

2446

CALSPAN REPORT NUMBER: 8304-4

**VEHICLE-TO-VEHICLE FRONTAL 30 DEGREE, 55% OVERLAP
105.9 kph IMPACT OF A MOVING DEFORMABLE BARRIER
INTO A STATIONARY 1995 FORD CONTOUR GL 4-DOOR SEDAN**

CALSPAN TEST NUMBER: Y57-4-1602

March 14, 1996

CALSPAN CORPORATION
ADVANCED TECHNOLOGY CENTER
P.O. BOX 400
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FINAL REPORT

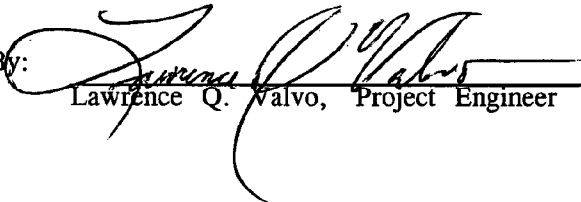
PREPARED FOR:

U. S. Department of Transportation
Research and Special Programs Administration
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Cambridge, MA 02142

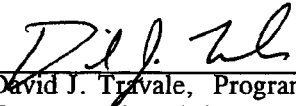
This Test Report was prepared for the U.S. Department of Transportation, Research and Special Programs Administration, under Contract No. DTRS-57-95-C-00009.

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TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Vehicle-to-Vehicle 30 degree, 55% overlap Frontal 105.9 kph Impact of a Moving Deformable Barrier into a stationary 1995 Ford Contour GL 4-Door Sedan		5. Report Date March 14, 1996	
		6. Performing Organization Code CAL	
7. Author(s) Lawrence Q. Valvo, Project Engineer David J. Travale, Program Manager		8. Performing Organization Report No. 8304-4	
9. Performing Organization Name and Address Calspan Advanced Technology Center P.O. Box 400 Buffalo, New York 14225		10. Work Unit No.	
		11. Contract or Grant No. DTRS-57-95-C-00009	
12. Sponsoring Agency Name and Address U.S. Department of Transportation Research and Special Programs Administration Transportation Systems Center Kendall Square, Cambridge, MA 02142		13. Type of Report and Period Covered Final	
		14. Sponsoring Agency Code DOT/NHTSA/NRD	
15. Supplementary Notes			
16. Abstract A 105.9 kph vehicle to vehicle 30 degree, 55% overlap impact test of a Moving Deformable Barrier into a stationary 1995 Ford Contour GL 4-door sedan was performed at the Calspan Advanced Technology Center crash facility in Buffalo, New York on March 14, 1996. The 1995 Ford Contour GL (Vehicle 1) contained 50th percentile male Hybrid III dummy occupants in the driver and right front passenger positions. Each dummy was restrained by an active 3-point continuous loop belt system and an airbag system. All dummy measurements were below the injury requirements of FMVSS208 "Occupant Crash Protection"			
17. Key Words		18. Distribution Statement <u>Copies of this report are available from:</u> NHTSA Technical Reference Division ; Mail Code: NAD-52 400 Seventh , S.W., Room 5108, Washington, D.C. 20590 Telephone No. (202) 366-4946 Attn: Robert Hornickle	
19. Security Classif. (of this report) UNCLASSIFIED	20. Security Classif. (of this page) UNCLASSIFIED	21. No. of Pages	22. Price

TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	PURPOSE AND TEST PROCEDURE	1-1
2	SUMMARY OF VEHICLE-TO-VEHICLE IMPACT TEST	2-1
3	OCCUPANT AND VEHICLE INFORMATION	3-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	VEHICLE AND DUMMY RESPONSE DATA	B-1
APPENDIX C	PART 572E DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA SHEETS	C-1

LIST OF FIGURES

<u>Figure No.</u>		<u>Page No.</u>
1	Vehicle-to-Vehicle Angled Front Impact Layout	3-2
2	Vehicle 1 Occupant Clearance Dimensions	3-8
3	Summary of Vehicle 1 Accelerometer Data	3-9
4	Vehicle 1 Pre- and Post-Test Accelerometer Locations	3-10
5	Vehicle 1 Target Locations	3-11
6	Vehicle 1 Measurement Points	3-13
7	Summary of Vehicle 2 Accelerometer Data	3-27
8	Camera Positions for VTV Angled Frontal Impacts	3-29
9	External Dimensions Setup Specifications	C-3

LIST OF TABLES

<u>Table No.</u>		<u>Page No.</u>
1	Vehicle 1 General Test and Vehicle 1 Parameter Data	3-4
2	Vehicle 1 Dummy Injury Criteria Values	3-7
3	Vehicle 1 Measurements	3-15
4	Vehicle 1 Frontal Profile Data	3-18
5	Vehicle 1 Fuel System Integrity Post Impact Test Data	3-20
6	Vehicle 1 Static Rollover Data Sheets	3-21
7	Vehicle 2 Crash Test Summary for Moving Barrier	3-26
8	Vehicle 2 Moving Deformable Honeycomb Barrier	3-28
9	Vehicle High-Speed Camera Locations	3-30

Section 1

PURPOSE AND TEST PROCEDURE

This 105.9 kph 30 degree, 55% overlap 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. DTRS-57-95-C-00009. The purpose of this Technical Task Directive (TTD 1) is to obtain responses from vehicles and restrained Hybrid III dummies during car-to-car overlapped frontal crashes. The goal is to investigate possible upgrades to the FMVSS 208 frontal test procedure.

This test was performed using a stationary 1995 Ford Contour GL 4-door sedan (Vehicle 1) and a Moving Deformable Barrier (MDB or Vehicle 2). The moving barrier was traveling at 105.9 kph with its longitudinal centerline at a crabbed angle of 15° counterclockwise from the guide rail. Vehicle 1 was positioned 15° clockwise from the guide rail such that the vehicle longitudinal centerlines were 30° apart. The vehicles were positioned so that the left edge of the MDB bumper was tangent to the forward projection of the Vehicle 1 centerline while both vehicles were in contact. The point of contact between the two vehicles was designated as the impact point.

The 1995 Ford Contour GL 4-door sedan, contained 50th percentile male Anthropomorphic Test Devices (ATDs) in the driver and right front passenger seating positions. The ATDs were fully restrained using the vehicle's driver and passenger airbag and 3-point belt systems.

Section 2

SUMMARY OF TEST

A stationary 1995 Ford Contour GL 4-door sedan (Vehicle 1) was impacted by a Moving Deformable Barrier (Vehicle 2) traveling forward at 105.9 kph. The vehicles were positioned so that Vehicle 2 impacted Vehicle 1 at a 30 degree, 55% overlap. Vehicle 1's transmission was placed in neutral with the parking brake slightly engaged to prevent the vehicle from rolling prior to the impact. The test was performed at the Calspan Corporation Advanced Technology Center Crash Test Facility on March 14, 1996.

Pre- and Post-test still photographs of the vehicles and dummies can be found in Appendix A. The impact event was documented with one real time movie camera and twelve high speed movie cameras. Vehicle photographic target locations can be found in Figure 5 and movie camera locations can be found in Figure 8.

The nominal vehicle impact points were determined as outlined in the previous section and shown in Figure 1. From film analysis, it was determined the vehicles struck 1.0 inches off target so as to create slightly less overlap.

Two Hybrid III 50th percentile Anthropomorphic Test Devices (ATDs) were placed in the driver and right front passenger seating positions of Vehicle 1. The dummies were positioned according to the dummy placement instructions from the FMVSS 208 "Occupant Crash Protection" Test Procedure. The driver and front right passenger seats of Vehicle 1 were also positioned according to FMVSS 208 instructions. Both seats were set in mid-travel position with the seat backs reclined so that the H point machine back angle measured 24° from vertical with the vehicle rockers level. The steering column was placed in mid-travel position. Both ATD's were restrained using the vehicle's driver and passenger airbag and 3-point belt system.

The 50th percentile male ATDs in the driver and right front passenger positions were instrumented with head, chest, and pelvic triaxial accelerometer packages; chest displacement potentiometers; upper neck force and moment transducers; femur axial force load cells; knee shear force potentiometers; and upper and lower tibia force and moment transducer packages. The driver ATD also contained lower neck force and moment transducers, an additional head accelerometer array, an additional 8 string pot chest displacement potentiometer array and a right foot rear Z-direction accelerometer.

The 120 channels of vehicle and dummy transducer data were recorded on a PC based data acquisition system. The data was reduced, filtered and processed as required by the appropriate test procedures using PC based software. Appendix B contains the vehicle and the dummy response data in plotted format.

The 1995 Ford Contour GL (Vehicle 1) driver HIC was 208 and the head contacted the airbag and the A-pillar. The driver's maximum chest acceleration over a three millisecond period was 41.8 gs and the maximum chest displacement was -24.1 mm. The left femur maximum axial compressive force was 5976 newtons and the right femur maximum axial compressive force was 8243 newtons.

Vehicle 1's passenger HIC was 308 and the face contacted the airbag in two locations. The passenger's maximum chest acceleration over a three millisecond period was 39.8 gs and the maximum chest displacement was -34.3 mm. The left femur maximum axial compressive force was 8281 newtons and the right femur maximum axial compressive force was 3343 newtons.

Structural damage to the 1995 Ford Contour GL (Vehicle 1) consisted of severe deformation to the left front quarter of the vehicle, roof rail deformation, driver side floor pan intrusion, and the steering column stroked. The vehicle windshield cracked throughout with a 1549 mm tear from the passenger-side top corner of the windshield to the bottom center of the windshield. A 965 mm molding separation occurred on the top edge of the windshield and a 356 mm molding separation occurred at the bottom edge of the windshield.

The honeycomb barrier used on the Moving Deformable Barrier (Vehicle 2) was the DSL-1285 specified barrier used for FMVSS 214D side impact testing. The rear of the barrier face attachment plate was instrumented with 5 load cells.

TEST ANOMALIES

Appendix B contains lists of all data channels. Anomalies occurred in the following data channels:

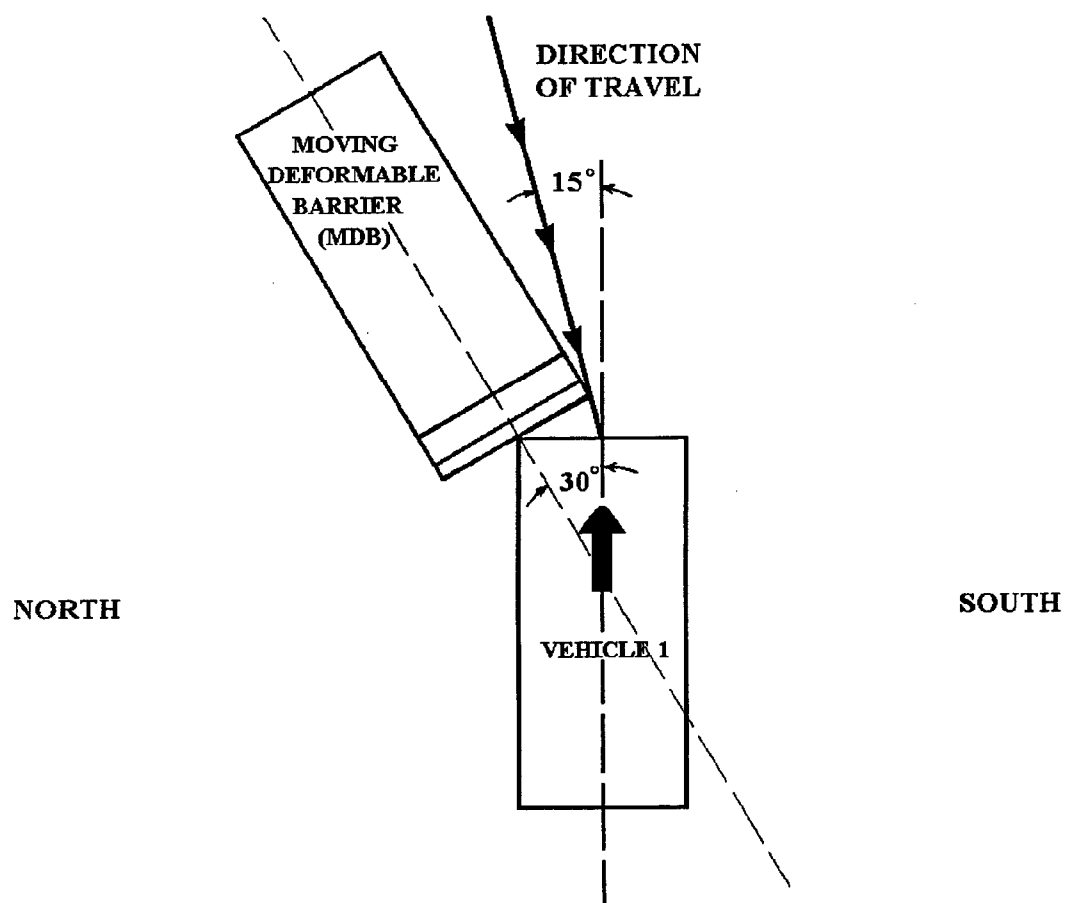
- Vehicle 1 Acc #2 LF Frame Rail X accelerometer: Accelerometer wire was cut after 125 msec.
- Vehicle 1 Acc #8 Brake Pedal X accelerometer: Accelerometer wire was cut after 140 msec.
- Vehicle 1 Acc #13 A-Pillar Hinge X accelerometer: Accelerometer wire was cut after 60 msec.
- Position 1 (Driver) Rt Lower Tibia My: Channel saturated from approximately 50 msec to 55 msec.

Section 3

VEHICLE AND OCCUPANT INFORMATION

Figure 1

VEHICLE-TO-VEHICLE ANGLED FRONTAL IMPACT LAYOUT



VEHICLE ONE DATA

Table 1

GENERAL TEST AND VEHICLE 1 PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1995 Ford Contour GL 4-door sedan

NHTSA Test No.: - VIN.: 1FALP6534SK204263

Body Color: Red Date of Manufacture: 4/95

Engine: 4 Cylinders; - C.I.D.; 2.0 Liters; - CC
X Gas; - Diesel; - Turbocharged
- Longitudinal; X Transverse

Transmission: 5 Speed; X Manual; - Automatic; - Overdrive

Final Drive: X Front Wheel; - Rear Wheel; - Four Wheel
- A/C; X P/S; X P/B; - P/wdo
- Tilt Wheel; - P/seats; - Cruise Control

Type of Occupant Restraint: driver and passenger airbag and 3-point belt system

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 234 kpa, Rear 234 kpa

Recommended Tire Size: P185/70R14

Recommended Cold Tire Pressure: Front 234 kpa, Rear 234 kpa

Tires on Vehicle: P185/70R14; Manufacturer: General

Number of Occupants: 2 Front; 3 Rear; - 3rd Seat; 5 TOTAL

Type of Front Seats: X Bucket; - Bench; - Split Bench;

Type of Front Seat Back: - Fixed; X Adj. With; - Lever X Rot. Knob

Vehicle Capacity Weight (VCW) = 399 kgs. (A)

No. of Occupants x 68.03 kgs. = 340 kgs. (B)

Rated Cargo and Luggage

Weight (RCLW) A - B = 59 kgs.

GVWR 1850 kgs. GAWR: Front 998 kgs. Rear 887 kgs.

Table 1

GENERAL TEST AND VEHICLE 1 PARAMETER DATA (continued)

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

Right Front	=	<u>390</u>	kgs.	Right Rear	=	<u>227</u>	kgs.
Left Front	=	<u>371</u>	kgs.	Left Rear	=	<u>280</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>761</u>	kgs.	(<u>60.0</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>507</u>	kgs.	(<u>40.0</u> % of Total Vehicle Weight)			
TOTAL DELIVERED WEIGHT	=	<u>1,268</u>	kgs.				

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMY:

Right Front	=	<u>423</u>	kgs.	Right Rear	=	<u>323</u>	kgs.
Left Front	=	<u>419</u>	kgs.	Left Rear	=	<u>315</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>842</u>	kgs.	(<u>56.9</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>638</u>	kg	(<u>43.1</u> % of Total Vehicle Weight)			
TOTAL TEST WEIGHT	=	<u>1,480</u>	kgs.				

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

Delivered Attitude:	RF	<u>715</u>	;	LF	<u>720</u>	;	RR	<u>705</u>	;	LR	<u>705</u>
Test Attitude:	RF	<u>714</u>	;	LF	<u>706</u>	;	RR	<u>643</u>	;	LR	<u>653</u>
Vehicle's Wheel Base=		<u>2692</u>	mm.								
Location of Vehicle's C.G. =		<u>1161 millimeters rearward of the front wheel center.</u>									

Table 1

GENERAL TEST AND VEHICLE 1 PARAMETER DATA (continued)POST-IMPACT DATA:

Type of Test:	<u>VTV Frontal 30°, 55% overlap</u>	Impact Angle:	<u>30 Deg.</u>
Date of Test:	<u>March 14, 1996</u>	Time of Test:	<u>15:01</u>
Ambient Temperature:	<u>10</u>	°C at impact area	
Temperature in Occupant Compartment:	<u>22</u>	°C	
Windshield Molding Temperature:	<u>-</u>	°C	
Required Impact Velocity Range:	<u>108</u>	to	<u>110</u> kph
Impact Velocity:	primary = <u>105.9</u>	kph, secondary =	<u>105.7</u> kph
Distance From Front Bumper to Barrier Face When			
Entering Speed Trap:	<u>132</u>	cm.	
Exiting Speed Trap:	<u>30.5</u>	cm.	

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Face to upper center of airbag, top of head to A-pillar</u>	<u>Face to center and top of airbag (face contacted airbag twice)</u>
Chest	<u>Airbag/Belt</u>	<u>Airbag/Belt</u>
Abdomen	<u>Airbag/Belt</u>	<u>Airbag/Belt</u>
Left Knee	<u>Bolster left of steering column</u>	<u>Left knee to left of glove box and bolster</u>
Right Knee	<u>Right side of steering column shroud and bolster</u>	<u>Right knee to center of glove box</u>

	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Door Opening	<u>Closed/Inoperable</u>	<u>Closed/Operable</u>	<u>Closed/Operable</u>	<u>Closed/Operable</u>

	<u>Front</u>		<u>Rear</u>	
<u>Seat Movement</u>	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Seat Back Failure	<u>None</u>	<u>None</u>	<u>N/A</u>	<u>N/A</u>
Seat Shift (mm.)	<u>3 forward</u>	<u>5 forward</u>	<u>N/A</u>	<u>N/A</u>

Table 2

VEHICLE 1 DUMMY INJURY CRITERIA VALUES

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DUMMY (1)	-41.7	-42.5	-20.9	46.1	-39.5	-32.5	18.6	41.8
DUMMY (2)	-50.2	-25.3	-28.9	57.3	-42.8	-14.5	-15.4	39.8

	MAXIMUM FORCE FEMUR LOAD (NEWTONS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	-5976.2	-8242.8
DUMMY (2)	-8280.6	-3342.7

	MAXIMUM LOAD (NEWTONS)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)	-	-	-
DUMMY (2)	-	-	-

	MAXIMUM ACCELERATION ("G")			
	HIC	t ₁ (SEC)	t ₂ (SEC)	Average Acceleration t ₁ TO t ₂
DUMMY (1)	208	59.280	90.240	33.97
DUMMY (2)	308	55.800	86.160	40.03

*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No. 208

Figure 2

VEHICLE 1 OCCUPANT CLEARANCE DIMENSIONS (mm)

	DRIVER (mm)	PASSENGER
HH	292	279
NW	523	538
NSW	376	-
NIP	538	574
NH	396	-
CD	541	493
CS	262	-
KDL	155	145
KDR	127	135
1	505	-
2	51	-
SA	24°(backpan)	24°(backpan)
PA	23°	25°
ULA	104°	102°
LLA	231°	229°

DISTANCE OF H-POINT FROM TARGET POSITION (mm)		
	Driver	Passenger
Longitudinal	5 behind	3 behind
Vertical	8 above	6 above

Angles taken relative to vertical

SA = Seat Back Angle

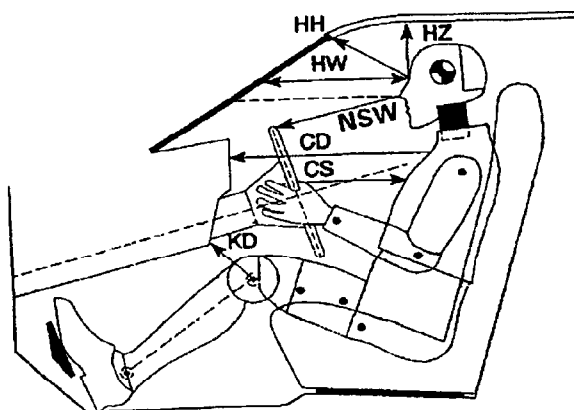
PA = Pelvic Angle

ULA= Upper Leg Angle

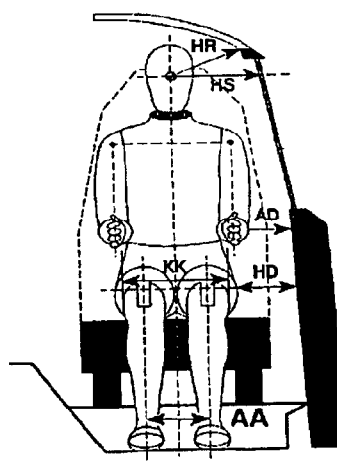
LLA= Lower Leg Angle

	DRIVER (mm)	PASSENGER
HR*	203	206
HS*	305	307
AD	86	84
HD	137	130
KK	292	272
AA	279	267
DT	71 (22°C)	71 (22°C)

* Measurements taken from intersection of nose and forehead in accordance with revised FMVSS 208 instructions.



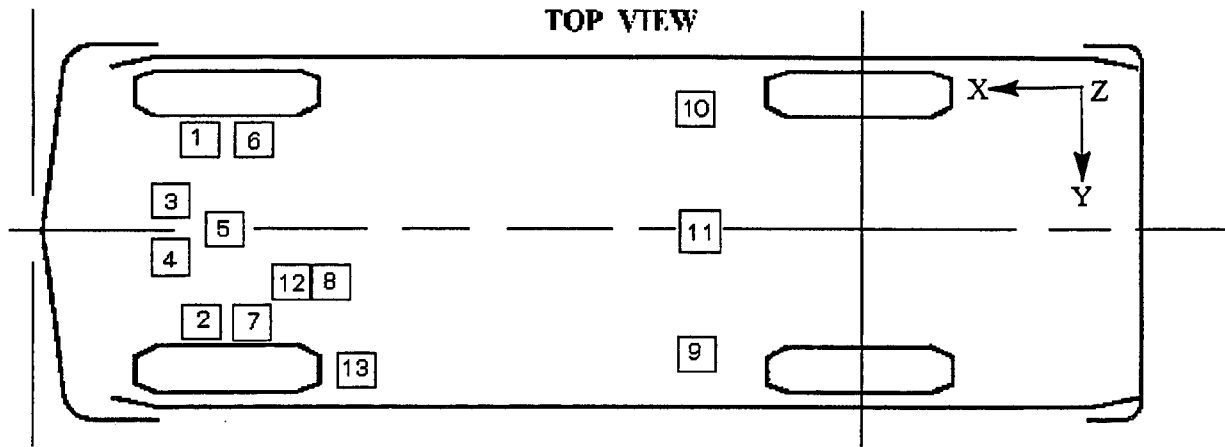
- HH - Head to Windshield Header
- NW - Head to Windshield
- NSW - Nose to Steering Wheel
- NIP - Nose to Instrument Panel
- NH - Nose to Steering Wheel Hub
- CD - Chest to Dash
- CS - Chest to Steering Wheel Hub
- KDL - Knee to Dash Left
- KDR - Knee to Dash Right
- 1 - Nose to Steering Column Target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

Figure 3

SUMMARY OF VEHICLE 1 ACCELEROMETER DATA



Vehicle: 1995 Ford Contour GL 4-door sedan

NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Acc 1 Rt Ft Frame Rail X	Gs	9.7	27.4	-58.4	50.9	60.0
1	Acc 1 Rt Ft Frame Rail Y	Gs	22.5	49.2	-40.0	38.9	60.0
1	Acc 1 Rt Ft Frame Rail Z	Gs	40.1	50.8	-17.9	26.0	60.0
2	Acc 2 Lt Ft Frame Rail X	Gs	425.6	235.4	-423.1	190.9	60.0
2	Acc 2 Lt Ft Frame Rail Y	Gs	40.5	30.0	-65.6	37.8	60.0
2	Acc 2 Lt Ft Frame Rail Z	Gs	73.8	46.9	-57.9	40.9	60.0
3	Acc 3 Rt Engine X	Gs	10.6	49.2	-84.2	32.8	60.0
4	Acc 4 Lt Engine X	Gs	32.7	52.8	-94.2	39.7	60.0
5	Acc 5 Engine Bottom X	Gs	27.0	52.3	-52.7	29.6	60.0
5	Acc 5 Engine Bottom Y	Gs	31.7	56.0	-31.0	46.7	60.0
6	Acc 6 Rt Shock Tower X	Gs	2.9	240.4	-66.9	46.8	60.0
6	Acc 6 Rt Shock Tower Y	Gs	27.0	56.3	-57.3	49.3	60.0
7	Acc 7 Lt Shock Tower X	Gs	24.2	66.5	-133.4	40.4	60.0
7	Acc 7 Lt Shock Tower Y	Gs	24.1	62.0	-60.0	26.8	60.0
8	Acc 8 Brake Pedal X	Gs	426.8	259.1	-427.1	230.6	60.0
8	Acc 8 Brake Pedal Y	Gs	96.5	58.1	-214.4	42.1	60.0
8	Acc 8 Brake Pedal Z	Gs	145.6	39.5	-141.5	47.9	60.0
9	Acc 9 Lt Rr Compartment X	Gs	3.5	162.5	-39.3	50.3	60.0
9	Acc 9 Lt Rr Compartment Y	Gs	3.2	67.3	-12.9	44.2	60.0
10	Acc 10 Rt Rr Compartment X	Gs	4.2	80.3	-42.9	52.8	60.0
10	Acc 10 Rt Rr Compartment Y	Gs	5.6	66.7	-15.9	53.9	60.0
11	Acc 11 C/L Rear Compartment X	Gs	2.9	118.9	-42.4	49.4	60.0
11	Acc 11 C/L Rear Compartment Y	Gs	5.2	72.5	-16.2	43.7	60.0
12	Acc 12 Toe Pan X	Gs	53.1	63.0	-71.2	34.6	60.0
12	Acc 12 Toe Pan Y	Gs	29.8	62.6	-72.6	36.0	60.0
12	Acc 12 Toe Pan Z	Gs	38.4	47.8	-59.4	40.4	60.0
13	Acc 13 A-Pillar Hinge	Gs	221.6	70.1	-219.6	87.5	60.0

Figure 4

VEHICLE 1 PRE- AND POST-TEST POSITION OF TEST VEHICLE

ACCELEROMETER MOUNTING LOCATIONS

Test Description: 105.9 kph Frontal Vehicle to Vehicle Impact

Test Vehicle: 1995 Ford Contour GL 4-door sedan

Reference Plane: X: Vehicle plane at rear bumper, positive forward;

Y: Vehicle longitudinal centerline, positive to the right; Z: Ground, positive up

VEHICLE No. 1		PRE-TEST AXIS (mm)			POST-TEST AXIS (mm)		
Loc. No.	DESCRIPTION	X	Y	Z	X	Y	Z
1	RIGHT FRONT FRAME RAIL	3830	360	190	3840	350	180
2	LEFT FRONT FRAME RAIL	3810	-350	190	3770	-410	145
3	RIGHT ENGINE TOP	3918	303	805	3825	380	800
4	LEFT ENGINE TOP	3925	-15	805	3748	65	815
5	ENGINE BOTTOM	3825	90	250	3790	200	205
6	RIGHT SHOCK TOWER	3730	612	850	3725	640	865
7	LEFT SHOCK TOWER	3740	-610	855	3410	-455	910
8	BRAKE PEDAL	3240	-300	455	3015	-285	495
9	LEFT REAR COMP.	1760	-430	450	1750	-435	440
10	RIGHT REAR COMP.	1750	450	450	1745	445	470
11	CENTER REAR COMP.	1800	0	445	1795	0	450
12	DRIVER TOEPAN	3360	-335	340	3120	-280	360
13	DRIVER 'A' PILLAR	3205	-775	615	3090	-820	530

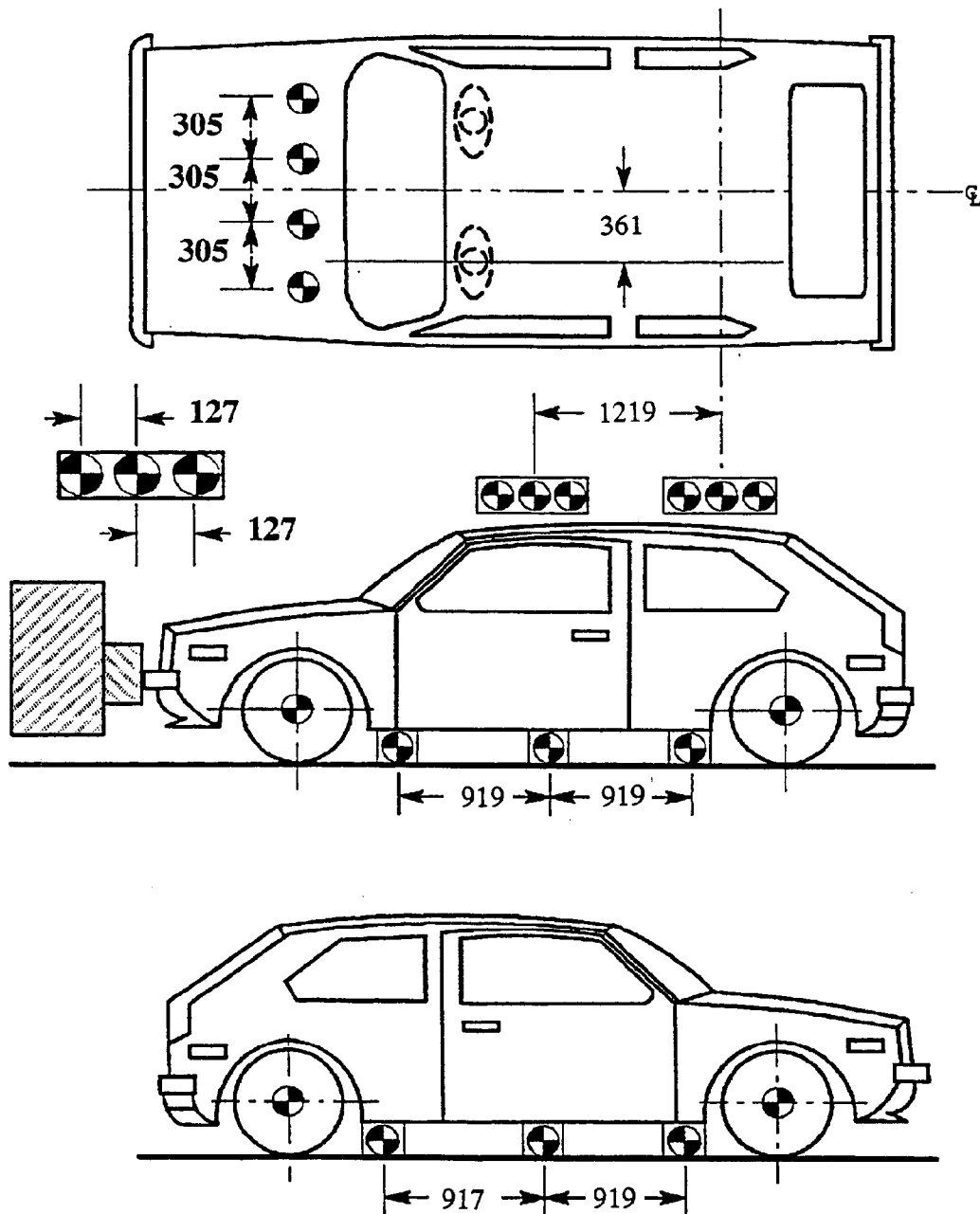
NOTE: Vehicle leveled to pre-test height for post-test measurements.

TOEPAN MEASUREMENT LOCATIONS*												
Loc. No.	DRIVER (mm.)						PASSENGER(mm.)					
	PRE-TEST AXIS			POST-TEST AXIS			PRE-TEST AXIS			POST-TEST AXIS		
	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
1 (lower left)	3190	-560	270	3080	-540	210	3210	235	270	3200	210	280
2 (upper left)	3350	-590	470	3140	-560	465	3400	260	425	3380	215	395
3 (center)	3360	-335	340	3120	-280	360	3340	345	335	3355	325	320
4 (lower right)	3260	-225	285	3180	-220	235	3230	545	265	3210	540	265
5 (upper right)	3390	-200	415	3200	-180	395	3350	525	455	3340	540	445

Figure 5

VEHICLE 1 TARGET LOCATIONS

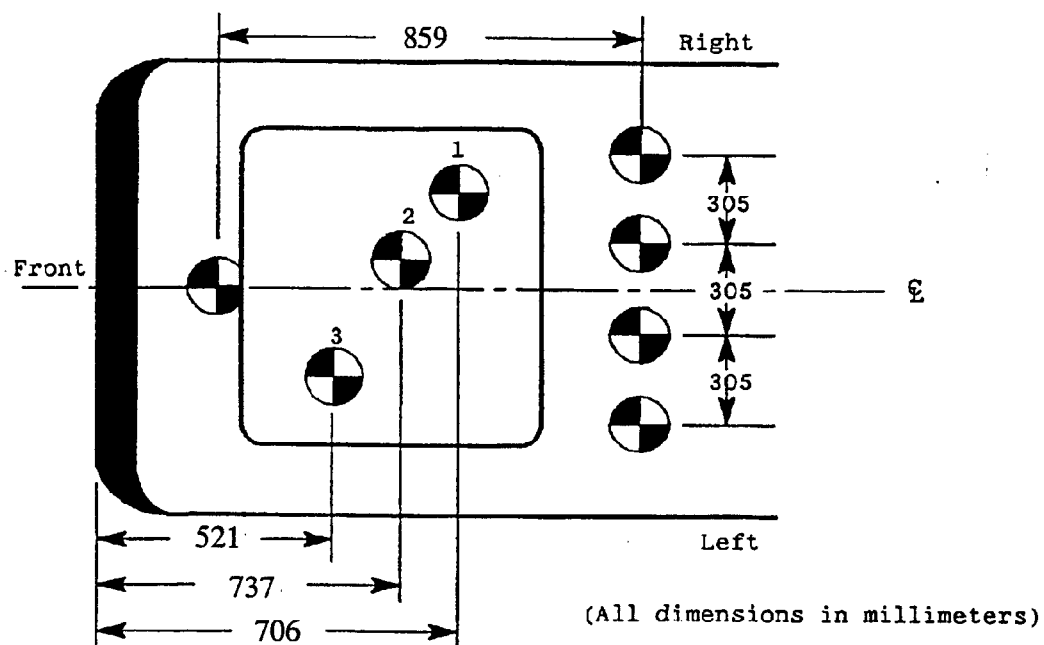
(All dimensions in millimeters)



(Dimensions in millimeters)

Figure 5

VEHICLE 1 TARGET LOCATIONS (continued)
(TOP VIEW OF HOOD AND ENGINE COMPARTMENT)



Note: Drawing not to scale.

Target 1: Engine Mount
2: Engine
3: Air cleaner

Figure 6

VEHICLE 1 MEASUREMENT POINTS

(All dimensions in millimeters)

REAR DATUM REFERENCE

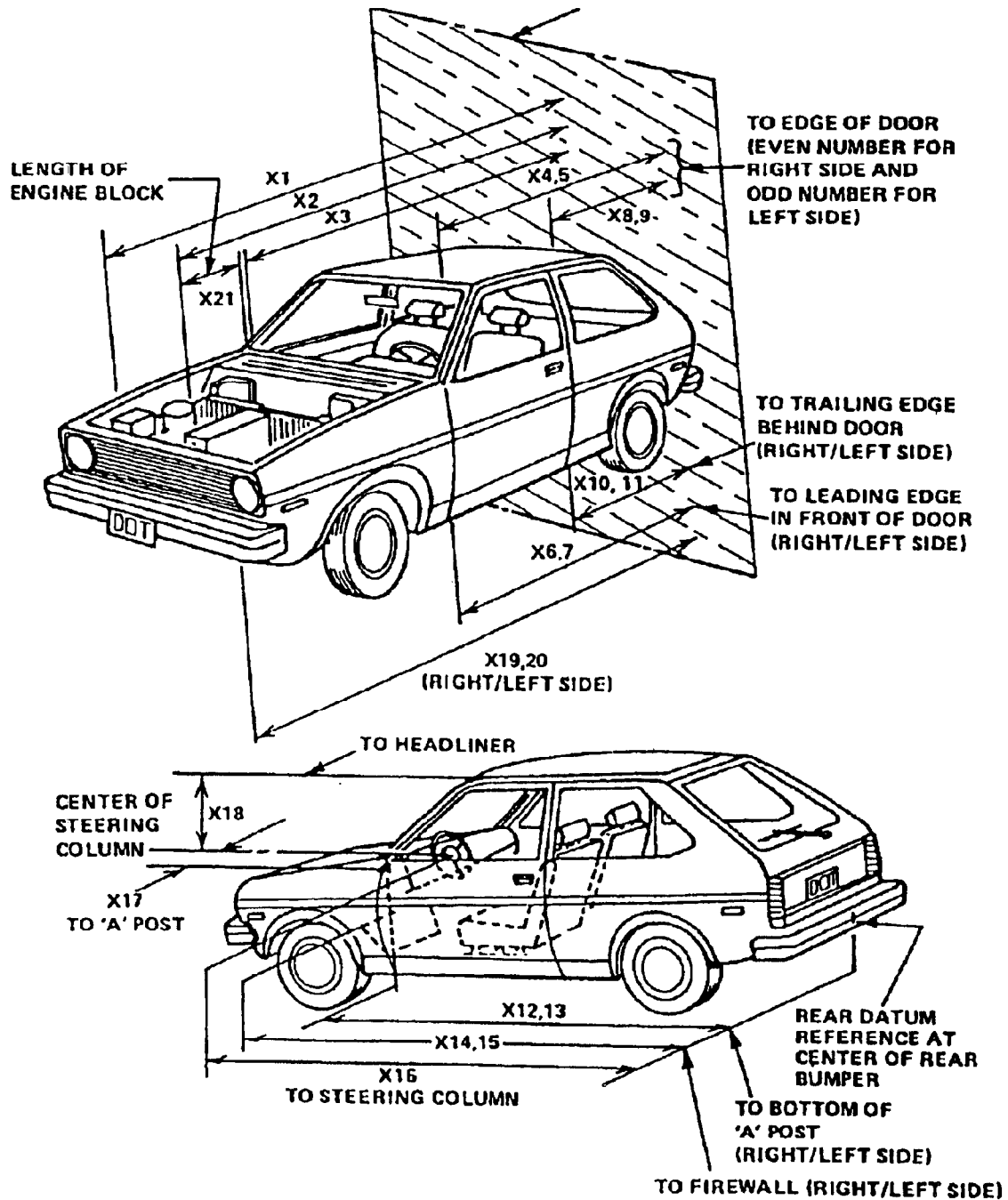


Figure 6

VEHICLE 1 MEASUREMENT POINTS (continued)

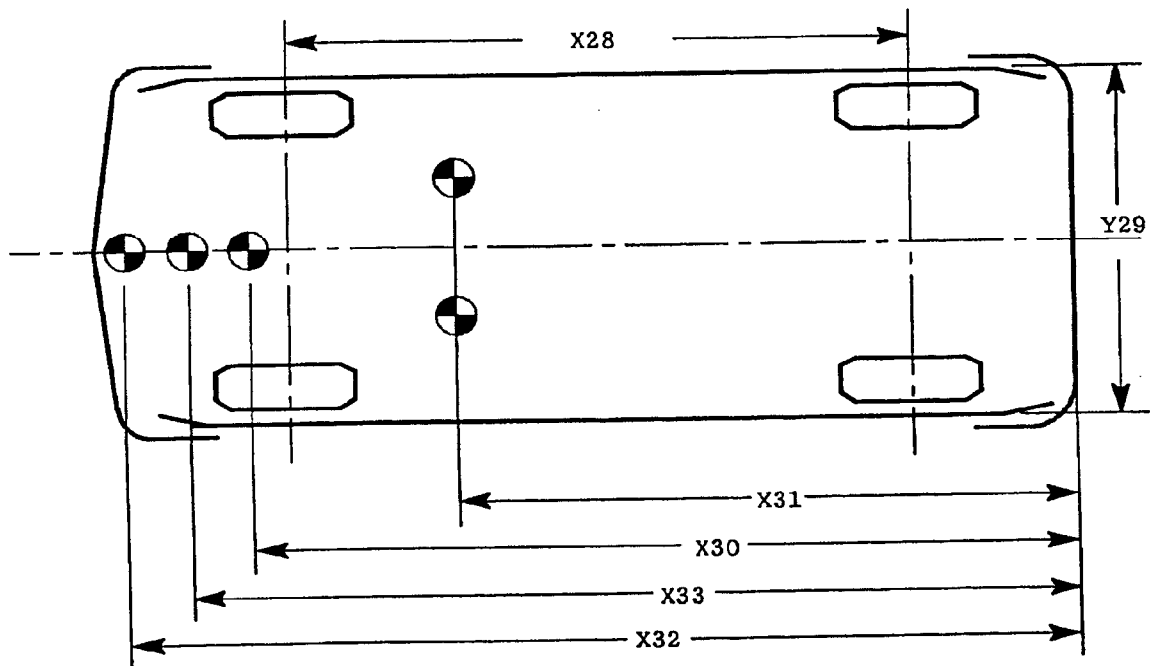
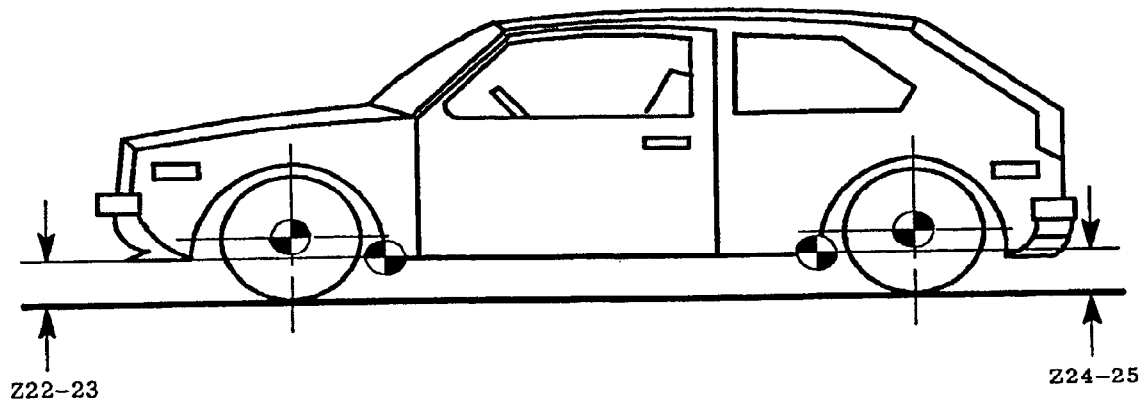


Table 3

VEHICLE 1 MEASUREMENTS

No.	TYPE OF MEASUREMENT	All Dimensions in millimeters		
		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4660	4480	180
X2	Rear Surface of Vehicle to Engine at Centerline	4080	3915	165
X3	Rear Surface of Vehicle to Firewall	3635	3485	150
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3241	3240	1
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3238	3154	84
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3210	3203	7
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3210	3121	89
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2129	2126	3
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2133	2055	78
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2105	2100	5
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2107	2025	82
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3205	3196	9
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3202	3100	102
X14	Rear Surface of Vehicle to Firewall - Right Side	3560	3530	30
X15	Rear Surface of Vehicle to Firewall - Left Side	3565	3430	135
X16	Rear Surface of Vehicle to Steering Wheel Center	2700	2670	30
X17	Steering Column to "A" Post	430	380	50

Table 3

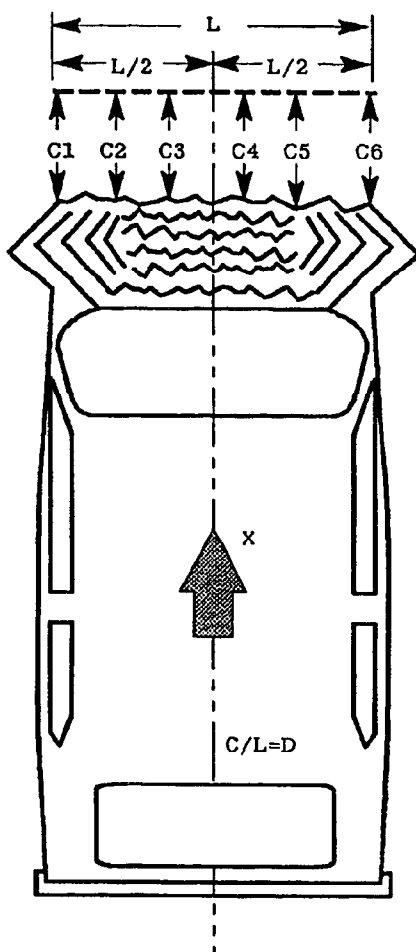
VEHICLE 1 MEASUREMENTS (continued)

No.	TYPE OF MEASUREMENT	All Dimensions in millimeters		
		Pre-Test	Post-Test	Difference
Z18	Rear of Windshield Header to Steering Wheel Column	440	390	50
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4545	4675	-130
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4550	4030	520
X21	Width of Engine Block	475	475	0
Z22	Right Front Sill to Ground Plane	205	215	-10
Z23	Left Front Sill to Ground Plane	203	160	43
Z24	Right Rear Sill to Ground Plane	205	250	-45
Z25	Left Rear Sill to Ground Plane	205	195	10
X26	Firewall to Engine or Transaxle	260	255	5
Z27	Vertical Dim. from Door Sill to Centerline of Steering Column	525	640	-115
X28	Wheelbase of Vehicle	L: 2692 R: 2692	L: 2413 R: 2705	L: 279 R: 13
Y29	Width of Vehicle at Maximum Width Point	1758	1758	0
X30	Rear Surface of Vehicle to Engine Target	3896	3759	137
X31	Rear Surface of Vehicle to Compartment Target	L: 3205 R: 3205	L: 3162 R: 3200	L: 43 R: 5
X32	Rear Surface of Vehicle to Bumper Target	4509	4318	191
X33	Rear Surface of Vehicle to Frame Crossmember	4265	3998	267

Table 3

VEHICLE 1 MEASUREMENT (continued)

(all dimensions in millimeters)



Location	Pre-Test	Post-Test	Change
C1	4500	3945	555
C2	4600	4195	405
C3	4645	4390	255
C4	4645	4525	120
C5	4600	4615	-15
C6	4500	4660	-160

Note: The bumper, which was separated from the vehicle during the impact, was sheet metal screwed into position for post test measurements.

Table 4

VEHICLE 1 FRONTAL PROFILE DATA* (mm)

		PRE-TEST PROFILE						POST-TEST PROFILE						CHANGE					
		Vehicle Left			Vehicle Right			Vehicle Left			Vehicle Right			Vehicle Left			Vehicle Right		
Location	Axis	pt. 1	pt. 2	pt. 3	pt. 4	pt. 5	pt. 6	pt. 1	pt. 2	pt. 3	pt. 4	pt. 5	pt. 6	pt. 1	pt. 2	pt. 3	pt. 4	pt. 5	pt. 6
Bottom of front Bumper	X	130	225	280	280	235	125	-305	-95	60	165	230	245	-435	-320	-220	-115	-5	120
	Y	-690	-370	-110	130	405	715	-695	-370	-110	325	400	710	-5	0	0	195	-5	-5
	Z	300	300	320	320	315	315	365	350	370	350	315	280	65	50	50	30	0	-35
Top of Front Bumper	X	200	300	345	345	300	200	-355	-105	90	225	315	360	-555	-405	-255	-120	15	160
	Y	-740	-430	-145	140	425	745	-740	-430	-50	45	430	745	0	0	95	-95	5	0
	Z	545	565	565	565	565	535	630	660	625	590	550	490	85	95	60	25	-15	-45
Center of Grill	X	85	195	225	220	190	90	-355	-445	-285	-145	250	95	-440	-640	-510	-365	60	5
	Y	-734	-425	-130	140	425	725	-600	-430	-50	40	480	720	134	-5	80	-100	55	-5
	Z	660	660	665	670	670	665	750	780	700	680	670	670	90	120	35	10	0	5
Front of Hood	X	40	75	85	85	70	40	-380	-450	-300	-155	5	35	-420	-525	-385	-240	-65	-5
	Y	-710	-410	-130	145	420	715	-605	-405	-130	130	410	720	105	5	0	-15	-10	5
	Z	720	740	735	735	735	720	755	790	760	650	650	695	35	50	25	-85	-85	-25

* - X axis measurements referenced to a plane 4300 mm. forward of rear bumper.

Y axis referenced to vehicle centerline and positive to right.

Z axis referenced to ground and positive up.

Table 4

Additional Measurements (mm.)

	PRE-TEST			POST-TEST			CHANGE		
	X	Y	Z	X	Y	Z	X	Y	Z
Driver IP above left knee	2905	-475	745	2800	-470	750	-105	5	5
Driver IP above right knee	2910	-180	735	2840	-180	750	-70	0	15
Pass. IP above left knee	2900	225	765	2890	220	775	-10	-5	10
Pass. IP above right knee	2890	520	760	2890	520	775	0	0	15
Intrusion of brake pedal	3240	-300	455	3015	-285	495	-225	15	40
Intrusion of left foot rest	3190	-560	270	3080	-540	210	-110	20	-60
Driver 'A' pillar hinge to rear door striker	1010	-	-	930	-	-	-80	-	-

* - X axis measurements referenced to a plane at rear bumper and positive forward.
 Y axis referenced to vehicle centerline and positive to right.
 Z axis referenced to ground and positive up.

Table 5
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

TEST VEHICLE NHTSA NO.: _____ - TEST DATE: March 14, 1996

Vehicle Mfgr./Make/Model: 1995 Ford Contour GL 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:

<u>X</u>	Frontal (109 kph) 30°, 55% overlap vehicle to vehicle contacting driver side first
<u>-</u>	Oblique (30 mph) with <u>-</u> ° barrier face first contacting _____ (driver/passenger) side
<u>-</u>	Rear Moving Barrier (30 mph)
<u>-</u>	Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT:

1. From impact until vehicle motion ceases
2. For five 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.

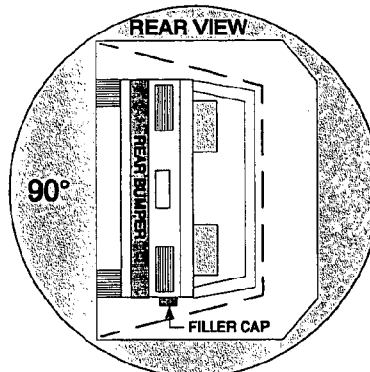
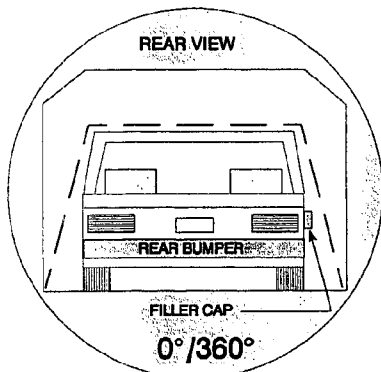
SOLVENT SPILLAGE DETAILS:

None

Table 6
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:
0-90 Deg.

Vehicle NHTSA ID No.:
--



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	<u>2</u> minutes <u>15</u> seconds
FMVSS 301 Position Hold Time +	<u>5</u> minutes <u>00</u> seconds
TOTAL	<u>7</u> minutes <u>15</u> seconds
Next whole minute interval	<u>8</u> minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes 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.

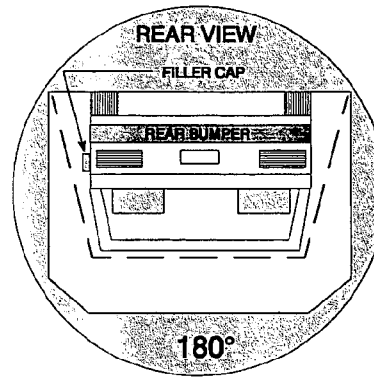
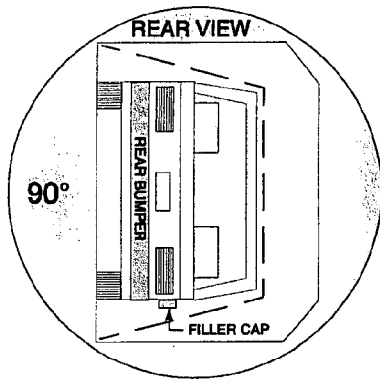
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 6
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:
90-180 Deg.

Vehicle NHTSA ID No.: _____



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	<u>1</u>	minutes	<u>56</u>	seconds
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>00</u>	seconds
TOTAL	<u>6</u>	minutes	<u>56</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes 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	N/A

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

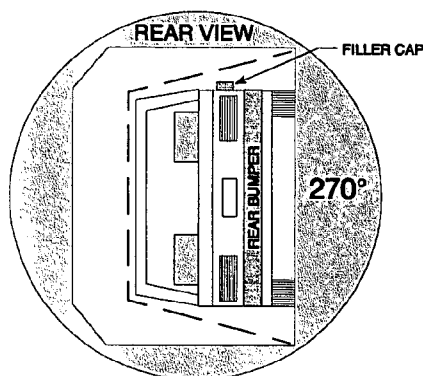
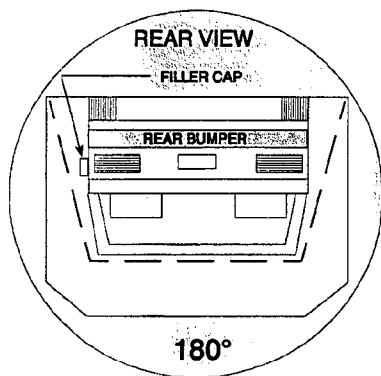
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 6
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:
180-270 Deg.

Vehicle NHTSA ID No.: _____



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 1 minutes 52 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL 6 minutes 52 seconds

Next whole minute interval 7 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes 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	N/A

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

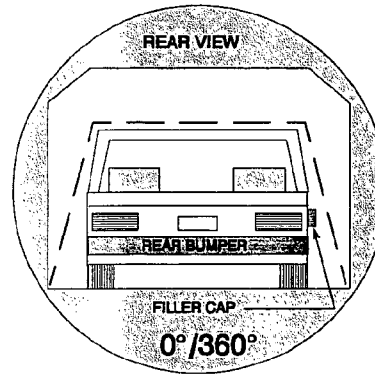
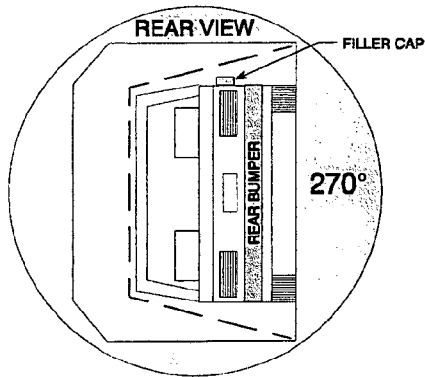
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 6
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:
270-360 Deg.

Vehicle NHTSA ID No.:
--



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	<u>1</u>	minutes	<u>57</u>	seconds
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>00</u>	seconds
TOTAL	<u>6</u>	minutes	<u>57</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes 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	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S):

None

VEHICLE TWO DATA

Table 7

CRASH TEST SUMMARY FOR MOVING BARRIER

POSITION OF IMPACTOR (MDB) TO THE MONORAIL:

Wheels crabbed 15° to the right when viewed from above.

MDB DETAILS (SN #17):

Overall Width of Framework Carriage	=	<u>1251</u>	millimeters
Overall Length of MDB (incl. honeycomb impact face)	=	<u>4102</u>	millimeters
Wheelbase of Framework Carriage	=	<u>2598</u>	millimeters
Tread of Framework Carriage (Front & Rear)	=	<u>1880</u>	millimeters
C.G. Location Rearward of Front Axle	=	<u>1013</u>	millimeters

MDB WEIGHT:

Right Front	=	<u>341</u>	kgs.	Right Rear	=	<u>340</u>	kgs.
Left Front	=	<u>528</u>	kgs.	Left Rear	=	<u>150.5</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>869</u>	kgs.	(<u>61.0</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>490.5</u>	kgs.	(<u>39.0</u> % of Total Vehicle Weight)			
TOTAL TEST WEIGHT	=	<u>1395.5</u>	kgs.				

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

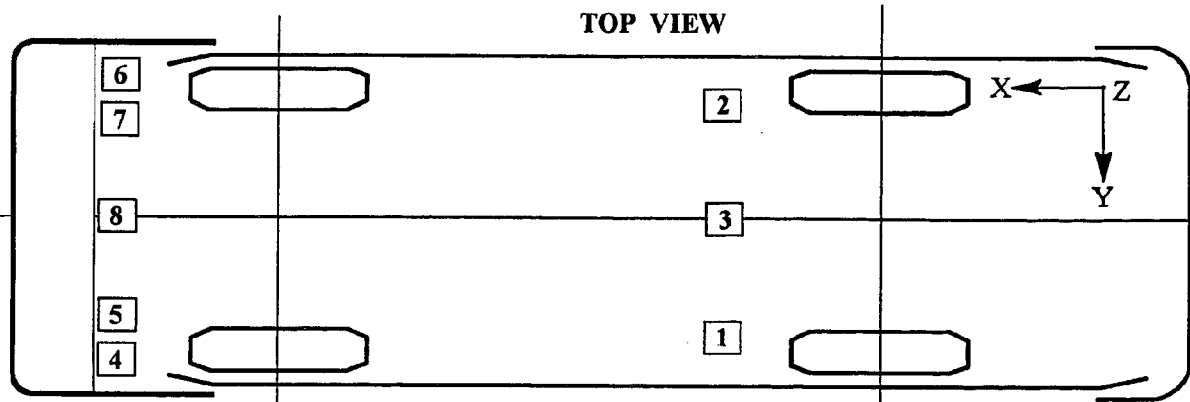
1. Row A at Bumper Level	=	<u>409</u>	millimeters
2. Row B at Mid-Stack Level	=	<u>362</u>	millimeters
3. Row C at Top of Stack Level	=	<u>299</u>	millimeters

INSTRUMENTATION:

Number of MDB Data Channels	=	<u>12</u>

Figure 7

SUMMARY OF VEHICLE 2 ACCELEROMETER DATA



Vehicle: Moving Deformable Barrier

NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Acc 1 MDB Left Rail X	Gs	3.6	167.5	-42.5	42.0	60.0
1	Acc 1 MDB Left Rail Y	Gs	9.2	39.0	-8.2	45.8	60.0
2	Acc 2 MDB Right Rail X	Gs	2.2	145.6	-37.8	42.2	60.0
2	Acc 2 MDB Right Rail Y	Gs	9.6	160.2	-10.1	45.1	60.0
3	Acc 3 MDB C.G. X	Gs	2.6	170.0	-38.7	40.9	60.0
3	Acc 3 MDB C.G. Y	Gs	11.5	69.6	-5.2	45.5	60.0
3	Acc 3 MDB C.G. Z	Gs	47.8	68.9	-27.2	62.0	60.0
4	MDB Load Cell TL	Nwt	118674.2	38.8	-9329.0	175.4	60.0
5	MDB Load Cell BL	Nwt	171526.7	48.4	-14902.6	95.4	60.0
6	MDB Load Cell TR	Nwt	36676.3	37.0	-20641.8	5.8	60.0
7	MDB Load Cell BR	Nwt	30907.9	53.4	-15986.6	30.8	60.0
8	MDB Load Cell CL	Nwt	172067.3	42.1	-1136.0	-3.7	60.0

Table 8

MOVING DEFORMABLE HONEYCOMB BARRIER
(Grid as looking at MDB from front)

Test Date:		March 14, 1996				Vehicle:				Moving Deformable Barrier															
		Distance Right of Center												Distance Left of Center											
Location		813	711	610	508	406	305	203	102	0.0	102	203	305	406	508	610	711	813							
Top of Stack Level	Pre	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188							
	Post	165	160	185	225	280	335	350	370	465	487	345	300	280	265	260	255	252							
	Crush	23	28	3	-37	-92	-147	-162	-182	-277	-299	-157	-112	-92	-77	-72	-67	-64							
Mid-Stack Level	Pre	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188							
	Post	200	215	215	230	265	310	360	500	550	505	535	530	530	525	525	525	510							
	Crush	-12	-27	-27	-42	-77	-122	-172	-312	-362	-317	-347	-342	-342	-337	-337	-337	-322							
Bumper Level	Pre	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86							
	Post	N/A	145	165	190	235	260	290	360	440	490	495	490	475	450	430	425	N/A							
	Crush	N/A	-59	-79	-104	-149	-174	-204	-274	-354	-404	-409	-404	-389	-364	-344	-339	N/A							

Figure 8

CAMERA POSITIONS FOR VEHICLE TO VEHICLE ANGLED FRONTAL IMPACT

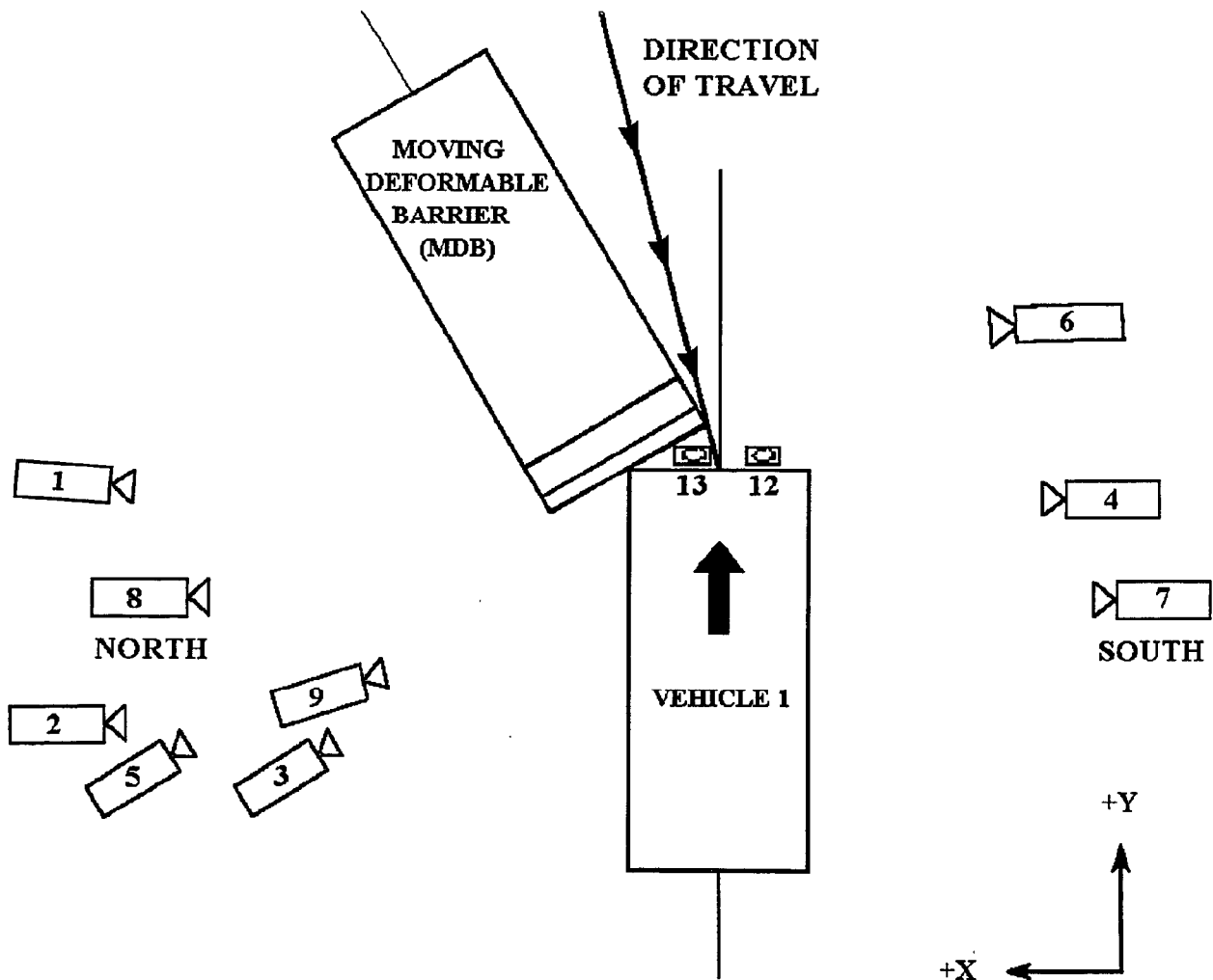


Table 9
HIGH-SPEED CAMERA LOCATIONS

Vehicle: 1995 Ford Contour GL 4-door sedan

Test No. Y57-4-1602

CAMERA Location	VIEW	CAMERA POSITIONS (mm)*			ANGLE** (deg)	LENS (mm)	SPEED (fps)	Camera No.	Lens No.
		X	Y	Z					
1	Real-Time Camera	-	-	-	-	-	24	-	-
2	Overall Camera	7341	-2489	1321	-4.4	13	730	1333	C21880
3	North Impact Point	9373	-3632	1118	-3.5	28	820	1692	5107277
4	South Impact Point	-8738	-610	1123	-1.2	25	660	1627	C7477
5	Moving Barrier Right Side View	7239	-4470	1245	-1.9	35	800	1330	142
6	Moving Barrier Left Side View	-6477	3480	1143	-3.2	25	960	1328	C14951
7	Vehicle 1 Passenger Side View	-9931	-2946	1359	-3.4	35	780	1663	A1264
8	Vehicle 1 Driver Side View	8560	-813	1295	-4.1	35	810	1650	A1281
9	Vehicle 1 Driver and Interior View	9423	-2159	1867	-4.8	50	720	1325	11699
10	Vehicle 1 Passenger belt/D-ring View	-	-	-	-	7.5	760	2000	C23844
11	Vehicle 1 Driver belt/D-ring View	-	-	-	-	8	-	2029	204
12	Overhead Overall View	762	-610	9805	-90	13	150	1326	C9836
13	Overhead Close-up	1016	-457	9805	-90	25	440	1332	62

*X = film plane to Vehicle 1 longitudinal centerline, positive left

Y = film plane to Vehicle 1 front bumper centerline

Z = film plane to ground

** = referenced to horizontal plane

APPENDIX A
PHOTOGRAPHS

APPENDIX A

TABLE OF CONTENTS

<u>Figure No.</u>	<u>Photograph Title</u>	<u>Page No.</u>
OVERALL TEST SETUP		
A-1	PRE-TEST OVERHEAD VIEW	A-3
A-2	POST-TEST OVERHEAD VIEW	A-4
A-3	PRE-TEST OVERALL SIDE VIEW	A-5
A-4	POST-TEST OVERALL SIDE VIEW	A-6
A-5	IMPACT PHOTO	A-7
VEHICLE 1 PHOTOGRAPHS		
A-6	PRE-TEST FRONT VIEW	A-9
A-7	POST-TEST FRONT VIEW	A-10
A-8	PRE-TEST FRONT RIGHT THREE QUARTER VIEW	A-11
A-9	POST-TEST FRONT RIGHT THREE QUARTER VIEW	A-12
A-10	PRE-TEST RIGHT SIDE VIEW	A-13
A-11	POST-TEST RIGHT SIDE VIEW	A-14
A-12	PRE-TEST REAR RIGHT THREE QUARTER VIEW	A-15
A-13	POST-TEST REAR RIGHT THREE QUARTER VIEW	A-16
A-14	PRE-TEST REAR VIEW	A-17
A-15	POST-TEST REAR VIEW	A-18
A-16	PRE-TEST REAR LEFT THREE QUARTER VIEW	A-19
A-17	POST-TEST REAR LEFT THREE QUARTER VIEW	A-20
A-18	PRE-TEST LEFT SIDE VIEW	A-21
A-19	POST-TEST LEFT SIDE VIEW	A-22
A-20	PRE-TEST FRONT LEFT THREE QUARTER VIEW	A-23
A-21	POST-TEST FRONT LEFT THREE QUARTER VIEW	A-24
A-22	PRE-TEST WINDSHIELD VIEW	A-25
A-23	POST-TEST WINDSHIELD VIEW	A-26
A-24	PRE-TEST OVERHEAD ENGINE COMPARTMENT VIEW	A-27
A-25	POST-TEST OVERHEAD ENGINE COMPARTMENT VIEW	A-28
A-26	PRE-TEST UNDERBODY FRONT VIEW	A-29
A-27	POST-TEST UNDERBODY FRONT VIEW	A-30
A-28	PRE-TEST UNDERBODY MIDDLE VIEW	A-31
A-29	POST-TEST UNDERBODY MIDDLE VIEW	A-32
A-30	PRE-TEST UNDERBODY REAR VIEW	A-33
A-31	POST-TEST UNDERBODY REAR VIEW	A-34
A-32	PRE-TEST UNDERBODY CLOSE-UP OF FRONT STRUCTURE	A-35
A-33	PRE-TEST UNDERBODY CLOSE-UP OF FRONT STRUCTURE	A-36
A-34	PRE-TEST DRIVER CLOSE-UP WITH DOOR CLOSED	A-37
A-35	POST-TEST DRIVER CLOSE-UP WITH DOOR CLOSED	A-38
A-36	PRE-TEST DRIVER CLOSE-UP WITH DOOR OPEN	A-39
A-37	POST-TEST DRIVER CLOSE-UP WITH DOOR OPEN	A-40

APPENDIX A

TABLE OF CONTENTS

<u>Figure No.</u>	<u>Photograph Title</u>	<u>Page No.</u>
VEHICLE 1 PHOTOGRAPHS (continued)		
A-38	PRE-TEST DRIVER FOOT/LEG CLOSE-UP WITH DOOR OPEN	A-41
A-39	POST-TEST DRIVER FOOT/LEG CLOSE-UP WITH DOOR OPEN	A-42
A-40	PRE-TEST PASSENGER CLOSE-UP WITH DOOR CLOSED	A-43
A-41	POST-TEST PASSENGER CLOSE-UP WITH DOOR CLOSED	A-44
A-42	PRE-TEST PASSENGER CLOSE-UP WITH DOOR OPEN	A-45
A-43	POST-TEST PASSENGER CLOSE-UP WITH DOOR OPEN	A-46
A-44	PRE-TEST PASSENGER FOOT/LEG CLOSE-UP WITH DOOR OPEN	A-47
A-45	POST-TEST PASSENGER FOOT/LEG CLOSE-UP WITH DOOR OPEN	A-48
A-46	POST-TEST DRIVER CHEST CONTACT POINT	A-49
A-47	POST-TEST PASSENGER CHEST CONTACT POINT	A-50
A-48	CERTIFICATION PLACARD	A-51
A-49	TIRE PLACARD	A-52
A-50	POST-TEST TOP VIEW	A-53
VEHICLE 2 PHOTOGRAPHS		
A-51	PRE-TEST MOVING DEFORMABLE BARRIER FRONT VIEW	A-55
A-52	POST-TEST MOVING DEFORMABLE BARRIER FRONT VIEW	A-56
A-53	PRE-TEST MOVING DEFORMABLE BARRIER RIGHT SIDE VIEW	A-57
A-54	POST-TEST MOVING DEFORMABLE BARRIER RIGHT SIDE VIEW	A-58
A-55	PRE-TEST MOVING DEFORMABLE BARRIER LEFT SIDE VIEW	A-59
A-56	POST-TEST MOVING DEFORMABLE BARRIER LEFT SIDE VIEW	A-60

OVERALL TEST SETUP



Figure A-1 PRE-TEST OVERHEAD VIEW

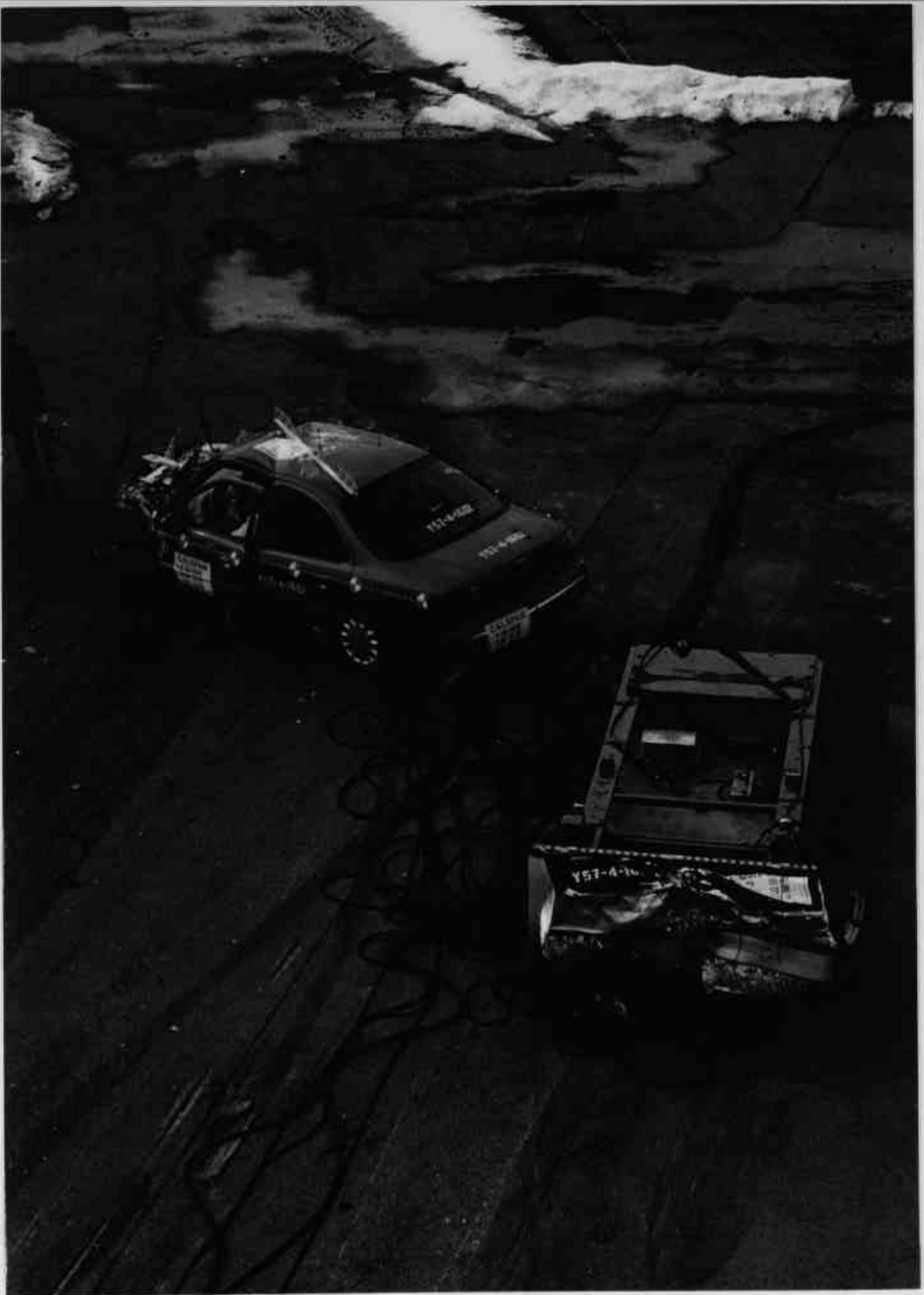


Figure A-2 POST-TEST OVERHEAD VIEW
A-4

8304-4



Figure A-3 PRE-TEST OVERALL SIDE VIEW



Figure A-4 POST-TEST OVERALL SIDE VIEW



Figure A-5 IMPACT PHOTO

VEHICLE 1 PHOTOGRAPHS

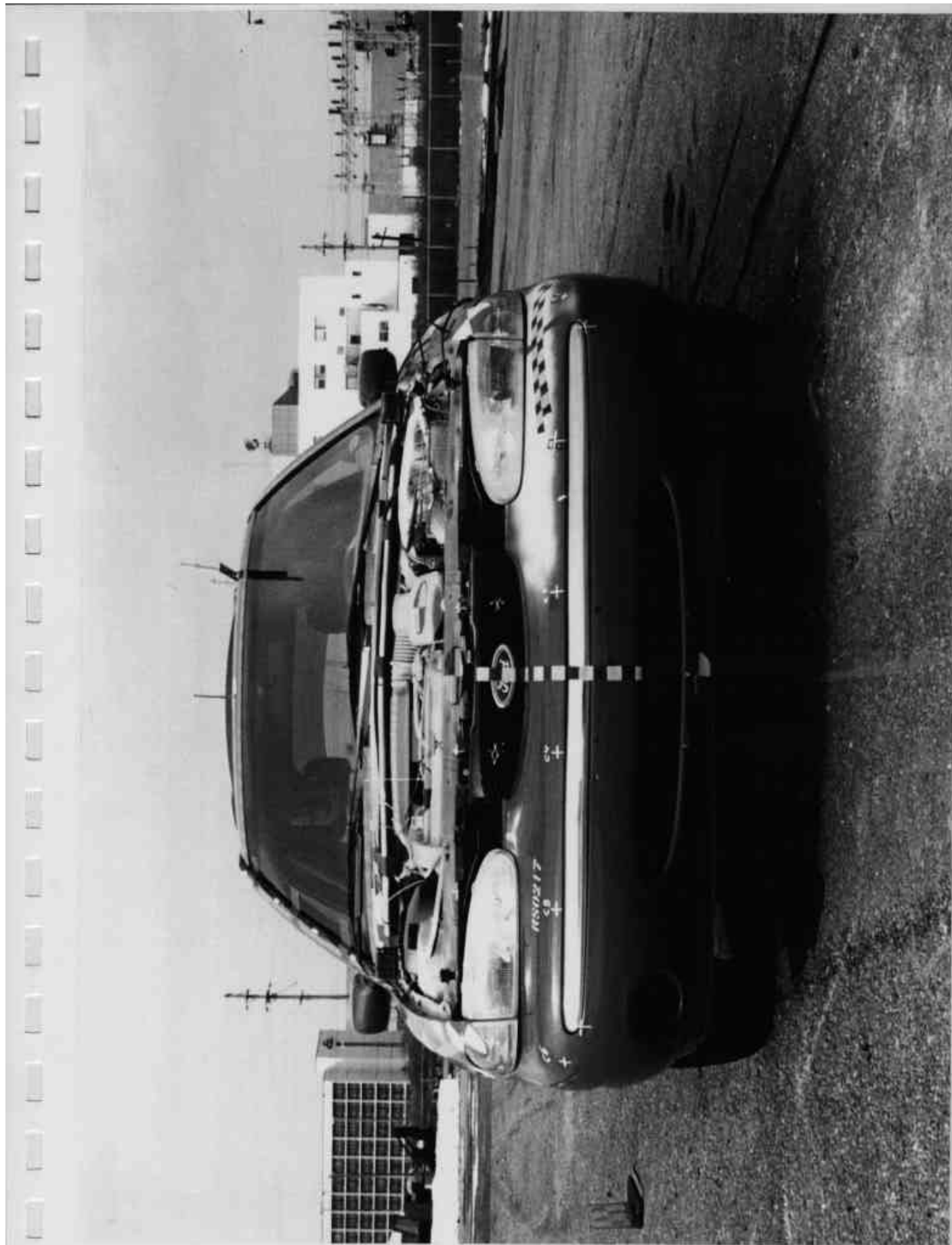


Figure A-6 PRE-TEST FRONT VIEW



Figure A-7 POST-TEST FRONT VIEW



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



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



Figure A-10 PRE-TEST RIGHT SIDE VIEW



Figure A-11 POST-TEST RIGHT SIDE VIEW



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



Figure A-13 POST-TEST REAR RIGHT THREE-QUARTER VIEW



Figure A-14 PRE-TEST REAR VIEW



Figure A-15 POST-TEST REAR VIEW



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



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



Figure A-18 PRE-TEST LEFT SIDE VIEW



Figure A-19 POST-TEST LEFT SIDE VIEW



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

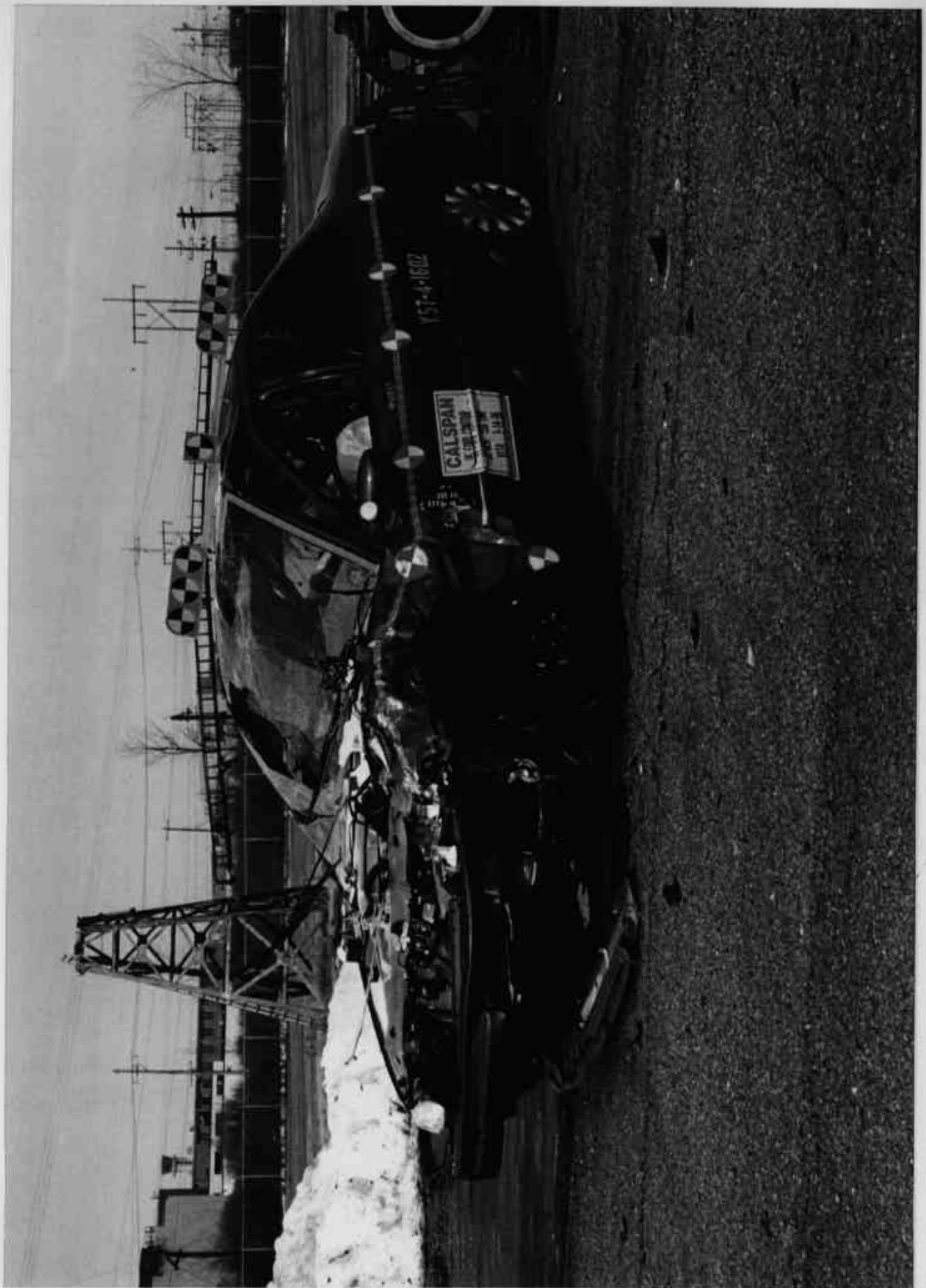


Figure A-21 POST-TEST FRONT LEFT THREE-QUARTER VIEW



Figure A-22 PRE-TEST WINDSHIELD VIEW



Figure A-23 POST-TEST WINDSHIELD VIEW

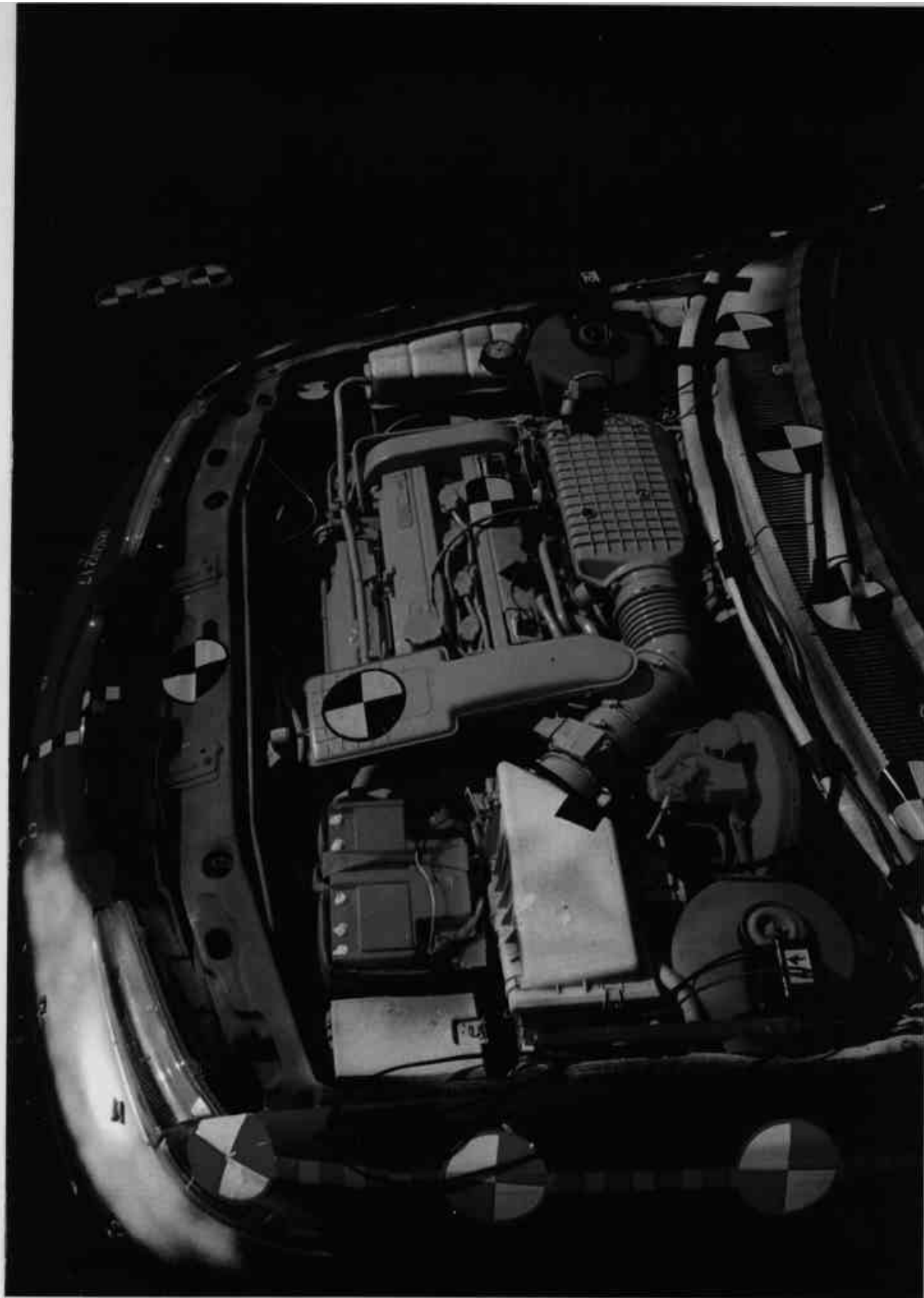


Figure A-24 PRE-TEST OVERHEAD ENGINE COMPARTMENT VIEW
A-27

8304-4



Figure A-25 POST-TEST OVERHEAD ENGINE COMPARTMENT VIEW

Figure A-26 PRE-TEST UNDERBODY FRONT VIEW

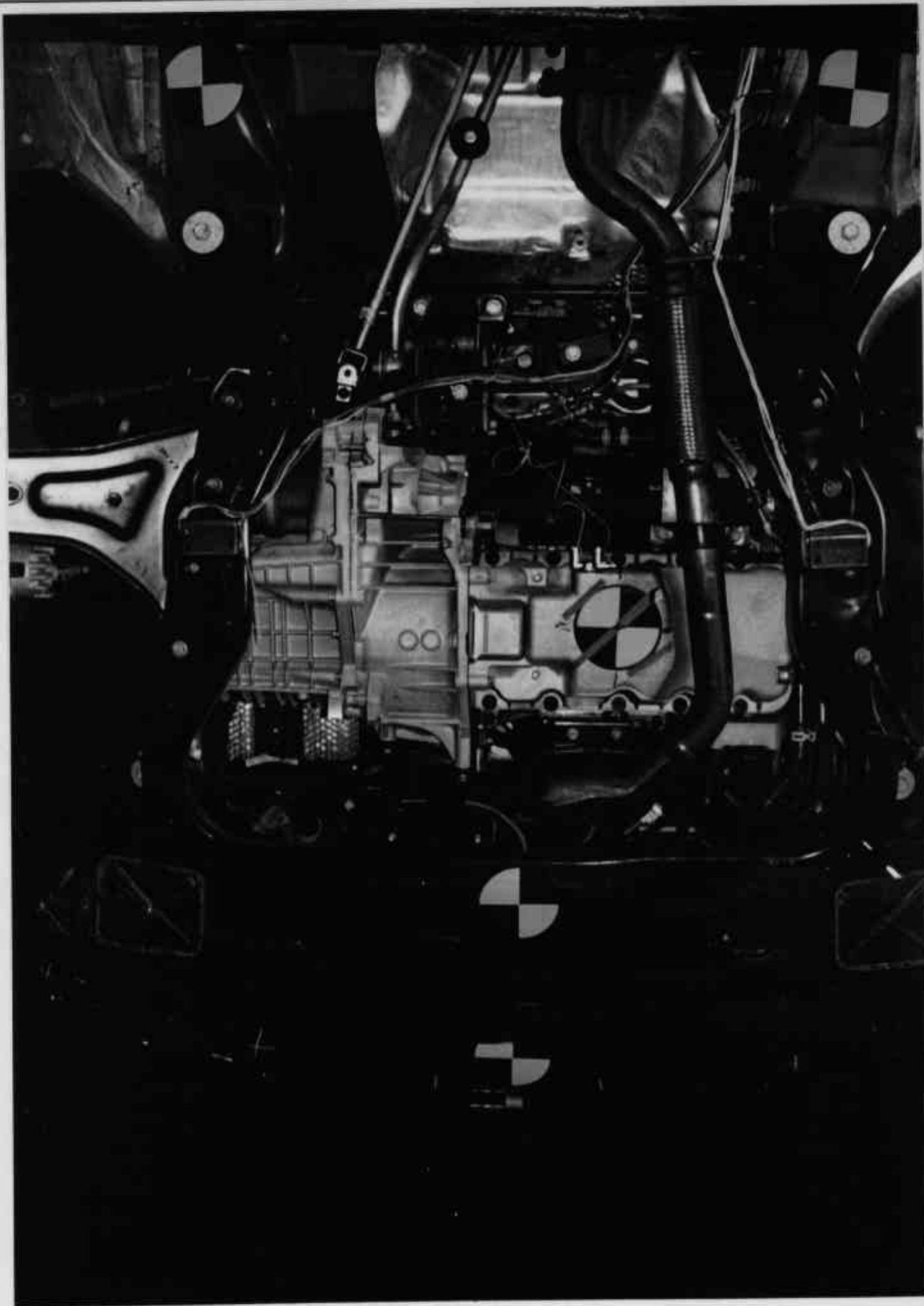




Figure A-27 POST-TEST UNDERBODY FRONT VIEW



Figure A-28 PRE-TEST UNDERBODY MIDDLE VIEW

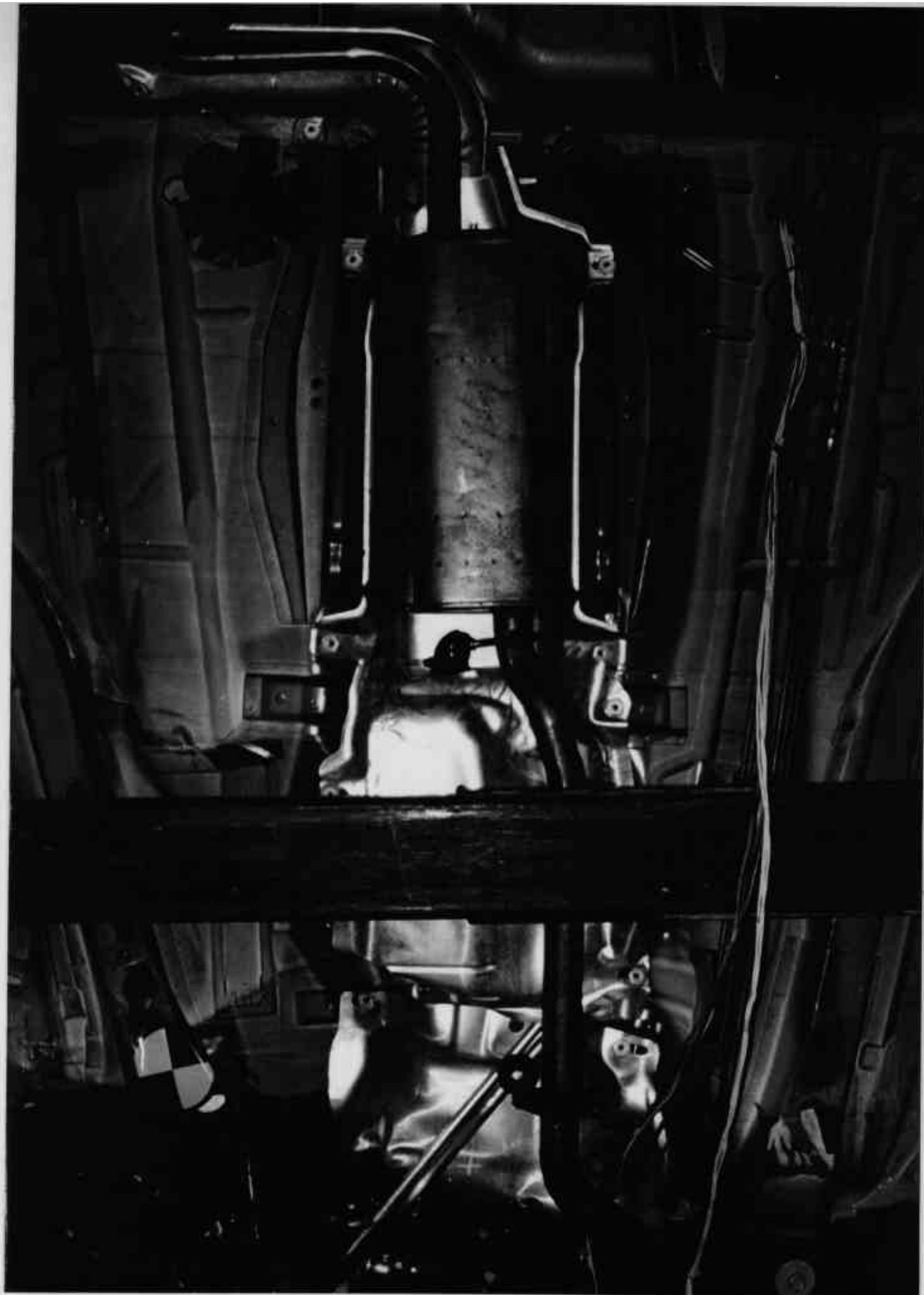


Figure A-29 POST-TEST UNDERBODY MIDDLE VIEW

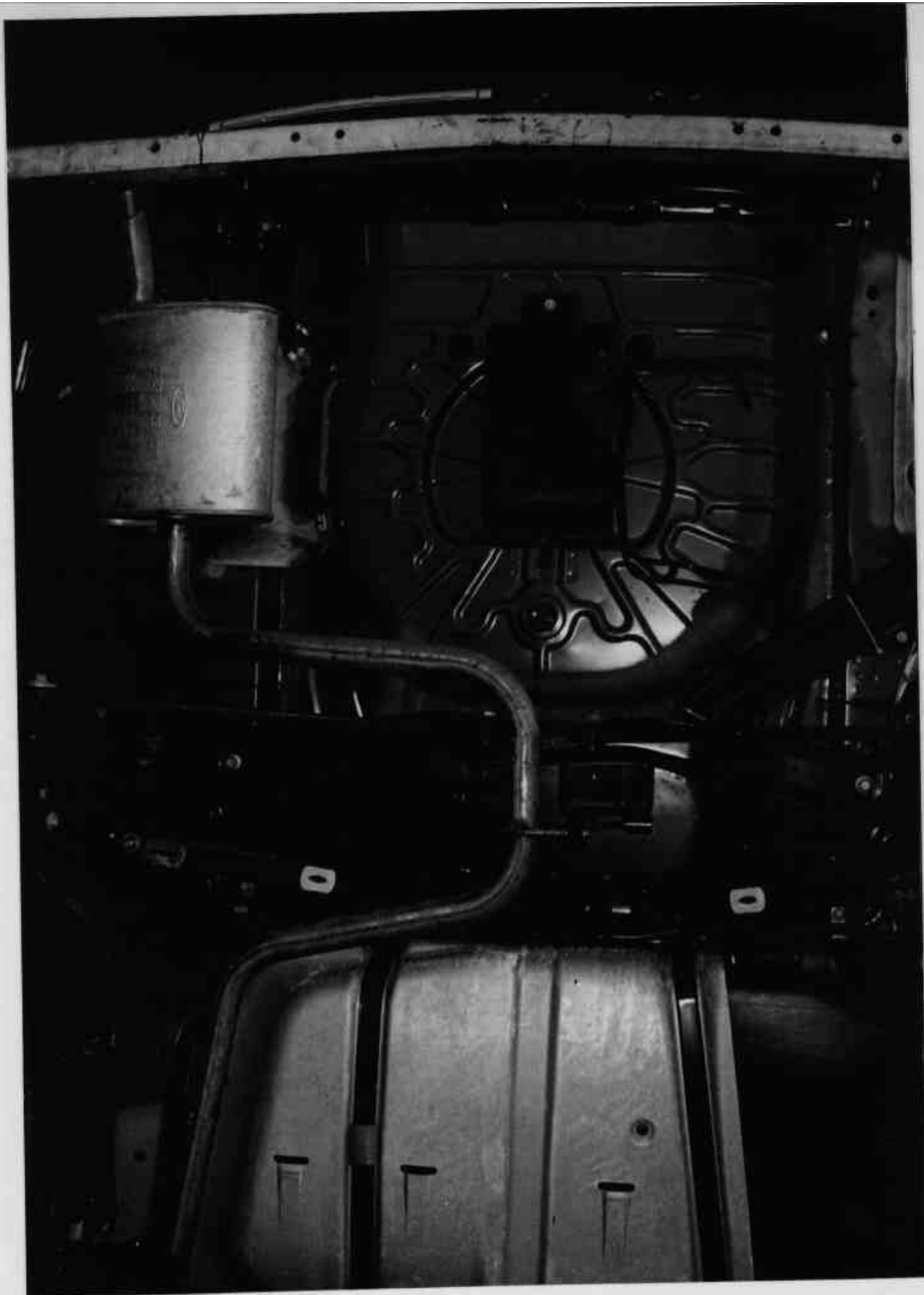


Figure A-30 PRE-TEST UNDERBODY REAR VIEW

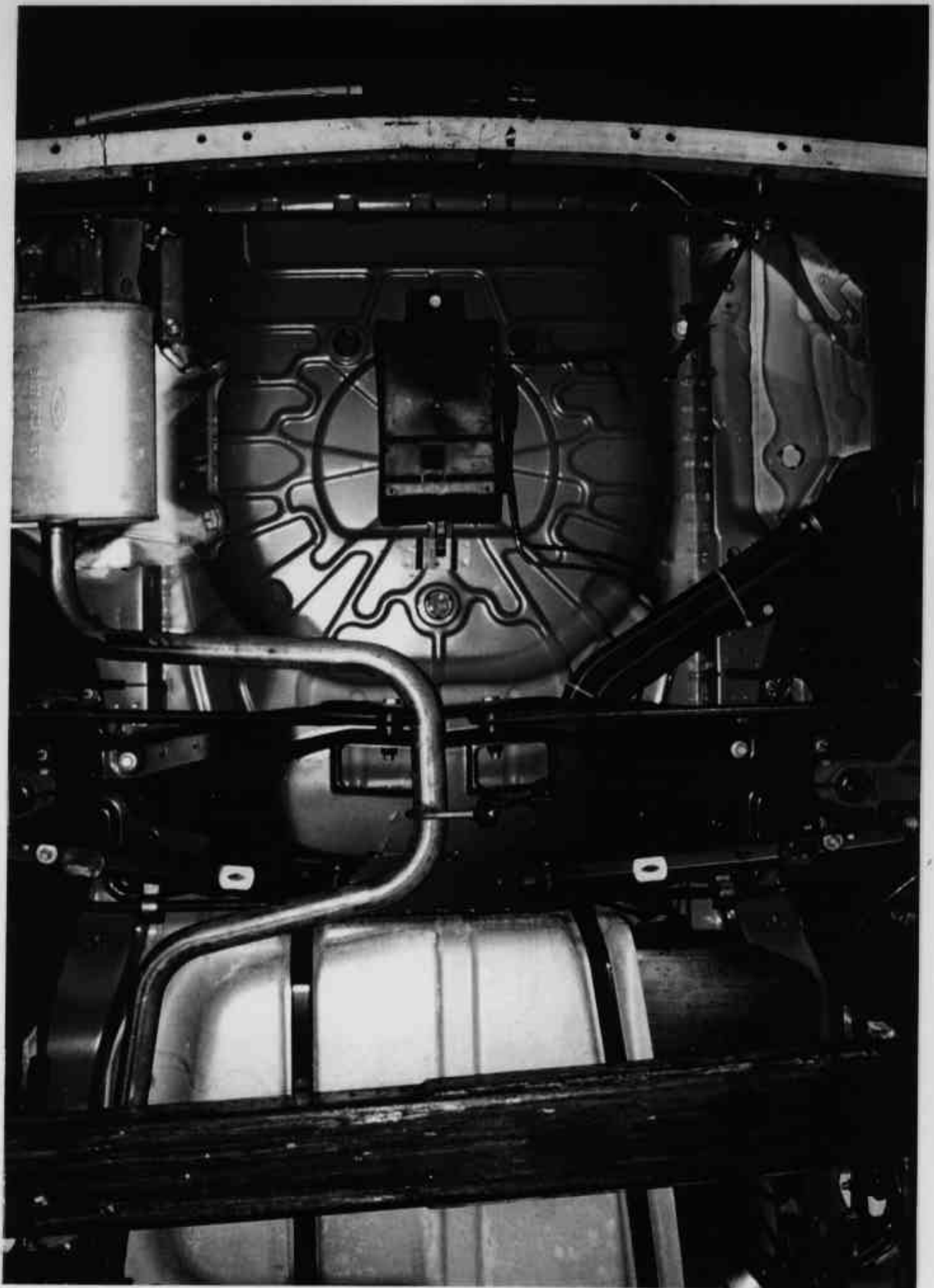


Figure A-31 POST-TEST UNDERBODY REAR VIEW

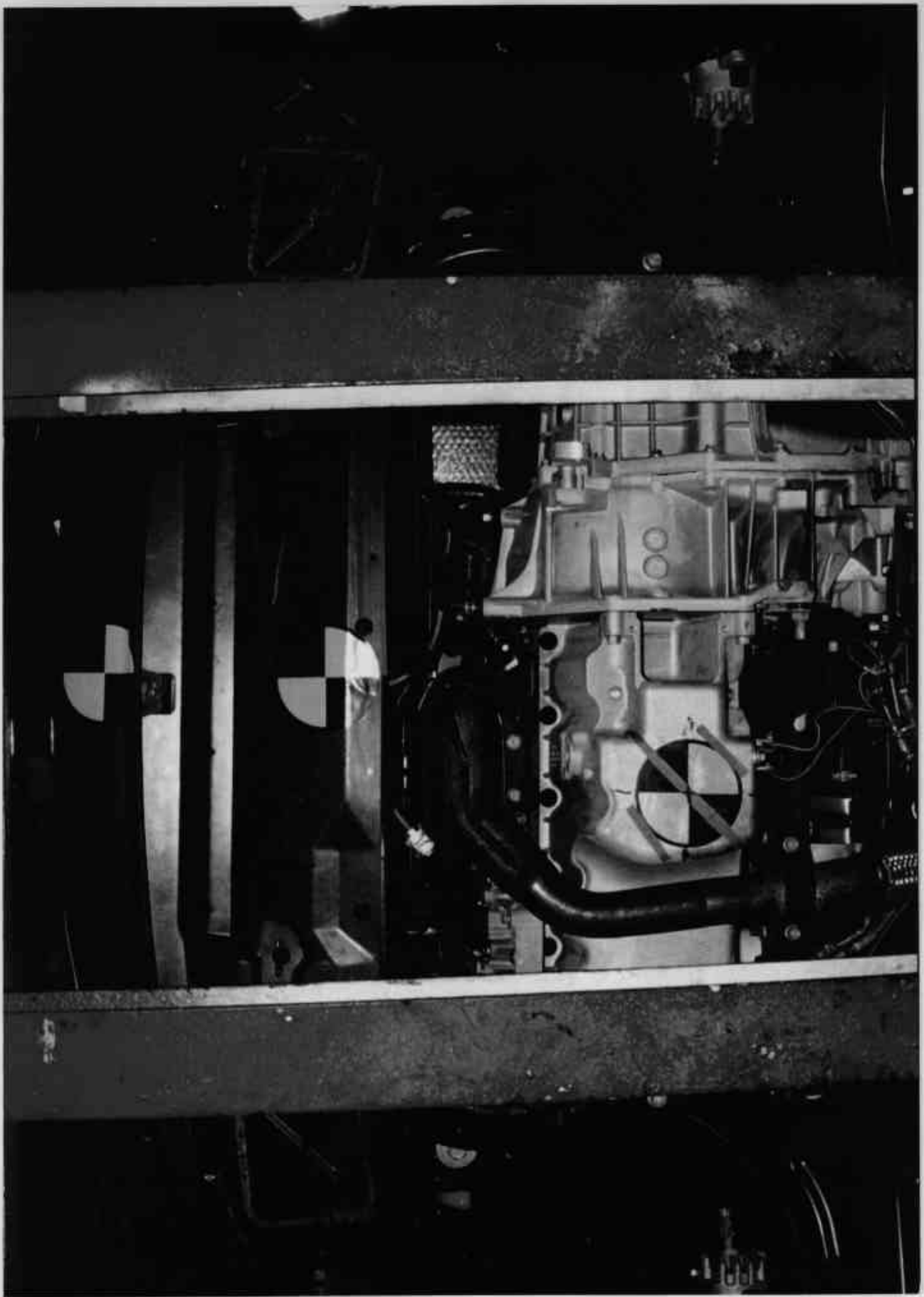


Figure A-32 PRE-TEST UNDERBODY CLOSE-UP OF FRONT STRUCTURE

Figure A-33 POST-TEST UNDERBODY CLOSE-UP OF FRONT STRUCTURE

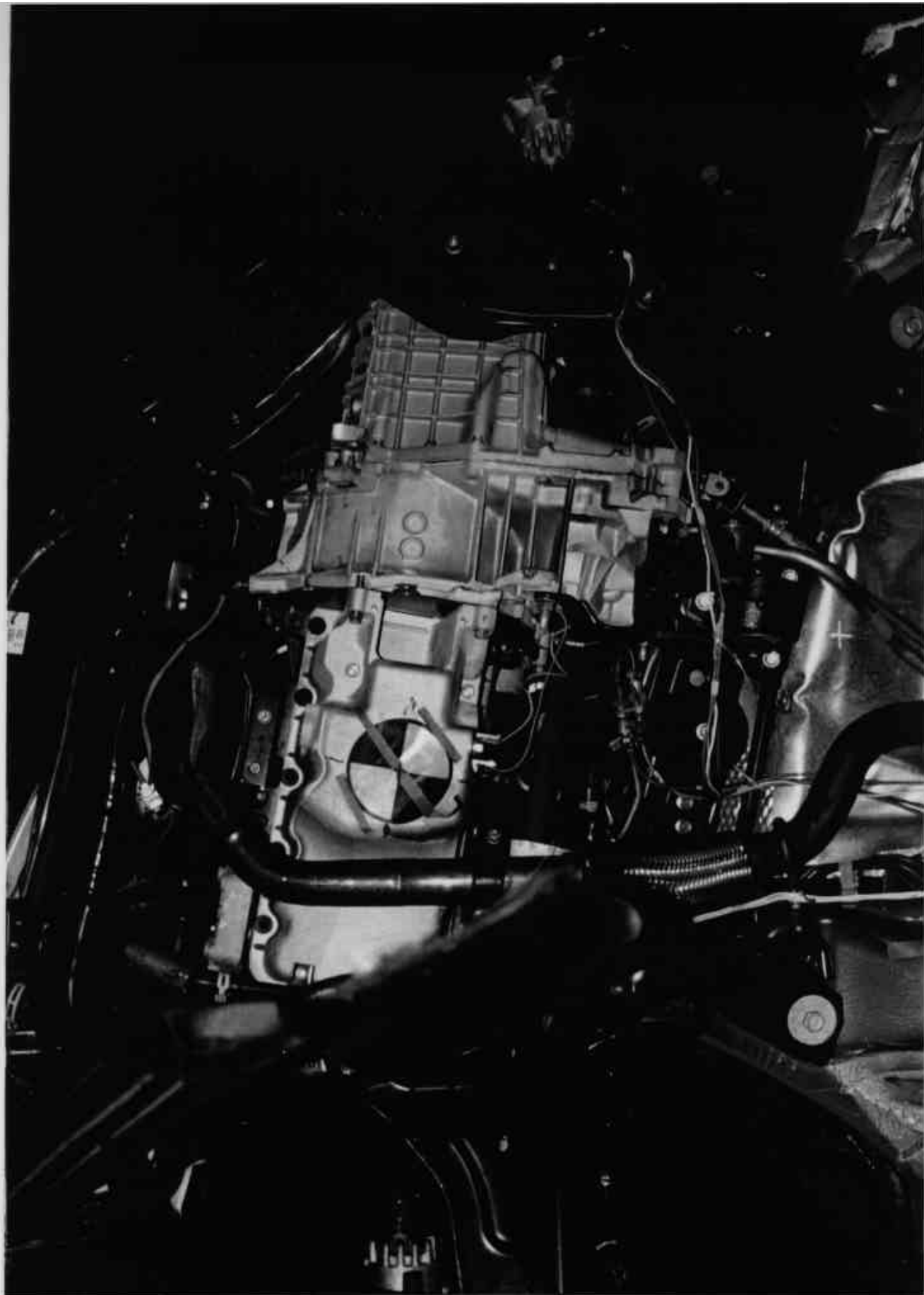




Figure A-34 PRE-TEST DRIVER CLOSE-UP WITH DOOR CLOSED



Figure A-35 POST-TEST DRIVER CLOSE-UP WITH DOOR CLOSED



Figure A-36 PRE-TEST DRIVER CLOSE-UP WITH DOOR OPEN
A-39

8304-4



Figure A-37 POST-TEST DRIVER CLOSE-UP WITH DOOR OPEN



Figure A-38 PRE-TEST DRIVER FOOT/LEG CLOSE-UP WITH DOOR OPEN



Figure A-39 POST-TEST DRIVER FOOT/LEG CLOSE-UP WITH DOOR OPEN



Figure A-40 PRE-TEST PASSENGER CLOSE-UP WITH DOOR CLOSED



Figure A-41 POST-TEST PASSENGER CLOSE-UP WITH DOOR CLOSED



Figure A-42 PRE-TEST PASSENGER CLOSE-UP WITH DOOR OPEN

A-45

8304-4 -



Figure A-43 POST-TEST PASSENGER CLOSE-UP WITH DOOR OPEN



Figure A-44 PRE-TEST PASSENGER FOOT/LEG CLOSE-UP WITH DOOR OPEN



Figure A-45 POST-TEST PASSENGER FOOT/LEG CLOSE-UP WITH DOOR OPEN



Figure A-46 POST-TEST DRIVER CHEST CONTACT POINT



Figure A-47 POST-TEST PASSENGER CHEST CONTACT POINT

PHOTOGRAPH NOT AVAILABLE

PHOTOGRAPH NOT AVAILABLE



Figure A-50 POST-TEST TOP VIEW

VEHICLE 2 PHOTOGRAPHS

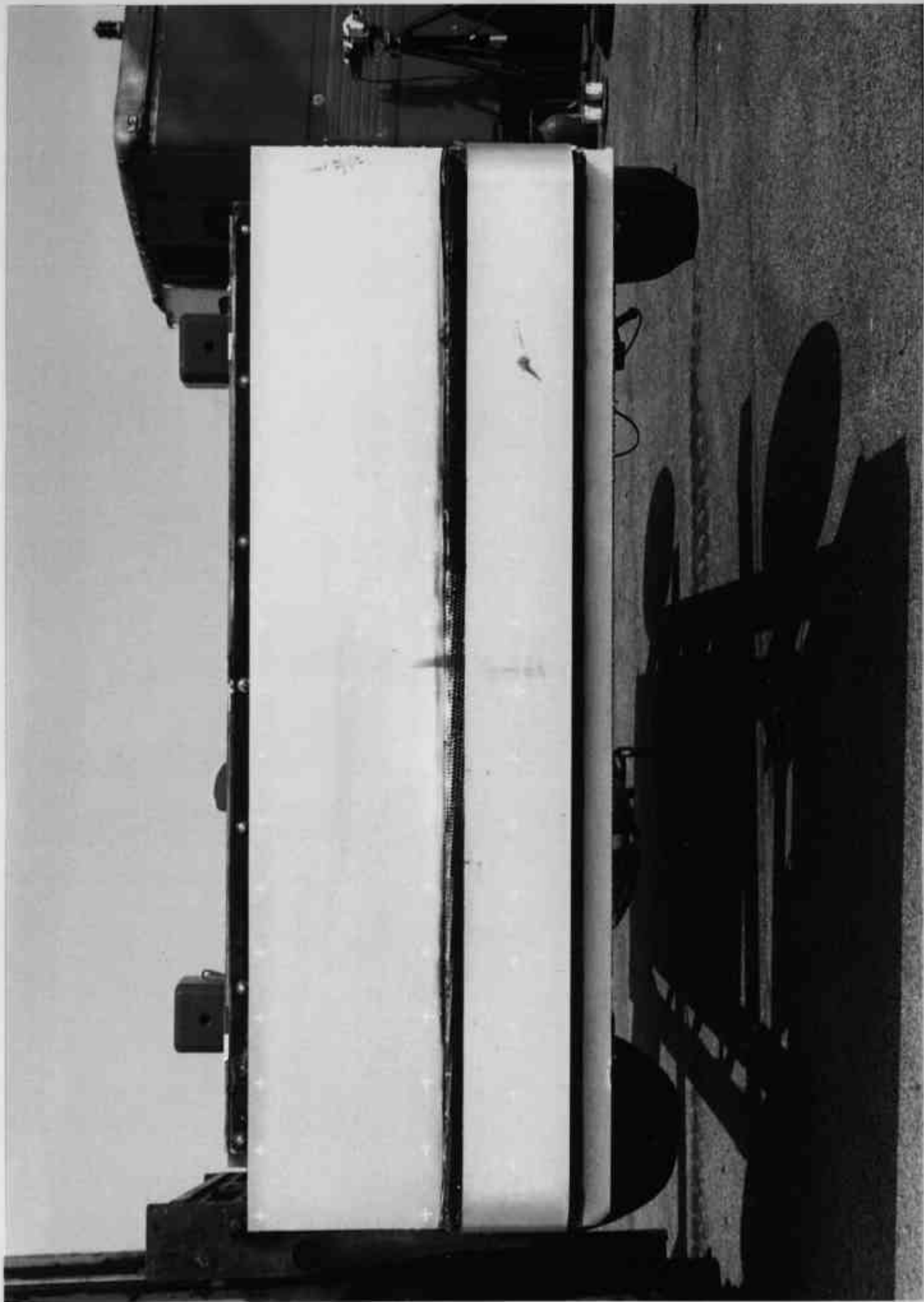


Figure A-51 PRE-TEST MOVING DEFORMABLE BARRIER FRONT VIEW

Figure A-52 POST-TEST MOVING DEFORMABLE BARRIER FRONT VIEW





Figure A-53 PRE-TEST MOVING DEFORMABLE BARRIER RIGHT SIDE VIEW

Figure A-54 POST-TEST MOVING DEFORMABLE BARRIER RIGHT SIDE VIEW





Figure A-55 PRE-TEST MOVING DEFORMABLE BARRIER LEFT SIDE VIEW

Figure A-56 POST-TEST MOVING DEFORMABLE BARRIER LEFT SIDE VIEW





Figure A-57 PRE-TEST MOVING DEFORMABLE BARRIER TOP VIEW



Figure A-58 POST-TEST MOVING DEFORMABLE BARRIER TOP VIEW

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA

Key: V1 - Vehicle 1
V2 - Vehicle 2 (MDB)
P1 - Position 1 (Driver)
P2 - Position 2 (Right Front Passenger)

Note: Data is presented using the NHTSA coordinate system.

