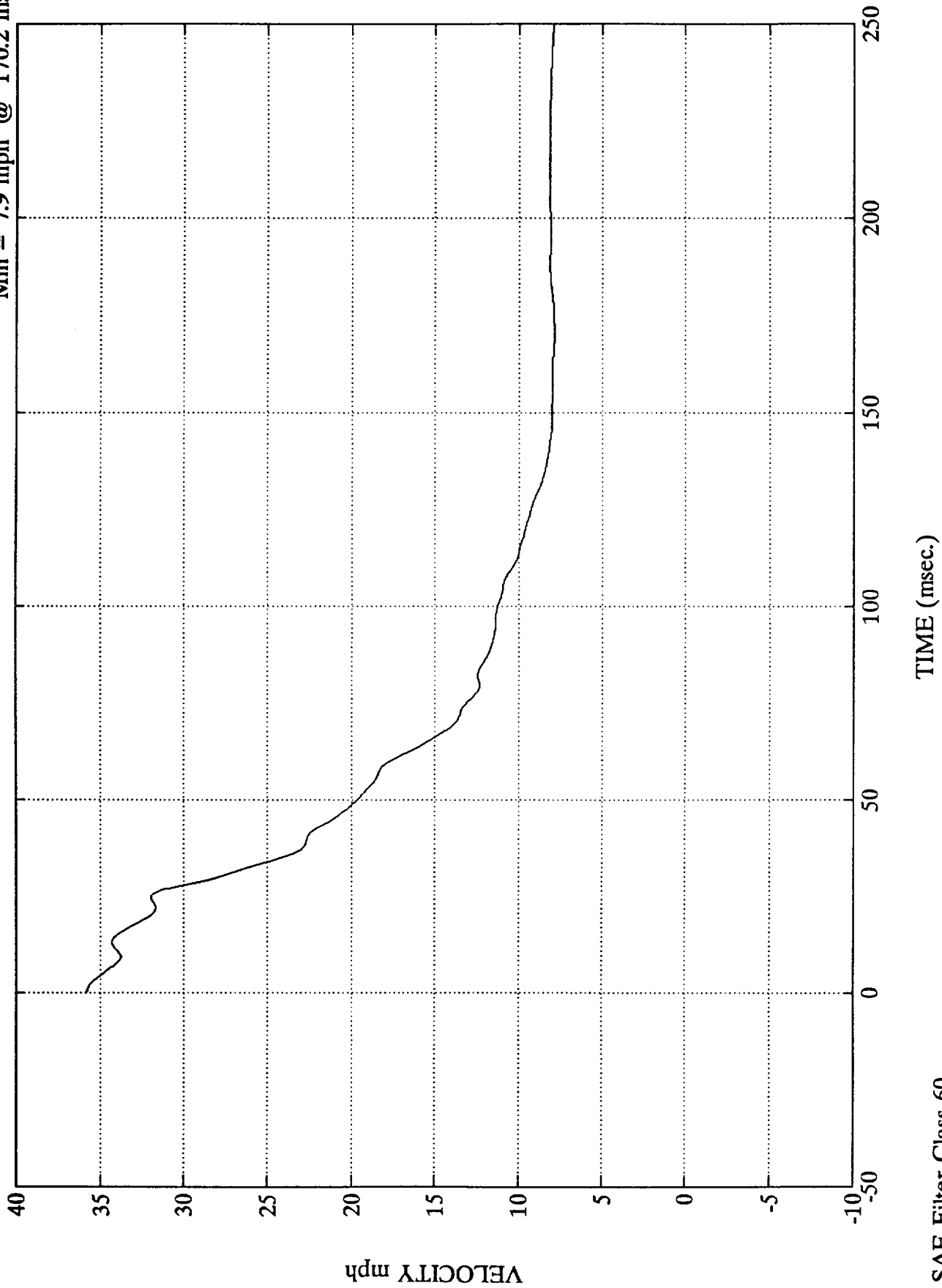


SAE Filter Class 60

Test 1025

V1 FRONT X-MEMBER (X)

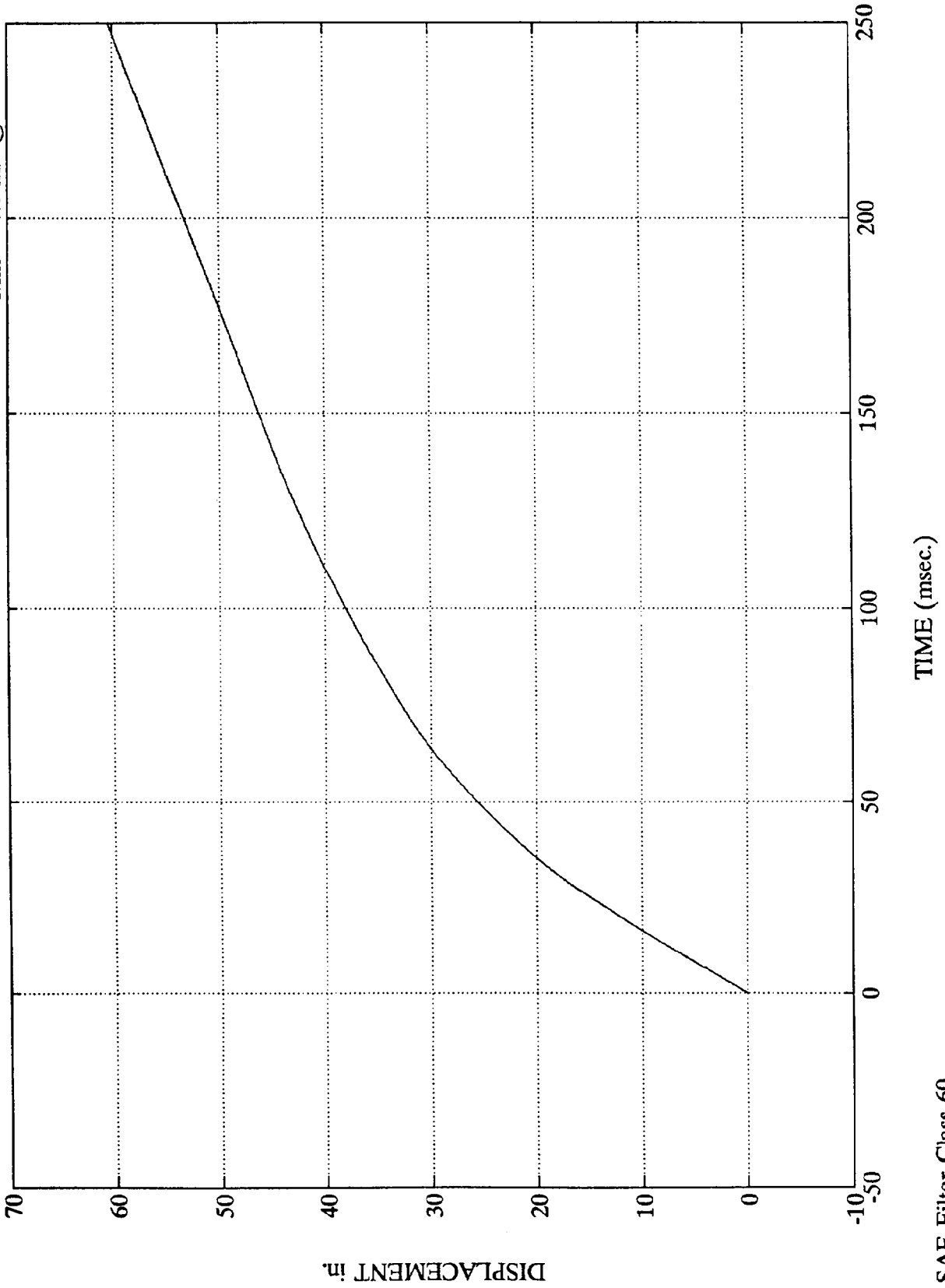
Max = 35.8 mph @ 0.0 msec
Min = 7.9 mph @ 170.2 msec



Test 1025

V1 FRONT X-MEMBER (X)

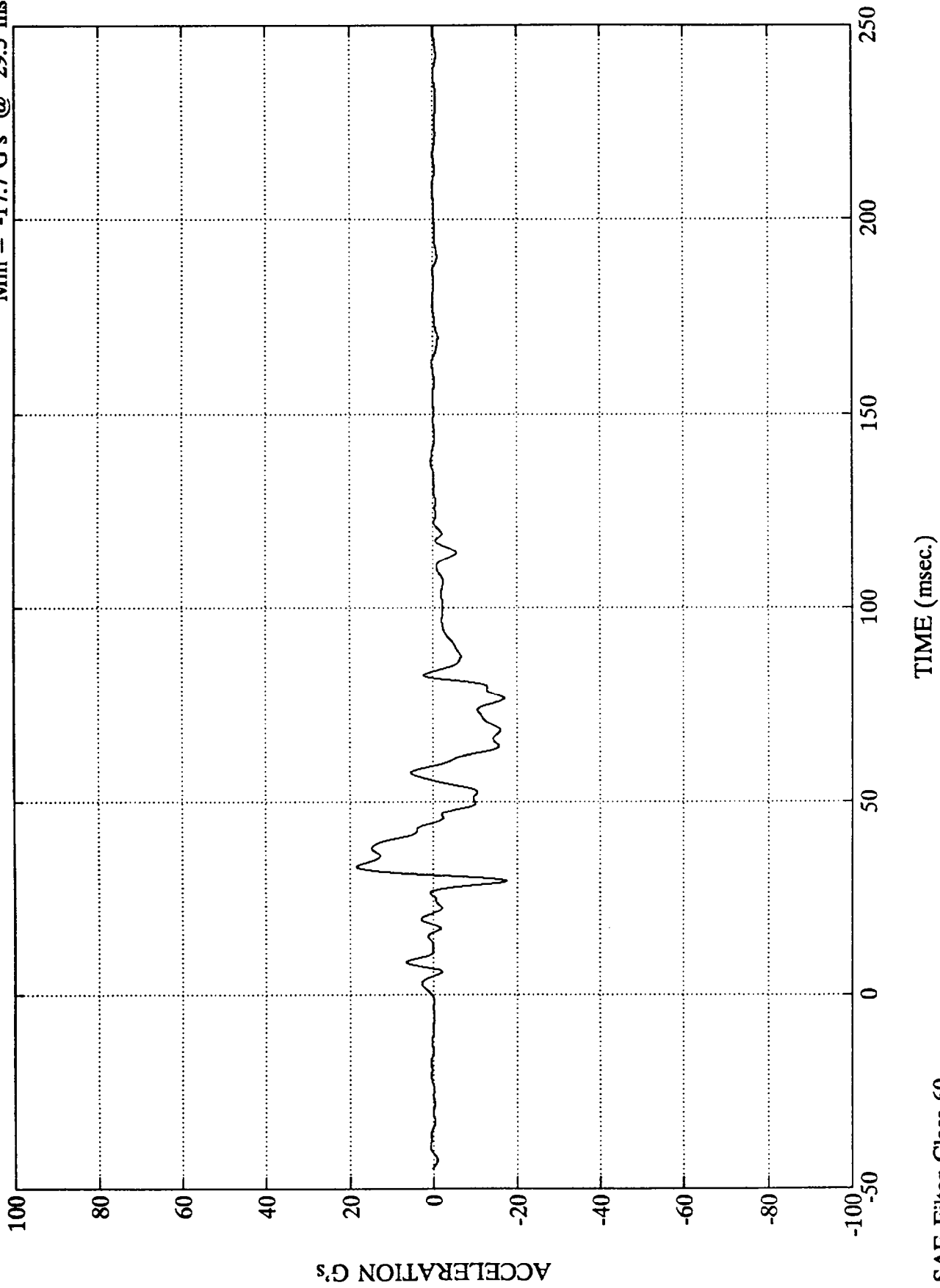
Max = 61.1 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec



Test 1025

V1 FRONT X-MEMBER (Z)

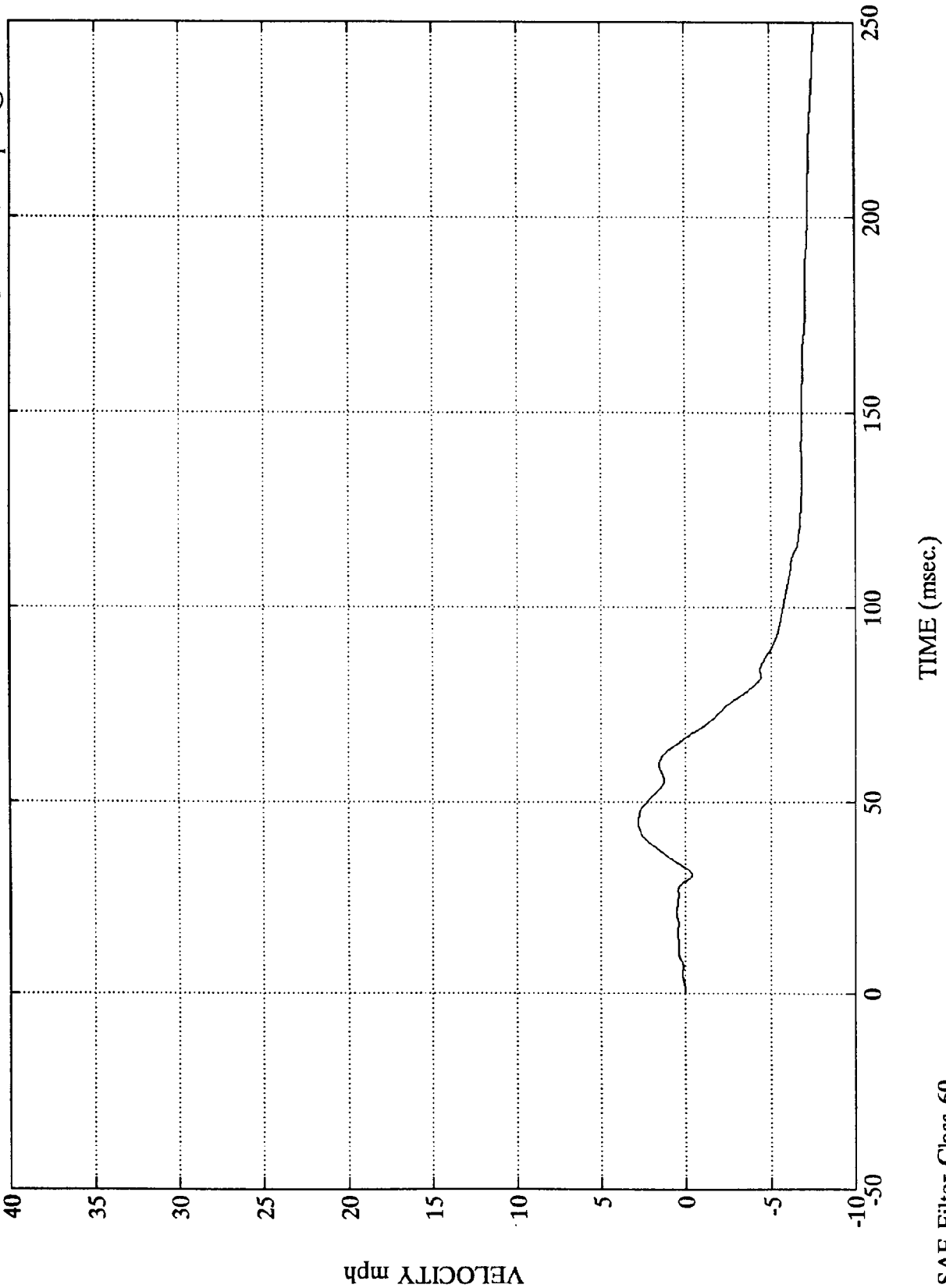
Max = 18.3 G's @ 33.1 msec
Min = -17.7 G's @ 29.5 msec



Test 1025

V1 FRONT X-MEMBER (Z)

Max = 2.8 mph @ 44.9 msec
Min = -7.7 mph @ 254.9 msec



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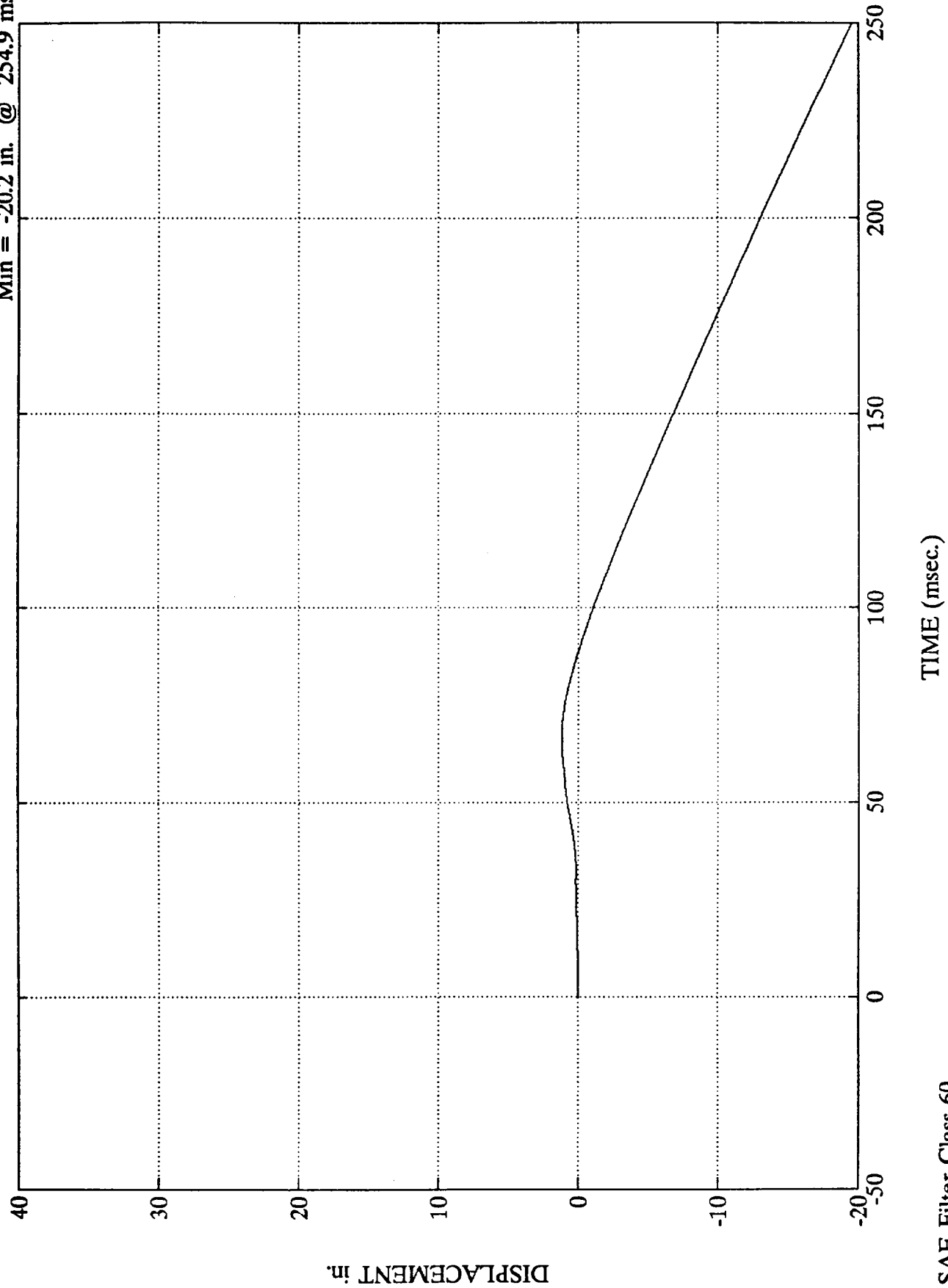
7883-1

SAE Filter Class 60

Test 1025

V1 FRONT X-MEMBER (Z)

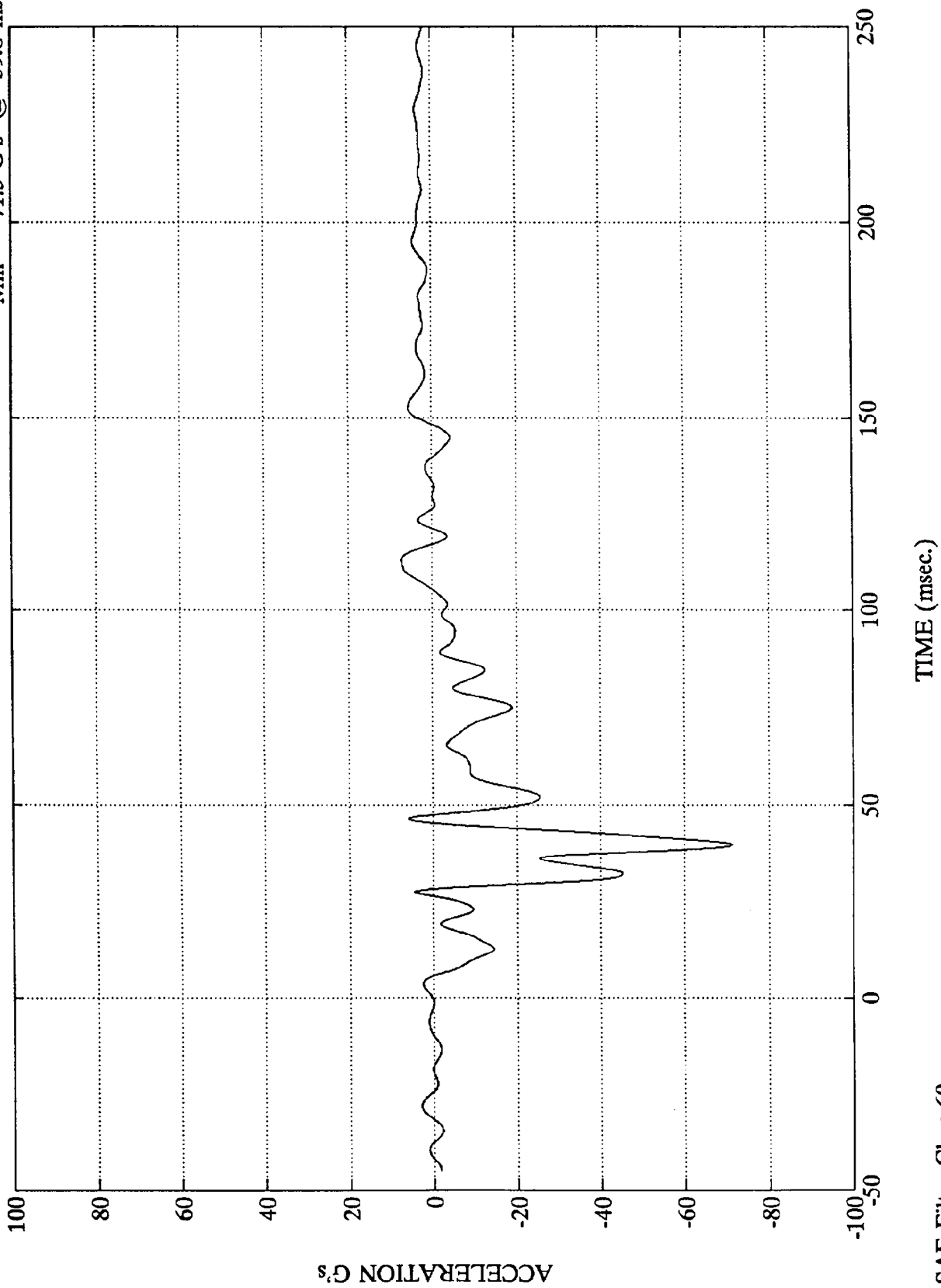
Max = 1.2 in. @ 67.0 msec
Min = -20.2 in. @ 254.9 msec



Test 1025

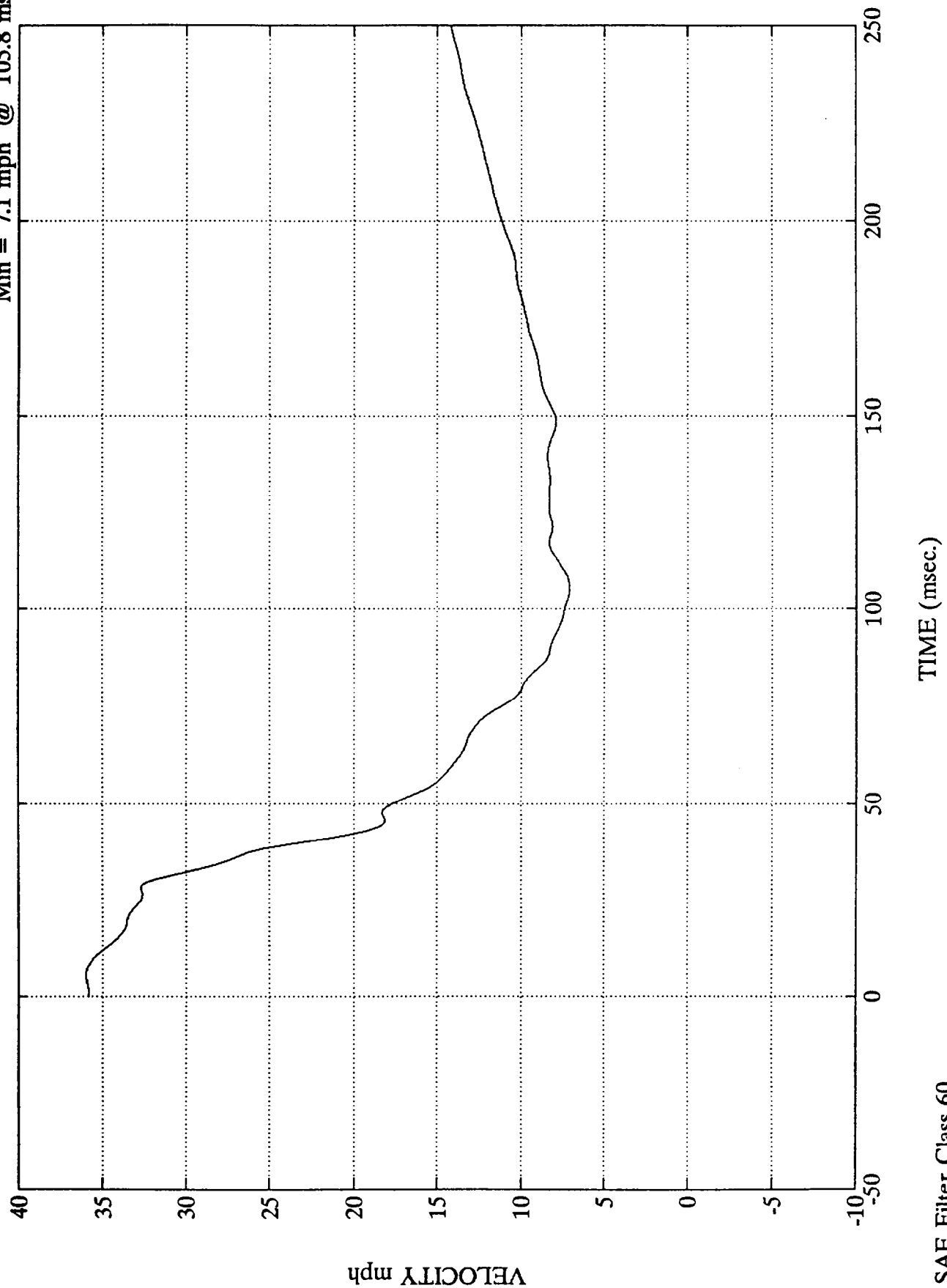
V1 LEFT BRAKE CALIPER (X)

Max = 7.3 G's @ 113.3 msec
Min = -71.3 G's @ 39.8 msec



Test 1025
Max = 36.0 mph @ 5.8 msec
Min = 7.1 mph @ 105.8 msec

V1 LEFT BRAKE CALIPER (X)



SAE Filter Class 60

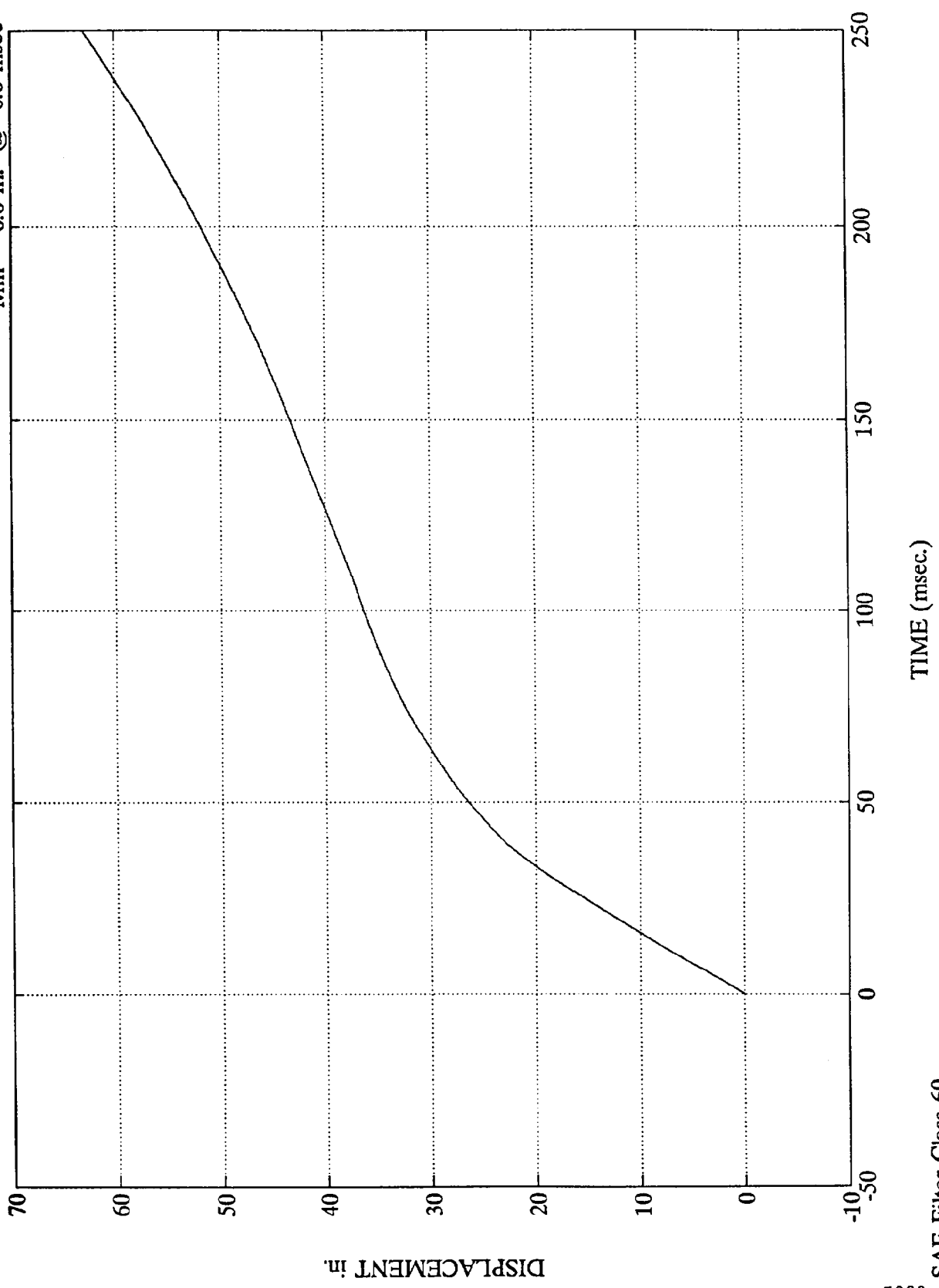
7883-1

B-35

Test 1025

V1 LEFT BRAKE CALIPER (X)

Max = 64.3 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec



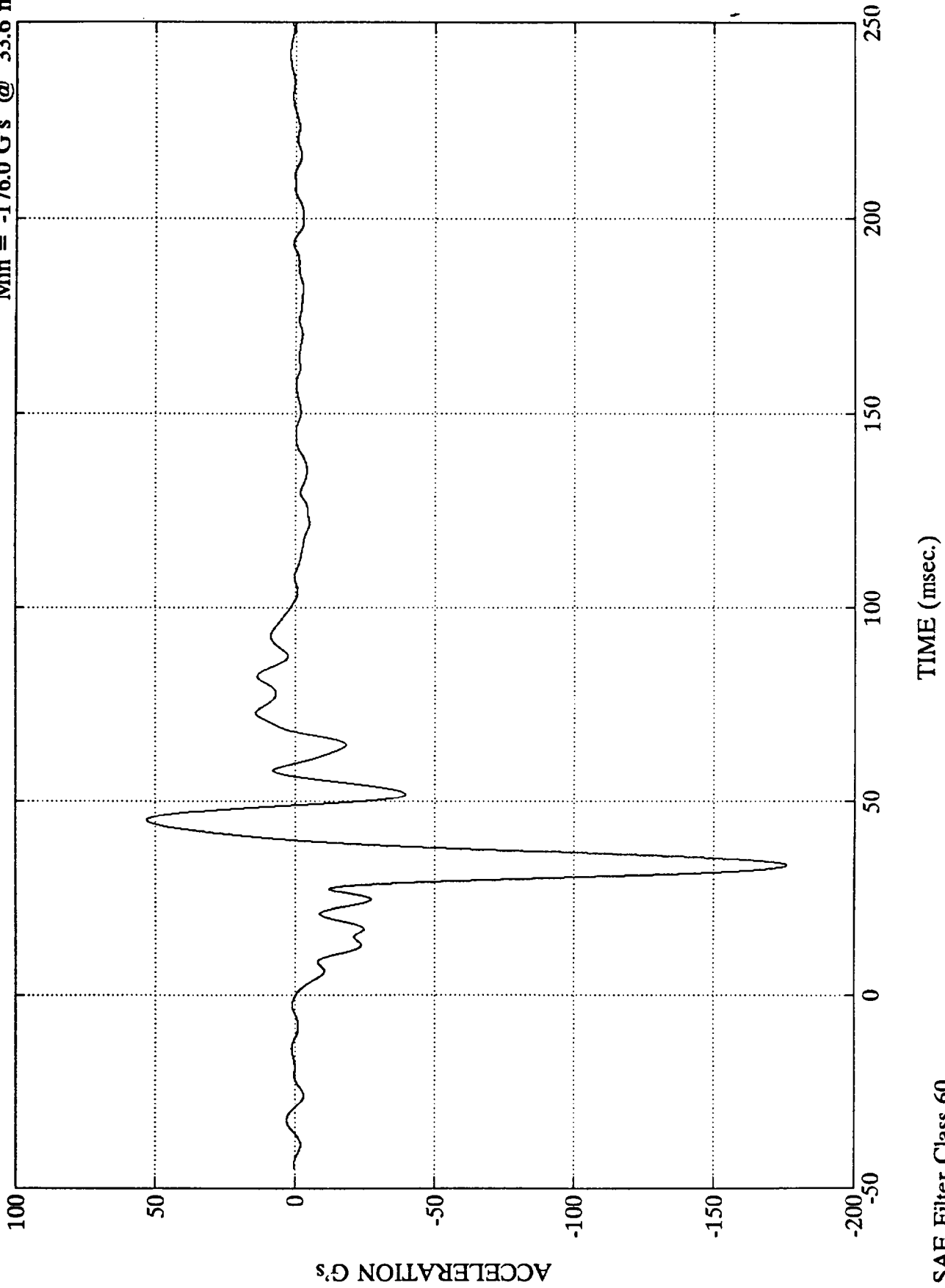
SAE Filter Class 60

7883-1

Test 1025

V1 RIGHT BRAKE CALIPER (X)

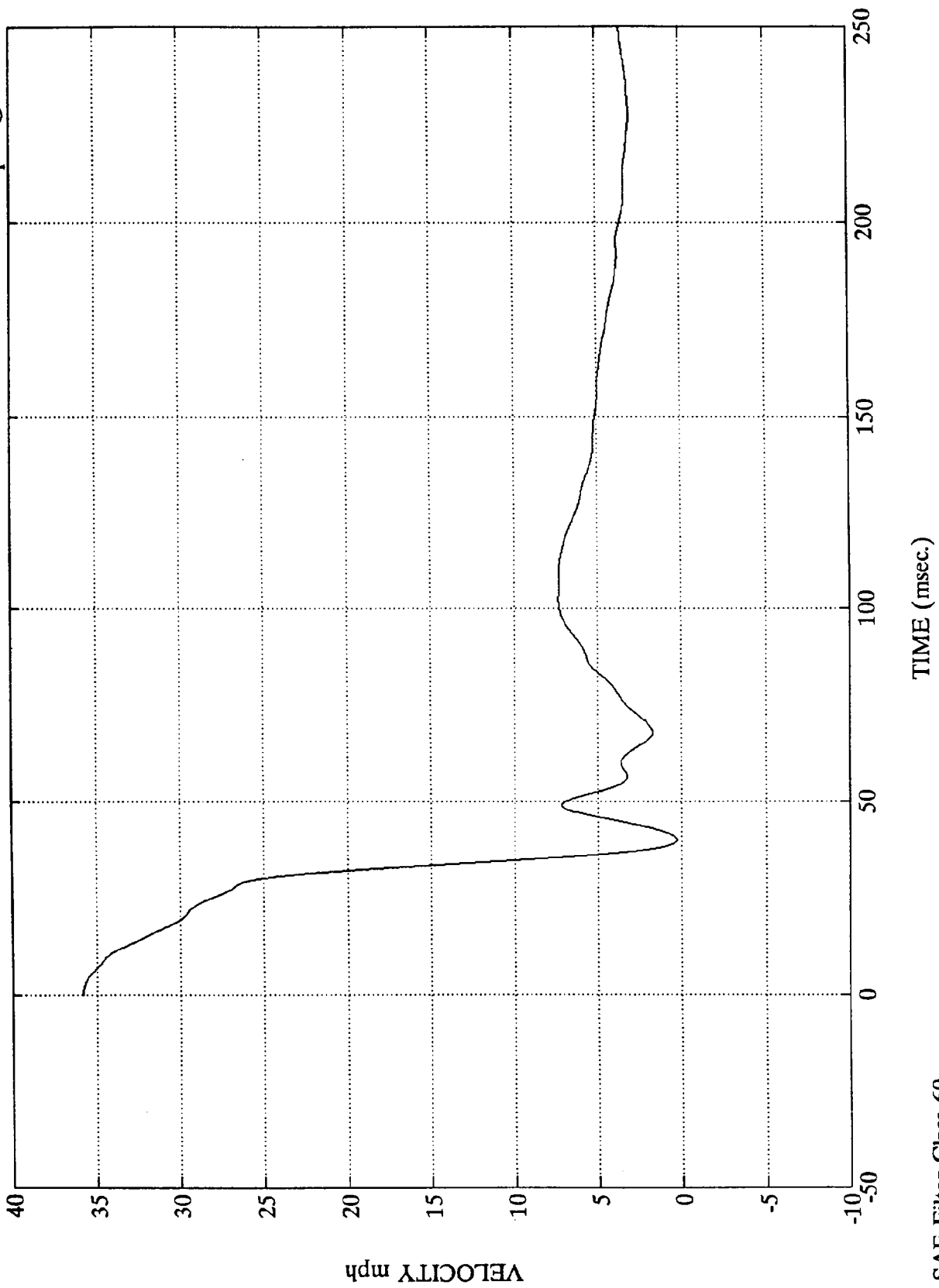
Max = 53.1 G's @ 45.1 msec
Min = -176.0 G's @ 33.6 msec



Test 1025

V1 RIGHT BRAKE CALIPER (X)

Max = 35.8 mph @ 0.2 msec
Min = 0.3 mph @ 40.1 msec



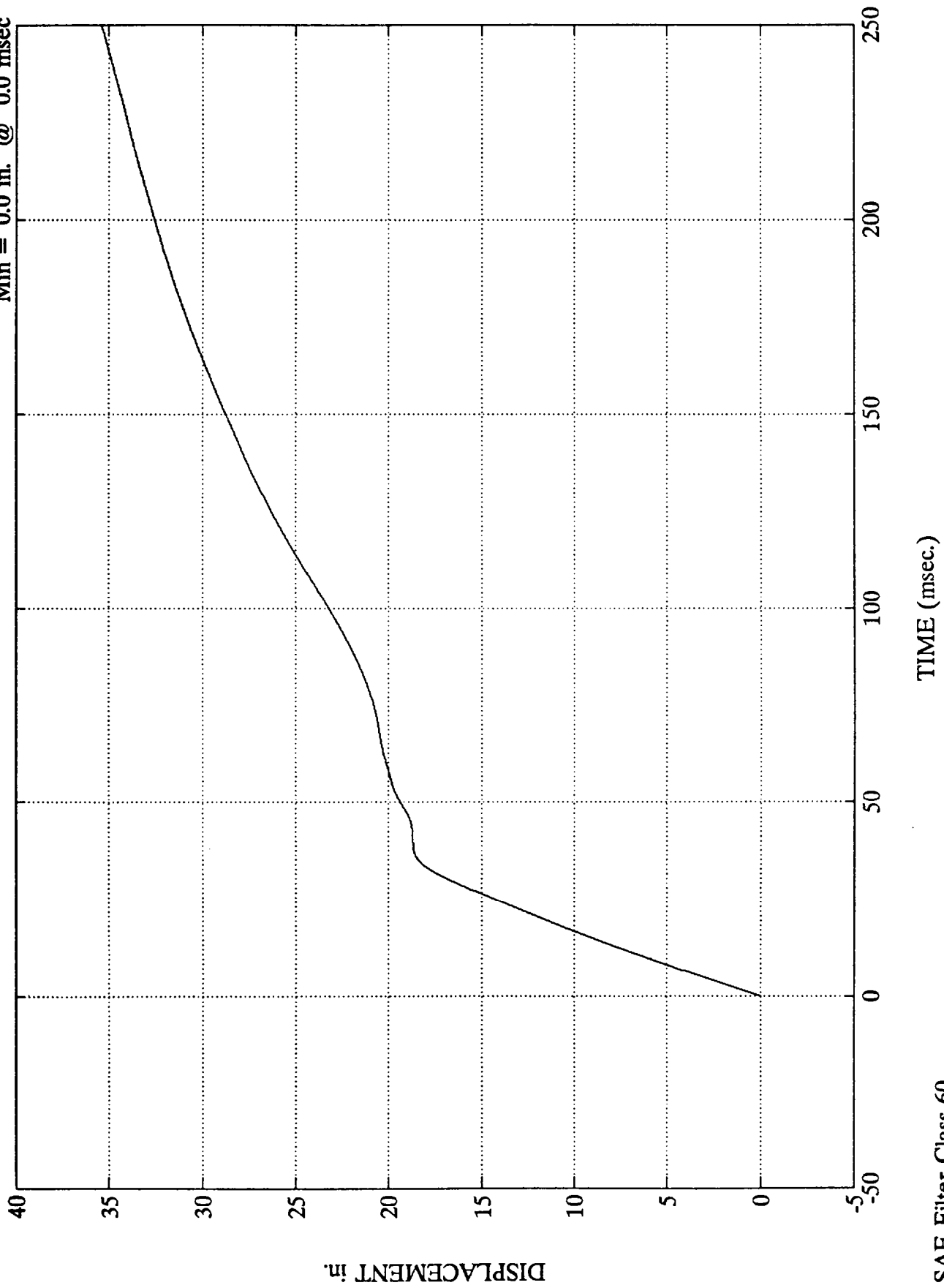
SAE Filter Class 60

7883-1

Test 1025

V1 RIGHT BRAKE CALIPER (X)

Max = 35.7 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec

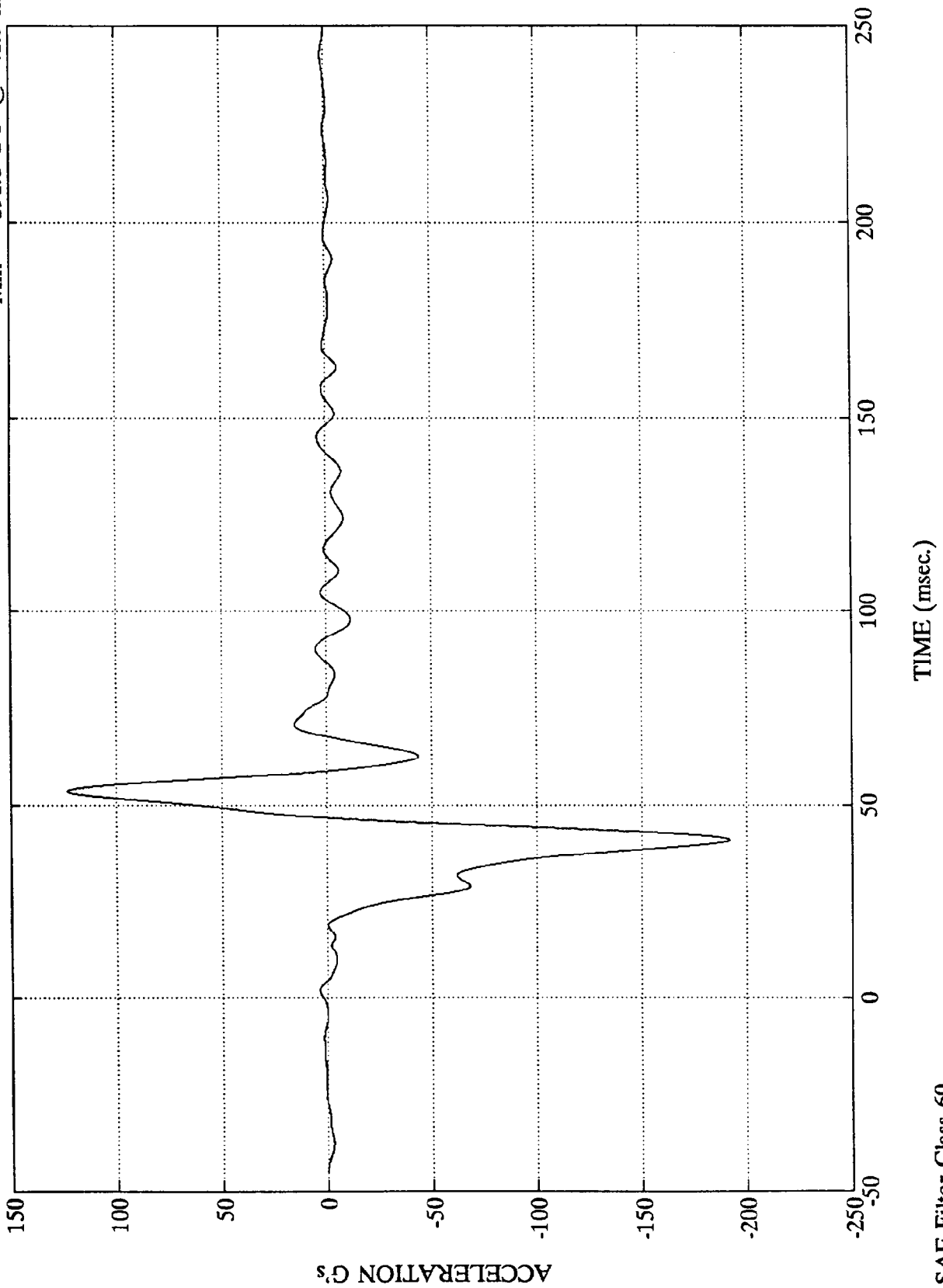


SAE Filter Class 60

Test 1025

V1 BRAKE PEDAL (X)

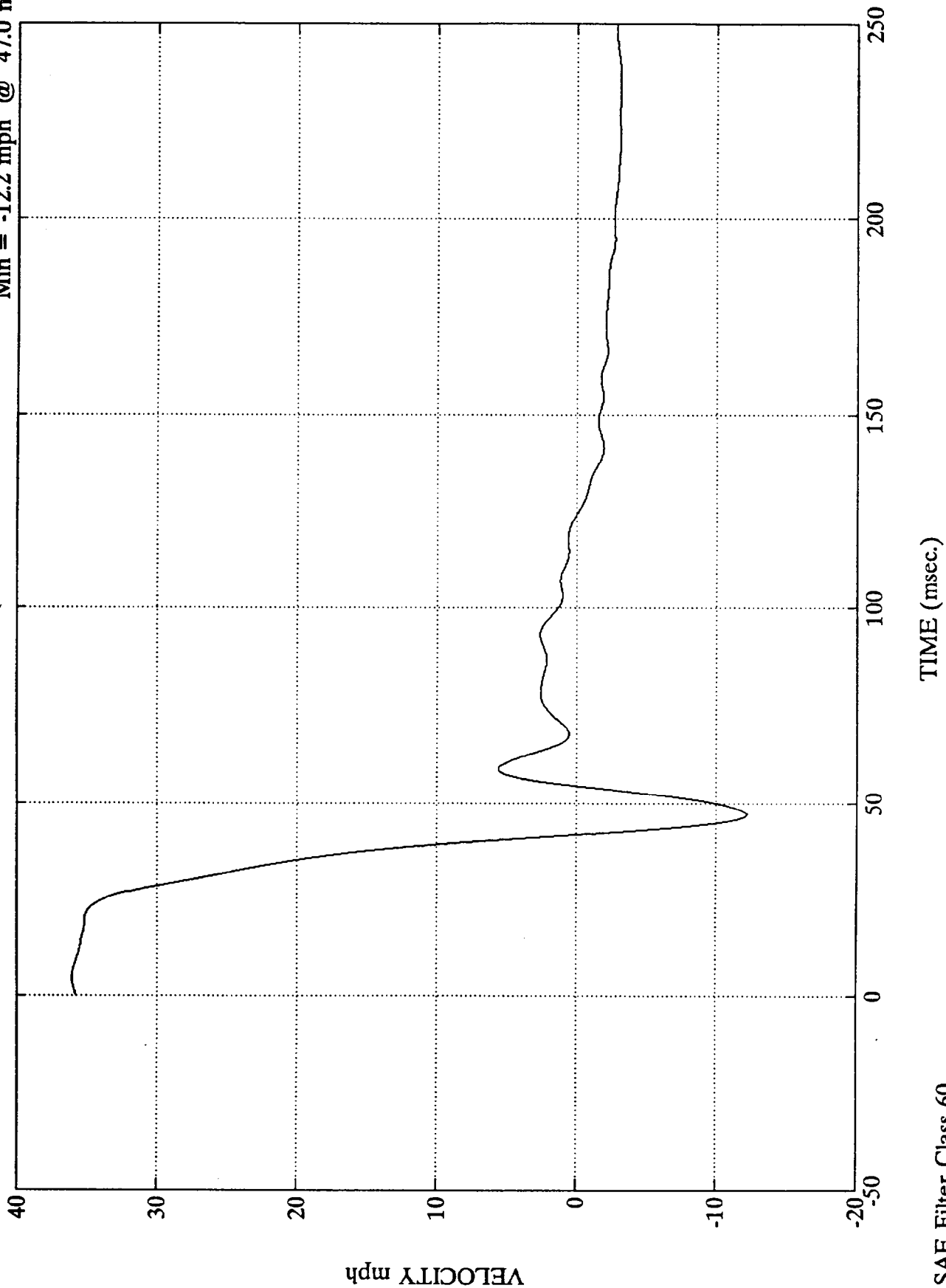
Max = 123.4 G's @ 53.6 msec
Min = -191.8 G's @ 41.3 msec



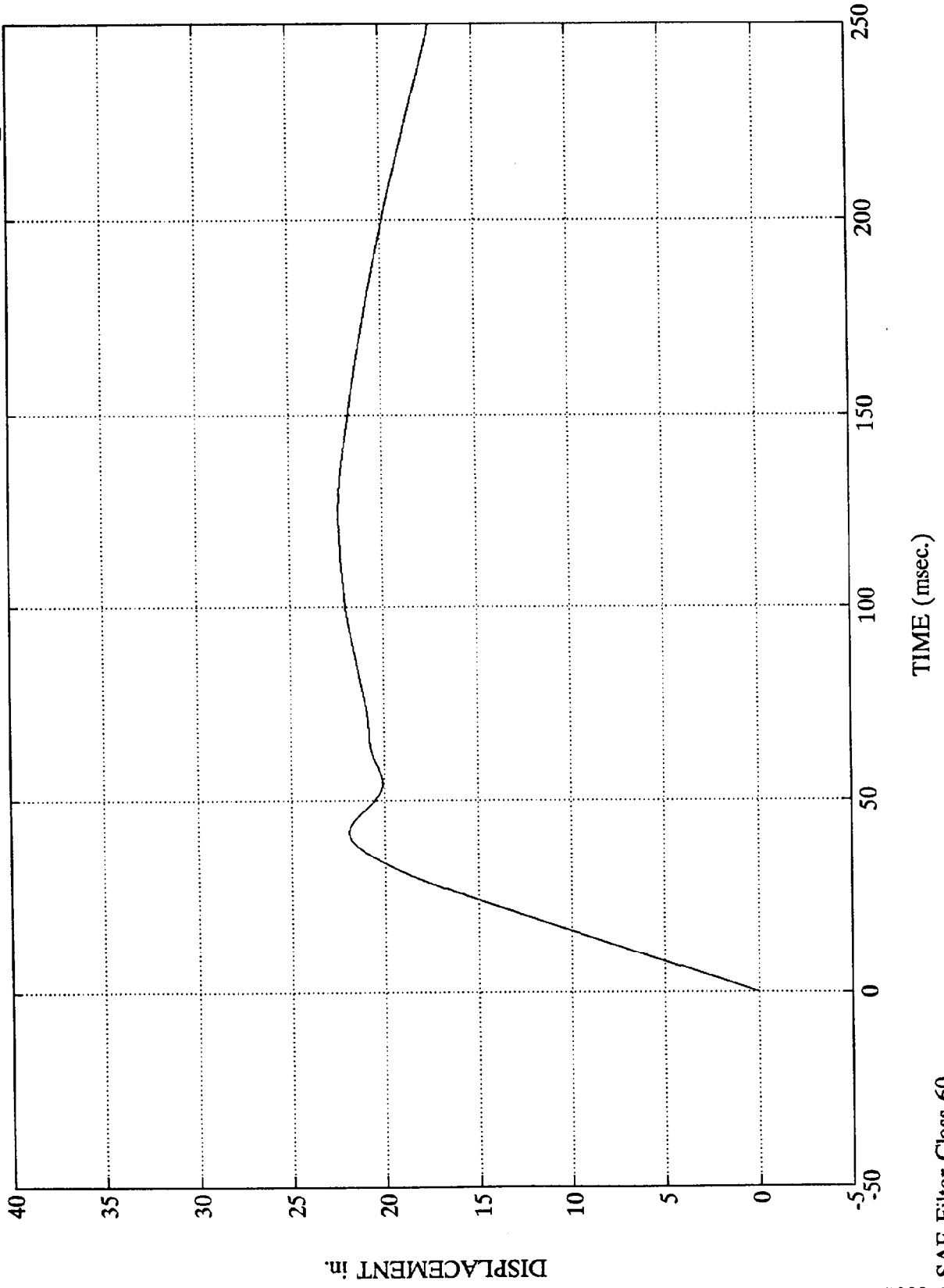
Test 1025

V1 BRAKE PEDAL (X)

