

V2513

CALSPAN REPORT NUMBER:: 8404-3

**VEHICLE-TO-VEHICLE
28.2 kph FRONTAL IMPACT OF A
1993 VOLVO 850 GLT 4-DOOR SEDAN INTO THE
REAR OF A 1986 VOLKSWAGEN GOLF 4-DOOR HATCH BACK**

CALSPAN TEST NUMBER: A109 4-1655

December 5, 1996

CALSPAN SRL CORPORATION
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FINAL REPORT

PREPARED FOR:

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

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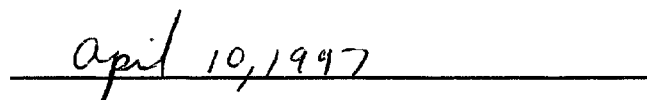
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16. Abstract A 28.2 kph vehicle to vehicle frontal impact test of a 1993 Volvo 850 GLT 4-door sedan into the rear of a 1986 Volkswagen Golf 4-door hatch back was performed at the Calspan SRL Corporation crash facility in Buffalo, New York on December 5, 1996. The 1993 Volvo 850 GLT (Vehicle 1) contained a 5 th percentile Hybrid III dummy in the left front driver seating position and a 6 year old toddler Hybrid III in the right front passenger seating position. The driver and passenger dummies were restrained using the vehicle's driver and passenger airbags only (the active 3-point belt systems were not used). The right front passenger dummy was held in an approximate pre-impact braking position using two 0.041" safety wires. Both wires were intentionally severed within 5 milliseconds of time zero. The vehicle airbag system did not deploy the airbags during the impact, therefore Calspan's onboard timing circuit forced the bags to deploy at 131 msec. The passenger dummy's HIC was 1034 g's, which exceeds the injury criteria set forth in the Laboratory Test Procedure FMVSS 208, Occupant Crash Protection, TP-208-09 dated March 15, 1993. All other injury criteria for the driver and passenger dummies were within that allowed by FMVSS 208.			
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Section 1

PURPOSE AND TEST PROCEDURE

This Vehicle-to-Vehicle impact test is part of the Crashworthiness Testing and Analysis Program sponsored by the Research and Special Programs Administration under Contract No. DTRS57-95-C-00009. The purpose of this Technical Task Directive (TTD 3) is to obtain responses from a 6 year old toddler Anthropomorphic Test Device (ATD) during various vehicle-to-vehicle crashes.

This test was performed using two vehicles, a 1993 Volvo 850 GLT 4-door sedan (Vehicle 1) and a 1986 Volkswagen Golf 4-door hatch back (Vehicle 2). In this test, Vehicle 1 was traveling forward a velocity of 28.2 kph into the rear of Vehicle 2, which was at rest. The vehicles were aligned so the left two-thirds of Vehicle 1's front bumper would impact the rear of Vehicle 2 with both vehicles facing the same direction and their longitudinal centerlines parallel. To ensure that Vehicle 1's front bumper would under-ride Vehicle 2's rear bumper, the rear suspension of Vehicle 2 was blocked up approximately 1.5 inches so that the top surface of Vehicle 1's bumper contacted the bottom surface of Vehicle 2's bumper.

The 1993 Volvo 850 GLT 4-door sedan contained a partially restrained 5th percentile Hybrid III ATD in the left front driver seating position and a partially restrained 6 year old toddler Hybrid III ATD in the right front passenger position. The 1986 Volkswagen Golf 4-door hatch back contained one ballast 50th percentile male ATDs in the driver seating position. The ballast ATD was restrained using the vehicle's 3-point belt system.

Section 2

SUMMARY OF TEST

A vehicle-to-vehicle 28.2 kph frontal impact of a 1993 Volvo 850 GLT 4-door sedan (Vehicle 1) into the rear of a 1986 Volkswagen Golf 4-door hatch back was performed at the Calspan SRL Corporation Crash Test Facility on October 15, 1996. The vehicles were aligned so the left two-thirds of Vehicle 1's front bumper would impact the rear of Vehicle 2 with both vehicles facing the same direction, their longitudinal centerlines parallel, and Vehicle 2 at rest.

Pre- and Post-test still photographs of the vehicles and dummies can be found in Appendix A. The impact event was documented with 1 real time movie camera and 9 high speed movie cameras. Vehicle photographic target locations can be found in Figure 5 and movie camera locations can be found in Figure 12.

A 5th percentile female Anthropomorphic Test Devices (ATD) was placed in the driver seating position and a 6 year old toddler ATD was placed in the right front passenger seating position. The driver ATD was restrained using the vehicle's driver airbag (the 3-point belt system was not used). The right front passenger dummy was held in an approximate pre-impact braking position using two 0.041" diameter safety wires. Both wires were intentionally severed within 5 milliseconds of impact. The right front passenger dummy was restrained during the impact using only the vehicle's passenger airbag.

The driver and right front passenger ATDs were instrumented with head and chest triaxial accelerometer packages; chest displacement potentiometers; and upper neck force and moment transducers packages. The driver ATD also contained left and right femur axial force load cells.

The 45 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 vehicle airbag system did not deploy the airbags during the impact, therefore Calspan's onboard timing circuit forced the bags to deploy at 131 msec. Chalk from the driver ATD's face was transferred to the top portion of the steering wheel rim, upper airbag flap, top left side of the airbag and the center of the airbag. The driver airbag contacted the driver ATD's face, chin and chest during deployment. Chalk from the passenger ATD's forehead was transferred to the windshield during the impact. The windshield contact occurred before airbag deployment. Chalk from the passenger's chin was transferred to the inboard top portion of the airbag flap and chalk from its neck and chest was transferred to the left side and left underside of the airbag. The passenger side airbag contacted the passenger ATD's chin, neck and chest during its deployment.

The driver's (5th female) HIC was 290. The 3 millisecond chest clip was 29.1 g's with -42.8 mm of chest deflection. The 6 year old right front passenger's HIC was 1034. The 3 millisecond chest clip was 16.9 g's with -21.9 mm of chest deflection.

Section 3

VEHICLE ONE AND OCCUPANT INFORMATION

Figure 1

VEHICLE-TO-VEHICLE II PACT LAYOUT

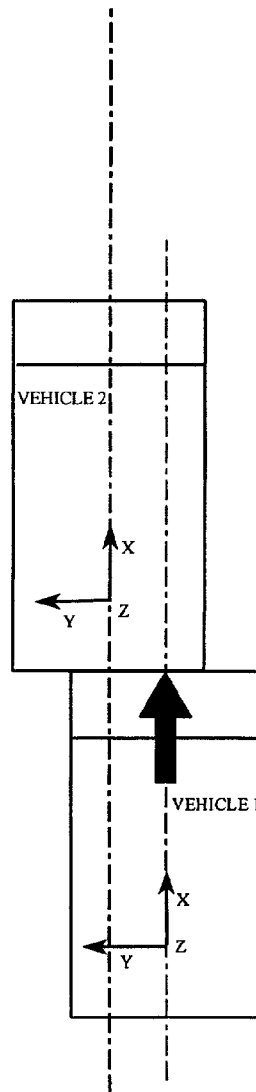


Table 1

VEHICLE 1 TEST PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1993 Volvo 850 GLT 4-door sedan

NHTSA Test No.: - VIN.: YV1LS5504P2074785

Body Color: Dark Green Date of Manufacture: 02/93

Engine: 5 Cylinders; - C.I.D.; 2.4 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; X P/wdo
X Tilt Wheel; X P/seats; X Cruise Control

Type of Occupant Restraint: Driver: Airbag (3-point belts not used)
Passenger: Airbag (3-point belts not used)

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 303 kpa, Rear 303 kpa

Recommended Tire Size: 195/60VR15

Recommended Cold Tire Pressure: Front 248 kpa, Rear 248 kpa

Tires on Vehicle: 195/60VR15 ; Manufacturer: Michelin

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

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

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

GVWR 1877.9 kgs. GAWR: Front 1016.1 kgs. Rear 889.1 kgs.

Table 1

VEHICLE 1 TEST PARAMETER DATA (continued)WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS) = UDW:

Right Front	=	<u>447.3</u>	kgs.	Right Rear	=	<u>273.1</u>	kgs.
Left Front	=	<u>464.5</u>	kgs.	Left Rear	=	<u>279.0</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>911.8</u>	kgs.	(<u>62.3</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>552.1</u>	kgs.	(<u>37.7</u> % of Total Vehicle Weight)			
TOTAL DELIVERED WEIGHT	=	<u>1463.9</u>	kgs.				

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMY:

Right Front	=	<u>456.3</u>	kgs.	Right Rear	=	<u>301.6</u>	kgs.
Left Front	=	<u>478.5</u>	kgs.	Left Rear	=	<u>299.8</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>934.8</u>	kgs.	(<u>60.9</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>601.4</u>	kgs.	(<u>39.1</u> % of Total Vehicle Weight)			
TOTAL TEST WEIGHT	=	<u>1536.2</u>	kgs.				

TARGET TEST WEIGHT FROM COTR * = 1495 kgs.

Vehicle's Wheel Base = 2260 mm

Location of Vehicle's C.G. = 885 mm rearward of front wheel C/L

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

Delivered Attitude:	RF	<u>645</u>	;	LF	<u>638</u>	;	RR	<u>651</u>	;	LR	<u>648</u>
Test Attitude:	RF	<u>643</u>	;	LF	<u>638</u>	;	RR	<u>632</u>	;	LR	<u>627</u>

* The vehicle delivered weight was greater than the total target weight requested by COTR. Therefore, the as tested vehicle weight was the vehicle delivered weight plus the ATDs and instrumentation less the weight of the drained fluids and the trunk lid. No additional ballast weight was added to the vehicle.

Table 1

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

Type of Test:	<u>Vehicle-to-Vehicle Frontal</u>	Impact Angle:	<u>0 degrees, 50% overlap</u>
Date of Test:	<u>December 5, 1996</u>	Time of Test:	<u>10:08</u>
Ambient Temperature:	<u>10.6</u>	°C at impact area	
Temperature in Occupant Compartment:	<u>21.7</u>	°C	
Windshield Molding Temperature:	<u>21.7</u>	°C	
Required Impact Velocity Range:	<u>27.36</u>	to	<u>28.97</u> kph
Impact Velocity:	primary = <u>28.16</u>	kph, secondary =	<u>28.16</u> kph
Distance From Front Bumper to Barrier Face When			
Entering Speed Trap:	<u>132</u>	cm.	
Exiting Speed Trap:	<u>30.5</u>	cm.	

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>		<u>Passenger</u>	
Head	Chin to airbag flap; forehead to upper steering wheel rim		Chin to top of airbag flap left of the flap center; neck to bottom edge of airbag flap left of the flap center	
Chest	Airbag		Bottom of airbag	
Abdomen	Airbag		Airbag	
Left Knee	Left side of knee bolster		Left side of knee bolster	
Right Knee	Right side of knee bolster		Right side of knee bolster	
	<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>-</u>	<u>-</u>
Seat Shift (mm.)	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>

Table 2

VEHICLE 1 DUMMY INJURY CRITERIA VALUES

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DUMMY (1)	-73.3	29.3	-136.3	137.5	-89.9	23.2	-30.2	29.1
DUMMY (2)	-113.3	55.4	197.1	213.4	19.4	12.0	82.7	16.9

	MAXIMUM CHEST DISPLACEMENT (mm)
DUMMY (1)	-42.8
DUMMY (2)	-21.9

	MAXIMUM COMPRESSIVE FEMUR LOAD (NEWTONS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	-1044.7	-1821.5
DUMMY (2)	-	-

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

	MAXIMUM ACCELERATION ("G")			
	HIC	t ₁ (SEC)	t ₂ (SEC)	Average Acceleration t ₁ TO t ₂
DUMMY (1)	290.1	128.76	161.52	37.9
DUMMY (2)	1033.6	138.00	142.92	134.6

*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No. 208

Figure 2

VEHICLE 1 OCCUPANT CLEARANCE DIMENSIONS (mm)

	DRIVER (mm)	PASSENGER
HZ	226	107
HH	310	373
NW	648	198
NSW	259	-
NIP	409	137
NH	259	-
CD	442	76
CS	206	-
KDL	109	41
KDR	124	41
1	348	-
2	50	-
SA	16 deg	16 deg
PA	24 deg	-
ULA	12 deg	-9 deg
LLA	27 deg	105 deg

	DRIVER (mm)	PASSENGER
HR*	312	384
HS*	320	N/A
AD	183	262
HD	198	269
KK	335	216
AA	249	163
DT	21.7 °C	21.7 °C

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

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

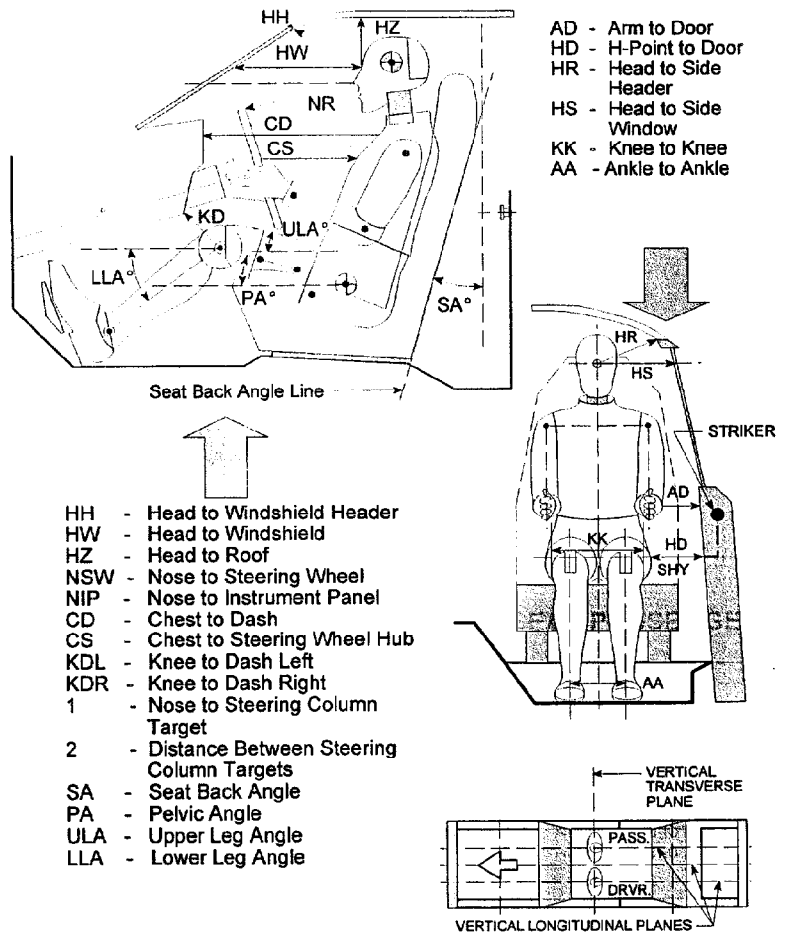
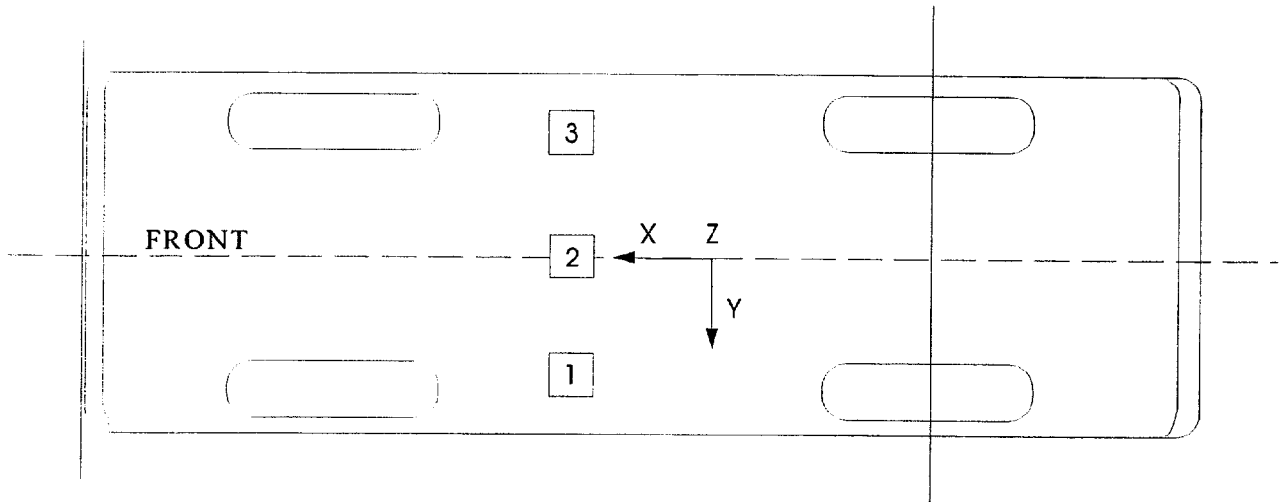


Figure 3

SUMMARY OF VEHICLE 1 ACCELEROMETER DATA

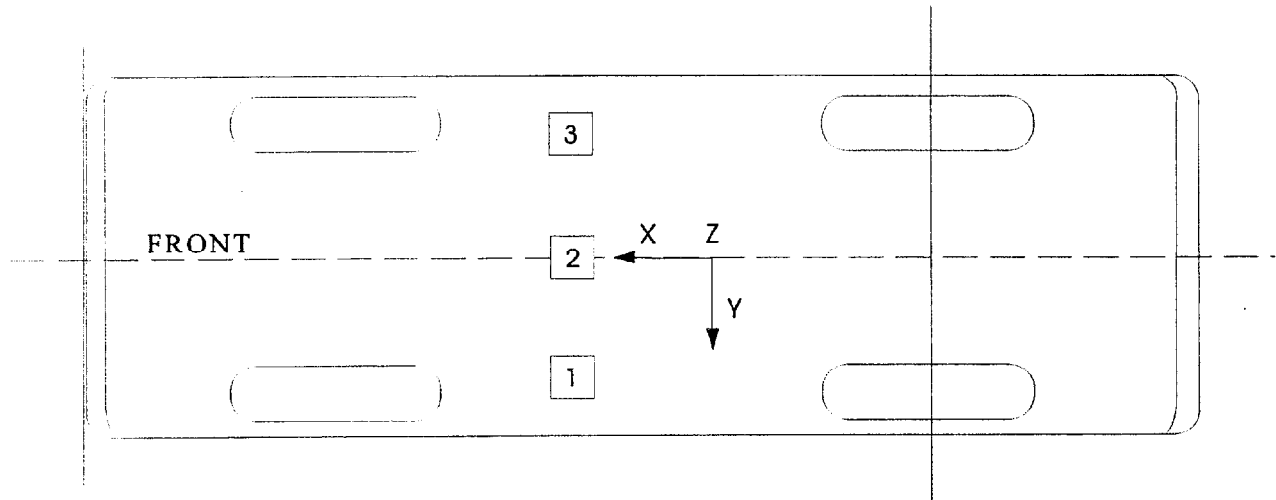


Vehicle: 1993 Volvo 850 GLT 4-door sedan

NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	V1 Left X	Gs	2.5	151.1	-7.1	33.5	60.0
1	V1 Left Y	Gs	1.7	46.4	-1.6	81.2	60.0
2	V1 Center X	Gs	3.1	150.8	-6.9	33.7	60.0
2	V1 Center Y	Gs	1.2	145.7	-1.1	46.3	60.0
2	V1 Center Z	Gs	1.8	16.6	-4.9	211.8	60.0
3	V1 Right X	Gs	2.1	150.7	-6.6	34.0	60.0
3	V1 Right Y	Gs	1.6	103.7	-2.0	57.5	60.0

Figure 4

VEHICLE 1 PRE-TEST ACCELEROMETER LOCATIONS



Test Description: 28.2 kph Frontal Vehicle to Vehicle Impact
 Test Vehicle: 1993 Volvo 850 GLT 4-door sedan
 Reference Plane: X: Vehicle plane at rear bumper, positive forward;
 Y: Vehicle longitudinal centerline, positive to the left; 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	LEFT "B" PILLAR	1628	-439	427	1630	-440	432
2	CENTER BETWEEN "B" PILLARS	1648	0	432	1649	0	435
3	RIGHT "B" PILLAR	1631	488	427	1630	488	430

Figure 5

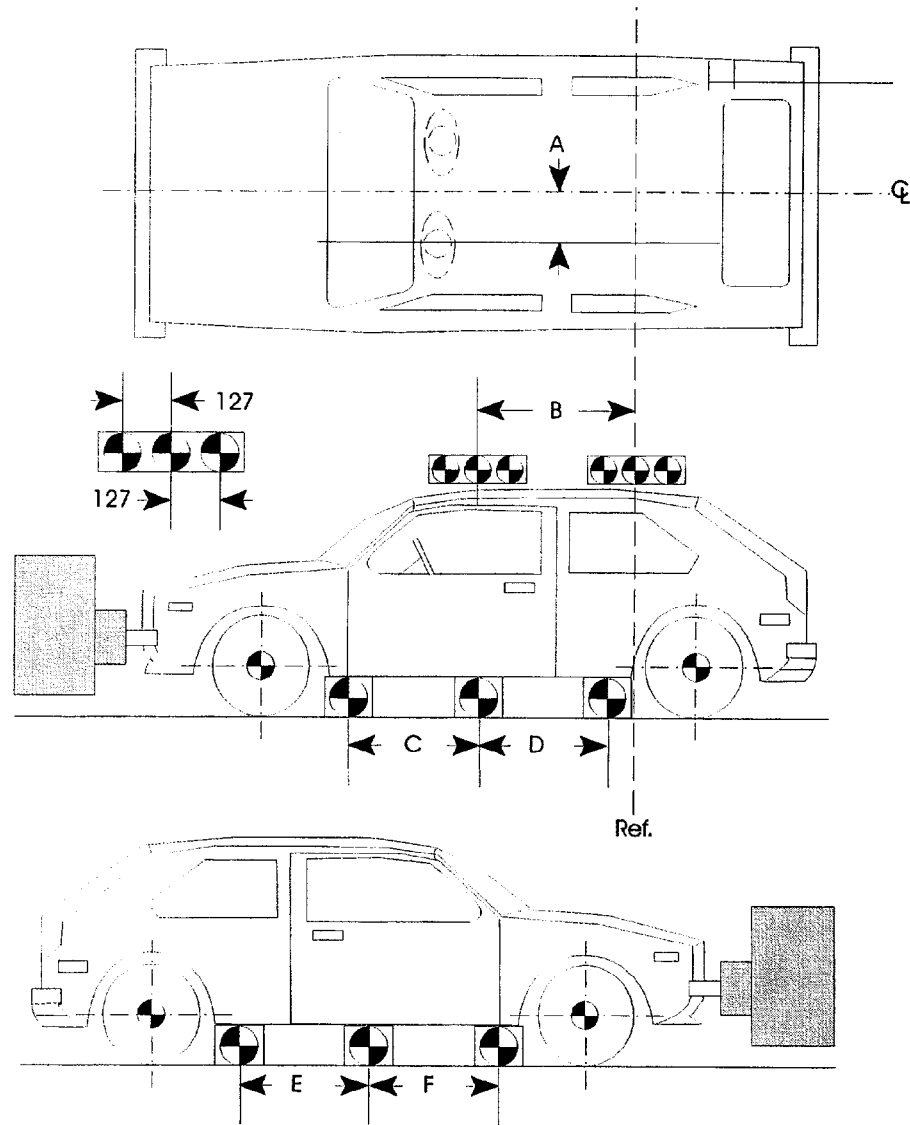
VEHICLE 1 TARGET LOCATIONS

(All dimensions in millimeters)

A = 368

B = 1219
C = 864
D = 864

E = 864
F = 864



Section 4

VEHICLE TWO AND OCCUPANT INFORMATION

Table 3

VEHICLE 2 TEST PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1986 Volkswagen Golf 4-door hatch back

NHTSA Test No.: - VIN.: 1VWFA01701GV056694

Body Color: Blue Date of Manufacture: -

Engine: 4 Cylinders; - C.I.D.; 1.8 Liters; - CC
X Gas; - Diesel; - Turbocharged
- Longitudinal; X Transverse

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

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

Type of Occupant Restraint: Driver: 3-point belts
Passenger: 3-point belts (no passenger)

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 241 kpa, Rear 241 kpa

Recommended Tire Size: P175/70R13

Recommended Cold Tire Pressure: Front 200 kpa, Rear 200 kpa

Tires on Vehicle: P175/70R13; Manufacturer: Firestone

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

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

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

GVWR 1440.2 kgs. GAWR: Front 816.5 kgs. Rear 698.5 kgs.

Table 3

VEHICLE 2 TEST PARAMETER DATA (continued)WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS) = UDW:

Right Front	=	<u>316.6</u>	kgs.	Right Rear	=	<u>190.1</u>	kgs.
Left Front	=	<u>310.3</u>	kgs.	Left Rear	=	<u>197.8</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>626.9</u>	kgs.	(<u>61.8</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>387.9</u>	kgs.	(<u>38.2</u> % of Total Vehicle Weight)			
TOTAL DELIVERED WEIGHT	=	1014.8	kgs.				

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMY:

Right Front	=	<u>337.9</u>	kgs.	Right Rear	=	<u>180.1</u>	kgs.
Left Front	=	<u>349.7</u>	kgs.	Left Rear	=	<u>188.2</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>687.6</u>	kgs.	(<u>65.1</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>368.3</u>	kgs.	(<u>34.9</u> % of Total Vehicle Weight)			
TOTAL TEST WEIGHT	=	<u>1055.9</u>	kgs.				

TARGET TEST WEIGHT PROVIDED BY COTR = 1054.2 kgs.

Vehicle's Wheel Base = 2472 mm

Location of Vehicle's C.G. = 862 mm rearward of front wheel C/L

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

Delivered Attitude:	RF	<u>629</u>	;	LF	<u>622</u>	;	RR	<u>632</u>	;	LR	<u>632</u>
Test Attitude:	RF	<u>612</u>	;	LF	<u>599</u>	;	RR	<u>668</u>	;	LR	<u>660</u>

Table 3

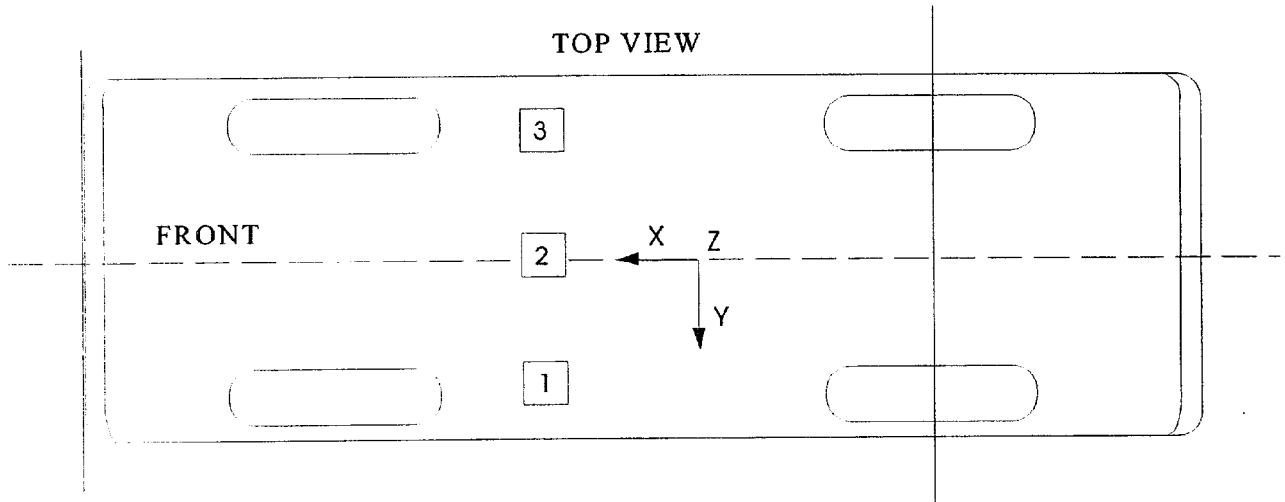
VEHICLE 2 TEST PARAMETER DATA (continued)POST-IMPACT DATA:

Type of Test:	<u>Vehicle-to-Vehicle Frontal</u>	Impact Angle:	<u>0 degrees, 50% overlap</u>
Date of Test:	<u>December 5, 1996</u>	Time of Test:	<u>10:08</u>
Ambient Temperature:	<u>10.6</u>	°C at impact area	

		<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>

Figure 6

SUMMARY OF VEHICLE 2 ACCELEROMETER DATA

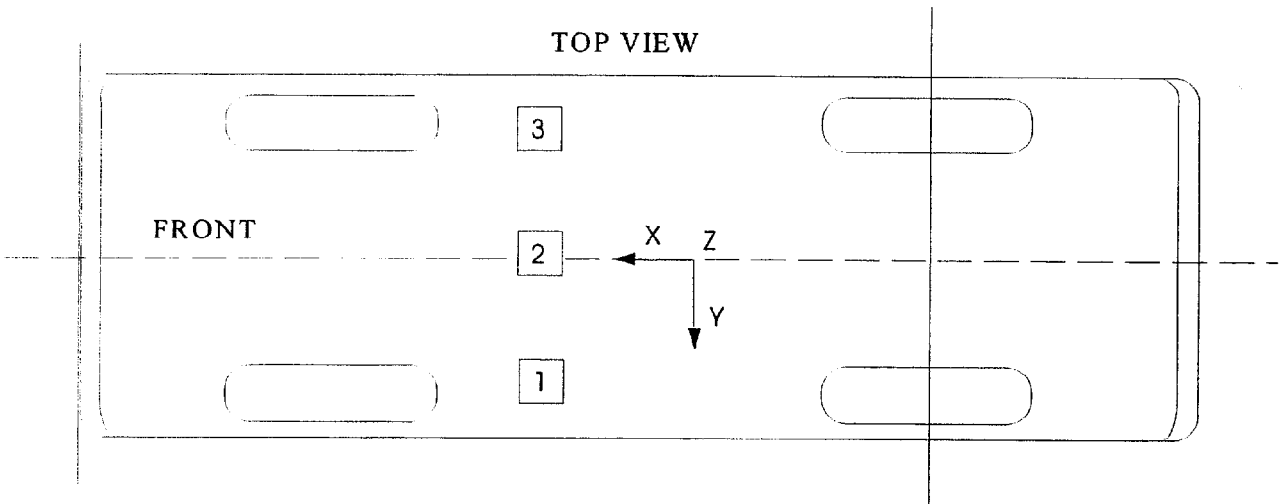


Vehicle: 1986 Volkswagen Golf 4-door hatch back

NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	msec	MINIMUM AMP	msec	FILTER CLASS
1	V2 Left X	Gs	13.5	63.5	-2.0	3.5	60.0
1	V2 Left Y	Gs	2.7	53.9	-1.7	40.1	60.0
2	V2 Center X	Gs	11.3	55.3	-1.8	4.1	60.0
2	V2 Center Y	Gs	3.6	20.4	-3.0	25.1	60.0
2	V2 Center Z	Gs	7.8	34.2	-5.7	38.9	60.0
3	V2 Right X	Gs	9.6	55.0	-0.8	181.8	60.0
3	V2 Right Y	Gs	4.3	20.9	-2.4	5.2	60.0

Figure 7

VEHICLE 2 PRE-TEST ACCELEROMETER LOCATIONS



Test Description: 28.2 kph Frontal Vehicle to Vehicle Impact

Test Vehicle: 1986 Volkswagen Golf 4-door hatch back

Reference Plane: X*: Vehicle plane at front bumper, positive forward;
Y: Vehicle longitudinal centerline, positive to the left; 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	LEFT "B" PILLAR	-3034*	544	178	-3033*	539	178
2	CENTER BETWEEN "B" PILLARS	-3085*	183	267	-3080*	180	266
3	RIGHT "B" PILLAR	-3034*	-544	178	-3028*	-546	174

* Note: Vehicle 2's rear bumper was impacted, therefore the front bumper was used as the measurement reference plane. The pre-impact longitudinal centerline length of Vehicle 2 was 4660 mm.

Figure 8

VEHICLE 2 TARGET LOCATIONS

(All dimensions in millimeters)

A = 340

B = N/A
C = 762
D = 762

E = 762
F = 762

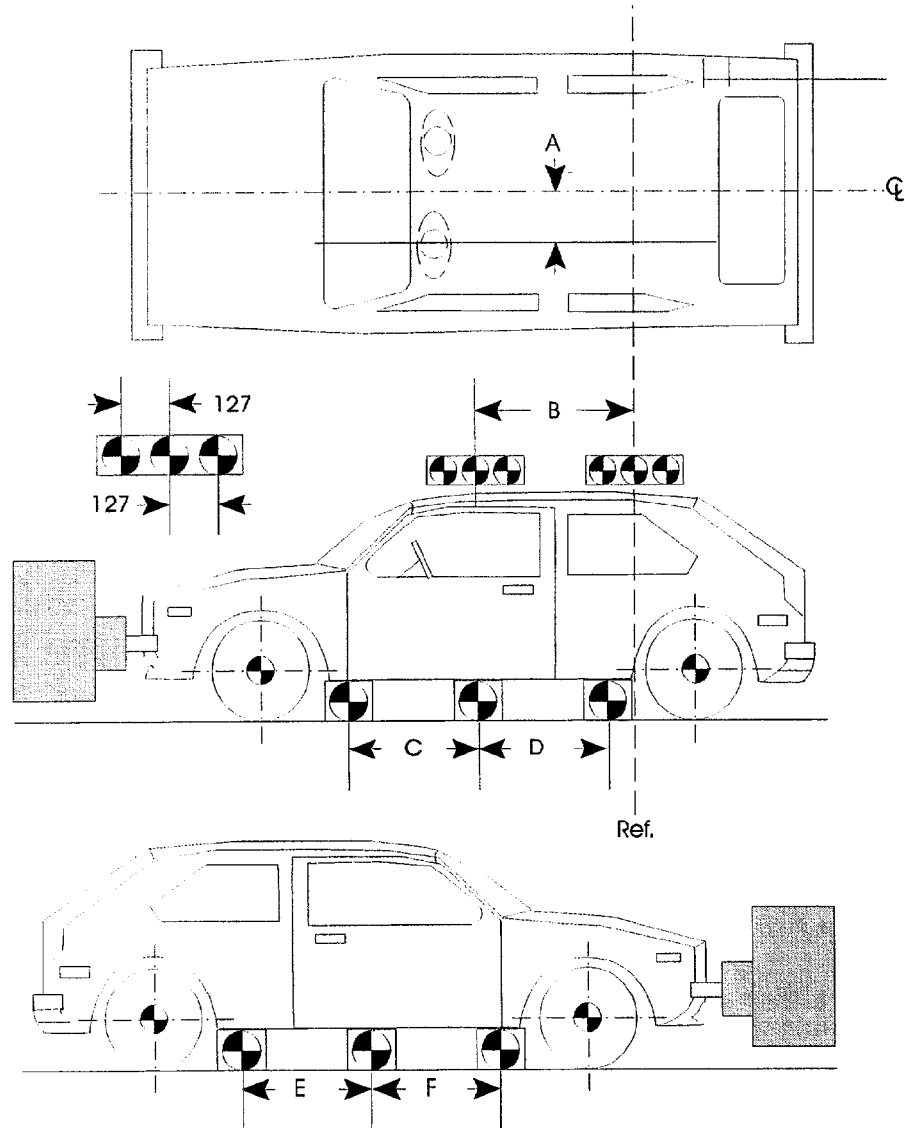


Figure 9

CAMERA POSITIONS FOR VEHICLE-TO-VEHICLE IMPACT TEST

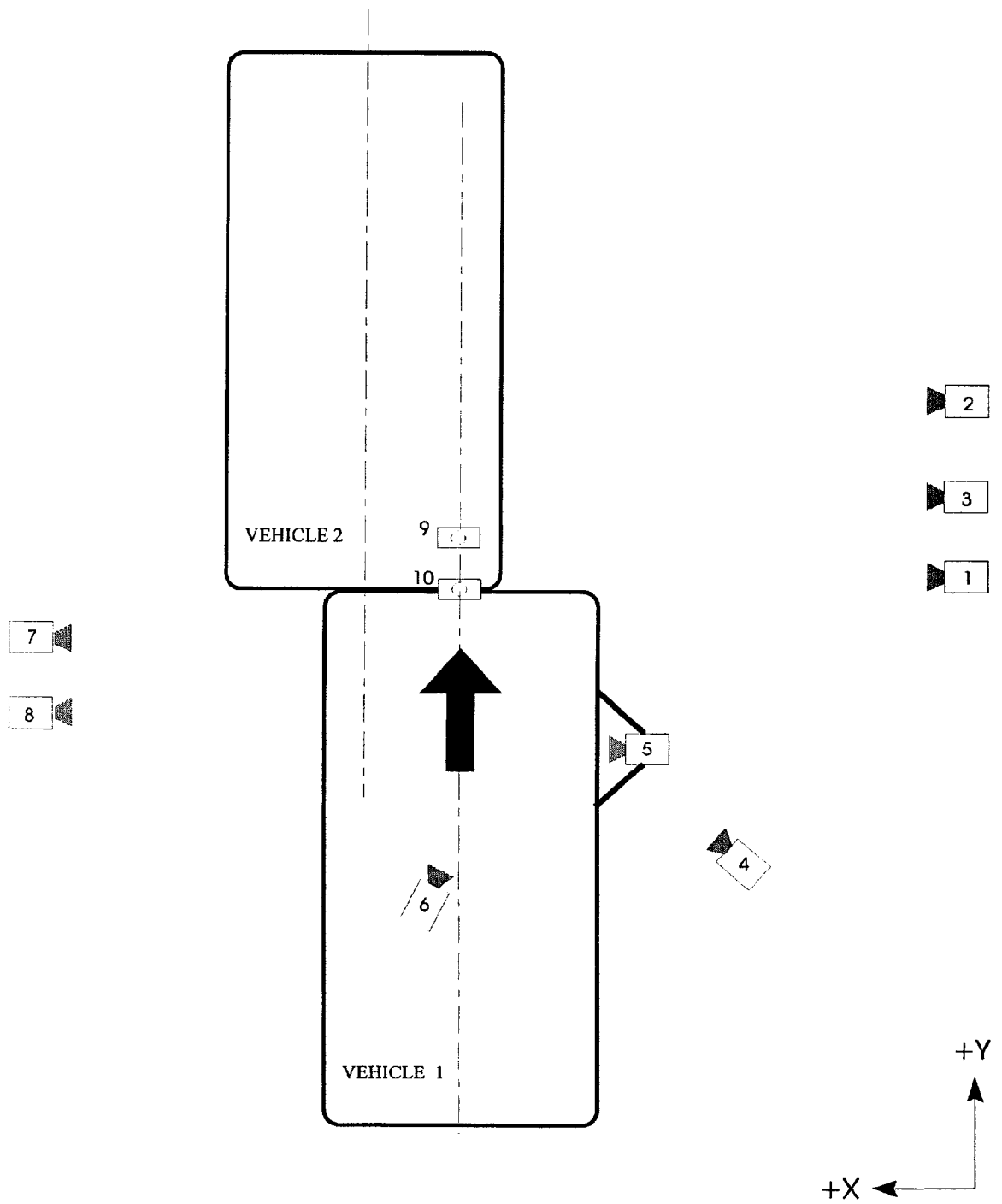


Table 4
HIGH-SPEED CAMERA LOCATIONS

Test No. A109-4-1655 Vehicle: 1993 Volvo 850 GLT 4-door sedan, 1986 Volkswagen Golf 4-door hatch back

CAMERA LOCATION	VIEW	CAMERA POSITIONS (mm)*			ANGLE** (deg)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	-	-	-	-	-	24
2	Overall Right Side View	-8992	1778	1143	-2	13	560
3	Right Impact Point View	-11735	940	1130	-3	35	560
4	Right Passenger and Interior View	-3861	-2692	1930	-16	13	560
5	Vehicle 1 Closeup Passenger Side View	-	-	-	-	8	520
6	Vehicle 1 Closeup Passenger Rear View	-	-	-	-	8	770
7	Overall Left Side View	8738	-50	1143	-1	13	530
8	Left Driver View	9144	-508	1092	-2	25	540
9	Overhead Overall View	305	660	9805	-90	13	850
10	Overhead Closeup View	305	356	9805	-90	25	550

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

Y = film plane to impact location, positive forward

Z = film plane to ground

** = referenced to horizontal plane

APPENDIX A

PHOTOGRAPHS: OVERALL TEST SETUP

APPENDIX A

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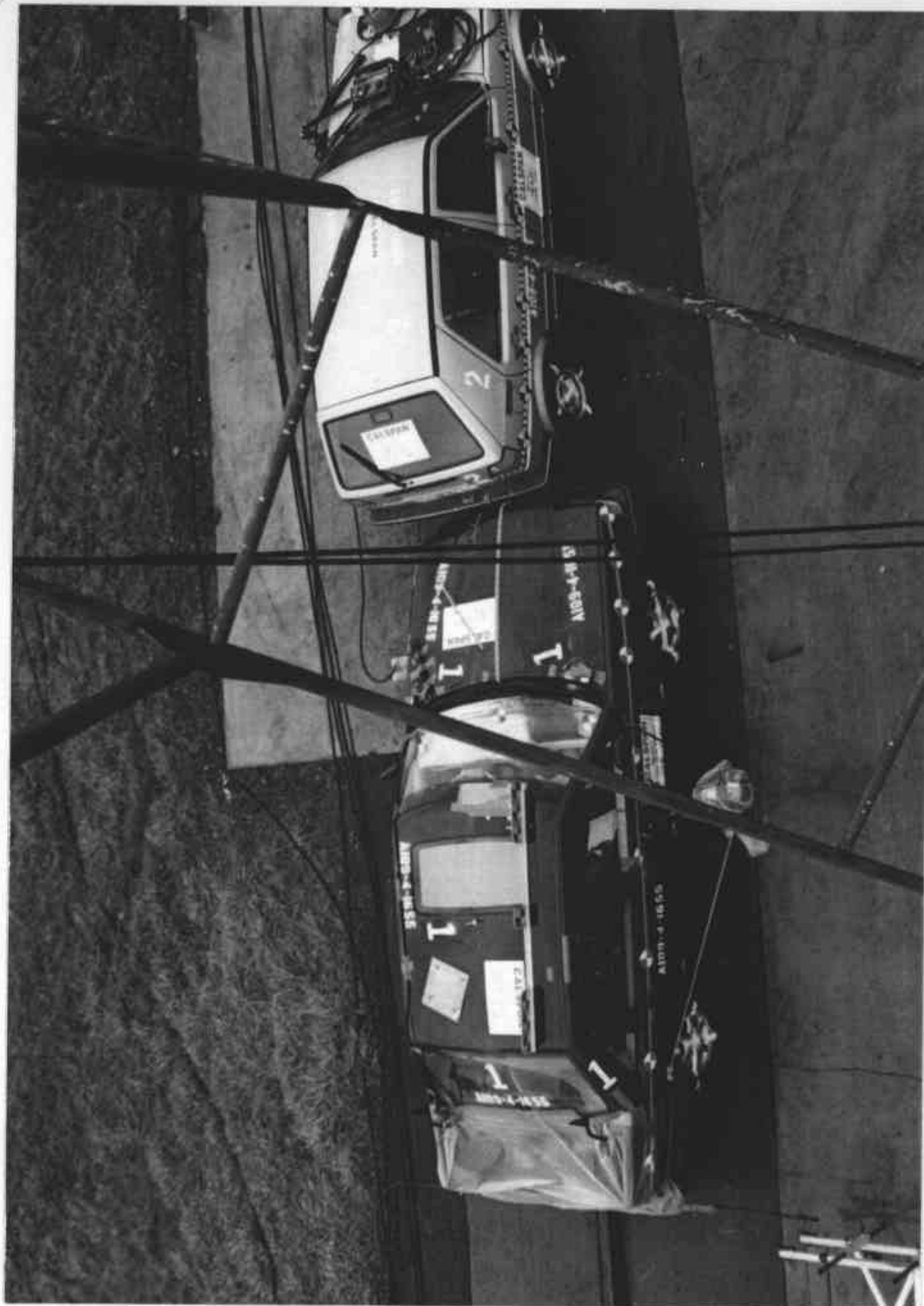


Figure A-1 PRE-TEST OVERHEAD VIEW

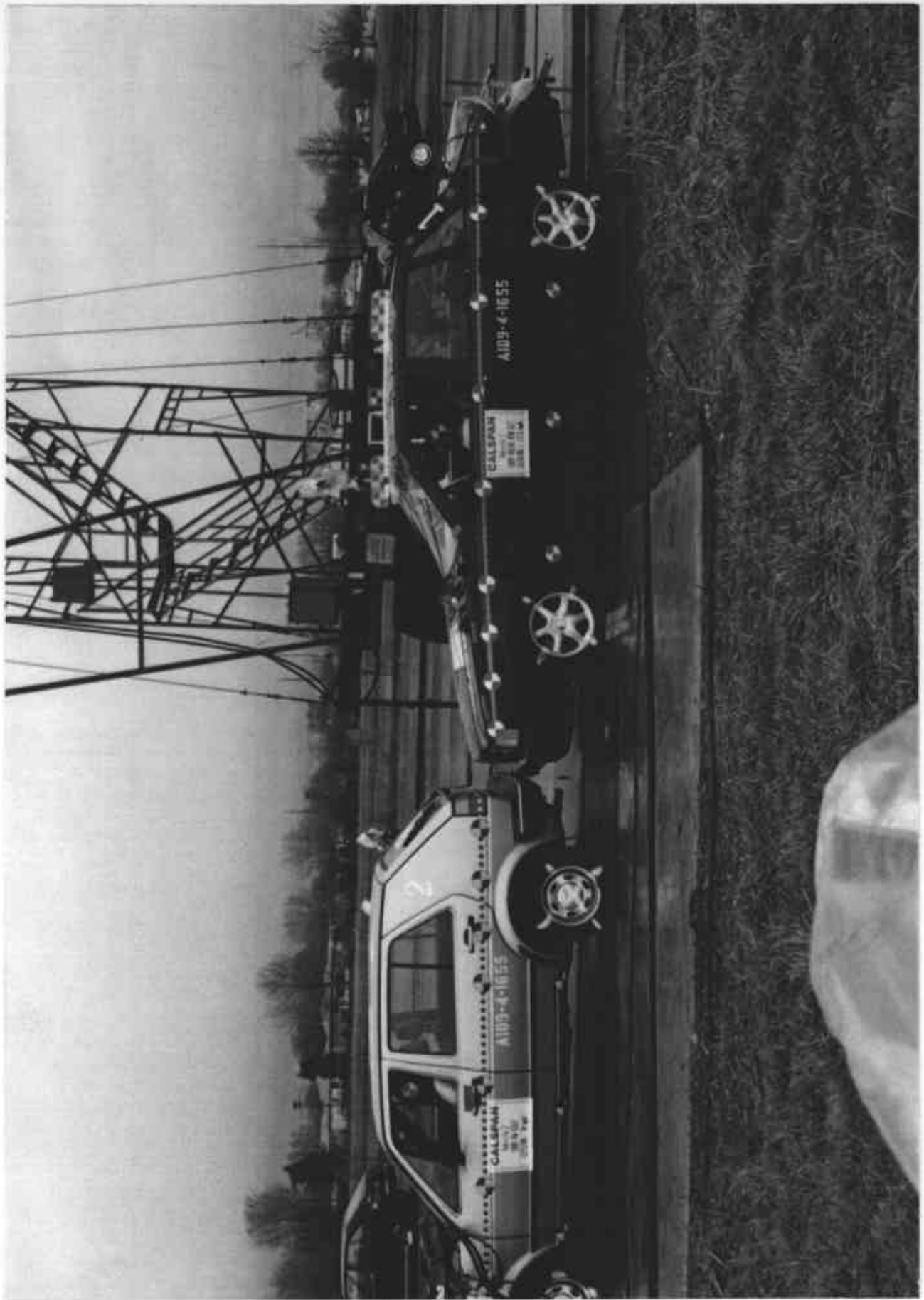


Figure A-2 PRE-TEST OVERALL LEFT SIDE VIEW



Figure A-3 PRE-TEST OVERALL RIGHT SIDE VIEW

Figure A-4 IMPACT PHOTO



APPENDIX B

PHOTOGRAPHS: VEHICLE 1 AND OCCUPANT

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Figure B-1 PRE-TEST FRONT VIEW

Figure B-2 POST-TEST FRONT VIEW



Figure B-3 PRE-TEST FRONT RIGHT THREE QUARTER VIEW

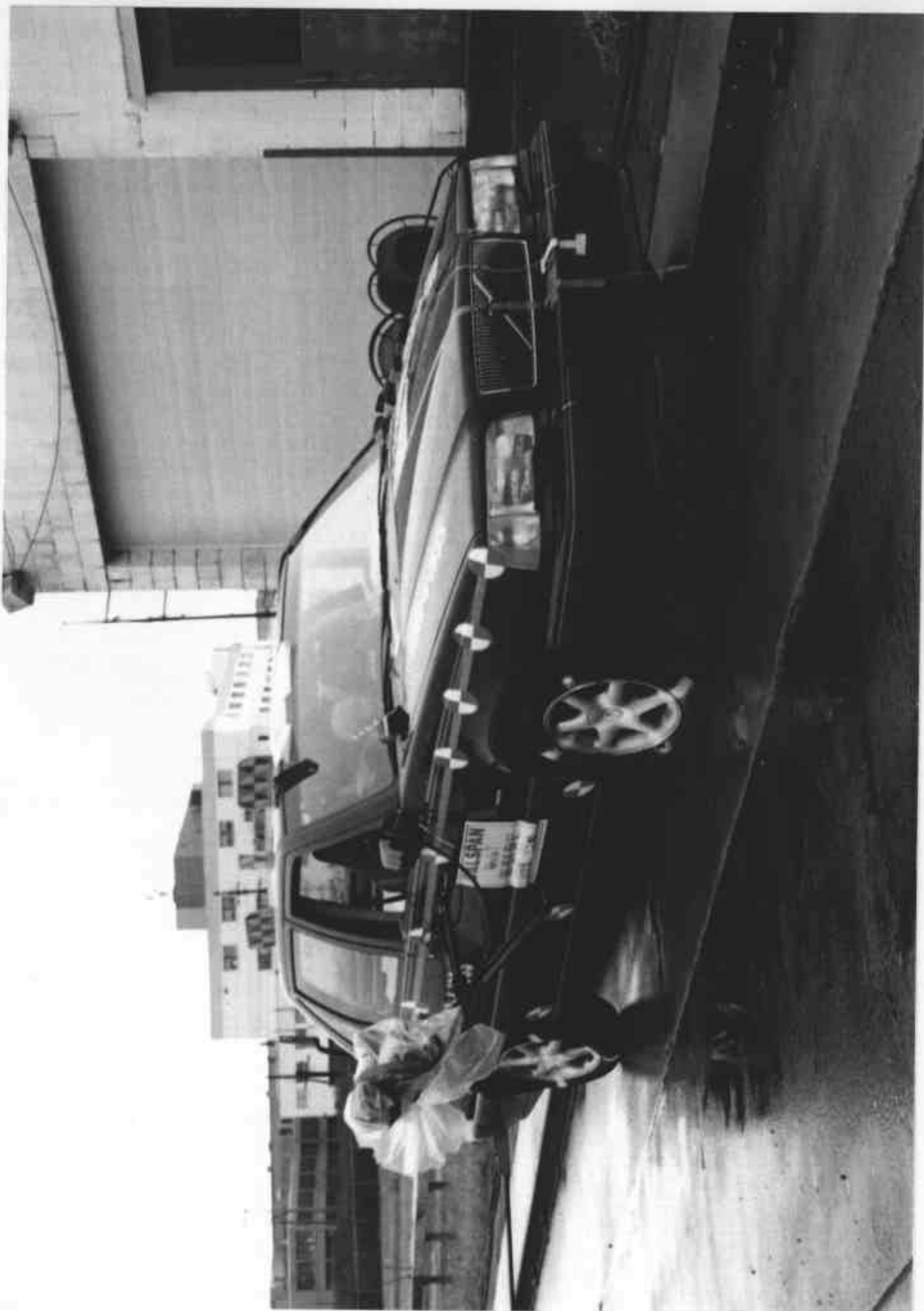




Figure B-4 POST-TEST FRONT RIGHT THREE QUARTER VIEW



Figure B-5 PRE-TEST RIGHT SIDE VIEW



Figure B-6 POST-TEST RIGHT SIDE VIEW



Figure B-7 PRE-TEST REAR RIGHT THREE QUARTER VIEW

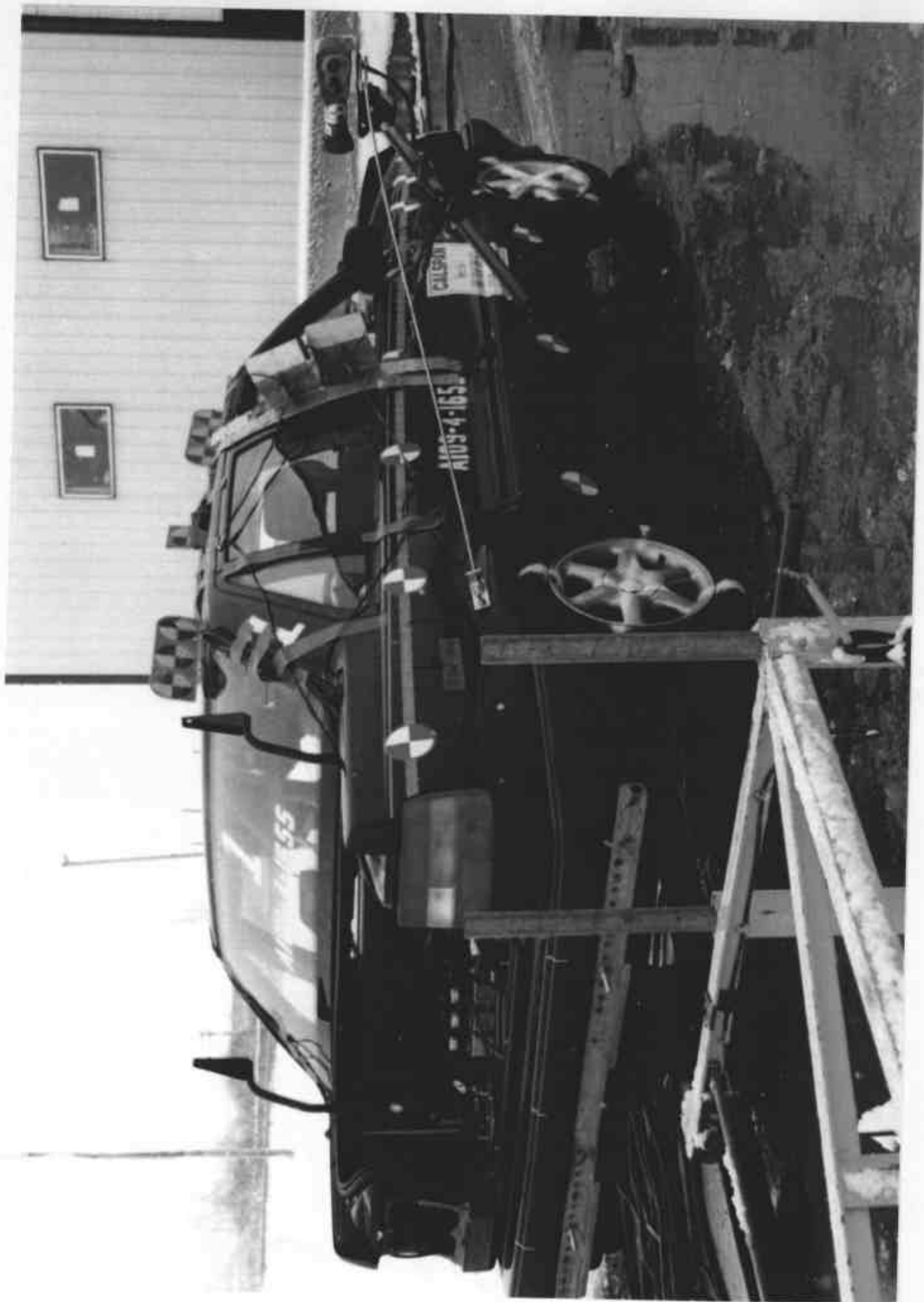


Figure B-8 POST-TEST REAR RIGHT THREE QUARTER VIEW



Figure B-9 PRE-TEST REAR VIEW

Figure B-10 POST-TEST REAR VIEW





Figure B-11 PRE-TEST REAR LEFT THREE QUARTER VIEW



Figure B-12 POST-TEST REAR LEFT THREE QUARTER VIEW



Figure B-13 PRE-TEST LEFT SIDE VIEW



B-16

8404-3

Figure B-14 POST-TEST LEFT SIDE VIEW



Figure B-15 PRE-TEST FRONT LEFT THREE QUARTER VIEW



Figure B-16 POST-TEST FRONT LEFT THREE QUARTER VIEW



Figure B-17 PRE-TEST WINDSHIELD VIEW



Figure B-18 POST-TEST WINDSHIELD VIEW



Figure B-19 PRE-TEST DRIVER SIDE VIEW



Figure B-20 POST-TEST DRIVER SIDE VIEW



Figure B-21 PRE-TEST DRIVER AND INTERIOR VIEW
B-23

8404-3



Figure B-22 POST-TEST DRIVER AND INTERIOR VIEW
B-24

8404-3



Figure B-23 PRE-TEST DRIVER INSIDE VIEW



Figure B-24 POST-TEST DRIVER INSIDE VIEW



Figure B-25 PRE-TEST PASSENGER SIDE VIEW



Figure B-26 POST-TEST PASSENGER SIDE VIEW

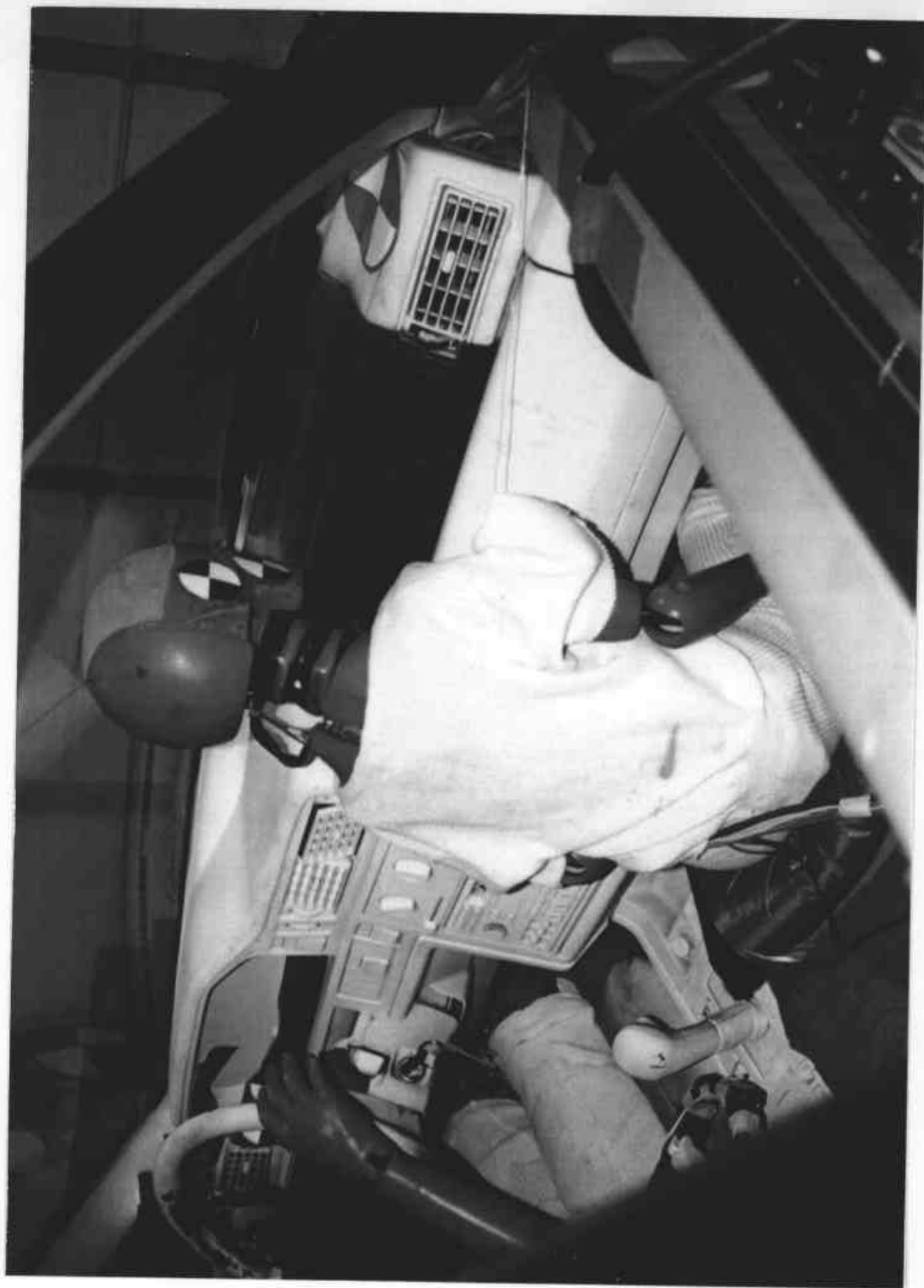


Figure B-27 PRE-TEST PASSENGER AND INTERIOR VIEW



Figure B-28 POST-TEST PASSENGER AND INTERIOR VIEW (airbag moved to reveal occupant)