FACILITY: track
 RUN #: 1602
 SERIES #: 1

TEST DATE: 14 Mar 1996
 TEST TIME: 15:01:38
 BOARD: a

TITLE: VTV TEST #4

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	P1 Head X	Gs	5.7	219.0	-41.7	67.2	1000.0
2	P1 Head Y	Gs	21.7	214.9	-42.5	104.9	1000.0
3	P1 Head Z	Gs	14.0	263.5	-20.9	63.5	1000.0
4	P1 HD9Y (X)	Gs	5.4	220.0	-46.1	67.9	1000.0
5	P1 Chest X	Gs	8.6	116.8	-39.5	78.6	180.0
6	P1 Chest Y	Gs	4.1	58.4	-32.5	91.0	180.0
7	P1 Chest Z	Gs	18.6	97.3	-13.3	60.5	180.0
8	P1 HD9Y (Z)	Gs	11.8	118.6	-22.4	212.6	1000.0
9	P1 Upper Neck Fx	Nwt	515.6	73.7	-349.2	216.6	1000.0
10	P1 Upper Neck Fy	Nwt	1016.1	108.5	-128.2	215.4	1000.0
11	P1 Upper Neck Fz	Nwt	2353.8	63.6	-934.1	216.1	1000.0
12	P1 HD9X (Y)	Gs	25.4	213.8	-29.2	104.9	1000.0
13	P1 Upper Neck Mx	Nwt-M	22.4	76.0	-68.1	117.2	600.0
14	P1 Upper Neck My	Nwt-M	53.7	111.1	-43.0	74.4	600.0
15	P1 Upper Neck Mz	Nwt-M	22.8	73.9	-5.5	263.5	600.0
16	P1 HD9X (Z)	Gs	14.8	108.0	-21.8	79.2	1000.0
17	P1 Head Resultant	Gs	46.1	67.4	.1	6.6	1000.0
18	P1 Chest Resultant	Gs	43.3	78.4	.0	-20.2	180.0
19	P1 Upper Neck Force Res	Nwt	2383.4	63.6	2.7	6.6	1000.0
20	P1 Upper Neck Moment Res	Nwt-M	76.4	115.1	.0	-7.7	600.0

V2 36 ms Fixed Duration HIC SUMMARY: P1 Head Resultant

hic: 208.25
 t1 = 59.280 msec
 t2 = 90.240 msec
 Average G's Over Hic Duration = 33.97

CLIP V2.1 SUMMARY: P1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 41.831 G's
 Tstart = 76.4343 ms
 Tend = 79.4343 ms
 CSI = 355.356

FACILITY: track
RUN #: 1602
SERIES #: 1

TEST DATE: 14 Mar 1996
TEST TIME: 15:01:38
BOARD: b

TITLE: VTV TEST #4

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	msec	MINIMUM AMP	msec	FILTER CLASS
1	P2 Head X	Gs	8.8	94.9	-50.2	59.8	1000.0
2	P2 Head Y	Gs	6.1	36.2	-25.3	75.2	1000.0
3	P2 Head Z	Gs	8.0	427.3	-28.9	59.4	1000.0
4	P1 HD9Z (X)	Gs	8.1	100.3	-49.6	63.5	1000.0
5	P2 Chest X	Gs	3.9	133.4	-42.8	71.0	180.0
6	P2 Chest Y	Gs	3.3	278.2	-14.5	82.2	180.0
7	P2 Chest Z	Gs	8.0	103.3	-15.4	58.7	180.0
8	P1 HD9Z (Y)	Gs	42.3	213.4	-79.6	104.4	1000.0
9	P2 Upper Neck Fx	Nwt	541.6	155.6	-669.9	44.3	1000.0
10	P2 Upper Neck Fy	Nwt	576.5	155.6	-567.2	427.3	1000.0
11	P2 Upper Neck Fz	Nwt	1854.3	72.7	-504.8	38.8	1000.0
12	P2 Left Femur	Nwt	227.9	35.0	-8280.6	55.6	600.0
13	P2 Upper Neck Mx	Nwt-M	25.9	64.2	-30.7	133.0	600.0
14	P2 Upper Neck My	Nwt-M	63.9	66.7	-53.7	85.4	600.0
15	P2 Upper Neck Mz	Nwt-M	19.2	149.4	-42.1	98.2	600.0
16	P2 Right Femur	Nwt	574.4	80.6	-3342.7	66.8	600.0
17	P2 Head Resultant	Gs	57.3	59.9	.1	6.1	1000.0
18	P2 Chest Resultant	Gs	44.6	71.0	.0	-16.6	180.0
19	P2 Upper Neck Force Res	Nwt	1864.8	72.7	1.6	10.6	1000.0
20	P2 Upper Neck Moment Res	Nwt-M	68.2	66.7	.0	-16.7	600.0

V2 36 ms Fixed Duration HIC SUMMARY: P2 Head Resultant

hic: 307.71

t1 = 55.800 msec

t2 = 86.160 msec

Average G's Over Hic Duration = 40.03

CLIP V2.1 SUMMARY: P2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 39.816 G's

Tstart = 69.6520 ms

Tend = 72.6520 ms

CSI = 280.763

FACILITY: track
RUN #: 1602
SERIES #: 1

TEST DATE: 14 Mar 1996
TEST TIME: 15:01:38
BOARD: c

TITLE: VTV TEST #4

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	P1 Lower Neck Fx	Nwt	578.2	81.2	-827.3	263.6	1000.0
2	P1 Lower Neck Fy	Nwt	601.2	73.8	-2311.7	263.6	1000.0
3	P1 Lower Neck Fz	Nwt	3143.9	73.0	-744.8	216.1	1000.0
4	Chest Displacement #125	mm	.0	3.4	-22.9	65.3	180.0
5	P1 Lower Neck Mx	Nwt-M	43.6	314.0	-210.7	113.9	600.0
6	P1 Lower Neck My	Nwt-M	56.6	116.8	-132.8	73.2	600.0
7	P1 Lower Neck Mz	Nwt-M	54.0	64.0	-130.9	99.6	600.0
8	P1 Chest Deflection	mm	.0	-1.6	-24.1	65.5	180.0
9	Chest Displacement #126	mm	1.2	137.2	-40.6	75.8	180.0
10	Chest Displacement #127	mm	1.1	424.6	-10.4	53.9	180.0
11	Chest Displacement #128	mm	7.9	135.1	-34.8	85.1	180.0
12	Chest Displacement #129	mm	12.5	84.1	-20.2	54.5	180.0
13	Chest Displacement #130	mm	1.9	425.9	-16.9	65.3	180.0
14	Chest Displacement #131	mm	4.1	426.2	-28.0	56.8	180.0
15	Chest Displacement #132	mm	.0	-8.8	-29.5	73.8	180.0
16	P1 Right Foot Rear Z	Gs	98.5	38.3	-98.8	38.8	1000.0
17	P1 Lower Neck Force Res	Nwt	3185.6	73.0	3.1	7.1	1000.0
18	P1 Lower Neck Moment Res	Nwt-M	215.6	114.1	.0	-.5	600.0

FACILITY: track
RUN #: 1602
SERIES #: 1

TEST DATE: 14 Mar 1996
TEST TIME: 15:01:38
BOARD: d

TITLE: VTV TEST #4

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	P1 Pelvic X	Gs	10.4	101.4	-79.4	46.4	1000.0
2	P1 Pelvic Y	Gs	37.5	46.4	-22.7	76.7	1000.0
3	P1 Pelvic Z	Gs	25.8	46.4	-4.4	114.4	1000.0
4	P1 Left Femur	Nwt	274.5	39.5	-5976.2	56.9	600.0
5	P1 Right Femur	Nwt	1393.4	72.5	-8242.8	46.6	600.0
6	P1 Lt Upper Tibia Mx	Nwt-M	62.9	52.8	-63.9	88.7	600.0
7	P1 Lt Upper Tibia My	Nwt-M	224.2	54.6	-105.4	46.9	600.0
8	P1 Lt Lower Tibia Fx	Nwt	1277.7	51.2	-249.6	69.7	600.0
9	P1 Lt Lower Tibia Fz	Nwt	211.5	248.2	-1606.2	43.2	600.0
10	P1 Lt Lower Tibia My	Nwt-M	384.4	55.0	-20.0	43.6	600.0
11	P1 Rt Upper Tibia Mx	Nwt-M	443.3	46.2	-54.4	185.2	600.0
12	P1 Rt Upper Tibia My	Nwt-M	31.7	69.7	-182.2	46.3	600.0
13	P1 Rt Lower Tibia Fx	Nwt	2708.2	42.7	-103.2	160.0	600.0
14	P1 Rt Lower Tibia Fz	Nwt	281.6	150.7	-4782.5	43.3	600.0
15	P1 Rt Lower Tibia My	Nwt-M	431.1	53.5	-36.9	38.9	600.0
16	Acc 13 A-Pillar Hinge	Gs	221.6	70.1	-219.6	87.5	60.0
17	P1 Pelvic Res.	Gs	91.5	46.4	.1	4.1	1000.0

FACILITY: track
RUN #: 1602
SERIES #: 1

TEST DATE: 14 Mar 1996
TEST TIME: 15:01:38
BOARD: e

TITLE: VTV TEST #4

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	P2 Pelvic X	Gs	4.7	118.6	-54.3	56.0	1000.0
2	P2 Pelvic Y	Gs	9.5	67.6	-23.7	75.2	1000.0
3	P2 Pelvic Z	Gs	14.2	79.1	-2.0	215.9	1000.0
4	P2 Chest Deflection	mm	1.0	56.3	-34.3	61.9	180.0
5	P2 Lt Upper Tibia Mx	Nwt-M	119.3	69.8	-96.3	49.3	600.0
6	P2 Lt Upper Tibia My	Nwt-M	21.0	49.0	-146.2	56.3	600.0
7	P2 Lt Lower Tibia Fx	Nwt	628.4	56.4	-323.3	49.4	600.0
8	P2 Lt Lower Tibia Fz	Nwt	197.1	153.4	-2644.3	50.6	600.0
9	P2 Lt Lower Tibia My	Nwt-M	46.2	50.8	-19.0	60.0	600.0
10	P2 Rt Upper Tibia Mx	Nwt-M	183.0	66.2	-77.5	228.8	600.0
11	P2 Rt Upper Tibia My	Nwt-M	50.3	54.0	-96.2	70.0	600.0
12	P2 Rt Lower Tibia Fx	Nwt	909.9	68.8	-138.1	52.1	600.0
13	P2 Rt Lower Tibia Fz	Nwt	119.1	263.5	-3538.0	68.2	600.0
14	P2 Rt Lower Tibia My	Nwt-M	41.5	66.7	-51.1	58.1	600.0
15	Acc 9 Lt Rr Compart X	Gs	3.5	162.5	-39.3	50.3	60.0
16	Acc 9 Lt Rr Compart Y	Gs	3.2	67.3	-12.9	44.2	60.0
17	P2 Pelvic Res	Gs	54.9	55.7	.0	4.1	1000.0

FACILITY: track

TEST DATE: 14 Mar 1996

RUN #: 1602

TEST TIME: 15:01:38

SERIES #: 1

BOARD: f

TITLE: VTV TEST #4

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	P1 Left Knee Shear	mm	.3	47.2	-8.1	58.0	180.0
2	P1 Right Knee Shear	mm	.3	64.8	-.4	44.0	180.0
3	P2 Left Knee Shear	mm	.1	45.4	-1.8	53.8	180.0
4	P2 Right Knee Shear	mm	.1	45.8	-2.4	61.9	180.0
5	Acc 10 Rt Rr Compartment X	Gs	4.2	80.3	-42.9	52.8	60.0
6	Acc 10 Rt Rr Compartment Y	Gs	5.6	66.7	-15.9	53.9	60.0
7	Acc 8 Brake Pedal X	Gs	426.8	259.1	-427.1	230.6	60.0
8	Acc 8 Brake Pedal Y	Gs	96.5	58.1	-214.4	42.1	60.0
9	Acc 8 Brake Pedal Z	Gs	145.6	39.5	-141.5	47.9	60.0
10	Acc 7 Lt Shock Tower X	Gs	24.2	66.5	-133.4	40.4	60.0
11	Acc 7 Lt Shock Tower Y	Gs	24.1	62.0	-60.0	26.8	60.0
12	Acc 6 Rt Shock Tower X	Gs	2.9	240.4	-66.9	46.8	60.0
13	Acc 6 Rt Shock Tower Y	Gs	27.0	56.3	-57.3	49.3	60.0
14	Acc 3 Rt Engine X	Gs	10.6	49.2	-84.2	32.8	60.0
15	Acc 4 Lt Engine X	Gs	32.7	52.8	-94.2	39.7	60.0
16	Acc 2 Lt Ft Frame Rail X	Gs	425.6	235.4	-423.1	190.9	60.0

FACILITY: tape
RUN #: 9602
SERIES #: 1

TEST DATE: 19 Mar 1996
TEST TIME: 10:24:07
BOARD: g

TITLE: VTV TEST #4

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Acc 2 Lt Ft Frame Rail Y	Gs	40.5	30.0	-65.6	37.8	60.0
2	Acc 2 Lt Ft Frame Rail Z	Gs	73.8	46.9	-57.9	40.9	60.0
3	Acc 1 Rt Ft Frame Rail X	Gs	9.7	27.4	-58.4	50.9	60.0
4	Acc 1 Rt Ft Frame Rail Y	Gs	22.5	49.2	-40.0	38.9	60.0
5	Acc 1 Rt Ft Frame Rail Z	Gs	40.1	50.8	-17.9	26.0	60.0
6	Acc 5 Engine Bottom X	Gs	27.0	52.3	-52.7	29.6	60.0
7	Acc 5 Engine Bottom Y	Gs	31.7	56.0	-31.0	46.7	60.0
8	Acc 12 Toe Pan X	Gs	53.1	63.0	-71.2	34.6	60.0
9	Acc 12 Toe Pan Y	Gs	29.8	62.6	-72.6	36.0	60.0
10	Acc 12 Toe Pan Z	Gs	38.4	47.8	-59.4	40.4	60.0
11	Acc 11 C/L Rear Compartment X	Gs	2.9	118.9	-42.4	49.4	60.0
12	Acc 11 C/L Rear Comp Y	Gs	5.2	72.5	-16.2	43.7	60.0

FACILITY: tape
RUN #: 602
SERIES #: 1

TEST DATE: 19 Mar 1996
TEST TIME: 10:30:27
BOARD: h

TITLE: VTV TEST #4

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Acc 1 MDB Left Rail X	Gs	3.6	167.5	-42.5	42.0	60.0
2	Acc 1 MDB Left Rail Y	Gs	9.2	39.0	-8.2	45.8	60.0
3	Acc 2 MDB Right Rail X	Gs	2.2	145.6	-37.8	42.2	60.0
4	Acc 2 MDB Right Rail Y	Gs	9.6	160.2	-10.1	45.1	60.0
5	Acc 3 MDB C.G. X	Gs	2.6	170.0	-38.7	40.9	60.0
6	Acc 3 MDB C.G. Y	Gs	11.5	69.6	-5.2	45.5	60.0
7	Acc 3 MDB C.G. Z	Gs	47.8	68.9	-27.2	62.0	60.0
8	MDB Load Cell TR	Nwt	36676.3	37.0	-20641.8	5.8	60.0
9	MDB Load Cell BR	Nwt	30907.9	53.4	-15986.6	30.8	60.0
10	MDB Load Cell TL	Nwt	118674.2	38.8	-9329.0	175.4	60.0
11	MDB Load Cell BL	Nwt	171526.7	48.4	-14902.6	95.4	60.0
12	MDB Load Cell CL	Nwt	172067.3	42.1	-1136.0	-3.7	60.0

TEST NO. Y57-4-1602

VEHICLE DATA

SAE FILTER CHANNEL CLASS

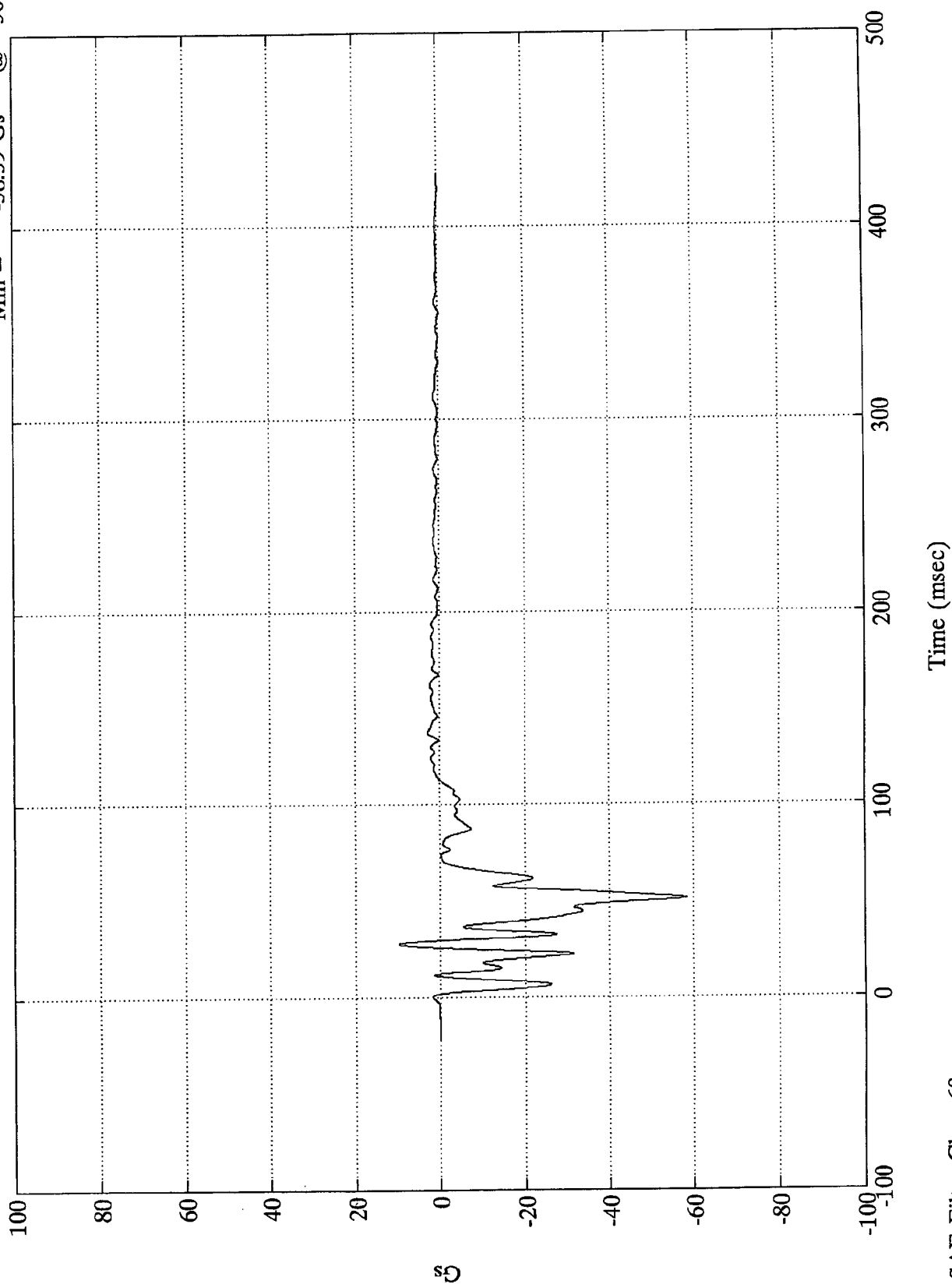
60

VEHICLE ONE DATA

VTV TEST #4

Max = 9.67 Gs @ 27.36 msec
Min = -58.39 Gs @ 50.88 msec

Acc 1 Rt Ft Frame Rail X

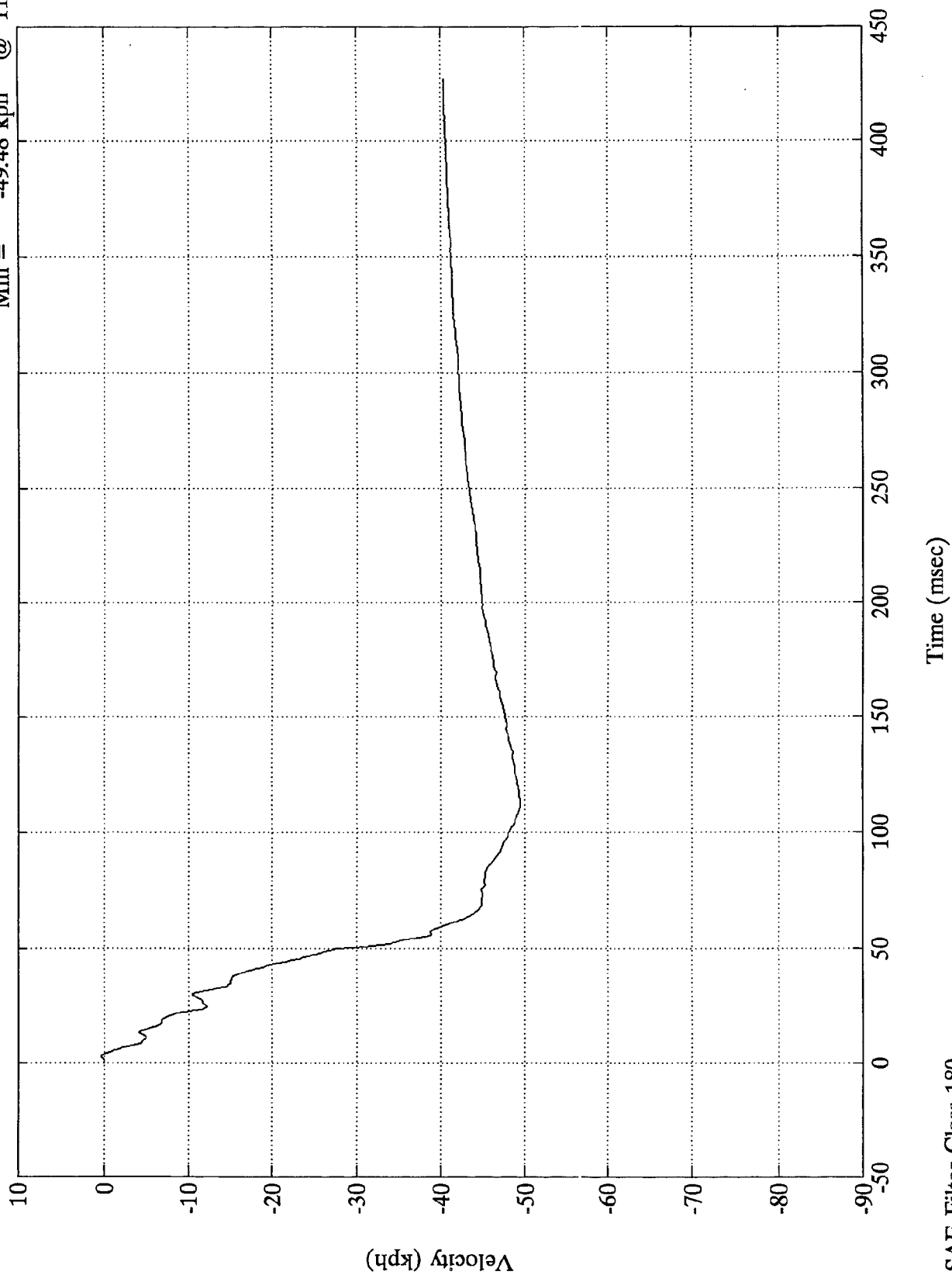


SAE Filter Class 60

VTV TEST #4

Acc 1 Rt Ft Frame Rail X

Max = .34 kph @ 2.87 msec
Min = -49.48 kph @ 113.40 msec

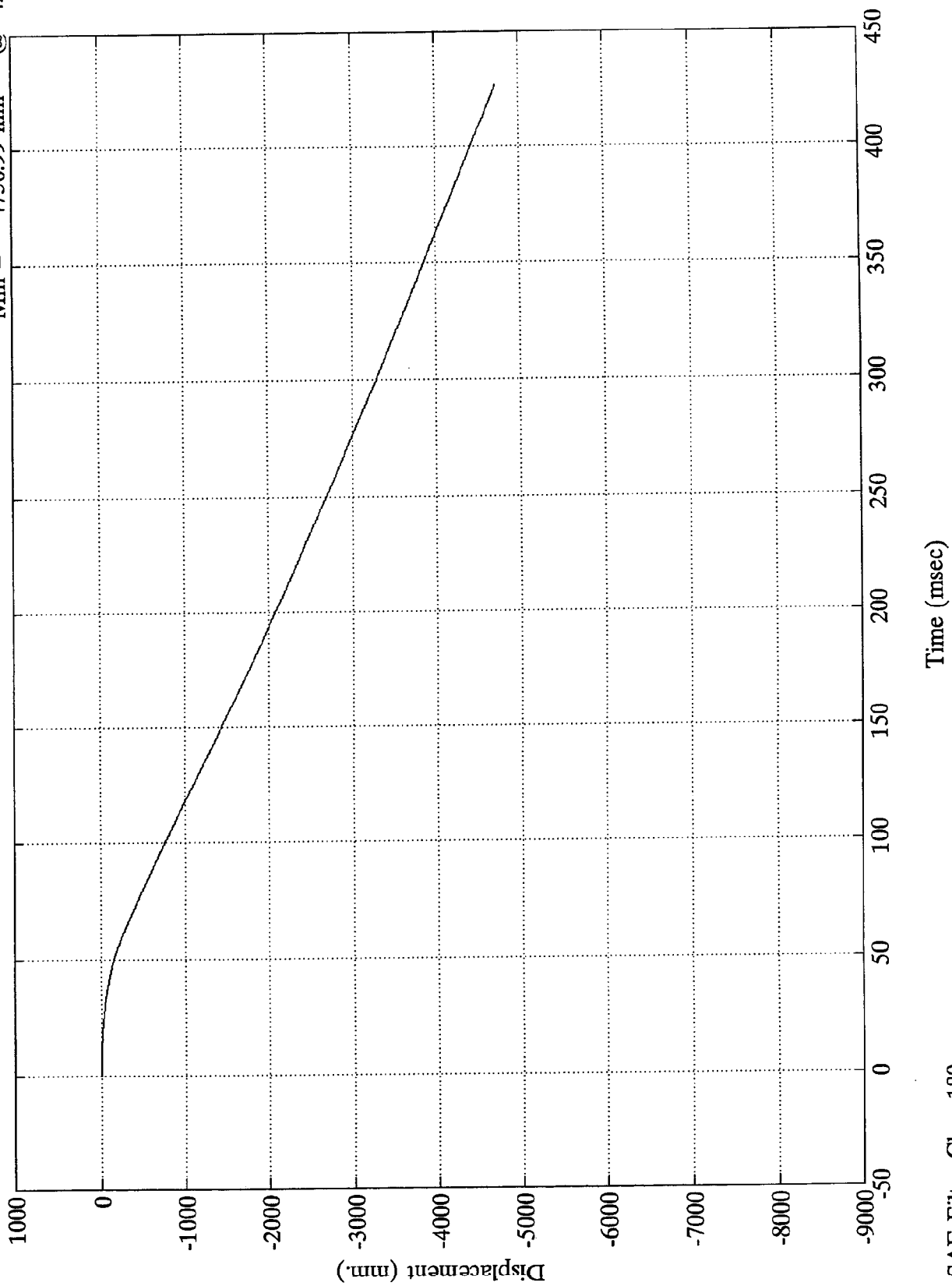


SAE Filter Class 180

VTV TEST #4

Acc 1 Rt Ft Frame Rail X

Max = .14 mm @ 3.83 msec
Min = -4730.99 mm @ 427.32 msec

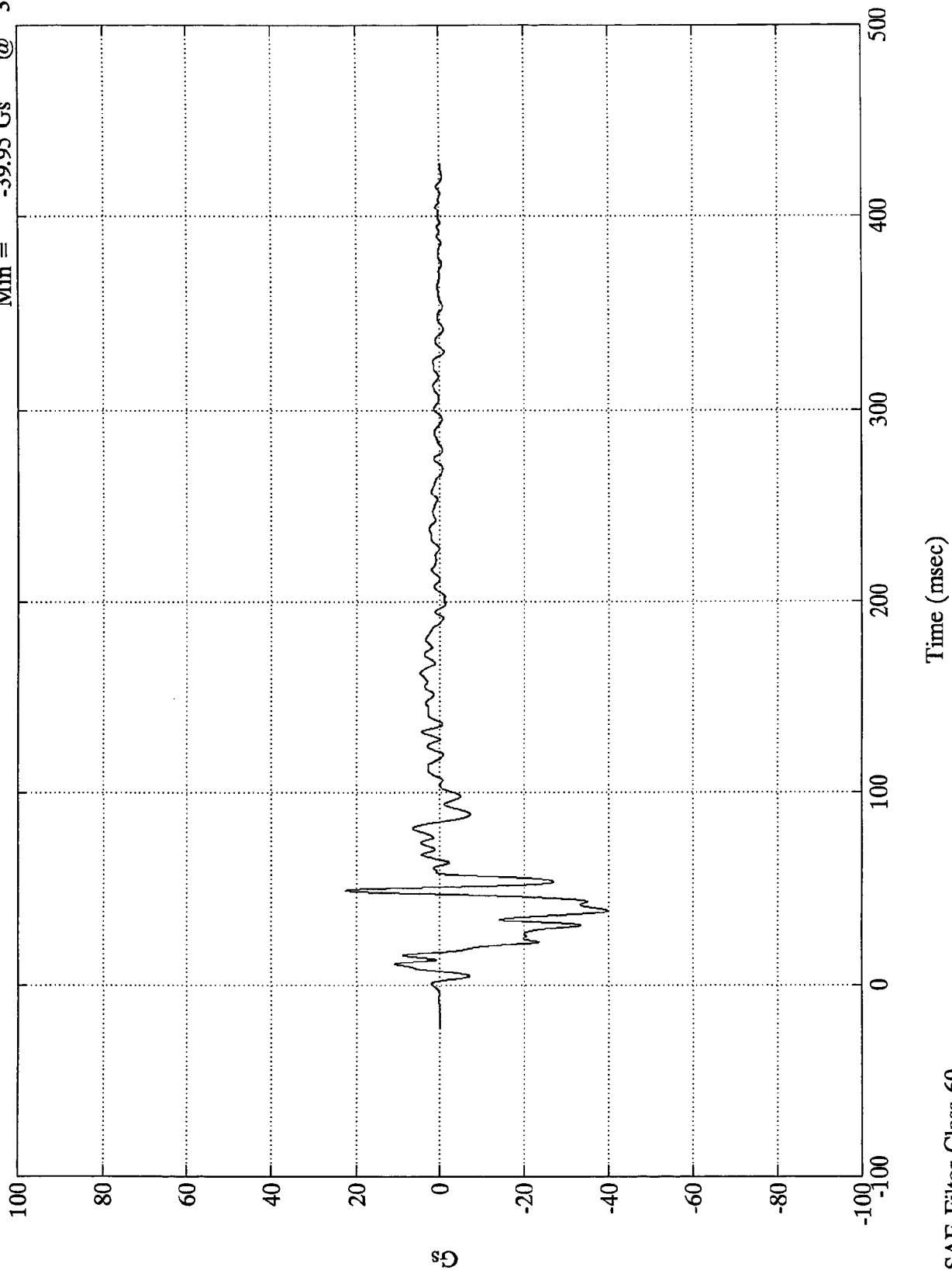


SAE Filter Class 180

VTV TEST #4

Acc 1 Rt Ft Frame Rail Y

Max = 22.53 Gs @ 49.20 msec
Min = -39.95 Gs @ 38.88 msec

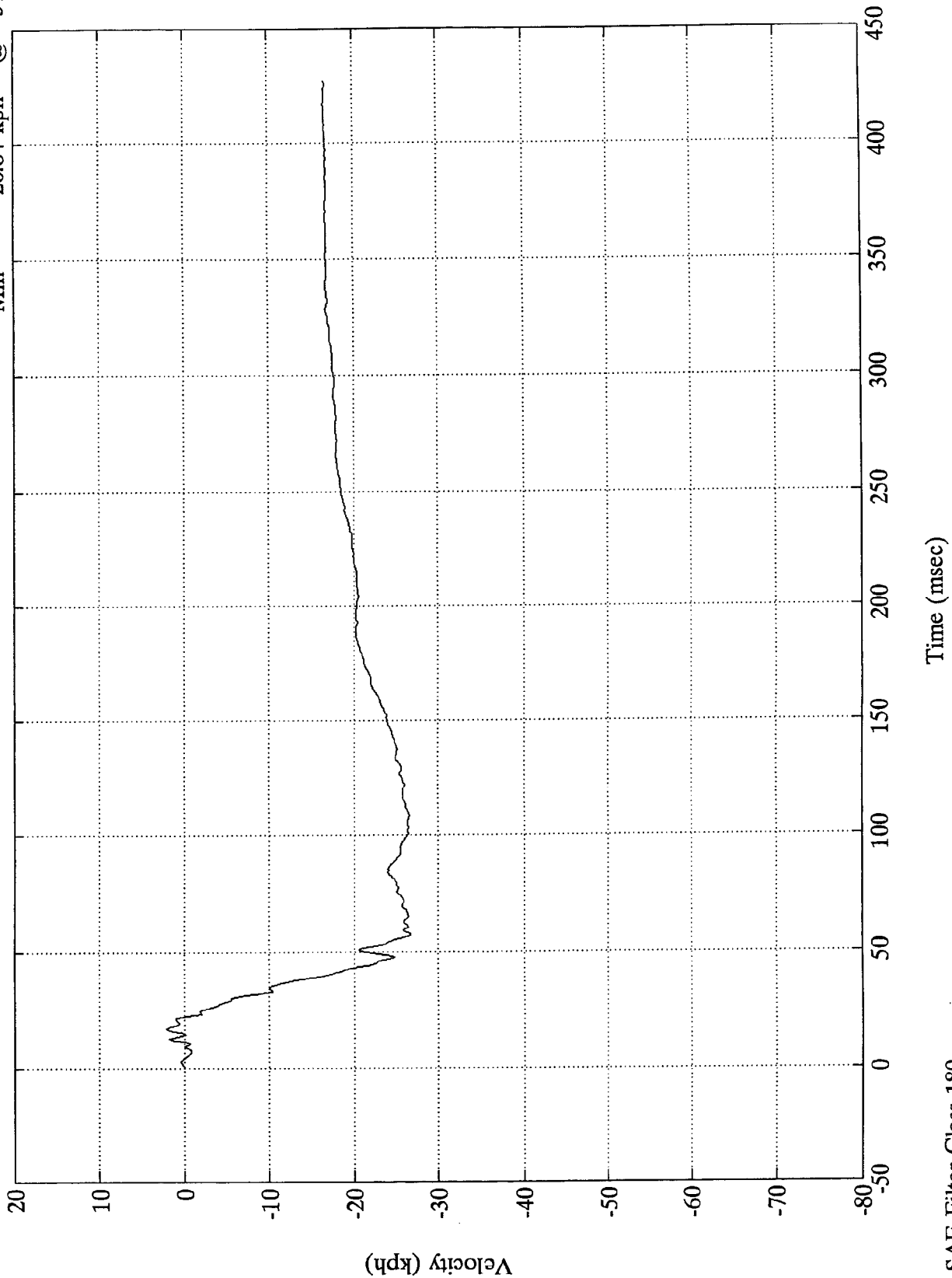


SAE Filter Class 60

VTV TEST #4

Max = 2.14 kph @ 17.16 msec
Min = -26.84 kph @ 57.24 msec

Acc 1 Rt Ft Frame Rail Y

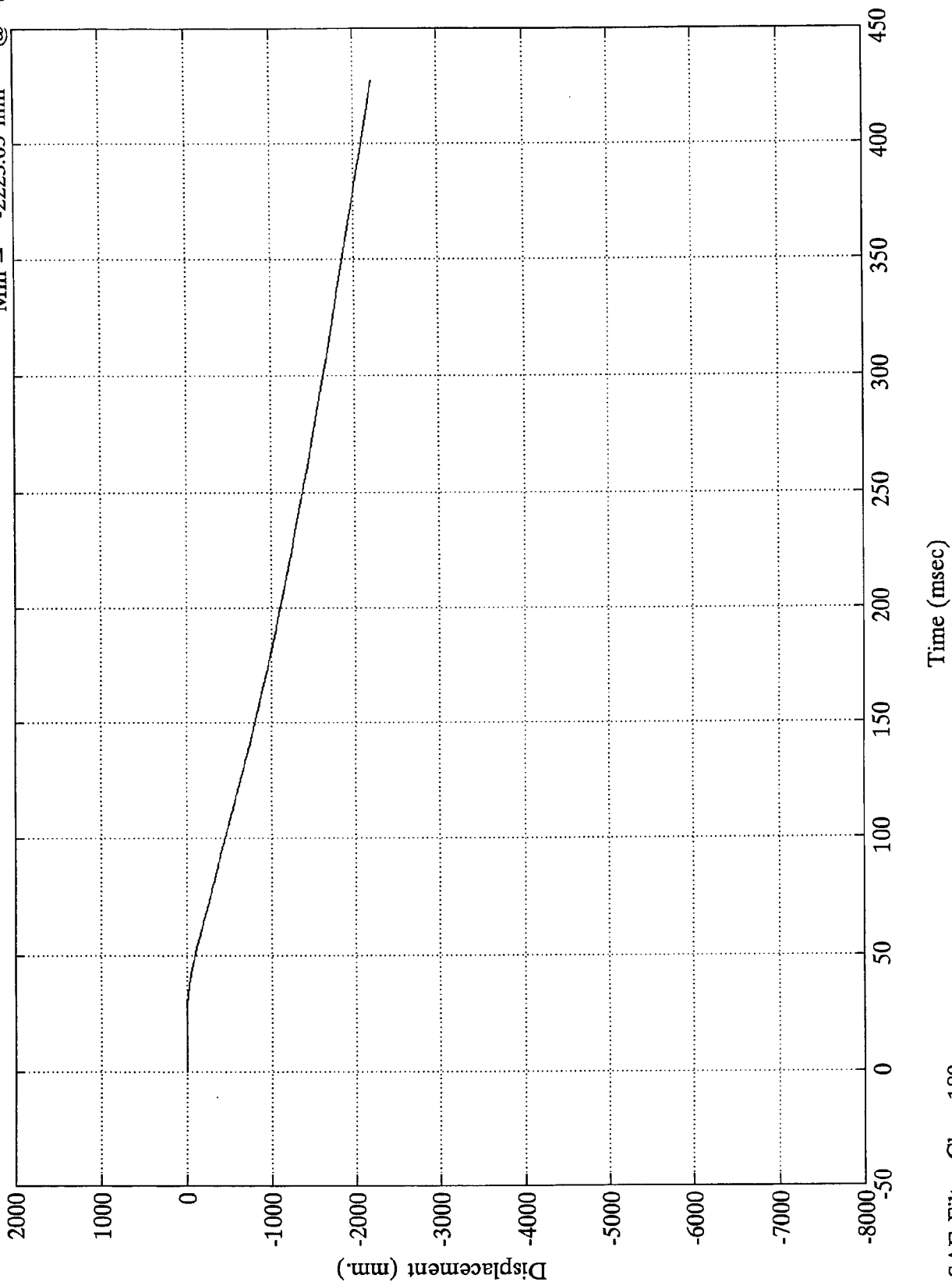


SAE Filter Class 180

VTV TEST #4

Acc 1 Rt Ft Frame Rail Y

Max = 2.34 mm @ 22.32 msec
Min = -2223.03 mm @ 427.32 msec

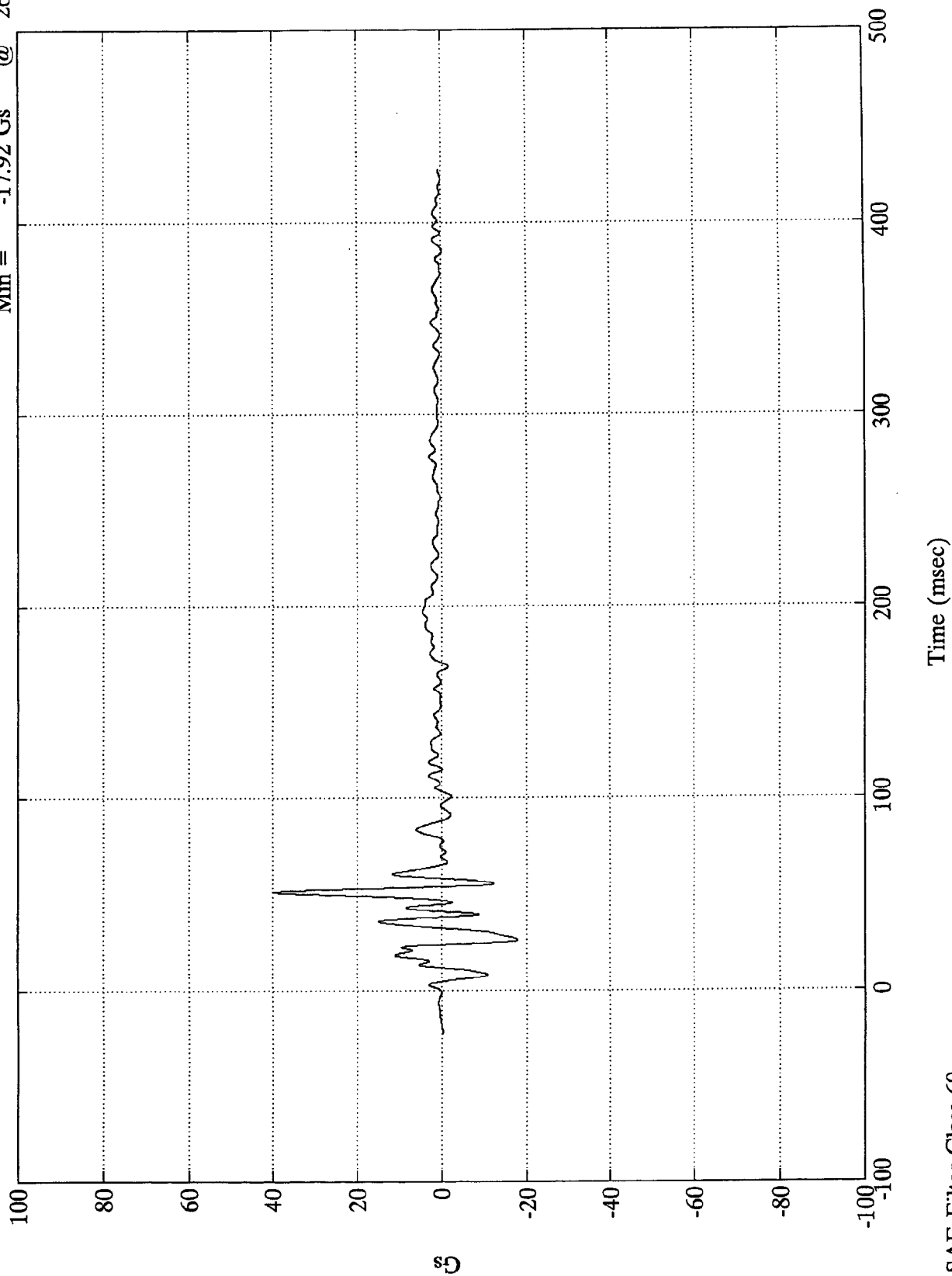


SAE Filter Class 180

VTV TEST #4

Max = 40.12 Gs @ 50.76 msec
Min = -17.92 Gs @ 26.04 msec

Acc 1 Rt Ft Frame Rail Z

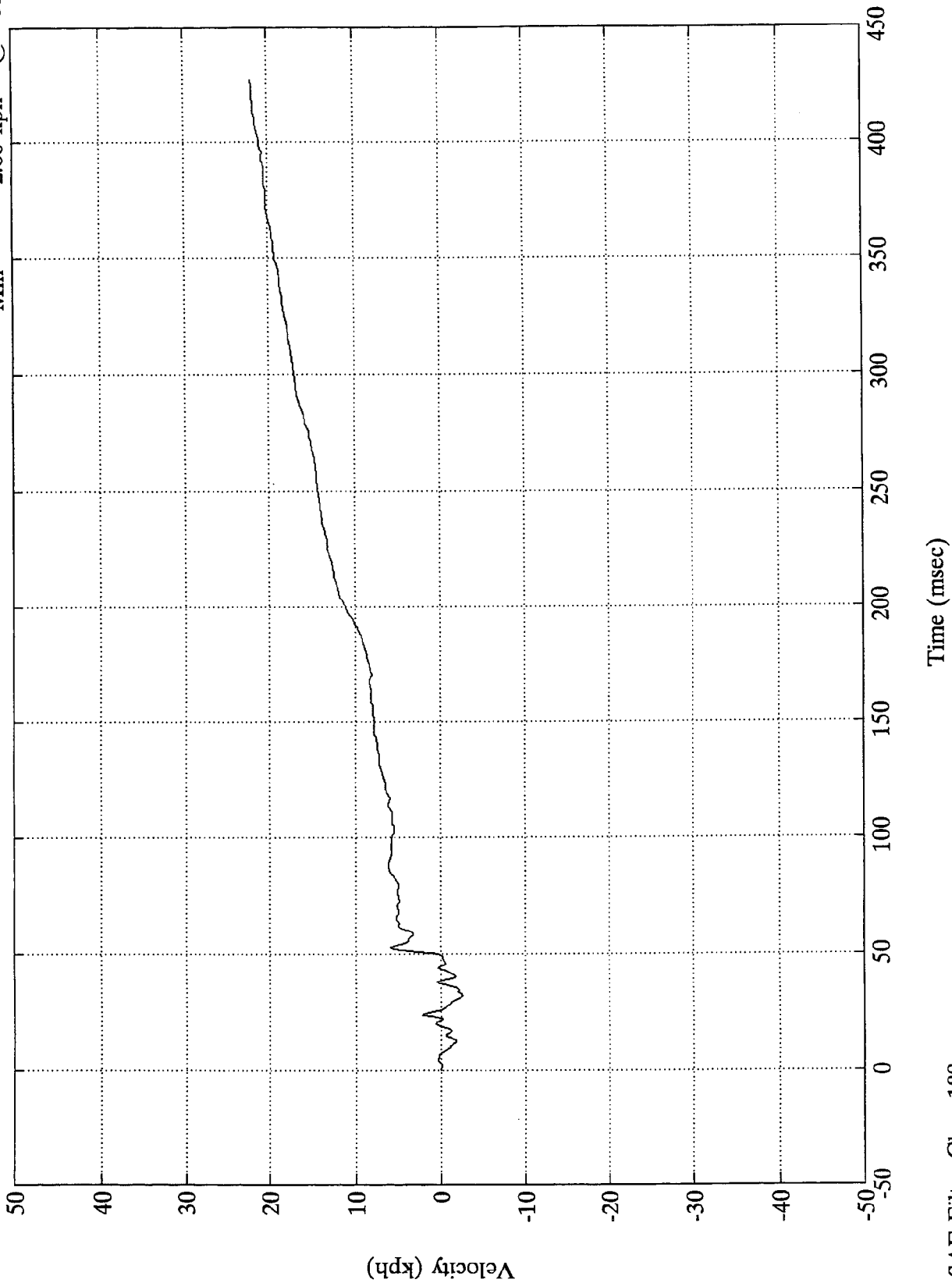


SAE Filter Class 60

VTV TEST #4

Acc 1 Rt Ft Frame Rail Z

Max = 21.93 kph @ 427.32 msec
Min = -2.60 kph @ 31.80 msec

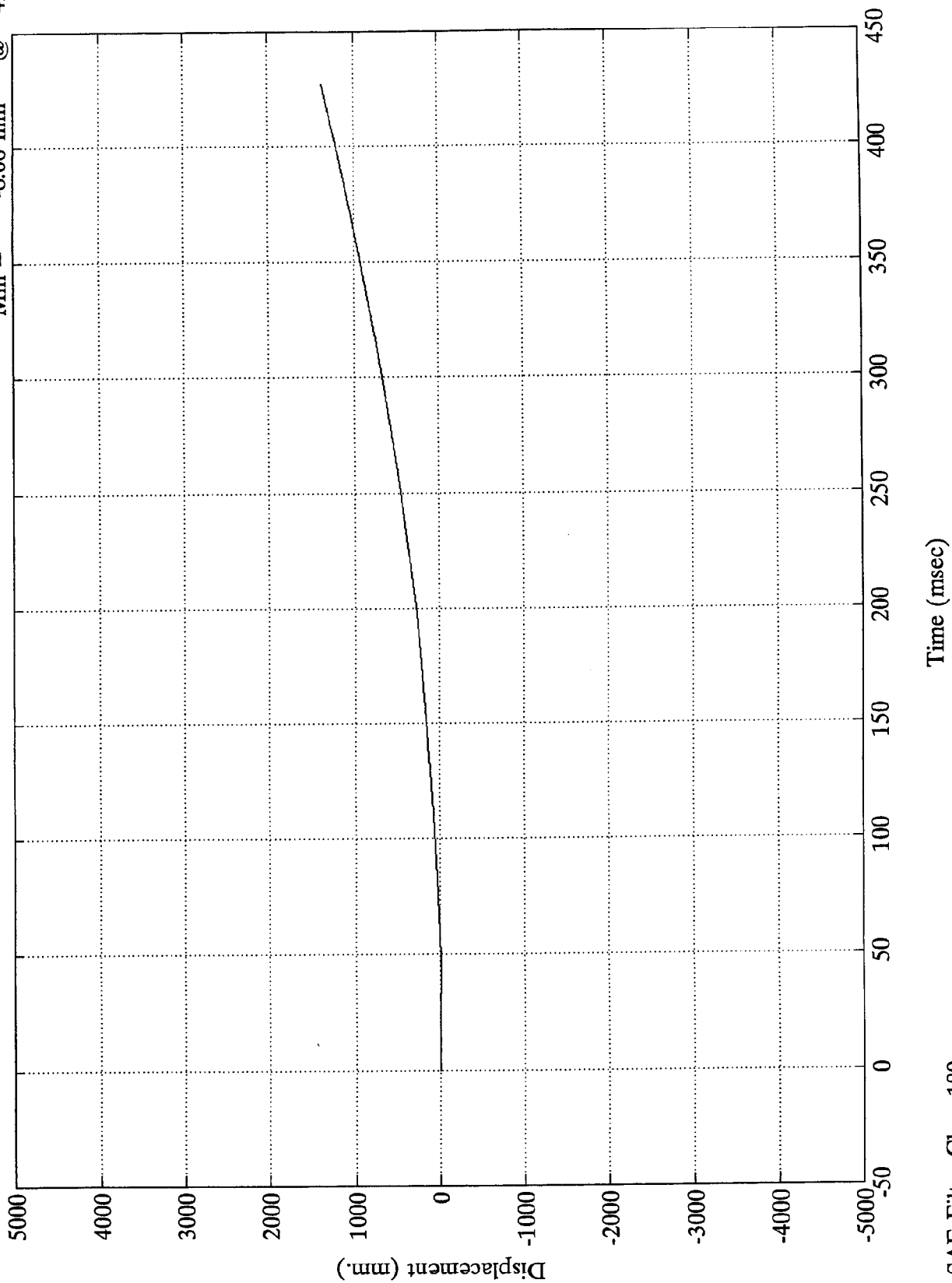


SAE Filter Class 180

VTV TEST #4

Acc 1 Rt Ft Frame Rail Z

Max = 1366.60 mm @ 427.32 msec
Min = -8.06 mm @ 49.32 msec

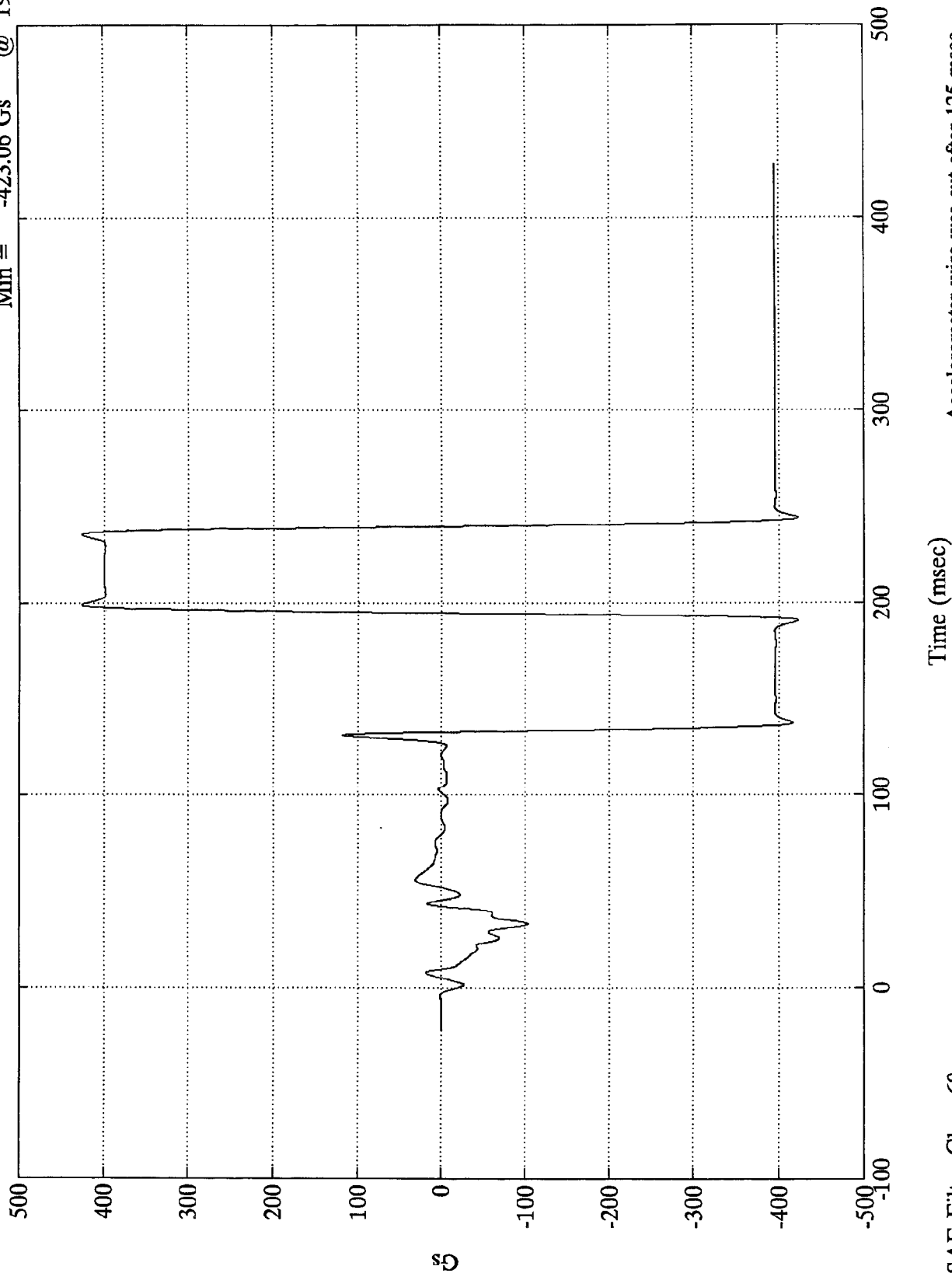


SAE Filter Class 180

VTV TEST #4

Acc 2 Lt Ft Frame Rail X

Max = 425.60 Gs @ 235.44 msec
Min = -423.06 Gs @ 190.92 msec



SAE Filter Class 60

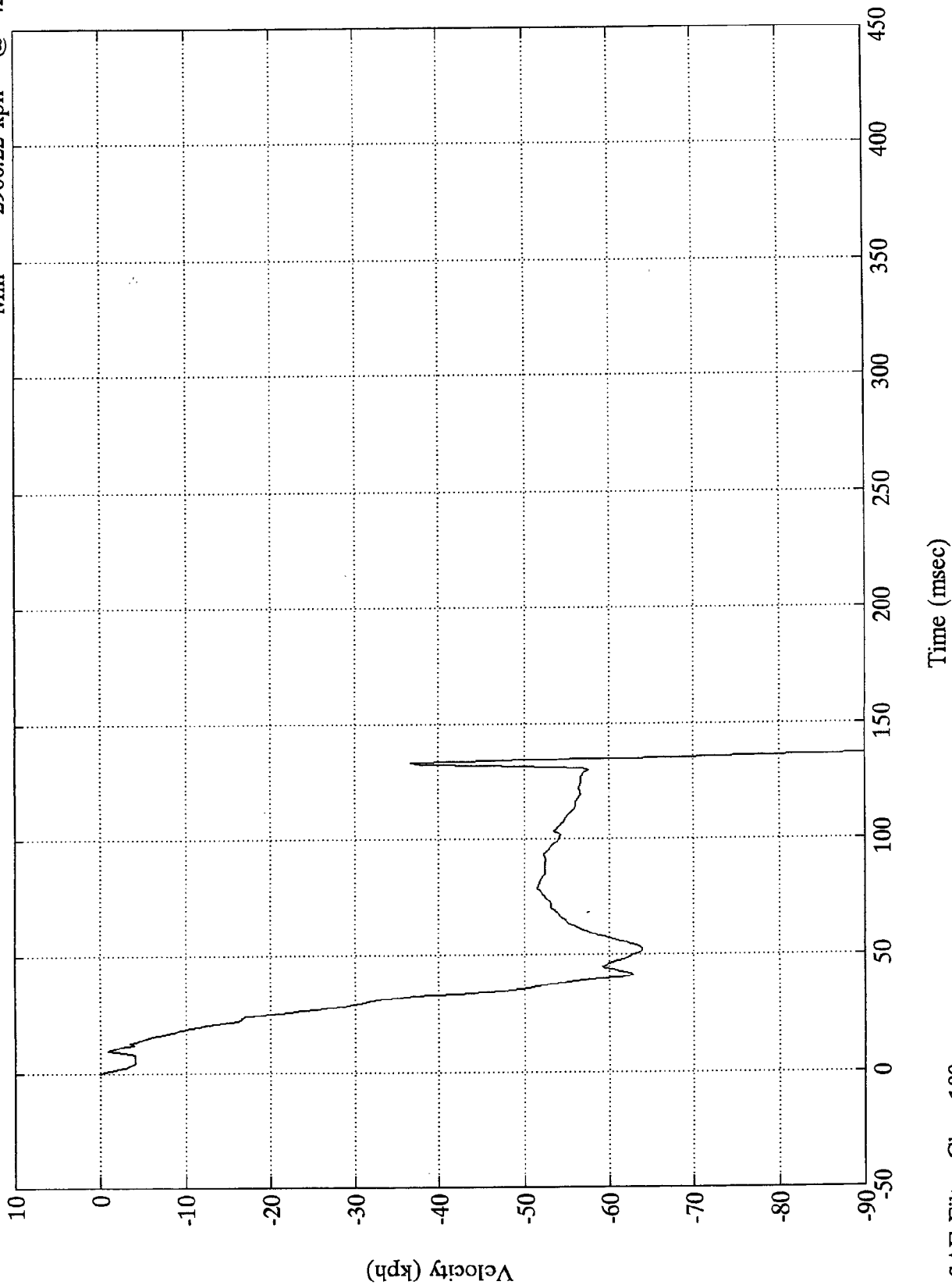
Time (msec)

Accelerometer wire was cut after 125 msec.

VTV TEST #4

Max = .00 kph @ -0.00 msec
Min = -2900.22 kph @ 427.32 msec

Acc 2 Lt Ft Frame Rail X



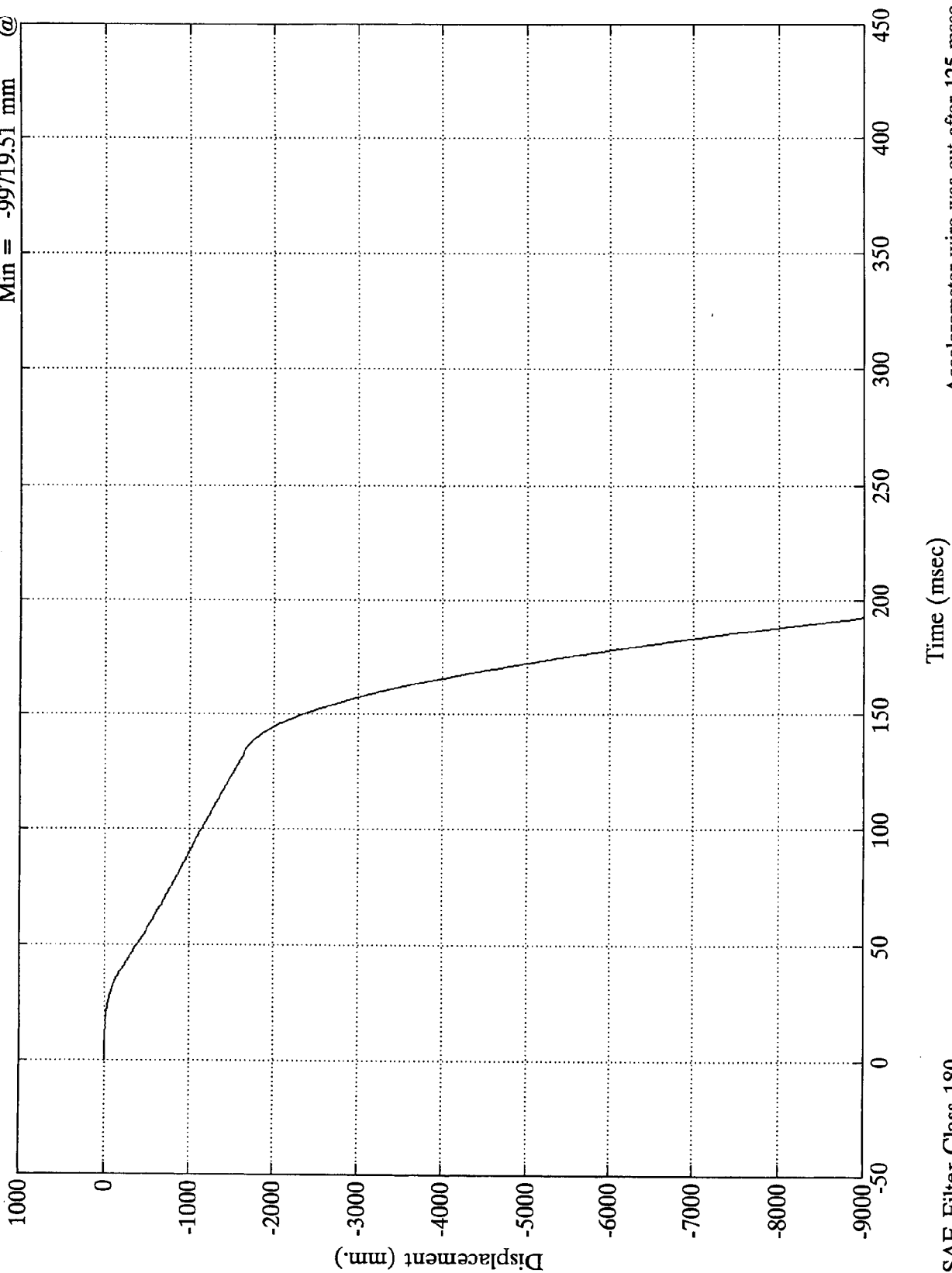
SAE Filter Class 180

Accelerometer wire was cut after 125 msec.

VTV TEST #4

Acc 2 Lt Ft Frame Rail X

Max = .00 mm @ -0.00 msec
Min = -99719.51 mm @ 427.32 msec



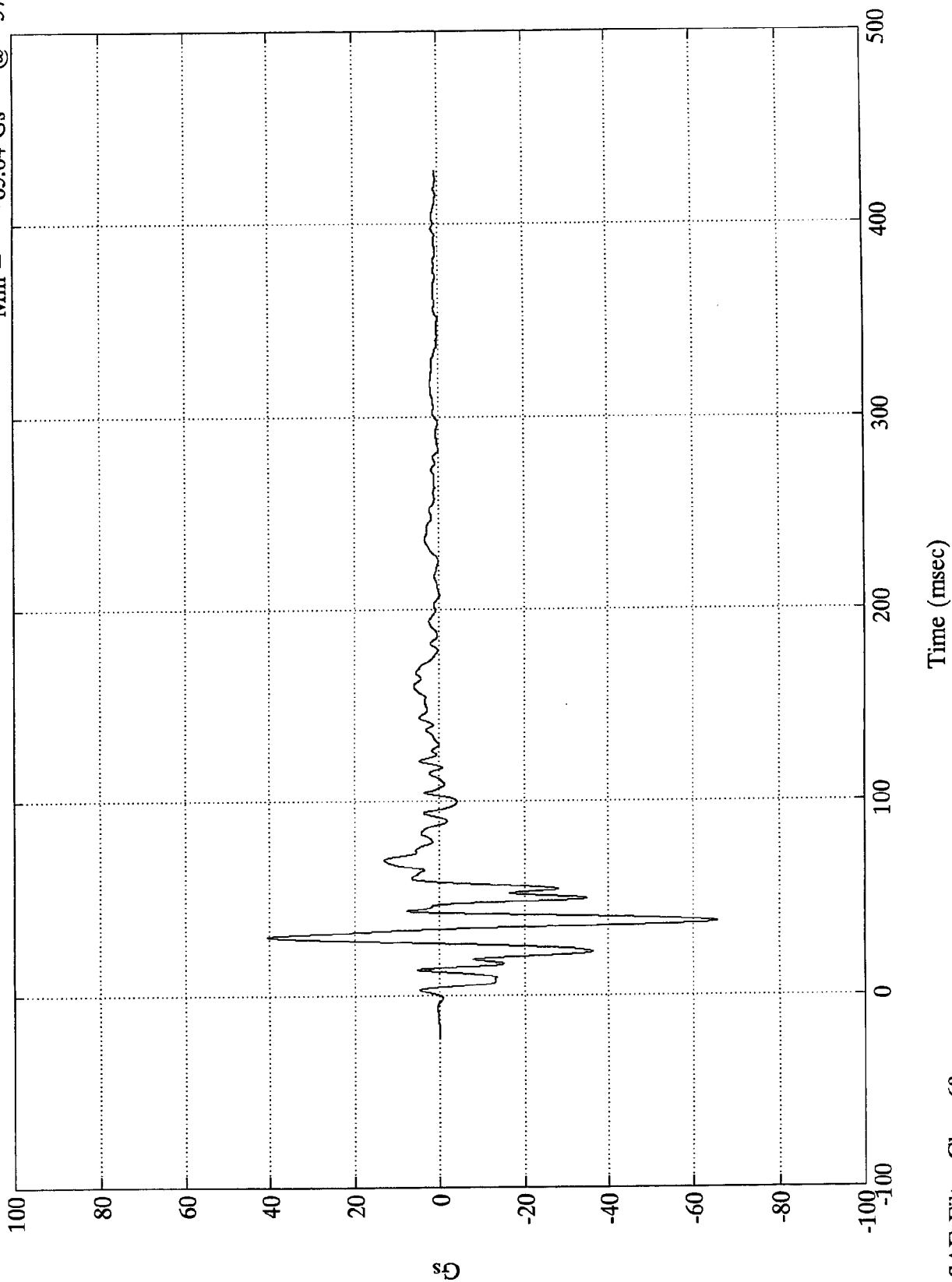
SAE Filter Class 180

Accelerometer wire was cut after 125 msec.

VTV TEST #4

Max = 40.52 Gs @ 30.00 msec
Min = -65.64 Gs @ 37.79 msec

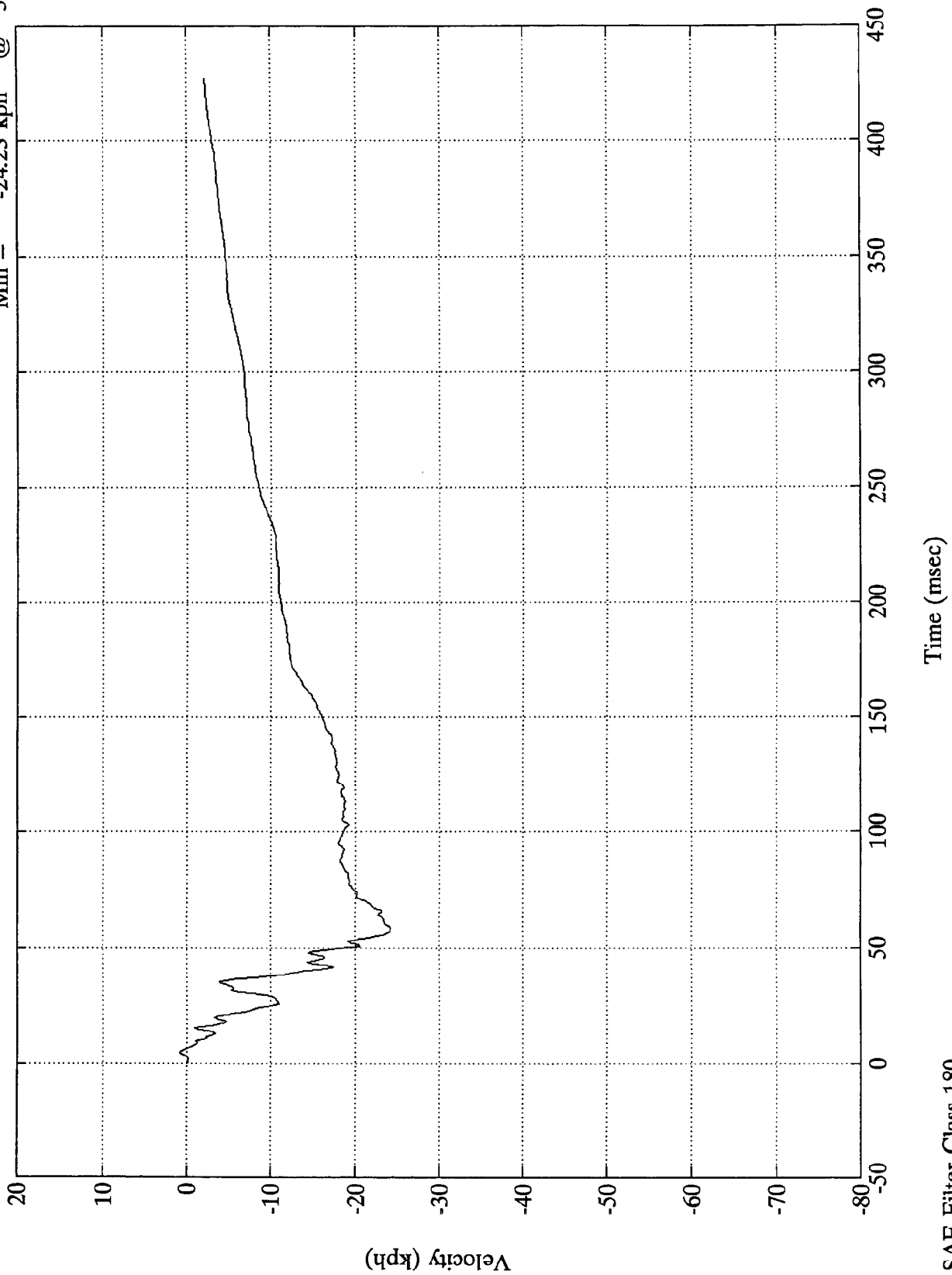
Acc 2 Lt Ft Frame Rail Y



VTV TEST #4

Acc 2 Lt Ft Frame Rail Y

Max = .81 kph @ 4.43 msec
Min = -24.23 kph @ 58.68 msec

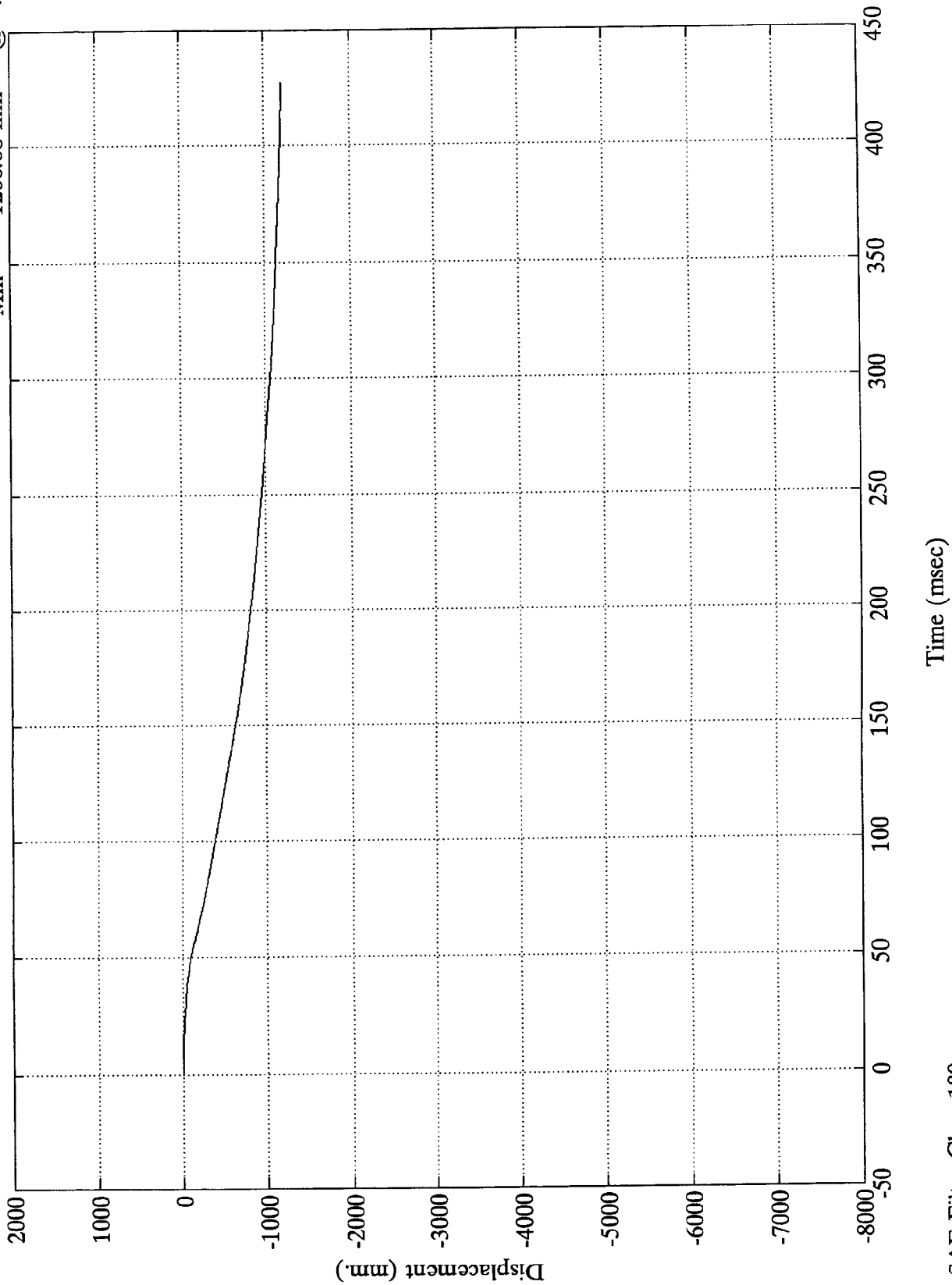


SAE Filter Class 180

VTV TEST #4

Acc 2 Lt Ft Frame Rail Y

Max = .36 mm @ 6.23 msec
Min = -1200.08 mm @ 427.32 msec

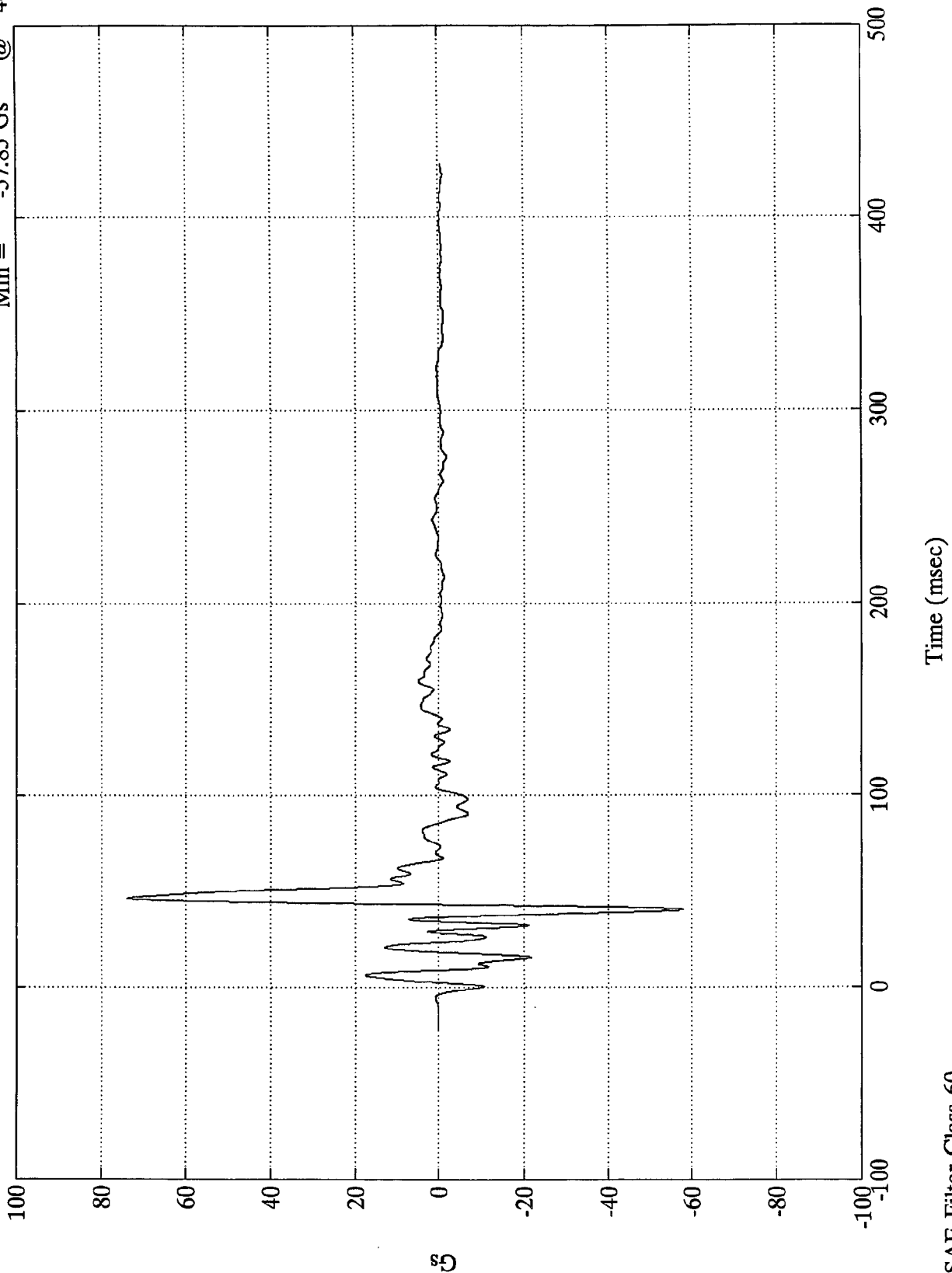


SAE Filter Class 180

VTV TEST #4

Acc 2 Lt Ft Frame Rail Z

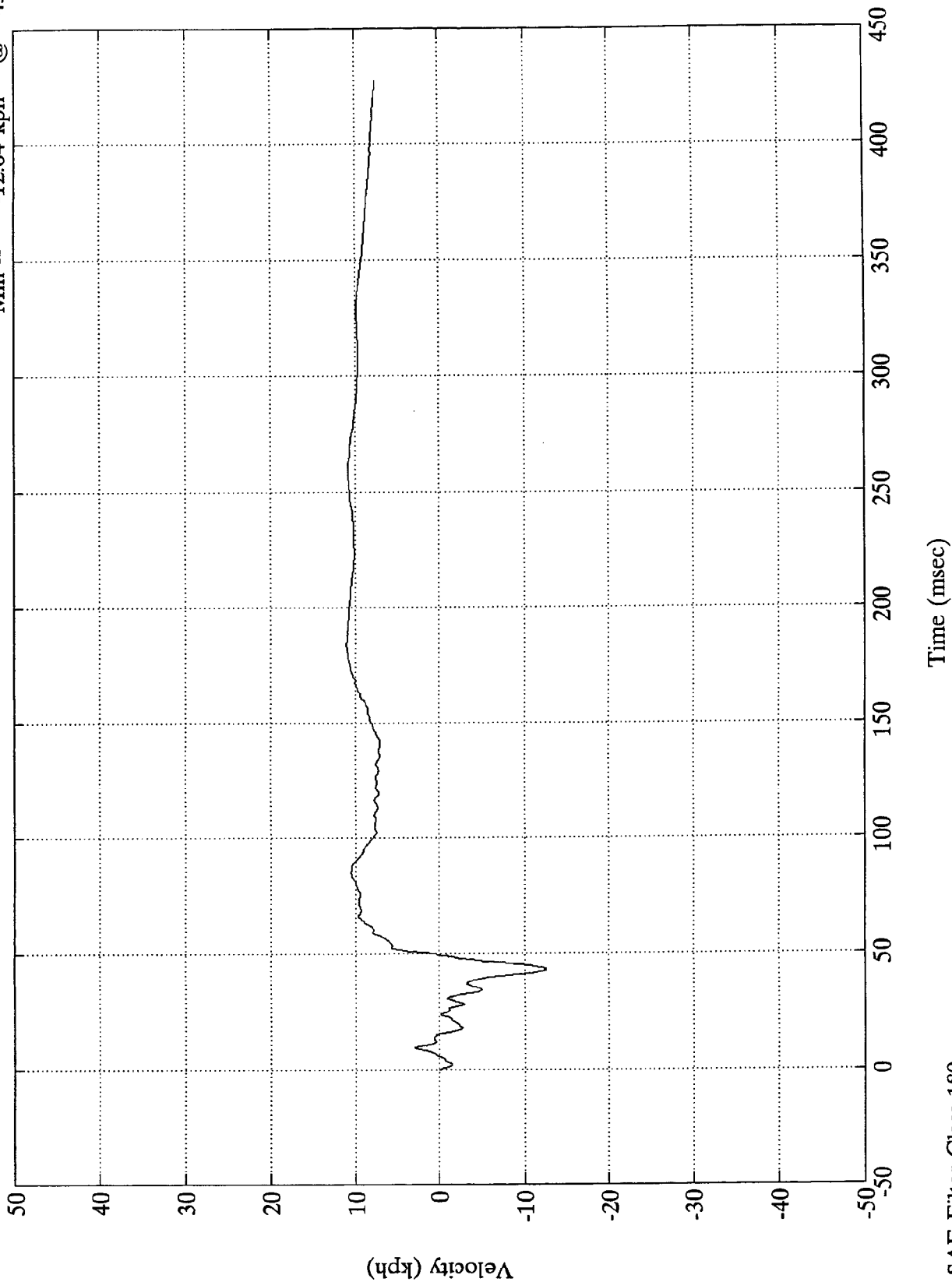
Max = 73.75 Gs @ 46.92 msec
Min = -57.85 Gs @ 40.92 msec



SAE Filter Class 60

VTV TEST #4

Acc 2 Lt Ft Frame Rail Z
Max = 11.05 kph @ 184.08 msec
Min = -12.64 kph @ 43.56 msec

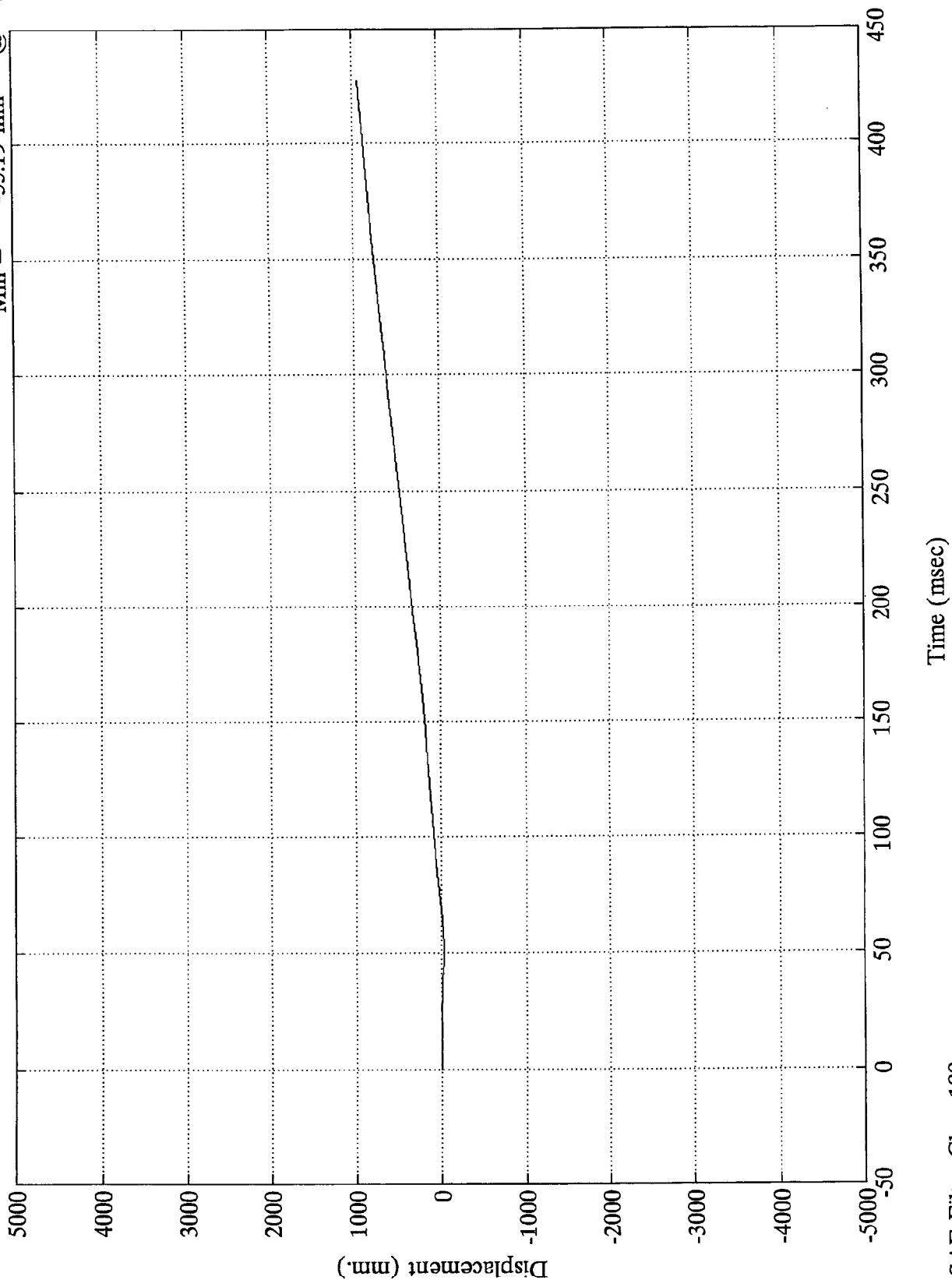


SAE Filter Class 180

VTV TEST #4

Acc 2 Lt Ft Frame Rail Z

Max = 930.04 mm @ 427.32 msec
Min = -35.19 mm @ 49.44 msec

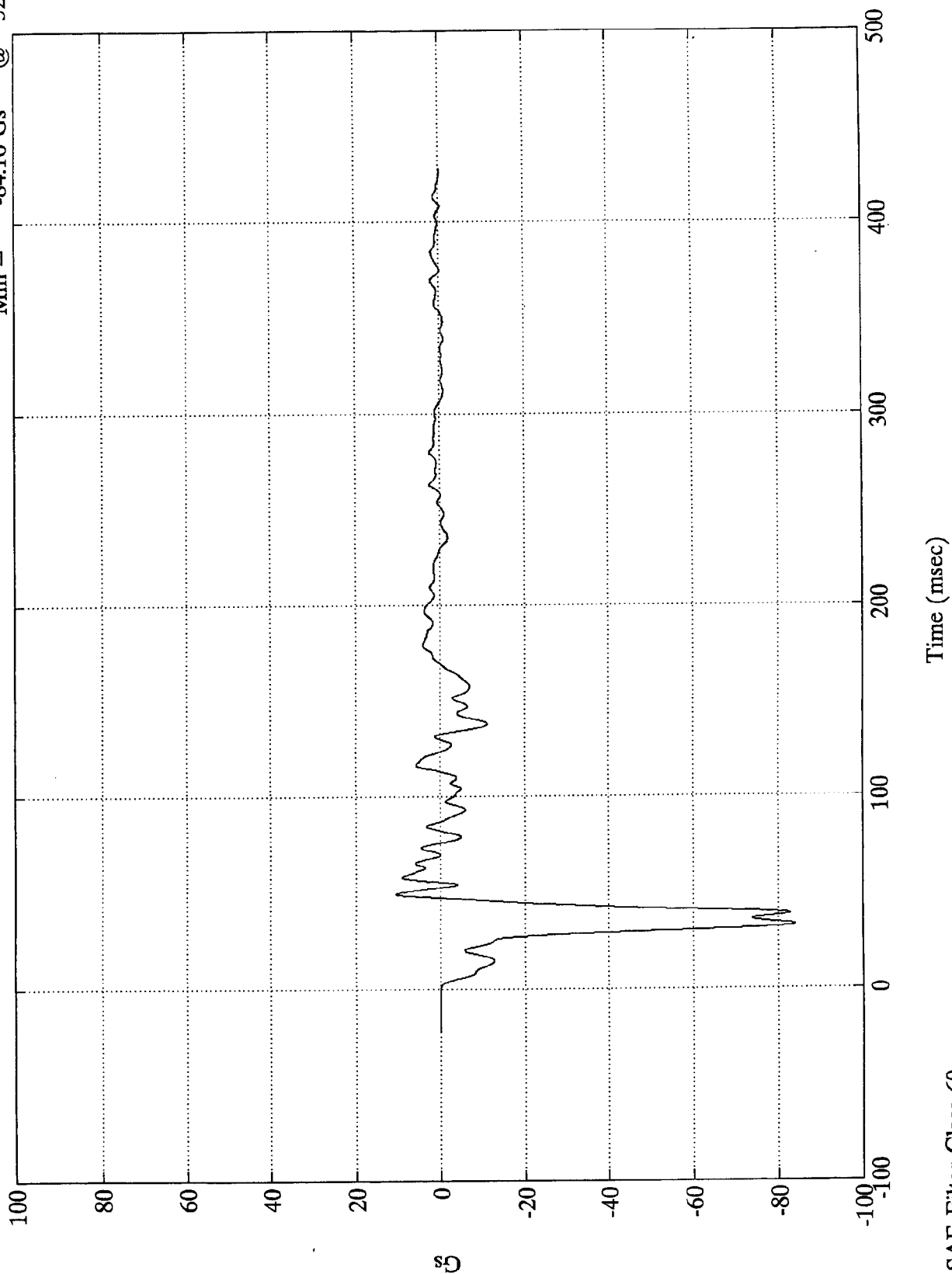


SAE Filter Class 180

VTV TEST #4

Acc 3 Rt Engine X

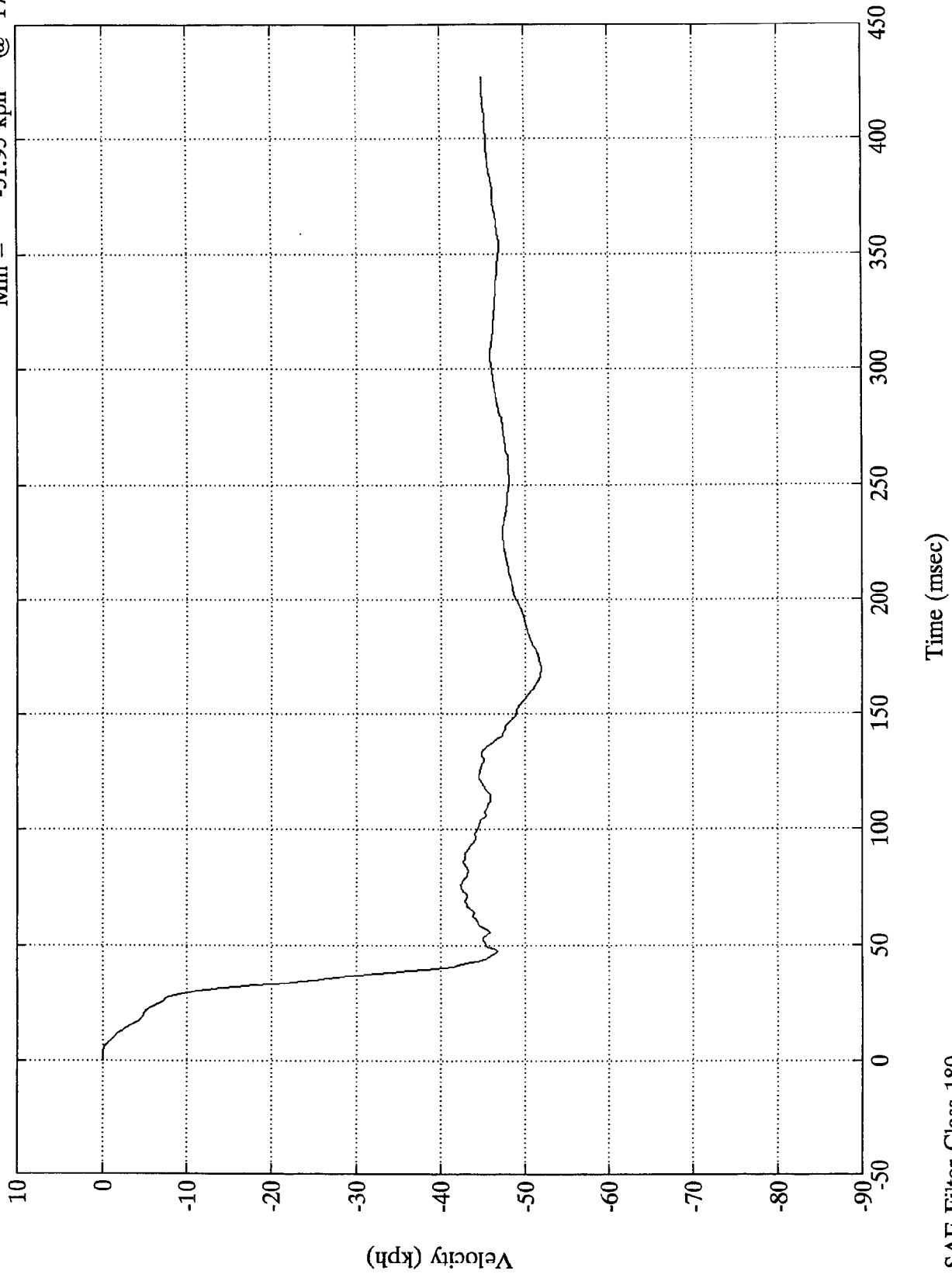
Max = 10.55 Gs @ 49.20 msec
Min = -84.16 Gs @ 32.76 msec



VTV TEST #4

Acc 3 Rt Engine X

Max = .00 kph @ -0.00 msec
Min = -51.95 kph @ 170.16 msec

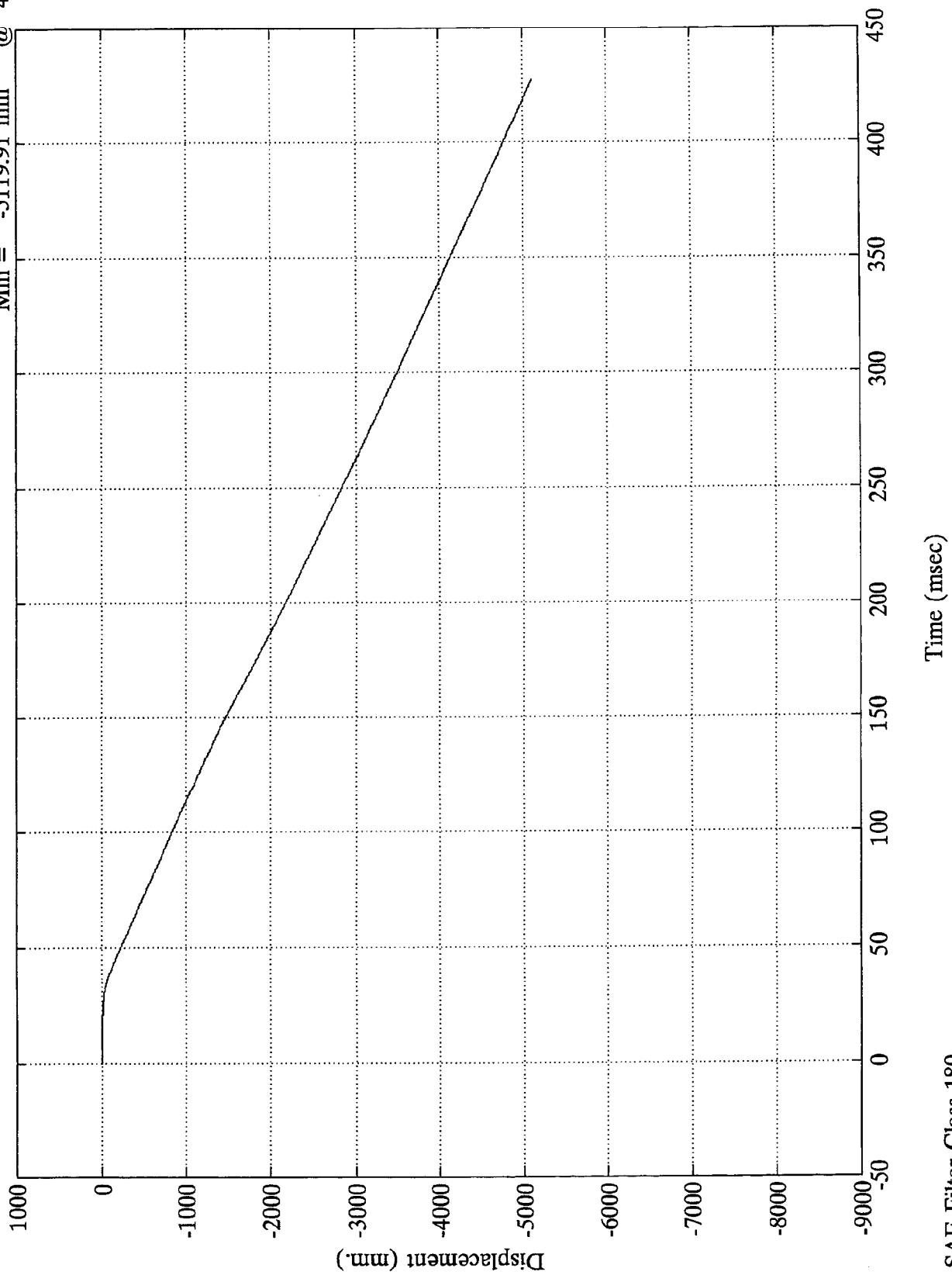


SAE Filter Class 180

VTV TEST #4

Acc 3 Rt Engine X

Max = .00 mm @ -0.00 msec
Min = -5119.91 mm @ 427.32 msec

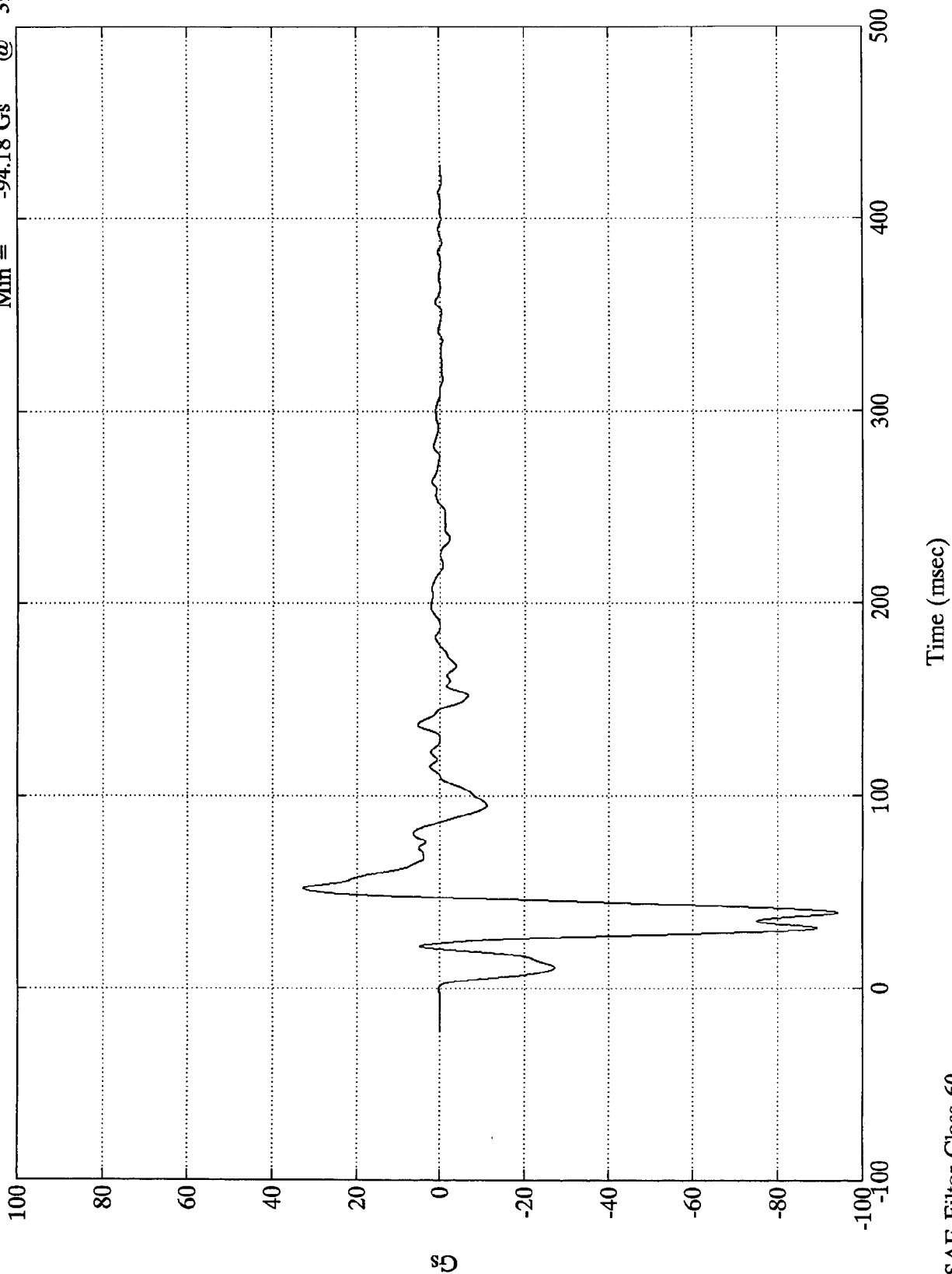


SAE Filter Class 180

VTV TEST #4

Acc 4 Lt Engine X

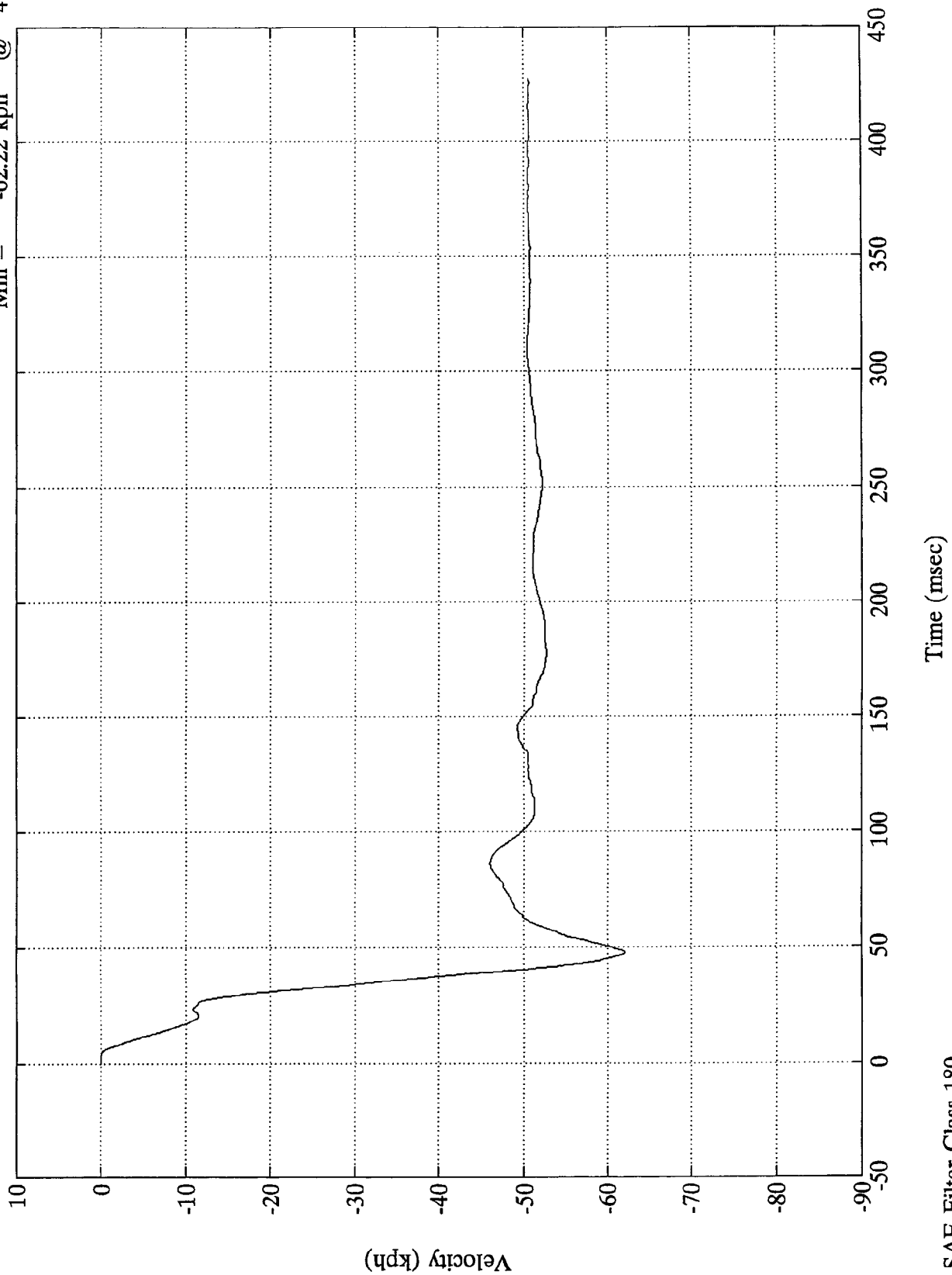
Max = 32.68 Gs @ 52.79 msec
Min = -94.18 Gs @ 39.72 msec



VTV TEST #4

Acc 4 Lt Engine X

Max = .00 kph @ -0.00 msec
Min = -62.22 kph @ 47.76 msec

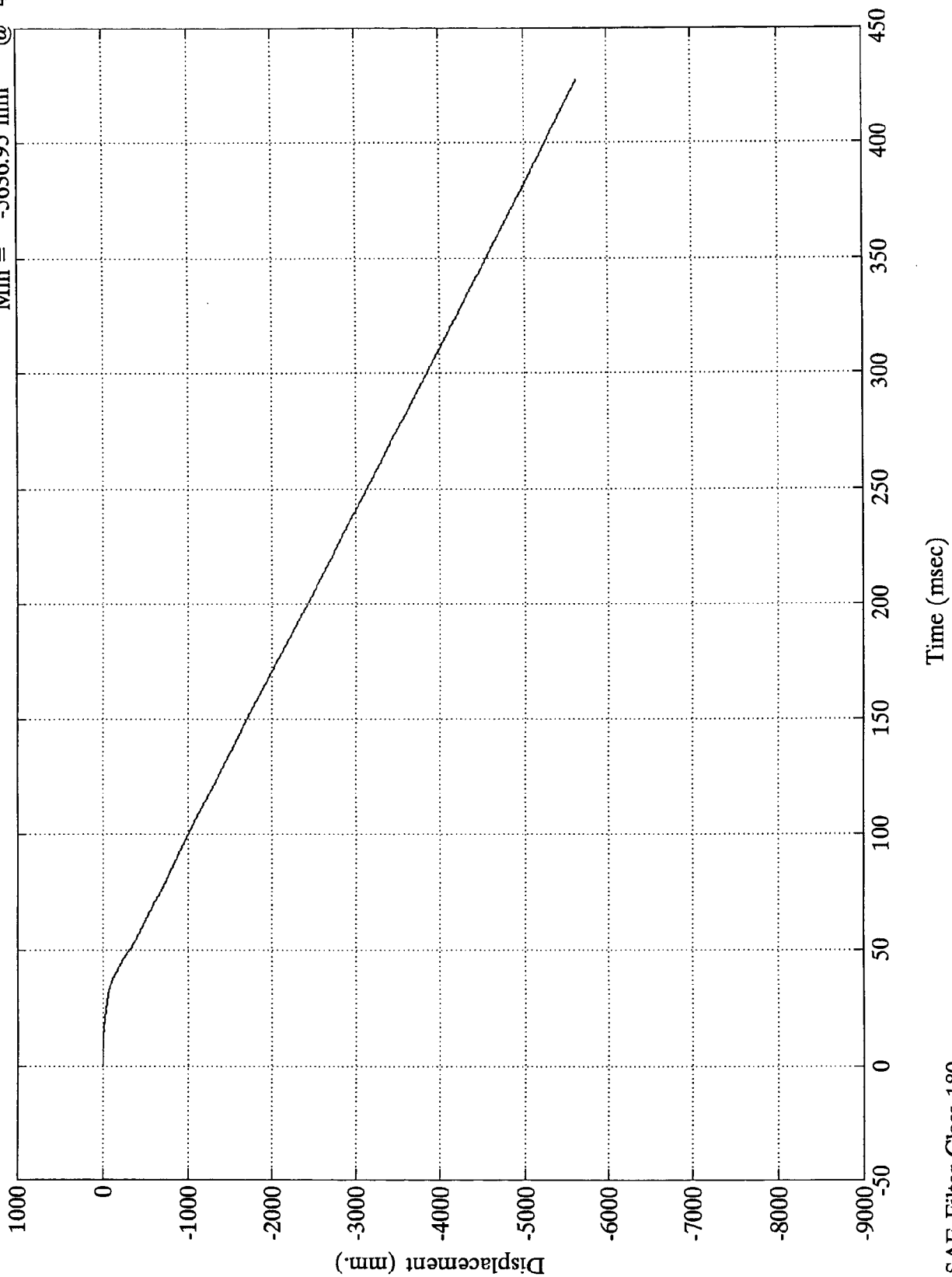


SAE Filter Class 180

VTV TEST #4

Acc 4 Lt Engine X

Max = .00 mm @ -0.00 msec
Min = -5636.95 mm @ 427.32 msec

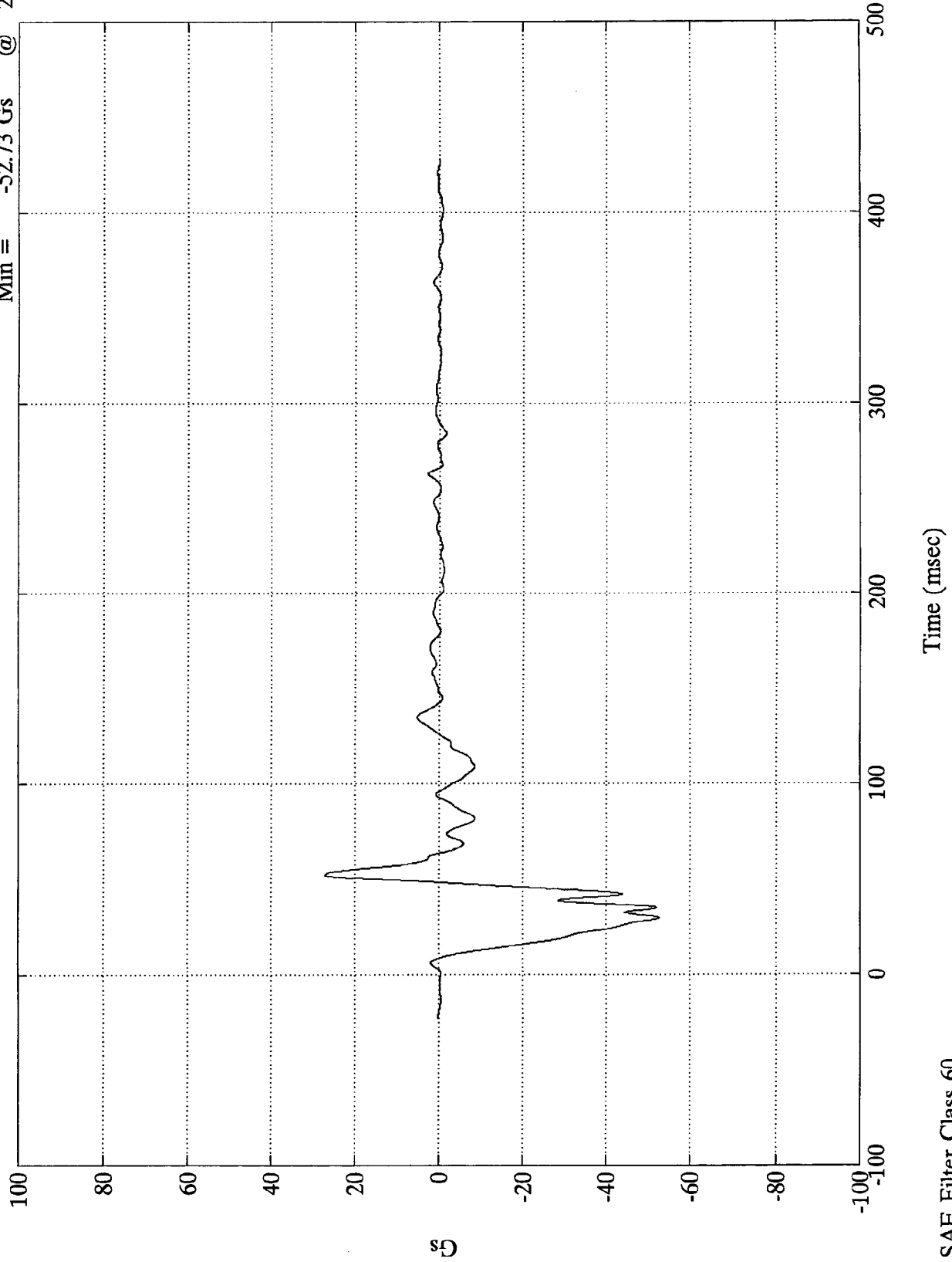


SAE Filter Class 180

VTV TEST #4

Acc 5 Engine Bottom X

Max = 27.03 Gs @ 52.31 msec
Min = -52.73 Gs @ 29.63 msec

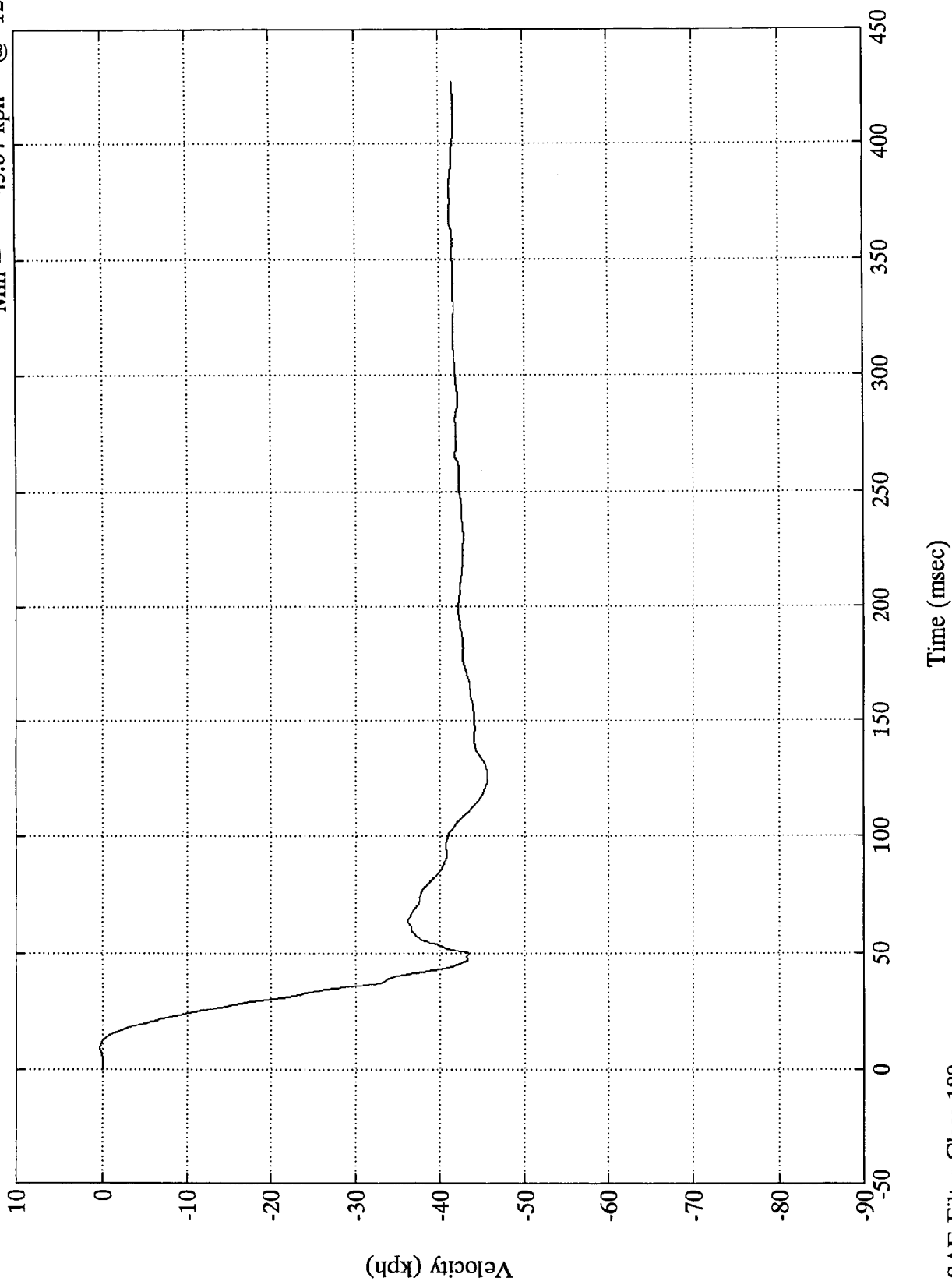


SAE Filter Class 60

VTV TEST #4

Acc 5 Engine Bottom X

Max = .25 kph @ 9.71 msec
Min = -45.64 kph @ 124.20 msec

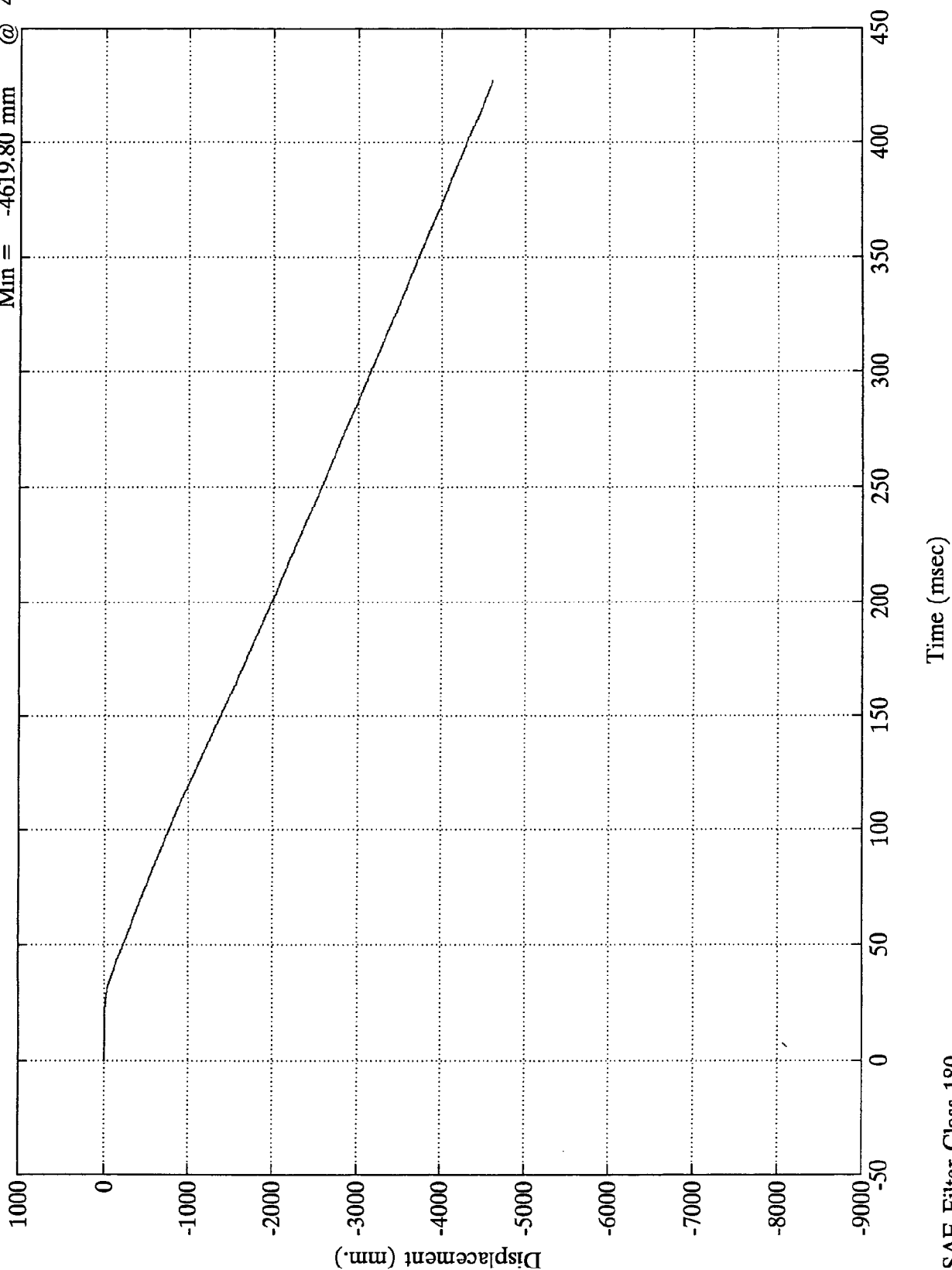


SAE Filter Class 180

VTV TEST #4

Acc 5 Engine Bottom X

Max = .24 mm @ 12.48 msec
Min = -4619.80 mm @ 427.32 msec

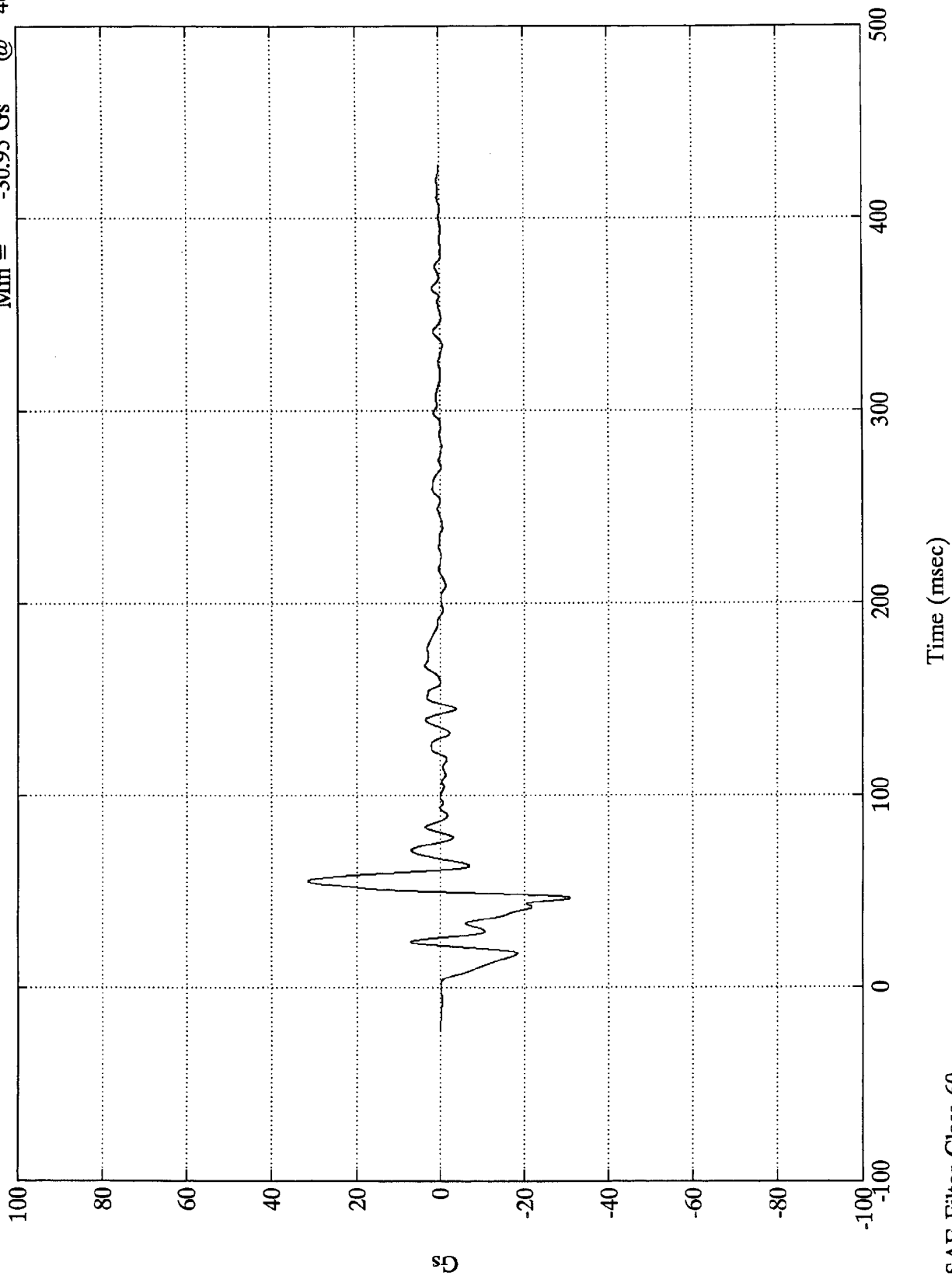


SAE Filter Class 180

VTV TEST #4

Acc 5 Engine Bottom Y

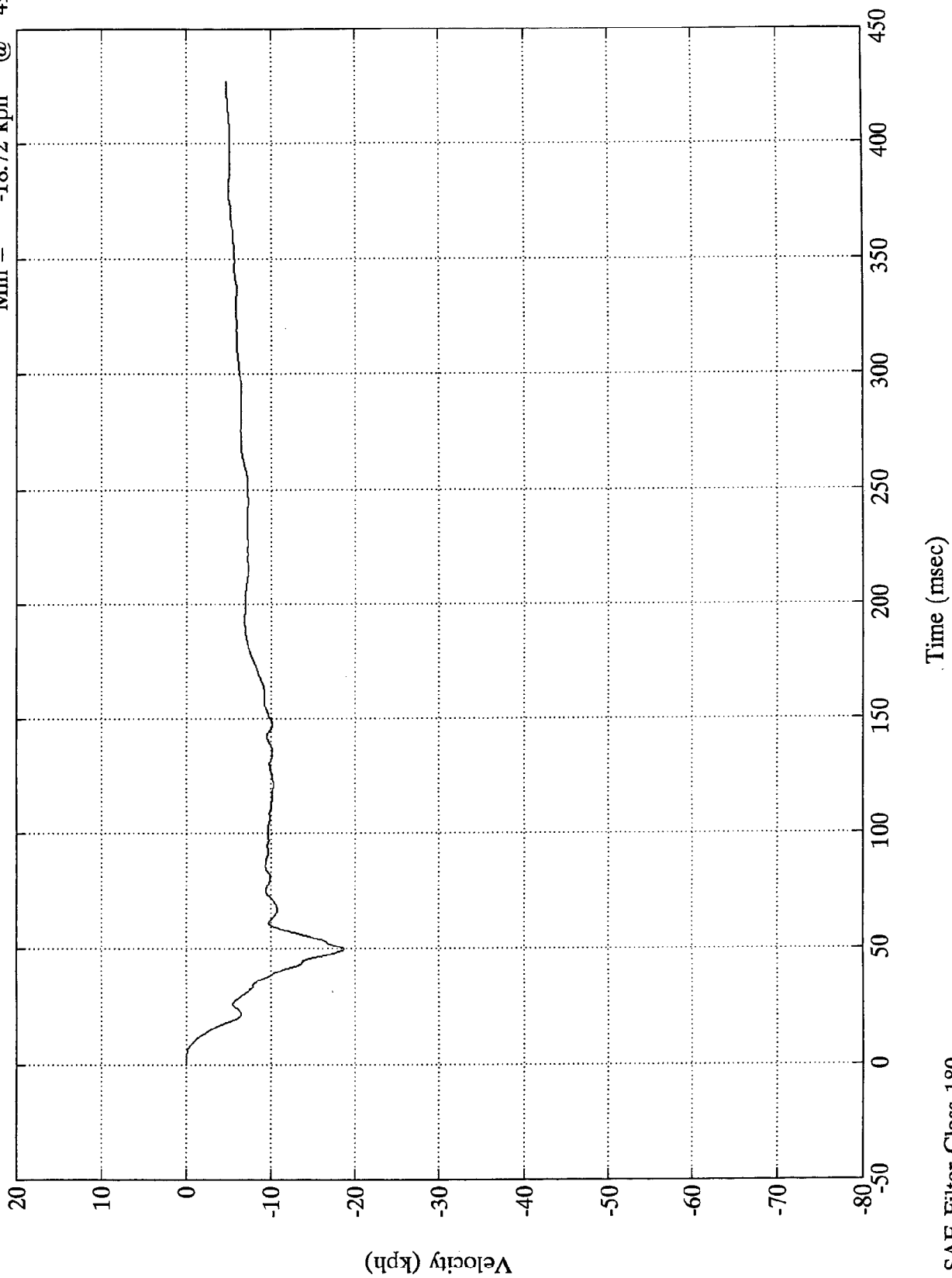
Max = 31.65 Gs @ 56.04 msec
Min = -30.95 Gs @ 46.68 msec



