

#2144

CALSPAN REPORT NUMBER: 8118-9

**VEHICLE-TO-VEHICLE FRONTAL 30° ANGLED
60% OVERLAPPED 66.4 kph IMPACT OF A
1994 CHEVROLET CORSICA 4-DOOR SEDAN AND
A MOVING DEFORMABLE BARRIER**

CALSPAN TEST NUMBER: Y49-9-1454

September 19, 1994

CALSPAN CORPORATION
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FINAL REPORT

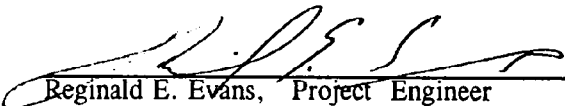
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16. Abstract A 66.4 kph vehicle to vehicle 30° angled 60% overlapped frontal impact test of a 1994 Chevrolet Corsica 4-Door Sedan and a Moving Deformable Honeycomb Barrier (MDB) was performed at the Calspan Advanced Technology Center crash facility in Buffalo, New York on September 19, 1994. The measured velocities of both vehiclees were 66.4 kph and the ambient temperature at time of test was 21.7°C. The 1994 Chevrolet Corsica contained a 50th percentile male Hybrid III Anthropomorphic Test Device (ATD) in the driver and right front passenger seating positions. Both dummies were restrained with the vehicle airbag and 3 point belt restraint systems. The driver ATD experienced a Head Injury Criterior (HIC) of 1578.47 g's, the driver left femur load was 11,024.5 newtons and the right femur load was 16,276.7 newtons. Both driver HIC and femur loads exceed the standard FMVSS 208 criterion. The HIC maximum being 1000 g's and femur loads maximum being 10,008 newtons (2,250 lbs). The right front passenger's 3 millisecond clipped chest resultant was 71.460 g's. The FMVSS 208 criterion requires a maximum of 60 g's. All other HIC, chest and femur loads were below the injury requirements of FMVSS 208 "occupant crash protection".			
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Section 1

PURPOSE AND TEST PROCEDURE

This 66.4 kph 30° angled 60% overlapped frontal vehicle-to-vehicle impact test is part of the Crashworthiness Testing and Analysis Program sponsored by the Research and Special Programs Administration under Contract No. DTRS-57-90-C-00104. The purpose of this Technical Task Directive (TTD 7) is to obtain responses from vehicles and restrained Hybrid III dummies during car-to-car overlapped frontal crashes.

This test was performed using a 1994 Chevrolet Corsica 4-Door Sedan and a Moving Deformable Honeycomb Barrier (MDB). Both vehicles were traveling at 66.4 kph and impacted at a 30 degree angle measured counter clockwise from the vehicle 1 centerline. Vehicle 2 was positioned with its left side tangent to a line measured 15 degrees counter clockwise from the vehicle 1 60% overlapped width line. The impact point was designated by a measurement to the right of vehicle 1 centerline approximately 60% of vehicle 1 maximum width dimension.

Vehicle number 1, a 1994 Chevrolet Corsica 4-Door Sedan, contained two Hybrid III 50th percentile male Anthropomorphic Test Devices (ATDs), in the front, driver and passenger seating positions. The driver ATD was restrained using the vehicle's driver side airbag and 3 point manual belt system. The passenger ATD was restrained using a 3 point manual belt system only. This vehicle was not equipped with a passenger side air bag restraint system.

The honeycomb barrier used on vehicle 2 was the DSL-1285 barrier used for FMVSS 214D side impact testing. The rear of the barrier face was instrumented with load cells.

Section 2

SUMMARY OF TEST

Two vehicles, both moving forward at 66.4 kph, were impacted with a 60% overlap with a 30° approach angle. Vehicle 1 was a 1994 Chevrolet Corsica 4-Door Sedan and Vehicle 2 was Moving Deformable Honeycomb Barrier. The test was performed at the Calspan Corporation Advanced Technology Center Crash Test Facility on September 19, 1994.

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

The nominal vehicle impact points were determined as outlined in the following section and shown in Figure 1. The vehicles struck 1 inch off target such that slightly less overlap occurred.

Two Hybrid III 50th percentile Anthropomorphic Test Devices (ATDs) were placed in the driver and right front passenger seating position of vehicle 1, a 1994 Chevrolet Corsica 4-door sedan. The ATDs were positioned according to the dummy placement instructions from the FMVSS 208 "Occupant Crash Protection" Test Procedure. The driver ATD was restrained using the vehicle's driver side airbag and a 3 point manual belt system. The passenger ATD was restrained using a manual 3 point belt restraint system only.

The ATDs were instrumented with head and chest three axis accelerometer packages; chest displacement potentiometer; upper neck force and moment transducers; femur axial force load cells and upper and lower tibia force and moment transducer packages. The driver ATD contained additional chest compression displacement potentiometer arrays. The driver shoulder belt forces were also recorded.

The 110 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.

Section 2

SUMMARY OF TEST (continued)

The 1994 Chevrolet Corsica (Vehicle 1) driver HIC was 1578.47 and the driver ATD's head contacted the vehicle air bag, "A" pillar and "B" pillar. The maximum chest acceleration over a three millisecond period was 54.165 g's. The left femur maximum axial compressive force was -11024.5 newtons and the right femur maximum axial compressive force was -16276.7 newtons.

The passenger HIC was 622.64, the ATD's head contacted the vehicle right sunvisor and roof rail. The maximum chest acceleration over a three millisecond period was 71.460 g's. The left femur maximum axial compressive force was -3972.5 newtons and the right femur maximum axial compressive force was -6004.5 newtons.

Structural damage to the 1994 Chevrolet Corsica (Vehicle 1) consisted of severe deformation to vehicle left front, left roof-rail, severe intrusion to dash-instrument panel, left front door beam intrusion through door outer skin and considerable tearing to right and lower center of the windshield.

TEST ANOMALIES

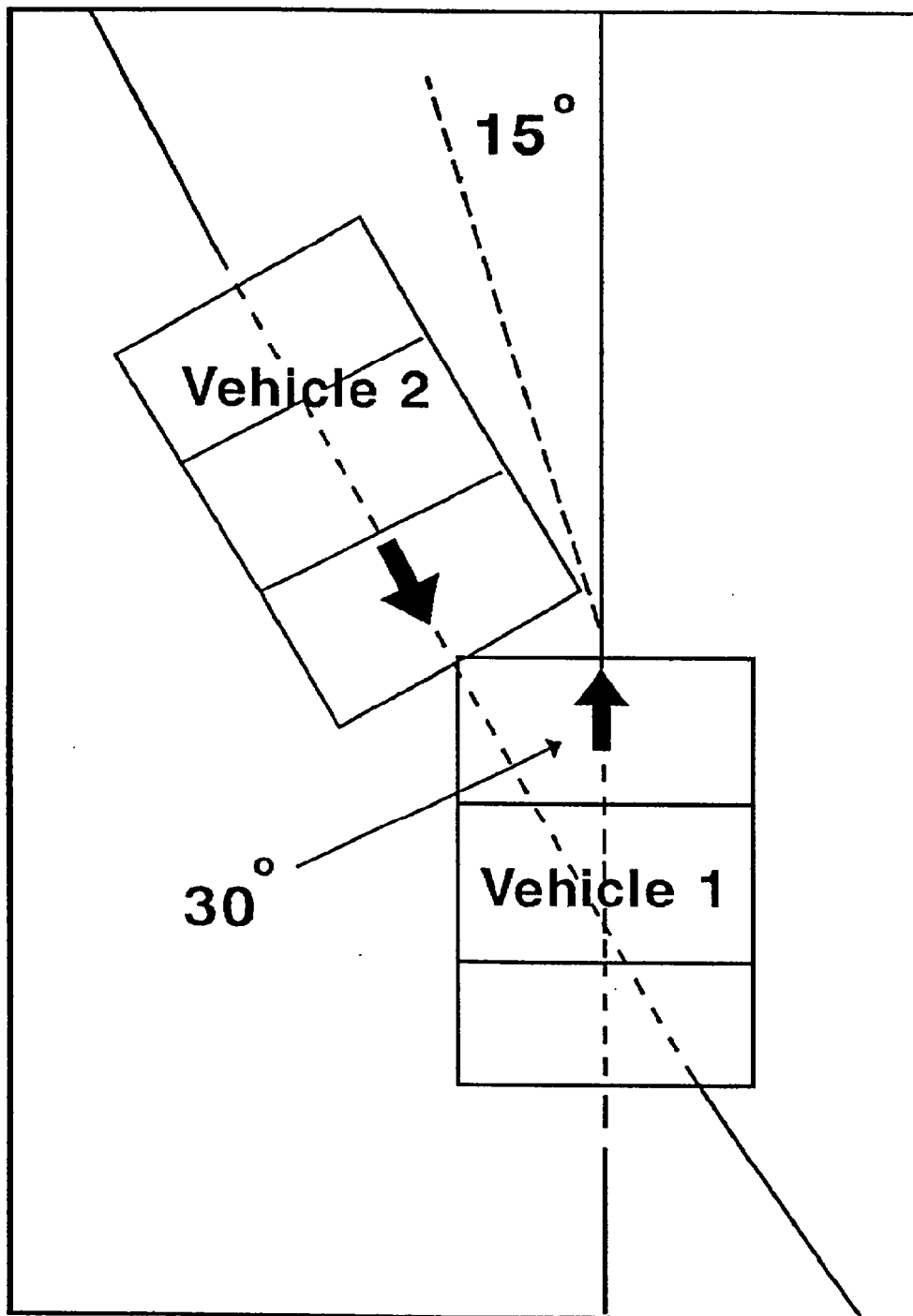
Appendix B contains lists of all data channels. Where an anomaly occurred, the channel is identified by an asterix and commented below.

Section 3

VEHICLE AND OCCUPANT INFORMATION

Figure 1

VEHICLE-TO-VEHICLE ANGLED FRONTAL IMPACT LAYOUT



VEHICLE ONE DATA

Table 1

GENERAL TEST AND VEHICLE 1 PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1994 Chevrolet Corsica 4-Door Sedan

NHTSA Test No.: - VIN.: 1G1LD5540RY279080

Body Color: White Date of Manufacture: June, 1994

Engine: 4 Cylinders; - C.I.D.; 2.2 Liters; 2200CC

X Gas; - Diesel; - Turbocharged

- Longitudinal; X Transverse

Transmission: 3 Speed; - Manual; X Automatic; - Overdrive

Final Drive: X Front Wheel; - Rear Wheel; - Four Wheel

X A/C; X P/S; X P/B; - P/wdo

- Tilt Wheel; - P/seats; - Cruise Control

Type of Occupant Restraint: Driver side airbag and 3 point belt. Passenger 3 point belt system.

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 210 kpa, Rear 210 kpa

Recommended Tire Size: P185/75 R14

Recommended Cold Tire Pressure: Front 210 kpa, Rear 210 kpa

Tires on Vehicle: P185/75 R14; Manufacturer: GOODYEAR

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; X Lever - Rot. Knob

Vehicle Capacity Weight (VCW) = 404 kgs. (A)

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

Rated Cargo and Luggage

Weight (RCLW) A - B = 64 kgs.

GVWR 1660 kgs. GAWR: Front 867 kgs. Rear 793 kgs.

Table 1

GENERAL TEST AND VEHICLE 1 PARAMETER DATA (continued)

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

Right Front	=	<u>383</u>	kgs.	Right Rear	=	<u>243</u>	kgs.
Left Front	=	<u>397</u>	kgs.	Left Rear	=	<u>234</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>780.0</u>	kgs.	(<u>62.1</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>477.0</u>	kgs.	(<u>38.0</u> % of Total Vehicle Weight)			
TOTAL DELIVERED WEIGHT=		<u>1,257.0</u>	kgs.				

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMY:

Right Front	=	<u>408.5</u>	kgs.	Right Rear	=	<u>301</u>	kgs.
Left Front	=	<u>288</u>	kgs.	Left Rear	=	<u>425.5</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>696.5</u>	kgs.	(<u>49.0</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>726.5</u>	kgs.	(<u>51.1</u> % of Total Vehicle Weight)			
TOTAL TEST WEIGHT	=	<u>1,423.0</u>	kgs.				

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

Delivered Attitude:	RF	<u>693</u>	;	LF	<u>686</u>	;	RR	<u>706</u>	;	LR	<u>704</u>
Test Attitude:	RF	<u>681</u>	;	LF	<u>702</u>	;	RR	<u>668</u>	;	LR	<u>665</u>
Vehicle's Wheel Base =		<u>2637</u>	mm.								
Location of Vehicle's C.G. =		<u>1346</u>	millimeters rearward of front wheel center.								

Table 1

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

Type of Test:	<u>Frontal 30° Angled</u>	Impact Angle:	<u>30 deg.</u>
Date of Test:	<u>September 19, 1994</u>	Time of Test:	<u>15:20</u>
Ambient Temperature:	<u>21.7</u>	°C at impact area	
Temperature in Occupant Compartment:	<u>21</u>	°C	
Windshield Molding Temperature:	<u>-</u>	°C	
Required Impact Velocity Range:	<u>-</u>	to	<u>-</u> kph
Impact Velocity:	primary = <u>66.4</u>	kph, secondary =	<u>-</u> kph
Distance From Front Bumper to Barrier Face When			
Entering Speed Trap:	<u>132.1</u>	cm.	
Exiting Speed Trap:	<u>30.5</u>	cm.	

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	Face with air bag, top of head with "A" pillar, rear and top of head with "B" pillar.	Top of head with sunvisor, top and front of head with right roof rail.
Chest	Air bag	No contact
Abdomen	No contact	No contact
Left Knee	Lower dash panel	Glove box door
Right Knee	Lower dash panel	Glove box door

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

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

* Seat moved rearward. Rear right seat mount broken.

Test Comments:

Tear in right side of windshield, 580 millimeters long. Windshield separated from mounting at lower center (574 mm long) and top right side (255 mm long). Left front of vehicle severely deformed. Left front tire pushed rearward into "A" pillar. Left roof rail severely deformed. Dash/instrument panel severely intruded. Left front door beam punctured through outer skin. Driver dummy head skin separated from dummy head.

Table 2

VEHICLE 1 DUMMY INJURY CRITERIA VALUES

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DUMMY (1)	101.1	-85.4	146.1	196.9	-59.2	33.8	30.9	54.165
DUMMY (2)	-100.0	87.3	28.9	129.6	-75.5	96.6	22.4	71.460
DUMMY (3)	-	-	-	-	-	-	-	-
DUMMY (4)	-	-	-	-	-	-	-	-

	MAXIMUM FORCE FEMUR LOAD (NEWTONS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	-16276.7	-11024.5
DUMMY (2)	-6004.5	-3972.5
DUMMY (3)	-	-
DUMMY (4)	-	-

	MAXIMUM LOAD (NEWTONS)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)	3380.9	-	-
DUMMY (2)	-	-	-
DUMMY (3)	-	-	-
DUMMY (4)	-	-	-

	MAXIMUM ACCELERATION ("G")			
	HIC	t ₁ (SEC)	t ₂ (SEC)	Average Acceleration t ₁ TO t ₂
DUMMY (1)	1578.47	104.640	109.920	154.97
DUMMY (2)	622.64	78.120	107.160	54.01
DUMMY (3)	-	-	-	-
DUMMY (4)	-	-	-	-

*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No. 208

Figure 2

VEHICLE 1 OCCUPANT CLEARANCE DIMENSIONS (mm)

	DRIVER (mm)	PASSENGER
HH	307	287
HW	505	496
NSW	368	-
NIP	514	557
NH	388	-
CD	498	469
CS	293	-
KDL	115	112
KDR	121	113
1	520	-
2	51	-
SA	24°	24°
PA	25°	23°
ULA	106°	106°
LLA	233	229

DISTANCE OF H-POINT FROM TARGET POSITION (mm)		
	Driver	Passenger
Longitudinal	5 forward	0
Vertical	3 below	4 above

Angles taken relative to vertical

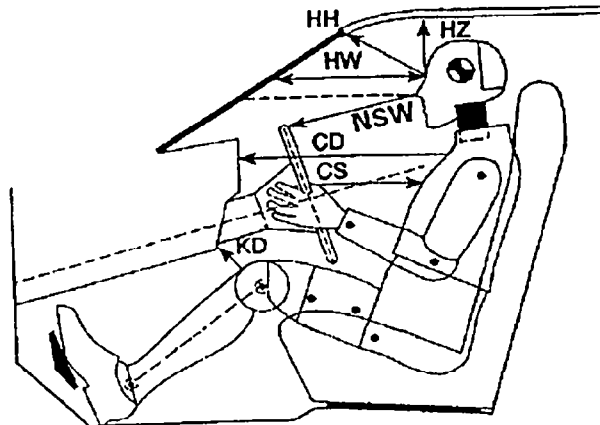
SA = Seat Back Angle

PA = Pelvic Angle

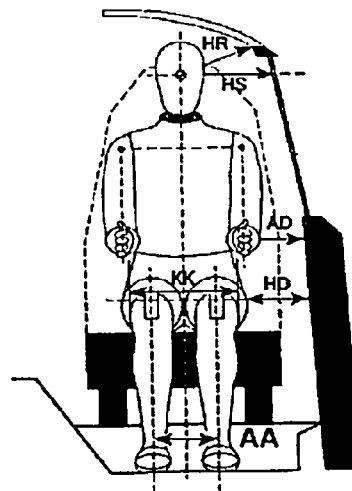
ULA= Upper Leg Angle

LLA= Lower Leg Angle

	DRIVER (mm)	PASSENGER
HR	170	161
HS	253	245
AD	98	88
HD	114	111
KK	270	240
AA	210	152
DT	22°C	22°C



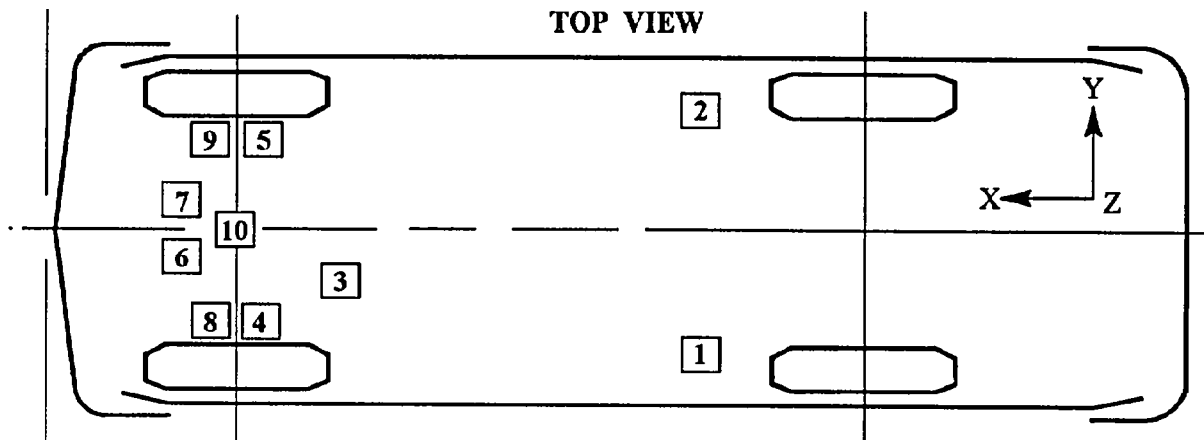
- HH - Head to Windshield Header
- HW - Head to Windshield
- NSW - Nose to Steering Wheel
- NIP - Nose to Instrument Panel
- NH - Nose to Steering Wheel Hub
- CD - Chest to Dash
- CS - Chest to Steering Wheel Hub
- KDL - Knee to Dash Left
- KDR - Knee to Dash Right
- 1 - Nose to Steering Column Target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



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

Figure 3

SUMMARY OF VEHICLE 1 ACCELEROMETER DATA



Vehicle: 1994 Chevrolet Corsica 4-Door Sedan

ACCELEROMETER NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	V1 L.R. Comp (X)	Gs	2.9	-18.7	-33.5	42.5	60.0
1	V1 L.R. Comp (Y)	Gs	19.6	40.2	-58.5	51.0	60.0
2	V1 R.R. Comp (X)	Gs	5.8	321.2	-92.8	51.1	60.0
2	V1 R.R. Comp (Y)	Gs	14.8	36.5	-35.6	50.8	60.0
++ 3	V1 Brake Pedal (X)	Gs	56381.4	54.7	-54720.1	49.7	60.0
3	V1 Brake Pedal (Y)	Gs	58.0	49.3	-59.9	62.2	60.0
3	V1 Brake Pedal (Z)	Gs	51.9	29.5	-81.1	42.7	60.0
4	V1 Left Shock Tower (X)	Gs	61.8	57.6	-143.3	38.3	60.0
4	V1 Left Shock Tower (Z)	Gs	126.4	34.8	-58.2	52.7	60.0
5	V1 Right Shock Tower (X)	Gs	20.2	65.0	-147.2	51.2	60.0
5	V1 Right Shock Tower (Y)	Gs	111.8	47.4	-48.2	57.2	60.0
6	V1 Left Engine (X)	Gs	47.6	46.4	-117.7	32.6	60.0
7	V1 Right Engine (X)	Gs	20.1	48.6	-23.5	28.2	60.0
** 8	V1 L.F Frame Rail (X)	Gs	*****	176.9	*****	52.7	60.0
8	V1 L.F Frame Rail (Y)	Gs	94.9	31.6	-32.1	60.1	60.0
8	V1 L.F Frame Rail (Z)	Gs	76.7	50.6	-67.6	43.3	60.0
9	V1 R.F Frame Rail (X)	Gs	10.6	83.3	-152.3	51.0	60.0
9	V1 R.F Frame Rail (Y)	Gs	71.4	34.2	-85.2	66.8	60.0
* 9	V1 R.F Frame Rail (Z)	Gs	61.3	41.0	-38.4	58.7	60.0
** 10	V1 Engine Bottom (X)	Gs	408.9	384.7	-418.7	180.6	60.0
** 10	V1 Engine Bottom (Y)	Gs	233.0	46.3	-245.0	169.0	60.0

* Wire cut at 55msec. ** Data not accurate, wire cut. ++ Data not accurate.

Figure 4

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

Test Description: 66.4 kph Frontal Vehicle to Vehicle Impact
 Test Vehicle: 1994 Chevrolet Corsica 4-Door Sedan
 Reference Plane: Vehicle plane at rear bumper

VEHICLE No. 1		PRE-TEST AXIS (mm)			POST-TEST AXIS (mm)		
Loc. No.	DESCRIPTION	X	Y	Z	X	Y	Z
1	RIGHT FRONT FRAME RAIL	3856	335	168	3823	254	232
2	LEFT FRONT FRAME RAIL	3856	335	168	3480	368	314
3	RIGHT ENGINE TOP	3886	292	792	3485	414	833
4	LEFT ENGINE TOP	3861	25	787	3526	-147	846
5	ENGINE BOTTOM	3559	102	145	3340	64	238
6	RIGHT SHOCK TOWER	3645	566	889	3099	643	912
7	LEFT SHOCK TOWER	3645	566	884	3295	330	983
8	BRAKE PEDAL	3241	264	409	2723	38	460
9	LEFT REAR COMP.	1623	607	394	1623	607	427
10	RIGHT REAR COMP.	1623	607	394	1623	607	419
11	CENTER REAR COMP.	-	-	-	-	-	-
12	LOWER STEERING COL.	-	-	-	-	-	-
13	UPPER STEERING COL.	-	-	-	-	-	-
14	LEFT DRIVER TOEPAN	3312	582	414	2680	229	371
15	RIGHT DRIVER TOEPAN	3404	277	373	2830	23	368

NOTE: Vehicle leveled to pre-test height for post-test measurements. Carpet removed from floor-pan.

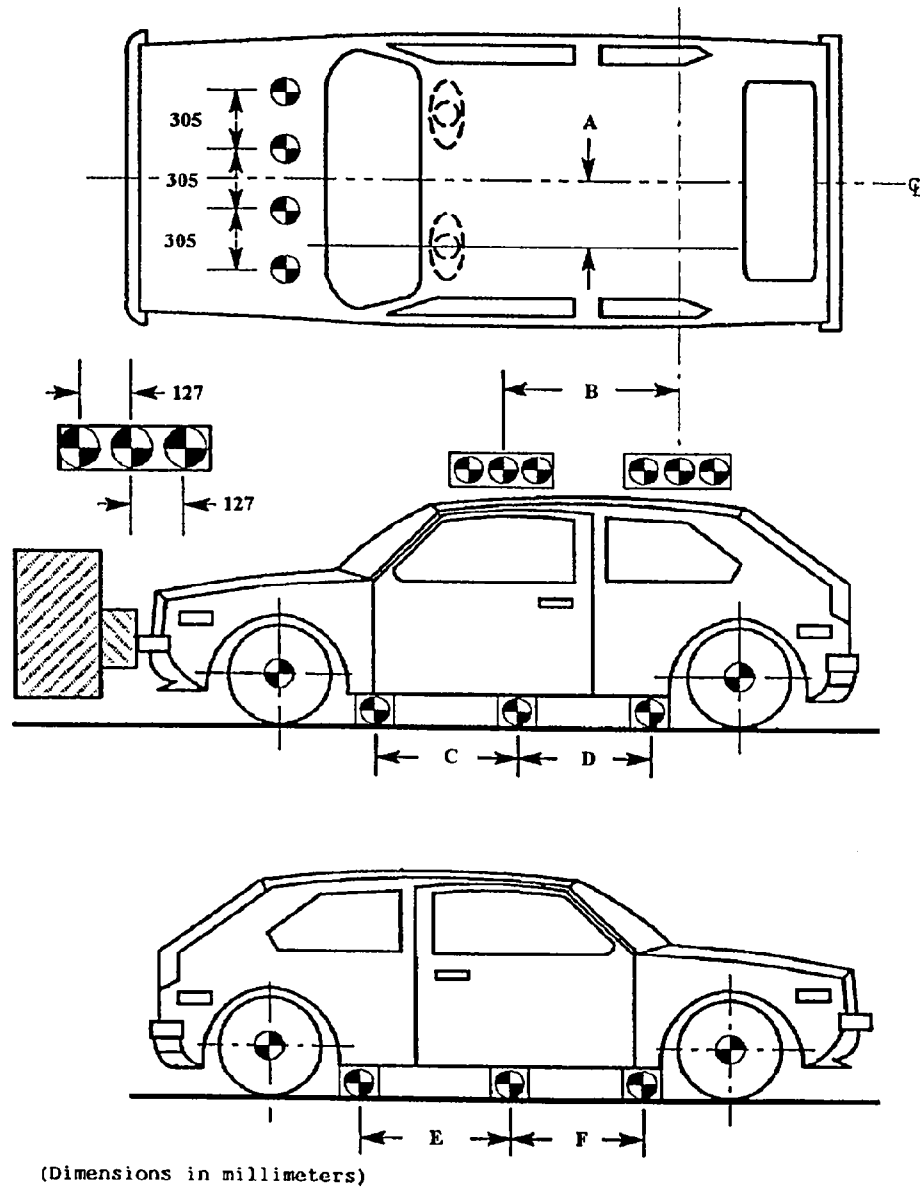
TOEPAN MEASUREMENT POSITIONS						
Loc. No.	PRE-TEST AXIS (mm)			POST-TEST AXIS (mm)		
	X	Y	Z	X	Y	Z
1	3348	582	566	2647	216	536
2	3244	546	351	2685	203	294
3	3368	378	381	2761	46	363
4	3414	175	389	-	-	-
5	3277	155	279	-	-	-

Information on post-test axis of toepan measurement positions are unavailable.

Figure 5

VEHICLE 1 TARGET LOCATIONS

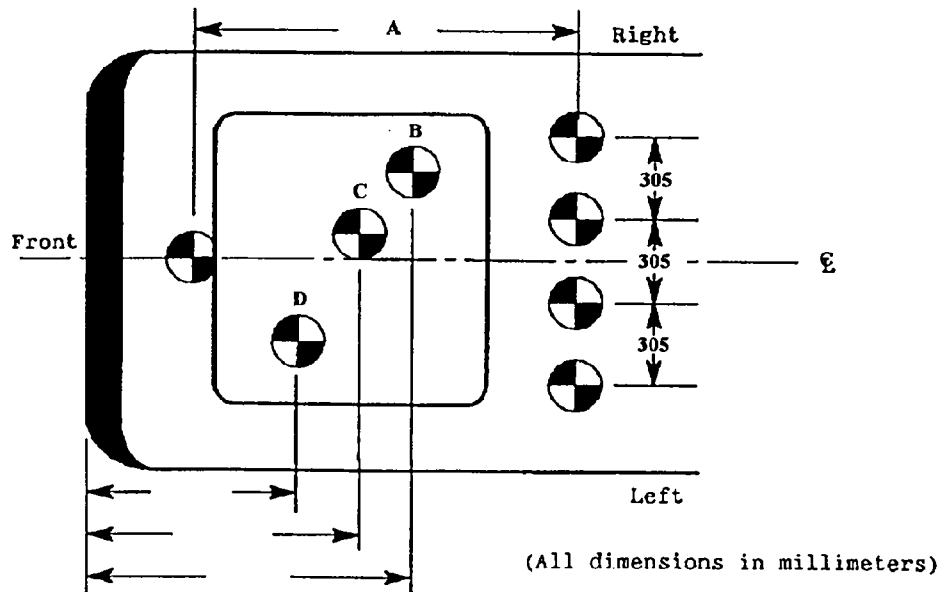
(All dimensions in millimeters)



Targets A: 335	D: 876
B: 1219	E: 876
C: 876	F: 874

Figure 5

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



Note: Drawing not to scale.

Target A: 922
B: Air Cleaner Assembly - 775
C: Valve Cover - 795
D: Alternator - 574

Figure 6

VEHICLE 1 MEASUREMENT POINTS

(All dimensions in millimeters)

REAR DATUM REFERENCE

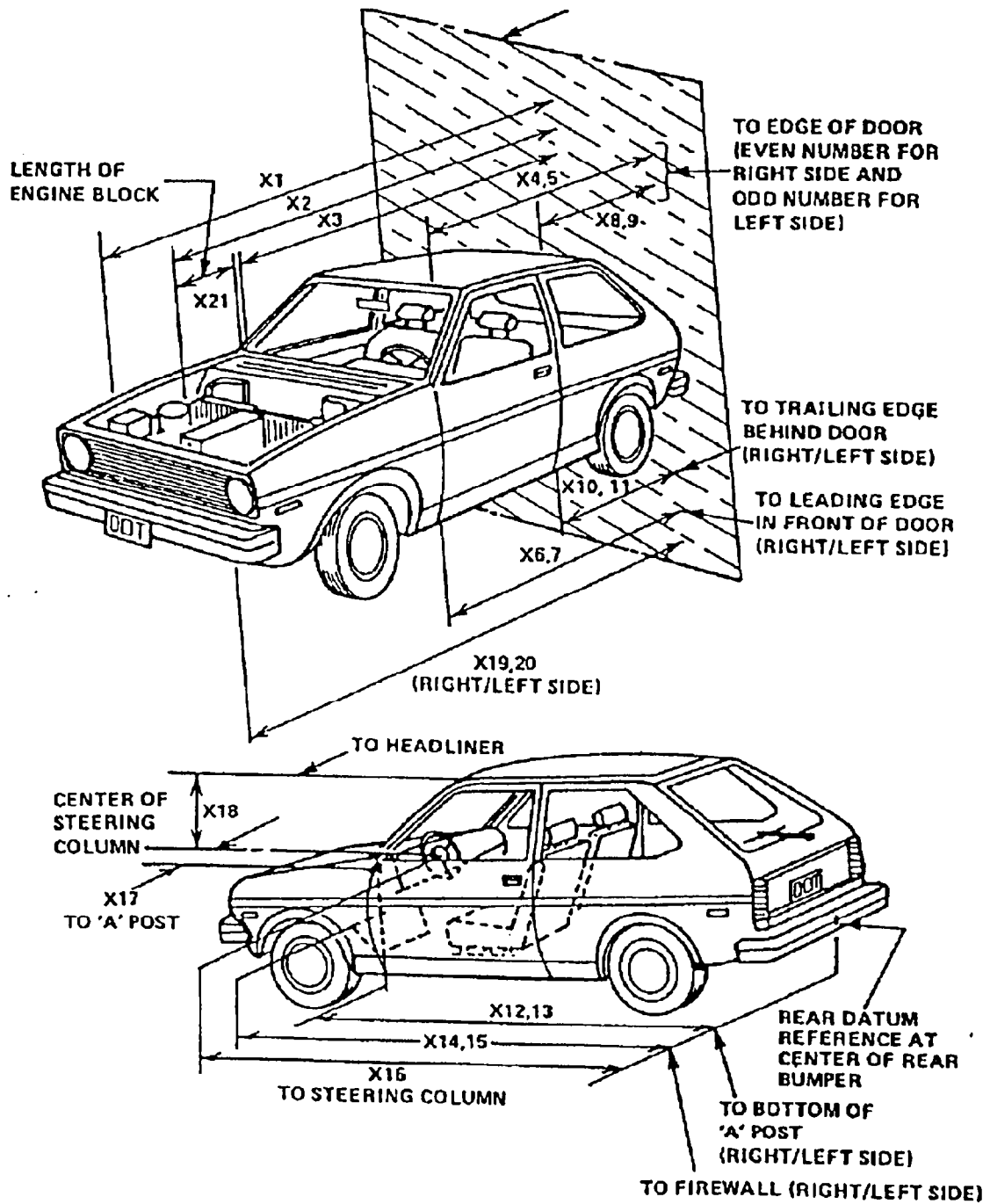


Figure 6

VEHICLE 1 MEASUREMENT POINTS (continued)

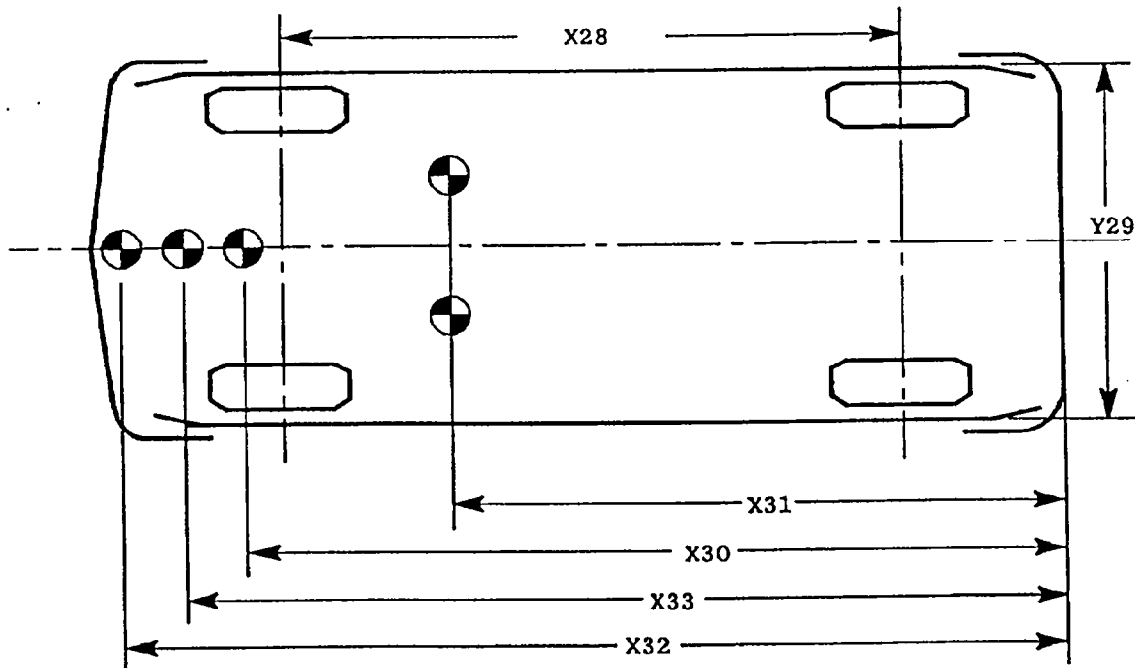
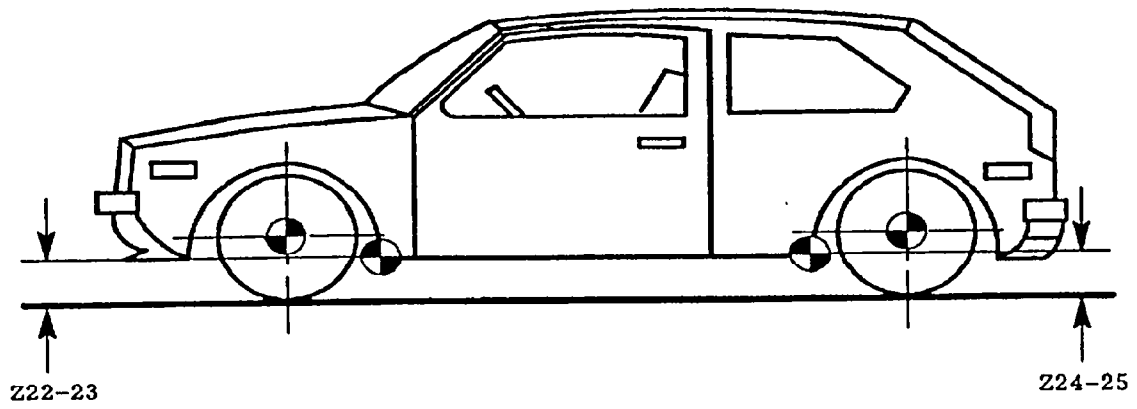


Table 3

VEHICLE 1 MEASUREMENTS

No.	TYPE OF MEASUREMENT	All Dimensions in millimeters	
		Pre-Test	Post-Test
X1	Total Length of Vehicle at Centerline	4656	4090
X2	Rear Surface of Vehicle to Engine at Centerline	3944	3686
X3	Rear Surface of Vehicle to Firewall	3445	3205
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3156	3124
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3165	2790
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3137	3080
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3136	2764
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2143	2119
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2143	2131
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2173	2115
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2169	2096
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3175	N/A
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3170	3140
X14	Rear Surface of Vehicle to Firewall - Right Side	3440	3385
X15	Rear Surface of Vehicle to Firewall - Left Side	3455	3006
X16	Rear Surface of Vehicle to Steering Wheel Center	2690	2405
X17	Steering Column to "A" Post	423	373
X18	Steering Column to Headliner	413	404

Table 3

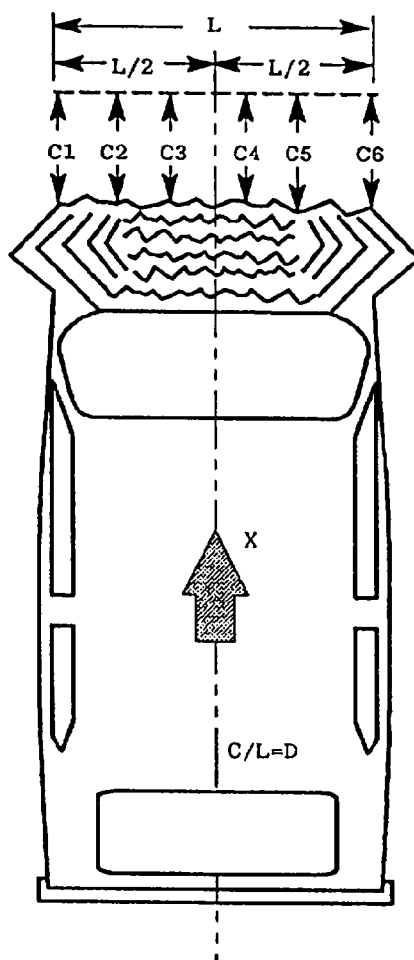
VEHICLE I MEASUREMENTS (continued)

No.	TYPE OF MEASUREMENT	All Dimensions in millimeters	
		Pre-Test	Post-Test
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4560	4485
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4570	3665
X21	Width of Engine Block	320	320
Z22	Right Front Sill to Ground Plane	243	223
X23	Left Front Sill to Ground Plane	243	168
Z24	Right Rear Sill to Ground Plane	256	327
Z25	Left Rear Sill to Ground Plane	258	148
X26	Firewall to Engine or Transaxle	1790	40
Z27	Vertical Dim. from Door Sill to Centerline of Steering Column	510	655
X28	Wheelbase of Vehicle	2630	Rt. = 2640 Lft. = 2020
Y29	Width of Vehicle at Maximum Width Point	1746	1768
X30	Rear Surface of Vehicle to Engine Target	3914	3642
X31	Rear Surface of Vehicle to Compartment Target	3023	2992
X32	Rear Surface of Vehicle to Bumper Target	4541	4072
X33	Rear Surface of Vehicle to Frame Crossmember	4267	3894

Table 3

VEHICLE 1 MEASUREMENT (continued)

(all dimensions in millimeters)



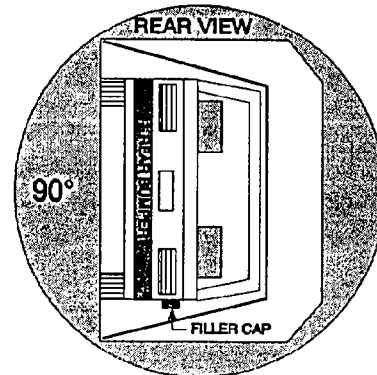
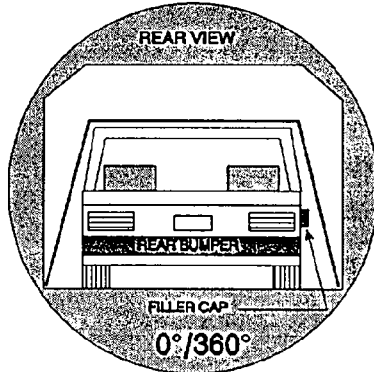
Location	Pre-Test	Post-Test	Change
C1	4494	3590	904
C2	4615	3840	775
C3	4644	4000	644
C4	4642	4180	462
C5	4607	4360	247
C6	4482	4520	-38

$L = 1365$

Table 5
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:
0-90 Deg.

Vehicle NHTSA ID No.:



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	<u>1</u>	minutes	<u>37</u>	seconds
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>00</u>	seconds
TOTAL	<u>6</u>	minutes	<u>37</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	----------------------

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A
---	---	---	-----

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

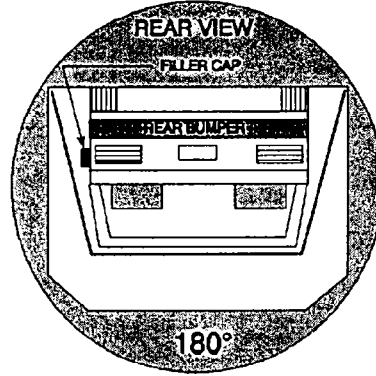
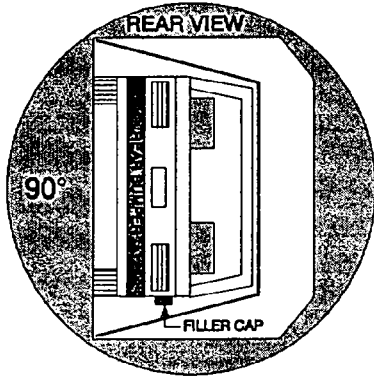
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 5
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:
90-180 Deg.

Vehicle NHTSA ID No.:



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>40</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>00</u>	seconds
TOTAL	<u>6</u>	minutes	<u>40</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	----------------------

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A
---	---	---	-----

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

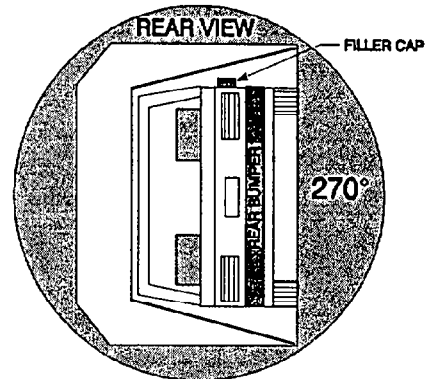
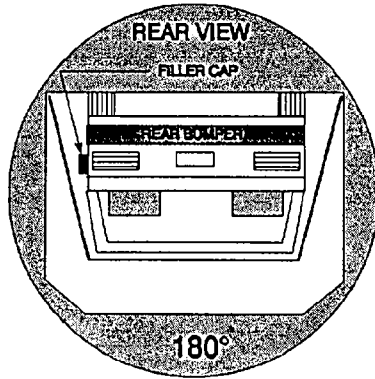
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 5
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:
180-270 Deg.

Vehicle NHTSA ID No.:



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	----------------------

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A
---	---	---	-----

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

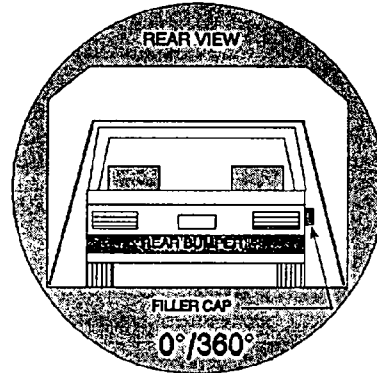
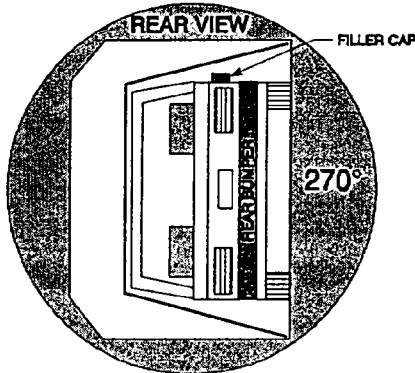
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 5
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:
270-360 Deg.

Vehicle NHTSA ID No.:



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	<u>1</u>	minutes	<u>48</u>	seconds
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>00</u>	seconds
TOTAL	<u>6</u>	minutes	<u>48</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	----------------------

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A
---	---	---	-----

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

IV. SOLVENT SPILLAGE LOCATION(S):

None

VEHICLE TWO DATA

Table 6

CRASH TEST SUMMARY FOR MOVING BARRIER

POSITION OF IMPACT (MDB) MONORAIL:

30° to right

MDB DETAILS:

Overall Width of Framework Carriage	=	<u>1251</u>	millimeters
Overall Length of MDB (incl. honeycomb impact face)	=	<u>4102</u>	millimeters
Wheelbase of Framework Carriage	=	<u>2598</u>	millimeters
Tread of Framework Carriage (Front & Rear)	=	<u>1880</u>	millimeters
C.G. Location Rearward of Front Axle	=	<u>1235</u>	millimeters

MDB WEIGHT:

Right Front	=	<u>266</u>	kgs.	Right Rear	=	<u>414</u>	kgs.
Left Front	=	<u>453</u>	kgs.	Left Rear	=	<u>237</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>719</u>	kgs.	(<u>52.4</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>651</u>	kgs.	(<u>47.5</u> % of Total Vehicle Weight)			
TOTAL TEST WEIGHT	=	1370	kgs.				

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

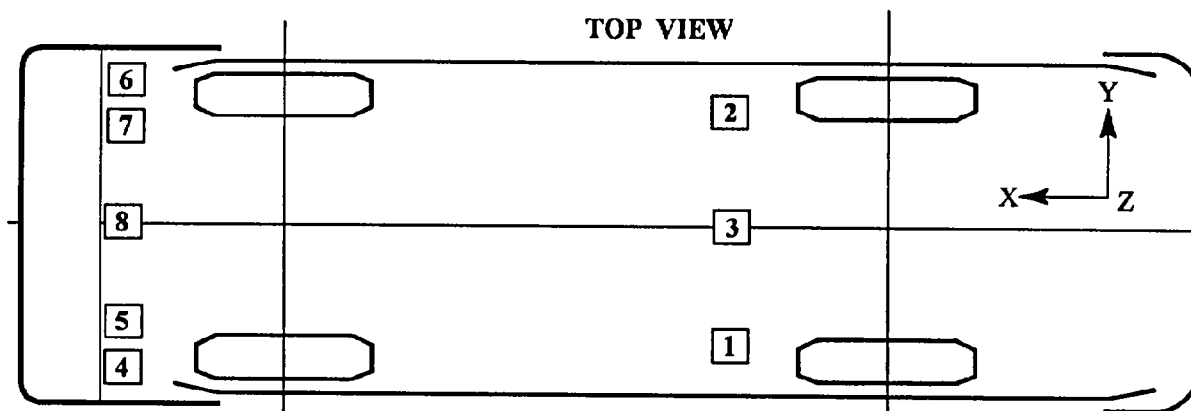
1. Row A at Bumper Level	=	<u>413</u>	millimeters
2. Row B at Mid-Stack Level	=	<u>302</u>	millimeters
3. Row C at Top of Stack Level	=	<u>203</u>	millimeters

INSTRUMENTATION:

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

Figure 7

SUMMARY OF VEHICLE 2 ACCELEROMETER DATA



Vehicle: Moving Deformable Barrier

ACCELEROMETER NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	V2 C.G. X	Gs	2.3	227.6	-60.8	39.2	60.0
2	V2 C.G. Y	Gs	5.9	33.1	-12.6	47.6	60.0
3	V2 C.G. Z	Gs	50.4	54.1	-42.1	62.4	60.0
4	V2 Left Rail X	Gs	67.2	38.4	-4.2	188.6	60.0
5	V2 Left Rail Y	Gs	34.0	56.0	-34.2	51.2	60.0
6	V2 Right Rail X	Gs	52.3	39.0	-1.6	-4.7	60.0
7	V2 Right Rail Y	Gs	18.0	56.0	-22.2	51.0	60.0
8	V2 TR Load Cell	Nwt	36951.7	26.3	-19218.0	7.1	60.0
9	V2 BR Load Cell	Nwt	6208.5	25.8	-57377.5	99.2	60.0
* 10	V2 TL Load Cell	Nwt	112253.5	97.3	-8156.0	52.0	60.0
11	V2 BL Load Cell	Nwt	6374.4	247.6	-2.565E+05	40.6	60.0
12	V2 CL Load Cell	Nwt	1088.2	-3.7	-2.180E+05	38.3	60.0
17	V2 C.G. Resultant	Gs	64.9	38.6	.3	320.9	60.0

* Data not accurate, wire cut.

Table 7

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

Test Date: September 19, 1994 Vehicle: Moving Deformable Barrier

		Distance Right of Center										Distance Left of Center									
Location		813	711	610	508	406	305	203	102	0.0	102	203	305	406	508	610	711	813			
Top of Stack Level	Pre	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380			
	Post	205	240	255	275	280	270	205	210	177	190	185	205	305	276	265	235	230			
	Crush	175	140	125	105	100	110	175	170	203	190	195	175	75	104	115	145	150			
Mid-Stack Level	Pre	382	382	382	382	382	382	382	382	382	382	382	382	382	382	382	382	382			
	Post	260	280	N/A	N/A	N/A	N/A	N/A	N/A	105	80	120	N/A	N/A	N/A	N/A	N/A	N/A			
	Crush	122	102	N/A	N/A	N/A	N/A	N/A	N/A	277	302	262	N/A	N/A	N/A	N/A	N/A	N/A			
Bumper Level	Pre	467	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	477			
	Post	190	175	165	150	188	152	155	150	132	115	82	72	108	105	110	110	80			
	Crush	277	310	320	335	297	333	330	335	353	370	403	413	377	380	375	375	397			

Figure 8

CAMERA POSITIONS FOR VEHICLE TO VEHICLE ANGLED FRONTAL IMPACT

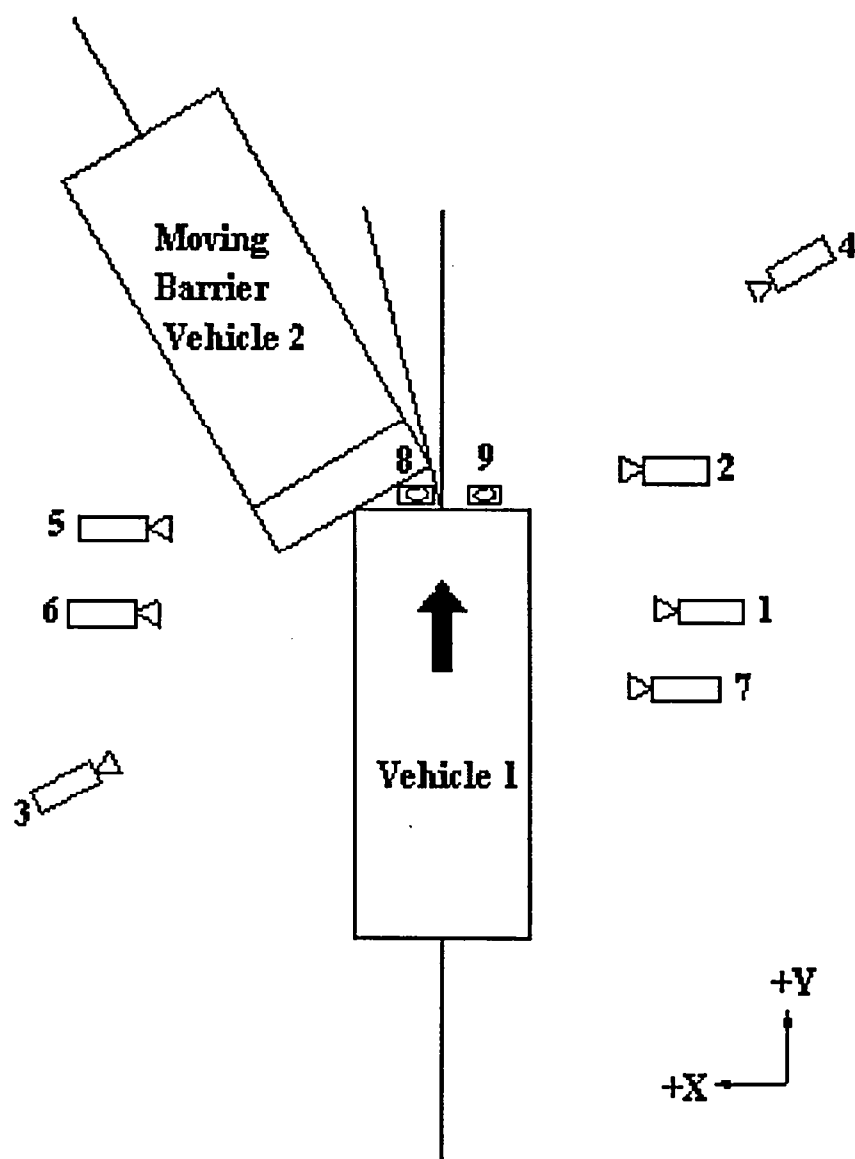


Table 8

HIGH-SPEED CAMERA LOCATIONS

Test No. Y49-9-1454 Vehicle: 1994 Chevrolet Corsica 4-Door Sedan, Moving Deformable Barrier

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)*			ANGLE** (deg)	LENS (mm)	SPEED (fps)
1	Real-Time Camera	-	-	-	-	-	24
2	South Overall Camera	8686.8	1371.6	1066.8	0	13	1000
3	South Impact Point	8788.4	0	1016.0	-1	25	1050
4	North Impact Point	-8636.0	279.4	1041.4	-1	25	1150
5	Vehicle 1 Driver Side View	10718.8	4419.6	1498.6	-2	35	1050
6	Vehicle Driver and Interior View	3606.8	-1117.6	1803.4	-19	13	550
7	Vehicle 1 Passenger Side View	-9423.4	-5207.0	1041.4	-1	25	1140
8	Overhead Overall View	457.2	0	9779	-90	13	1090
9	Overhead Impact Point	457.2	0	9779	-90	25	1000

*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

** = referenced to horizontal plane

APPENDIX A
PHOTOGRAPHS

APPENDIX A

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OVERALL TEST SETUP

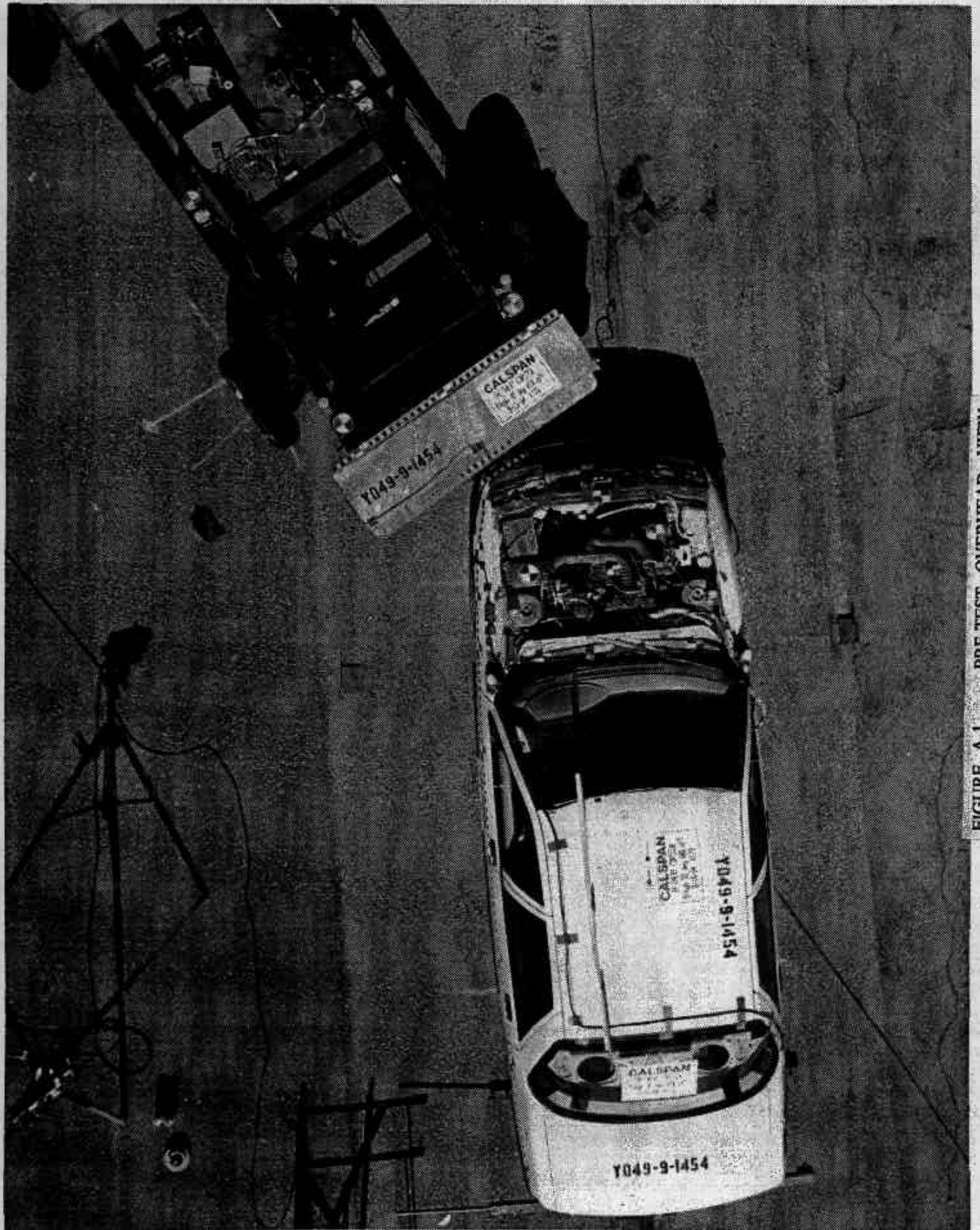


FIGURE A-1 PRE-TEST OVERHEAD VIEW

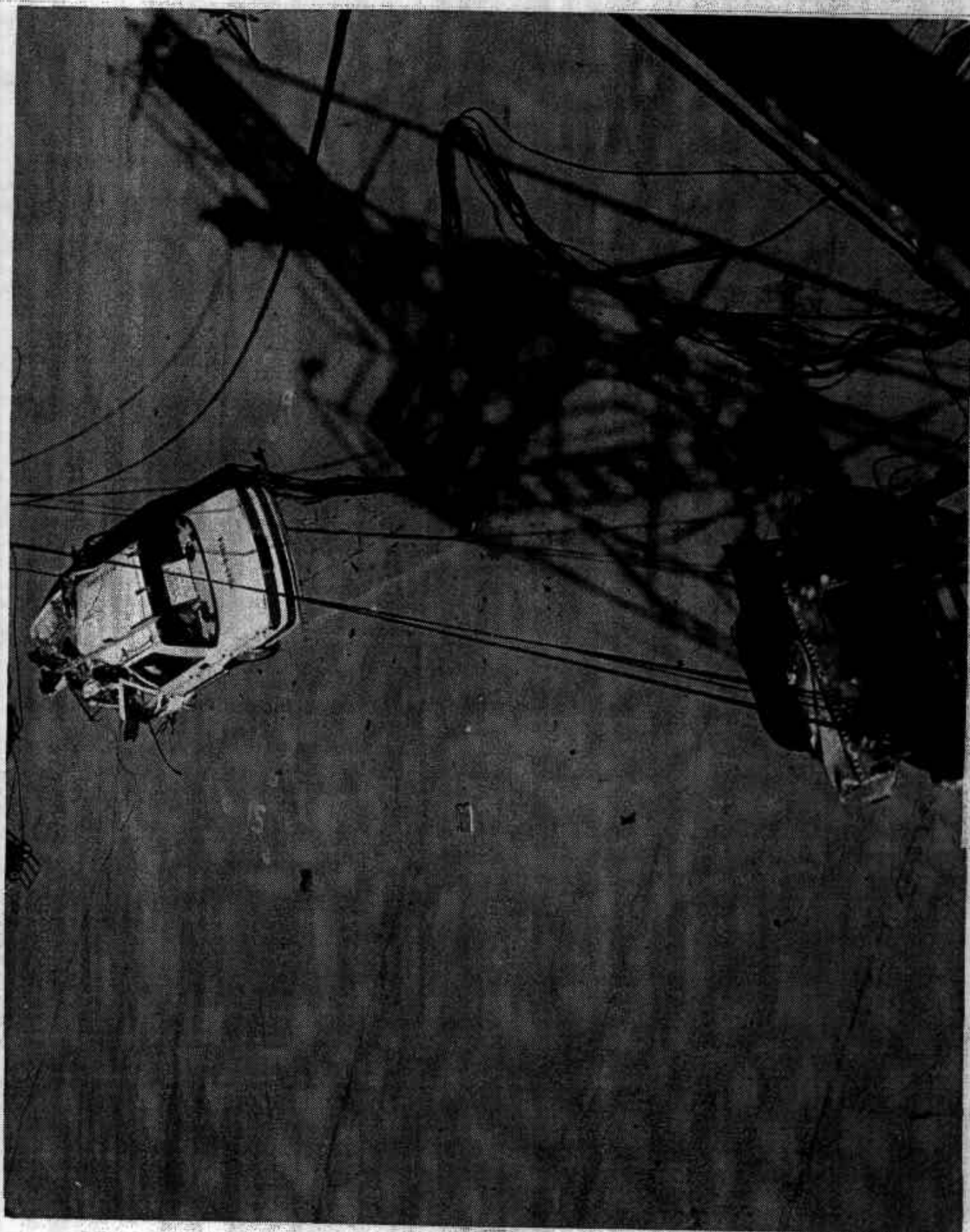


FIGURE A-2 POST-TEST OVERHEAD VIEW

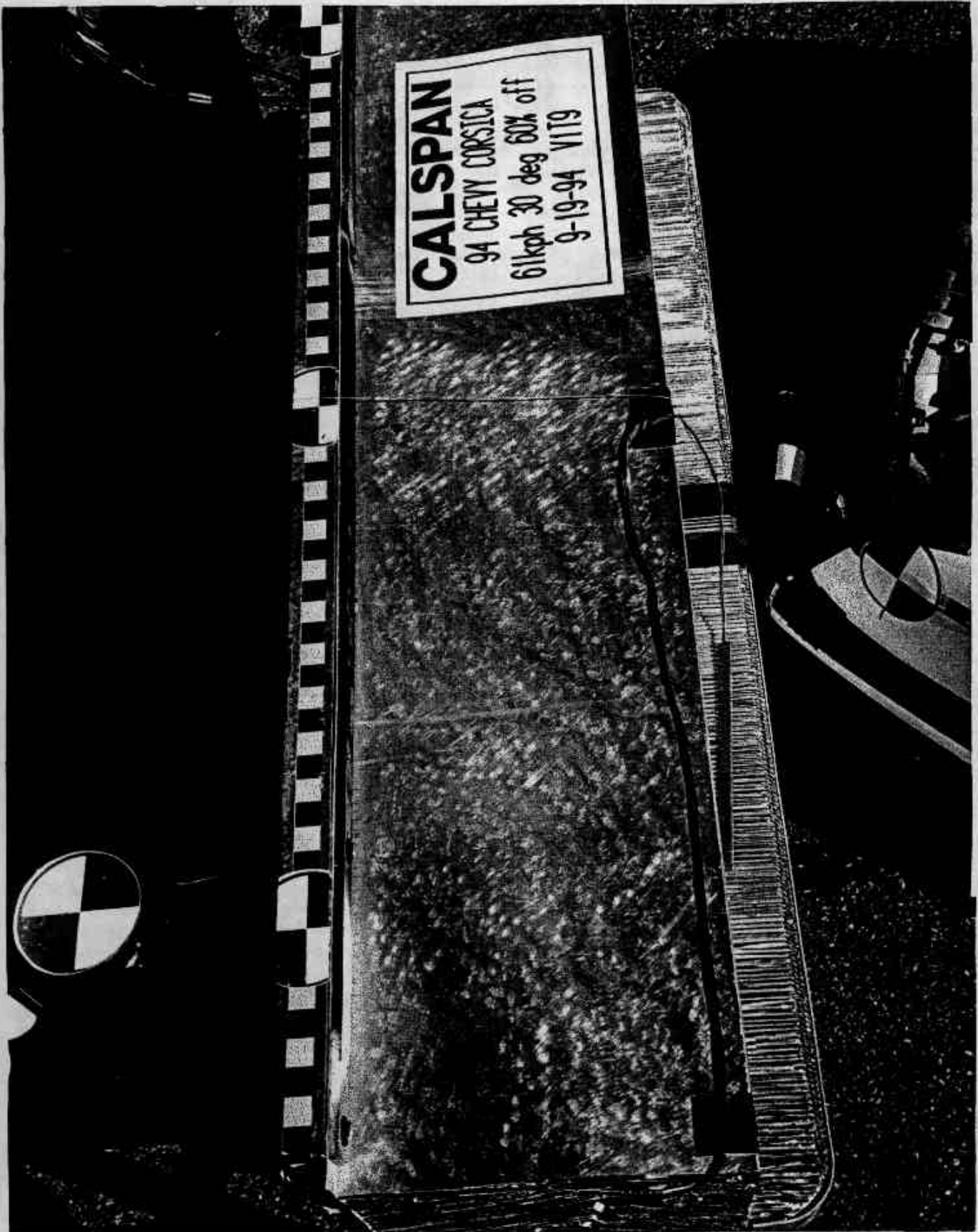


FIGURE A-3 PRE-TEST OVERHEAD CONTACT POINT

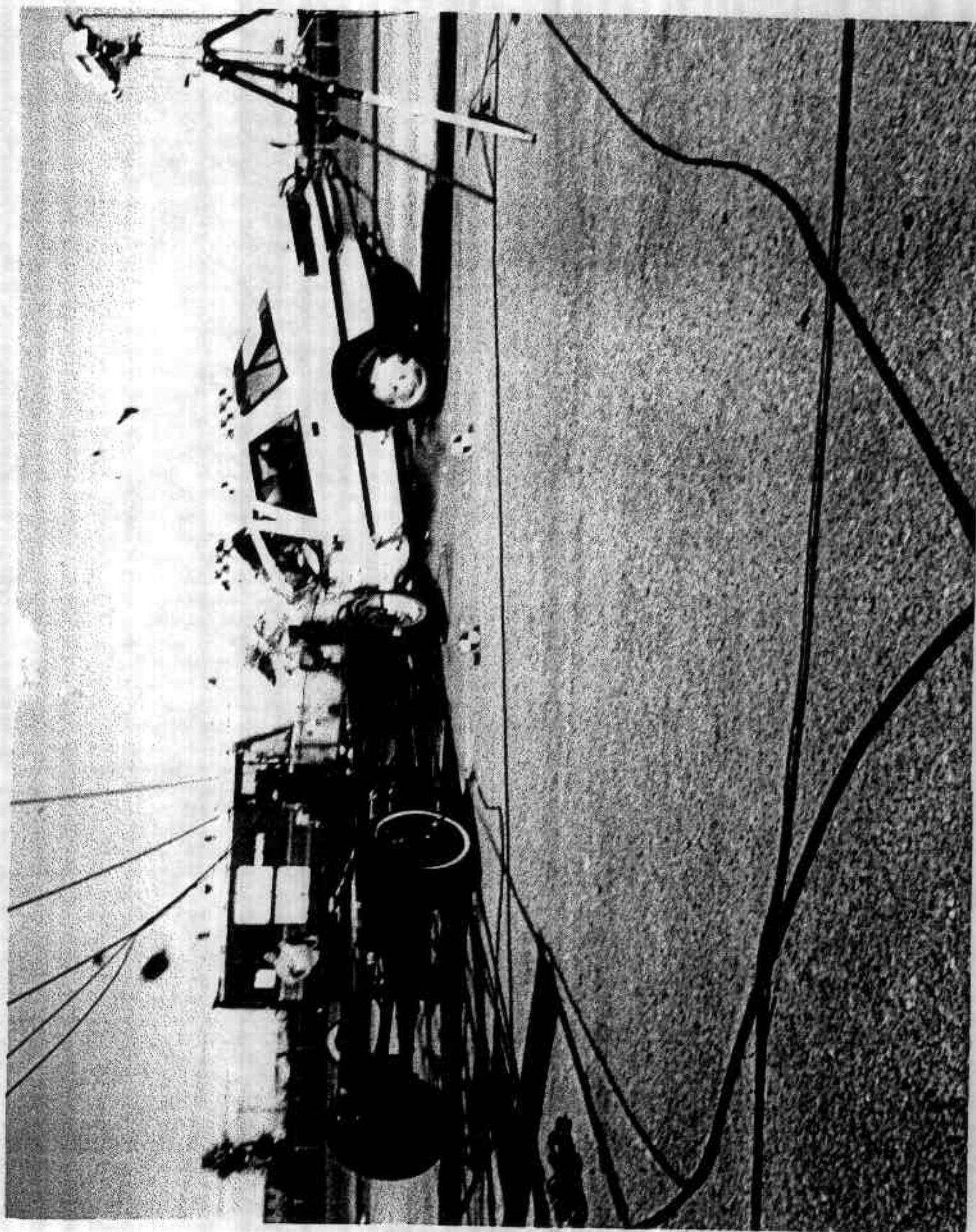


FIGURE A-4 IMPACT PHOTO

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VEHICLE 1 PHOTOGRAPHS

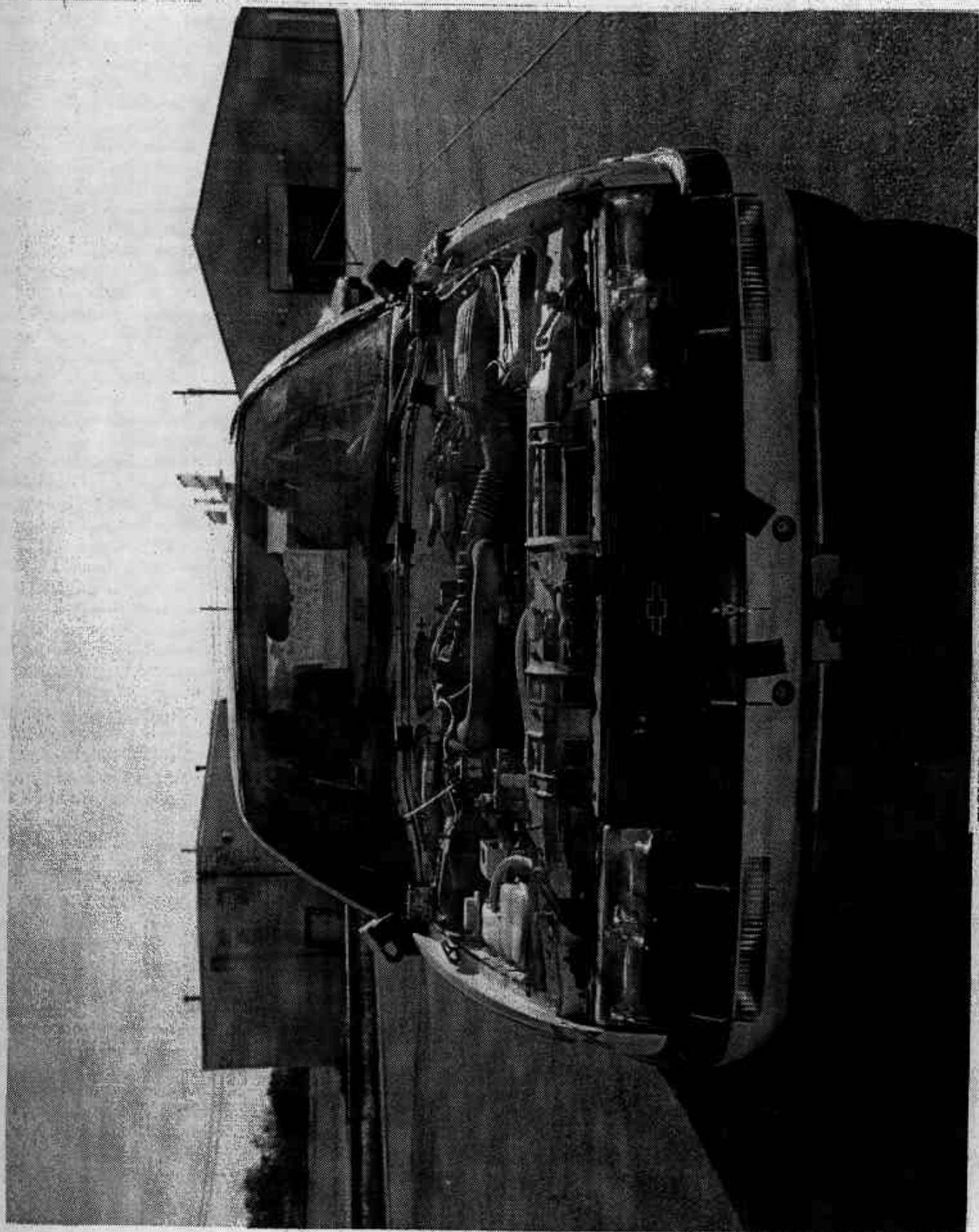


FIGURE A-5 PRE-TEST FRONT VIEW

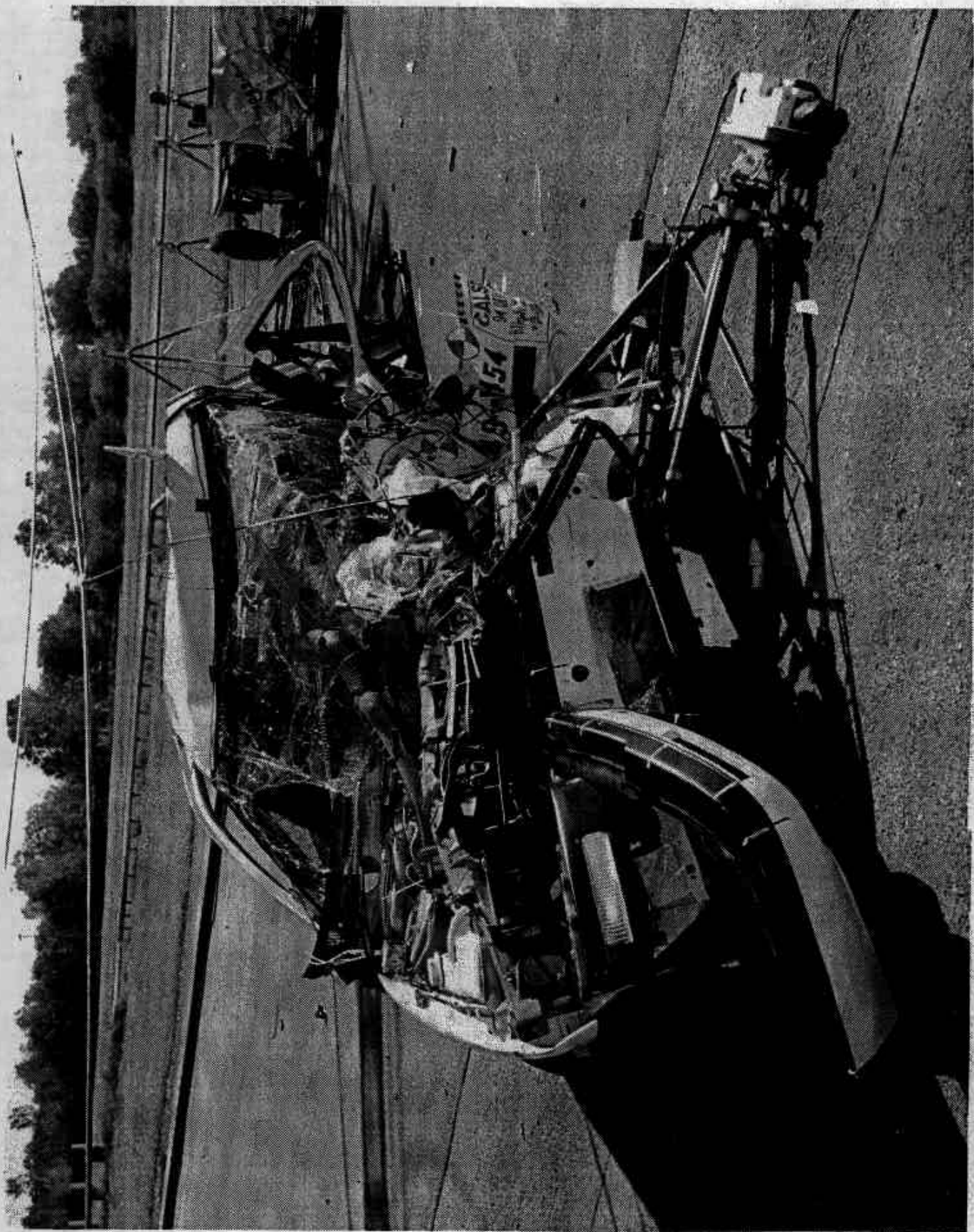


FIGURE A-6 POST-TEST FRONT VIEW

A-9

8118-9



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

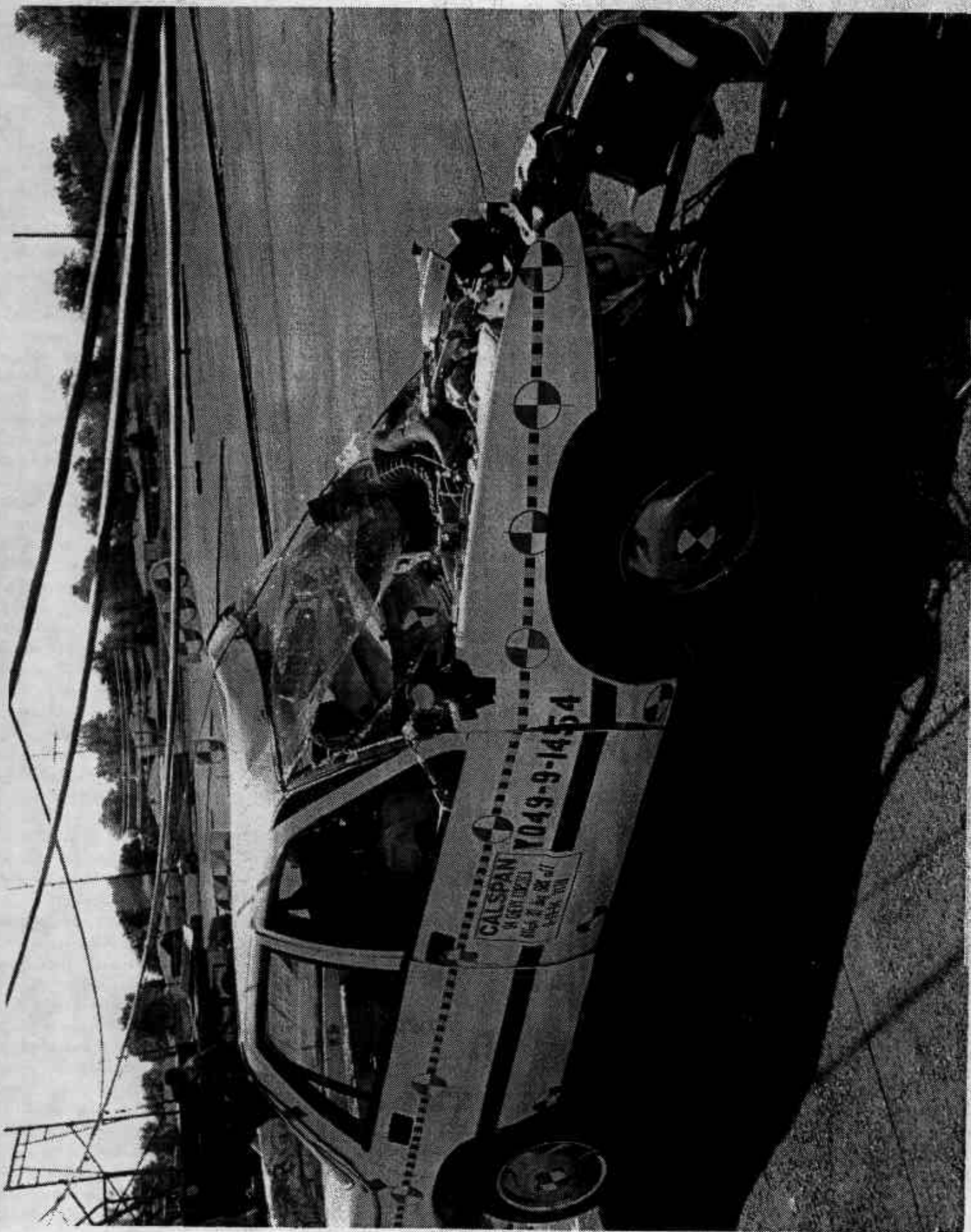


FIGURE A-8 POST-TEST FRONT RIGHT THREE QUARTER VIEW

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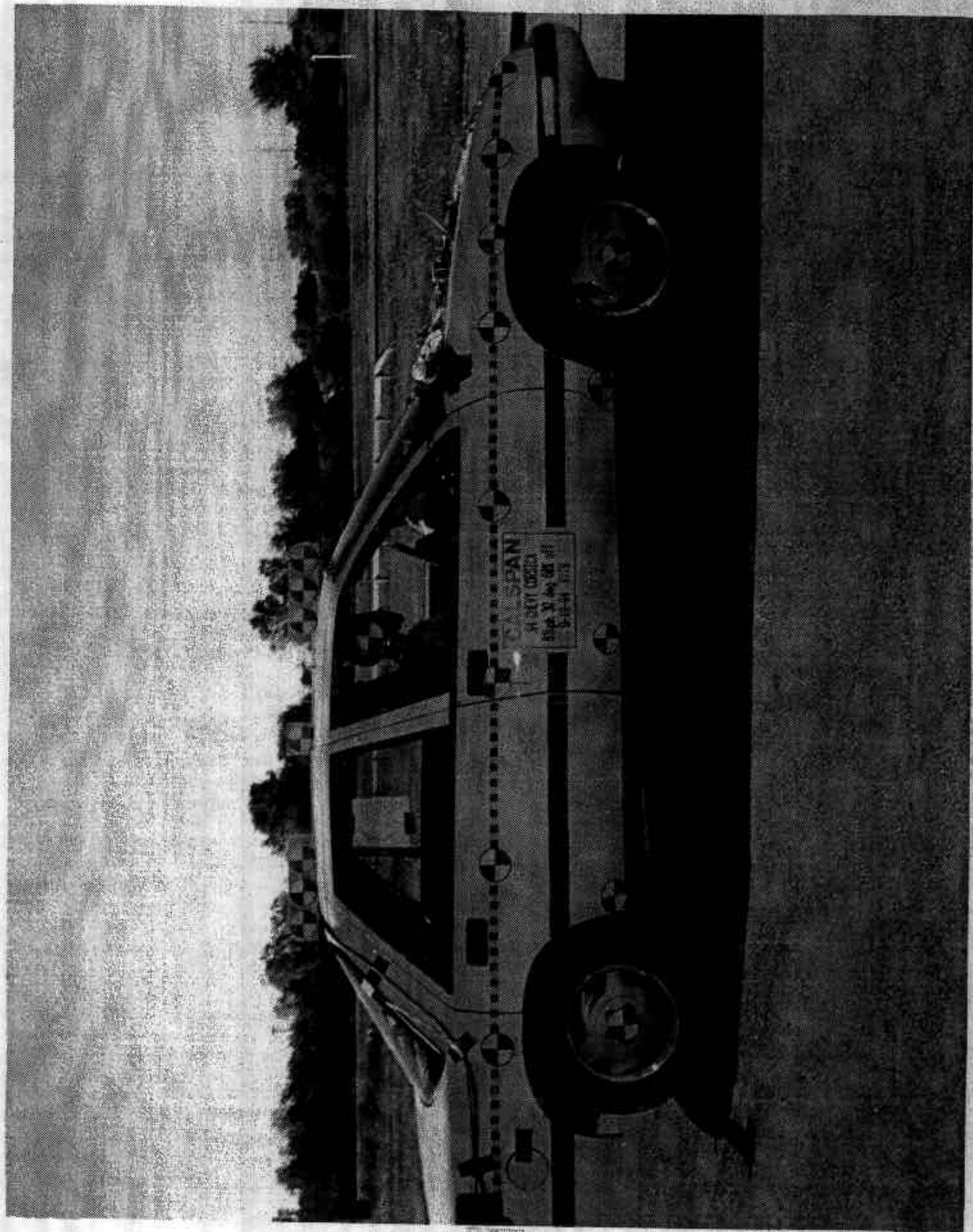


