

CALSPAN REPORT NUMBER: 8304-1

**VEHICLE-TO-VEHICLE FRONTAL 30 DEGREE, 50% OVERLAP
111.4 kph IMPACT OF A MOVING DEFORMABLE BARRIER
INTO A STATIONARY 1995 FORD TAURUS GL 4-DOOR SEDAN**

CALSPAN TEST NUMBER: Y57-1-1542

July 18, 1995

CALSPAN CORPORATION
ADVANCED TECHNOLOGY CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225



FINAL REPORT

PREPARED FOR:

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

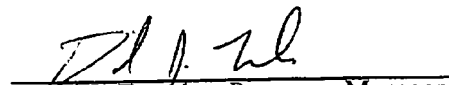
This Test Report was prepared for the U.S. Department of Transportation, Research and Special Programs Administration, under Contract No. DTRS-57-95-C-00009.

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By:


Lawrence Q. Valvo, Project Engineer

Approved By:


David J. Trayale, Program Manager
Transportation Sciences Center

Approval Date:

August 1, 1995

FINAL REPORT ACCEPTANCE BY:

Accepted By:

Contract Technical Manager

Acceptance Date:

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, 50% overlap Frontal 111.4 kph Impact of a Moving Deformable Barrier into a stationary 1995 Ford Taurus GL 4-Door Sedan		5. Report Date July 18, 1995	
		6. Performing Organization Code CAL	
7. Author(s) Lawrence Q. Valvo, Project Engineer David J. Travale, Program Manager		8. Performing Organization Report No. 8304-1	
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 111.4 kph vehicle to vehicle 30 degree, 50% overlap impact test of a Moving Deformable Barrier into a stationary 1995 Ford Taurus GL 4-door sedan was performed at the Calspan Advanced Technology Center crash facility in Buffalo, New York on July 18, 1995. The 1995 Ford Taurus 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. The Vehicle 1 driver had a chest resultant acceleration which exceeded 60 G's. All other 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 111.4 kph 30 degree, 50% 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 Taurus GL 4-door sedan (Vehicle 1) and a Moving Deformable Barrier (MDB or Vehicle 2). The moving barrier was traveling at 111.4 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 impact point was designated using an offset measurement at the Vehicle 1 centerline which was 50% of the Vehicle 1 maximum width dimension. From this 50% width point (parallel with the Vehicle 1 centerline), a 15° counterclockwise line tangent to the Vehicle 2 left most point of the bumper was determined. These angles and tangent line determine the impact point.

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

Section 2

SUMMARY OF TEST

A stationary 1995 Ford Taurus GL 4-door sedan (Vehicle 1) was impacted by a Moving Deformable Barrier (Vehicle 2) traveling forward at 111.4 kph. The vehicles were positioned so that Vehicle 2 impacted Vehicle 1 at a 30 degree, 50% 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 July 18, 1995.

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 1.5 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 to 20° from vertical as measured from the seat back frame 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, and an additional 8 string pot chest displacement potentiometer array. Driver shoulder belt tensile forces were also recorded.

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 Taurus GL (Vehicle 1) driver HIC was 497 and the head contacted the airbag and the B-pillar. The driver's maximum chest acceleration over a three millisecond period was 62.5 gs and the maximum chest displacement was -35.1 mm. The left femur maximum axial compressive force was 7532 newtons and the right femur maximum axial compressive force was 5842 newtons.

Vehicle 1's passenger HIC was 133 and the head contacted the airbag and the headrest. The passenger's maximum chest acceleration over a three millisecond period was 49.8 gs and the maximum chest displacement was -37.3 mm. The left femur maximum axial compressive force was 5975 newtons and the right femur maximum axial compressive force was 3484 newtons.

Structural damage to the 1995 Ford Taurus 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 2050 mm tear from the passenger-side top corner of the windshield to the driver-side bottom corner of the windshield. A 170 mm windshield molding separation occurred at the driver-side bottom corner.

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:

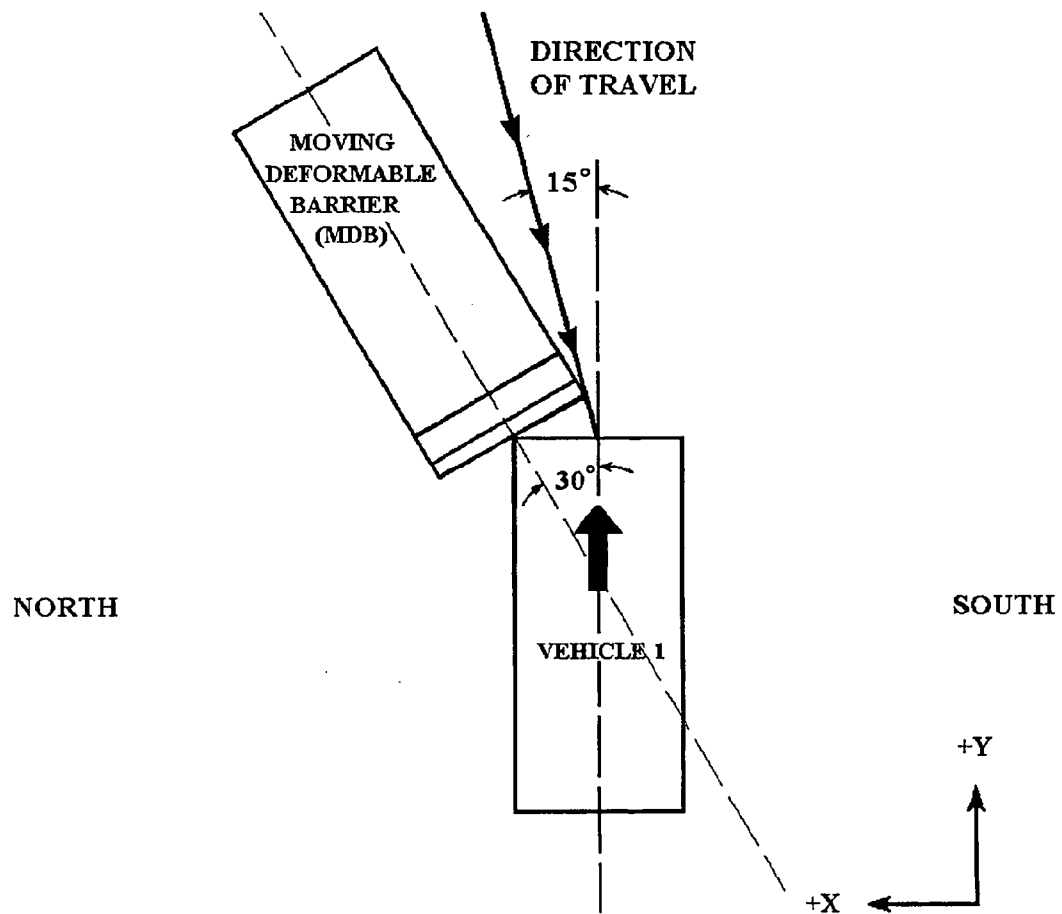
- Vehicle 1 Right Frame Rail X, Y & Z accelerometers: Data is questionable after 300 msec.
Vehicle 1's right front tire ruptured during the test causing the right front frame rail accelerometer protective housing to contact the ground after 300 msec.
- Vehicle 1 A-pillar X accelerometer: Accelerometer wire was cut after 60 msec.
- Position 2 (Right Front Passenger) Chest Z accelerometer: The accelerometer opened from 35 msec to 51 msec and the resulting data is questionable in this region. The reported maximum chest acceleration over a 3 millisecond period calculated from the Position 2 Chest Resultant acceleration was not in this time interval.

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 Taurus GL 4-door sedan

NHTSA Test No.: - VIN.: 1FALP52U8SG218161

Body Color: Green Date of Manufacture: 1/95

Engine: 6 Cylinders; - C.I.D.; 3.0 Liters; - CC
X Gas; - Diesel; - Turbocharged
- Longitudinal; X Transverse

Transmission: 4 Speed; - Manual; X Automatic; X Overdrive

Final Drive: X Front Wheel; - Rear Wheel; - Four Wheel
X A/C; X P/S; X P/B; - P/wdo
X Tilt Wheel; - P/seats; X 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 240 kpa, Rear 240 kpa

Recommended Tire Size: P205/65R15

Recommended Cold Tire Pressure: Front 240 kpa, Rear 240 kpa

Tires on Vehicle: P205/65R15; Manufacturer: General

Number of Occupants: 3 Front; 3 Rear; - 3rd Seat; 6 TOTAL

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

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

Vehicle Capacity Weight (VCW) = 499 kgs. (A)

No. of Occupants x 68.03 kgs. = 408 kgs. (B)

Rated Cargo and Luggage

Weight (RCLW) A - B = 91 kgs.

GVWR 2110 kgs. GAWR: Front 1138 kgs. Rear 985 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>474</u>	kgs.	Right Rear	=	<u>248</u>	kgs.
Left Front	=	<u>454</u>	kgs.	Left Rear	=	<u>271</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>928</u>	kgs.	(<u>64.1</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>519</u>	kgs.	(<u>35.9</u> % of Total Vehicle Weight)			
TOTAL DELIVERED WEIGHT	=	<u>1,447</u>	kgs.				

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMY:

Right Front	=	<u>478</u>	kgs.	Right Rear	=	<u>337</u>	kgs.
Left Front	=	<u>470</u>	kgs.	Left Rear	=	<u>324</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>948</u>	kgs.	(<u>58.9</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>661</u>	kgs.	(<u>41.1</u> % of Total Vehicle Weight)			
TOTAL TEST WEIGHT	=	<u>1,609</u>	kgs.				

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

Delivered Attitude:	RF	<u>716</u>	;	LF	<u>724</u>	;	RR	<u>692</u>	;	LR	<u>689</u>
Test Attitude:	RF	<u>728</u>	;	LF	<u>724</u>	;	RR	<u>648</u>	;	LR	<u>643</u>
Vehicle's Wheel Base=	<u>2695</u> mm.										
Location of Vehicle's C.G. =	<u>1107 millimeters rearward of front wheel center.</u>										

Table 1

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

Type of Test: VTV Frontal 30°, 50% overlap Impact Angle: 30 Deg.

Date of Test: July 18, 1995 Time of Test: 14:28

Ambient Temperature: 22 °C at impact area

Temperature in Occupant Compartment: 22 °C

Windshield Molding Temperature: - °C

Required Impact Velocity Range: 111.5 to 114.5 kph

Impact Velocity: primary = 111.4 kph, secondary = 111.4 kph

Distance From Front Bumper to Barrier Face When

Entering Speed Trap: 132 cm.

Exiting Speed Trap: 30.5 cm.

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Back of head with B-pillar, face with center of airbag</u>	<u>Back of head with inboard side of head rest, face with center of airbag</u>
Chest	<u>Lower half of airbag</u>	<u>Lower half of airbag</u>
Abdomen	<u>No contact</u>	<u>No contact</u>
Left Knee	<u>Bolster to left side of steering column</u>	<u>Bolster to left of glove compartment</u>
Right Knee	<u>Bolster to right side of steering column</u>	<u>Center of glove compartment door</u>

	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Door Opening	<u>Closed/Operable</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>0.0</u>	<u>0.0</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)	-63.8	29.1	-29.4	69.9	-61.7	-13.6	-22.0	62.5
DUMMY (2)	-30.7	-21.1	-41.7	48.6	-48.4	-18.6	41.8	49.8

	MAXIMUM FORCE FEMUR LOAD (NEWTONS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	-5842	-7532
DUMMY (2)	-3484	-5975

	MAXIMUM LOAD (NEWTONS)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)	3858.5	-	-
DUMMY (2)	-	-	-

	MAXIMUM ACCELERATION ("G")			
	HIC	t ₁ (SEC)	t ₂ (SEC)	Average Acceleration t ₁ TO t ₂
DUMMY (1)	497	60.960	87.600	51.09
DUMMY (2)	133	50.640	86.520	26.73

*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	298	308
NW	505	506
NSW	364	-
NIP	521	-
NH	386	-
CD	513	475
CS	264	-
KDL	145	155
KDR	157	155
1	500	-
2	51	-
SA	20°	20°
PA	21°	24°
ULA	113°	109°
LLA	227°	229°

DISTANCE OF H-POINT FROM TARGET POSITION (mm)		
	Driver	Passenger
Longitudinal	4 forward	0
Vertical	2 above	2 above

Angles taken relative to vertical

SA = Seat Back Angle

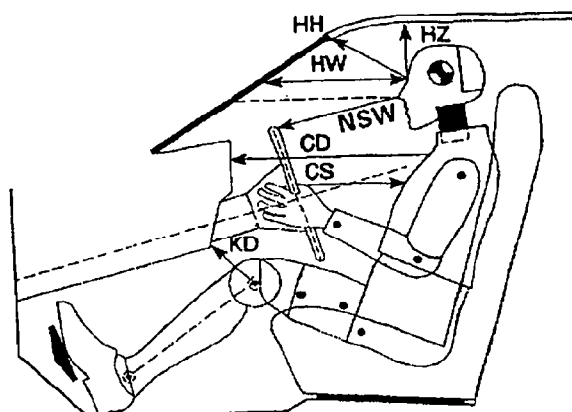
PA = Pelvic Angle

ULA= Upper Leg Angle

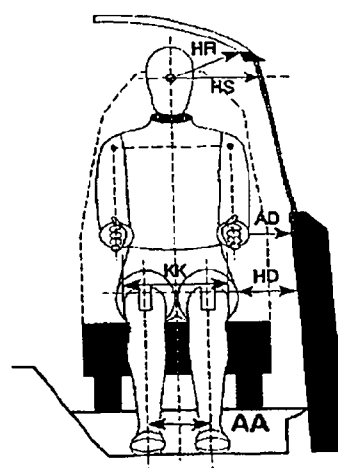
LLA= Lower Leg Angle

	DRIVER (mm)	PASSENGER
HR*	193	204
HS*	315	312
AD	109	107
HD	208	198
KK	315	318
AA	330	257
DT	72 (22°C)	72 (22°C)

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



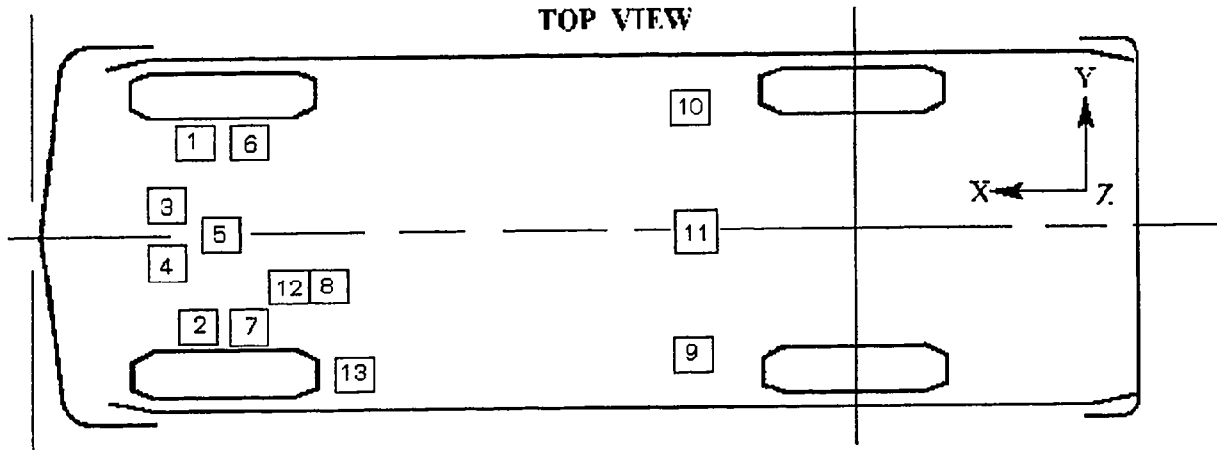
- HH - Head to Windshield Header
- NW - Head to Windshield
- NSW - Nose to Steering Wheel
- NIP - Nose to Instrument Panel
- NH - Nose to Steering Wheel Hub
- CD - Chest to Dash
- CS - Chest to Steering Wheel Hub
- KDL - Knee to Dash Left
- KDR - Knee to Dash Right
- 1 - Nose to Steering Column Target
- 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 Taurus GL 4-door sedan

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1*	Rt Ft Frame Rail X	Gs	14.7	41.6	-103.6	329.4	60.0
1*	Rt Ft Frame Rail Y	Gs	70.0	42.1	-119.4	37.3	60.0
1*	Rt Ft Frame Rail Z	Gs	83.5	328.0	-51.3	41.4	60.0
2	Lt Ft Frame Rail X	Gs	32.7	50.9	-155.8	36.0	60.0
2	Lt Ft Frame Rail Y	Gs	44.2	58.2	-70.7	36.5	60.0
2	Lt Ft Frame Rail Z	Gs	125.6	42.5	-94.7	35.3	60.0
3	Rt Engine X	Gs	27.8	56.9	-99.5	44.2	60.0
3	Lt Engine X	Gs	31.9	63.2	-138.8	57.6	60.0
4	Engine Bottom X	Gs	59.5	49.4	-114.9	37.4	60.0
4	Engine Bottom Y	Gs	32.5	50.2	-64.5	36.2	60.0
5	Rt Shock Tower X	Gs	10.9	25.4	-71.9	49.7	60.0
5	Rt Shock Tower Y	Gs	17.6	64.6	-96.6	49.7	60.0
6	Lt Shock Tower X	Gs	26.1	75.0	-66.0	33.0	60.0
6	Lt Shock Tower Z	Gs	25.0	9.1	-35.6	41.9	60.0
7	Brake Pedal X	Gs	37.2	45.2	-100.7	54.5	60.0
7	Brake Pedal Y	Gs	91.8	72.2	-108.1	56.9	60.0
7	Brake Pedal Z	Gs	122.8	54.8	-42.1	39.7	60.0
8	Lt Rear Compartment X	Gs	1.6	198.5	-43.5	47.6	60.0
8	Lt Rear Compartment Y	Gs	4.6	78.8	-29.0	54.2	60.0
9	Rt Rear Compartment X	Gs	1.4	336.8	-45.0	56.0	60.0
9	Rt Rear Compartment Y	Gs	2.9	78.1	-24.9	54.6	60.0
10	C/L Rear Compartment X	Gs	1.8	156.8	-46.7	47.8	60.0
10	C/L Rear Compartment Y	Gs	5.1	77.2	-24.1	55.8	60.0
12	Toe Pan X	Gs	34.6	53.6	-119.3	46.8	60.0
12	Toe Pan Y	Gs	23.8	74.9	-78.8	47.8	60.0
12	Toe Pan Z	Gs	110.5	48.2	-77.9	53.8	60.0
13*	A-Pillar Hinge X	Gs	231.0	246.7	-226.9	87.6	60.0

* Data is questionable or channel was damaged during the impact.

Figure 4

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

ACCELEROMETER MOUNTING LOCATIONS

Test Description: 111.4 kph Frontal Vehicle to Vehicle Impact
 Test Vehicle: 1995 Ford Taurus 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	4070	480	117	4045	670	130
2	LEFT FRONT FRAME RAIL	4070	-480	116	3875	-215	130
3	RIGHT ENGINE TOP	4025	215	880	3860	410	900
4	LEFT ENGINE TOP	3960	-70	878	2820	150	925
5	ENGINE BOTTOM	4050	-290	188	3825	-2	255
6	RIGHT SHOCK TOWER	3802	650	920	3780	690	940
7	LEFT SHOCK TOWER	3815	-645	915	2610	-530	1030
8	BRAKE PEDAL	3370	-330	455	3320	-290	345
9	LEFT REAR COMP.	1954	-610	400	1950	-615	345
10	RIGHT REAR COMP.	1942	615	405	1935	635	450
11	CENTER REAR COMP.	1901	-15	475	1890	-15	495
12	DRIVER TOEPAN	3520	-405	365	3380	-285	295
13	DRIVER 'A' PILLAR	3320	-785	870	3174	-742	780

NOTE: Vehicle leveled to pre-test height for post-test measurements. Carpet not removed from floor-pan.

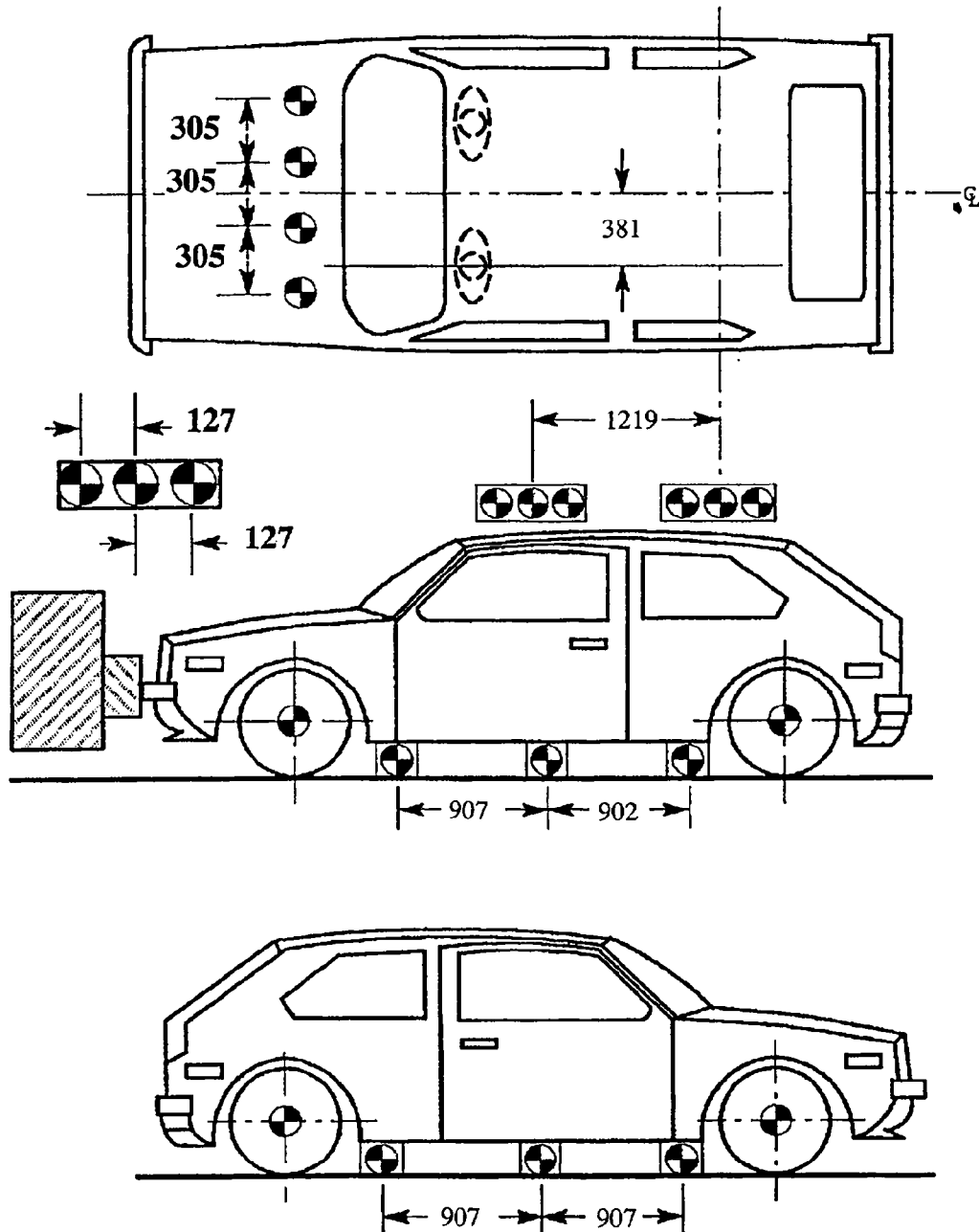
TOEPAN MEASUREMENT LOCATIONS*												
Loc. No.	DRIVER (mm.)						PASSENGER(mm.)					
	PRE-TEST AXIS			POST-TEST AXIS			PRE-TEST AXIS			POST-TEST AXIS		
	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
1 (lower left)	3370	-555	305	3315	-528	235	3355	195	260	3350	210	185
2 (upper left)	3485	-570	511	3335	-495	464	3560	150	425	3475	185	395
3 (center)	3520	-405	365	3400	-300	325	3495	235	355	3460	360	325
4 (lower right)	3410	-150	295	3350	-114	215	3345	560	255	3340	565	215
5 (upper right)	3570	-140	435	3410	-38	385	3490	525	460	3455	545	405

* Carpet not removed from floor-pan.

Figure 5

VEHICLE 1 TARGET LOCATIONS

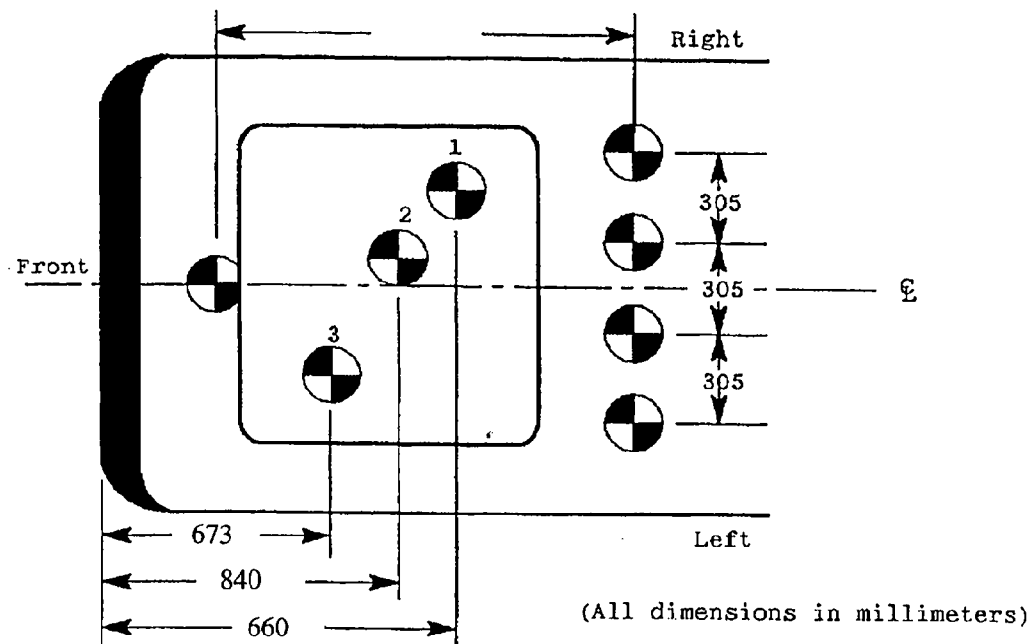
(All dimensions in millimeters)



(Dimensions in millimeters)

Figure 5

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



Note: Drawing not to scale.

Target 1: Alternator
2: Intake Manifold
3: Air cleaner

Figure 6

VEHICLE 1 MEASUREMENT POINTS

(All dimensions in millimeters)

REAR DATUM REFERENCE

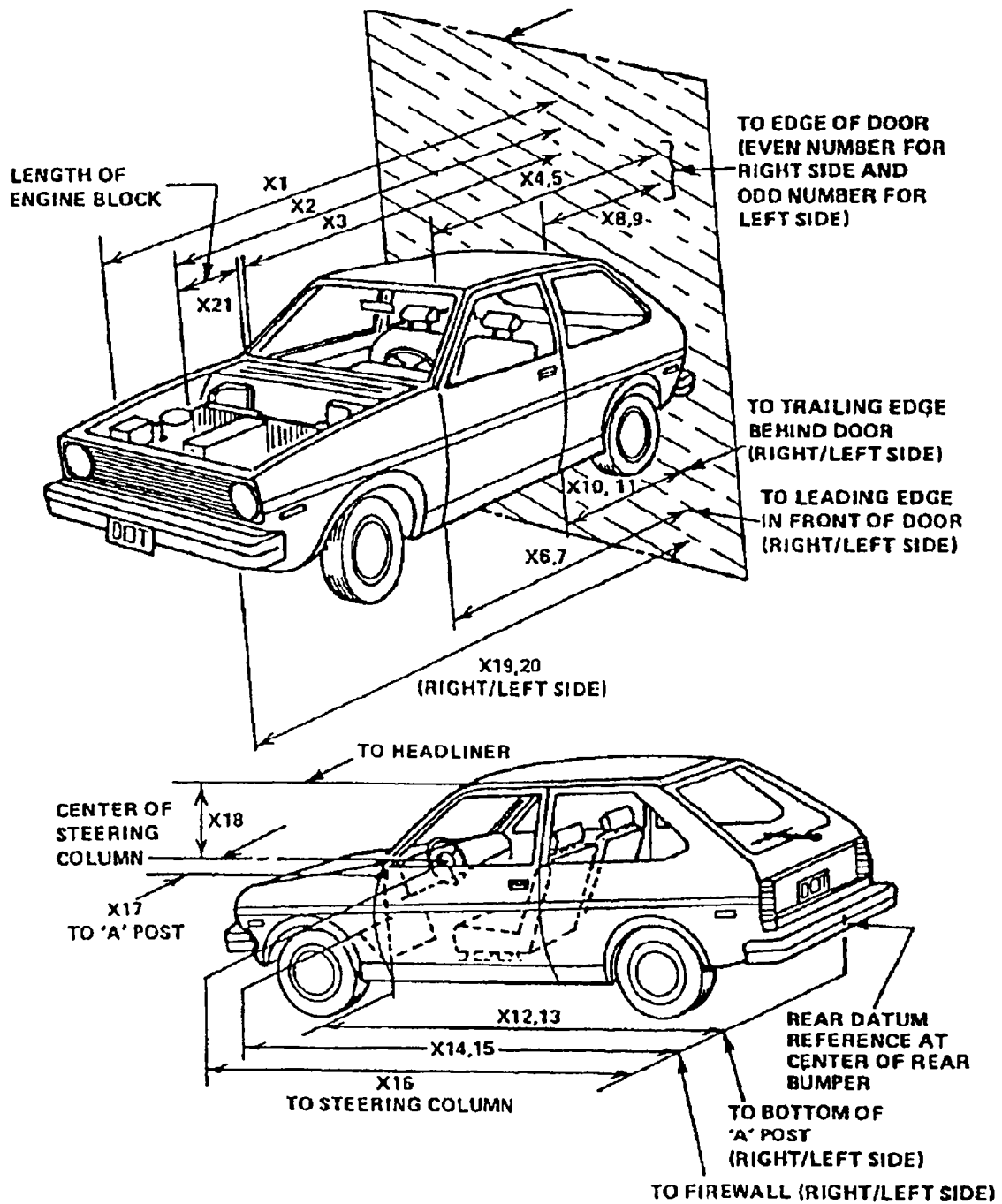


Figure 6

VEHICLE 1 MEASUREMENT POINTS (continued)

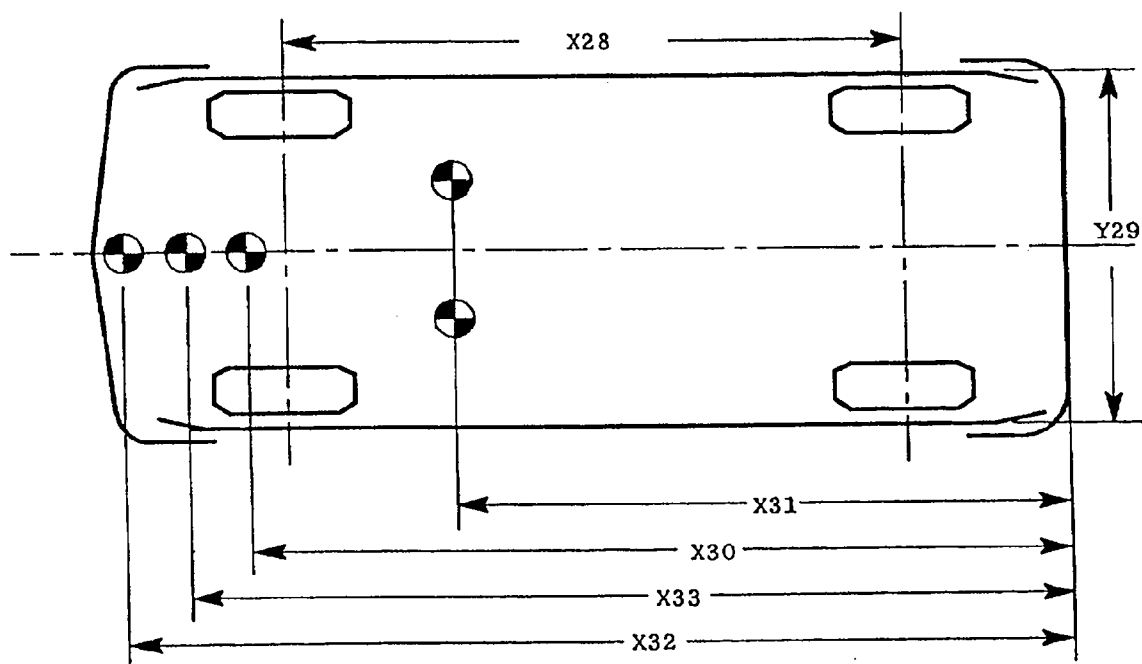
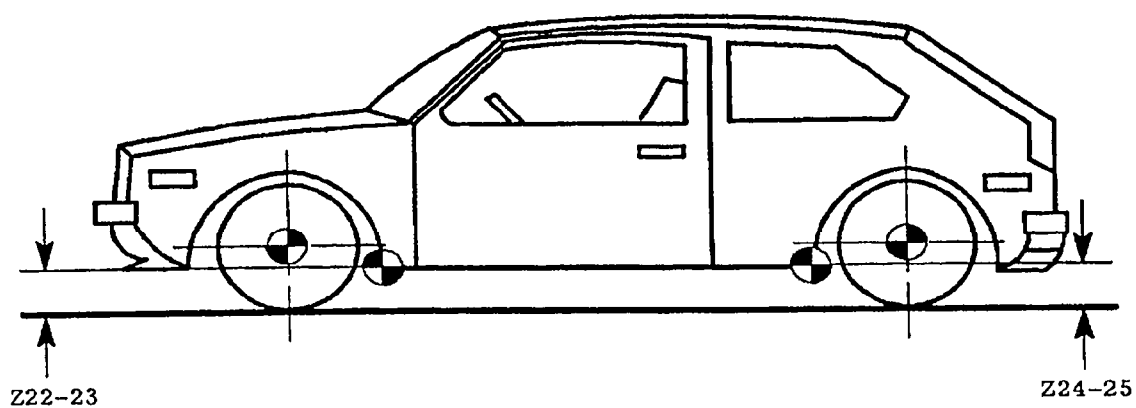


Table 3

VEHICLE 1 MEASUREMENTS

No.	TYPE OF MEASUREMENT	All Dimensions in millimeters	
		Pre-Test	Post-Test
X1	Total Length of Vehicle at Centerline	4880	4520
X2	Rear Surface of Vehicle to Engine at Centerline	4115	3900
X3	Rear Surface of Vehicle to Firewall	3660	3545
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3366	3348
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3365	3215
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3305	3275
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3307	3227
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2295	2280
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2294	2263
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2268	2242
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2269	2202
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3335	3303
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3335	3305
X14	Rear Surface of Vehicle to Firewall - Right Side	3640	3580
X15	Rear Surface of Vehicle to Firewall - Left Side	3630	3365
X16	Rear Surface of Vehicle to Steering Wheel Center	2850	2750
X17	Steering Column to "A" Post	400	335

Table 3

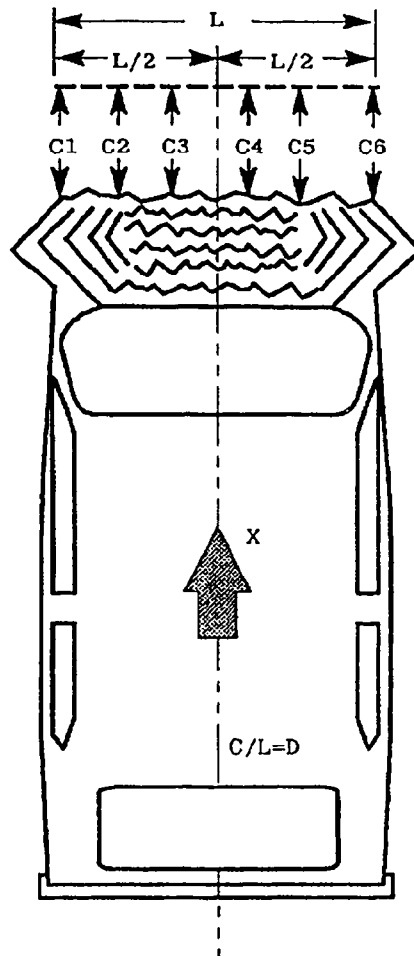
VEHICLE 1 MEASUREMENTS (continued)

No.	TYPE OF MEASUREMENT	All Dimensions in millimeters	
		Pre-Test	Post-Test
Z18	Rear of Windshield Header to Steering Wheel Column	420	490
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4825	4880
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4825	4200
X21	Width of Engine Block	410	410
Z22	Right Front Sill to Ground Plane	231	210
Z23	Left Front Sill to Ground Plane	228	110
Z24	Right Rear Sill to Ground Plane	222	220
Z25	Left Rear Sill to Ground Plane	218	100
X26	Firewall to Engine or Transaxle	214	220
Z27	Vertical Dim. from Door Sill to Centerline of Steering Column	530	670
X28	Wheelbase of Vehicle	2695	2480
Y29	Width of Vehicle at Maximum Width Point	1810	1815
X30	Rear Surface of Vehicle to Engine Target	4068	3944
X31	Rear Surface of Vehicle to Compartment Target	3289	L=3272 R=3291
X32	Rear Surface of Vehicle to Bumper Target	4800	4469
X33	Rear Surface of Vehicle to Frame Crossmember	4306	4190

Table 3

VEHICLE 1 MEASUREMENT (continued)

(all dimensions in millimeters)



Location	Pre-Test	Post-Test	Change
C1	4755	4055	700
C2	4835	4240	595
C3	4872	4350	522
C4	4872	4670	202
C5	4840	4835	5
C6	4760	4985	-225

Table 4

VEHICLE 1 FRONTAL PROFILE DATA* (in mm.)

Location		PRE-TEST PROFILE						POST-TEST PROFILE						CHANGE					
		Vehicle Left			Vehicle Right			Vehicle Left			Vehicle Right			Vehicle Left			Vehicle Right		
	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	330	412	441	440	405	300	-30	-120	70	390	600	750	-360	-532	-371	-50	195	450
	Y	-650	-425	-200	200	430	660	-390	-190	-15	205	350	620	260	235	185	5	-80	-40
	Z	273	274	271	273	275	275	420	470	415	340	310	300	147	196	144	67	35	25
Top of Front Bumper	X	460	535	465	570	530	460	-20	-20	80	400	570	600	-480	-555	-385	-170	40	140
	Y	-700	-445	-205	195	430	685	-390	-190	-15	205	350	620	310	255	190	10	-80	-65
	Z	550	550	545	545	550	550	660	600	550	470	430	400	110	50	5	-75	-120	-150
Center of Grill	X	330	435	465	465	430	335	-270	-100	50	300	440	460	-600	-535	-415	-165	10	125
	Y	-715	-440	-195	200	435	720	-390	-190	-70	185	600	630	325	250	125	-15	165	-90
	Z	665	665	660	650	660	665	840	775	735	675	650	650	175	110	75	25	-10	-15
Front of Hood	X	290	390	420	421	395	295	-240	-130	30	280	390	380	-530	-520	-390	-141	-5	85
	Y	-700	-435	-195	195	425	695	-390	-190	-10	275	600	630	310	245	185	80	175	-65
	Z	715	715	715	715	715	715	920	905	860	790	740	725	205	190	145	75	25	10

* - 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	3045	-470	785	2940	-465	770	-105	5	-15
Driver IP above right knee	3045	-210	785	2930	-150	760	-115	60	-25
Pass. IP above left knee	3055	230	790	3025	260	784	-30	30	-6
Pass. IP above right knee	3055	460	790	3030	475	770	-25	15	-20
Intrusion of brake pedal	3370	-330	455	3320	-290	345	-50	40	-110
Intrusion of left foot rest	3370	-555	305	3315	-528	235	-55	27	-70
Driver 'A' pillar hinge to rear door striker	980	-	-	840	-	-	-140	-	-

* - 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: July 18, 1995

Vehicle Mfgr./Make/Model: 1995 Ford Taurus 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 (113 kph) 30°, 50% 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.

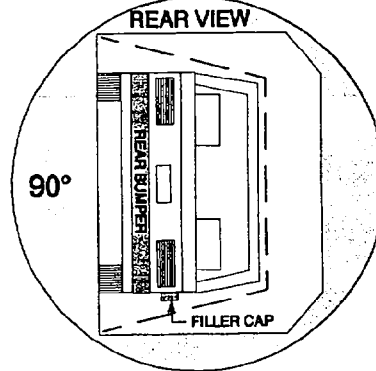
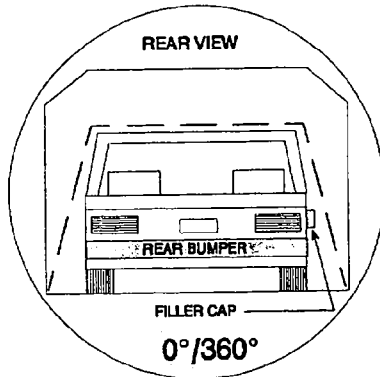
SOLVENT SPILLAGE DETAILS:

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)	1	minutes	58	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	58	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.

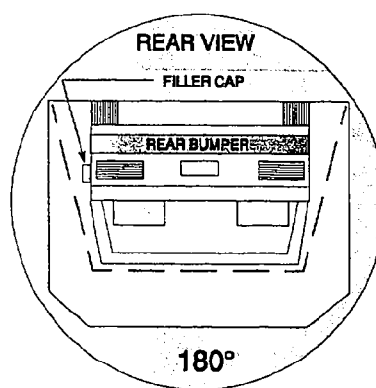
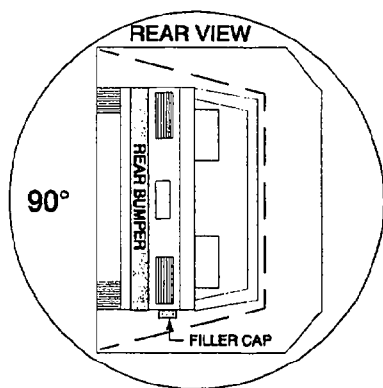
IV. SOLVENT SPILLAGE LOCATION(S):

None

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

TEST PHASE:
90-180 Deg.

Vehicle NHTSA ID No.:
--



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>2</u>	minutes	<u>12</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>00</u>	seconds
	<u>7</u>	minutes	<u>12</u>	seconds
TOTAL				
	<u>8</u>	minutes		
Next whole minute interval				

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.

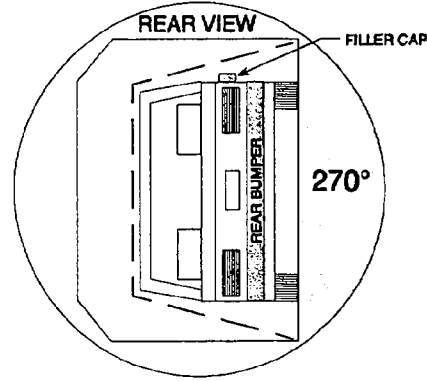
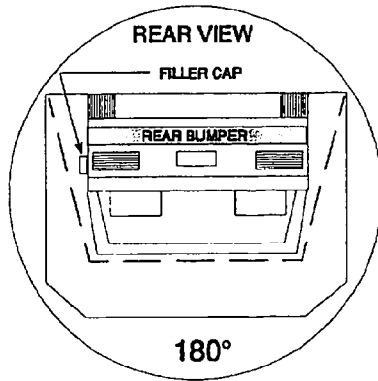
IV. SOLVENT SPILLAGE LOCATION(S):

None

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

TEST PHASE:
180-270 Deg.

Vehicle NHTSA ID No.:



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>2</u>	minutes	<u>03</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>00</u>	seconds
TOTAL	<u>7</u>	minutes	<u>03</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.

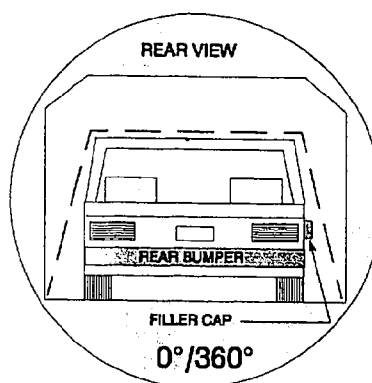
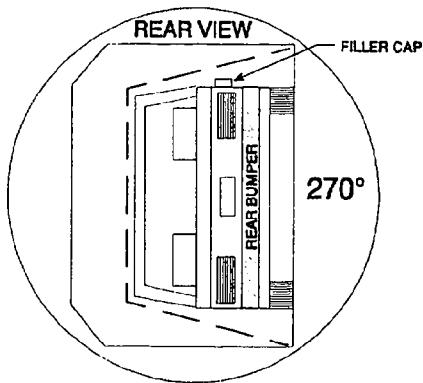
IV. SOLVENT SPILLAGE LOCATION(S):

None

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

TEST PHASE:
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>58</u>	seconds
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>00</u>	seconds
TOTAL	<u>6</u>	minutes	<u>58</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:

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>456.5</u>	kgs.	Right Rear	=	<u>345.0</u>	kgs.
Left Front	=	<u>519.0</u>	kgs.	Left Rear	=	<u>278.5</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>975.5</u>	kgs.	(<u>61.0</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>623.5</u>	kgs.	(<u>39.0</u> % of Total Vehicle Weight)			
TOTAL TEST WEIGHT	=	<u>1599.0</u>	kgs.				

MAXIMUM STATIC CRUSH OR HONEYCOMB IMPACT FACE:

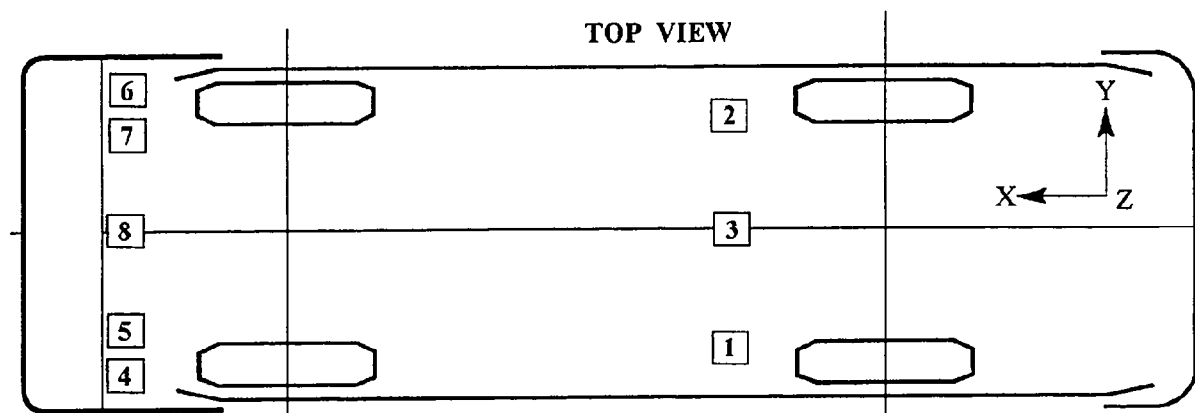
1. Row A at Bumper Level	=	<u>406</u>	millimeters
2. Row B at Mid-Stack Level	=	<u>337</u>	millimeters
3. Row C at Top of Stack Level	=	<u>287</u>	millimeters

INSTRUMENTATION:

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

Figure 7

SUMMARY OF VEHICLE 2 ACCELEROMETER DATA



Vehicle: Moving Deformable Barrier

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	MDB Left Rail X	Gs	2.3	210.4	-40.2	37.3	60.0
1	MDB Left Rail Y	Gs	16.3	49.7	-21.6	55.1	60.0
2	MDB Right Rail X	Gs	1.6	189.4	-37.7	38.8	60.0
2	MDB Right Rail Y	Gs	14.6	49.3	-23.9	55.1	60.0
3	MDB C.G. X	Gs	1.1	389.3	-38.5	42.7	60.0
3	MDB C.G. Y	Gs	6.5	47.8	-16.4	60.0	60.0
3	MDB C.G. Z	Gs	7.7	56.2	-14.8	67.0	60.0
4	MDB Load Cell TL	Nwt	208619.9	41.4	-10030.1	83.2	60.0
5	MDB Load Cell BL	Nwt	167332.8	43.6	-1512.7	423.4	60.0
6	MDB Load Cell TR	Nwt	55170.5	51.7	-21042.0	7.6	60.0
7	MDB Load Cell BR	Nwt	25082.5	102.2	-24690.2	34.8	60.0
8	MDB Load Cell CL	Nwt	159899.7	37.2	-1462.4	390.6	60.0

Table 8

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

Test Date: July 18, 1995 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	191	191	191	191	191	191	191	191	191	191	191	191	191	191	191	191																		
	Post	160	165	211	241	292	323	338	376	478	432	389	351	391	381	401	460																		
	Crush	31	26	-20	-50	-101	-132	-147	-185	-287	-241	-198	-160	-200	-190	-210	-269																		
Mid-Stack Level	Pre	191	191	191	191	191	191	191	191	191	191	191	191	191	191	191	191																		
	Post	178	198	216	241	262	312	356	381	452	483	516	516	503	503	503	528																		
	Crush	13	-7	-25	-50	-71	-121	-147	-165	-190	-261	-292	-325	-312	-312	-312	-337																		
Bumper Level	Pre	N/A	89	89	89	89	89	89	89	89	89	89	89	89	89	89	N/A																		
	Post	N/A	185	226	267	312	330	292	338	427	495	490	460	445	427	419	N/A																		
	Crush	N/A	-96	-137	-178	-223	-241	-203	-249	-338	-406	-401	-371	-356	-338	-330	N/A																		

Figure 8

CAMERA POSITIONS FOR VEHICLE TO VEHICLE ANGLED FRONTAL IMPACT

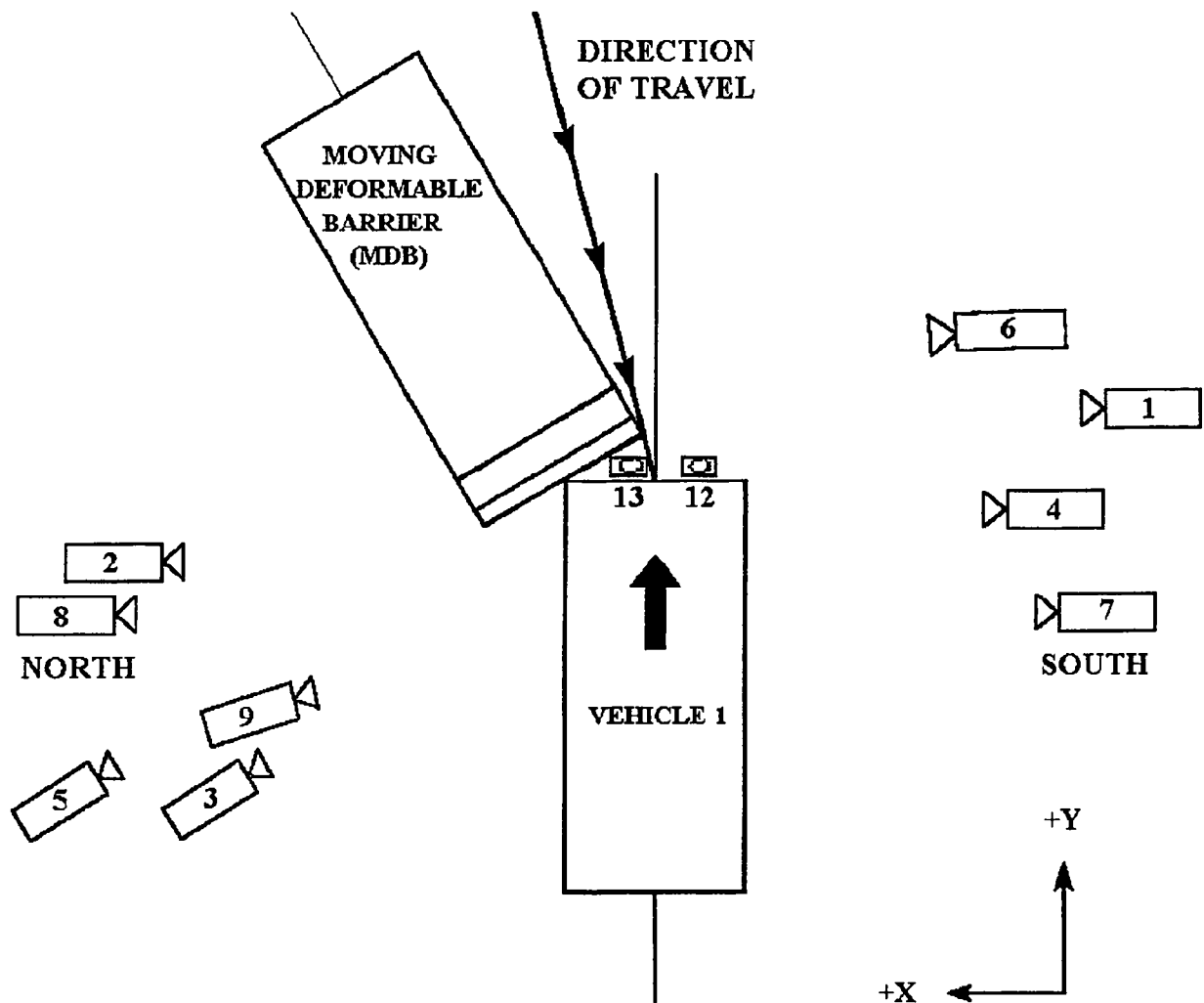


Table 9
HIGH-SPEED CAMERA LOCATIONS

Test No. Y57-1-1542

Vehicle: 1995 Ford Taurus GL 4-door sedan,

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	9880	-965	1040	-2	13	765	1333	C21880
3	North Impact Point	7265	-3937	1040	0	25	775	1692	C14951
4	South Impact Point	-7950	-1220	1040	0	25	750	1627	C7477
5	Moving Barrier Right Side View	8560	-3940	1040	-3	25	790	1330	142
6	Moving Barrier Left Side View	-6450	3580	1120	-1	25	850	1328	72
7	Vehicle 1 Passenger Side View	-10010	-3175	1320	-2	35	800	1663	A1264
8	Vehicle 1 Driver Side View	10770	-1420	1245	-3	35	810	1650	A1281
9	Vehicle 1 Driver and Interior View	7265	-2670	1905	-9	35	755	1325	C7914
10	Vehicle 1 Passenger belt/D-ring View	-	-	-	-	7.5	1020	2000	C23844
11	Vehicle 1 Driver belt/D-ring View	-	-	-	-	8	945	2029	204
12	Overhead Overall View	940	0	9805	-90	13	820	1326	C9836
13	Overhead Close-up	940	0	9805	-90	25	855	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	POST-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
A-57	PRE-TEST MOVING DEFORMABLE BARRIER TOP VIEW	A-61
A-58	POST-TEST MOVING DEFORMABLE BARRIER TOP VIEW	A-62