Figure B-29 PRE-TEST PASSENGER INSIDE VIEW

Figure B-30 POST-TEST PASSENGER INSIDE VIEW





Figure B-31 POST-TEST DRIVER FACE/CHEST CONTACT POINT



Figure B-32 POST-TEST DRIVER AIRBAG FLAP CONTACT POINT



Figure B-33 POST-TEST PASSENGER FACE/CHEST CONTACT POINT



Figure B-34 POST-TEST PASSENGER AIRBAG FLAP CONTACT POINT

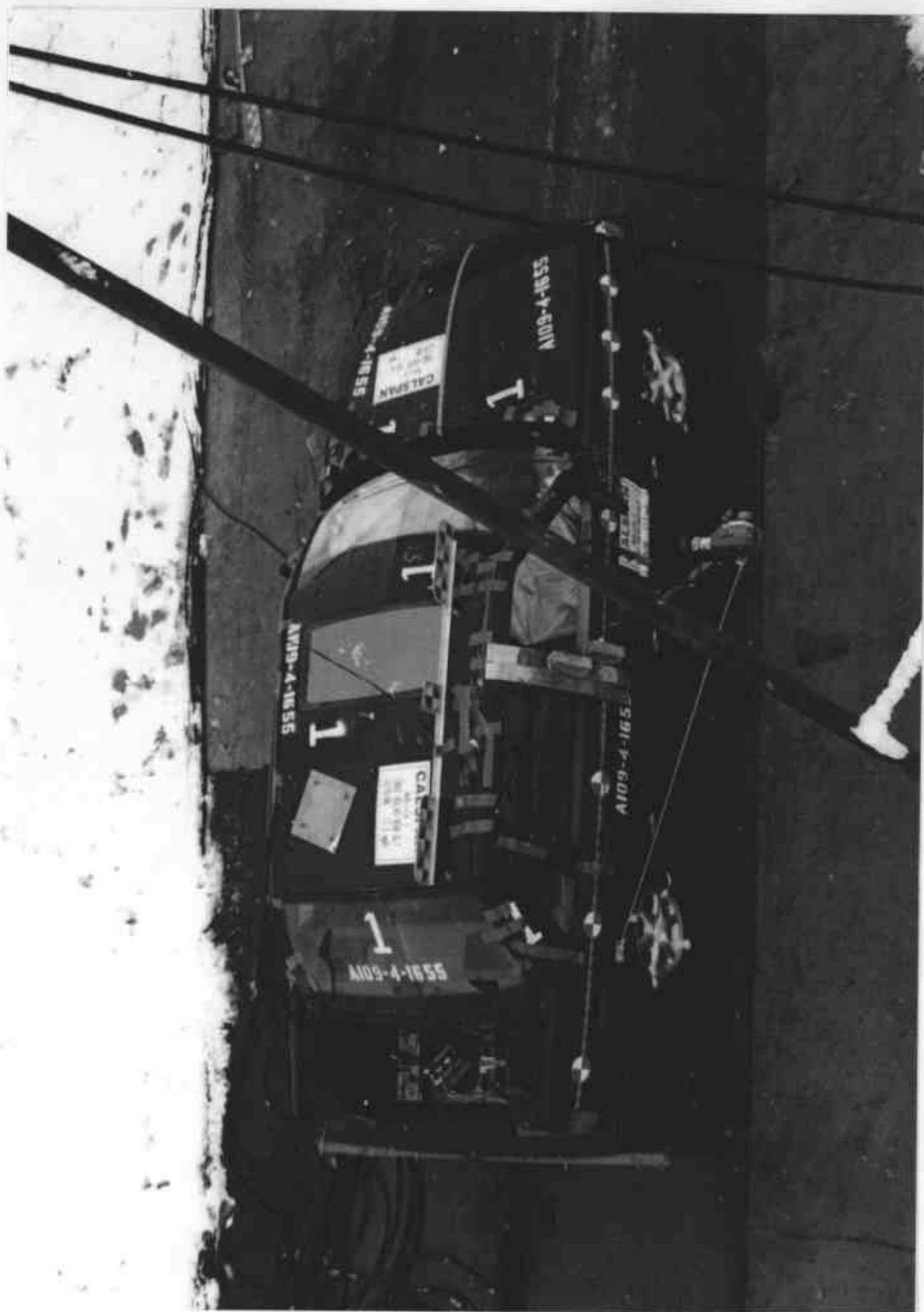


Figure B-35 POST-TEST TOP VIEW

MFD BY VOLVO GOTHENBURG SWEDEN

DATE	GVWR	GAW FRONT	GAW REAR
02/93	4140	2240	1960 LB

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY BUMPER AND THEFT PROTECTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE

VIN YV1LS5504P2074785 PASS CAR

3045896



T VOLVO 3514635

Figure B-36 CERTIFICATION PLACARD

APPENDIX C
PHOTOGRAPHS: VEHICLE 2

APPENDIX C

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C-15	PRE-TEST FRONT LEFT THREE QUARTER VIEW	C-17
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Figure C-1 PRE-TEST FRONT VIEW



Figure C-2 POST-TEST FRONT VIEW



Figure C-3 PRE-TEST FRONT RIGHT THREE QUARTER VIEW



Figure C-4 POST-TEST FRONT RIGHT THREE QUARTER VIEW



Figure C-5 PRE-TEST RIGHT SIDE VIEW



Figure C-6 POST-TEST RIGHT SIDE VIEW



Figure C-7 PRE-TEST REAR RIGHT THREE QUARTER VIEW



Figure C-8 POST-TEST REAR RIGHT THREE QUARTER VIEW



Figure C-9 PRE-TEST REAR VIEW



Figure C-10 POST-TEST REAR VIEW



Figure C-11 PRE-TEST REAR LEFT THREE QUARTER VIEW



Figure C-12 POST-TEST REAR LEFT THREE QUARTER VIEW



Figure C-13 PRE-TEST LEFT SIDE VIEW



Figure C-14 POST-TEST LEFT SIDE VIEW



Figure C-15 PRE-TEST FRONT LEFT THREE QUARTER VIEW



Figure C-16 POST-TEST FRONT LEFT THREE QUARTER VIEW

APPENDIX D

VEHICLE AND DUMMY RESPONSE DATA

Key: V1 - Vehicle 1
V2 - Vehicle 2
P1 - Driver Side Dummy (5th female)
P2 - Right Front Passenger Side Dummy (6 year old)

FACILITY: track
RUN #: 1655
SERIES #: 1

TEST DATE: 09 Dec 1996
TEST TIME: 10:07:42
BOARD: a

TITLE: VTV TEST #3

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	msec	MINIMUM AMP	msec	FILTER CLASS
1	P1 Head X	Gs	32.2	196.4	-73.3	141.1	1000.0
2	P1 Head Y	Gs	29.3	139.6	-24.5	137.4	1000.0
3	P1 Head Z	Gs	71.2	137.0	-136.3	138.1	1000.0
4	P1 Left Femur	Nwt	888.5	418.9	-1821.5	87.2	600.0
5	P1 Chest X	Gs	11.5	229.7	-89.9	137.5	180.0
6	P1 Chest Y	Gs	23.2	138.4	-21.0	139.8	180.0
7	P1 Chest Z	Gs	11.8	138.2	-30.2	140.8	180.0
8	P1 Right Femur	Nwt	474.3	418.9	-1044.7	89.2	600.0
9	P1 Upper Neck Fx	Nwt	3105.9	152.5	-127.1	208.0	1000.0
10	P1 Upper Neck Fy	Nwt	186.0	163.8	-282.0	139.4	1000.0
11	P1 Upper Neck Fz	Nwt	5395.6	138.0	-315.7	182.8	1000.0
12	P1 Chest Displacement	mm	.0	51.0	-42.8	140.4	180.0
13	P1 Upper Neck Mx	Nwt-M	4.0	207.5	-25.4	159.5	600.0
14	P1 Upper Neck My	Nwt-M	7.5	128.0	-149.9	141.6	600.0
15	P1 Upper Neck Mz	Nwt-M	21.4	156.7	-10.7	237.8	600.0
16	P2 Chest Displacement	mm	.6	73.2	-21.9	111.6	180.0
17	P1 Head Resultant	Gs	137.5	138.1	.1	64.4	1000.0
18	P1 Chest Resultant	Gs	90.8	137.5	.0	-18.7	180.0
19	P1 Upper Neck Force Res	Nwt	5520.0	138.0	4.8	342.0	1000.0
20	P1 Upper Neck Moment Res	Nwt-M	151.1	141.6	.0	-20.4	600.0

V2 36 ms Fixed Duration HIC SUMMARY: P1 Head Resultant

hic: 290.06
t1 = 128.760 msec
t2 = 161.520 msec
Average G's Over Hic Duration = 37.92

CLIP V2.1 SUMMARY: P1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 29.114 G's
Tstart = 136.4812 ms
Tend = 141.6706 ms
CSI = 139.494

FACILITY: track
 RUN #: 1655
 SERIES #: 1

TEST DATE: 09 Dec 1996
 TEST TIME: 10:07:42
 BOARD: b

TITLE: VTV TEST #3

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	P2 Head X	Gs	9.4	348.5	-113.3	141.2	1000.0
2	P2 Head Y	Gs	55.4	142.8	-45.1	139.7	1000.0
3	P2 Head Z	Gs	197.1	139.3	-85.6	141.4	1000.0
4	P2 Head Z(R)	Gs	110.9	144.2	-138.2	139.3	1000.0
5	P2 Chest X	Gs	19.4	141.8	-12.5	154.2	180.0
6	P2 Chest Y	Gs	12.0	171.0	-8.7	143.4	180.0
7	P2 Chest Z	Gs	82.7	139.7	-21.3	143.9	180.0
8	V1 Left X	Gs	2.5	151.1	-7.1	33.5	60.0
9	P2 Upper Neck Fx	Nwt	4511.5	142.1	-268.3	76.3	1000.0
10	P2 Upper Neck Fy	Nwt	199.7	146.6	-671.9	142.1	1000.0
11	P2 Upper Neck Fz	Nwt	6891.7	141.2	-875.7	64.2	1000.0
12	V1 Left Y	Gs	1.7	46.4	-1.6	81.2	60.0
13	P2 Upper Neck Mx	Nwt-M	16.7	177.5	-71.8	142.3	600.0
14	P2 Upper Neck My	Nwt-M	10.6	250.2	-210.4	142.4	600.0
15	P2 Upper Neck Mz	Nwt-M	19.8	142.6	-23.0	173.9	600.0
16	V1 Center X	Gs	3.1	150.8	-6.9	33.7	60.0
17	P2 Head Resultant	Gs	213.4	139.2	.1	-18.8	1000.0
18	P2 Chest Resultant	Gs	82.9	139.7	.0	43.1	180.0
19	P2 Upper Neck Force Res	Nwt	8011.5	141.4	.5	57.2	1000.0
20	P2 Upper Neck Moment Res	Nwt-M	223.0	142.4	.0	8.4	600.0

V2 36 ms Fixed Duration HIC SUMMARY: P2 Head Resultant

hic: 1033.62
 t1 = 138.000 msec
 t2 = 142.920 msec
 Average G's Over Hic Duration = 134.57

CLIP V2.1 SUMMARY: P2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 16.928 G's
 Tstart = 170.1455 ms
 Tend = 173.1455 ms
 CSI = 131.260

FACILITY: track
RUN #: 1655
SERIES #: 1

TEST DATE: 09 Dec 1996
TEST TIME: 10:07:42
BOARD: c

TITLE: VTV TEST #3

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	msec	MINIMUM AMP	msec	FILTER CLASS
1	V1 Center Y	Gs	1.2	145.7	-1.1	46.3	60.0
2	V1 Center Z	Gs	1.8	16.6	-4.9	211.8	60.0
3	V1 Right X	Gs	2.1	150.7	-6.6	34.0	60.0
4	V1 Right Y	Gs	1.6	103.7	-2.0	57.5	60.0
5	Timer Squib Out	Non	10.1	154.4	-.1	106.4	1000.0
6	Vehicle Squib Out	Non	10.0	427.3	-.1	106.4	1000.0
7	V2 Left X	Gs	13.5	63.5	-2.0	3.5	60.0
8	V2 Left Y	Gs	2.7	53.9	-1.7	40.1	60.0
9	V2 Center X	Gs	11.3	55.3	-1.8	4.1	60.0
10	V2 Center Y	Gs	3.6	20.4	-3.0	25.1	60.0
11	V2 Center Z	Gs	7.8	34.2	-5.7	38.9	60.0
12	V2 Right X	Gs	9.6	55.0	-.8	181.8	60.0
13	V2 Right Y	Gs	4.3	20.9	-2.4	5.2	60.0

TEST NO. A109-4-1655

VEHICLE DATA

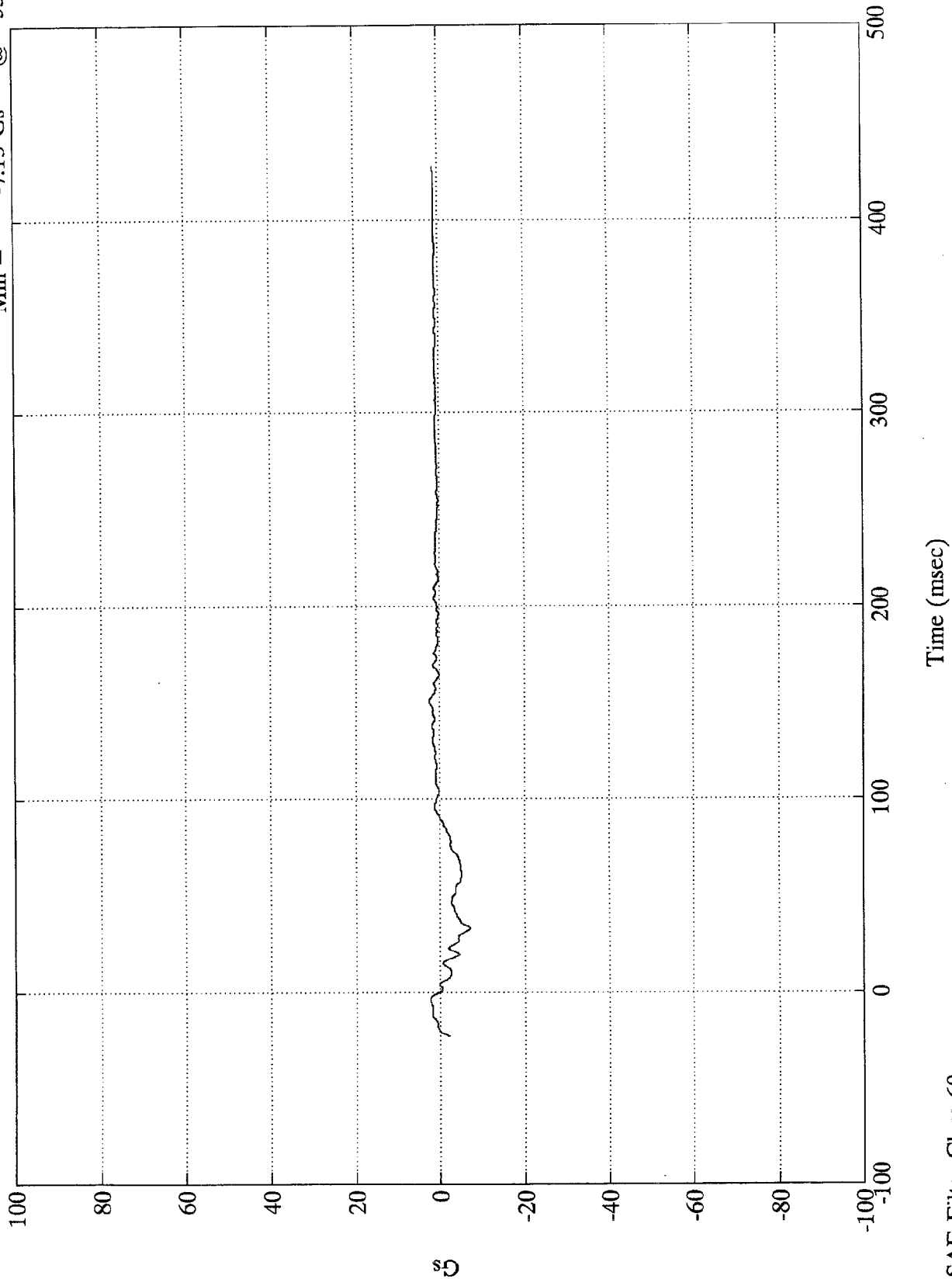
CHANNEL
Vehicle Data
Integrations

SAE FILTER CHANNEL CLASS
60
180

VTV TEST #3

Max = 2.53 Gs @ 151.08 msec
Min = -7.13 Gs @ 33.47 msec

V1 Left X

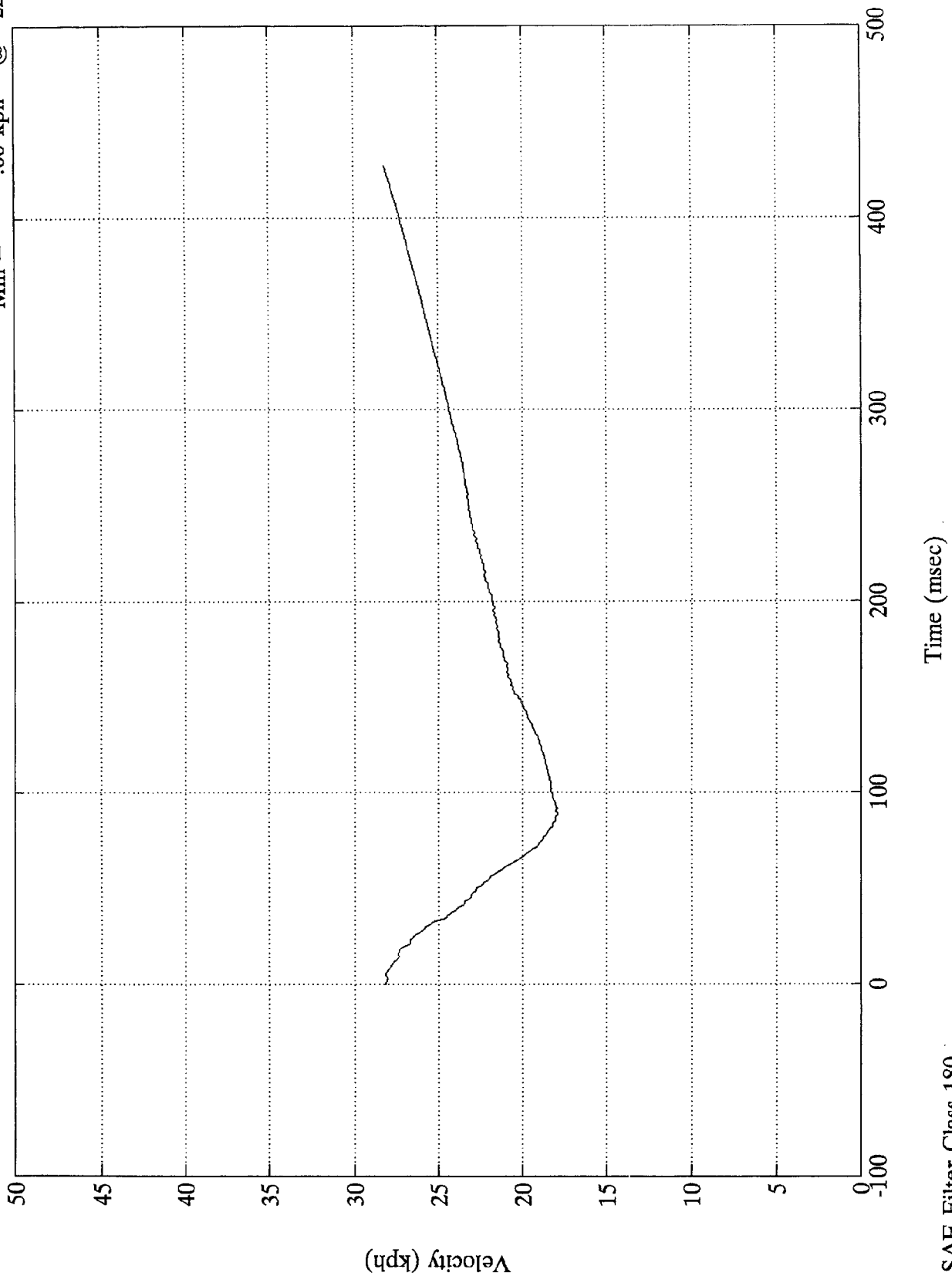


SAE Filter Class 60

VTV TEST #3

Max = 28.18 kph @ 427.32 msec
Min = .00 kph @ -22.44 msec

V1 Left X

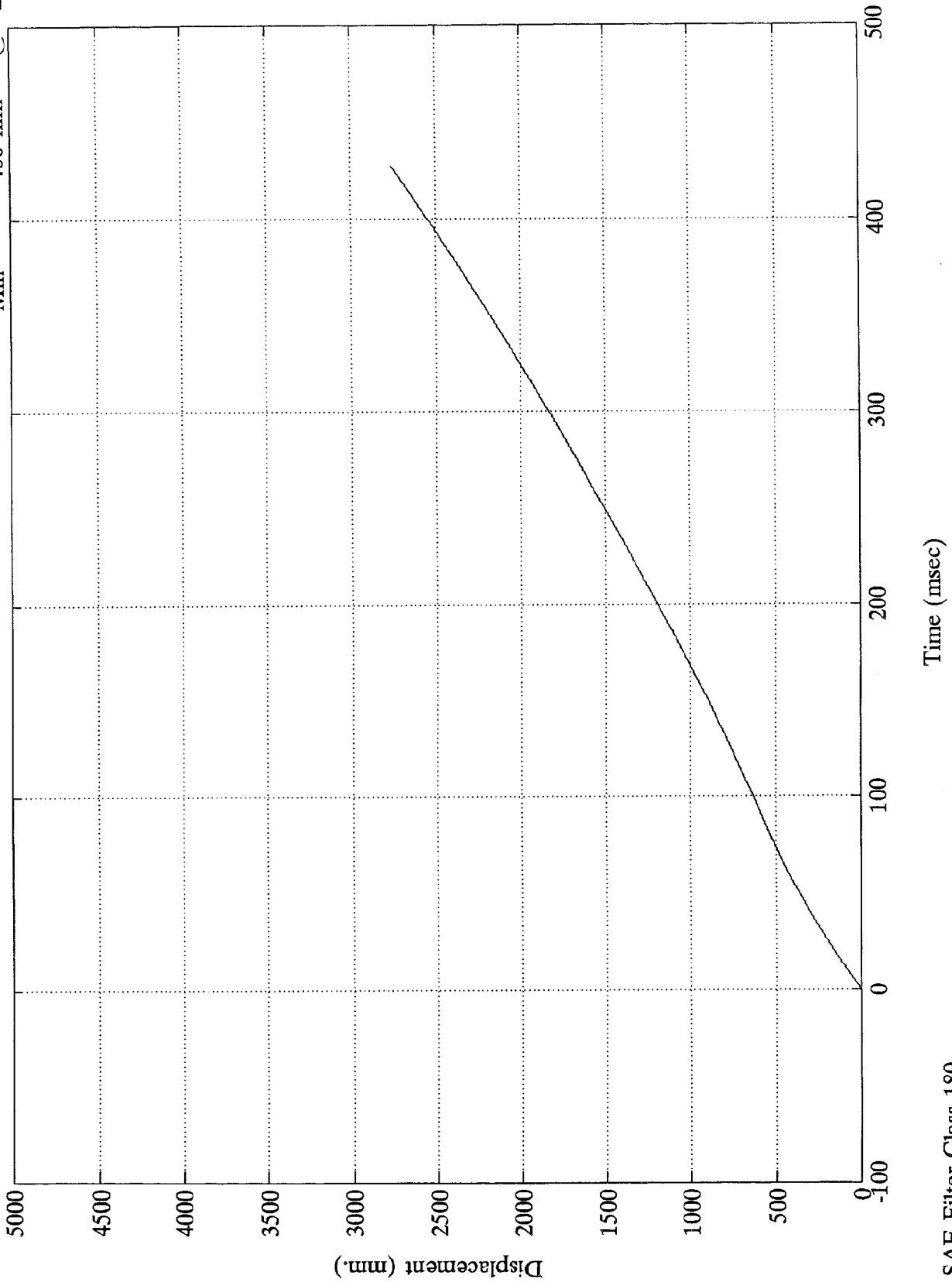


SAE Filter Class 180

VTV TEST #3

Max = 2757.78 mm @ 427.32 msec
 Min = .00 mm @ -22.44 msec

V1 Left X

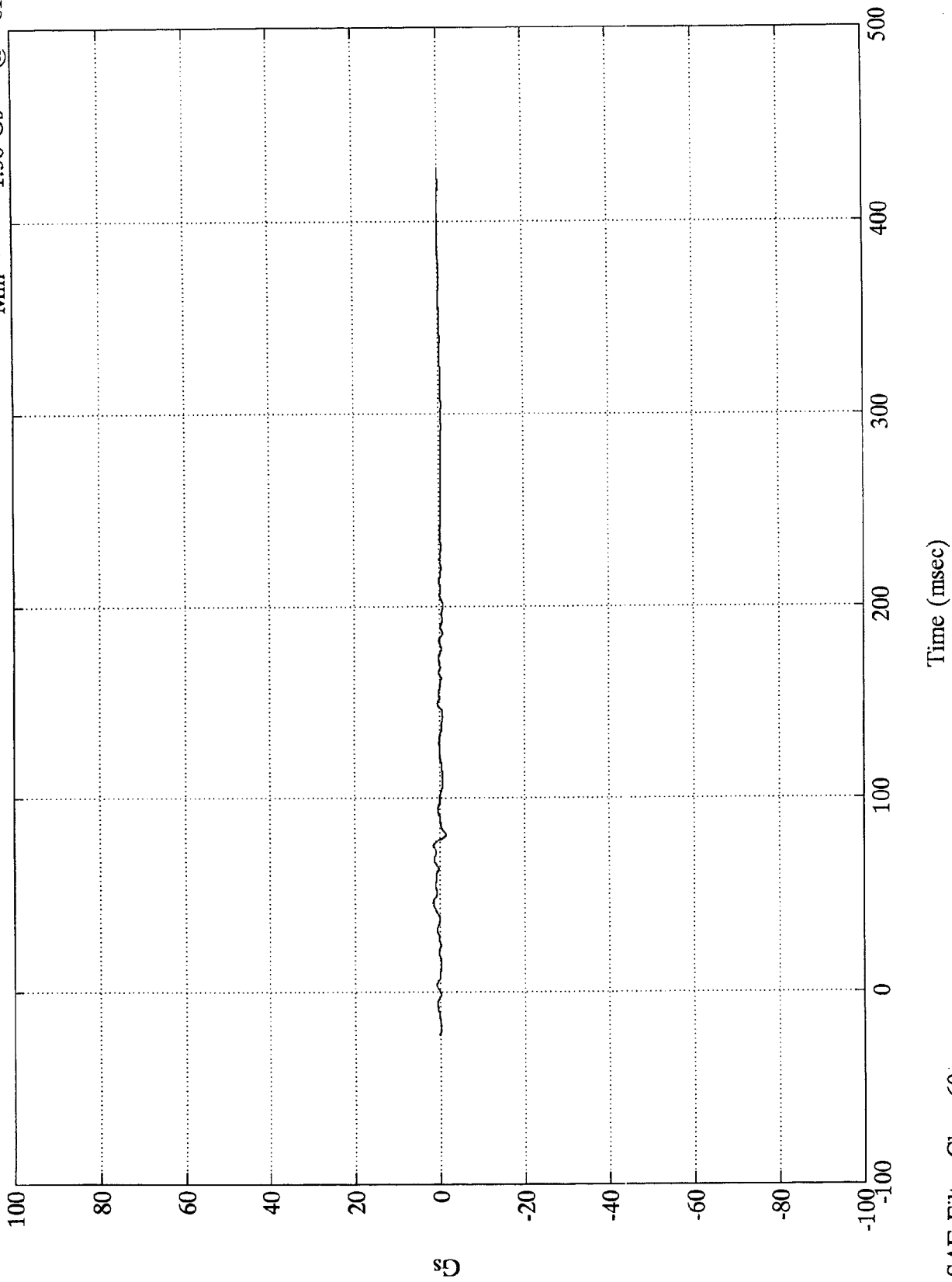


SAE Filter Class 180

VTV TEST #3

Max = 1.70 Gs @ 46.44 msec
Min = -1.56 Gs @ 81.24 msec

V1 Left Y

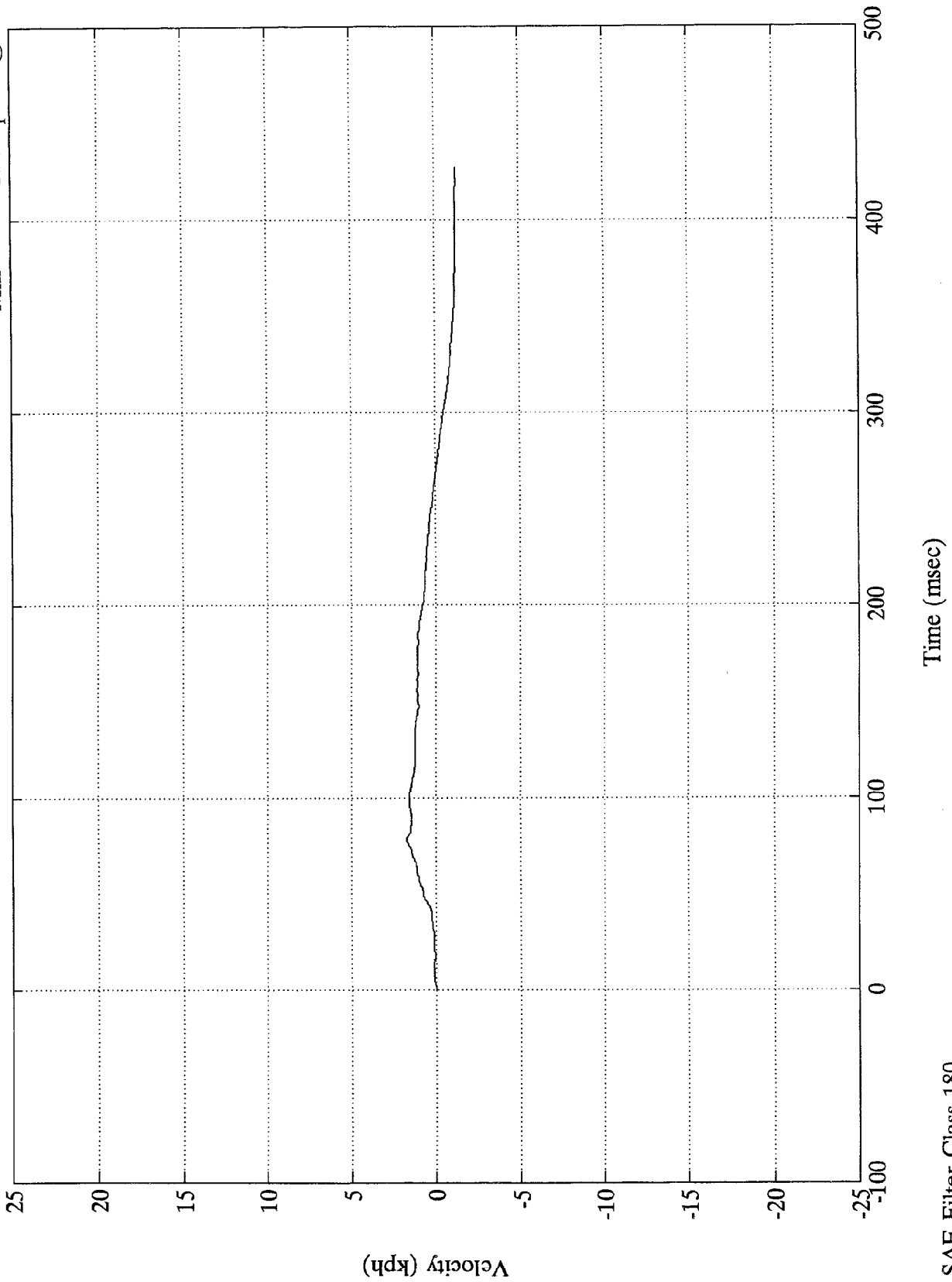


SAE Filter Class 60

VTV TEST #3

V1 Left Y

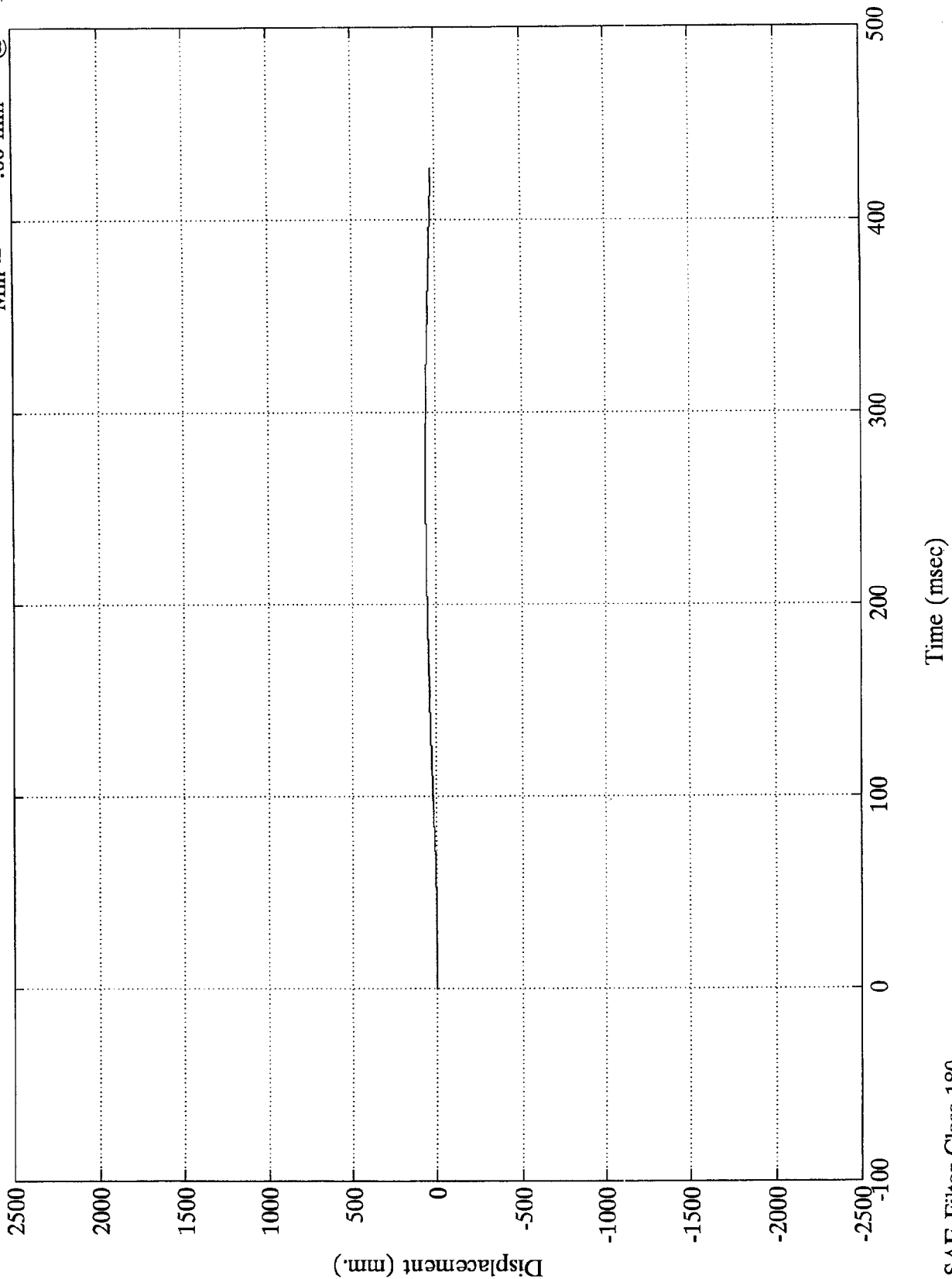
Max = 1.74 kph @ 79.56 msec
Min = -1.29 kph @ 427.32 msec



SAE Filter Class 180

VTV TEST #3

V1 Left Y
Max = 60.86 mm @ 267.72 msec
Min = -0.00 mm @ 1.31 msec

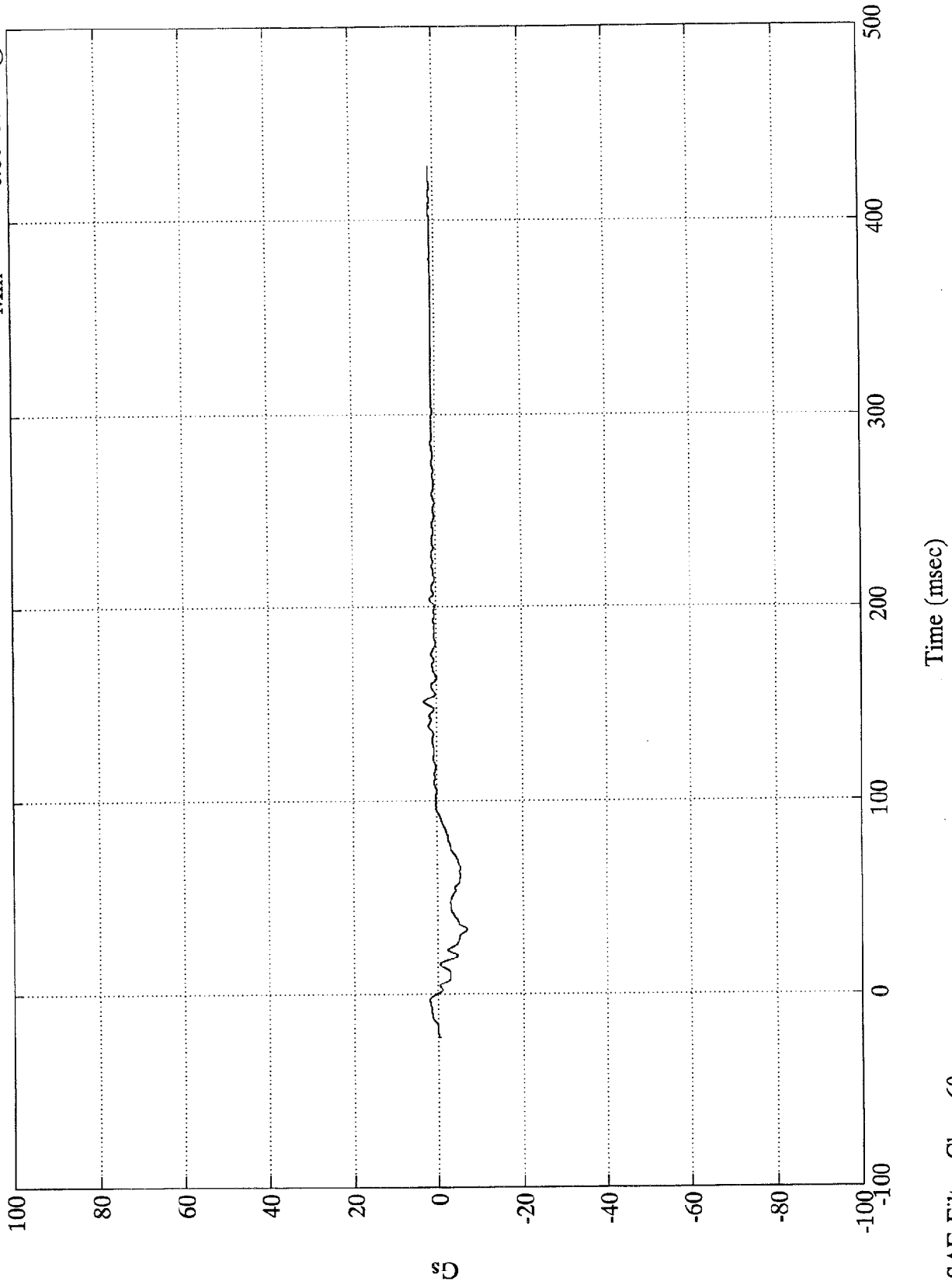


SAE Filter Class 180

VTV TEST #3

Max = 3.08 Gs @ 150.83 msec
Min = -6.86 Gs @ 33.72 msec

V1 Center X

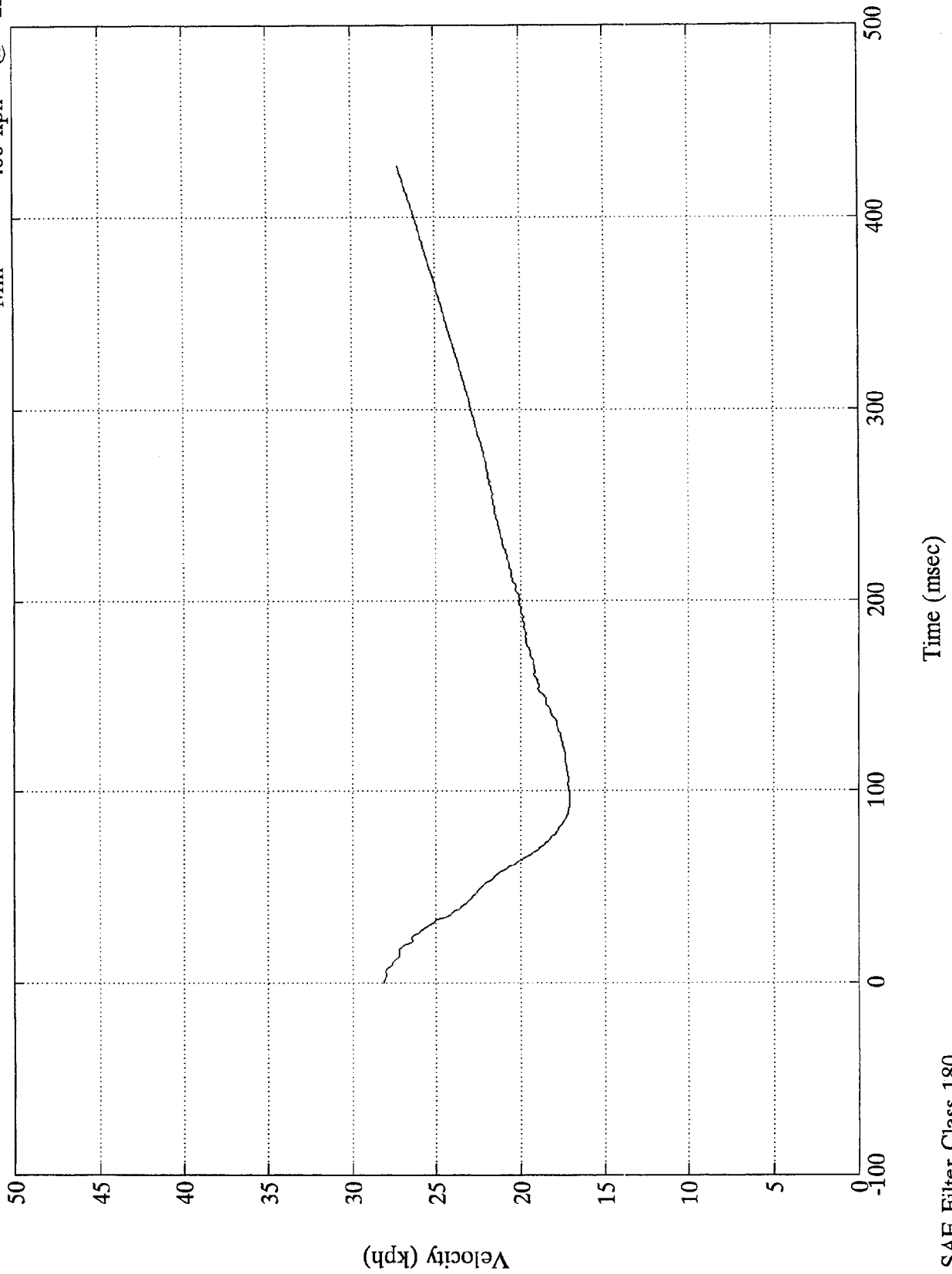


SAE Filter Class 60

VTV TEST #3

Max = 28.16 kph @ 0.11 msec
Min = .00 kph @ -22.44 msec

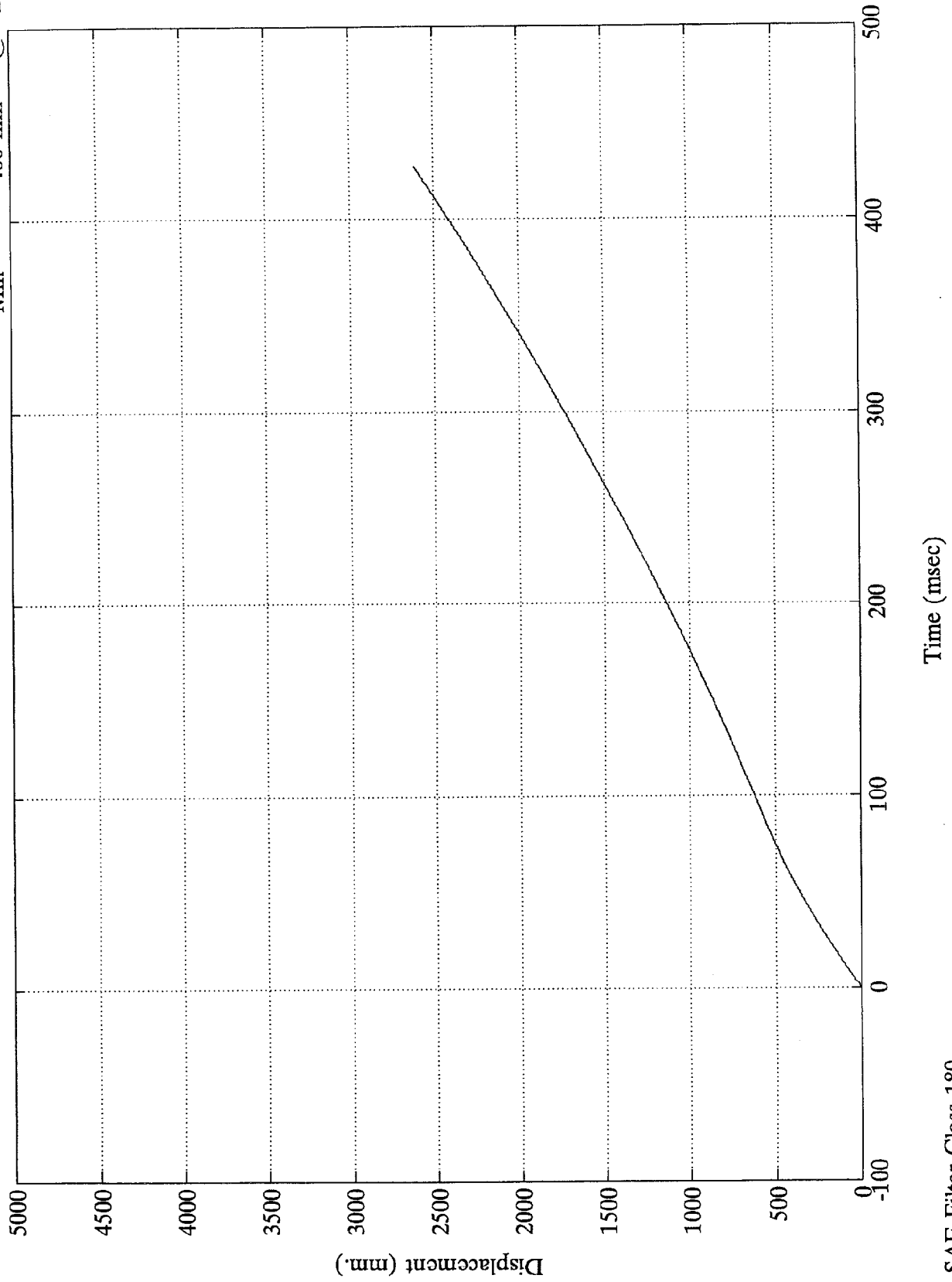
V1 Center X



VTV TEST #3

Max = 2614.90 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec

V1 Center X

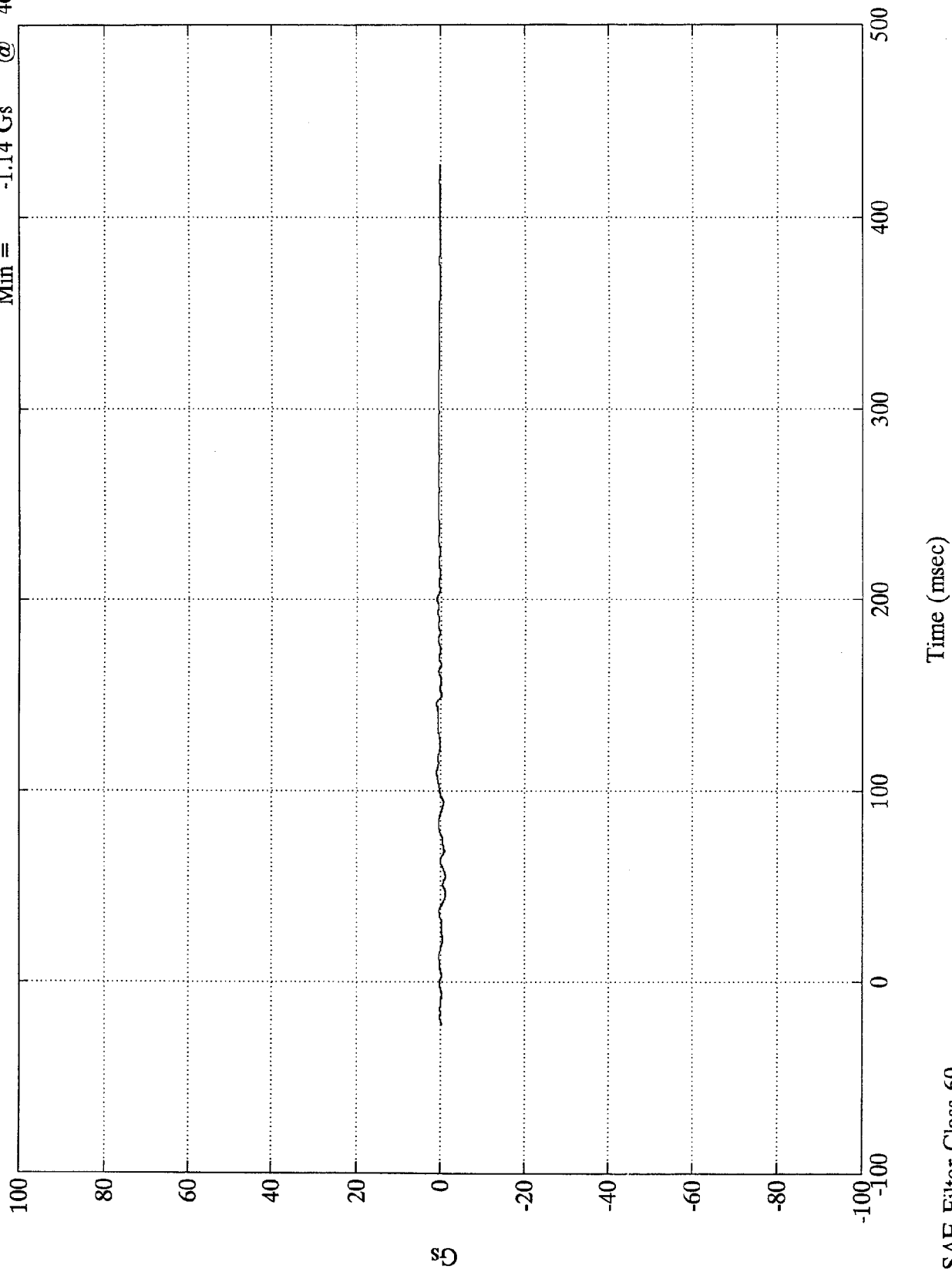


SAE Filter Class 180

VTV TEST #3

Max = 1.16 Gs @ 145.68 msec
Min = -1.14 Gs @ 46.32 msec

V1 Center Y

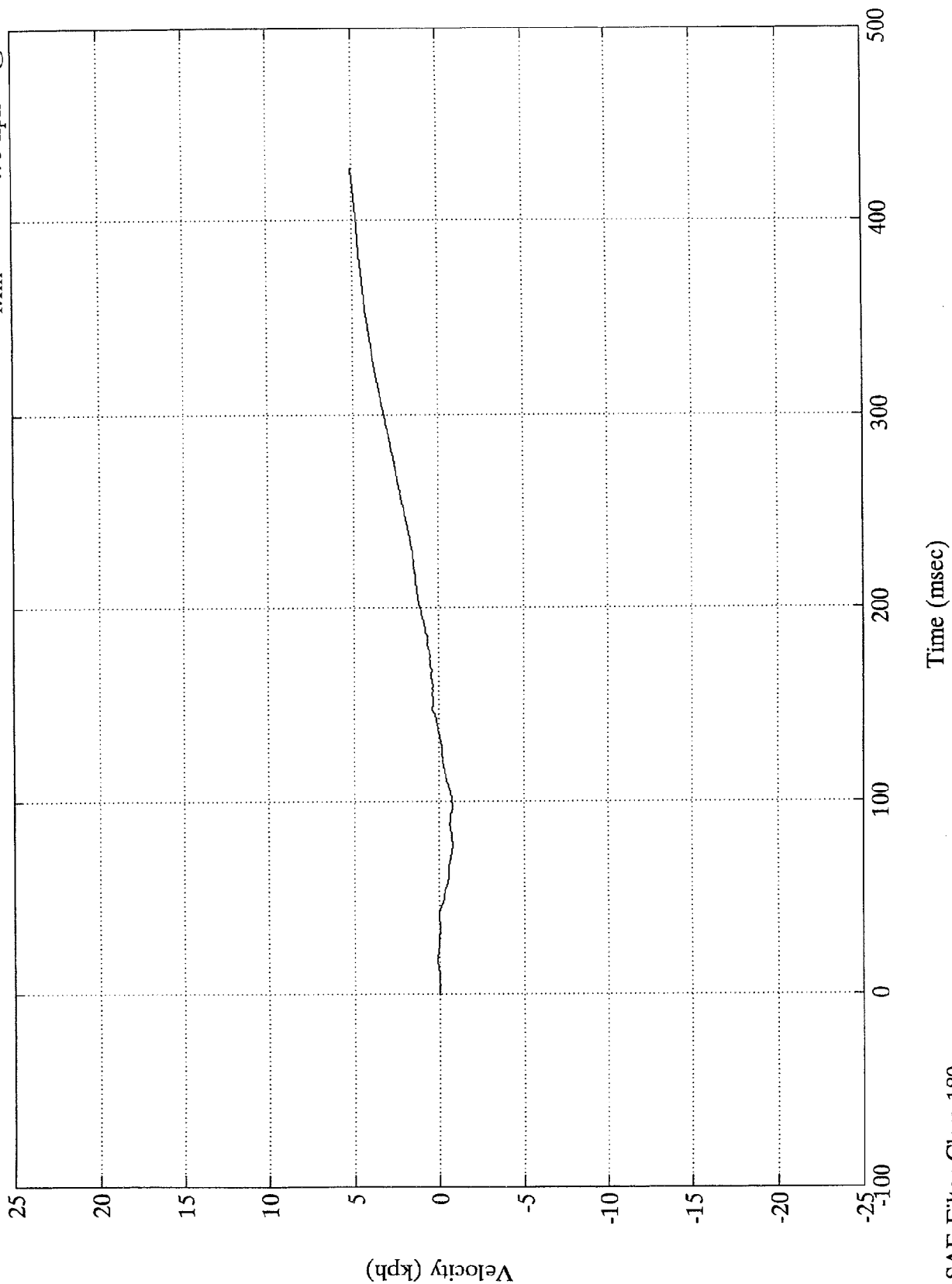


SAE Filter Class 60

VTV TEST #3

V1 Center Y

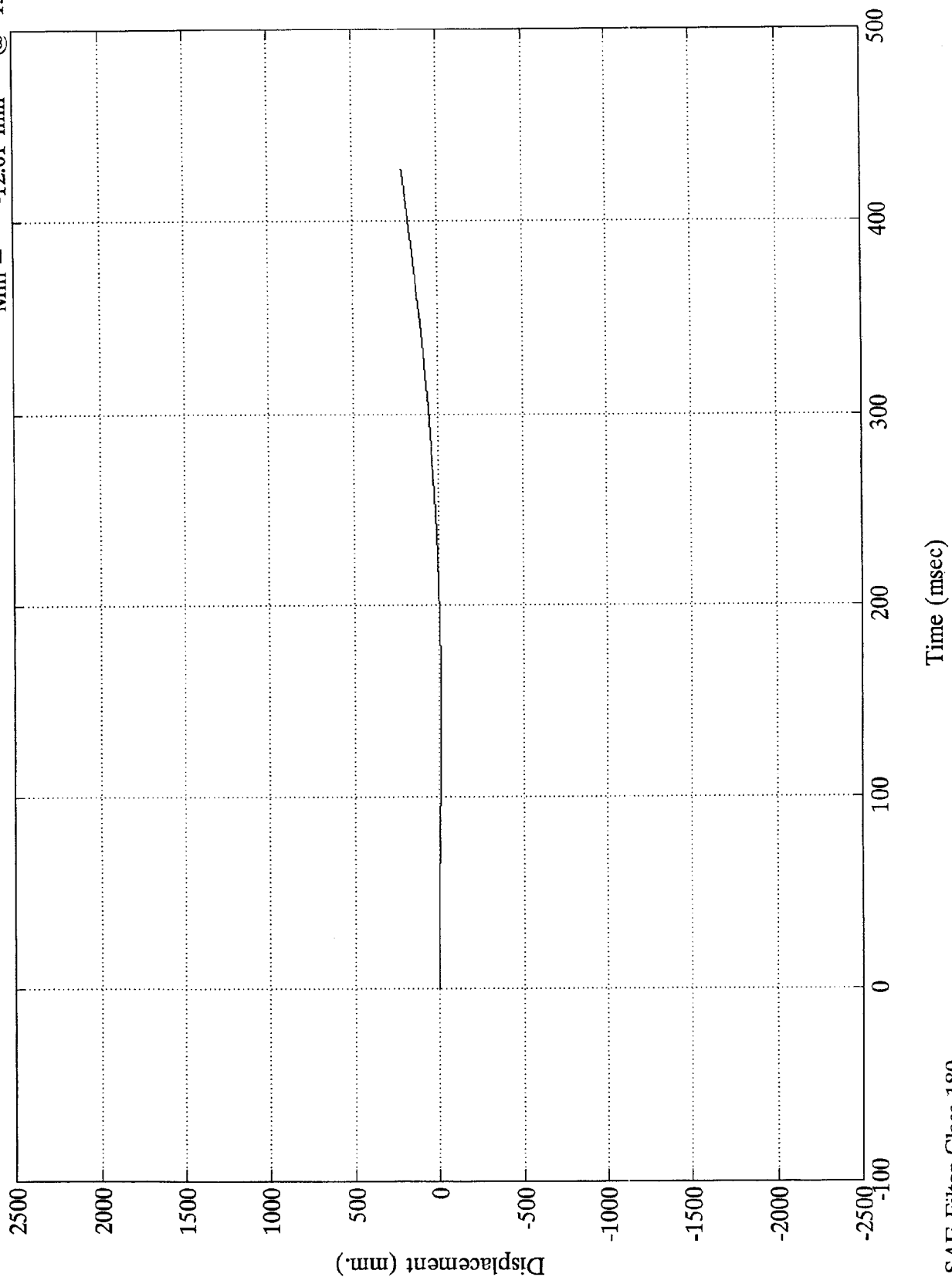
Max = 5.06 kph @ 427.32 msec
Min = -.76 kph @ 77.64 msec