FIGURE A-9 PRE-TEST RIGHT SIDE VIEW

A-12

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FIGURE A-10 POST-TEST RIGHT SIDE VIEW

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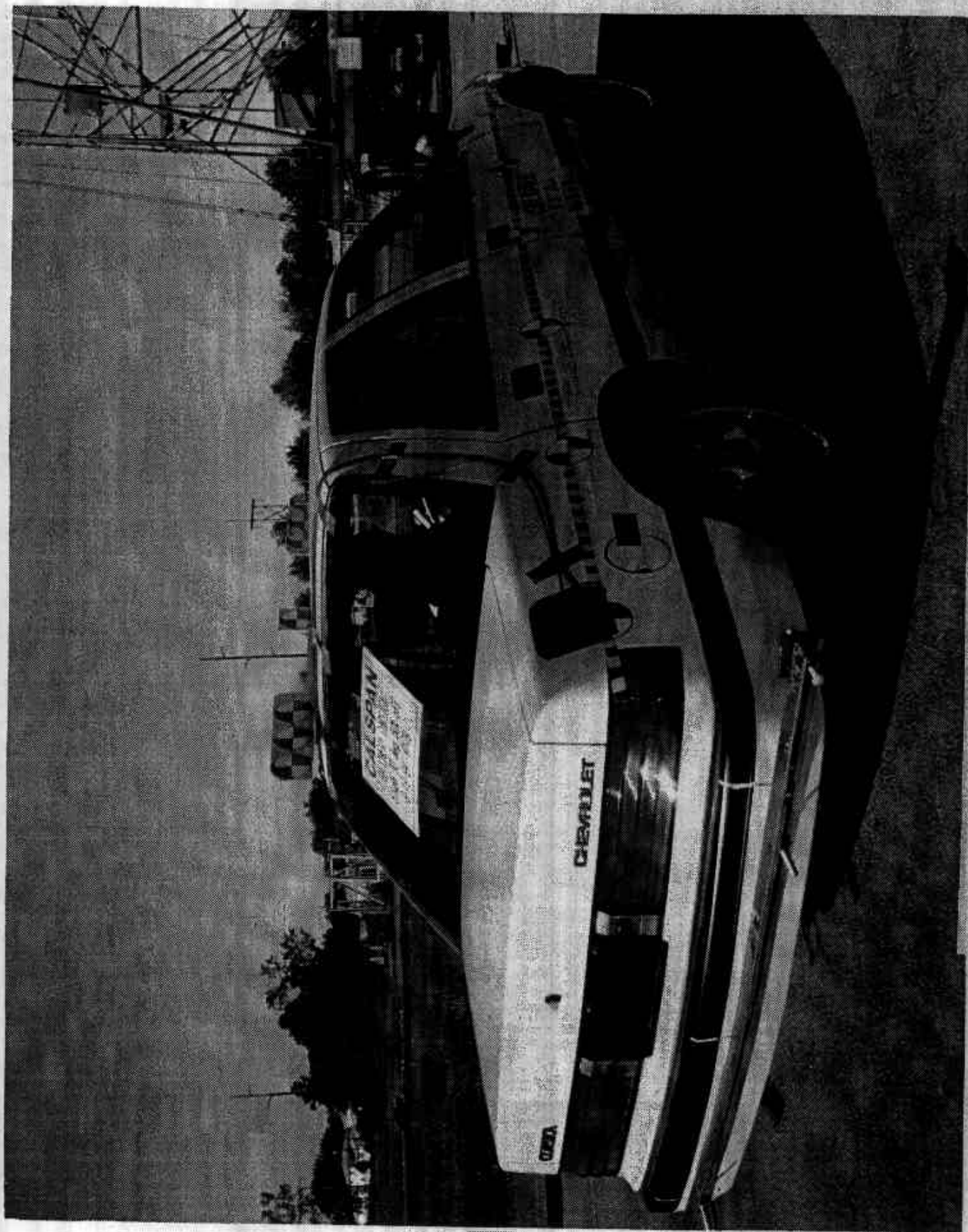


FIGURE A-11 PRE-TEST REAR RIGHT THREE QUARTER VIEW

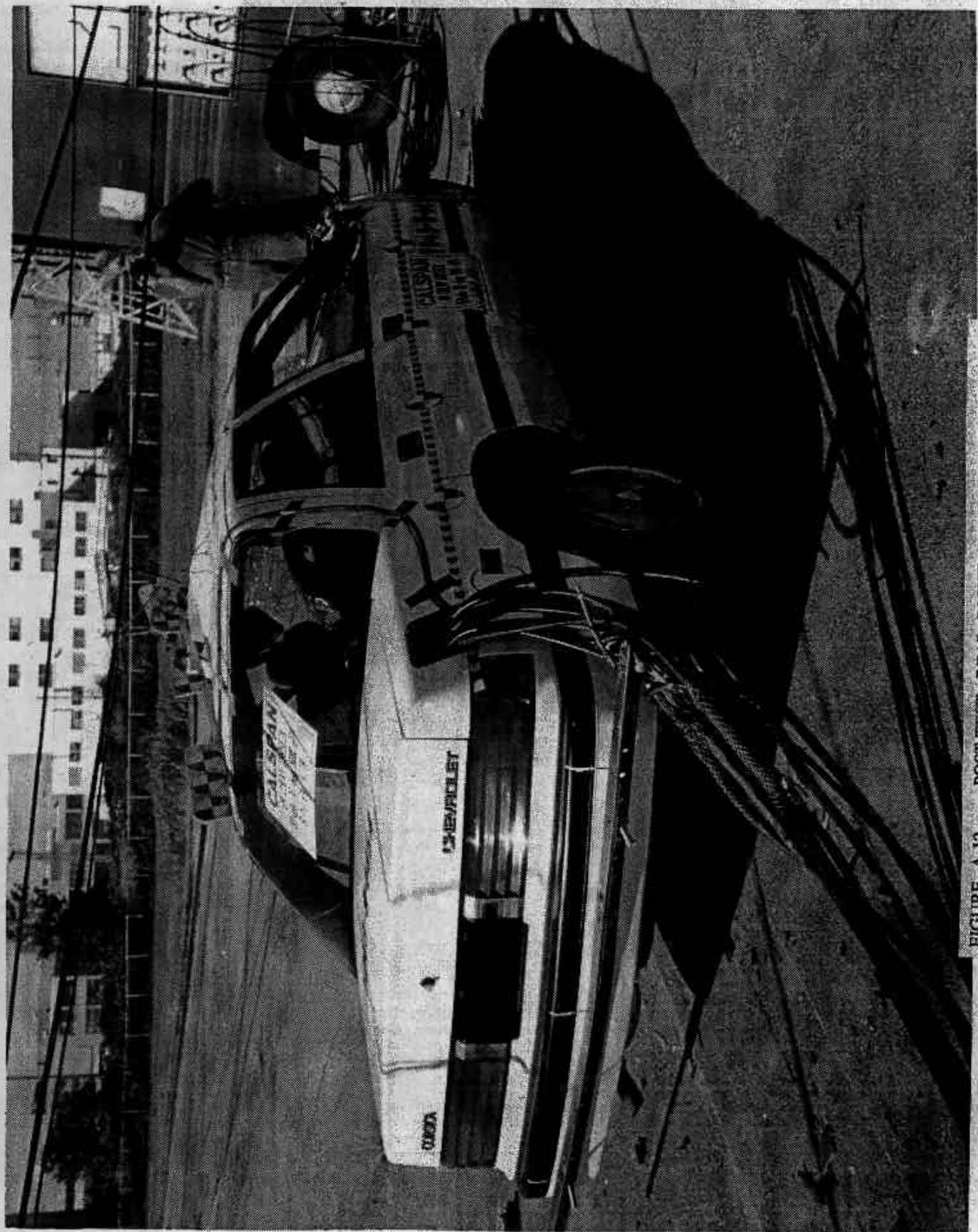


FIGURE A-12 POST-TEST REAR RIGHT THREE QUARTER VIEW

A-15

8118-9

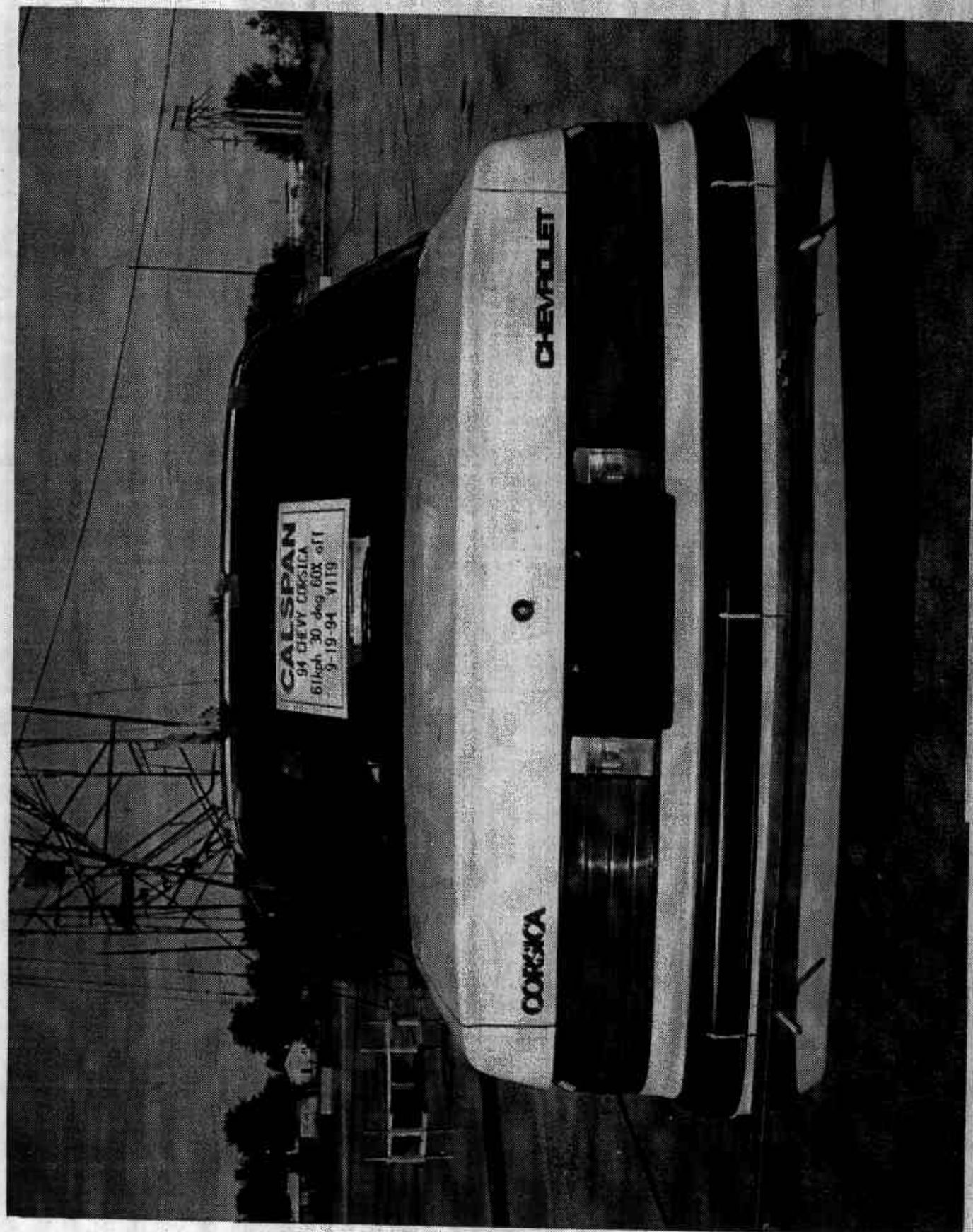


FIGURE A-13 PRE-TEST REAR VIEW

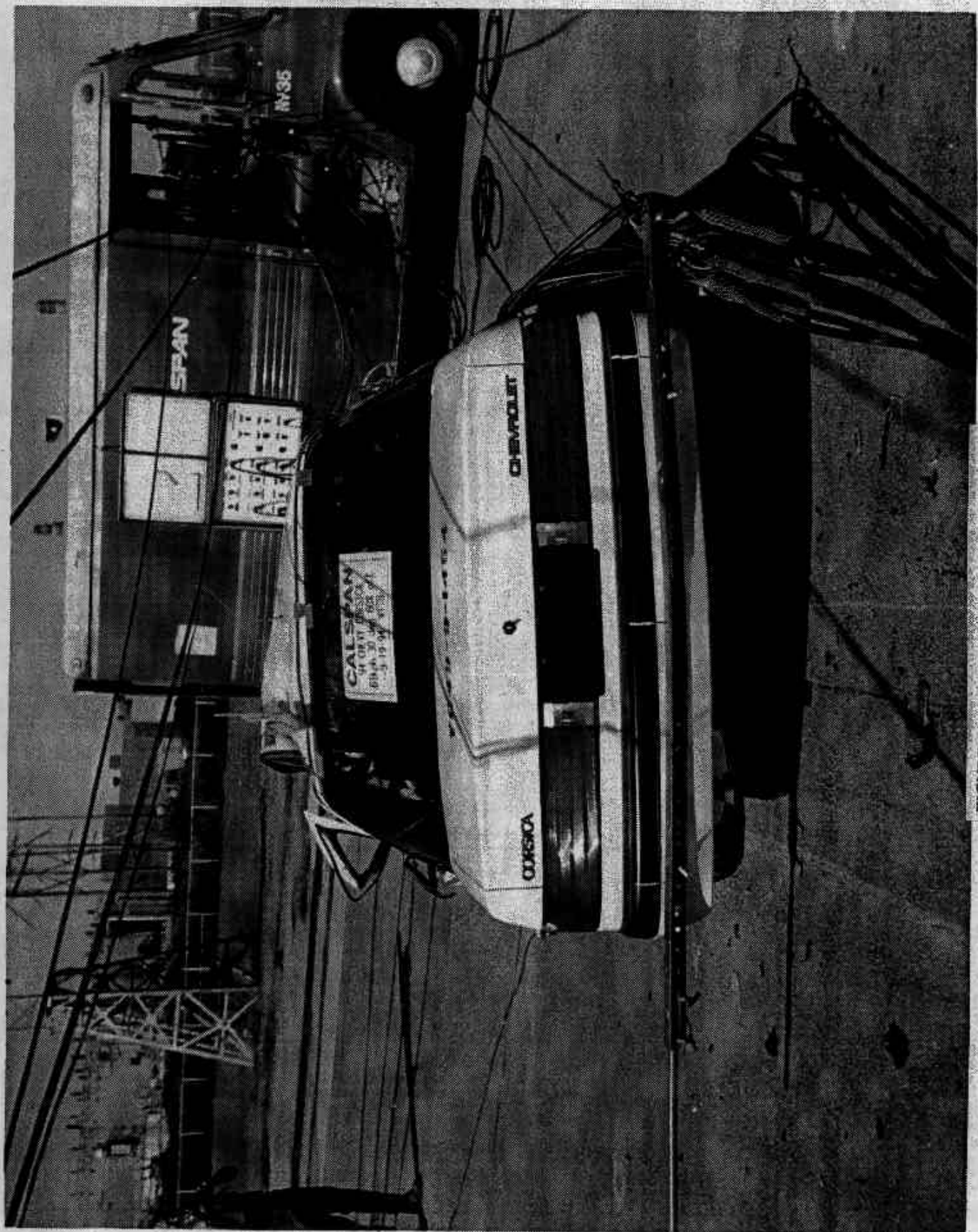


FIGURE A-14 POST-TEST REAR VIEW

A-17

8118-9

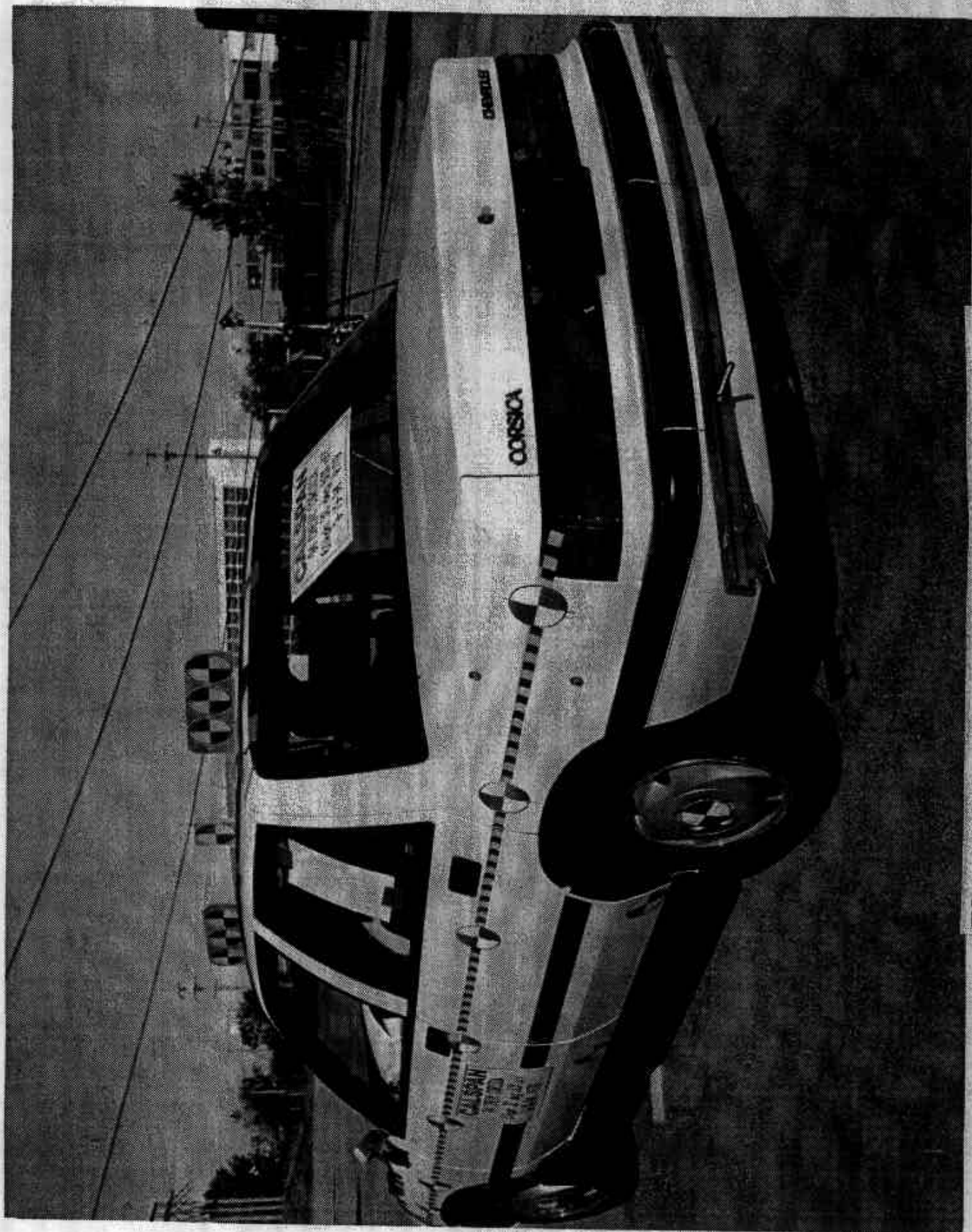


FIGURE A-15 PRE-TEST REAR LEFT THREE QUARTER VIEW

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FIGURE A-16 POST-TEST REAR LEFT THREE QUARTER VIEW

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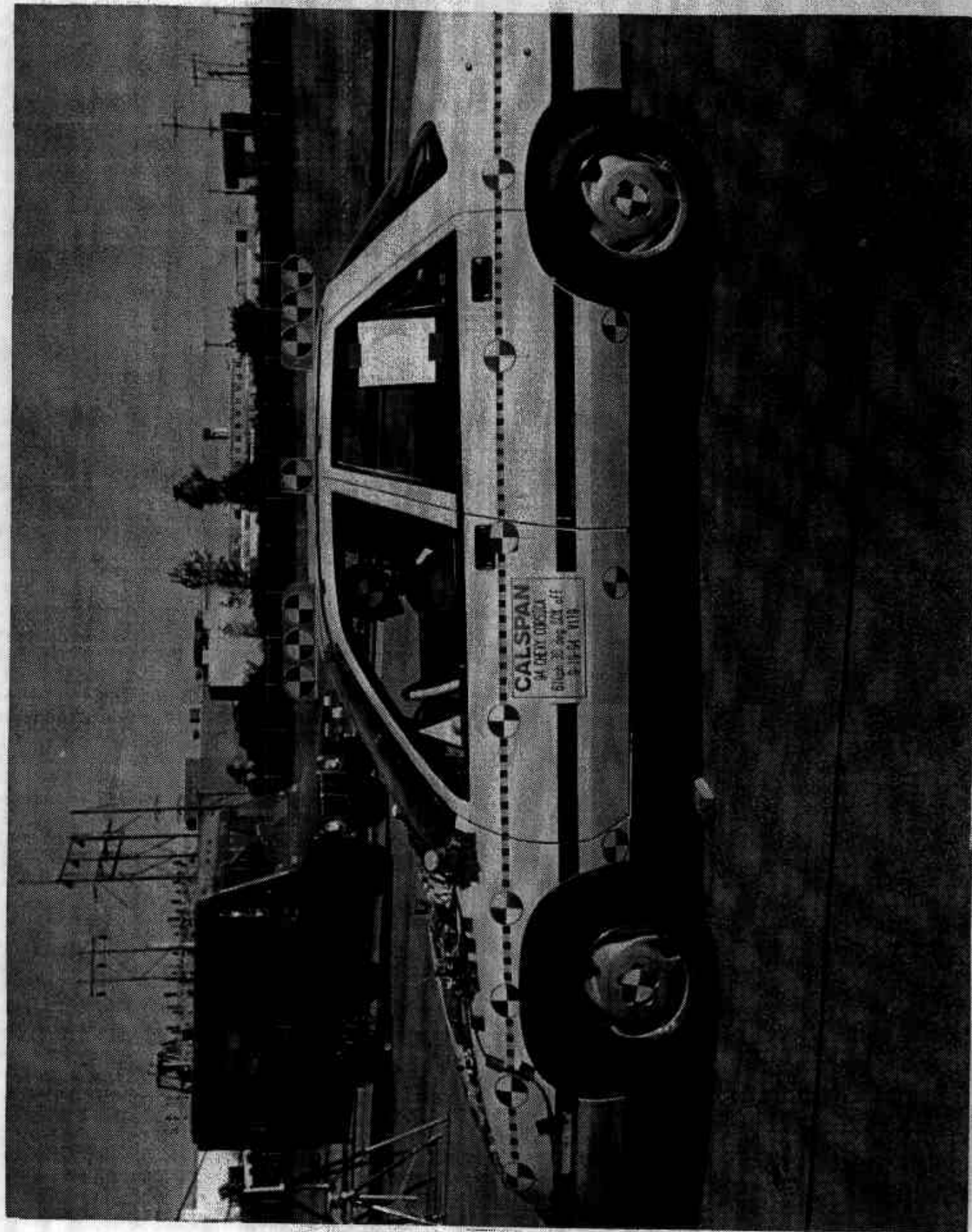


FIGURE A-17 PRE-TEST LEFT SIDE VIEW

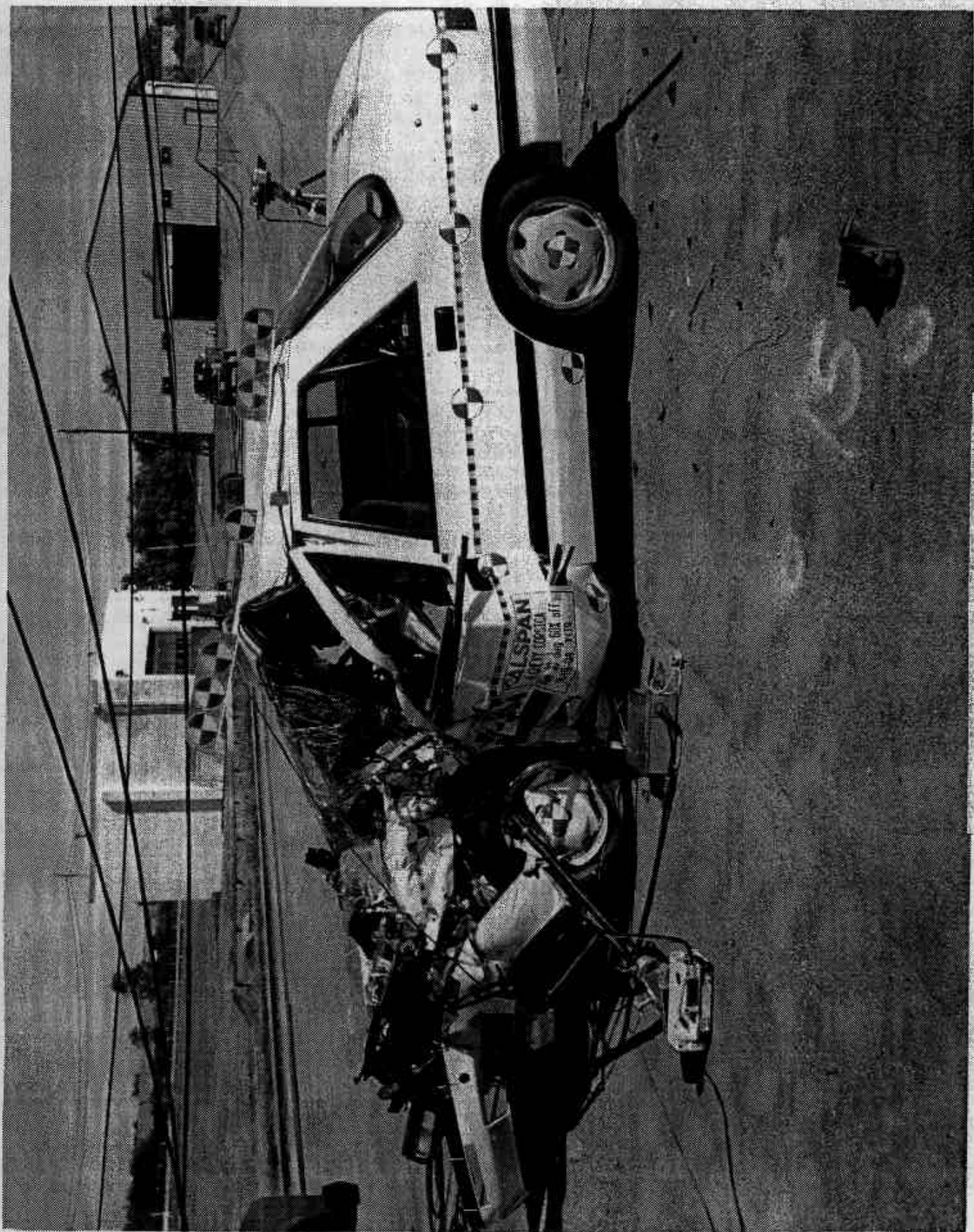


FIGURE A-18 POST-TEST LEFT SIDE VIEW

A-21

8118-9

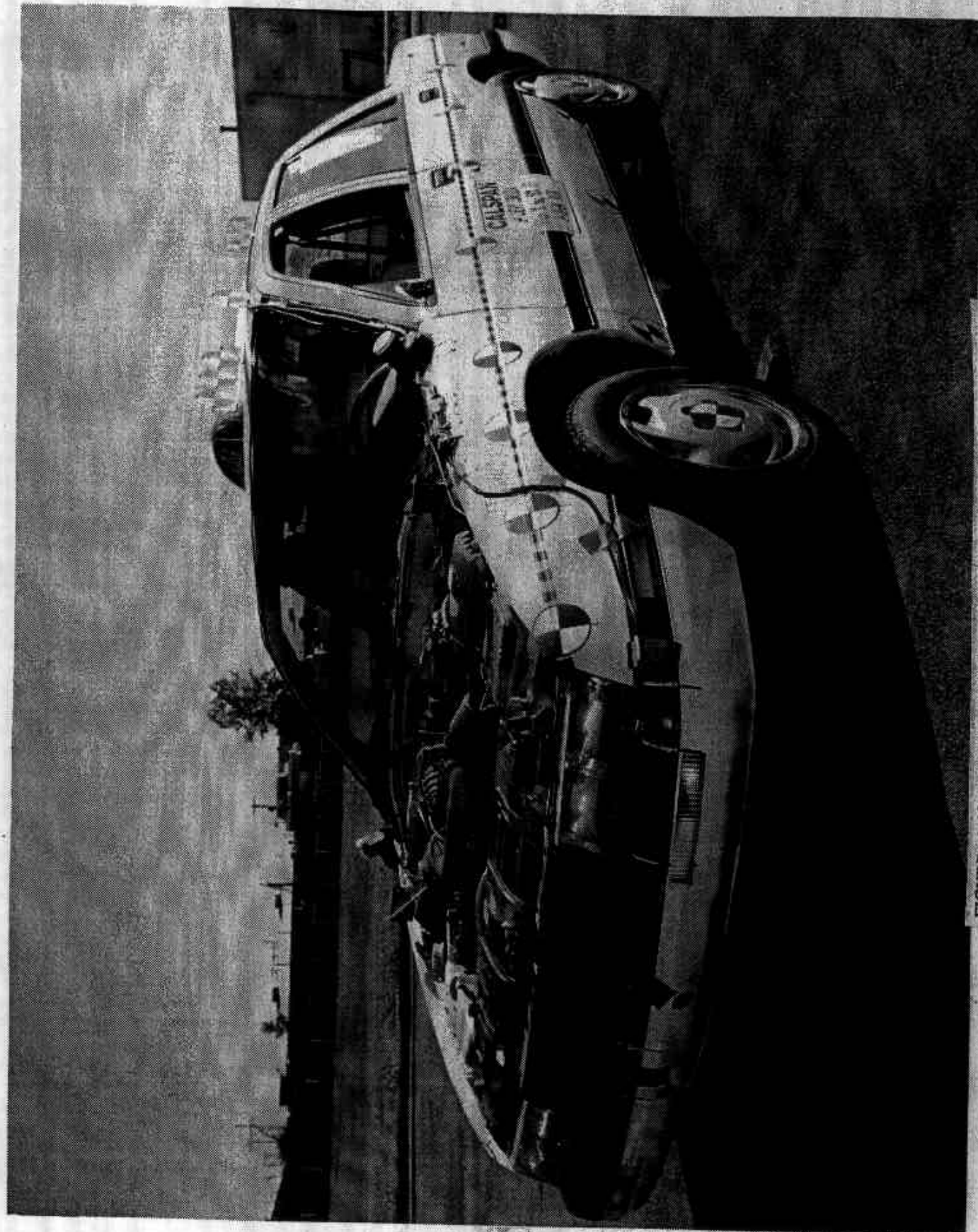


FIGURE A-19 PRE-TEST FRONT LEFT THREE QUARTER VIEW

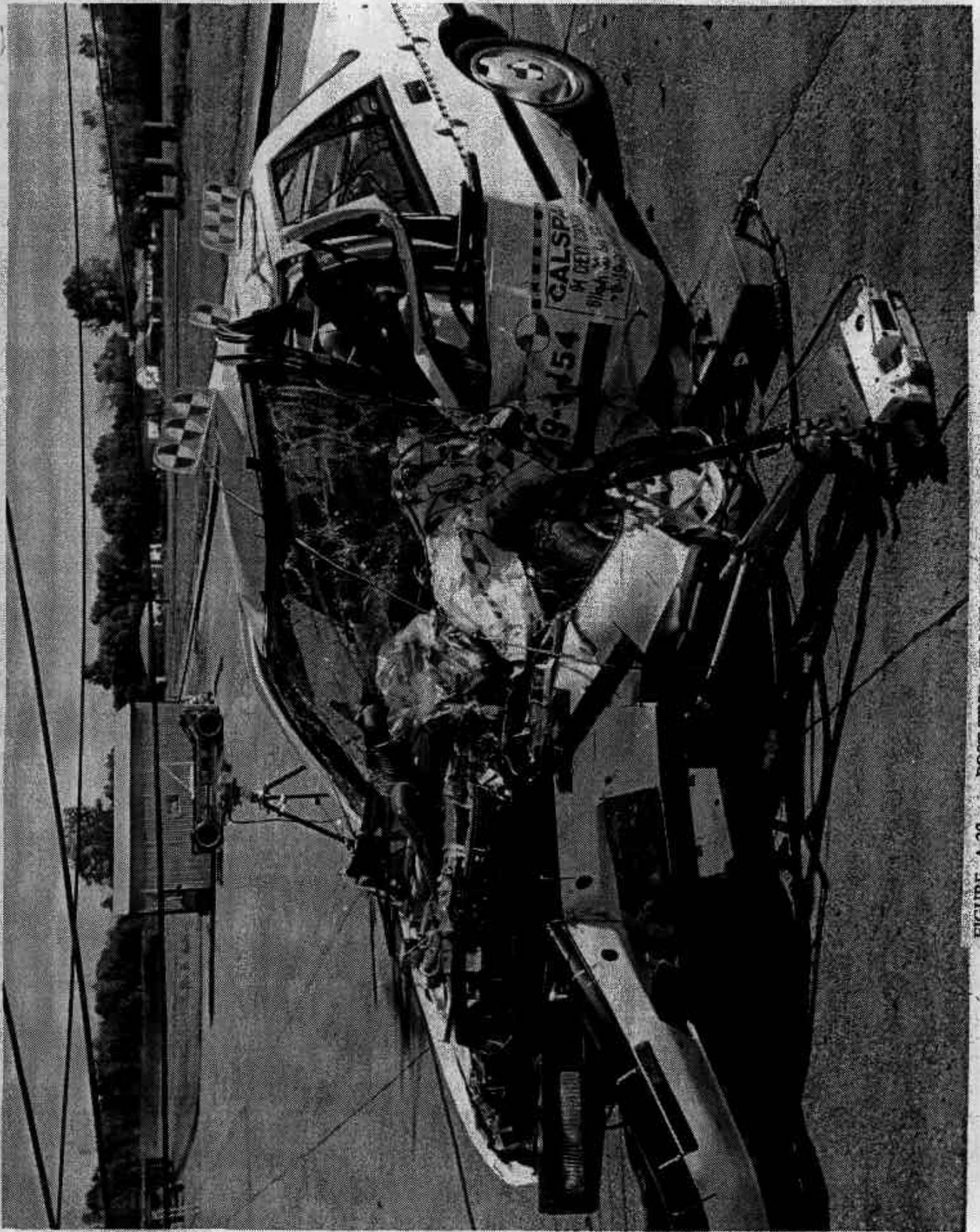


FIGURE A-20 POST-TEST FRONT LEFT THREE QUARTER VIEW



FIGURE A-21 PRE-TEST WINDSHIELD VIEW

A-24

8118-9



FIGURE A-22 POST-TEST WINDSHIELD VIEW

A-25

8118-9

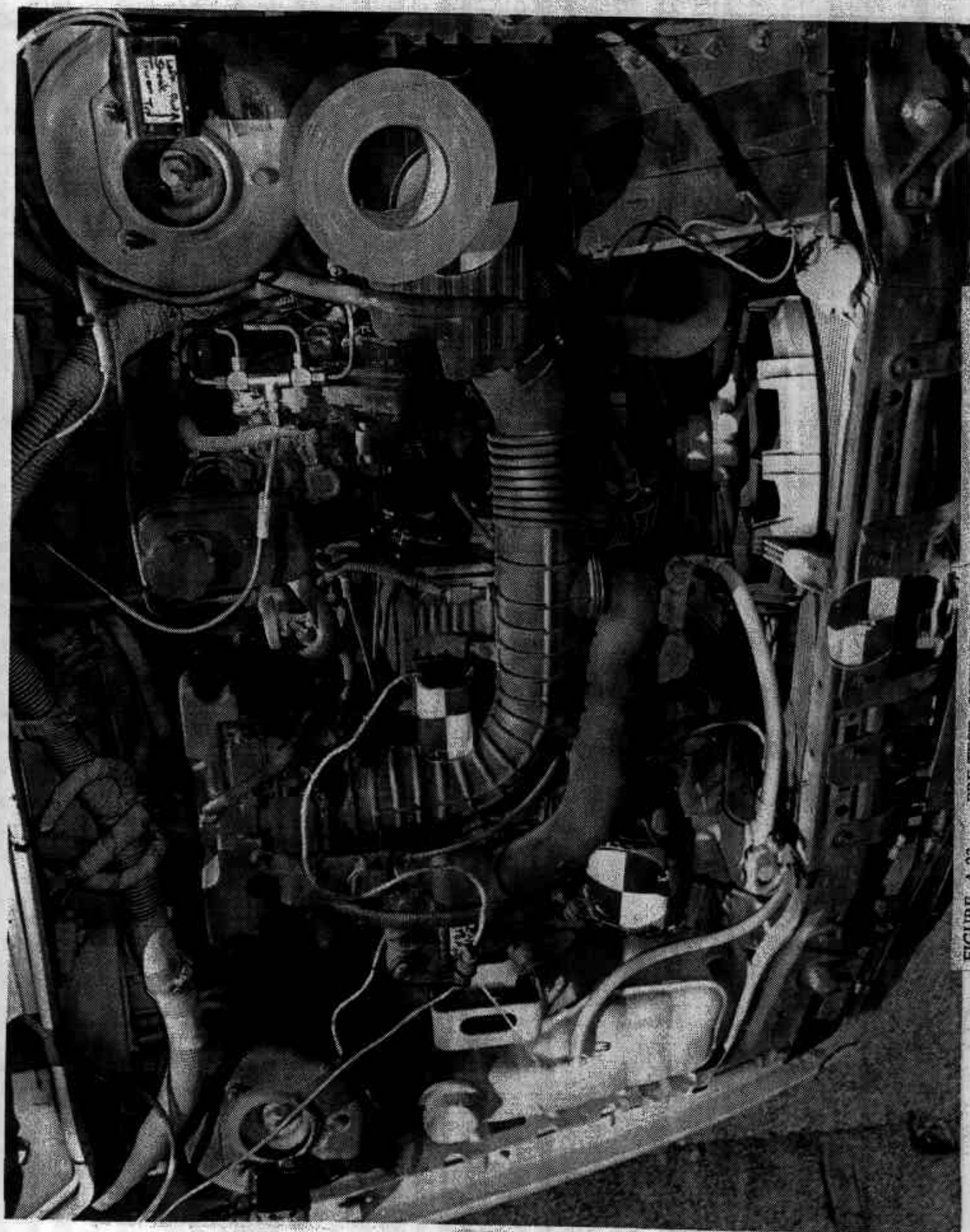


FIGURE A-23 PRE-TEST OVERHEAD ENGINE COMPARTMENT VIEW



FIGURE A-24 POST-TEST OVERHEAD ENGINE COMPARTMENT VIEW

A-27

8118-9

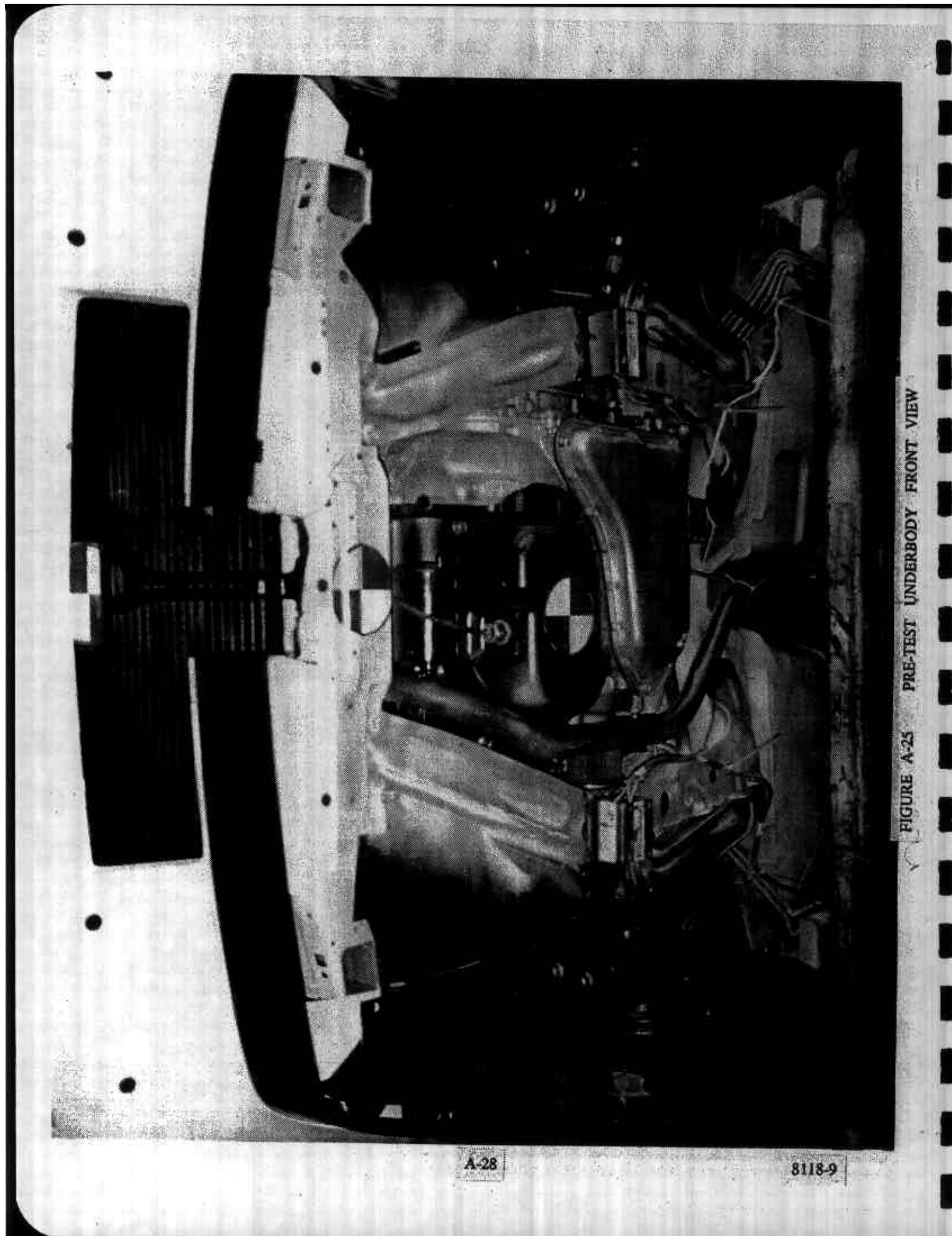


FIGURE A-25 PRE-TEST UNDERBODY FRONT VIEW

A-28

8118-9



FIGURE A-26 POST-TEST UNDERBODY FRONT VIEW

A-29

.8118-9

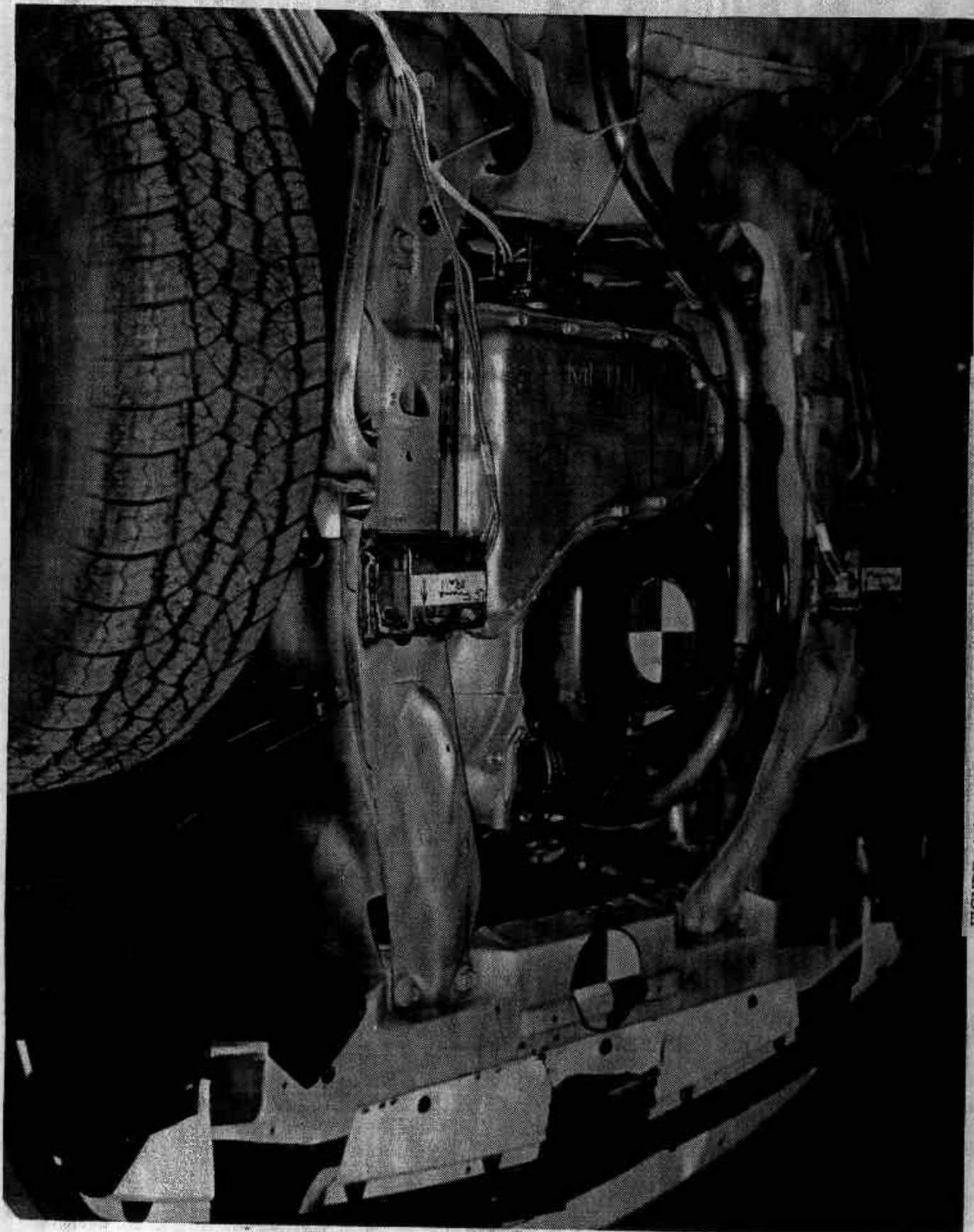


FIGURE A-27 PRE-TEST UNDERBODY FRONT SIDE VIEW

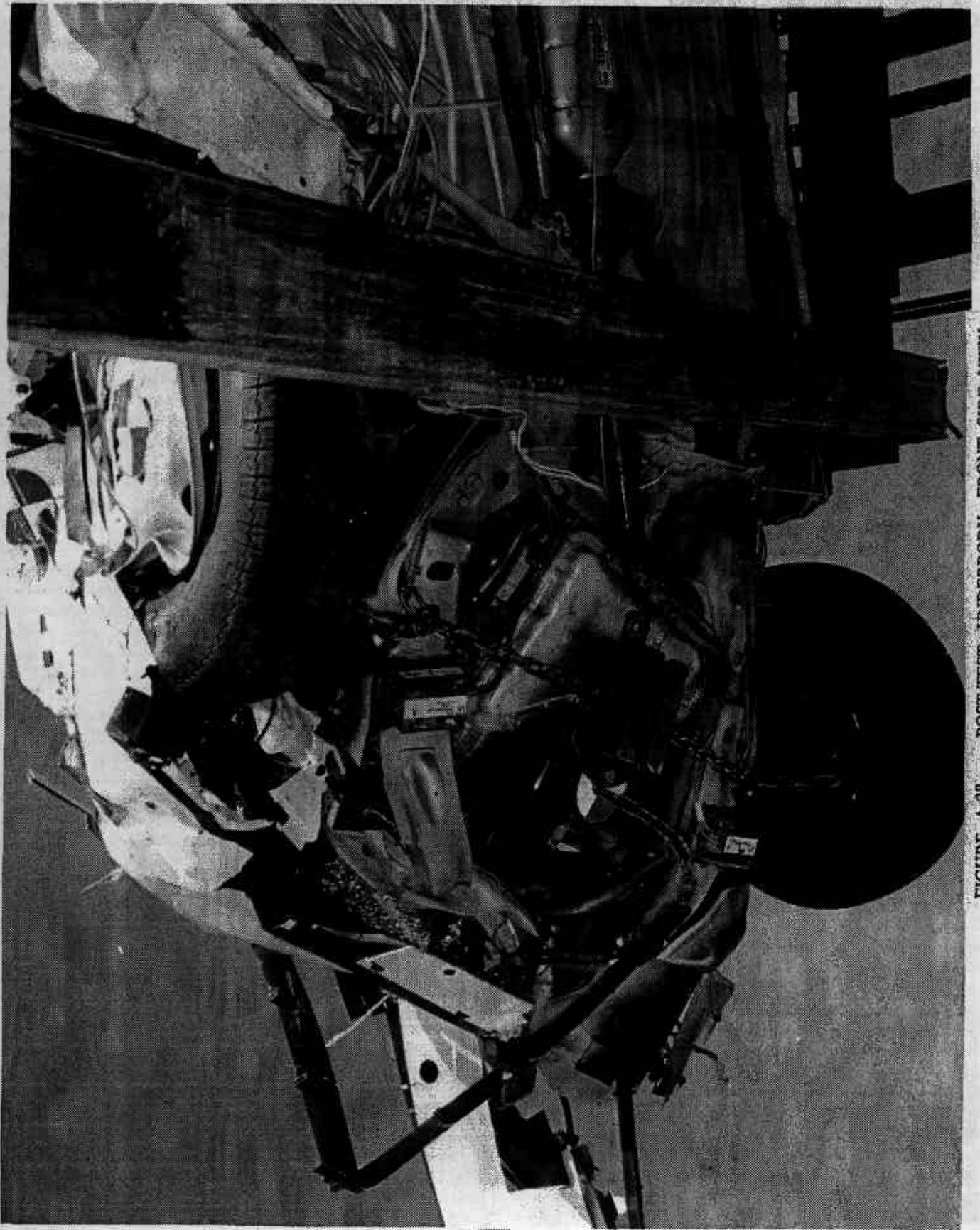


FIGURE A-28 POST-TEST UNDERBODY FRONT SIDE VIEW

A-31

8118-9

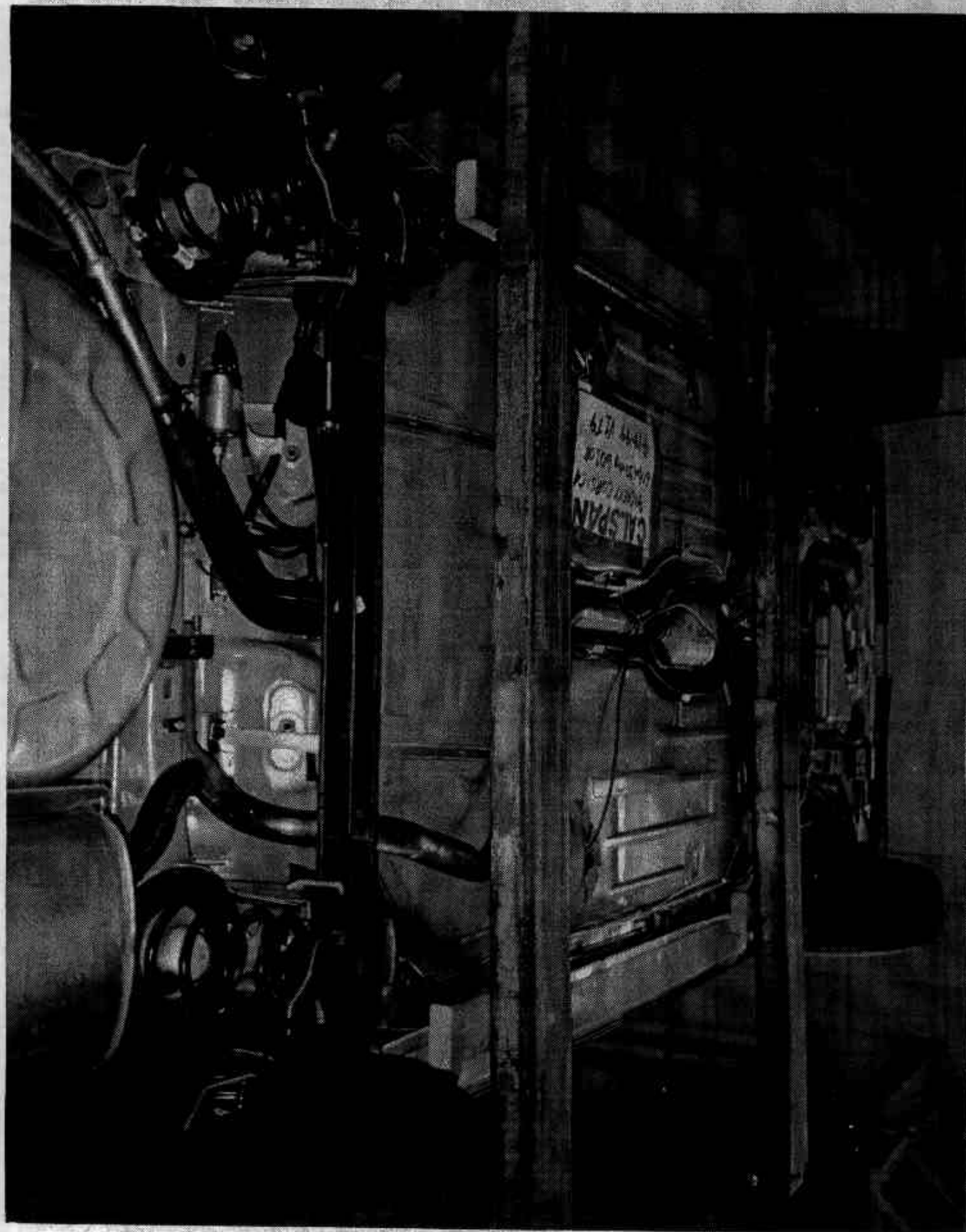


FIGURE A-29 PRE-TEST UNDERBODY REAR VIEW

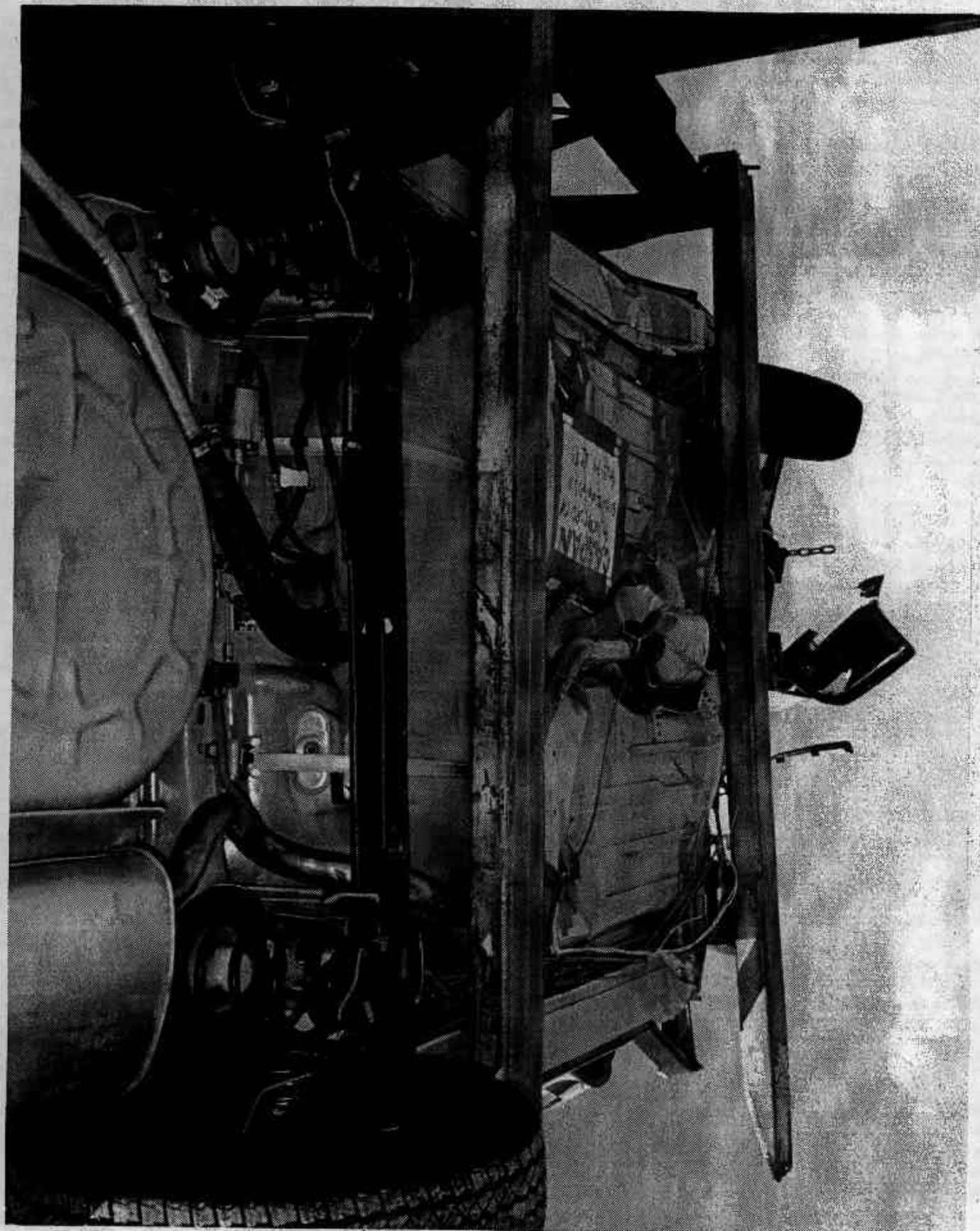


FIGURE A-30 POST-TEST UNDERBODY REAR VIEW

A-33

8118-9



FIGURE A-31 PRE-TEST DRIVER POSITION VIEW



FIGURE A-32 POST-TEST DRIVER POSITION VIEW

A-35

8118-9

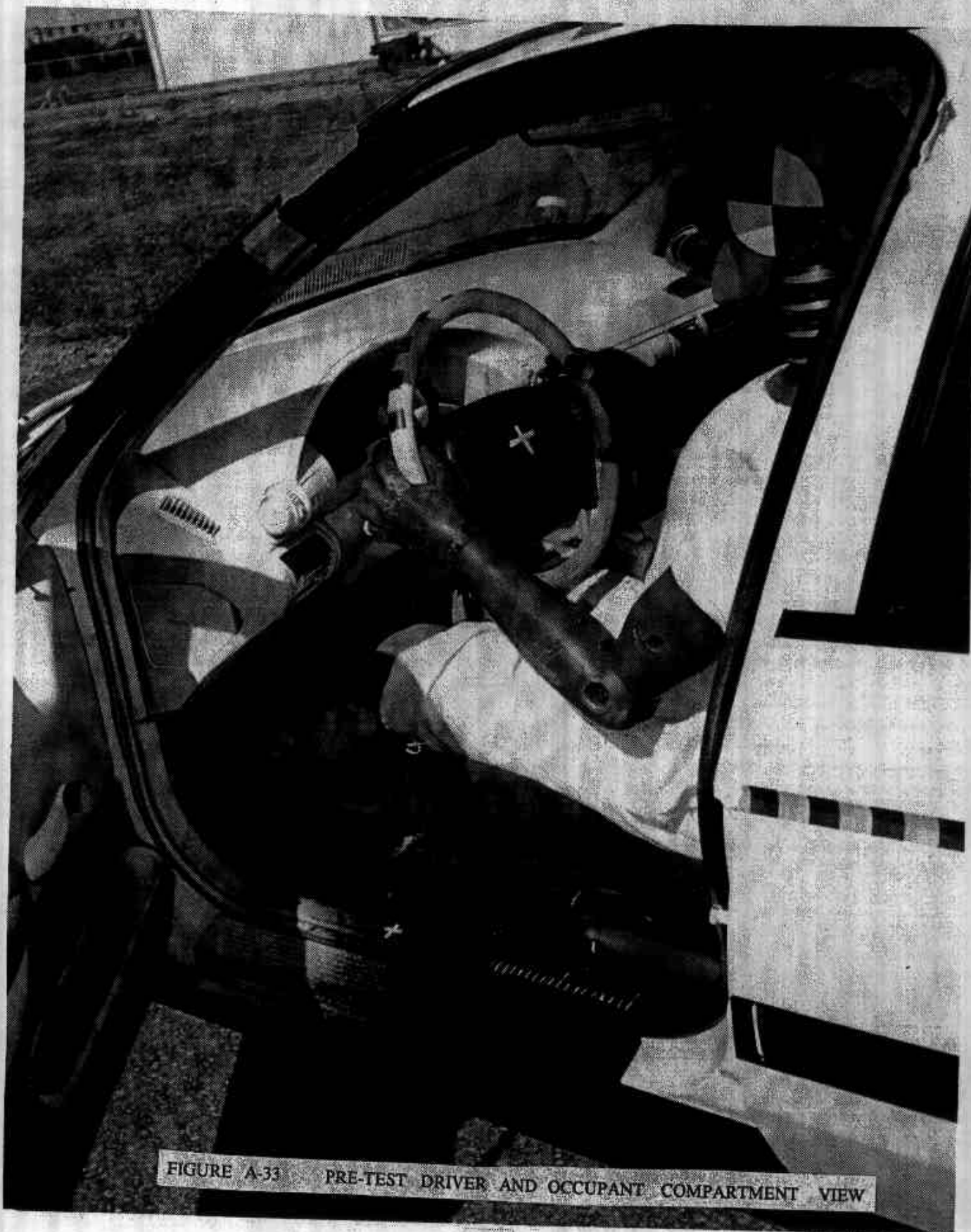


FIGURE A-33 PRE-TEST DRIVER AND OCCUPANT COMPARTMENT VIEW



FIGURE A-34 POST-TEST DRIVER AND OCCUPANT COMPARTMENT VIEW

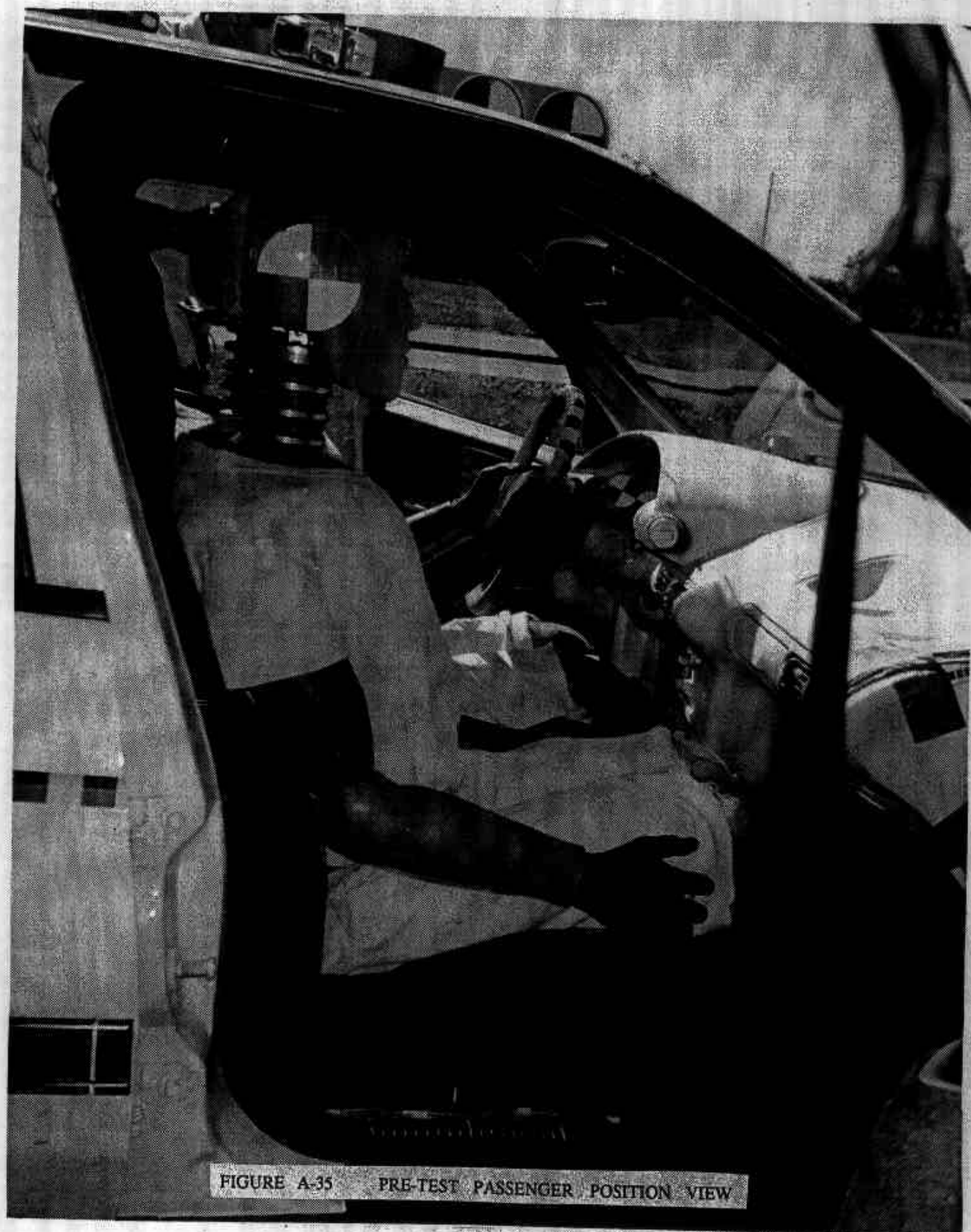


FIGURE A-35 PRE-TEST PASSENGER POSITION VIEW

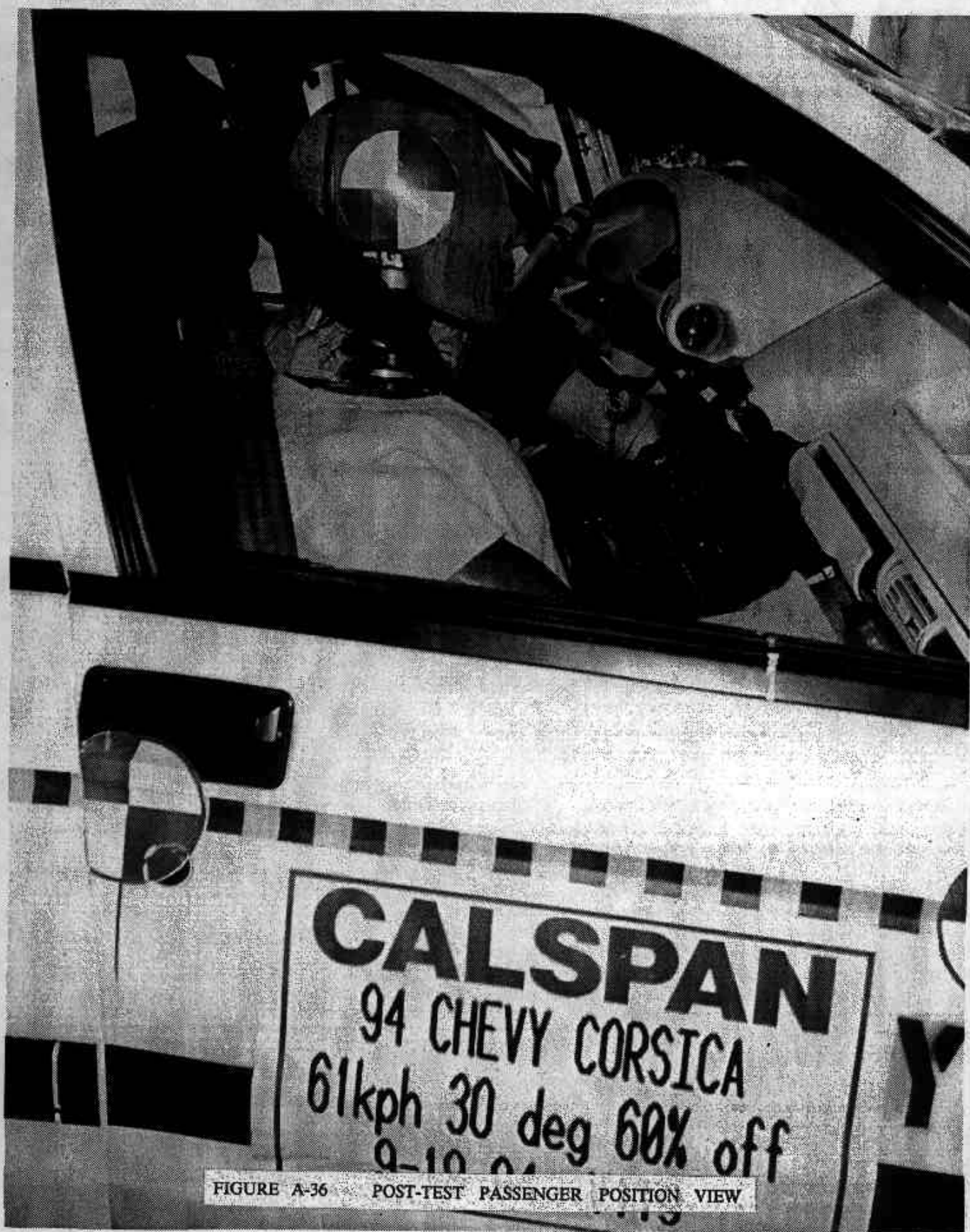


FIGURE A-36 POST-TEST PASSENGER POSITION VIEW

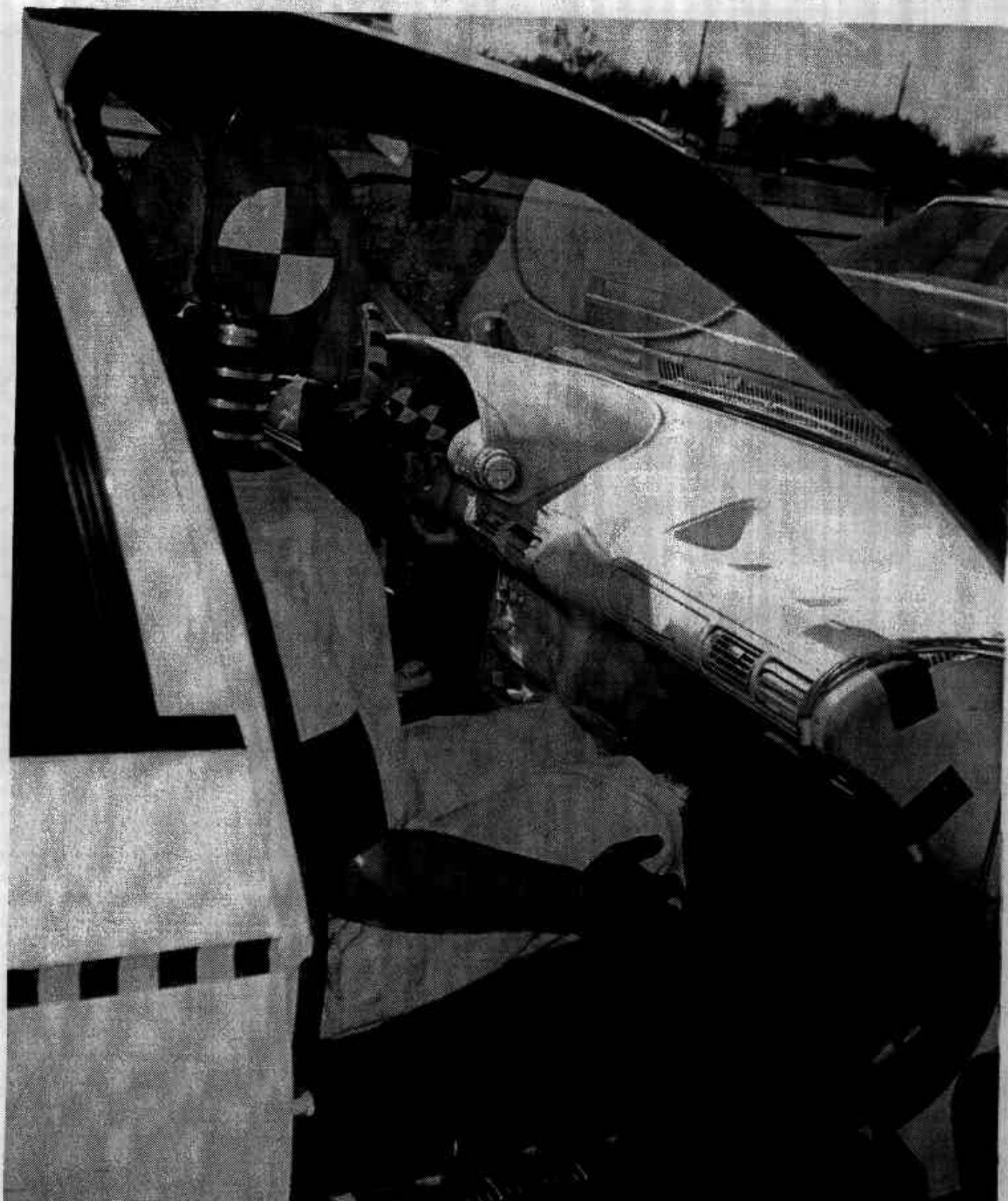


FIGURE A-37 PRE-TEST PASSENGER AND OCCUPANT COMPARTMENT VIEW

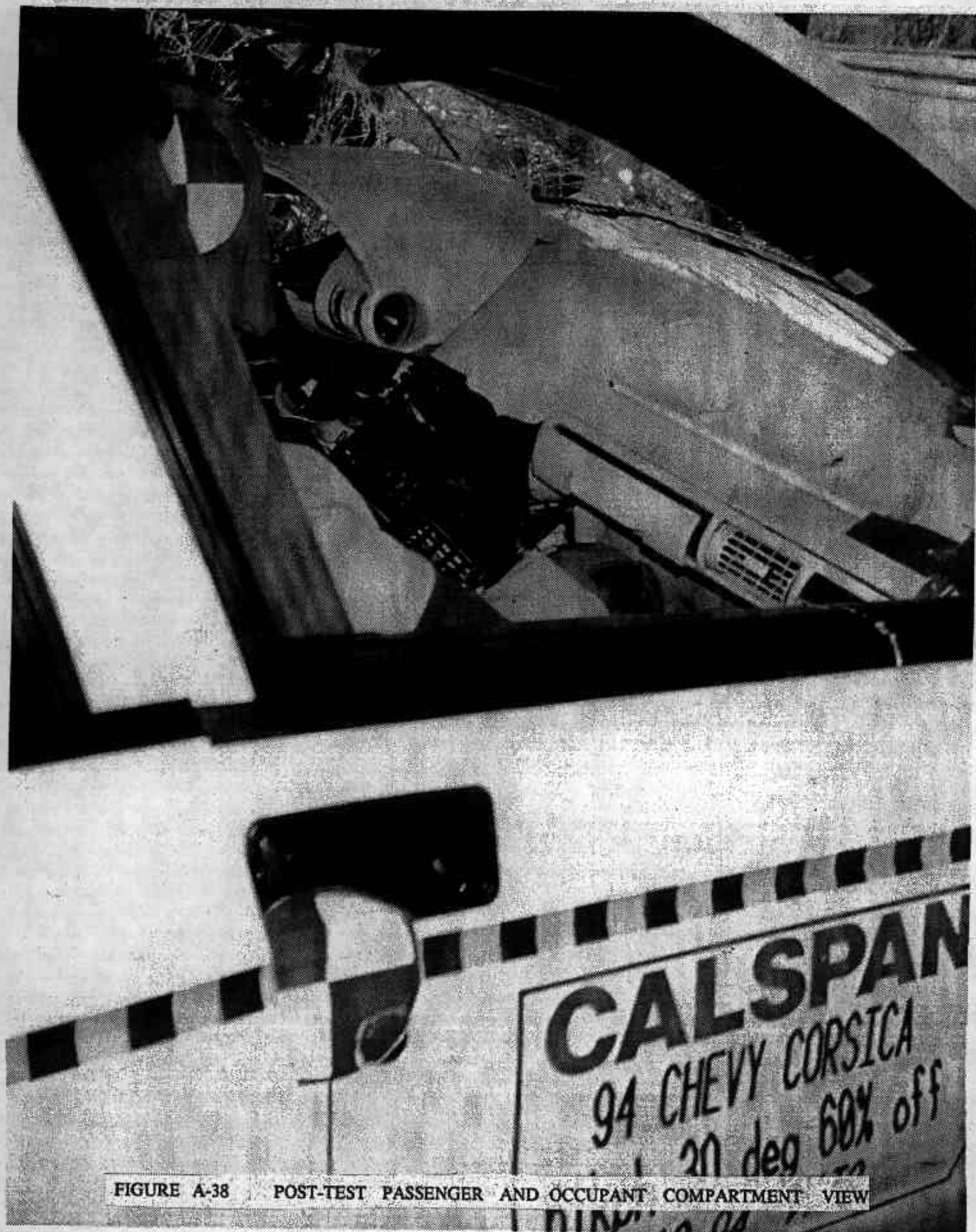


FIGURE A-38 POST-TEST PASSENGER AND OCCUPANT COMPARTMENT VIEW

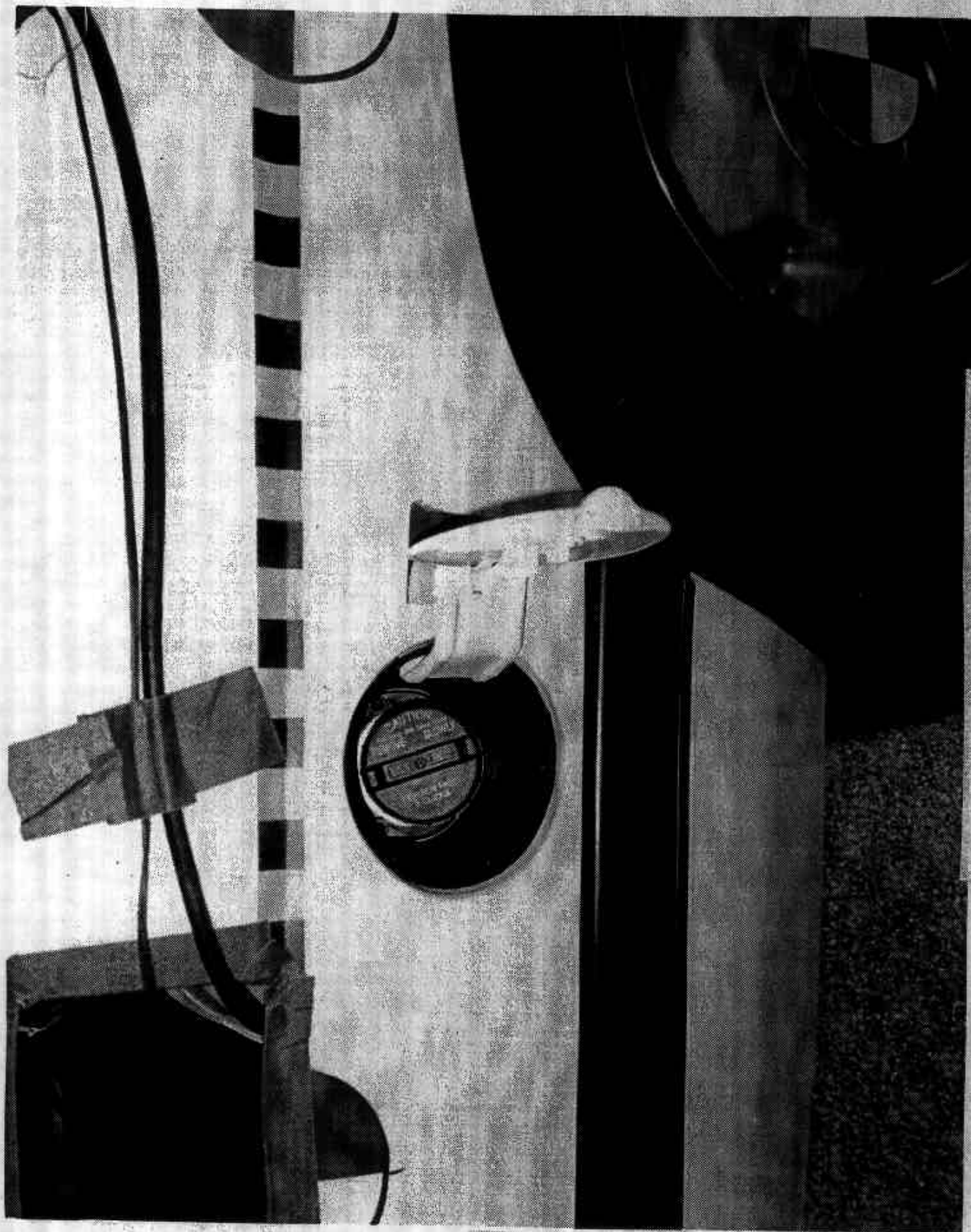
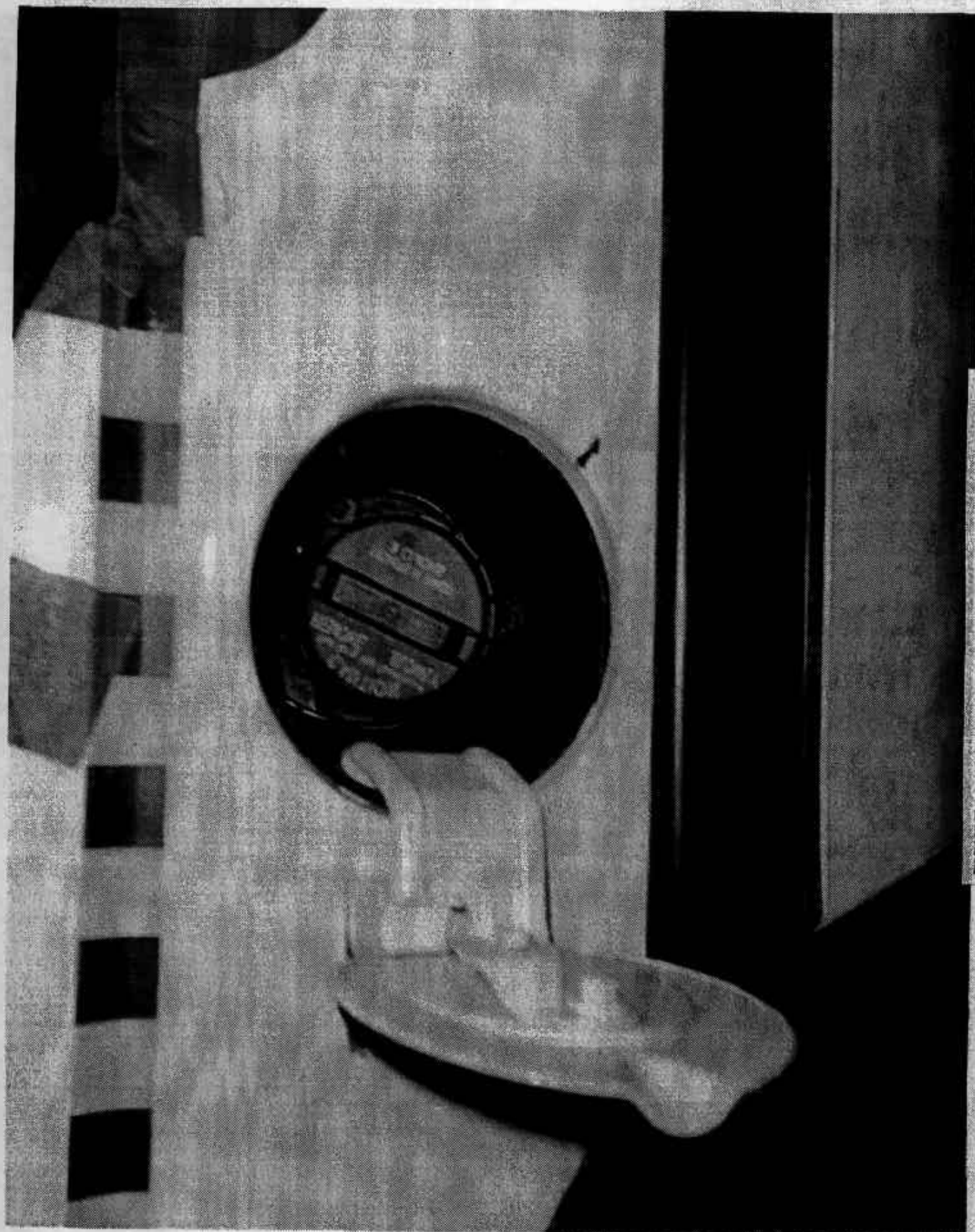