OVERALL TEST SETUP

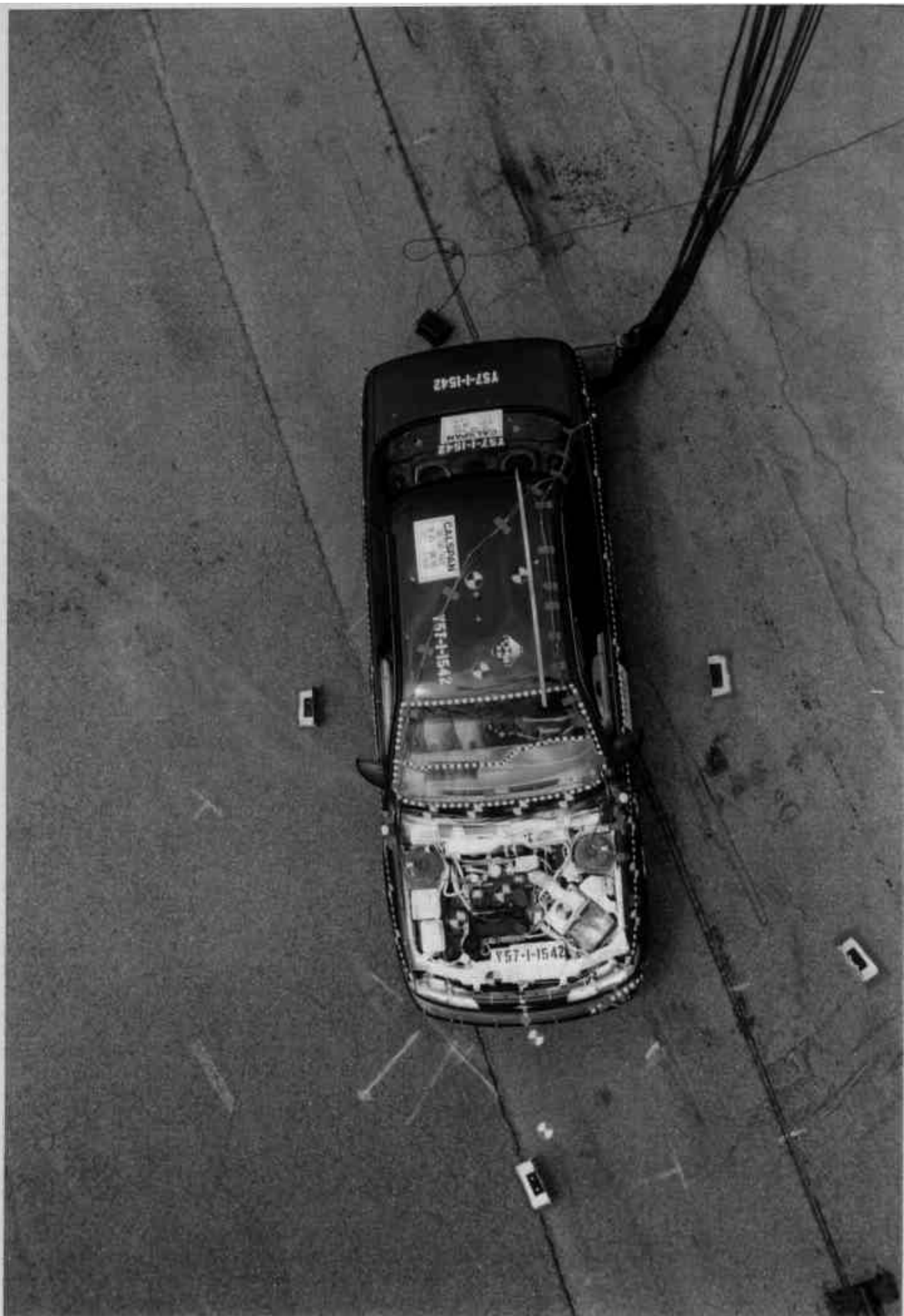


Figure A-1 PRE-TEST OVERHEAD VIEW

PHOTOGRAPH NOT AVAILABLE

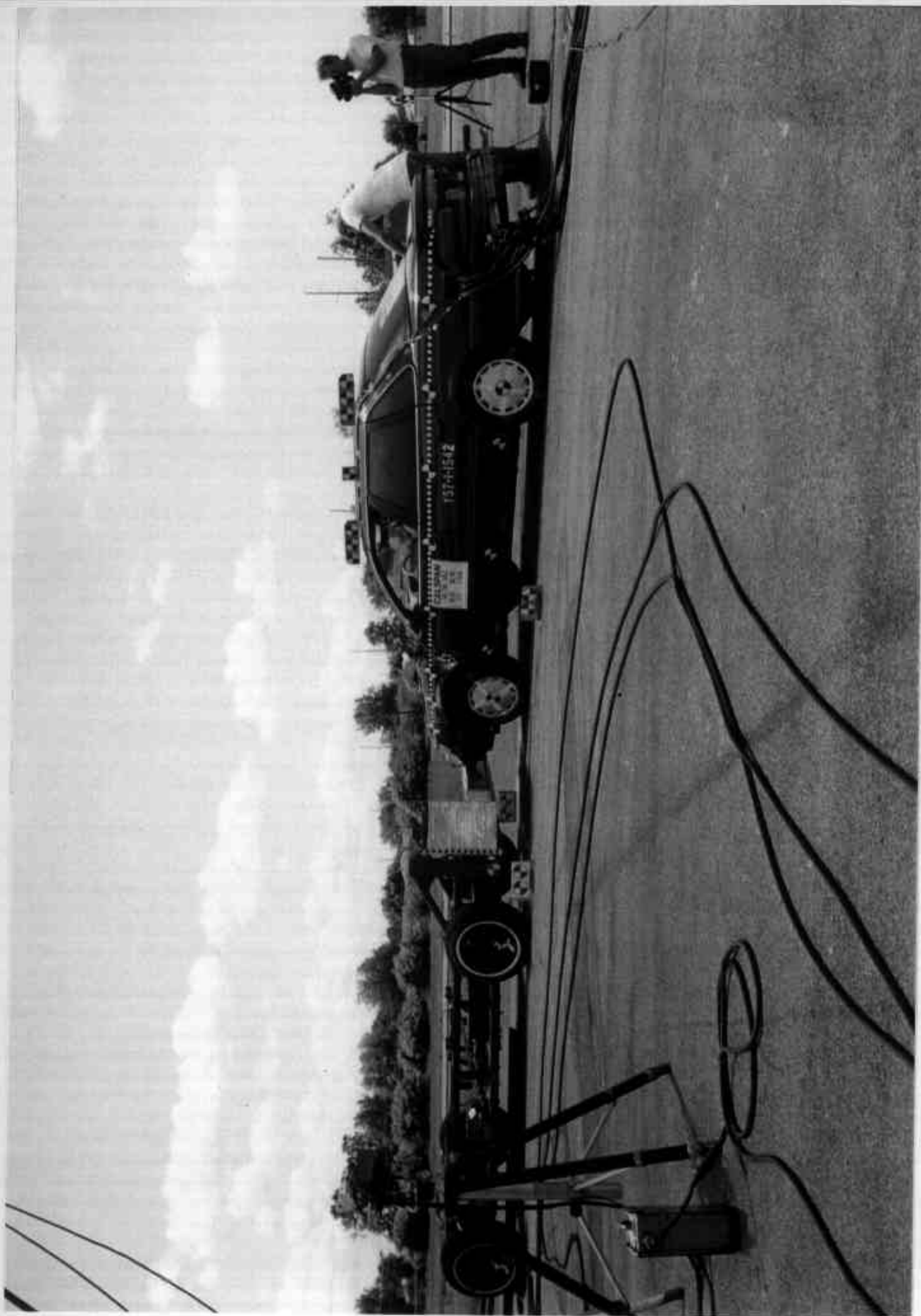


Figure A-3 PRE-TEST OVERALL SIDE VIEW

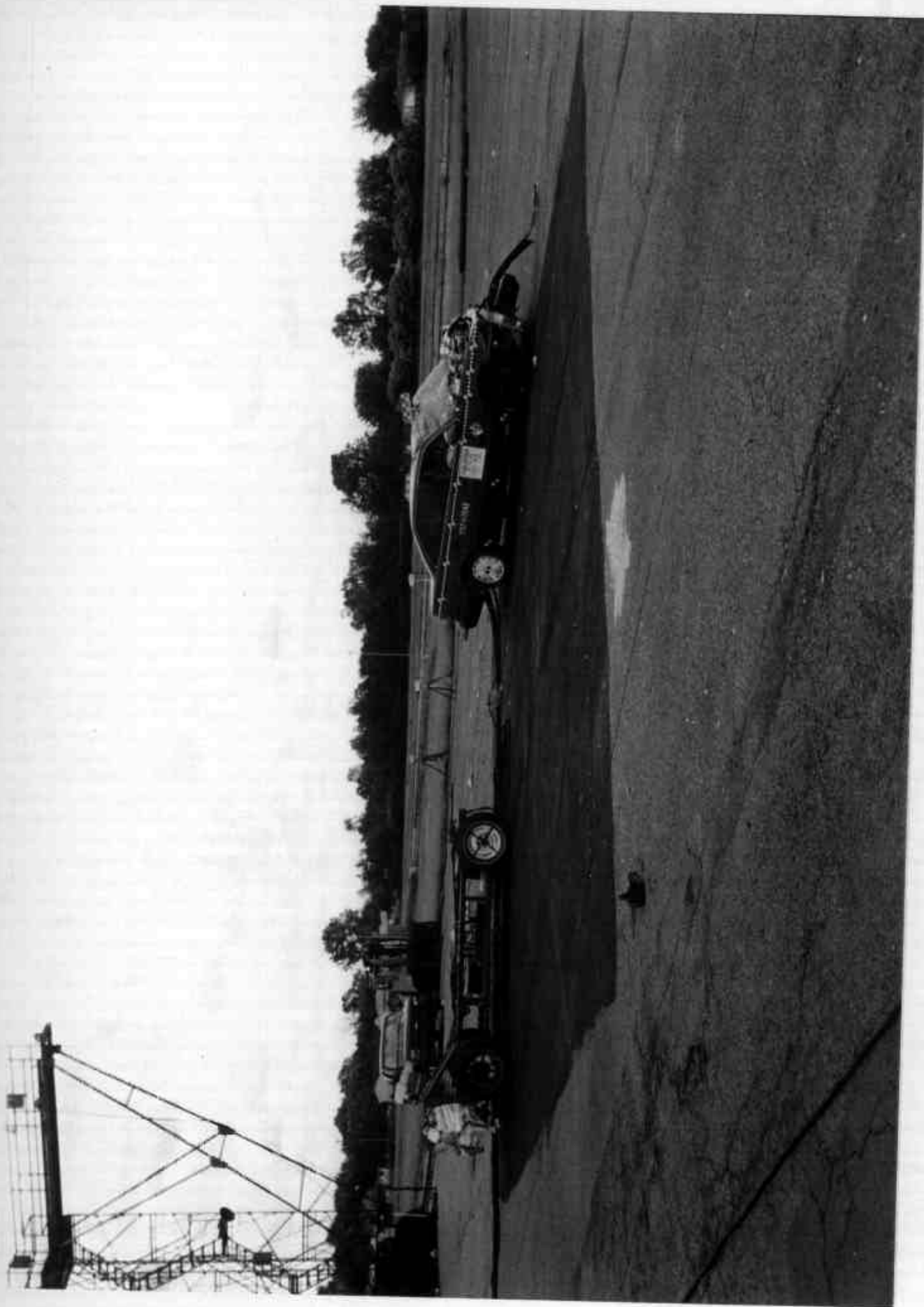


Figure A-4 POST-TEST OVERALL SIDE VIEW



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

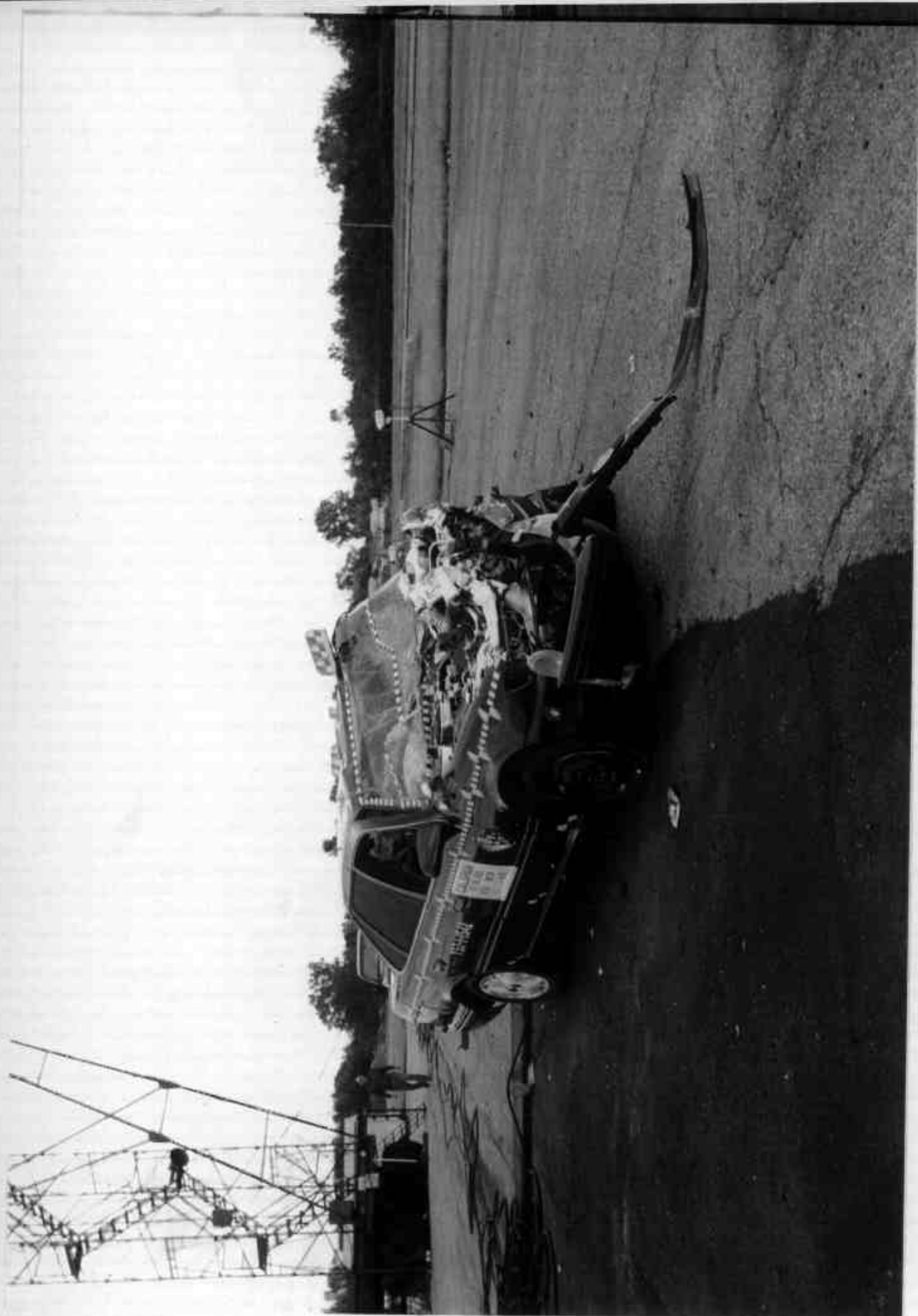


Figure A-9 POST-TEST FRONT RIGHT THREE-QUARTER VIEW

Figure A-10 PRE-TEST RIGHT SIDE VIEW

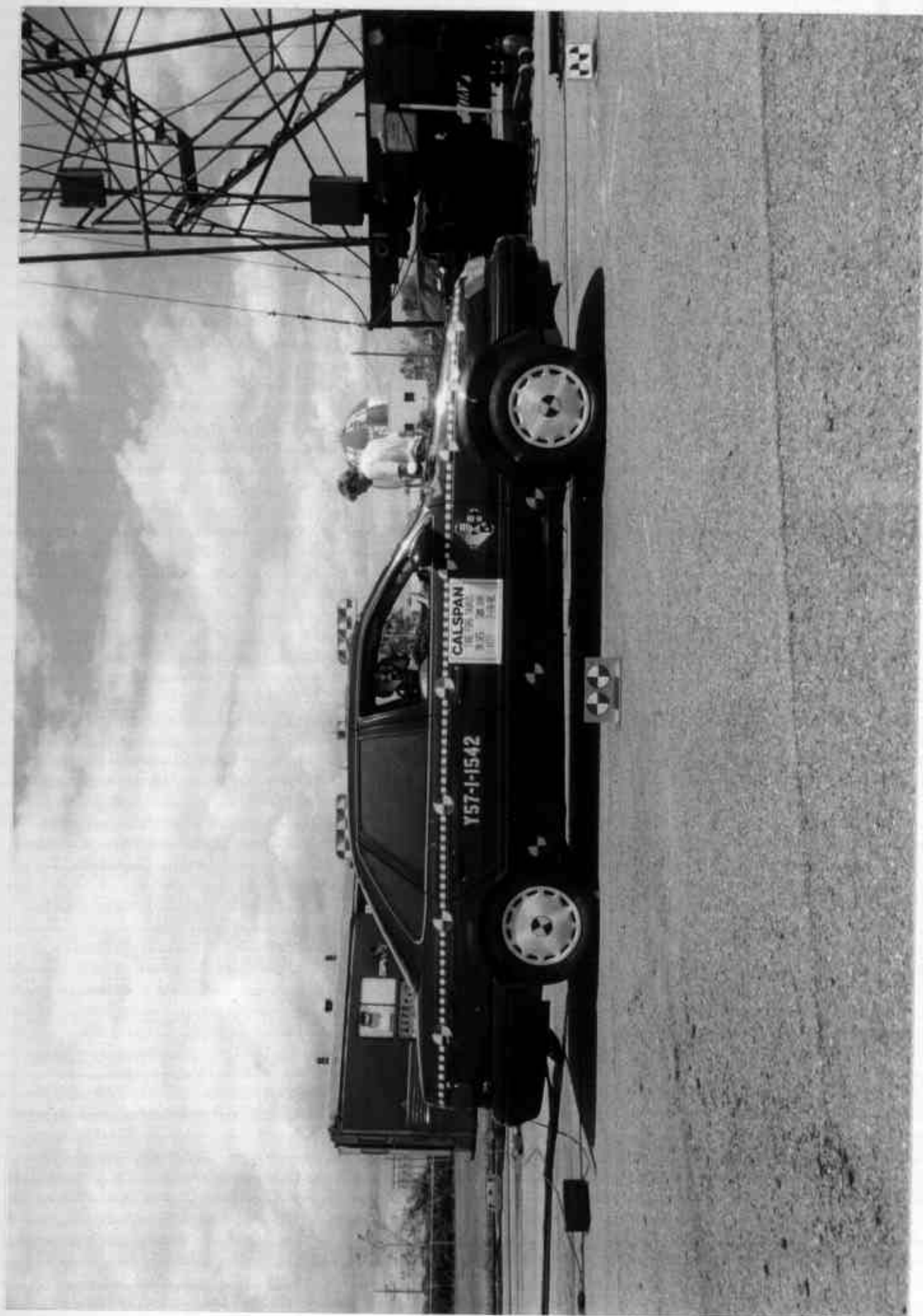




Figure A-11 POST-TEST RIGHT SIDE VIEW



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

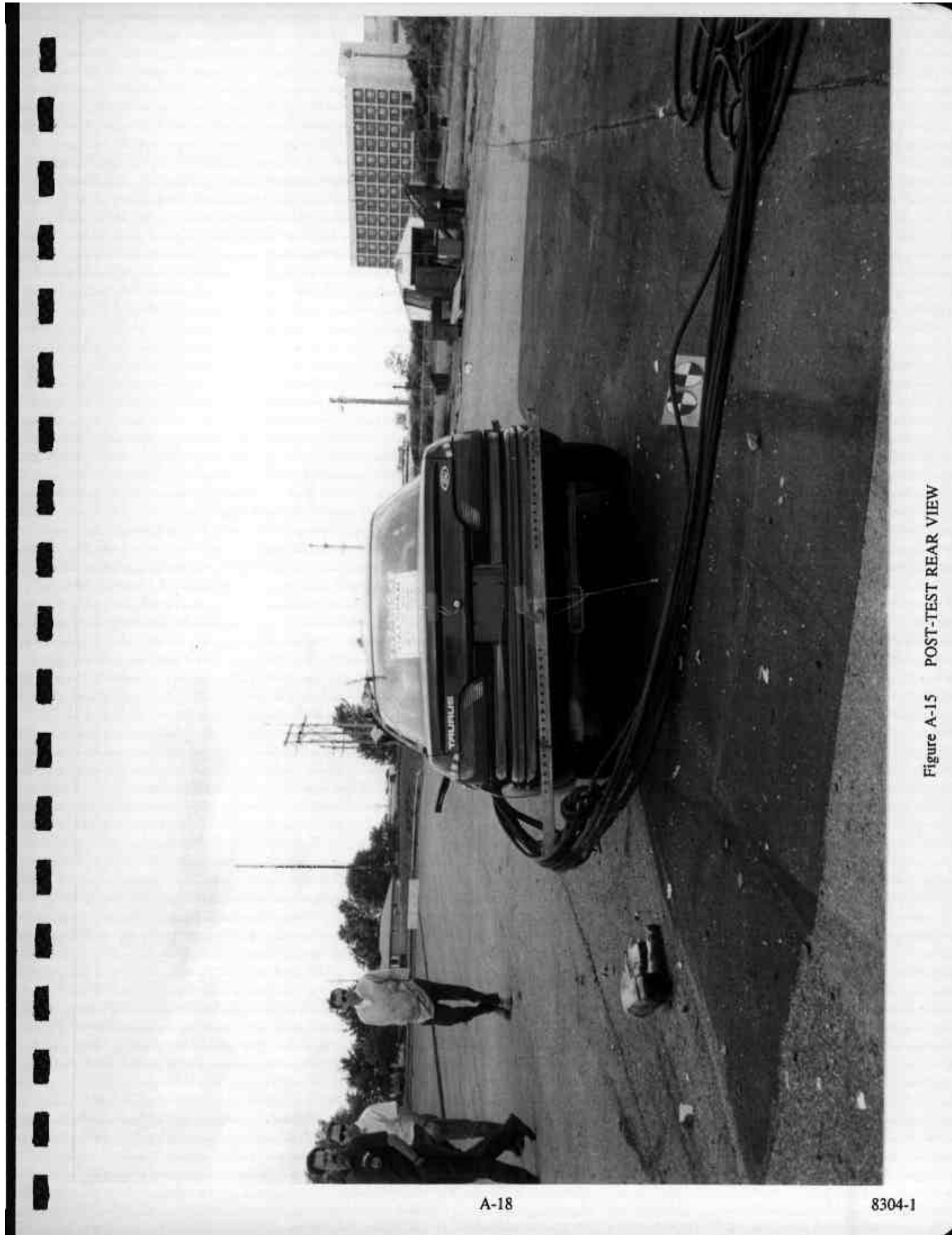


Figure A-15 POST-TEST REAR VIEW



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

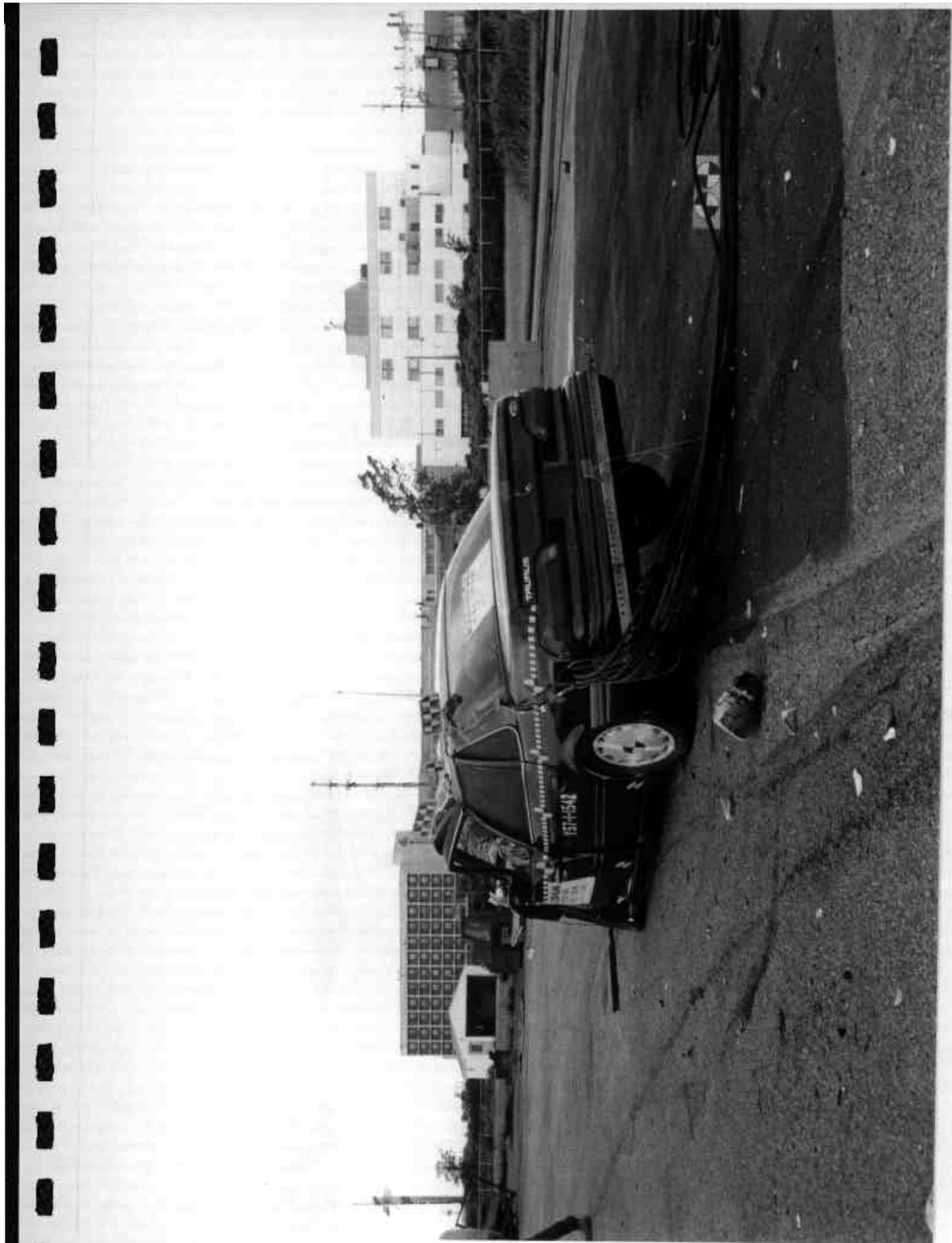


Figure A-17 POST-TEST REAR LEFT THREE-QUARTER VIEW



Figure A-18 PRE-TEST LEFT SIDE VIEW



Figure A-19 POST-TEST LEFT SIDE VIEW

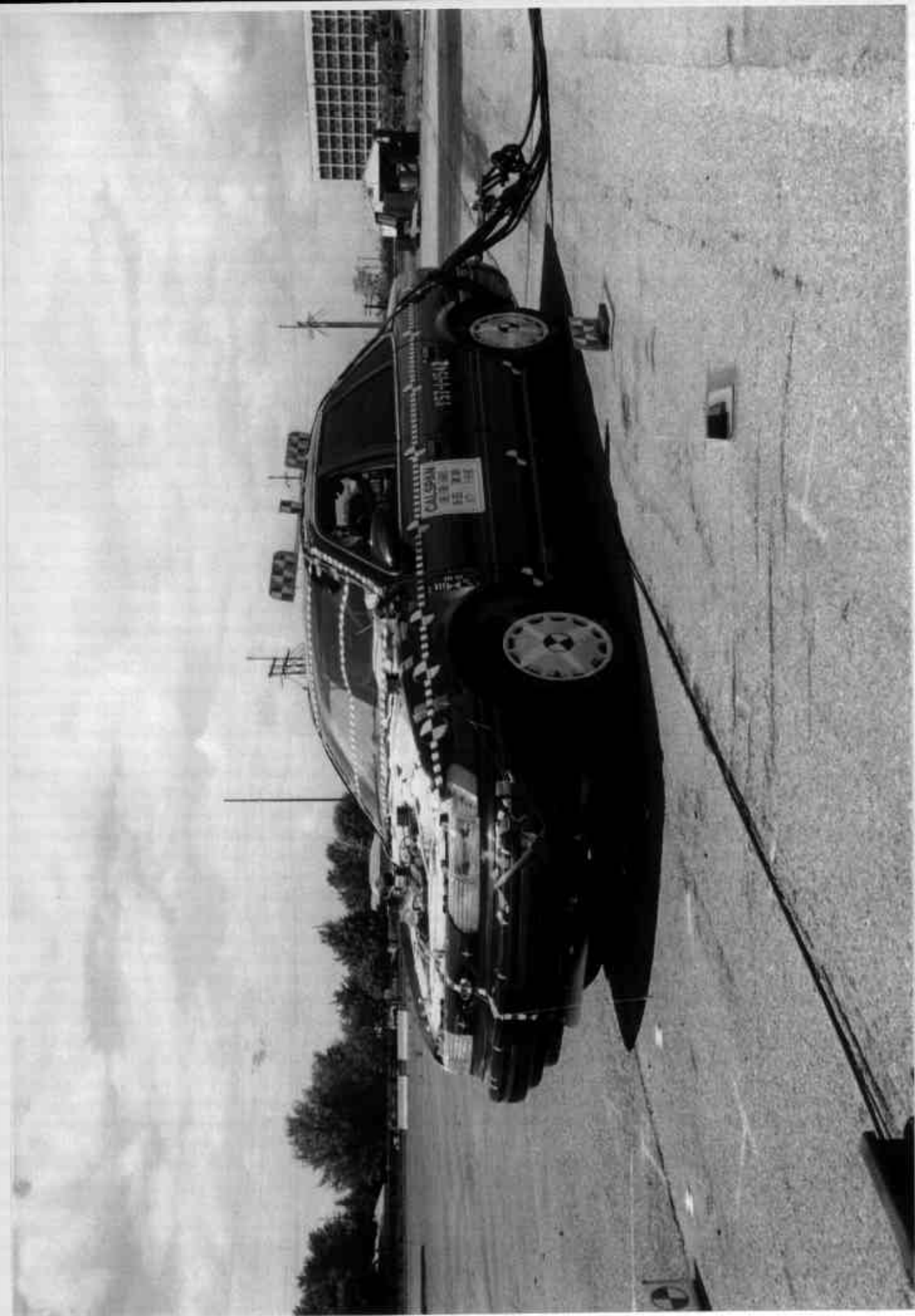


Figure A-20 PRE-TEST FRONT LEFT THREE-QUARTER VIEW



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

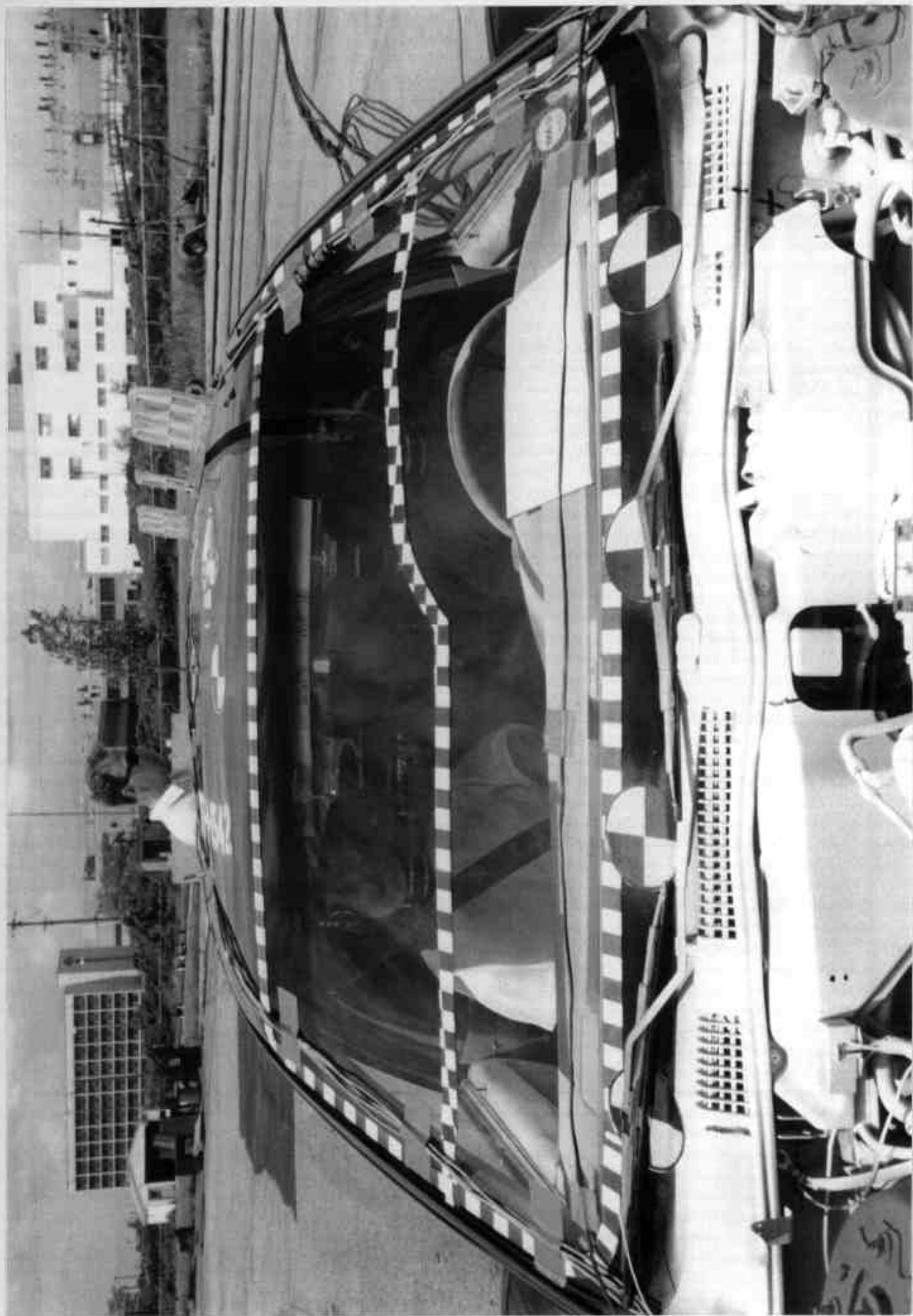


Figure A-22 PRE-TEST WINDSHIELD VIEW

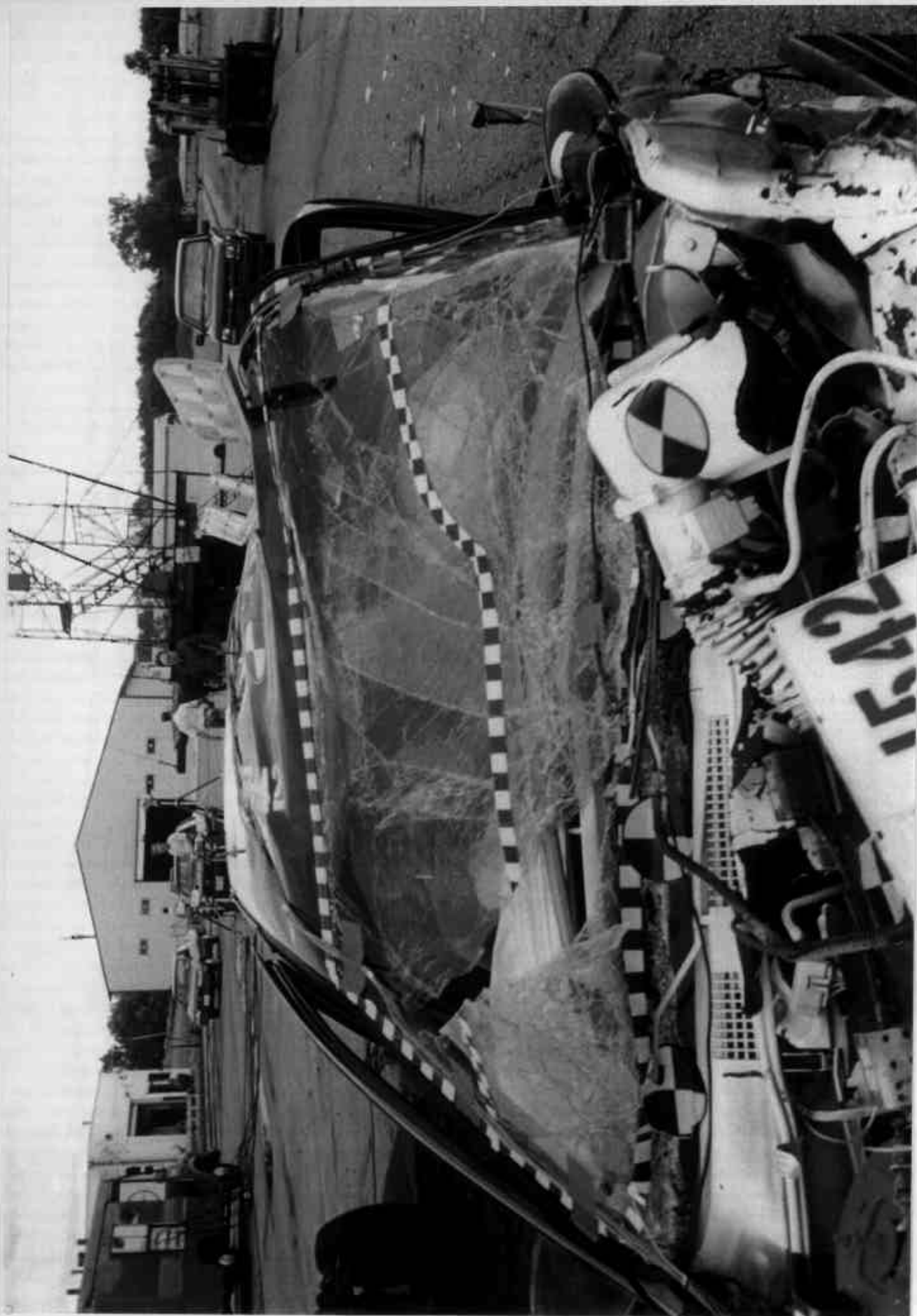


Figure A-23 POST-TEST WINDSHIELD VIEW

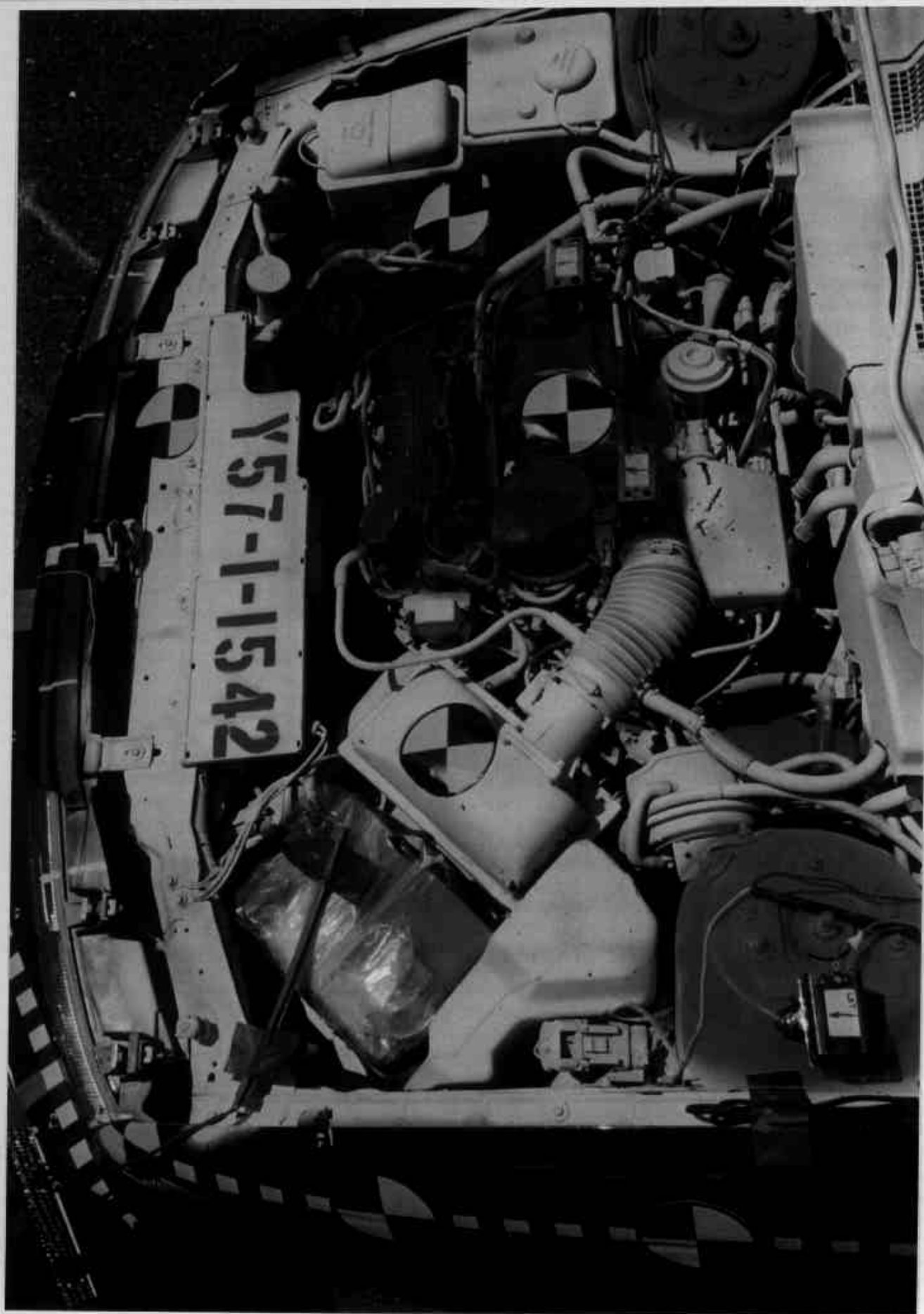


Figure A-24 PRE-TEST OVERHEAD ENGINE COMPARTMENT VIEW
A-27



Figure A-25 POST-TEST OVERHEAD ENGINE COMPARTMENT VIEW

A-28

8304-1

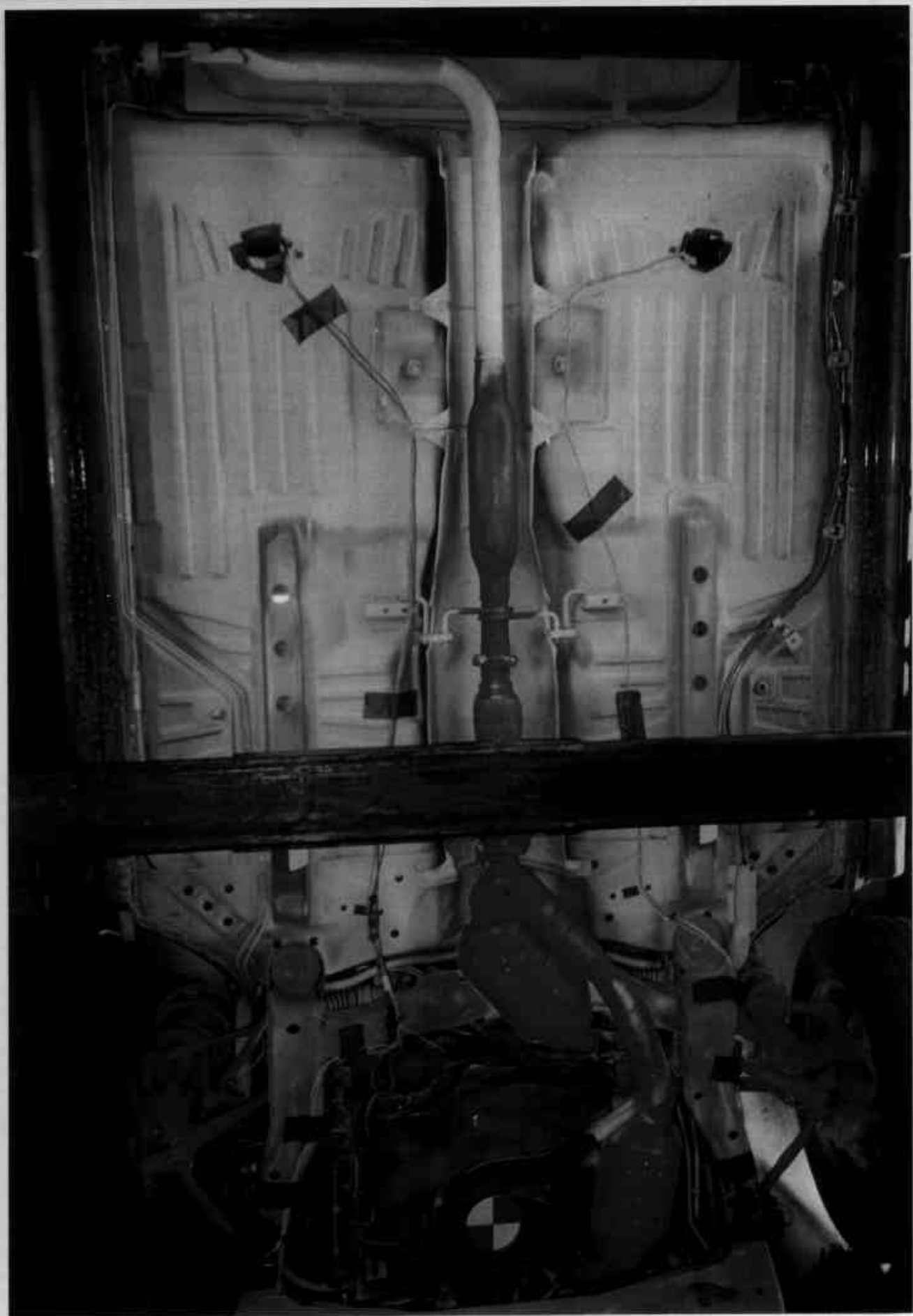


Figure A-26 PRE-TEST UNDERBODY FRONT VIEW

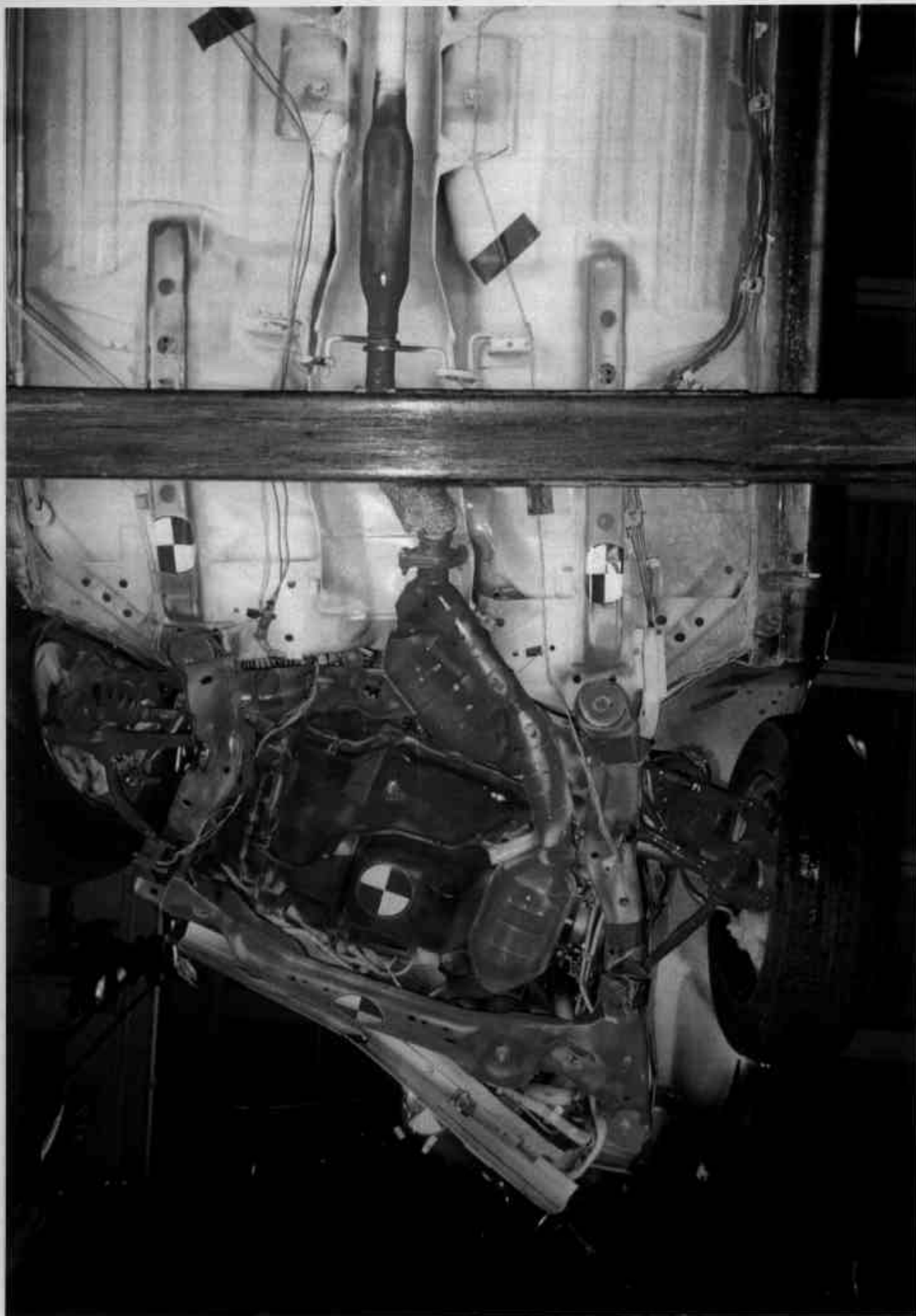


Figure A-27 POST-TEST UNDERBODY FRONT VIEW

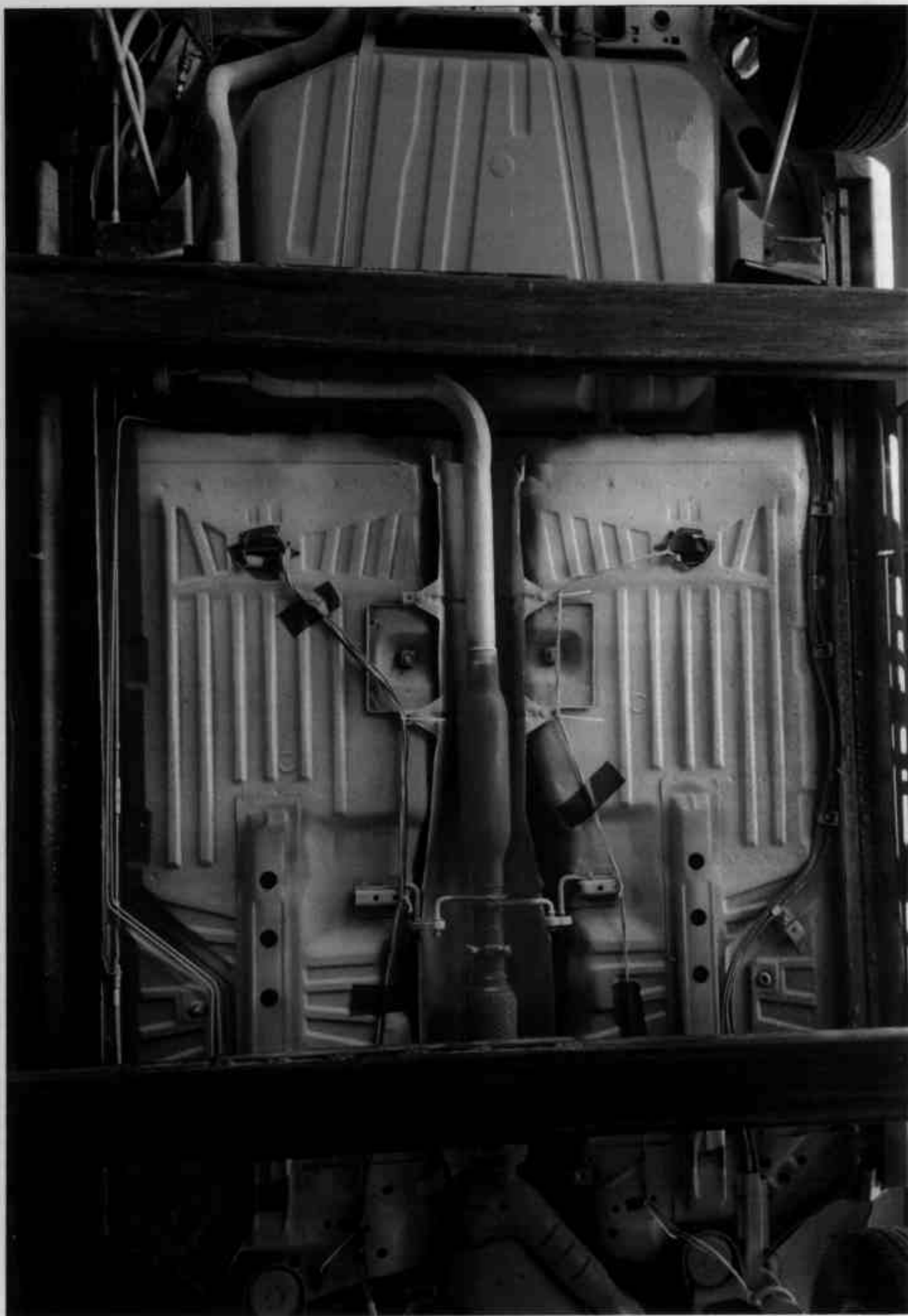


Figure A-28 PRE-TEST UNDERBODY MIDDLE VIEW

Figure A-29 POST-TEST UNDERBODY MIDDLE VIEW



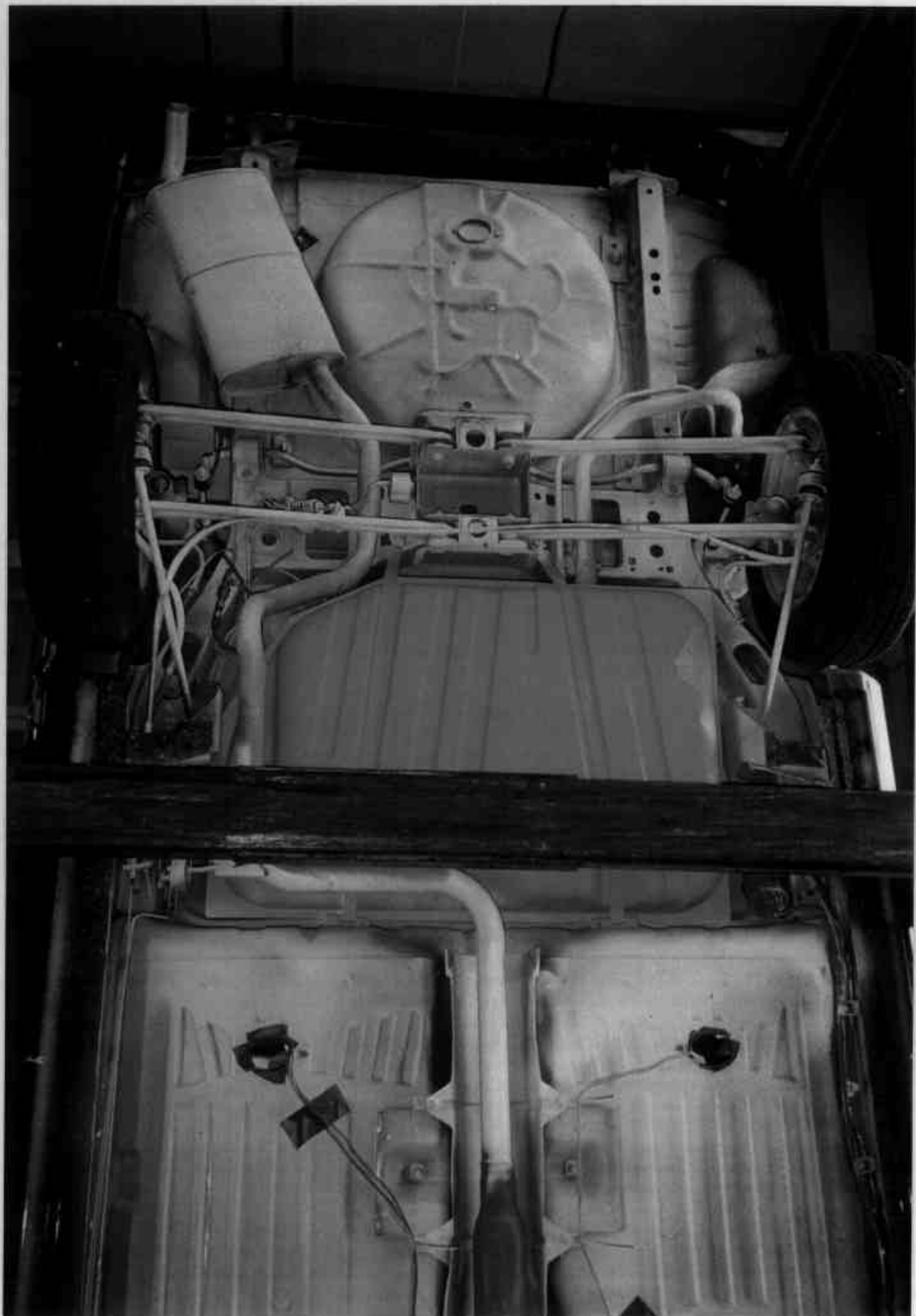


Figure A-30 PRE-TEST UNDERBODY REAR VIEW

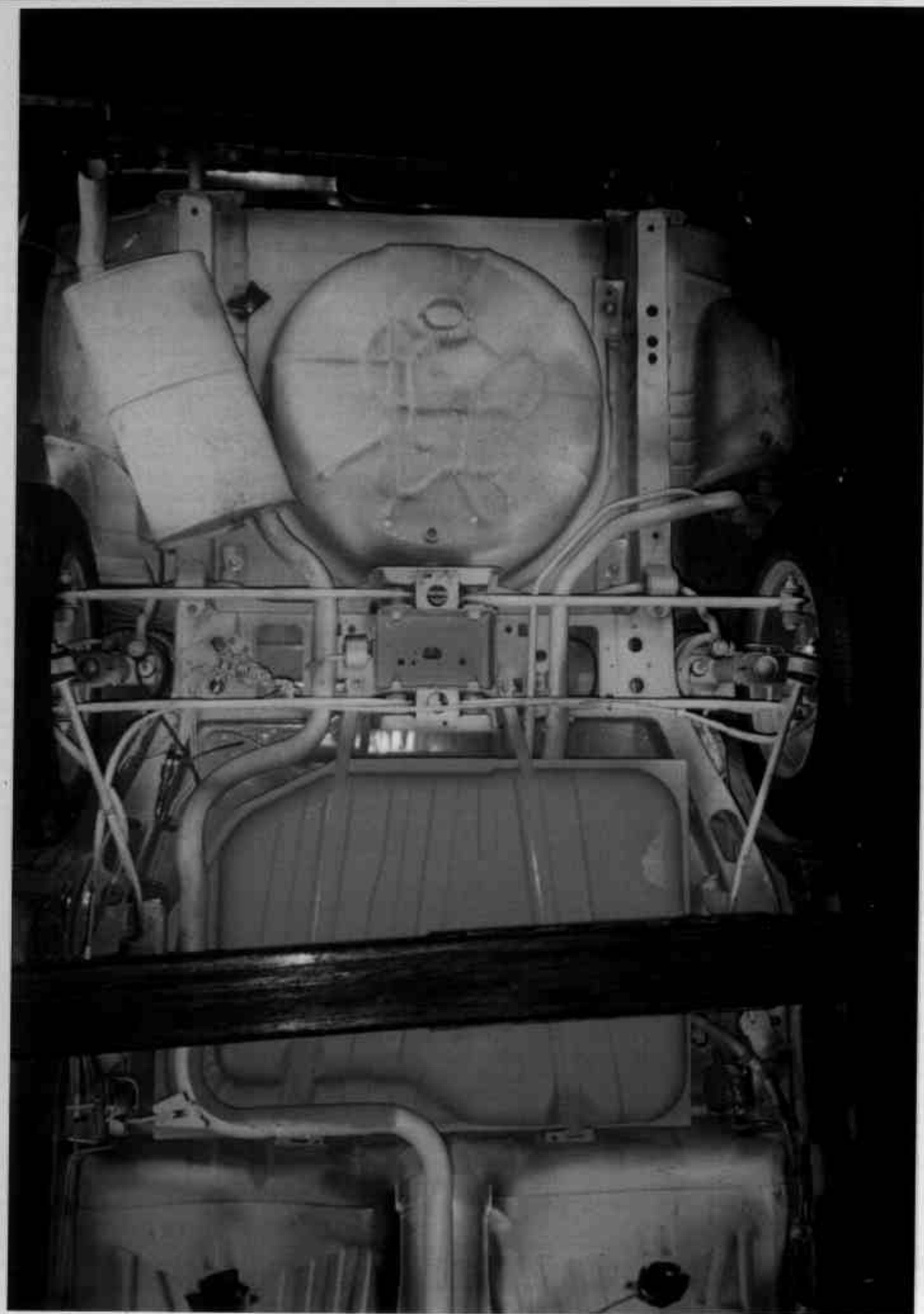


Figure A-31 POST-TEST UNDERBODY REAR VIEW



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

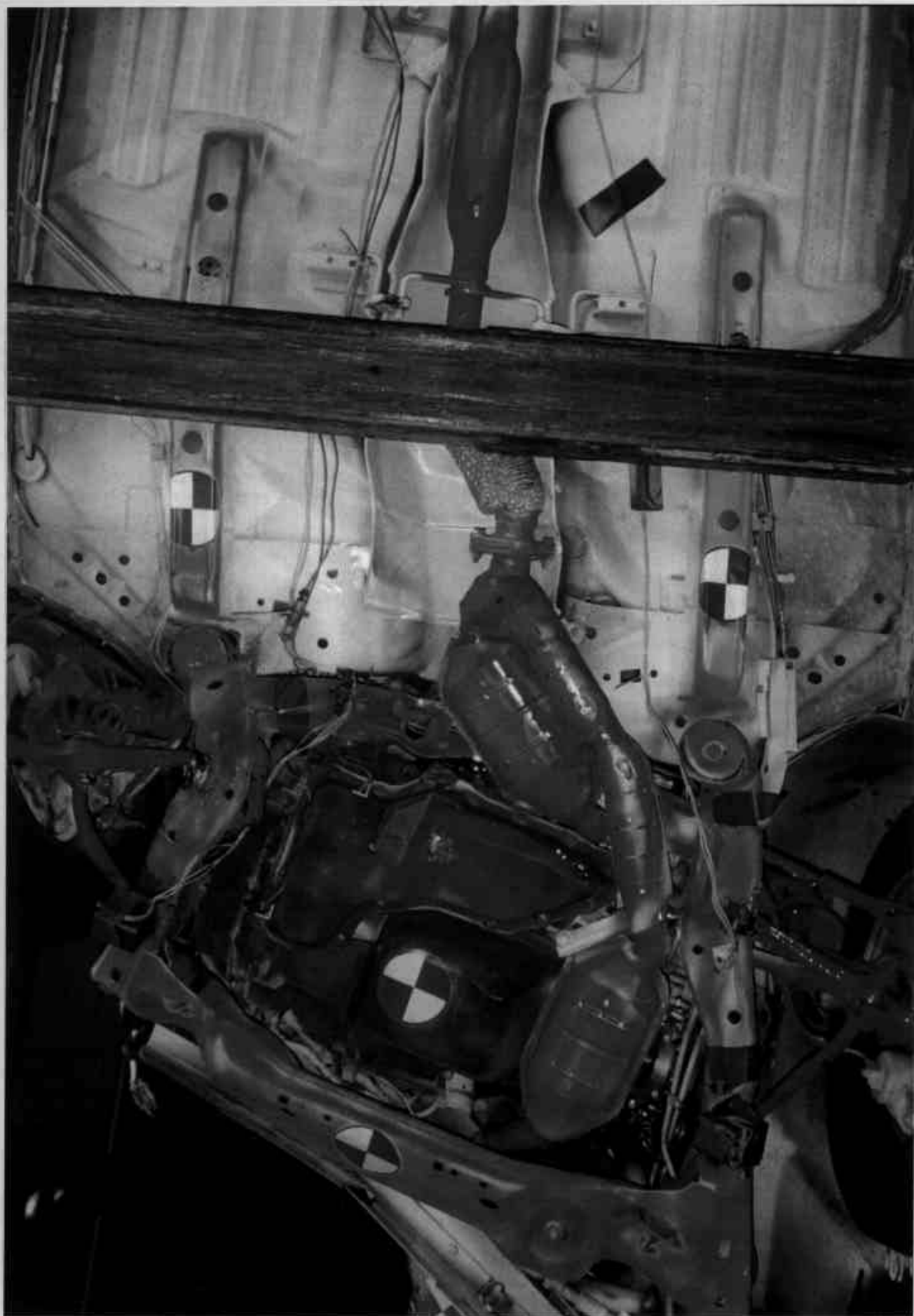


Figure A-33 POST-TEST UNDERBODY CLOSE-UP OF FRONT STRUCTURE



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

8304-1



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

A-40

8304-1



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

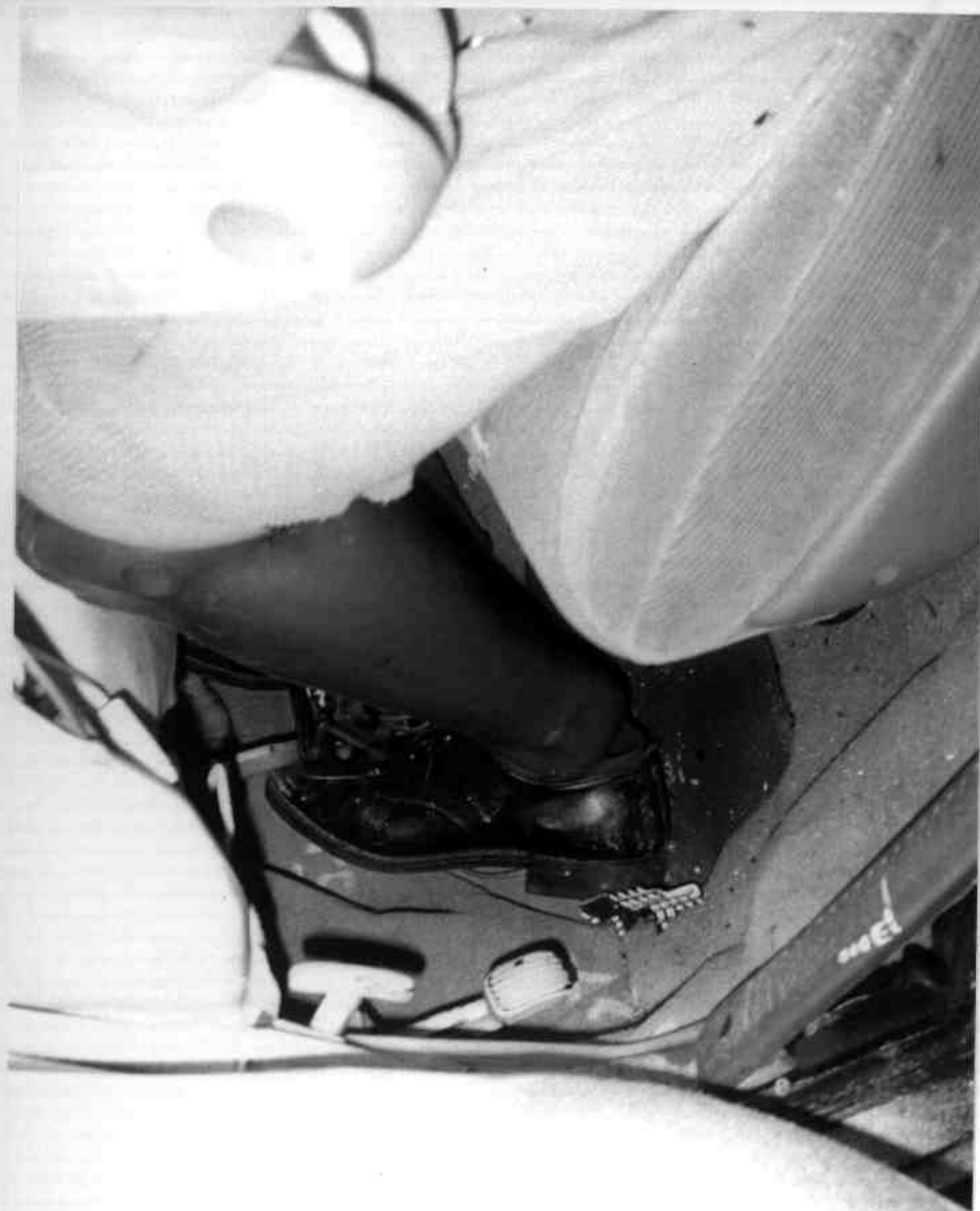




Figure A-40 PRE-TEST PASSENGER CLOSE-UP WITH DOOR CLOSED



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



Figure A-42 PRE-TEST PASSENGER CLOSE-UP WITH DOOR OPEN
A-45

8304-1



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

A-46

8304-1

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

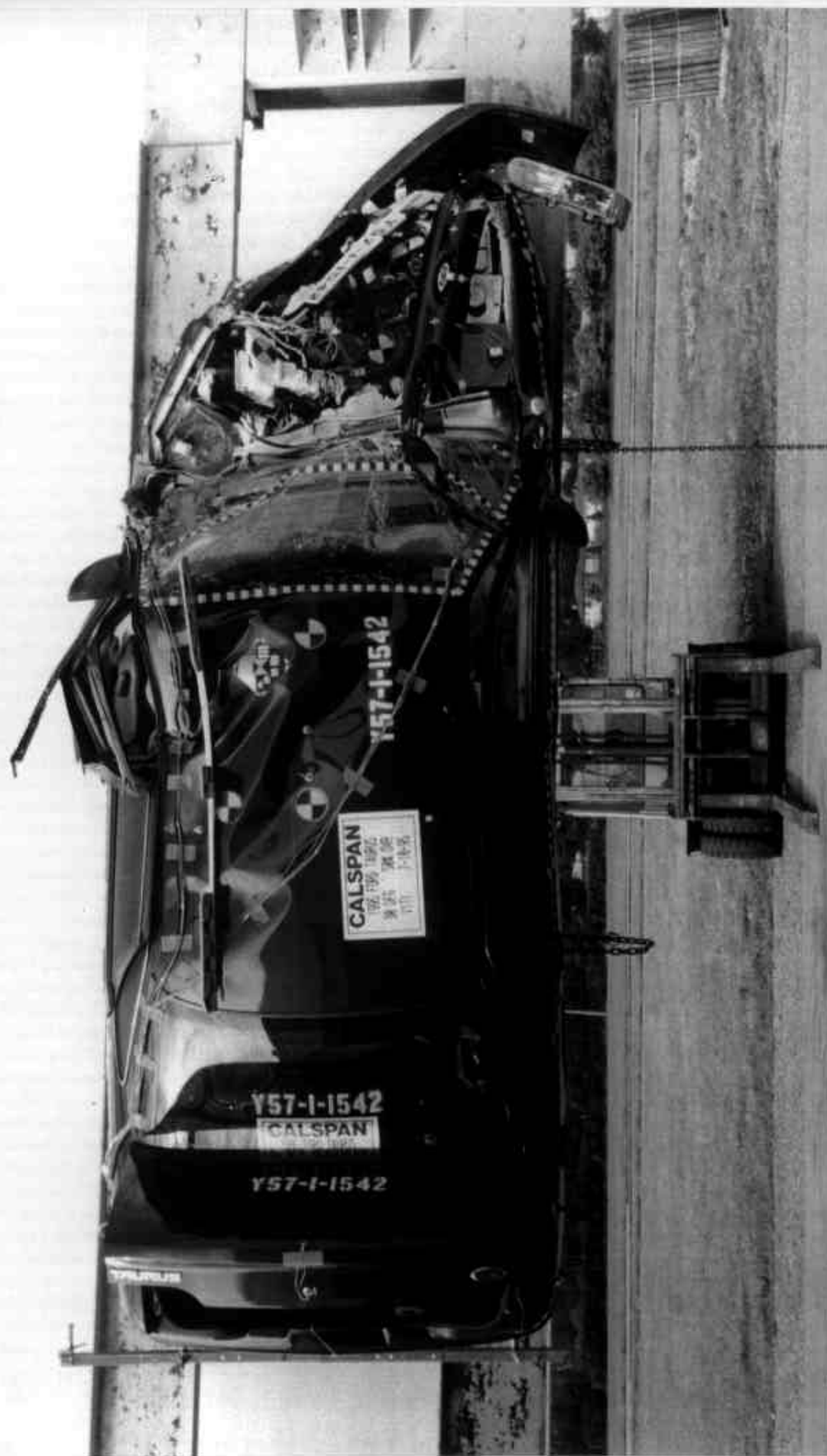


Figure A-50 POST-TEST TOP VIEW

VEHICLE 2 PHOTOGRAPHS

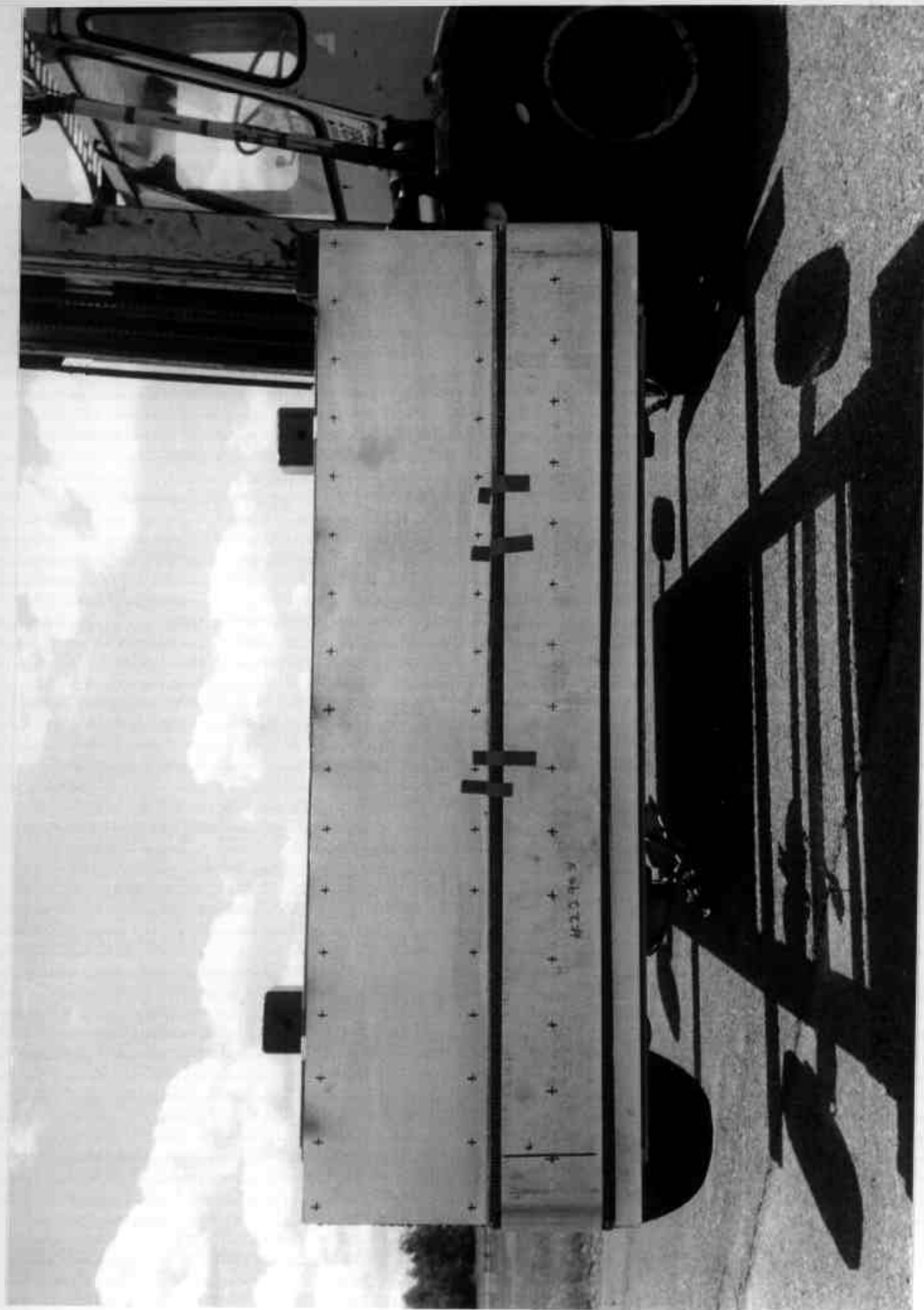


Figure A-51 PRE-TEST MOVING DEFORMABLE BARRIER FRONT VIEW

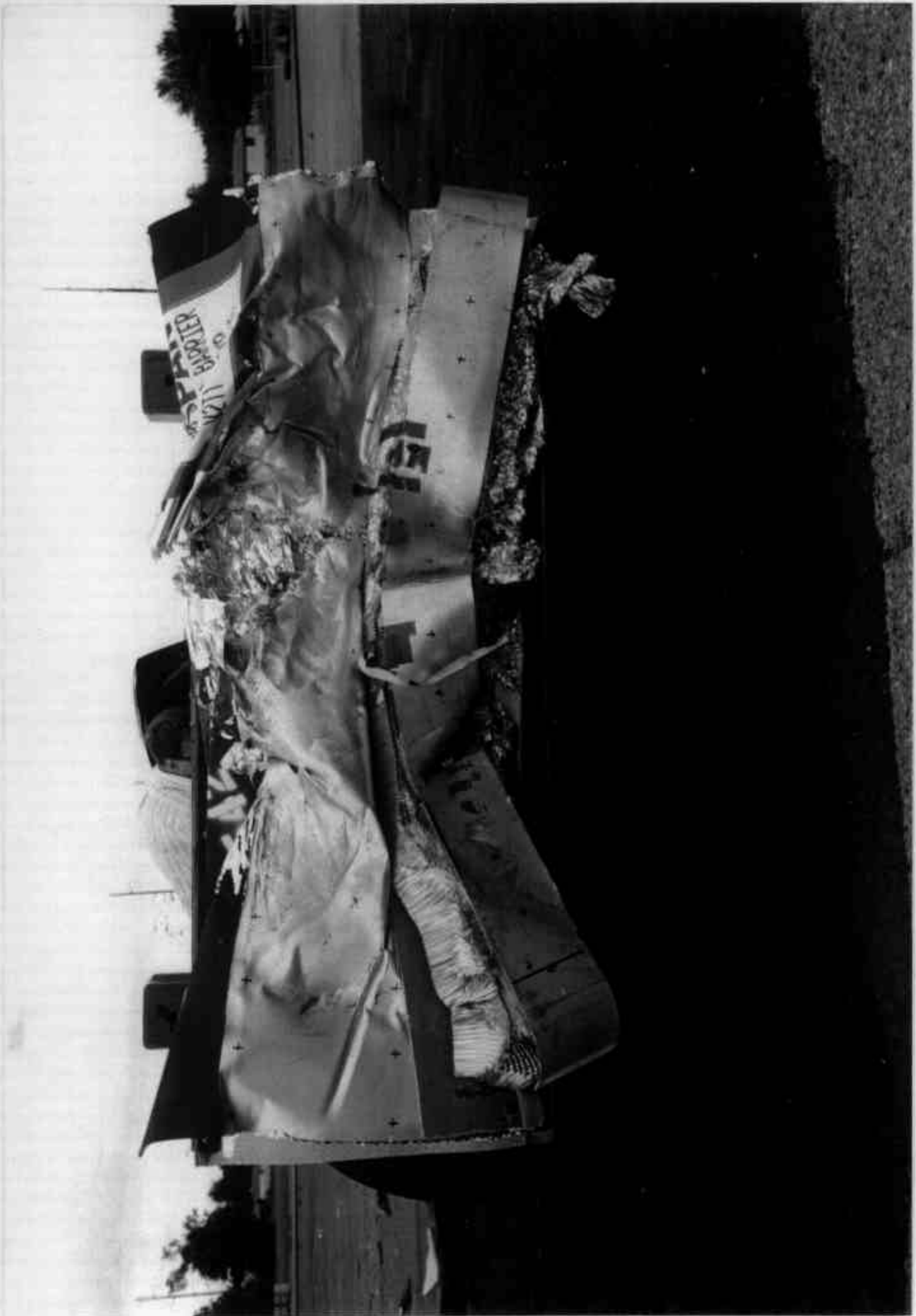


Figure A-52 POST-TEST MOVING DEFORMABLE BARRIER FRONT VIEW

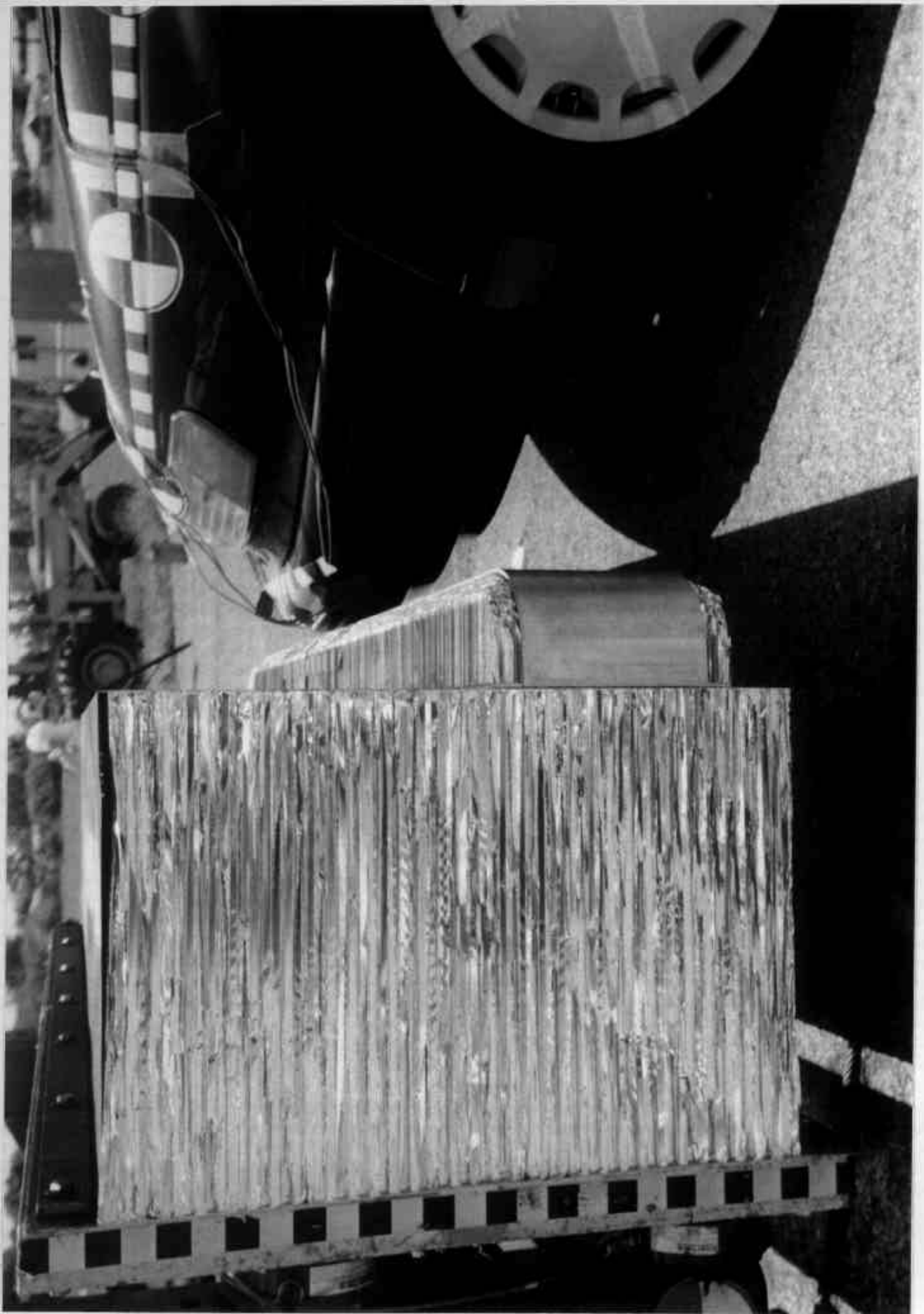


Figure A-53 PRE-TEST MOVING DEFORMABLE BARRIER RIGHT SIDE VIEW



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

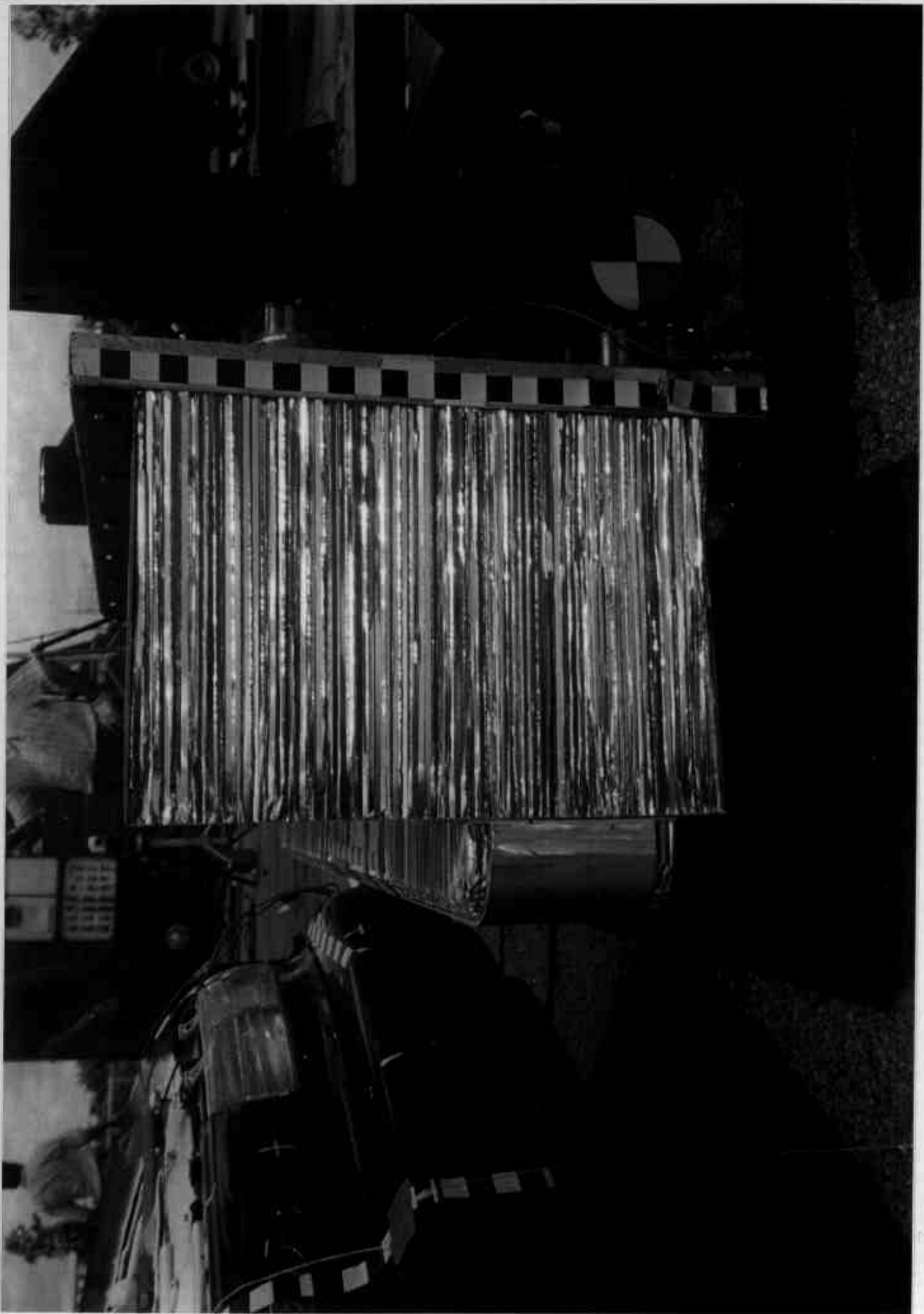


Figure A-55 PRE-TEST MOVING DEFORMABLE BARRIER LEFT SIDE VIEW



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 presenter using the NHTSA coordinate system.

FACILITY: TRACK
RUN #: 1542
SERIES #: 1

TEST DATE: 18 Jul 1995
TEST TIME: 13:28:03
BOARD: a

TITLE: VTV TEST #1

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	msec	MINIMUM AMP	msec	FILTER CLASS
1	P1 Head X	Gs	17.6	180.2	-68.3	75.6	1000.0
2	P1 Head Y	Gs	29.1	135.2	-16.8	88.9	1000.0
3	P1 Head Z	Gs	18.6	109.7	-29.4	64.2	1000.0
4	P1 HD9Y (X)	Gs	18.0	180.2	-47.9	75.8	1000.0
5	P1 Chest X	Gs	14.9	143.6	-61.7	76.6	180.0
6	P1 Chest Y	Gs	5.3	143.3	-13.6	95.8	180.0
7	P1 Chest Z	Gs	18.3	107.9	-22.0	74.5	180.0
8	P1 HD9Y (Z)	Gs	23.8	111.2	-31.6	64.7	1000.0
9	P1 Upper Neck Fx	Nwt	151.4	339.7	-421.3	110.2	1000.0
10	P1 Upper Neck Fy	Nwt	358.4	141.5	-231.0	109.9	1000.0
11	P1 Upper Neck Fz	Nwt	2772.3	64.8	-937.1	110.5	1000.0
12	P1 HD9X (Y)	Gs	26.8	135.5	-32.3	77.8	1000.0
13	P1 Upper Neck Mx	Nwt-M	19.6	141.5	-27.6	91.4	600.0
14	P1 Upper Neck My	Nwt-M	25.1	55.0	-29.0	76.8	600.0
15	P1 Upper Neck Mz	Nwt-M	6.0	65.2	-41.6	116.2	600.0
16	P1 HD9X (Z)	Gs	23.5	91.0	-19.8	70.8	1000.0
17	P1 Head Resultant	Gs	69.9	76.3	.0	17.5	1000.0
18	P1 Chest Resultant	Gs	63.7	76.3	.0	-1.0	180.0
19	P1 Upper Neck Force Res	Nwt	2782.0	64.8	4.8	19.0	1000.0
20	P1 Upper Neck Moment Res	Nwt-M	43.2	109.0	.0	-22.0	600.0

36 ms Fixed Duration HIC SUMMARY: P1 Head Resultant

hic: 497.04
t1 = 60.960 msec
t2 = 87.600 msec
Average G's Over Hic Duration = 51.09

CLIP SUMMARY: P1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 62.512 G's
Tstart = 73.3200 ms
Tend = 76.3200 ms
CSI = 494.457

FACILITY: TRACK
RUN #: 1542
SERIES #: 1

TEST DATE: 18 Jul 1995
TEST TIME: 13:28:03
BOARD: b

TITLE: VTV TEST #1

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP msec	MINIMUM AMP msec	FILTER CLASS
1	P2 Head X	Gs	3.1 243.4	-30.7 56.8	1000.0
2	P2 Head Y	Gs	7.2 32.2	-21.1 122.2	1000.0
3	P2 Head Z	Gs	8.8 36.6	-41.7 79.4	1000.0
4	P1 Chest Disp.	mm	.1 17.5	-35.1 71.8	60.0
5	P2 Chest X	Gs	1.6 128.0	-48.4 68.6	180.0
6	P2 Chest Y	Gs	3.4 387.0	-18.6 76.2	180.0
7*	P2 Chest Z	Gs	41.8 38.8	-16.9 35.8	180.0
8	P2 Chest Disp.	mm	.0 -13.4	-37.3 64.8	60.0
9	P1 Lower Neck Fx	Nwt	510.0 115.3	-890.8 88.1	1000.0
10	P1 Lower Neck Fy	Nwt	659.7 74.9	-1665.4 90.0	1000.0
11	P1 Lower Neck Fz	Nwt	3456.4 71.0	-1369.9 110.0	1000.0
12	P1 HD9Z (X)	Gs	21.7 180.6	-60.4 73.6	1000.0
13	P1 Lower Neck Mx	Nwt-M	82.1 90.0	-55.2 74.9	600.0
14	P1 Lower Neck My	Nwt-M	42.9 333.1	-222.6 70.8	600.0
15	P1 Lower Neck Mz	Nwt-M	42.5 72.2	-114.9 90.1	600.0
16	P1 HD9Z (Y)	Gs	27.0 181.2	-7.0 75.1	1000.0
17	P2 Head Resultant	Gs	48.6 79.3	.1 2.5	1000.0
18*	P2 Chest Resultant	Gs	50.5 68.9	.0 -21.7	180.0
19	P1 Lower Neck Force Res	Nwt	3525.5 70.8	3.9 7.9	1000.0
20	P1 Lower Neck Moment Res	Nwt-M	228.9 70.8	.0 -20.0	600.0

36 ms Fixed Duration HIC SUMMARY: P2 Head Resultant

hic: 132.51
t1 = 50.640 msec
t2 = 86.520 msec
Average G's Over Hic Duration = 26.73

CLIP SUMMARY: P2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 49.818 G's
Tstart = 66.6000 ms
Tend = 69.6000 ms
CSI = 498.305

* Data is questionable between 35 msec and 51 msec, accelerometer opened.

RUN #: 1542
 SERIES #: 1

TEST TIME: 13:28:03
 BOARD: c

TITLE: VTV TEST #1

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	P1 Left Femur	Nwt	138.6	28.1	-7531.5	56.5	600.0
2	P1 Right Femur	Nwt	2447.1	77.6	-5842.4	55.6	600.0
3	P1 Lt Upper Tibia Mx	Nwt-M	77.6	75.2	-5139.4	64.3	600.0
4	P1 Lt Upper Tibia My	Nwt-M	814.5	77.3	-87.2	50.9	600.0
5	P1 Lt Lower Tibia Fy	Nwt	1661.5	52.2	-262.6	78.4	600.0
6	P1 Lt Lower Tibia Fz	Nwt	351.6	100.3	-2985.8	51.6	600.0
7	P1 Lt Lower Tibia Mx	Nwt-M	2964.7	54.0	-36.9	40.0	600.0
8	P1 Rt Upper Tibia Mx	Nwt-M	9365.1	56.8	-5061.3	53.3	600.0
9	P1 Rt Upper Tibia My	Nwt-M	2041.9	60.6	-4734.6	78.2	600.0
10	P1 Rt Lower Tibia Fy	Nwt	1865.8	53.0	-1154.4	54.8	600.0
11	P1 Rt Lower Tibia Fz	Nwt	625.7	51.0	-4828.6	55.2	600.0
12	P1 Rt Lower Tibia Mx	Nwt-M	490.6	55.0	-45.0	97.6	600.0
13	P1 Left Knee Shear	mm	.1	38.8	-8.6	79.6	180.0
14	P1 Right Knee Shear	mm	.3	78.2	-5.6	66.1	180.0
15	P1 Lap Belt Load	Nwt	3858.5	72.2	-41.0	126.6	60.0
16*	A-Pillar Hinge X	Gs	231.0	246.7	-226.9	87.6	60.0

* Data is questionable after 60 msec, accelerometer wire was damaged.

FACILITY: TRACK

RUN #: 1542

SERIES #: 1

TEST DATE: 18 Jul 1995

TEST TIME: 13:28:03

BOARD: d

TITLE: VTV TEST #1

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	P1 Pelvic X	Gs	13.4	116.8	-47.0	56.0	60.0
2	P1 Pelvic Y	Gs	14.3	56.4	-18.9	78.4	60.0
3	P1 Pelvic Z	Gs	16.5	105.0	-5.3	79.1	60.0
4	Chest Displacement #125	mm	2.5	131.0	-32.8	71.0	60.0
5	P2 Upper Neck Fx	Nwt	676.9	52.0	-87.0	240.4	1000.0
6	P2 Upper Neck Fy	Nwt	727.3	135.6	-154.1	63.4	1000.0
7	P2 Upper Neck Fz	Nwt	1673.3	64.3	-85.6	30.0	1000.0
8	Chest Displacement #126	mm	14.3	132.0	-49.3	72.2	60.0
9	P2 Upper Neck Mx	Nwt-M	11.2	225.8	-42.3	138.4	600.0
10	P2 Upper Neck My	Nwt-M	36.3	131.3	-63.1	52.1	600.0
11	P2 Upper Neck Mz	Nwt-M	12.0	152.8	-22.9	98.6	600.0
12	Chest Displacement #127	mm	4.8	112.1	-10.9	58.9	60.0
13	Chest Displacement #128	mm	34.2	72.1	-10.0	147.7	60.0
14	Chest Displacement #129	mm	10.5	108.6	-17.8	135.5	60.0
15	Chest Displacement #130	mm	.0	153.6	-37.8	73.7	60.0
16	Chest Displacement #131	mm	.0	-13.3	-43.1	72.0	60.0
17	P1 Pelvic Res.	Gs	49.1	56.2	.0	-20.8	60.0
18	P2 Upper Neck Force Res	Nwt	1690.1	64.3	7.3	25.9	1000.0
19	P2 Upper Neck Moment Res	Nwt-M	63.2	52.1	.0	6.7	600.0

FACILITY: TRACK
RUN #: 1542
SERIES #: 1

TEST DATE: 18 Jul 1995
TEST TIME: 13:28:03
BOARD: e

TITLE: VTV TEST #1

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	P2 Left Femur	Nwt	175.6	427.1	-5974.7	62.4	600.0
2	P2 Right Femur	Nwt	542.4	52.4	-3483.7	65.2	600.0
3	P2 Lt Upper Tibia Mx	Nwt-M	179.3	53.3	-86.3	52.3	600.0
4	P2 Lt Upper Tibia My	Nwt-M	14.2	126.6	221.7	54.8	600.0
5	P2 Lt Lower Tibia Fy	Nwt	437.8	64.3	-1951.3	52.1	600.0
6	P2 Lt Lower Tibia Fz	Nwt	696.2	65.8	-6808.1	52.1	600.0
7	P2 Lt Lower Tibia Mx	Nwt-M	431.8	53.8	-41.0	51.6	600.0
8	P2 Rt Upper Tibia Mx	Nwt-M	33.1	60.0	-51.6	57.1	600.0
9	P2 Rt Upper Tibia My	Nwt-M	106.6	66.8	-91.9	53.4	600.0
10	P2 Rt Lower Tibia Fy	Nwt	307.0	69.4	-805.0	53.8	600.0
11	P2 Rt Lower Tibia Fz	Nwt	124.2	64.6	-1419.7	53.4	600.0
12	P2 Rt Lower Tibia Mx	Nwt-M	45.9	90.8	-75.4	54.0	600.0
13	P2 Left Knee Shear	mm	.0	53.6	-.2	56.4	180.0
14	P2 Right Knee Shear	mm	.3	60.0	-1.2	82.2	180.0
15	Chest Displacement #132	mm	.0	-14.8	-50.1	71.9	60.0
16	Lt Rear Compart. X	Gs	1.6	198.5	-43.5	47.6	60.0

RUN #: 1542
 SERIES #: 1

TEST TIME: 13:28:03
 BOARD: f

TITLE: VTV TEST #1

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	P2 Pelvic X	Gs	18.4	11.5	-54.4	62.0	60.0
2	P2 Pelvic Y	Gs	4.6	117.6	-38.7	73.3	60.0
3	P2 Pelvic Z	Gs	21.9	76.1	-1.7	183.4	60.0
4	Lt Rear Compart Y	Gs	4.6	78.8	-29.0	54.2	60.0
5	Toepan X	Gs	34.6	53.6	-119.3	46.8	60.0
6	Toepan Y	Gs	23.8	74.9	-78.8	47.8	60.0
7	Toepan Z	Gs	110.5	48.2	-77.9	53.8	60.0
8	Rt Rear Compart X	Gs	1.4	336.8	-45.0	56.0	60.0
9*	Rt Ft Frame Rail X	Gs	14.7	41.6	-103.6	329.4	60.0
10*	Rt Ft Frame Rail Y	Gs	70.0	42.1	-119.4	37.3	60.0
11*	Rt Ft Frame Rail Z	Gs	83.5	328.0	-51.3	41.4	60.0
12	Rt Rear Compart Y	Gs	2.9	78.1	-24.9	54.6	60.0
13	Lt Ft Frame Rail X	Gs	32.7	50.9	-155.8	36.0	60.0
14	Lt Ft Frame Rail Y	Gs	44.2	58.2	-70.7	36.5	60.0
15	Lt Ft Frame Rail Z	Gs	125.6	42.5	-94.7	35.3	60.0
16	C/L Rear Comp X	Gs	1.8	156.8	-46.7	47.8	60.0
17	P2 Pelvic Res	Gs	63.9	73.9	.0	-13.7	60.0
18	Toepan Res	Gs	175.8	47.9	.0	-17.0	60.0
19*	Rt Ft Frame Res	Gs	132.7	328.4	.0	-18.8	60.0
20	Lt FT Frame Res	Gs	192.3	35.9	.0	-20.3	60.0

* Data is questionable after 300 msec, accelerometer protective housing contacted the ground.

FACILITY: TAPE
RUN #: 8542
SERIES #: 1

TEST DATE: 27 Jul 1995
TEST TIME: 09:17:00
BOARD: g

TITLE: VTV TEST #1

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	C/L Rear Compartment Y	Gs	5.1	77.2	-24.1	55.8	60.0

FACILITY: TAPE
RUN #: 9542
SERIES #: 1

TEST DATE: 19 Jul 1995
TEST TIME: 09:55:25
BOARD: h

TITLE: VTV TEST #1

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Brake Pedal X	Gs	37.2	45.2	-100.7	54.5	60.0
2	Brake Pedal Y	Gs	91.8	72.2	-108.1	56.9	60.0
3	Brake Pedal Z	Gs	122.8	54.8	-42.1	39.7	60.0
4	Rt Engine X	Gs	27.8	56.9	-99.5	44.2	60.0
5	Lt Engine X	Gs	31.9	63.2	-138.8	57.6	60.0
6	Engine Bottom X	Gs	59.5	49.4	-114.9	37.4	60.0
7	Engine Bottom Y	Gs	32.5	50.2	-64.5	36.2	60.0
8	Rt Shock Tower X	Gs	10.9	25.4	-71.9	49.7	60.0
9	Rt Shock Tower Y	Gs	17.6	64.6	-96.6	49.7	60.0
10	Lt Shock Tower X	Gs	26.1	75.0	-66.0	33.0	60.0
11	Lt Shock Tower Z	Gs	25.0	9.1	-35.6	41.9	60.0
17	Brake Pedal Res	Gs	183.4	54.8	.0	-18.4	60.0

FACILITY: TAPE
RUN #: 542
SERIES #: 1

TEST DATE: 19 Jul 1995
TEST TIME: 10:07:11
BOARD: I

TITLE: VTV TEST #1

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	MDB C.G. X	Gs	1.1	389.3	-38.5	42.7	60.0
2	MDB C.G. Y	Gs	6.5	47.8	-16.4	60.0	60.0
3	MDB C.G. Z	Gs	7.7	56.2	-14.8	67.0	60.0
4	MDB Load Cell TR	Nwt	55170.5	51.7	-21042.0	7.6	60.0
5	MDB Load Cell BR	Nwt	25082.5	102.2	-24690.2	34.8	60.0
6	MDB Load Cell TL	Nwt	208619.9	41.4	-10030.1	83.2	60.0
7	MDB Load Cell BL	Nwt	167332.8	43.6	-1512.7	423.4	60.0
8	MDB Load Cell CL	Nwt	159899.7	37.2	-1462.4	390.6	60.0
9	MDB Left Rail X	Gs	2.3	210.4	-40.2	37.3	60.0
10	MDB Left Rail Y	Gs	16.3	49.7	-21.6	55.1	60.0
11	MDB Right Rail X	Gs	1.6	189.4	-37.7	38.8	60.0
12	MDB Right Rail Y	Gs	14.6	49.3	-23.9	55.1	60.0
17	MDB C.G. Res	Gs	38.6	42.7	.4	218.8	60.0

TEST NO. Y57-1-1542

VEHICLE DATA

SAE FILTER CHANNEL CLASS

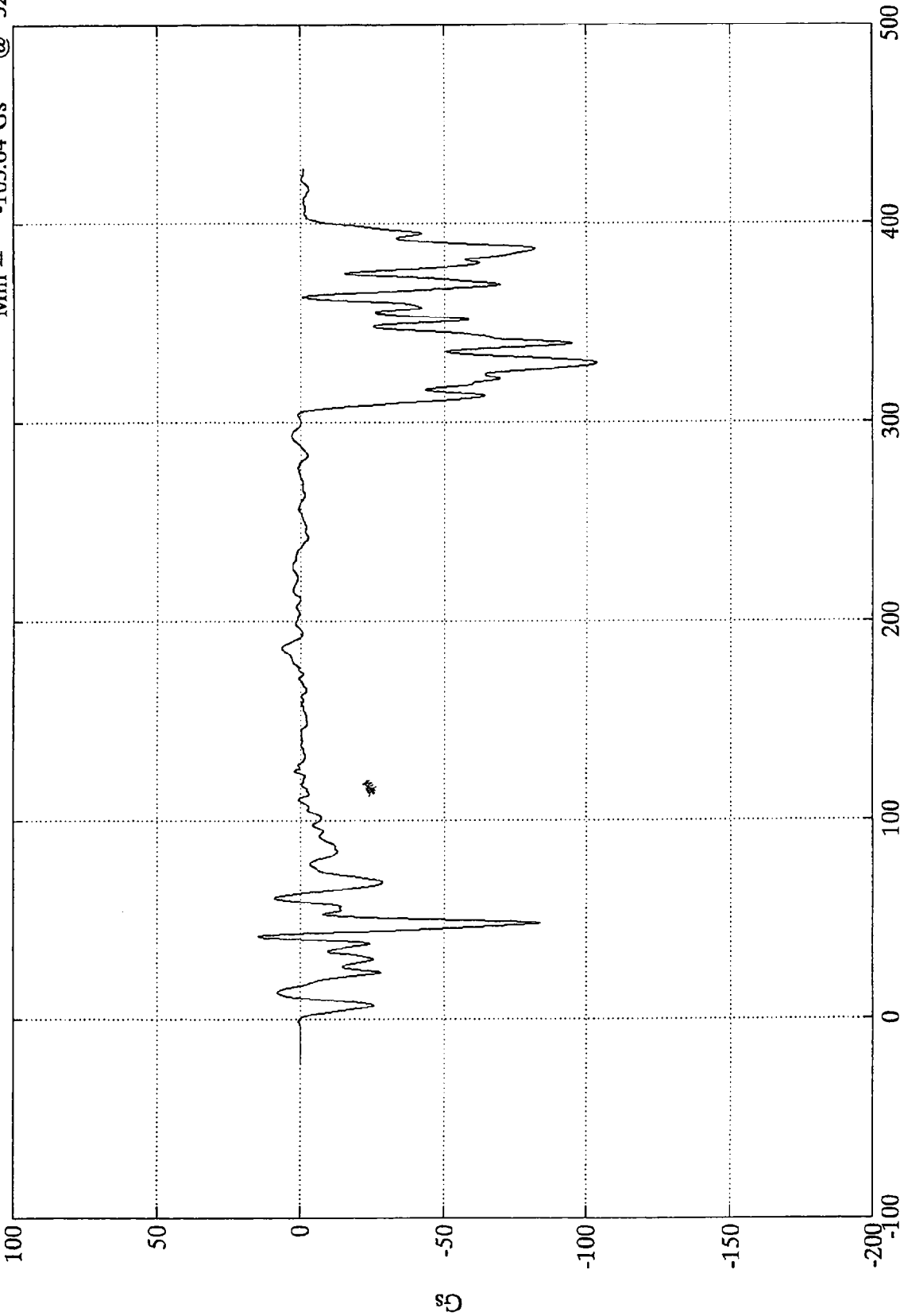
60

VEHICLE ONE DATA

VTV TEST #1

Max = 14.70 Gs @ 41.64 msec
 Min = -103.64 Gs @ 329.39 msec

Rt Ft Frame Rail X



Data is questionable after 300 msec.

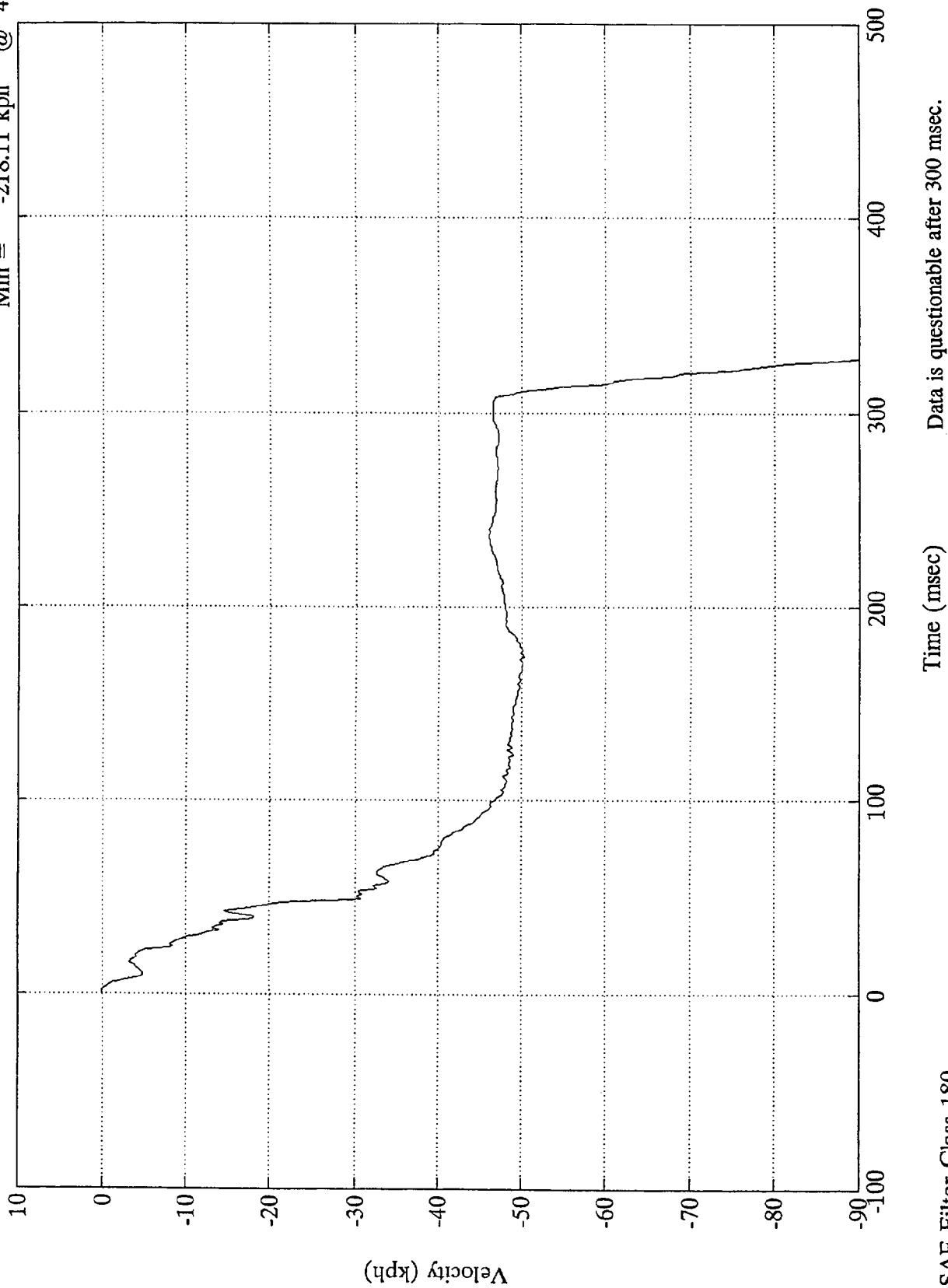
Time (msec)

SAE Filter Class 60

VTV TEST #1

Max = .04 kph @ 1.55 msec
Min = -218.11 kph @ 427.32 msec

Rt Ft Frame Rail X

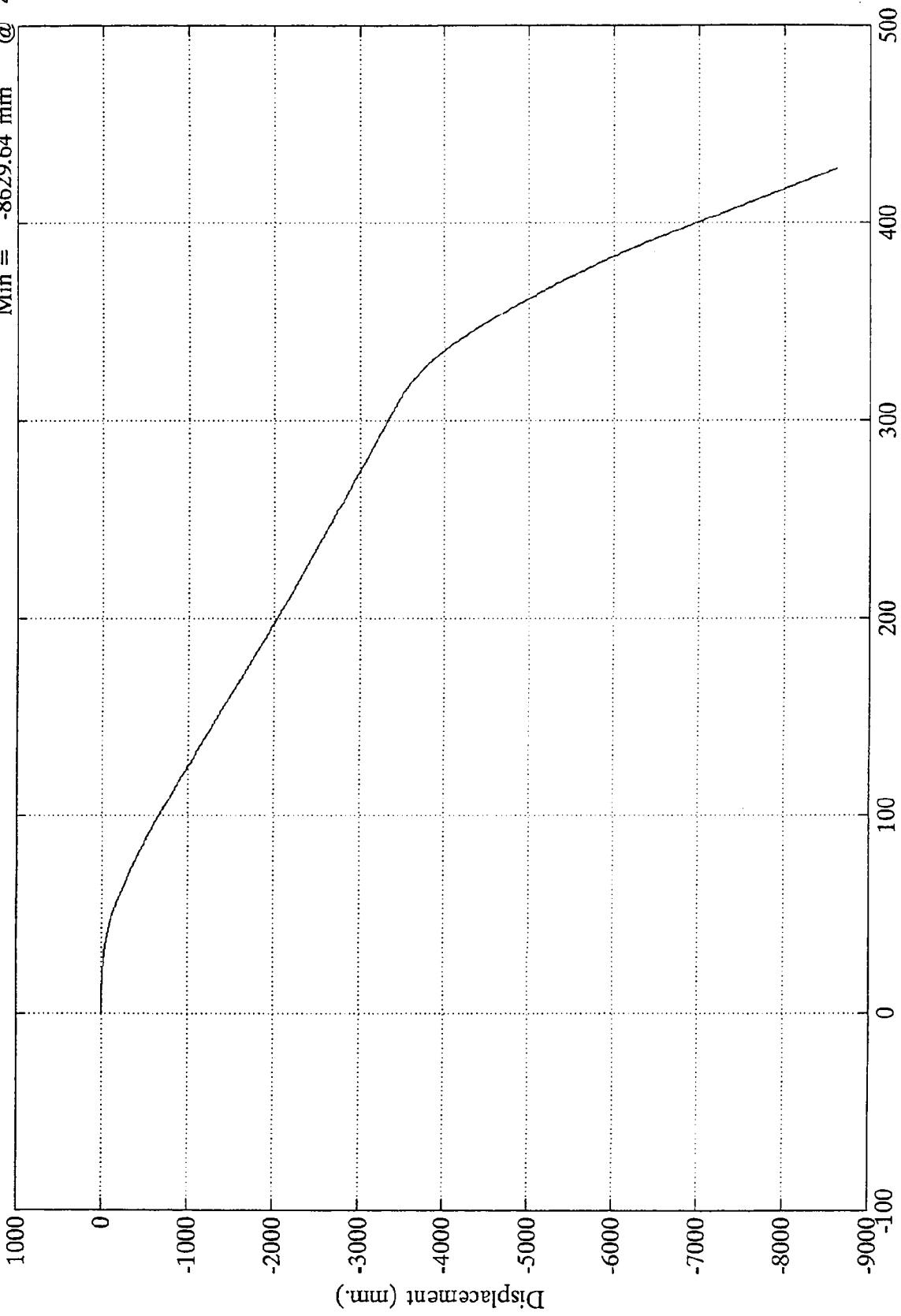


Data is questionable after 300 msec.

SAE Filter Class 180

VTV TEST #1

Rt Ft Frame Rail X
Max = .01 mm @ 2.39 msec
Min = -8629.64 mm @ 427.32 msec

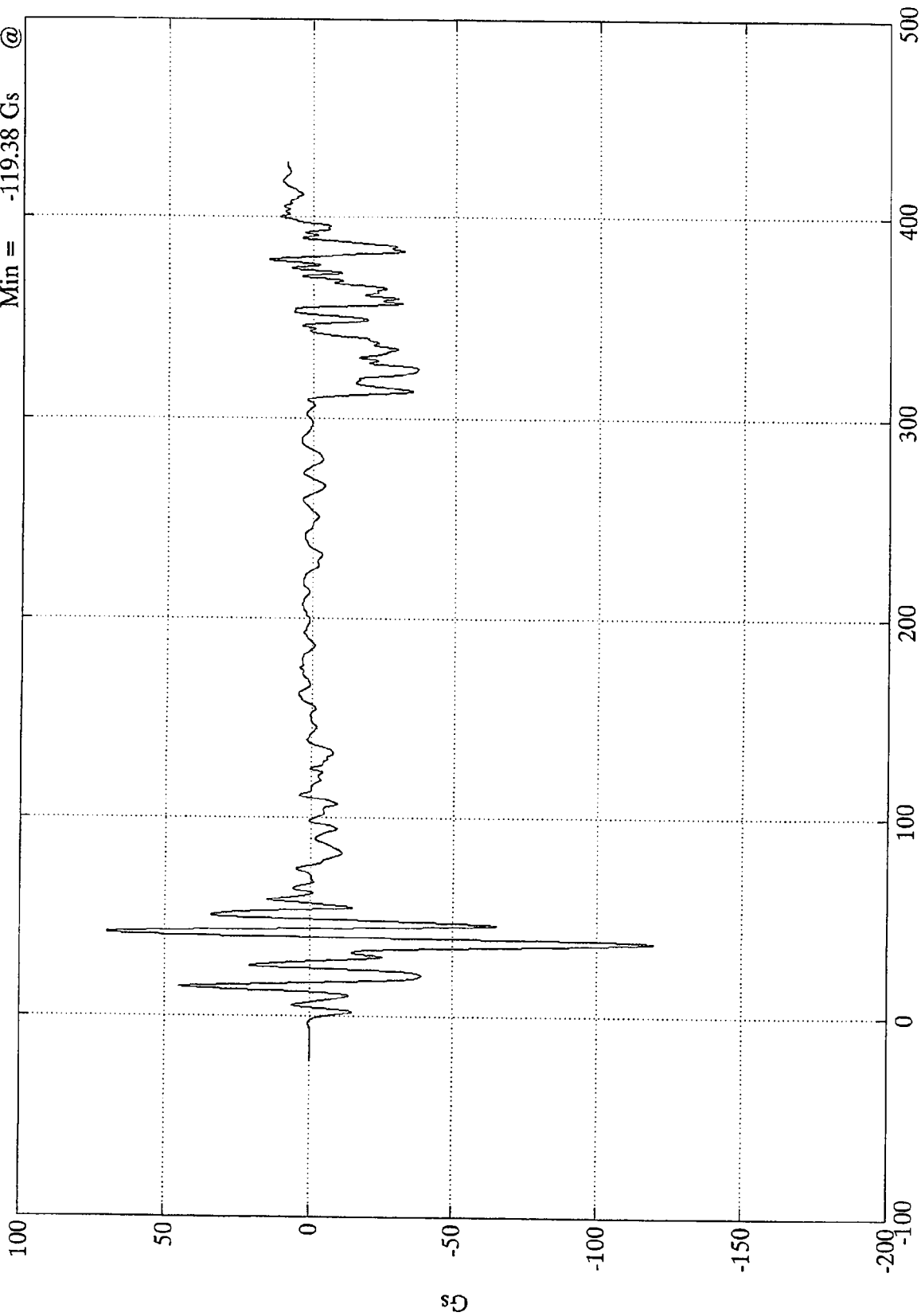


Time (msec) Data is questionable after 300 msec.

SAE Filter Class 180

VTV TEST #1

Rt Ft Frame Rail Y Max = 69.95 Gs @ 42.12 msec
 Min = -119.38 Gs @ 37.31 msec



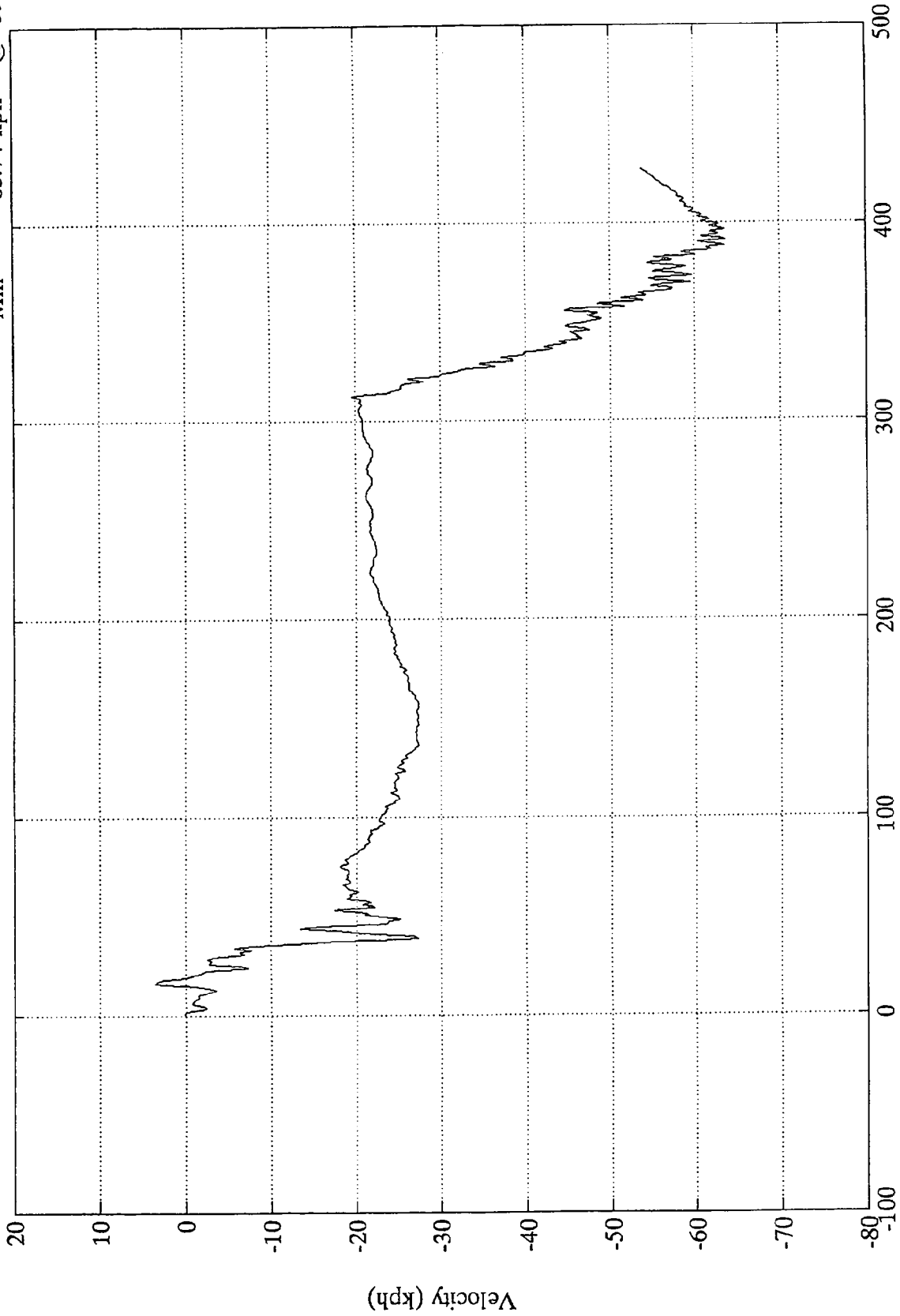
Time (msec) Data is questionable after 300 msec.

SAE Filter Class 60

VTV TEST #1

Rt Ft Frame Rail Y

Max = 3.42 kph @ 16.92 msec
Min = -63.74 kph @ 391.32 msec

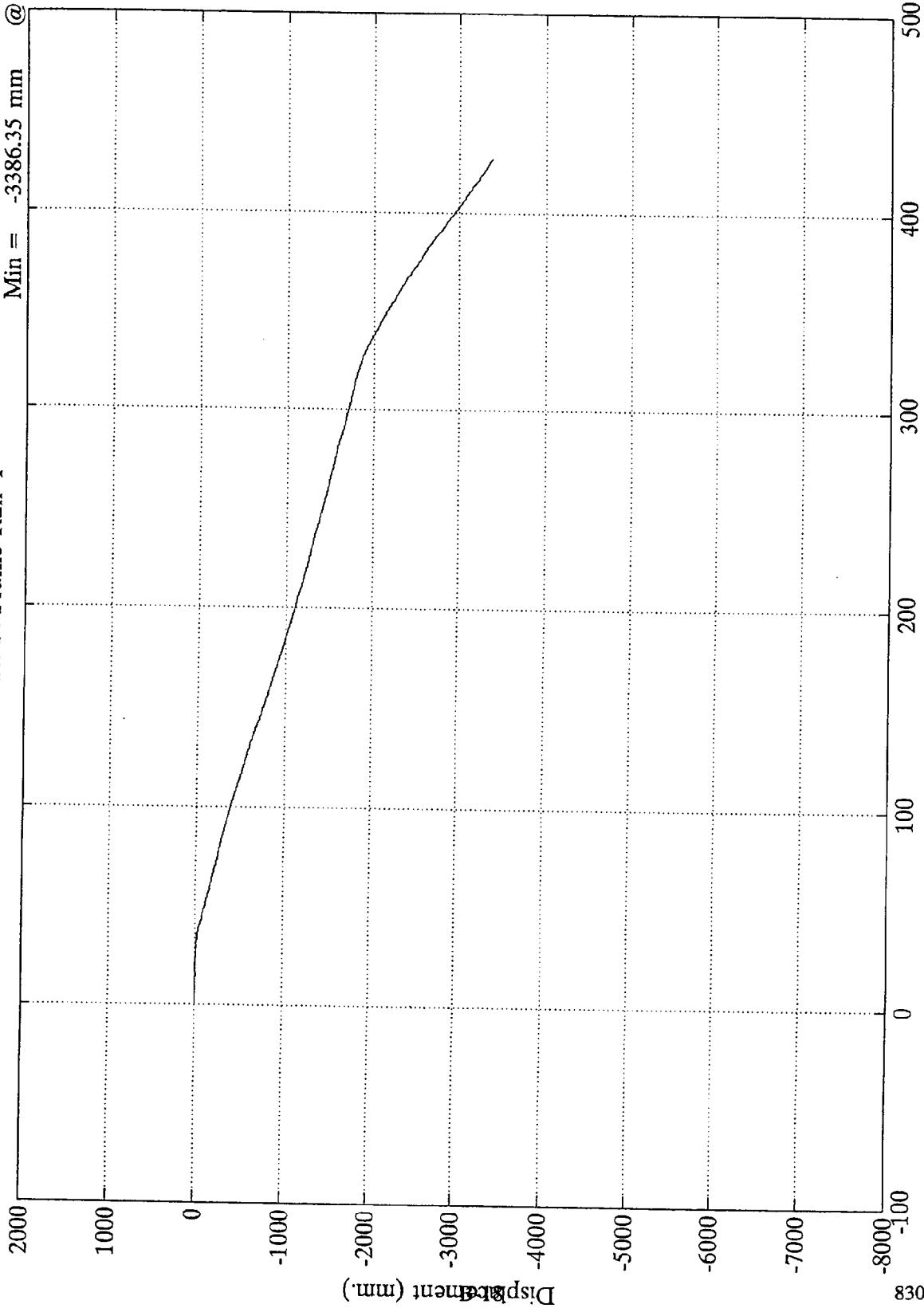


Data is questionable after 300 msec.

SAE Filter Class 180

VTUV TEST #1

Rt Ft Frame Rail Y Max = .03 mm @ 1.55 msec
Min = -3386.35 mm @ 427.32 msec



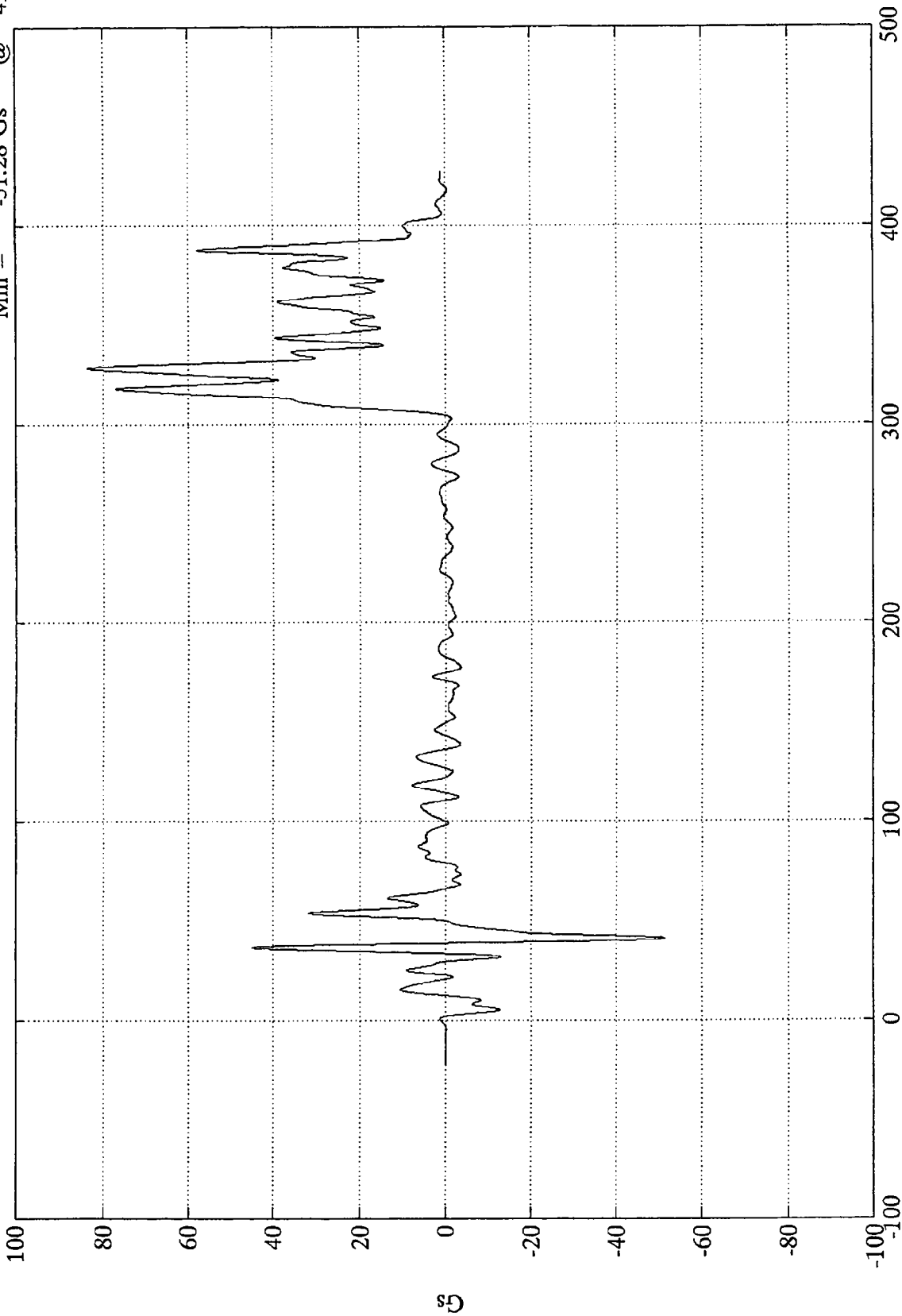
Data is questionable after 300 msec.

SAE Filter Class 180

8304-1

VTV TEST #1

Rt Ft Frame Rail Z
 Max = 83.50 Gs @ 327.96 msec
 Min = -51.28 Gs @ 41.40 msec

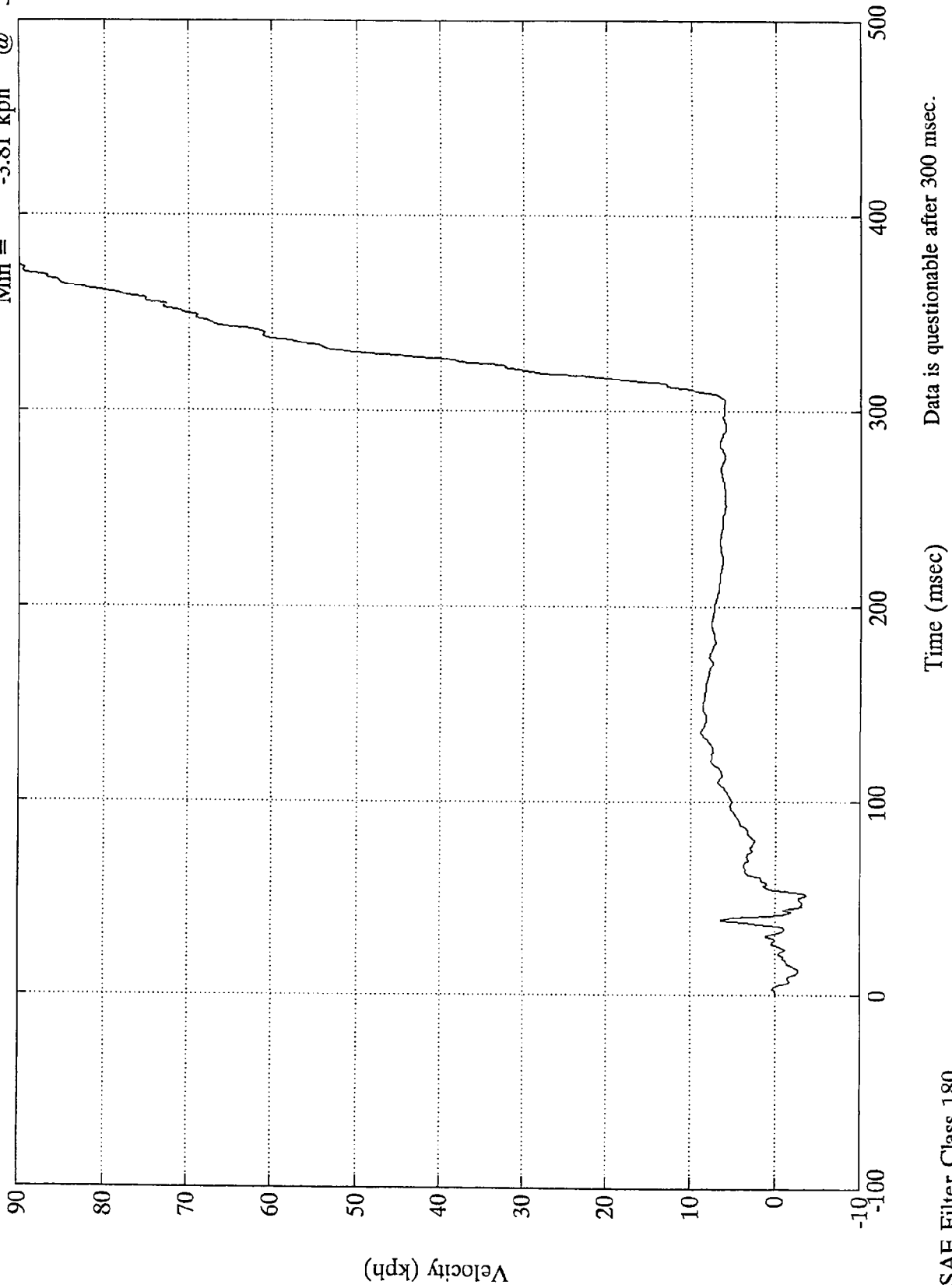


Time (msec) Data is questionable after 300 msec.

SAE Filter Class 60

VTV TEST #1

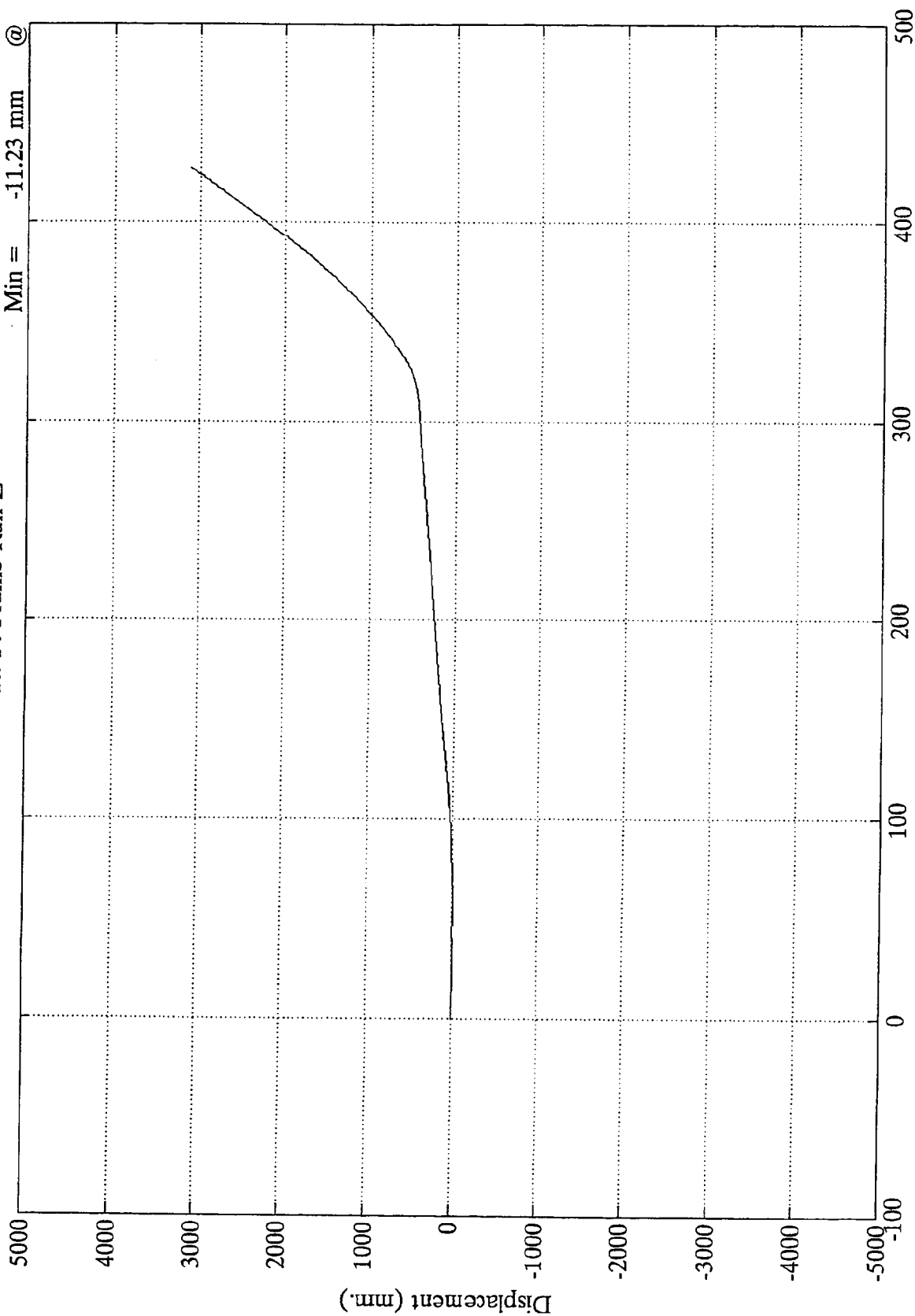
Rt Ft Frame Rail Z
Max = 117.16 kph @ 427.32 msec
Min = -3.81 kph @ 51.96 msec



SAE Filter Class 180

VTV TEST #1

Rt Ft Frame Rail Z
Max = 3118.63 mm @ 427.32 msec
Min = -11.23 mm @ 54.60 msec



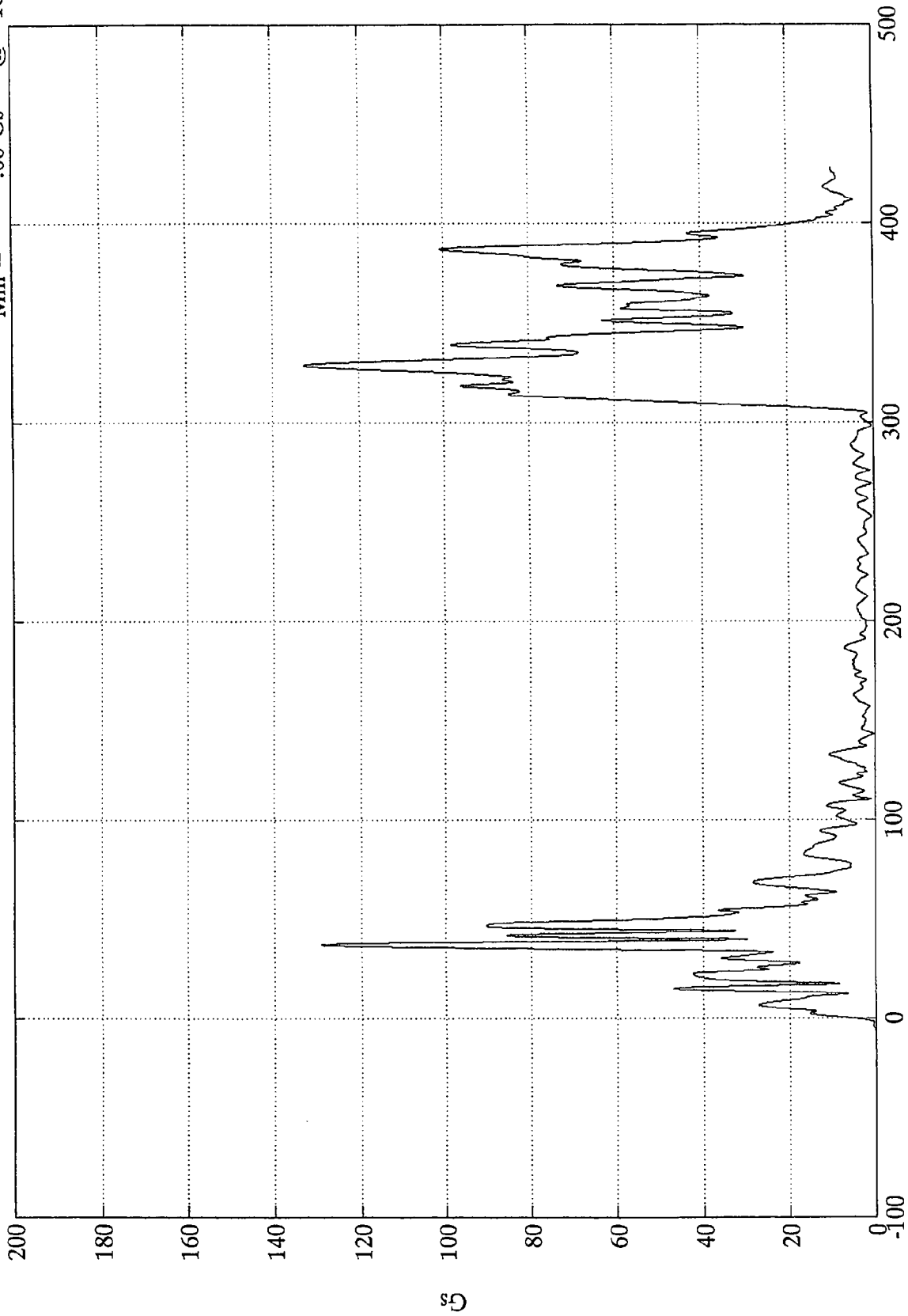
Data is questionable after 300 msec.

SAE Filter Class 180

VTV TEST #1

Max = 132.65 Gs @ 328.44 msec
 Min = .00 Gs @ -18.84 msec

Rt Ft Frame Res



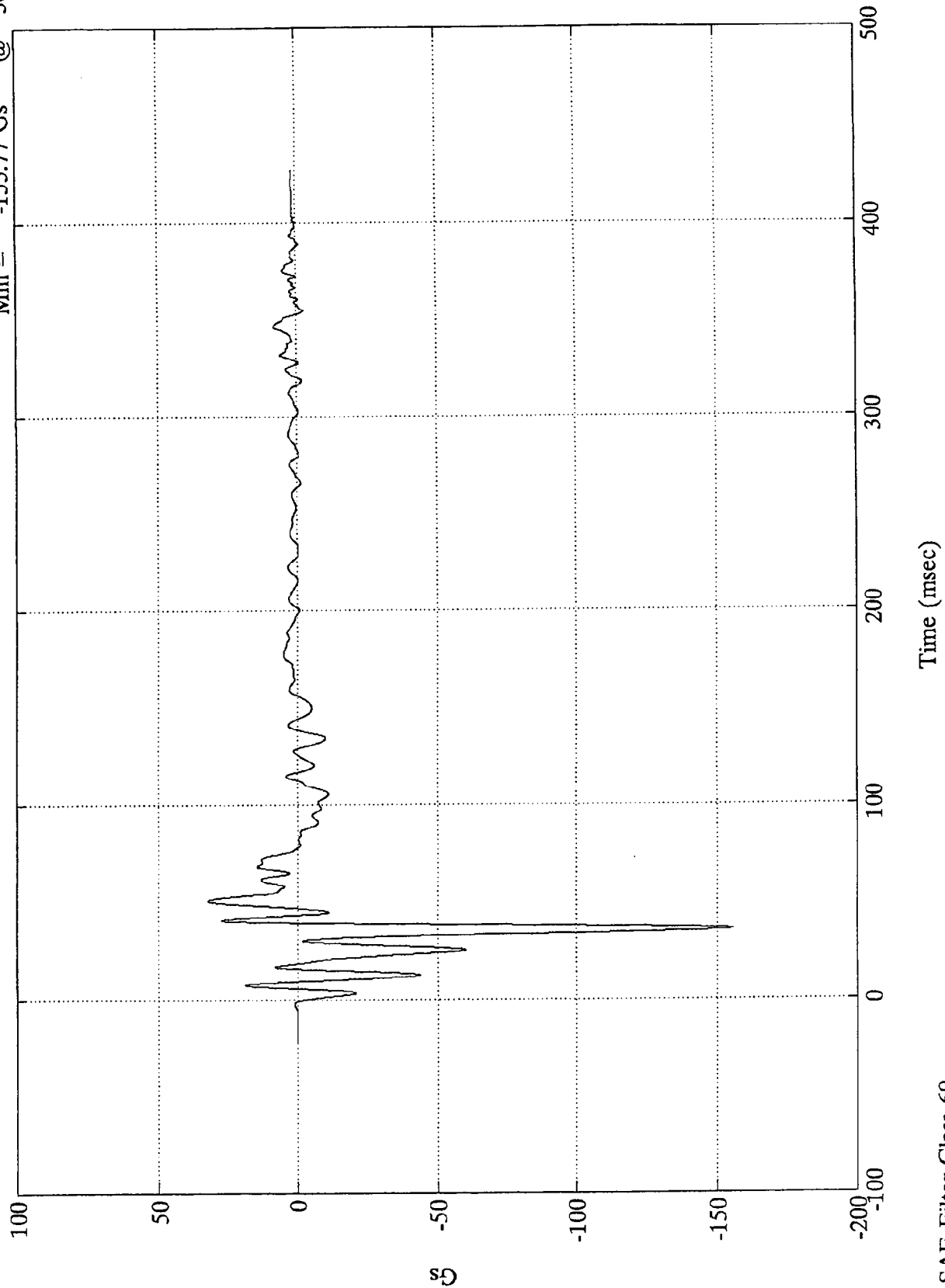
Data is questionable after 300 msec.

Time (msec)

SAE Filter Class 60

VTV TEST #1

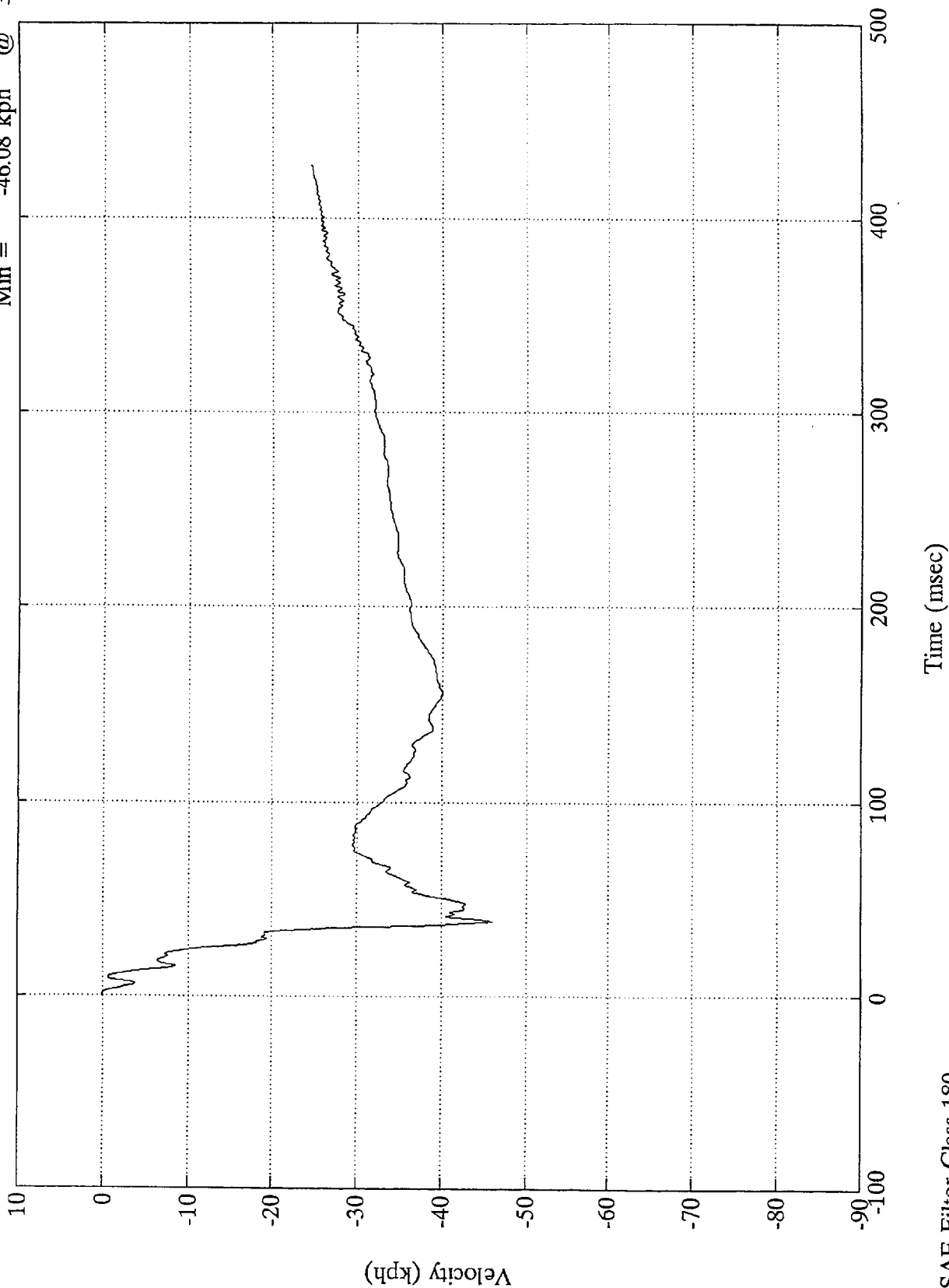
Lt Ft Frame Rail X
Max = 32.65 Gs @ 50.88 msec
Min = -155.77 Gs @ 36.00 msec



VTV TEST #1

Max = .08 kph @ 0.83 msec
Min = -46.08 kph @ 39.11 msec

Lt Ft Frame Rail X

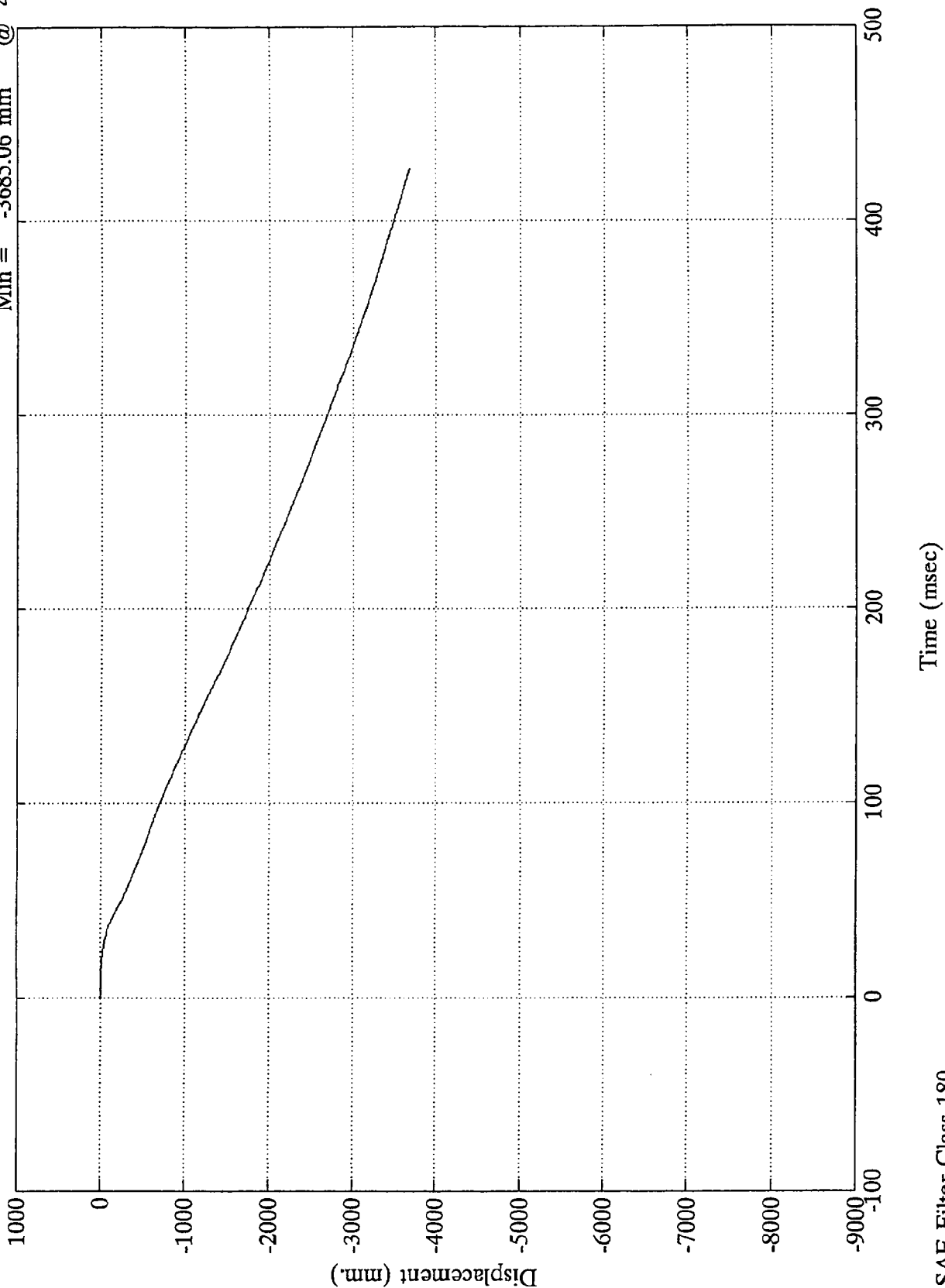


SAE Filter Class 180

VTV TEST #1

Lt Ft Frame Rail X

Max = .02 mm @ 1.43 msec
Min = -3685.06 mm @ 427.32 msec



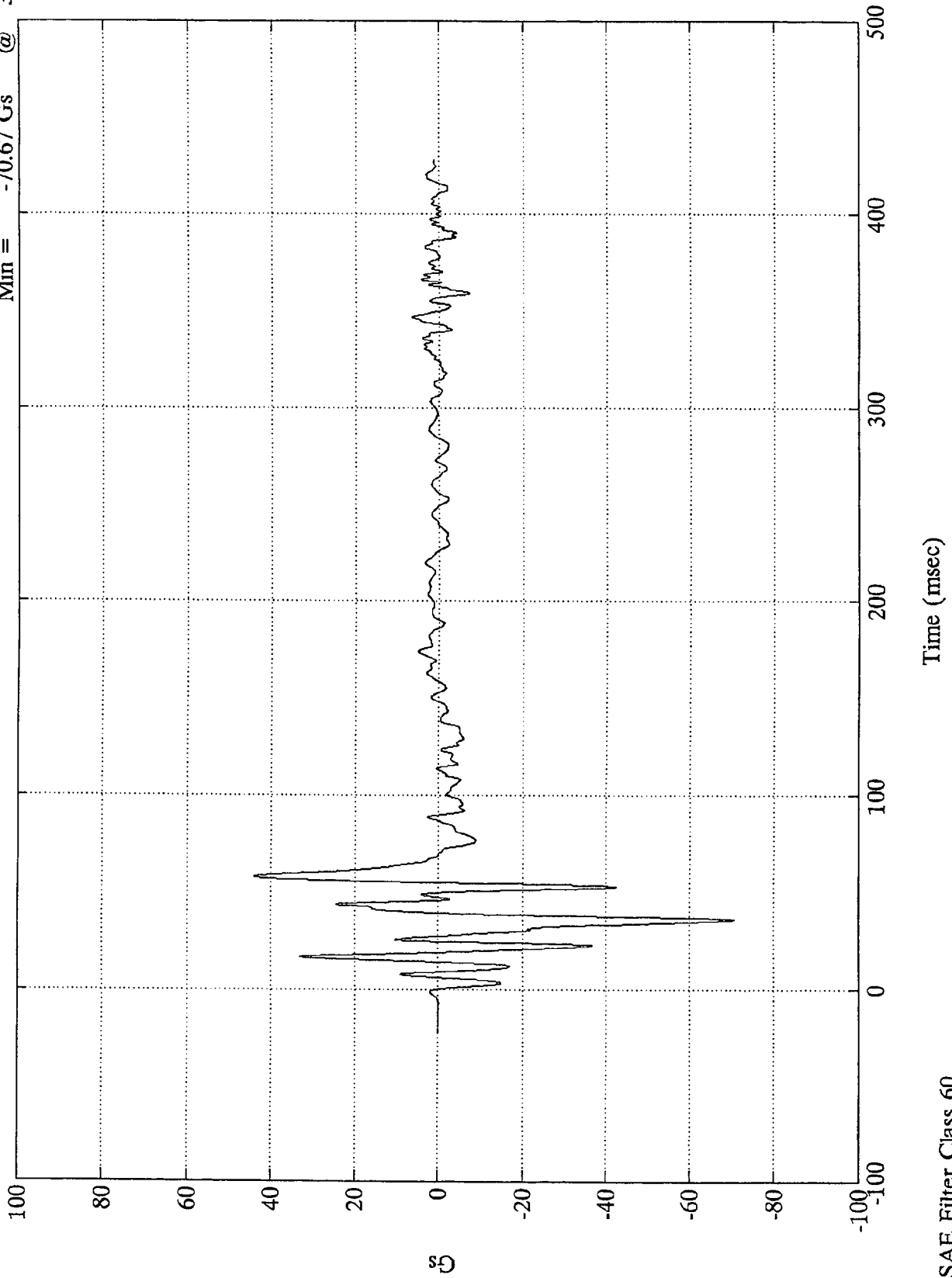
SAE Filter Class 180

VTV TEST #1

Lt Ft Frame Rail Y

Max = 44.19 Gs @ 58.20 msec

Min = -70.67 Gs @ 36.48 msec

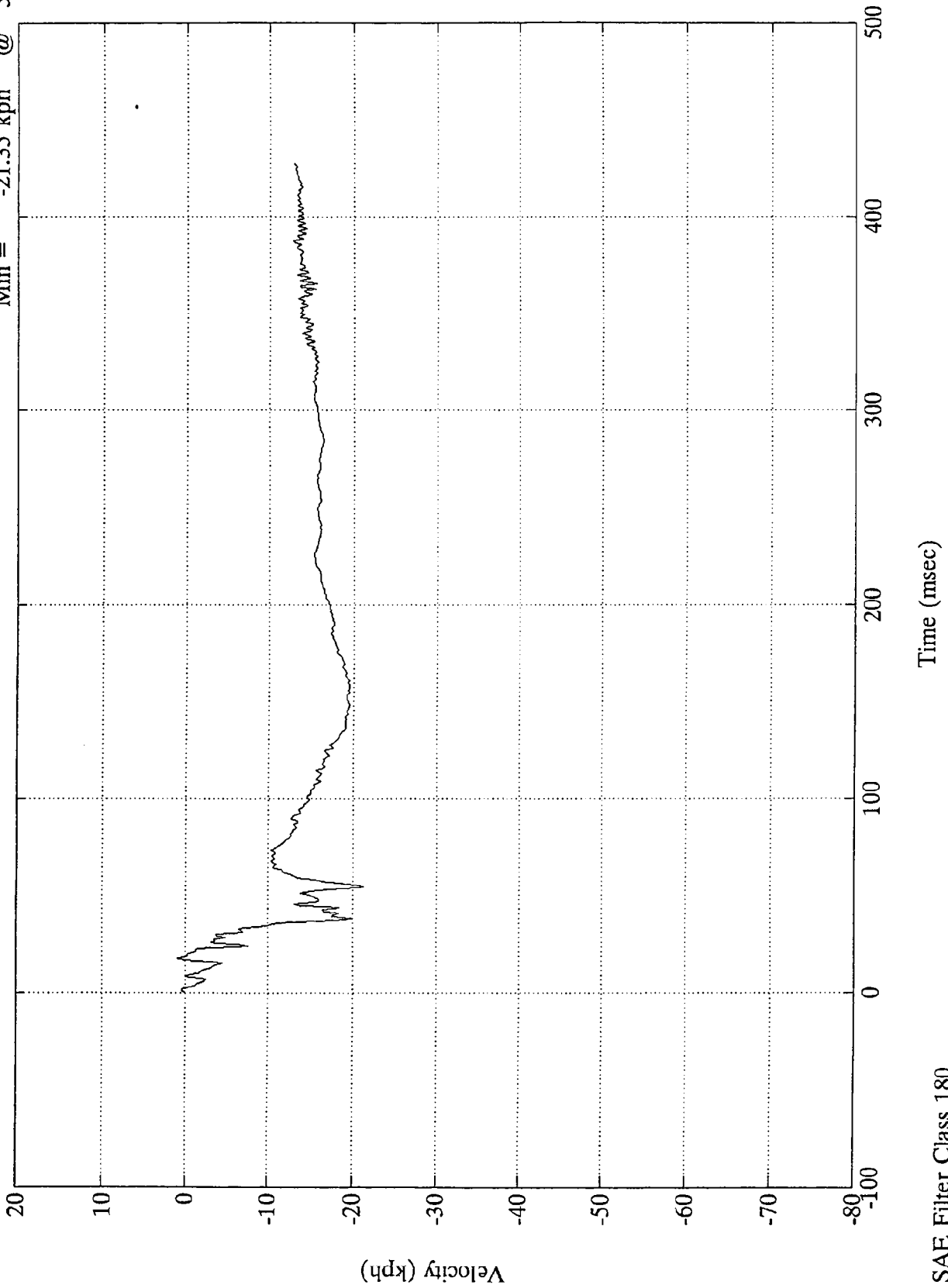


SAE Filter Class 60

VTV TEST #1

Max = .99 kph @ 17.76 msec
Min = -21.35 kph @ 55.08 msec

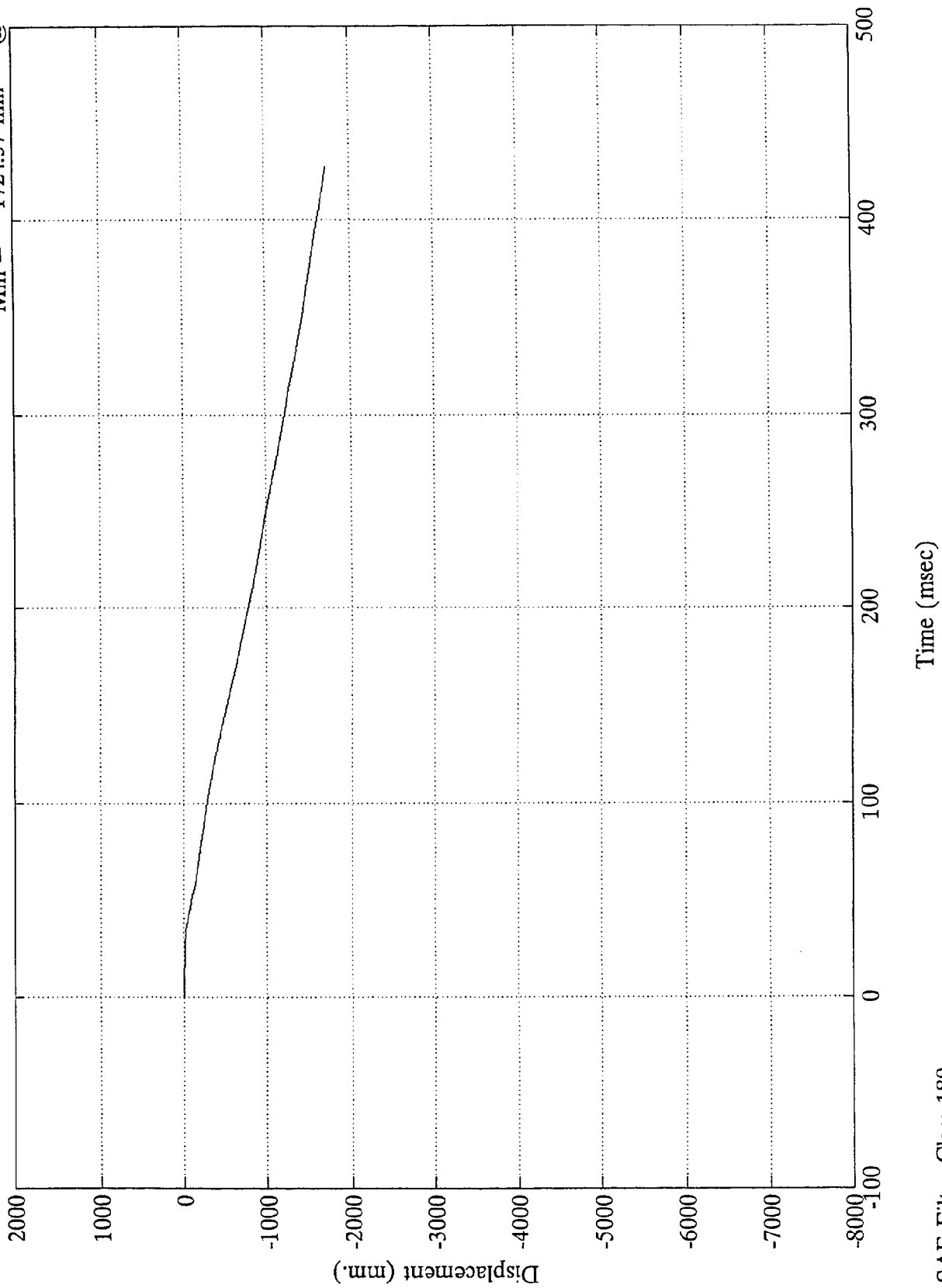
Lt Ft Frame Rail Y



SAE Filter Class 180

VTV TEST #1

Lt Ft Frame Rail Y
Max = .18 mm @ 2.51 msec
Min = -1724.37 mm @ 427.32 msec

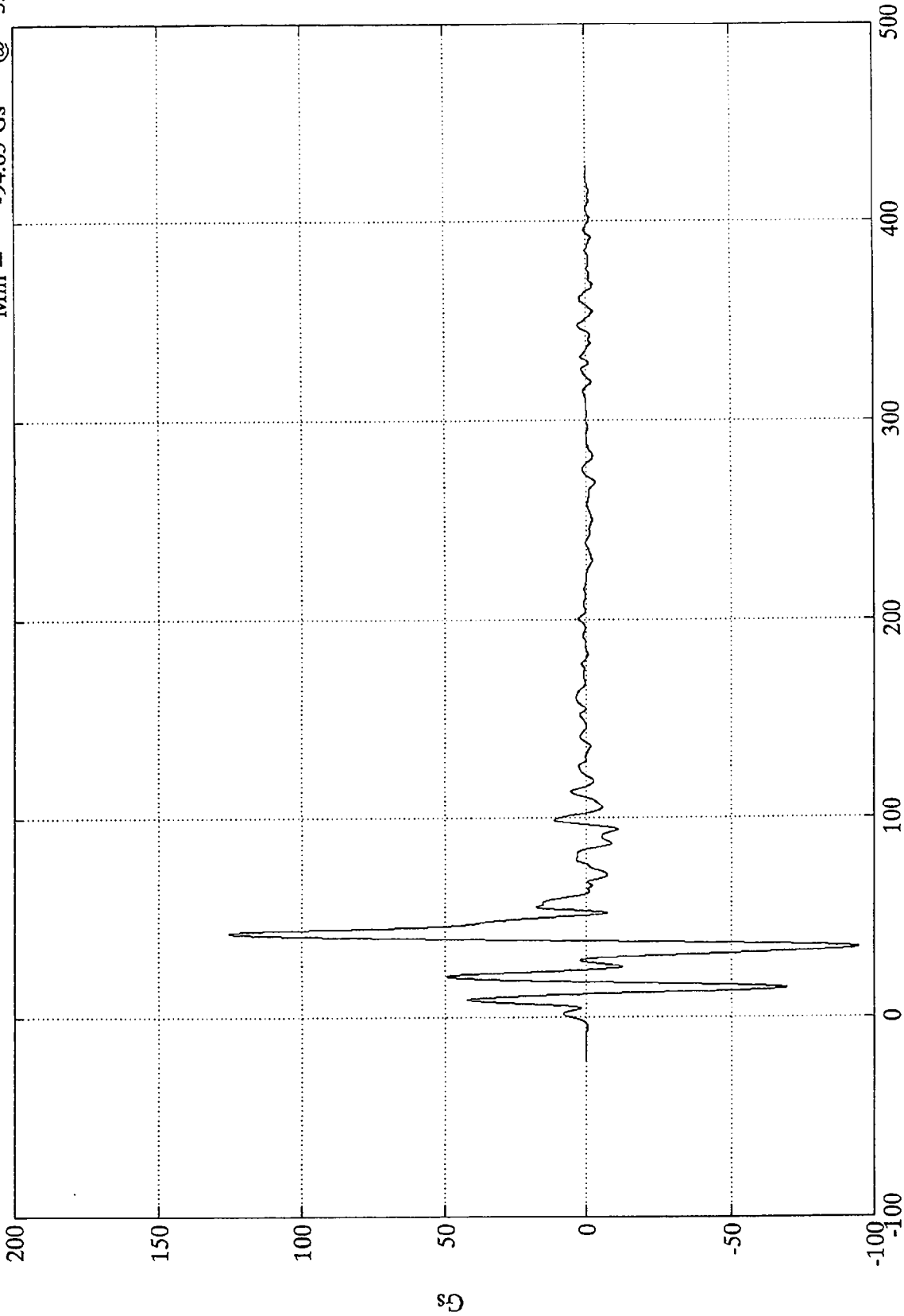


SAE Filter Class 180

VTV TEST #1

Lt Ft Frame Rail Z

Max = 125.58 Gs @ 42.47 msec
Min = -94.65 Gs @ 35.27 msec



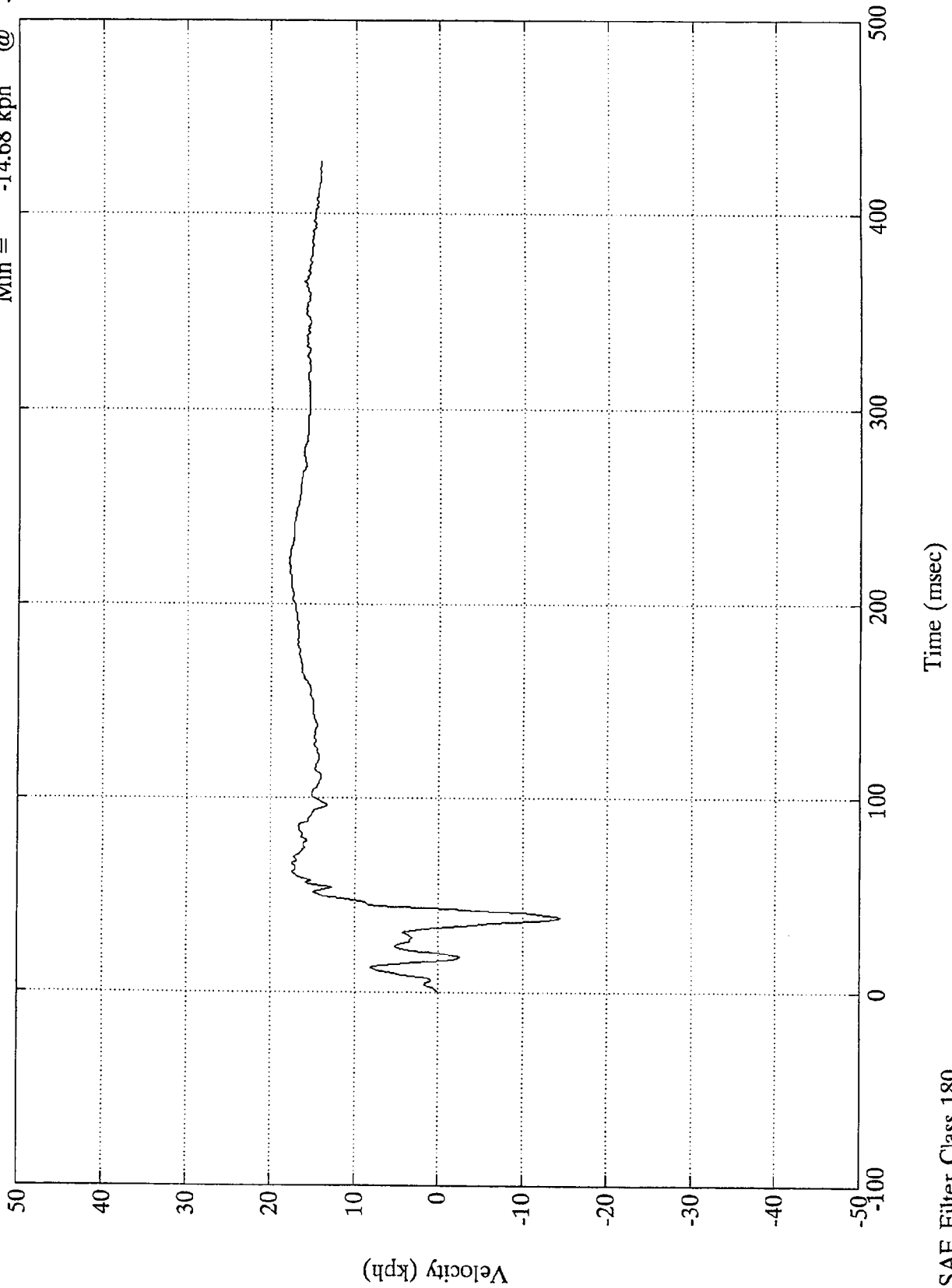
Time (msec)

SAE Filter Class 60

VTV TEST #1

Max = 17.88 kph @ 221.64 msec
Min = -14.68 kph @ 38.28 msec

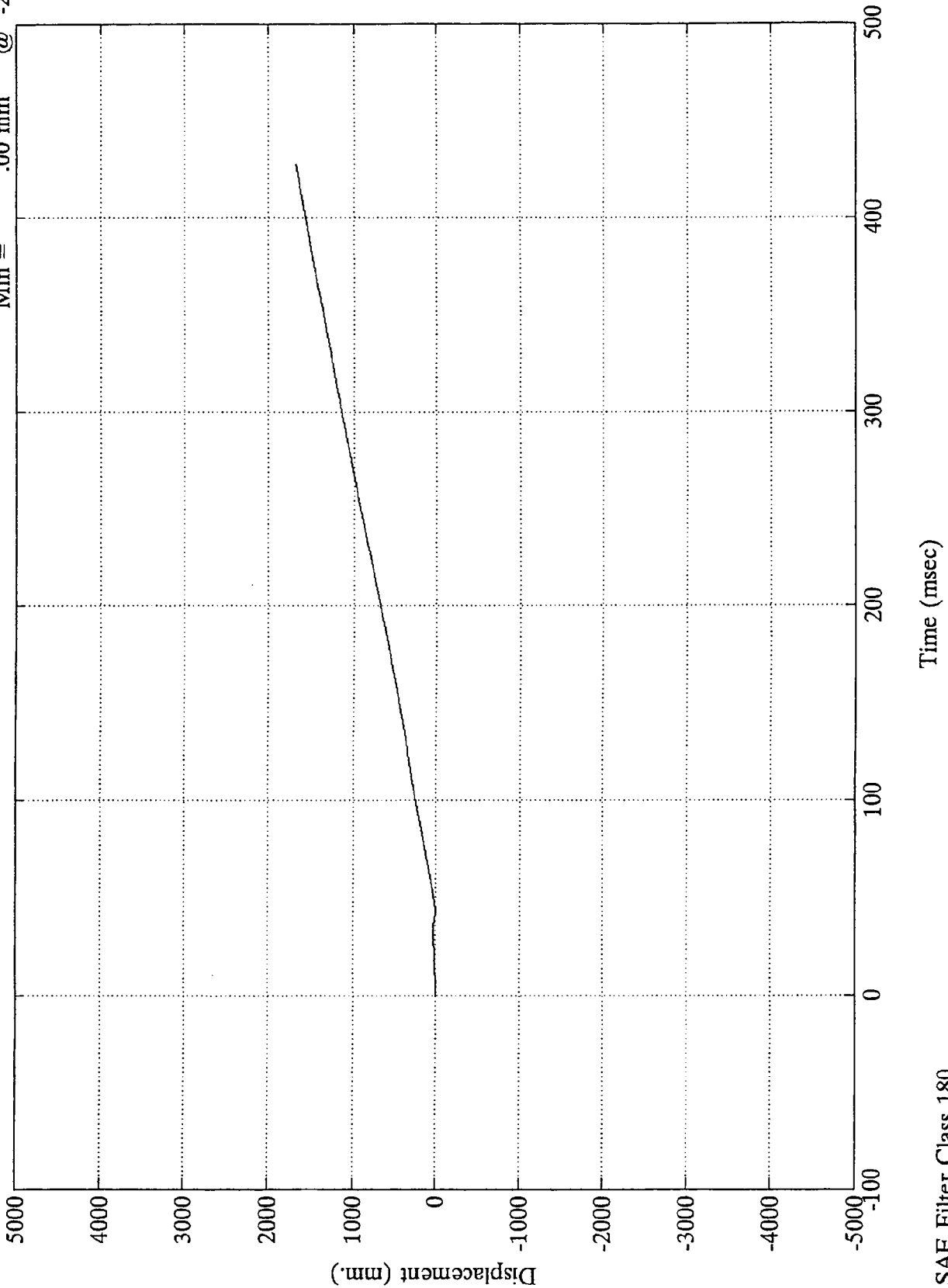
Lt Ft Frame Rail Z



SAE Filter Class 180

VTV TEST #1

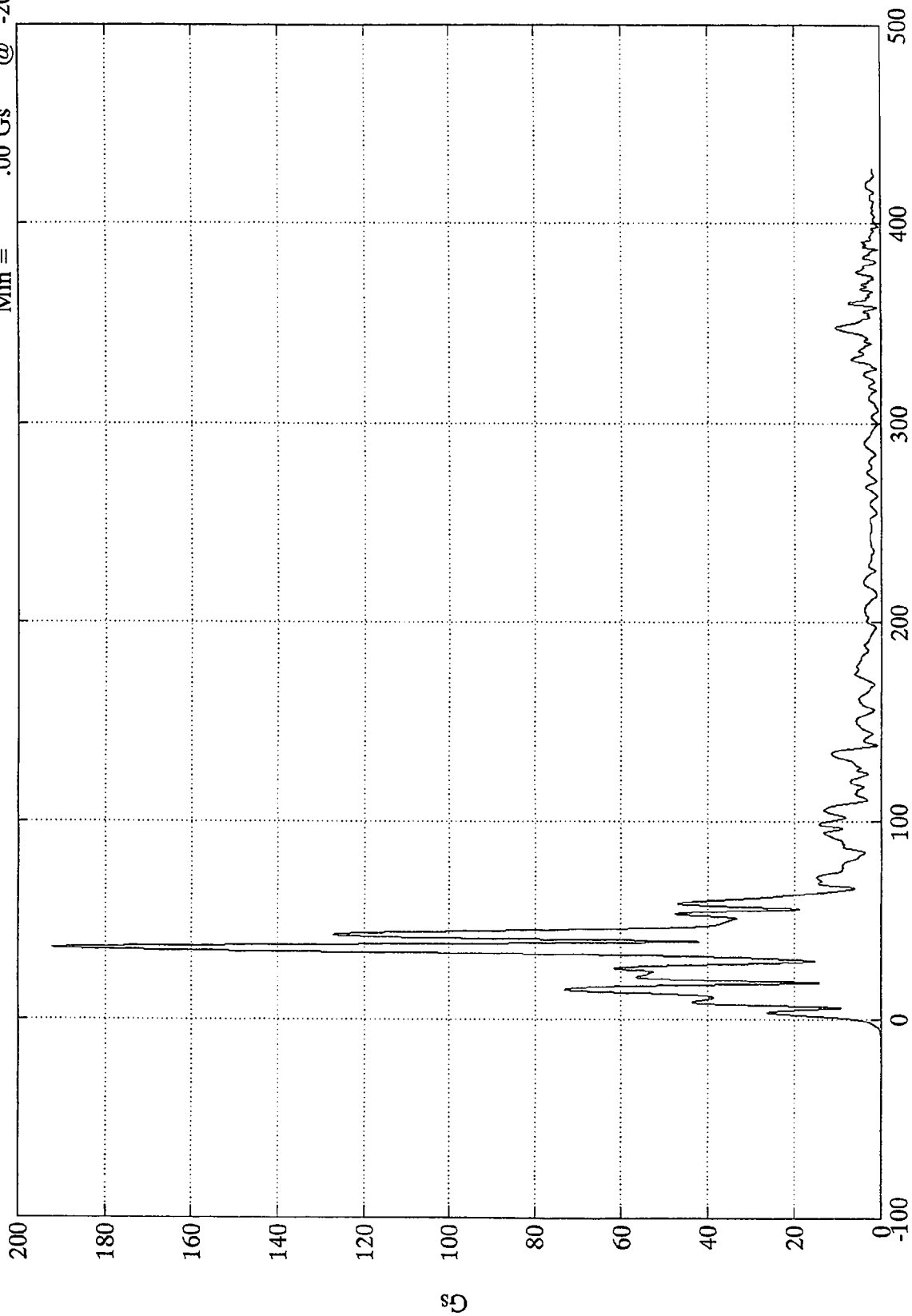
Lt Ft Frame Rail Z
Max = 1678.49 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



VTV TEST #1

Max = 192.31 Gs @ 35.88 msec
 Min = .00 Gs @ -20.28 msec

Lt FT Frame Res

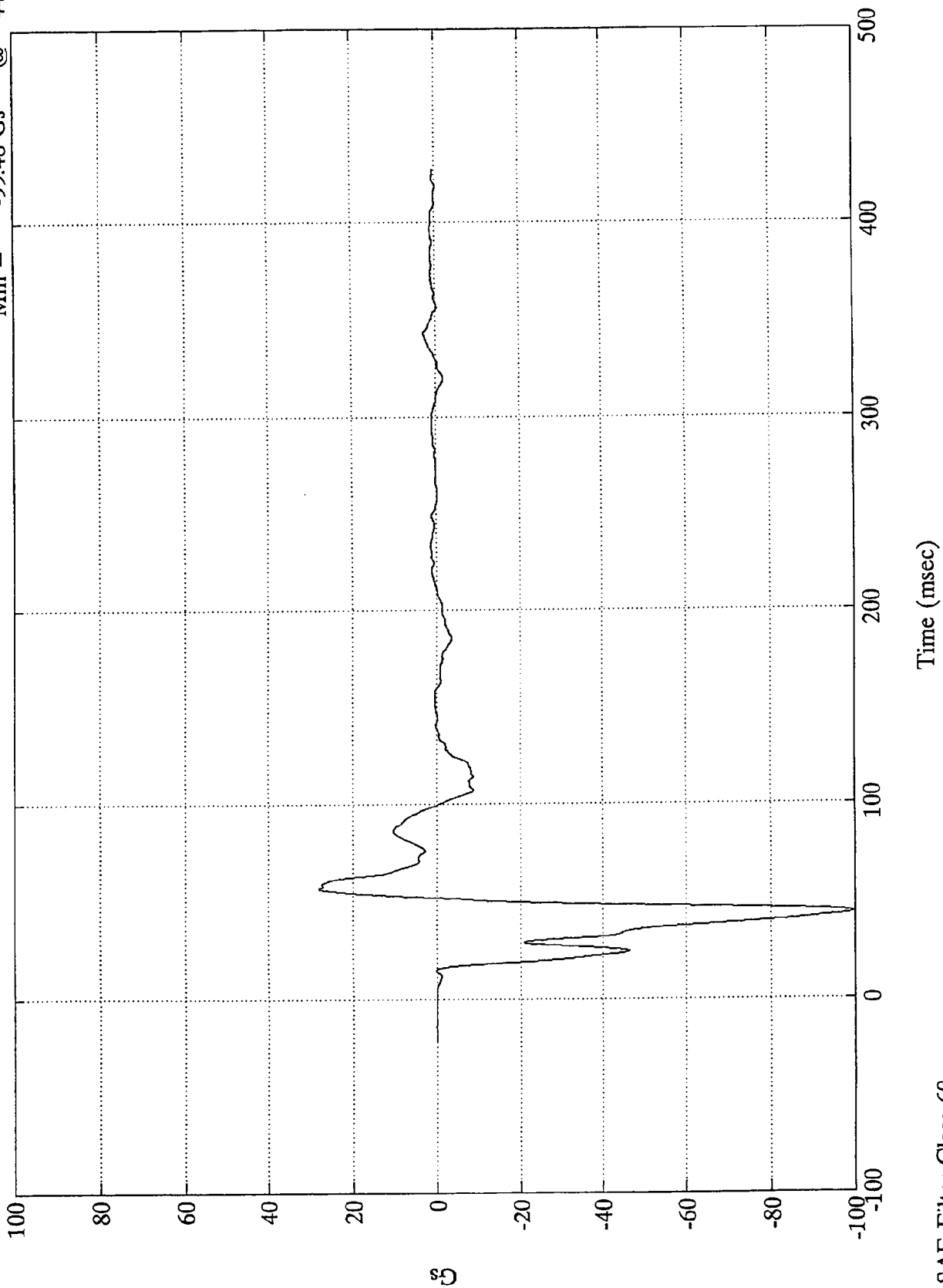


Time (msec)

SAE Filter Class 60

VTV TEST #1

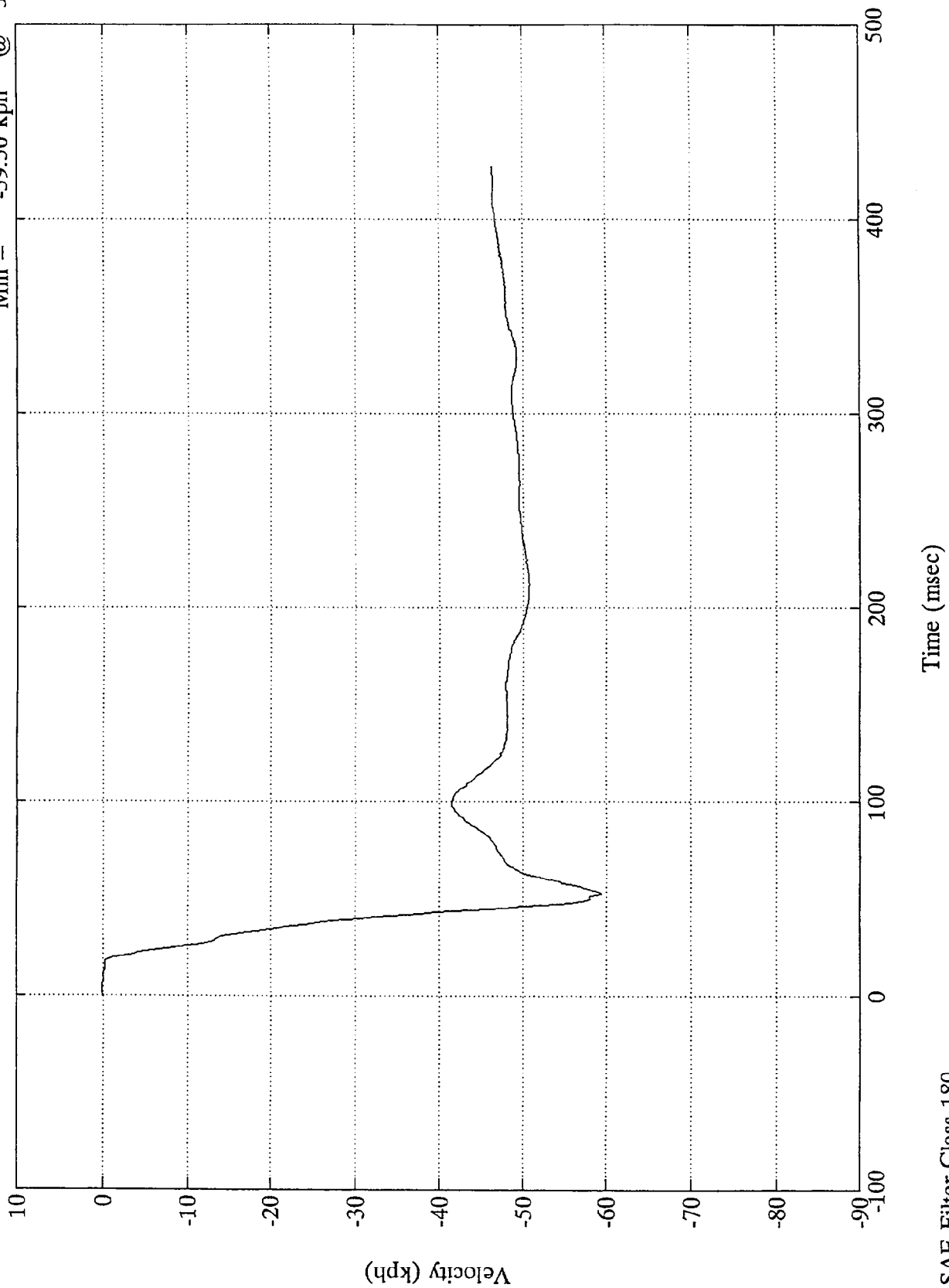
Rt Engine X Max = 27.82 Gs @ 56.88 msec
Min = -99.48 Gs @ 44.15 msec