Max = 36.1 mph @ 4.8 msec
Min = -12.2 mph @ 47.0 msec



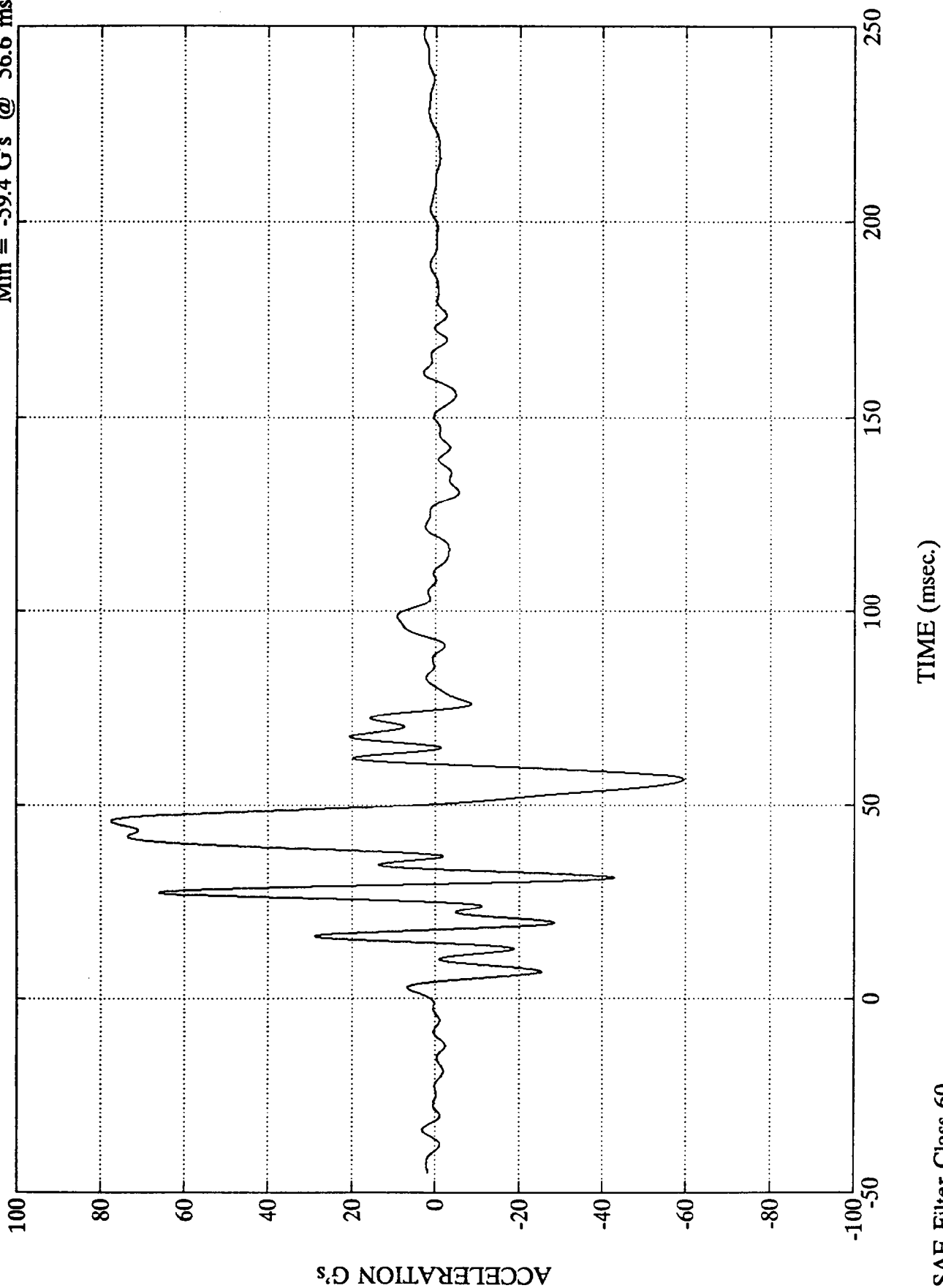
Test 1025
V1 BRAKE PEDAL (X)
Max = 22.4 in. @ 125.0 msec
Min = 0.0 in. @ 0.0 msec



SAE Filter Class 60

Test 1025
Max = 77.5 G's @ 45.7 msec
Min = -59.4 G's @ 56.6 msec

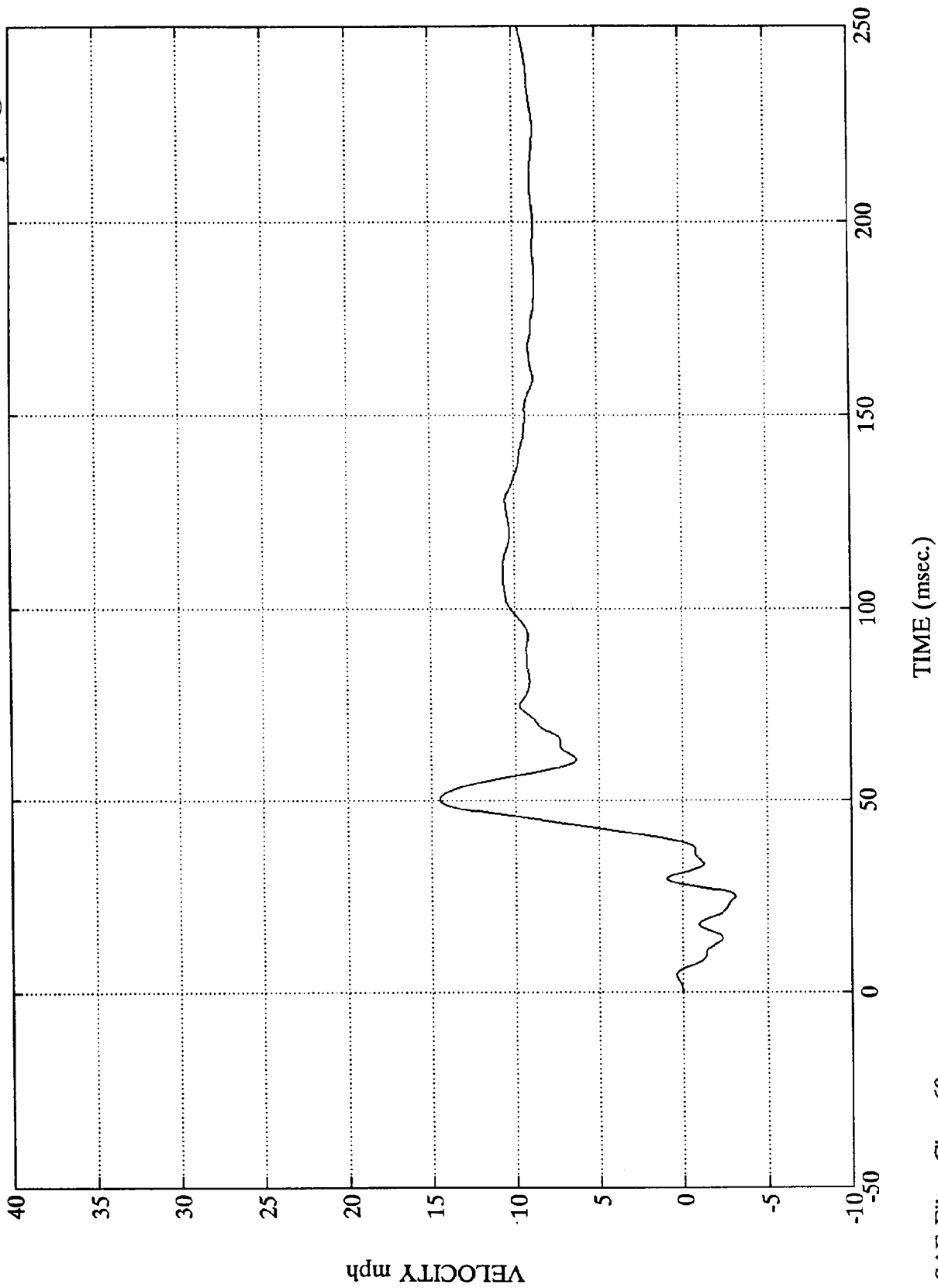
V1 BRAKE PEDAL (Z)



Max = 14.5 mph @ 50.4 msec
Min = -3.1 mph @ 25.2 msec

V1 BRAKE PEDAL (Z)

Test 1025



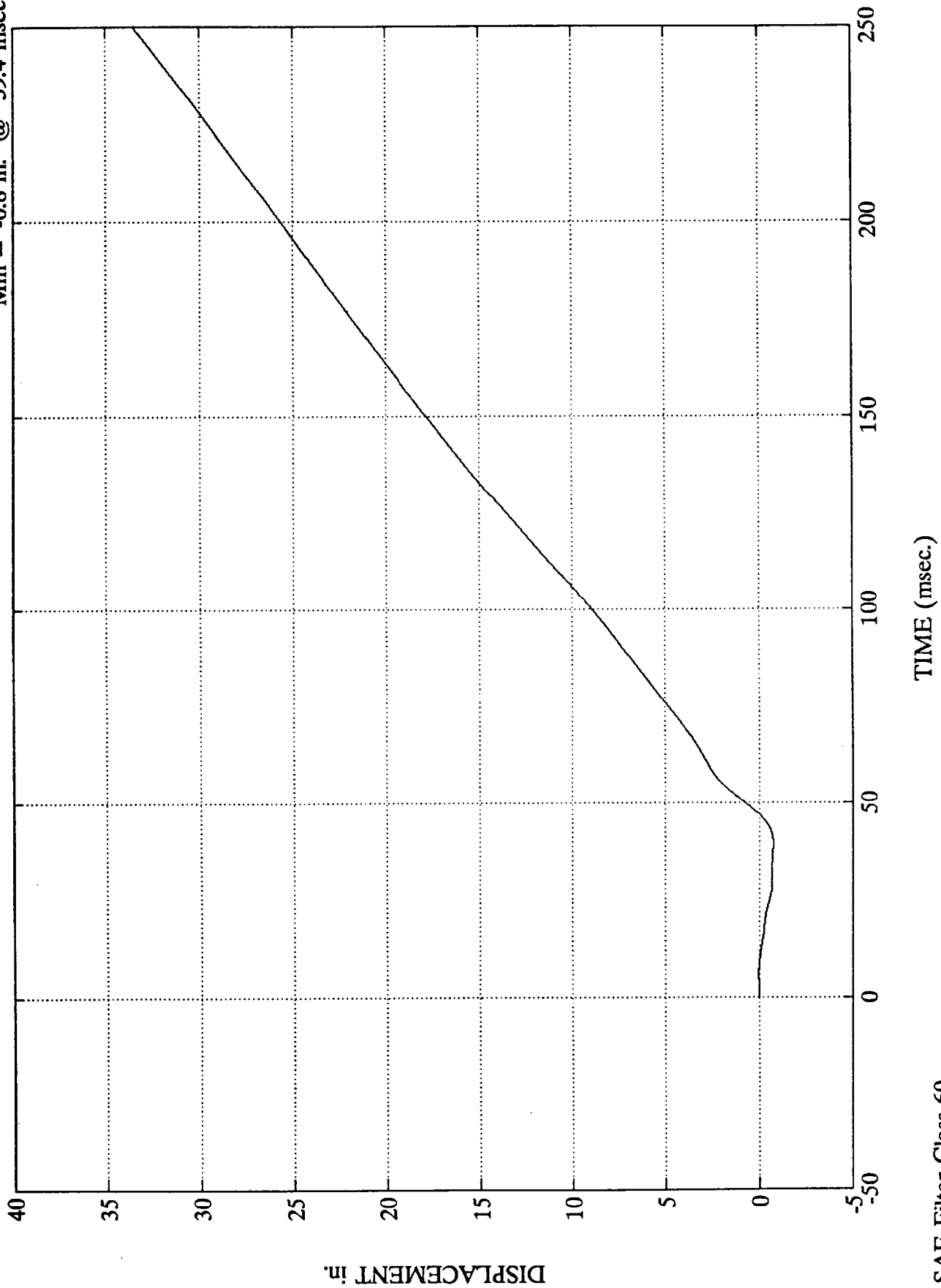
SAE Filter Class 60

7883-1

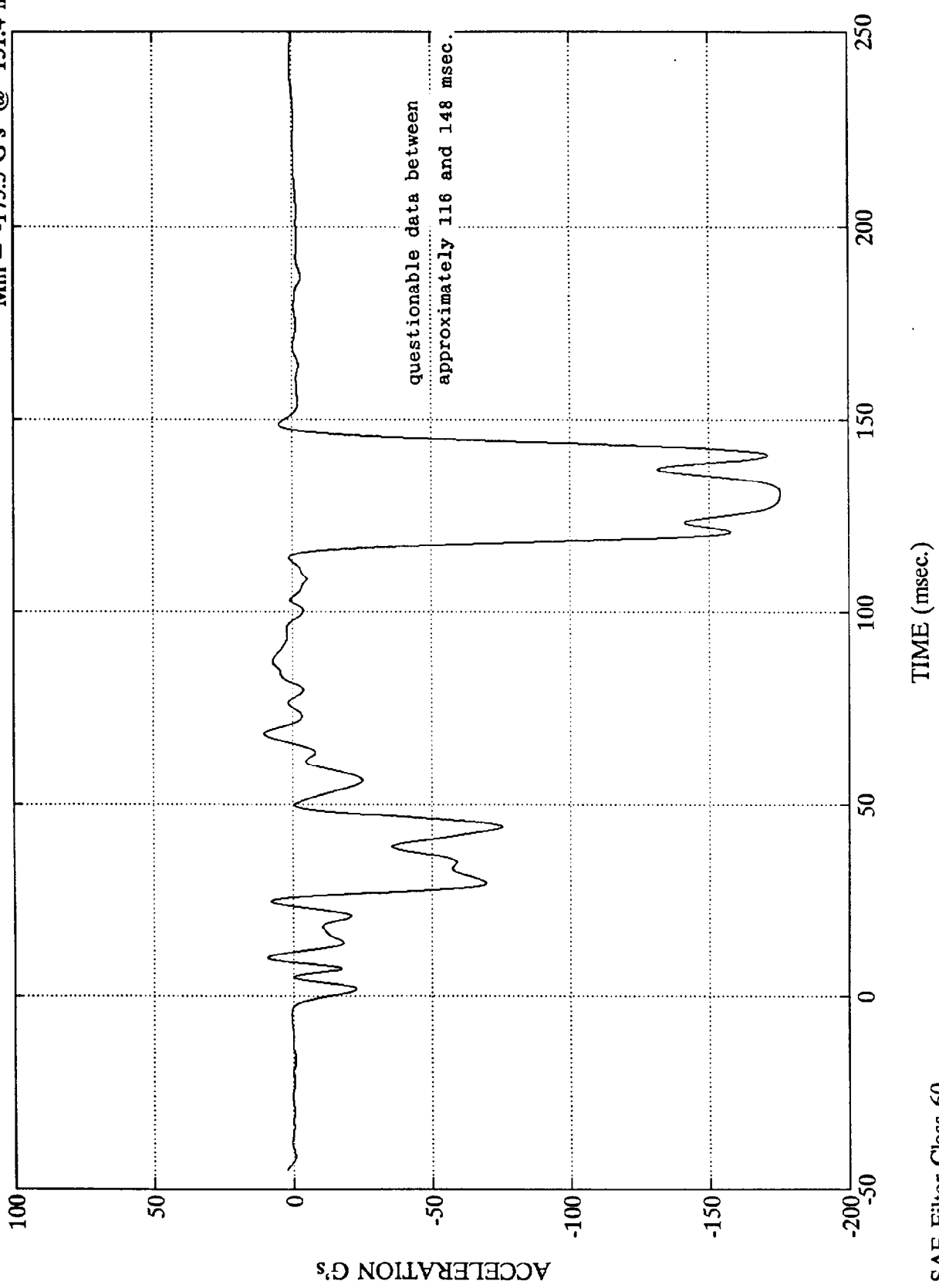
Test 1025

V1 BRAKE PEDAL (Z)

Max = 34.4 in. @ 254.9 msec
Min = -0.8 in. @ 39.4 msec



Test 1025
V1 TOE PAN (X)
Max = 10.3 G's @ 68.2 msec
Min = -175.5 G's @ 131.4 msec

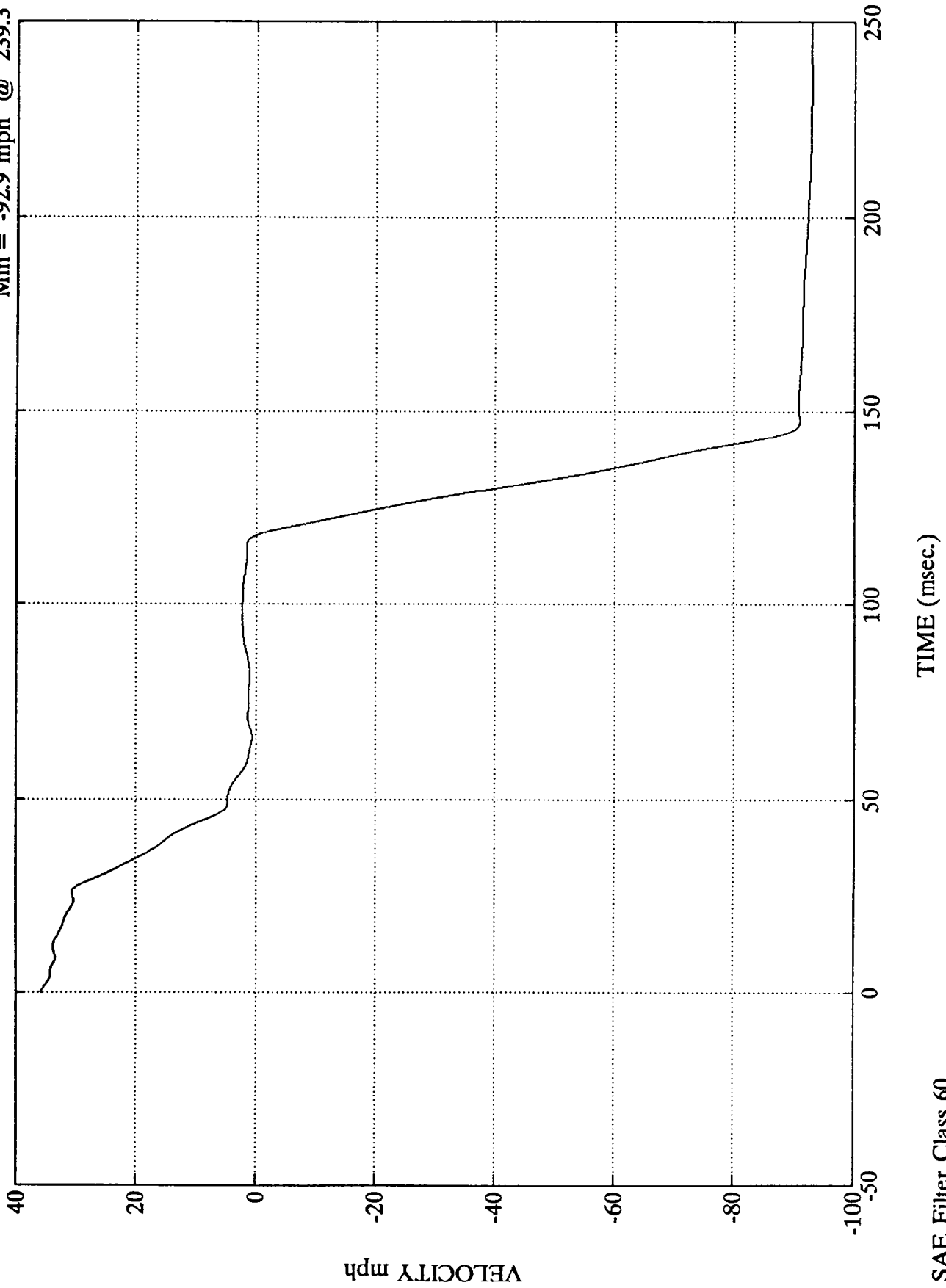


SAE Filter Class 60

Test 1025

V1 TOE PAN (X)

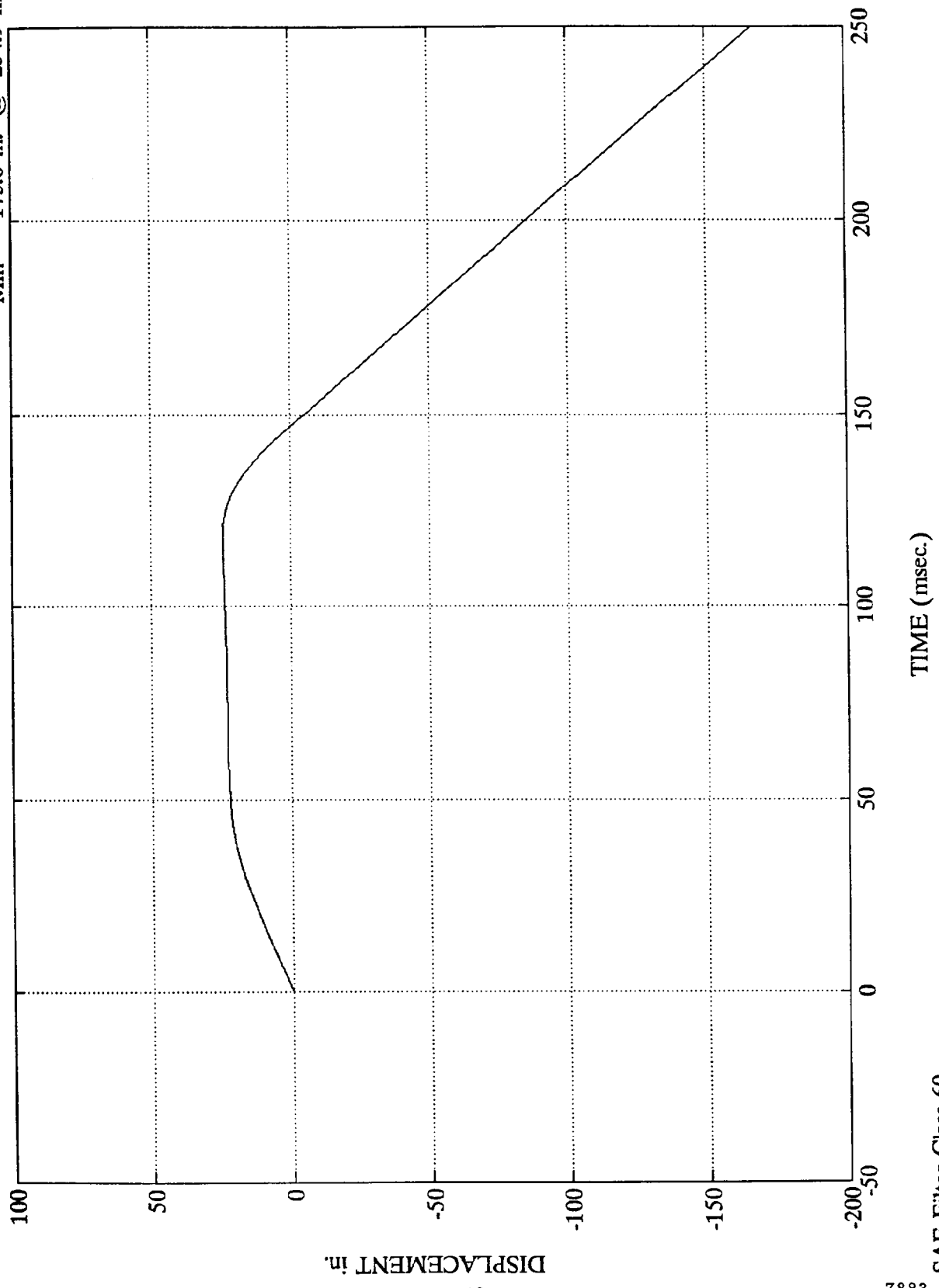
Max = 35.8 mph @ 0.0 msec
Min = -92.9 mph @ 239.3 msec



Max = 24.3 in. @ 118.3 msec
Min = -175.0 in. @ 254.9 msec

V1 TOE PAN (X)

Test 1025



TEST NO. Y42-1-1025

DUMMY DATA

CLASS	FILTER CHANNEL
Head Accelerations	1000
Chest Accelerations	180
Femur Forces	600
Torso Belt	60
Chest Displacement	180
Neck Forces, Moments	1000
Tibia Forces, Moments	600

RUN NUMBER: 1025

TEST DATE: 20 Dec 1990 TEST TIME: 15:32:29

V-to-V Test #1

VEHICLE 1 (1991 ISUZU STYLUS) - Driver Dummy

hic: 483.28

t1 = 49.92 msec

t2 = 71.76 msec

Average G's Over Hic Duration = 54.70

Chest Resultant (3 ms CLIPPED DURATION) = 48.621 G's

Tstart = 56.0400 ms

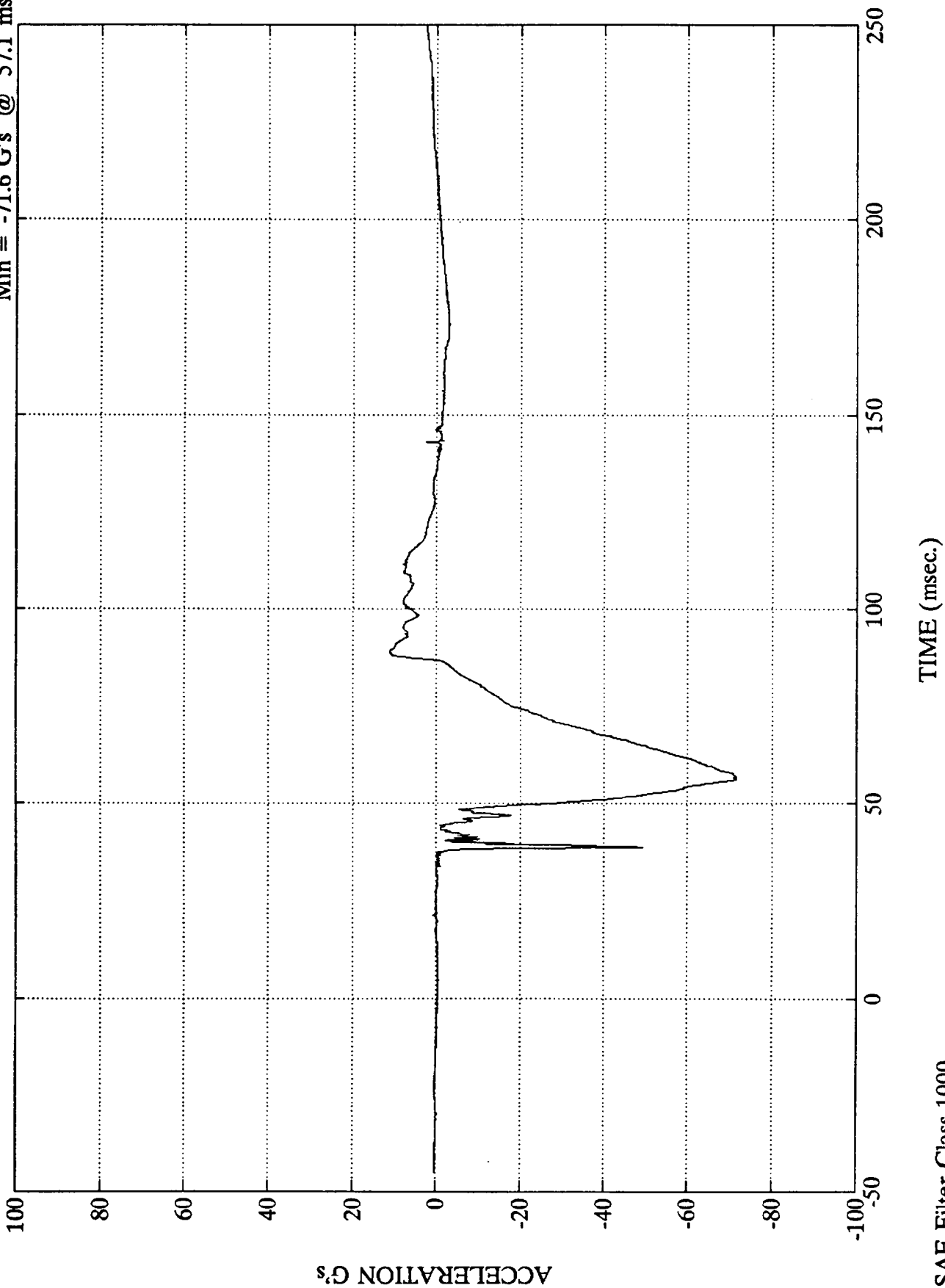
Tend = 59.0400 ms

CSI = 453.738

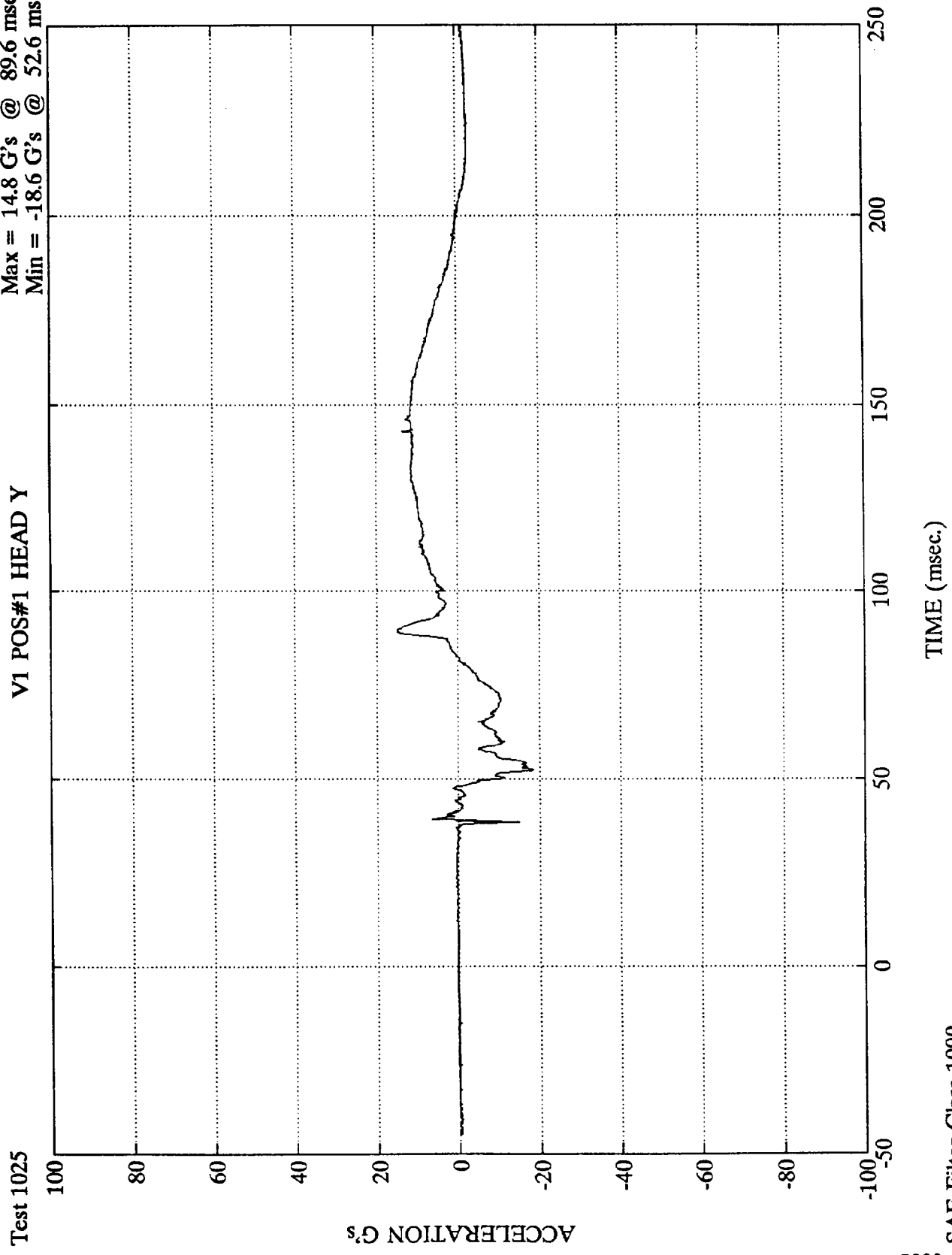
Test 1025

V1 POS#1 HEAD X

Max = 11.3 G's @ 89.3 msec
Min = -71.6 G's @ 57.1 msec



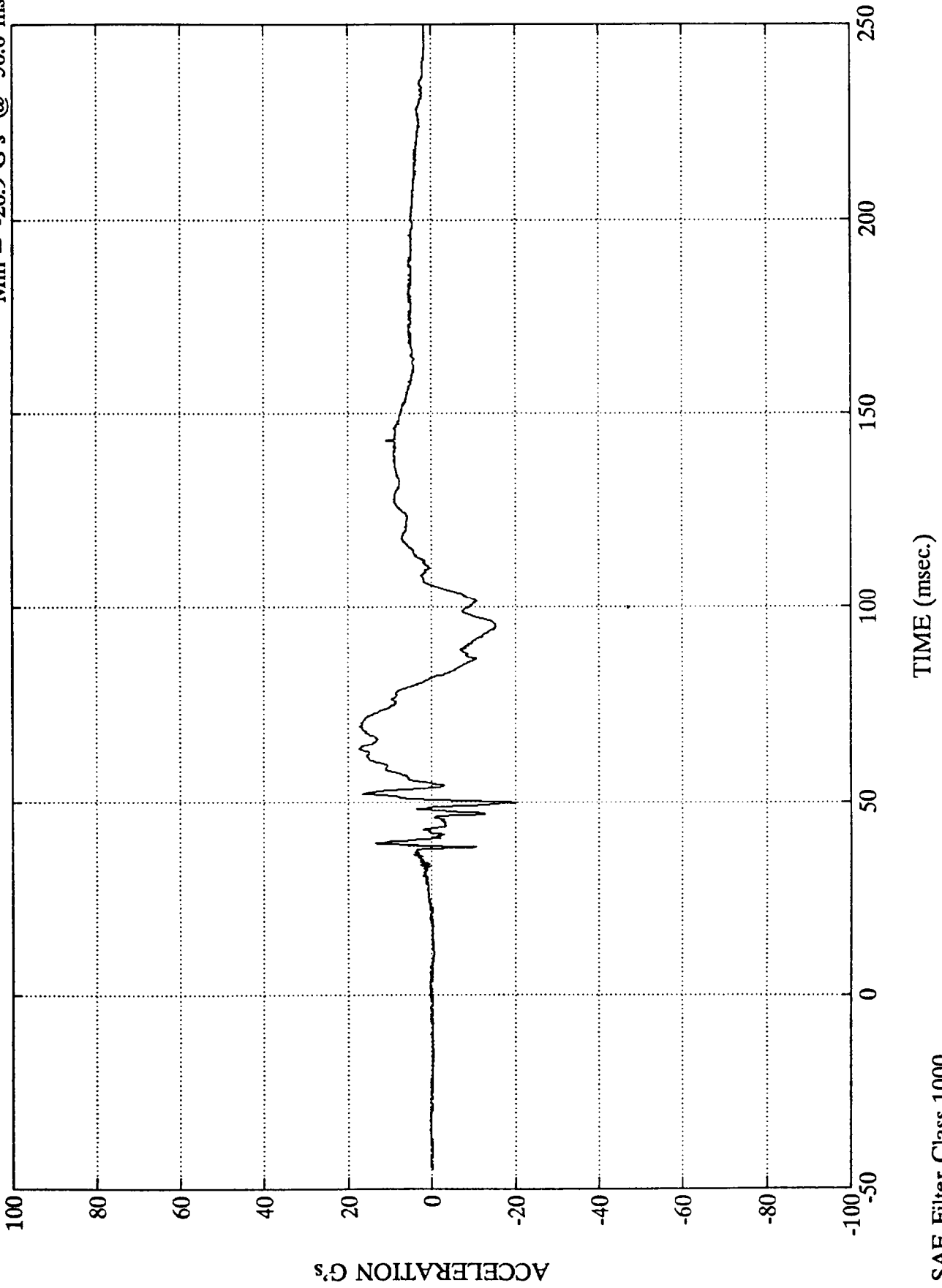
Test 1025
V1 POS#1 HEAD Y
Max = 14.8 G's @ 89.6 msec
Min = -18.6 G's @ 52.6 msec



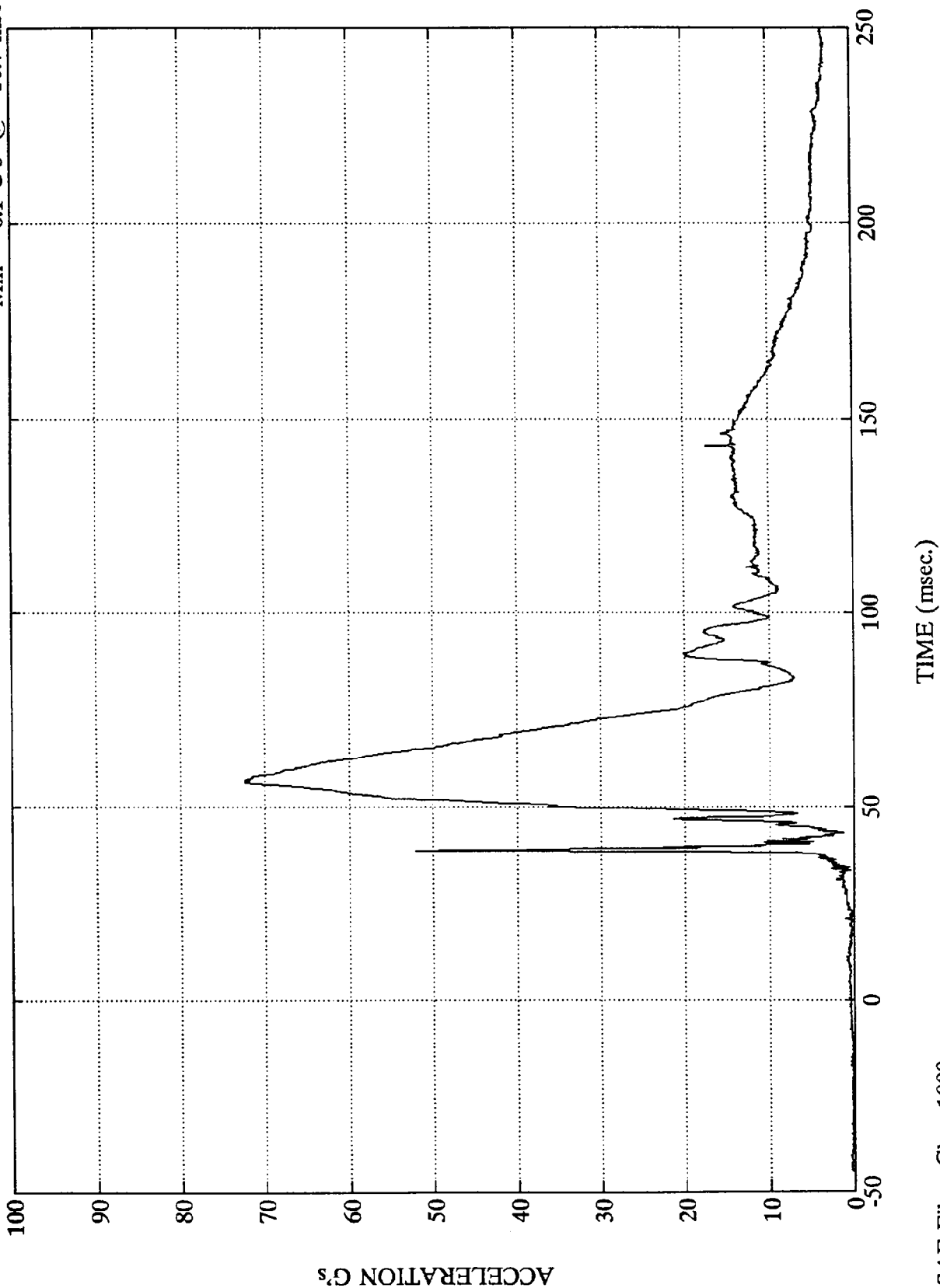
Test 1025

V1 POS#1 HEAD Z

Max = 17.2 G's @ 69.6 msec
Min = -20.9 G's @ 50.0 msec



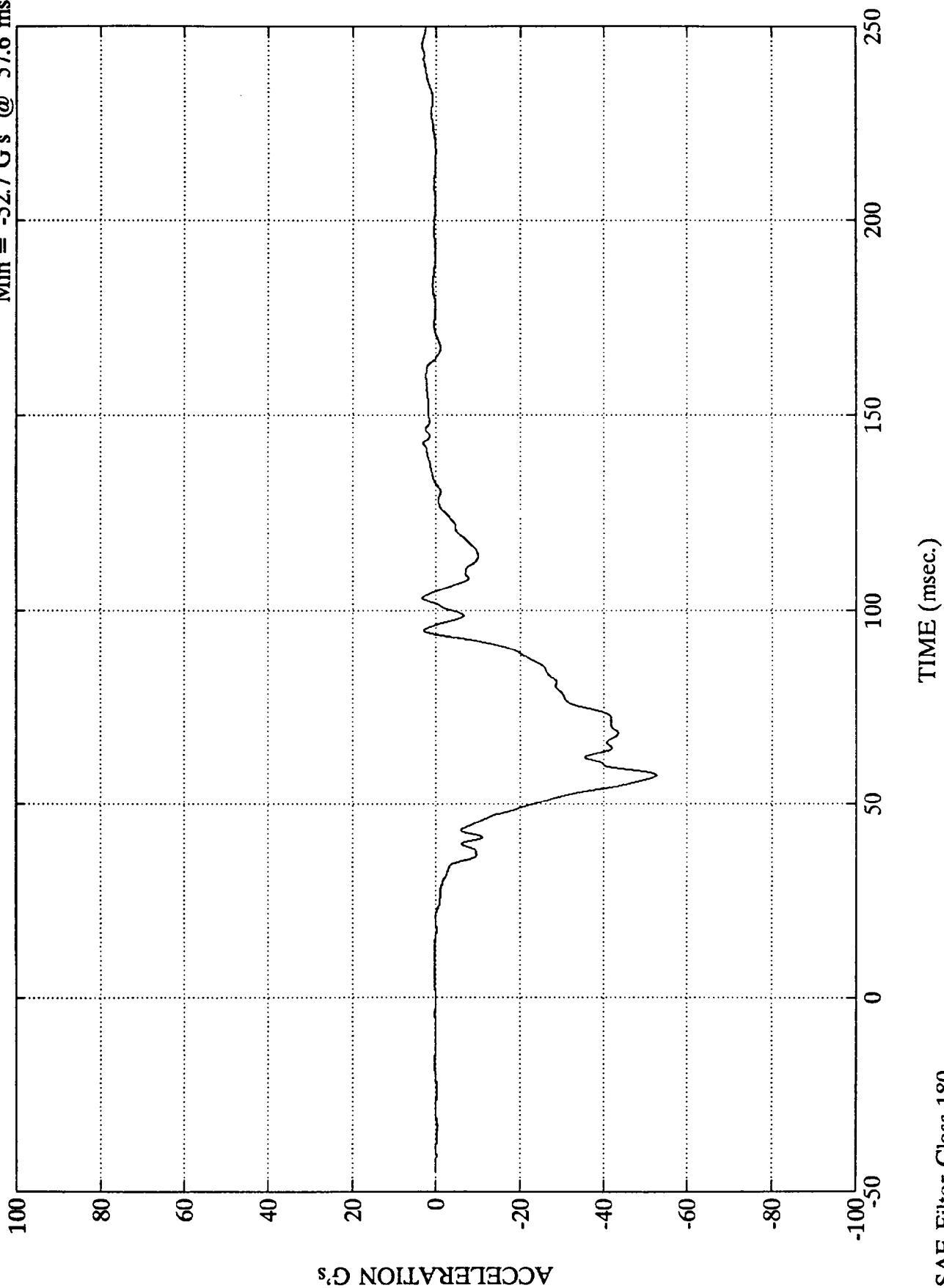
Test 1025
V1 POS#1 HEAD RESULTANT
Max = 72.4 G's @ 56.5 msec
Min = 0.1 G's @ -10.7 msec



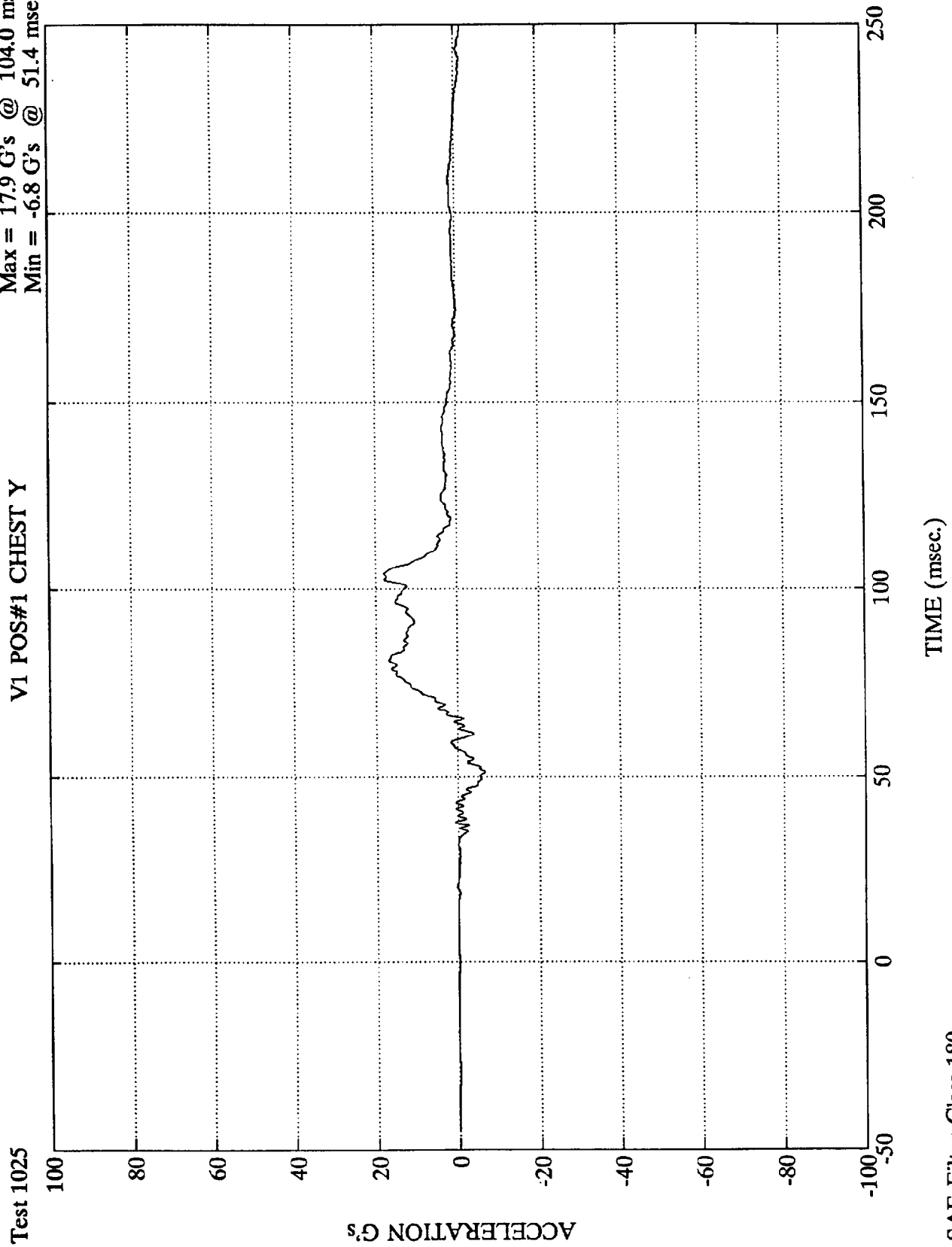
Test 1025

V1 POS#1 CHEST X

Max = 3.4 G's @ 245.2 msec
Min = -52.7 G's @ 57.6 msec



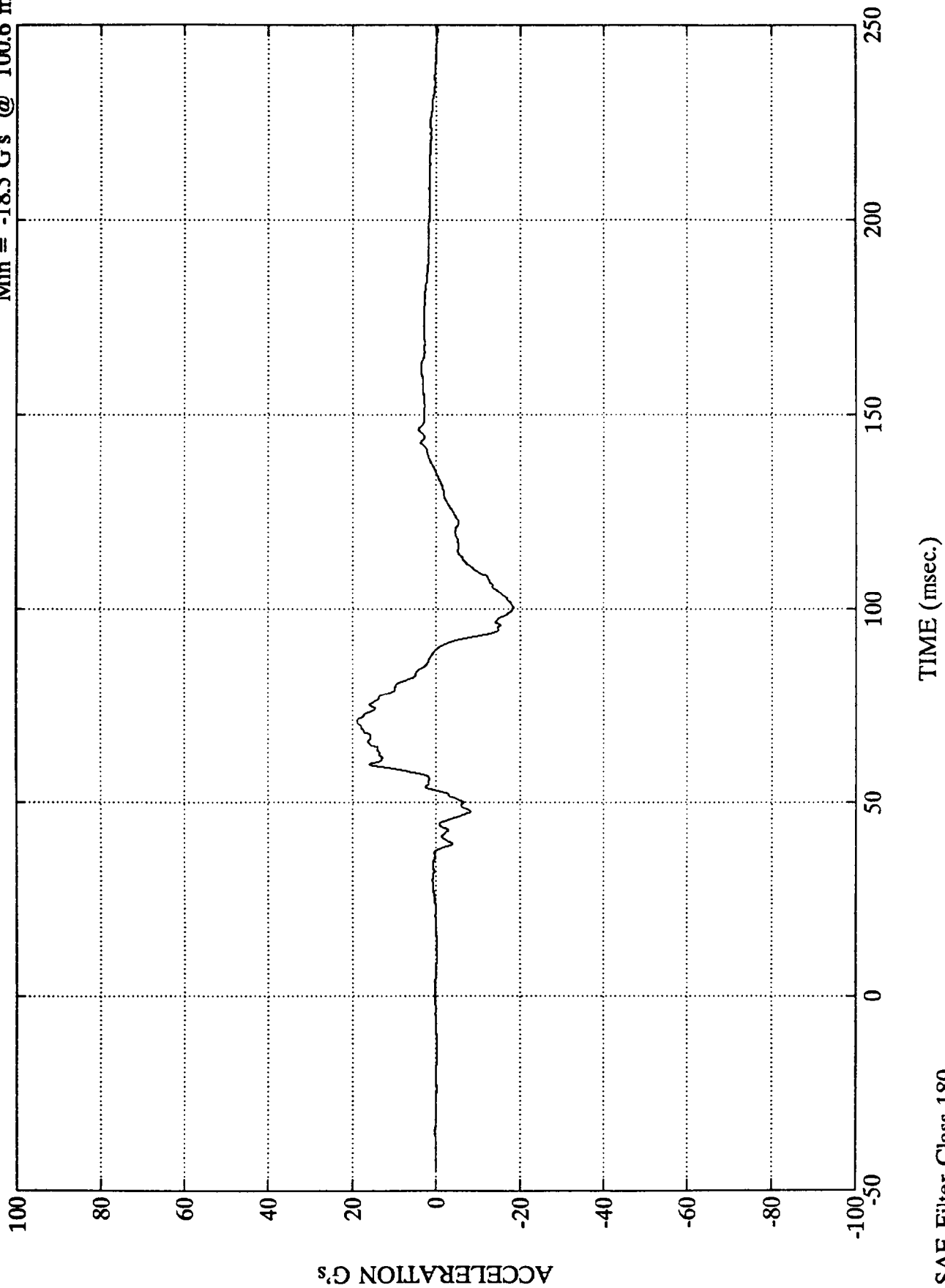
Test 1025
V1 POS#1 CHEST Y
Max = 17.9 G's @ 104.0 msec
Min = -6.8 G's @ 51.4 msec