VTV TEST #3

Max = 205.02 mm @ 427.32 msec
Min = -12.01 mm @ 135.48 msec

V1 Center Y

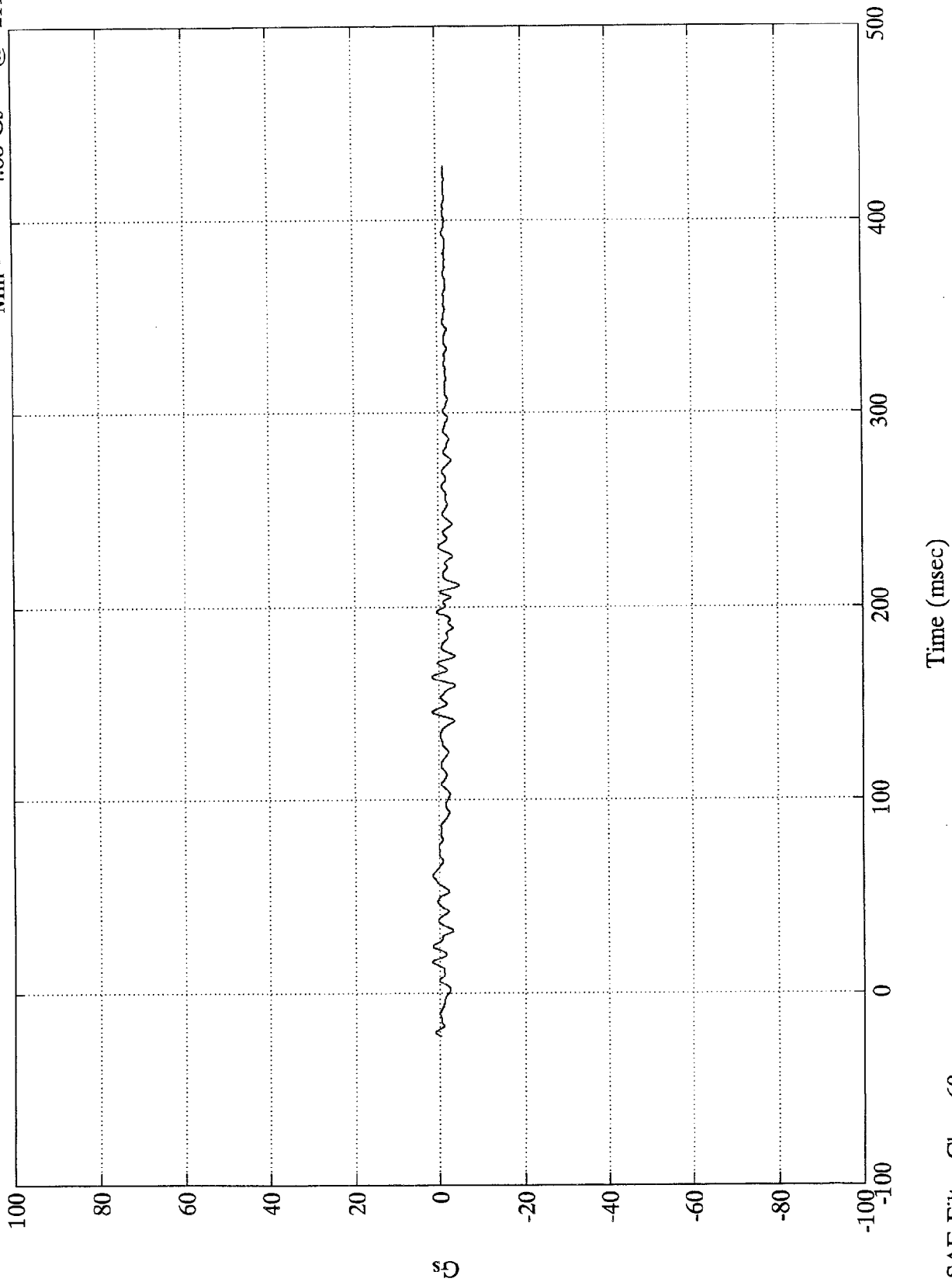


SAE Filter Class 180

VTV TEST #3

Max = 1.75 Gs @ 16.55 msec
 Min = -4.88 Gs @ 211.80 msec

V1 Center Z

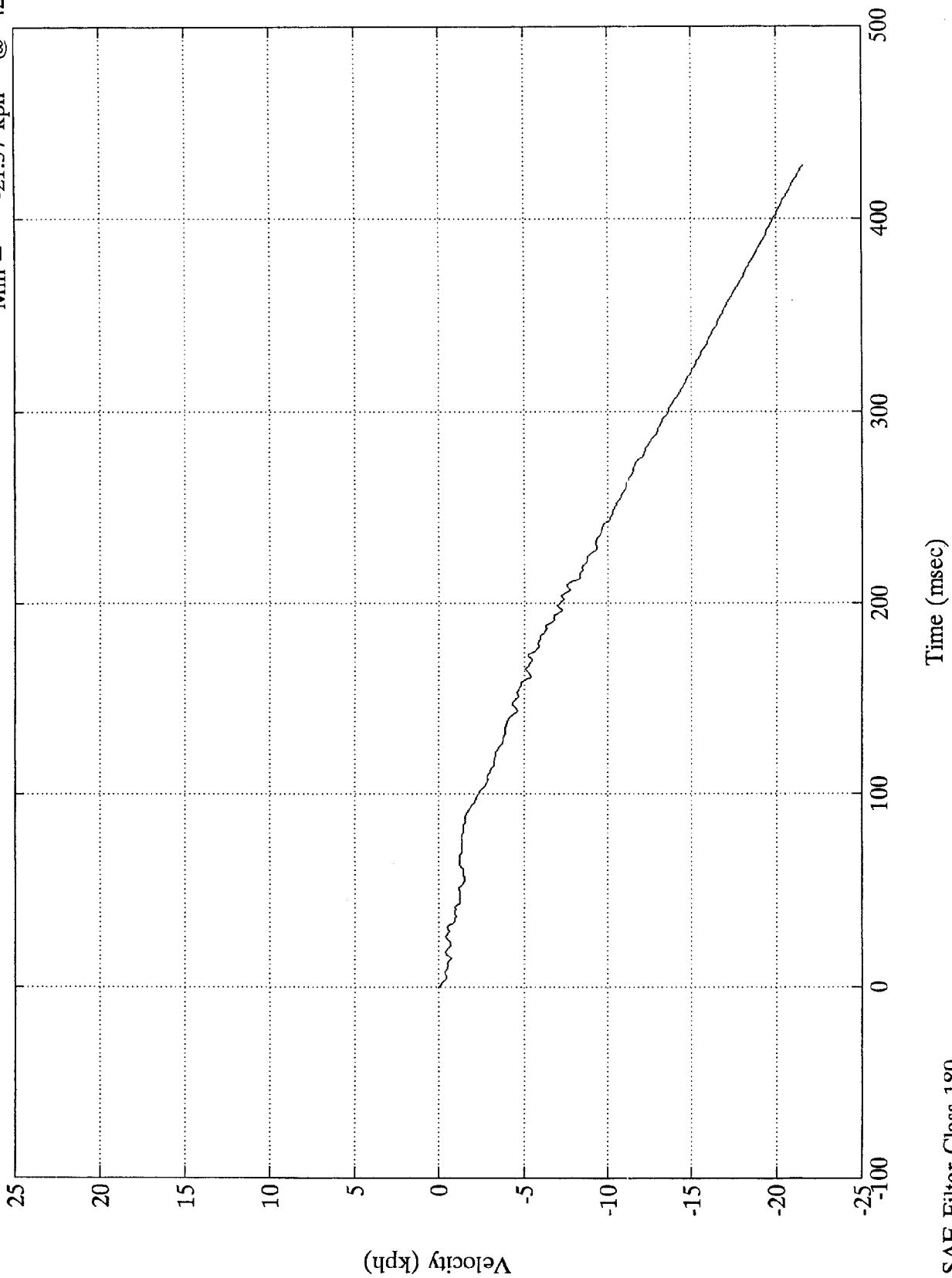


SAE Filter Class 60

VTV TEST #3

Max = .00 kph @ -0.00 msec
Min = -21.57 kph @ 427.32 msec

V1 Center Z

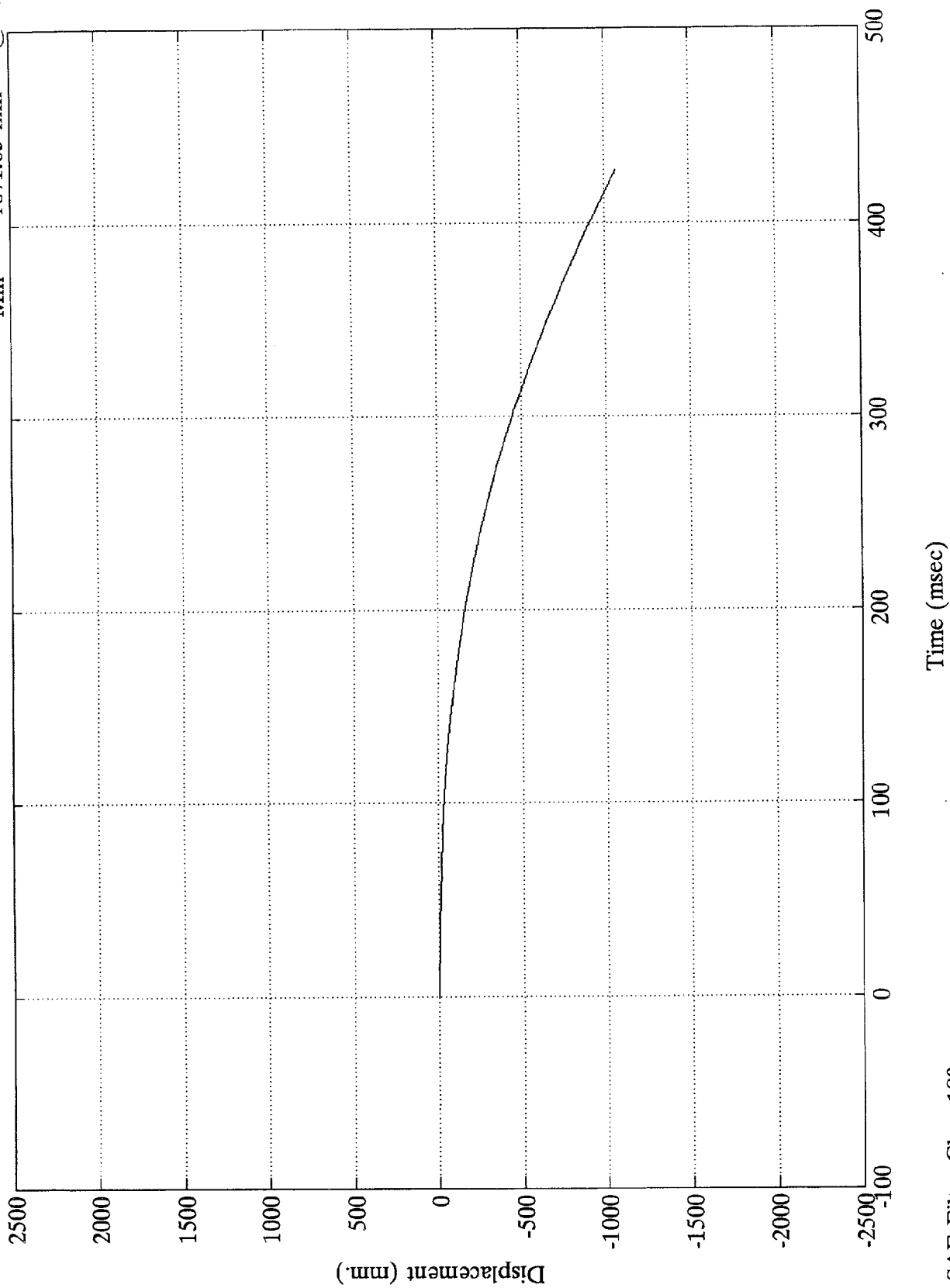


SAE Filter Class 180

VTV TEST #3

Max = .00 mm @ -0.00 msec
Min = -1071.03 mm @ 427.32 msec

V1 Center Z

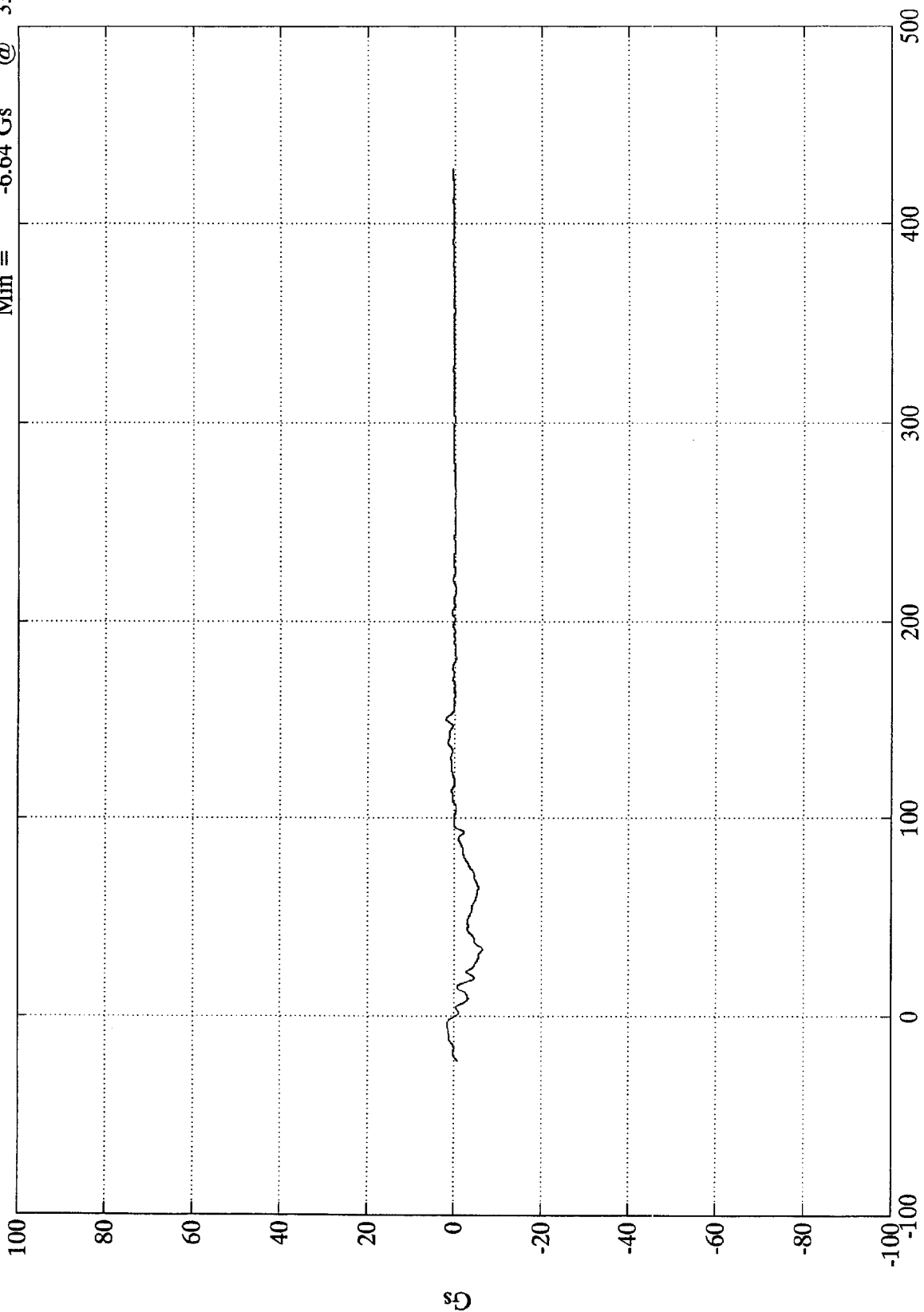


SAE Filter Class 180

VTV TEST #3

V1 Right X

Max = 2.13 Gs @ 150.72 msec
Min = -6.64 Gs @ 33.95 msec



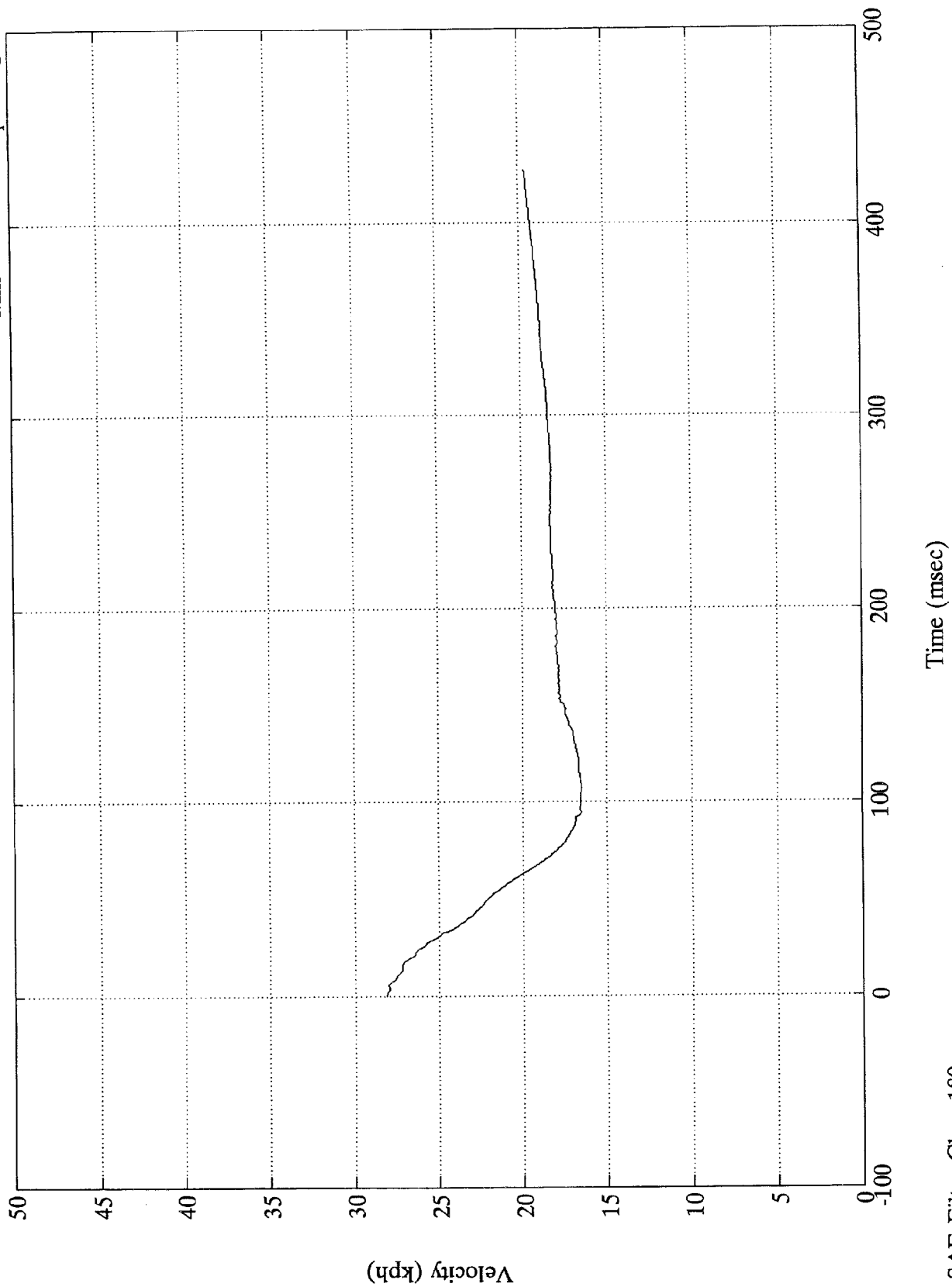
Time (msec)

SAE Filter Class 60

VTV TEST #3

Max = 28.16 kph @ -0.00 msec
 Min = .00 kph @ -22.44 msec

V1 Right X

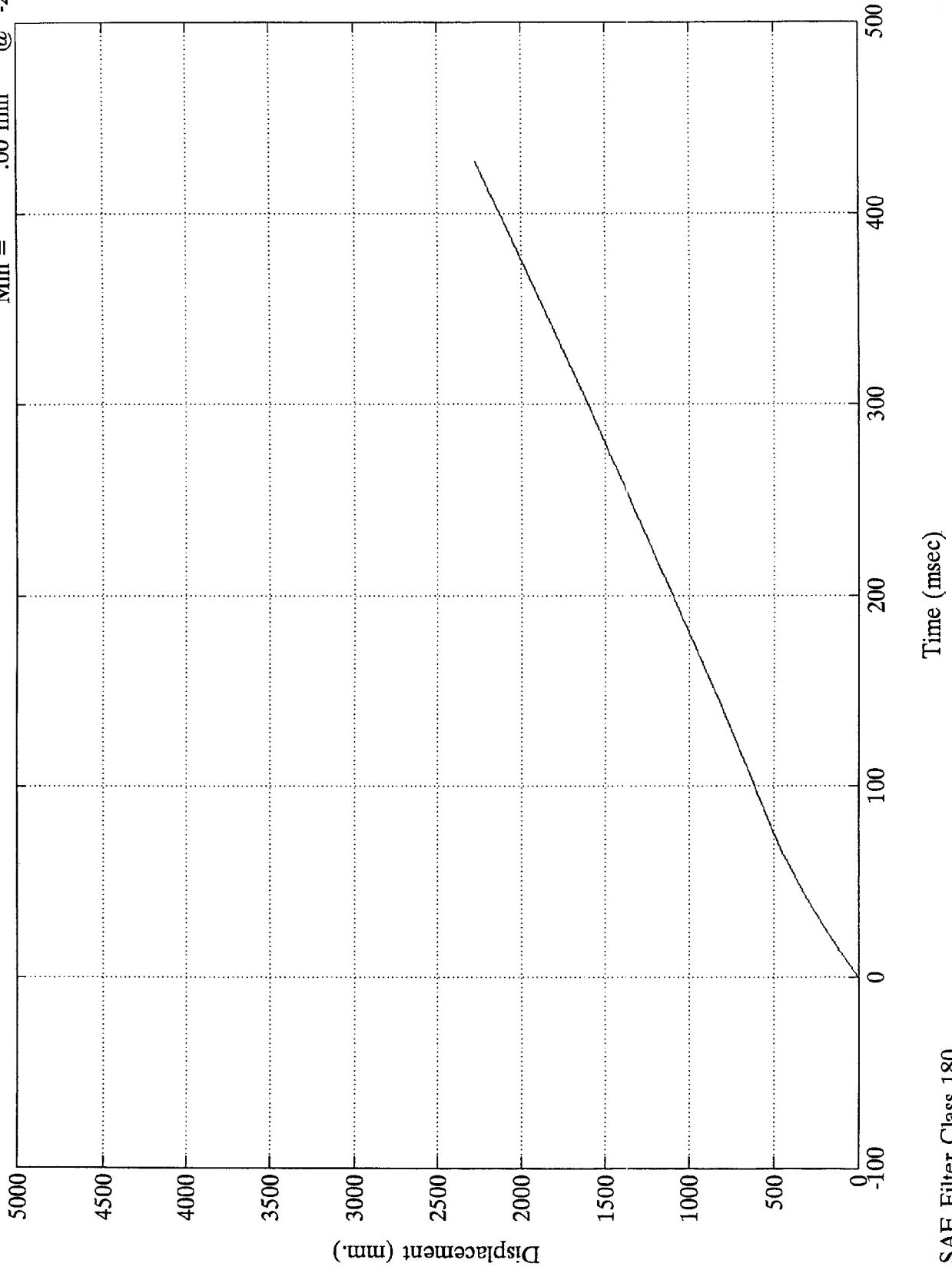


SAE Filter Class 180

VTV TEST #3

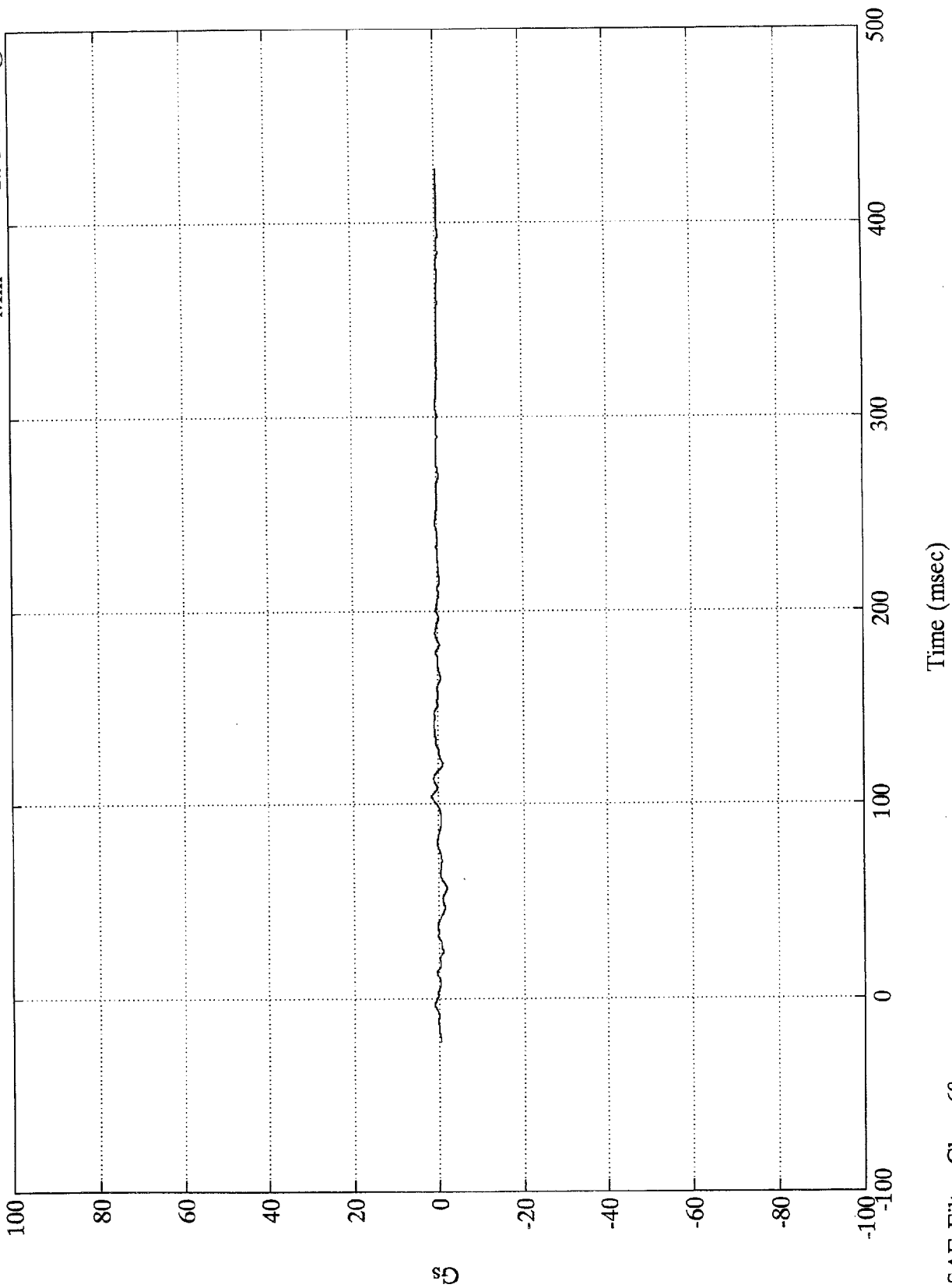
V1 Right X

Max = 2273.60 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



VTV TEST #3

V1 Right Y
 Max = 1.58 Gs @ 103.68 msec
 Min = -1.98 Gs @ 57.47 msec

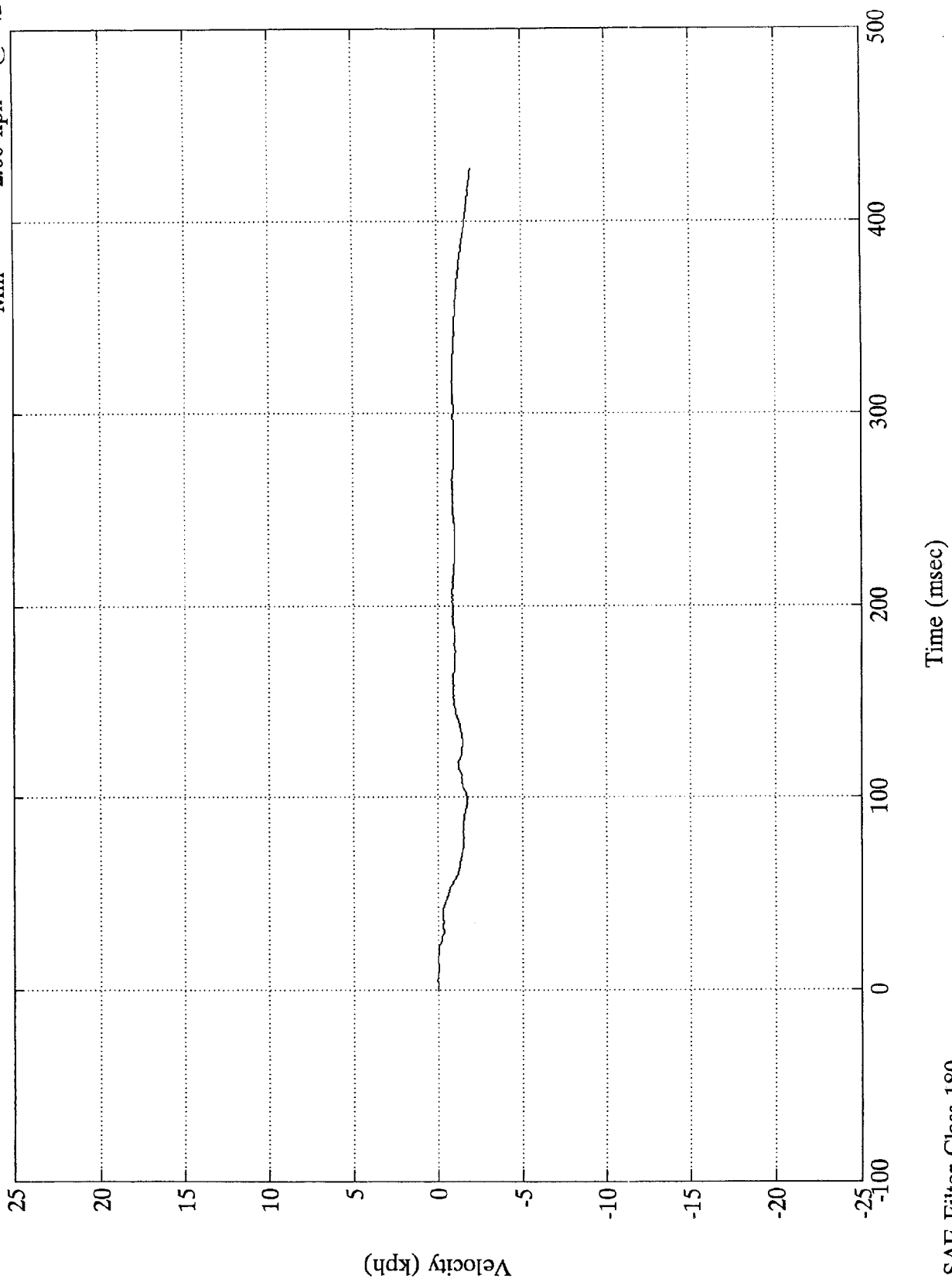


SAE Filter Class 60

VTV TEST #3

Max = .05 kph @ 5.15 msec
Min = -2.00 kph @ 427.32 msec

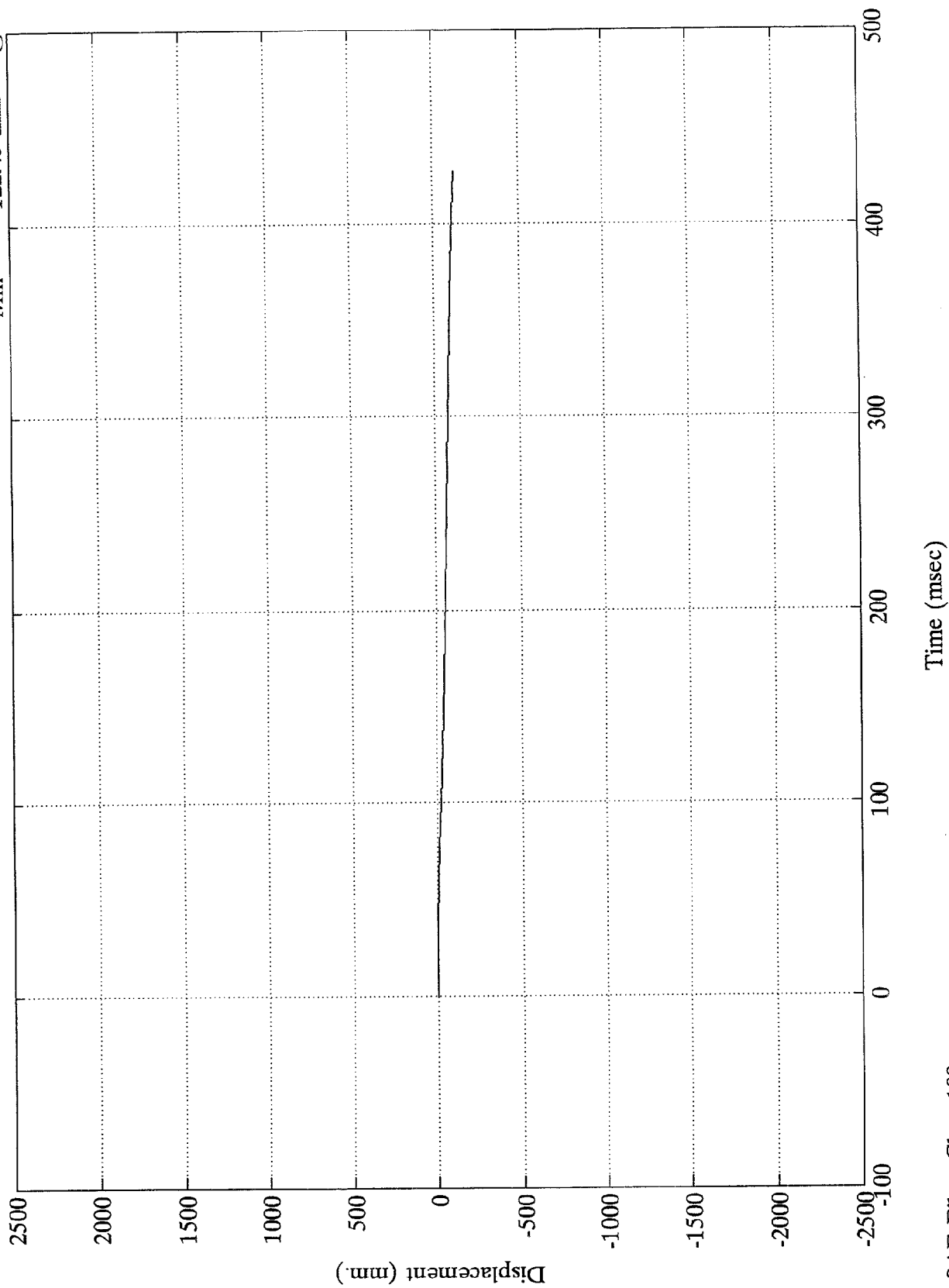
V1 Right Y



SAE Filter Class 180

VTV TEST #3

V1 Right Y
Max = .04 mm @ 7.91 msec
Min = -122.43 mm @ 427.32 msec

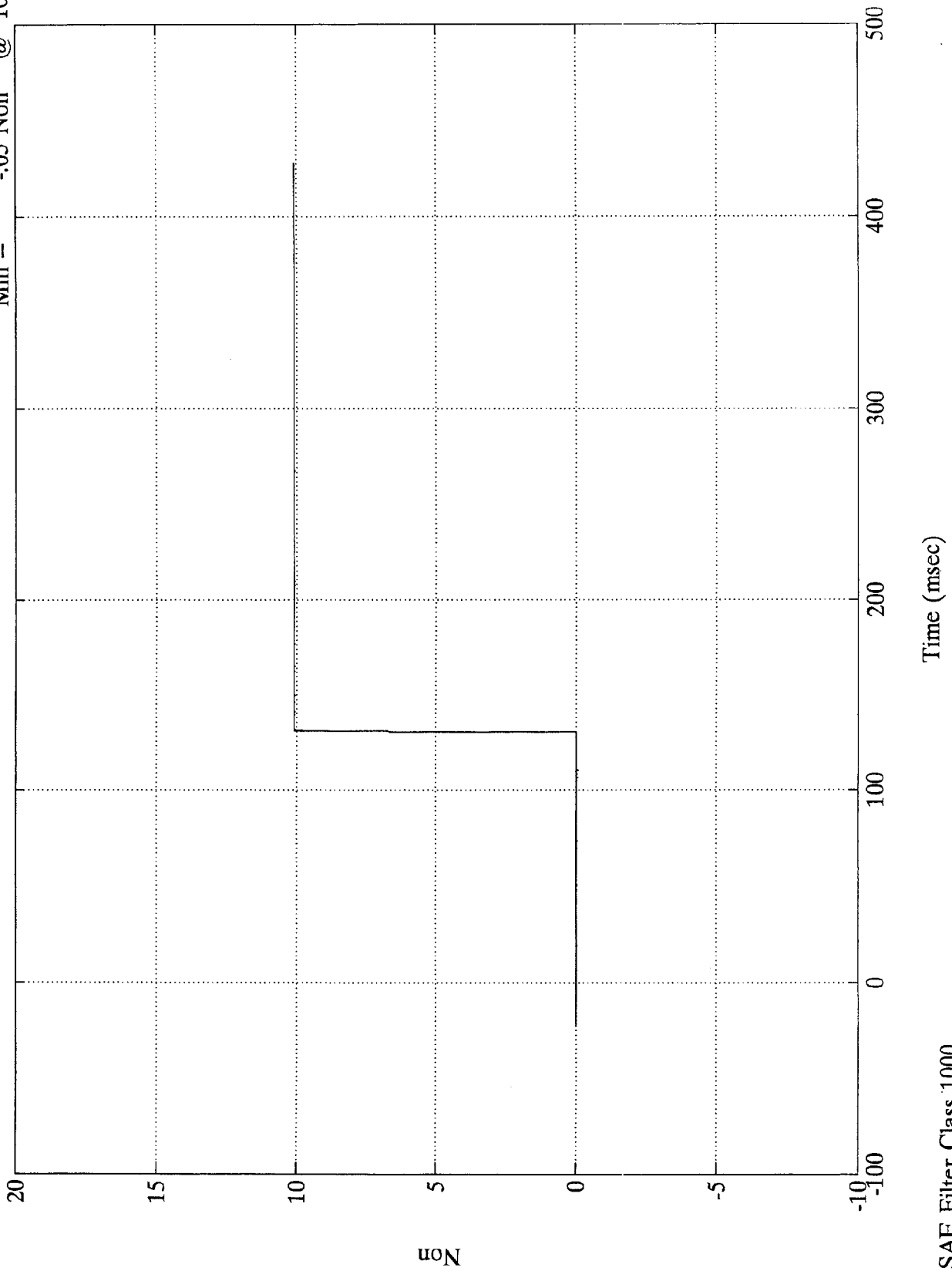


SAE Filter Class 180

VTV TEST #3

Max = 10.10 Non @ 154.44 msec
Min = -.05 Non @ 106.44 msec

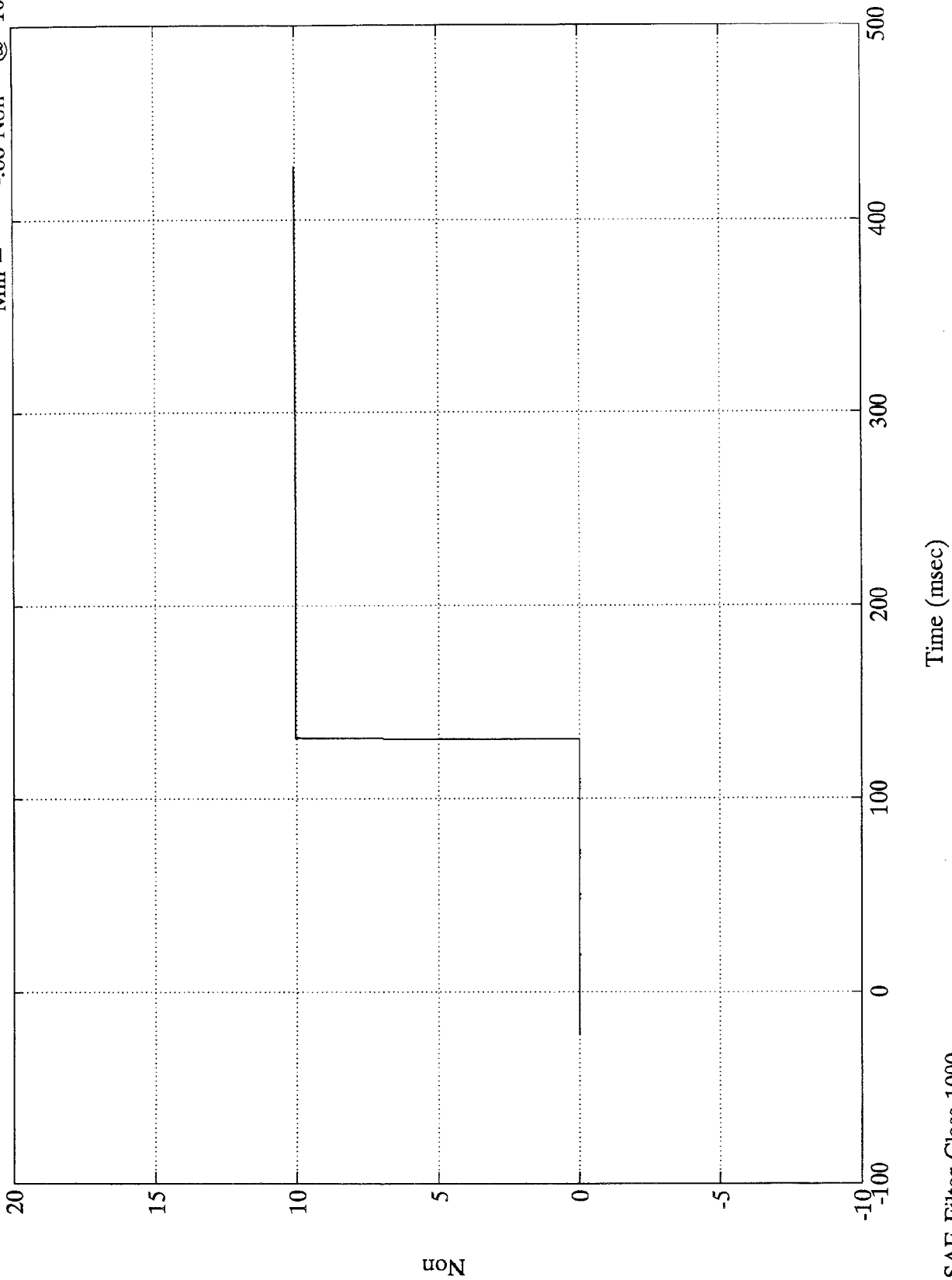
Timer Squib Out



VTV TEST #3

Vehicle Squib Out

Max = 10.04 Non @ 427.32 msec
 Min = -.06 Non @ 106.44 msec

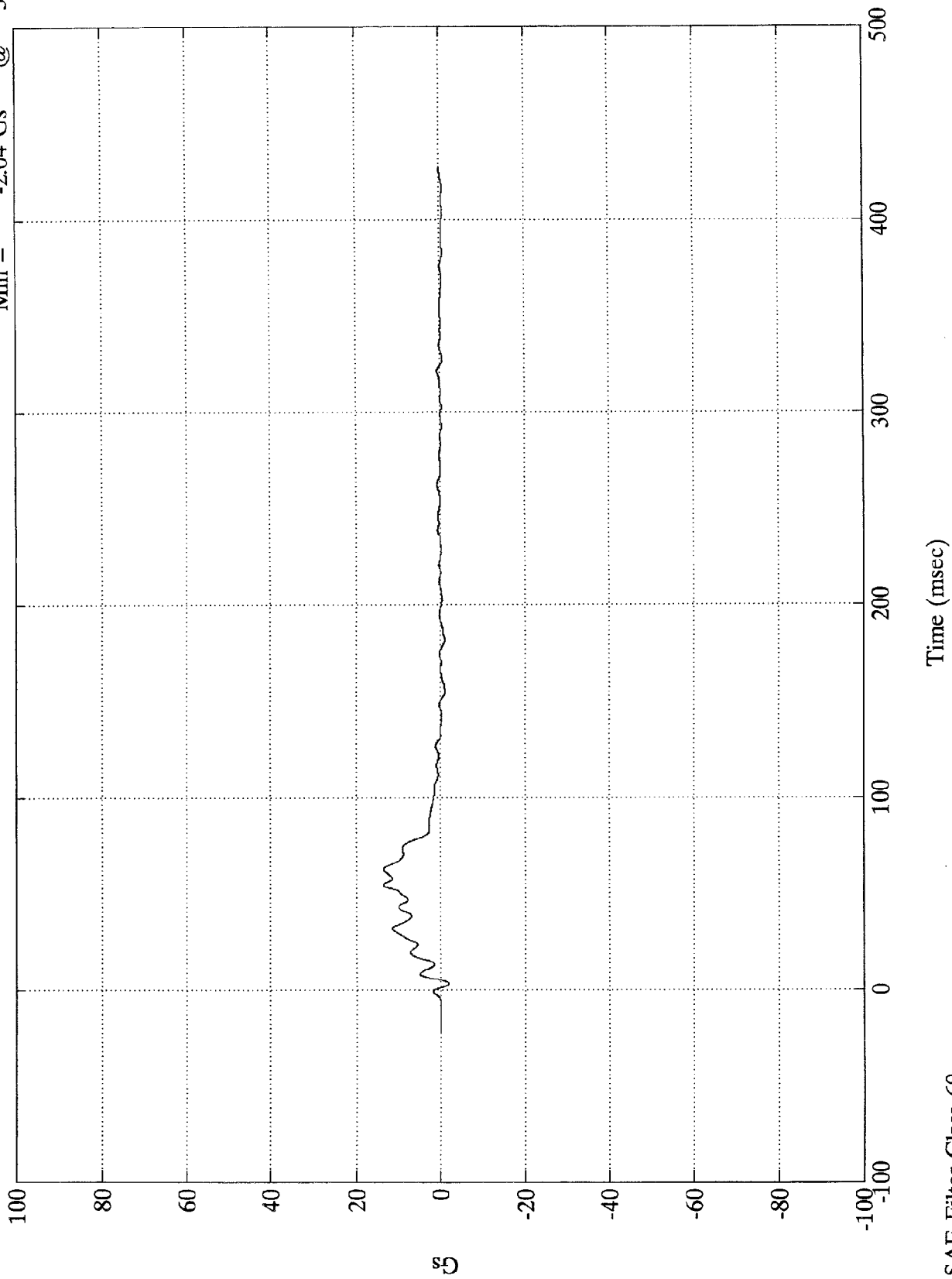


SAE Filter Class 1000

VTV TEST #3

Max = 13.48 Gs @ 63.48 msec
 Min = -2.04 Gs @ 3.47 msec

V2 Left X

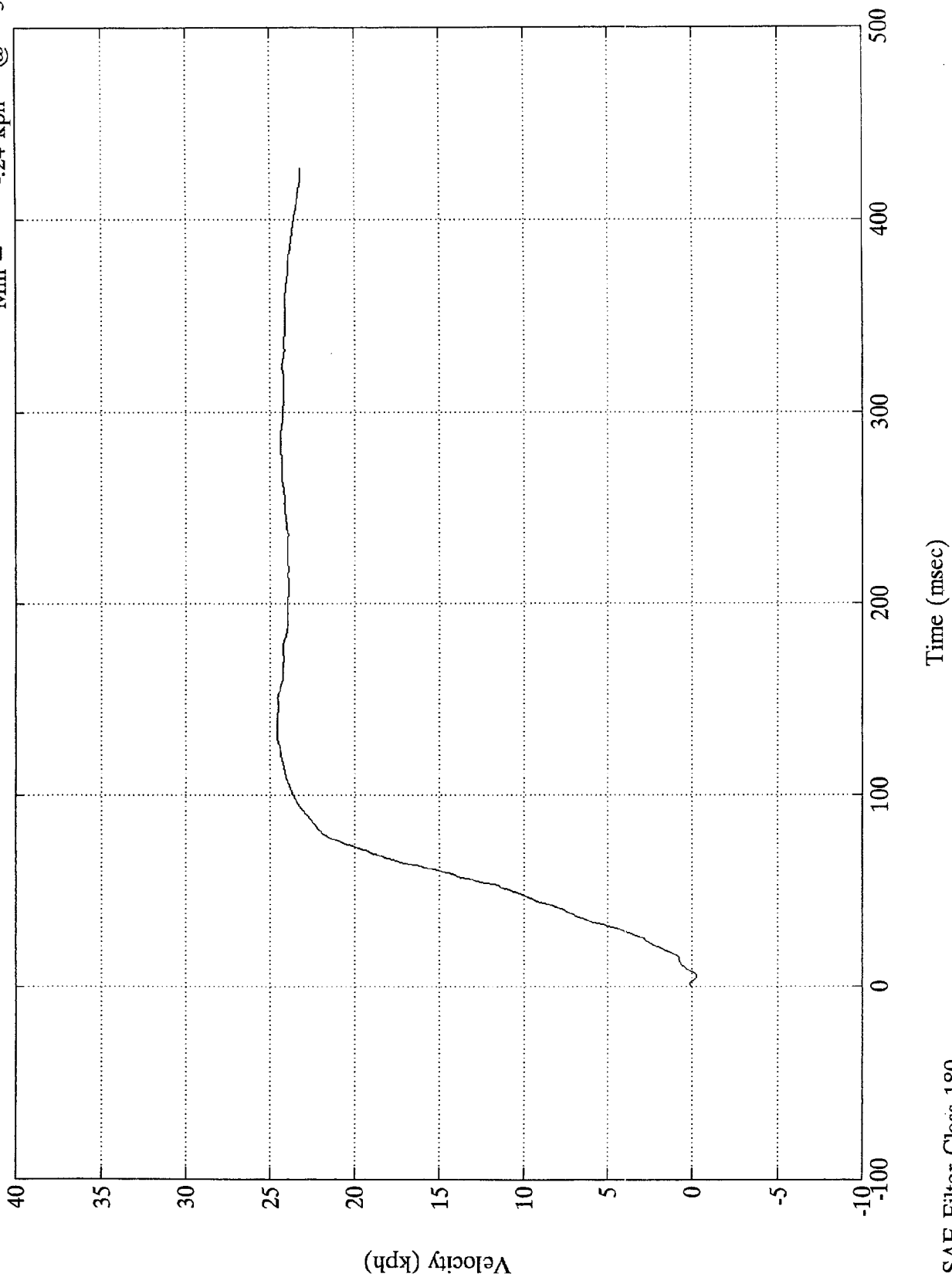


SAE Filter Class 60

VTV TEST #3

V2 Left X

Max = 24.60 kph @ 137.28 msec
Min = -24 kph @ 5.75 msec

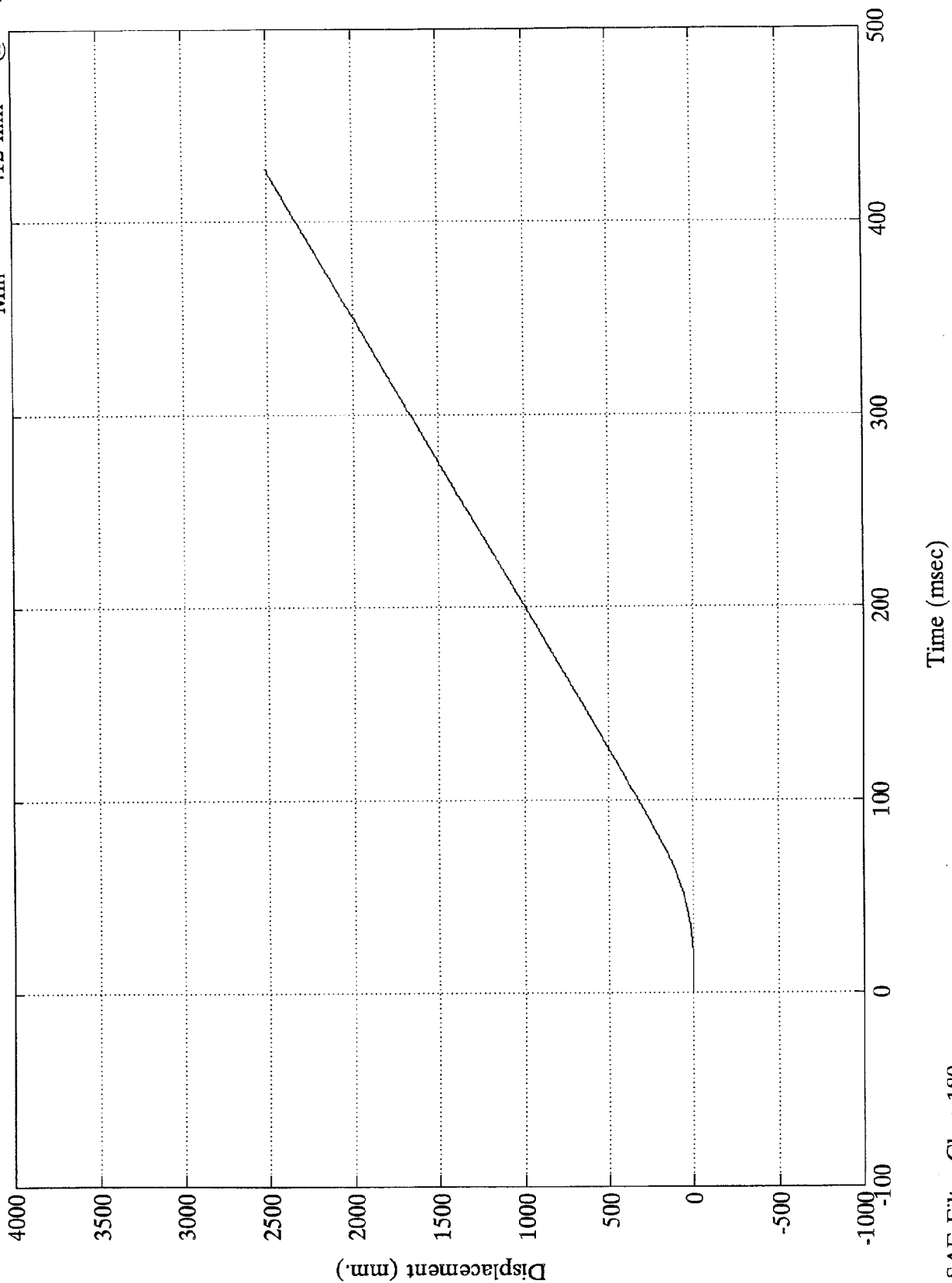


SAE Filter Class 180

VTV TEST #3

Max = 2507.93 mm @ 427.32 msec
Min = -12 mm @ 7.55 msec

V2 Left X



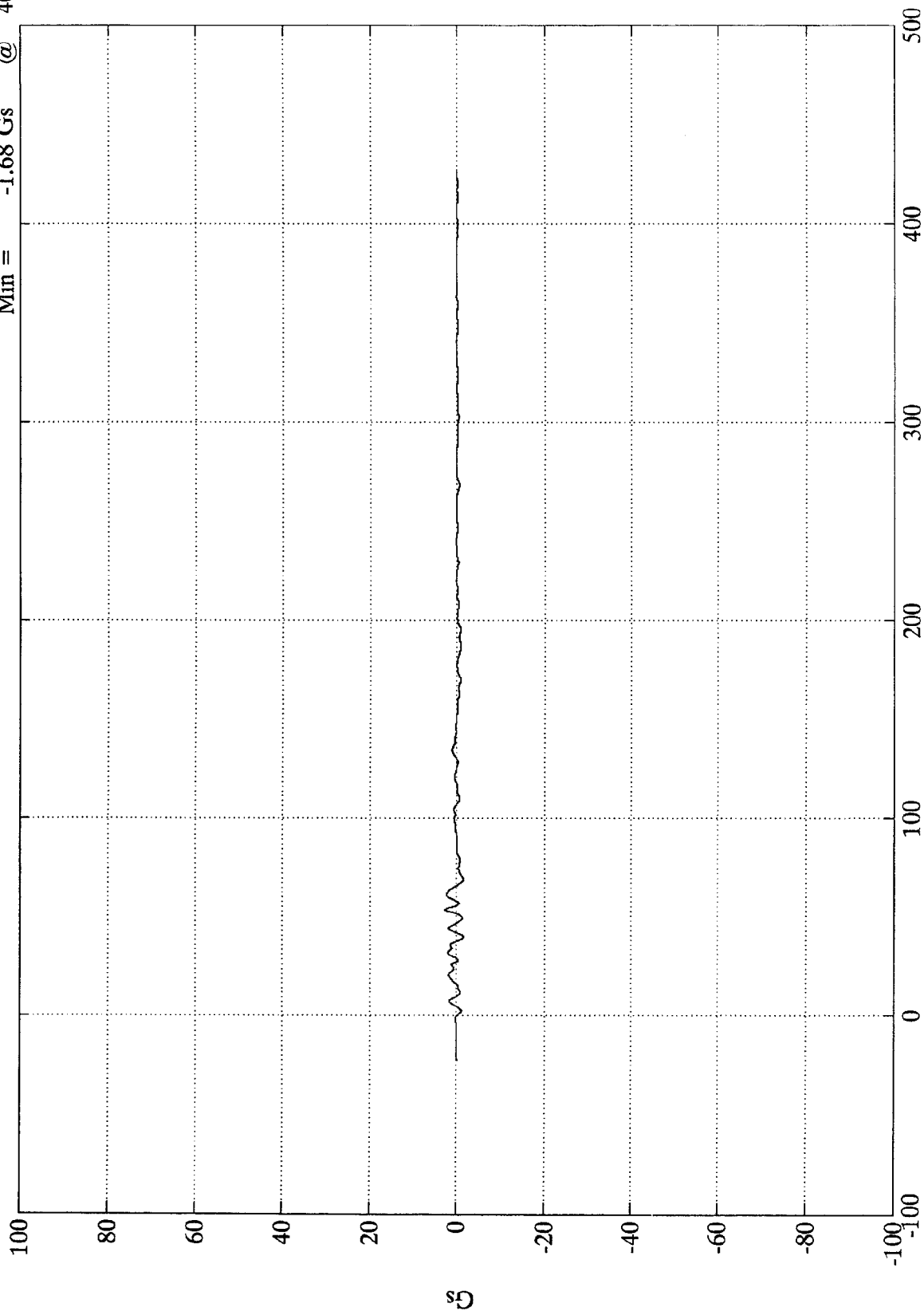
SAE Filter Class 180

VTV TEST #3

Max = 53.88 msec
Min = 40.07 msec

2.73 Gs
-1.68 Gs

V2 Left Y



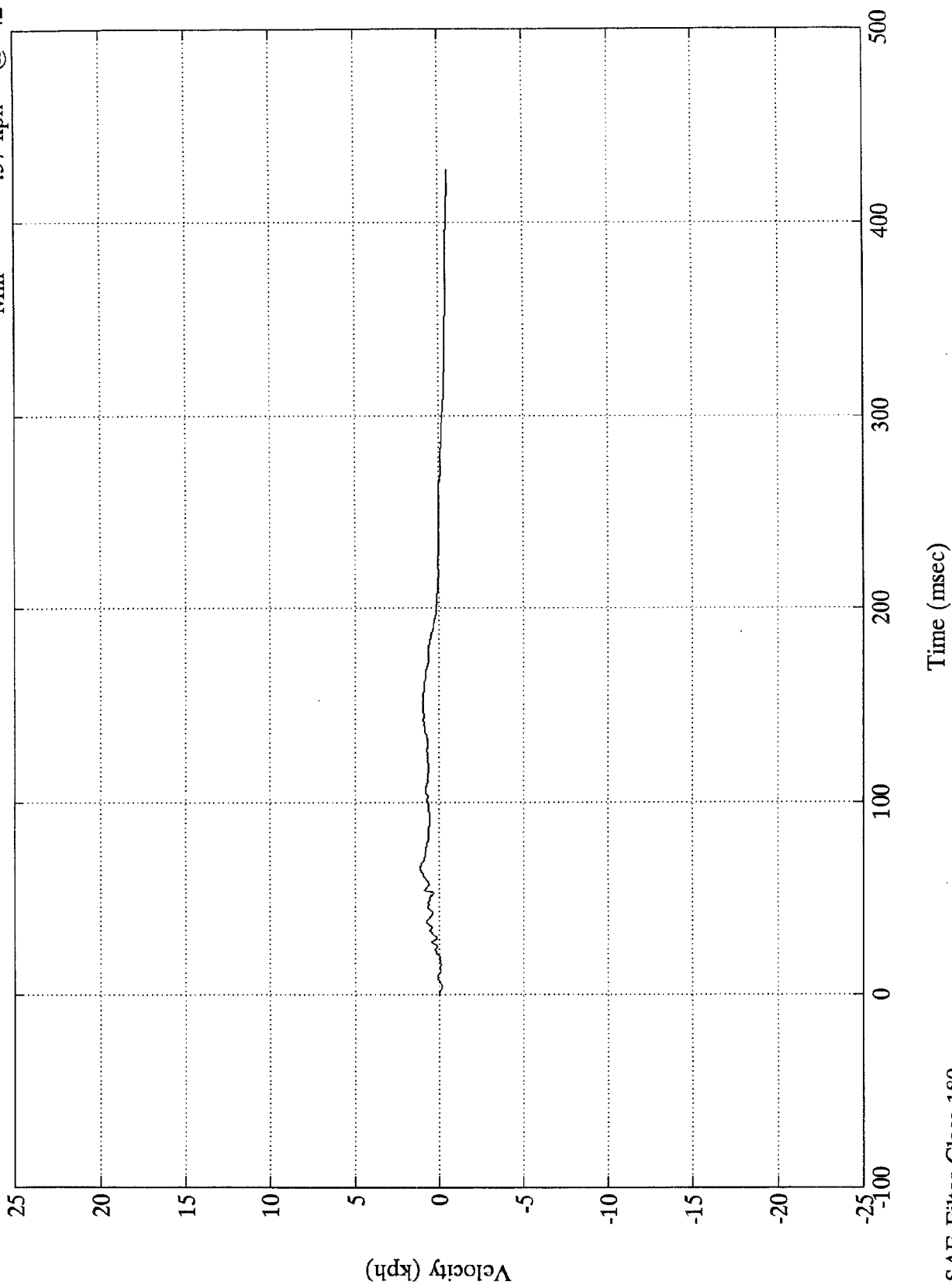
Time (msec)