SAE Filter Class 60

VTV TEST #1

Rt Engine X
Max = .01 kph @ 5.99 msec
Min = -59.50 kph @ 52.20 msec

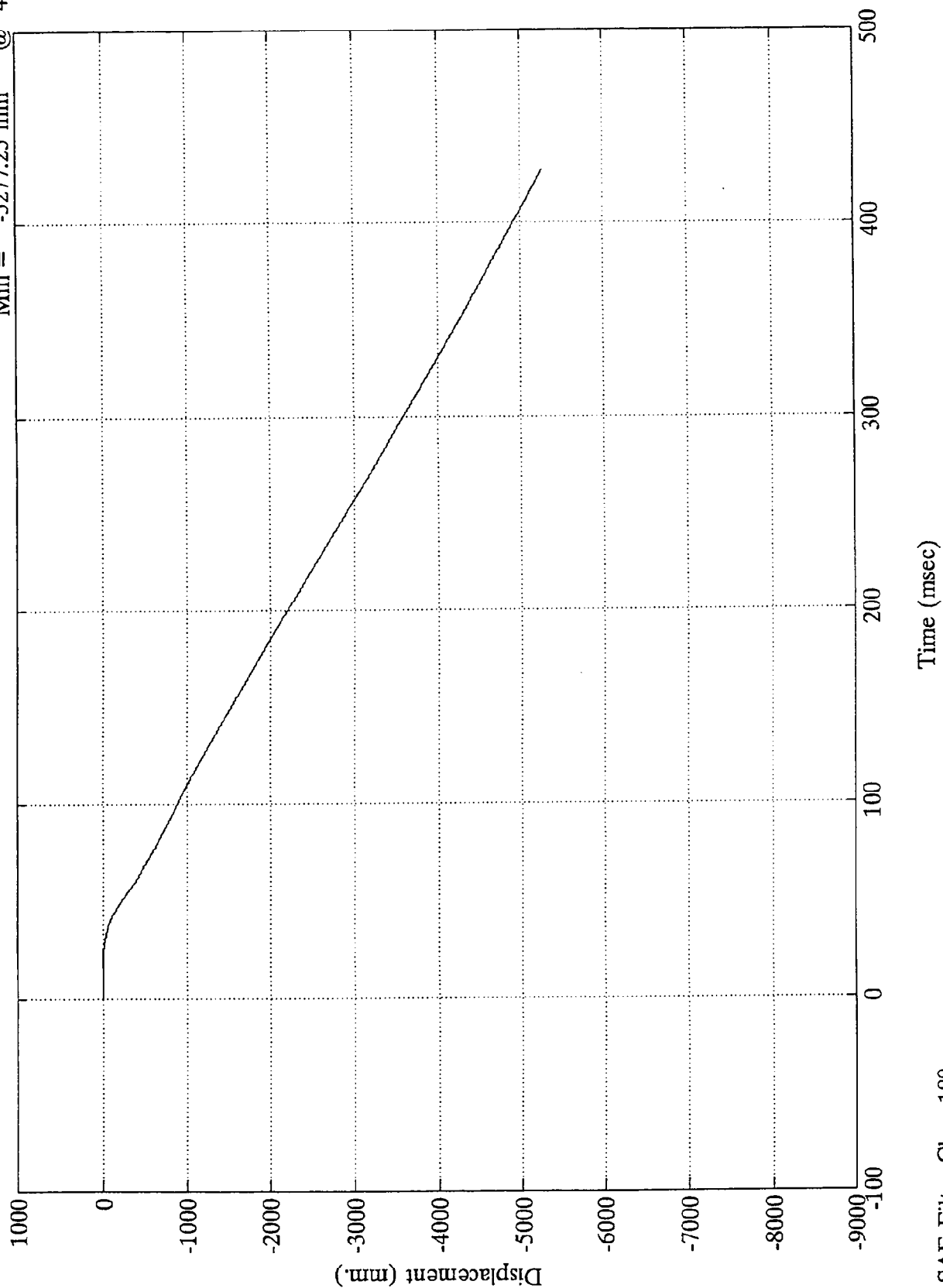


SAE Filter Class 180

VTV TEST #1

Rt Engine X

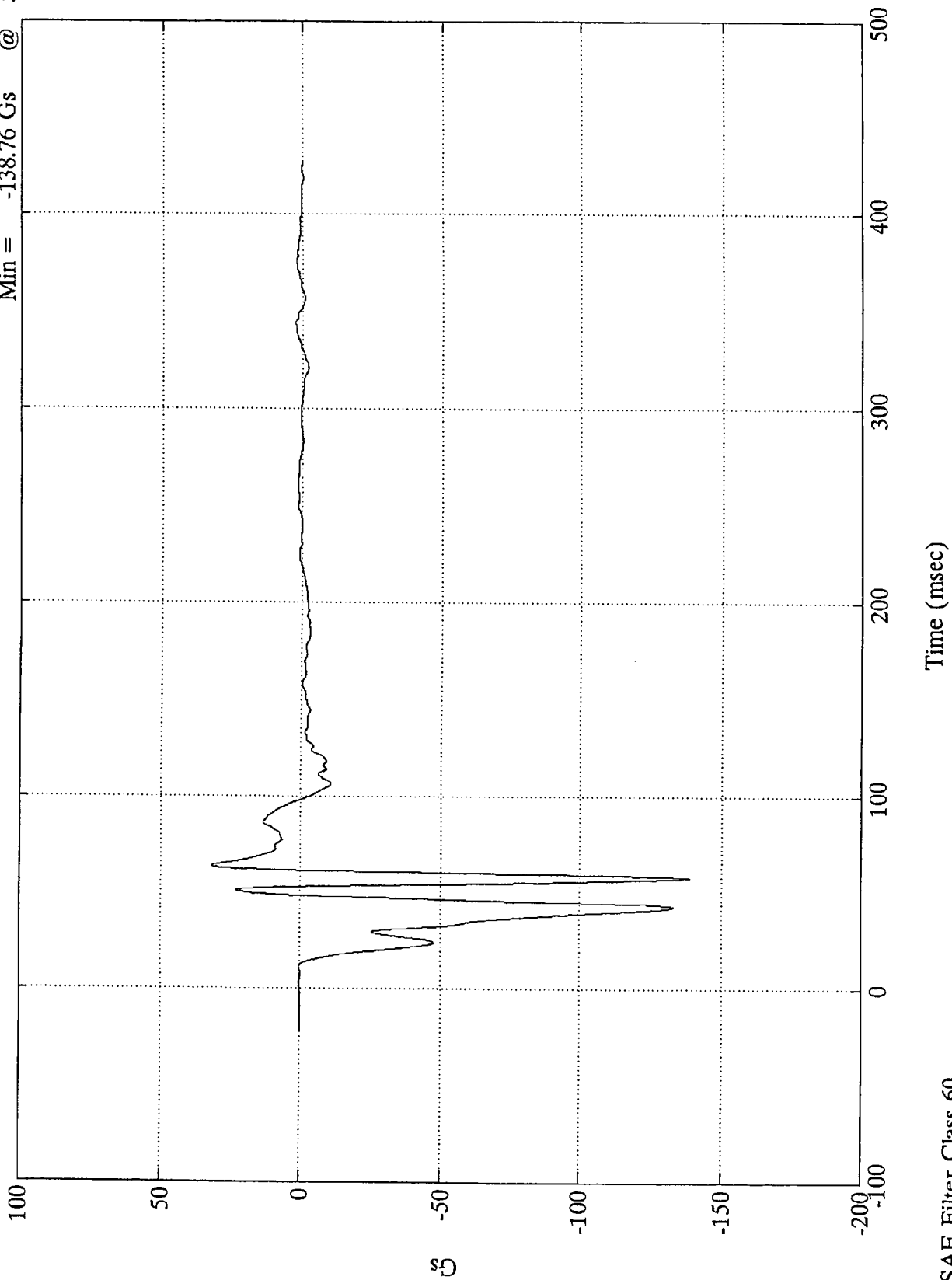
Max = .02 mm @ 7.19 msec
Min = -5277.25 mm @ 427.32 msec



VTV TEST #1

Lt Engine X

Max = 31.93 Gs @ 63.23 msec
Min = -138.76 Gs @ 57.60 msec

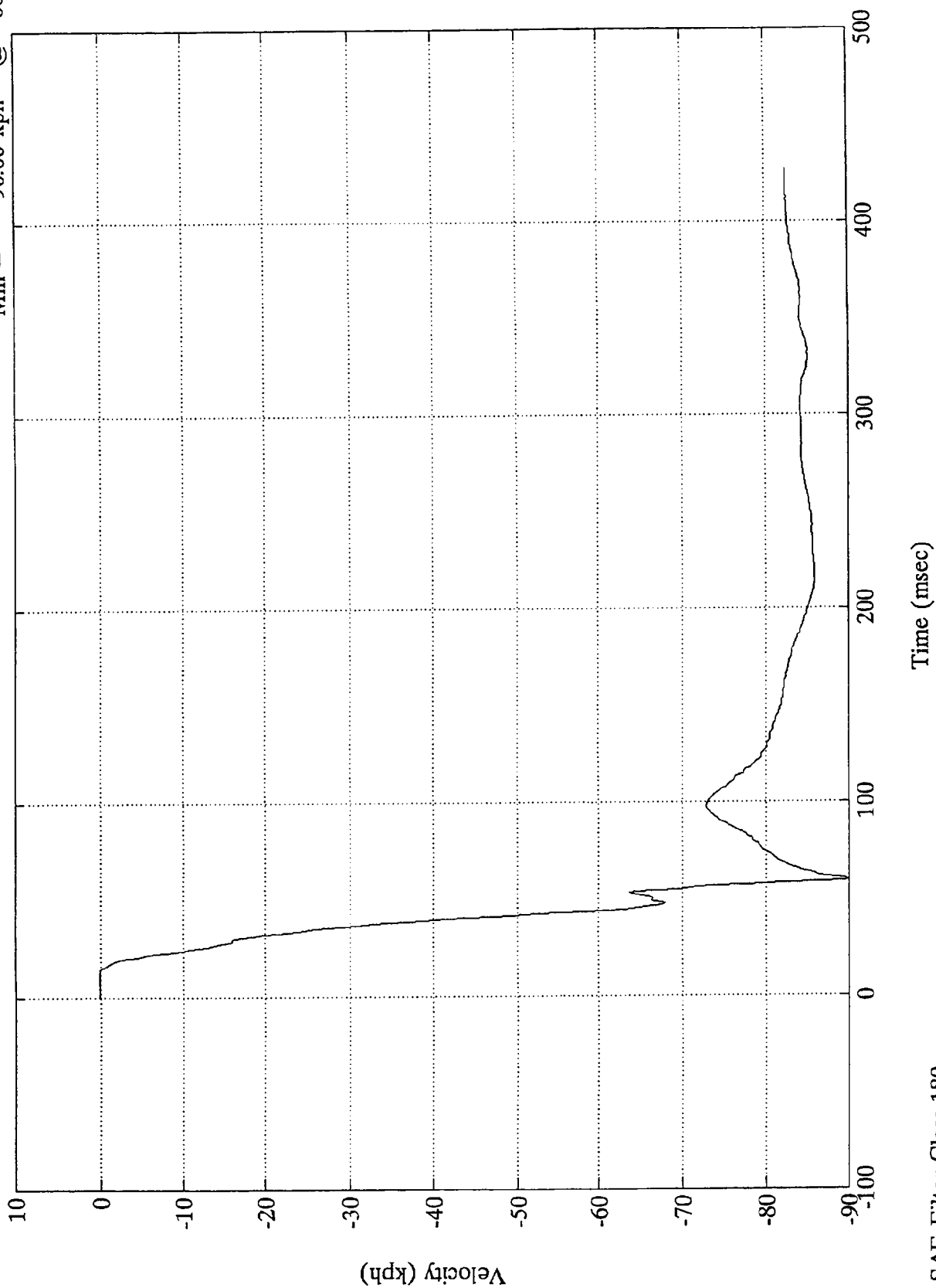


SAE Filter Class 60

VTV TEST #1

Lt Engine X

Max = .07 kph @ 9.47 msec
Min = -90.00 kph @ 60.00 msec

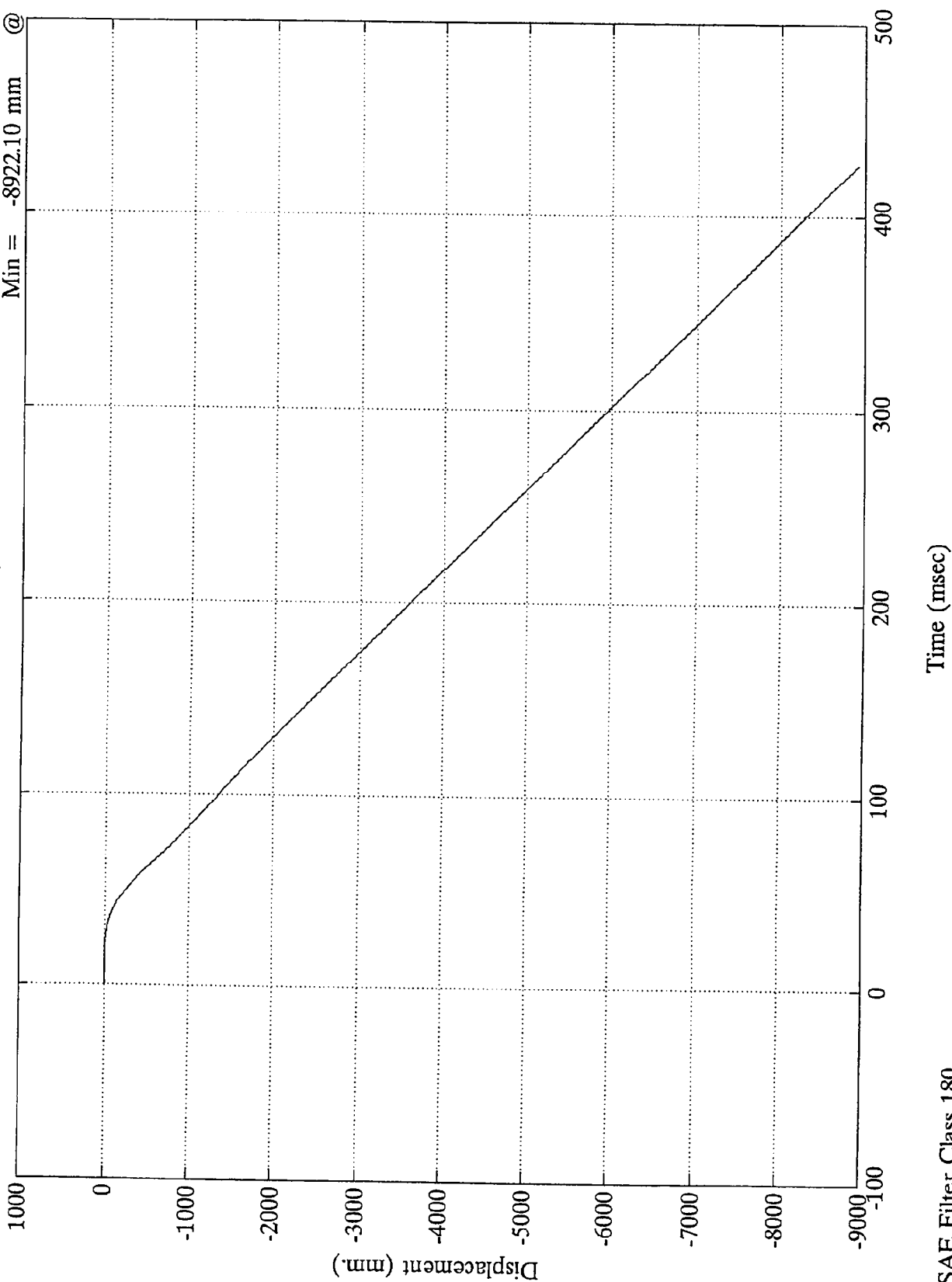


SAE Filter Class 180

VTV TEST #1

Lt Engine X

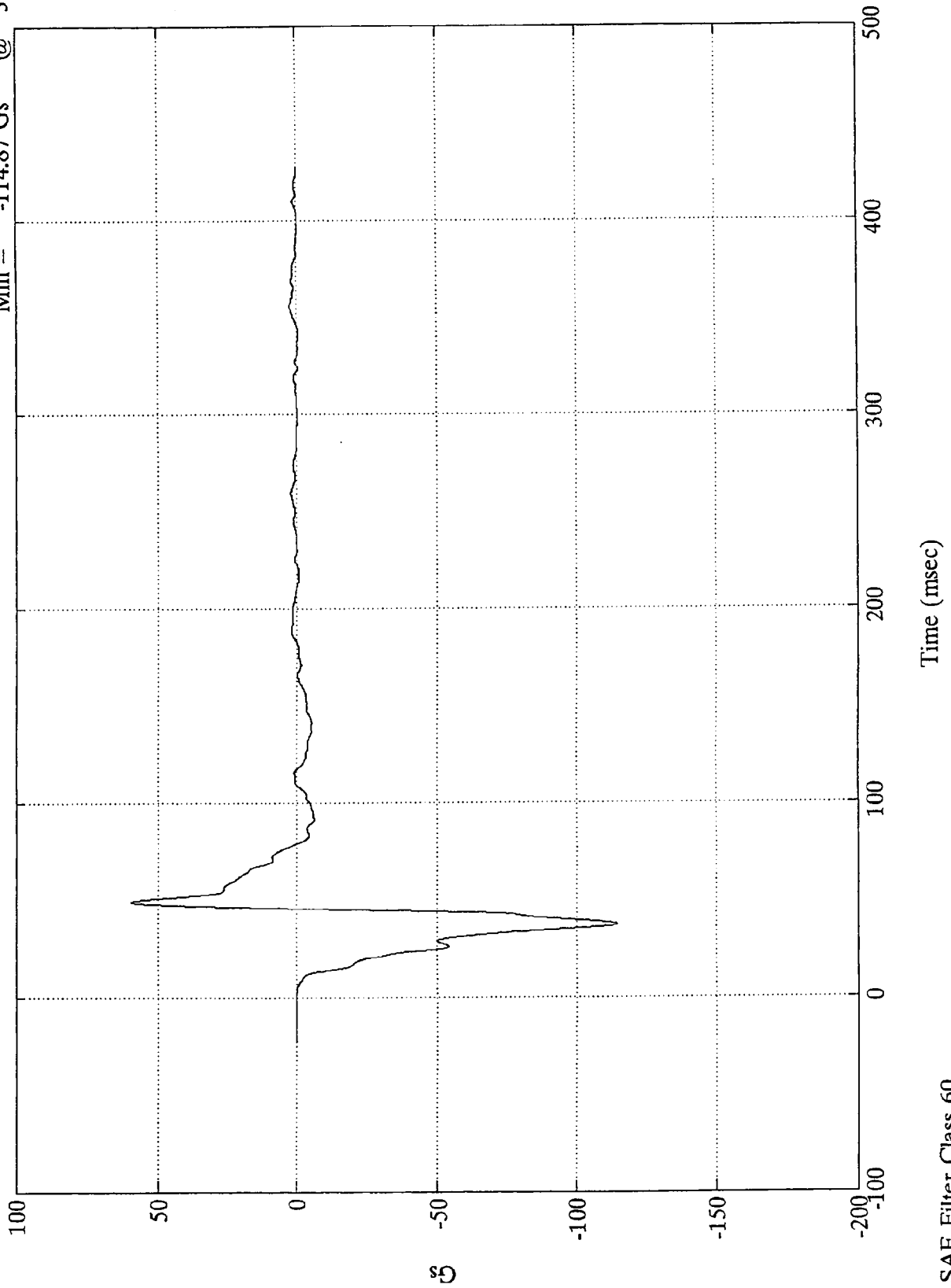
Max = .19 mm @ 14.75 msec
Min = -8922.10 mm @ 427.32 msec



SAE Filter Class 180

VTV TEST #1

Engine Bottom X
Max = 59.53 Gs @ 49.43 msec
Min = -114.87 Gs @ 37.44 msec

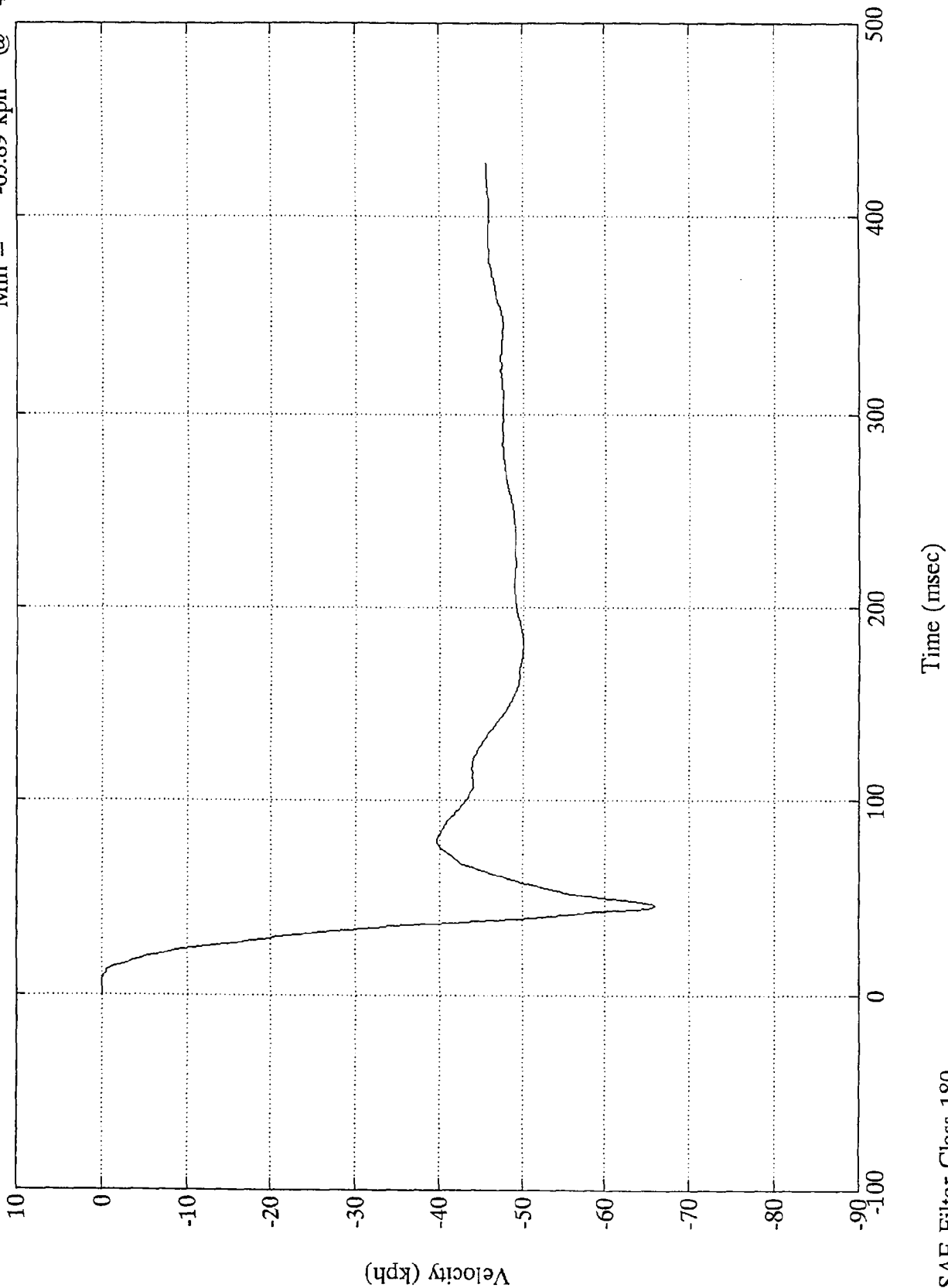


SAE Filter Class 60

VTV TEST #1

Max = .00 kph @ 2.75 msec
Min = -65.89 kph @ 45.71 msec

Engine Bottom X

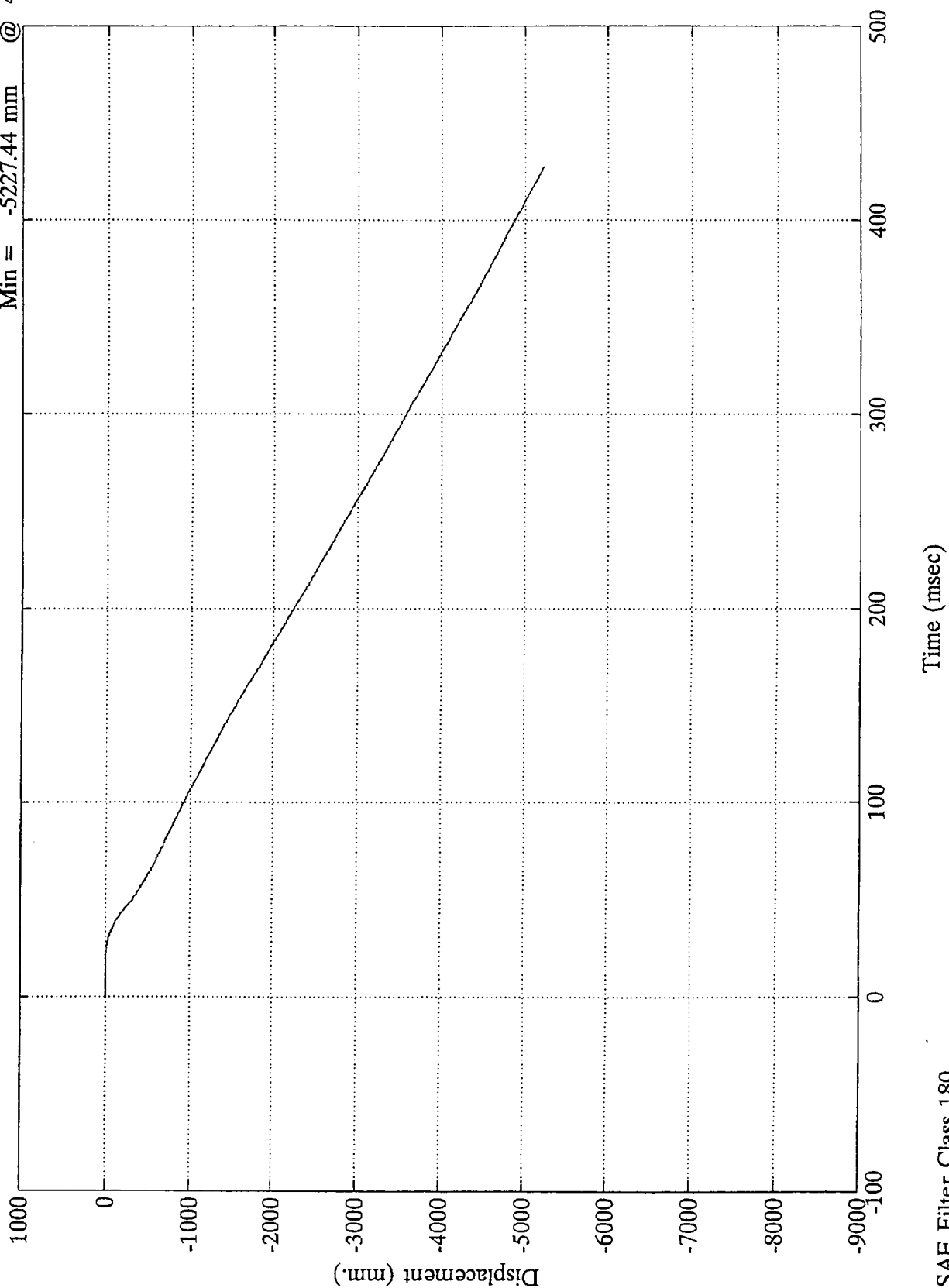


SAE Filter Class 180

VTV TEST #1

Engine Bottom X

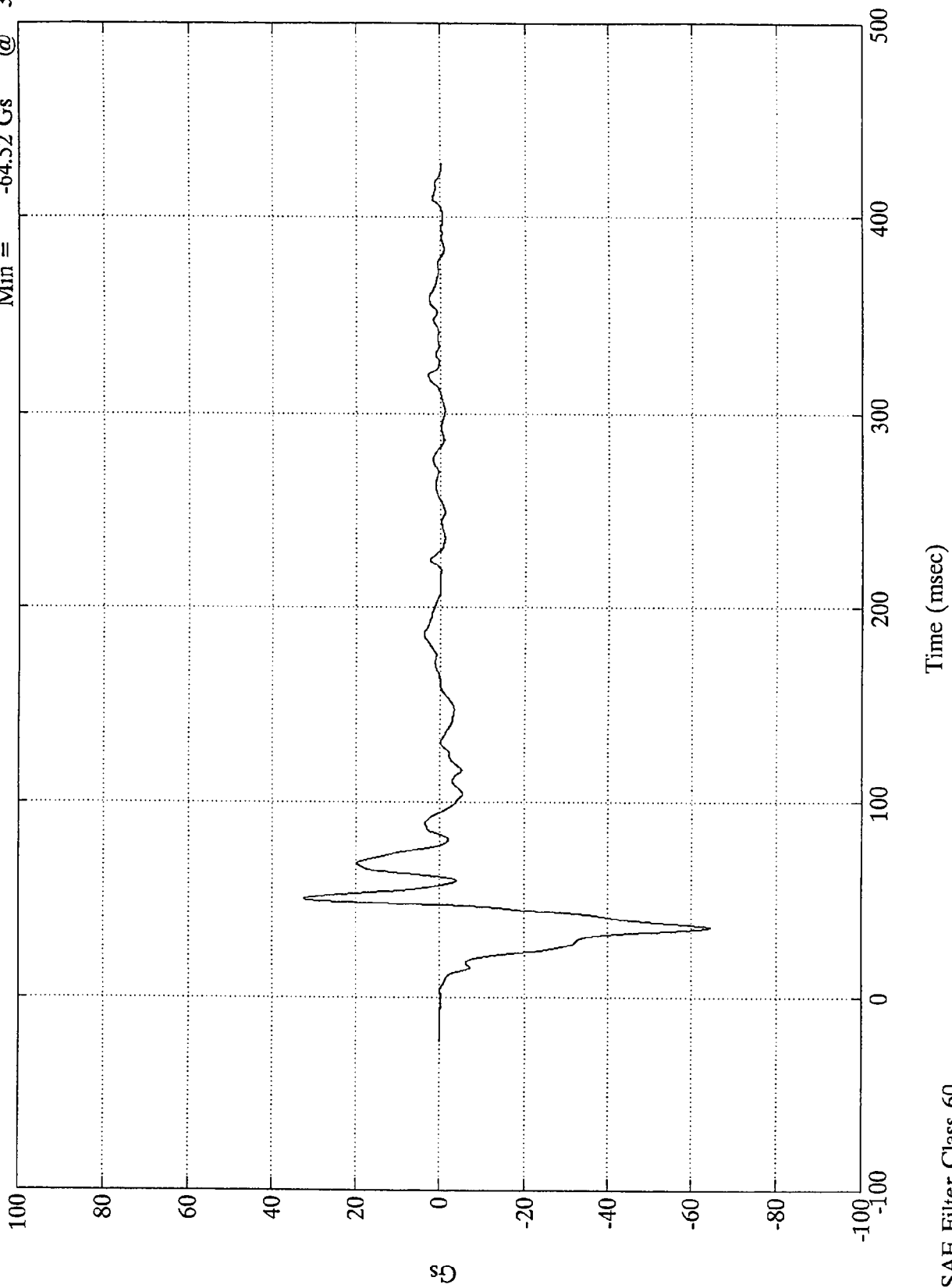
Max = .00 mm @ 3.23 msec
Min = -5227.44 mm @ 427.32 msec



SAE Filter Class 180

VTV TEST #1

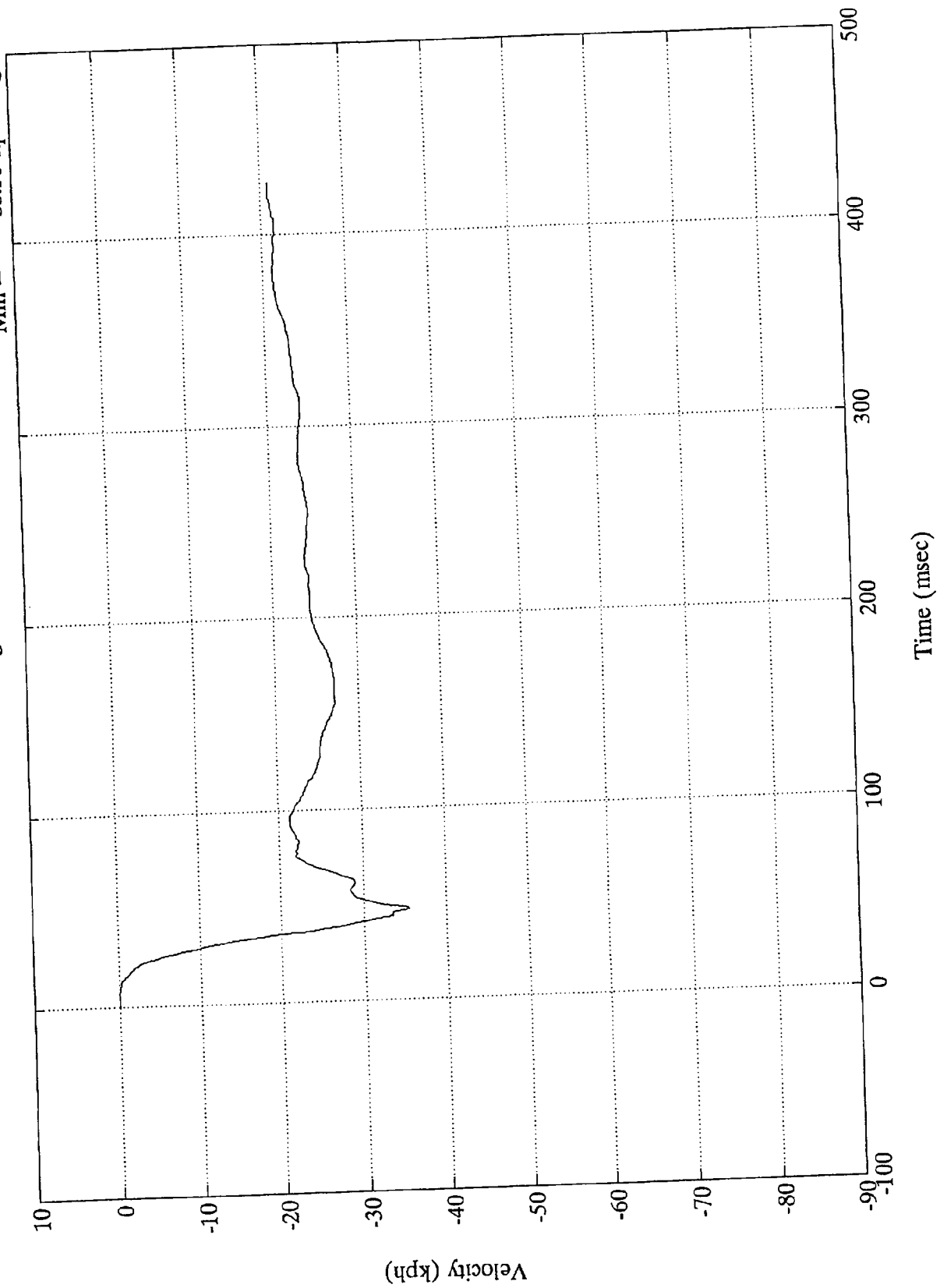
Engine Bottom Y Max = 32.45 Gs @ 50.16 msec
Min = -64.52 Gs @ 36.24 msec



VTV TEST #1

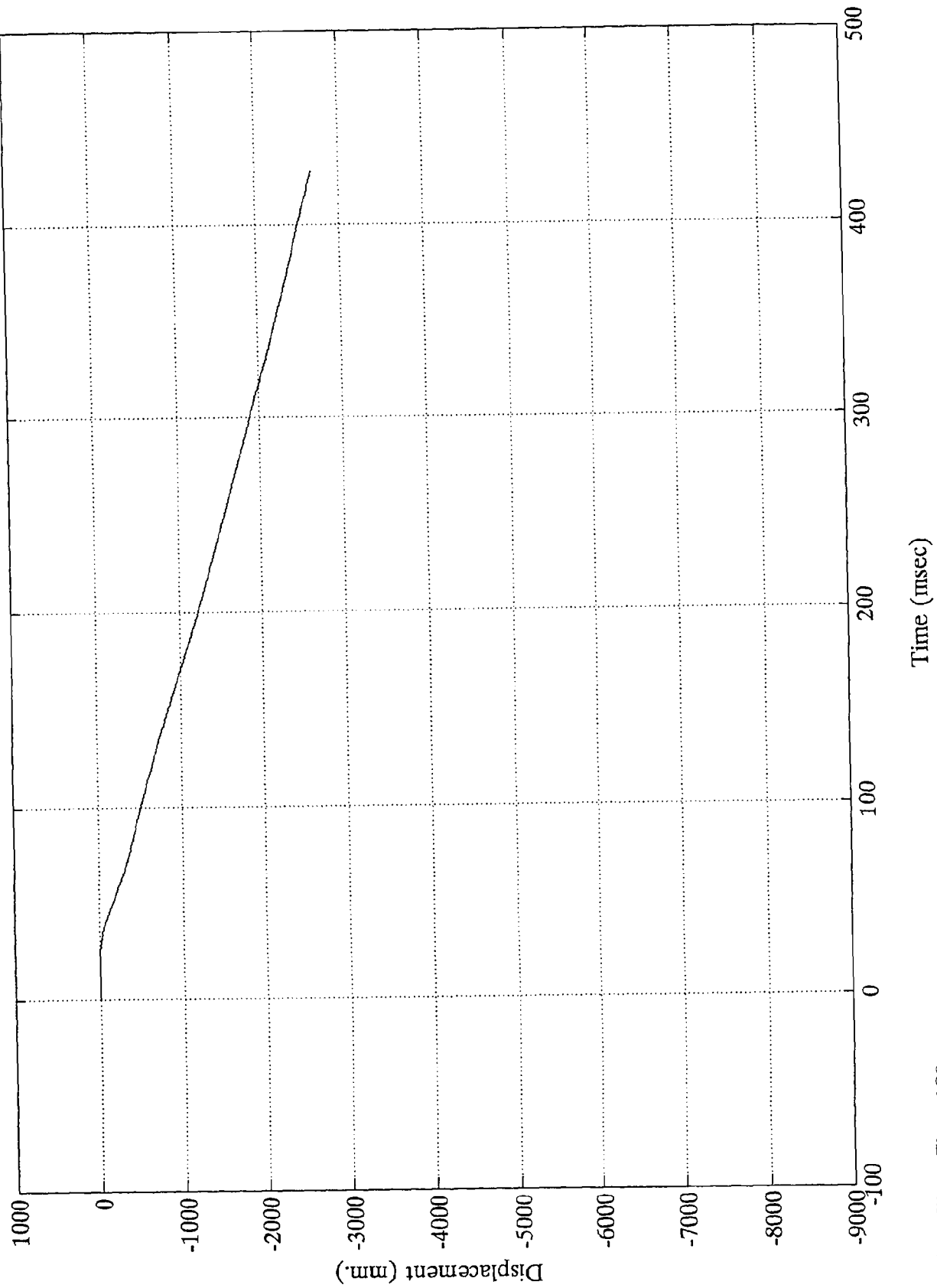
Engine Bottom Y

Max = .00 kph @ -0.00 msec
Min = -35.58 kph @ 47.63 msec



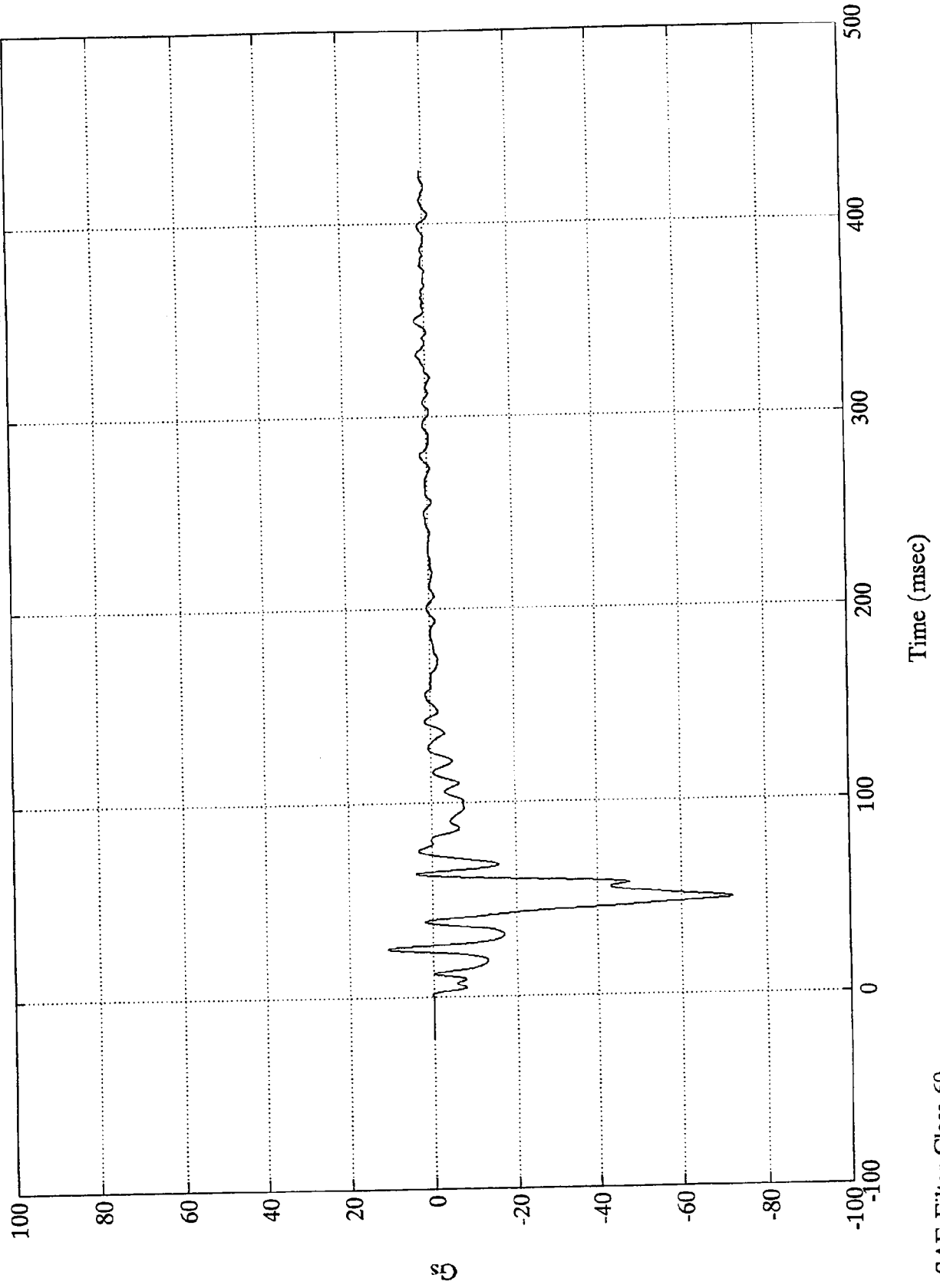
VTV TEST #1

Engine Bottom Y
Max = .00 mm @ -0.00 msec
Min = -2665.77 mm @ 427.32 msec



VTV TEST #1

Rt Shock Tower X
Max = 10.87 Gs @ 25.44 msec
Min = -71.91 Gs @ 49.68 msec



Gs

Time (msec)

SAE Filter Class 60

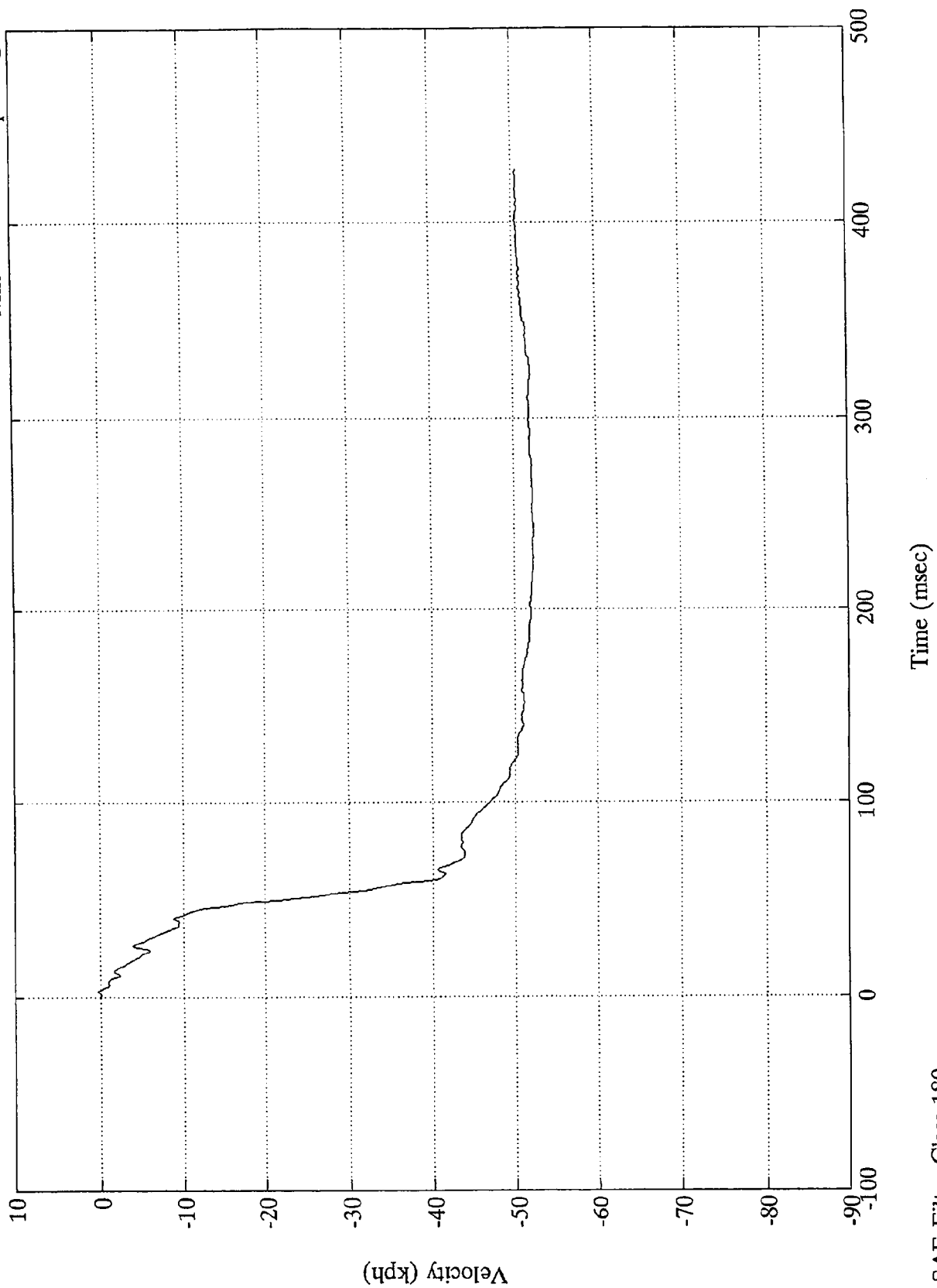
B-45

8304-1

VTV TEST #1

Max = .26 kph @ 3.11 msec
Min = -52.41 kph @ 242.16 msec

Rt Shock Tower X

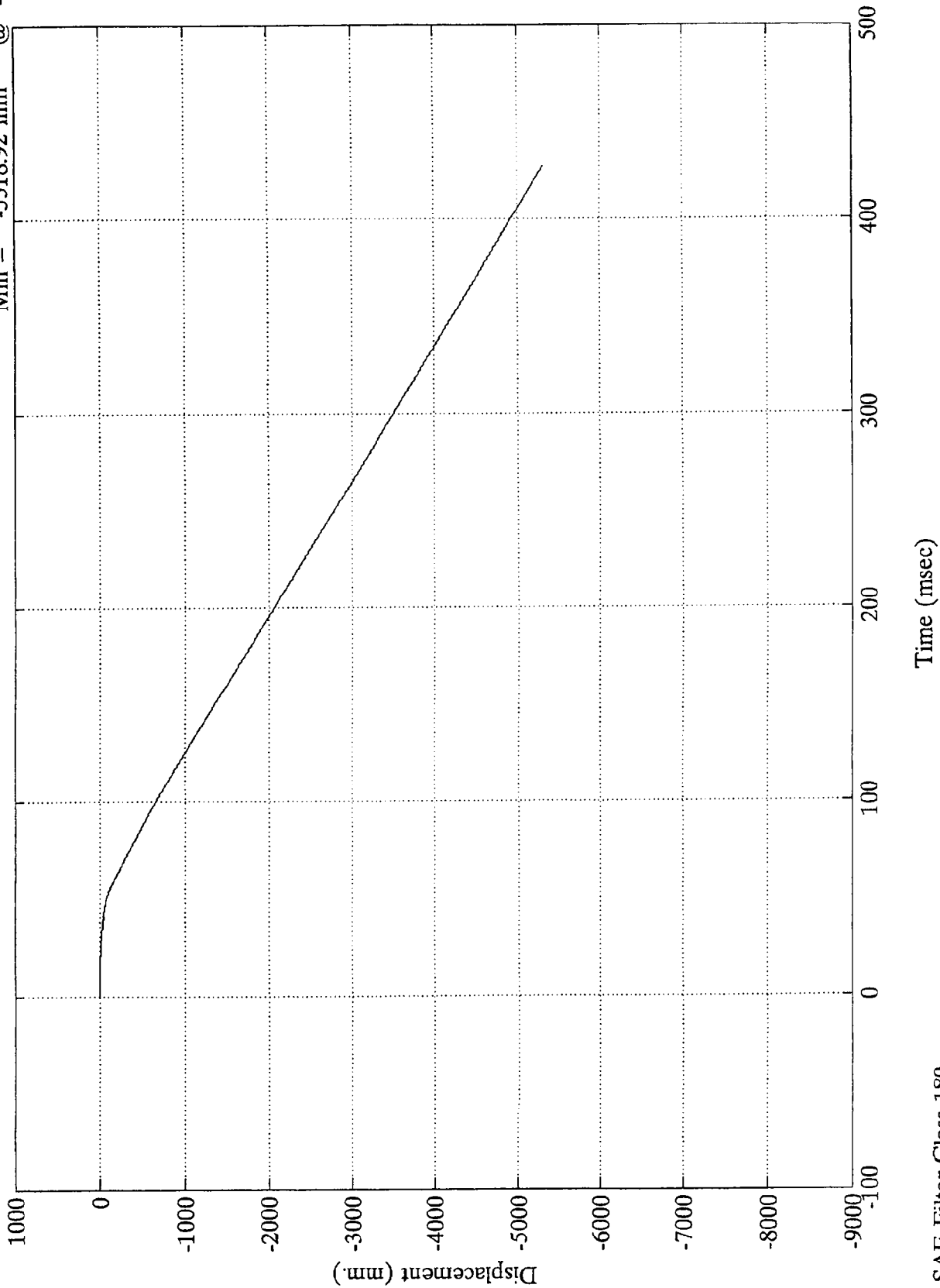


SAE Filter Class 180

VTV TEST #1

Max = .04 mm @ 3.95 msec
Min = -5318.92 mm @ 427.32 msec

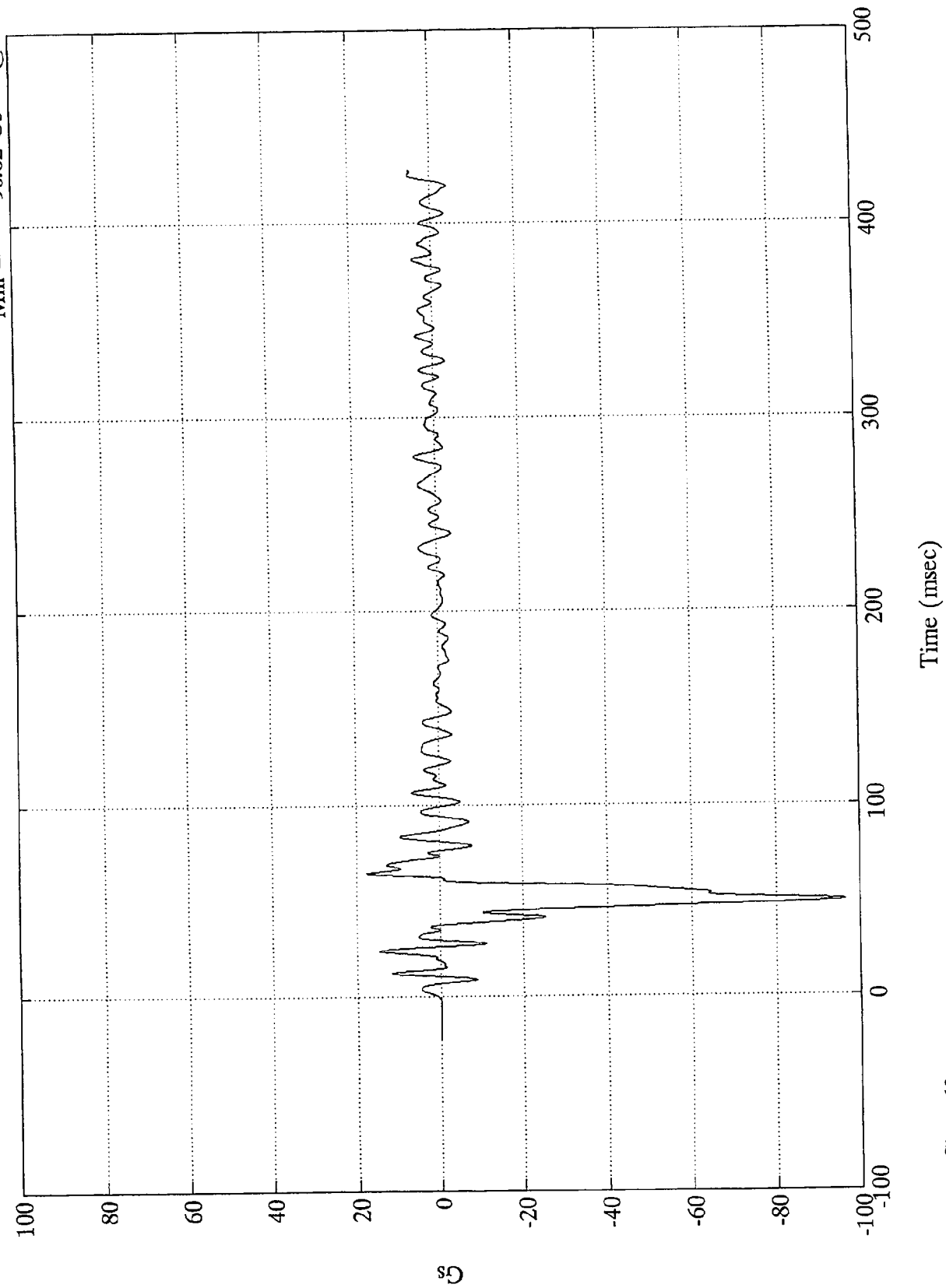
Rt Shock Tower X



SAE Filter Class 180

VTV TEST #1

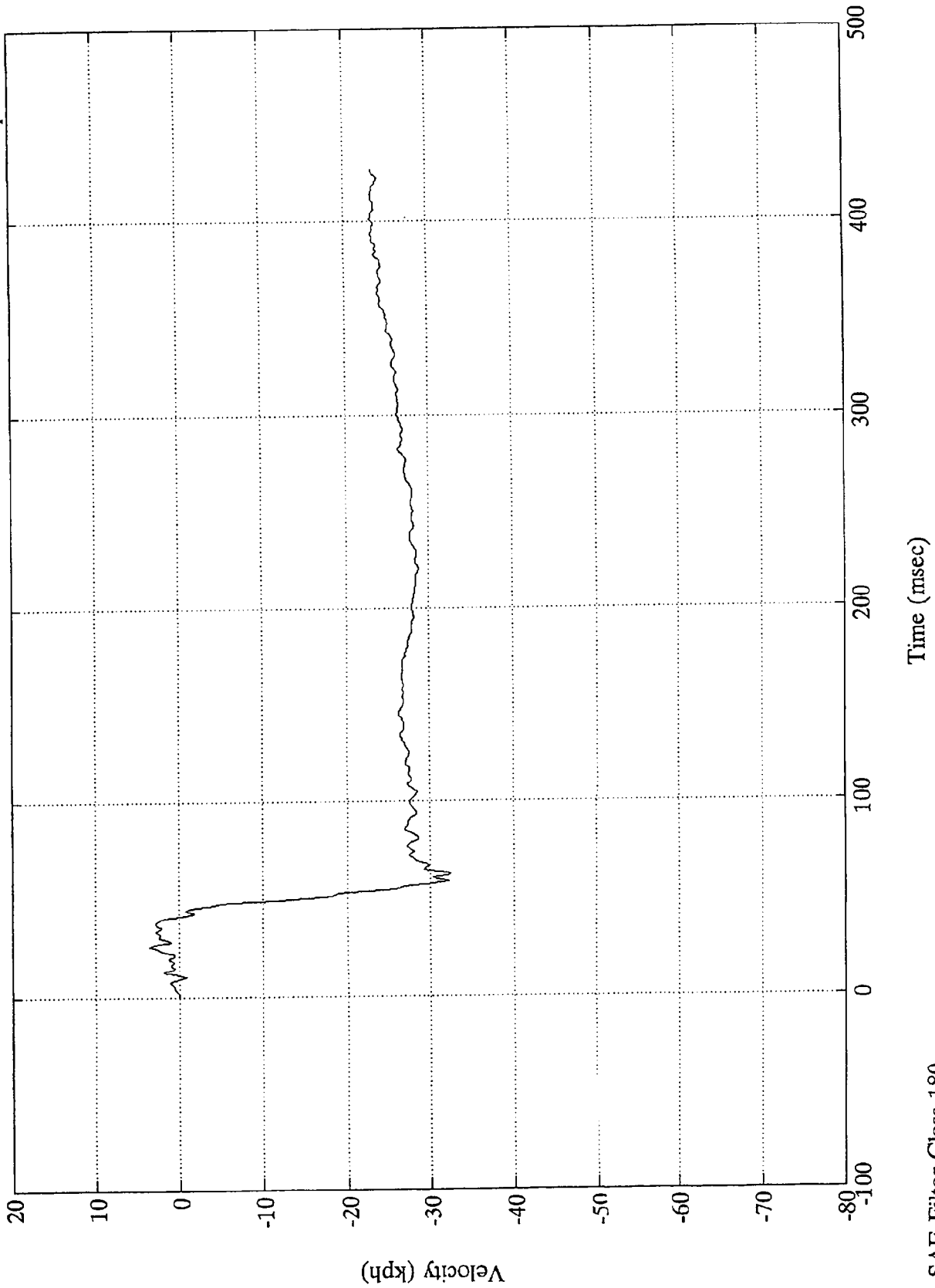
Rt Shock Tower Y
Max = 17.59 Gs @ 64.56 msec
Min = -96.62 Gs @ 49.68 msec



SAE Filter Class 60

VTV TEST #1

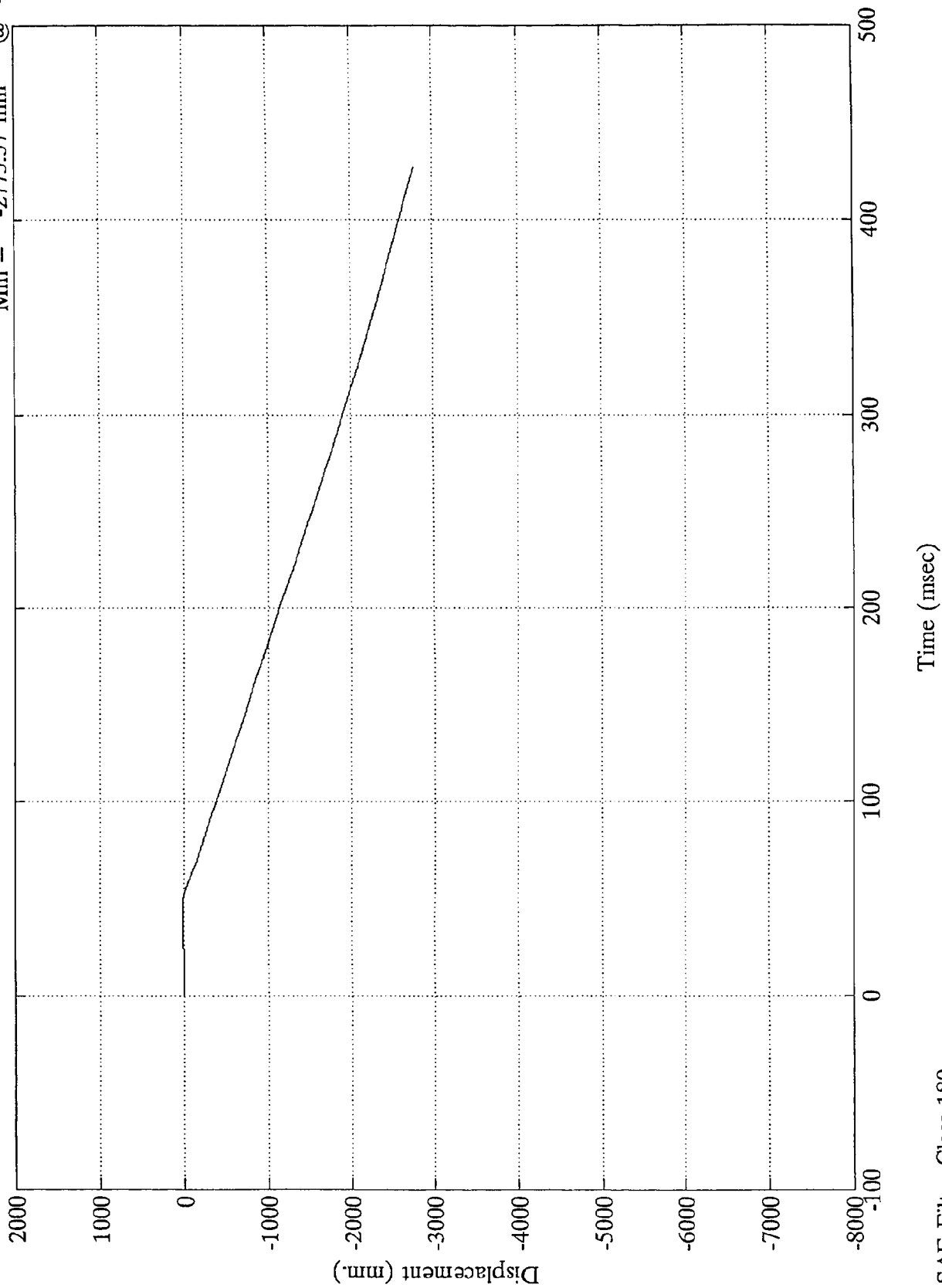
Rt Shock Tower Y
Max = 3.54 kph @ 26.52 msec
Min = -32.51 kph @ 63.12 msec



SAE Filter Class 180

VTV TEST #1

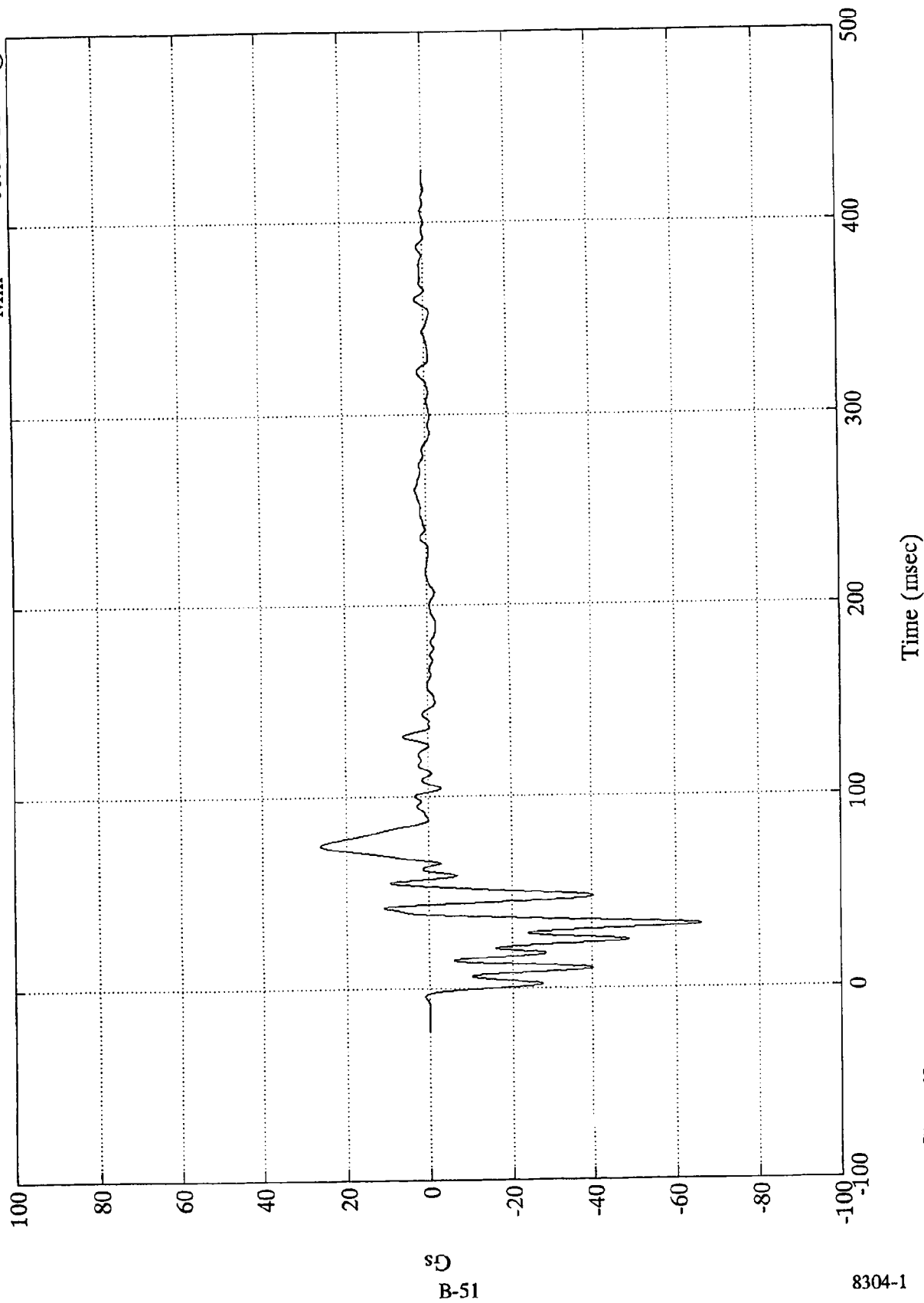
Rt Shock Tower Y
Max = 15.47 mm @ 41.88 msec
Min = -2775.57 mm @ 427.32 msec



VTV TEST #1

Max = 26.10 Gs @ 75.00 msec
Min = -66.03 Gs @ 33.00 msec

Lt Shock Tower X



SAE Filter Class 60

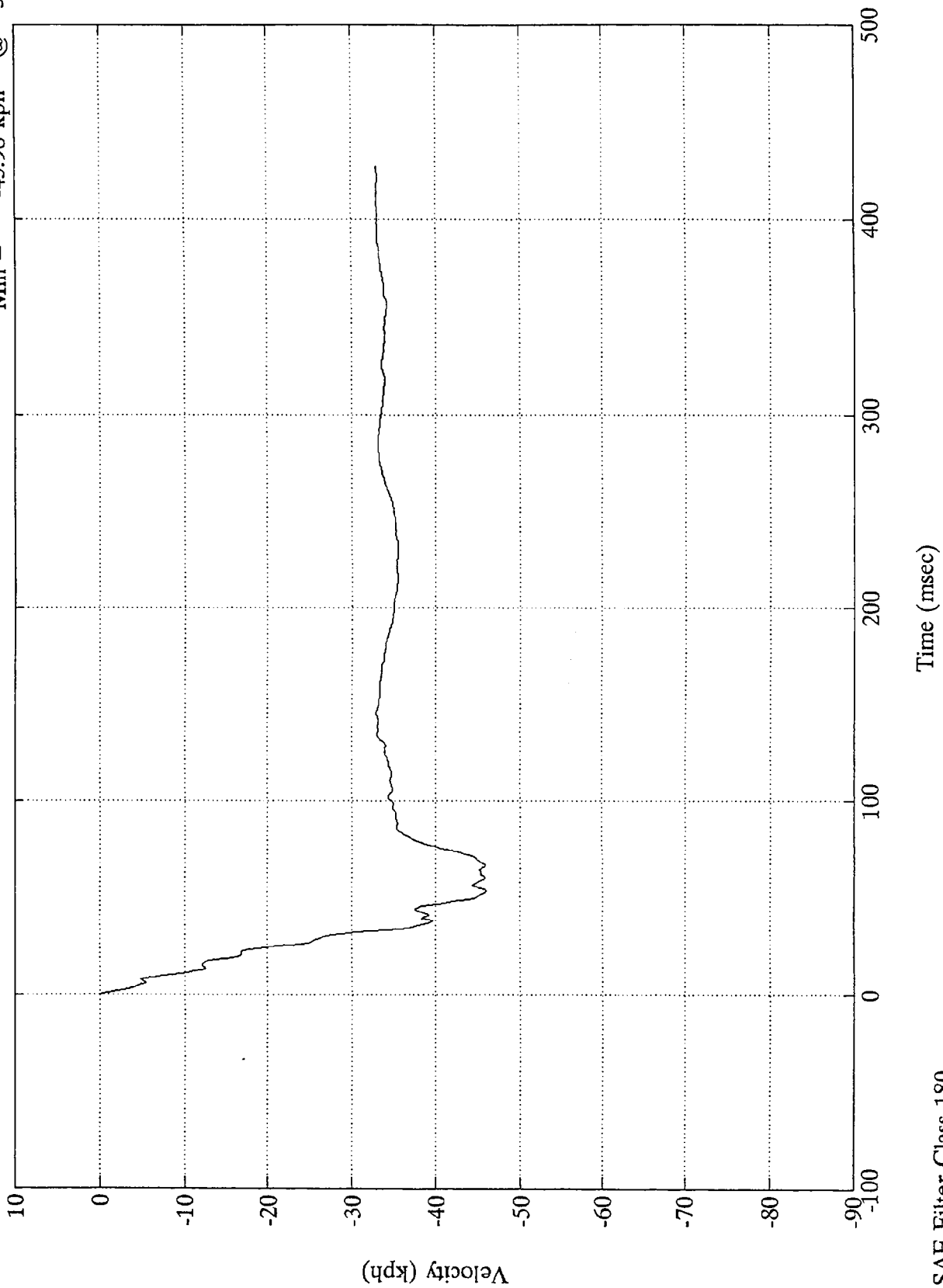
8304-1

B-51

VTV TEST #1

Max = .00 kph @ -0.00 msec
Min = -45.98 kph @ 53.40 msec

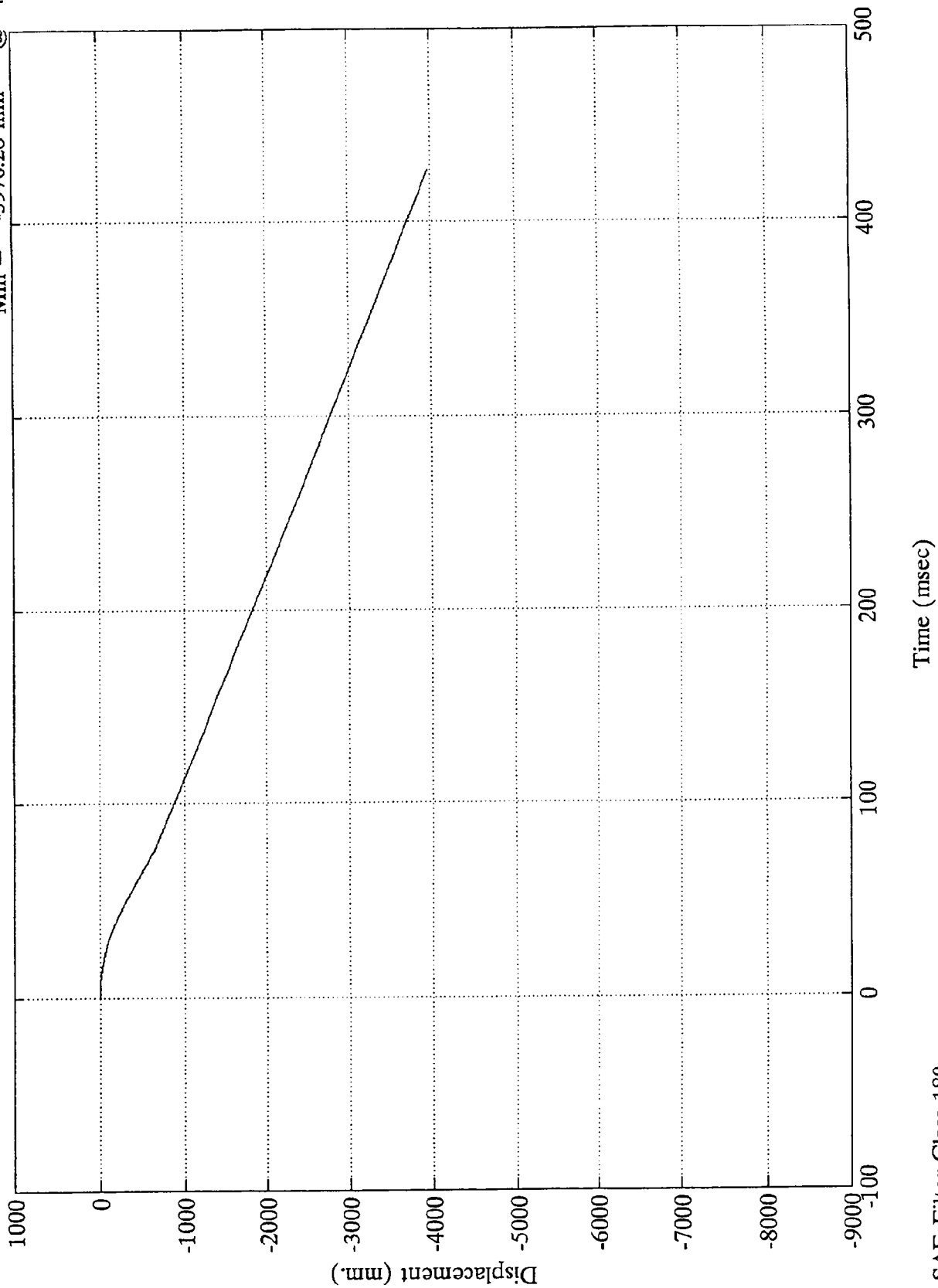
Lt Shock Tower X



VTV TEST #1

Lt Shock Tower X

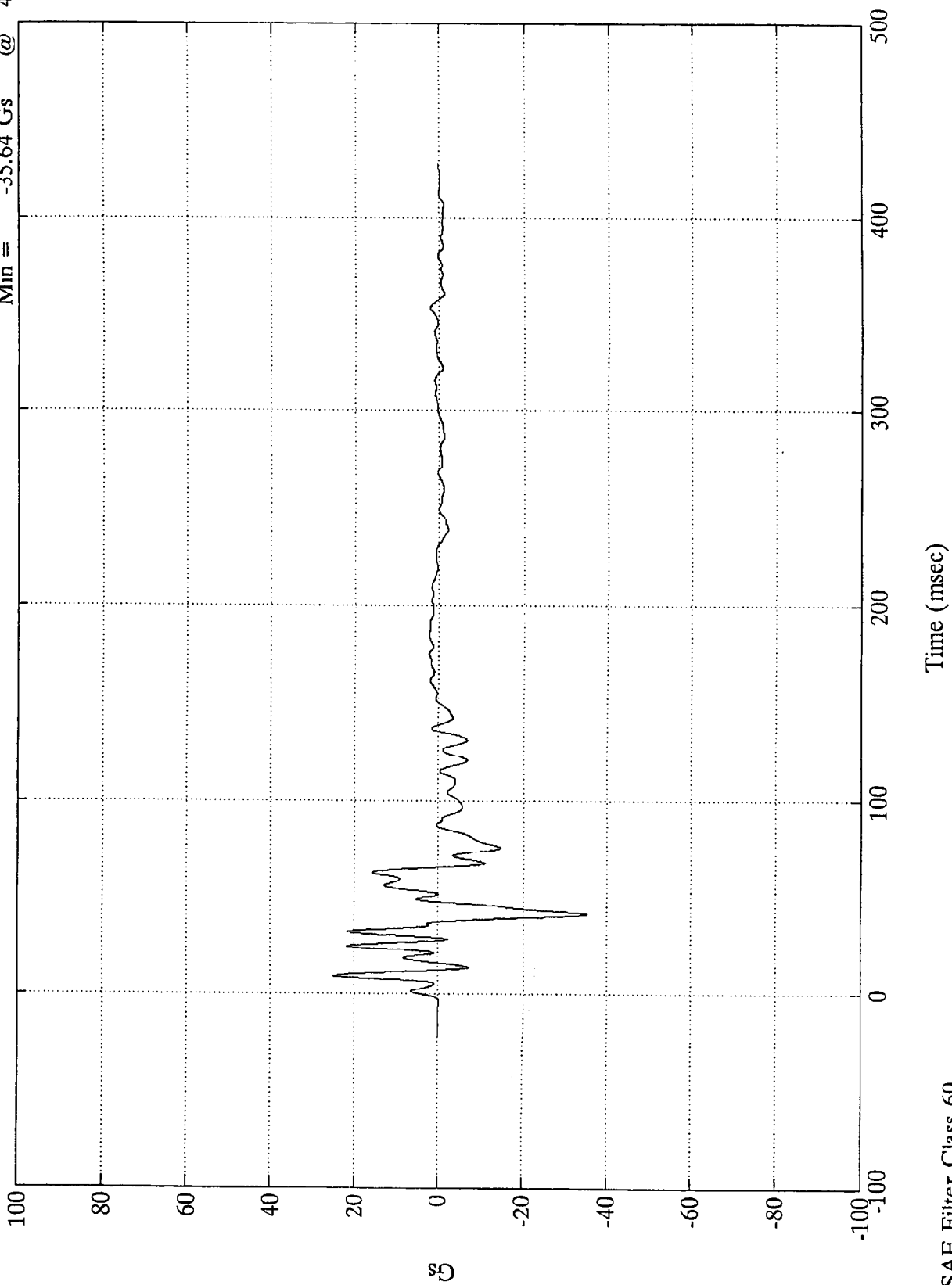
Max = .00 mm @ -0.00 msec
Min = -3970.28 mm @ 427.32 msec



VTV TEST #1

Lt Shock Tower Z

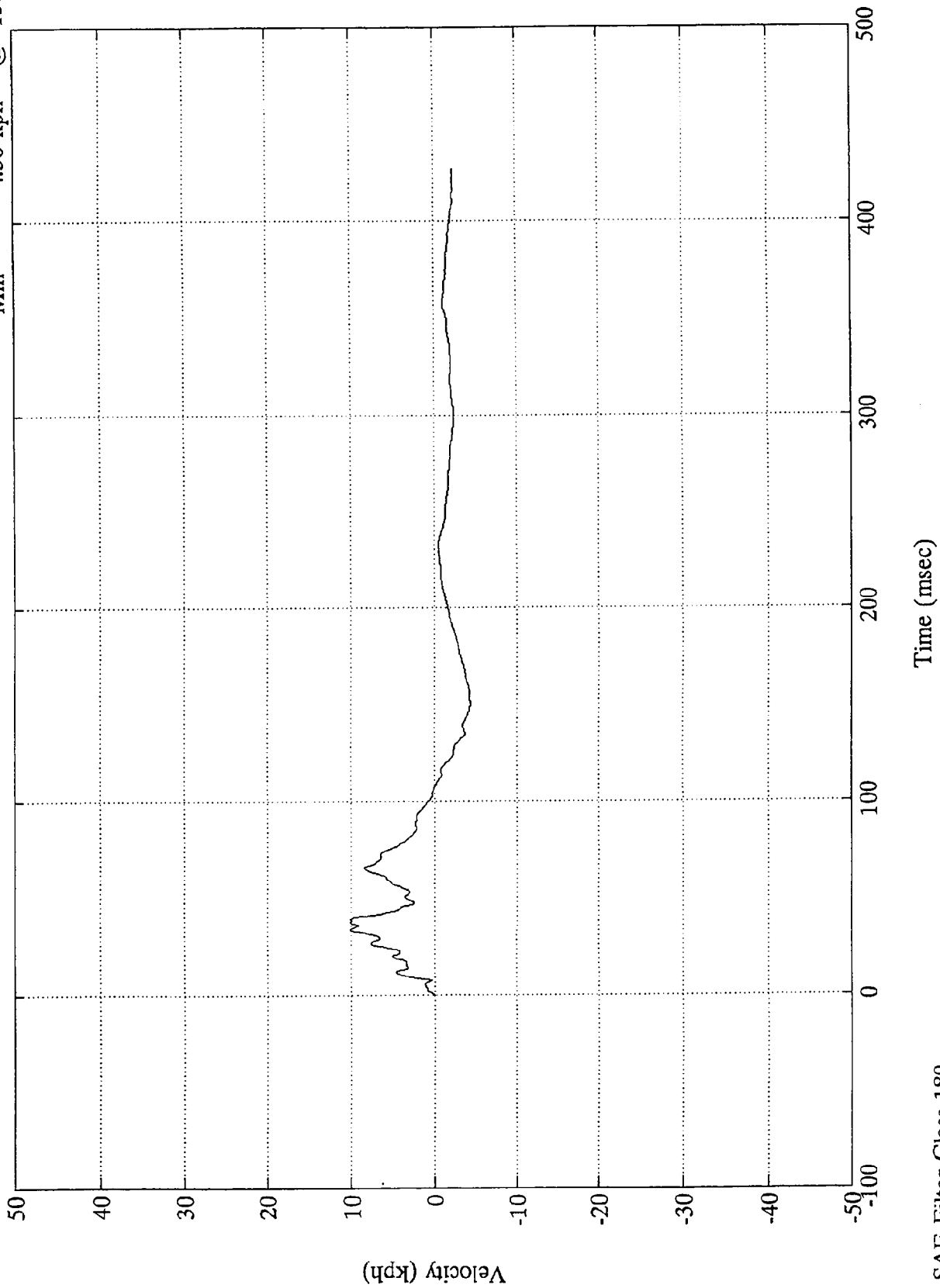
Max =	25.02 Gs	@	9.11 msec
Min =	-35.64 Gs	@	41.88 msec



VTV TEST #1

Max = 10.11 kph @ 37.80 msec
Min = -4.36 kph @ 150.72 msec

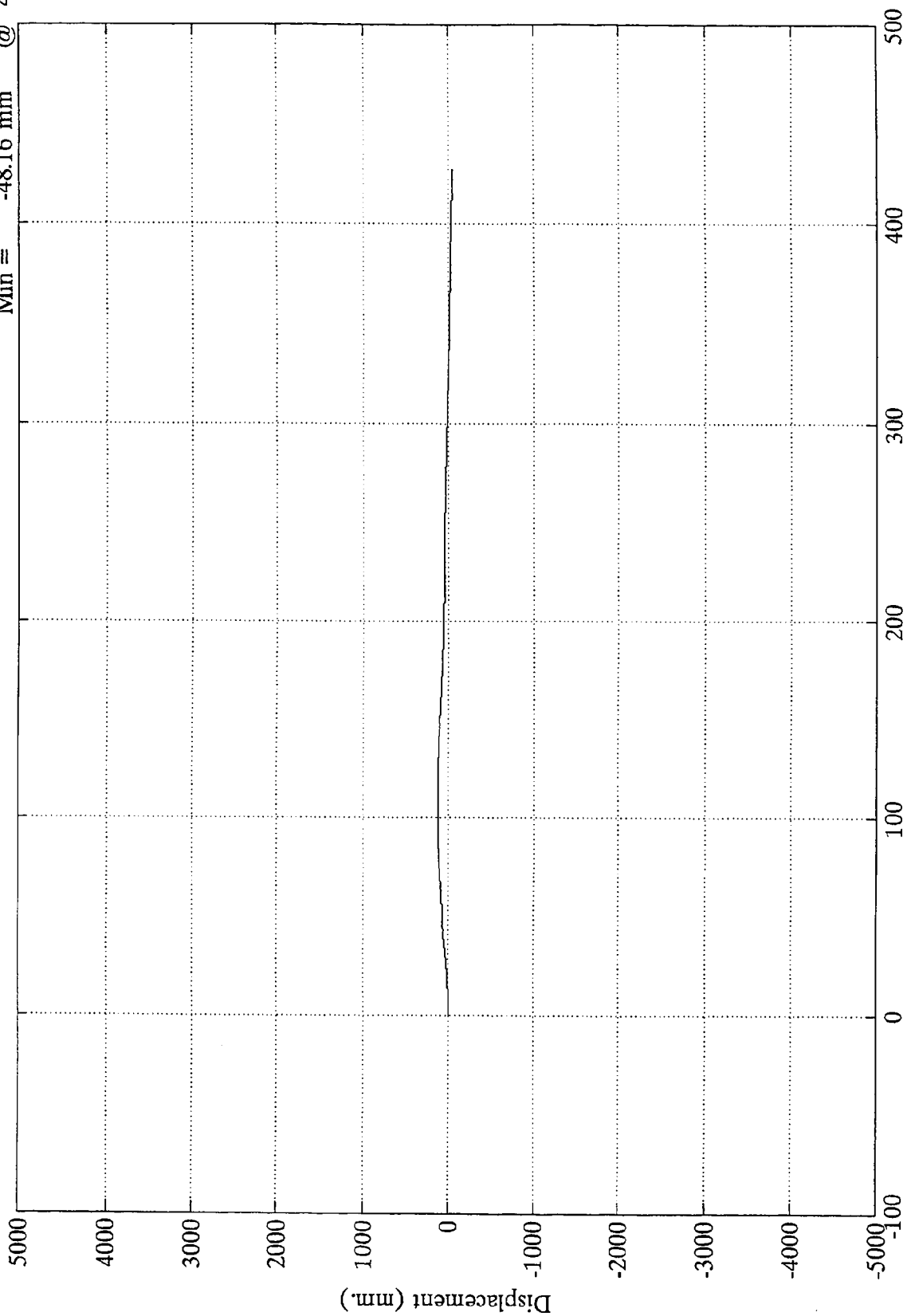
Lt Shock Tower Z



VTV TEST #1

Max = 127.32 mm @ 107.40 msec
Min = -48.16 mm @ 427.32 msec

Lt Shock Tower Z



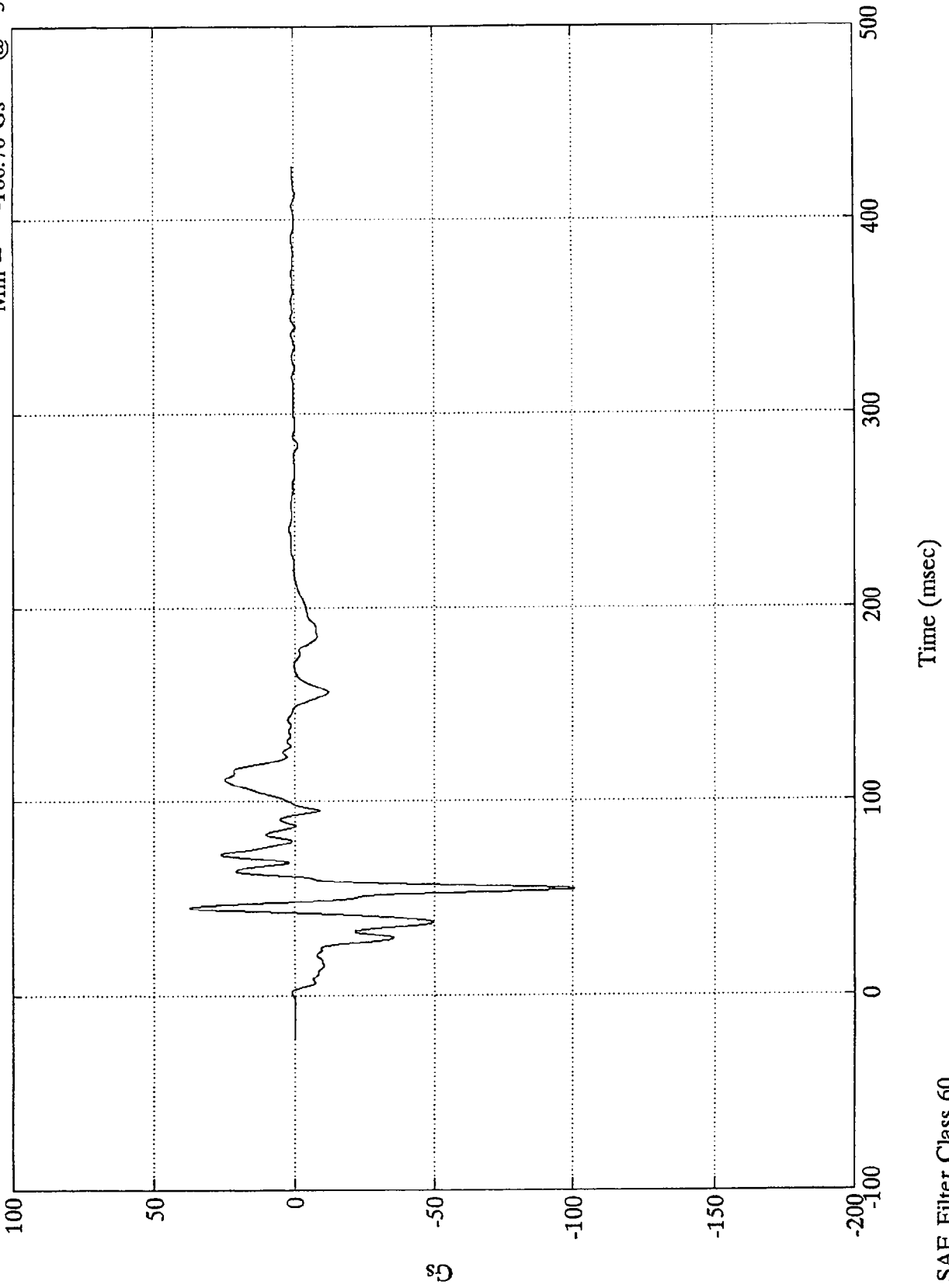
Time (msec)

SAE Filter Class 180

VTV TEST #1

Brake Pedal X

Max = 37.19 Gs @ 45.24 msec
Min = -100.70 Gs @ 54.47 msec

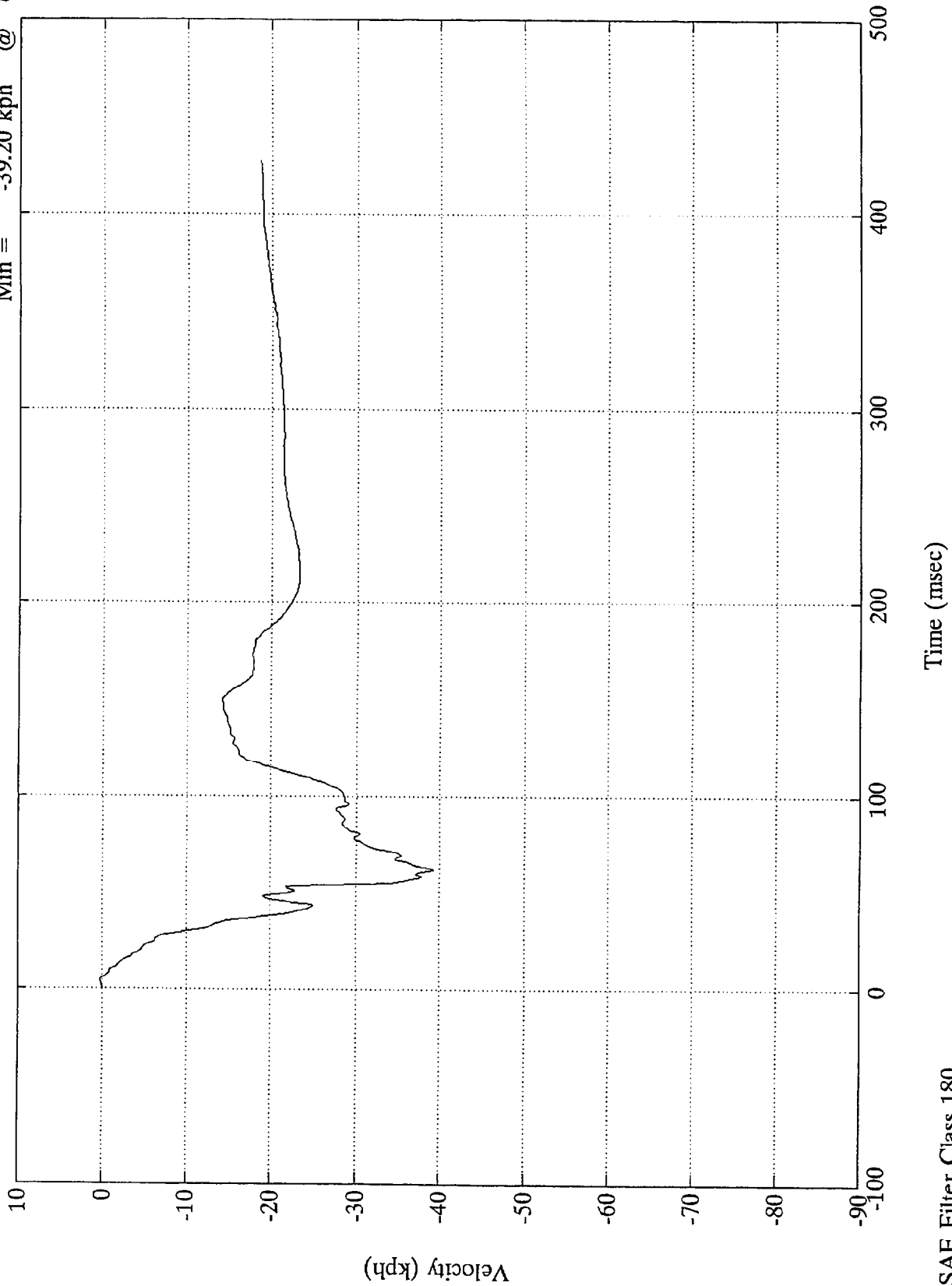


SAE Filter Class 60

VTV TEST #1

Max = .19 kph @ 4.31 msec
Min = -39.20 kph @ 61.92 msec

Brake Pedal X

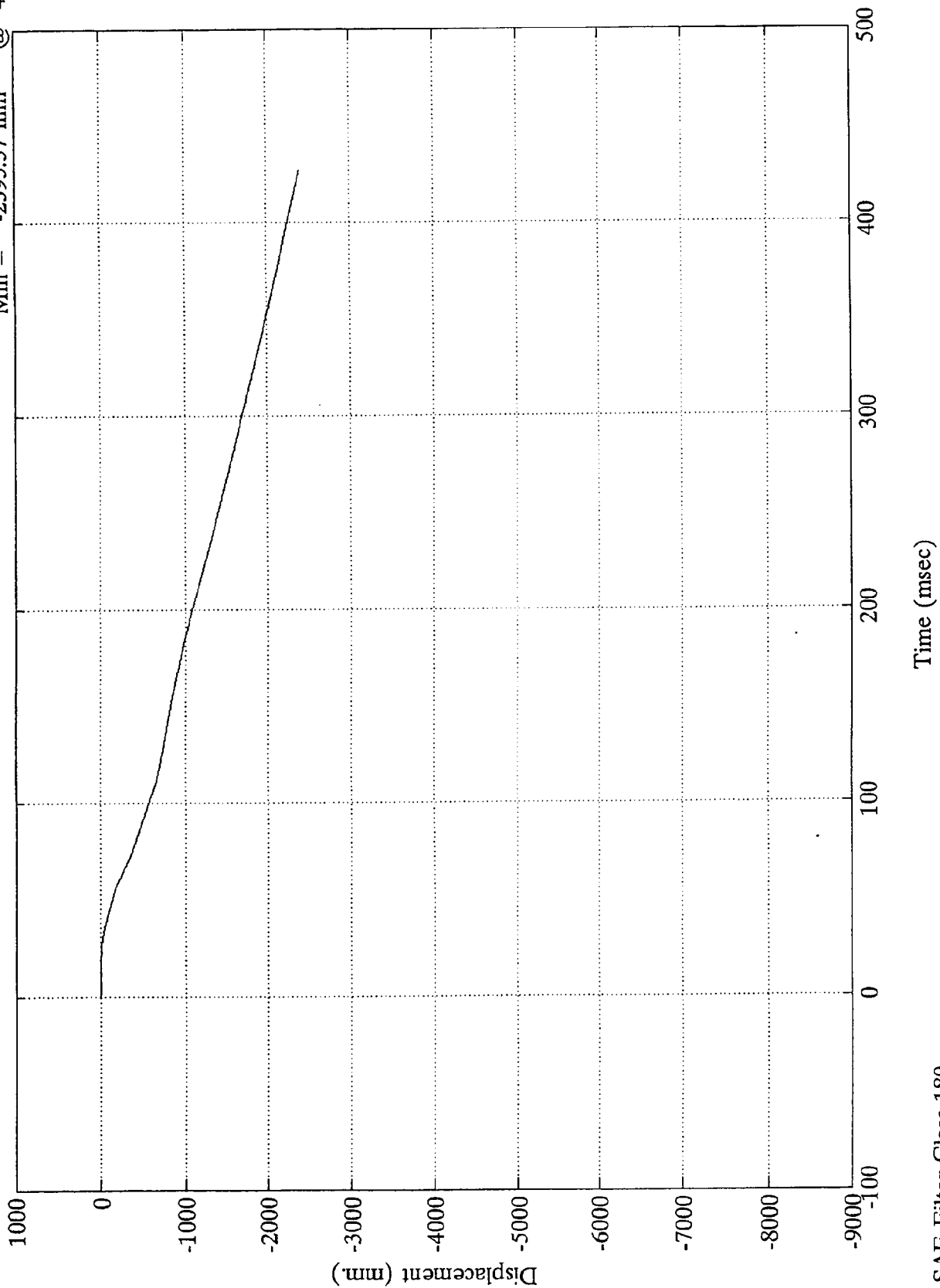


SAE Filter Class 180

VTV TEST #1

Max = .12 mm @ 5.39 msec
Min = -2395.57 mm @ 427.32 msec

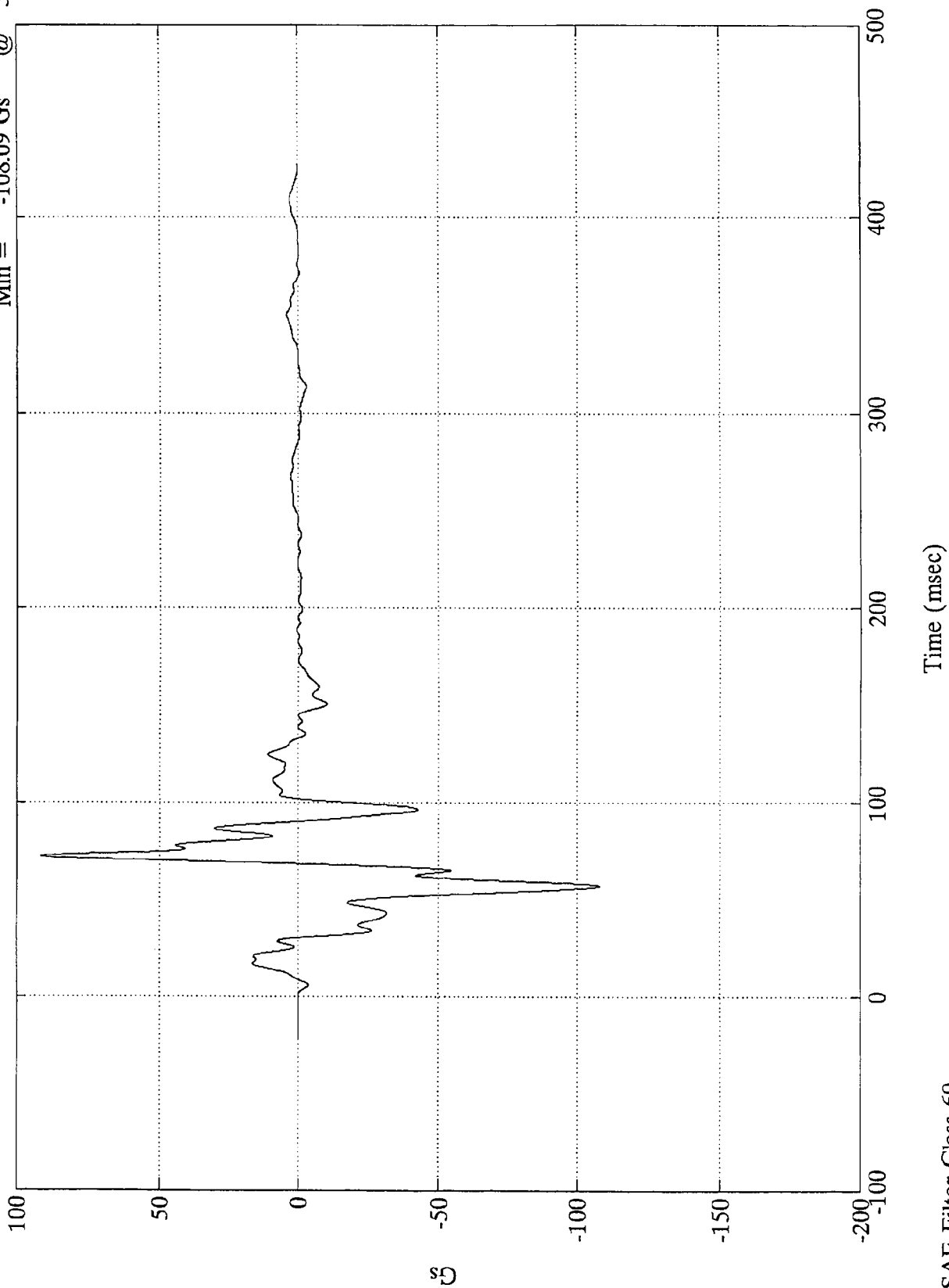
Brake Pedal X



SAE Filter Class 180

VTV TEST #1

Brake Pedal Y
Max = 91.75 Gs @ 72.24 msec
Min = -108.09 Gs @ 56.88 msec

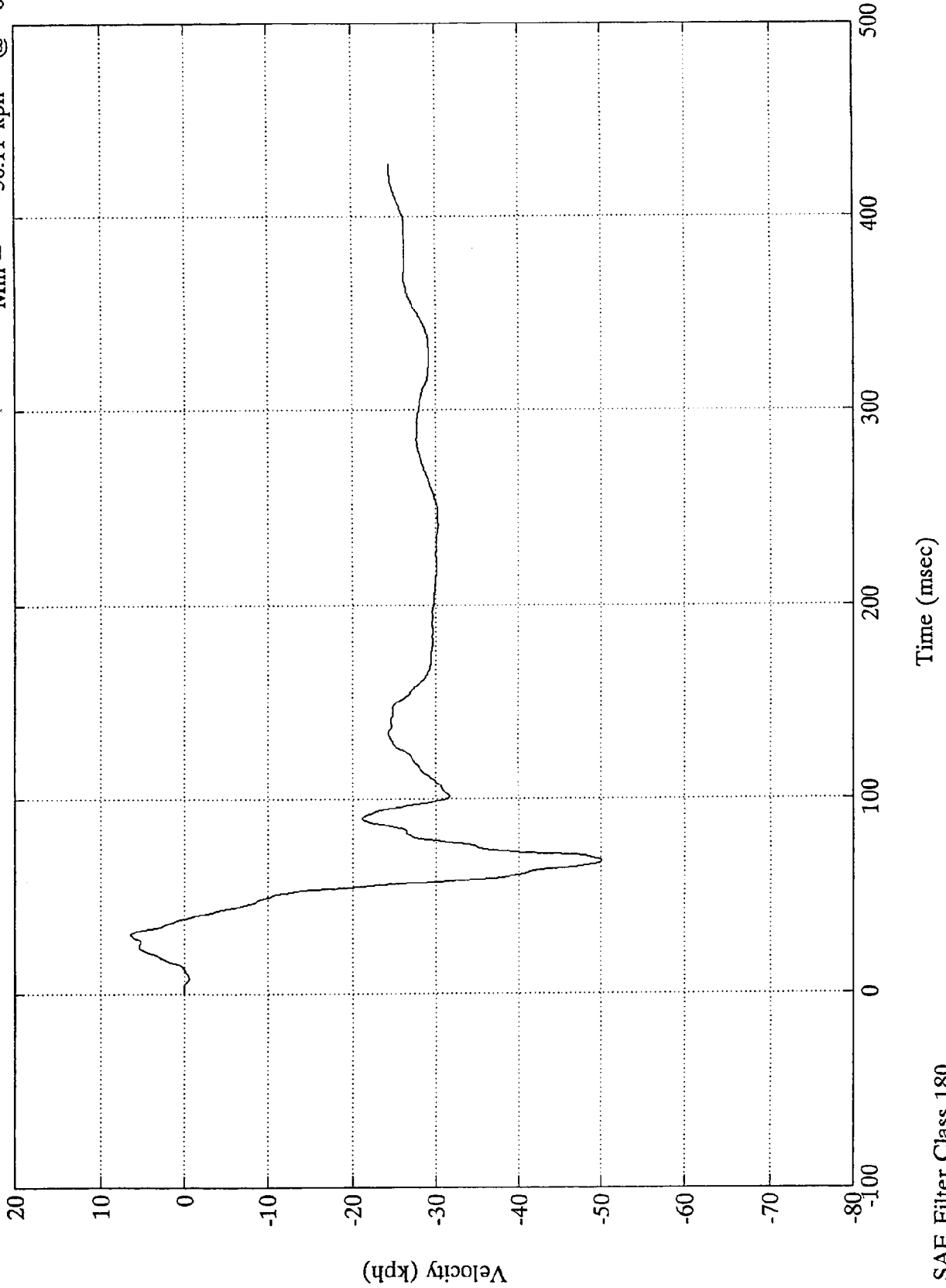


SAE Filter Class 60

VTV TEST #1

Brake Pedal Y

Max = 6.48 kph @ 30.84 msec
Min = -50.11 kph @ 68.16 msec

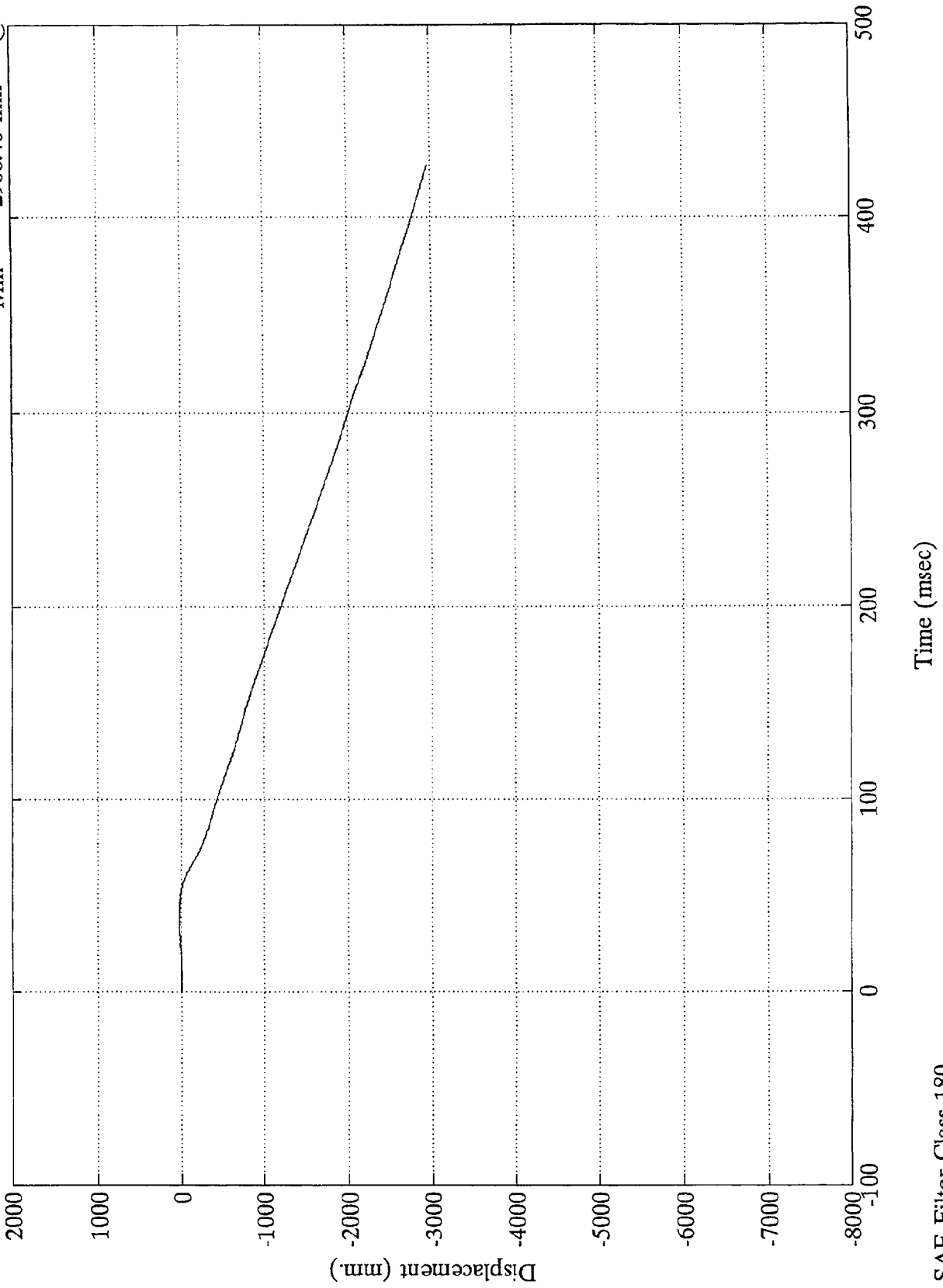


SAE Filter Class 180

VTV TEST #1

Max = 25.07 mm @ 39.00 msec
Min = -2966.46 mm @ 427.32 msec

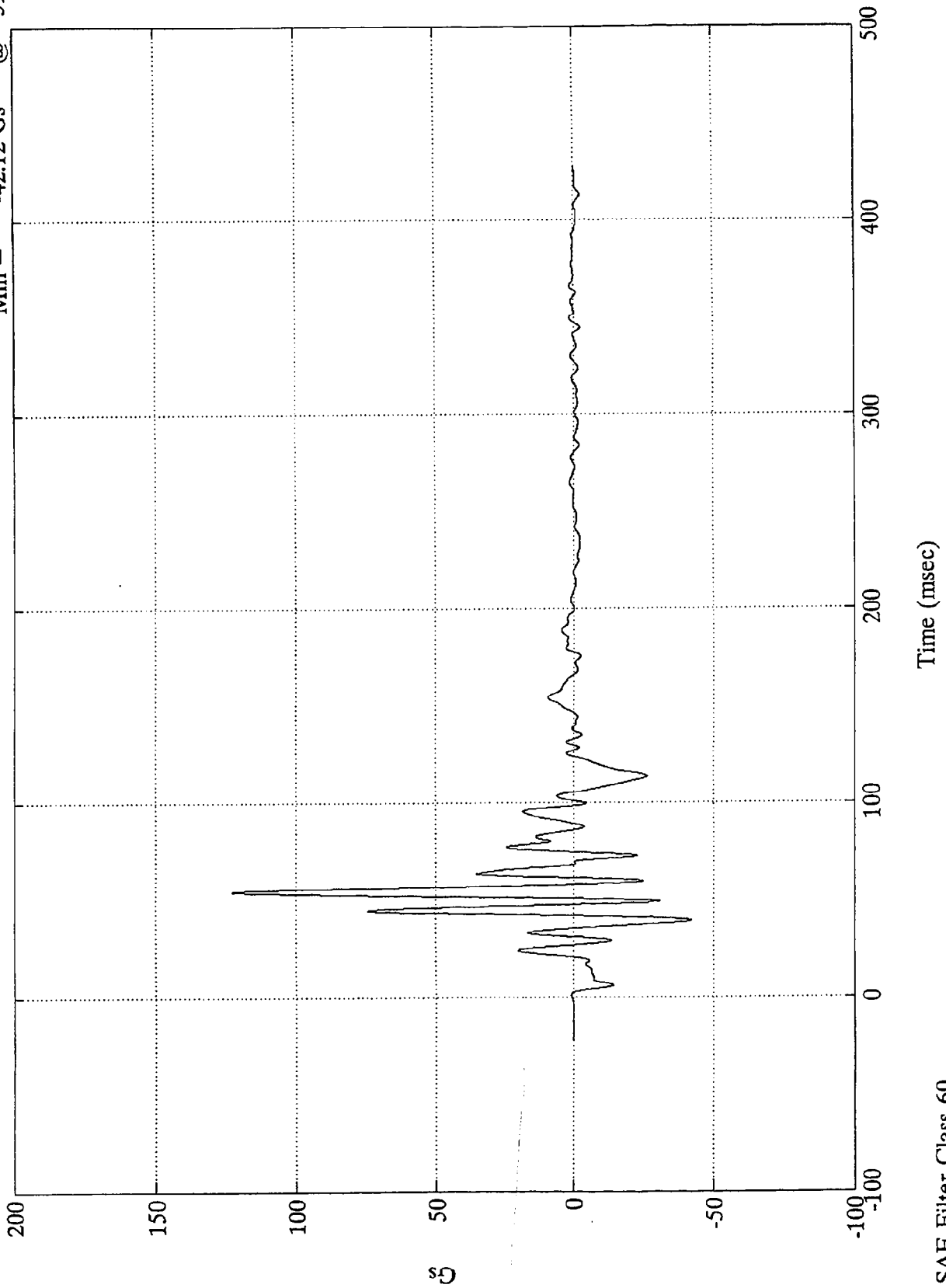
Brake Pedal Y



SAE Filter Class 180

VTV TEST #1

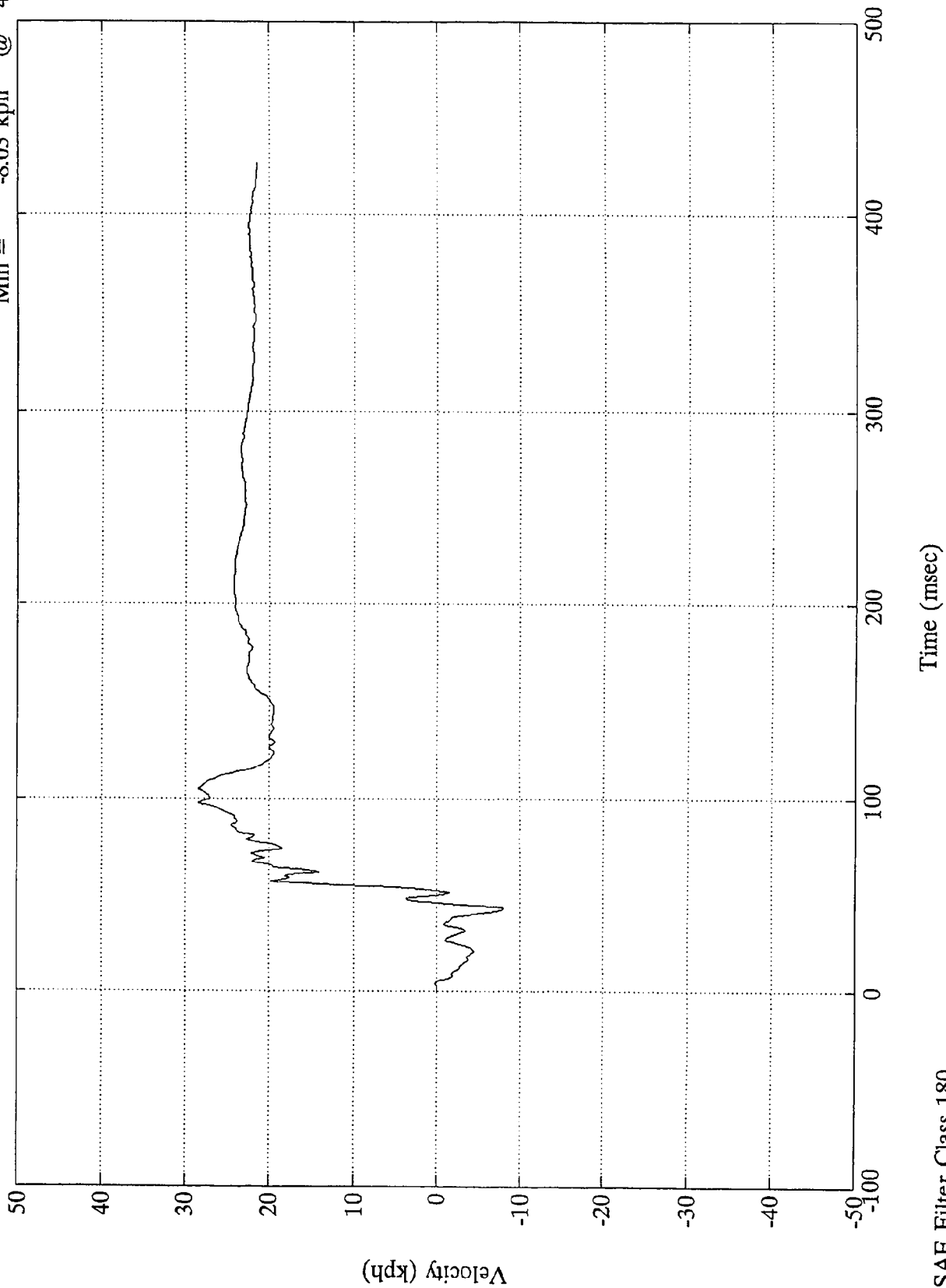
Brake Pedal Z Max = 122.84 Gs @ 54.84 msec
Min = -42.12 Gs @ 39.72 msec