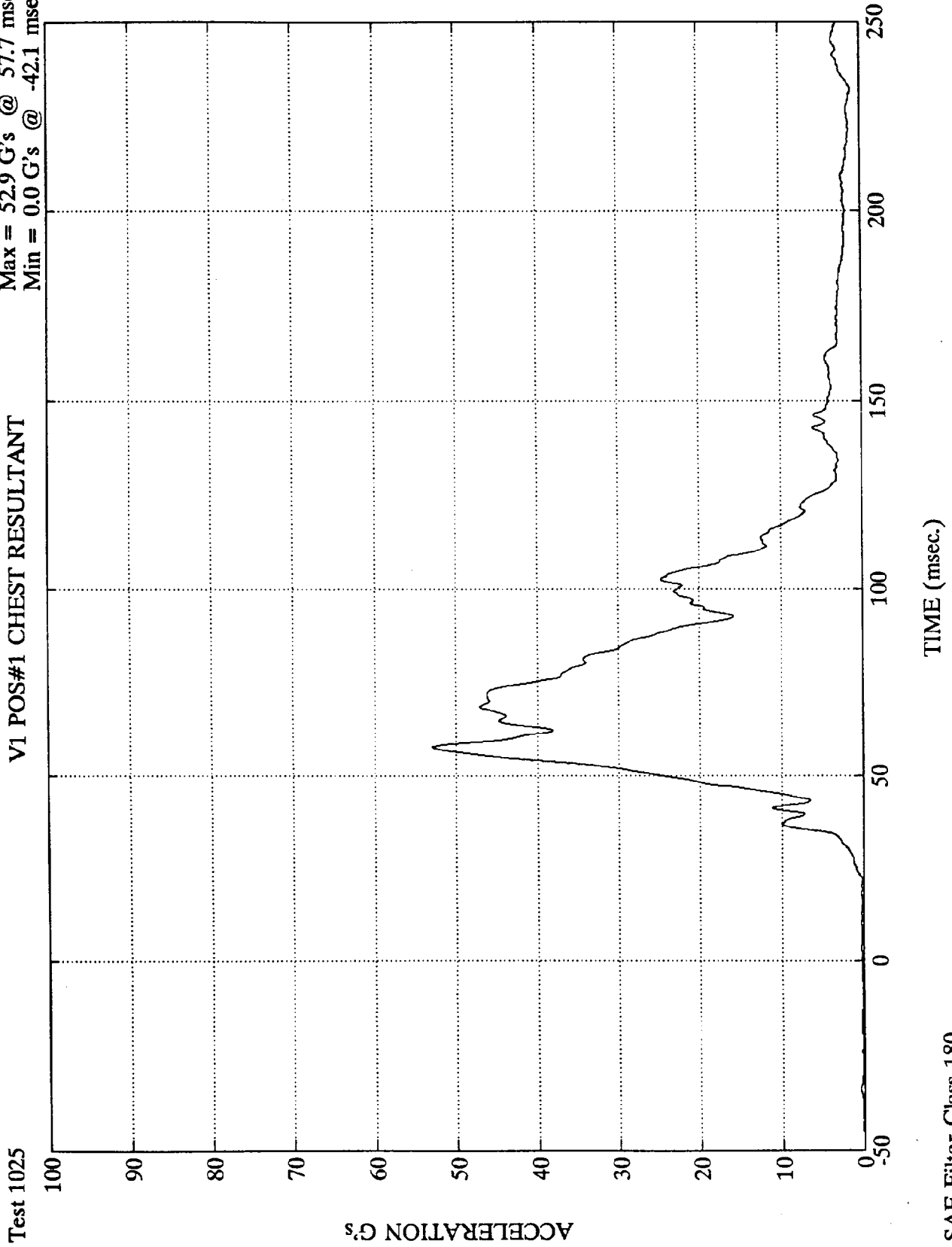
Test 1025

V1 POS#1 CHEST Z

Max = 18.8 G's @ 71.4 msec
Min = -18.5 G's @ 100.6 msec



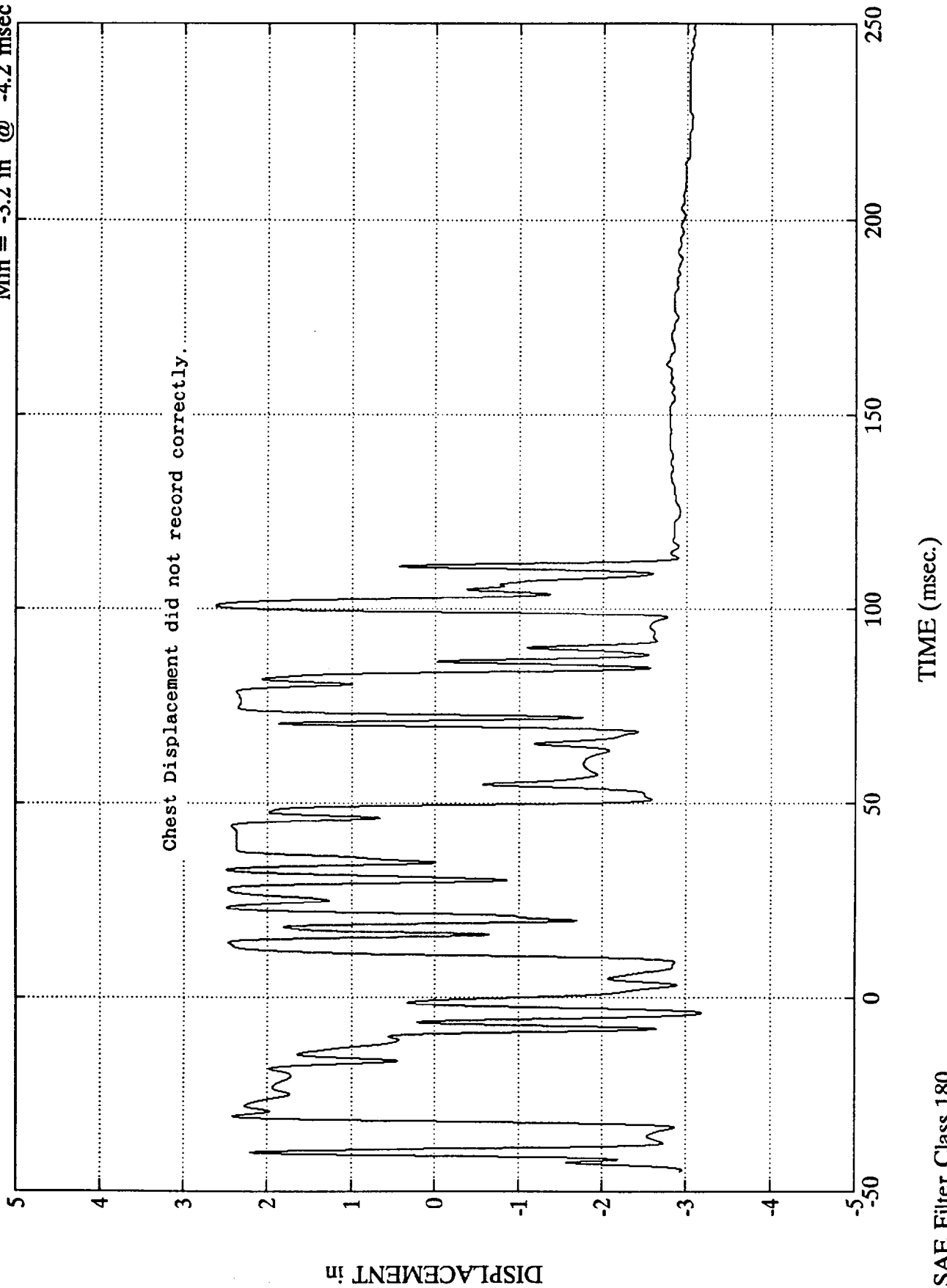
Test 1025
V1 POS#1 CHEST RESULTANT
Max = 52.9 G's @ 57.7 msec
Min = 0.0 G's @ -42.1 msec



Test 1025

V1 POS#1 CHEST DISPLACEMENT

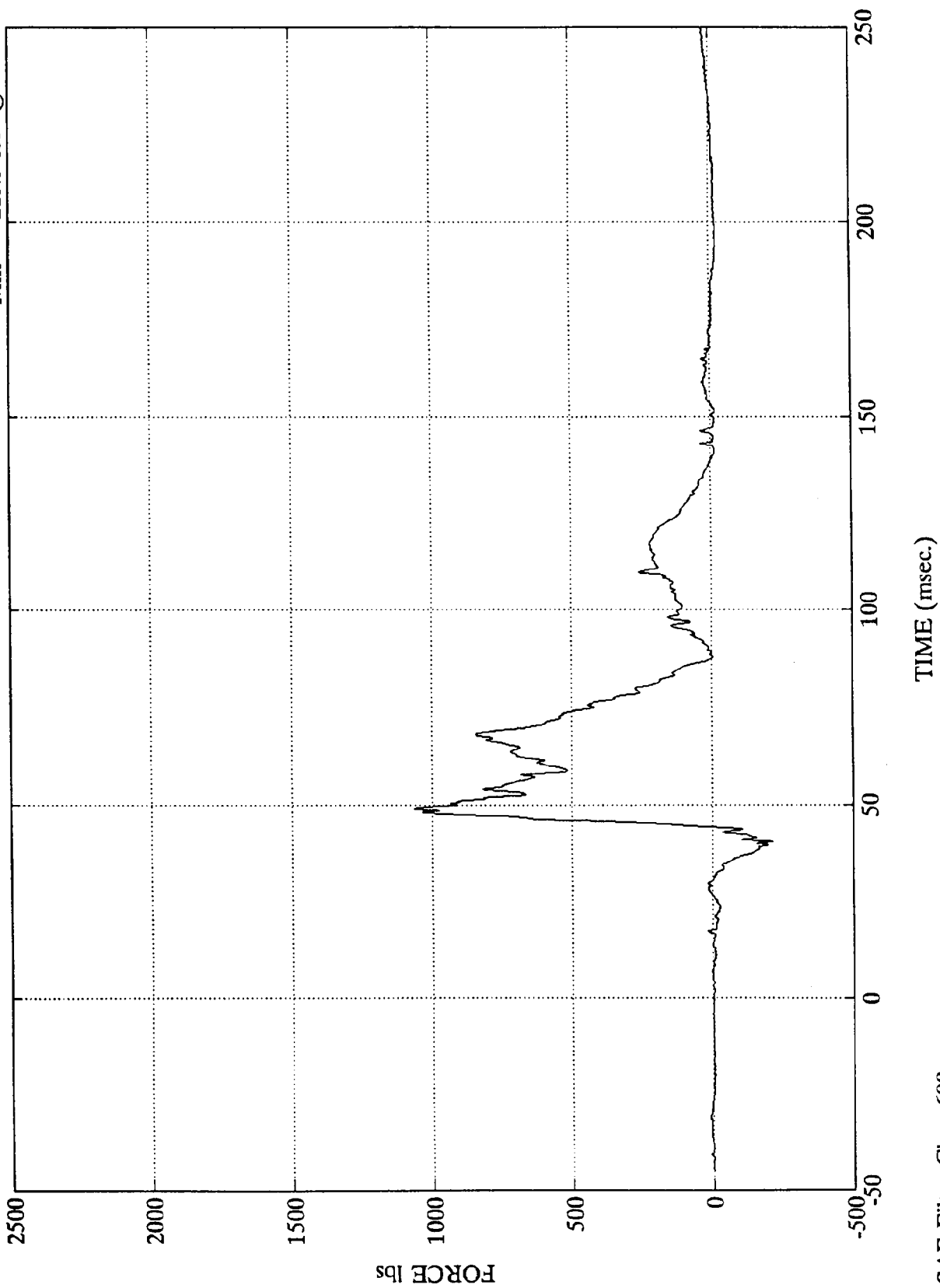
Max = 2.6 in @ 100.8 msec
Min = -3.2 in @ -4.2 msec



Test 1025

Max = 1062.6 lbs @ 49.2 msec
Min = -213.5 lbs @ 40.7 msec

V1 POS#1 LEFT FEMUR



SAE Filter Class 600

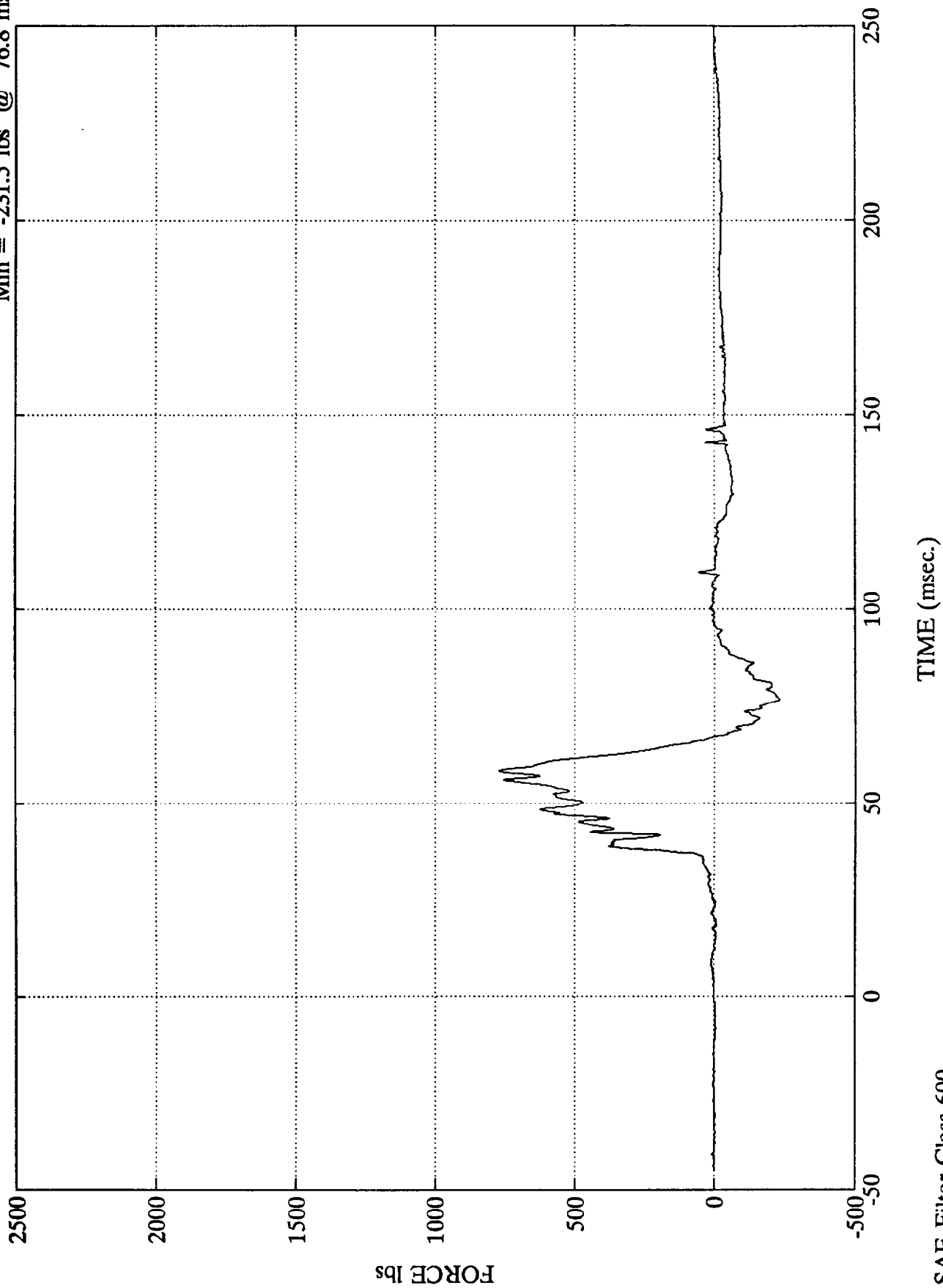
7883-1

B-60

Test 1025

V1 POS#1 RIGHT FEMUR

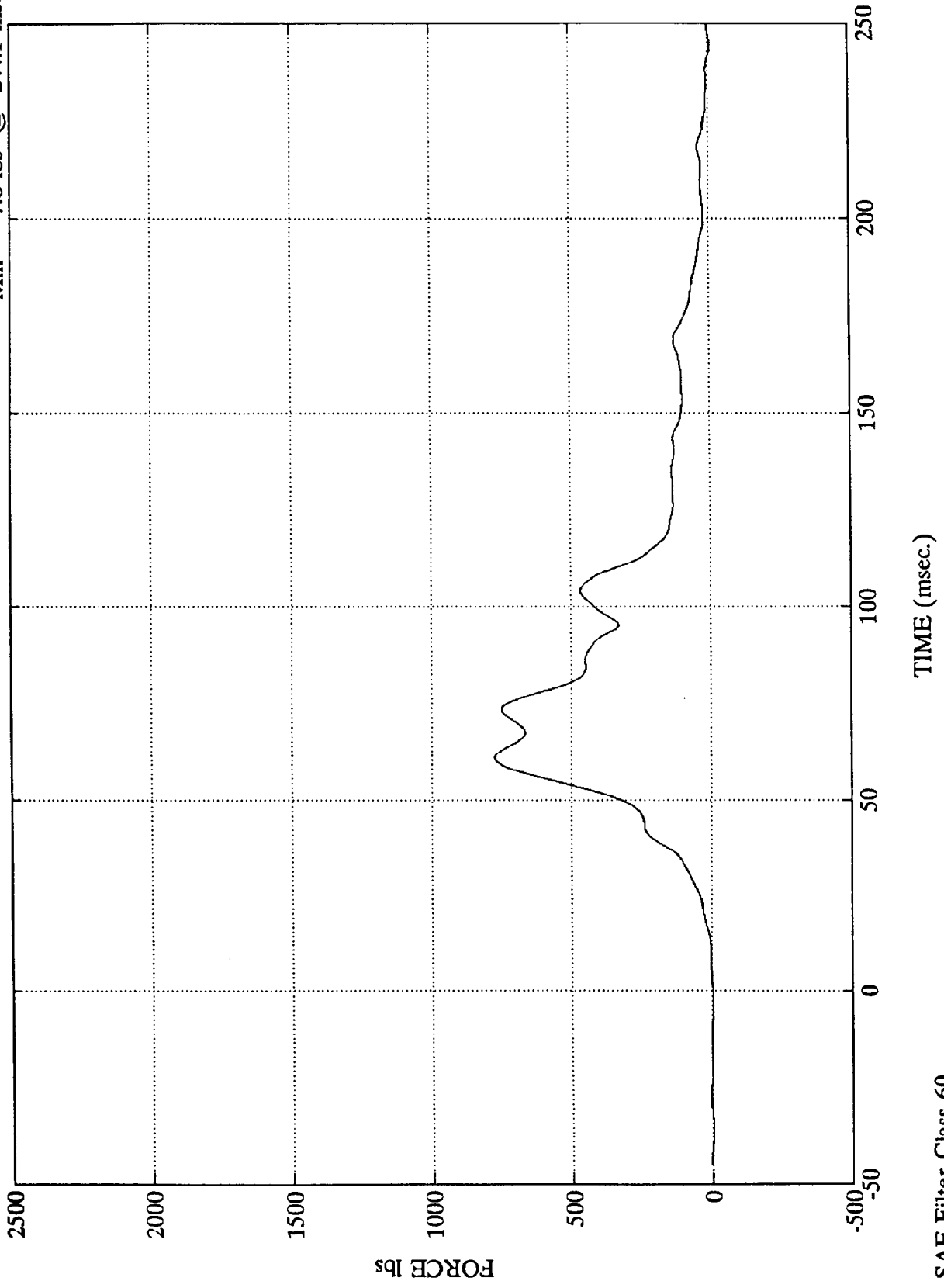
Max = 772.3 lbs @ 58.6 msec
Min = -231.5 lbs @ 76.8 msec



Test 1025

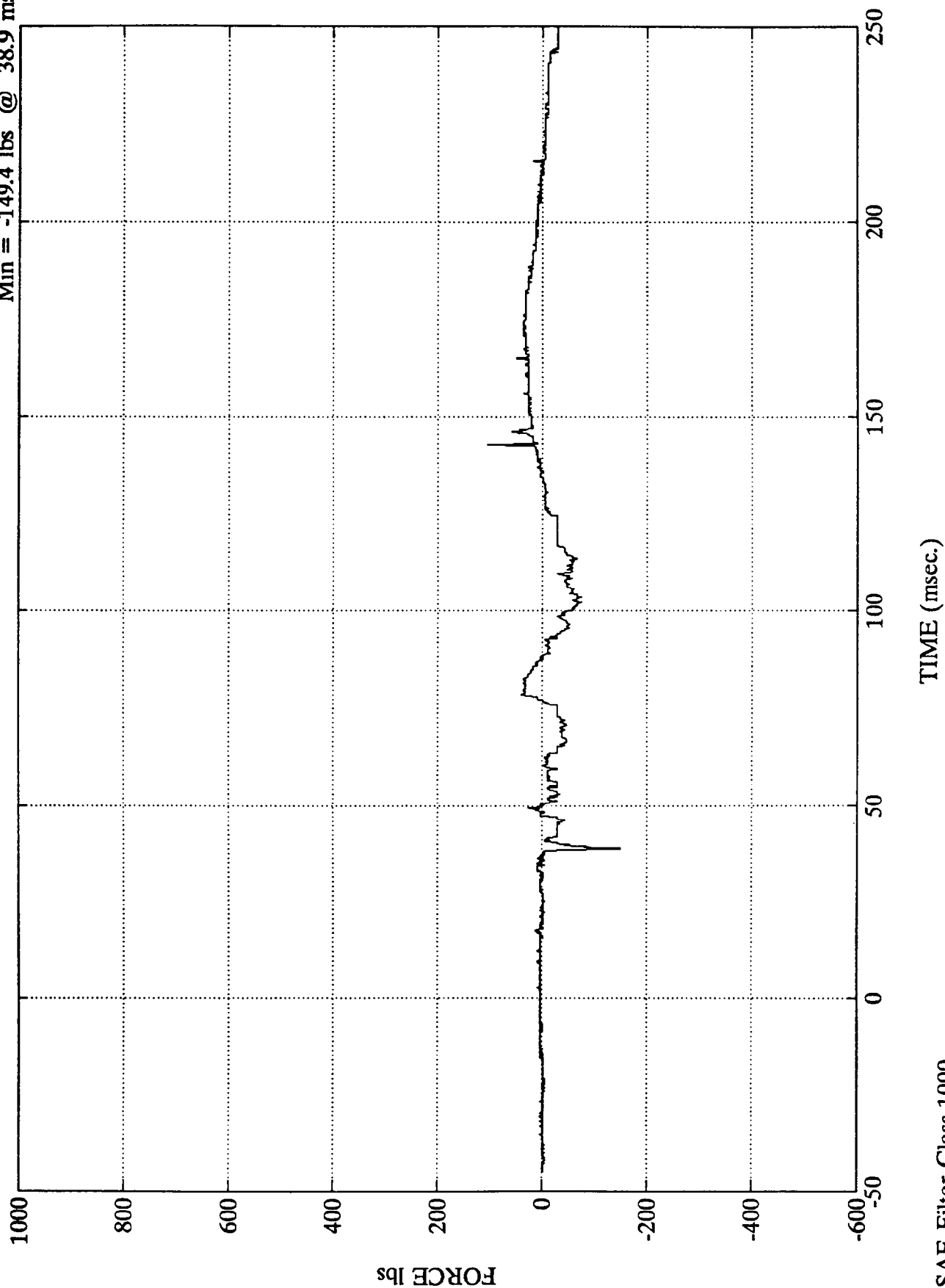
V1 POS#1 TORSO BELT

Max = 774.3 lbs @ 61.1 msec
Min = -7.8 lbs @ 244.1 msec



Test 1025
V1 POS#1 UPPER NECK FORCE (X)
Max = 105.2 lbs @ 142.8 msec
Min = -149.4 lbs @ 38.9 msec

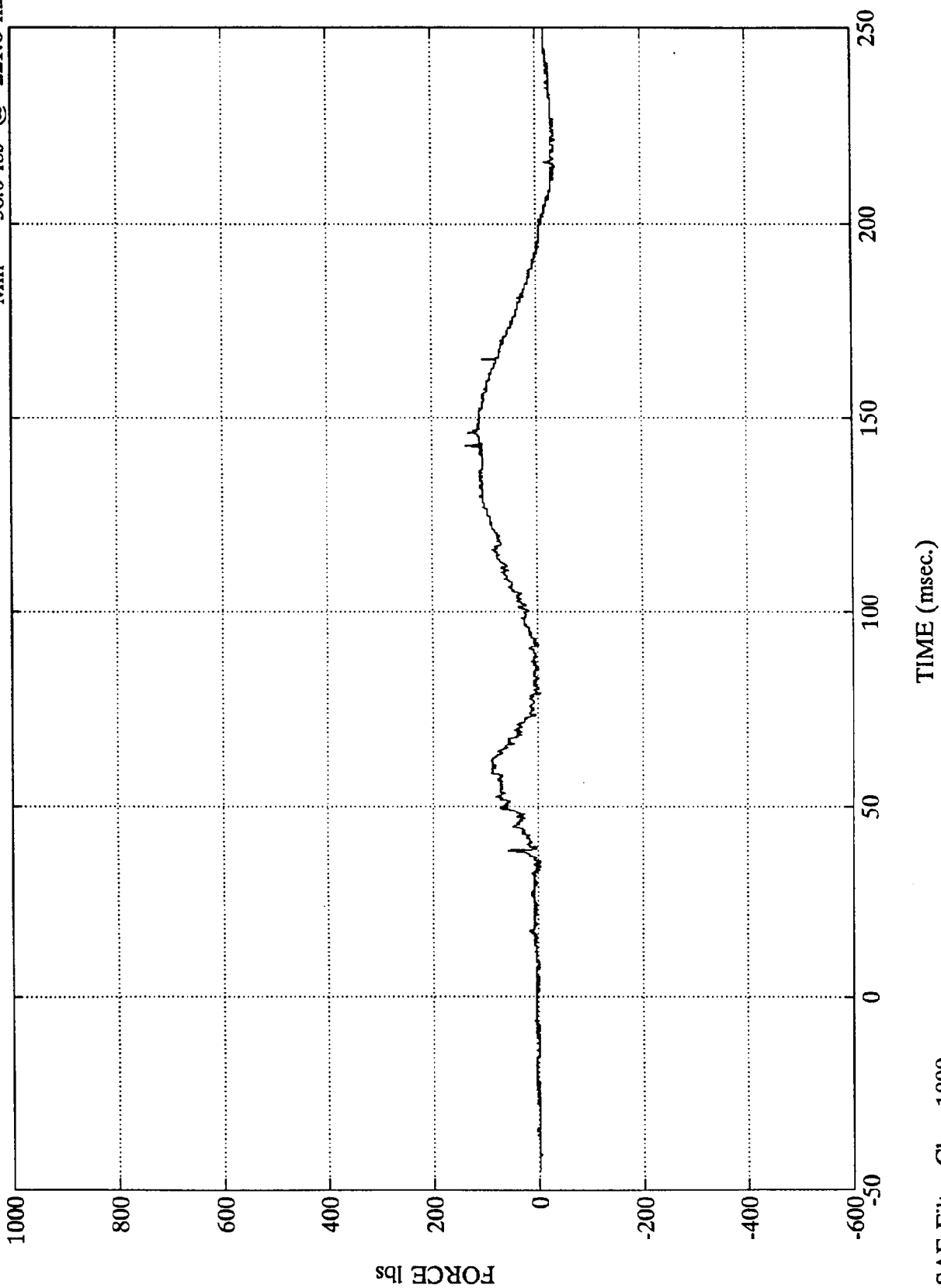
SAE Filter Class 1000



Test 1025

V1 POS#1 UPPER NECK FORCE (Y)

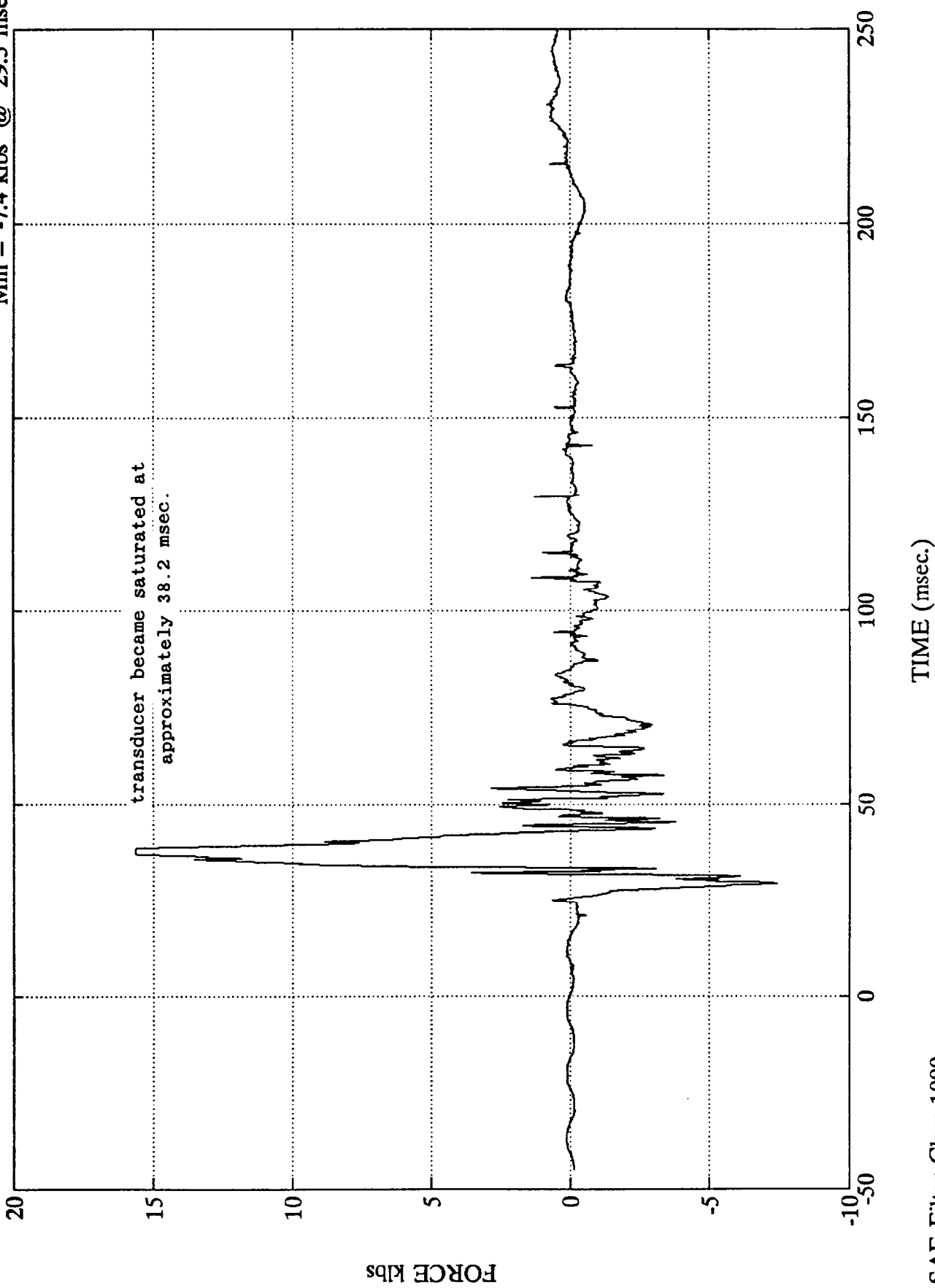
Max = 135.9 lbs @ 142.8 msec
Min = -38.6 lbs @ 221.6 msec



Test 1025

V1 POS#1 UPPER NECK FORCE (Z)

Max = 15.7 klbs @ 38.2 msec
Min = -7.4 klbs @ 29.5 msec

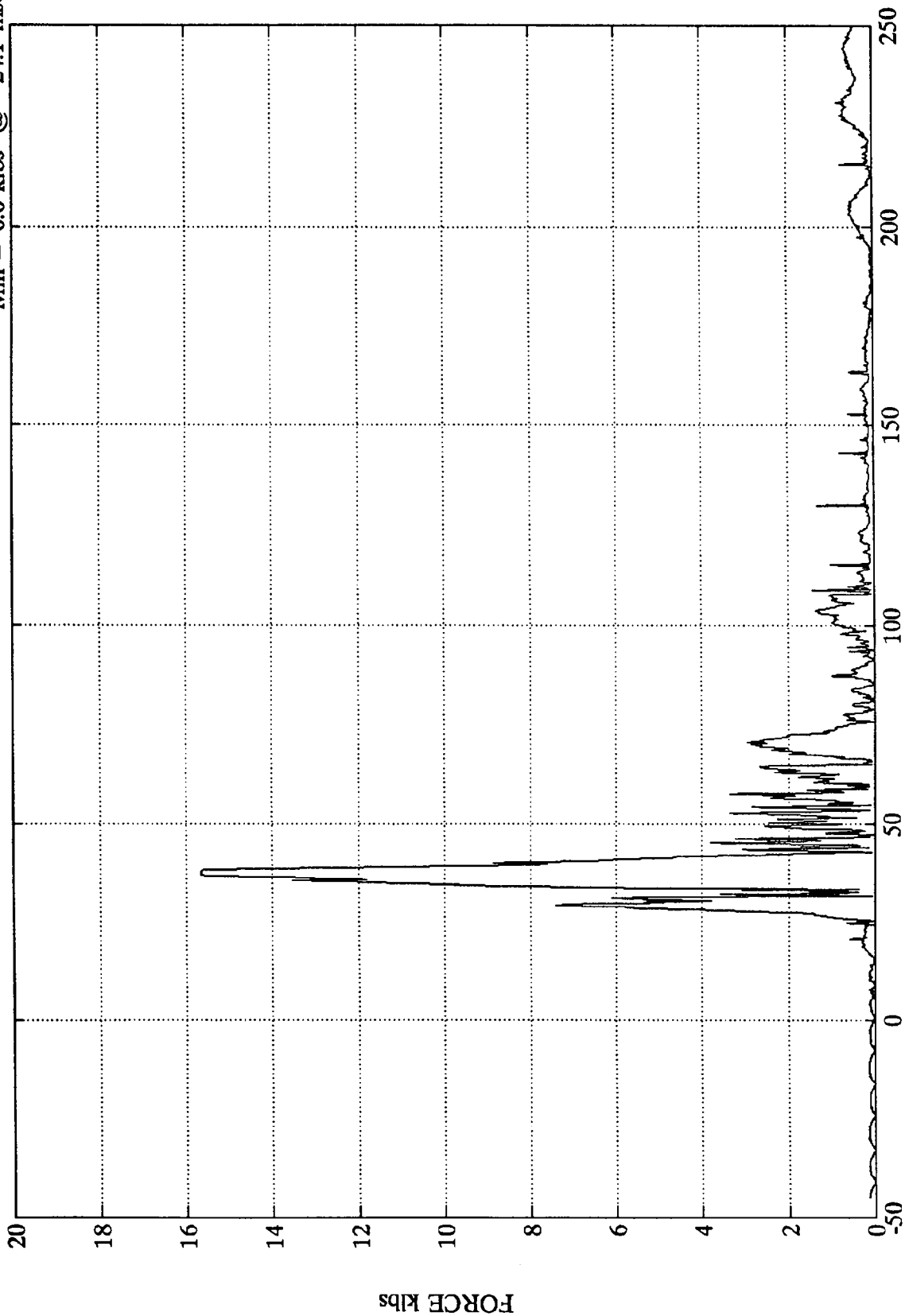


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Test 1025

V1 POS#1 NECK FORCE RESULTANT

Max = 15.7 klbs @ 38.2 msec
Min = 0.0 klbs @ -24.1 msec



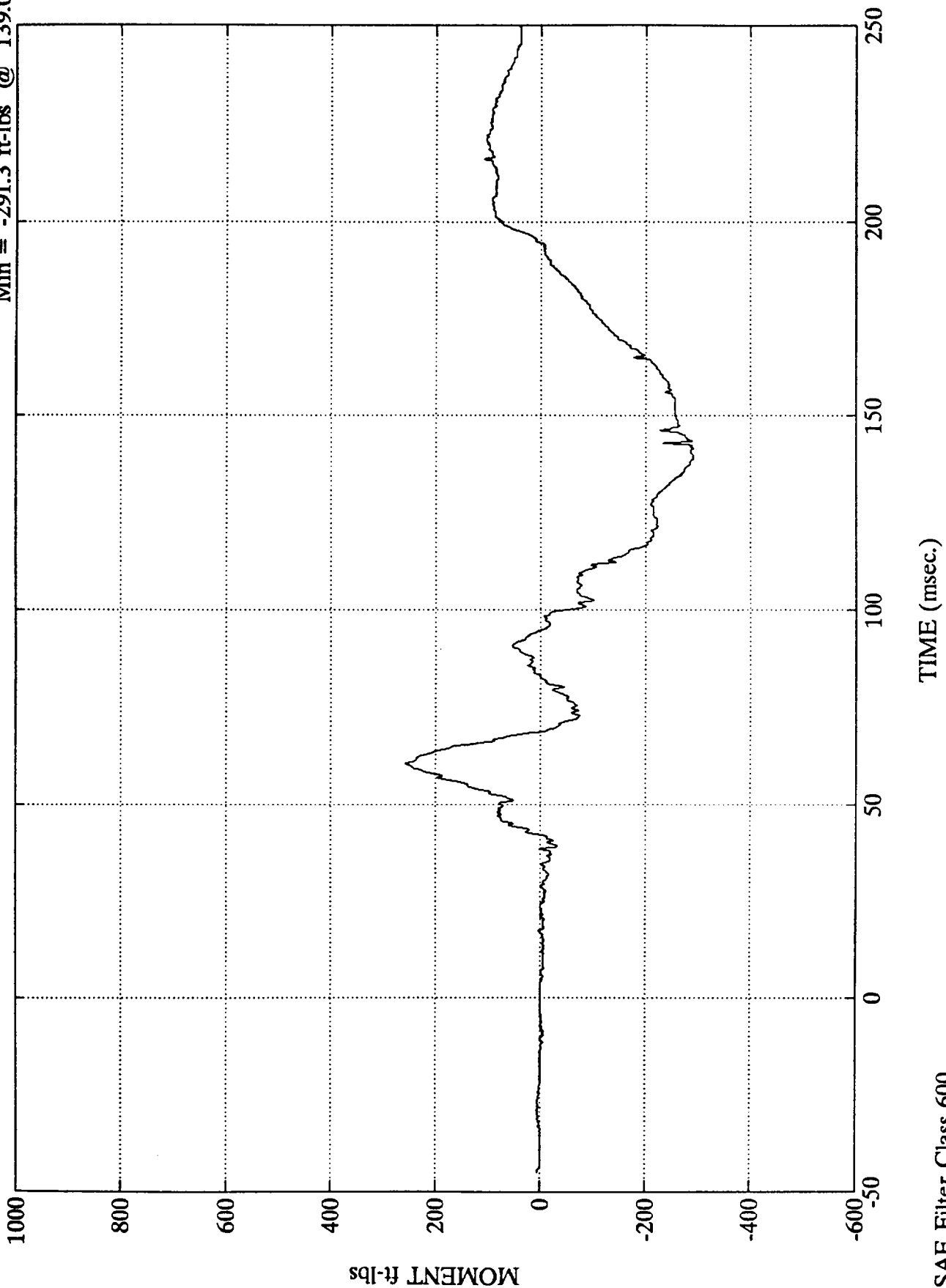
TIME (msec.)

SAE Filter Class 1000

Test 1025

V1 POS#1 UPPER NECK MOMENT (X)

Max = 256.9 ft-lbs @ 60.6 msec
Min = -291.3 ft-lbs @ 139.0 msec

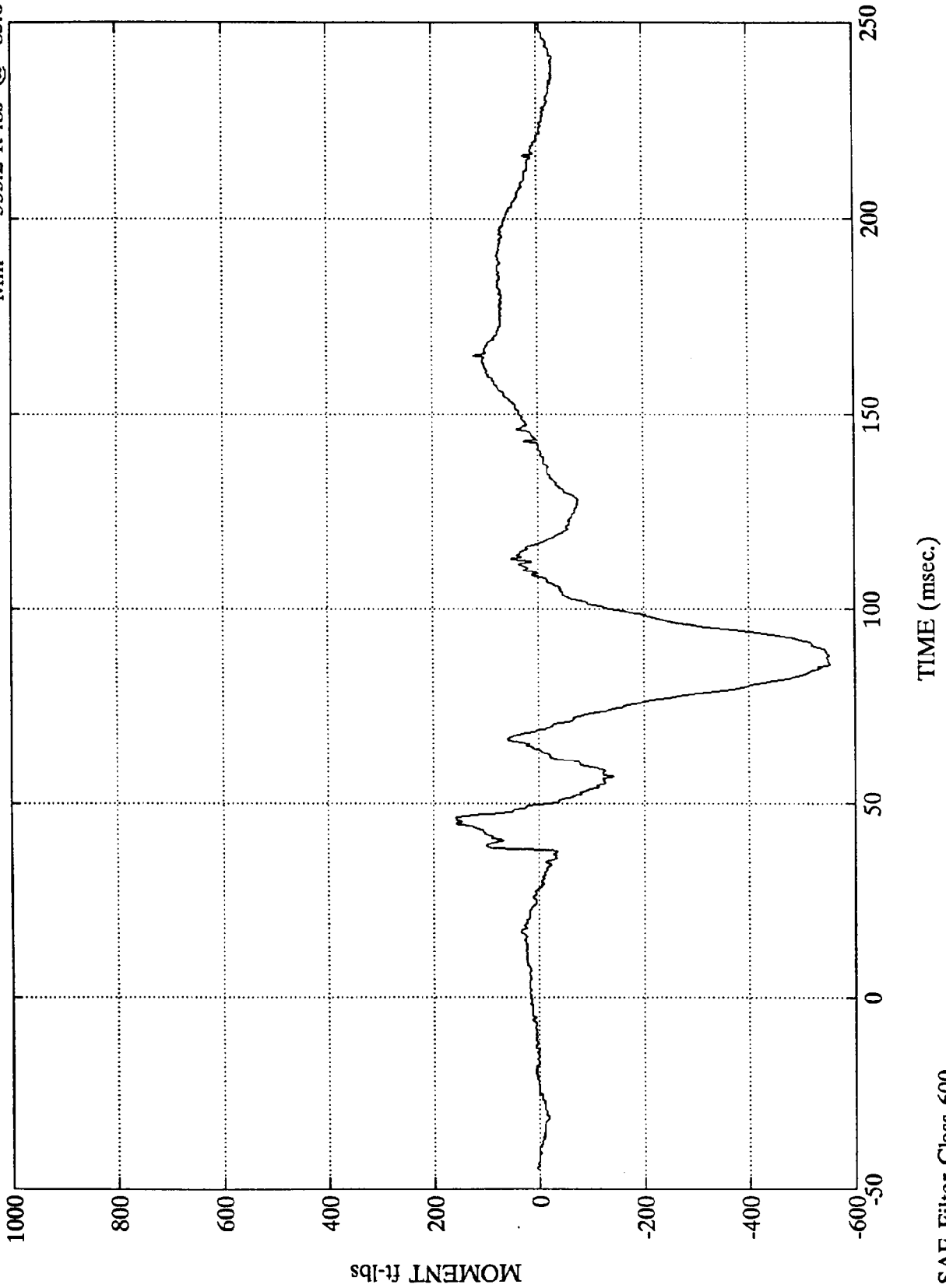


SAE Filter Class 600

Test 1025

V1 POS#1 UPPER NECK MOMENT (Y)

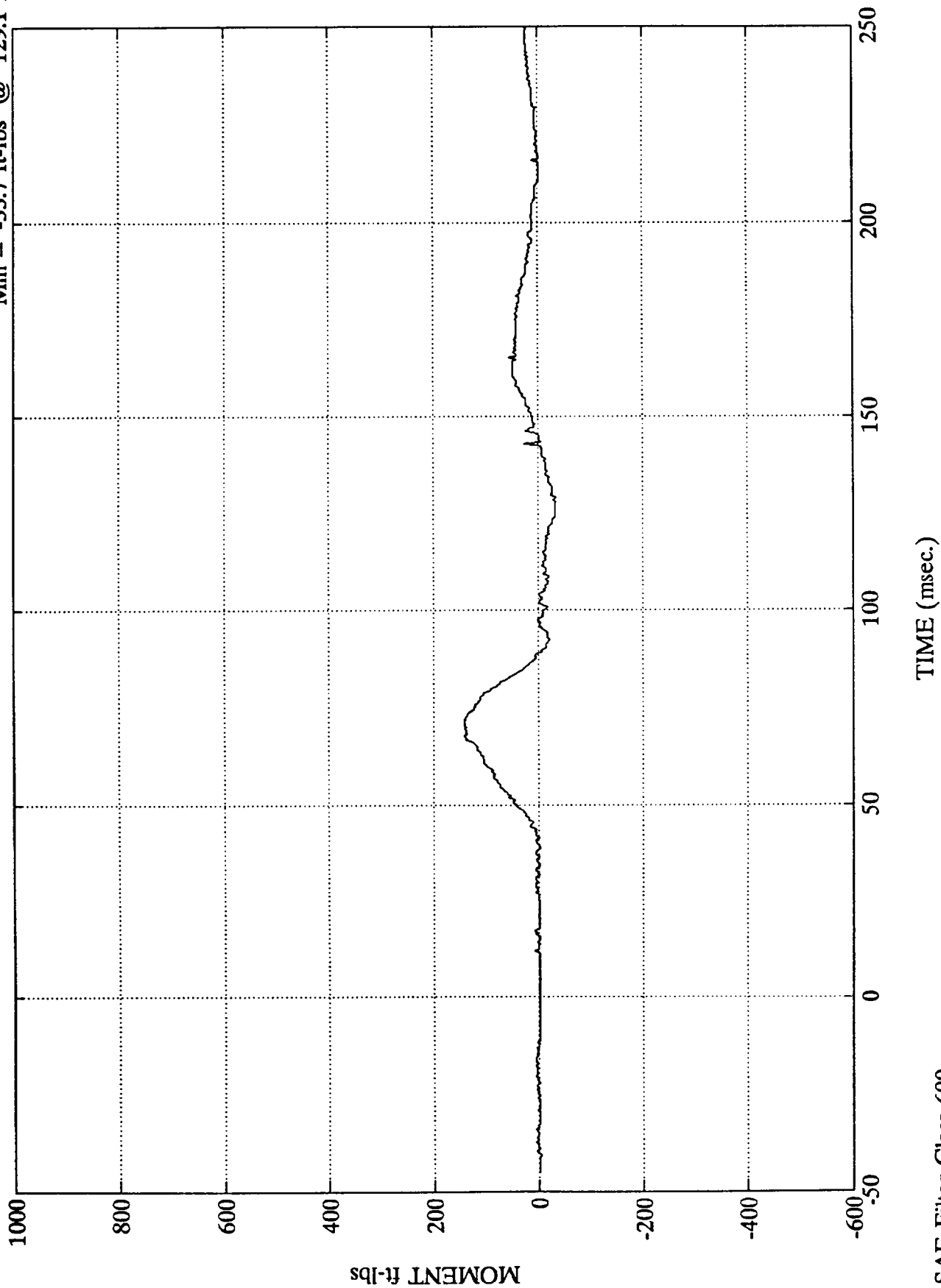
Max = 159.4 ft-lbs @ 46.4 msec
Min = -553.2 ft-lbs @ 85.6 msec



Test 1025

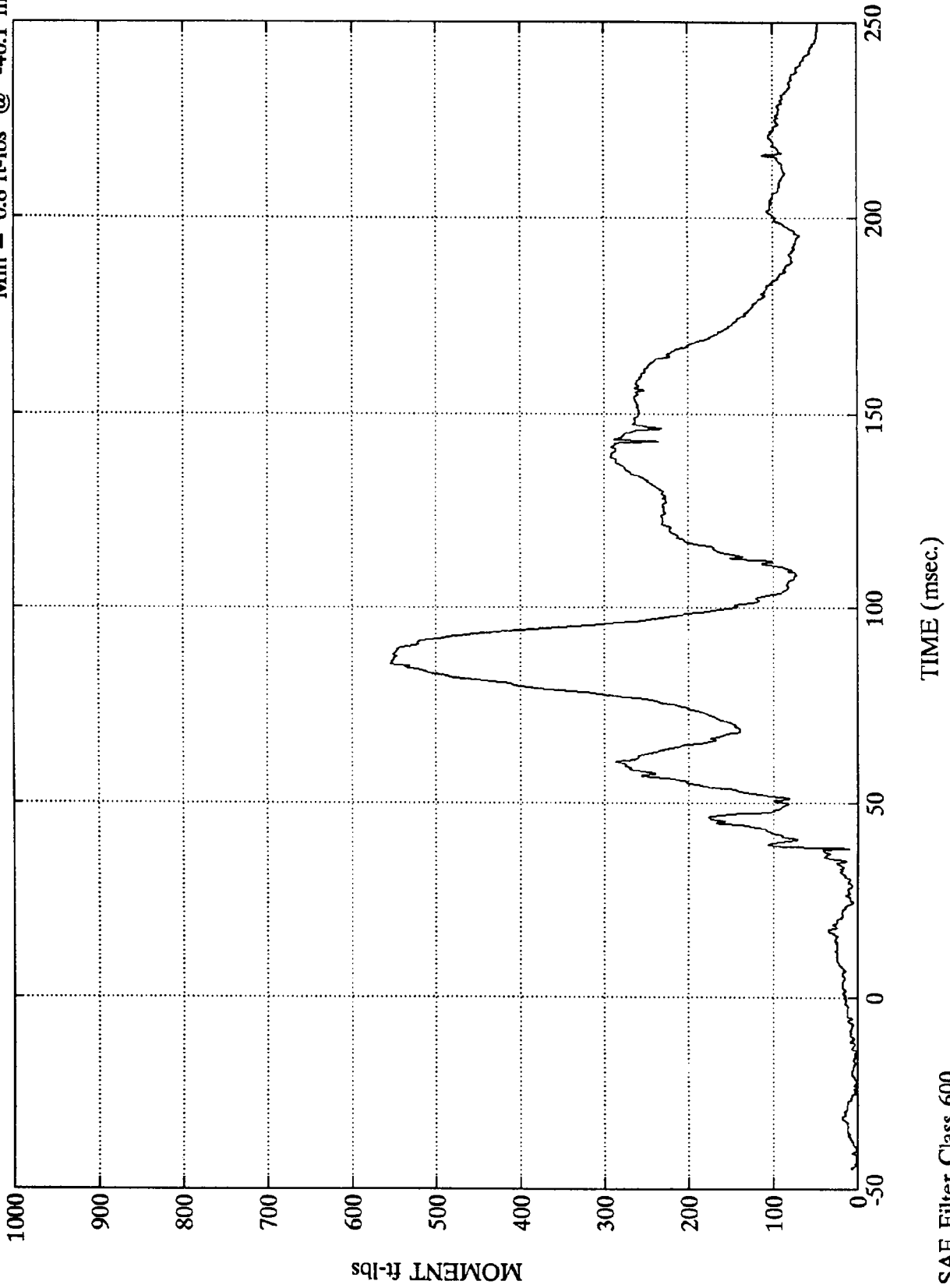
V1 POS#1 UPPER NECK MOMENT (Z)

Max = 142.0 ft-lbs @ 70.6 msec
Min = -33.7 ft-lbs @ 129.1 msec



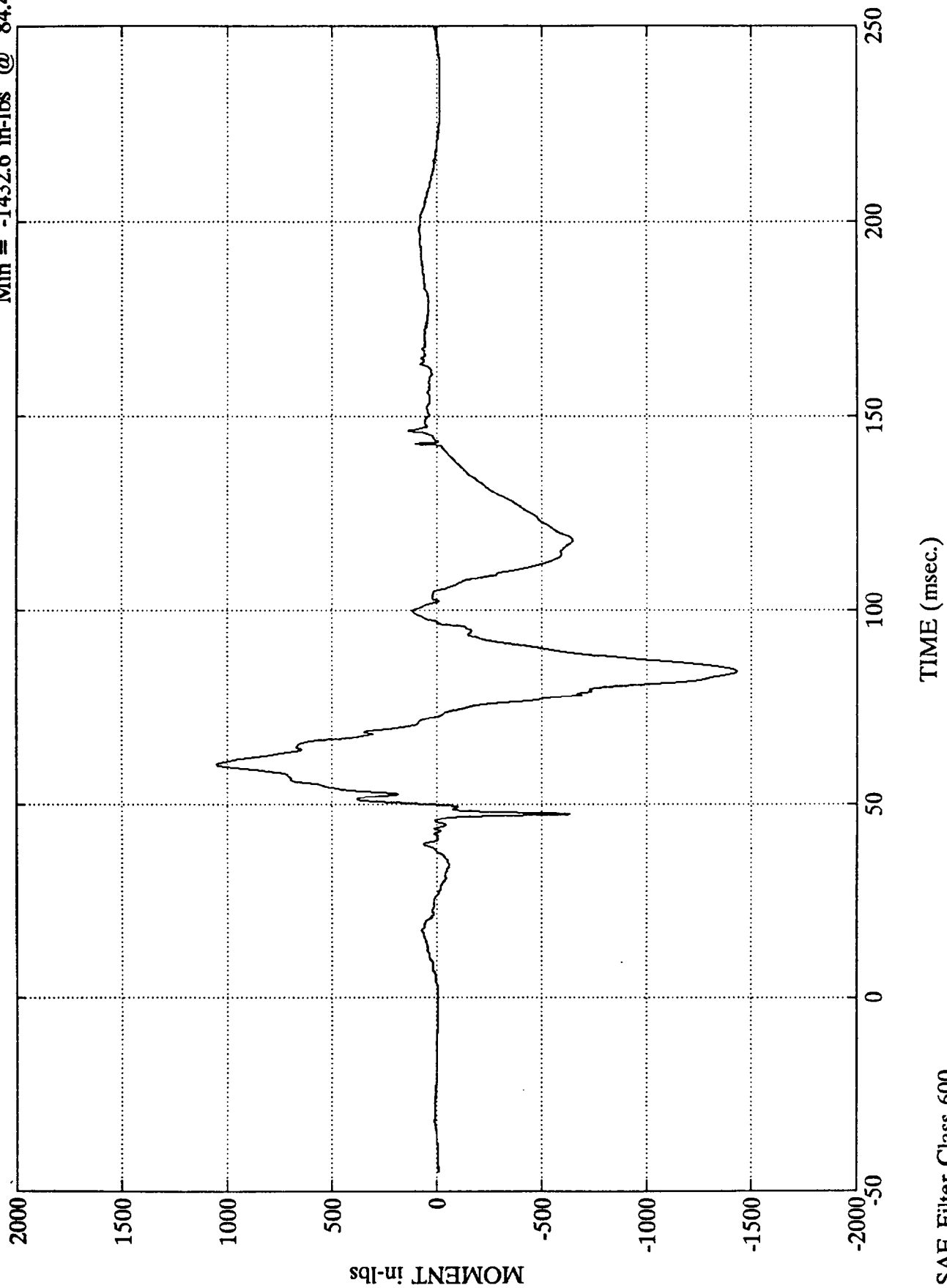
Test 1025
Max = 554.0 ft-lbs @ 85.6 msec
Min = 0.8 ft-lbs @ -40.1 msec