FIGURE A-39 PRE-TEST FUEL FILLER CAP VIEW

FIGURE A-40 POST-TEST FUEL FILLER CAP VIEW



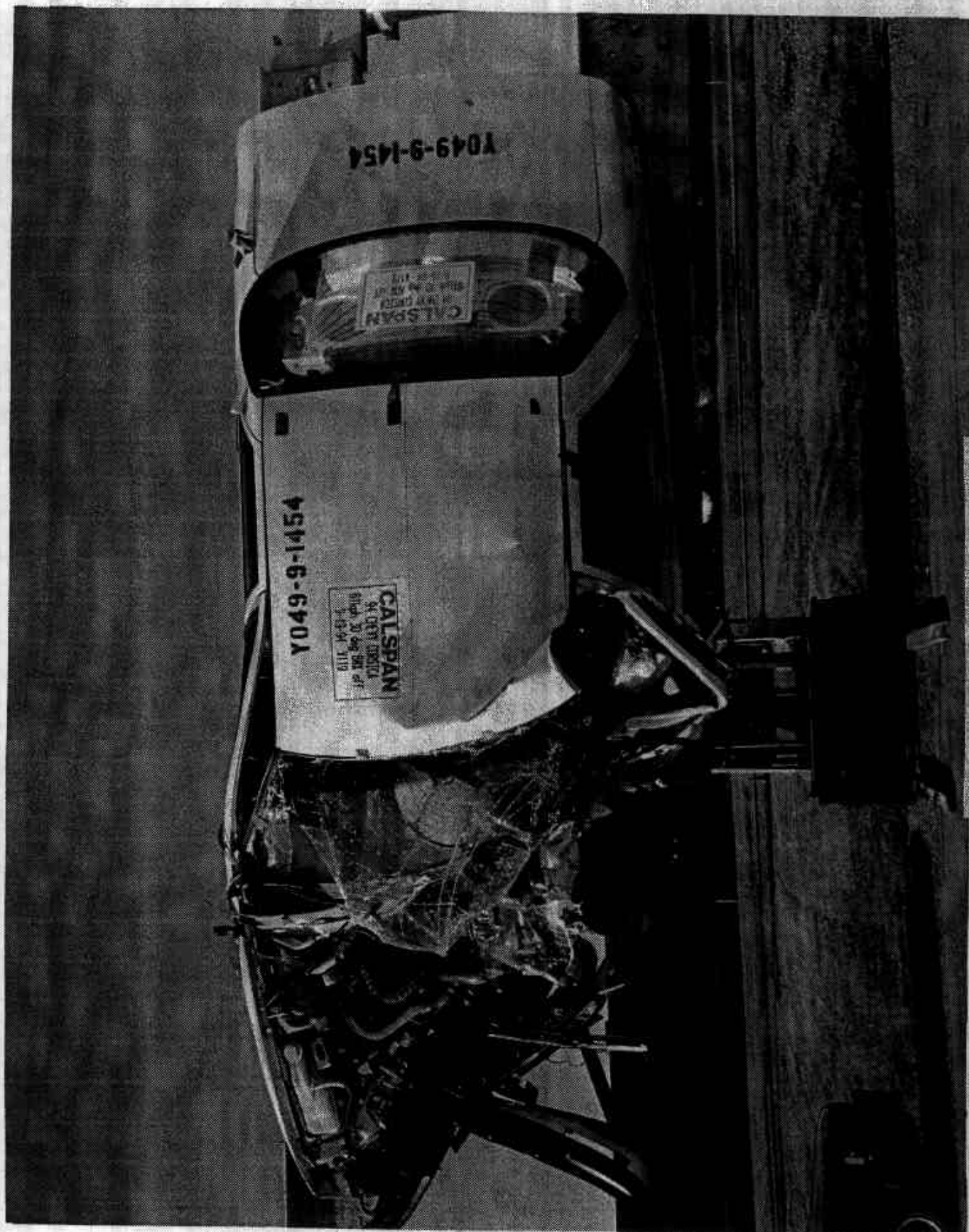


FIGURE A-41 POST-TEST TOP VIEW

VEHICLE 2 PHOTOGRAPHS

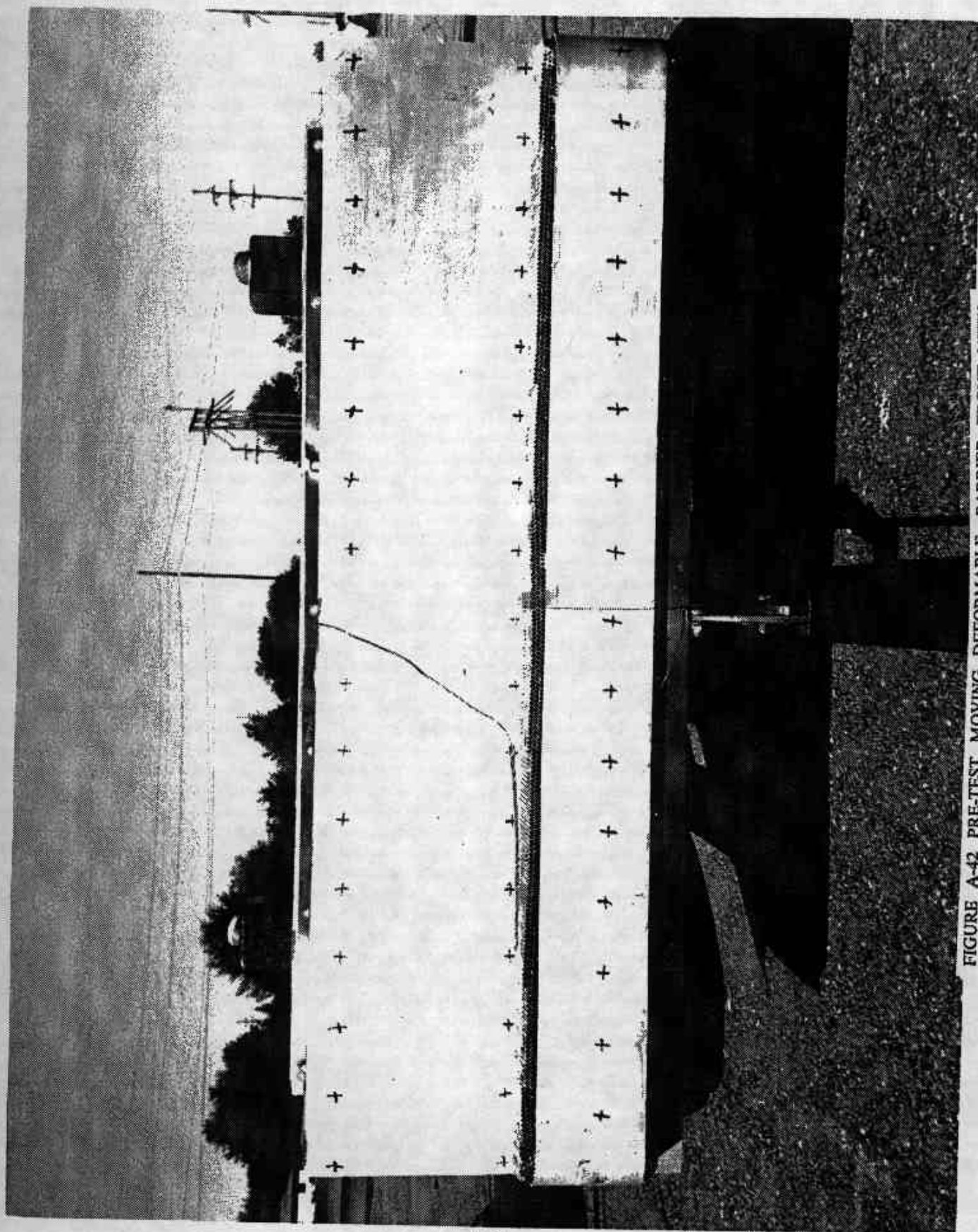


FIGURE A-42 PRE-TEST MOVING DEFORMABLE BARRIER FRONT VIEW



FIGURE A-43 POST-TEST MOVING DEFORMABLE BARRIER FRONT VIEW

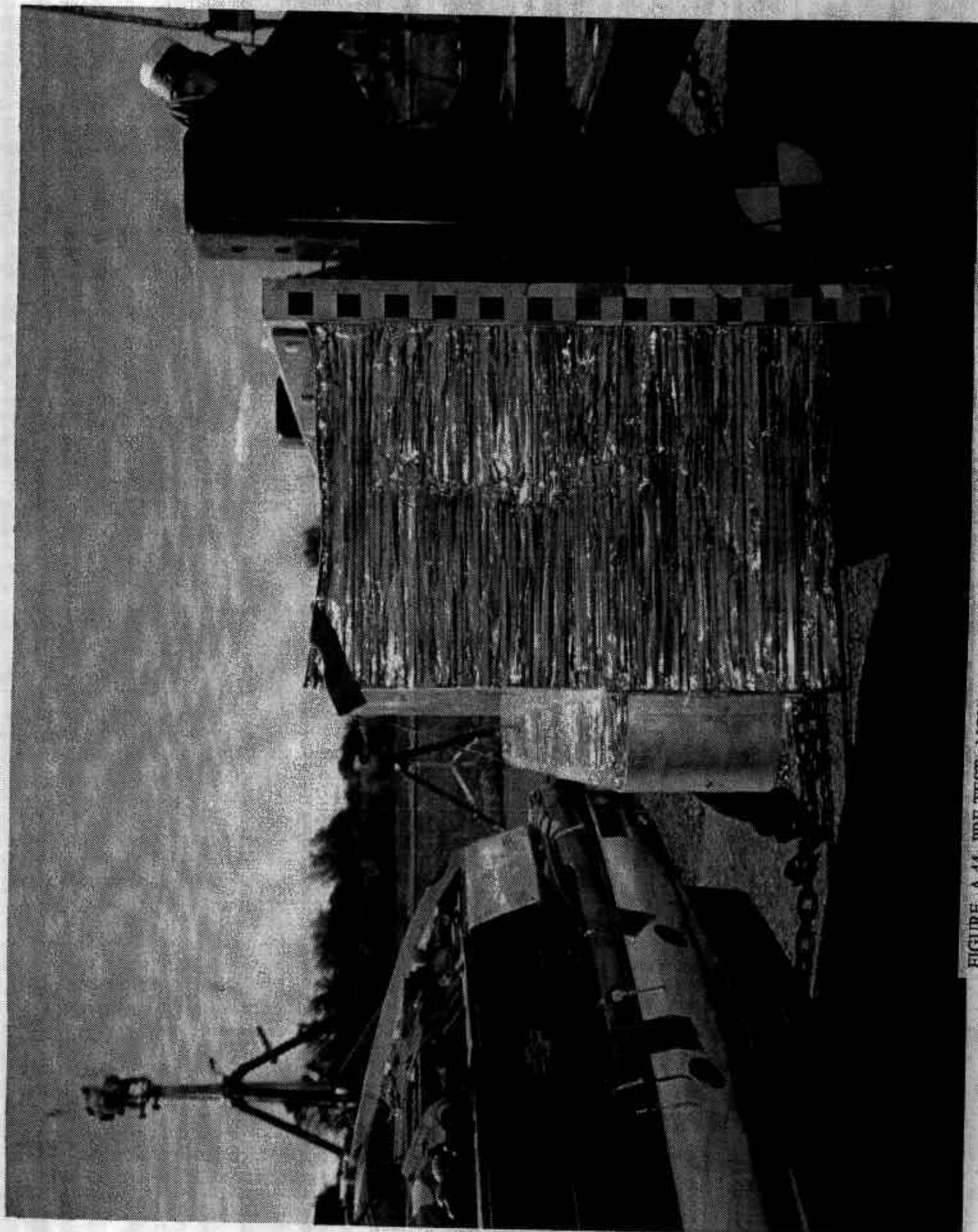


FIGURE A-44 PRE-TEST MOVING DEFORMABLE BARRIER LEFT SIDE VIEW

A-48

8118-9

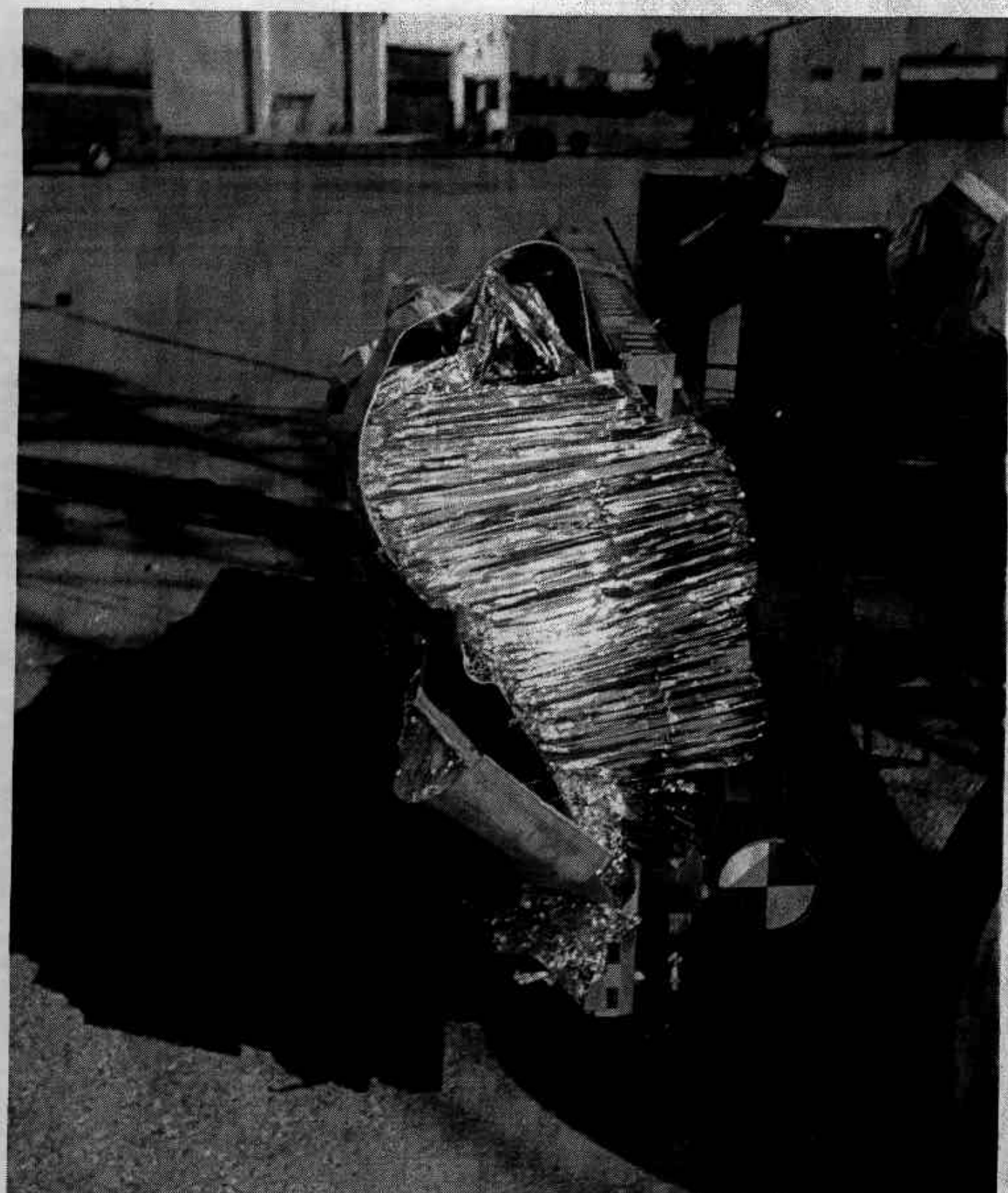


FIGURE A-45 POST-TEST MOVING DEFORMABLE BARRIER LEFT SIDE VIEW

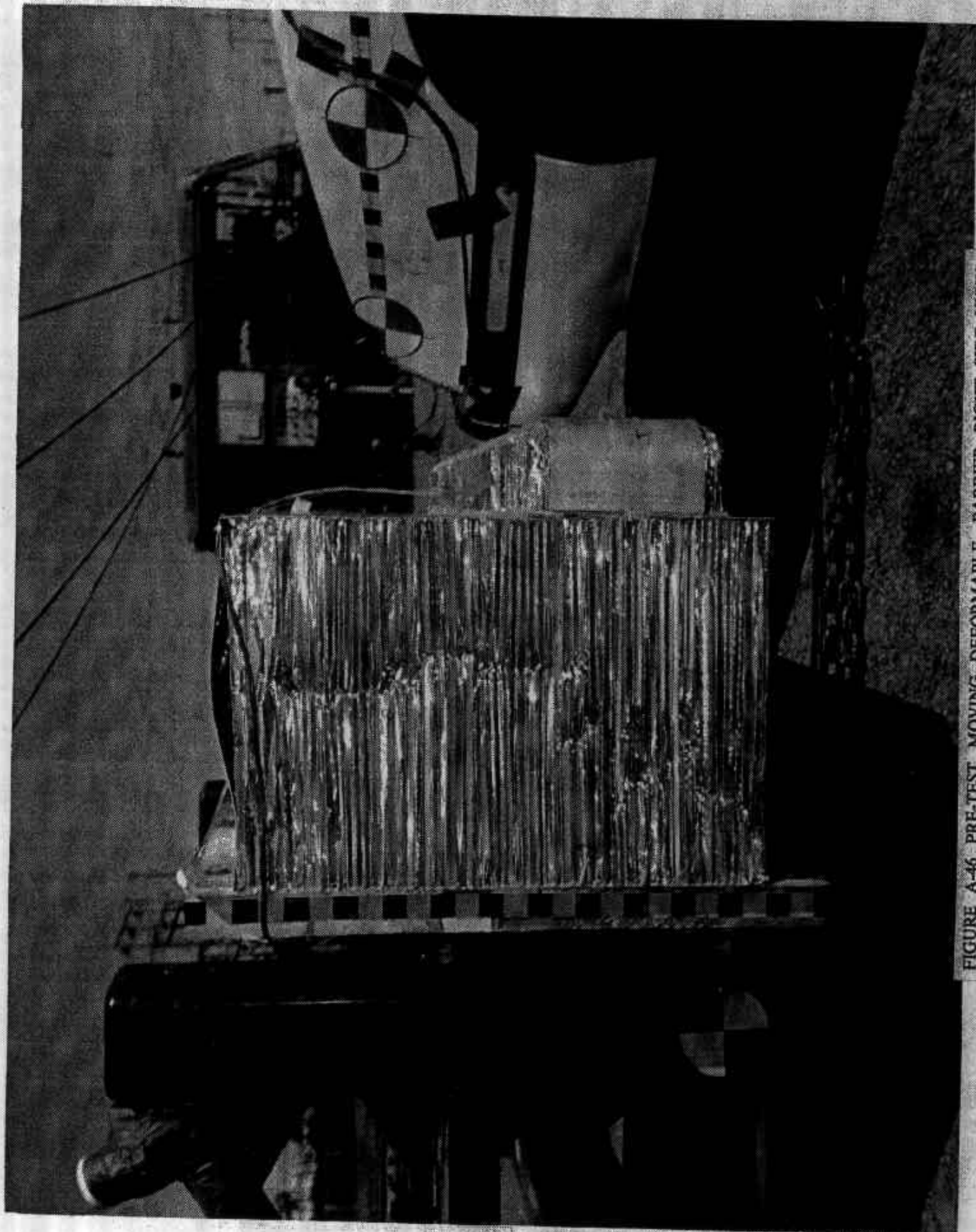


FIGURE A-46 PRE-TEST MOVING DEFORMABLE BARRIER RIGHT SIDE VIEW



FIGURE A-47 POST-TEST MOVING DEFORMABLE BARRIER RIGHT SIDE VIEW

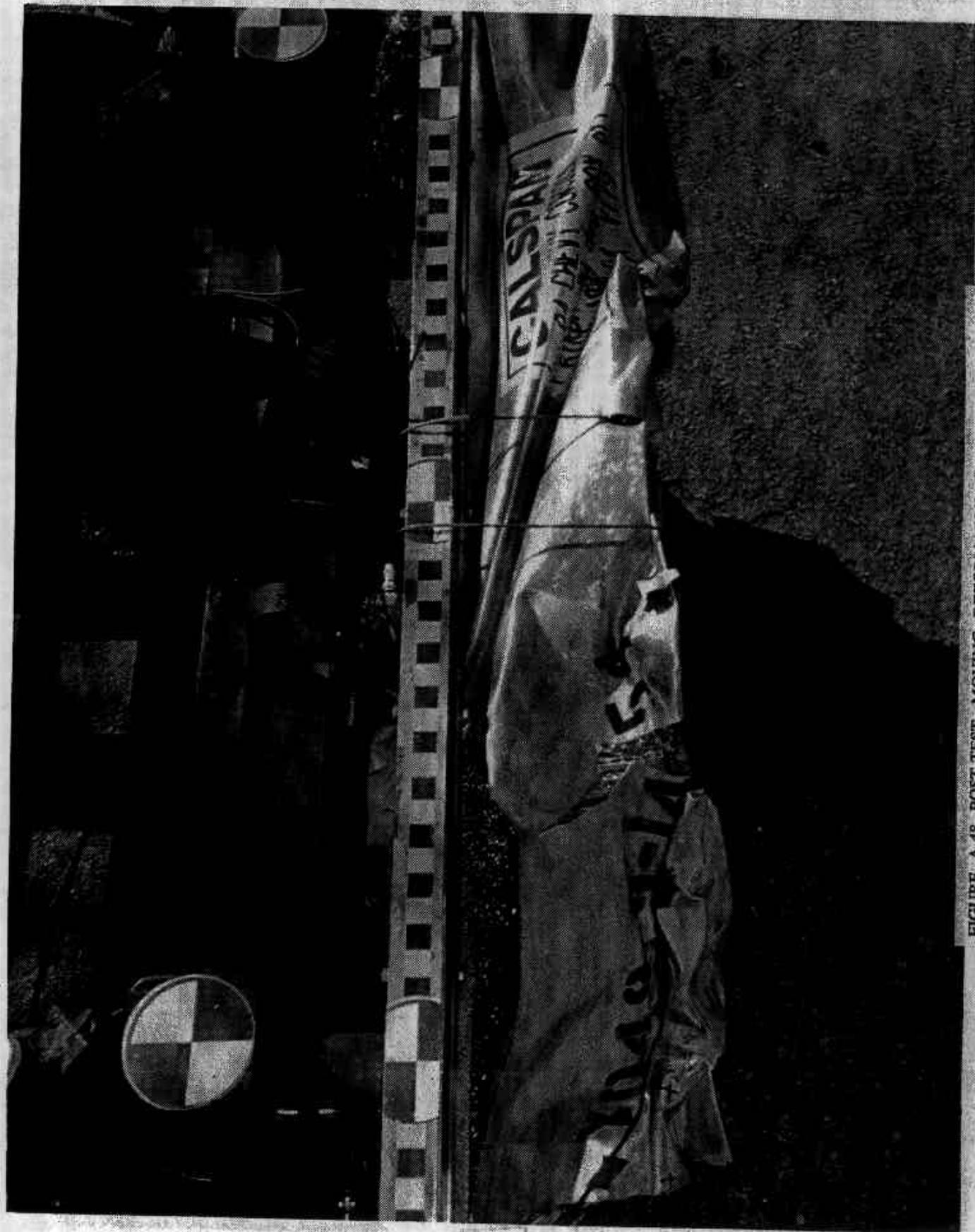


FIGURE A-48 POST-TEST MOVING DEFORMABLE BARRIER TOP VIEW

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA

Key: V1 - Vehicle 1
V2 - Vehicle 2

FACILITY: TRACK
 RUN #: 1454
 SERIES #: 1

TEST DATE: 19 Sep 1994
 TEST TIME: 15:20:00
 BOARD: A

TITLE: VTV TEST #9

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	V1-P1 Head X	Gs	101.1	106.3	-82.3	64.3	1000.0
2	V1-P1 Head Y	Gs	20.2	125.2	-85.4	106.8	1000.0
3	V1-P1 Head Z	Gs	146.1	106.3	-56.2	79.8	1000.0
4	V1-P1 HD9Y (X)	Gs	64.1	107.4	-62.4	62.6	1000.0
5	V1-P1 Chest X	Gs	36.6	111.8	-59.2	69.8	180.0
6	V1-P1 Chest Y	Gs	33.8	80.0	-7.7	50.0	180.0
7	V1-P1 Chest Z	Gs	30.9	63.1	-17.7	84.0	180.0
8	V1-P1 HD9Y (Z)	Gs	136.9	106.4	-70.8	79.9	1000.0
9	V1-P1 Upper Neck Fx	Nwt	884.3	110.2	-584.0	83.2	1000.0
10	V1-P1 Upper Neck Fy	Nwt	643.1	57.2	-541.4	79.1	1000.0
11	V1-P1 Upper Neck Fz	Nwt	2652.1	65.3	-2264.0	109.3	1000.0
* 12	V1-P1 HD9X (Y)	Gs	31.2	145.2	-193.5	144.7	1000.0
13	V1-P1 Upper Neck Mx	Nwt-M	70.8	79.0	-151.5	113.6	600.0
14	V1-P1 Upper Neck My	Nwt-M	41.9	109.4	-75.5	83.3	600.0
15	V1-P1 Upper Neck Mz	Nwt-M	33.6	77.5	-71.0	113.2	600.0
16	V1-P1 HD9X (Z)	Gs	191.2	105.8	-60.8	85.0	1000.0
17	Head Resultant	Gs	196.9	106.3	.1	23.3	1000.0
18	Chest Resultant	Gs	60.8	69.8	.1	1.3	180.0
19	Upper Neck Force Res.	Nwt	2726.2	65.3	2.4	22.6	1000.0
20	Upper Neck Moment Res.	Nwt-M	167.2	113.6	.0	-8.2	600.0

* Noise spikes in data at 125 ms and 140ms

36 ms Fixed Duration HIC SUMMARY: Head Resultant

hic: 1578.47
 t1 = 104.640 msec
 t2 = 109.920 msec
 Average G's Over Hic Duration = 154.97

CLIP SUMMARY: Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 54.165 G's
 Tstart = 68.7600 ms
 Tend = 71.8800 ms
 CSI = 581.004

FACILITY: TRACK
RUN #: 1454
SERIES #: 1

TEST DATE: 19 Sep 1994
TEST TIME: 15:20:00
BOARD: B

TITLE: VTV TEST #9

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	msec	MINIMUM AMP	msec	FILTER CLASS
1	V1-P2 Head X	Gs	19.6	269.6	-100.0	85.8	1000.0
2	V1-P2 Head Y	Gs	87.3	79.7	-45.5	269.8	1000.0
3	V1-P2 Head Z	Gs	28.9	83.2	-16.2	166.9	1000.0
4	V1-P1 Chest Disp.	mm	.0	-1.1	-20.4	60.1	180.0
5	V1-P2 Chest X	Gs	4.1	310.8	-75.5	82.7	180.0
6	V1-P2 Chest Y	Gs	96.6	81.5	-6.9	282.7	180.0
7	V1-P2 Chest Z	Gs	22.4	87.6	-7.6	174.4	180.0
8	V1-P1 Torso Belt Load	Nwt	3380.9	64.4	-56.7	16.8	60.0
9	V1-P1 Lower Neck Fx	Nwt	2588.0	69.0	-1275.7	110.5	1000.0
10	V1-P1 Lower Neck Fy	Nwt	8908.2	82.8	-2920.3	56.6	1000.0
11	V1-P1 Lower Neck Fz	Nwt	5156.2	63.5	-589.7	174.1	1000.0
12	V1-P1 HD9Z (X)	Gs	179.1	105.5	-102.8	63.1	1000.0
13	V1-P1 Lower Neck Mx	Nwt-M	66.1	60.5	-401.4	84.4	600.0
14	V1-P1 Lower Neck My	Nwt-M	68.9	110.3	-394.5	69.1	600.0
15	V1-P1 Lower Neck Mz	Nwt-M	77.9	58.7	-365.7	83.9	600.0
* 16	V1-P1 HD9Z (Y)	Gs	180.4	167.9	-184.8	181.7	1000.0
17	V1-P2 Head Resultant	Gs	129.6	85.8	.0	10.4	1000.0
18	V1-P2 Chest Resultant	Gs	103.3	81.6	.0	-12.7	180.0
19	V1-P1 Lower Neck F(res)	Nwt	9634.9	82.8	3.4	-.1	1000.0
20	V1-P1 Lower Neck M(res)	Nwt-M	615.6	83.2	.2	-10.4	600.0

* Data questionable after 80ms

36 ms Fixed Duration HIC SUMMARY: V1-P2 Head Resultant

hic: 622.64
t1 = 78.120 msec
t2 = 107.160 msec
Average G's Over Hic Duration = 54.01

CLIP SUMMARY: V1-P2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 71.460 G's
Tstart = 80.2800 ms
Tend = 83.4000 ms
CSI = 755.132

FACILITY: TRACK
RUN #: 1454
SERIES #: 1

TEST DATE: 19 Sep 1994
TEST TIME: 15:20:00
BOARD: C

TITLE: VTV TEST #9

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	V1-P1 Lt Lower Tibia Fy	Nwt	1225.5	46.0	-345.1	39.7	600.0
2	V1-P1 Lt Lower Tibia Fz	Nwt	2662.5	55.2	-8539.2	33.6	600.0
3	V1-P1 Lt Lower Tibia Mx	Nwt-M	102.8	63.2	-270.5	44.8	600.0
4	V1-P1 Rt Lower Tibia Fy	Nwt	955.9	40.0	-889.4	46.7	600.0
5	V1-P1 Rt Lower Tibia Fz	Nwt	3868.0	89.3	-5510.8	44.2	600.0
6	V1-P1 Rt Lower Tibia Mx	Nwt-M	473.8	45.0	-85.5	63.2	600.0
7	V1-P1 Left Femur	Nwt	1199.2	78.6	-11024.5	58.8	600.0
8	V1-P1 Right Femur	Nwt	1462.8	89.3	-16276.7	48.7	600.0
9	V1-P2 Left Femur	Nwt	861.9	174.2	-3972.5	70.9	600.0
10	V1-P2 Right Femur	Nwt	954.7	174.4	-6004.5	66.7	600.0
11	V1-P2 Lt Upper Tibia Mx	Nwt-M	64.2	105.6	-272.0	78.4	600.0
12	V1-P2 Lt Upper Tibia My	Nwt-M	200.0	68.5	-130.2	55.2	600.0
13	V1-P2 Lt Lower Tibia Fy	Nwt	1050.6	78.5	-459.7	46.8	600.0
14	V1-P2 Lt Lower Tibia Fz	Nwt	1338.0	70.8	-2602.0	55.0	600.0
15	V1 Right Shock Tower (Y)	Gs	111.8	47.4	-48.2	57.2	60.0
16	V1 Left Shock Tower (X)	Gs	61.8	57.6	-143.3	38.3	60.0

FACILITY: TRACK
RUN #: 1454
SERIES #: 1

TEST DATE: 19 Sep 1994
TEST TIME: 15:20:00
BOARD: D

TITLE: VTV TEST #9

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	V1 R.F Frame Rail (X)	Gs	10.6	83.3	-152.3	51.0	60.0
2	V1 R.F Frame Rail (Y)	Gs	71.4	34.2	-85.2	66.8	60.0
* 3	V1 R.F Frame Rail (Z)	Gs	61.3	41.0	-38.4	58.7	60.0
** 4	V1 Engine Bottom (X)	Gs	408.9	384.7	-418.7	180.6	60.0
++ 5	V1 L.F Frame Rail (X)	Gs	*****	176.9	*****	52.7	60.0
6	V1 L.F Frame Rail (Y)	Gs	94.9	31.6	-32.1	60.1	60.0
7	V1 L.F Frame Rail (Z)	Gs	76.7	50.6	-67.6	43.3	60.0
8	V1-P2 Chest Disp.	mm	.1	30.0	-48.1	90.5	180.0
9	V1-P1 Lt Upper Tibia Mx	Nwt-M	129.0	83.8	-203.9	45.6	600.0
10	V1-P1 Lt Upper Tibia My	Nwt-M	78.9	103.7	-257.7	34.6	600.0
11	V1-P1 Rt Upper Tibia Mx	Nwt-M	101.0	92.8	-370.4	46.4	600.0
12	V1-P1 Rt Upper Tibia My	Nwt-M	93.6	91.3	-302.6	42.2	600.0
13	V1 L.R. Comp (X)	Gs	2.9	-18.7	-33.5	42.5	60.0
14	V1 L.R. Comp (Y)	Gs	19.6	40.2	-58.5	51.0	60.0
15	V1 R.R. Comp (X)	Gs	5.8	321.2	-92.8	51.1	60.0
16	V1 R.R. Comp (Y)	Gs	14.8	36.5	-35.6	50.8	60.0
** 17	V1 R.F Frame Rail Res.	Gs	168.4	50.9	.8	-7.1	60.0
++ 18	V1 L.F Frame Rail Res.	Gs	*****	176.9	87.6	326.9	60.0

* Wire cut at 55msec

** Data not accurate, wire cut

++ Data not accurate, wire cut

RUN #: 1454
SERIES #: 1

FACILITY: TRACK
TEST TIME: 15:20:00
BOARD: E

TEST DATE: 19 Sep 1994

TITLE: VTV TEST #9

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	msec	MINIMUM AMP	msec	FILTER CLASS
1	V1-P1 Pelvic X	Gs	57.4	62.4	-59.6	58.8	1000.0
2	V1-P1 Pelvic Y	Gs	61.0	83.5	-38.9	48.5	1000.0
3	V1-P1 Pelvic Z	Gs	16.1	35.0	-44.1	62.4	1000.0
4	V1 Right Engine (X)	Gs	20.1	48.6	-23.5	28.2	60.0
5	V1-P2 Upper Neck Fx	Nwt	353.3	174.2	-1029.1	95.6	1000.0
6	V1-P2 Upper Neck Fy	Nwt	858.7	286.4	-196.8	19.2	1000.0
7	V1-P2 Upper Neck Fz	Nwt	5226.1	83.5	-3432.2	276.6	1000.0
* 8	V1 Engine Bottom (Y)	Gs	233.0	46.3	-245.0	169.0	60.0
9	V1-P2 Upper Neck Mx	Nwt-M	4125.2	51.1	-4512.0	52.6	600.0
** 10	V1-P2 Upper Neck My	Nwt-M	36.4	113.6	-30.4	69.5	600.0
11	V1-P2 Upper Neck Mz	Nwt-M	18.6	83.0	-13.4	109.0	600.0
12	V1 Left Engine (X)	Gs	47.6	46.4	-117.7	32.6	60.0
13	V1-P2 Pelvic X	Gs	5.2	138.6	-62.6	70.1	1000.0
14	V1-P2 Pelvic Y	Gs	66.1	76.9	-9.5	174.5	1000.0
15	V1-P2 Pelvic Z	Gs	8.3	276.2	-28.3	77.5	1000.0
16	V1 Right Shock Tower (X)	Gs	20.2	65.0	-147.2	51.2	60.0
17	V1-P1 Pelvic Res.	Gs	74.5	83.9	.1	10.1	1000.0
18	V1-P2 Upper Neck F(res)	Nwt	5276.8	83.5	2.7	-.5	1000.0
** 19	V1-P2 Upper Neck M(res)	Nwt-M	4512.0	52.6	.1	14.0	600.0
20	V1-P2 Pelvic Res.	Gs	94.8	76.9	.0	-2.0	1000.0

* Data not accurate, wire cut

** Data not accurate, noise in channel

RUN #: 1454
SERIES #: 1

TEST TIME: 15:20:00
BOARD: F

TITLE: VTV TEST #9

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	msec	MINIMUM AMP	msec	FILTER CLASS
* 1	V1 Brake Pedal (X)	Gs	56381.4	54.7	-54720.1	49.7	60.0
2	V1 Brake Pedal (Y)	Gs	58.0	49.3	-59.9	62.2	60.0
3	V1 Brake Pedal (Z)	Gs	51.9	29.5	-81.1	42.7	60.0
4	V1-P2 Lt Lower Tibia Mx	Nwt-M	19.2	101.0	-177.5	58.7	600.0
5	V1-P2 Rt Upper Tibia Mx	Nwt-M	65.9	65.4	-119.9	58.4	600.0
6	V1-P2 Rt Upper Tibia My	Nwt-M	224.5	61.6	-64.9	58.4	600.0
7	V1-P2 Rt Lower Tibia Fy	Nwt	236.1	174.2	-935.9	56.9	600.0
8	V1-P2 Rt Lower Tibia Fz	Nwt	1024.4	174.2	-7003.2	56.0	600.0
9	V1-P2 Rt Lower Tibia Mx	Nwt-M	13.9	92.3	-241.3	56.0	600.0
10	V1 Left Shock Tower (Z)	Gs	126.4	34.8	-58.2	52.7	60.0
11	NULL	in	.0	427.3	.0	427.3	1000.0
12	NULL	in	.0	427.3	.0	427.3	1000.0
* 17	V1 Brake Pedal (res)	Gs	56381.4	54.7	4.9	422.0	60.0

* Data not accurate

RUN #: 7454
SERIES #: 1

FACILITY: TAPE
TEST TIME: 09:22:15
BOARD: G

TEST DATE: 20 Sep 1994

TITLE: VTV TEST #9

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Chest Displacement #132	mm	18.5	91.2	-6.5	49.7	180.0
2	NULL	Gs	.0	427.3	.0	427.3	1000.0
3	NULL	Gs	.0	427.3	.0	427.3	1000.0
4	NULL	Gs	.0	427.3	.0	427.3	1000.0

FACILITY: TAPE
RUN #: 8454
SERIES #: 1

TEST DATE: 20 Sep 1994
TEST TIME: 09:13:27
BOARD: H

TITLE: VTV TEST #9

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Chest Displacement #125	mm	9.7	55.7	-9.4	49.9	180.0
* 2	Chest Displacement #126	mm	9.6	60.6	-5.8	388.2	180.0
3	Chest Displacement #127	mm	29.4	105.0	-1.5	102.7	180.0
** 4	Chest Displacement #128	mm	3.7	67.1	-39.6	89.8	180.0
5	Chest Displacement #129	mm	3.8	91.1	-2.0	105.8	180.0
6	Chest Displacement #130	mm	12.0	94.1	-1.8	49.8	180.0
7	Chest Displacement #131	mm	6.2	60.1	-3.2	53.6	180.0
8	NULL		.0	427.3	.0	427.3	1000.0

* Data not accurate

** Data not accurate, noise in channel

RUN #: 9454
SERIES #: 1

TEST TIME: 08:59:56
BOARD: I

FACILITY: TAPE

TEST DATE: 20 Sep

TITLE: VTV TEST #9

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	V2 C.G. X	Gs	2.3	227.6	-60.8	39.2	60.0
2	V2 C.G. Y	Gs	5.9	33.1	-12.6	47.6	60.0
3	V2 C.G. Z	Gs	50.4	54.1	-42.1	62.4	60.0
4	V2 Left Rail X	Gs	67.2	38.4	-4.2	188.6	60.0
5	V2 Left Rail Y	Gs	34.0	56.0	-34.2	51.2	60.0
6	V2 Right Rail X	Gs	52.3	39.0	-1.6	-4.7	60.0
7	V2 Right Rail Y	Gs	18.0	56.0	-22.2	51.0	60.0
8	V2 TR Load Cell	Nwt	36951.7	26.3	-19218.0	7.1	60.0
9	V2 BR Load Cell	Nwt	6208.5	25.8	-57377.5	99.2	60.0
* 10	V2 TL Load Cell	Nwt	112253.5	97.3	-8156.0	52.0	60.0
11	V2 BL Load Cell	Nwt	6374.4	247.6	-2.565E+05	40.6	60.0
12	V2 CL Load Cell	Nwt	1088.2	-3.7	-2.180E+05	38.3	60.0
17	V2 C.G. Resultant	Gs	64.9	38.6	.3	320.9	60.0

* Data not accurate, wire cut

TEST NO. Y49-9-1454

VEHICLE DATA

SAE FILTER CHANNEL CLASS

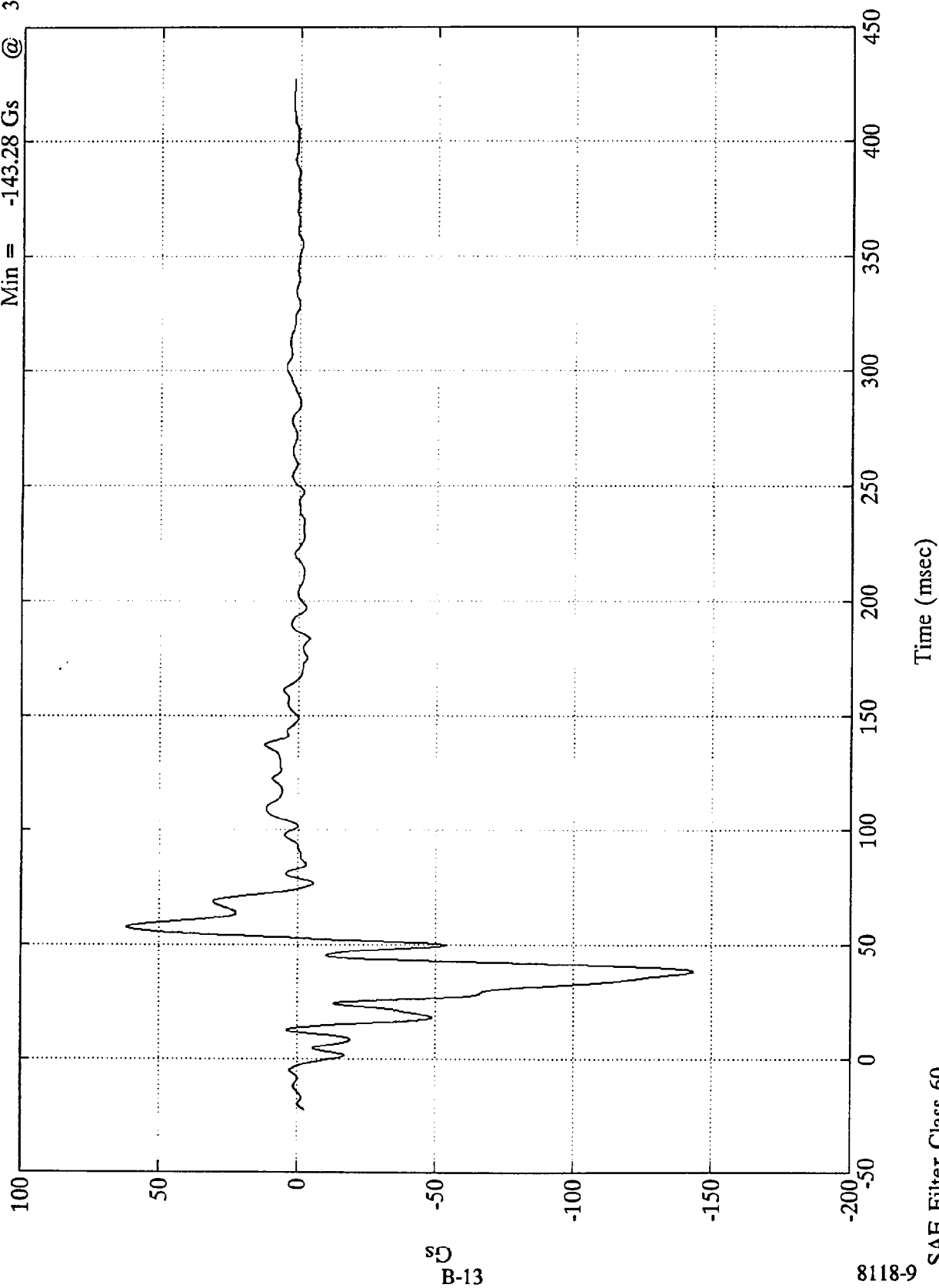
60

VEHICLE ONE DATA

VTV TEST #9

V1 Left Shock Tower (X)

Max = 61.81 Gs @ 57.60 msec
Min = -143.28 Gs @ 38.27 msec



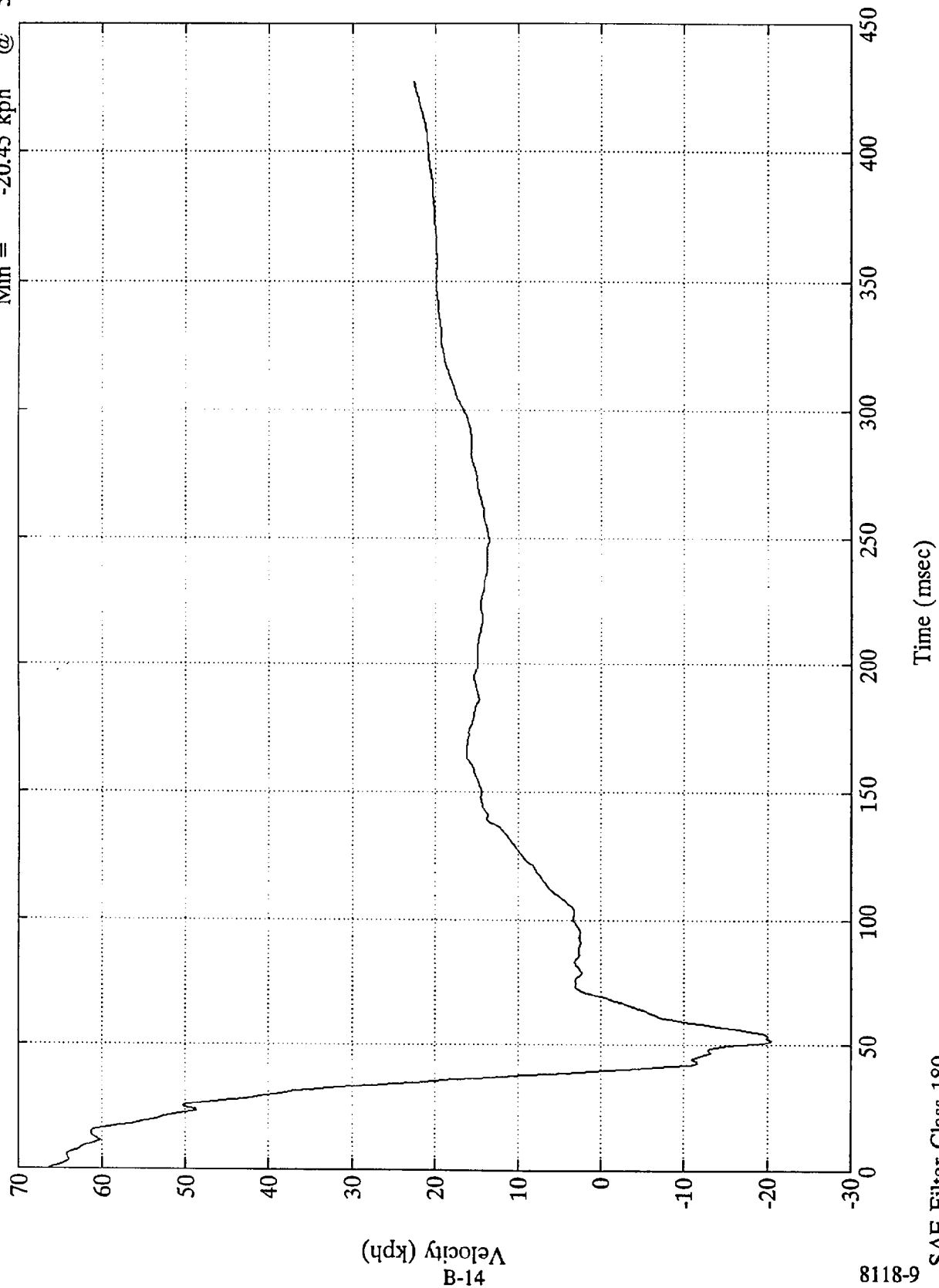
B-13

8118-9

VTV TEST #9

V1 Left Shock Tower (X)

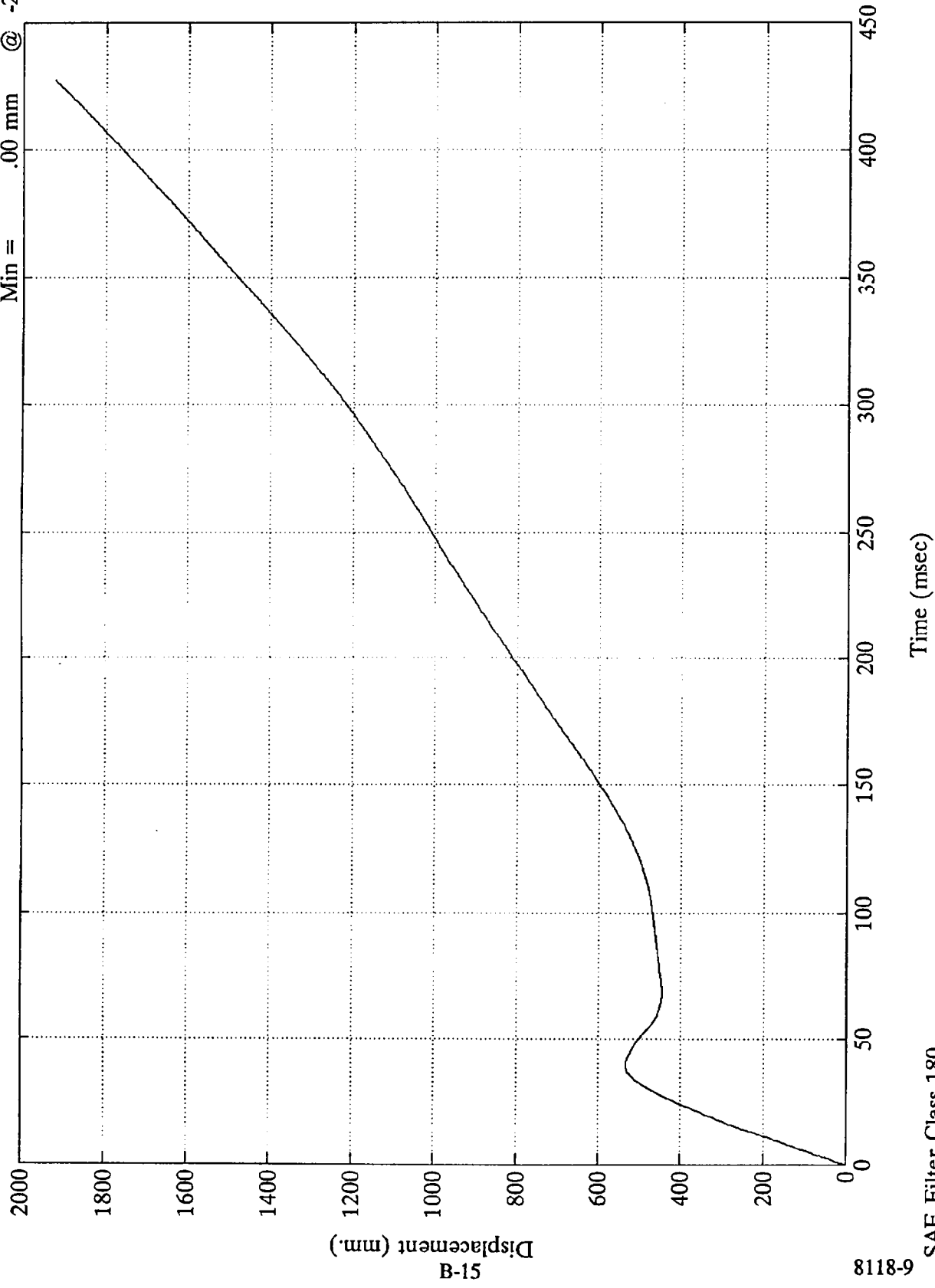
Max = 66.46 kph @ -0.00 msec
Min = -20.45 kph @ 51.48 msec



VTV TEST #9

V1 Left Shock Tower (X)

Max = 1923.40 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



SAE Filter Class 180

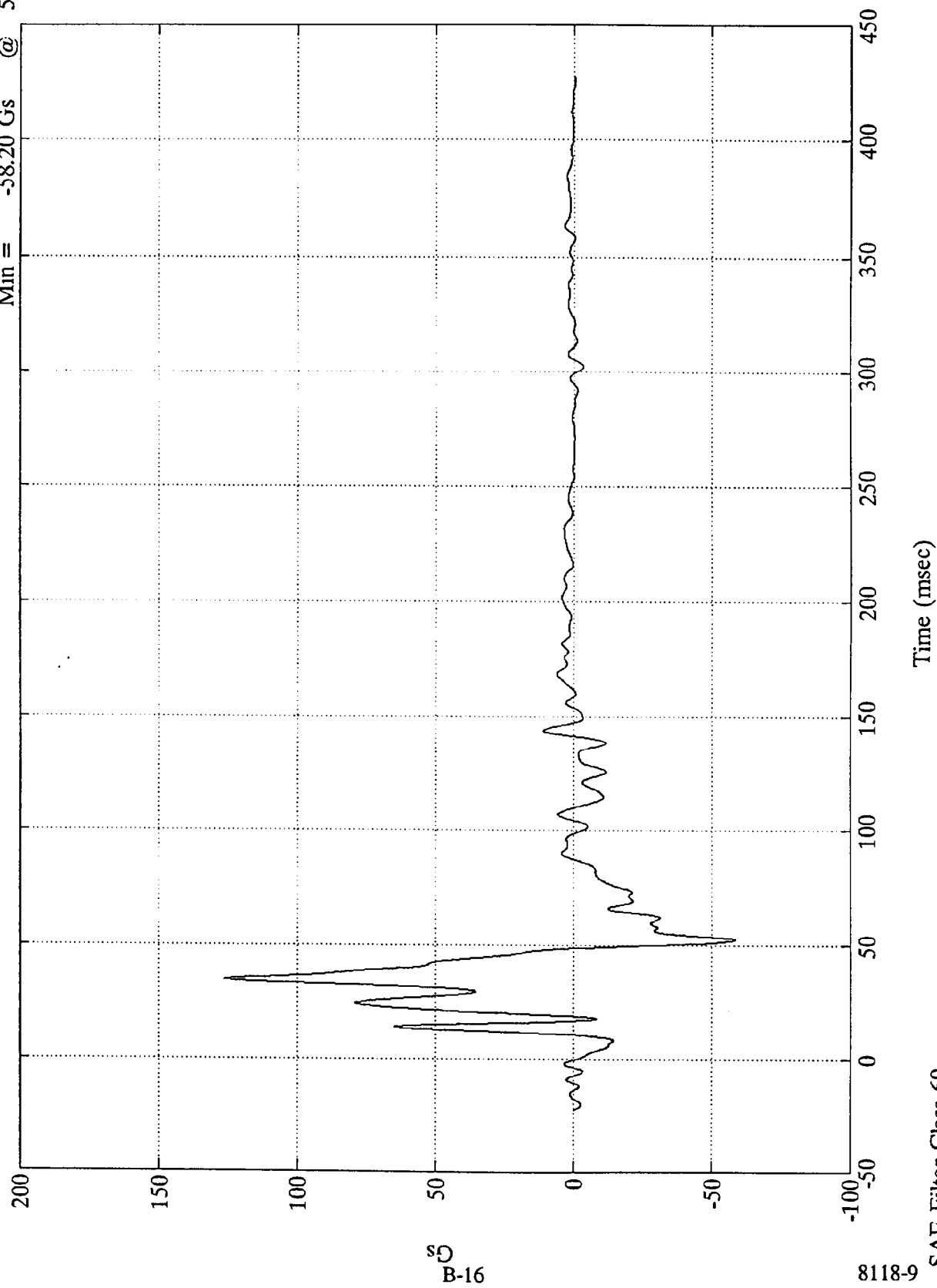
6-8118

51-B

VTV TEST #9

V1 Left Shock Tower (Z)

Max = 126.44 Gs @ 34.79 msec
Min = -58.20 Gs @ 52.68 msec

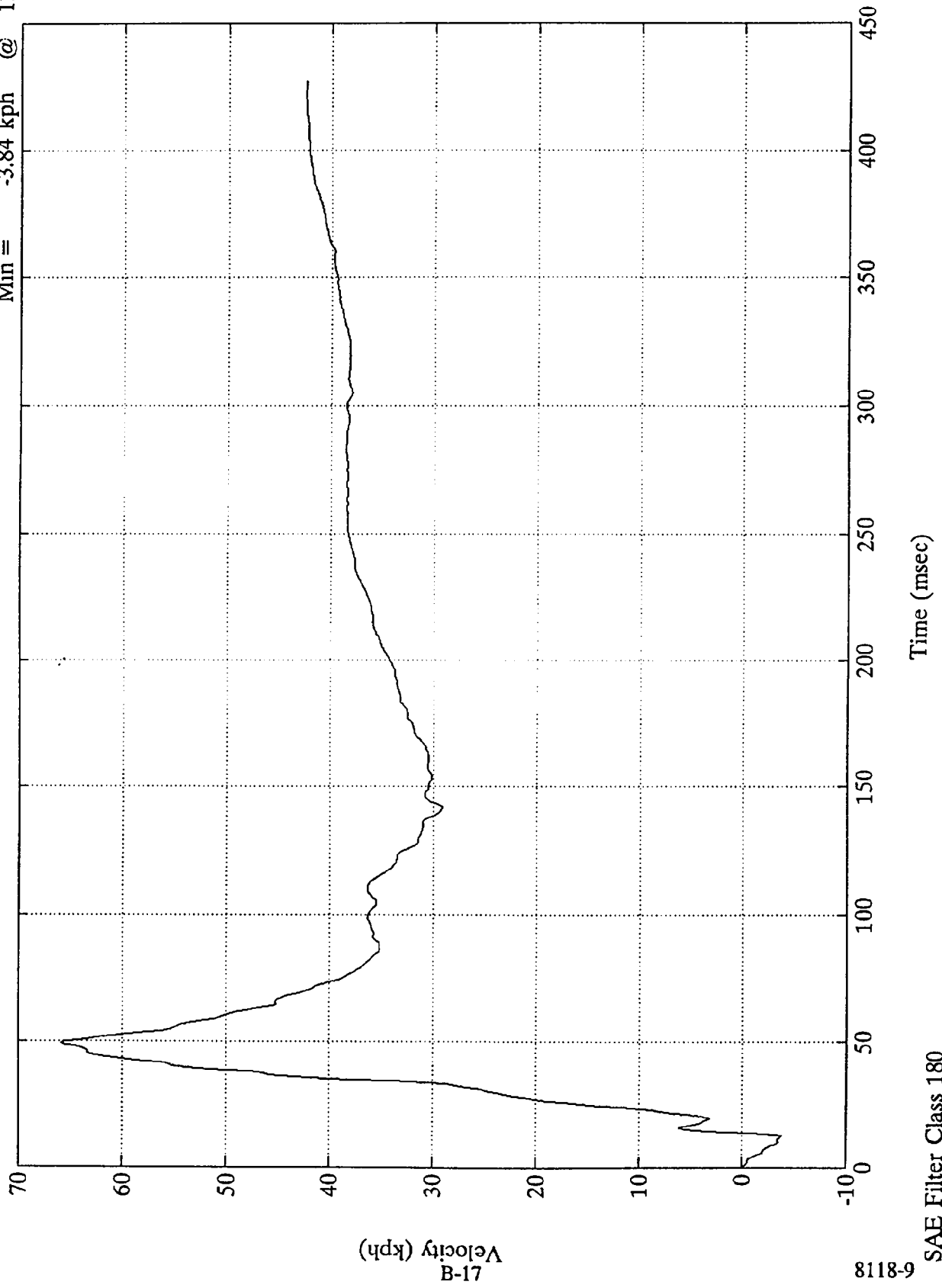


8118-9
B-16

SAE Filter Class 60

VTV TEST #9

V1 Left Shock Tower (Z) Max = 65.92 kph @ 49.20 msec
Min = -3.84 kph @ 12.48 msec



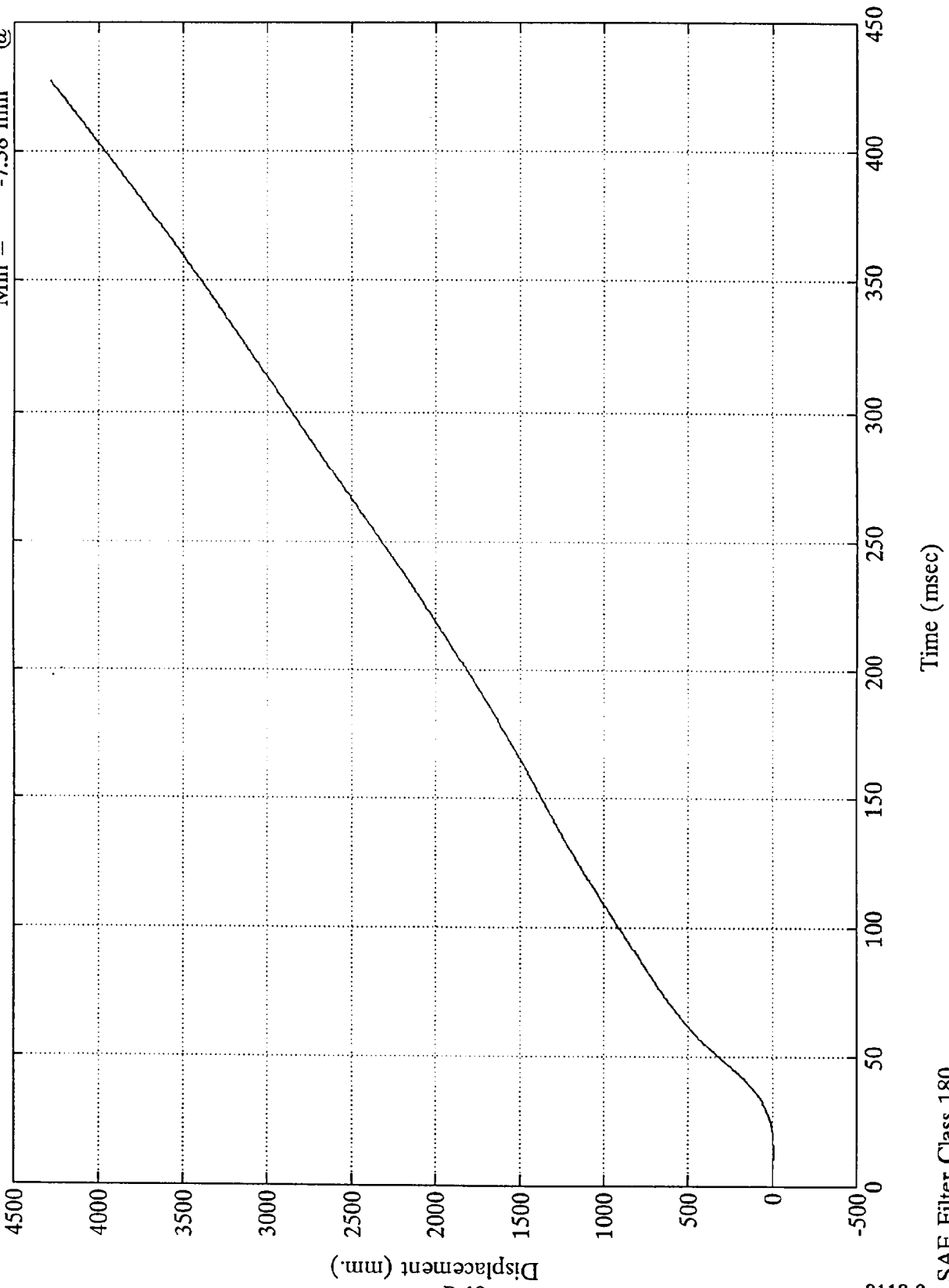
8118-9

SAE Filter Class 180

VTV TEST #9

V1 Left Shock Tower (Z)

Max = 4281.72 mm @ 427.32 msec
Min = -7.38 mm @ 14.03 msec



81-B

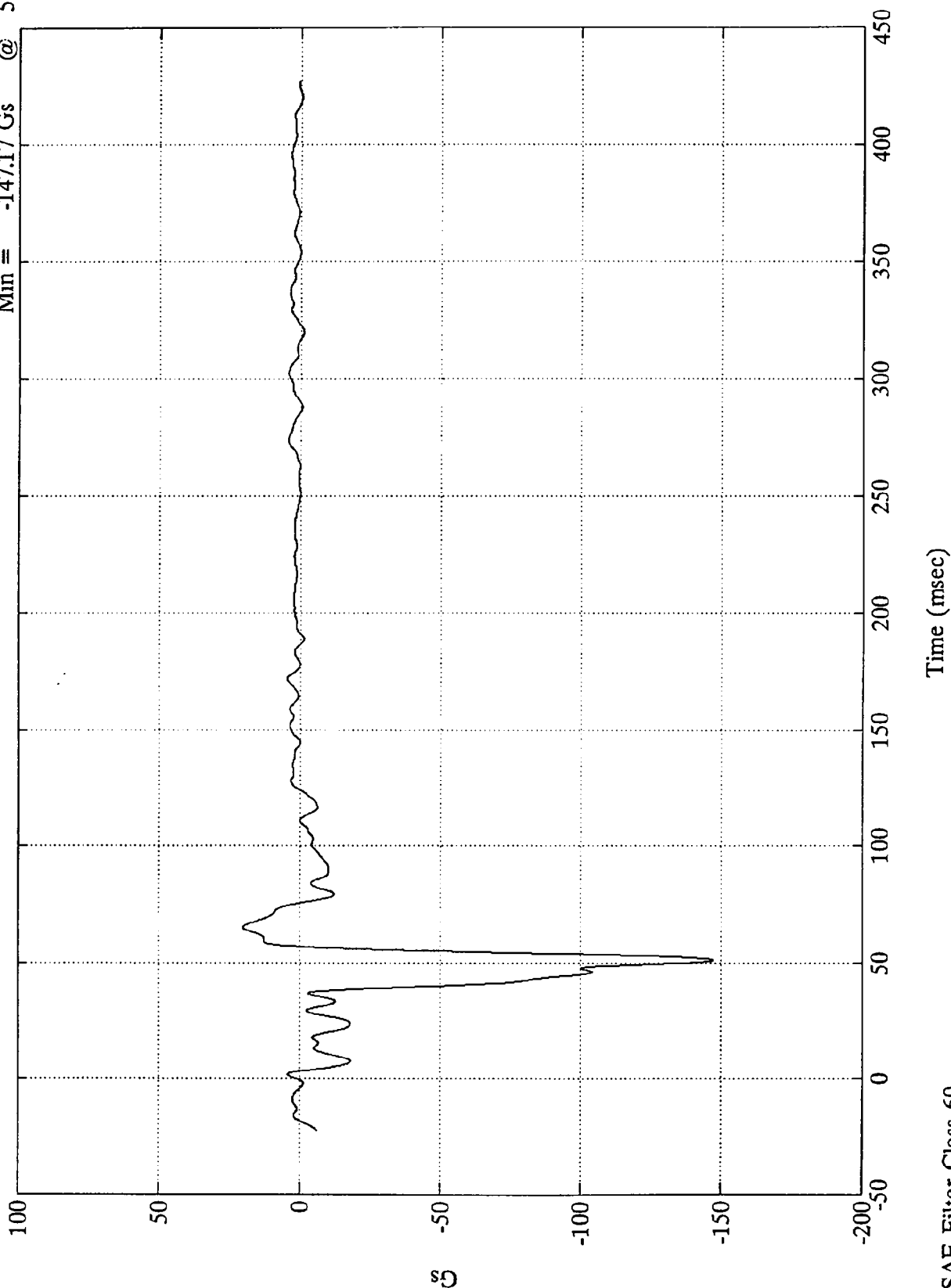
9-8118

SAE Filter Class 180

VTV TEST #9

V1 Right Shock Tower (X)

Max = 20.22 Gs @ 65.04 msec
Min = -147.17 Gs @ 51.24 msec



G

B-19

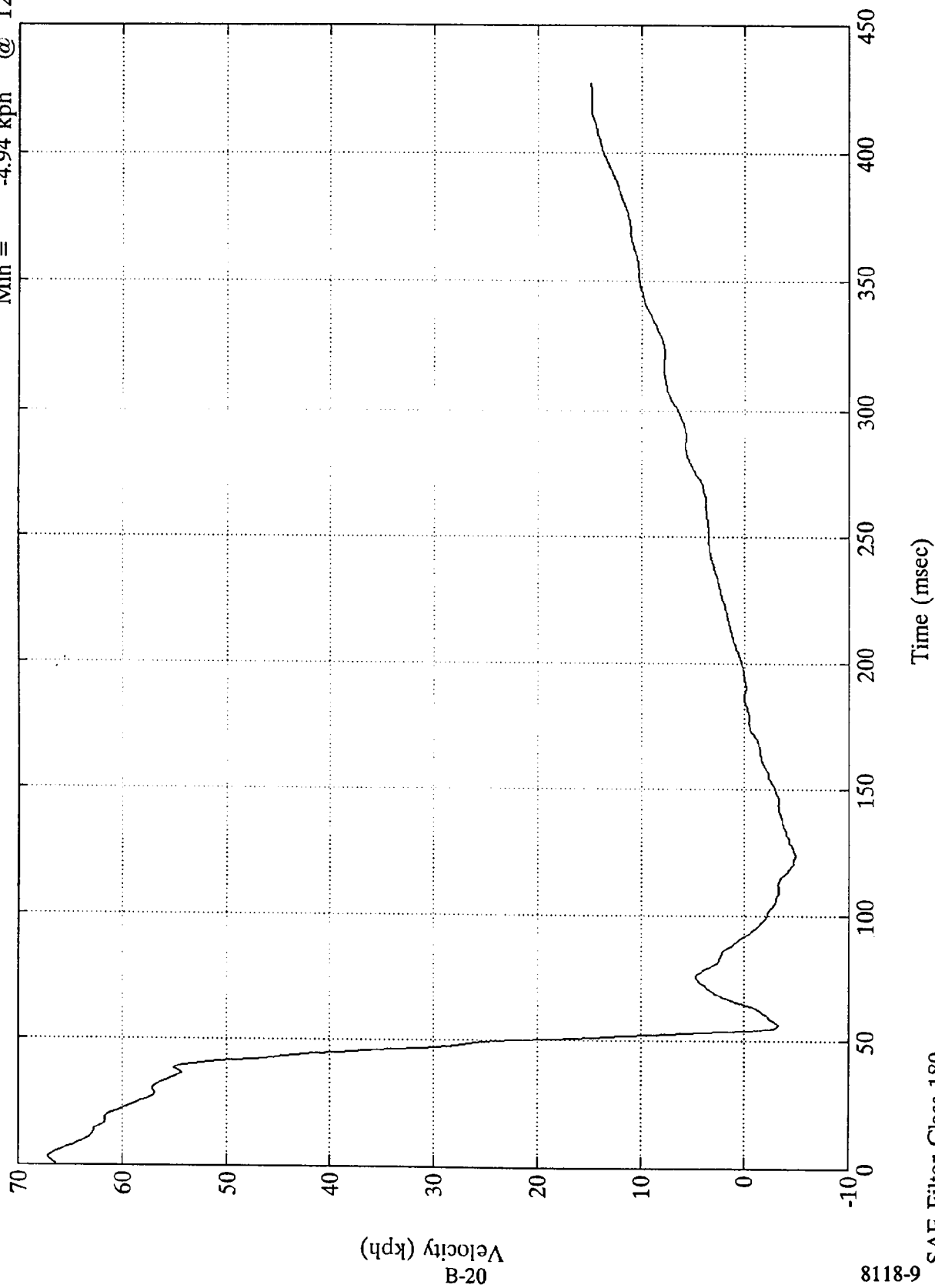
8118-9

SAE Filter Class 60

VTV TEST #9

V1 Right Shock Tower (X)

Max = 67.21 kph @ 3.35 msec
Min = -4.94 kph @ 123.84 msec



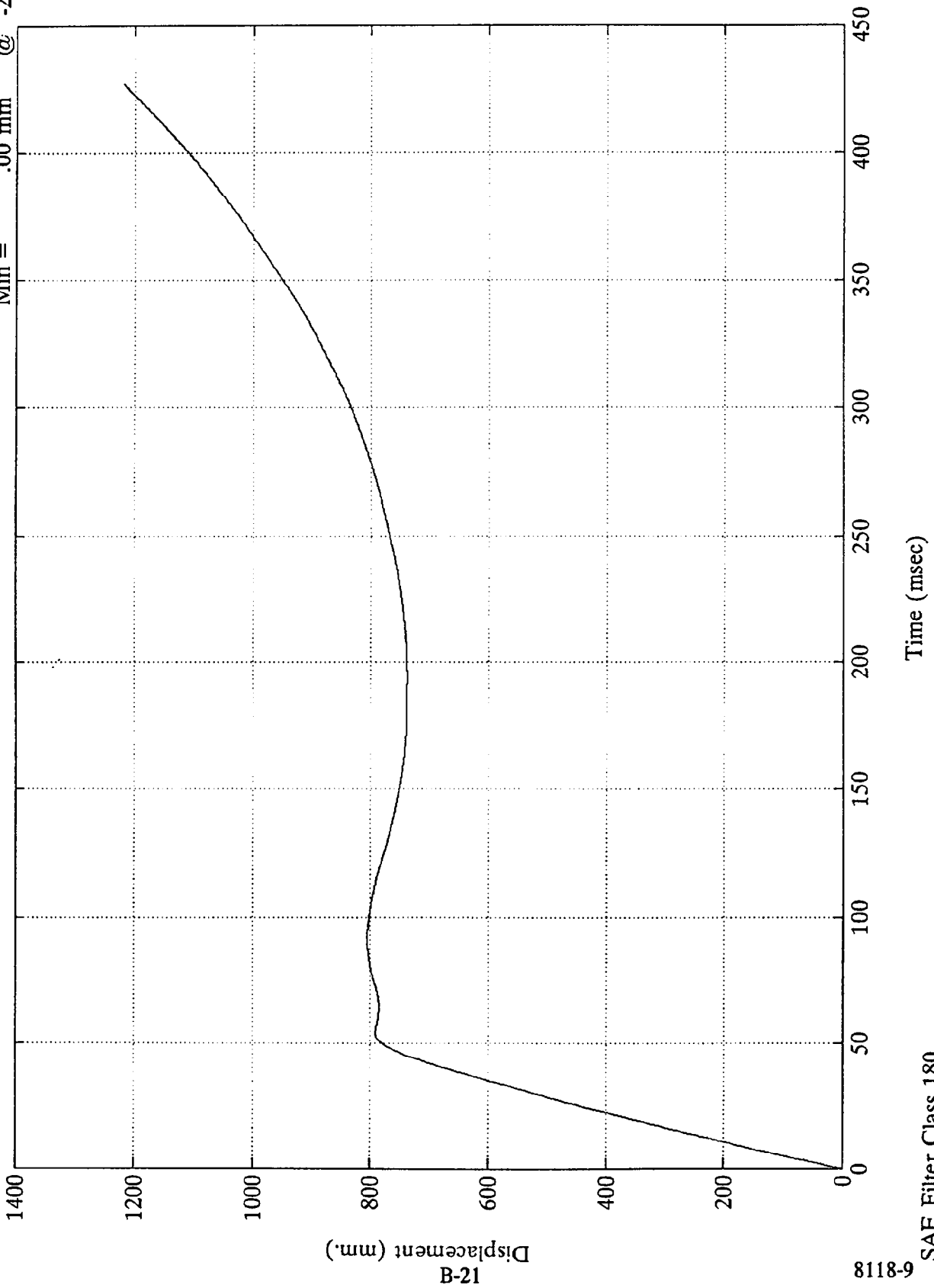
SAE Filter Class 180

8118-9

VTV TEST #9

V1 Right Shock Tower (X)

Max = 1219.15 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



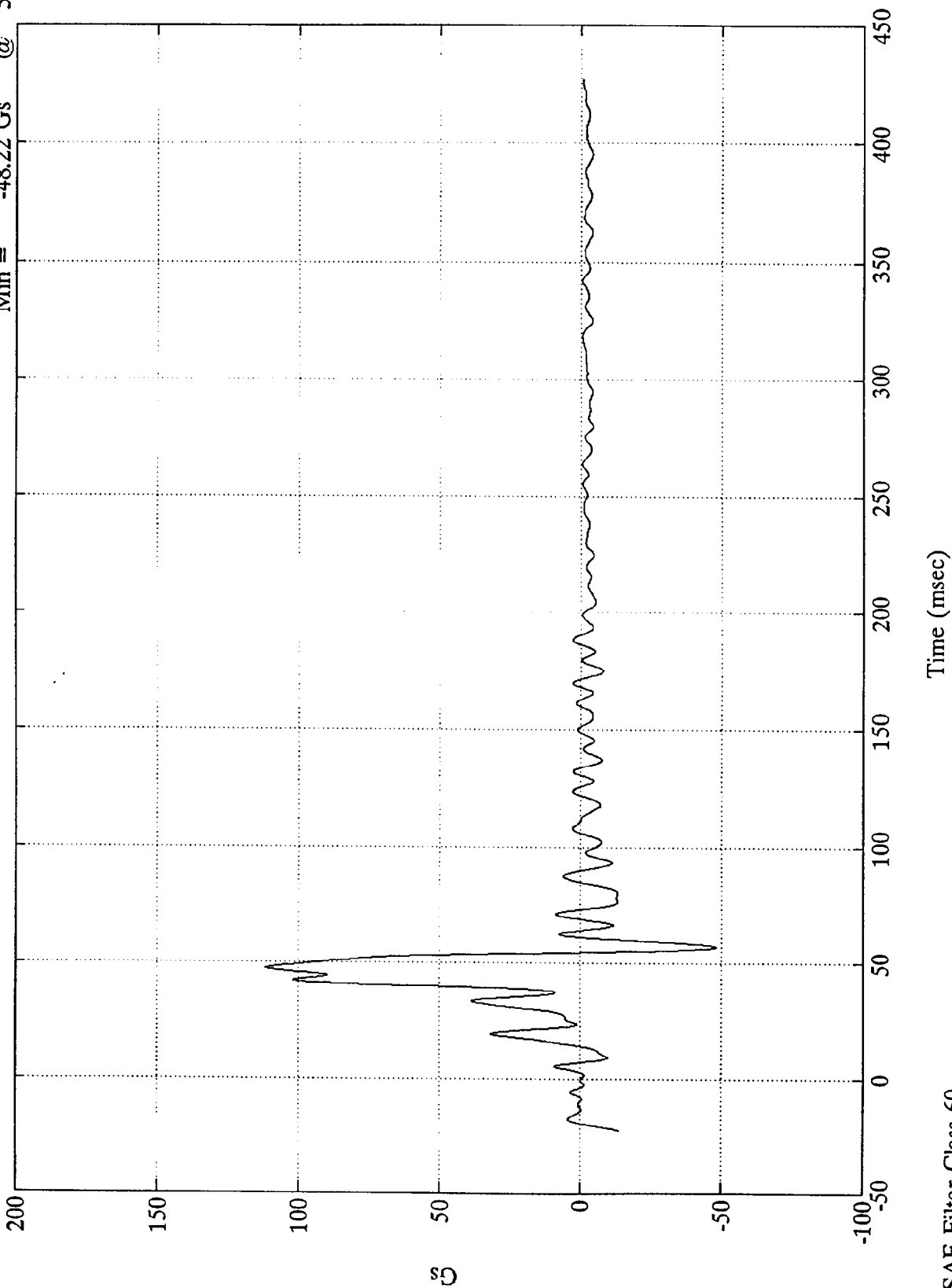
6-8118

SAE Filter Class 180

VTV TEST #9

V1 Right Shock Tower (Y)

Max = 111.76 Gs @ 47.40 msec
Min = -48.22 Gs @ 57.24 msec



Gs

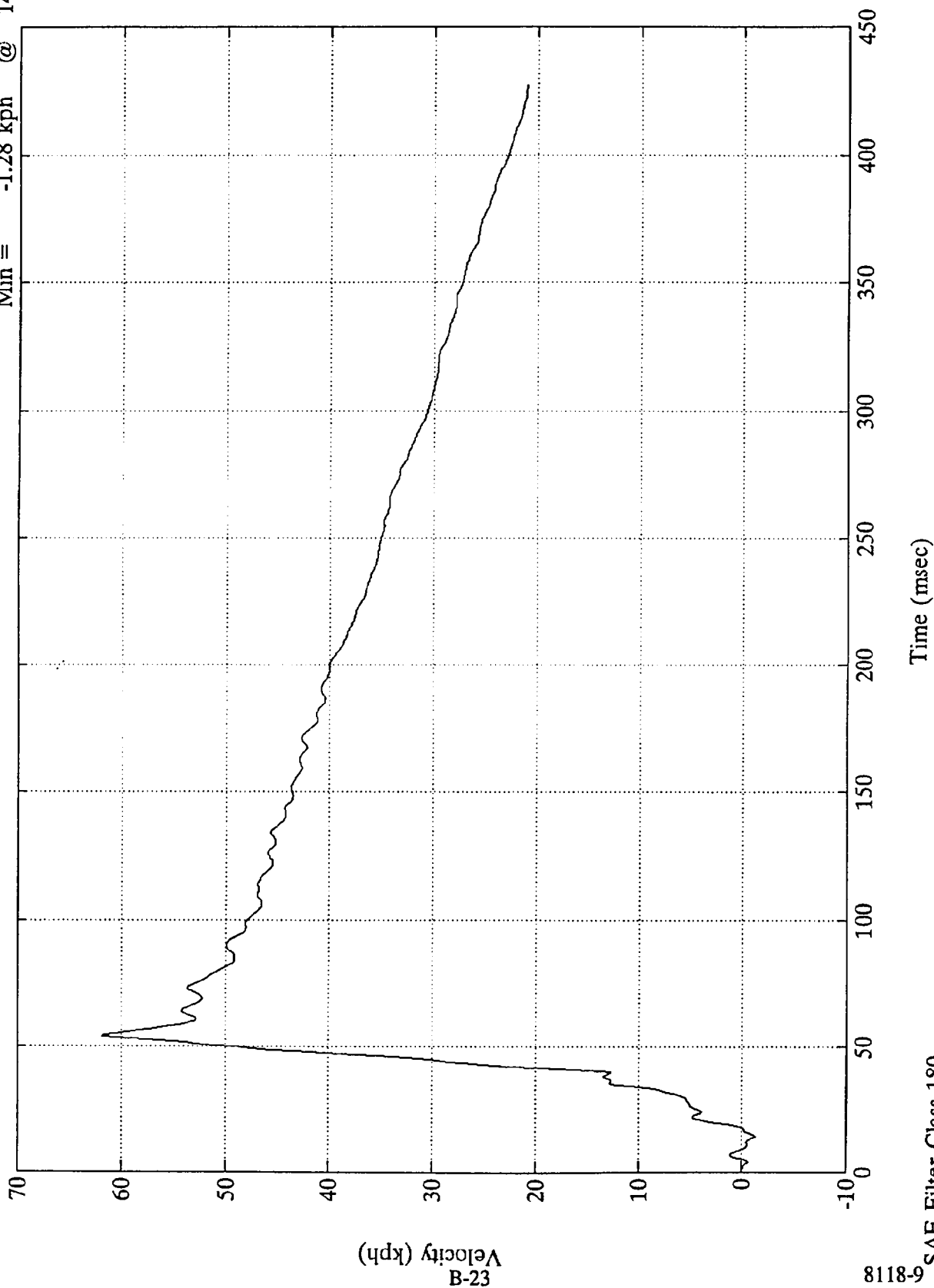
Time (msec)

B-22

8118-9 SAE Filter Class 60

VTV TEST #9

V1 Right Shock Tower (Y)
Max = 61.99 kph @ 54.24 msec
Min = -1.28 kph @ 14.51 msec



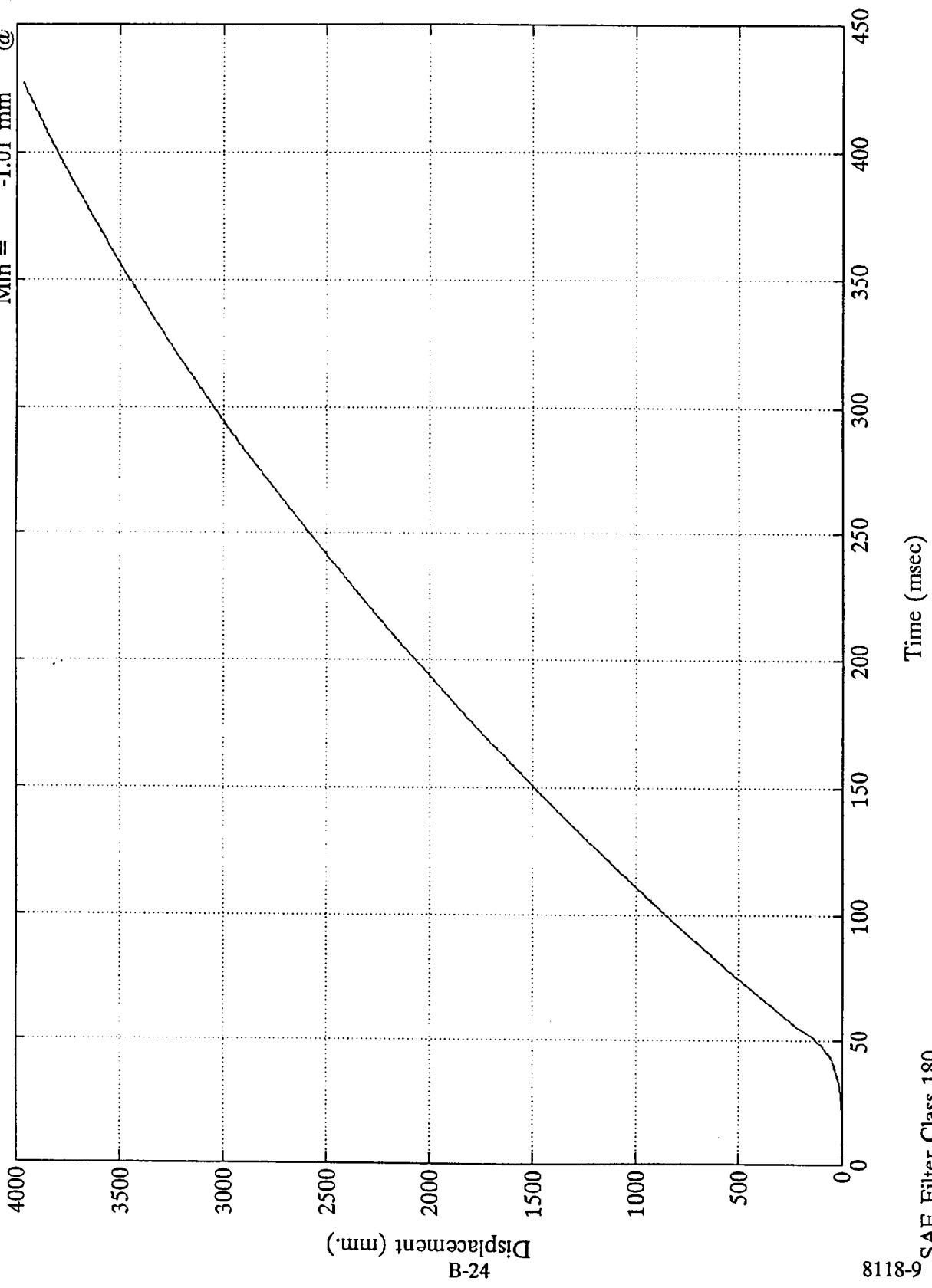
8118-9

SAE Filter Class 180

VTV TEST #9

V1 Right Shock Tower (Y)