SAE Filter Class 60

VTV TEST #3

Max = 1.14 kph @ 65.99 msec
Min = -.57 kph @ 424.68 msec

V2 Left Y

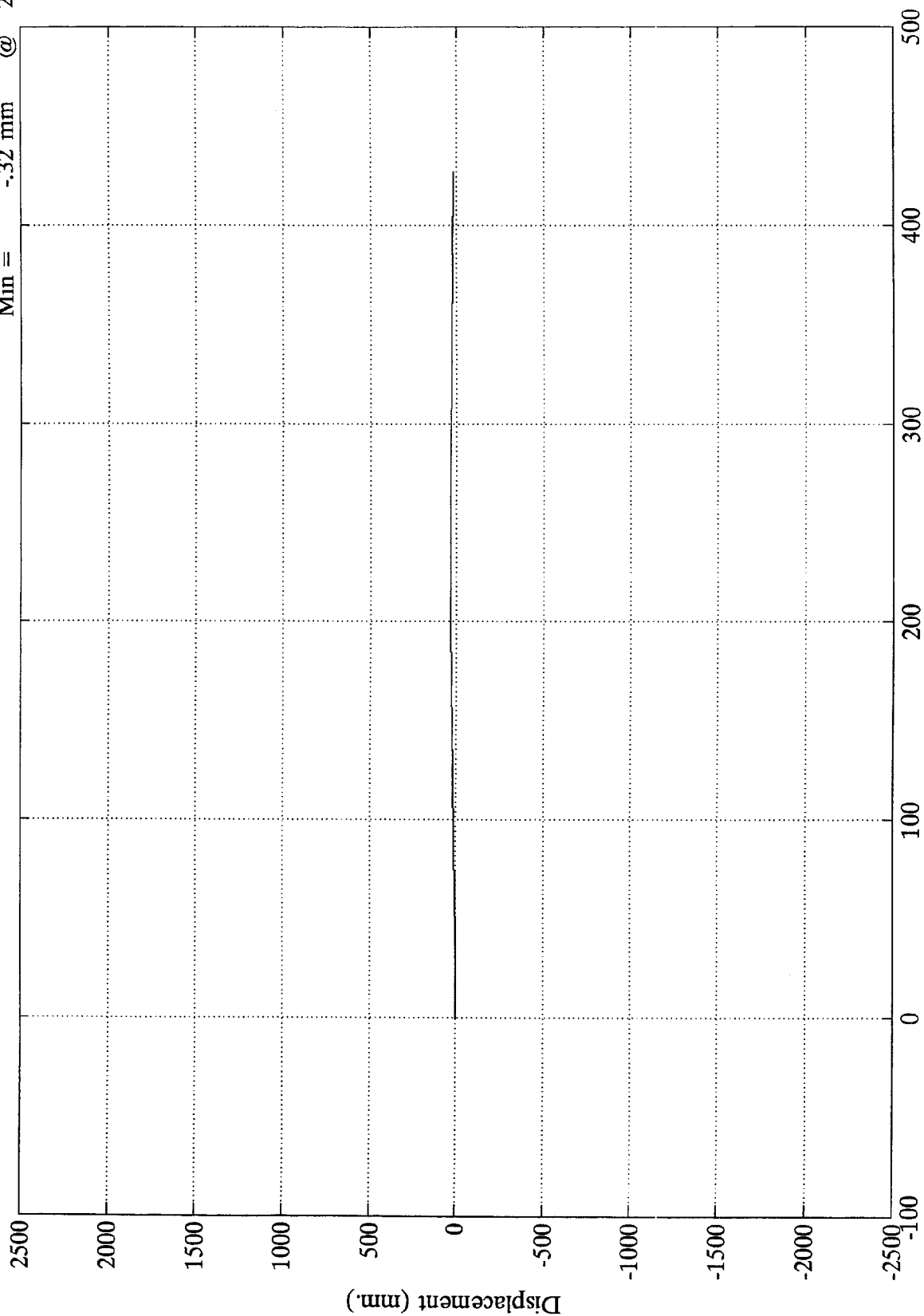


SAE Filter Class 180

VTV TEST #3

Max = 33.33 mm @ 248.04 msec
Min = -32 mm @ 20.27 msec

V2 Left Y



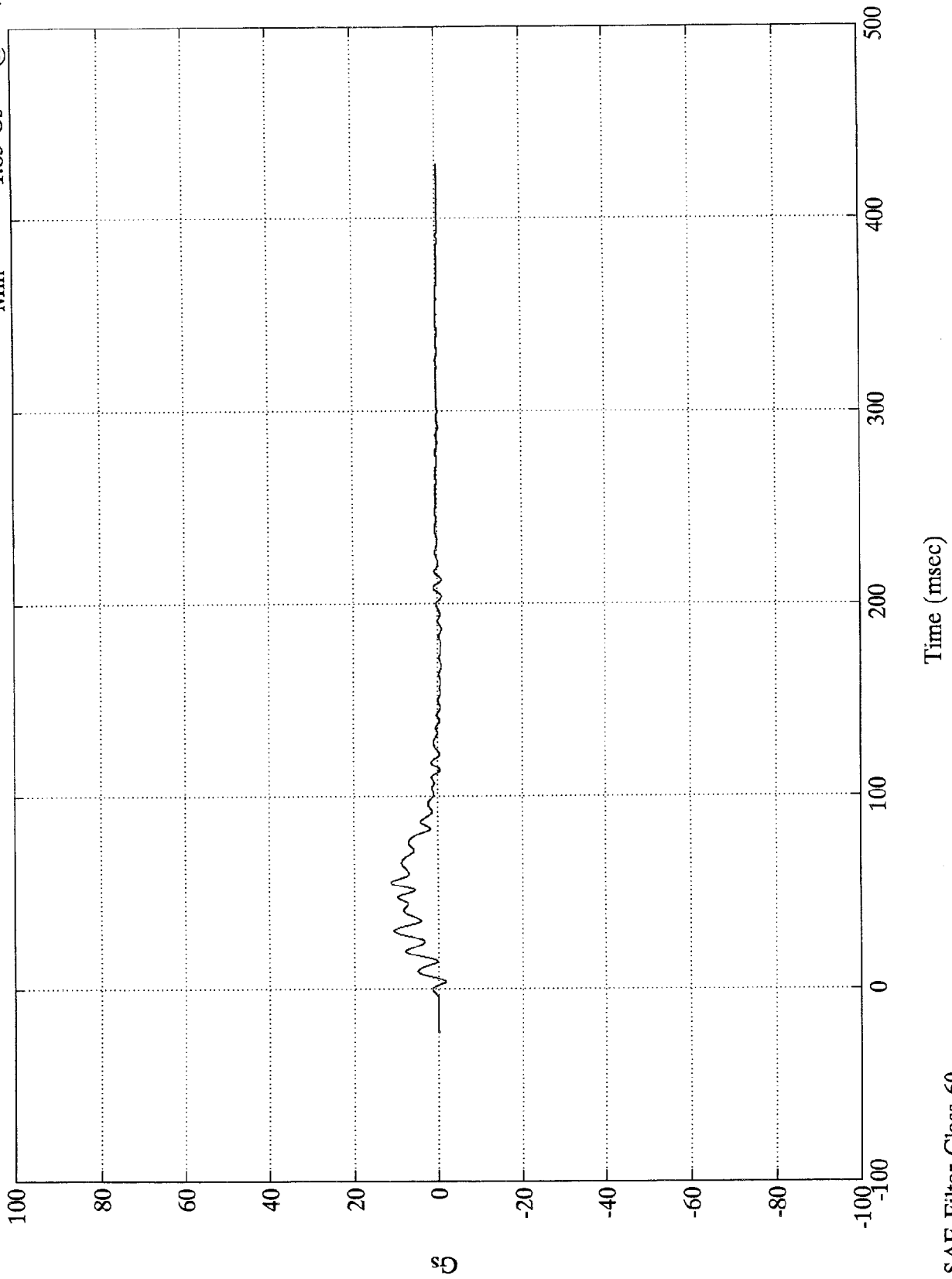
Time (msec)

SAE Filter Class 180

VTV TEST #3

Max = 11.27 Gs @ 55.32 msec
Min = -1.83 Gs @ 4.07 msec

V2 Center X

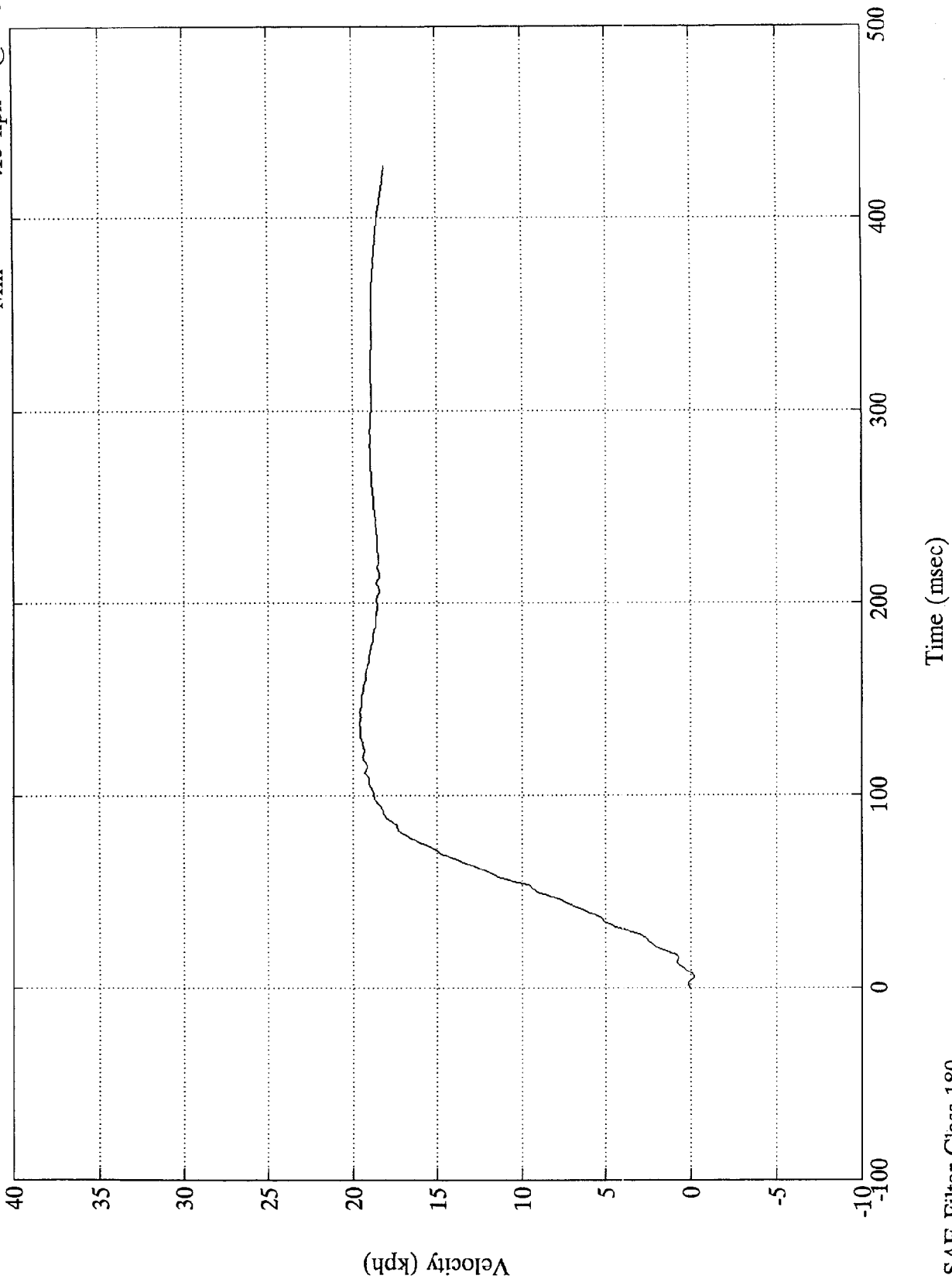


SAE Filter Class 60

VTV TEST #3

Max = 19.61 kph @ 137.87 msec
Min = -1.15 kph @ 5.99 msec

V2 Center X

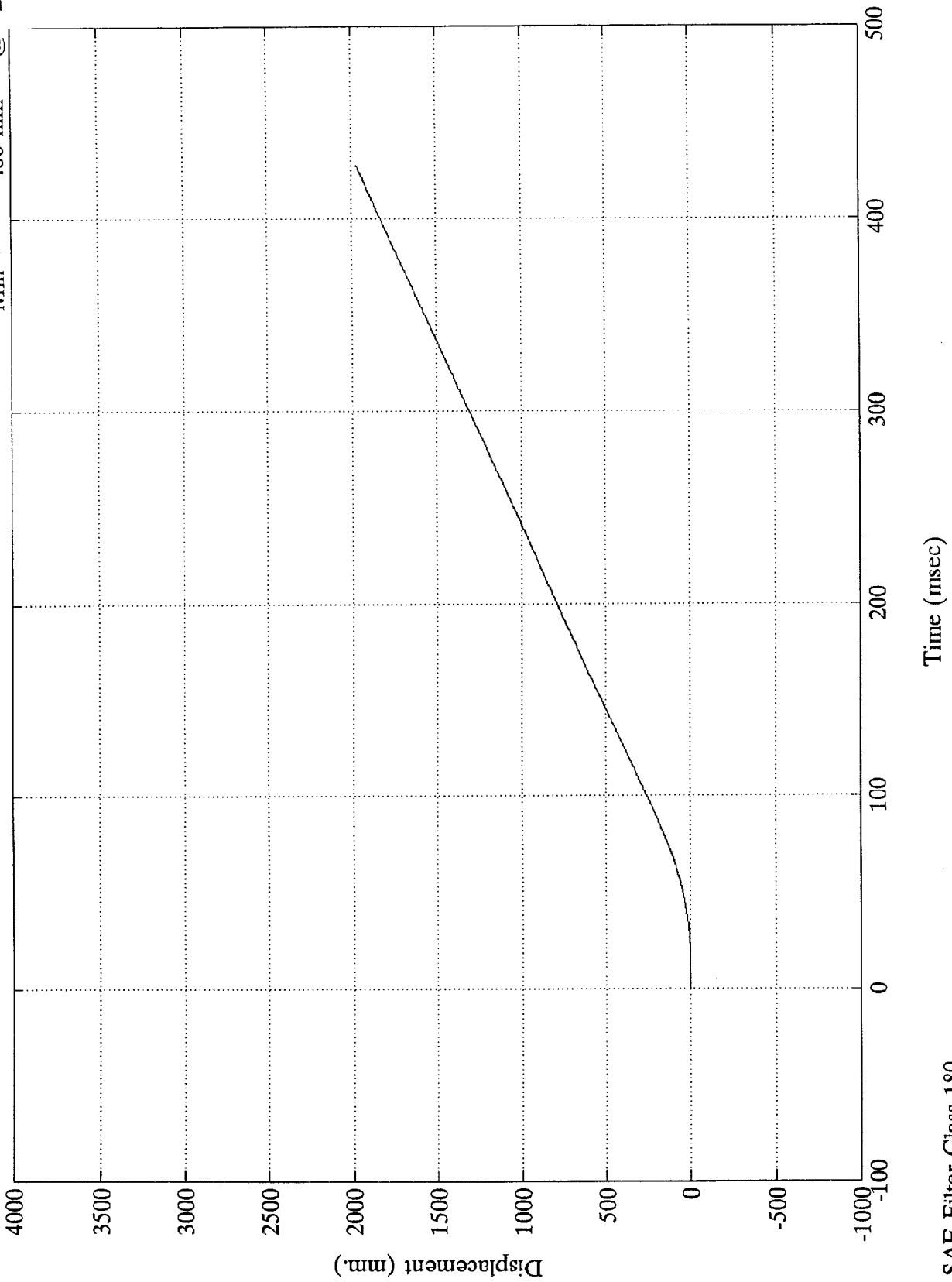


SAE Filter Class 180

VTV TEST #3

Max = 1968.10 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec

V2 Center X

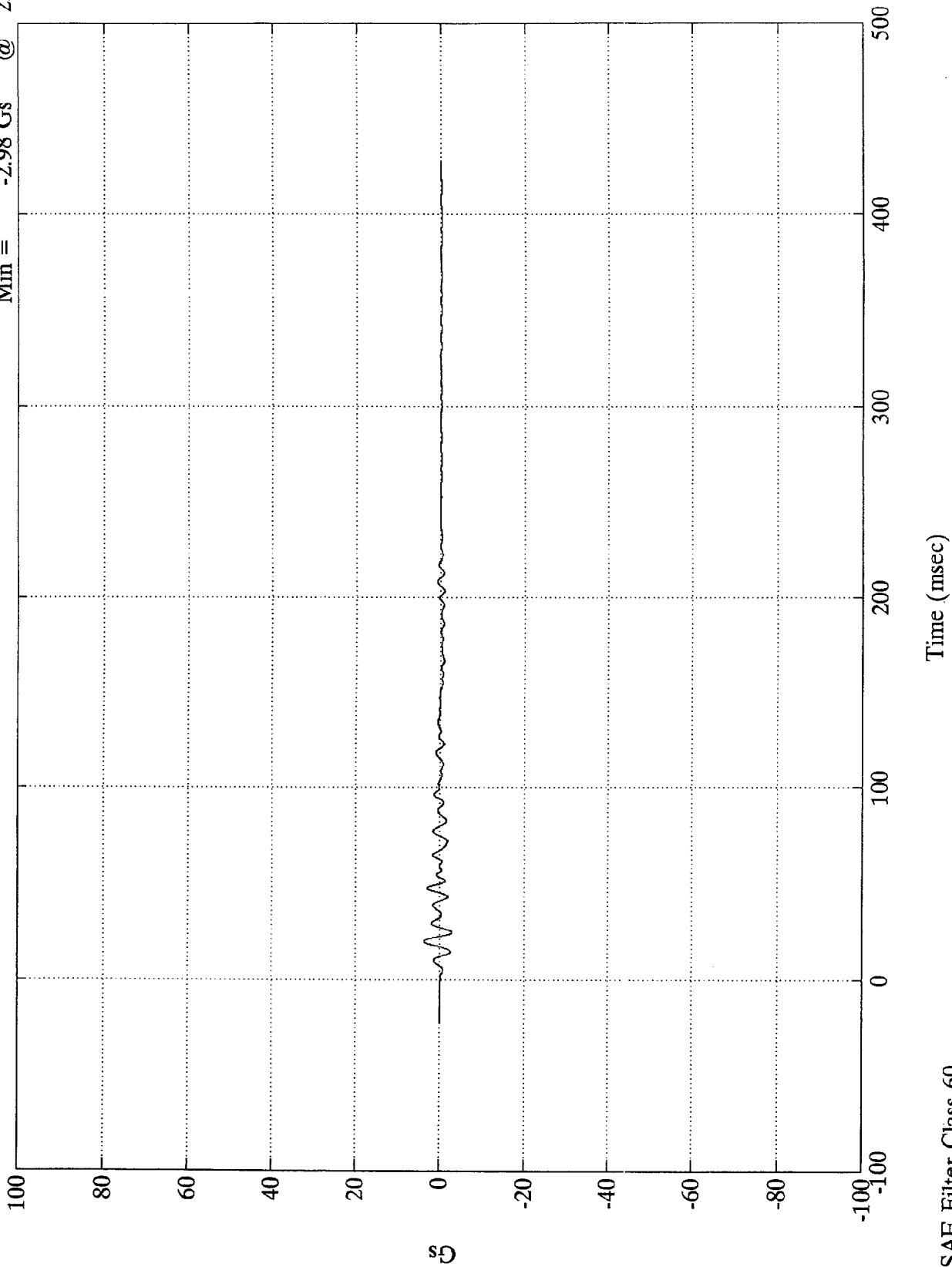


SAE Filter Class 180

VTV TEST #3

Max = 3.61 Gs @ 20.40 msec
Min = -2.98 Gs @ 25.08 msec

V2 Center Y

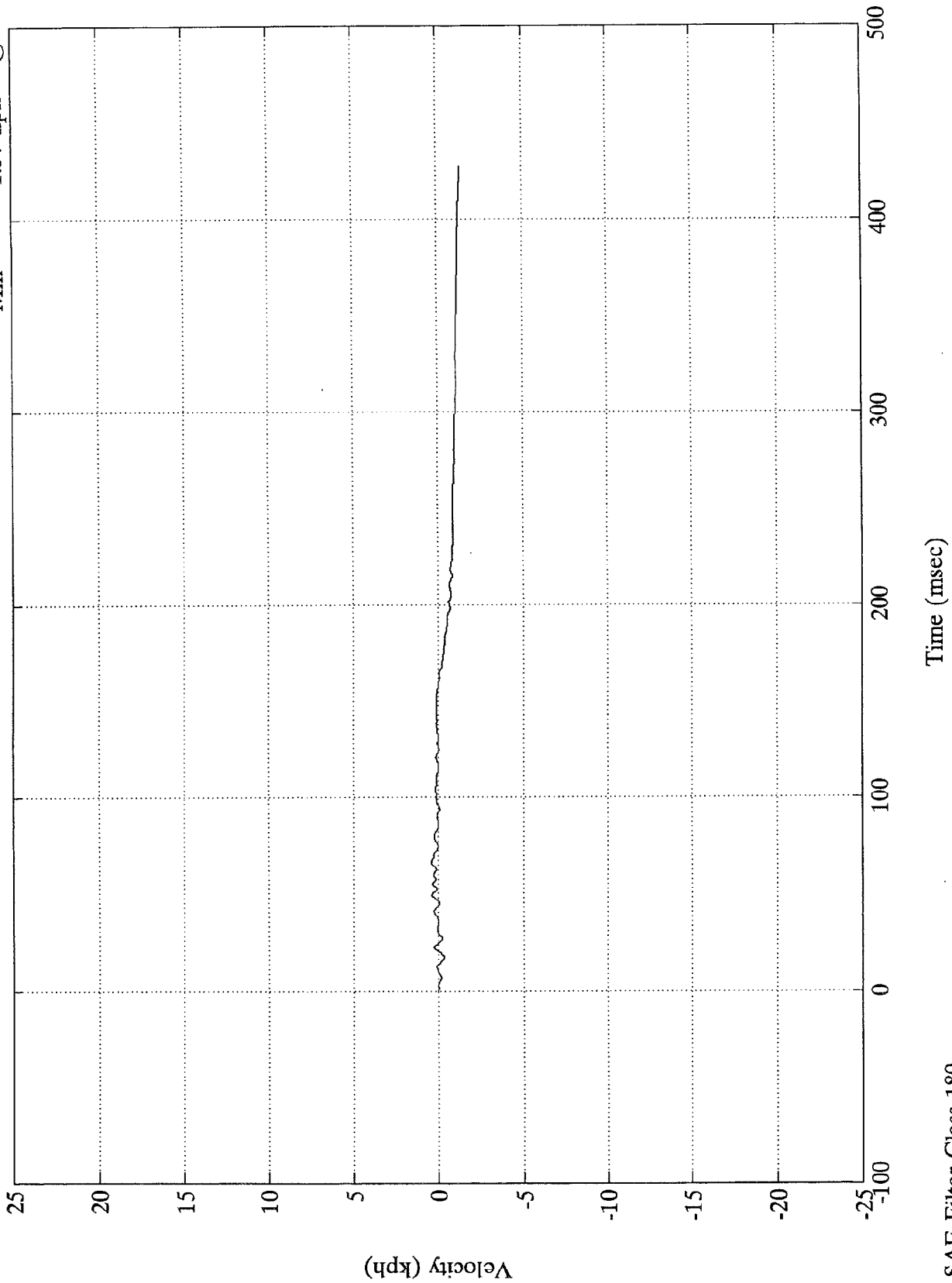


SAE Filter Class 60

VTV TEST #3

Max = .43 kph @ 49.56 msec
Min = -1.37 kph @ 423.36 msec

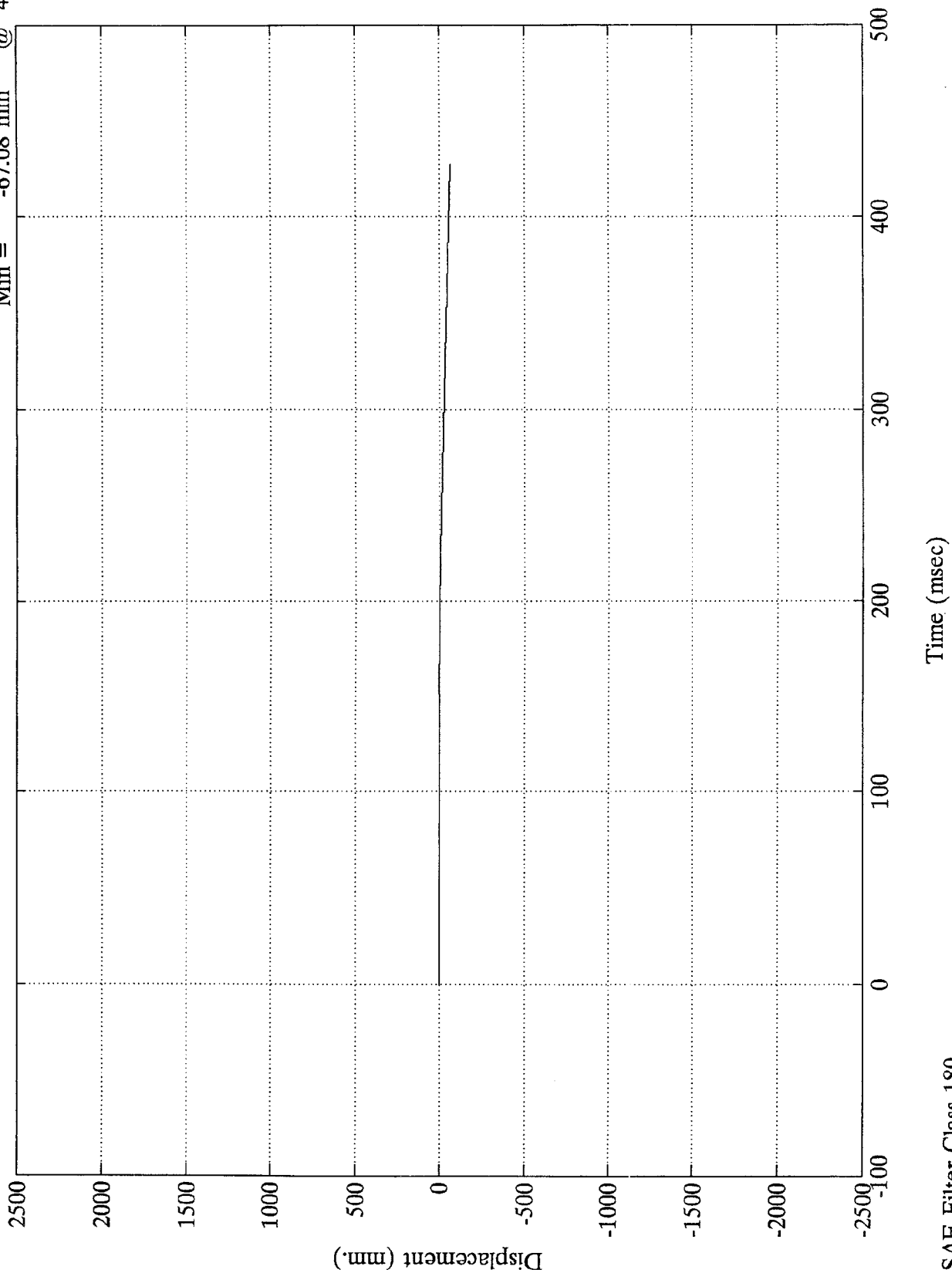
V2 Center Y



SAE Filter Class 180

VTV TEST #3

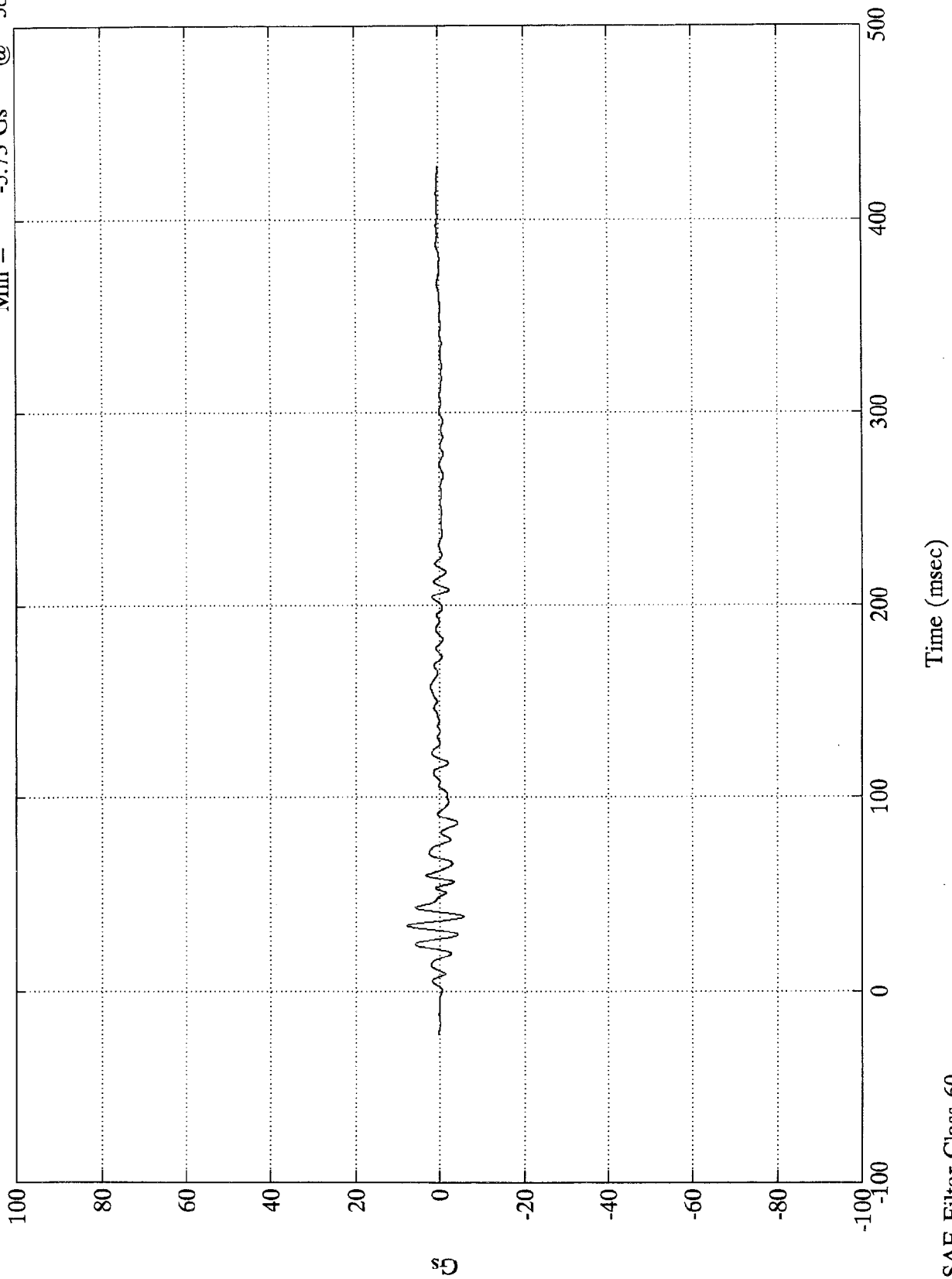
V2 Center Y
Max = 3.65 mm @ 159.84 msec
Min = -67.08 mm @ 427.32 msec



VTV TEST #3

Max = 7.81 Gs @ 34.20 msec
 Min = -5.73 Gs @ 38.88 msec

V2 Center Z

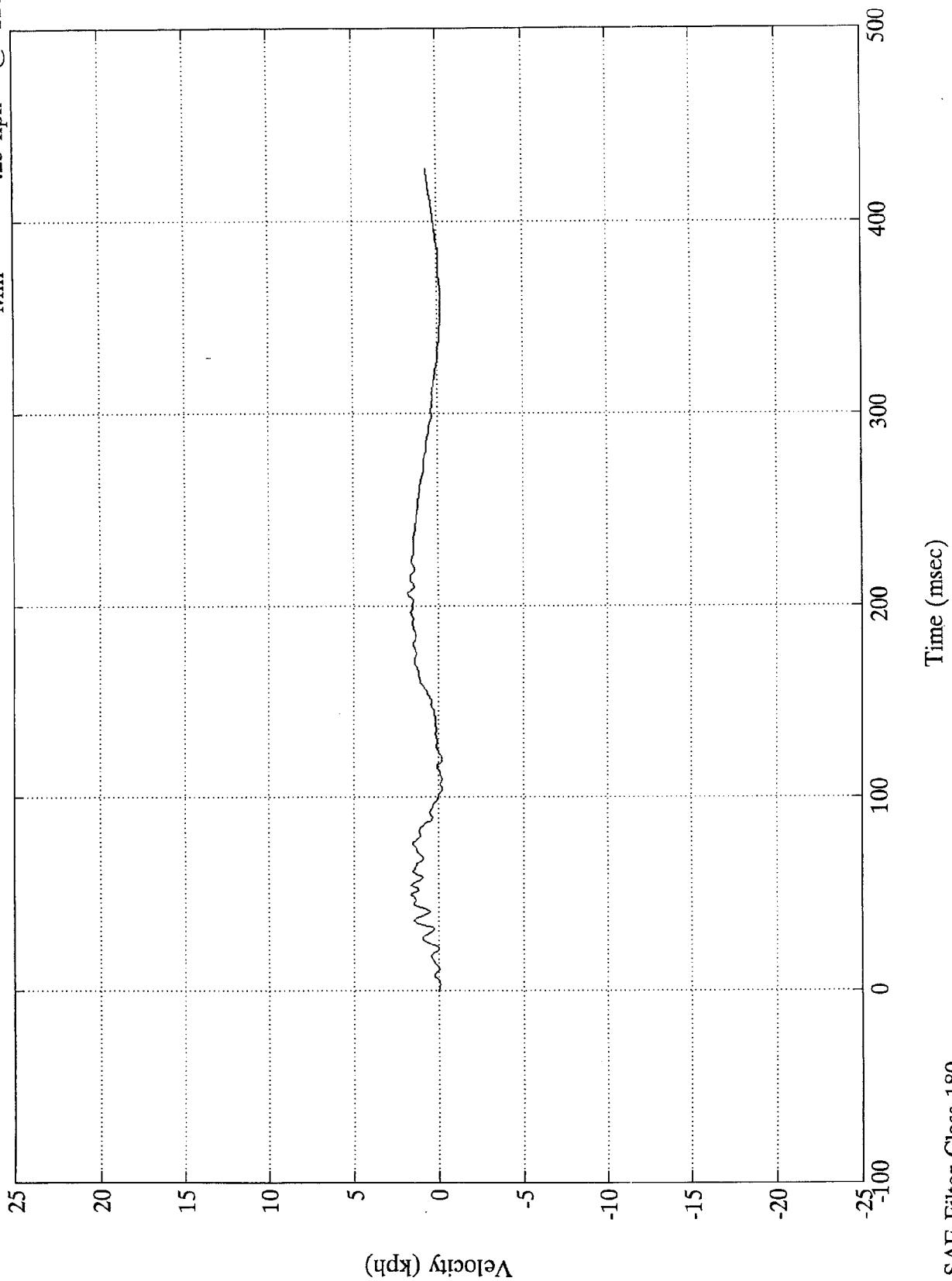


SAE Filter Class 60

VTV TEST #3

Max = 1.80 kph @ 206.64 msec
Min = -.23 kph @ 120.12 msec

V2 Center Z

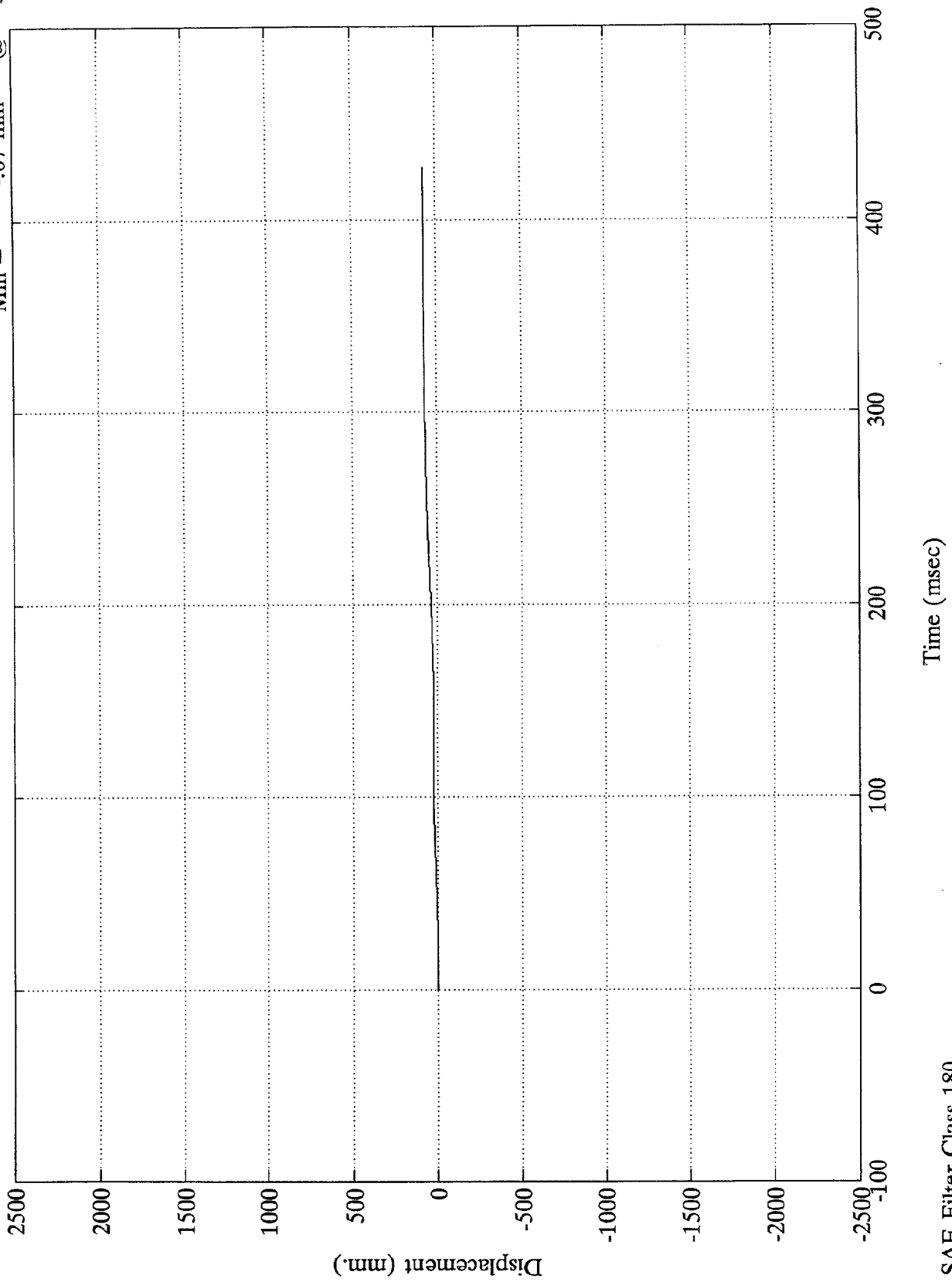


SAE Filter Class 180

VTV TEST #3

Max = 74.91 mm @ 427.32 msec
Min = -.07 mm @ 5.15 msec

V2 Center Z

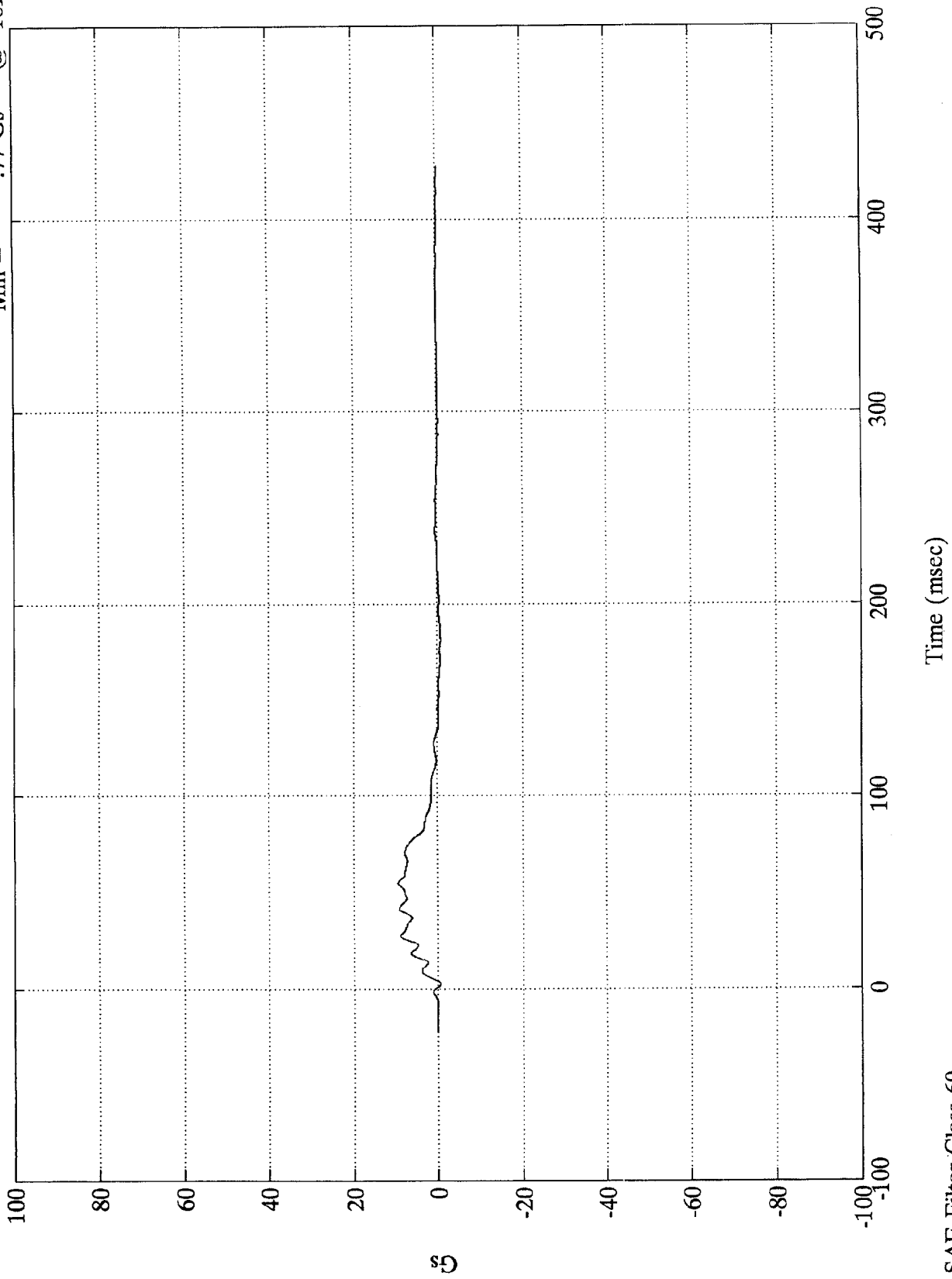


SAE Filter Class 180

VTV TEST #3

Max = 9.55 Gs @ 54.96 msec
Min = -7.77 Gs @ 181.80 msec

V2 Right X

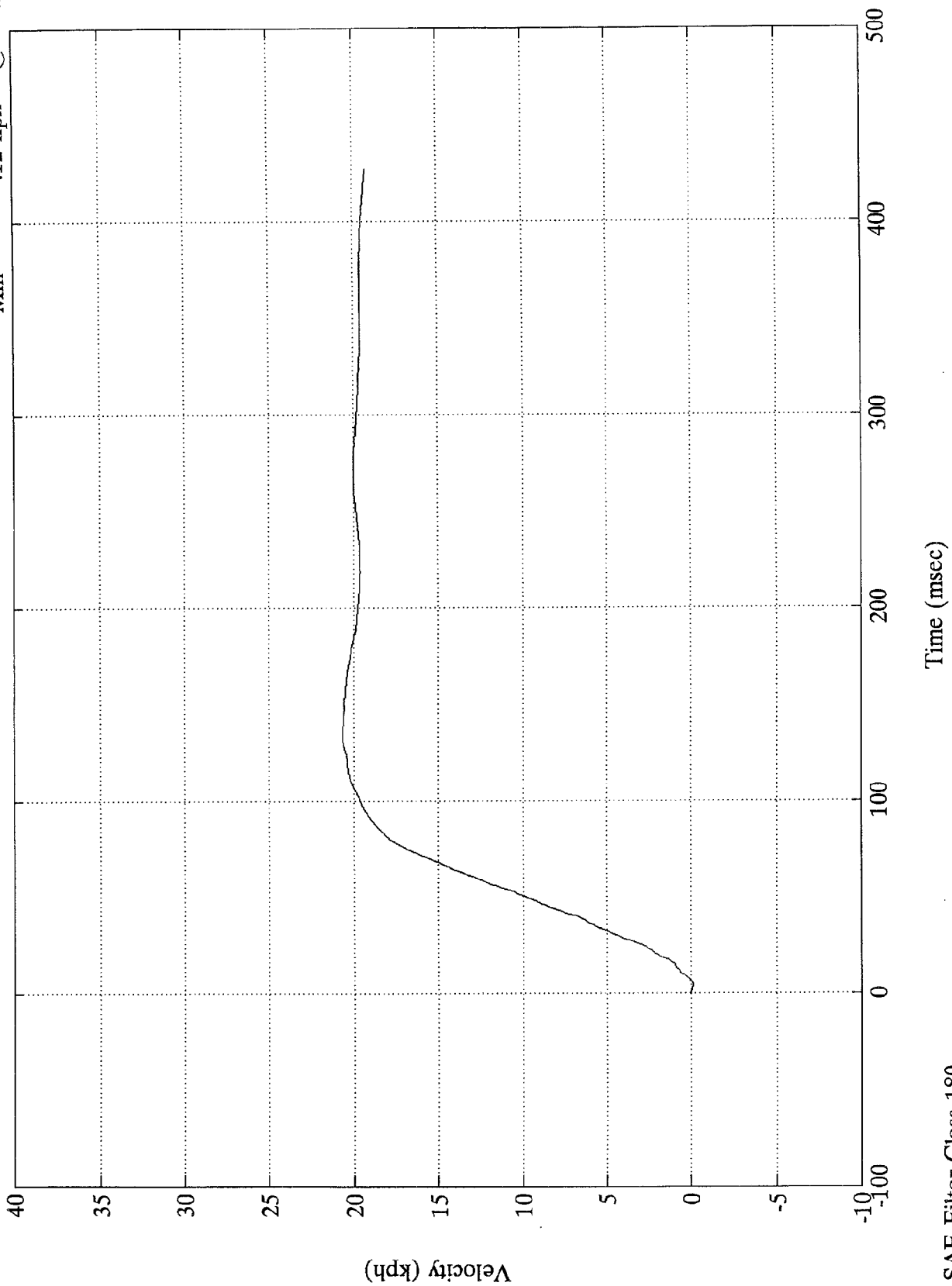


SAE Filter Class 60

VTV TEST #3

V2 Right X

Max = 20.66 kph @ 134.03 msec
Min = -12 kph @ 4.67 msec

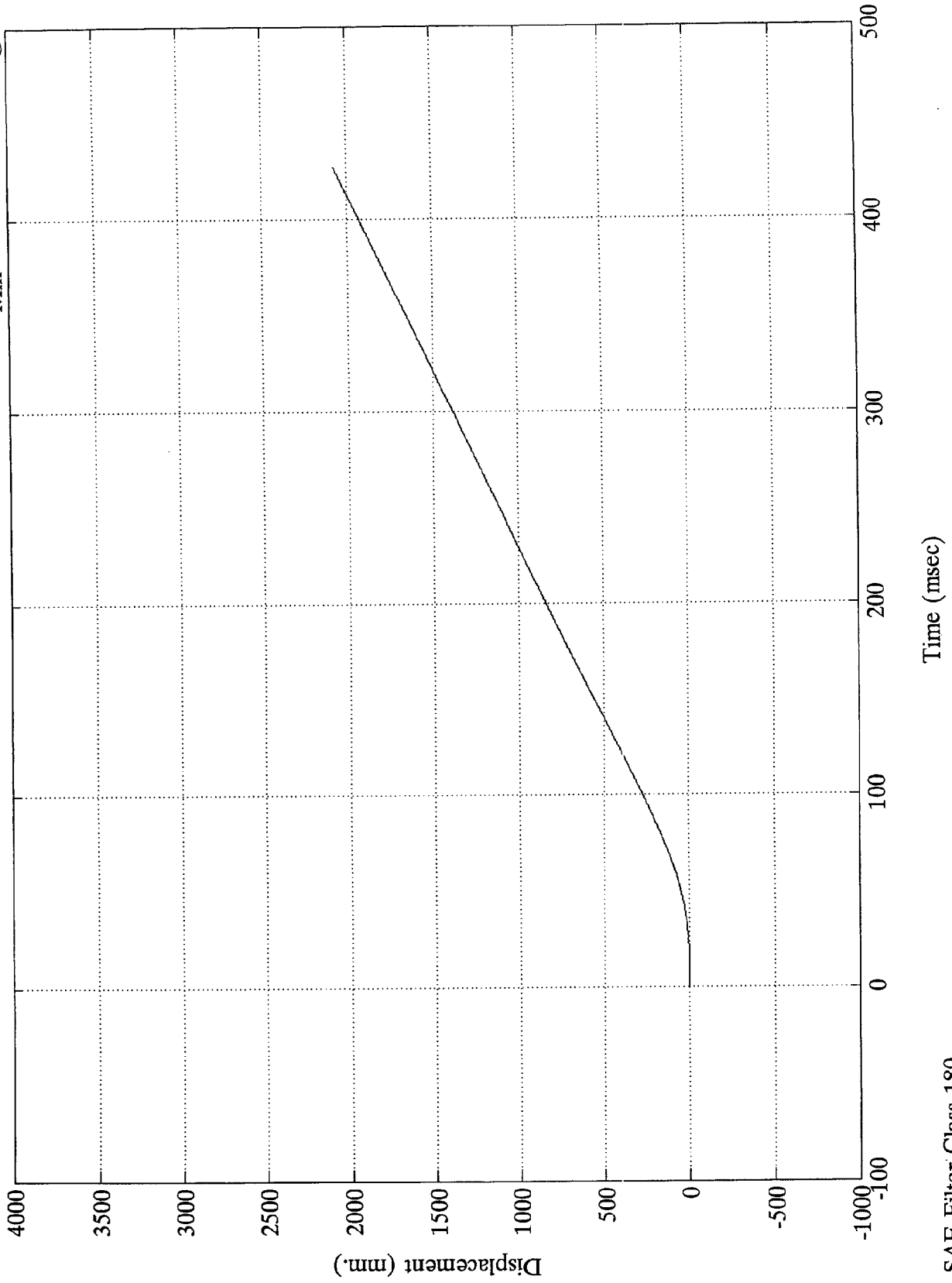


SAE Filter Class 180

VTV TEST #3

V2 Right X

Max = 2076.00 mm @ 427.32 msec
Min = -.08 mm @ 6.11 msec

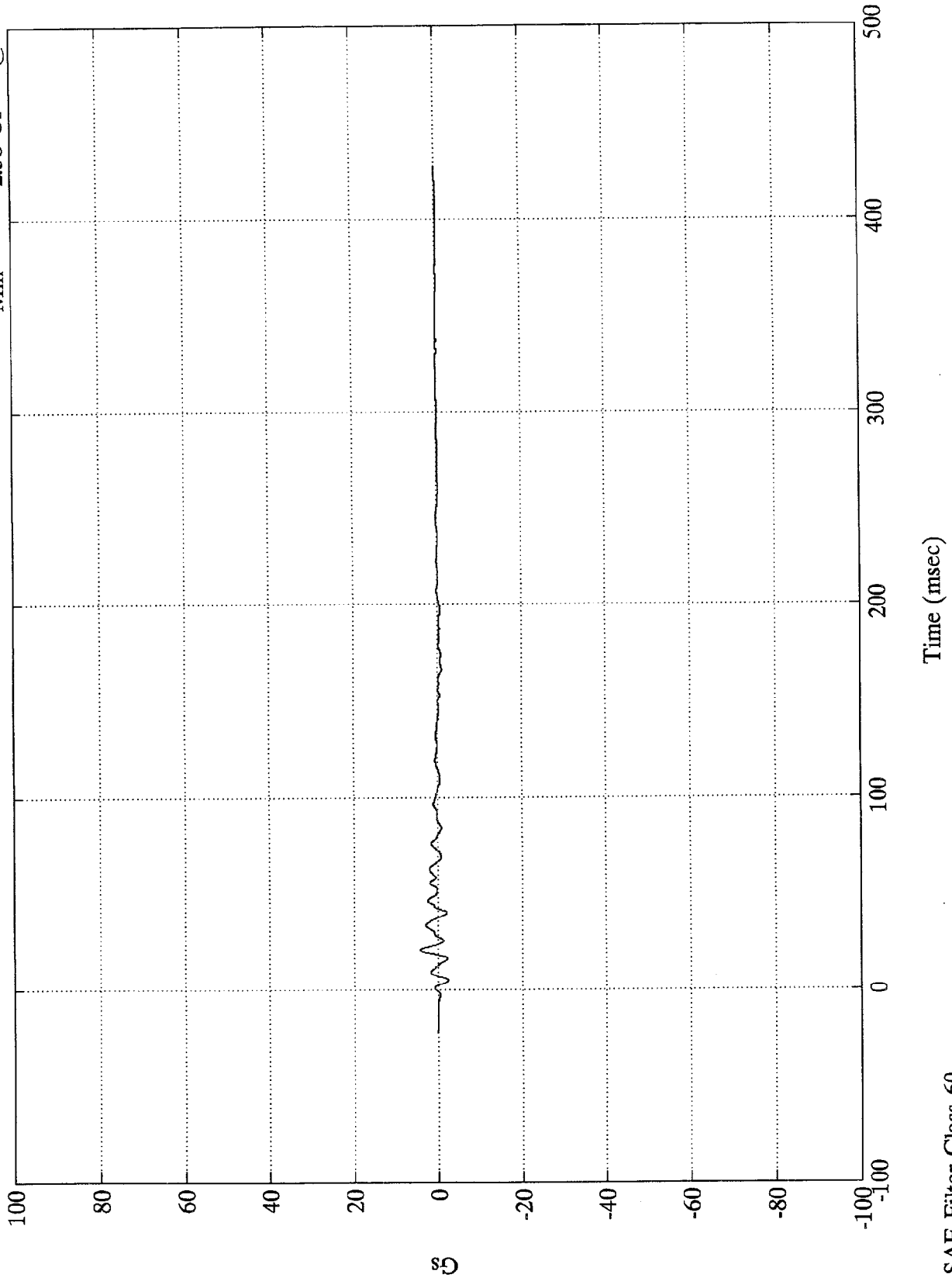


SAE Filter Class 180

VTV TEST #3

V2 Right Y

Max = 4.29 Gs @ 20.88 msec
 Min = -2.38 Gs @ 5.15 msec

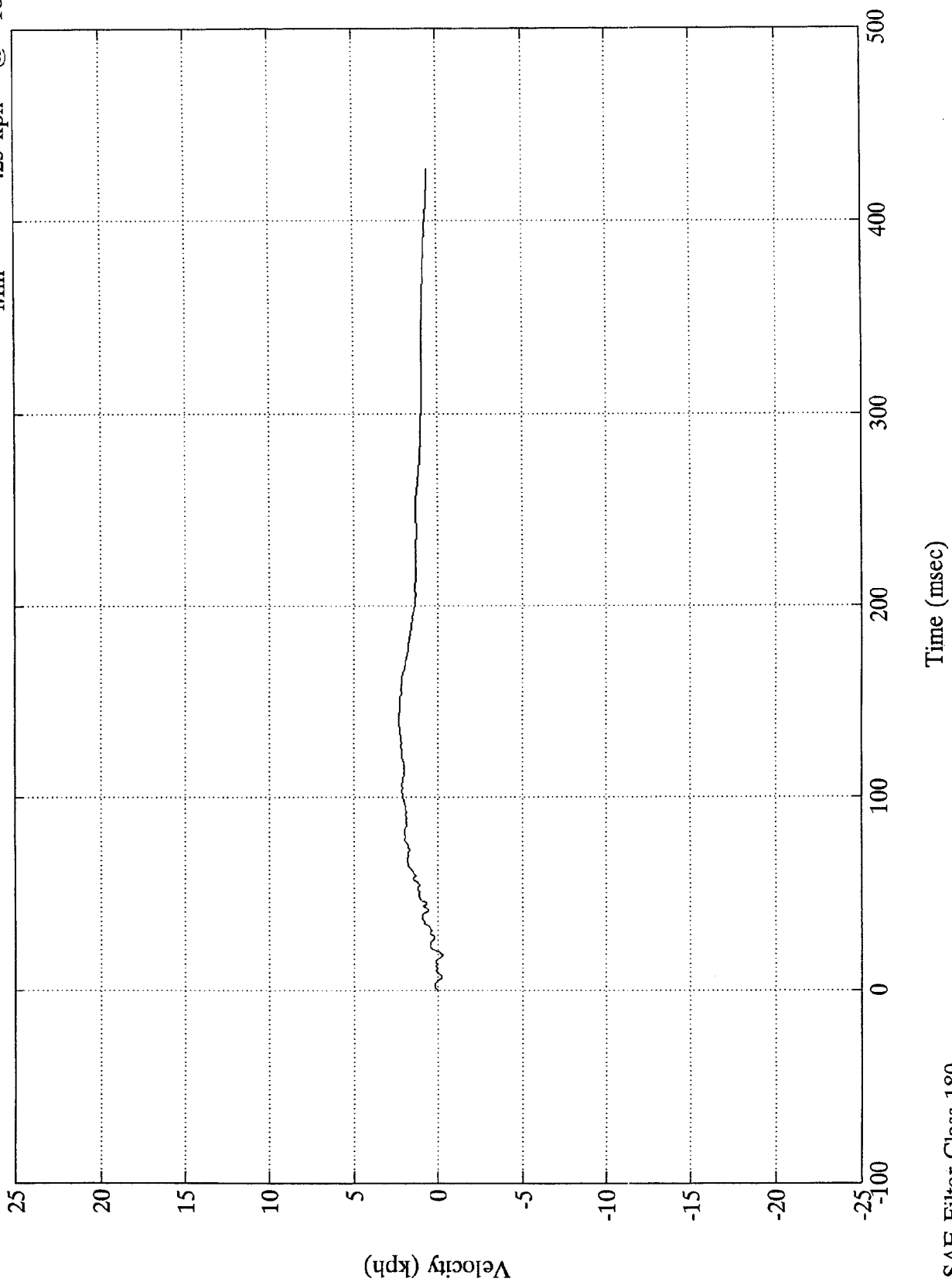


SAE Filter Class 60

VTV TEST #3

Max = 2.31 kph @ 138.60 msec
Min = -2.25 kph @ 18.60 msec

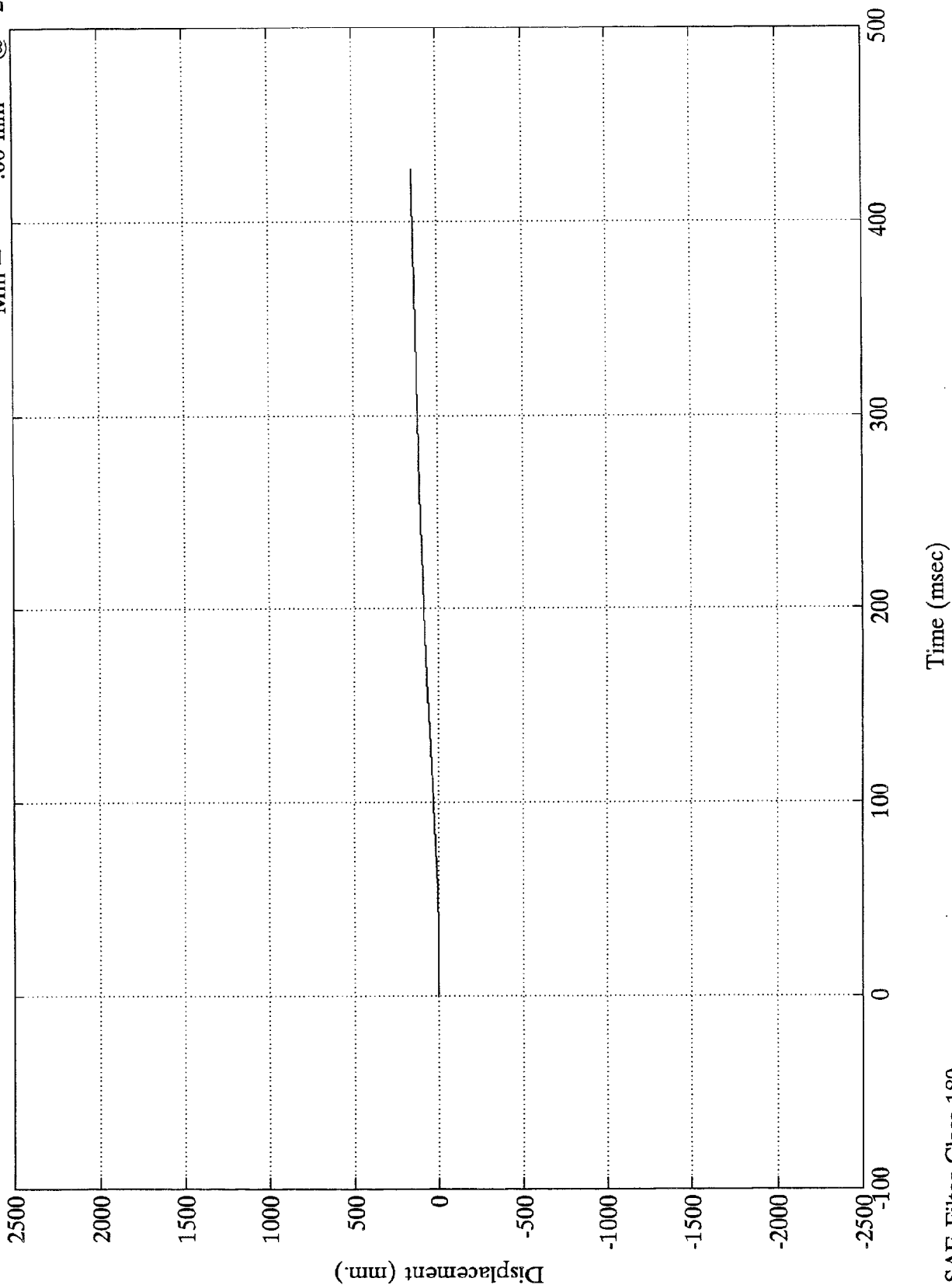
V2 Right Y



VTV TEST #3

Max = 147.40 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec

V2 Right Y



SAE Filter Class 180

TEST NO. A109-4-1655

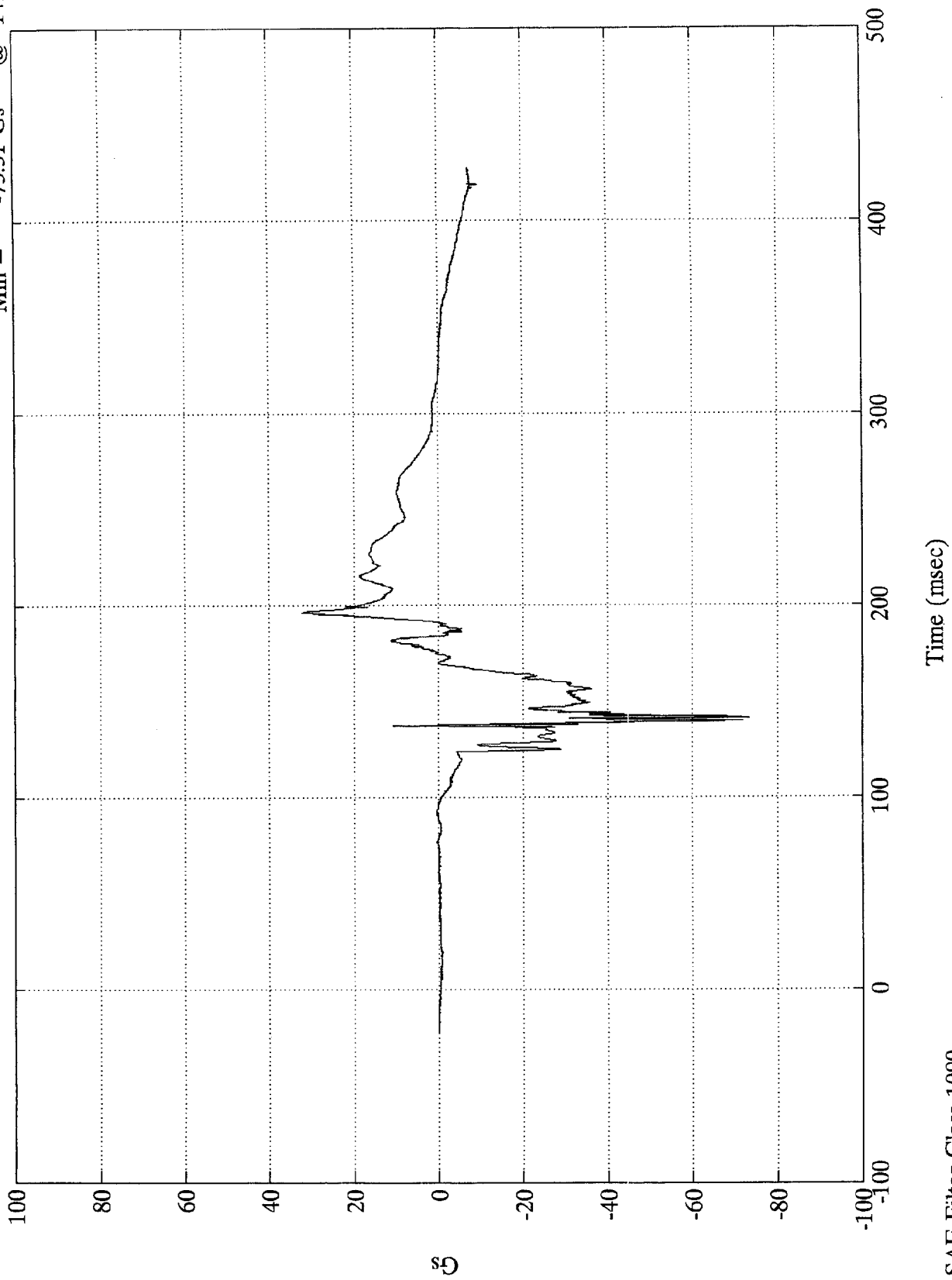
VEHICLE 1 - DUMMY DATA

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

VTV TEST #3

P1 Head X

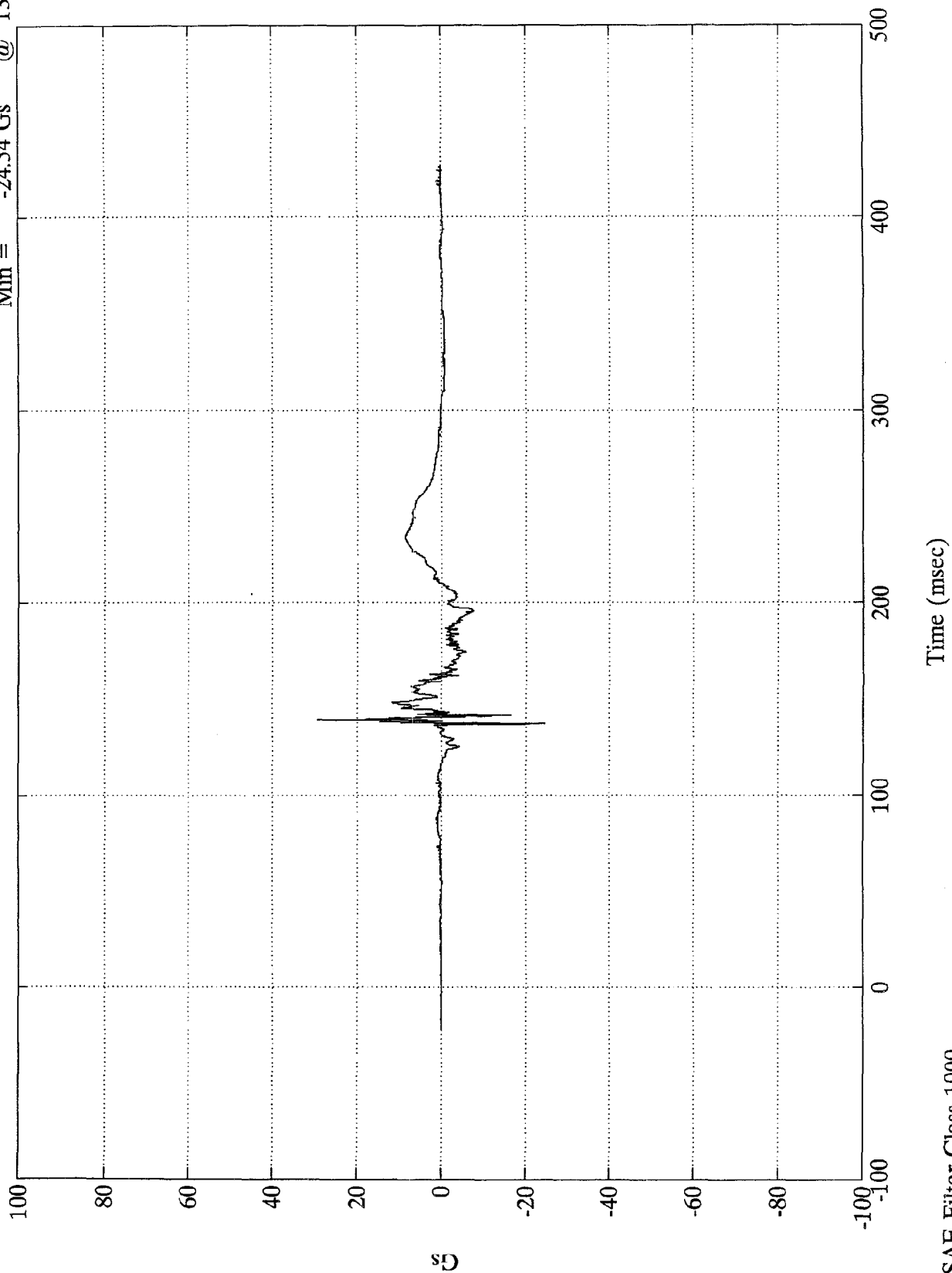
Max = 32.22 Gs @ 196.44 msec
Min = -73.31 Gs @ 141.11 msec