V1 POS#1 NECK MOMENT RESULTANT



SAE Filter Class 600

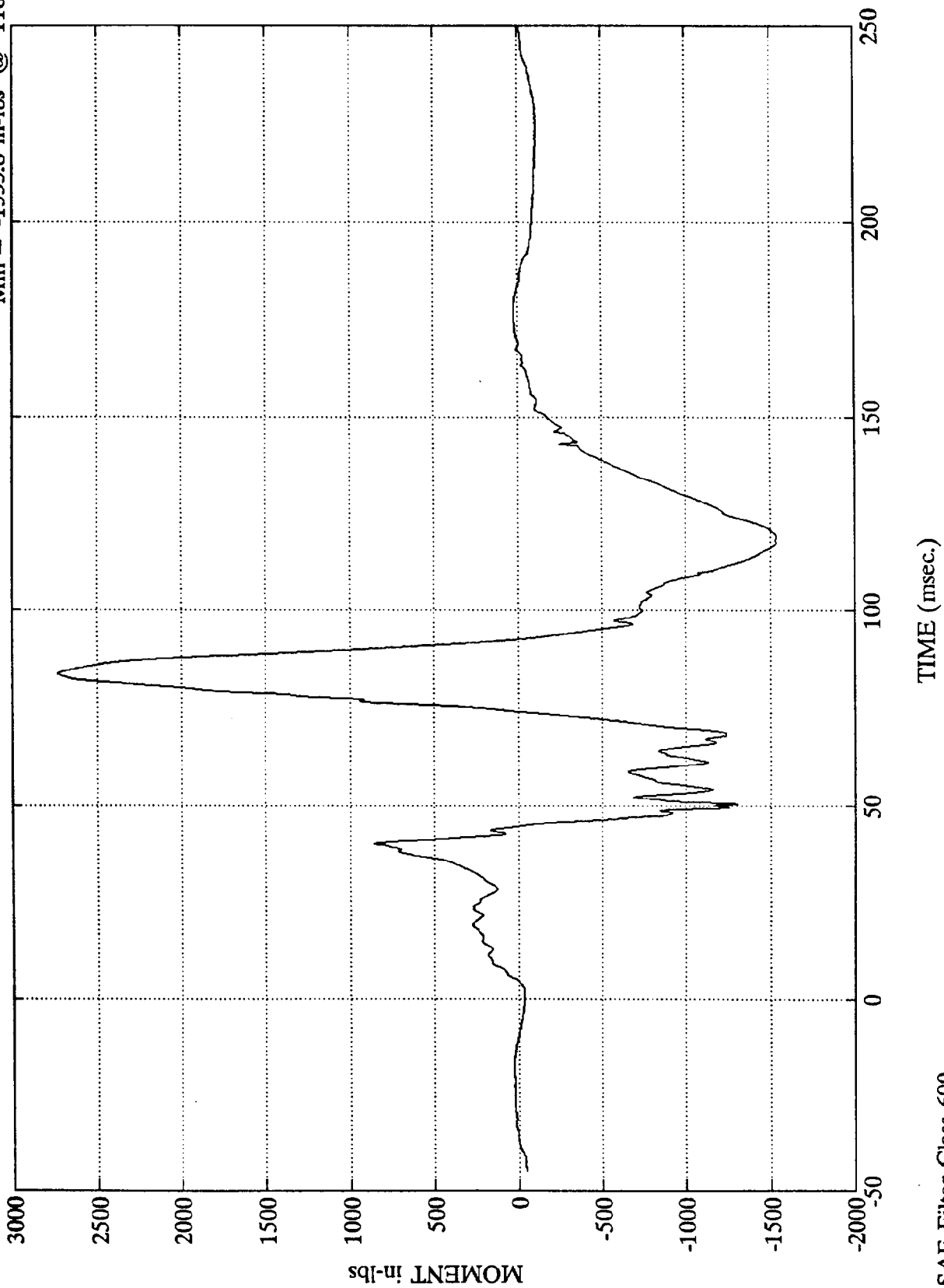
Test 1025 V1 POS#1 L UPPER TIBIA MOMENT (X) Max = 1048.4 in-lbs @ 60.4 msec
Min = -1432.6 in-lbs @ 84.4 msec



Test 1025

V1 POS#1 L UPPER TIBIA MOMENT (Y)

Max = 2730.7 in-lbs @ 83.6 msec
Min = -1535.8 in-lbs @ 118.9 msec

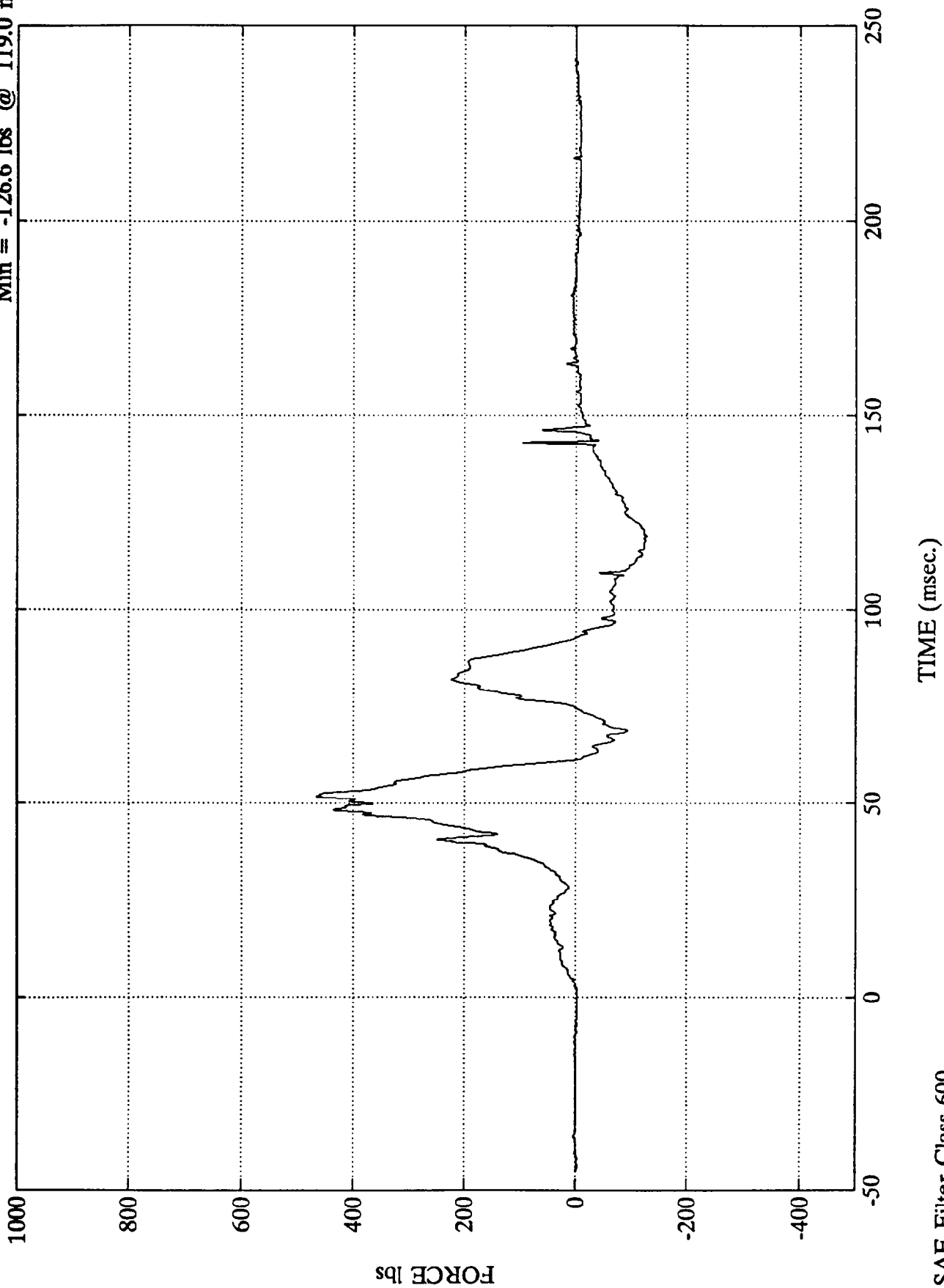


SAE Filter Class 600

Test 1025

V1 POS#1 L LOWER TIBIA FORCE (Y)

Max = 465.1 lbs @ 52.0 msec
Min = -126.6 lbs @ 119.0 msec



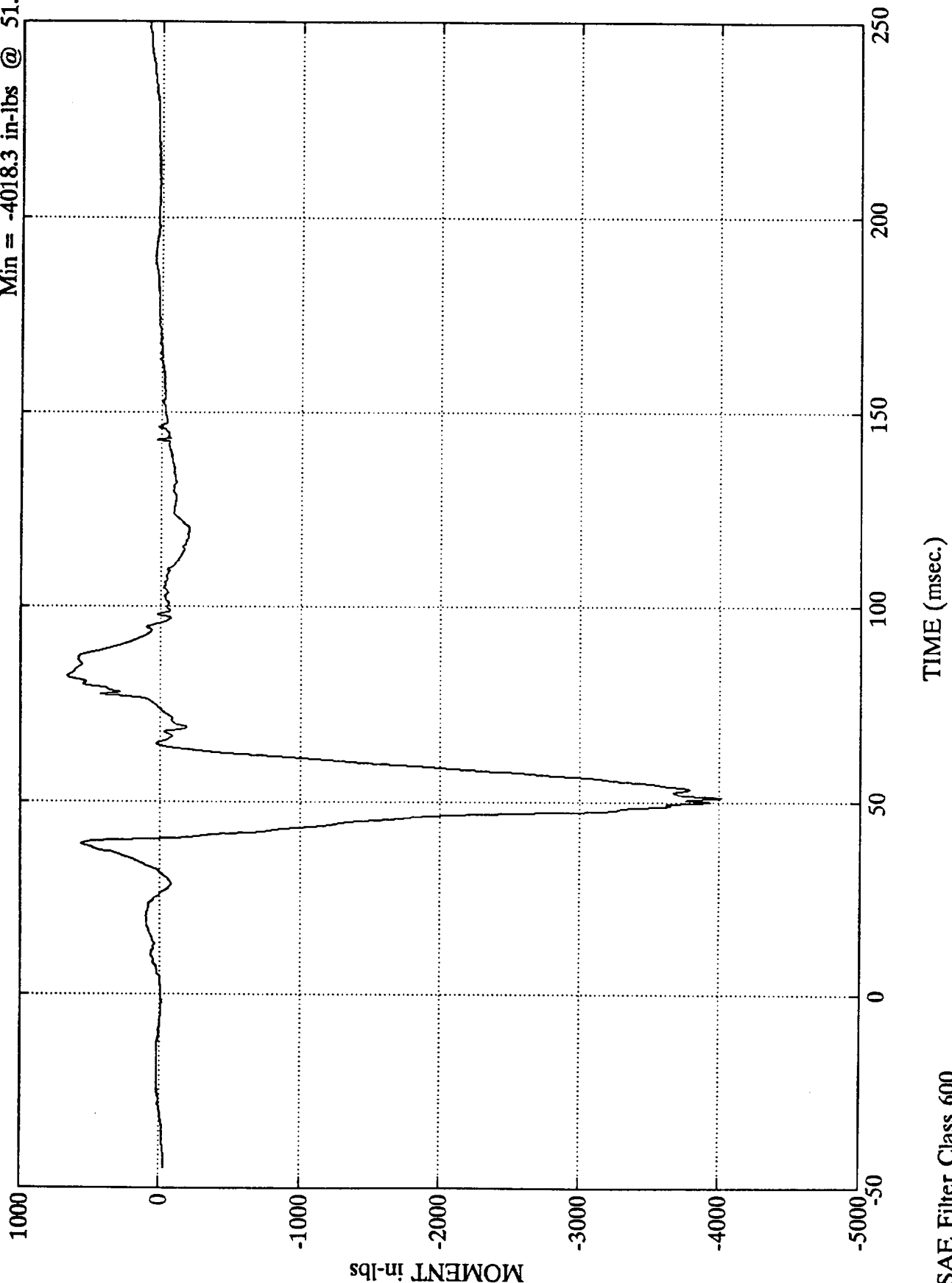
Vehicle 1 L. Lower Tibia Force (Z)

(Data was not available.)

Test 1025

V1 POS#1 L LOWER TIBIA MOMENT (X)

Max = 662.6 in-lbs @ 82.1 msec
Min = -4018.3 in-lbs @ 51.2 msec

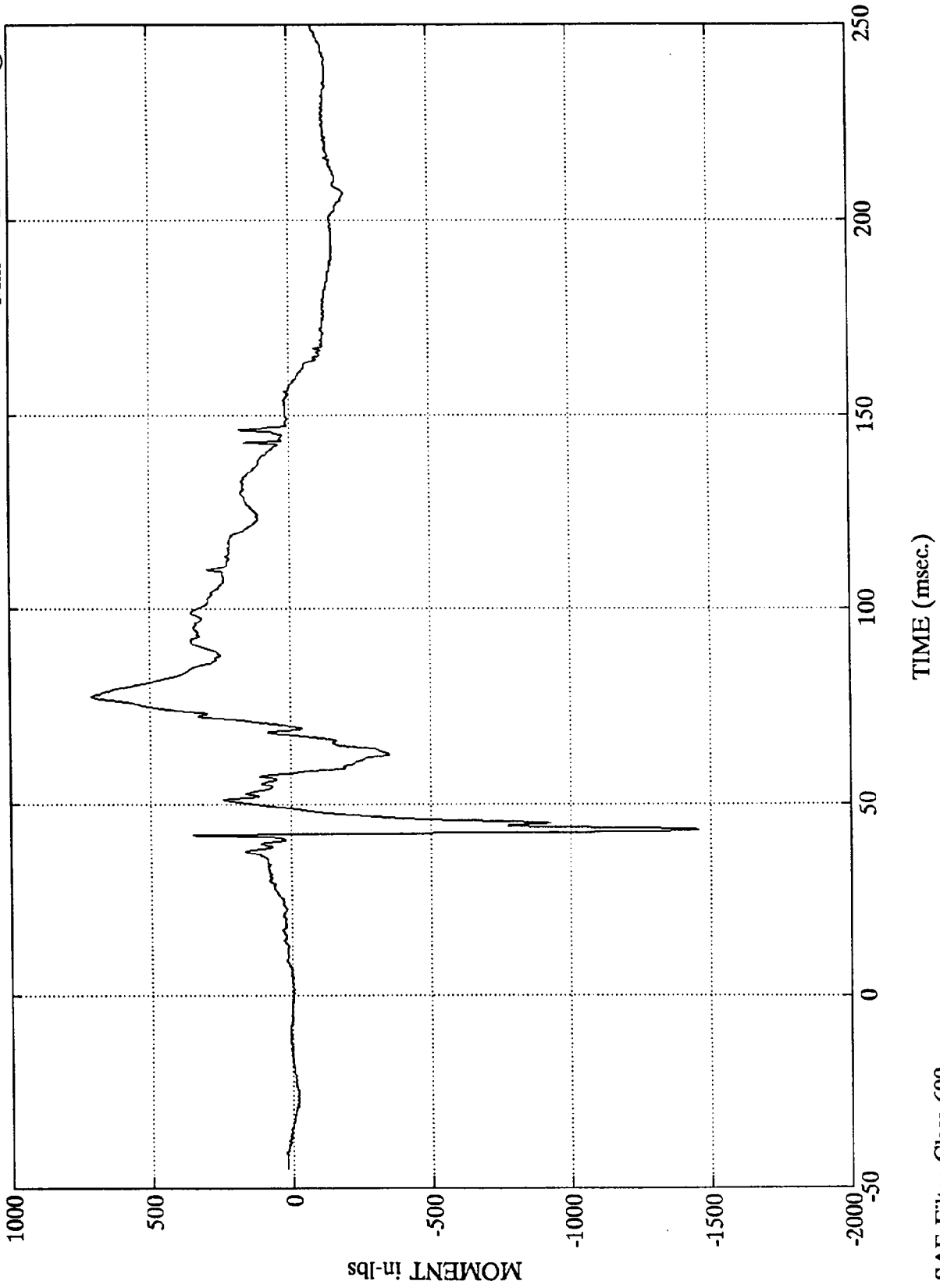


Test 1025

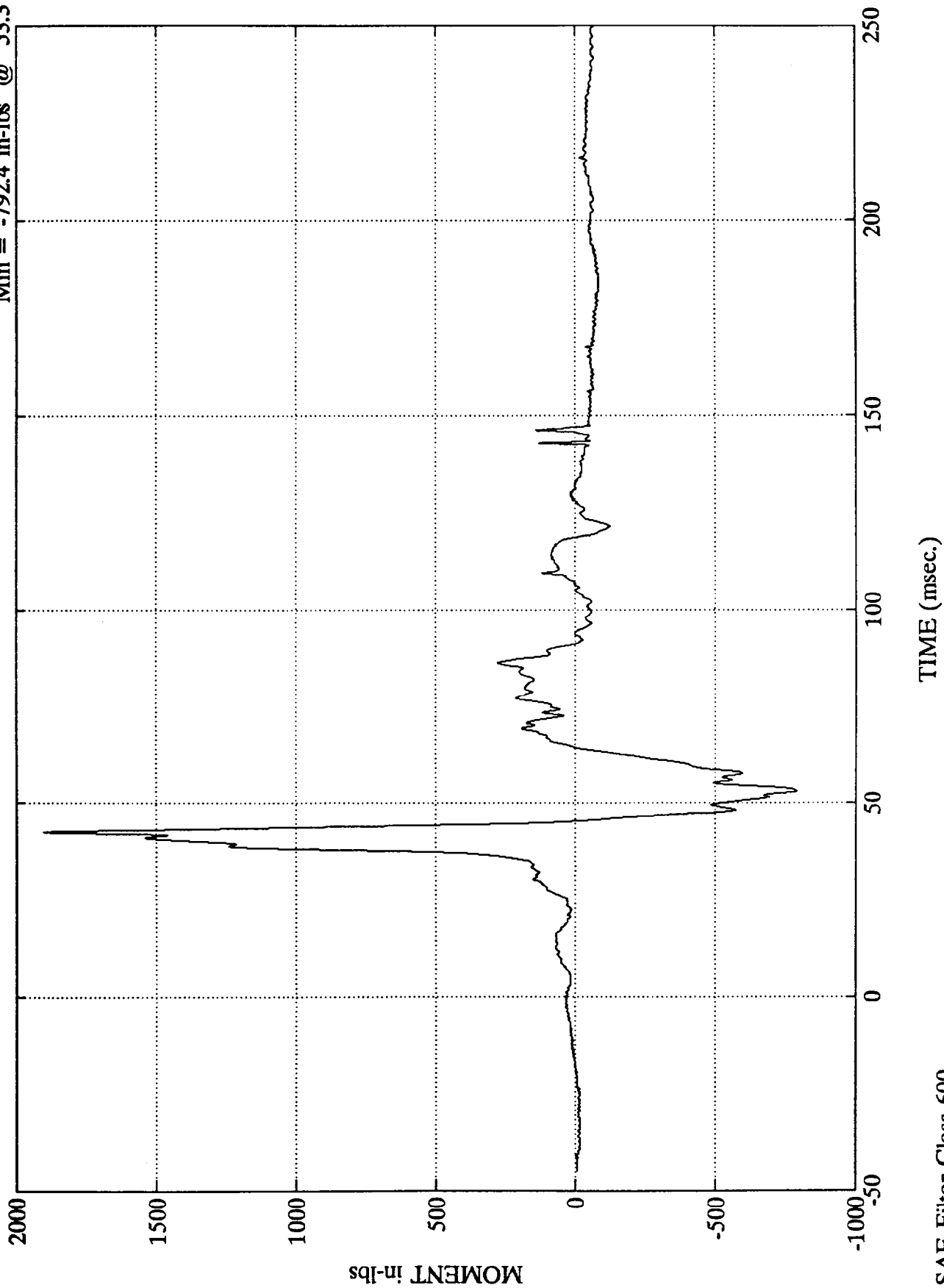
V1 POS#1 R. UPPER TIBIA MOMENT (X)

Max = 710.9 in-lbs @ 77.6 msec

Min = -1457.2 in-lbs @ 43.6 msec



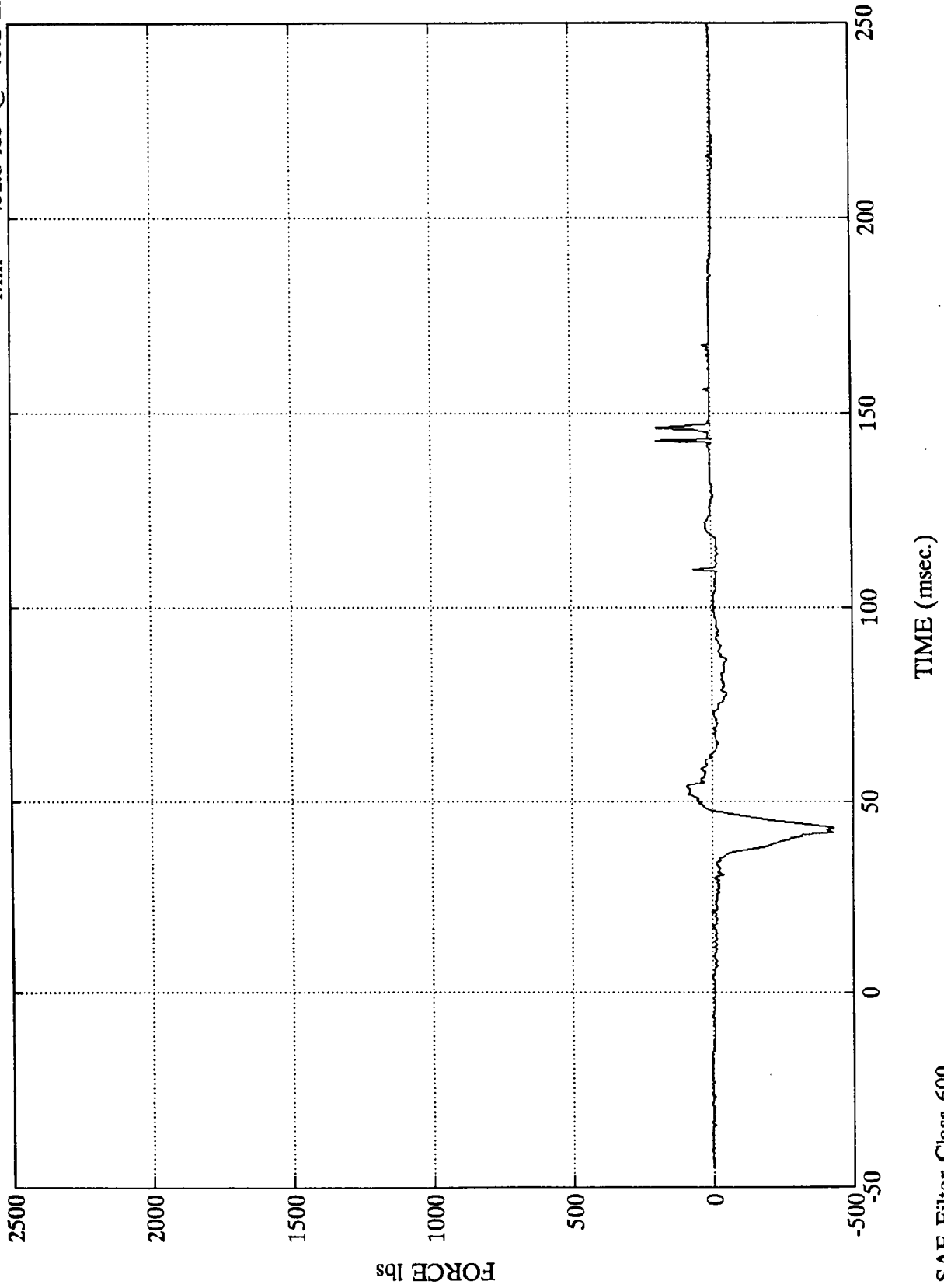
Test 1025 V1 POS#1 R. UPPER TIBIA MOMENT (Y) Max = 1903.4 in-lbs @ 42.5 msec
Min = -792.4 in-lbs @ 53.3 msec



Test 1025

V1 POS#1 R. LOWER TIBIA FORCE (Y)

Max = 194.2 lbs @ 142.9 msec
Min = -432.8 lbs @ 43.2 msec



SAE Filter Class 600

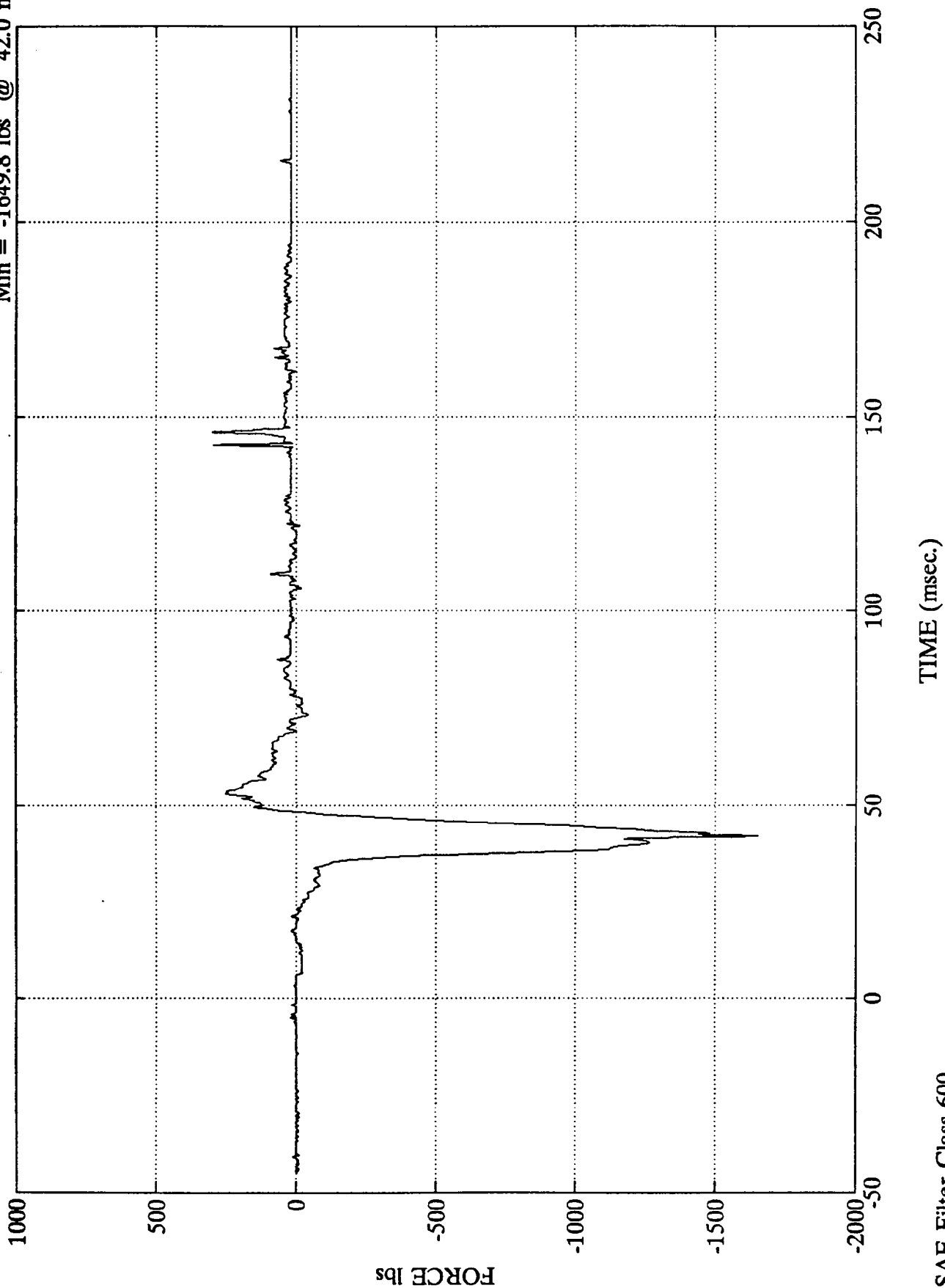
7883-1

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Test 1025

V1 POS#1 R. LOWER TIBIA FORCE (Z)

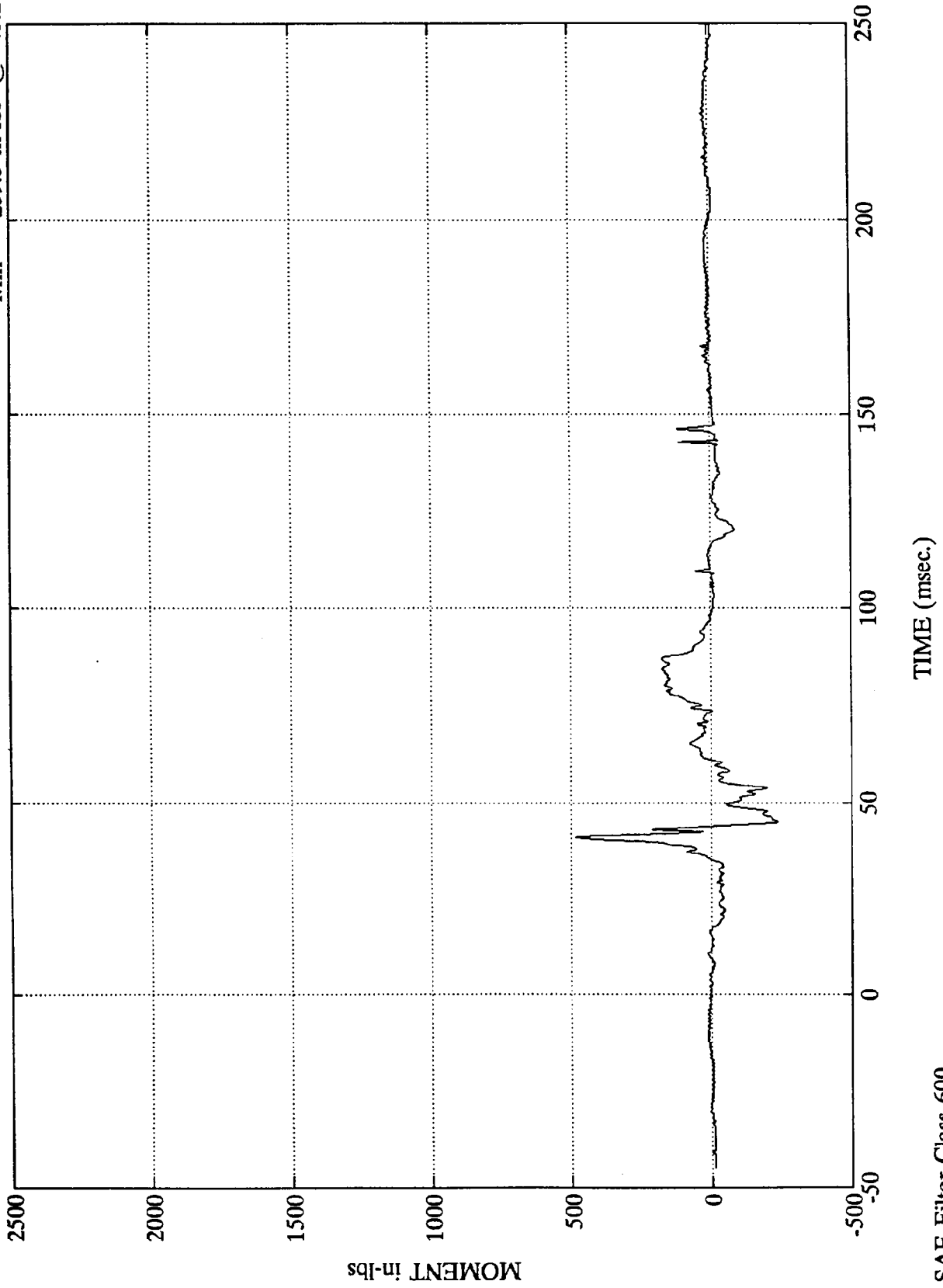
Max = 300.1 lbs @ 146.0 msec
Min = -1649.8 lbs @ 42.0 msec



Test 1025

V1 POS#1 R. LOWER TIBIA MOMENT (X)

Max = 483.2 in-lbs @ 41.4 msec
Min = -239.3 in-lbs @ 45.2 msec



SAE Filter Class 600

7883-1

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VEHICLE TWO DATA

1991 HONDA ACCORD

TEST NO. Y42-1-1025

VEHICLE DATA

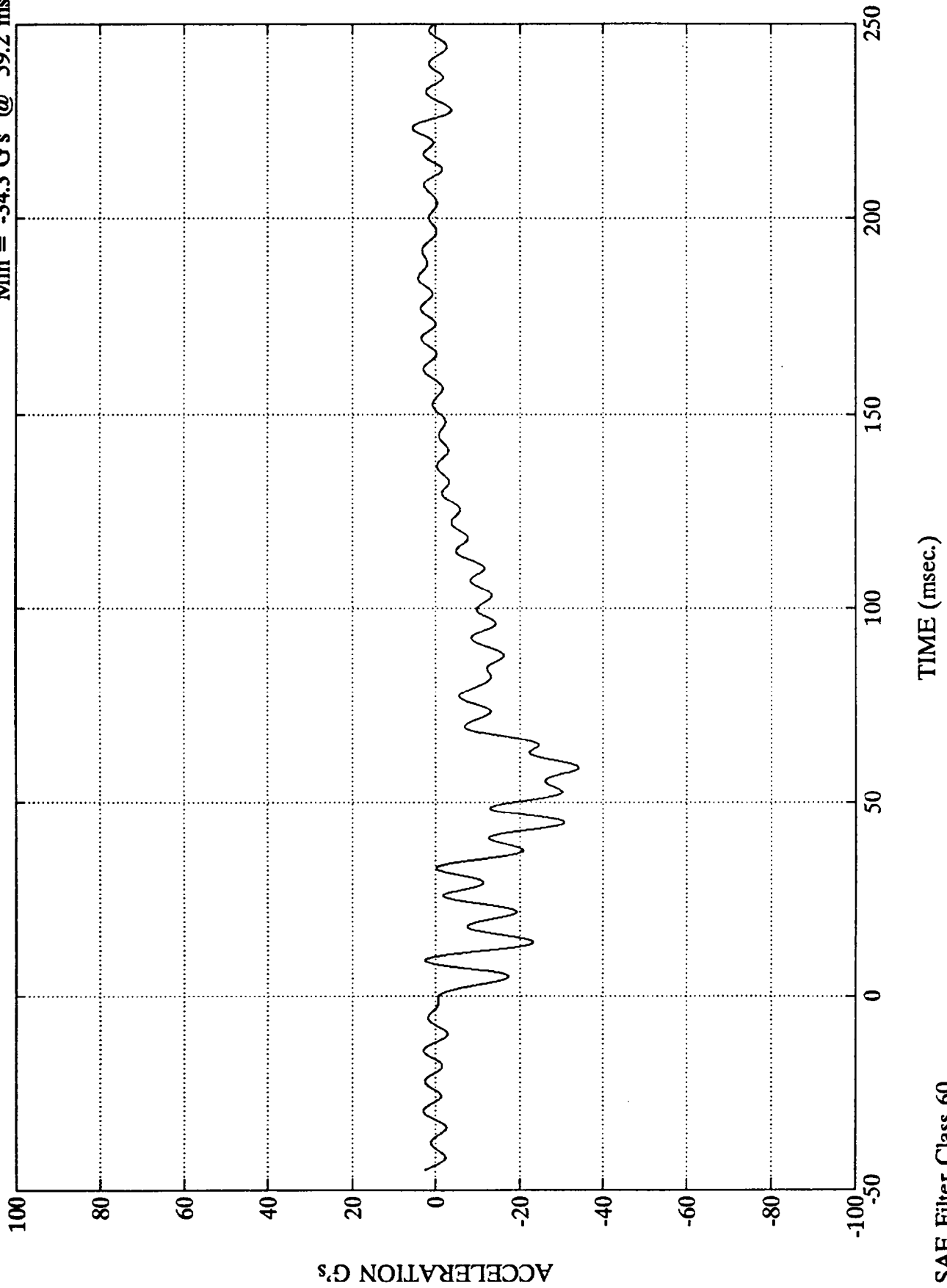
FILTER CHANNEL CLASS

60

Test 1025

V2 L. REAR SEAT X-MEMBER (X)

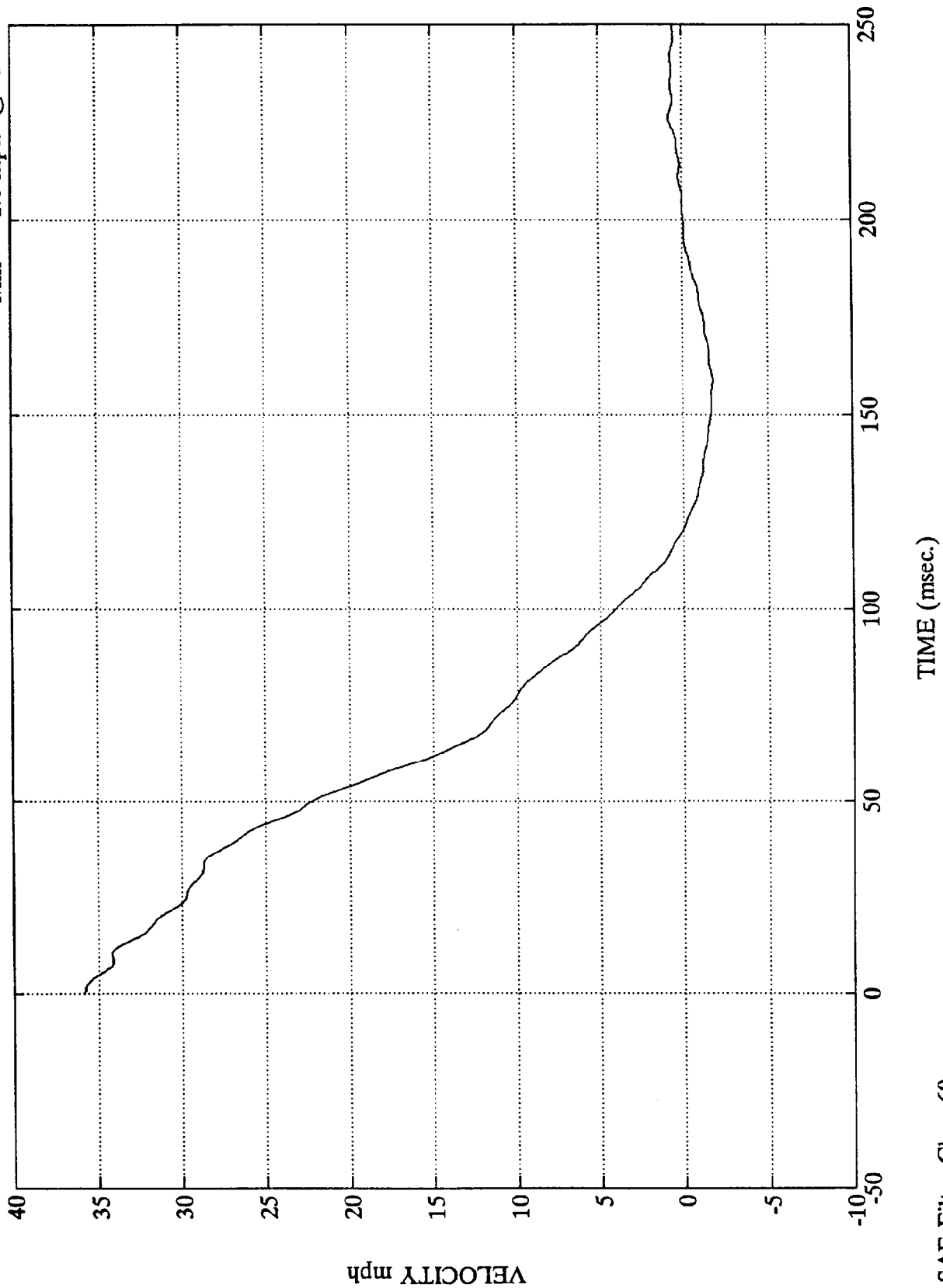
Max = 5.5 G's @ 223.3 msec
Min = -34.3 G's @ 59.2 msec



Test 1025

V2 L REAR SEAT X-MEMBER (X)

Max = 35.8 mph @ 0.0 msec
Min = -1.8 mph @ 158.9 msec



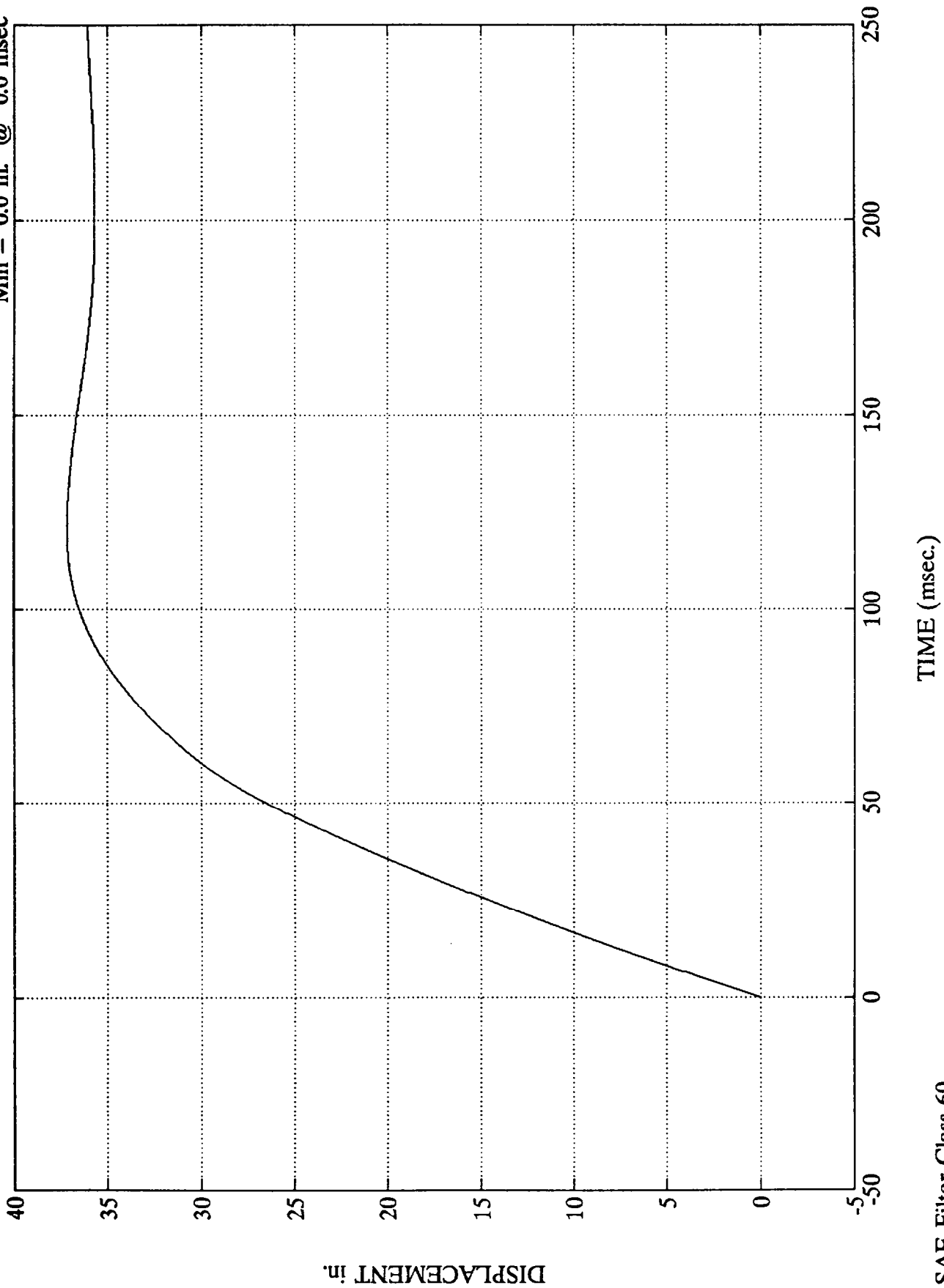
B-84

7883-1

SAE Filter Class 60

Test 1025
Max = 37.2 in. @ 122.9 msec
Min = 0.0 in. @ 0.0 msec

V2 L REAR SEAT X-MEMBER (X)



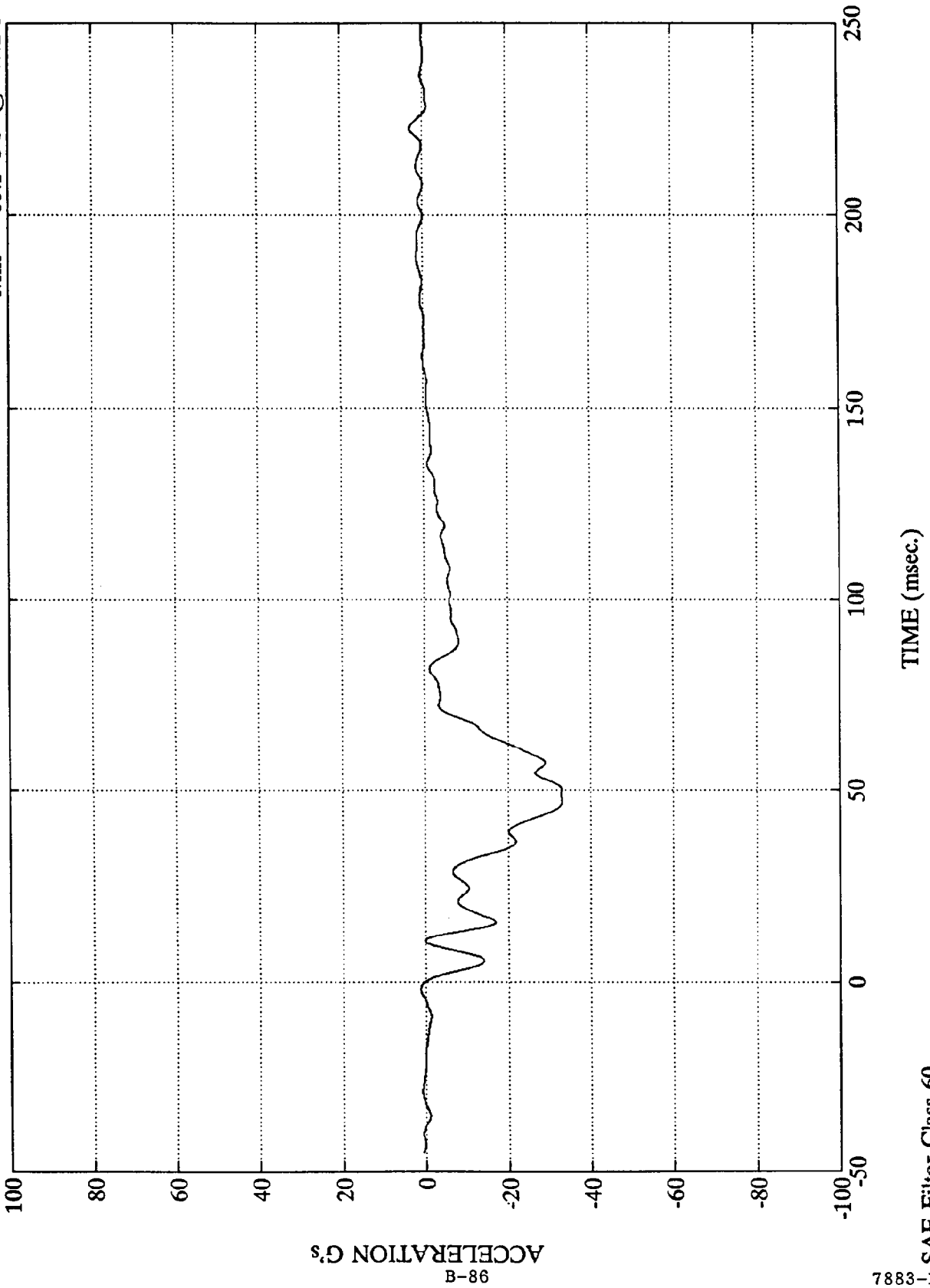
B-85

7883-1

SAE Filter Class 60

Test 1025
Max = 3.1 G's @ 222.5 msec
Min = -33.1 G's @ 47.2 msec

V2 R. REAR SEAT X-MEMBER (X)

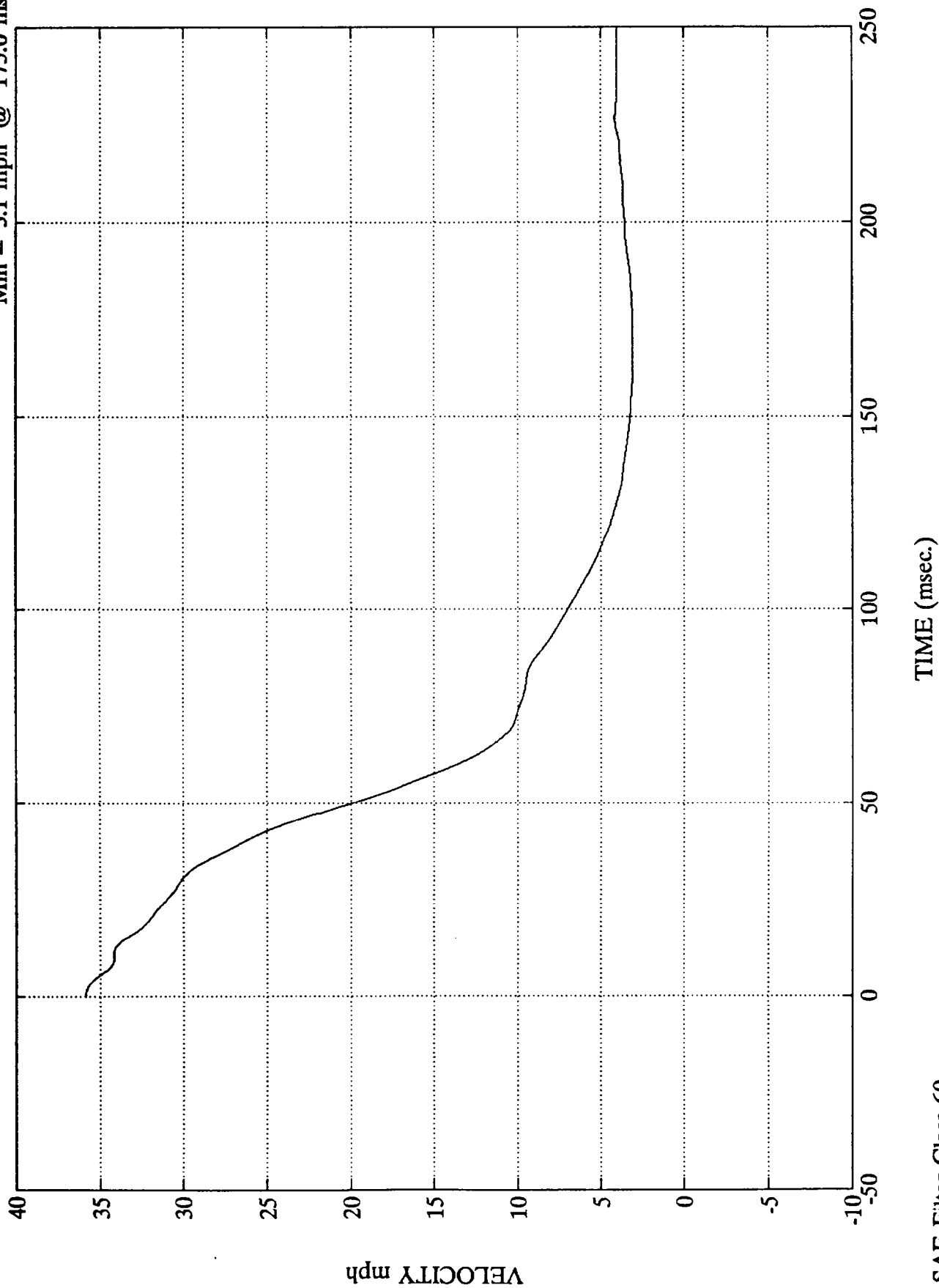


SAE Filter Class 60

Test 1025

V2 R. REAR SEAT X-MEMBER (X)

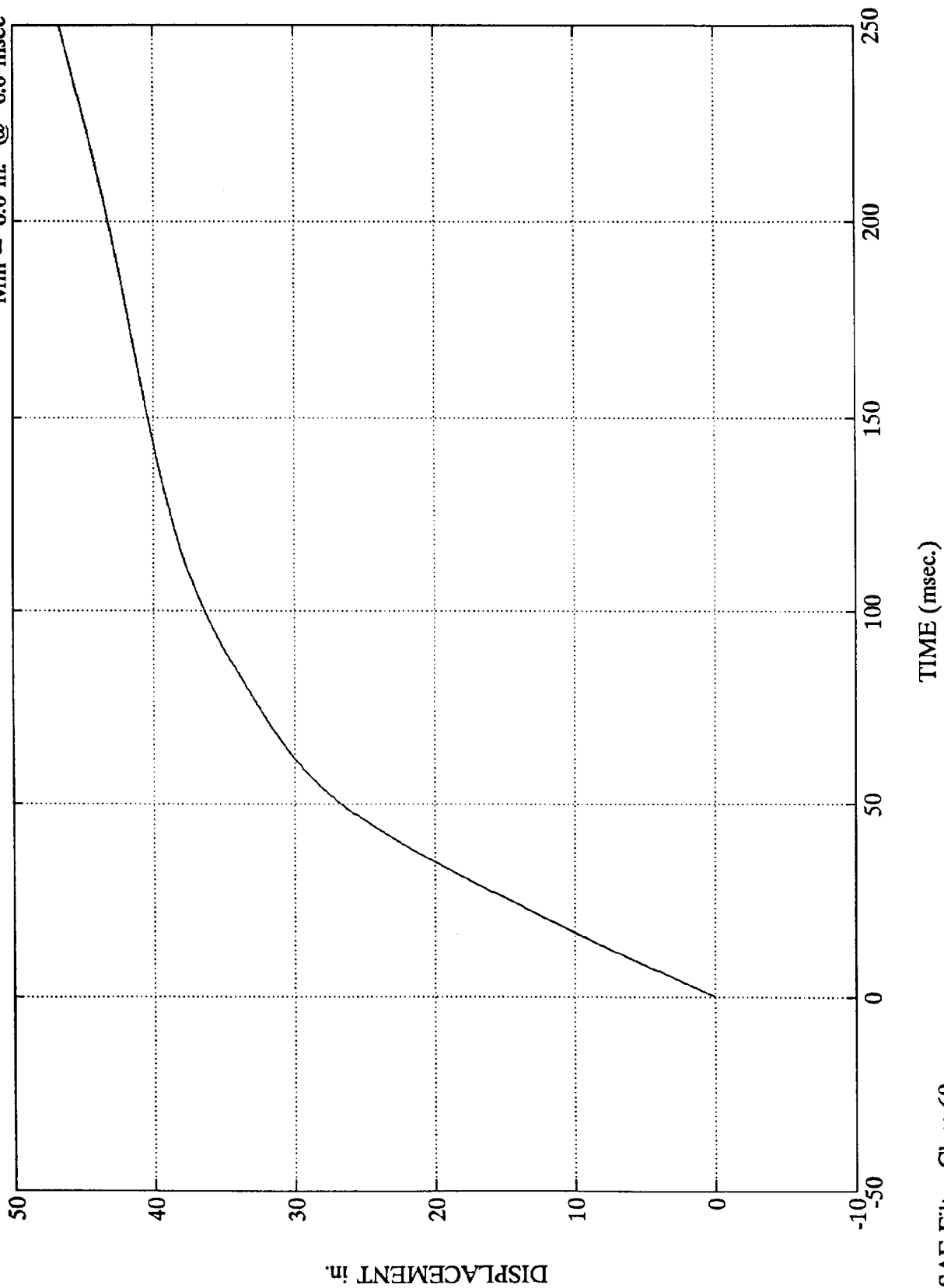
Max = 35.8 mph @ 0.7 msec
Min = 3.1 mph @ 175.0 msec