Max = 3966.49 mm @ 427.32 msec
Min = -1.01 mm @ 17.88 msec



VTV TEST #9

$\times 10^4$

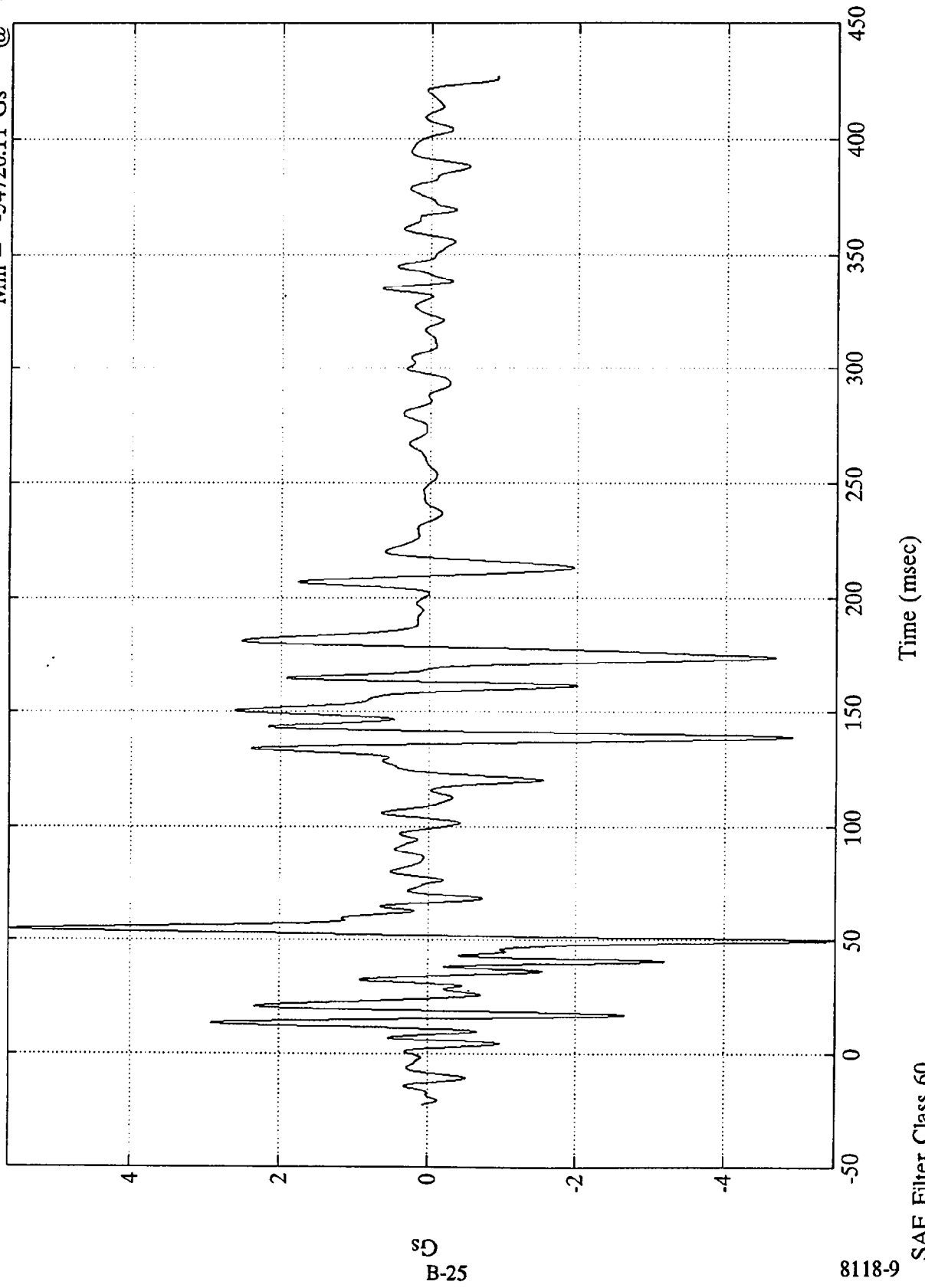
V1 Brake Pedal (X)

Max = 56381.37 Gs

@ 54.72 msec

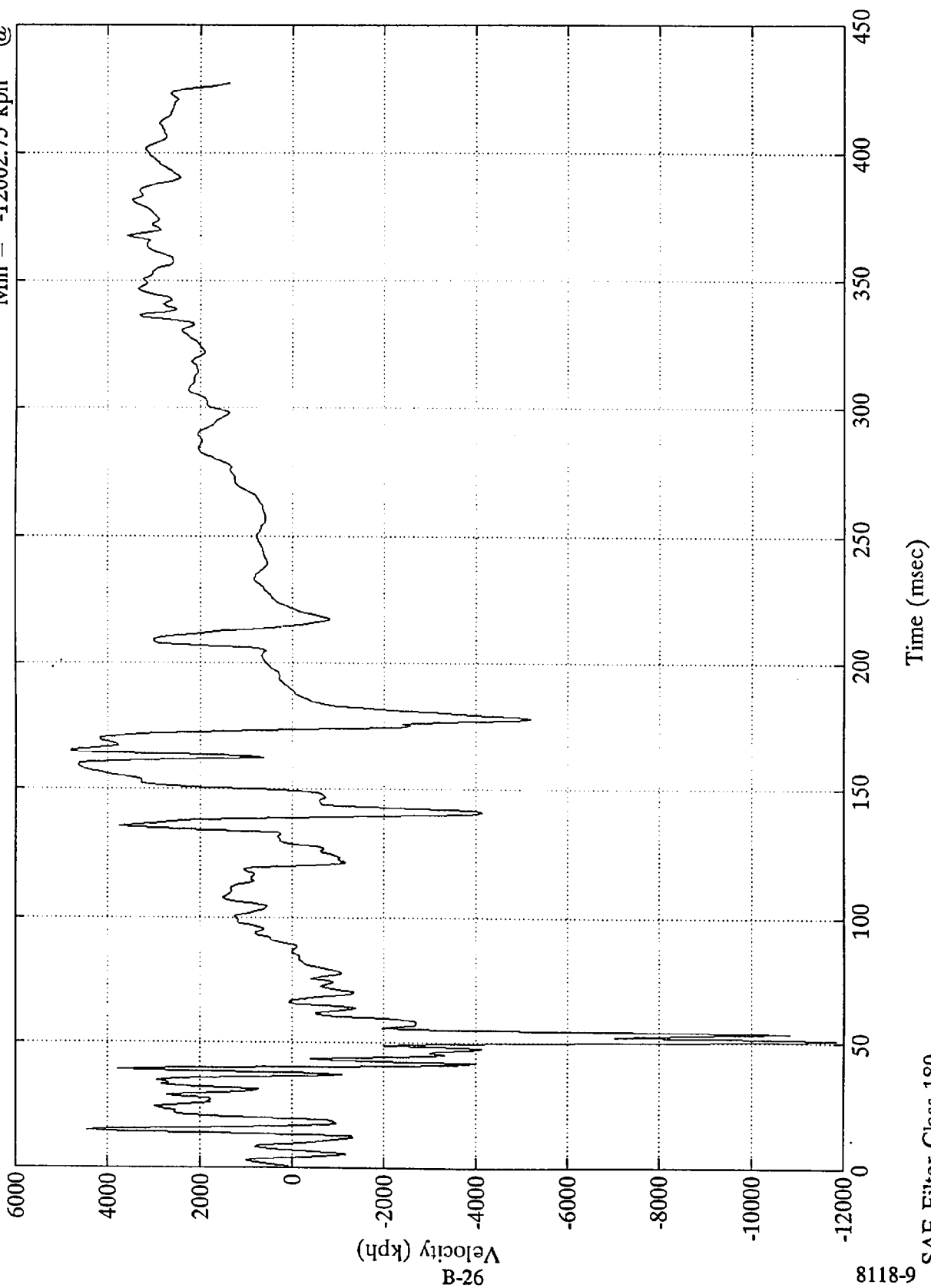
Min = -54720.11 Gs

@ 49.68 msec



VTV TEST #9

V1 Brake Pedal (X) Max = 4846.43 kph @ 165.24 msec
Min = -12002.75 kph @ 50.76 msec



SAE Filter Class 180

8118-9

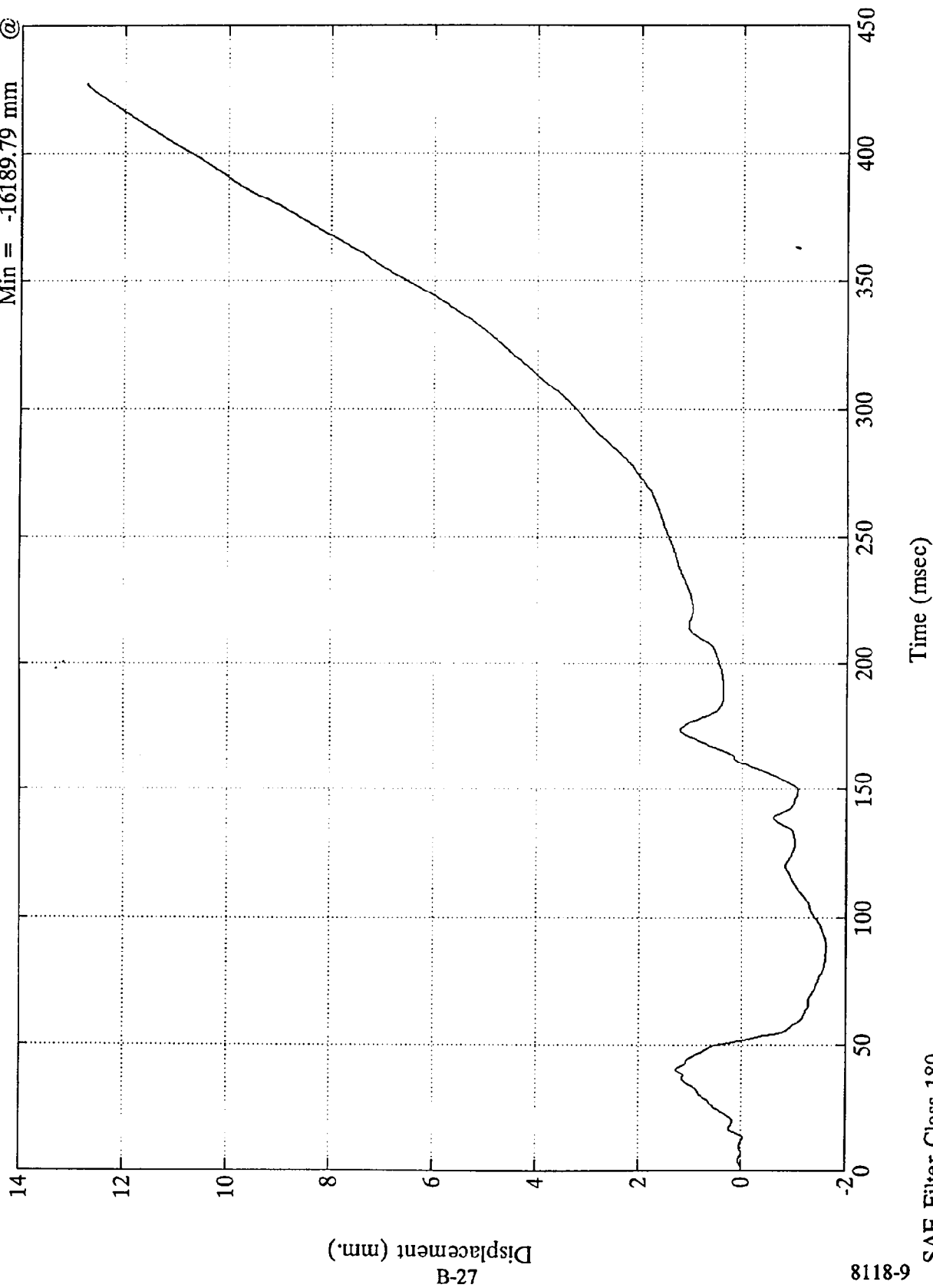
B-26

VTV TEST #9

$\times 10^4$

V1 Brake Pedal (X)

Max = 127421.05 mm @ 427.32 msec
Min = -16189.79 mm @ 89.28 msec



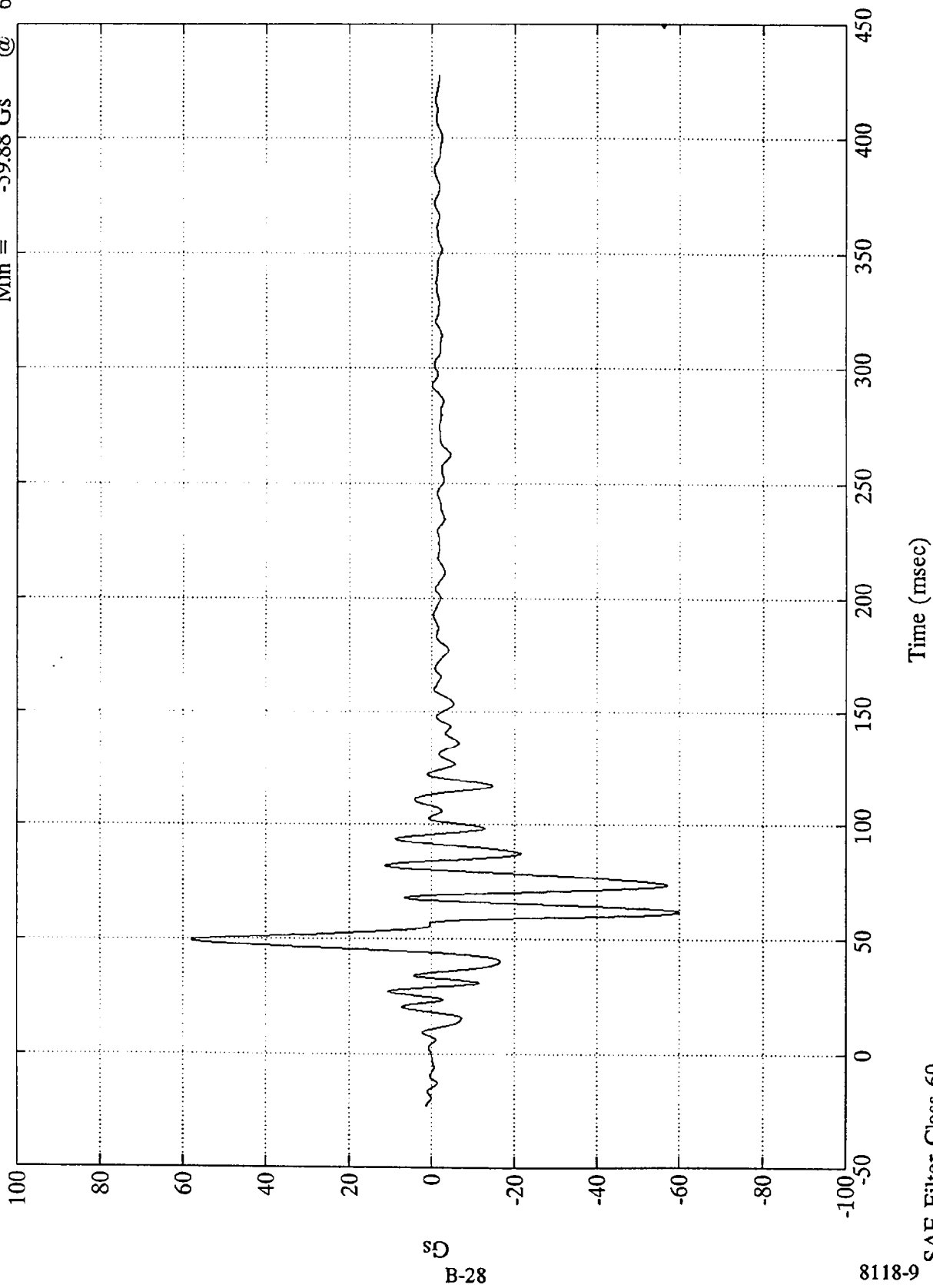
6-8118-9

SAE Filter Class 180

VTV TEST #9

V1 Brake Pedal (Y)

Max = 58.03 Gs @ 49.31 msec
Min = -59.88 Gs @ 62.15 msec



B-28

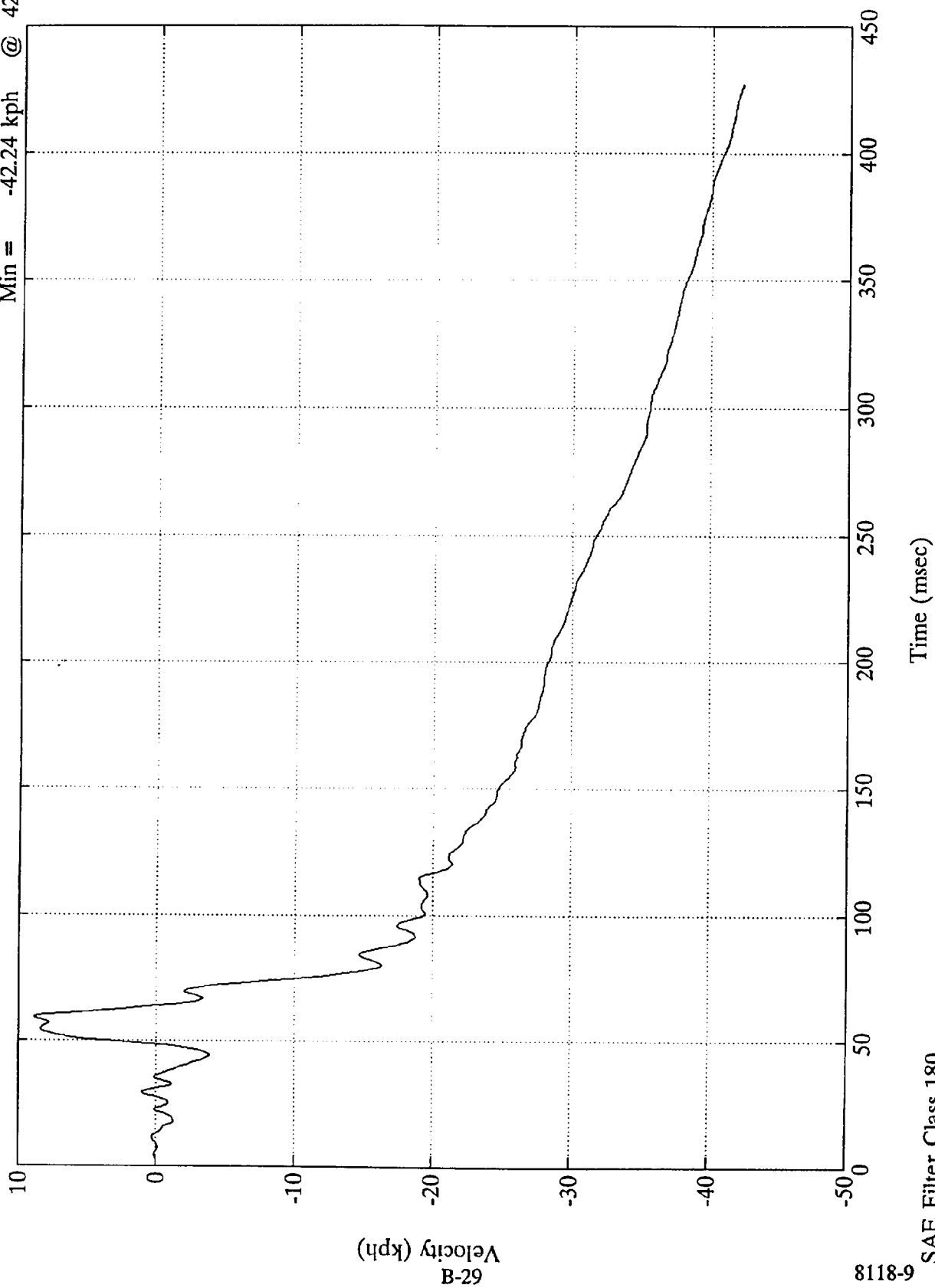
8118-9

SAE Filter Class 60

VTV TEST #9

V1 Brake Pedal (Y)

Max = 8.92 kph @ 59.16 msec
Min = -42.24 kph @ 427.32 msec



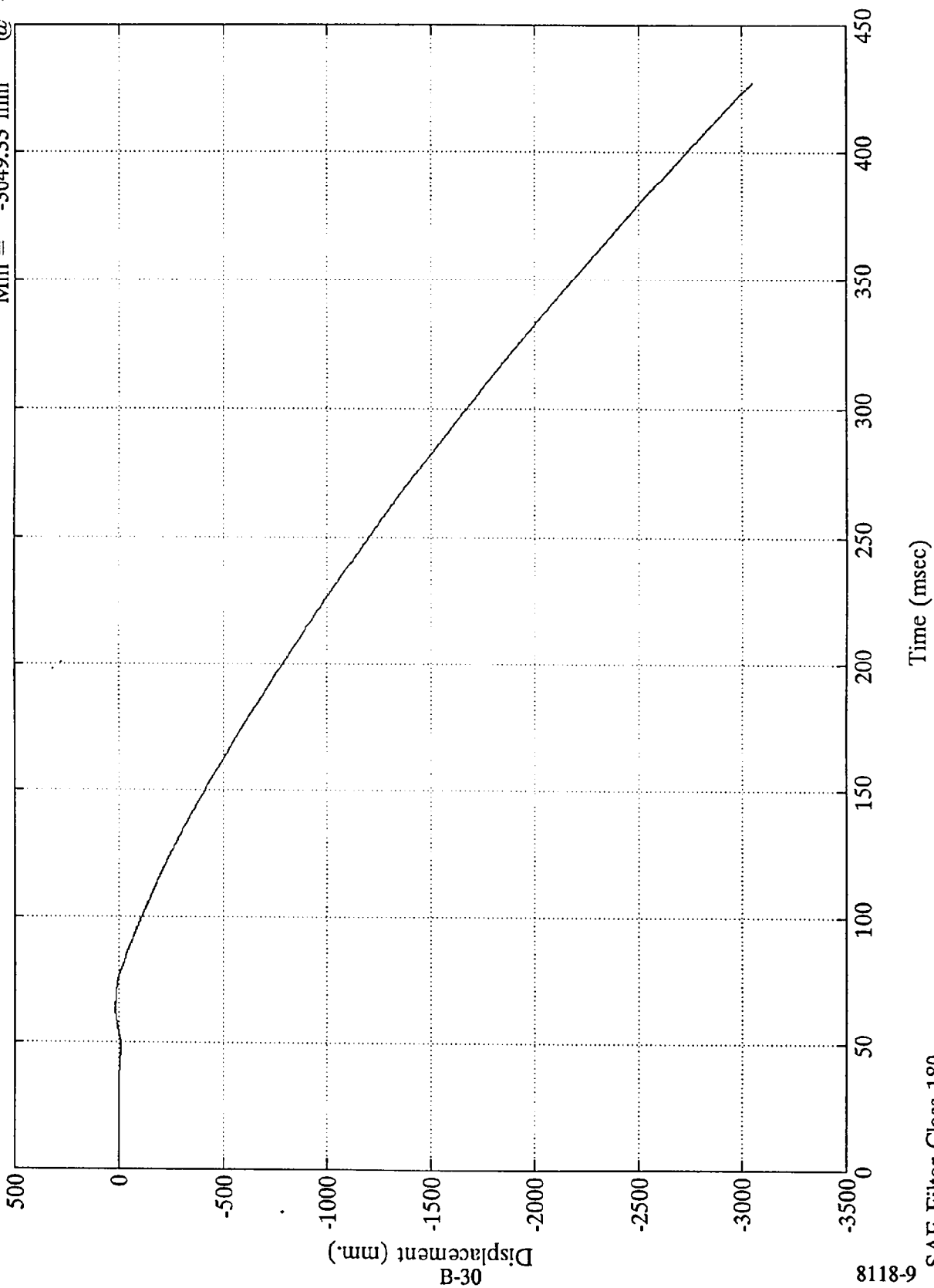
8118-9

SAE Filter Class 180

VTV TEST #9

V1 Brake Pedal (Y)

Max =	16.65 mm	@	63.60 msec
Min =	-3049.33 mm	@	427.32 msec

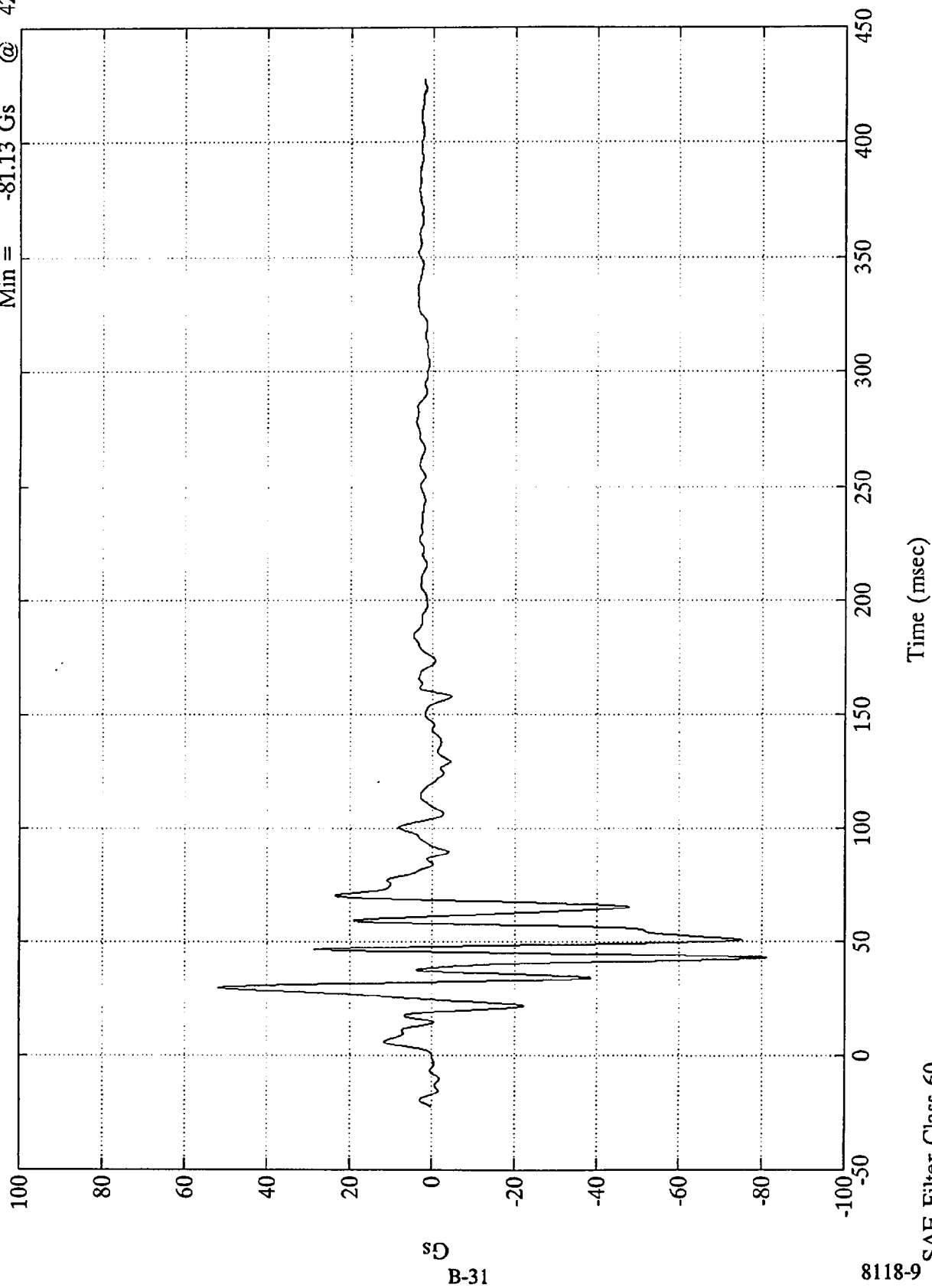


8118-9

VTV TEST #9

V1 Brake Pedal (Z)

Max = 51.87 Gs @ 29.52 msec
Min = -81.13 Gs @ 42.72 msec



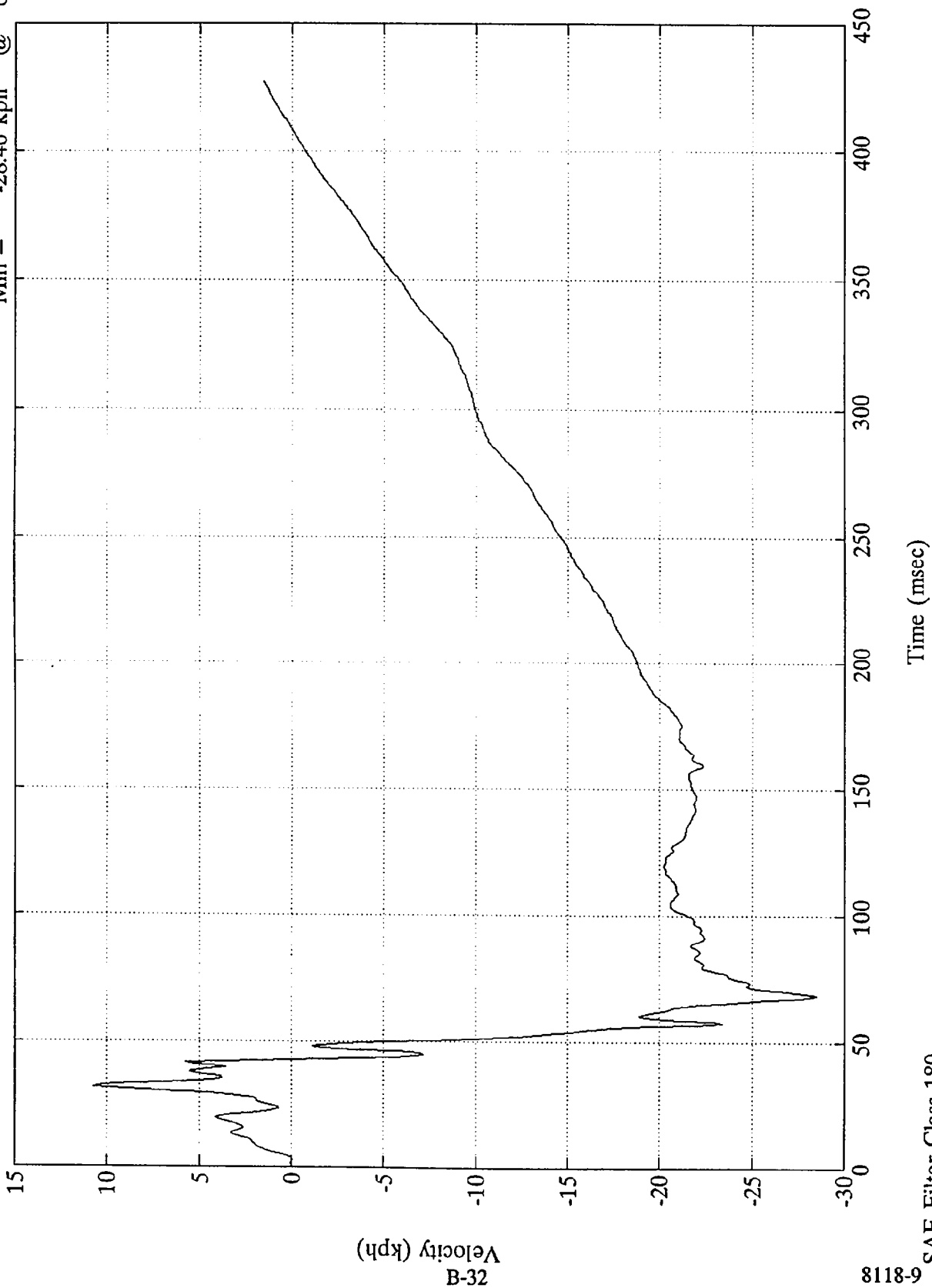
8118-9

SAE Filter Class 60

B-31

VTV TEST #9

V1 Brake Pedal (Z)
Max = 10.74 kph @ 31.92 msec
Min = -28.46 kph @ 68.40 msec



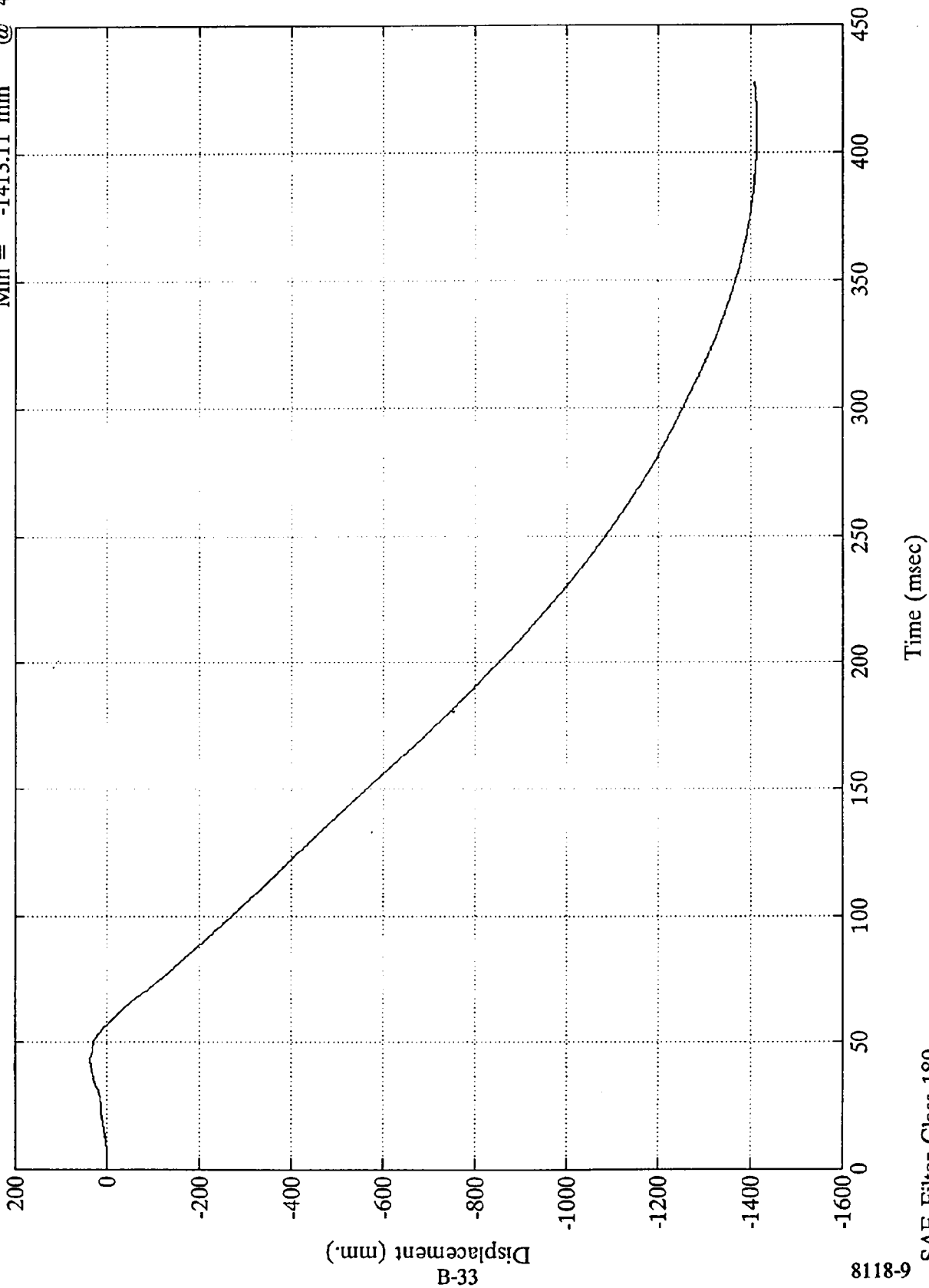
6-118-9

SAE Filter Class 180

VTV TEST #9

V1 Brake Pedal (Z)

Max = 37.34 mm @ 42.60 msec
Min = -1413.11 mm @ 408.60 msec



B-33

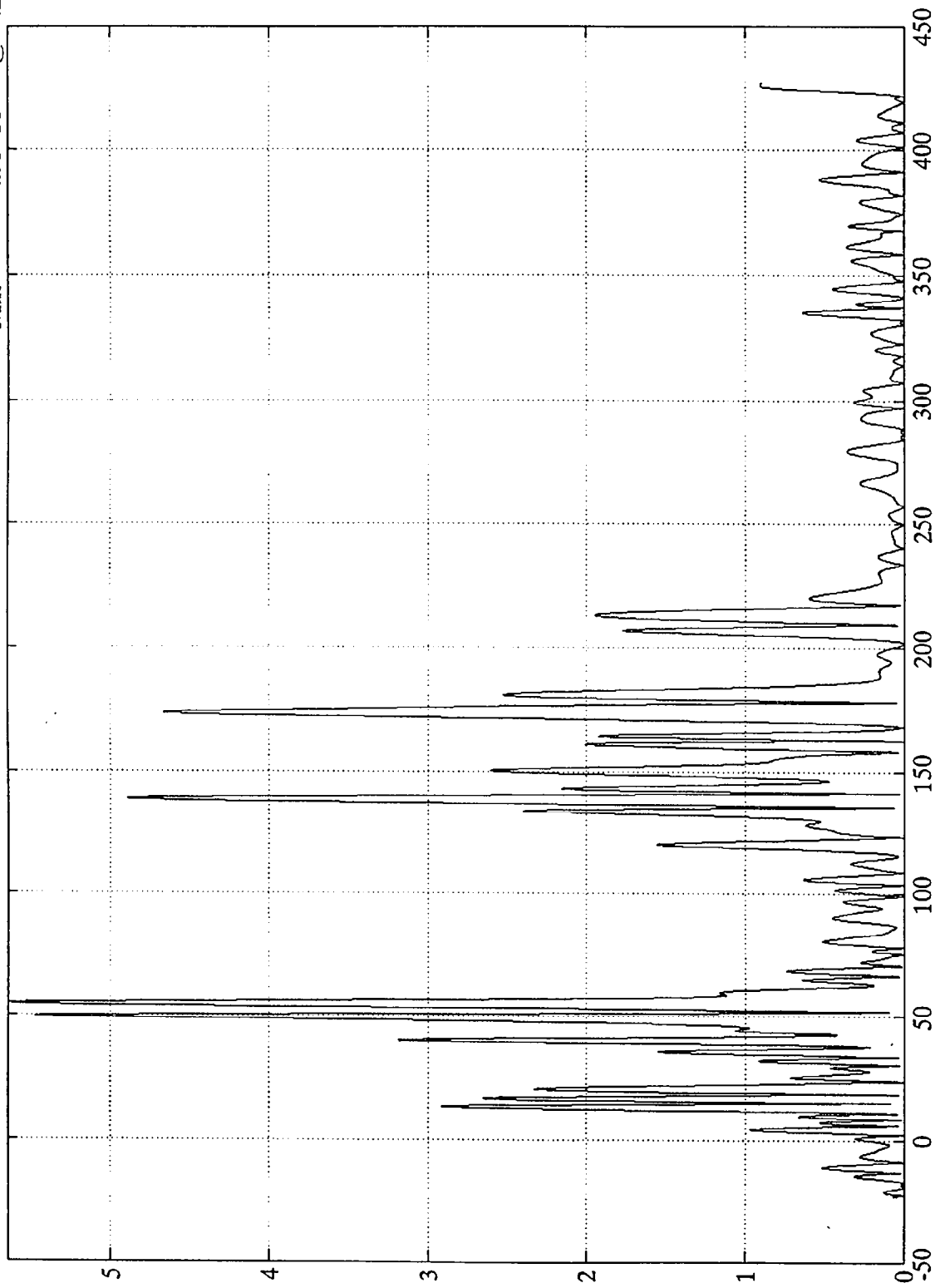
8118-9

SAE Filter Class 180

VTV TEST #9
x10⁴

V1 Brake Pedal (res)

Max = 56381.39 Gs @ 54.72 msec
Min = 4.93 Gs @ 422.04 msec



B-34

8118-9

SAE Filter Class 60

VTV TEST #9

$\times 10^6$

V1 LF Frame Rail (X)

Max =

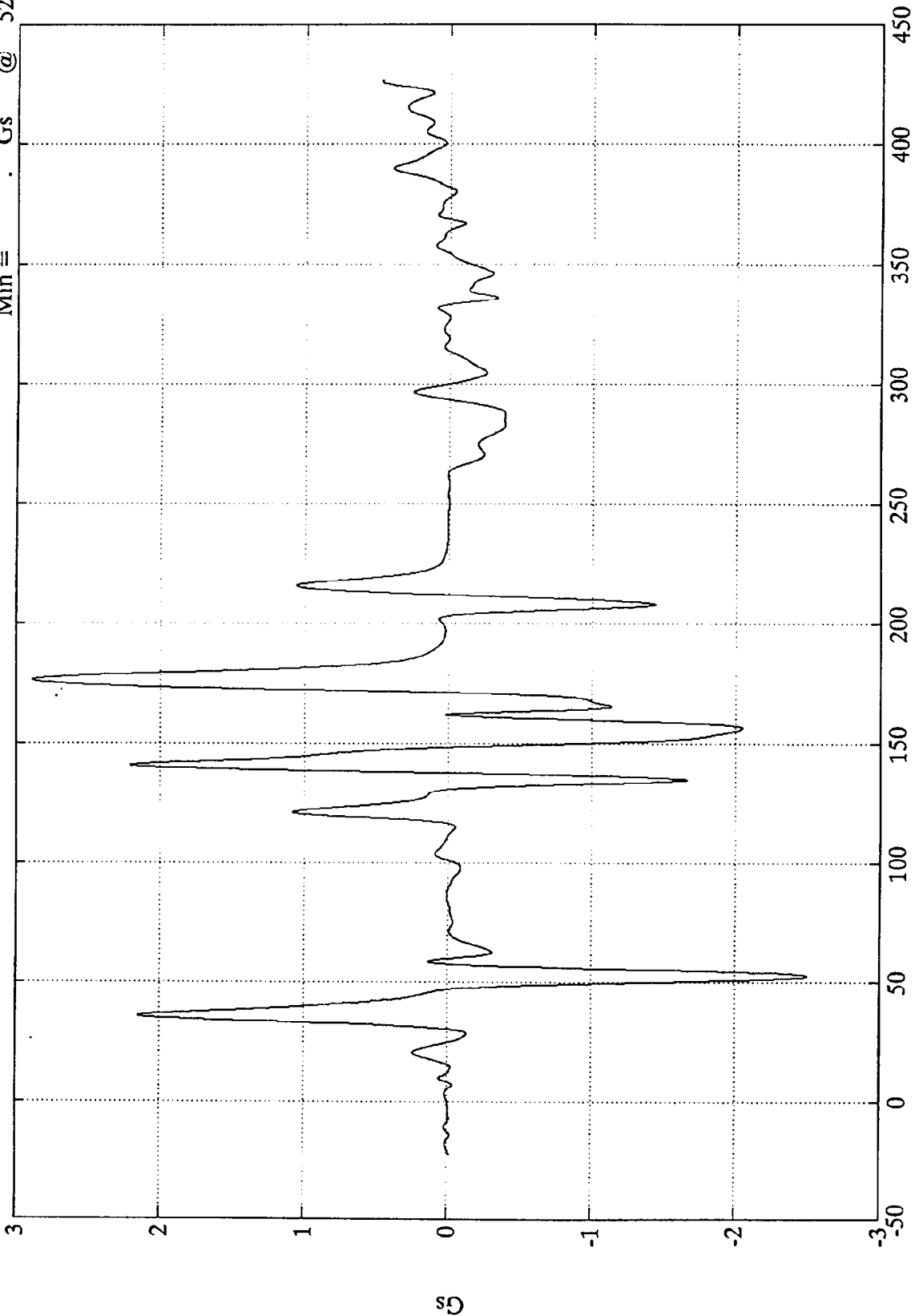
Gs

@ 176.88 msec

Min =

Gs

@ 52.68 msec



Time (msec)
Data not accurate, wire cut

SAE Filter Class 60

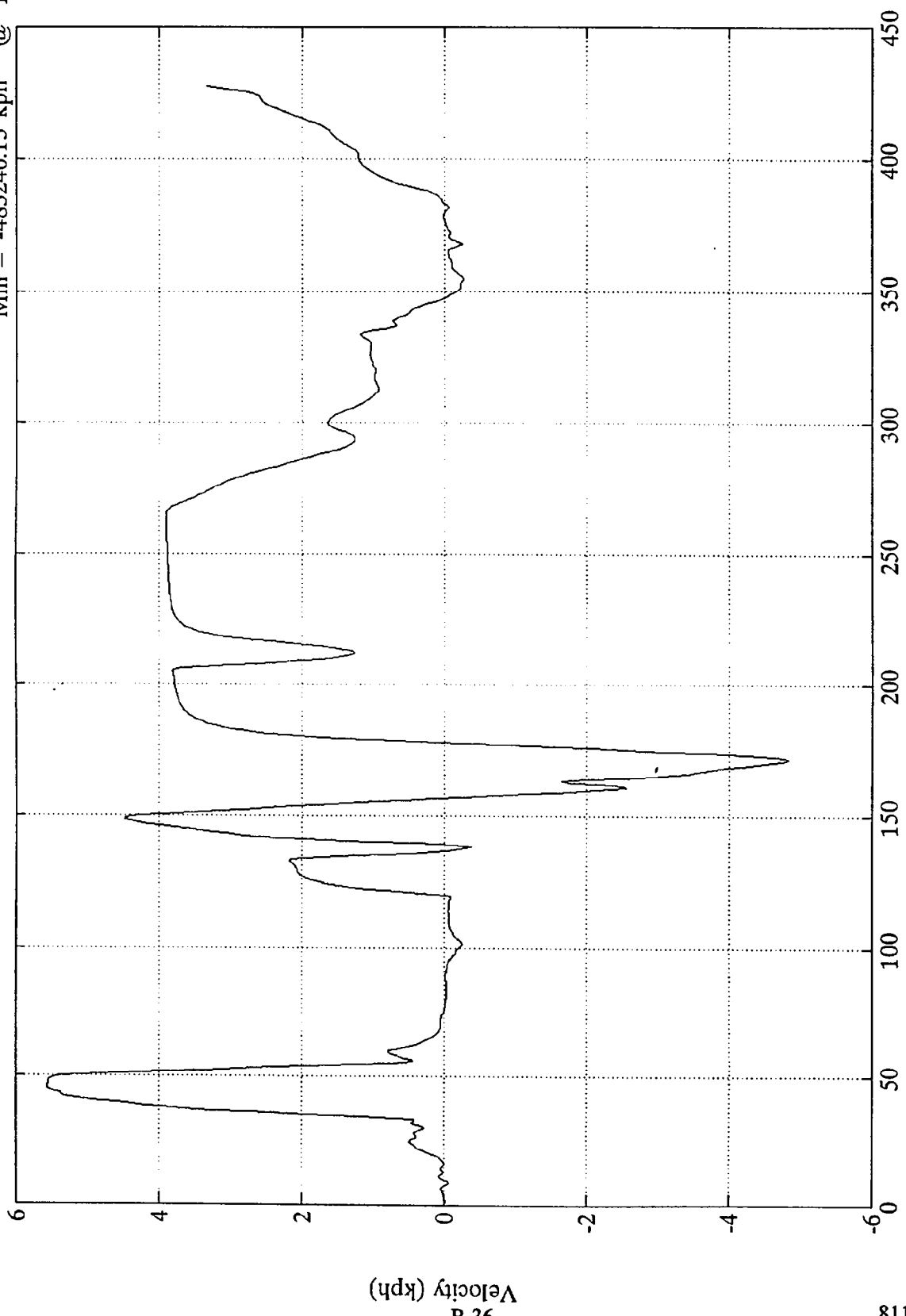
8118-9

B-35

VTV TEST #9
x10⁵

V1 L.F Frame Rail (X)

Max = 556394.56 kph @ 45.96 msec
Min = -483240.13 kph @ 171.72 msec



Time (msec)
Data not accurate, wire cut

SAE Filter Class 180

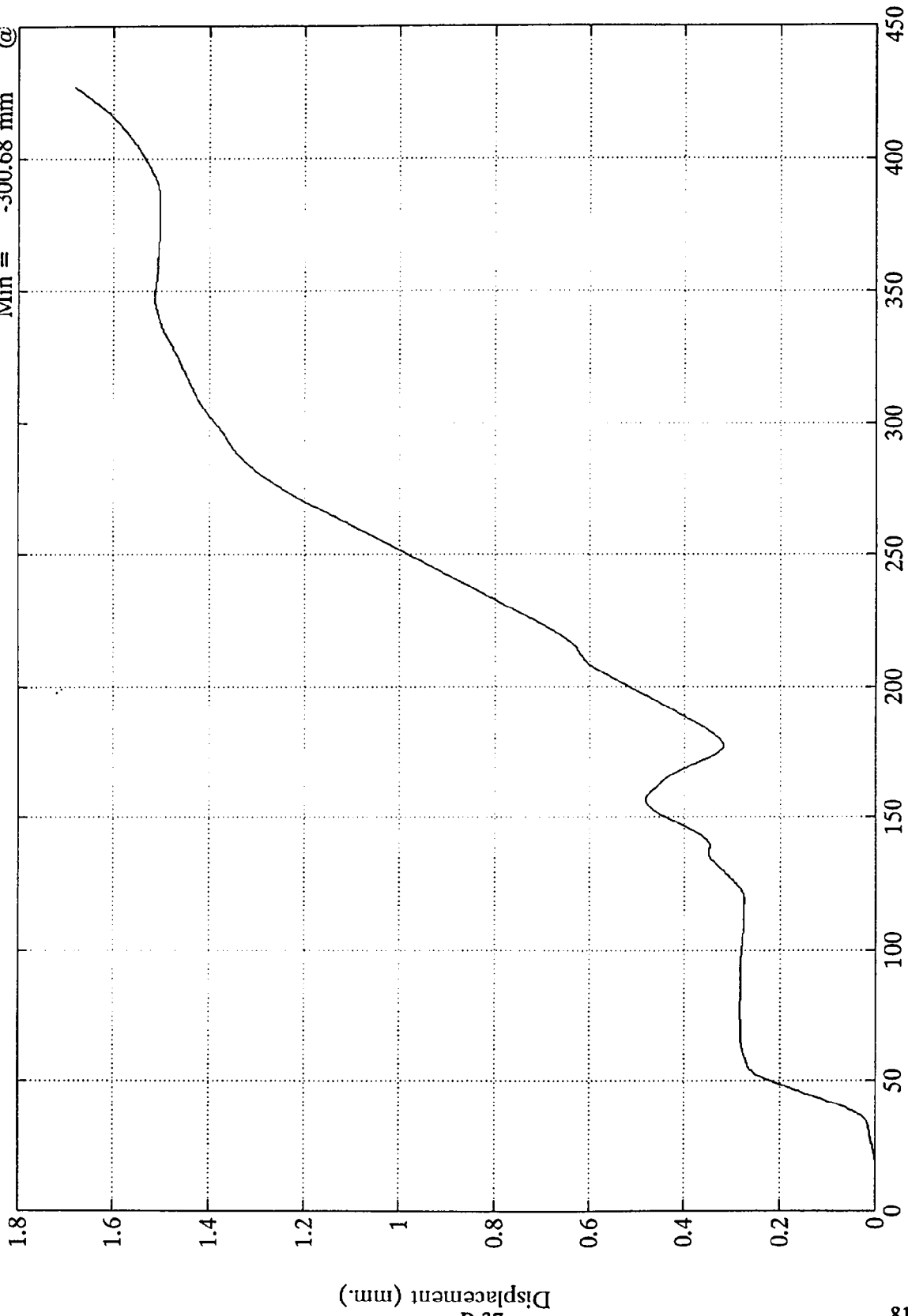
8118-9

B-36

VTV TEST #9
x10⁷

V1 LF Frame Rail (X)

Max = . mm @ 427.32 msec
Min = -300.68 mm @ 2.63 msec



Time (msec)
Data not accurate, wire cut

SAE Filter Class 180

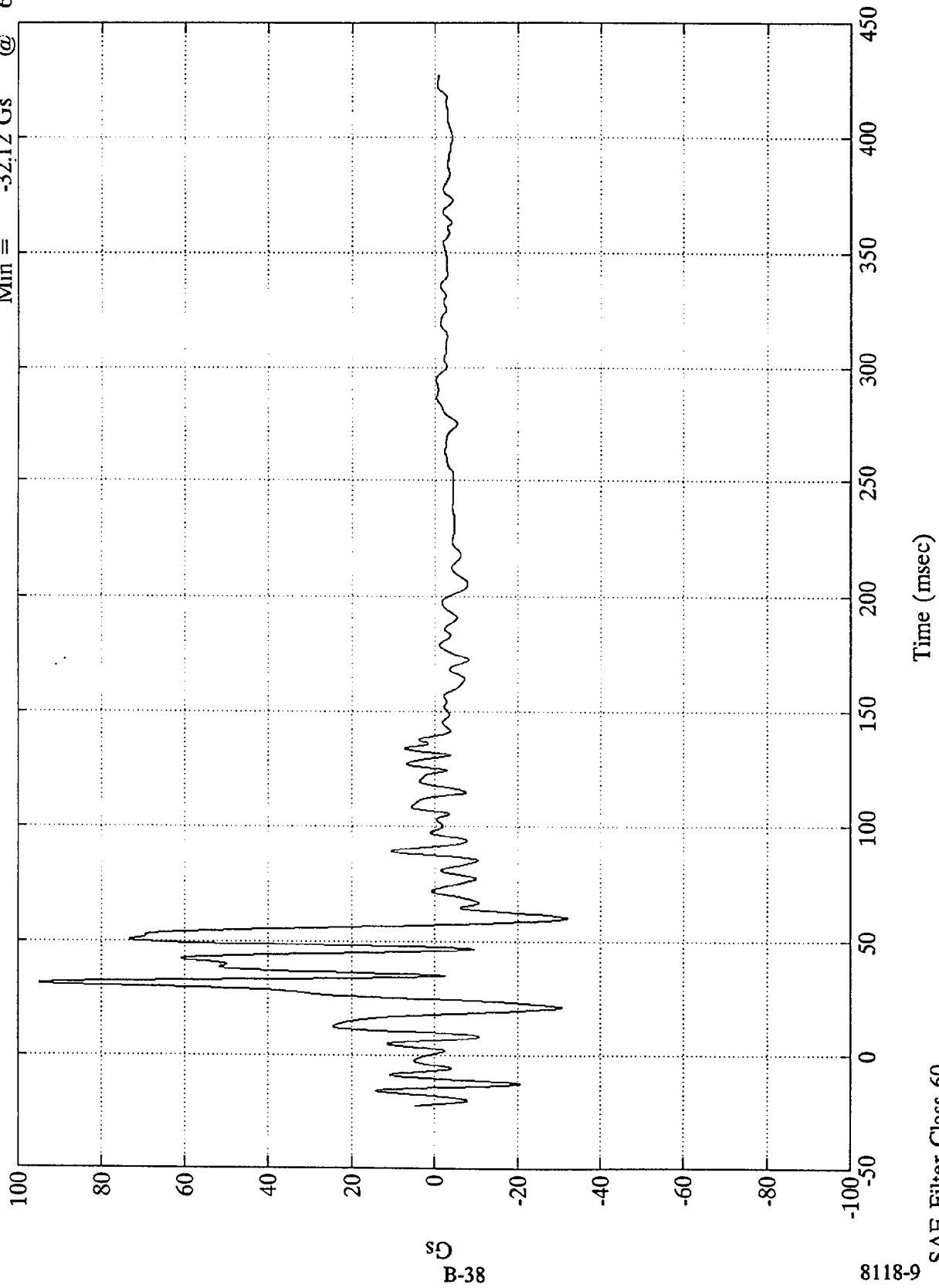
8118-9

45-B

VTV TEST #9

V1 LF Frame Rail (Y)

Max = 94.95 Gs @ 31.55 msec
Min = -32.12 Gs @ 60.12 msec



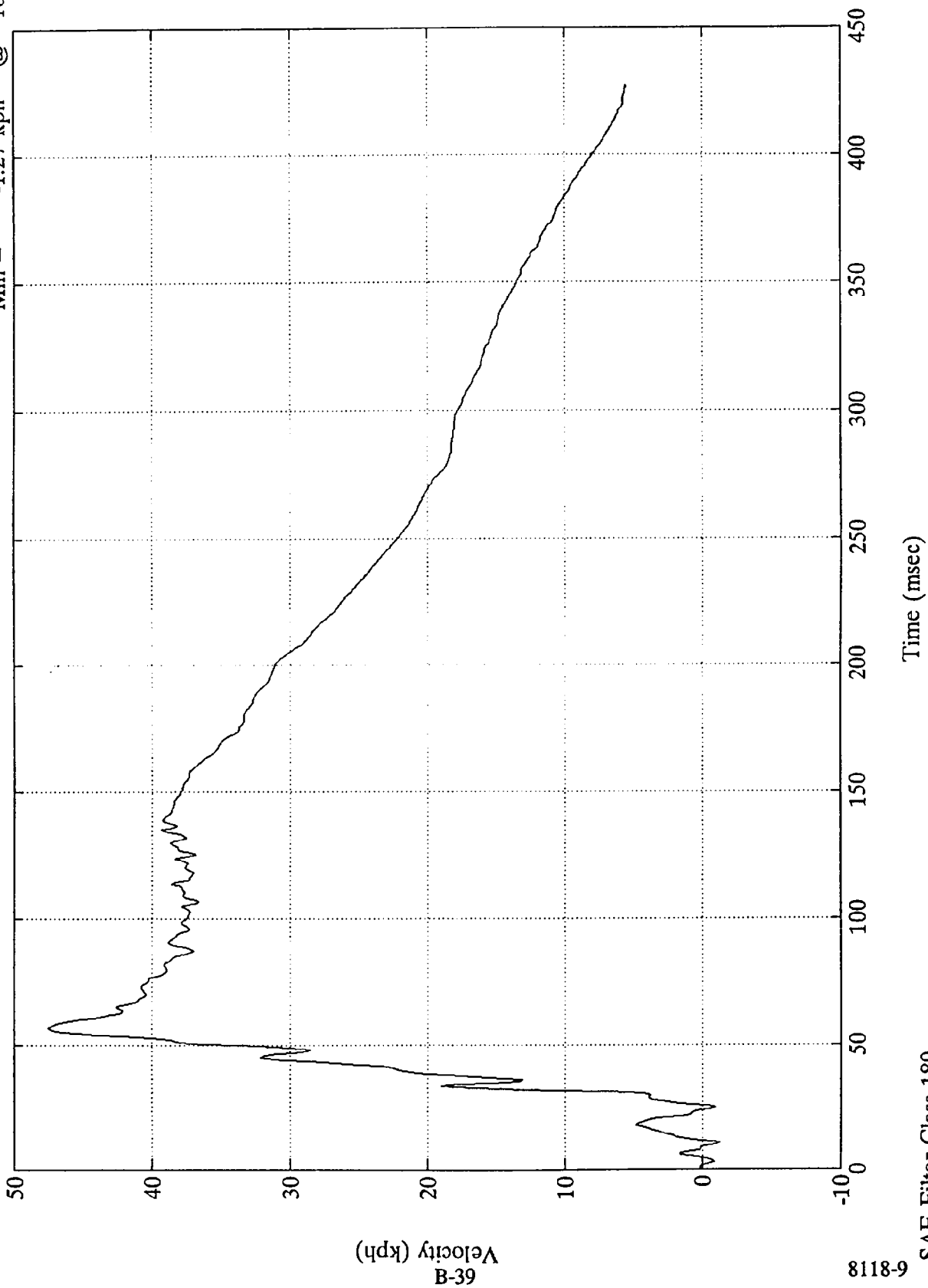
B-38

8118-9
SAE Filter Class 60

VTV TEST #9

V1 L.F. Frame Rail (Y)

Max = 47.56 kph @ 56.52 msec
Min = -1.27 kph @ 10.68 msec



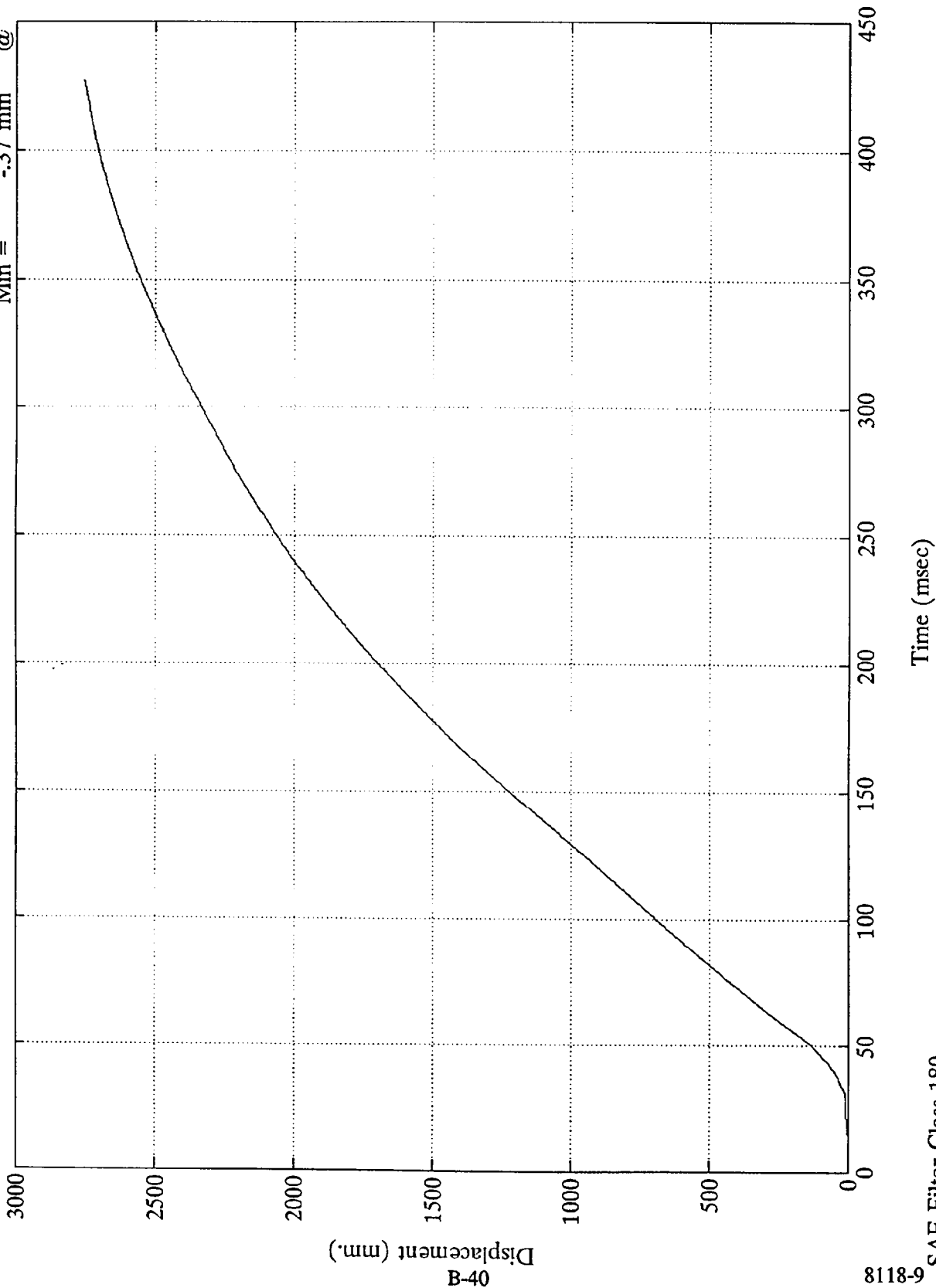
6-8118

SAE Filter Class 180

VTV TEST #9

V1 LF Frame Rail (Y)

Max = 2753.88 mm @ 427.32 msec
Min = -37 mm @ 4.67 msec



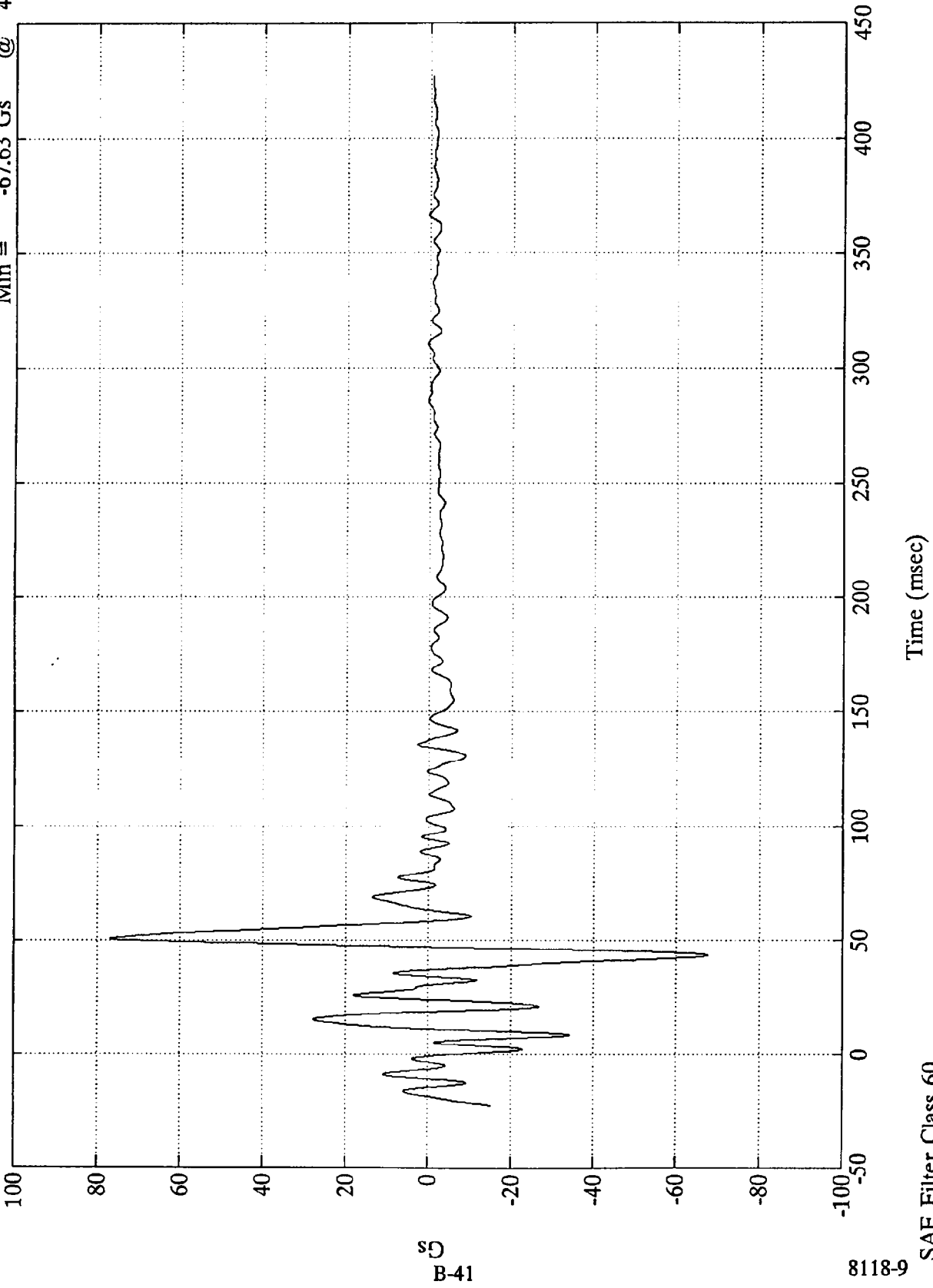
6-118-9

SAE Filter Class 180

VTV TEST #9

V1 L.F. Frame Rail (Z)

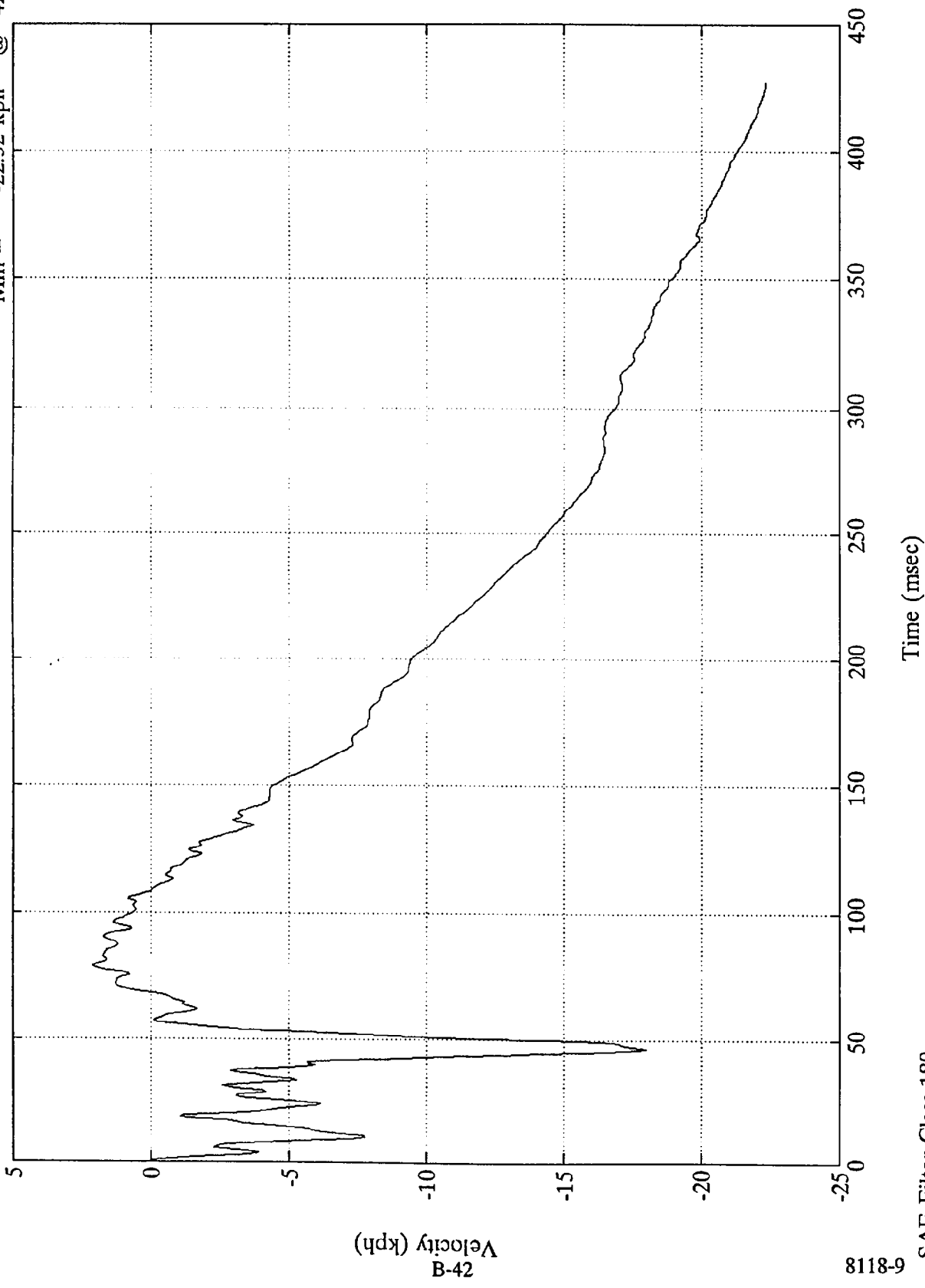
Max = 76.67 Gs @ 50.64 msec
Min = -67.63 Gs @ 43.31 msec



VTV TEST #9

V1 L F Frame Rail (Z)

Max = 2.14 kph @ 78.96 msec
Min = -22.32 kph @ 427.32 msec



8118-9

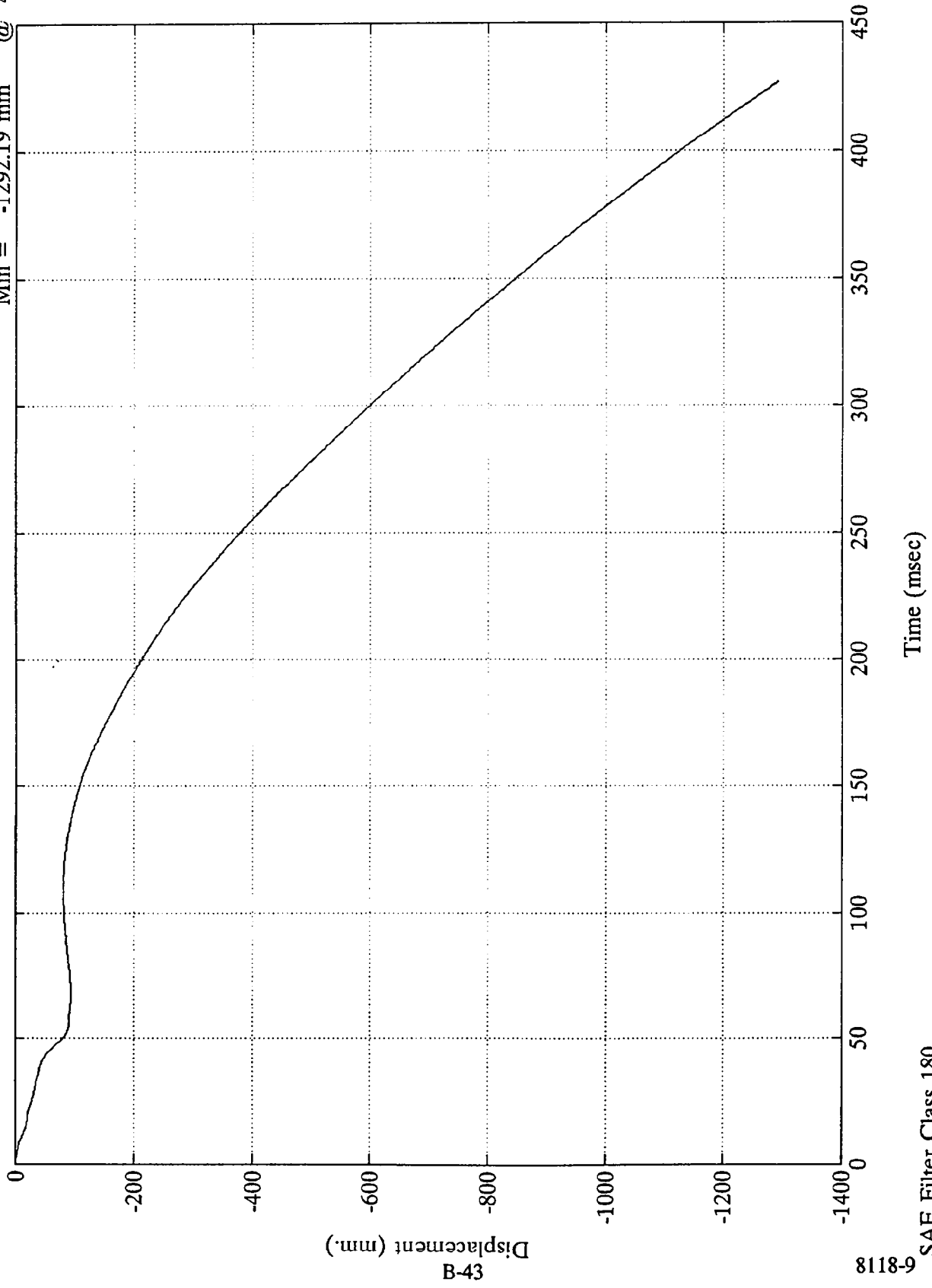
SAE Filter Class 180

B-42

VTV TEST #9

V1 L.F Frame Rail (Z)

Max = .00 mm @ 0.35 msec
Min = -1292.19 mm @ 427.32 msec

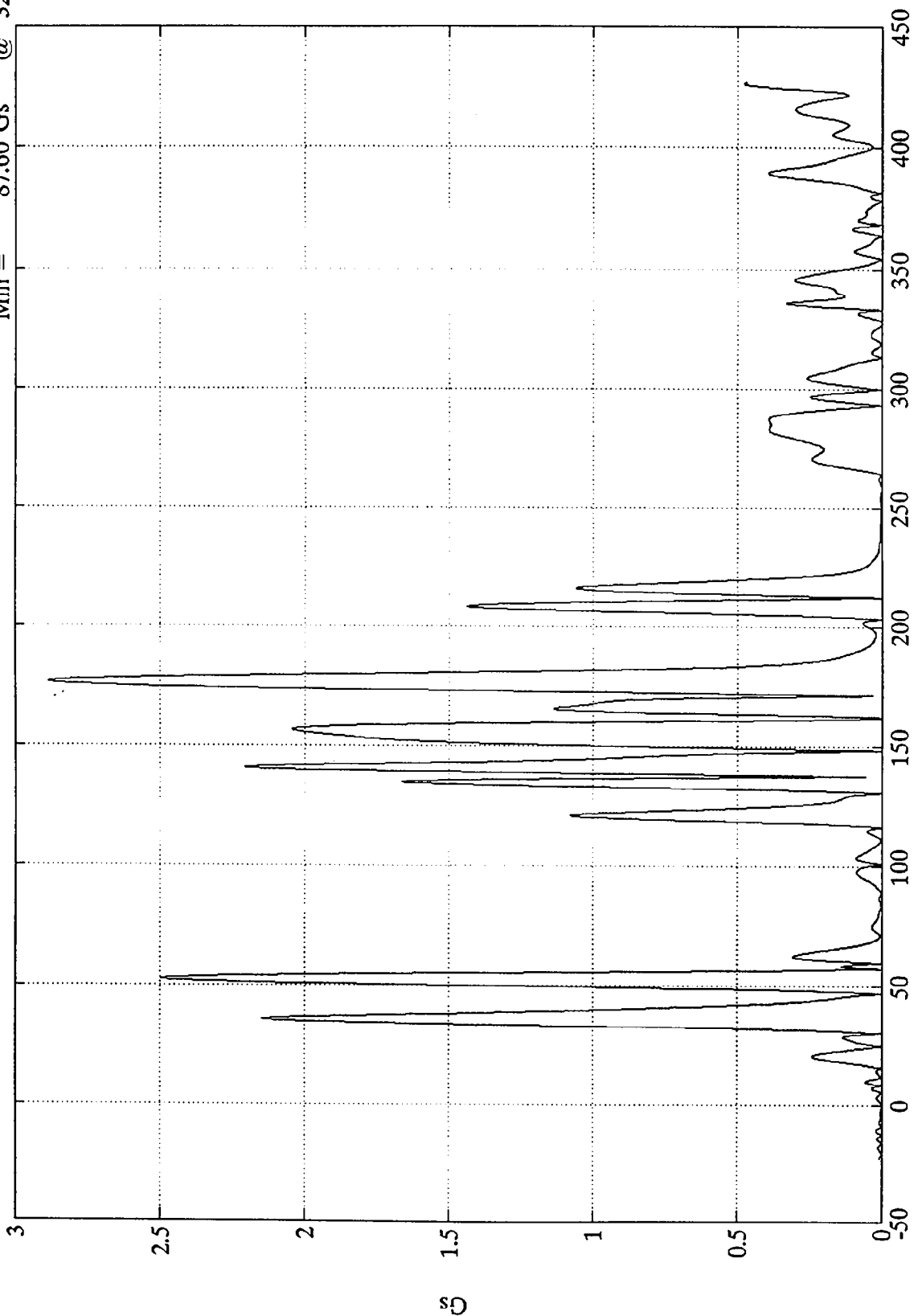


SAE Filter Class 180

VTV TEST #9
x10⁶

V1 L.F Frame Rail Res.