SAE Filter Class 1000

VTV TEST #3

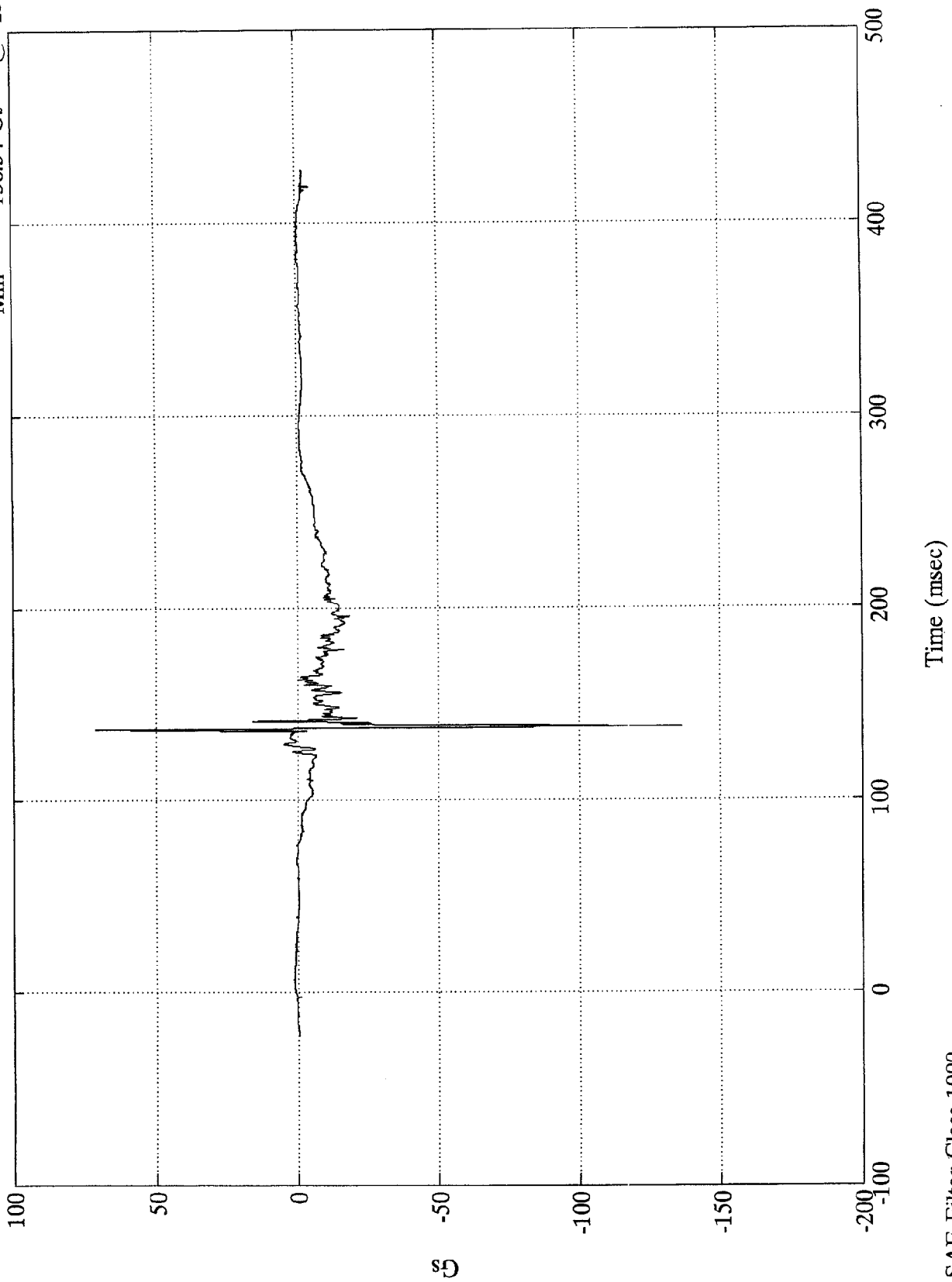
P1 Head Y
Max = 29.33 Gs @ 139.55 msec
Min = -24.54 Gs @ 137.39 msec



VTV TEST #3

Max = 71.18 Gs @ 137.04 msec
 Min = -136.34 Gs @ 138.12 msec

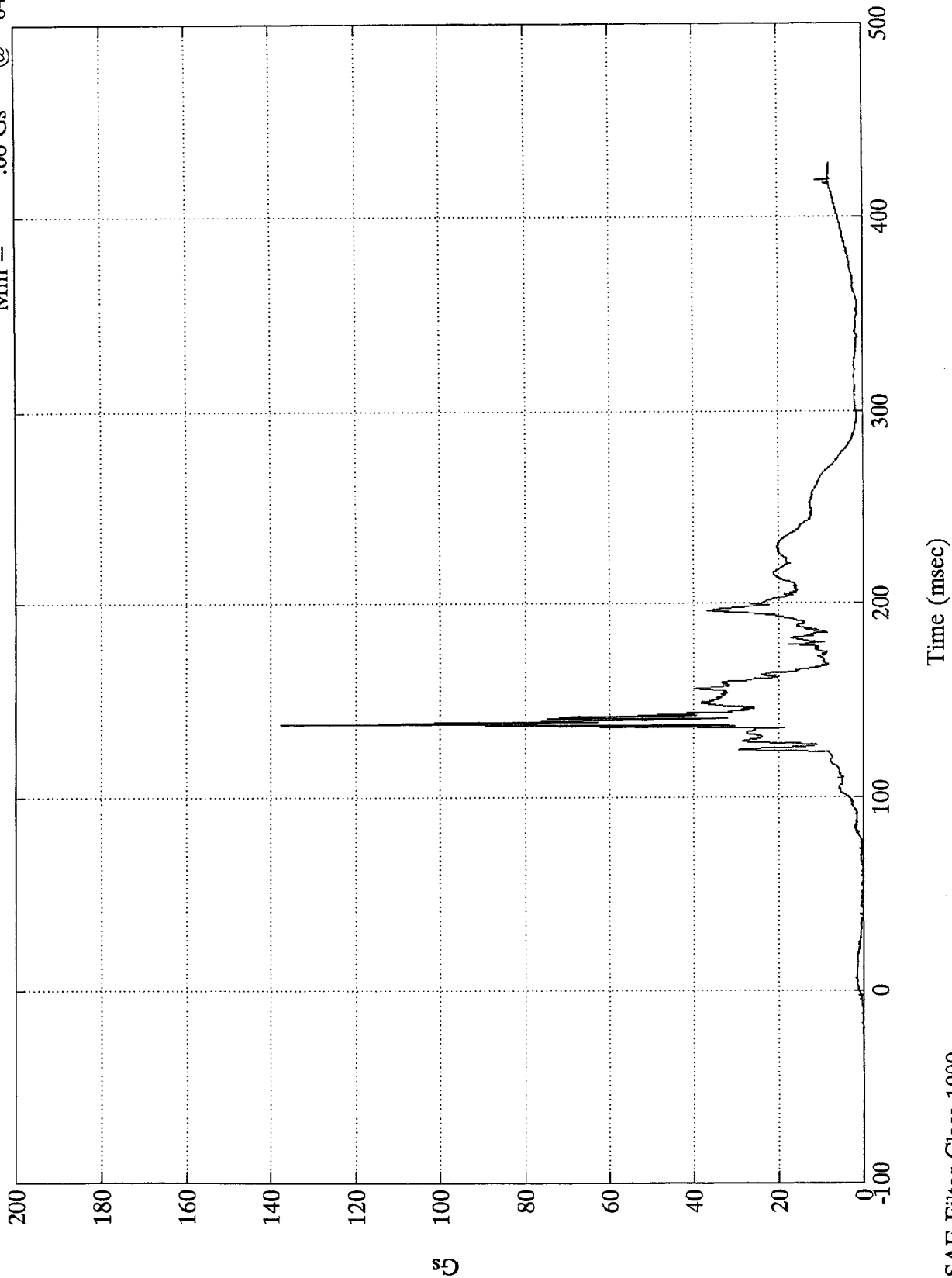
P1 Head Z



VTV TEST #3

Max = 137.51 Gs @ 138.12 msec
 Min = .06 Gs @ 64.44 msec

P1 Head Resultant

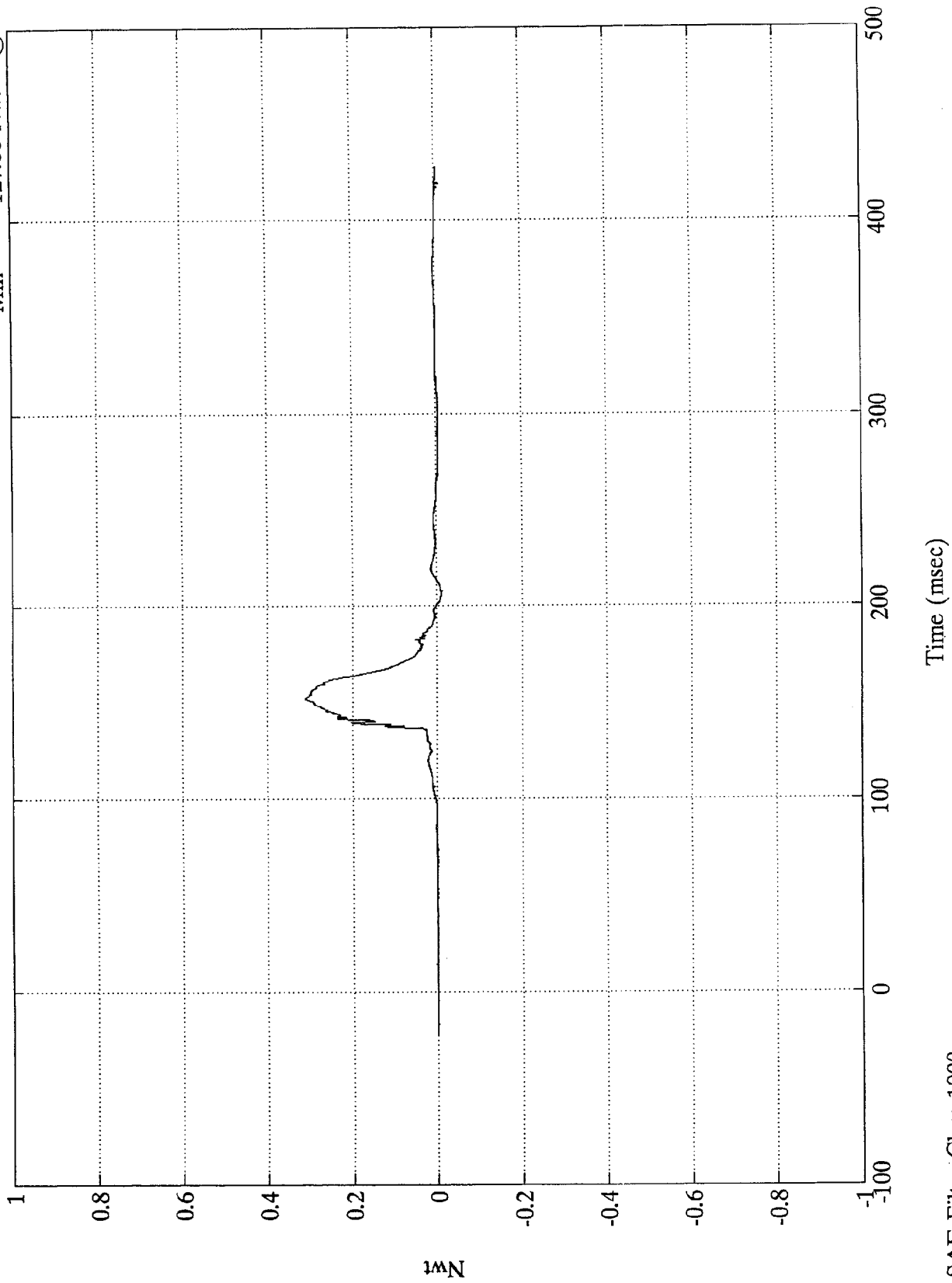


SAE Filter Class 1000

VTV TEST #3
x10⁴

P1 Upper Neck Fx

Max = 3105.89 Nwt @ 152.52 msec
Min = -127.06 Nwt @ 207.96 msec

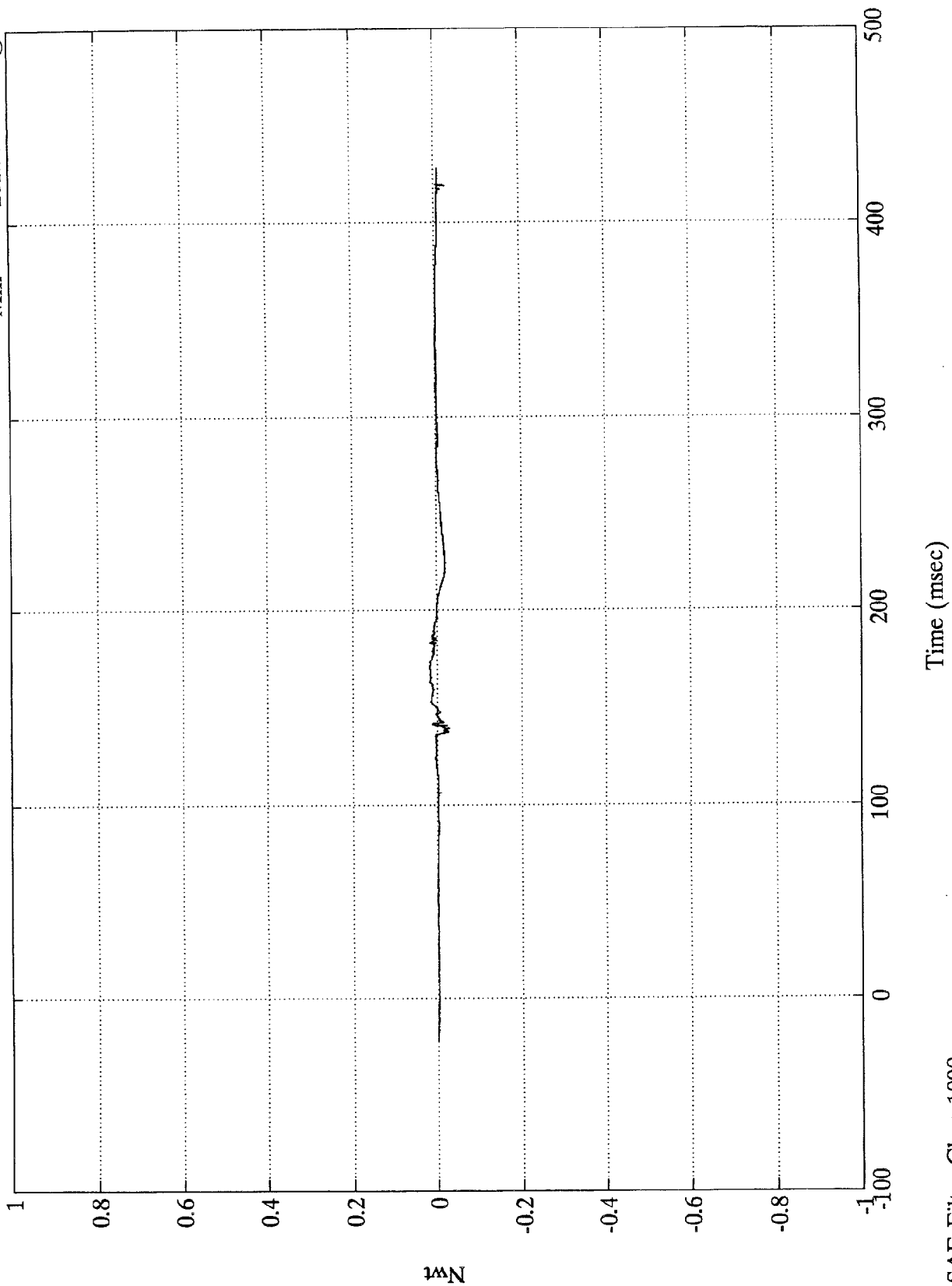


SAE Filter Class 1000

VTV TEST #3
 x10⁴

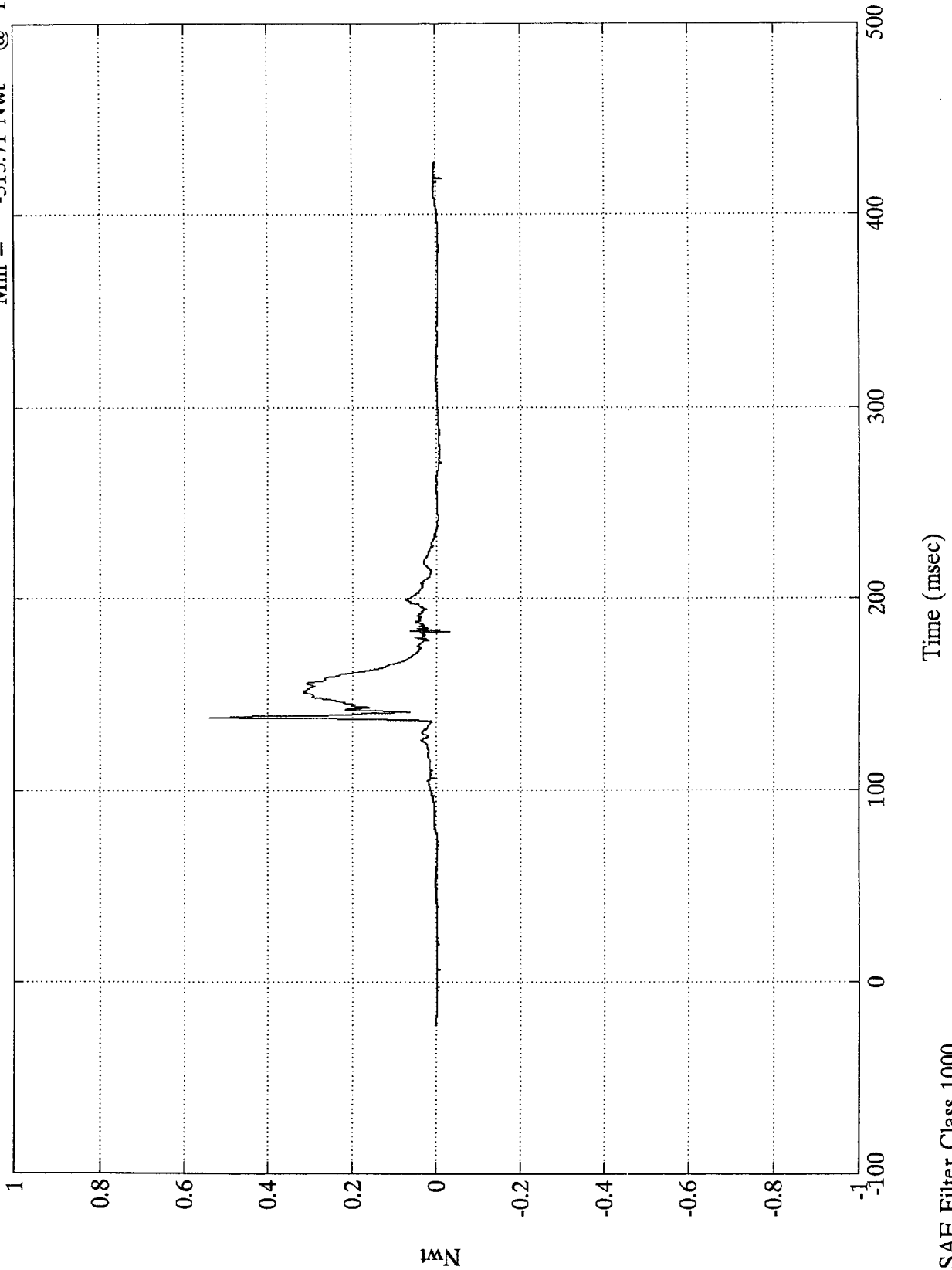
P1 Upper Neck Fy

Max = 186.03 Nwt @ 163.80 msec
 Min = -281.95 Nwt @ 139.44 msec



SAE Filter Class 1000

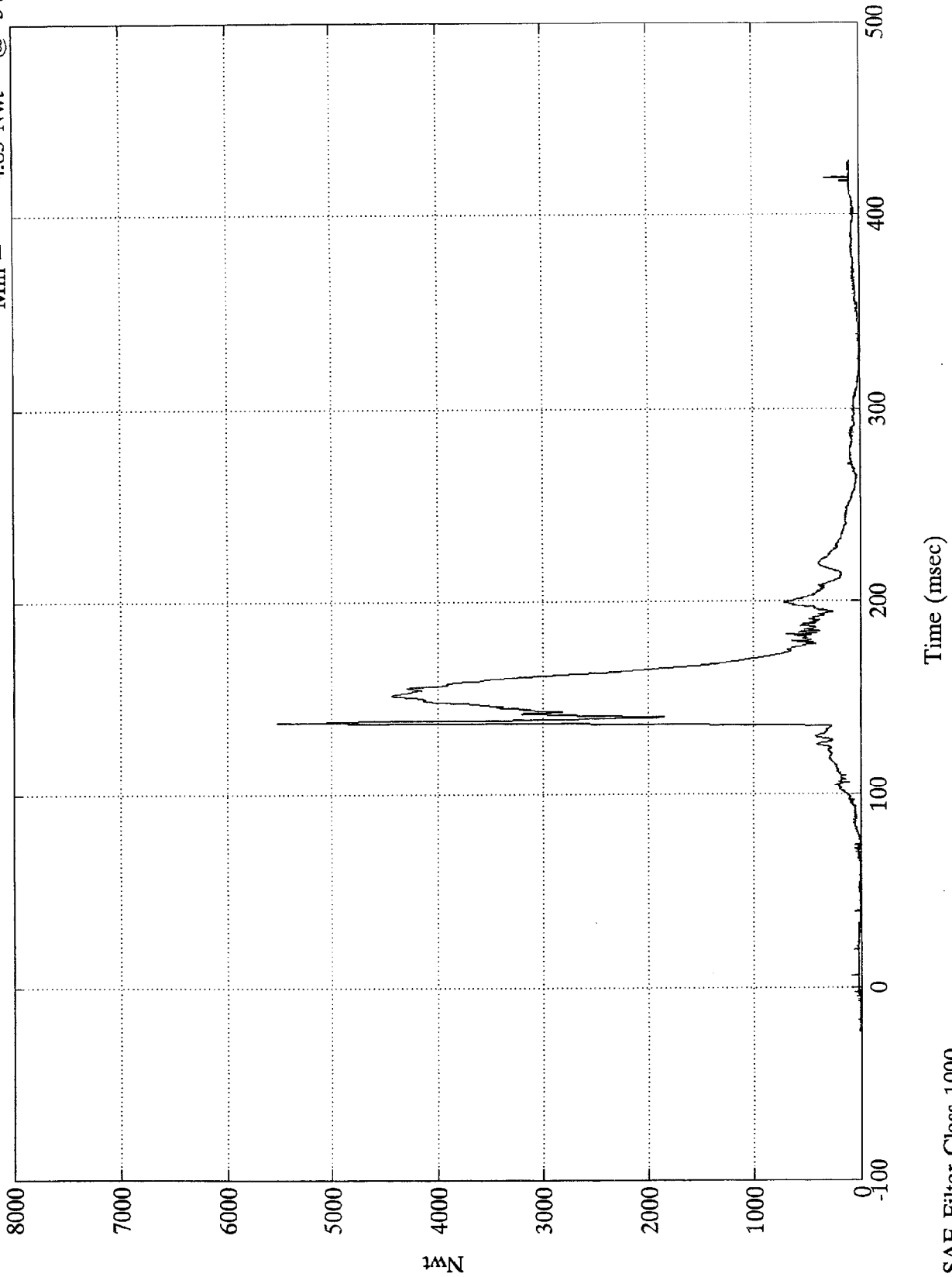
VTV TEST #3
x10⁴
P1 Upper Neck Fz
Max = 5395.60 Nwt @ 138.00 msec
Min = -315.71 Nwt @ 182.75 msec



VTV TEST #3

P1 Upper Neck Force Res

Max = 5520.04 Nwt @ 138.00 msec
Min = 4.83 Nwt @ 342.00 msec

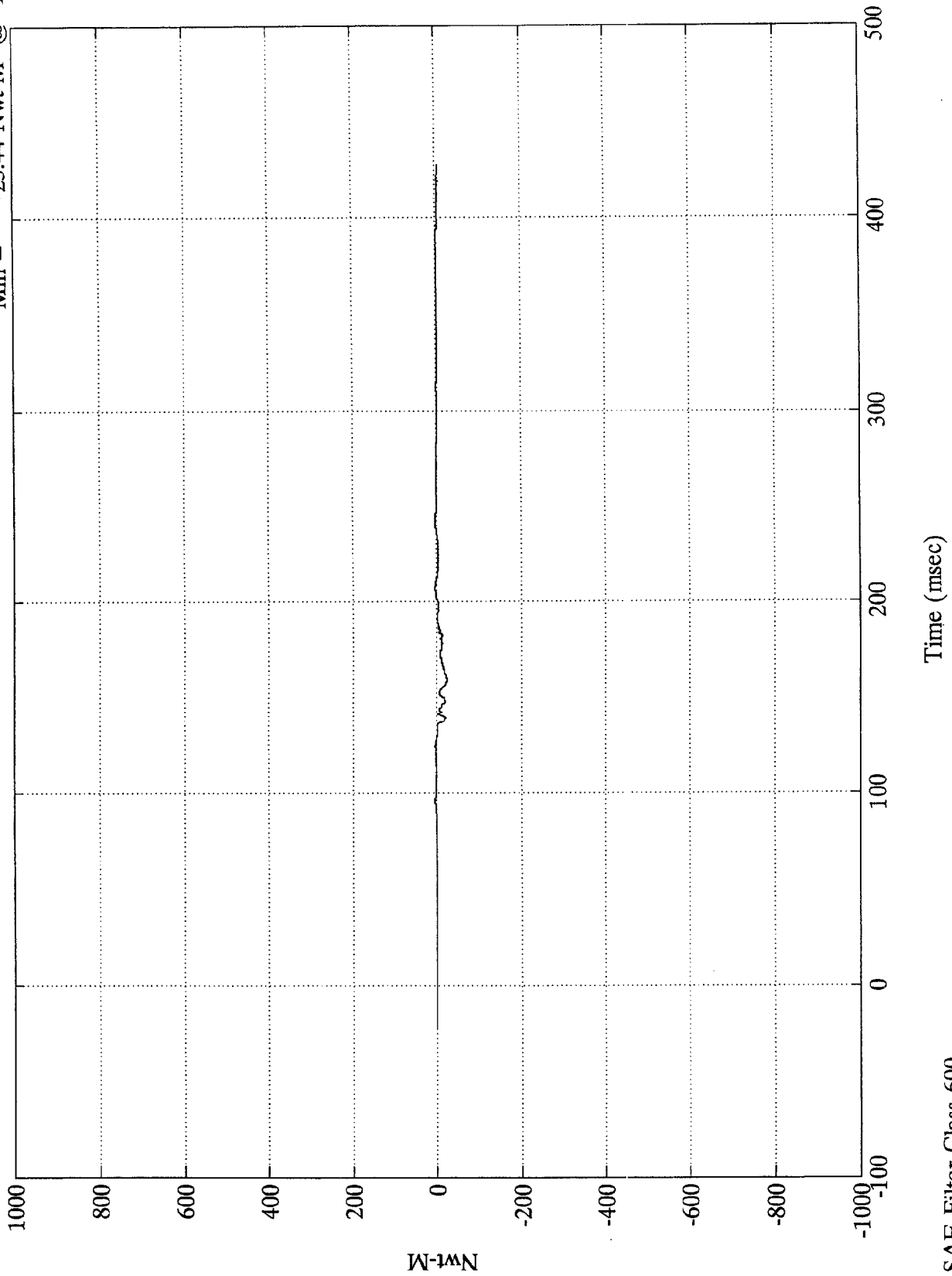


SAE Filter Class 1000

VTV TEST #3

P1 Upper Neck Mx

Max = 4.01 Nwt-M @ 207.48 msec
Min = -25.44 Nwt-M @ 159.48 msec

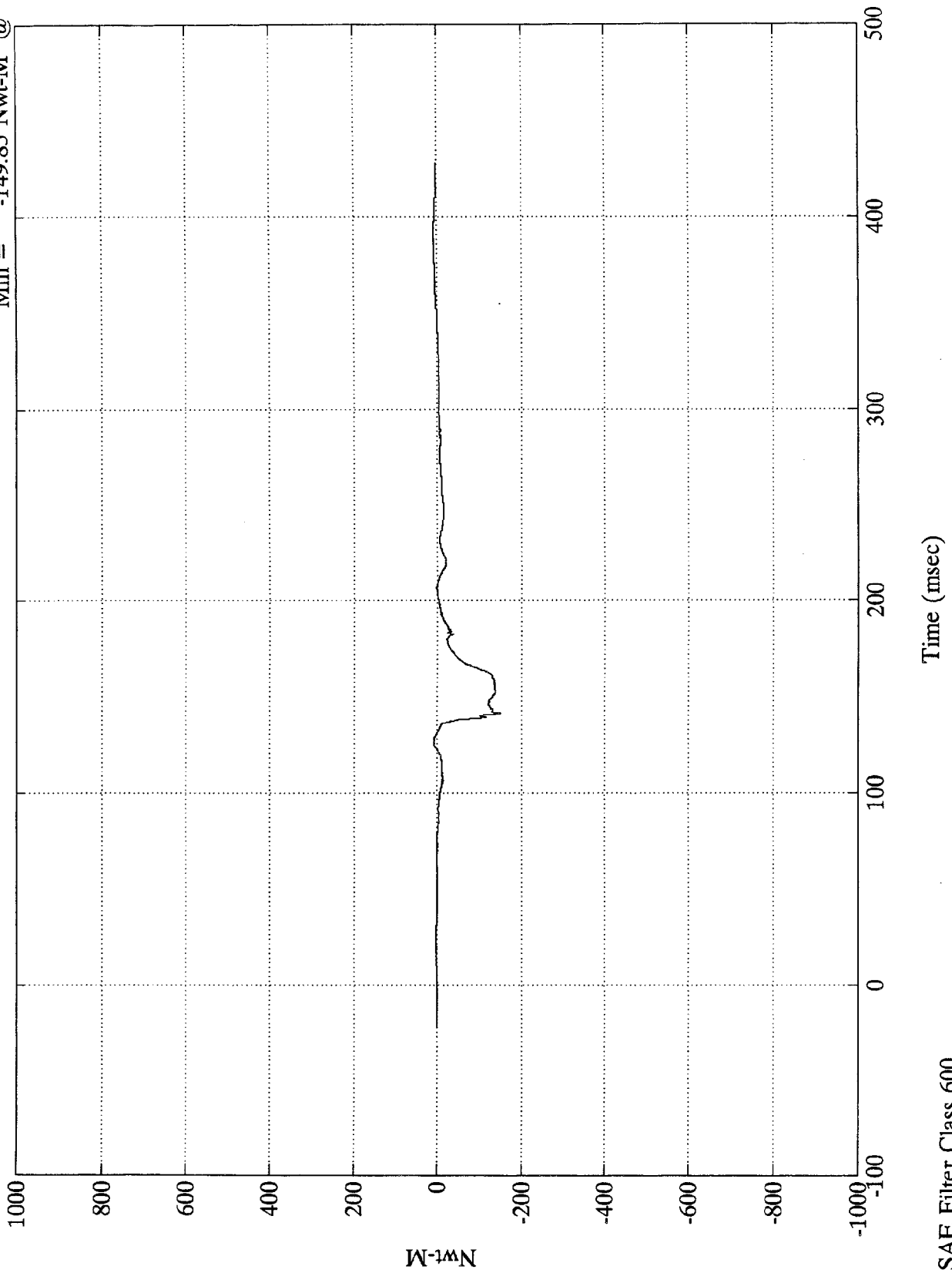


SAE Filter Class 600

VTV TEST #3

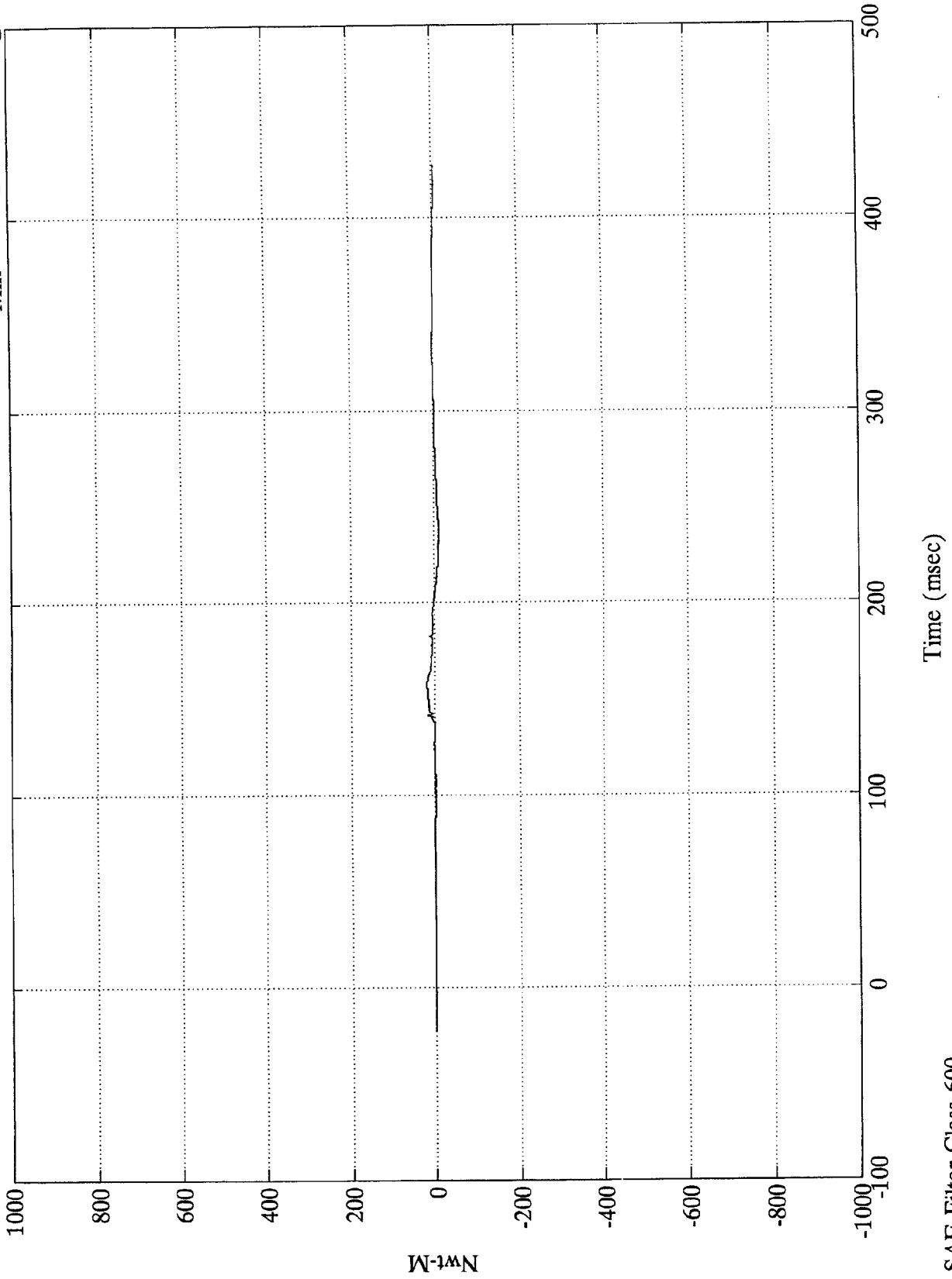
P1 Upper Neck My

Max = 7.53 Nwt-M @ 128.03 msec
Min = -149.85 Nwt-M @ 141.59 msec



VTV TEST #3

P1 Upper Neck Mz
Max = 21.40 Nwt-M @ 156.72 msec
Min = -10.69 Nwt-M @ 237.84 msec

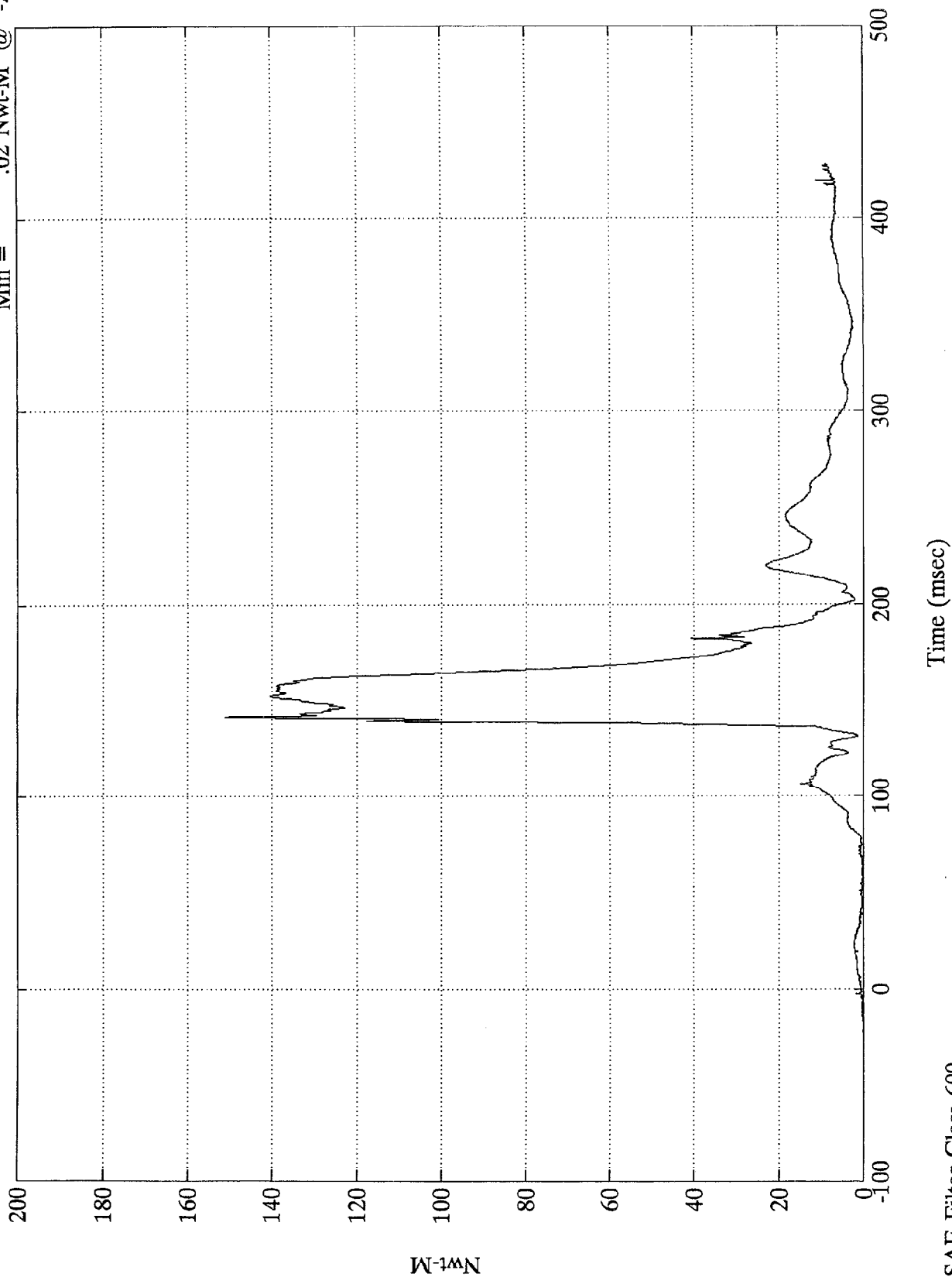


SAE Filter Class 600

VTV TEST #3

P1 Upper Neck Moment Res

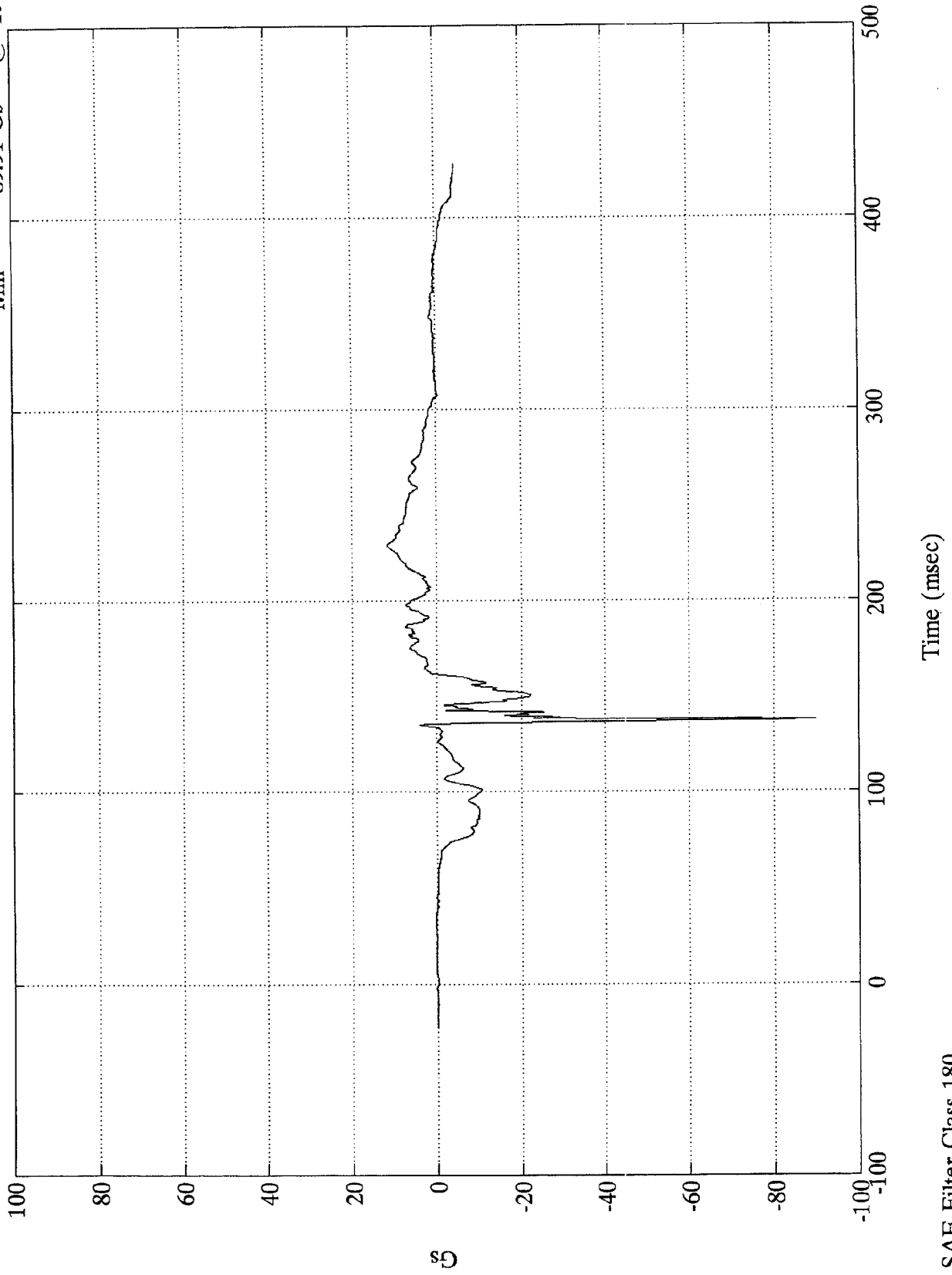
Max = 151.06 Nwt-M @ 141.59 msec
Min = .02 Nwt-M @ -20.40 msec



VTV TEST #3

Max = 11.45 Gs @ 229.68 msec
Min = -89.91 Gs @ 137.52 msec

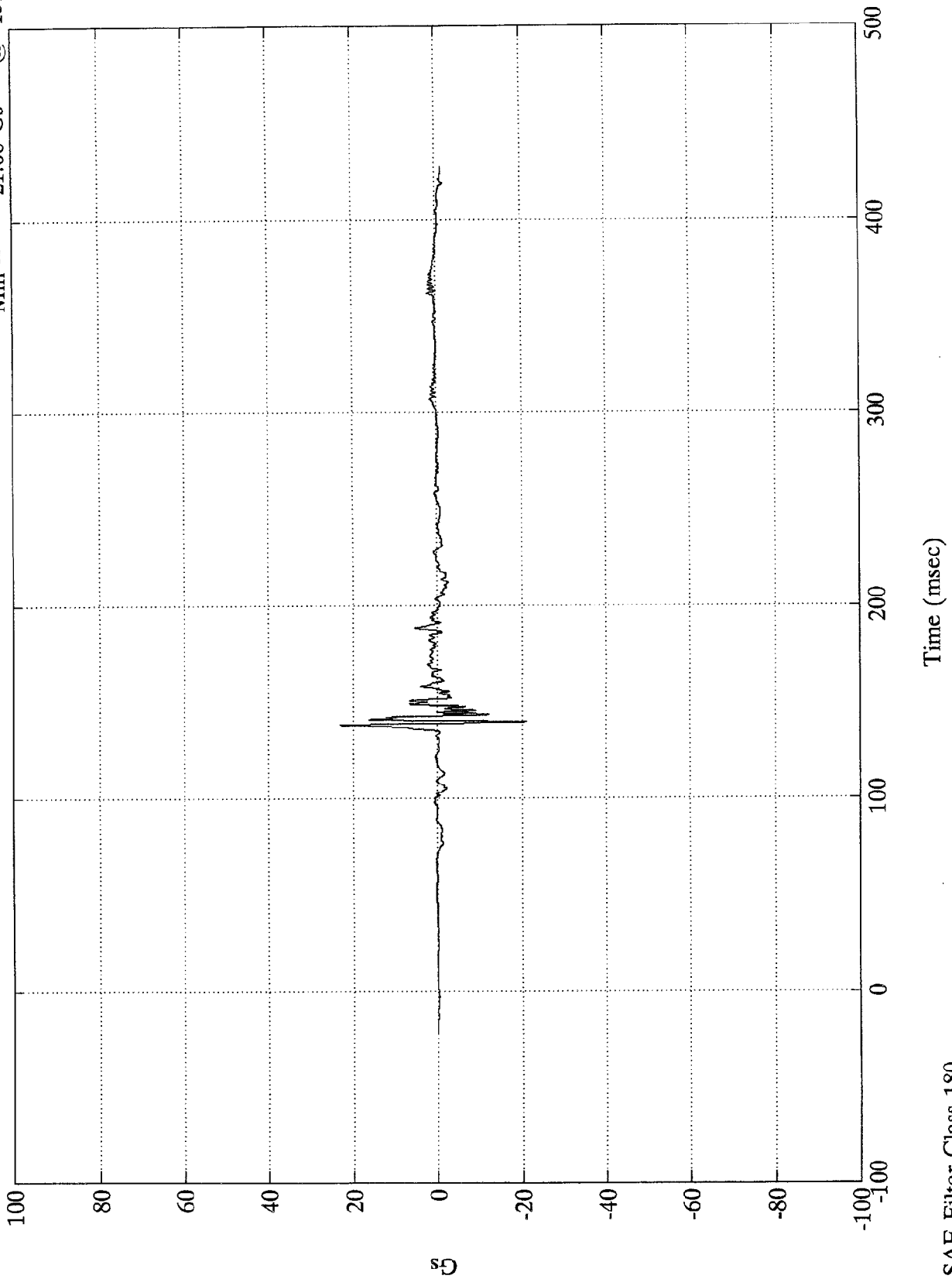
P1 Chest X



SAE Filter Class 180

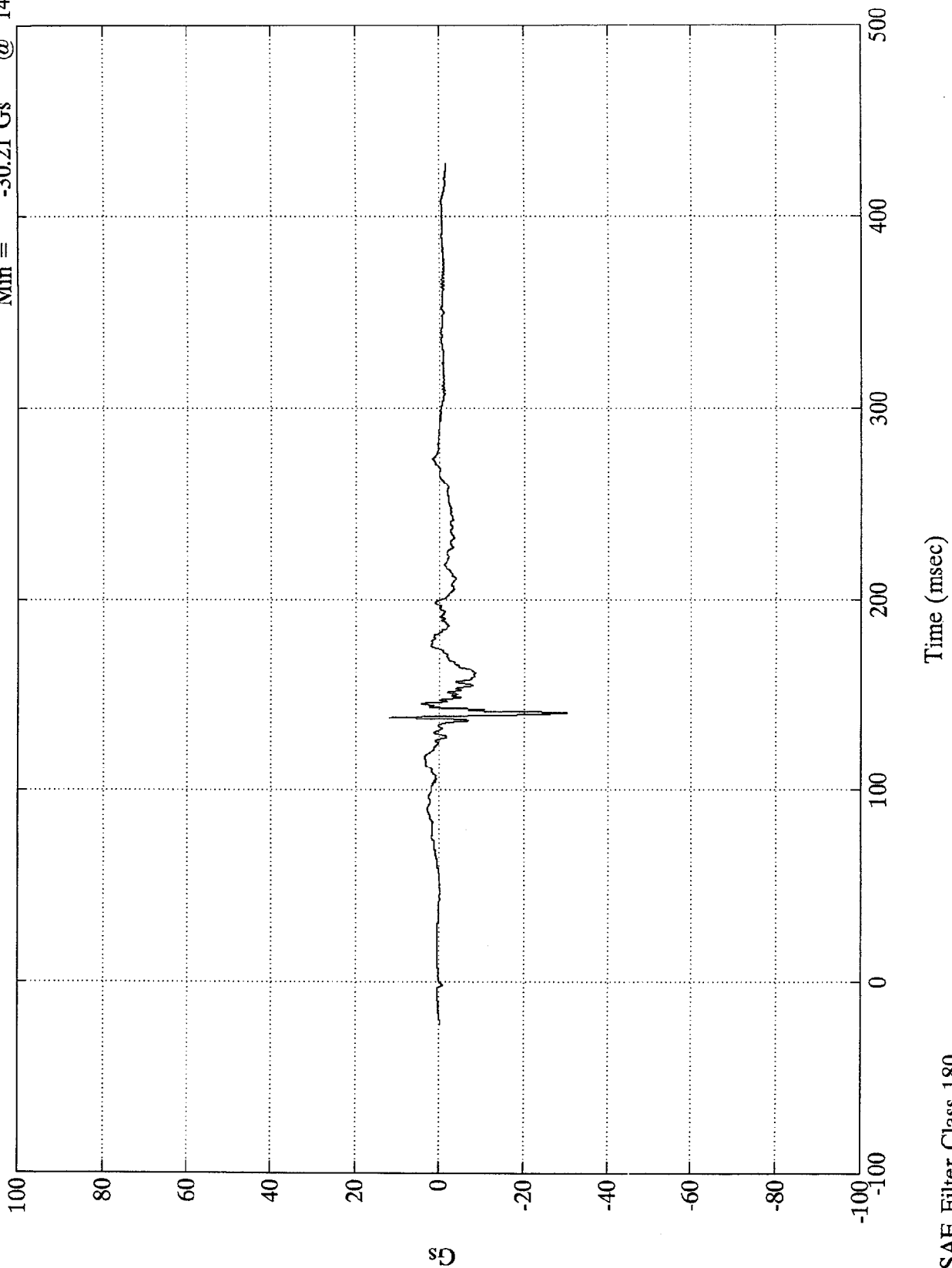
VTV TEST #3

P1 Chest Y
Max = 23.15 Gs @ 138.36 msec
Min = -21.00 Gs @ 139.80 msec



VTV TEST #3

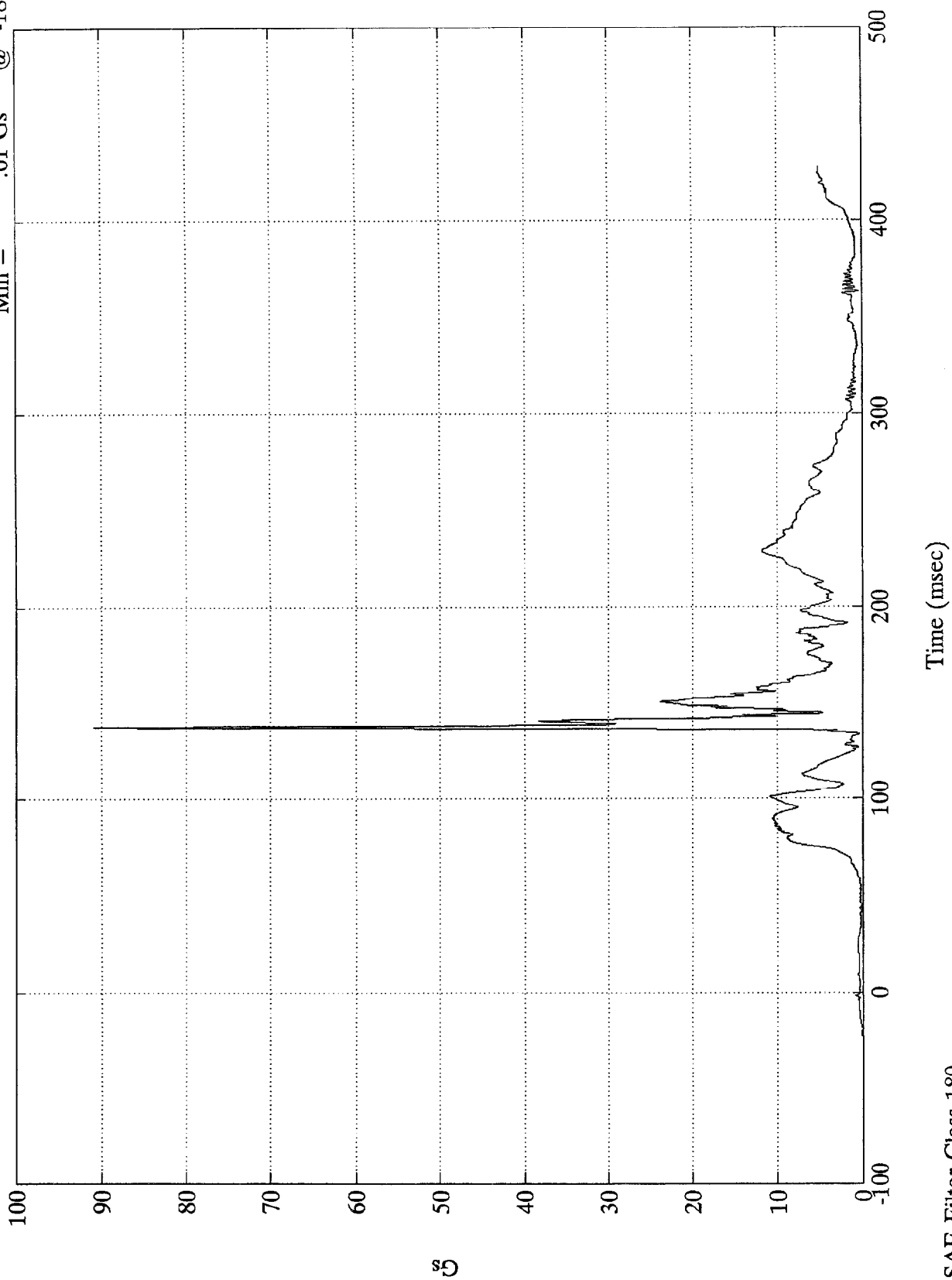
P1 Chest Z
Max = 11.77 Gs @ 138.24 msec
Min = -30.21 Gs @ 140.76 msec