B-87

7883-1 SAE Filter Class 60

Test 1025
V2 R. REAR SEAT X-MEMBER (X)
Max = 47.0 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec



SAE Filter Class 60

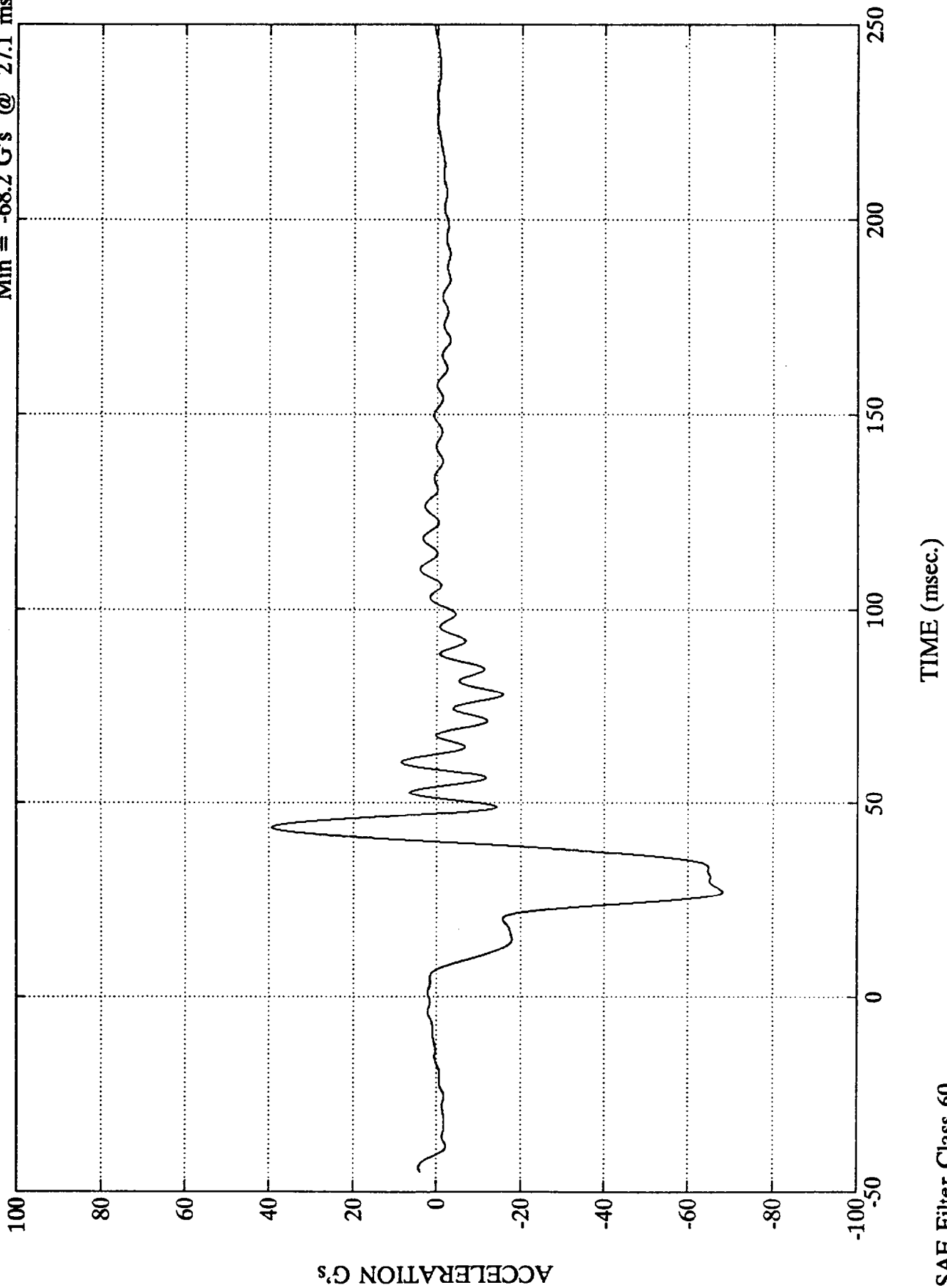
7883-1

B-88

Test 1025
Max = 39.3 G's @ 43.7 msec
Min = -68.2 G's @ 27.1 msec

V2 ENGINE TOP (X)

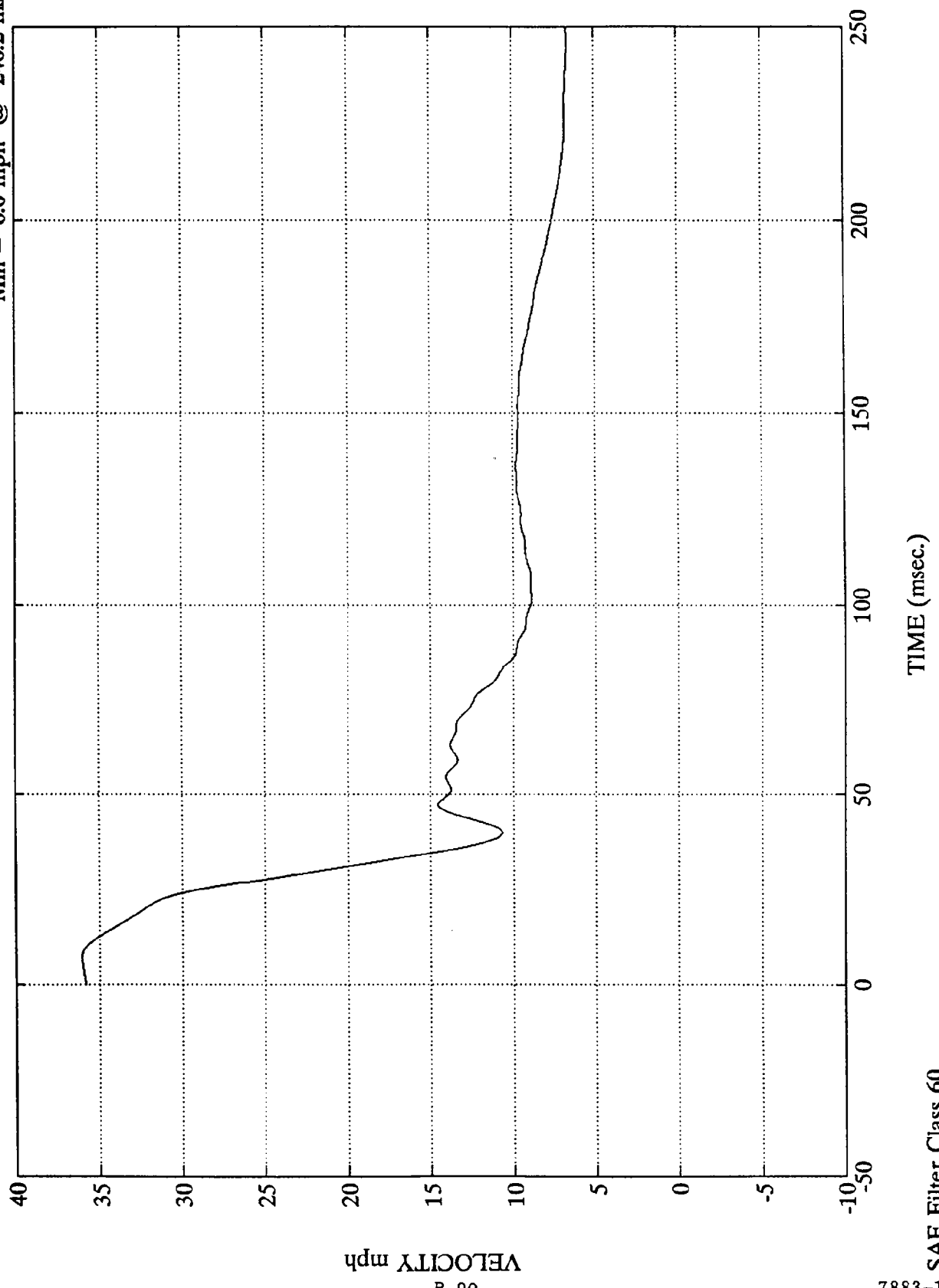
Test 1025



Max = 36.0 mph @ 7.4 msec
Min = 6.6 mph @ 246.2 msec

V2 ENGINE TOP (X)

Test 1025



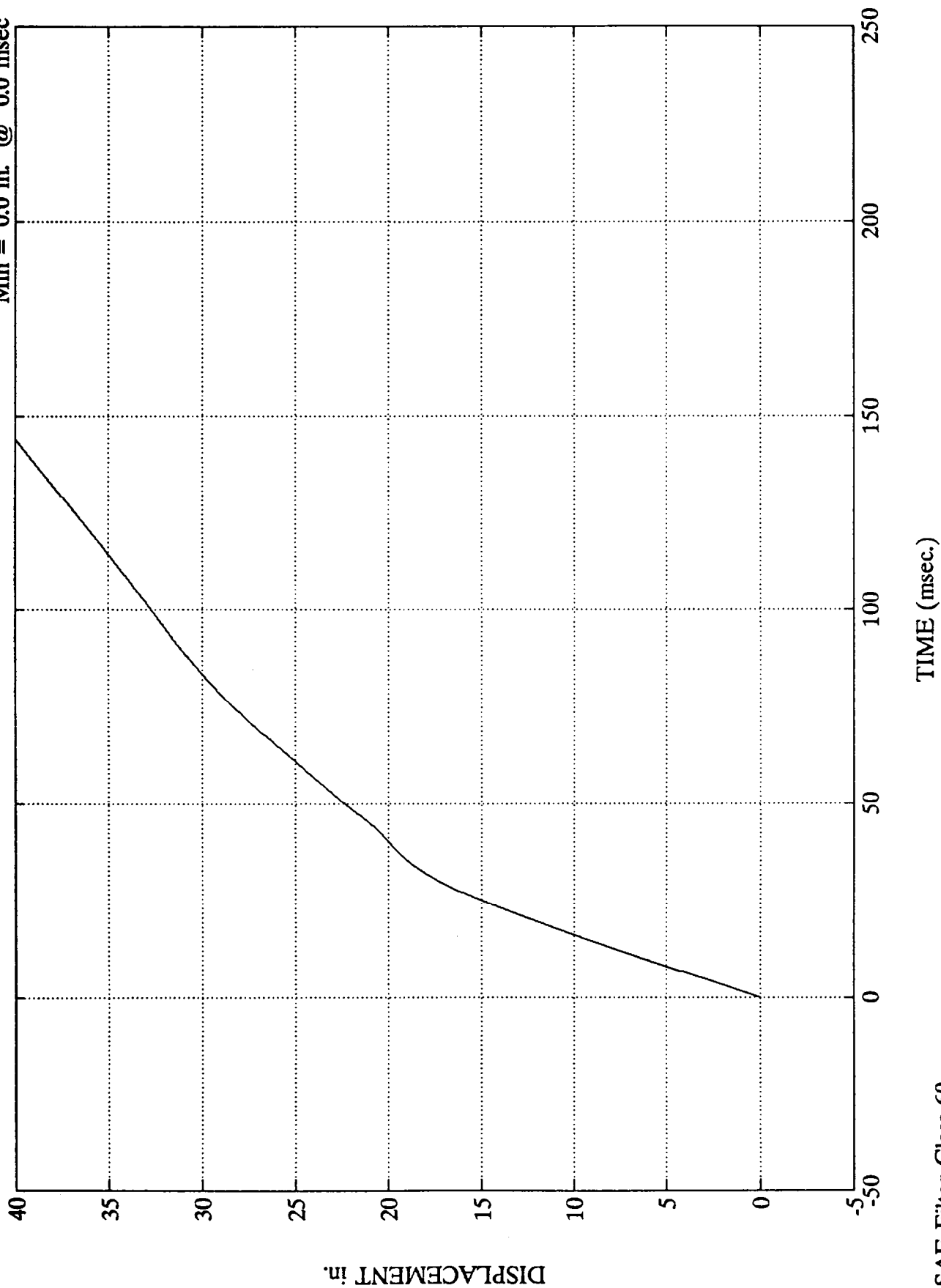
VELOCITY mph
B-90

7883-1
SAE Filter Class 60

Test 1025

V2 ENGINE TOP (X)

Max = 55.4 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec



B-91

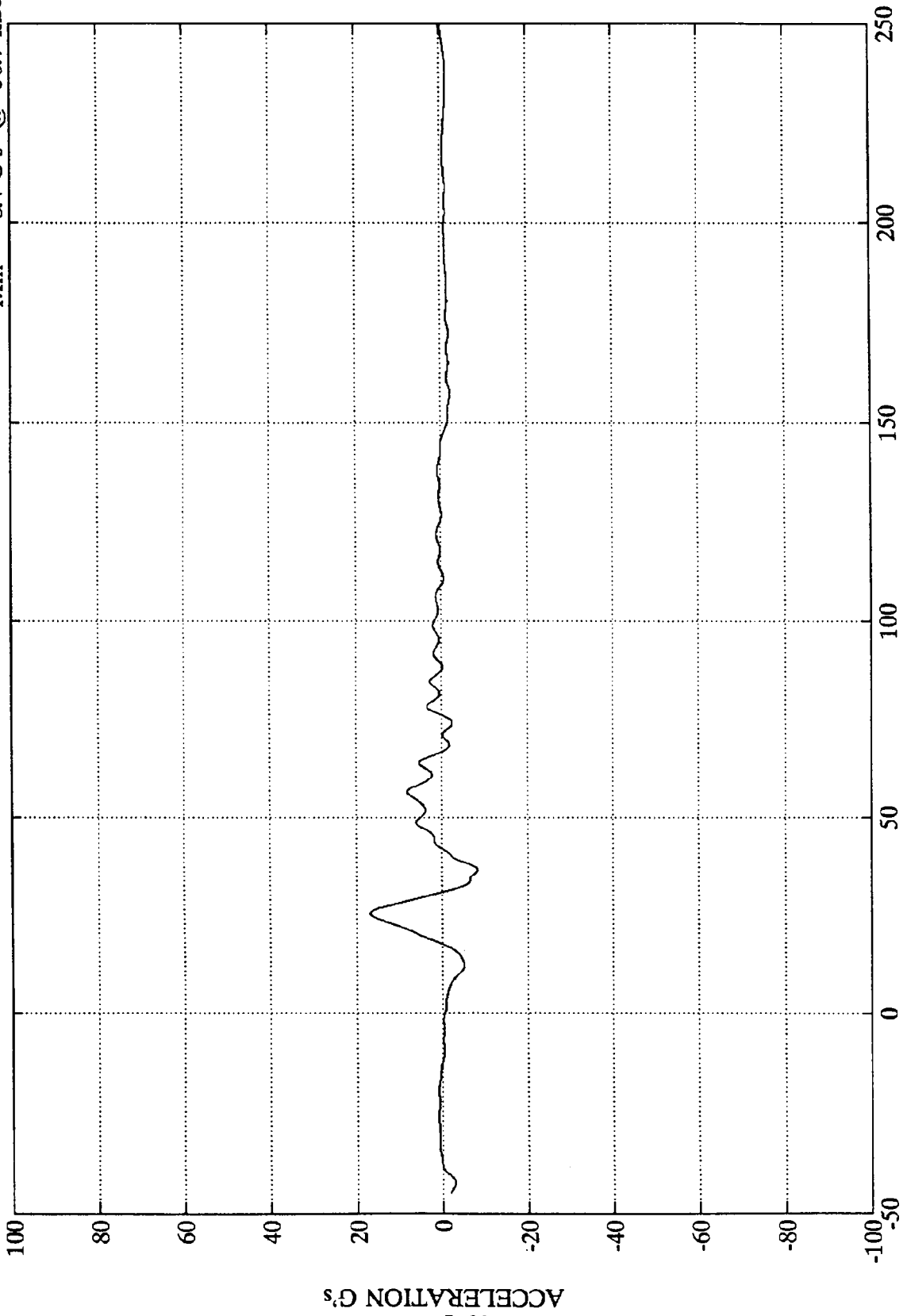
7883-1

SAE Filter Class 60

Test 1025

V2 ENGINE TOP (Z)

Max = 16.7 G's @ 25.4 msec
Min = -8.4 G's @ 36.7 msec

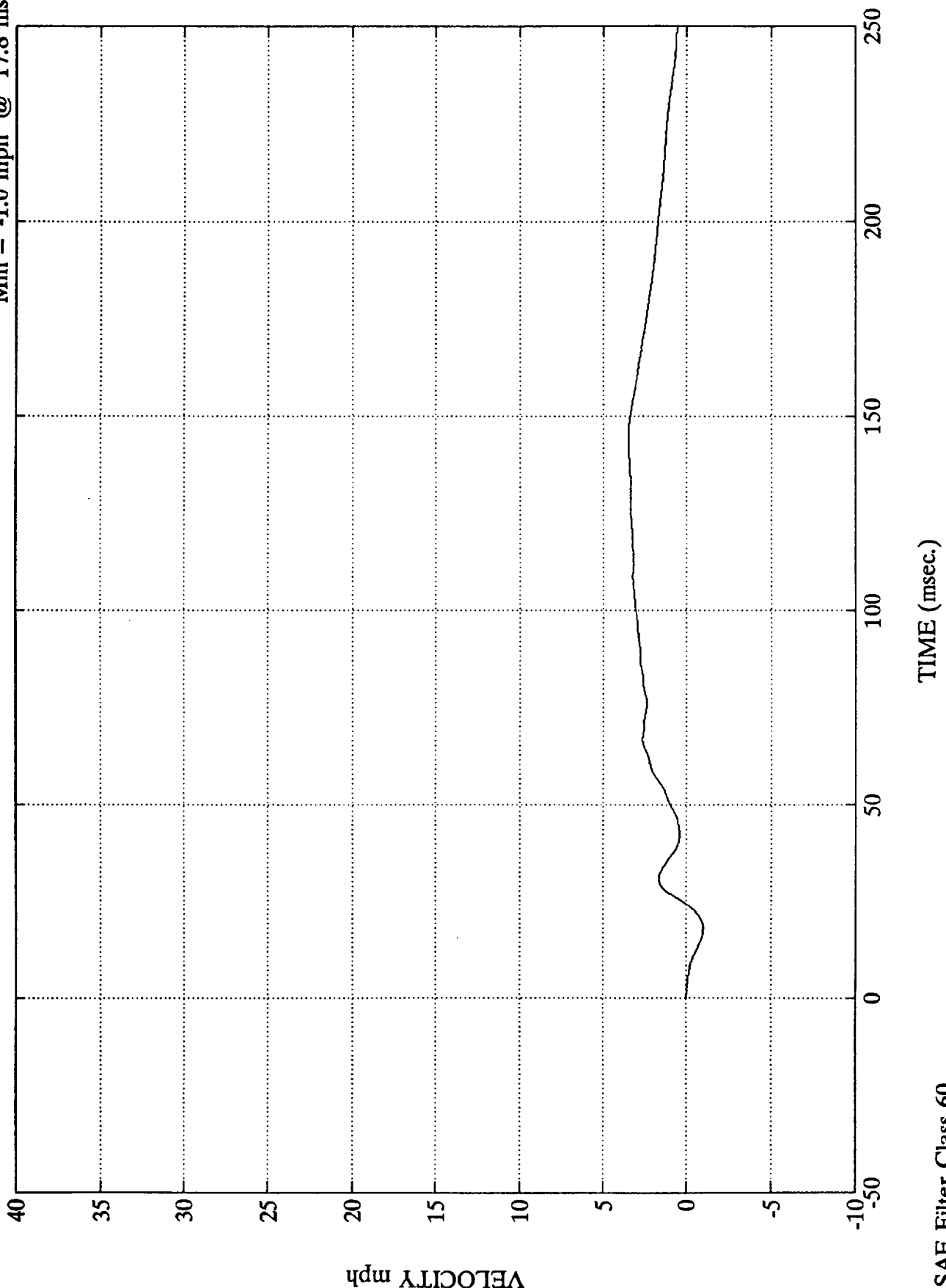


TIME (msec.)

SAE Filter Class 60

Test 1025 V2 ENGINE TOP (Z)

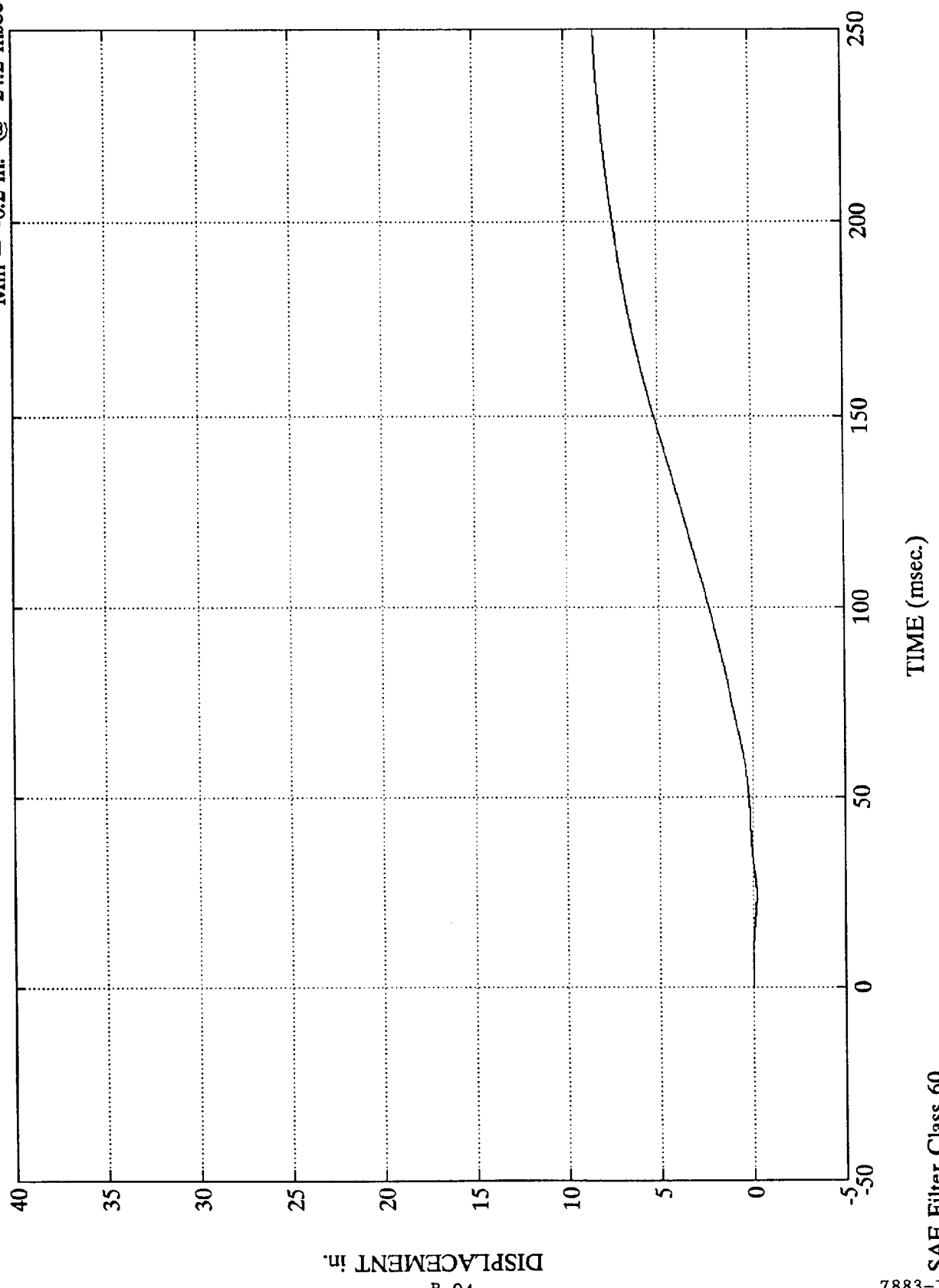
Max = 3.5 mph @ 145.4 msec
Min = -1.0 mph @ 17.8 msec



Max = 8.4 in. @ 254.9 msec
Min = -0.2 in. @ 24.2 msec

V2 ENGINE TOP (Z)

Test 1025



SAE Filter Class 60

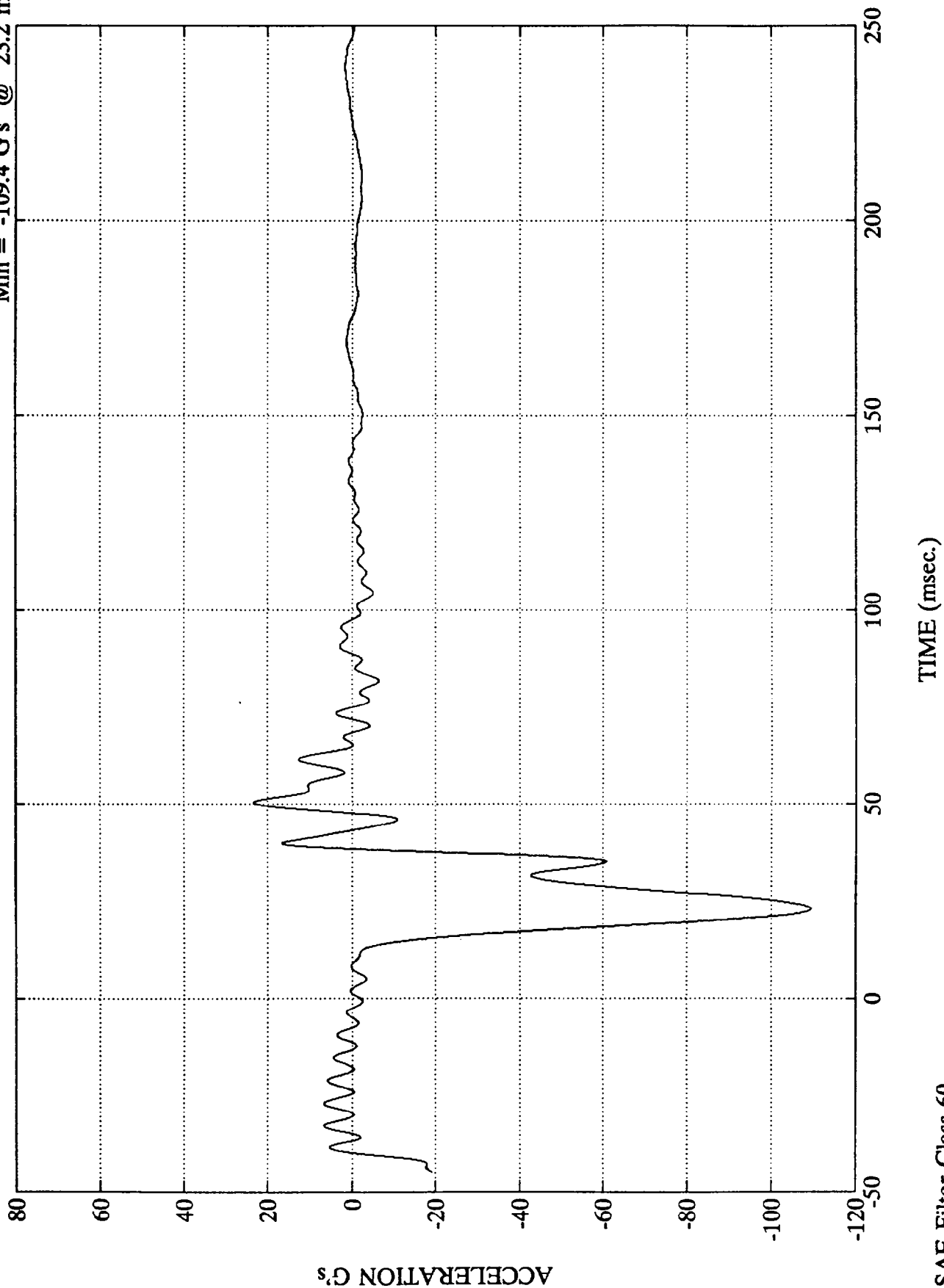
7883-1

B-94

Test 1025

V2 ENGINE BOTTOM (X)

Max = 23.4 G's @ 50.4 msec
Min = -109.4 G's @ 23.2 msec



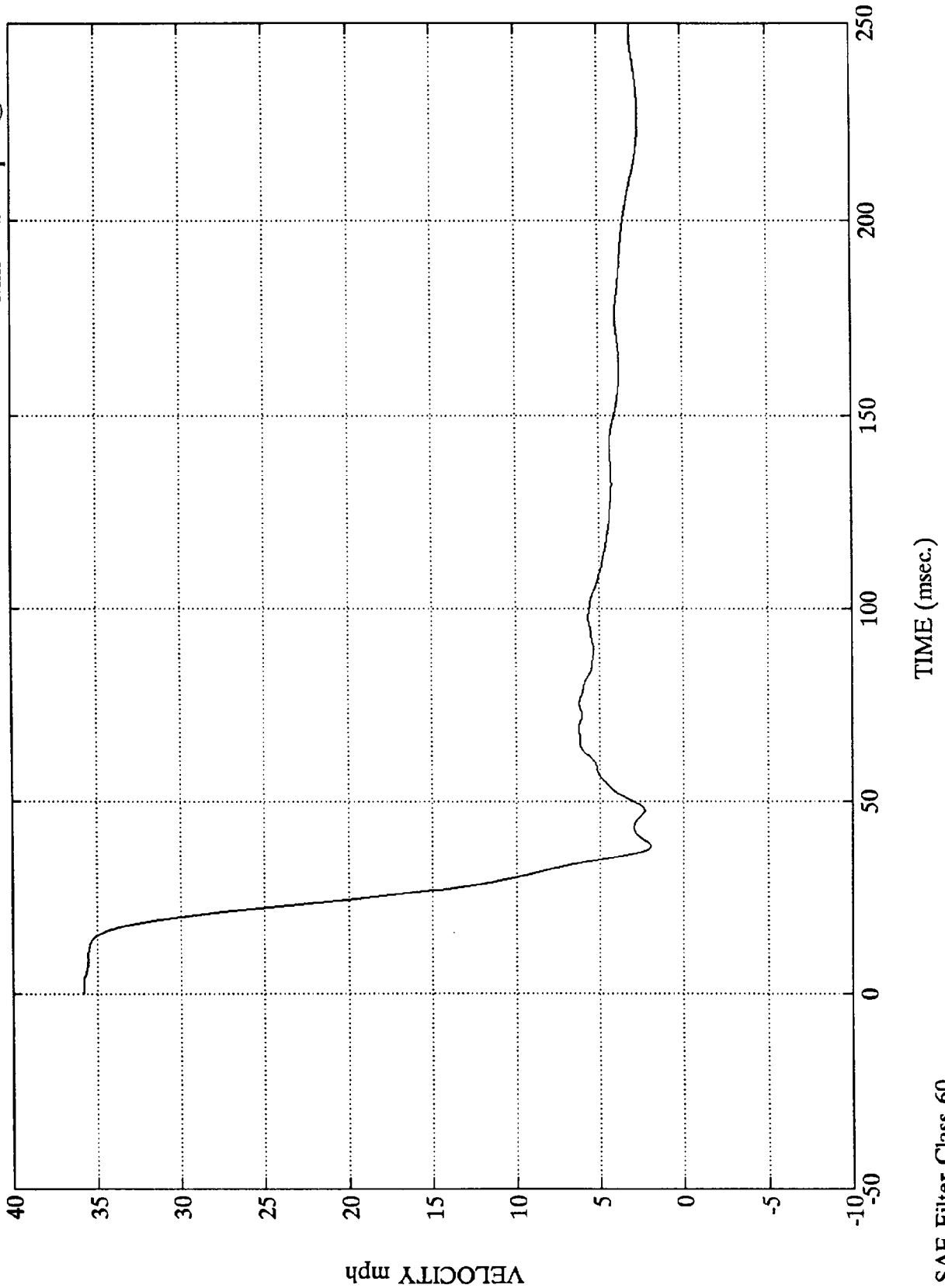
B-95

7883-1 SAE Filter Class 60

Test 1025

V2 ENGINE BOTTOM (X)

Max = 35.8 mph @ 0.0 msec
Min = 2.0 mph @ 38.6 msec

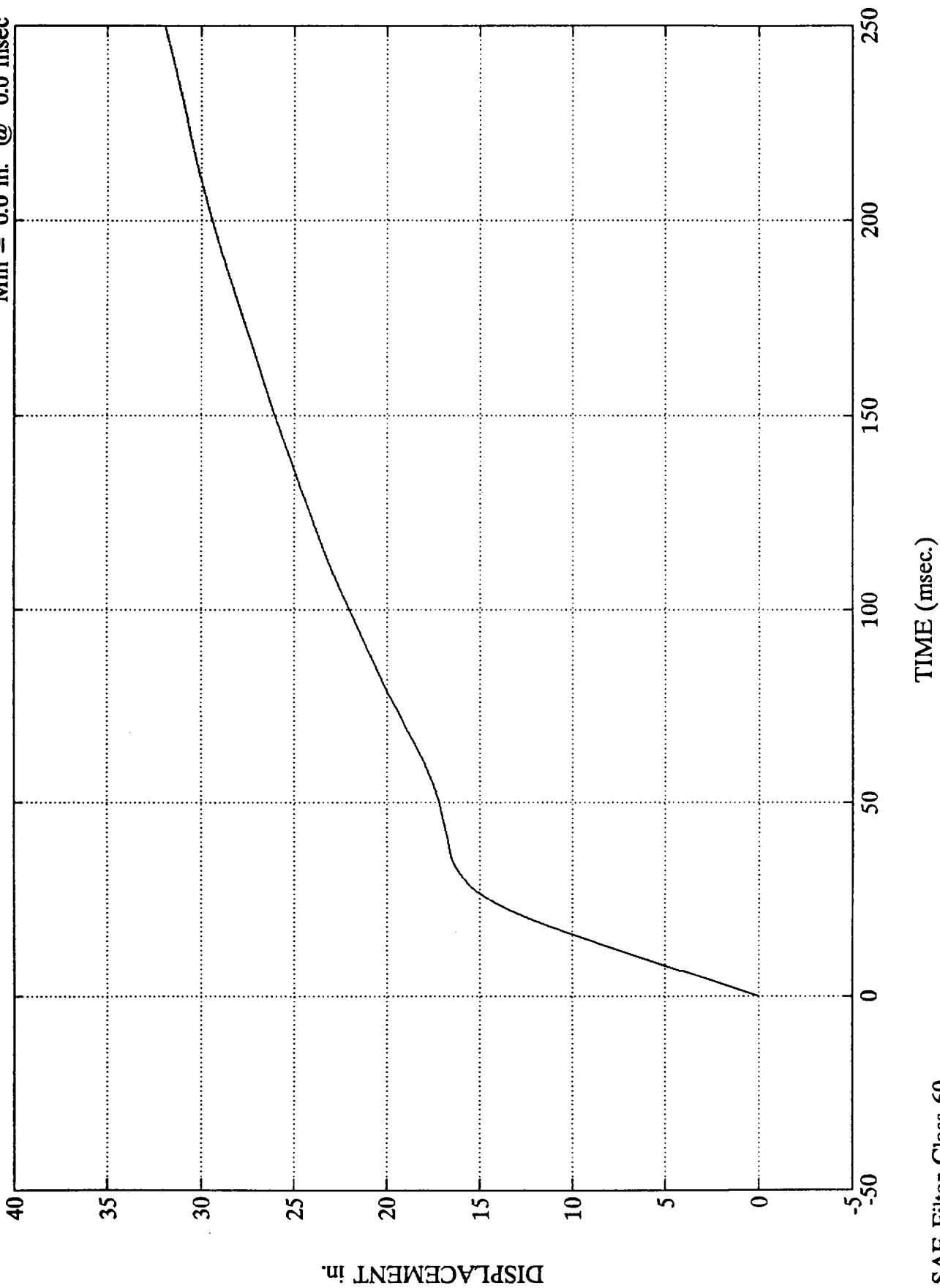


SAE Filter Class 60

Test 1025

V2 ENGINE BOTTOM (X)

Max = 32.2 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec



B-97

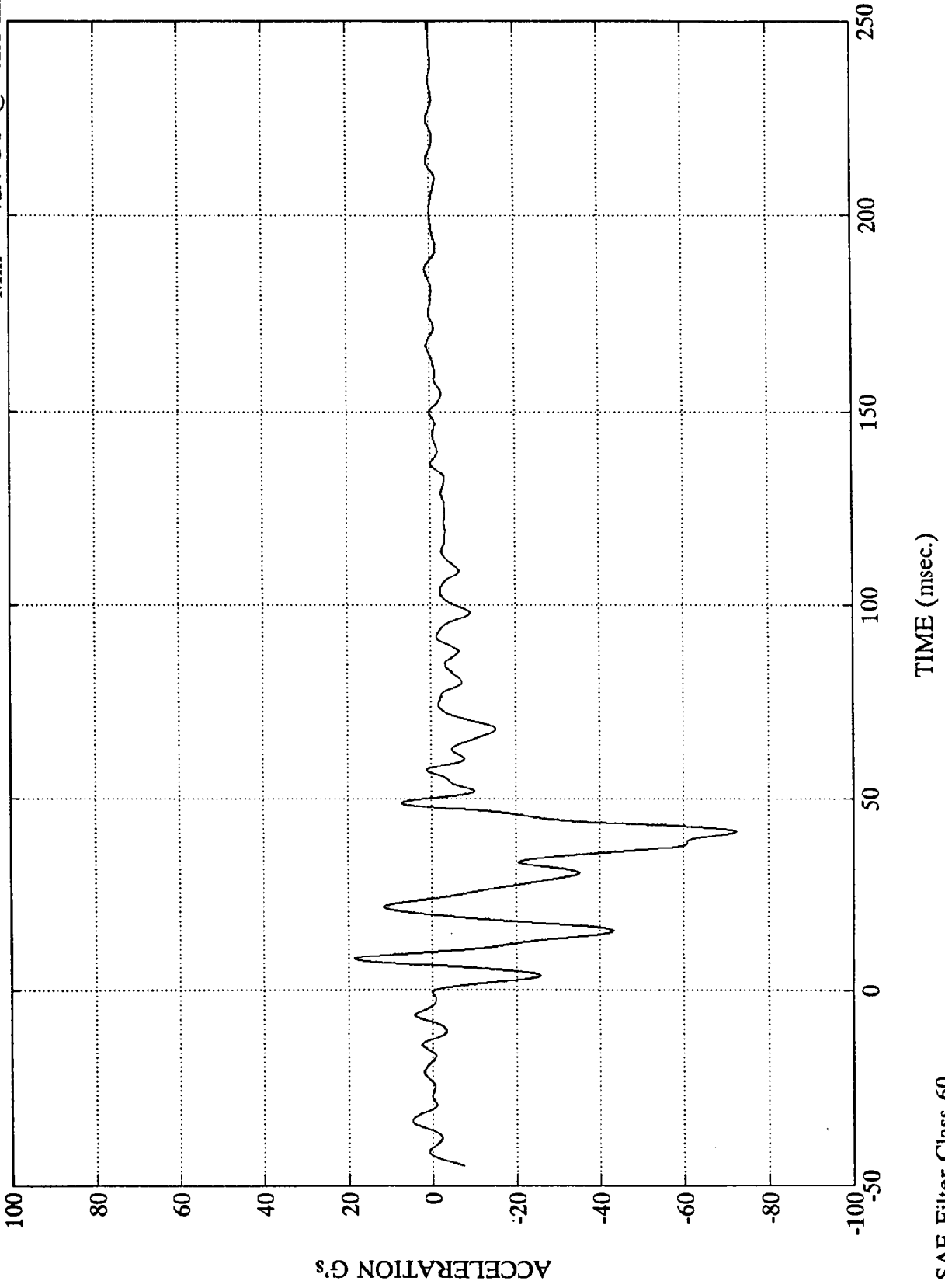
7883-1

SAE Filter Class 60

Test 1025

V2 FRONT X-MEMBER (X)

Max = 18.5 G's @ 8.3 msec
Min = -72.4 G's @ 41.6 msec



SAE Filter Class 60

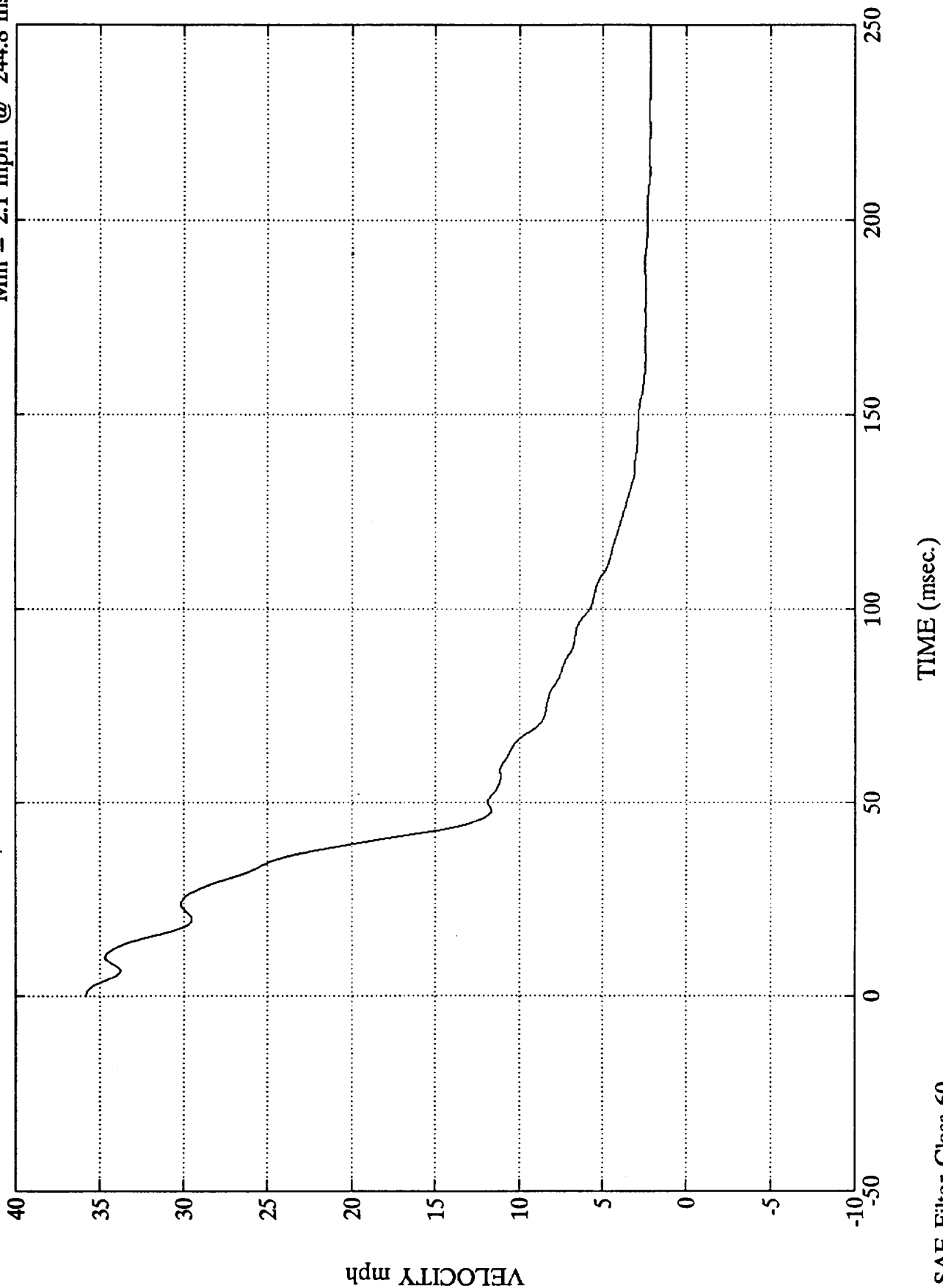
7883-1

B-98

Test 1025

V2 FRONT X-MEMBER (X)

Max = 35.8 mph @ 0.0 msec
Min = 2.1 mph @ 244.8 msec

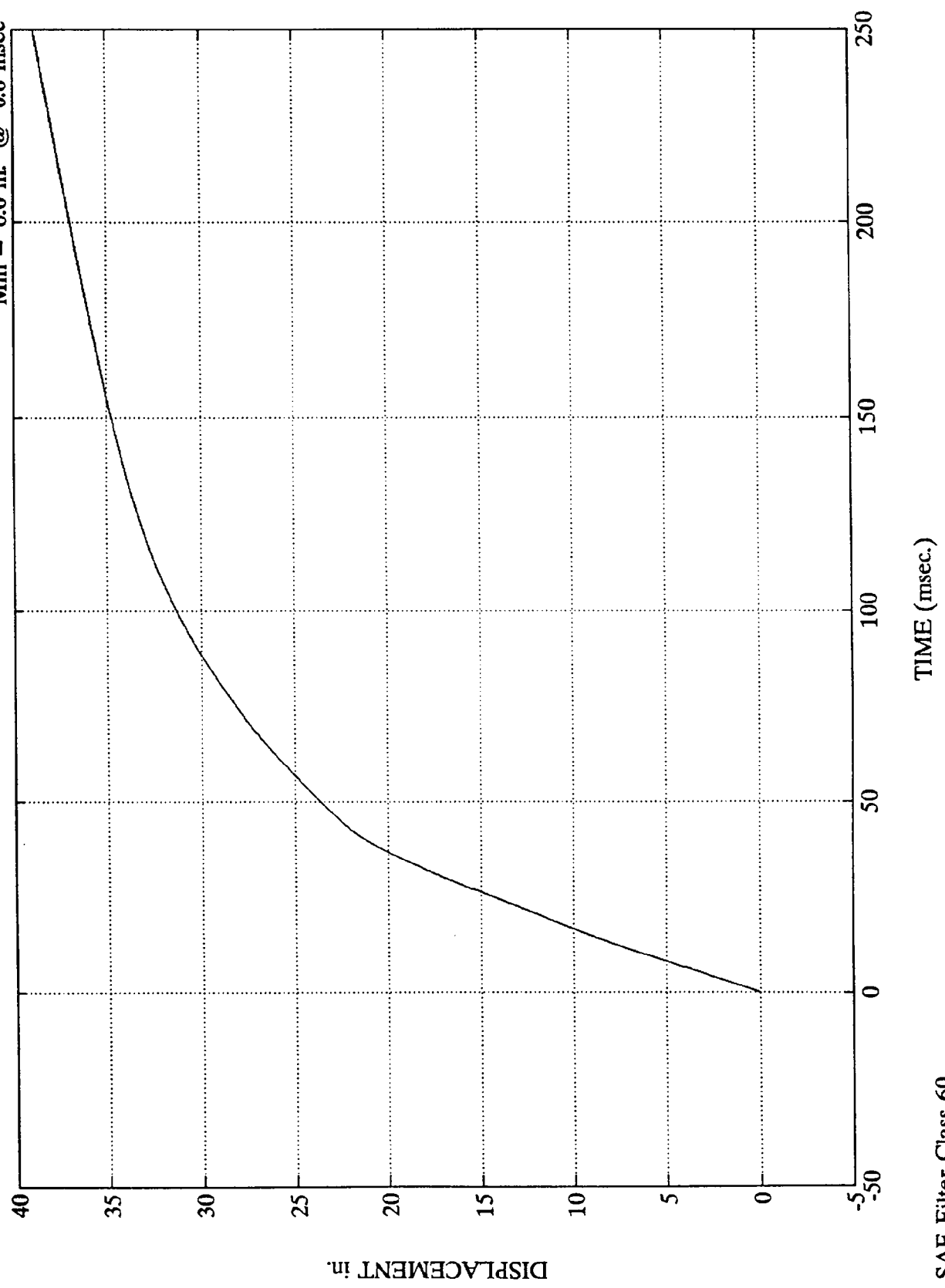


B-99

7883-1 SAE Filter Class 60

Test 1025
Max = 39.1 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec

V2 FRONT X-MEMBER (X)



SAE Filter Class 60

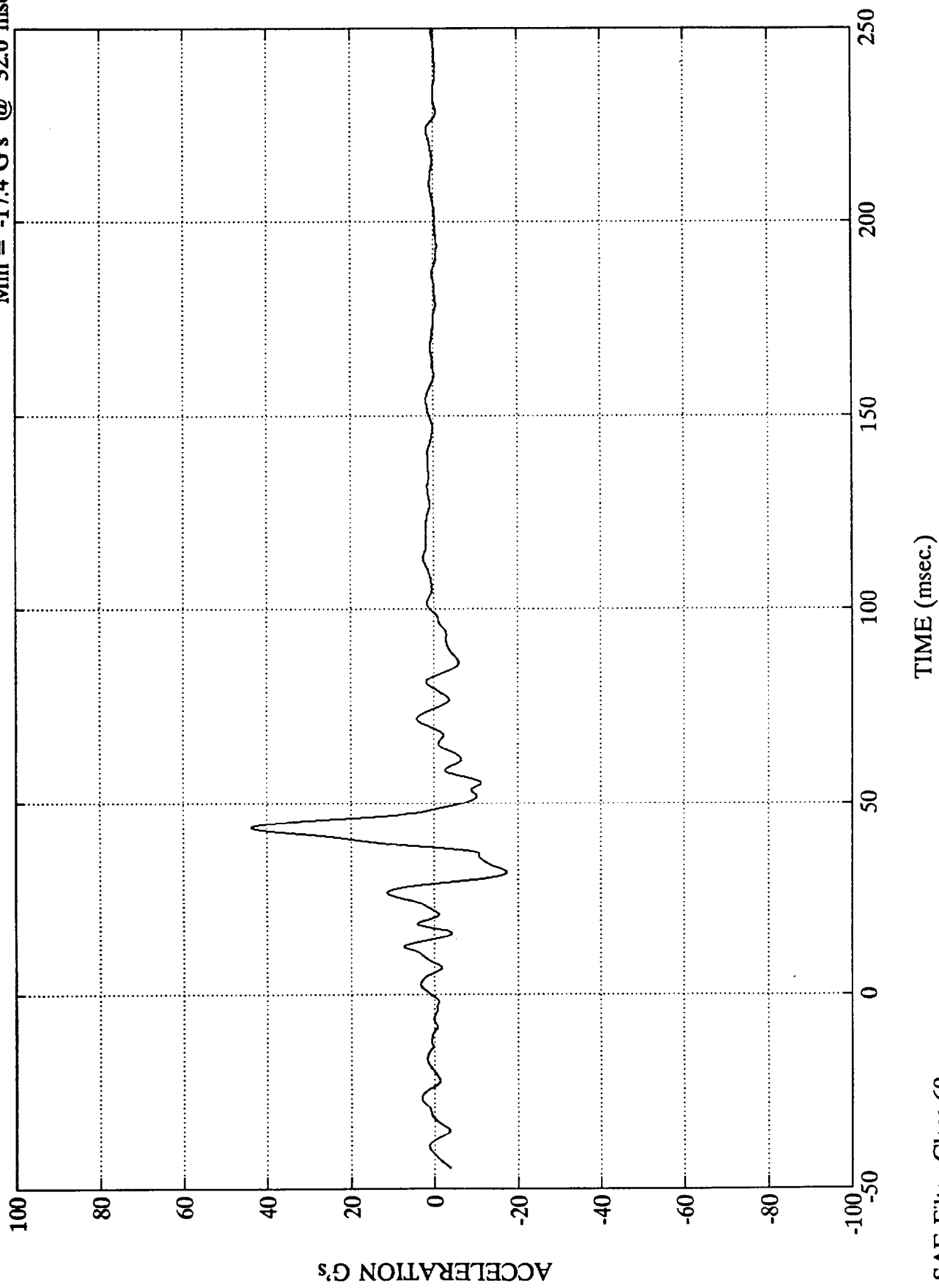
7883-1

B-100

Test 1025

V2 FRONT X-MEMBER (Z)