Max = Gs @ 176.88 msec
Min = 87.60 Gs @ 326.88 msec



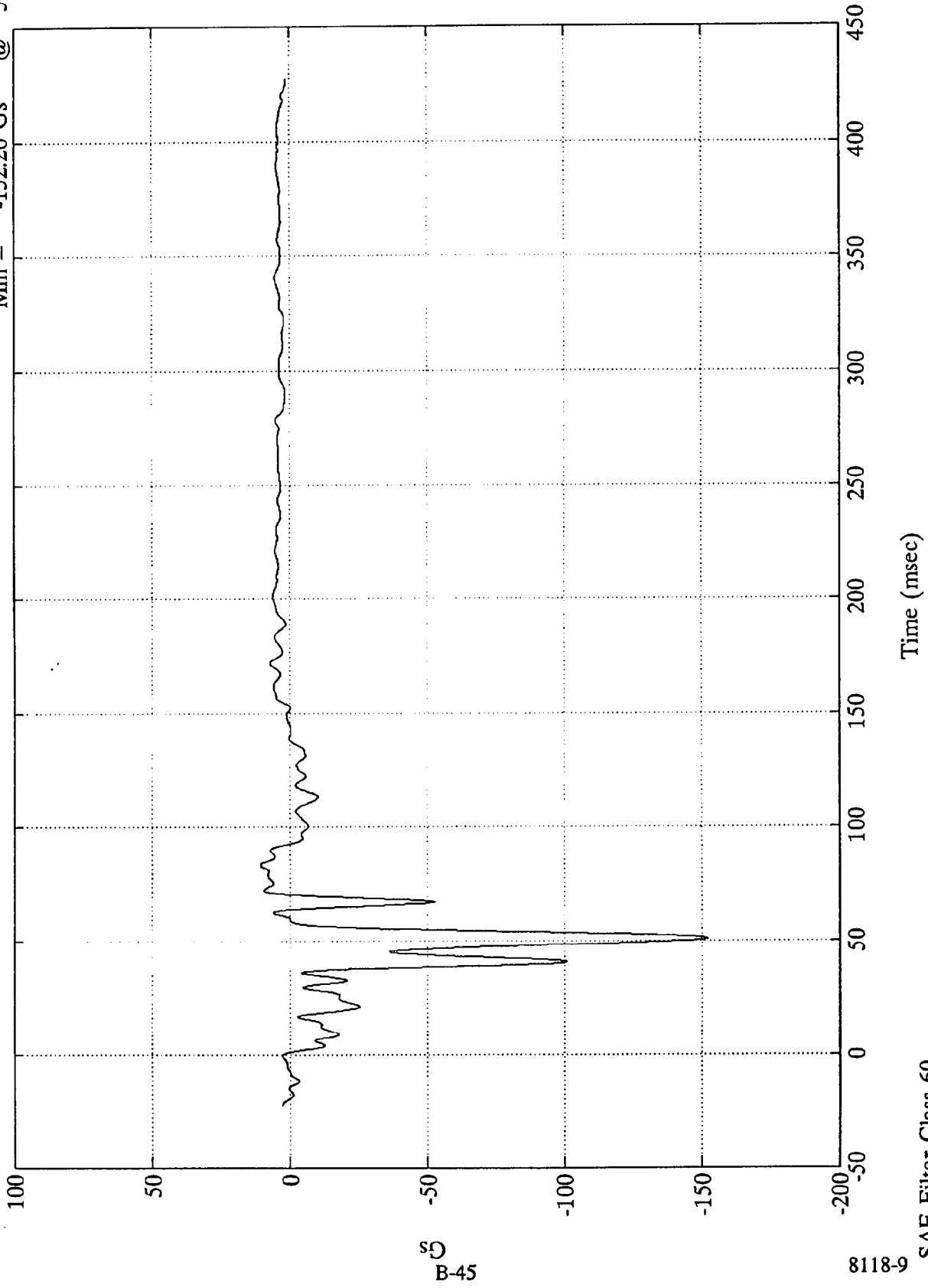
Time (msec)
Data not accurate, wire cut

SAE Filter Class 60

VTV TEST #9

V1 R.F Frame Rail (X)

Max = 10.57 Gs @ 83.28 msec
Min = -152.26 Gs @ 51.00 msec



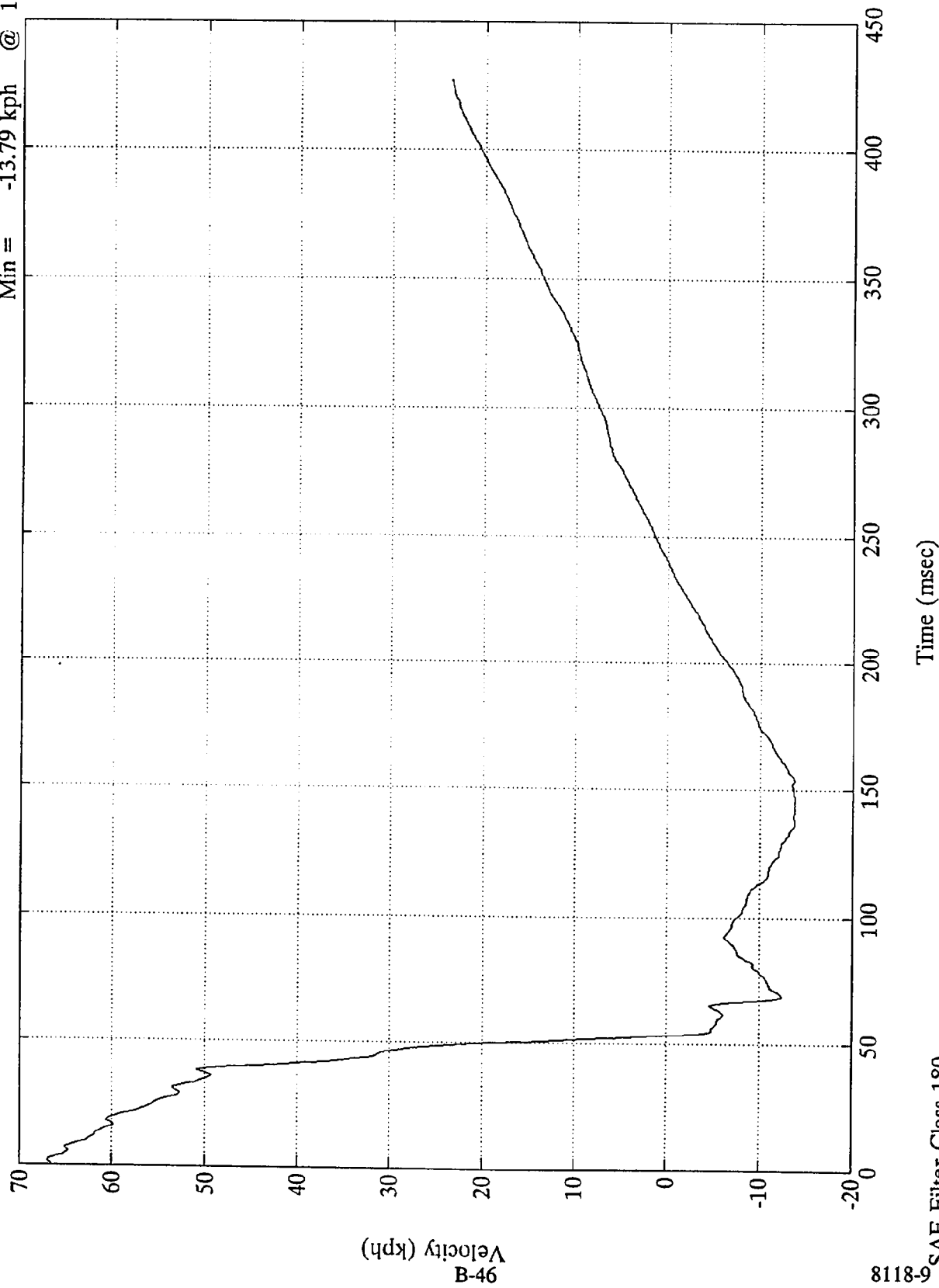
8118-9
B-45

SAE Filter Class 60

VTV TEST #9

V1 R.F Frame Rail (X)

Max = 66.96 kph @ 1.91 msec
Min = -13.79 kph @ 144.84 msec

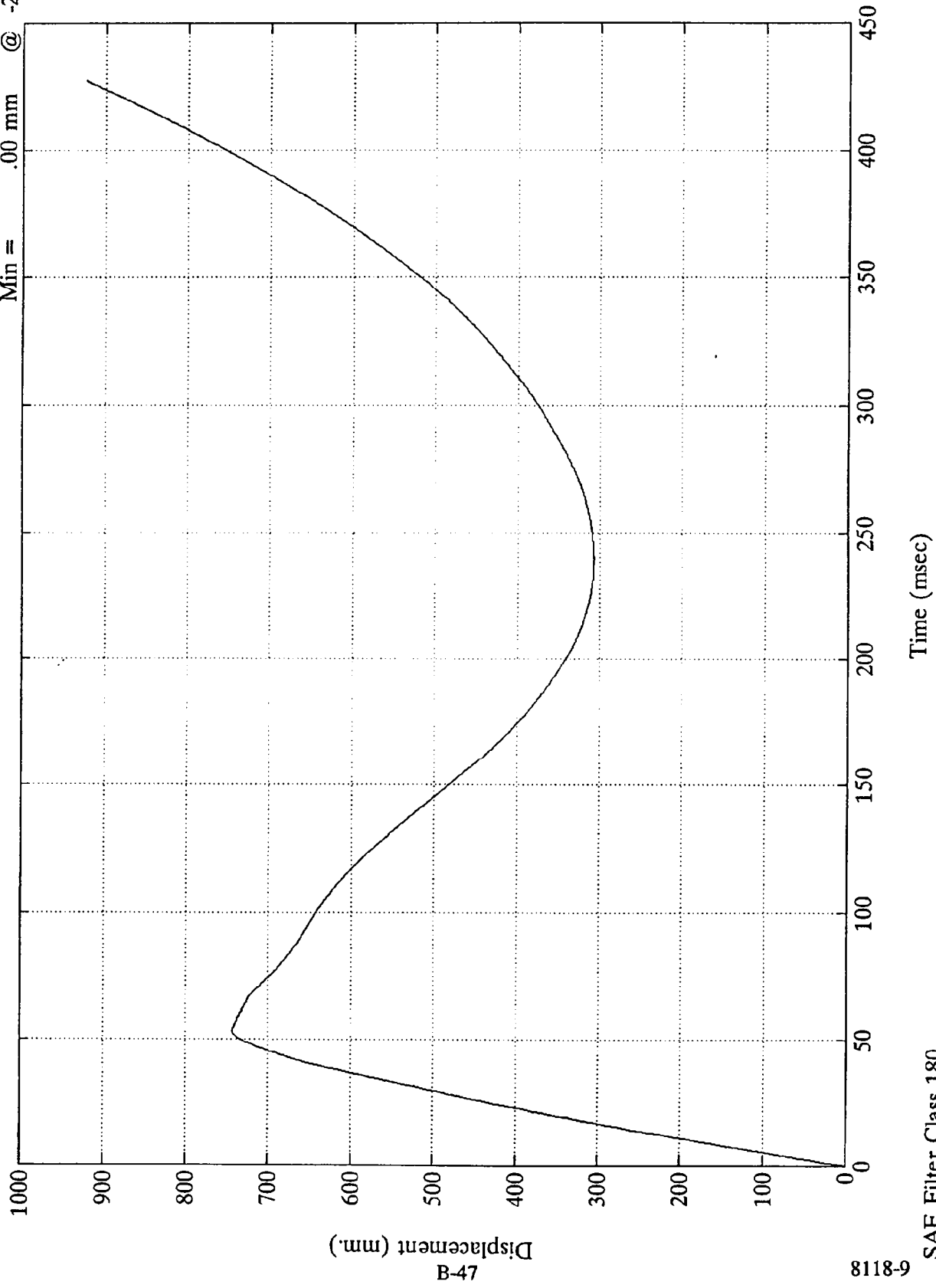


8118-9
SAE Filter Class 180

VTV TEST #9

V1 R.F Frame Rail (X)

Max = 924.05 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



6-8118

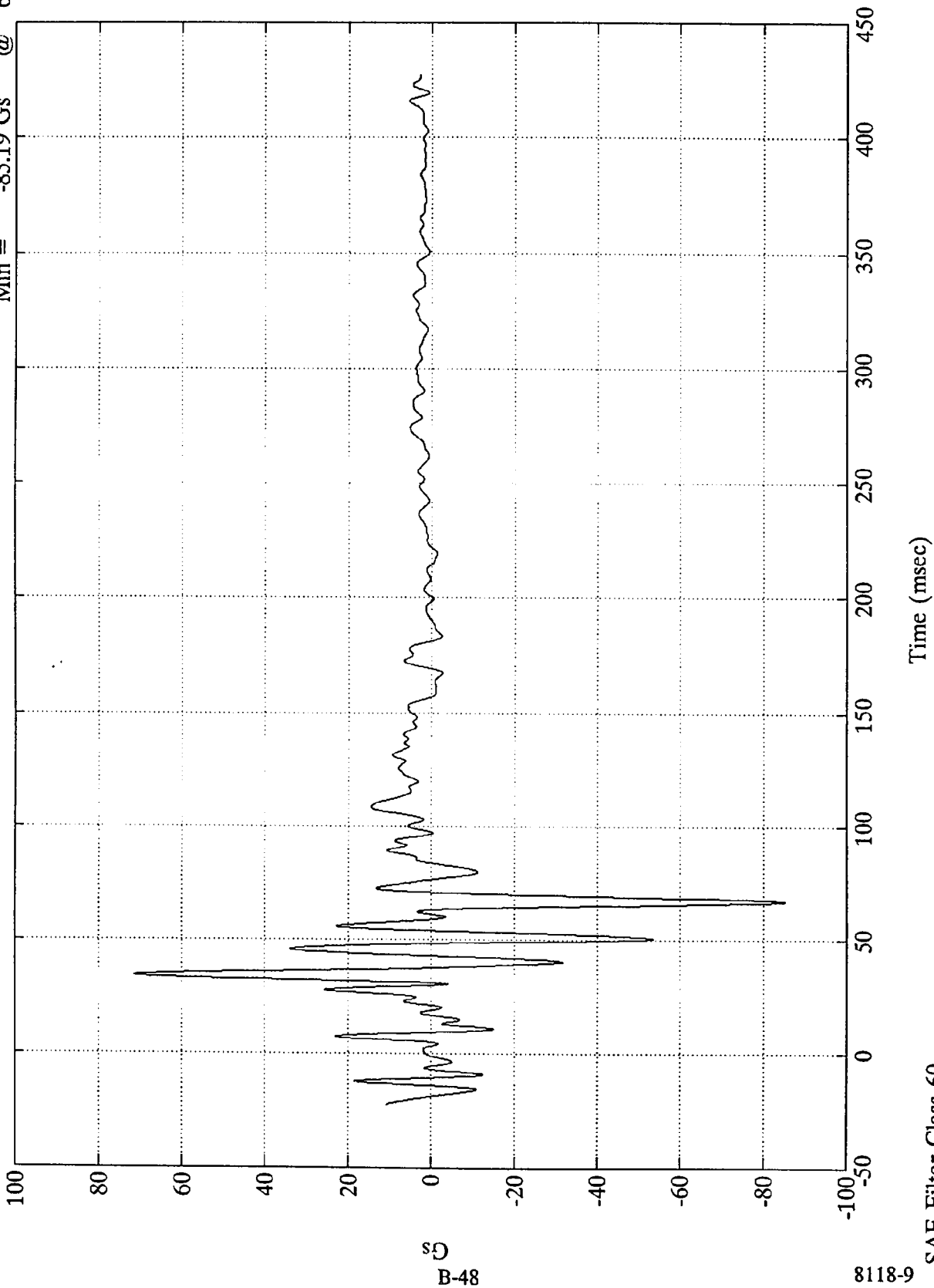
SAE Filter Class 180

B-47

VTV TEST #9

V1 R.F Frame Rail (Y)

Max =	71.36 Gs	@	34.20 msec
Min =	-85.19 Gs	@	66.84 msec



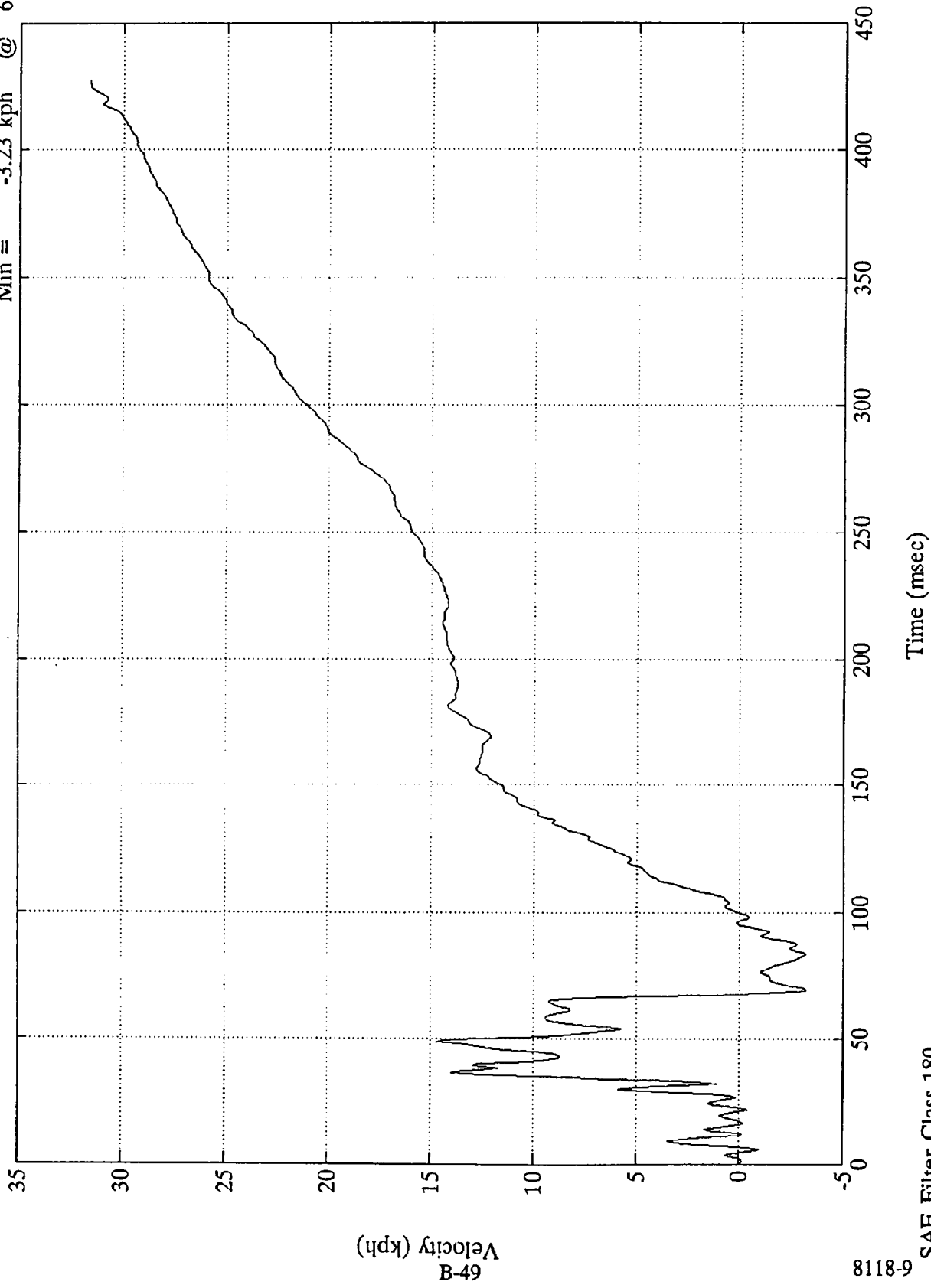
B-48

8118-9

VTV TEST #9

V1 R.F Frame Rail (Y)

Max = 31.62 kph @ 427.32 msec
Min = -3.23 kph @ 69.24 msec



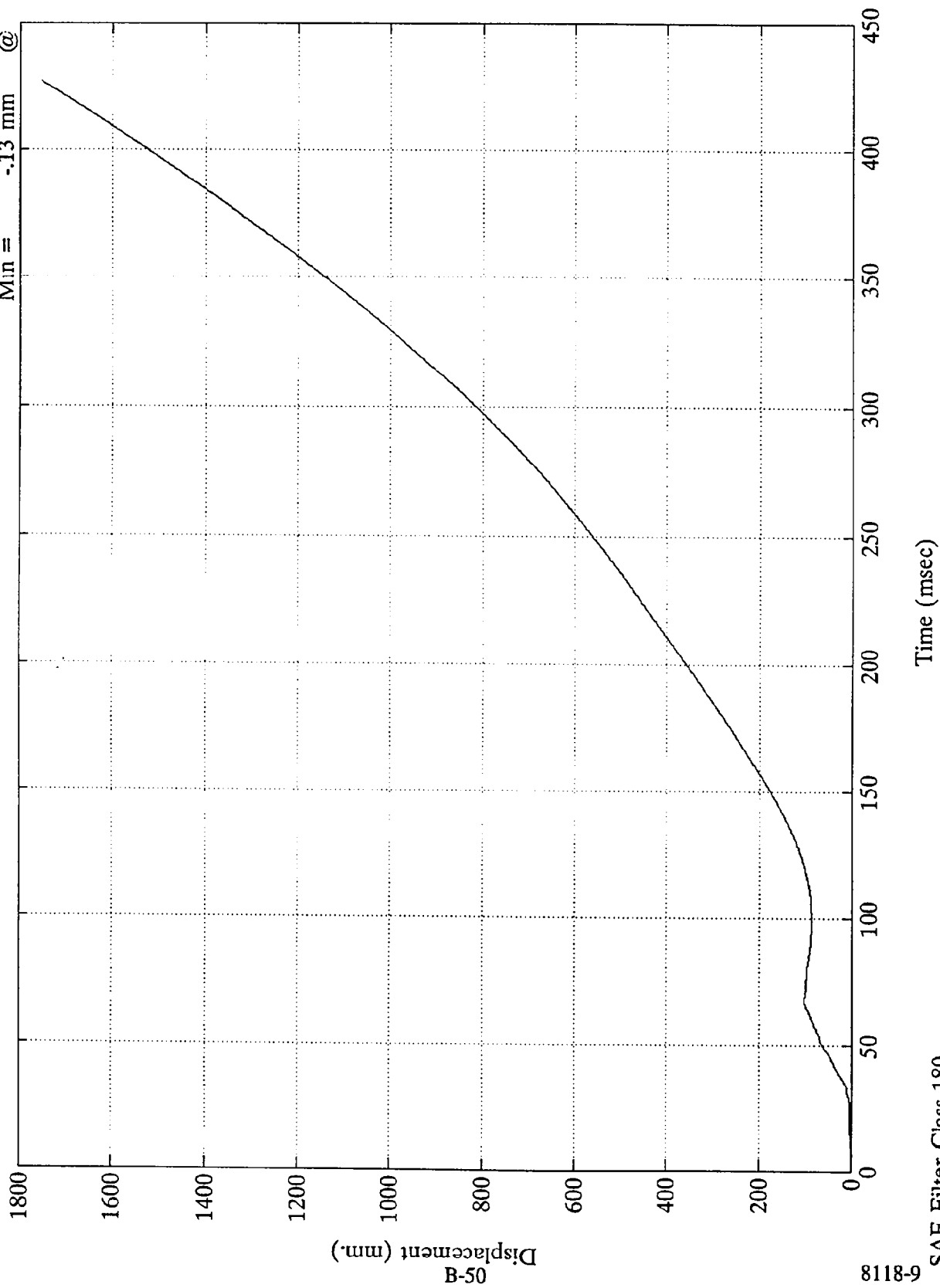
8118-9

SAE Filter Class 180

VTV TEST #9

V1 R.F Frame Rail (Y)

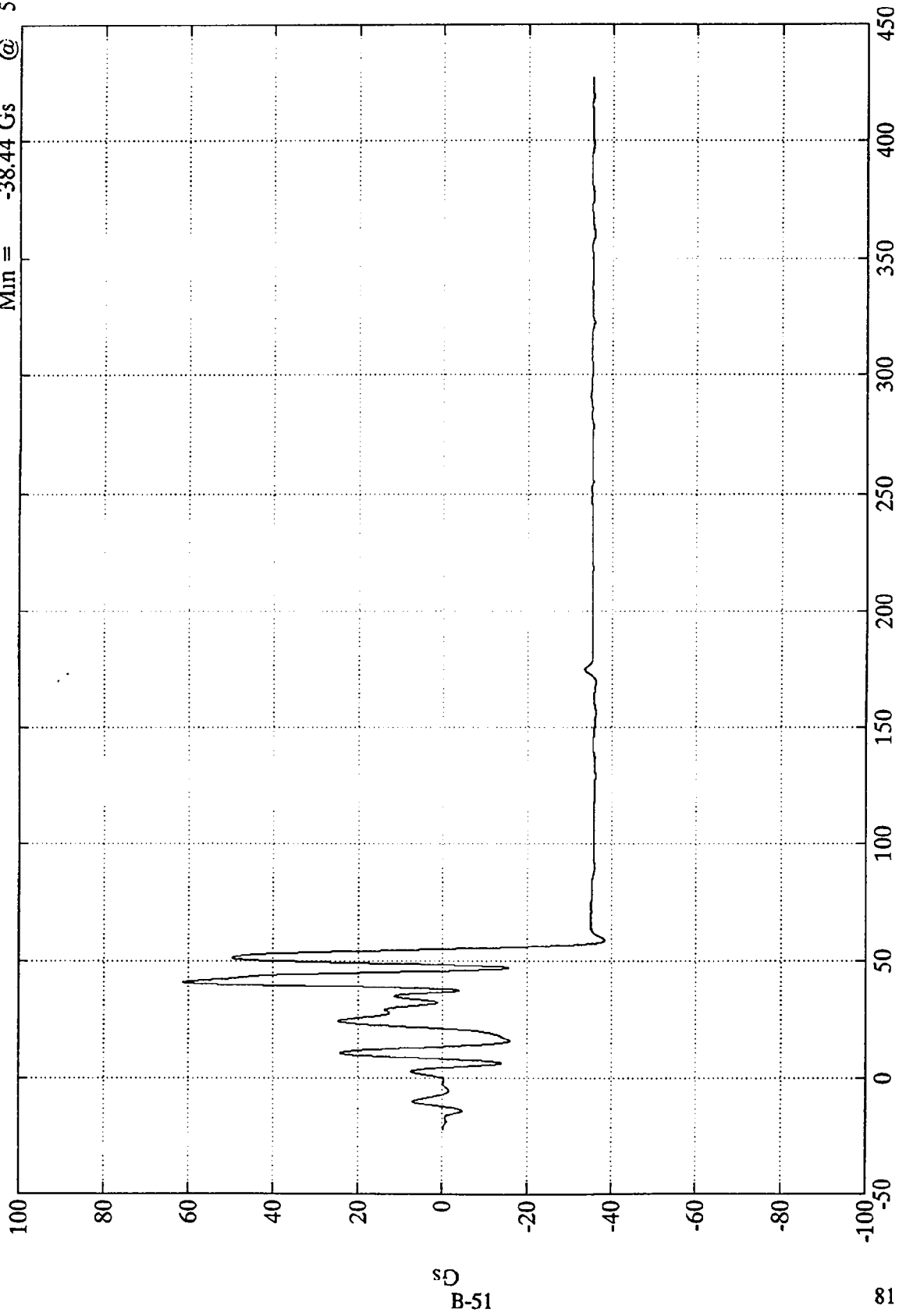
Max = 1754.91 mm @ 427.32 msec
Min = -13 mm @ 6.83 msec



VTV TEST #9

V1 R.F. Frame Rail (Z)

Max = 61.26 Gs @ 41.04 msec
Min = -38.44 Gs @ 58.68 msec



Time (msec)
Wire cut at 55msec

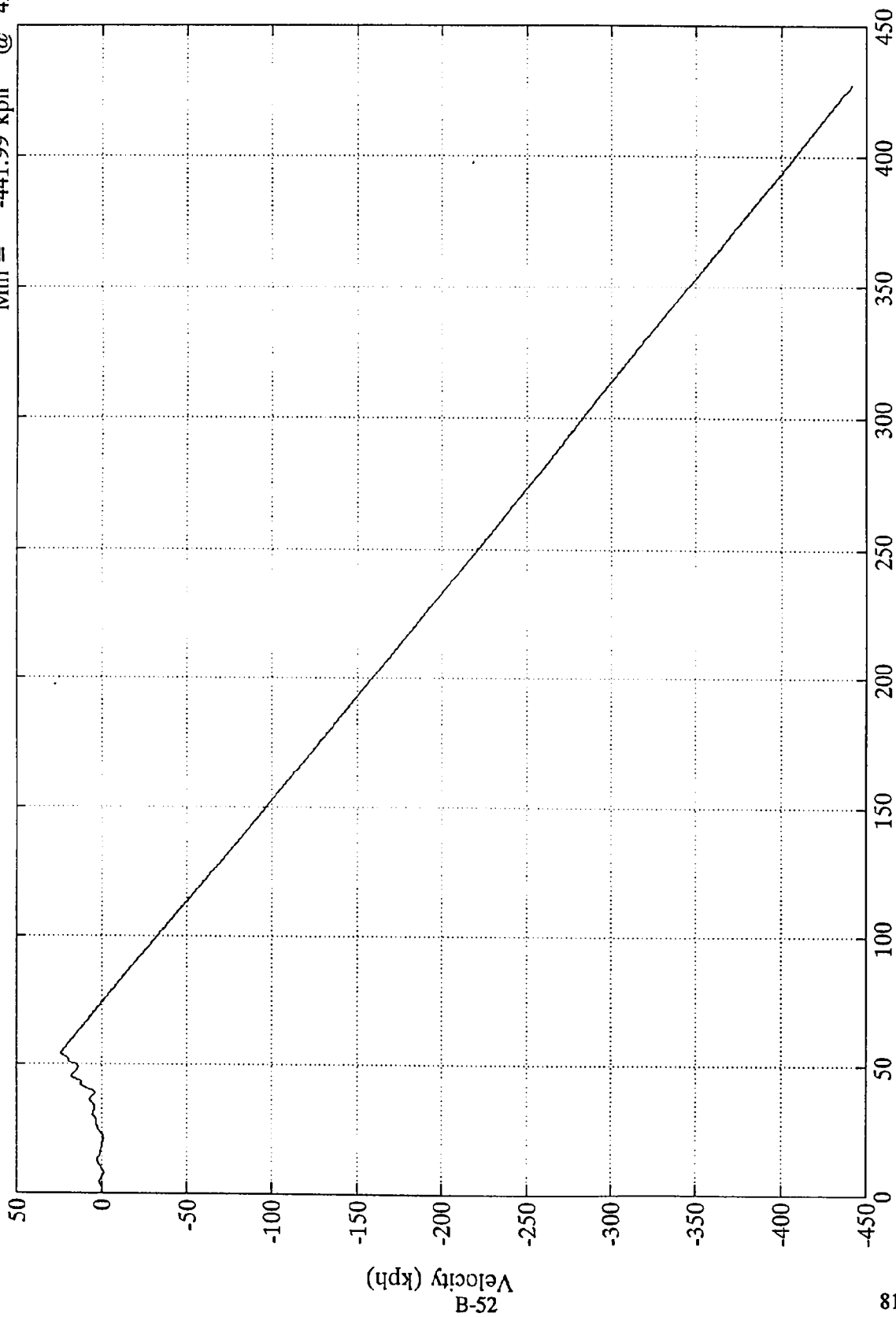
SAE Filter Class 60

8118-9

B-51

VTV TEST #9

V1 R.F Frame Rail (Z)
Max = 23.78 kph @ 54.48 msec
Min = -441.99 kph @ 427.32 msec



8118-9

SAE Filter Class 180

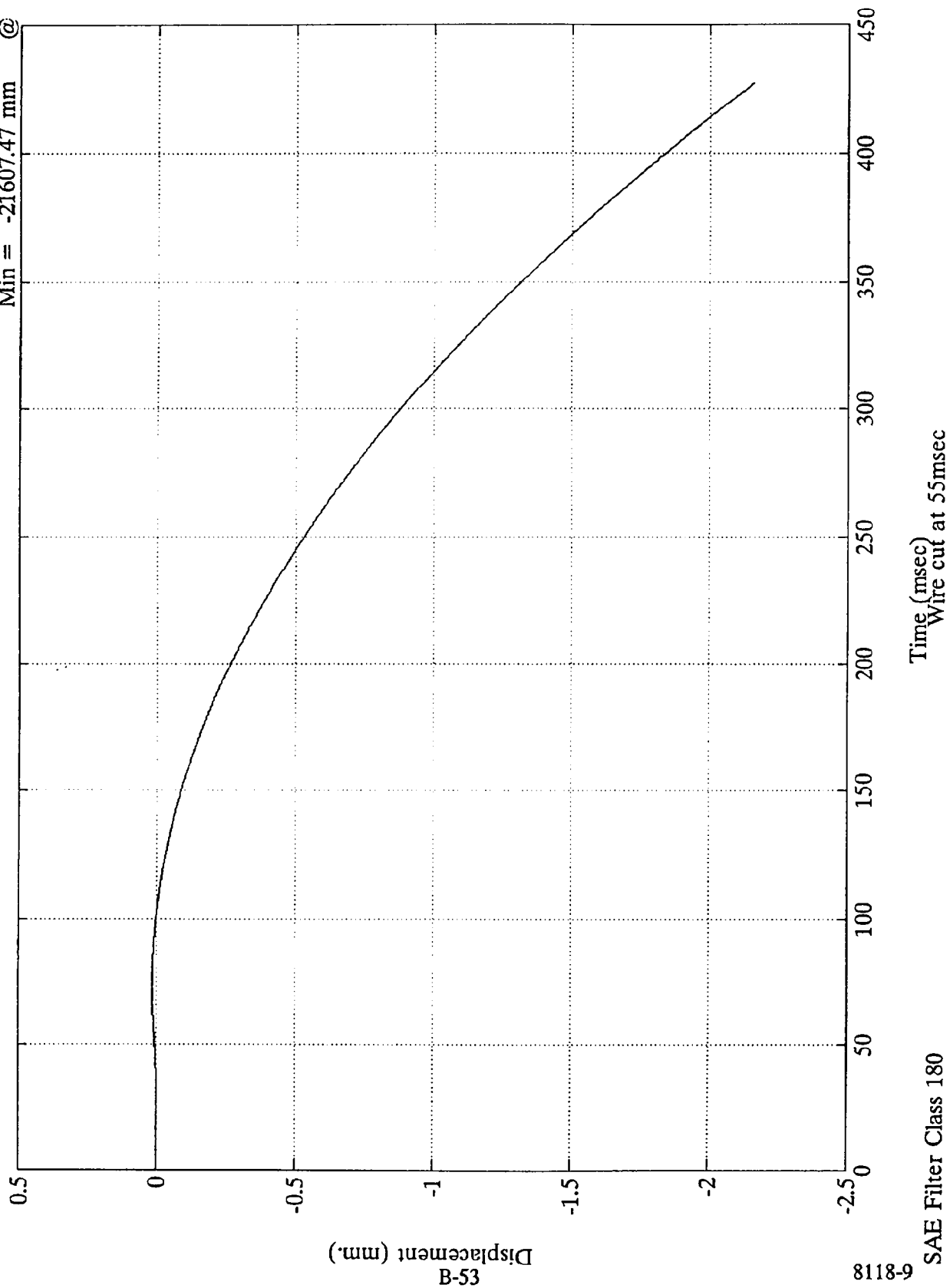
Wire cut at 55msec

VTV TEST #9

$\times 10^4$

V1 R.F Frame Rail (Z)

Max = 148.92 mm @ 73.80 msec
Min = -21607.47 mm @ 427.32 msec



6-8118

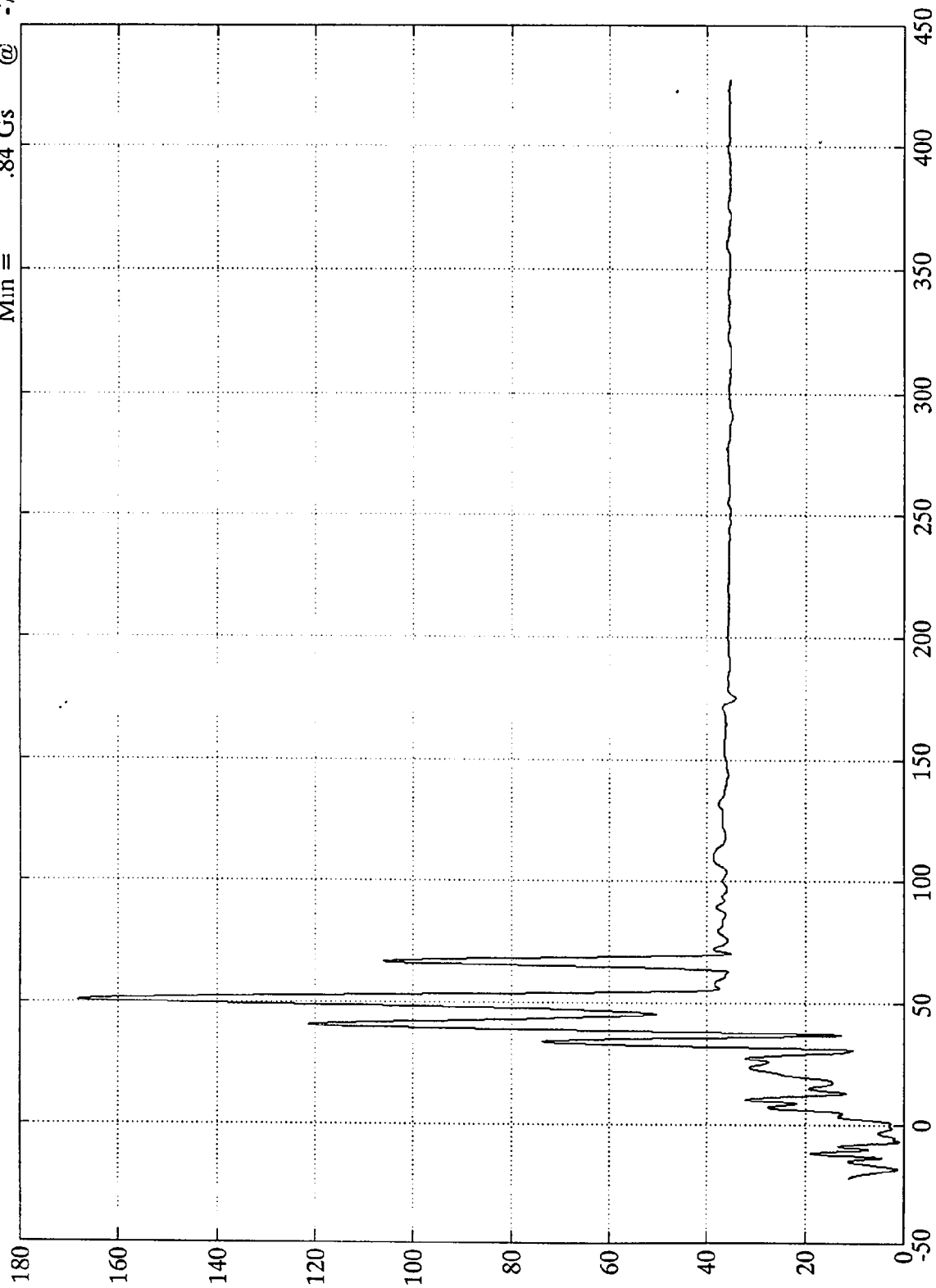
SAE Filter Class 180

Time (msec)
Wire cut at 55msec

VTV TEST #9

V1 R.F Frame Rail Res.

Max = 168.37 Gs @ 50.88 msec
Min = .84 Gs @ -7.08 msec



Time (msec)
Data not accurate, wire cut

SAE Filter Class 60

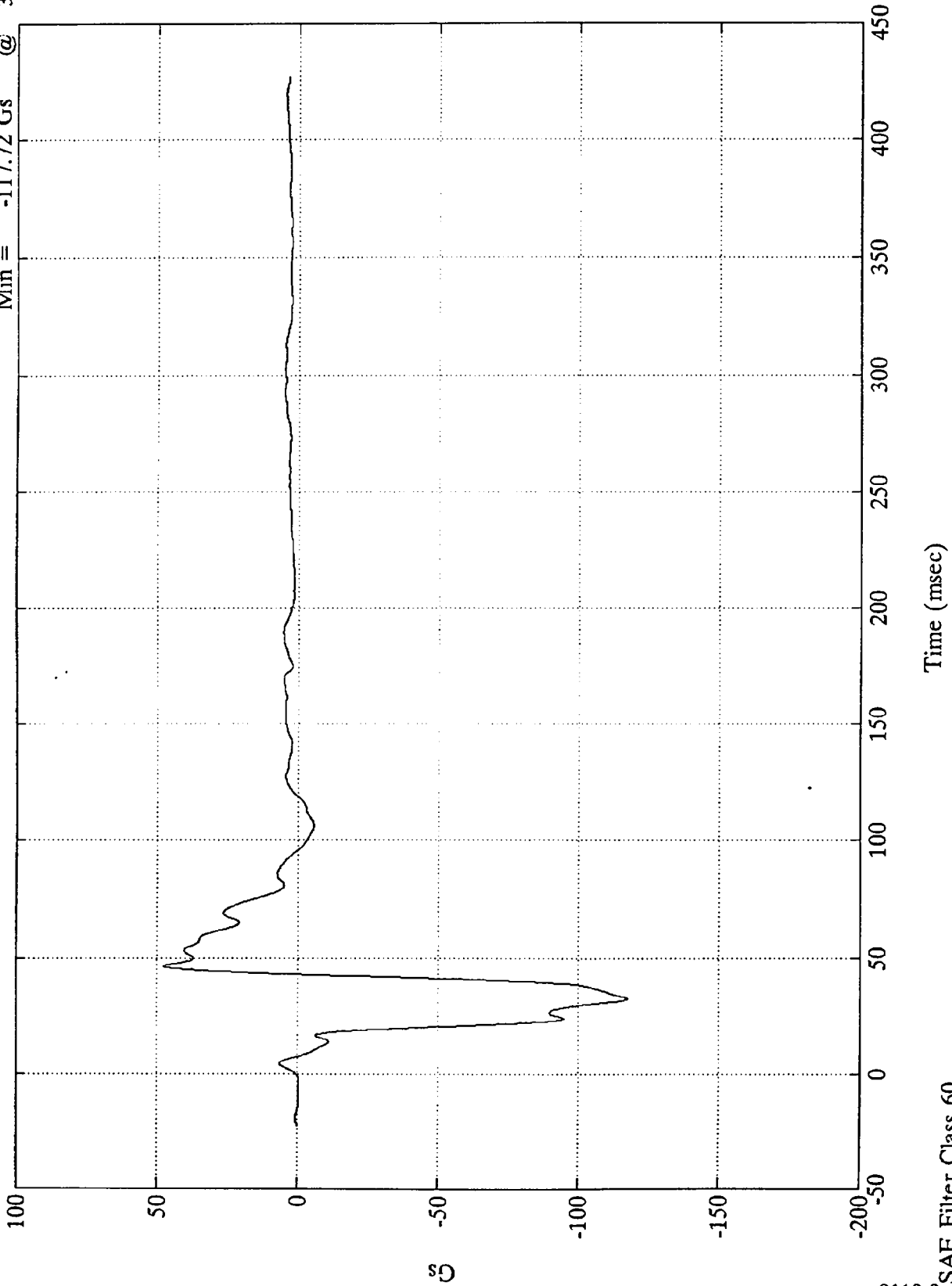
B-54

8118-9

VTV TEST #9

V1 Left Engine (X)

Max = 47.63 Gs @ 46.44 msec
Min = -117.72 Gs @ 32.63 msec



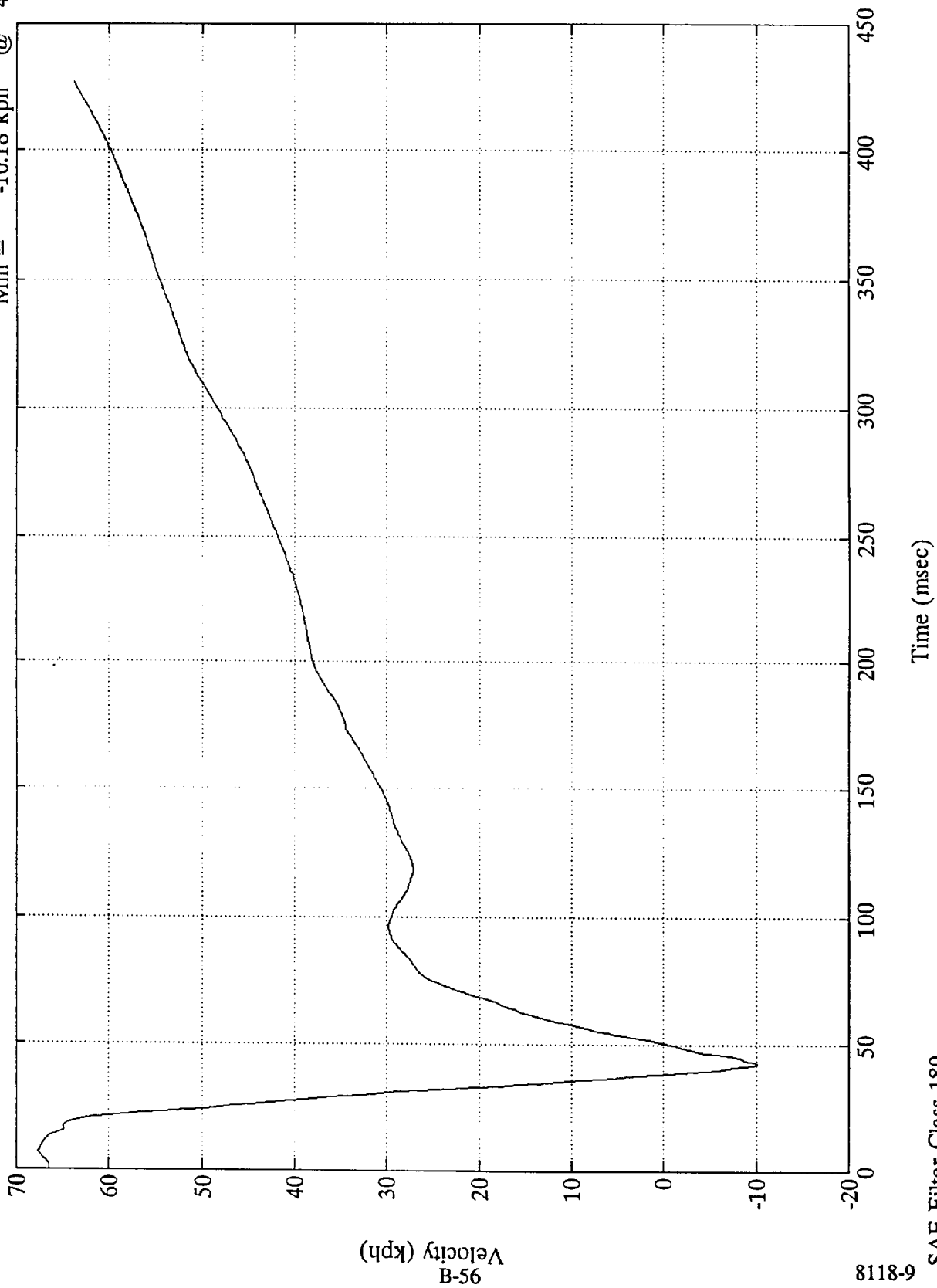
B-55

8118-9 SAE Filter Class 60

VTV TEST #9

V1 Left Engine (X)

Max = 67.67 kph @ 6.95 msec
Min = -10.18 kph @ 42.47 msec

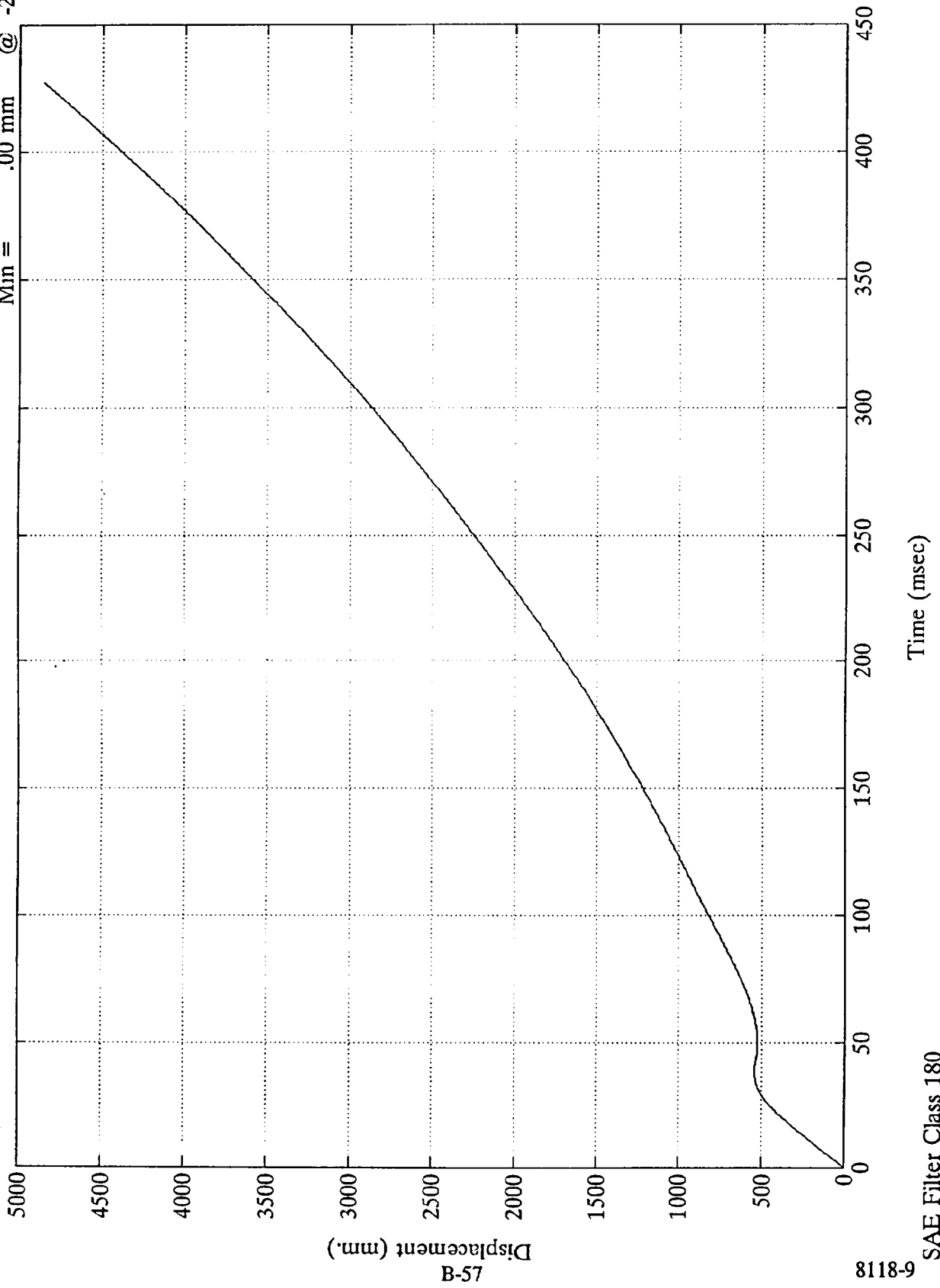


8118-9

VTV TEST #9

V1 Left Engine (X)

Max = 4850.82 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



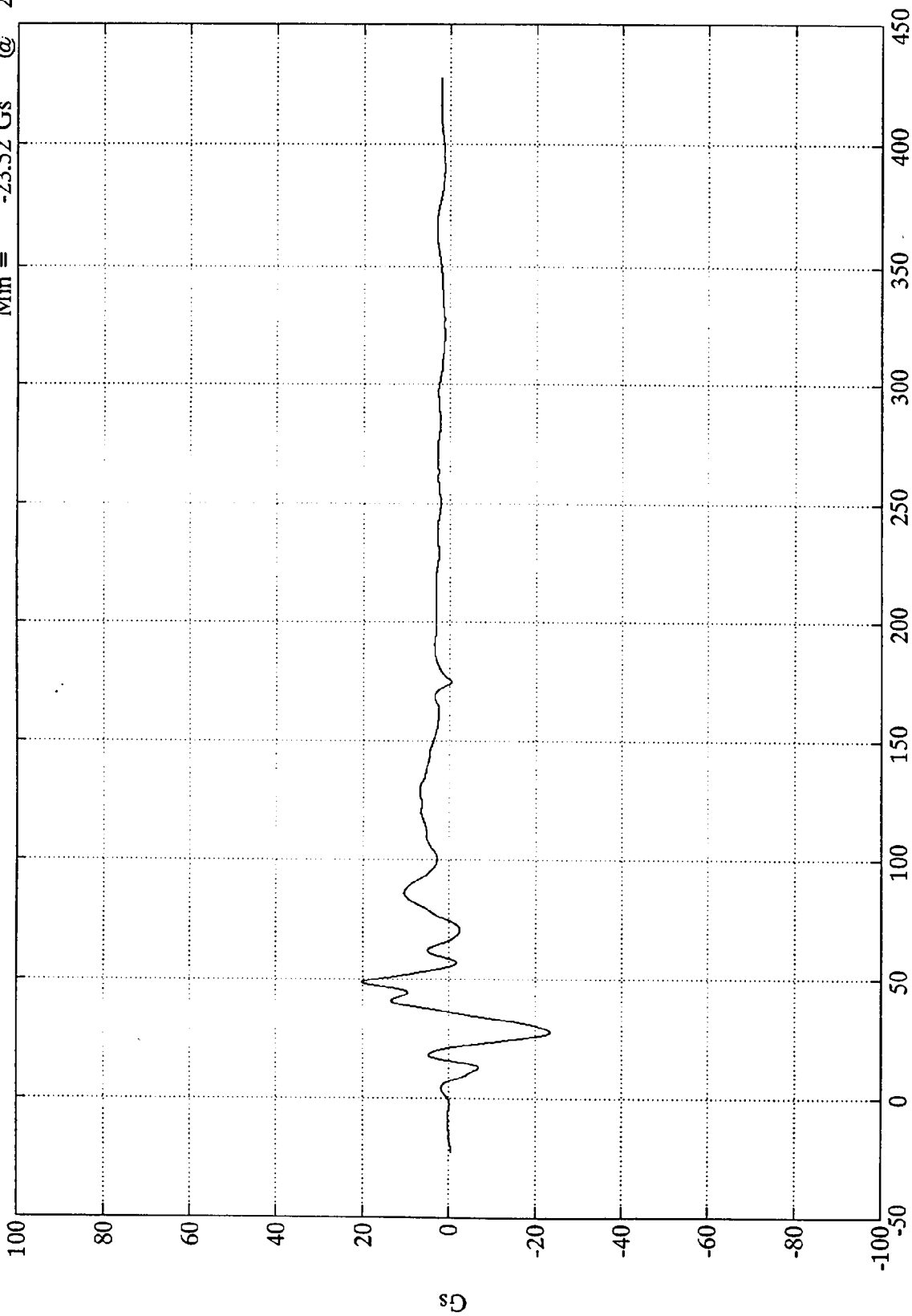
6-8118

SAE Filter Class 180

VTV TEST #9

V1 Right Engine (X)

Max =	20.10 Gs	@	48.59 msec
Min =	-23.52 Gs	@	28.20 msec



Gs

Time (msec)

B-58

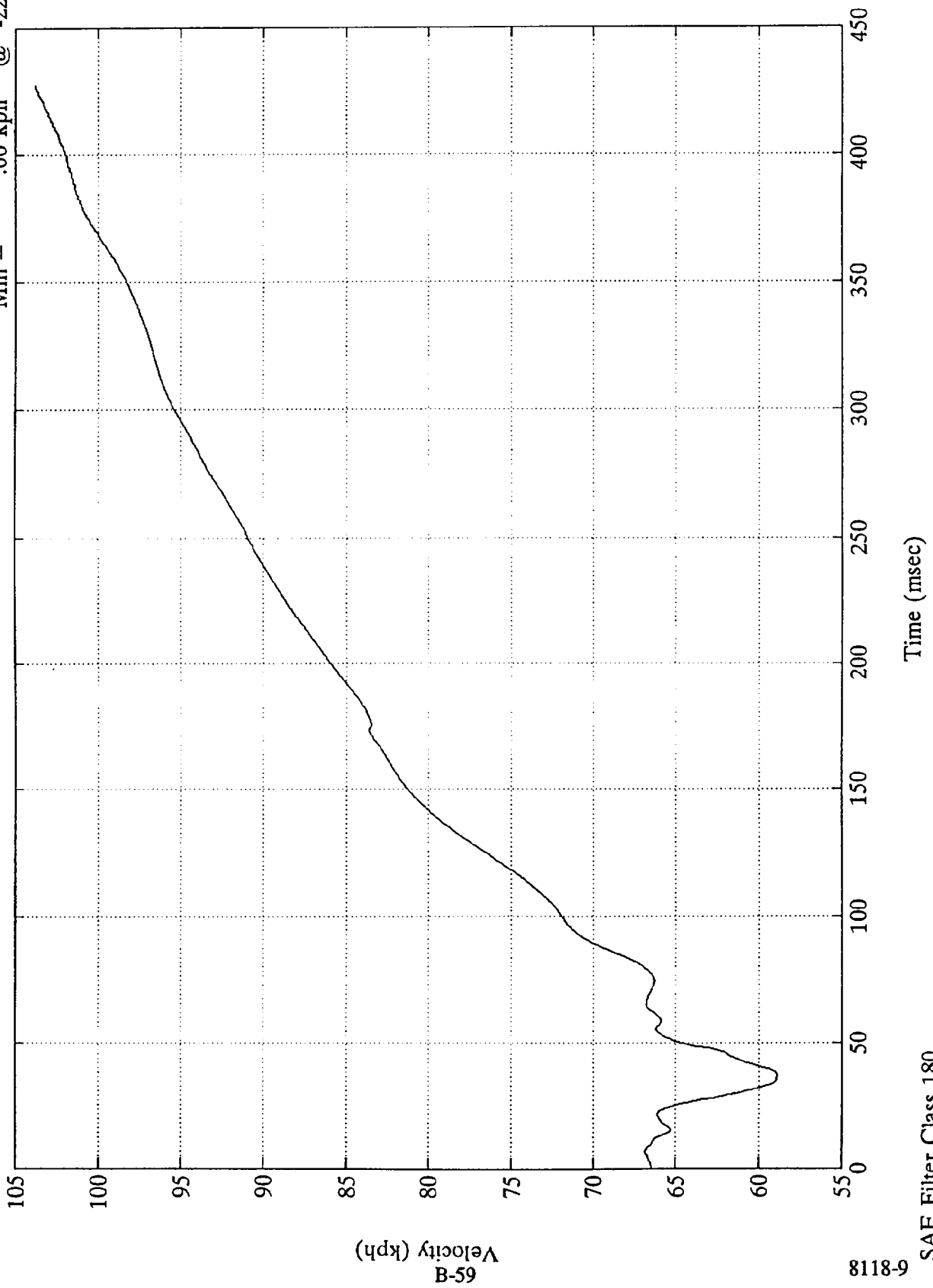
8118-9

SAE Filter Class 60

VTV TEST #9

V1 Right Engine (X)

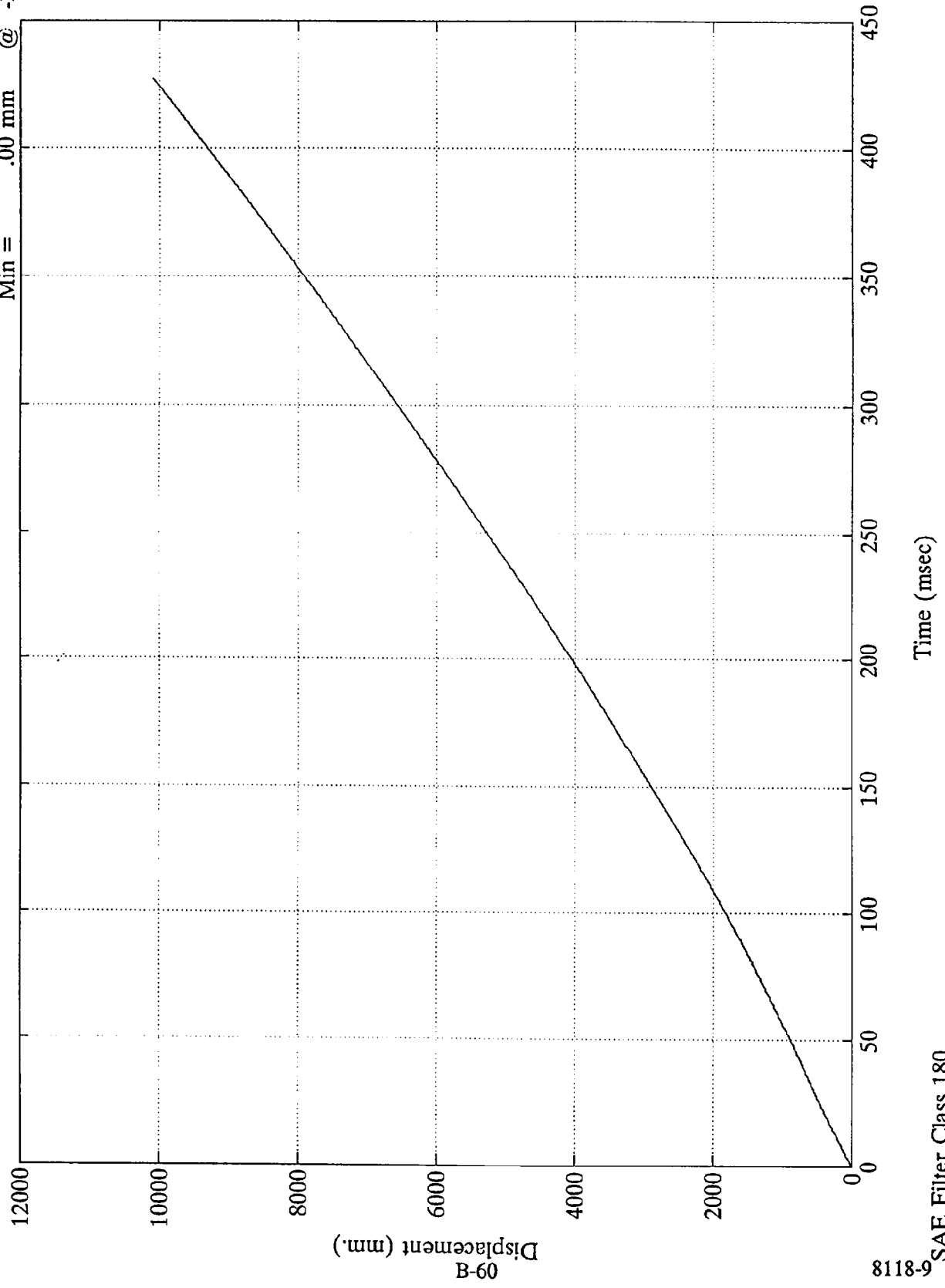
Max = 103.82 kph @ 427.32 msec
Min = .00 kph @ -22.44 msec



VTV TEST #9

V1 Right Engine (X)

Max = 10091.19 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



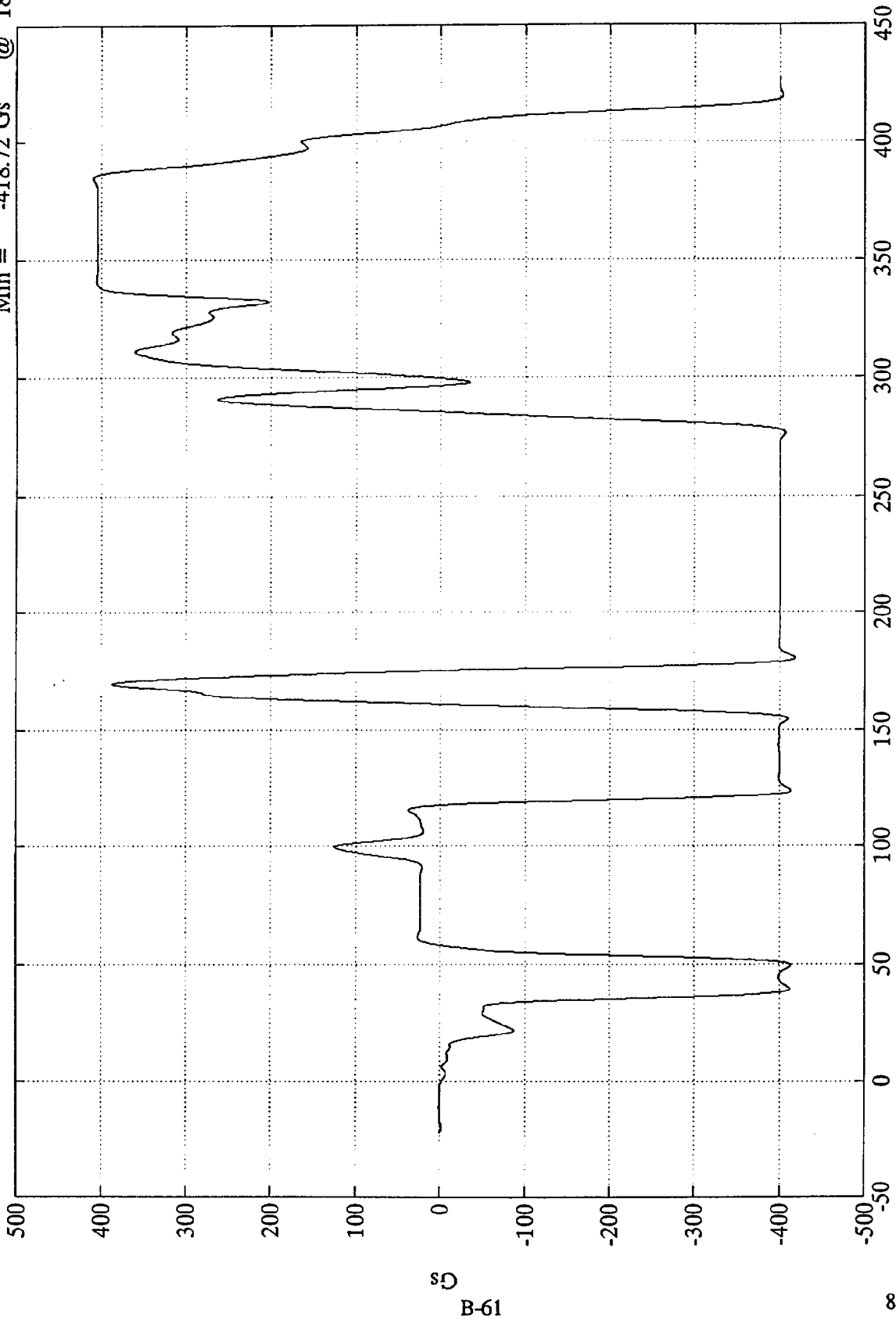
6-8118

SAE Filter Class 180

VTV TEST #9

V1 Engine Bottom (X)

Max = 408.92 Gs @ 384.72 msec
Min = -418.72 Gs @ 180.60 msec



Time (msec)
Data not accurate, wire cut

SAE Filter Class 60

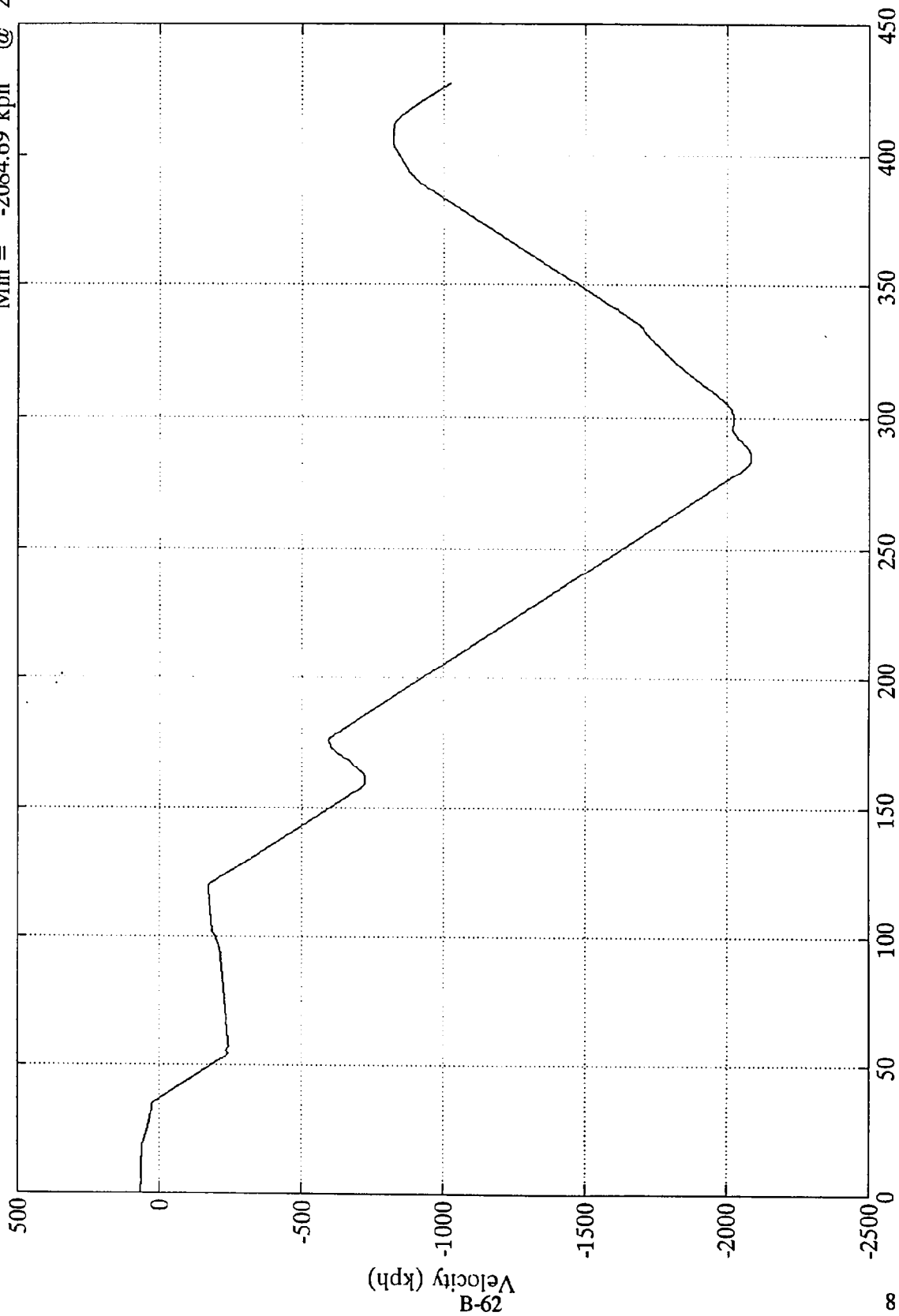
8118-9

B-61

VTV TEST #9

V1 Engine Bottom (X)

Max = 66.47 kph @ 0.23 msec
Min = -2084.69 kph @ 285.60 msec



Time (msec)
Data not accurate, wire cut

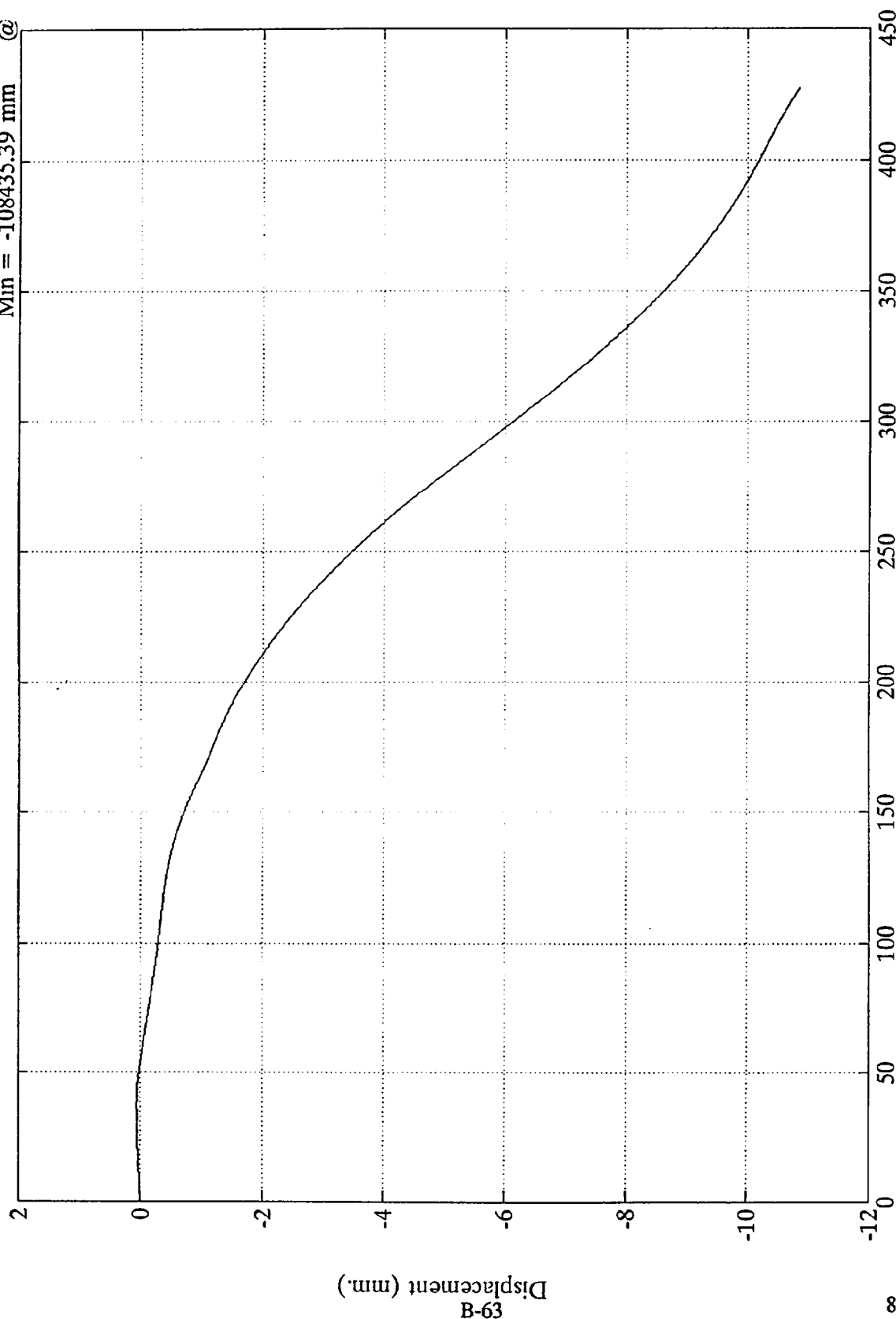
8118-9
SAE Filter Class 180

VTV TEST #9

x10⁴

V1 Engine Bottom (X)

Max = 527.18 mm @ 36.96 msec
Min = -108435.39 mm @ 427.32 msec



Time (msec)
Data not accurate, wire cut

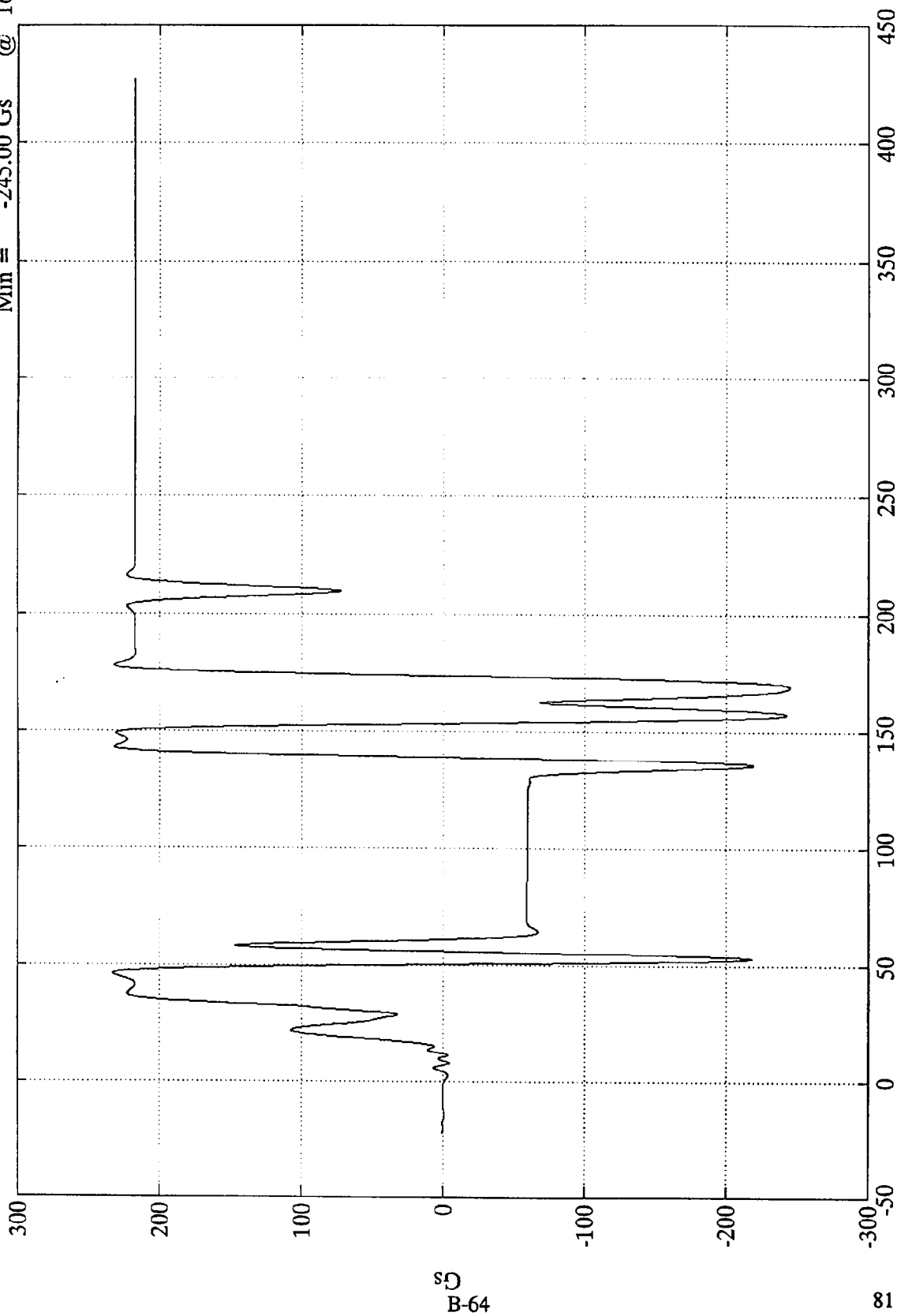
6-8118

SAE Filter Class 180

VTV TEST #9

V1 Engine Bottom (Y)

Max = 233.00 Gs @ 46.32 msec
Min = -245.00 Gs @ 168.96 msec



Time (msec)
Data not accurate, wire cut

SAE Filter Class 60

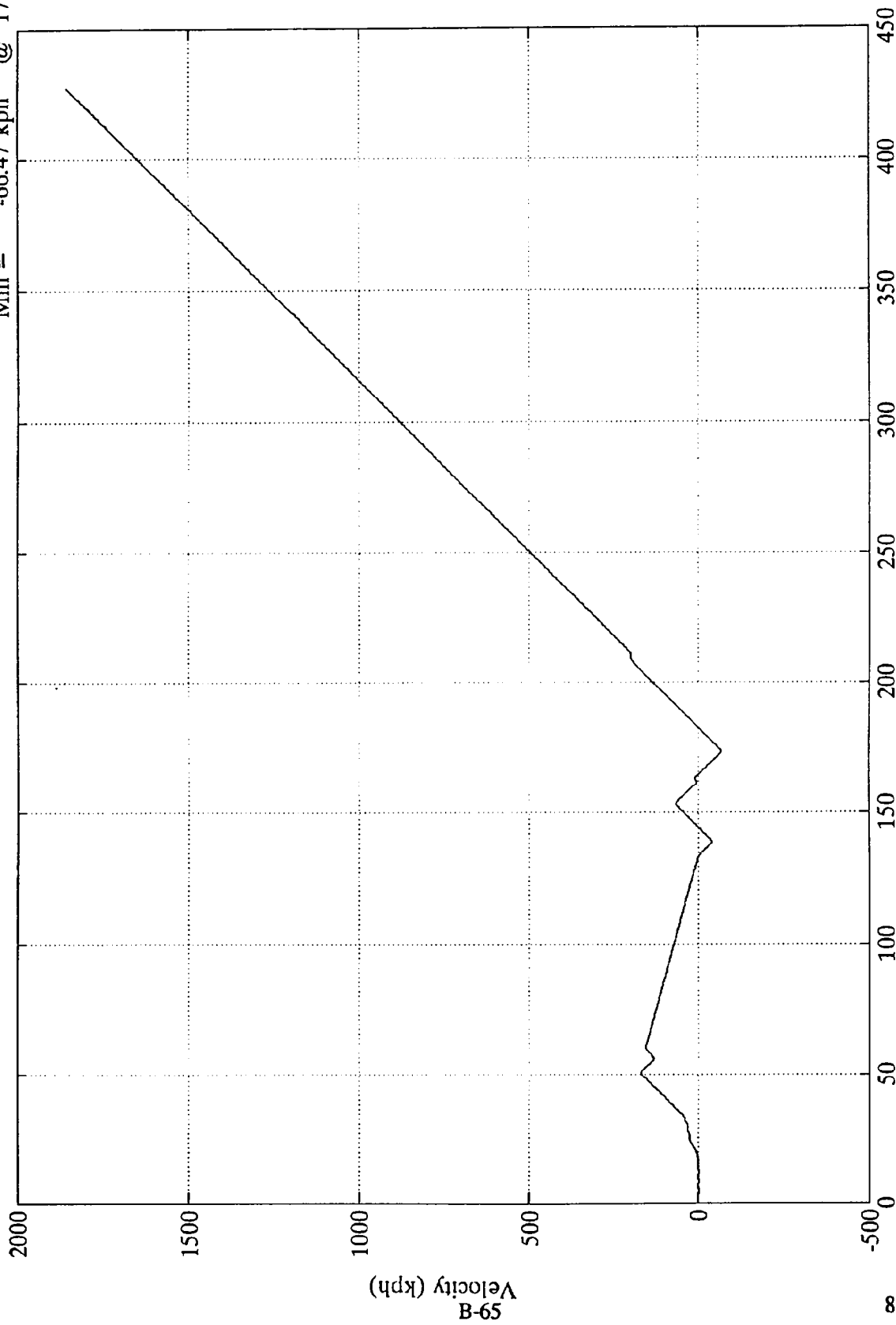
8118-9

B-64

VTV TEST #9

V1 Engine Bottom (Y)

Max = 1857.60 kph @ 427.32 msec
Min = -66.47 kph @ 173.52 msec



Time (msec)
Data not accurate, wire cut

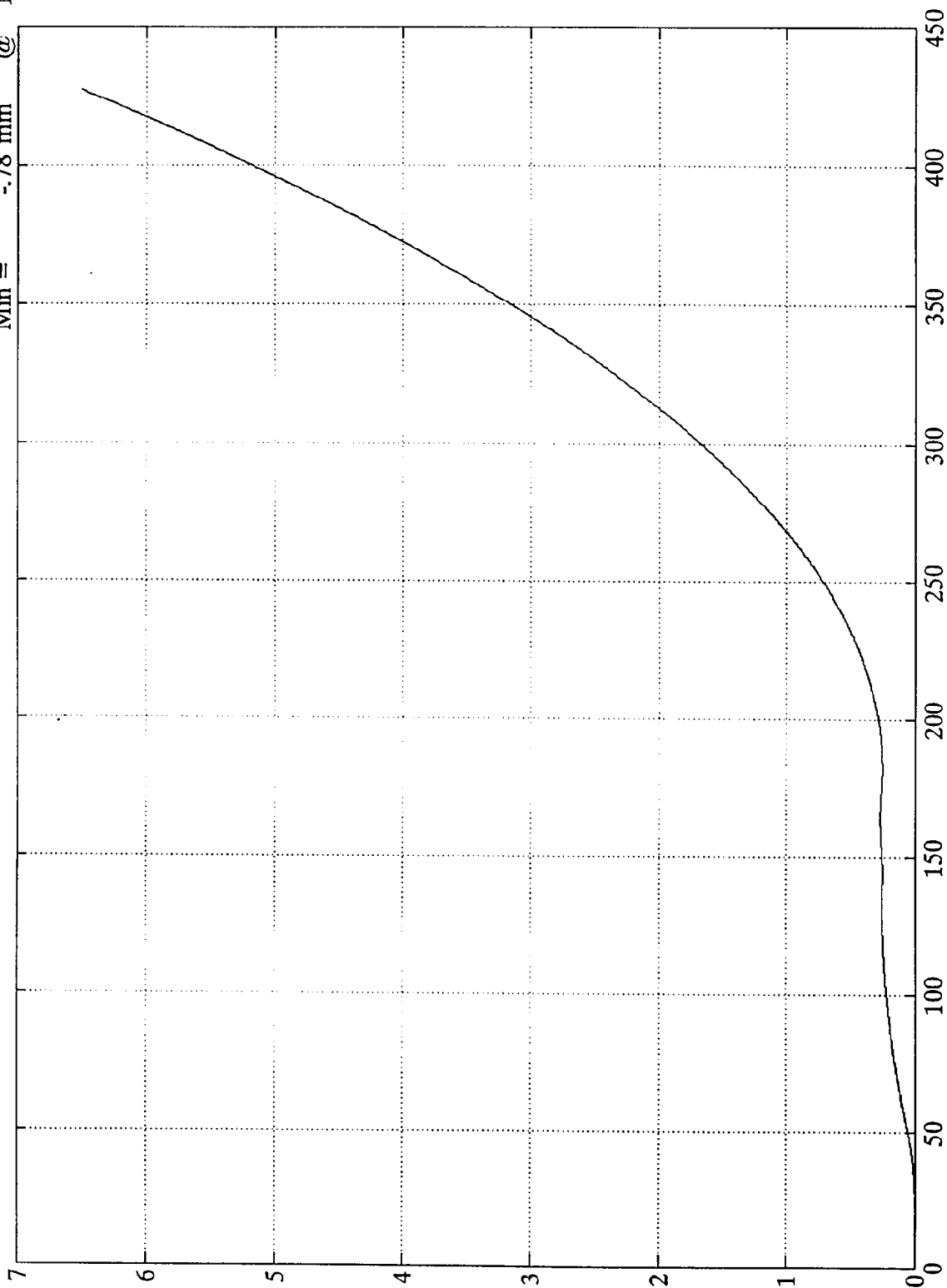
8118-9
SAE Filter Class 180

VTV TEST #9
x10⁴

V1 Engine Bottom (Y)

Max = 65095.73 mm @ 427.32 msec
Min = -78 mm @ 13.55 msec

99-B
Displacement (mm.)