SAE Filter Class 60

VTV TEST #4

Acc 5 Engine Bottom Y
Max = .00 kph @ -0.00 msec
Min = -18.72 kph @ 49.92 msec

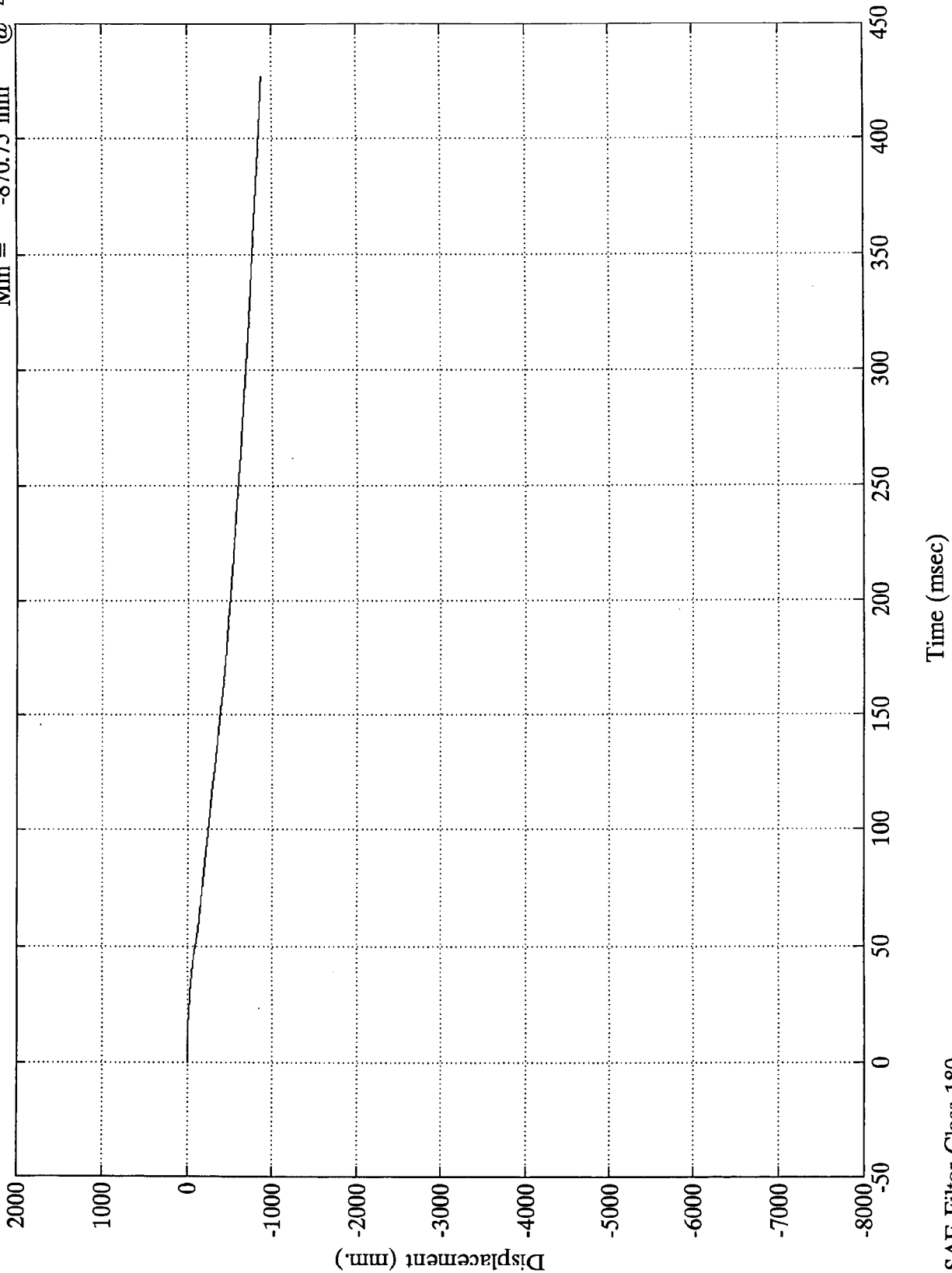


SAE Filter Class 180

VTV TEST #4

Acc 5 Engine Bottom Y

Max = .00 mm @ -0.00 msec
Min = -870.75 mm @ 427.32 msec

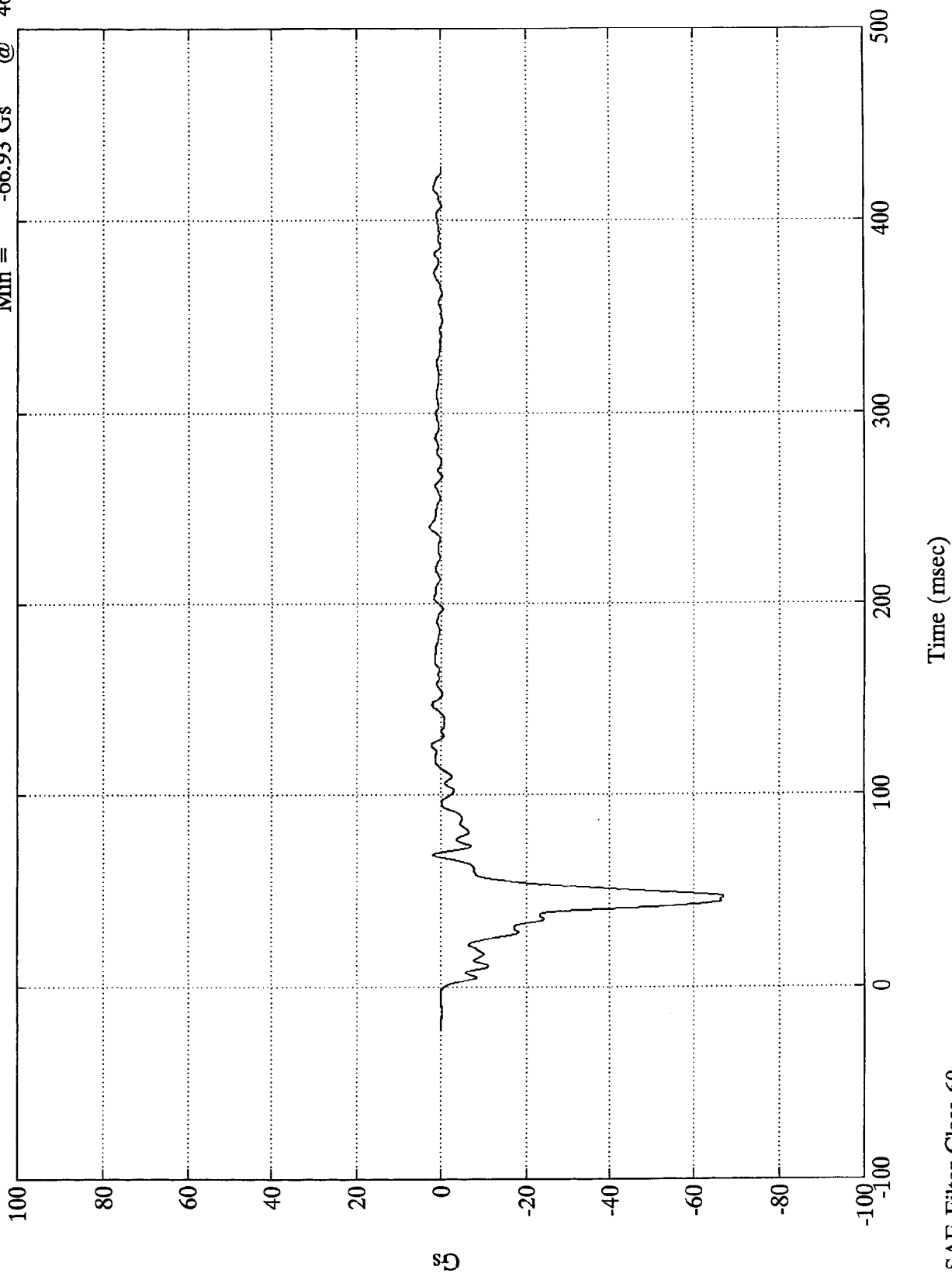


SAE Filter Class 180

VTV TEST #4

Acc 6 Rt Shock Tower X

Max = 2.89 Gs @ 240.36 msec
Min = -66.93 Gs @ 46.80 msec

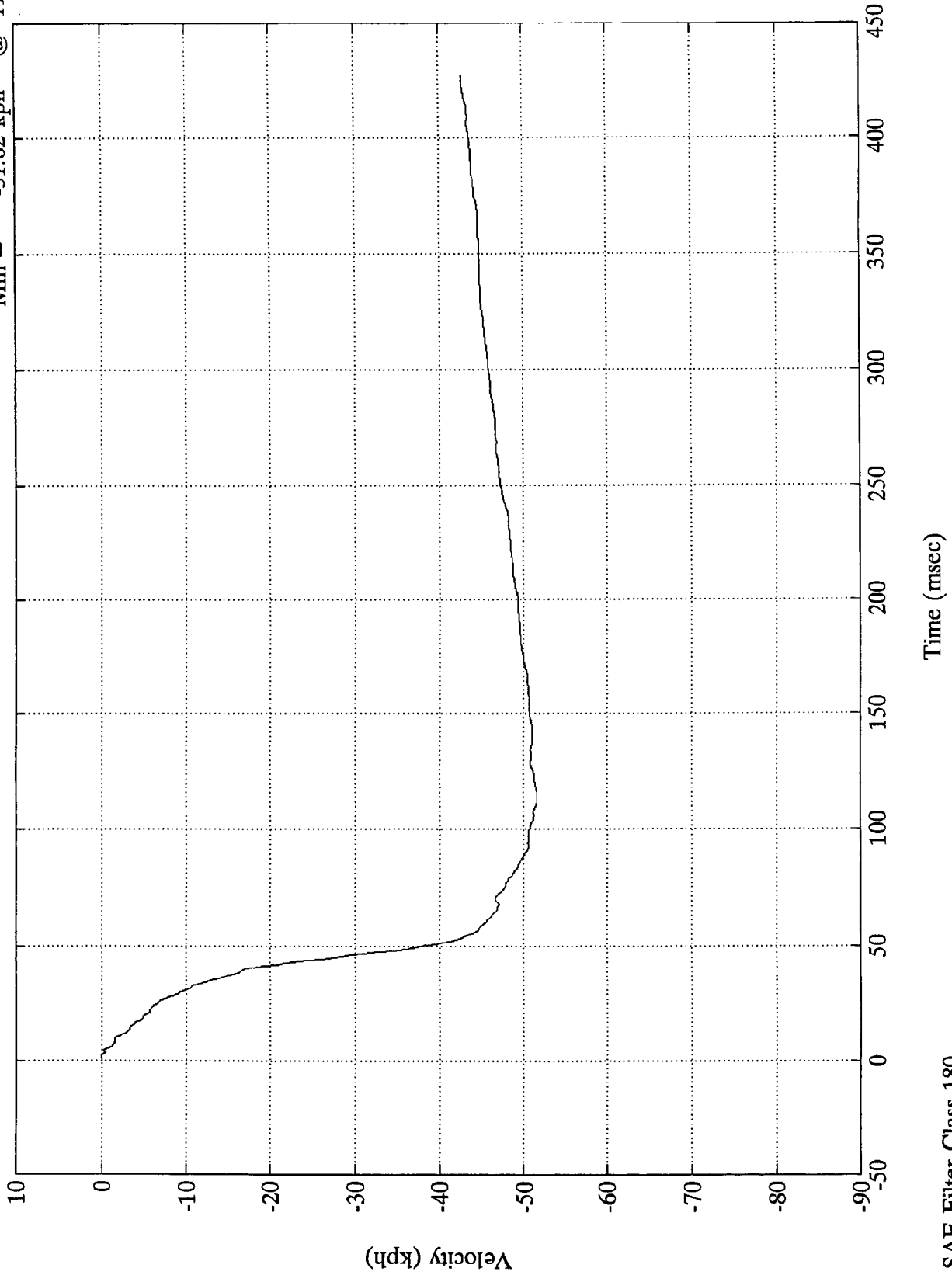


SAE Filter Class 60

VTV TEST #4

Acc 6 Rt Shock Tower X

Max = .07 kph @ 2.27 msec
Min = -51.62 kph @ 113.76 msec

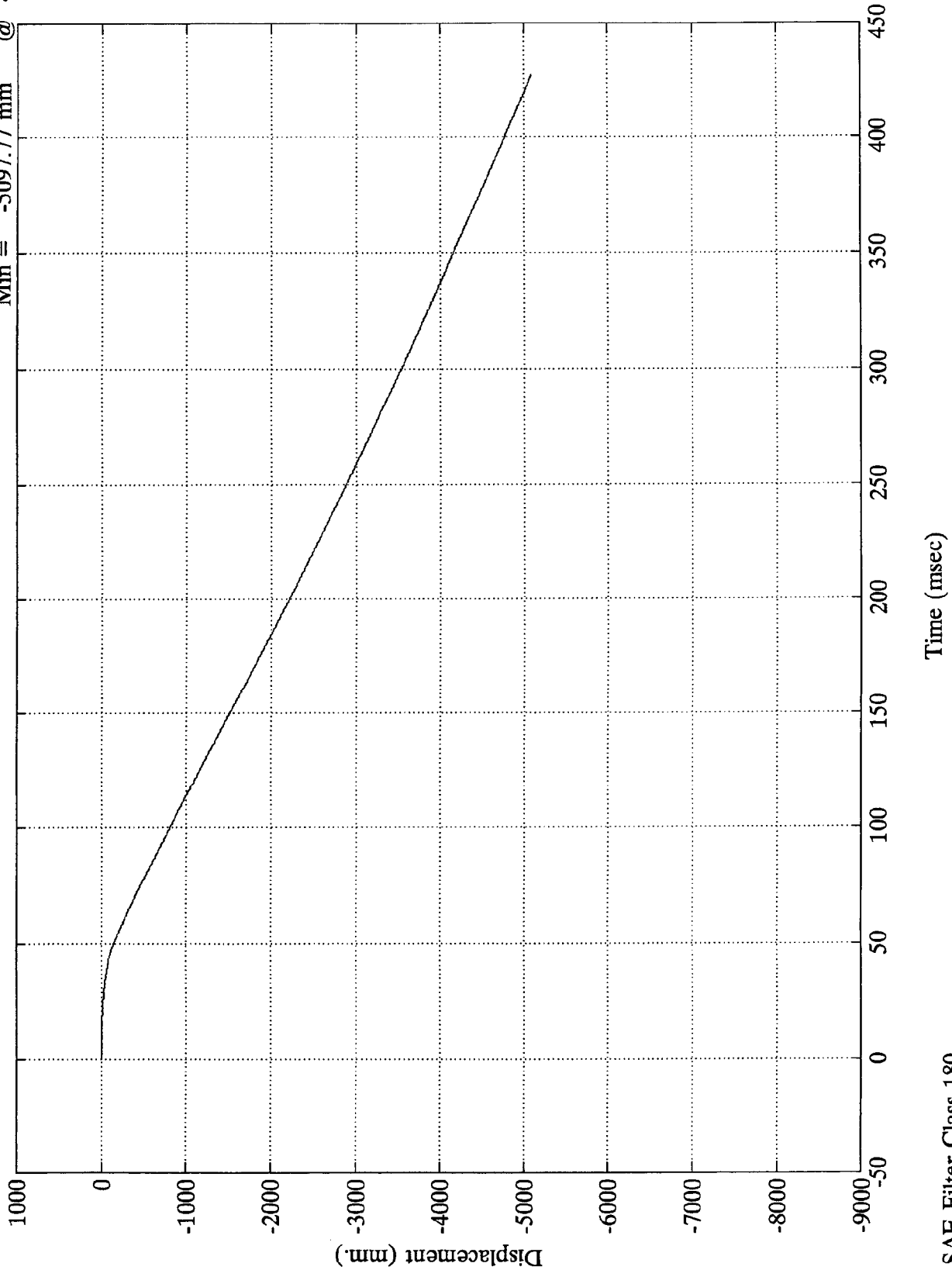


SAE Filter Class 180

VTV TEST #4

Acc 6 Rt Shock Tower X

Max = .00 mm @ -0.00 msec
Min = -5097.77 mm @ 427.32 msec

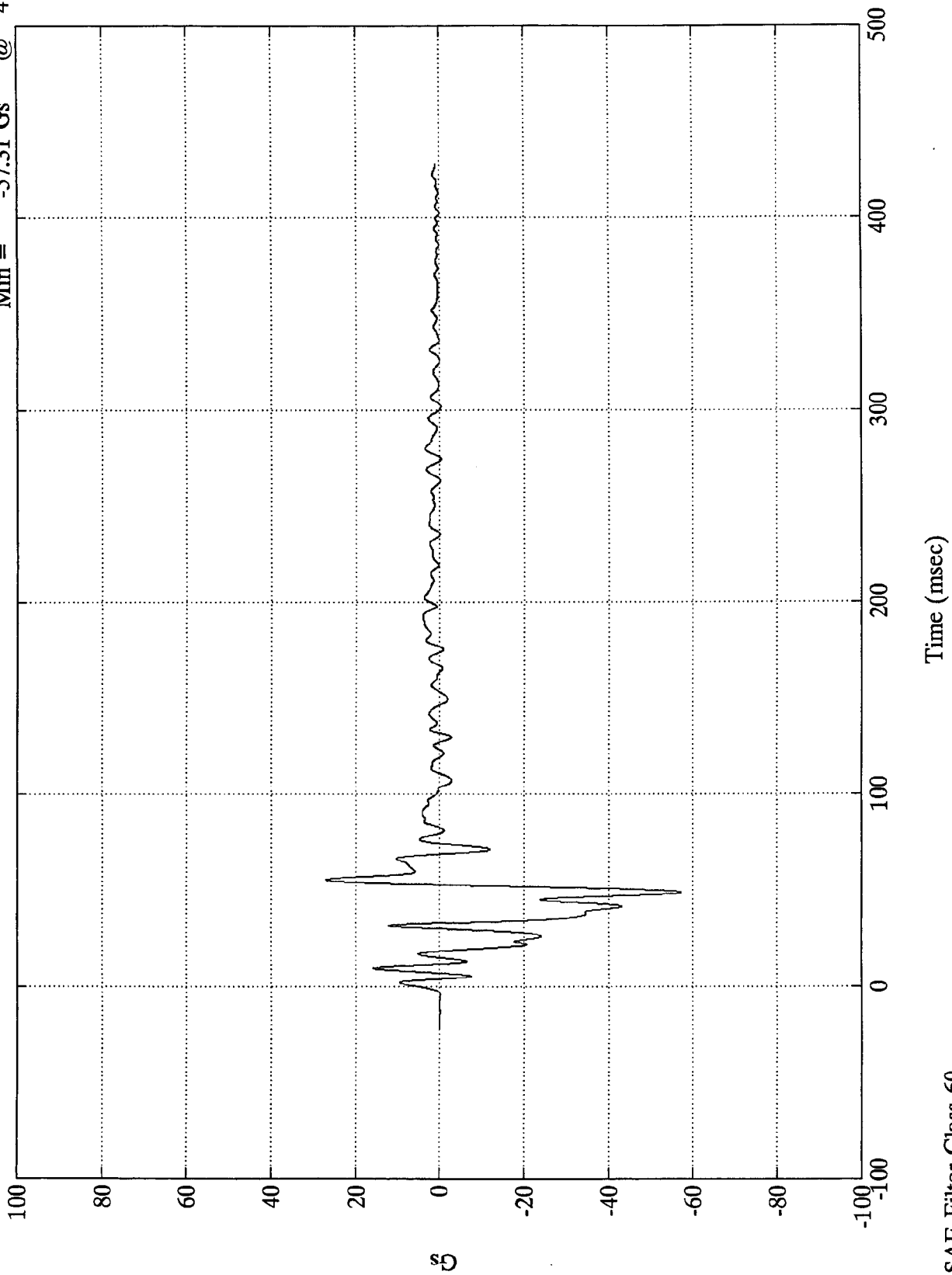


SAE Filter Class 180

VTV TEST #4

Acc 6 Rt Shock Tower Y

Max = 26.98 Gs @ 56.28 msec
Min = -57.31 Gs @ 49.31 msec

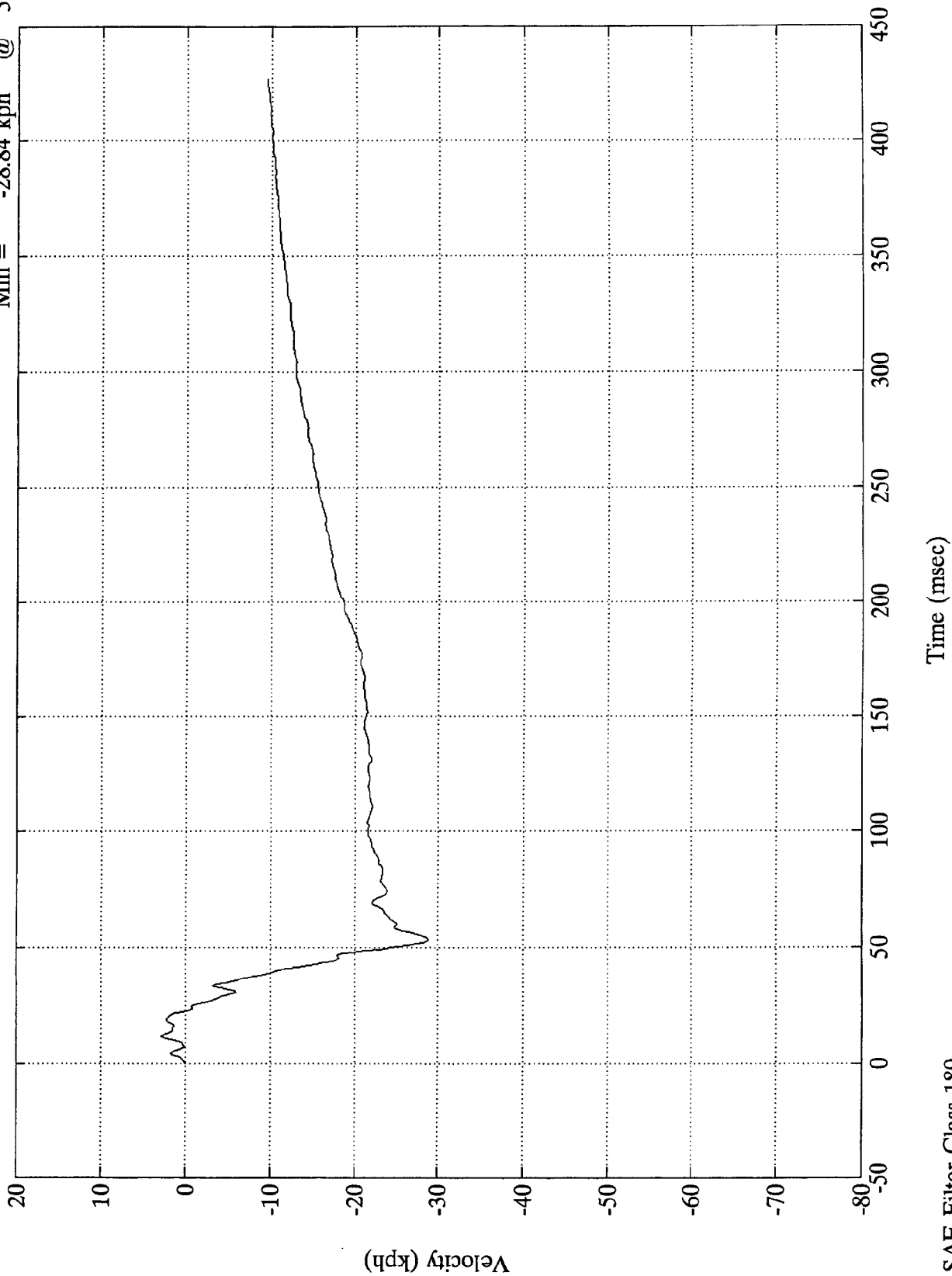


SAE Filter Class 60

VTV TEST #4

Max = 2.97 kph @ 11.52 msec
Min = -28.84 kph @ 53.52 msec

Acc 6 Rt Shock Tower Y

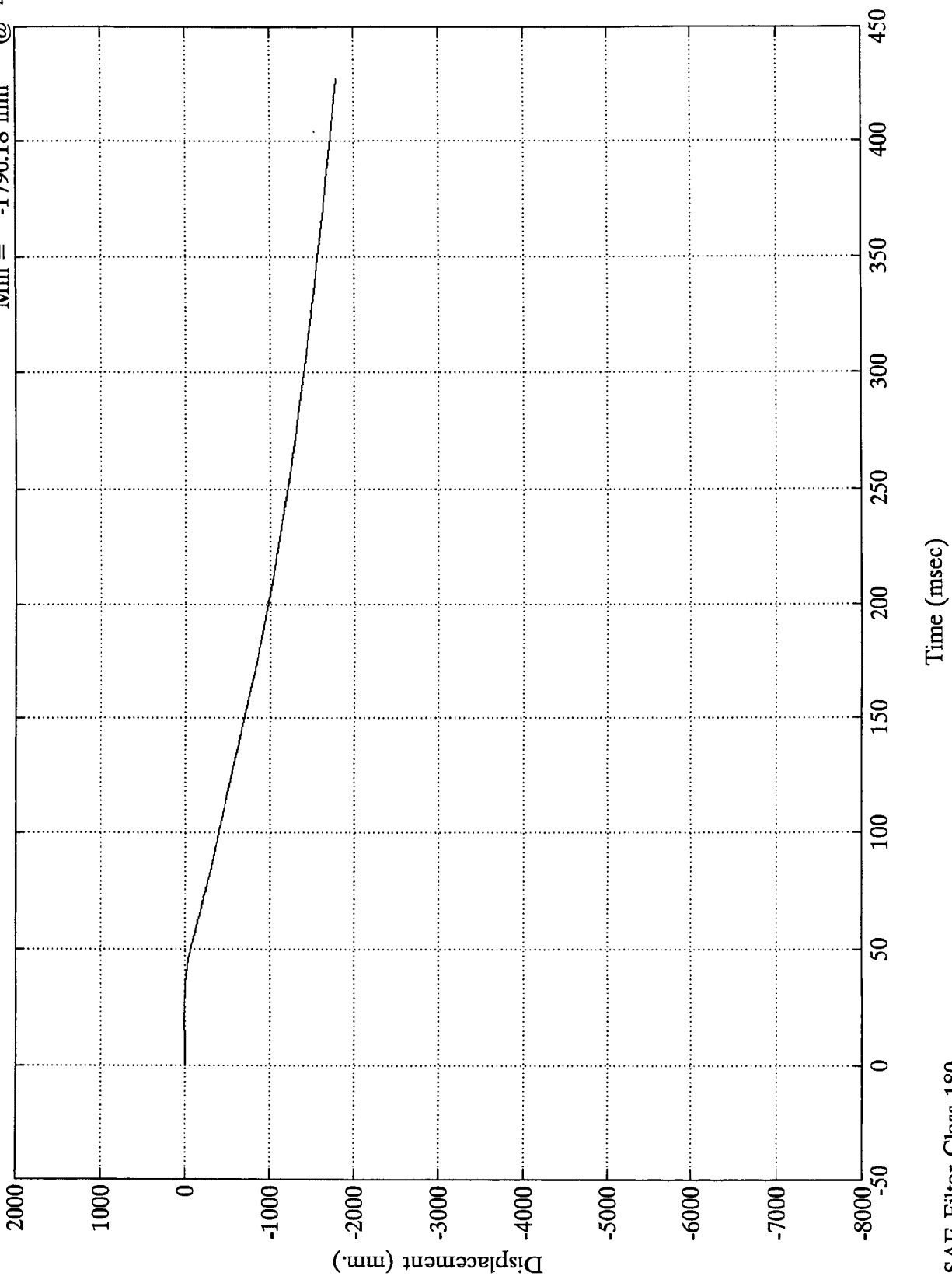


SAE Filter Class 180

VTV TEST #4

Acc 6 Rt Shock Tower Y

Max = 8.43 mm @ 22.43 msec
Min = -1790.18 mm @ 427.32 msec

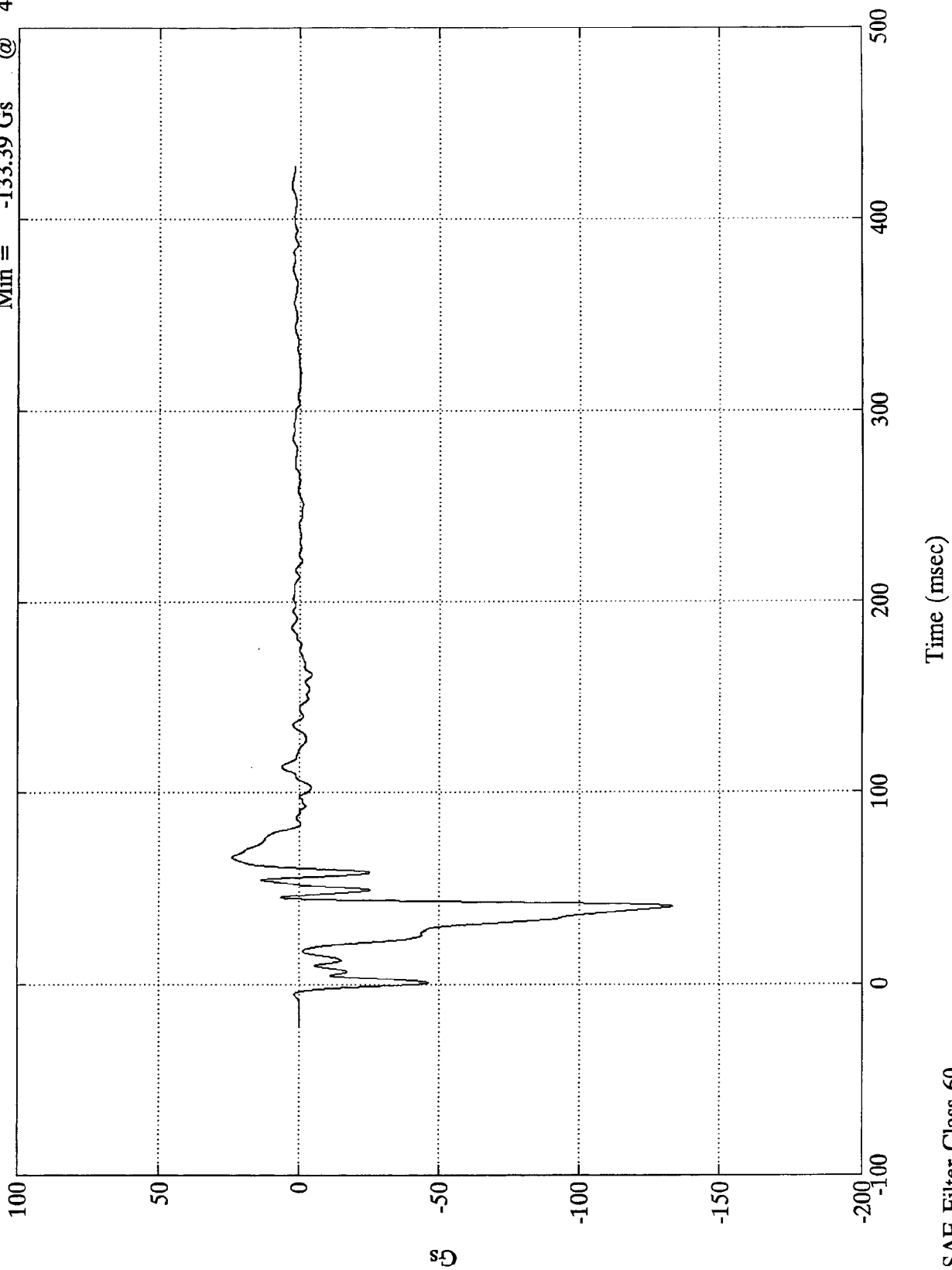


SAE Filter Class 180

VTV TEST #4

Acc 7 Lt Shock Tower X

Max = 24.21 Gs @ 66.48 msec
Min = -133.39 Gs @ 40.44 msec

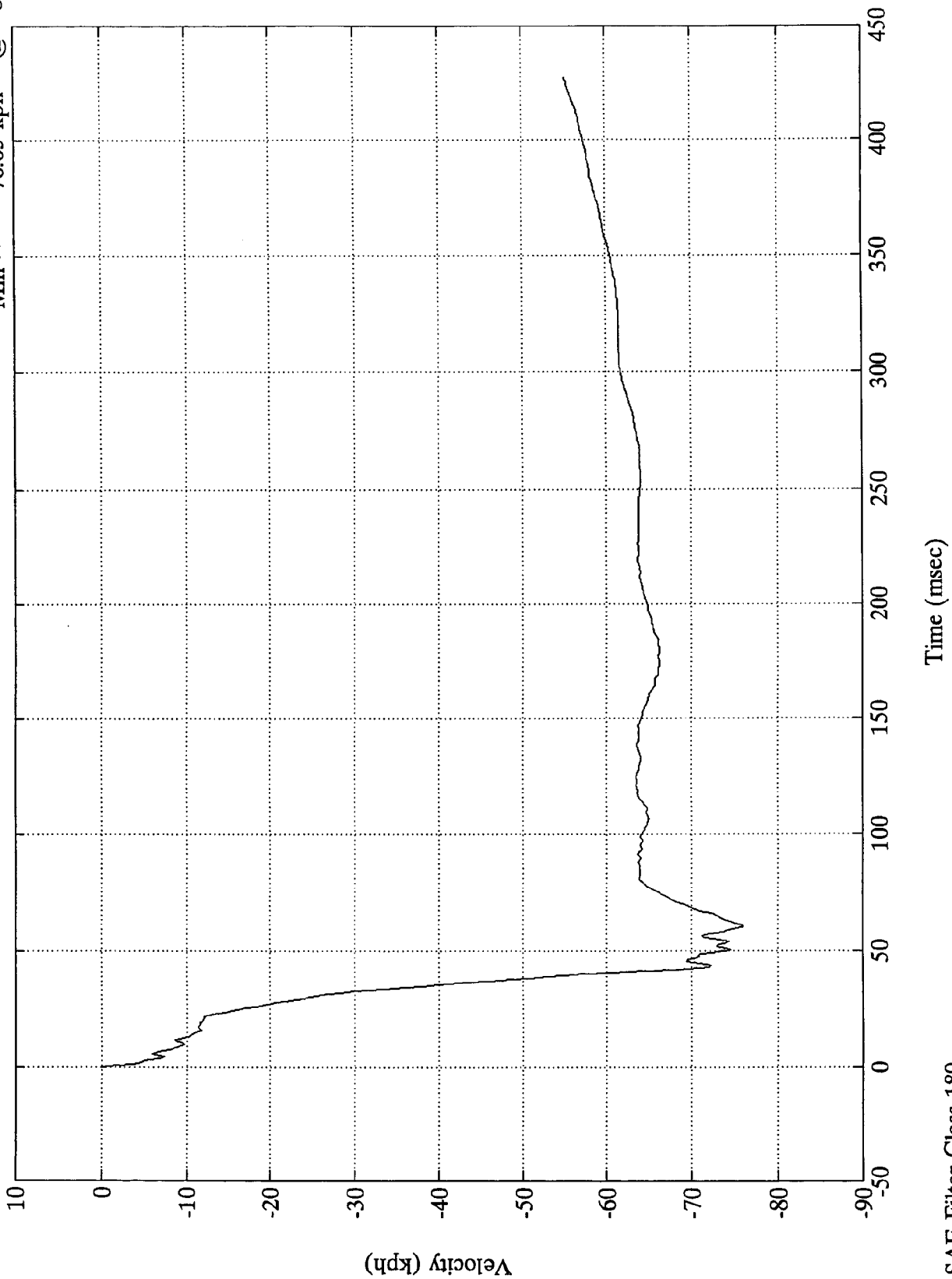


SAE Filter Class 60

VTV TEST #4

Acc 7 Lt Shock Tower X

Max = .00 kph @ -0.00 msec
Min = -76.05 kph @ 60.36 msec

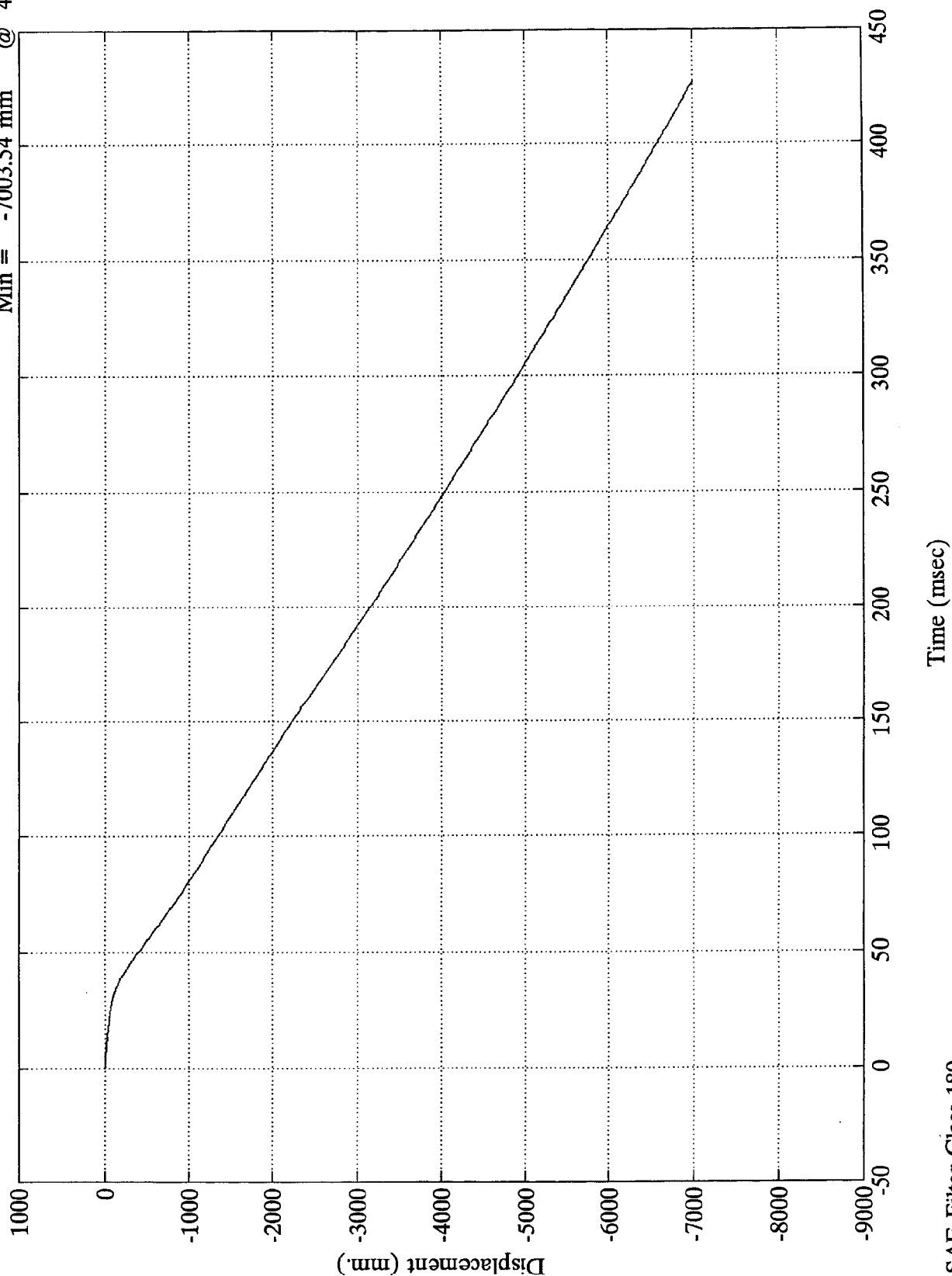


SAE Filter Class 180

VTV TEST #4

Max = .00 mm @ -0.00 msec
Min = -7003.54 mm @ 427.32 msec

Acc 7 Lt Shock Tower X

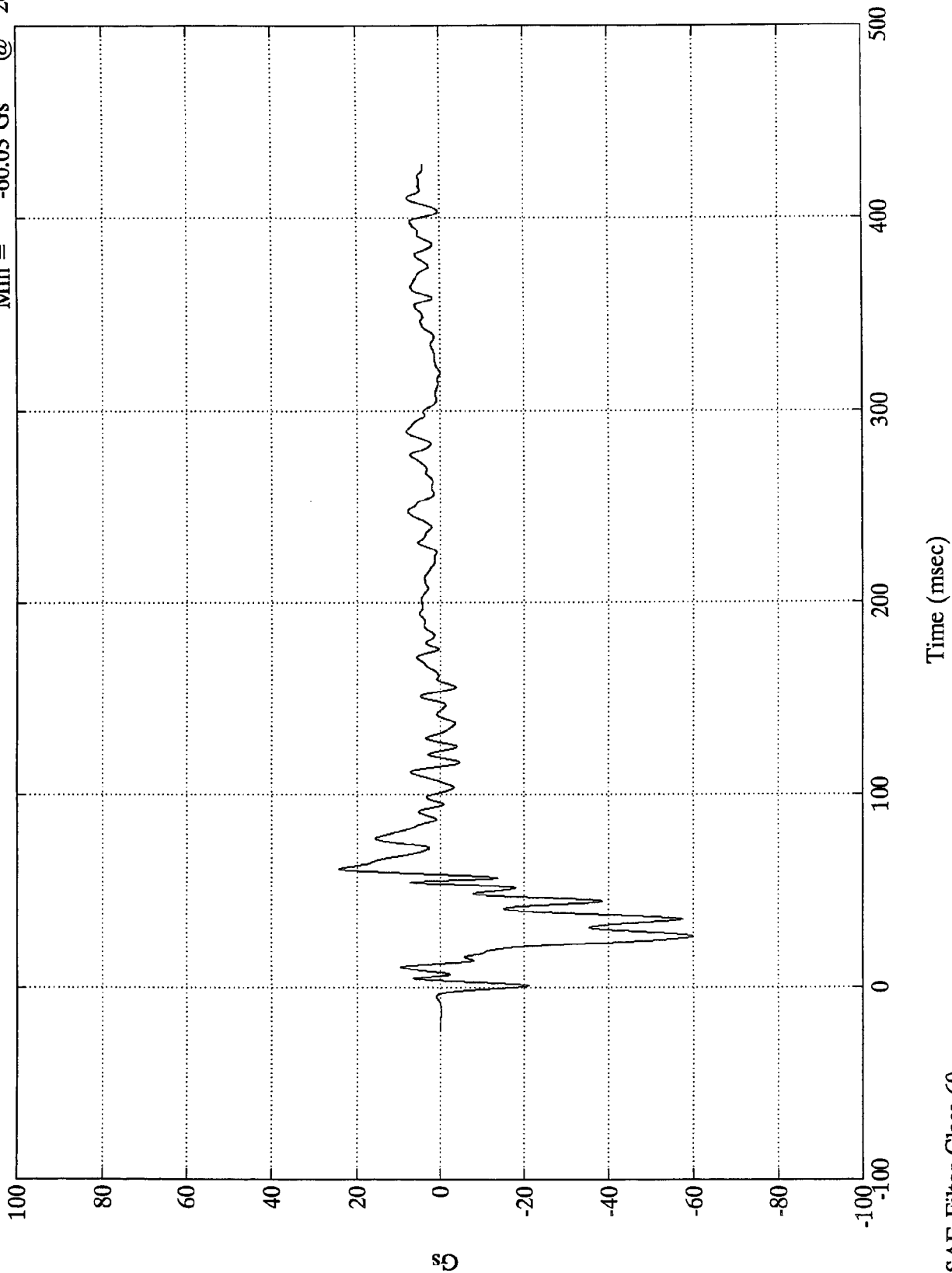


SAE Filter Class 180

VTV TEST #4

Acc 7 Lt Shock Tower Y

Max =	24.11 Gs	@	62.04 msec
Min =	-60.03 Gs	@	26.76 msec

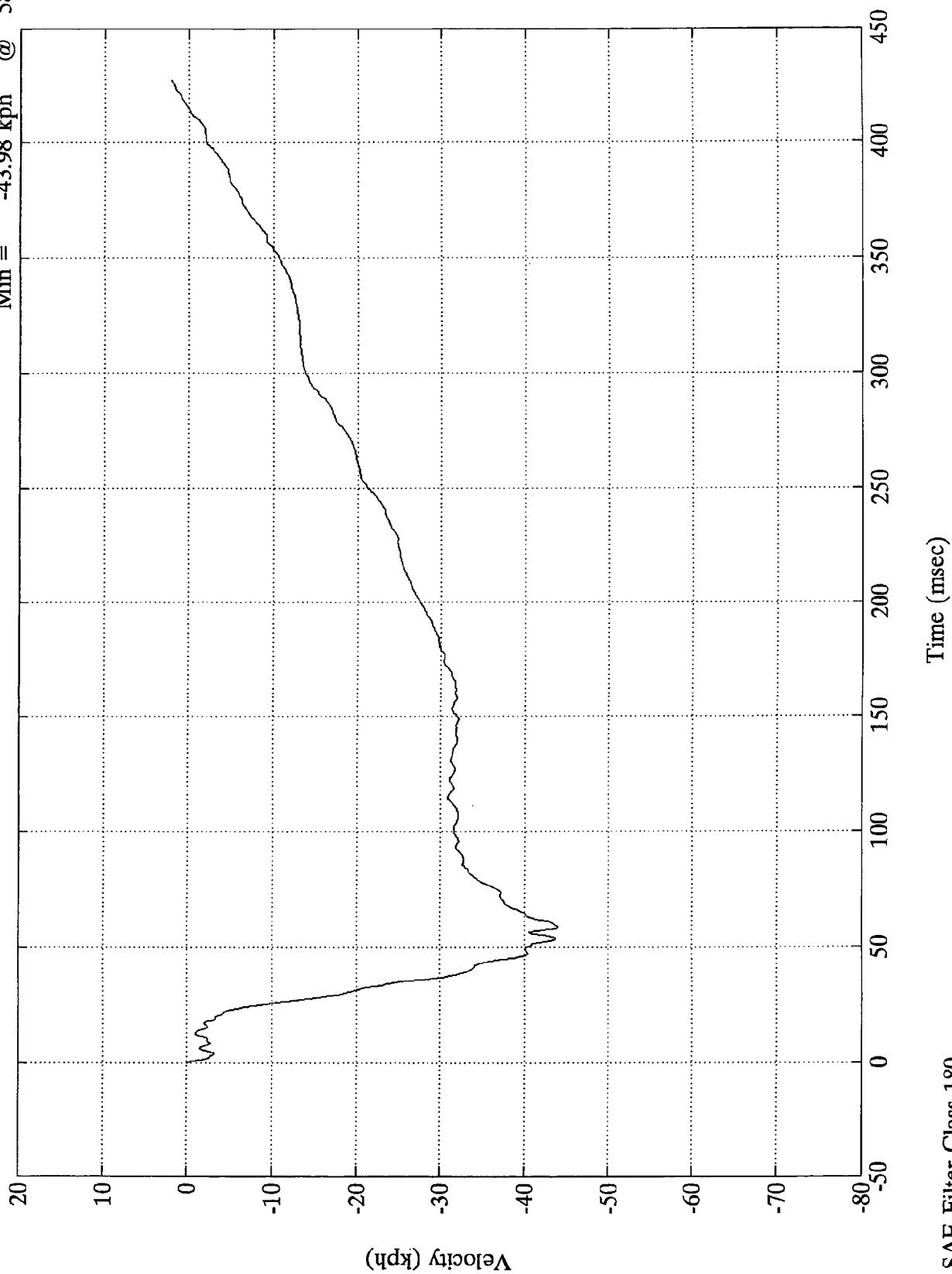


SAE Filter Class 60

VTV TEST #4

Acc 7 Lt Shock Tower Y

Max = 2.05 kph @ 427.32 msec
Min = -43.98 kph @ 58.56 msec

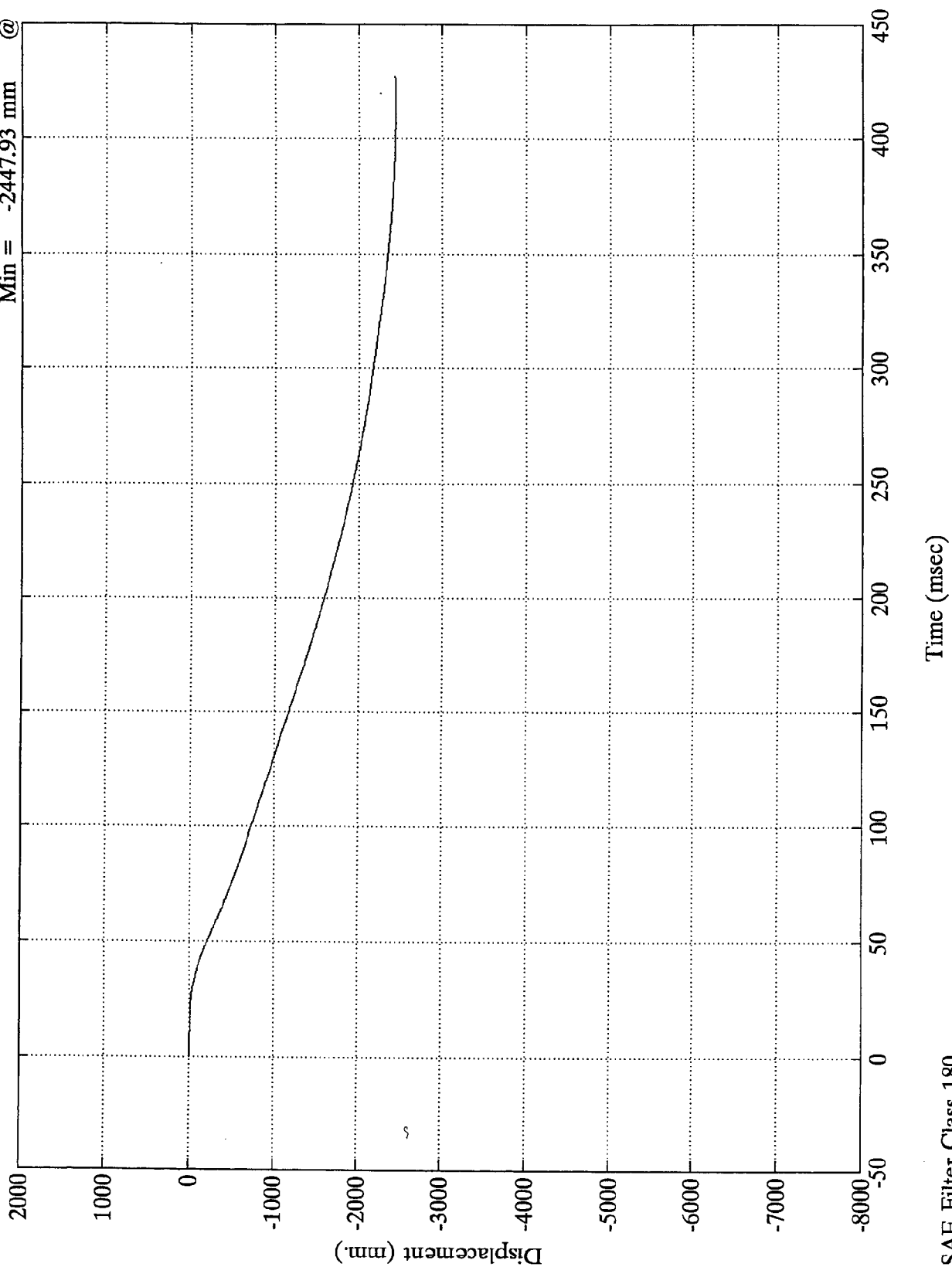


SAE Filter Class 180

VTV TEST #4

Acc 7 Lt Shock Tower Y

Max = .00 mm @ -0.00 msec
Min = -2447.93 mm @ 415.56 msec

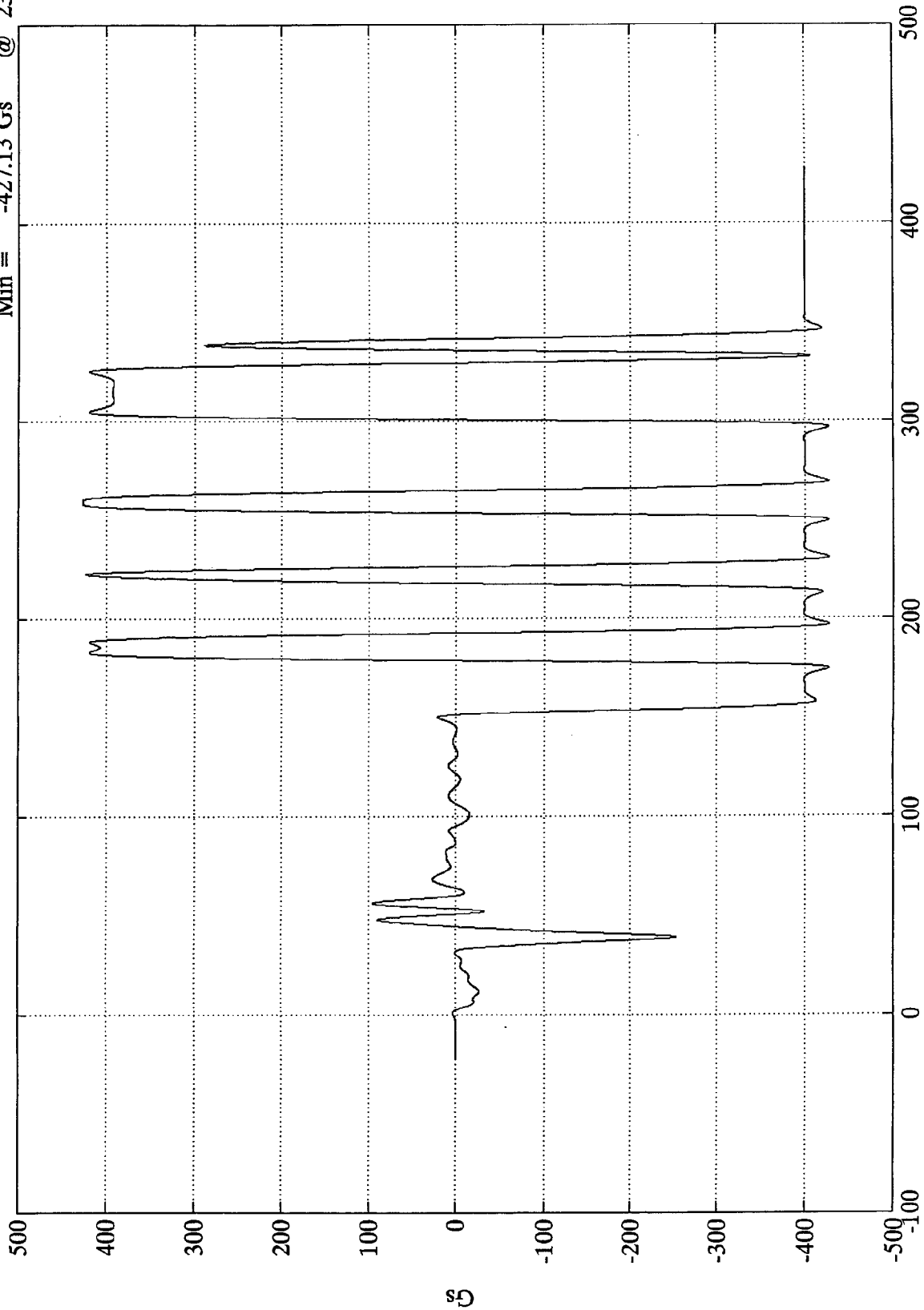


SAE Filter Class 180

VTV TEST #4

Acc 8 Brake Pedal X

Max = 426.77 Gs @ 259.08 msec
Min = -427.13 Gs @ 230.64 msec



SAE Filter Class 60

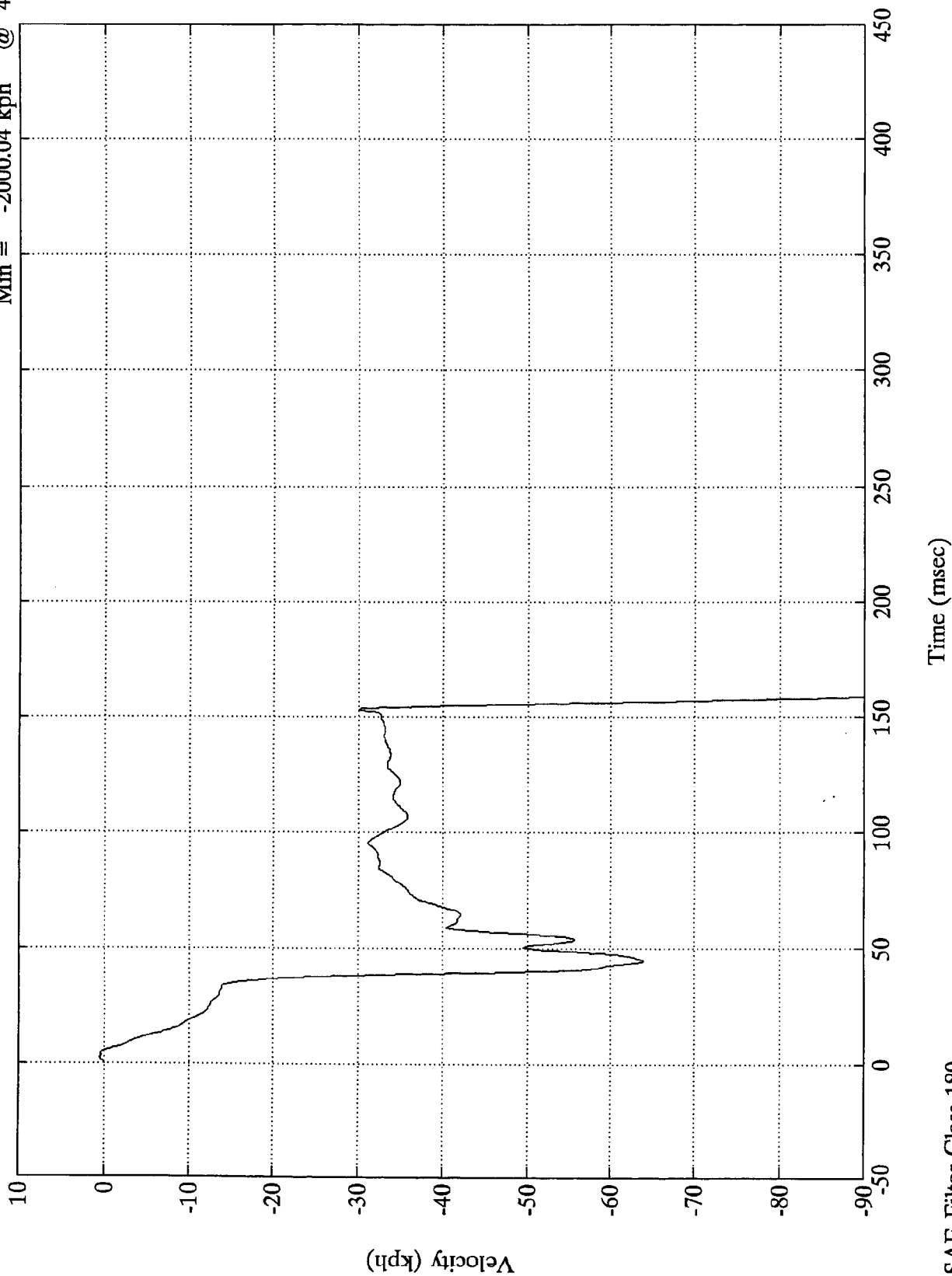
Time (msec)

Accelerometer wire was cut after 140 msec.

VTV TEST #4

Acc 8 Brake Pedal X

Max = .48 kph @ 2.27 msec
Min = -2000.04 kph @ 427.32 msec



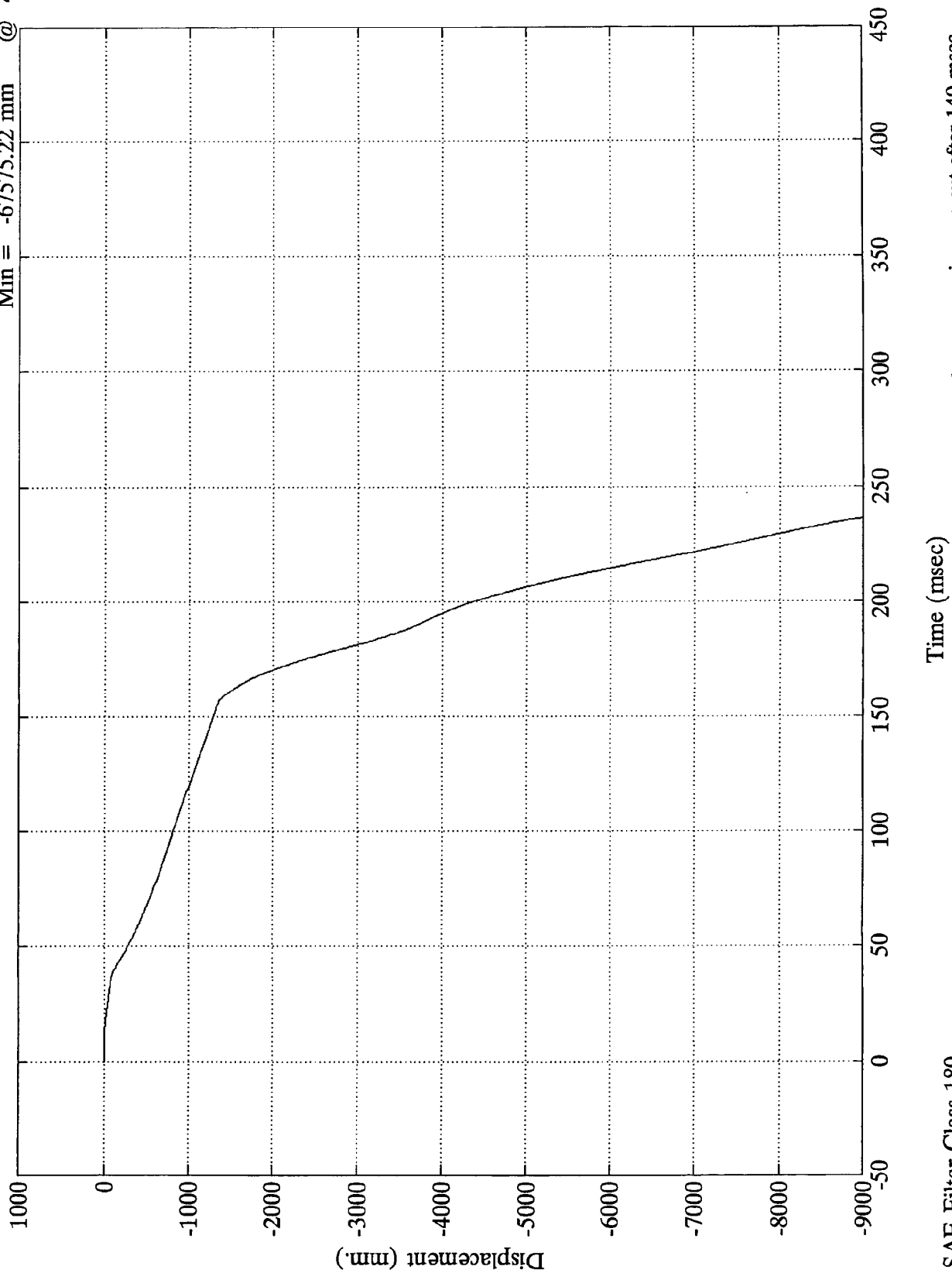
SAE Filter Class 180

Accelerometer wire was cut after 140 msec.

VTV TEST #4

Acc 8 Brake Pedal X

Max = .44 mm @ 5.27 msec
Min = -67575.22 mm @ 427.32 msec



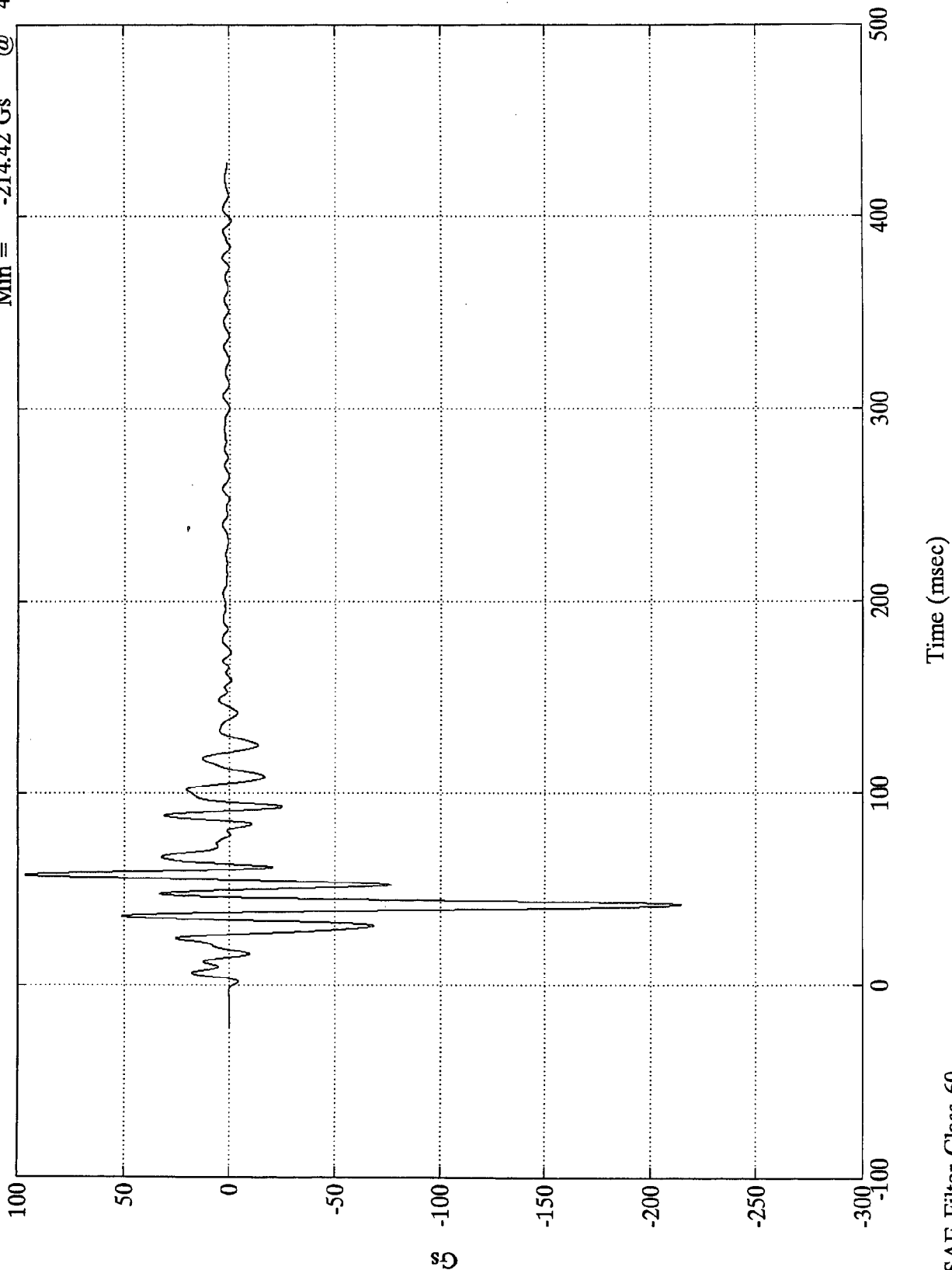
SAE Filter Class 180

Time (msec)

VTV TEST #4

Acc 8 Brake Pedal Y

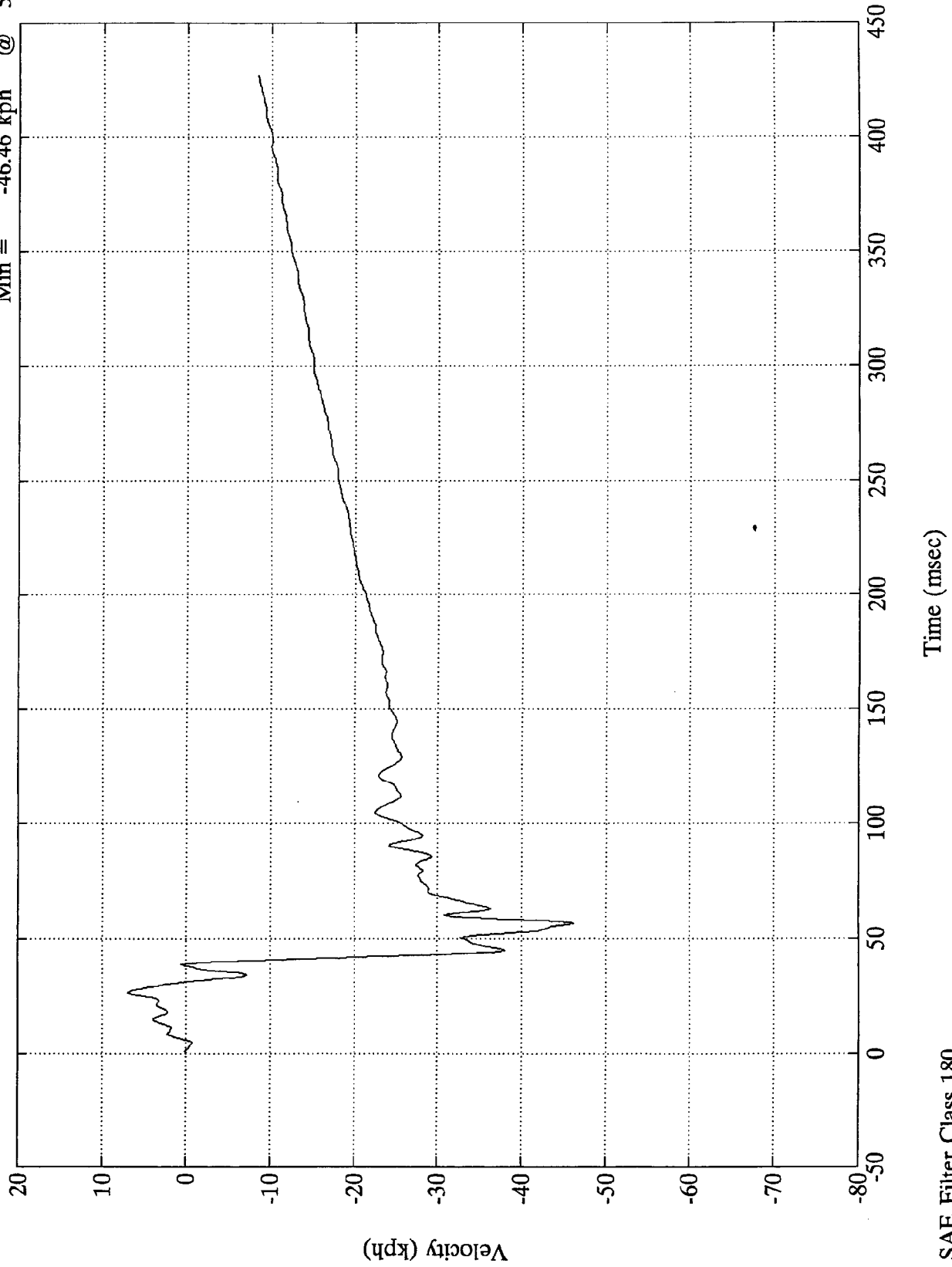
Max = 96.52 Gs @ 58.08 msec
Min = -214.42 Gs @ 42.12 msec



SAE Filter Class 60

VTV TEST #4

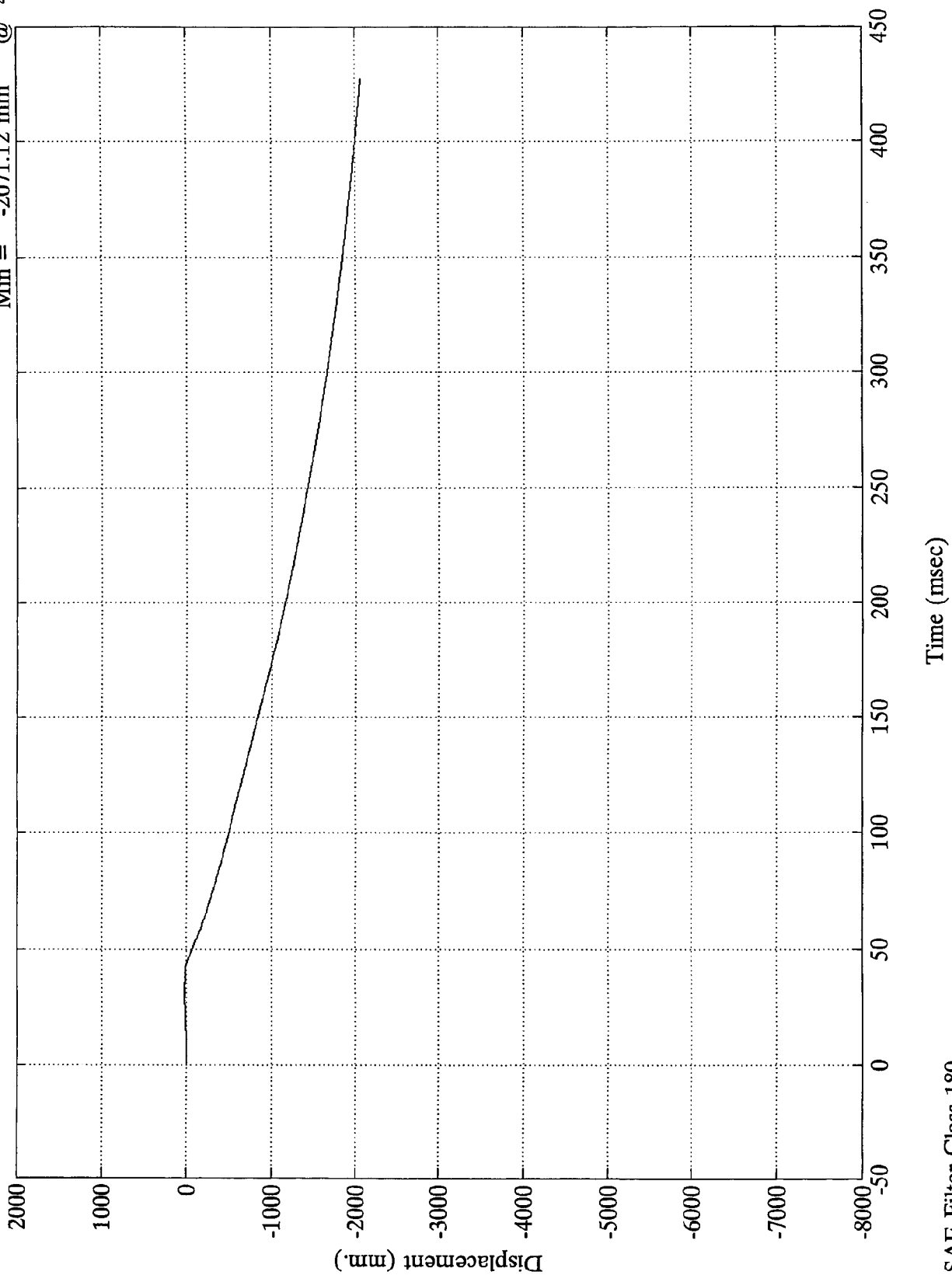
Acc 8 Brake Pedal Y Max = 6.91 kph @ 26.63 msec
Min = -46.46 kph @ 56.64 msec



VTV TEST #4

Acc 8 Brake Pedal Y

Max = 21.89 mm @ 31.08 msec
Min = -2071.12 mm @ 427.32 msec

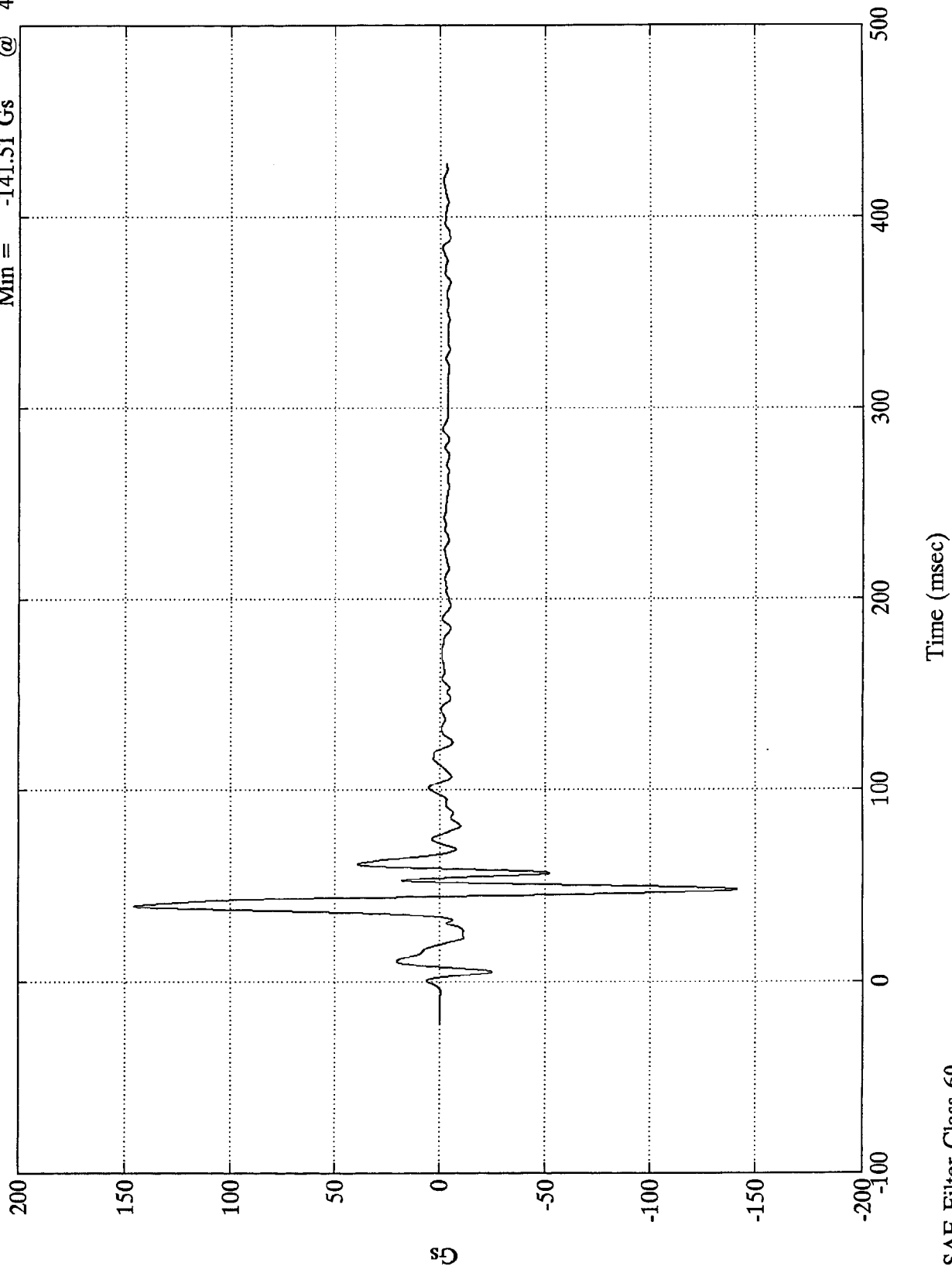


SAE Filter Class 180

VTV TEST #4

Acc 8 Brake Pedal Z

Max = 145.60 Gs @ 39.47 msec
Min = -141.51 Gs @ 47.88 msec

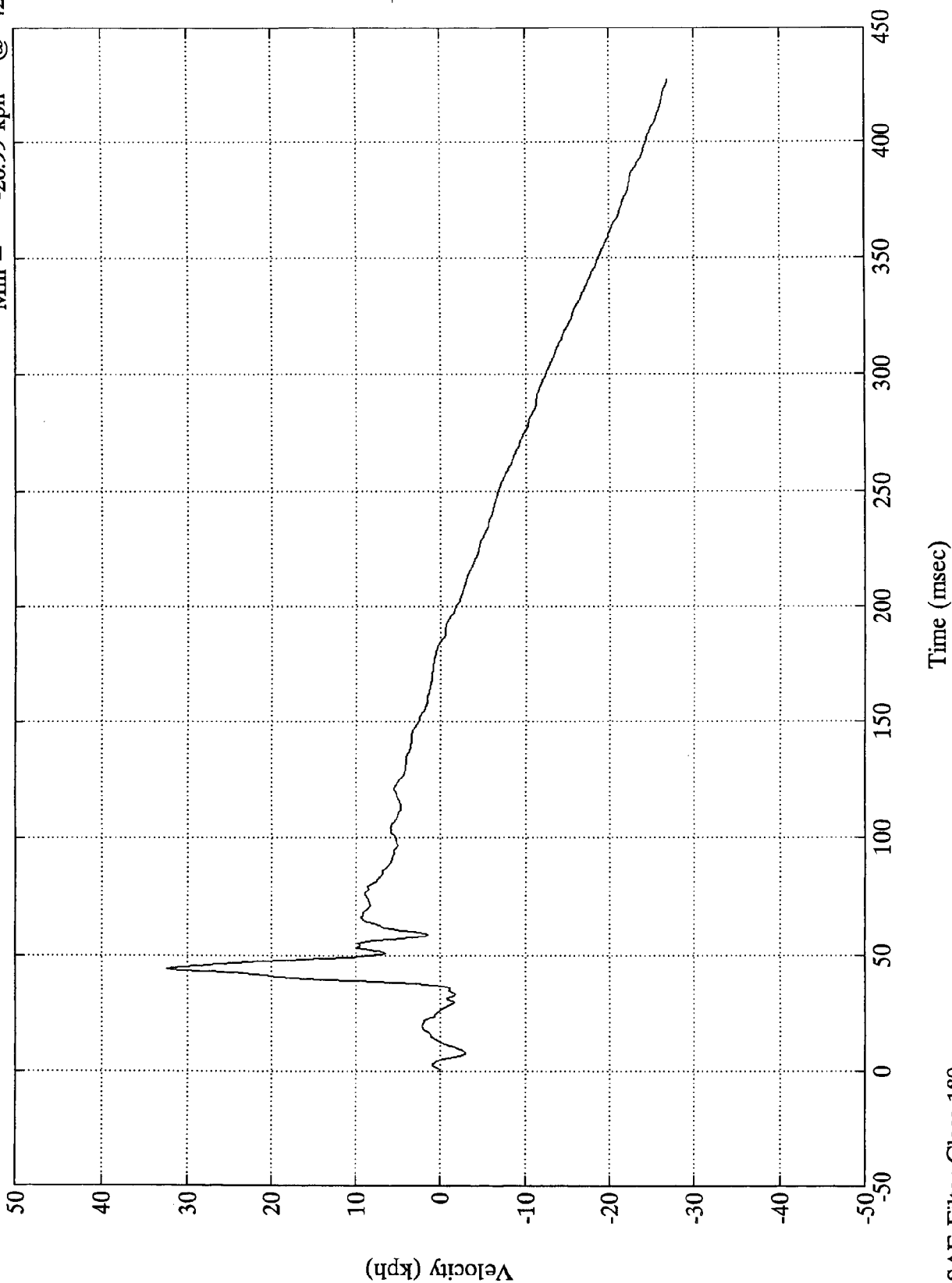


SAE Filter Class 60

VTV TEST #4

Acc 8 Brake Pedal Z

Max = 32.73 kph @ 44.16 msec
Min = -26.99 kph @ 427.32 msec

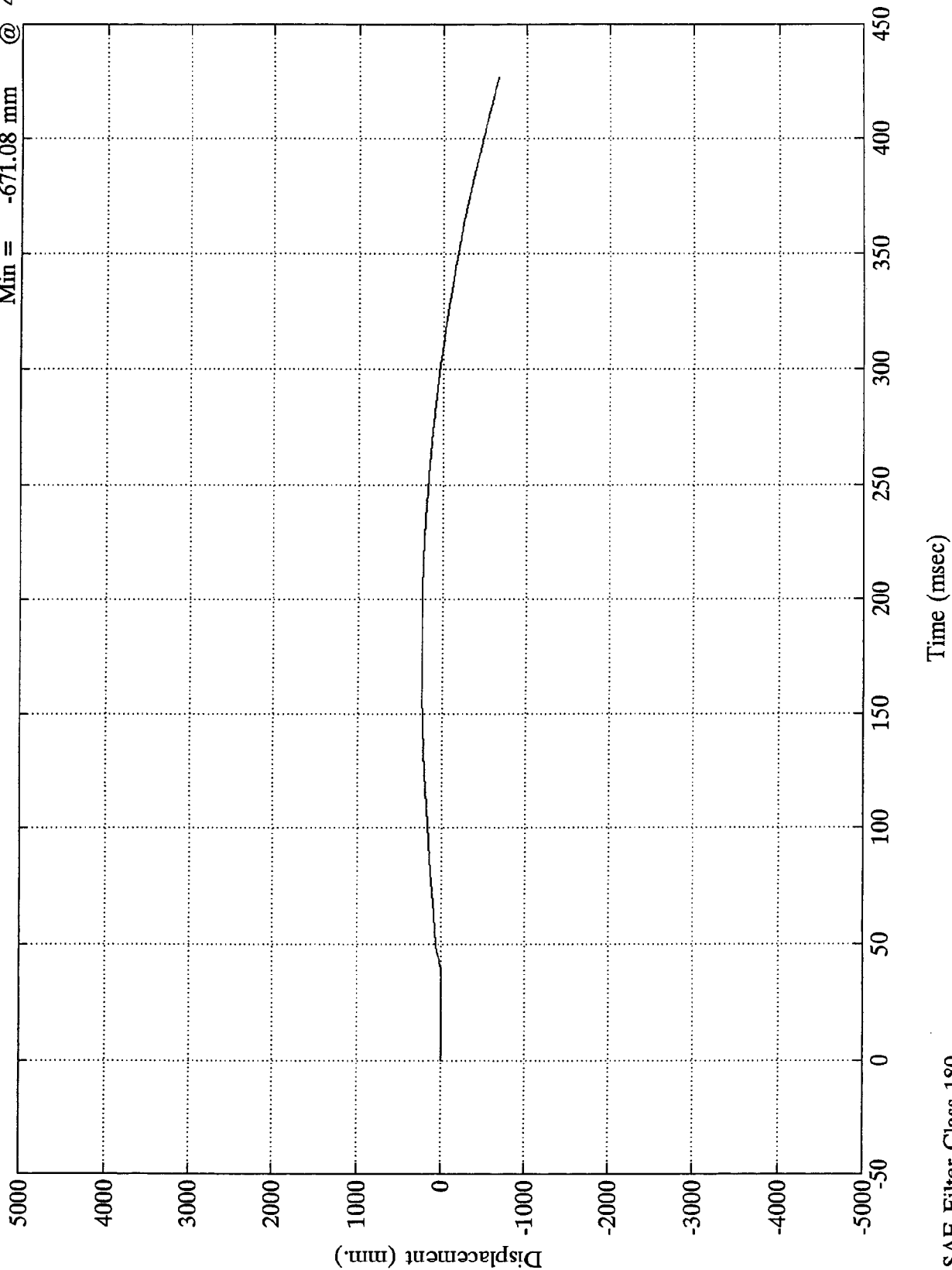


SAE Filter Class 180

VTV TEST #4

Max = 240.82 mm @ 184.92 msec
Min = -671.08 mm @ 427.32 msec

Acc 8 Brake Pedal Z

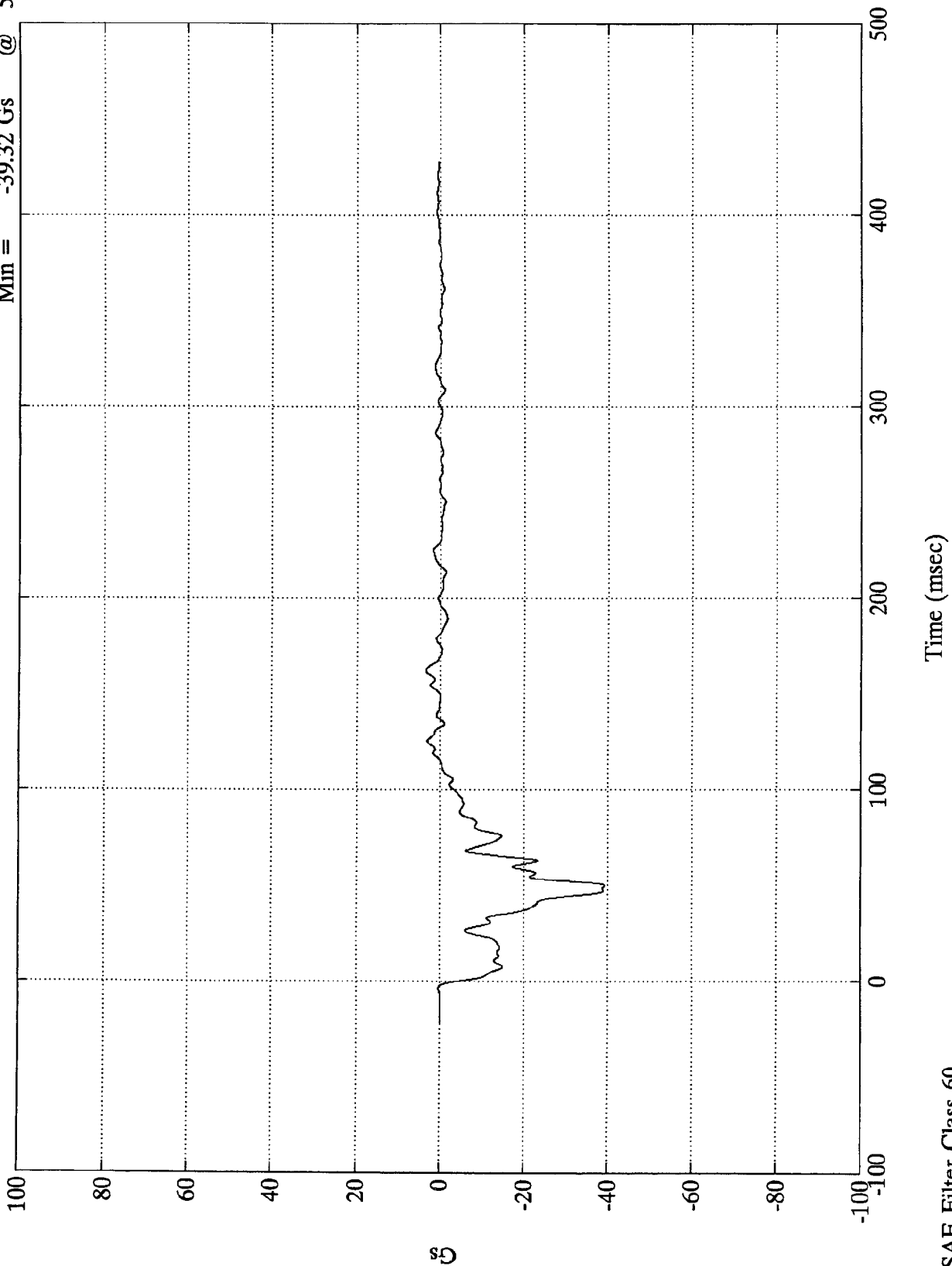


SAE Filter Class 180

VTV TEST #4

Acc 9 Lt Rr Compart X

Max = 3.47 Gs @ 162.48 msec
Min = -39.32 Gs @ 50.28 msec

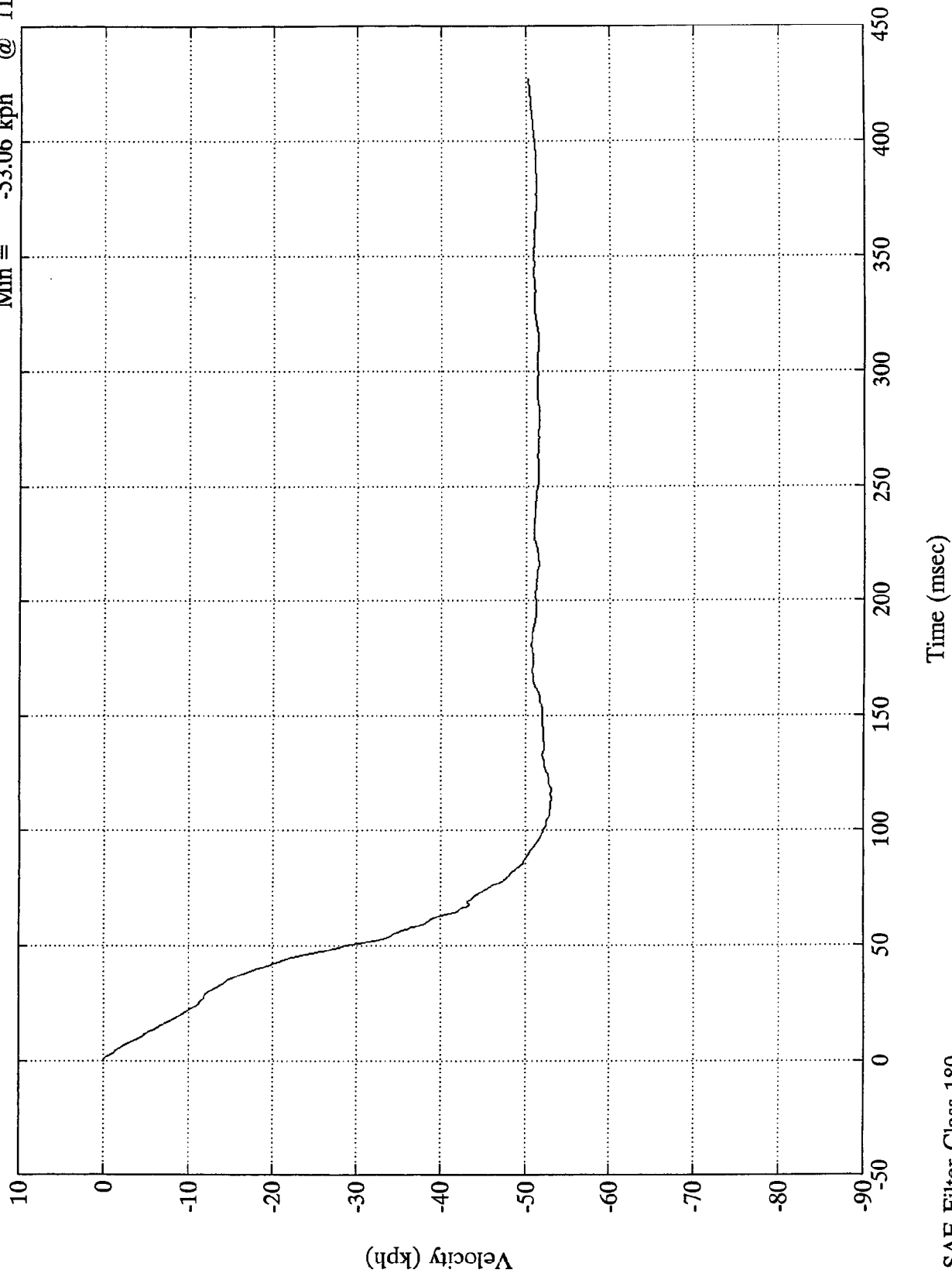


SAE Filter Class 60

VTV TEST #4

Acc 9 Lt Rr Compart X

Max = .00 kph @ -0.00 msec
Min = -53.06 kph @ 117.72 msec

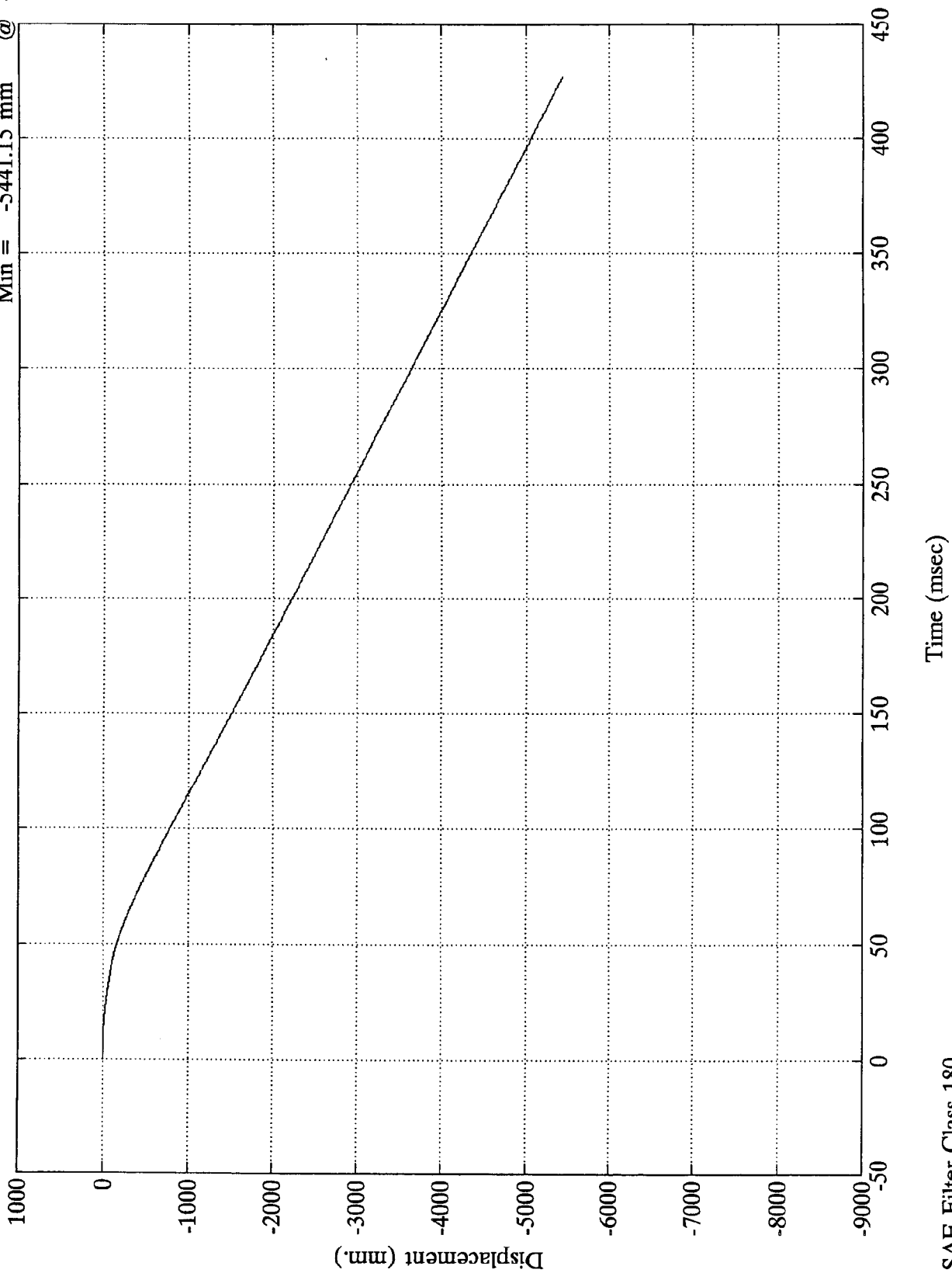


SAE Filter Class 180

VTV TEST #4

Acc 9 Lt Rr Compart X

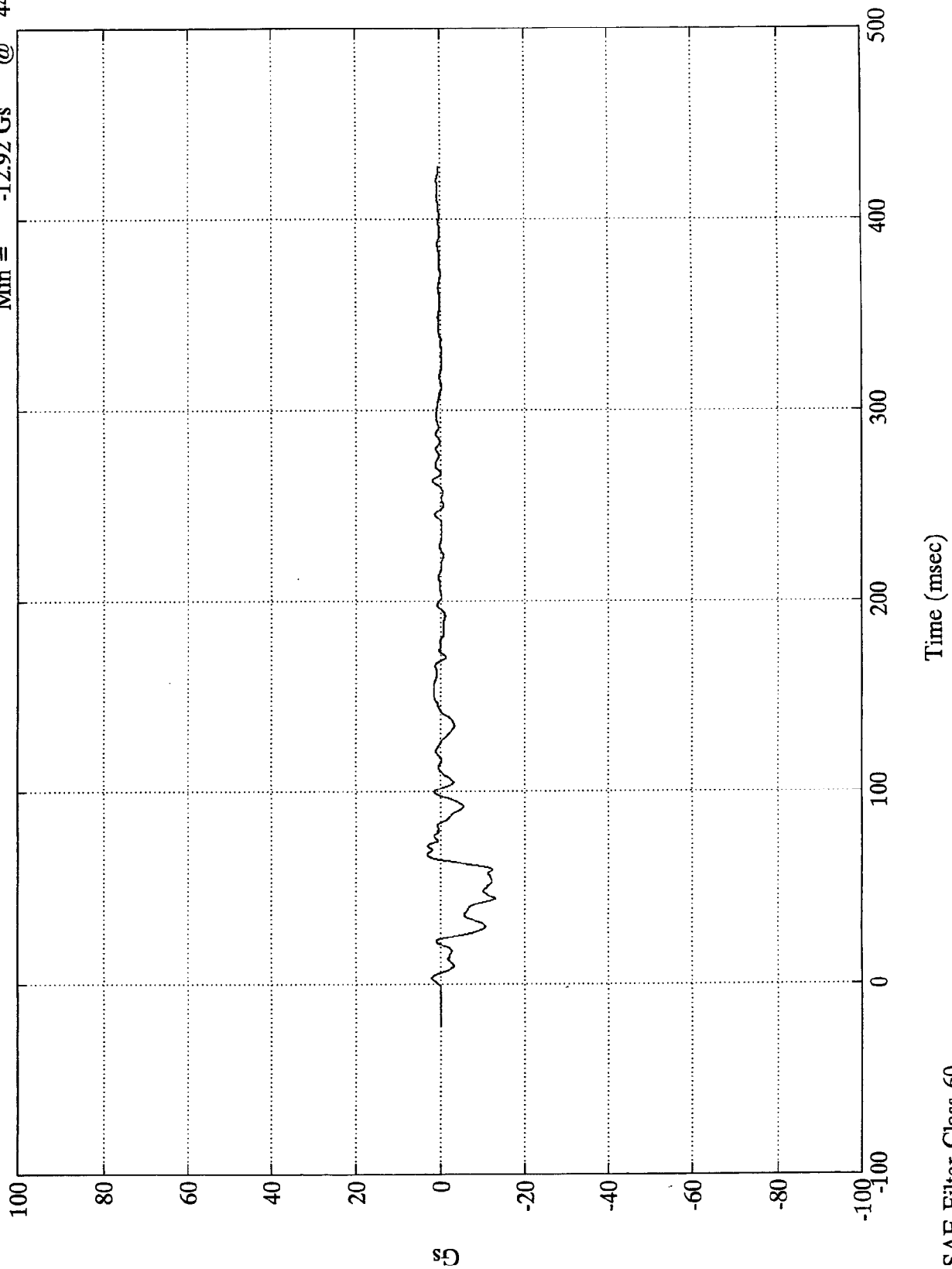
Max = .00 mm @ -0.00 msec
Min = -5441.15 mm @ 427.32 msec



SAE Filter Class 180

VTV TEST #4

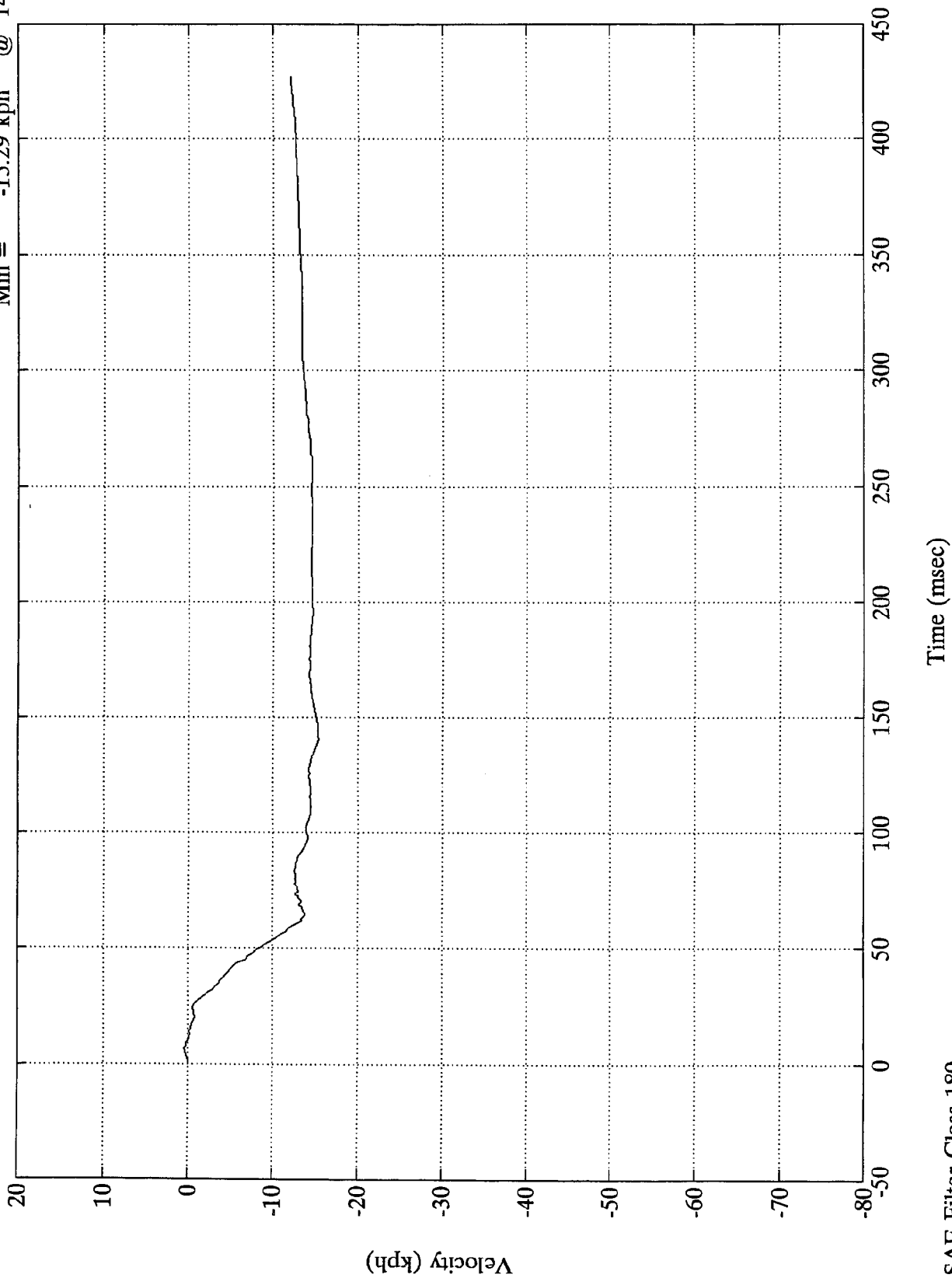
Acc 9 Lt Rr Compart Y Max = 3.20 Gs @ 67.32 msec
Min = -12.92 Gs @ 44.15 msec