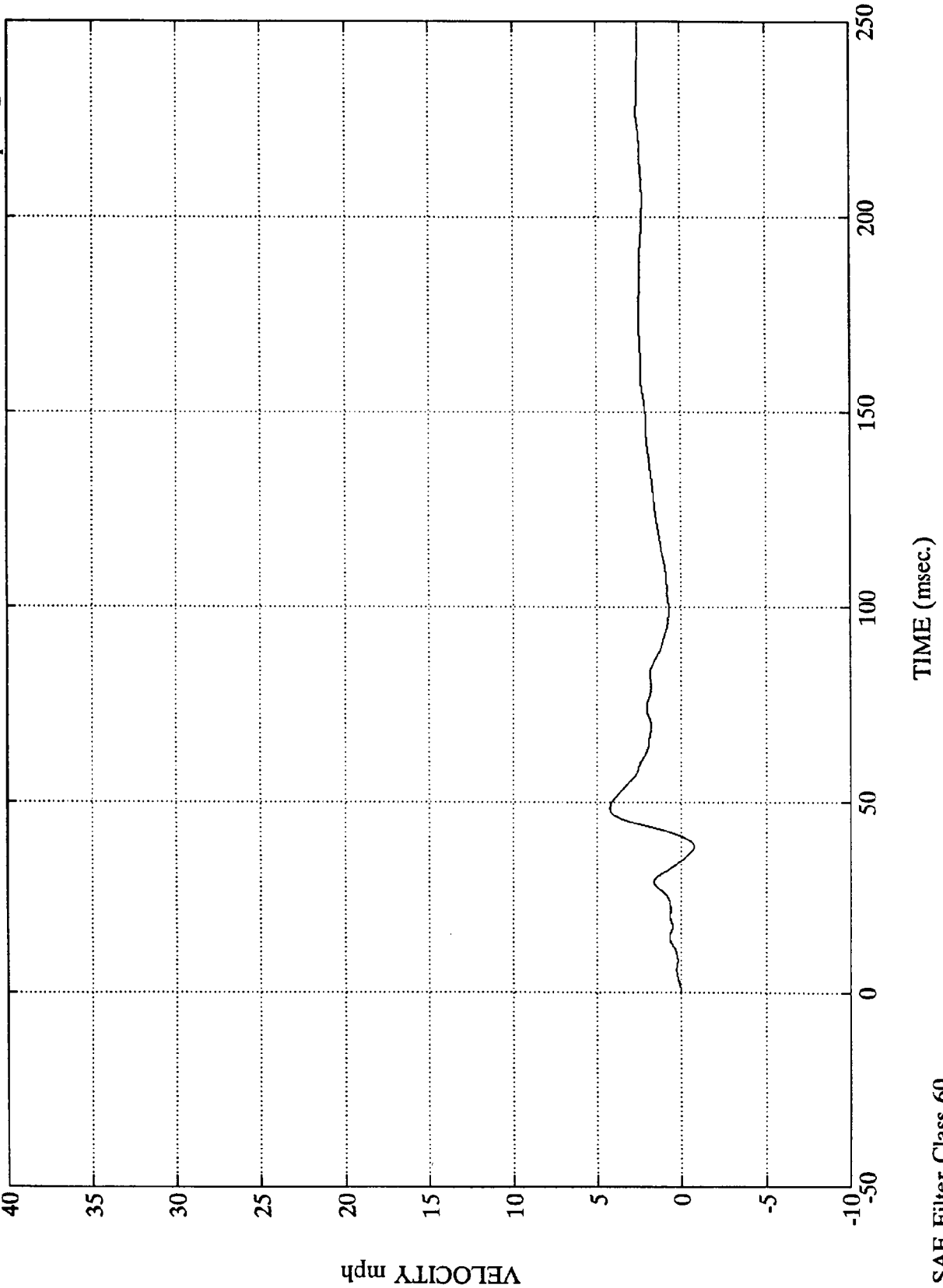
Max = 43.9 G's @ 43.7 msec
Min = -17.4 G's @ 32.0 msec



Test 1025

V2 FRONT X-MEMBER (Z)

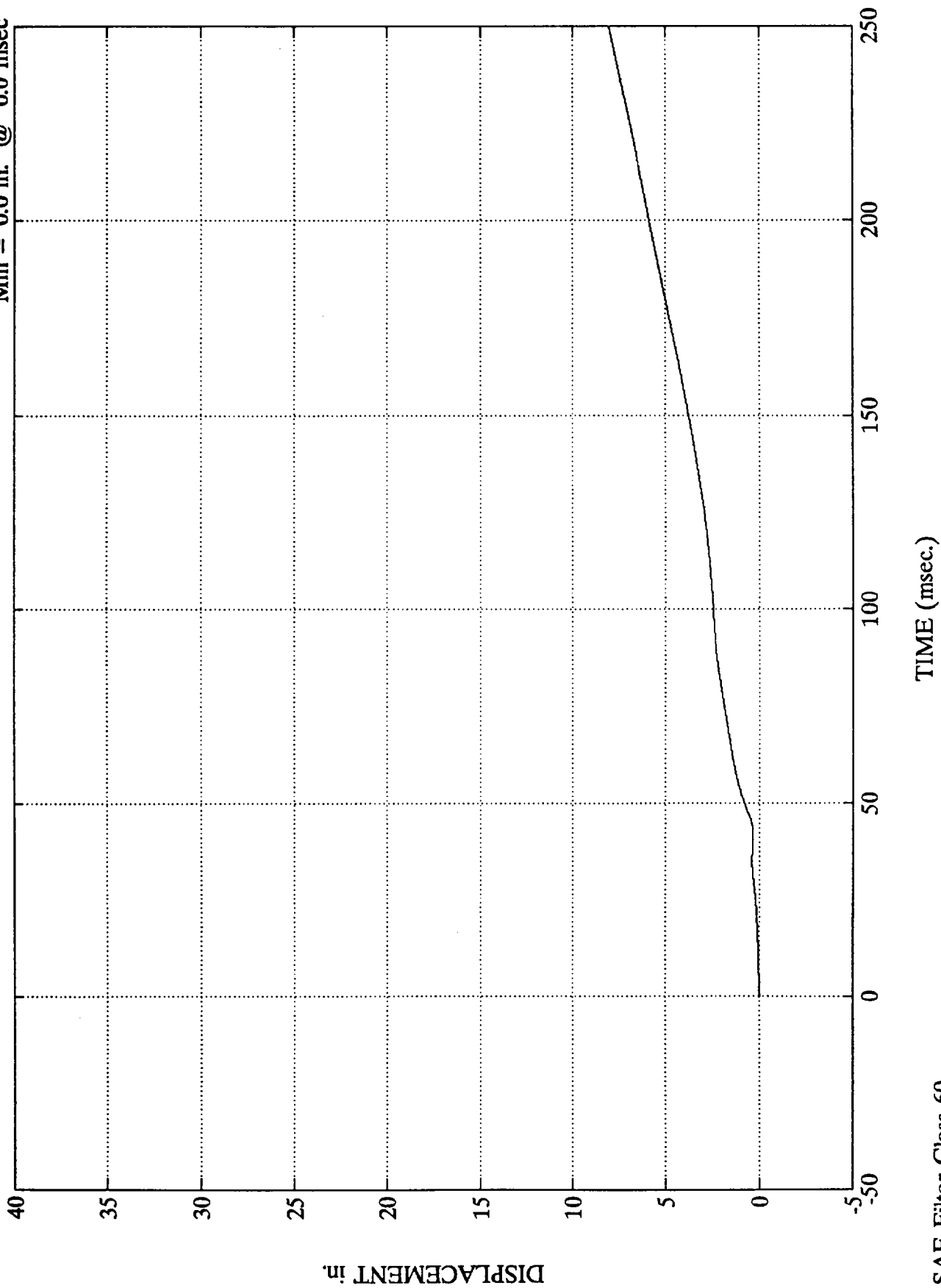
Max = 4.2 mph @ 48.7 msec
Min = -0.8 mph @ 38.6 msec



Test 1025

V2 FRONT X-MEMBER (Z)

Max = 8.3 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec



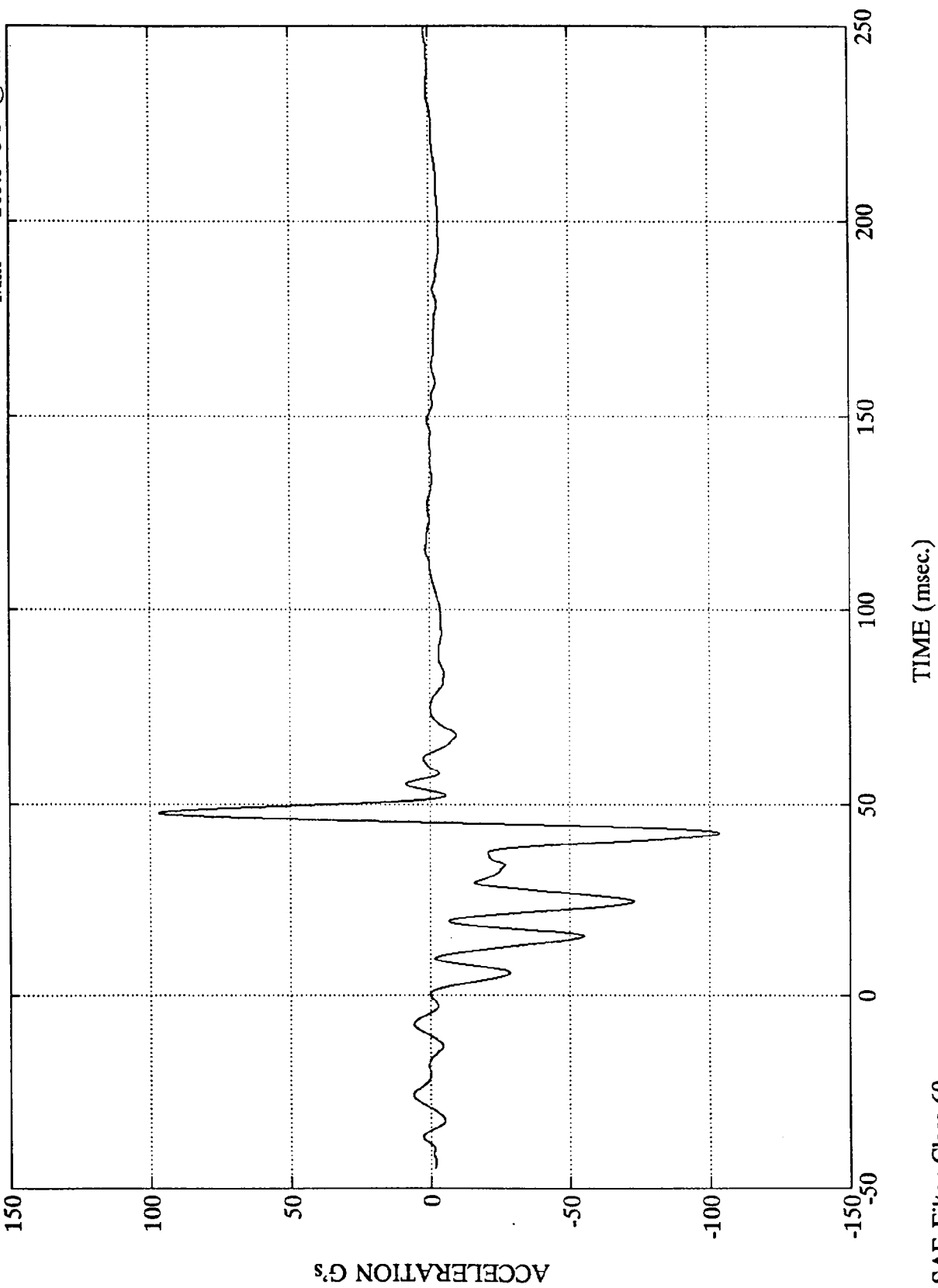
B-103

7883-1 SAE Filter Class 60

Test 1025

V2 LEFT BRAKE CALIPER (X)

Max = 96.9 G's @ 47.9 msec
Min = -103.3 G's @ 42.7 msec



SAE Filter Class 60

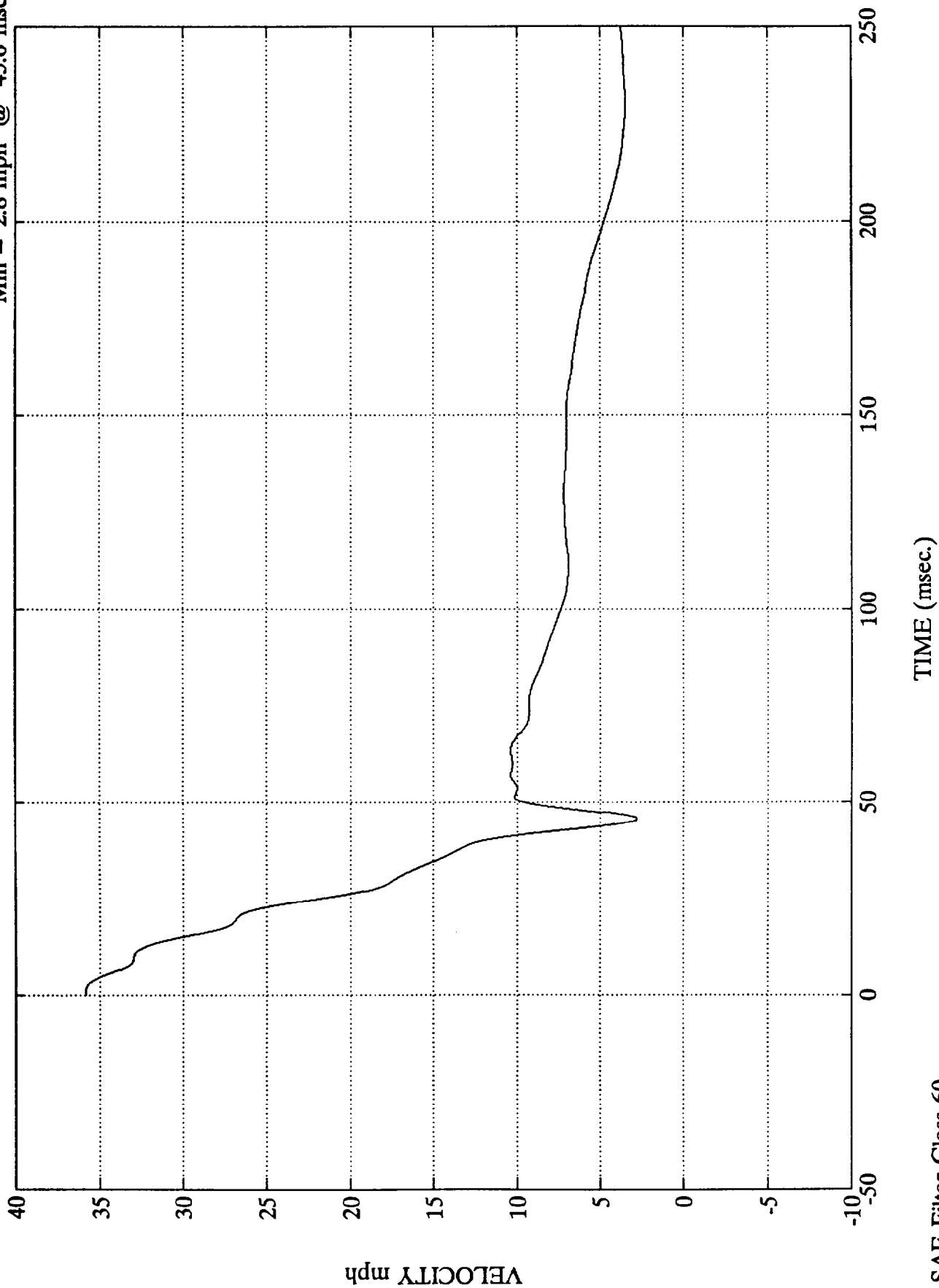
7883-1

B-104

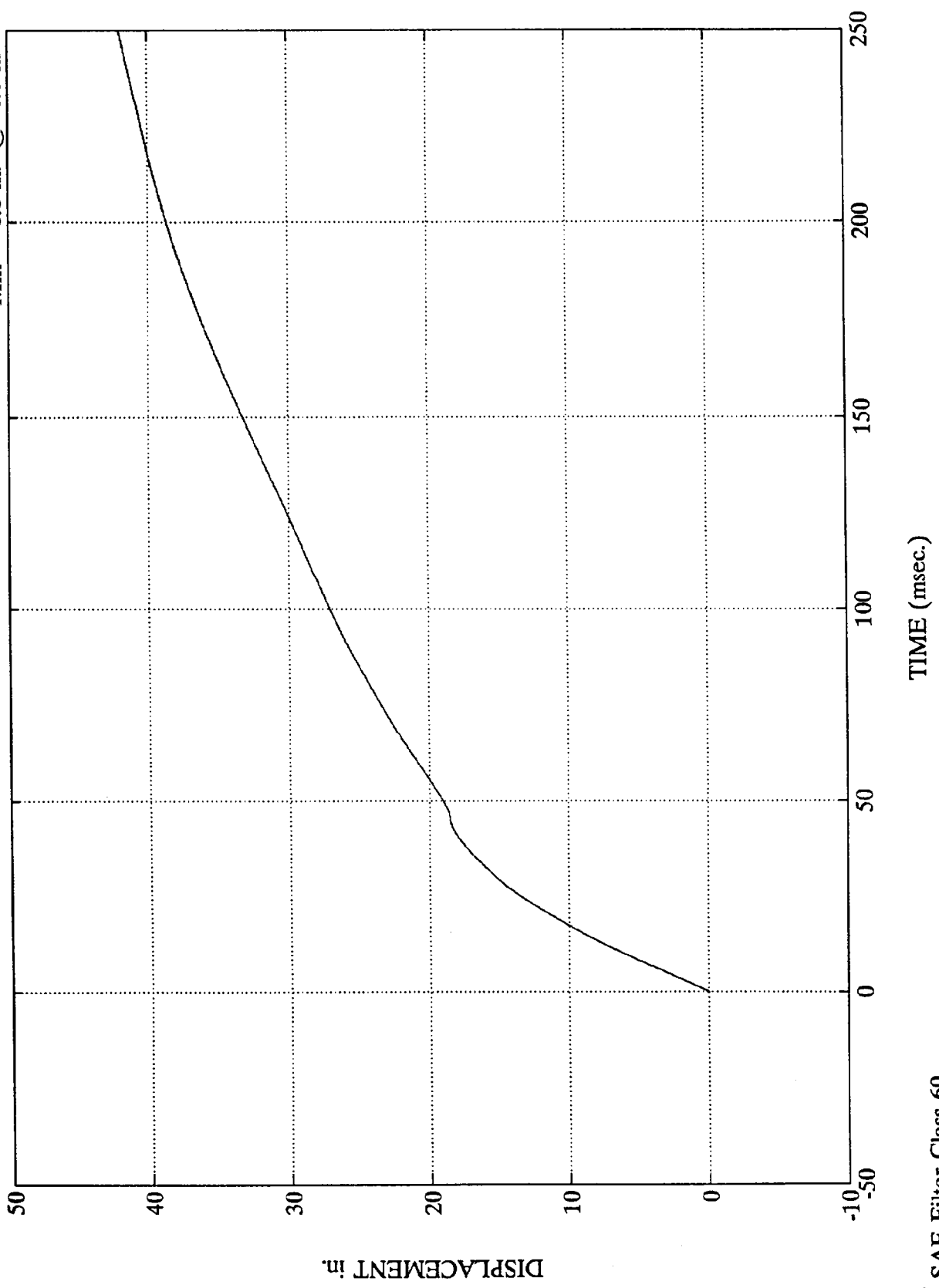
Test 1025

V2 LEFT BRAKE CALIPER (X)

Max = 35.8 mph @ 1.2 msec
Min = 2.8 mph @ 45.6 msec



Test 1025
V2 LEFT BRAKE CALIPER (X)
Max = 42.4 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec



SAE Filter Class 60

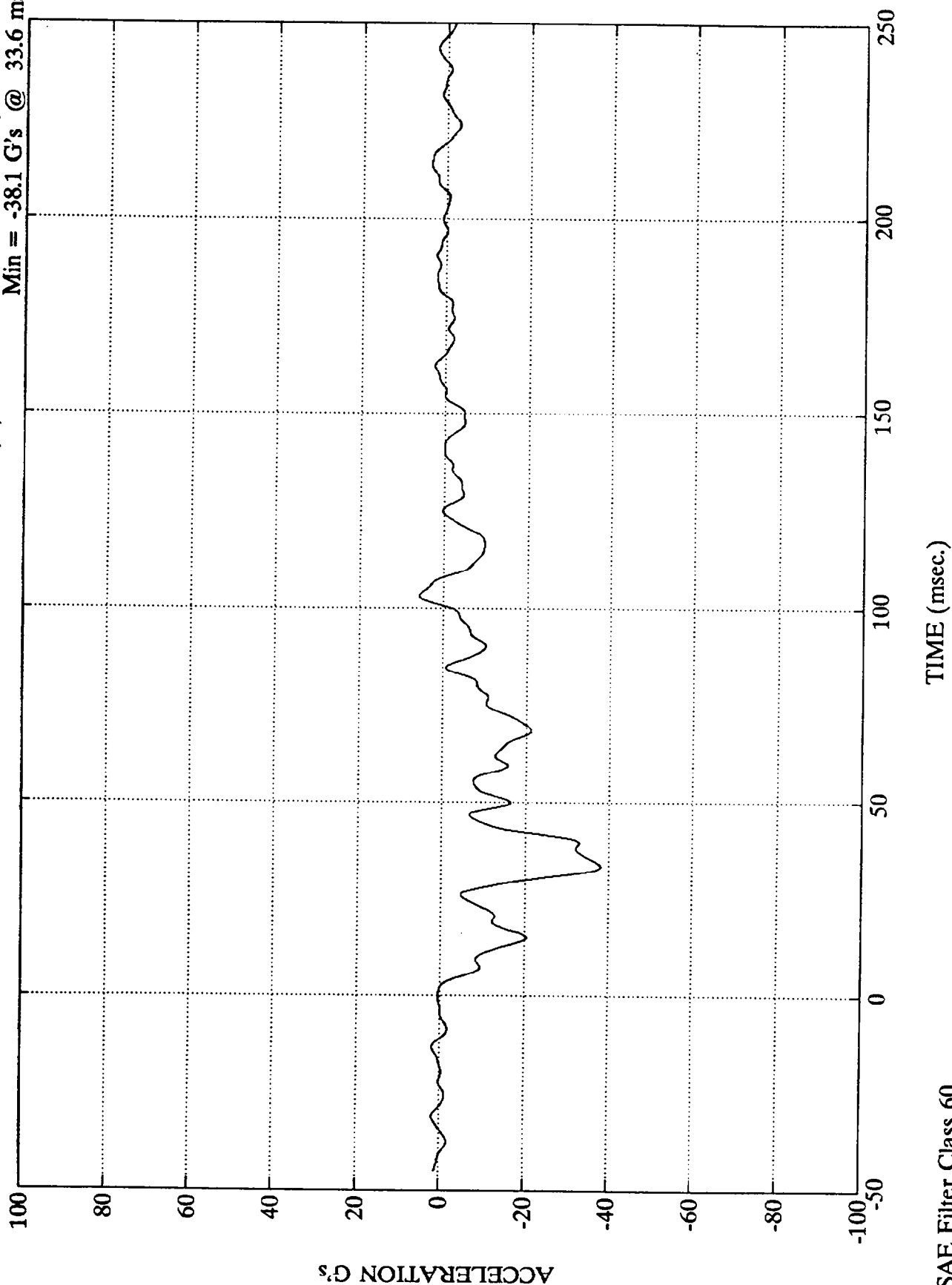
78883-1

B-106

Test 1025

V2 RIGHT BRAKE CALIPER (X)

Max = 5.7 G's @ 103.2 msec
Min = -38.1 G's @ 33.6 msec



B-107

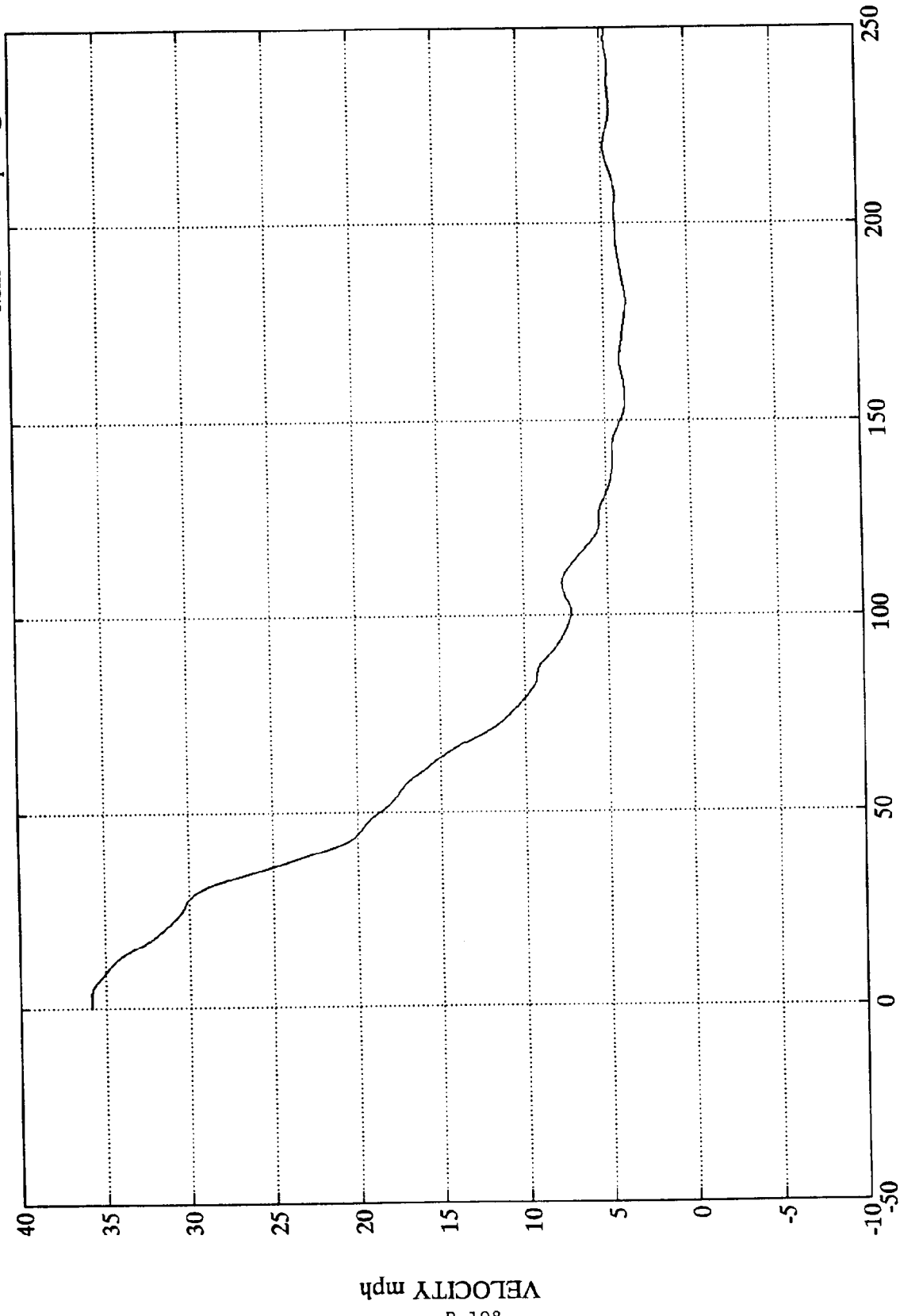
7883-1

SAE Filter Class 60

Max = 35.8 mph @ 3.1 msec
Min = 3.7 mph @ 180.0 msec

V2 RIGHT BRAKE CALIPER (X)

Test 1025



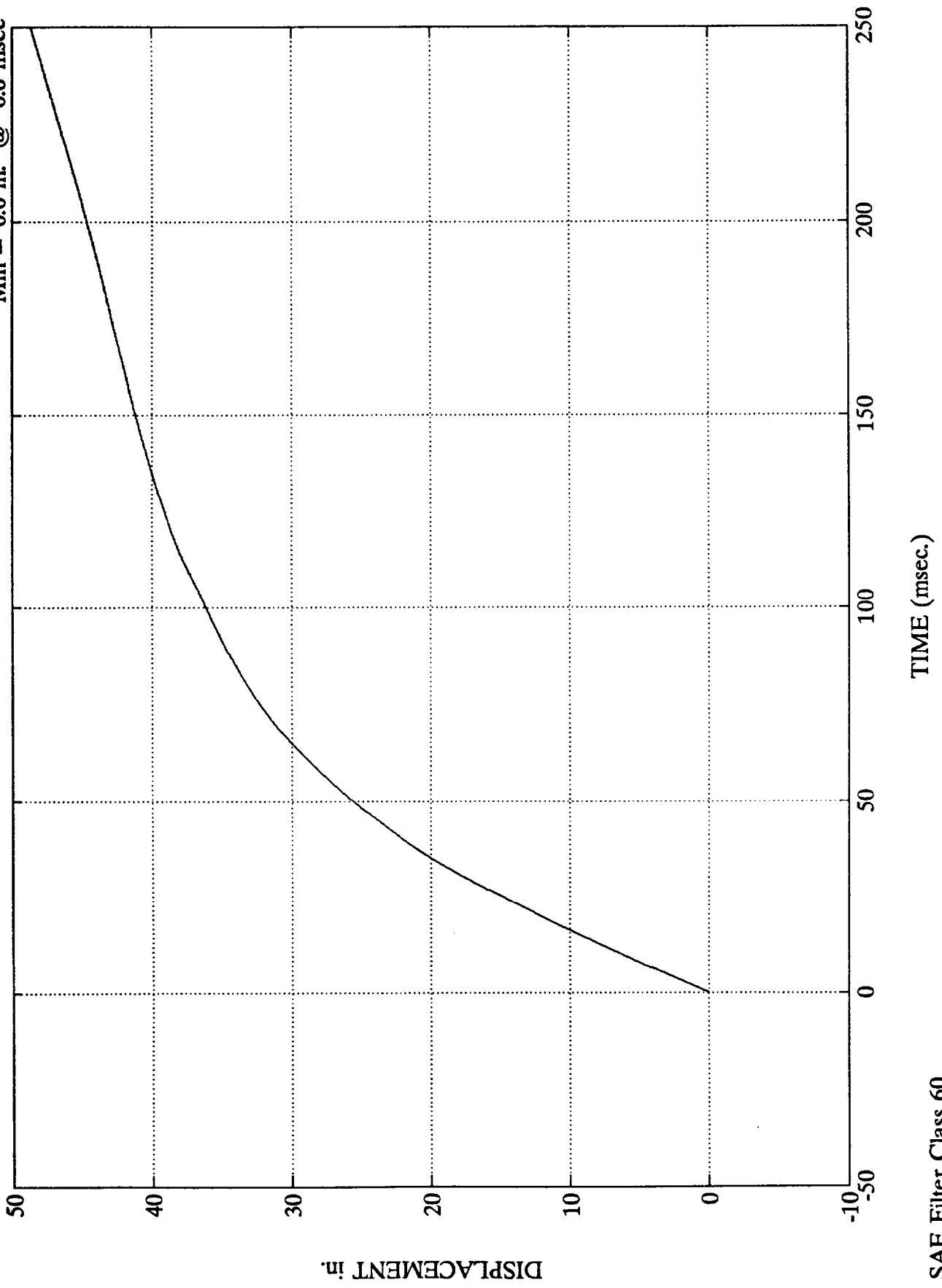
TIME (msec.)

VELOCITY mph

Test 1025

V2 RIGHT BRAKE CALIPER (X)

Max = 49.1 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec



B-109

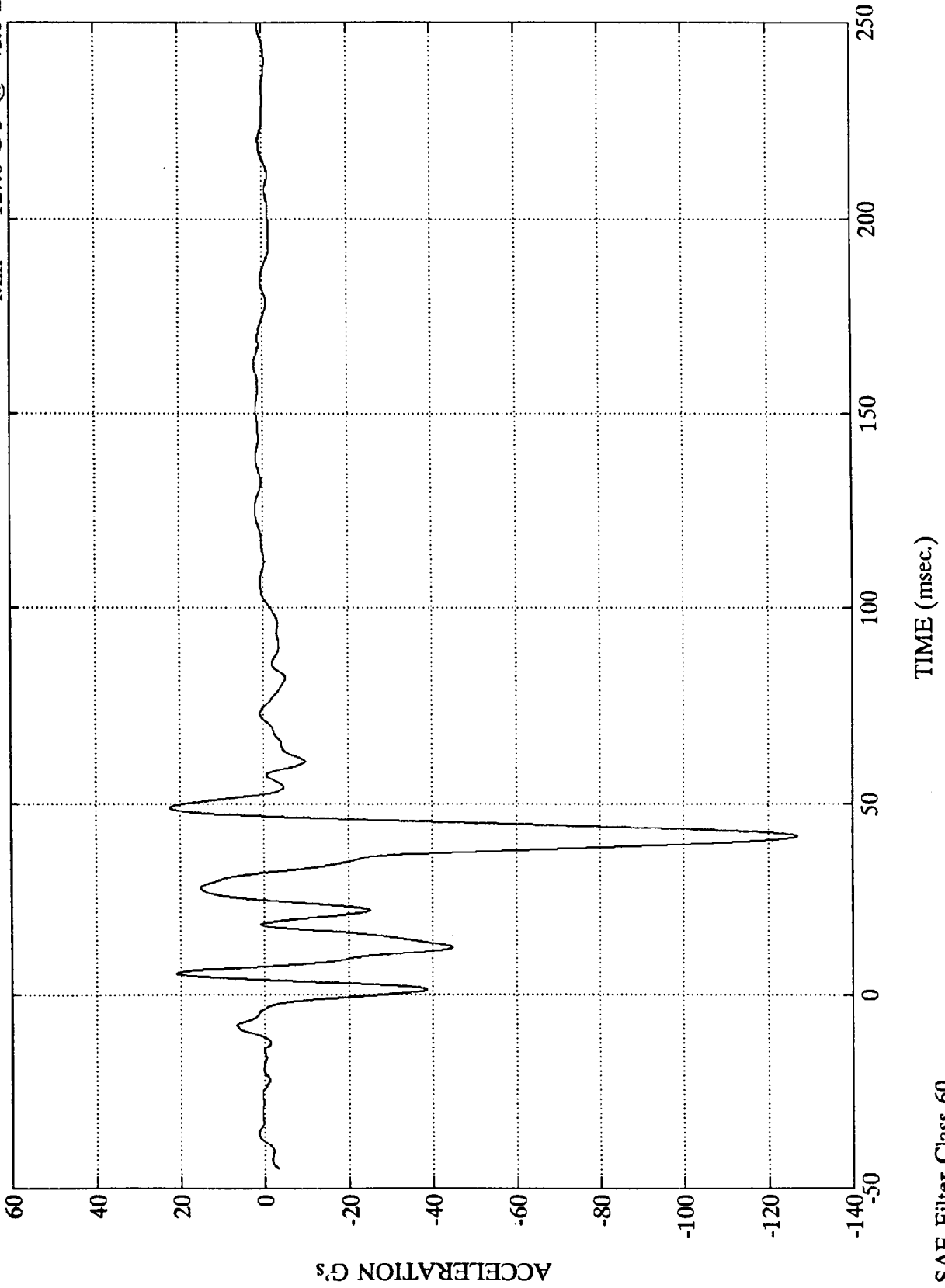
7883-1

SAE Filter Class 60

Test 1025

V2 TOE PAN (X)

Max = 22.4 G's @ 49.2 msec
Min = -127.0 G's @ 41.8 msec

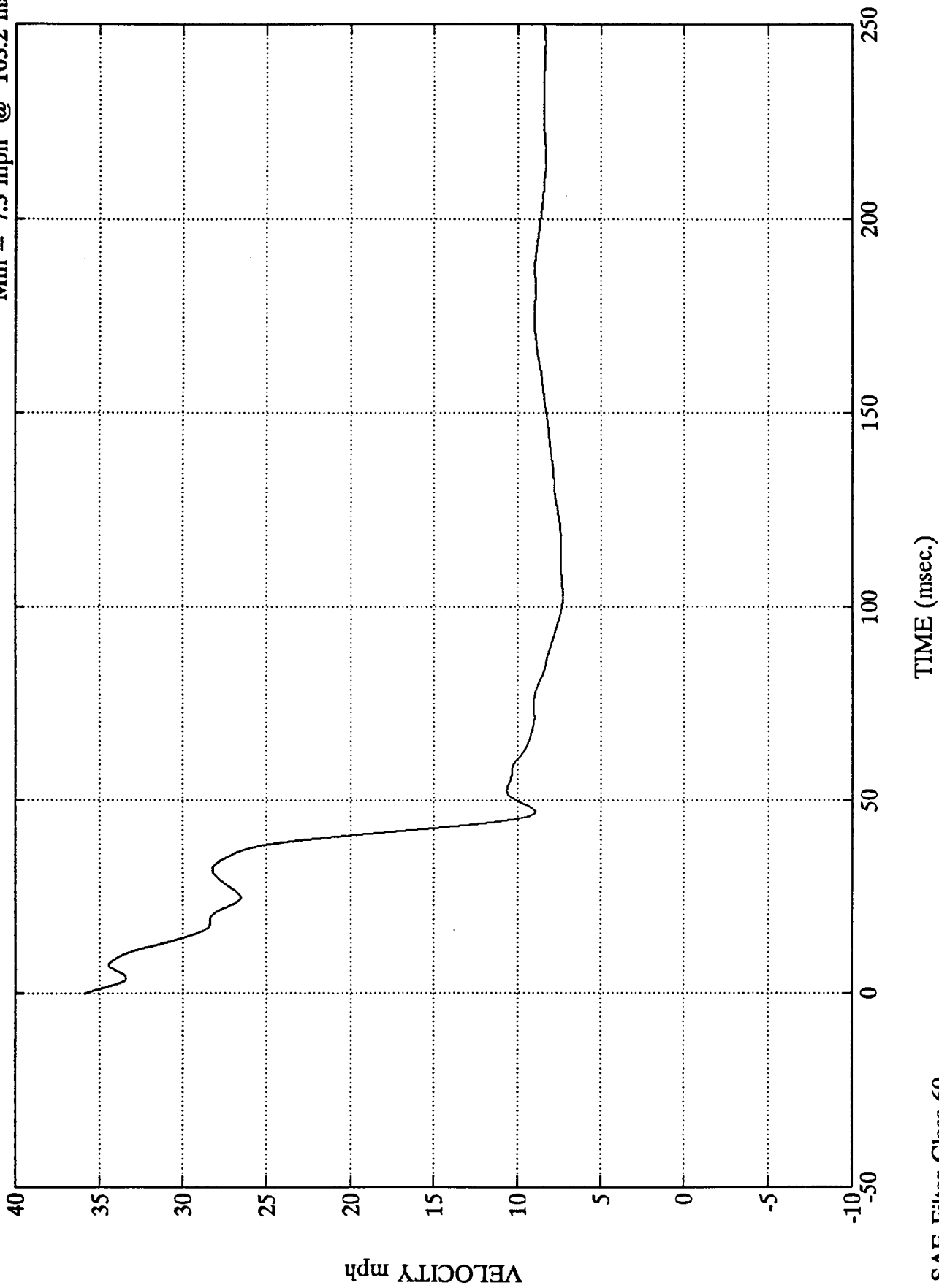


SAE Filter Class 60

Test 1025

V2 TOE PAN (X)

Max = 35.8 mph @ 0.0 msec
Min = 7.3 mph @ 103.2 msec



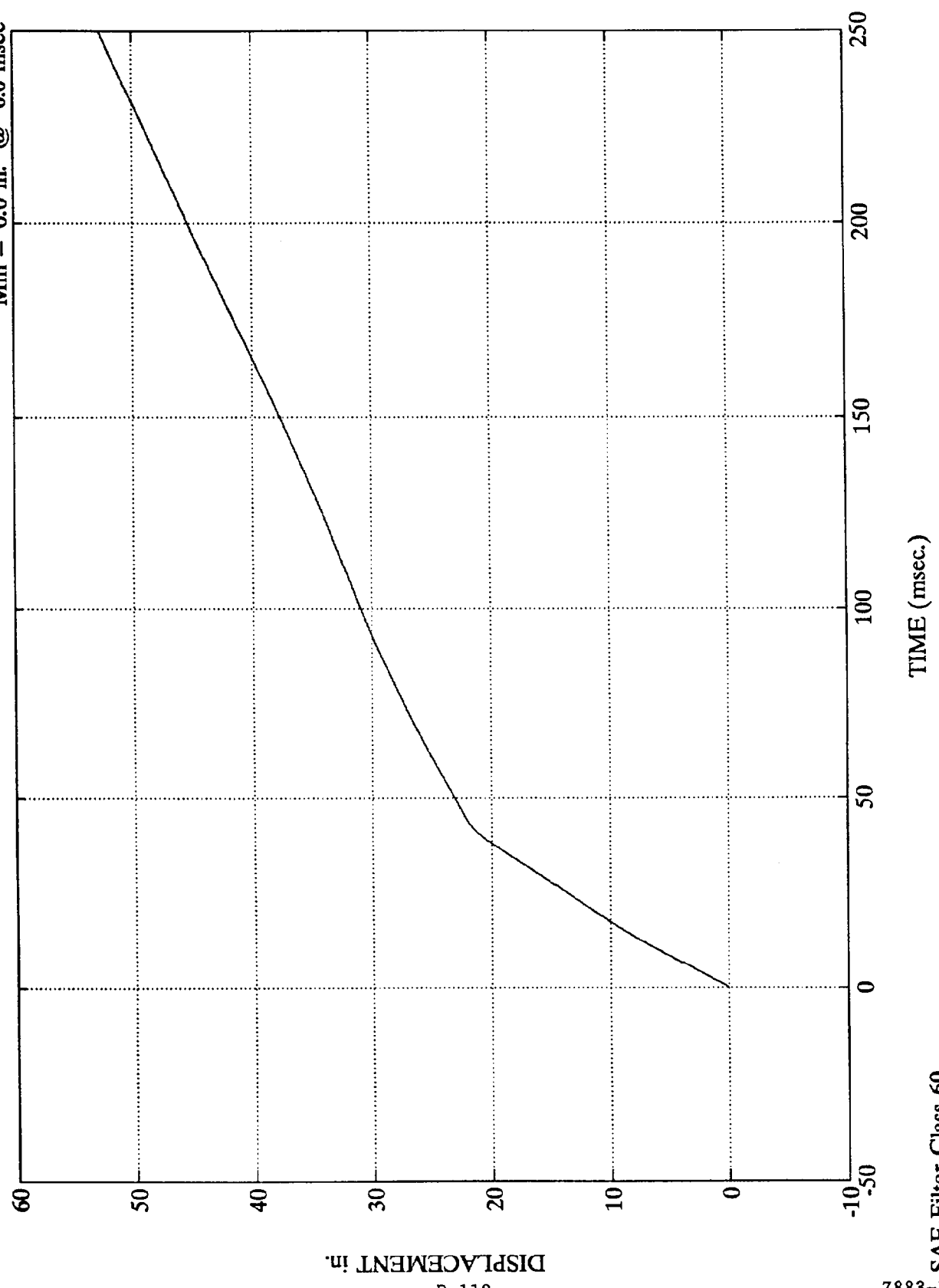
7883-1

SAE Filter Class 60

Max = 53.5 in. @ 254.9 msec
Min = 0.0 in. @ 0.0 msec

V2 TOE PAN (X)

Test 1025



B-112

TEST NO. Y42-1-1025

DUMMY DATA

CLASS	FILTER CHANNEL
Head Accelerations	1000
Chest Accelerations	180
Femur Forces	600
Torso Belt	60
Chest Displacement	180
Neck Forces, Moments	1000
Tibia Forces, Moments	600

RUN NUMBER: 1025

TEST DATE: 20 Dec 1990 TEST TIME: 15:32:29

V-to-V Test #1

VEHICLE 2 (1991 HONDA ACCORD) - Driver Dummy

hic: 875.51

t1 = 61.92 msec

t2 = 97.80 msec

Average G's Over Hic Duration = 56.88

Chest Resultant (3 ms CLIPPED DURATION) = 52.103 G's

Tstart = 64.2000 ms

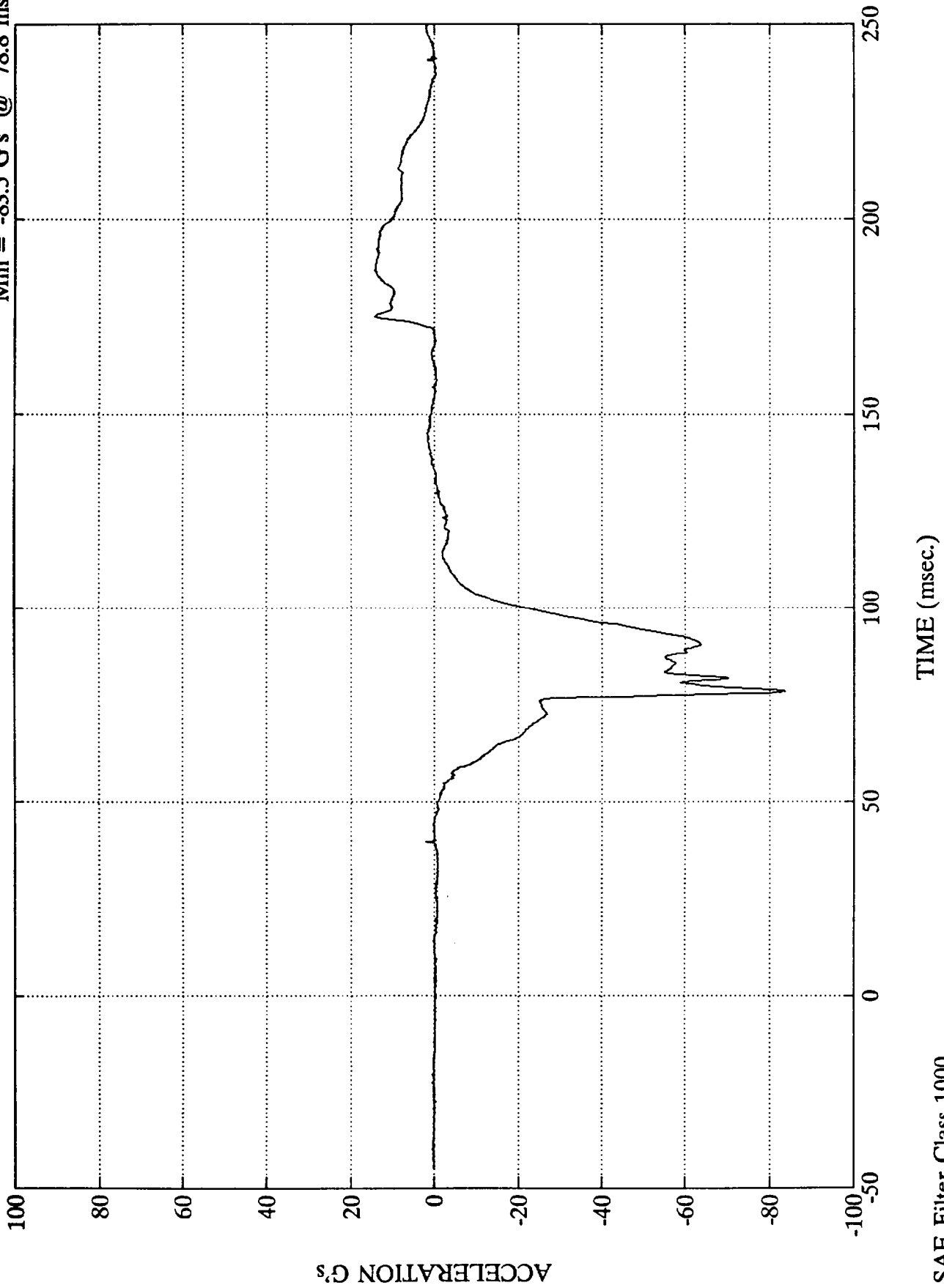
Tend = 67.2000 ms

CSI = 464.861

Test 1025

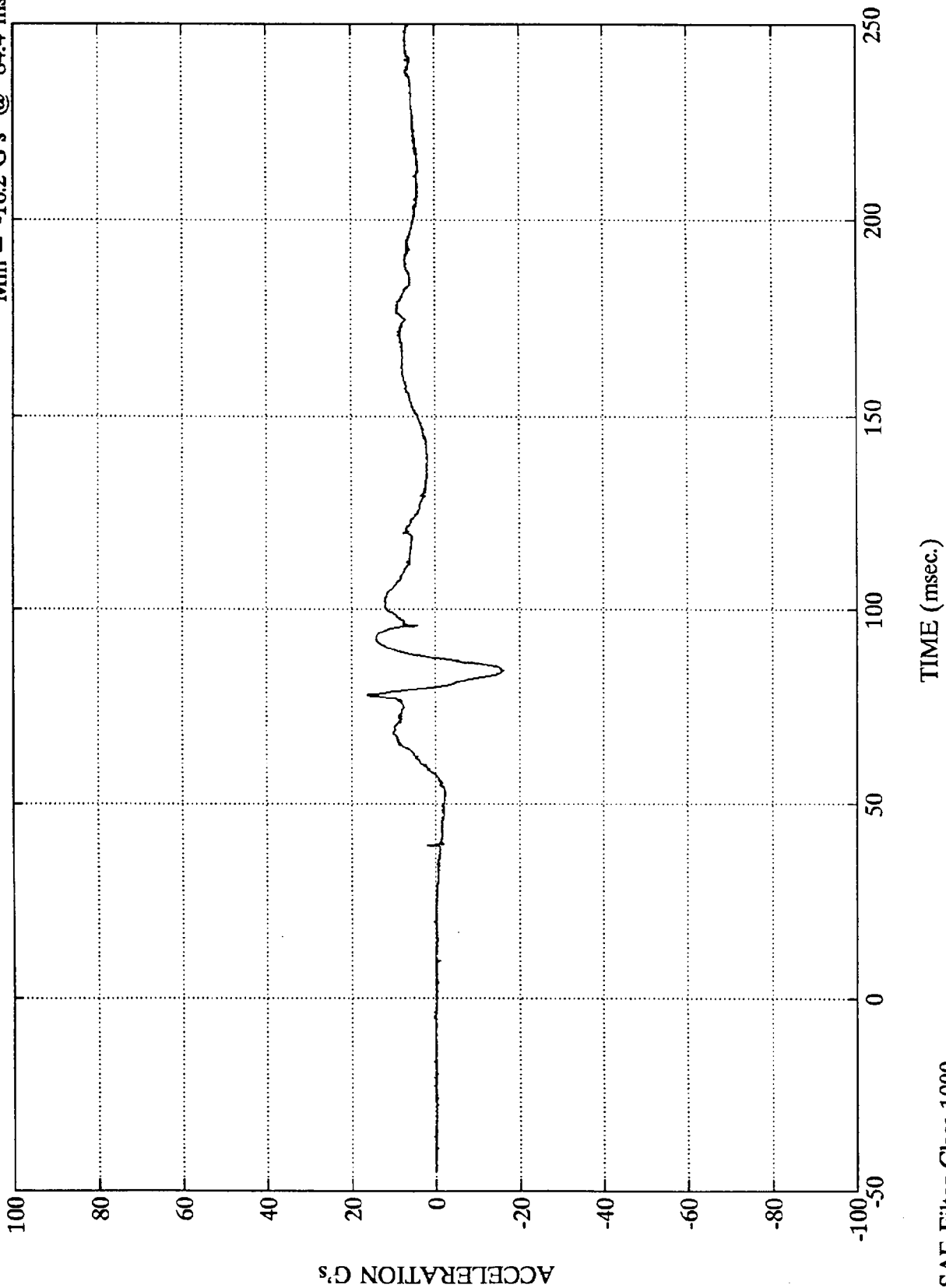
V2 POS#1 HEAD X

Max = 14.3 G's @ 187.1 msec
Min = -83.5 G's @ 78.8 msec



Test 1025
V2 POS#1 HEAD Y
Max = 16.2 G's @ 78.1 msec
Min = -16.2 G's @ 84.4 msec

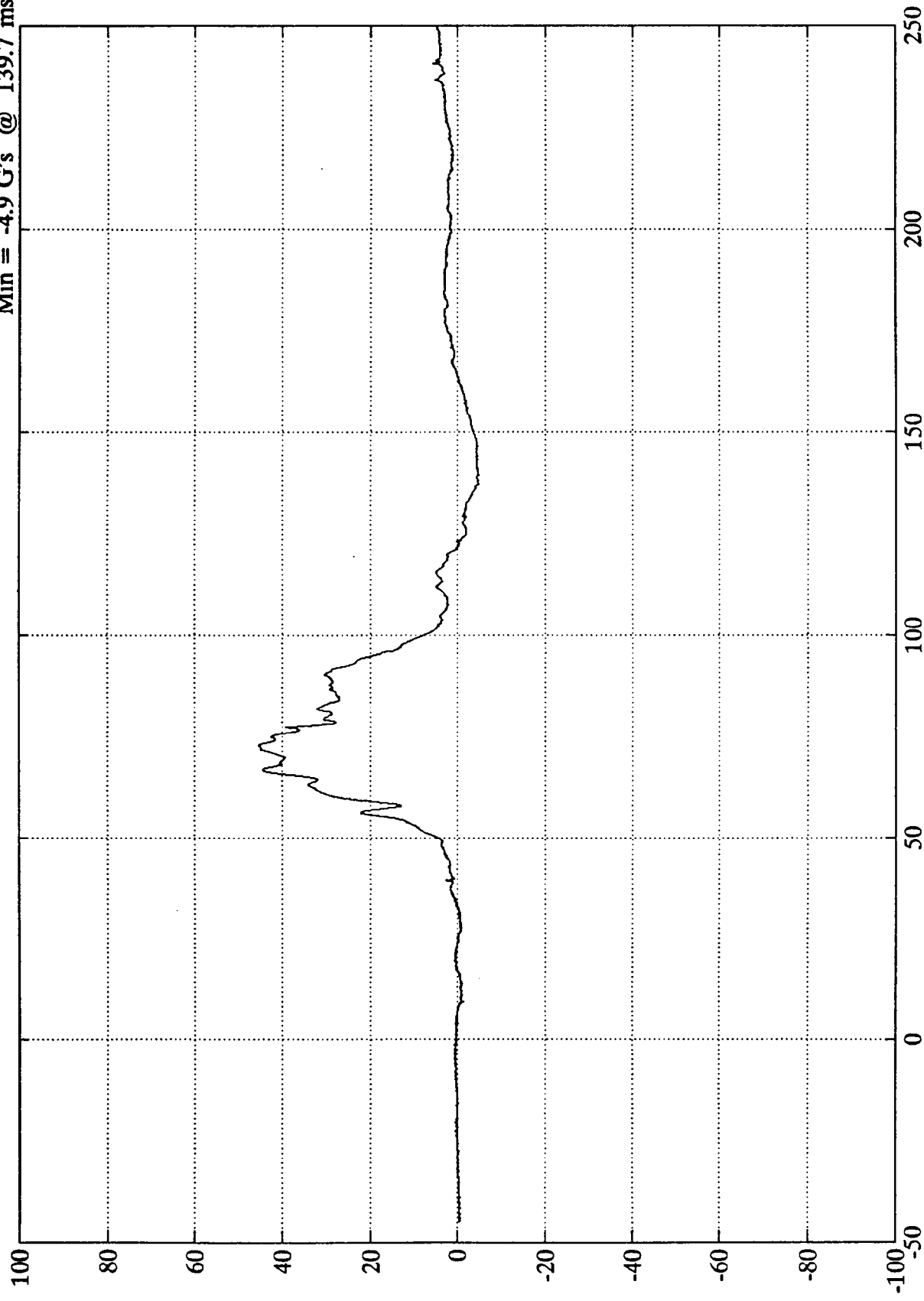
SAE Filter Class 1000



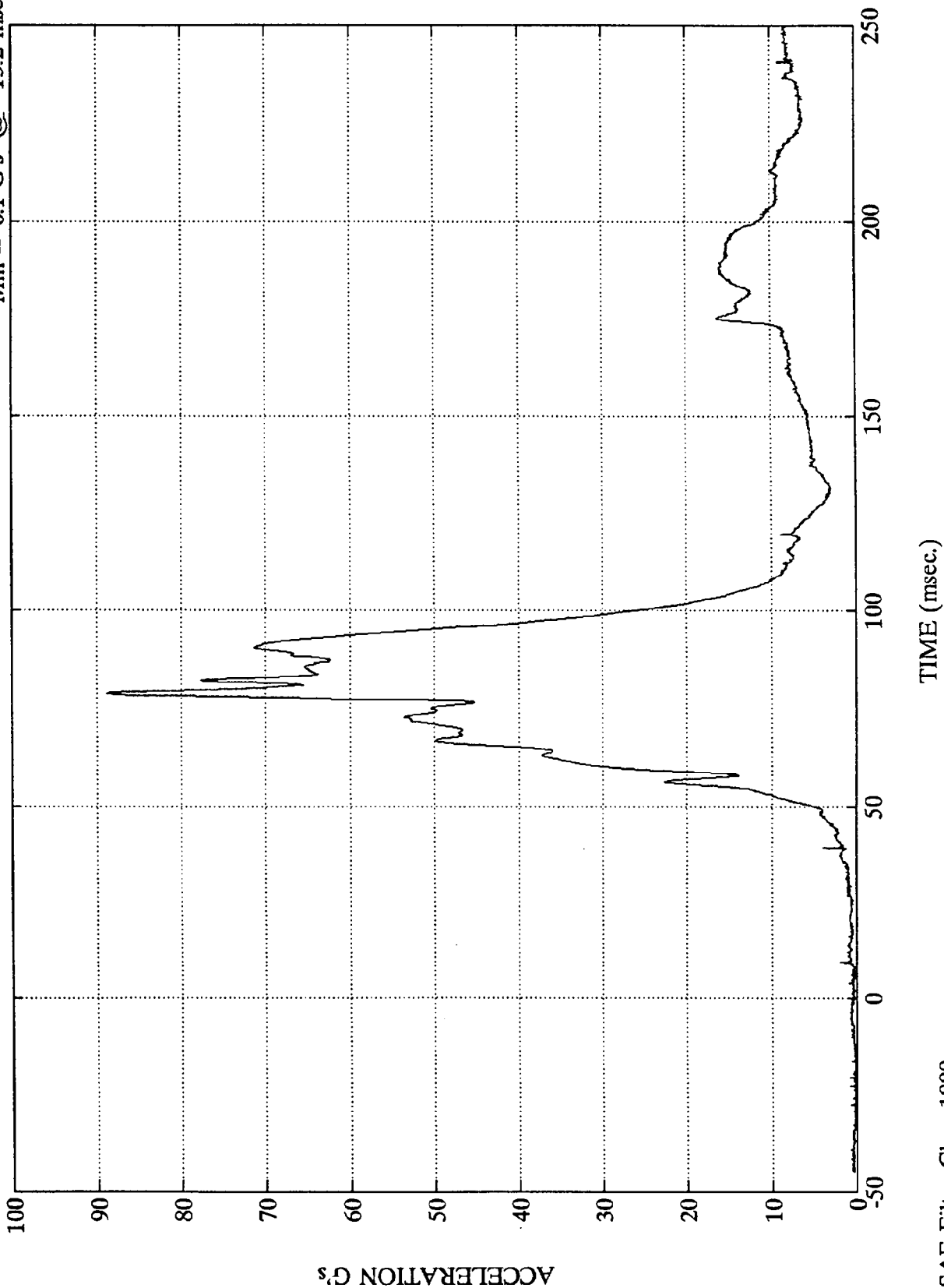
Test 1025
V2 POS#1 HEAD Z
Max = 45.4 G's @ 72.8 msec
Min = -4.9 G's @ 139.7 msec

ACCELERATION G's

TIME (msec.)