Time (msec)
Data not accurate, wire cut

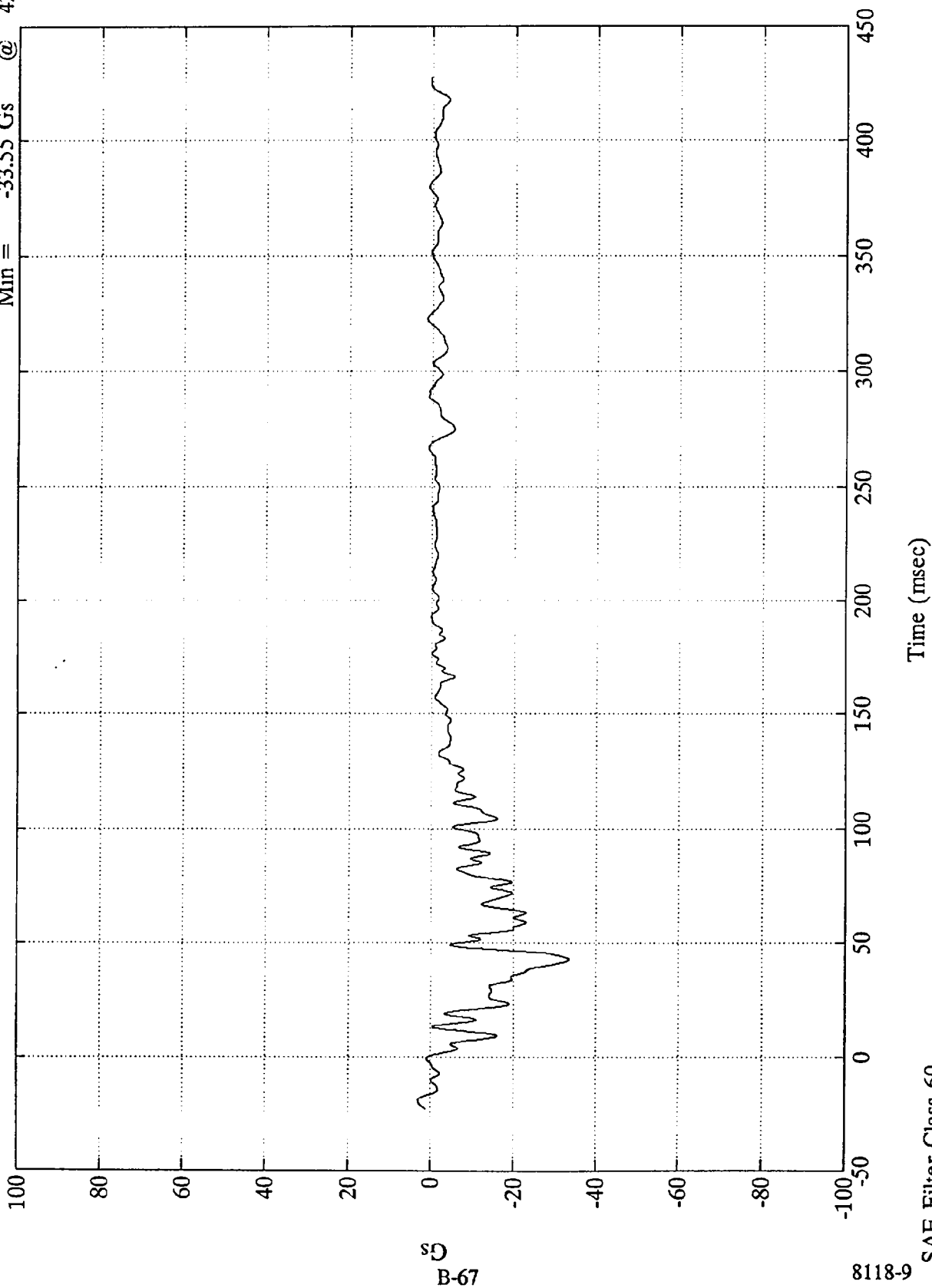
SAE Filter Class 180

9-8118-9

VTV TEST #9

V1 L.R. Comp (X)

Max = 2.94 Gs @ -18.72 msec
Min = -33.55 Gs @ 42.47 msec



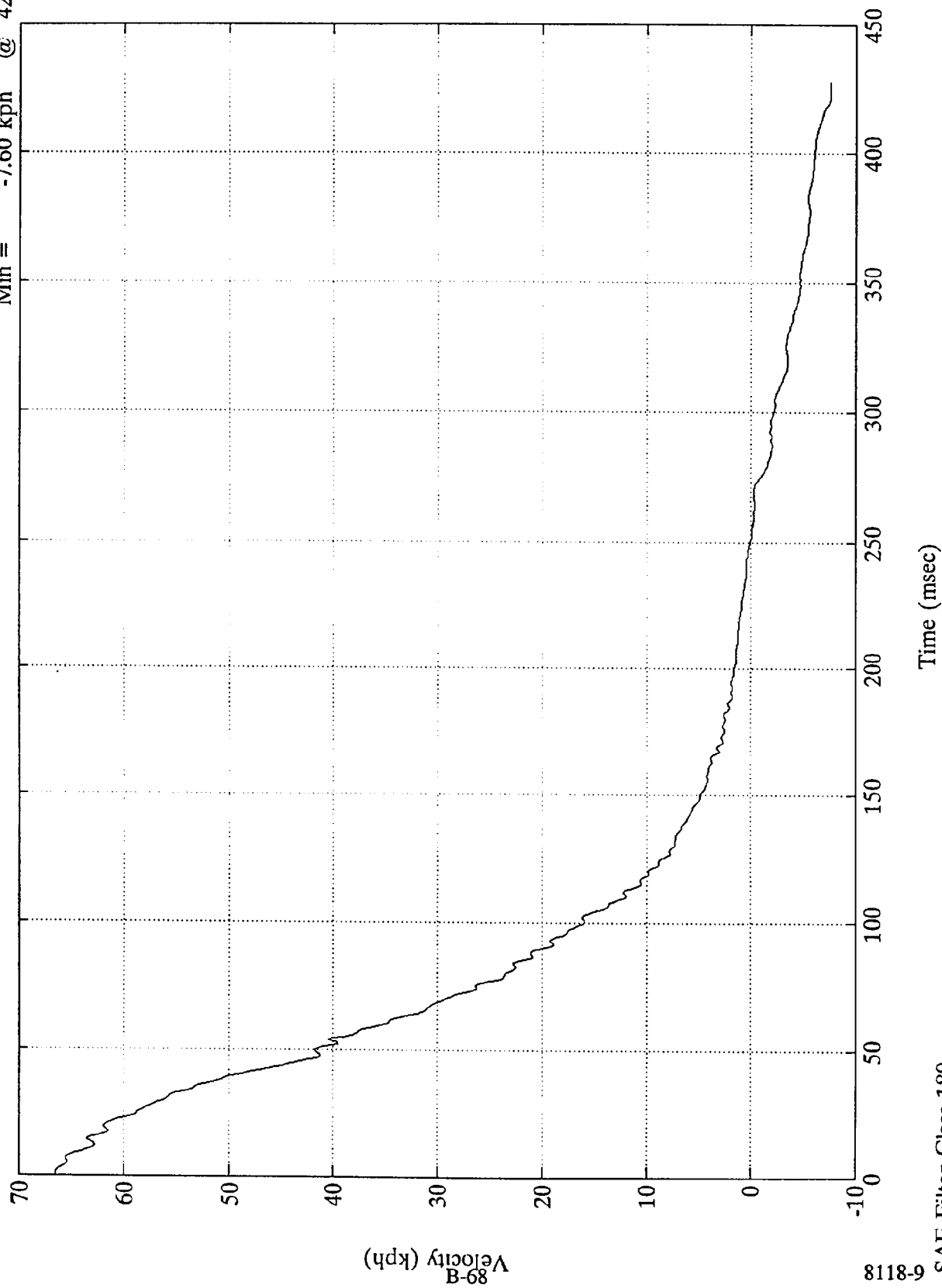
B-67

8118-9

SAE Filter Class 60

VTV TEST #9

V1 L.R. Comp (X) Max = 66.56 kph @ 1.19 msec
Min = -7.60 kph @ 422.52 msec

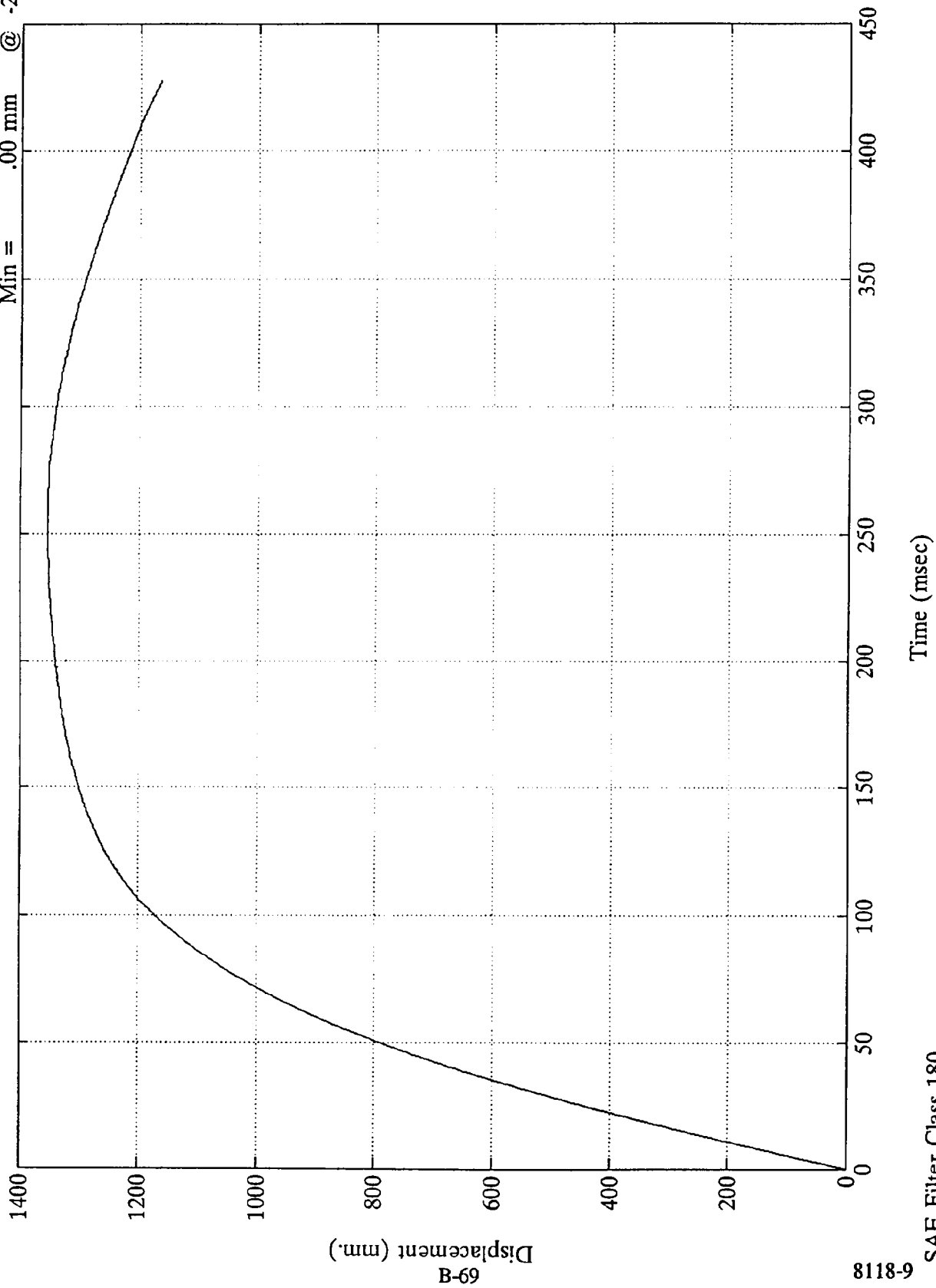


6-1118

SAE Filter Class 180

VTV TEST #9

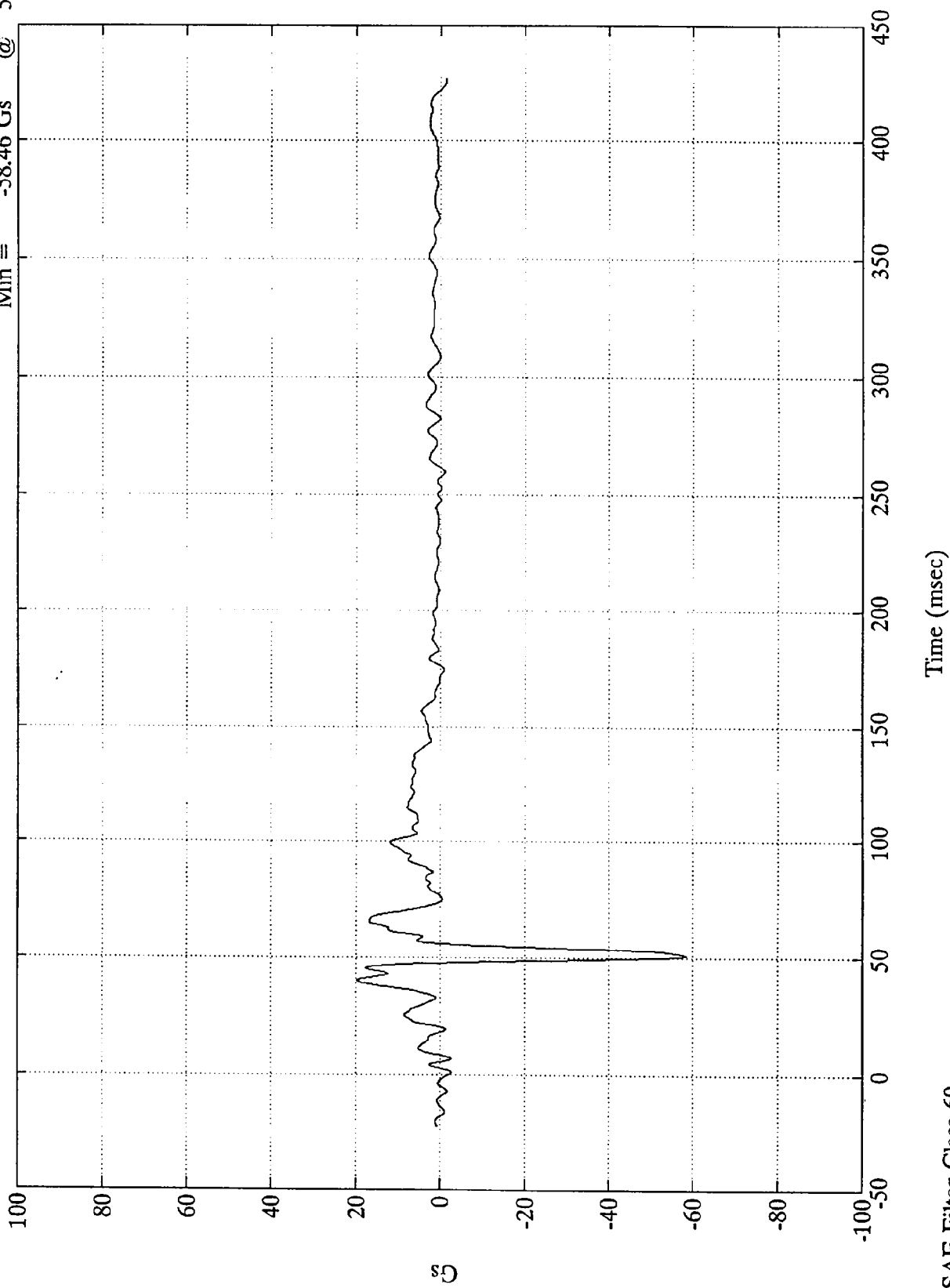
V1 L.R. Comp (X)
Max = 1353.38 mm @ 251.40 msec
Min = .00 mm @ -22.44 msec



VTV TEST #9

V1 L.R. Comp (Y)

Max =	19.64 Gs	@	40.20 msec
Min =	-58.46 Gs	@	51.00 msec



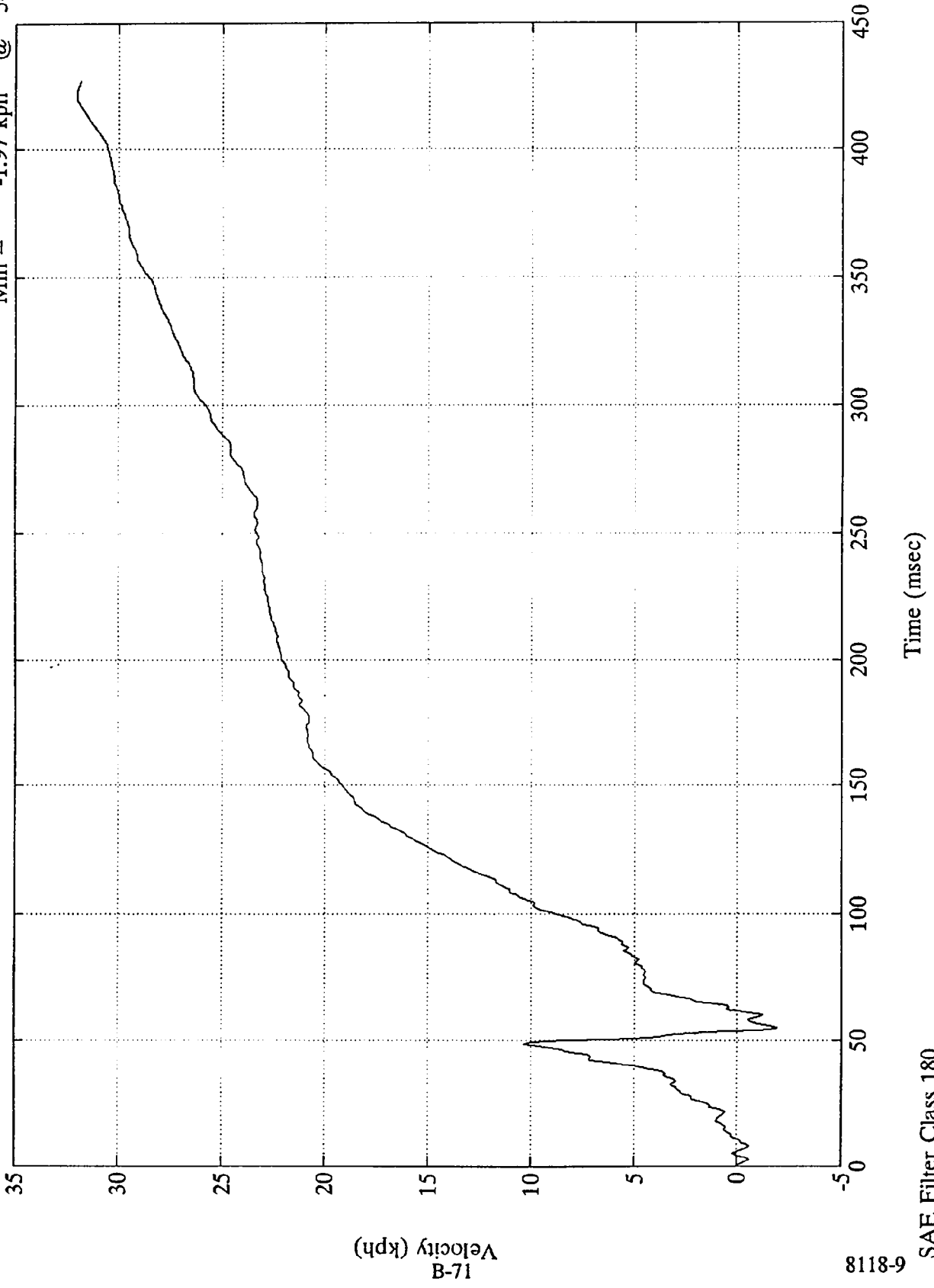
B-70

8118-9 SAE Filter Class 60

VTV TEST #9

V1 L.R. Comp (Y)

Max = 32.03 kph @ 421.56 msec
Min = -1.97 kph @ 54.96 msec



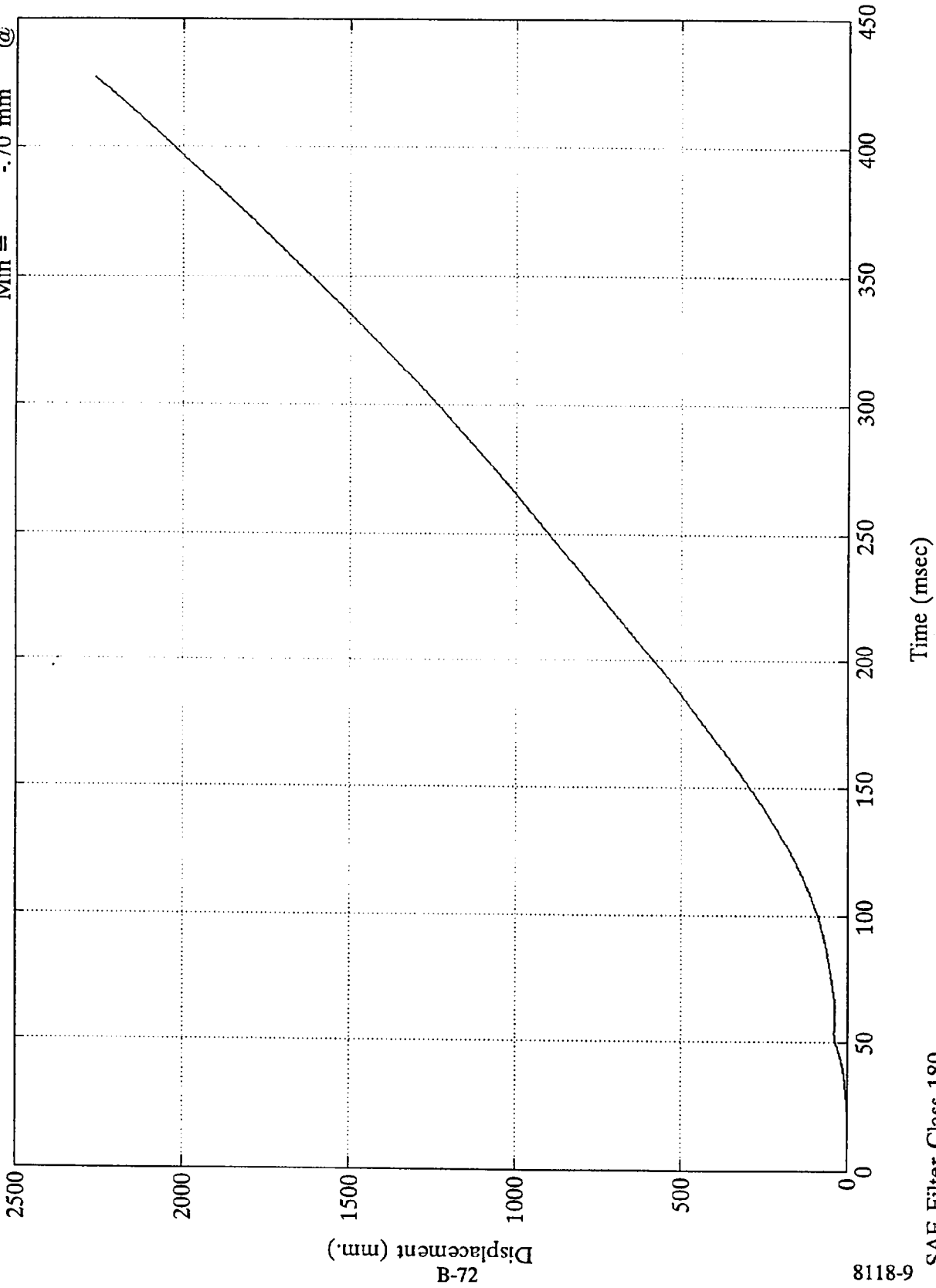
8118-9

SAE Filter Class 180

VTV TEST #9

V1 L.R. Comp (Y)

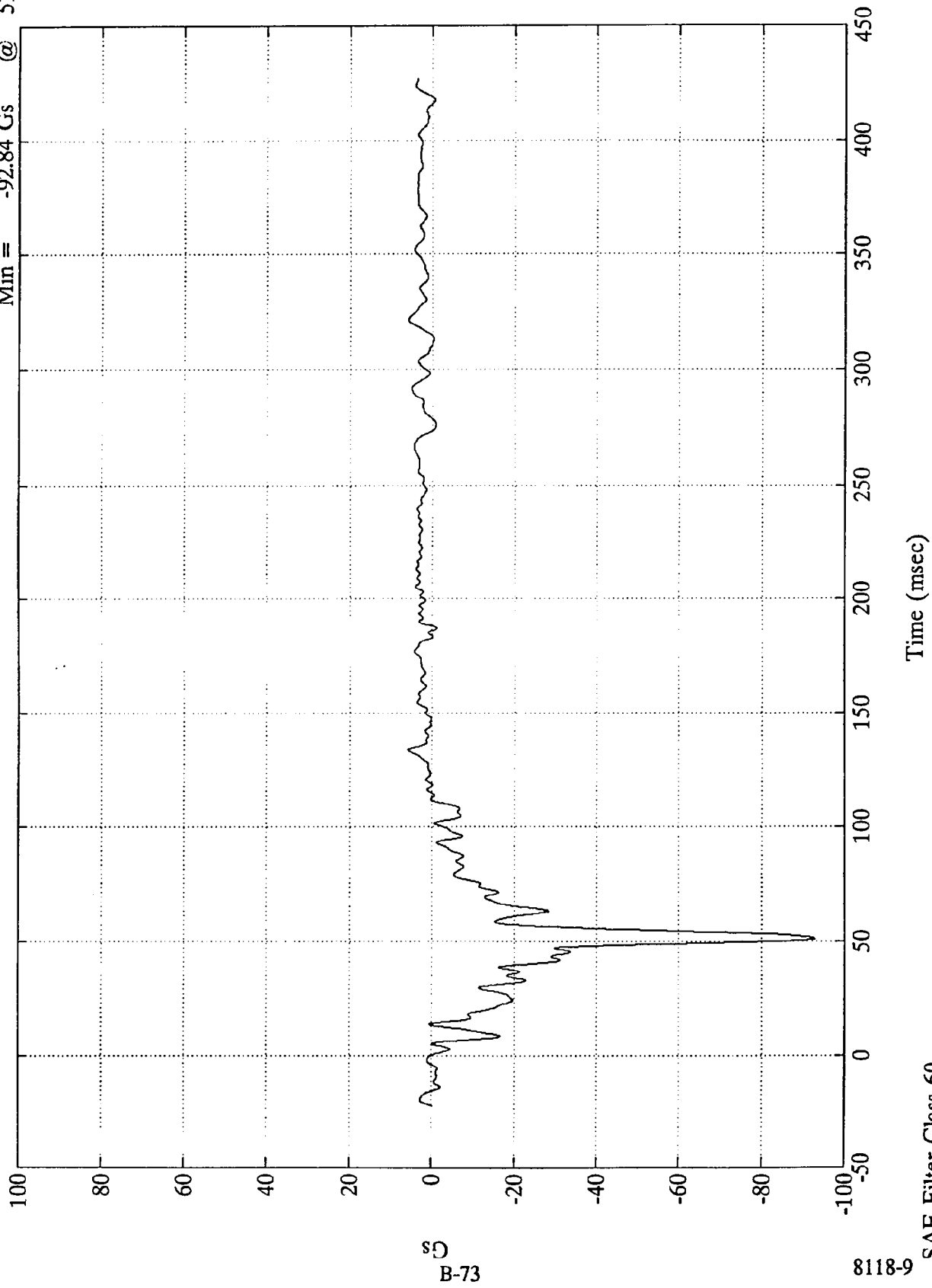
Max = 2265.13 mm @ 427.32 msec
Min = -70 mm @ 11.04 msec



VTV TEST #9

V1 R.R. Comp (X)

Max = 5.77 Gs @ 321.24 msec
Min = -92.84 Gs @ 51.12 msec



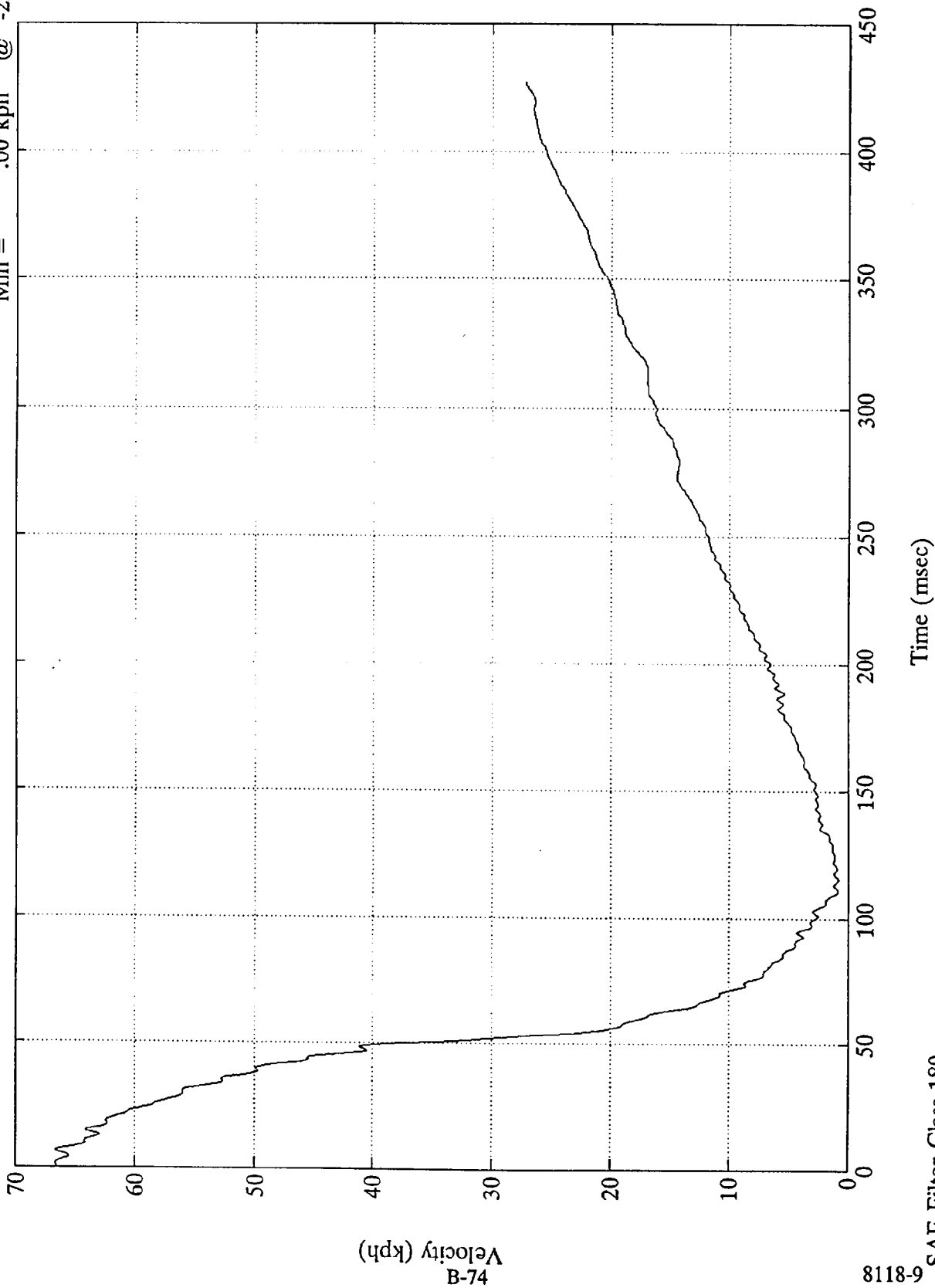
B-73

8118-9

SAE Filter Class 60

VTV TEST #9

V1 R.R. Comp (X)
Max = 66.66 kph @ 6.59 msec
Min = .00 kph @ -22.44 msec



8118-9

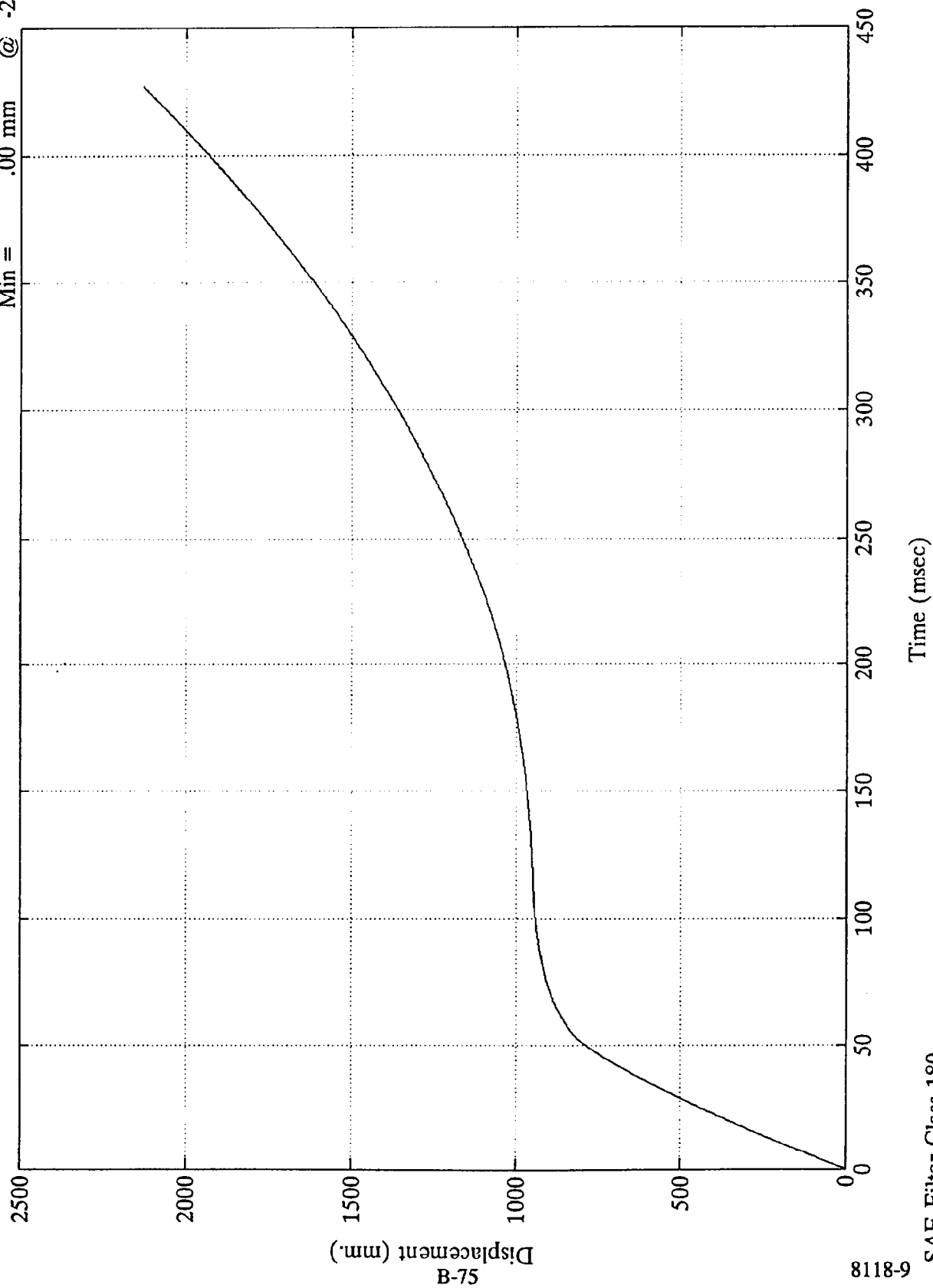
SAE Filter Class 180

B-74
Velocity (kph)

VTV TEST #9

V1 R.R. Comp (X)

Max = 2129.95 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



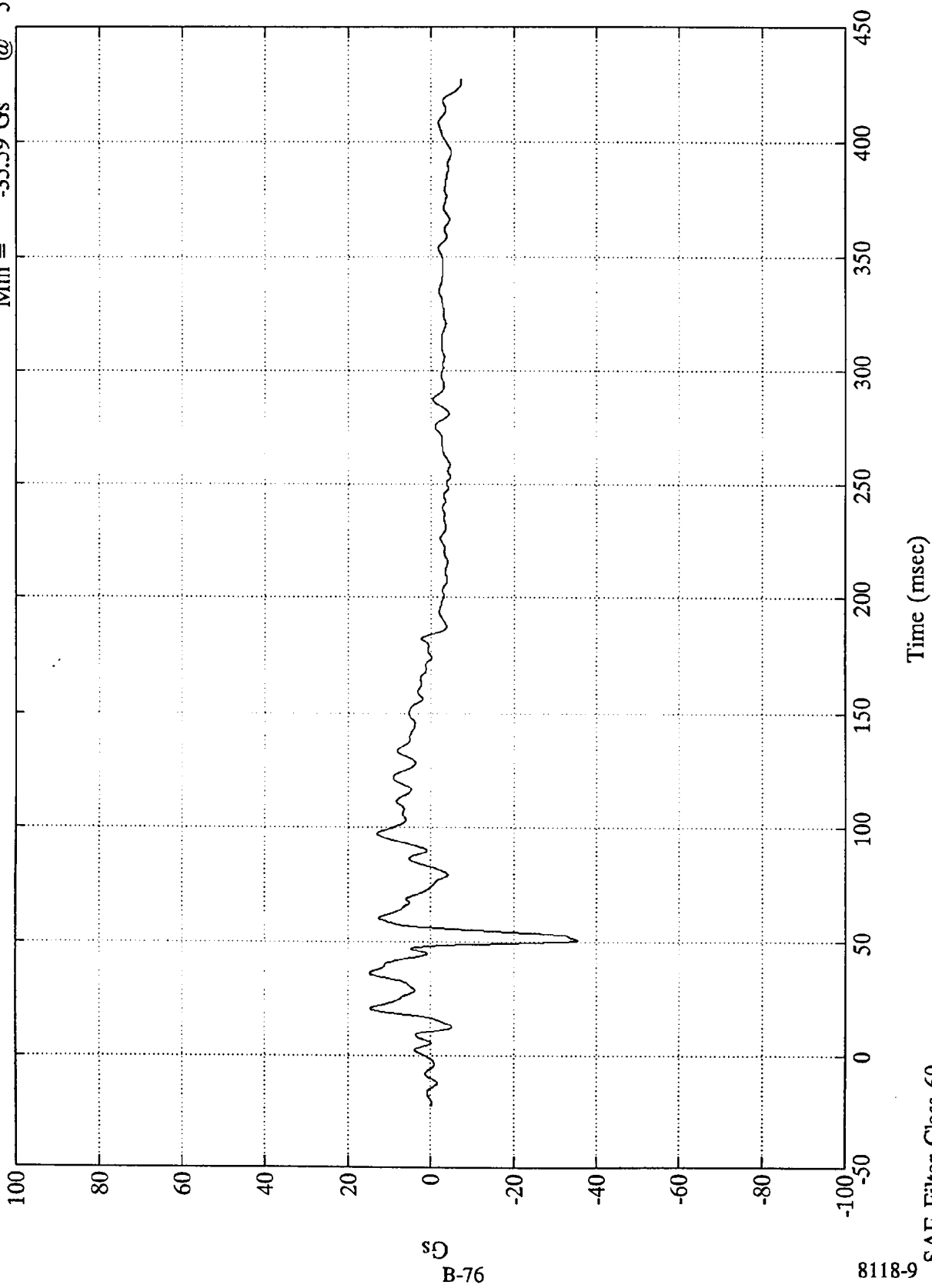
6-8118

SAE Filter Class 180

VTV TEST #9

V1 R.R. Comp (Y)

Max =	14.81 Gs	@	36.48 msec
Min =	-35.59 Gs	@	50.76 msec



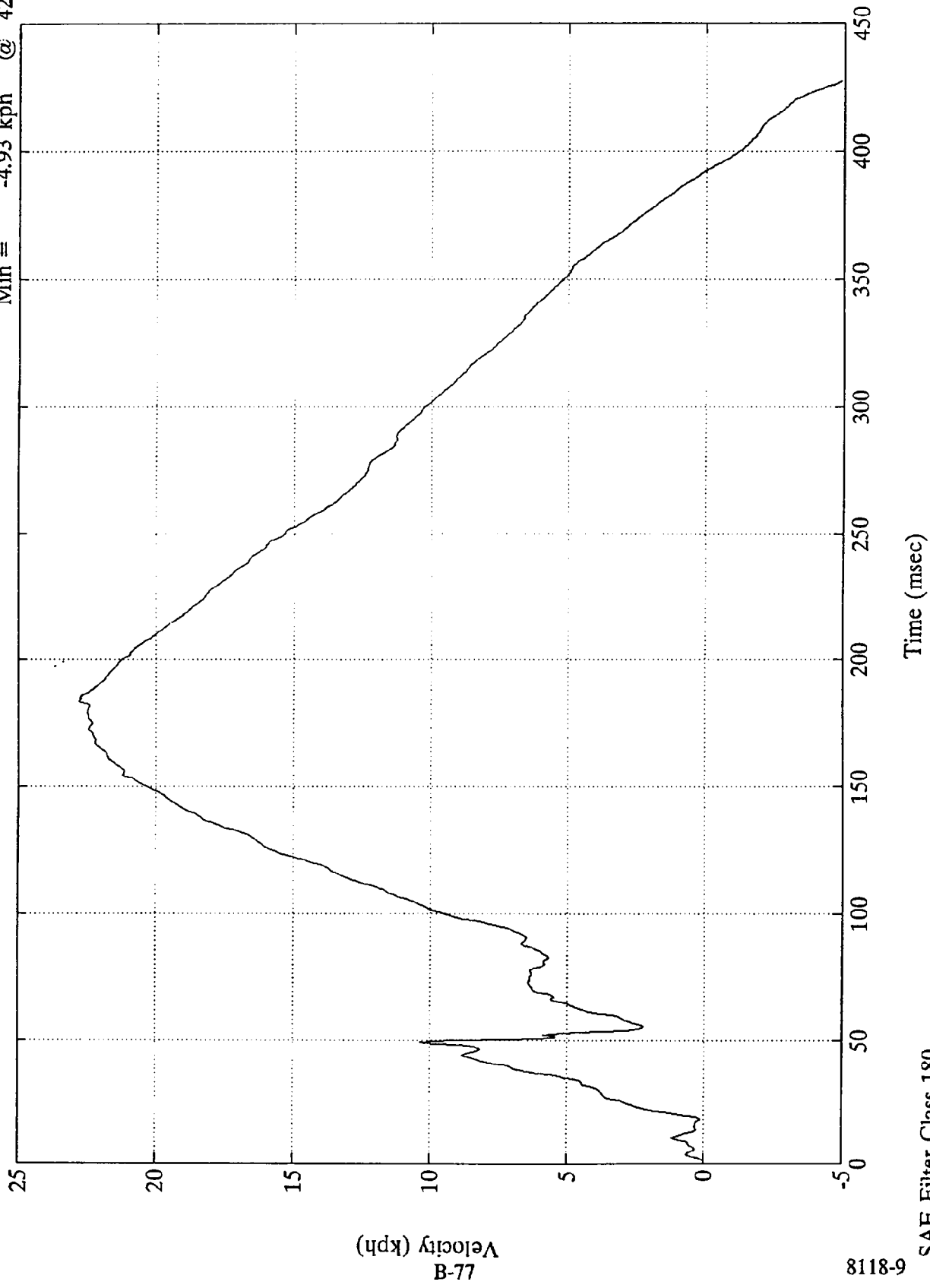
B-76

8118-9

SAE Filter Class 60

VTV TEST #9

V1 R.R. Comp (Y) Max = 22.80 kph @ 183.36 msec
Min = -4.93 kph @ 427.32 msec



8118-9

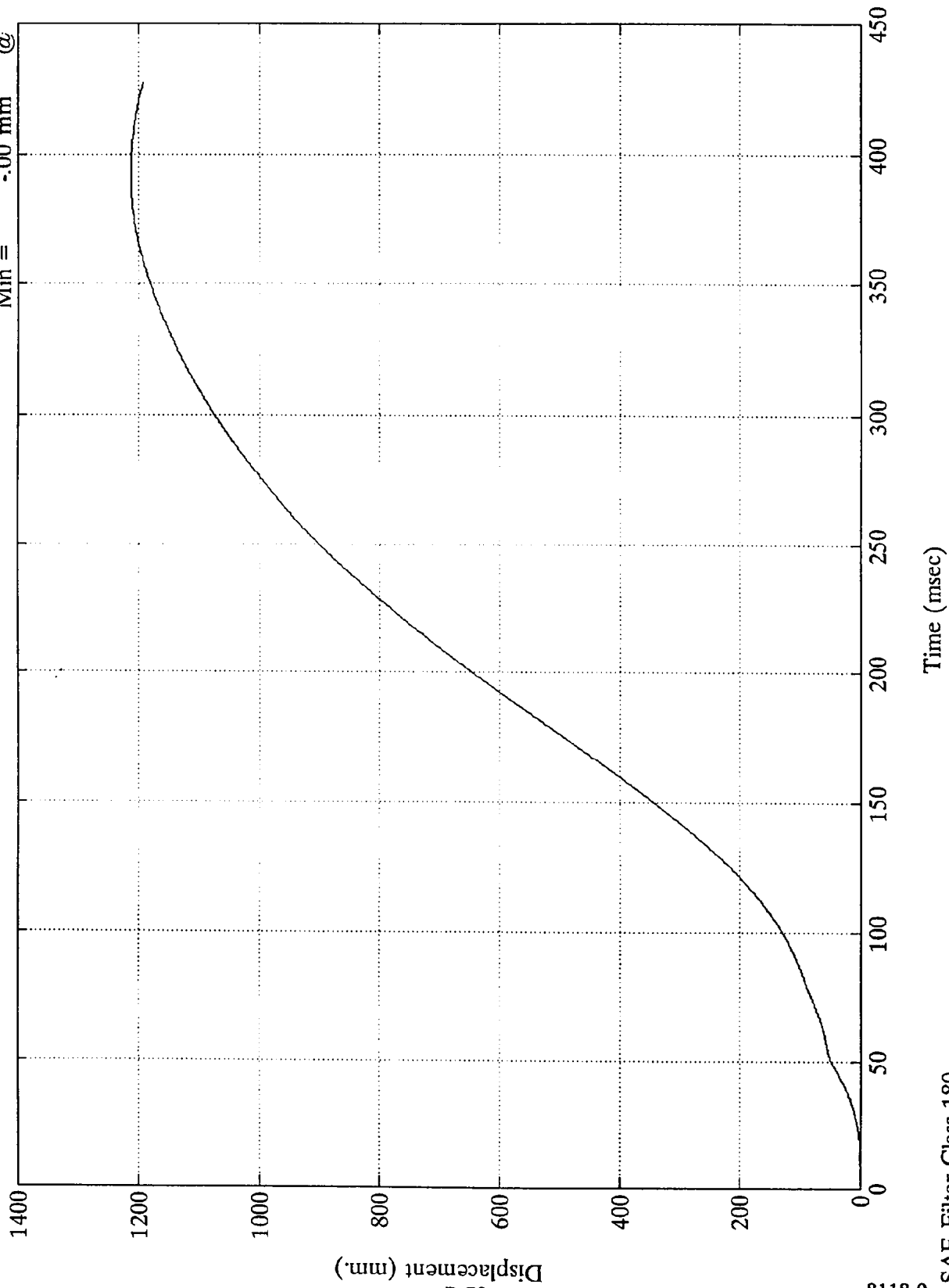
SAE Filter Class 180

B-77
Velocity (kph)

VTV TEST #9

V1 R.R. Comp (Y)

Max = 1213.22 mm @ 392.52 msec
Min = -.00 mm @ 1.19 msec



8-B

9-8118

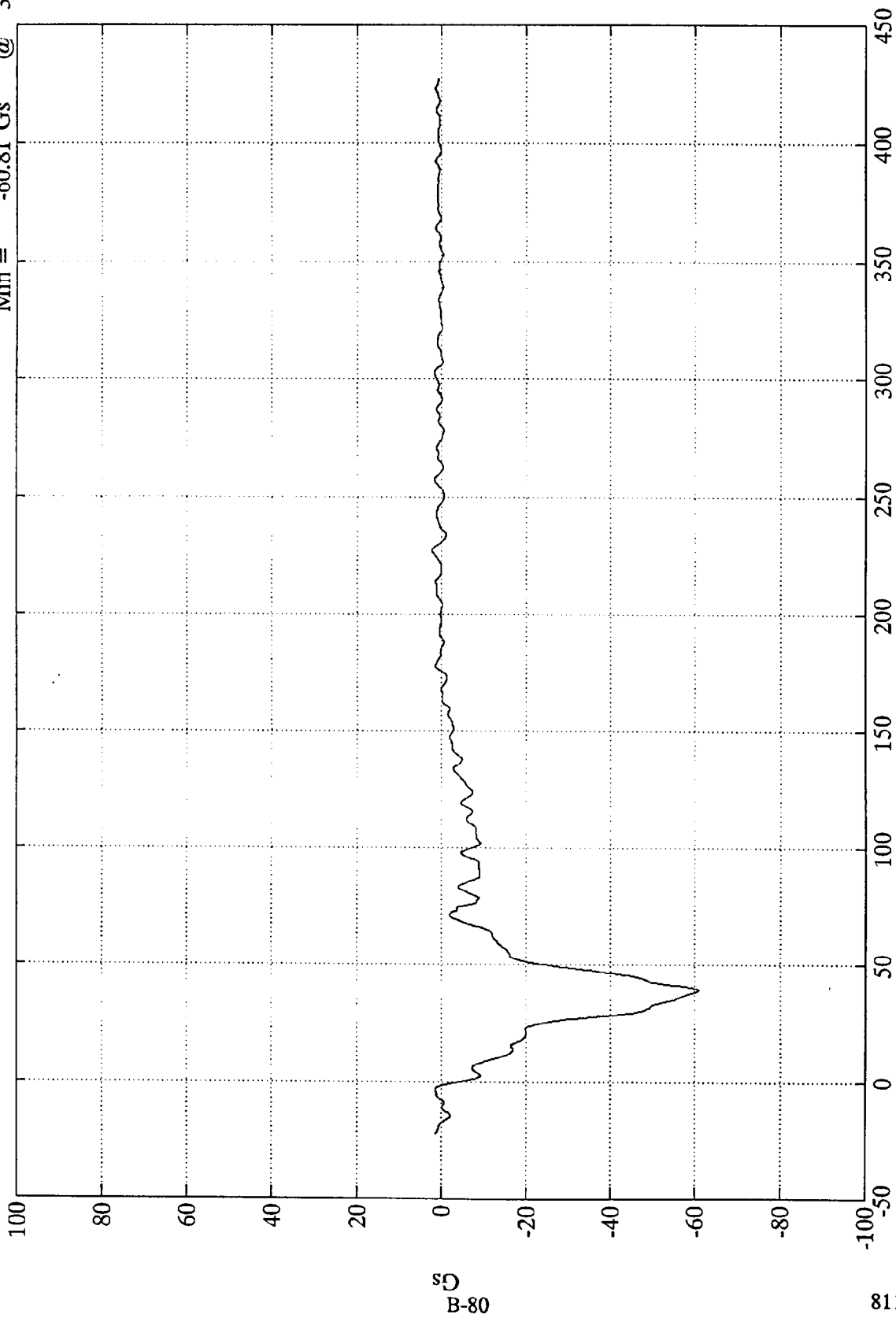
SAE Filter Class 180

VEHICLE TWO DATA

VTV TEST #9

V2 C.G. X

Max = 2.35 Gs @ 227.63 msec
Min = -60.81 Gs @ 39.24 msec



Time (msec)

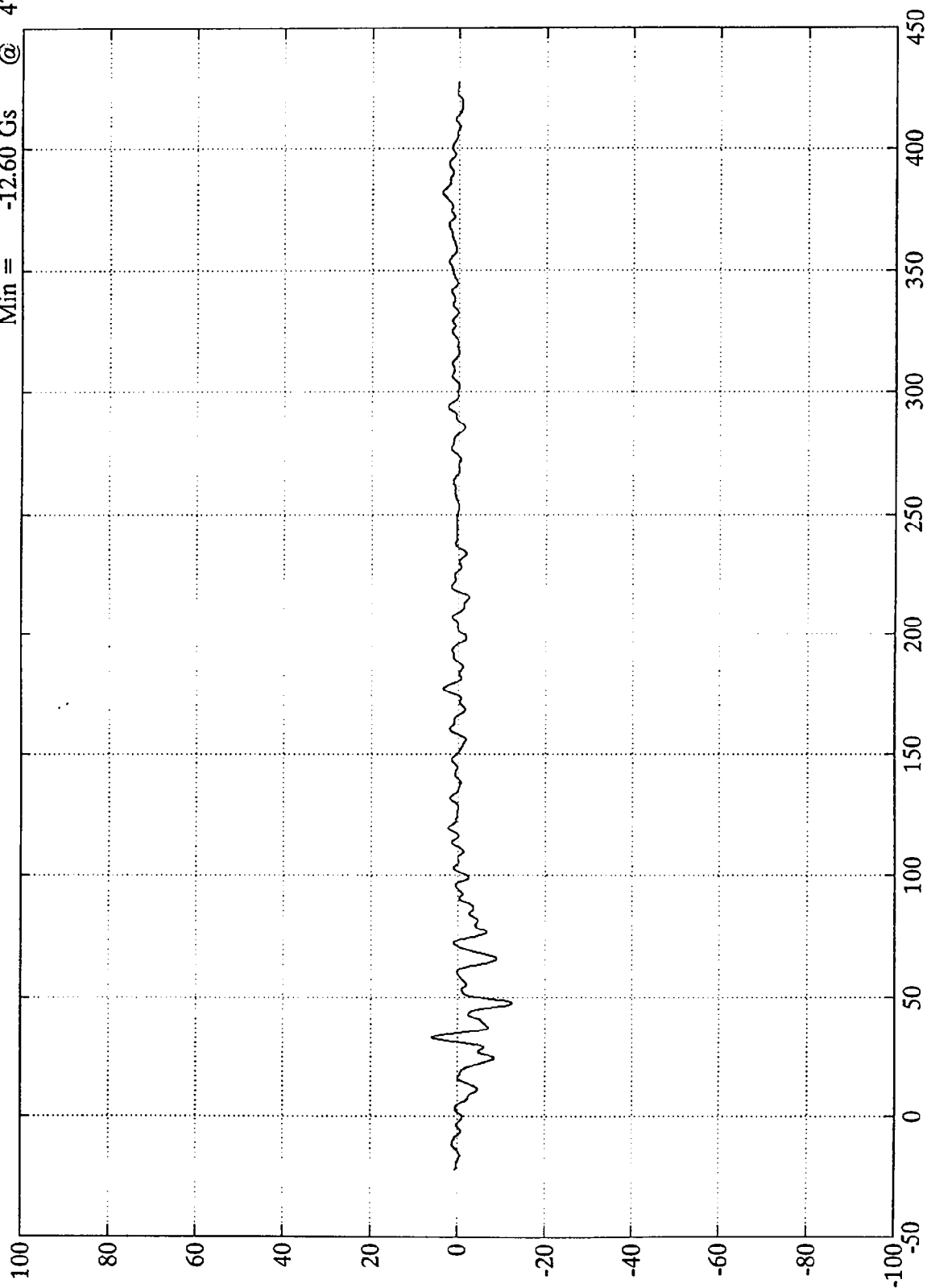
SAE Filter Class 60

8118-9

VTV TEST #9

Max = 5.87 Gs @ 33.11 msec
Min = -12.60 Gs @ 47.63 msec

V2 C.G. Y



Time (msec)

B-81

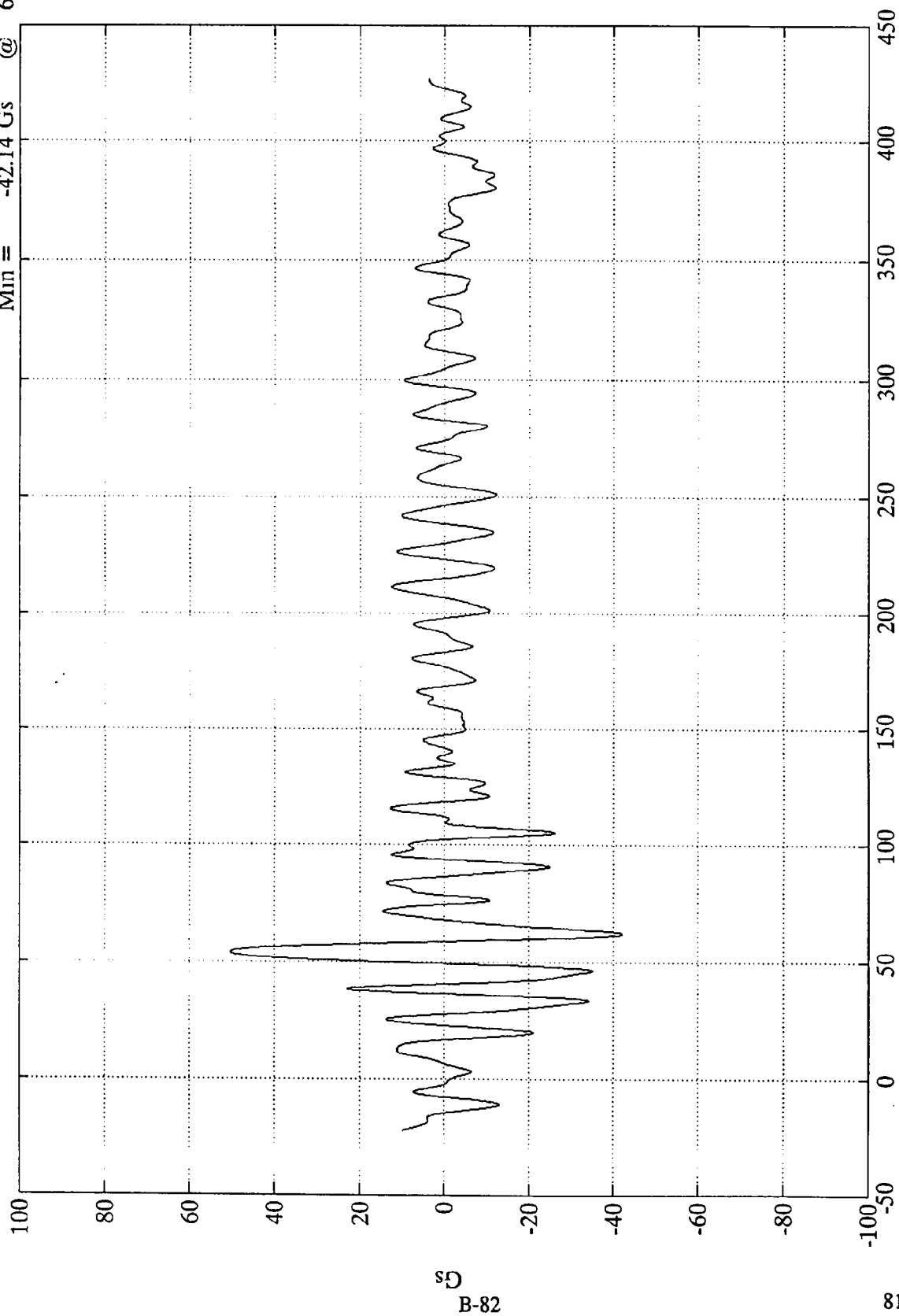
8118-9

SAE Filter Class 60

VTV TEST #9

V2 C.G. Z

Max = 50.44 Gs @ 54.11 msec
Min = -42.14 Gs @ 62.40 msec



Time (msec)

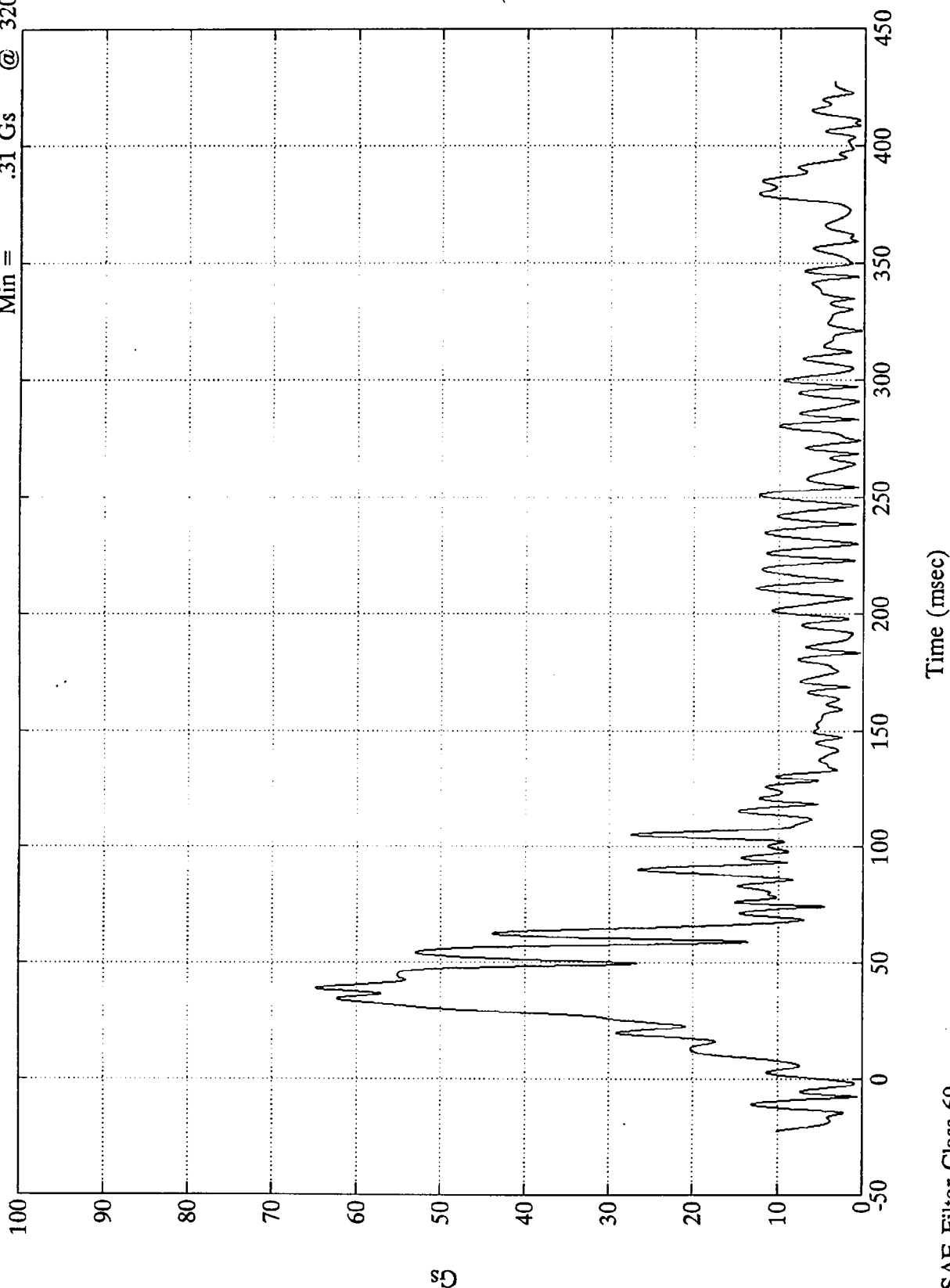
SAE Filter Class 60

8118-9

B-82

VTV TEST #9

V2 C.G. Max = 64.91 Gs @ 38.63 msec
Min = .31 Gs @ 320.88 msec

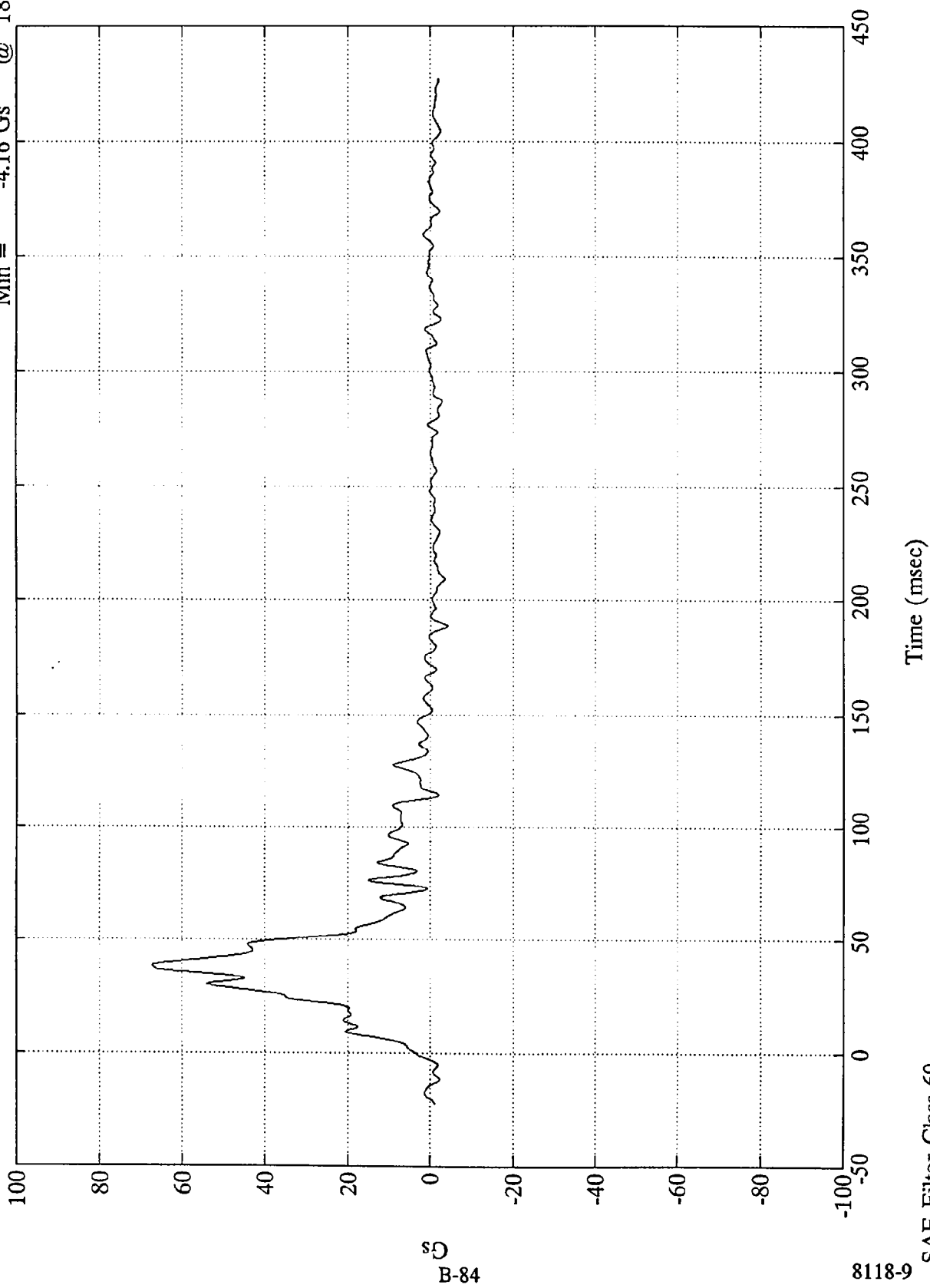


B-83

8118-9 SAE Filter Class 60

VTV TEST #9

V2 Left Rail X
Max = 67.18 Gs @ 38.40 msec
Min = -4.16 Gs @ 188.64 msec



B-84

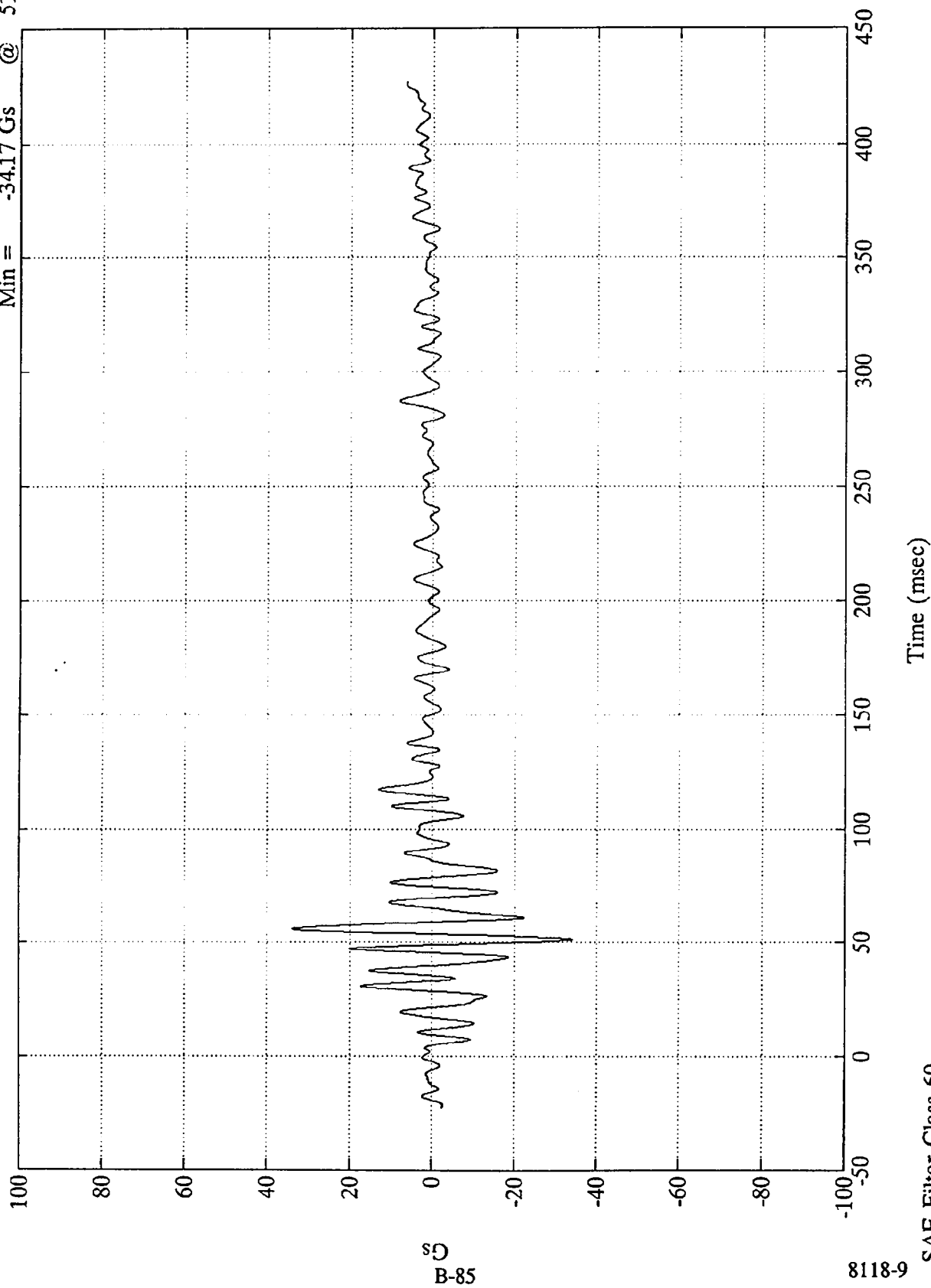
8118-9

SAE Filter Class 60

VTV TEST #9

V2 Left Rail Y

Max = 34.02 Gs @ 56.04 msec
Min = -34.17 Gs @ 51.24 msec



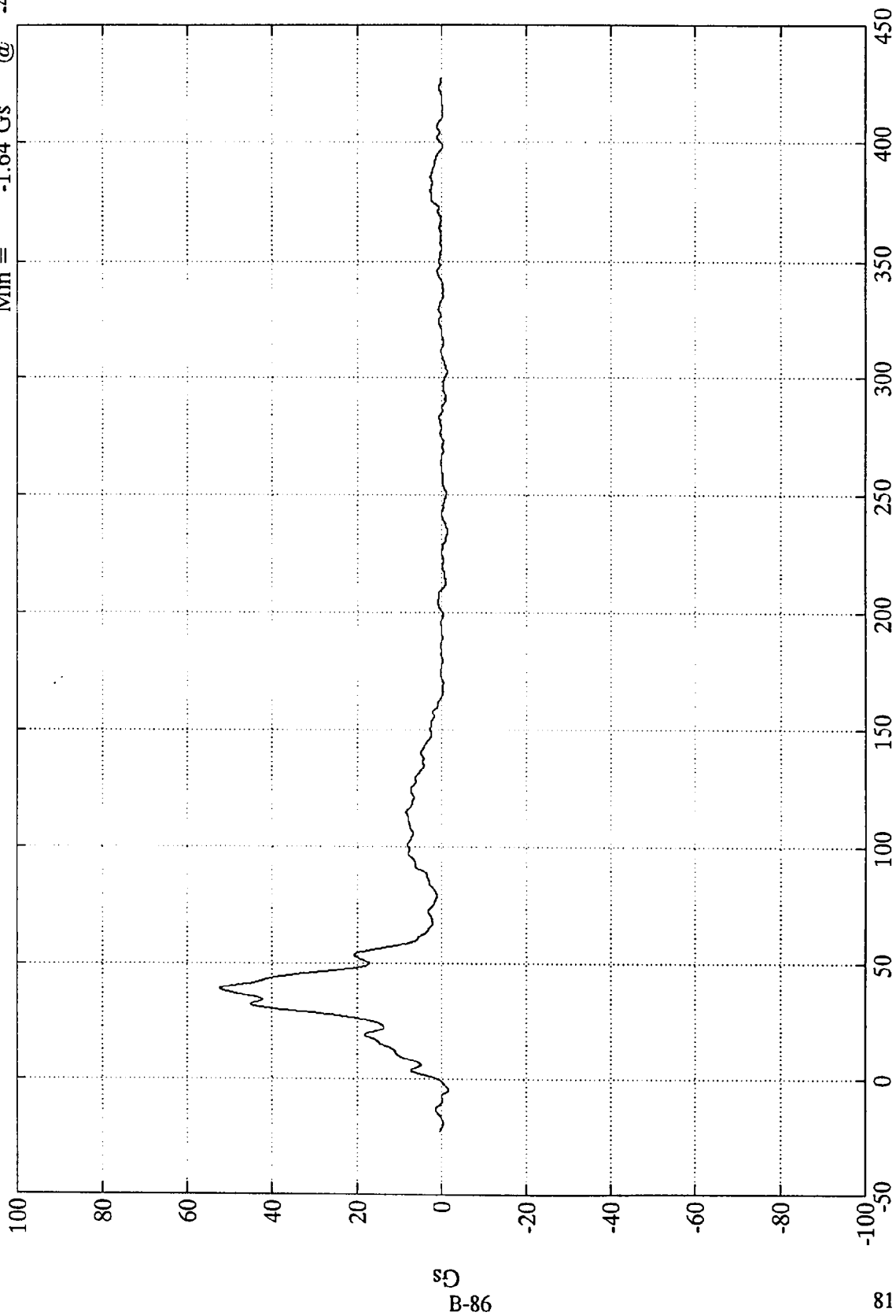
8118-9
B-85

SAE Filter Class 60

VTV TEST #9

V2 Right Rail X

Max = 52.35 Gs @ 39.00 msec
Min = -1.64 Gs @ -4.68 msec



Time (msec)

SAE Filter Class 60

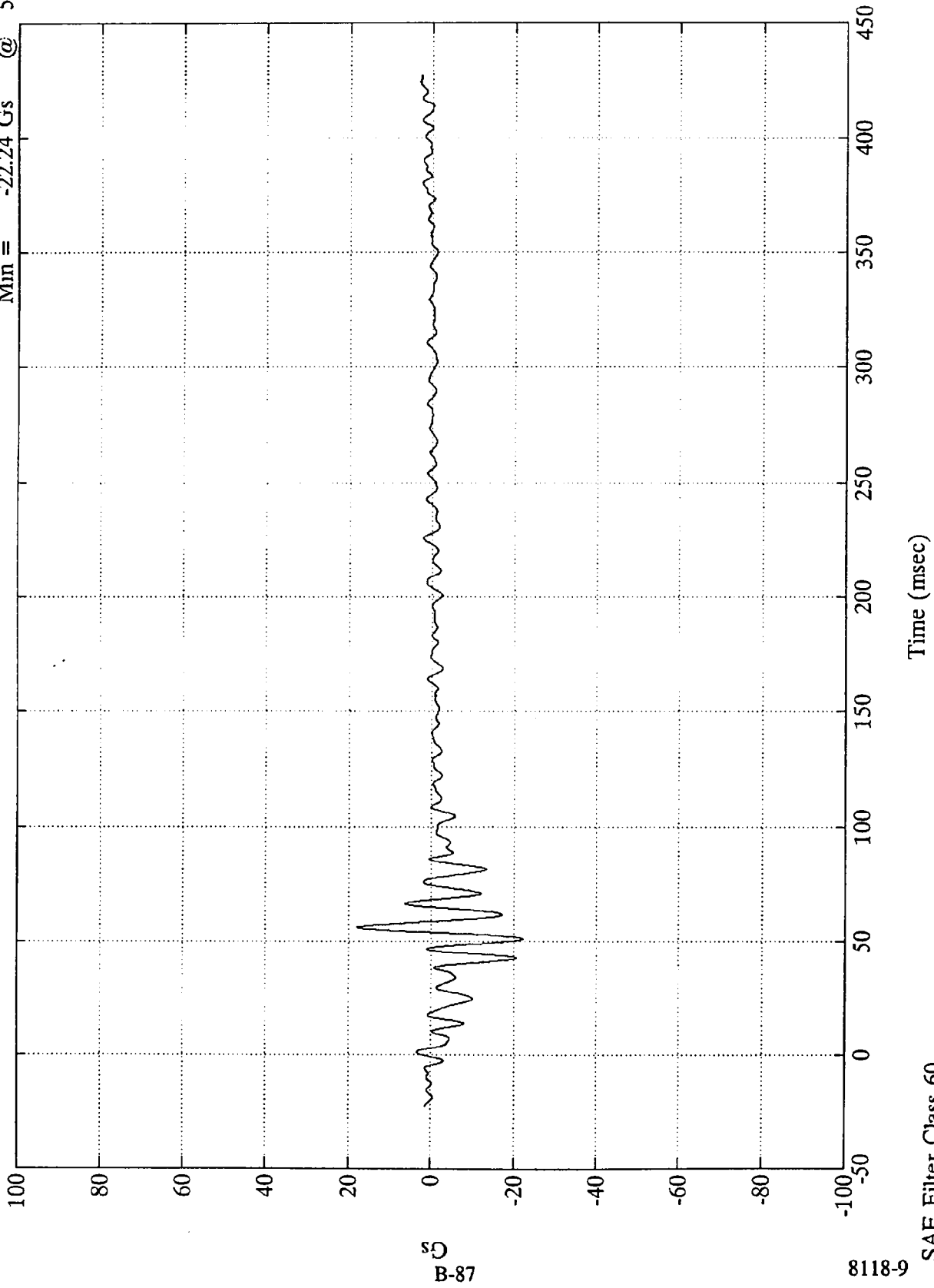
B-86

8118-9

VTV TEST #9

V2 Right Rail Y

Max = 17.97 Gs @ 56.04 msec
Min = -22.24 Gs @ 51.00 msec



B-87

8118-9

SAE Filter Class 60

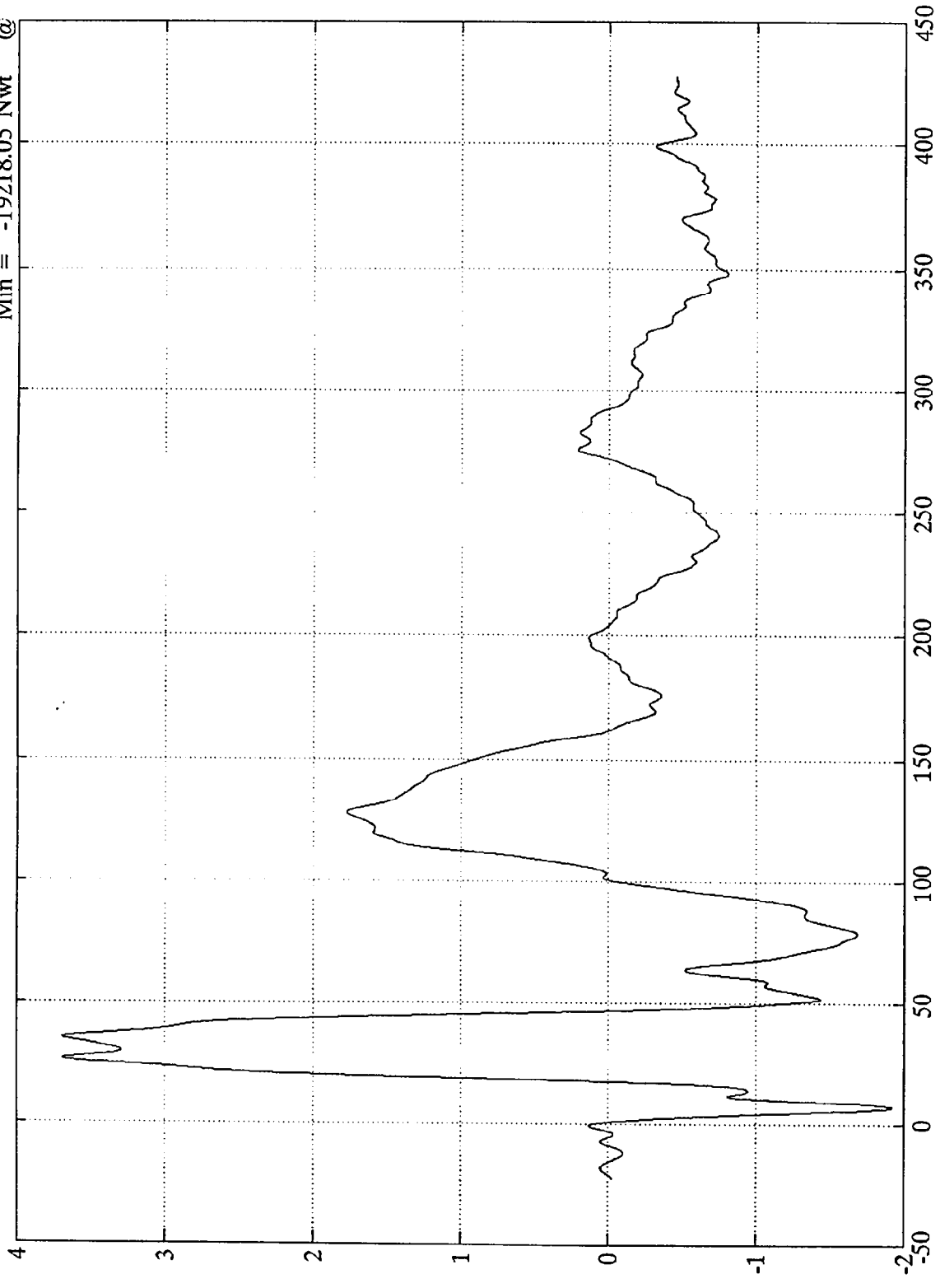
VTV TEST #9

$\times 10^4$

V2 TR Load Cell

Max = 36951.69 Nwt @
Min = -19218.05 Nwt @

26.28 msec
7.07 msec



Time (msec)