VTV TEST #1

Max = 28.36 kph @ 98.04 msec
Min = -8.03 kph @ 42.72 msec

Brake Pedal Z

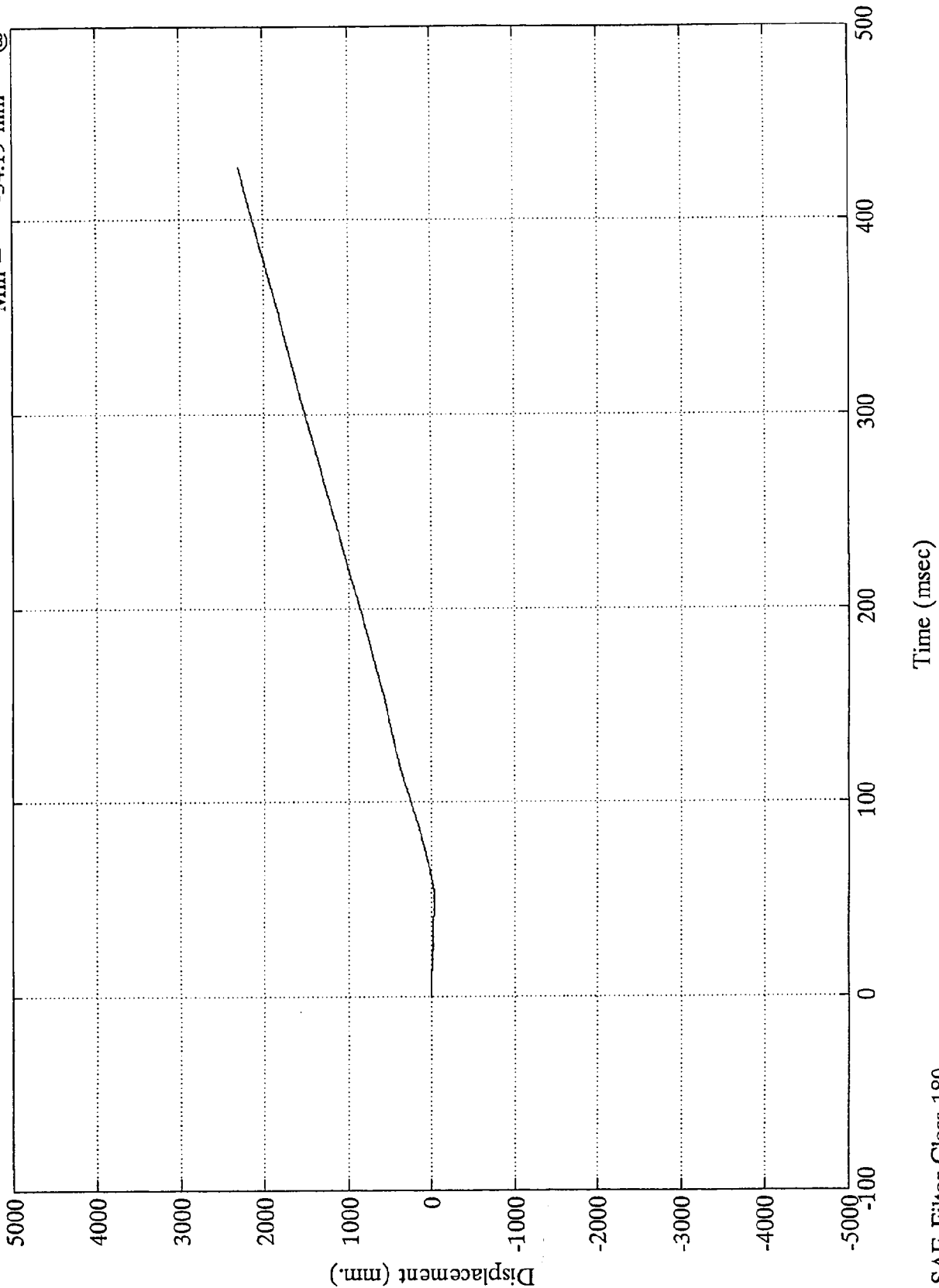


SAE Filter Class 180

VTV TEST #1

Max = 2295.22 mm @ 427.32 msec
Min = -34.19 mm @ 45.60 msec

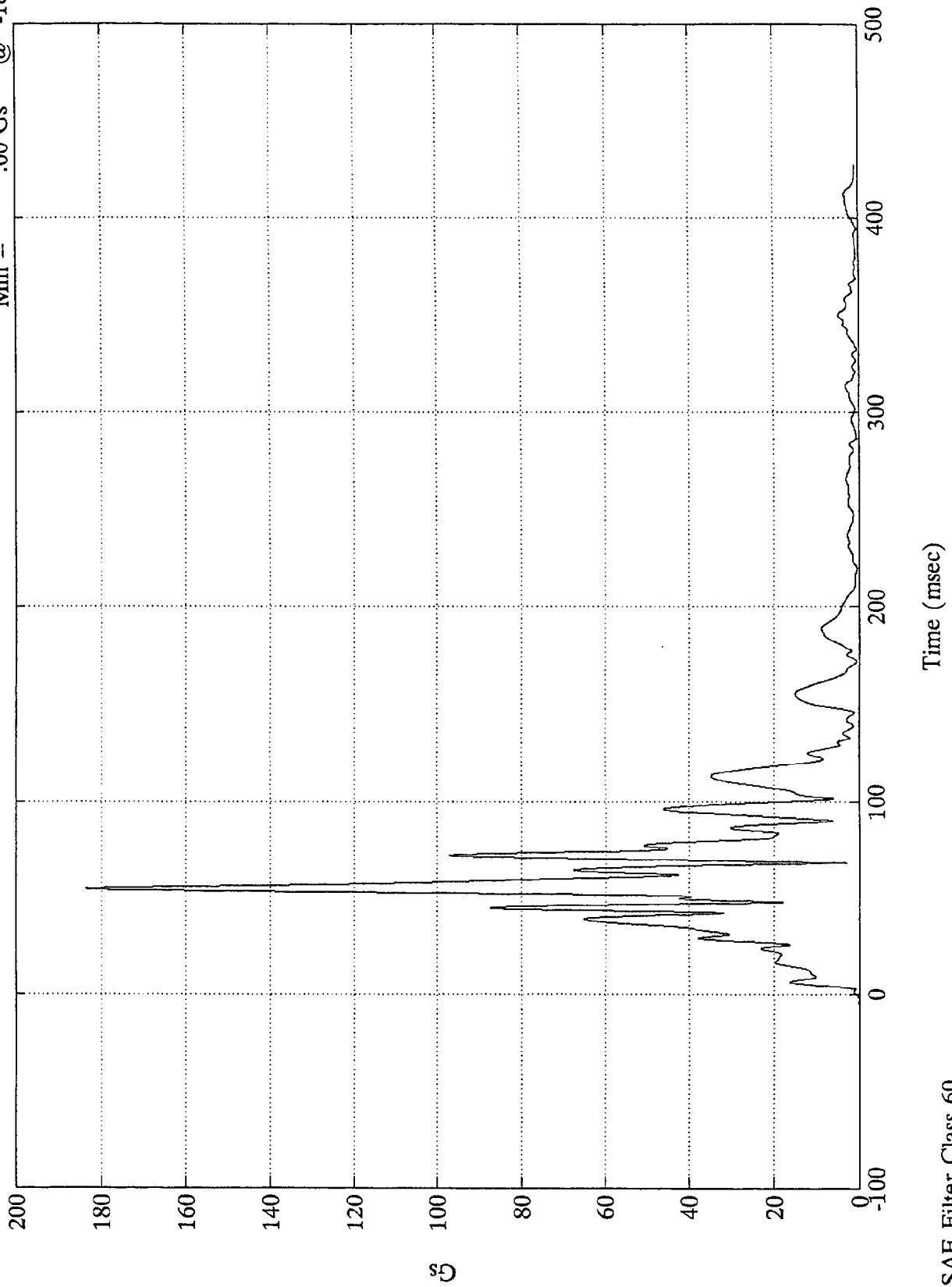
Brake Pedal Z



SAE Filter Class 180

VTV TEST #1

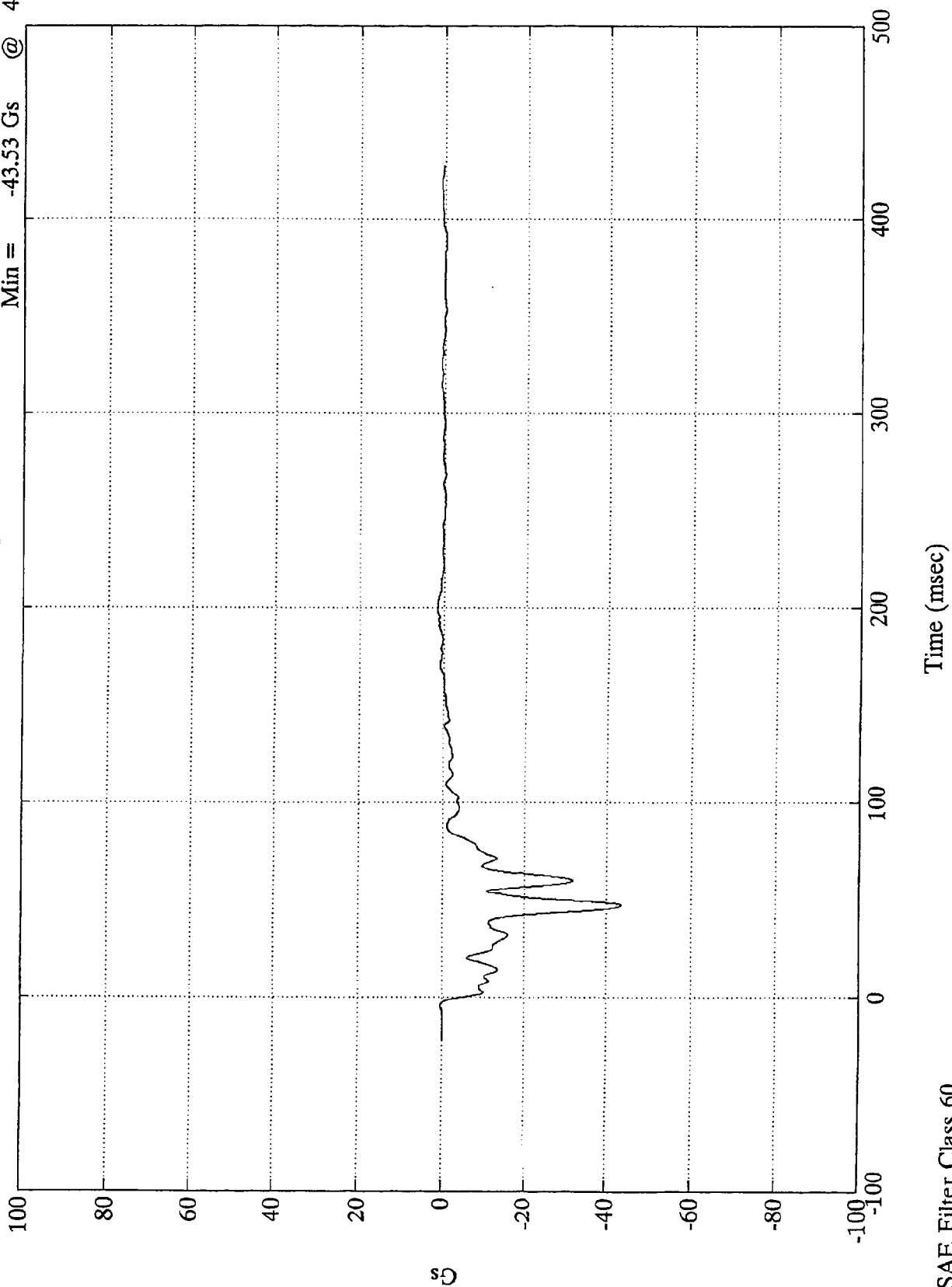
Brake Pedal Res
Max = 183.42 Gs @ 54.84 msec
Min = .00 Gs @ -18.36 msec



VTV TEST #1

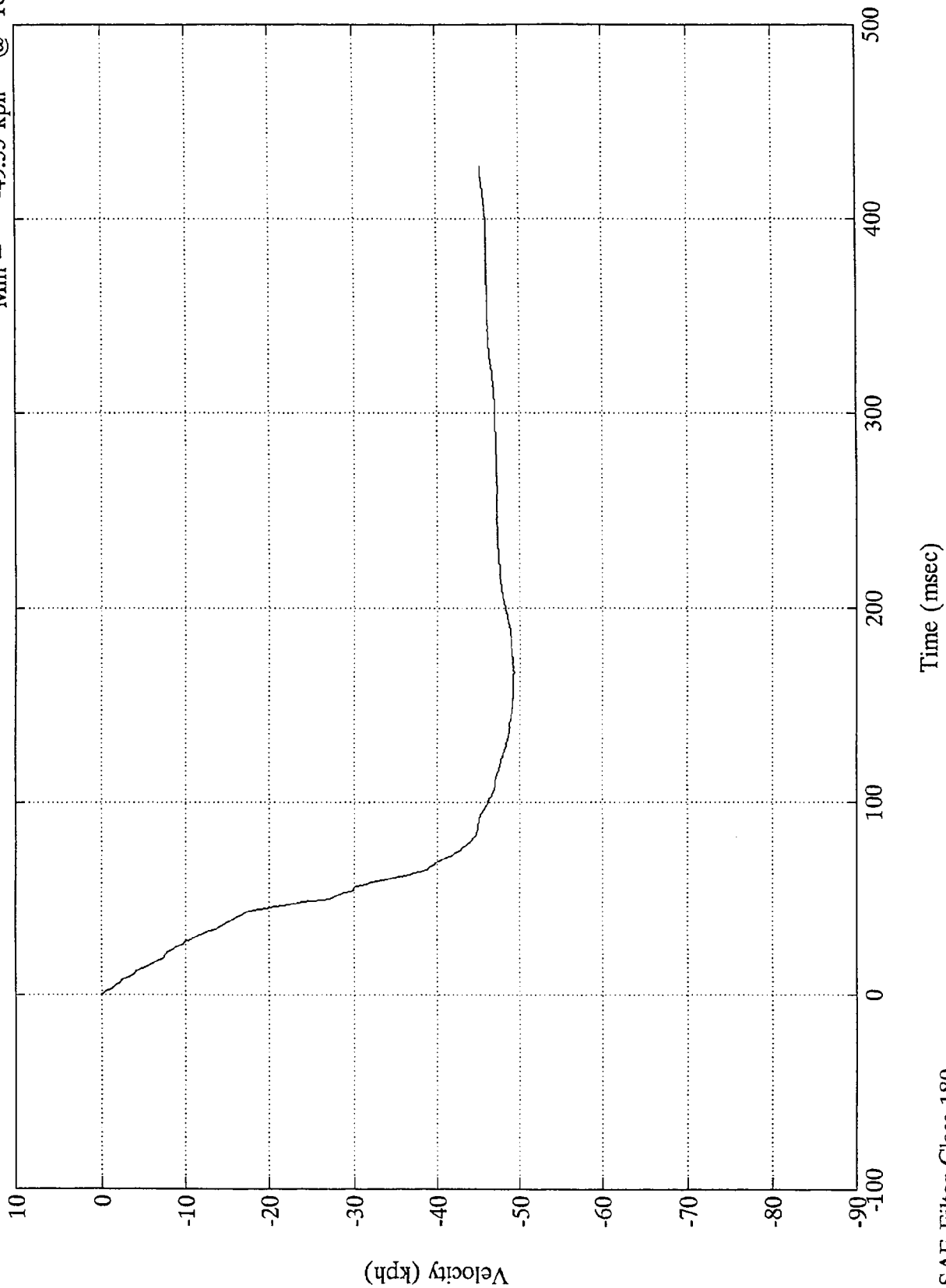
Lt Rear Compart. X

Max = 1.58 Gs @ 198.48 msec
Min = -43.53 Gs @ 47.63 msec



VTV TEST #1

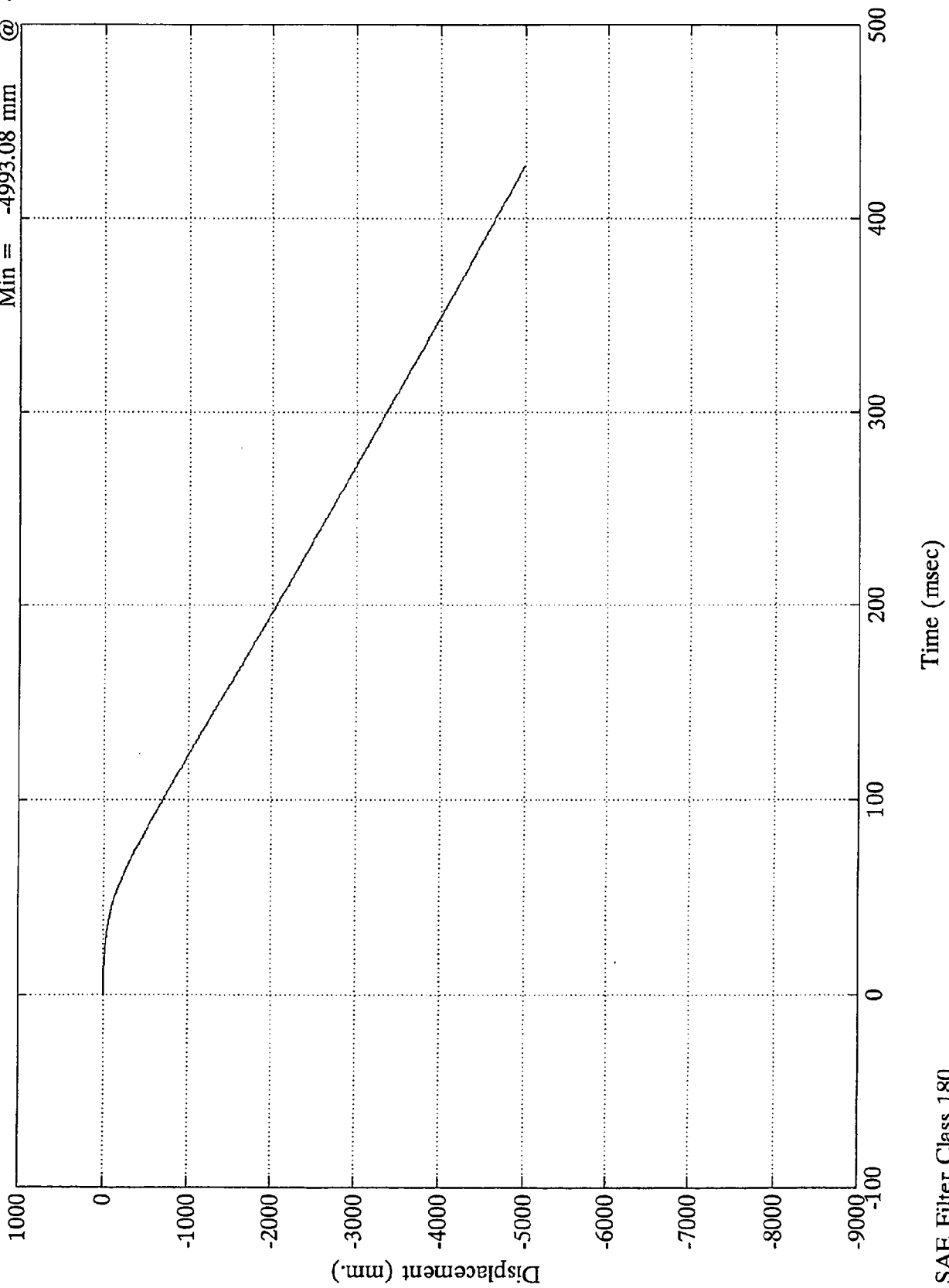
Lt Rear Compart. X
Max = .00 kph @ -0.00 msec
Min = -49.35 kph @ 167.04 msec



SAE Filter Class 180

VTV TEST #1

Lt Rear Compart. X
Max = .00 mm @ -0.00 msec
Min = -4993.08 mm @ 427.32 msec



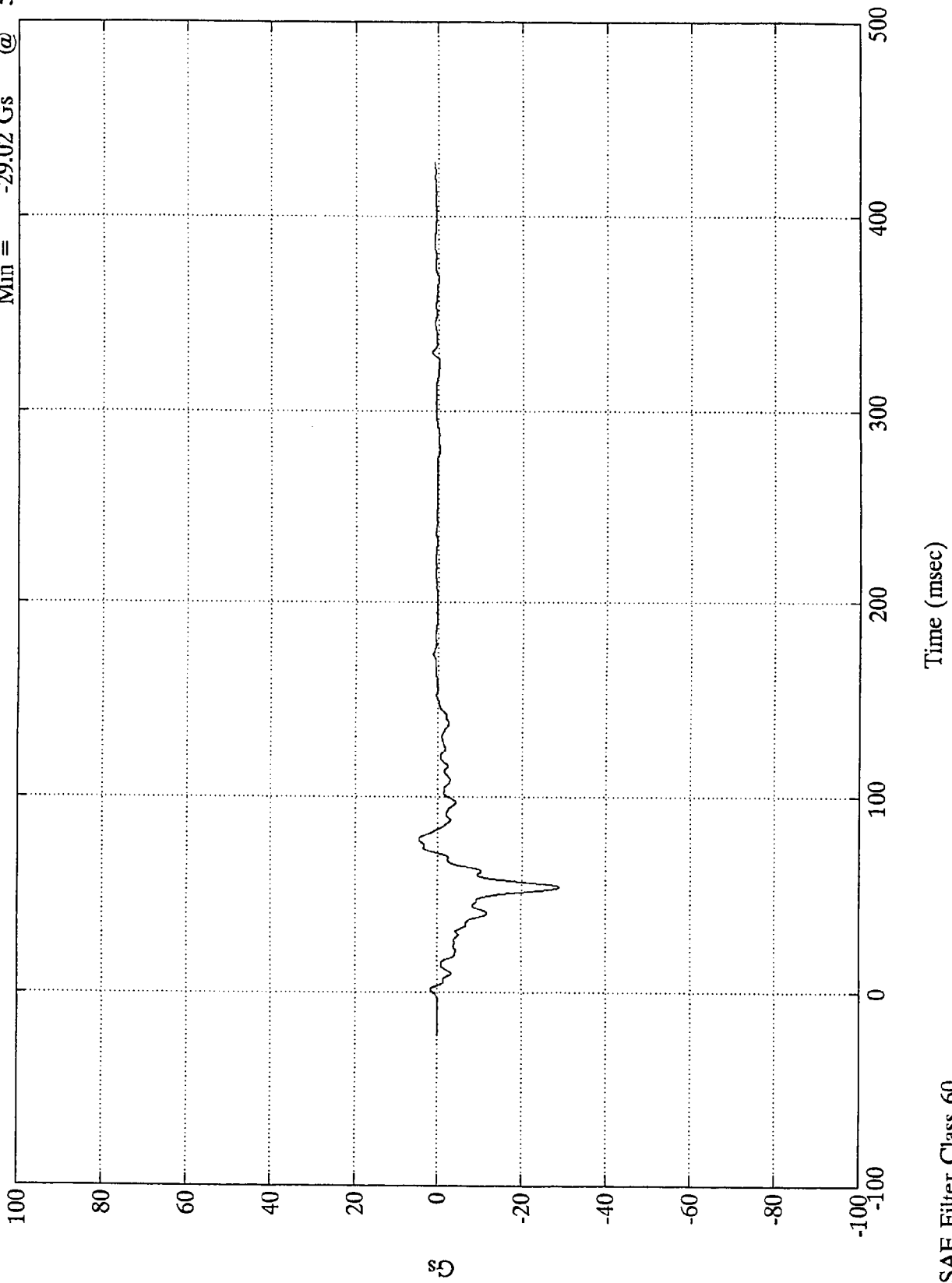
B-69

8304-1

SAE Filter Class 180

VTV TEST #1

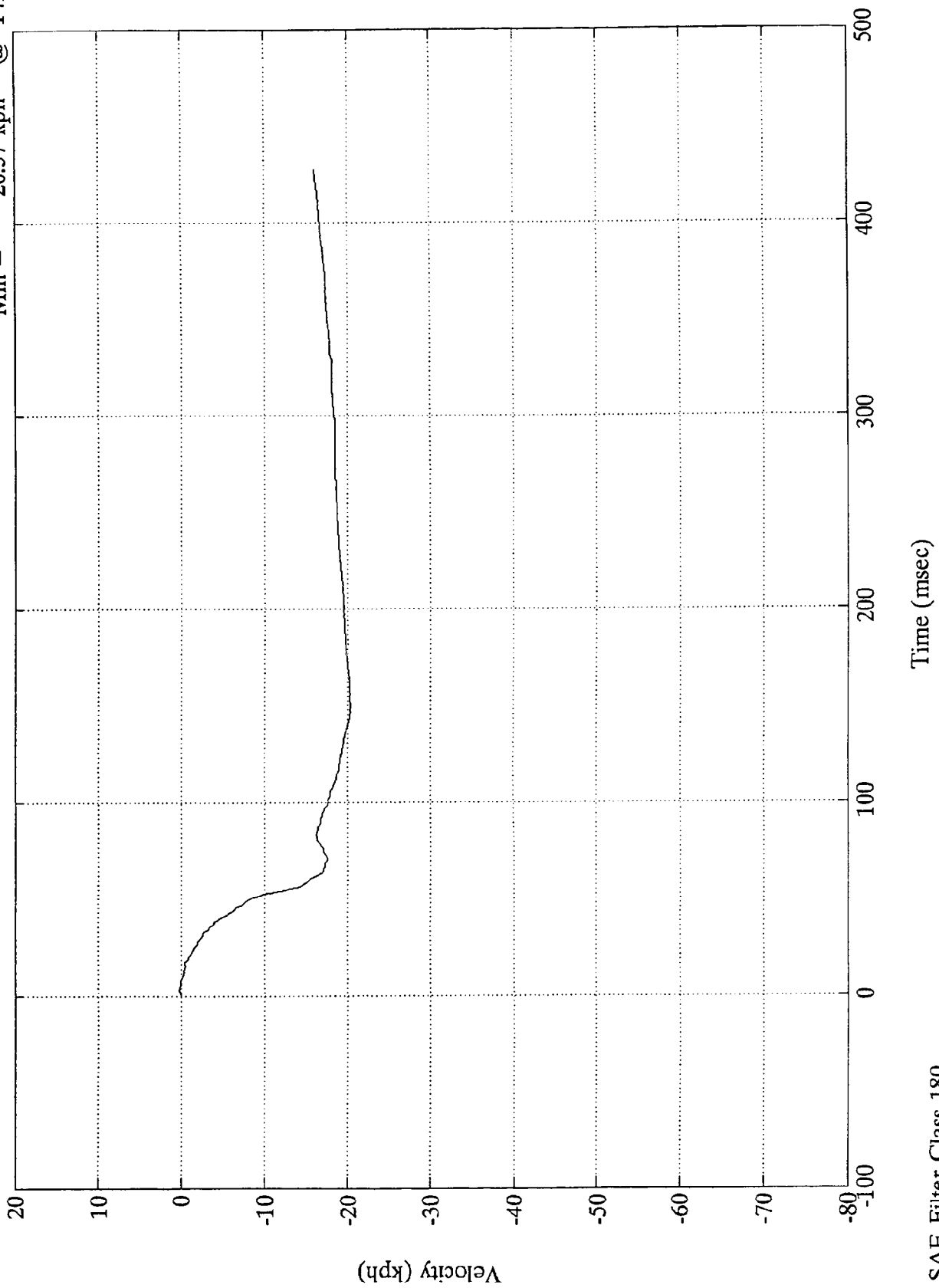
Lt Rear Compart Y Max = 4.56 Gs @ 78.84 msec
Min = -29.02 Gs @ 54.23 msec



VTV TEST #1

Lt Rear Compart Y

Max = .28 kph @ 3.47 msec
Min = -20.37 kph @ 149.76 msec

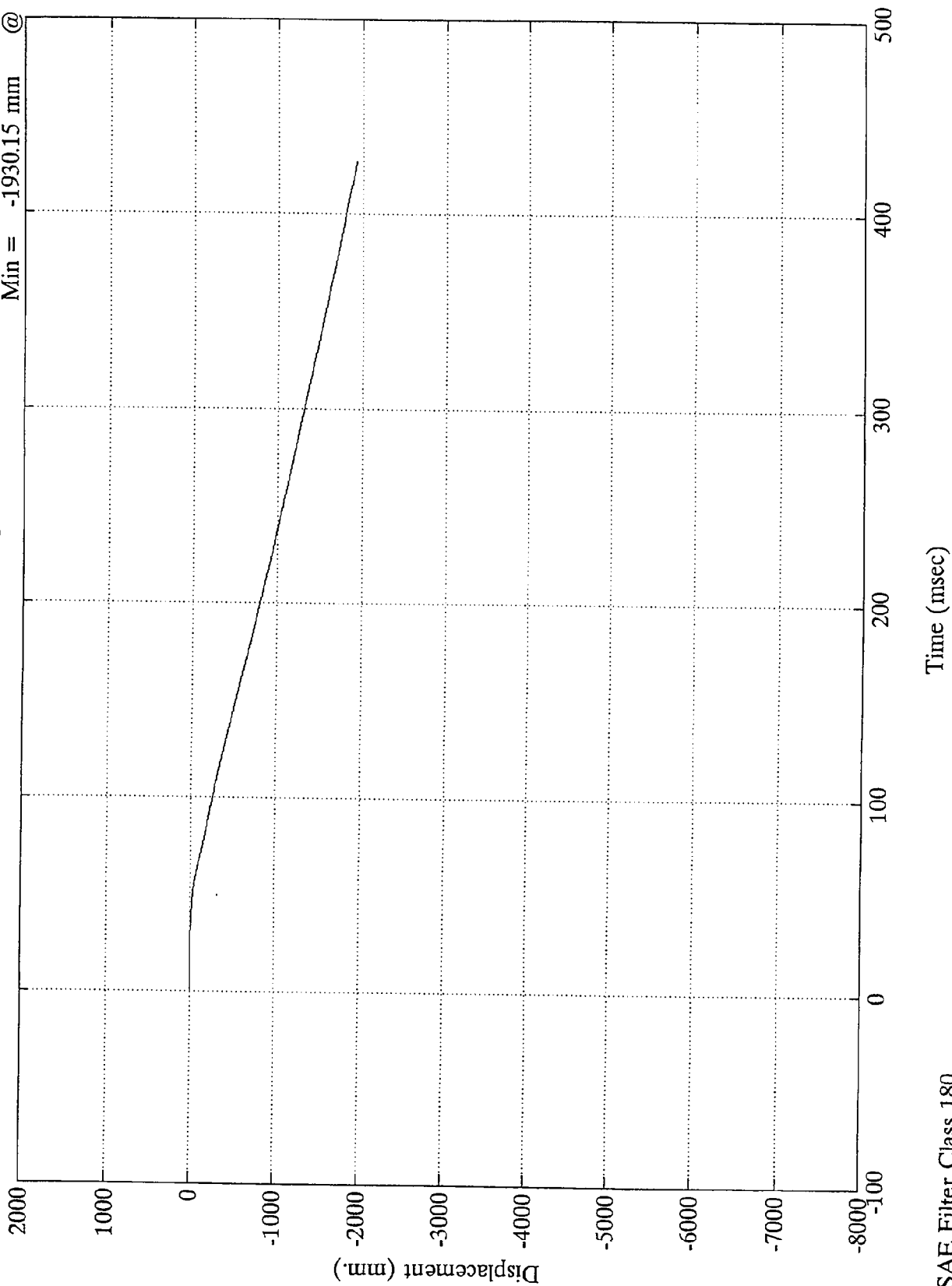


SAE Filter Class 180

VTV TEST #1

Lt Rear Compartment Y

Max = .33 mm @ 9.11 msec
Min = -1930.15 mm @ 427.32 msec

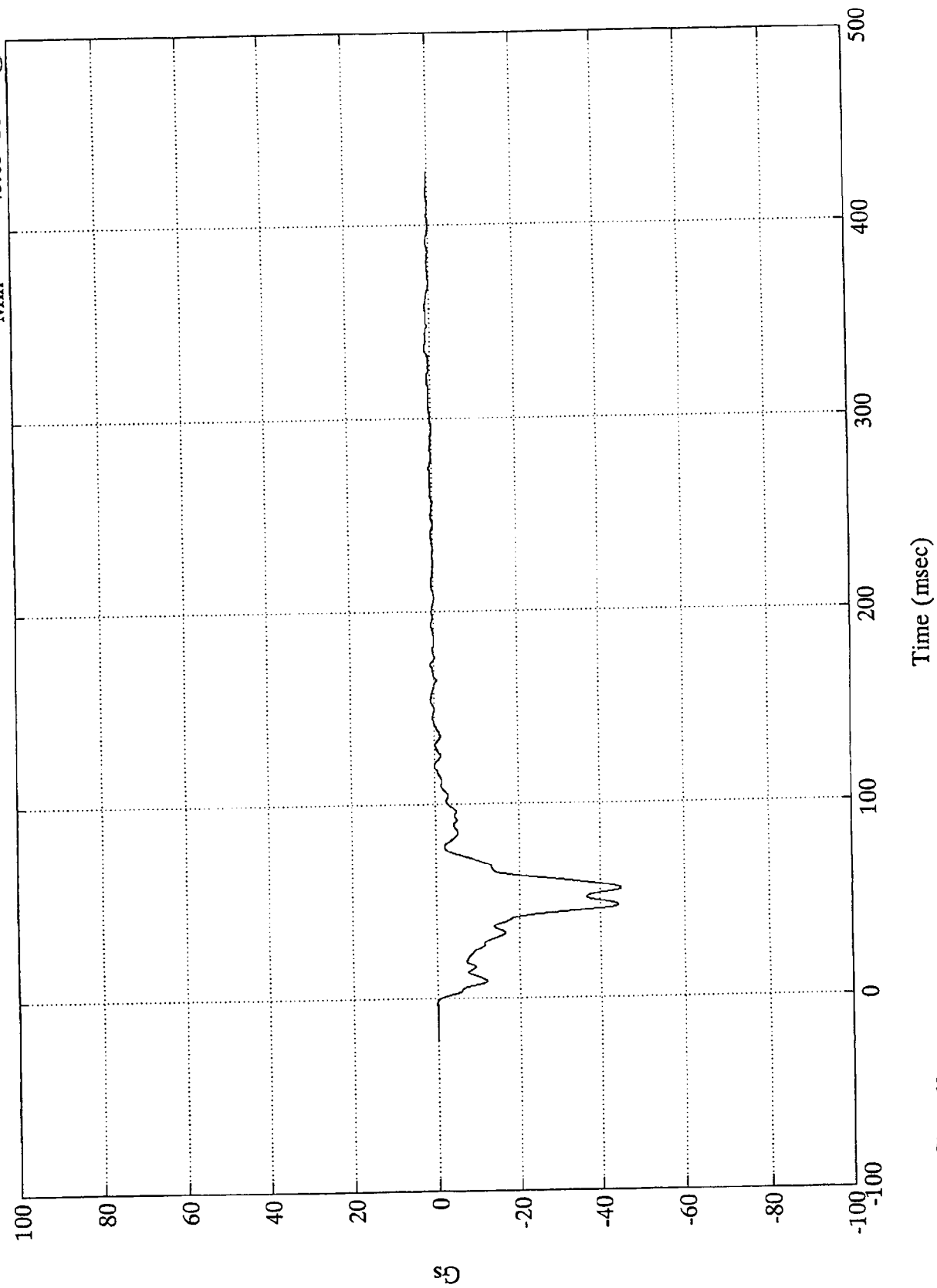


SAE Filter Class 180

VTV TEST #1

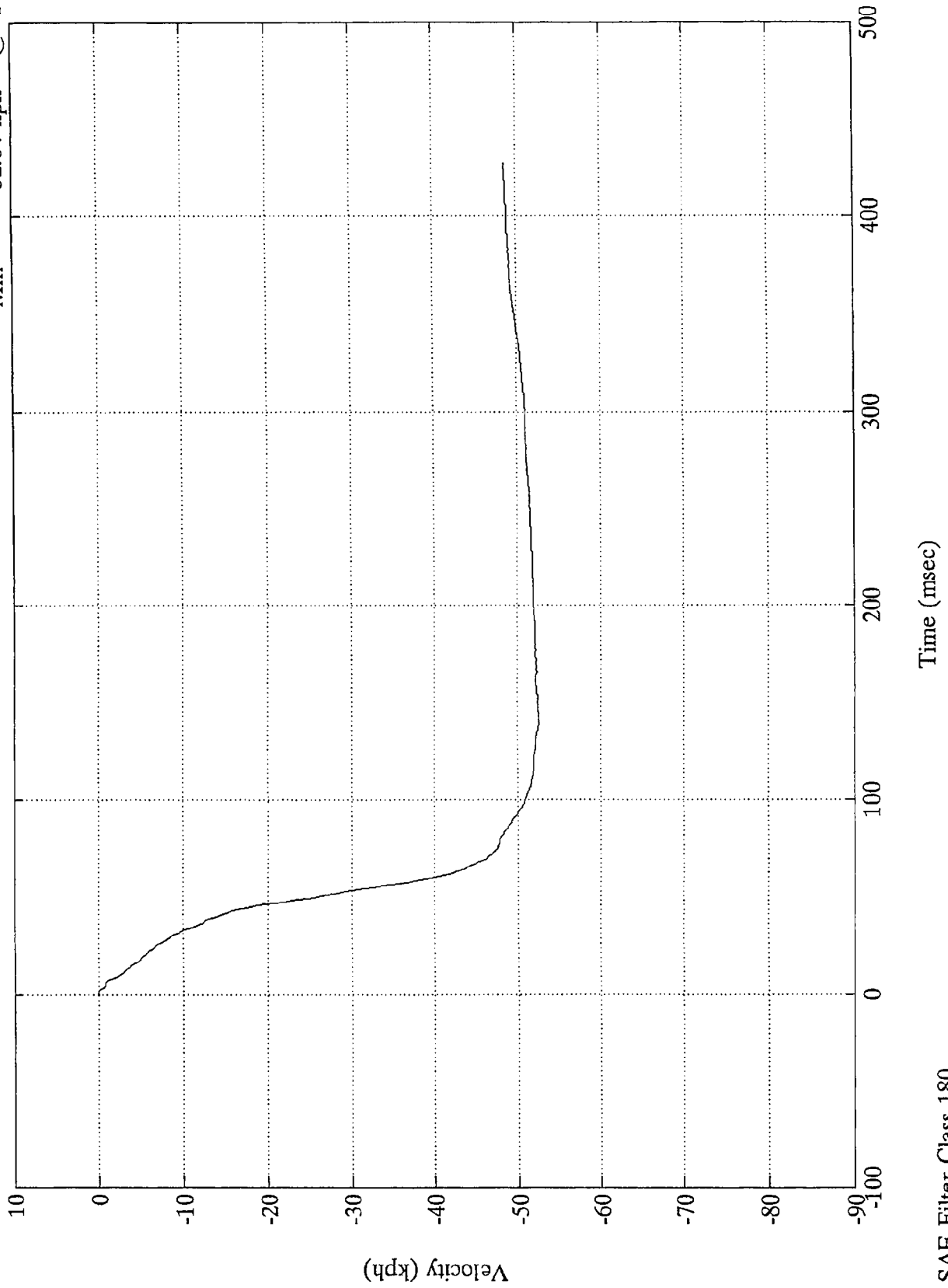
Rt Rear Compartment X

Max = 1.38 Gs @ 336.83 msec
Min = -45.03 Gs @ 56.04 msec



VTV TEST #1

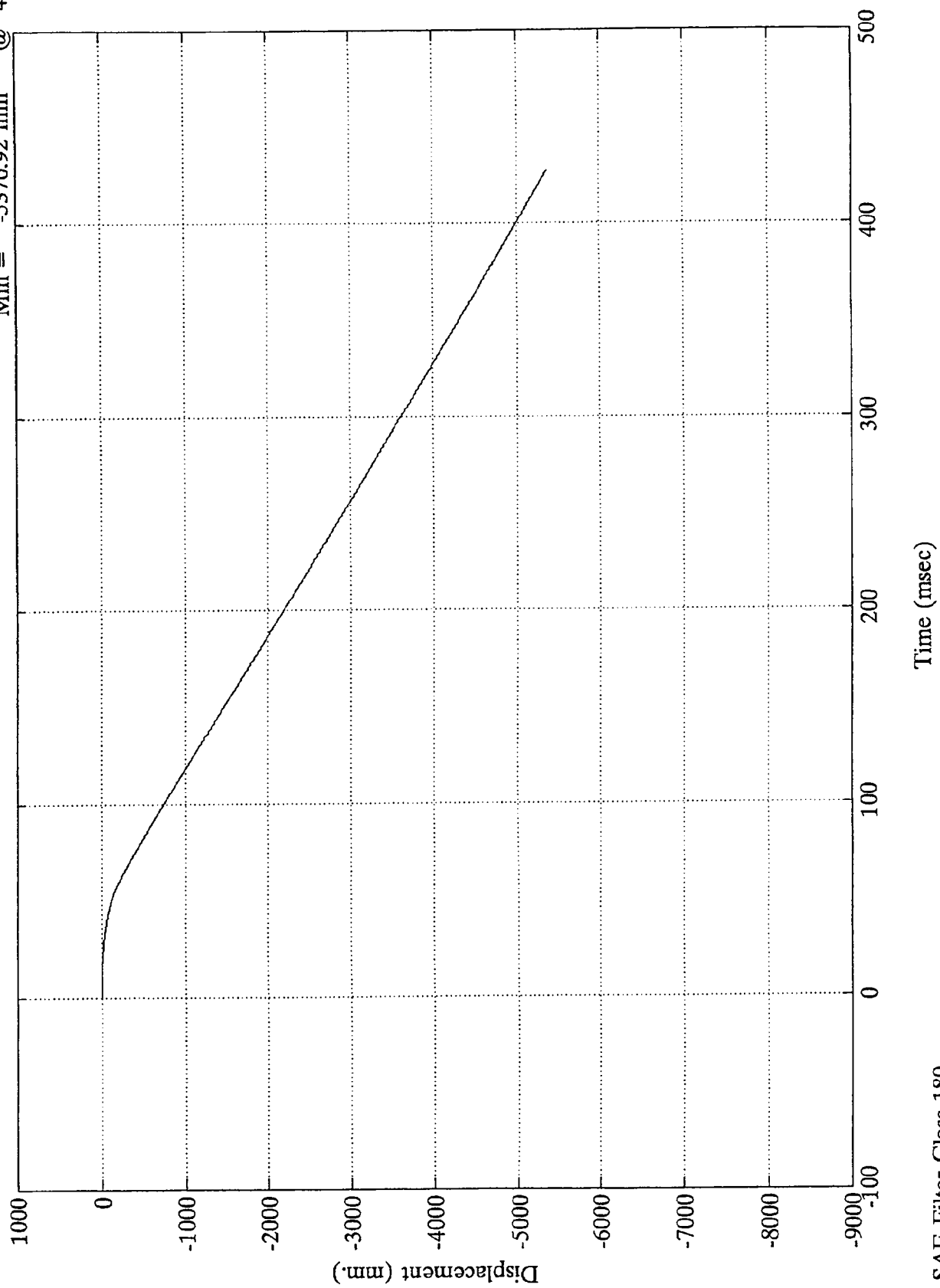
Rt Rear Compartment X
Max = .00 kph @ 0.23 msec
Min = -52.64 kph @ 141.24 msec



VTV TEST #1

Rt Rear Compart X

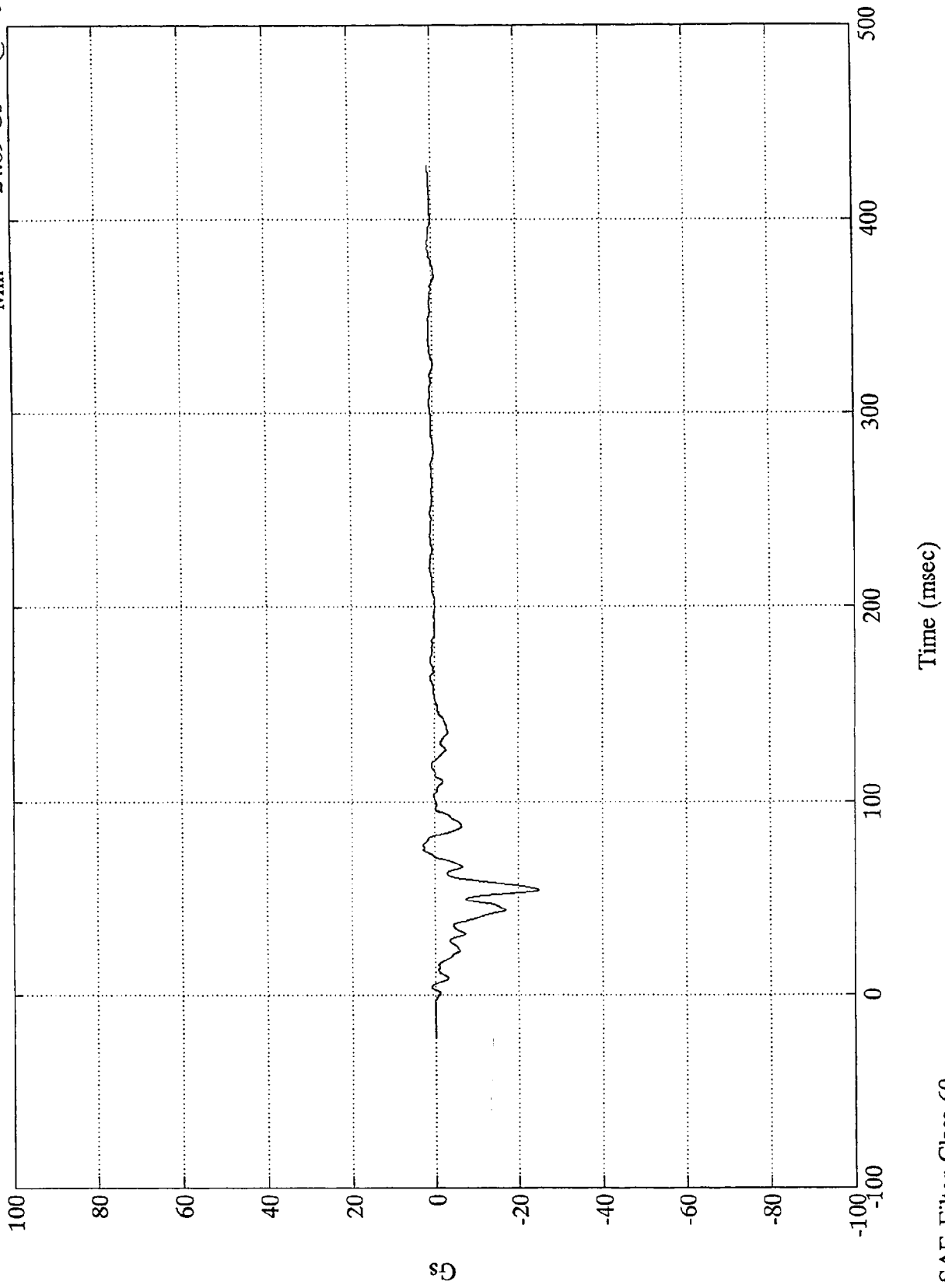
Max = .00 mm @ 0.35 msec
Min = -5370.92 mm @ 427.32 msec



VTV TEST #1

Rt Rear Compart Y

Max =	2.91 Gs	@	78.12 msec
Min =	-24.89 Gs	@	54.59 msec

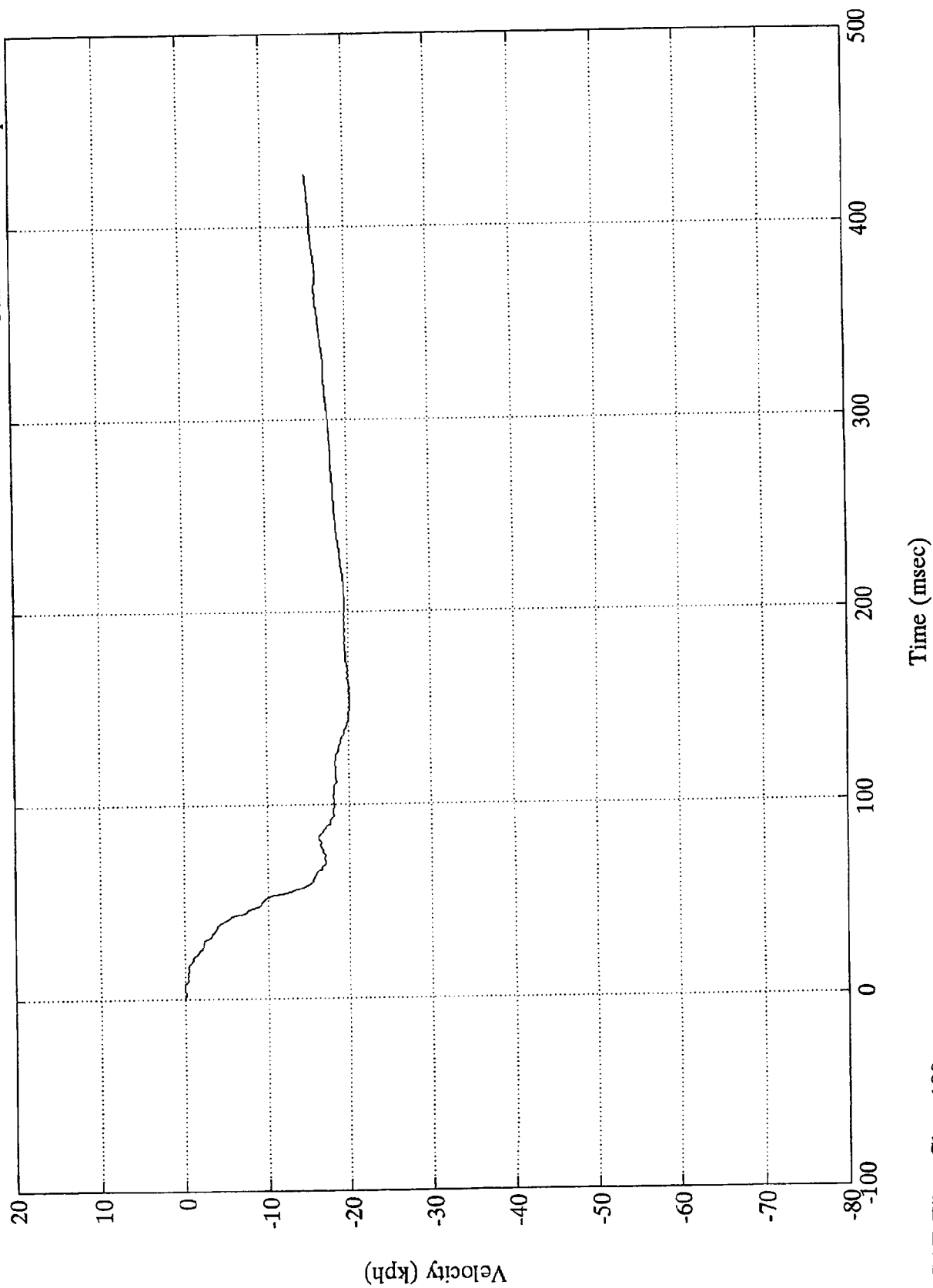


SAE Filter Class 60

VTV TEST #1

Rt Rear Compartment Y

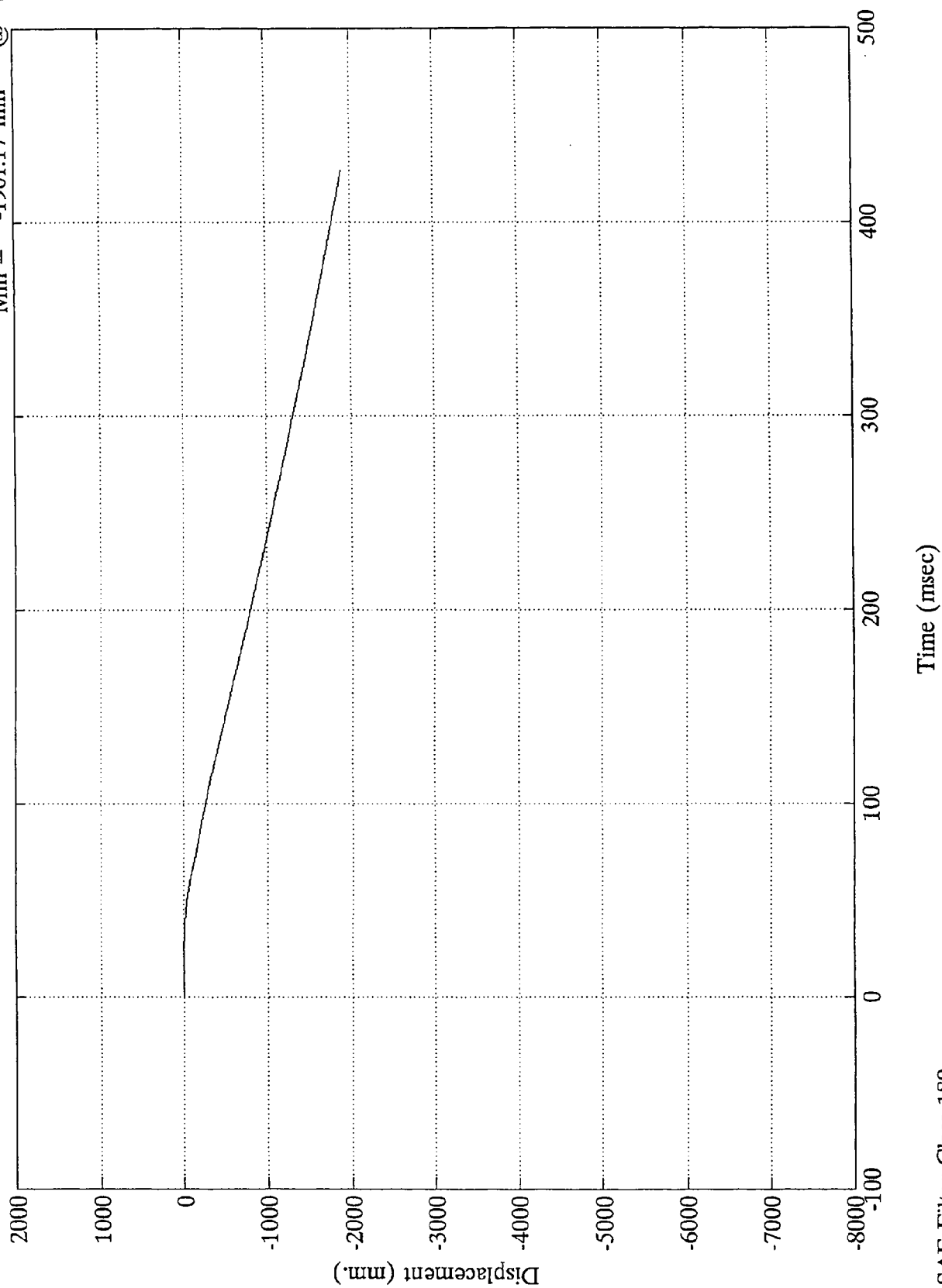
Max = .02 kph @ 5.03 msec
Min = -20.15 kph @ 154.32 msec



SAE Filter Class 180

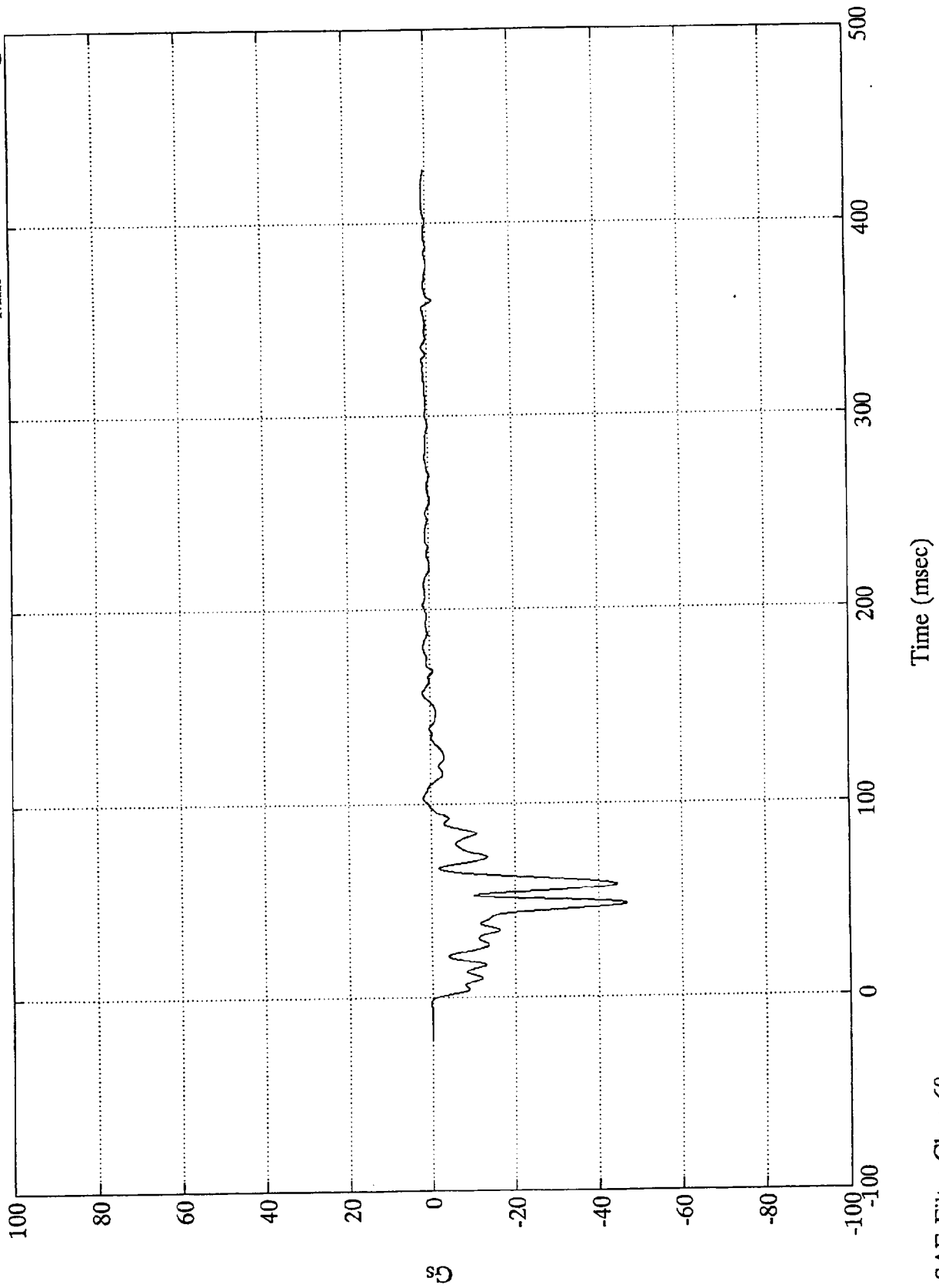
VTV TEST #1

Rt Rear Compart Y
Max = .00 mm @ -0.00 msec
Min = -1901.17 mm @ 427.32 msec



VTV TEST #1

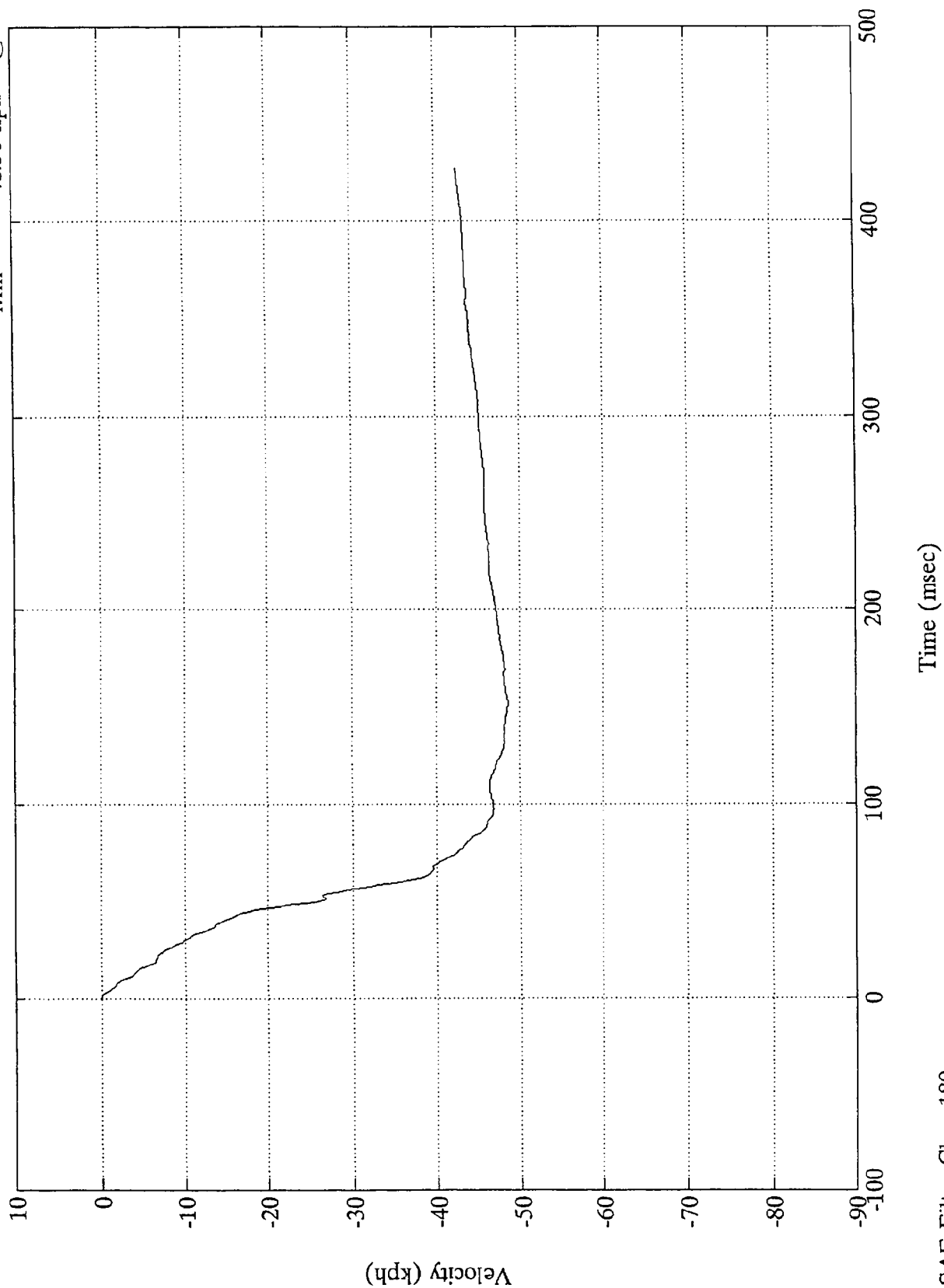
C/L Rear Comp X
Max = 1.84 Gs @ 156.84 msec
Min = -46.74 Gs @ 47.76 msec



SAE Filter Class 60

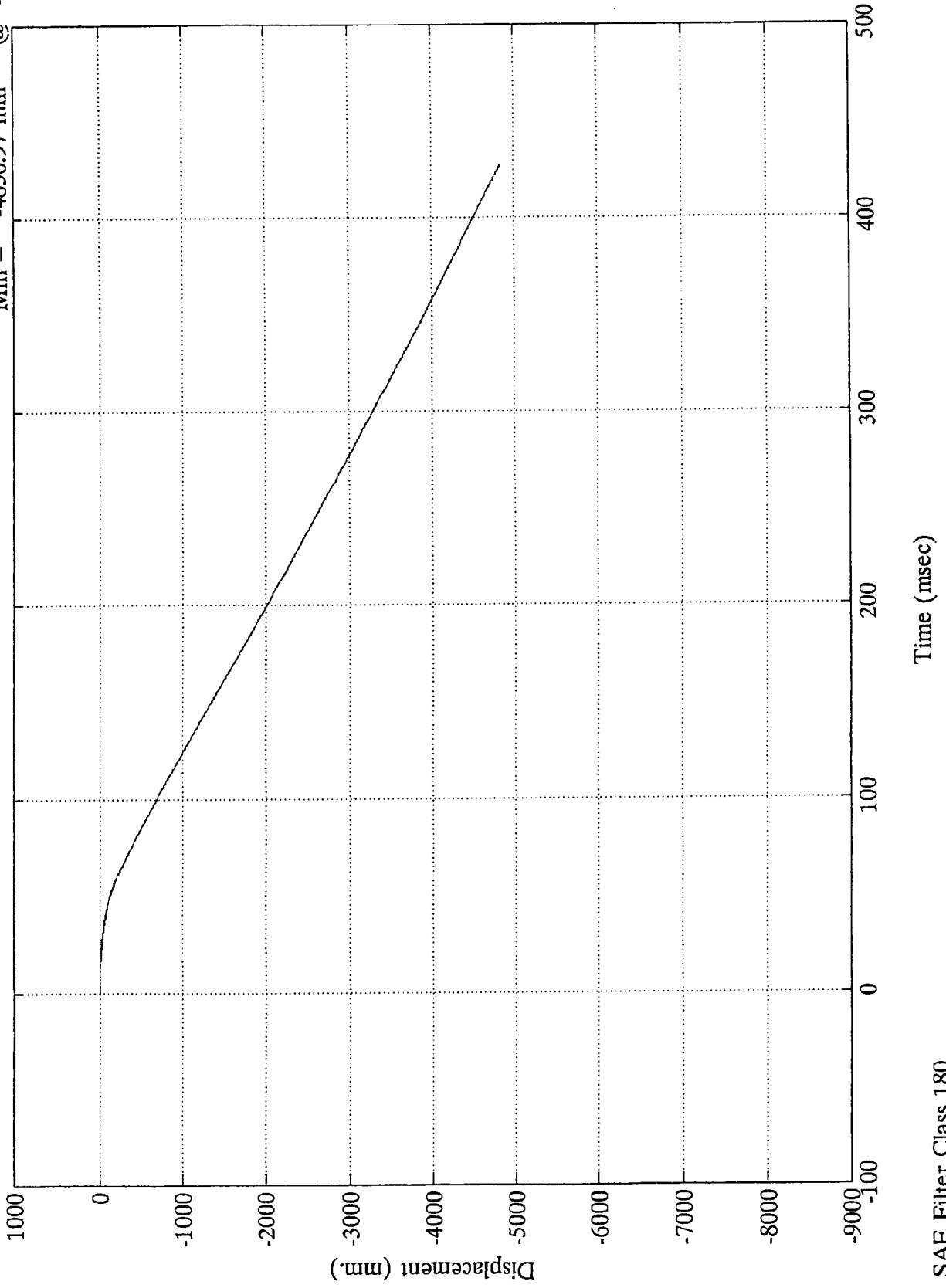
VTV TEST #1

C/L Rear Comp X
Max = .00 kph @ 0.23 msec
Min = -48.56 kph @ 153.24 msec



VTV TEST #1

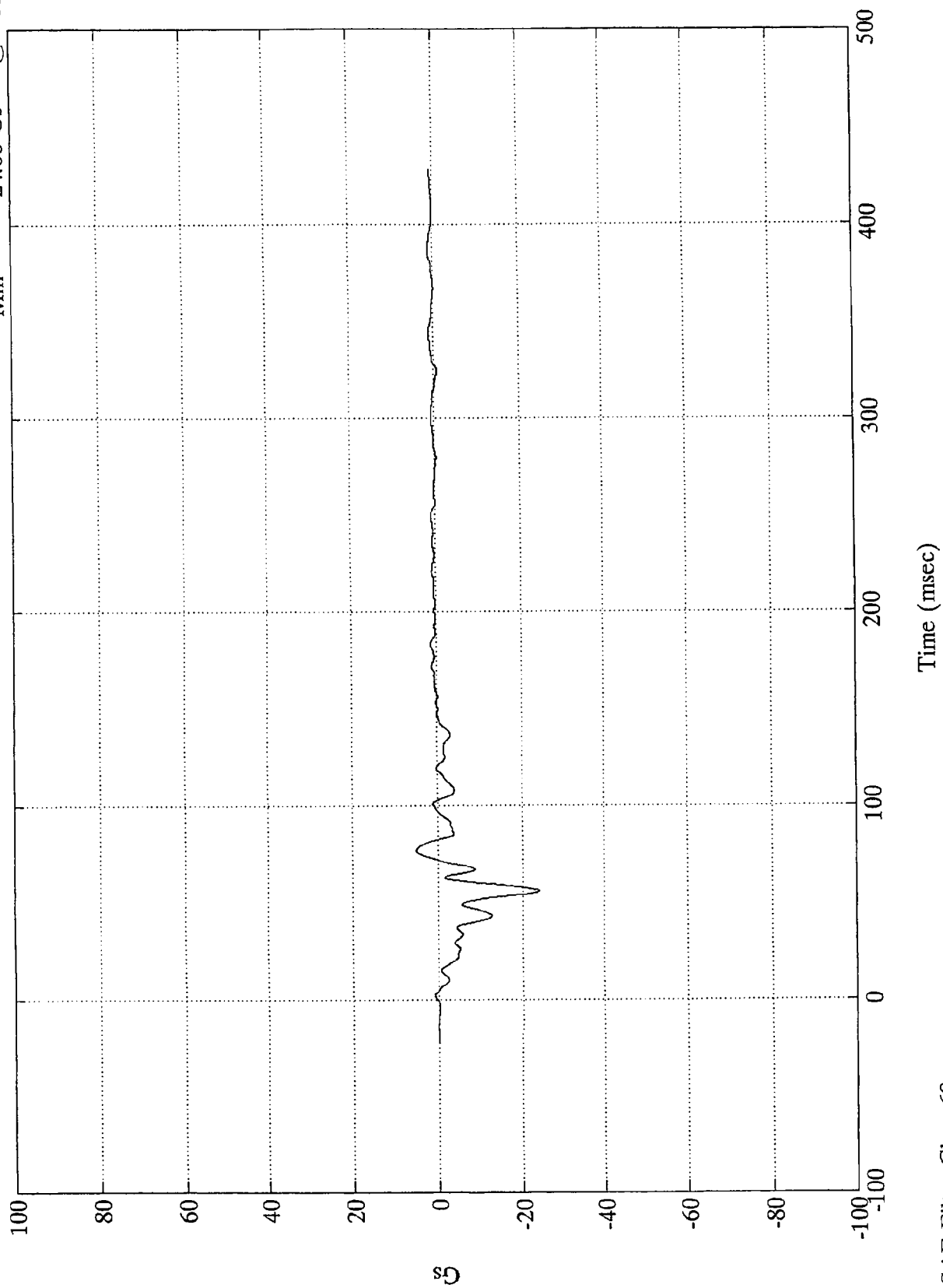
C/L Rear Comp X
Max = .00 mm @ 0.47 msec
Min = -4836.97 mm @ 427.32 msec



VTV TEST #1

Max = 5.07 Gs @ 77.16 msec
Min = -24.06 Gs @ 55.80 msec

C/L Rear Compartment Y

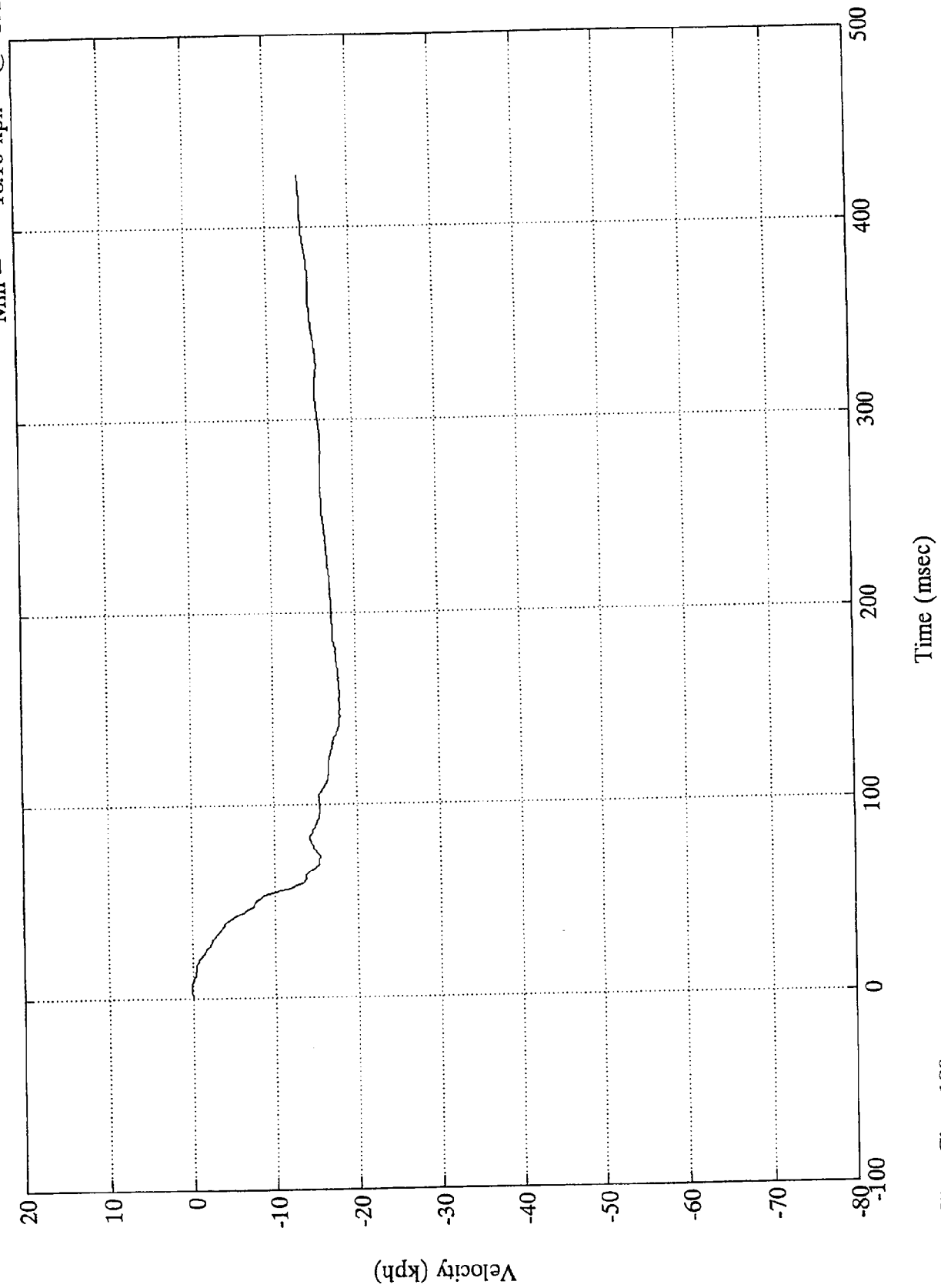


SAE Filter Class 60

VTV TEST #1

C/L Rear Compartment Y

Max = .15 kph @ 3.71 msec
Min = -18.10 kph @ 151.92 msec

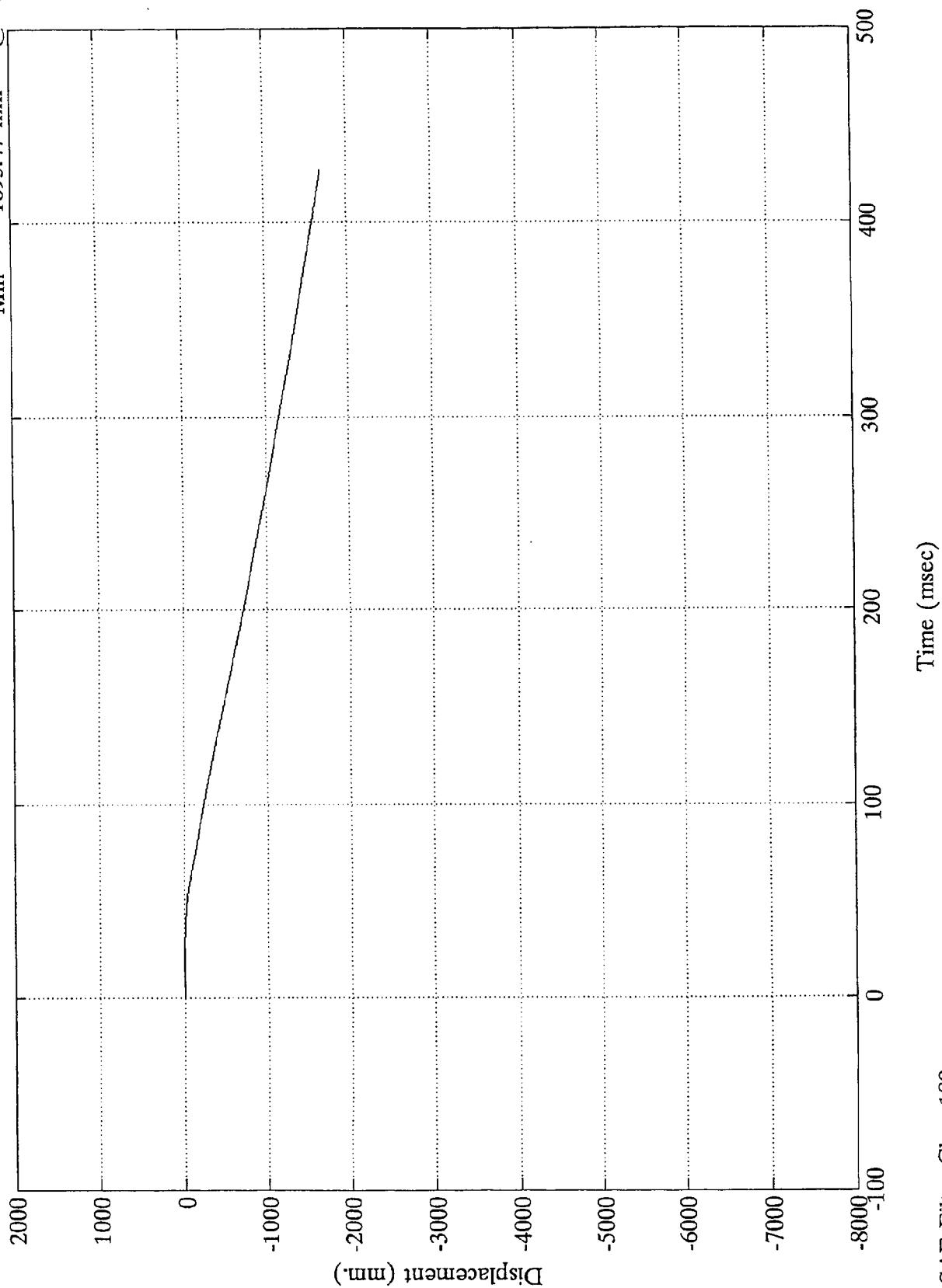


SAE Filter Class 180

VTV TEST #1

C/L Rear Compartment Y

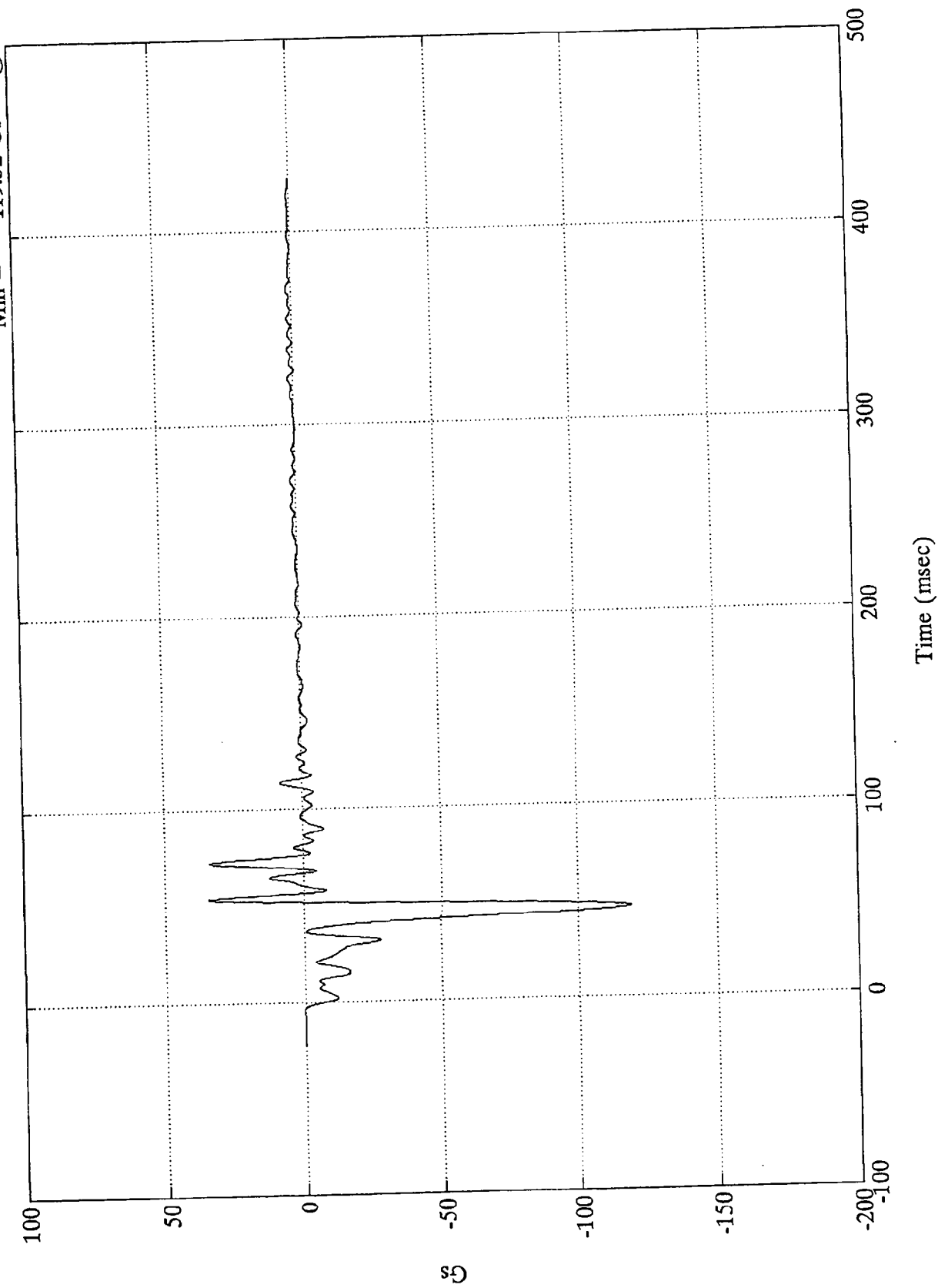
Max = .17 mm @ 8.63 msec
Min = -1695.47 mm @ 427.32 msec



VTV TEST #1

Toe Pan X

Max = 34.55 Gs @ 53.63 msec
Min = -119.32 Gs @ 46.80 msec

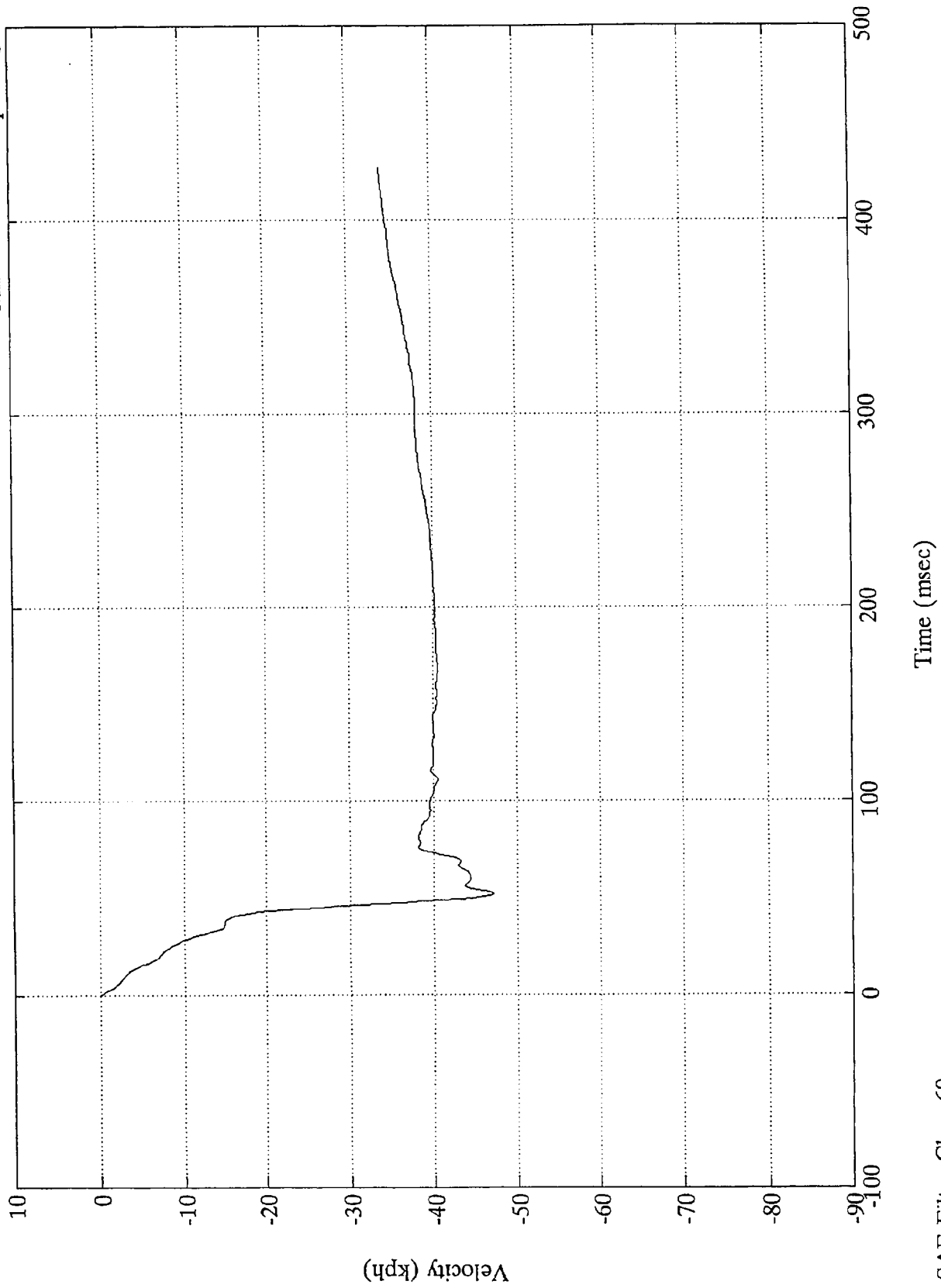


SAE Filter Class 60

8304-1

VTV TEST #1

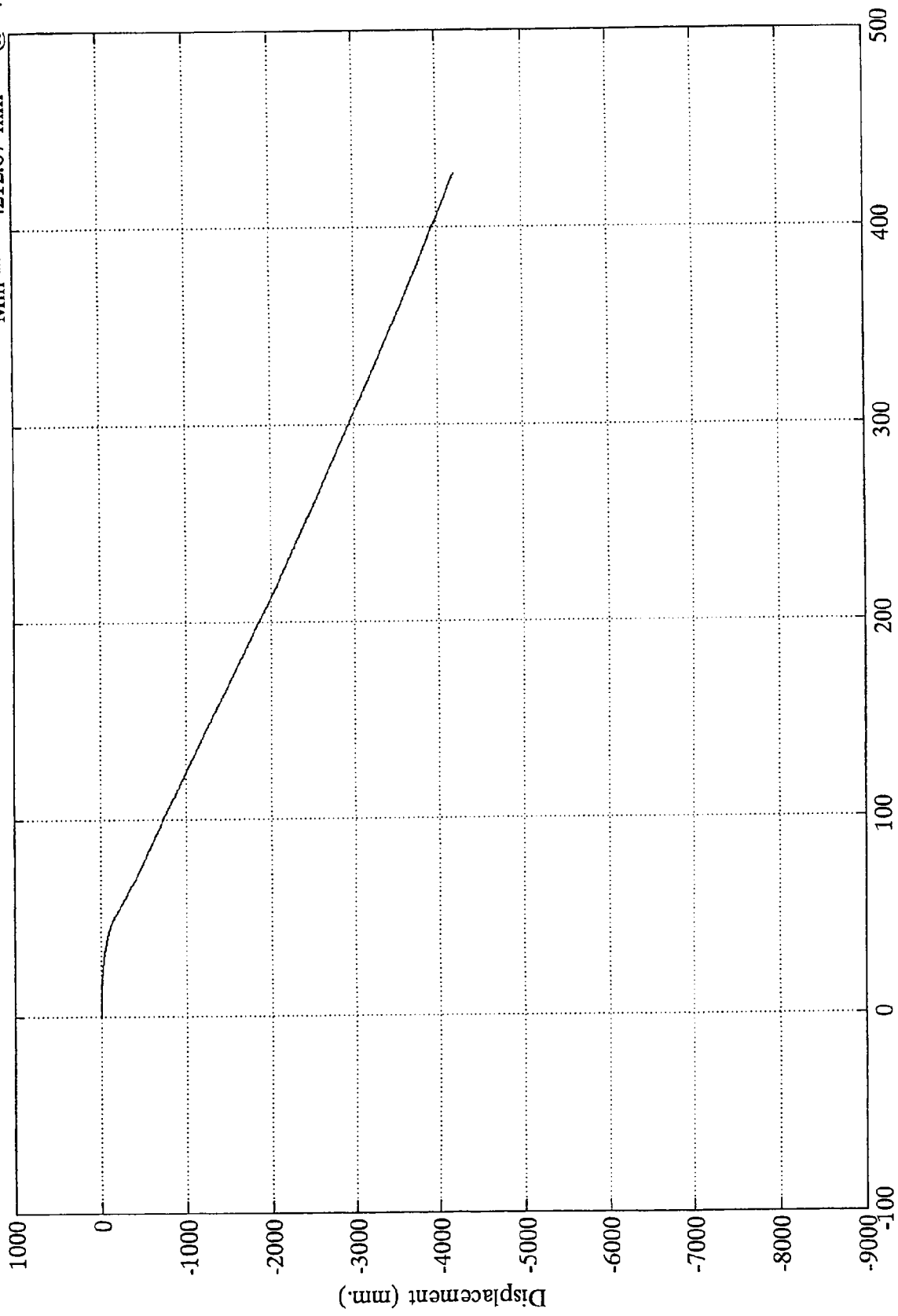
Toe Pan X
Max = .00 kph @ -0.00 msec
Min = -47.19 kph @ 51.72 msec



VTV TEST #1

Toe Pan X

Max = .00 mm @ -0.00 msec
Min = -4212.67 mm @ 427.32 msec

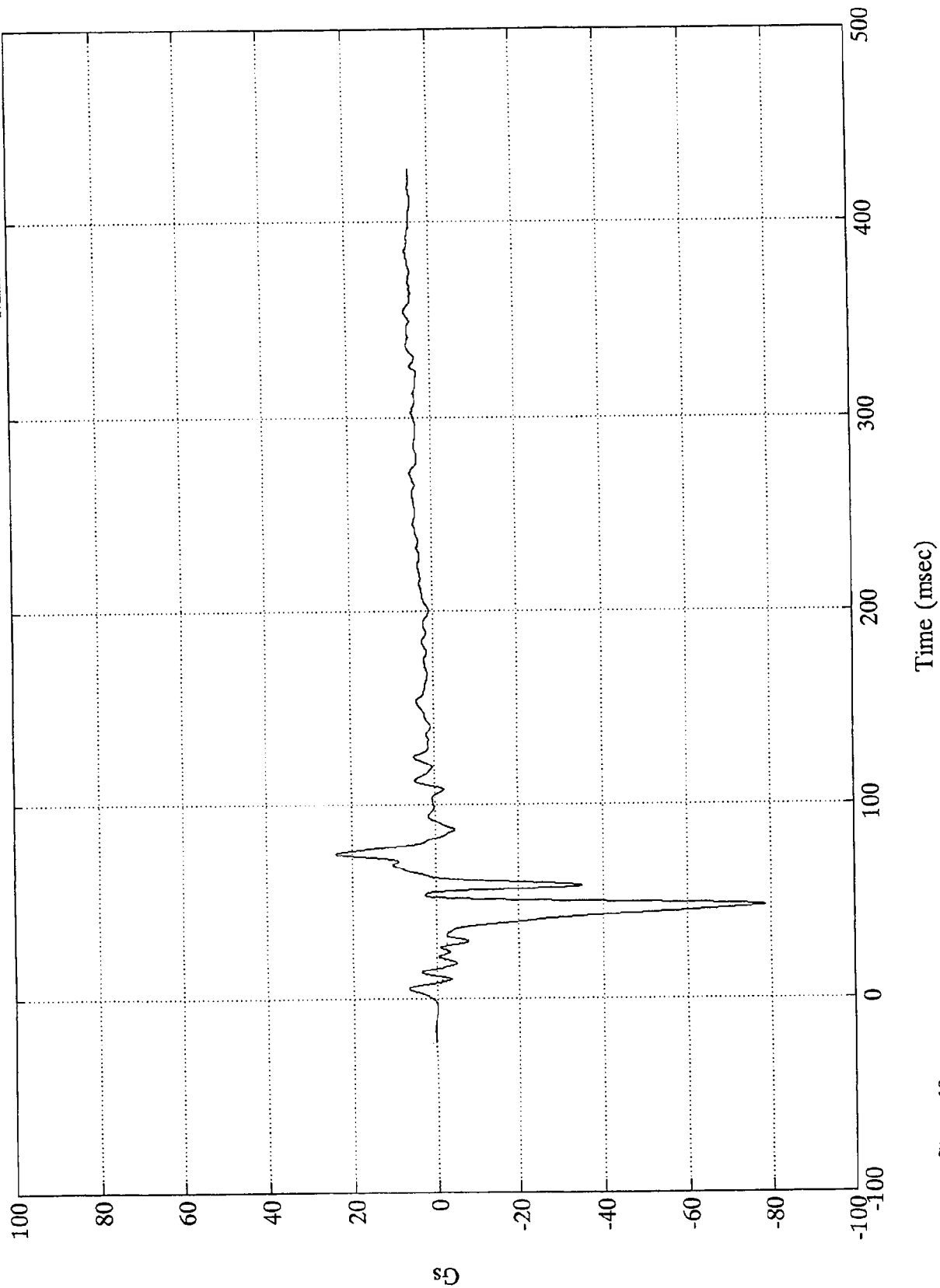


Time (msec)

SAE Filter Class 60

VTV TEST #1

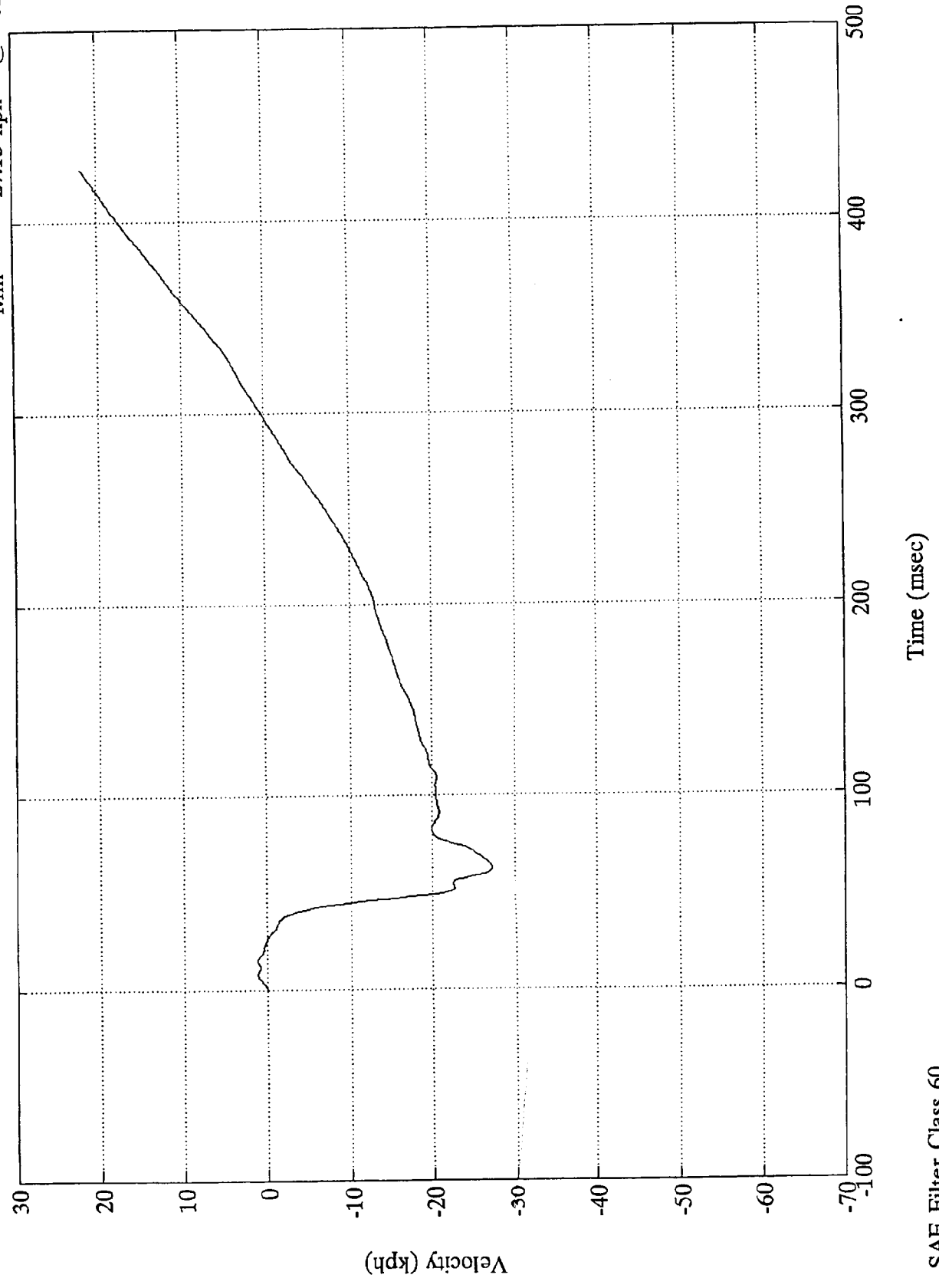
Toepan Y Max = 23.75 Gs @ 74.88 msec
Min = -78.75 Gs @ 47.76 msec



VTV TEST #1

Toe pan Y

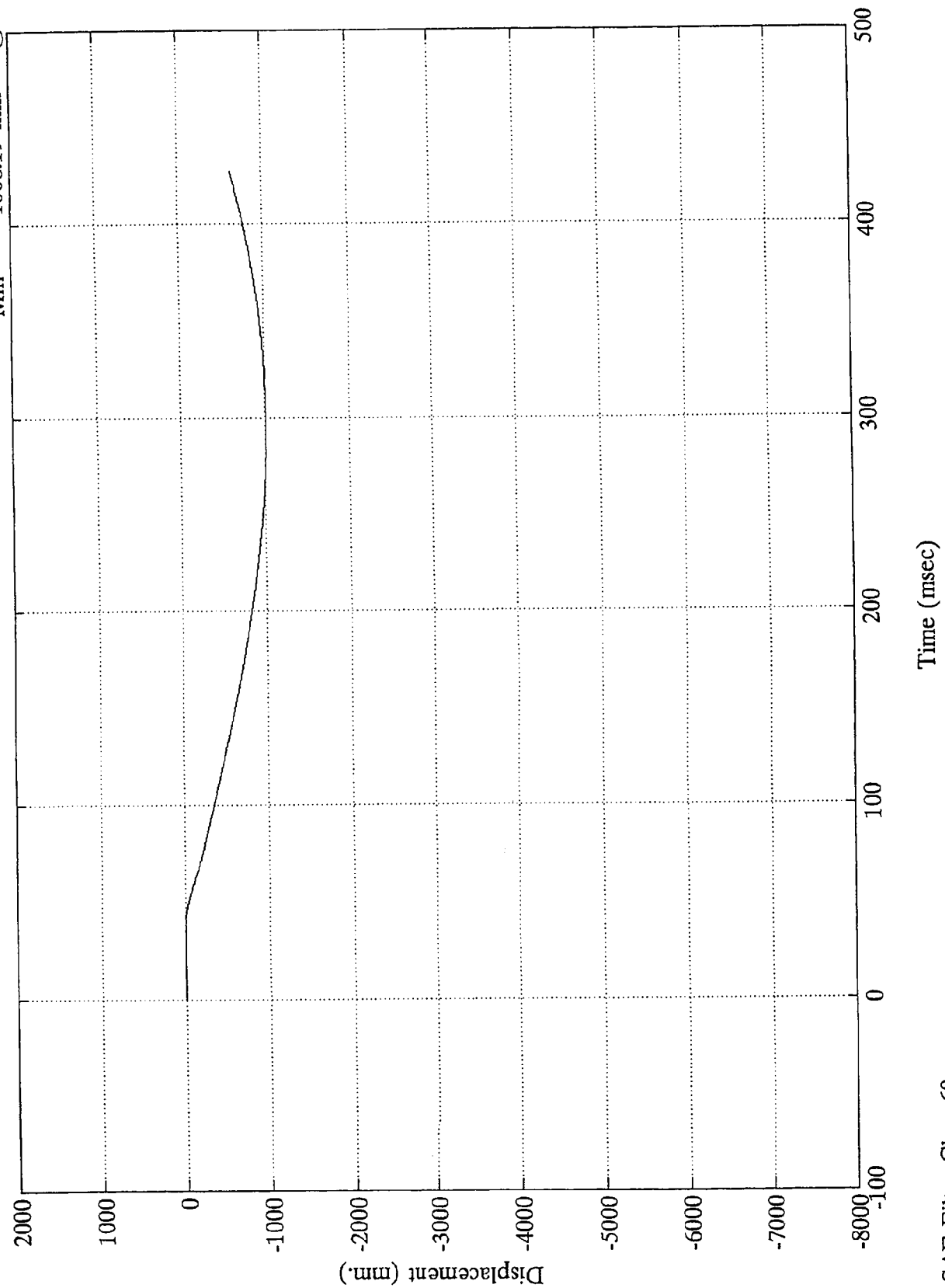
Max = 21.87 kph @ 427.32 msec
Min = -27.13 kph @ 62.16 msec



VTV TEST #1

Toe Pan Y

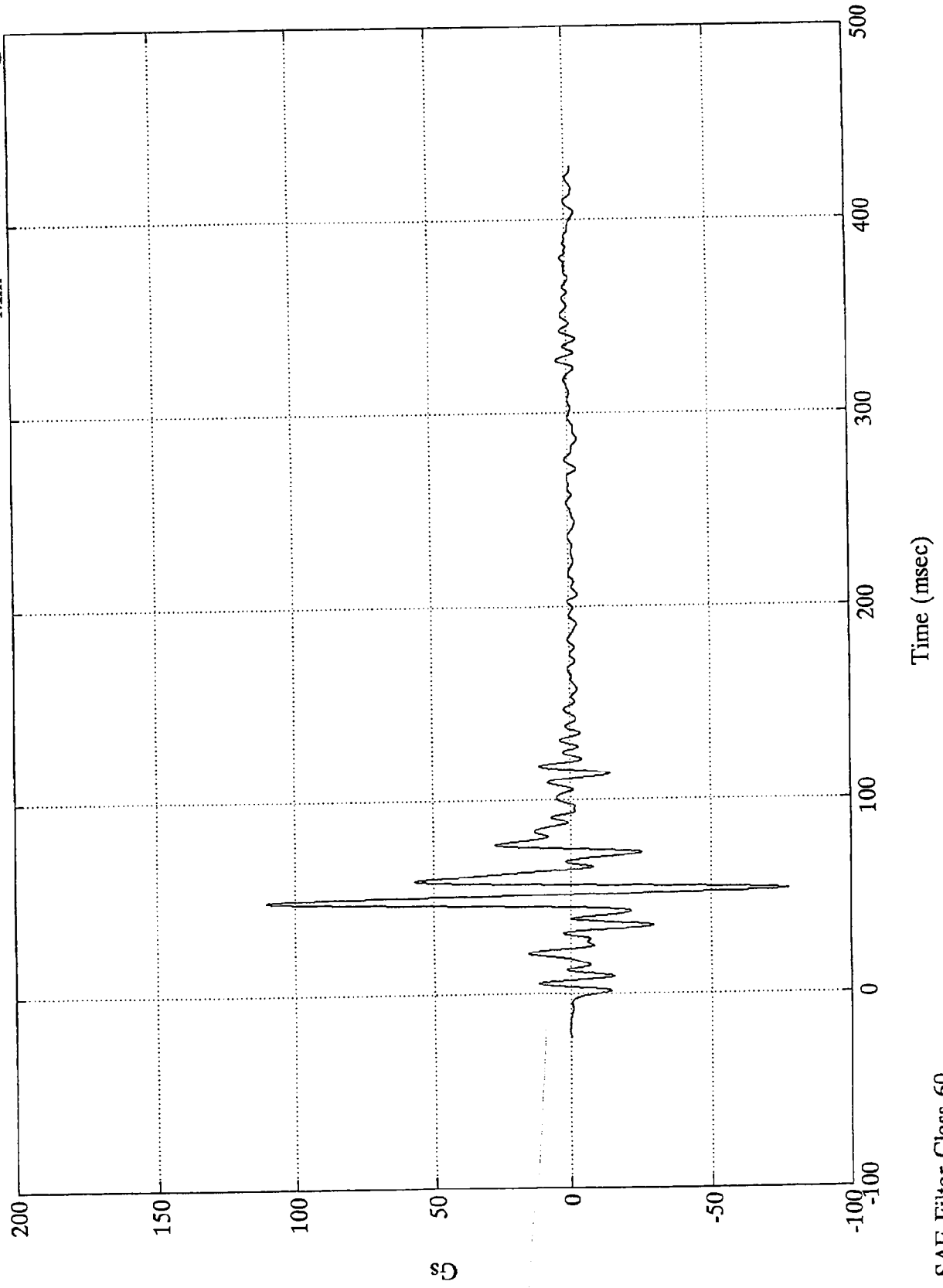
Max = 4.78 mm @ 26.76 msec
Min = -1008.19 mm @ 297.83 msec



SAE Filter Class 60

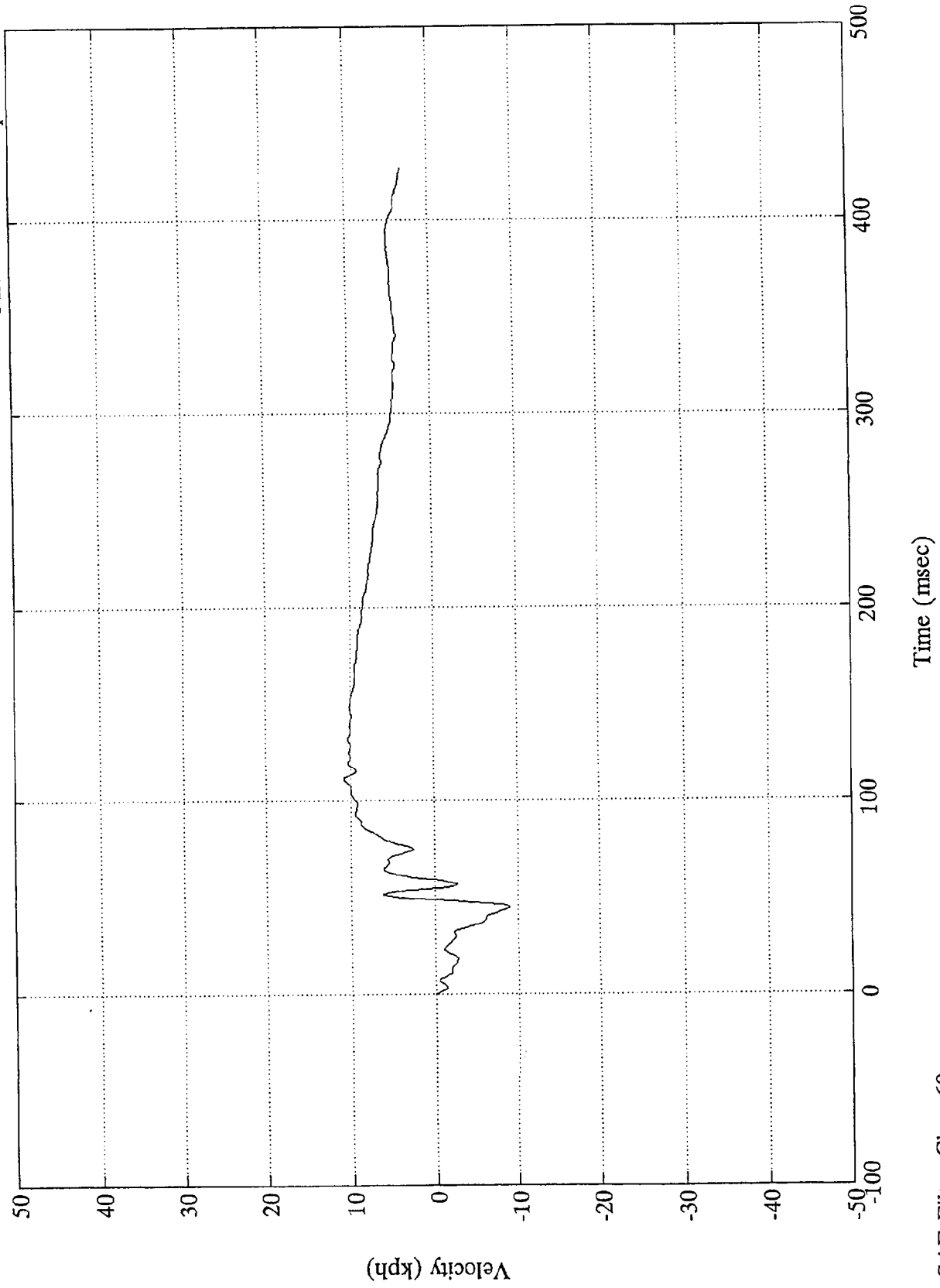
VTV TEST #1

Toe Pan Z Max = 110.51 Gs @ 48.24 msec
Min = -77.94 Gs @ 53.75 msec



VTV TEST #1

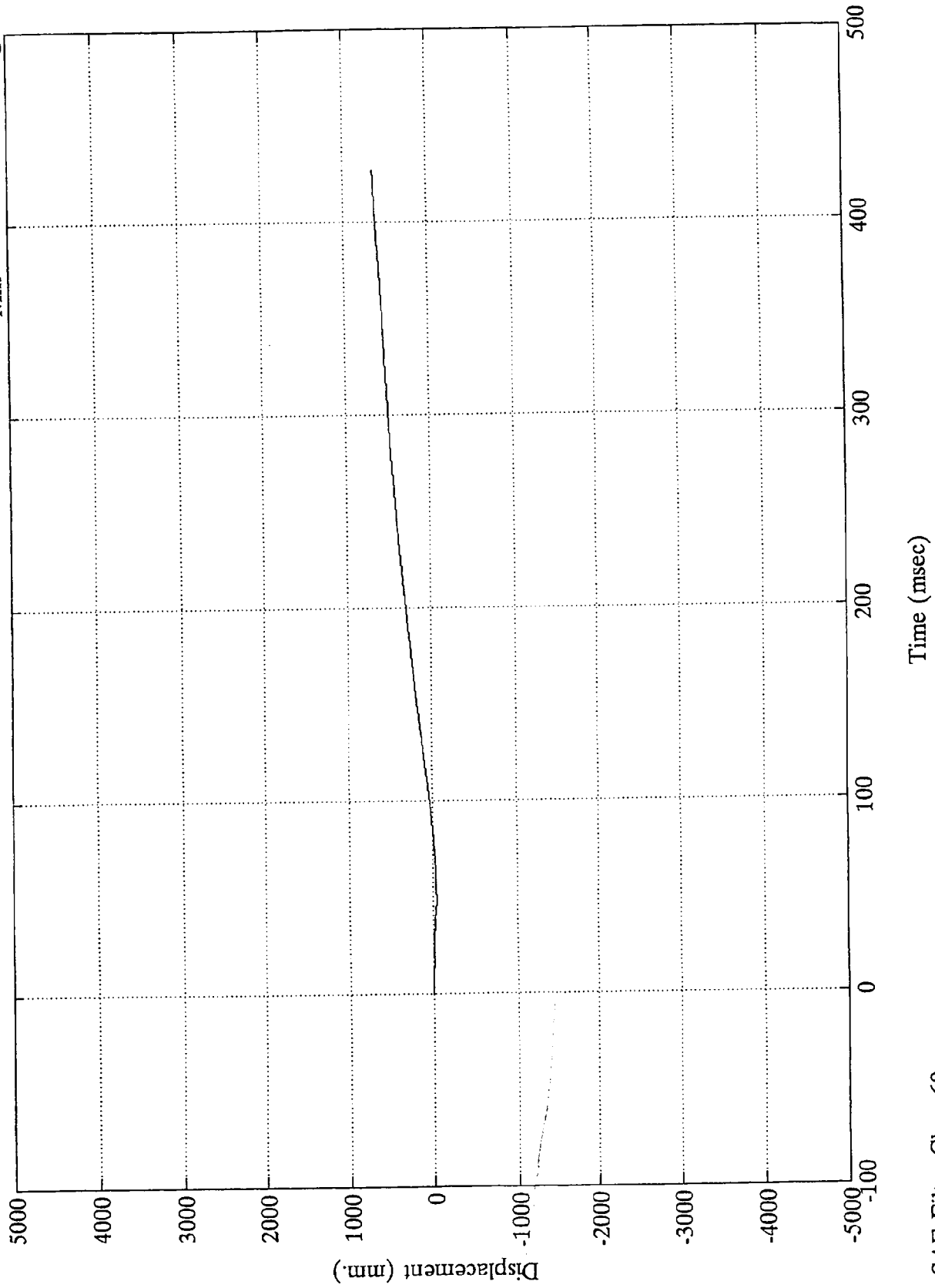
Toe Pan Z Max = 10.77 kph @ 111.00 msec
Min = -9.01 kph @ 44.75 msec



VTV TEST #1

Toepan Z

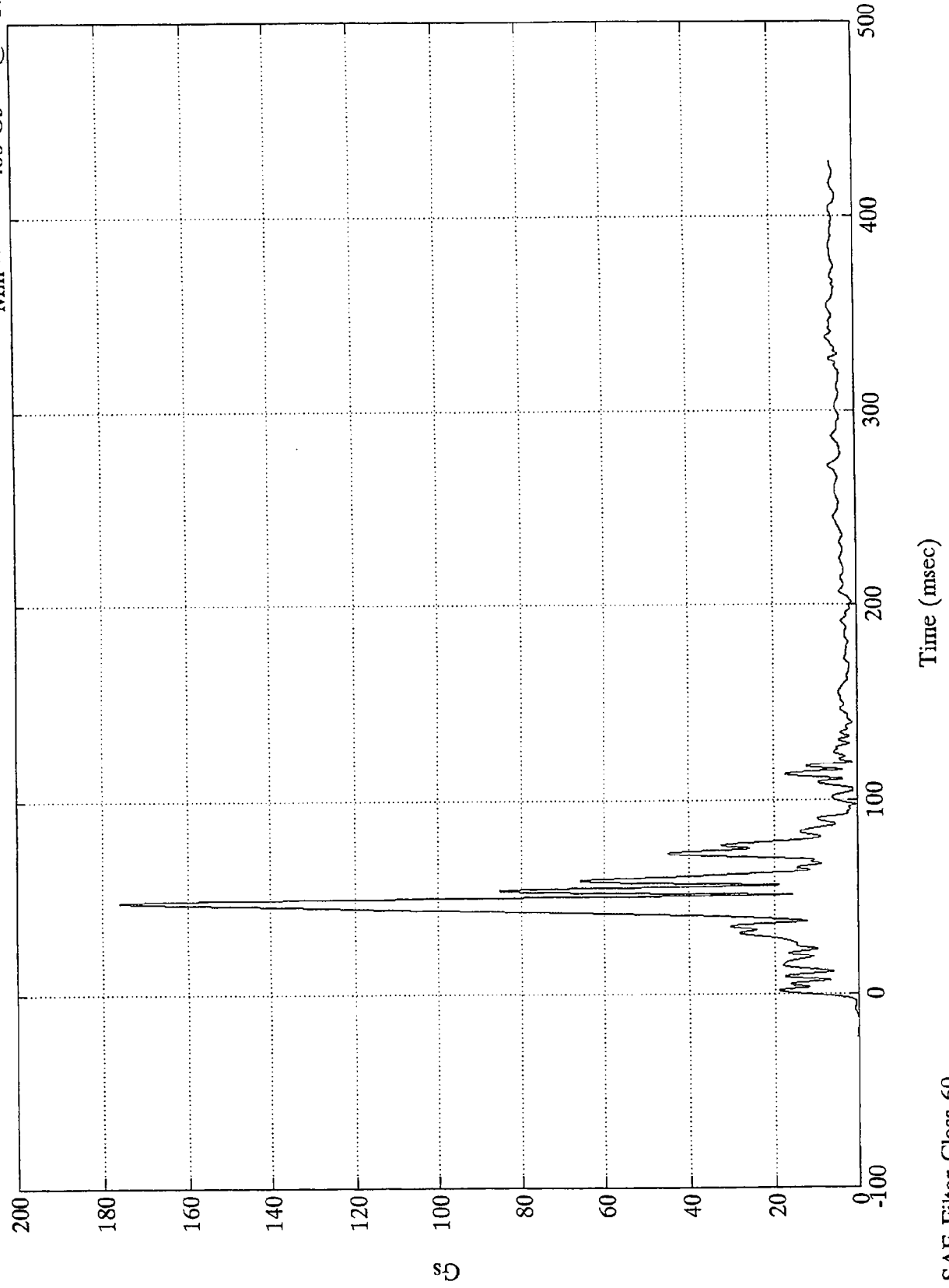
Max = 646.95 mm @ 427.32 msec
Min = -41.55 mm @ 48.60 msec



VTV TEST #1

Max = 175.80 Gs @ 47.88 msec
Min = .00 Gs @ -17.04 msec

Toe Pan Res



Gs

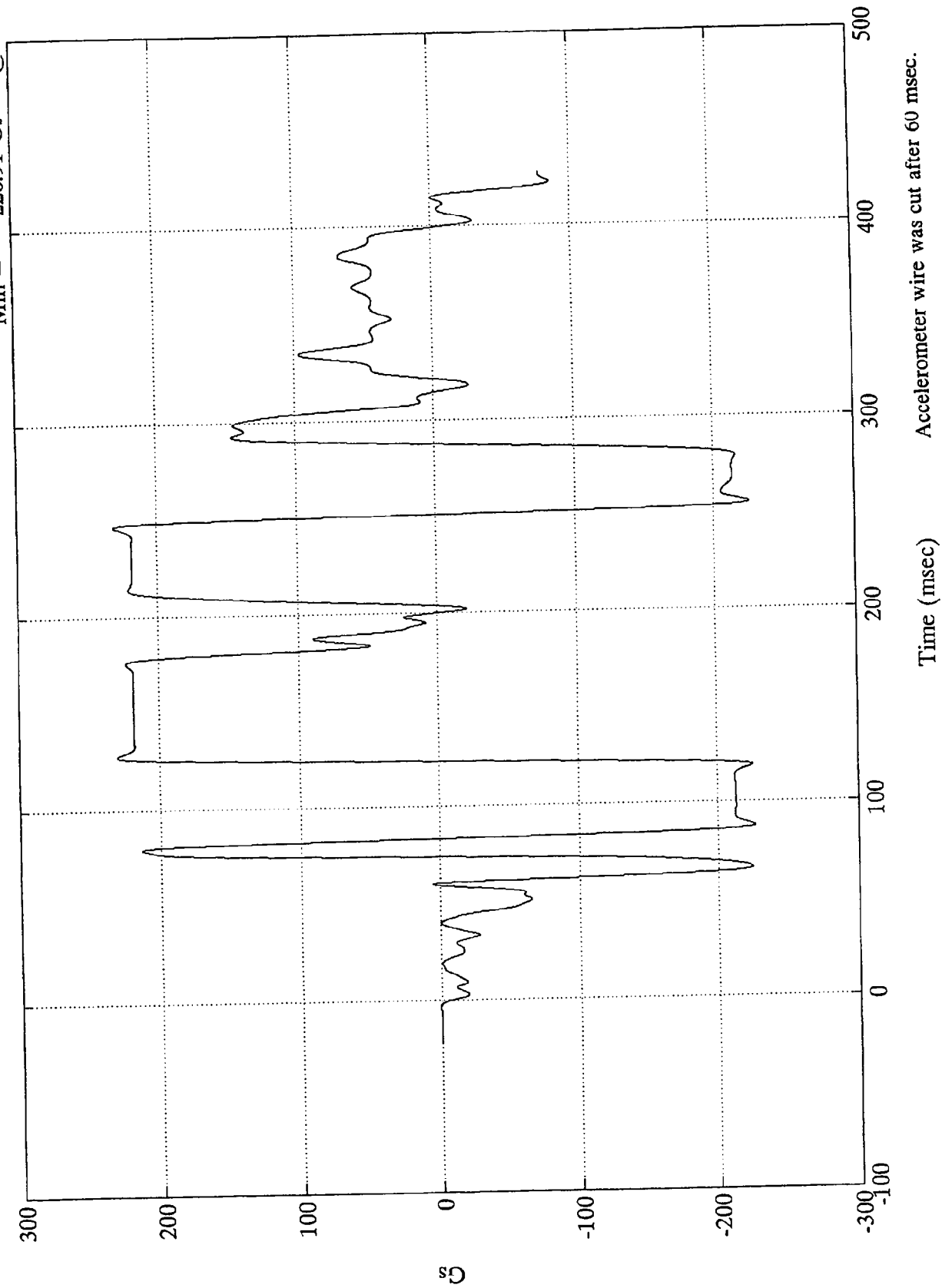
Time (msec)

SAE Filter Class 60

VTV TEST #1

A-Pillar Hinge X

Max = 231.04 Gs @ 246.72 msec
Min = -226.91 Gs @ 87.59 msec



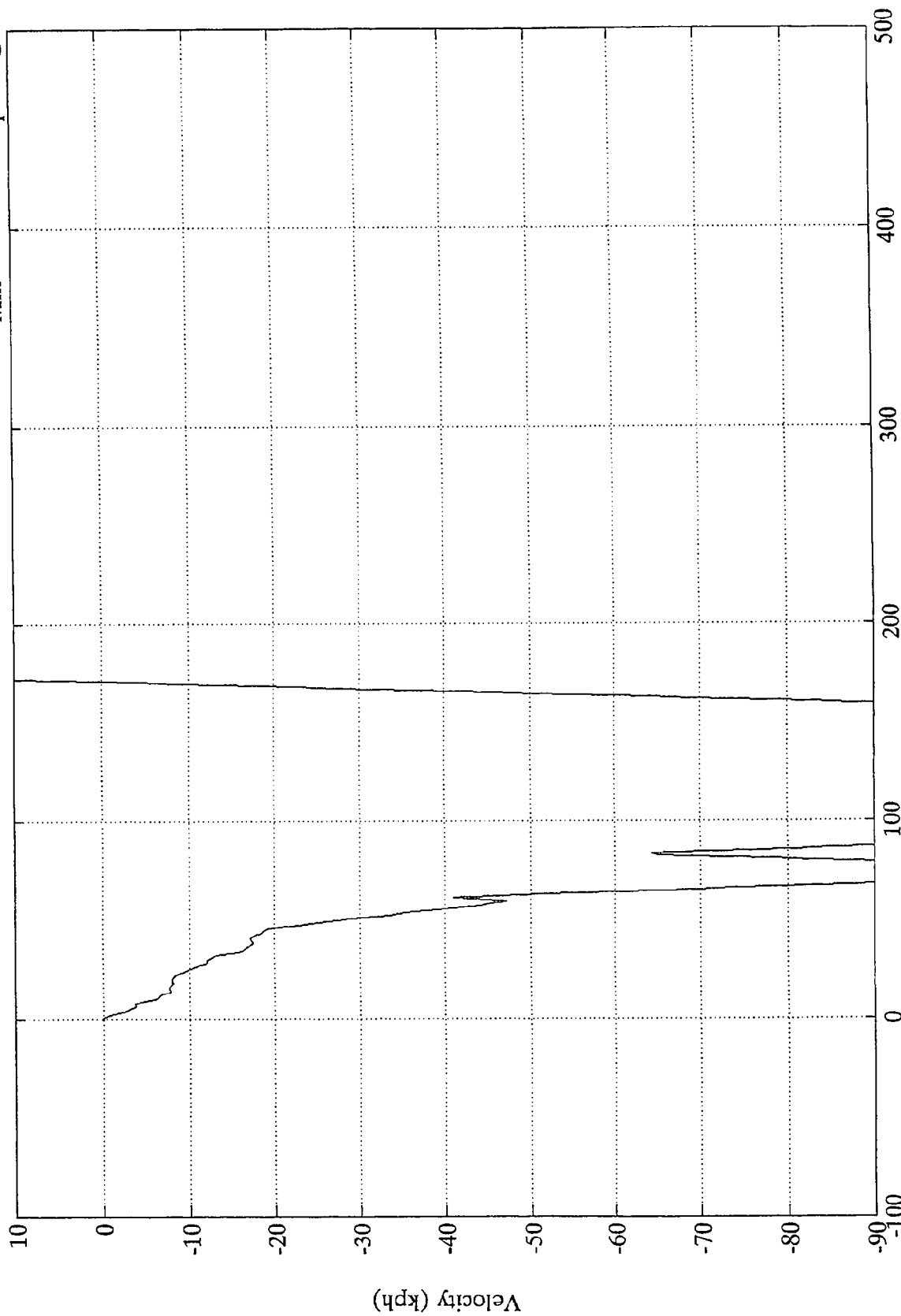
Accelerometer wire was cut after 600 msec.