VTV TEST #4

Acc 9 Lt Rr Compart Y

Max = .40 kph @ 6.47 msec
Min = -15.29 kph @ 140.88 msec

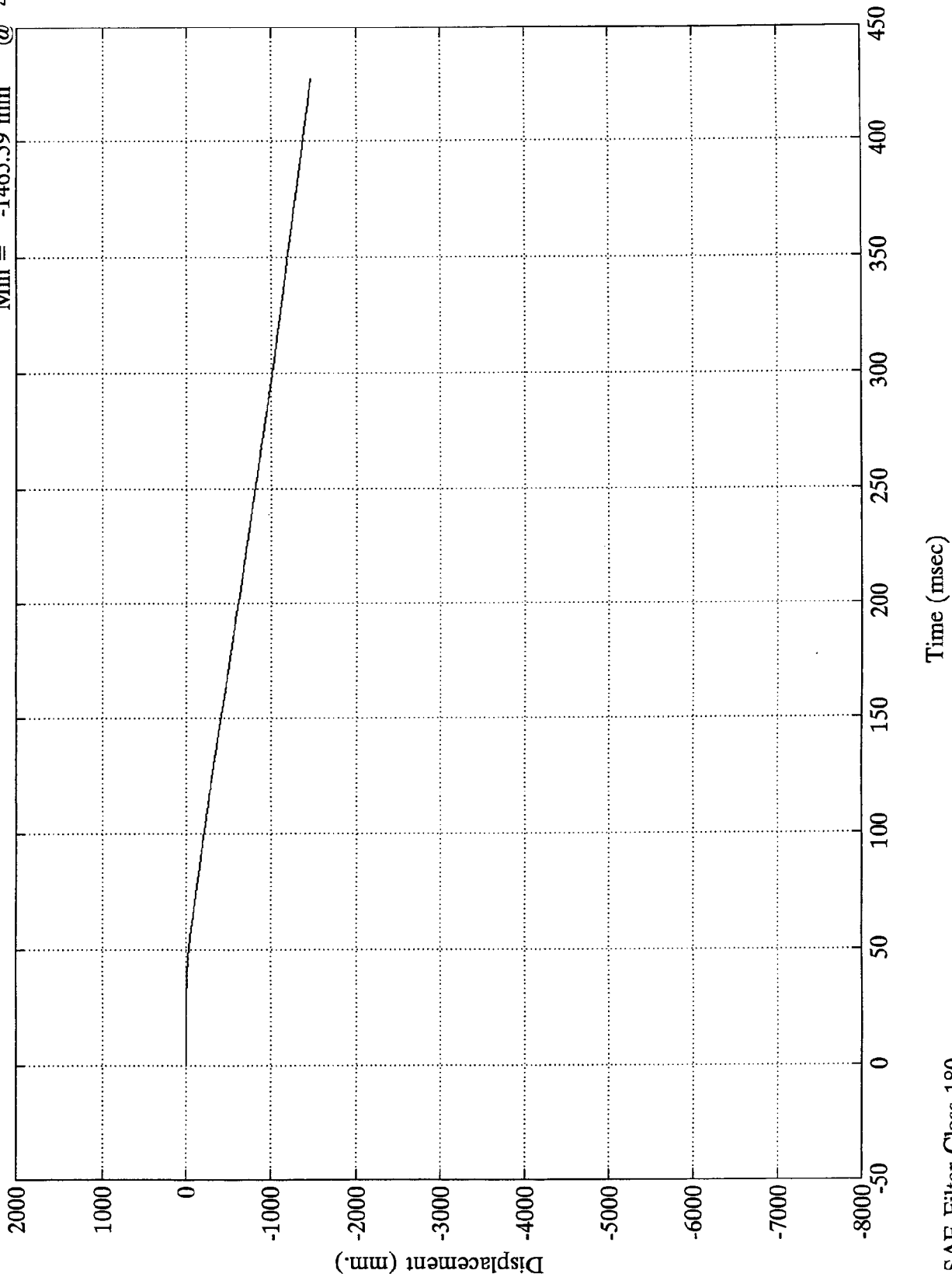


SAE Filter Class 180

VTV TEST #4

Acc 9 Lt Rr Compart Y

Max = .53 mm @ 10.07 msec
Min = -1465.59 mm @ 427.32 msec

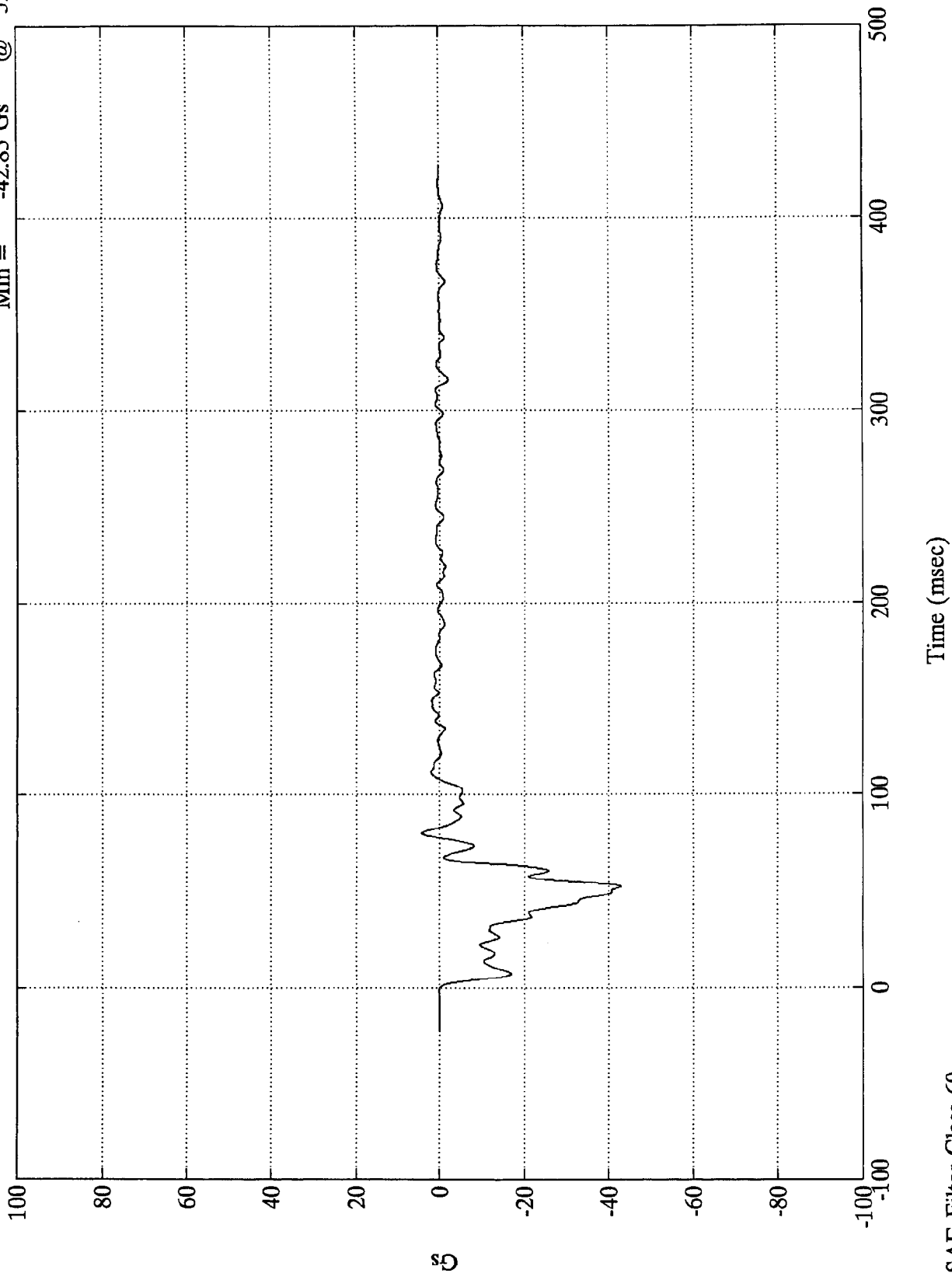


SAE Filter Class 180

VTV TEST #4

Acc 10 Rt Rr Compart X

Max = 4.17 Gs @ 80.28 msec
Min = -42.85 Gs @ 52.79 msec

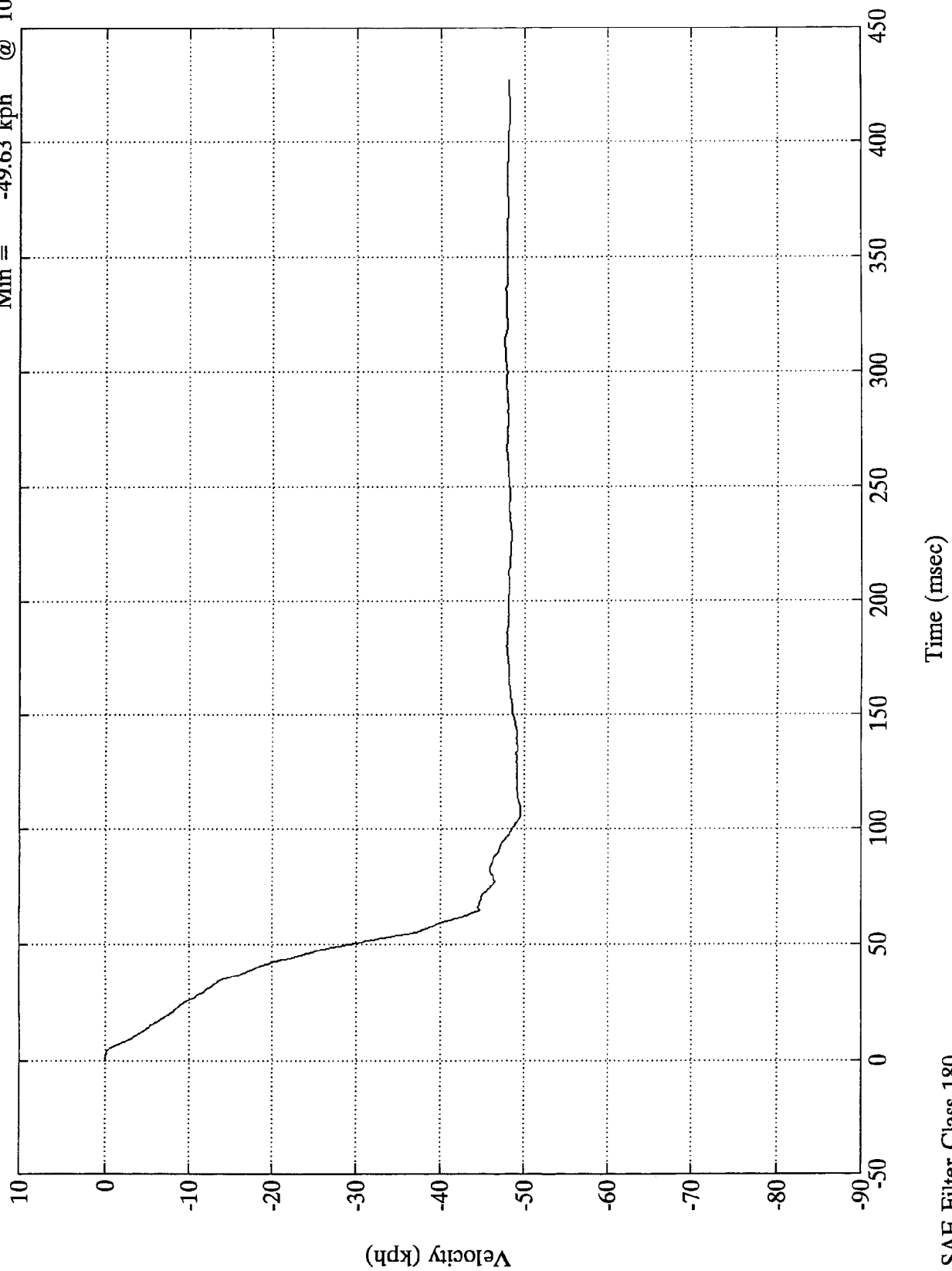


SAE Filter Class 60

VTV TEST #4

Acc 10 Rt Rr Compart X

Max = .00 kph @ -0.00 msec
Min = -49.63 kph @ 108.36 msec

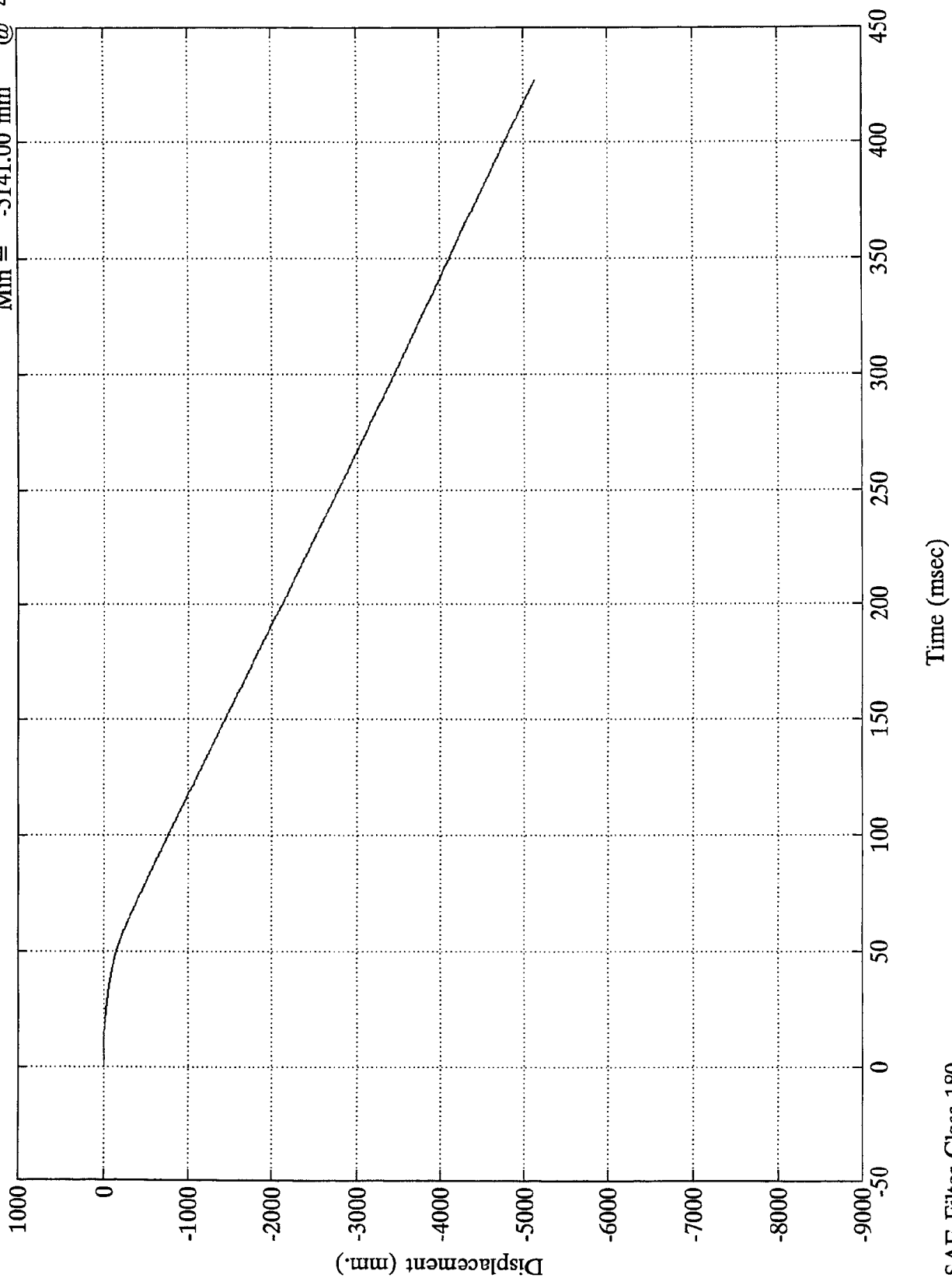


SAE Filter Class 180

VTV TEST #4

Acc 10 Rt Rr Compart X

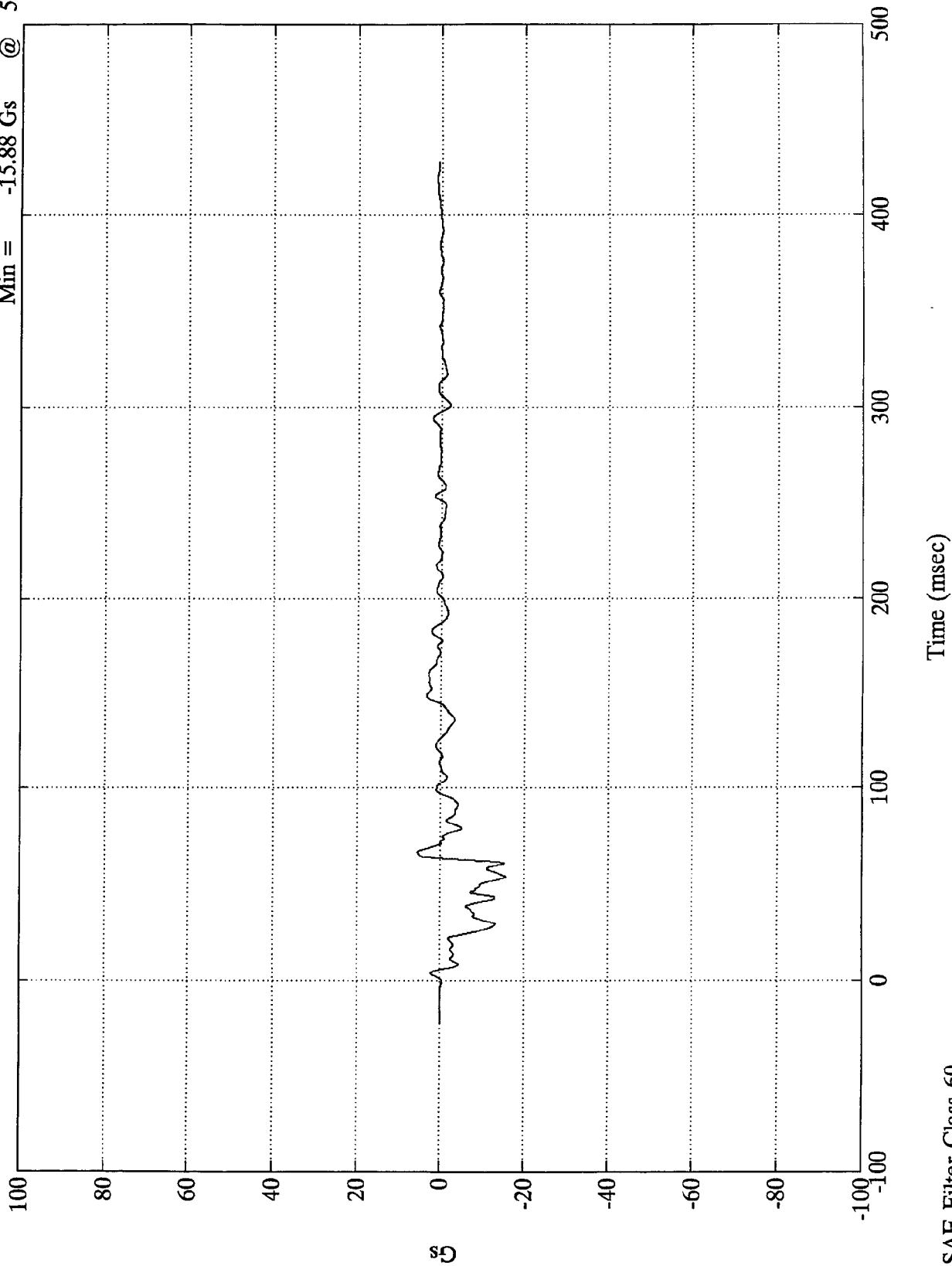
Max = .00 mm @ -0.00 msec
Min = -5141.00 mm @ 427.32 msec



SAE Filter Class 180

VTV TEST #4

Acc 10 Rt Rr Compart Y Max = 5.55 Gs @ 66.72 msec
Min = -15.88 Gs @ 53.88 msec

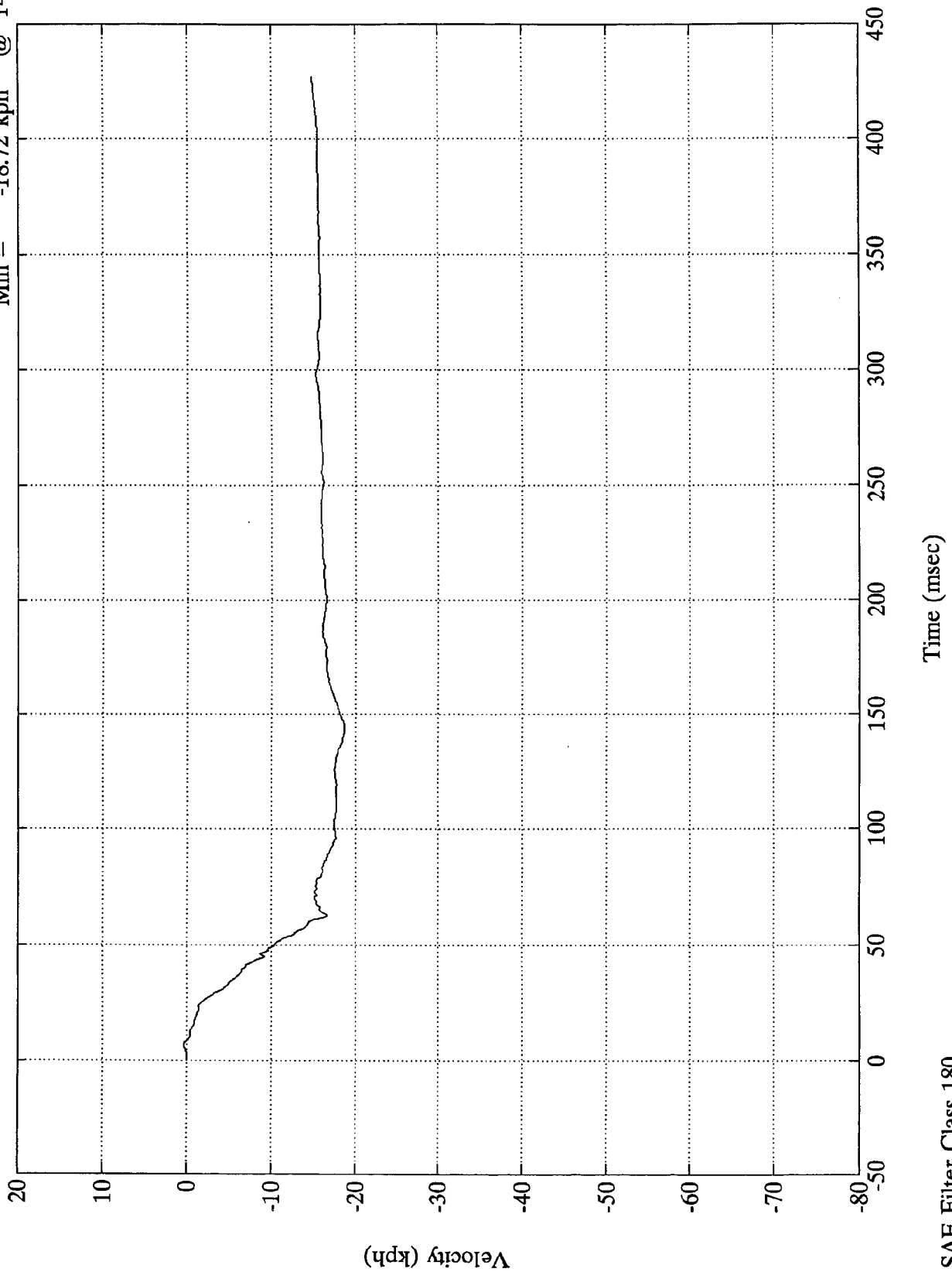


SAE Filter Class 60

VTV TEST #4

Acc 10 Rt Rr Compart Y

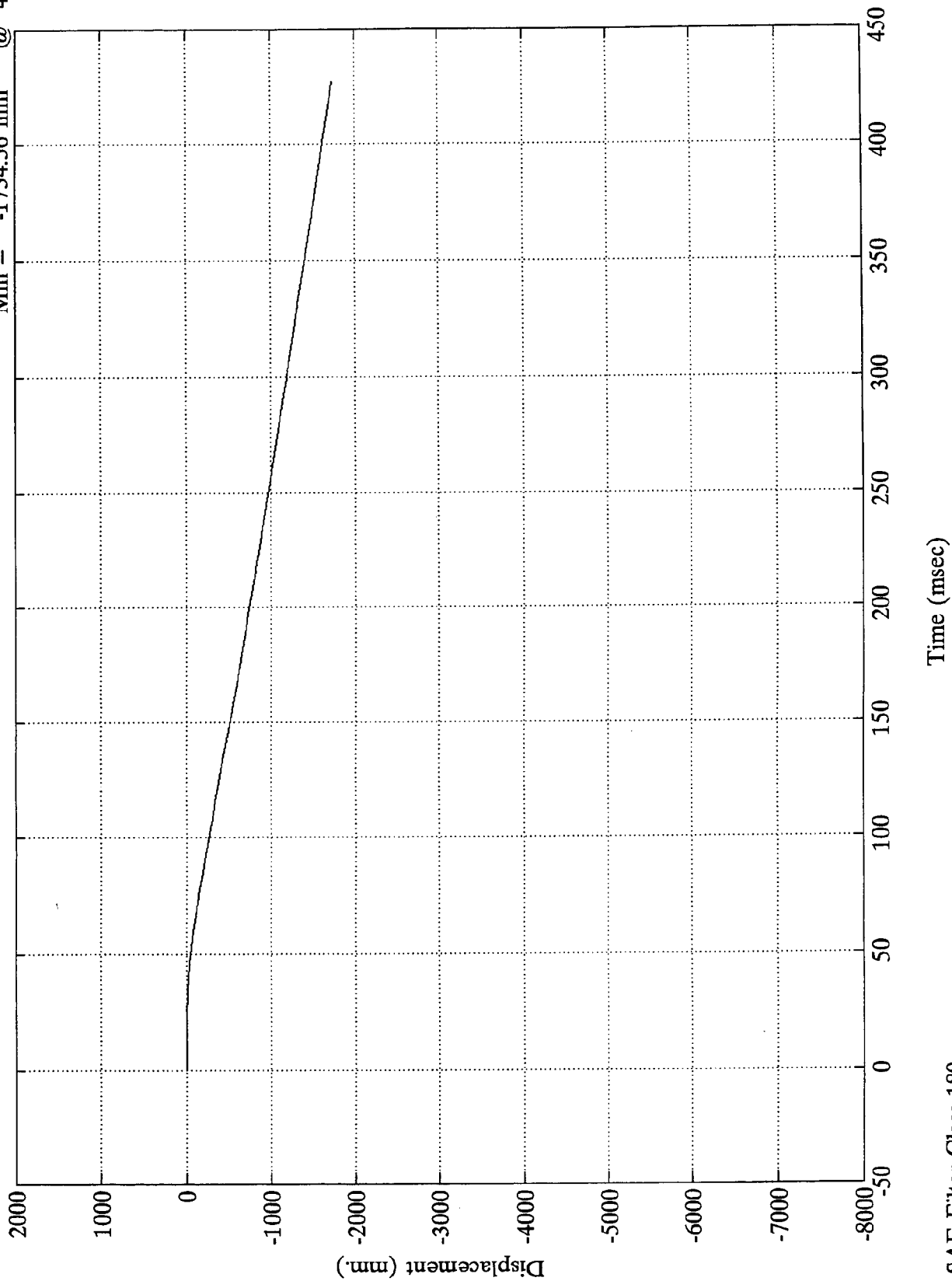
Max = .33 kph @ 6.71 msec
Min = -18.72 kph @ 144.24 msec



VTV TEST #4

Acc 10 Rt Rr Compart Y

Max = .21 mm @ 8.51 msec
Min = -1734.56 mm @ 427.32 msec

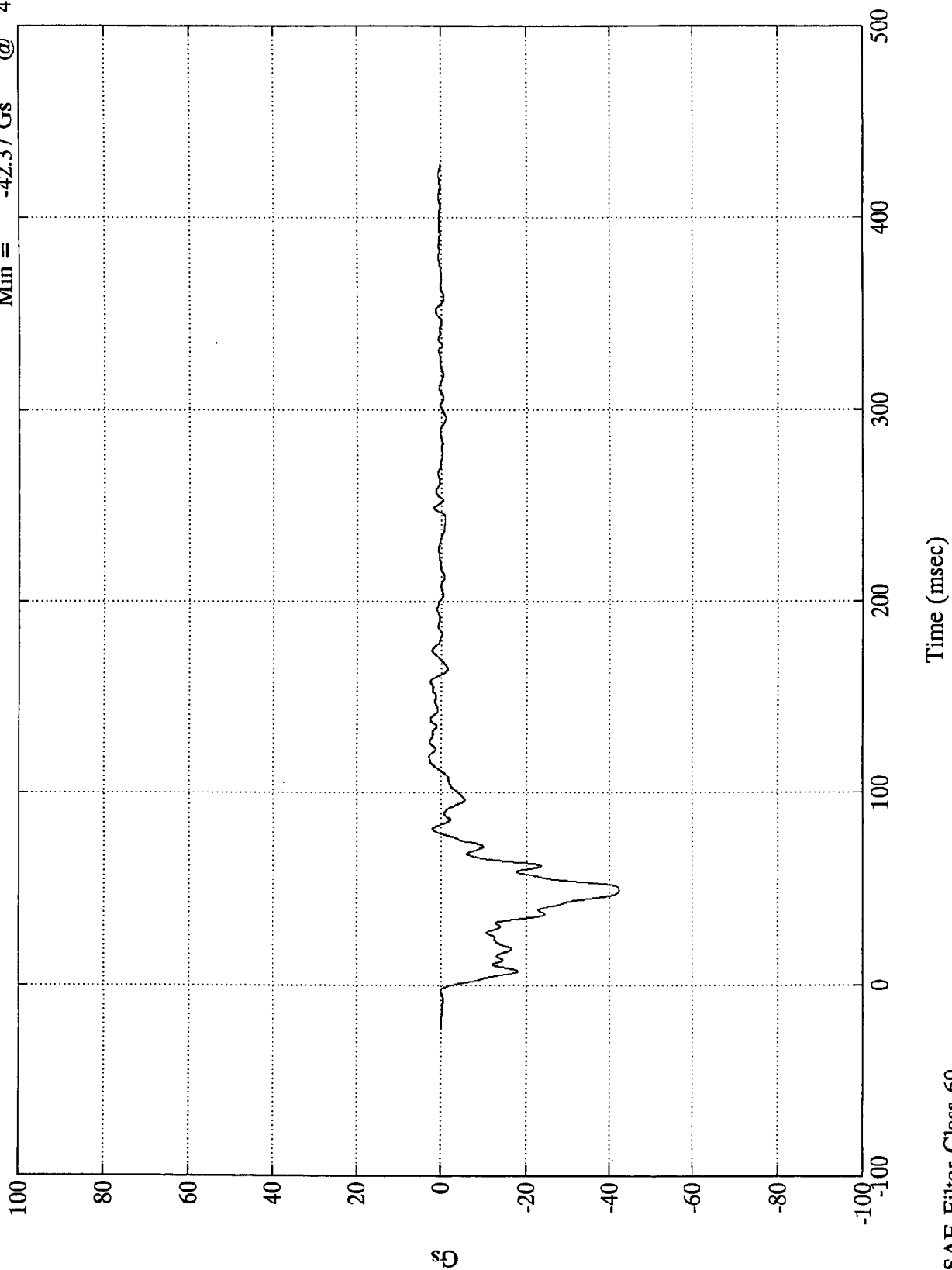


SAE Filter Class 180

VTV TEST #4

Acc 11 C/L Rear Compart X

Max = 2.85 Gs @ 118.92 msec
Min = -42.37 Gs @ 49.43 msec

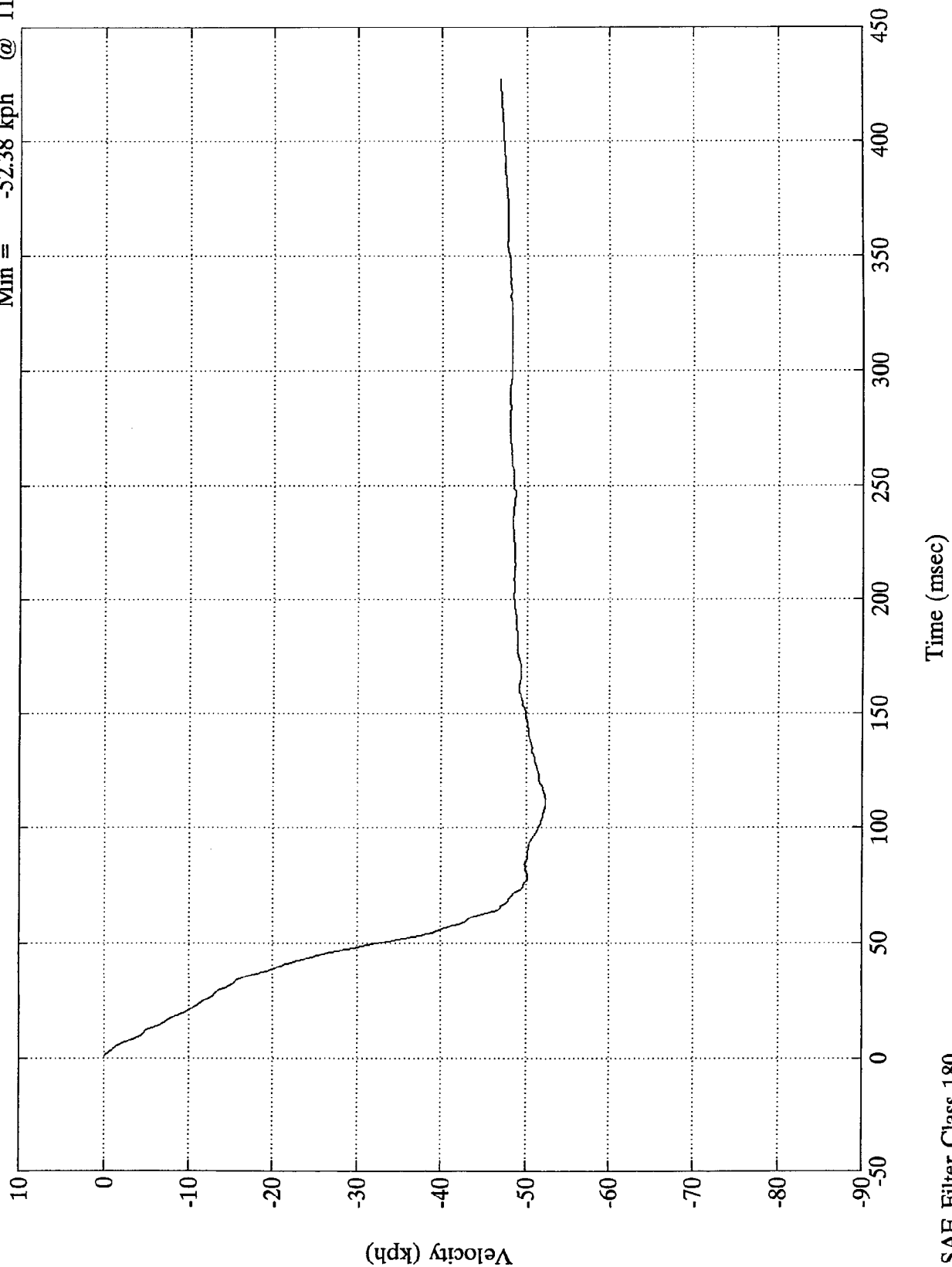


SAE Filter Class 60

VTV TEST #4

Max = .00 kph @ -0.00 msec
Min = -52.38 kph @ 110.64 msec

Acc 11 C/L Rear Compart X

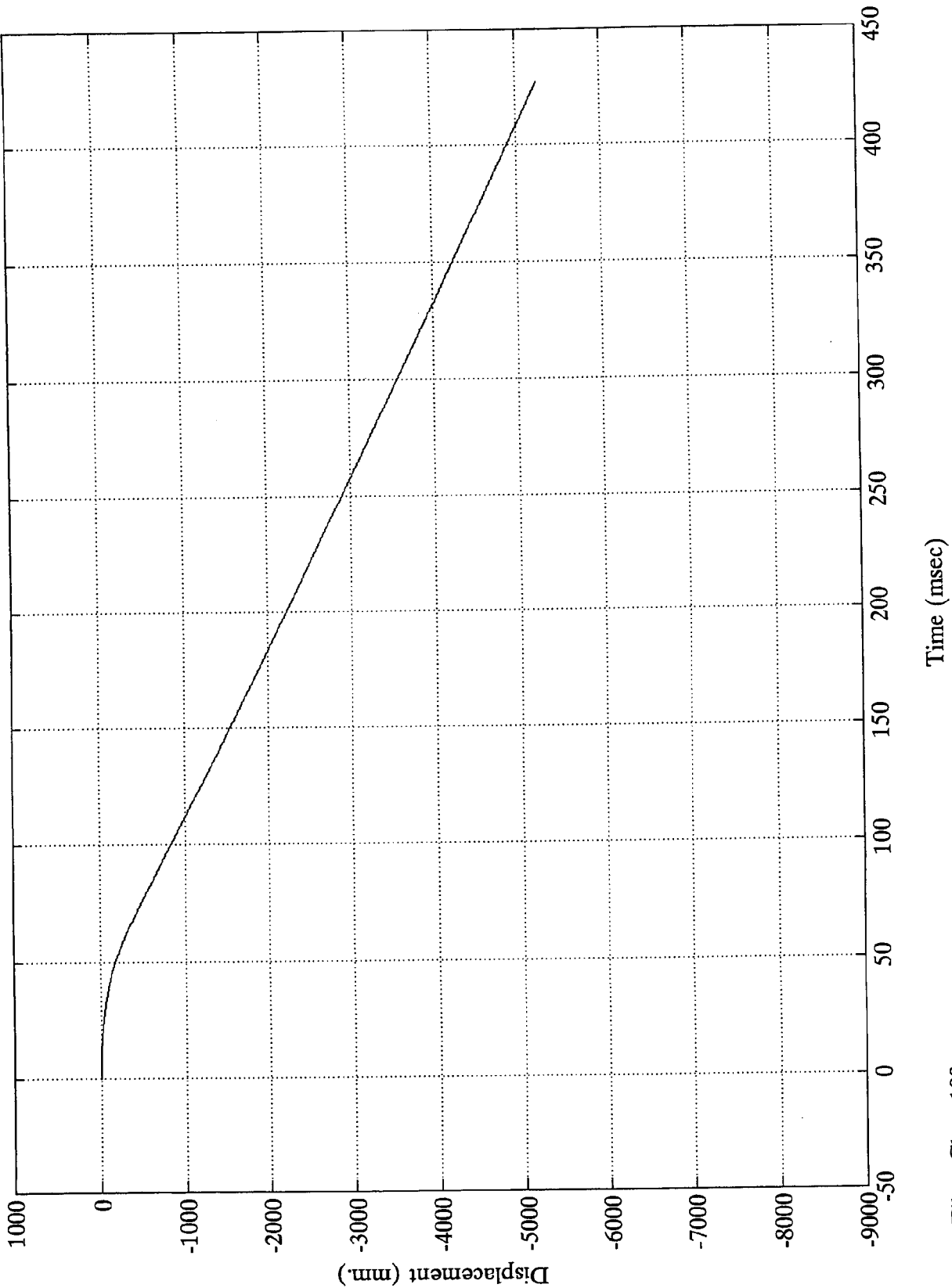


SAE Filter Class 180

VTV TEST #4

Acc 11 C/L Rear Compart X

Max = .00 mm @ -0.00 msec
Min = -5254.39 mm @ 427.32 msec

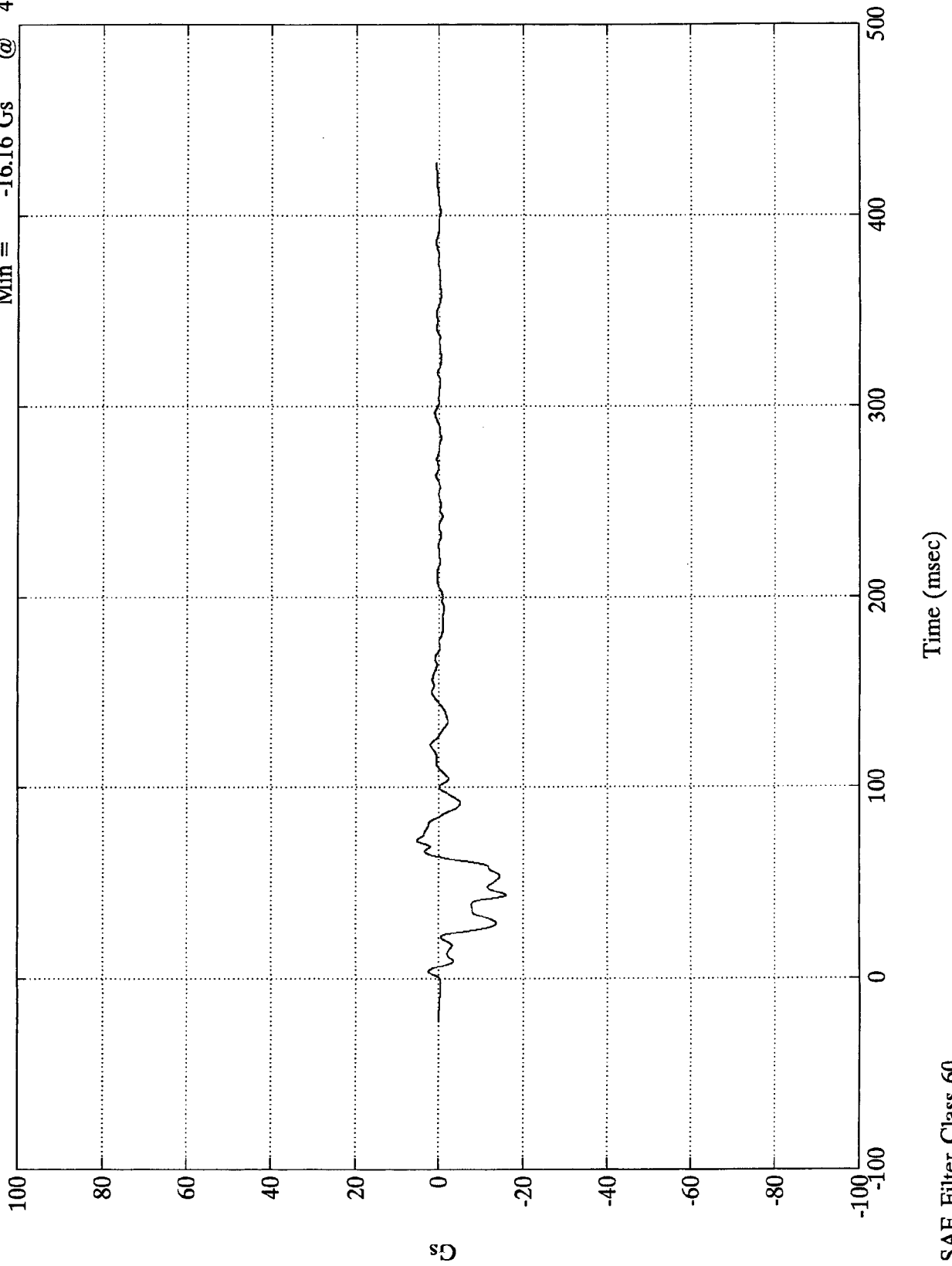


SAE Filter Class 180

VTV TEST #4

Acc 11 C/L Rear Comp Y

Max = 5.16 Gs @ 72.48 msec
Min = -16.16 Gs @ 43.68 msec

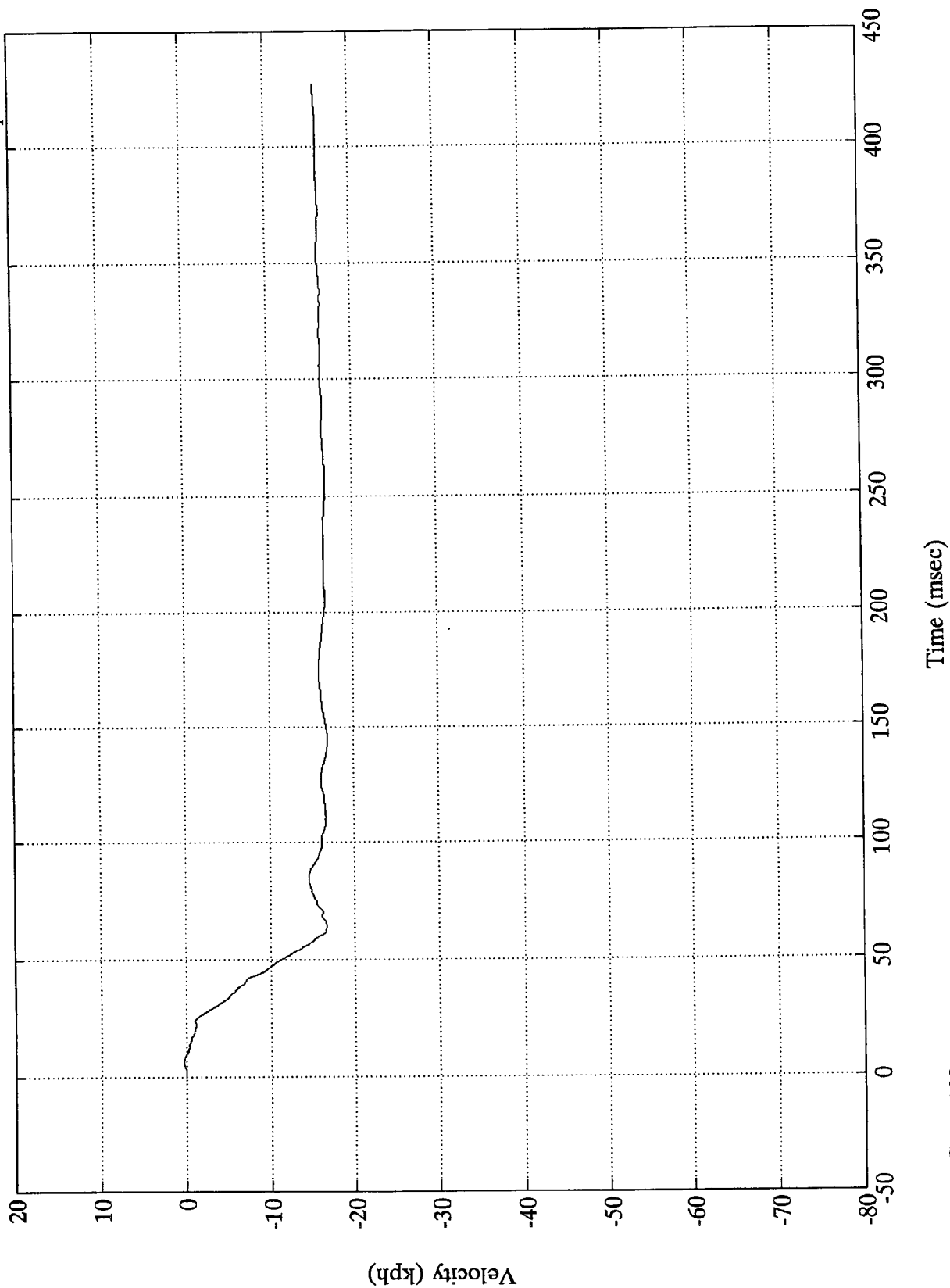


SAE Filter Class 60

VTV TEST #4

Acc 11 C/L Rear Compart Y

Max = .31 kph @ 6.47 msec
Min = -16.89 kph @ 143.52 msec

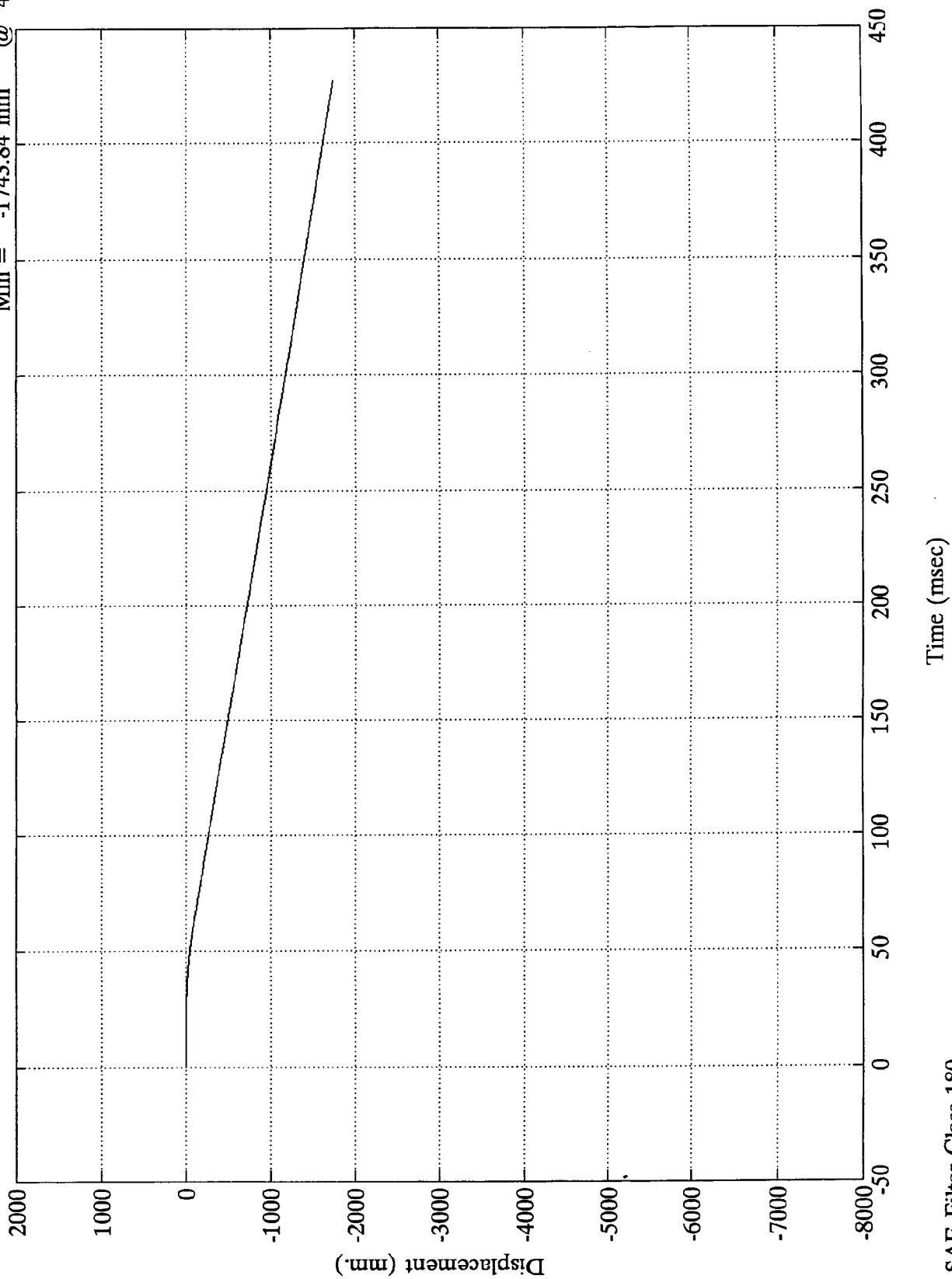


SAE Filter Class 180

VTV TEST #4

Acc 11 C/L Rear Compart Y

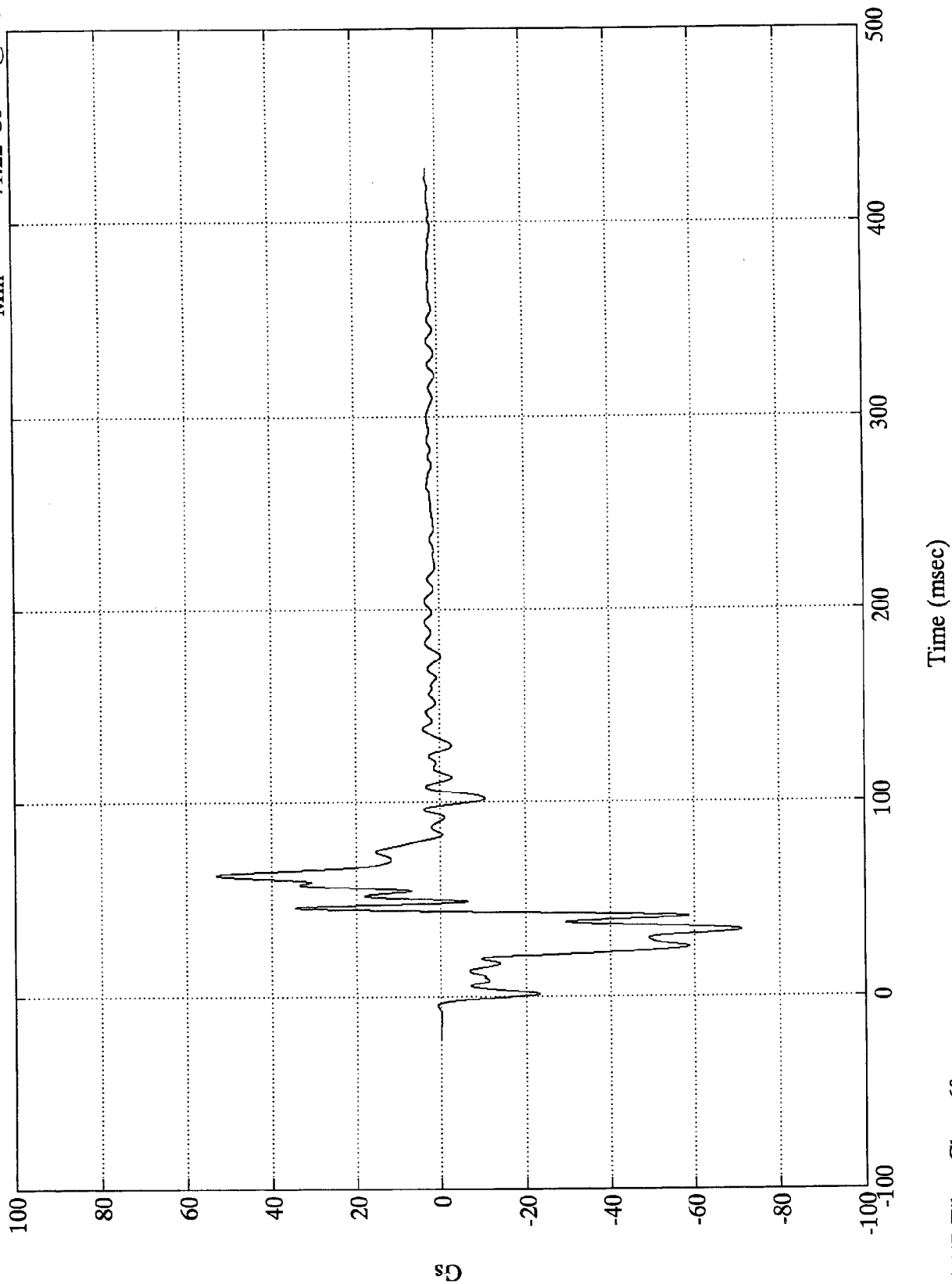
Max = .36 mm @ 9.59 msec
Min = -1743.84 mm @ 427.32 msec



SAE Filter Class 180

VTV TEST #4

Acc 12 Toe Pan X
Max = 53.06 Gs @ 63.00 msec
Min = -71.22 Gs @ 34.56 msec

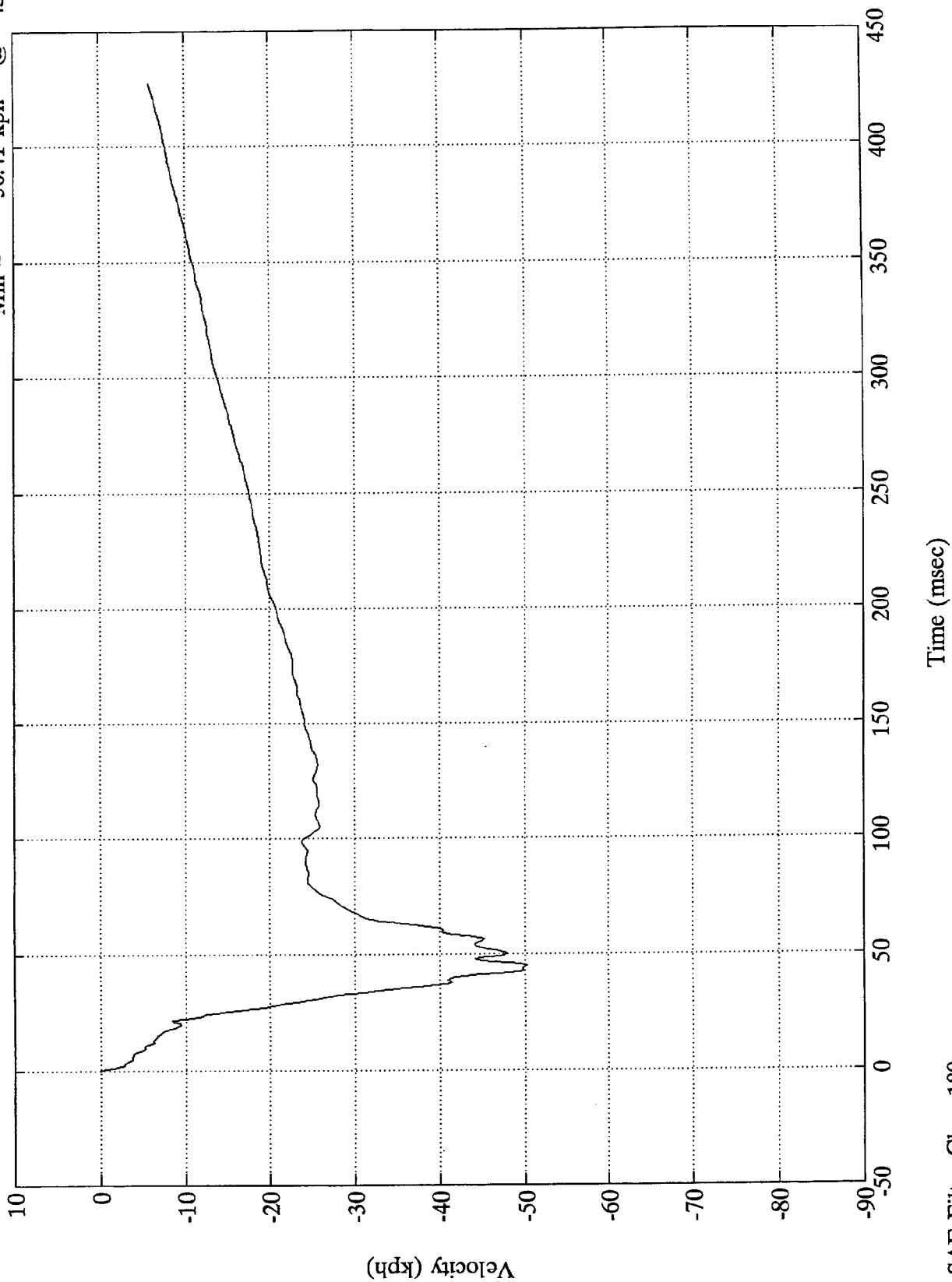


SAE Filter Class 60

VTV TEST #4

Acc 12 Toe Pan X

Max = .00 kph @ -0.00 msec
Min = -50.41 kph @ 45.23 msec

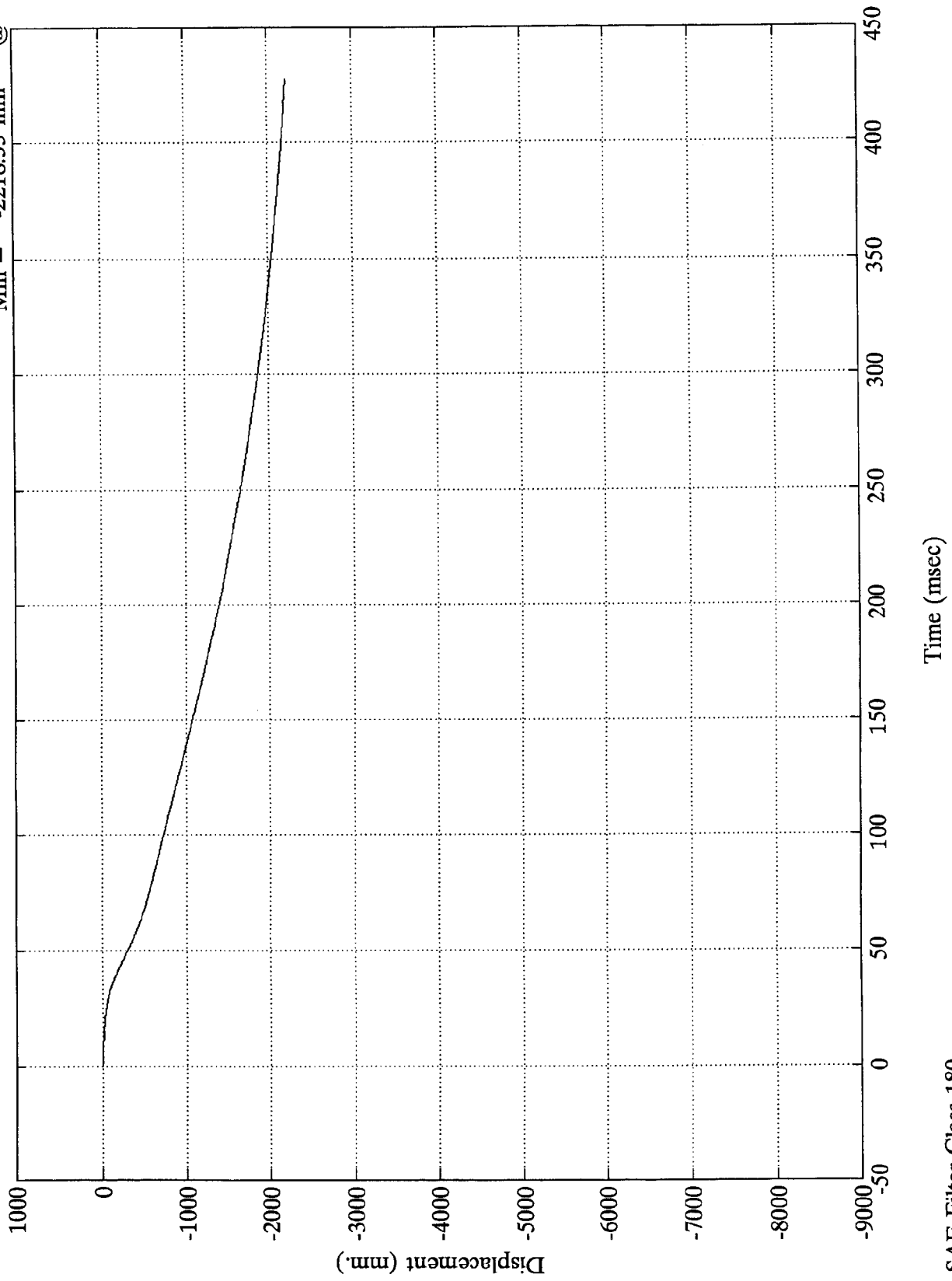


SAE Filter Class 180

VTV TEST #4

Acc 12 Toe Pan X

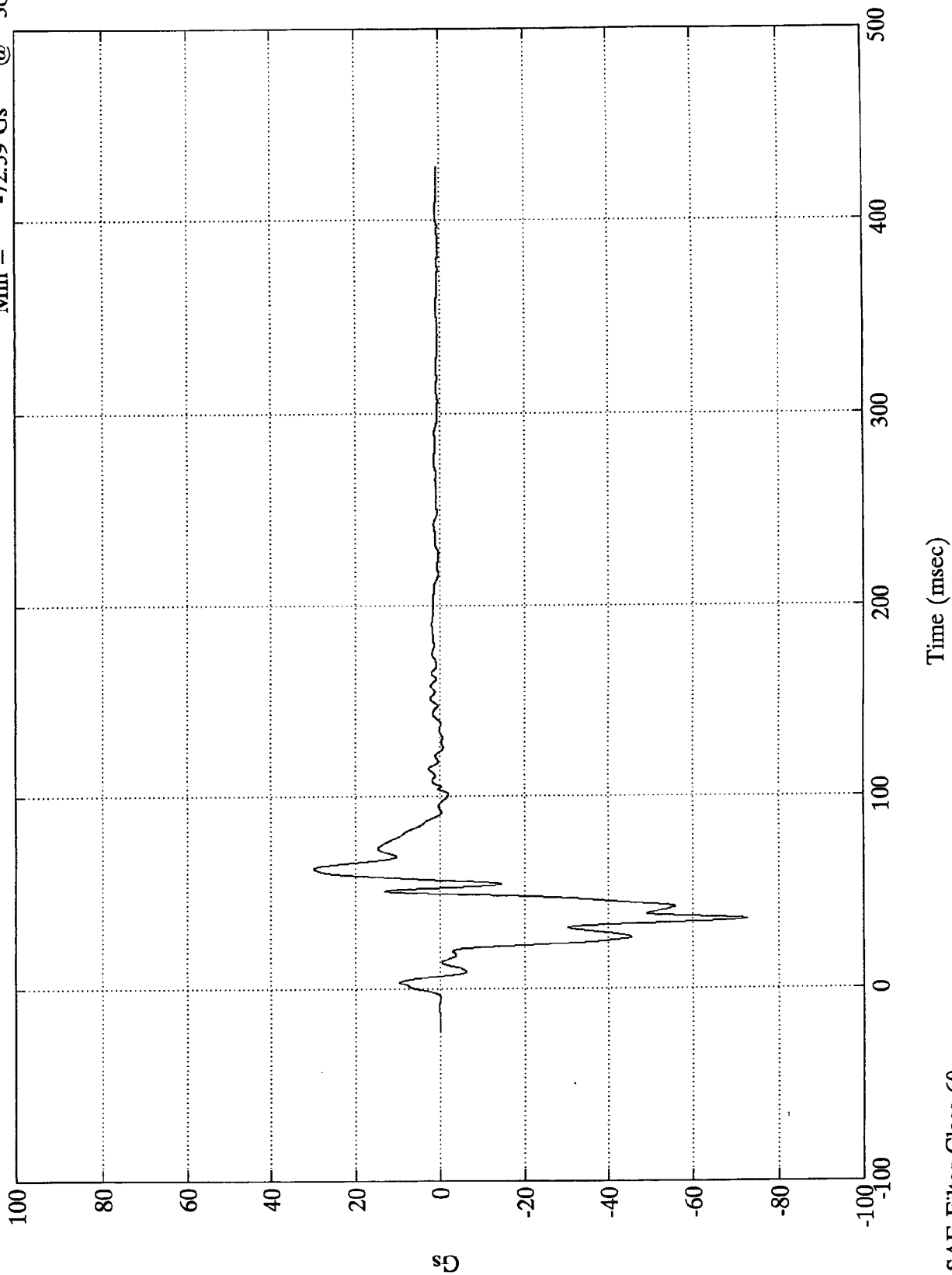
Max = .00 mm @ -0.00 msec
Min = -2218.33 mm @ 427.32 msec



SAE Filter Class 180

VTV TEST #4

Acc 12 Toe Pan Y
Max = 29.82 Gs @ 62.64 msec
Min = -72.59 Gs @ 36.00 msec

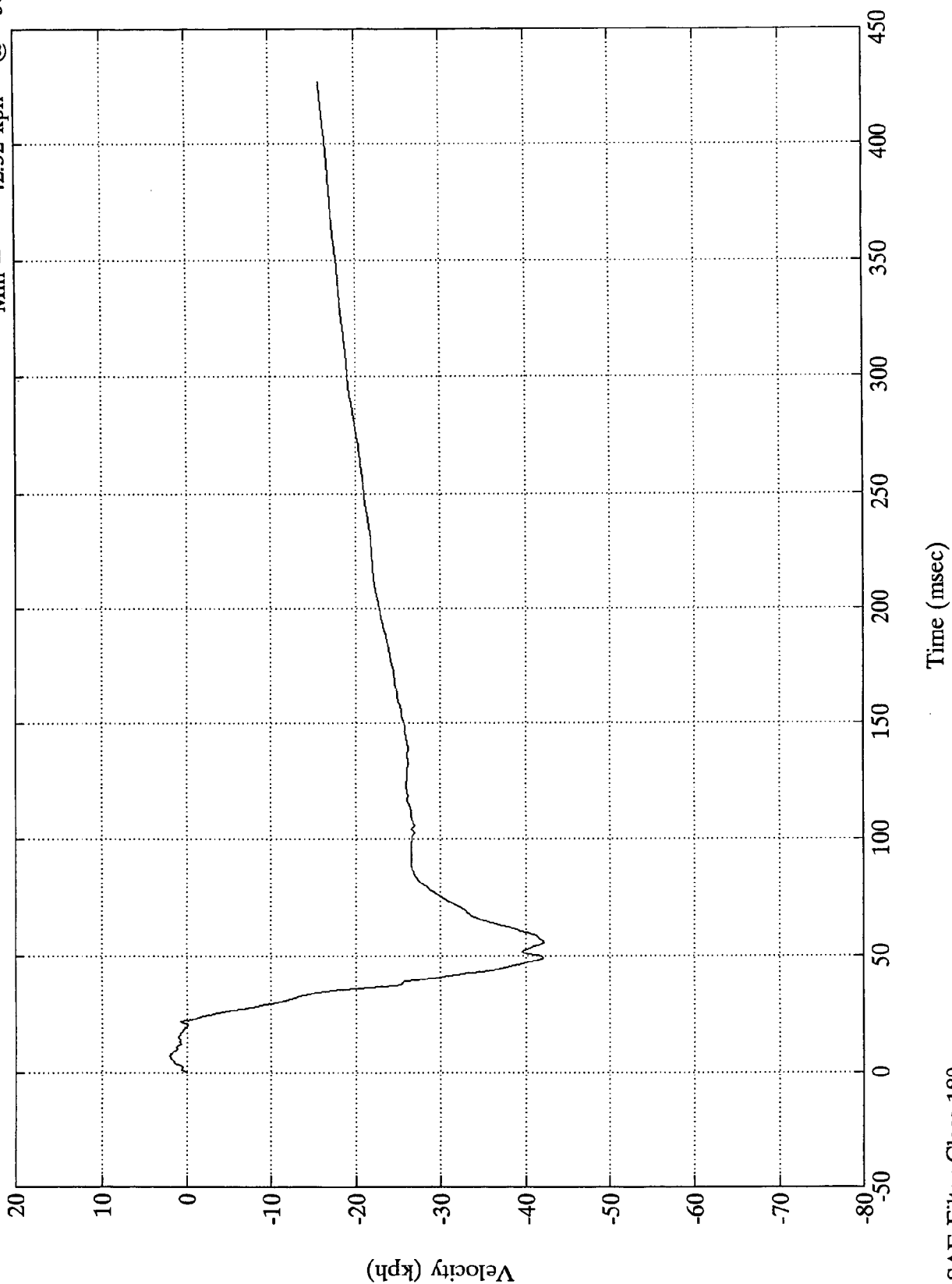


SAE Filter Class 60

VTV TEST #4

Max = 1.98 kph @ 7.31 msec
Min = -42.32 kph @ 56.04 msec

Acc 12 Toe Pan Y

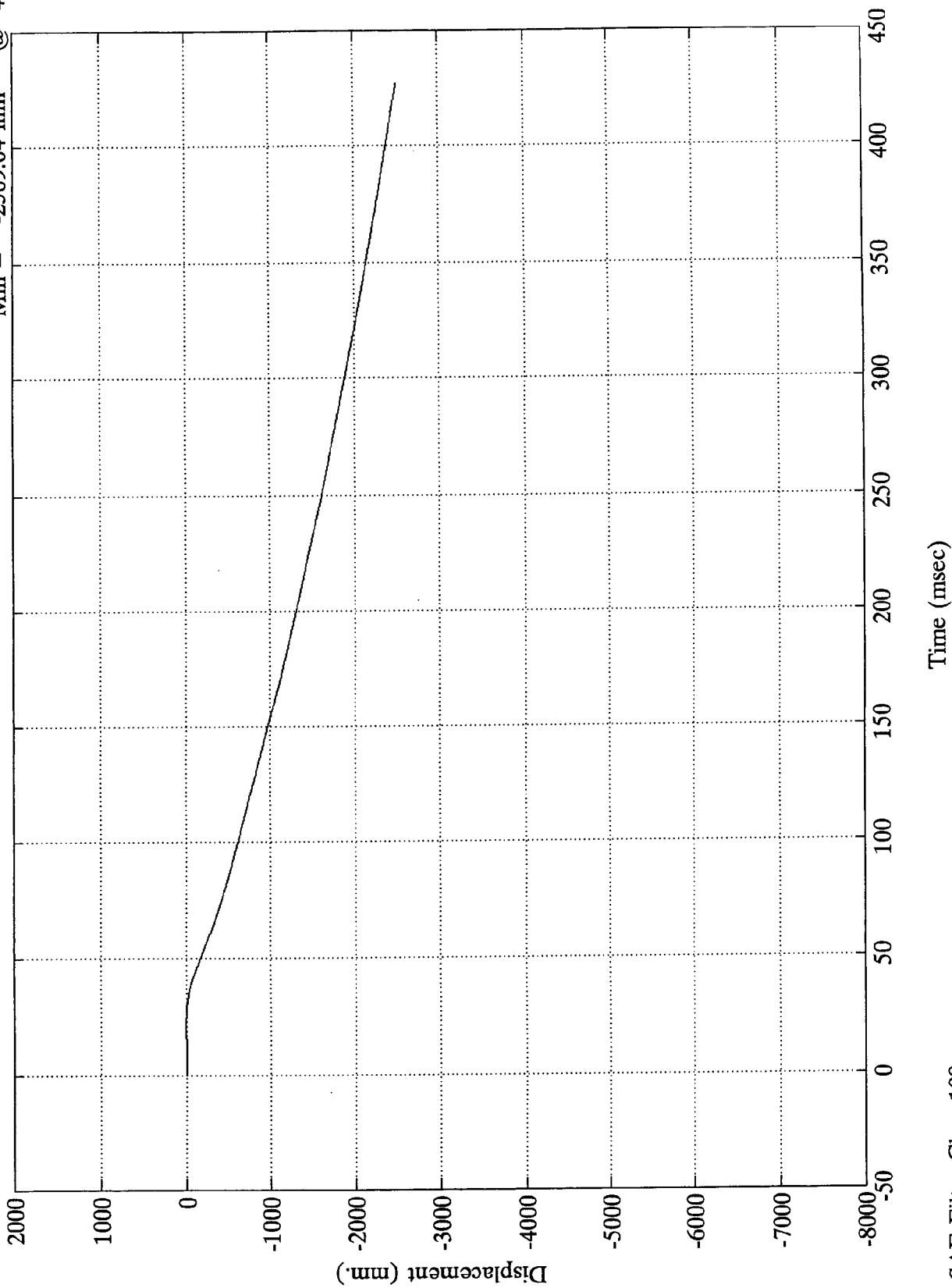


SAE Filter Class 180

VTV TEST #4

Max = 5.62 mm @ 22.19 msec
Min = -2509.04 mm @ 427.32 msec

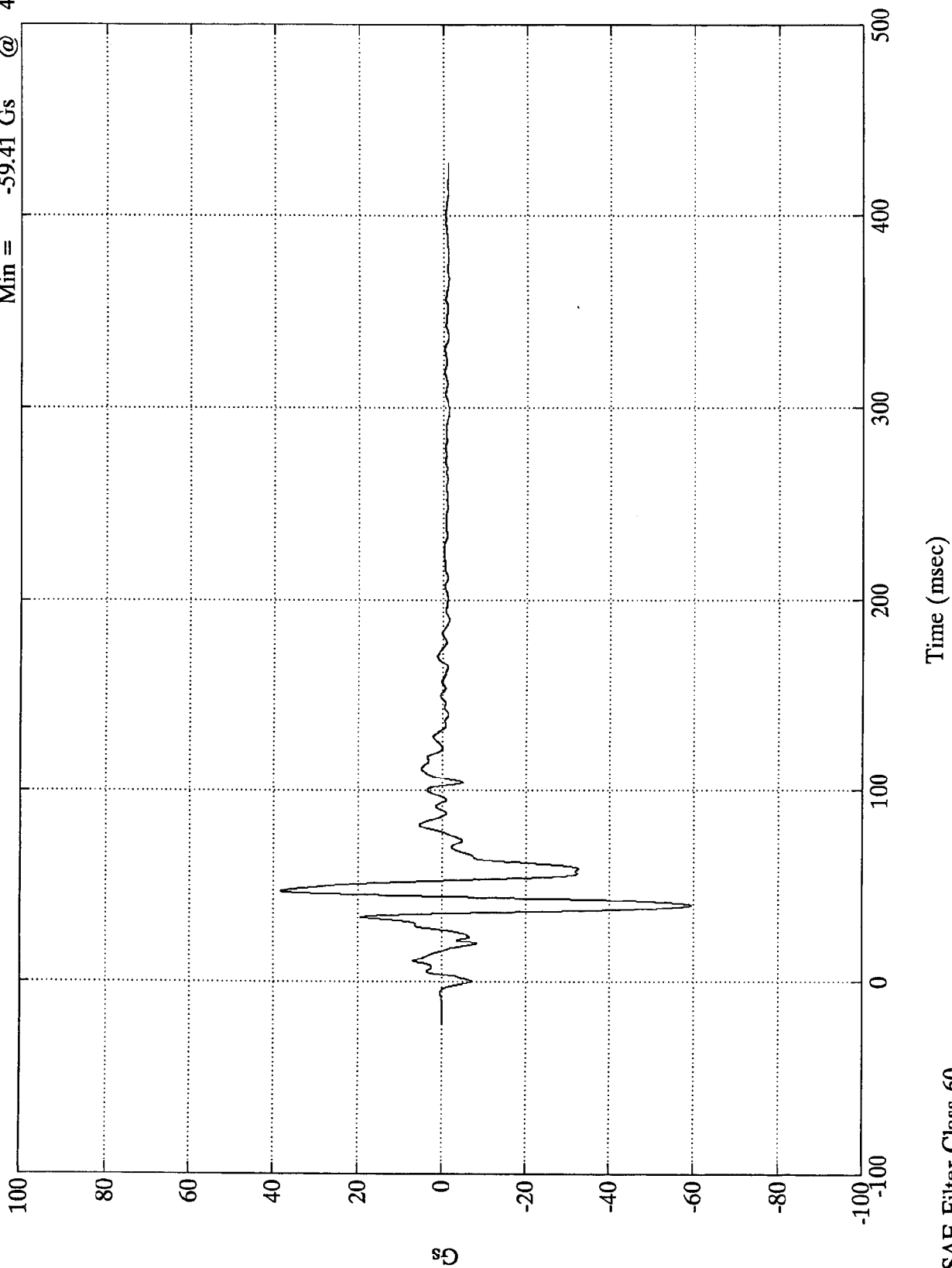
Acc 12 Toe Pan Y



SAE Filter Class 180

VTV TEST #4

Acc 12 Toe Pan Z
Max = 38.37 Gs @ 47.76 msec
Min = -59.41 Gs @ 40.44 msec

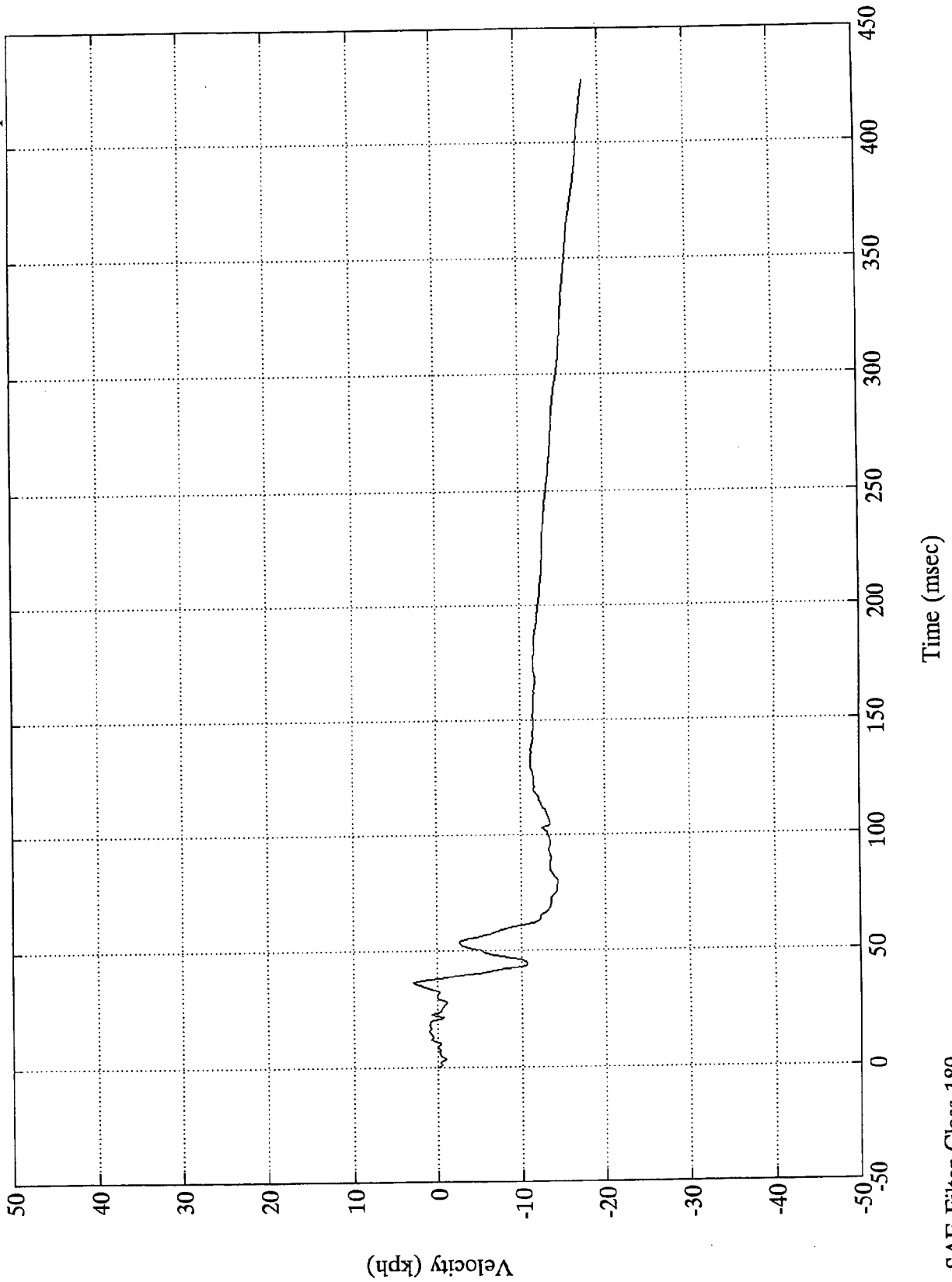


SAE Filter Class 60

VTV TEST #4

Acc 12 Toe Pan Z

Max = 2.93 kph @ 36.60 msec
Min = -18.13 kph @ 427.32 msec

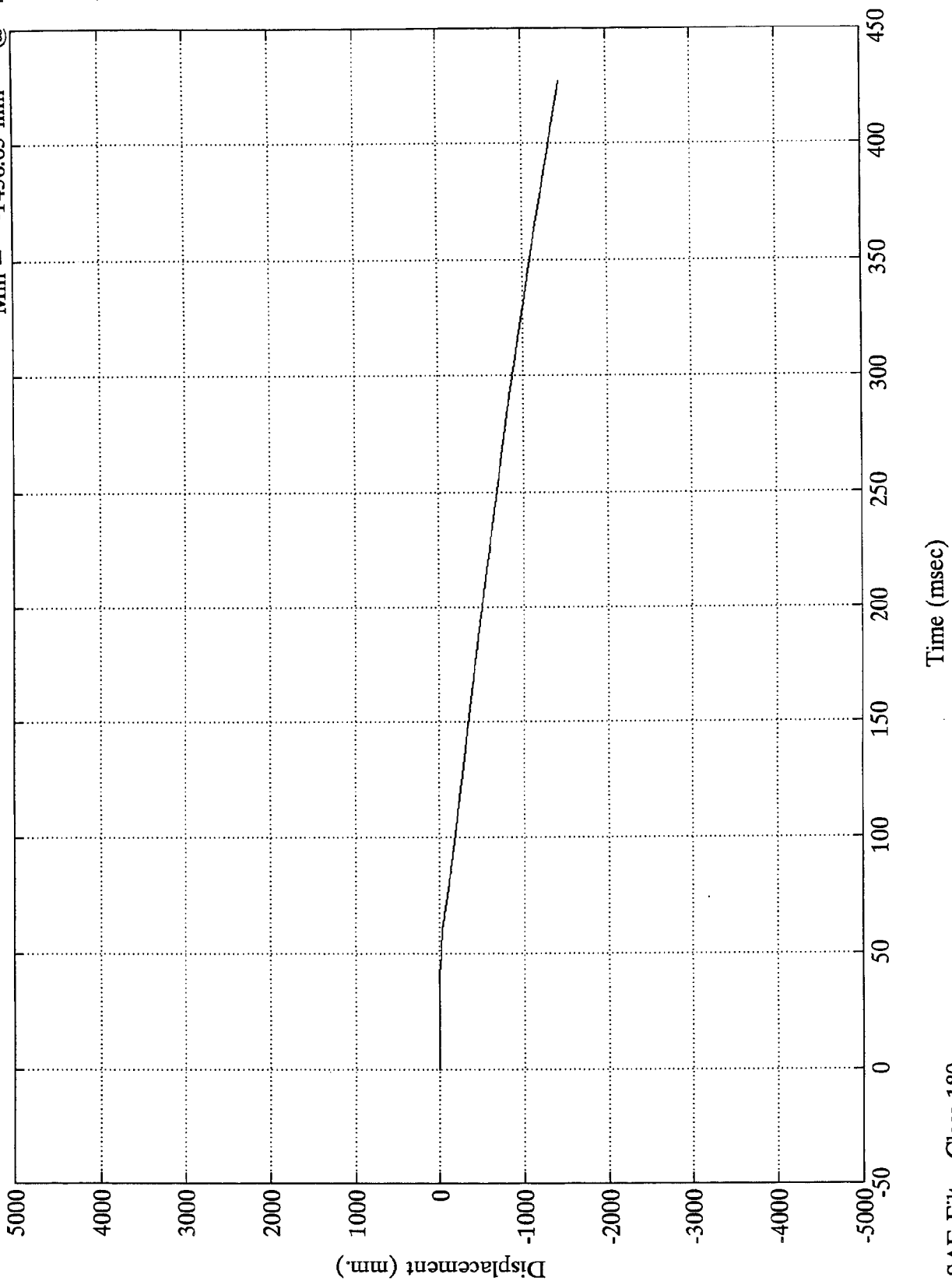


SAE Filter Class 180

VTV TEST #4

Acc 12 Toe Pan Z

Max = 2.26 mm @ 38.28 msec
Min = -1456.63 mm @ 427.32 msec

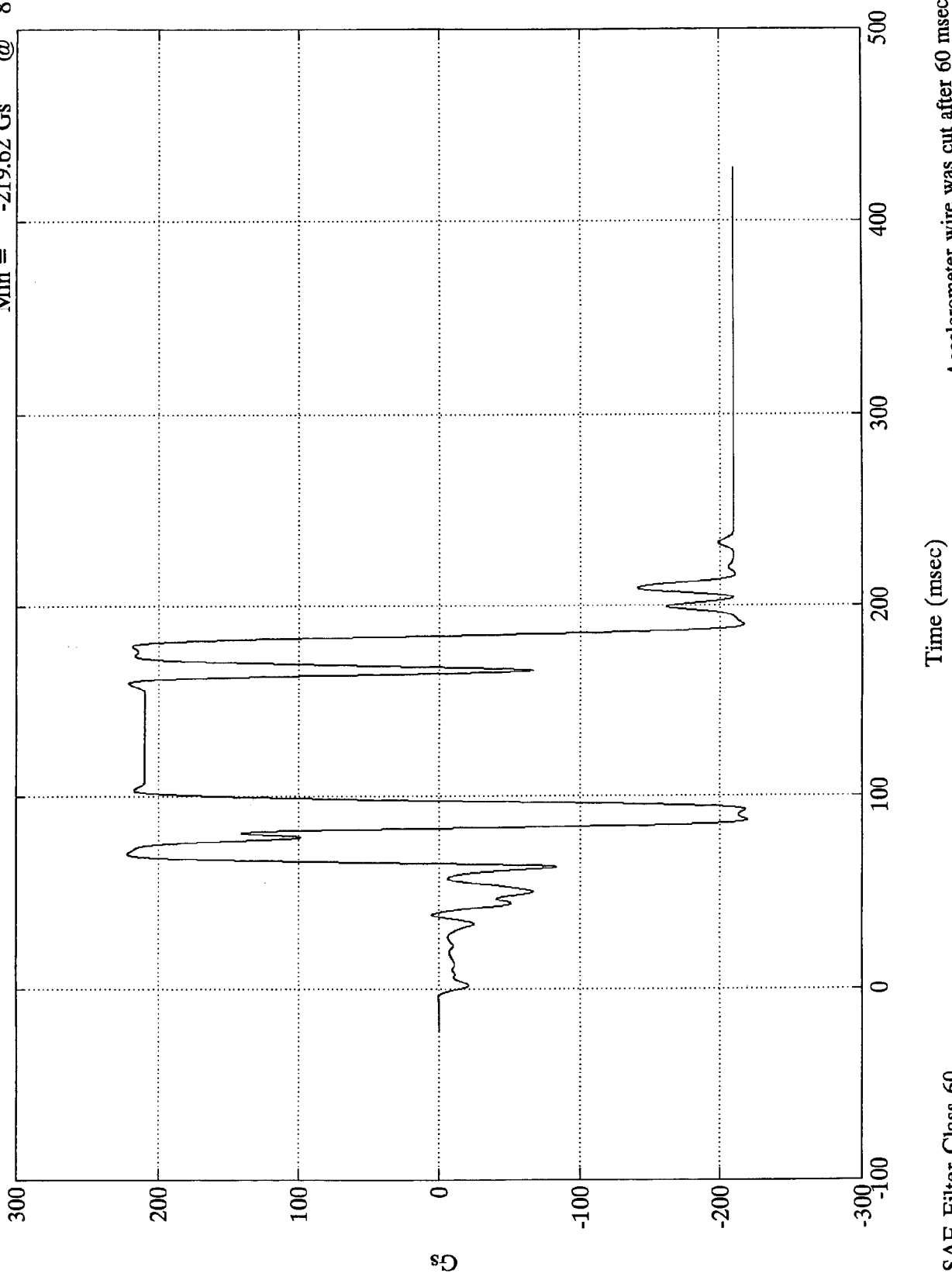


SAE Filter Class 180

VTV TEST #4

Acc 13 A-Pillar Hinge

Max = 221.59 Gs @ 70.08 msec
Min = -219.62 Gs @ 87.48 msec



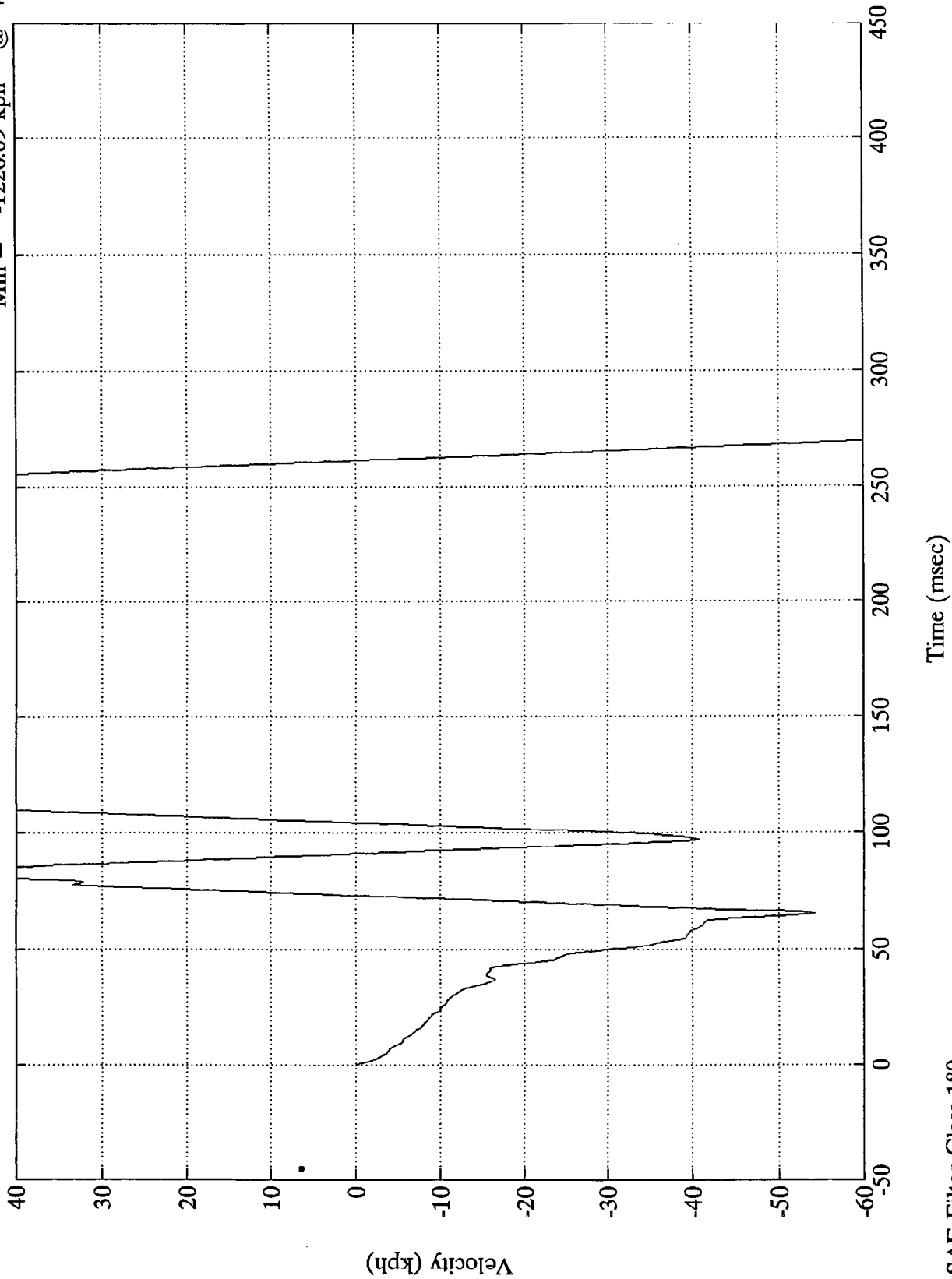
Accelerometer wire was cut after 60 msec.

SAE Filter Class 60

VTV TEST #4

Acc 13 A-Pillar Hinge

Max = 533.80 kph @ 184.67 msec
Min = -1226.09 kph @ 427.32 msec



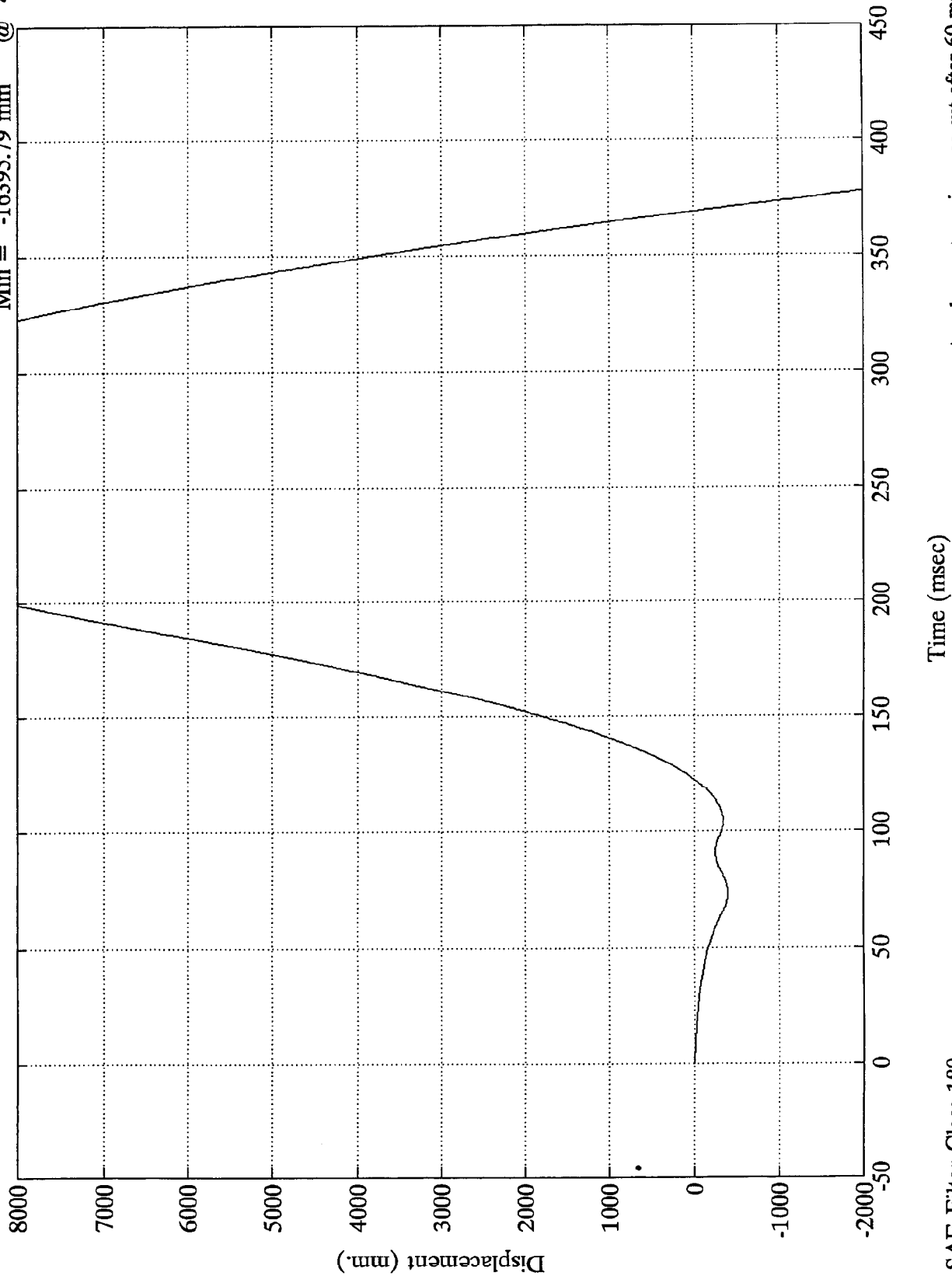
SAE Filter Class 180

Accelerometer wire was cut after 60 msec.

VTV TEST #4

Acc 13 A-Pillar Hinge

Max = 11889.22 mm @ 261.24 msec
Min = -16395.79 mm @ 427.32 msec



SAE Filter Class 180

Time (msec)

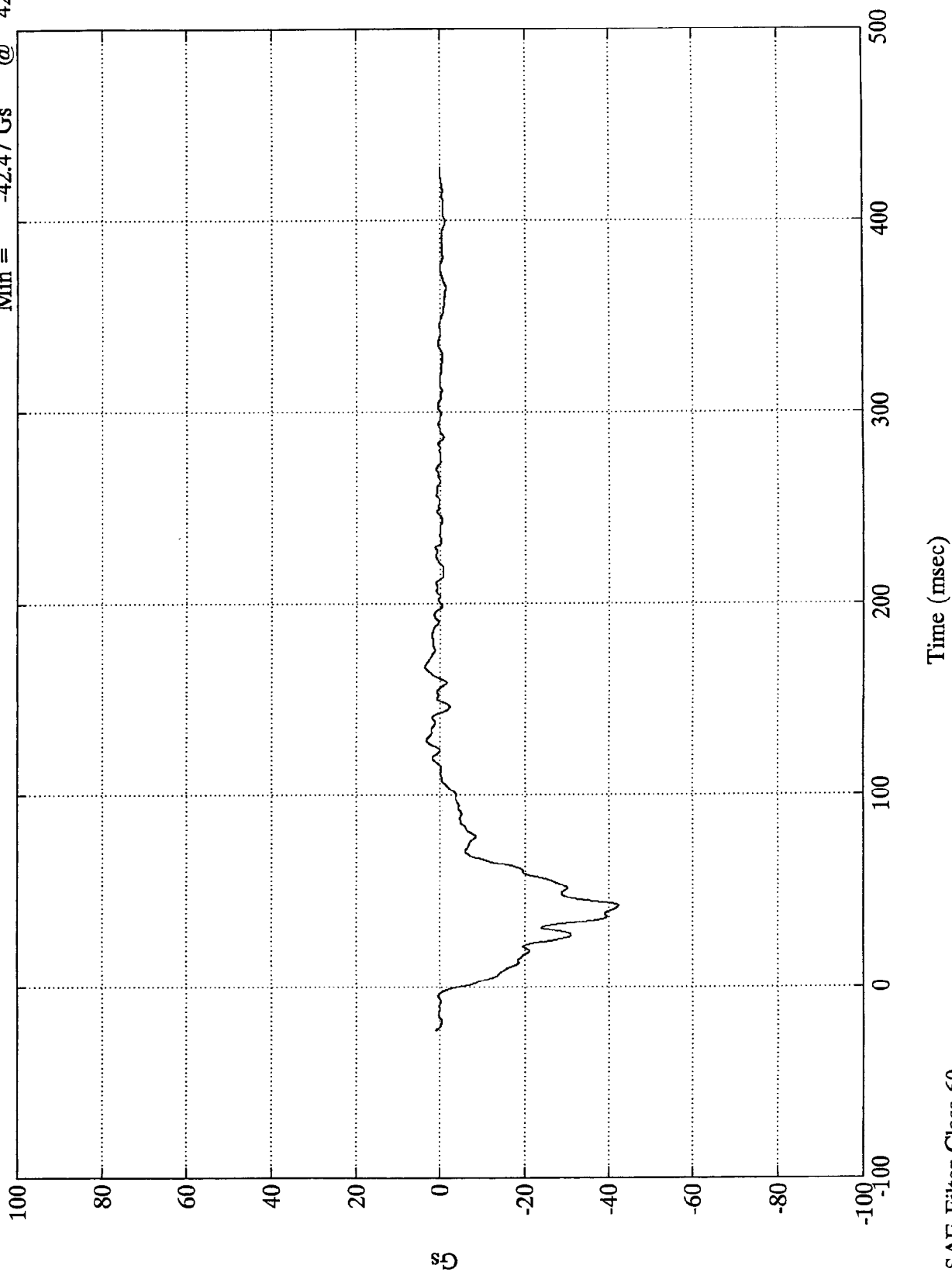
Accelerometer wire was cut after 60 msec.