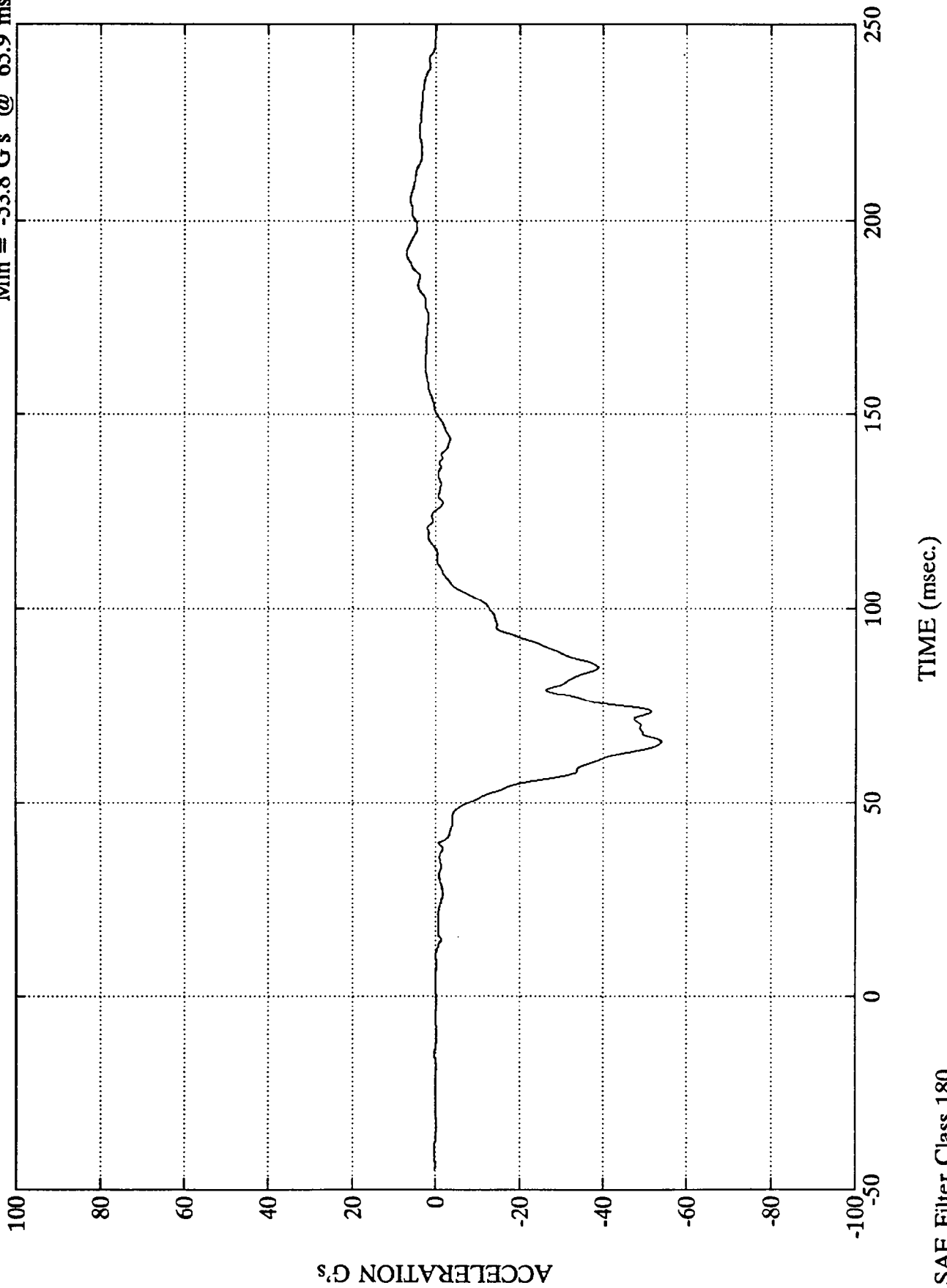
Test 1025
V2 POS#1 HEAD RESULTANT
Max = 88.8 G's @ 78.8 msec
Min = 0.1 G's @ -13.2 msec



Test 1025

V2 POS#1 CHEST X

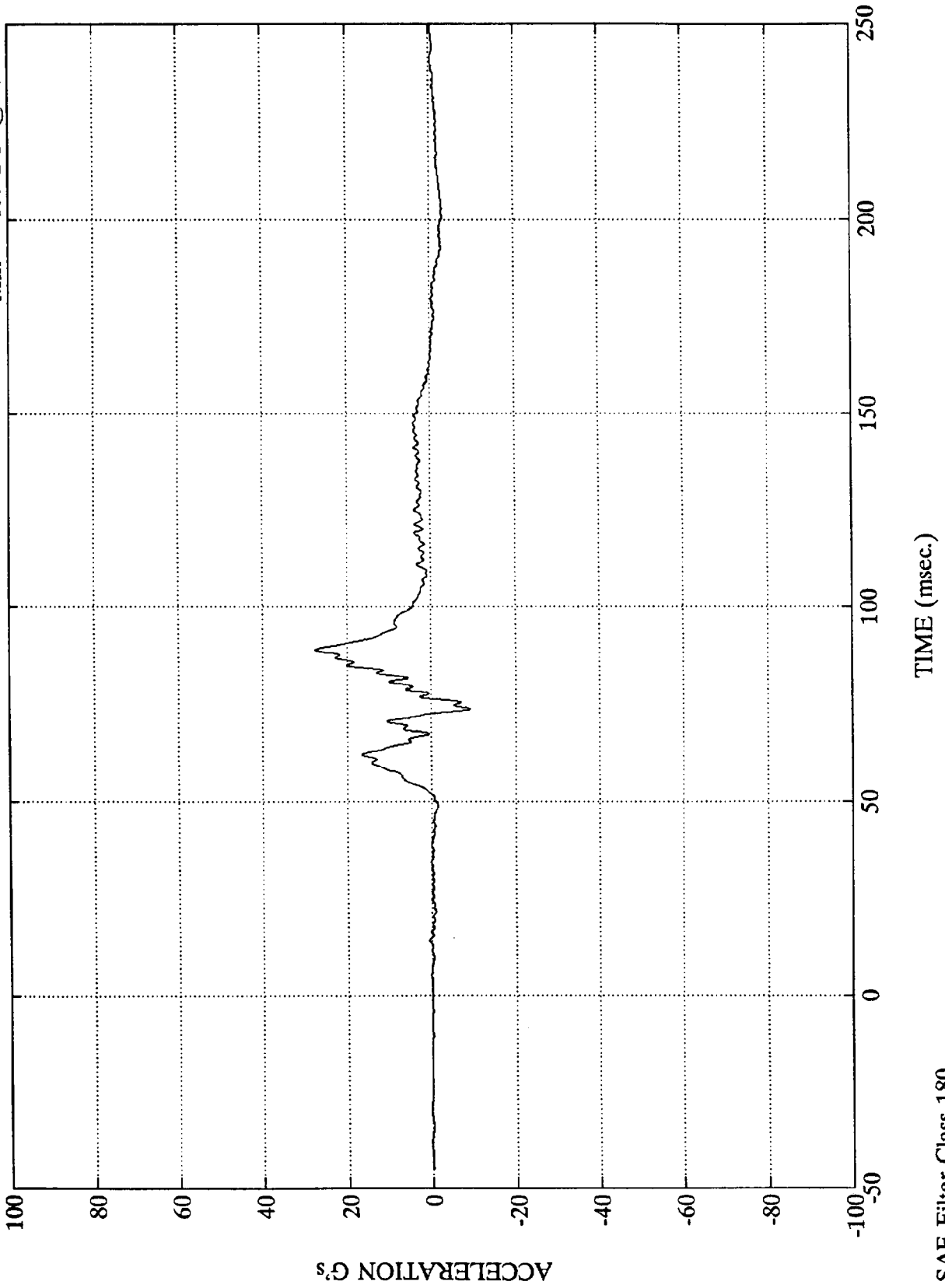
Max = 7.0 G's @ 191.5 msec
Min = -53.8 G's @ 65.9 msec



Test 1025

V2 POS#1 CHEST Y

Max = 27.5 G's @ 89.2 msec
Min = -9.4 G's @ 73.7 msec



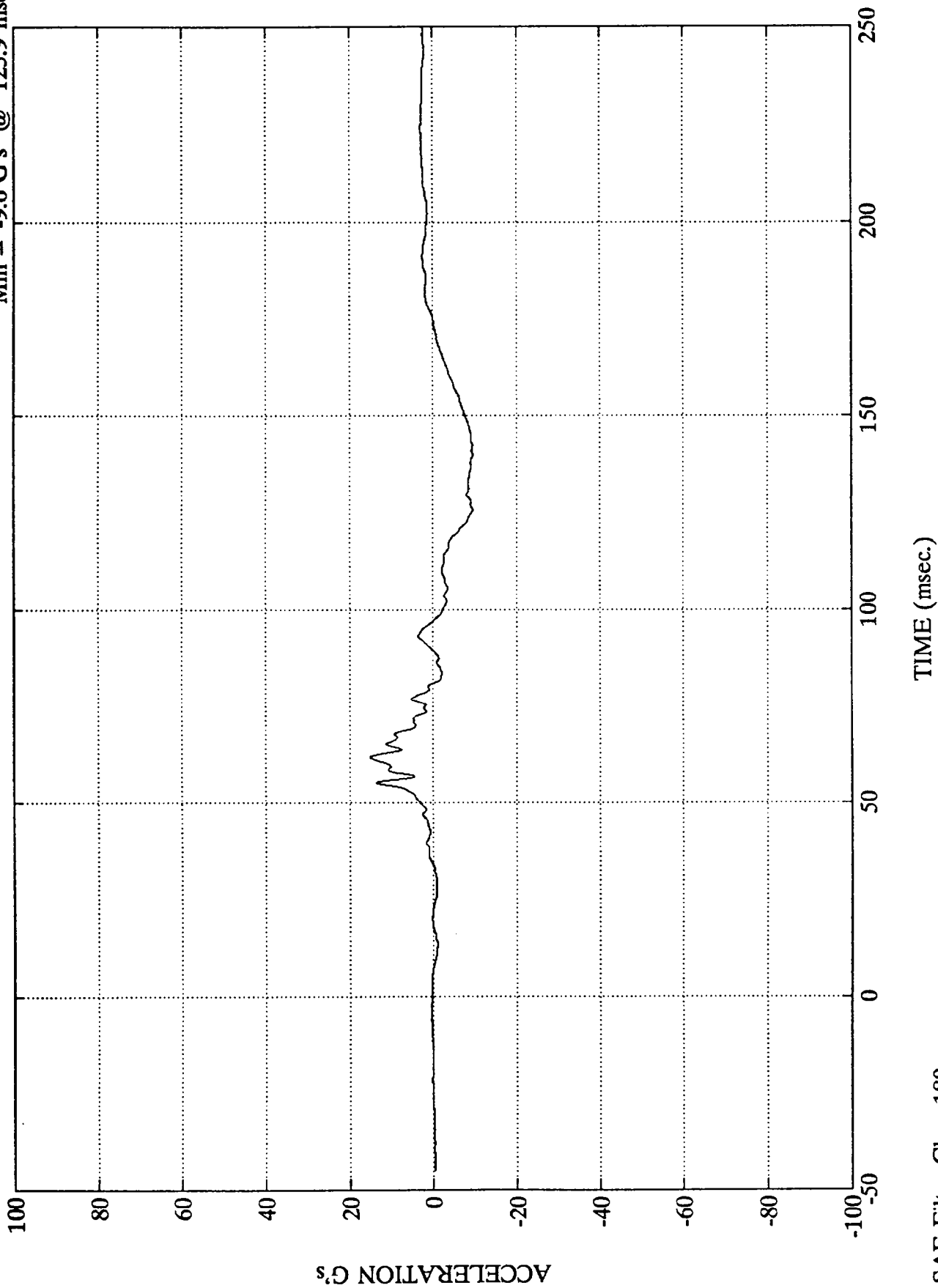
B-120

7883-1 SAE Filter Class 180

Test 1025

V2 POS#1 CHEST Z

Max = 15.1 G's @ 62.0 msec
Min = -9.6 G's @ 125.9 msec



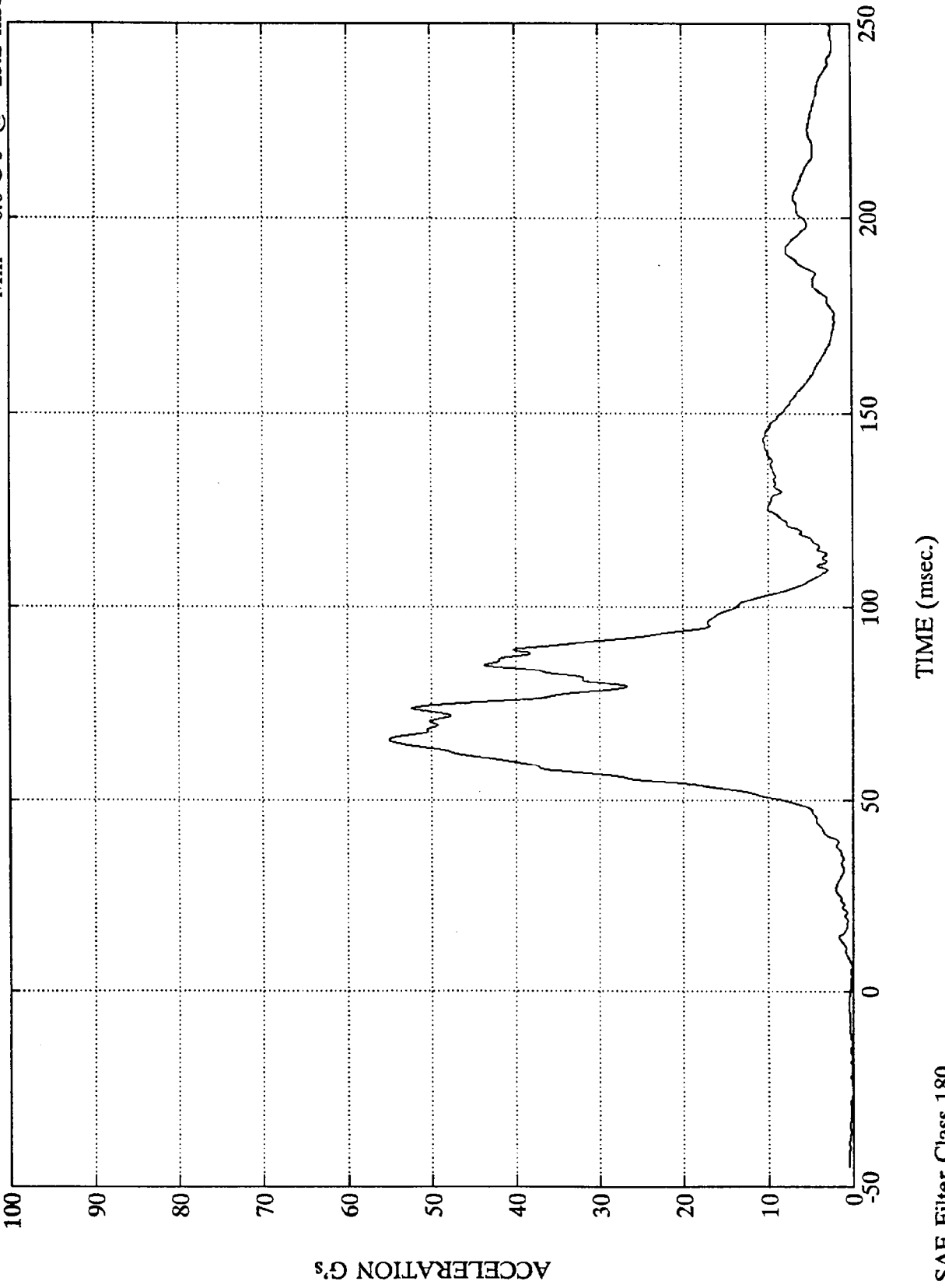
B-121

7883-1

SAE Filter Class 180

Test 1025
V2 POS#1 CHEST RESULTANT

Max = 55.1 G's @ 65.8 msec
Min = 0.0 G's @ -25.2 msec

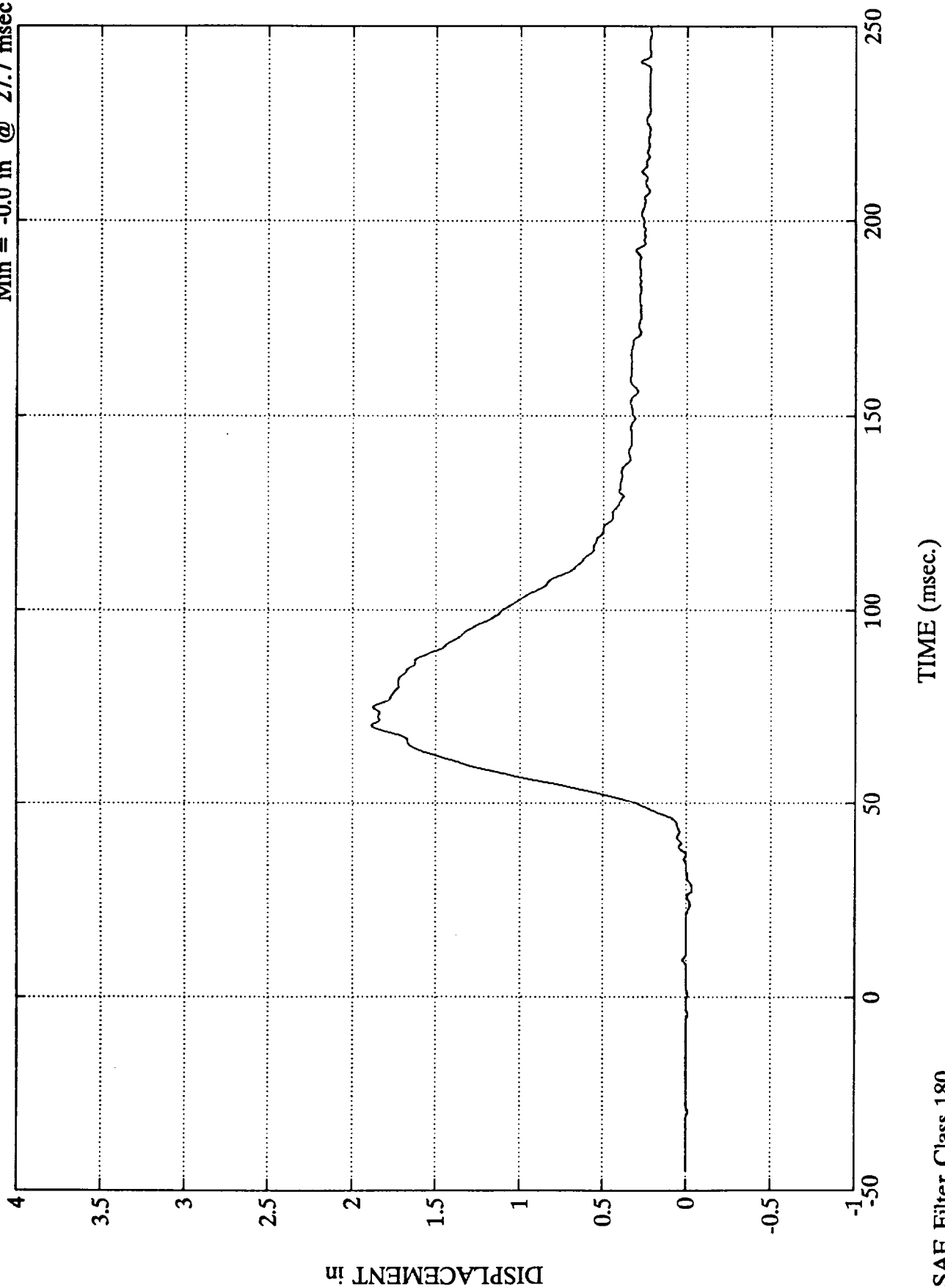


7883-1 SAE Filter Class 180

Test 1025

V2 POS#1 CHEST DISPLACEMENT

Max = 1.9 in @ 70.3 msec
Min = -0.0 in @ 27.7 msec



B-123

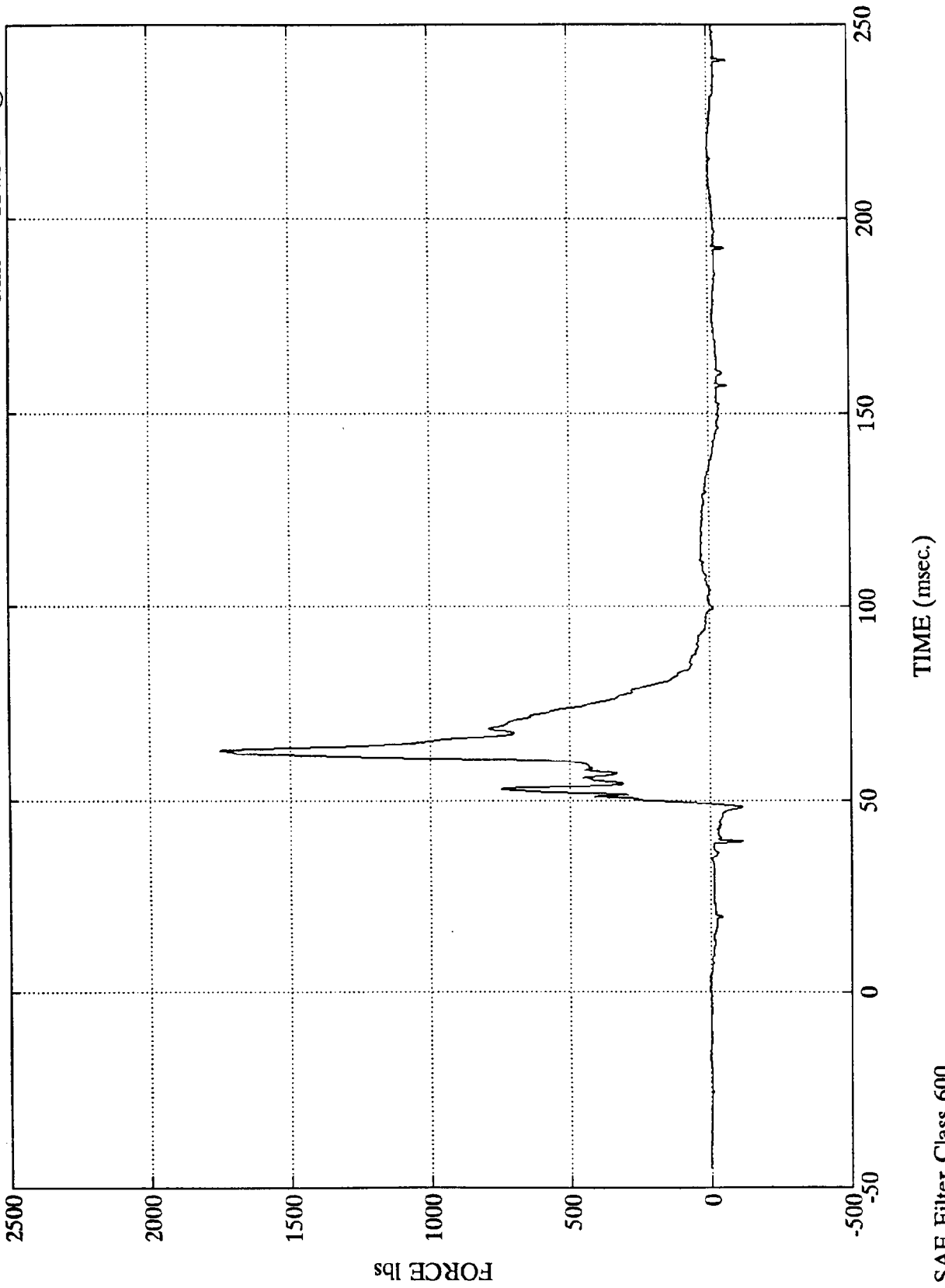
7883-1

SAE Filter Class 180

Test 1025

V2 POS#1 LEFT FEMUR

Max = 1753.6 lbs @ 63.0 msec
Min = -114.2 lbs @ 39.6 msec



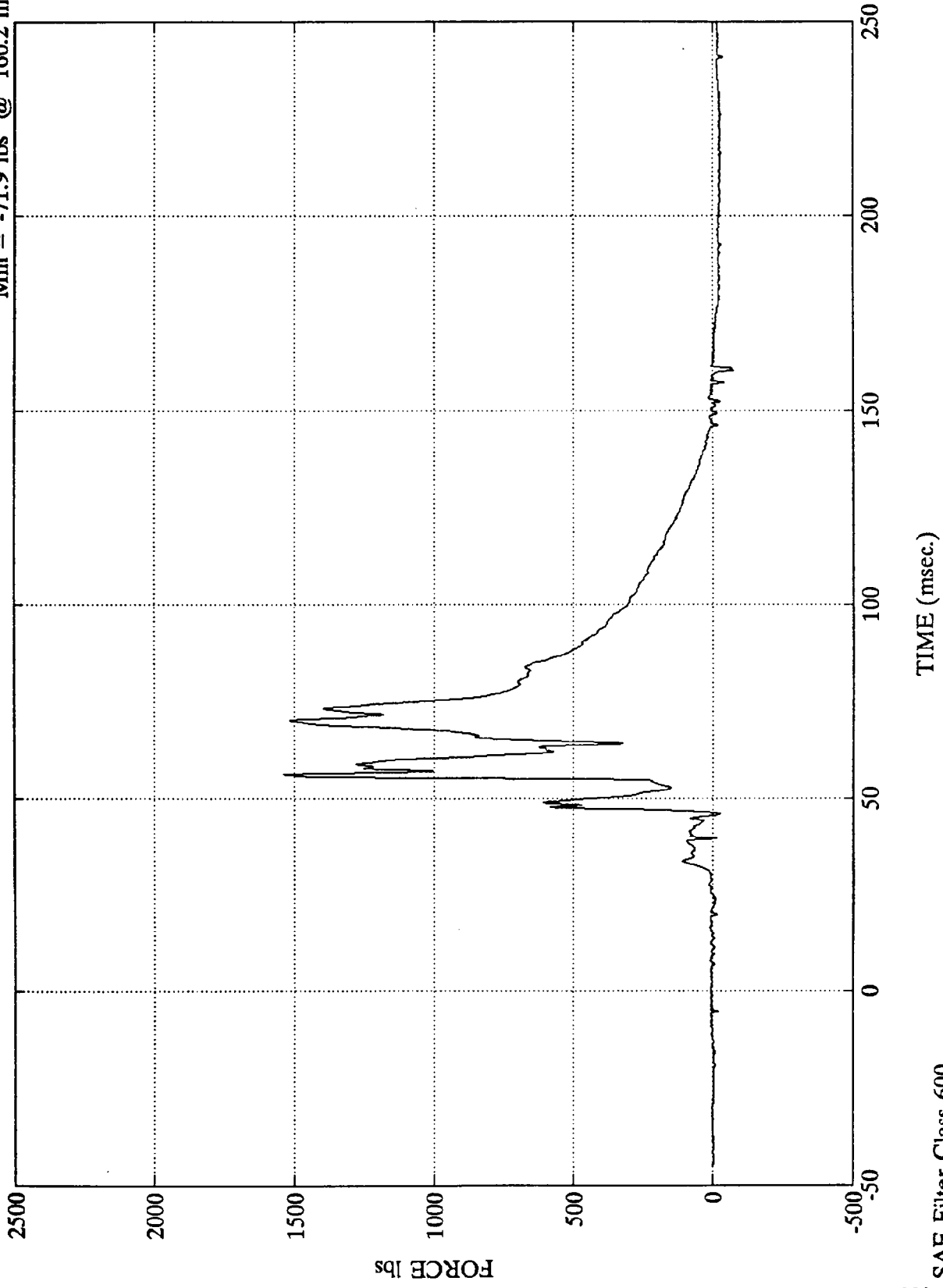
SAE Filter Class 600

7883-1

Test 1025

V2 POS#1 RIGHT FEMUR

Max = 1542.0 lbs @ 56.3 msec
Min = -71.9 lbs @ 160.2 msec



B-125

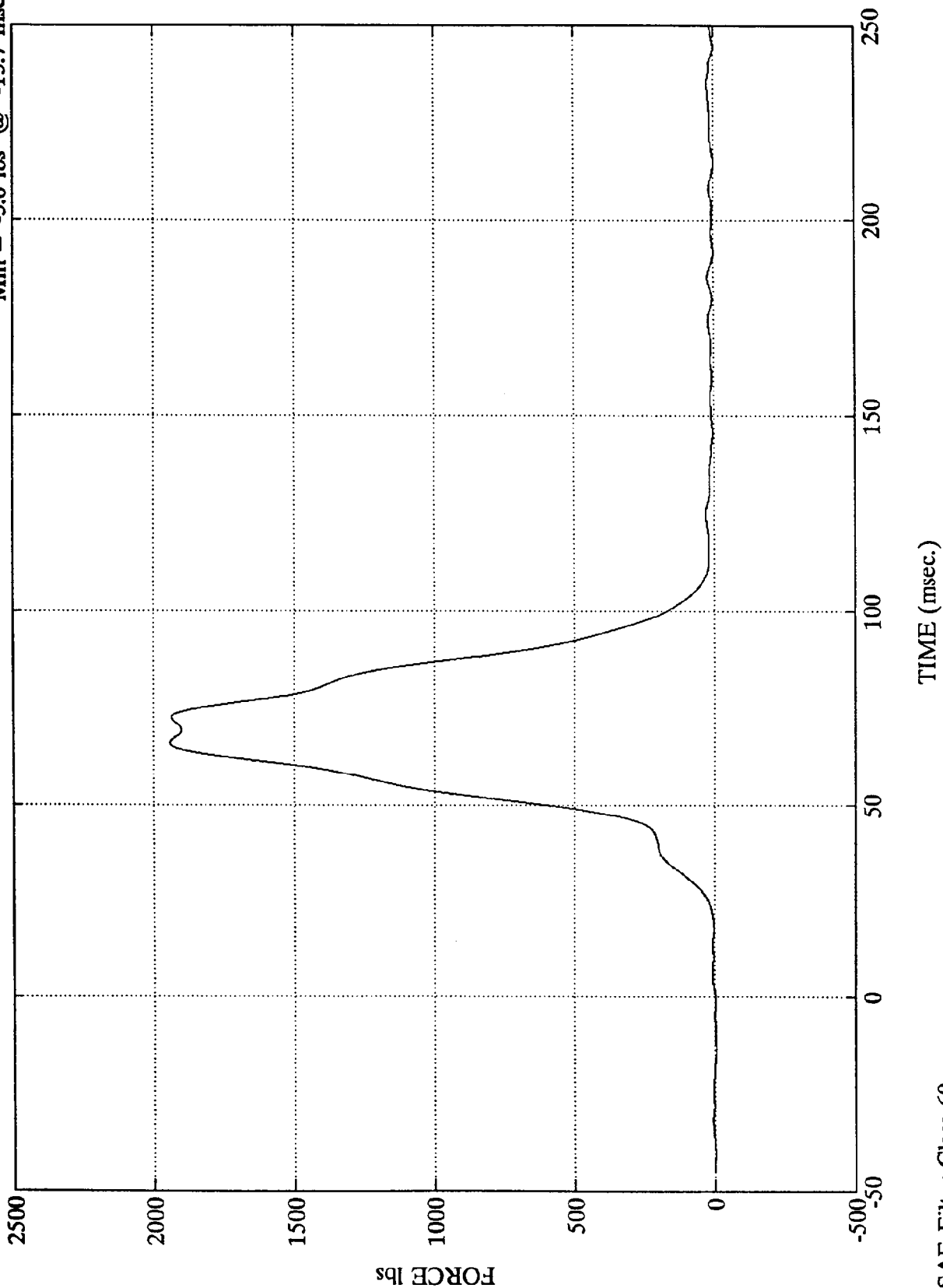
7883-1

SAE Filter Class 600

Test 1025

V2 POS#1 TORSO BELT

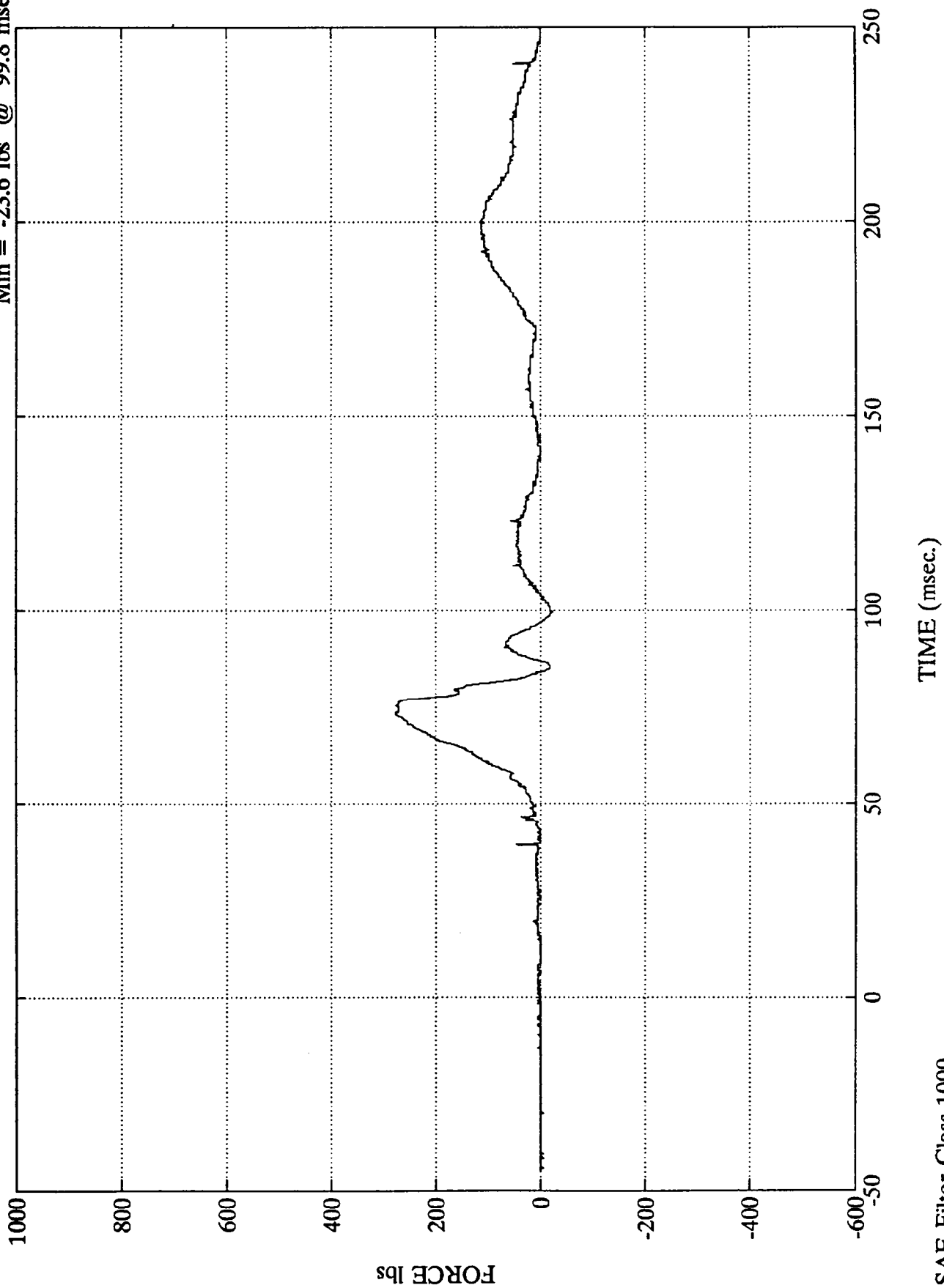
Max = 1942.2 lbs @ 66.1 msec
Min = -5.6 lbs @ -13.7 msec



Test 1025

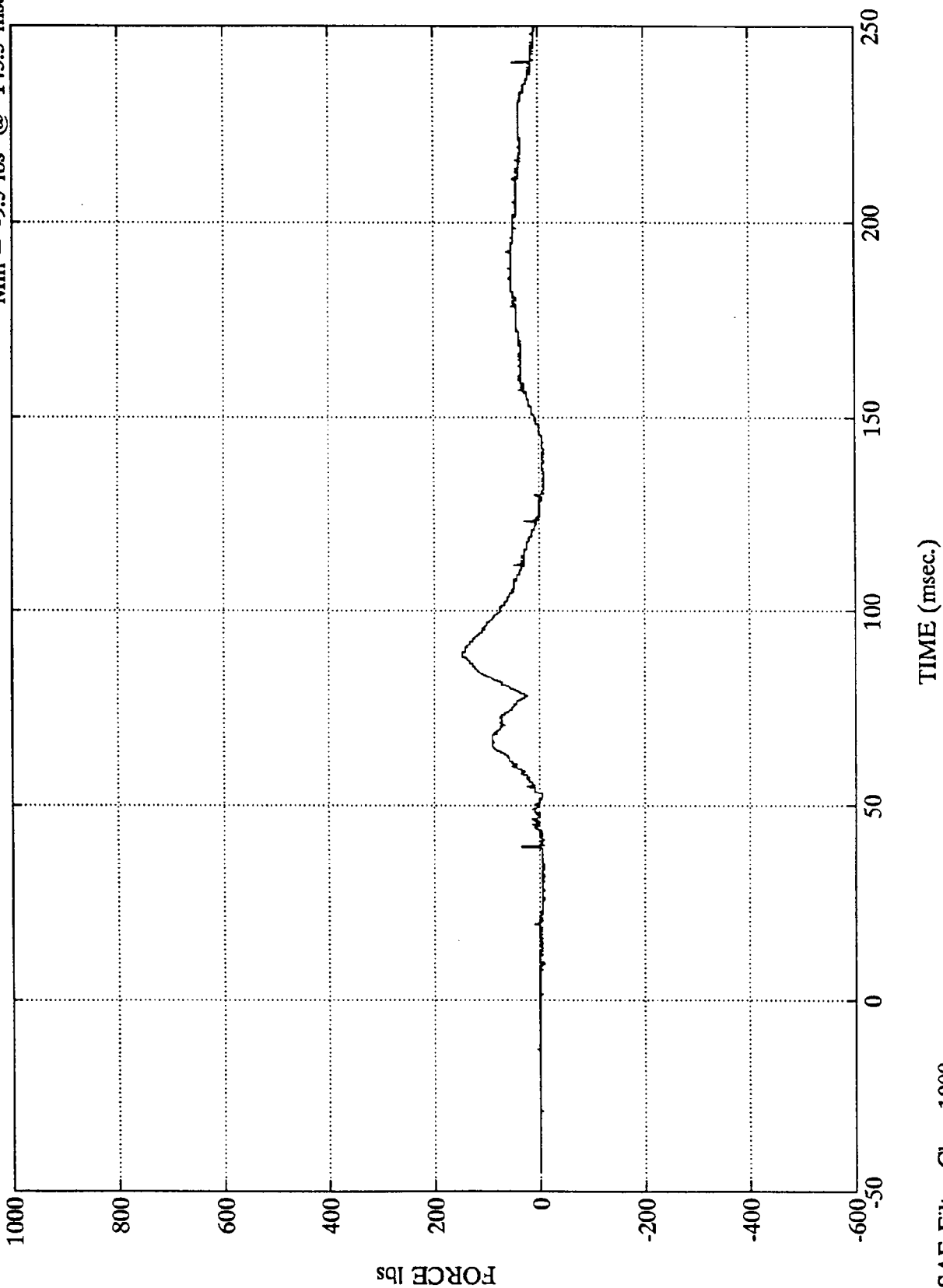
V2 POS#1 UPPER NECK FORCE (X)

Max = 276.7 lbs @ 75.6 msec
Min = -23.6 lbs @ 99.8 msec



Test 1025
V2 POS#1 UPPER NECK FORCE (Y)

Max = 146.6 lbs @ 89.6 msec
Min = -9.5 lbs @ 143.5 msec



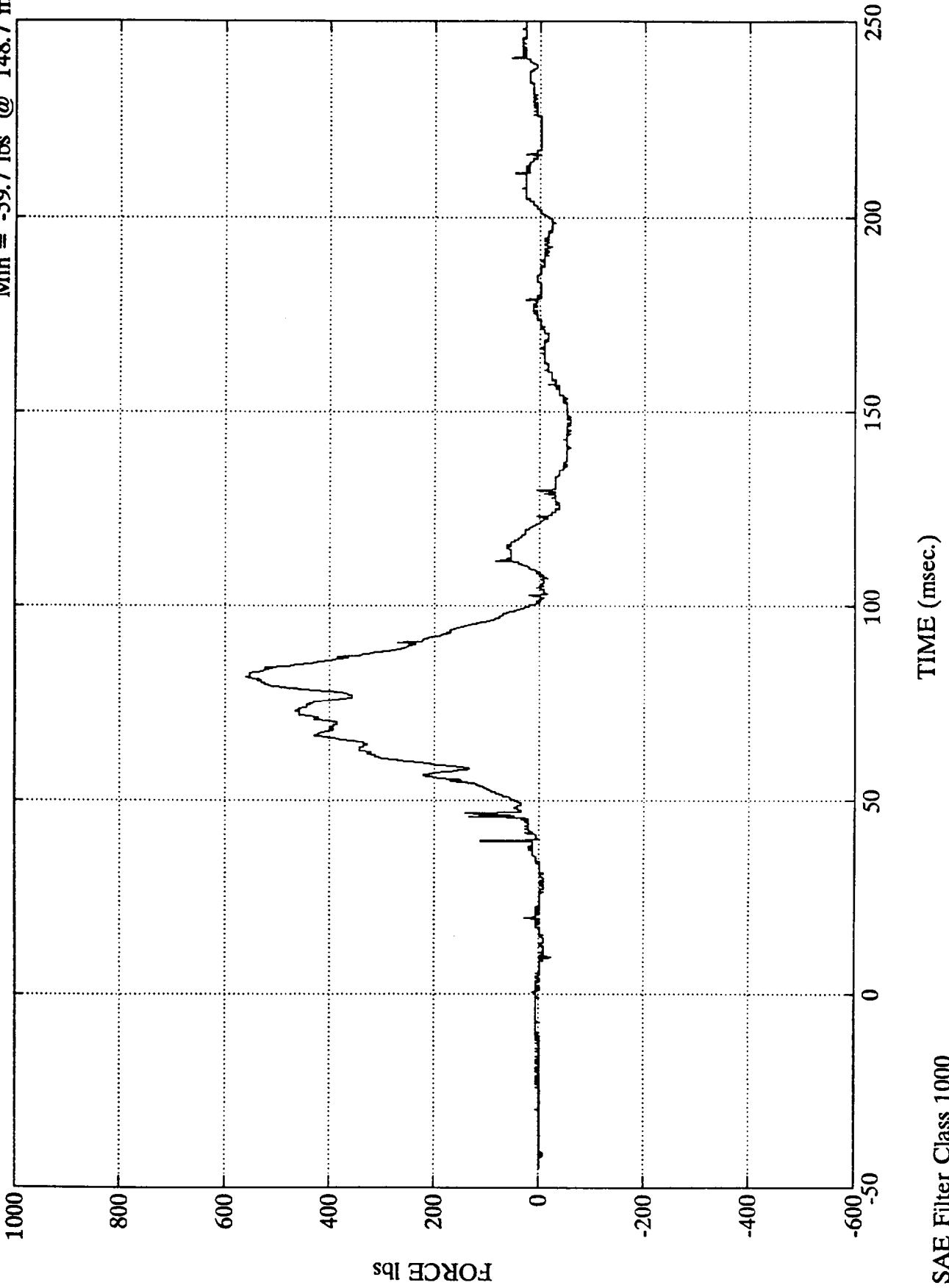
FORCE lbs
B-128

7883-1
SAE Filter Class 1000

Test 1025

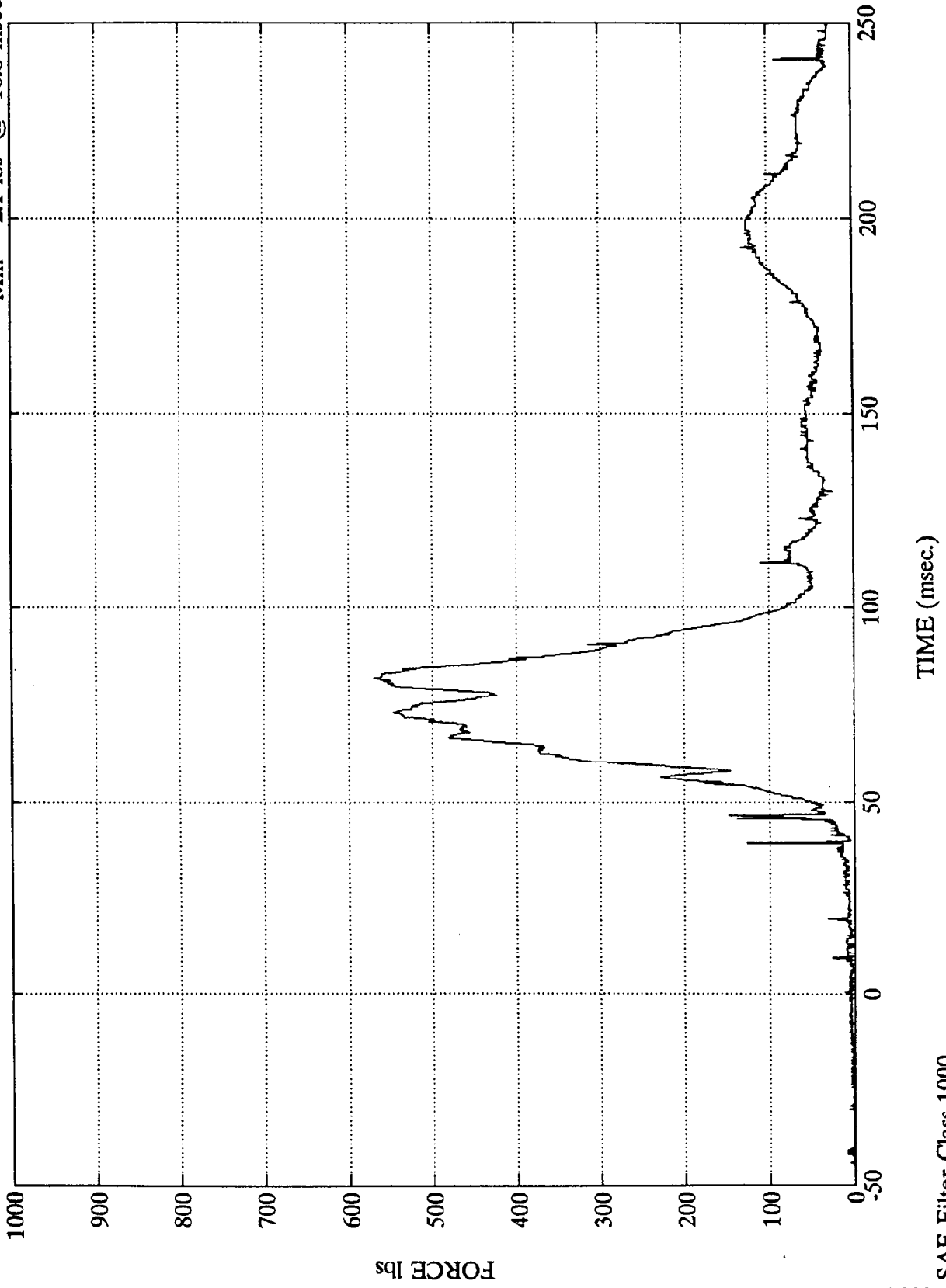
V2 POS#1 UPPER NECK FORCE (Z)