SAE Filter Class 60

VTV TEST #1

A-Pillar Hinge X

Max = 434.19 kph @ 251.28 msec
Min = -360.00 kph @ 123.48 msec



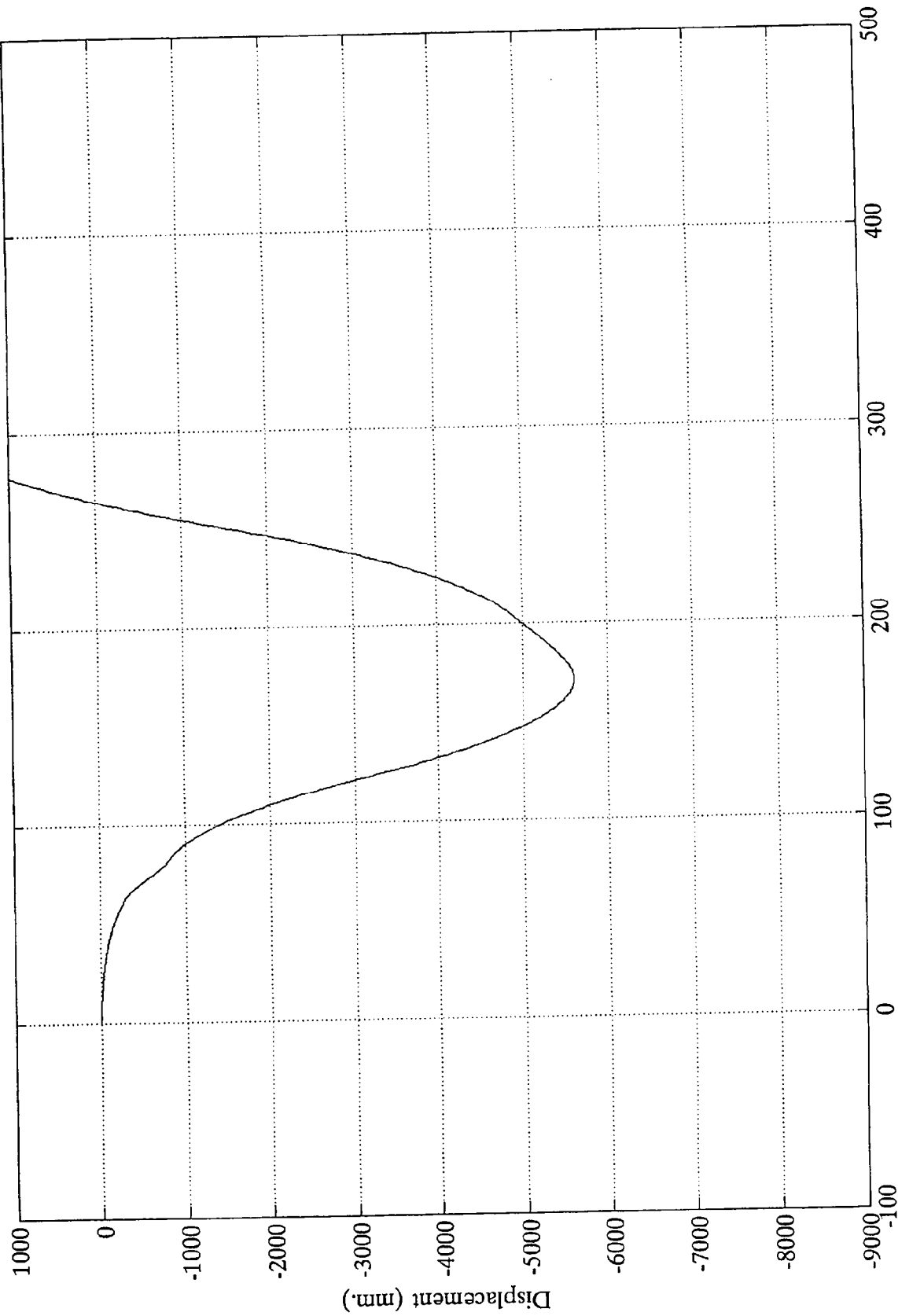
Accelerometer wire was cut after 60 msec.

SAE Filter Class 180

VTV TEST #1

A-Pillar Hinge X

Max = 14057.08 mm @ 427.32 msec
Min = -5607.53 mm @ 171.00 msec



Time (msec) Accelerometer wire was cut after 60 msec.

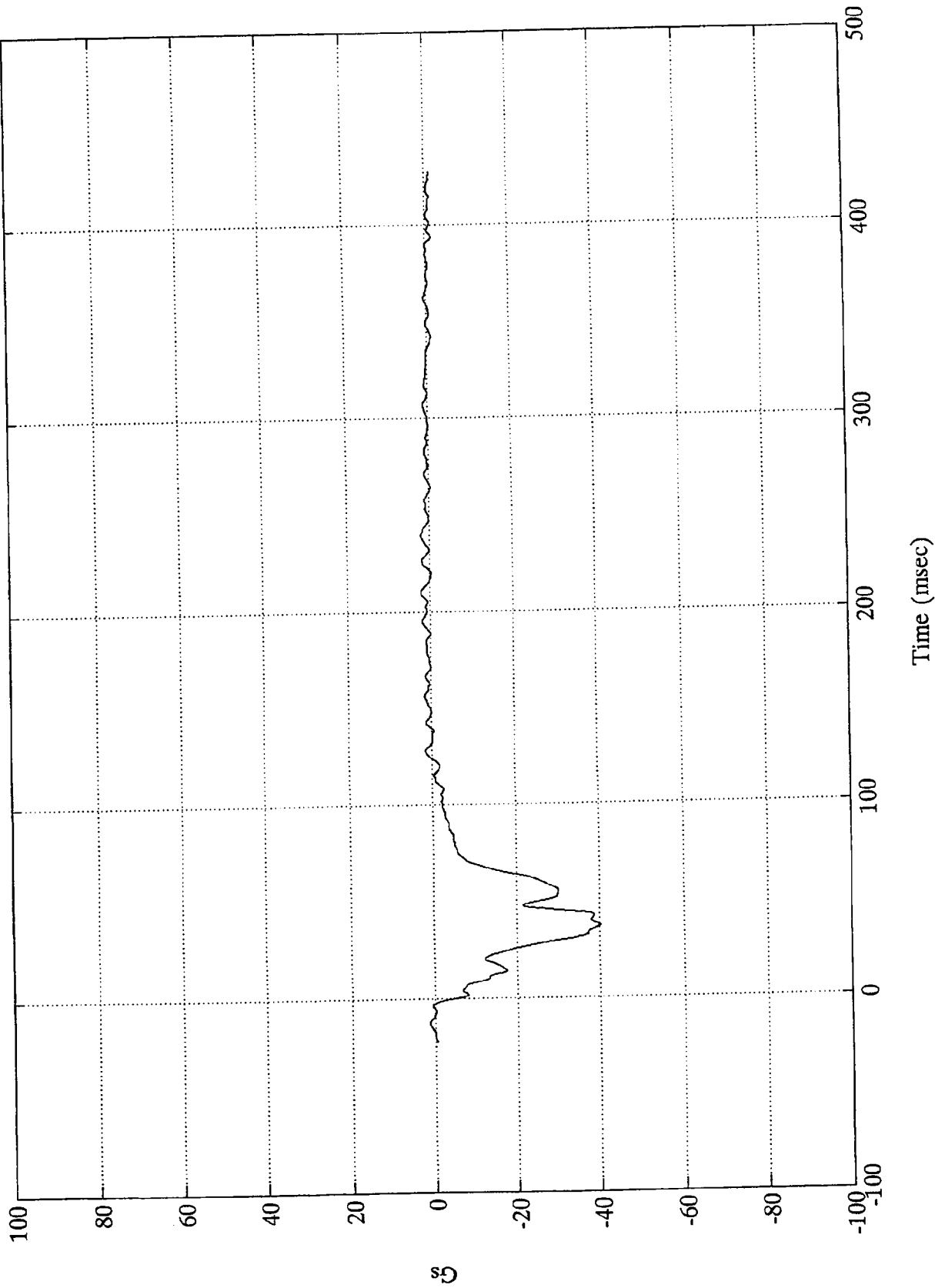
SAE Filter Class 180

VEHICLE TWO DATA

VTV TEST #1

Max = 2.34 Gs @ 210.36 msec
Min = -40.20 Gs @ 37.31 msec

MDB Left Rail X

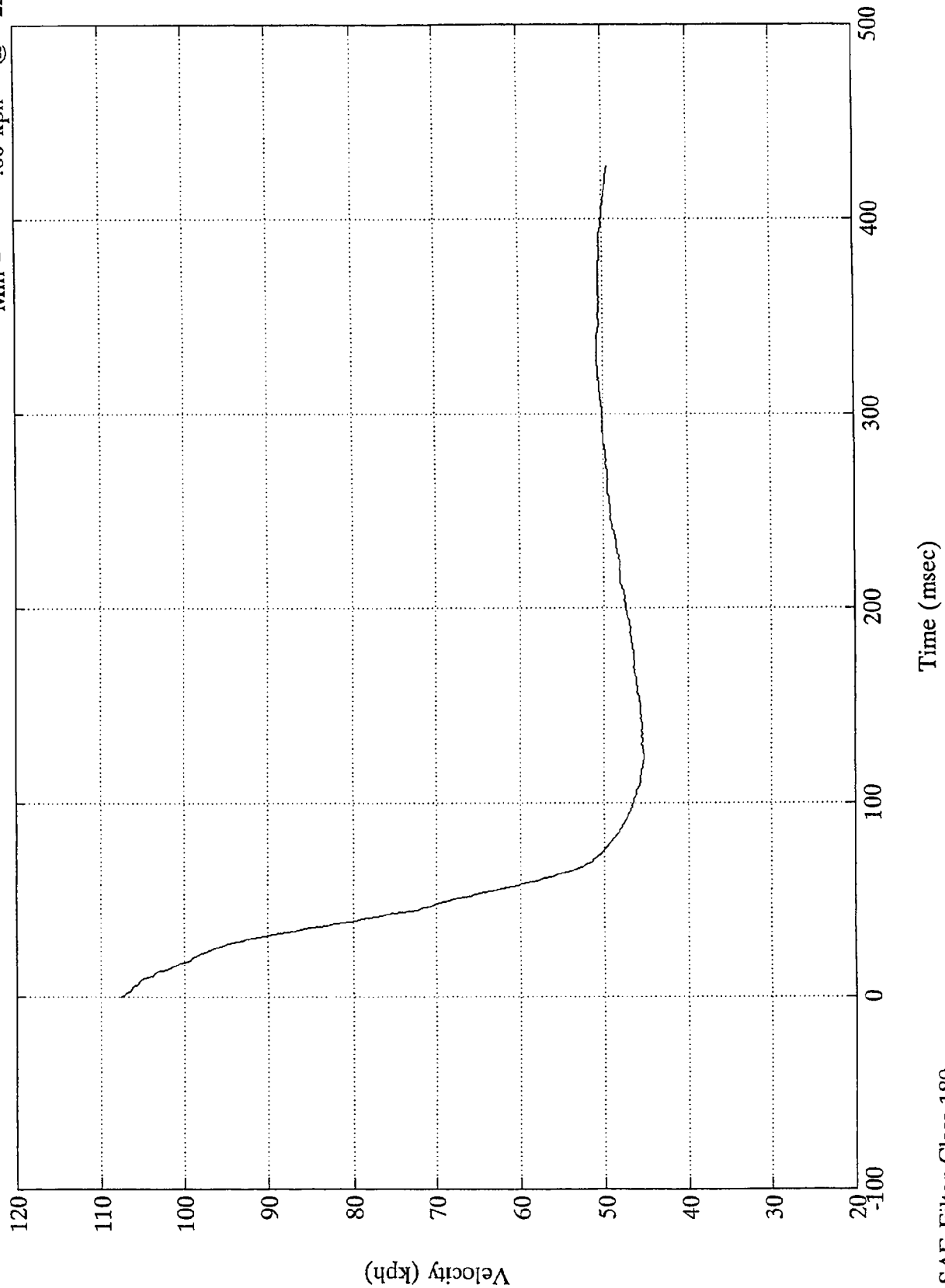


SAE Filter Class 60

VTV TEST #1

Max = 107.57 kph @ -0.00 msec
Min = .00 kph @ -22.44 msec

MDB Left Rail X

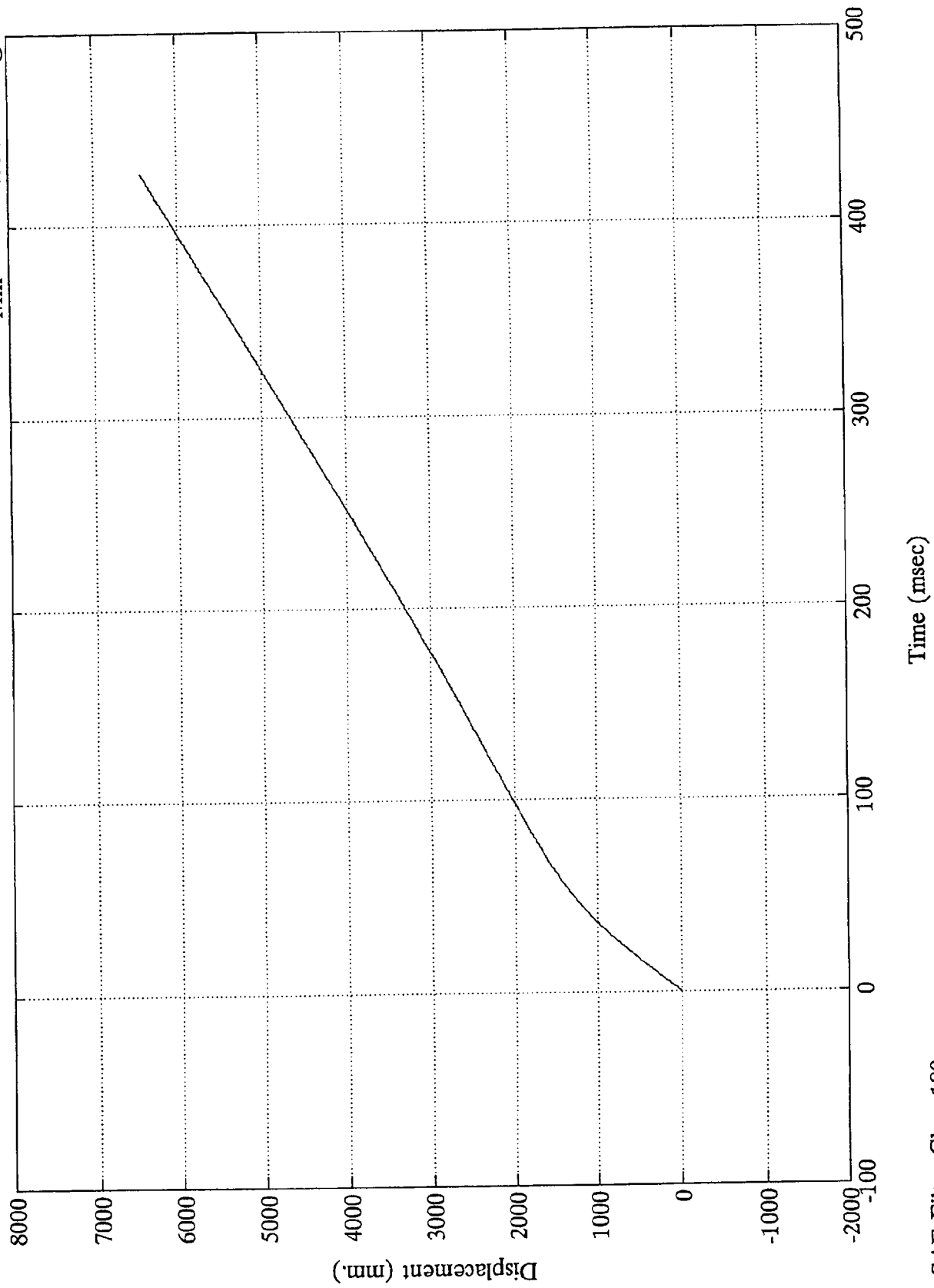


SAE Filter Class 180

VTV TEST #1

MDB Left Rail X

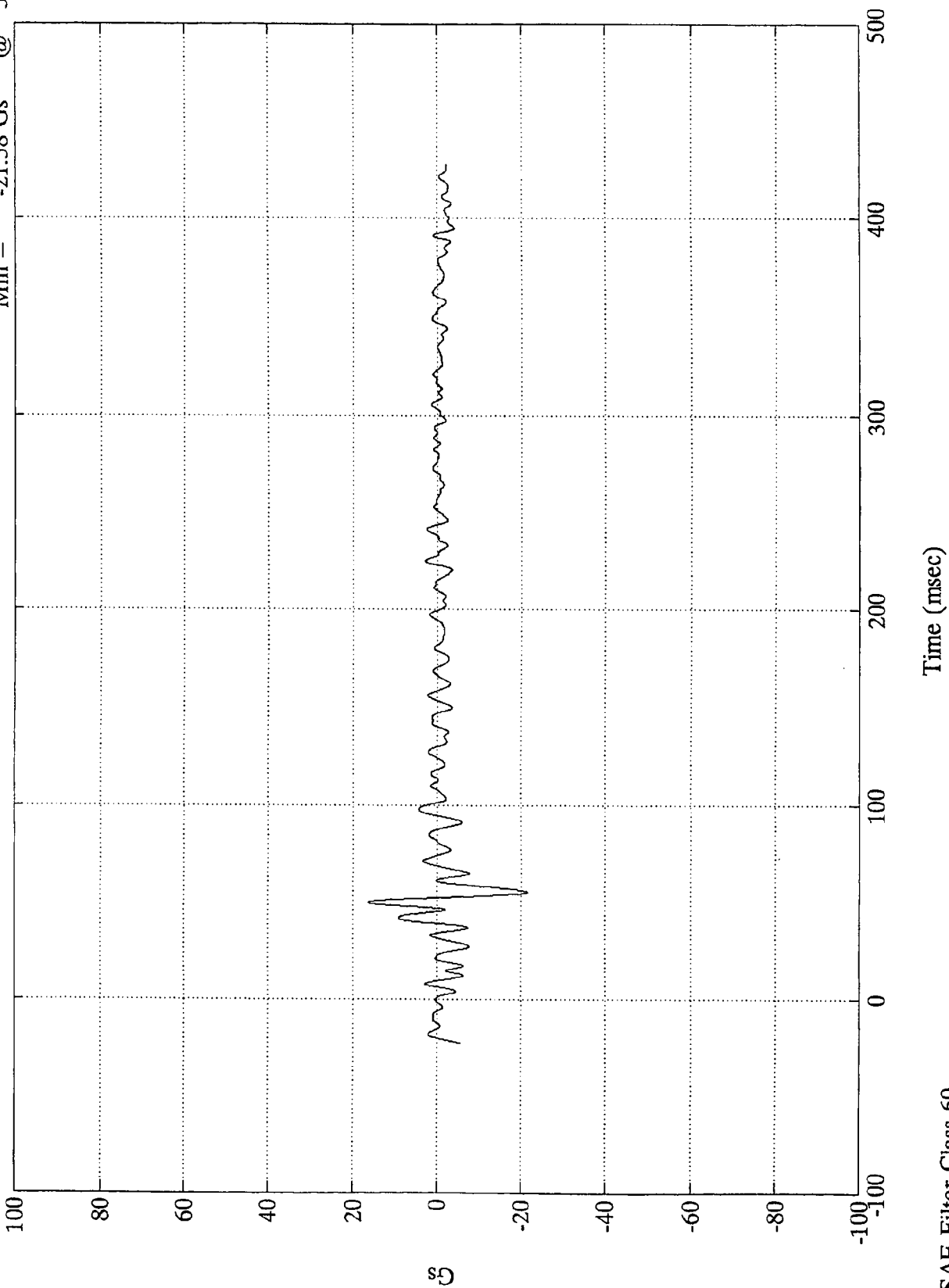
Max = 6438.52 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



VTV TEST #1

Max = 16.34 Gs @ 49.68 msec
Min = -21.58 Gs @ 55.08 msec

MDB Left Rail Y

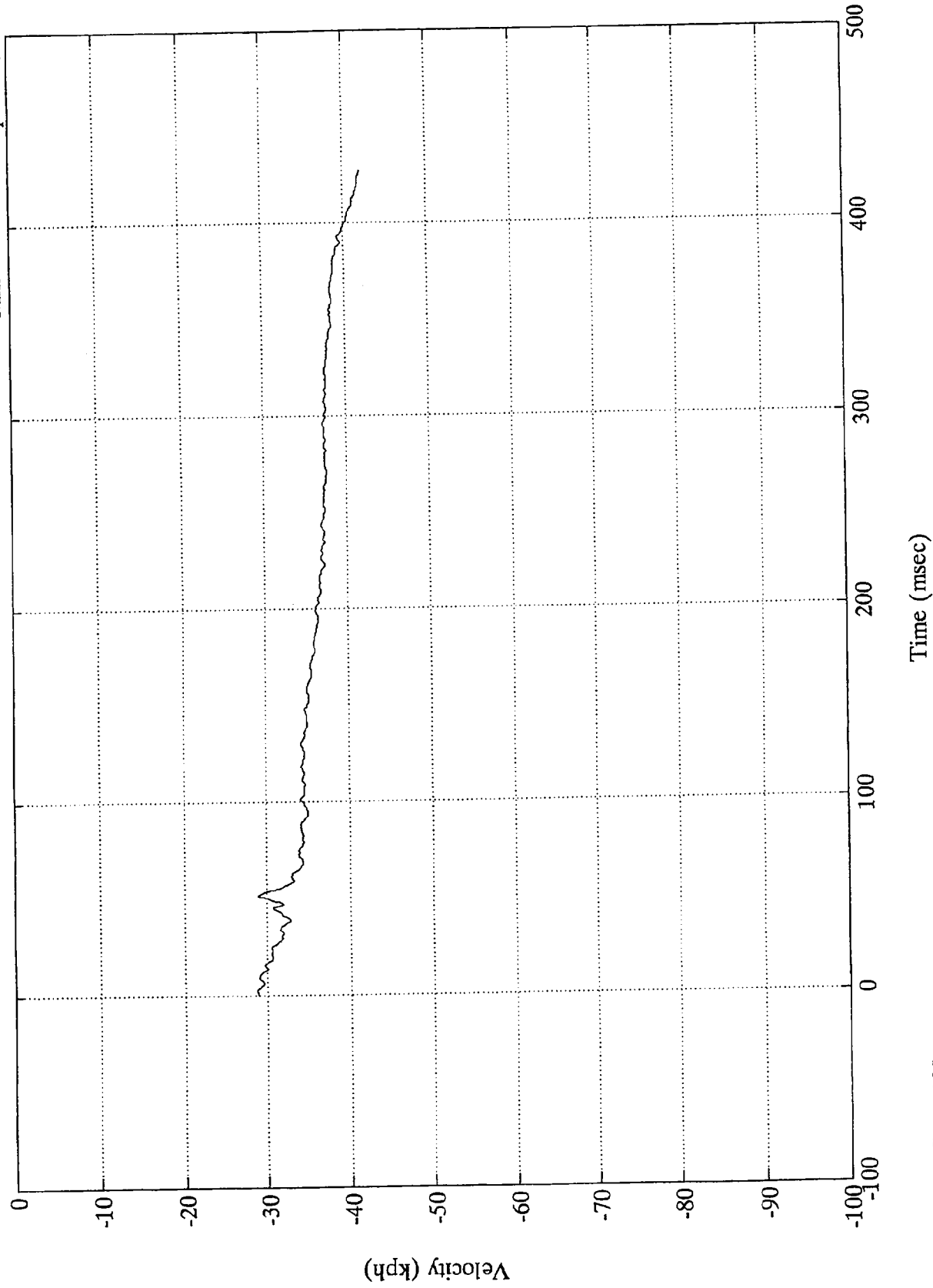


SAE Filter Class 60

VTV TEST #1

MDB Left Rail Y

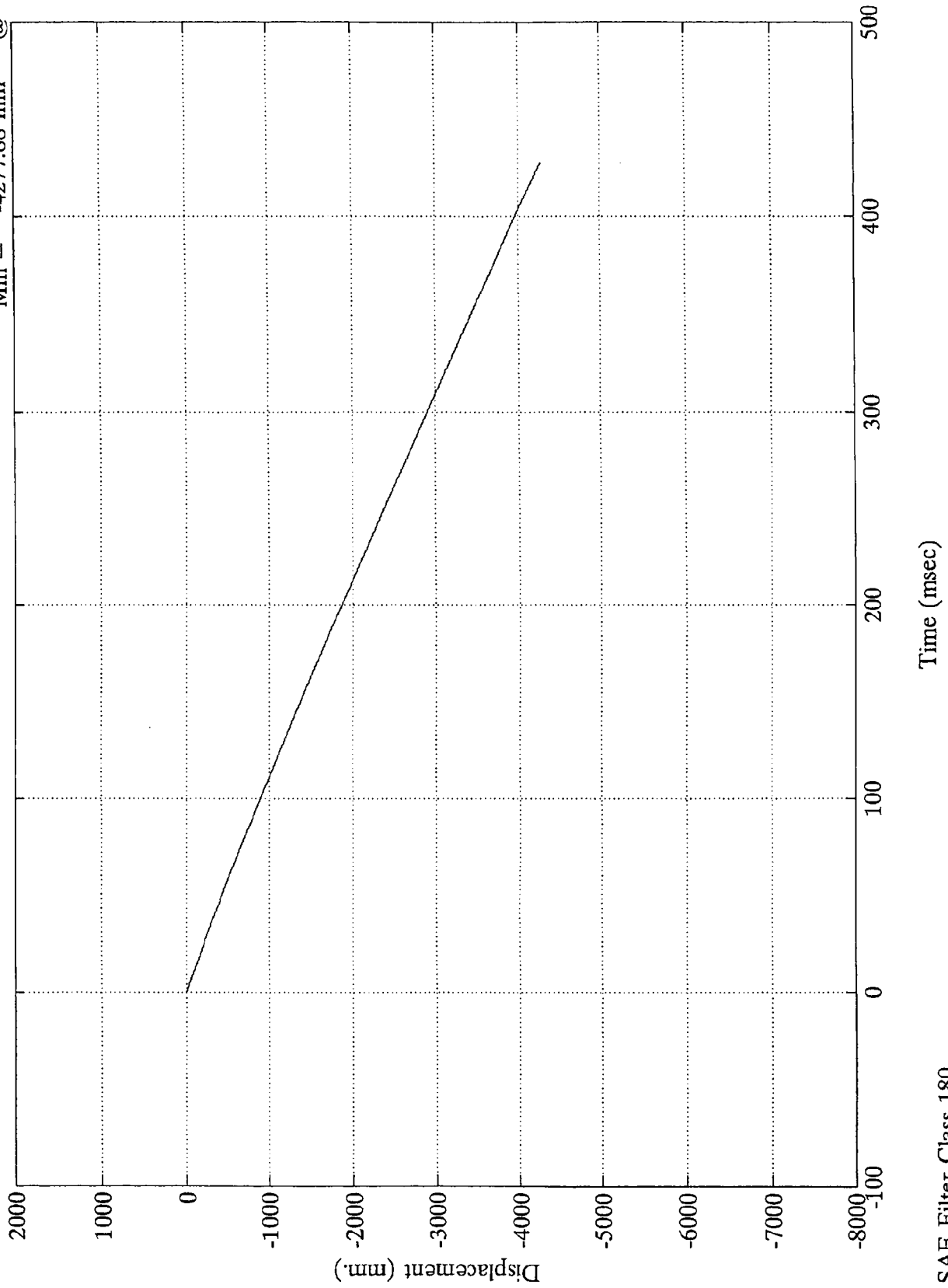
Max = .00 kph @ -22.44 msec
Min = -42.03 kph @ 427.32 msec



VTV TEST #1

Max = .00 mm @ -0.00 msec
Min = -4277.88 mm @ 427.32 msec

MDB Left Rail Y

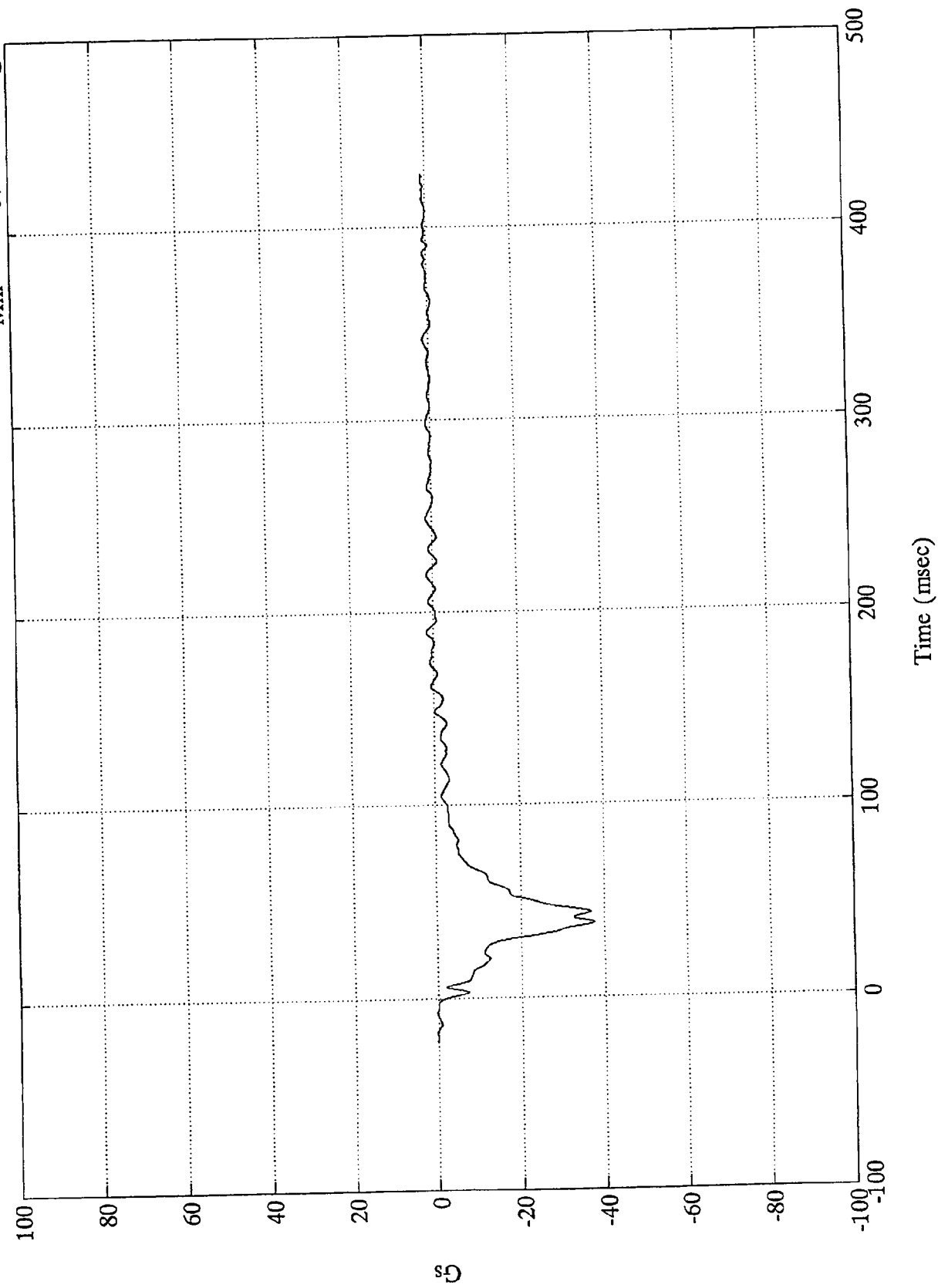


SAE Filter Class 180

VTV TEST #1

MDB Right Rail X

Max = 1.63 Gs @ 189.36 msec
Min = -37.66 Gs @ 38.75 msec



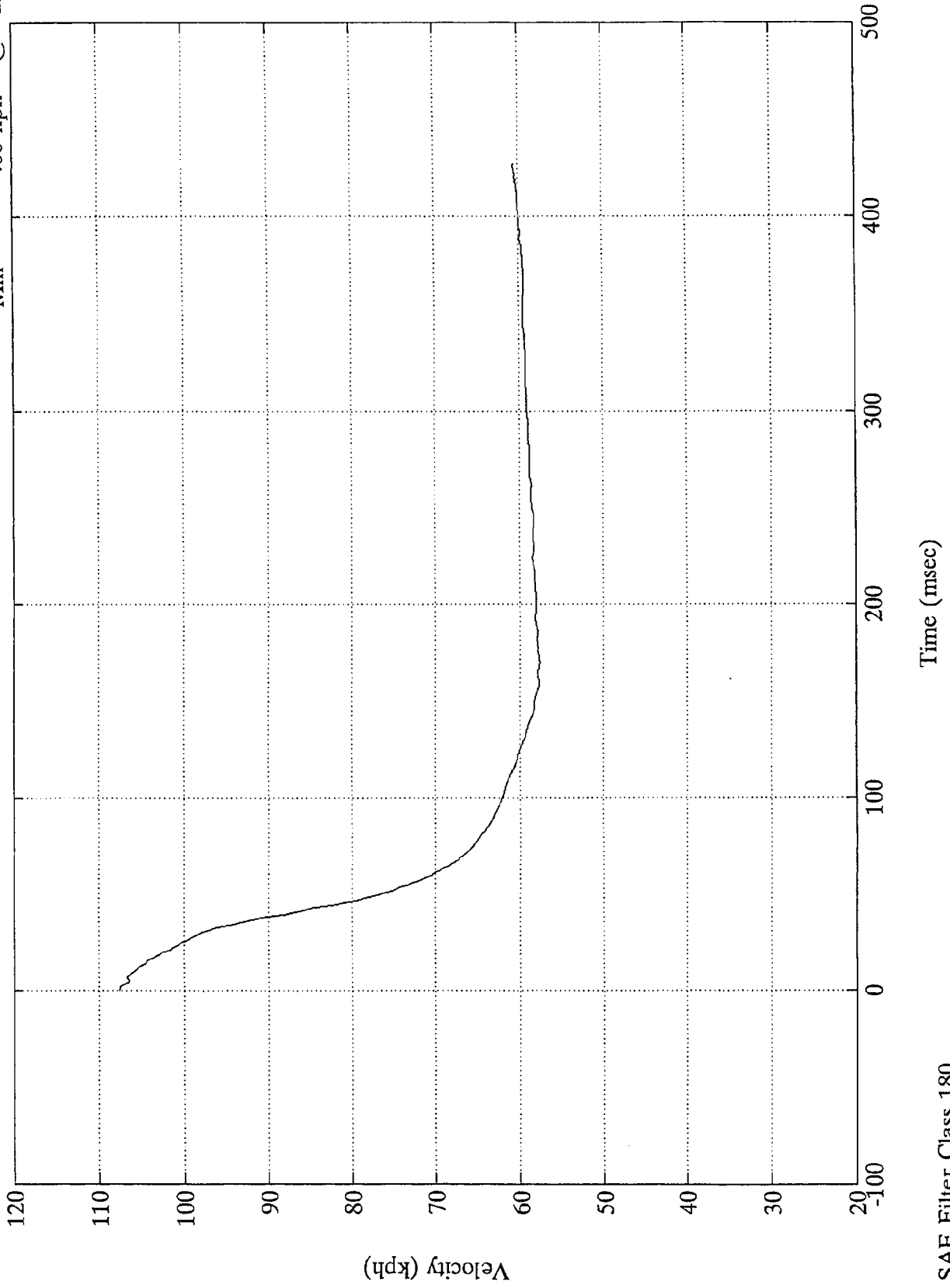
8304-1

B-105

SAE Filter Class 60

VTV TEST #1

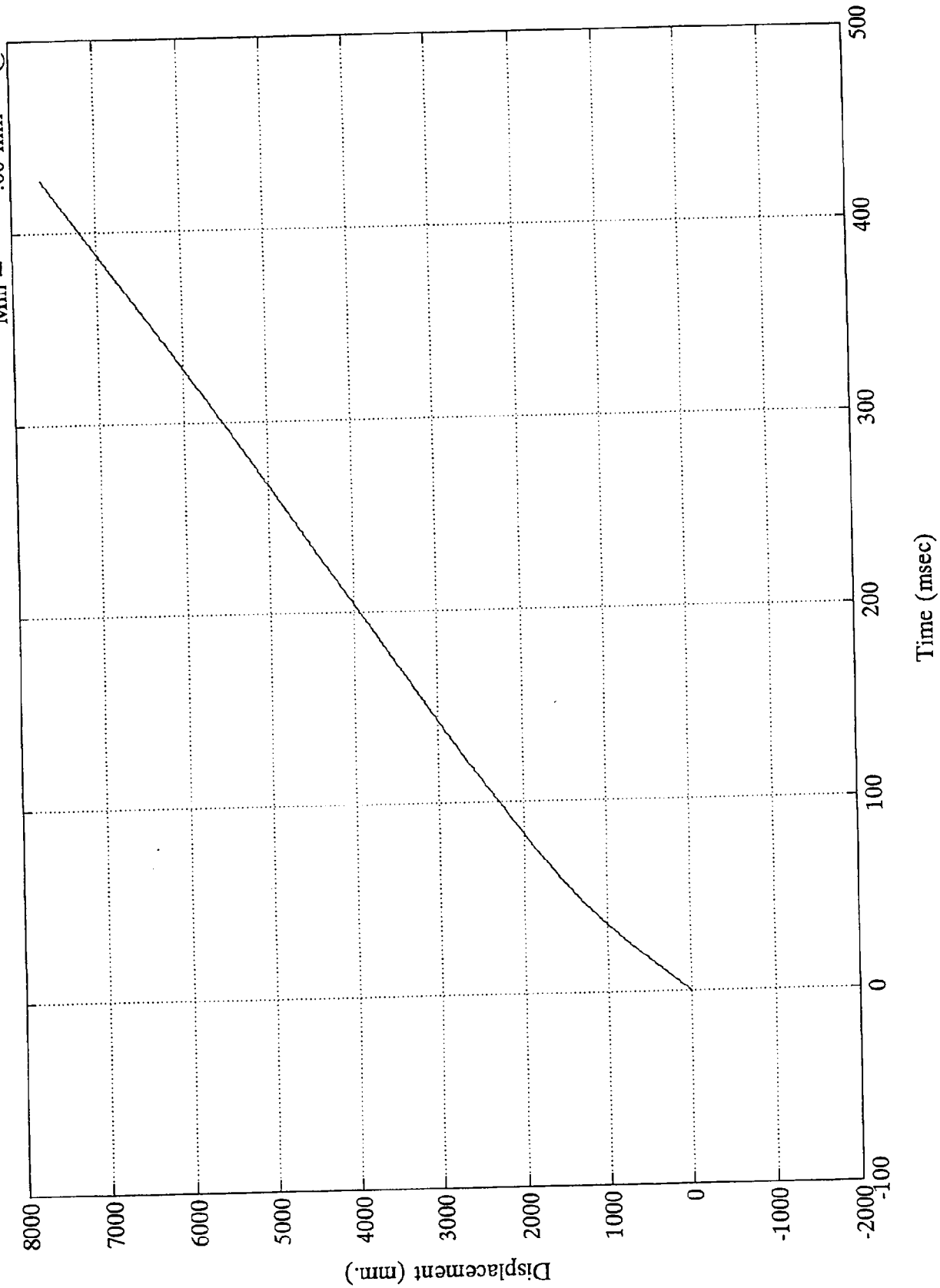
MDB Right Rail X
Max = 107.57 kph @ -0.00 msec
Min = .00 kph @ -22.44 msec



VTV TEST #1

MDB Right Rail X

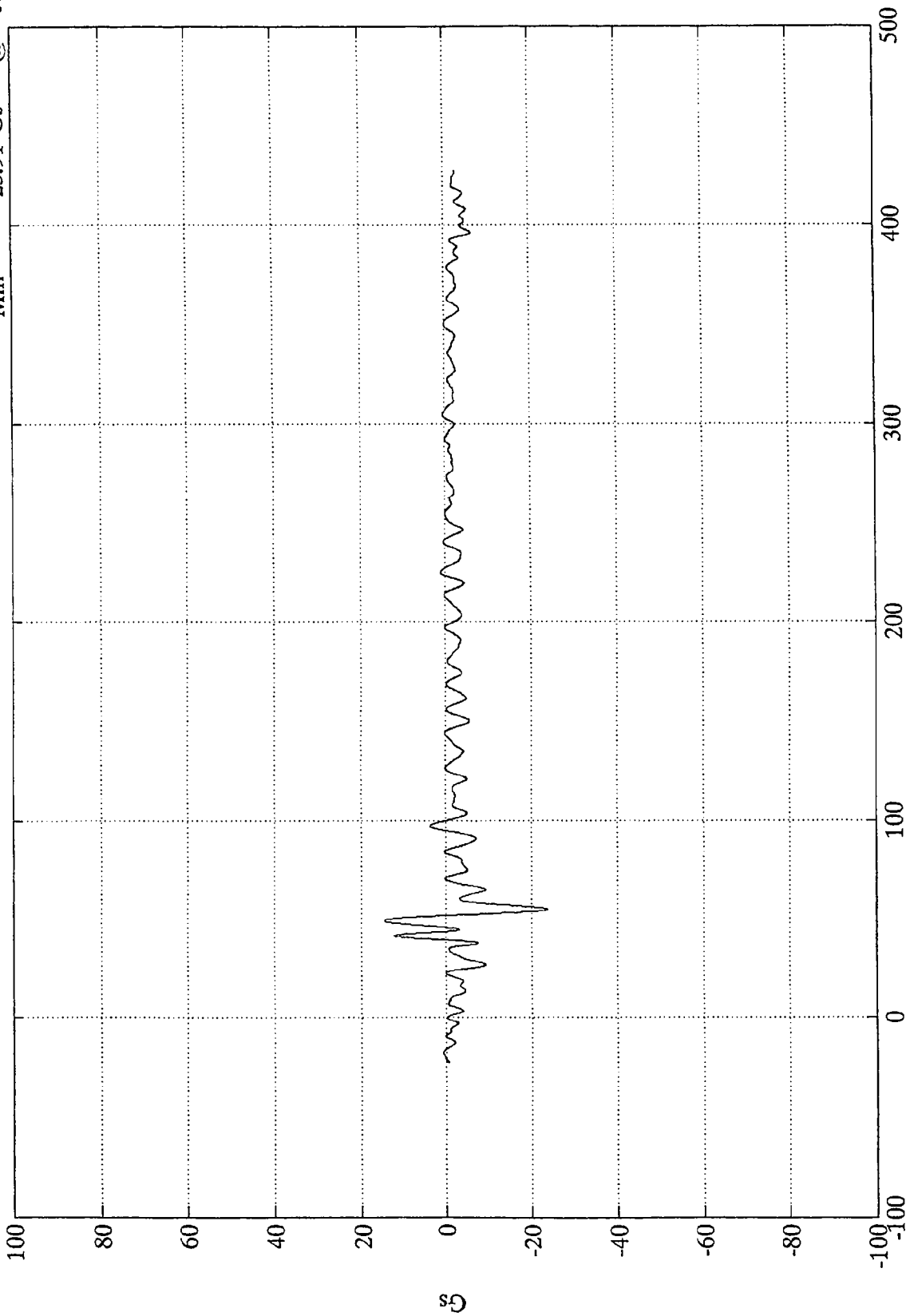
Max = 7649.72 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



VTV TEST #1

MDB Right Rail Y

Max =	14.62 Gs	@	49.31 msec
Min =	-23.91 Gs	@	55.08 msec



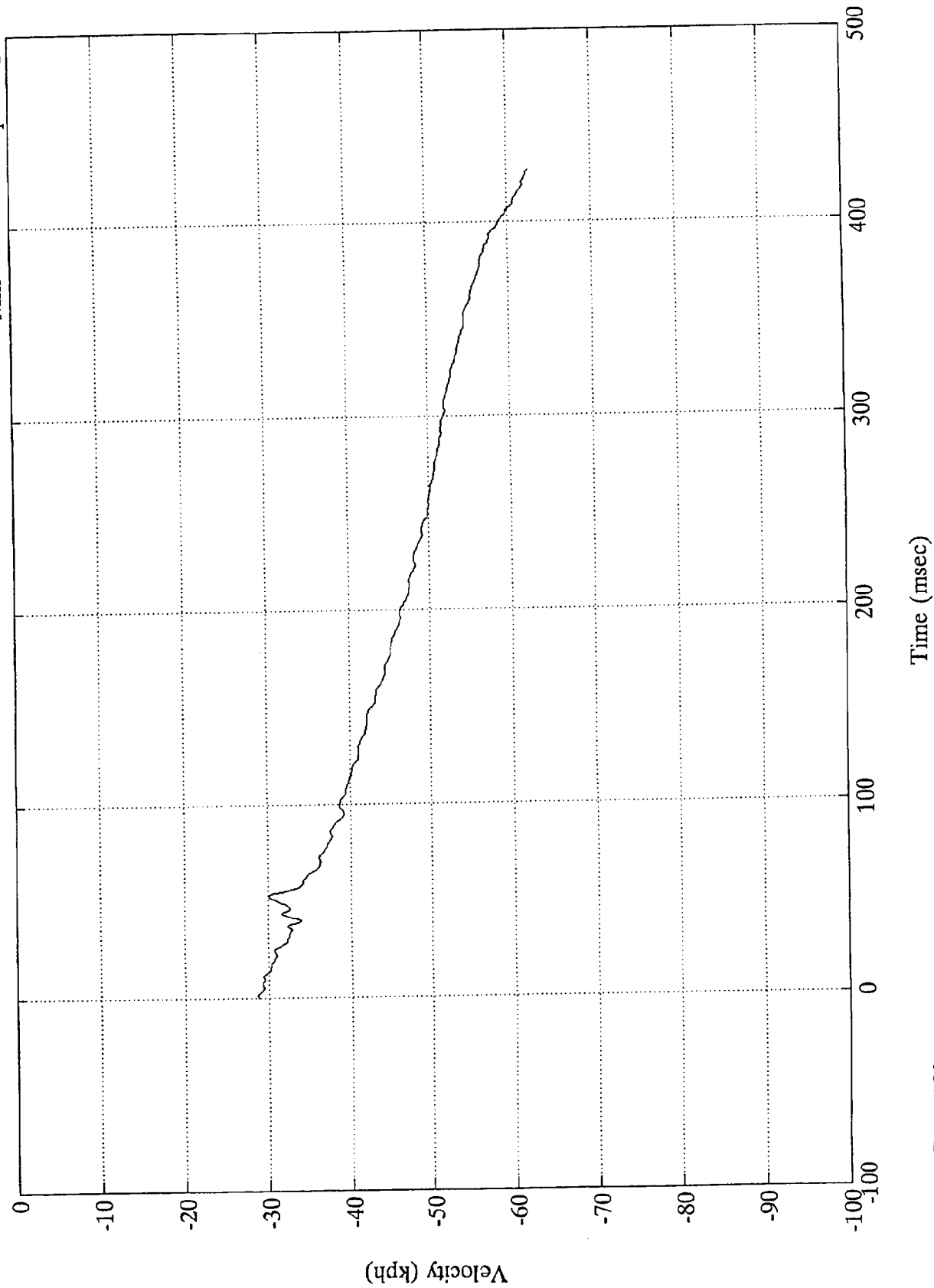
Time (msec)

SAE Filter Class 60

VTV TEST #1

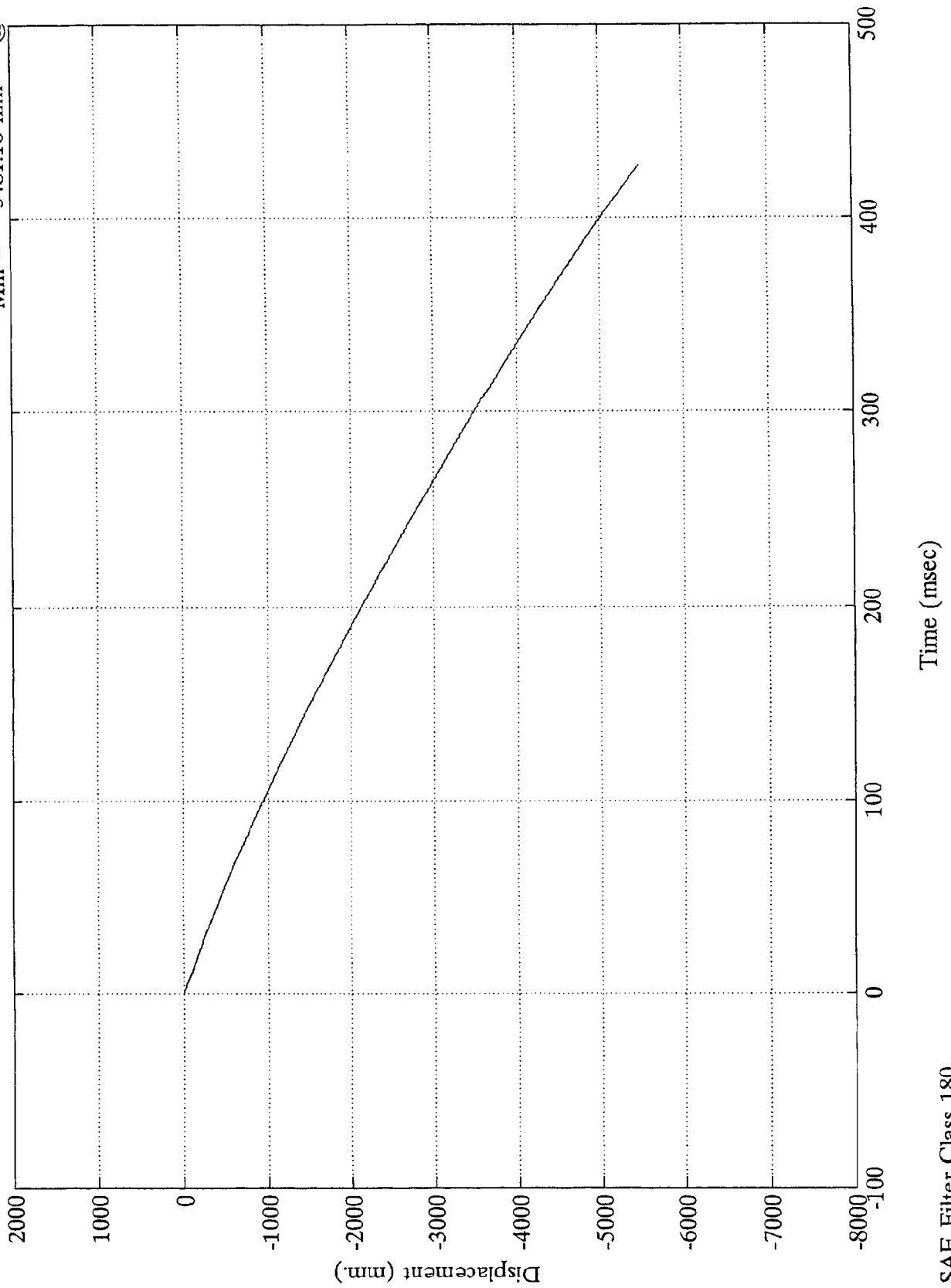
MDB Right Rail Y

Max = .00 kph @ -22.44 msec
Min = -62.66 kph @ 427.32 msec



VTV TEST #1

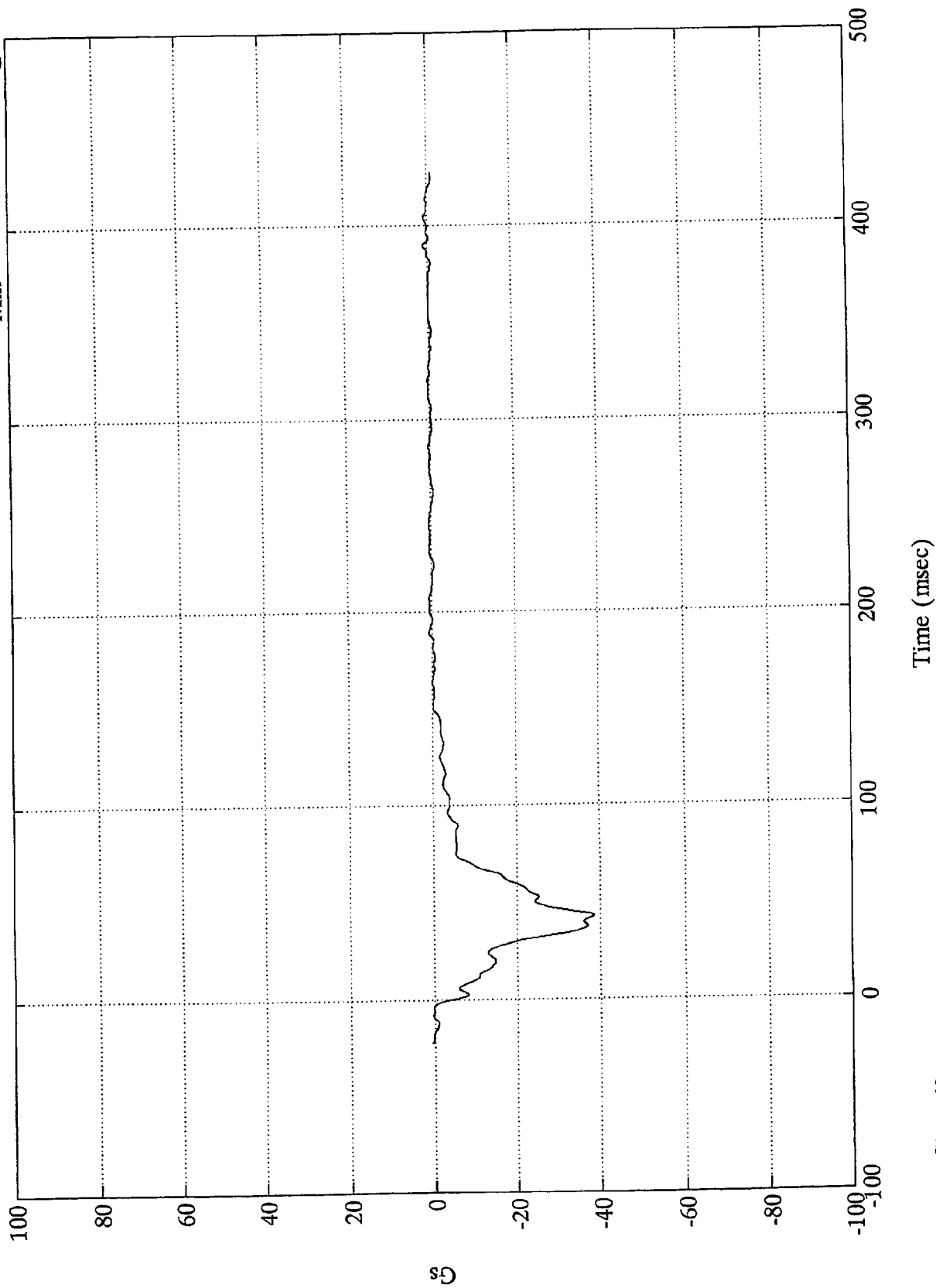
MDB Right Rail Y
Max = .00 mm @ -0.00 msec
Min = -5481.16 mm @ 427.32 msec



VTV TEST #1

Max = 1.13 Gs @ 389.28 msec
Min = -38.52 Gs @ 42.72 msec

MDB C.G. X



50

B-111

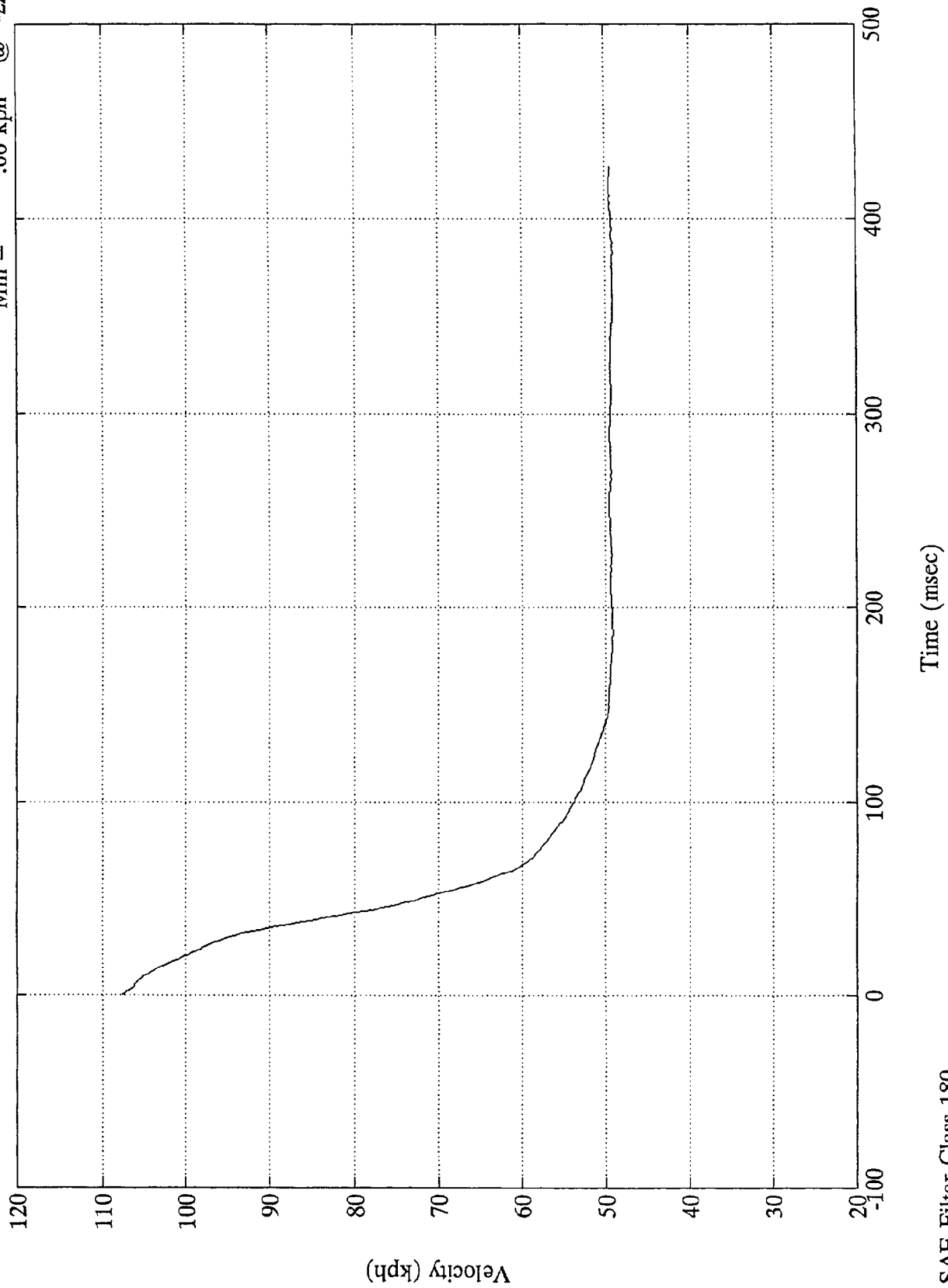
SAE Filter Class 60

8304-1

VTV TEST #1

MDB C.G. X

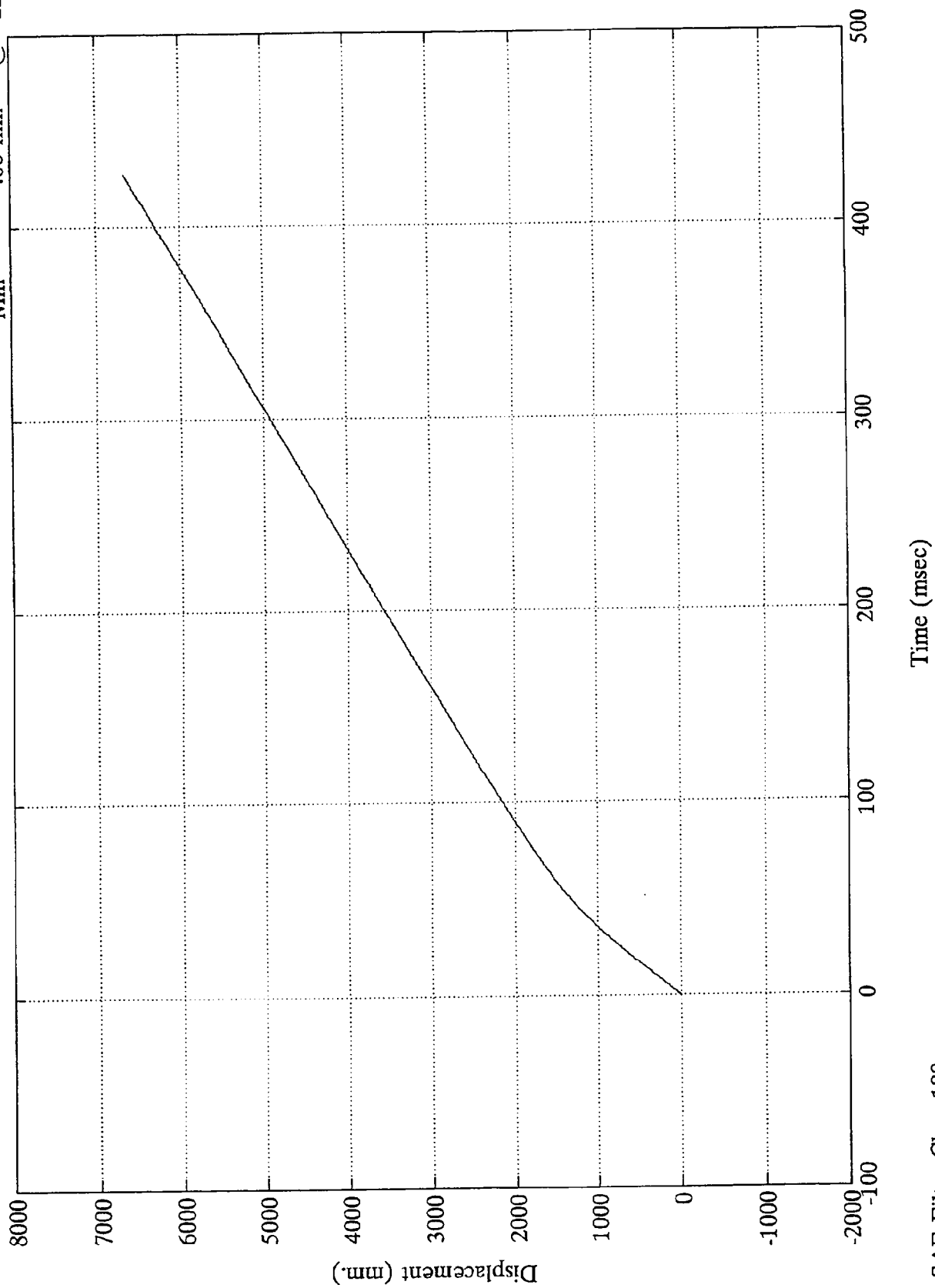
Max = 107.57 kph @ -0.00 msec
Min = .00 kph @ -22.44 msec



VTV TEST #1

MDB C.G. X

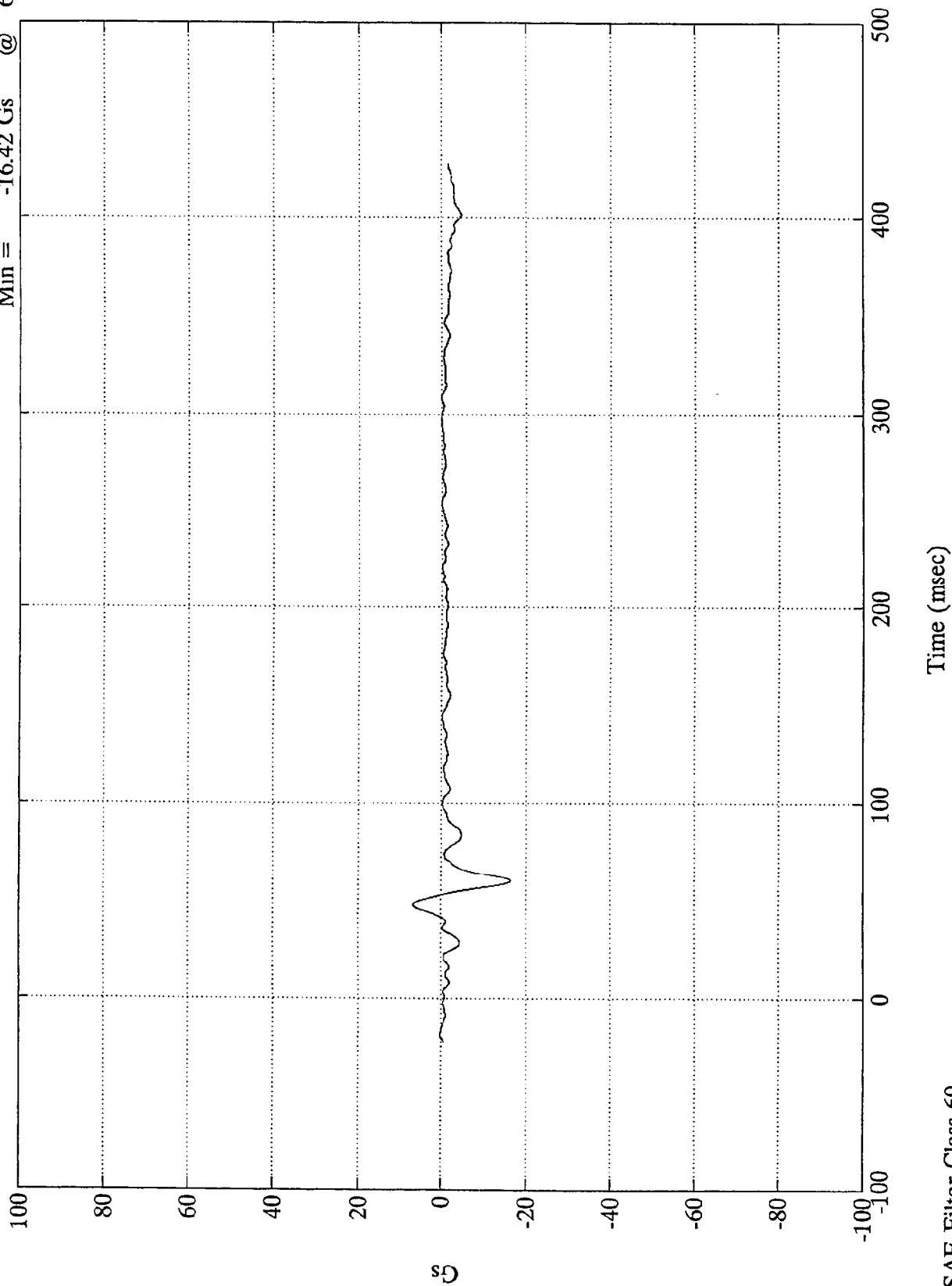
Max = 6665.54 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



VTV TEST #1

Max = 6.53 Gs @ 47.76 msec
Min = -16.42 Gs @ 60.00 msec

MDB C.G. Y

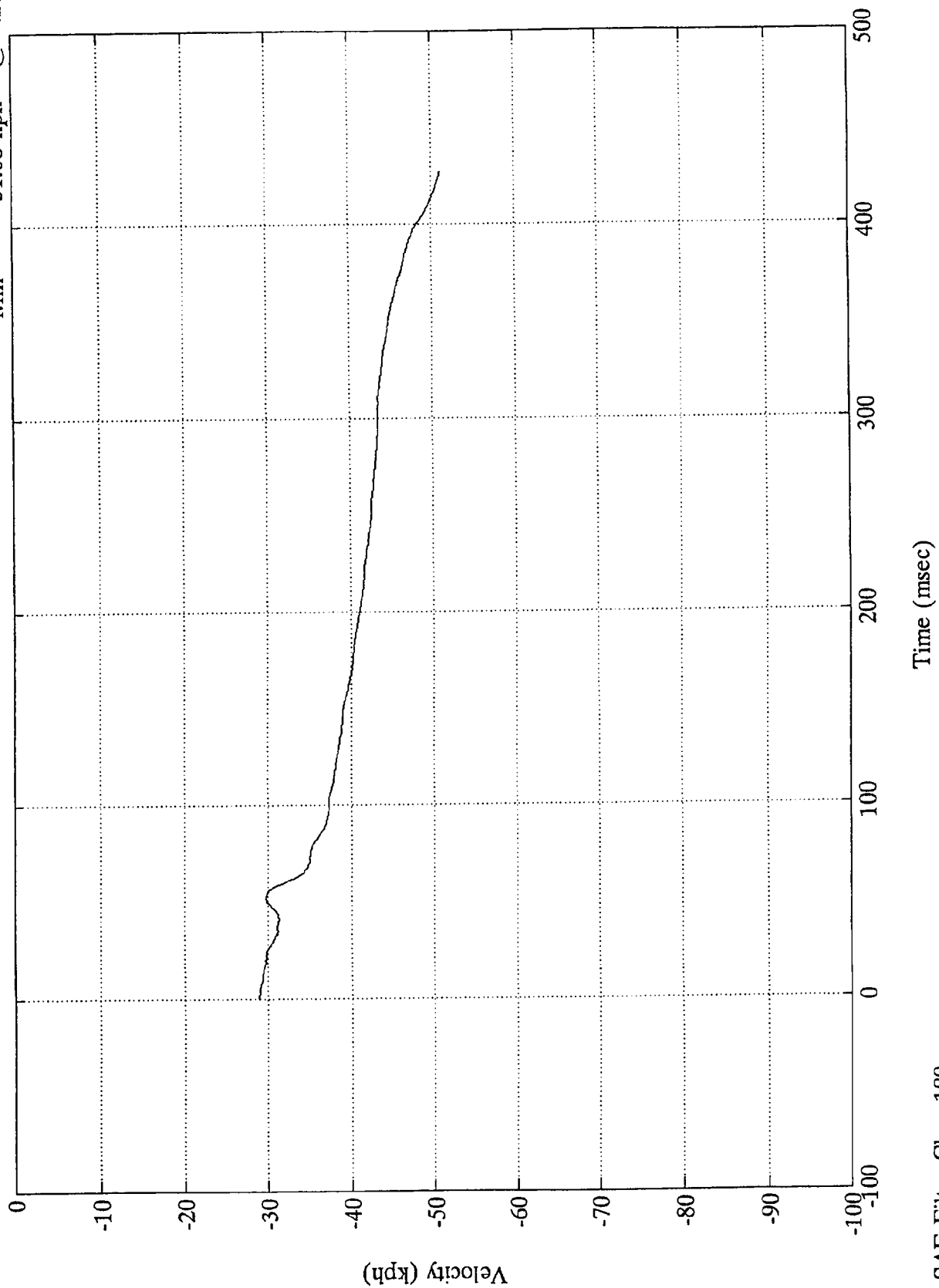


SAE Filter Class 60

VTV TEST #1

Max = .00 kph @ -22.44 msec
Min = -51.08 kph @ 427.32 msec

MDB C.G. Y

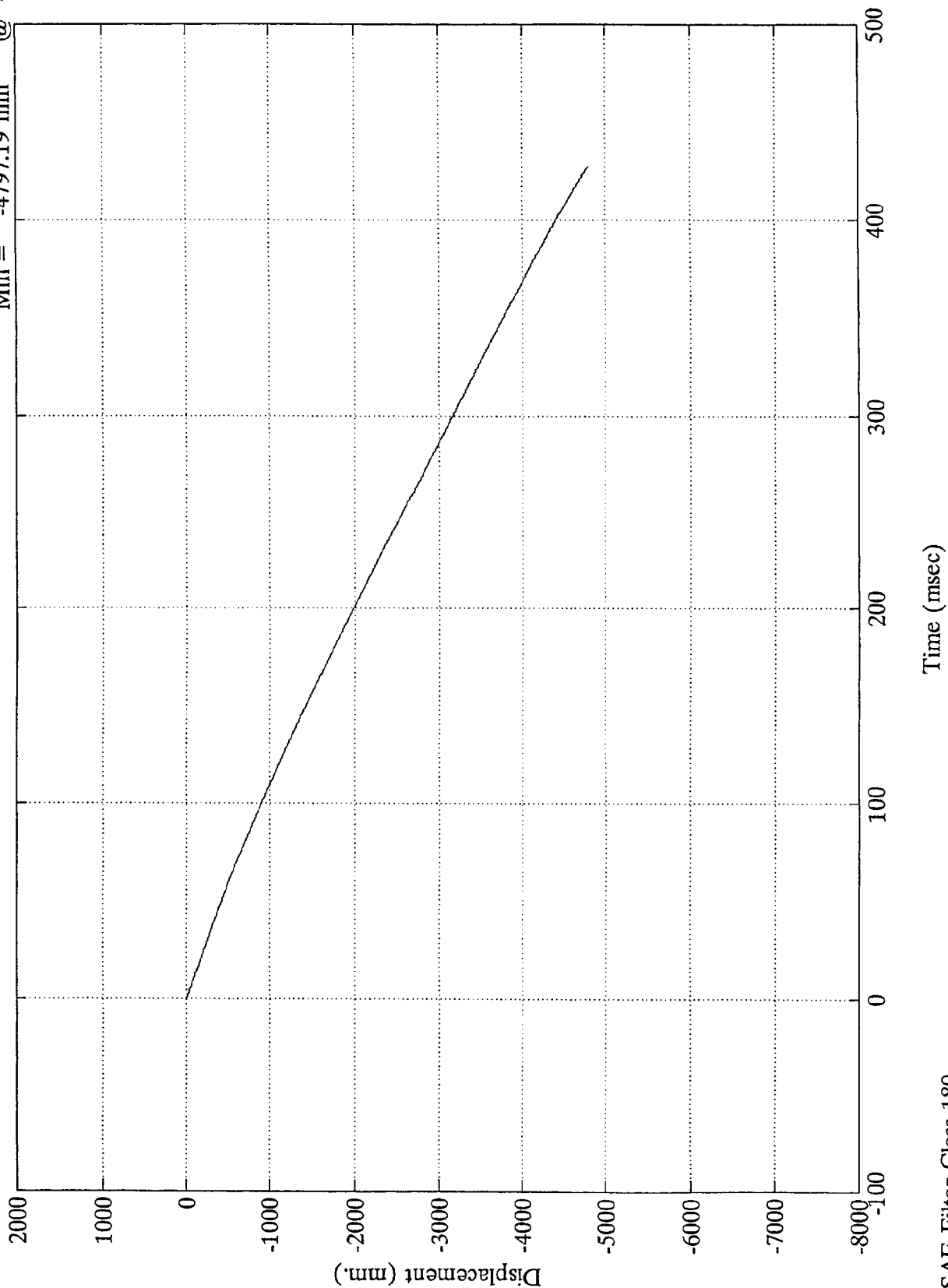


SAE Filter Class 180

VTV TEST #1

Max = .00 mm @ -0.00 msec
Min = -4797.19 mm @ 427.32 msec

MDB C.G. Y

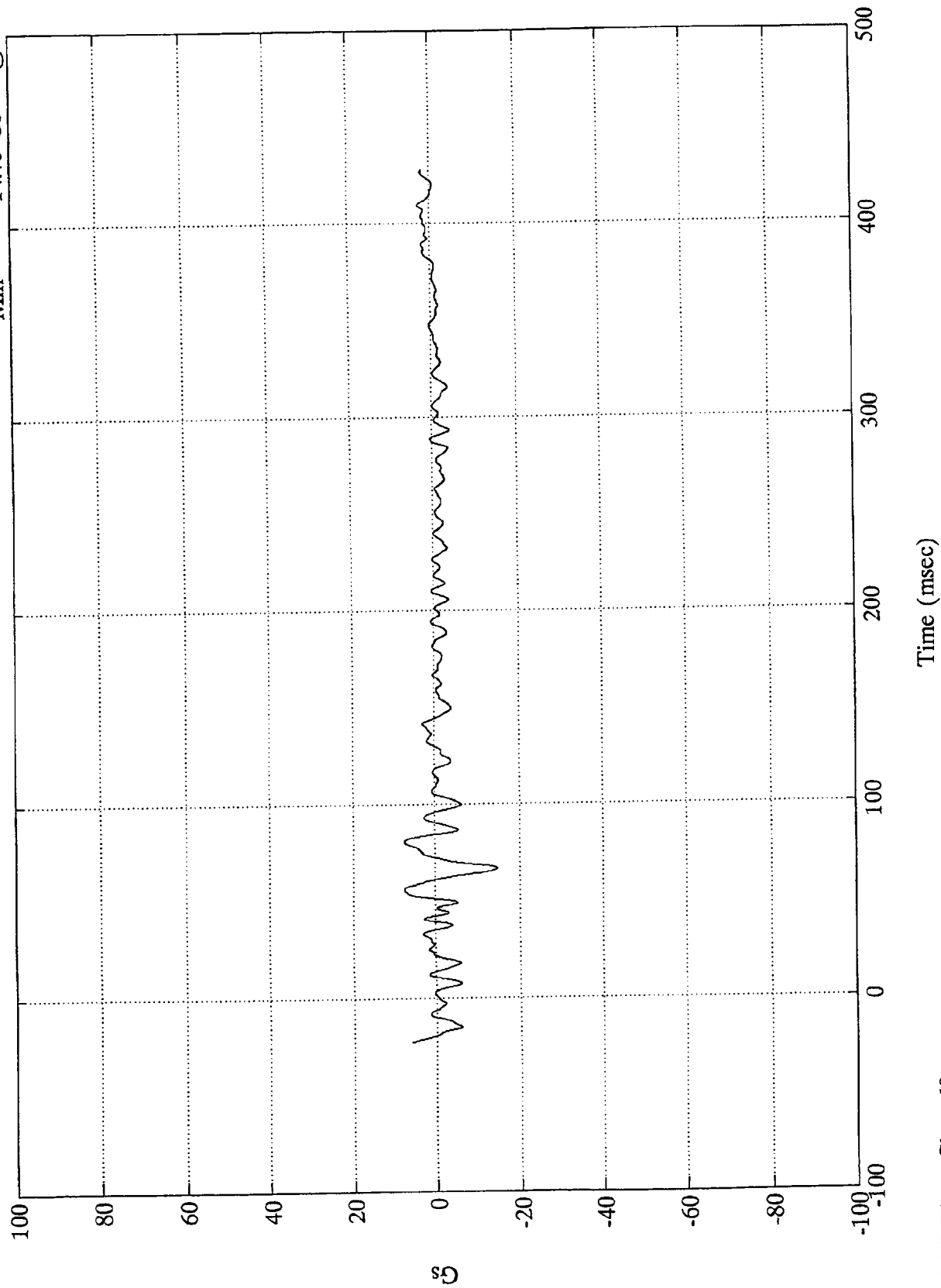


SAE Filter Class 180

VTV TEST #1

Max = 7.70 Gs @ 56.16 msec
Min = -14.75 Gs @ 66.95 msec

MDB C.G. Z

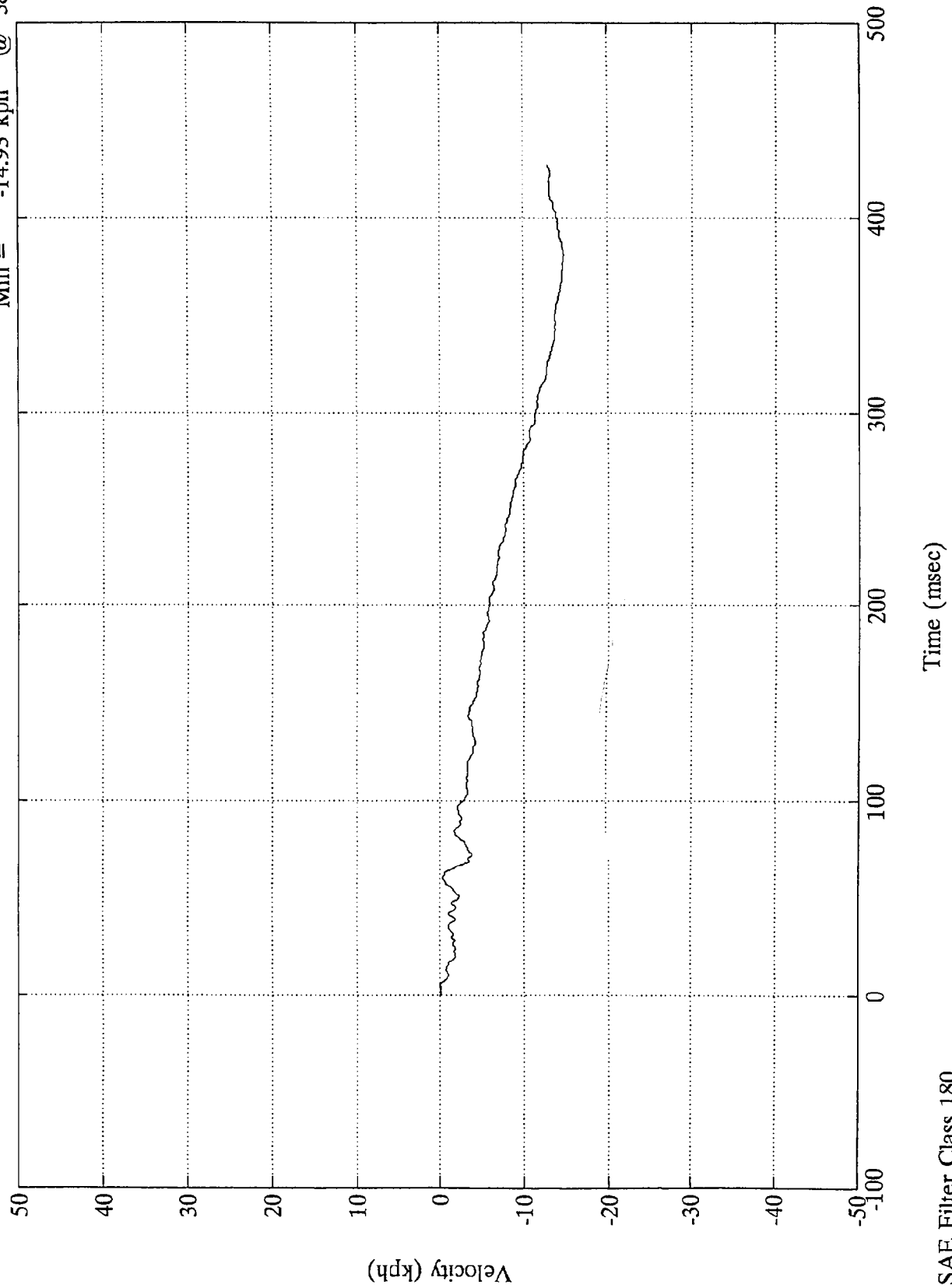


SAE Filter Class 60

VTV TEST #1

Max = .00 kph @ -0.00 msec
Min = -14.93 kph @ 381.12 msec

MDB C.G. Z

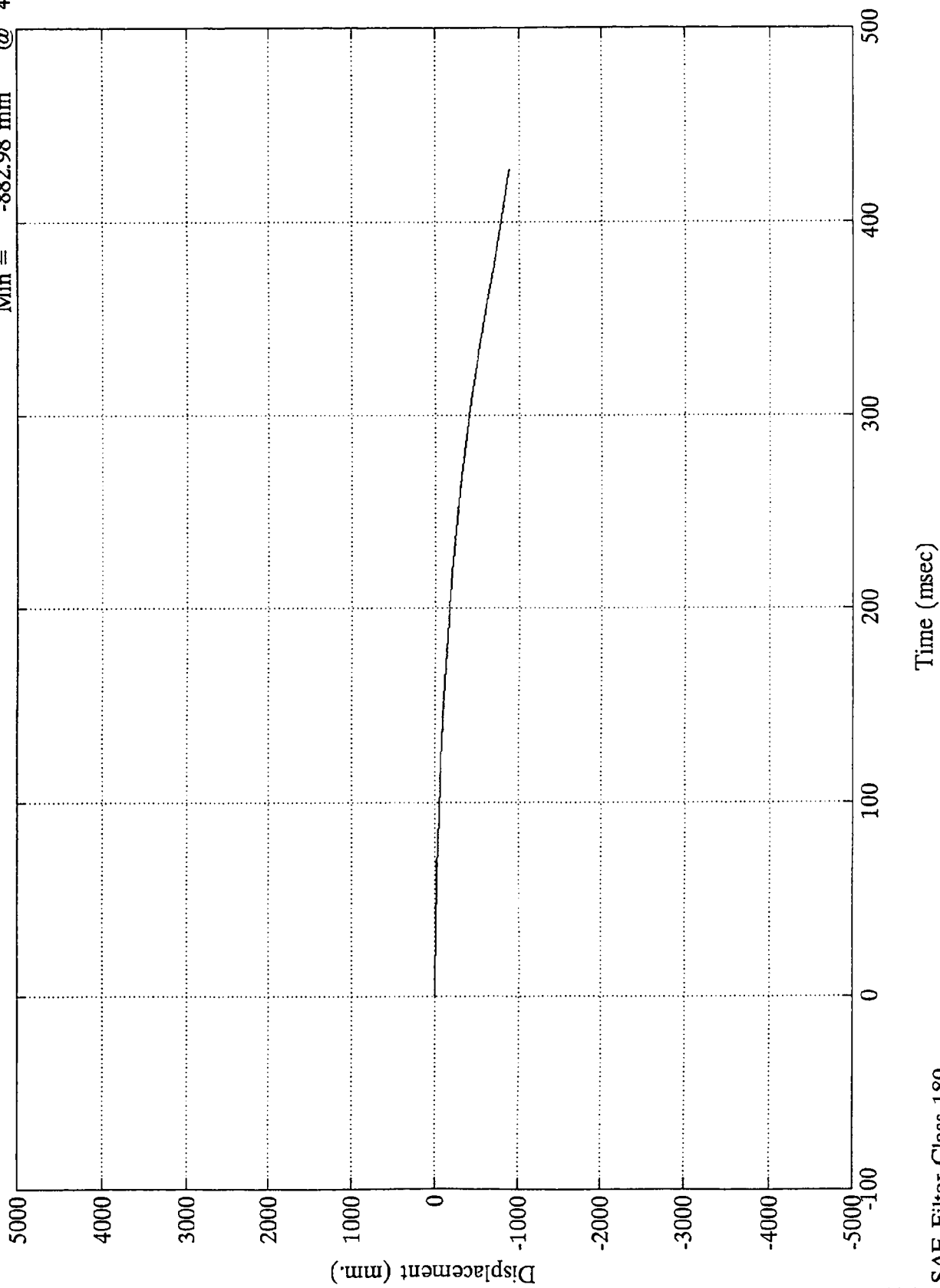


SAE Filter Class 180

VTV TEST #1

Max = .00 mm @ -0.00 msec
Min = -882.98 mm @ 427.32 msec

MDB C.G. Z



6-1-9

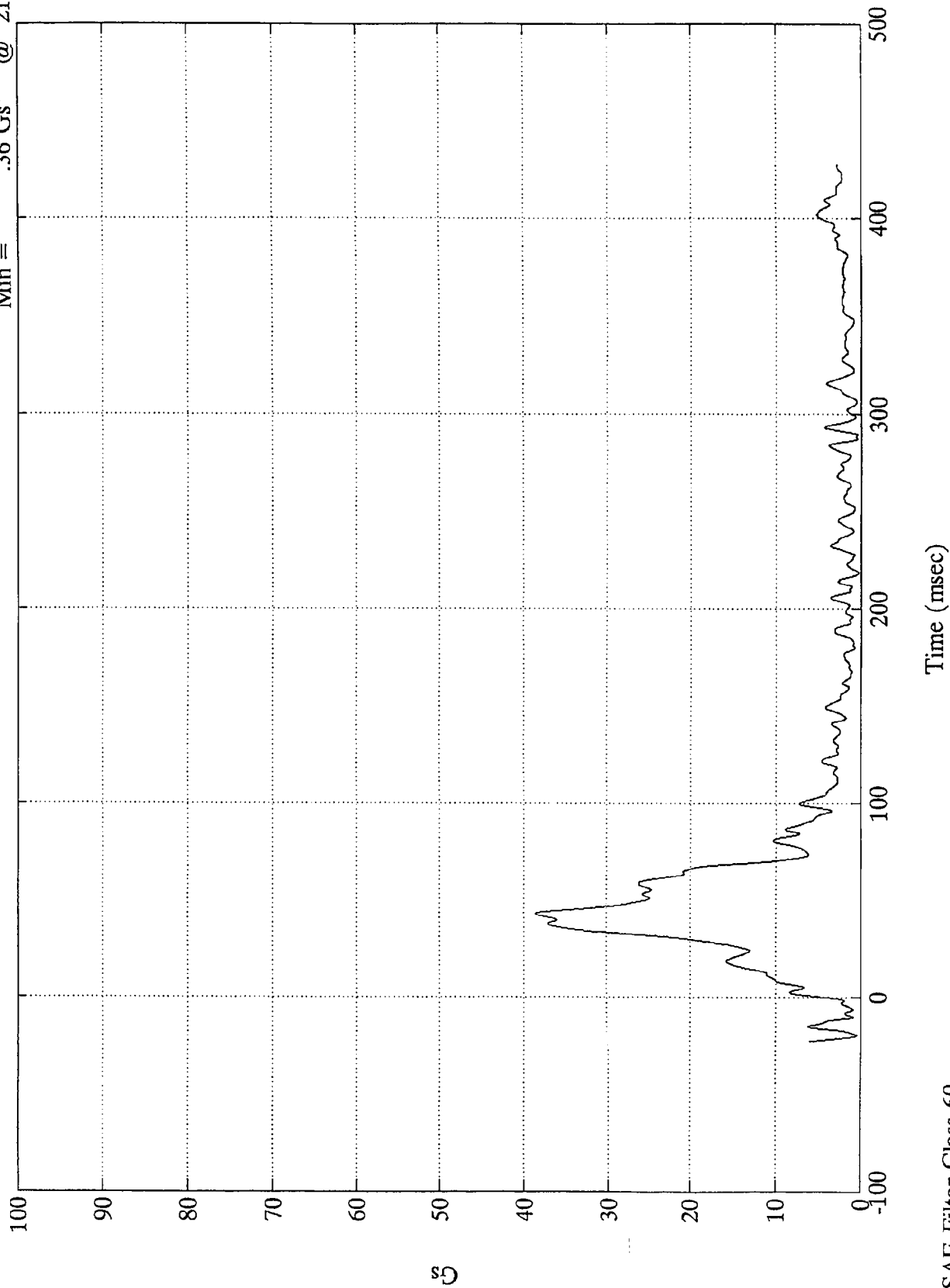
8304-1

SAE Filter Class 180

VTV TEST #1

Max = 38.56 Gs @ 42.72 msec
Min = .36 Gs @ 218.76 msec

MDB C.G. Res



Gs

B-120

8304-1

SAE Filter Class 60

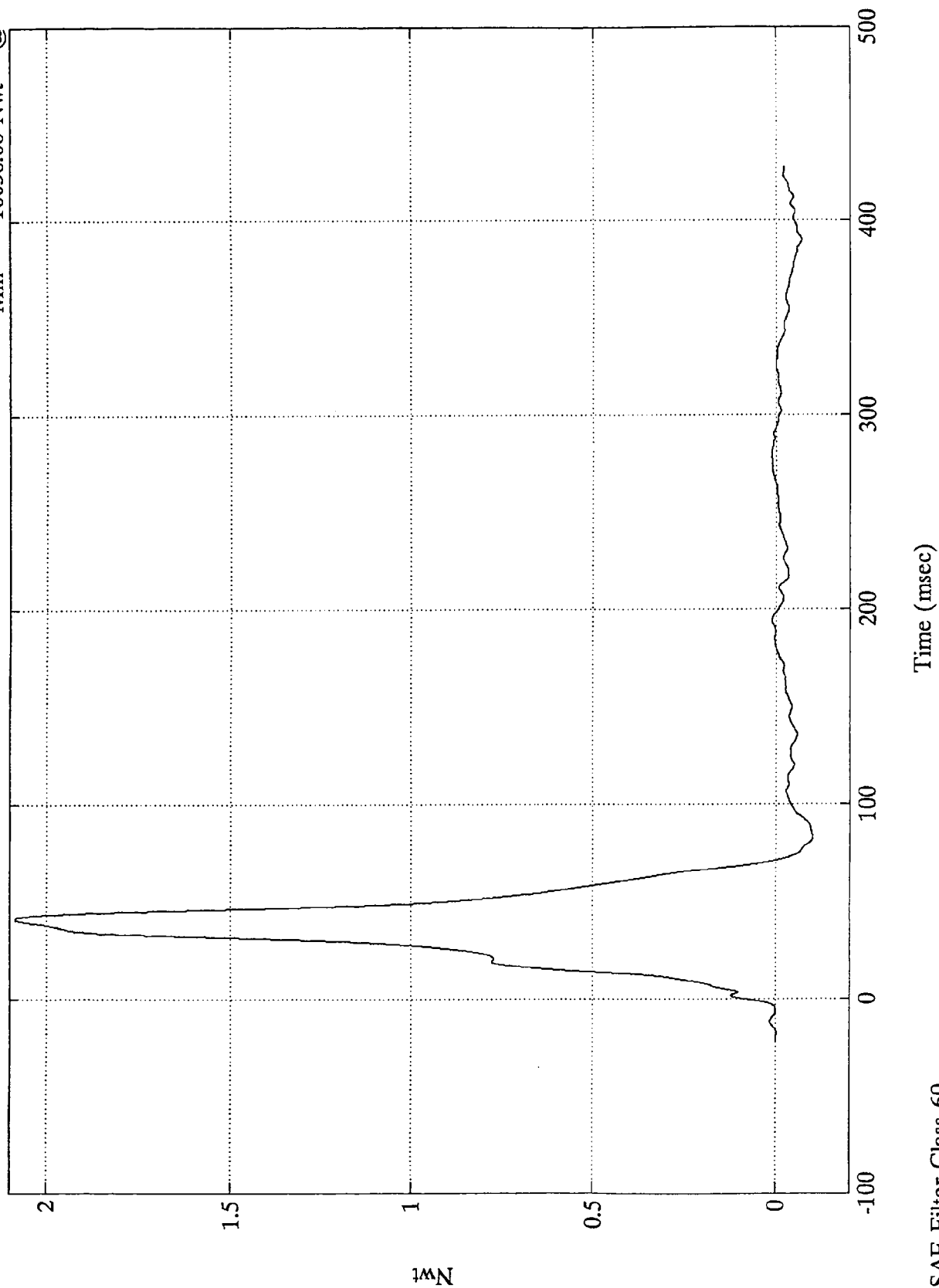
Time (msec)

VTV TEST #1

$\times 10^5$

MDB Load Cell TL

Max = 208619.87 Nwt @ 41.40 msec
Min = -10030.06 Nwt @ 83.16 msec



Nwt

B-121

8304-1

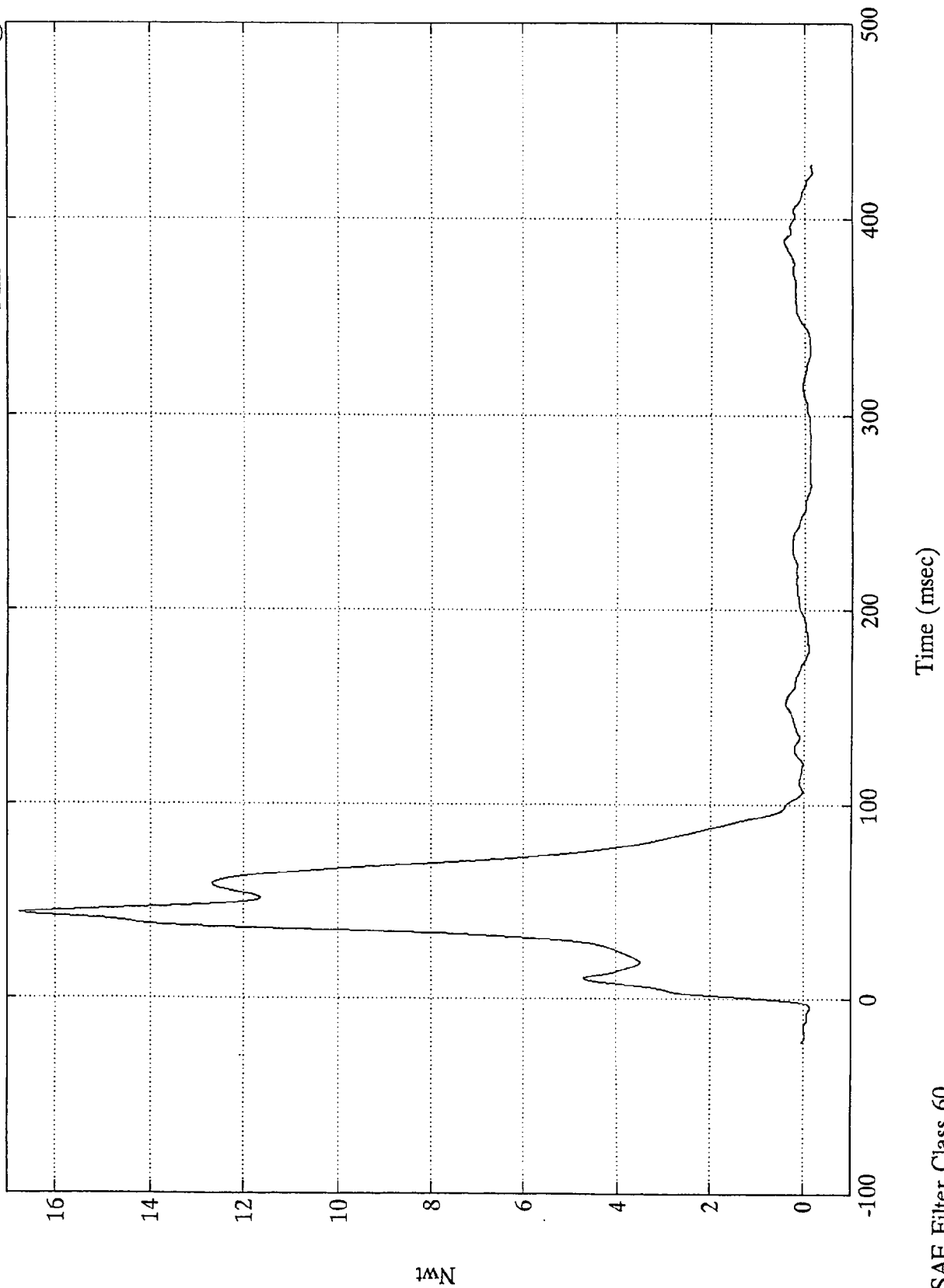
SAE Filter Class 60

VTV TEST #1

$\times 10^4$

MDB Load Cell BL

Max = 167332.78 Nwt @ 43.56 msec
Min = -1512.74 Nwt @ 423.36 msec



16N

B-122

8304-1

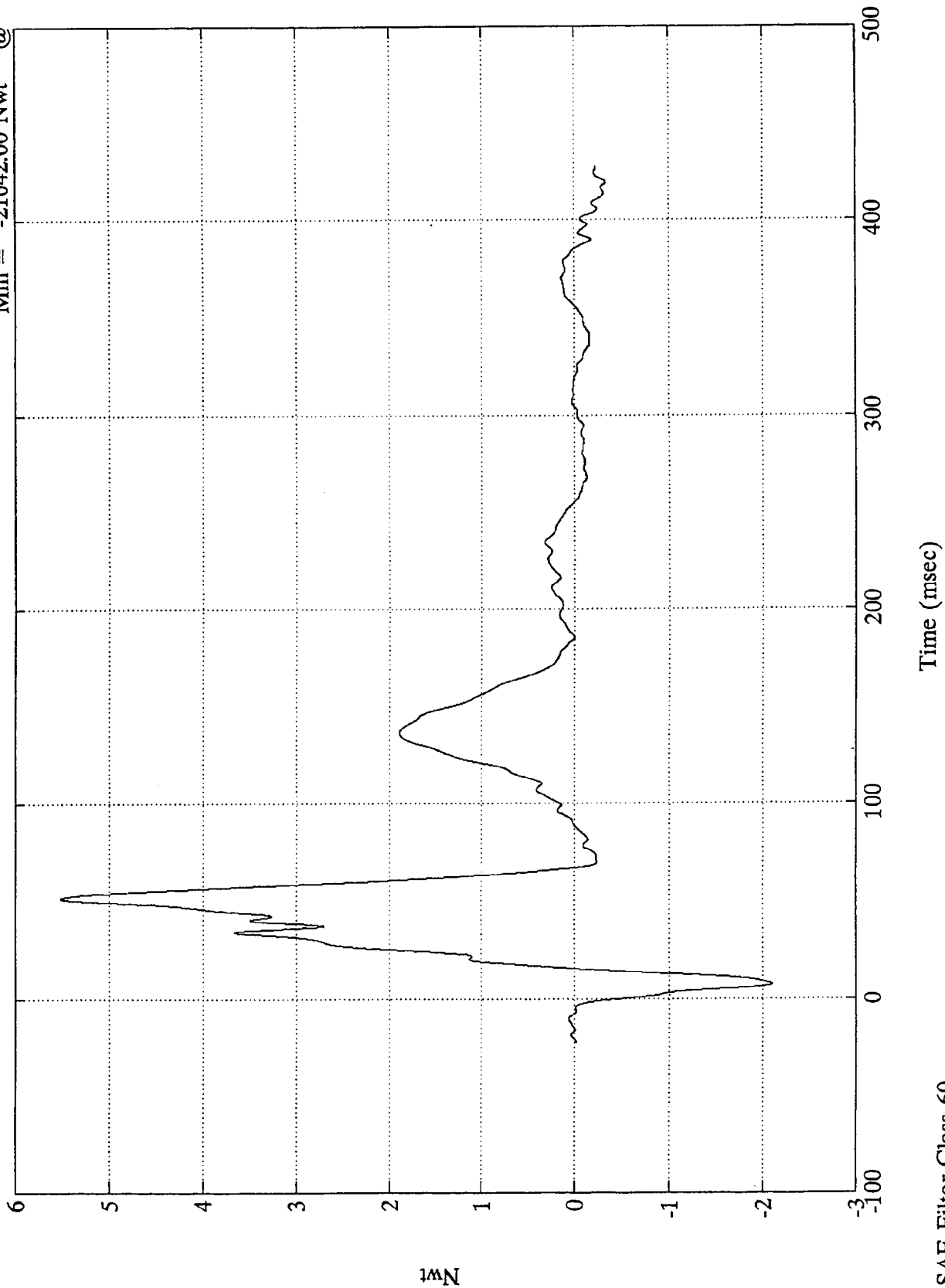
SAE Filter Class 60

VTV TEST #1

$\times 10^4$

MDB Load Cell TR

Max = 55170.50 Nwt @ 51.72 msec
Min = -21042.00 Nwt @ 7.55 msec



Nwt

B-123

8304-1

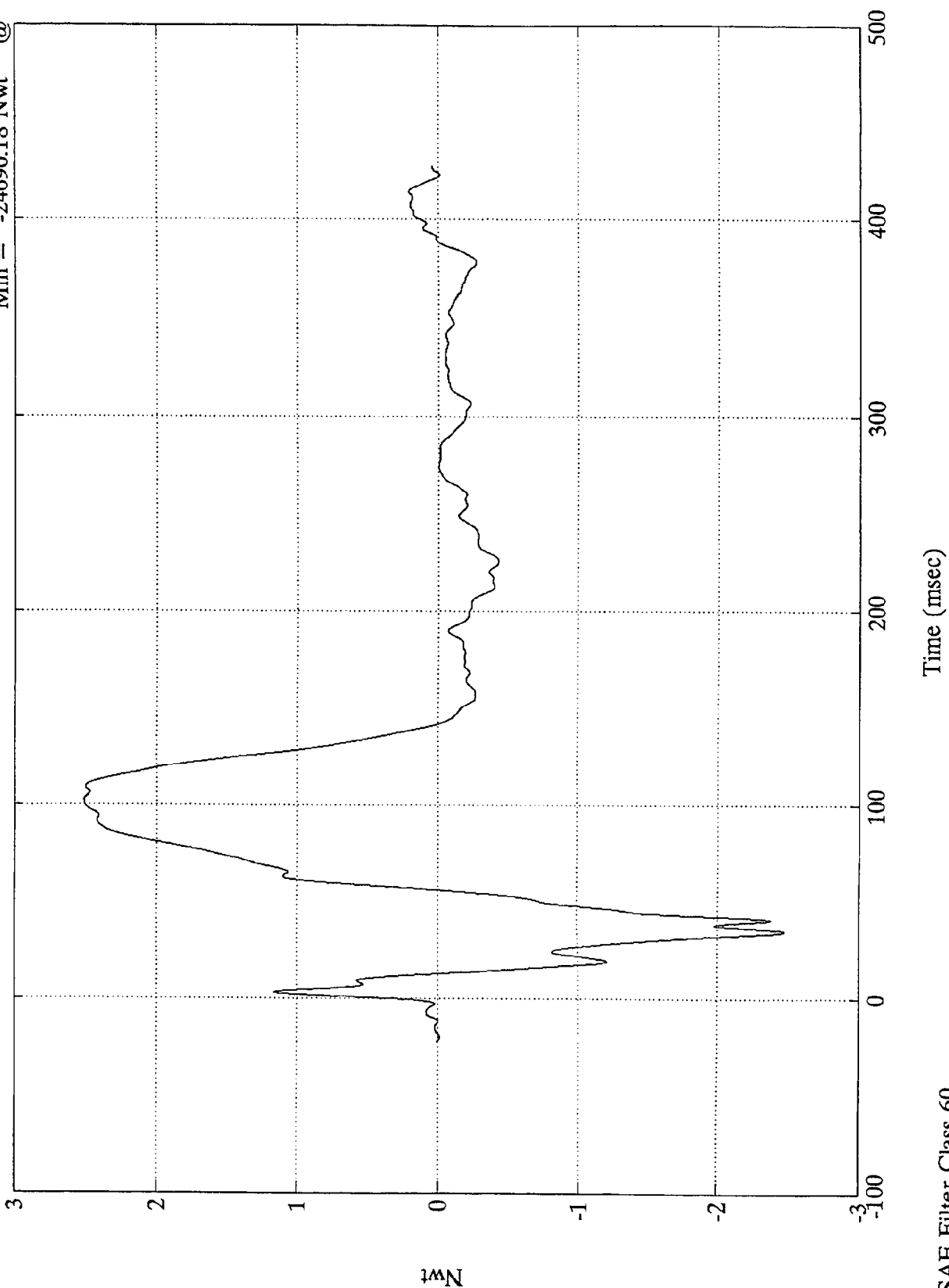
SAE Filter Class 60

VTV TEST #1

$\times 10^4$

MDB Load Cell BR

Max = 25082.45 Nwt @ 102.24 msec
Min = -24690.18 Nwt @ 34.79 msec



Nwt

B-124

8304-1

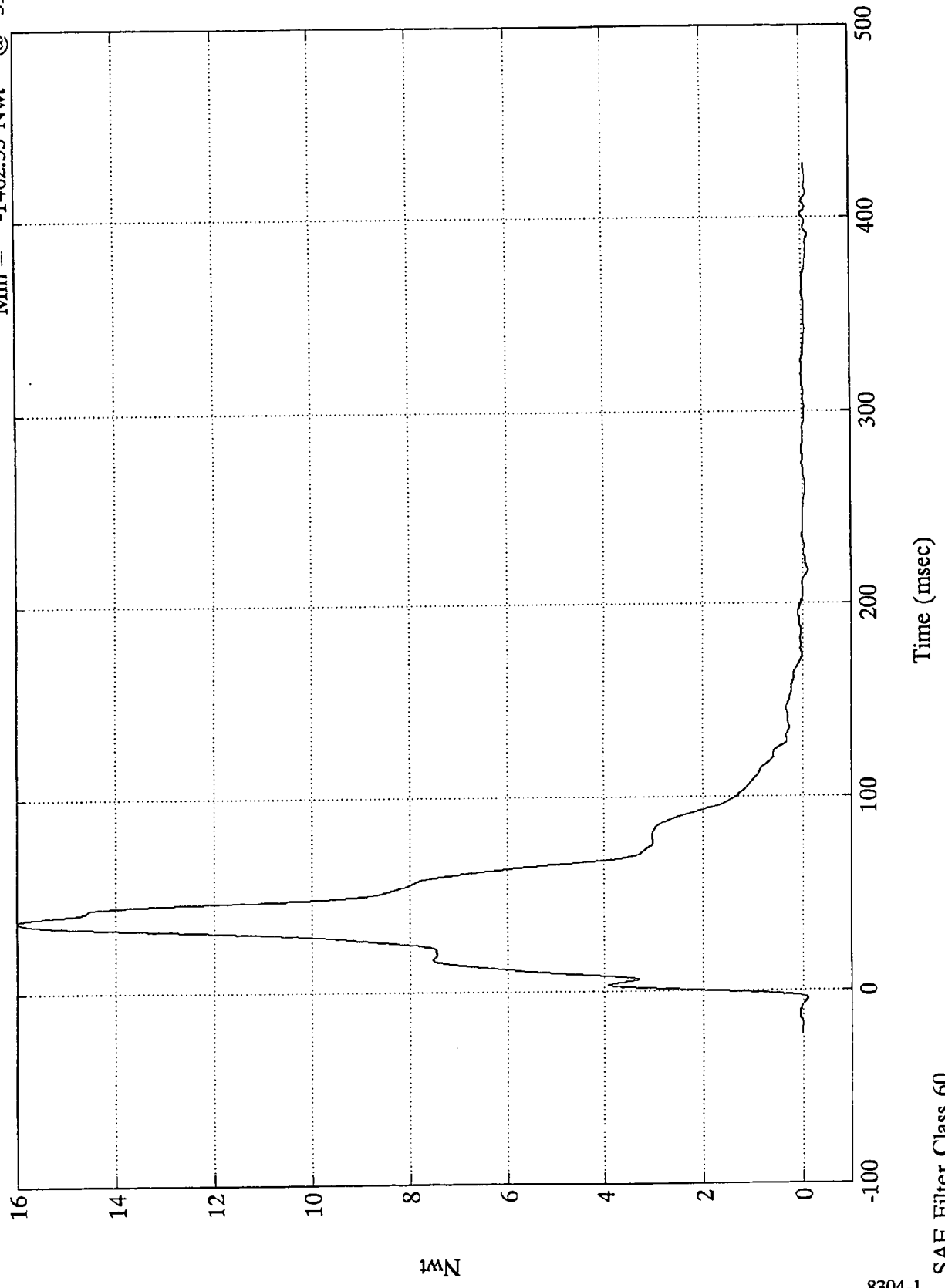
SAE Filter Class 60

VTV TEST #1

$\times 10^4$

Max = 159899.71 Nwt @ 37.20 msec
Min = -1462.35 Nwt @ 390.60 msec

MDB Load Cell CL



Nwt

B-125

8304-1

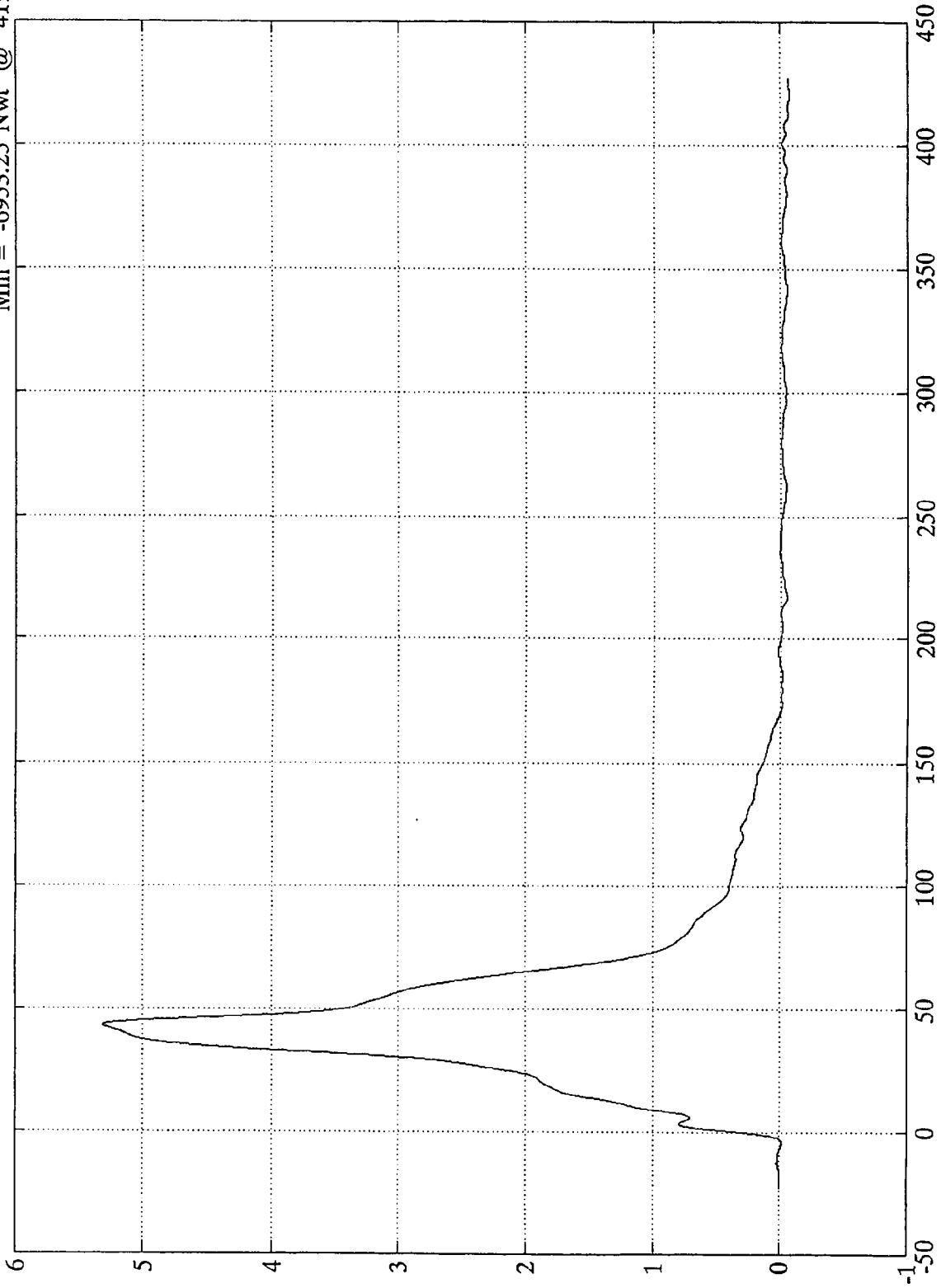
SAE Filter Class 60

VTV TEST #1

$\times 10^5$

MDB Load Cell Sum

Max = 531580.00 Nwt @ 43.08 msec
Min = -6953.25 Nwt @ 419.88 msec



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

Time (msec)

SAE Filter Class 60

TEST NO. Y57-1-1542

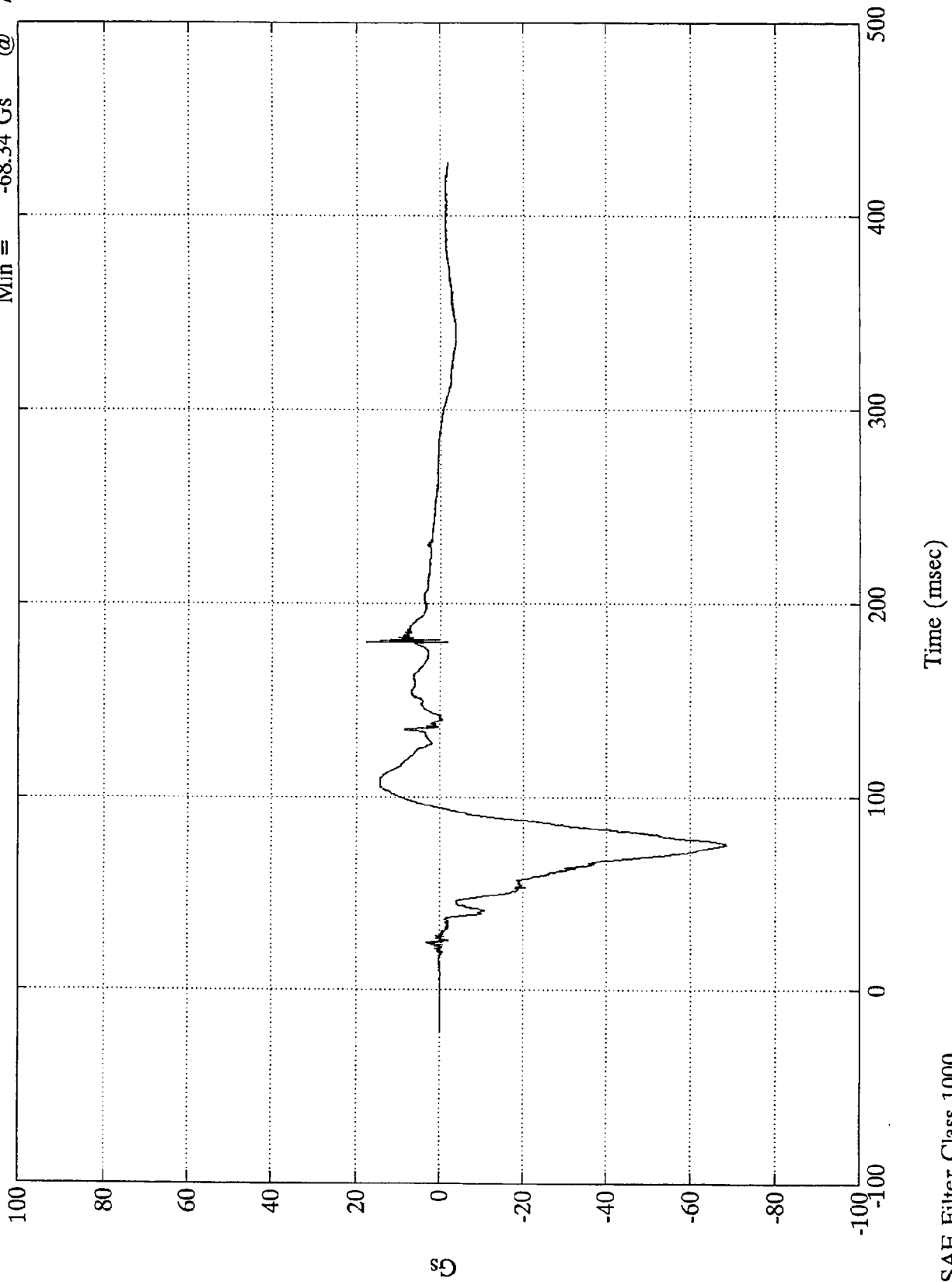
VEHICLE 1 - DUMMY DATA

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

VTV TEST #1

Max = 17.62 Gs @ 180.24 msec
Min = -68.34 Gs @ 75.60 msec

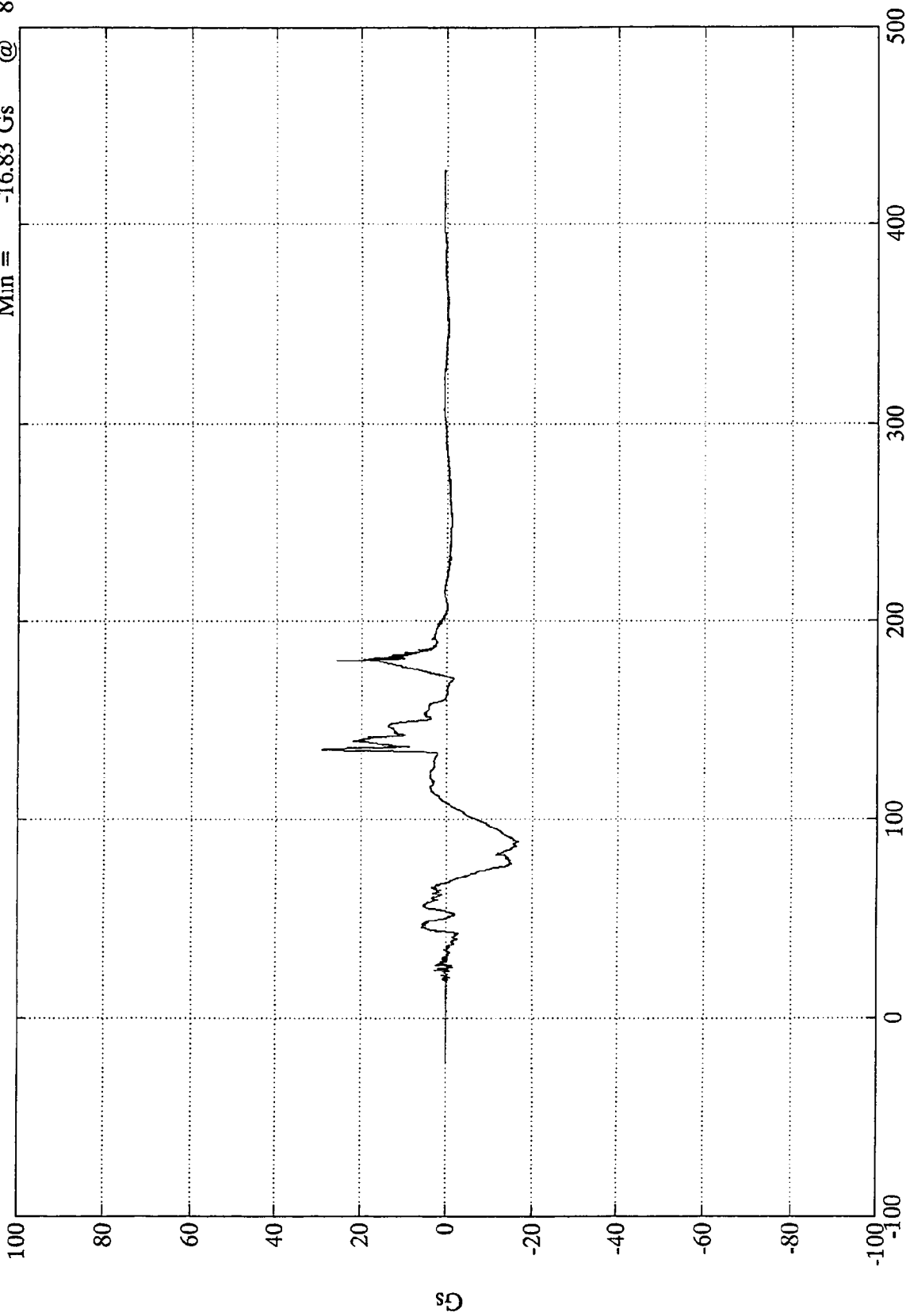
P1 Head X



SAE Filter Class 1000

VTV TEST #1

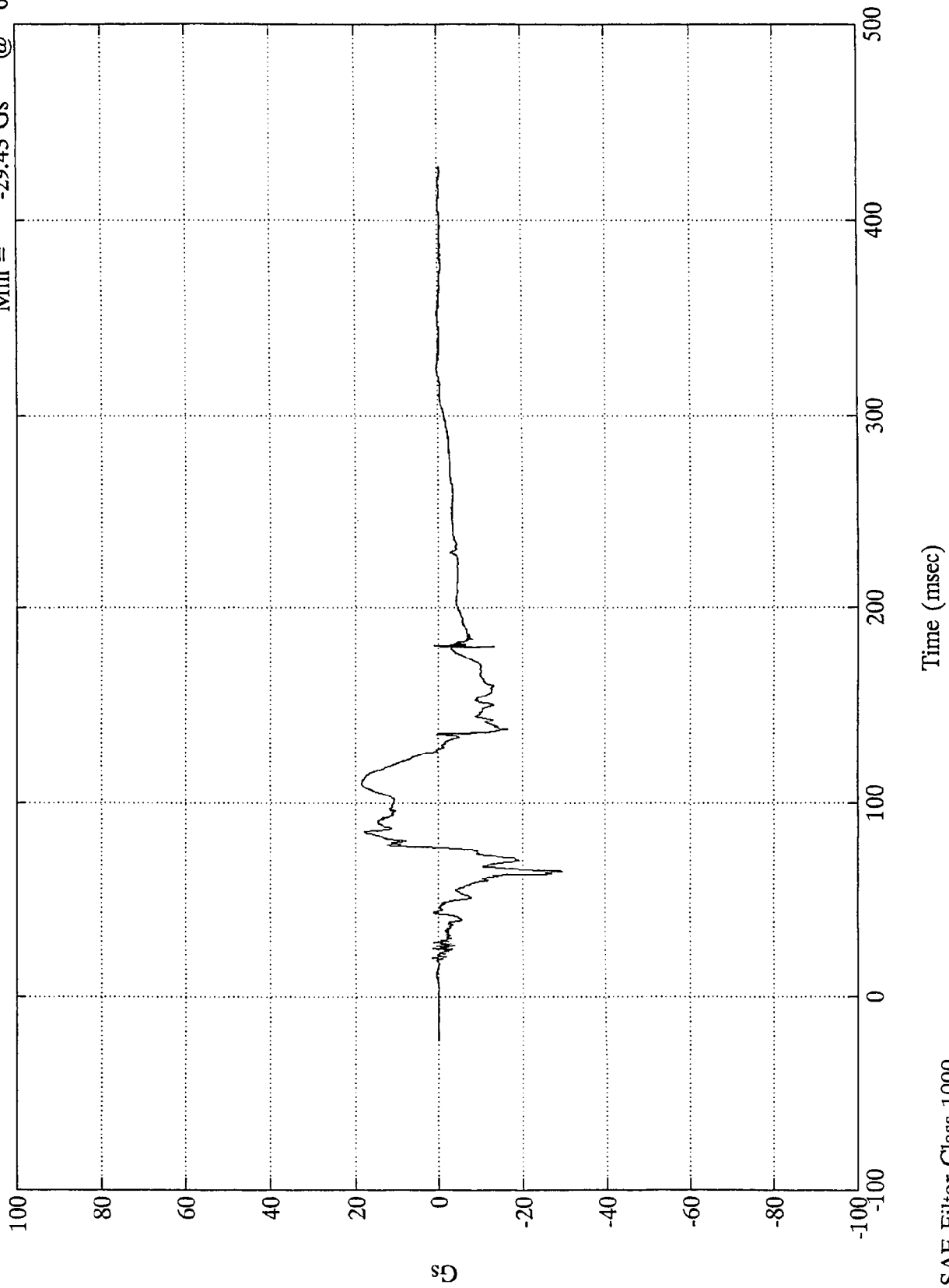
P1 Head Y Max = 29.05 Gs @ 135.24 msec
Min = -16.83 Gs @ 88.92 msec