VTV TEST #3

P1 Chest Resultant

Max = 90.79 Gs @ 137.52 msec
 Min = .01 Gs @ -18.72 msec

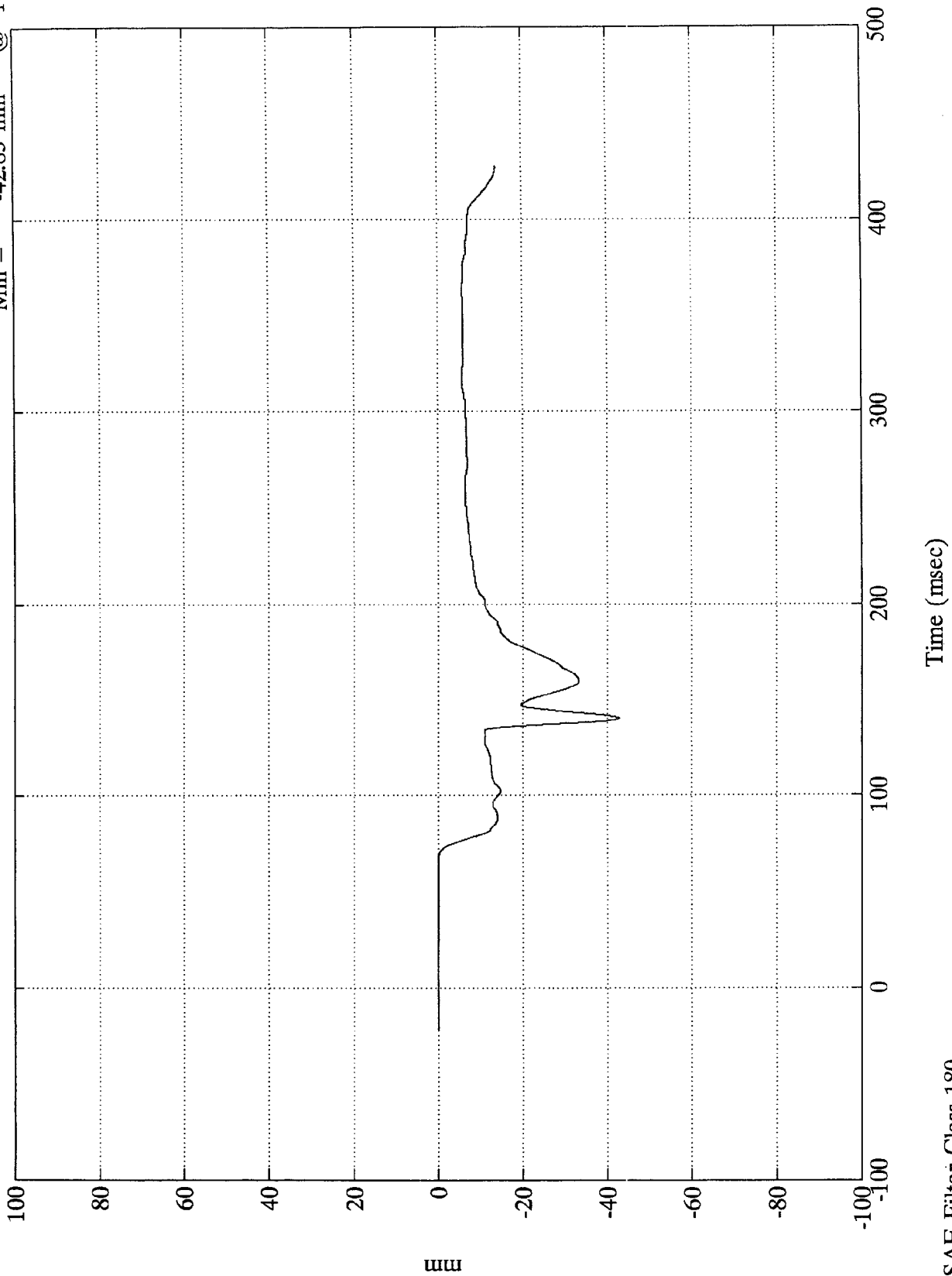


SAE Filter Class 180

VTV TEST #3

P1 Chest Displacement

Max =	.00 mm	@	51.00 msec
Min =	-42.83 mm	@	140.40 msec

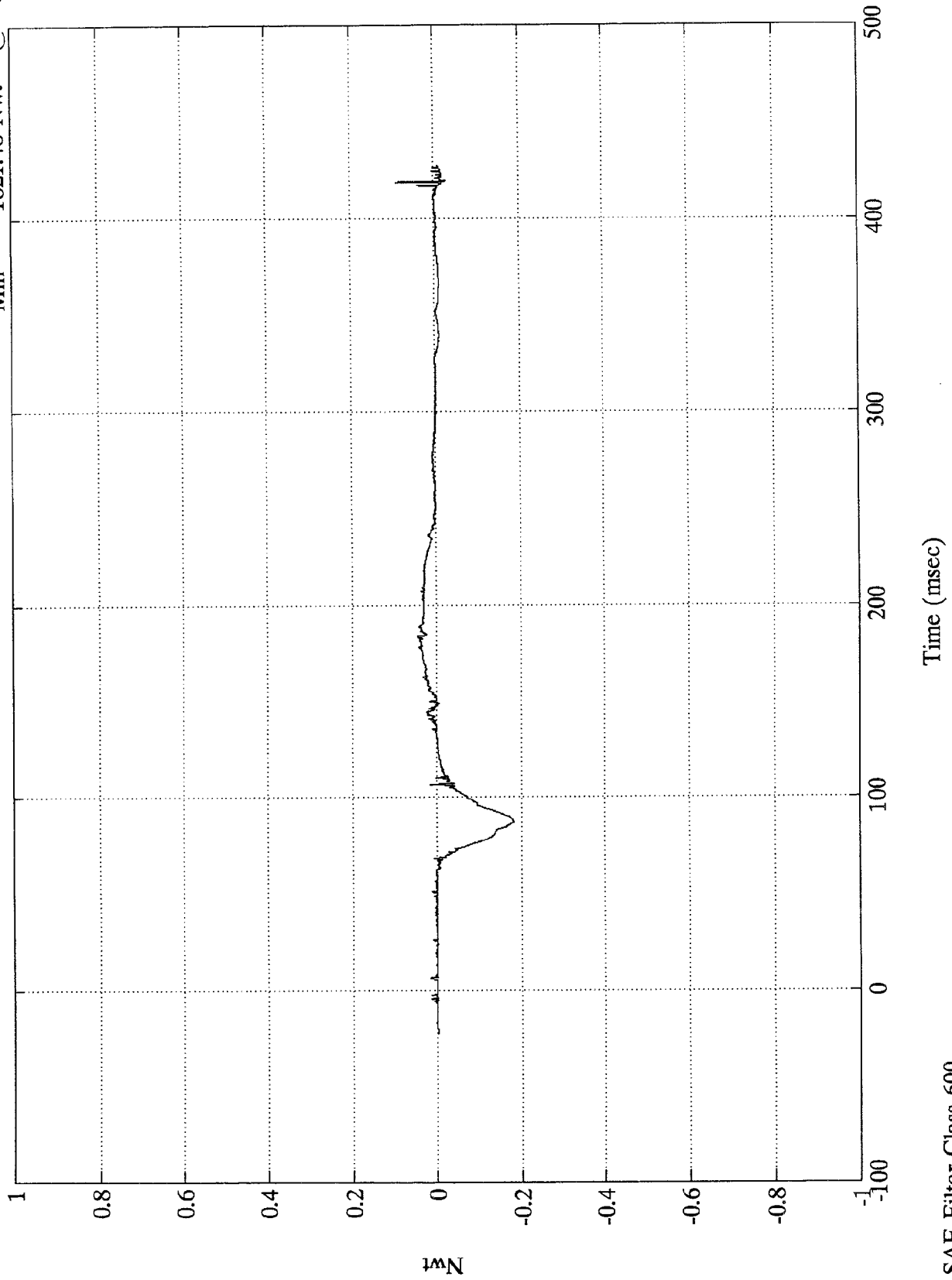


VTV TEST #3

$\times 10^4$

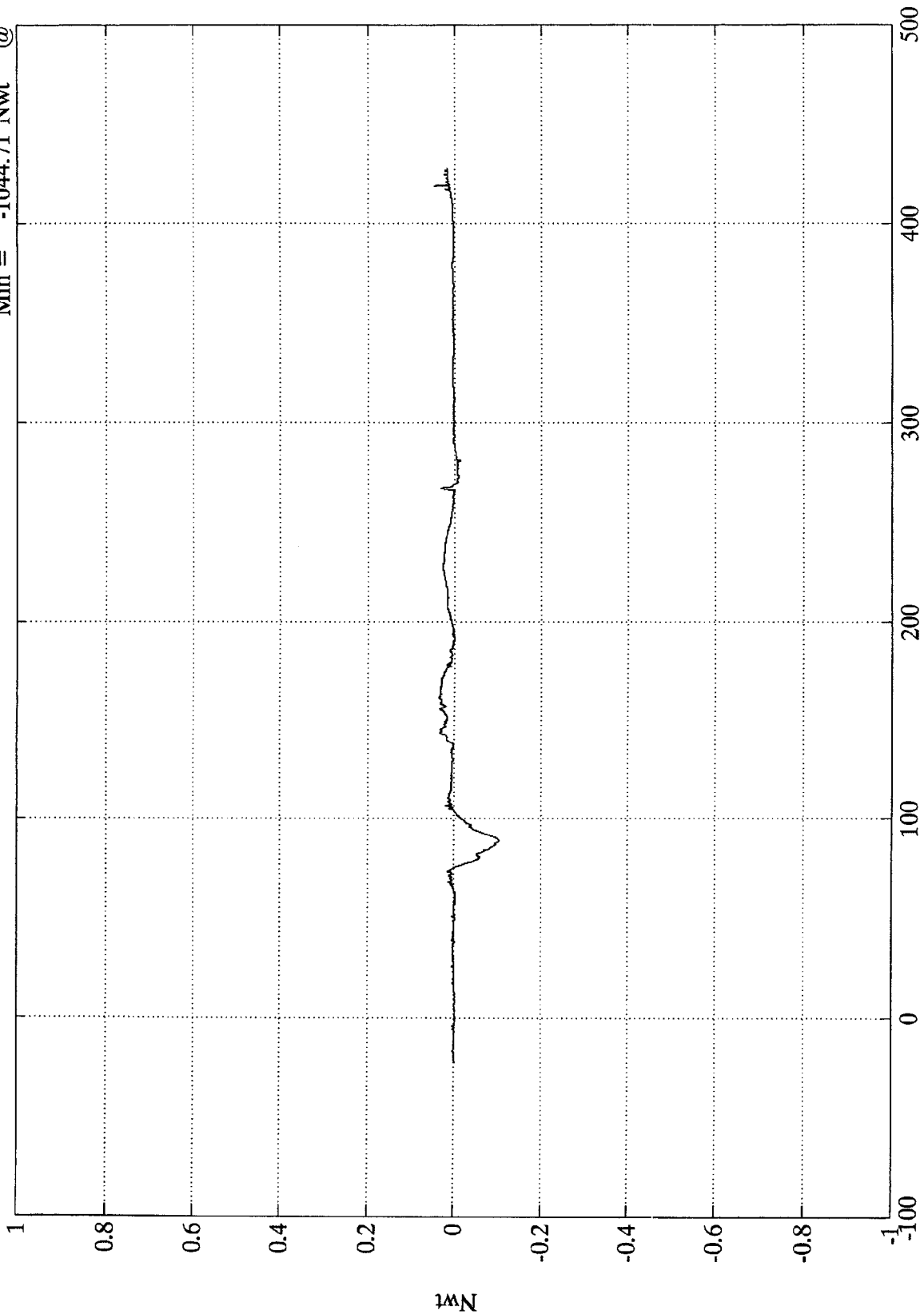
P1 Left Femur

Max = 888.54 Nwt @ 418.92 msec
Min = -1821.48 Nwt @ 87.24 msec



SAE Filter Class 600

VTV TEST #3
 x10⁴
 P1 Right Femur
 Max = 474.30 Nwt @ 418.92 msec
 Min = -1044.71 Nwt @ 89.16 msec



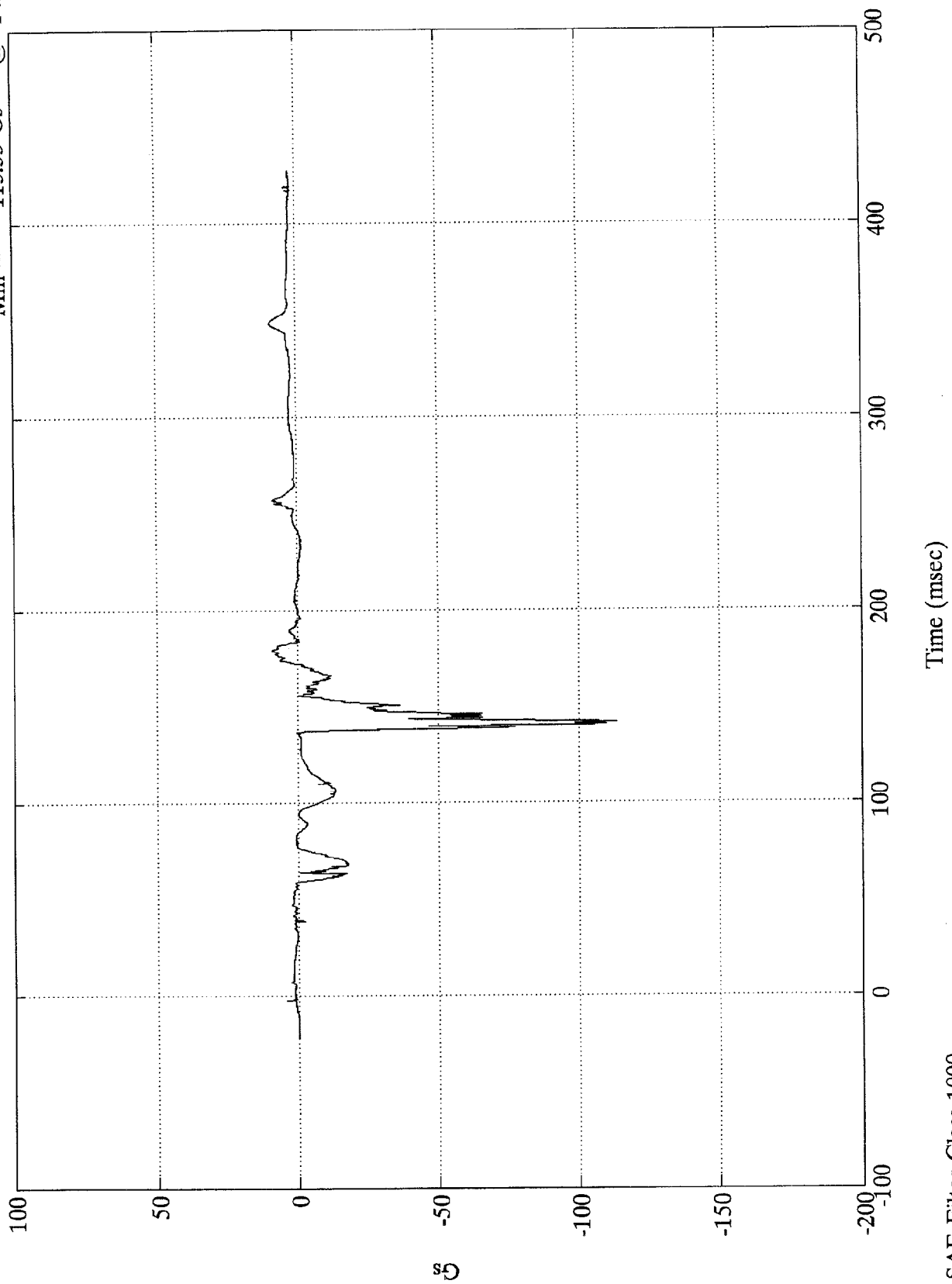
Time (msec)

SAE Filter Class 600

VTV TEST #3

Max = 9.41 Gs @ 348.48 msec
Min = -113.33 Gs @ 141.24 msec

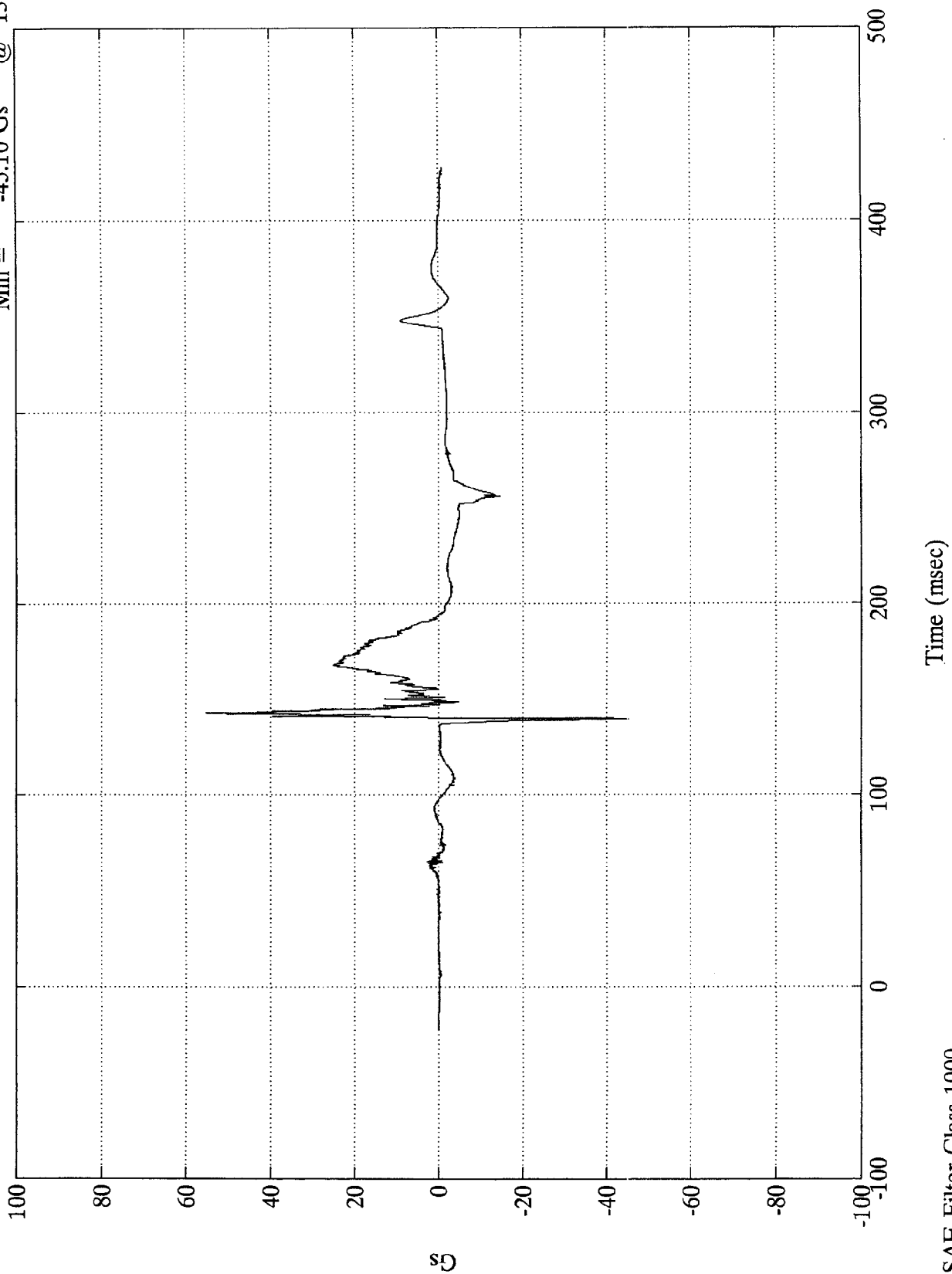
P2 Head X



SAE Filter Class 1000

VTV TEST #3

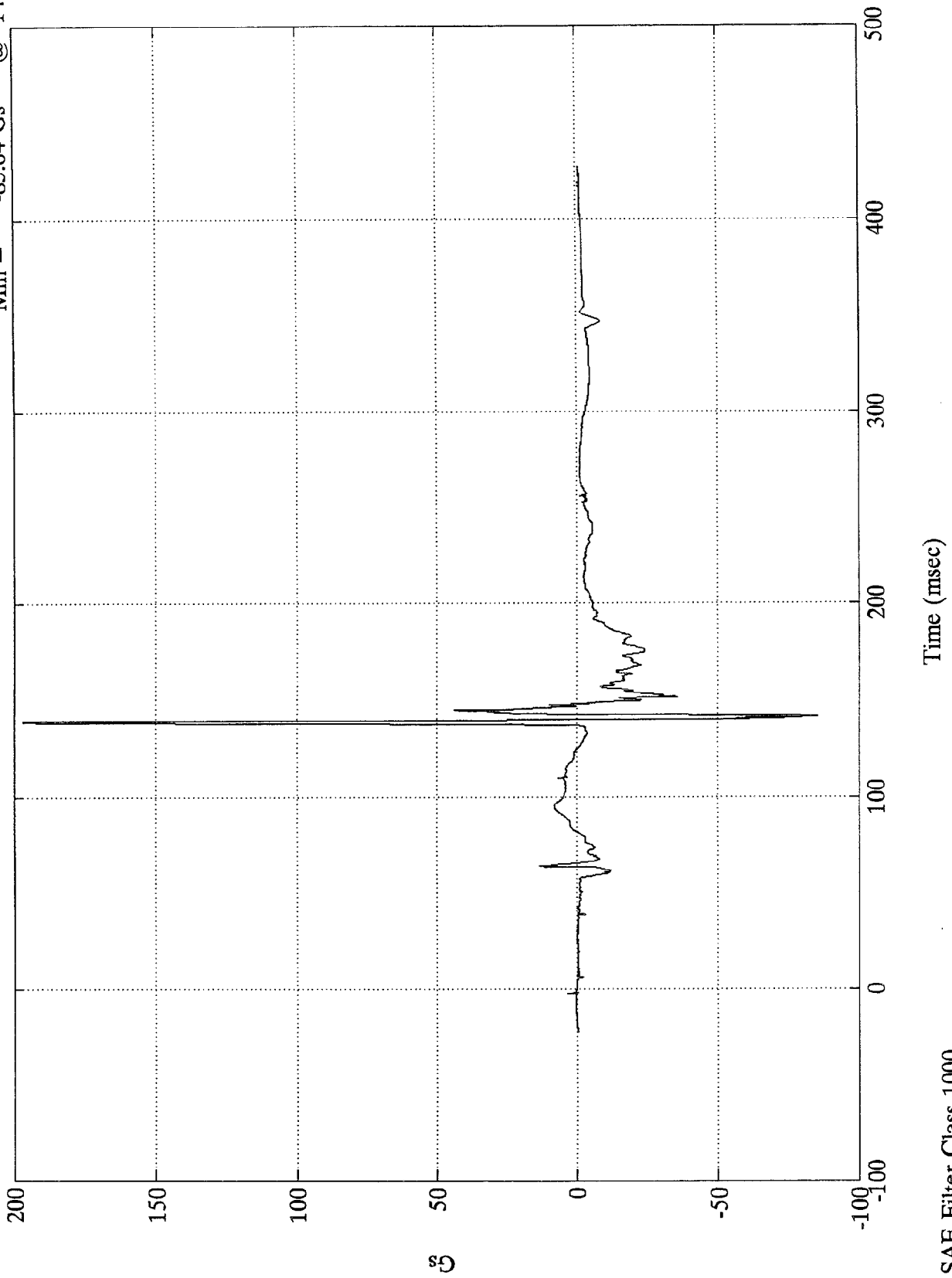
P2 Head Y
Max = 55.36 Gs @ 142.80 msec
Min = -45.10 Gs @ 139.67 msec



VTV TEST #3

Max = 197.10 Gs @ 139.32 msec
Min = -85.64 Gs @ 141.36 msec

P2 Head Z

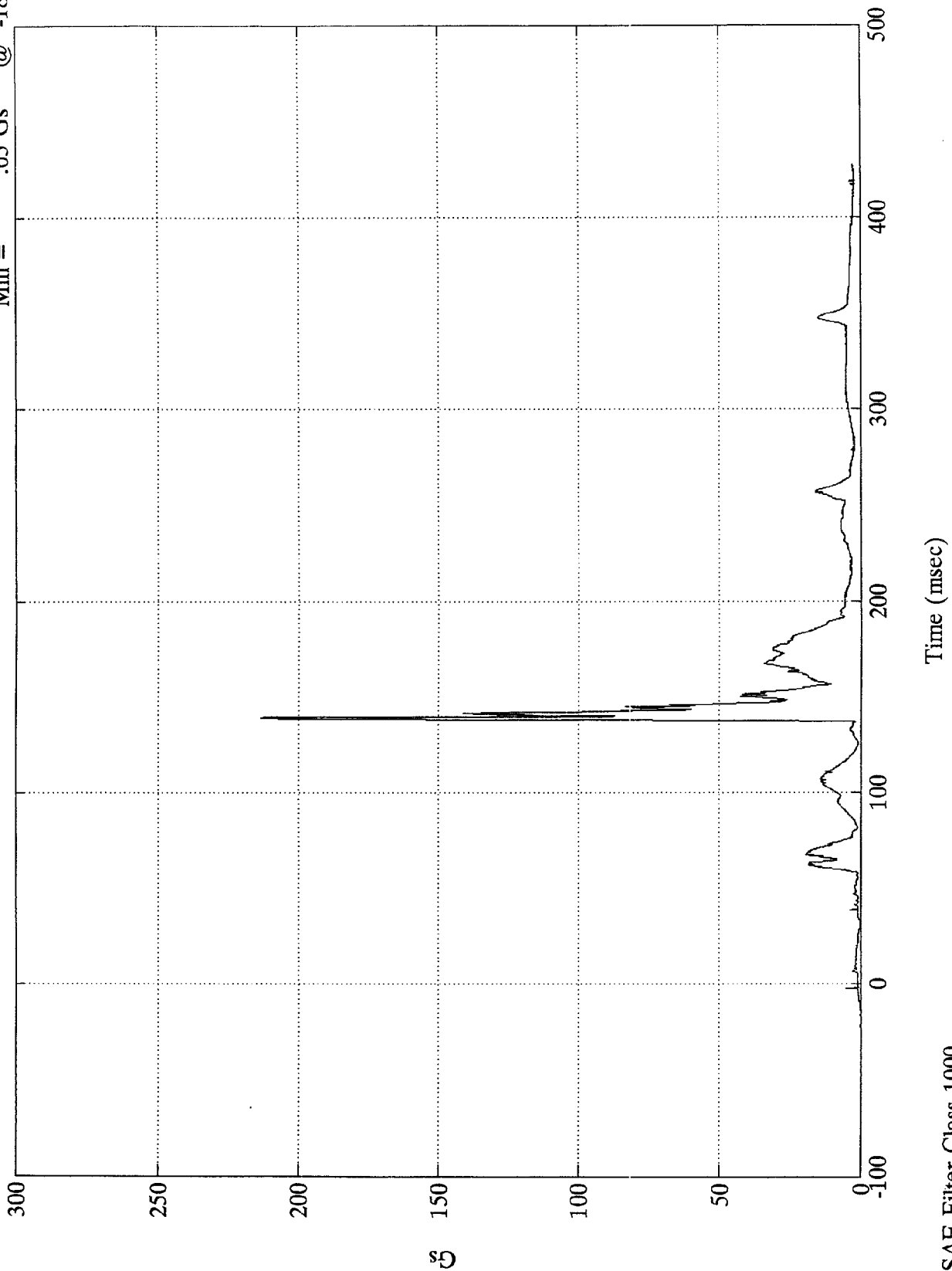


SAE Filter Class 1000

VTV TEST #3

Max = 213.37 Gs @ 139.19 msec
 Min = .05 Gs @ -18.84 msec

P2 Head Resultant

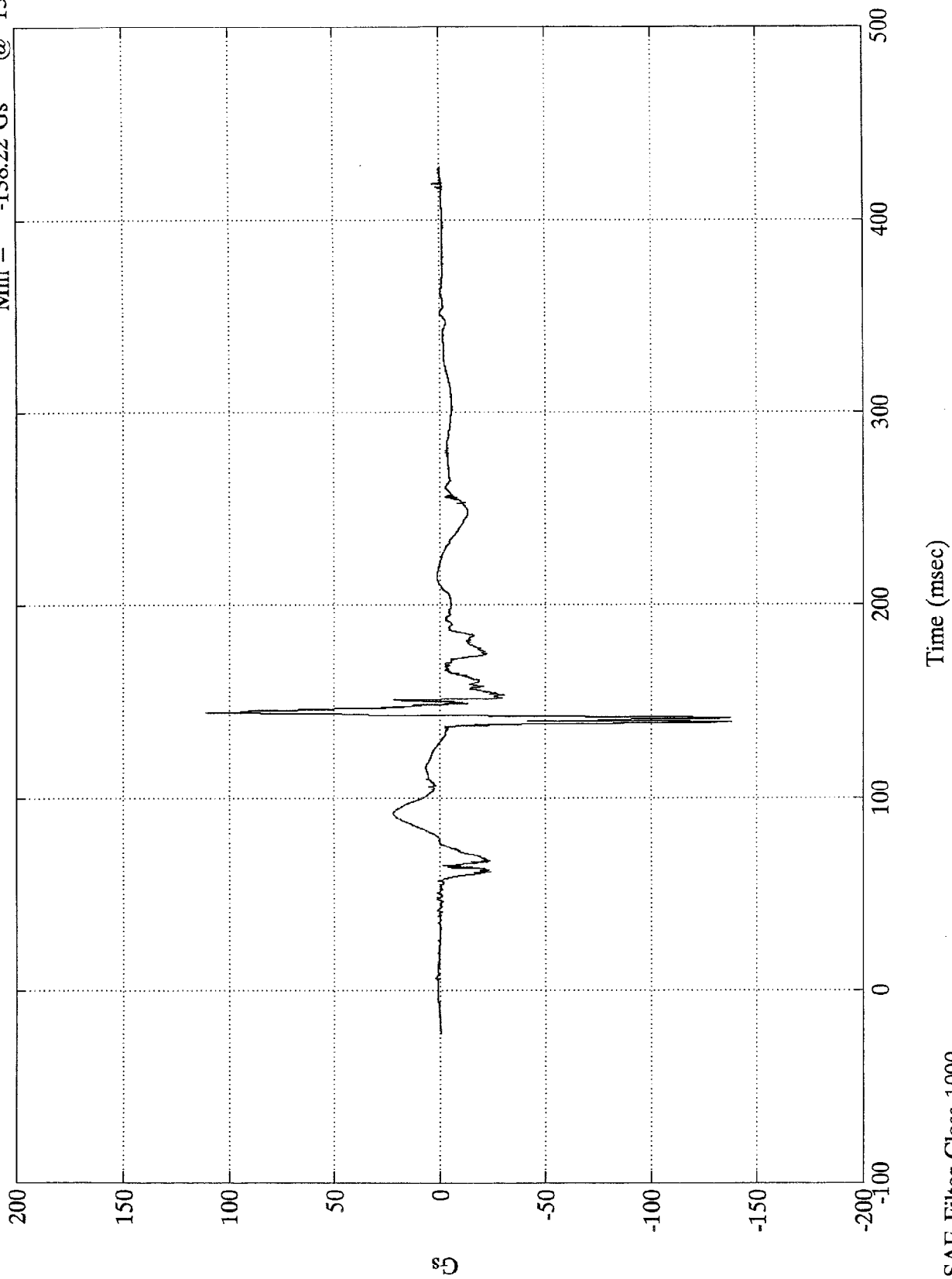


SAE Filter Class 1000

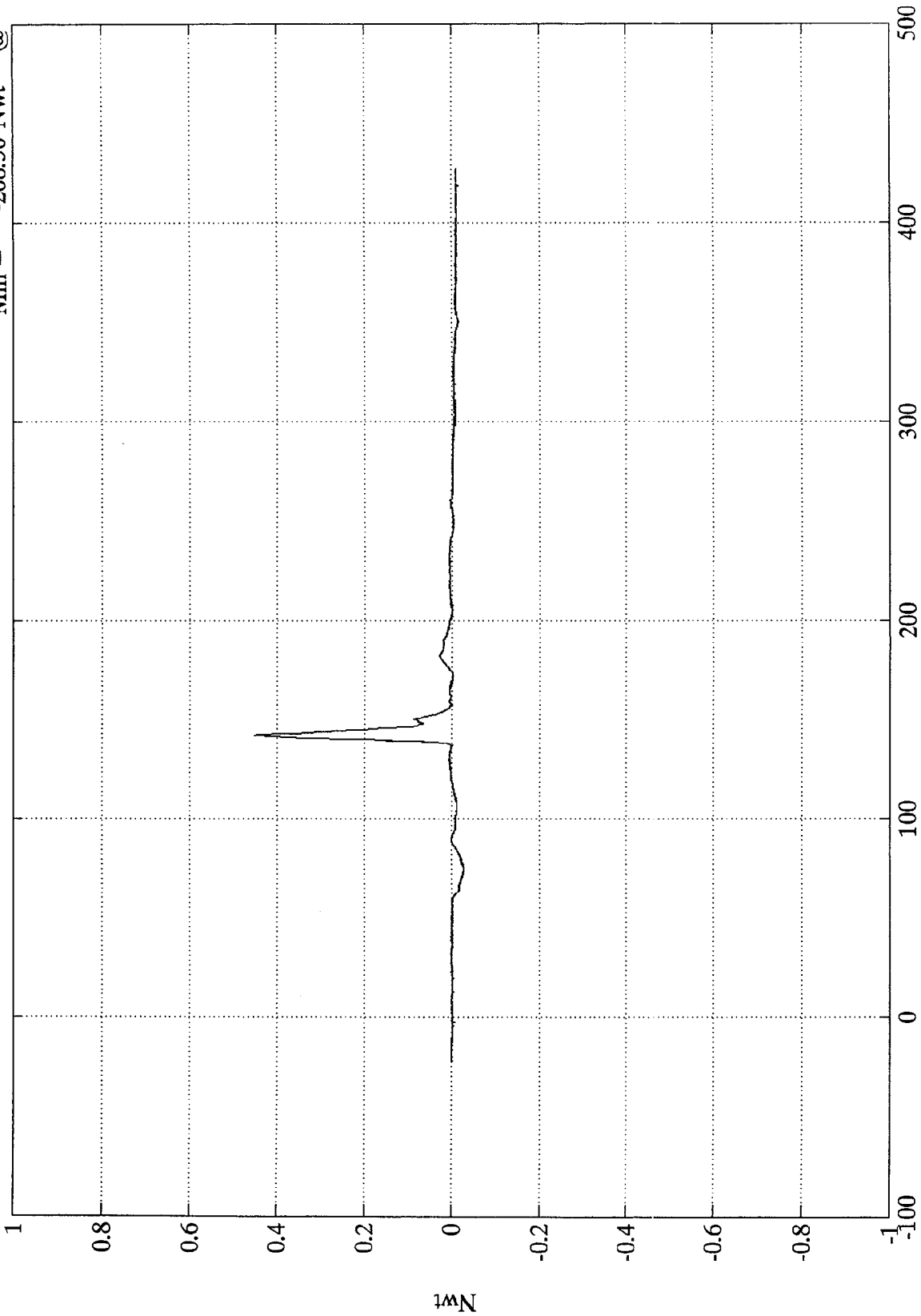
VTV TEST #3

P2 Head Z(R)

Max = 110.88 Gs @ 144.24 msec
Min = -138.22 Gs @ 139.32 msec



VTV TEST #3
 x10⁴
 P2 Upper Neck Fx
 Max = 4511.51 Nwt @ 142.08 msec
 Min = -268.30 Nwt @ 76.31 msec



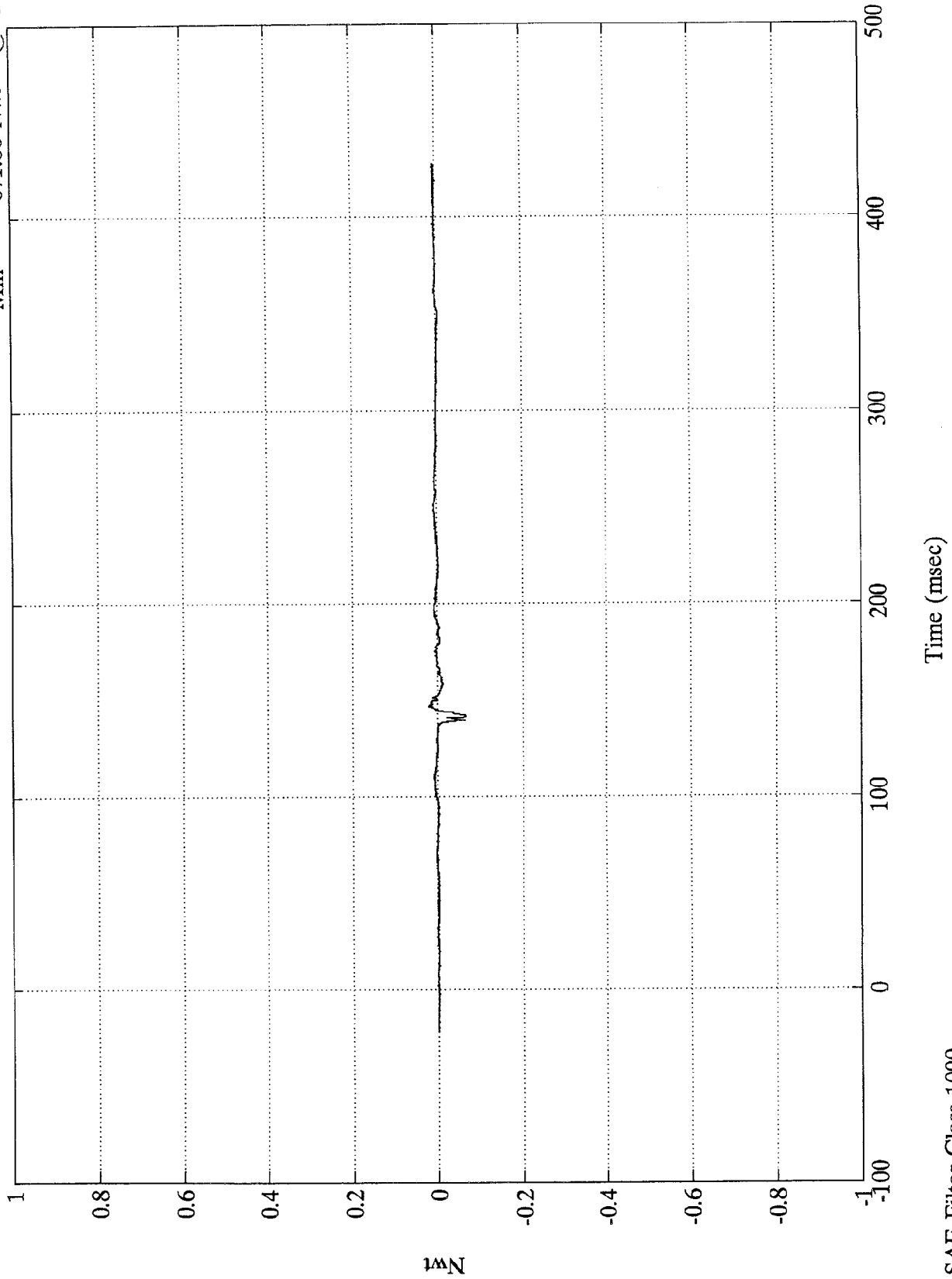
Time (msec)

SAE Filter Class 1000

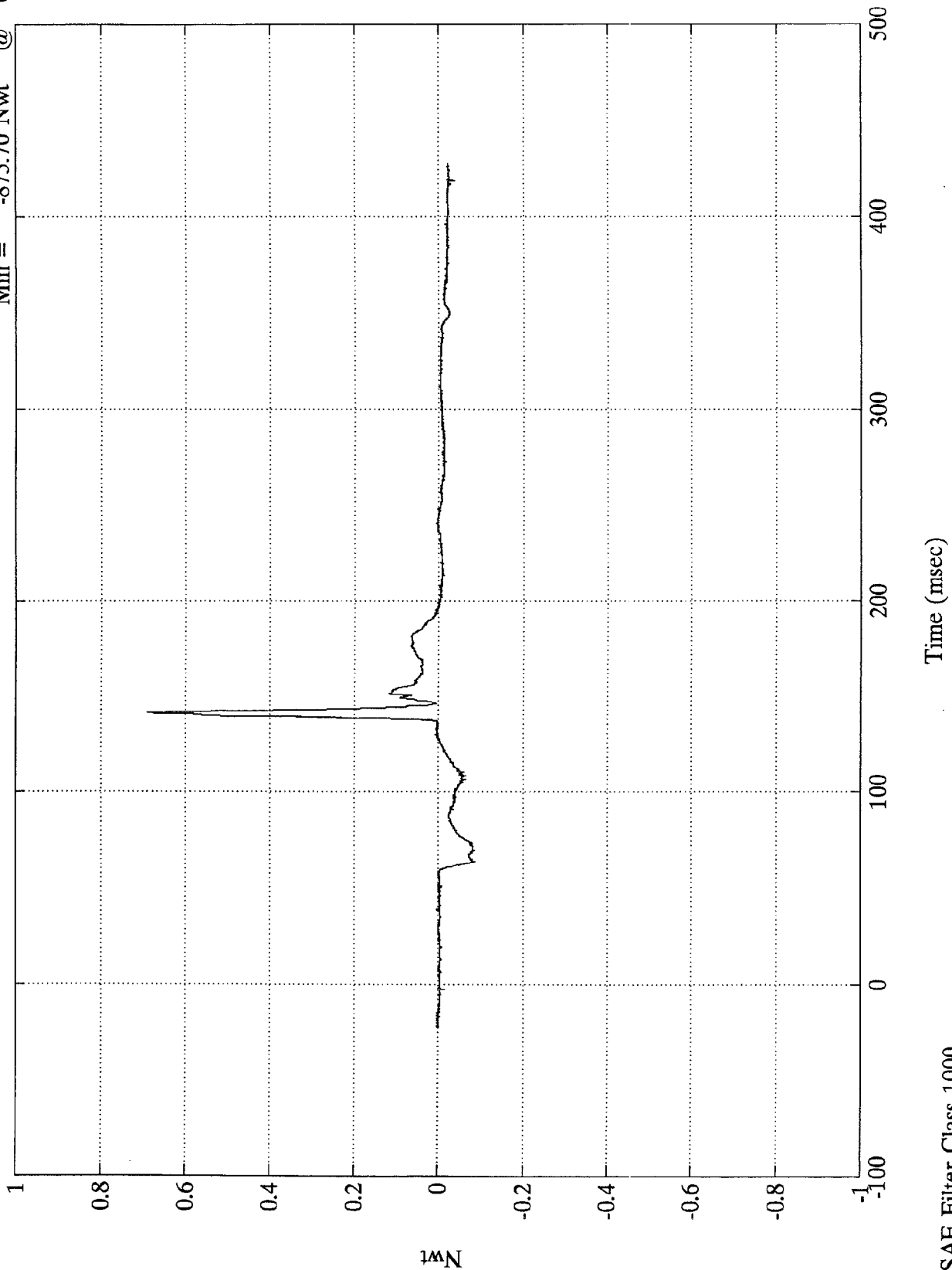
VTV TEST #3
x10⁴

P2 Upper Neck Fy

Max = 199.67 Nwt @ 146.63 msec
Min = -671.86 Nwt @ 142.08 msec



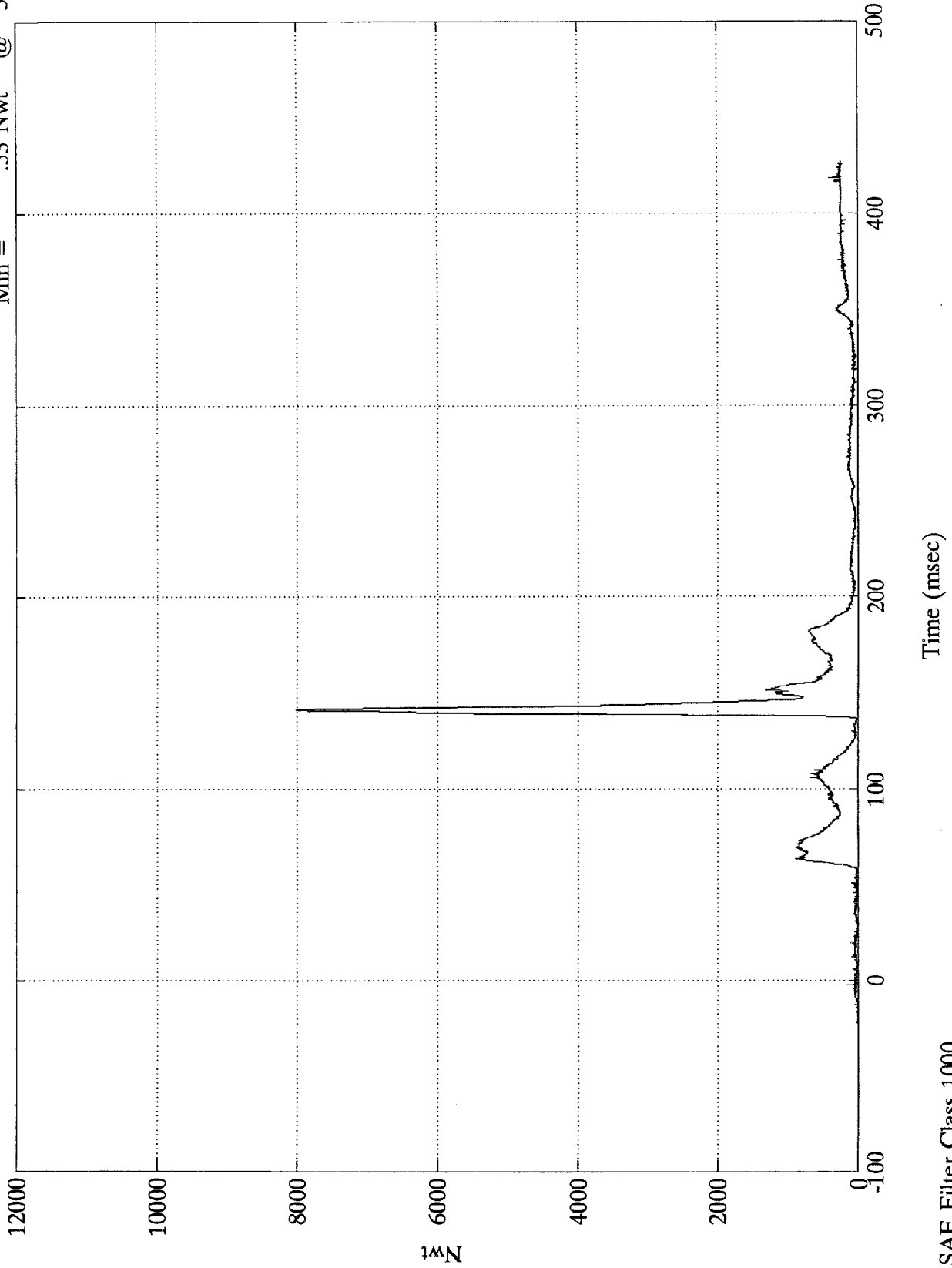
VTV TEST #3
 x10⁴
 P2 Upper Neck Fz
 Max = 6891.71 Nwt @ 141.24 msec
 Min = -875.70 Nwt @ 64.19 msec



VTV TEST #3

P2 Upper Neck Force Res

Max = 8011.49 Nwt @ 141.36 msec
Min = .53 Nwt @ 57.24 msec

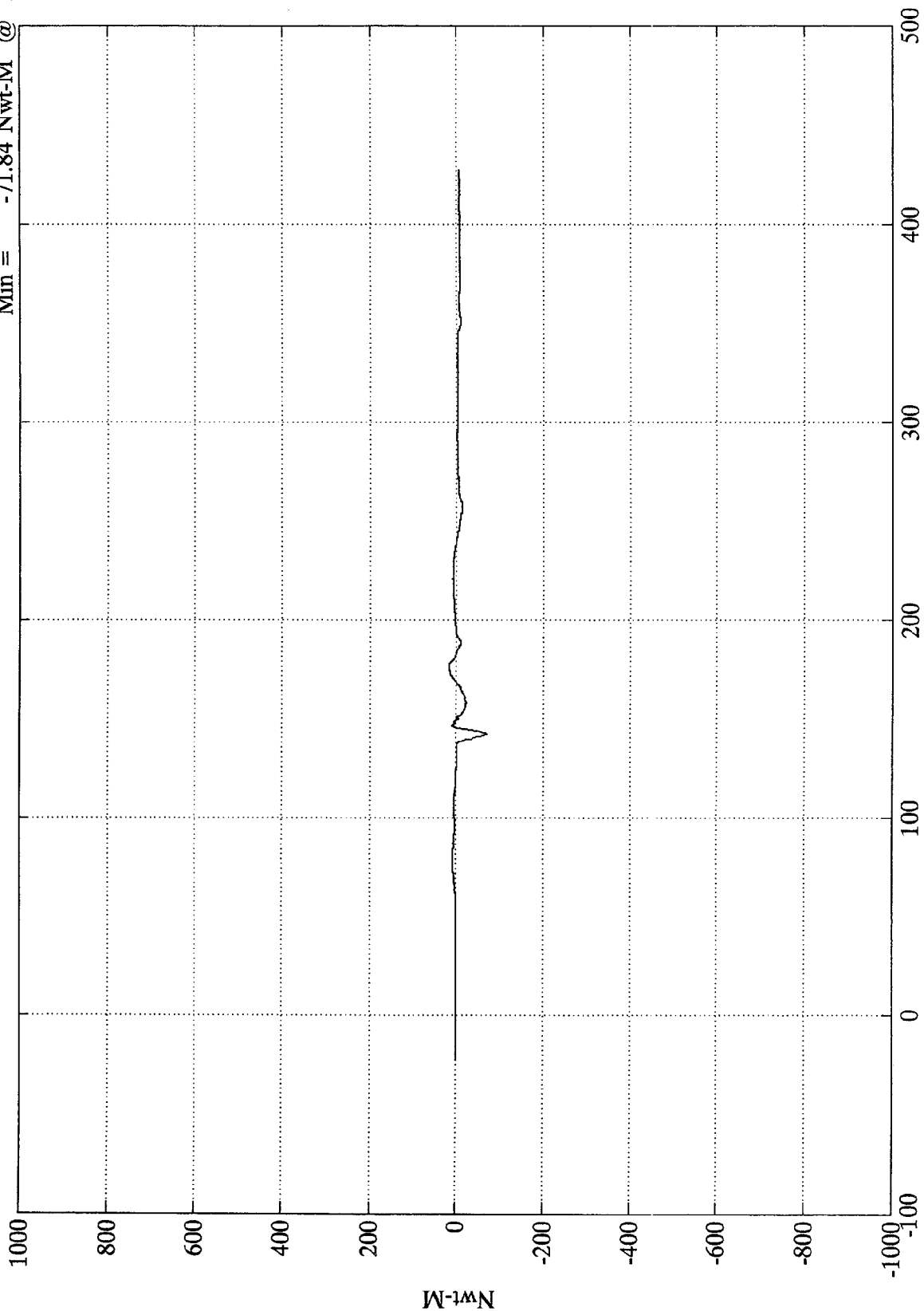


SAE Filter Class 1000

VTV TEST #3

P2 Upper Neck Mx

Max = 16.69 Nwt-M @ 177.48 msec
Min = -71.84 Nwt-M @ 142.32 msec



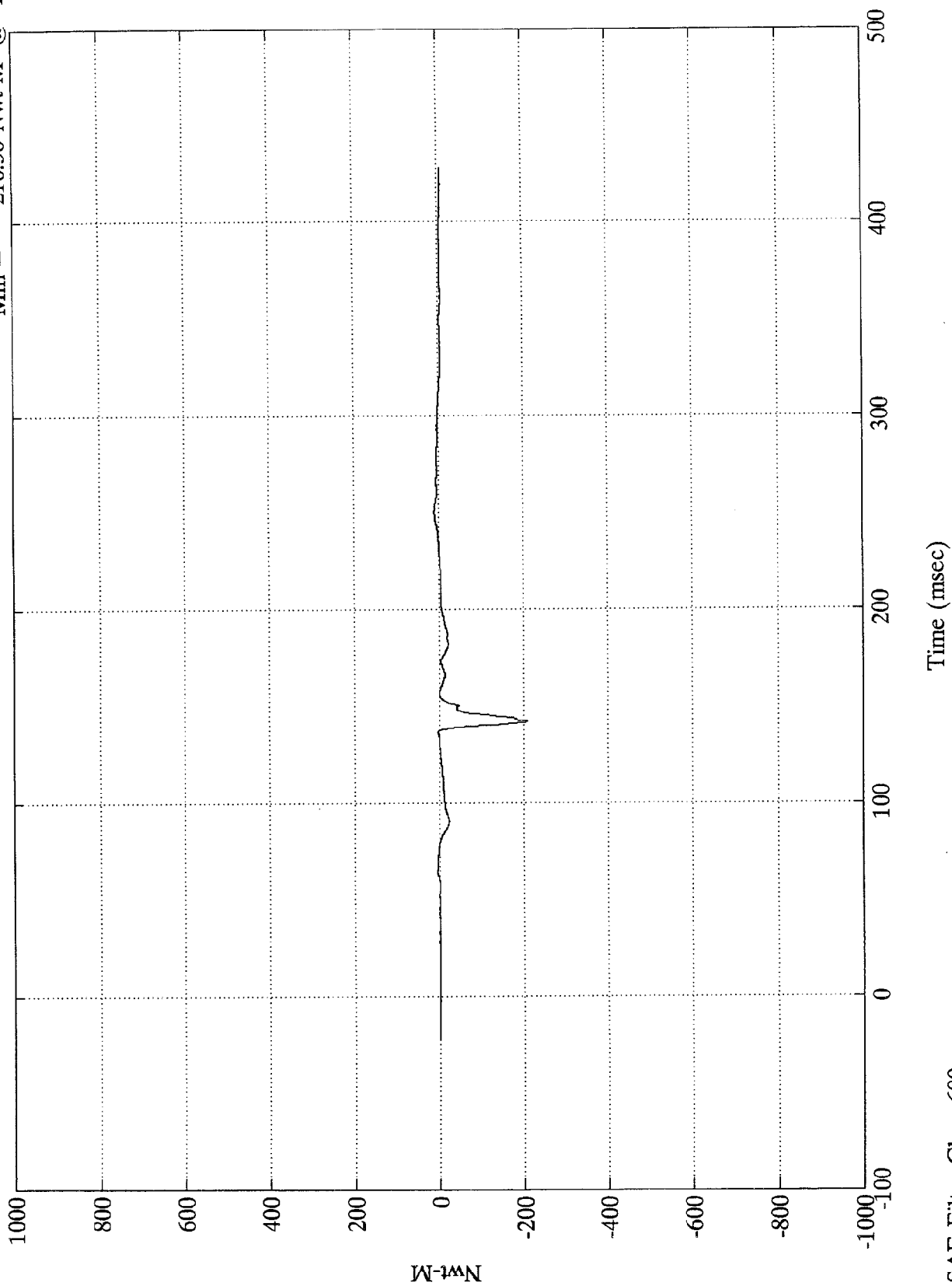
Time (msec)

SAE Filter Class 600

VTV TEST #3

Max = 10.61 Nwt-M @ 250.19 msec
Min = -210.36 Nwt-M @ 142.44 msec

P2 Upper Neck My

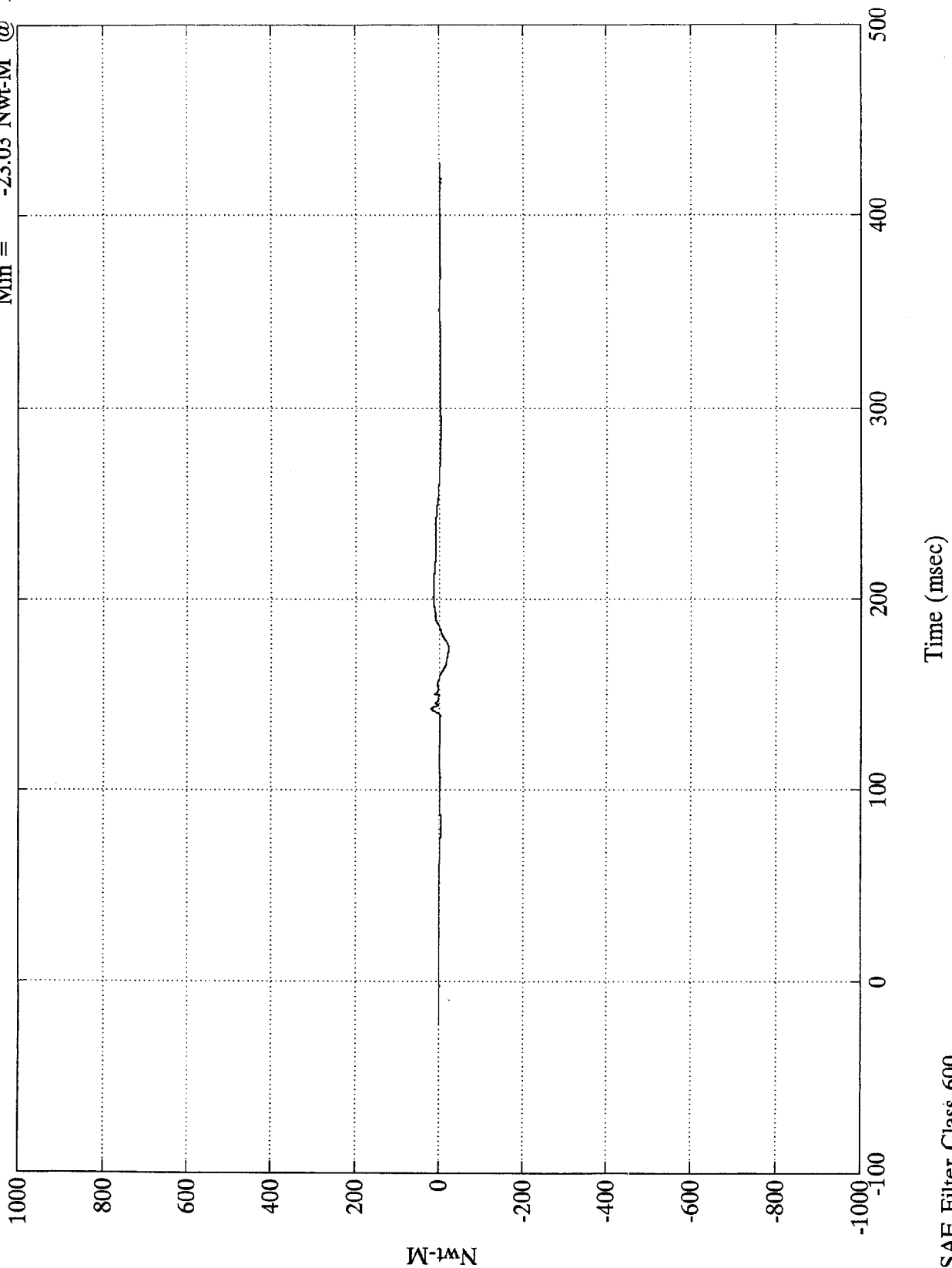


SAE Filter Class 600

VTV TEST #3

P2 Upper Neck Mz

Max = 19.80 Nwt-M @ 142.55 msec
Min = -23.03 Nwt-M @ 173.88 msec

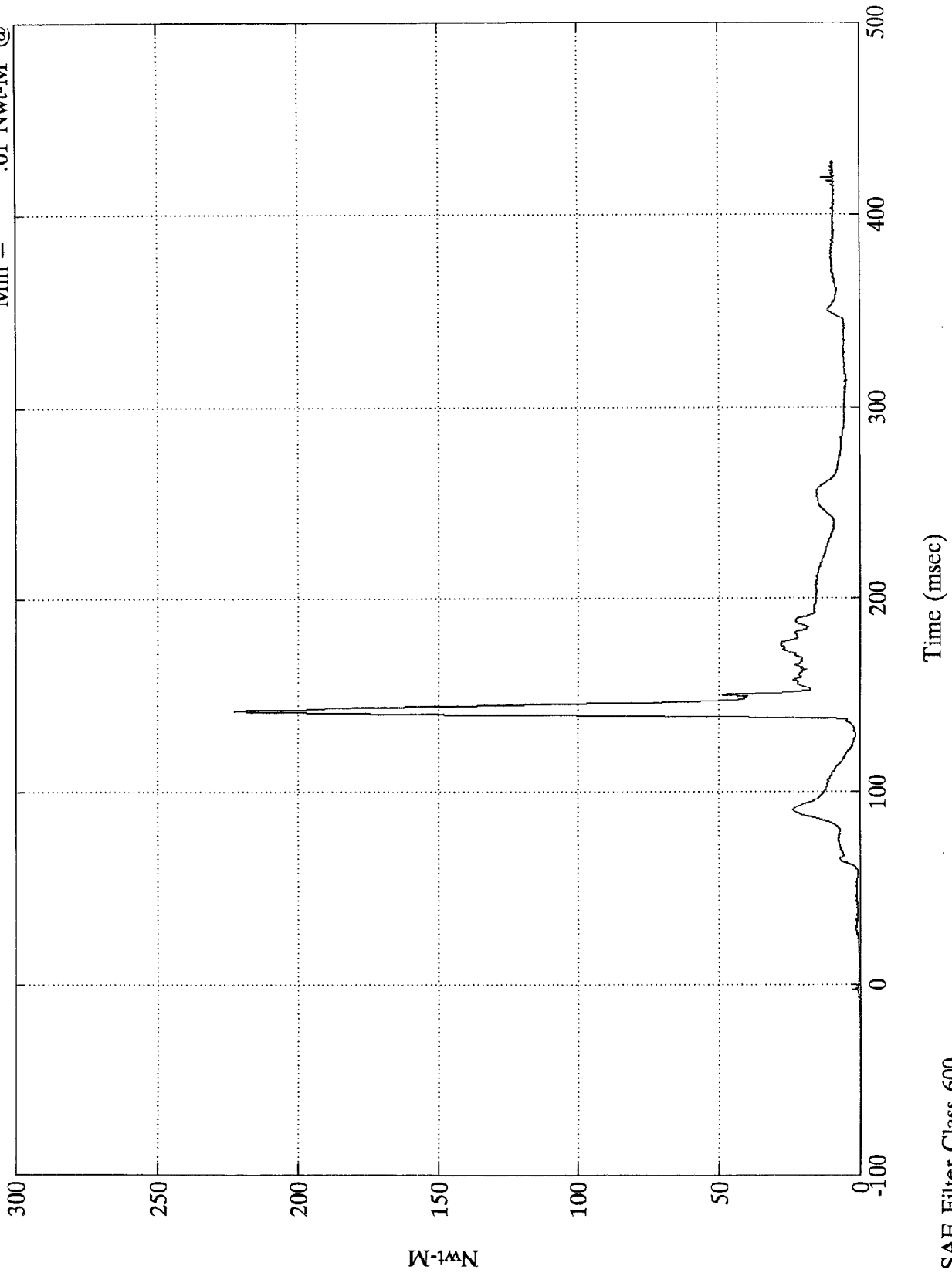


VTV TEST #3

P2 Upper Neck Moment Res

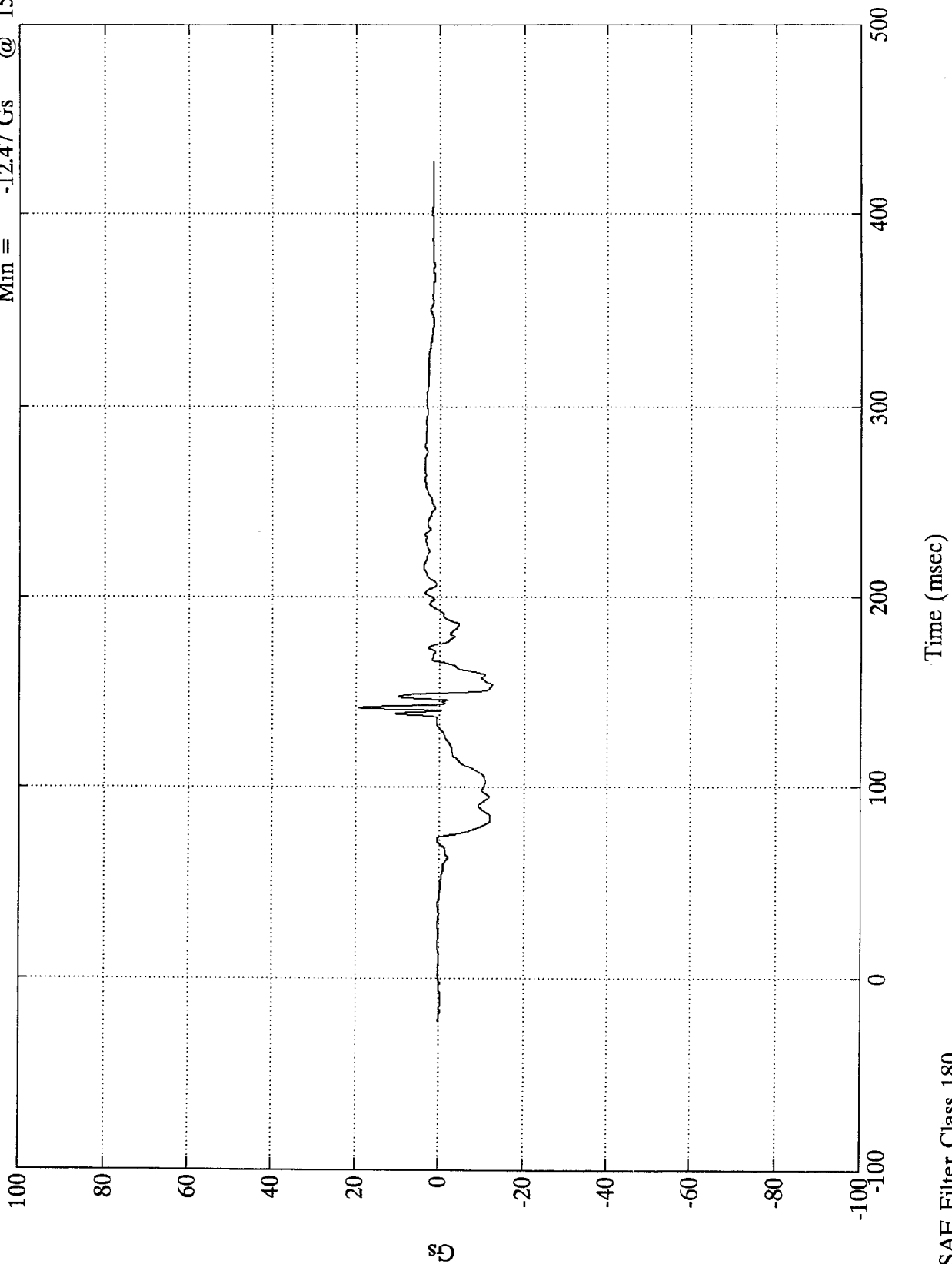
Max = 223.00 Nwt-M @
Min = .01 Nwt-M @

142.44 msec
8.39 msec



VTV TEST #3

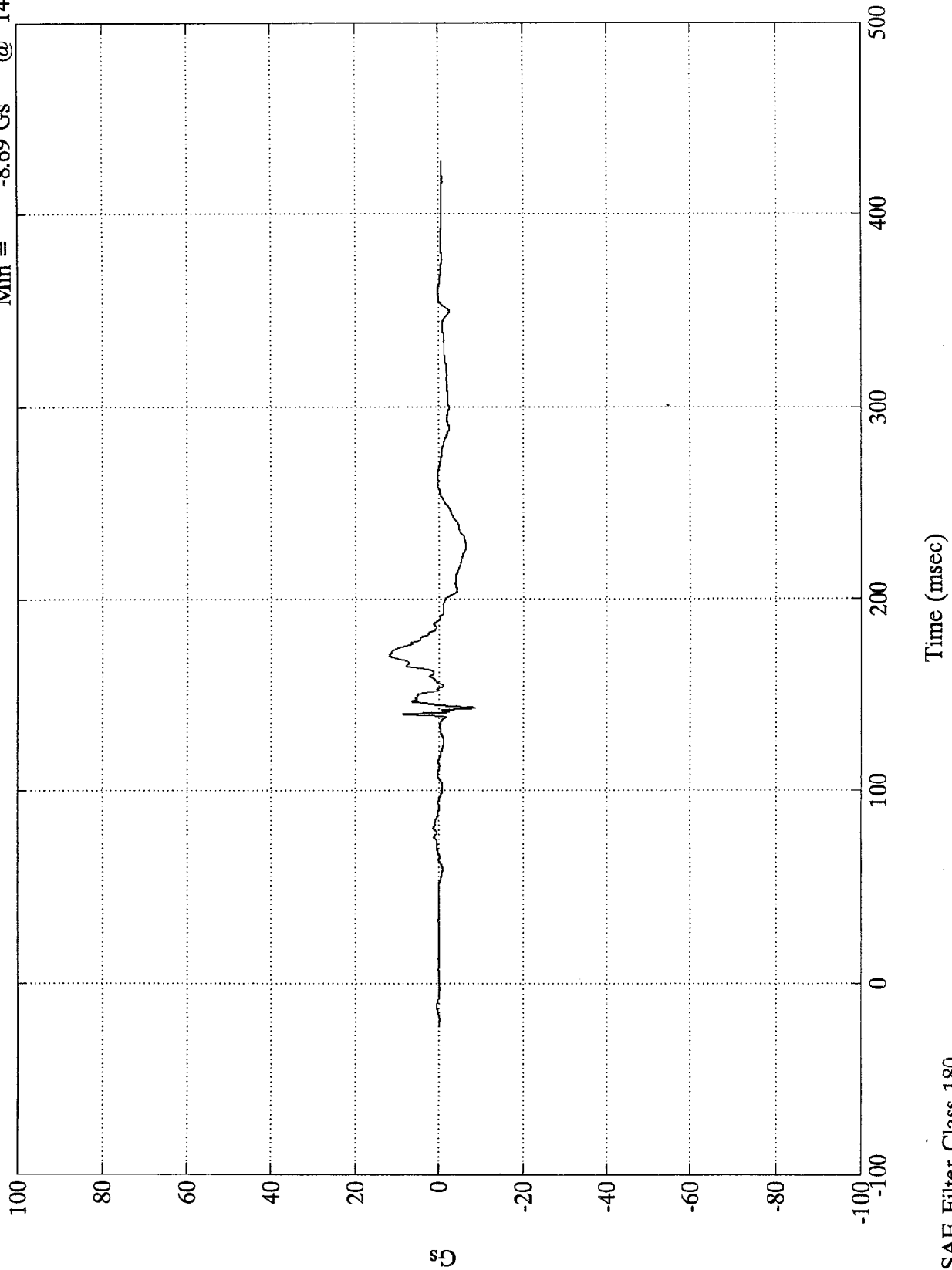
P2 Chest X
Max = 19.36 Gs @ 141.84 msec
Min = -12.47 Gs @ 154.19 msec