B-88

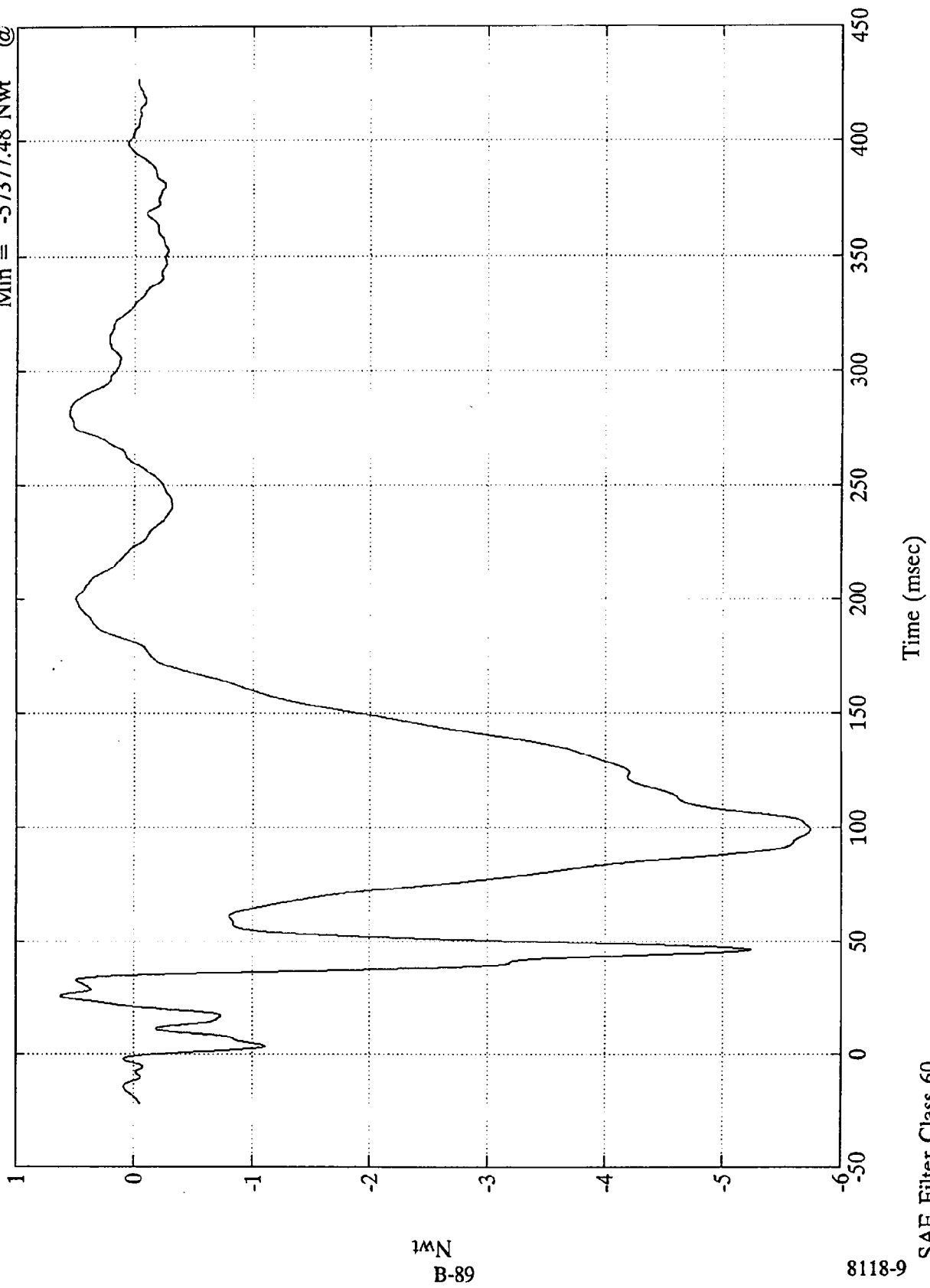
8118-9

SAE Filter Class 60

VTV TEST #9
x10⁴

V2 BR Load Cell

Max = 6208.49 Nwt @ 25.80 msec
Min = -57377.48 Nwt @ 99.24 msec



8118-9

B-89

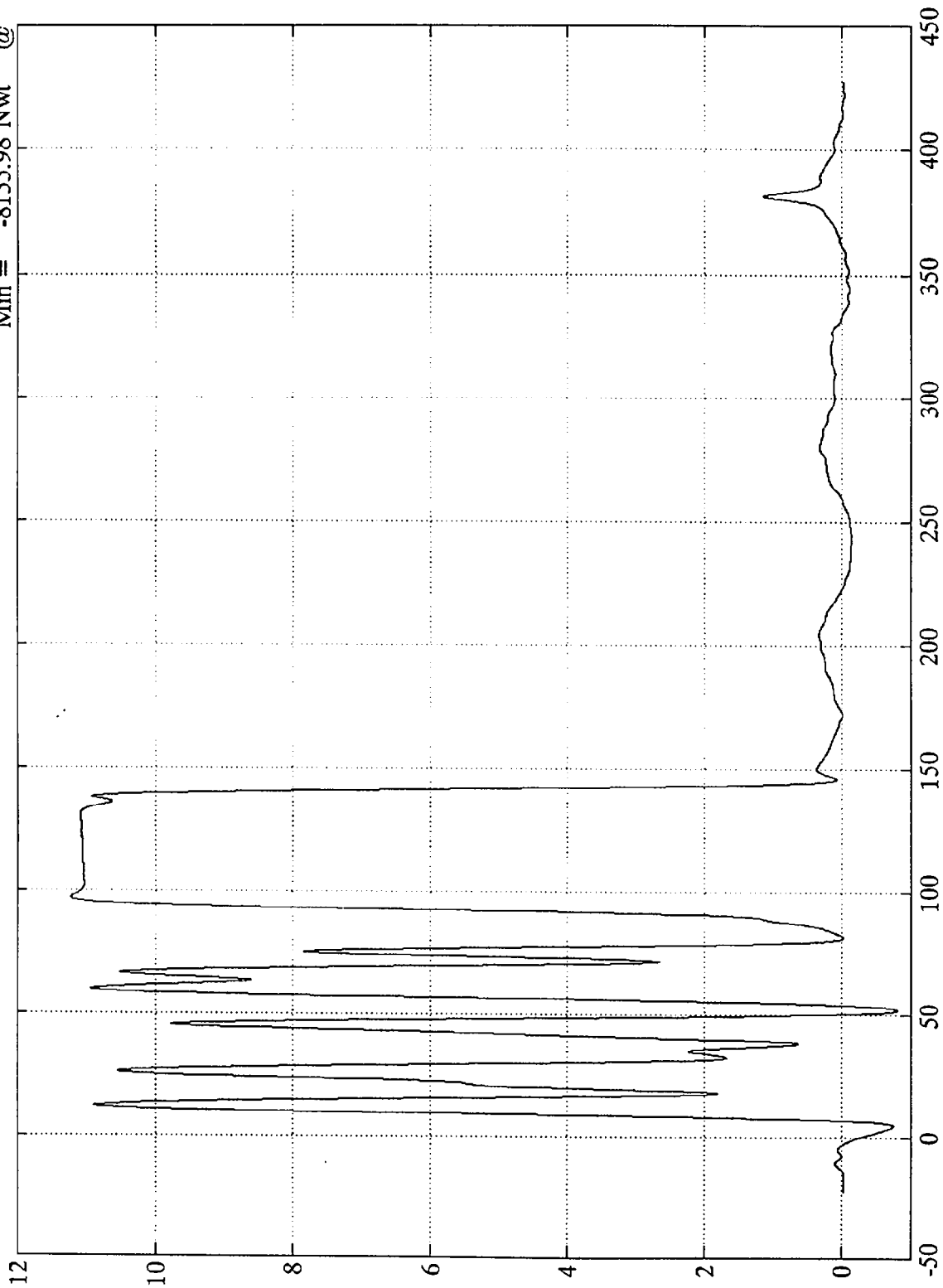
SAE Filter Class 60

VTV TEST #9

$\times 10^4$

V2 TL Load Cell

Max = 112253.46 Nwt @ 97.32 msec
Min = -8155.98 Nwt @ 51.96 msec



B-90

8118-9

SAE Filter Class 60

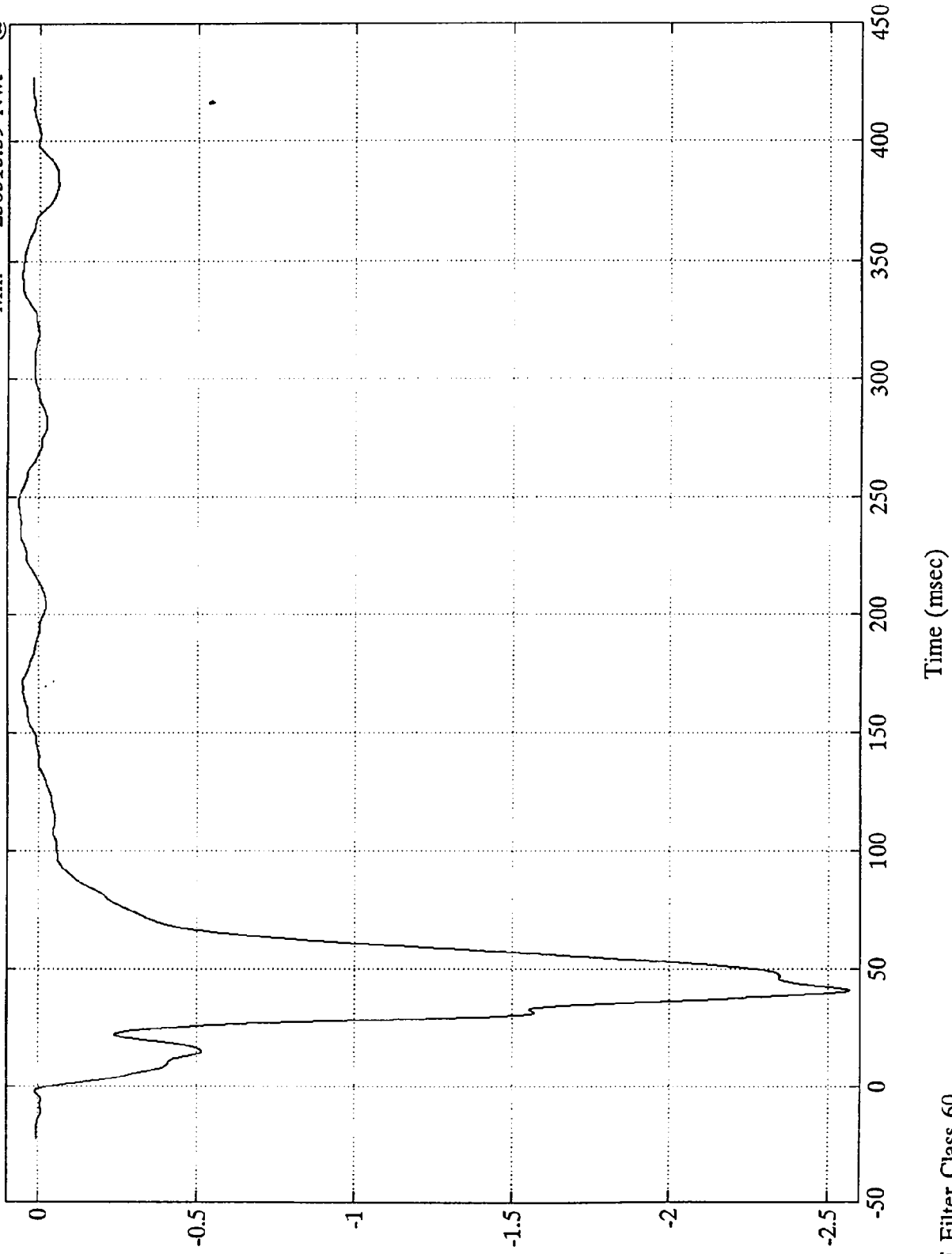
Time (msec)
Data not accurate, wire cut

VTV TEST #9

$\times 10^5$

V2 BL Load Cell

Max = 6374.36 Nwt @ 247.56 msec
Min = -256515.39 Nwt @ 40.56 msec



Nwt
B-91

8118-9
SAE Filter Class 60

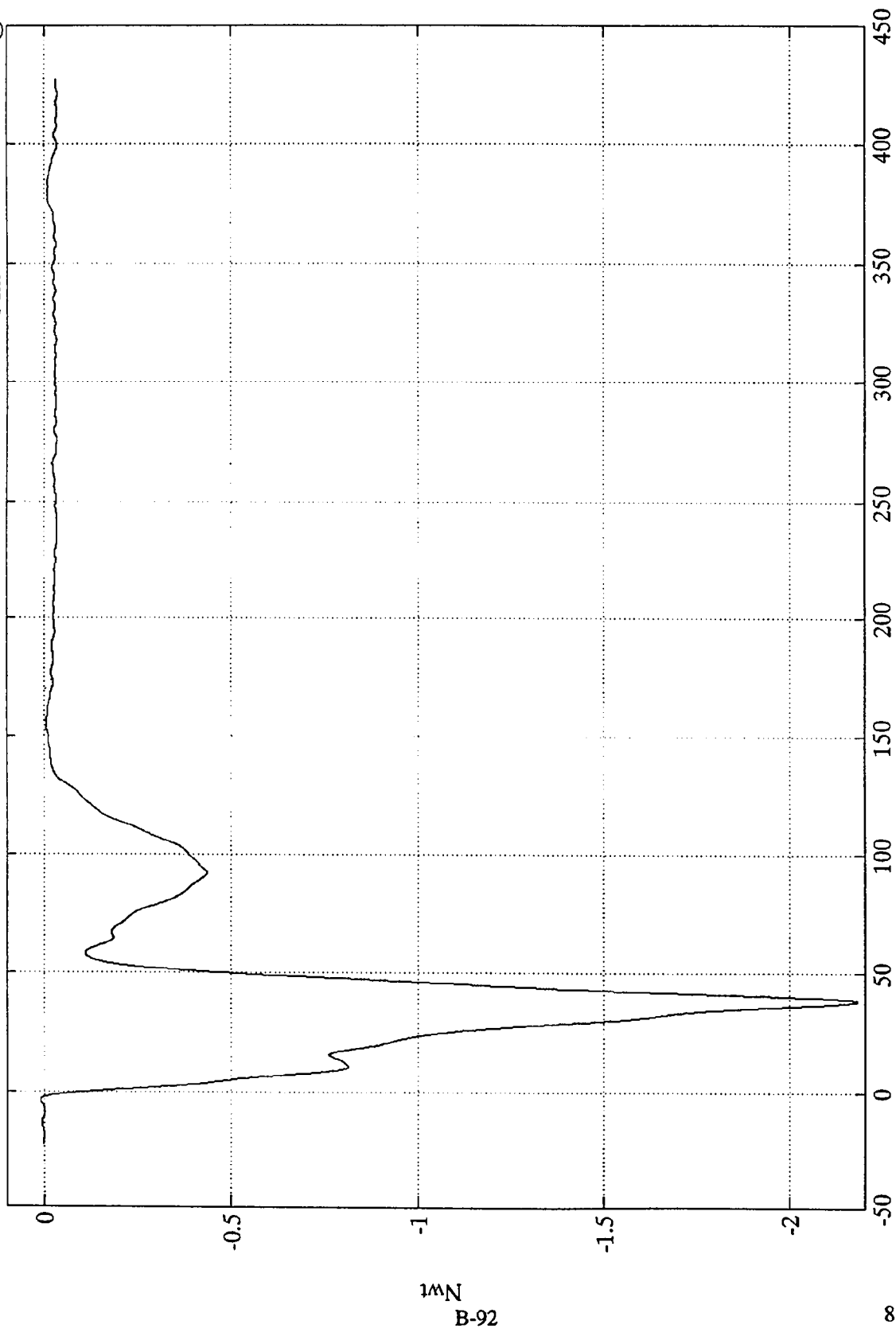
VTV TEST #9

$\times 10^5$

V2 CL Load Cell

Max = 1088.17 Nwt @
Min = -218049.86 Nwt @

-3.72 msec
38.27 msec



Time (msec)

SAE Filter Class 60

8118-9

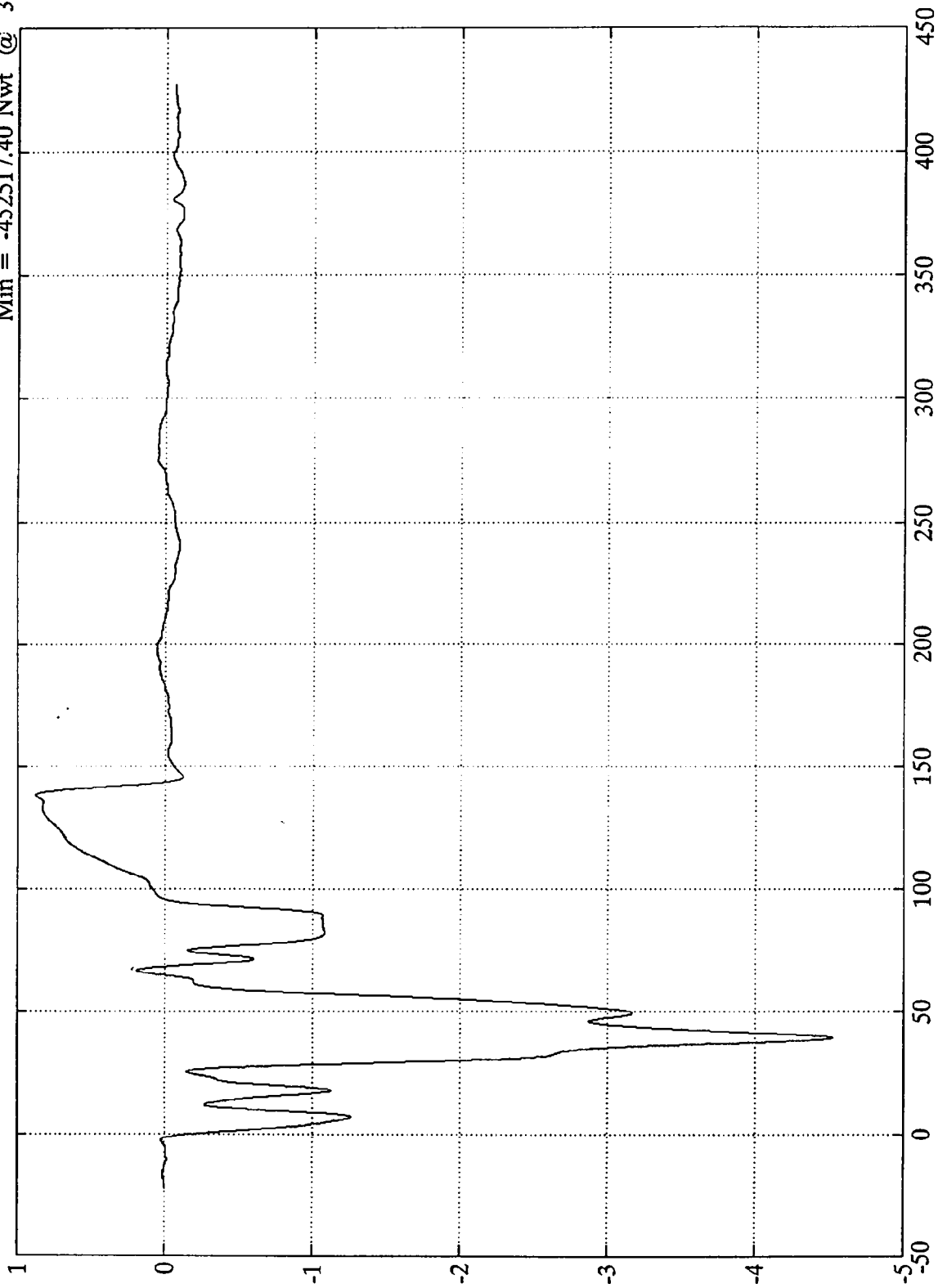
B-92

VTV TEST #9

$\times 10^5$

V2 Load Cell Barrier Sum

Max = 87863.16 Nwt @ 138.36 msec
Min = -452517.40 Nwt @ 39.12 msec



1wN B-93

8118

SAE Filter Class 60

Time (msec) Data questionable after 75msec, wire cut

TEST NO. Y49-9-1454

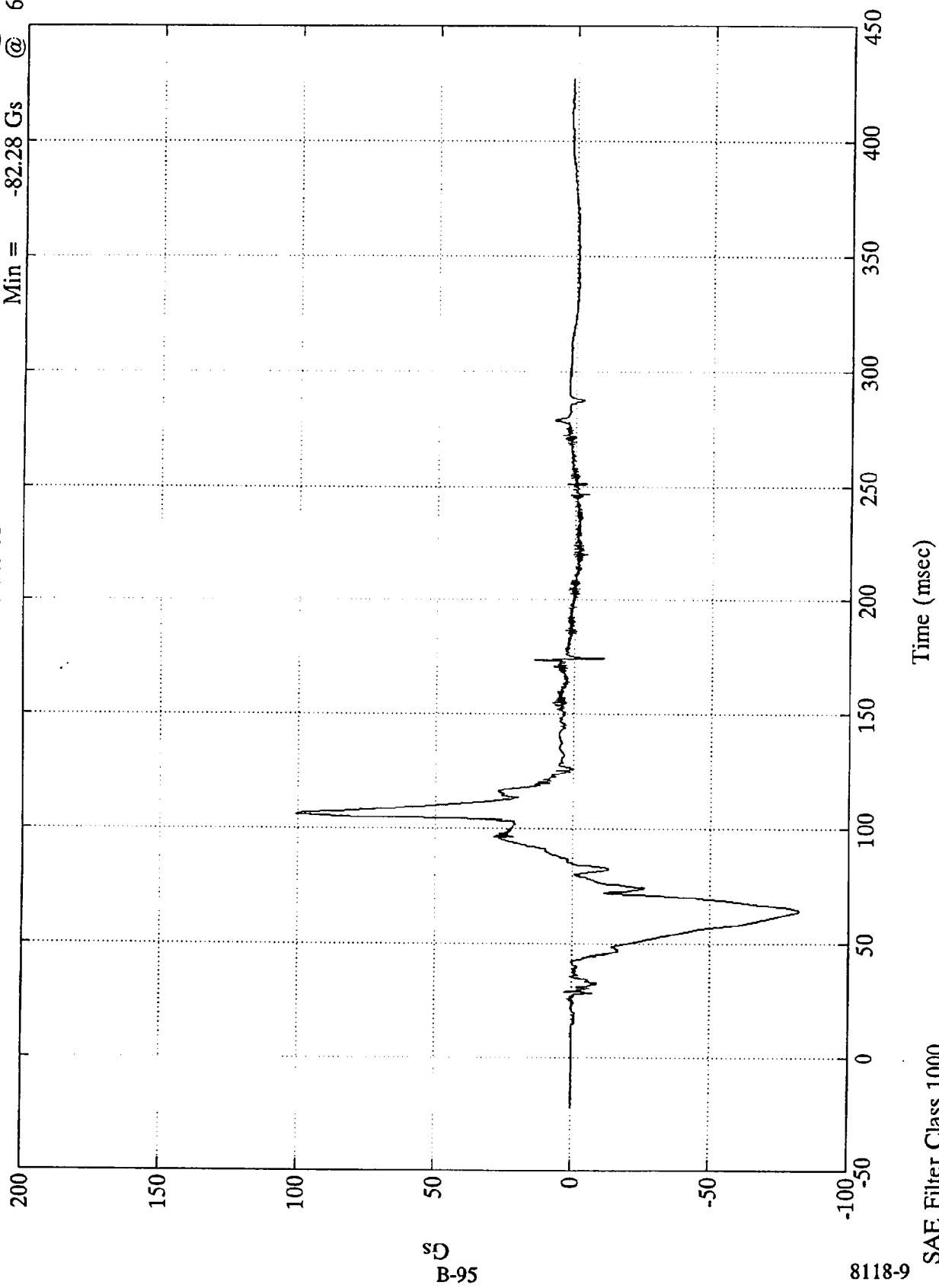
VEHICLE 1 - DUMMY DATA

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 #9

V1-P1 Head X

Max = 101.11 Gs @ 106.31 msec
Min = -82.28 Gs @ 64.31 msec



8118-9

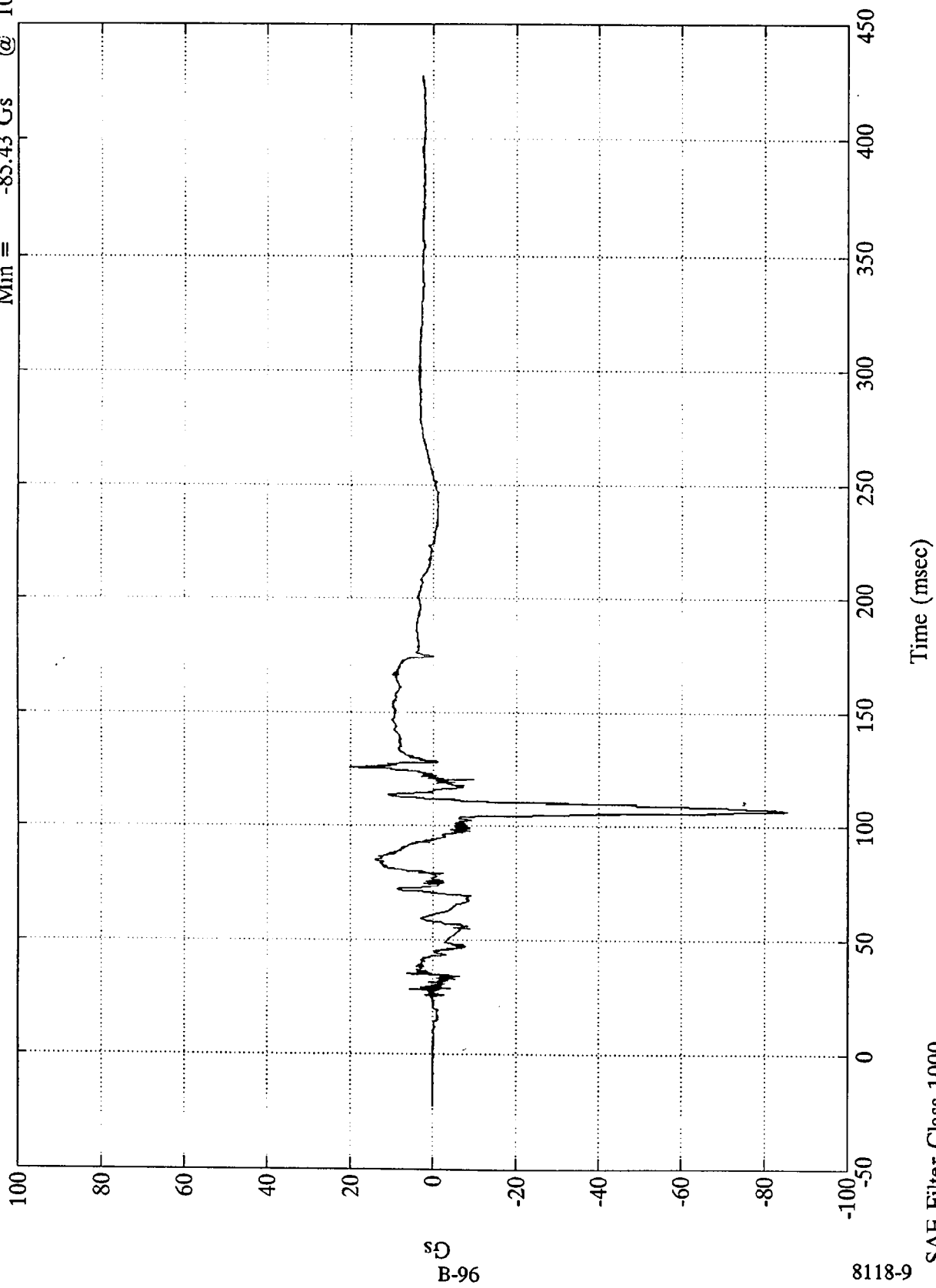
SAE Filter Class 1000

B-95

VTV TEST #9

V1-P1 Head Y

Max = 20.21 Gs @ 125.16 msec
Min = -85.43 Gs @ 106.80 msec



B-96

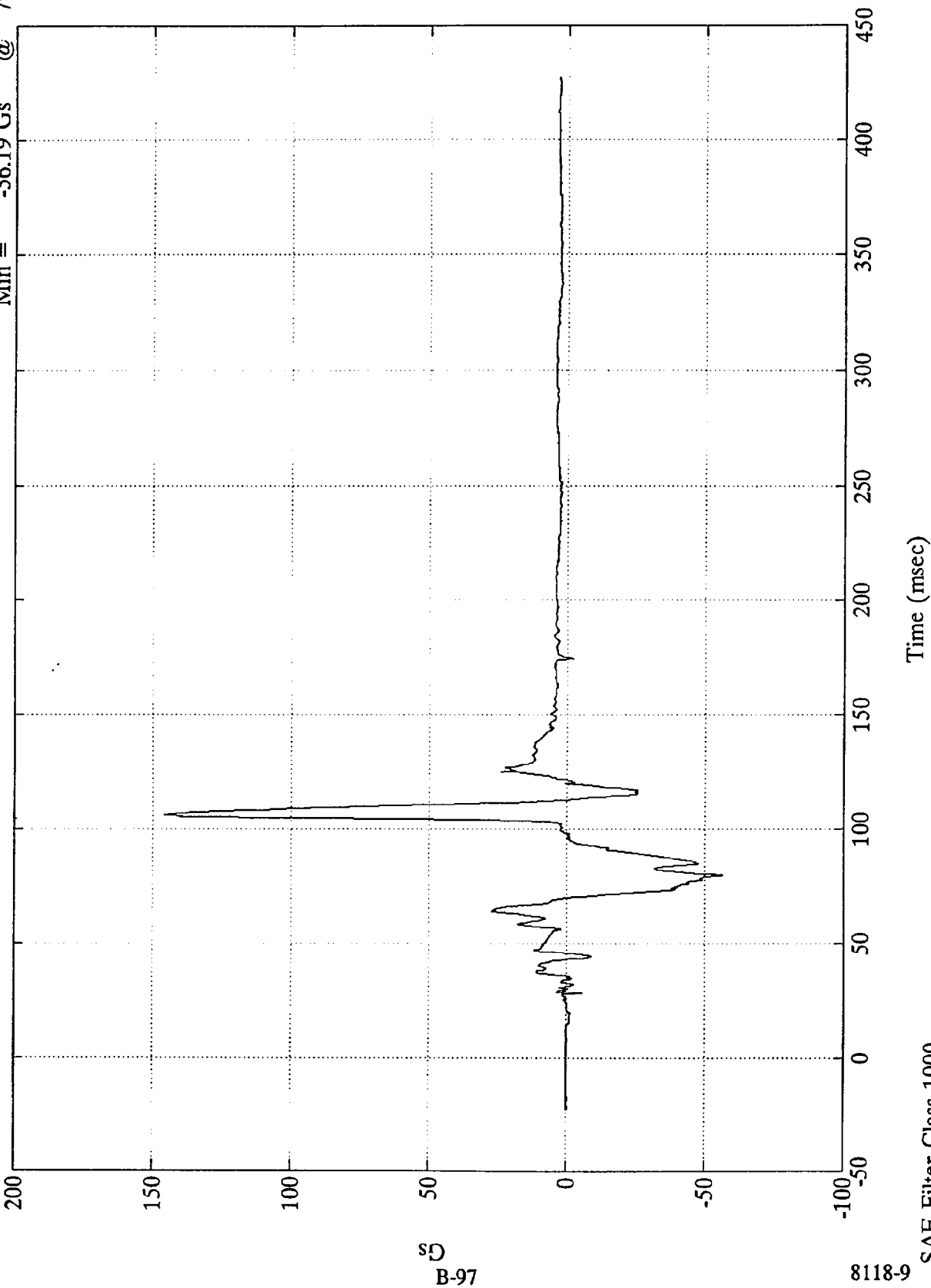
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P1 Head Z

Max = 146.06 Gs @ 106.31 msec
Min = -56.19 Gs @ 79.80 msec



B-97

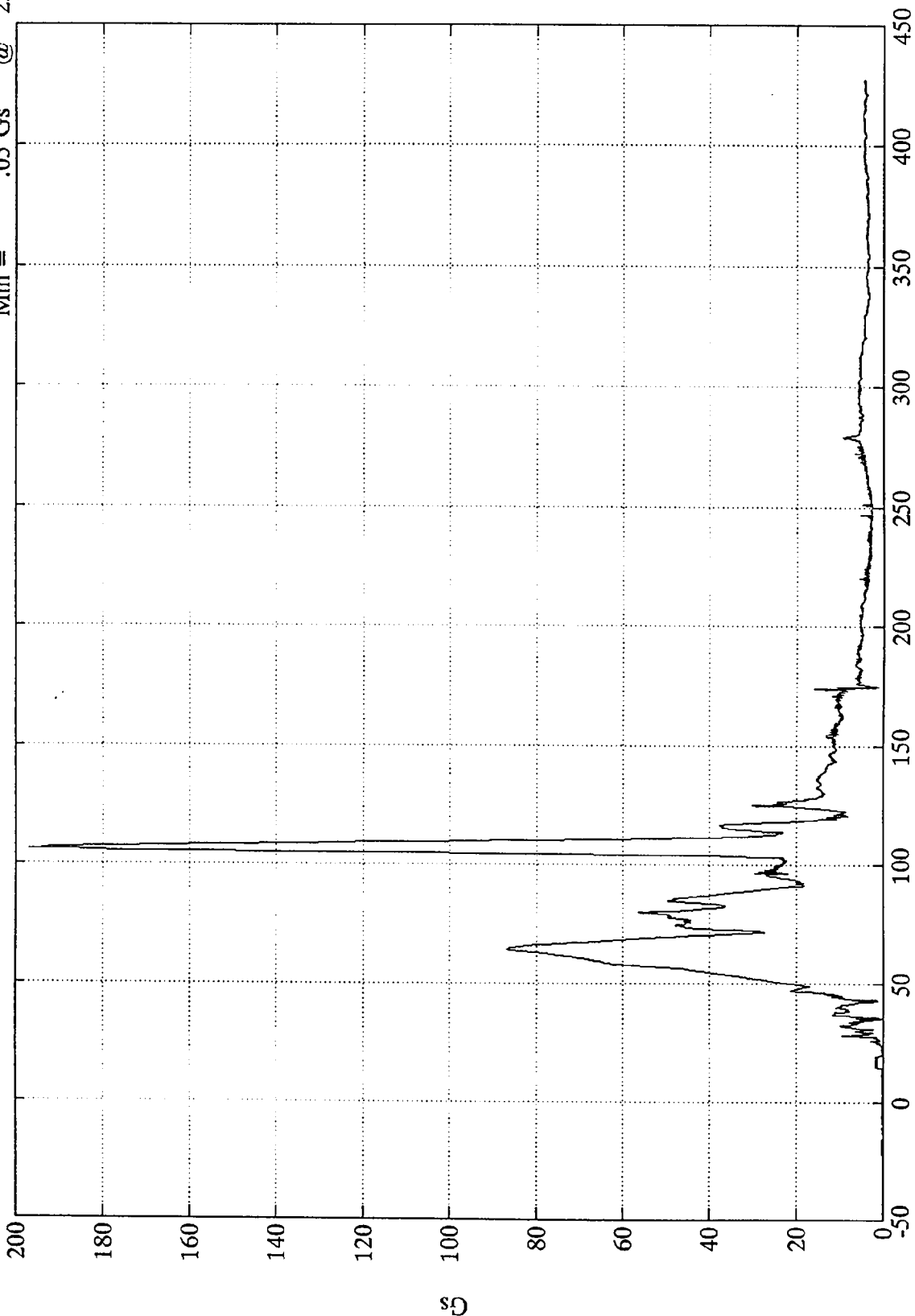
8118-9

SAE Filter Class 1000

VTV TEST #9

Max = 196.88 Gs @ 106.31 msec
Min = .05 Gs @ 23.28 msec

Head Resultant



Time (msec)

SAE Filter Class 1000

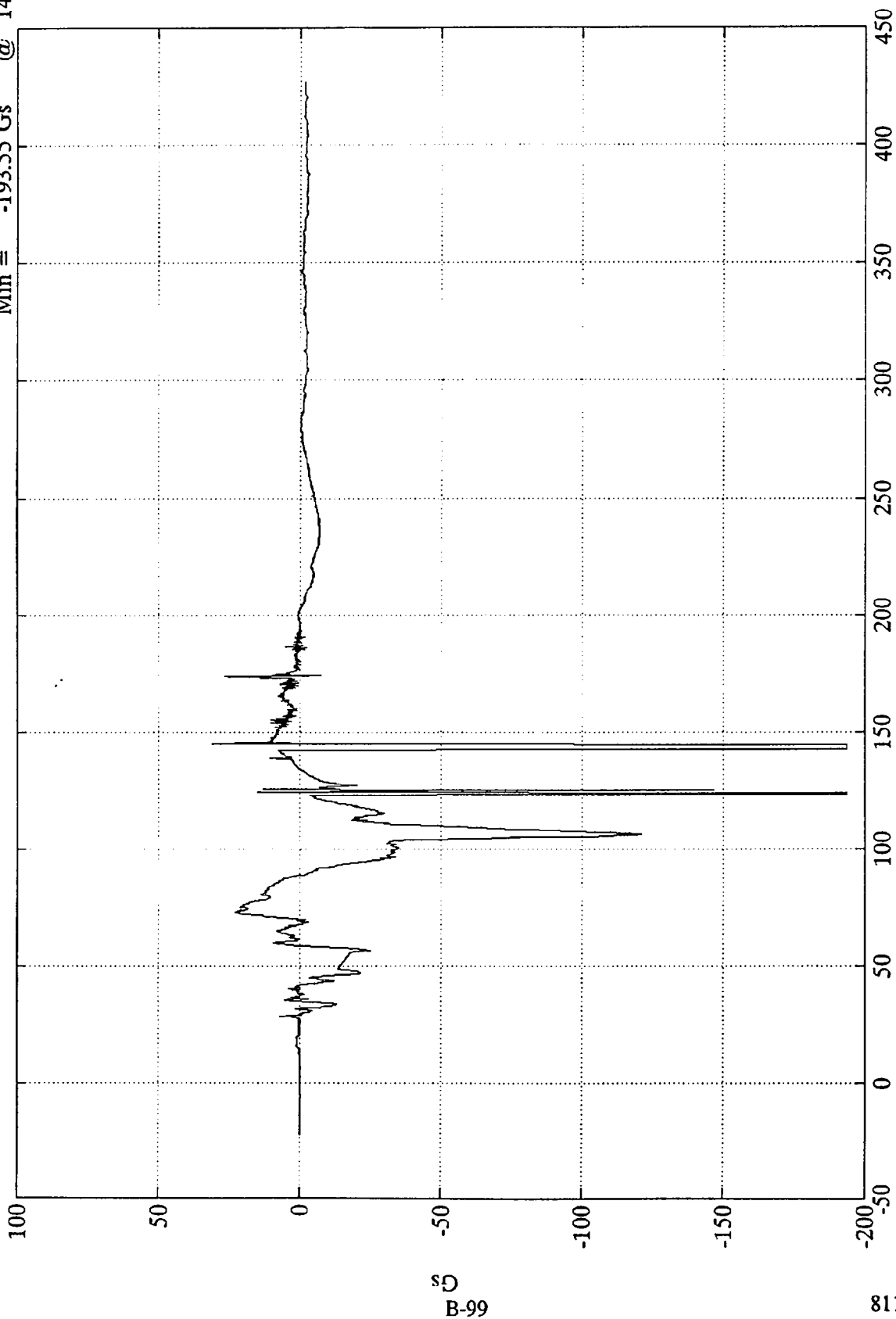
8118-9

B-98

VTV TEST #9

V1-P1 HD9X (Y)

Max = 31.22 Gs @ 145.19 msec
Min = -193.55 Gs @ 144.72 msec



Time (msec)
Noise spikes in data at 125 ms and 140ms

SAE Filter Class 1000

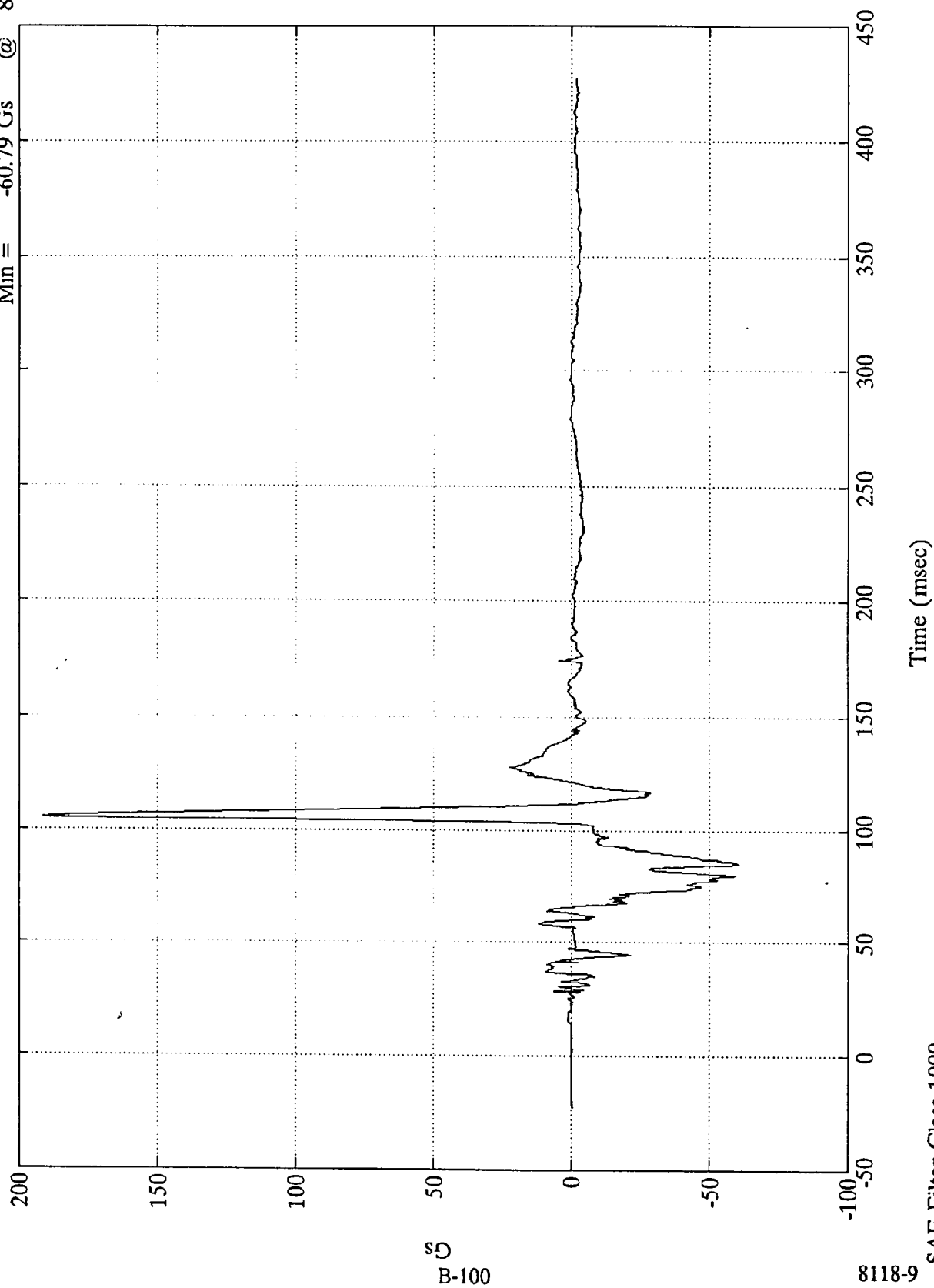
8118-9

B-99

VTV TEST #9

V1-P1 HD9X (Z)

Max = 191.23 Gs @ 105.84 msec
Min = -60.79 Gs @ 84.95 msec



B-100

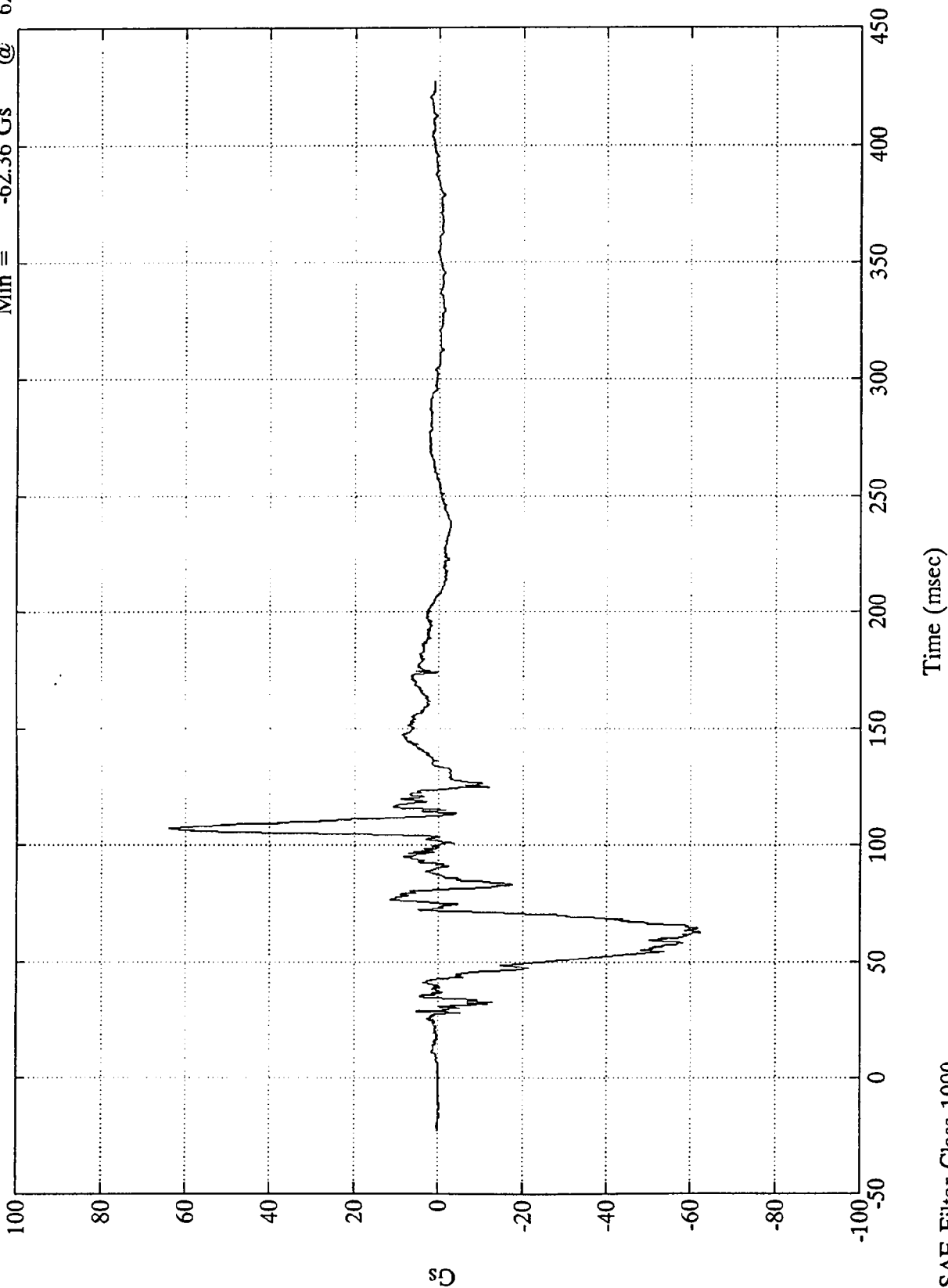
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P1 HD9Y (X)

Max = 64.07 Gs @ 107.40 msec
Min = -62.36 Gs @ 62.64 msec



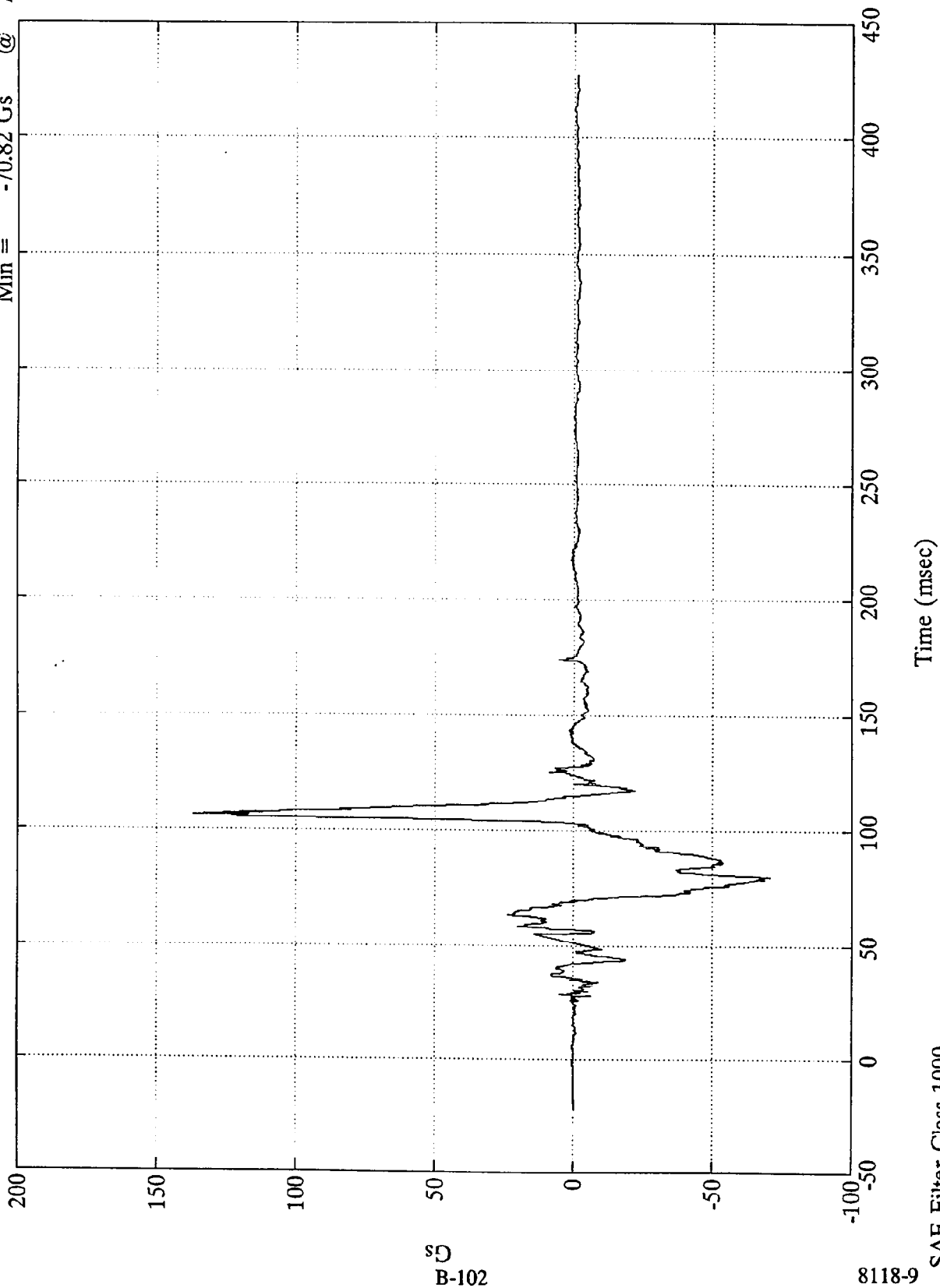
B-101

8118-9
SAE Filter Class 1000

VTV TEST #9

V1-P1 HD9Y (Z)

Max = 136.95 Gs @ 106.44 msec
Min = -70.82 Gs @ 79.91 msec



B-102

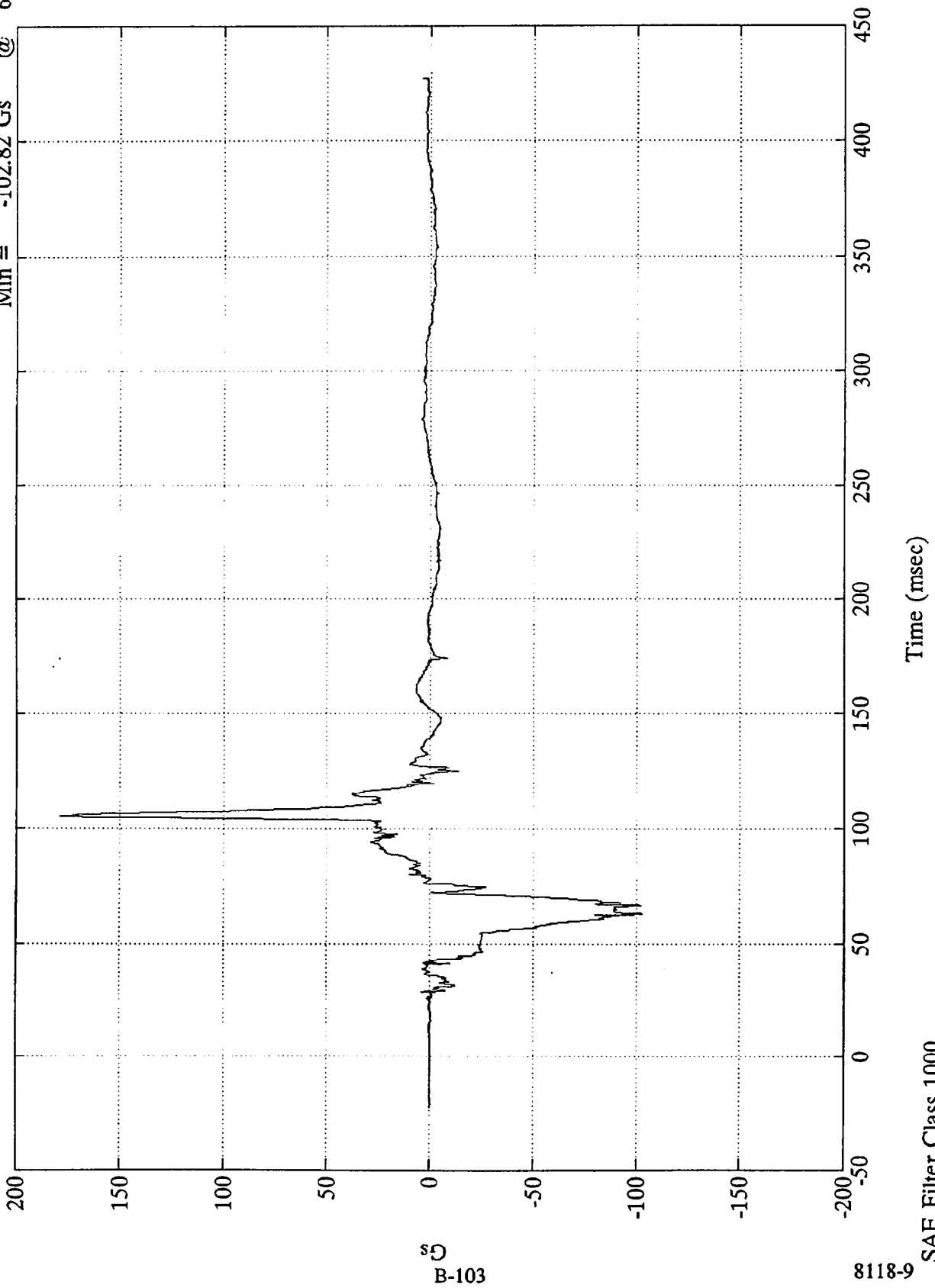
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P1 HD9Z (X)

Max = 179.07 Gs @ 105.48 msec
Min = -102.82 Gs @ 63.11 msec



B-103

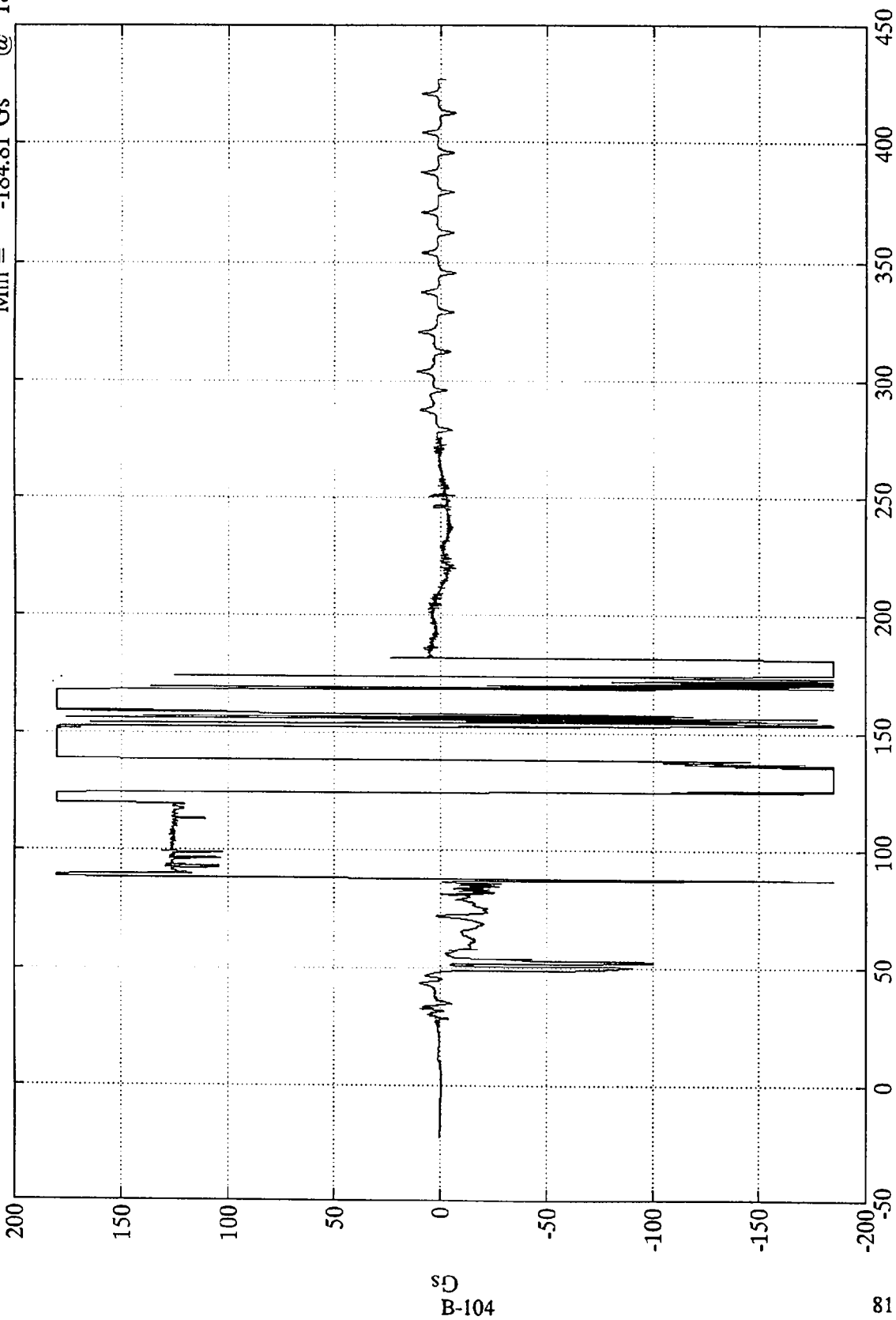
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P1 HD9Z (Y)

Max = 180.40 Gs @ 167.88 msec
Min = -184.81 Gs @ 181.68 msec



Time (msec)
Data questionable after 80ms

SAE Filter Class 1000

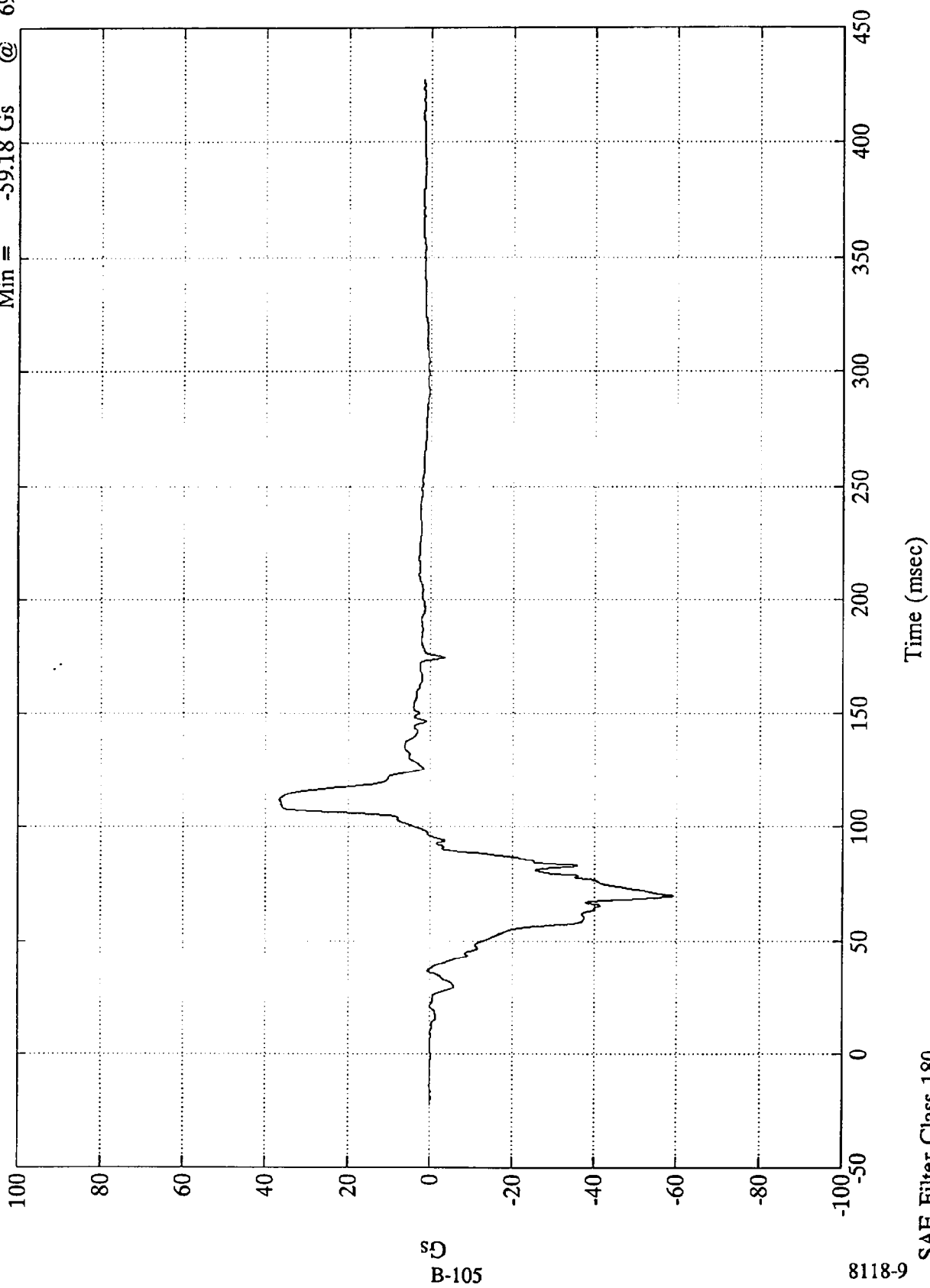
8118-9

B-104

VTV TEST #9

V1-P1 Chest X

Max = 36.64 Gs @ 111.84 msec
Min = -59.18 Gs @ 69.83 msec



B-105

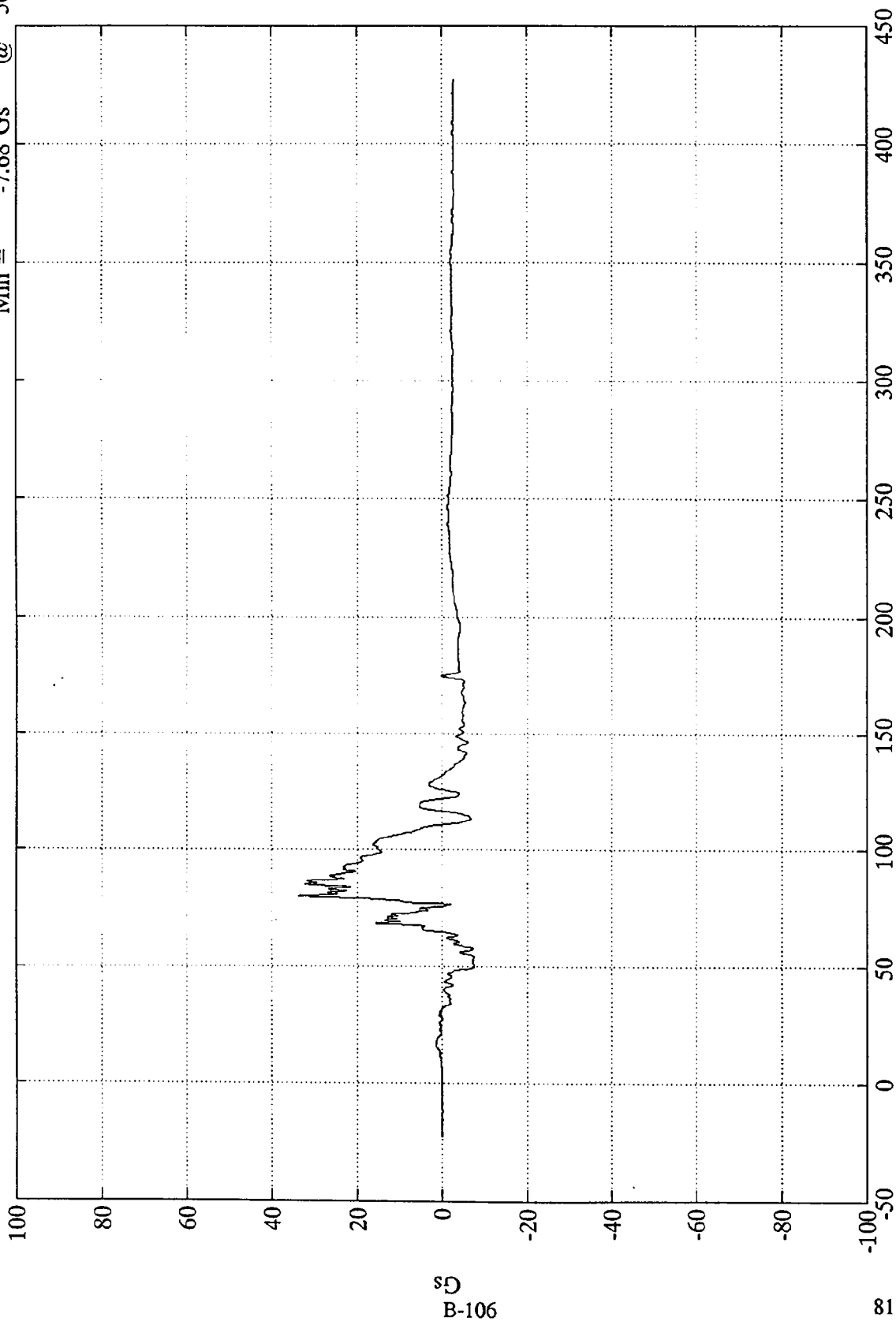
8118-9

SAE Filter Class 180

VTV TEST #9

Max = 33.85 Gs @ 80.04 msec
Min = -7.68 Gs @ 50.04 msec

V1-P1 Chest Y



Time (msec)

80
B-106

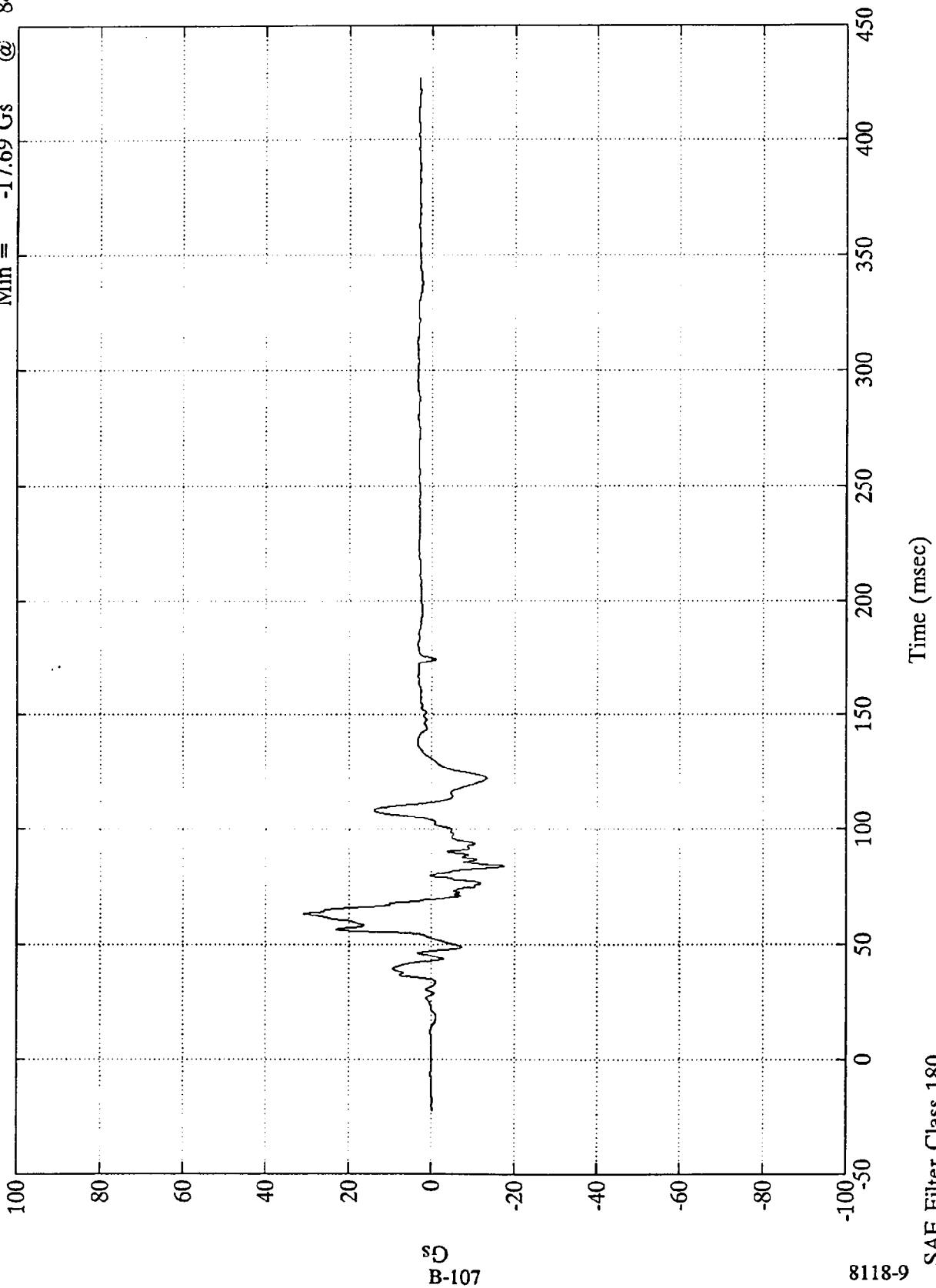
8118-9

SAE Filter Class 180

VTV TEST #9

V1-P1 Chest Z

Max = 30.89 Gs @ 63.11 msec
Min = -17.69 Gs @ 84.00 msec



SD
B-107

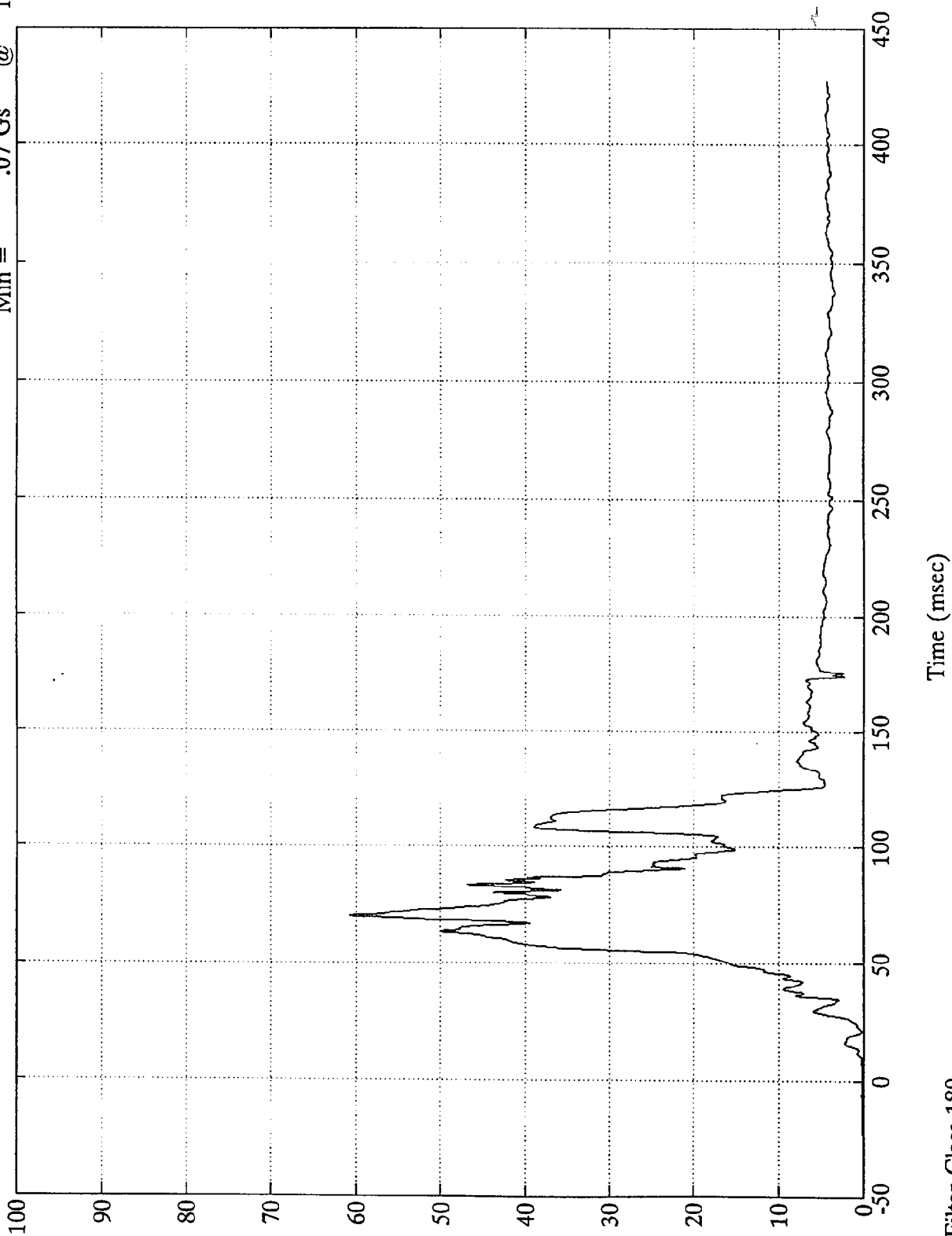
8118-9

SAE Filter Class 180

VTV TEST #9

Max = 60.80 Gs @ 69.83 msec
Min = .07 Gs @ 1.31 msec

Chest Resultant



SD
B-108

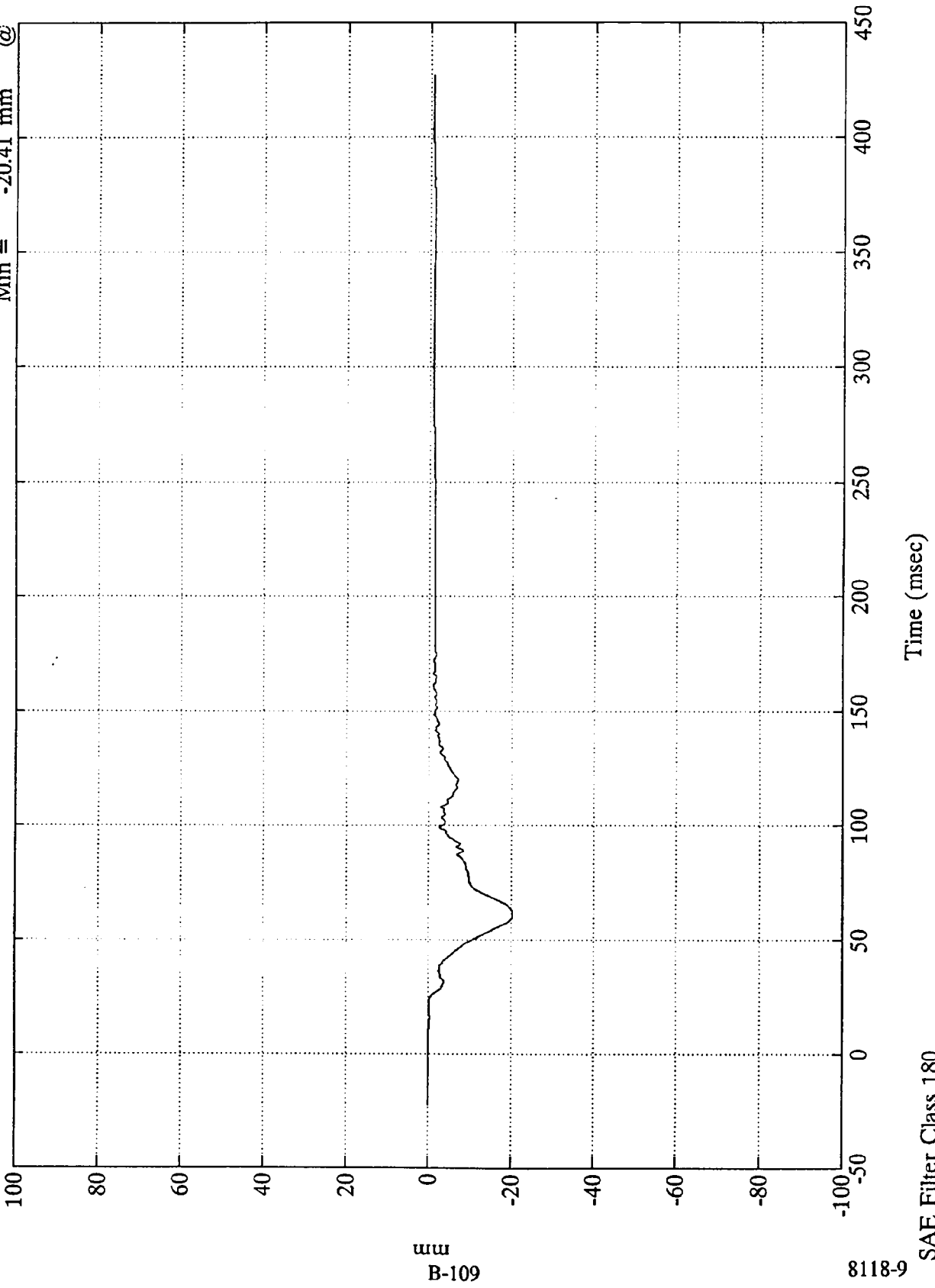
8118-9

SAE Filter Class 180

VTV TEST #9

V1-P1 Chest Disp.