VTV TEST #1

Max = 18.64 Gs @ 109.68 msec
Min = -29.43 Gs @ 64.19 msec

P1 Head Z



Time (msec)

SAE Filter Class 1000

Gs

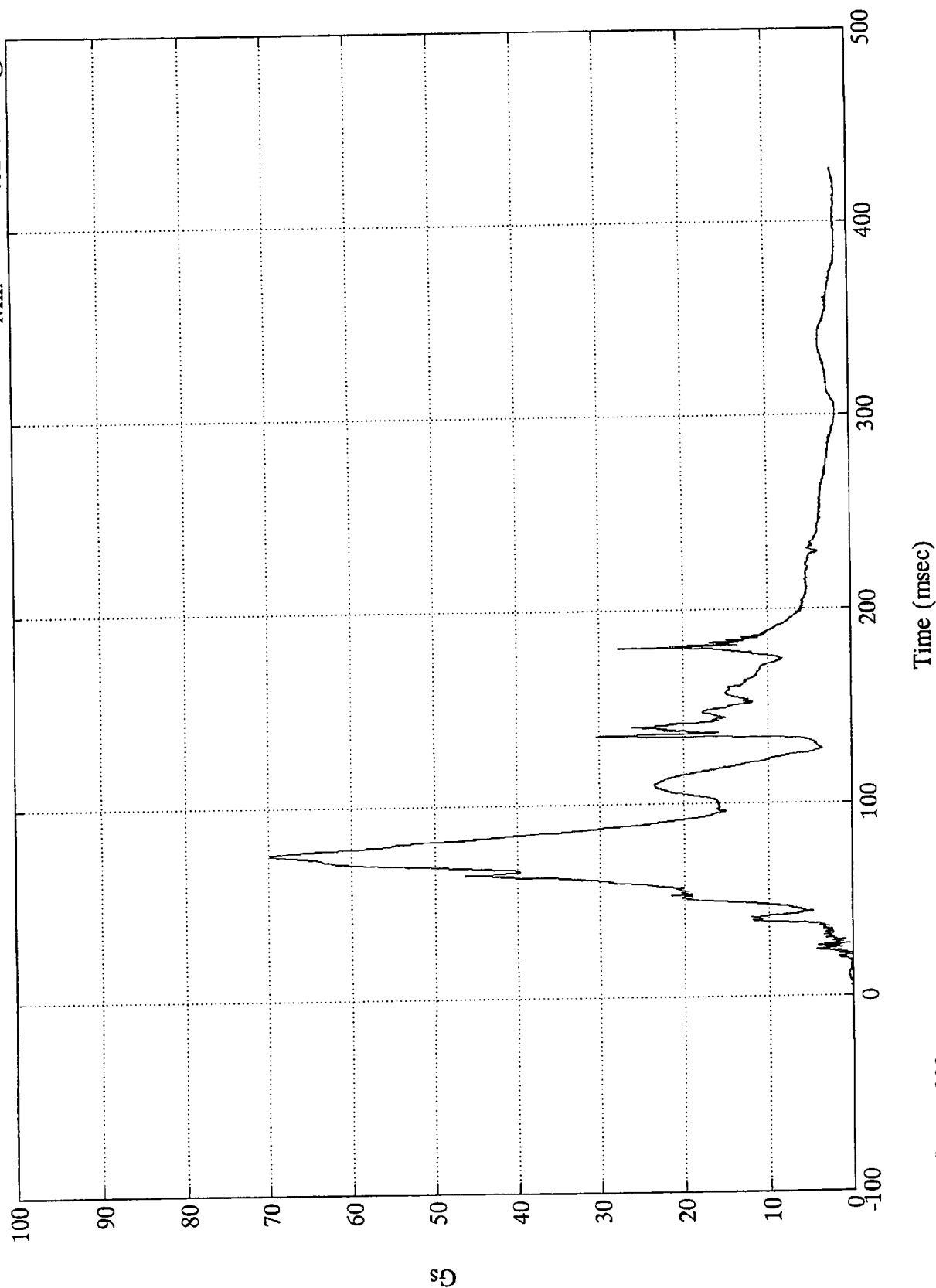
B-130

8304-1

VTV TEST #1

Max = 69.89 Gs @ 76.31 msec
Min = .02 Gs @ 17.51 msec

P1 Head Resultant



Gs

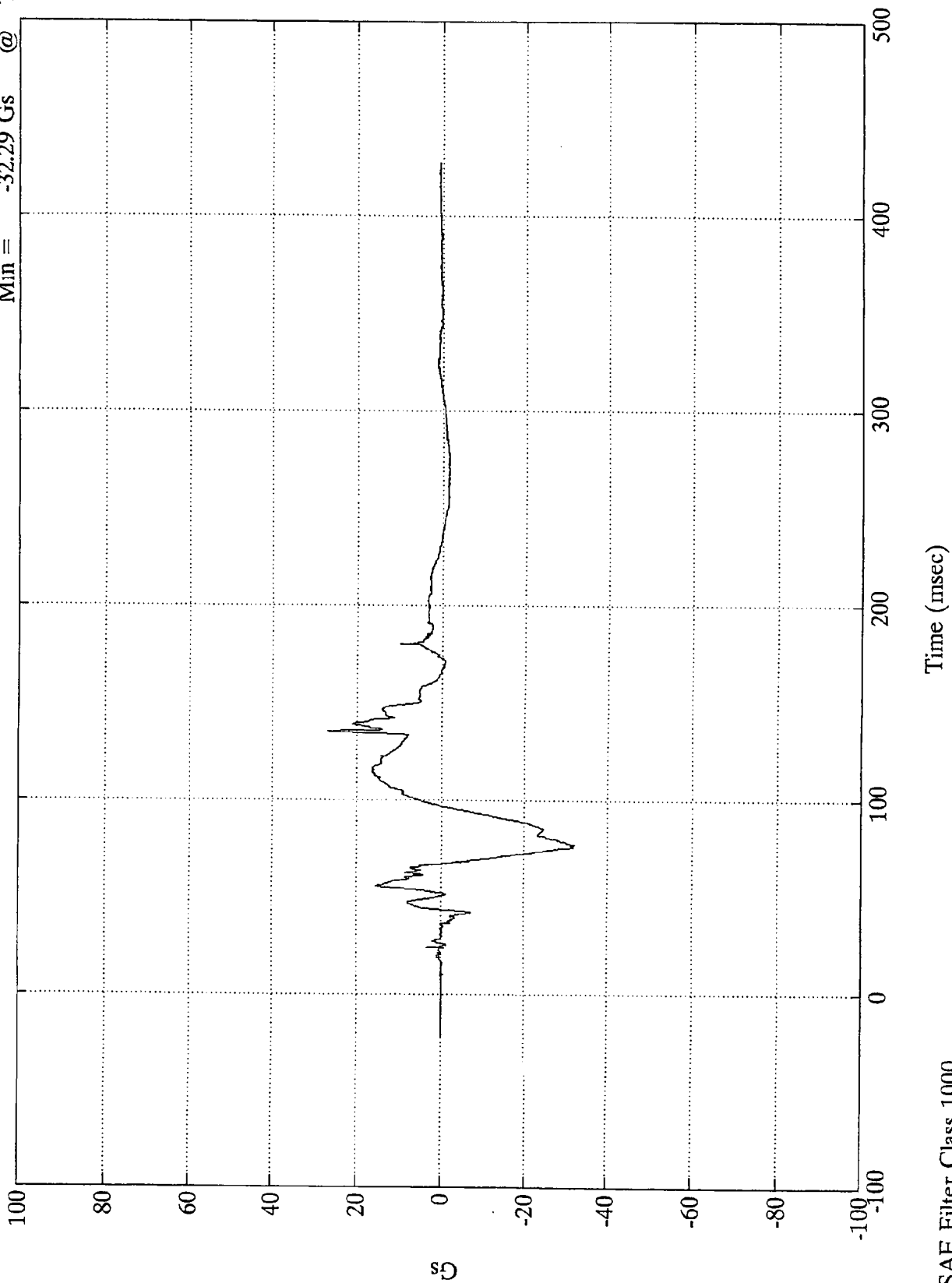
B-131

8304-1

SAE Filter Class 1000

VTV TEST #1

P1 HD9X (Y) Max = 26.76 Gs @ 135.47 msec
Min = -32.29 Gs @ 77.76 msec



Gs

B-132

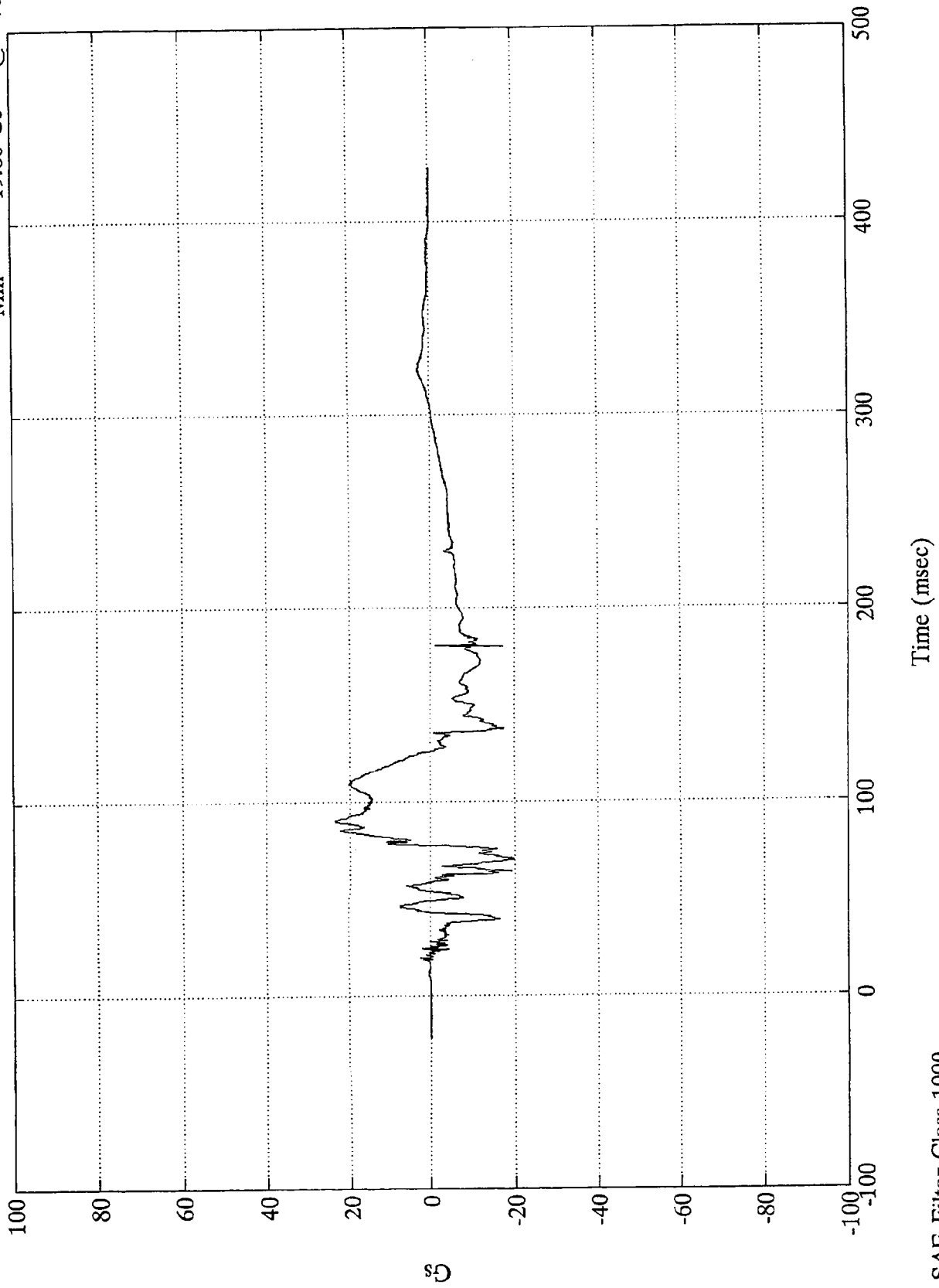
8304-1

SAE Filter Class 1000

VTV TEST #1

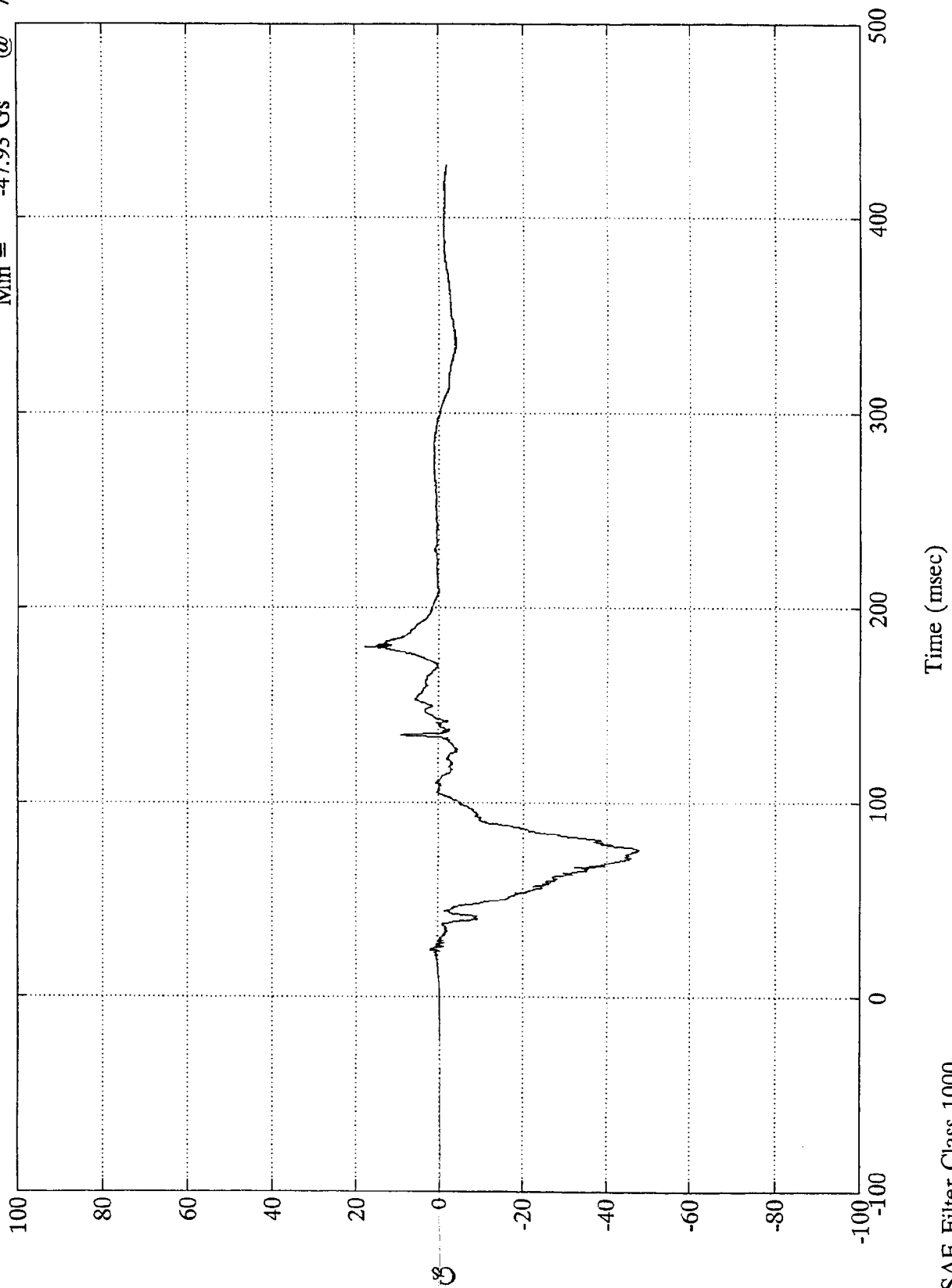
P1 HD9X (Z)

Max = 23.51 Gs @ 90.96 msec
Min = -19.80 Gs @ 70.79 msec



VTV TEST #1

P1 HD9Y (X) Max = 18.02 Gs @ 180.24 msec
Min = -47.93 Gs @ 75.84 msec



8

B-134

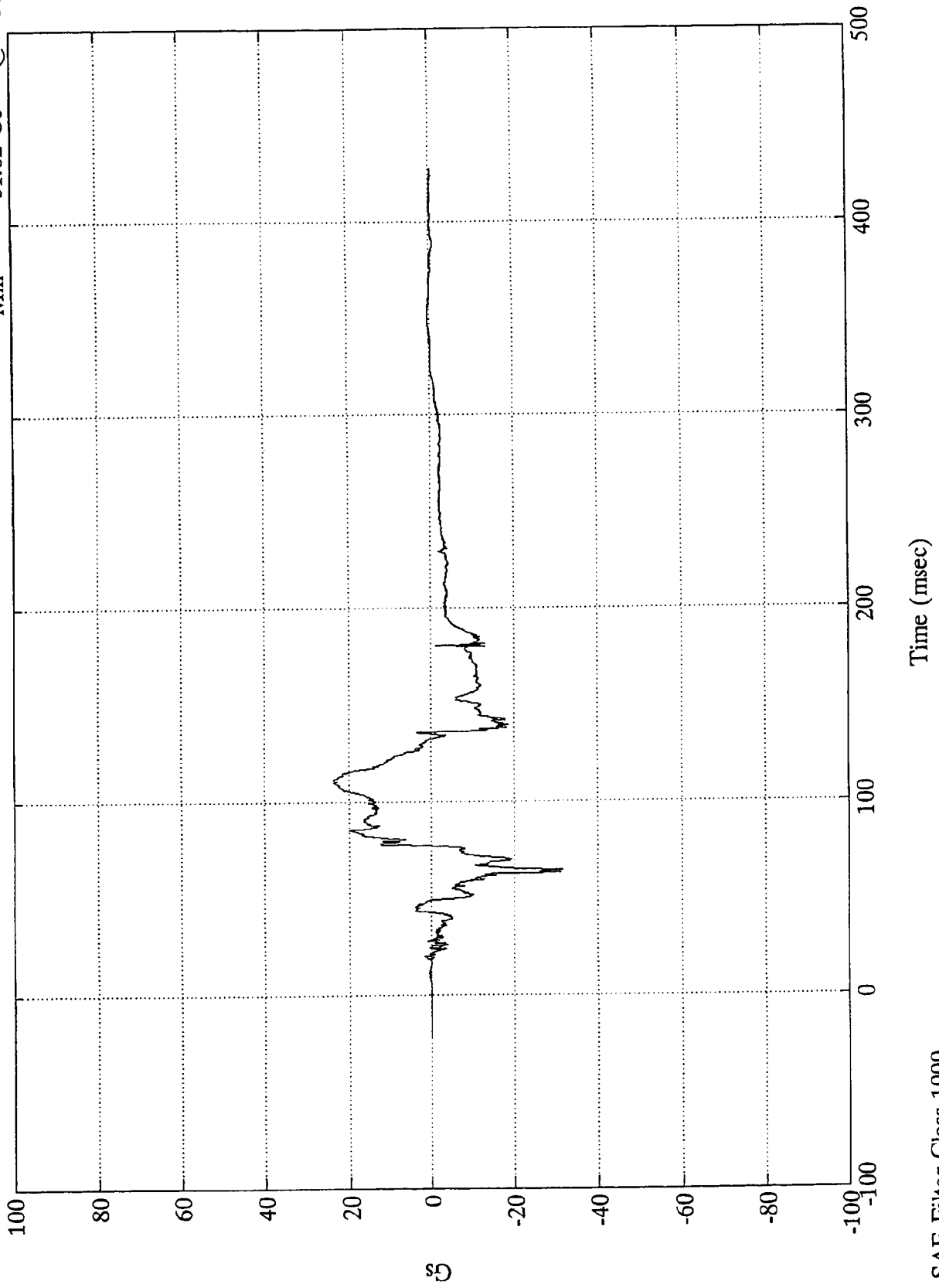
8304-1

SAE Filter Class 1000

VTV TEST #1

P1 HD9Y (Z)

Max = 23.76 Gs @ 111.24 msec
Min = -31.62 Gs @ 64.68 msec



8D

B-135

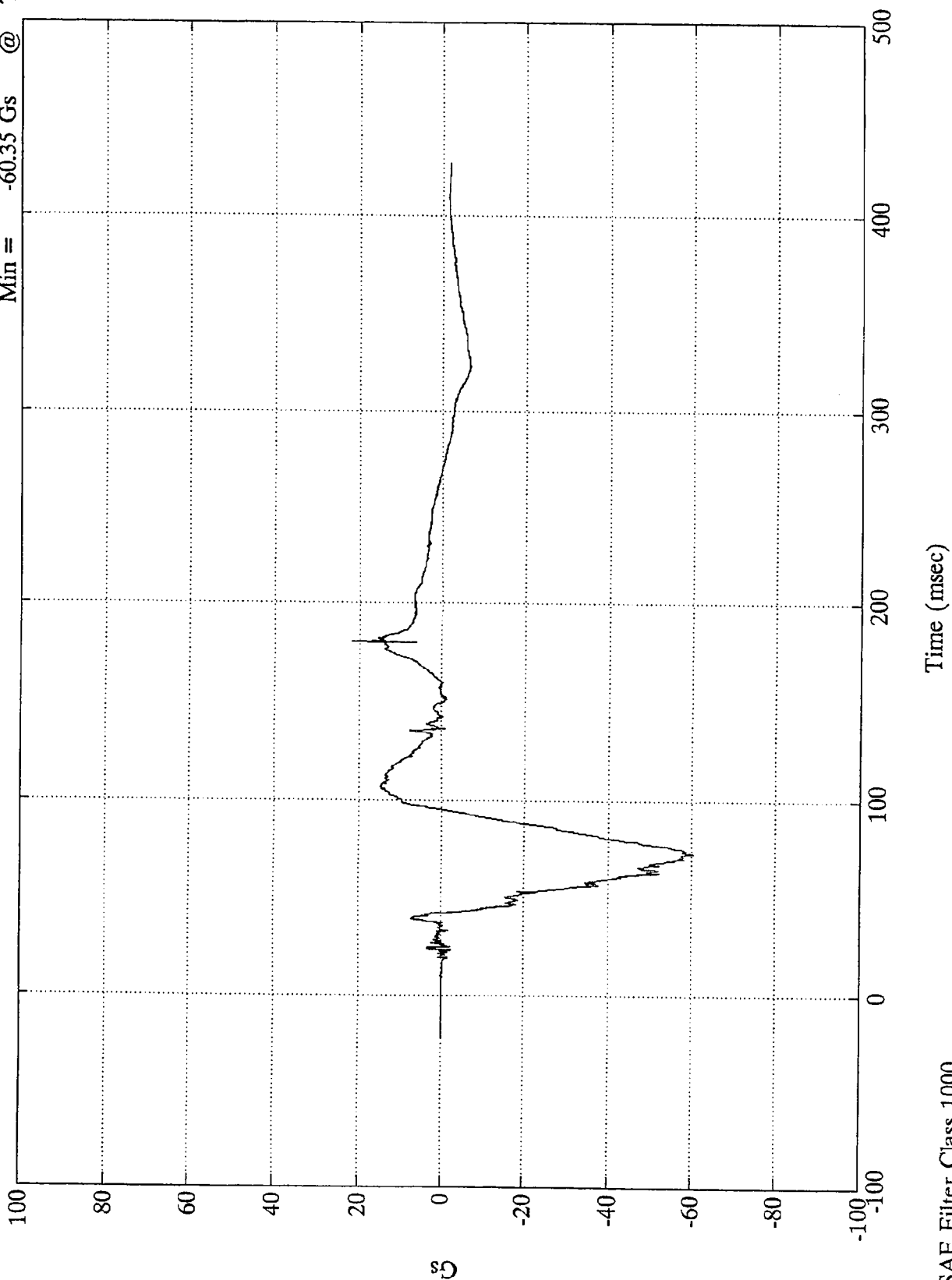
8304-1

SAE Filter Class 1000

VTV TEST #1

Max = 21.74 Gs @ 180.60 msec
Min = -60.35 Gs @ 73.55 msec

P1 HD9Z (X)



Gs

B-136

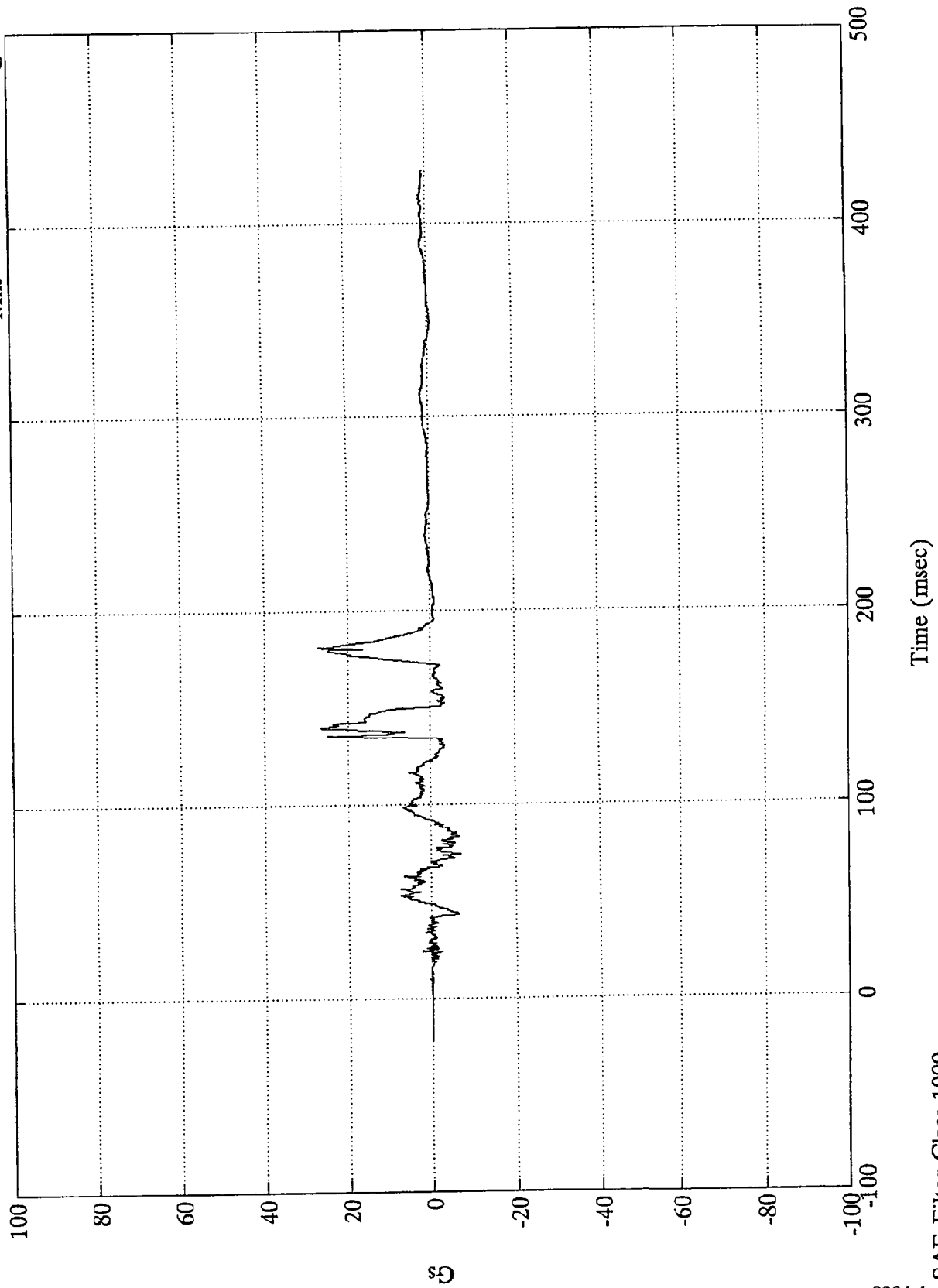
8304-1

SAE Filter Class 1000

VTV TEST #1

P1 HD9Z (Y)

Max = 27.01 Gs @ 181.20 msec
Min = -6.96 Gs @ 75.12 msec



Gs

B-137

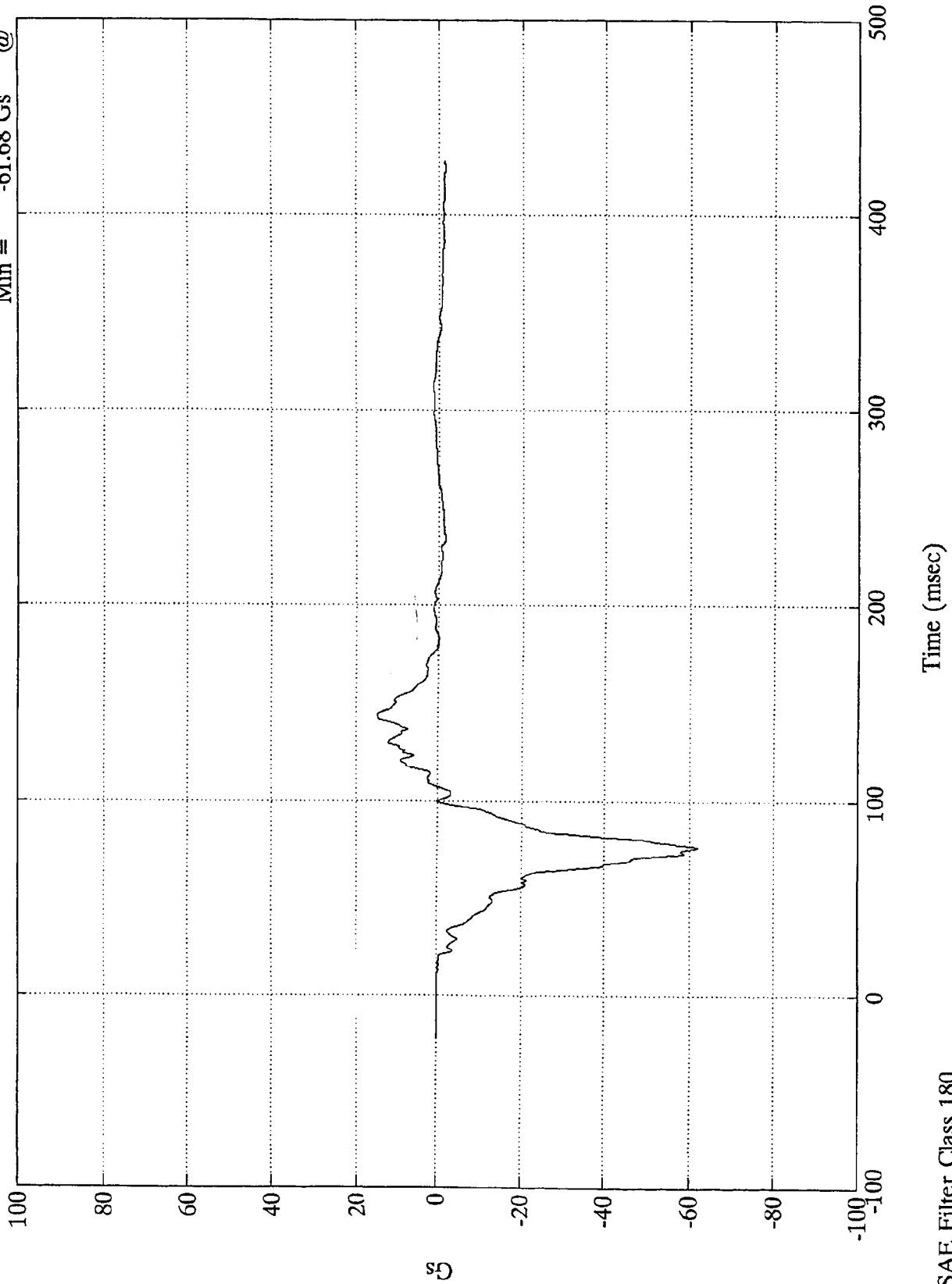
8304-1

SAE Filter Class 1000

VTV TEST #1

Max = 14.85 Gs @ 143.64 msec
Min = -61.68 Gs @ 76.56 msec

P1 Chest X



Gs

Time (msec)

B-138

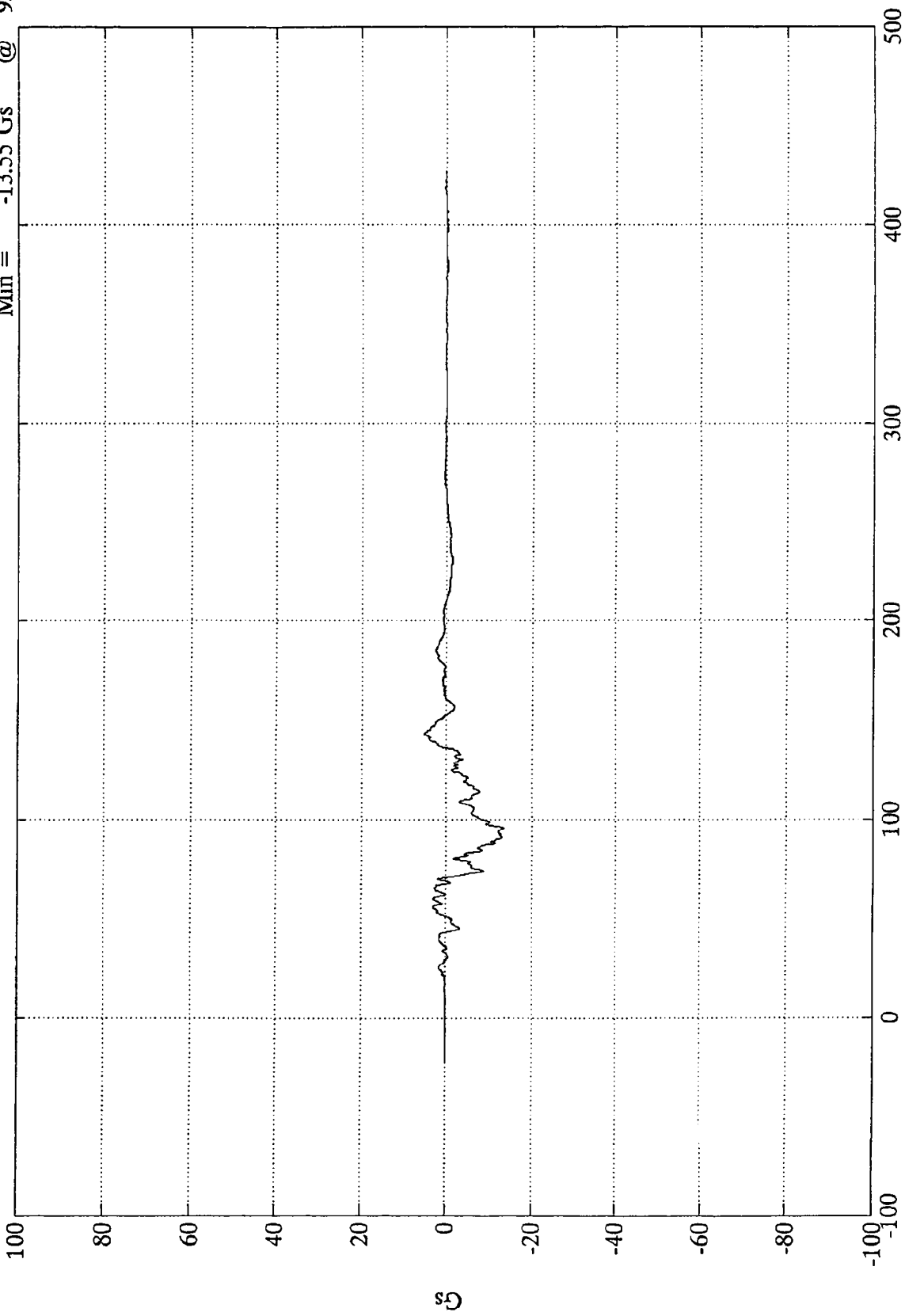
8304-1

SAE Filter Class 180

VTV TEST #1

Max = 5.28 Gs @ 143.27 msec
 Min = -13.55 Gs @ 95.76 msec

P1 Chest Y



Time (msec)

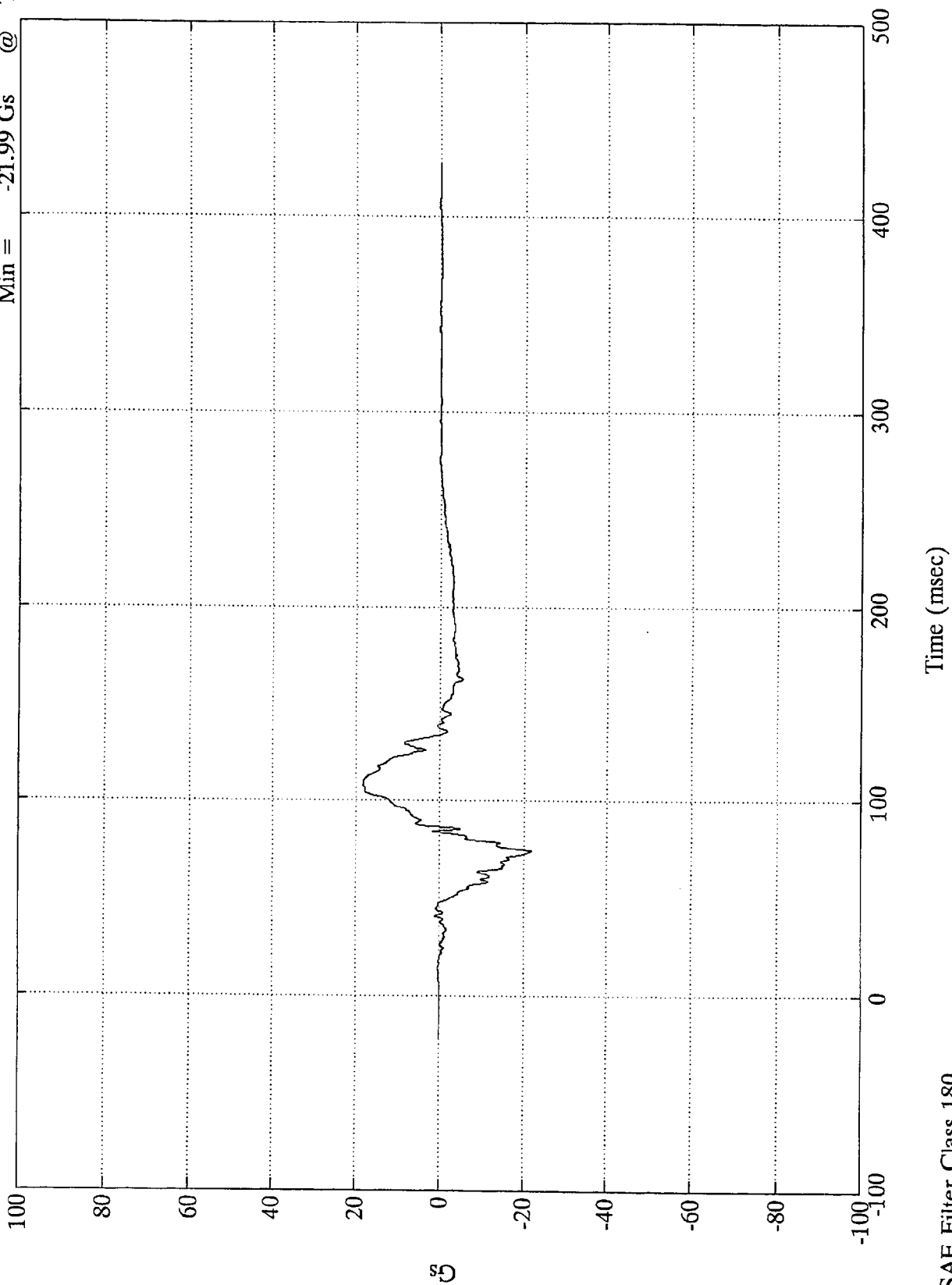
SAE Filter Class 180

Gs

VTV TEST #1

Max = 18.28 Gs @ 107.88 msec
Min = -21.99 Gs @ 74.51 msec

P1 Chest Z



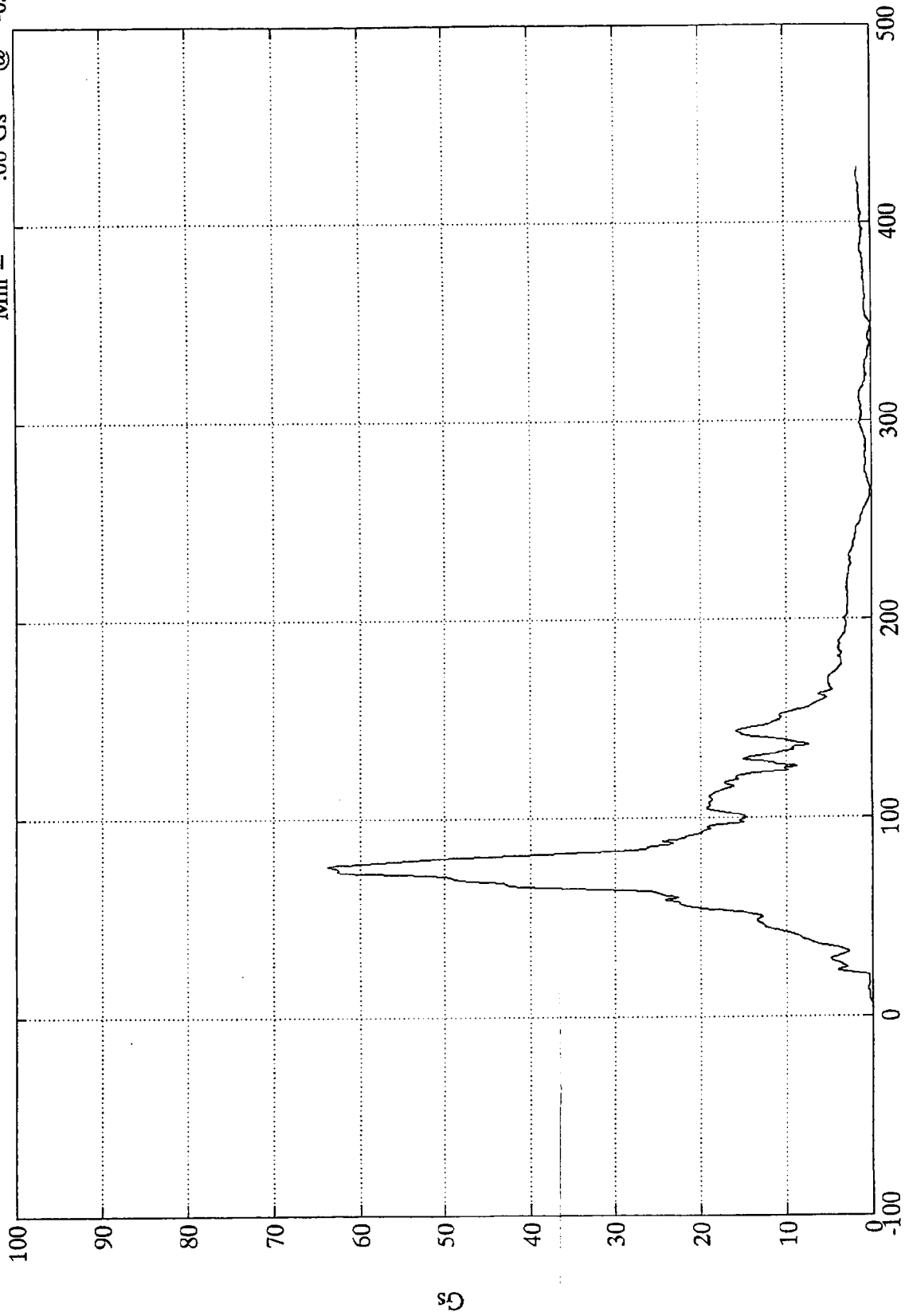
B-1.0

8304-1

SAE Filter Class 180

VTV TEST #1

P1 Chest Resultant
Max = 63.73 Gs @ 76.31 msec
Min = .00 Gs @ -0.96 msec



Time (msec)

SAE Filter Class 180

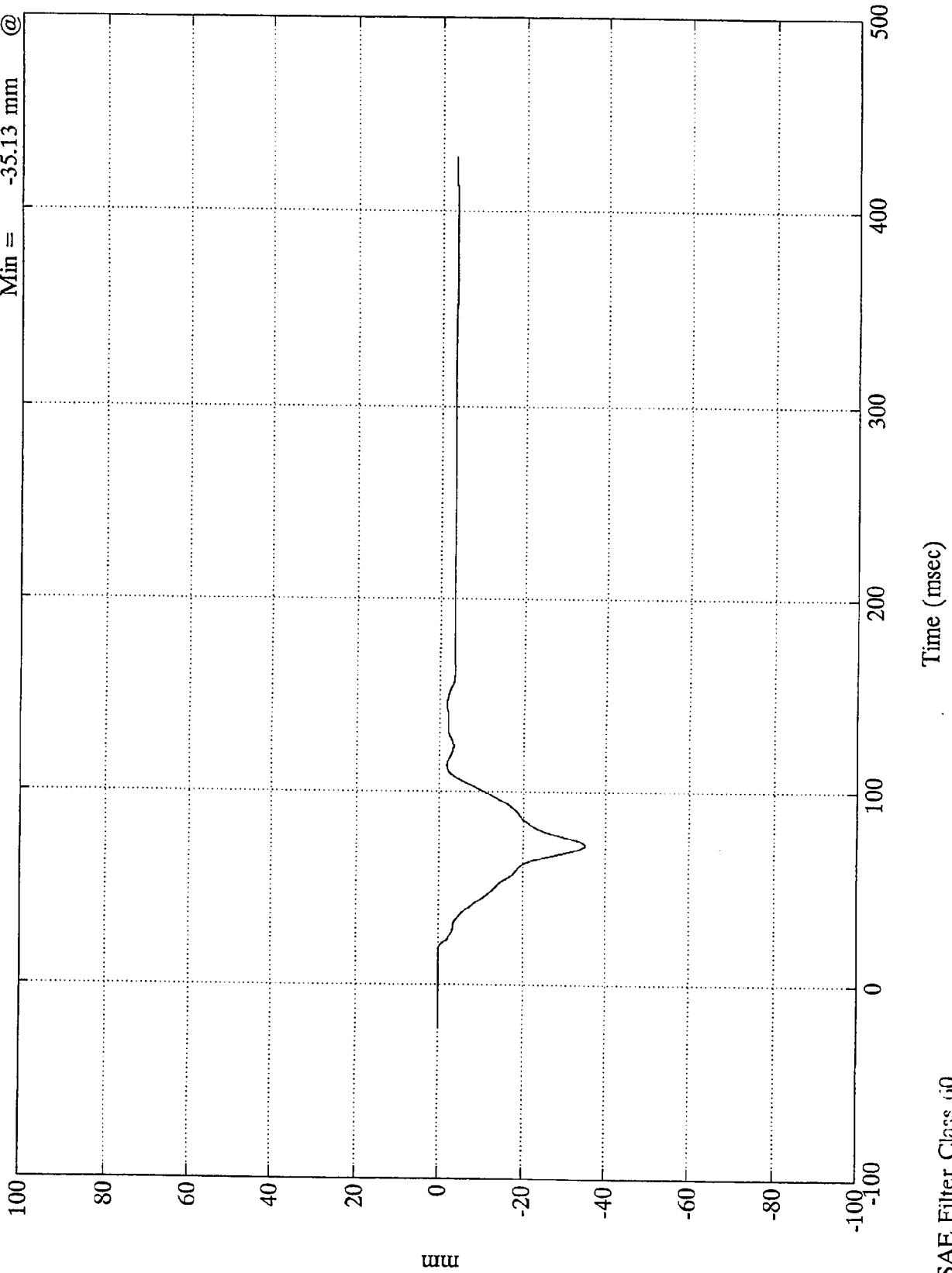
8304-1

B-141

VTV TEST #1

P1 Chest Disp.

Max = .06 mm @ 17.51 msec
Min = -35.13 mm @ 71.76 msec



mm

B-142

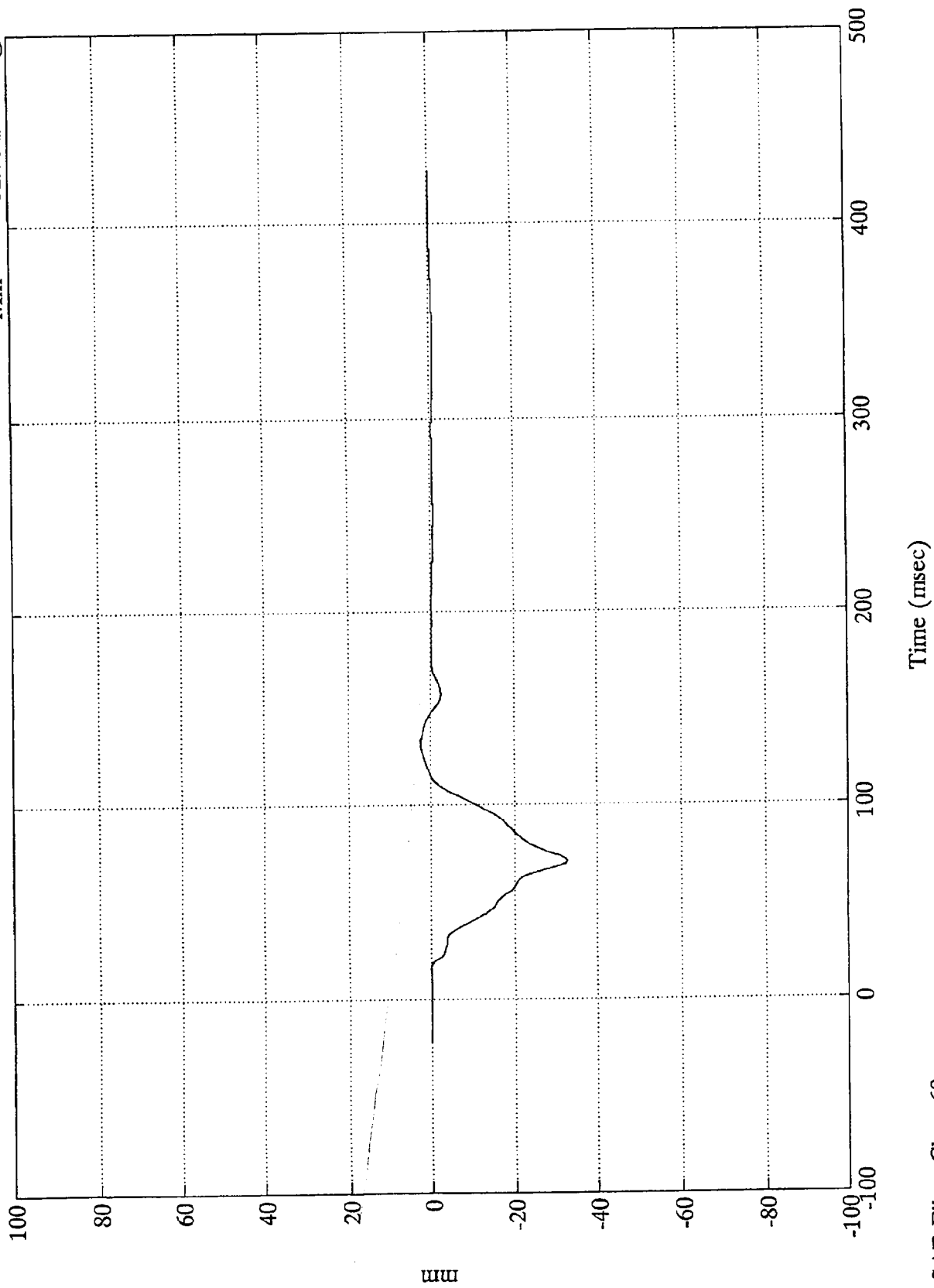
8304-1

SAE Filter Class 60

VTV TEST #1

Chest Displacement #125

Max = 2.54 mm @ 131.04 msec
Min = -32.76 mm @ 71.04 msec

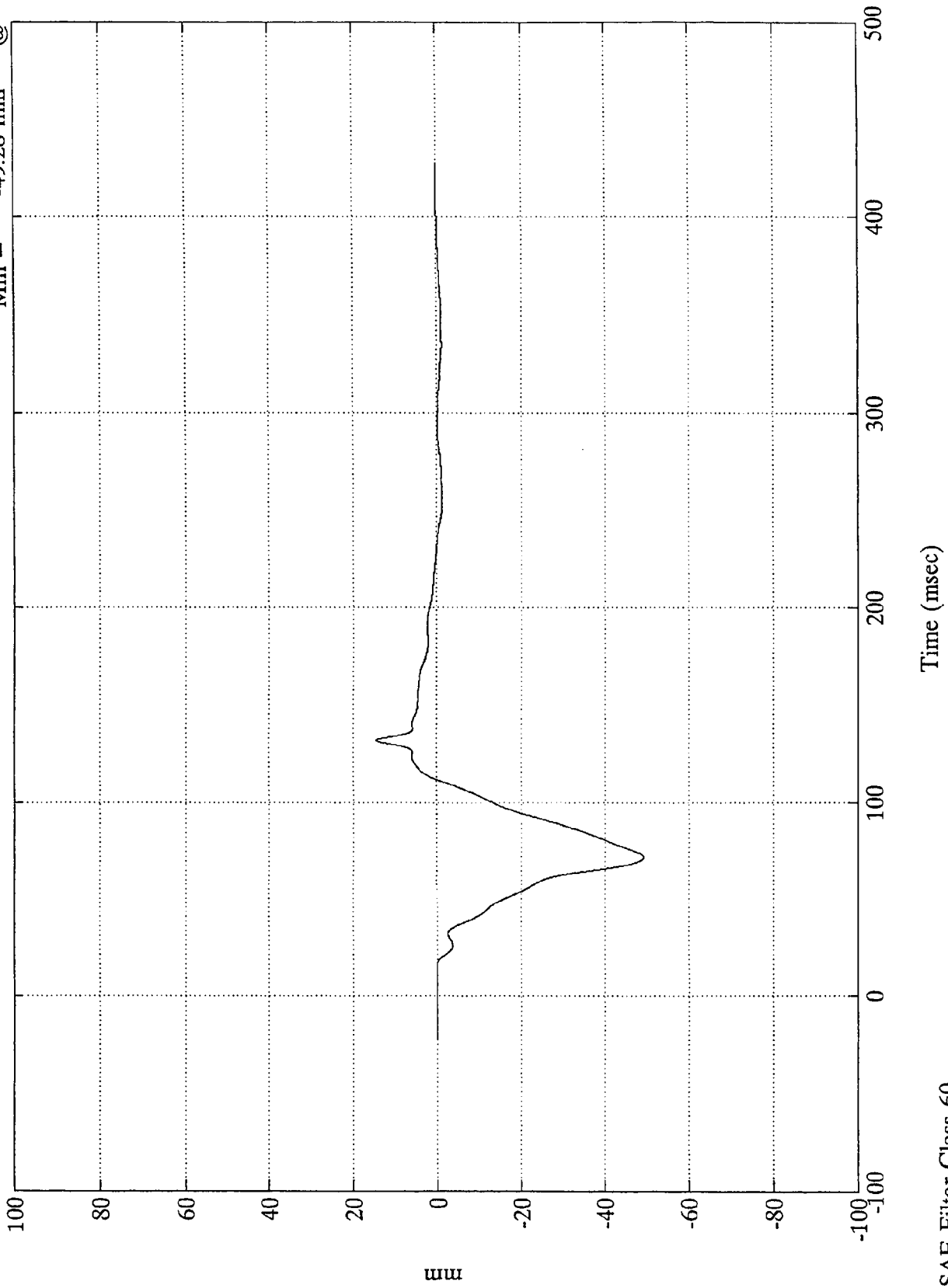


mm

Time (msec)

VTV TEST #1

Chest Displacement #126
Max = 14.33 mm @ 132.00 msec
Min = -49.28 mm @ 72.24 msec



mm

B-144

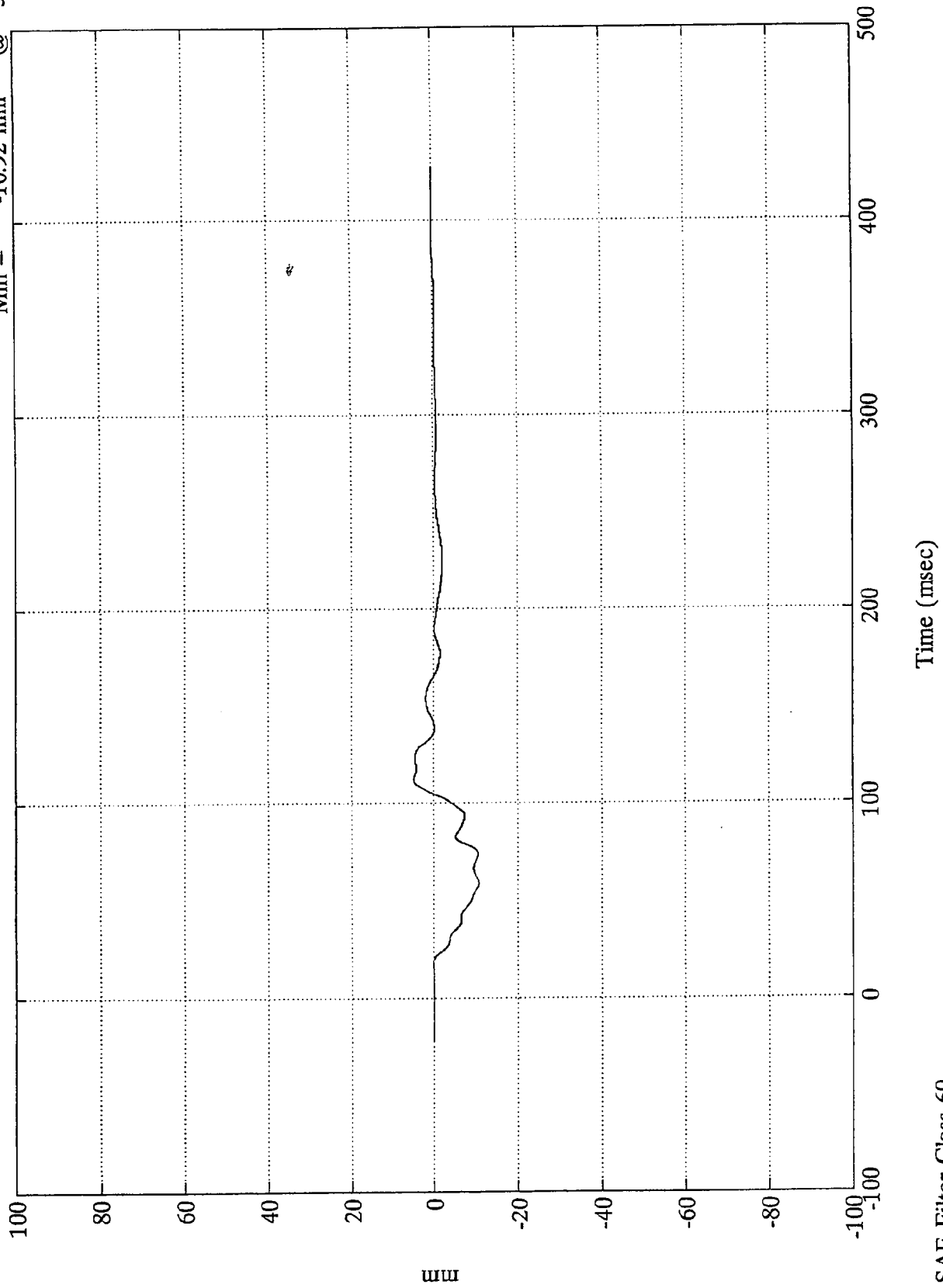
8304-1

SAE Filter Class 60

VTV TEST #1

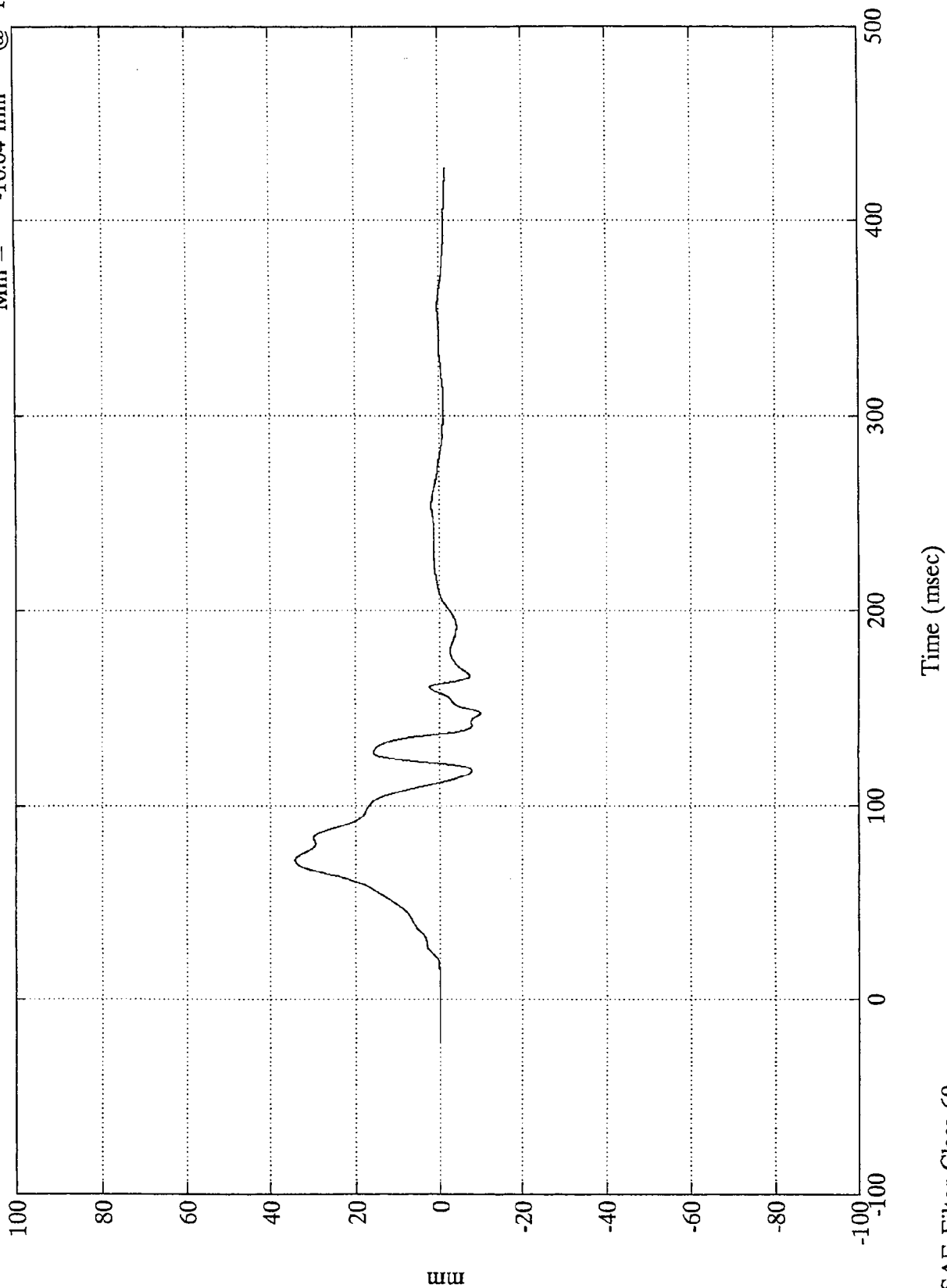
Chest Displacement #127

Max = 4.82 mm @ 112.08 msec
Min = -10.92 mm @ 58.91 msec



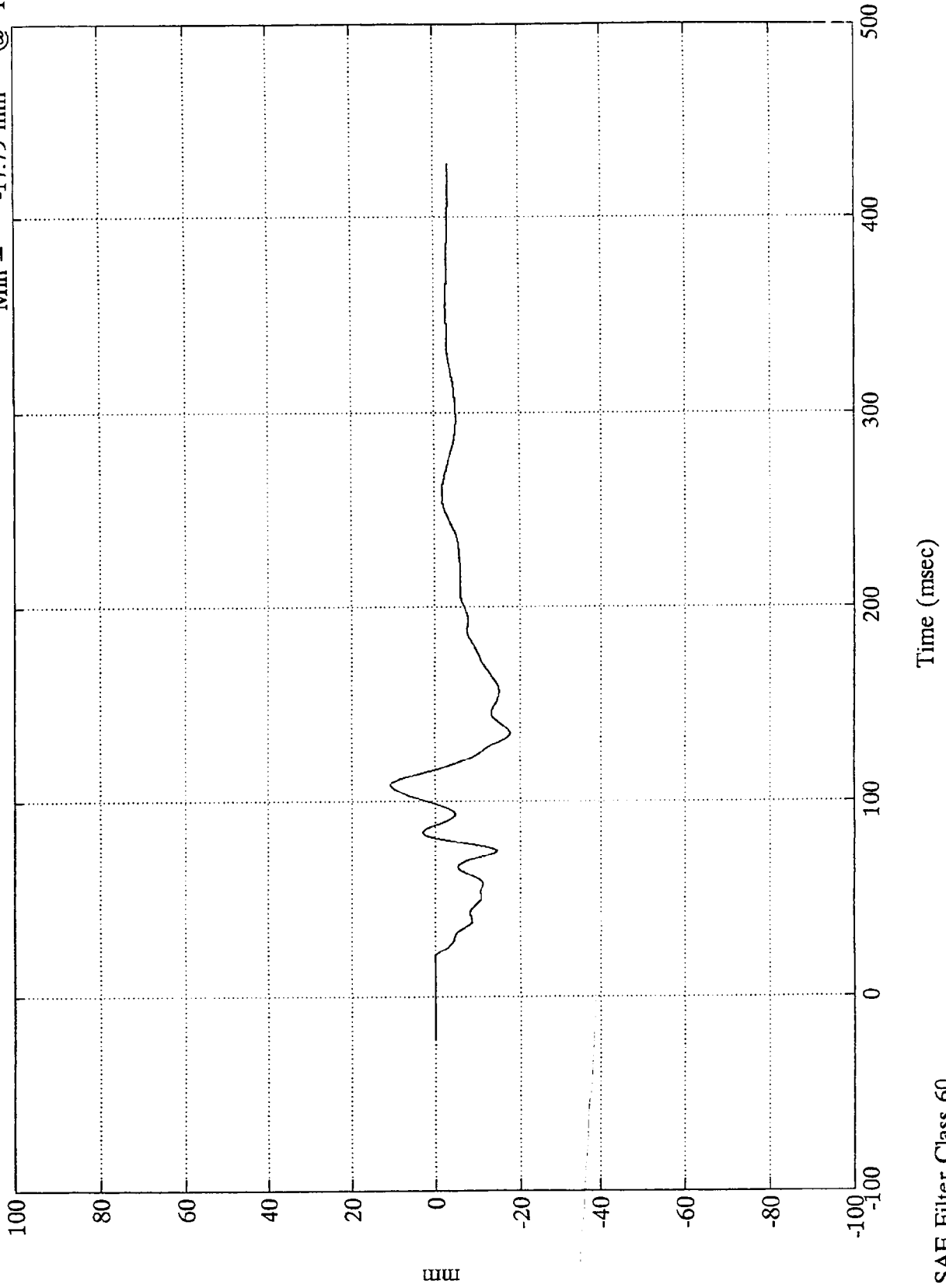
VTV TEST #1

Chest Displacement #128
Max = 34.16 mm @ 72.12 msec
Min = -10.04 mm @ 147.72 msec



VTV TEST #1

Chest Displacement #129
Max = 10.49 mm @ 108.60 msec
Min = -17.79 mm @ 135.47 msec



mm

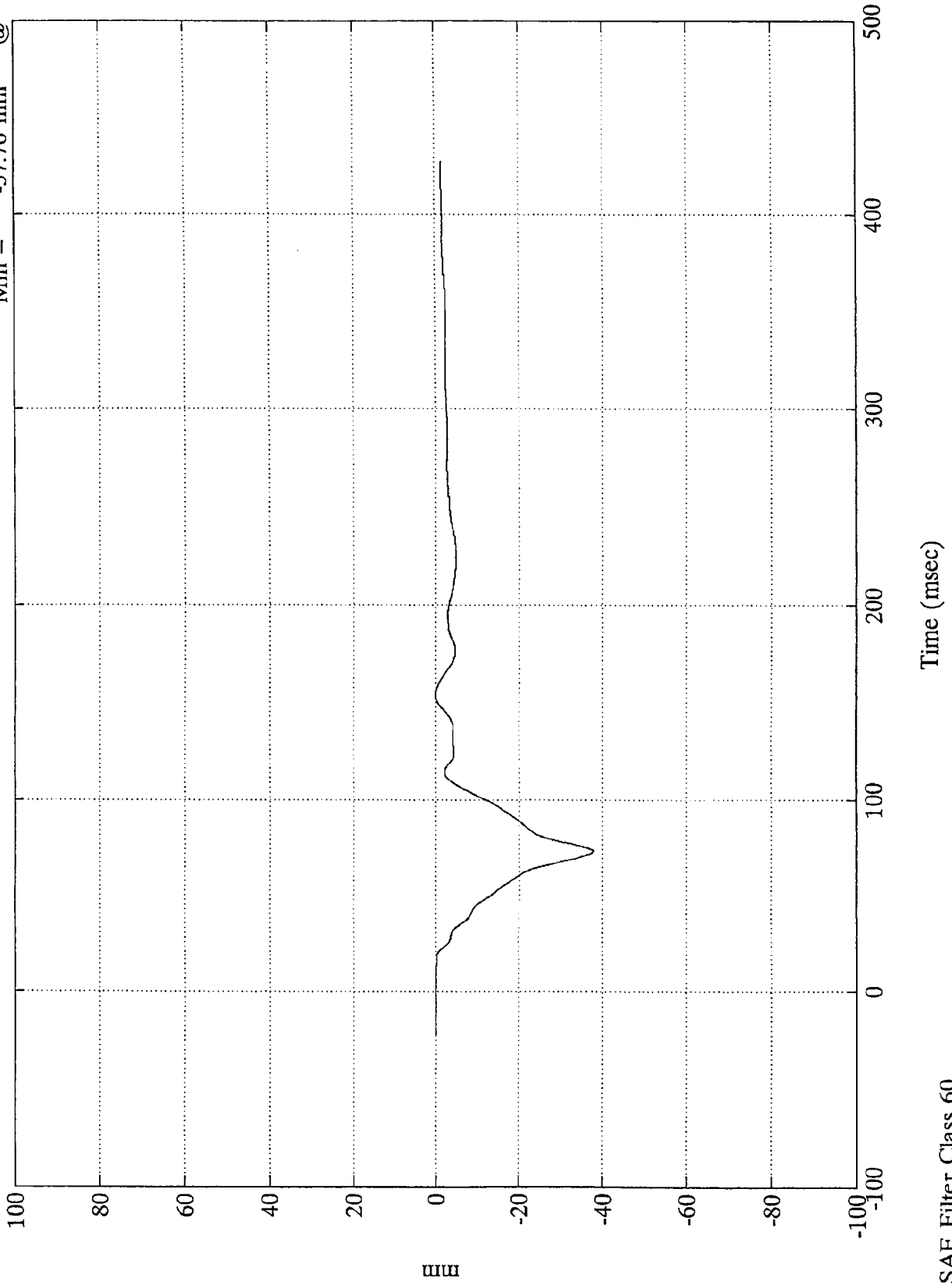
B-147

8304-1

SAE Filter Class 60

VTV TEST #1

Chest Displacement #130
Max = .03 mm @ 153.60 msec
Min = -37.76 mm @ 73.68 msec



mm

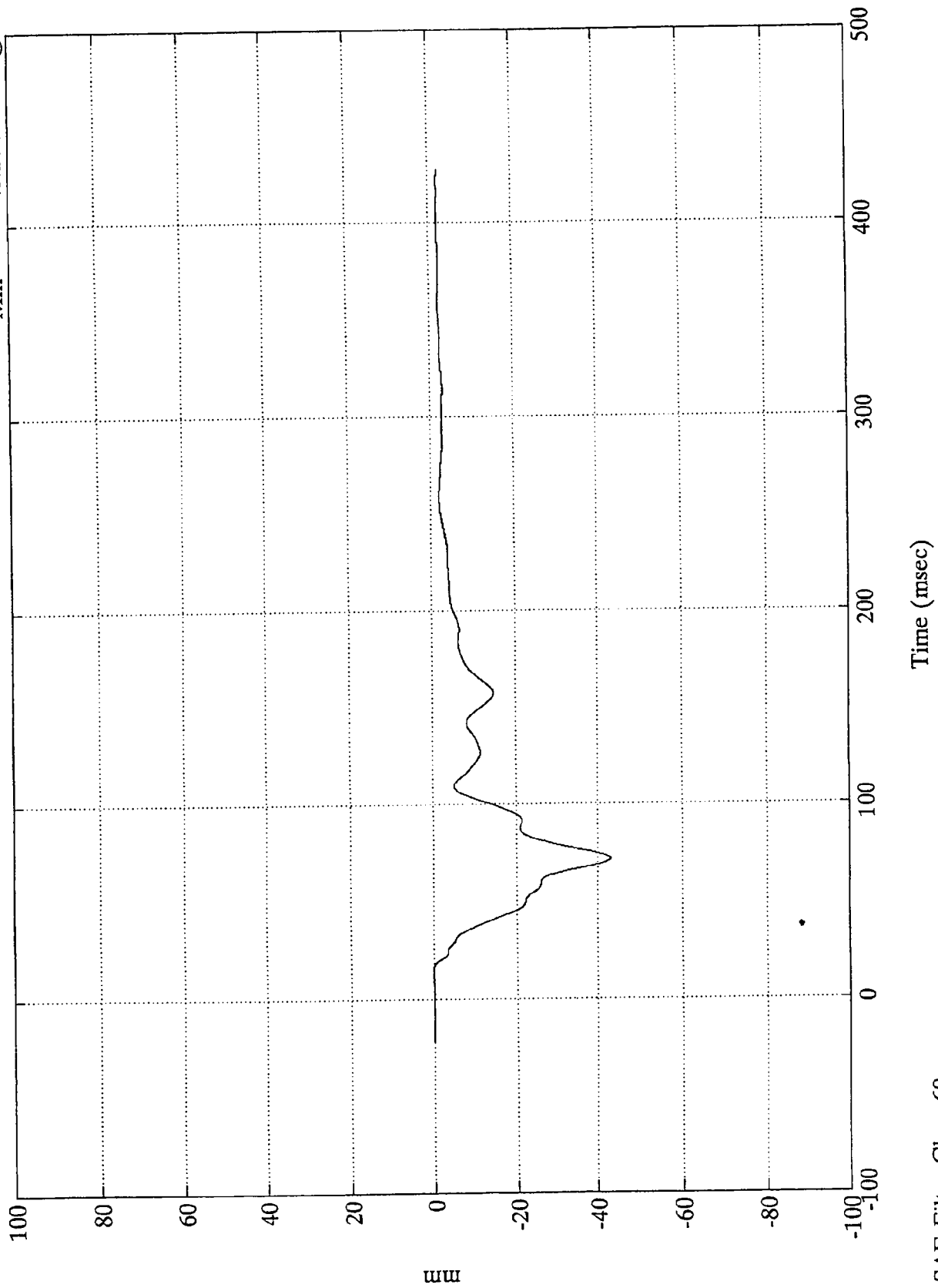
B-143

SAE Filter Class 60

8304-1

VTV TEST #1

Chest Displacement #131
Max = .04 mm @ -13.32 msec
Min = -43.10 mm @ 72.00 msec



mm

B-149

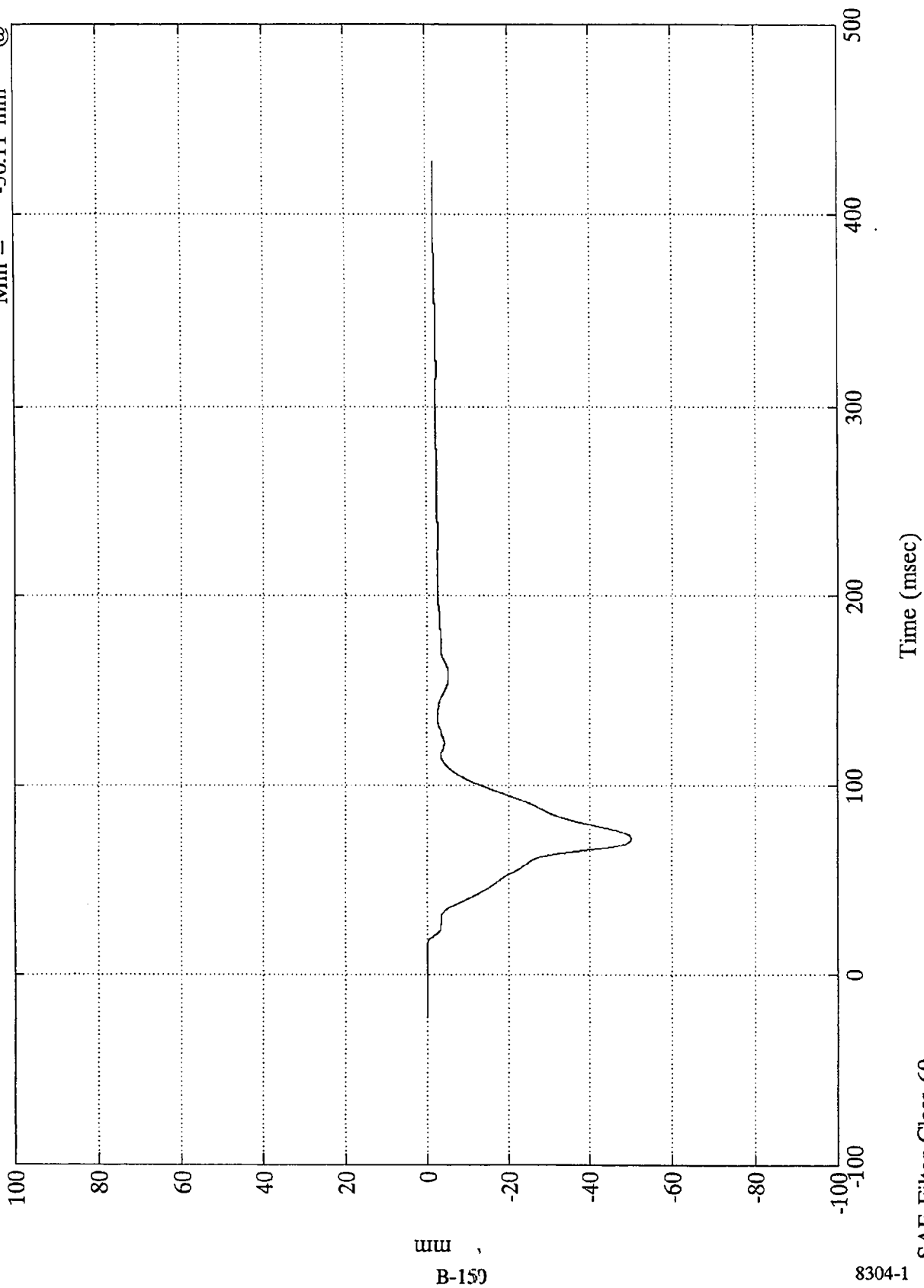
8304-1

SAE Filter Class 60

VTV TEST #1

Chest Displacement #132

Max =	.02 mm	@	-14.76 msec
Min =	-50.11 mm	@	71.88 msec



B-150

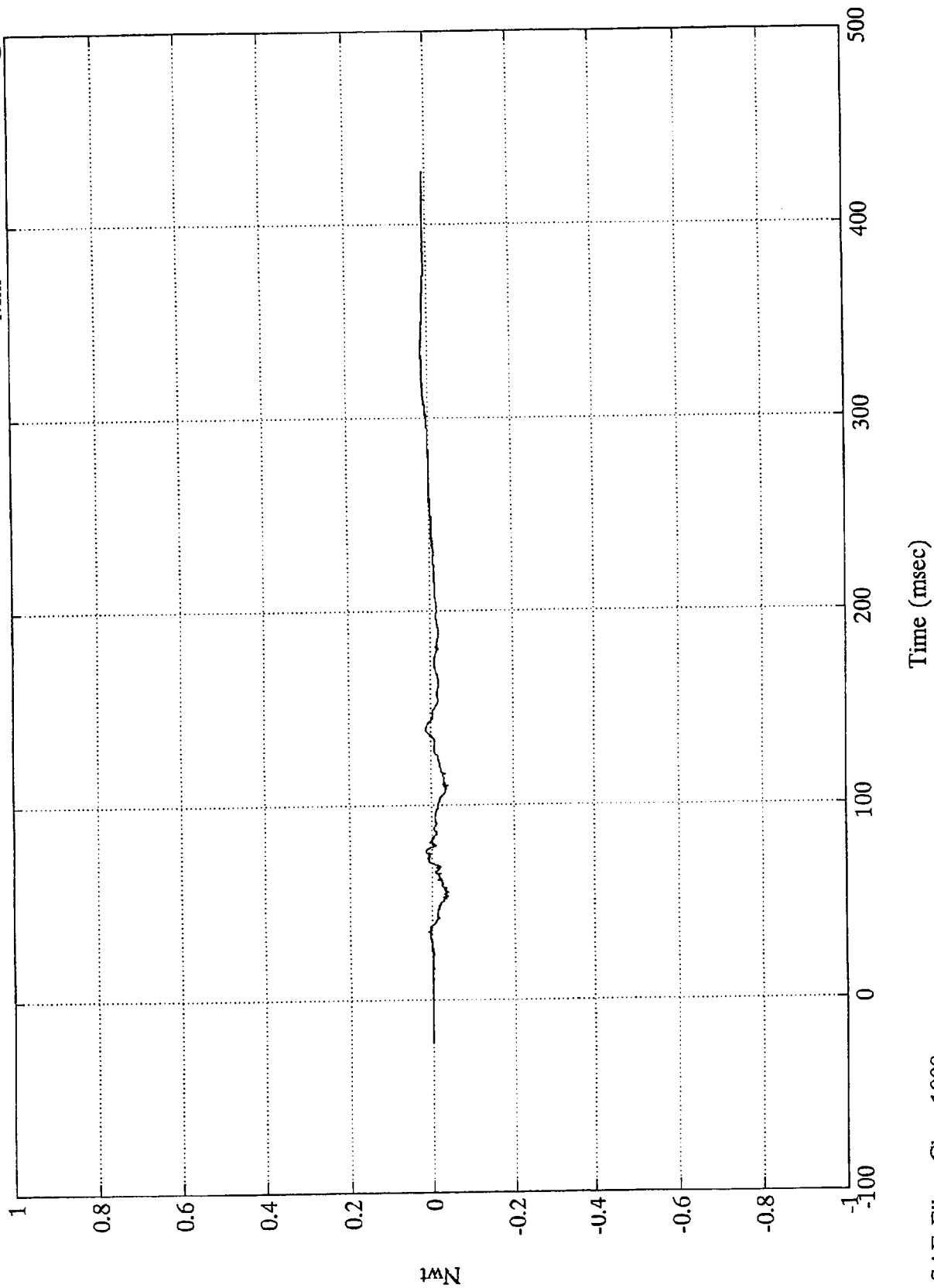
8304-1

VTV TEST #1

$\times 10^4$

P1 Upper Neck Fx

Max = 151.37 Nwt @ 339.72 msec
Min = -421.29 Nwt @ 110.16 msec



Nwt

B-151

8304-1

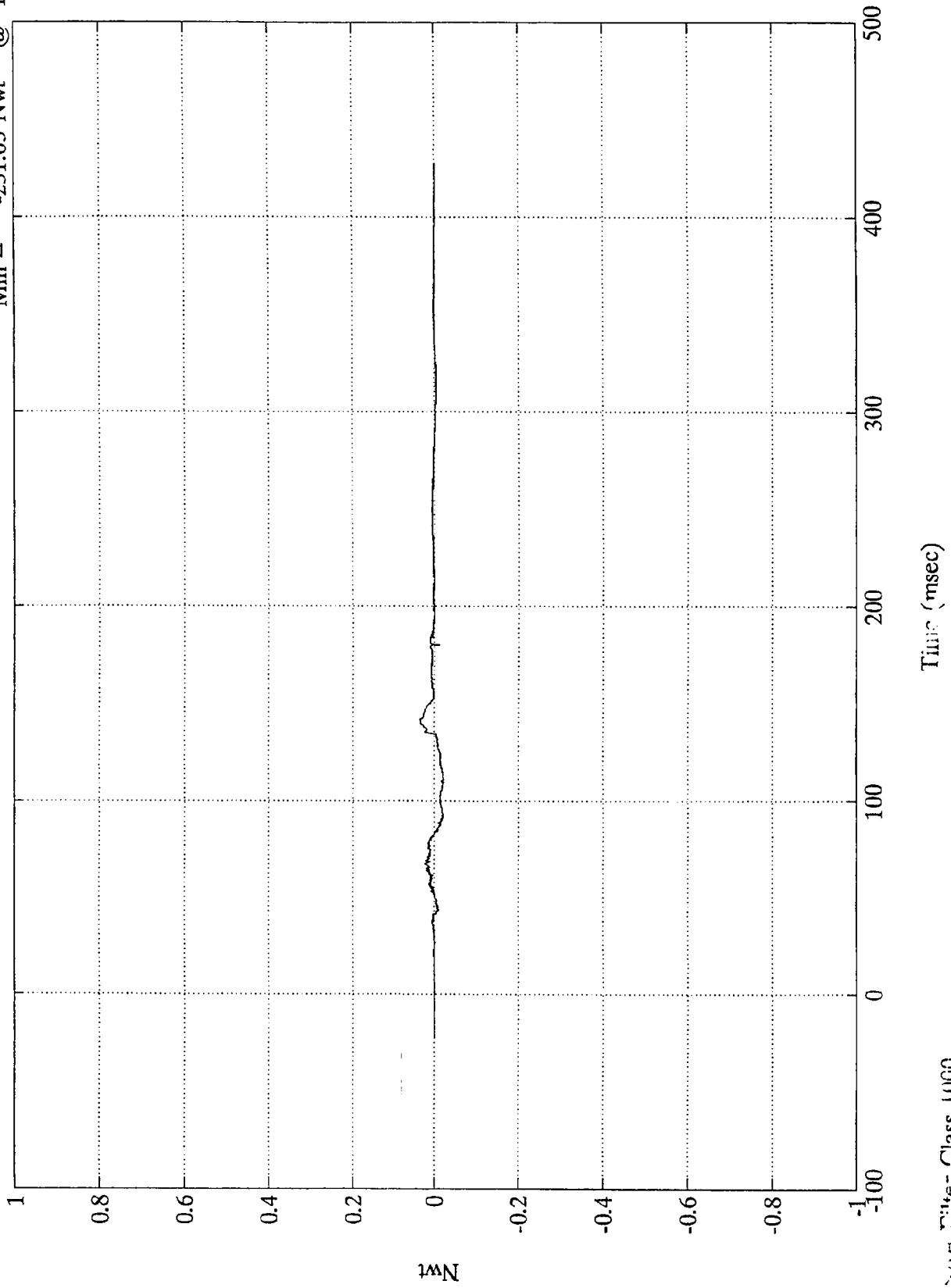
SAE Filter Class 1000

VTV TEST #1

$\times 10^4$

P1 Upper Neck Fy

Max = 358.44 Nwt @ 141.47 msec
Min = -231.03 Nwt @ 109.92 msec



Nwt

B-152

8304-1

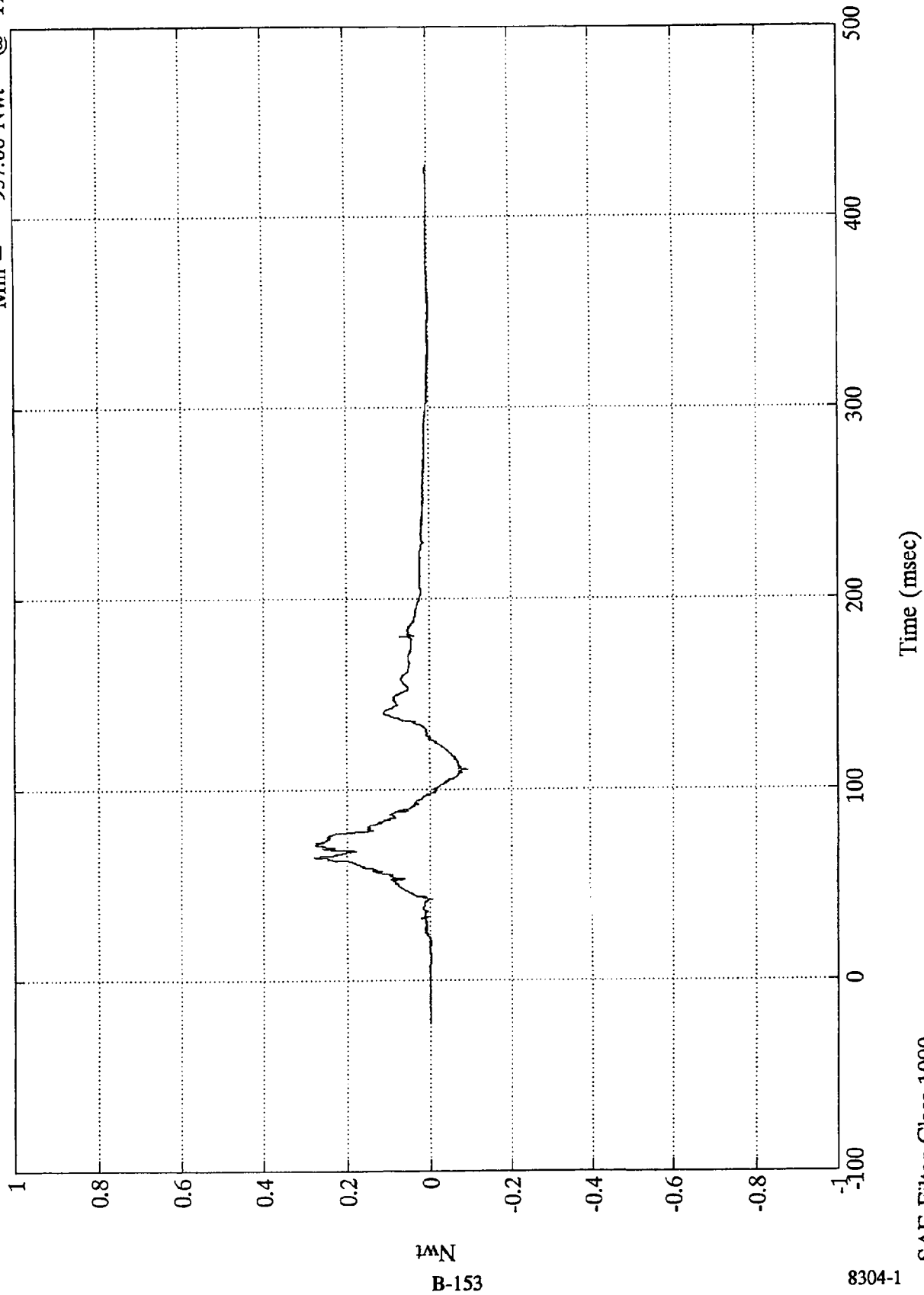
SAVE TEST# Class 1060

VTV TEST #1

$\times 10^4$

P1 Upper Neck Fz

Max = 2772.32 Nwt @ 64.80 msec
Min = -937.06 Nwt @ 110.52 msec



Nwt

B-153

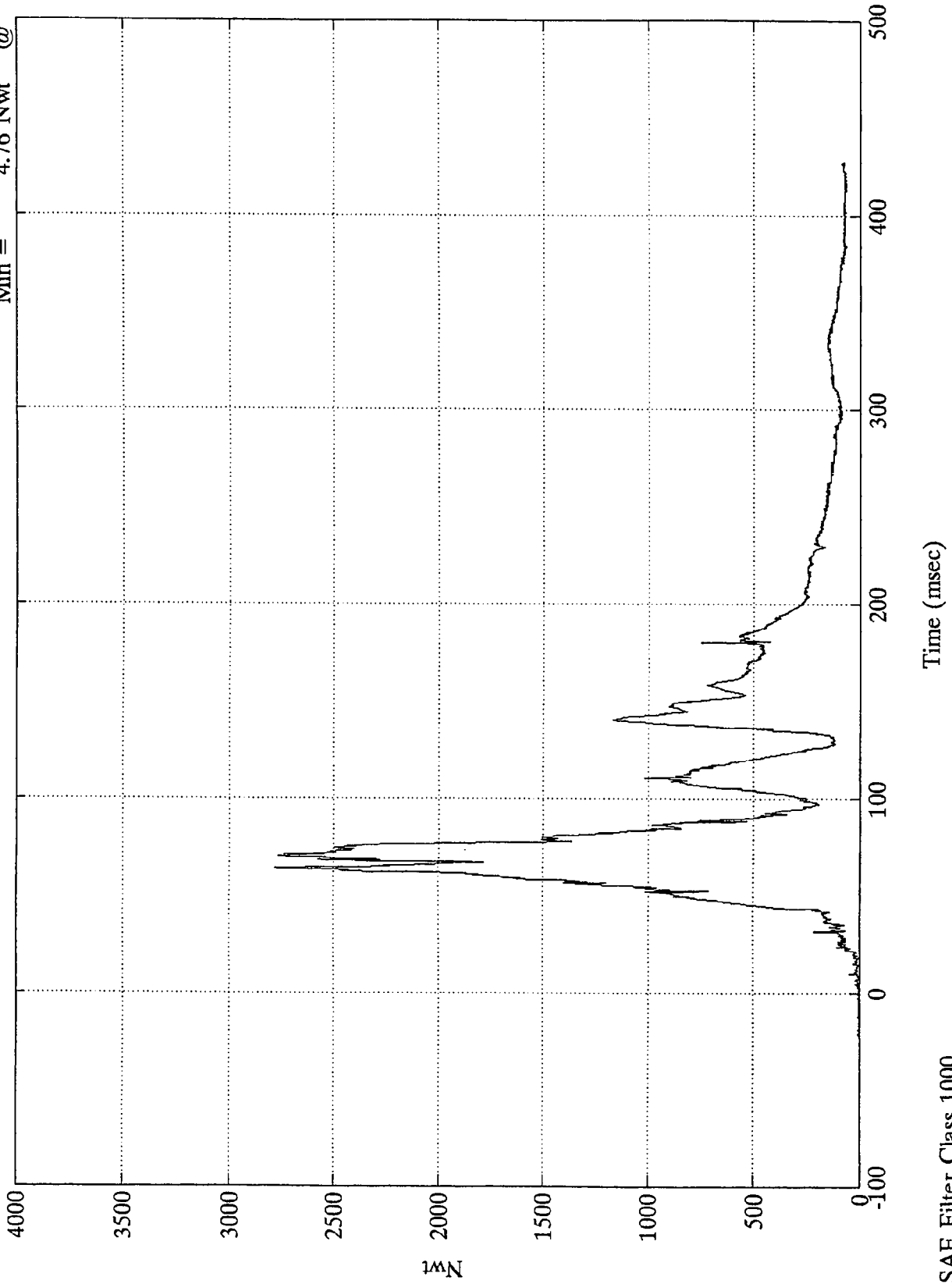
8304-1

SAE Filter Class 1000

VTV TEST #1

P1 Upper Neck Force Res.

Max = 2781.97 Nwt @ 64.80 msec
Min = 4.76 Nwt @ 18.96 msec



Nwt

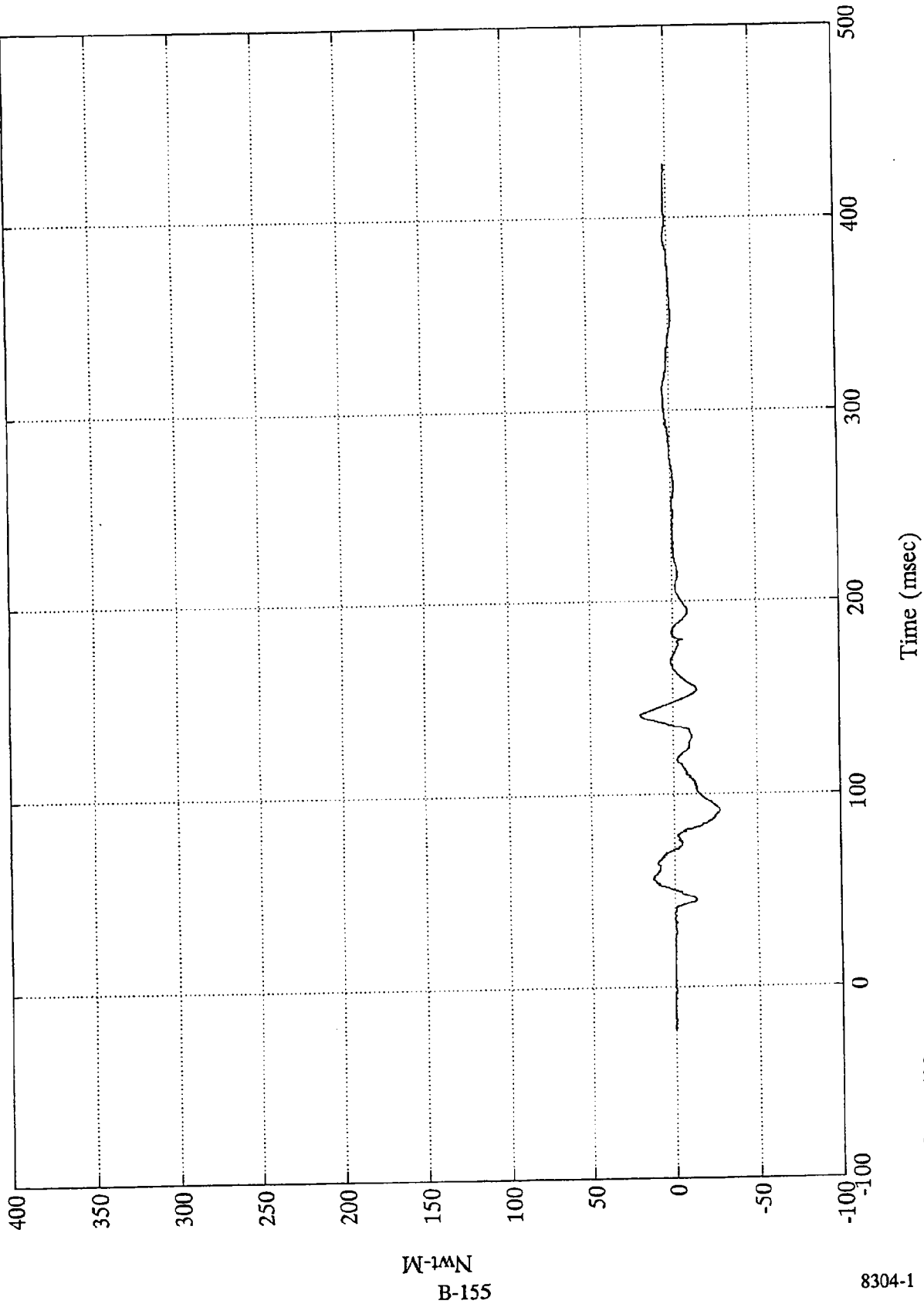
Time (msec)

SAE Filter Class 1000

VTV TEST #1

P1 Upper Neck Mx

Max = 19.55 Nwt-M @ 141.47 msec
Min = -27.62 Nwt-M @ 91.44 msec



M-14N
B-155

8304-1

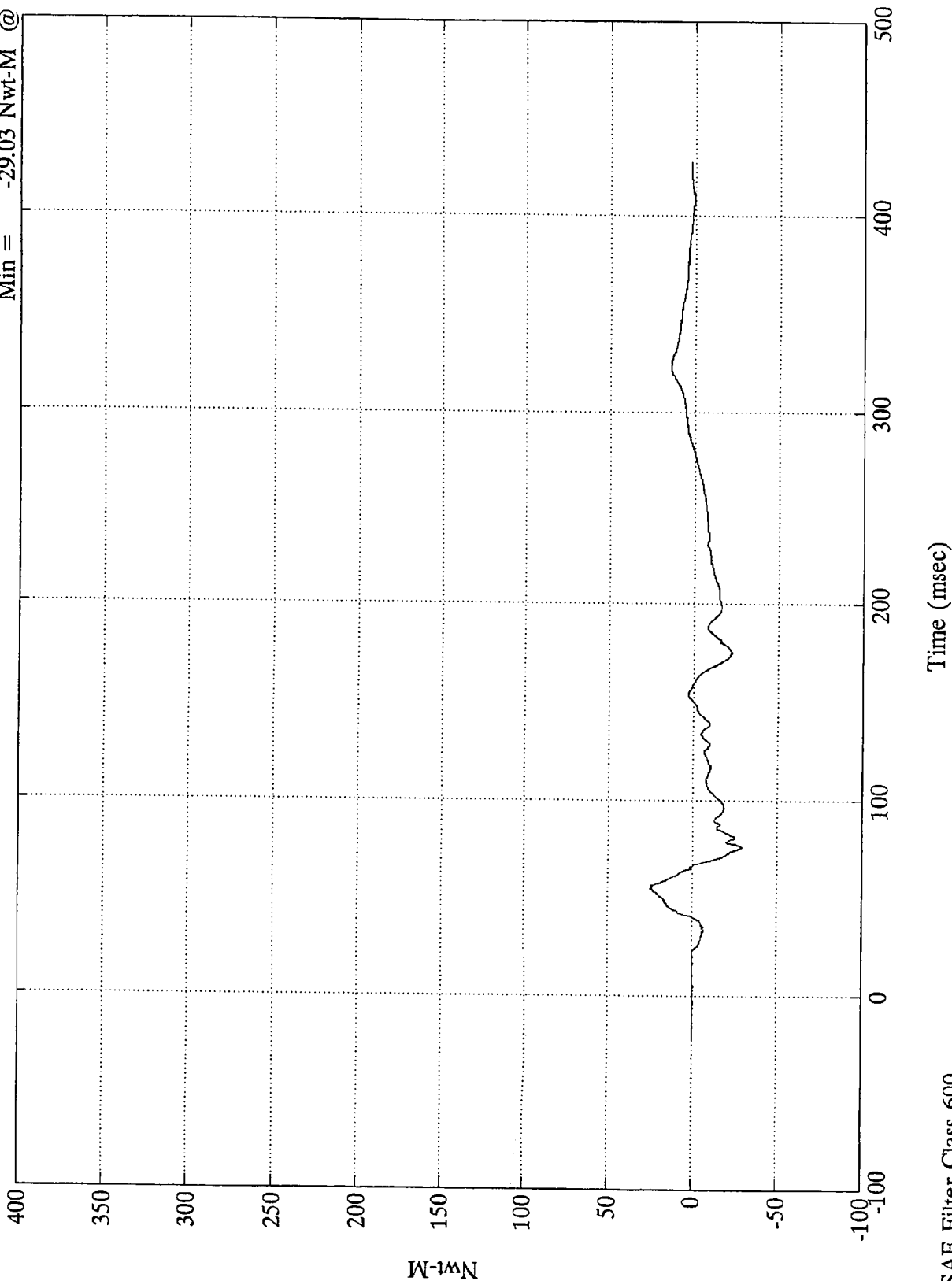
SAE Filter Class 600

VTV TEST #1

P1 Upper Neck My

Max = 25.08 Nwt-M @
Min = -29.03 Nwt-M @

54.96 msec
76.80 msec



B-156

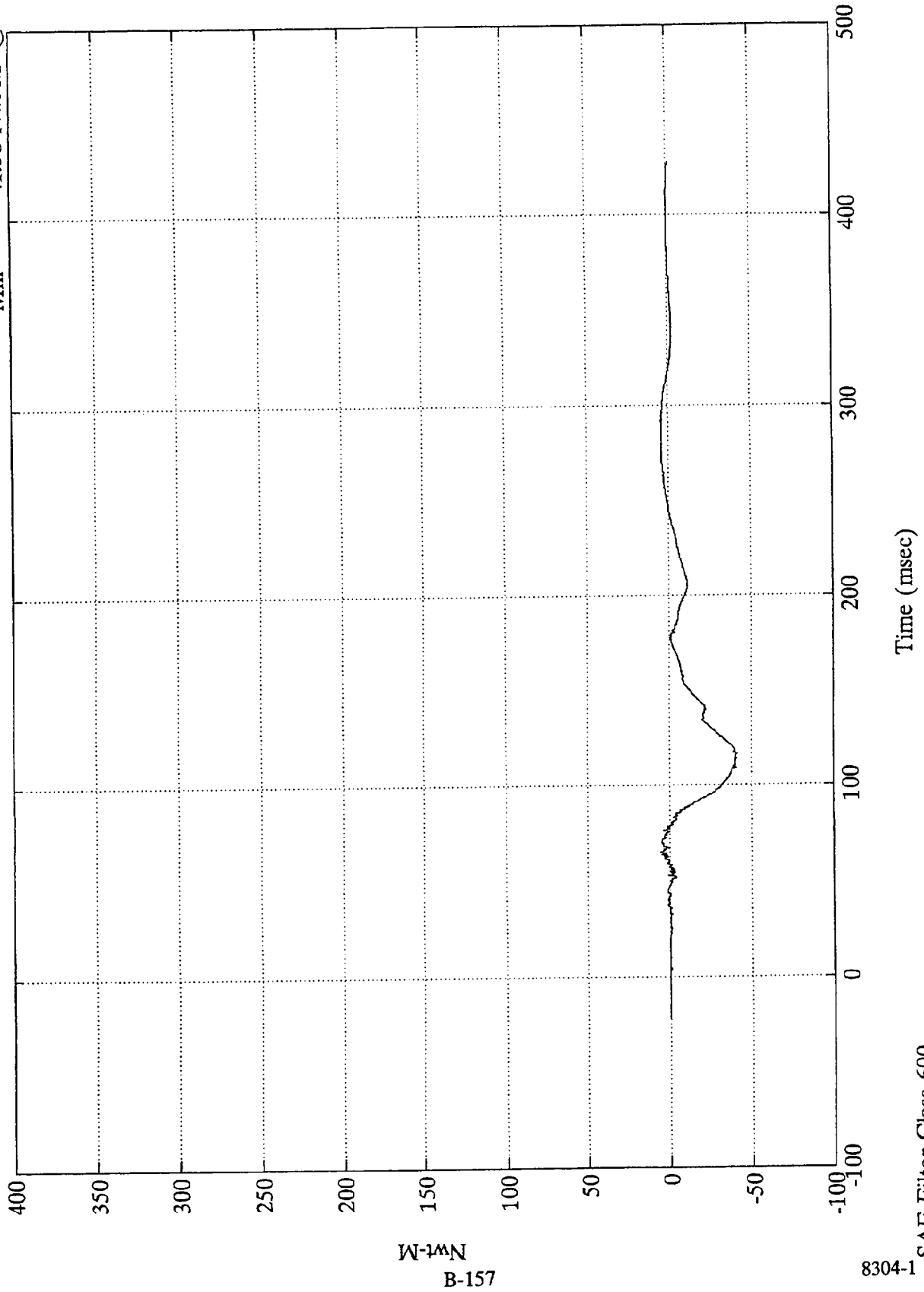
8304-1

SAE Filter Class 600

VTV TEST #1

P1 Upper Neck Mz

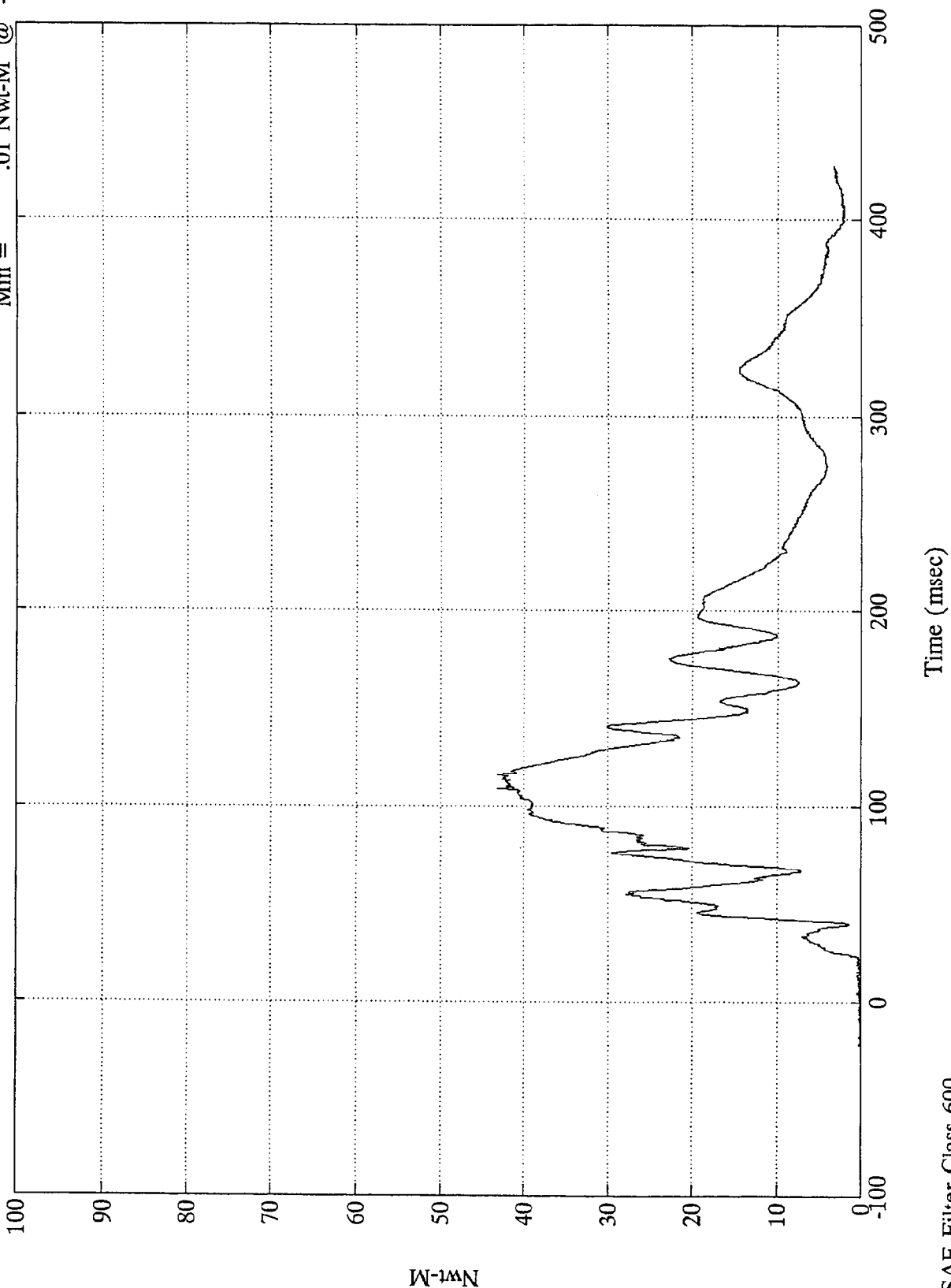
Max = 6.02 Nwt-M @ 65.15 msec
Min = -41.58 Nwt-M @ 116.16 msec



VTV TEST #1

P1 Upper Neck Moment Res.