VTV TEST #3

Max = 11.96 Gs @ 171.00 msec
Min = -8.69 Gs @ 143.39 msec

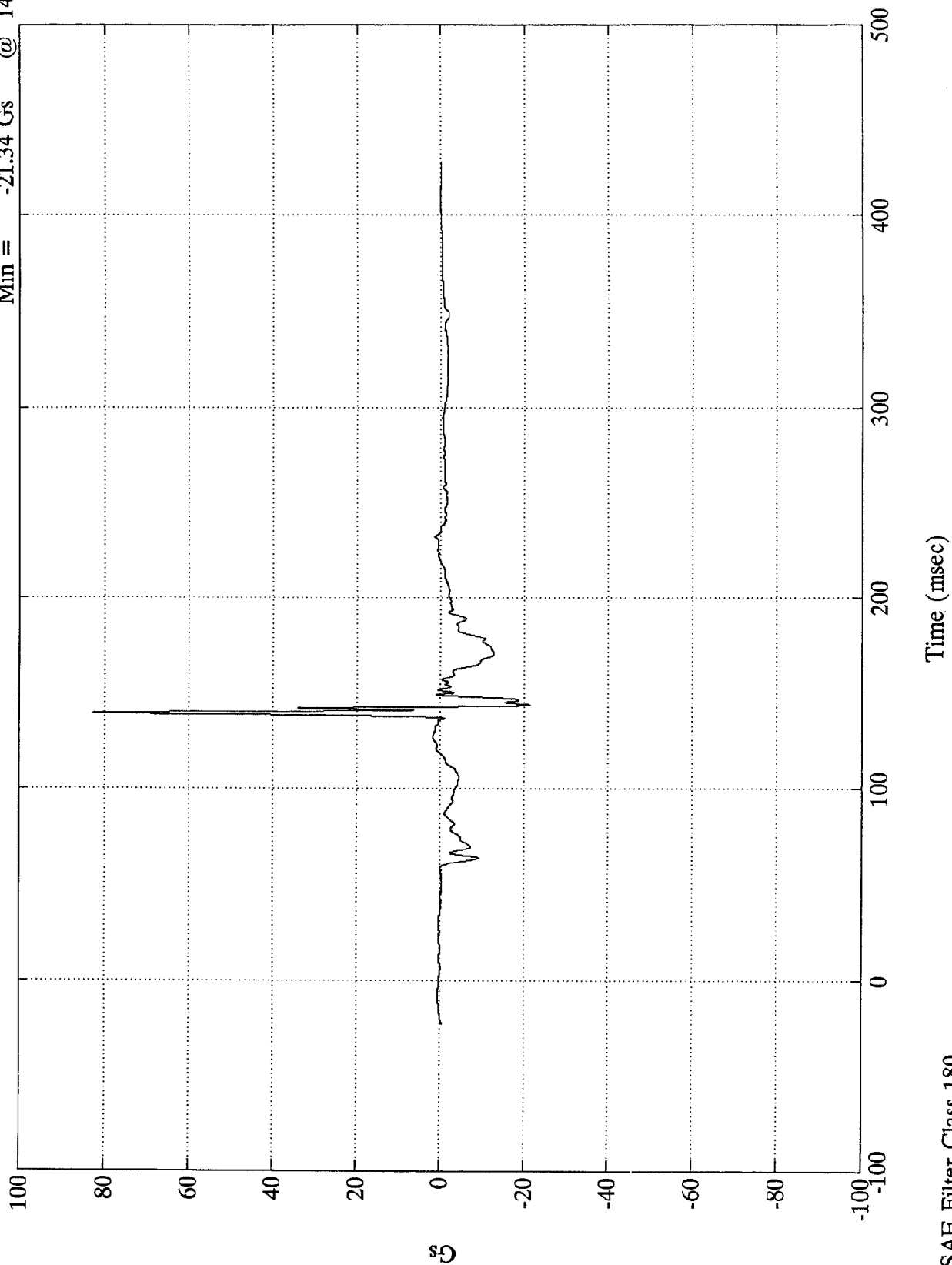
P2 Chest Y



VTV TEST #3

Max = 82.66 Gs @ 139.67 msec
Min = -21.34 Gs @ 143.88 msec

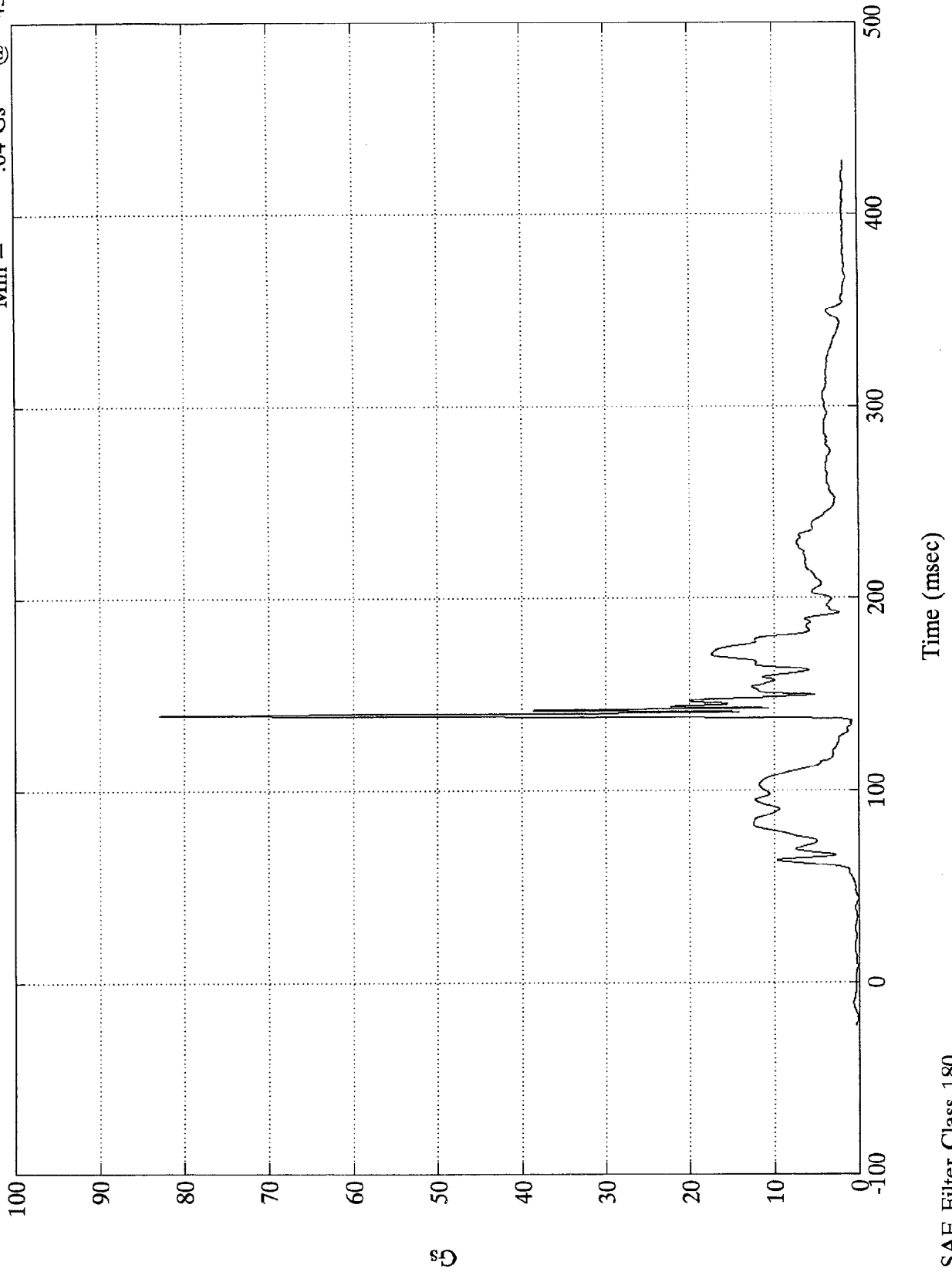
P2 Chest Z



SAE Filter Class 180

VTV TEST #3

P2 Chest Resultant
Max = 82.89 Gs @ 139.67 msec
Min = .04 Gs @ 43.08 msec

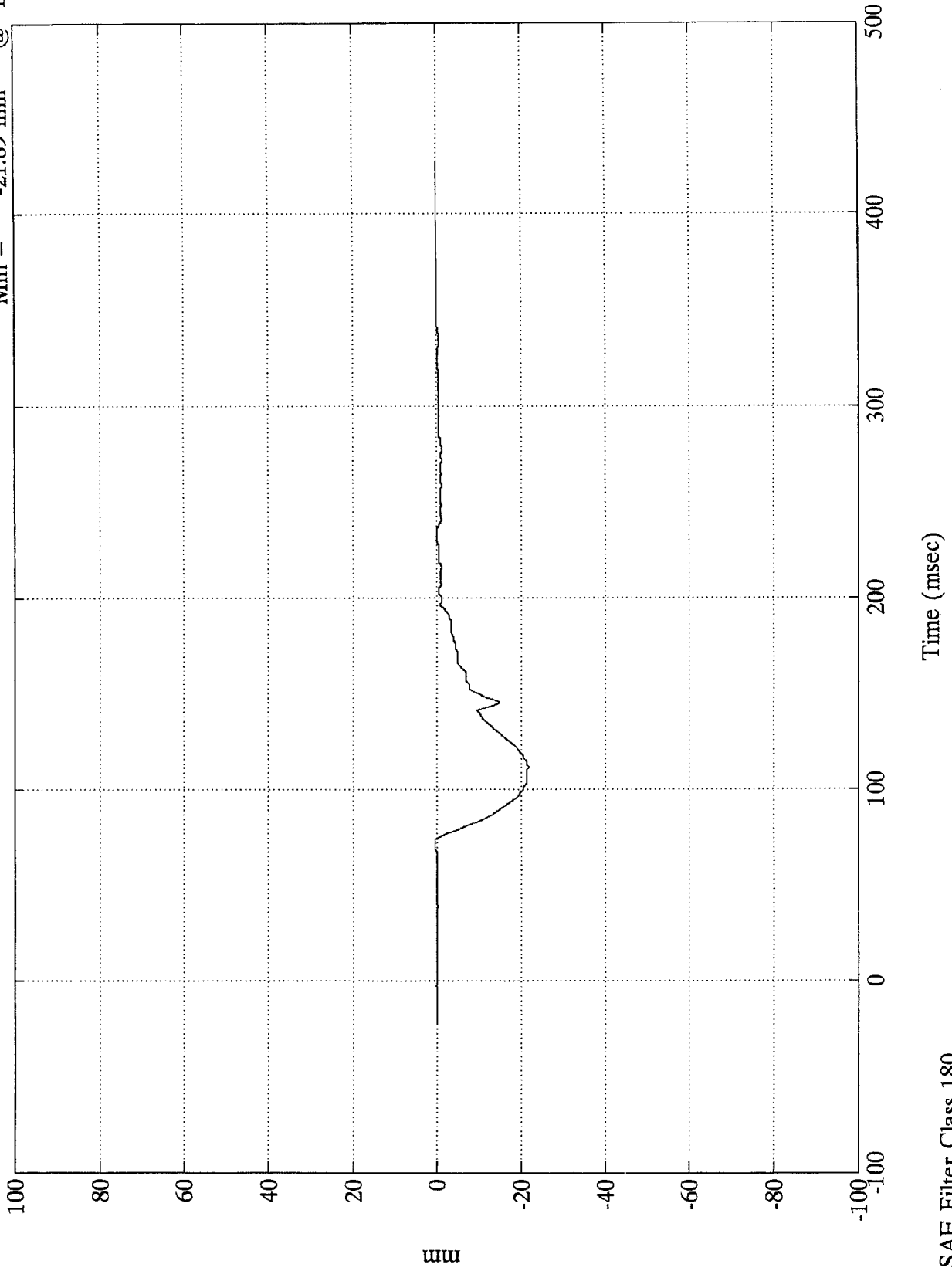


SAE Filter Class 180

VTV TEST #3

Max = .57 mm @ 73.20 msec
Min = -21.89 mm @ 111.60 msec

P2 Chest Displacement



SAE Filter Class 180

APPENDIX E

ACCIDENT RESEARCH DIVISION DATA



U.S. Department of Transportation
National Highway Traffic Safety
Administration

SMASH PROGRAM SUMMARY

(All Measurements in Metric)

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

Identifying Title

NASS-SSC Calapan case 93-07

Primary
Sampling Unit

Case No.-Stratum

Accident Event
Sequence No.

Date (Month, day, year) of Run

GENERAL INFORMATION

VEHICLE 1

NASS Vehicle Number

01
19 93

Year

Make

Volvo

Model

850 GLT

Body Style

4S
12 FDEW1

CDC

PDOF

$\pm$ *360*°

Heading Angle

$\pm$ *0*°

VEHICLE 2

NASS Vehicle Number

02
19 86

Year

Make

Volkswagen

Model

Golf

Body Style

5H
06 BZGWI

CDC

PDOF

$\pm$ *180*°

Heading Angle

$\pm$ *0*°

VEHICLE SPECIFICATIONS

VEHICLE 1

Wheelbase

266 cm

Overall Length

466 cm

Overall Width

176 cm

Weight

1495 + *-* + *-* = *-* kg

Curb Occupant(s) Cargo

Engine Displacement

L

Drive System

FWD

Size

3

Stiffness

3

VEHICLE 2

Wheelbase

247 cm

Overall Length

401 cm

Overall Width

166 cm

Weight

1054 + *-* + *-* = *-* kg

Curb Occupant(s) Cargo

Engine Displacement

- L

Drive System

-

Size

2

Stiffness

1

DAMAGE INFORMATION

VEHICLE 1

Damage Known?

156 *Y* cm

Damage Length

Damage Offset

$\pm$ *022* cm

Crush Depth:

C1 *000* cm

C2 *000* cm

C3 *007* cm

C4 *005* cm

C5 *000* cm

C6 *000* cm

VEHICLE 2

Damage Known?

152 *Y* cm

Damage Length

Damage Offset

$\pm$ *044* cm

Crush Depth:

C1 *000* cm

C2 *002* cm

C3 *003* cm

C4 *005* cm

C5 *006* cm

C6 *007* cm

National Accident Sampling System-Crashworthiness Data System: SMASH Program Summary

SCENE INFORMATION

Rest and Impact Positions ☐ No ☐ Yes

VEHICLE 1

Rest X _____ m
 Position Y _____ m
 Heading Angle _____ °
 Impact X _____ m
 Position Y _____ m
 Heading Angle _____ °
 Slip Angle (-180 to +180) _____ °

VEHICLE 2

Rest X _____ m
 Position Y _____ m
 Heading Angle _____ °
 Impact X _____ m
 Position Y _____ m
 Heading Angle _____ °
 Slip Angle (-180 to +180) _____ °

VEHICLE MOTION

Sustained Contact ☐ No ☐ Yes

VEHICLE 1

Vehicle Rotation ☐ No ☐ Yes
 Rotation Stop Before Rest ☐ No ☐ Yes
 End of Rotation X _____ m
 Position Y _____ m
 Heading Angle _____ °

Curved Path ☐ No ☐ Yes

Point on Path

X _____ m Y _____ m

Rotation Direction ☐ None ☐ CW ☐ CCW

Rotation > 360° ☐ No ☐ Yes

Sustained Contact ☐ No ☐ Yes

VEHICLE 2

Vehicle Rotation ☐ No ☐ Yes
 Rotation Stop Before Rest ☐ No ☐ Yes
 End of Rotation X _____ m
 Position Y _____ m
 Heading Angle _____ °

Curved Path ☐ No ☐ Yes

Point on Path

X _____ m Y _____ m

Rotation Direction ☐ None ☐ CW ☐ CCW

Rotation > 360° ☐ No ☐ Yes

FRICTION INFORMATION

Coefficient of Friction

Rolling Resistance Option

1

Vehicle 1 Rolling Resistance

LF _____
 RF _____
 LR _____
 RR _____

Vehicle 2 Rolling Resistance

LF _____
 RF _____
 LR _____
 RR _____

IF THIS COMMON IMPACT WAS WITH A CDS VEHICLE NOT IN TRANSPORT, FILL IN THE INFORMATION BELOW.

Model Year: _____

Make: _____

Model: _____

VIN: _____

The Weight, CDC, Scene Data and Damage Information for this vehicle should be recorded above.

Complete and ATTACH the appropriate damage sketch and dimensions to the form.

April 7, 1997

Page 1

Summary of Results Using Damage

NASS SSC Calspan Case 93-07

Vehicle #1

	Speed Change	
	(Damage)	
Total	12 km/h (7 mph)	
Longitudinal	-12 km/h (-7 mph)	
Latitudinal	-0 km/h (-0 mph)	
PDOF Angle	0 °	
Energy Dissipated	= 12528 Joules (9239 Ft-Lb)	
Barrier Equivalent Speed	= 14.6 km/h (9.1 mph)	

Calculated using size and stiffness categories.

*SMASH results
are borderline flows
due to override/
underide
damage.*

Vehicle #2

Total	17 km/h (10 mph)	
Longitudinal	17 km/h (10 mph)	
Latitudinal	0 km/h (0 mph)	
PDOF Angle	-180 °	
Energy Dissipated	= 10162 Joules (7494 Ft-Lb)	
Barrier Equivalent Speed	= 13.8 km/h (8.6 mph)	

Calculated using size and stiffness categories.

General Information

	Vehicle #1	Vehicle #2
Year	1993	1986
Make	Volvo	Volkswagen
Model	850 GLT	Golf
CDC	12FDEW1	06BZEW1
Side Damaged	F	B
PDOF Angle	360 °	180 °
Heading Angle	0 °	0 °

Calculation method:	Size and Stiffness	Size and Stiffness
Size Category	3	2
Stiffness Category	3	1
Vehicle Weight	1495 kgs (3296 lbs)	1054 kgs (2324 lbs)

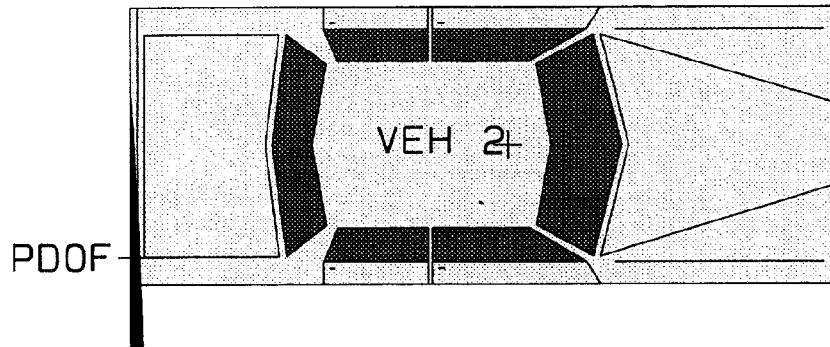
Damage Information

Vehicle Damage Known	<u>Vehicle #1</u>		<u>Vehicle #2</u>	
	Yes		Yes	
Crush Length	156.0	cm (61 in)	152.0	cm (60 in)
C1	0.0	cm (0 in)	0.0	cm (0 in)
C2	0.0	cm (0 in)	2.0	cm (1 in)
C3	7.0	cm (3 in)	3.0	cm (1 in)
C4	5.0	cm (2 in)	5.0	cm (2 in)
C5	0.0	cm (0 in)	6.0	cm (2 in)
C6	0.0	cm (0 in)	7.0	cm (3 in)
D	-21.9	cm (-9 in)	44.0	cm (17 in)
D'	13.2	cm (5 in)	66.7	cm (26 in)

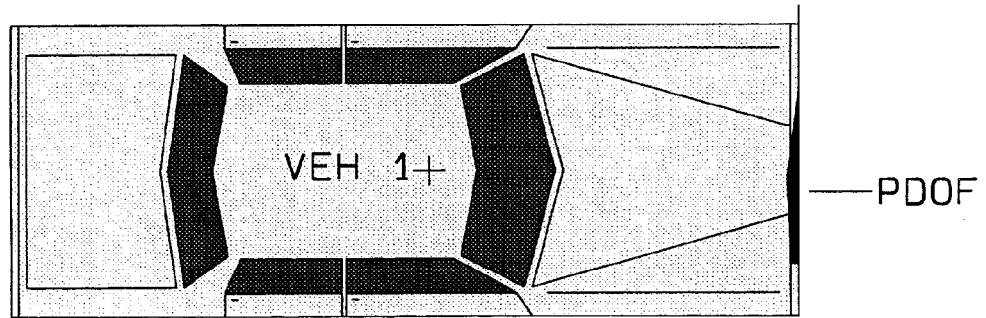
Vehicle Dimensions

	<u>Vehicle #1</u>		<u>Vehicle #2</u>	
Length	466.0	cm (183 in)	401.3	cm (158 in)
Width	176.0	cm (69 in)	166.4	cm (66 in)
Wheelbase	266.0	cm (105 in)	247.2	cm (97 in)
Weight	1495	kgs (3296 lbs)	1054	kgs (2324 lbs)
CG to Front of Veh	228.1	cm (90 in)	211.6	cm (83 in)
Engine Displacement	0.0 liters		1.8 liters	
Moment of Inertia	293300	kgs (25960 lbs)	153373	kgs (13575 lbs)
Vehicle Mass	1495	kgs (8.6 lb-s ² /in)	1054	kgs (6.0 lb-s ² /in)

1986 Volkswagen Golf



1993 Volvo 850 GLT



ACCIDENT RESEARCH DIVISION DATA

1993 VOLVO 850 GLT 4-DOOR SEDAN

EXTERIOR VEHICLE FORM

**NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM**

1. Primary Sampling Unit Number _____		3. Vehicle Number _____	
2. Case Number - Stratum _____		NASS-SSC Oklahoma case No 93-07	

VEHICLE IDENTIFICATION

VIN YV1L55504P2074785 Model Year 93
Vehicle Make (specify): Volvo Vehicle Model (specify): 850 GLE

LOCATOR

Locate the end of the damage with respect to the vehicle's damaged center point or bumper corner for end impacts or an undamaged axle for side impacts.

Specific Impact No.	Location of Direct Damage	Location of Field L	Location of Max Crush
1	Left front BC extending right 108 cm.	entire front bumper	5 cm (R) of C3

CRUSH PROFILE IN CENTIMETERS

NOTES: Identify the plane at which the C-measurements are taken (e.g., at bumper, above bumper, at sill, above sill, etc.) and label adjustments (e.g., free space).

Measure C1 to C6 from driver to passenger side in front or rear impacts and rear to front in side impacts.

Free space value is defined as the distance between the baseline and the original body contour taken at the individual C locations. This may include the following: bumper lead, bumper taper, side protrusion, side taper, etc. Record the value for each C-measurement and maximum crush.

Use as many lines/columns as necessary to describe each damage profile.

[illegible]

ORIGINAL SPECIFICATIONS WORK SHEET

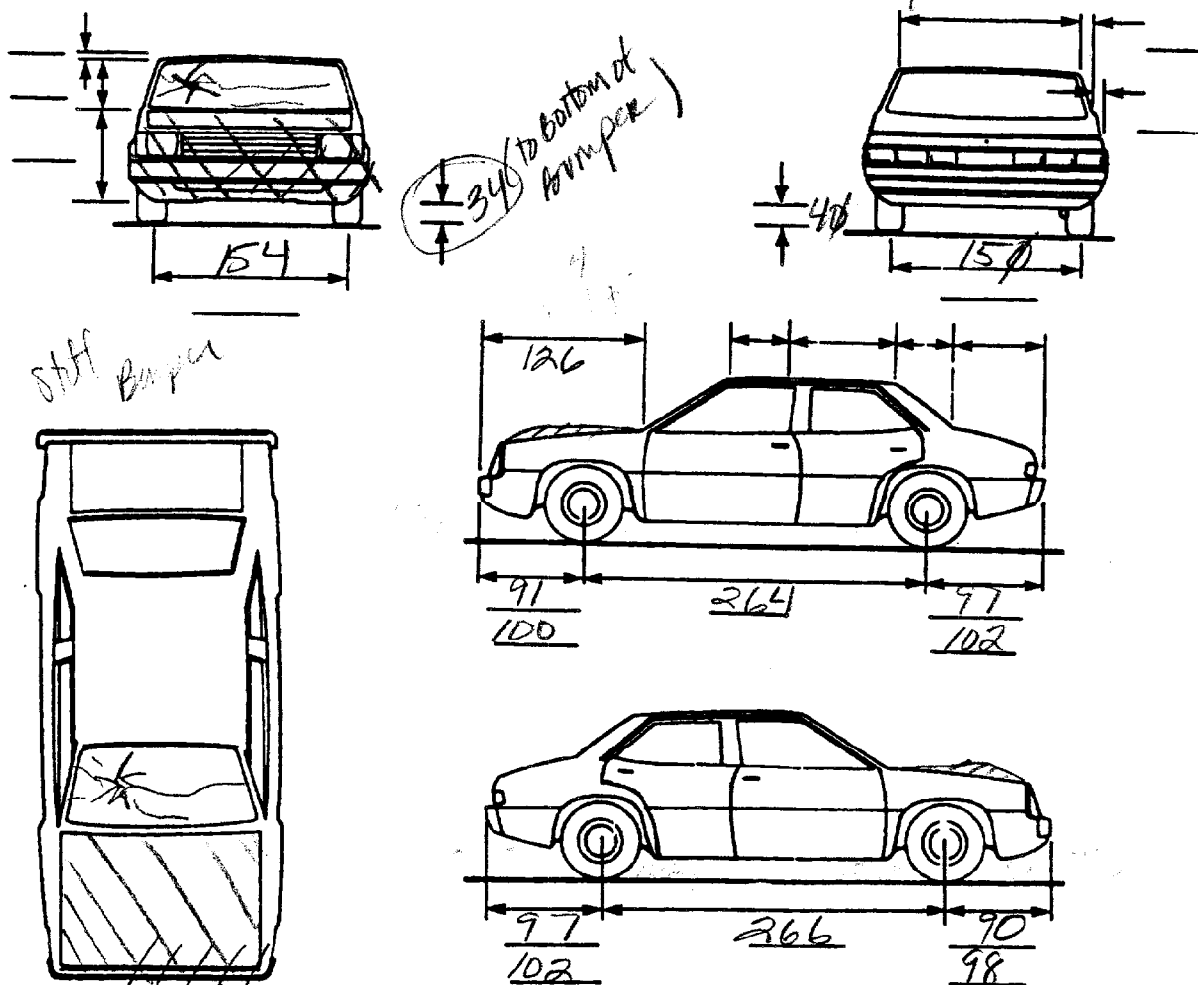
Wheelbase	<u>104.9</u>	inches	x 2.54	=	<u>266</u> cm
Overall Length	<u>183.5</u>	inches	x 2.54	=	<u>466</u> cm
Maximum Width	<u>69.3</u>	inches	x 2.54	=	<u>176</u> cm
Curb Weight	<u>3,295</u>	pounds	x .4536	=	<u>1,495</u> kg
Average Track	<u>58.9</u>	inches	x 2.54	=	<u>150</u> cm
Front Overhang	<u>39.0</u>	inches	x 2.54	=	<u>98</u> cm
Rear Overhang	<u>40.2</u>	inches	x 2.54	=	<u>102</u> cm
Undeformed End Width	<u>61.4</u>	inches	x 2.54	=	<u>156</u> cm
Engine Size: cyl./displ.	_____	cc	x .001	=	_____ L
	_____	CID	x .0164	=	_____ L

VEHICLE DAMAGE SKETCH

TIRE—WHEEL DAMAGE		ORIGINAL SPECIFICATIONS		WHEEL STEER ANGLES (For locked front wheels or displaced rear axles only)	
a. Rotation physically restricted	b. Tire deflated	Wheelbase	<u>266</u> cm	RF	<u>20</u> °
RF <u>2</u>	RF <u>2</u>	Overall Length	<u>466</u> cm	LF	<u>20</u> °
LF <u>2</u>	LF <u>2</u>	Maximum Width	<u>176</u> cm	RR	<u>±</u> °
RR <u>3</u>	RR <u>2</u>	Curb Weight	<u>1495</u> kg	LR	<u>±</u> °
LR <u>2</u>	LR <u>2</u>	Average Track	<u>150</u> cm	Within ± 5 degrees	
(1) Yes (2) No (8) NA (9) Unk.		Front Overhang	<u>98</u> cm	AND? DRIVE WHEELS	
TYPE OF TRANSMISSION		Rear Overhang	<u>102</u> cm	☒ FWD ☐ RWD ☐ 4WD	
☐ Manual ☒ Automatic		Undeformed End Width	<u>156</u> cm	Approximate Cargo Weight <u>0</u> kg	
END SHIFT ≥ 10 CM		Engine Size: cyl./displ.	L		
☐ Yes ☒ No					

MEASUREMENTS IN CENTIMETERS

- This vehicle is a 1980s Volkswagen



NOTES: Sketch new perimeter and cross hatch direct damage and single hatch induced damage on all views. Annotate observations which might be useful in reconstructing the accident (e.g., grass in tire bead, direction of striations, scuff on sidewalls, etc.). If pulling trailer, sketch type of trailer and damage received on the back of this page.

Annotate any damage caused by extrication such as component removal by torching, prying, or hydraulic shears.

CODES FOR OBJECT CONTACTED

(57) Fence

(58) Wall

- (59) Building
(60) Ditch or culvert
(61) Ground
(62) Fire hydrant
(63) Curb
(64) Bridge
(68) Other fixed object

(68) Other fixed object (specify):

(69) Unknown fixed object

Collision with Nonfixed Object

(70) Passenger car, light truck, van, or other vehicle not in-transport

- (71) Medium/heavy truck or bus not in-transport
(72) Pedestrian
(73) Cyclist or cycle
(74) Other nonmotorist or conveyance

(75) Vehicle occupant

(76) Animal

- (77) Train
(78) Trailer, disconnected in transport
(79) Object fell from vehicle in-transport
(88) Other nonfixed object (specify):

(89) Unknown nonfixed object

- (98) Other event (specify):

(99) Unknown event or object

[illegible]

COLLISION DEFORMATION CLASSIFICATION

HIGHEST DELTA "V"

Accident Event Sequence Number	Object Contacted	(1) (2) Direction of Force	(3) Deformation Location	(4) Longitudinal or Lateral Location	(5) Vertical or Lateral Location	(6) Type of Damage Distribution	(7) Deformation Extent
4. <u>01</u>	5. <u>02</u>	6. <u>12</u>	7. <u>F</u>	8. <u>D</u>	9. <u>E</u>	10. <u>W</u>	11. <u>01</u>

Second Highest Delta "V"

12. _____ 13. _____ 14. _____ 15. _____ 16. _____ 17. _____ 18. _____ 19. _____

CRUSH PROFILE IN CENTIMETERS

The crush profile for the damage described in the CDC(s) above should be documented in the appropriate space below. (ALL MEASUREMENTS ARE IN CENTIMETERS.)

HIGHEST DELTA "V"

20. L 21. C₁ C₂ C₃ C₄ C₅ C₆ 22. ± D

156 000 000 007 005 000 000 + 0022

Second Highest Delta "V"

23. L 24. C₁ C₂ C₃ C₄ C₅ C₆ 25. ± D

1 +

26. Undeformed End Width
(Coded when highest severity impact is an end plane impact.) 156
Code to the nearest centimeter
(250) 250 centimeters or more
(998) No highest severity end plane impact
(999) Unknown

27. Direct Damage Width
(For highest severity impact) 108
Code to the nearest centimeter
(250) 250 centimeters or more
(999) Unknown

28. Original Wheelbase
Code to the nearest centimeter 266
(650) 650 centimeters or more
(999) Unknown
104.7 inches X 2.54 = 266 centimeters

29. Original Average Track Width
Code to the nearest centimeter 150
(185) 185 centimeters or more
(999) Unknown
58.7 inches X 2.54 = 150 centimeters

		FUEL SYSTEM	
30. Are CDCs Documented but Not Coded on The Automated File?	<u>0</u>	35. Location of Fuel Tank-1 Filler Cap	<u>3</u>
(0) No		36. Location of Fuel Tank-2 Filler Cap	<u>7</u>
(1) Yes		(0) No fuel tank	
		(1) On back plane	
		(2) Aft of center of the rear wheels (rear axle) on left side plane	
		(3) Aft of center of the rear wheels (rear axle) on right side plane	
		(4) Forward of center of the rear wheels (rear axle) on left side plane	
		(5) Forward of center of the rear wheels (rear axle) on right side plane	
		(6) Over the center of the rear wheels (rear axle) on left side plane	
		(7) Over the center of the rear wheels (rear axle) on right side plane	
		(8) Other (specify): _____	
		(9) Unknown	
31. Researcher's Assessment of Vehicle Disposition	<u>0</u>	37. Type of Fuel Tank-1	<u>1</u>
(0) Not towed due to vehicle damage		38. Type of Fuel Tank-2	<u>0</u>
(1) Towed due to vehicle damage		(0) No fuel tank (electrical vehicle)	
(9) Unknown		(1) Metallic	
		(2) Non-metallic	
		(9) Unknown	
32. Is This A Multi-Stage Manufactured Vehicle And/Or A Certified Altered Vehicle?	<u>0</u>	39. Location of Fuel Tank-1	<u>7</u>
(0) No post manufacturer modifications		40. Location of Fuel Tank-2	<u>7</u>
(1) Yes - post manufacturer modifications (specify): _____		(0) No fuel tank	
_____		(1) Aft of center of the rear wheels (rear axle) centered	
_____		(2) Aft of center of the rear wheels (rear axle) left side	
(Include photograph of CERTIFICATION PLACARD in case report)		(3) Aft of center of the rear wheels (rear axle) right side	
(9) Unknown if vehicle is modified		(4) Forward of center of the rear wheels (rear axle) centered	
		(5) Forward of center of the rear wheels (rear axle) left side	
		(6) Forward of center of the rear wheels (rear axle) right side	
		(7) Over center of the rear wheels (rear axle)	
		(8) Other (specify): _____	
		(9) Unknown	
		41. Damage to Fuel Tank-1	<u>1</u>
		42. Damage to Fuel Tank-2	<u>7</u>
		(0) No fuel tank	
		(1) No damage to fuel tank	
		(2) Deformed, no seam failure	
		(3) Deformed, with a seam failure	
		(4) Punctured	
		(5) Lacerated (ripped)	
		(6) Abraded (scraped)	
		(7) Filler neck separation from the fuel tank	
		(8) Other damage (specify): _____	
		(9) Unknown	

FIRE OCCURRENCE	
33. Fire Occurrence	<u>0</u>
(0) No fire	
Yes, fire occurred	
(1) Minor	
(2) Major	
(9) Unknown	
34. Origin of Fire	<u>0</u>
(0) No fire	
(1) Vehicle exterior (front, side, back, top)	
(2) Exhaust system	
(3) Fuel tank (and other fuel retention system parts)	
(4) Engine compartment	
(5) Cargo/trunk compartment	
(6) Instrument panel	
(7) Passenger compartment area	
(8) Other location (specify): _____	
(9) Unknown	

43. Leakage Location of Fuel System-1 <u>1</u> 44. Leakage Location of Fuel System-2 <u>0</u> (0) No fuel tank (1) No fuel leakage <i>Primary Area Of Leakage</i> (2) Tank (3) Filler neck (4) Cap (5) Lines/pump/filter (6) Vent/emission recovery (8) Other (specify): _____ (9) Unknown 45. Fuel Type-1 <u>01</u> 46. Fuel Type-2 <u>00</u> <i>Single Fuel Type</i> (00) No fuel tank (01) Gasoline (02) Diesel (03) CNG (Compressed Natural Gas) (04) LPG (Liquid Petroleum Gas) also known as Propane (05) LNG (Liquid Natural Gas) (06) Methanol (M100 or M85) (07) Ethanol (E100 or E85) (08) Other (Hydrogen or others) (specify): _____ <i>Electric Powered or Electric/Solar Powered Vehicles</i> (10) Lead Acid Battery (11) Nickel-Iron Battery (12) Nickel-Cadmium Battery (13) Sodium Metal Chloride Battery (14) Sodium Sulfur Battery (18) Other (Specify): _____ (98) Other Hybrid (specify): _____ (99) Unknown fuel type	47. Is This Vehicle Equipped With More Than Two Fuel Tanks? <u>0</u> (0) No (one or two tanks only) <i>Yes - More Than Two Tanks</i> (1) Yes -- <u>no damage</u> to any tank or filler cap and <u>no fuel system leakage</u> (2) Yes -- <u>no damage</u> to any tank or filler cap but <u>there is fuel system leakage</u> (specify leakage location): _____ (3) Yes -- <u>damage</u> to an additional tank or filler cap and <u>there is fuel system leakage</u> (specify the following): Type of tank _____ Tank location _____ Filler cap location _____ Tank damage _____ Location of leakage _____ Type of fuel _____ (9) Unknown if more than two tanks
COMMENTS _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	

*** STOP: IF THE CDS APPLICABLE VEHICLE WAS NOT TOWED ***

(GV10=0)

DO NOT COMPLETE THE INTERIOR VEHICLE FORM.



EXTERIOR VEHICLE LOG

TO BE COMPLETED BY TEAM

1. PSU Number _____
2. Case Number—Stratum _____
3. Researcher Completing Form _____
4. Vehicle Number _____
5. Date Vehicle Inspected ____/____/____
6. Number of Exterior Vehicle Slides _____

14. Number of Coded CDCs (0,1,2) _____
15. Number of Coded Crush Profiles (0,1,2) _____

TO BE COMPLETED BY ZONE CENTER

7. Applicable Precrash Measurements _____
(0) Not applicable
(1) Substandard - beyond researcher control
(2) Substandard
(3) Standard
8. Reference Line Placement _____
(0) Not applicable (e.g. rollover)
(1) Substandard - beyond researcher control
(2) Substandard
(3) Standard
9. Impact Damage Documentation _____
(0) Not applicable
(1) Substandard - beyond researcher control
(2) Substandard
(3) Standard
10. Quality Of Vehicle Damage Sketch _____
(0) Not applicable (e.g., repaired vehicle)
(1) Substandard - beyond researcher control
(2) Substandard
(3) Standard
11. Exterior Slides Subject Quality _____
(0) Not applicable
(1) Substandard - beyond researcher control
(2) Substandard
(3) Standard
12. Exterior Slides Quality _____
(0) Not applicable
(1) Substandard - beyond researcher control
(2) Substandard
(3) Standard
13. Primary Error Source (Vehicle Plane) _____
(0) No error
(1) Front
(2) Side (left or right)
(3) Back (rear)
(4) Top
(5) Undercarriage
(8) Other (specify): _____

DATA STATUS OF VARIABLE NUMBERS 4-47

Highest CDC

4 5 6 7 8 9 10 11

--	--	--	--	--	--	--	--

Secondary CDC

12 13 14 15 16 17 18 19

--	--	--	--	--	--	--	--

Highest Crush Profile

20 21 22

--	--	--

Secondary Crush Profile

23 24 25

--	--	--

26 27 28 29 30 31 32 33 34 35 36

--	--	--	--	--	--	--	--	--	--	--

37 38 39 40 41 42 43 44 45 46 47

--	--	--	--	--	--	--	--	--	--	--

Data Status Codes:

- (Blank) Correct
(1) Derived error
(2) Non-correctable error
(3) Correctable error
(4) Change—no error
(5) Sequencing error
(7) Incorrect edit override
(8) MDE error
(9) Unknown coded

IF THIS VEHICLE WAS NOT TOWED (I.E., GV09 ≠ 1), DO NOT COMPLETE THE
INTERIOR VEHICLE LOG



INTERIOR VEHICLE FORM

1. Primary Sampling Unit Number _____
2. Case Number - Stratum _____
3. Vehicle Number _____

INTEGRITY

4. Passenger Compartment Integrity 06
(00) No integrity loss

Yes, Integrity Was Lost Through LF WINDOW

- (01) Windshield
- (02) Door (side)
- (03) Door/hatch (back door)
- (04) Roof
- (05) Roof glass
- (06) Side window
- (07) Rear window (backlight)
- (08) Roof and roof glass
- (09) Windshield and door (side)
- (10) Windshield and roof
- (11) Side and rear window (side window and backlight)
- (12) Windshield and side window
- (13) Door and side window
- (98) Other combination of above (specify): _____
- (99) Unknown

Door, Tailgate or Hatch Opening

5. LF 1 6. RF 1 7. LR 1 8. RR 1 9. TG/H 0

- (0) No door/gate/hatch
- (1) Door/gate/hatch remained closed and operational
- (2) Door/gate/hatch came open during collision
- (3) Door/gate/hatch jammed shut
- (8) Other (specify): _____
- (9) Unknown

Damage/Failure Associated with Door, Tailgate or Hatch Opening in Collision. If IV05-IV09 ≠ 2, Then code 0

10. LF 0 11. RF 0 12. LR 0 13. RR 0 14. TG/H 0

- (0) No door/gate/hatch or door not opened

Door, Tailgate or Hatch Came Open During Collision

- (1) Door operational (no damage)
- (2) Latch/striker failure due to damage
- (3) Hinge failure due to damage
- (4) Door structure failure due to damage
- (5) Door support (i.e., pillar, sill, roof side rail, etc.) failure due to damage
- (6) Latch/striker and hinge failure due to damage
- (8) Other failure (specify): _____
- (9) Unknown

GLAZING

Type of Window/Windshield Glazing

15. WS 1 16. LF 2 17. RF 2 18. LR 2 19. RR 2
20. BL 1 21. Roof 3 22. Other 2

- (0) No glazing
- (1) AS-1 — Laminated
- (2) AS-2 — Tempered
- (3) AS-3 — Tempered-tinted (original)
- (4) AS-2 — Tempered-with after market tint
- (5) AS-3 — Tempered-tinted (with additional after market tint)
- (6) AS-14 — Glass/Plastic
- (7) Glazing removed prior to accident
- (8) Other (specify): _____
- (9) Unknown

Window Precrash Glazing Status

23. WS 1 24. LF 4 25. RF 2 26. LR 2 27. RR 2
28. BL 1 29. Roof 2 30. Other 1

- (0) No glazing
- (1) Fixed
- (2) Closed
- (3) Partially opened
- (4) Fully opened
- (7) Glazing removed prior to accident
- (9) Unknown

Glazing Damage from Impact Forces

31. WS 9 32. LF 1 33. RF 1 34. LR 1 35. RR 1
36. BL 1 37. Roof 1 38. Other 1

- (0) No glazing
- (1) No glazing damage from impact forces
- (2) Glazing in place and cracked from impact forces
- (3) Glazing in place and holed from impact forces
- (4) Glazing out-of-place (cracked or not) and not holed from impact forces
- (5) Glazing out-of-place and holed from impact forces
- (6) Glazing disintegrated from impact forces
- (7) Glazing removed prior to accident
- (9) Unknown if damaged

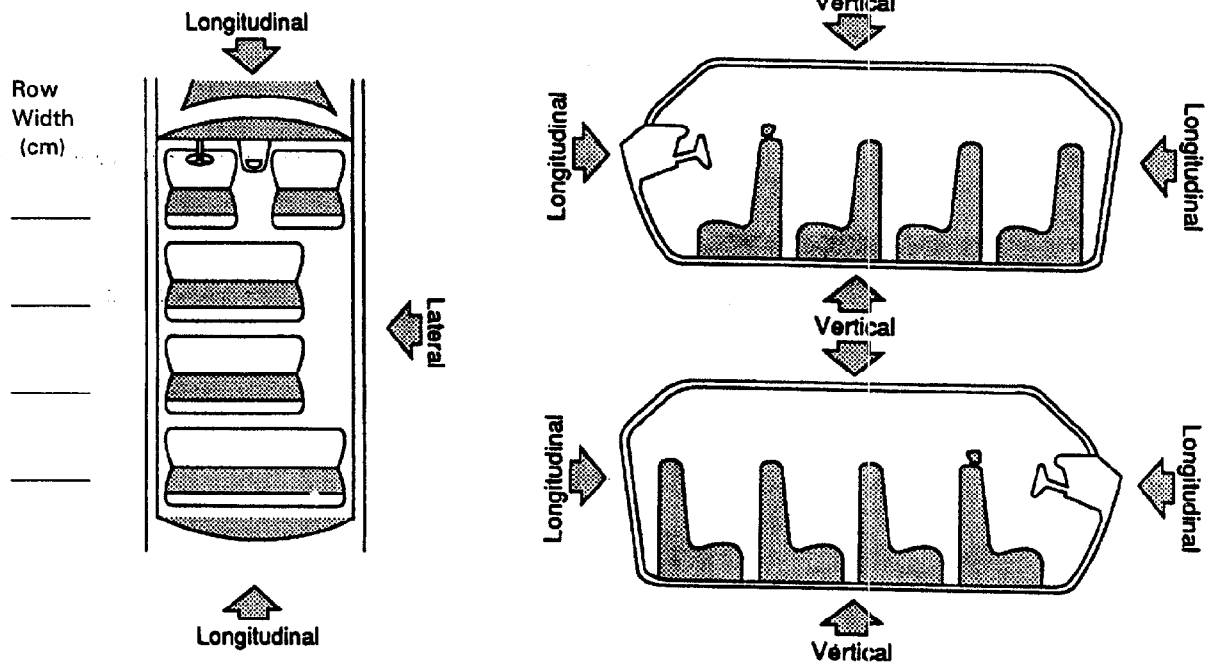
Glazing Damage from Occupant Contact

39. WS 3 40. LF 1 41. RF 8 42. LR 1 43. RR 1
44. BL 1 45. Roof 1 46. Other 1

- (0) No glazing
- (1) No occupant contact to glazing
- (2) Glazing contacted by occupant but no glazing damage
- (3) Glazing in place and cracked by occupant contact
- (4) Glazing in place and holed by occupant contact
- (5) Glazing out-of-place (cracked or not) by occupant contact and not holed by occupant contact
- (6) Glazing out-of-place by occupant contact and holed by occupant contact
- (7) Glazing removed prior to accident
- (8) Glazing disintegrated by occupant contact
- (9) Unknown if contacted by occupant

INTRUSION WORKSHEET

NOTE: SKETCH INTRUDED AREAS



LOCATION OF INTRUSION	INTRUDED COMPONENT	(All Measurements Are In Centimeters)			INTRUSION	DOMINANT CRUSH DIRECTION
		COMPARISON VALUE	—	INTRUDED VALUE	=	
			—		=	
			—		=	
			—		=	
			—		=	
			—		=	
			—		=	
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			—		=	
			—		=	
			—		=	
			—		=	
			—		=	

Document no more than the 15 most severe intrusions

OCCUPANT AREA INTRUSION

Note: If no intrusions, leave variables IV47-IV86 blank.

	Location of Intrusion	Intruding Component	Magnitude of Intrusion	Dominant Crush Direction
1st	47. _____	48. _____	49. _____	50. _____
2nd	51. _____	52. _____	53. _____	54. _____
3rd	55. _____	56. _____	57. _____	58. _____
4th	59. _____	60. _____	61. _____	62. _____
5th	63. _____	64. _____	65. _____	66. _____
6th	67. _____	68. _____	69. _____	70. _____
7th	71. _____	72. _____	73. _____	74. _____
8th	75. _____	76. _____	77. _____	78. _____
9th	79. _____	80. _____	81. _____	82. _____
10th	83. _____	84. _____	85. _____	86. _____

LOCATION OF INTRUSION

Front Seat

- (11) Left
- (12) Middle
- (13) Right

Second Seat

- (21) Left
- (22) Middle
- (23) Right

Third Seat

- (31) Left
- (32) Middle
- (33) Right

Fourth Seat

- (41) Left
- (42) Middle
- (43) Right

(97) Catastrophic

- (98) Other enclosed area (specify) _____

(99) Unknown

INTRUDING COMPONENT

Interior Components

- (01) Steering assembly
- (02) Instrument panel left
- (03) Instrument panel center
- (04) Instrument panel right
- (05) Toe pan
- (06) A (A1/A2)-pillar
- (07) B-pillar
- (08) C-pillar
- (09) D-pillar
- (10) Side panel - forward of the A1/A2-pillar
- (11) Door panel (side)
- (12) Side panel - rear of the B-pillar
- (13) Roof (or convertible top)
- (14) Roof side rail
- (15) Windshield
- (16) Windshield header
- (17) Window frame
- (18) Floor pan (includes sill)
- (19) Backlight header
- (20) Front seat back
- (21) Second seat back
- (22) Third seat back
- (23) Fourth seat back
- (24) Fifth seat back
- (25) Seat cushion
- (26) Back door/panel (e.g., tailgate)
- (27) Other interior component (specify): _____

Exterior Components

- (30) Hood
- (31) Outside surface of this vehicle (specify): _____
- (32) Other exterior object in the environment (specify): _____
- (33) Unknown exterior object
- (97) Catastrophic
- (98) Intrusion of unlisted component(s) (specify): _____
- (99) Unknown

MAGNITUDE OF INTRUSION

- (1) ≥ 3 centimeters but < 8 centimeters
- (2) ≥ 8 centimeters but < 15 centimeters
- (3) ≥ 15 centimeters but < 30 centimeters
- (4) ≥ 30 centimeters but < 46 centimeters
- (5) ≥ 46 centimeters but < 61 centimeters
- (6) ≥ 61 centimeters
- (7) Catastrophic
- (9) Unknown

DOMINANT CRUSH DIRECTION

- (1) Vertical
- (2) Longitudinal
- (3) Lateral
- (7) Catastrophic
- (9) Unknown

STEERING RIM/SPOKE DEFORMATION

(All Measurements Are in Centimeters)

COMPARISON VALUE	—	DAMAGE VALUE	=	DEFORMATION
	—		=	
	—		=	
	—		=	
	—		=	

STEERING COLUMN

INSTRUMENT PANEL

87. Steering Column Type 2

- (1) Fixed column
 (2) Tilt column
 (3) Telescoping column
 (4) Tilt and telescoping column
 (8) Other column type (specify):
 (9) Unknown

88. Tilt Steering Column Adjustment 1

- (0) No tilt steering column
 (1) Full up
 (2) Between full up and center
 (3) Center
 (4) Between center and full down
 (5) Full down
 (9) Unknown

89. Telescoping Steering Column Adjustment 0

- (0) No telescoping steering column
 (1) Full back
 (2) Between full back and midpoint
 (3) Midpoint
 (4) Between midpoint and full forward
 (5) Full forward
 (9) Unknown

90. Steering Rim/Spoke Deformation 00

- Code actual measured
 deformation to the nearest centimeter
 (00) No steering rim deformation
 (01-14) Actual measured value in centimeters
 (15) 15 centimeters or more
 (98) Observed deformation cannot be measured
 (99) Unknown

91. Location of Steering Rim/Spoke Deformation 00

- (00) No steering rim deformation

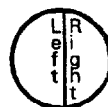
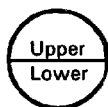
Quarter Sections

- (01) Section A
 (02) Section B
 (03) Section C
 (04) Section D



Half Sections

- (05) Upper half of rim/spoke
 (06) Lower half of rim/spoke
 (07) Left half of rim/spoke
 (08) Right half of rim/spoke



- (09) Complete steering wheel collapse
 (10) Undetermined location
 (99) Unknown

92. Odometer Reading 084,000

- _____ kilometers
 Code to the nearest 1,000 kilometers
 (000) No odometer
 (001) Less than 1,500 kilometers
 (500) 499,500 kilometers or more
 (999) Unknown
52033 miles X 1.6093 = 83737 kilometers

Source: Vehicle inspection

93. Instrument Panel Damage from Occupant Contact? 1

- (0) No
 (1) Yes
 (9) Unknown

94. Type of Knee Bolster Covering 2

- (0) No knee bolster
 (1) Padded
 (2) Rigid plastic
 (8) Other (specify):
 (9) Unknown

95. Knee Bolsters Deformed from Occupant Contact? 1

- (0) No knee bolster
 (1) No deformation
 (2) Yes - deformation
 (9) Unknown

96. Did Glove Compartment Door Open During Collision(s)? 2

- (0) No glove compartment door
 (1) No - door did not open
 (2) Yes - door opened
 (9) Unknown

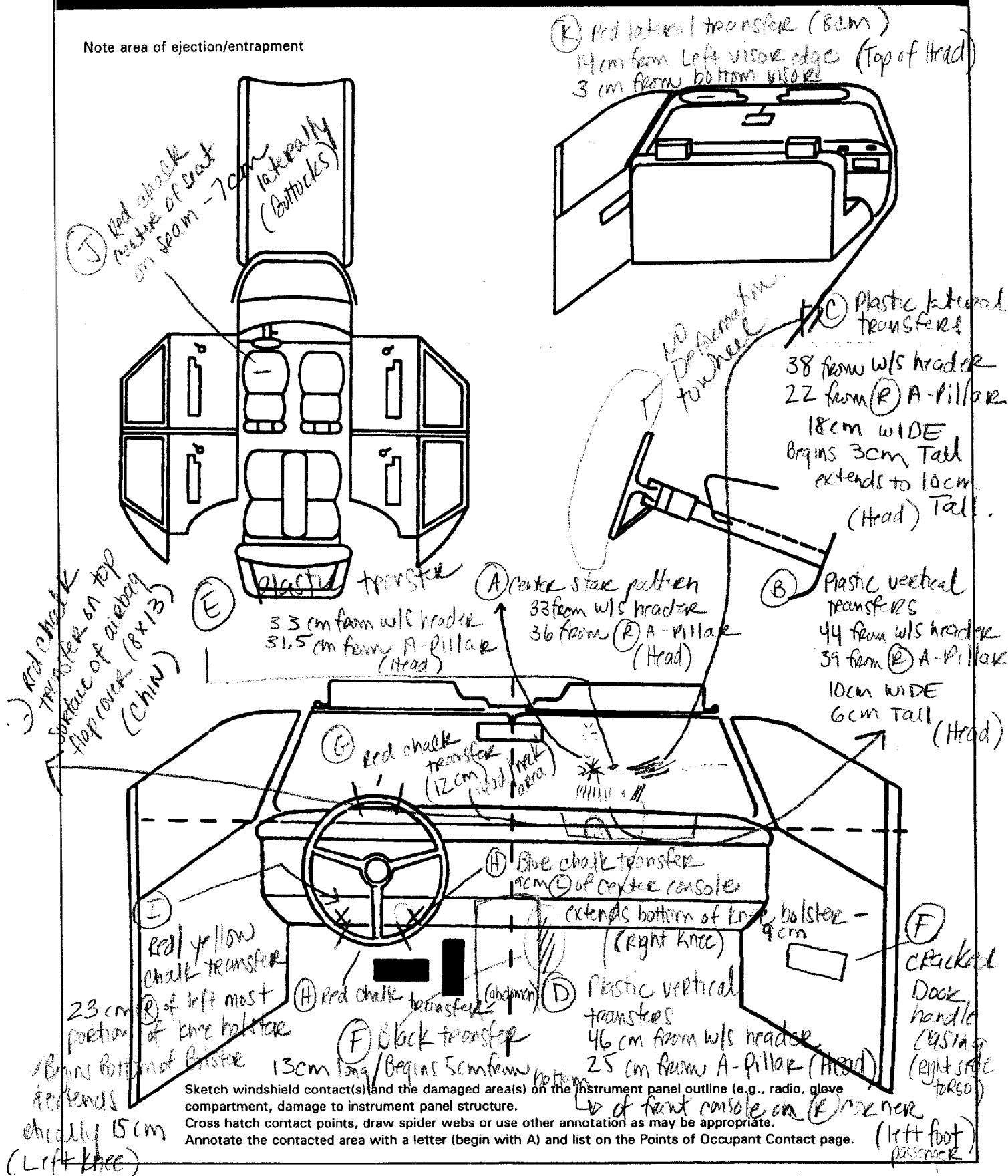
97. Adaptive (Assistive) Driving Equipment 0

- (0) No adaptive driving equipment
 (1) Adaptive driving equipment installed (Check all that apply.)
☐ Hand controls for braking/acceleration
☐ Steering control devices (attached to OEM steering wheel)
☐ Steering knob attached to steering wheel
☐ Low effort power steering (unit or device)
☐ Replacement steering wheel (i.e., reduced diameter)
☐ Joy-stick steering controls
☐ Wheelchair tie-downs
☐ Modification to seat belts (specify):
☐ Additional or relocated switches (specify):
☐ Raised roof
☐ Wall-mounted head rest (used behind wheelchair)
☐ Other adaptive device (specify):

(9) Unknown

VEHICLE INTERIOR SKETCHES

Note area of ejection/entrapment



POINTS OF OCCUPANT CONTACT

Contact	Interior Component Contacted	Occupant No. If Known	Body Region If Known	Supporting Physical Evidence	Confidence Level of Contact Point
A					
B					
C					
D					
E					
F					
G					
H					
I					
J					
K					
L					
M					
N					

FRONT

- (001) Windshield
 (002) Mirror
 (003) Sunvisor
 (004) Steering wheel rim
 (005) Steering wheel hub/spoke
 (006) Steering wheel (combination of codes 004 and 005)
 (007) Steering column, transmission selector lever, other attachment
 (008) Cellular telephone or CB radio
 (009) Add on equipment (e.g., tape deck, air conditioner)
 (010) Left instrument panel and below
 (011) Center instrument panel and below
 (012) Right instrument panel and below
 (013) Glove compartment door
 (014) Knee bolster
 (015) Windshield including one or more of the following: front header, A (A1/A2)-pillar, instrument panel, mirror, or steering assembly (driver side only)
 (016) Windshield including one or more of the following: front header, A (A1/A2)-pillar, instrument panel, or mirror (passenger side only)
 (017) Windshield reinforced by exterior object, (specify):
 (019) Other front object (specify):

CODES FOR INTERIOR COMPONENTS

LEFT SIDE

- (051) Left side interior surface, excluding hardware or armrests
 (052) Left side hardware or armrest
 (053) Left A (A1/A2)-pillar
 (054) Left B-pillar
 (055) Other left pillar (specify):
 (056) Left side window glass
 (057) Left side window frame
 (058) Left side window sill
 (059) Left side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
 (060) Other left side object (specify):

RIGHT SIDE

- (101) Right side interior surface, excluding hardware or armrests
 (102) Right side hardware or armrest
 (103) Right A (A1/A2)-pillar
 (104) Right B-pillar
 (105) Other right pillar (specify):
 (106) Right side window glass
 (107) Right side window frame
 (108) Right side window sill
 (109) Right side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
 (110) Other right side object (specify):

INTERIOR

- (151) Seat, back support
 (152) Belt restraint webbing/buckle
 (153) Belt restraint B-pillar or door frame attachment point
 (154) Other restraint system component (specify):
 (155) Head restraint system
 (160) Other occupants (specify):
 (161) Interior loose objects
 (162) Child safety seat (specify):
 (163) Other interior object (specify):

AIR BAG

- (170) Air bag-driver side
 (175) Air bag compartment cover-driver side
 (180) Air bag-passenger side
 (185) Air bag compartment cover-passenger side
 (190) Other air bag (specify):
 (195) Other air bag compartment cover (specify):

ROOF

- (201) Front header
 (202) Rear header
 (203) Roof left side rail
 (204) Roof right side rail
 (205) Roof or convertible top

FLOOR

- (251) Floor (including toe pan)
 (252) Floor or console mounted transmission lever, including console
 (253) Parking brake handle
 (254) Foot controls including parking brake

REAR

- (301) Backlight (rear window)
 (302) Backlight storage rack, door, etc.
 (303) Other rear object (specify):

ADAPTIVE (ASSISTIVE) DRIVING EQUIPMENT

- (401) Hand controls for braking/acceleration
 (402) Steering control devices (attached to OEM steering wheel)
 (403) Steering knob attached to steering wheel
 (405) Replacement steering wheel (i.e., reduced diameter)
 (406) Joy stick steering controls
 (407) Wheelchair tie-downs
 (408) Modification to seat belts, (specify):
 (409) Additional or relocated switches, (specify):
 (410) Raised roof
 (411) Wall mounted head rest (used behind wheel chair)
 (412) Other adaptive device (specify):

CONFIDENCE LEVEL OF CONTACT POINT

- (1) Certain
 (2) Probable
 (3) Possible
 (9) Unknown

MANUAL RESTRAINTS

NOTES: Encode the applicable data for each seat position in the vehicle. The attribute for the variable may be found below. Restraint systems should be assessed during the vehicle inspection then coded on the Occupant Assessment Form.