VEHICLE TWO DATA

VTV TEST #4

Acc 1 MDB Left Rail X

Max = 3.63 Gs @ 167.52 msec
Min = -42.47 Gs @ 42.00 msec

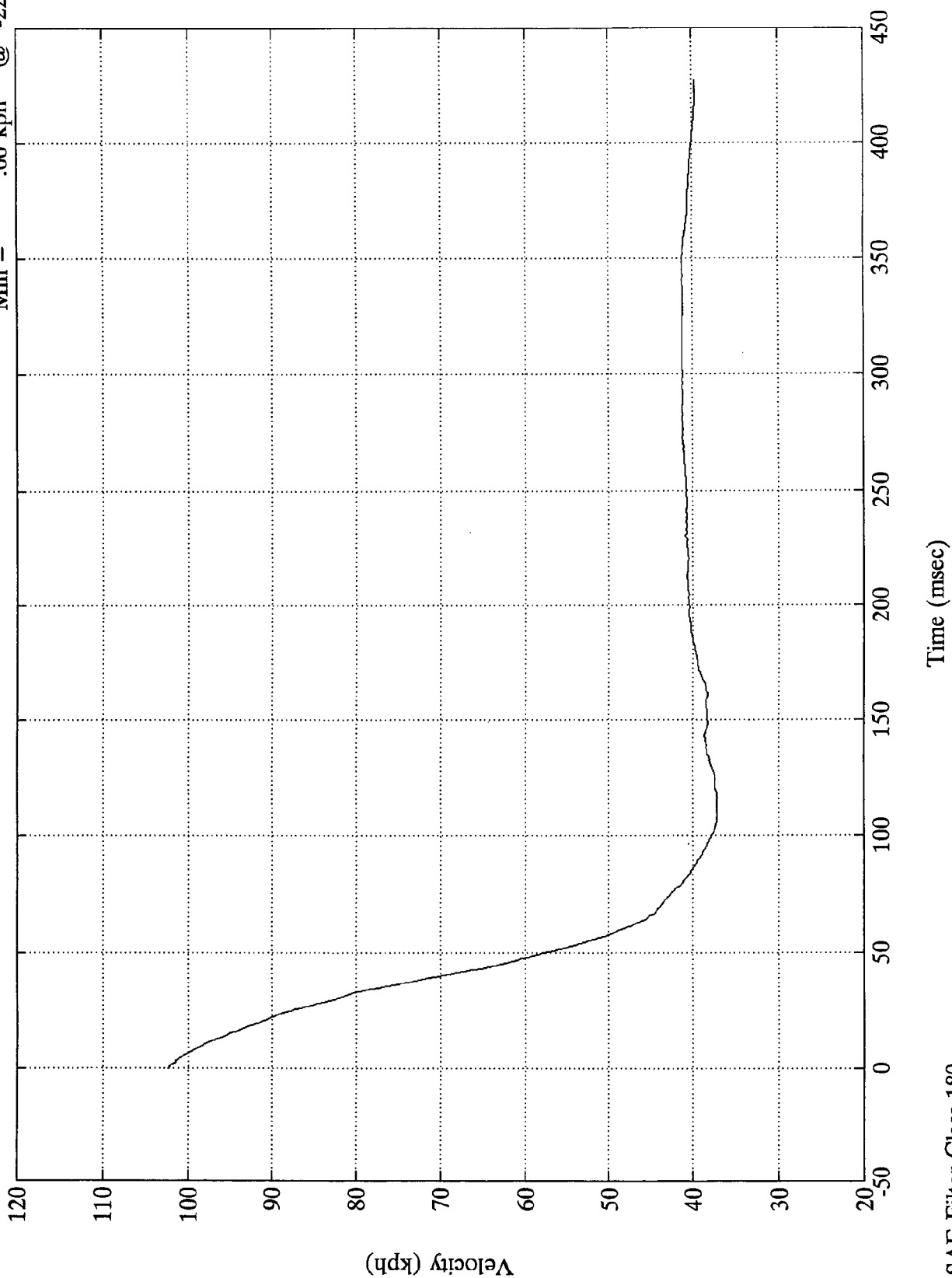


SAE Filter Class 60

VTV TEST #4

Acc 1 MDB Left Rail X

Max = 102.29 kph @ -0.00 msec
Min = .00 kph @ -22.44 msec

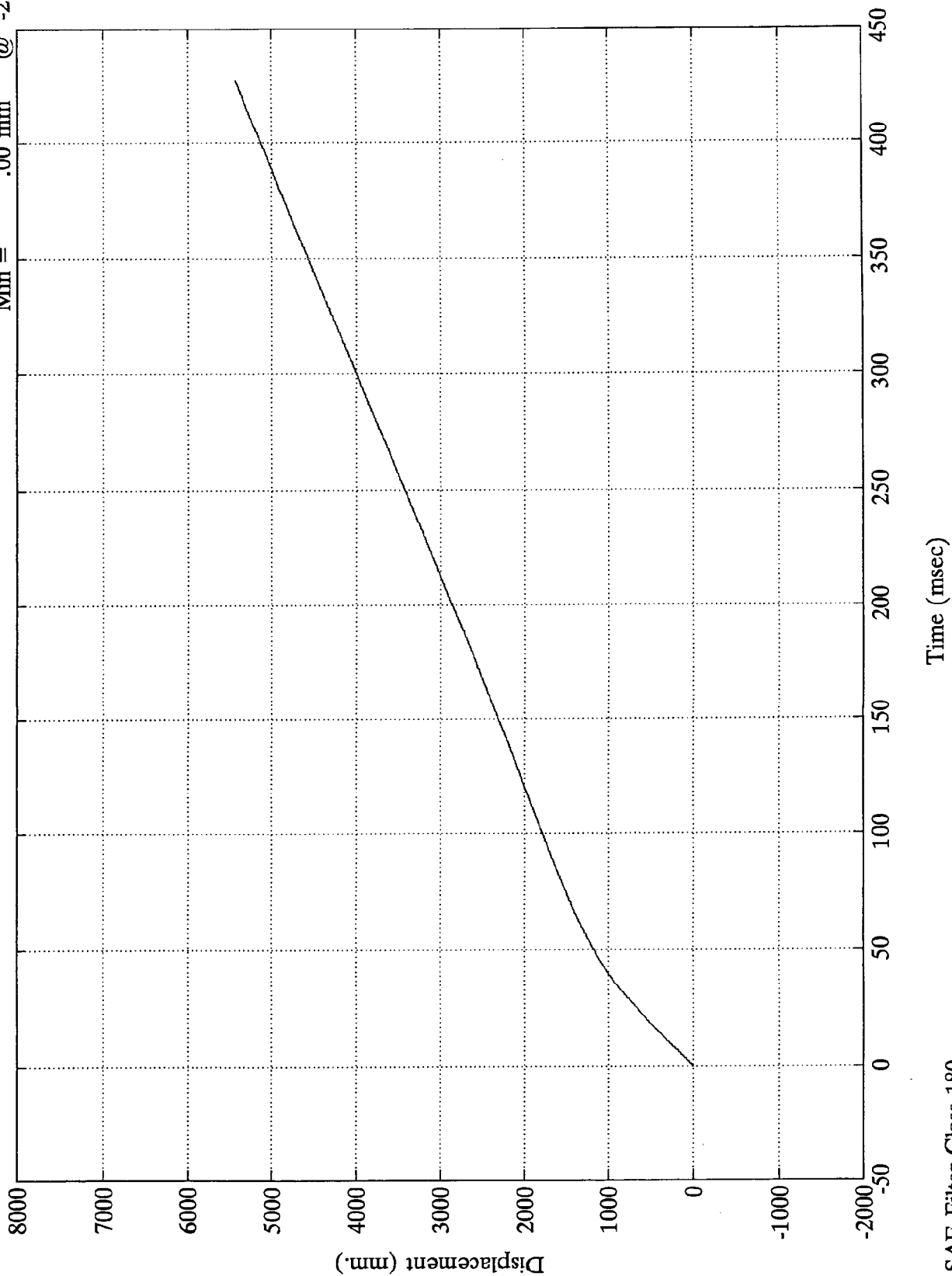


SAE Filter Class 180

VTV TEST #4

Acc 1 MDB Left Rail X

Max = 5430.56 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec

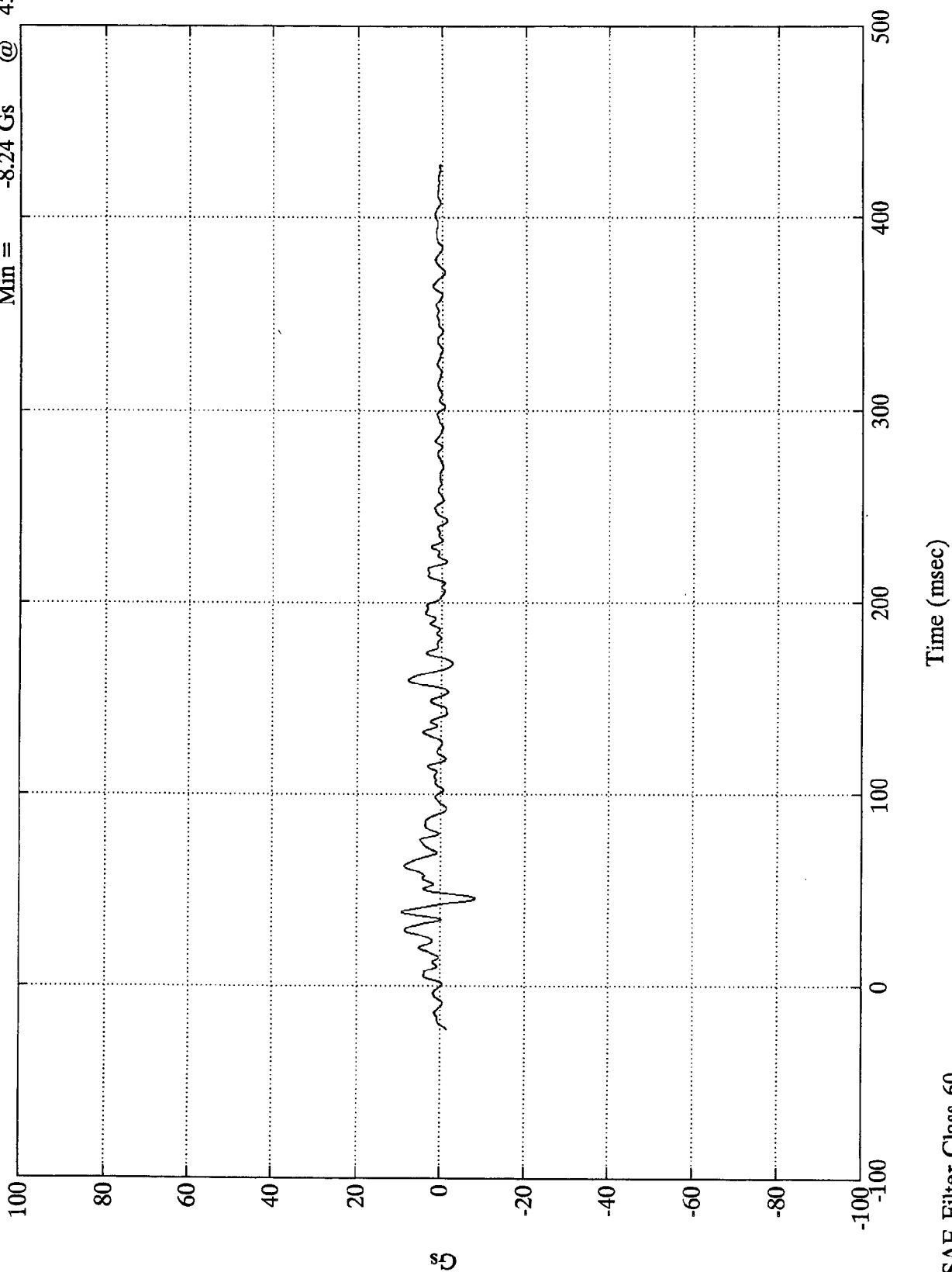


SAE Filter Class 180

VTV TEST #4

Acc 1 MDB Left Rail Y

Max = 9.24 Gs @ 39.00 msec
Min = -8.24 Gs @ 45.84 msec

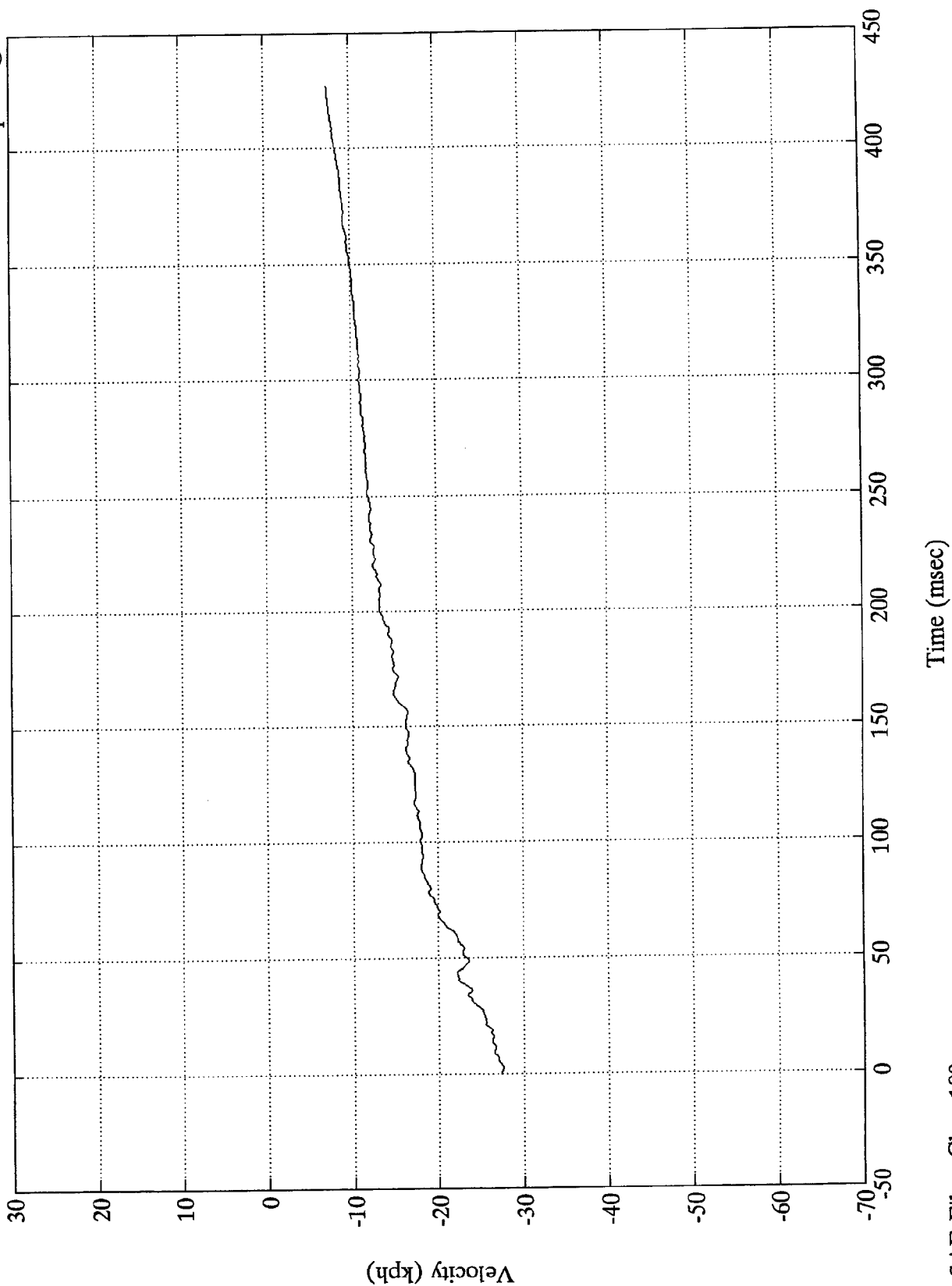


SAE Filter Class 60

VTV TEST #4

Acc 1 MDB Left Rail Y

Max = .00 kph @ -22.44 msec
Min = -27.58 kph @ 2.75 msec

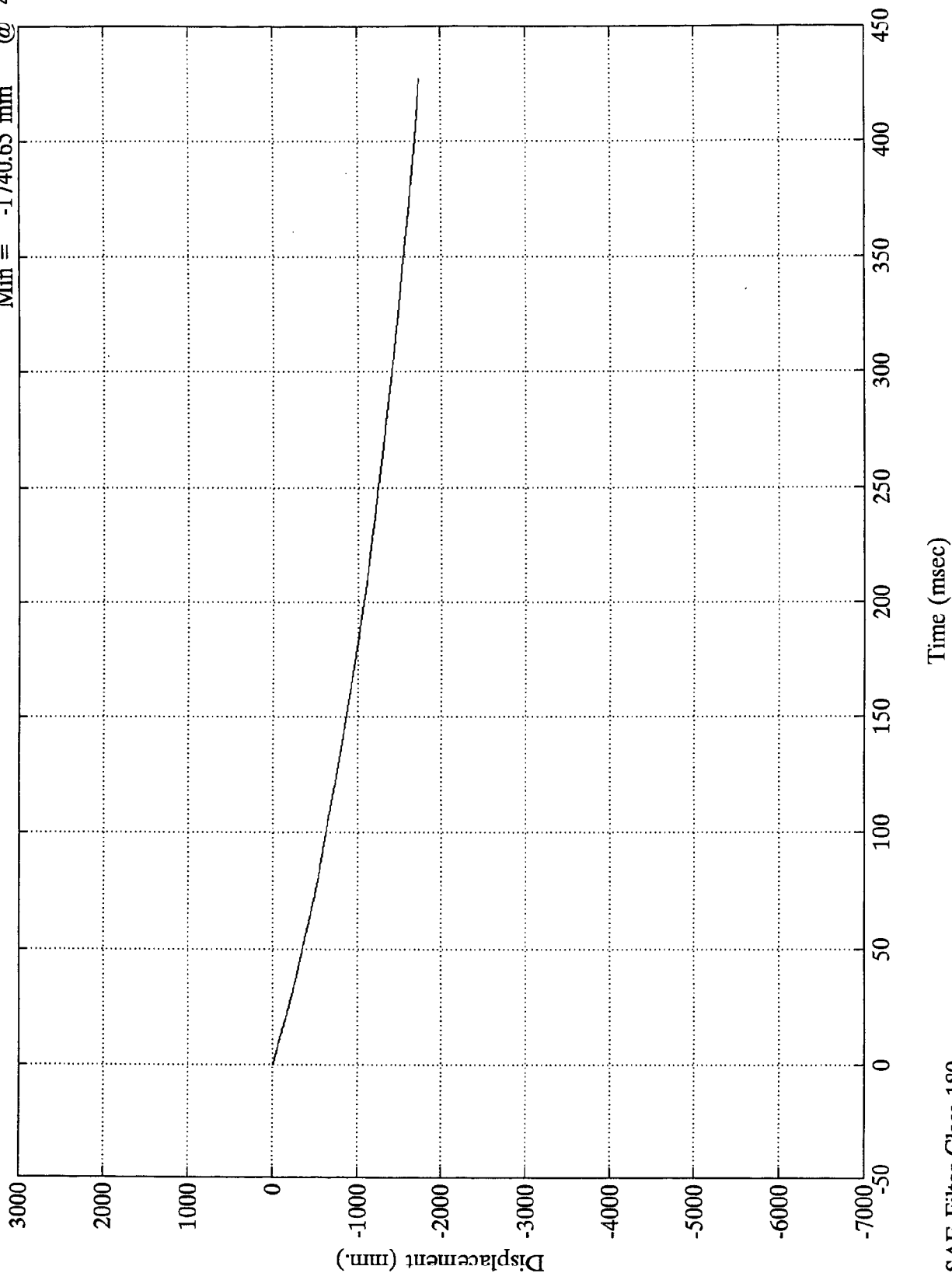


SAE Filter Class 180

VTV TEST #4

Acc 1 MDB Left Rail Y

Max = .00 mm @ -0.00 msec
Min = -1740.65 mm @ 427.32 msec

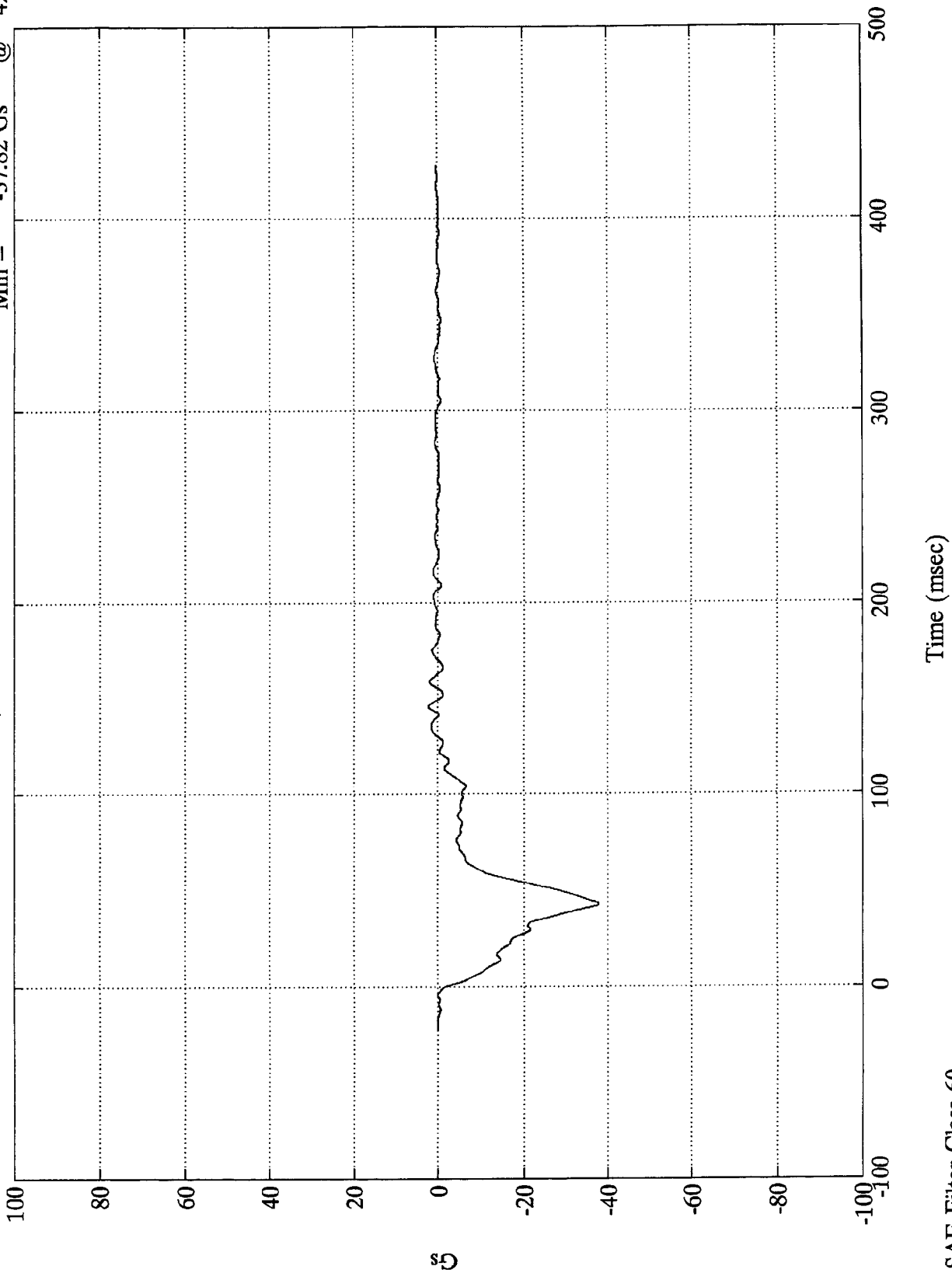


SAE Filter Class 180

VTV TEST #4

Acc 2 MDB Right Rail X

Max = 2.24 Gs @ 145.56 msec
Min = -37.82 Gs @ 42.24 msec

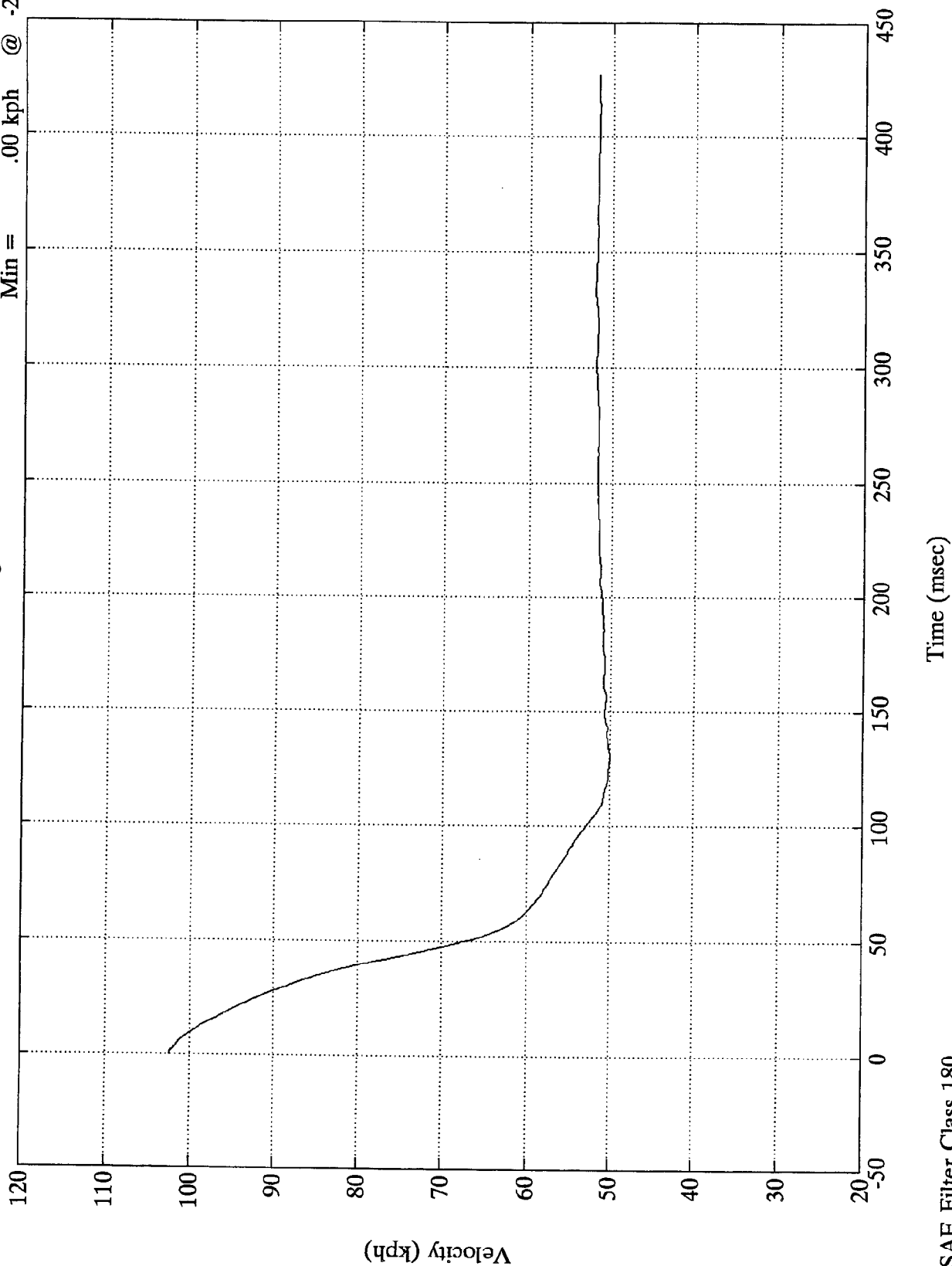


SAE Filter Class 60

VTV TEST #4

Acc 2 MDB Right Rail X

Max = 102.29 kph @ -0.00 msec
Min = .00 kph @ -22.44 msec

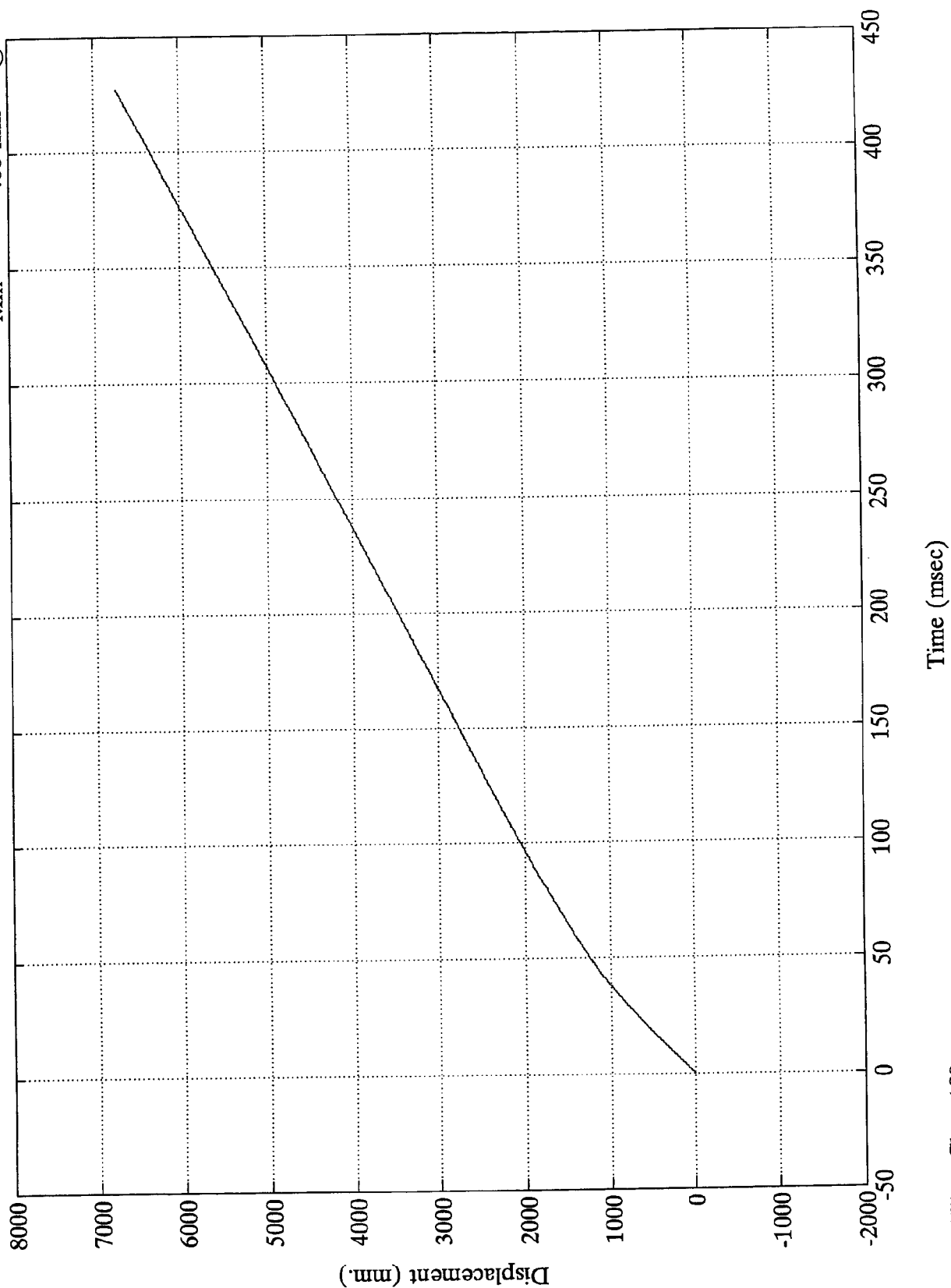


SAE Filter Class 180

VTV TEST #4

Acc 2 MDB Right Rail X

Max = 6728.40 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec

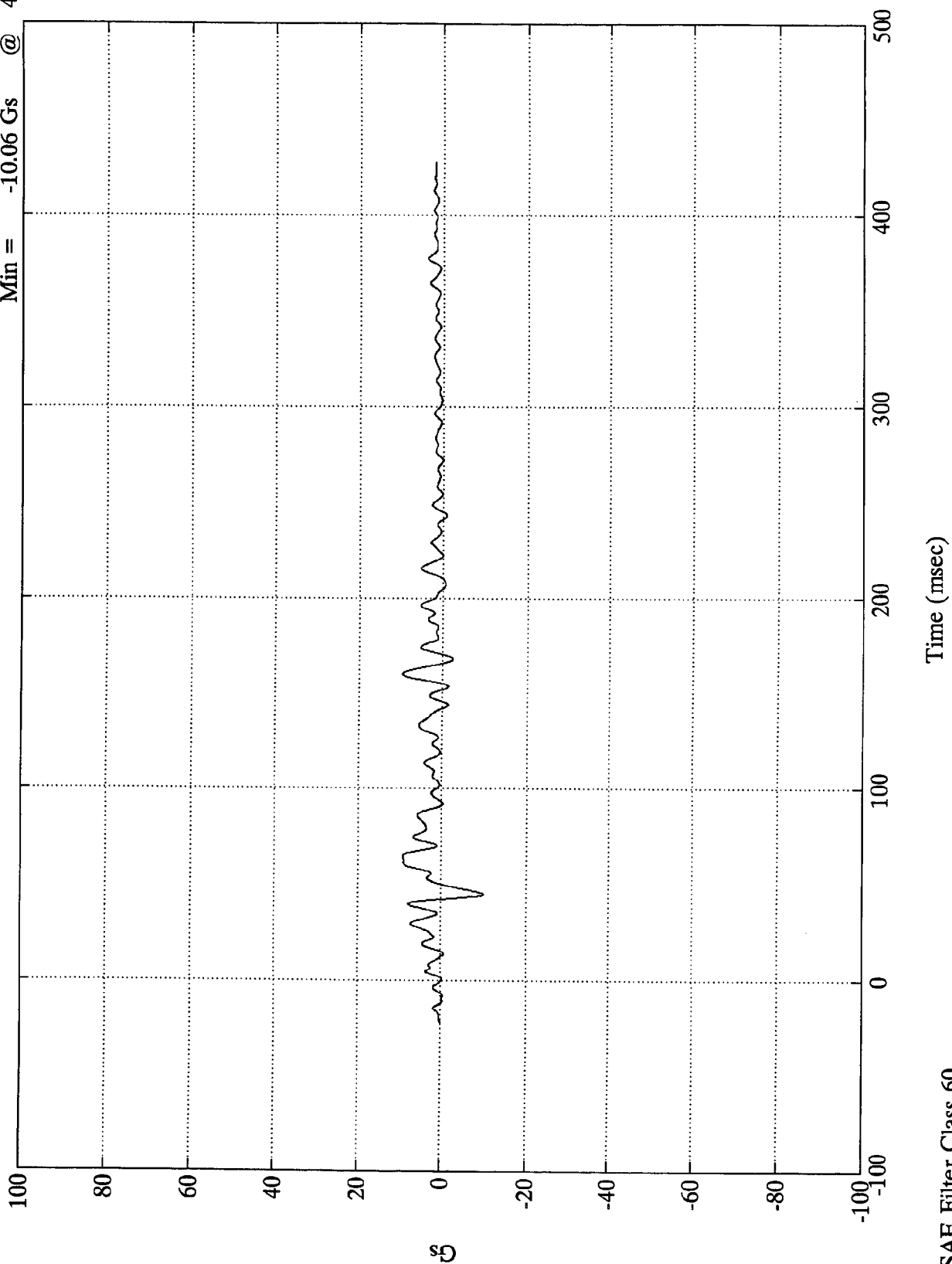


SAE Filter Class 180

VTV TEST #4

Acc 2 MDB Right Rail Y

Max = 9.58 Gs @ 160.19 msec
Min = -10.06 Gs @ 45.12 msec

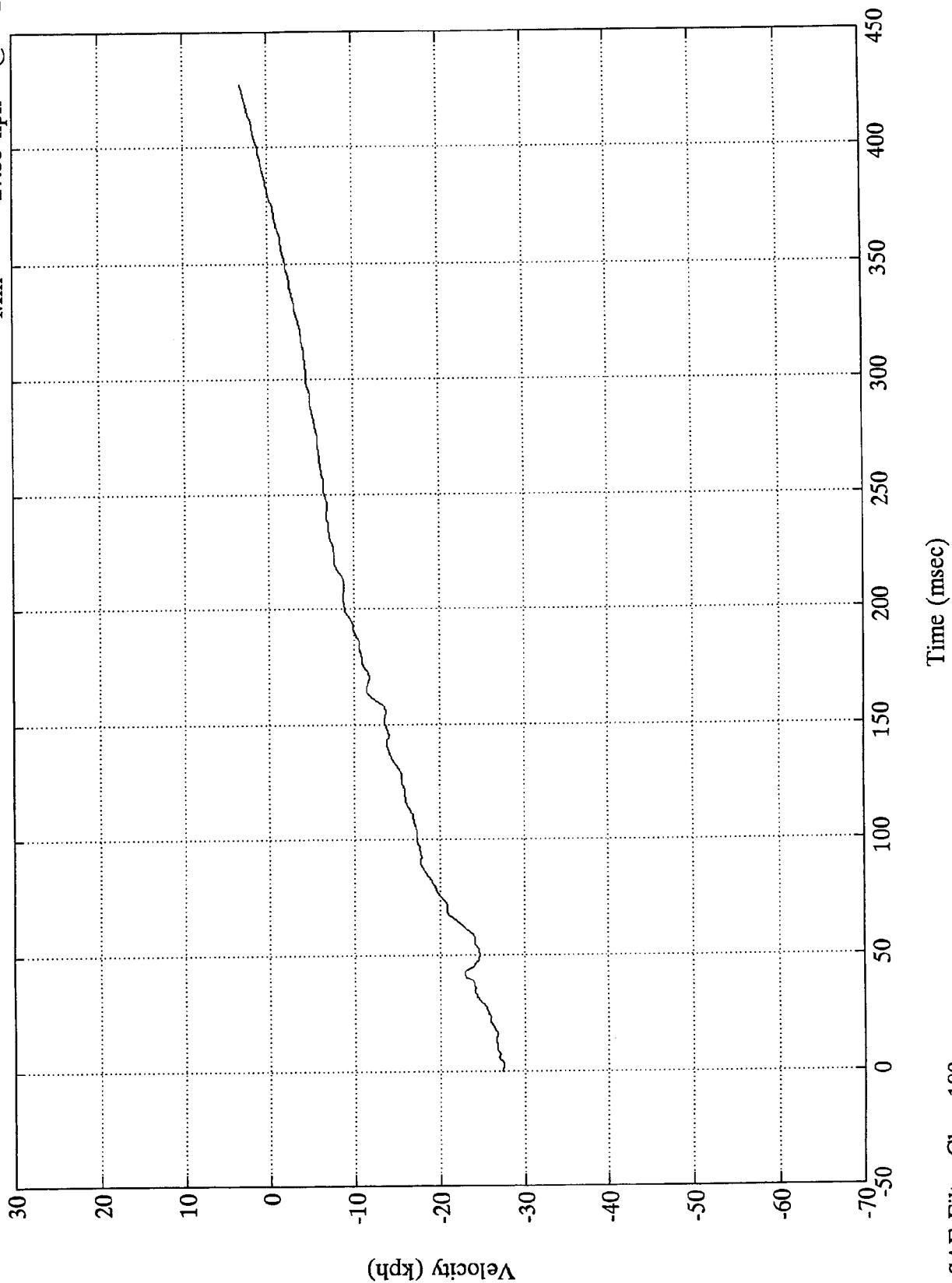


SAE Filter Class 60

VTV TEST #4

Acc 2 MDB Right Rail Y

Max = 3.20 kph @ 427.32 msec
Min = -27.53 kph @ 2.75 msec

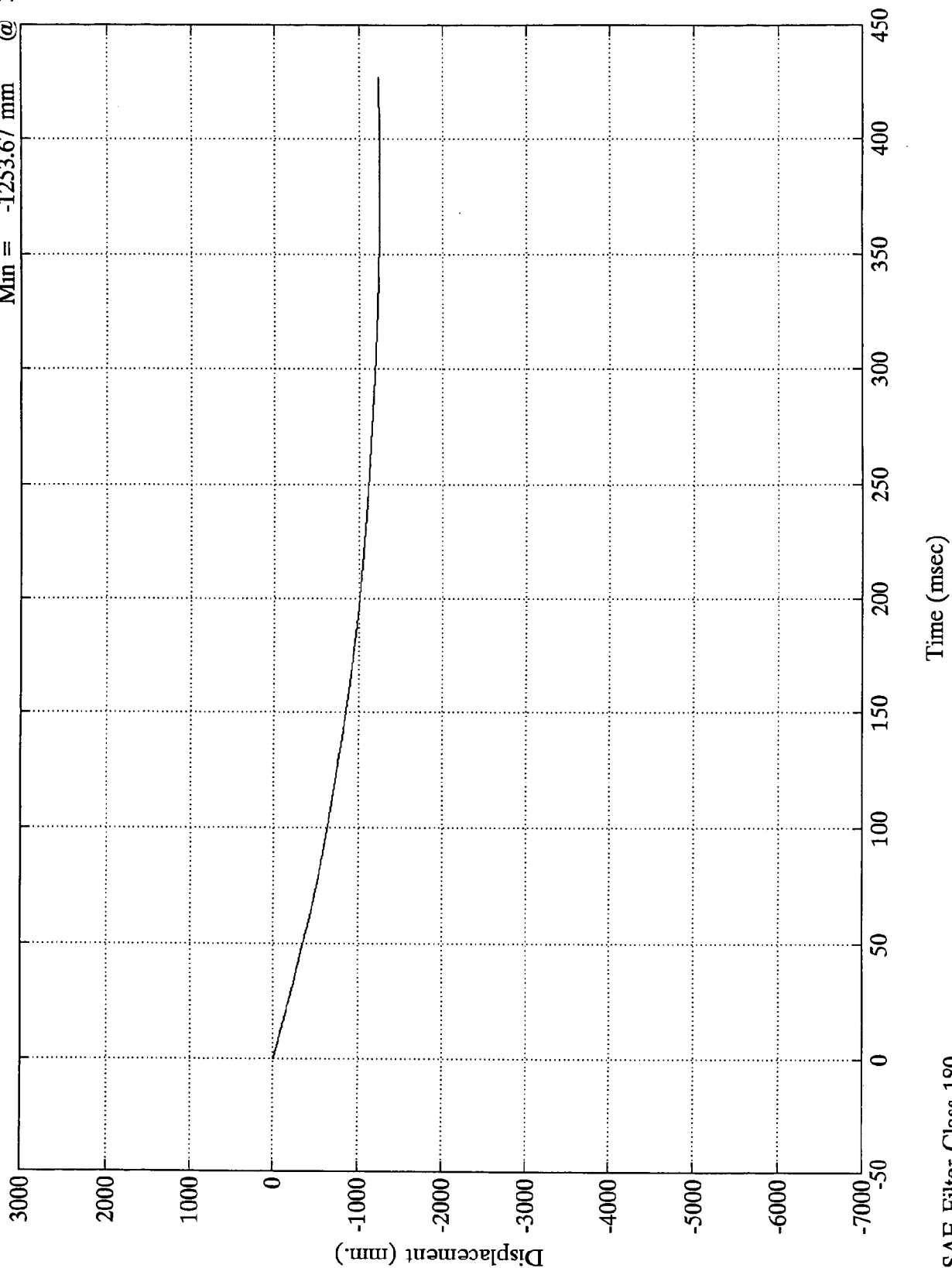


SAE Filter Class 180

VTV TEST #4

Acc 2 MDB Right Rail Y

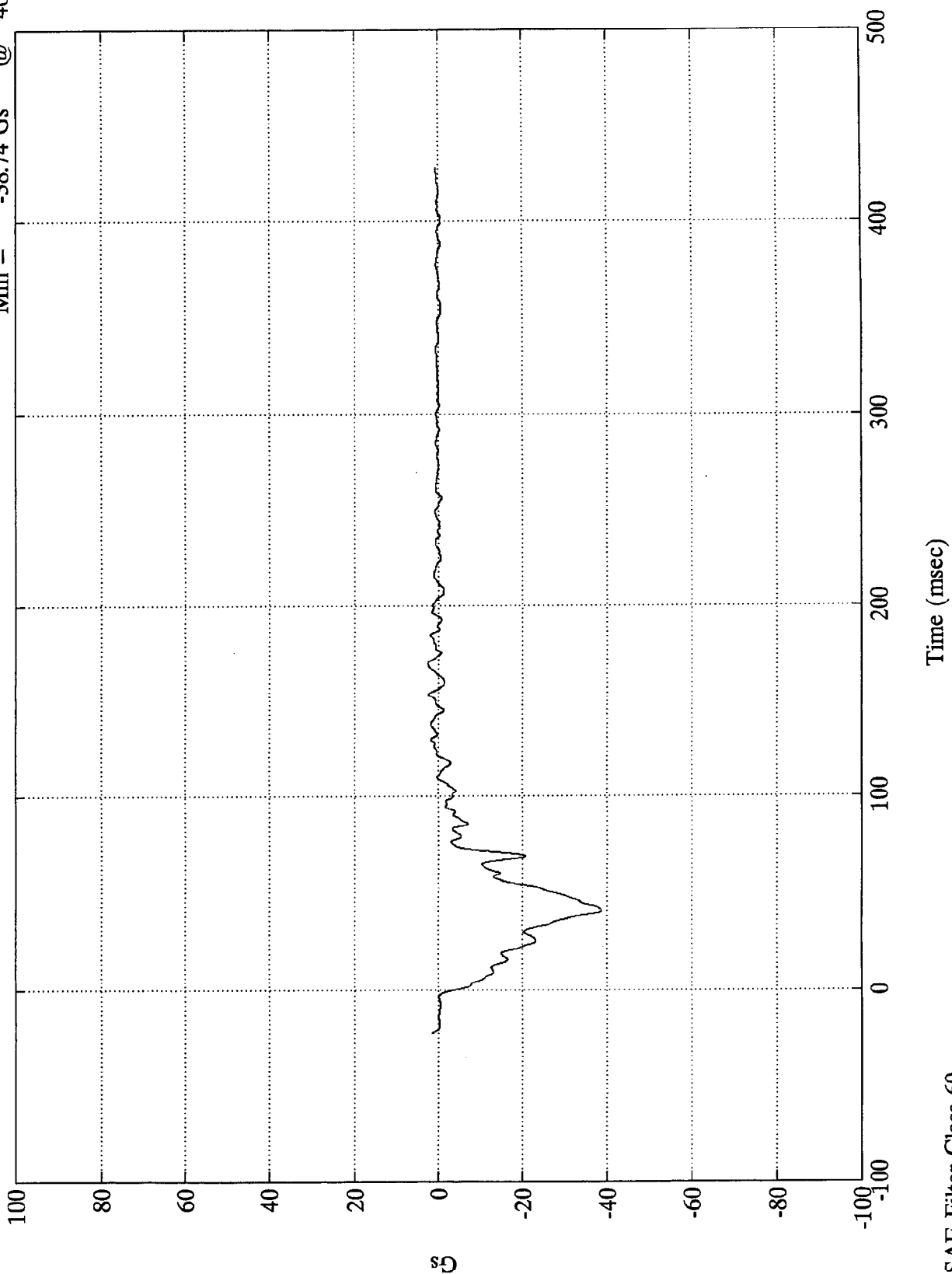
Max = .00 mm @ -0.00 msec
Min = -1253.67 mm @ 380.04 msec



SAE Filter Class 180

VTV TEST #4

Acc 3 MDB C.G. X Max = 2.62 Gs @ 170.04 msec
 Min = -38.74 Gs @ 40.92 msec

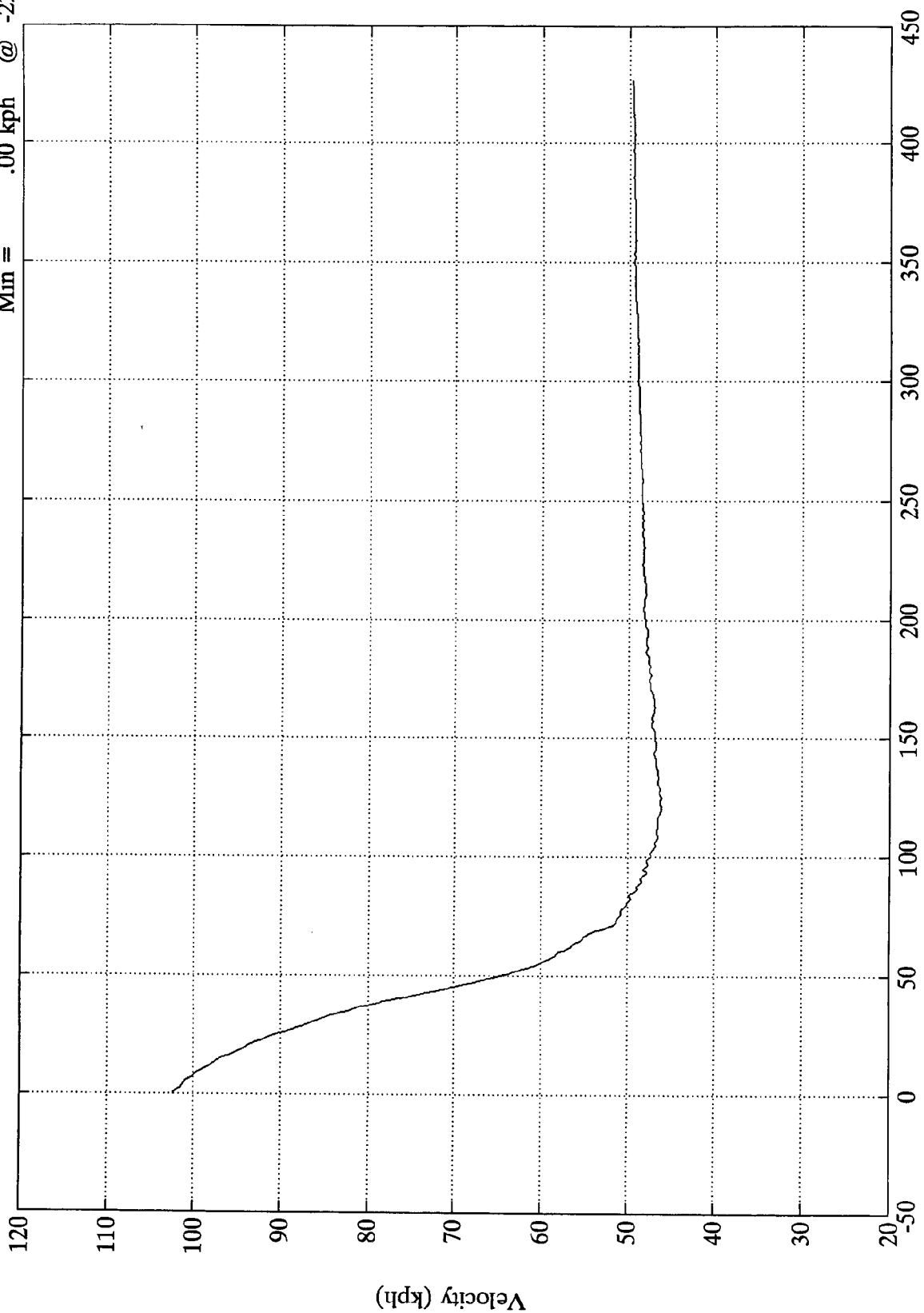


SAE Filter Class 60

VTV TEST #4

Acc 3 MDB C.G. X

Max = 102.29 kph @ -0.00 msec
Min = .00 kph @ -22.44 msec



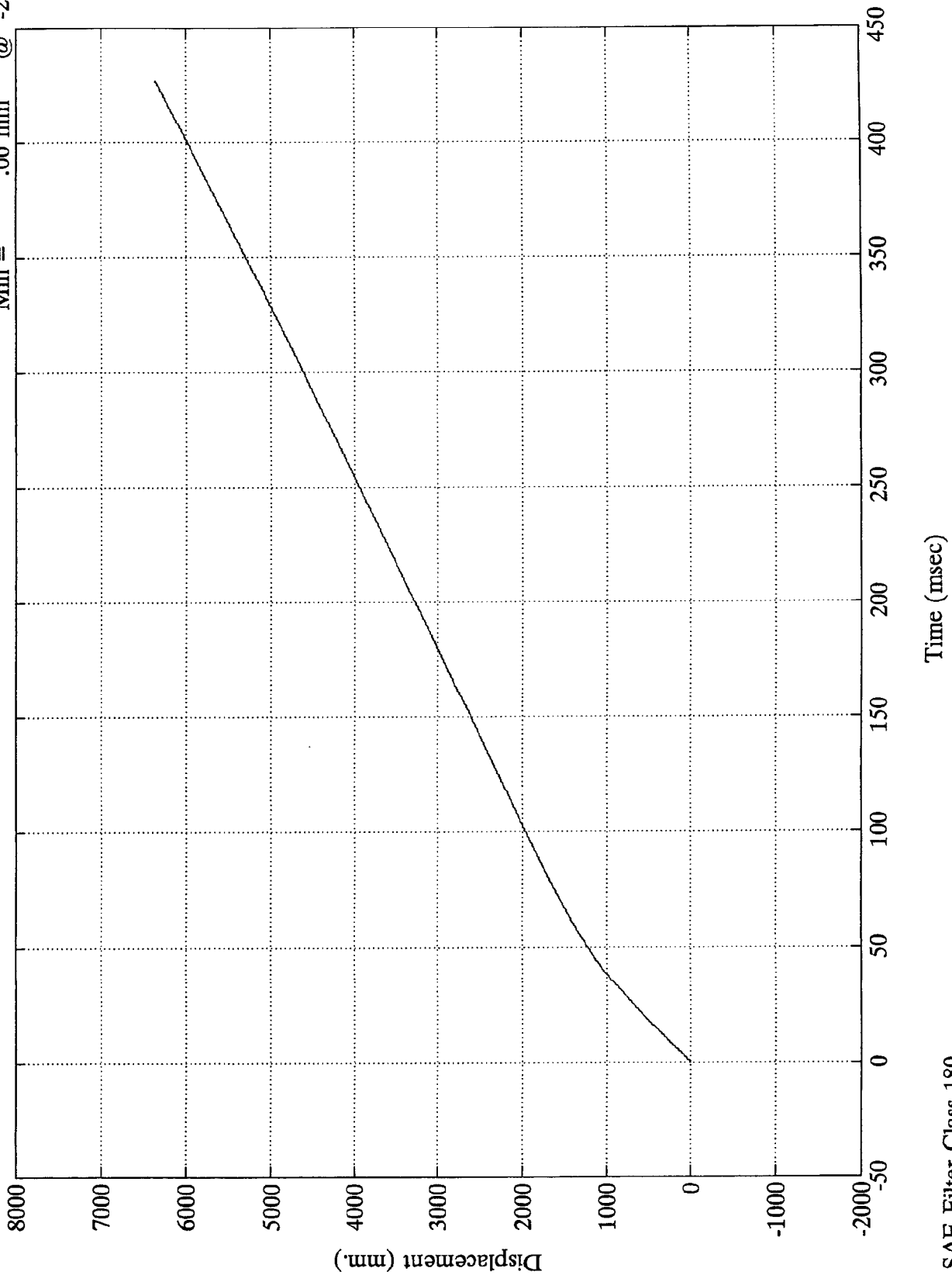
Time (msec)

SAE Filter Class 180

VTV TEST #4

Acc 3 MDB C.G. X

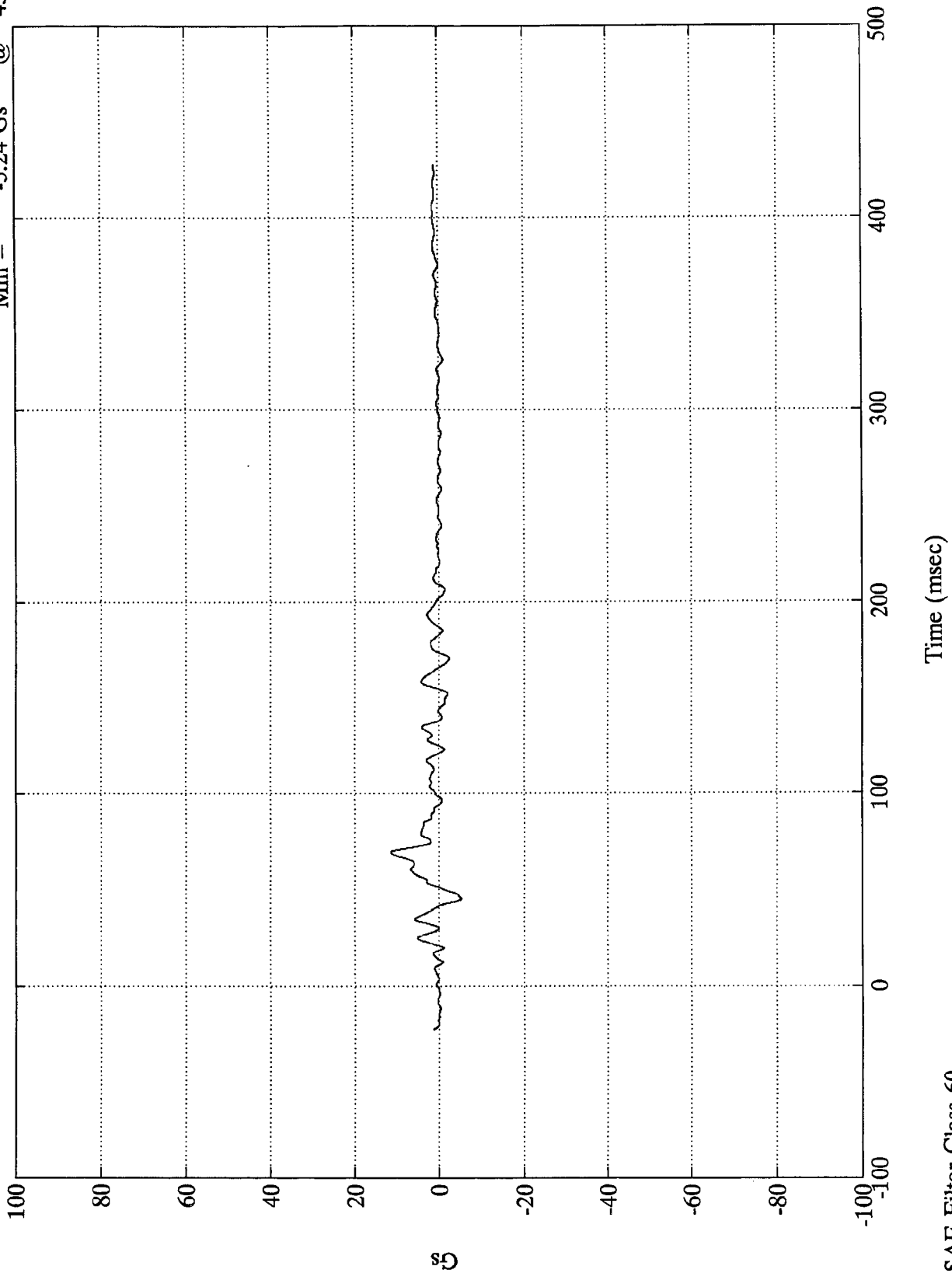
Max = 6357.19 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



SAE Filter Class 180

VTV TEST #4

Acc 3 MDB C.G. Y Max = 11.50 Gs @ 69.59 msec
Min = -5.24 Gs @ 45.48 msec

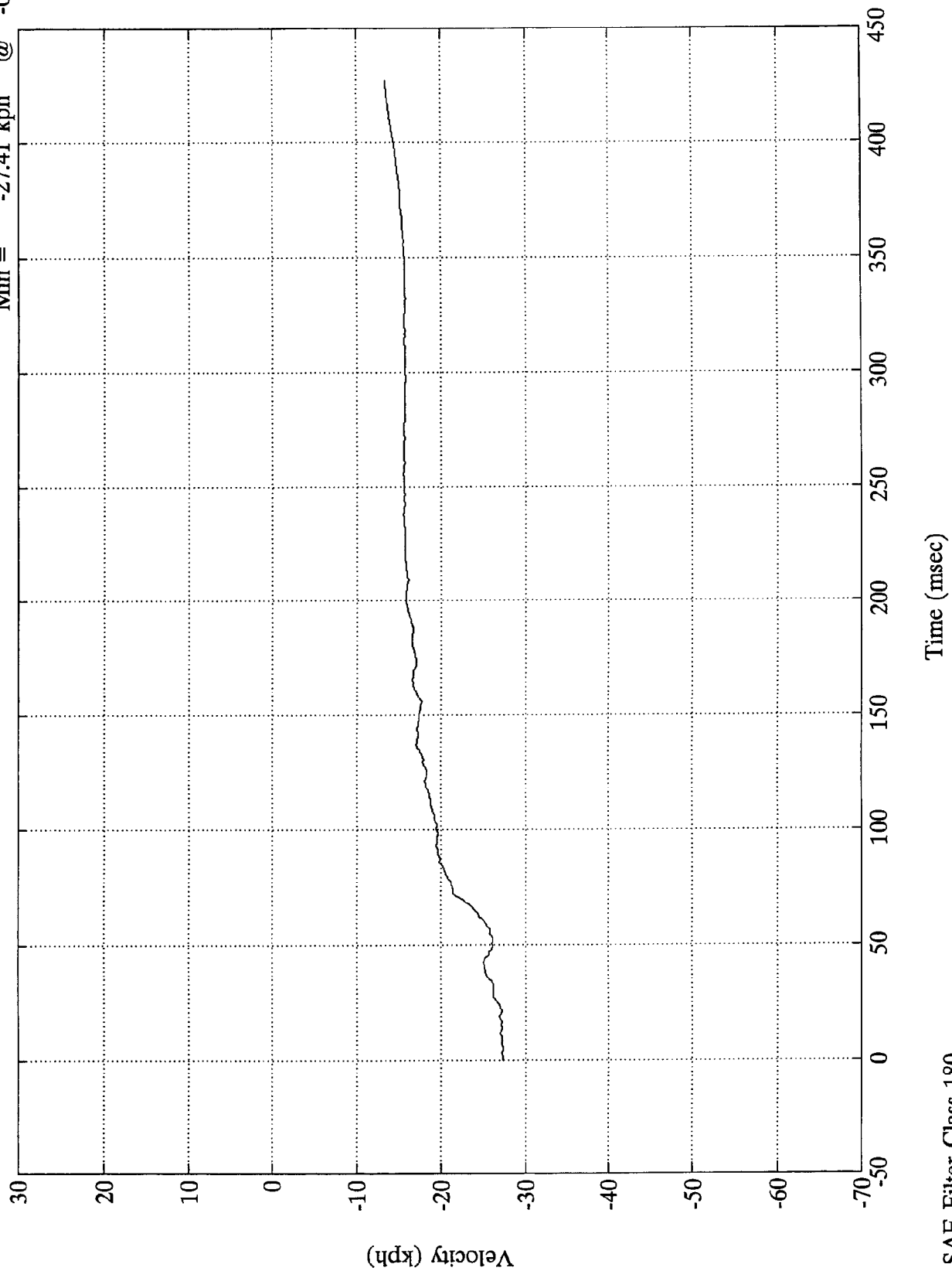


SAE Filter Class 60

VTV TEST #4

Max = .00 kph @ -22.44 msec
Min = -27.41 kph @ -0.00 msec

Acc 3 MDB C.G. Y

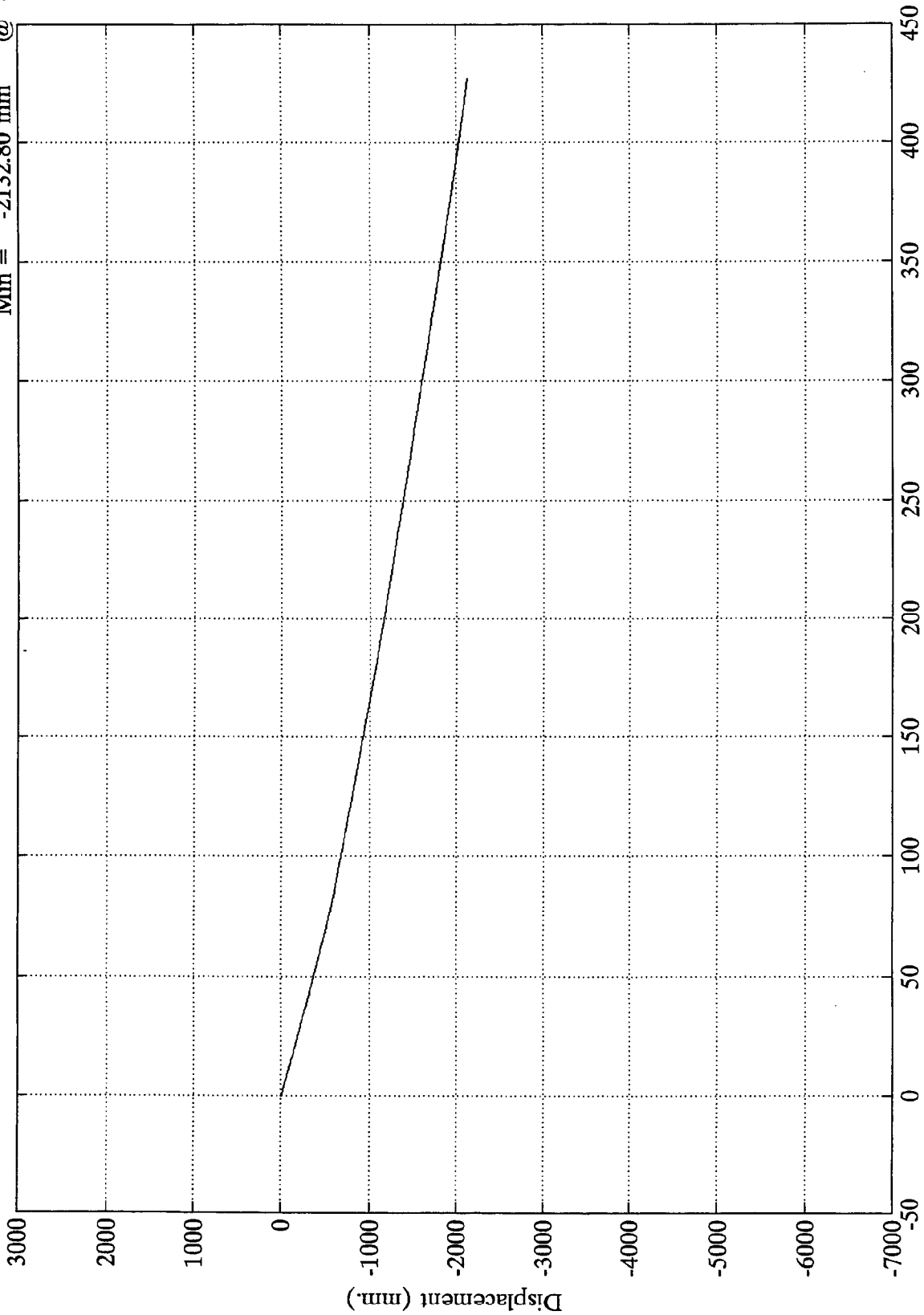


SAE Filter Class 180

VTV TEST #4

Acc 3 MDB C.G. Y

Max = .00 mm @ -0.00 msec
Min = -2132.80 mm @ 427.32 msec

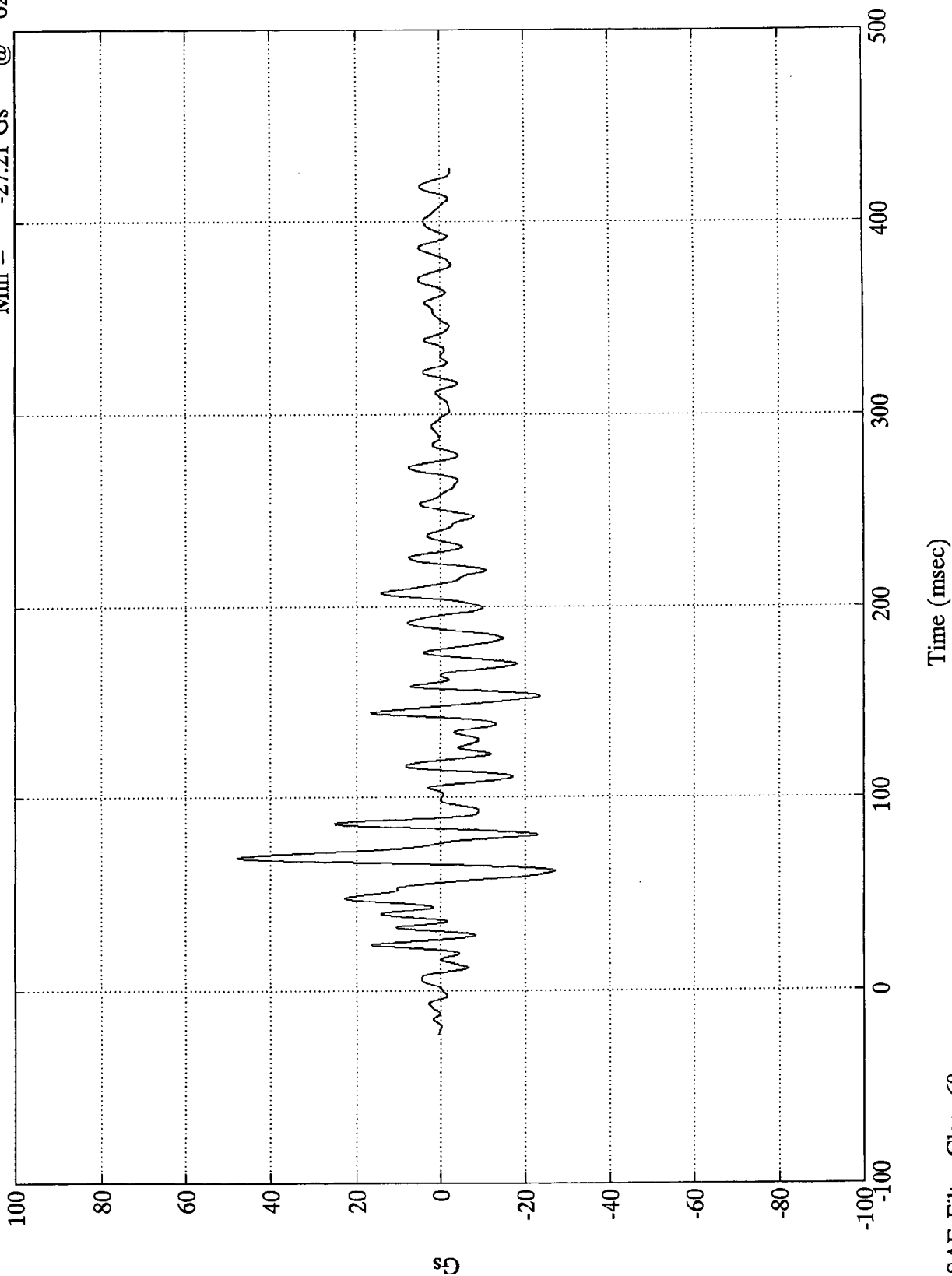


Time (msec)

SAE Filter Class 180

VTV TEST #4

Acc 3 MDB C.G. Z Max = 47.81 Gs @ 68.87 msec
 Min = -27.21 Gs @ 62.04 msec

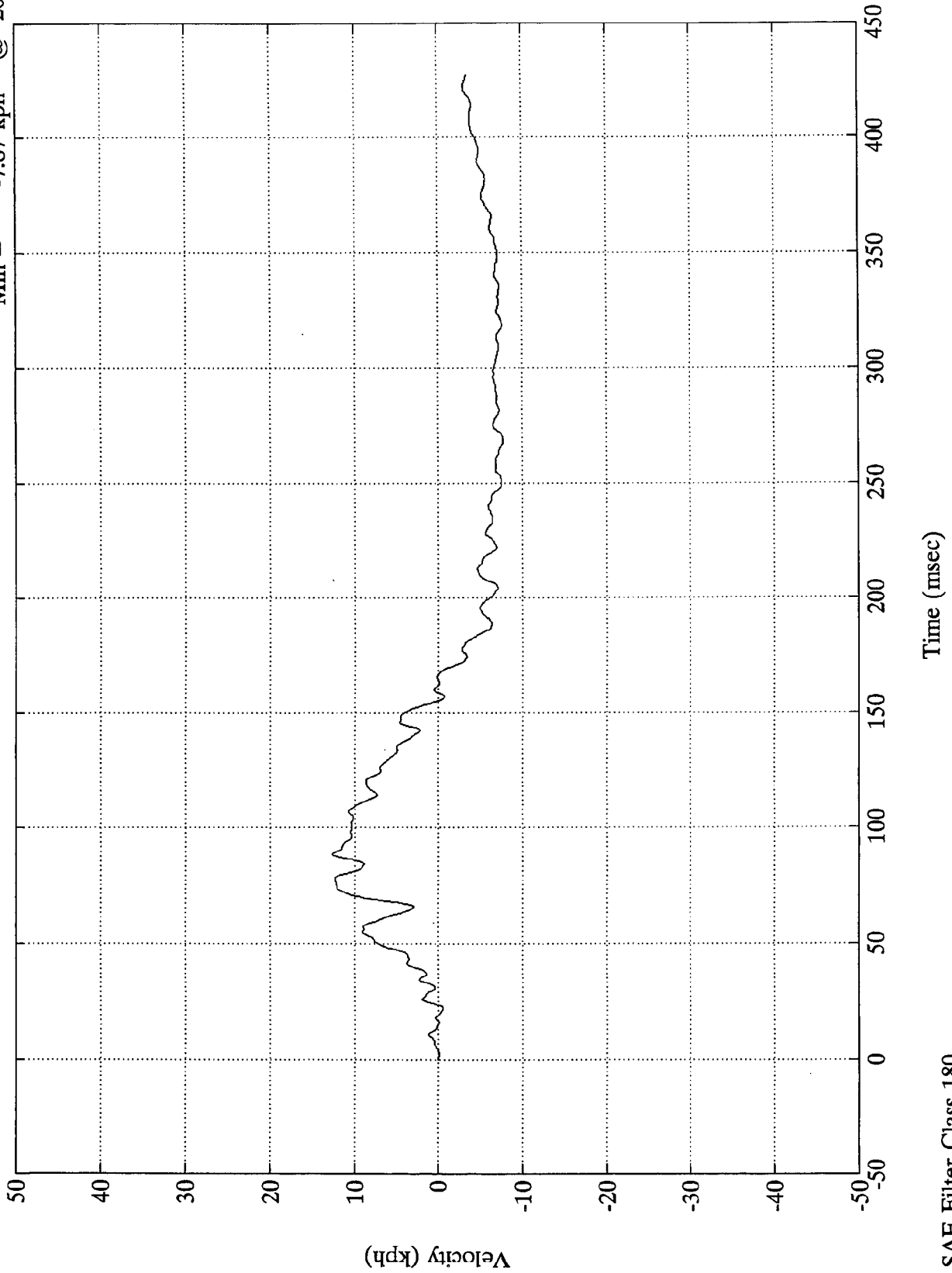


SAE Filter Class 60

VTV TEST #4

Acc 3 MDB C.G. Z

Max = 12.67 kph @ 88.68 msec
Min = -7.87 kph @ 268.92 msec

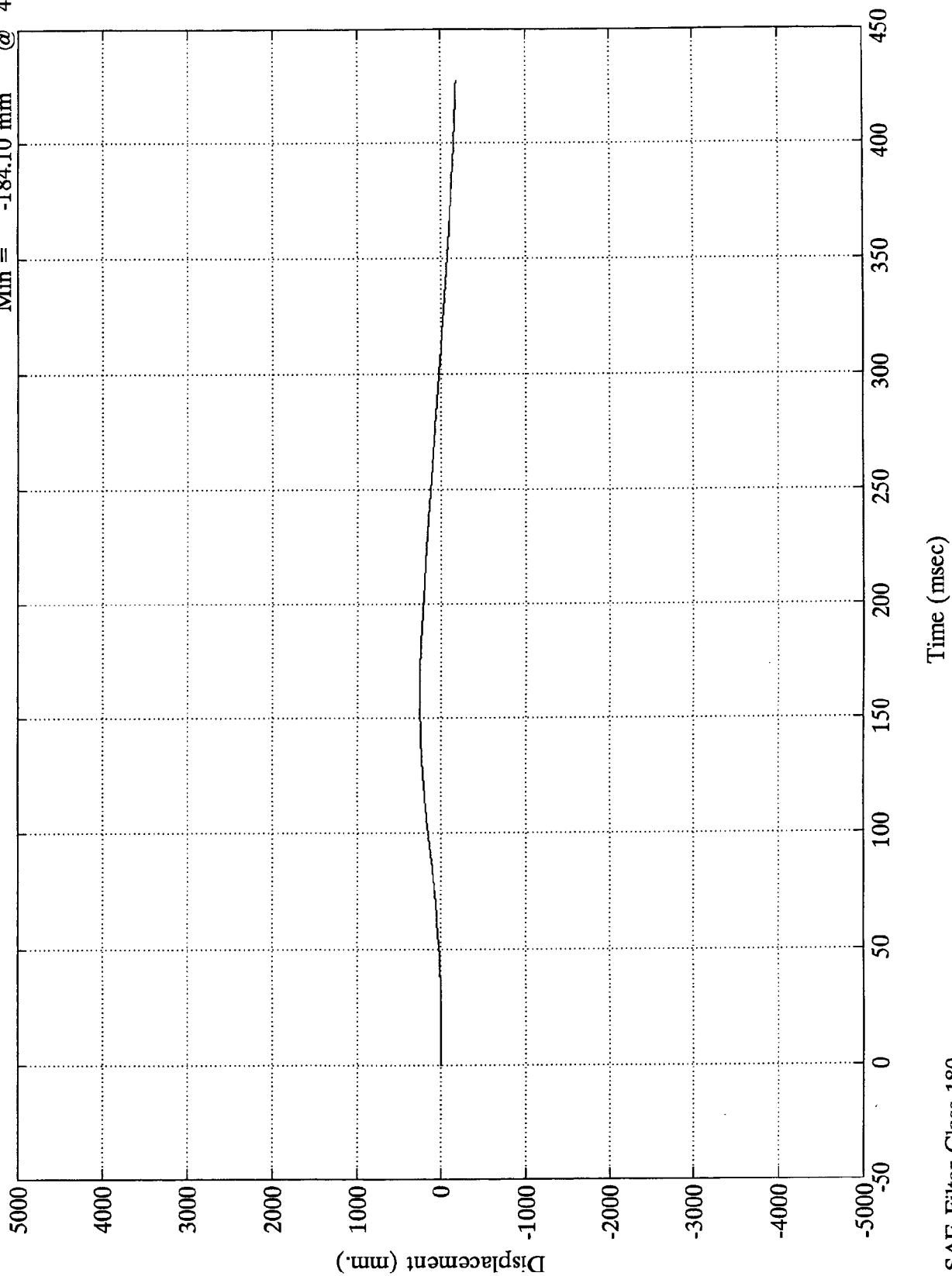


SAE Filter Class 180

VTV TEST #4

Acc 3 MDB C.G. Z

Max = 247.24 mm @ 155.40 msec
Min = -184.10 mm @ 427.32 msec



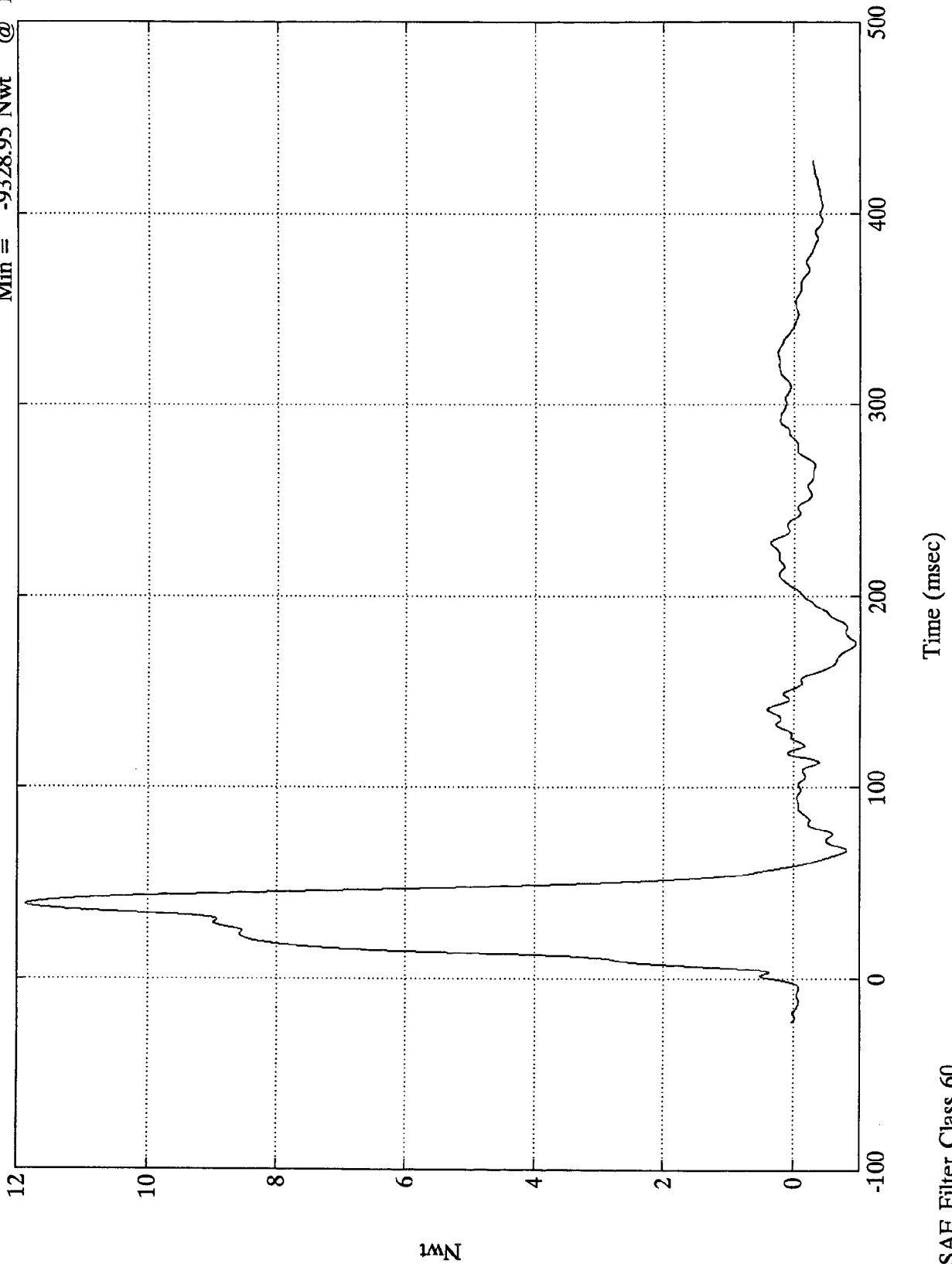
SAE Filter Class 180

VTV TEST #4

$\times 10^4$

MDB Load Cell TL

Max = 118674.24 Nwt @ 38.75 msec
Min = -9328.95 Nwt @ 175.44 msec



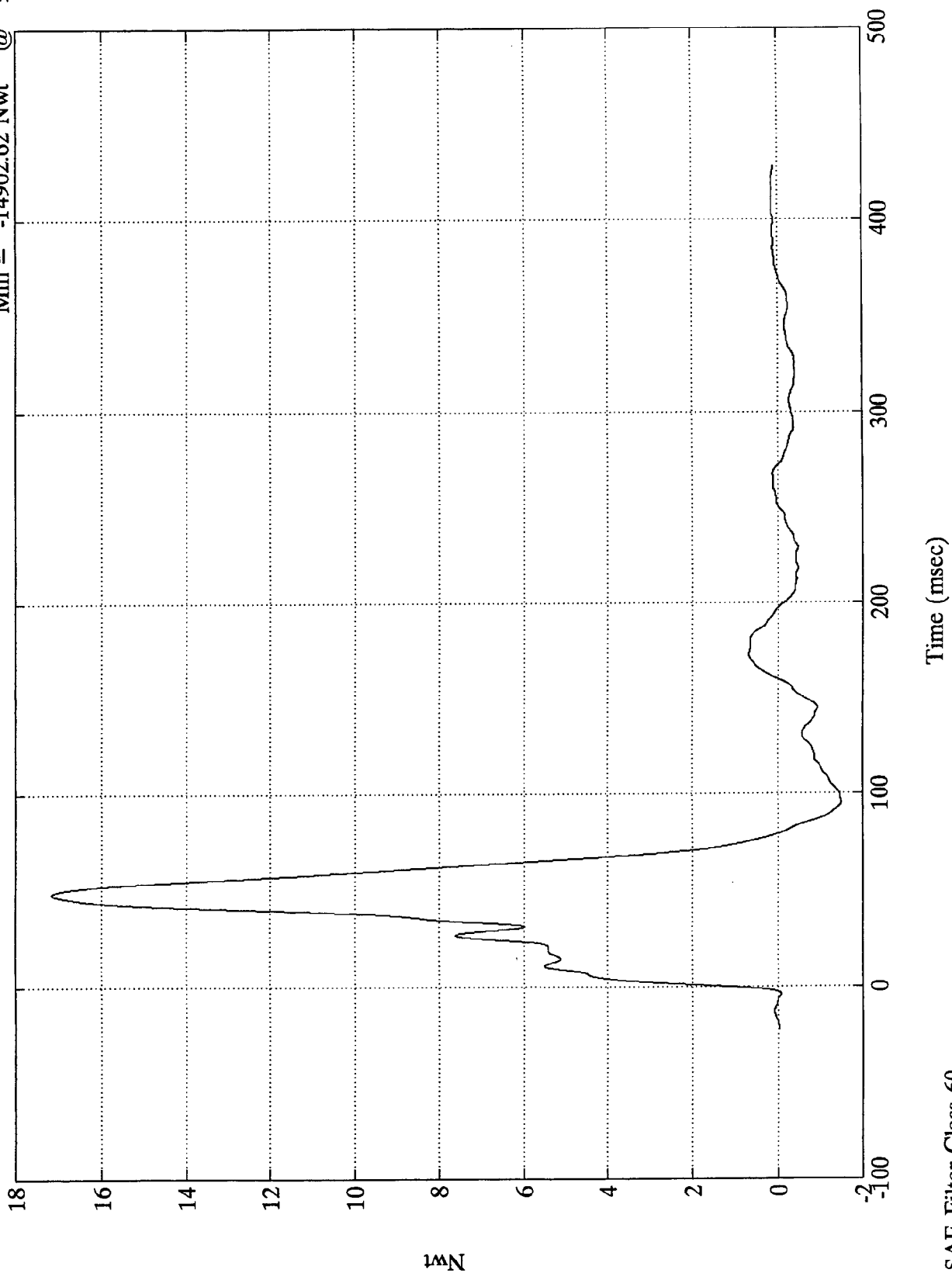
SAE Filter Class 60

VTV TEST #4

$\times 10^4$

MDB Load Cell BL

Max = 171526.67 Nwt @ 48.36 msec
Min = -14902.62 Nwt @ 95.40 msec



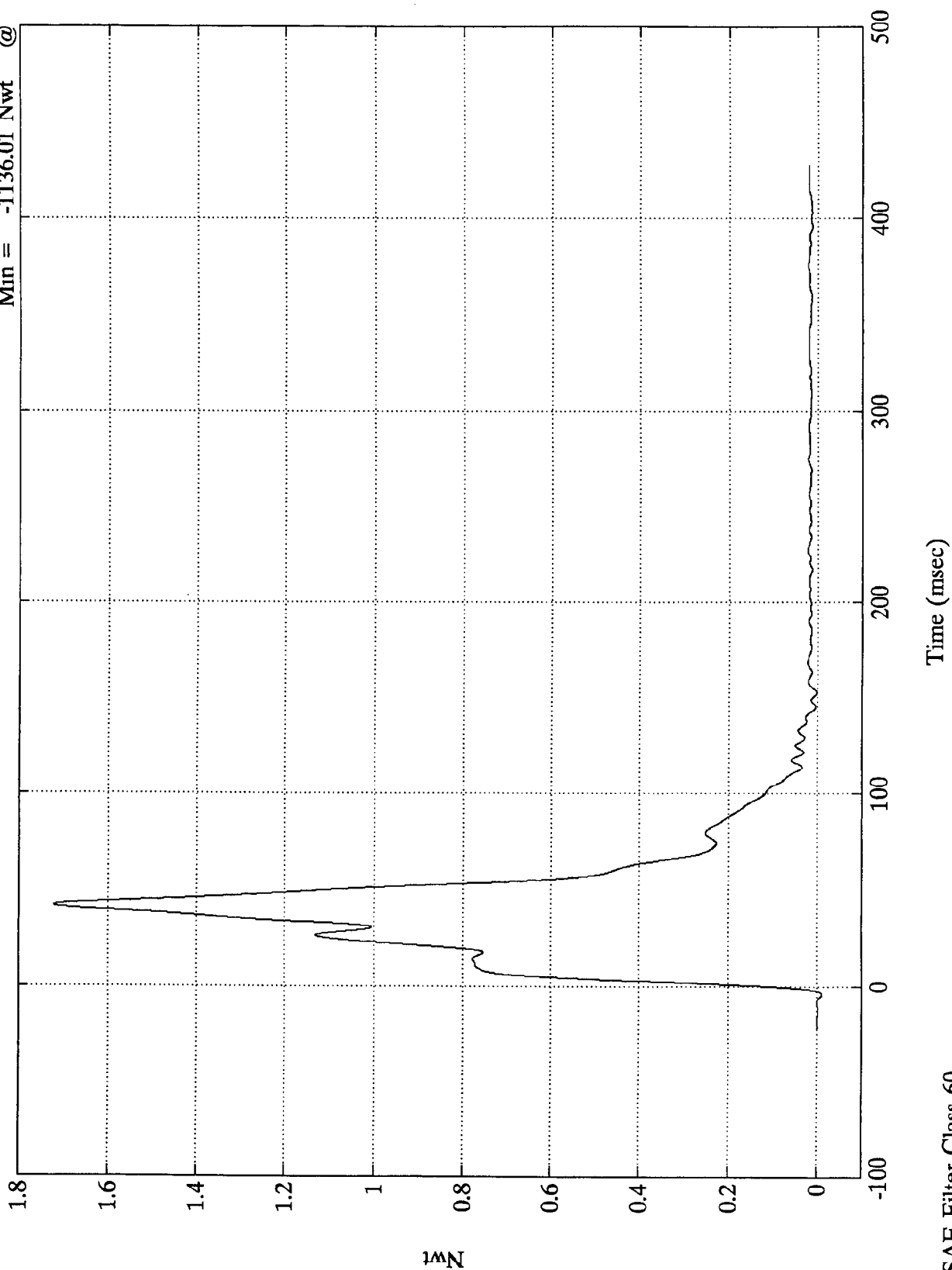
SAE Filter Class 60

VTW TEST #4

Max = 172067.29 Nwt @ 42.12 msec
Min = -1136.01 Nwt @ -3.72 msec

MDB Load Cell CL

$\times 10^5$

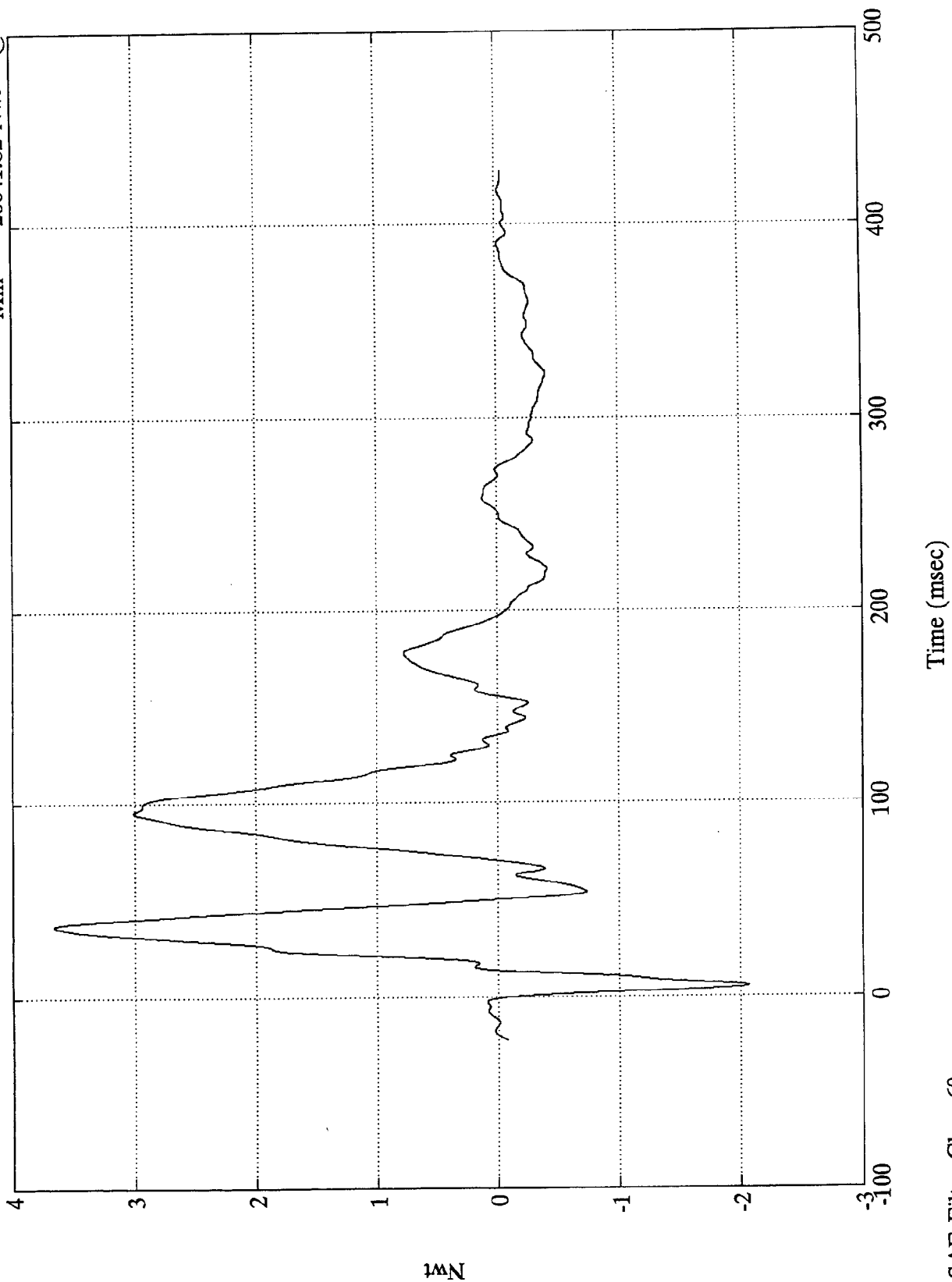


SAE Filter Class 60

VTV TEST #4
x10⁴

Max = 36676.27 Nwt @ 36.96 msec
Min = -20641.82 Nwt @ 5.75 msec

MDB Load Cell TR



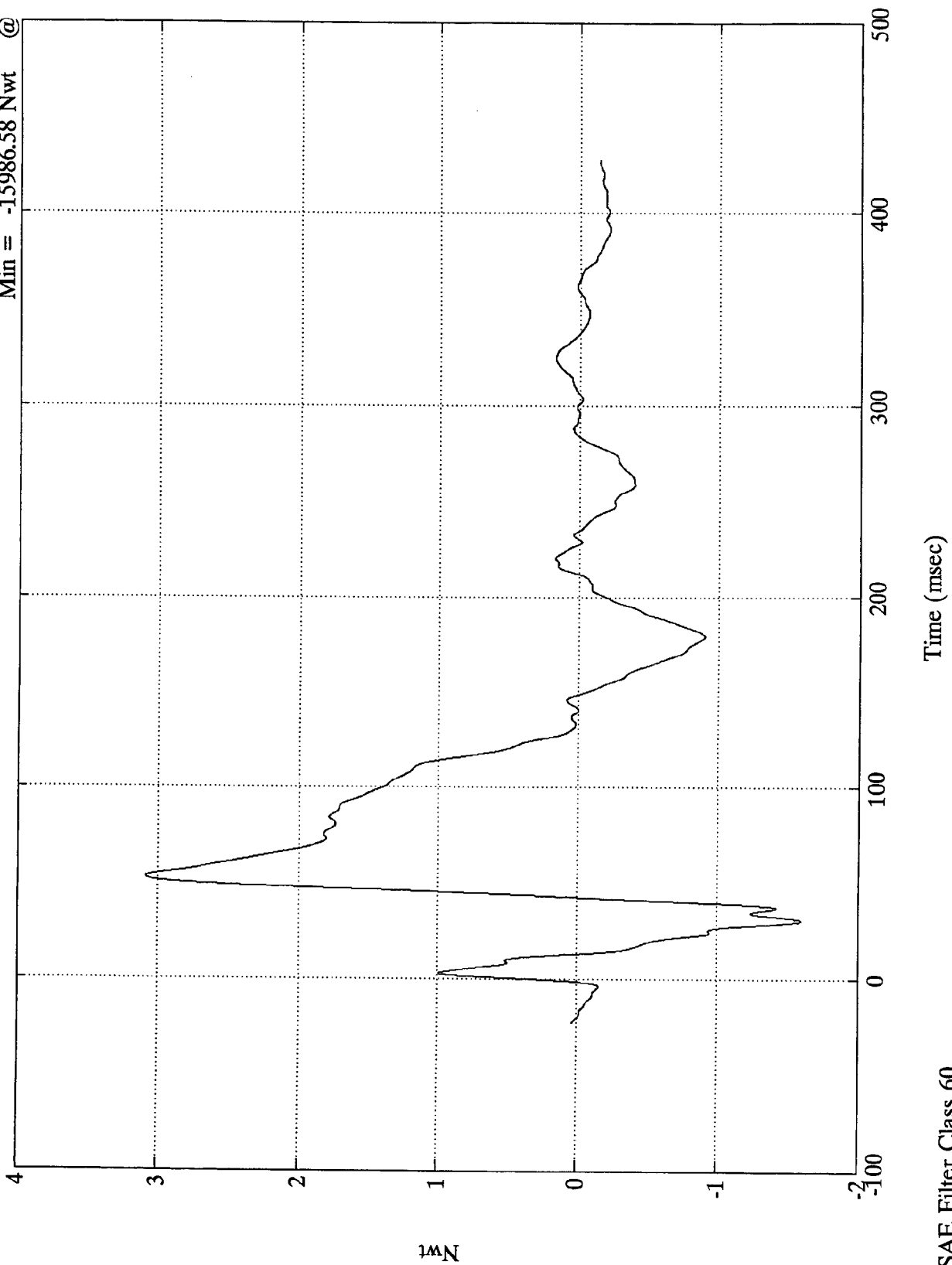
SAE Filter Class 60

VTV TEST #4

Max = 30907.89 Nwt @ 53.40 msec
Min = -15986.58 Nwt @ 30.84 msec

MDB Load Cell BR

$\times 10^4$



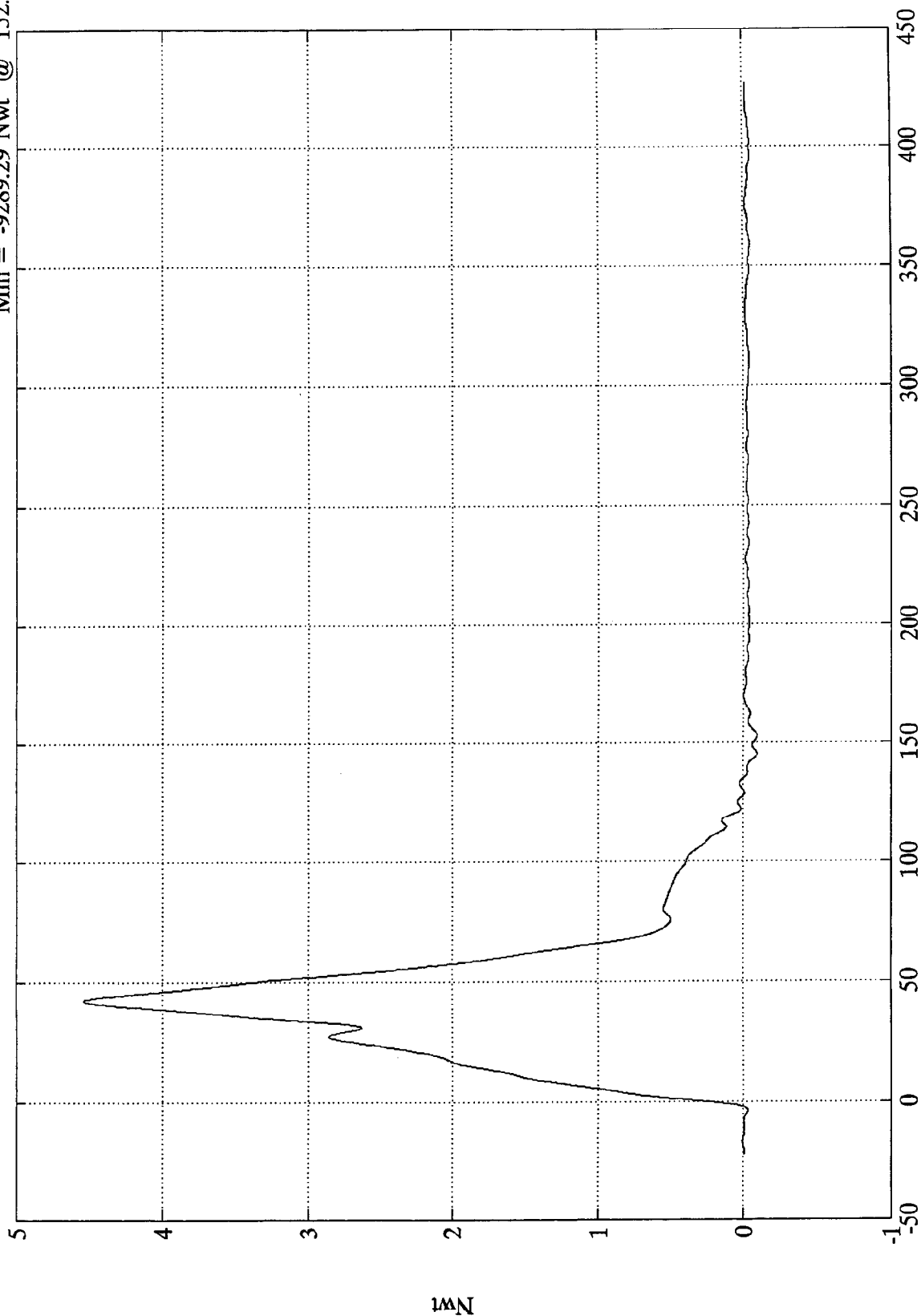
SAE Filter Class 60

VTV TEST #4

$\times 10^5$

MDB Load Cell Sum

Max = 454076.67 Nwt @ 42.48 msec
Min = -9289.29 Nwt @ 152.64 msec



Time (msec) , Load Cells (TR,BR,CL,TL,BL)

SAE Filter Class 60

TEST NO. Y57-4-1602

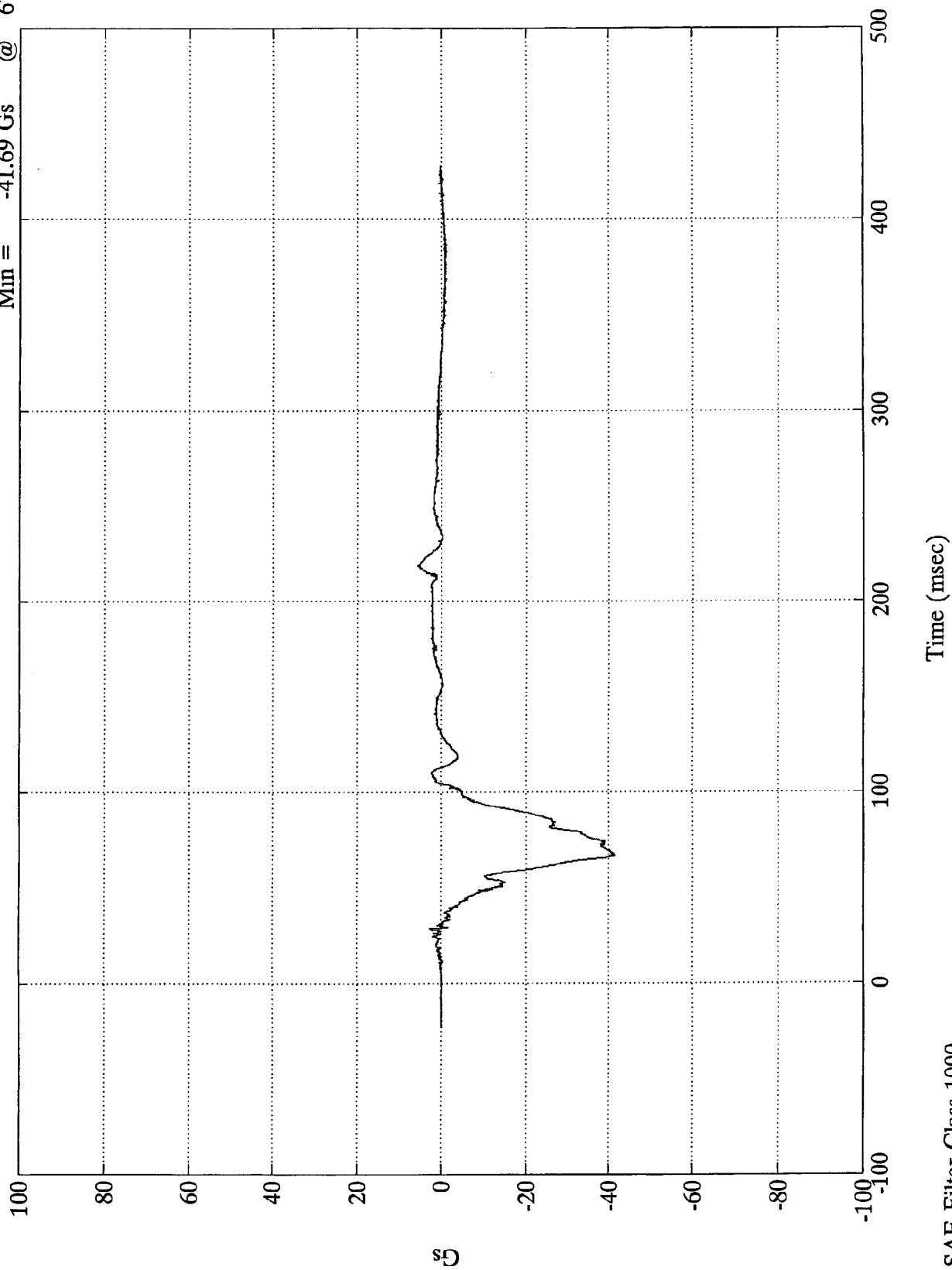
VEHICLE 1 - DUMMY DATA

CHANNEL	SAE FILTER CHANNEL CLASS
Head Accelerations	1000
Chest Accelerations	180
Femur Forces	600
Knee Shear	180
Chest Displacement	180
Neck Forces	1000
Neck Moments	600
Tibia Forces, Moments	600

VTV TEST #4

P1 Head X

Max = 5.66 Gs @ 219.00 msec
Min = -41.69 Gs @ 67.20 msec

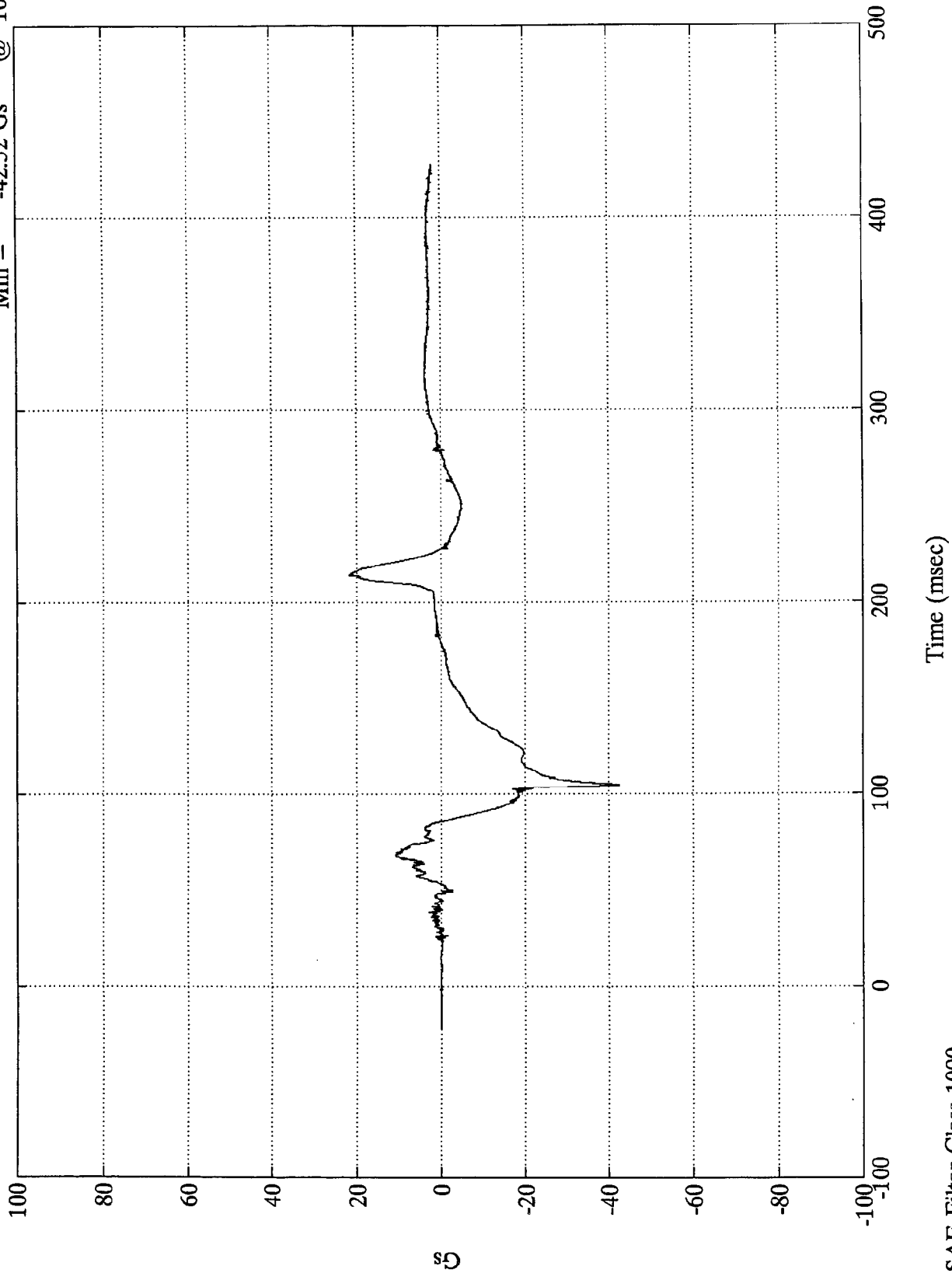


SAE Filter Class 1000

VTV TEST #4

P1 Head Y

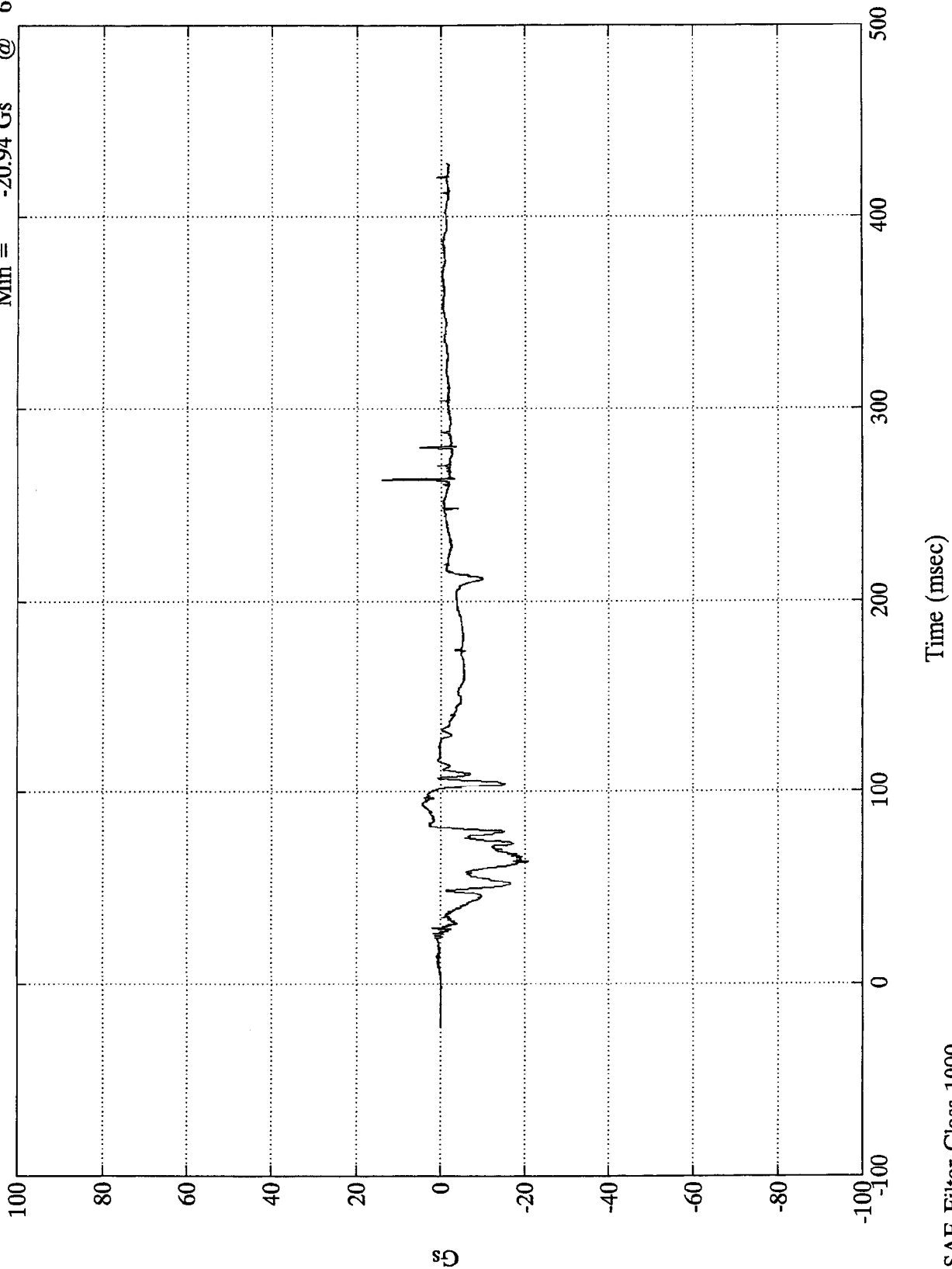
Max = 21.72 Gs @ 214.92 msec
Min = -42.52 Gs @ 104.88 msec



VTV TEST #4

Max = 14.02 Gs @ 263.51 msec
Min = -20.94 Gs @ 63.48 msec

P1 Head Z

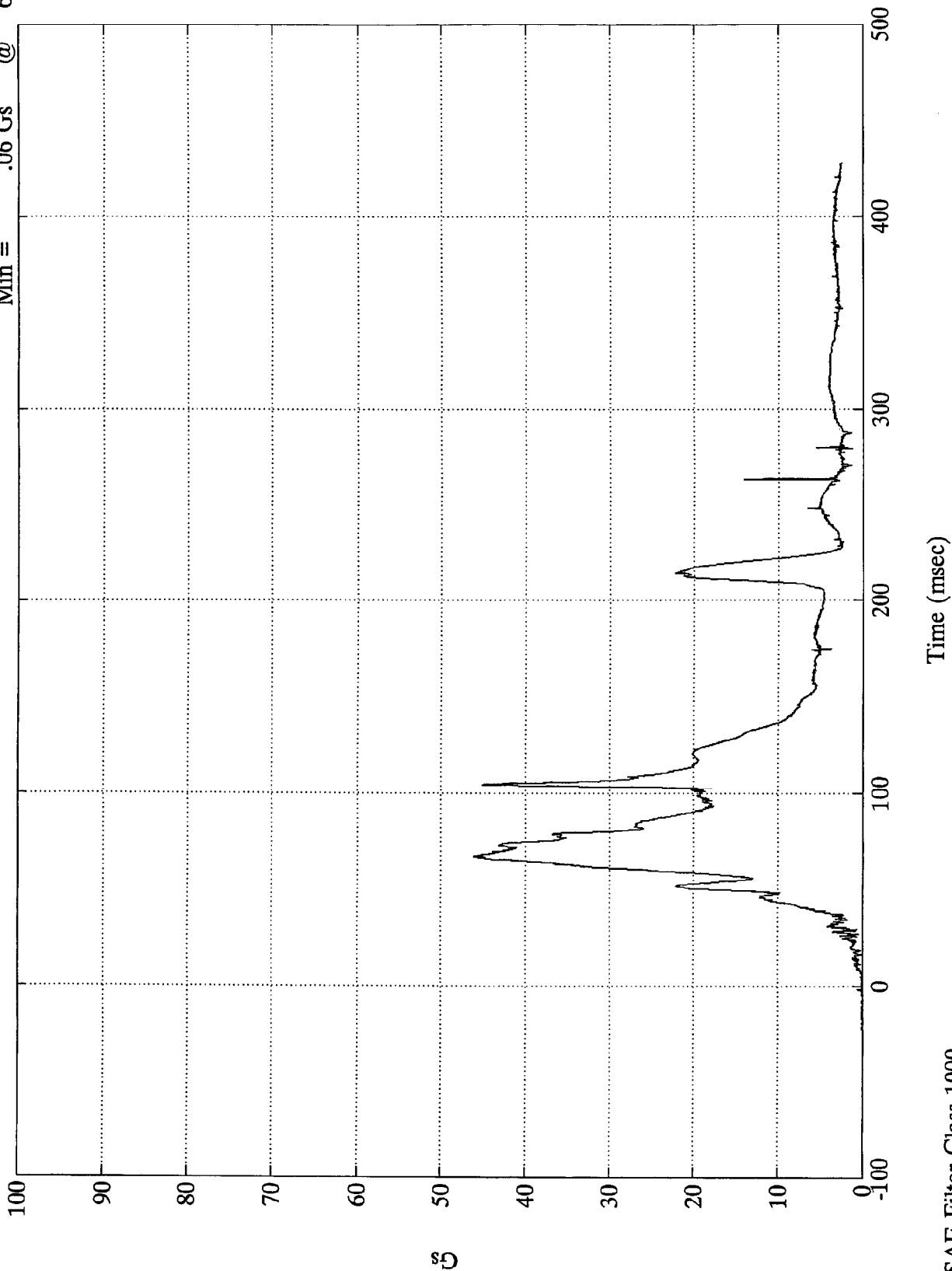


SAE Filter Class 1000

VTV TEST #4

P1 Head Resultant

Max = 46.06 Gs @ 67.44 msec
Min = .06 Gs @ 6.59 msec

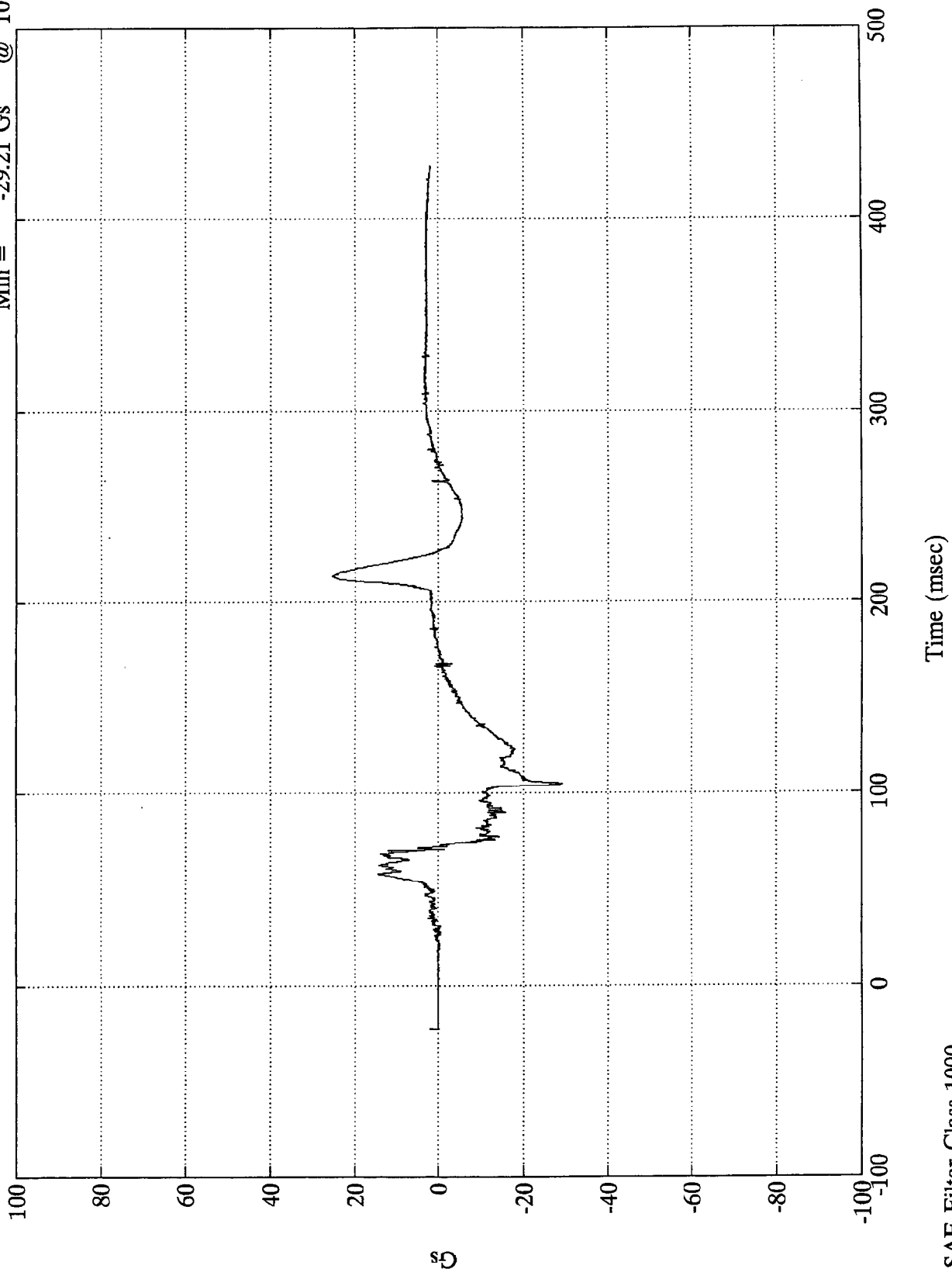


SAE Filter Class 1000

VTV TEST #4

P1 HD9X (Y)

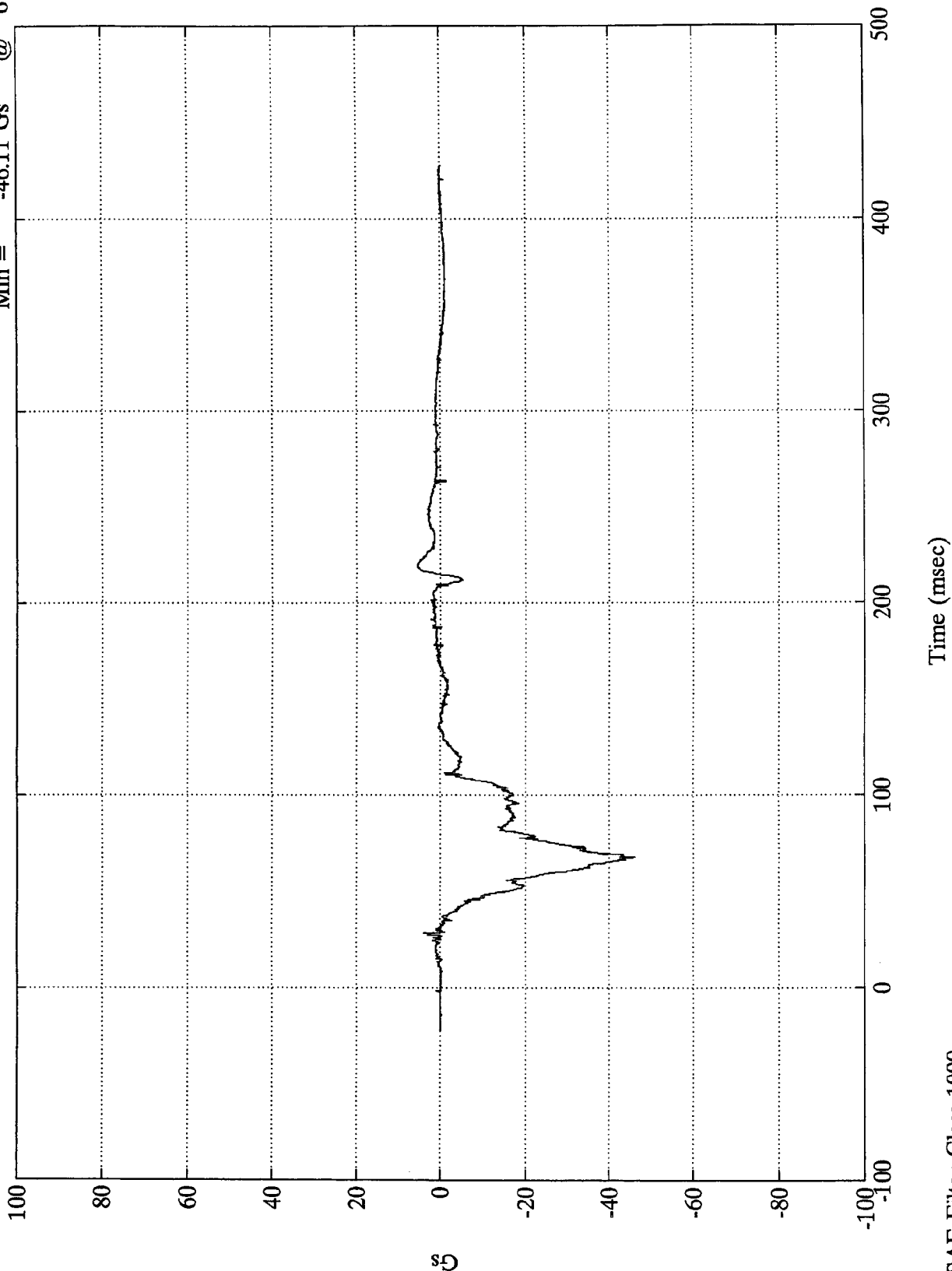
Max = 25.43 Gs @ 213.84 msec
Min = -29.21 Gs @ 104.88 msec



VTV TEST #4

P1 HD9Y (X)

Max = 5.44 Gs @ 219.96 msec
Min = -46.11 Gs @ 67.91 msec

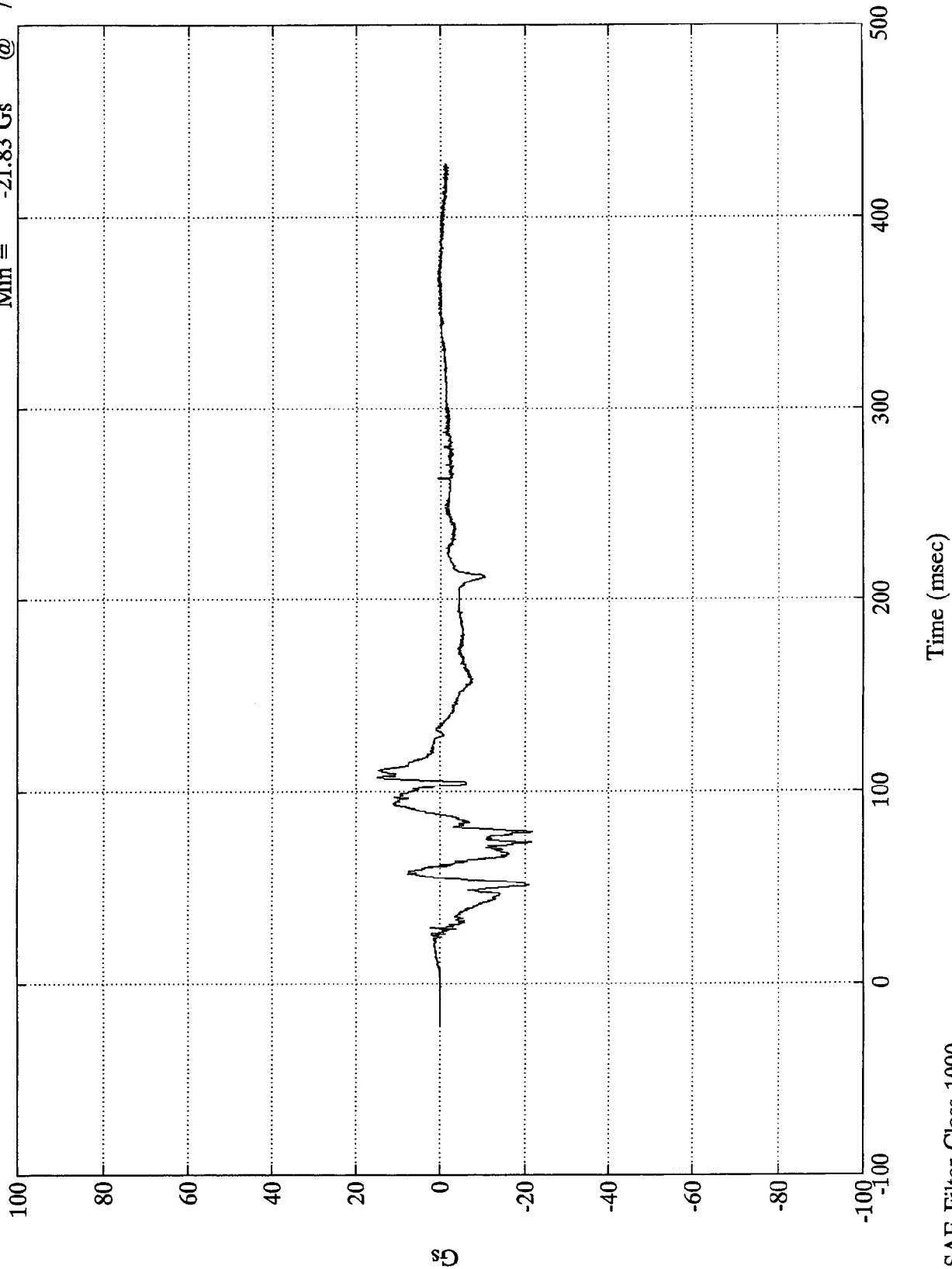


SAE Filter Class 1000

VTV TEST #4

P1 HD9X (Z)

Max = 14.80 Gs @ 108.00 msec
Min = -21.83 Gs @ 79.19 msec

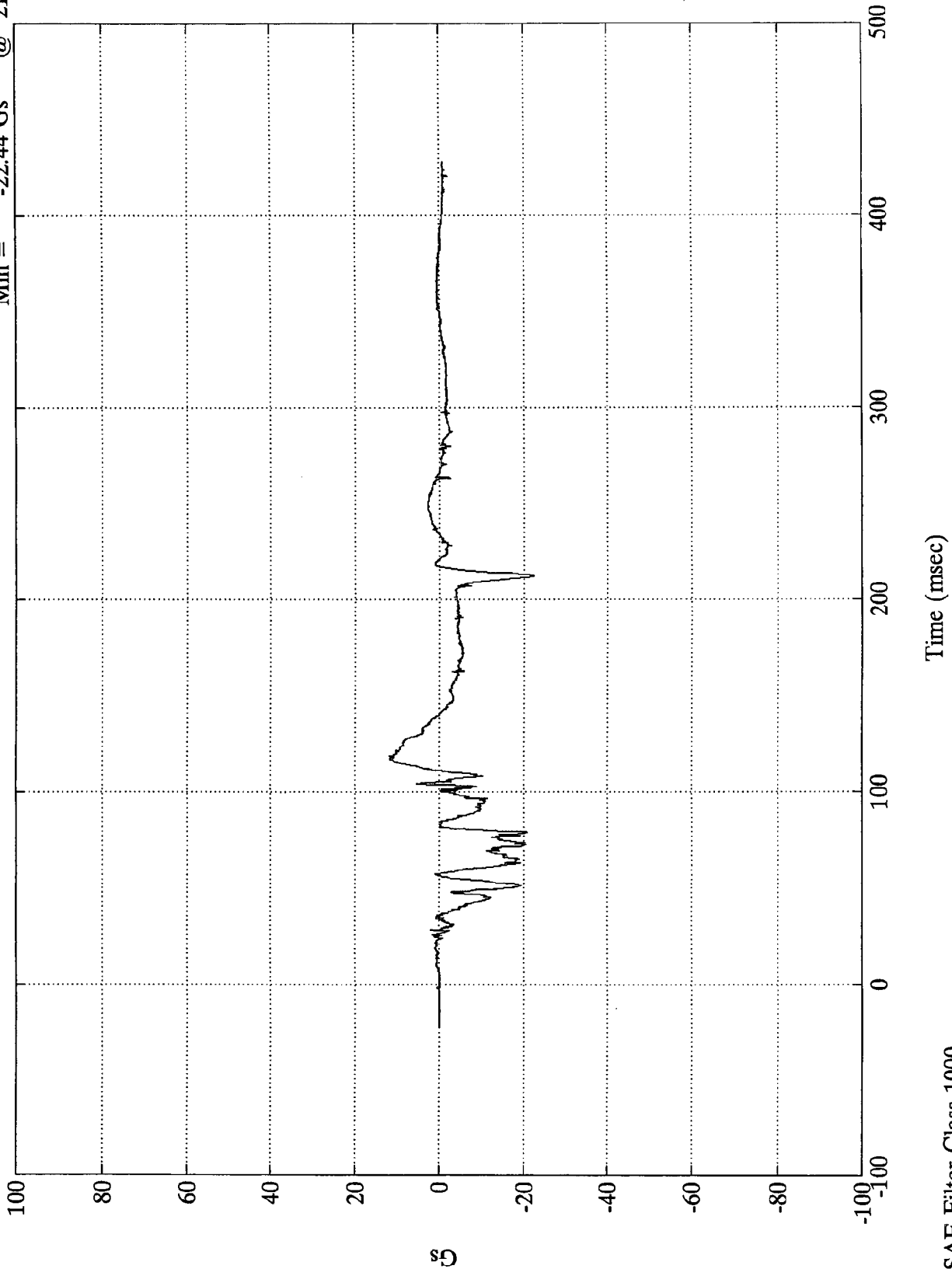


SAE Filter Class 1000

VTV TEST #4

P1 HD9Y (Z)

Max = 11.83 Gs @ 118.55 msec
Min = -22.44 Gs @ 212.63 msec

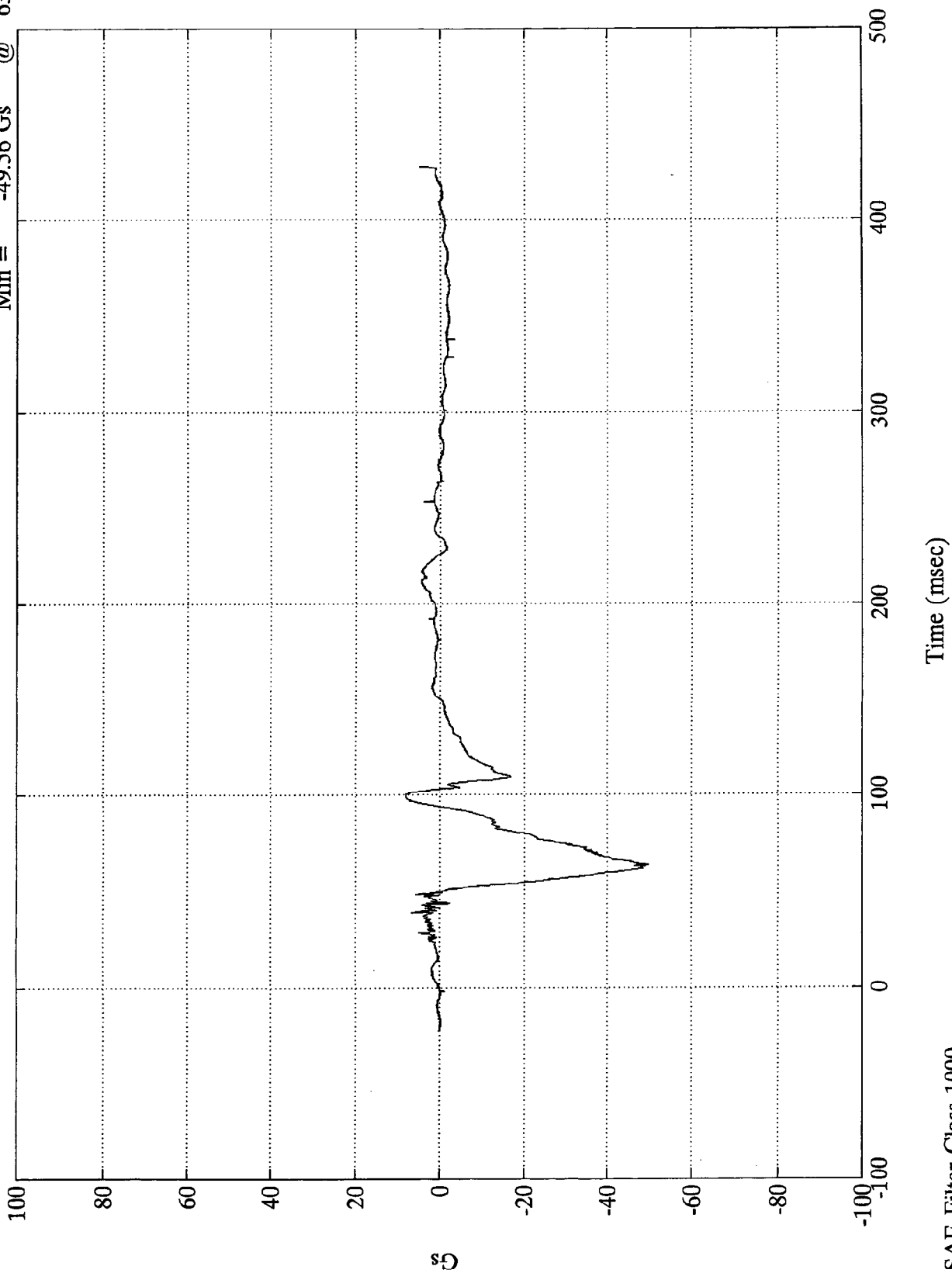


SAE Filter Class 1000

VTV TEST #4

P1 HD9Z (X)