Max = 43.15 Nwt-M @ 108.95 msec
Min = .01 Nwt-M @ -21.96 msec



Nwt-M
B-158

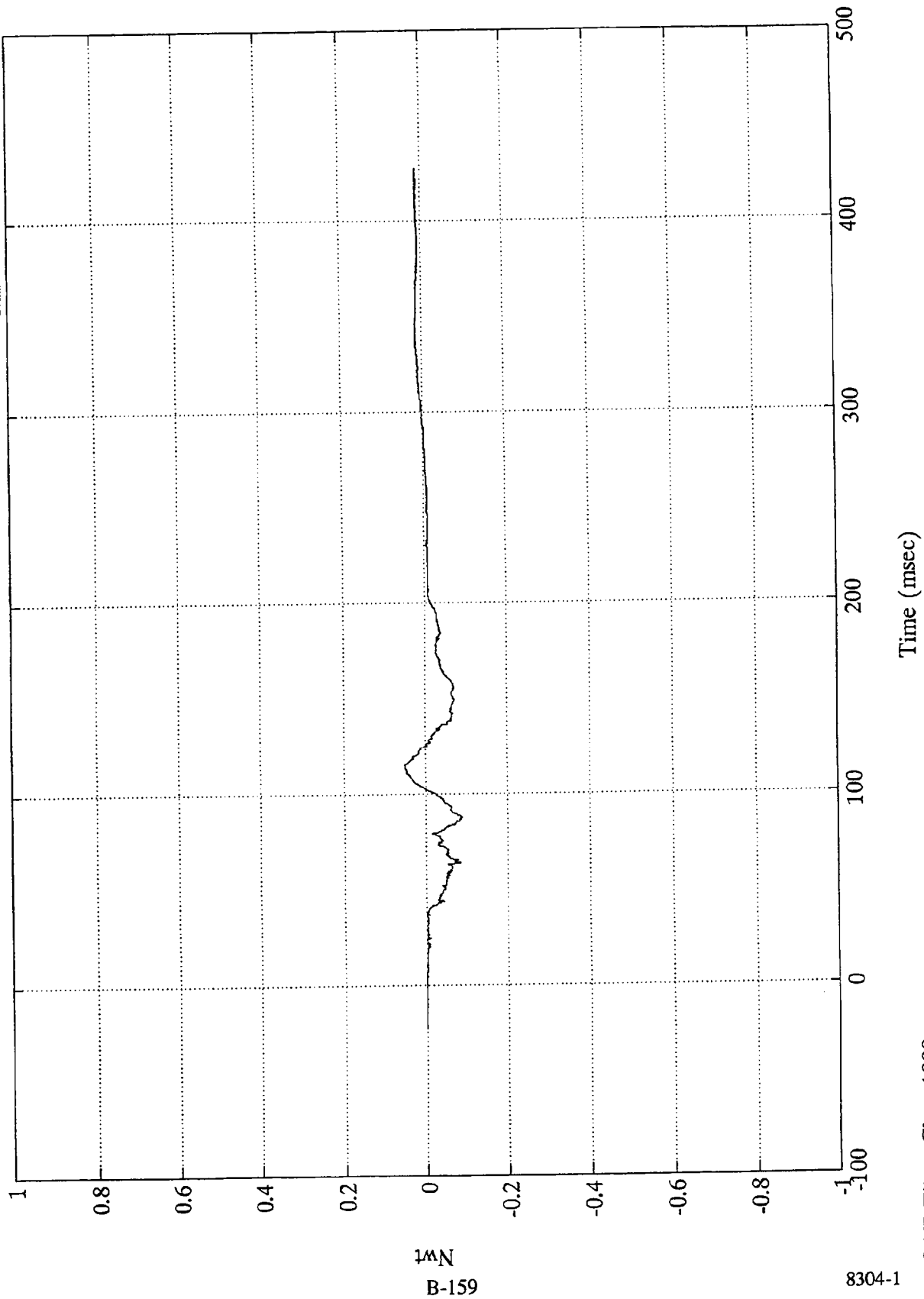
8304-1
SAE Filter Class 600

VTV TEST #1

$\times 10^4$

Max = 510.04 Nwt @ 115.32 msec
Min = -890.76 Nwt @ 88.08 msec

P1 Lower Neck Fx



B-159

8304-1

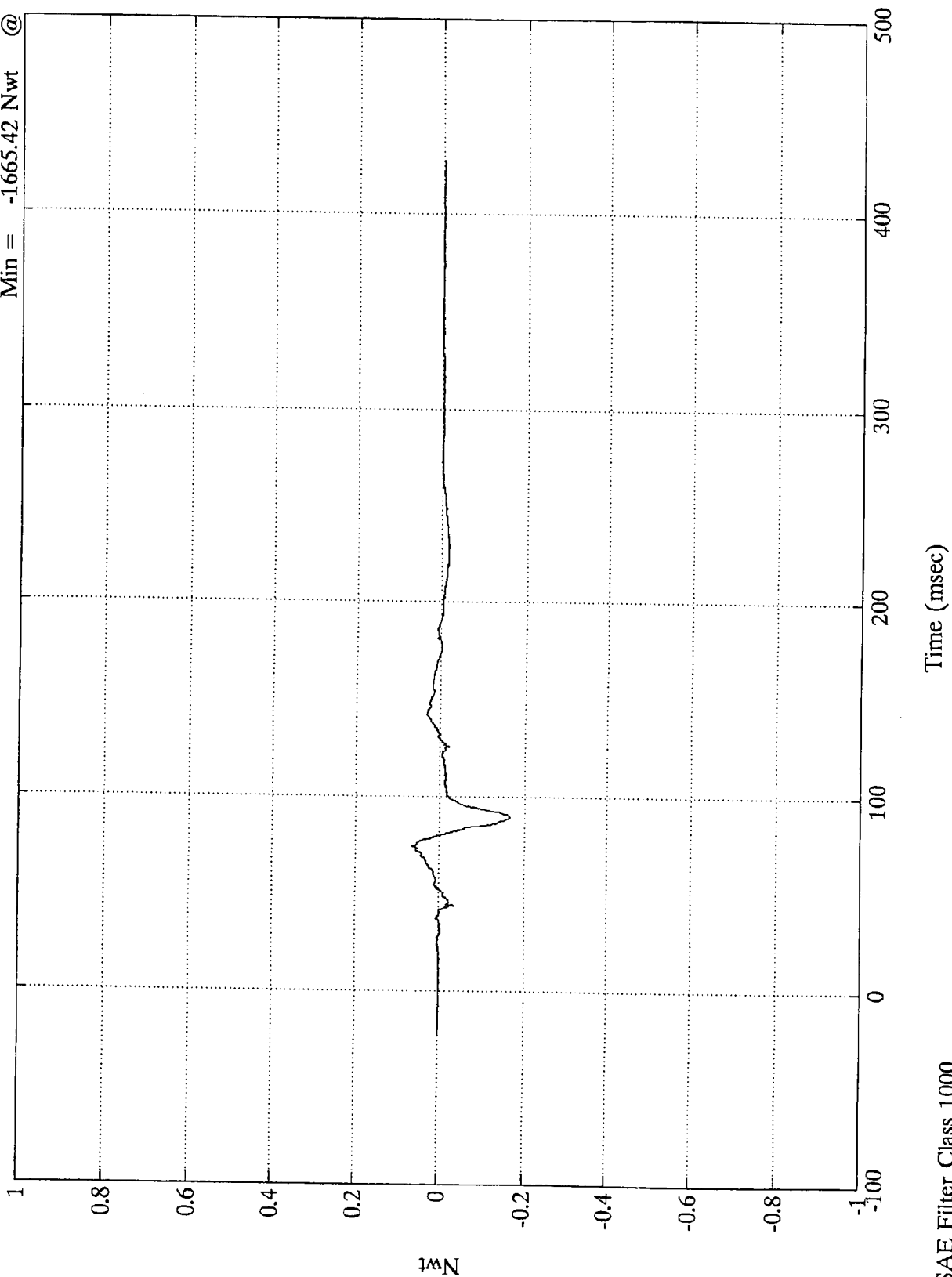
SAE Filter Class 1000

VTV TEST #1

Max = 659.72 Nwt @ 74.88 msec
Min = -1665.42 Nwt @ 90.00 msec

P1 Lower Neck Fy

$\times 10^4$



B-160

8304-1

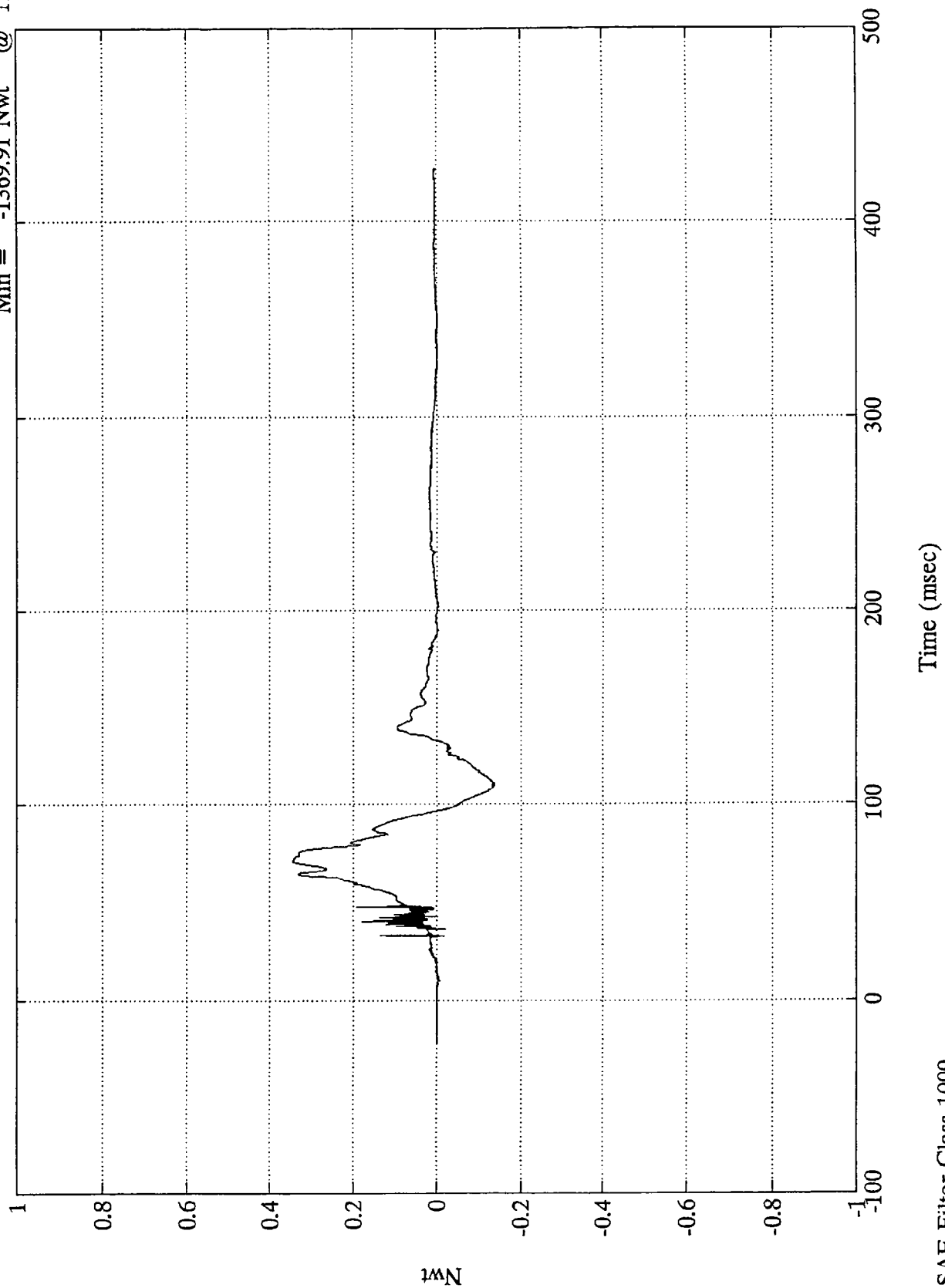
SAE Filter Class 1000

VTV TEST #1

$\times 10^4$

P1 Lower Neck Fz

Max = 3456.41 Nwt @ 71.04 msec
Min = -1369.91 Nwt @ 110.04 msec



Nwt

B-161

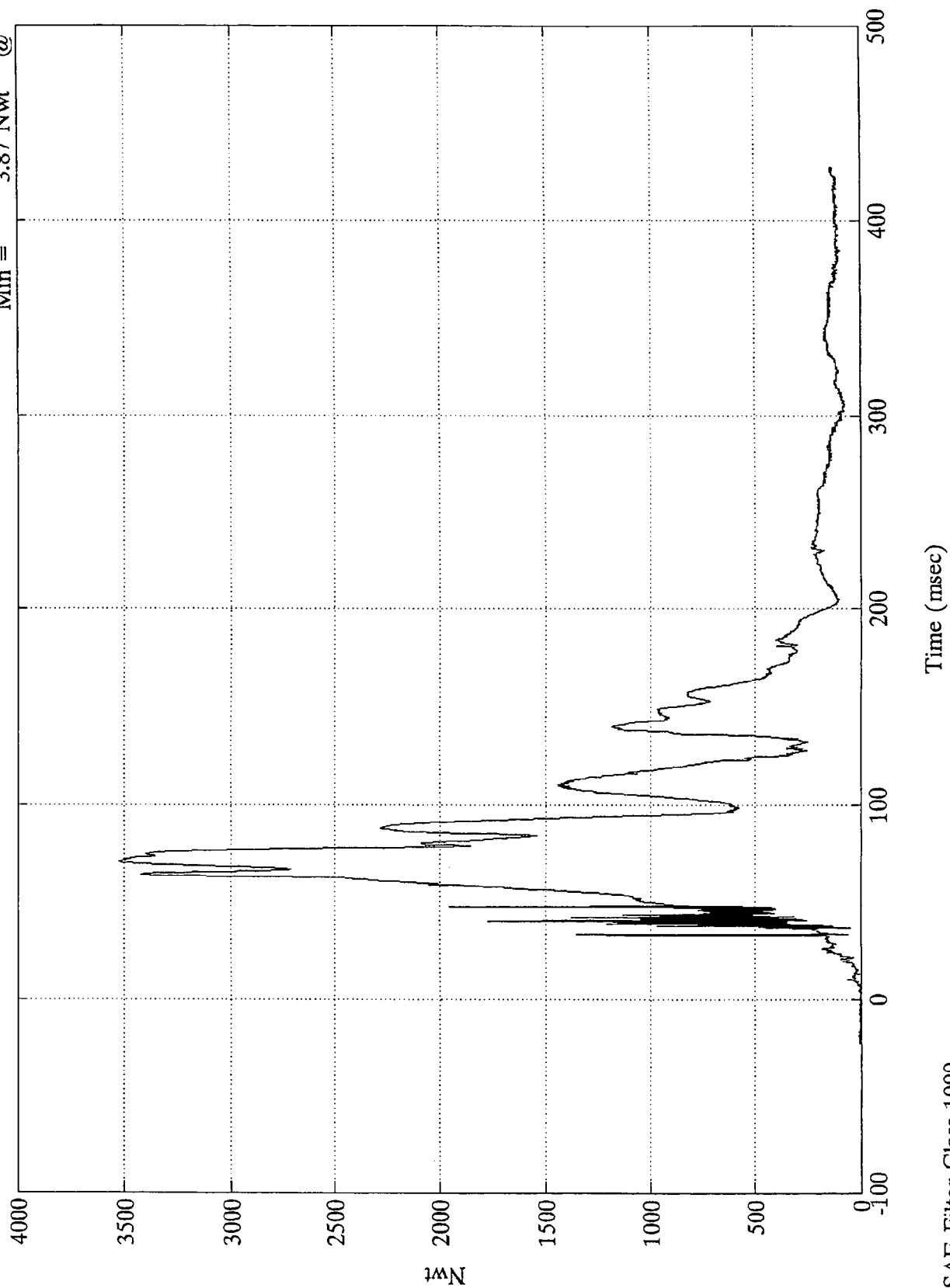
8304-1

SAE Filter Class 1000

VTV TEST #1

Max = 3525.54 Nwt @ 70.79 msec
Min = 3.87 Nwt @ 7.91 msec

P1 Lower Neck Force Res



8304-1

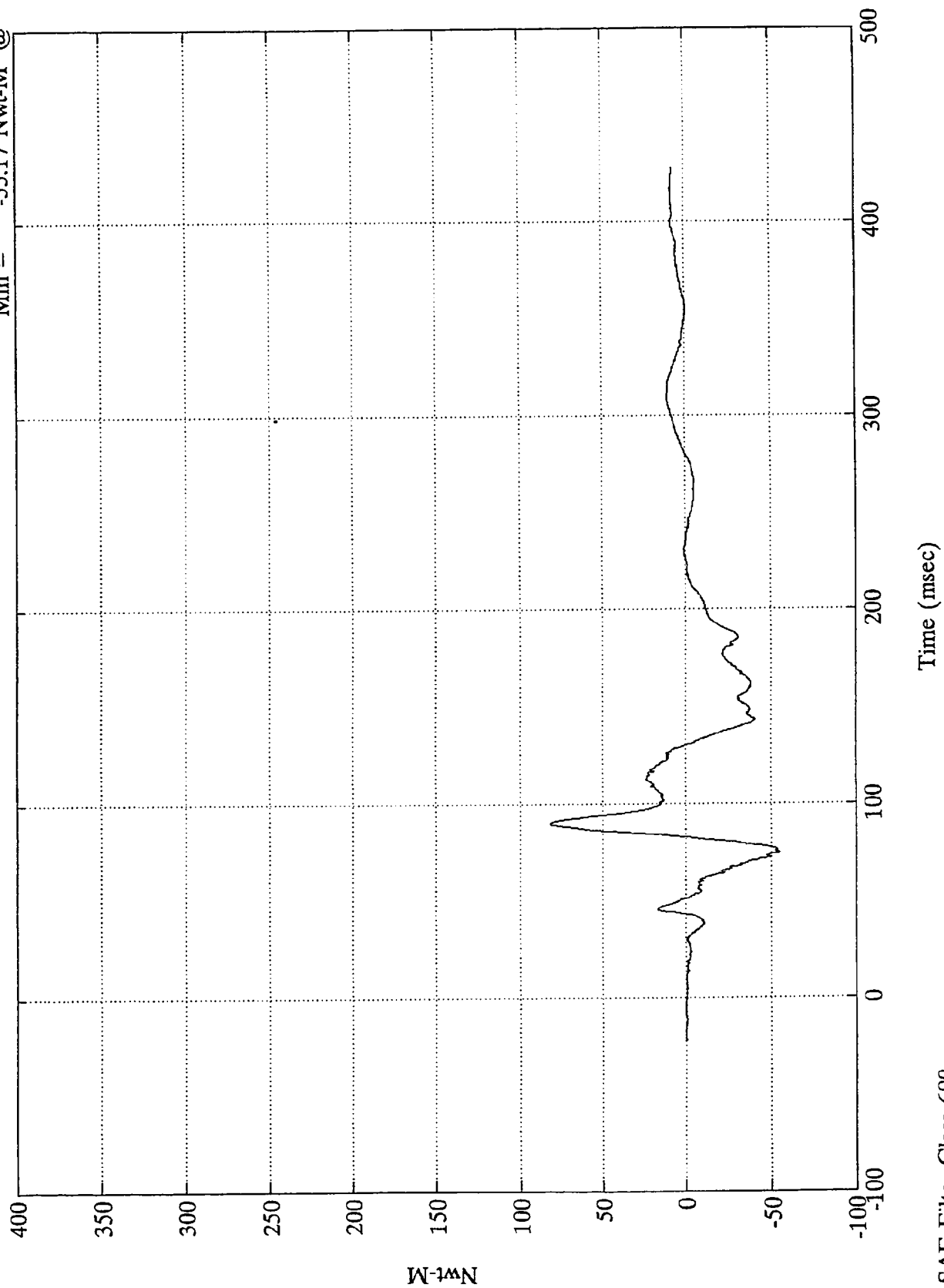
SAE Filter Class 1000

B-162

VTV TEST #1

Max = 82.05 Nwt-M @ 90.00 msec
Min = -55.17 Nwt-M @ 74.88 msec

P1 Lower Neck Mx



Nwt-M

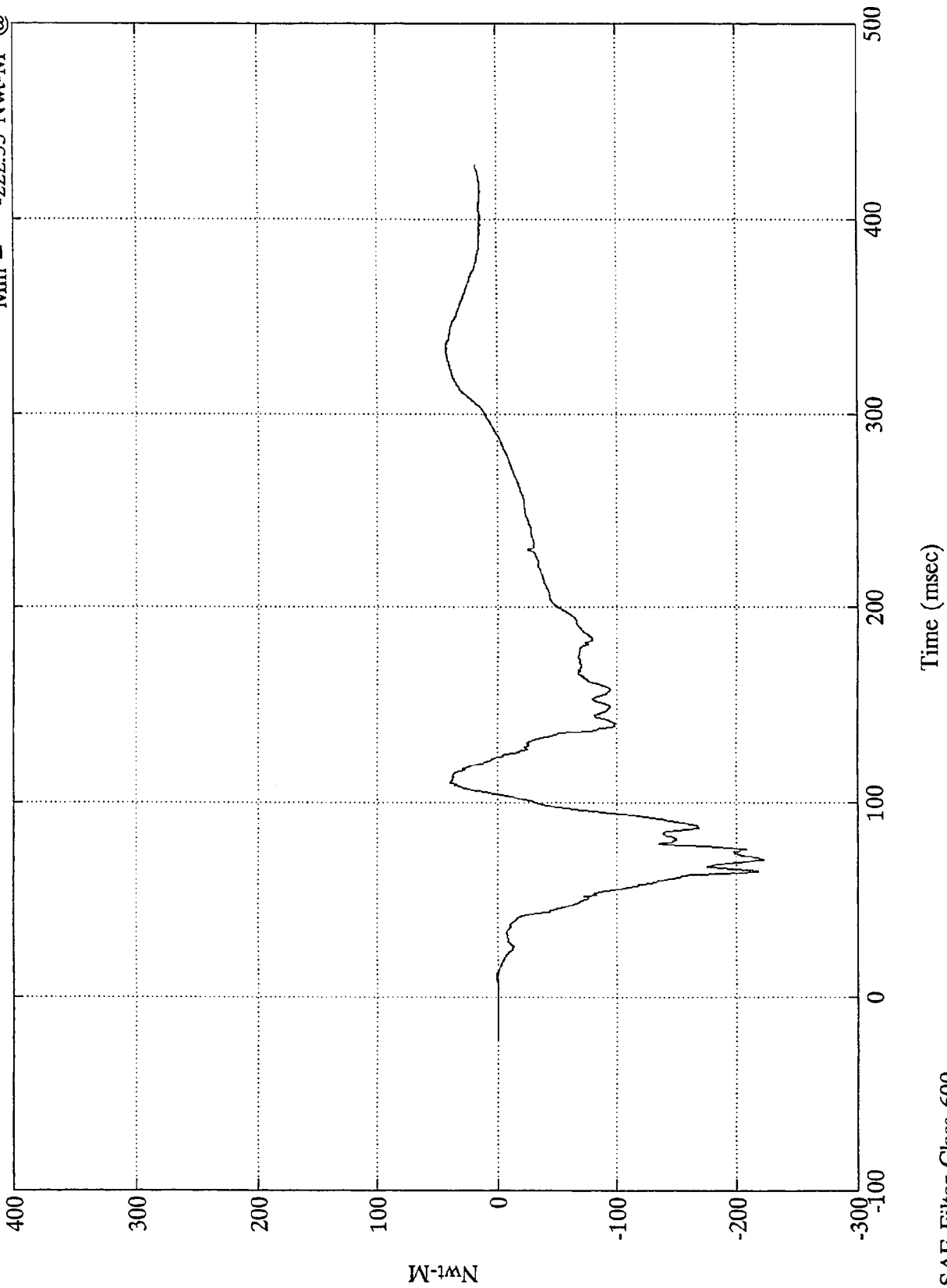
B-163

8304-1

SAE Filter Class 600

VTV TEST #1

P1 Lower Neck My
Max = 42.86 Nwt-M @ 333.12 msec
Min = -222.55 Nwt-M @ 70.79 msec



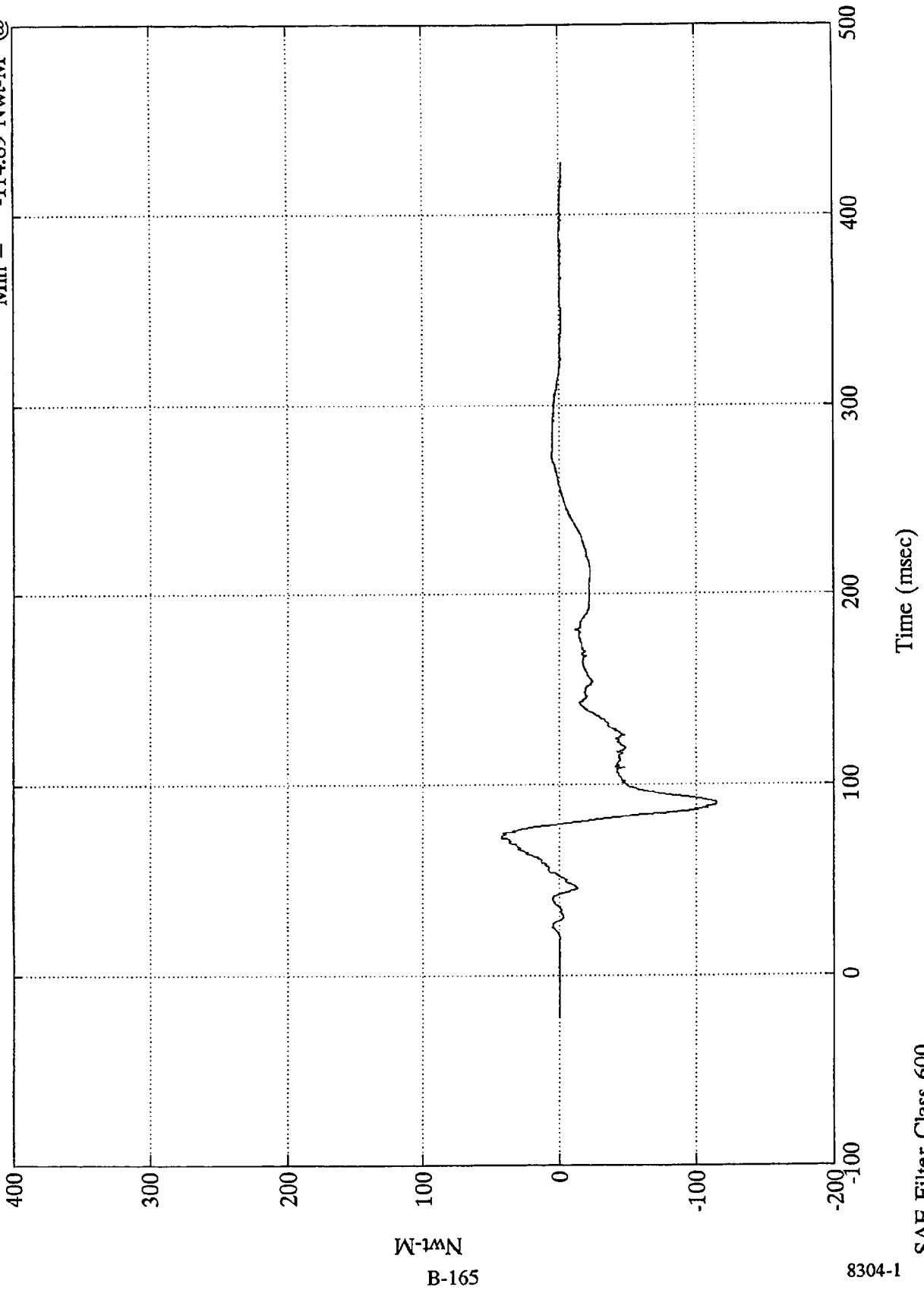
B-164

8304-1

SAE Filter Class 600

VTV TEST #1

P1 Lower Neck Mz
Max = 42.50 Nwt-M @ 72.24 msec
Min = -114.89 Nwt-M @ 90.12 msec



B-165

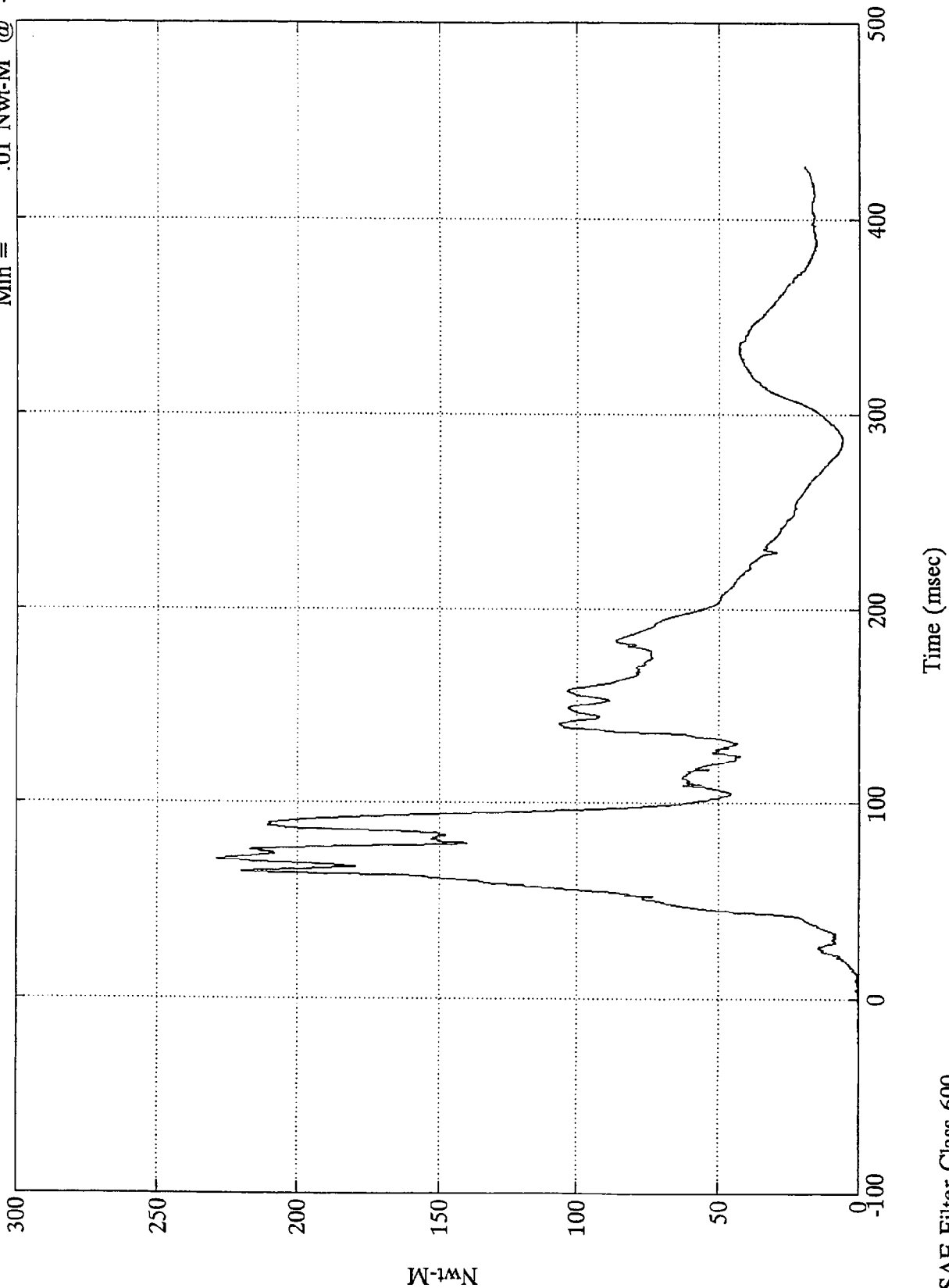
8304-1

SAE Filter Class 600

VTV TEST #1

Max = 228.87 Nwt-M @ 70.79 msec
Min = .01 Nwt-M @ -20.04 msec

P1 Lower Neck Moment Res



SAE Filter Class 600

Nwt-M

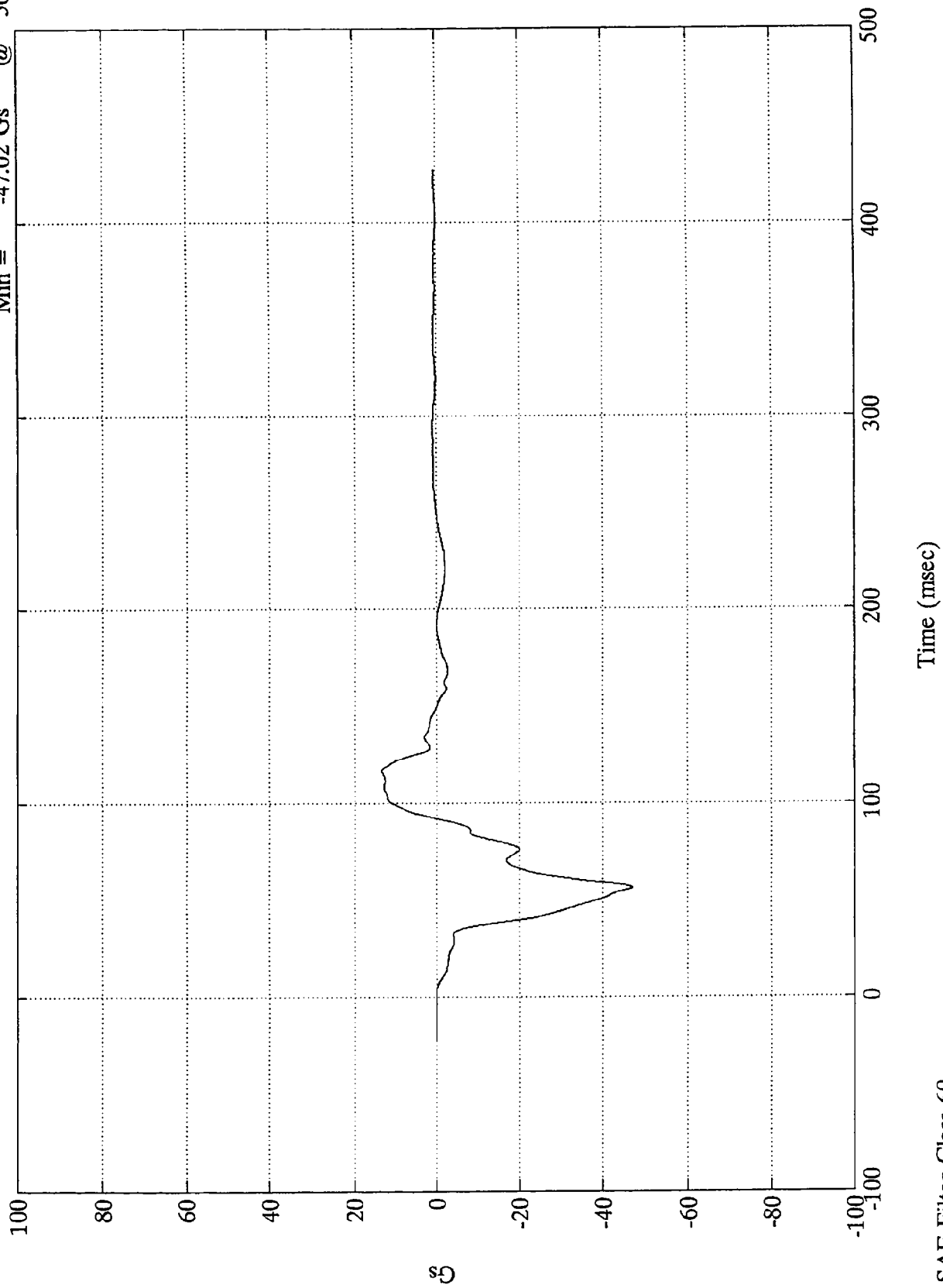
B-166

8304-1

VTV TEST #1

Max = 13.39 Gs @ 116.76 msec
Min = -47.02 Gs @ 56.04 msec

P1 Pelvic X



50

B-167

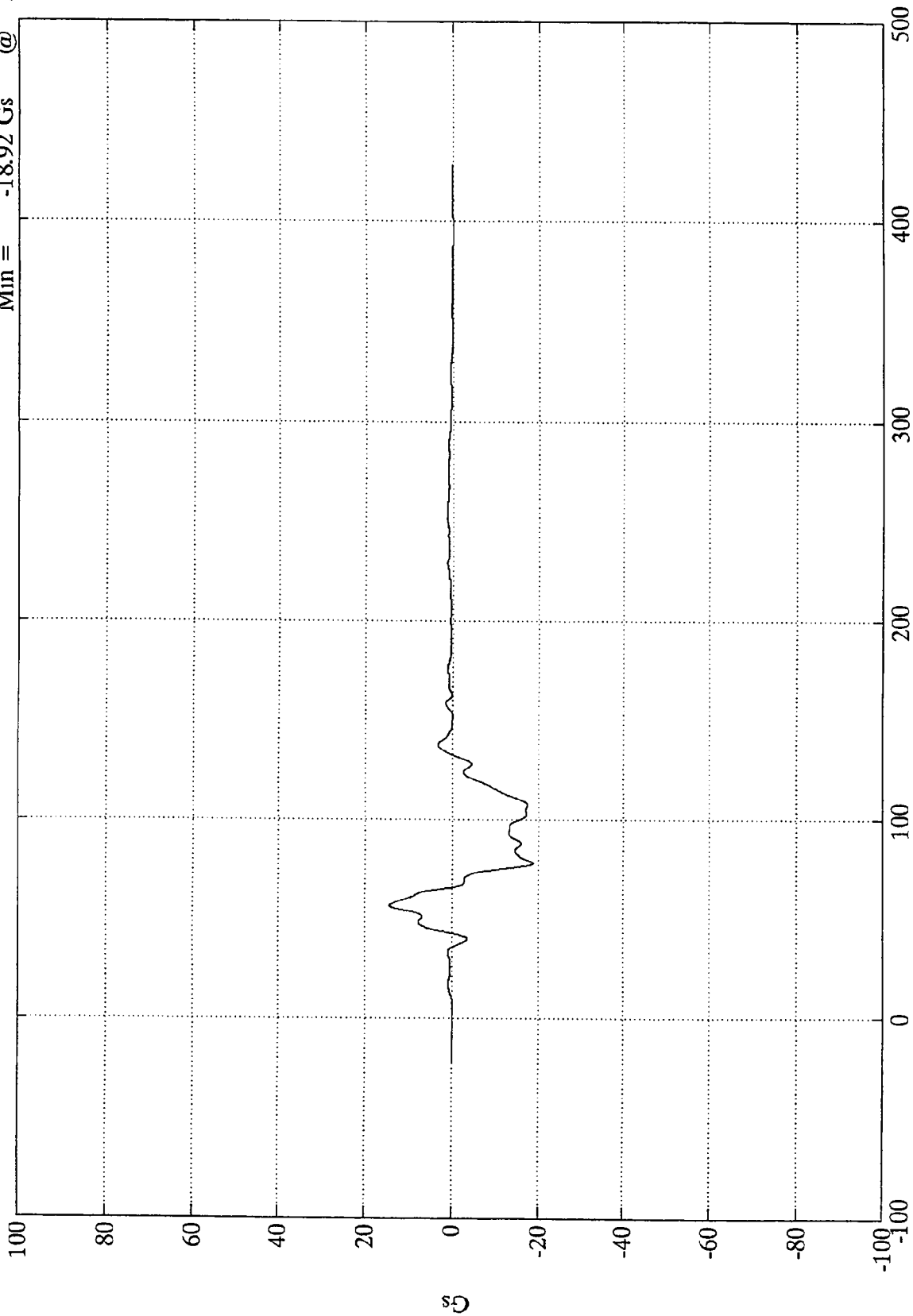
8304-1

SAE Filter Class 60

VTV TEST #1

Max = 14.29 Gs @ 56.40 msec
Min = -18.92 Gs @ 78.36 msec

P1 Pelvic Y



Gs
B-168

Time (msec)

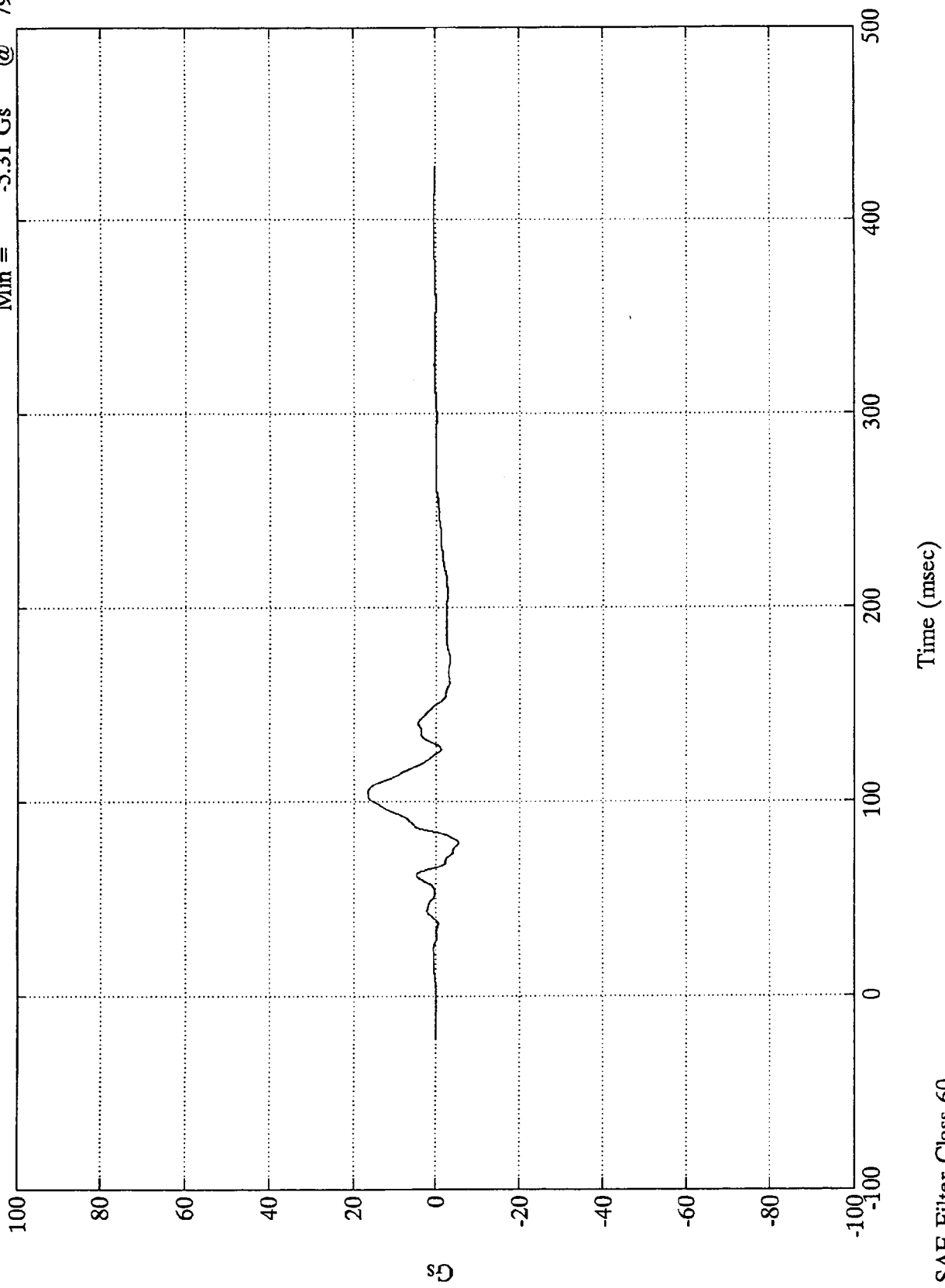
SAE Filter Class 60

8304-1

VTV TEST #1

Max = 16.51 Gs @ 105.00 msec
Min = -5.31 Gs @ 79.08 msec

P1 Pelvic Z



Gs

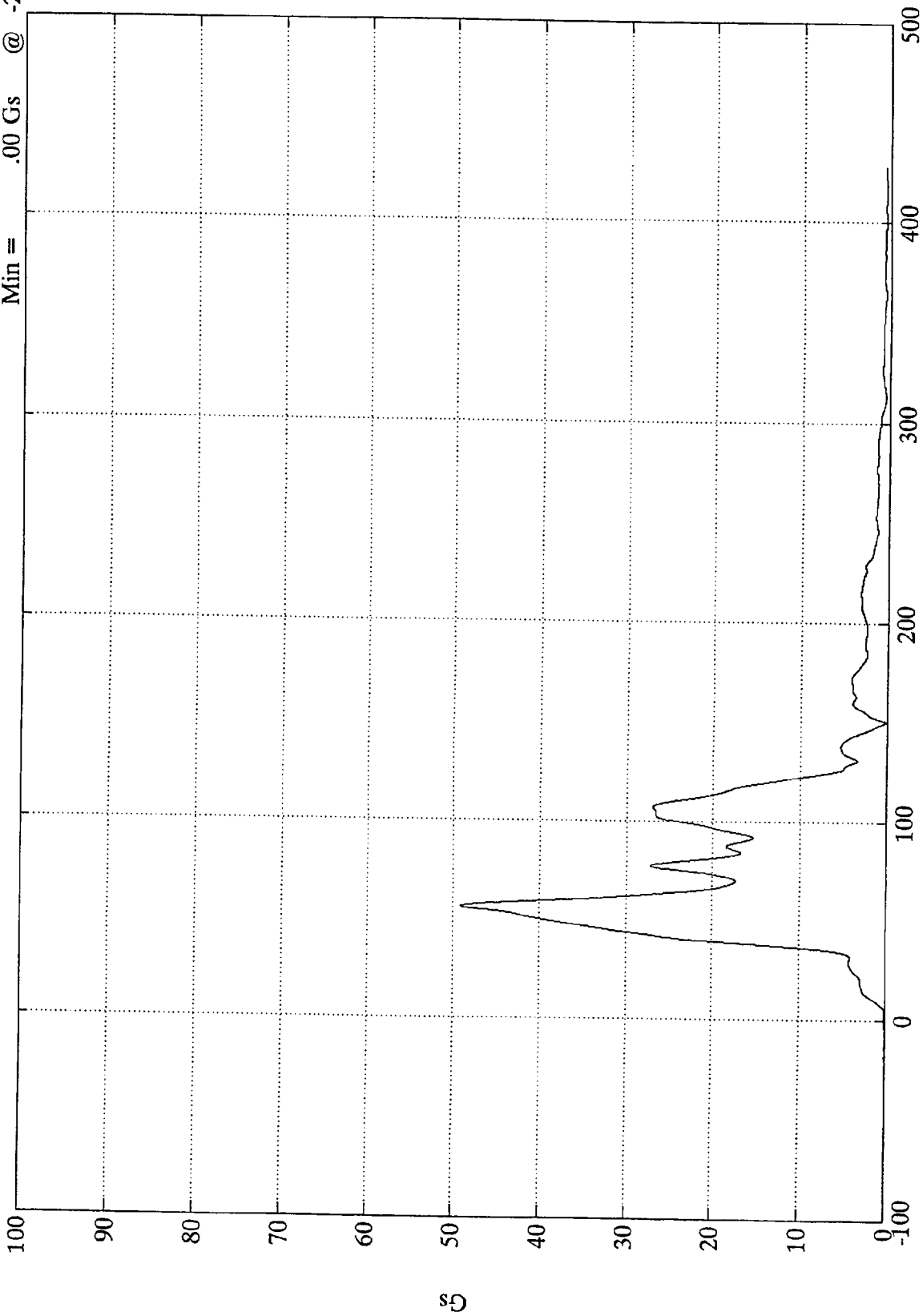
Time (msec)

SAE Filter Class 60

VTV TEST #1

Max = 49.12 Gs @ 56.16 msec
Min = .00 Gs @ -20.76 msec

P1 Pelvic Res.



Time (msec)

SAE Filter Class 60

Gs

B-170

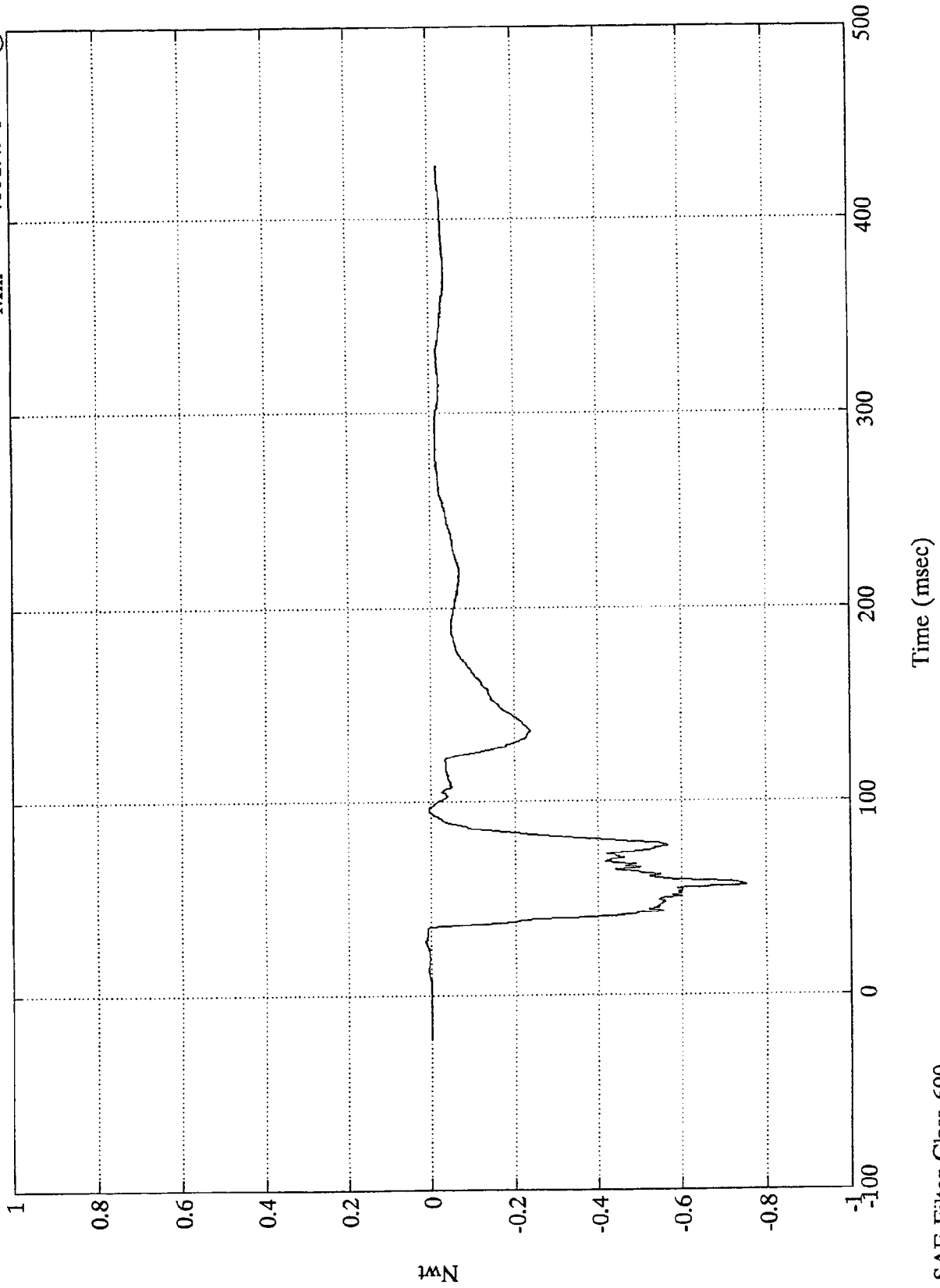
8304-1

VTV TEST #1

$\times 10^4$

P1 Left Femur

Max = 138.63 Nwt @ 28.07 msec
Min = -7531.49 Nwt @ 56.52 msec



Nwt

Time (msec)

SAE Filter Class 600

8304-1

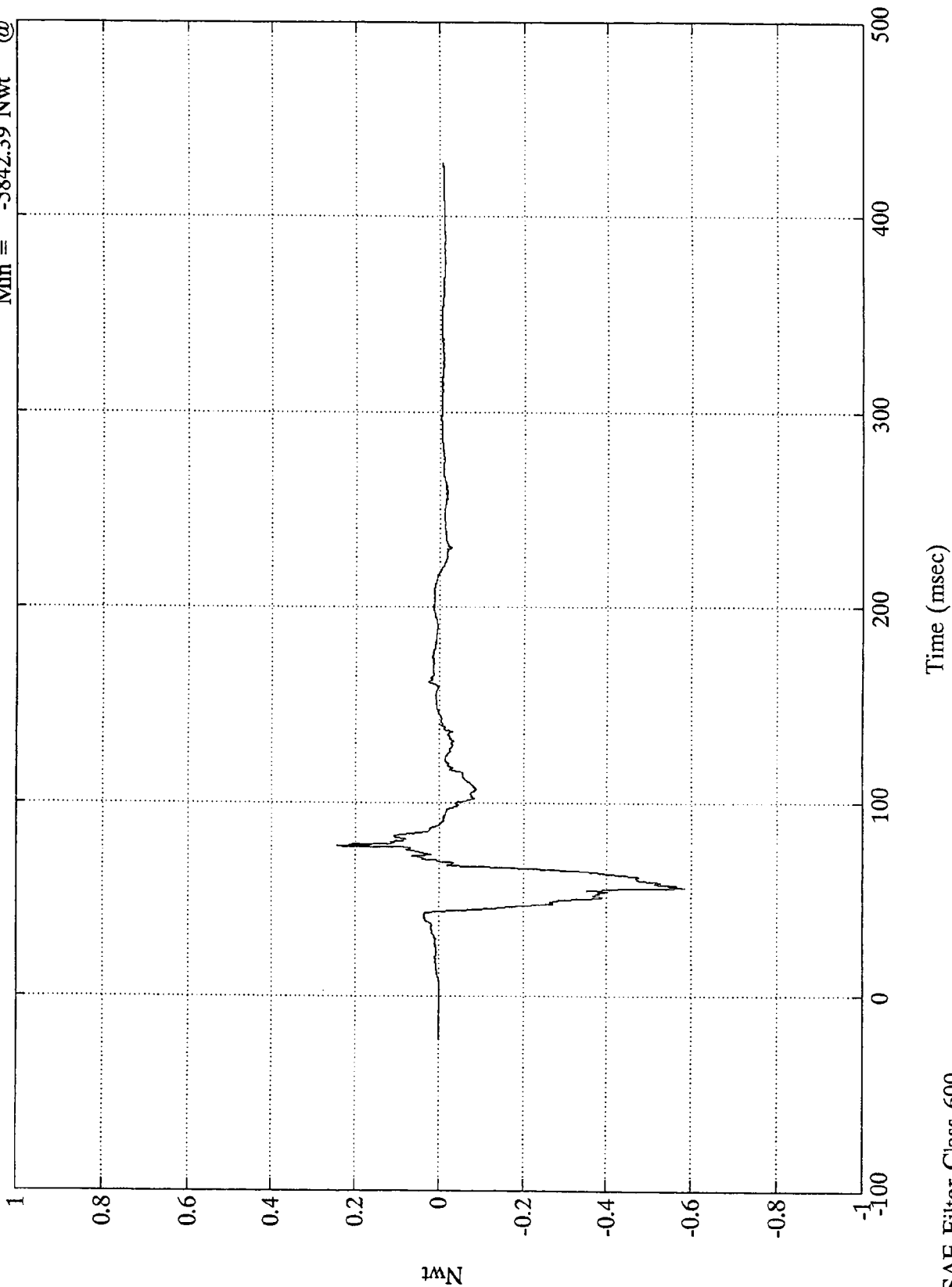
B-171

VTV TEST #1

$\times 10^4$

P1 Right Femur

Max = 2447.06 Nwt @ 77.64 msec
Min = -5842.39 Nwt @ 55.56 msec



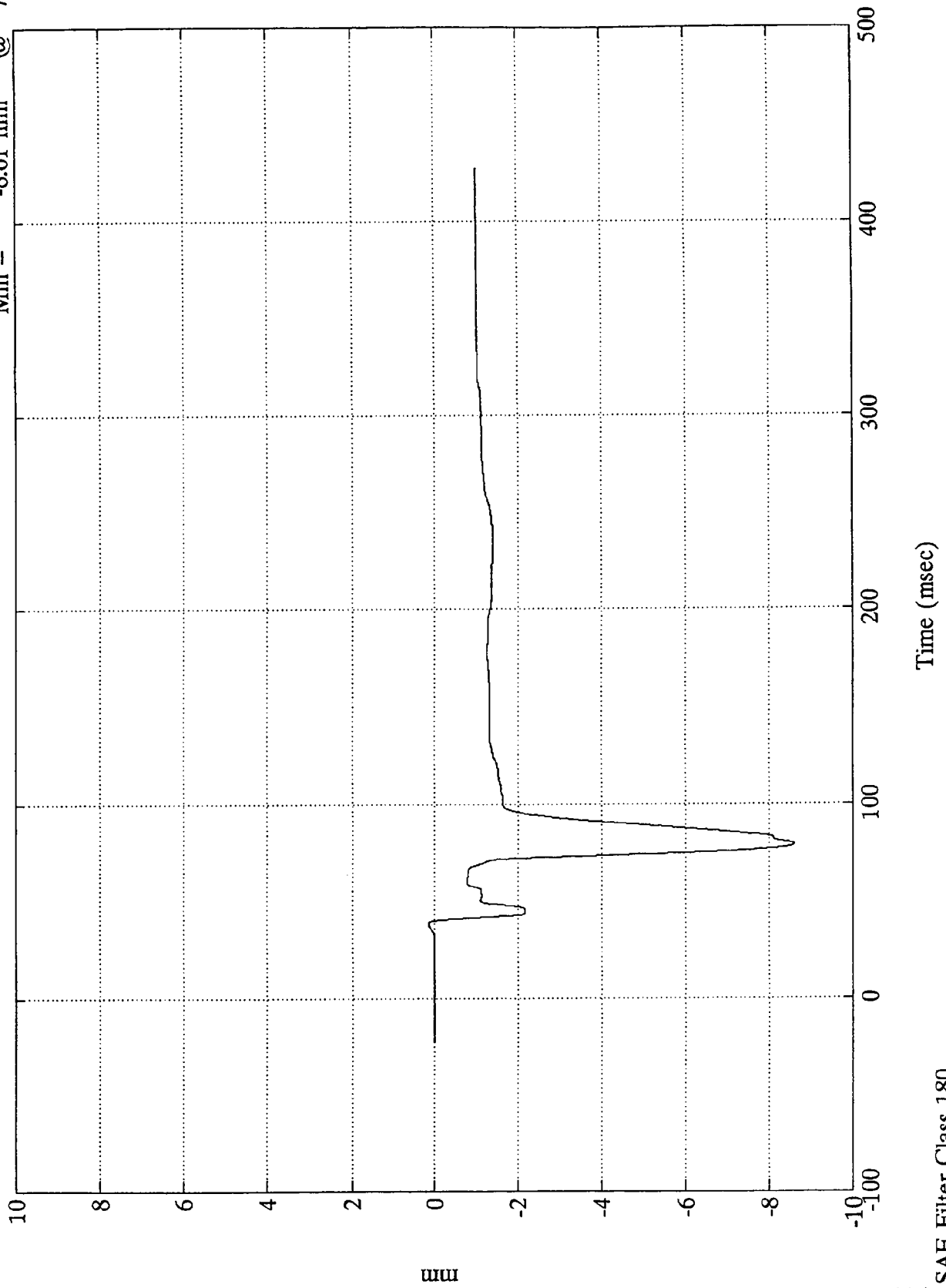
Nwt

Time (msec)

SAE Filter Class 600

VTV TEST #1

P1 Left Knee Shear
Max = .14 mm @ 38.75 msec
Min = -8.61 mm @ 79.56 msec



mm

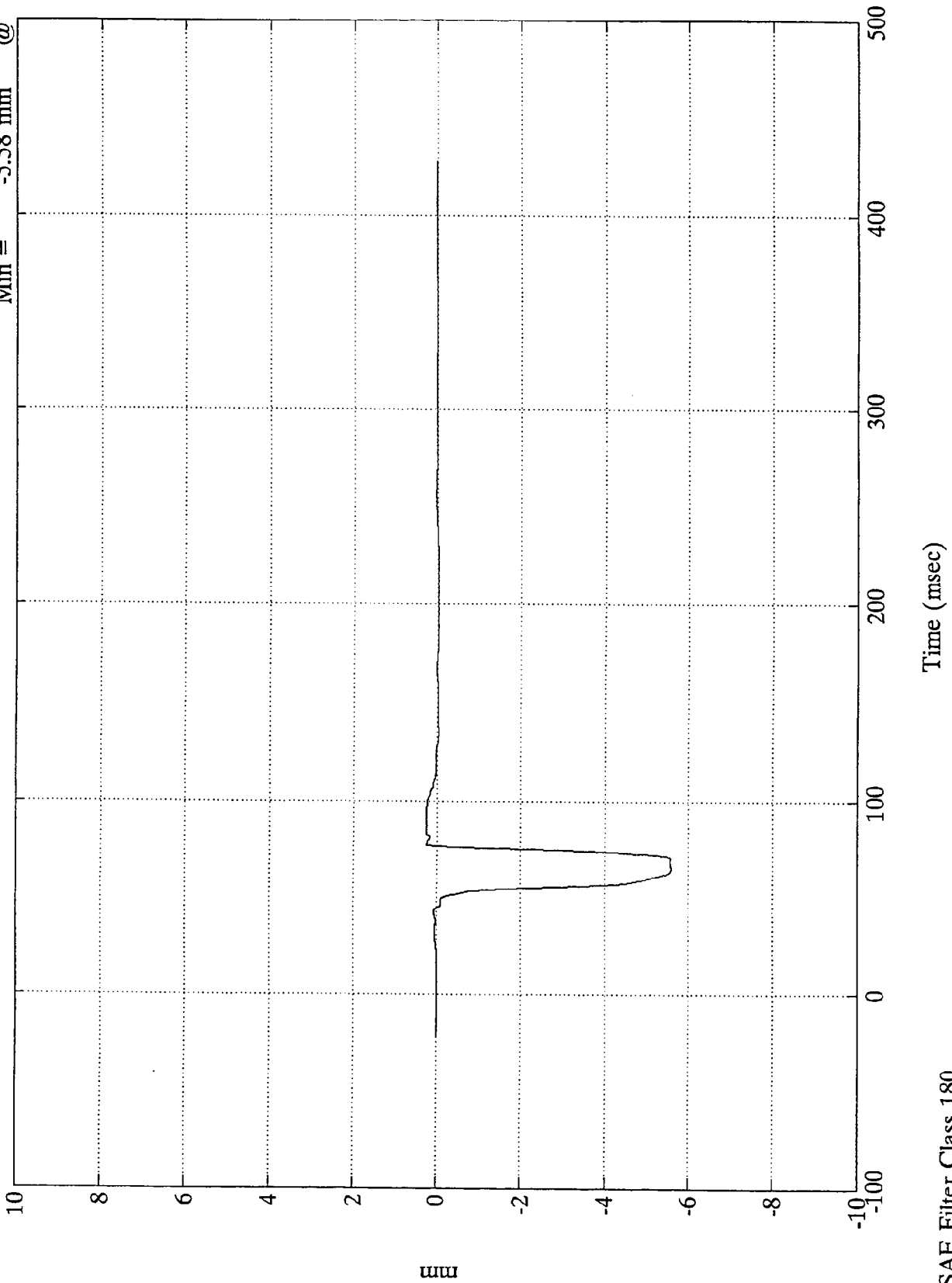
B-173

8304-1

SAE Filter Class 180

VTV TEST #1

P1 Right Knee Shear
Max = .25 mm @ 78.23 msec
Min = -5.58 mm @ 66.11 msec



mm

B-174

8304-1

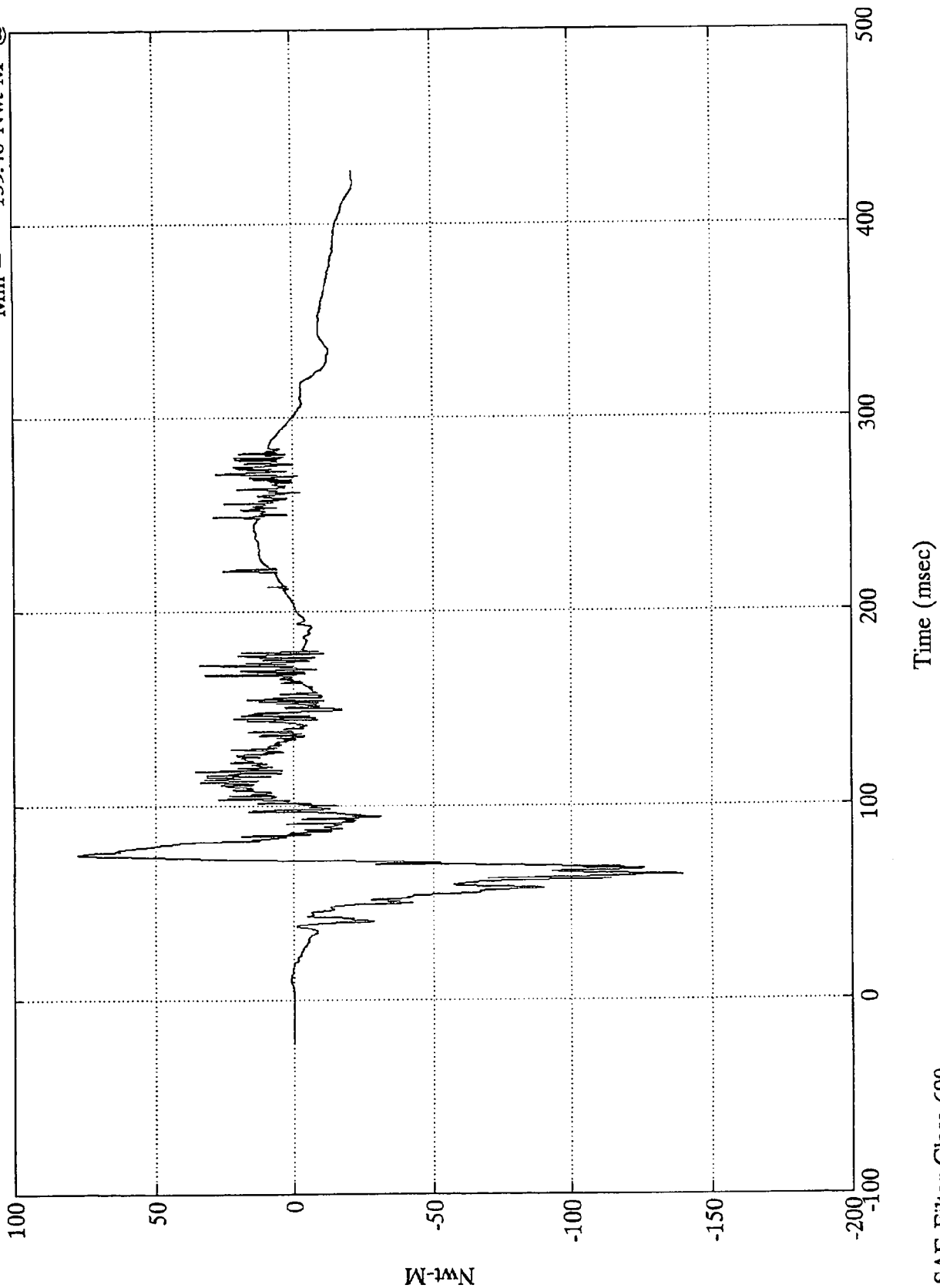
SAE Filter Class 180

VTV TEST #1

75.23 msec
64.31 msec

Max = 77.63 Nwt-M @
Min = -139.40 Nwt-M @

P1 Lt Upper Tibia Mx



Nwt-M

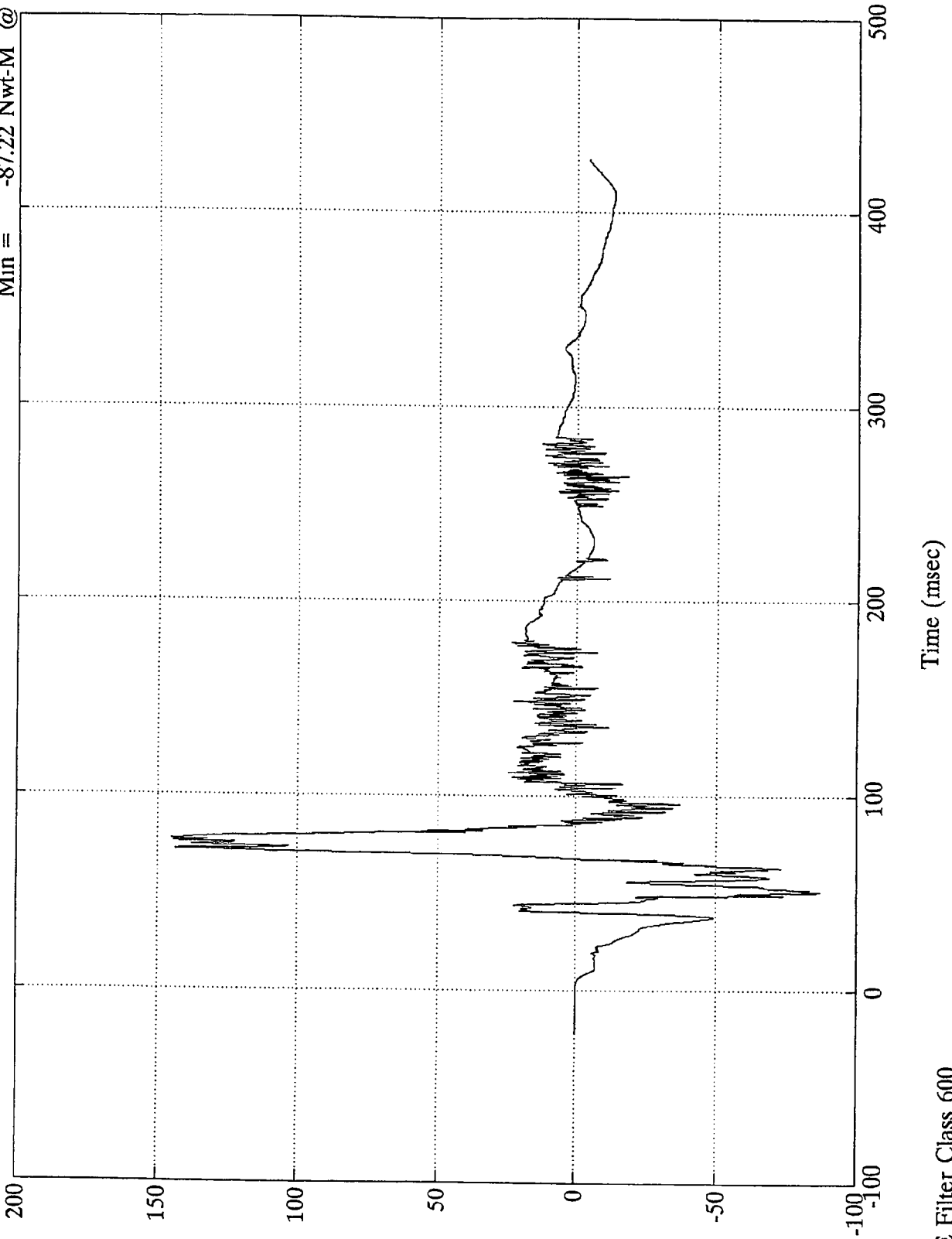
B-175

8304-1

SAE Filter Class 600

VTV TEST #1

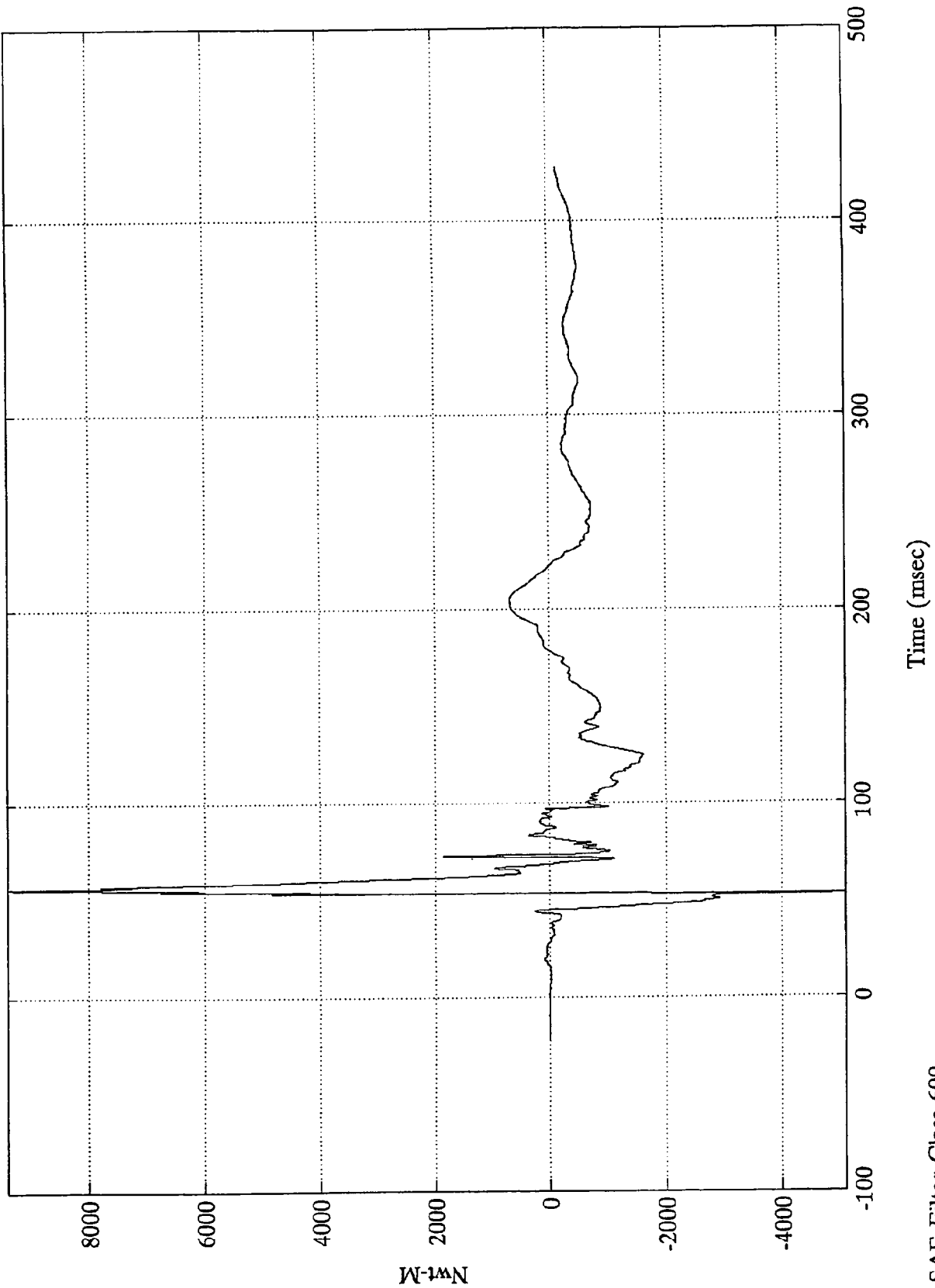
P1 Lt Upper Tibia My
Max = 145.08 Nwt-M @ 77.27 msec
Min = -87.22 Nwt-M @ 50.88 msec



VTV TEST #1

P1 Rt Upper Tibia Mx

Max = 9365.09 Nwt-M @ 56.76 msec
Min = -5061.29 Nwt-M @ 53.27 msec



B-177

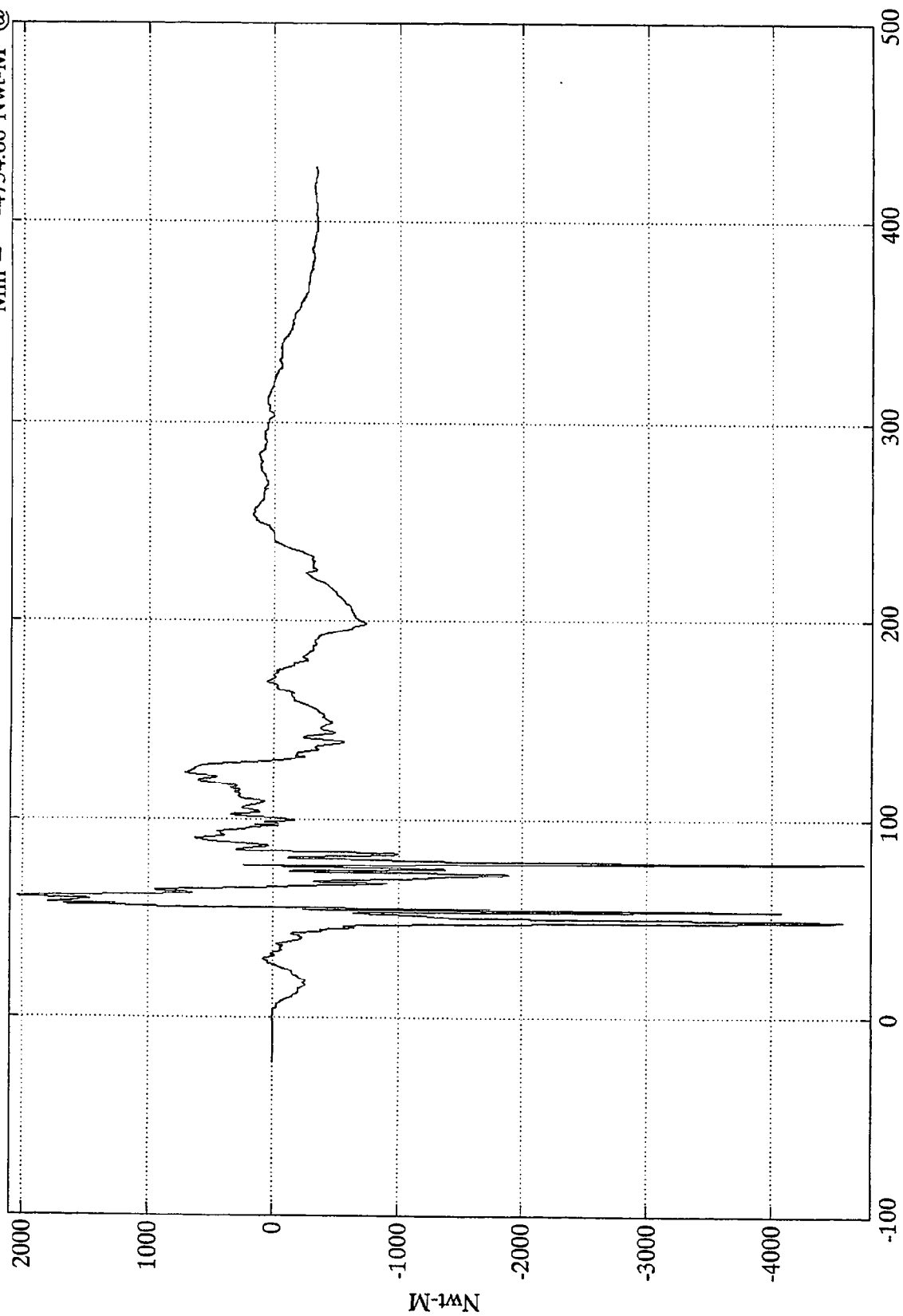
8304-1

SAE Filter Class 600

VTV TEST #1

P1 Rt Upper Tibia My

Max = 2041.88 Nwt-M @ 60.60 msec
Min = -4734.60 Nwt-M @ 78.23 msec



Time (msec)

SAE Filter Class 600

Nwt-M

B-178

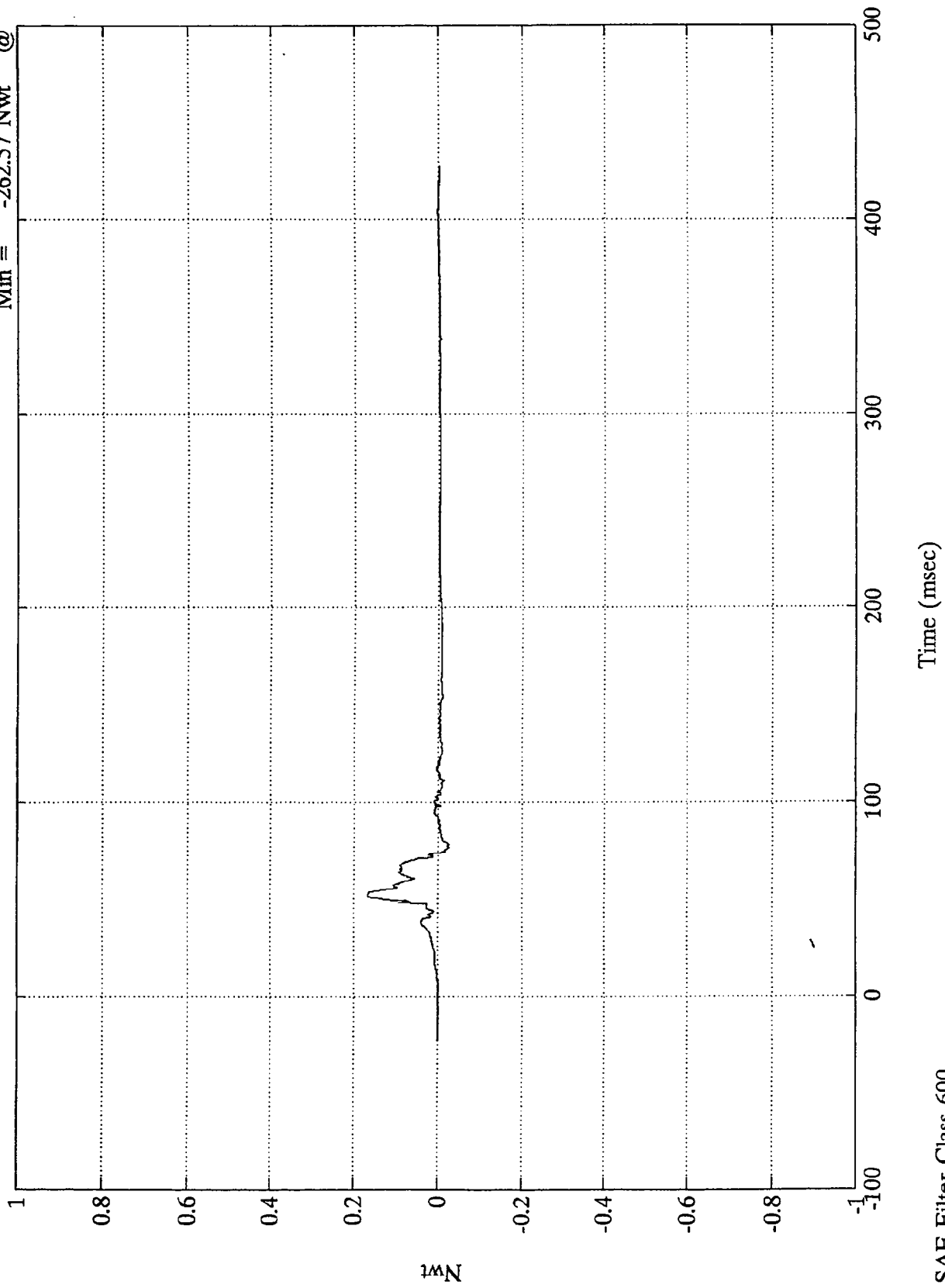
8304-1

VTV TEST #1

$\times 10^4$

P1 Lt Lower Tibia Fy

Max = 1661.48 Nwt @ 52.20 msec
Min = -262.57 Nwt @ 78.36 msec



Nwt

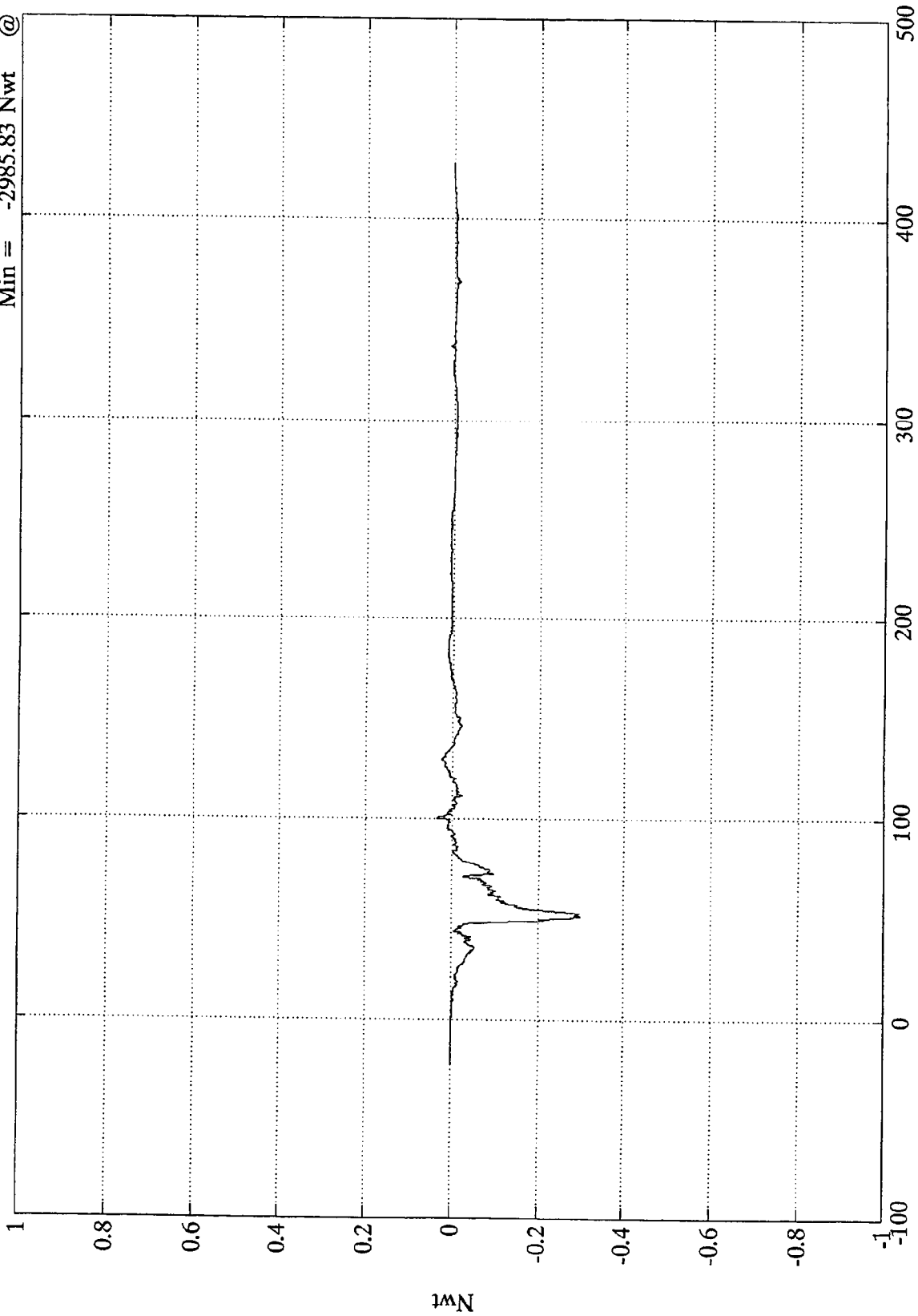
SAE Filter Class 600

VTV TEST #1

Max = 351.63 Nwt @ 100.32 msec
Min = -2985.83 Nwt @ 51.60 msec

P1 Lt Lower Tibia Fz

$\times 10^4$



1wN

B-180

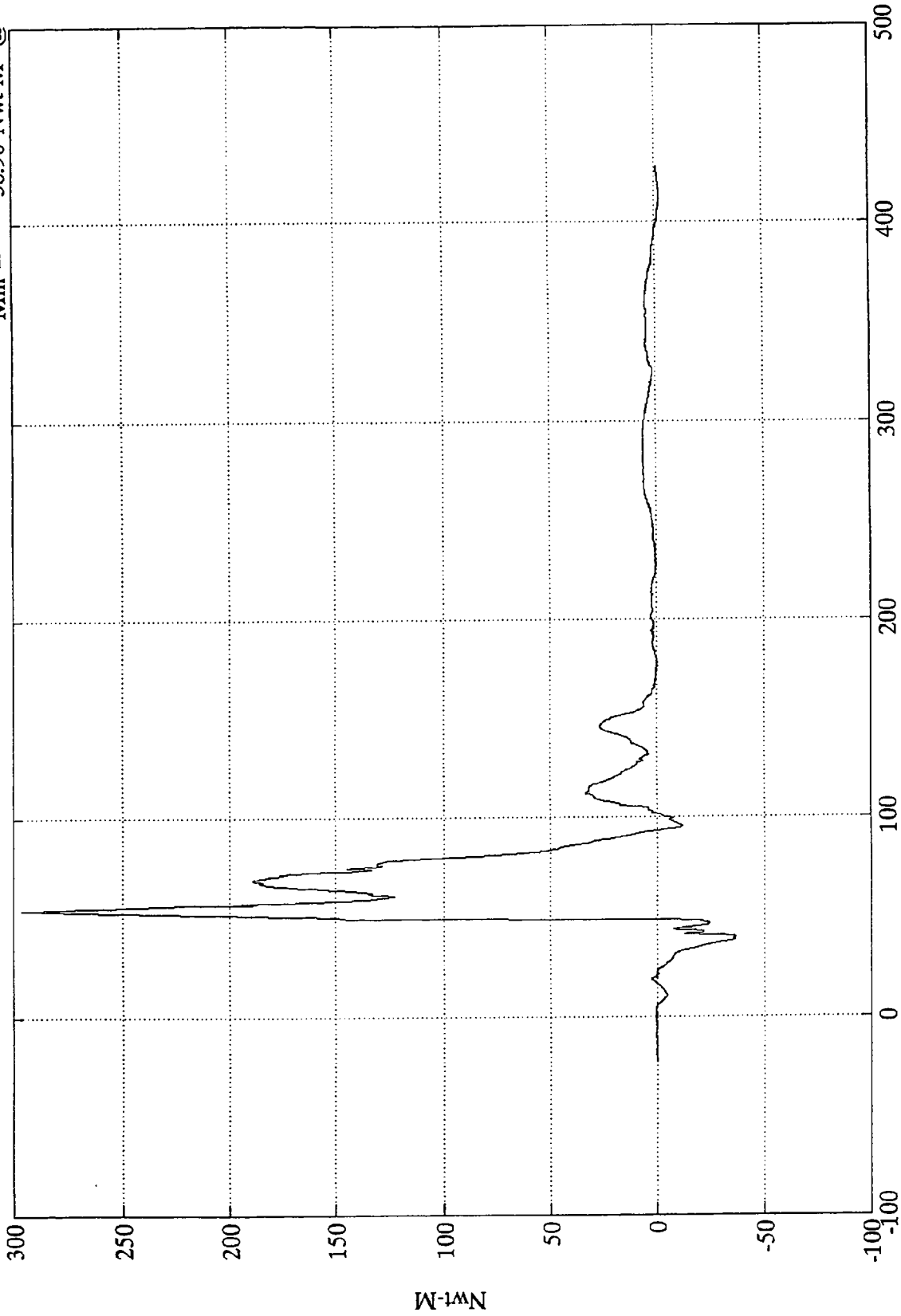
Time (msec)

SAE Filter Class 600

8304-1

VTV TEST #1

P1 Lt Lower Tibia Mx
Max = 296.65 Nwt-M @ 54.00 msec
Min = -36.90 Nwt-M @ 39.95 msec



M-1N

B-181

Time (msec)

SAE Filter Class 600

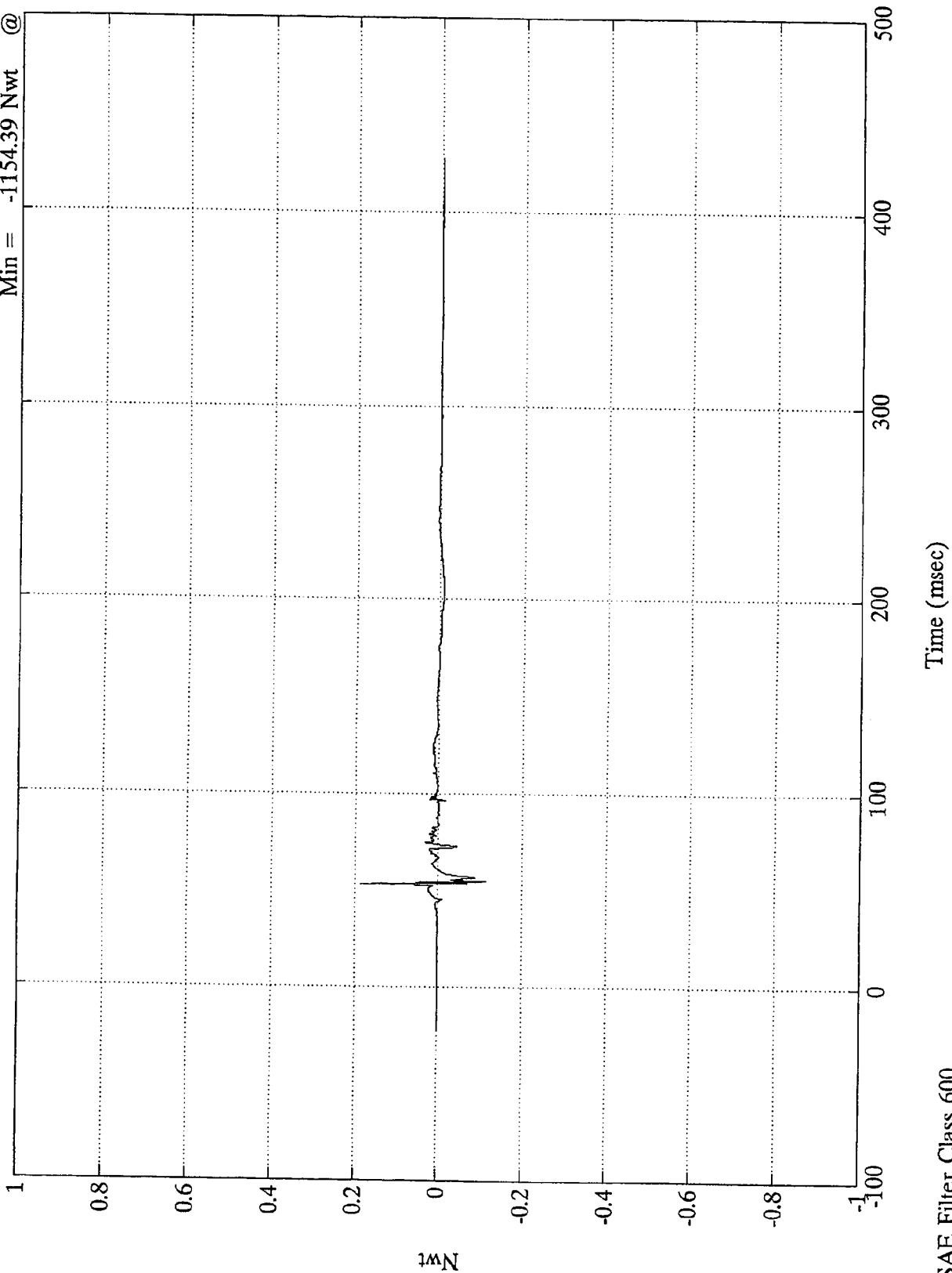
8304-1

VTV TEST #1

$\times 10^4$

P1 Rt Lower Tibia Fy

Max = 1865.78 Nwt @ 53.04 msec
Min = -1154.39 Nwt @ 54.84 msec



B-182

8304-1

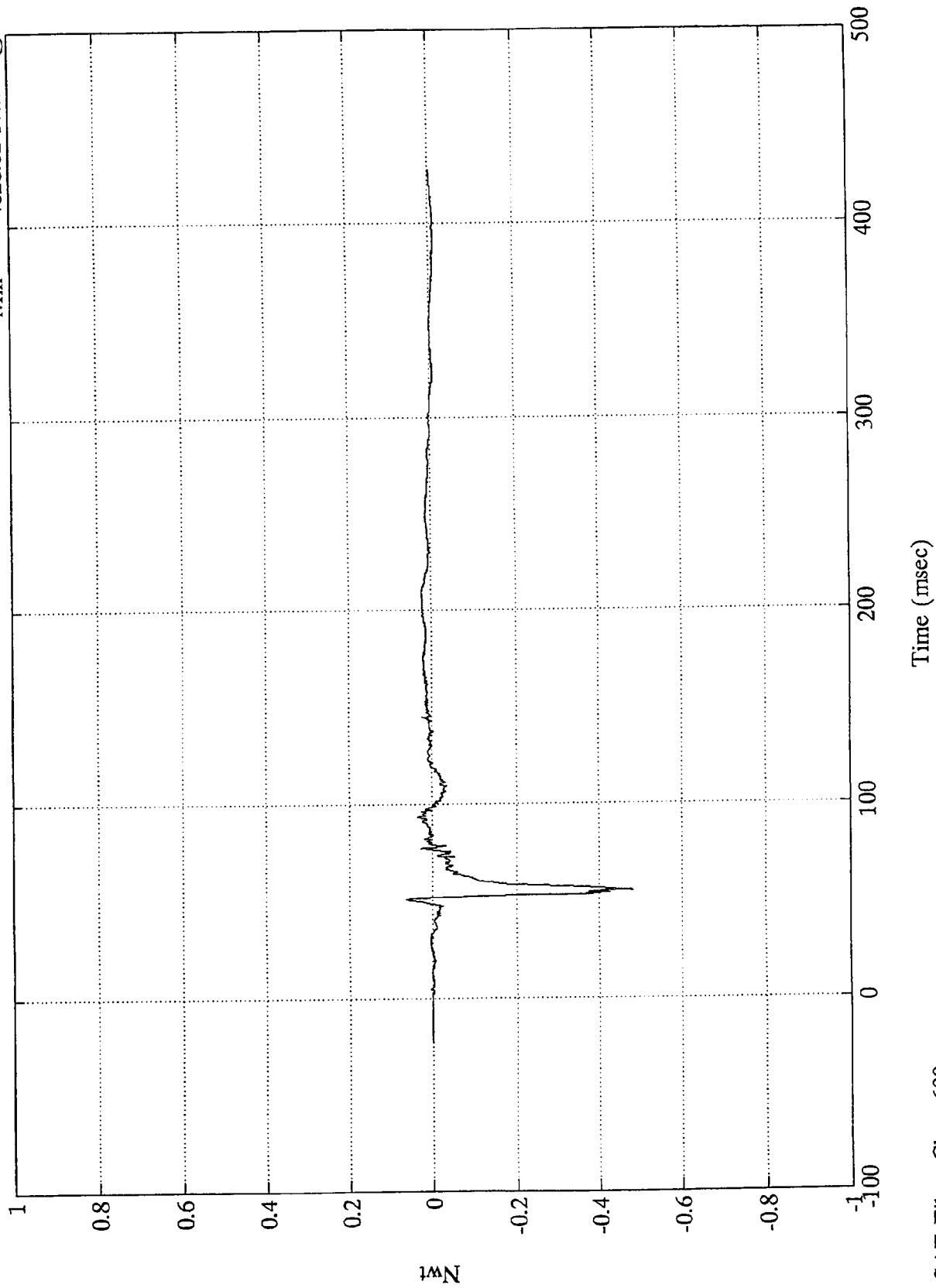
SAE Filter Class 600

VTV TEST #1

$\times 10^4$

P1 Rt Lower Tibia Fz

Max = 625.72 Nwt @ 51.00 msec
Min = -4828.62 Nwt @ 55.20 msec



1mN

B-183

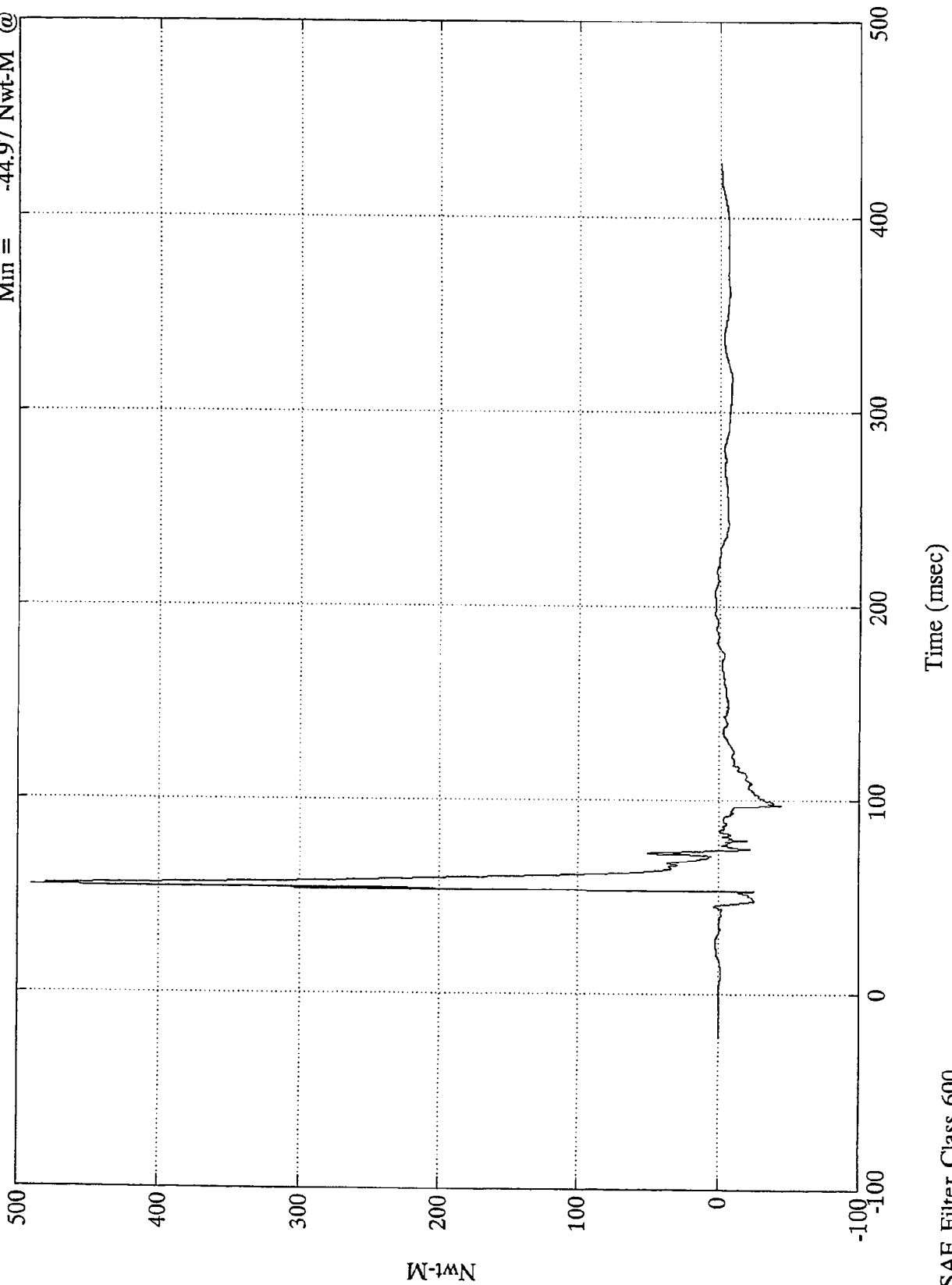
8304-1

SAE Filter Class 600

VTV TEST #1

P1 Rt Lower Tibia Mx

Max = 490.57 Nwt-M @ 54.96 msec
Min = -44.97 Nwt-M @ 97.56 msec



Nwt-M

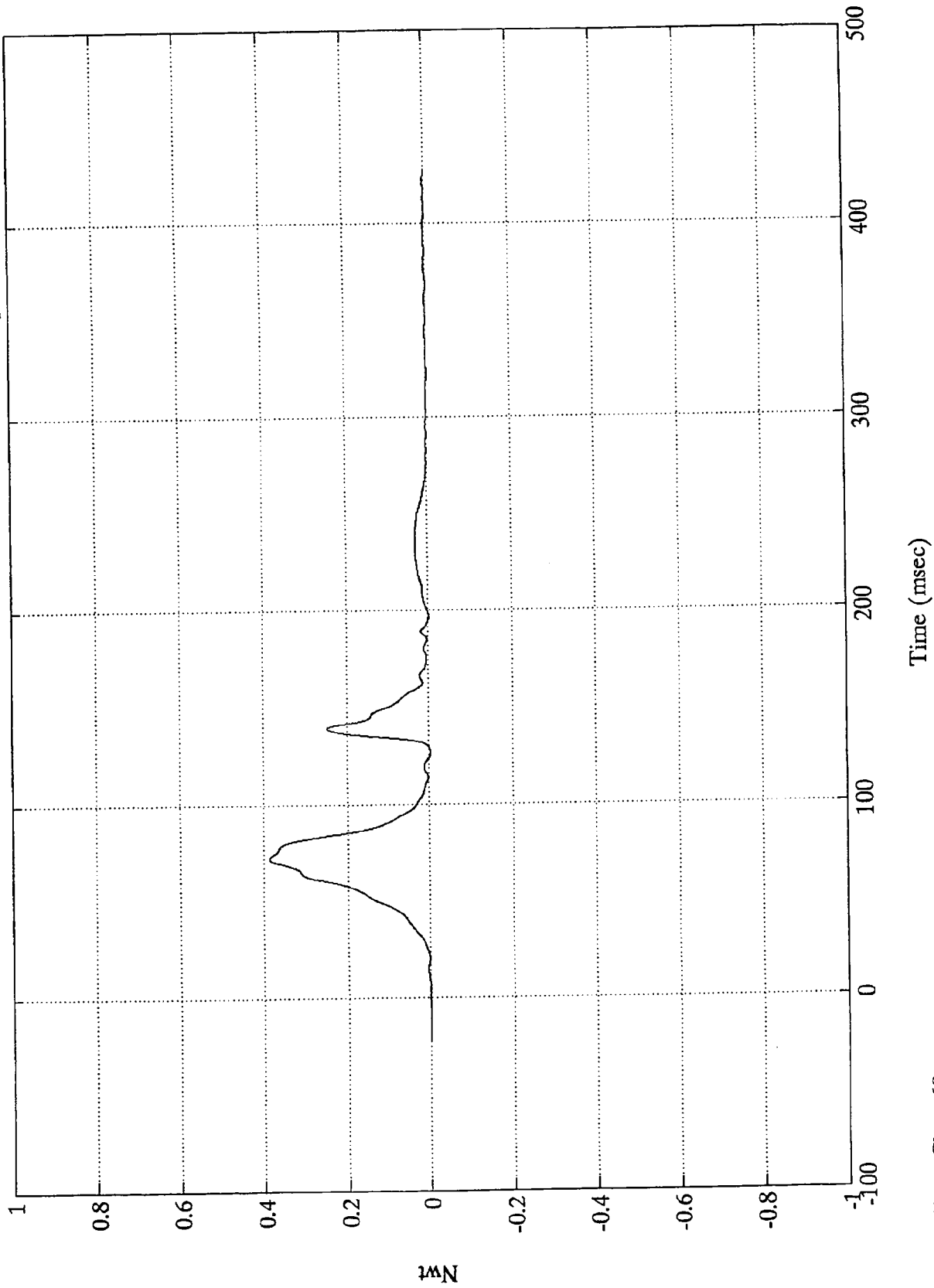
Time (msec)

SAE Filter Class 600

VTV TEST #1
x10⁴

P1 Lap Belt Load

Max = 3858.45 Nwt @ 72.24 msec
Min = -40.99 Nwt @ 126.59 msec



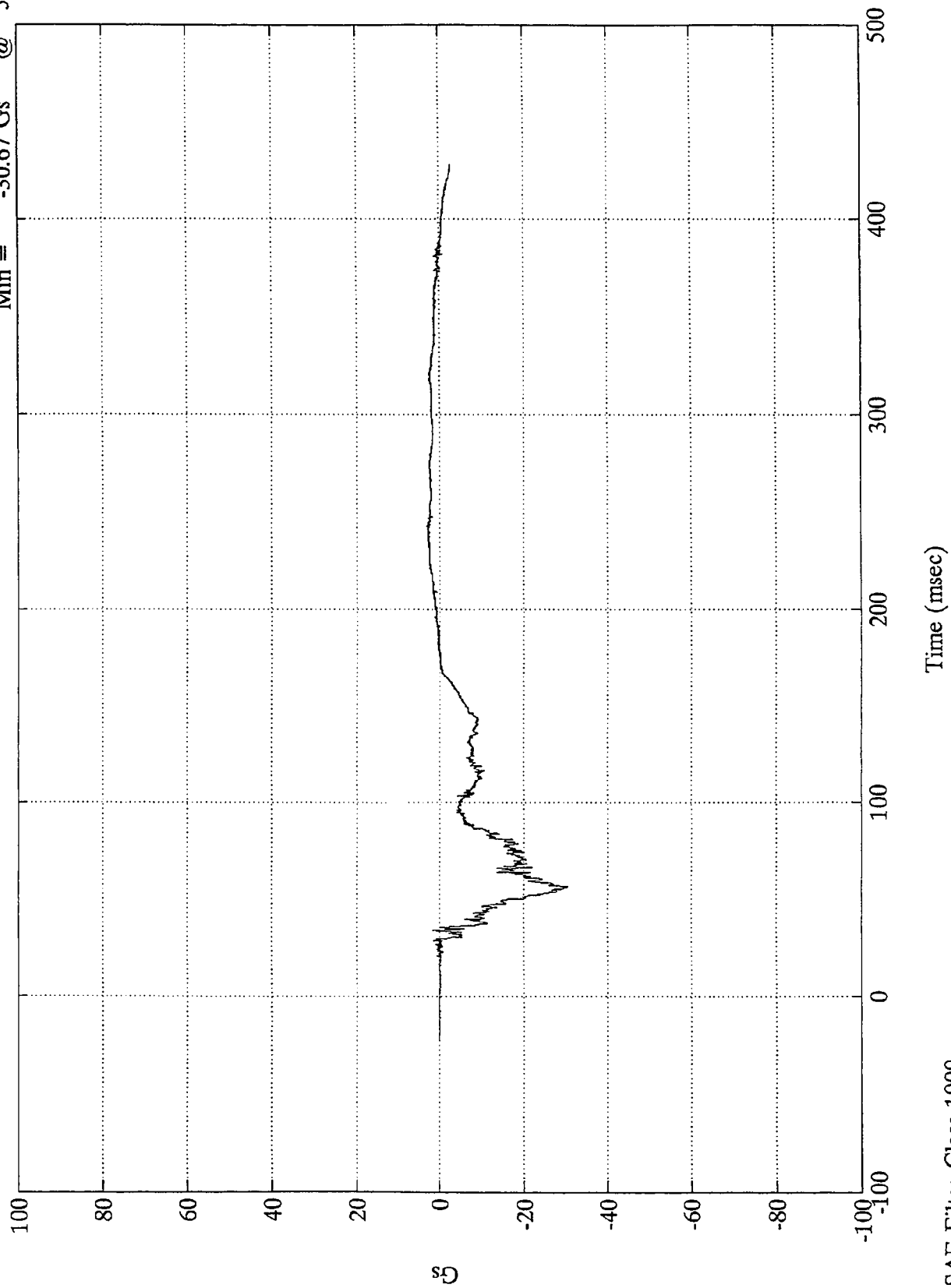
B-185

8304-1

SAE Filter Class 60

VTV TEST #1

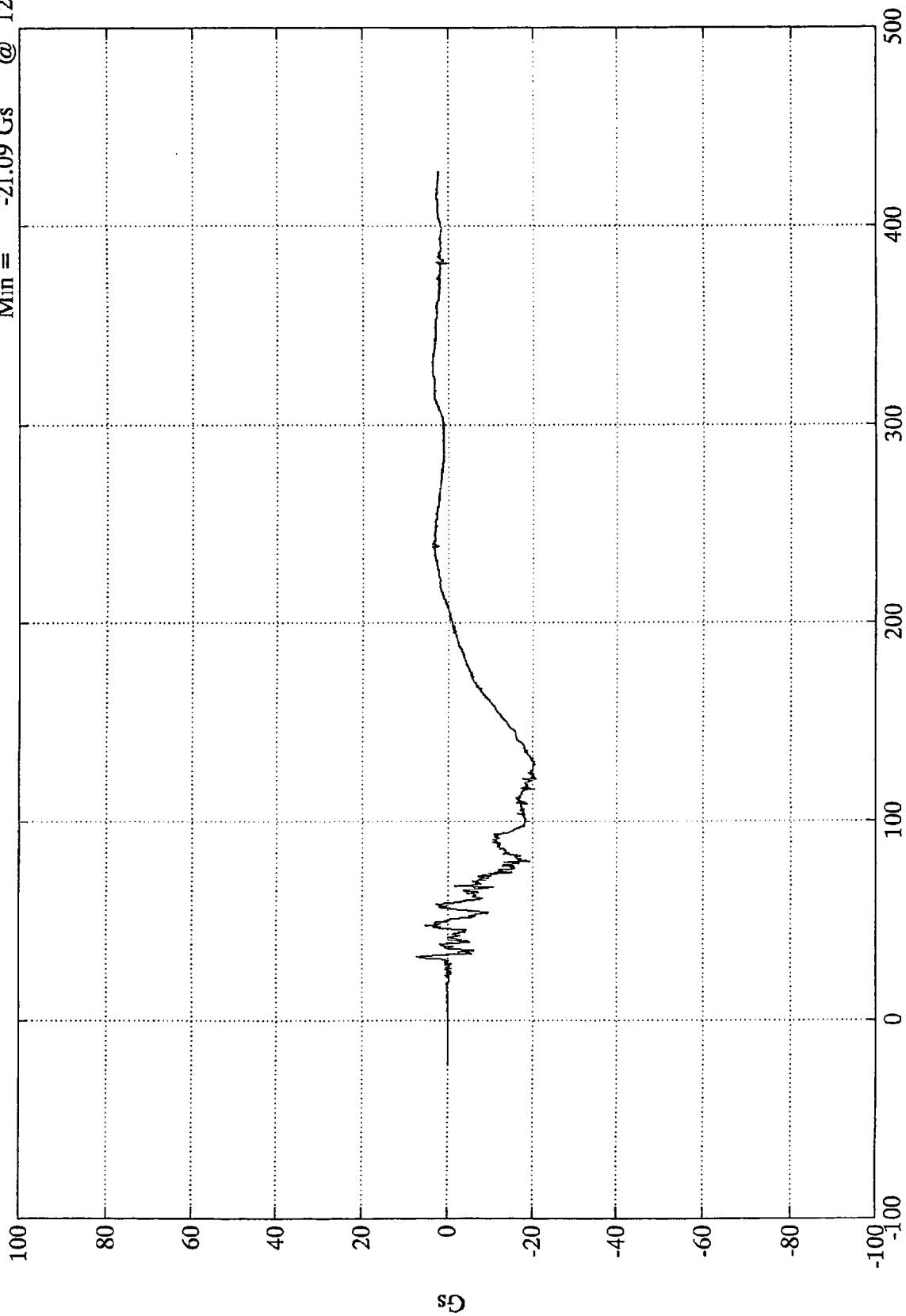
P2 Head X
Max = 3.14 Gs @ 243.36 msec
Min = -30.67 Gs @ 56.76 msec



VTV TEST #1

Max = 7.22 Gs @ 32.15 msec
Min = -21.09 Gs @ 122.16 msec

P2 Head Y



Time (msec)

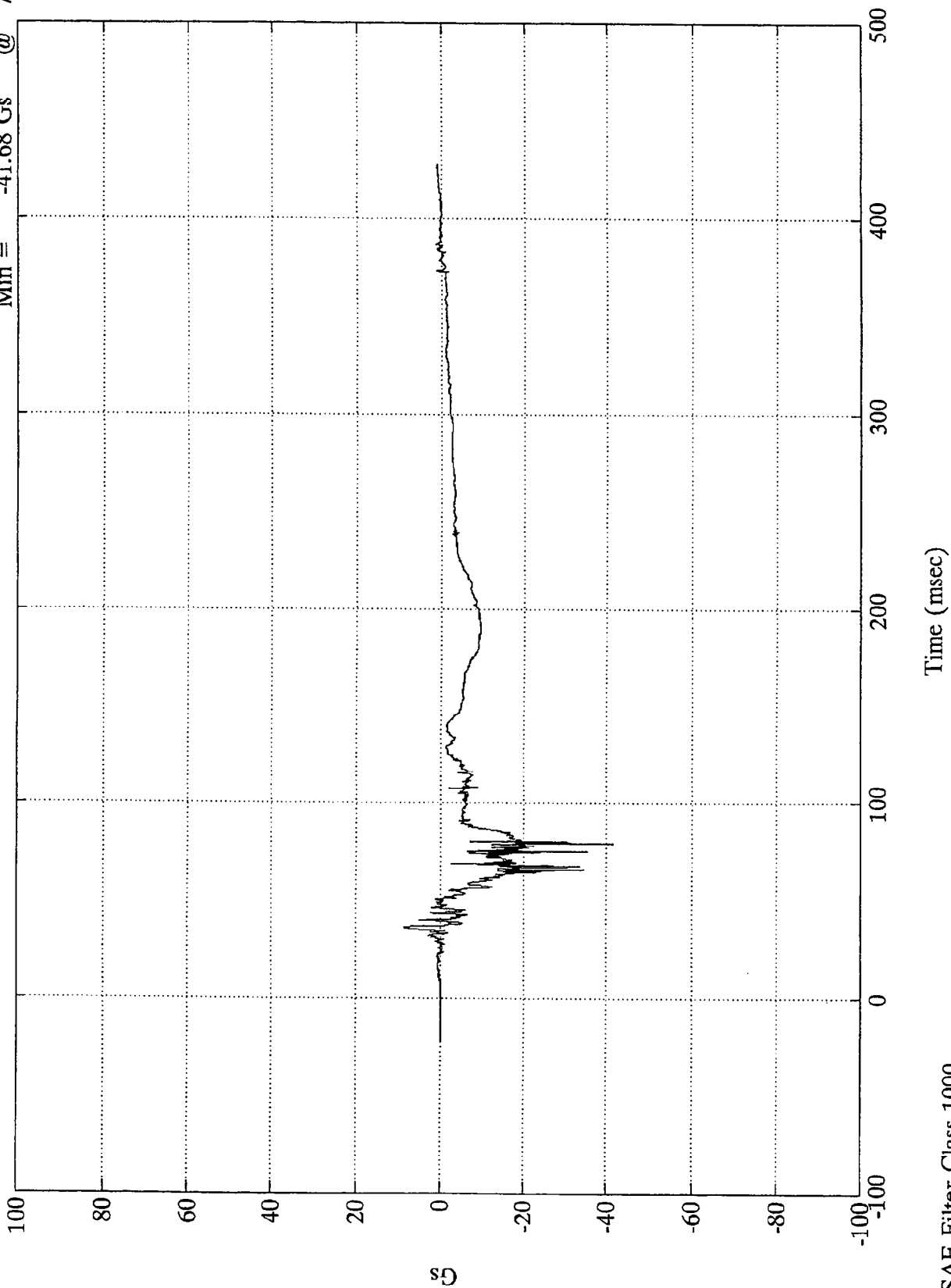
SAE Filter Class 1000

sg

VTV TEST #1

P2 Head Z

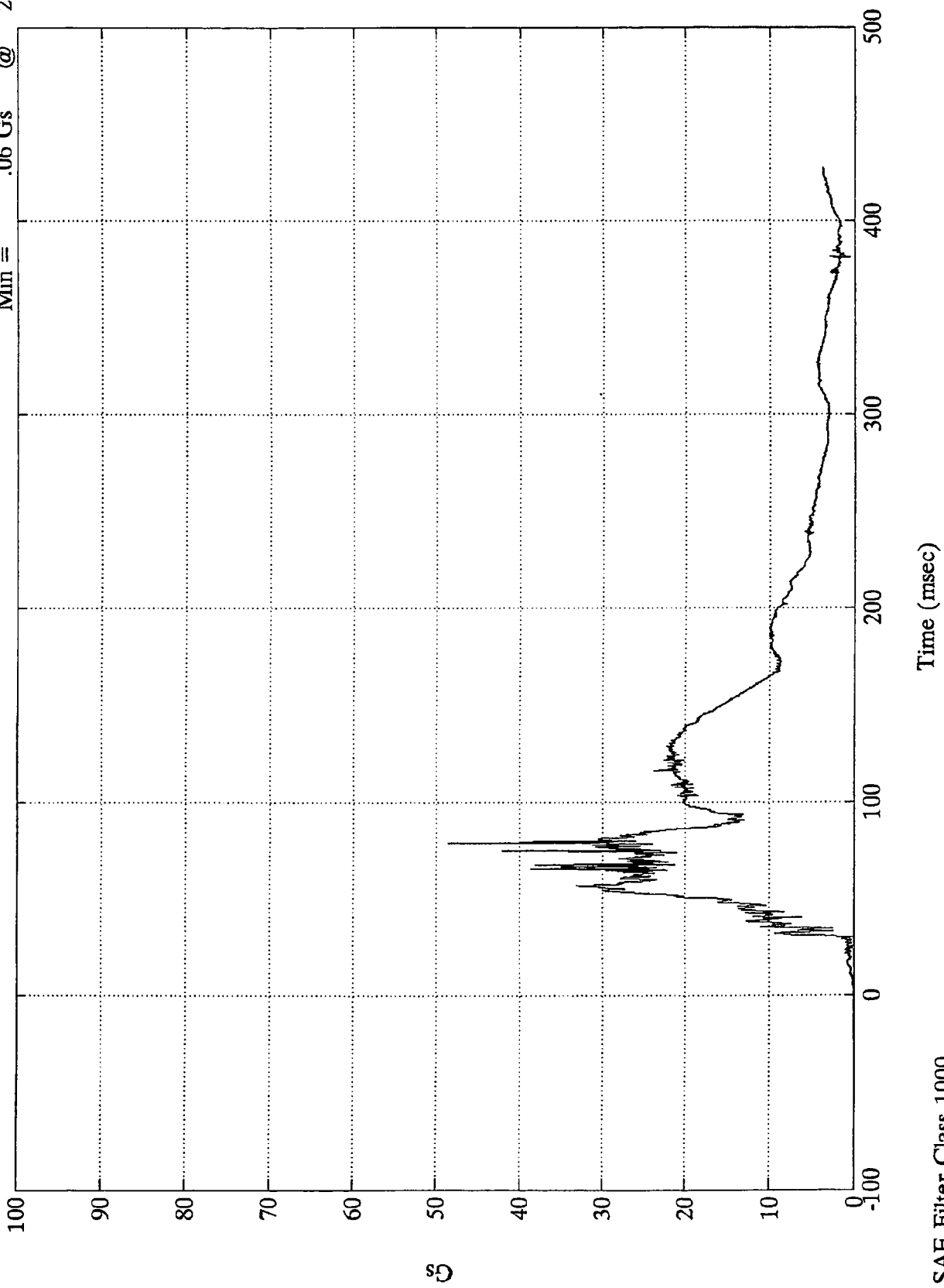
Max =	8.76 Gs	@	36.60 msec
Min =	-41.68 Gs	@	79.44 msec



VTV TEST #1

P2 Head Resultant

Max =	48.56 Gs	@	79.31 msec
Min =	.06 Gs	@	2.51 msec



80

B-189

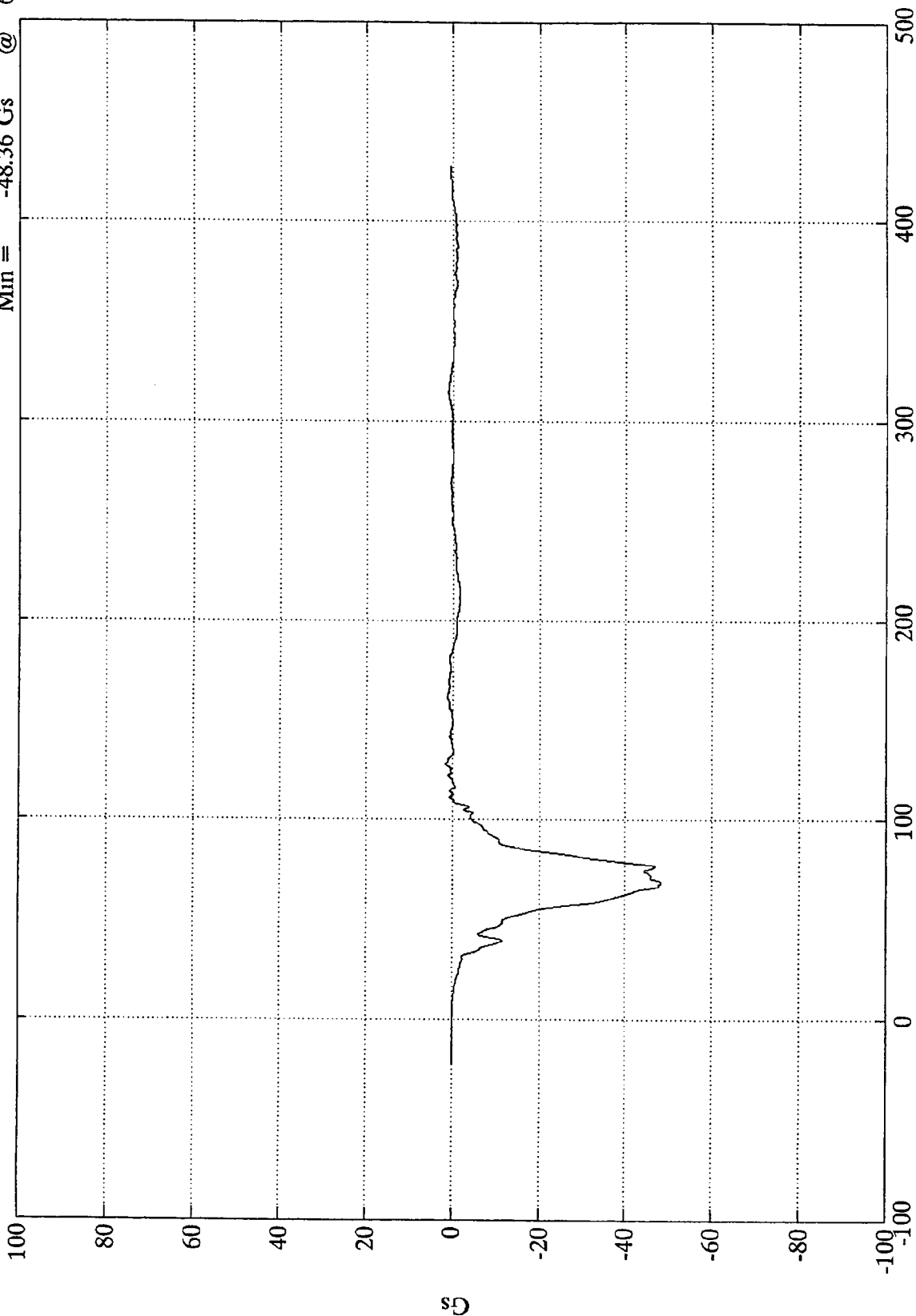
SAE Filter Class 1000

8304-1

VTV TEST #1

Max = 1.62 Gs @ 128.03 msec
Min = -48.36 Gs @ 68.63 msec

P2 Chest X



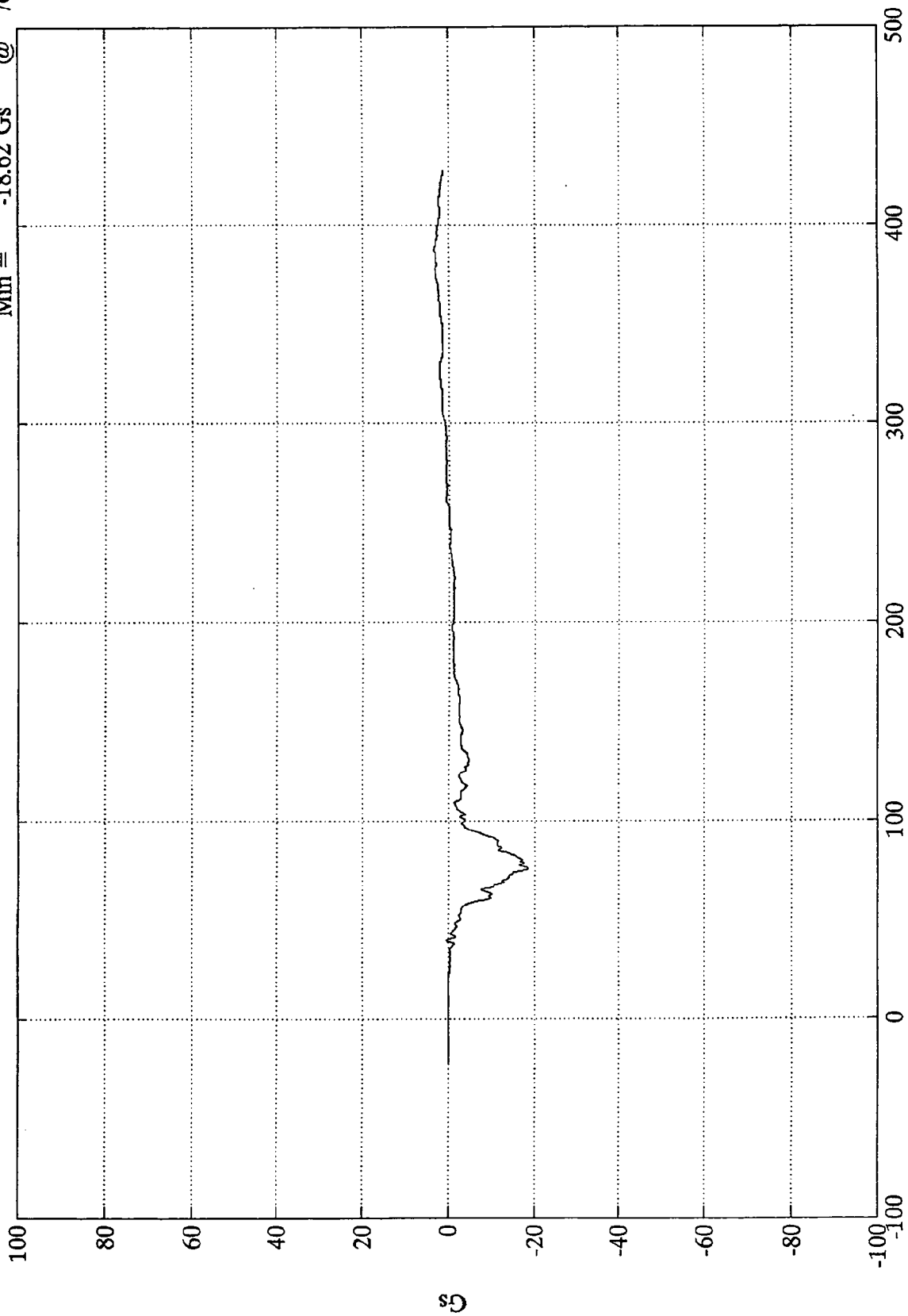
Time (msec)

SAE Filter Class 180

VTV TEST #1

Max = 3.41 Gs @ 387.00 msec
Min = -18.62 Gs @ 76.20 msec

P2 Chest Y



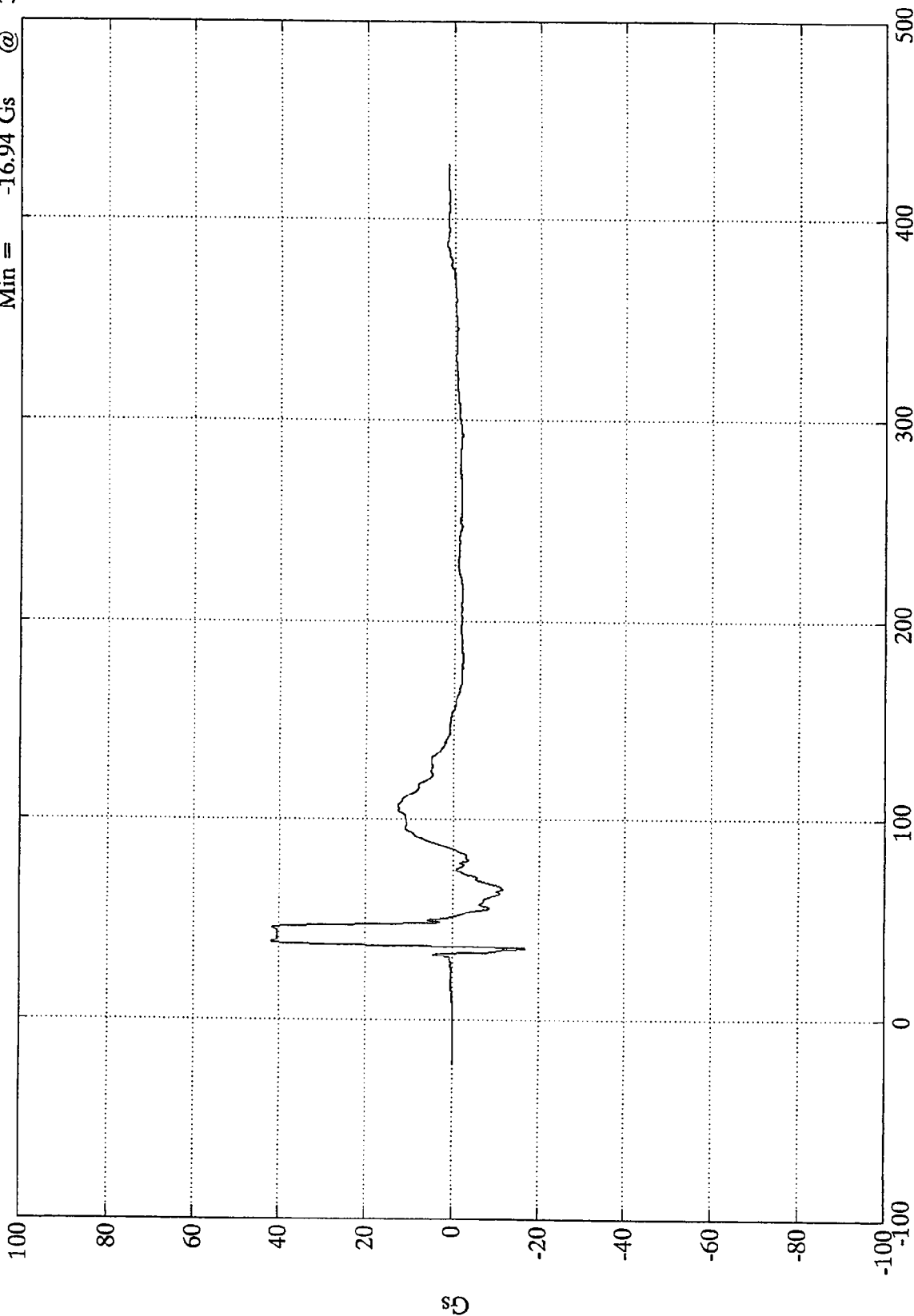
Time (msec)

SAE Filter Class 180

VTV TEST #1

Max = 41.77 Gs @ 38.75 msec
 Min = -16.94 Gs @ 35.76 msec

P2 Chest Z



Data is questionable between 35 and 51 msec,
 accelerometer opened.