If a child safety seat is present, encode the data on the back of this page 11.

If the vehicle has automatic restraints available, encode the appropriate data on page 6.

		Left	Center	Right
FIRST	A-Availability	4	/	4
	B-Evidence of usage	04		04
	C-Used in this crash?	00		00
	D-Proper Use	00		00
	E-Failure Modes	0		0
	F-Anchorage Adjustment	1		1
SECOND	A-Availability	4	3	4
	B-Evidence of usage	04		04
	C-Used in this crash?	00		00
	D-Proper Use	00		00
	E-Failure Modes	0		0
	F-Anchorage Adjustment	0		0
OTHER	A-Availability	/	/	/
	B-Evidence of usage			
	C-Used in this crash?			
	D-Proper Use			
	E-Failure Modes			
	F-Anchorage Adjustment			

A-Manual (Active) Belt System Availability

- (0) None available
- (1) Belt removed/destroyed
- (2) Shoulder belt
- (3) Lap belt
- (4) Lap and shoulder belt
- (5) Belt available - type unknown

Integral Belt Partially Destroyed

- (6) Shoulder belt (lap belt destroyed/removed)
- (7) Lap belt (shoulder belt destroyed/removed)
- (8) Other belt (specify):

- (9) Unknown

B/C-Manual (Active) Belt System Use

- (00) None used, not available, or belt removed/destroyed
- (01) Inoperable (specify):

- (02) Shoulder belt
- (03) Lap belt
- (04) Lap and shoulder belt
- (05) Belt used - type unknown
- (08) Other belt used (specify):

- (12) Shoulder belt used with child safety seat
- (13) Lap belt used with child safety seat
- (14) Lap and shoulder belt used with child safety seat
- (15) Belt used with child safety seat - type unknown
- (18) Other belt used with child safety seat (specify):
- (99) Unknown if belt used

D-Proper Use of Manual (Active) Belts

- (0) None used or not available
- (1) Belt used properly
- (2) Belt used properly with child safety seat

Belt Used Improperly

- (3) Shoulder belt worn under arm
- (4) Shoulder belt worn behind back or seat
- (5) Belt worn around more than one person
- (6) Lap belt worn on abdomen
- (7) Lap belt or lap and shoulder belt used improperly with child safety seat (specify):
- (8) Other improper use of manual belt system (specify):
- (9) Unknown

E-Manual (Active) Belt Failure Modes During Accident

- (0) No manual belt used or not available
- (1) No manual belt failure(s)
- (2) Torn webbing (stretched webbing not included)
- (3) Broken buckle or latchplate
- (4) Upper anchorage separated
- (5) Other anchorage separated (specify):
- (6) Broken retractor
- (7) Combination of above (specify):
- (8) Other manual belt failure (specify):
- (9) Unknown

F-Shoulder Belt Upper Anchorage Adjustment

- (0) No shoulder belt
- (1) No upper anchorage adjustment for shoulder belt

Adjustable shoulder Belt Upper Anchorage

- (2) In full up position
- (3) In mid position
- (4) In full down position
- (5) Position unknown
- (9) Unknown if position has adjustable upper anchorage adjustment

* anchorage is not "adjustable", but can automatically adjust (via sliding motion) to the occupants height.

AUTOMATIC RESTRAINTS

NOTES: Encode the data for each applicable front seat position. The attribute for the variables may be found below. Restraint systems should be assessed during the vehicle inspection then coded on the Occupant Assessment Form.

AIR BAGS

		Frontal Air Bags--Left Front	Frontal Air Bags--Right Front	Other Air Bag
F I R S T	Availability/Function	/	/	/
	Deployment	/	/	/
	Failure	/	/	/

Air Bag System Availability/Function

(0) Not equipped/not available

(1) Air bag

Non-functional

(2) Air bag disconnected (specify):

(3) Air bag not reinstalled

(9) Unknown

**Air Bag System Deployment
(This Occupant Position)**

(0) Not equipped/not available

(1) Deployed during accident (as a result of impact)

(2) Deployed inadvertently just prior to accident

(3) Deployed, accident sequence undetermined

(4) Deployed as a result of a noncollision event during accident sequence (e.g., fire, explosion, electrical)

(5) Unknown if deployed

(7) Nondeployed

(9) Unknown

Are There Indications of Air Bag System Failure? (This Occupant Position)

(0) Not equipped/not available

(1) No

(2) Yes (specify):

(9) Unknown

AUTOMATIC BELTS

		Left	Right
F I R S T	A-Availability/Function	/	/
	B-Use	/	/
	C-Type	/	/
	D-Proper Use	/	/
	E-Failure Modes	/	/

A-Automatic (Passive) Belt System Availability/Function

(0) Not equipped/not available

(1) 2 point automatic belts

(2) 3 point automatic belts

(3) Automatic belts - type unknown

Non-functional

(4) Automatic belts destroyed or rendered inoperative

(9) Unknown

B-Automatic (Passive) Belt System Use

(0) Not equipped/not available/destroyed or rendered inoperative

(1) Automatic belt in use

(2) Automatic belt not in use (manually disconnected, motorized track inoperative)

(3) Automatic belt use unknown

(9) Unknown

C-Automatic (Passive) Belt System Type

(0) Not equipped/not available

(1) Non-motorized system

(2) Motorized system

(9) Unknown

D-Proper Use of Automatic (Passive) Belt System

(0) Not equipped/not available/not used

(1) Automatic belt used properly

(2) Automatic belt used properly with child safety seat

Automatic Belt Used Improperly

(3) Automatic shoulder belt worn under arm

(4) Automatic shoulder belt worn behind back

(5) Automatic belt worn around more than one person

(6) Lap portion of automatic belt worn on abdomen

(7) Automatic lap and shoulder belt or

automatic shoulder belt used improperly with child safety seat (specify):

(8) Other improper use of automatic belt system (specify):

(9) Unknown

E-Automatic (Passive) Belt Failure Modes During Accident

(0) Not equipped/not available/not in use

(1) No automatic belt failure(s)

(2) Torn webbing (stretched webbing not included)

(3) Broken buckle or latchplate

(4) Upper anchorage separated

(5) Other anchorage separated (specify):

(6) Broken retractor

(7) Combination of above (specify):

(8) Other automatic belt failure (specify):

(9) Unknown

FIRST SEAT FRONTAL AIR BAGS

NOTES: Encode the applicable data *for the driver and first seat passenger* in the vehicle. The attribute for the variable may be found below. Restraint systems should be assessed during the vehicle inspection then coded on the Occupant Assessment Form.

	Driver	Passenger
A-Type of air bag?	1	1
B-Flaps open at tear points?	2	2
C-Flaps damaged?	1 (Not from impact)	1 (Not from impact)
D-Air bag damaged?	01	01
E-Source of air bag damage	01	01
F-Air bag tethered?	2	1
G-Air bag have vent ports?	2	1
H-Other occupant contact air bag?	1	1
I-Occupant wearing eyewear?	9	9

A-Type of Air Bag

- (0) Not equipped/not available
- (1) Original manufacturer installed system
- (2) Retrofitted air bag
- (3) Replacement air bag
- (8) Unknown type of air bag
- (9) Unknown

B-Did Air Bag Module Cover Flap(s) Open At Designated Tear Points?

- (0) Not equipped/not available
- (1) No
- (2) Yes
- (3) Deployed, unknown if flap(s) opened at designated tear points
- (7) Not deployed
- (8) Unknown if deployed
- (9) Unknown

C-Were Air Bag Module Cover Flap(s) Damaged?

- (0) Not equipped/not available
- (1) No
- (2) Yes (specify):
- (3) Deployed, unknown if air bag module cover flap(s) damaged
- (7) Not deployed
- (8) Unknown if deployed
- (9) Unknown

D-Was There Damage To The Air Bag?

- (00) Not equipped/not available
- (01) Not damaged

Yes - Air Bag Damage

- (02) Ruptured
- (03) Cut
- (04) Torn
- (05) Holed
- (06) Burned
- (07) Abraded
- (88) Other damage (specify):

- (95) Damaged, details unknown
- (96) Deployed, unknown if damaged
- (97) Not deployed
- (98) Unknown if deployed
- (99) Unknown

E-Source of Air Bag Damage

- (00) Not equipped/not available
- (01) Not damaged
- (02) Object worn by occupant, (specify):
- (03) Object carried by occupant, (specify):
- (04) Adaptive/assistive controls, (specify):
- (05) Fire in vehicle
- (06) Thermal burns
- (07) Rescue or emergency efforts
- (88) Other damage source (specify):
- (95) Damaged, unknown source
- (96) Deployed, unknown if damaged
- (97) Not deployed
- (98) Unknown if deployed
- (99) Unknown

F-Was The Air Bag Tethered?

- (0) Not equipped/not available
- (1) No
- (2) Yes (specify number of tether straps): 1
- (3) Deployed, unknown if tethered
- (7) Not deployed
- (8) Unknown if deployed
- (9) Unknown

G-Did The Air Bag Have Vent Ports?

- (0) Not equipped/not available
- (1) No
- (2) Yes (specify number of vent ports): 4
- (3) Deployed, unknown if vent ports present
- (7) Not deployed
- (8) Unknown if deployed
- (9) Unknown

H-Was the Air Bag in this Occupant's Position Contacted by Another Occupant?

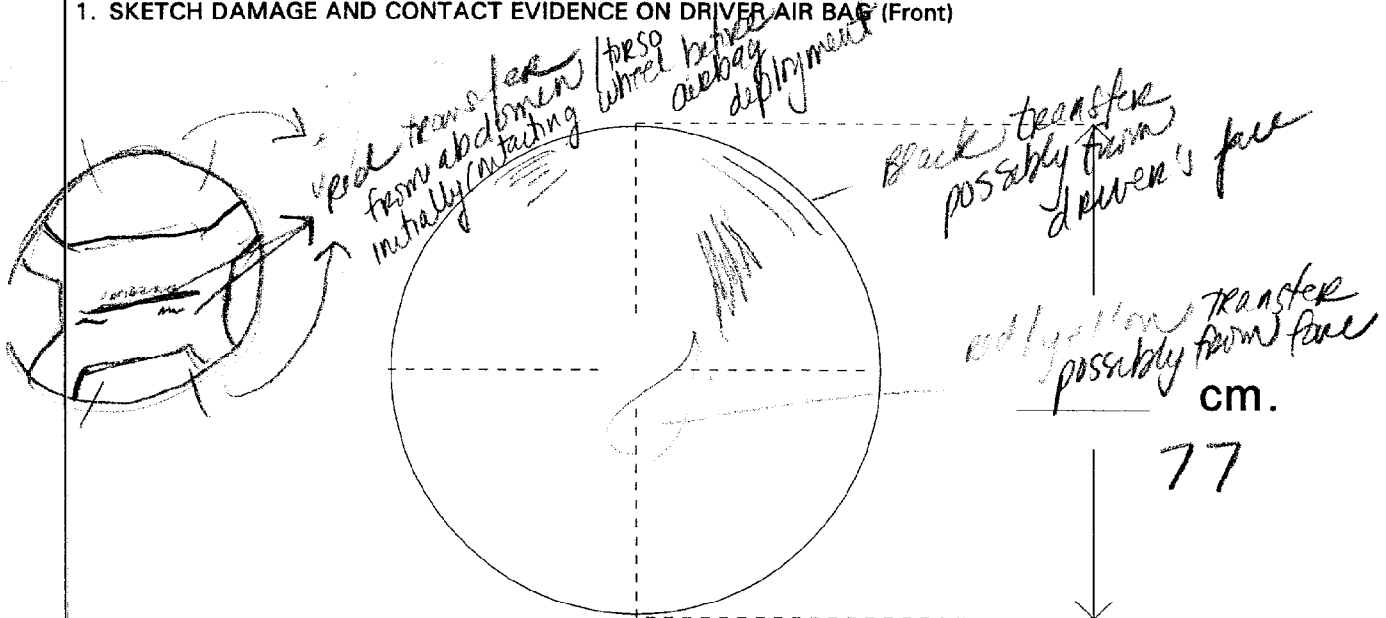
- (0) Not equipped/not available
- (1) No
- (2) Yes (specify):
- (3) Deployed, unknown if other occupant contact to air bag
- (7) Not deployed
- (8) Unknown if deployed
- (9) Unknown

I-Was This Occupant Wearing Eye-wear?

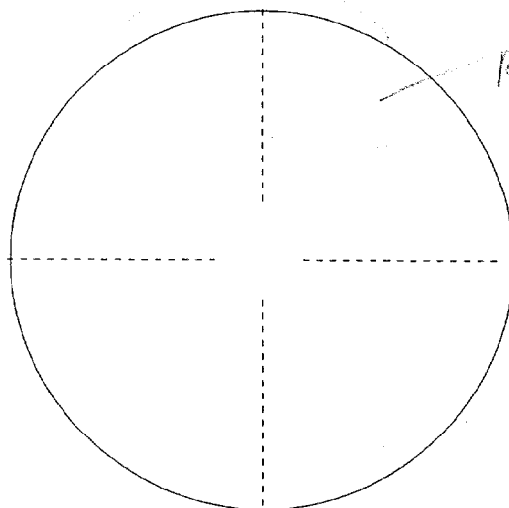
- (0) Not equipped/not available
- (1) No
- (2) Eyeglasses/sunglasses
- (3) Contact lenses
- (4) Deployed, unknown if eyewear worn
- (7) Not deployed
- (8) Unknown if deployed
- (9) Unknown

DRIVER AIR BAG DAMAGE AND CONTACT SKETCHES

1. SKETCH DAMAGE AND CONTACT EVIDENCE ON DRIVER AIR BAG (Front)



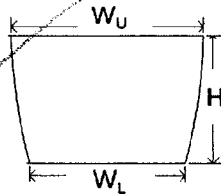
2. SKETCH DAMAGE AND CONTACT EVIDENCE ON DRIVER AIR BAG (Back)



DRIVER AIR BAG SKETCHES (Cont'd)

3. DRIVER AIR BAG MODULE COVER FLAP SIZE (SINGLE)

width (W_U) _____ width (W_L) _____
height (H) _____



4. DRIVER AIR BAG MODULE COVER FLAP SIZE (DOUBLE)

a. Upper Flap

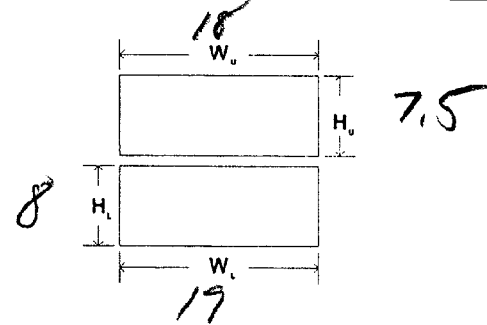
b. Lower Flap

width (W_U) 18

width (W_L) 19

height (H_U) 7.5

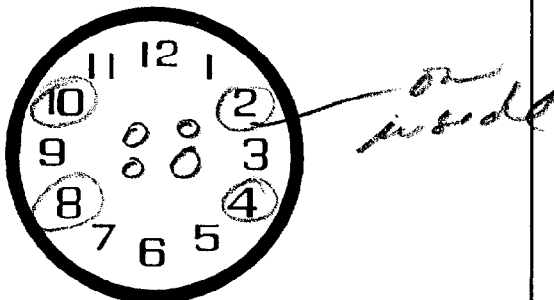
height (H_L) 8



5. SKETCH OF OTHER TYPE OF AIR BAG MODULE FLAP AND SIZE

6. SKETCH OF OTHER TYPE OF AIR BAG VENT PORTS

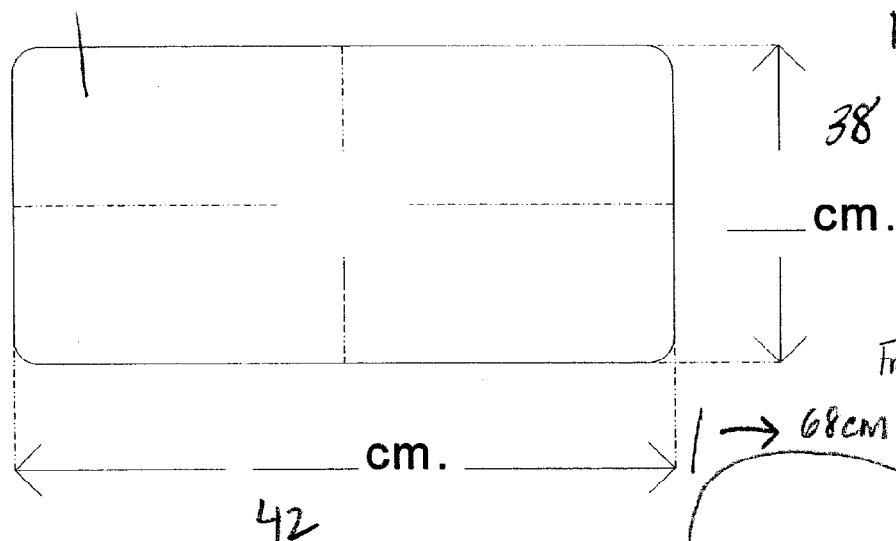
7. SKETCH LOCATION OF CIRCULAR AIR BAG VENT PORTS



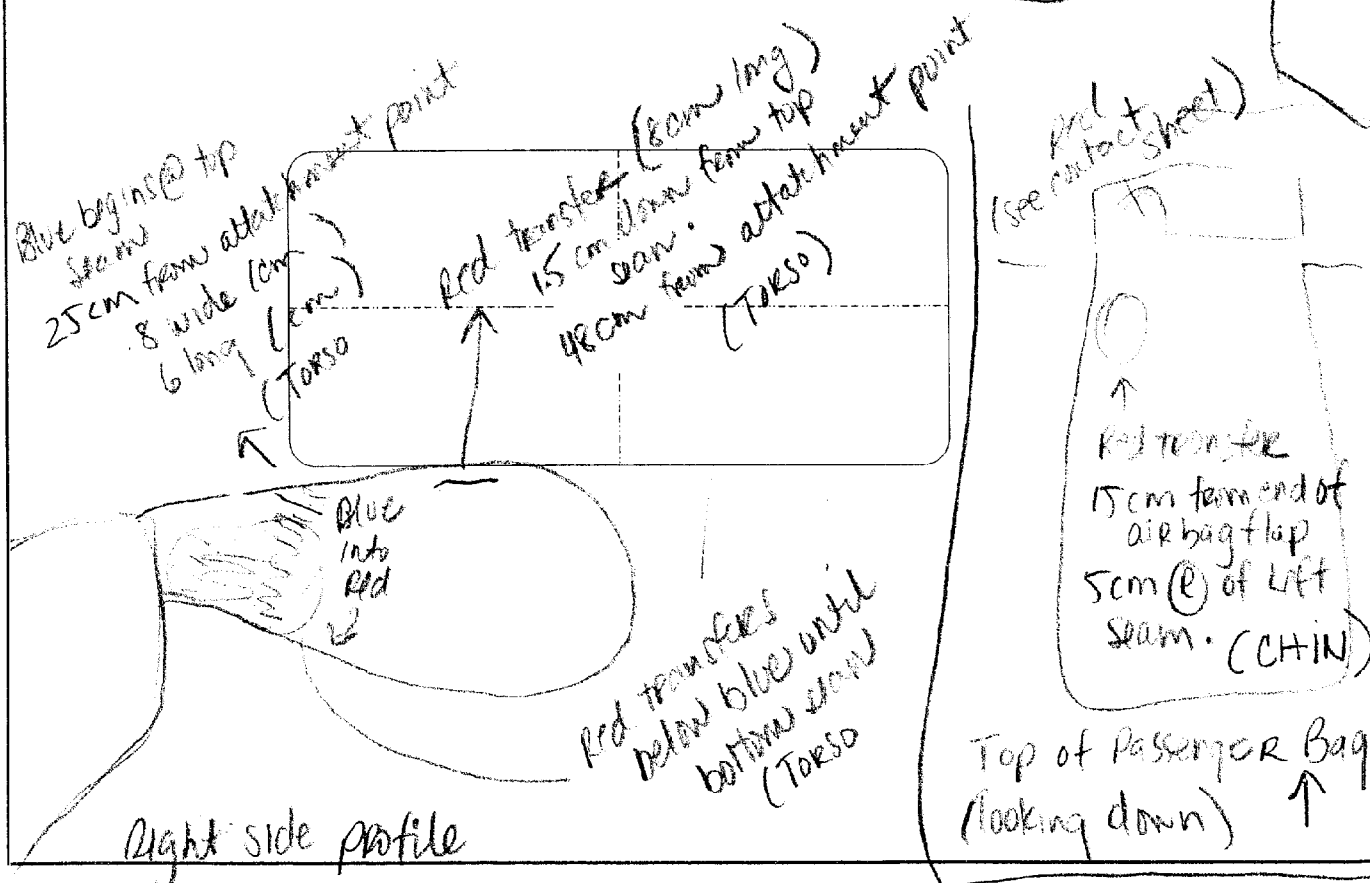
PASSENGER AIR BAG DAMAGE AND CONTACT SKETCHES

1. SKETCH DAMAGE AND CONTACT EVIDENCE ON PASSENGER AIR BAG (Front)

no transfers on face of bag.



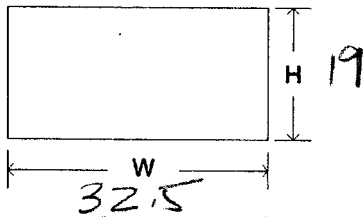
2. SKETCH DAMAGE AND CONTACT EVIDENCE ON PASSENGER AIR BAG (Back)



PASSENGER AIR BAG SKETCHES (Cont'd)

3. PASSENGER AIR BAG MODULE COVER FLAP SIZE (SINGLE)

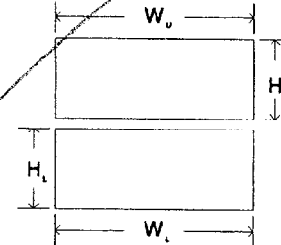
width (W) 32.5
height (H) 19



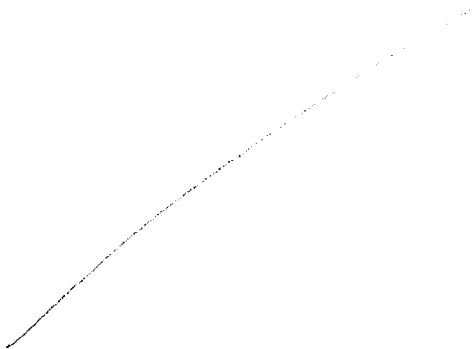
** located on top of instrument panel*

4. PASSENGER AIR BAG MODULE COVER FLAP SIZE (DOUBLE)

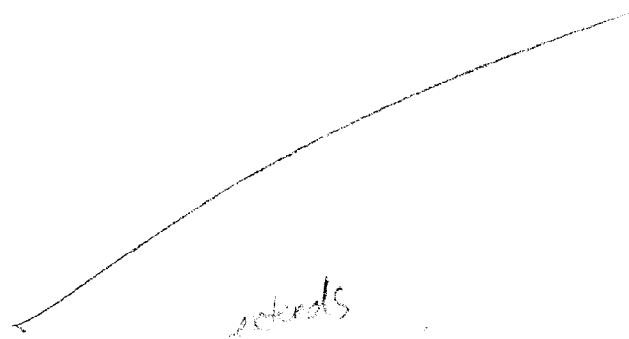
a. Upper Flap b. Lower Flap
width (W_U) _____ width (W_L) _____
height (H_U) _____ height (H_L) _____



5. SKETCH OF OTHER TYPE OF AIR BAG MODULE FLAP AND SIZE



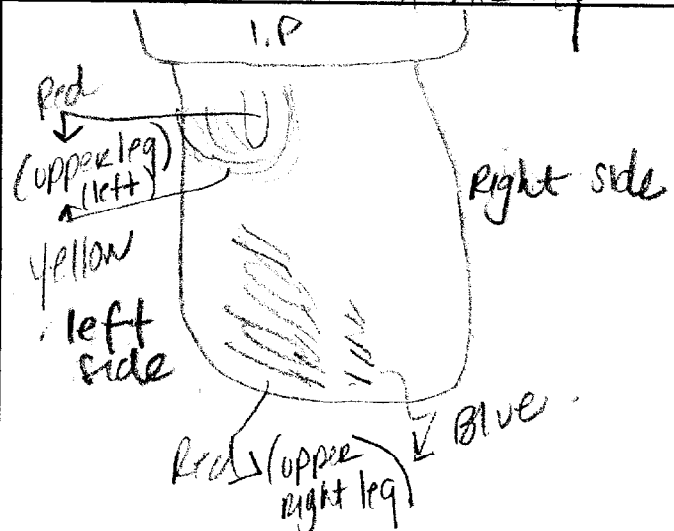
6. SKETCH OF OTHER TYPE OF AIR BAG VENT PORTS



7. SKETCH LOCATION OF RECTANGULAR AIR BAG VENT PORTS

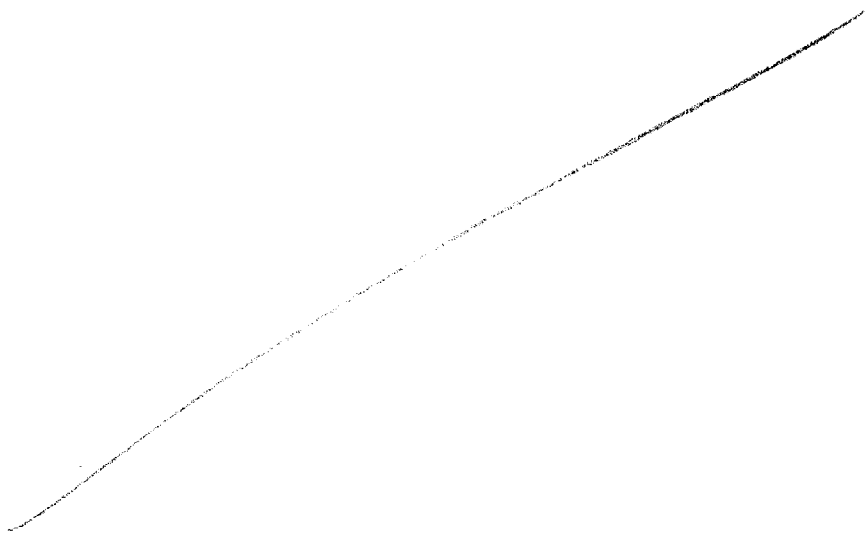
10	11	12	1	2
9				3
8	7	6	5	4

contacts to Bottom of Airbag:

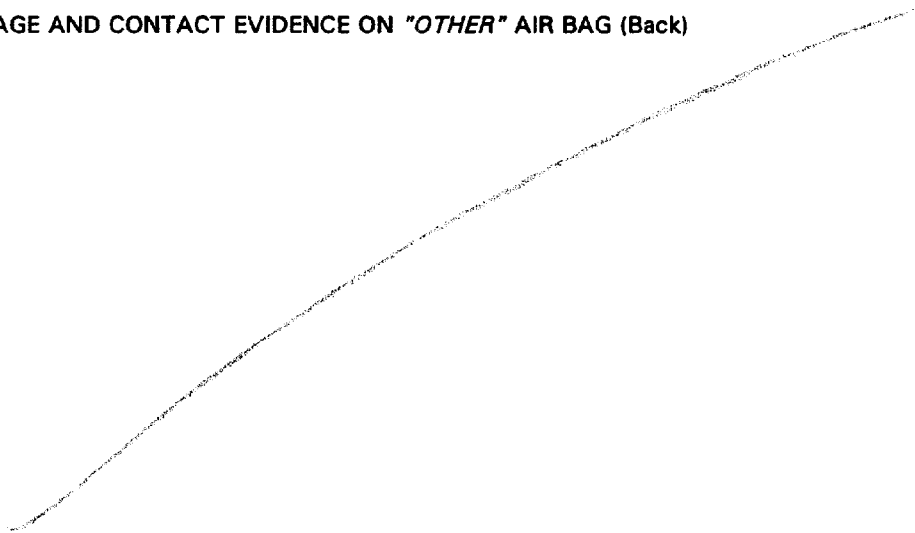


"OTHER" AIR BAG DAMAGE AND CONTACT SKETCHES

1. SKETCH DAMAGE AND CONTACT EVIDENCE ON "OTHER" AIR BAG (Front)

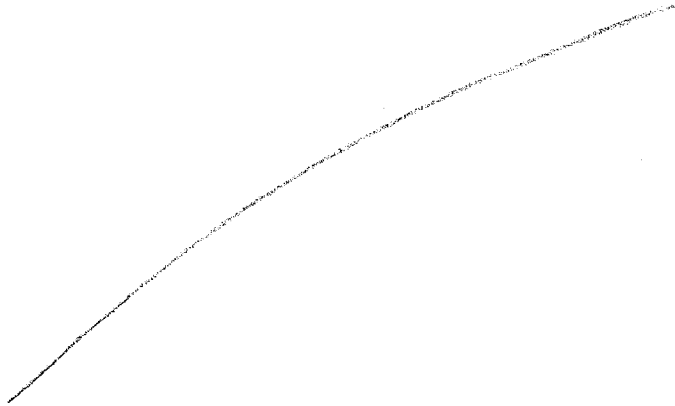


2. SKETCH DAMAGE AND CONTACT EVIDENCE ON "OTHER" AIR BAG (Back)

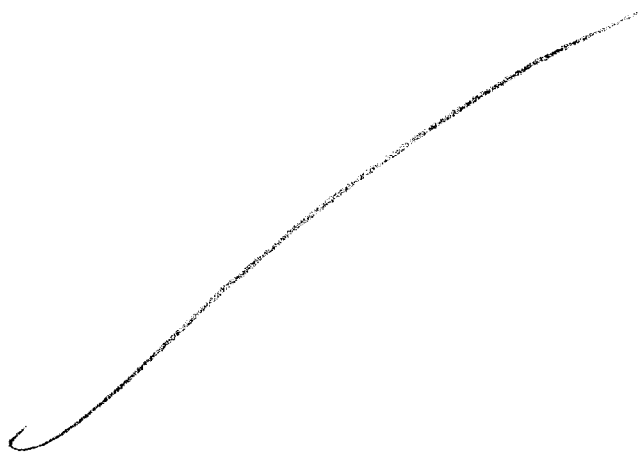


"OTHER" AIR BAG SKETCHES (Cont'd)

3. SKETCH AIR BAG MODULE FLAP AND SIZE OR OPENING FOR AIRBAG



4. SKETCH AIR BAG VENT PORTS



HEAD RESTRAINTS/SEAT EVALUATION

NOTES: Encode the applicable data for each seat position in the vehicle. The attribute for these variables may be found on the next page. Head restraint type/damage and seat type/performance should be assessed during the vehicle inspection then coded on the Occupant Assessment Form.

		Left	Center	Right
FIRST	A-Head Restraint Type/Damage	1		1
	B-Seat Type	01		01
	C-Seat Orientation	1		1
	D-Seat Track Position	2		4
	E-Seat Back Incline Pre/Post Impact	23		17
	F-Seat Performance	1		1
SECOND	A-Head Restraint Type/Damage			
	B-Seat Type			
	C-Seat Orientation	N/A	N/A	N/A
	D-Seat Track Position			
	E-Seat Back Incline Pre/Post Impact			
	F-Seat Performance	* occupants not seated		
THIRD	A-Head Restraint Type/Damage			
	B-Seat Type			
	C-Seat Orientation			
	D-Seat Track Position			
	E-Seat Back Incline Pre/Post Impact			
	F-Seat Performance			
OTHER	A-Head Restraint Type/Damage			
	B-Seat Type			
	C-Seat Orientation			
	D-Seat Track Position			
	E-Seat Back Incline Pre/Post Impact			
	F-Seat Performance			

**DESCRIBE ANY INDICATION OF ABNORMAL OCCUPANT POSTURE
(I.E., UNUSUAL OCCUPANT CONTACT PATTERN)**

HEAD RESTRAINTS/SEAT EVALUATION

A-Head Restraint Type/Damage by Occupant at This Occupant Position

- (0) No head restraints
- (1) Integral — no damage
- (2) Integral — damaged during accident
- (3) Adjustable — no damage
- (4) Adjustable — damaged during accident
- (5) Add-on — no damage
- (6) Add-on — damaged during accident
- (8) Other
Specify): _____
- (9) Unknown

B-Seat Type (this Occupant Position)

- (00) Occupant not seated or no seat
- (01) Bucket
- (02) Bucket with folding back
- (03) Bench
- (04) Bench with separate back cushions
- (05) Bench with folding back(s)
- (06) Split bench with separate back cushions
- (07) Split bench with folding back(s)
- (08) Pedestal (i.e., column supported)
- (09) Box mounted seat (i.e., van type)
- (10) Other seat type (specify): _____
- (99) Unknown

C-Seat Orientation (this Occupant Position)

- (0) Occupant not seated or no seat
- (1) Forward facing seat
- (2) Rear facing seat
- (3) Side facing seat (inward)
- (4) Side facing seat (outward)
- (8) Other (specify): _____
- (9) Unknown

D-Seat Track Adjusted Position Prior To Impact

- (0) Occupant not seated or no seat
- (1) Non-adjustable seat track

Adjustable Seat Track

- (2) Seat at forward most track position
- (3) Seat between forward most and middle track positions
- (4) Seat at middle track position
- (5) Seat between middle and rear most track positions
- (6) Seat at rear most track position
- (9) Unknown

E-Seat Back Incline Prior and Post Impact

- (00) Occupant not seated or no seat
- (01) Not adjustable

Upright prior to impact

- (11) Moved to completely rearward position
- (12) Moved to rearward midrange position
- (13) Moved to slightly rearward position
- (14) Retained pre-impact position
- (15) Moved to slightly forward position
- (16) Moved to forward midrange position
- (17) Moved to completely forward position

Slightly reclined prior to impact

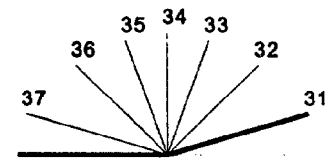
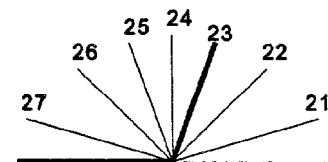
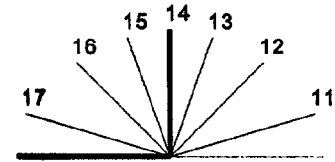
- (21) Moved to completely rearward position
- (22) Moved to rearward midrange position
- (23) Retained pre-impact position
- (24) Moved to upright position
- (25) Moved to slightly forward position
- (26) Moved to forward midrange position
- (27) Moved to completely forward position

Completely reclined prior to impact

- (31) Retained pre-impact position
- (32) Moved to rearward midrange position
- (33) Moved to slightly rearward position
- (34) Moved to upright position
- (35) Moved to slightly forward position
- (36) Moved to forward midrange position
- (37) Moved to completely forward position
- (99) Unknown

F-Seat Performance (this Occupant Position)

- (0) Occupant not seated or no seat
- (1) No seat performance failure(s)
- (2) Seat adjusters failed
- (3) Seat back folding locks or "seat back" failed (specify): _____
- (4) Seat tracks/anchors failed
- (5) Deformed by impact of occupant
- (6) Deformed by passenger compartment intrusion (specify): _____
- (7) Combination of above (specify): _____
- (8) Other (specify): _____
- (9) Unknown

Coding diagrams for *Seat Back Incline Position Prior and Post Impact*

DESCRIBE ANY INDICATION OF
ABNORMAL OCCUPANT POSTURE
(I.E., UNUSUAL OCCUPANT
CONTACT PATTERN)

CHILD SAFETY SEAT FIELD ASSESSMENT

When a child safety seat is present enter the occupant's number in the first row and complete the column below the occupant's number using the codes listed below. Complete a column for each child safety seat present.

Occupant Number						
1. Type of Child Safety Seat						
2. Child Safety Seat Orientation						
3. Child Safety Seat Harness Usage						
4. Child Safety Seat Shield Usage						
5. Child Safety Seat Tether Usage						
6. Child Safety Seat Make/Model	Specify Below for Each Child Safety Seat					

1. Type of Child Safety Seat

- (0) No child safety seat
- (1) Infant seat
- (2) Toddler seat
- (3) Convertible seat
- (4) Booster seat
- (7) Other type child safety seat (specify): _____
- (8) Unknown child safety seat type
- (9) Unknown if child safety seat used

2. Child Safety Seat Orientation

- (00) No child safety seat
- Designed for Rear Facing for This Age/Weight
- (01) Rear facing
- (02) Forward facing
- (08) Other orientation (specify): _____
- (09) Unknown orientation
- Designed for Forward Facing for This Age/Weight
- (11) Rear facing
- (12) Forward facing
- (18) Other orientation (specify): _____
- (19) Unknown orientation
- Unknown Design or Orientation For This Age/Weight, or Unknown Age/Weight
- (21) Rear facing
- (22) Forward facing
- (28) Other orientation (specify): _____
- (29) Unknown orientation
- (99) Unknown if child safety seat used

3. Child Safety Seat Harness Usage

4. Child Safety Seat Shield Usage

5. Child Safety Seat Tether Usage

Note: Options Below Are Used for Variables 3-5.

(00) No child safety seat

Not Designed with Harness/Shield/Tether

- (01) After market harness/shield/tether added, not used
- (02) After market harness/shield/tether used
- (03) Child safety seat used, but no after market harness/shield/tether added
- (09) Unknown if harness/shield/tether added or used

Designed With Harness/Shield/Tether

- (11) Harness/shield/tether not used
- (12) Harness/shield/tether used
- (19) Unknown if harness/shield/tether used

Unknown If Designed With Harness/Shield/Tether

- (21) Harness/shield/tether not used
- (22) Harness/shield/tether used
- (29) Unknown if harness/shield/tether used

(99) Unknown if child safety seat used

6. Child Safety Seat Make/Model

(Specify make/model and occupant number)

EJECTION/ENTRAPMENT DATA

Complete the following if the researcher has any indication that an occupant was either ejected from or entrapped in the vehicle. Code the appropriate data on the Occupant Assessment Form.

EJECTION No ☒ Yes ☐

Describe indications of ejection and body parts involved in partial ejection(s):

Occupant Number						
Ejection						
(Note on Vehicle Interior Sketch) Ejection Area						
Ejection Medium						
Medium Status						

Ejection

- (1) Complete ejection
(2) Partial ejection
(3) Ejection, Unknown degree
(9) Unknown

Ejection Area

- (1) Windshield
(2) Left front
(3) Right front
(4) Left rear
(5) Right rear
(6) Rear

(7) Roof

- (8) Other area (e.g., back of pickup, etc.) (specify):

- (9) Unknown

Ejection Medium

- (1) Door/hatch/tailgate
(2) Nonfixed roof structure
(3) Fixed glazing
(4) Nonfixed glazing (specify):

(5) Integral structure

- (8) Other medium (specify):

- (9) Unknown

Medium Status (Immediately Prior to Impact)

- (1) Open
(2) Closed
(3) Integral structure
(9) Unknown

ENTRAPMENT No ☒ Yes ☐

Describe entrapment mechanism: _____

Component(s): _____

(Note on vehicle interior sketch)



INTERIOR VEHICLE LOG

TO BE COMPLETED BY TEAM	
1. PSU Number	_____
2. Case Number—Stratum	_____
3. Researcher Completing Form	_____
4. Vehicle Number	_____
5. Number of Interior Vehicle Slides	_____

TO BE COMPLETED BY ZONE CENTER	
6. Documentation Of Integrity	_____
7. Documentation Of Glazing	_____
8. Documentation of Intrusions	_____
9. Documentation of Steering Column/Wheel	_____
10. Documentation of Occupant Contacts	_____
11. Documentation of Seat Belt Type/Availability/Usage	_____
12. Documentation of Air Bag Type/Availability/Deployment	_____
13. Documentation of Seats	_____
14. Documentation of Ejection/Entrapment	_____
15. Interior Slides Subject Quality	_____
16. Interior Slides Quality	_____
 Codes For Log Variables 6-16 (0) Not applicable (1) Substandard - beyond researcher control (2) Substandard (3) Standard	
17. Number of Coded Intrusions	_____

DATA STATUS OF VARIABLE NUMBERS 4-97															
Integrity															
4	5	6	7	8	9	10	11	12	13	14					
Glazing															
15	16	17	18	19	20	21	22	23	24	25					
26	27	28	29	30	31	32	33	34	35	36					
37	38	39	40	41	42	43	44	45	46						
Intrusion															
47	48	49	50	51	52	53	54	55	56	57					
58	59	60	61	62	63	64	65	66	67	68					
69	70	71	72	73	74	75	76	77	78	79					
80	81	82	83	84	85	86									
Steering Column/Wheel and Instrument Panel															
87	88	89	90	91	92	93	94	95	96	97					
Data Status Codes:															
(Blank) Correct															
(1) Derived error															
(2) Non-correctable error															
(3) Correctable error															
(4) Change—no error															
(5) Sequencing error															
(7) Incorrect edit override															
(8) MDE error															
(9) Unknown coded															

ACCIDENT RESEARCH DIVISION DATA

1986 VOLKSWAGEN GOLF 4-DOOR HATCH BACK

EXTERIOR VEHICLE FORM

**NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM**

1. Primary Sampling Unit Number	_____	3. Vehicle Number	_____
2. Case Number - Stratum	_____	NASS SSC Calpan case No 93-07	

VEHICLE IDENTIFICATION

VIN 1VWF A01 70G V05 66 94 Model Year 86
Vehicle Make (specify): Volkswagen Vehicle Model (specify): Bif

LOCATOR

Locate the end of the damage with respect to the vehicle's damaged center point or bumper corner for end impacts or an undamaged axle for side impacts.

Specific Impact No.	Location of Direct Damage	Location of Field L	Location of Max Crush
1	RR bumper area → extends left 70 cm.	entire rear bumper	C6

CRUSH PROFILE IN CENTIMETERS

NOTES: Identify the plane at which the C-measurements are taken (e.g., at bumper, above bumper, at sill, above sill, etc.) and label adjustments (e.g., free space).

Measure C1 to C6 from driver to passenger side in front or rear impacts and rear to front in side impacts.

Free space value is defined as the distance between the baseline and the original body contour taken at the individual C locations. This may include the following: bumper lead, bumper taper, side protrusion, side taper, etc. Record the value for each C-measurement and maximum crush.

Use as many lines/columns as necessary to describe each damage profile.

[illegible]

ORIGINAL SPECIFICATIONS WORK SHEET

Wheelbase	<u>97.3</u>	inches	x 2.54	=	<u>247</u> cm
Overall Length	<u>183.5</u>	inches	x 2.54	=	<u>401</u> cm
Maximum Width	<u>65.5</u>	inches	x 2.54	=	<u>166</u> cm
Curb Weight	<u>2,324</u>	pounds	x .4536	=	<u>1,054</u> kg
Average Track	<u>56.2</u>	inches	x 2.54	=	<u>143</u> cm
Front Overhang	_____	inches	x 2.54	=	_____ cm
Rear Overhang	_____	inches	x 2.54	=	_____ cm
Undeformed End Width	<u>59.8</u>	inches	x 2.54	=	<u>152</u> cm
Engine Size: cyl./displ.	_____	cc	x .001	=	_____ L
	_____	CID	x .0164	=	_____ L

VEHICLE DAMAGE SKETCH

TIRE—WHEEL DAMAGE

- a. Rotation physically restricted b. Tire deflated

RF 2 RF 2
 LF 2 LF 2
 RR 1 RR 2
 LR 2 LR 2

(1) Yes (2) No (8) NA (9) Unk.

TYPE OF TRANSMISSION

☒ Manual ☐ Automatic

END SHIFT ≥ 10 CM

☐ Yes ☒ No

ORIGINAL SPECIFICATIONS

Wheelbase 247 cm
 Overall Length 401 cm
 Maximum Width 166 cm
 Curb Weight 1054 kg
 Average Track 143 cm
 Front Overhang 83 cm
 Rear Overhang 71 cm
 Undeformed End Width B=152 cm
 Engine Size: cyl./displ. 4/1.8 L

WHEEL STEER ANGLES
(For locked front wheels or displaced rear axles only)

RF ± _____ °

LF ± _____ °

RR ± _____ °

LR ± _____ °

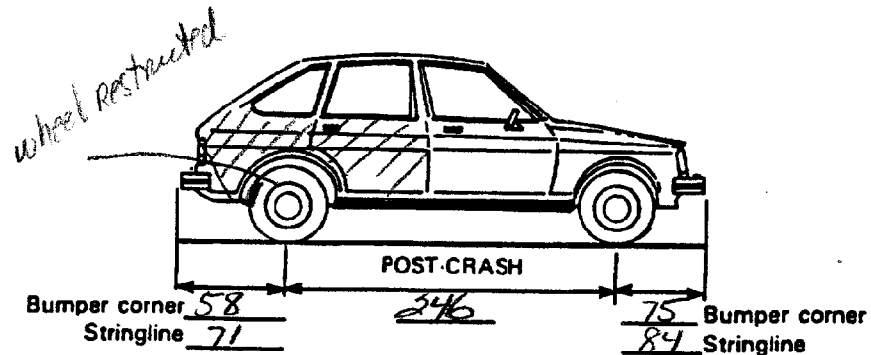
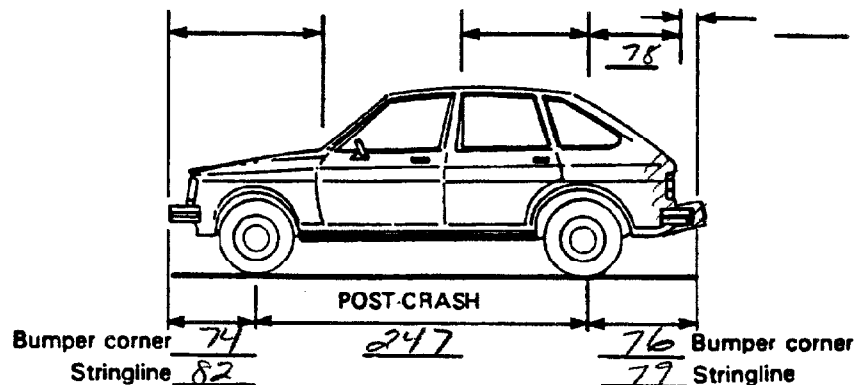
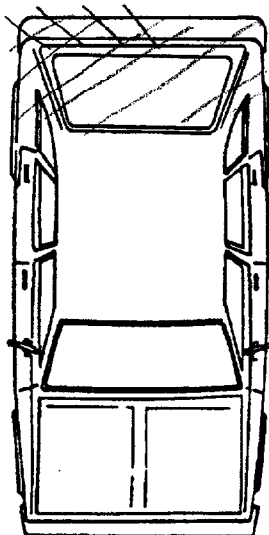
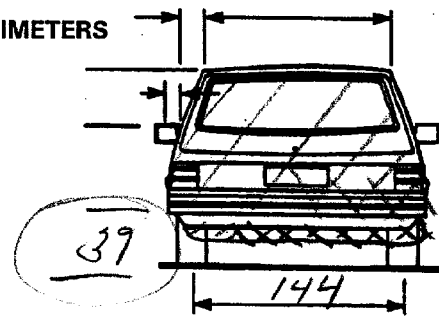
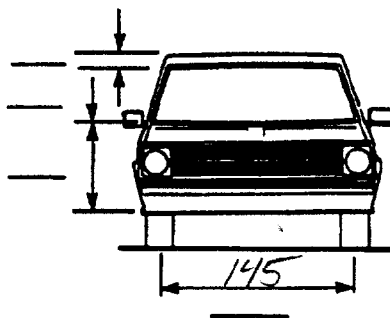
Within ± 5 degrees

DRIVE WHEELS

☒ FWD ☐ RWD ☐ 4WD

Approximate Cargo Weight 0 kg

MEASUREMENTS IN CENTIMETERS



NOTES: Sketch new perimeter and cross hatch direct damage and single hatch induced damage on all views. Annotate observations which might be useful in reconstructing the accident (e.g., grass in tire bead, direction of striations, scuff on sidewalls, etc.). If pulling trailer, sketch type of trailer and damage received on the back of this page.

Annotate any damage caused by extrication such as component removal by torching, prying, or hydraulic shears.

CODES FOR OBJECT CONTACTED

(75)	Vehicle occupant
(76)	Animal
(77)	Train
(78)	Trailer, disconnected in transport
(79)	Object fell from vehicle in-transport
(88)	Other nonfixed object (specify):
(89)	Unknown nonfixed object
(98)	Other event (specify):
(99)	Unknown event or object

[illegible]

COLLISION DEFORMATION CLASSIFICATION

HIGHEST DELTA "V"

Accident Event Sequence Number	Object Contacted	(1) (2) Direction of Force	(3) Deformation Location	(4) Longitudinal or Lateral Location	(5) Vertical or Lateral Location	(6) Type of Damage Distribution	(7) Deformation Extent
4. <u>01</u>	5. <u>01</u>	6. <u>06</u>	7. <u>B</u>	8. <u>Z</u>	9. <u>E</u>	10. <u>W</u>	11. <u>01</u>

Second Highest Delta "V"

12. _____	13. _____	14. _____	15. _____	16. _____	17. _____	18. _____	19. _____
-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------

CRUSH PROFILE IN CENTIMETERS

The crush profile for the damage described in the CDC(s) above should be documented in the appropriate space below. (ALL MEASUREMENTS ARE IN CENTIMETERS.)

HIGHEST DELTA "V"

20. L	21. C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	22. ± D
<u>152</u>	<u>000</u>	<u>002</u>	<u>003</u>	<u>005</u>	<u>006</u>	<u>007</u>	<u>044</u>

Second Highest Delta "V"

23. L	24. C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	25. ± D
_____	_____	_____	_____	_____	_____	_____	_____

26. Undeformed End Width
(Coded when highest severity impact is an end plane impact.)
_____ Code to the nearest centimeter
(250) 250 centimeters or more
(998) No highest severity end plane impact
(999) Unknown

27. Direct Damage Width
(For highest severity impact)
_____ Code to the nearest centimeter
(250) 250 centimeters or more
(999) Unknown

28. Original Wheelbase
_____ Code to the nearest centimeter
(650) 650 centimeters or more
(999) Unknown
77.3 inches X 2.54 = 247 centimeters

29. Original Average Track Width
_____ Code to the nearest centimeter
(185) 185 centimeters or more
(999) Unknown
56.2 inches X 2.54 = 143 centimeters

FUEL SYSTEM

30. Are CDCs Documented but Not Coded on The Automated File? 0
 (0) No
 (1) Yes

31. Researcher's Assessment of Vehicle Disposition 0
 (0) Not towed due to vehicle damage
 (1) Towed due to vehicle damage
 (9) Unknown

32. Is This A Multi-Stage Manufactured Vehicle And/Or A Certified Altered Vehicle? 0
 (0) No post manufacturer modifications
 (1) Yes - post manufacturer modifications (specify): _____

(Include photograph of CERTIFICATION PLACARD in case report)

(9) Unknown if vehicle is modified

FIRE OCCURRENCE

33. Fire Occurrence 0
 (0) No fire

 Yes, fire occurred
 (1) Minor
 (2) Major
 (9) Unknown

34. Origin of Fire 0
 (0) No fire
 (1) Vehicle exterior (front, side, back, top)
 (2) Exhaust system
 (3) Fuel tank (and other fuel retention system parts)
 (4) Engine compartment
 (5) Cargo/trunk compartment
 (6) Instrument panel
 (7) Passenger compartment area
 (8) Other location (specify): _____
 (9) Unknown

35. Location of Fuel Tank-1 Filler Cap 3

36. Location of Fuel Tank-2 Filler Cap 0
 (0) No fuel tank
 (1) On back plane
 (2) Aft of center of the rear wheels (rear axle) on left side plane
 (3) Aft of center of the rear wheels (rear axle) on right side plane
 (4) Forward of center of the rear wheels (rear axle) on left side plane
 (5) Forward of center of the rear wheels (rear axle) on right side plane
 (6) Over the center of the rear wheels (rear axle) on left side plane
 (7) Over the center of the rear wheels (rear axle) on right side plane
 (8) Other (specify): _____
 (9) Unknown

37. Type of Fuel Tank-1 1

38. Type of Fuel Tank-2 0
 (0) No fuel tank (electrical vehicle)
 (1) Metallic
 (2) Non-metallic
 (9) Unknown

39. Location of Fuel Tank-1 1

40. Location of Fuel Tank-2 0
 (0) No fuel tank
 (1) Aft of center of the rear wheels (rear axle) centered
 (2) Aft of center of the rear wheels (rear axle) left side
 (3) Aft of center of the rear wheels (rear axle) right side
 (4) Forward of center of the rear wheels (rear axle) centered
 (5) Forward of center of the rear wheels (rear axle) left side
 (6) Forward of center of the rear wheels (rear axle) right side
 (7) Over center of the rear wheels (rear axle)
 (8) Other (specify): _____
 (9) Unknown

41. Damage to Fuel Tank-1 1

42. Damage to Fuel Tank-2 0
 (0) No fuel tank
 (1) No damage to fuel tank
 (2) Deformed, no seam failure
 (3) Deformed, with a seam failure
 (4) Punctured
 (5) Lacerated (ripped)
 (6) Abraded (scraped)
 (7) Filler neck separation from the fuel tank
 (8) Other damage (specify): _____
 (9) Unknown

43. Leakage Location of Fuel System-1 144. Leakage Location of Fuel System-2 0

- (0) No fuel tank
(1) No fuel leakage

Primary Area Of Leakage

- (2) Tank
(3) Filler neck
(4) Cap
(5) Lines/pump/filter
(6) Vent/emission recovery
(8) Other (specify): _____
(9) Unknown

45. Fuel Type-1 0246. Fuel Type-2 00*Single Fuel Type*

- (00) No fuel tank
(01) Gasoline
(02) Diesel
(03) CNG (Compressed Natural Gas)
(04) LPG (Liquid Petroleum Gas) also known as Propane
(05) LNG (Liquid Natural Gas)
(06) Methanol (M100 or M85)
(07) Ethanol (E100 or E85)
(08) Other (Hydrogen or others) (specify): _____

Electric Powered or Electric/Solar Powered Vehicles

- (10) Lead Acid Battery
(11) Nickel-Iron Battery
(12) Nickel-Cadmium Battery
(13) Sodium Metal Chloride Battery
(14) Sodium Sulfur Battery
(18) Other (Specify): _____

(98) Other Hybrid (specify): _____

(99) Unknown fuel type

47. Is This Vehicle Equipped With More Than Two Fuel Tanks? 0

(0) No (one or two tanks only)

Yes - More Than Two Tanks

- (1) Yes -- no damage to any tank or filler cap and no fuel system leakage
(2) Yes -- no damage to any tank or filler cap but there is fuel system leakage (specify leakage location): _____
(3) Yes -- damage to an additional tank or filler cap and there is fuel system leakage (specify the following):
Type of tank _____
Tank location _____
Filler cap location _____
Tank damage _____
Location of leakage _____
Type of fuel _____
(9) Unknown if more than two tanks

COMMENTS

*** STOP: IF THE CDS APPLICABLE VEHICLE WAS NOT TOWED ***

(GV10=0)

DO NOT COMPLETE THE INTERIOR VEHICLE FORM.



EXTERIOR VEHICLE LOG

TO BE COMPLETED BY TEAM

1. PSU Number _____
2. Case Number—Stratum _____
3. Researcher Completing Form _____
4. Vehicle Number _____
5. Date Vehicle Inspected ____/____/____
6. Number of Exterior Vehicle Slides _____

TO BE COMPLETED BY ZONE CENTER

7. Applicable Precrash Measurements _____
(0) Not applicable
(1) Substandard - beyond researcher control
(2) Substandard
(3) Standard
8. Reference Line Placement _____
(0) Not applicable (e.g. rollover)
(1) Substandard - beyond researcher control
(2) Substandard
(3) Standard
9. Impact Damage Documentation _____
(0) Not applicable
(1) Substandard - beyond researcher control
(2) Substandard
(3) Standard
10. Quality Of Vehicle Damage Sketch _____
(0) Not applicable (e.g., repaired vehicle)
(1) Substandard - beyond researcher control
(2) Substandard
(3) Standard
11. Exterior Slides Subject Quality _____
(0) Not applicable
(1) Substandard - beyond researcher control
(2) Substandard
(3) Standard
12. Exterior Slides Quality _____
(0) Not applicable
(1) Substandard - beyond researcher control
(2) Substandard
(3) Standard
13. Primary Error Source (Vehicle Plane) _____
(0) No error
(1) Front
(2) Side (left or right)
(3) Back (rear)
(4) Top
(5) Undercarriage
(8) Other (specify): _____

14. Number of Coded CDCs (0,1,2) _____

15. Number of Coded Crush Profiles (0,1,2) _____

DATA STATUS OF VARIABLE NUMBERS 4-47

Highest CDC

4 5 6 7 8 9 10 11

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Secondary CDC

12 13 14 15 16 17 18 19

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Highest Crush Profile

20 21 22

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Secondary Crush Profile

23 24 25

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26 27 28 29 30 31 32 33 34 35 36

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37 38 39 40 41 42 43 44 45 46 47

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Data Status Codes:

- (Blank) Correct
(1) Derived error
(2) Non-correctable error
(3) Correctable error
(4) Change—no error
(5) Sequencing error
(7) Incorrect edit override
(8) MDE error
(9) Unknown coded

IF THIS VEHICLE WAS NOT TOWED (I.E., GV09 ≠ 1), DO NOT COMPLETE THE
INTERIOR VEHICLE LOG