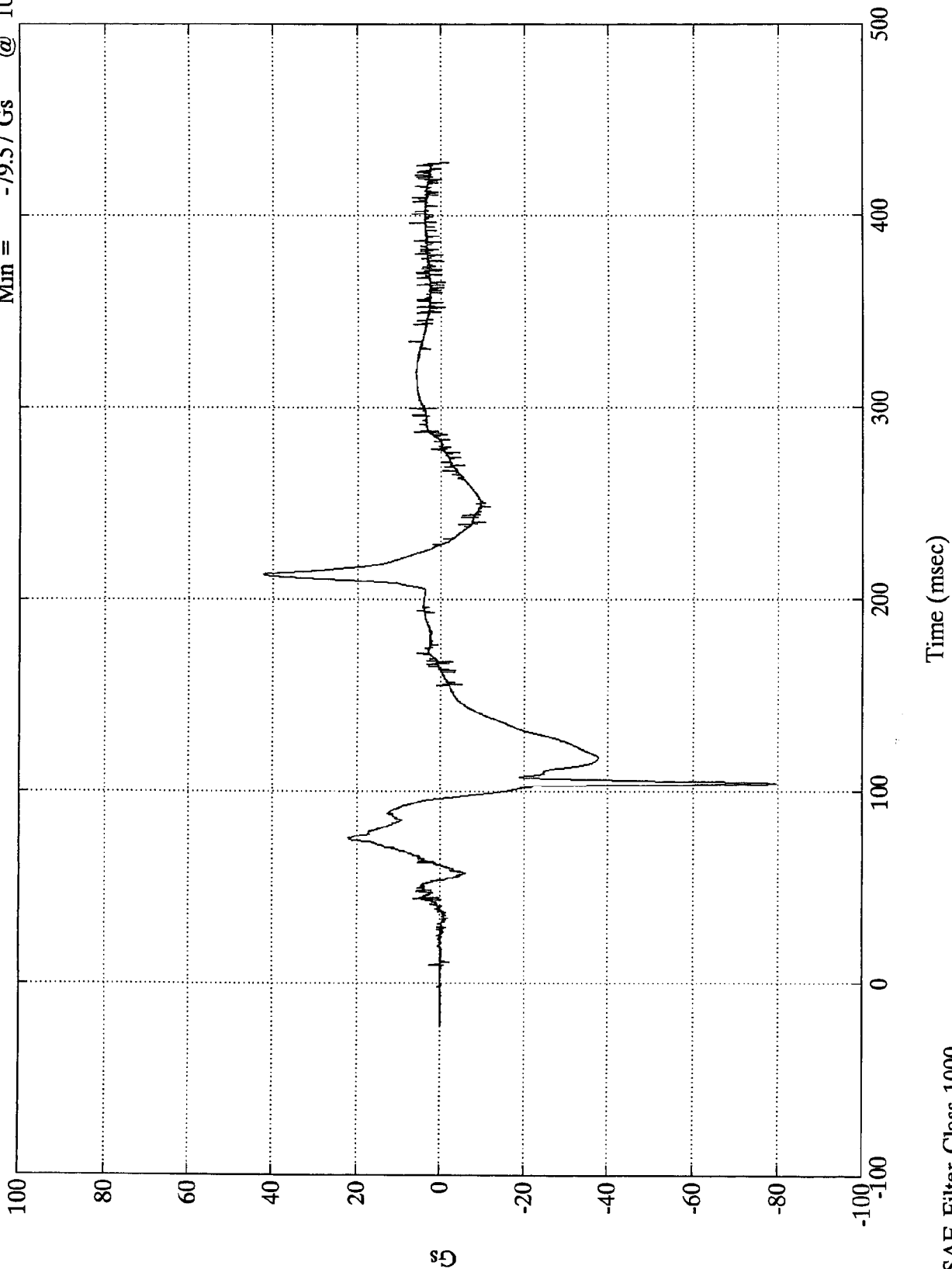
Max = 8.11 Gs @ 100.32 msec
Min = -49.56 Gs @ 63.48 msec



VTV TEST #4

P1 HD9Z (Y)

Max = 42.25 Gs @ 213.36 msec
Min = -79.57 Gs @ 104.40 msec

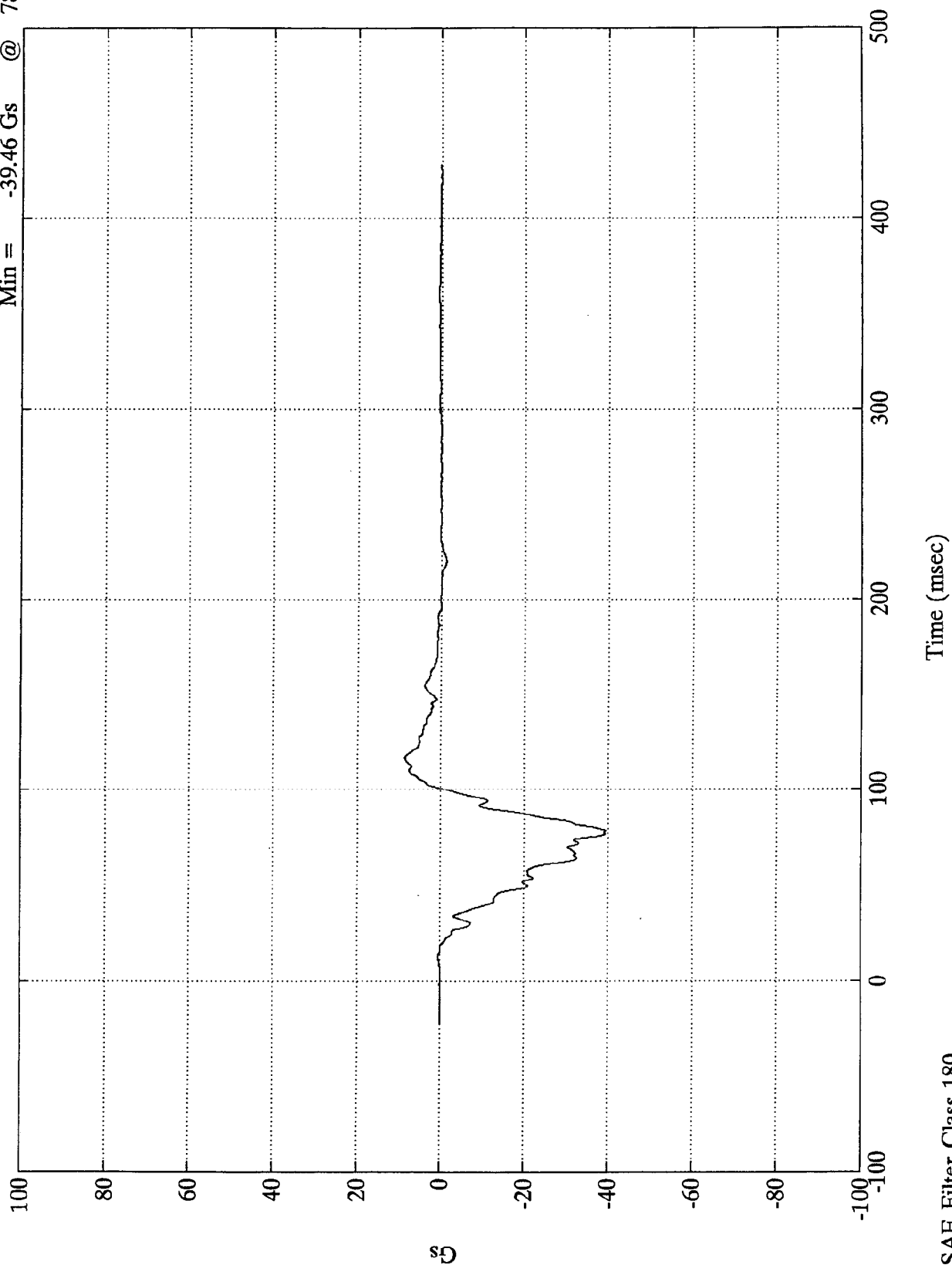


SAE Filter Class 1000

VTV TEST #4

P1 Chest X

Max = 8.64 Gs @ 116.76 msec
Min = -39.46 Gs @ 78.60 msec

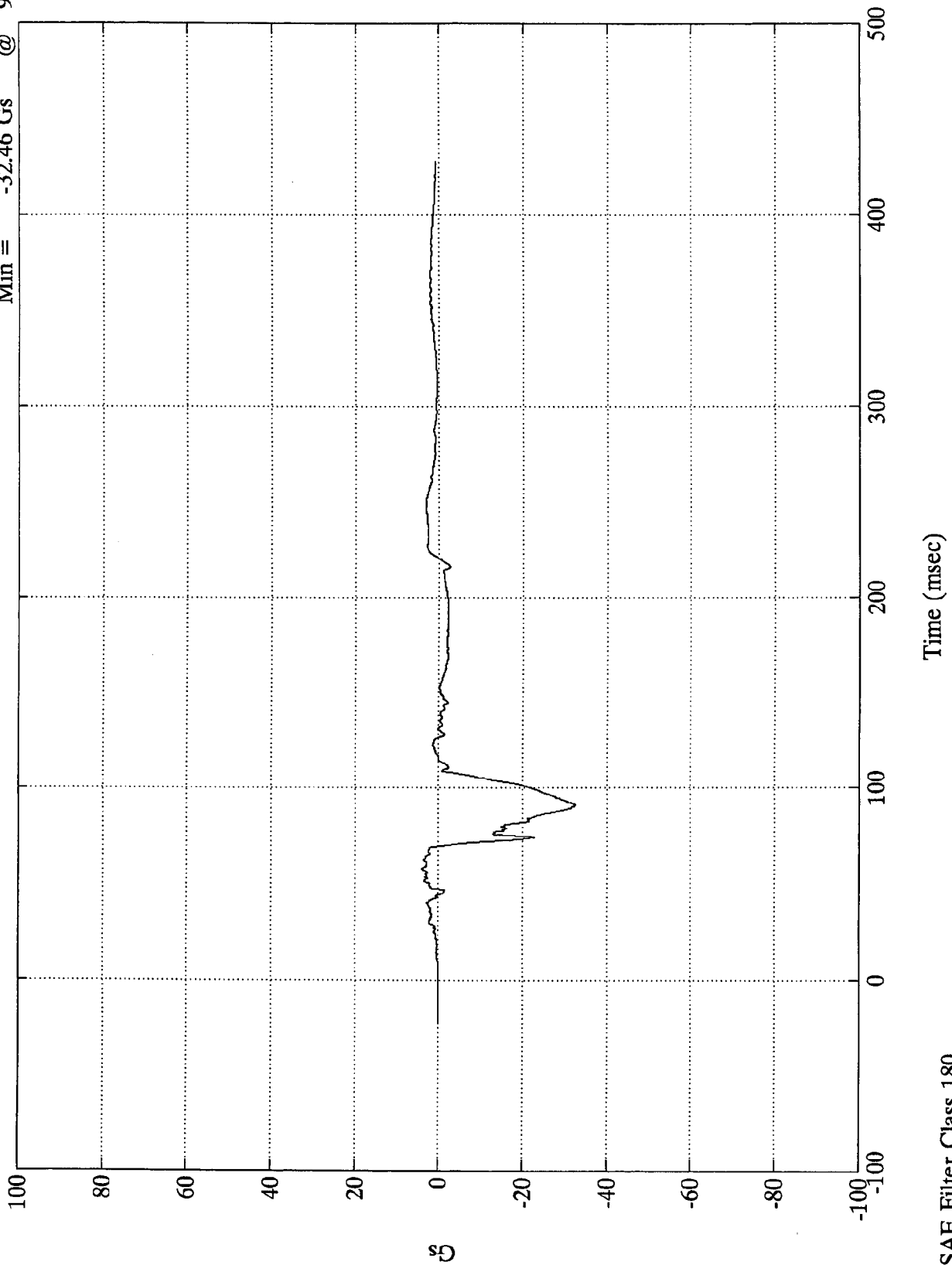


SAE Filter Class 180

VTV TEST #4

P1 Chest Y

Max = 4.07 Gs @ 58.43 msec
Min = -32.46 Gs @ 90.96 msec

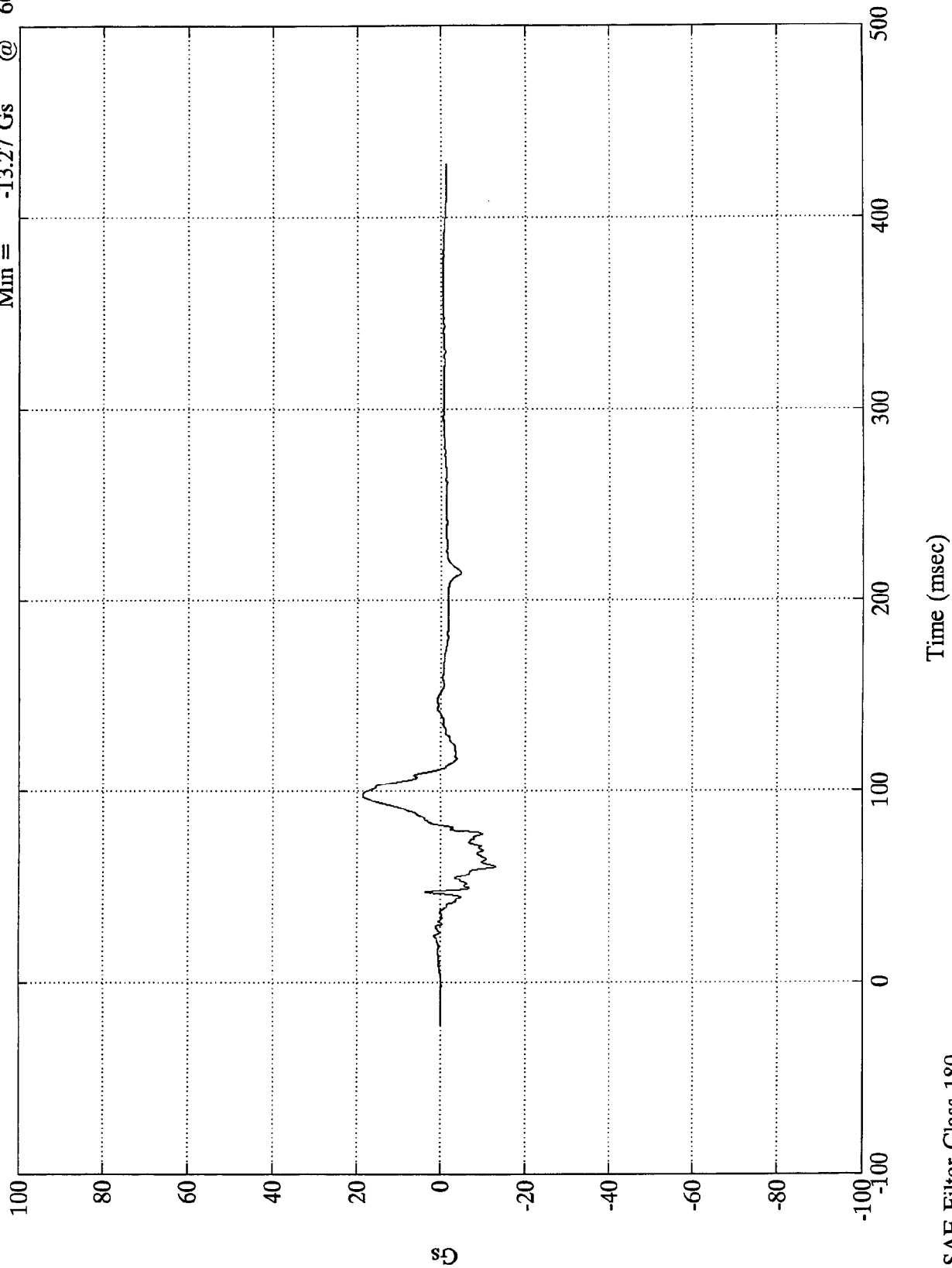


SAE Filter Class 180

VTV TEST #4

Max = 18.59 Gs @ 97.32 msec
 Min = -13.27 Gs @ 60.48 msec

P1 Chest Z

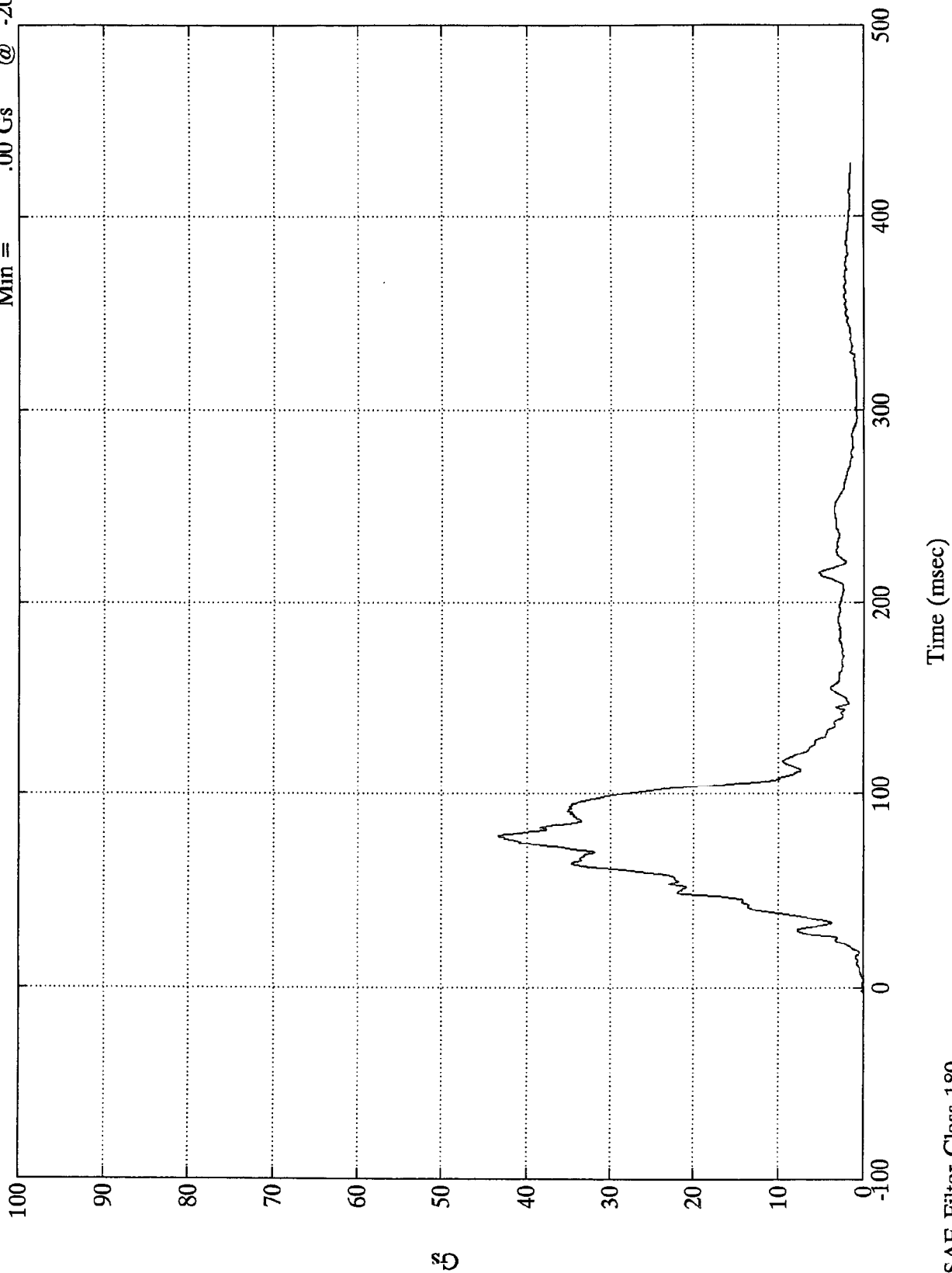


SAE Filter Class 180

VTV TEST #4

P1 Chest Resultant

Max = 43.30 Gs @ 78.36 msec
Min = .00 Gs @ -20.15 msec



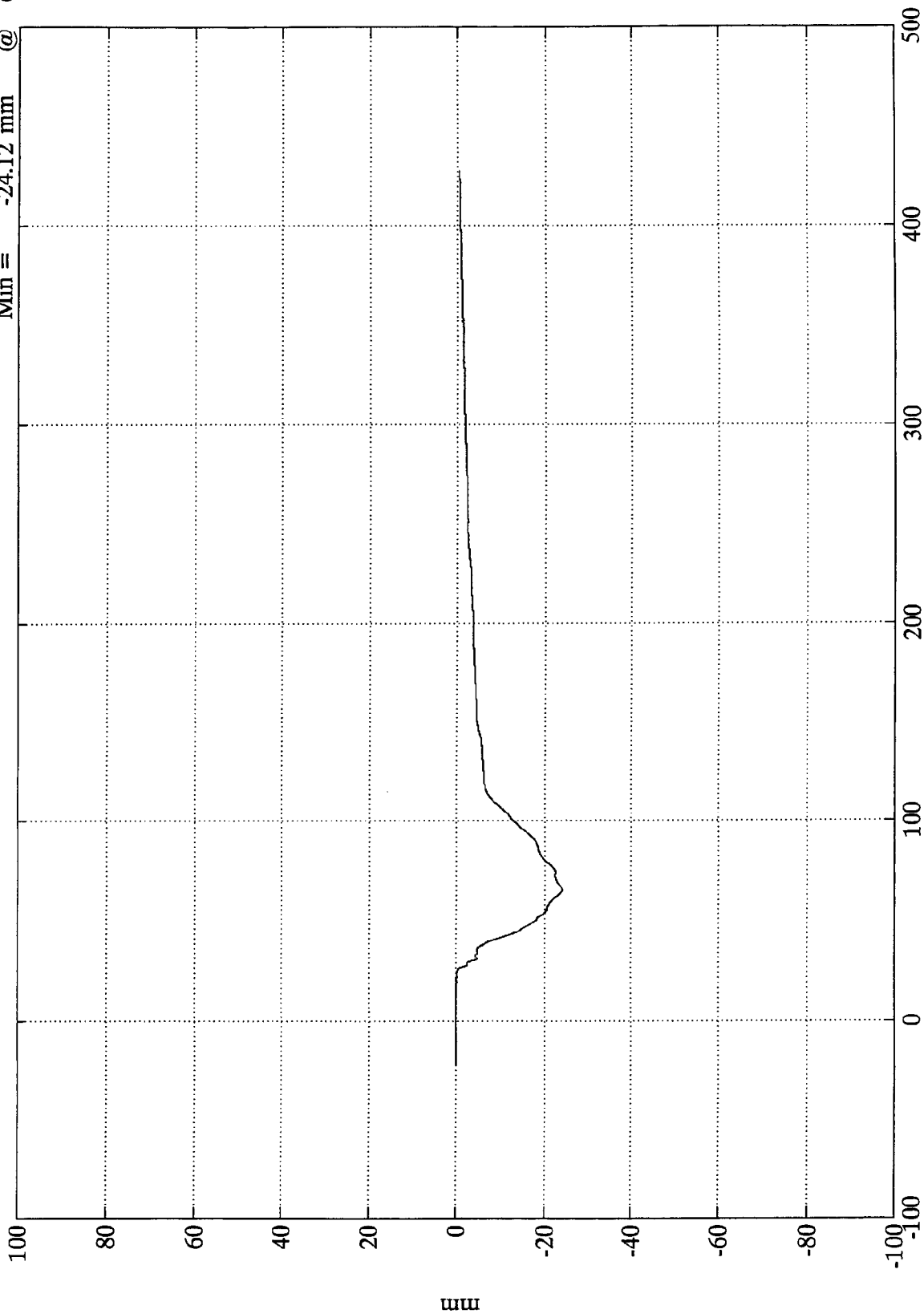
SAE Filter Class 180

VTV TEST #4

Max = -1.56 mm
Min = -24.12 mm

@ 65.52 msec
@ -1.56 msec

P1 Chest Deflection



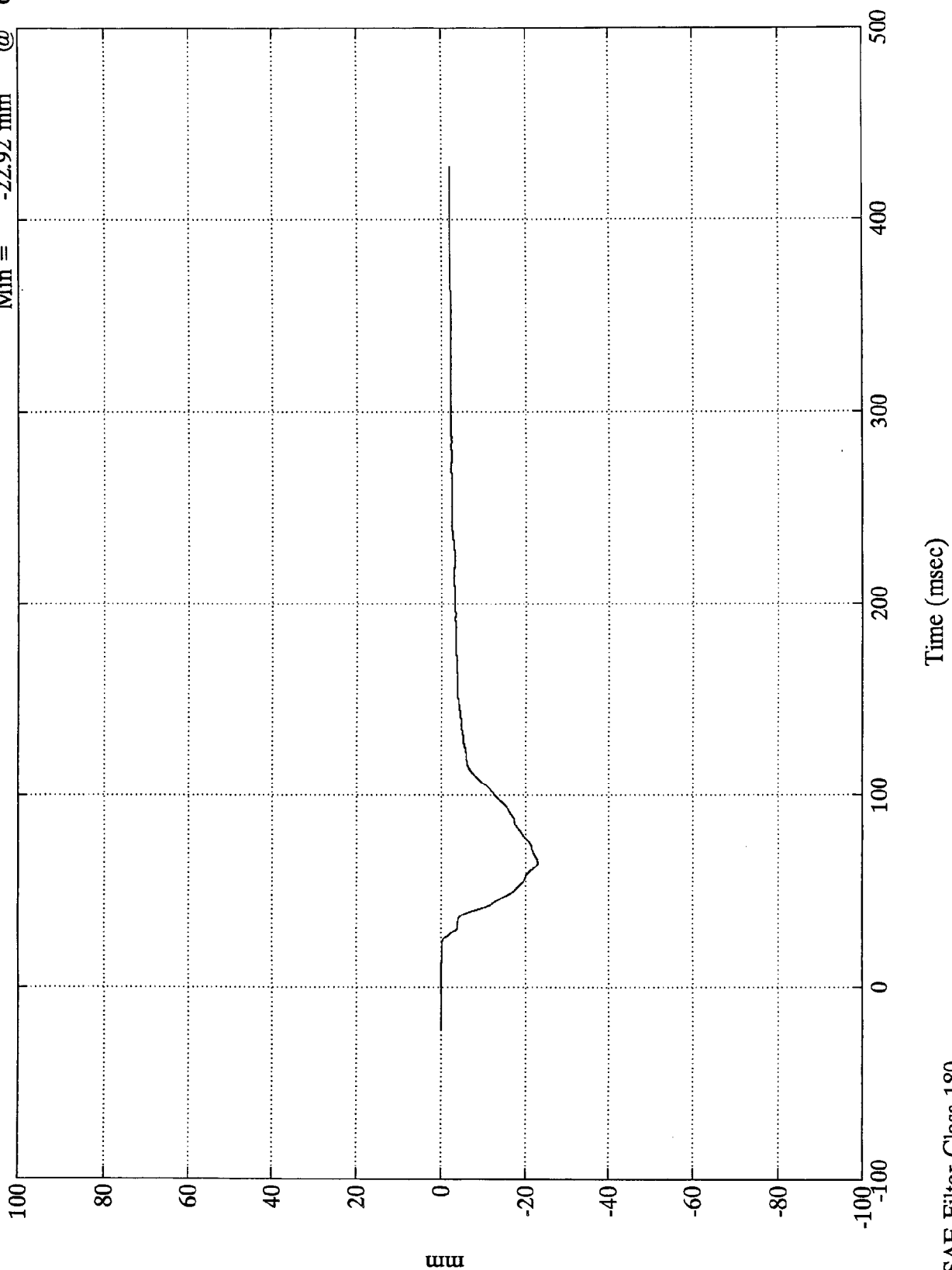
Time (msec)

SAE Filter Class 180

VTV TEST #4

Chest Displacement #125

Max = .01 mm @ 3.35 msec
Min = -22.92 mm @ 65.28 msec



mm

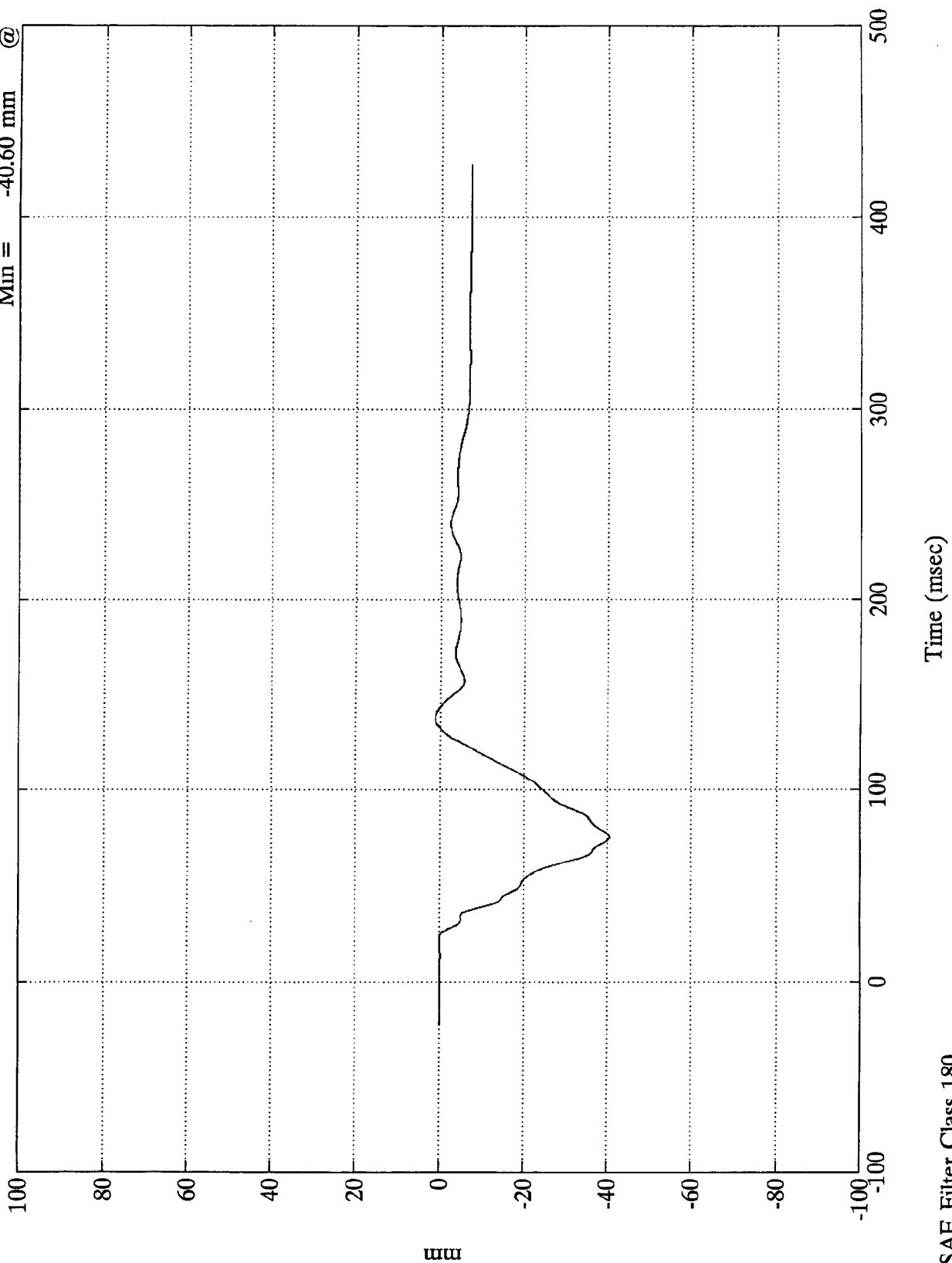
Time (msec)

SAE Filter Class 180

VTV TEST #4

Chest Displacement #126

Max = 1.22 mm @ 137.16 msec
Min = -40.60 mm @ 75.84 msec

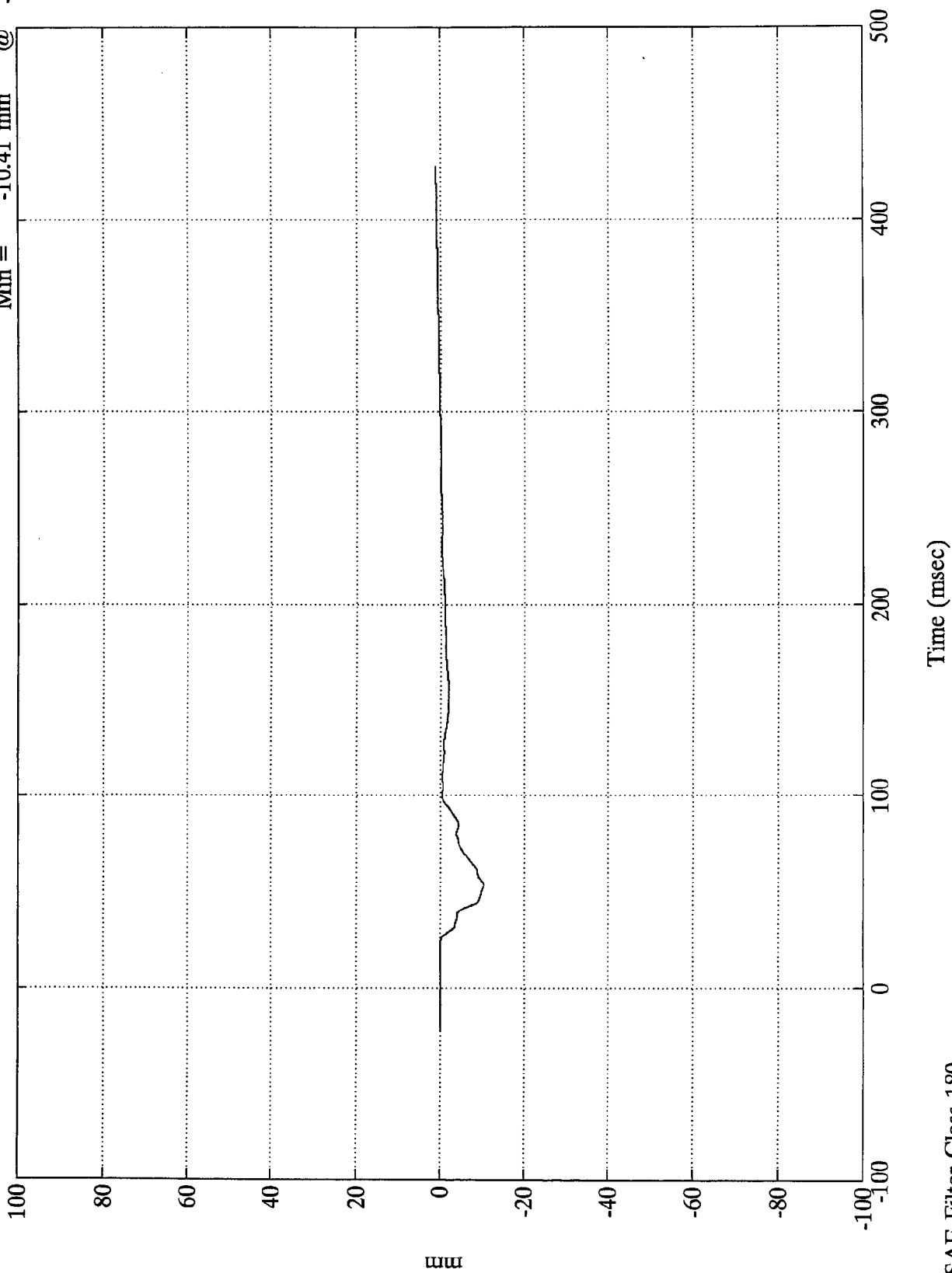


SAE Filter Class 180

VTV TEST #4

Chest Displacement #127

Max = 1.07 mm @ 424.55 msec
Min = -10.41 mm @ 53.88 msec

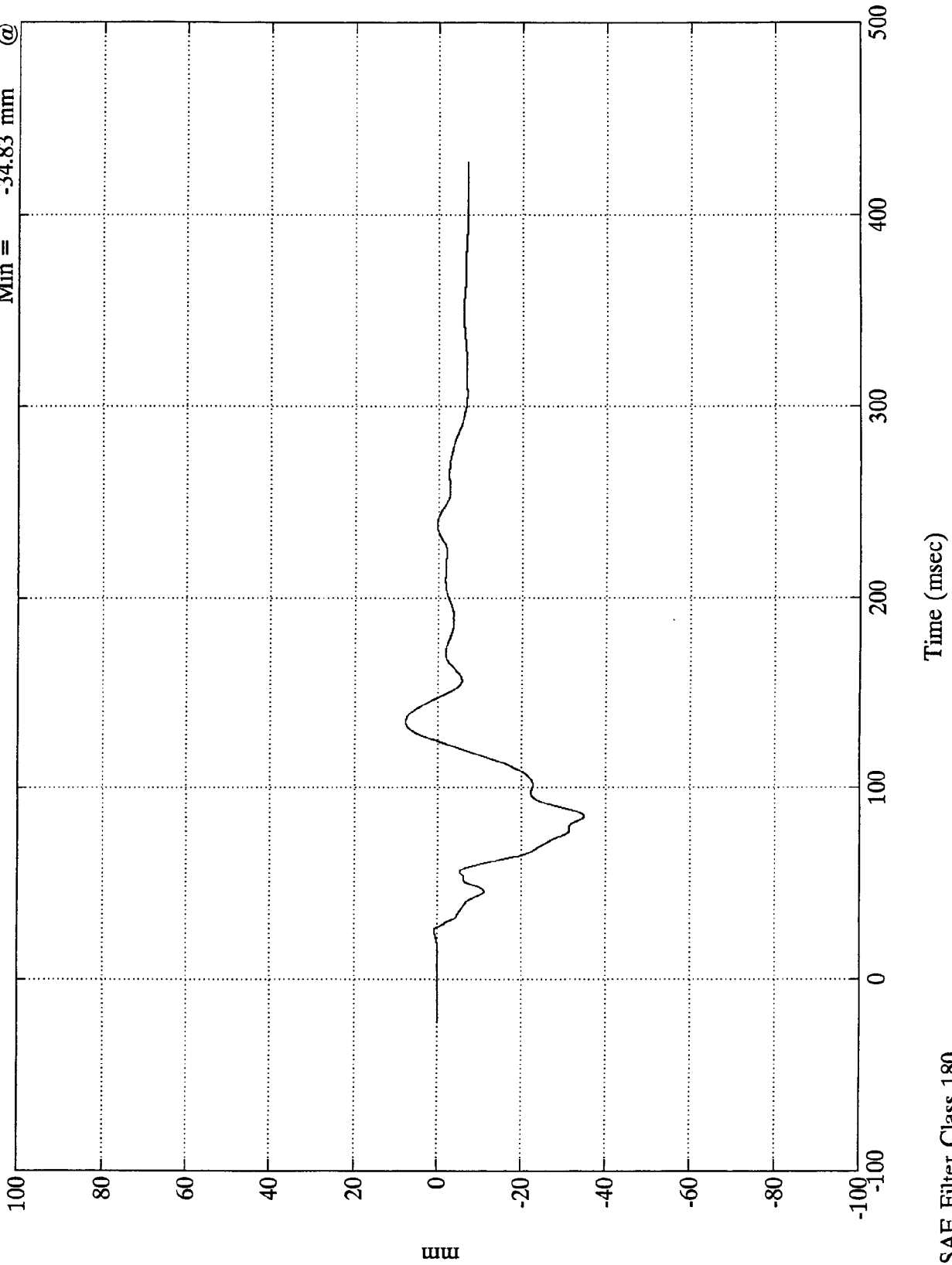


SAE Filter Class 180

VTV TEST #4

Chest Displacement #128

Max = 7.92 mm @ 135.12 msec
Min = -34.83 mm @ 85.08 msec

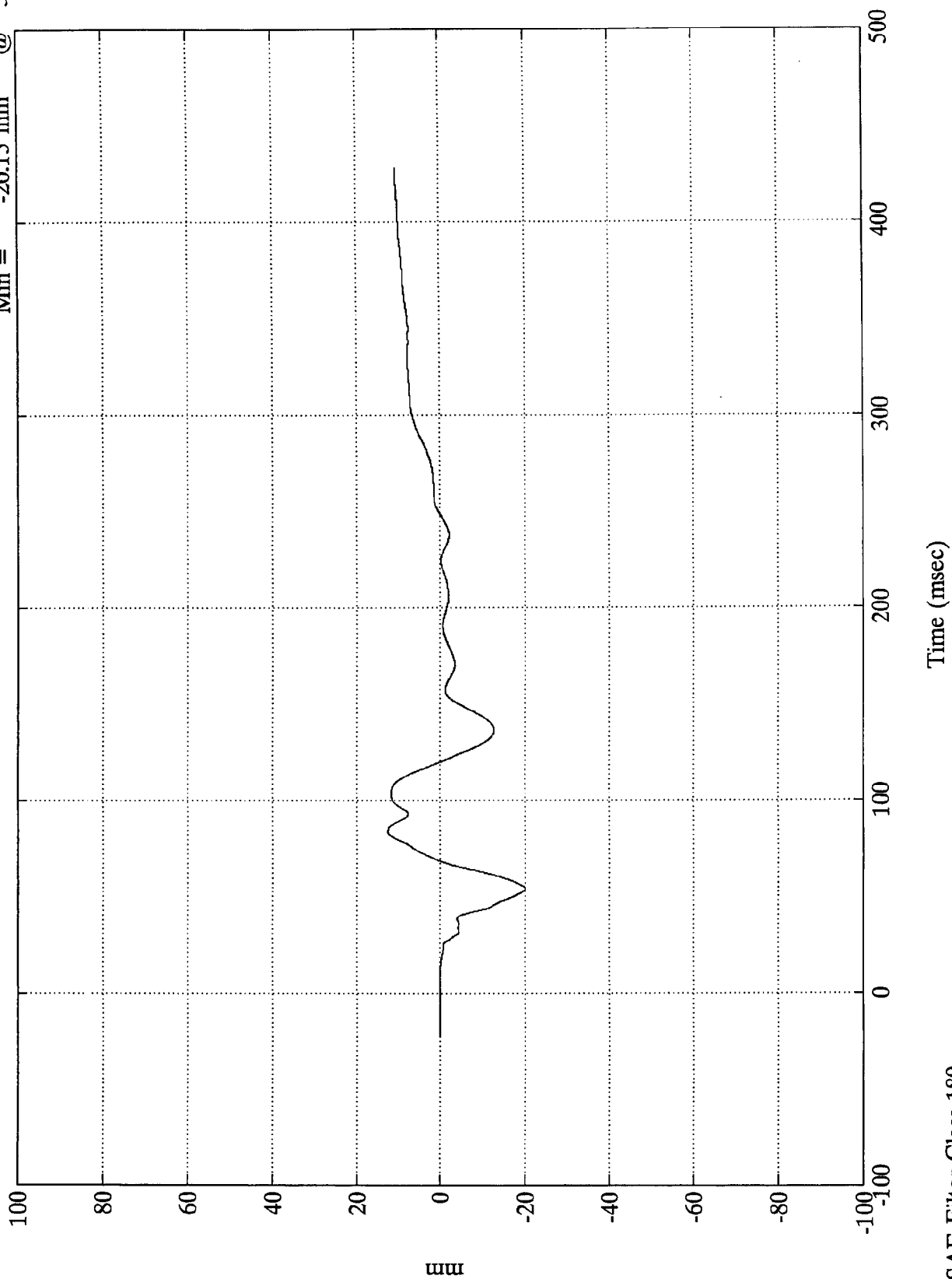


SAE Filter Class 180

VTV TEST #4

Chest Displacement #129

Max = 12.47 mm @ 84.12 msec
Min = -20.15 mm @ 54.47 msec

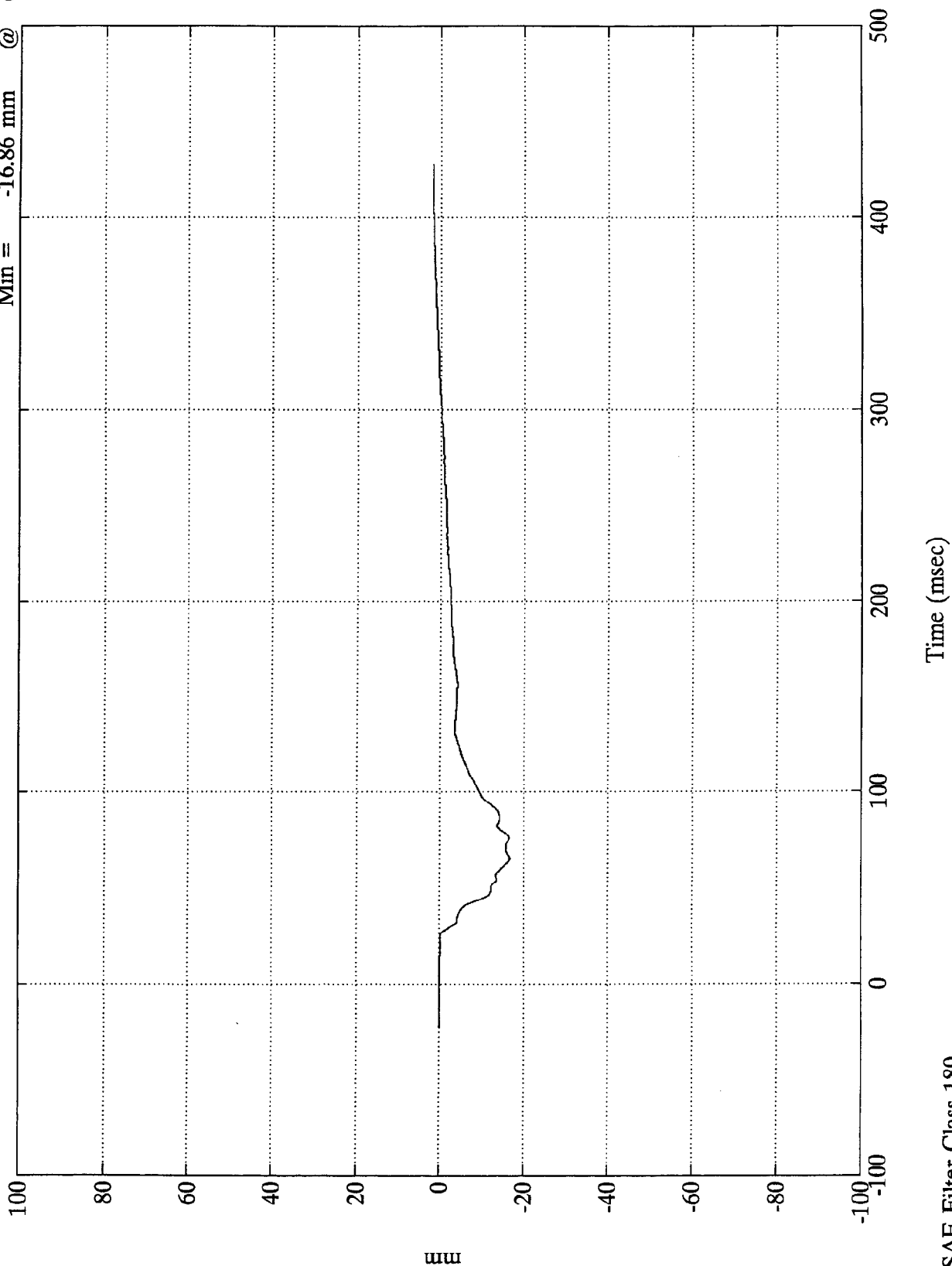


SAE Filter Class 180

VTV TEST #4

Chest Displacement #130

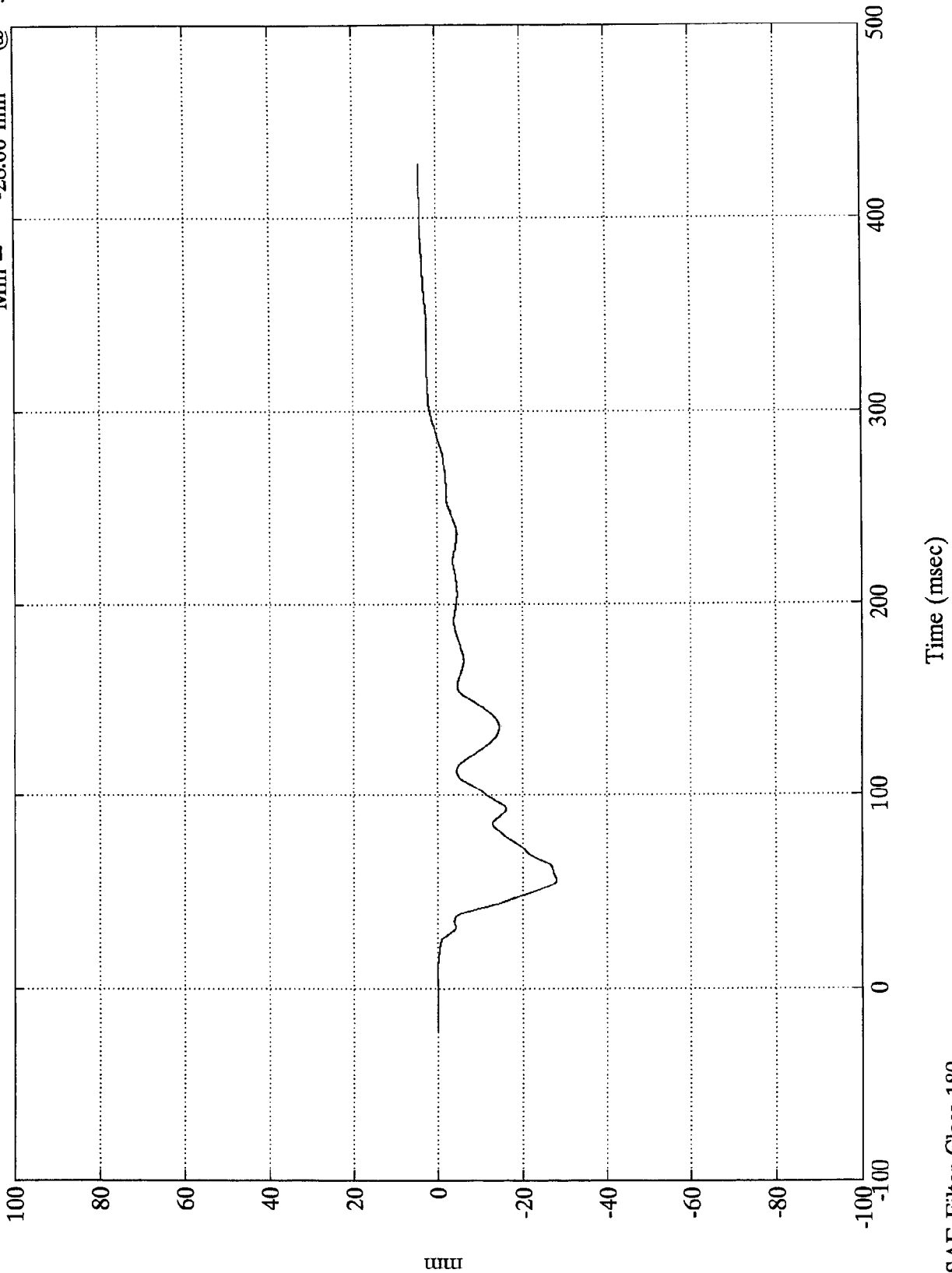
Max = 1.90 mm @ 425.88 msec
Min = -16.86 mm @ 65.28 msec



VTV TEST #4

Chest Displacement #131

Max = 4.08 mm @ 426.24 msec
Min = -28.00 mm @ 56.76 msec

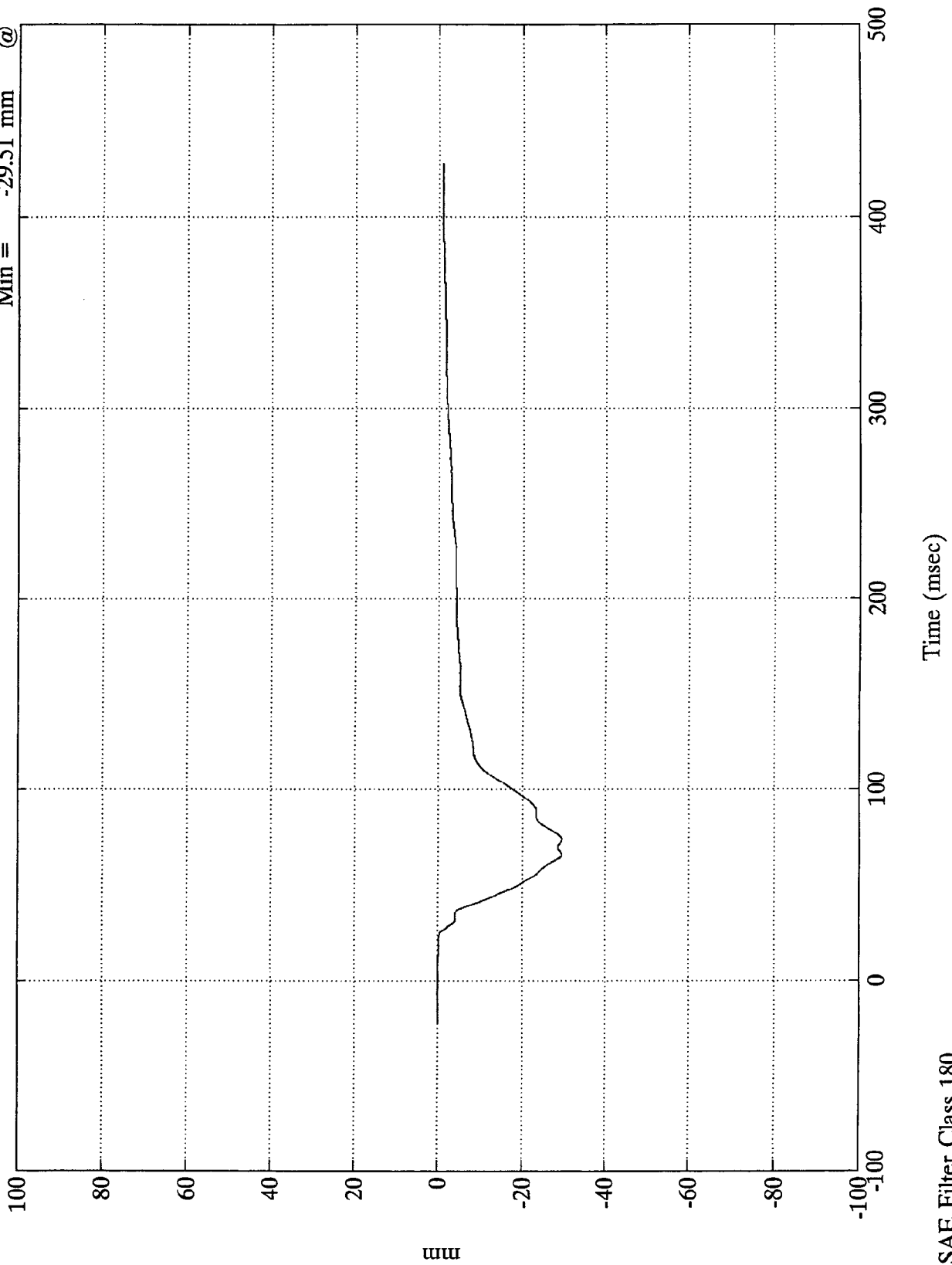


SAE Filter Class 180

VTV TEST #4

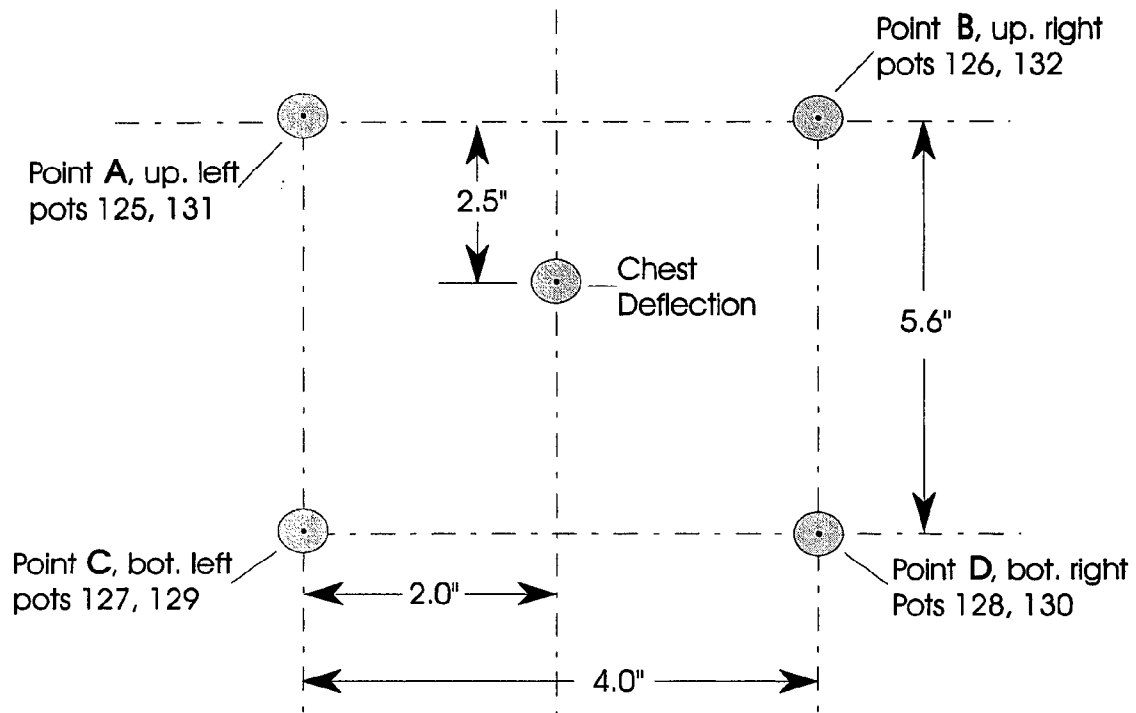
Chest Displacement #132

Max = .01 mm @ -8.76 msec
Min = -29.51 mm @ 73.80 msec



SAE Filter Class 180

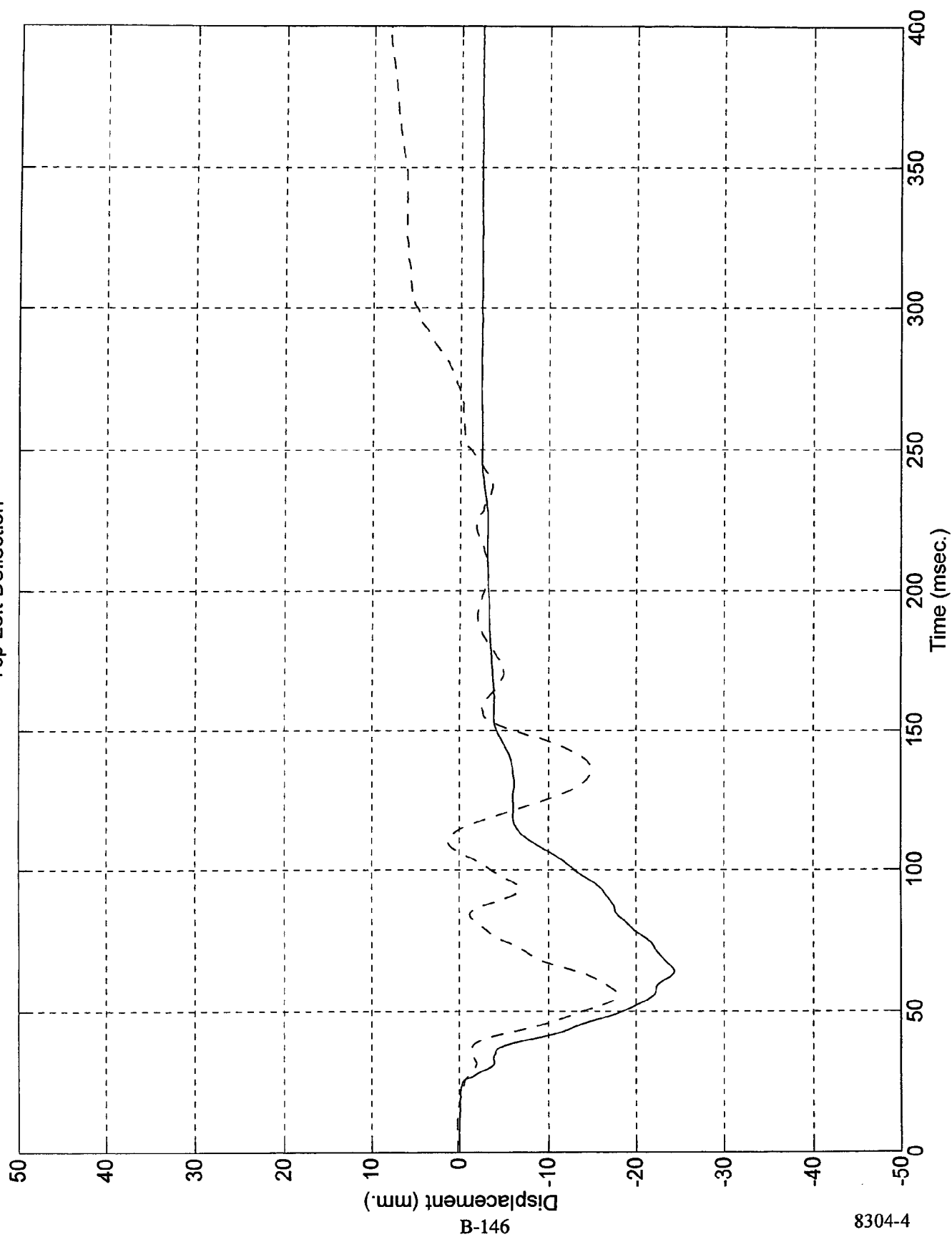
CHEST POTENTIOMETER ARRAY LAYOUT



VIEW LOOKING FORWARD

Note: The following four data traces represent the X and Y displacement of the points A, B, C, and D respectively.

Top Left Deflection

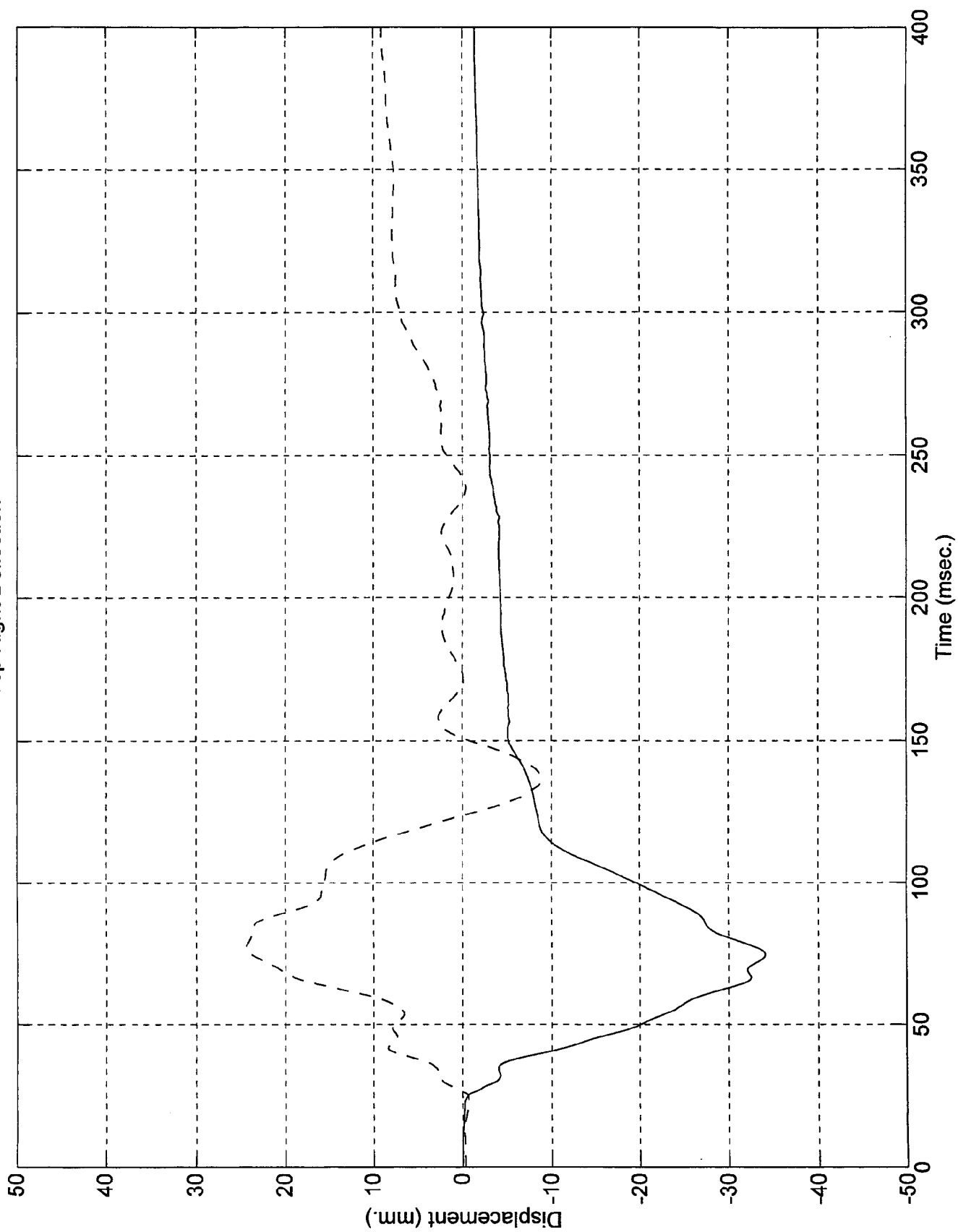


Chest Pot. 125 & 131

8304-4

B-146

Top Right Deflection

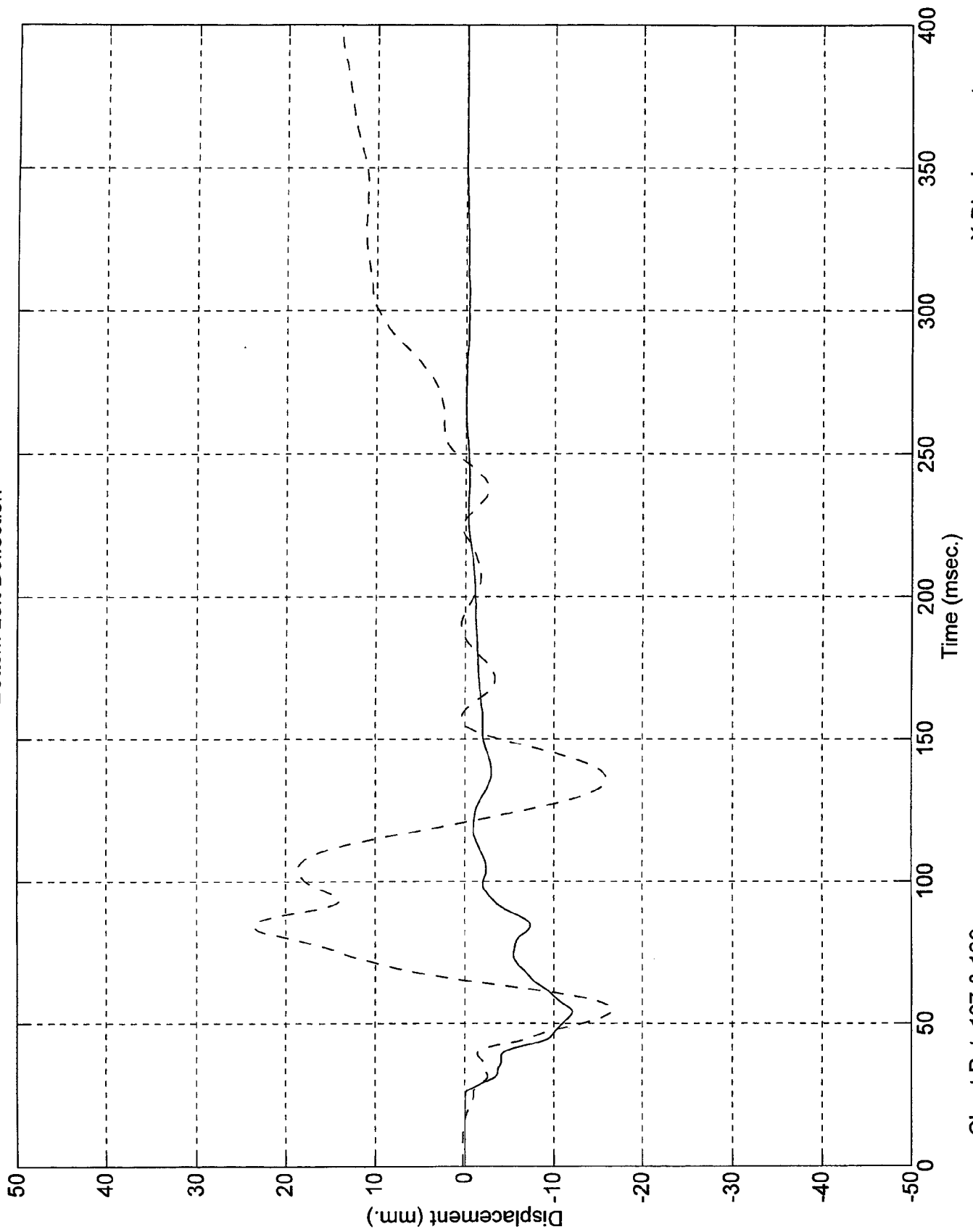


Chest Pot. 126 & 132

B-147

8304-4

Bottom Left Deflection



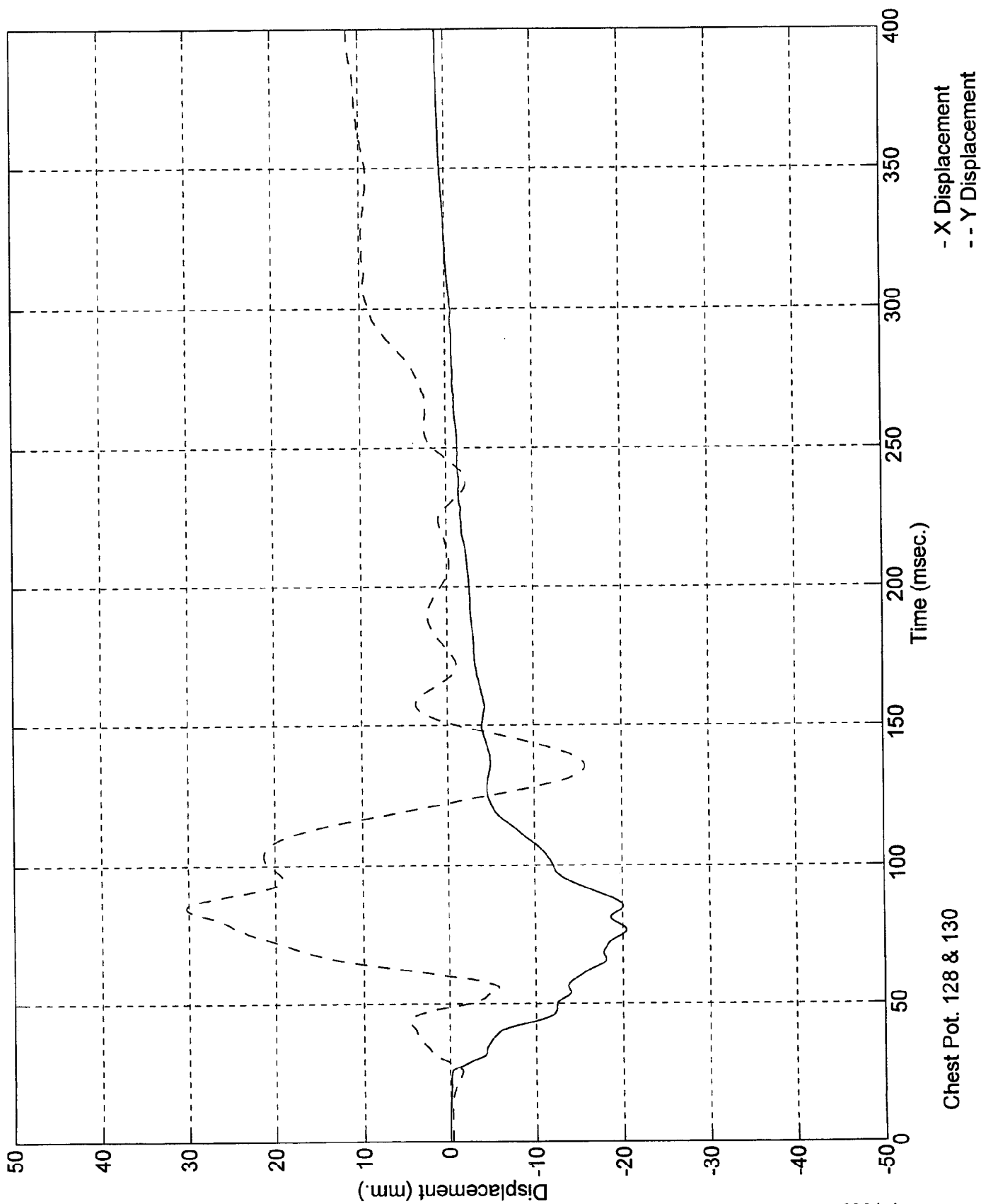
B-148

8304-4

Chest Pot. 127 & 129

- X Displacement
- - Y Displacement

Bottom Right Deflection

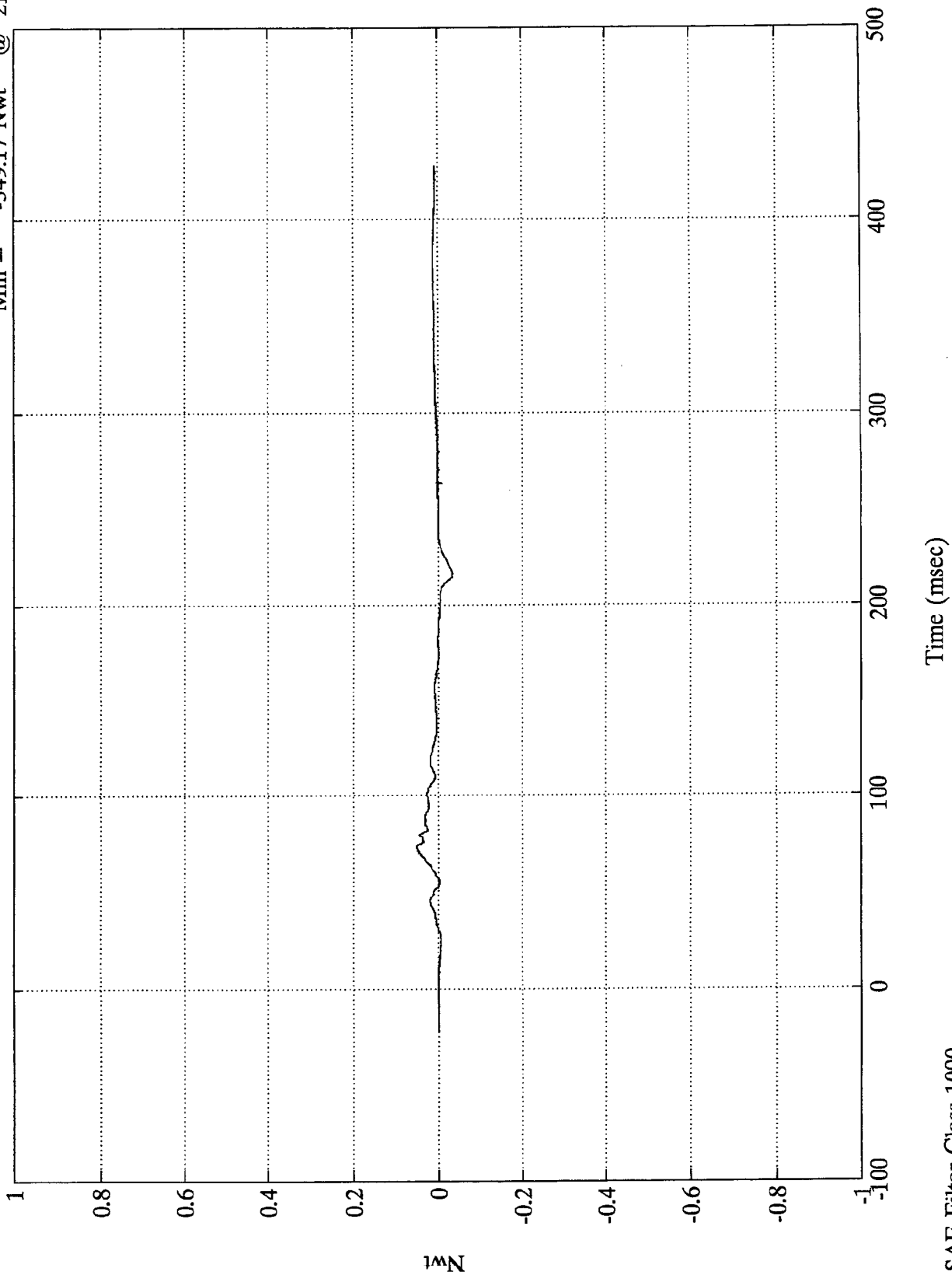


VTV TEST #4

$\times 10^4$

P1 Upper Neck Fx

Max = 515.64 Nwt @ 73.68 msec
Min = -349.17 Nwt @ 216.60 msec

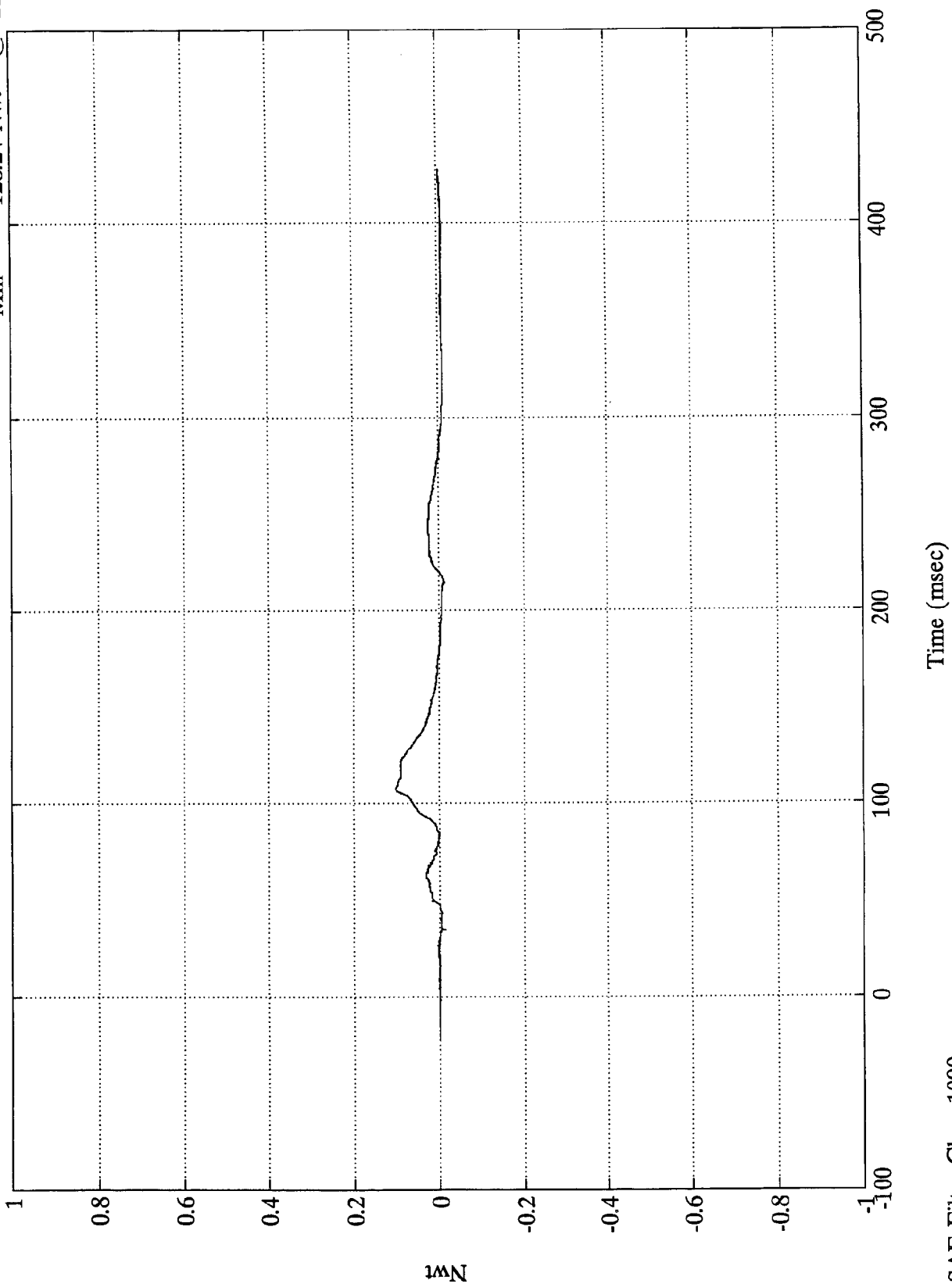


SAE Filter Class 1000

VTV TEST #4
x10⁴

P1 Upper Neck Fy

Max = 1016.13 Nwt @ 108.48 msec
Min = -128.24 Nwt @ 215.40 msec



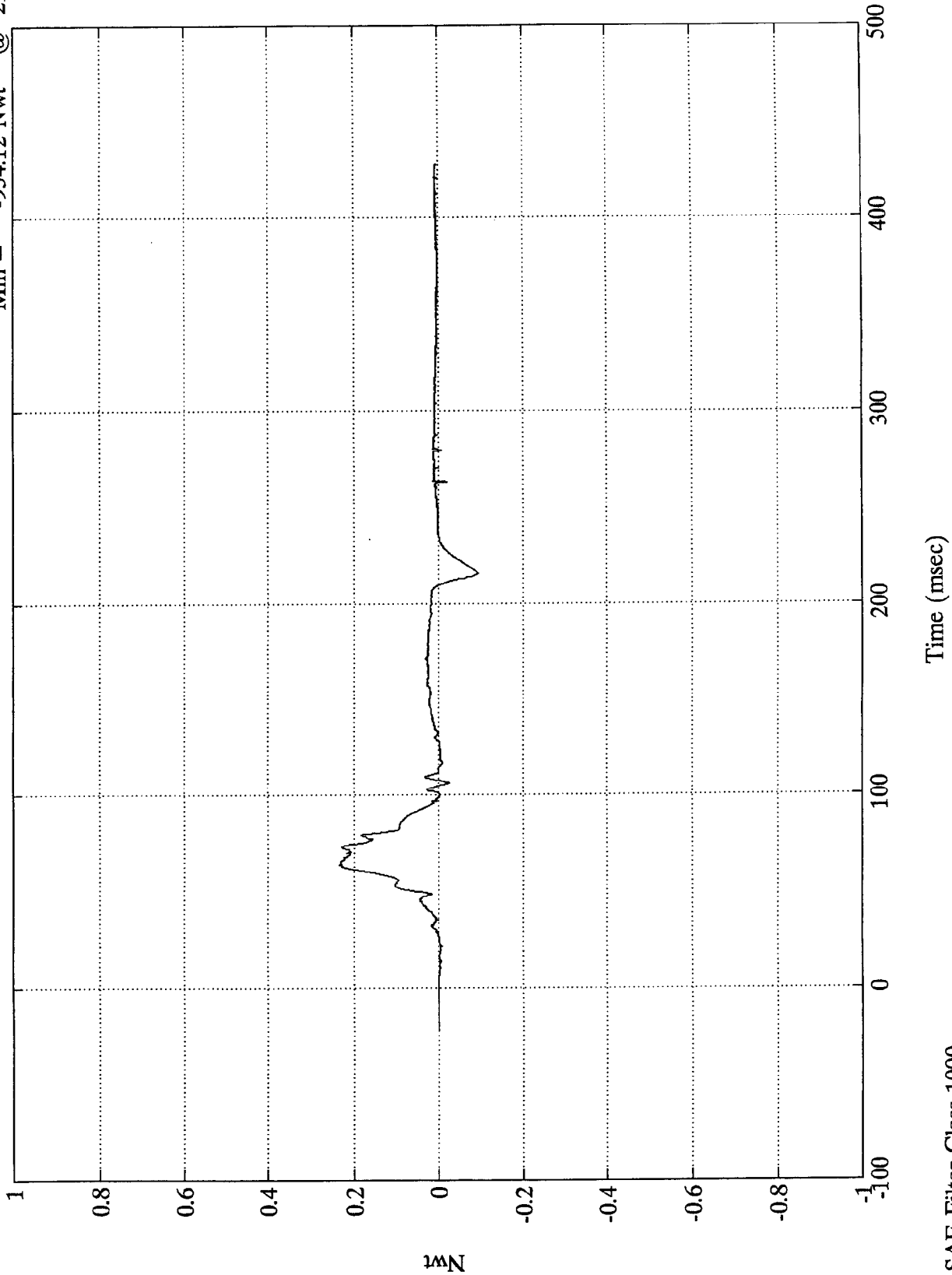
SAE Filter Class 1000

VTV TEST #4

$\times 10^4$

P1 Upper Neck Fz

Max = 2353.75 Nwt @ 63.60 msec
Min = -934.12 Nwt @ 216.12 msec

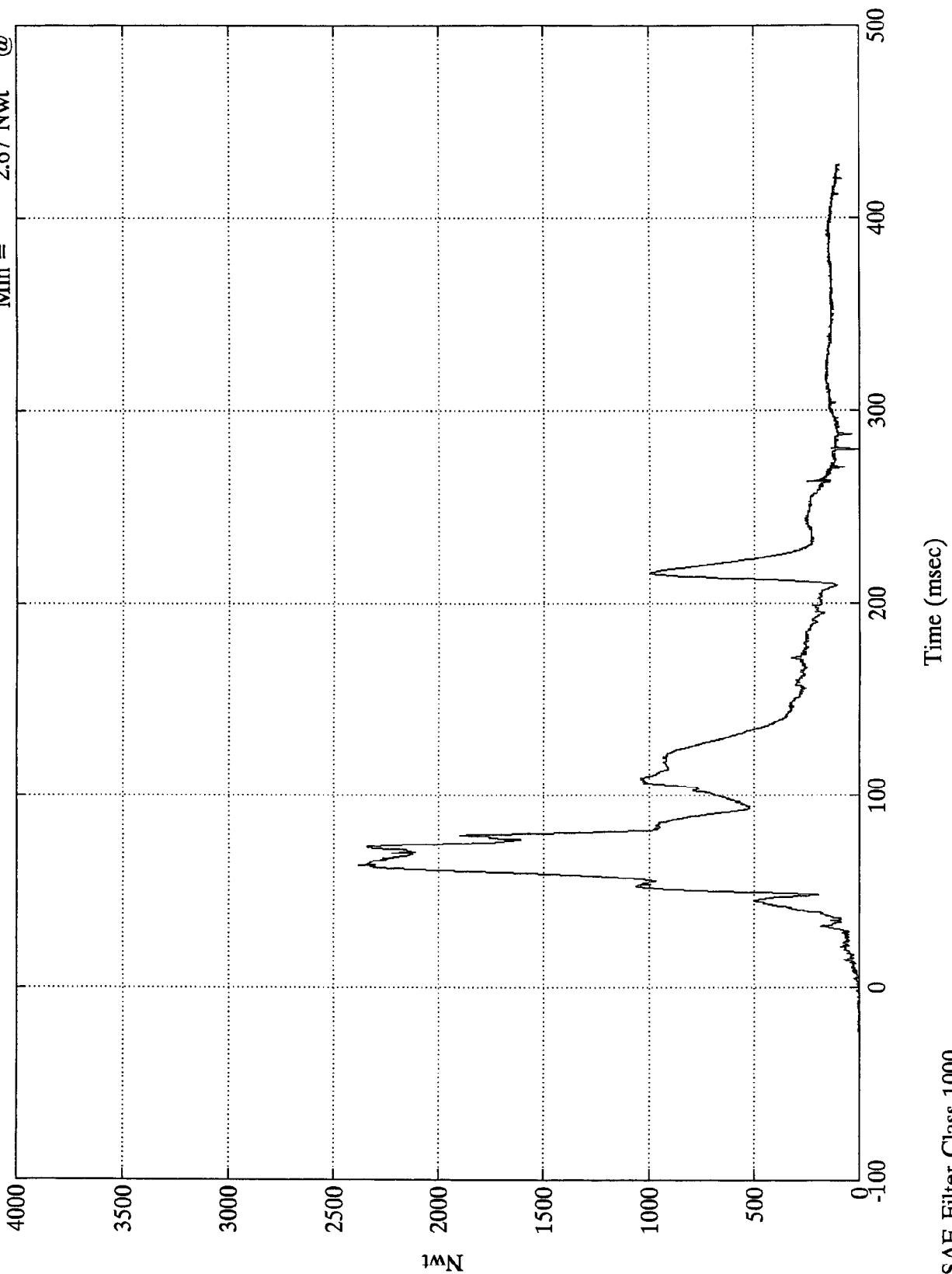


SAE Filter Class 1000

VTV TEST #4

P1 Upper Neck Force Res

Max = 2383.41 Nwt @ 63.60 msec
Min = 2.67 Nwt @ 6.59 msec

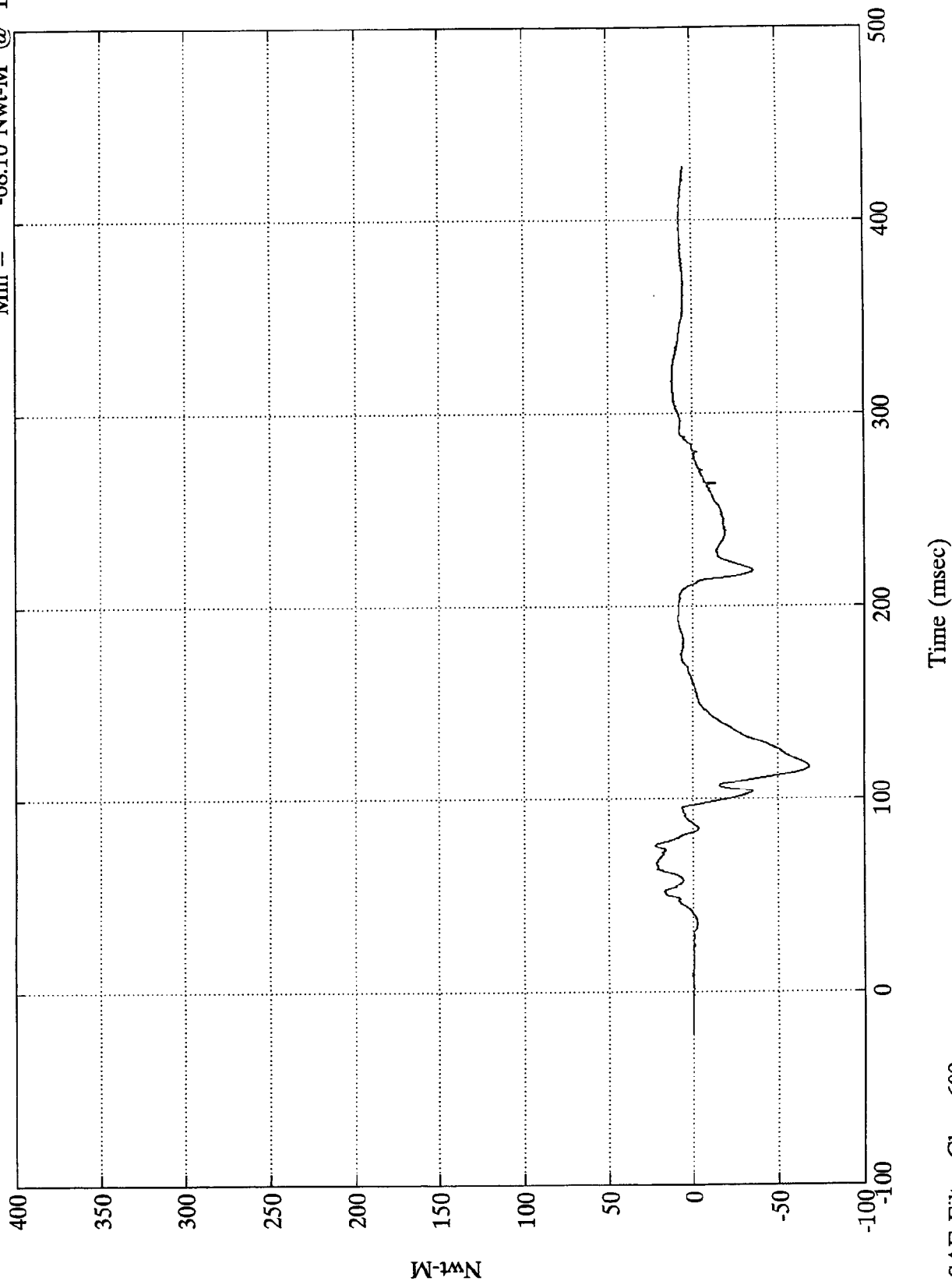


SAE Filter Class 1000

VTV TEST #4

P1 Upper Neck Mx

Max = 22.43 Nwt-M @ 75.95 msec
Min = -68.10 Nwt-M @ 117.24 msec

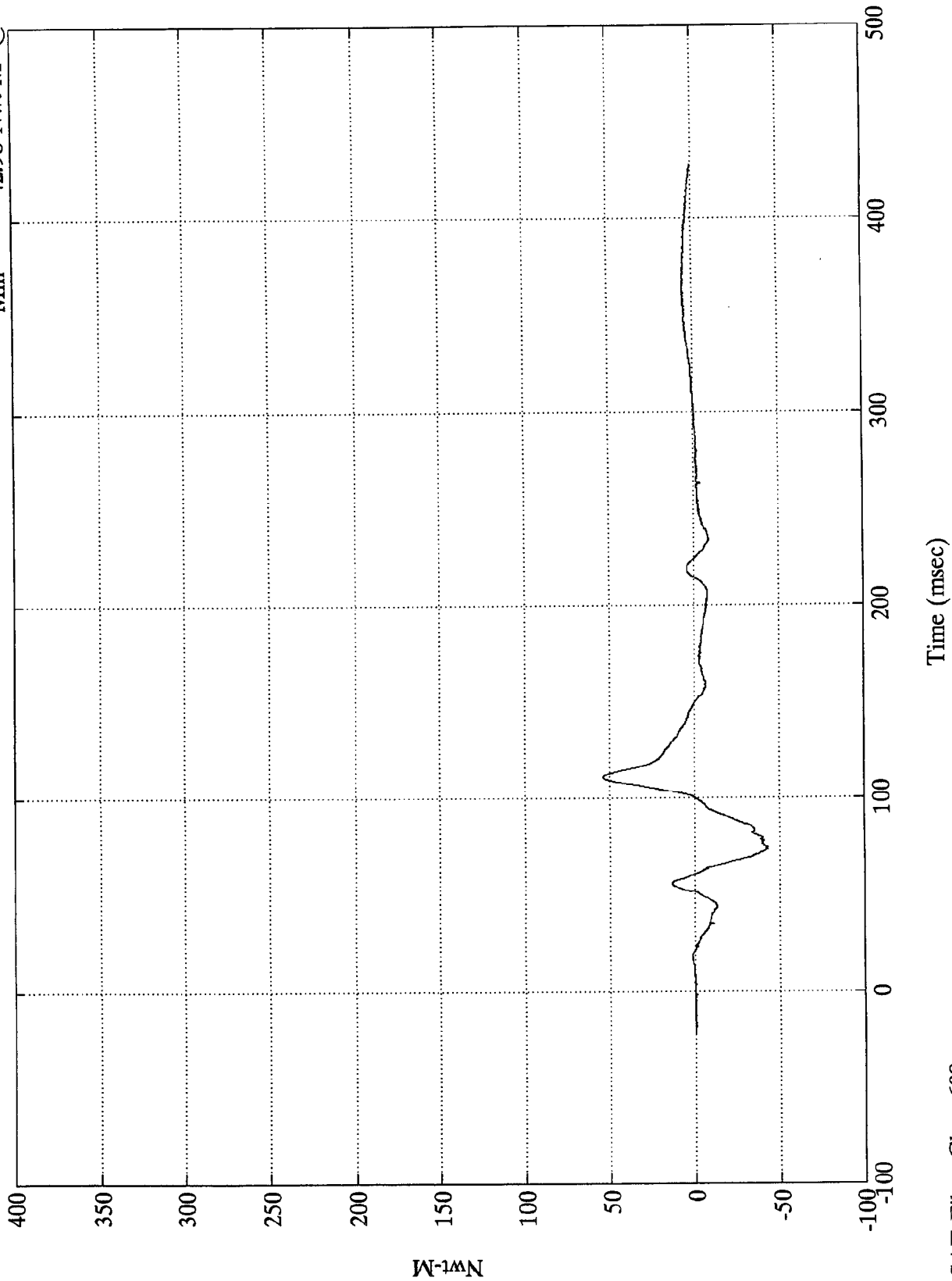


SAE Filter Class 600

VTV TEST #4

P1 Upper Neck My

Max = 53.69 Nwt-M @ 111.12 msec
Min = -42.98 Nwt-M @ 74.40 msec

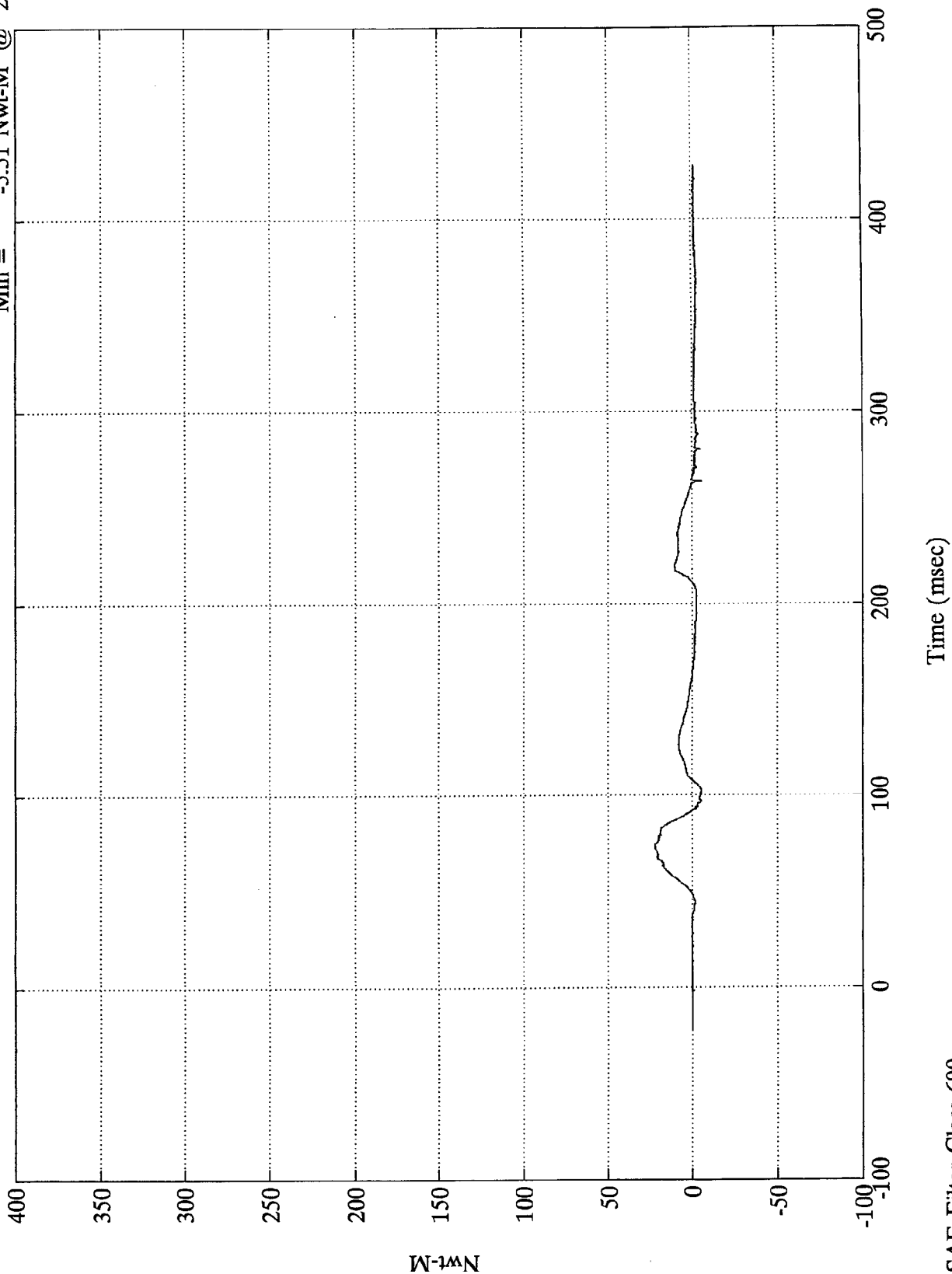


SAE Filter Class 600

VTV TEST #4

P1 Upper Neck Mz

Max = 22.77 Nwt-M @ 73.92 msec
Min = -5.51 Nwt-M @ 263.51 msec

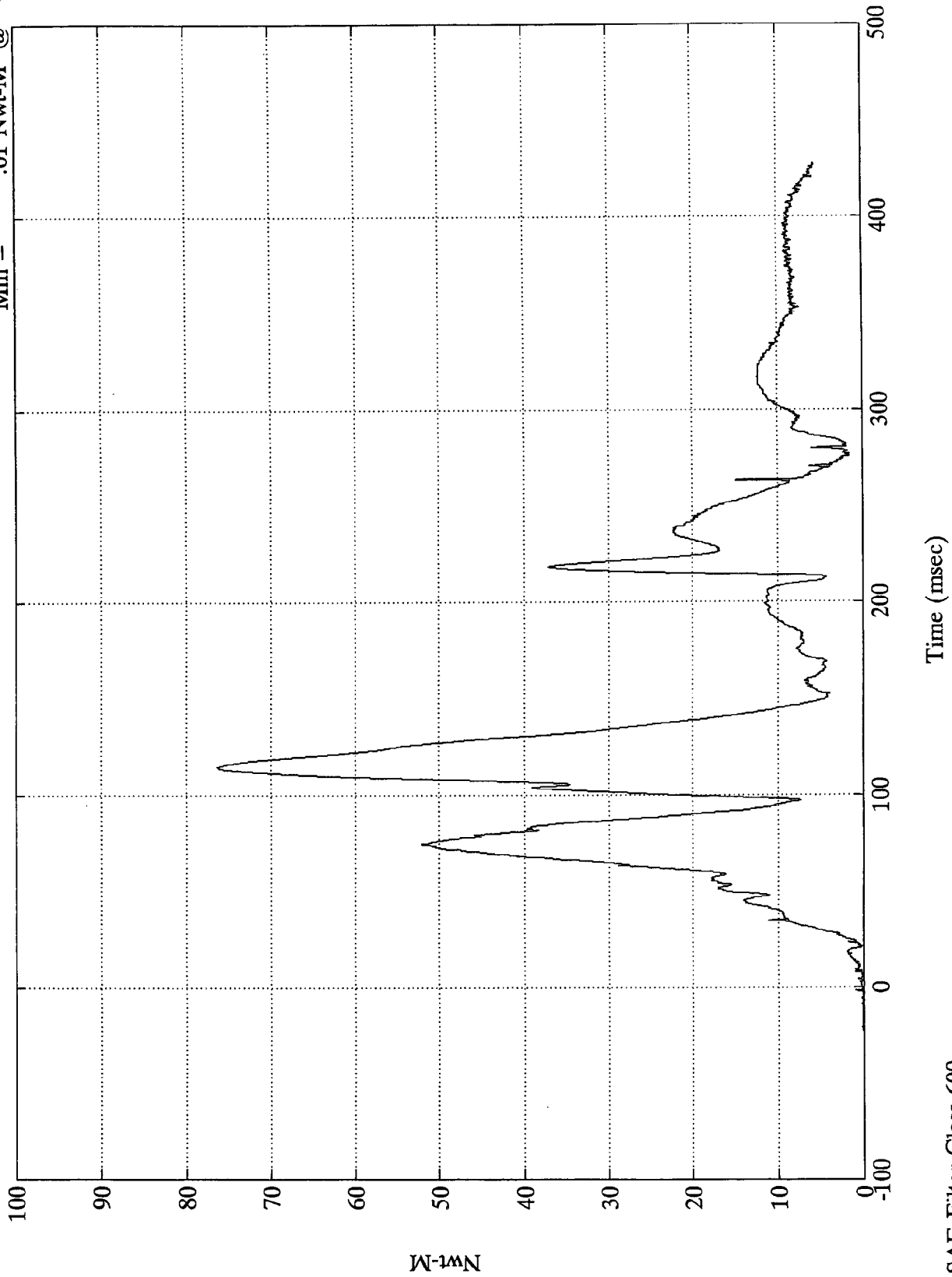


SAE Filter Class 600

VTV TEST #4

P1 Upper Neck Moment Res

Max = 76.36 Nwt-M @ 115.08 msec
Min = .01 Nwt-M @ -7.68 msec



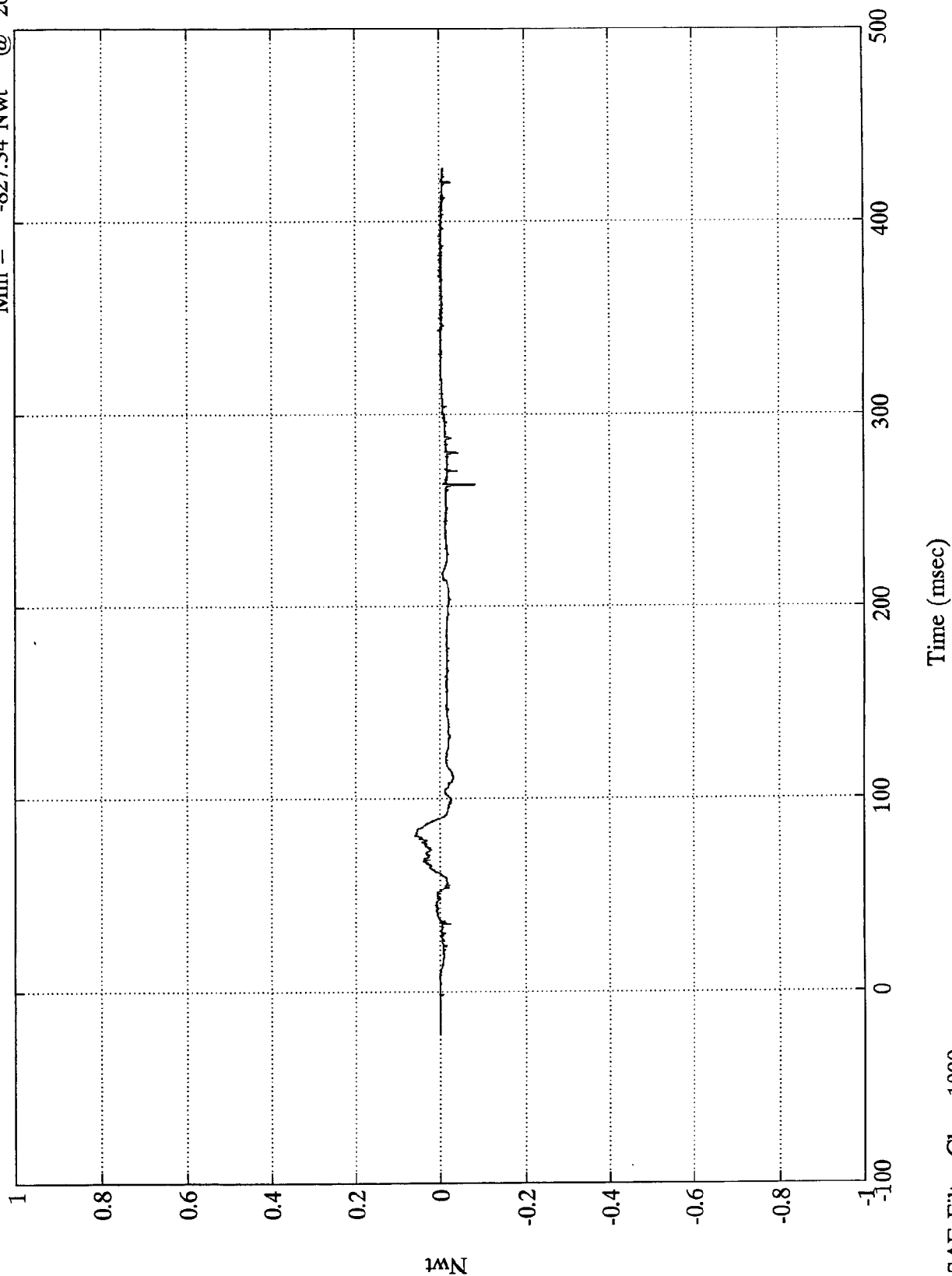
SAE Filter Class 600

VTV TEST #4

Max = 578.22 Nwt @ 81.24 msec
Min = -827.34 Nwt @ 263.64 msec

P1 Lower Neck Fx

$\times 10^4$



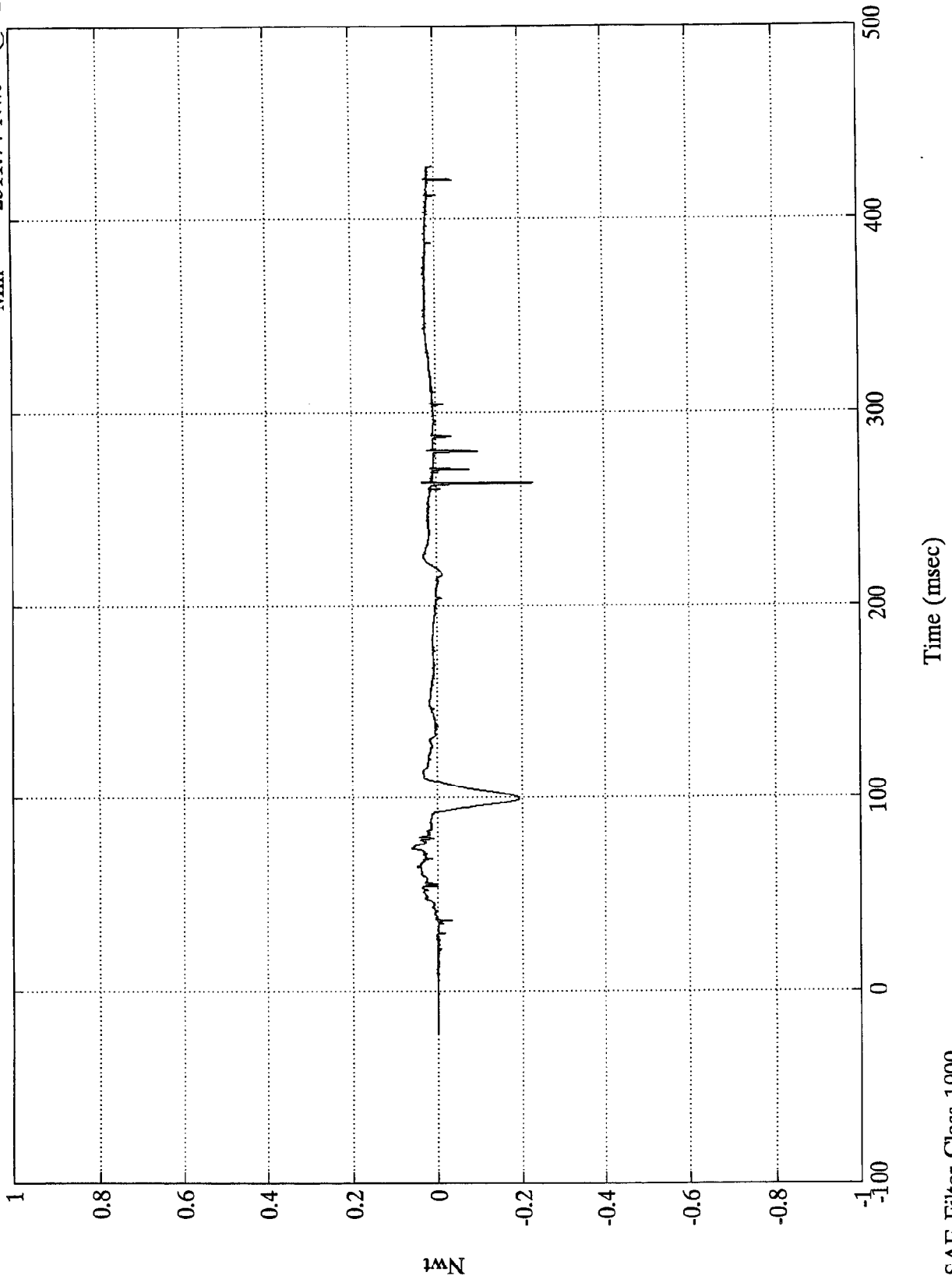
SAE Filter Class 1000

VTV TEST #4

$\times 10^4$

P1 Lower Neck Fy

Max = 601.23 Nwt @ 73.80 msec
Min = -2311.74 Nwt @ 263.64 msec



Time (msec)

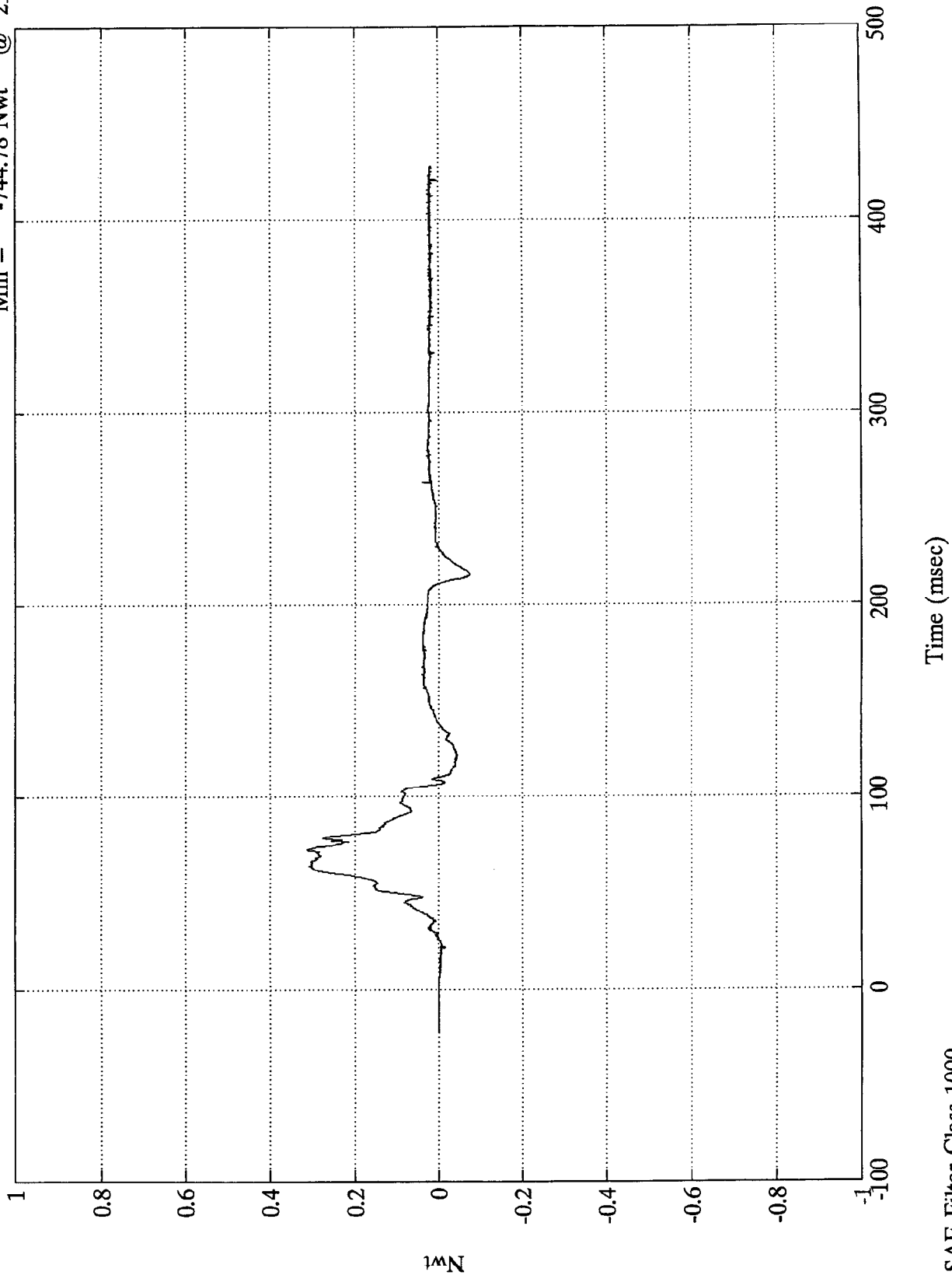
SAE Filter Class 1000

VTV TEST #4

Max = 3143.91 Nwt @ 72.96 msec
Min = -744.78 Nwt @ 216.12 msec

P1 Lower Neck Fz

$\times 10^4$

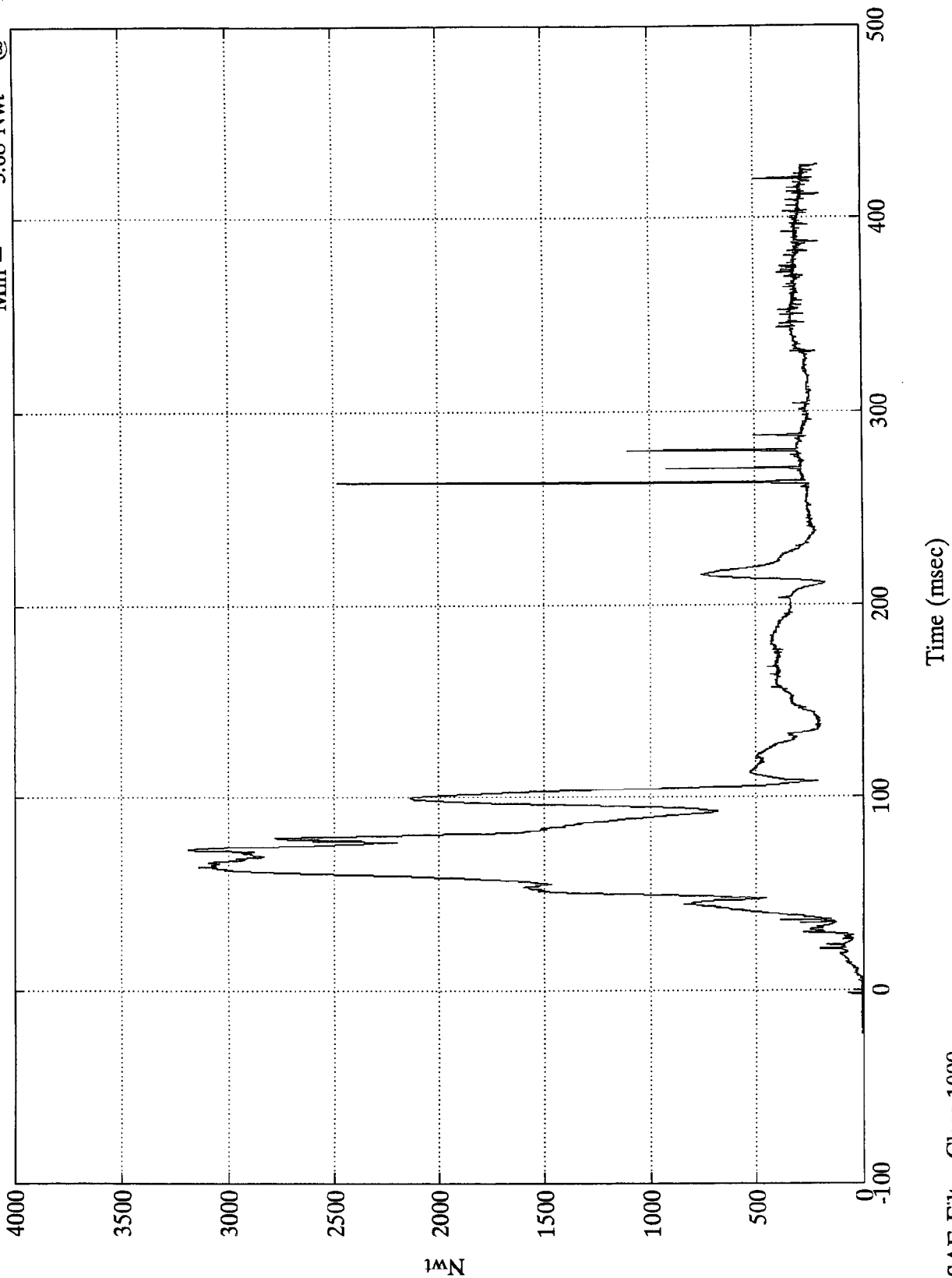


SAE Filter Class 1000

VTV TEST #4

P1 Lower Neck Force Res

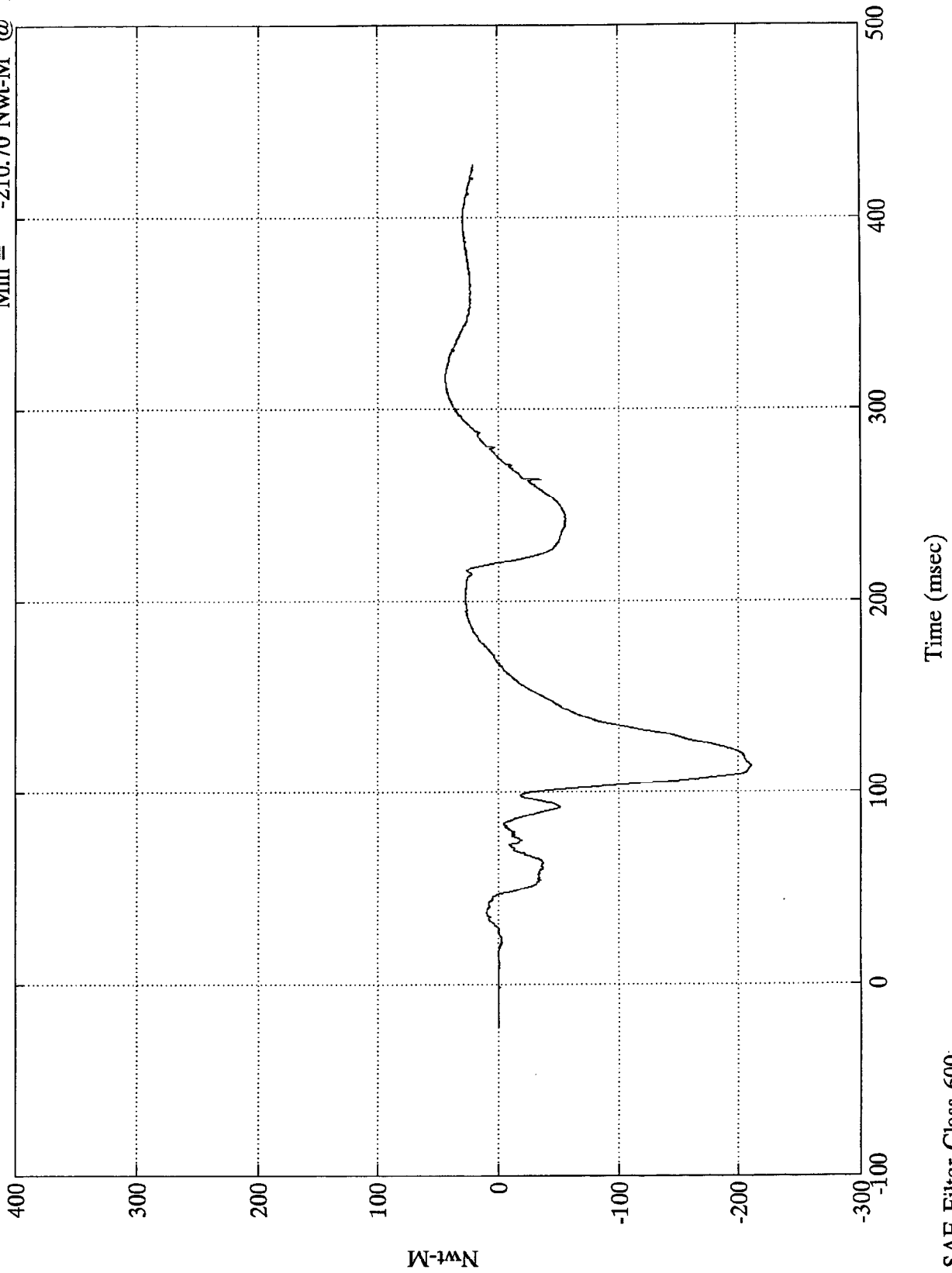
Max =	3185.63 Nwt	@	72.96 msec
Min =	3.08 Nwt	@	7.07 msec