SAE Filter Class 180

Gs

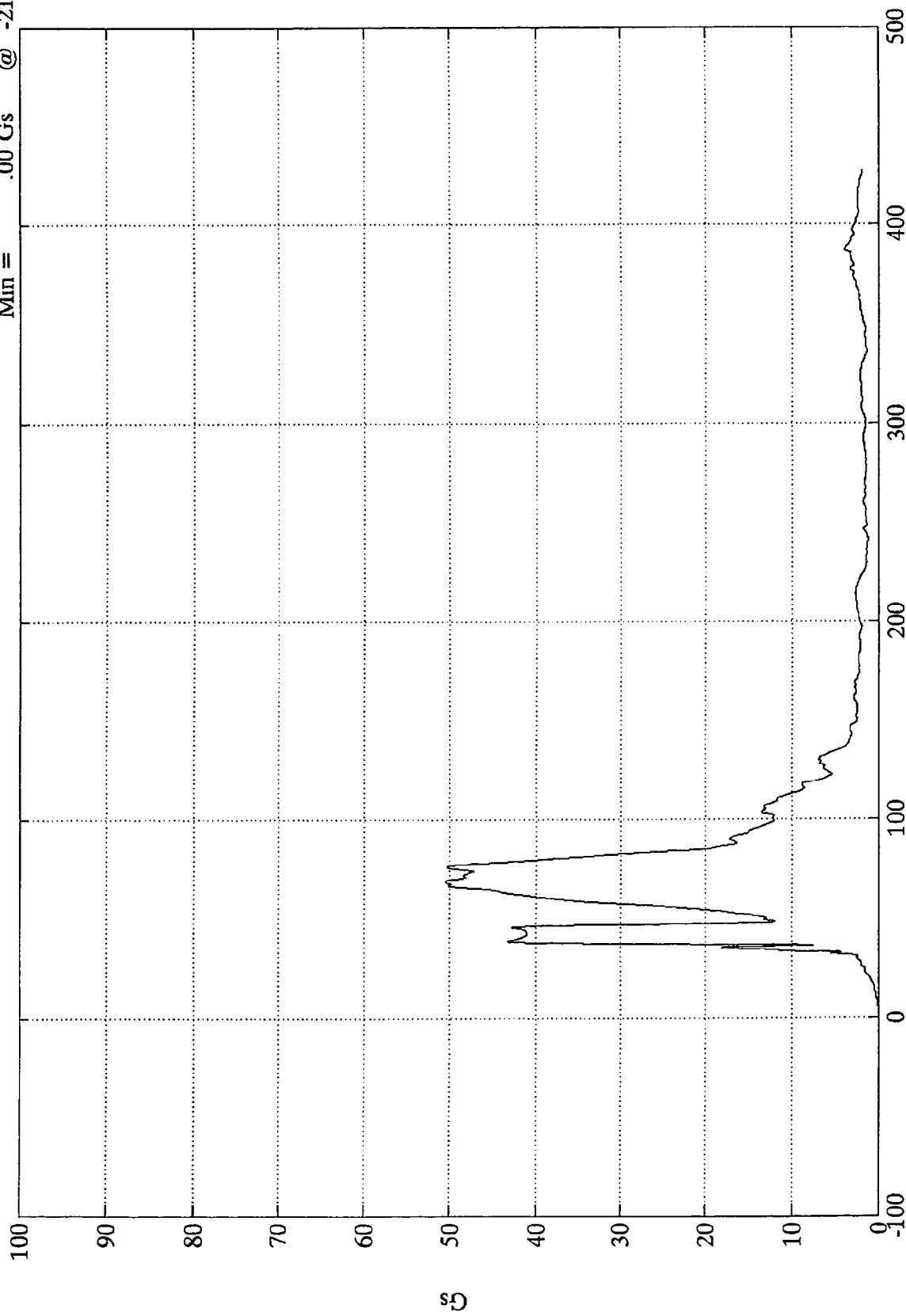
B-192

8304-1

VTV TEST #1

Max = 50.48 Gs @ 68.87 msec
Min = .00 Gs @ -21.72 msec

P2 Chest Resultant



Data is questionable between 35 and 51 msec,
accelerometer opened.

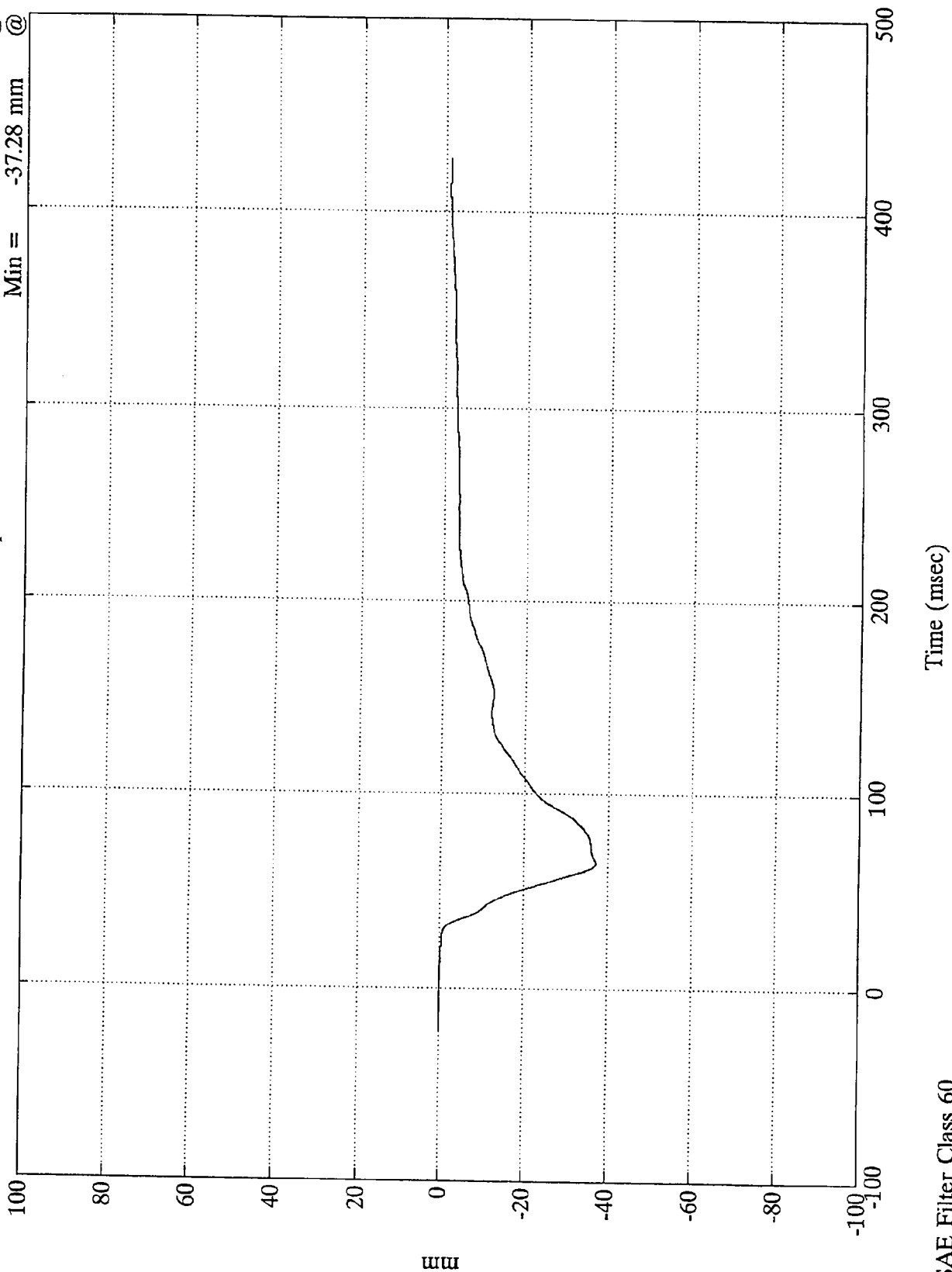
SAE Filter Class 180

85

VTV TEST #1

Max = .00 mm @ -13.44 msec
Min = -37.28 mm @ 64.80 msec

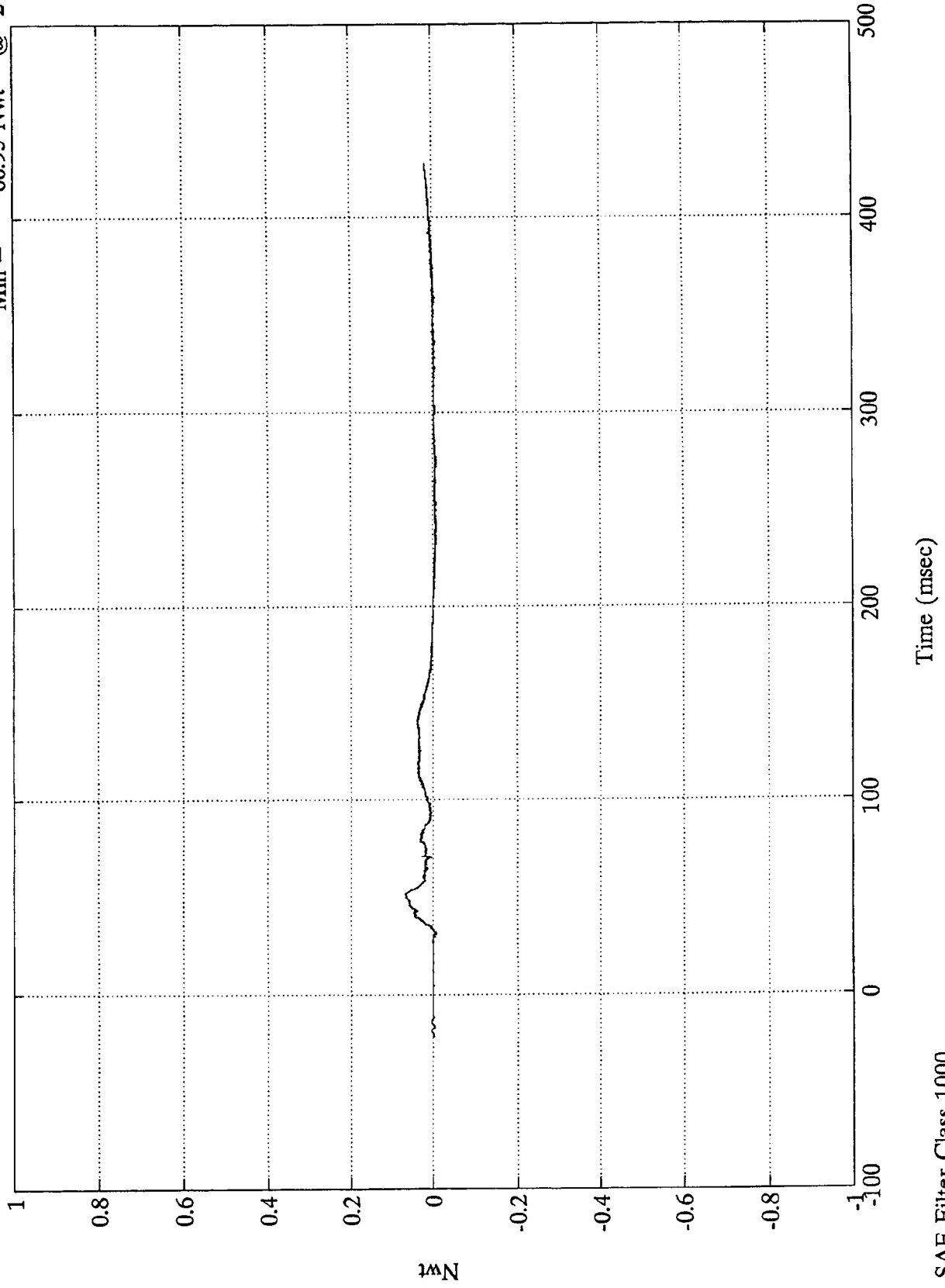
P2 Chest Disp.



VTV TEST #1
x10⁴

P2 Upper Neck Fx

Max = 676.85 Nwt @ 51.96 msec
Min = -86.95 Nwt @ 240.36 msec



1wN

B-195

SAE Filter Class 1000

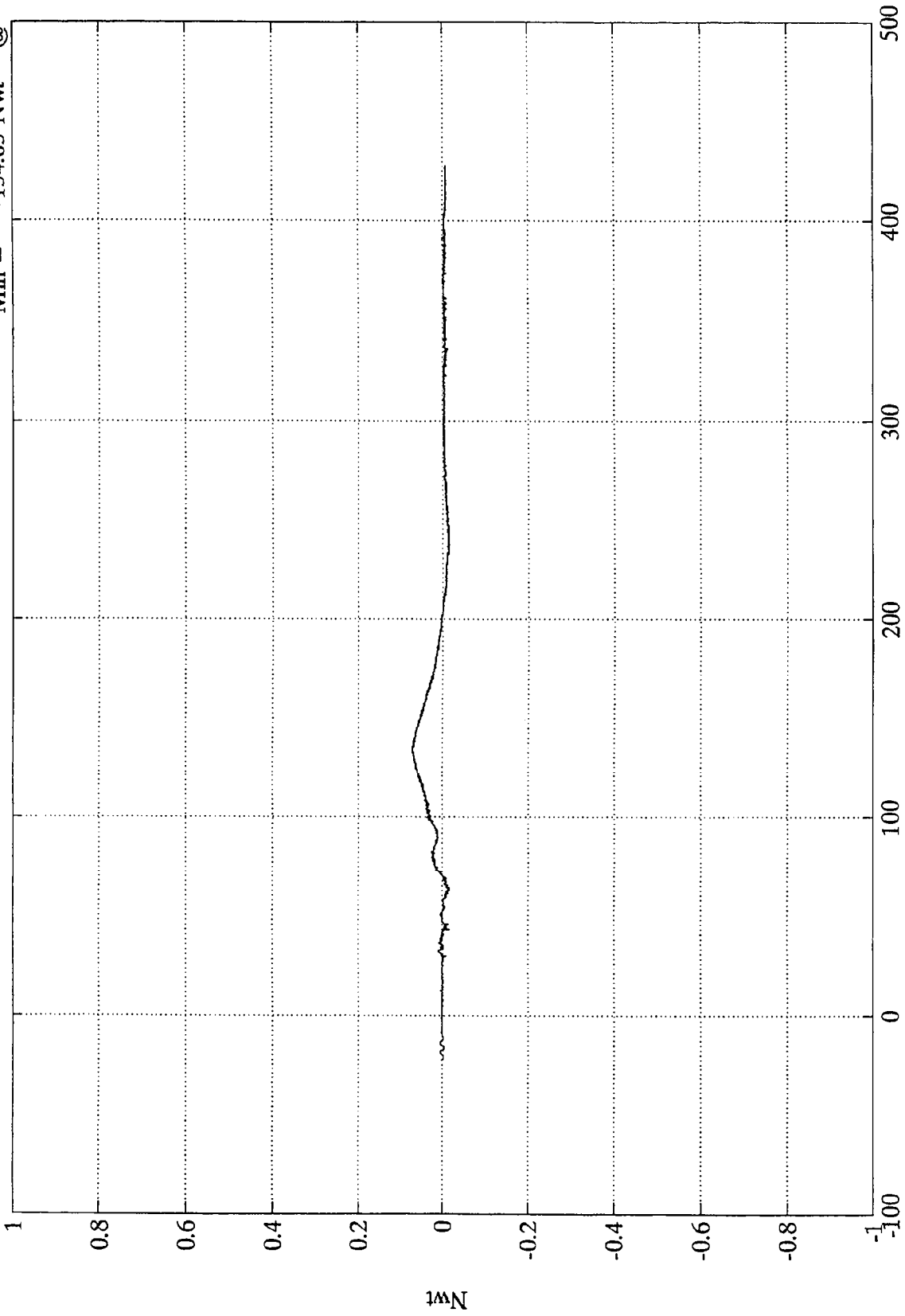
8304-1

VTV TEST #1

$\times 10^4$

P2 Upper Neck Fy

Max = 727.29 Nwt @ 135.60 msec
Min = -154.05 Nwt @ 63.35 msec



Time (msec)

SAE Filter Class 1000

Nwt

B-196

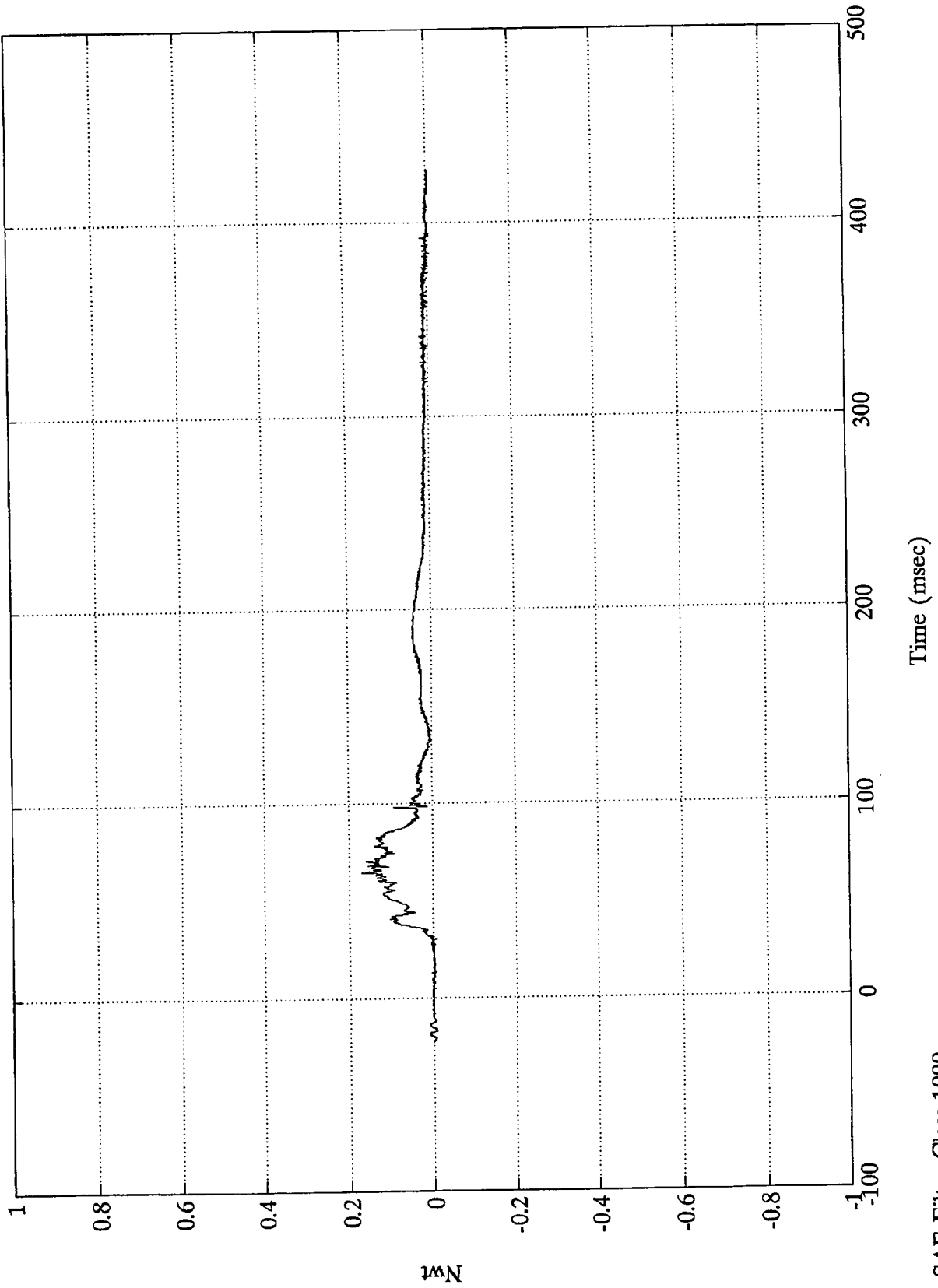
8304-1

VTV TEST #1

$\times 10^4$

P2 Upper Neck Fz

Max = 1673.29 Nwt @ 64.31 msec
Min = -85.60 Nwt @ 30.00 msec



16N

B-197

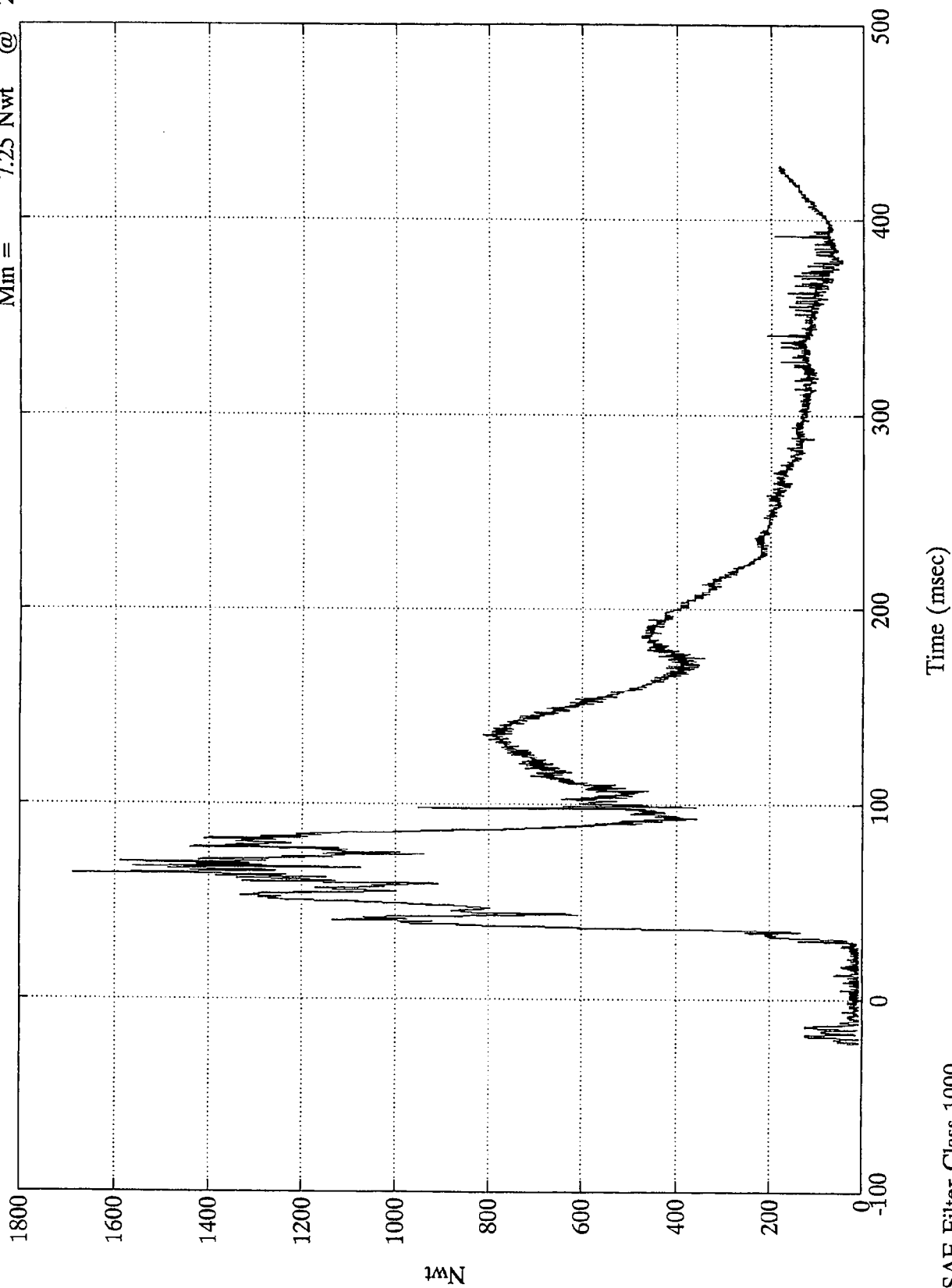
8304-1

SAE Filter Class 1000

VTV TEST #1

Max = 1690.05 Nwt @ 64.31 msec
Min = 7.25 Nwt @ 25.92 msec

P2 Upper Neck Force Res



SAE Filter Class 1000

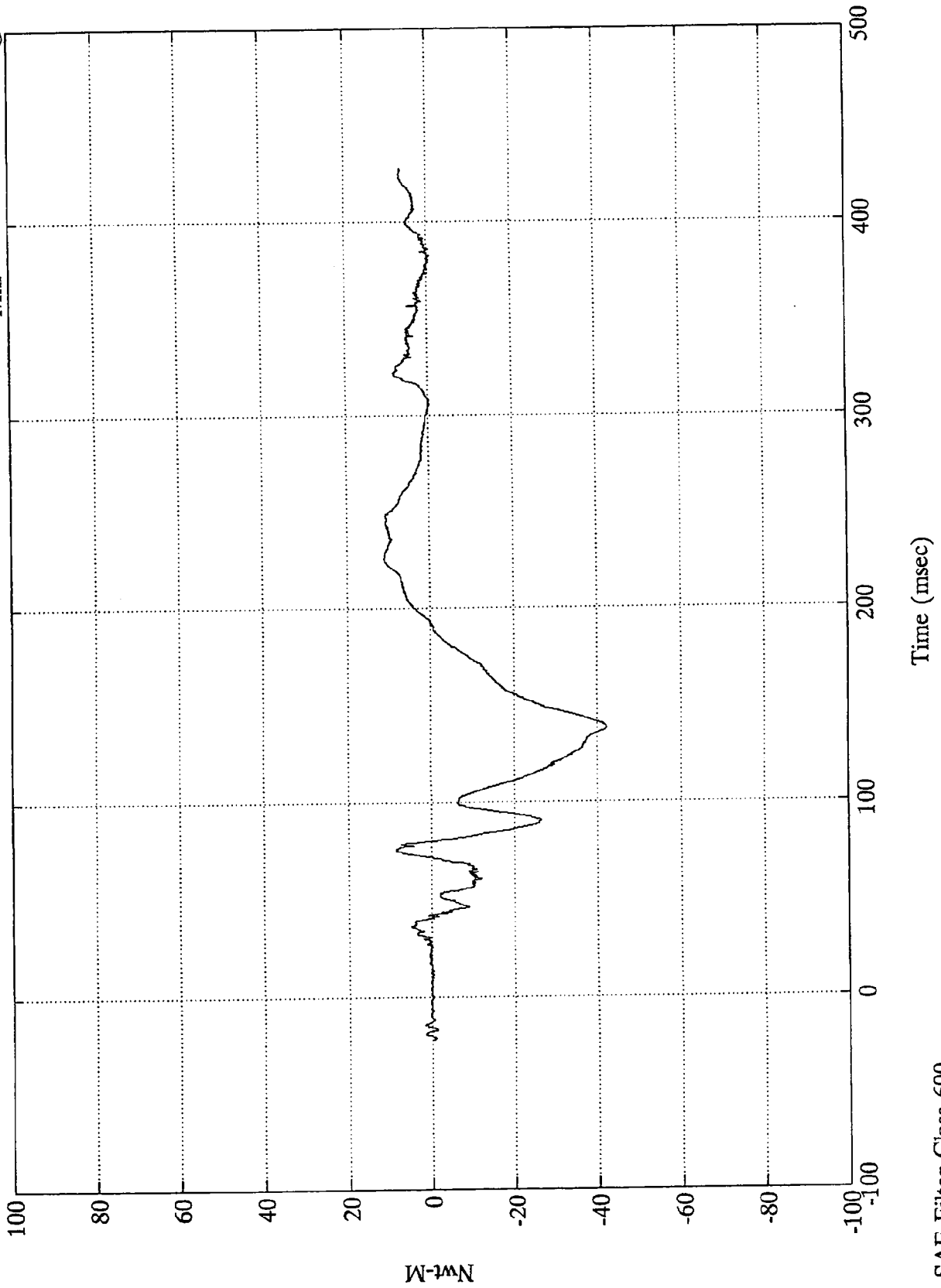
Nwt

Time (msec)

VTV TEST #1

P2 Upper Neck Mx

Max = 11.17 Nwt-M @ 225.83 msec
Min = -42.25 Nwt-M @ 138.36 msec



Nwt-M

B-199

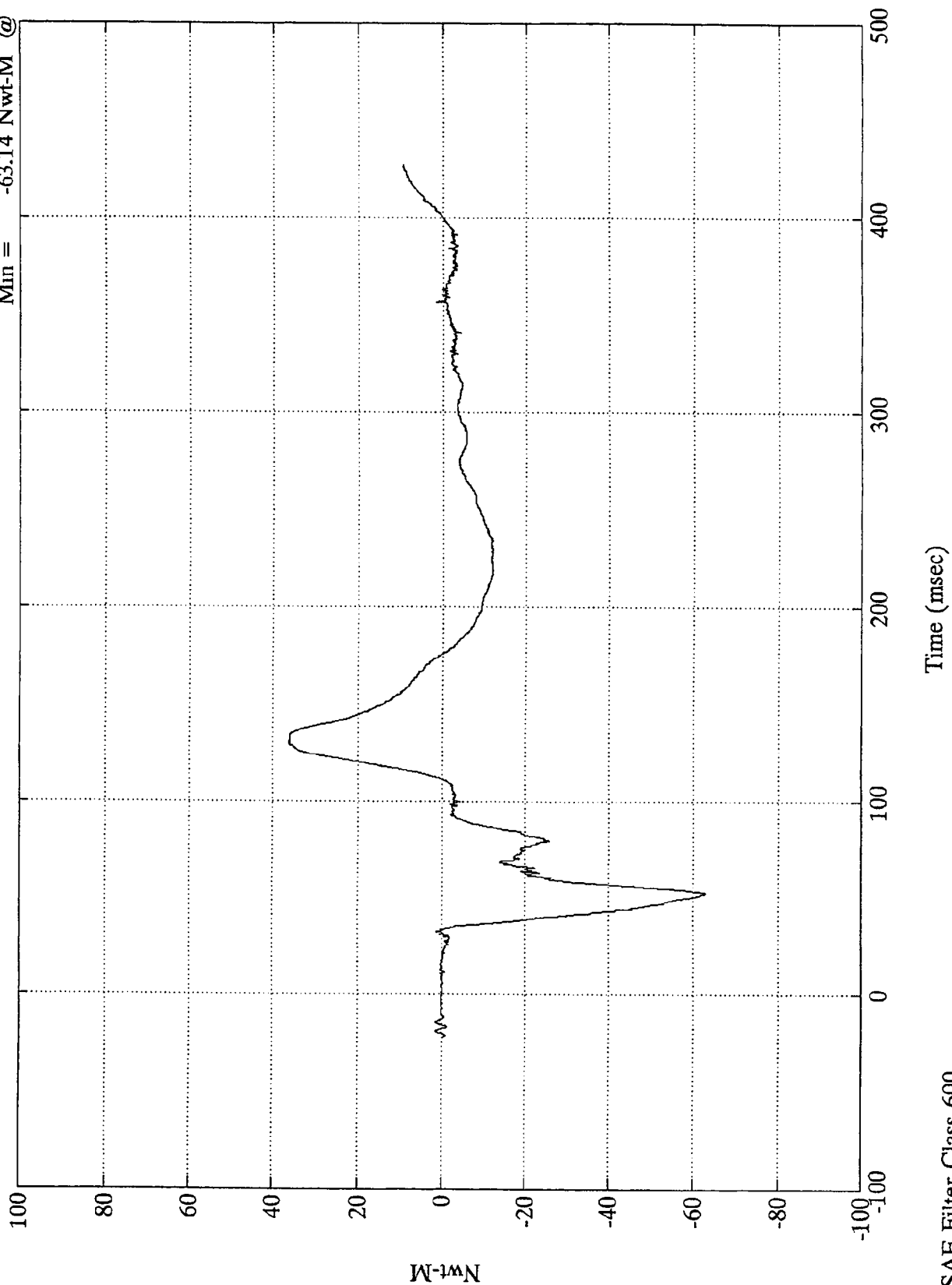
8304-1

SAE Filter Class 600

VTV TEST #1

Max = 36.25 Nwt-M @ 131.27 msec
Min = -63.14 Nwt-M @ 52.08 msec

P2 Upper Neck My

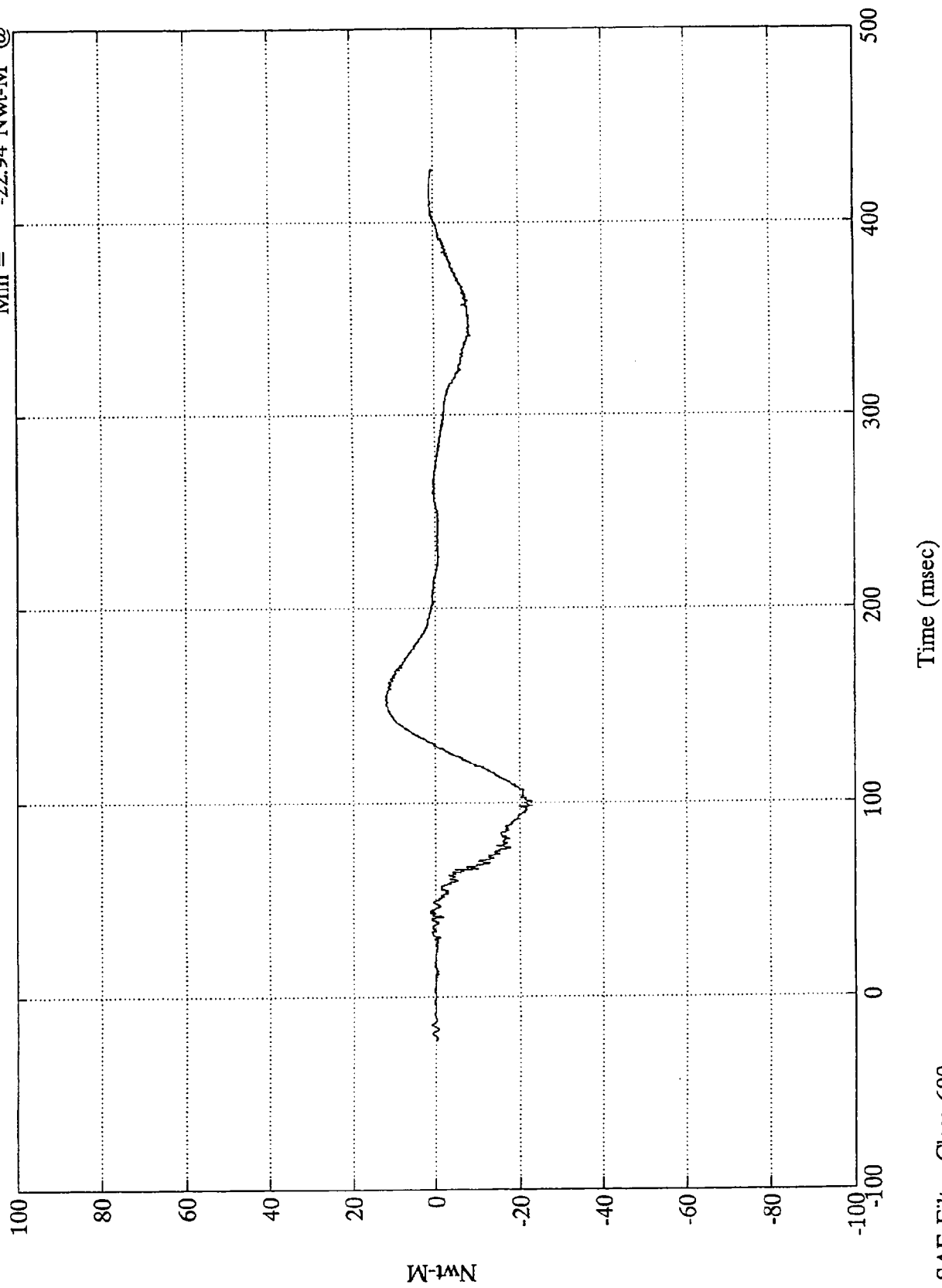


SAE Filter Class 600

VTIV TEST #1

P2 Upper Neck Mz

Max = 12.02 Nwt-M @ 152.75 msec
Min = -22.94 Nwt-M @ 98.63 msec



Nwt-M

B-201

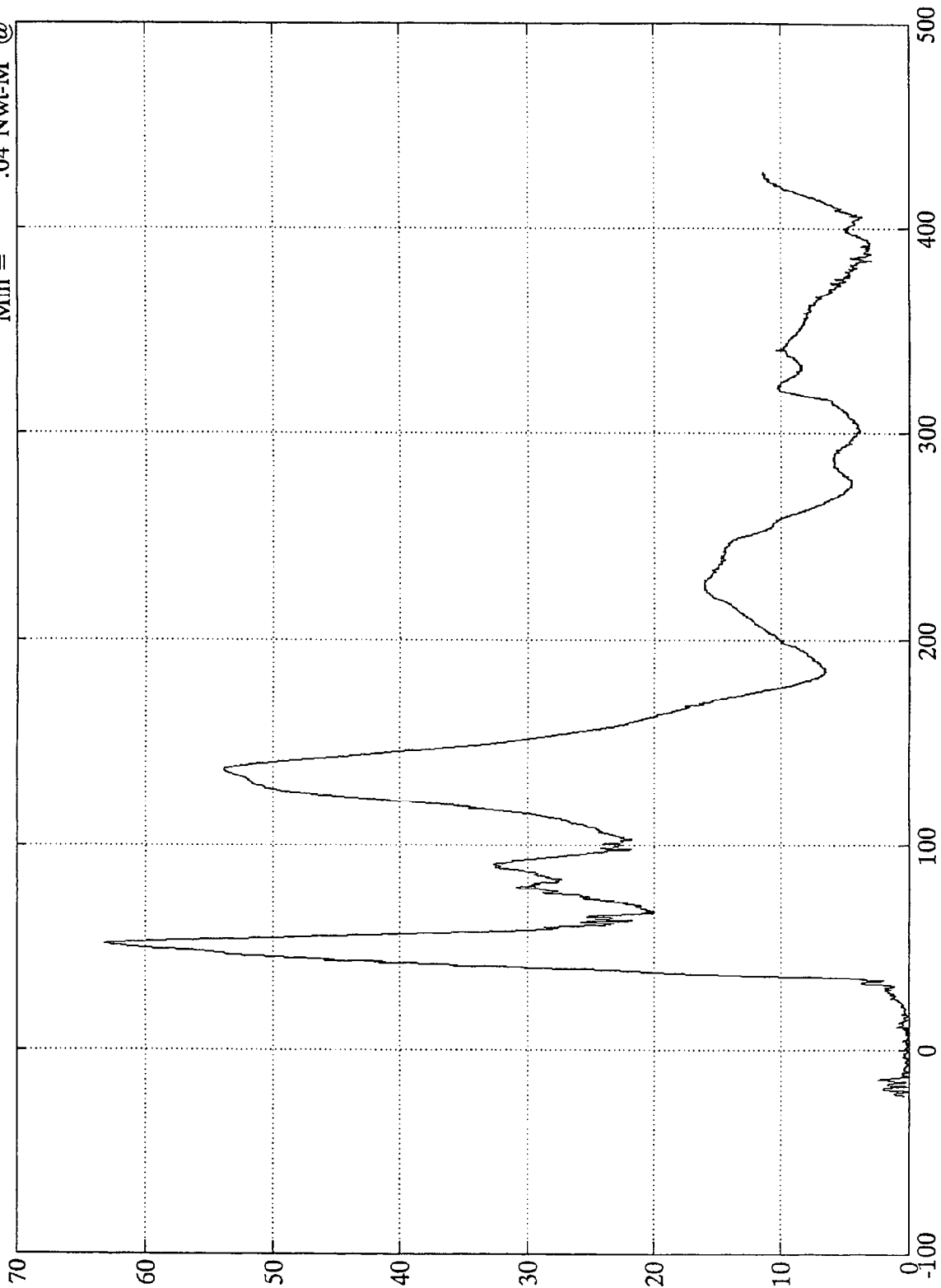
8304-1

SAE Filter Class 600

VTV TEST #1

Max = 63.19 Nwt-M @ 52.08 msec
Min = .04 Nwt-M @ 6.71 msec

P2 Upper Neck Moment Res



Time (msec)

SAE Filter Class 600

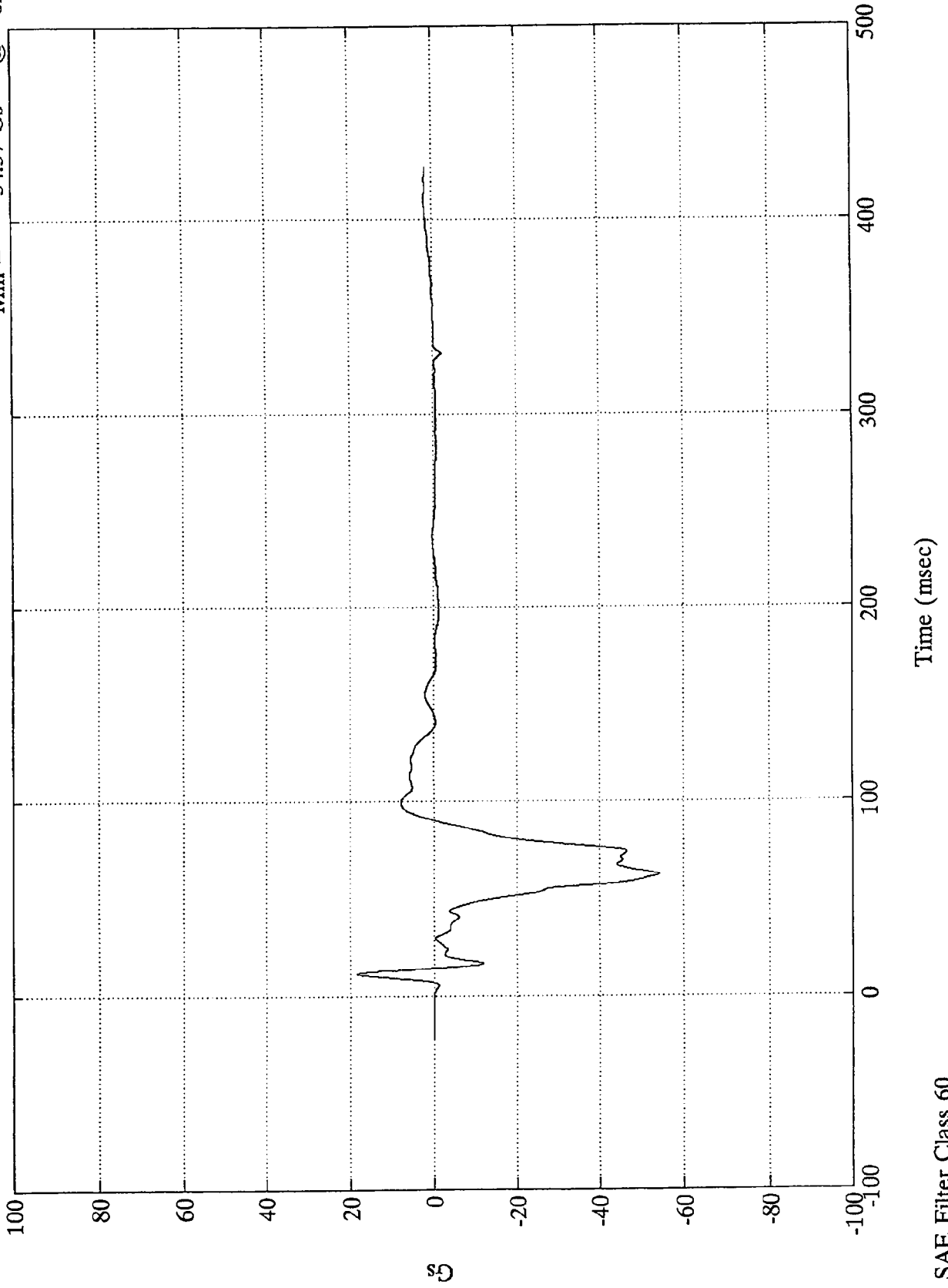
Nwt-M
B-202

8304-1

VTV TEST #1

P2 Pelvic X

Max =	18.37 Gs	@	11.52 msec
Min =	-54.37 Gs	@	62.04 msec



8304-1

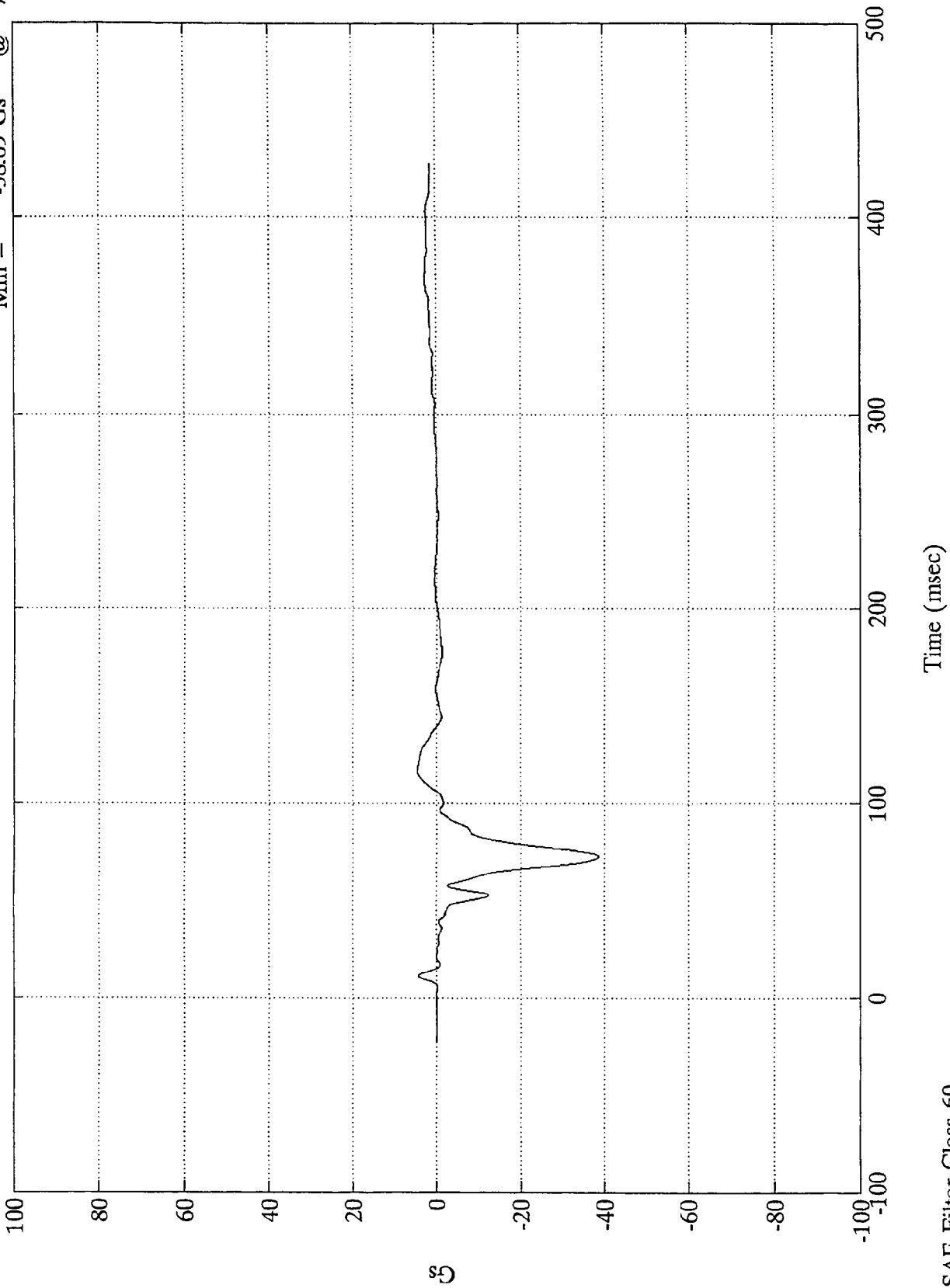
B-203

SAE Filter Class 60

VTV TEST #1

P2 Pelvic Y

Max = 4.56 Gs @ 117.59 msec
Min = -38.69 Gs @ 73.31 msec



Gs

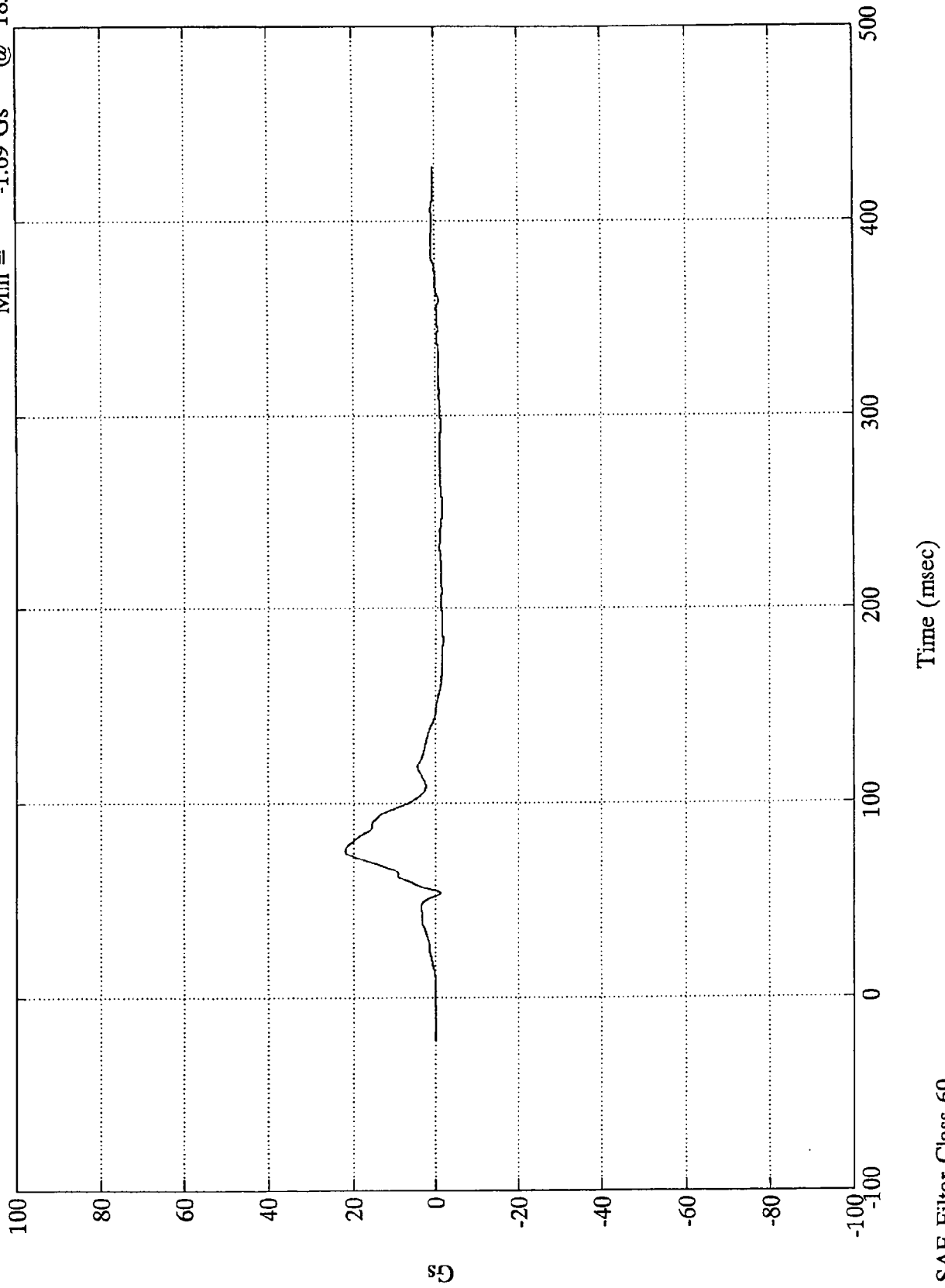
B-204

8304-1

SAE Filter Class 60

VTV TEST #1

P2 Pelvic Z
Max = 21.85 Gs @ 76.08 msec
Min = -1.69 Gs @ 183.36 msec



B-205

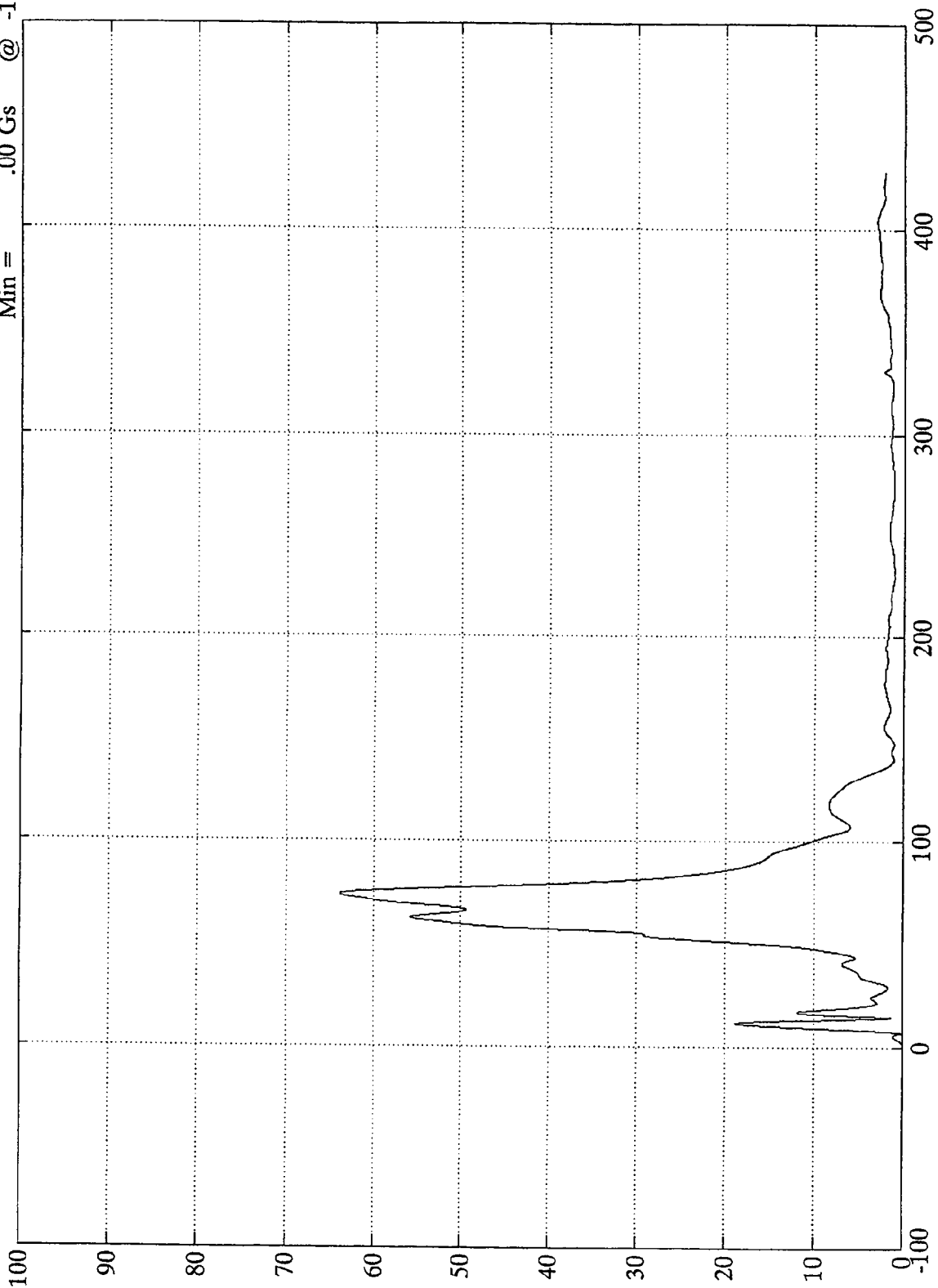
8304-1

SAE Filter Class 60

VTV TEST #1

P2 Pelvic Res

Max =	63.93 Gs	@	73.92 msec
Min =	.00 Gs	@	-13.68 msec



Time (msec)

SAE Filter Class 60

50

B-206

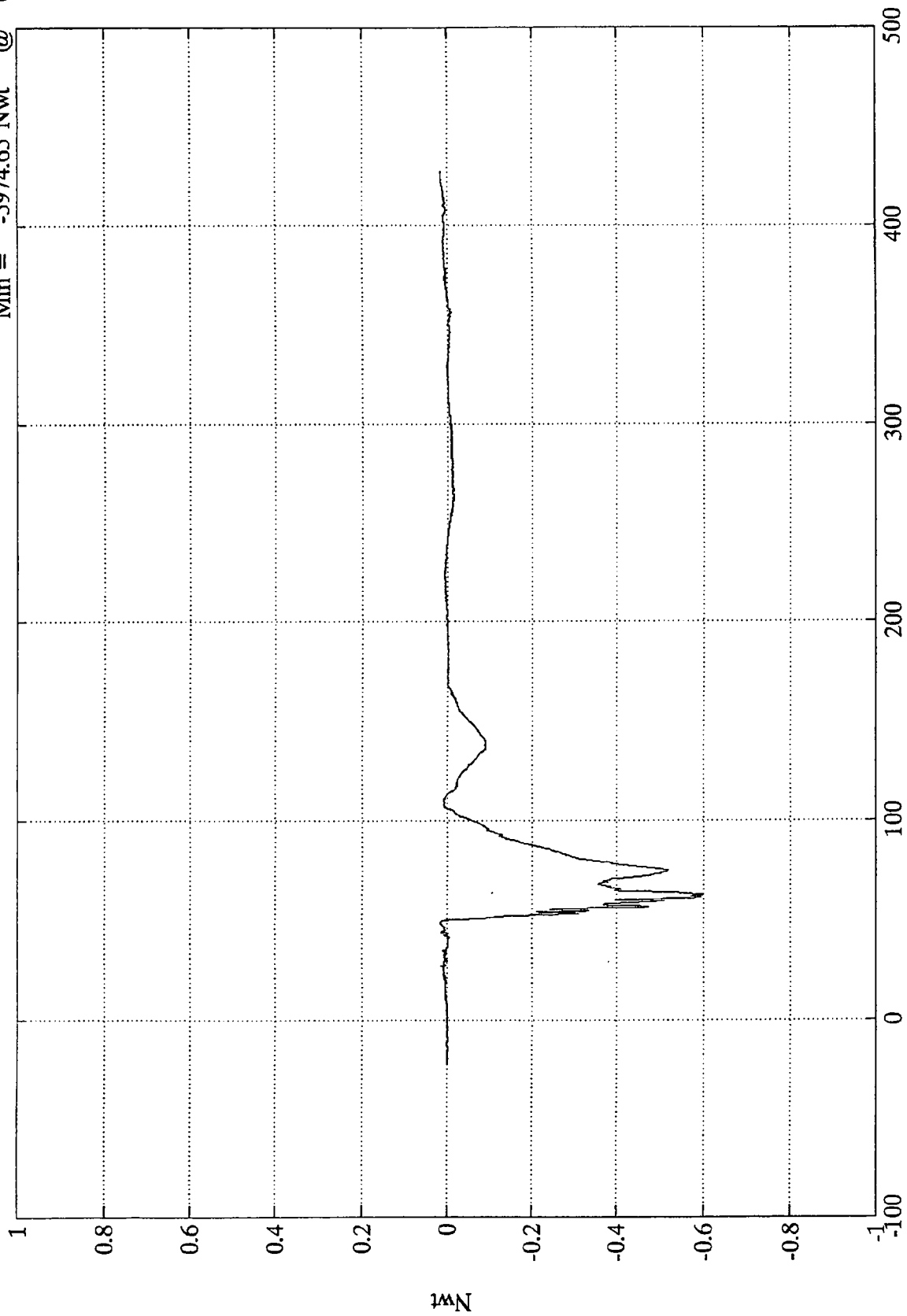
8304-1

VIV TEST #1

$\times 10^4$

P2 Left Femur

Max = 175.59 Nwt @ 427.08 msec
Min = -5974.65 Nwt @ 62.40 msec



Nwt

B-207

Time (msec)

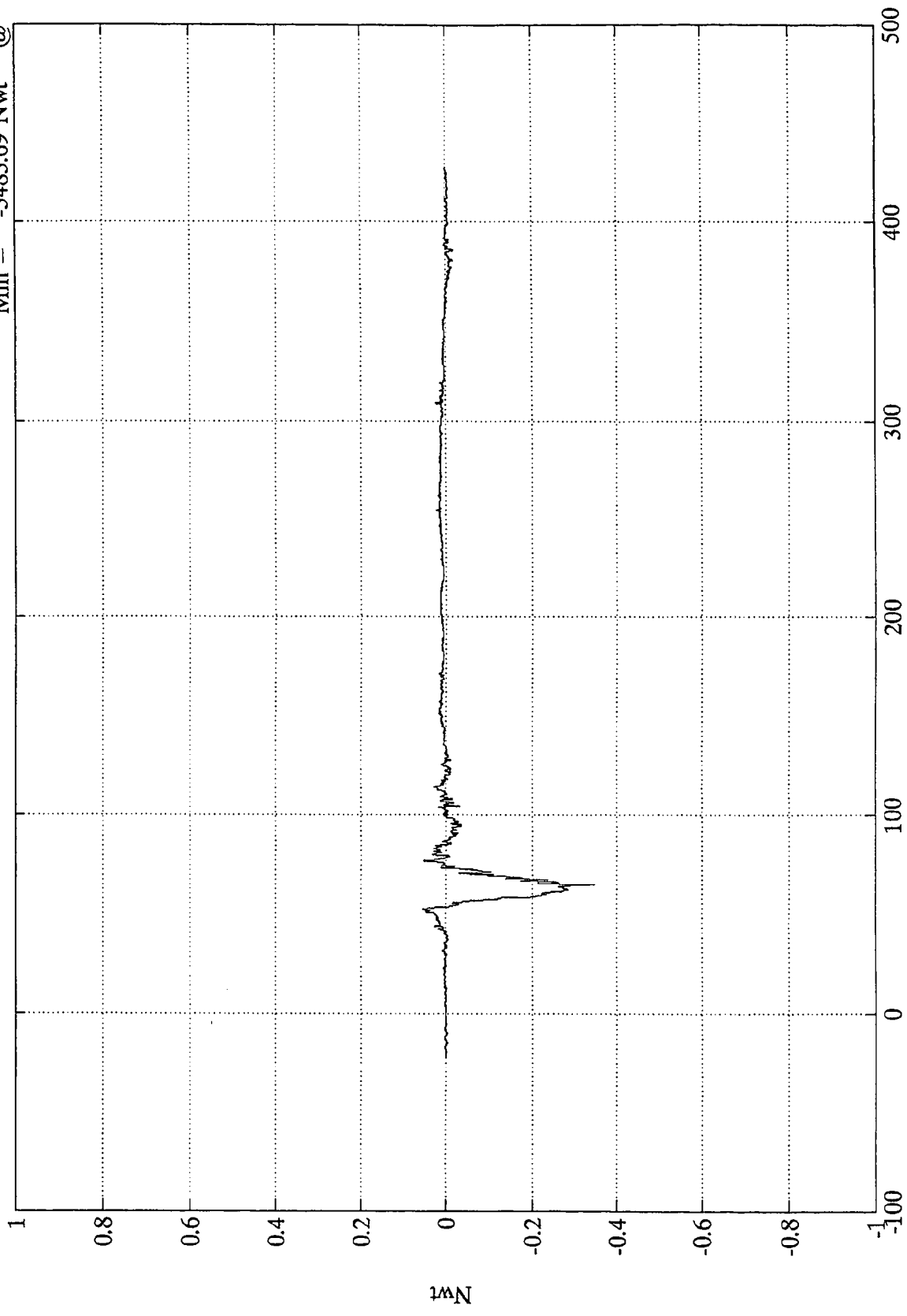
SAE Filter Class 600

8304-1

VTV TEST #1
x10⁴

P2 Right Femur

Max = 542.43 Nwt @ 52.44 msec
Min = -3483.69 Nwt @ 65.15 msec



B-208

8304-1

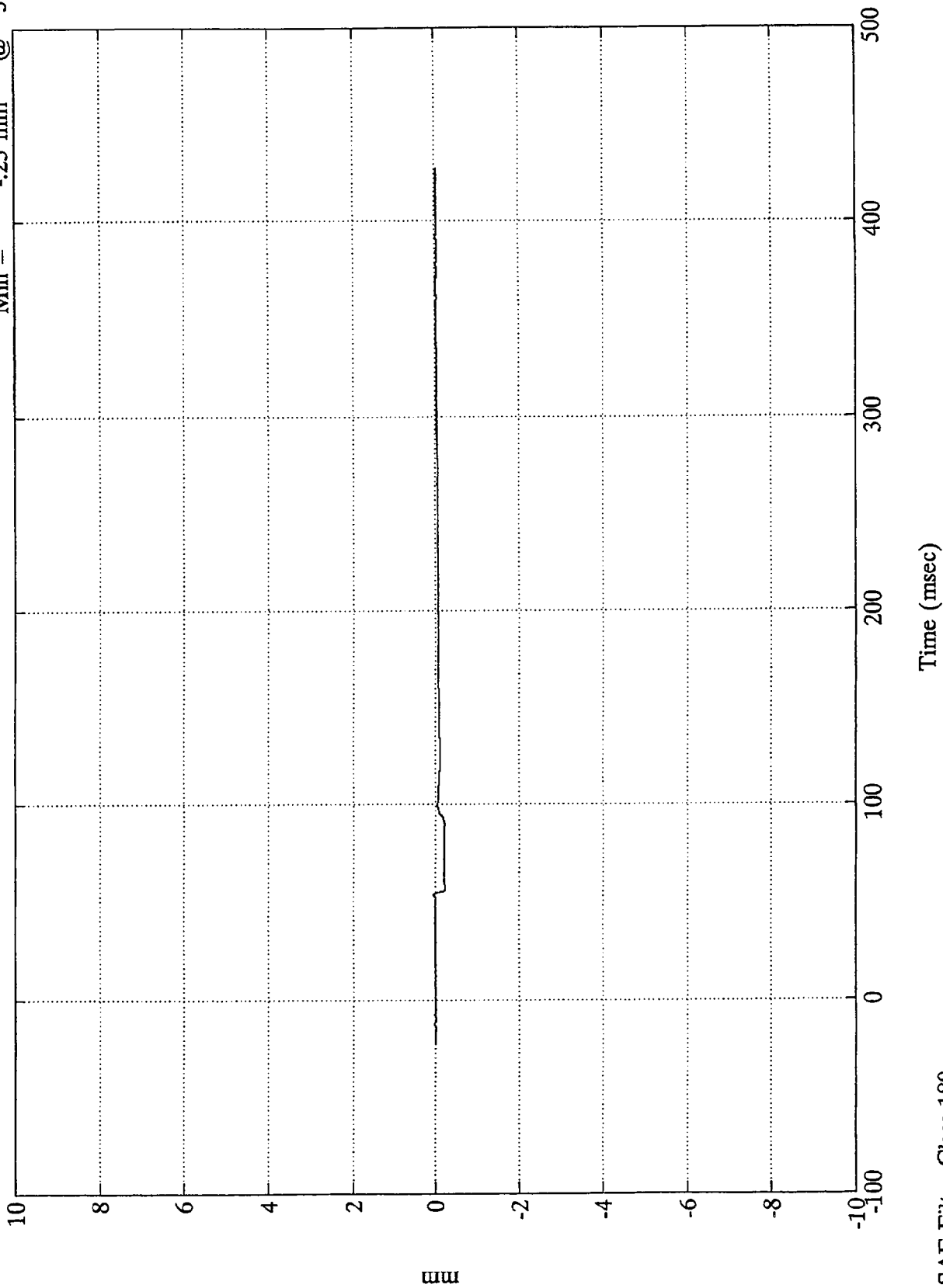
SAE Filter Class 600

Time (msec)

VTV TEST #1

P2 Left Knee Shear

Max = .04 mm @ 53.63 msec
Min = -.23 mm @ 56.40 msec



mm

B-209

8304-1

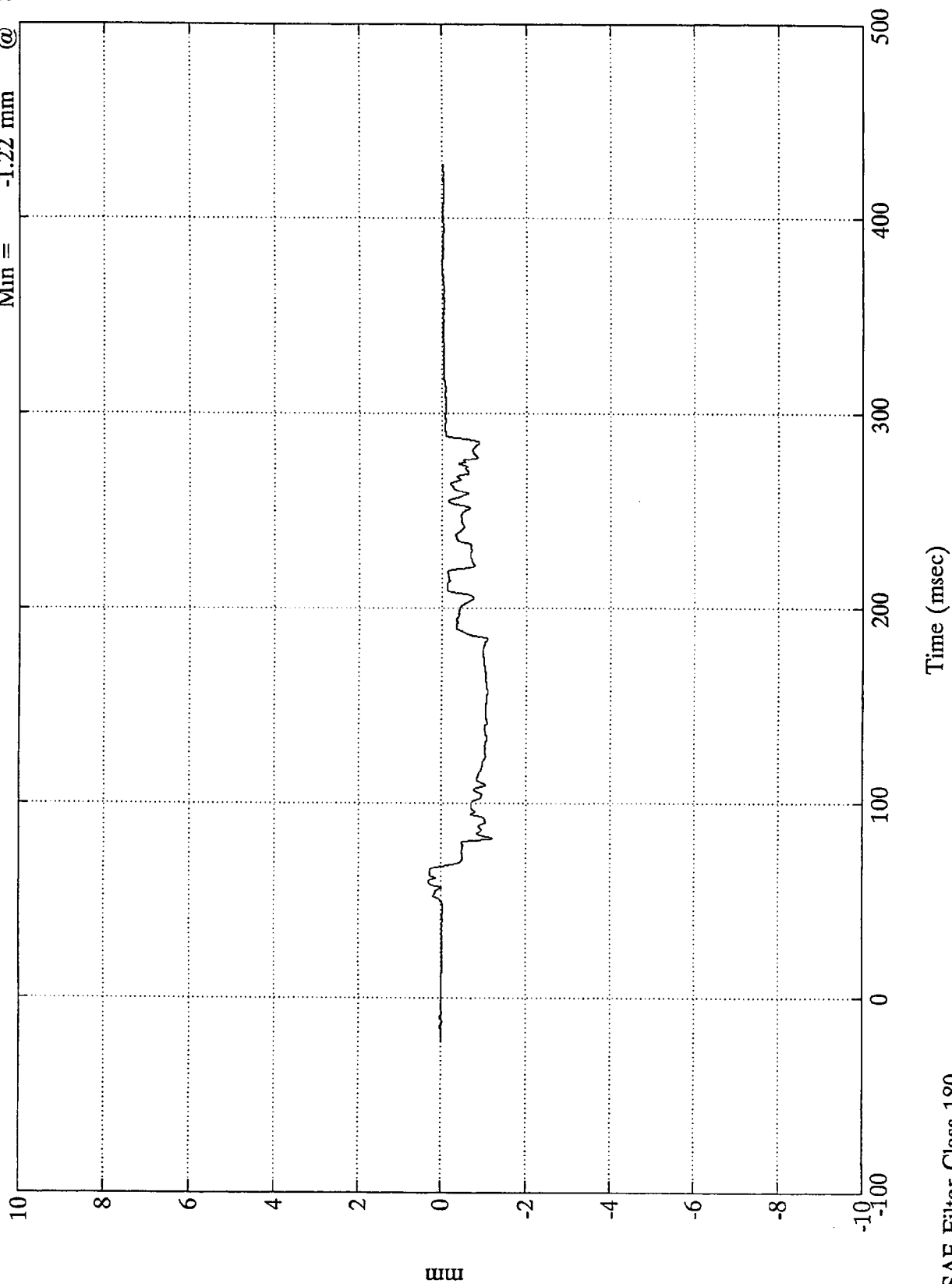
SAE Filter Class 180

VTV TEST #1

P2 Right Knee Shear

Max = .30 mm @
Min = -1.22 mm @

60.00 msec
82.20 msec



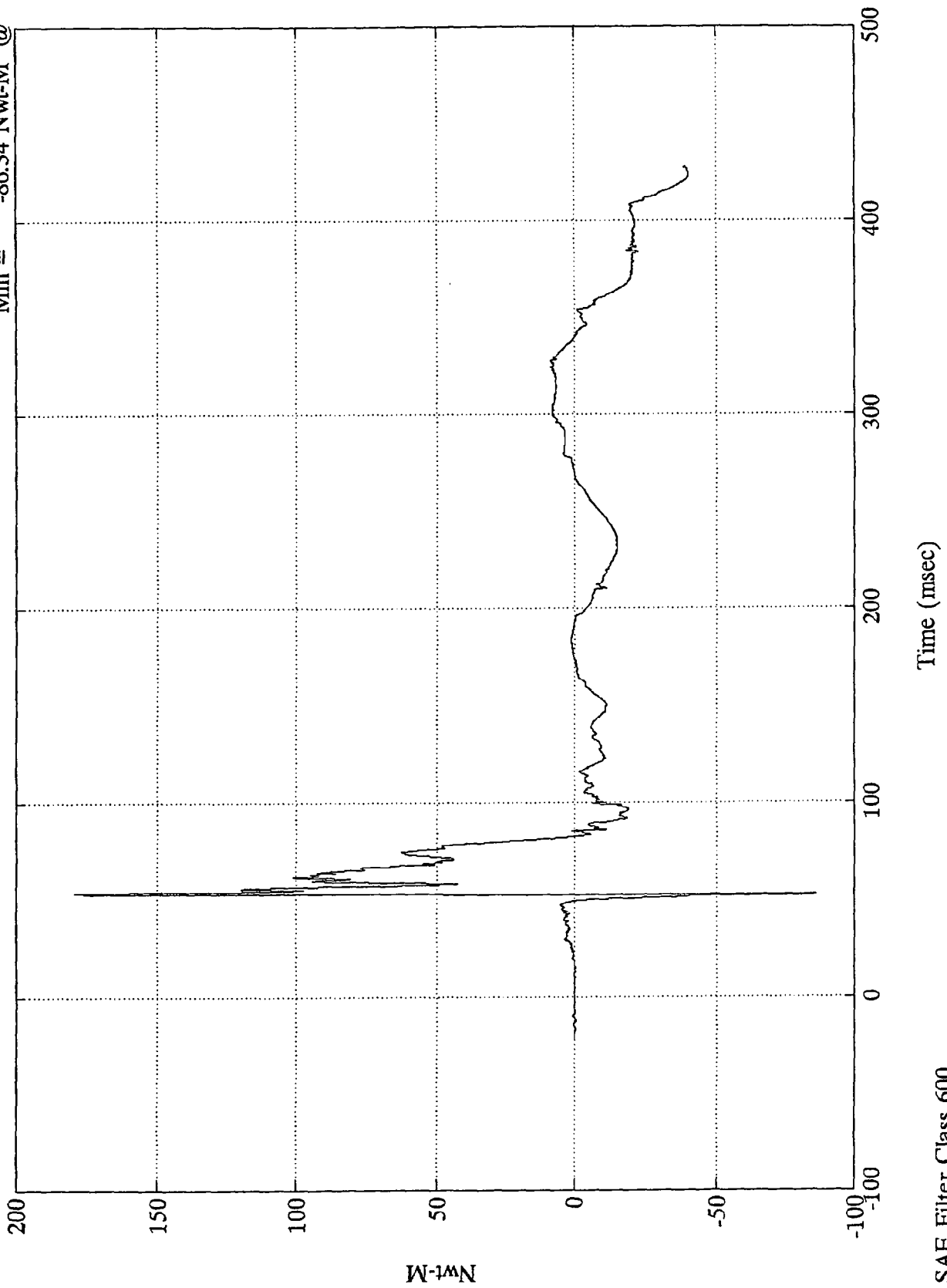
B-210

8304-1

SAE Filter Class 180

VTV TEST #1

P2 Lt Upper Tibia Mx
Max = 179.32 Nwt-M @ 53.27 msec
Min = -86.34 Nwt-M @ 52.31 msec



Nwt-M

B-211

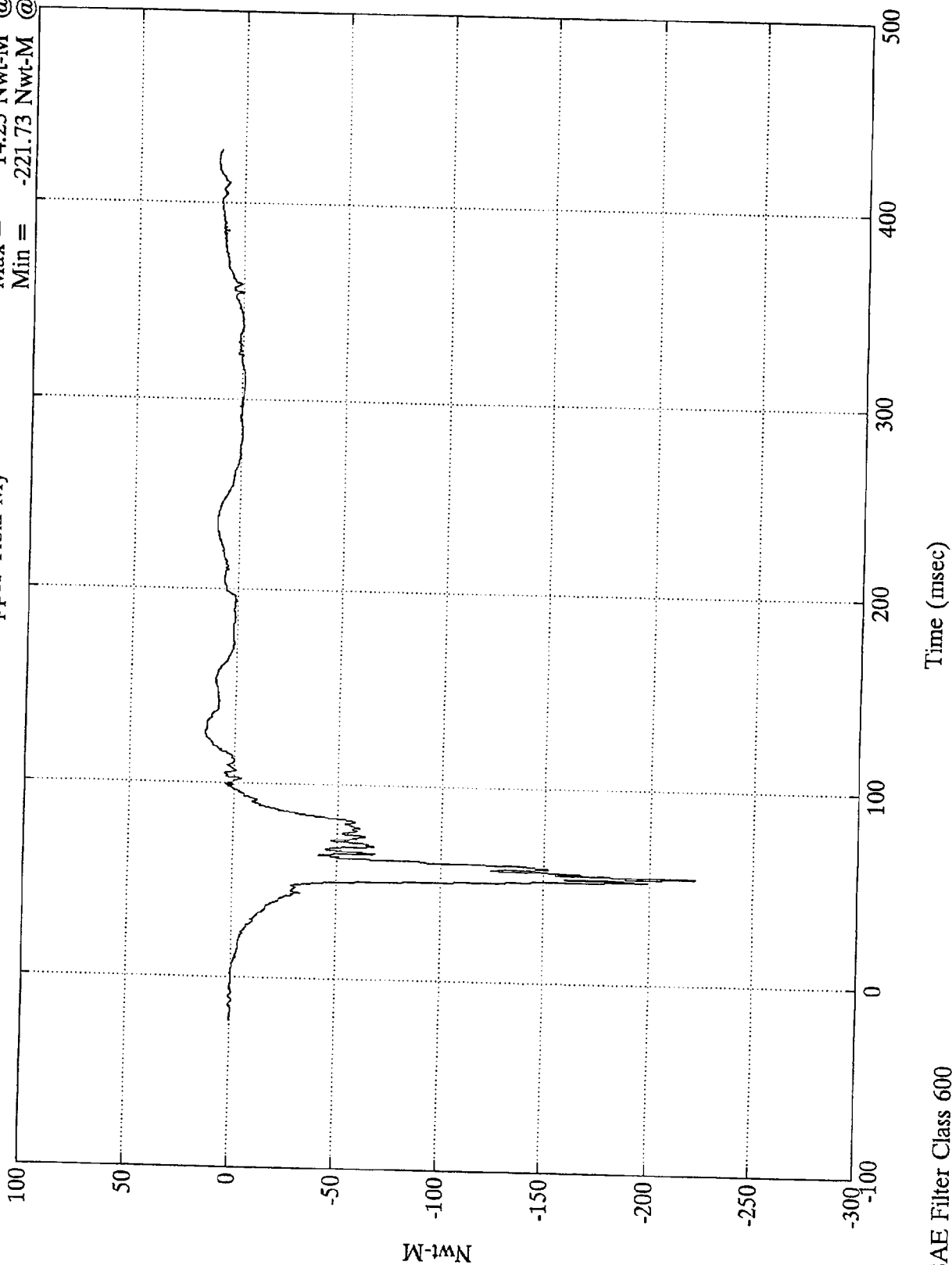
8304-1

SAE Filter Class 600

VTV TEST #1

P2 Lt Upper Tibia My

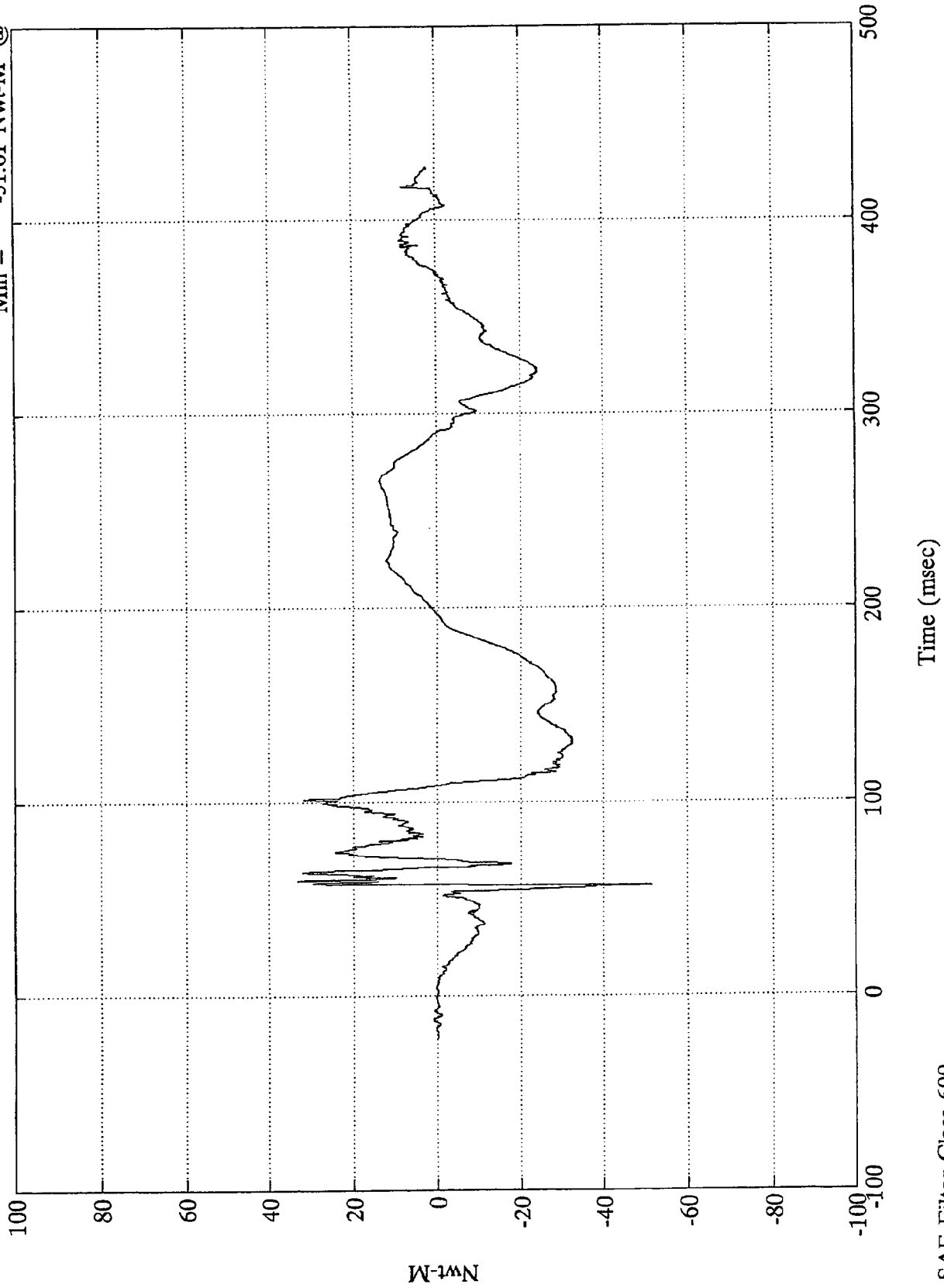
Max = 14.23 Nwt-M @ 126.59 msec
Min = -221.73 Nwt-M @ 54.84 msec



VTV TEST #1

P2 Rt Upper Tibia Mx

Max = 33.05 Nwt-M @ 60.00 msec
Min = -51.61 Nwt-M @ 57.12 msec



Nwt-M

B-213

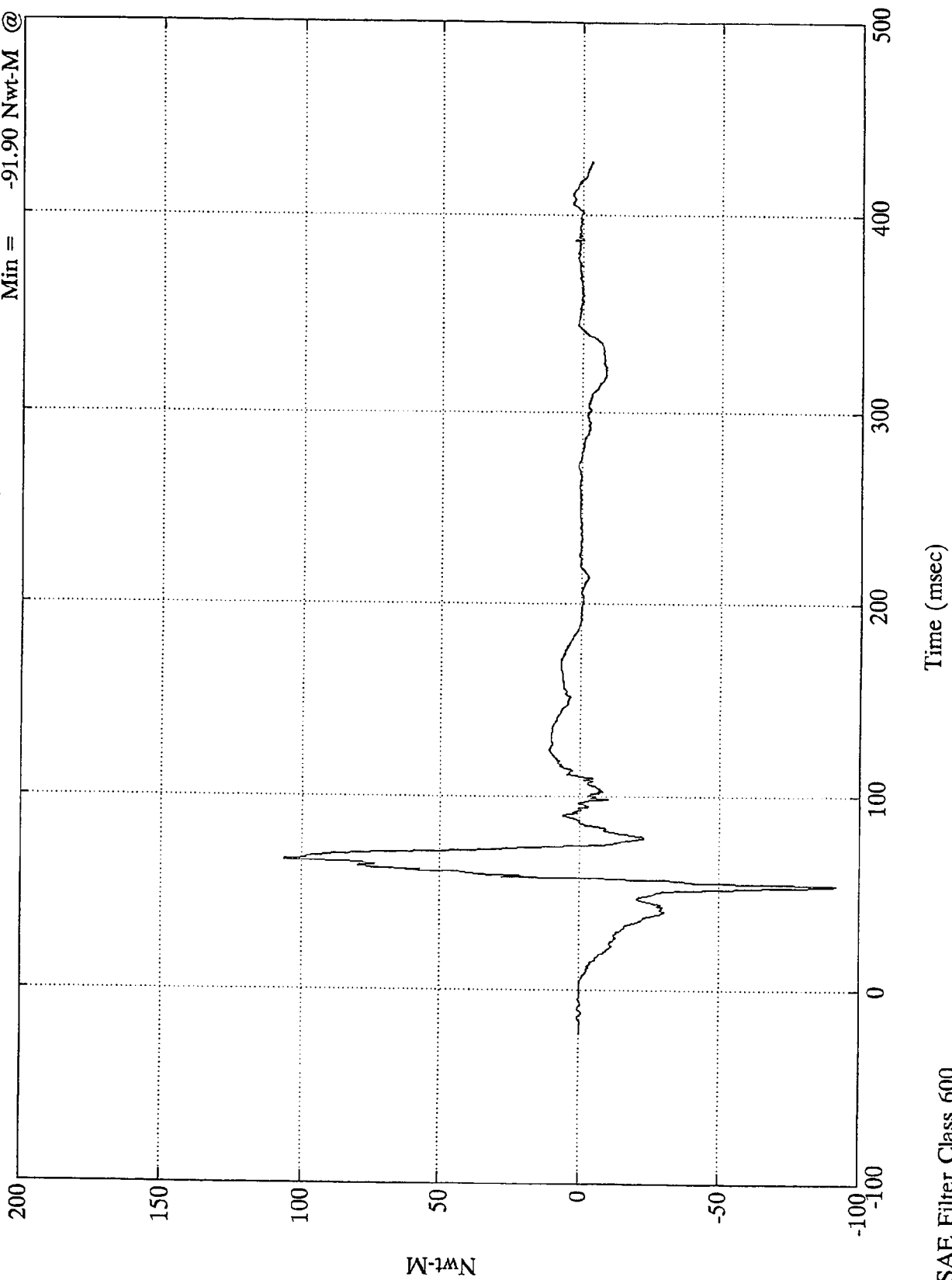
8304-1

SAE Filter Class 600

VTV TEST #1

P2 Rt Upper Tibia My

Max = 106.61 Nwt-M @ 66.84 msec
Min = -91.90 Nwt-M @ 53.40 msec



SAE Filter Class 600

Nwt-M

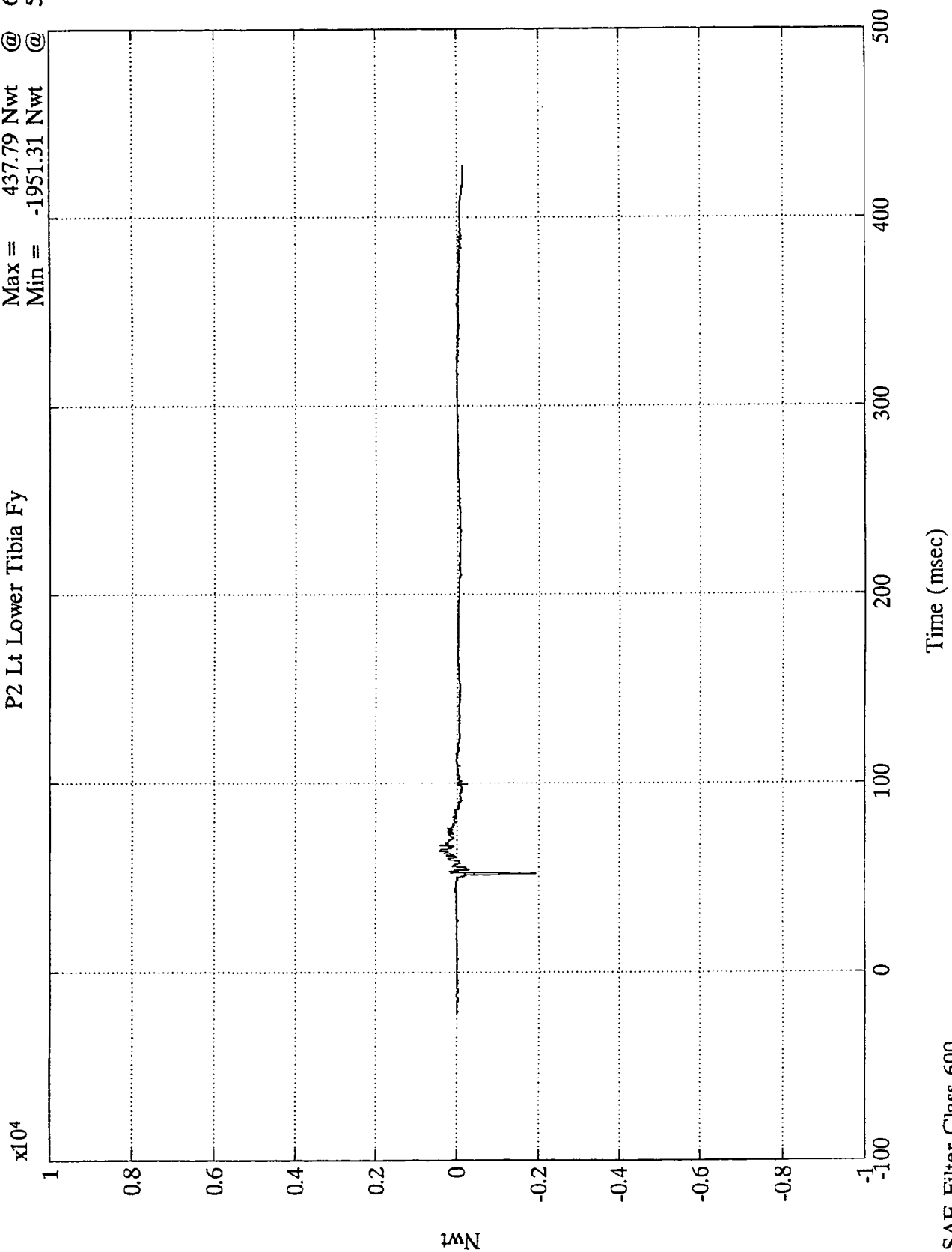
B-214

8304-1

VTV TEST #1

Max = 437.79 Nwt @ 64.31 msec
Min = -1951.31 Nwt @ 52.08 msec

P2 Lt Lower Tibia Fy



Nwt

8304-1

SAE Filter Class 600

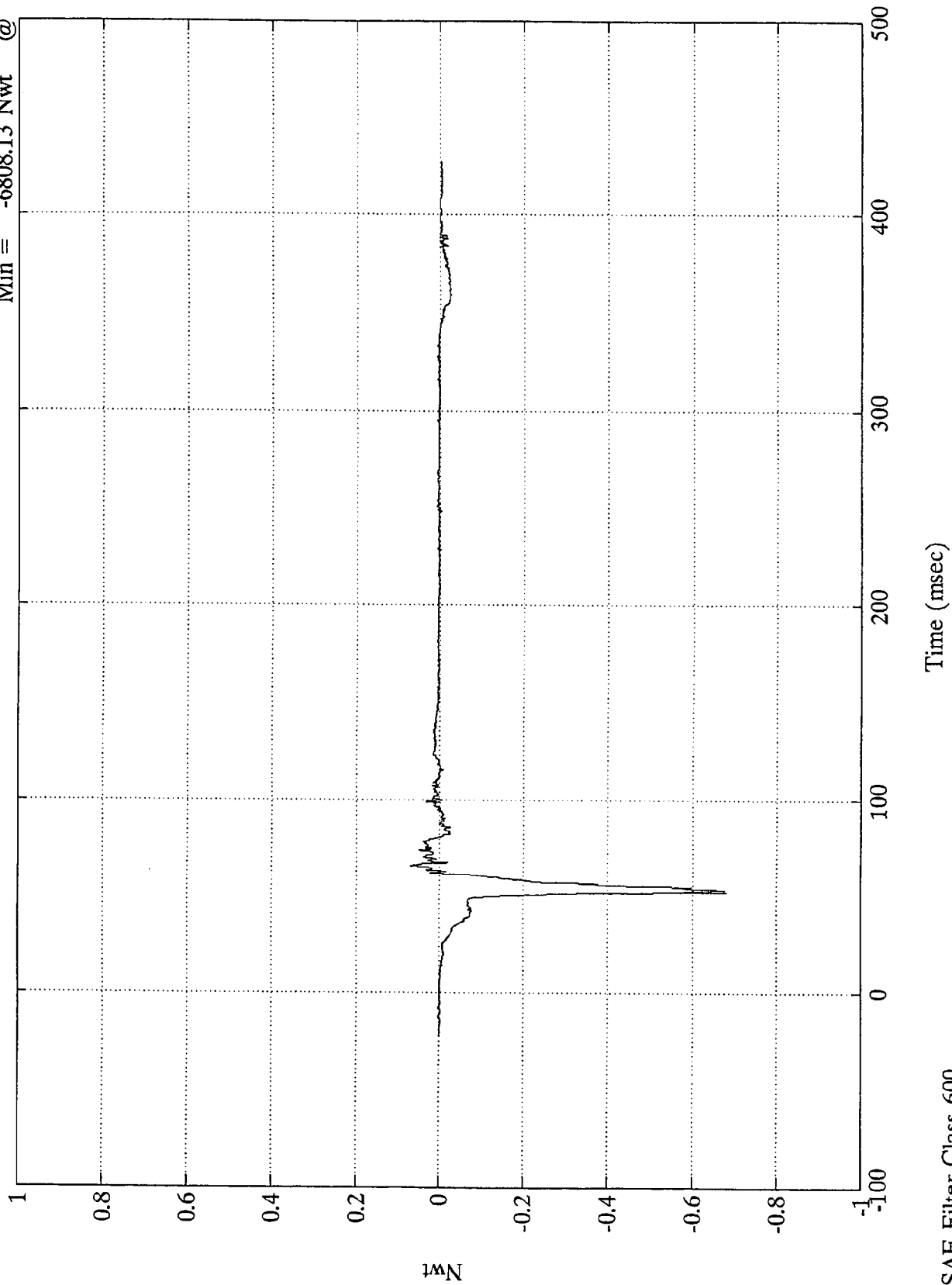
B-215

VTV TEST #1

$\times 10^4$

P2 Lt Lower Tibia Fz

Max = 696.16 Nwt @ 65.76 msec
Min = -6808.13 Nwt @ 52.08 msec



Nwt

B-216

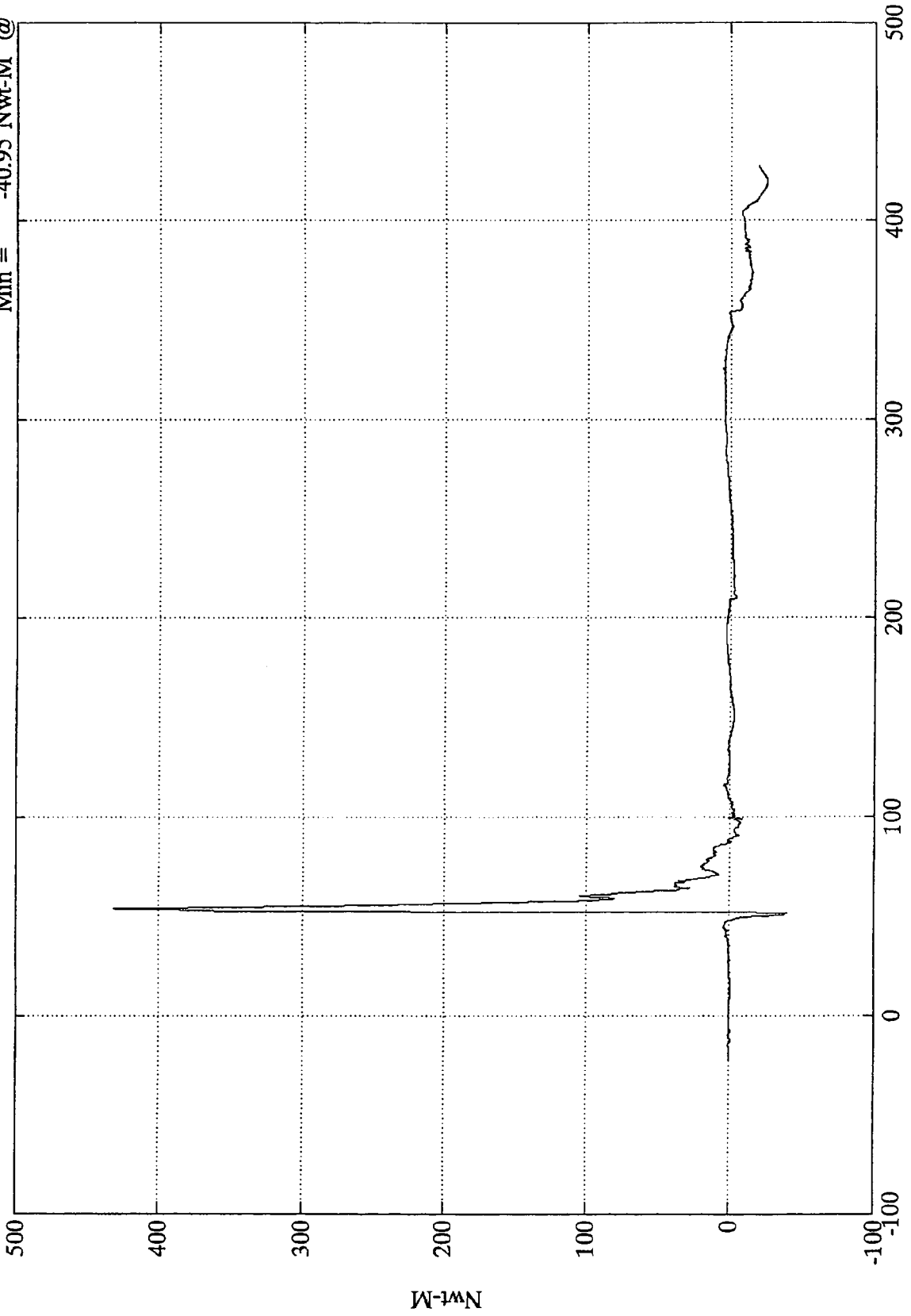
8304-1

SAE Filter Class 600

VTV TEST #1

Max = 431.83 Nwt-M @ 53.75 msec
Min = -40.95 Nwt-M @ 51.60 msec

P2 Lt Lower Tibia Mx



Time (msec)

SAE Filter Class 600

Nwt-M

B-217

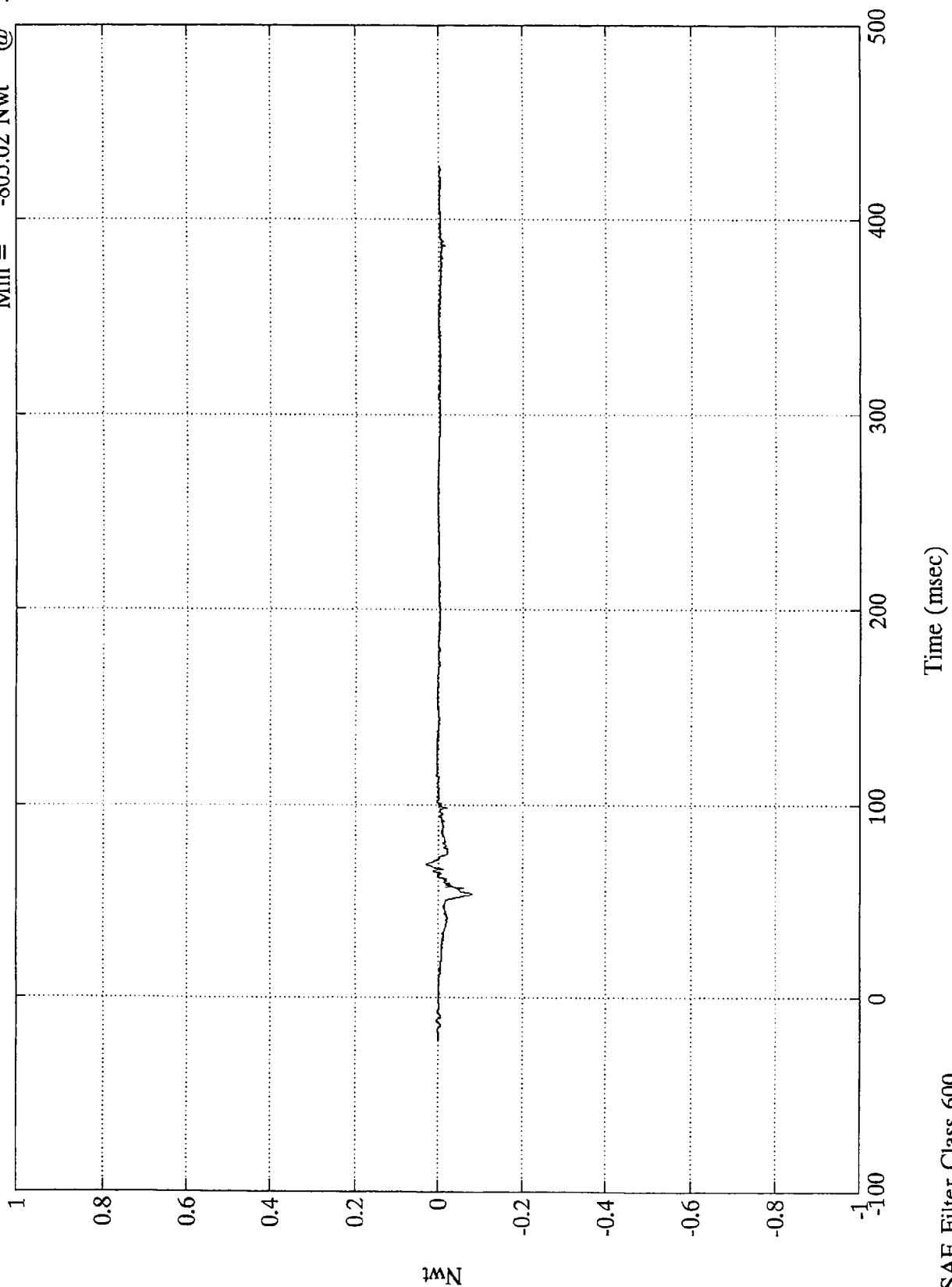
8304-1

VTV TEST #1

$\times 10^4$

P2 Rt Lower Tibia Fy

Max = 306.96 Nwt @ 69.36 msec
Min = -805.02 Nwt @ 53.75 msec



VTV TEST #1

x10⁴

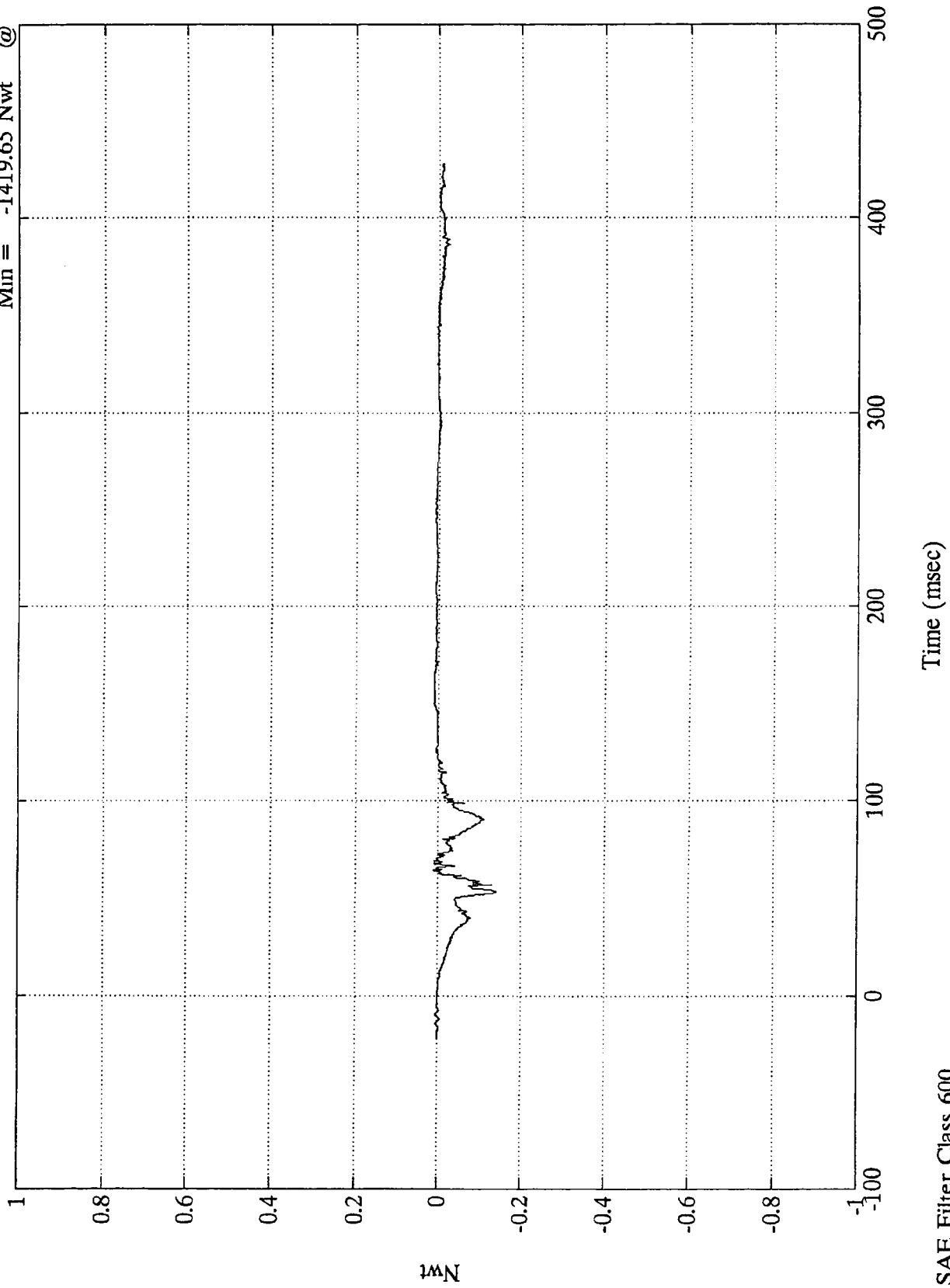
P2 Rt Lower Tibia Fz

Max = 124.20 Nwt

@ 64.56 msec

Min = -1419.65 Nwt

@ 53.40 msec



10N

B-219

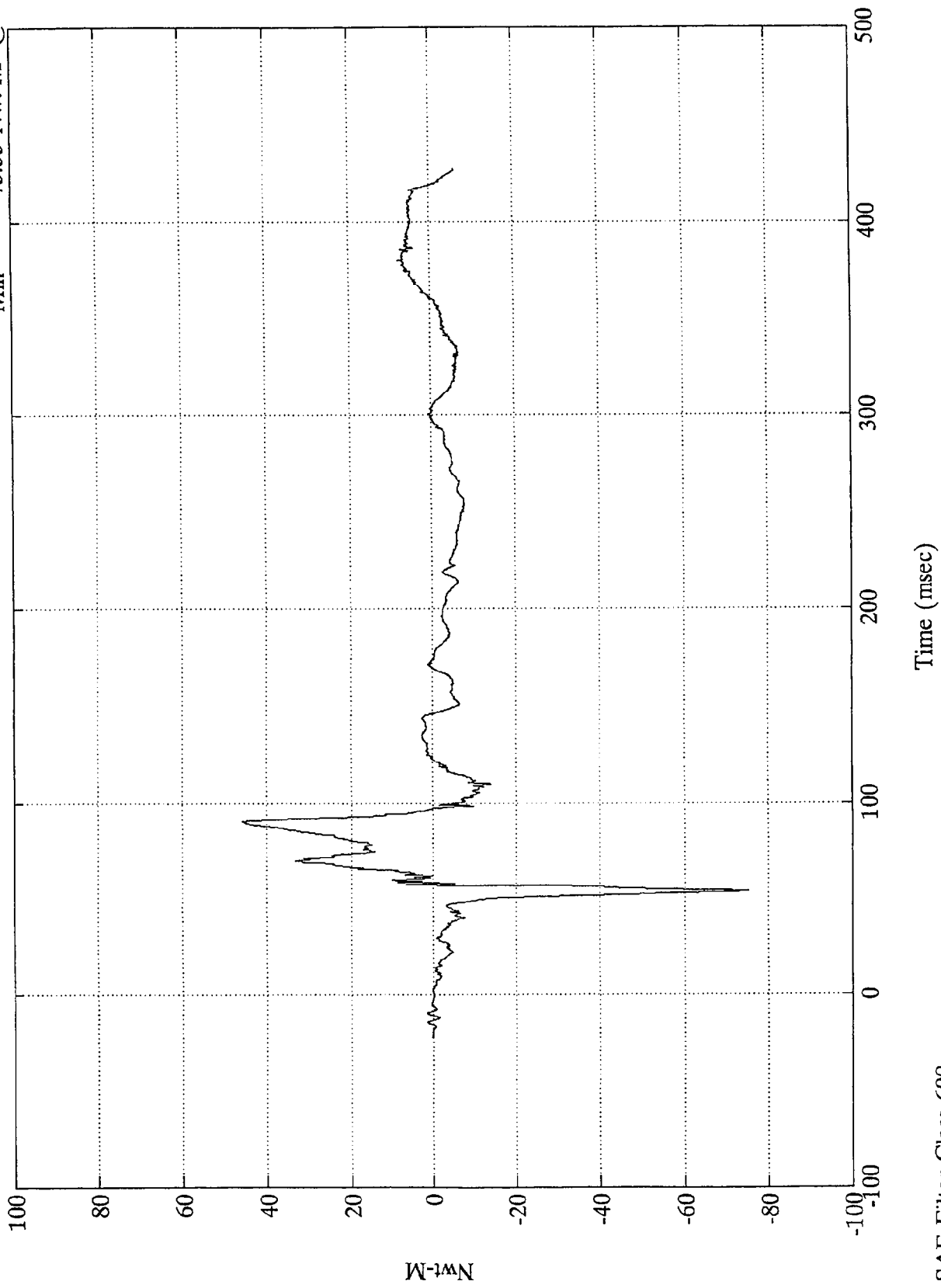
8304-1

SAE Filter Class 600

VTV TEST #1

Max = 45.94 Nwt-M @ 90.84 msec
Min = -75.35 Nwt-M @ 54.00 msec

P2 Rt Lower Tibia Mx



Nwt-M
B-220

SAE Filter Class 600

8304-1

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.

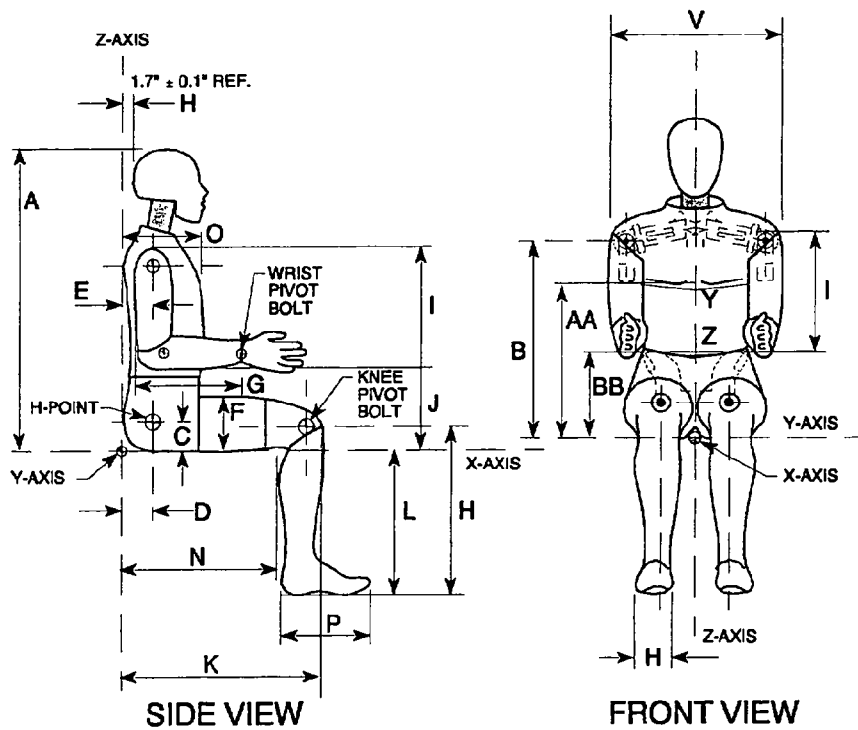
Dummy serial numbers and certification dates are:

<u>Serial No.</u>	<u>Completion Date</u>
061	3-16-95
245	6-15-95

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

Manufacturer: Humanoid

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 : 2/15/95

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN 061 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.5 - 22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	26 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	23.7 KPH
MAXIMUM DEFLECTION	64 - 73 mm	64 mm
MAXIMUM RESISTIVE FORCE	5160 - 5894 NEWTONS	5829 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	71.8 %

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: 061 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21.6 DEG. C
RELATIVE HUMIDITY	10% - 70%	41 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4742 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: 061 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21.6 DEG. C
RELATIVE HUMIDITY	10% - 70%	40 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4790 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	6/95	12/95
ENDEVCO	AF5F7	6/95	12/95
ENDEVCO	AF5E1	6/95	12/95
ENDEVCO	A84J	6/95	12/95
ENDEVCO	A57G	6/95	12/95
ENDEVCO	AE8W7	6/95	12/95
GSE	231	6/95	12/95
GSE	232	6/95	12/95

B. CALIBRATION LABORATORY INSTRUMENTS

1. PENDULUM ACC.

2. TEST PROBE ACCELEROMETER

MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
CEC	A160	6/95	12/95
CEC	A161	6/95	12/95

VEHICLE 1, POSITION 2 - FRONT PASSENGER DUMMY

Manufacturer: Humanoid

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 MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

HEAD DROP TEST

HYBRID III

DATE : 2/21/95

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 245 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	230.7 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	8 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 : 2/23/95

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	AL6C4	6/95	12/95
ENDEVCO	AL553	6/95	12/95
ENDEVCO	AL5M5	6/95	12/95
ENDEVCO	AL511	6/95	12/95
ENDEVCO	AH5N0	6/95	12/95
ENDEVCO	AH5M8	6/95	12/95
GSE	255	6/95	12/95
GSE	420	6/95	12/95

**B. CALIBRATION LABORATORY
INSTRUMENTS**

1. PENDULUM ACC.

**2. TEST PROBE
ACCELEROMETER**

MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
CEC	A160	6/95	12/95
CEC	A161	6/95	12/95