Max = 559.4 lbs @ 81.8 msec
Min = -59.7 lbs @ 148.7 msec



Test 1025
Max = 569.4 lbs @ 81.8 msec
Min = 2.1 lbs @ 16.8 msec

V2 POS#1 NECK FORCE RESULTANT

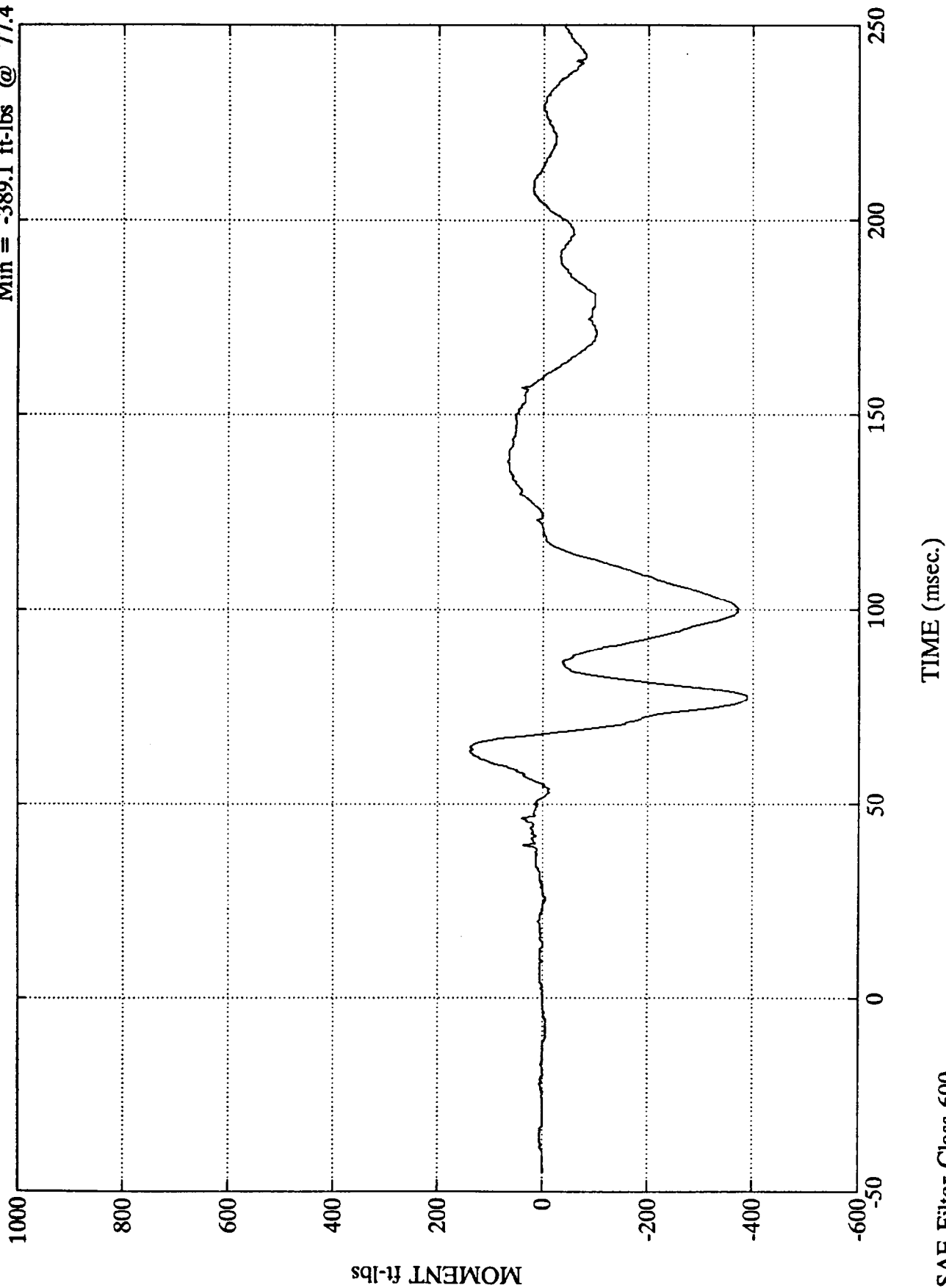


B-130

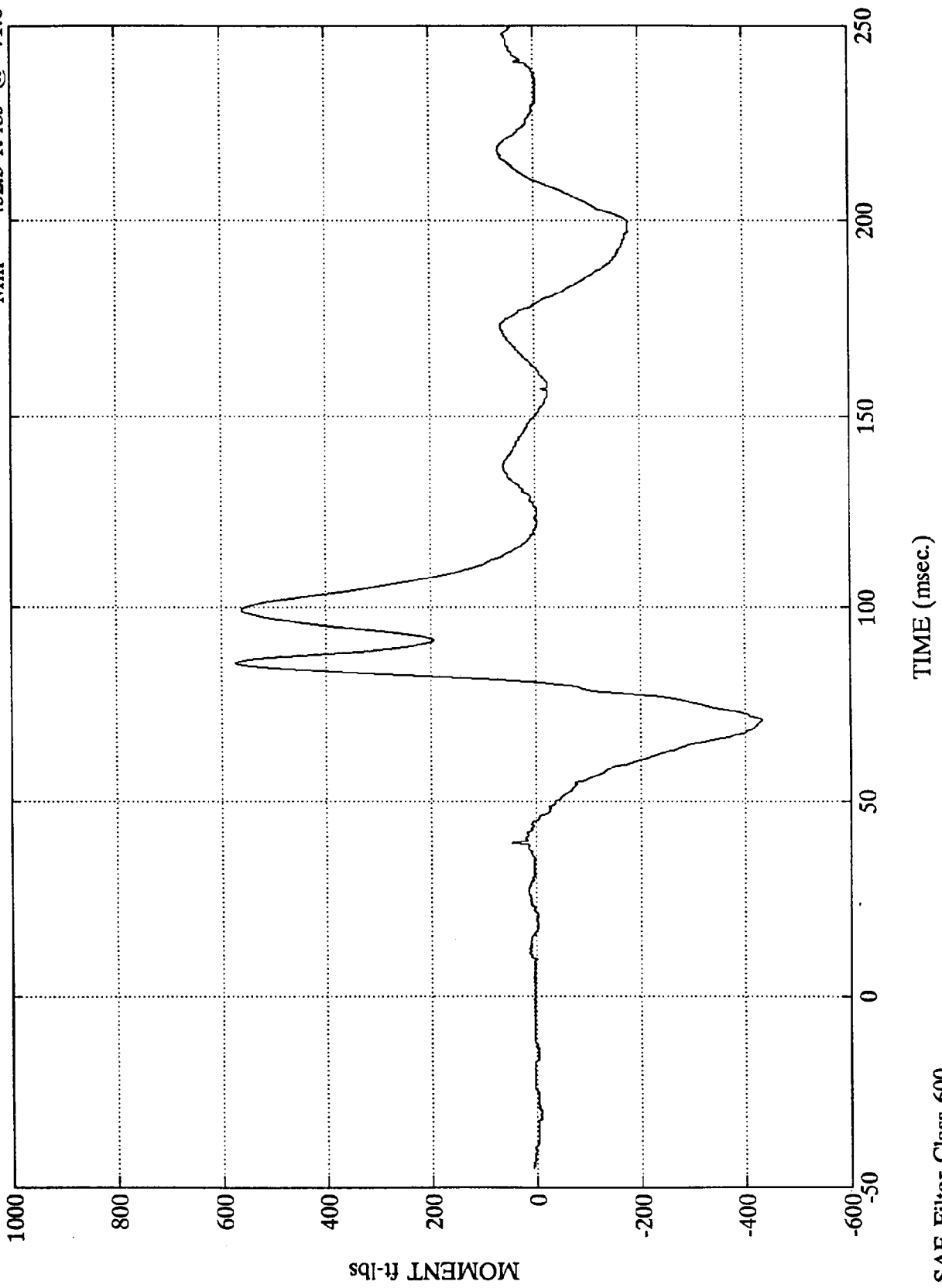
Test 1025

V2 POS#1 UPPER NECK MOMENT (X)

Max = 139.3 ft-lbs @ 63.7 msec
Min = -389.1 ft-lbs @ 77.4 msec



Test 1025
V2 POS#1 UPPER NECK MOMENT (Y)
Max = 572.4 ft-lbs @ 85.8 msec
Min = -432.3 ft-lbs @ 71.0 msec



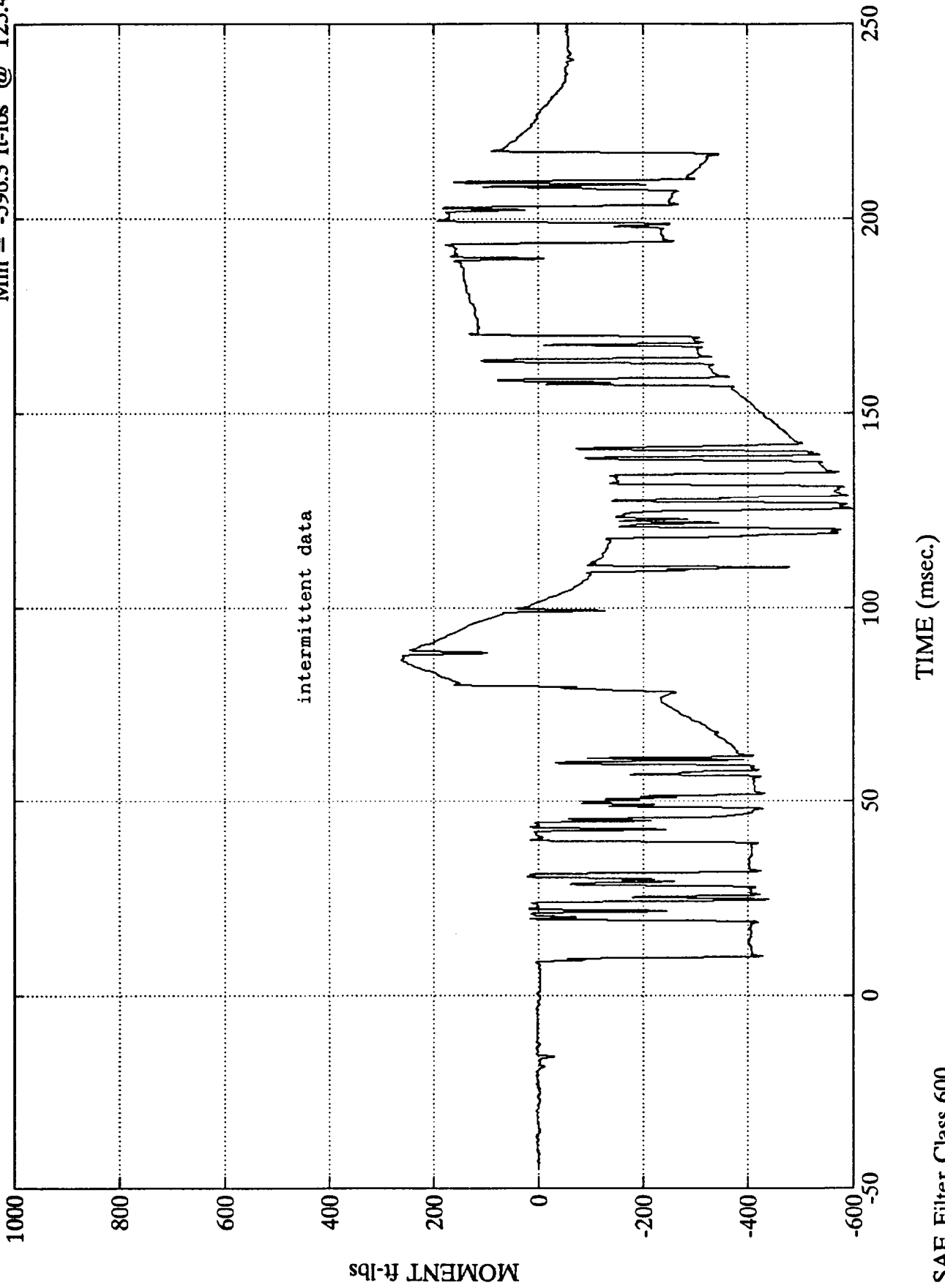
B-132

7883-1
SAE Filter Class 600

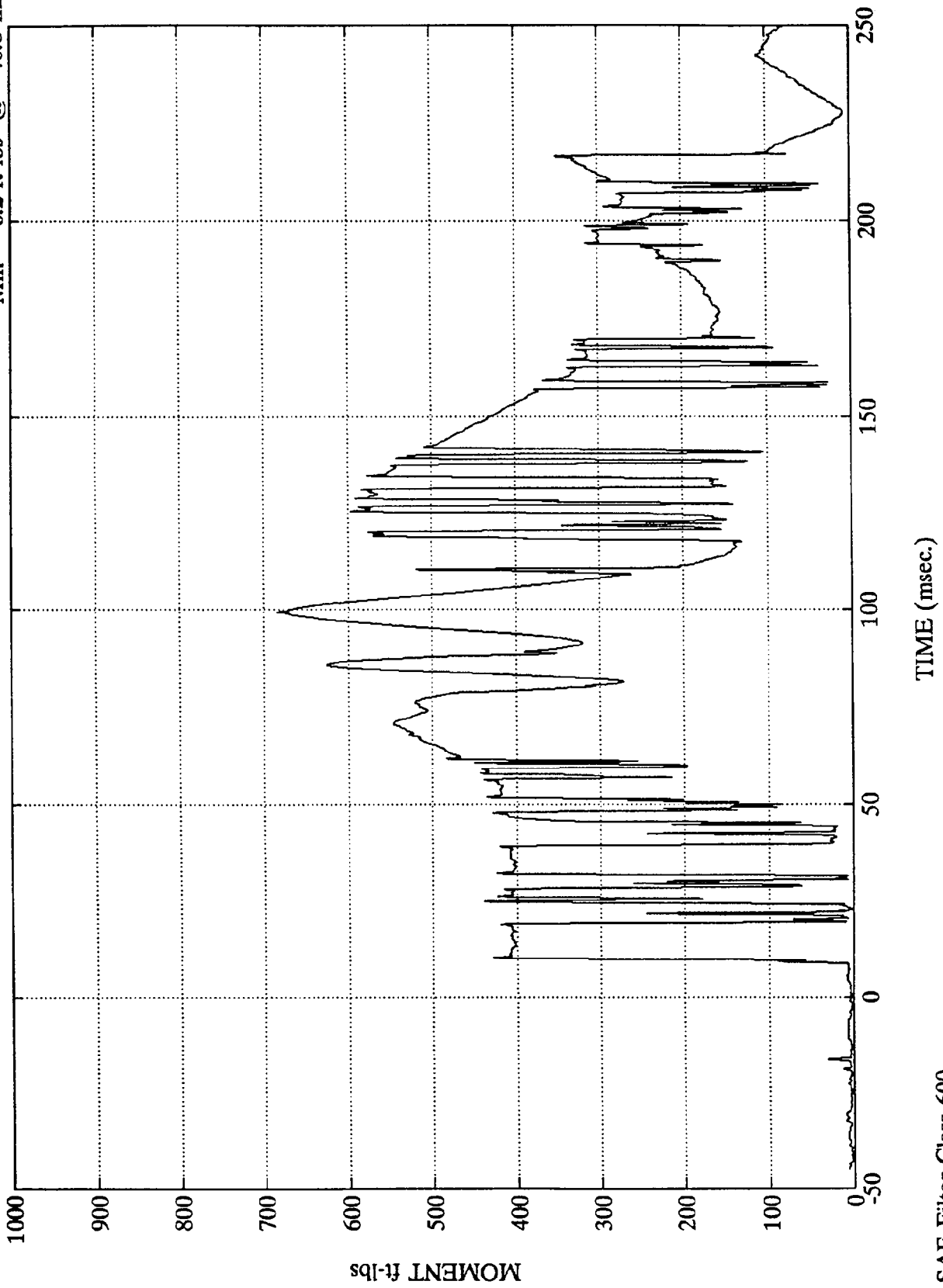
Test 1025

V2 POS#1 UPPER NECK MOMENT (Z)

Max = 263.1 ft-lbs @ 86.9 msec
Min = -596.3 ft-lbs @ 125.4 msec



Test 1025
V2 POS#1 NECK MOMENT RESULTANT
Max = 684.9 ft-lbs @ 99.5 msec
Min = 0.2 ft-lbs @ -40.8 msec



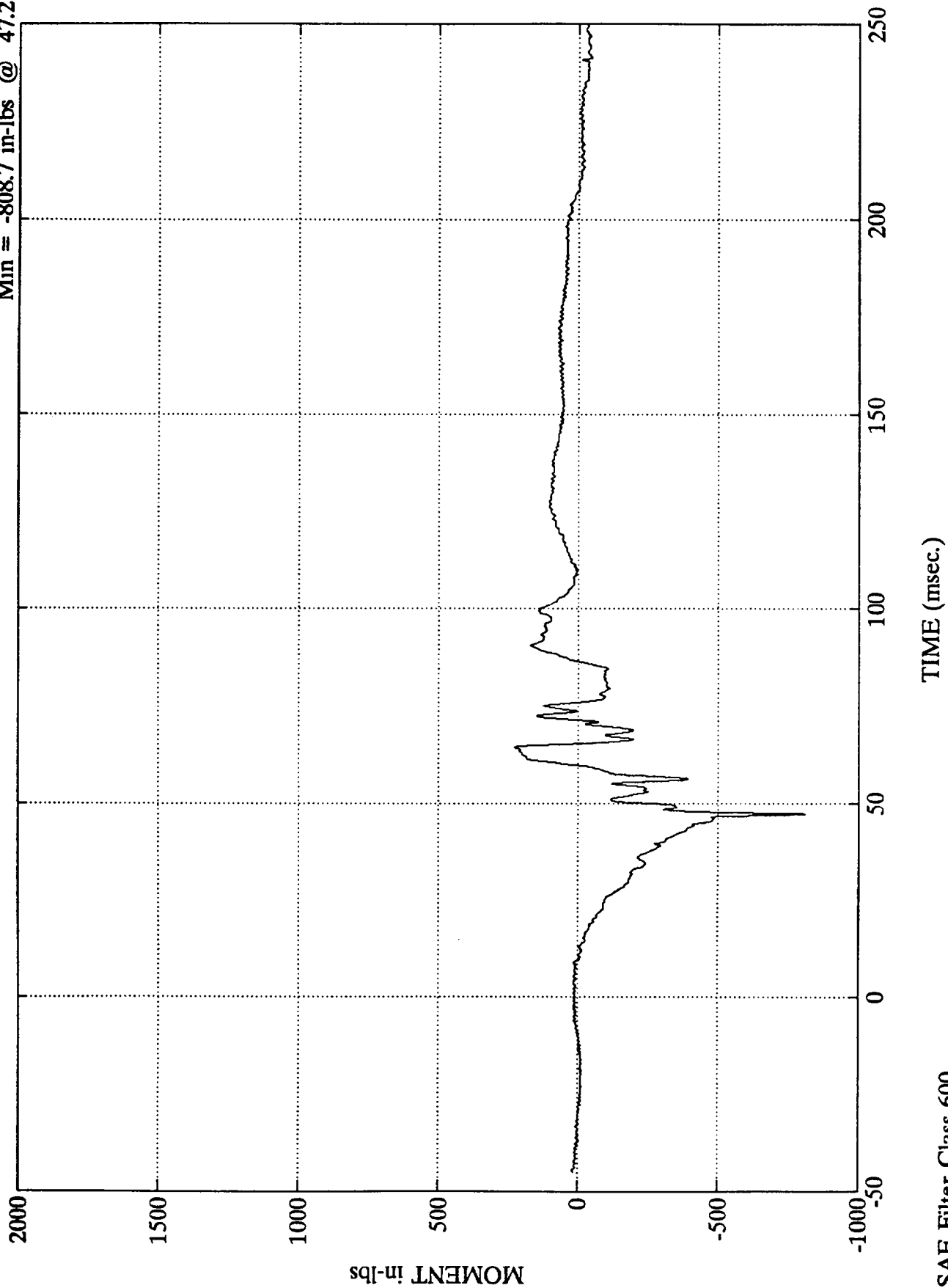
B-134

7883-1
SAE Filter Class 600

Test 1025

V2 POS#1 L. UPPER TIBIA MOMENT (X)

Max = 228.5 in-lbs @ 64.6 msec
Min = -808.7 in-lbs @ 47.2 msec

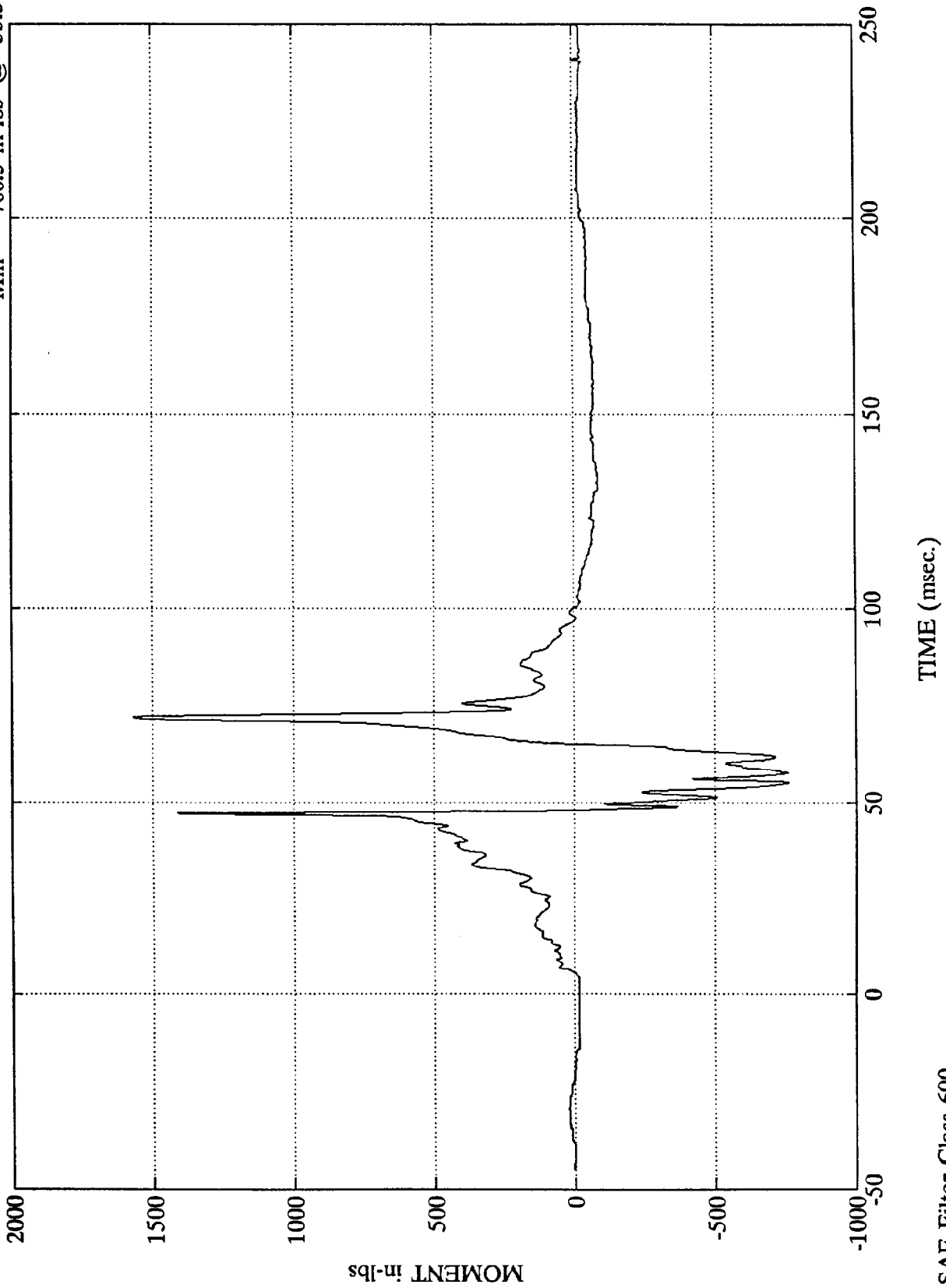


B-135

7883-1 SAE Filter Class 600

Test 1025
Max = 1567.3 in-lbs @ 72.1 msec
Min = -760.5 in-lbs @ 55.3 msec

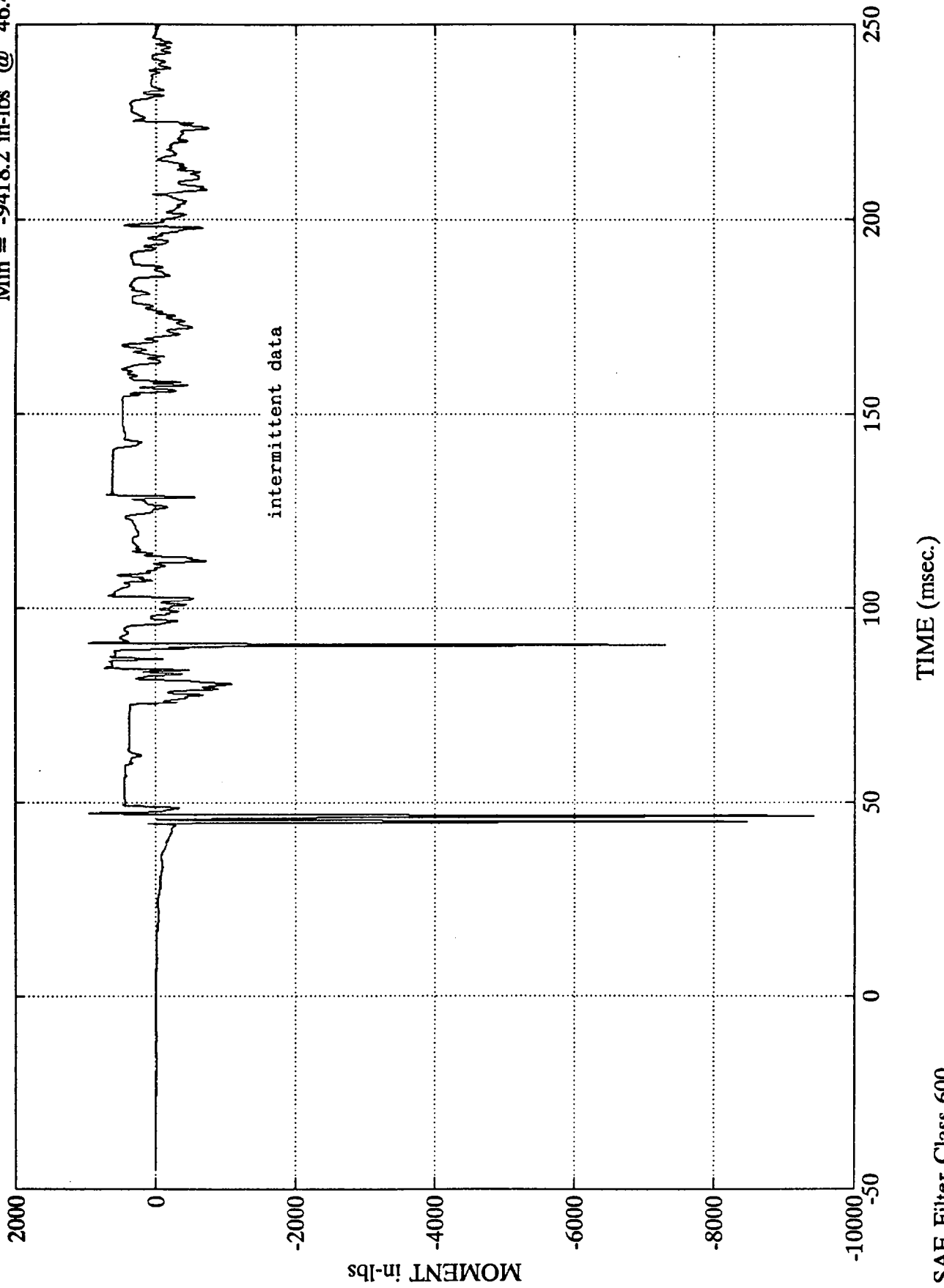
V2 POS#1 L UPPER TIBIA MOMENT (Y)



Test 1025

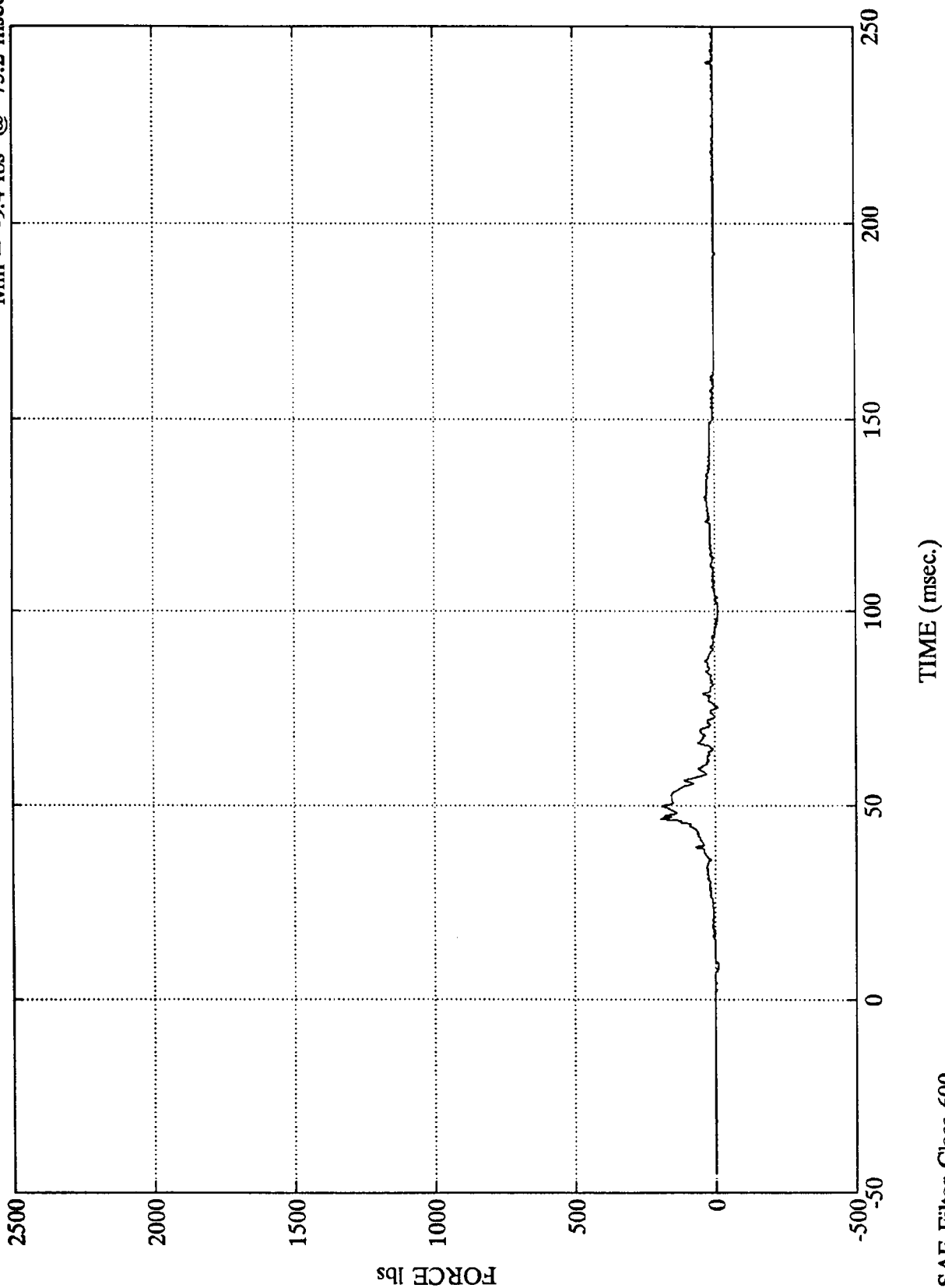
V2 POS#1 L. LOWER TIBIA MOMENT (X)

Max = 953.8 in-lbs @ 91.2 msec
Min = -9418.2 in-lbs @ 46.4 msec



Test 1025
V2 POS#1 L LOWER TIBIA FORCE (Y)

Max = 193.5 lbs @ 46.7 msec
Min = -9.4 lbs @ 75.2 msec



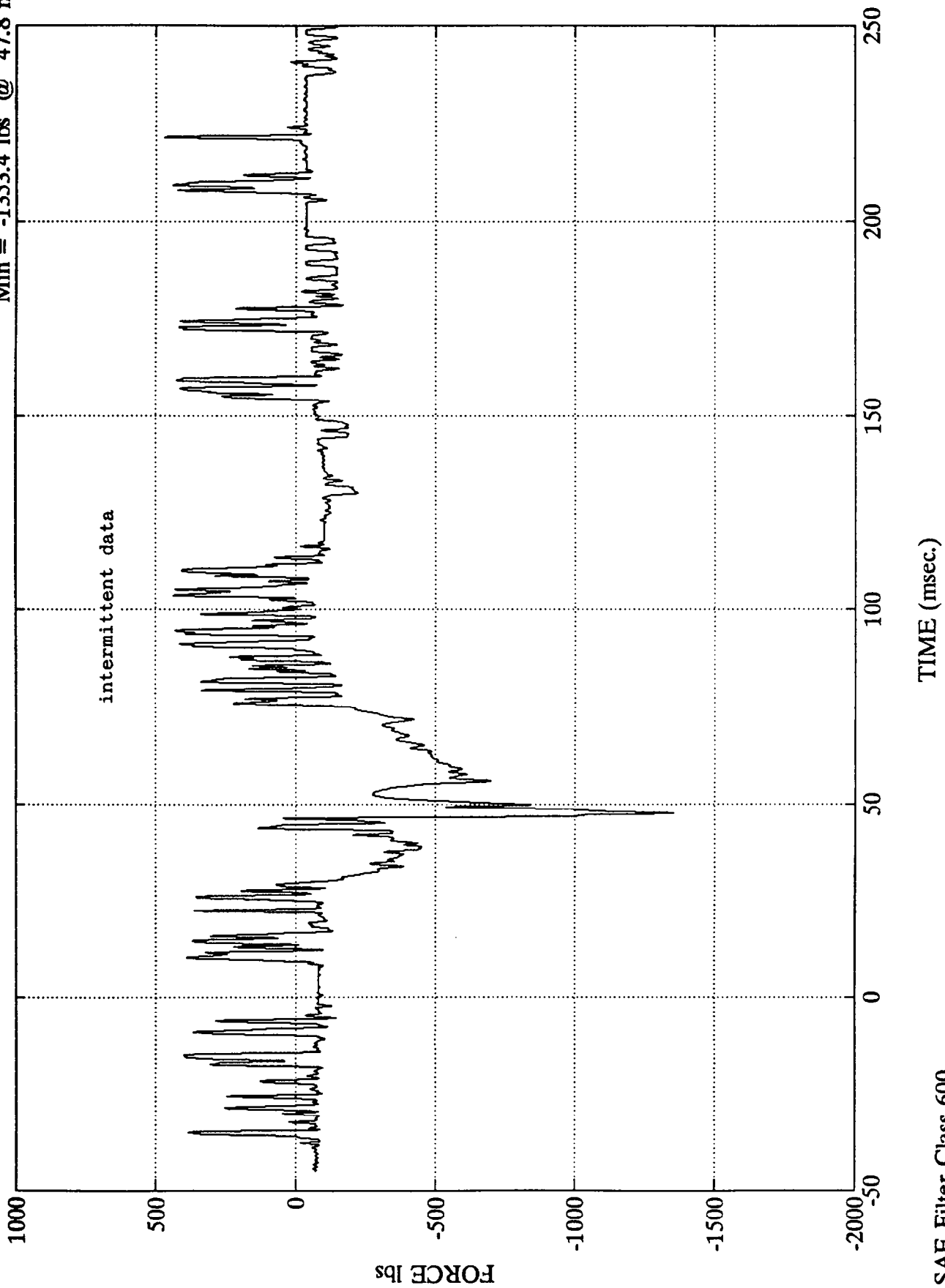
SAE Filter Class 600

7883-1

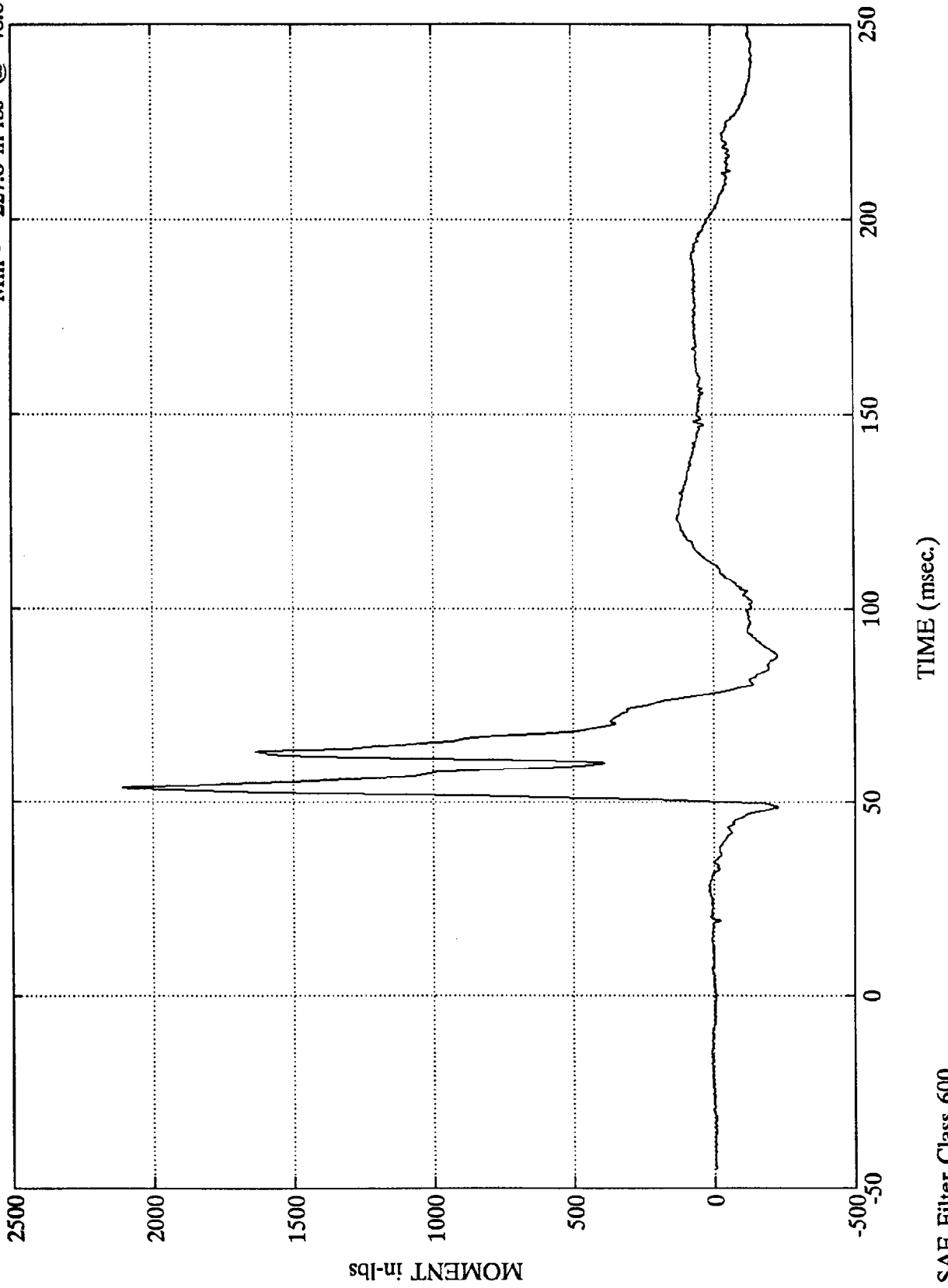
Test 1025

V2 POS#1 L LOWER TIBIA FORCE (Z)

Max = 469.0 lbs @ 221.6 msec
Min = -1353.4 lbs @ 47.8 msec



Test 1025
V2 POS#1 R. UPPER TIBIA MOMENT (X)
Max = 2106.8 in-lbs @ 53.6 msec
Min = -227.8 in-lbs @ 48.8 msec



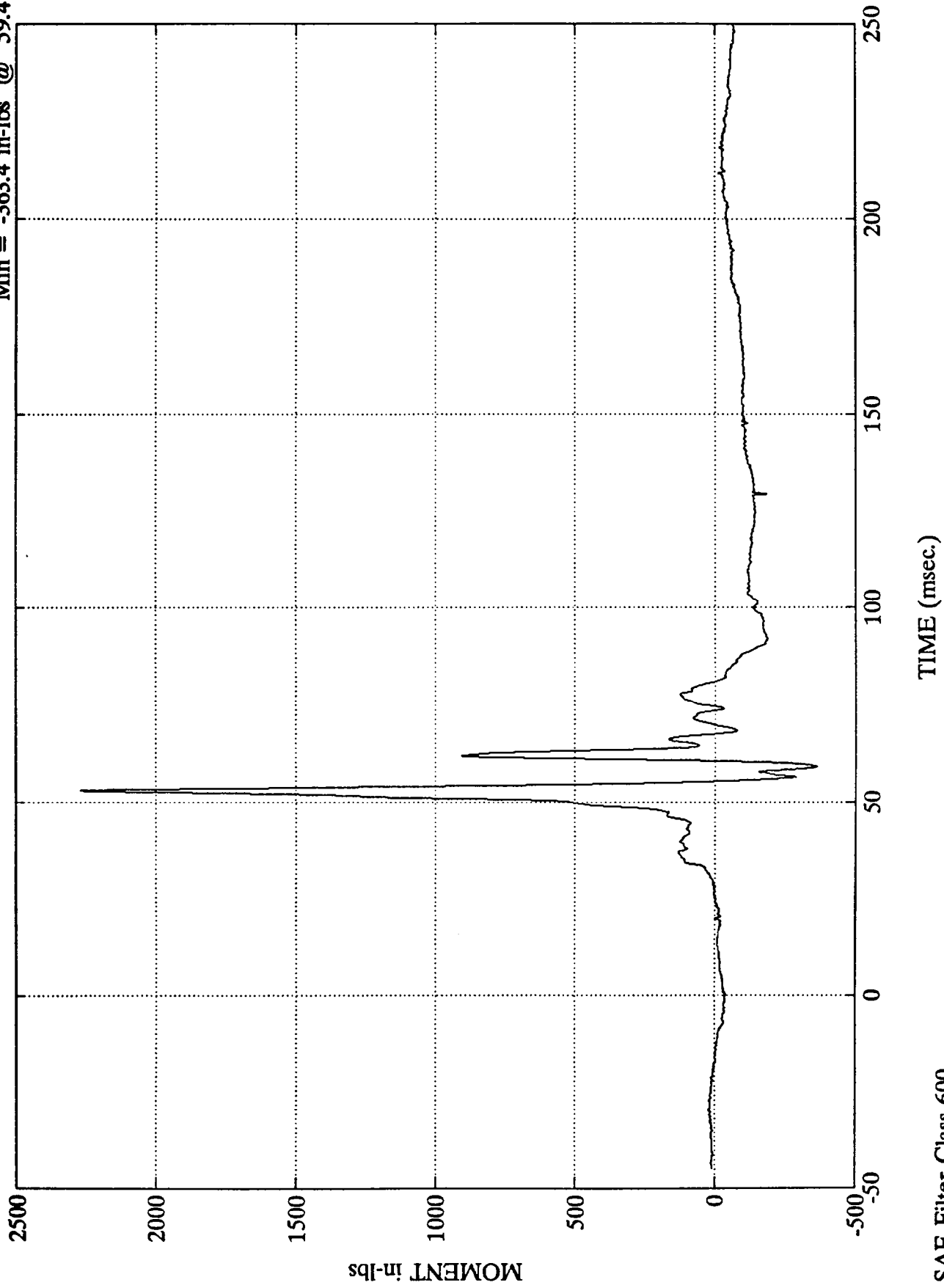
B-140

7883-1 SAE Filter Class 600

Test 1025

V2 POS#1 R. UPPER TIBIA MOMENT (Y)

Max = 2268.8 in-lbs @ 53.2 msec
Min = -363.4 in-lbs @ 59.4 msec



B-141

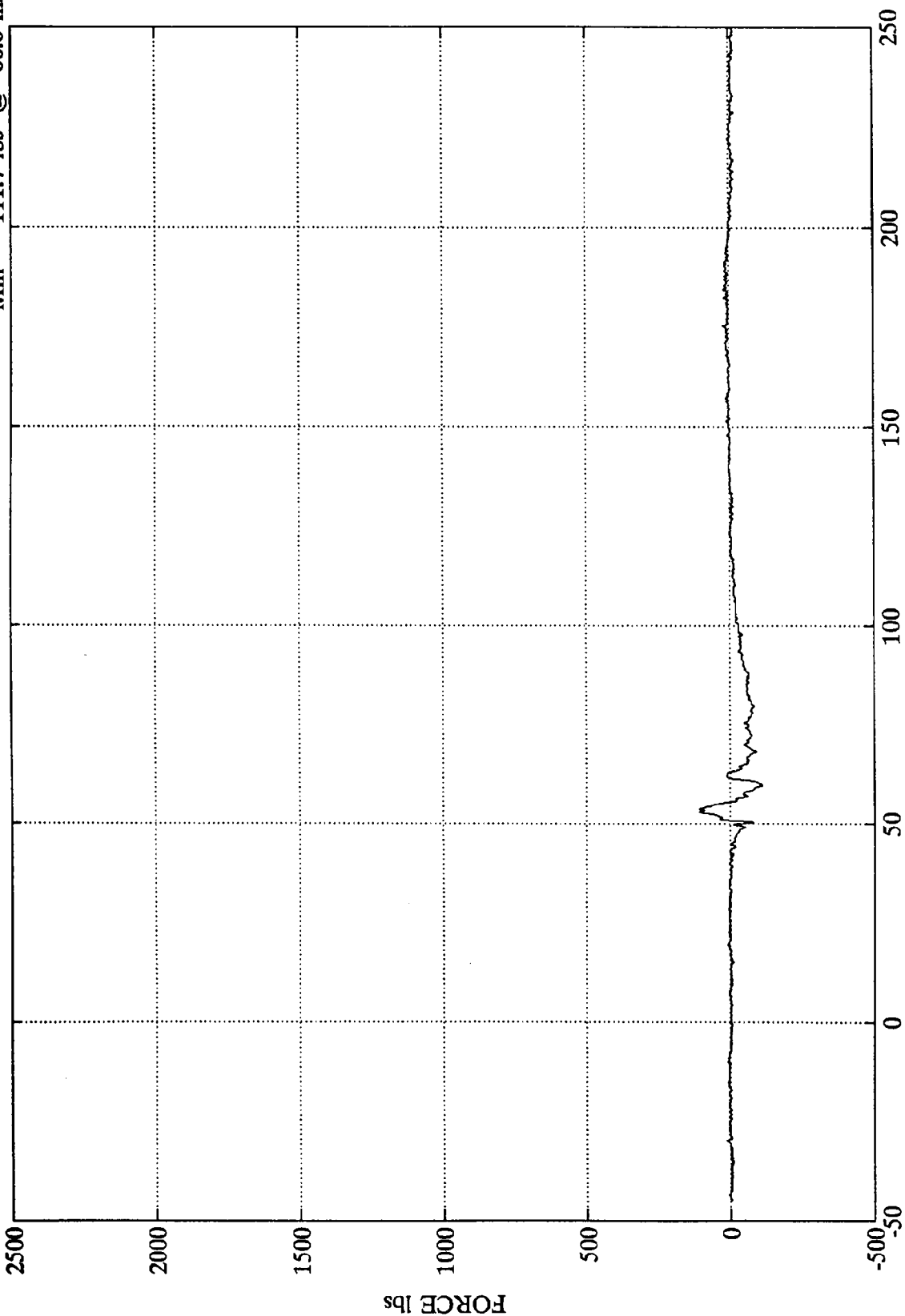
7883-1

SAE Filter Class 600

Test 1025

V2 POS#1 R. LOWER TIBIA FORCE (Y)

Max = 108.1 lbs @ 53.8 msec
Min = -111.7 lbs @ 60.0 msec



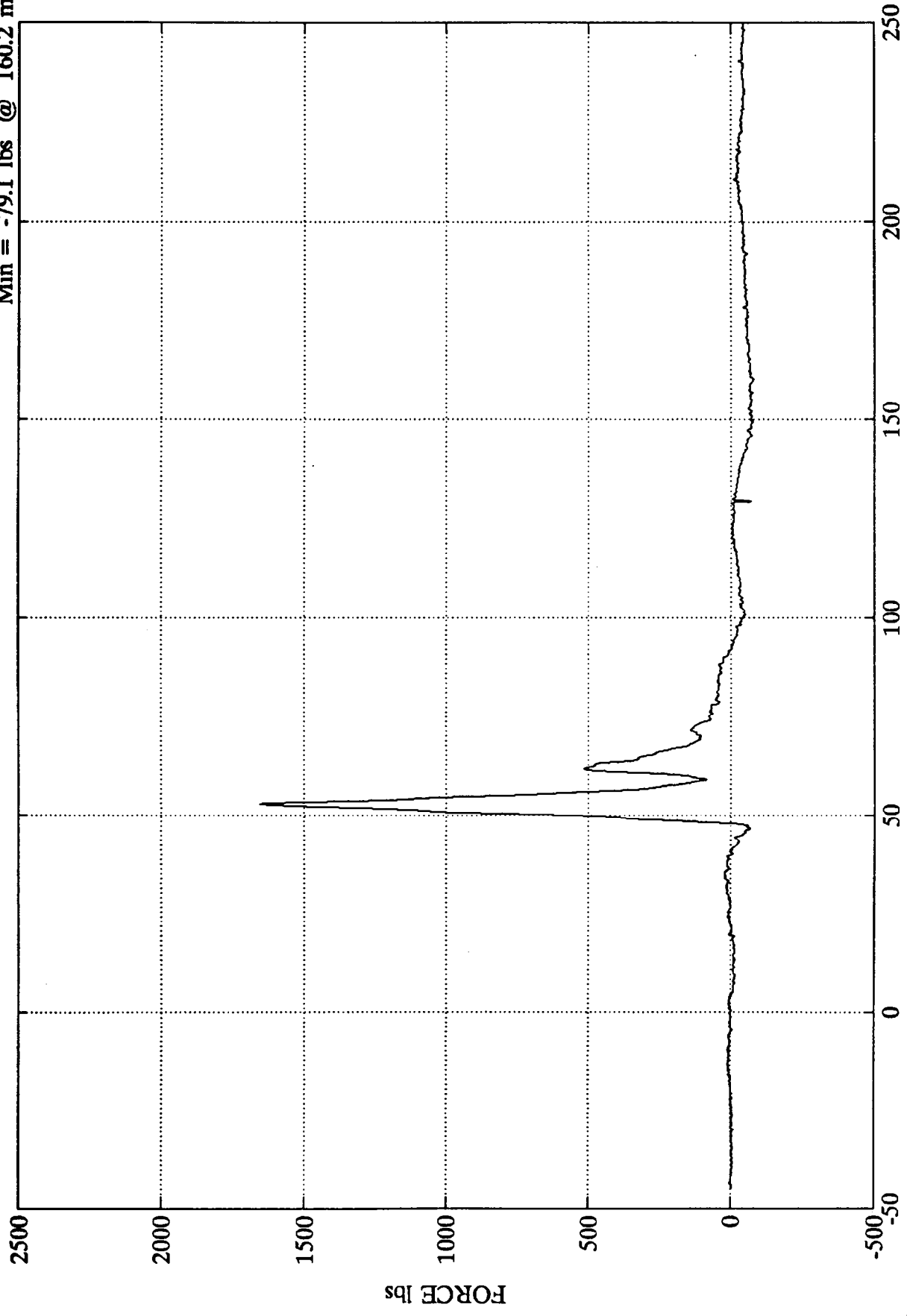
TIME (msec.)

SAE Filter Class 600

Test 1025

V2 POS#1 R. LOWER TIBIA FORCE (Z)

Max = 1655.2 lbs @ 53.0 msec
Min = -79.1 lbs @ 160.2 msec



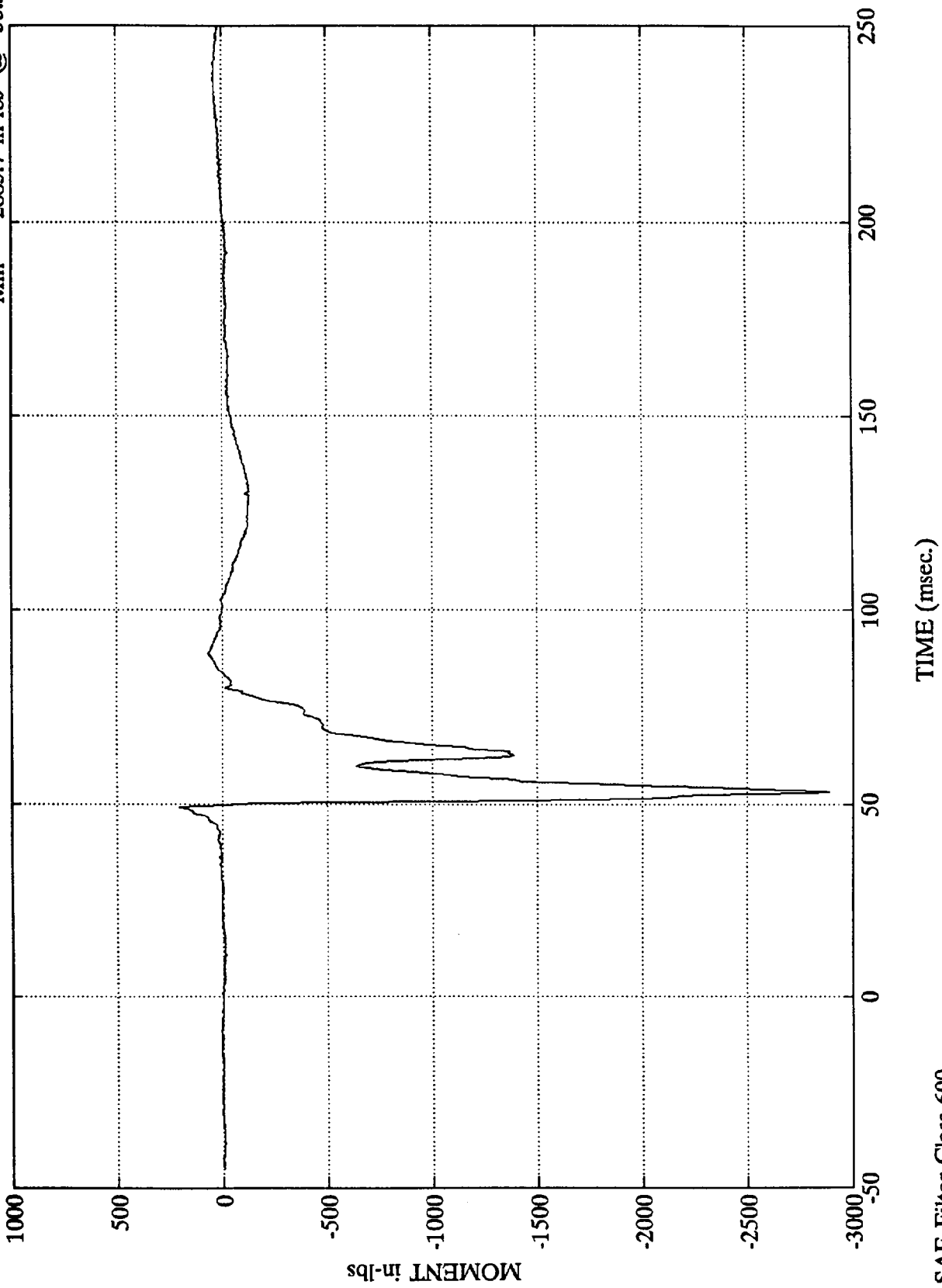
TIME (msec.)

SAE Filter Class 600

Test 1025

V2 POS#1 R. LOWER TIBIA MOMENT (X)

Max = 204.0 in-lbs @ 49.3 msec
Min = -2885.7 in-lbs @ 53.3 msec



B-144

7883-1
SAE Filter Class 600