VTV TEST #4

P1 Lower Neck Mx

Max = 43.60 Nwt-M @ 314.04 msec
Min = -210.70 Nwt-M @ 113.87 msec

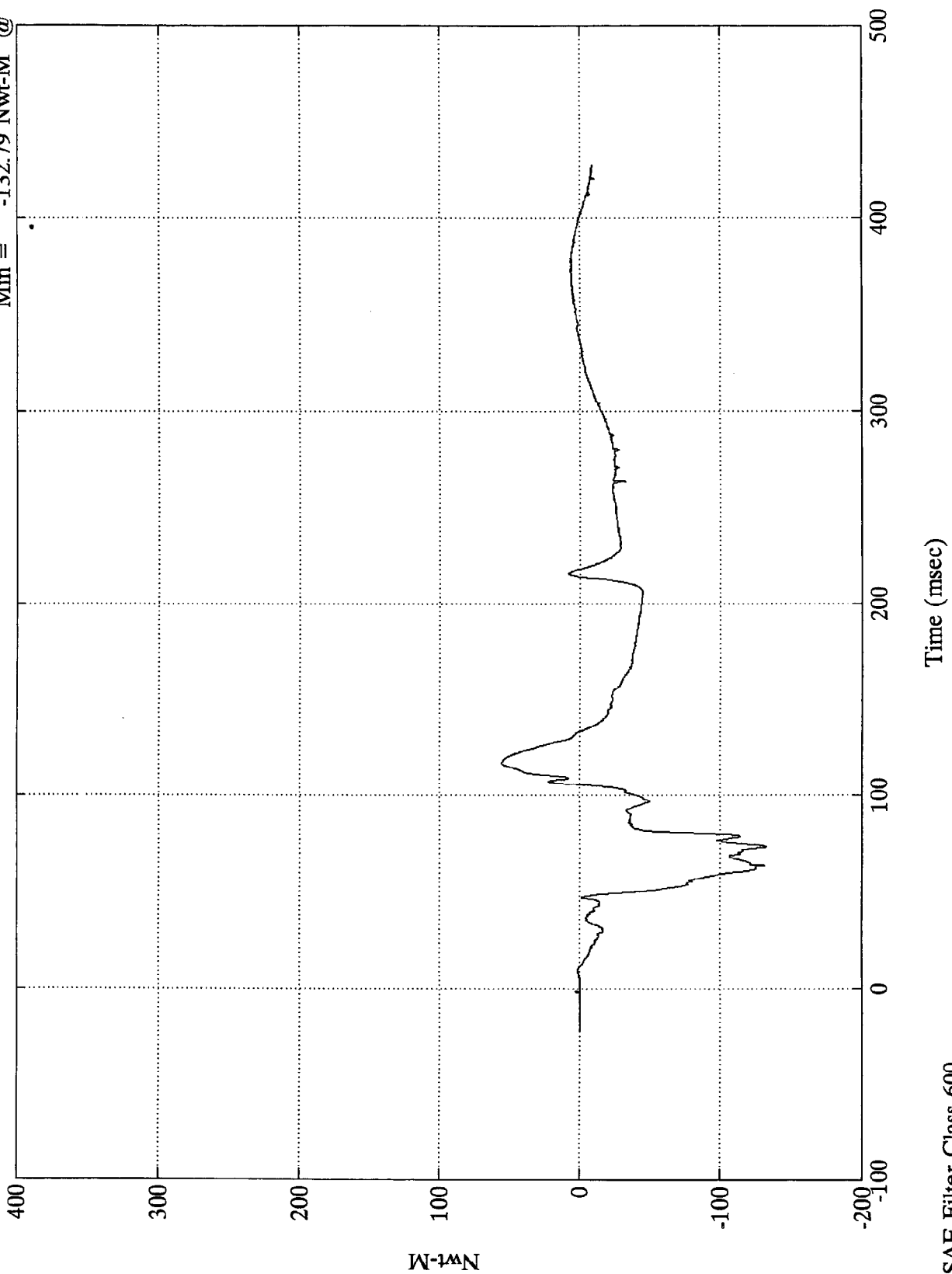


SAE Filter Class 600

VTV TEST #4

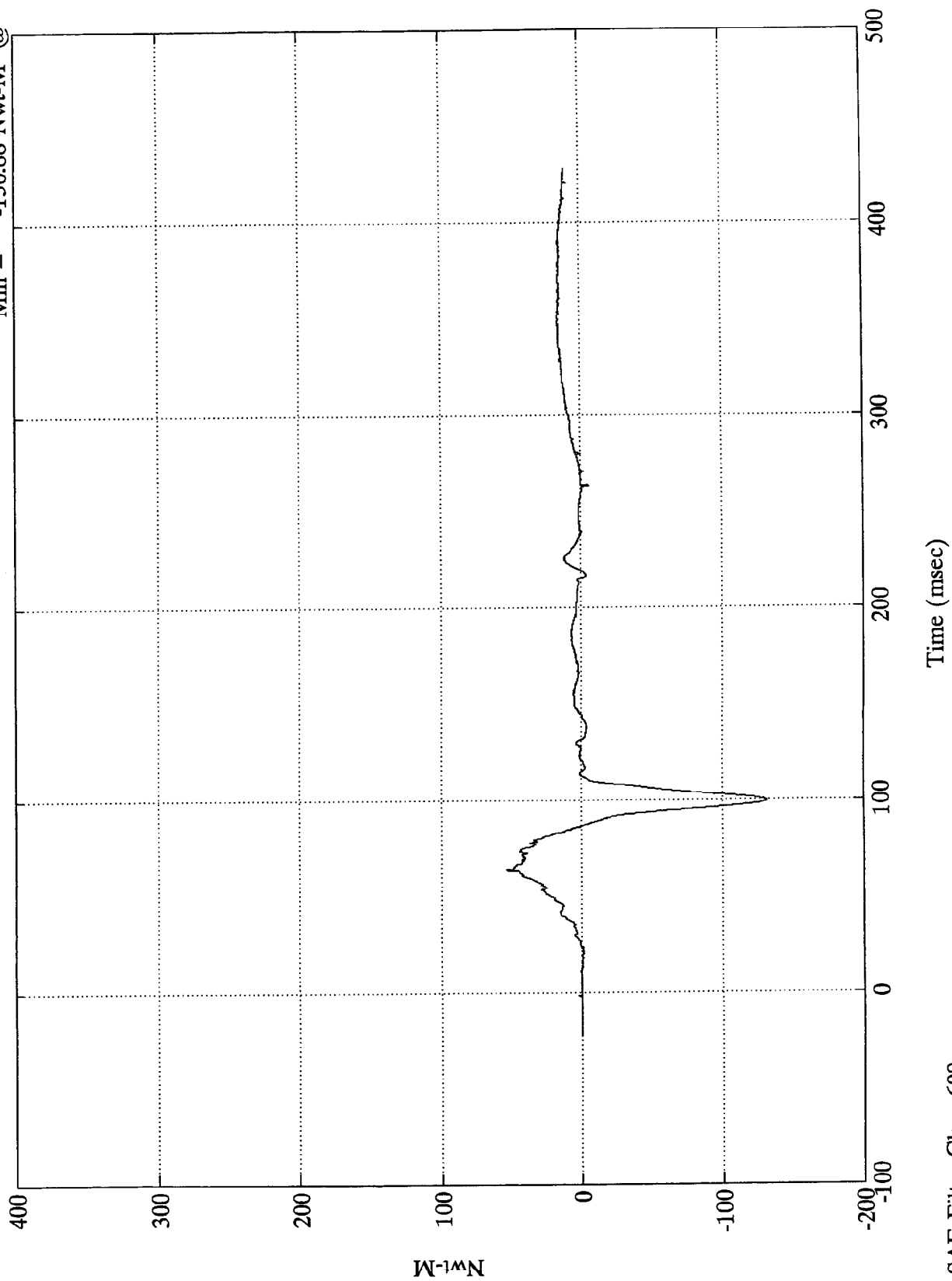
P1 Lower Neck My

Max = 56.60 Nwt-M @ 116.76 msec
Min = -132.79 Nwt-M @ 73.20 msec



VTV TEST #4

P1 Lower Neck Mz
Max = 53.99 Nwt-M @ 63.95 msec
Min = -130.88 Nwt-M @ 99.59 msec

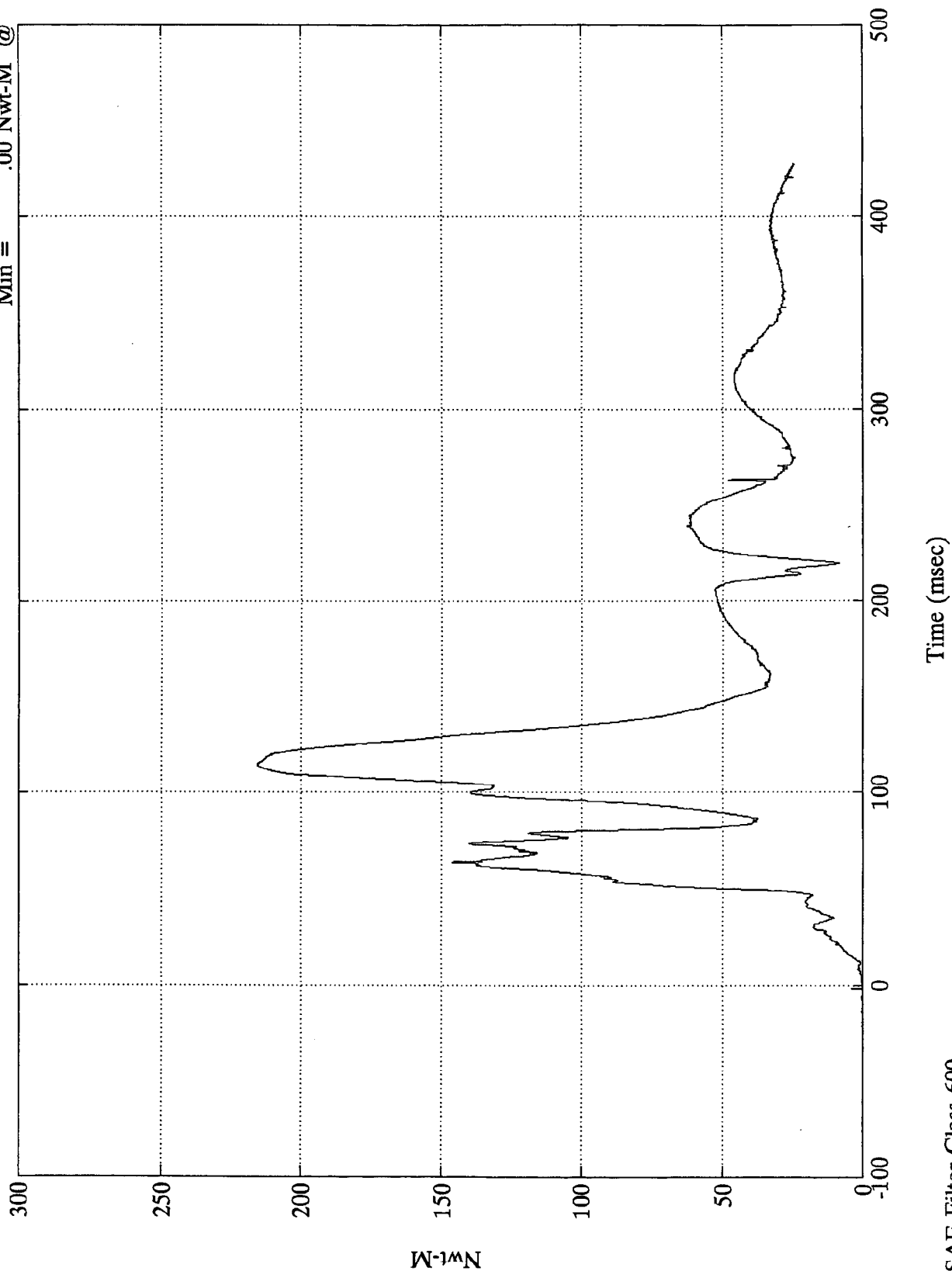


SAE Filter Class 600

VTV TEST #4

Max = 215.60 Nwt-M @ 114.12 msec
Min = .00 Nwt-M @ -0.48 msec

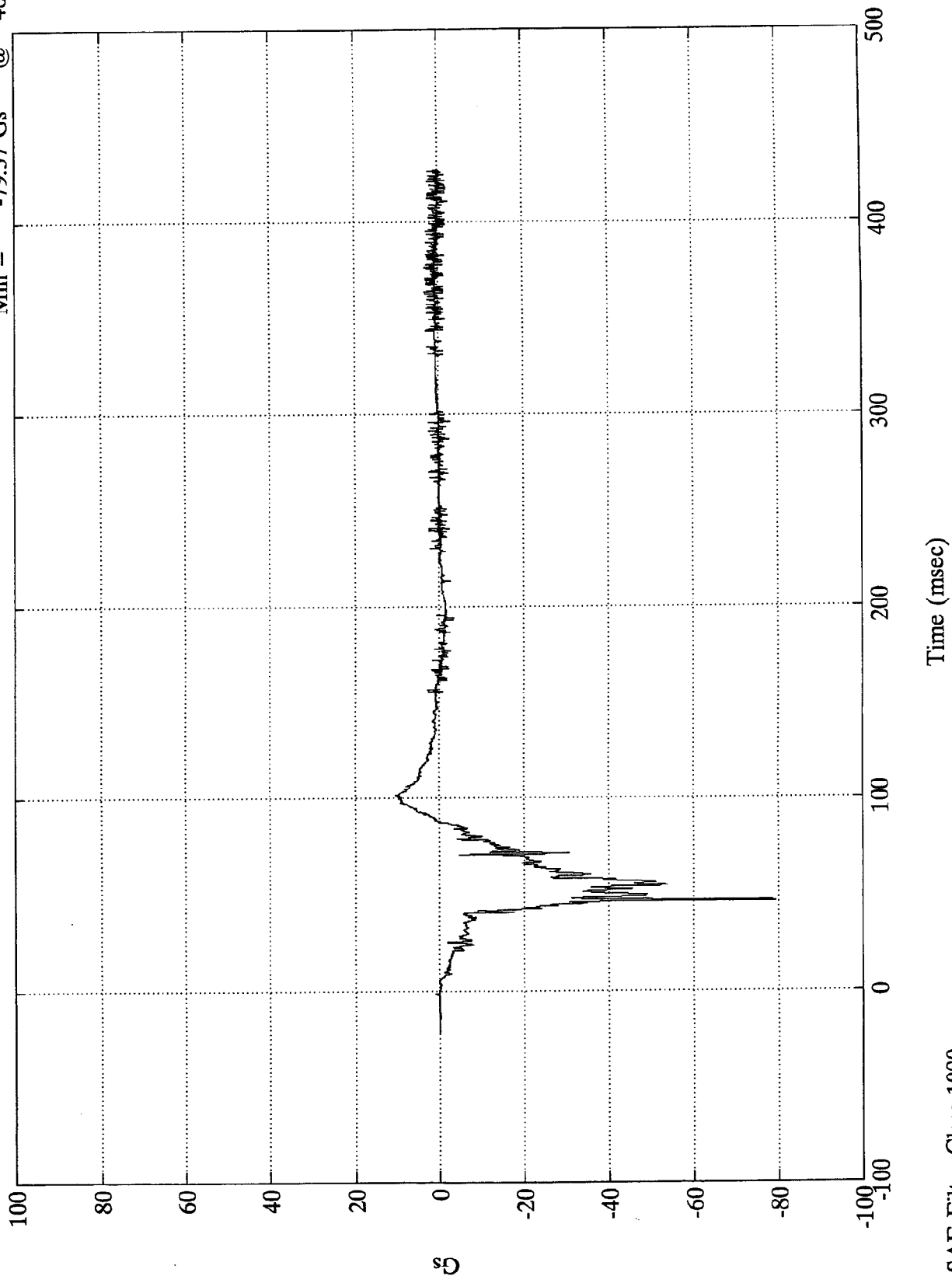
P1 Lower Neck Moment Res



SAE Filter Class 600

VTV TEST #4

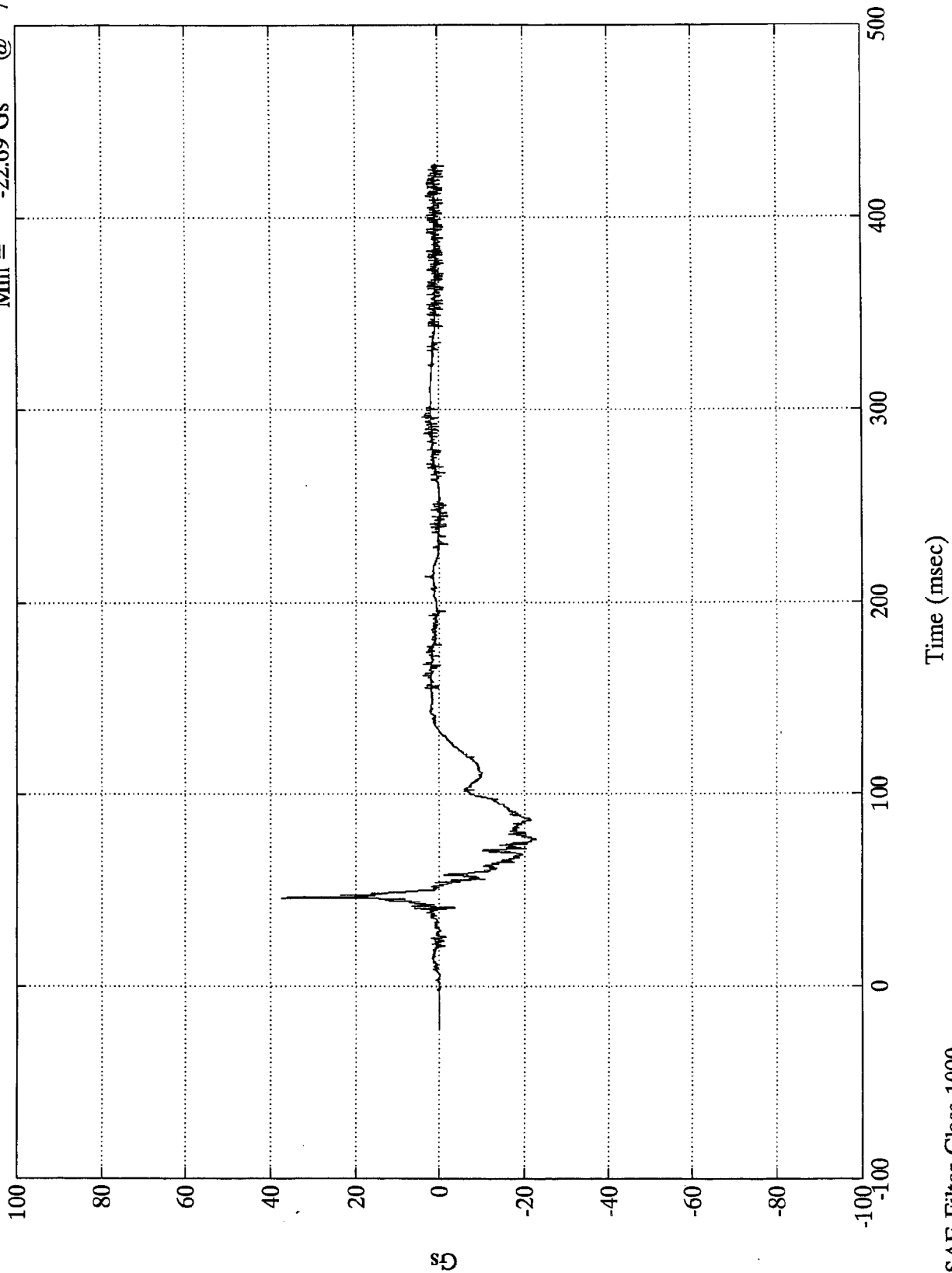
P1 Pelvic X
Max = 10.41 Gs @ 101.40 msec
Min = -79.37 Gs @ 46.44 msec



SAE Filter Class 1000

VTV TEST #4

P1 Pelvic Y
Max = 37.48 Gs @ 46.44 msec
Min = -22.69 Gs @ 76.68 msec

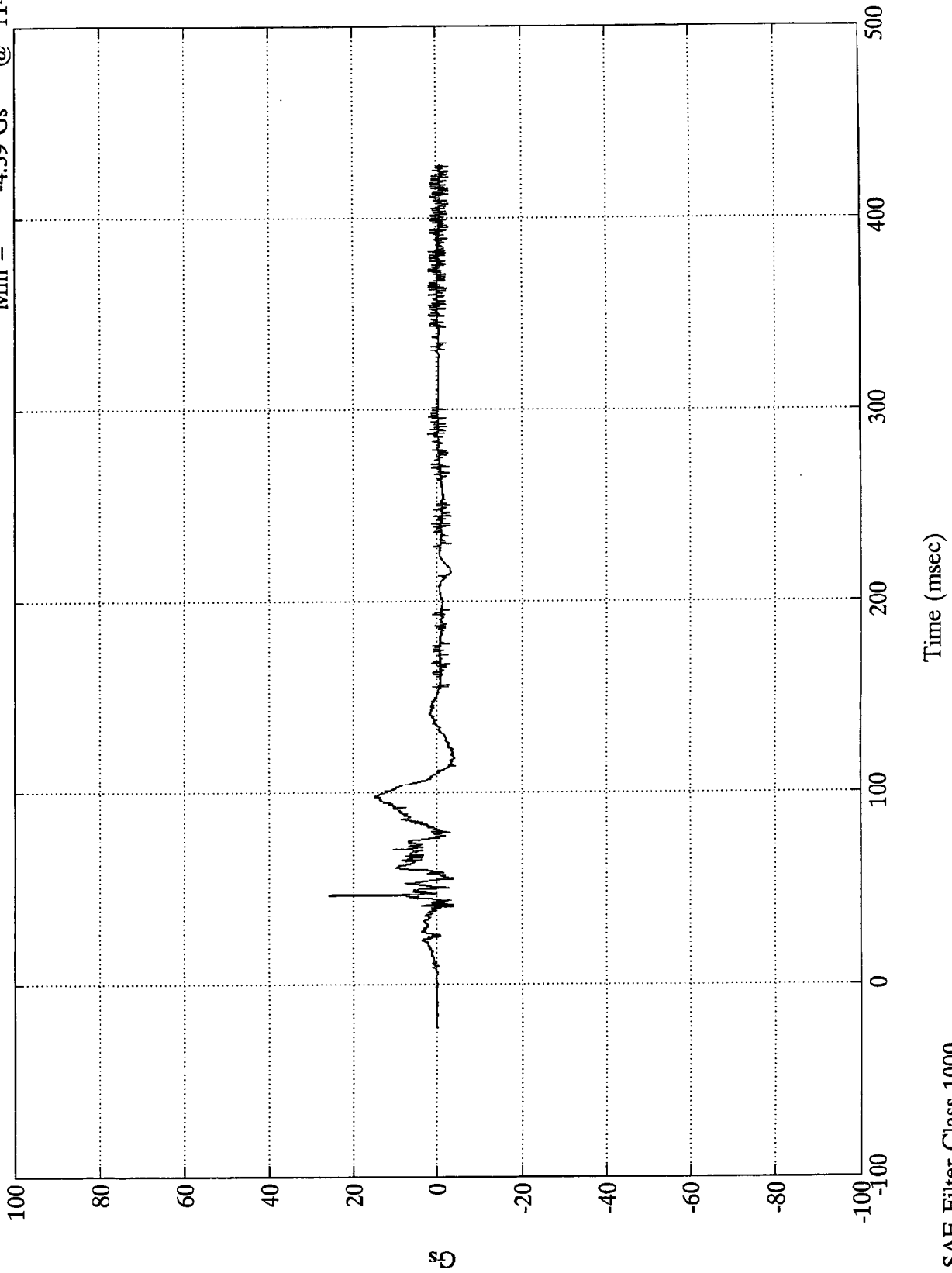


SAE Filter Class 1000

VTV TEST #4

Max = 25.78 Gs @ 46.44 msec
Min = -4.39 Gs @ 114.36 msec

P1 Pelvic Z

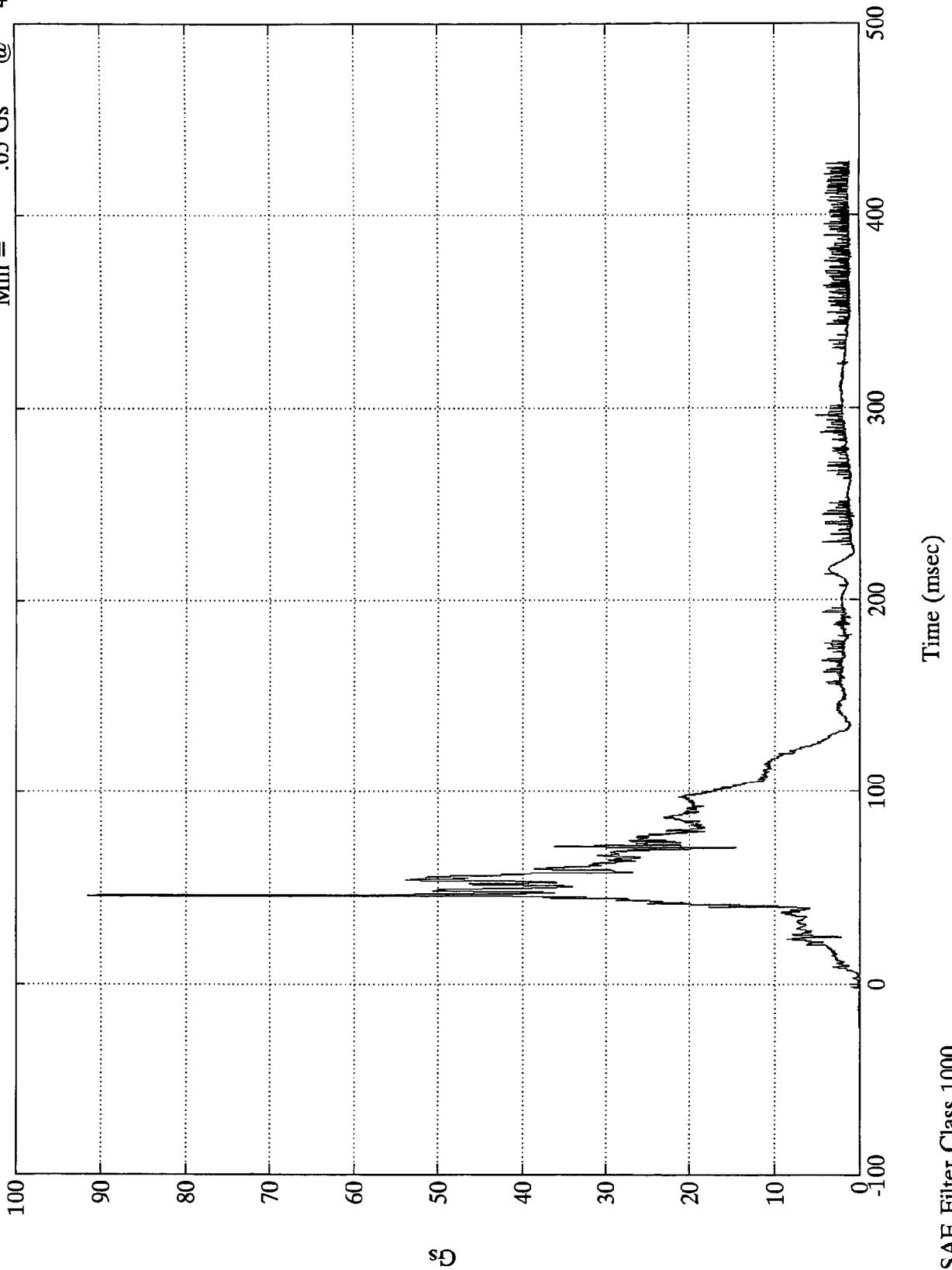


SAE Filter Class 1000

VTV TEST #4

P1 Pelvic Res.

Max = 91.49 Gs @ 46.44 msec
Min = .05 Gs @ 4.07 msec



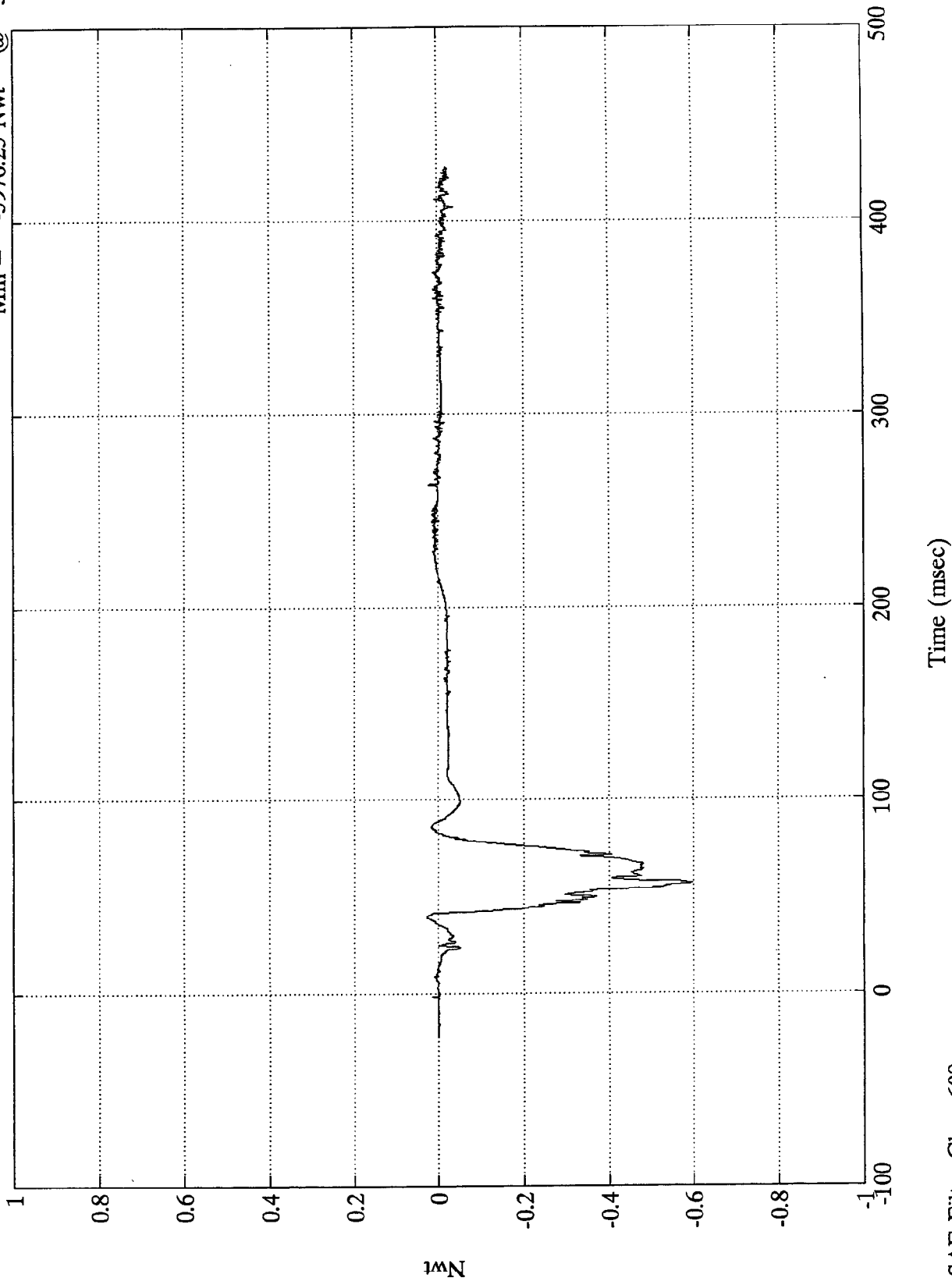
SAE Filter Class 1000

VIV TEST #4

$\times 10^4$

P1 Left Femur

Max = 274.53 Nwt @ 39.47 msec
Min = -5976.23 Nwt @ 56.88 msec



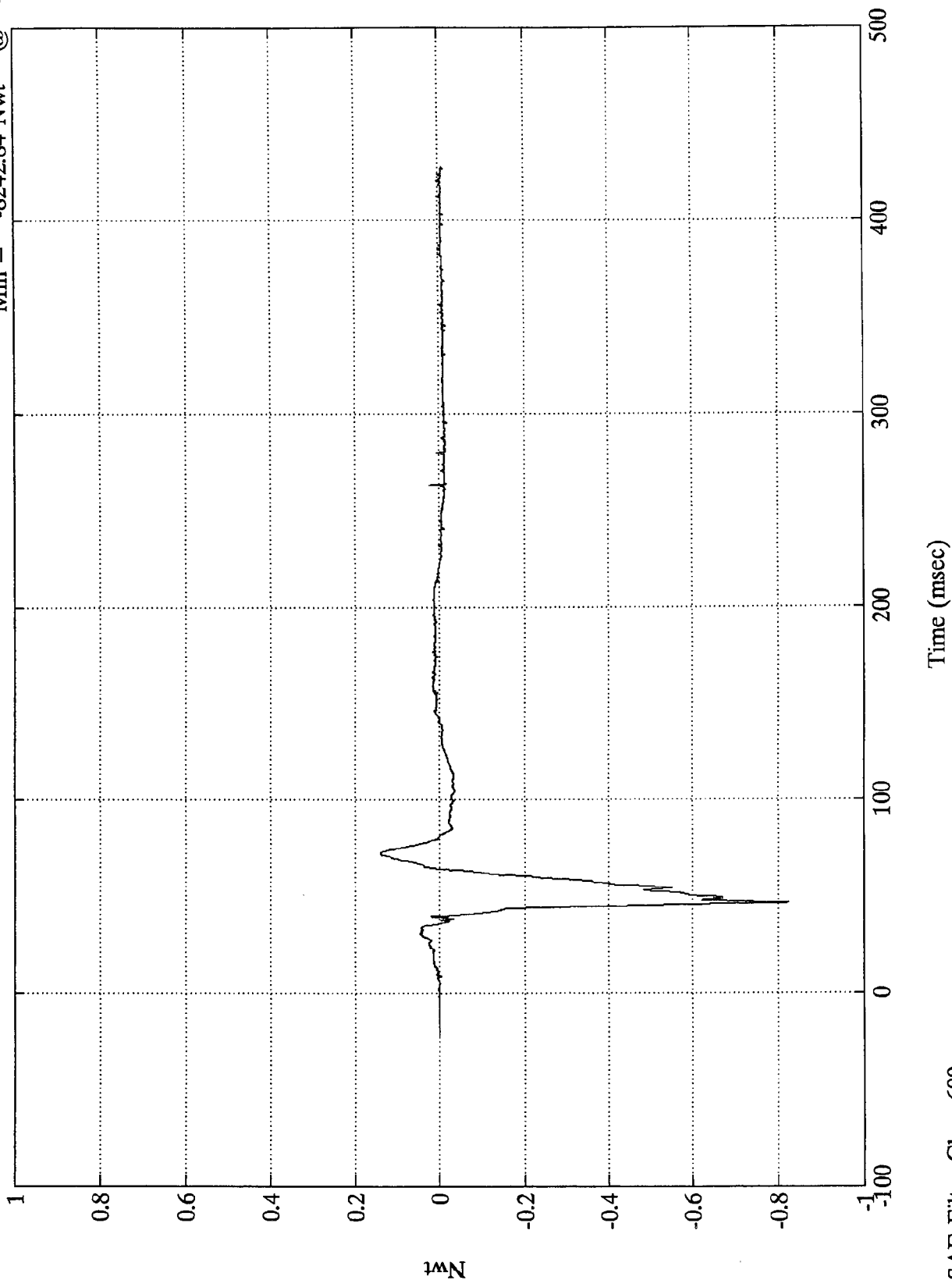
SAE Filter Class 600

VTV TEST #4

$\times 10^4$

P1 Right Femur

Max = 1393.43 Nwt @ 72.48 msec
Min = -8242.84 Nwt @ 46.56 msec

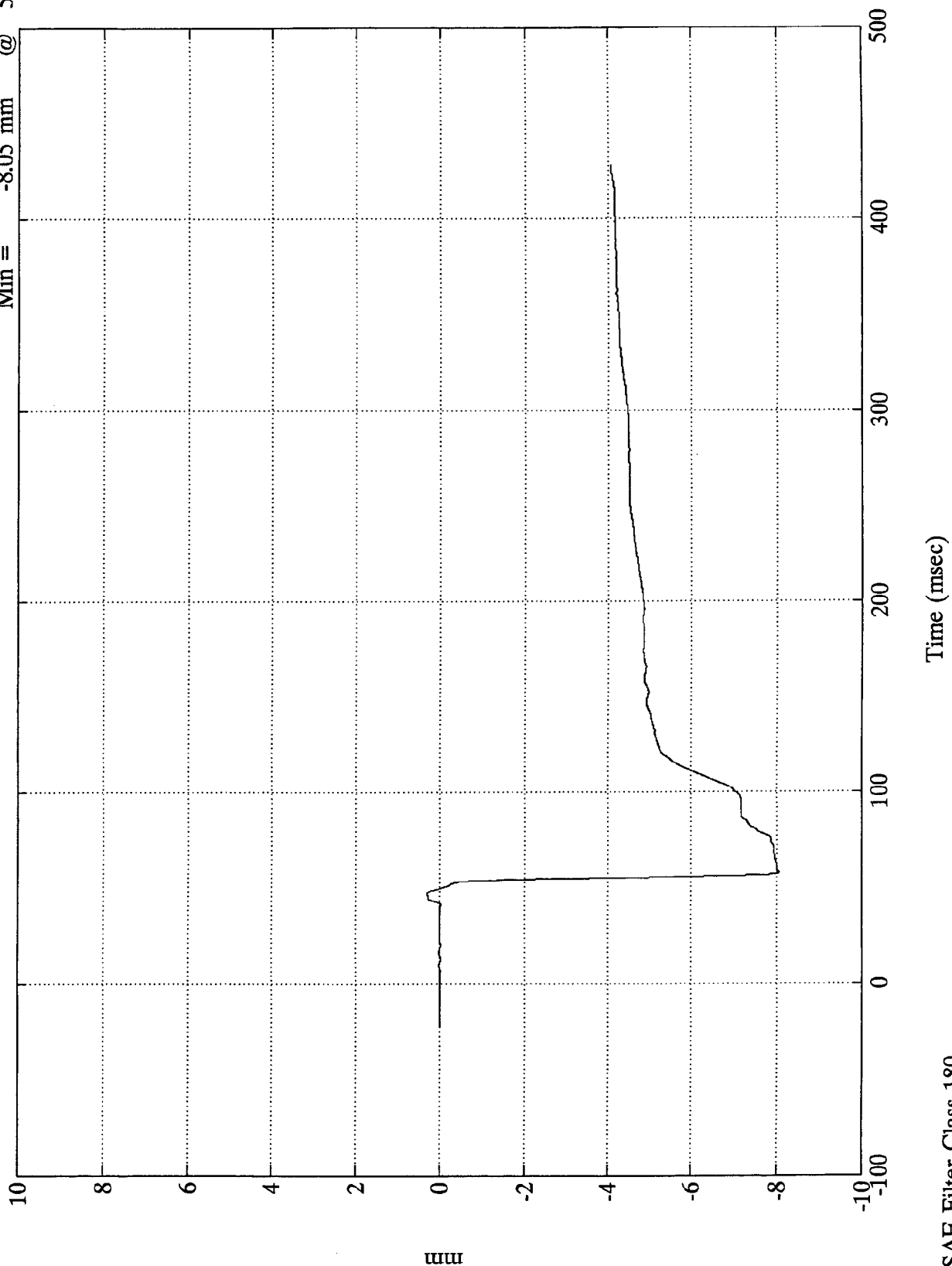


SAE Filter Class 600

VTV TEST #4

P1 Left Knee Shear

Max = .29 mm @ 47.15 msec
Min = -8.05 mm @ 57.95 msec

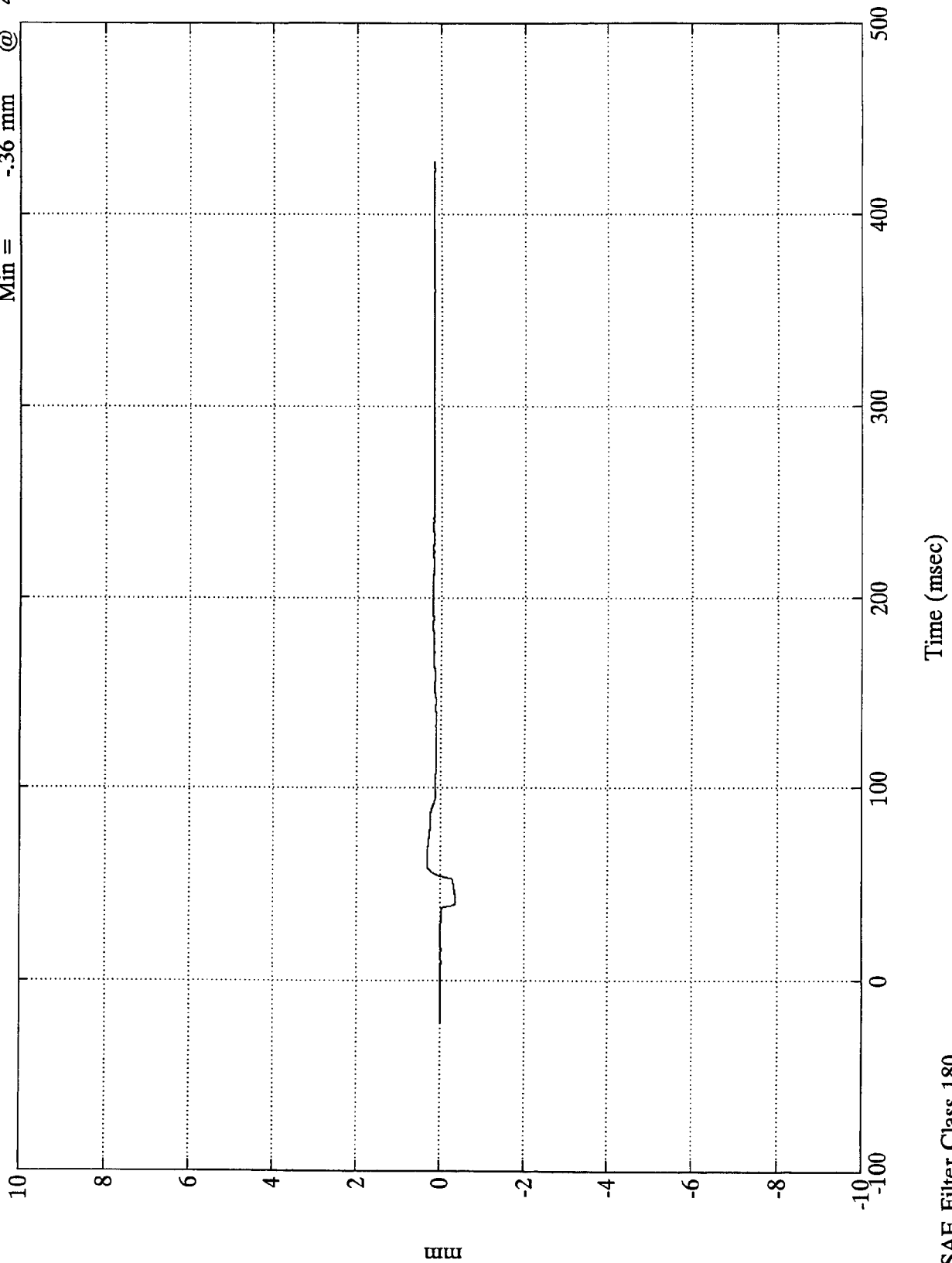


SAE Filter Class 180

VTV TEST #4

P1 Right Knee Shear

Max = .32 mm @ 64.80 msec
Min = -.36 mm @ 44.04 msec

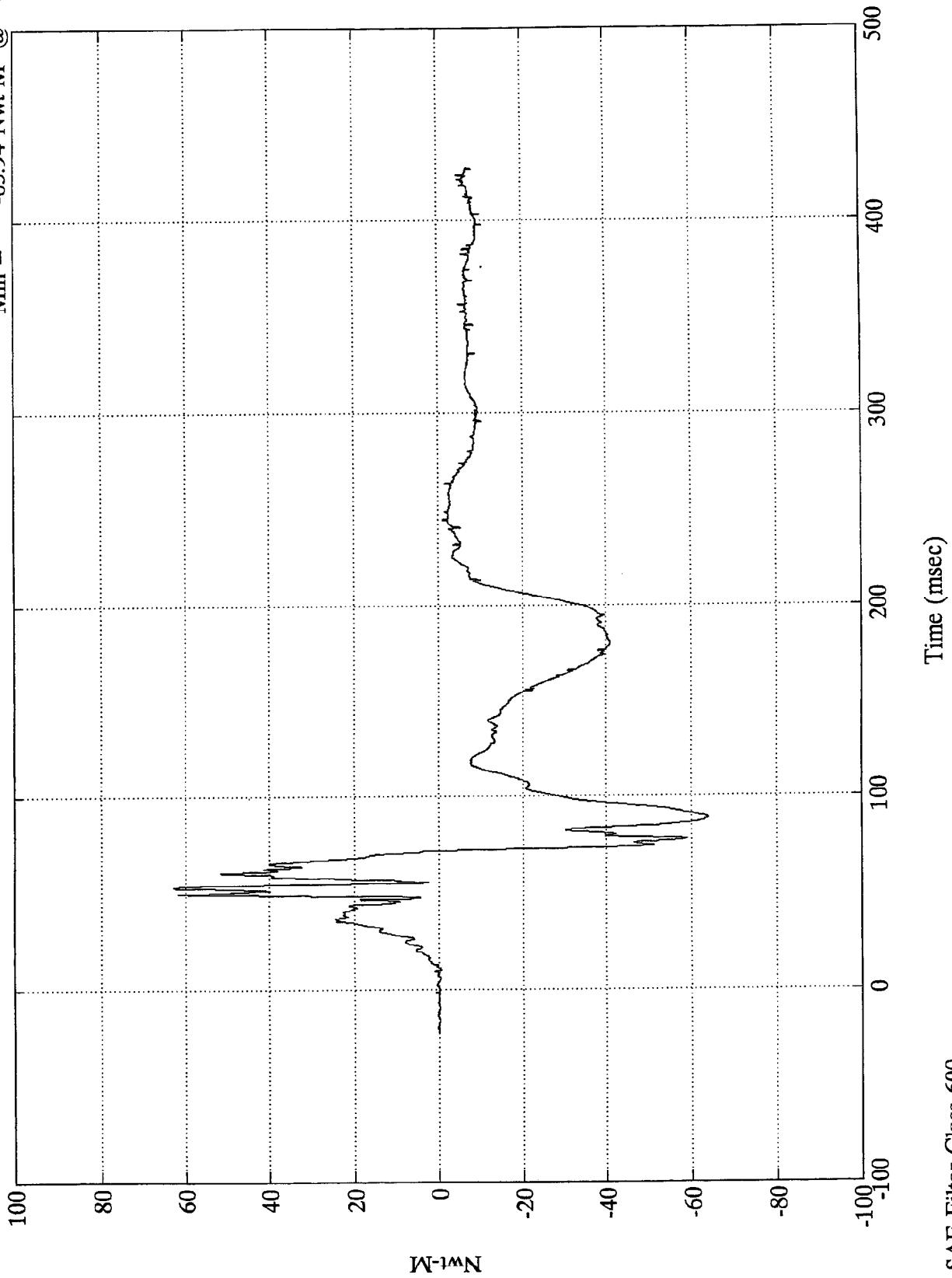


SAE Filter Class 180

VTV TEST #4

P1 Lt Upper Tibia Mx

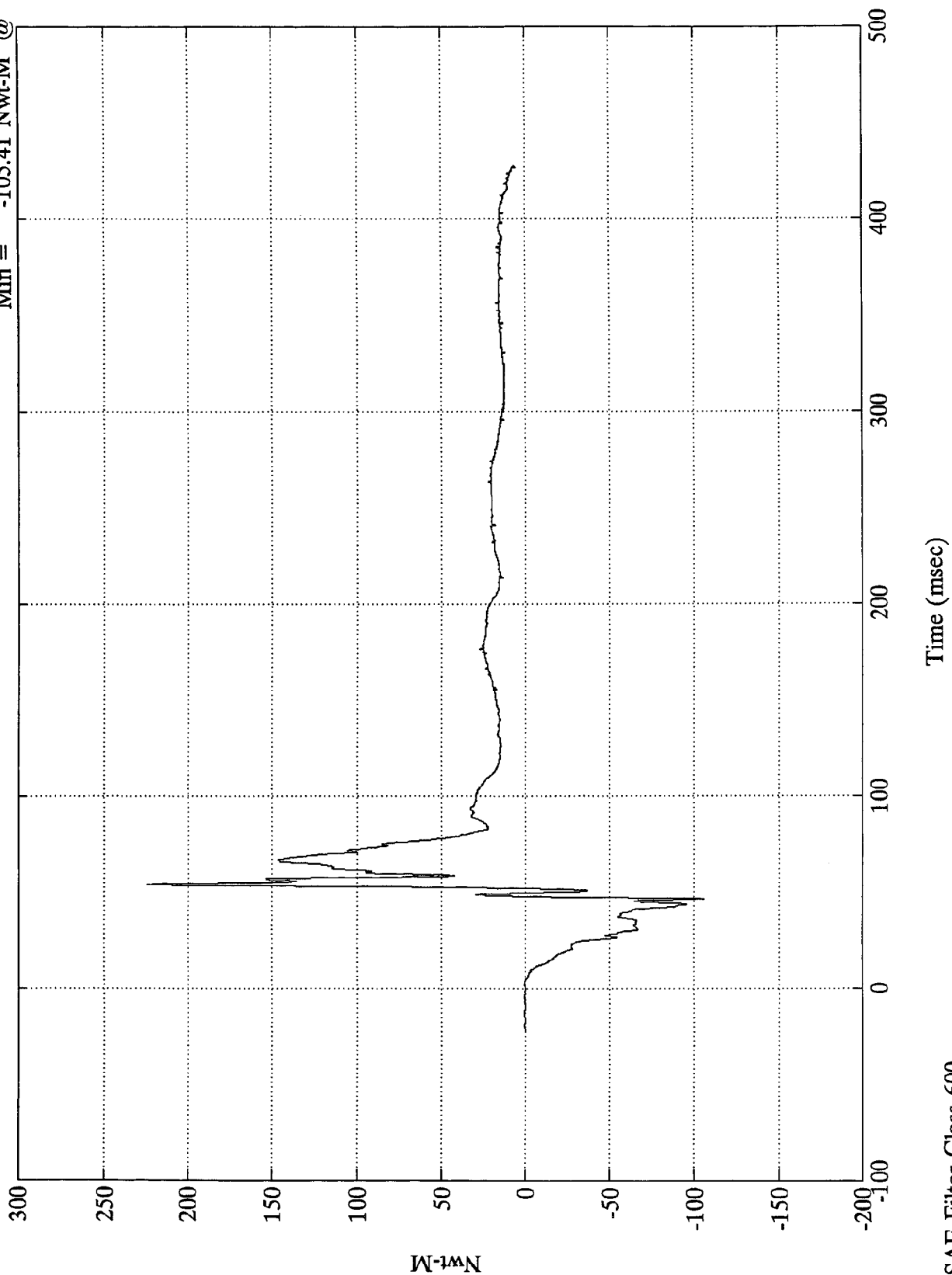
Max = 62.90 Nwt-M @ 52.79 msec
Min = -63.94 Nwt-M @ 88.68 msec



VTV TEST #4

P1 Lt Upper Tibia My

Max = 224.21 Nwt-M @ 54.59 msec
Min = -105.41 Nwt-M @ 46.92 msec

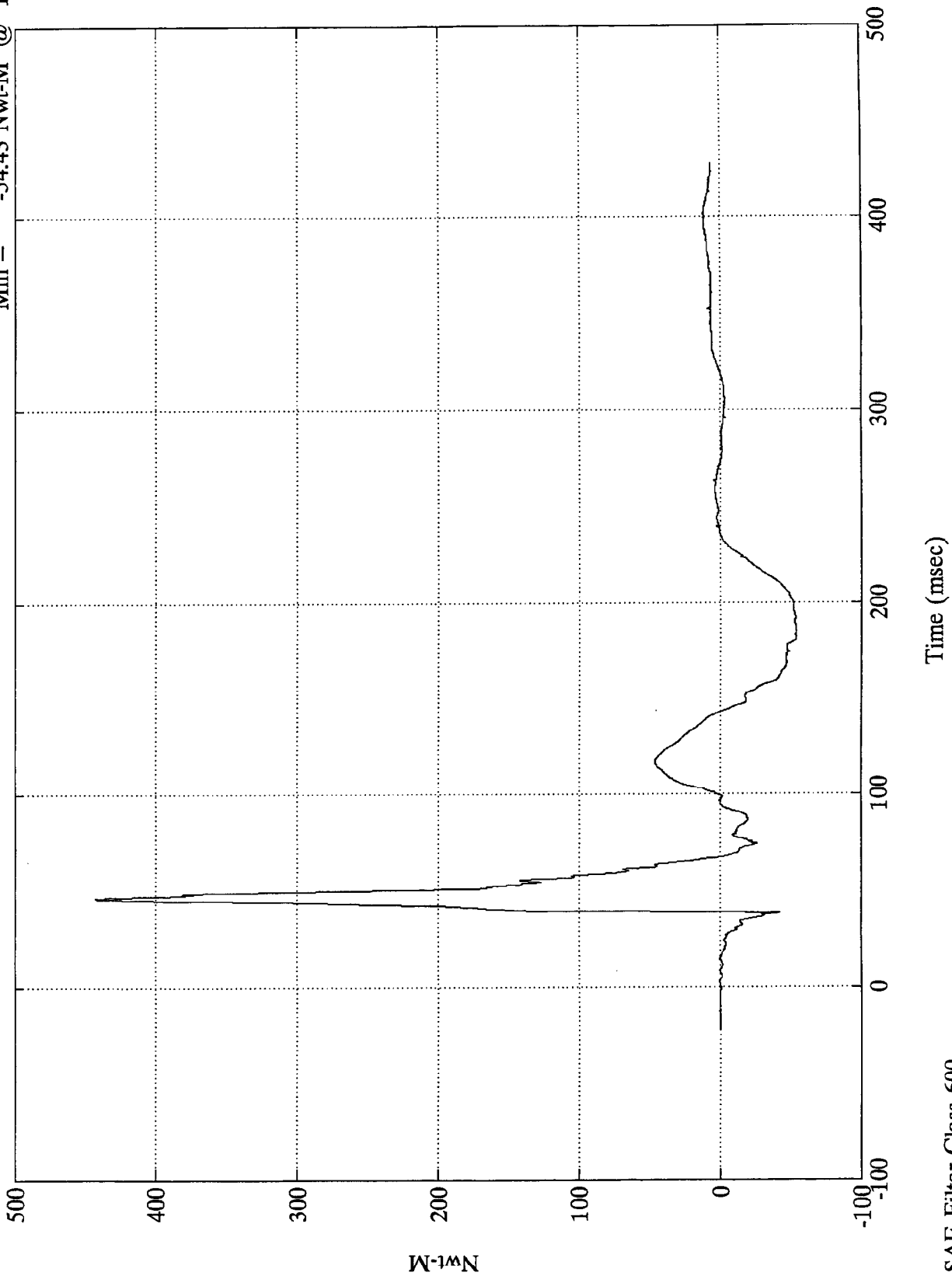


SAE Filter Class 600

VTV TEST #4

P1 Rt Upper Tibia Mx

Max = 443.28 Nwt-M @ 46.20 msec
Min = -54.43 Nwt-M @ 185.16 msec

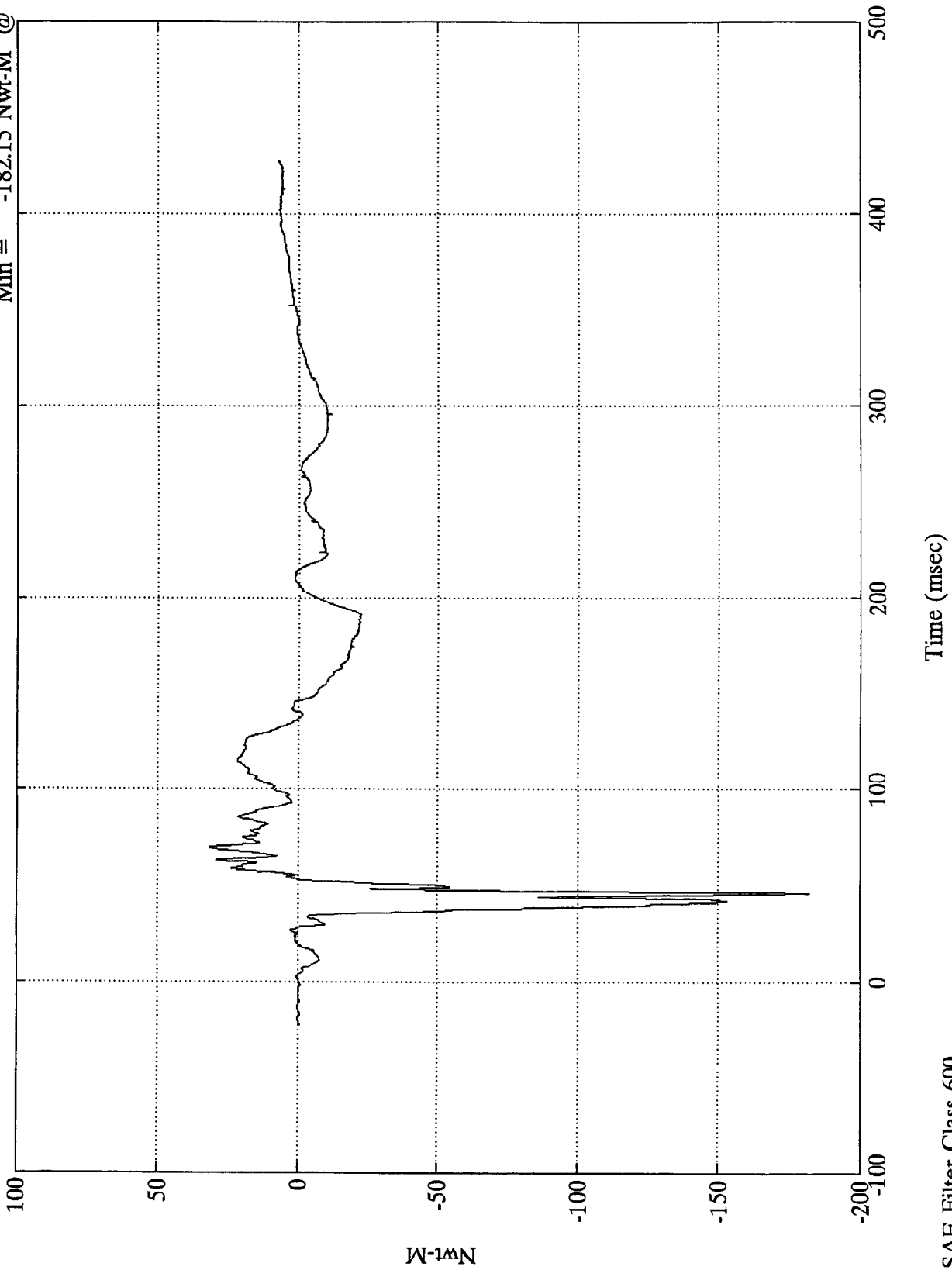


SAE Filter Class 600

VTV TEST #4

P1 Rt Upper Tibia My

Max = 31.74 Nwt-M @ 69.72 msec
Min = -182.15 Nwt-M @ 46.32 msec



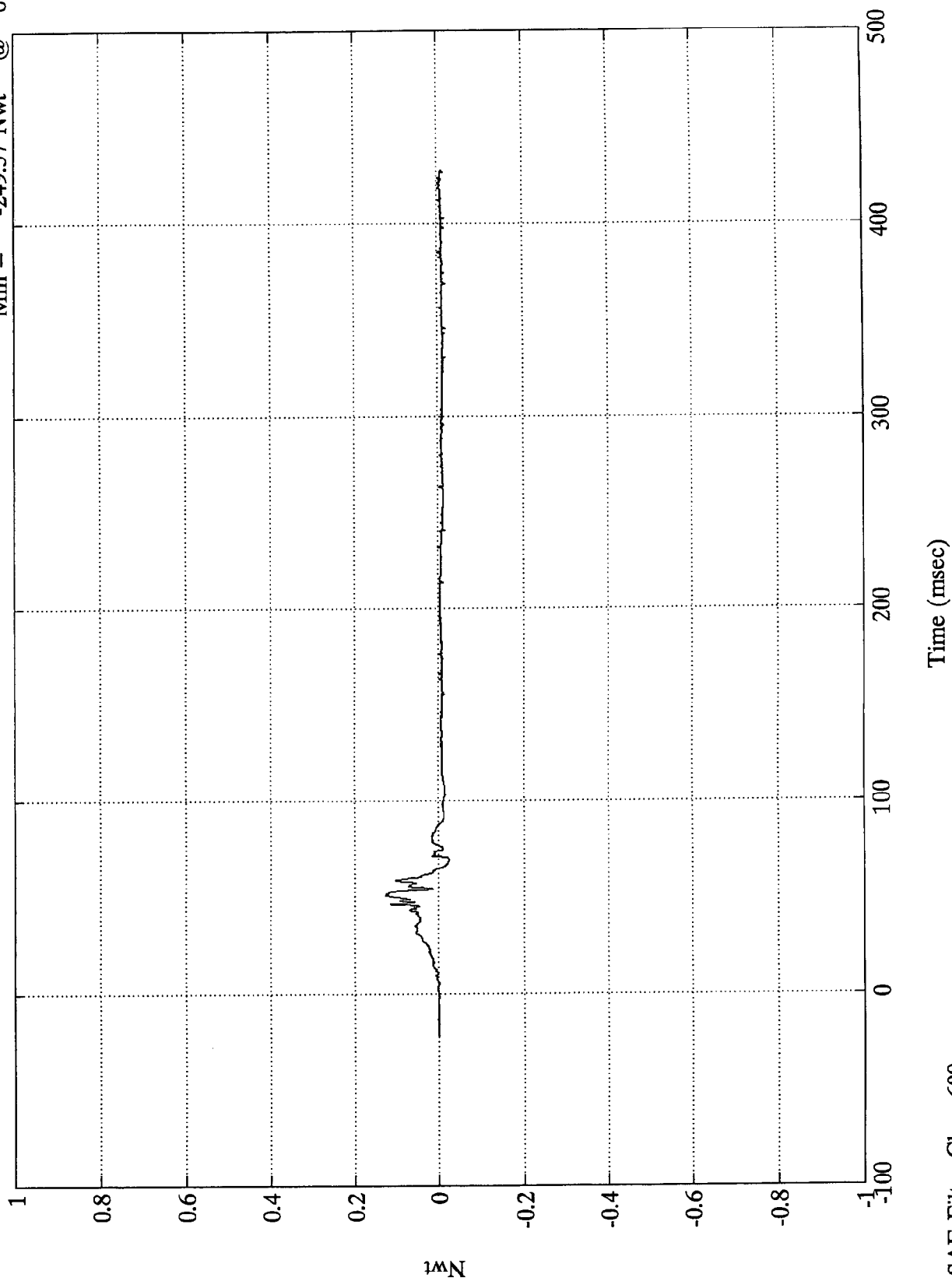
SAE Filter Class 600

VTV TEST #4

$\times 10^4$

P1 Lt Lower Tibia Fx

Max = 1277.71 Nwt @ 51.24 msec
Min = -249.57 Nwt @ 69.72 msec



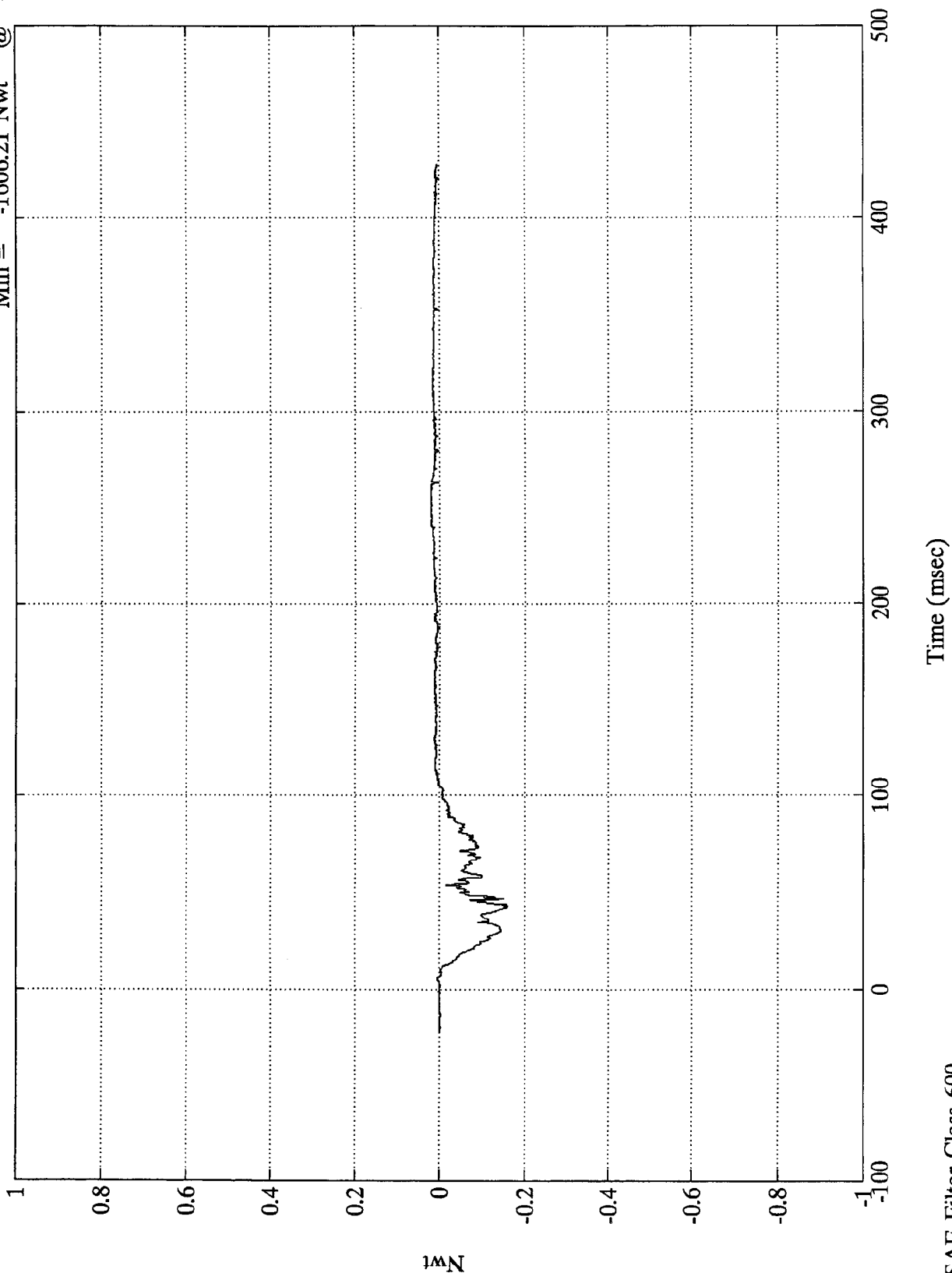
SAE Filter Class 600

VTV TEST #4

$\times 10^4$

P1 Lt Lower Tibia Fz

Max = 211.50 Nwt @ 248.16 msec
Min = -1606.21 Nwt @ 43.20 msec

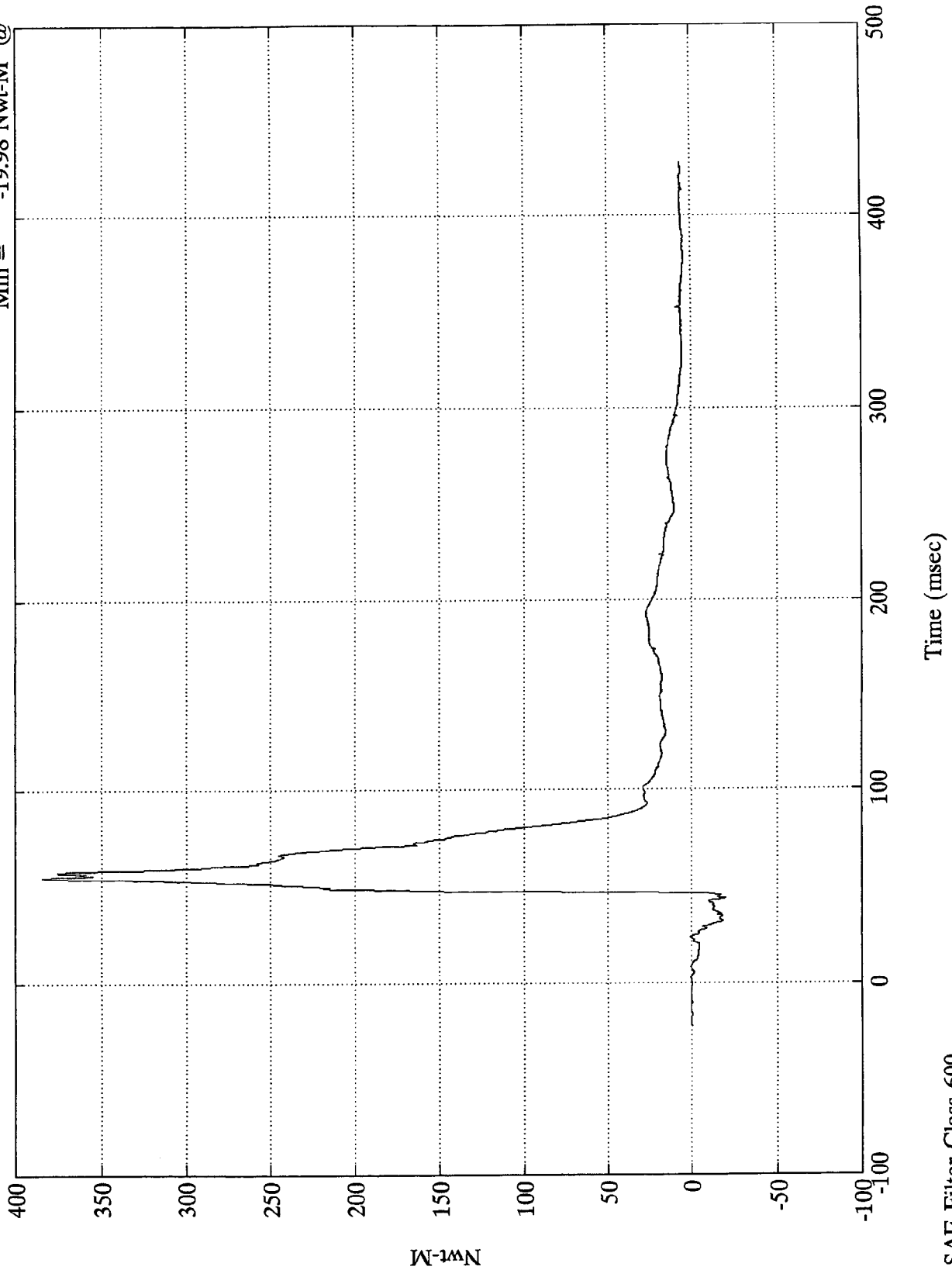


SAE Filter Class 600

VTV TEST #4

P1 Lt Lower Tibia My

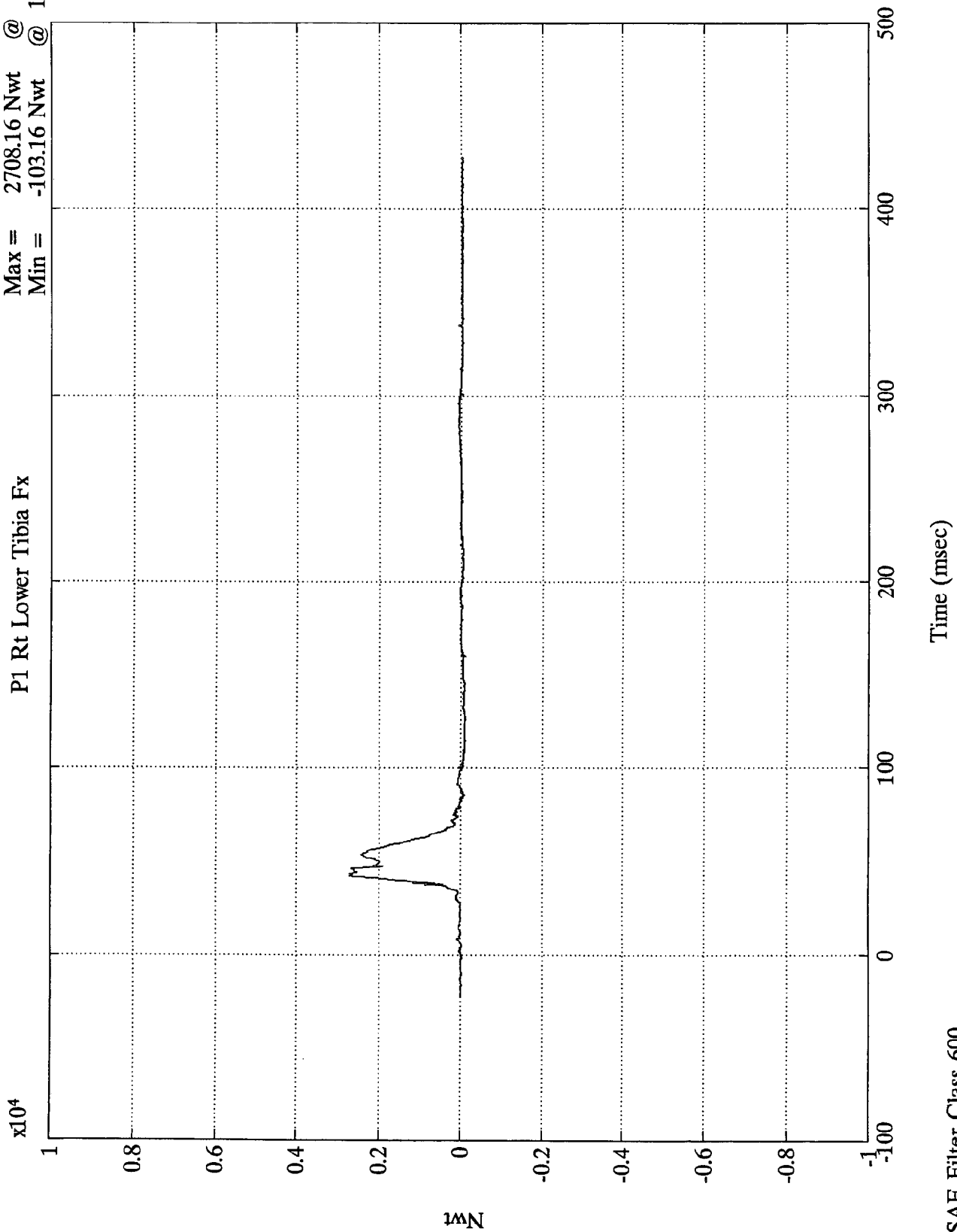
Max = 384.38 Nwt-M @ 54.96 msec
Min = -19.98 Nwt-M @ 43.56 msec



VTV TEST #4

P1 Rt Lower Tibia Fx

Max = 2708.16 Nwt @ 42.72 msec
Min = -103.16 Nwt @ 159.96 msec



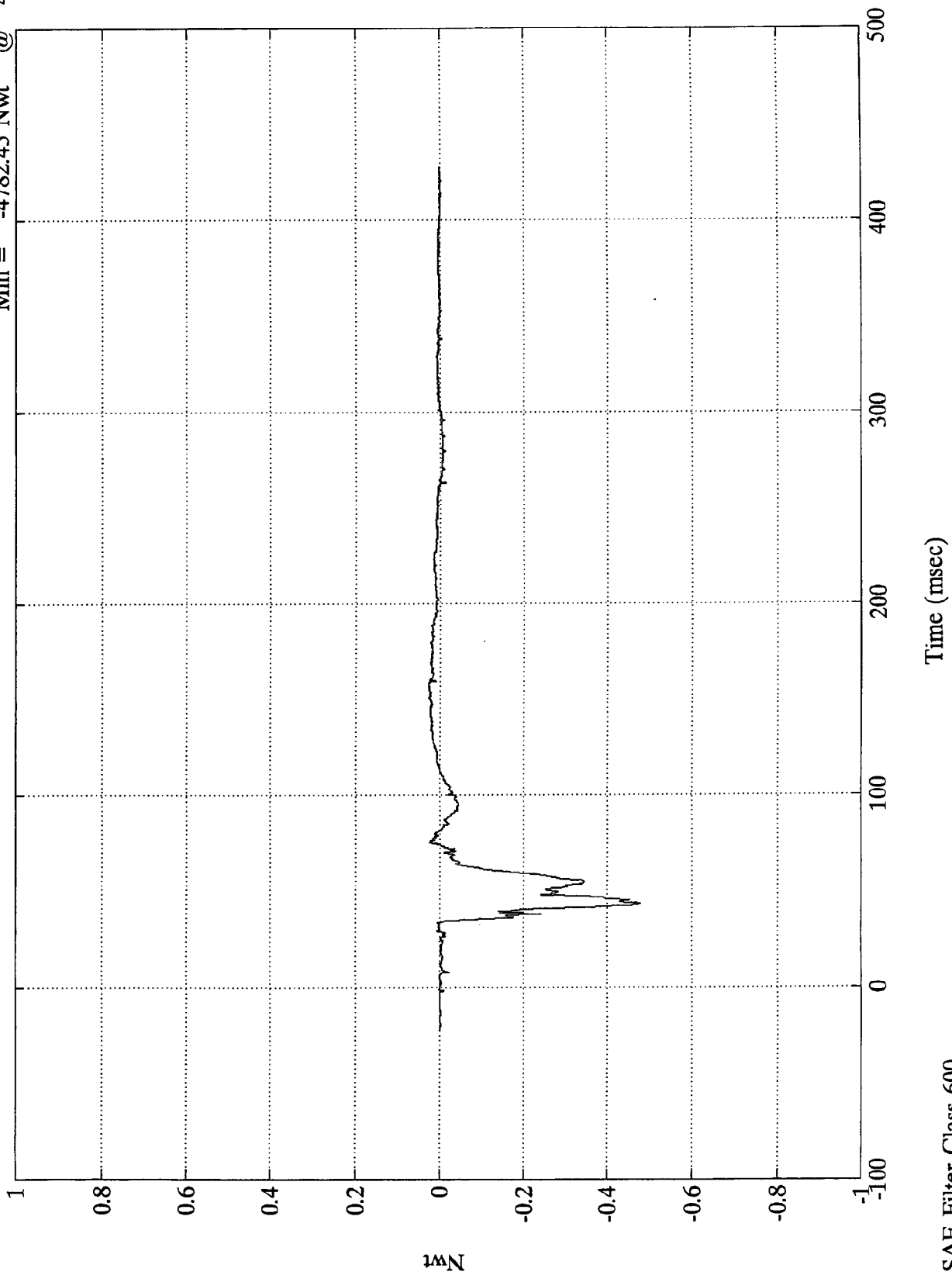
SAE Filter Class 600

VTV TEST #4

$\times 10^4$

P1 Rt Lower Tibia Fz

Max = 281.61 Nwt @ 150.72 msec
Min = -4782.45 Nwt @ 43.31 msec

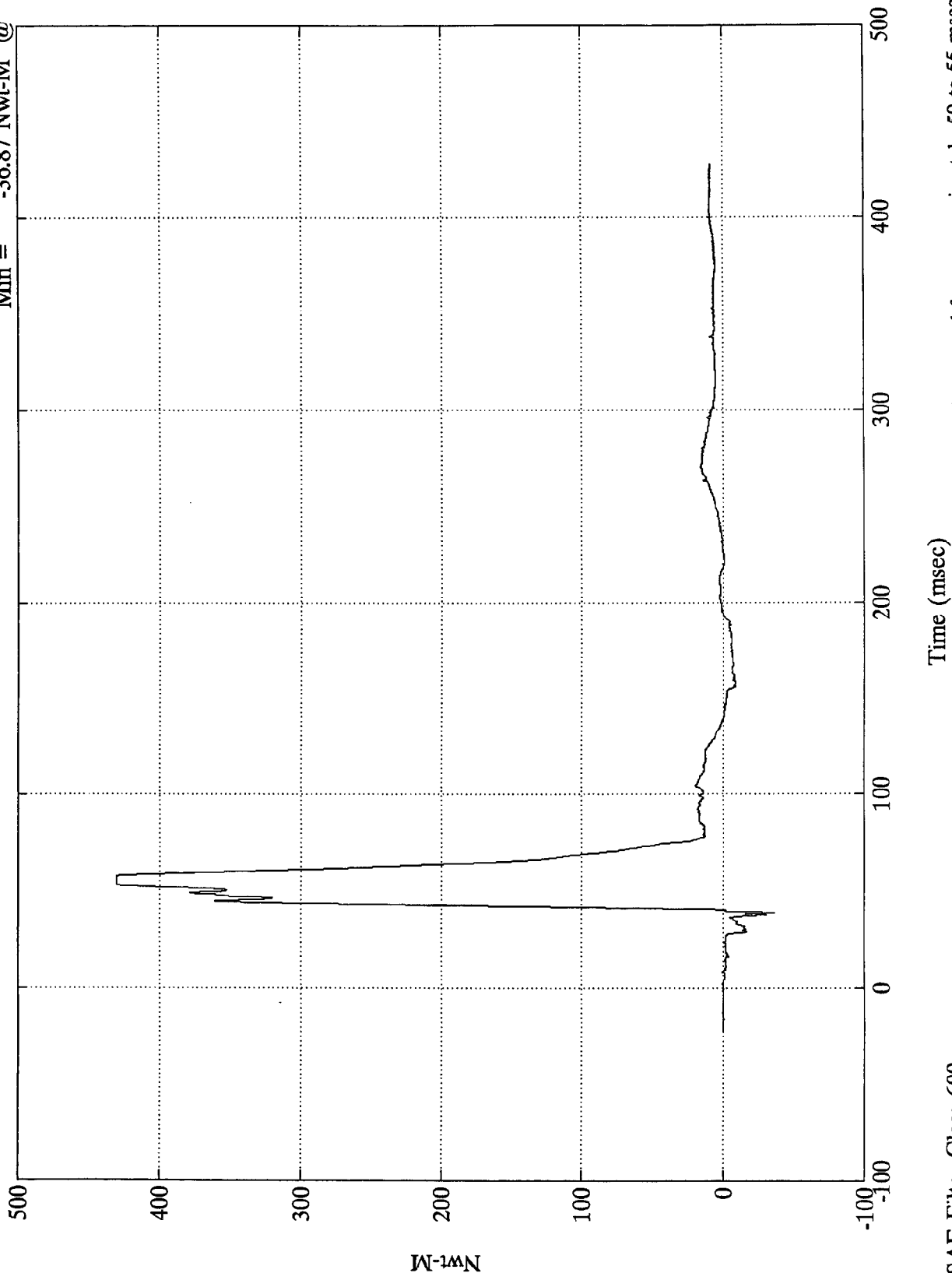


SAE Filter Class 600

VTV TEST #4

P1 Rt Lower Tibia My

Max = 431.08 Nwt-M @ 53.52 msec
Min = -36.87 Nwt-M @ 38.88 msec



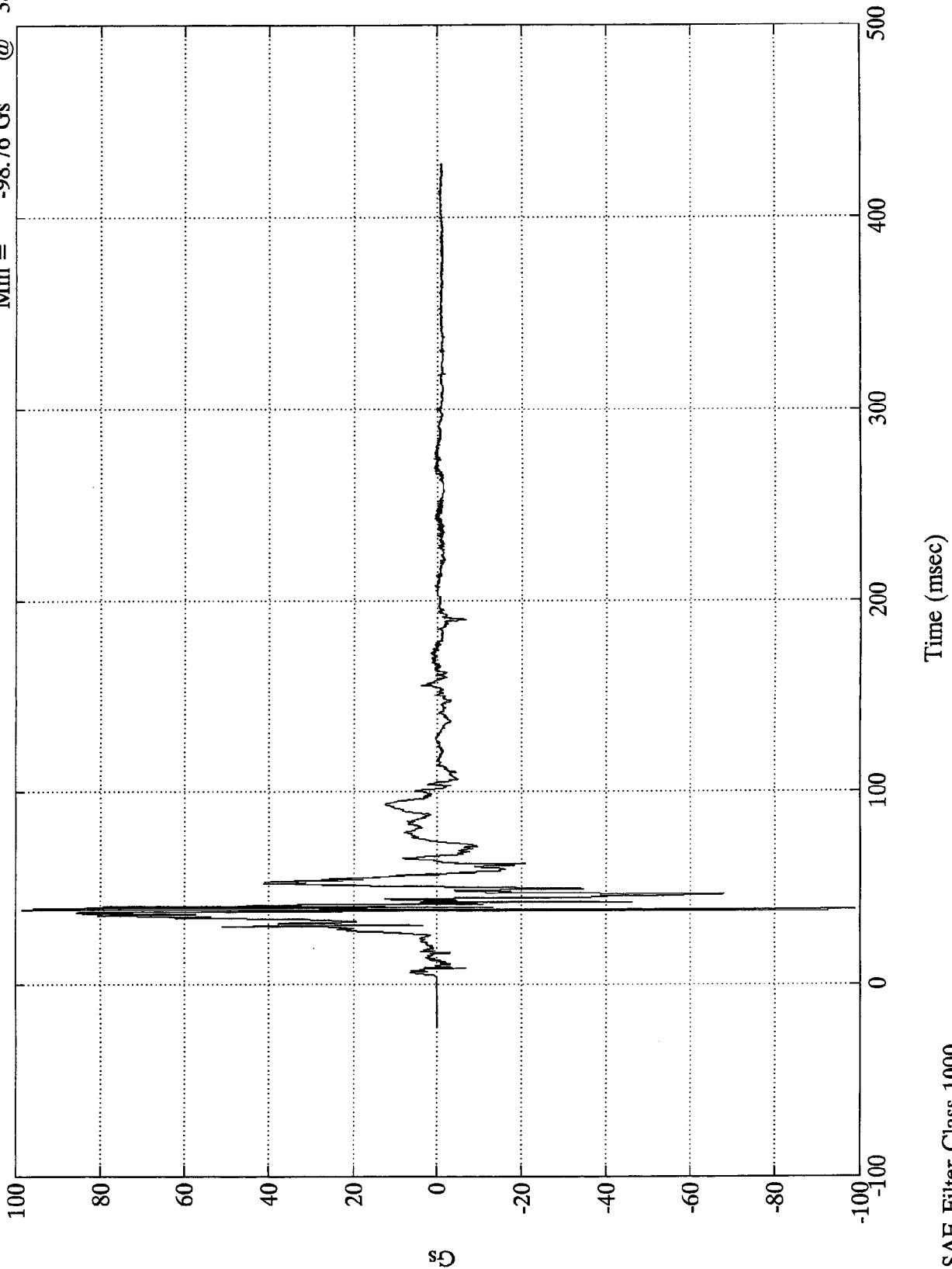
SAE Filter Class 600

Channel saturated from approximately 50 to 55 msec.

VTV TEST #4

P1 Right Foot Rear Z

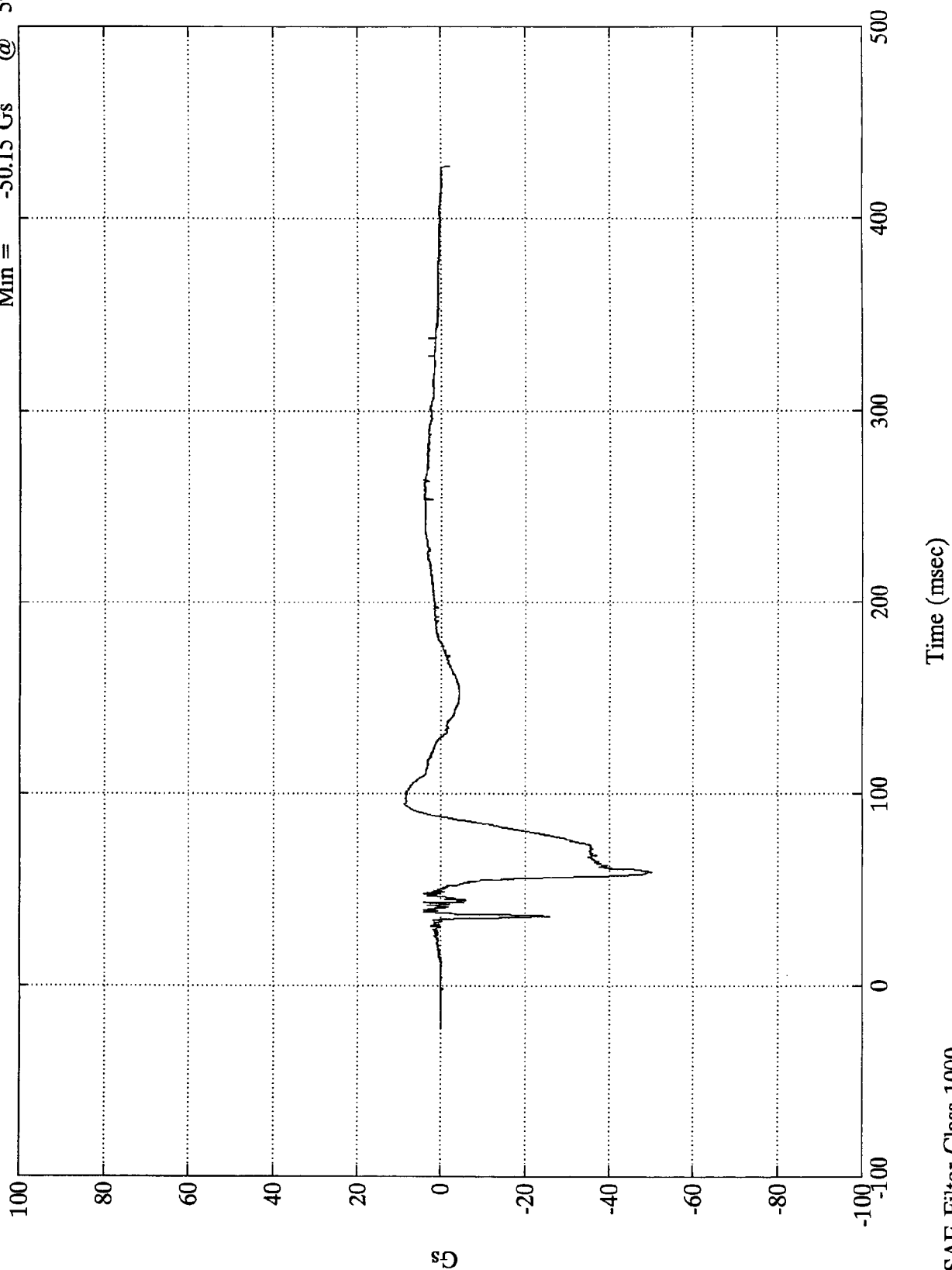
Max = 98.49 Gs @ 38.27 msec
Min = -98.76 Gs @ 38.75 msec



VTV TEST #4

P2 Head X

Max = 8.78 Gs @ 94.91 msec
Min = -50.15 Gs @ 59.76 msec

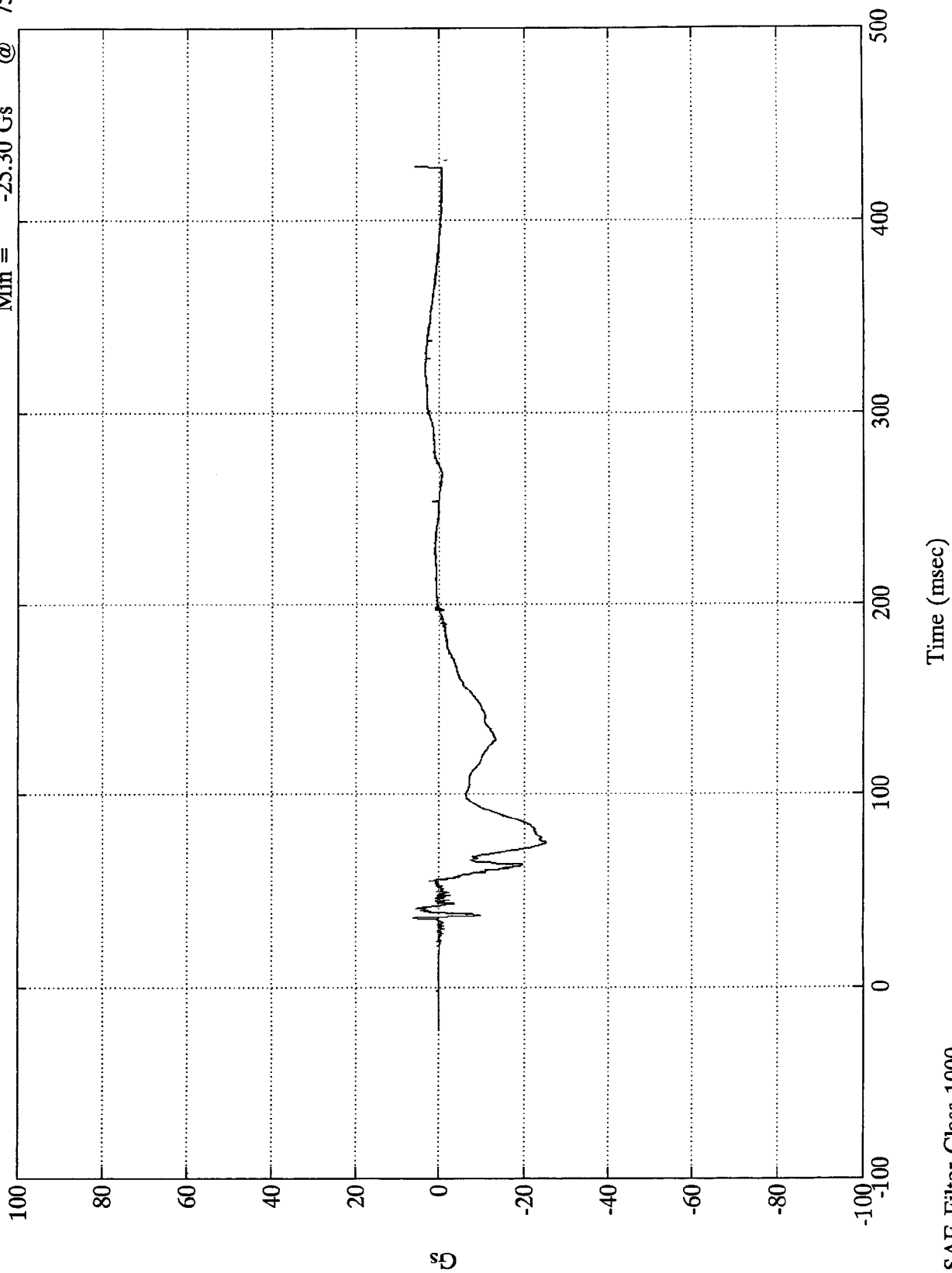


SAE Filter Class 1000

VTV TEST #4

Max = 6.13 Gs @ 36.24 msec
Min = -25.30 Gs @ 75.23 msec

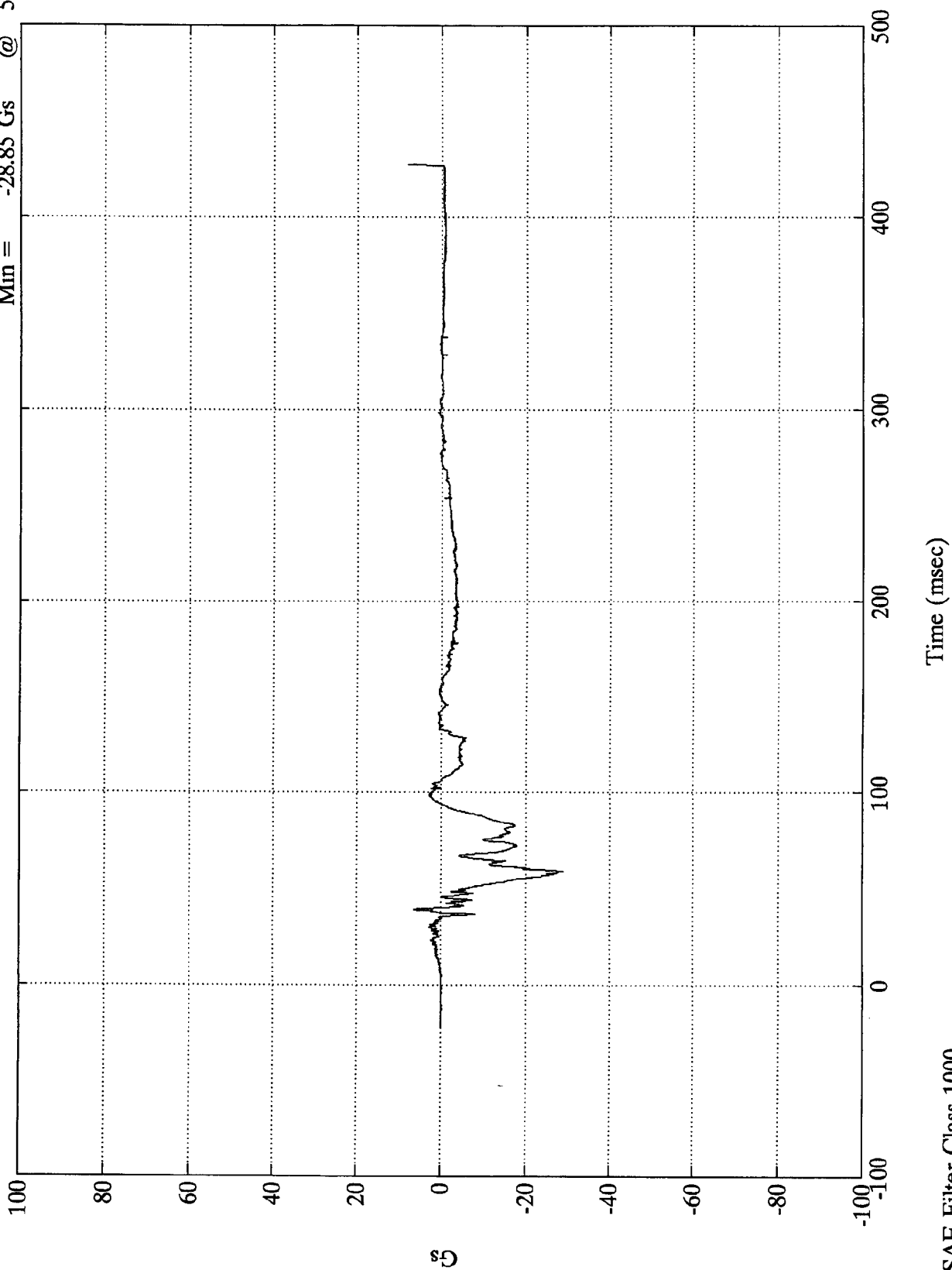
P2 Head Y



SAE Filter Class 1000

VTV TEST #4

P2 Head Z
Max = 8.04 Gs @ 427.32 msec
Min = -28.85 Gs @ 59.40 msec



SAE Filter Class 1000

VTV TEST #4

P2 Head Resultant

Max = 57.27 Gs @ 59.88 msec
 Min = .05 Gs @ 6.11 msec

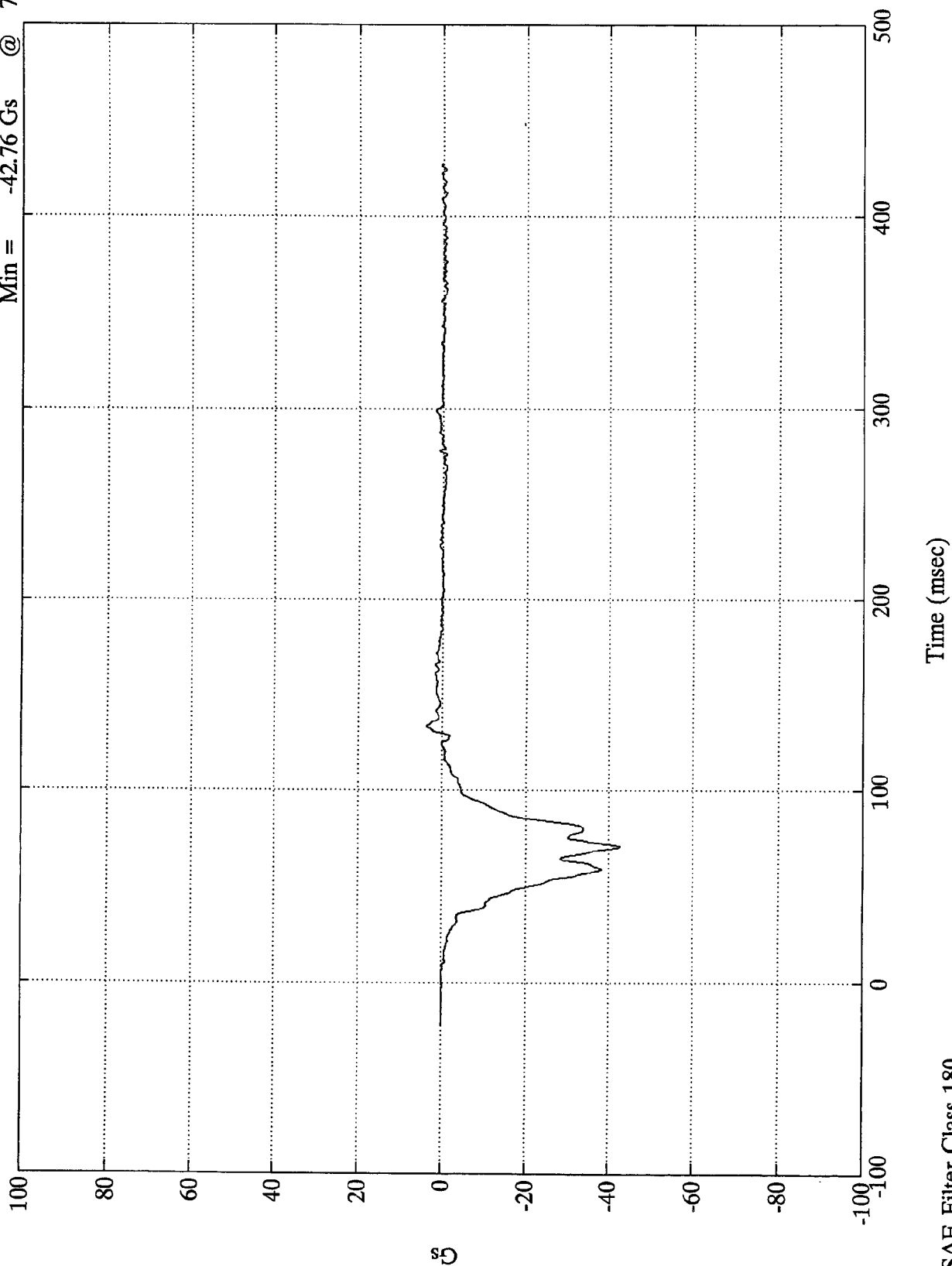


Time (msec)

SAE Filter Class 1000

VTV TEST #4

P2 Chest X
Max = 3.92 Gs @ 133.44 msec
Min = -42.76 Gs @ 71.04 msec

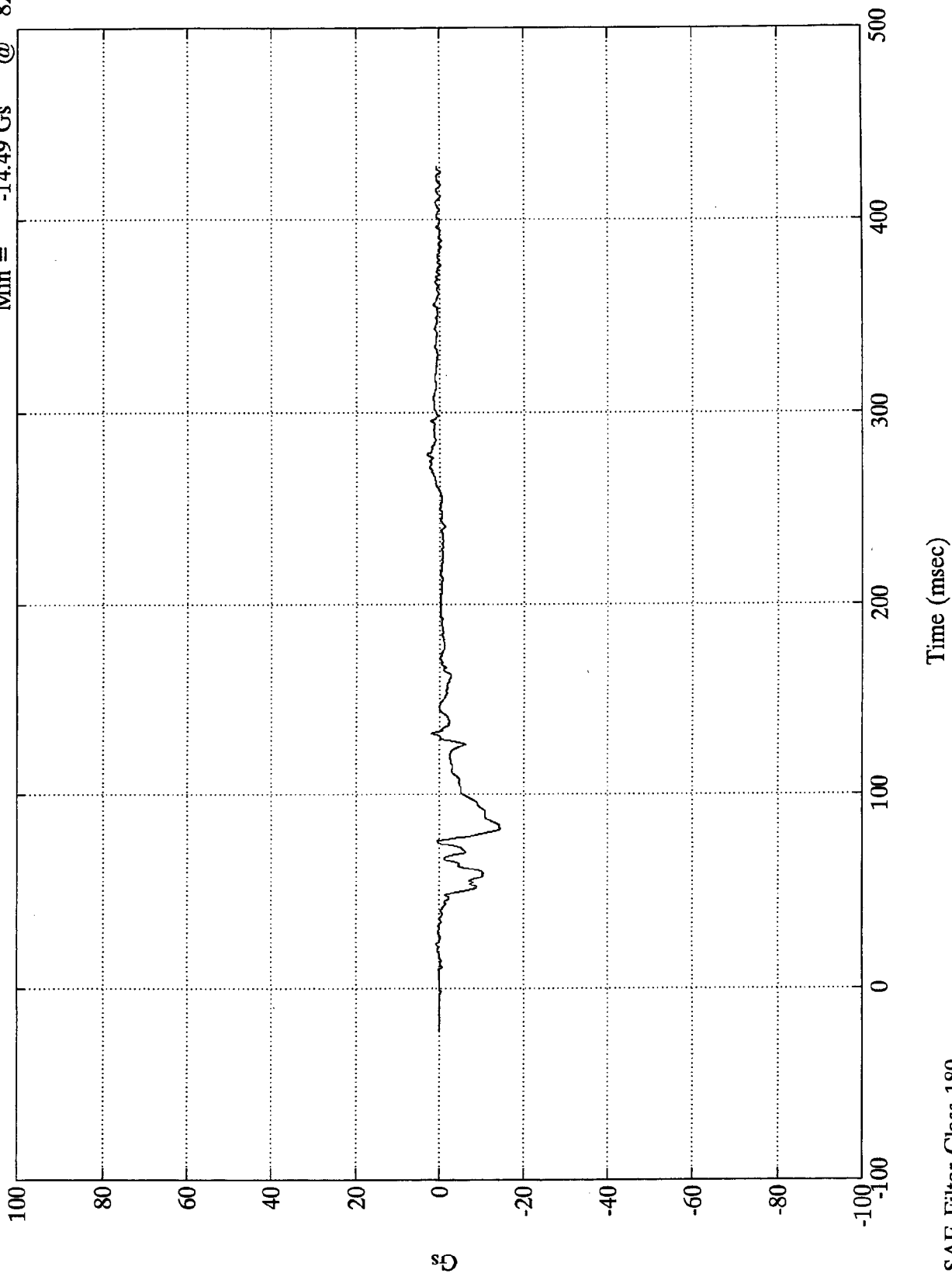


SAE Filter Class 180

VTV TEST #4

Max = 3.25 Gs @ 278.16 msec
Min = -14.49 Gs @ 82.20 msec

P2 Chest Y

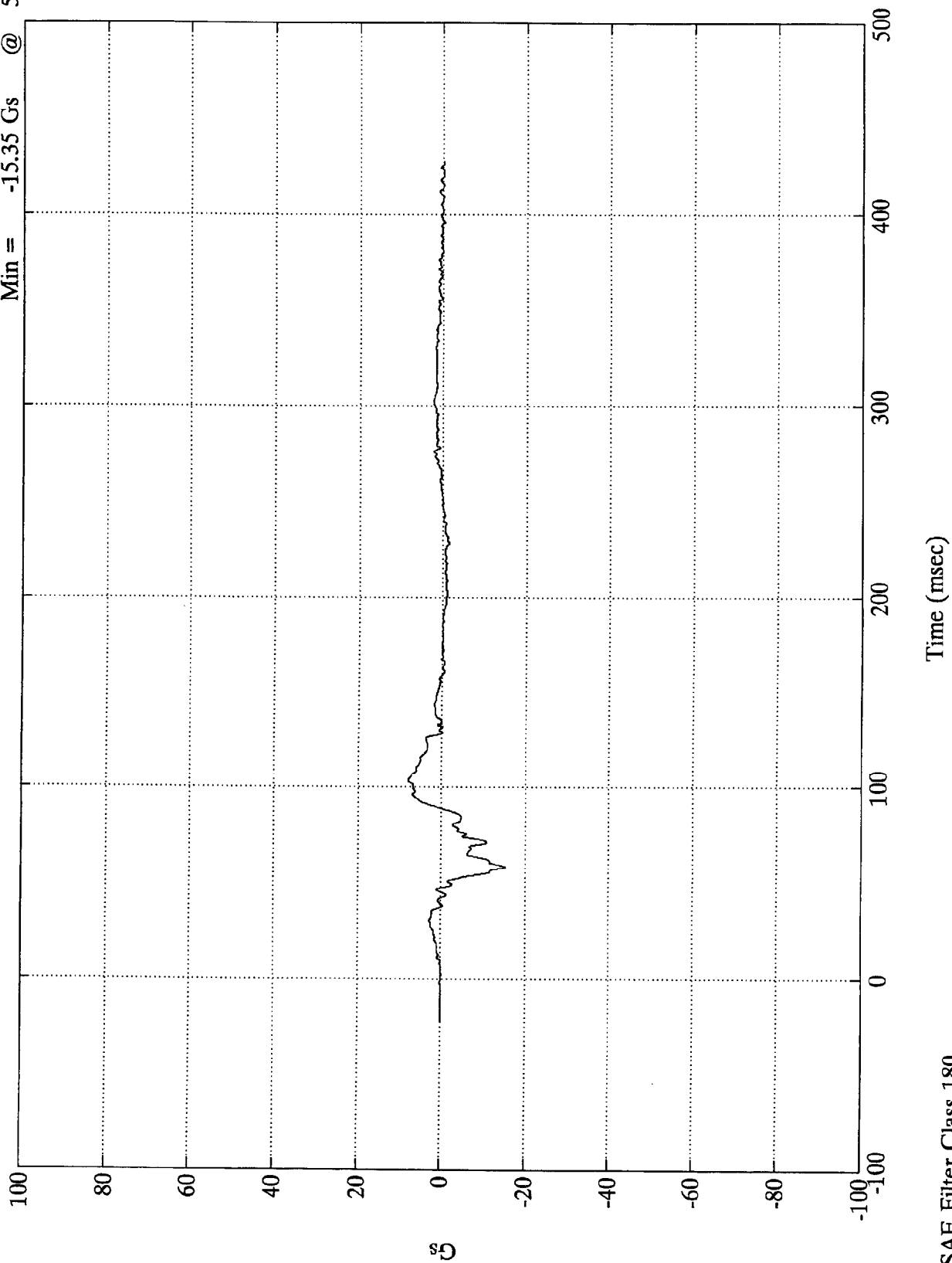


SAE Filter Class 180

Time (msec)

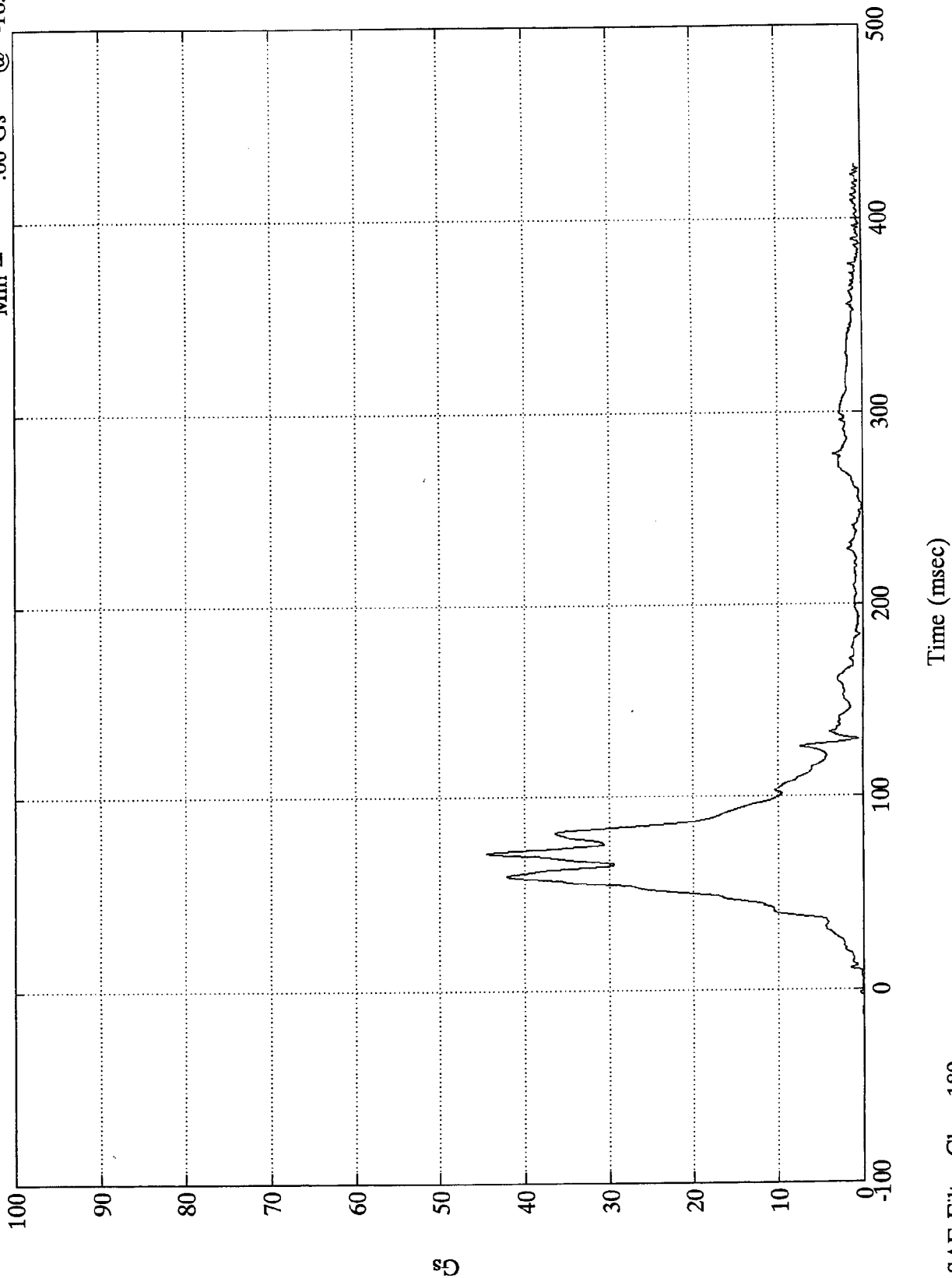
VTV TEST #4

P2 Chest Z
Max = 7.96 Gs @ 103.31 msec
Min = -15.35 Gs @ 58.68 msec



VTV TEST #4

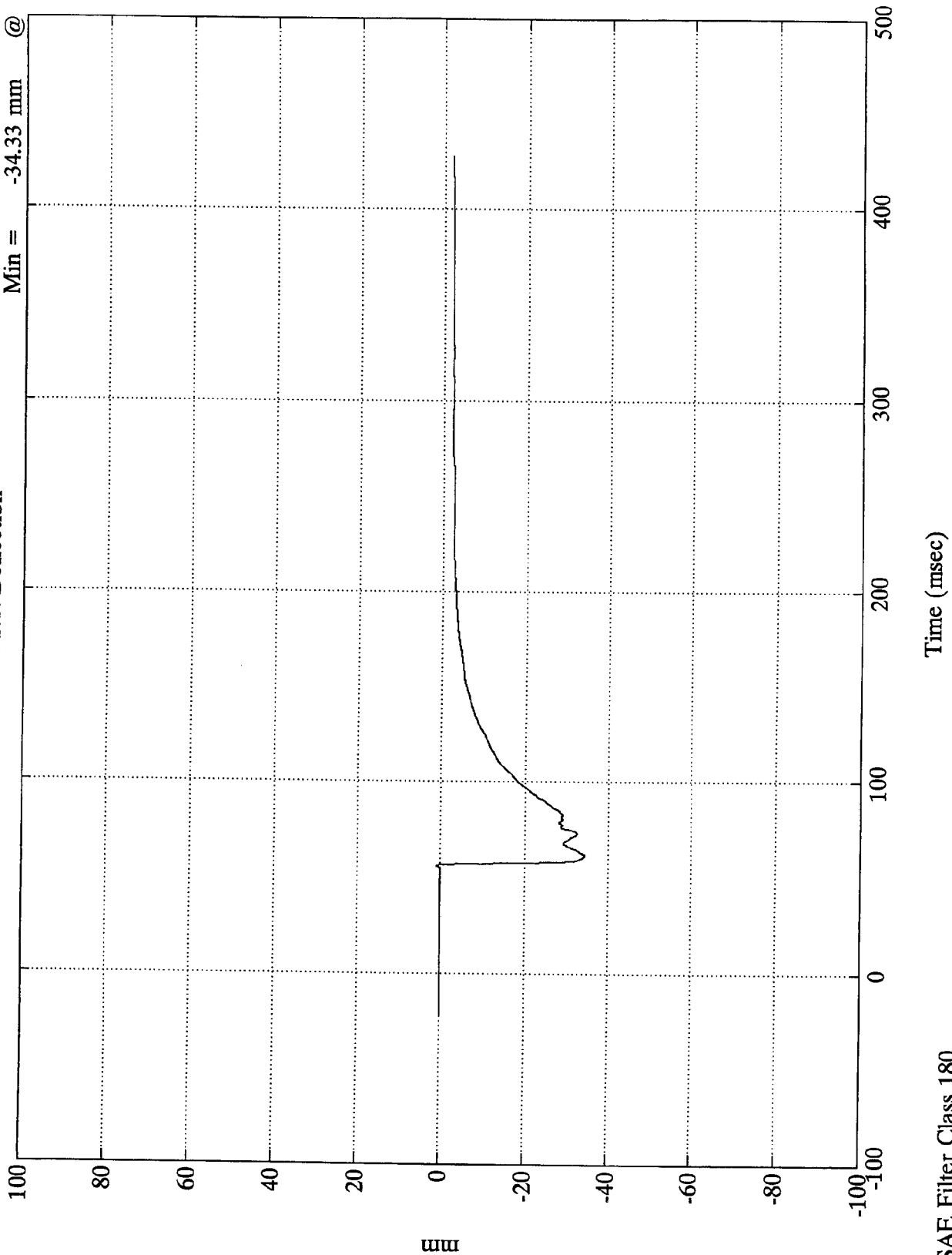
P2 Chest Resultant
Max = 44.56 Gs @ 71.04 msec
Min = .00 Gs @ -16.56 msec



SAE Filter Class 180

VTV TEST #4

P2 Chest Deflection
Max = .98 mm @ 56.28 msec
Min = -34.33 mm @ 61.92 msec

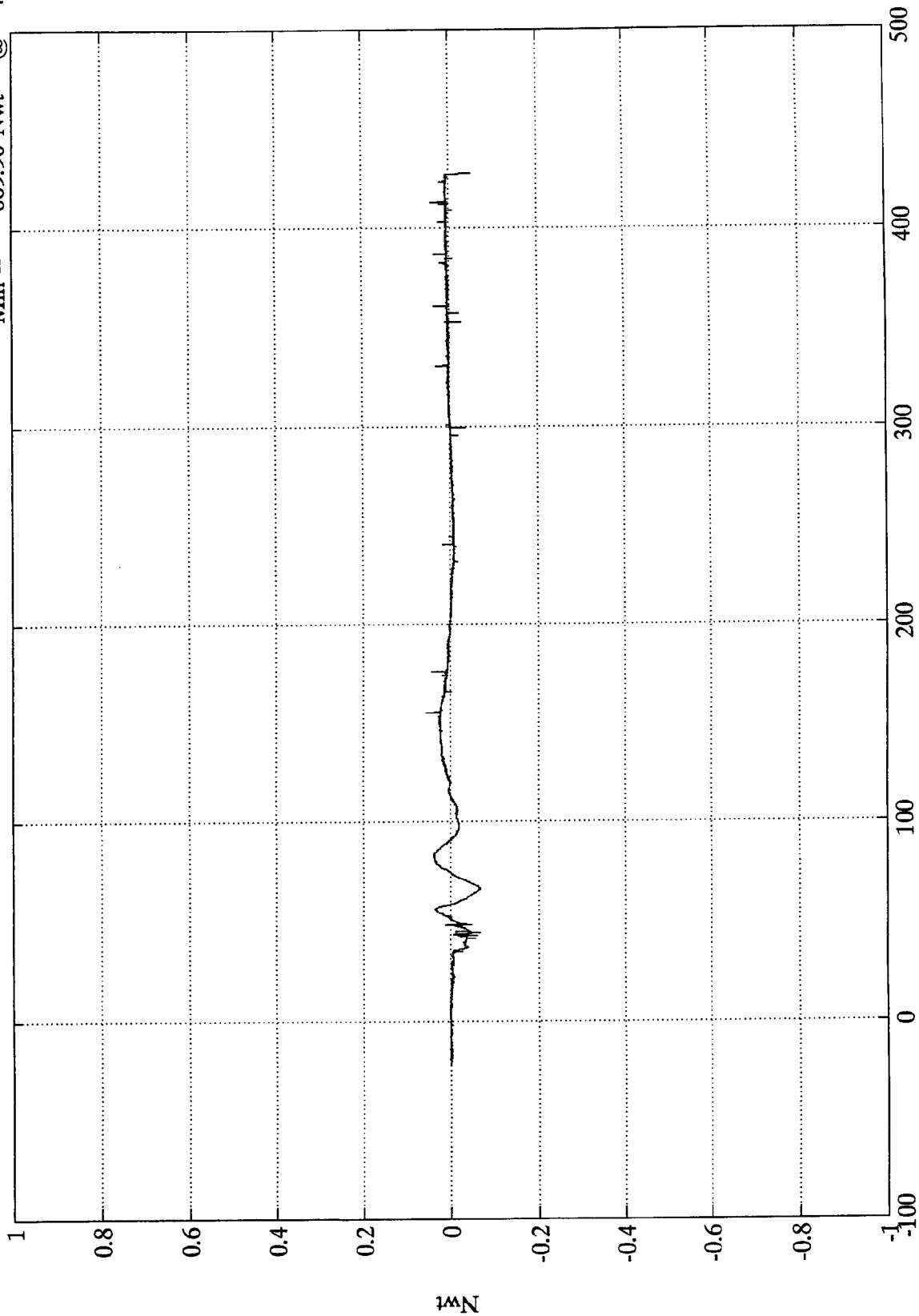


VTV TEST #4

$\times 10^4$

P2 Upper Neck Fx

Max = 541.55 Nwt @ 155.63 msec
Min = -669.90 Nwt @ 44.27 msec



Time (msec)

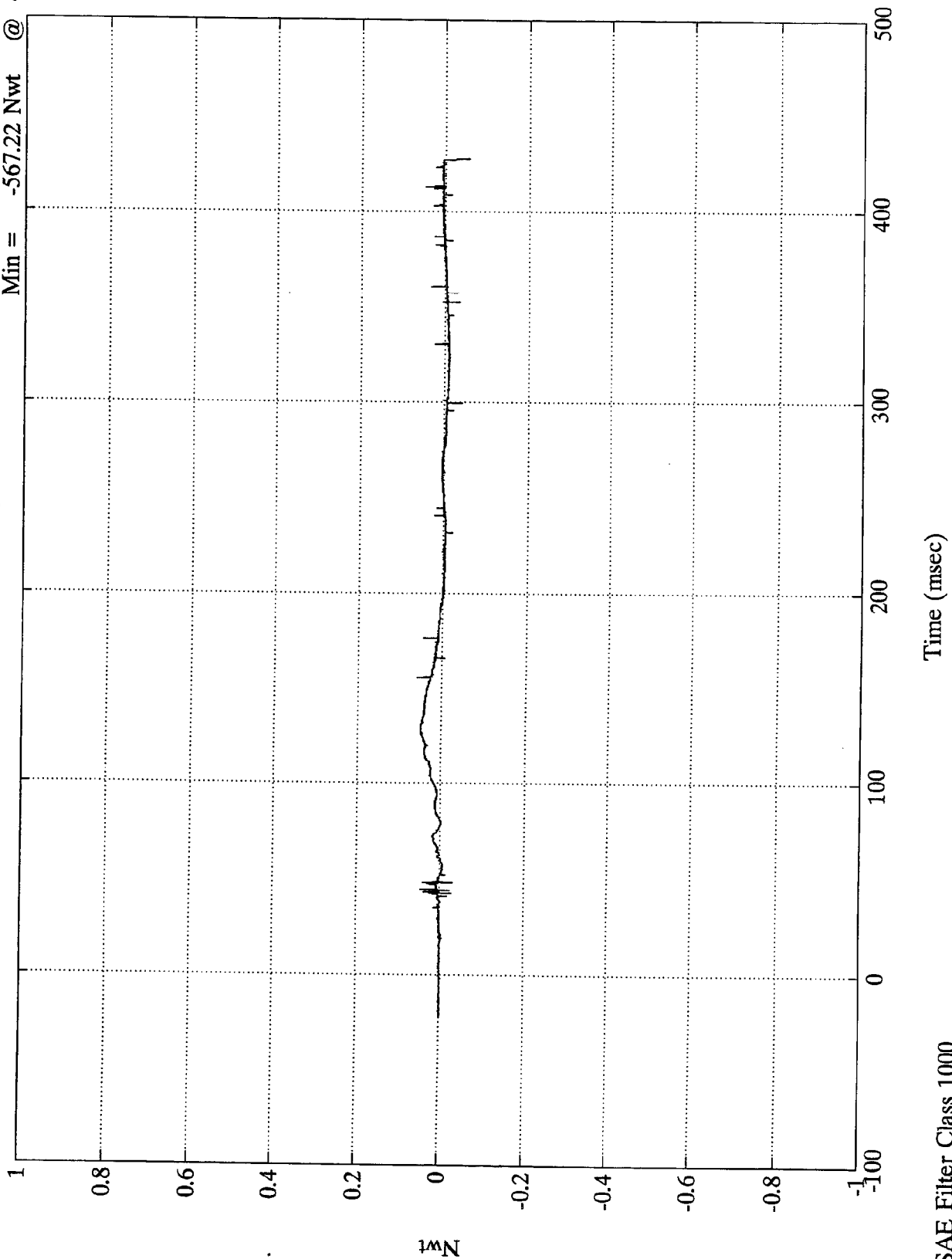
SAE Filter Class 1000

VTV TEST #4

P2 Upper Neck Fy

Max = 576.53 Nwt @ 155.63 msec
Min = -567.22 Nwt @ 427.32 msec

$\times 10^4$

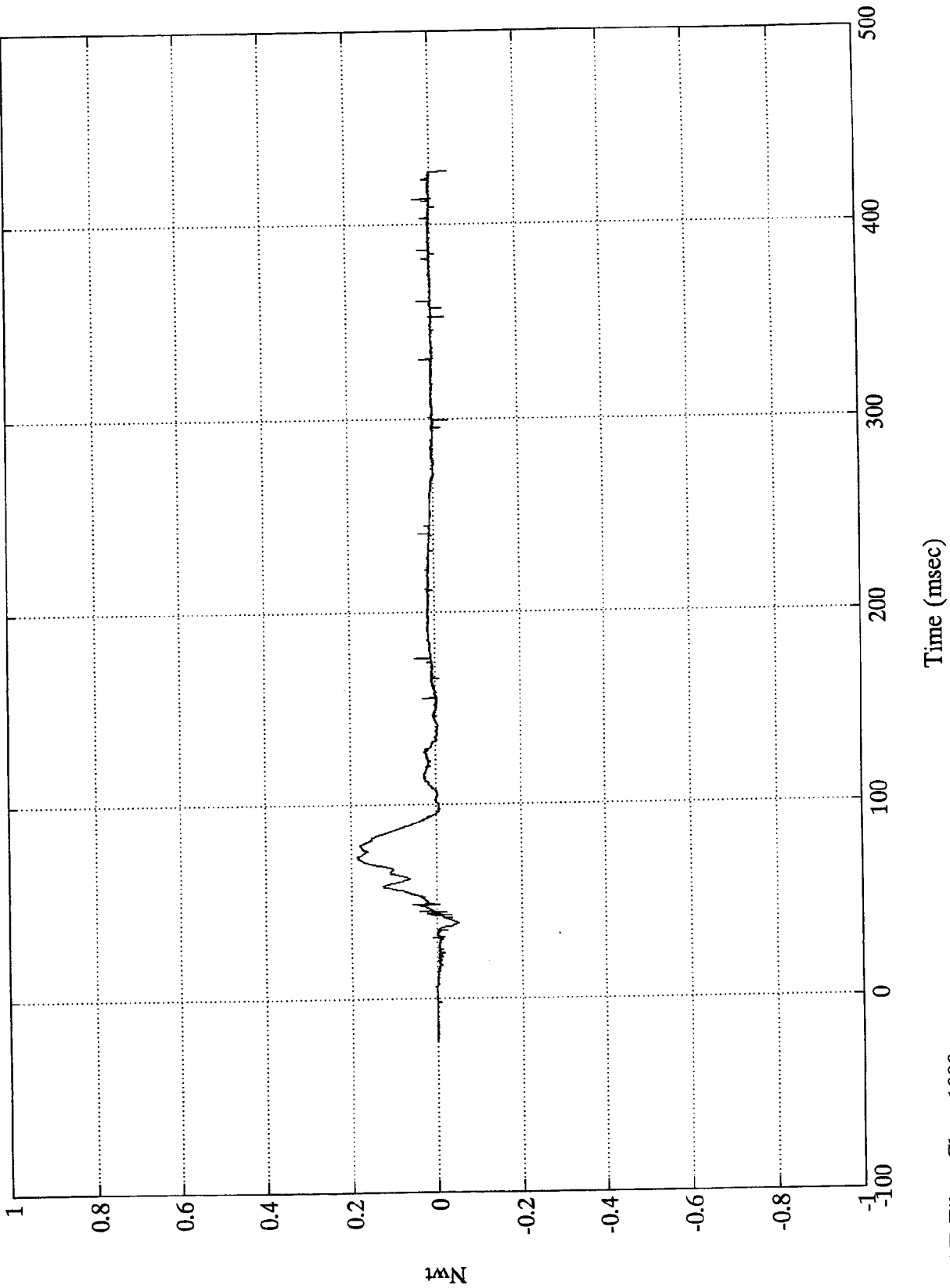


SAE Filter Class 1000

VTV TEST #4
x10⁴

P2 Upper Neck Fz

Max = 1854.33 Nwt @ 72.72 msec
Min = -504.80 Nwt @ 38.75 msec

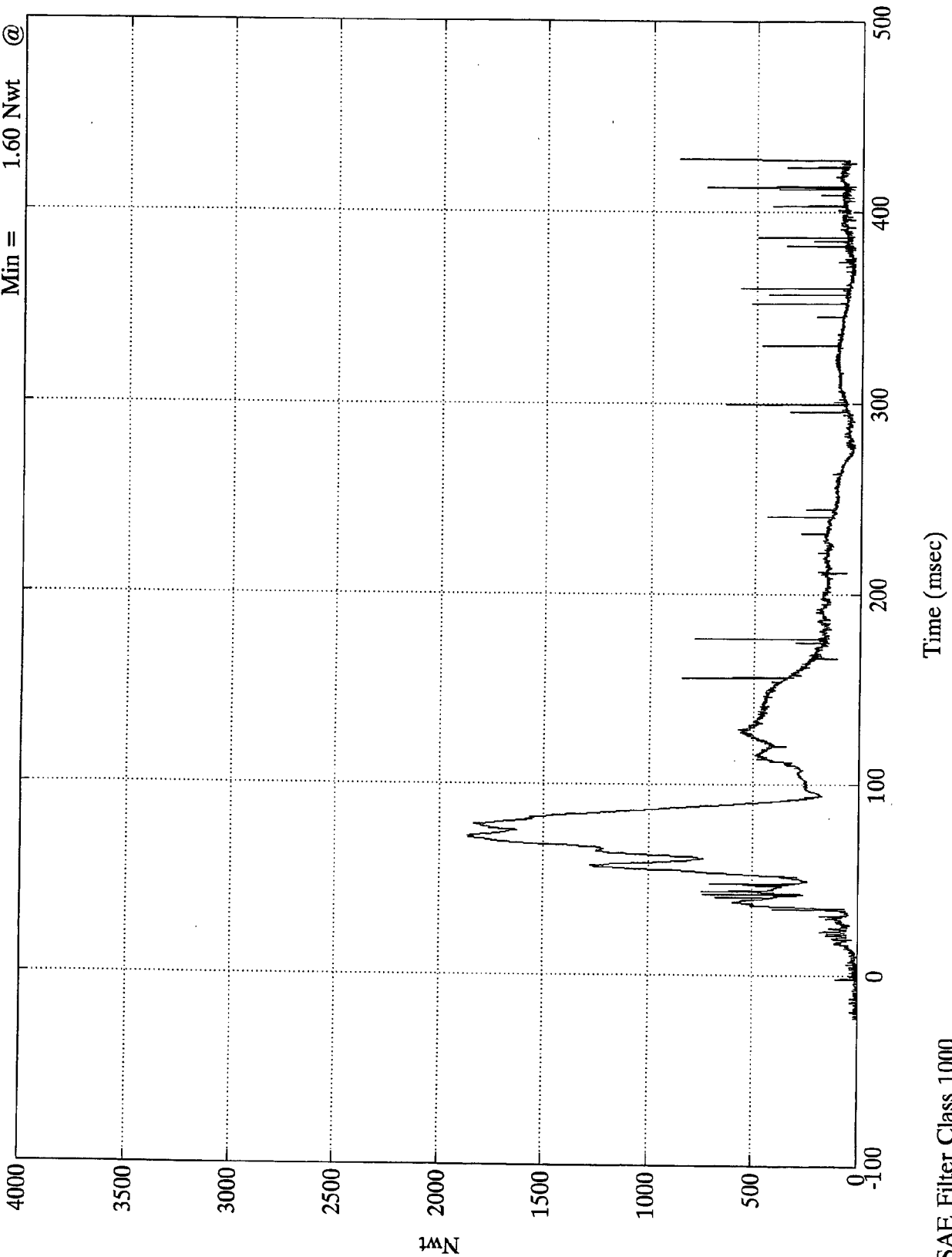


SAE Filter Class 1000

VTV TEST #4

P2 Upper Neck Force Res

Max = 1864.76 Nwt @ 72.72 msec
Min = 1.60 Nwt @ 10.55 msec

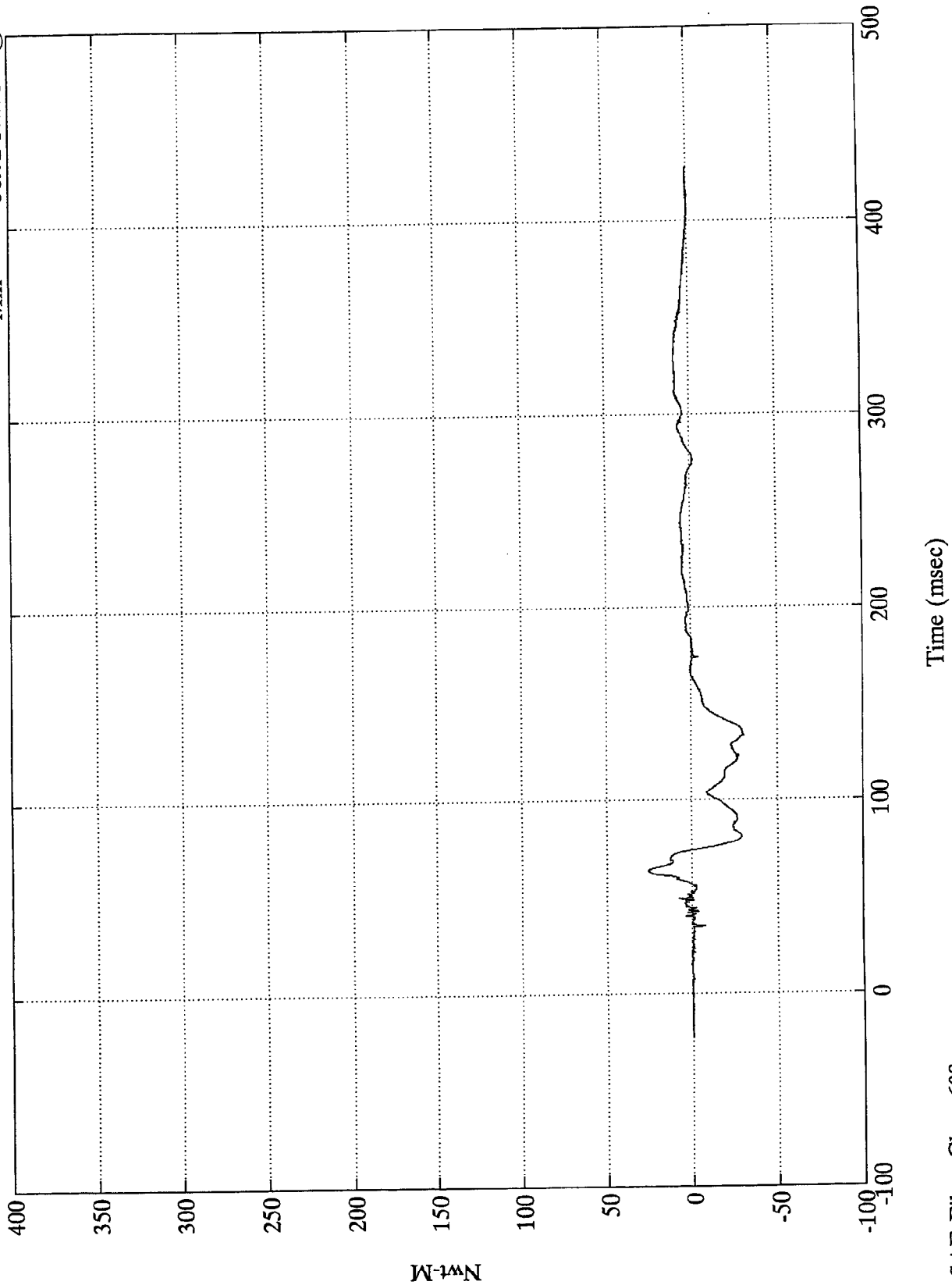


SAE Filter Class 1000

VTV TEST #4

P2 Upper Neck Mx

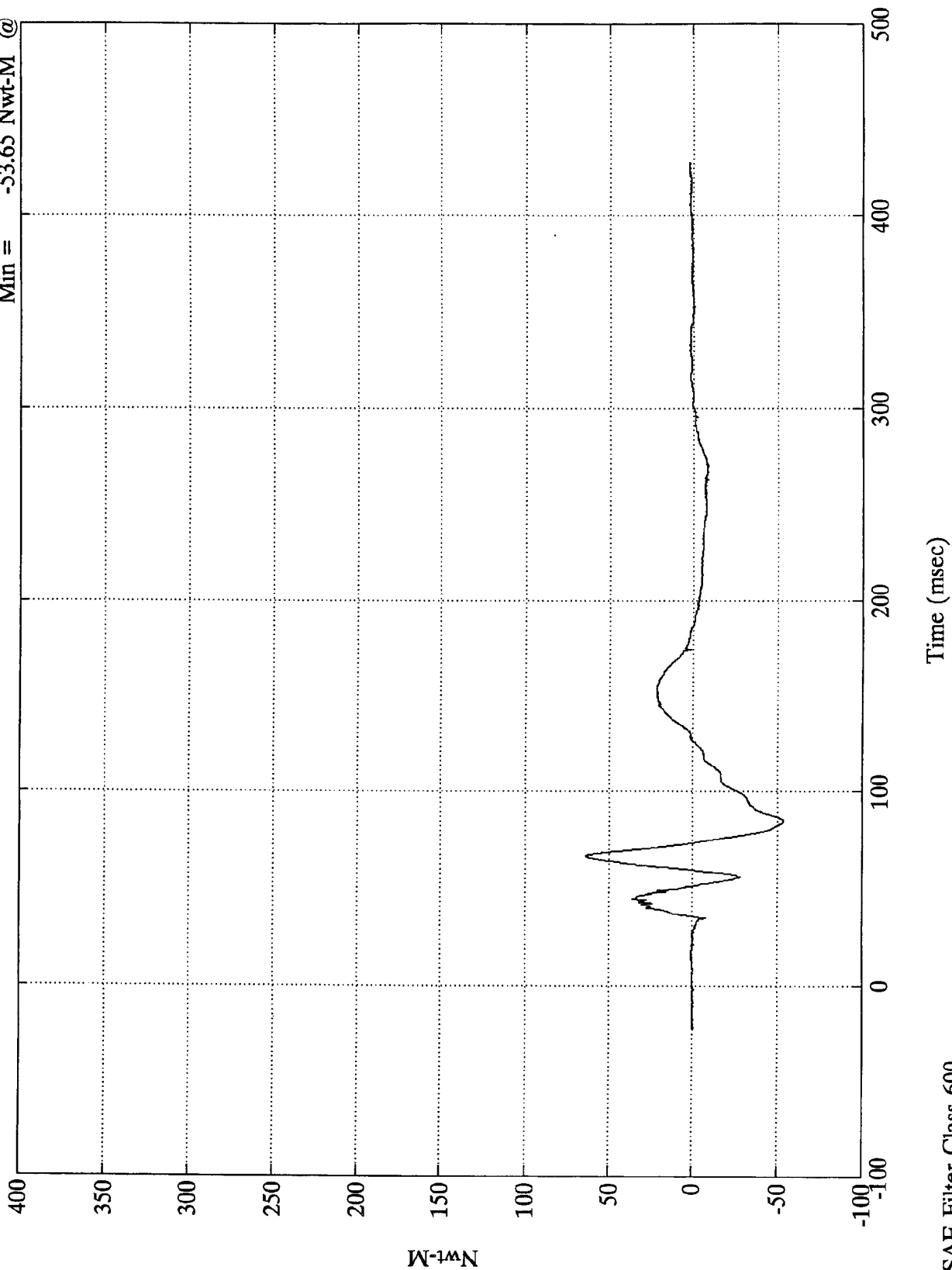
Max = 25.91 Nwt-M @ 64.19 msec
Min = -30.72 Nwt-M @ 132.96 msec



VTV TEST #4

P2 Upper Neck My

Max = 63.86 Nwt-M @ 66.72 msec
Min = -53.65 Nwt-M @ 85.44 msec

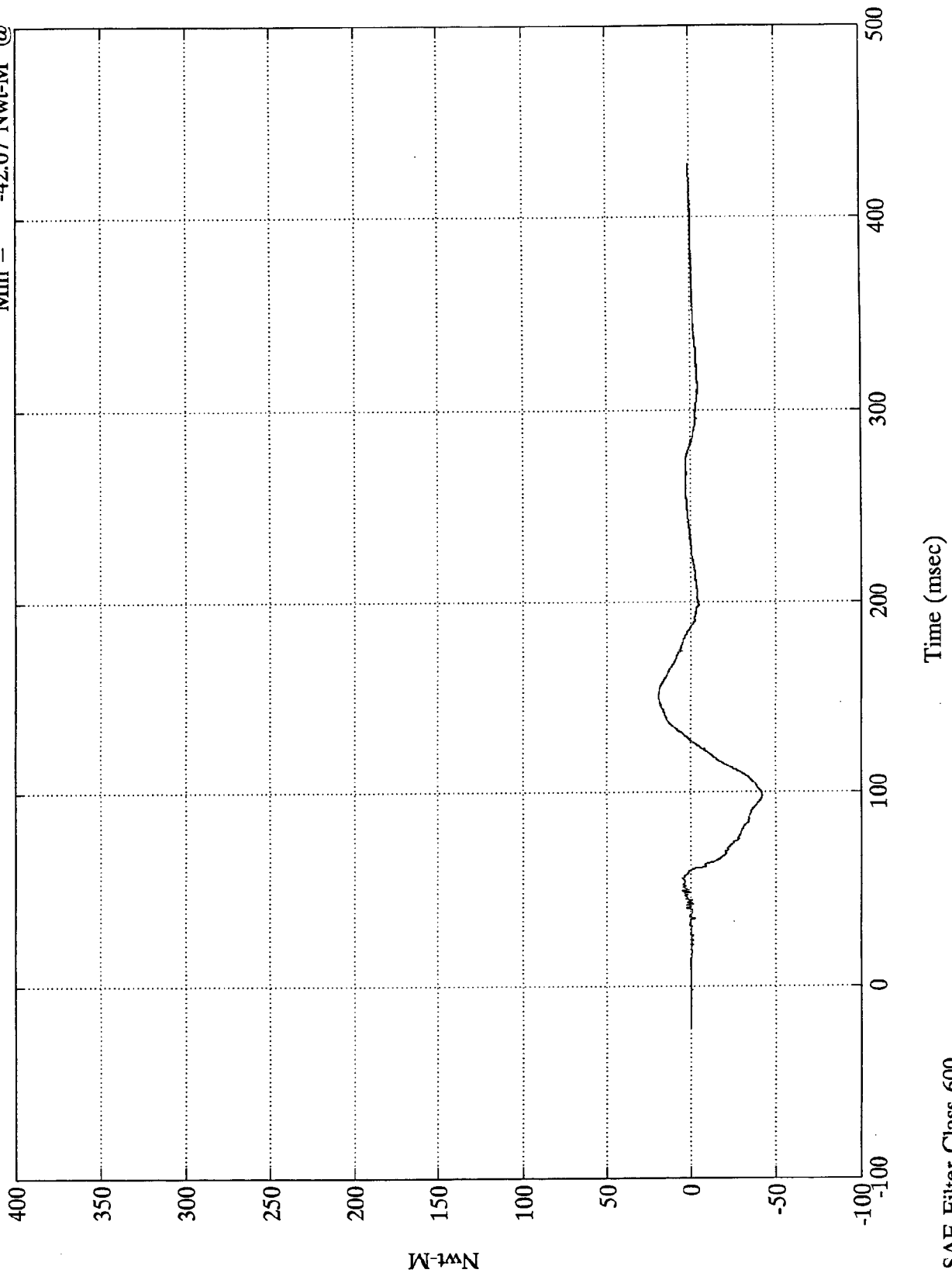


SAE Filter Class 600

VTV TEST #4

Max = 19.17 Nwt-M @ 149.40 msec
Min = -42.07 Nwt-M @ 98.16 msec

P2 Upper Neck Mz

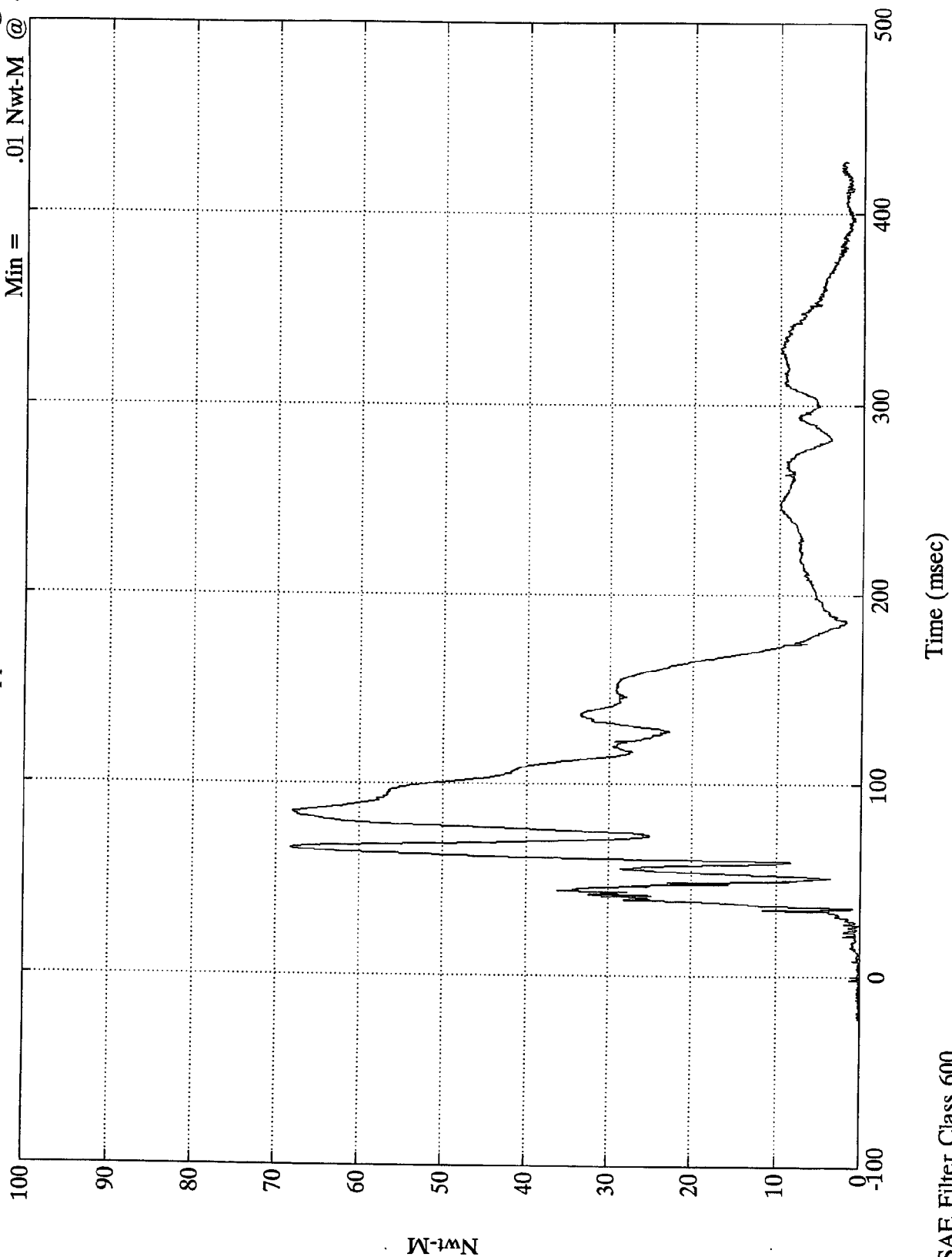


SAE Filter Class 600

VTV TEST #4

P2 Upper Neck Moment Res

Max = 68.19 Nwt-M @ 66.72 msec
Min = .01 Nwt-M @ -16.68 msec

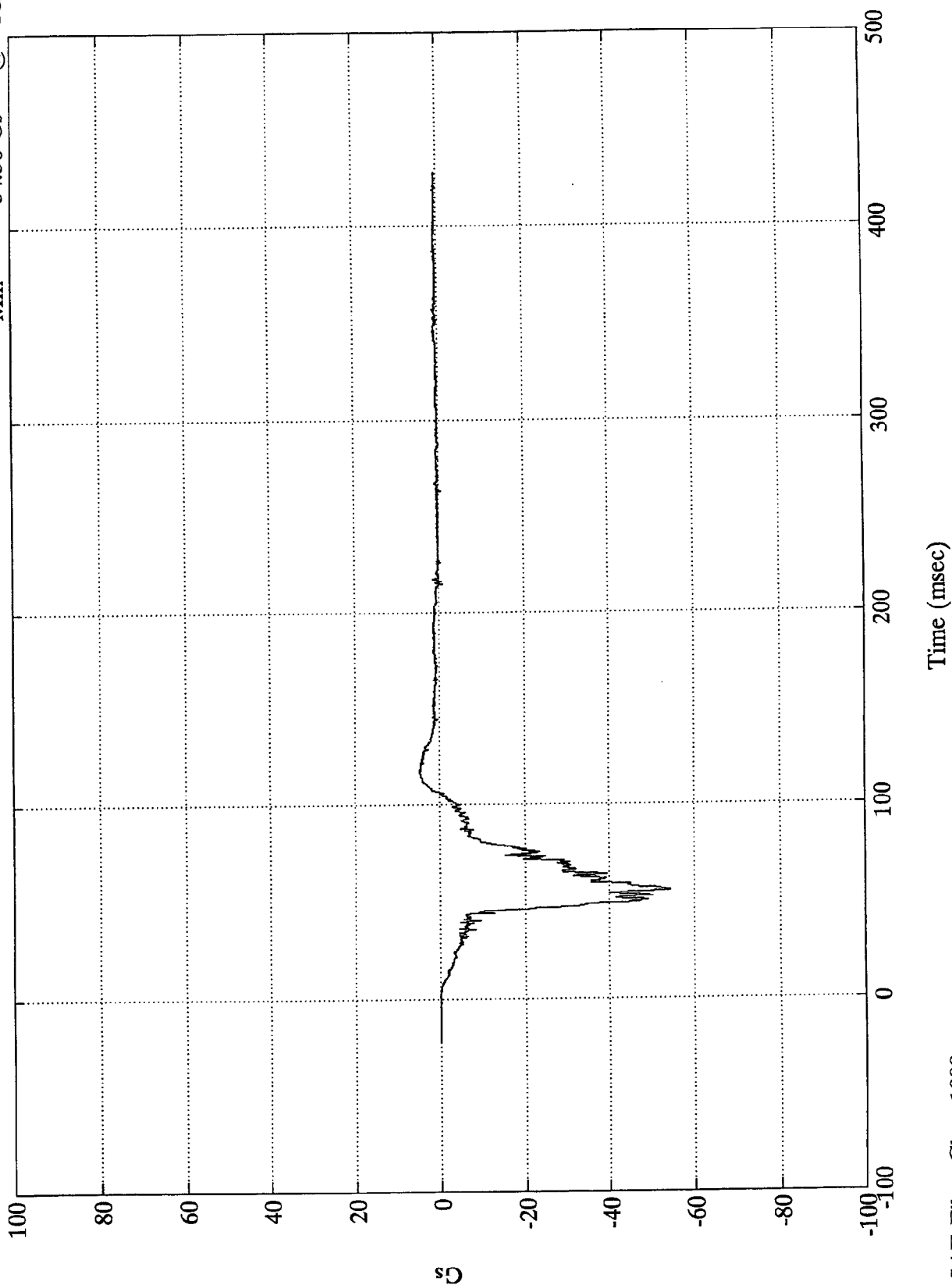


SAE Filter Class 600

VTV TEST #4

Max = 4.65 Gs @ 118.55 msec
Min = -54.30 Gs @ 56.04 msec

P2 Pelvic X

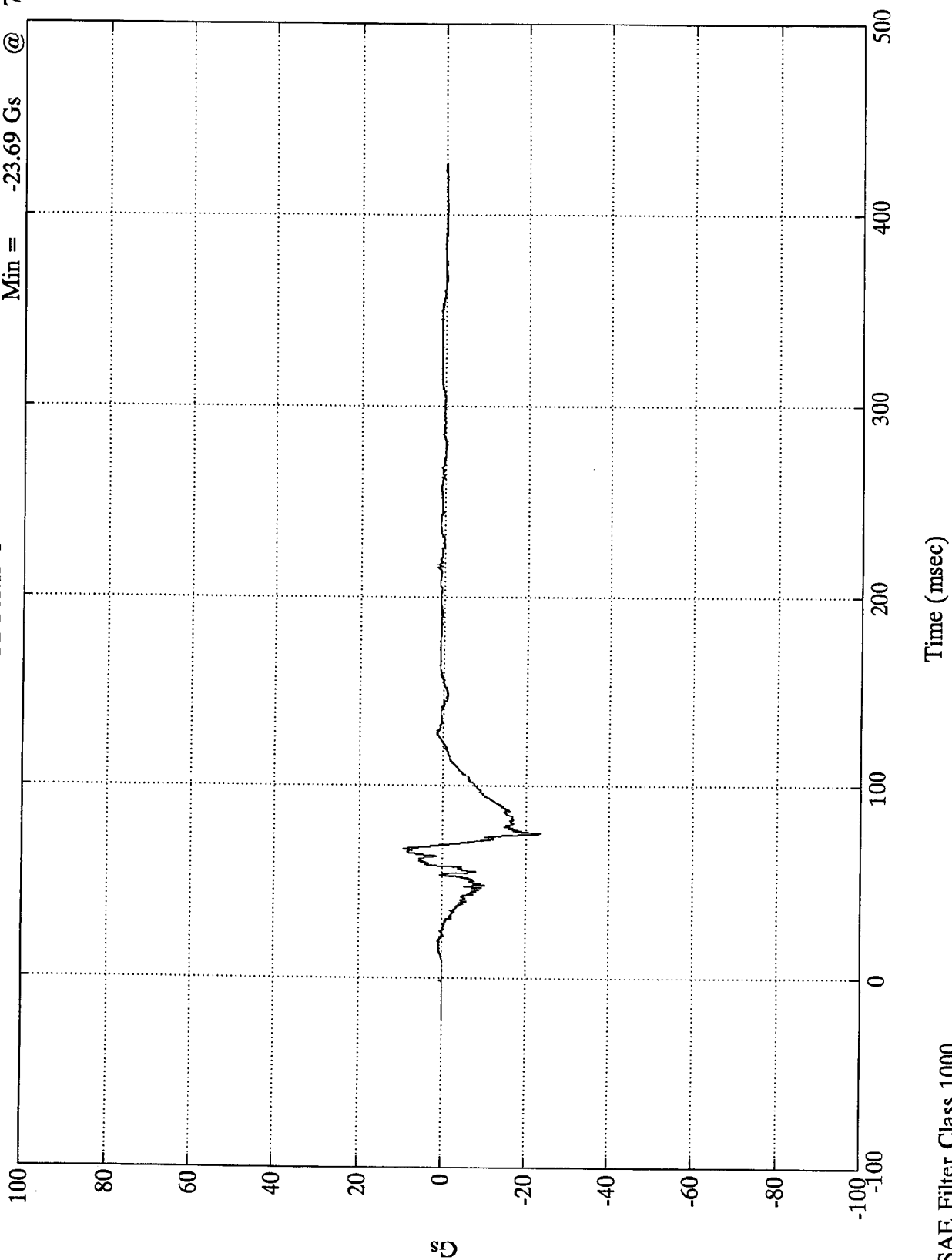


SAE Filter Class 1000

VTV TEST #4

Max = 9.52 Gs @ 67.56 msec
Min = -23.69 Gs @ 75.23 msec

P2 Pelvic Y

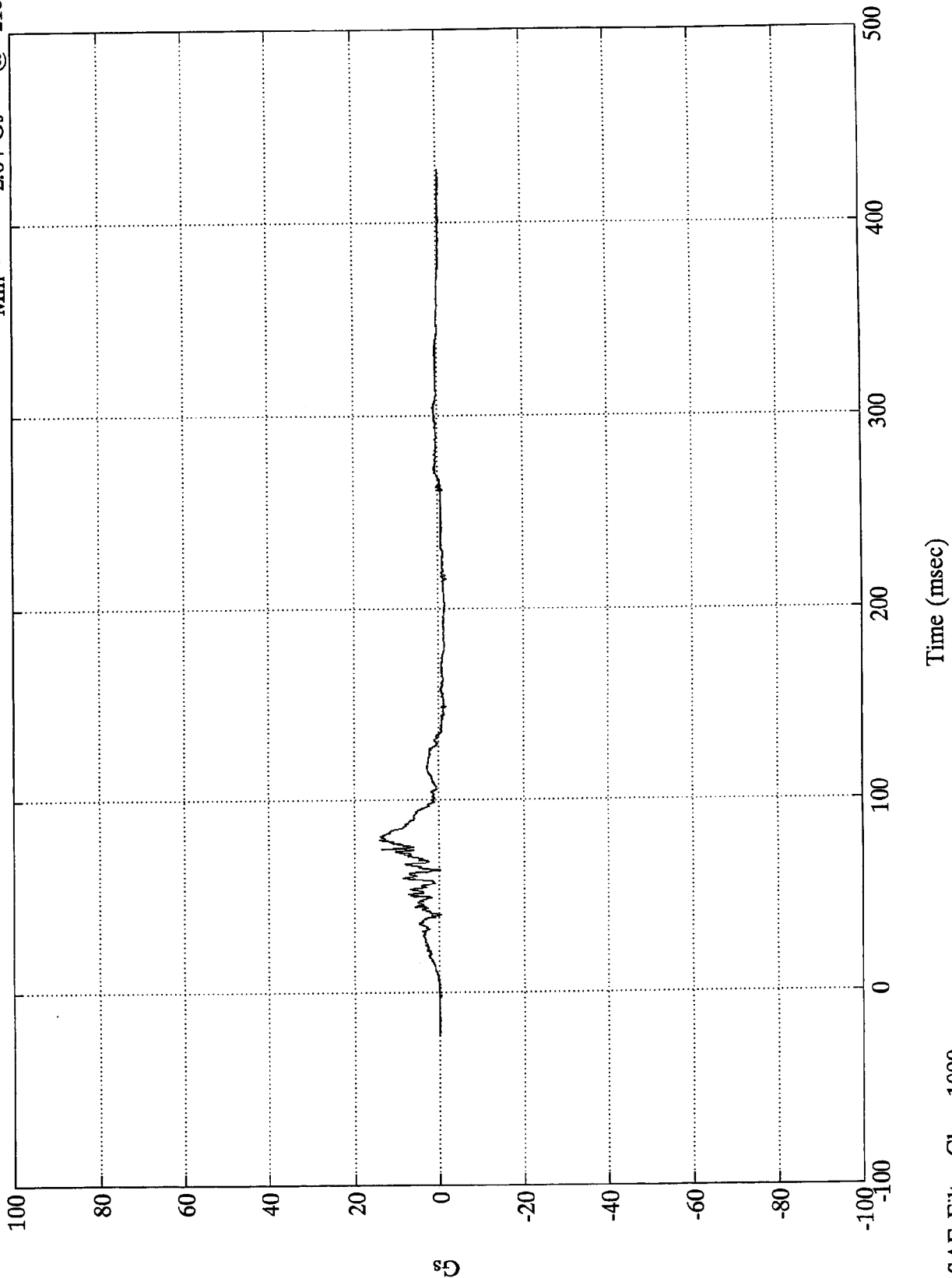


SAE Filter Class 1000

VTV TEST #4

Max = 14.16 Gs @ 79.08 msec
Min = -2.04 Gs @ 215.88 msec

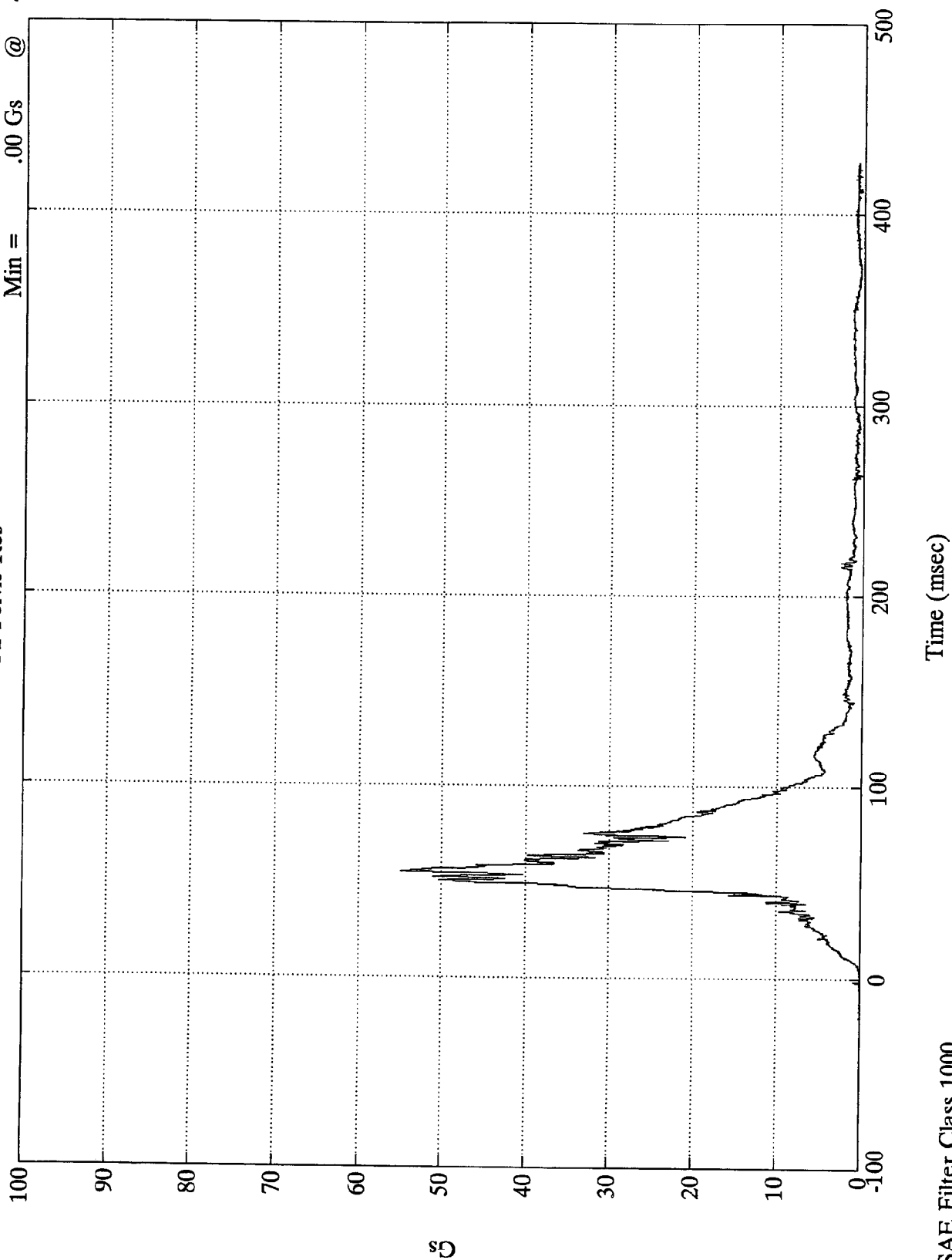
P2 Pelvic Z



VTV TEST #4

P2 Pelvic Res

Max = 54.91 Gs @ 55.68 msec
Min = .00 Gs @ 4.07 msec



SAE Filter Class 1000

VTV TEST #4

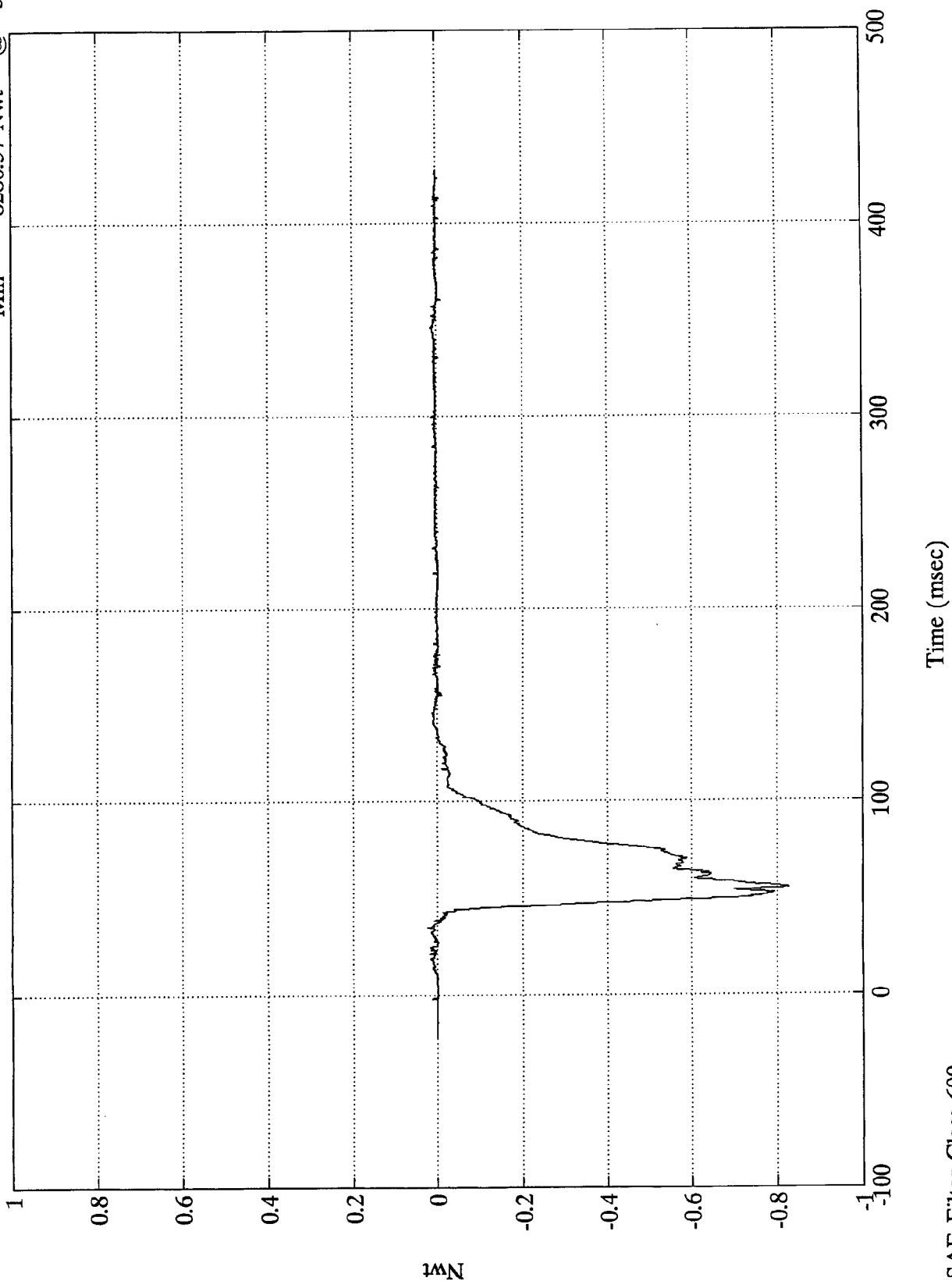
$\times 10^4$

P2 Left Femur

Max =
Min =

227.94 Nwt
-8280.57 Nwt

@ 35.04 msec
@ 55.56 msec

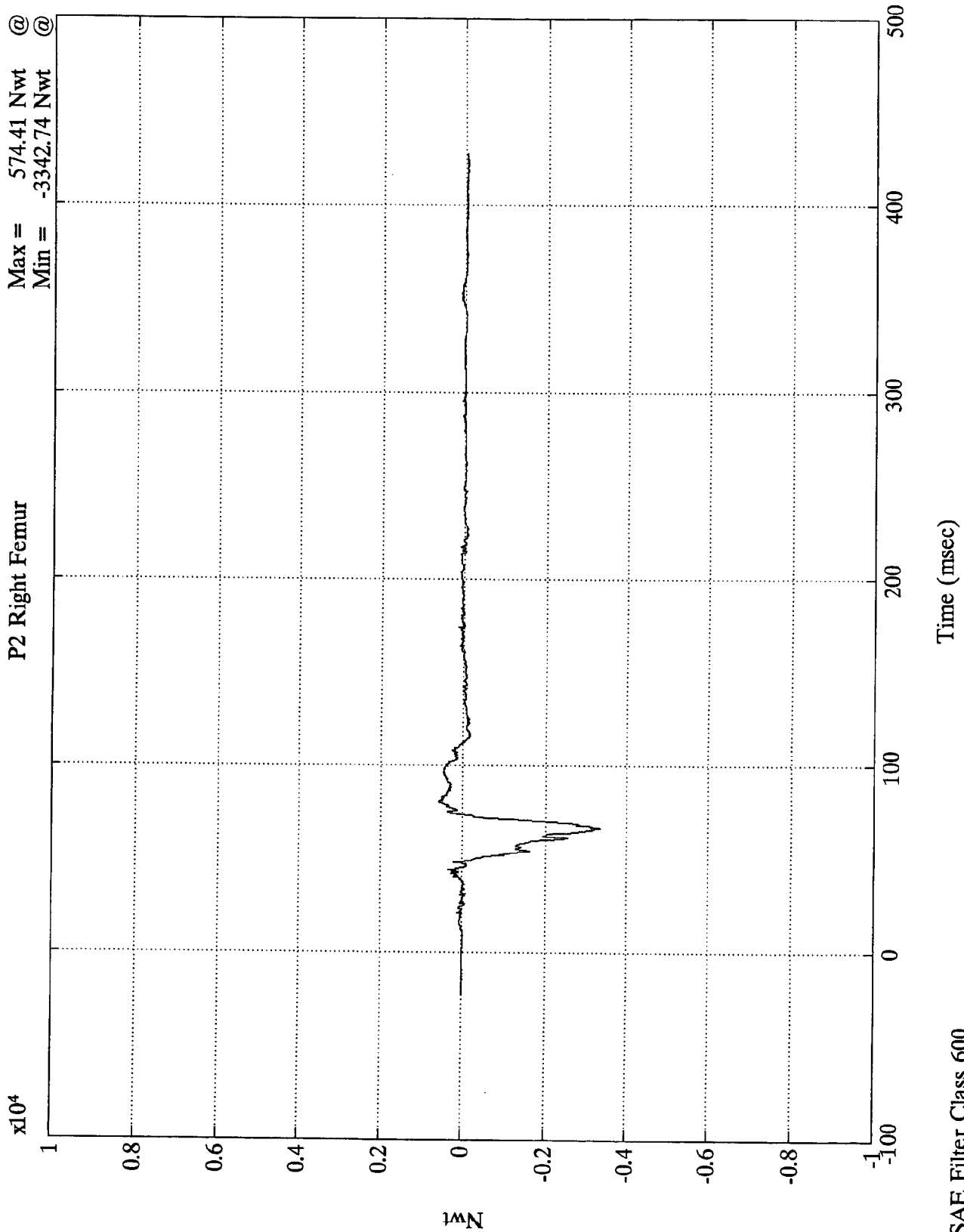


SAE Filter Class 600

VTV TEST #4

P2 Right Femur

Max = 574.41 Nwt @ 80.63 msec
Min = -3342.74 Nwt @ 66.84 msec

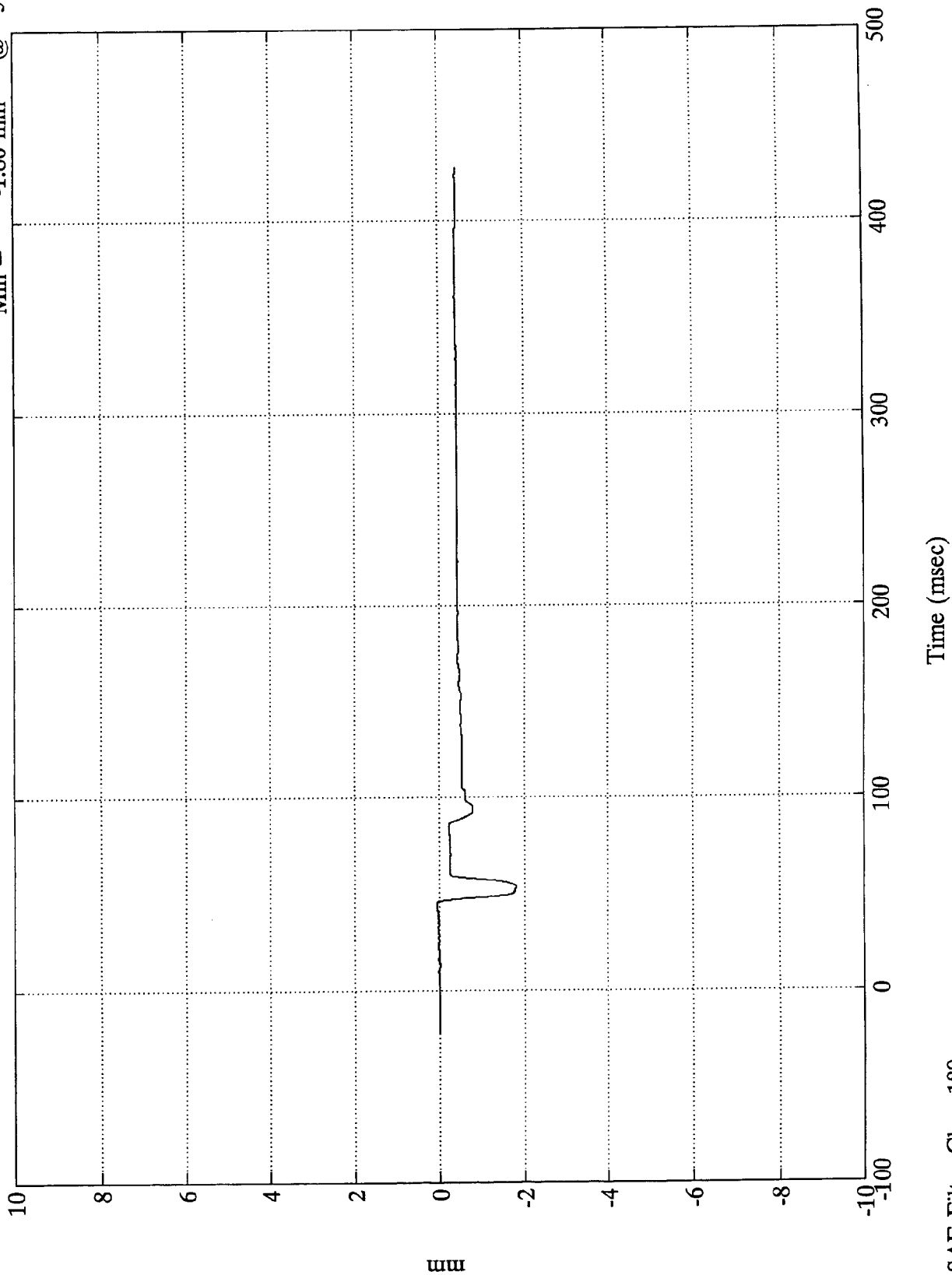


SAE Filter Class 600

VTV TEST #4

Max = .05 mm @ 45.36 msec
Min = -1.80 mm @ 53.75 msec

P2 Left Knee Shear

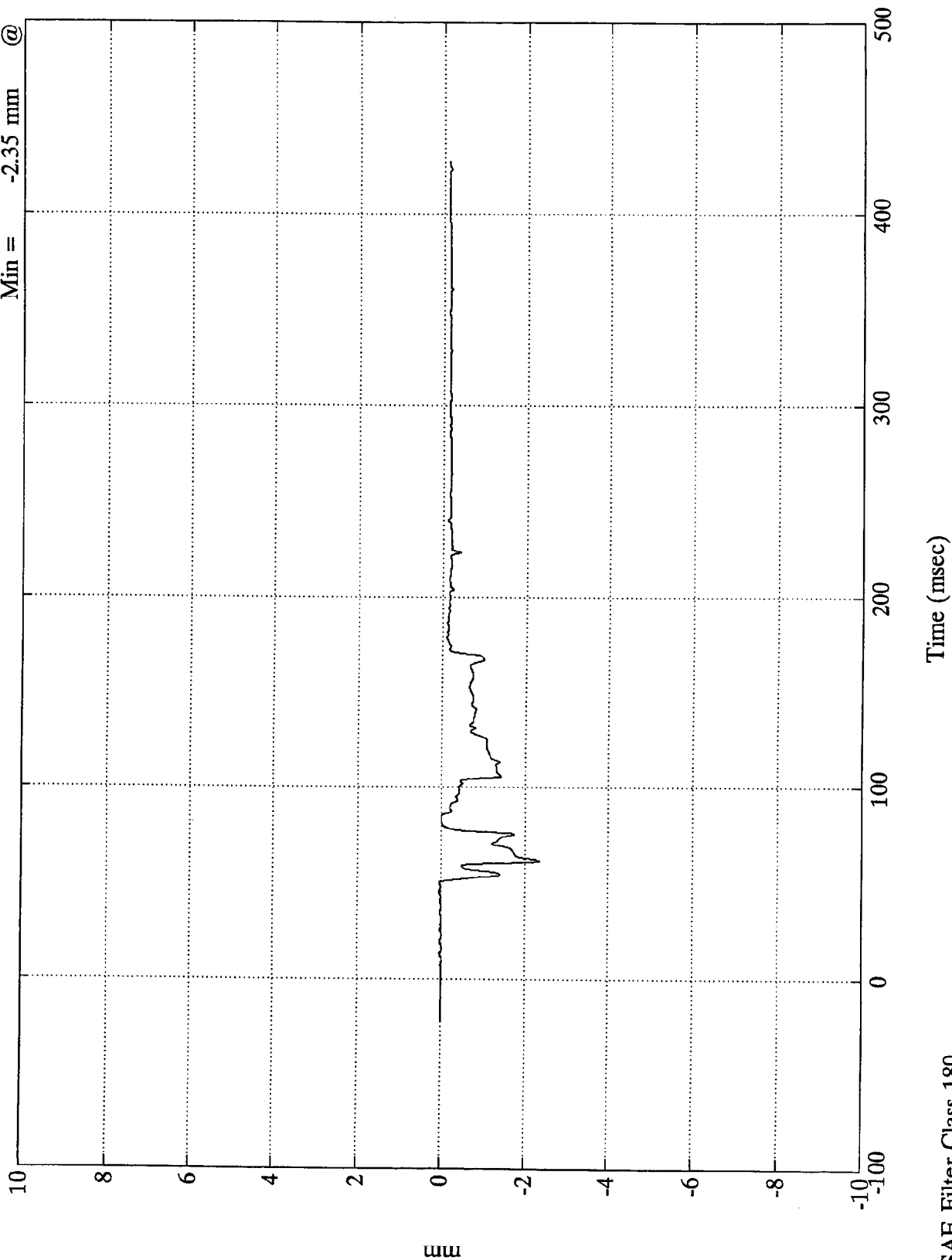


SAE Filter Class 180

VTV TEST #4

P2 Right Knee Shear

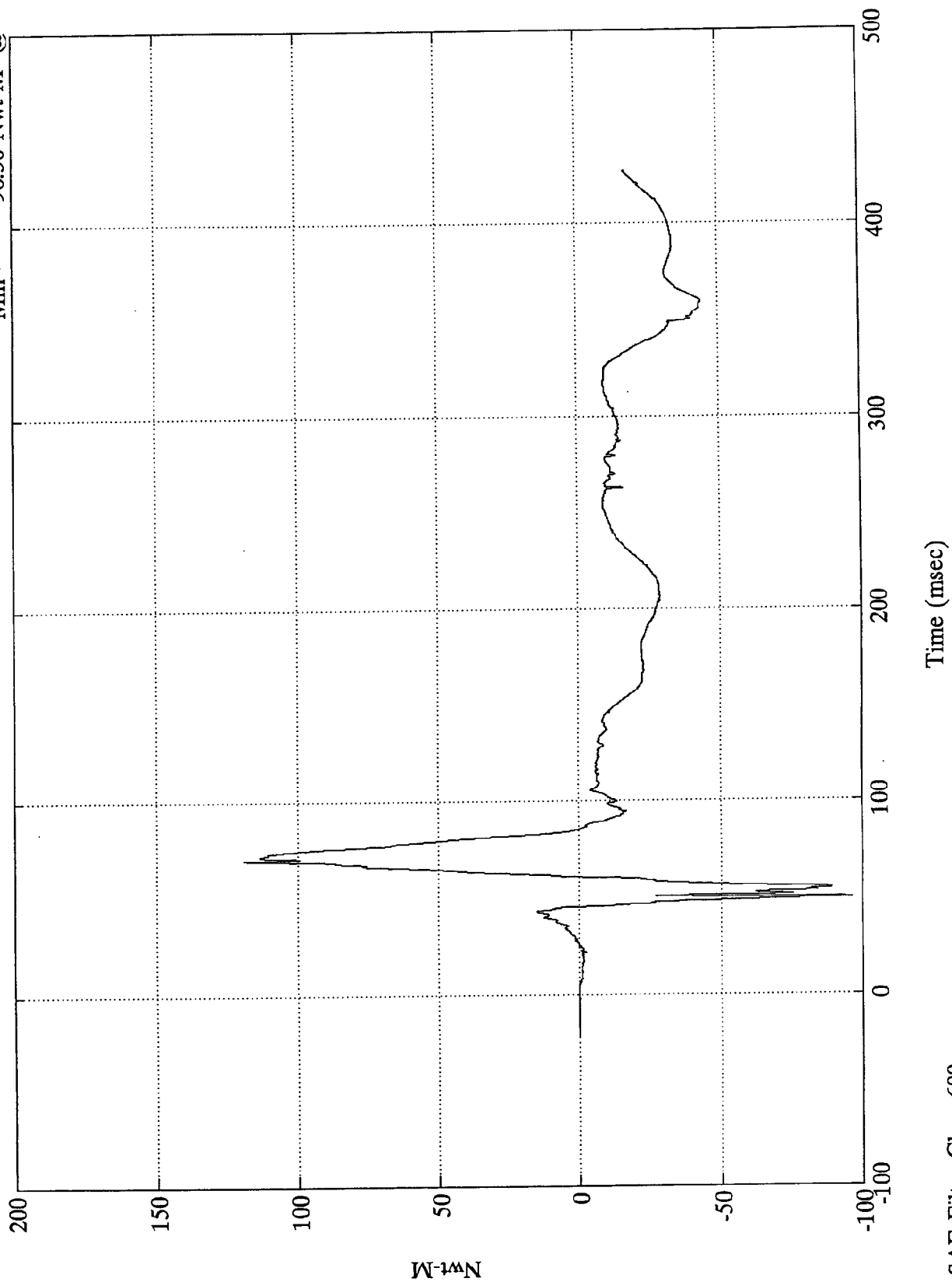
Max = .05 mm @ 45.84 msec
Min = -2.35 mm @ 61.92 msec



VTV TEST #4

P2 Lt Upper Tibia Mx

Max = 119.26 Nwt-M @ 69.83 msec
Min = -96.30 Nwt-M @ 49.31 msec

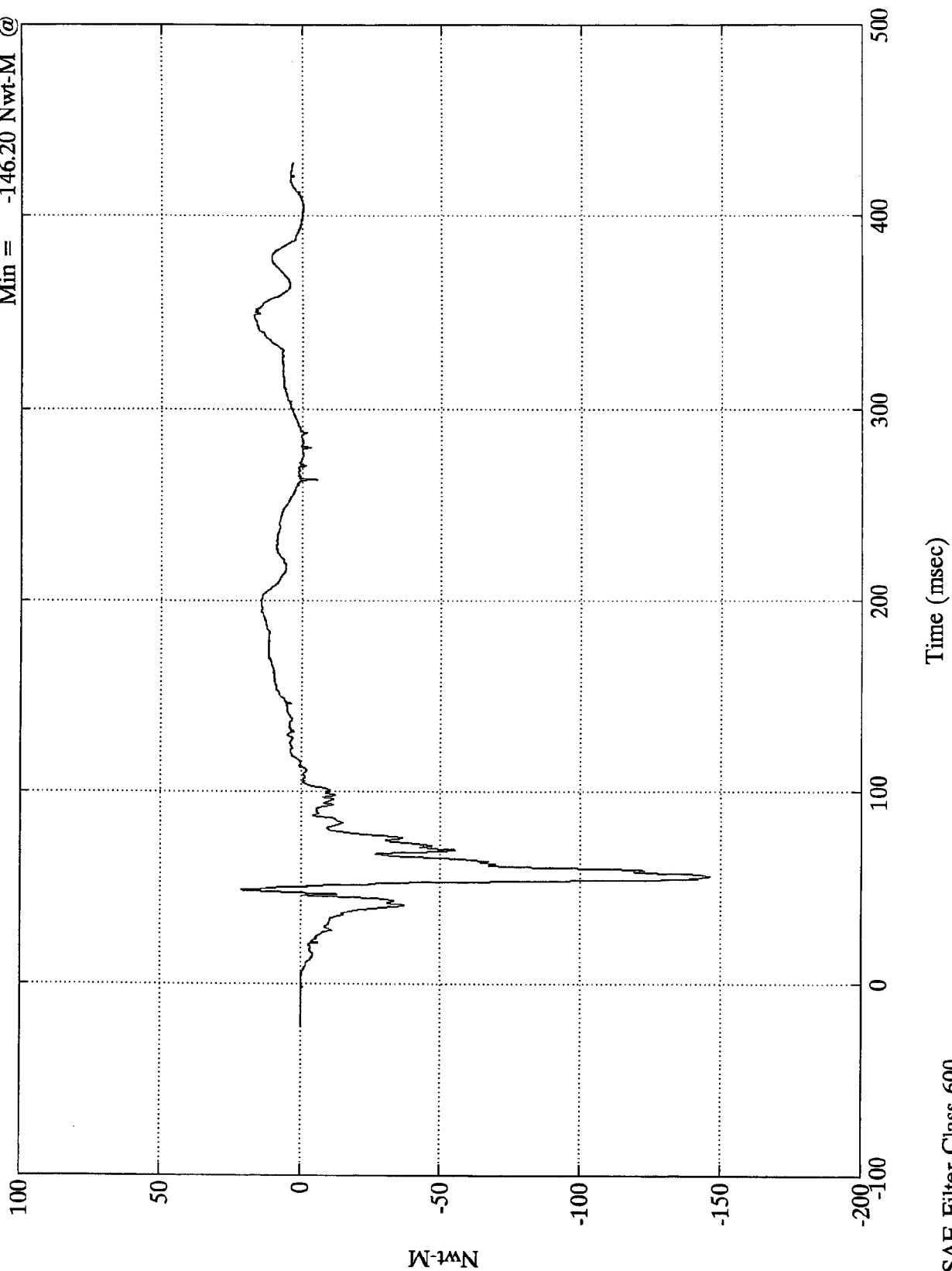


SAE Filter Class 600

VTV TEST #4

P2 Lt Upper Tibia My

Max = 21.04 Nwt-M @ 48.95 msec
Min = -146.20 Nwt-M @ 56.28 msec

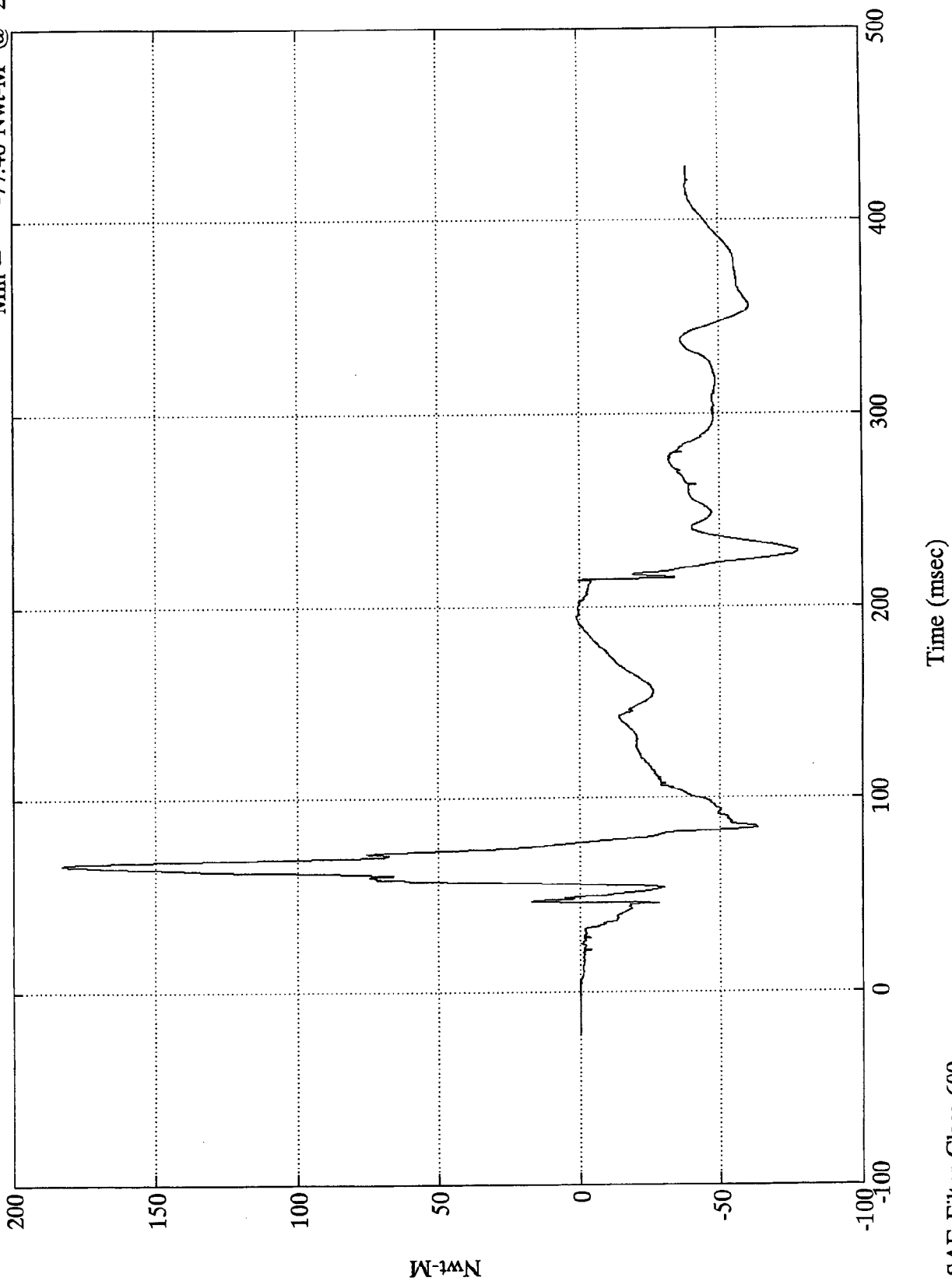


SAE Filter Class 600

VTV TEST #4

P2 Rt Upper Tibia Mx

Max = 183.00 Nwt-M @ 66.24 msec
Min = -77.46 Nwt-M @ 228.84 msec

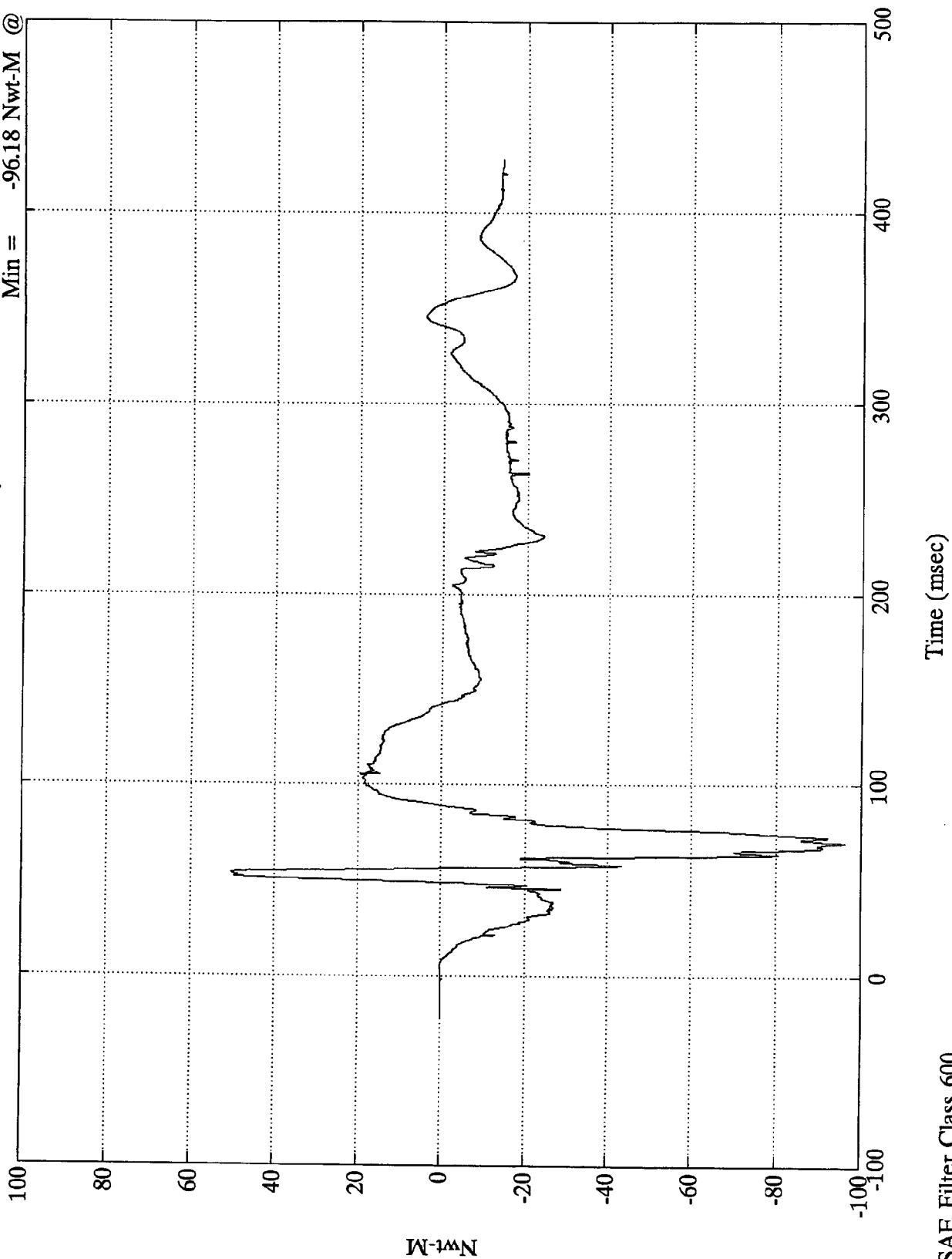


SAE Filter Class 600

VTV TEST #4

P2 Rt Upper Tibia My

Max = 50.27 Nwt-M @ 54.00 msec
Min = -96.18 Nwt-M @ 69.96 msec



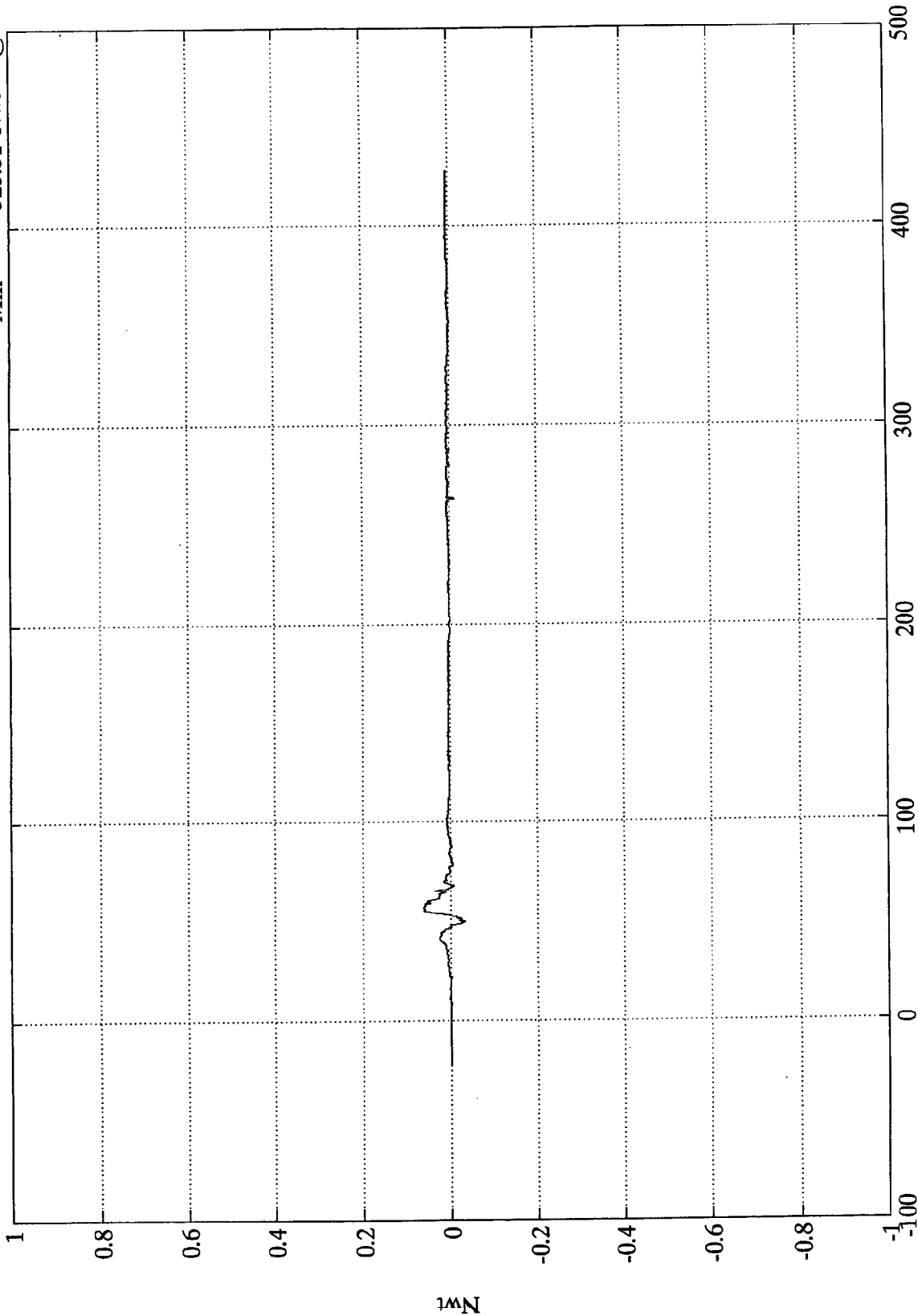
SAE Filter Class 600

VTV TEST #4

$\times 10^4$

Max = 628.41 Nwt @ 56.40 msec
Min = -323.31 Nwt @ 49.43 msec

P2 Lt Lower Tibia Fx



Time (msec)

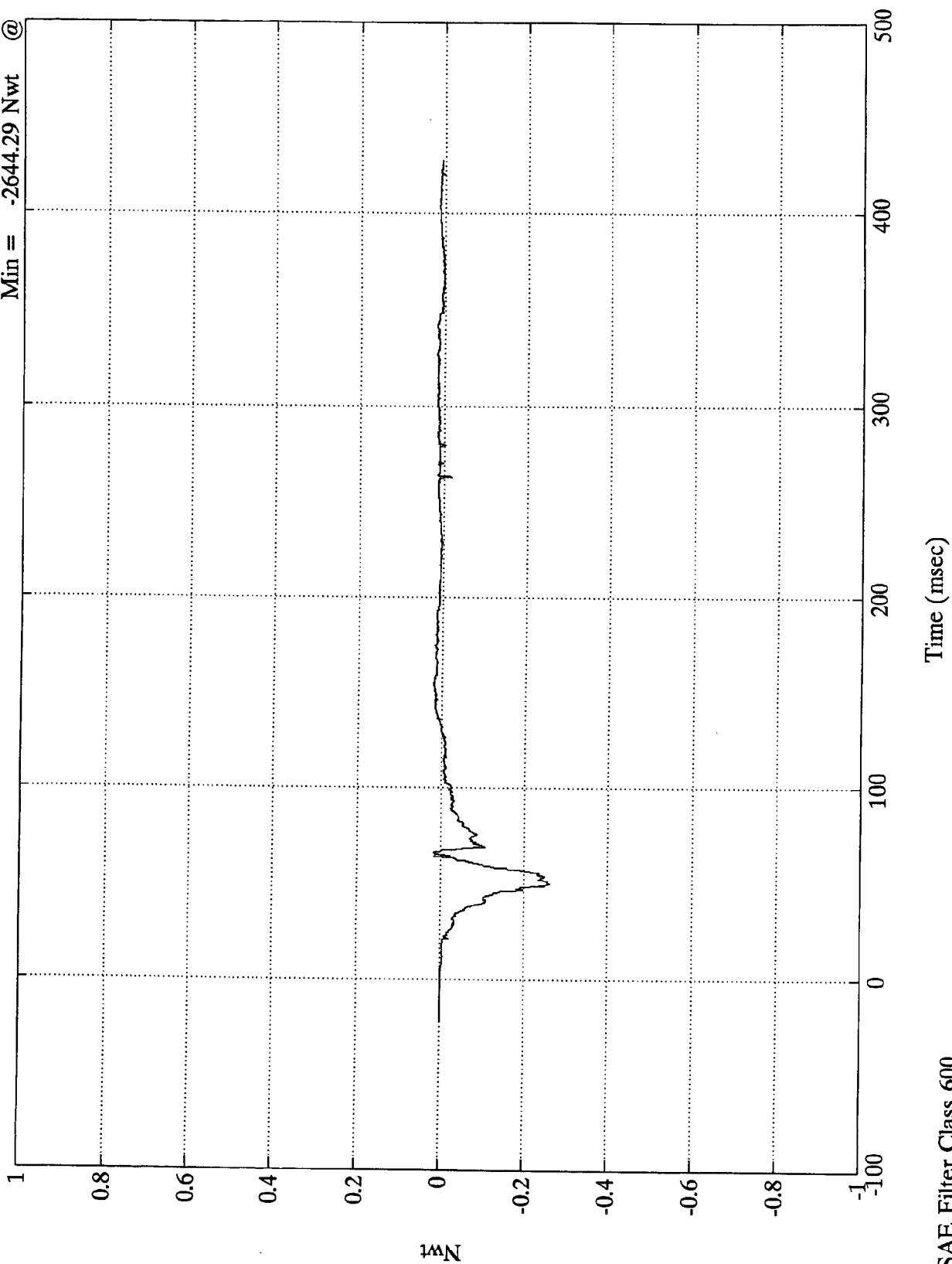
SAE Filter Class 600

VTV TEST #4

$\times 10^4$

P2 Lt Lower Tibia Fz

Max = 197.09 Nwt @ 153.36 msec
Min = -2644.29 Nwt @ 50.64 msec

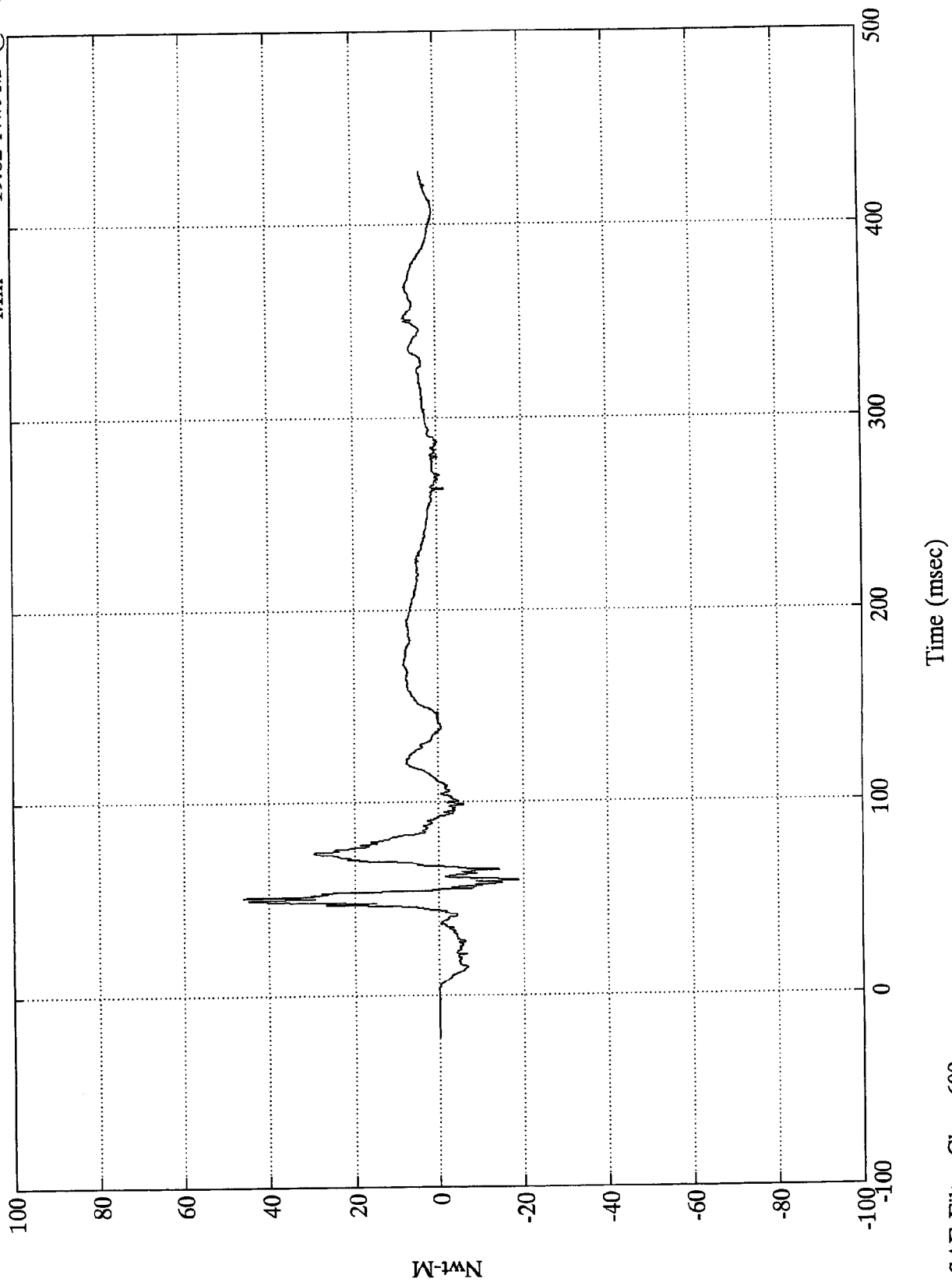


SAE Filter Class 600

VTV TEST #4

P2 Lt Lower Tibia My

Max = 46.21 Nwt-M @ 50.76 msec
Min = -19.02 Nwt-M @ 60.00 msec



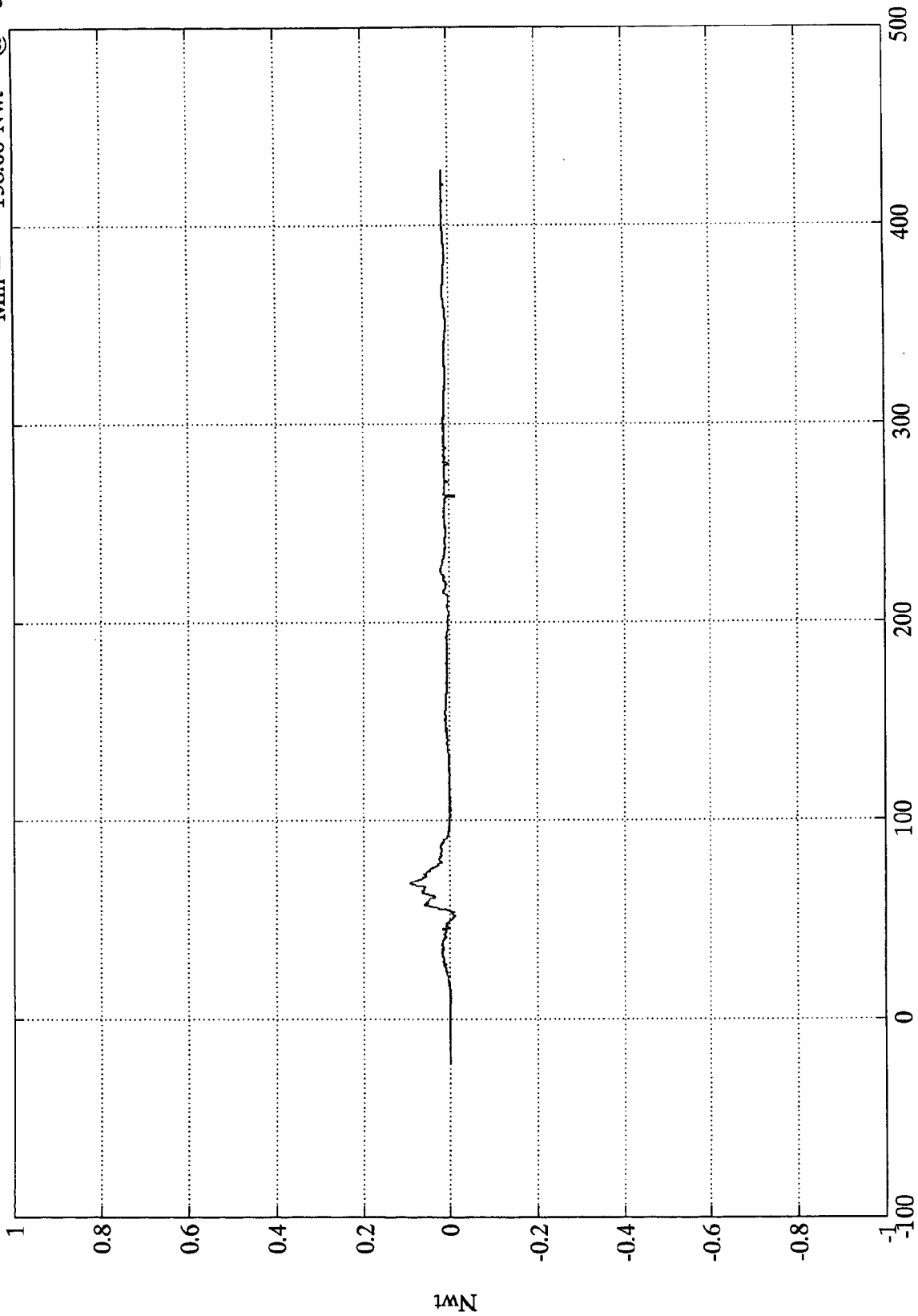
SAE Filter Class 600

VTV TEST #4

$\times 10^4$

P2 Rt Lower Tibia Fx

Max = 909.94 Nwt @ 68.76 msec
Min = -138.06 Nwt @ 52.08 msec



Time (msec)

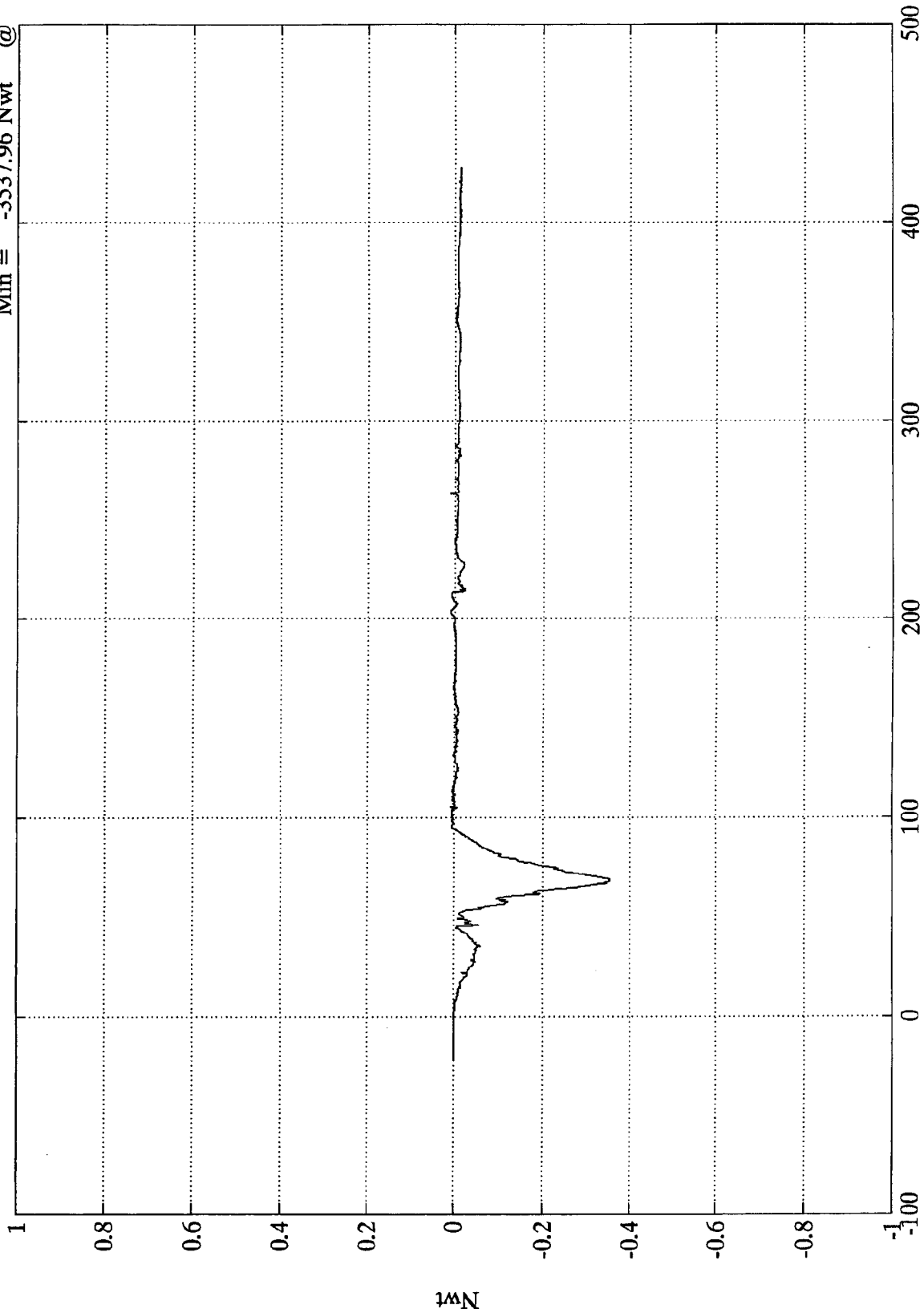
SAE Filter Class 600

VTV TEST #4

$\times 10^4$

P2 Rt Lower Tibia Fz

Max = 119.06 Nwt @ 263.51 msec
Min = -3537.96 Nwt @ 68.16 msec



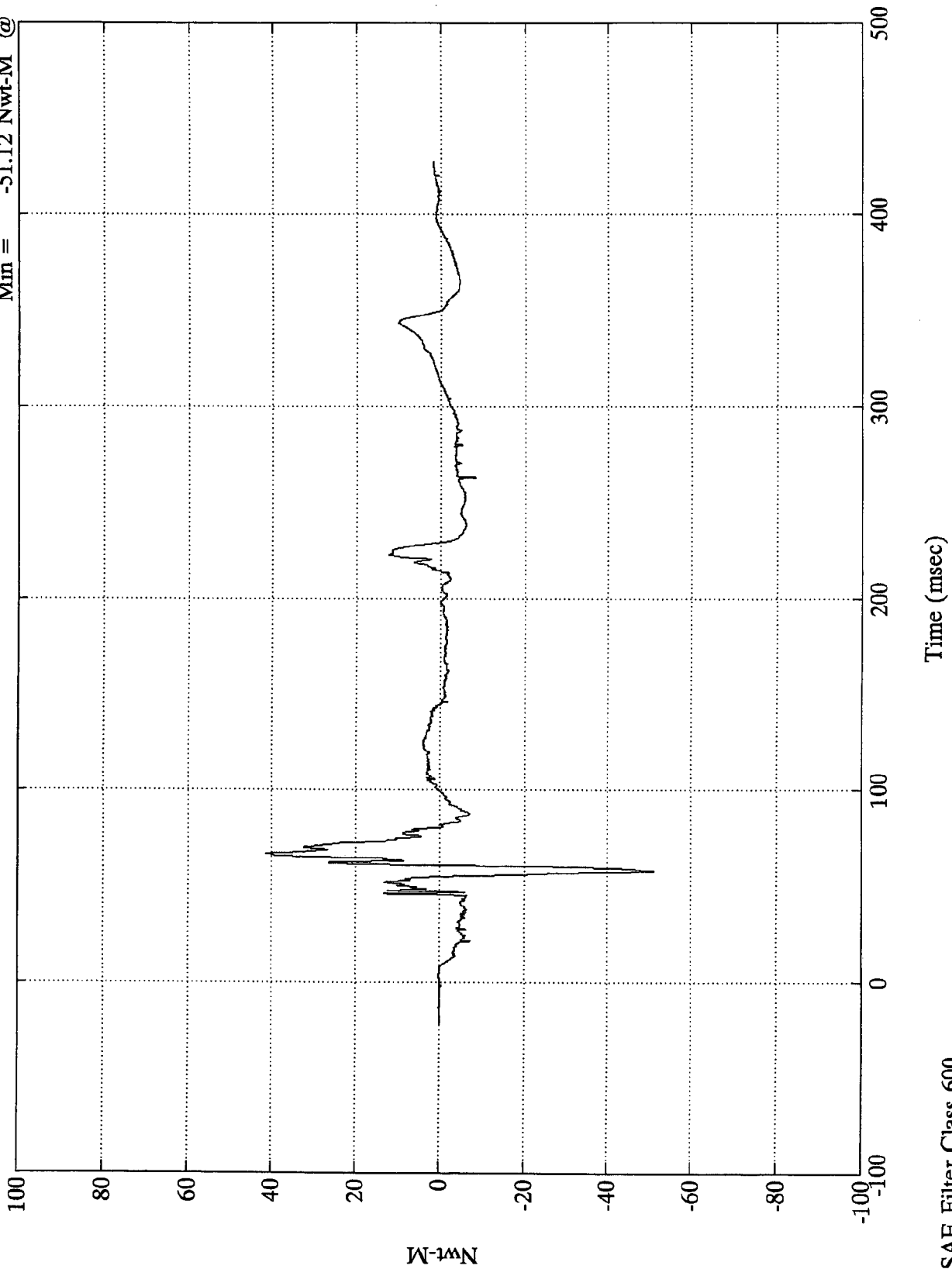
Time (msec)

SAE Filter Class 600

VTV TEST #4

P2 Rt Lower Tibia My

Max = 41.45 Nwt-M @ 66.72 msec
Min = -51.12 Nwt-M @ 58.08 msec



SAE Filter Class 600

APPENDIX C

**PART 572E DUMMY CONFIGURATION AND
PERFORMANCE VERIFICATION DATA SHEETS**

Appendix C contains the results from certification tests performed on the 50th percentile male anthropomorphic test devices utilized for this crash test. The results indicate that the dummies meet all of the performance requirements of the six standard tests as specified in 49 CFR Part 572, Federal Register, Volume 42, No. 25, dated February 7, 1977.

The tests were conducted at the Dummy Certification Test Facility of Calspan Corporation, Advanced Technology Center. A summary of the test results, and Part 572 specifications are included in the Appendix.

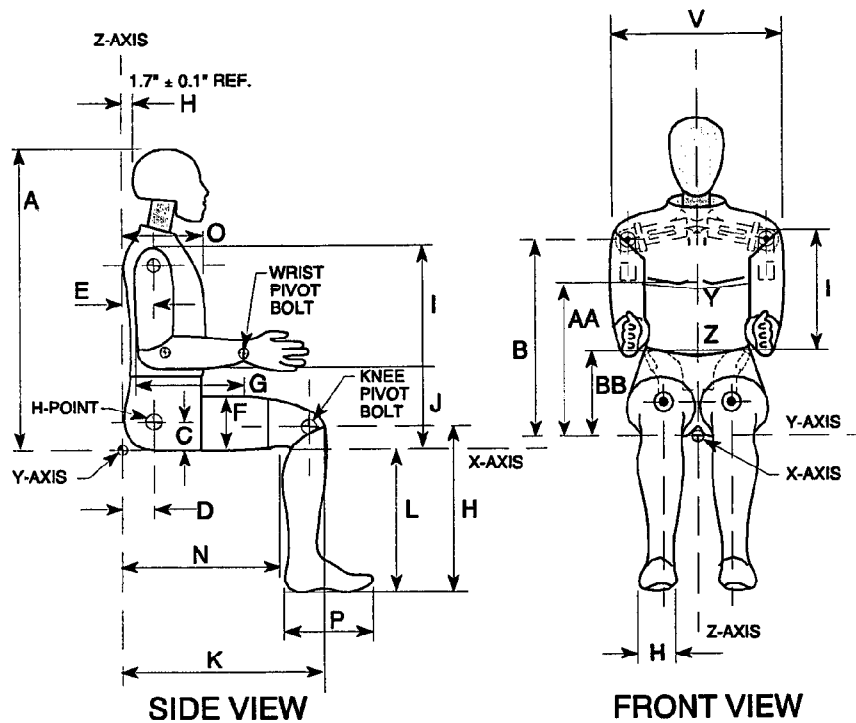
Dummy serial numbers and certification dates are:

<u>Serial No.</u>	<u>Completion Date</u>
061	1-22-96
245	1-22-96

FIGURE 9

EXTERNAL DIMENSIONS SETUP SPECIFICATIONS

EXTERNAL DIMENSIONS
SPECIFICATIONS



NOTE: Figure is referenced to the erect seated position. The curved lumbar does not allow the Hybrid III to be positioned in a perfect erect attitude.
(REF: S572.31(A)(6))

VEHICLE 1, POSITION 1 - DRIVER DUMMY

Serial No.: 061

HYBRID III EXTERNAL DIMENSIONS

S/N 061 HUMANOID

DUMMY SERIAL NO. 061

DATE: 2/25/95

TEMPERATURE		21 DEG. C
RELATIVE HUMIDITY		26 %
LOCATION FOR CHEST CIRCUMFERENCE (AA)	429-434 mm	432 mm
LOCATION FOR WAIST CIRCUMFERENCE (BB)	226-231 mm	229 mm
CHEST CIRCUMFERENCE (Y)	970-1001 mm	1000 mm
WAIST CIRCUMFERENCE (Z)	836-866 mm	851 mm
CHEST DEPTH (O)	213-229 mm	216 mm
H-POINT HEIGHT (C)	84-89 mm	86 mm
H-POINT FROM SEAT BACK (D)	135-140 mm	137 mm
SKULL CAP TO BACKLINE (H)	41-46 mm	43 mm
TOTAL SITTING HEIGHT (A)	879-889 mm	884 mm
THIGH CLEARANCE (F)	140-155 mm	155 mm
BUTTOCK KNEE LENGTH (K)	580-605 mm	592 mm
BUTTOCK POPLITAL LENGTH (N)	452-477 mm	465 mm
POPLITEAL LENGTH (L)	430-455 mm	450 mm
KNEE PIVOT HEIGHT (M)	485-501 mm	493 mm
FOOT LENGTH (P)	252-267 mm	256 mm
FOOT BREADTH (W)	91-107 mm	96 mm
SHOULDER PIVOT FROM BACKLINE (E)	84-94 mm	89 mm
SHOULDER BREADTH (V)	422-437 mm	427 mm
SHOULDER PIVOT HEIGHT (B)	505-521 mm	511 mm
ELBOW REST HEIGHT (J)	190-211 mm	196 mm
SHOULDER-ELBOW LENGTH (I)	330-345 mm	340 mm
BACK OF ELBOW TO WRIST PIVOT (G)	290-305 mm	295 mm

DUMMY MEETS SPECIFICATIONS

TECHNICIAN: IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
HEAD DROP TEST
HYBRID III

DATE : 2/21/95

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 061 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	32 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	270 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	10.7 G'S
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST
HYBRID III

DATE : 2/24/95

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 061 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5 - 22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY		10% - 70%	28 %
IMPACT VELOCITY		21.4 - 22.3 KPH	22.16 KPH
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	18.35 G'S
	20 MS	14.00 - 19.00 G'S	15.71 G'S
	30 MS	11.00 - 16.00 G'S	14.97 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	14.97 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	44 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	92.15 DEG.
	TIME	72 - 82 MS	77.88 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-80.0/-52.9 N-M	-57.7 N-M
	TIME	65 - 79 MS	72.63 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	159.63 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	135.5 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK FLEXION TEST
HYBRID III

DATE : 2/23/95

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5-22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY		10% - 70%	31 %
IMPACT VELOCITY		24.8 - 25.7 KPH	25.6 KPH
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	25.64 G'S
	20 MS	17.60 - 22.60 G'S	20.66 G'S
	30 MS	12.50 - 18.50 G'S	18.31 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	18.31 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	38.38 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	68.7 DEG.
	TIME	57 - 64 MS	59.75 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88 - 108 N-M	92.6 N-M
	TIME	47 - 58 MS	50.75 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	121.25 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	102.13 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 1/16/96

CALSPAN SEQUENTIAL NUMBER 3

HY3 SN 061 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.5 - 22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	30 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	24.1 KPH
MAXIMUM DEFLECTION	64 - 73 mm	65 mm
MAXIMUM RESISTIVE FORCE	5160 - 5894 NEWTONS	5826 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	75 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 1/16/96

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN: 061 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	70 DEG. C
RELATIVE HUMIDITY	10% - 70%	30 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	5142 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 1/22/96

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 3

HY3 SN: 061 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	30 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4795 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY I.D. NUMBER: 061

A. DUMMY INSTRUMENTS

1. HEAD ACCELEROMETER

HX LONGITUDINAL

HY LATERAL

HZ VERTICAL

2. CHEST ACCELEROMETER

CX LONGITUDINAL

CY LATERAL

CZ VERTICAL

3. FEMUR LOAD CELLS

LEFT SIDE

RIGHT SIDE

MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
ENDEVCO	AF5B3	1/96	7/96
ENDEVCO	AF5F7	1/96	7/96
ENDEVCO	AF5E1	1/96	7/96
ENDEVCO	A84J	1/96	7/96
ENDEVCO	A57G	1/96	7/96
ENDEVCO	AE8W7	1/96	7/96
GSE	231	12/95	6/96
GSE	232	12/95	6/96

B. CALIBRATION LABORATORY INSTRUMENTS

1. PENDULUM ACC.

2. TEST PROBE ACCELEROMETER

3. LUMBAR FLEXION TEST PUSH FORCE GAUGE

4. ABDOMINAL COMPRESS. TEST FORCE GAUGE

5. ABDOMINAL COMPRESS. TEST FORCE GAUGE

MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
CEC	A160	8/95	2/96
CEC	A177	8/95	2/96
TRANS- DUCER INC	20051	12/95	6/96
BLH	72952	12/95	6/96
CIC	567-11	12/95	6/96

VEHICLE 1, POSITION 2 - FRONT PASSENGER DUMMY

Serial No.: 245

HYBRID III EXTERNAL DIMENSIONS

S/N 245 HUMANOID

DUMMY SERIAL NO. 245

DATE: 6/15/95

TEMPERATURE		21 DEG. C
RELATIVE HUMIDITY		44 %
LOCATION FOR CHEST CIRCUMFERENCE (AA)	429-434 mm	432 mm
LOCATION FOR WAIST CIRCUMFERENCE (BB)	226-231 mm	229 mm
CHEST CIRCUMFERENCE (Y)	970-1001 mm	991 mm
WAIST CIRCUMFERENCE (Z)	836-866 mm	856 mm
CHEST DEPTH (O)	213-229 mm	213 mm
H-POINT HEIGHT (C)	84-89 mm	86 mm
H-POINT FROM SEAT BACK (D)	135-140 mm	137 mm
SKULL CAP TO BACKLINE (H)	41-46 mm	43 mm
TOTAL SITTING HEIGHT (A)	879-889 mm	886 mm
THIGH CLEARANCE (F)	140-155 mm	152 mm
BUTTOCK KNEE LENGTH (K)	580-605 mm	594 mm
BUTTOCK POPLITAL LENGTH (N)	452-477 mm	465 mm
POPLITEAL LENGTH (L)	430-455 mm	444 mm
KNEE PIVOT HEIGHT (M)	485-501 mm	488 mm
FOOT LENGTH (P)	252-267 mm	259 mm
FOOT BREADTH (W)	91-107 mm	96 mm
SHOULDER PIVOT FROM BACKLINE (E)	84-94 mm	91 mm
SHOULDER BREADTH (V)	422-437 mm	427 mm
SHOULDER PIVOT HEIGHT (B)	505-521 mm	513 mm
ELBOW REST HEIGHT (J)	190-211 mm	203 mm
SHOULDER-ELBOW LENGTH (I)	330-345 mm	335 mm
BACK OF ELBOW TO WRIST PIVOT (G)	290-305 mm	295 mm

DUMMY MEETS SPECIFICATIONS

TECHNICIAN: IVAN MINKIEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
HEAD DROP TEST
HYBRID III

DATE : 1/22/96

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN: 245 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	30 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	247.2 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	3.9 G'S
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST
HYBRID III

DATE : 2/23/95

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 245 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5 - 22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY		10% - 70%	29 %
IMPACT VELOCITY		21.4 - 22.3 KPH	22.16 KPH
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	18.69 G'S
	20 MS	14.00 - 19.00 G'S	14.17 G'S
	30 MS	11.00 - 16.00 G'S	14.36 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	14.36 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	45.5 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	84.27 DEG.
	TIME	72 - 82 MS	75.63 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-80.0/-52.9 N-M	-65.14 N-M
	TIME	65 - 79 MS	70.5 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	147.63 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	129.75 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK FLEXION TEST

HYBRID III

DATE : 2/23/95

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 245 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5-22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY		10% - 70%	29 %
IMPACT VELOCITY		24.8 - 25.7 KPH	25.56 KPH
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	22.73 G'S
	20 MS	17.60 - 22.60 G'S	20.06 G'S
	30 MS	12.50 - 18.50 G'S	17.99 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	17.99 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	40.63 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	67.53 DEG.
	TIME	57 - 64 MS	59.88 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88 - 108 N-M	92.26 N-M
	TIME	47 - 58 MS	53.38 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	118.13 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	98.5 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 2/17/95

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN 245 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.5 - 22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	29 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	23.7 KPH
MAXIMUM DEFLECTION	64 - 73 mm	65.3 mm
MAXIMUM RESISTIVE FORCE	5160 - 5894 NEWTONS	5888 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	73.1 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 3/16/95

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 245 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	40 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4871 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 3/16/95

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 245 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	40 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4808 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY I.D. NUMBER: 245

A. DUMMY INSTRUMENTS

1. HEAD ACCELEROMETER

HX LONGITUDINAL

HY LATERAL

HZ VERTICAL

2. CHEST ACCELEROMETER

CX LONGITUDINAL

CY LATERAL

CZ VERTICAL

3. FEMUR LOAD CELLS

LEFT SIDE

RIGHT SIDE

MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
ENDEVCO	ADL50	10/95	4/96
ENDEVCO	A59J	10/95	4/96
ENDEVCO	AC2P5	10/95	4/96
ENDEVCO	A33A	10/95	4/96
ENDEVCO	FB32L	10/95	4/96
ENDEVCO	AD395	10/95	4/96
GSE	449	12/95	6/96
GSE	450	12/95	6/96

B. CALIBRATION LABORATORY INSTRUMENTS

1. PENDULUM ACC.

2. TEST PROBE ACCELEROMETER

3. LUMBAR FLEXION TEST PUSH FORCE GAUGE

4. ABDOMINAL COMPRESS. TEST FORCE GAUGE

5. ABDOMINAL COMPRESS. TEST FORCE GAUGE

MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
CEC	A160	8/95	2/96
CEC	A177	8/95	2/96
TRANS- DUCER INC	20051	12/95	6/96
BLH	72952	12/95	6/96
CIC	567-11	12/95	6/96