Max = -1.08 mm @ -1.08 msec
Min = -20.41 mm @ 60.12 msec



B-109

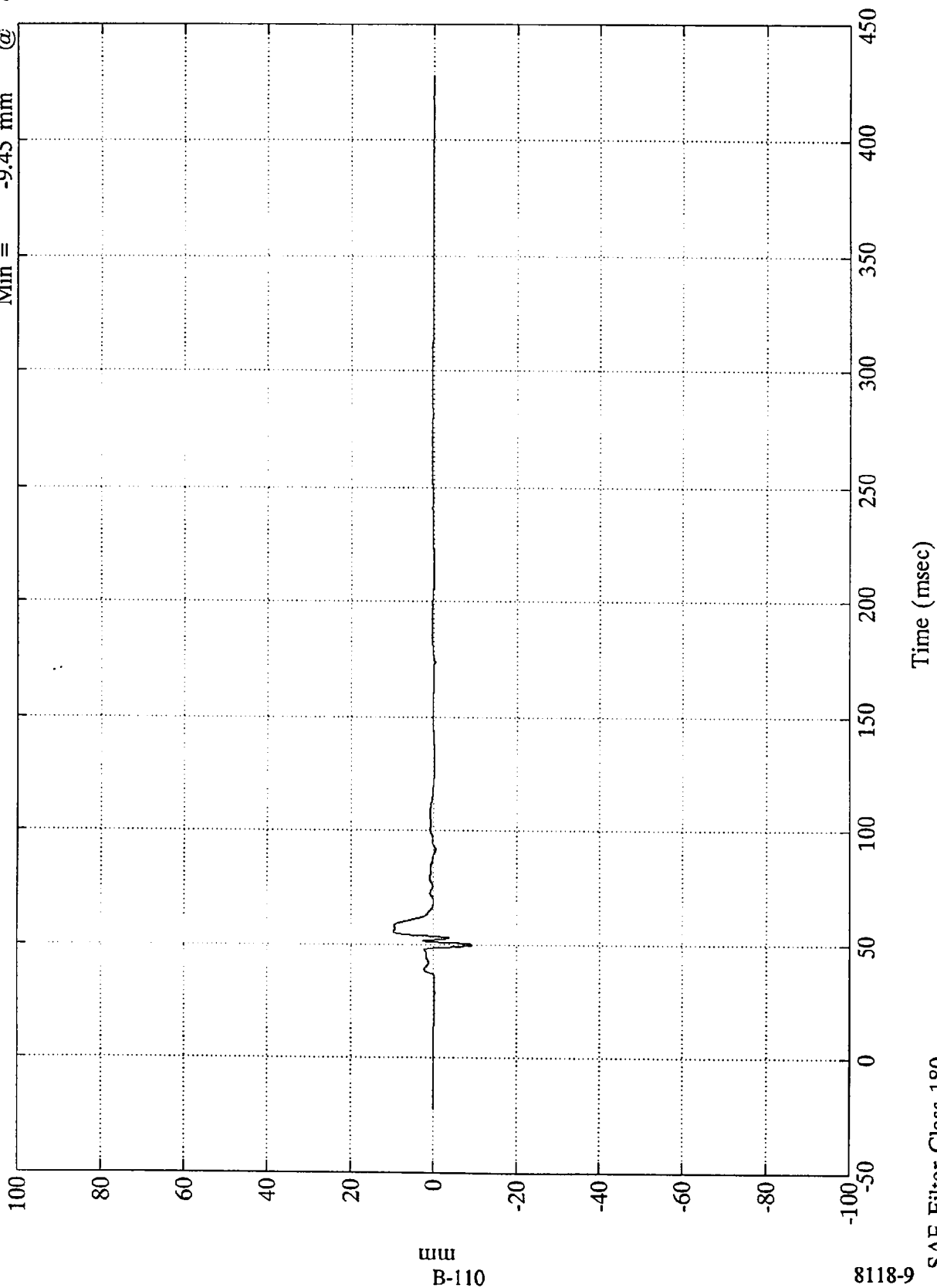
8118-9

SAE Filter Class 180

VTV TEST #9

Chest Displacement #125

Max =	9.75 mm	@	55.68 msec
Min =	-9.45 mm	@	49.92 msec



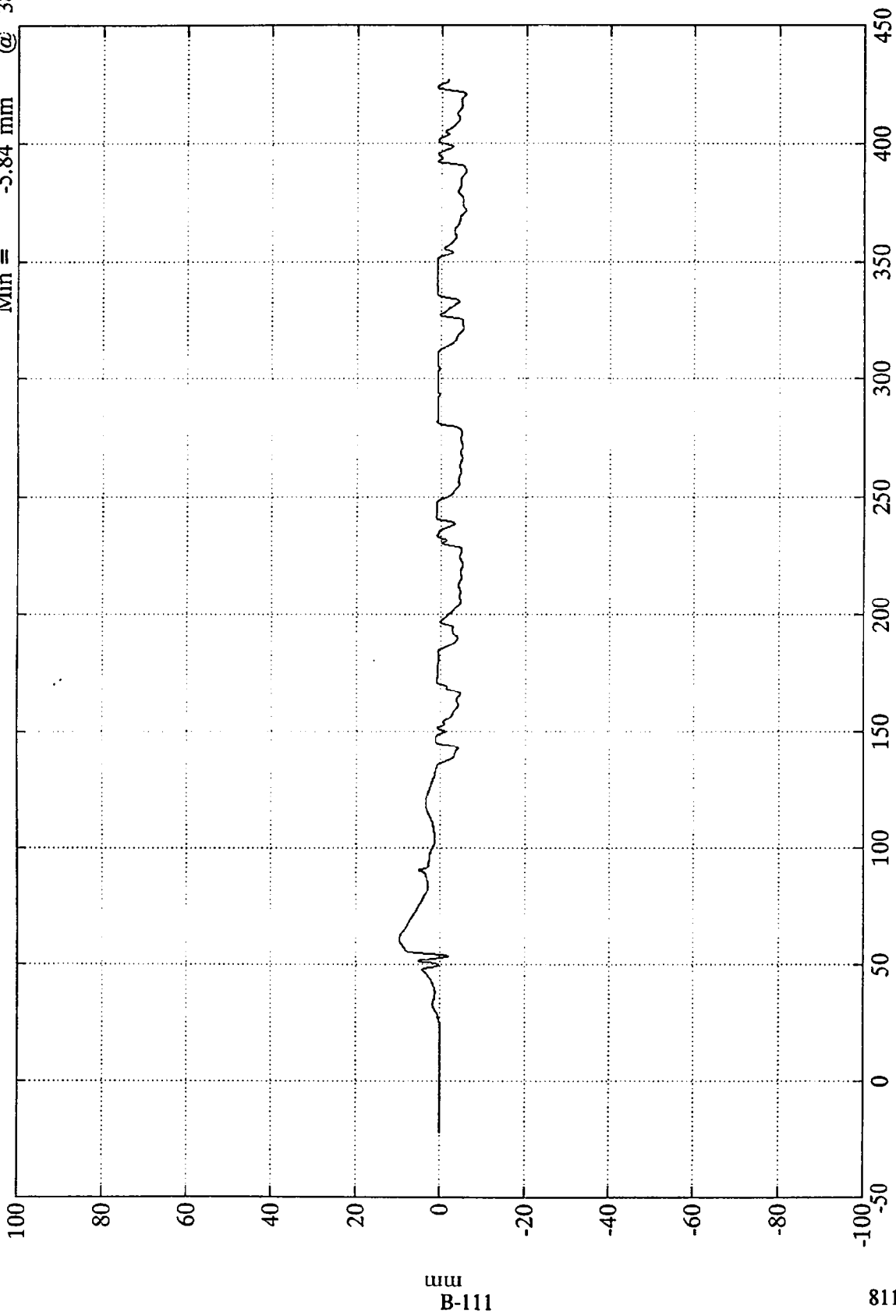
B-110

8118-9

VTV TEST #9

Chest Displacement #126

Max = 9.63 mm @ 60.60 msec
Min = -5.84 mm @ 388.20 msec



Time (msec)
Data not accurate

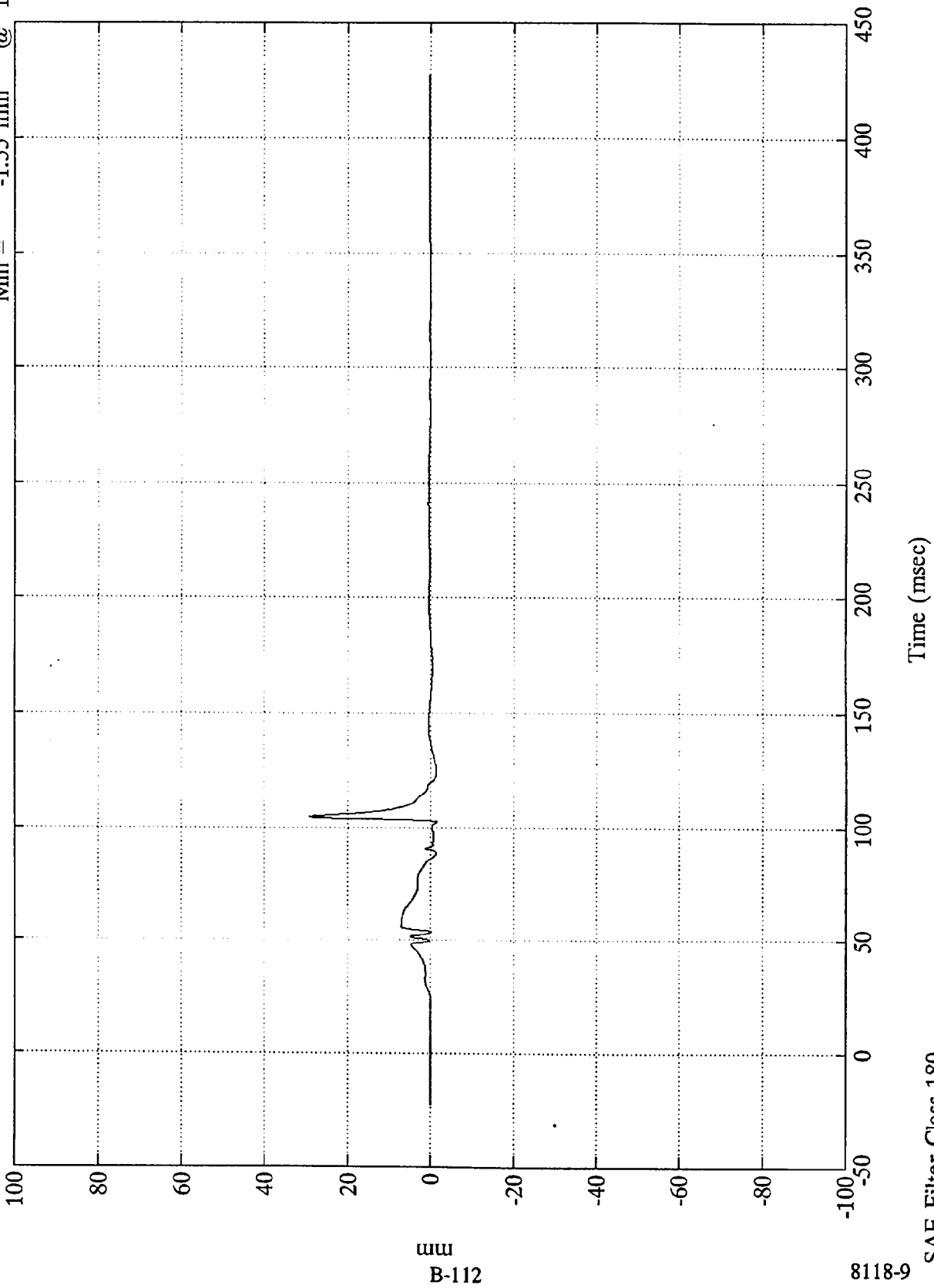
SAE Filter Class 180

8118-9

mm
B-111

VTV TEST #9

Chest Displacement #127
Max = 29.36 mm @ 105.00 msec
Min = -1.55 mm @ 102.72 msec



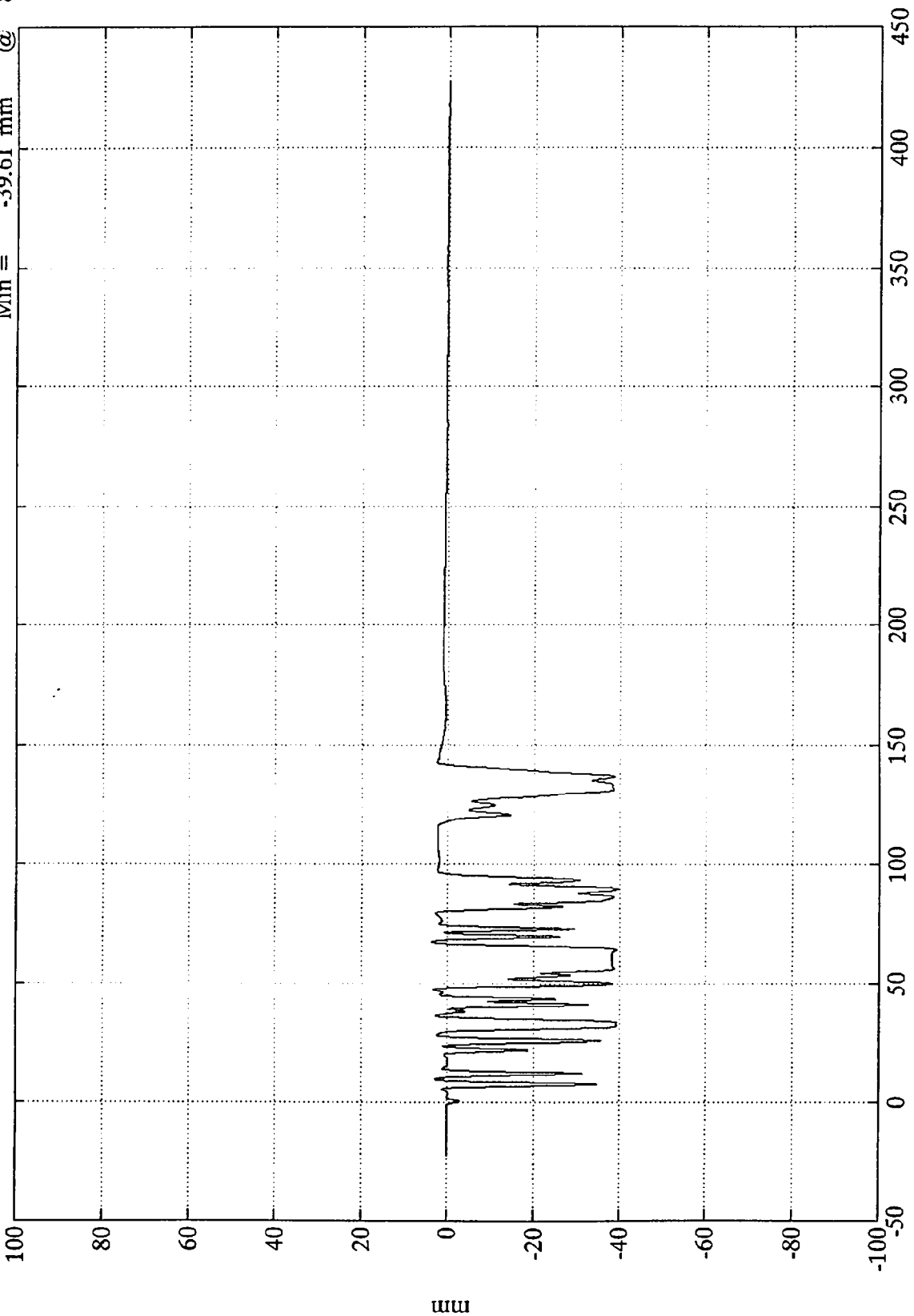
B-112

8118-9

VTV TEST #9

Chest Displacement #128

Max = 3.67 mm @ 67.08 msec
Min = -39.61 mm @ 89.76 msec



Time (msec)
Data not accurate, noise in channel

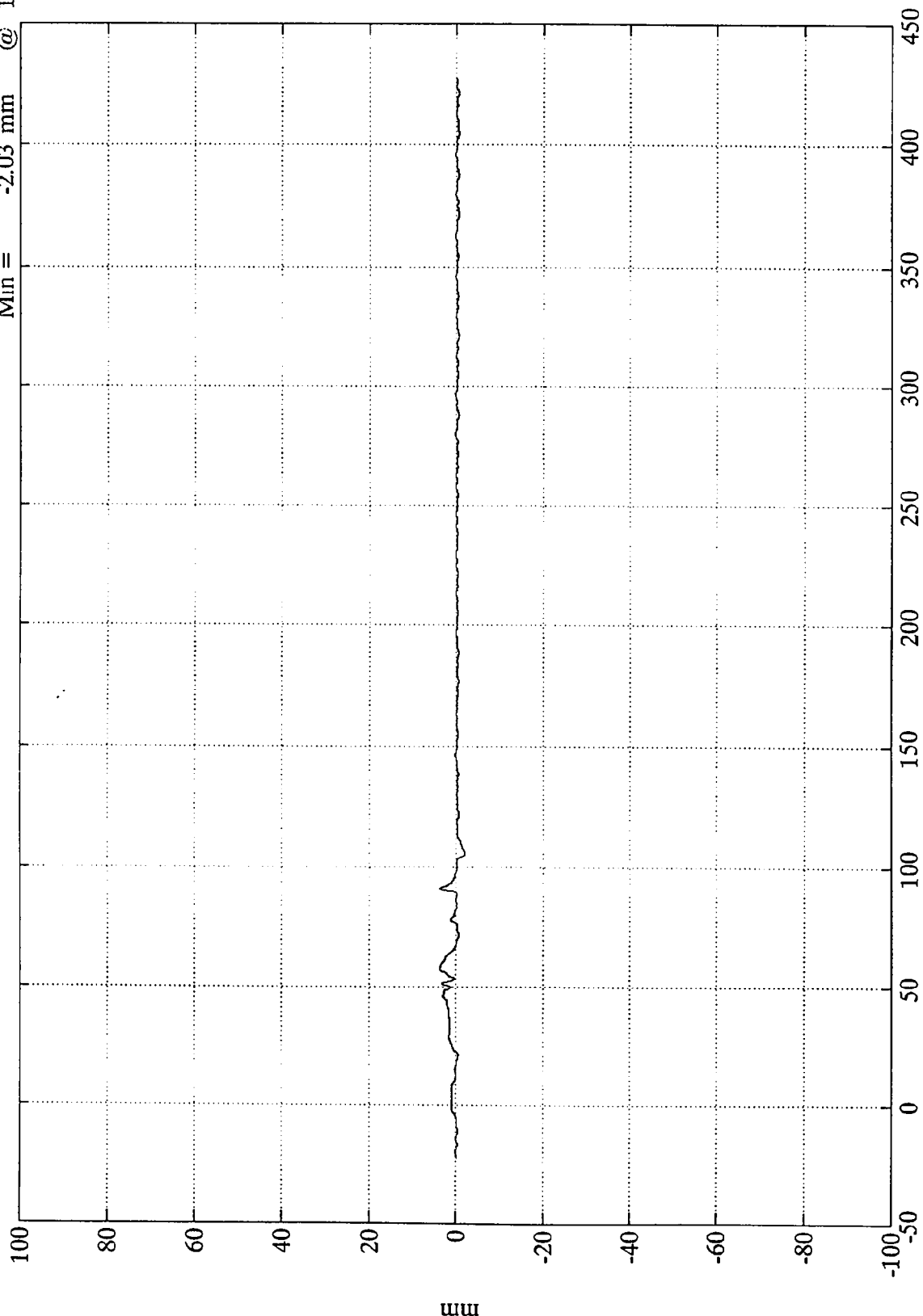
mm
B-113

8118-9
SAE Filter Class 180

VTV TEST #9

Max = 3.81 mm @ 91.08 msec
Min = -2.03 mm @ 105.84 msec

Chest Displacement #129



mm
B-114

Time (msec)

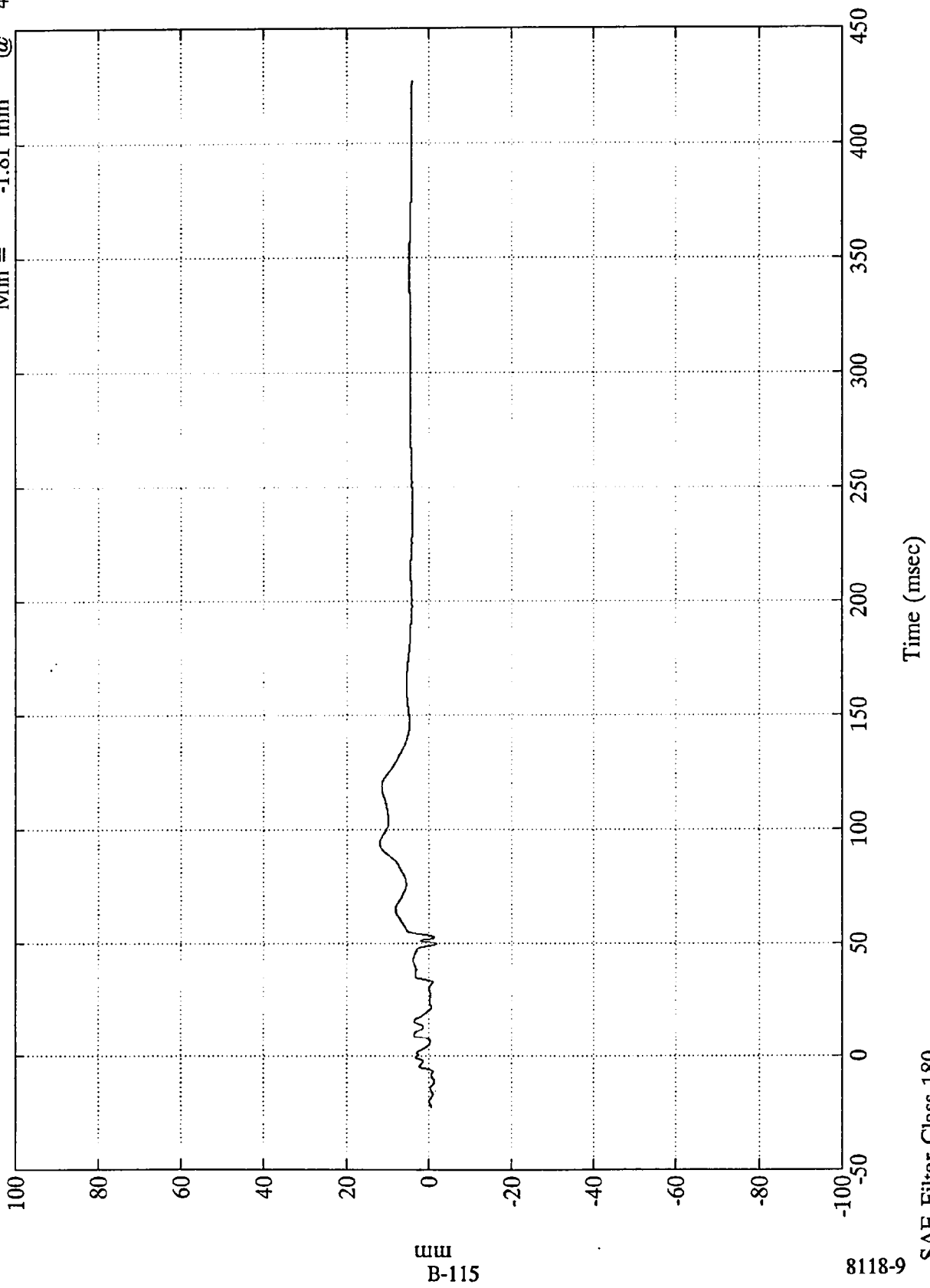
SAE Filter Class 180

8118-9

VTV TEST #9

Chest Displacement #130

Max = 11.98 mm @ 94.08 msec
Min = -1.81 mm @ 49.79 msec

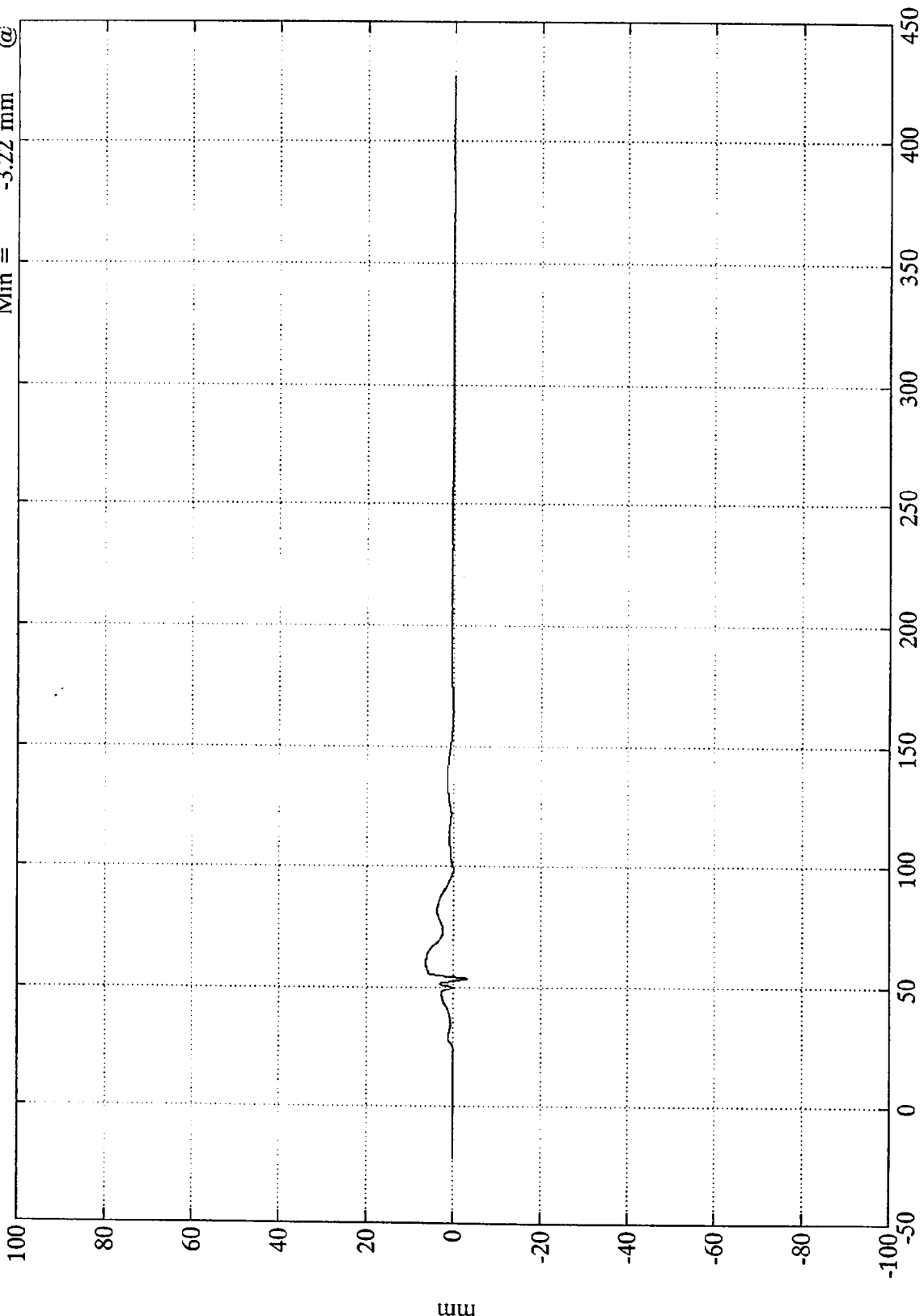


8118-9

VTV TEST #9

Chest Displacement #131

Max =	6.21 mm	@	60.12 msec
Min =	-3.22 mm	@	53.63 msec



B-116

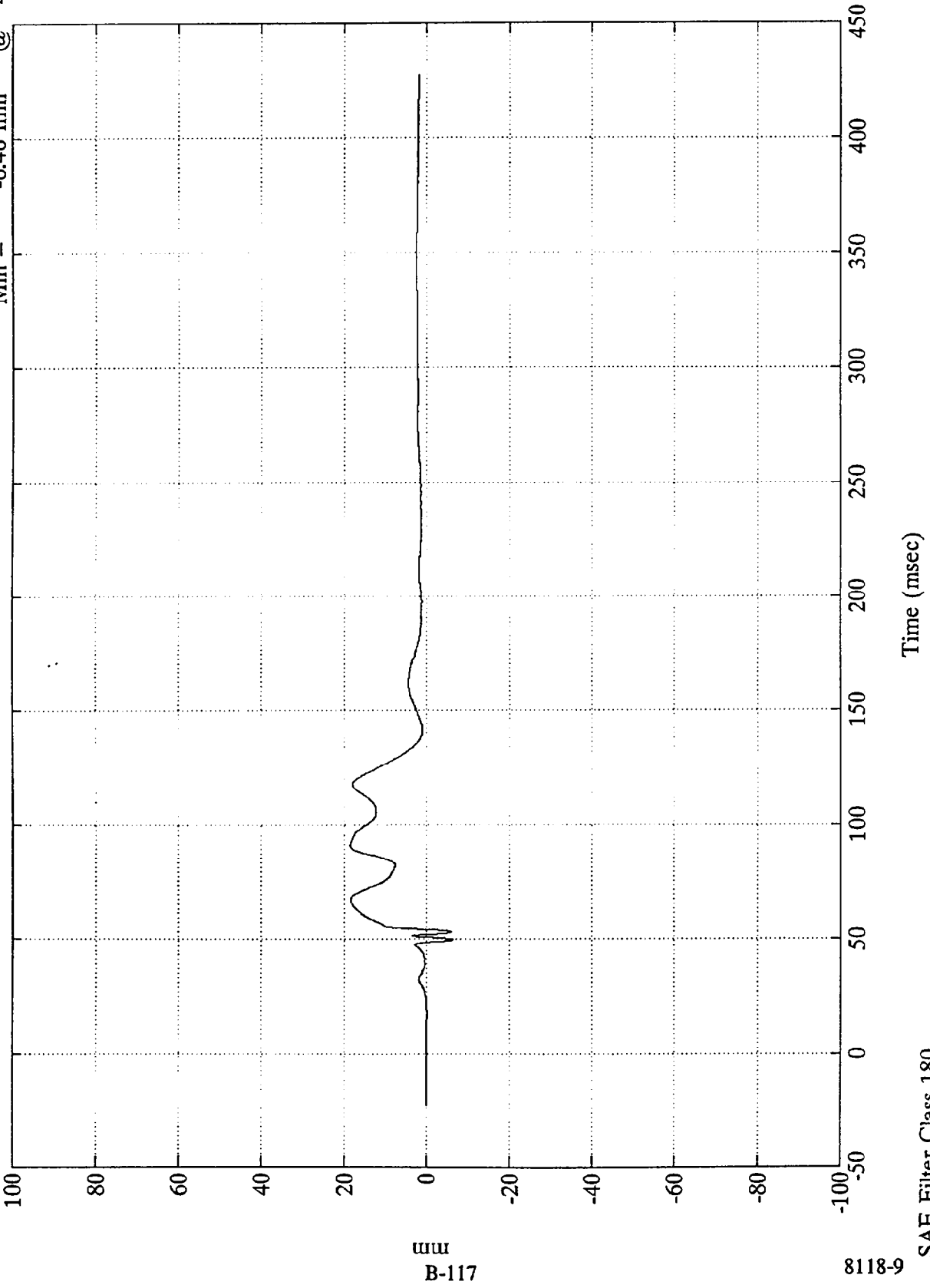
8118-9

SAE Filter Class 180

Time (msec)

VTV TEST #9

Chest Displacement #132
Max = 18.54 mm @ 91.20 msec
Min = -6.46 mm @ 49.68 msec



mm
B-117

8118-9

SAE Filter Class 180

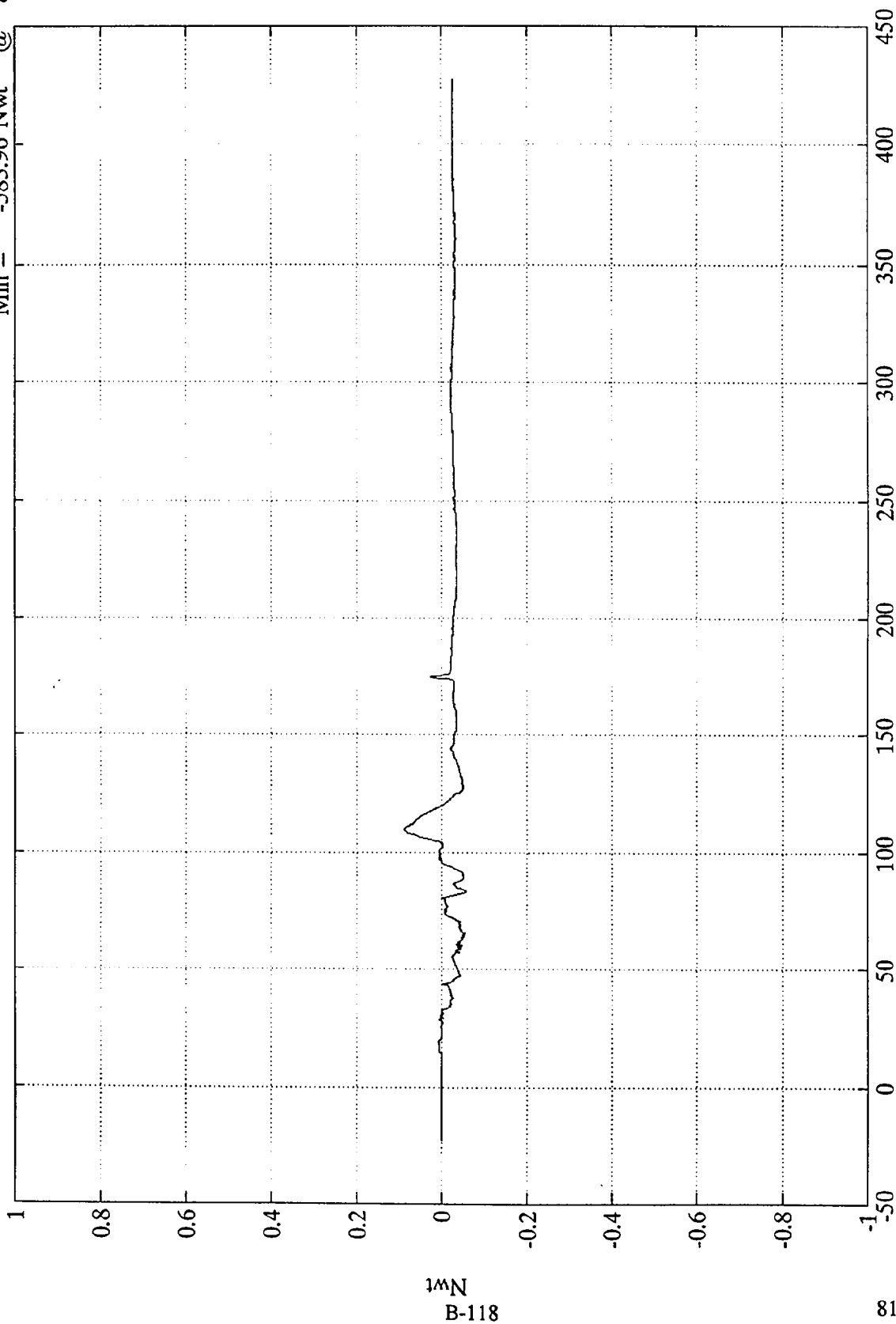
VTV TEST #9

$\times 10^4$

V1-P1 Upper Neck Fx

Max = 884.34 Nwt
Min = -583.96 Nwt

@ 110.16 msec
@ 83.16 msec



1Nwt

B-118

8118-9

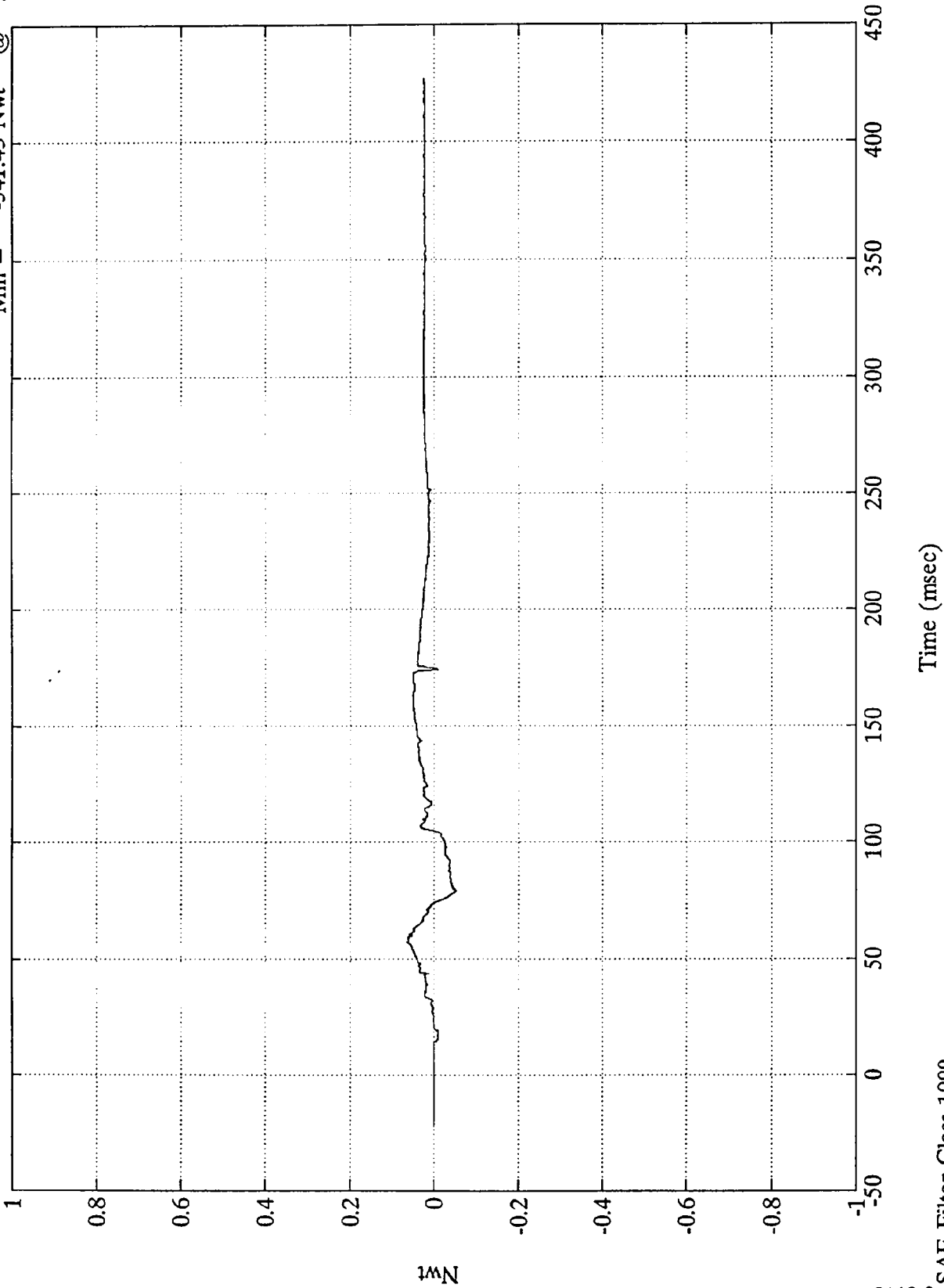
SAE Filter Class 1000

VTV TEST #9

$\times 10^4$

V1-P1 Upper Neck Fy

Max = 643.10 Nwt @ 57.24 msec
Min = -541.43 Nwt @ 79.08 msec



1Nwt

B-119

8118-9

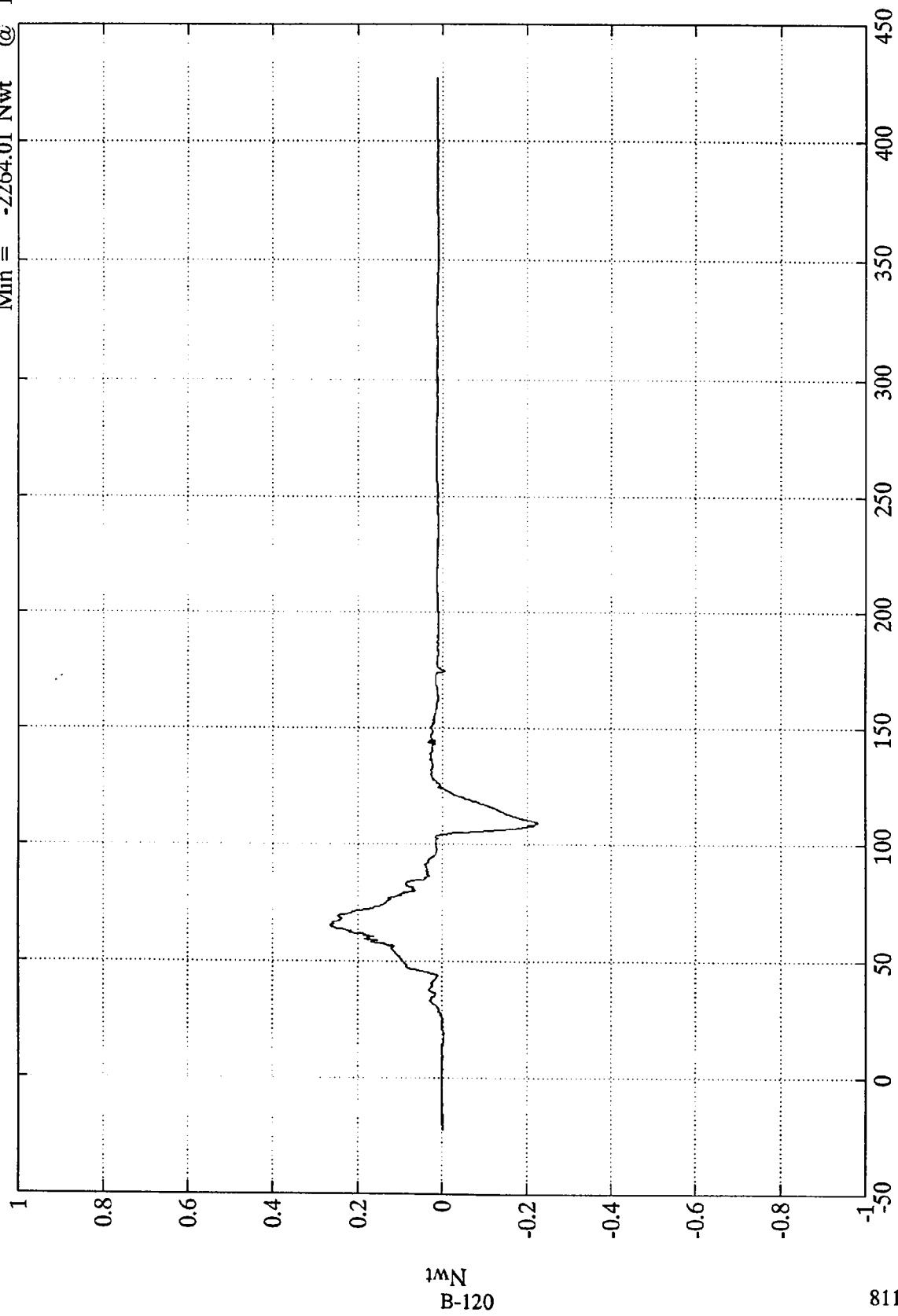
SAE Filter Class 1000

VTV TEST #9

$\times 10^4$

V1-P1 Upper Neck Fz

Max = 2652.11 Nwt @ 65.28 msec
Min = -2264.01 Nwt @ 109.31 msec



10N
B-120

8118-9

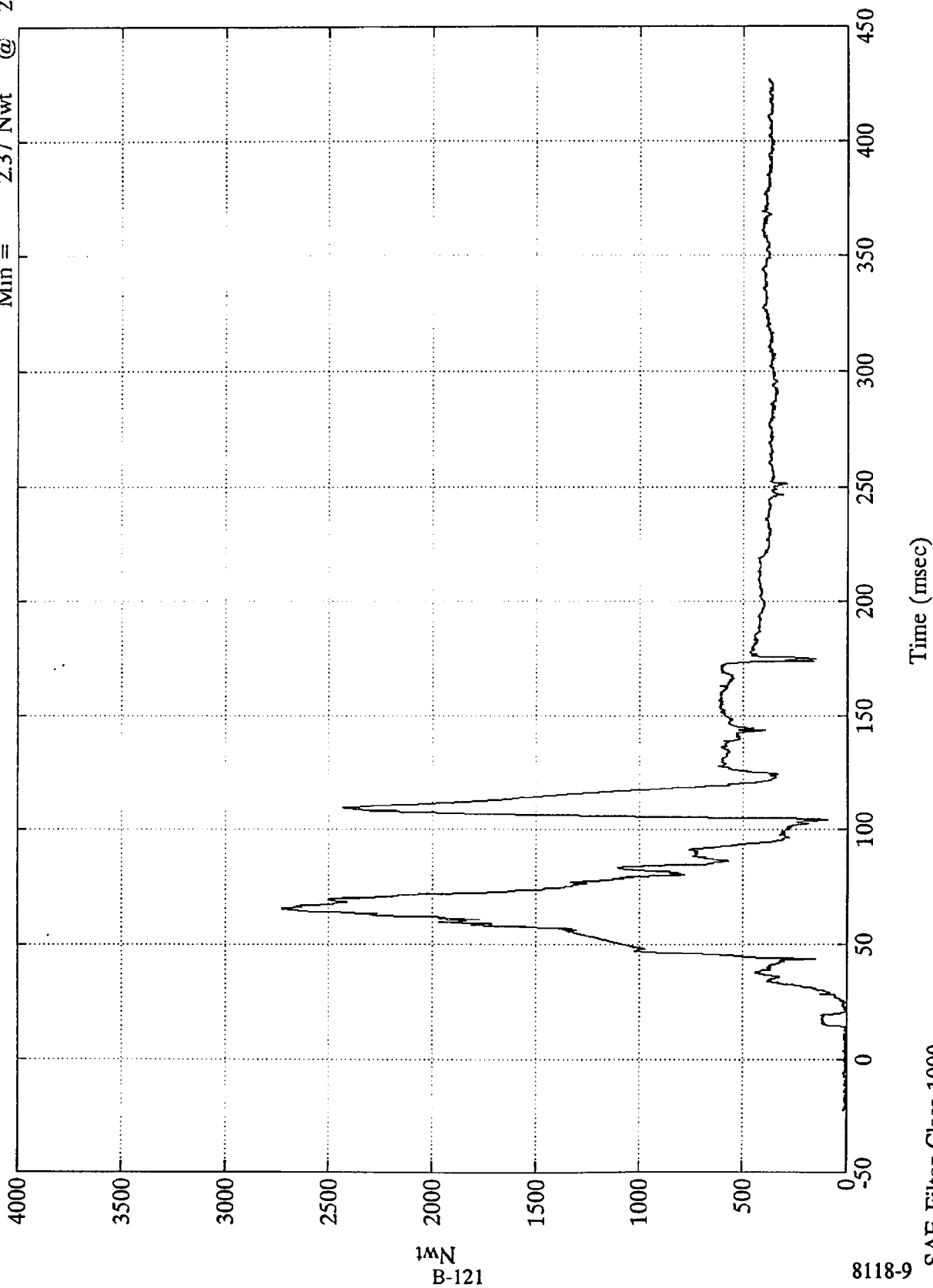
SAE Filter Class 1000

Time (msec)

VTV TEST #9

Upper Neck Force Res.

Max = 2726.18 Nwt @ 65.28 msec
Min = 2.37 Nwt @ 22.56 msec

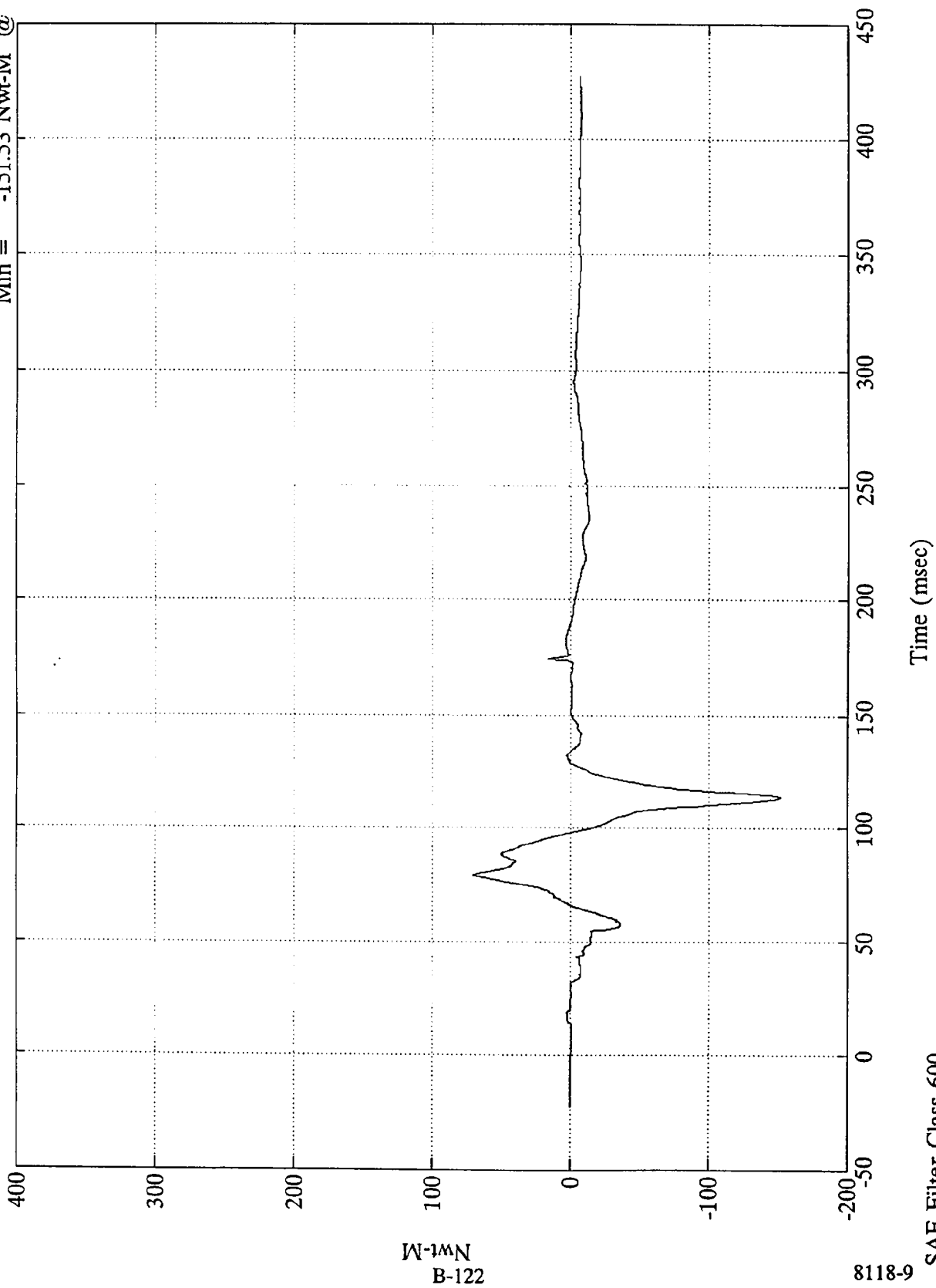


B-121

8118-9

VTV TEST #9

V1-P1 Upper Neck Mx
Max = 70.80 Nwt-M @ 78.95 msec
Min = -151.53 Nwt-M @ 113.63 msec



Mwt-M
B-122

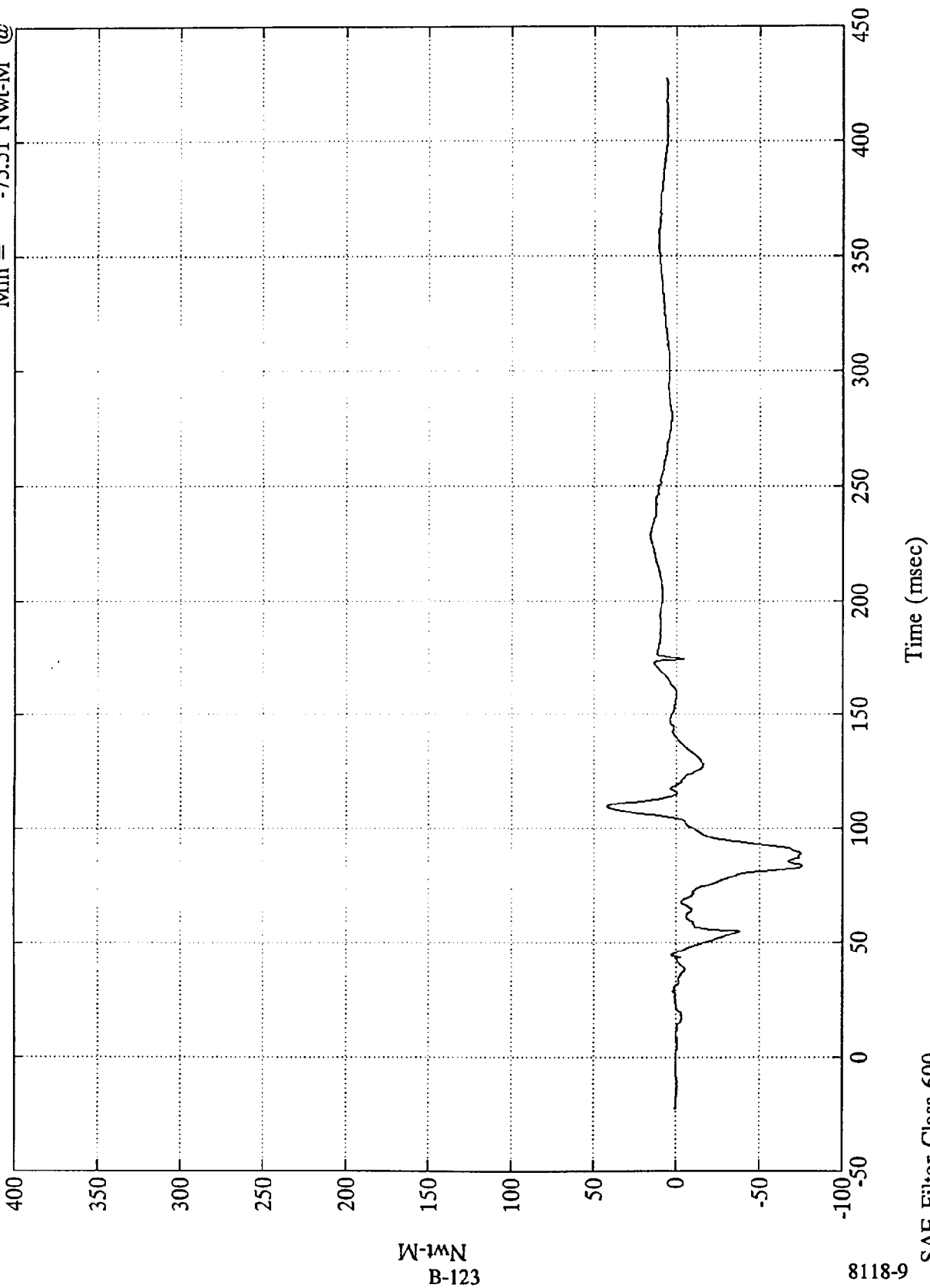
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P1 Upper Neck My

Max = 41.86 Nwt-M @ 109.44 msec
Min = -75.51 Nwt-M @ 83.28 msec



W-1wN
B-123

8118-9

SAE Filter Class 600

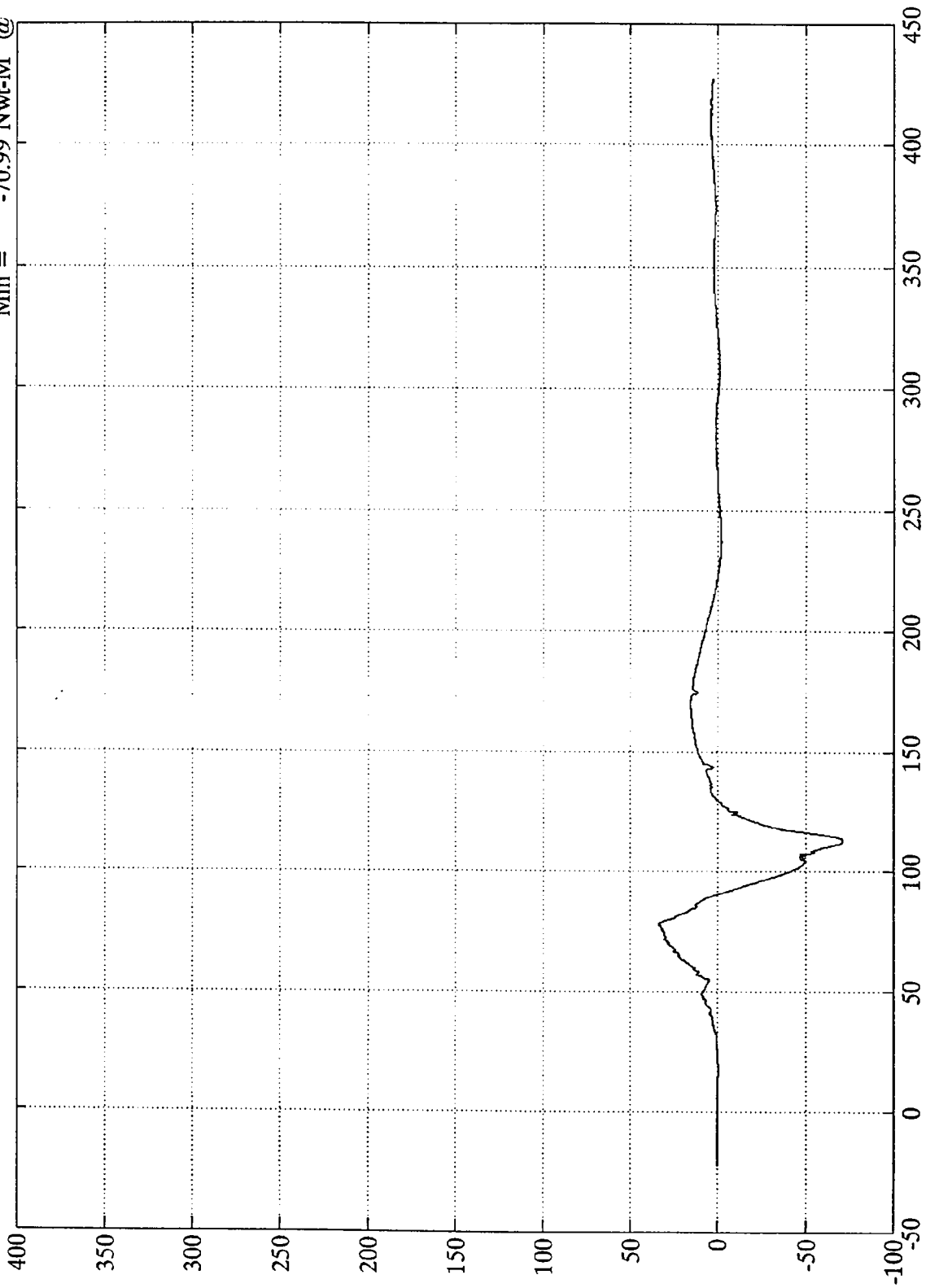
VTV TEST #9

V1-P1 Upper Neck Mz

Max =
Min =

33.64 Nwt-M @
-70.99 Nwt-M @

77.52 msec
113.16 msec



Nwt-M
B-124

8118-9

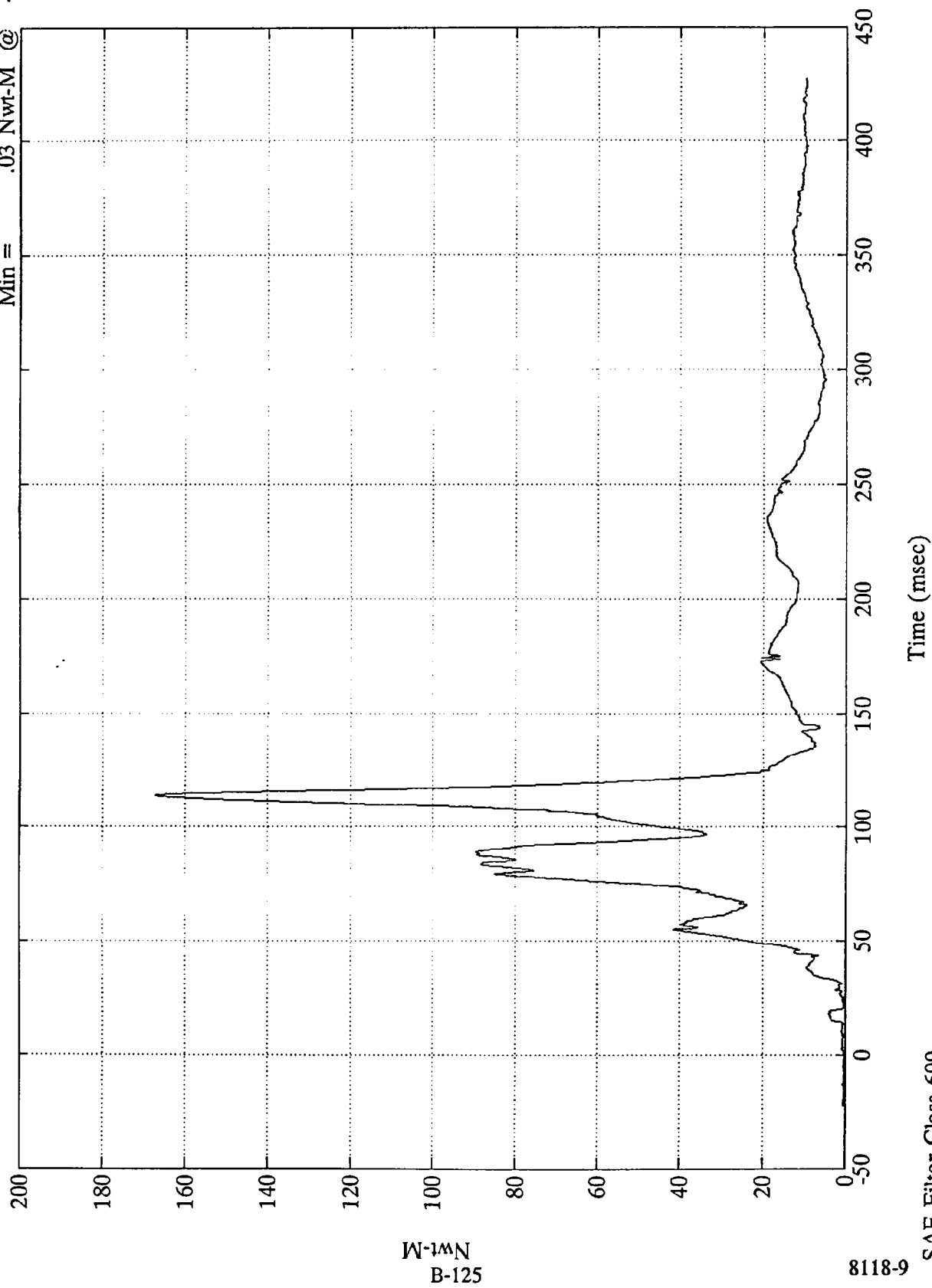
SAE Filter Class 600

Time (msec)

VTV TEST #9

Upper Neck Moment Res.

Max = 167.22 Nwt-M @ 113.63 msec
Min = .03 Nwt-M @ -8.16 msec



B-125

8118-9

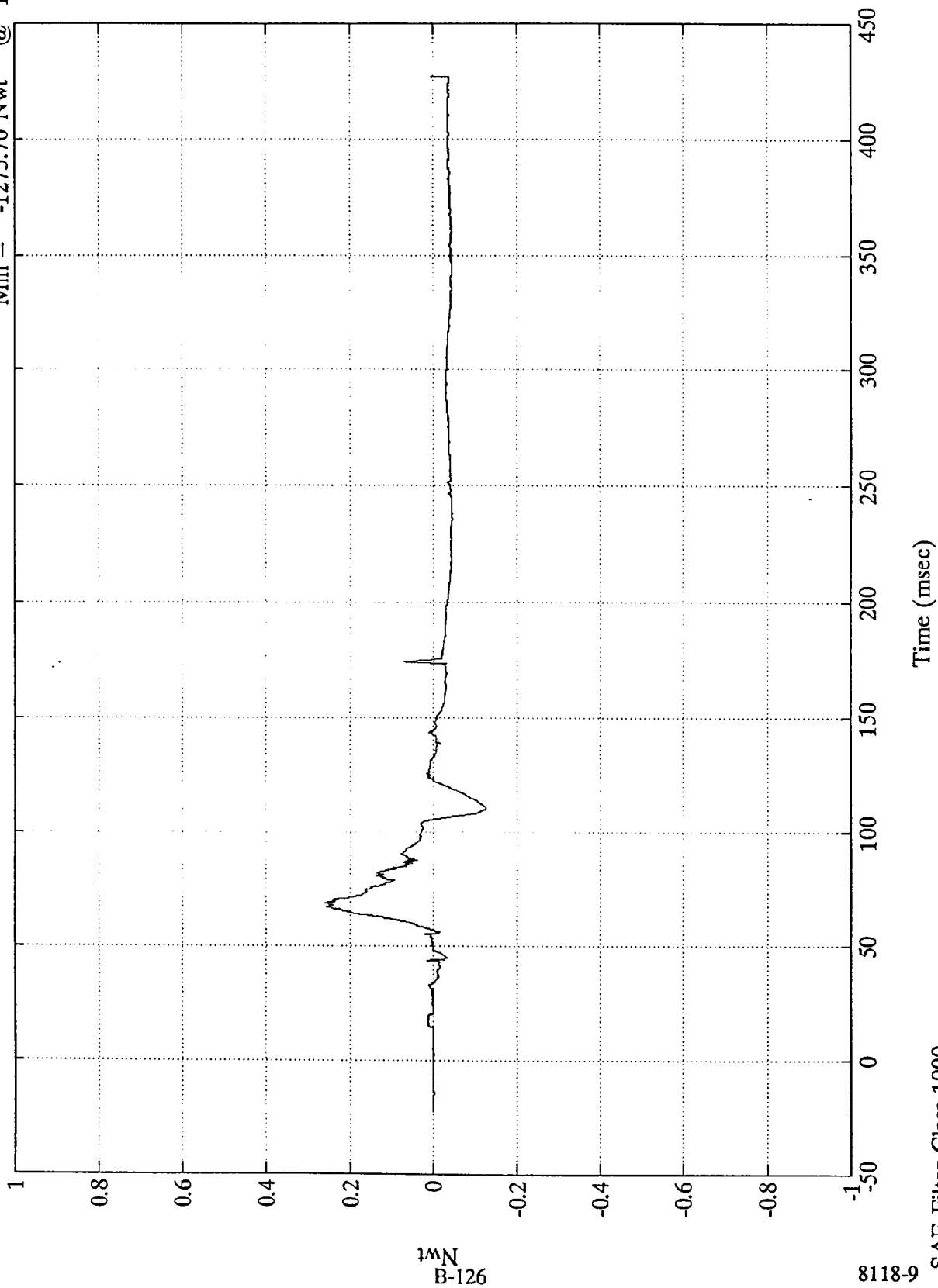
SAE Filter Class 600

VTV TEST #9

$\times 10^4$

V1-P1 Lower Neck Fx

Max = 2587.96 Nwt @ 69.00 msec
Min = -1275.70 Nwt @ 110.52 msec



B-126

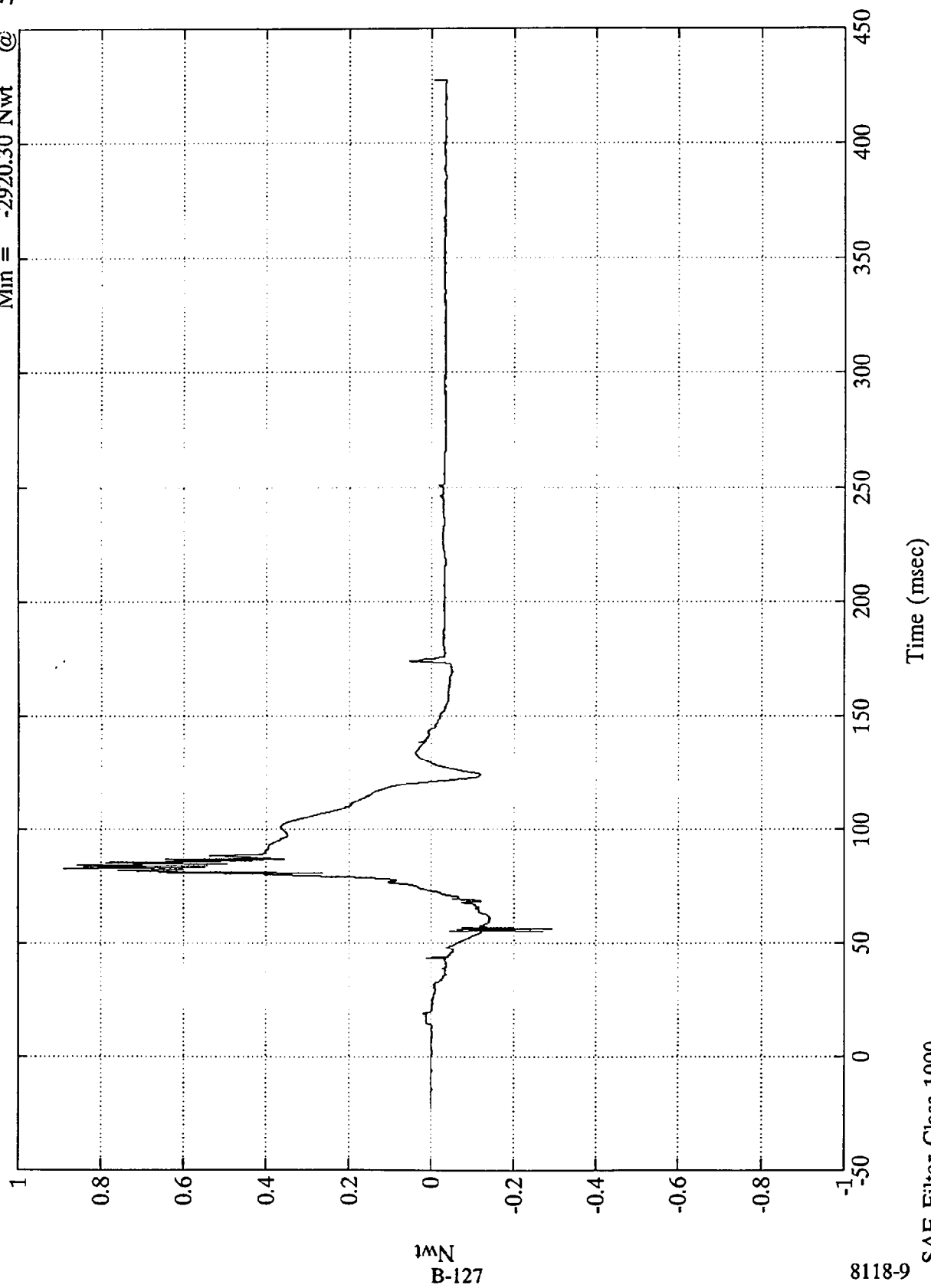
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P1 Lower Neck Fy

Max = 8908.16 Nwt @ 82.80 msec
Min = -2920.30 Nwt @ 56.64 msec



1wN
B-127

8118-9

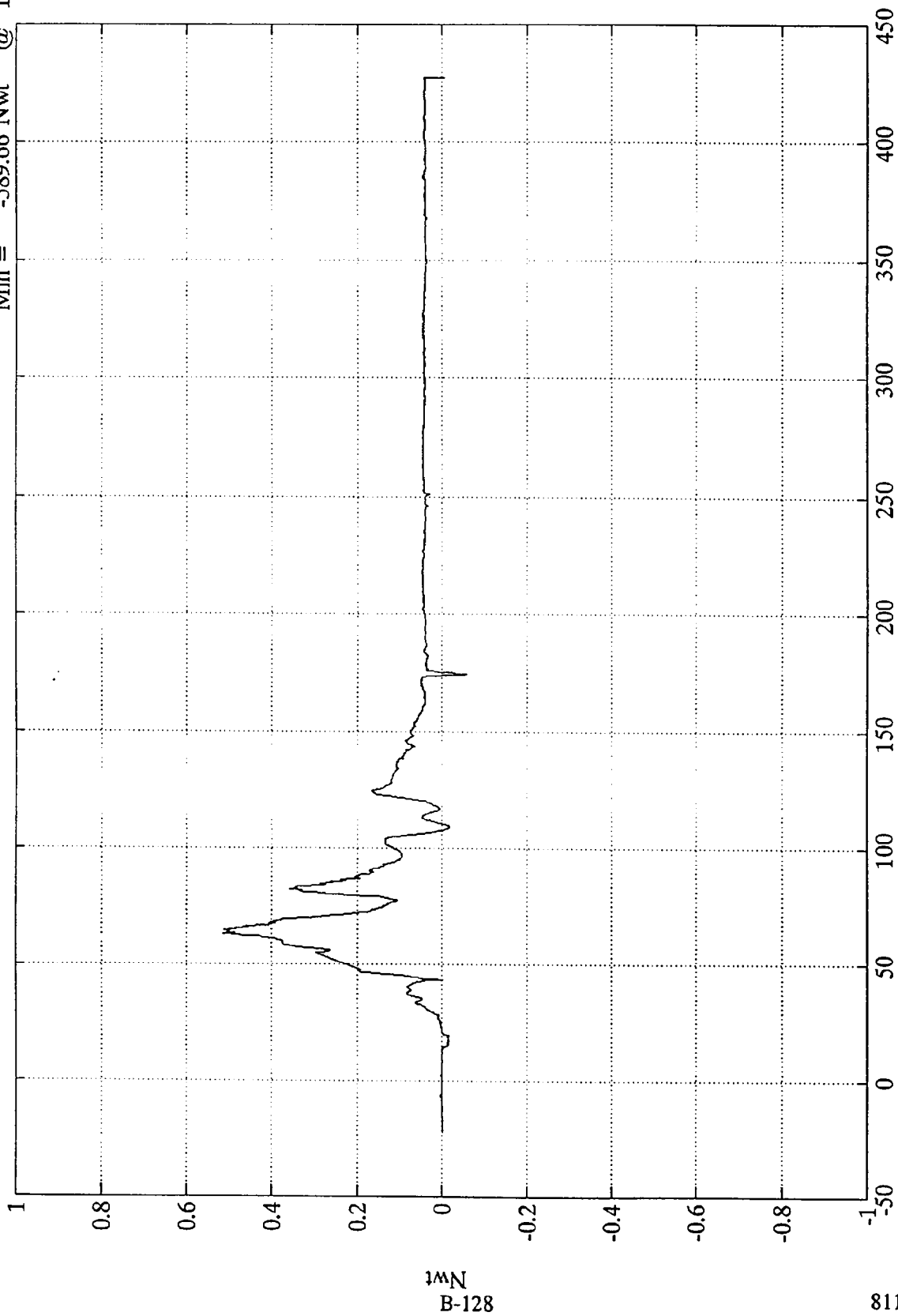
SAE Filter Class 1000

VTV TEST #9

$\times 10^4$

Max = 5156.24 Nwt @ 63.48 msec
Min = -589.66 Nwt @ 174.12 msec

V1-P1 Lower Neck Fz



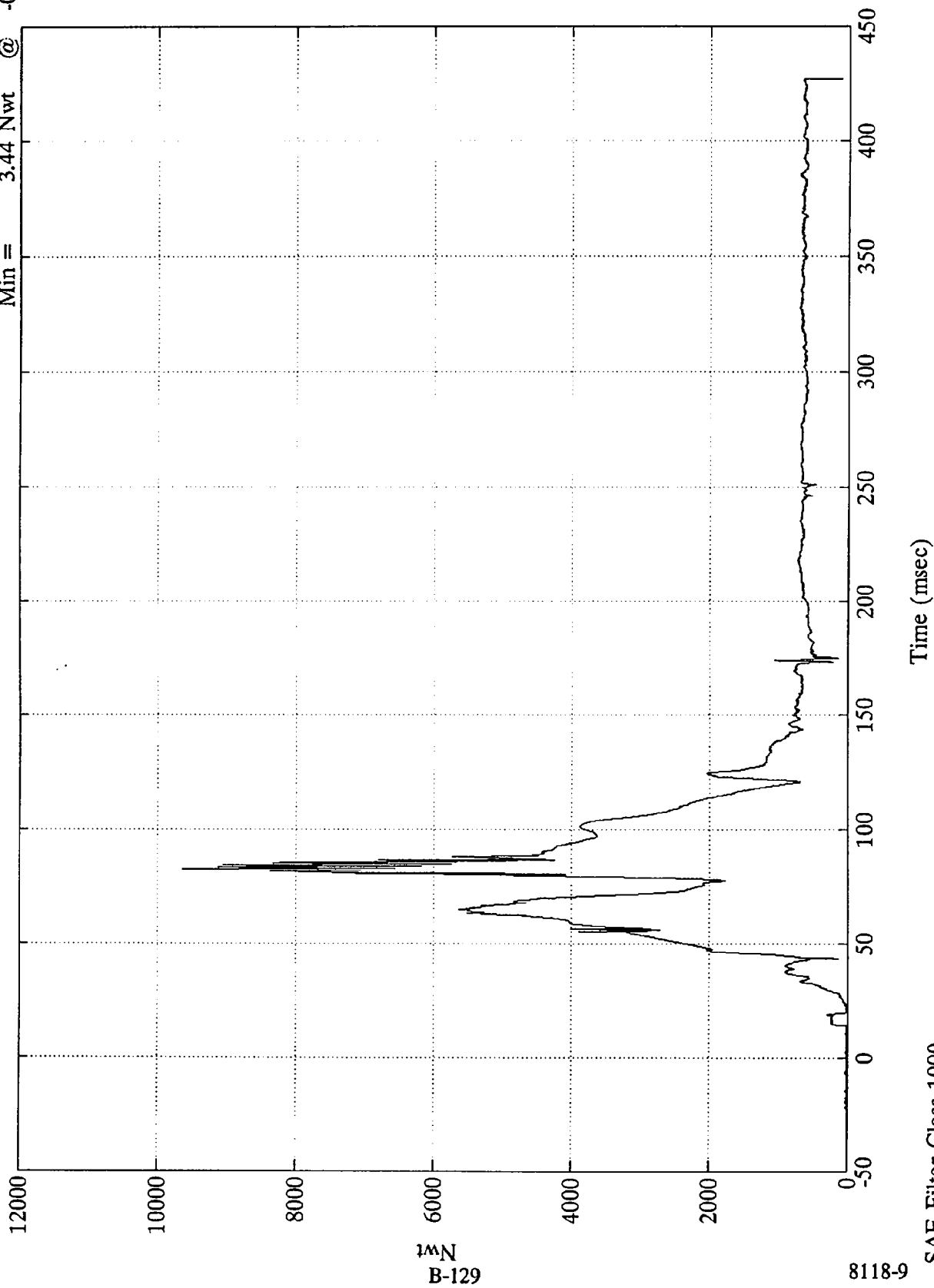
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P1 Lower Neck F(res)

Max = 9634.91 Nwt @ 82.80 msec
Min = 3.44 Nwt @ -0.12 msec



B-129

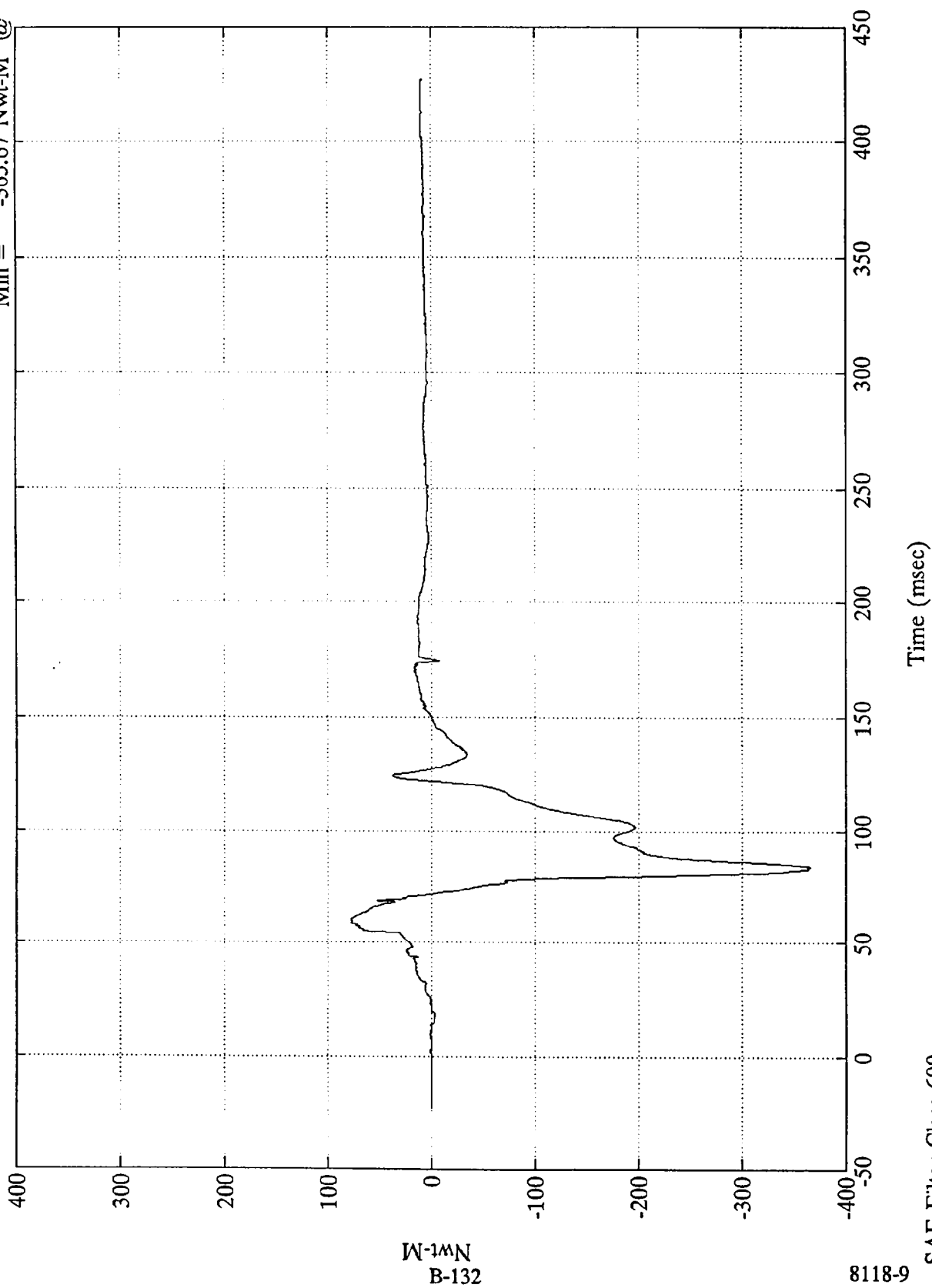
8118-9

SAE Filter Class 1000

VTV TEST #9

Max = 77.90 Nwt-M @ 58.68 msec
Min = -365.67 Nwt-M @ 83.87 msec

V1-P1 Lower Neck Mz



Mwt-M
B-132

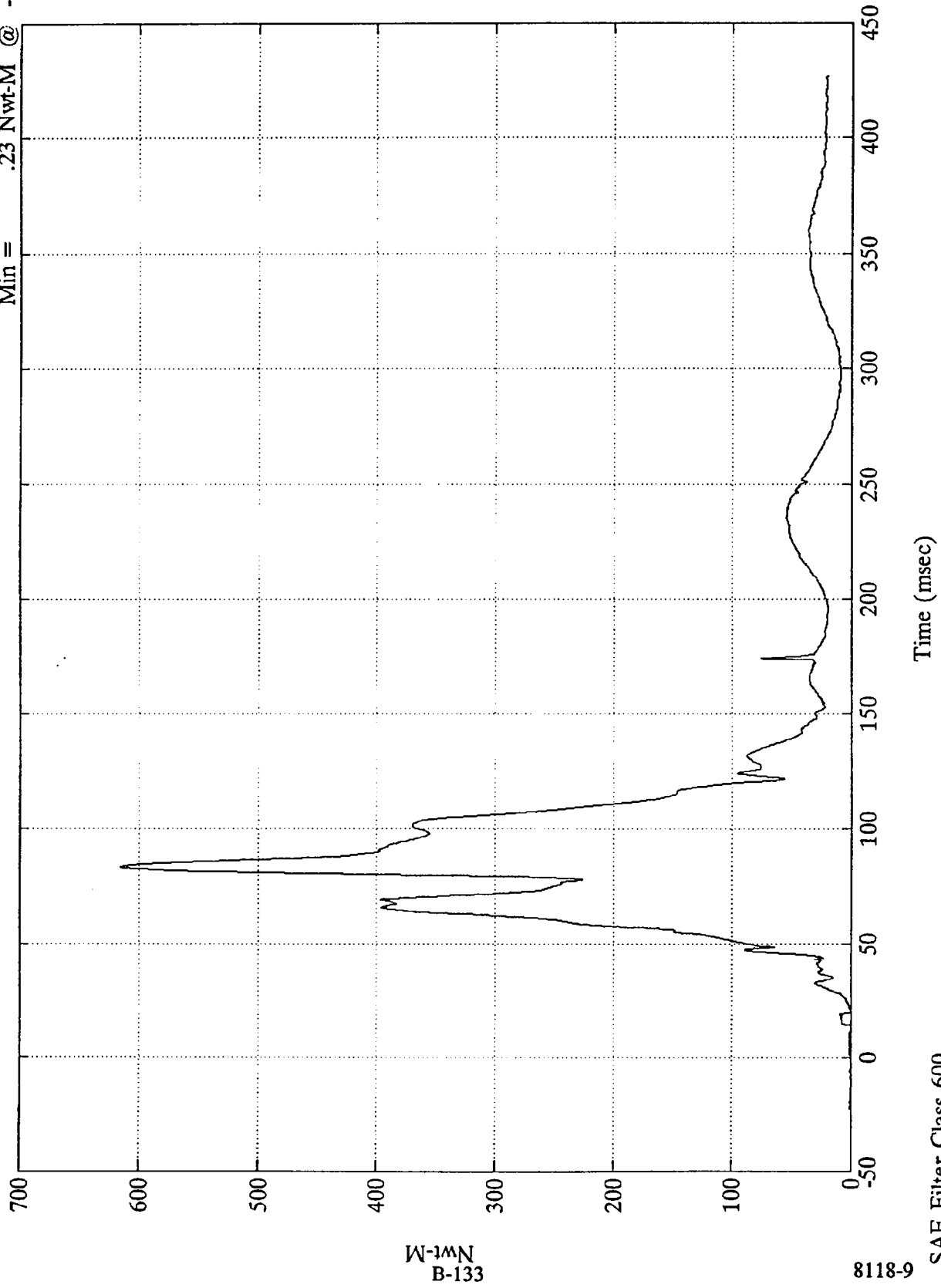
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P1 Lower Neck M(res)

Max = 615.56 Nwt-M @ 83.16 msec
Min = .23 Nwt-M @ -10.44 msec



Nwt-M
B-133

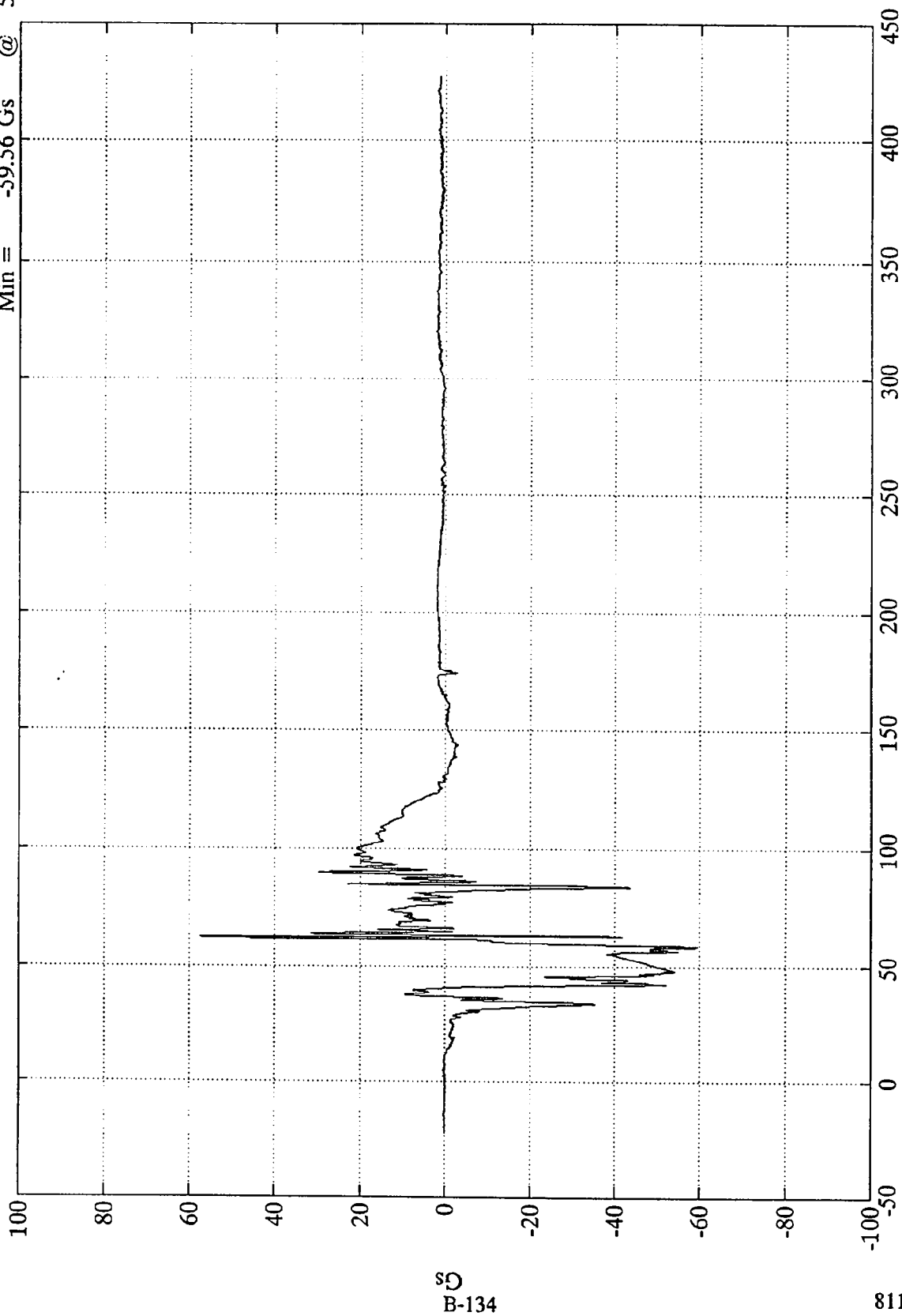
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P1 Pelvic X

Max = 57.42 Gs @ 62.40 msec
Min = -59.56 Gs @ 58.79 msec



Time (msec)

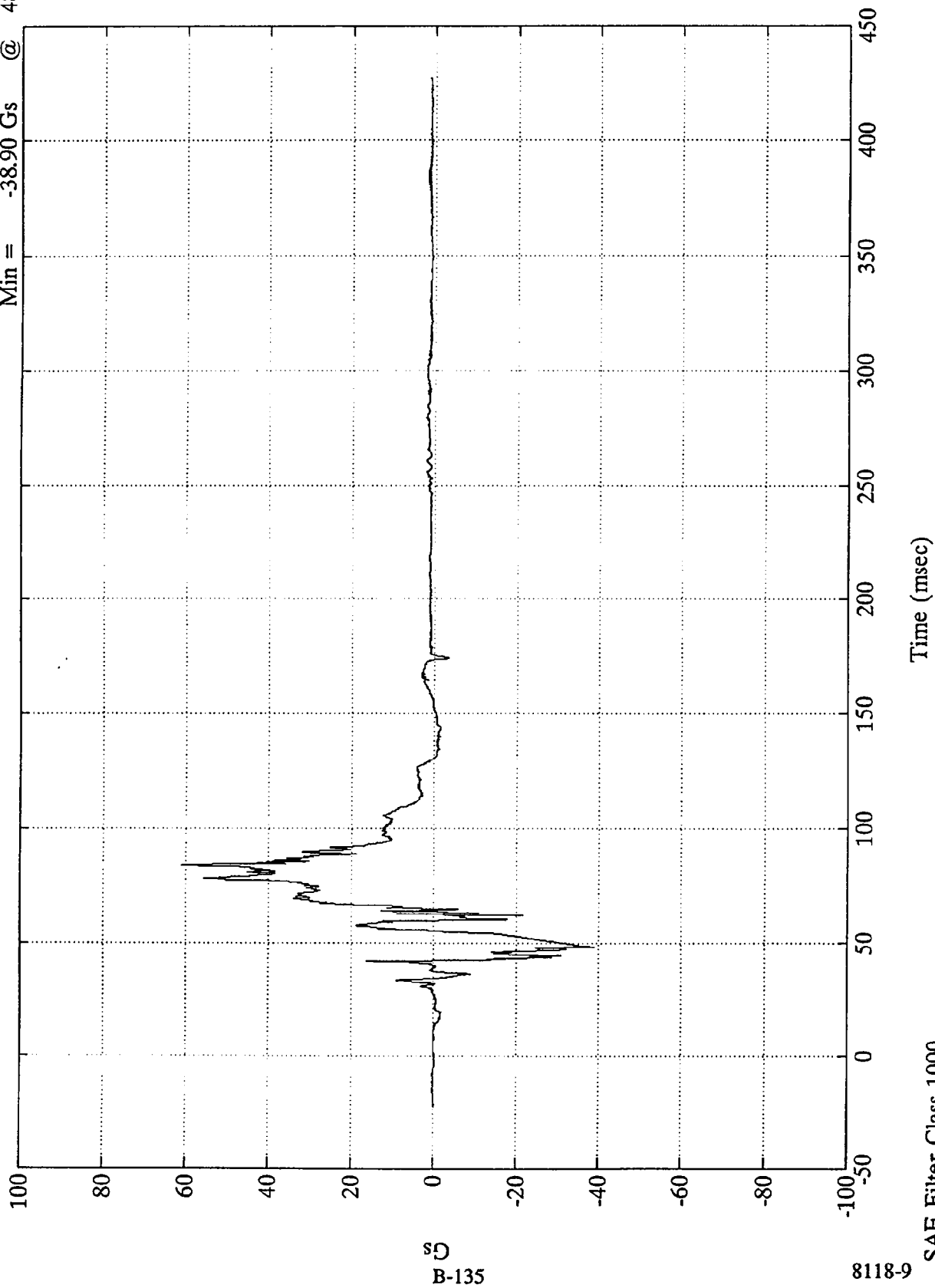
SAE Filter Class 1000

8118-9

B-134

VTV TEST #9

V1-P1 Pelvic Y Max = 61.04 Gs @ 83.52 msec
Min = -38.90 Gs @ 48.47 msec



B-135

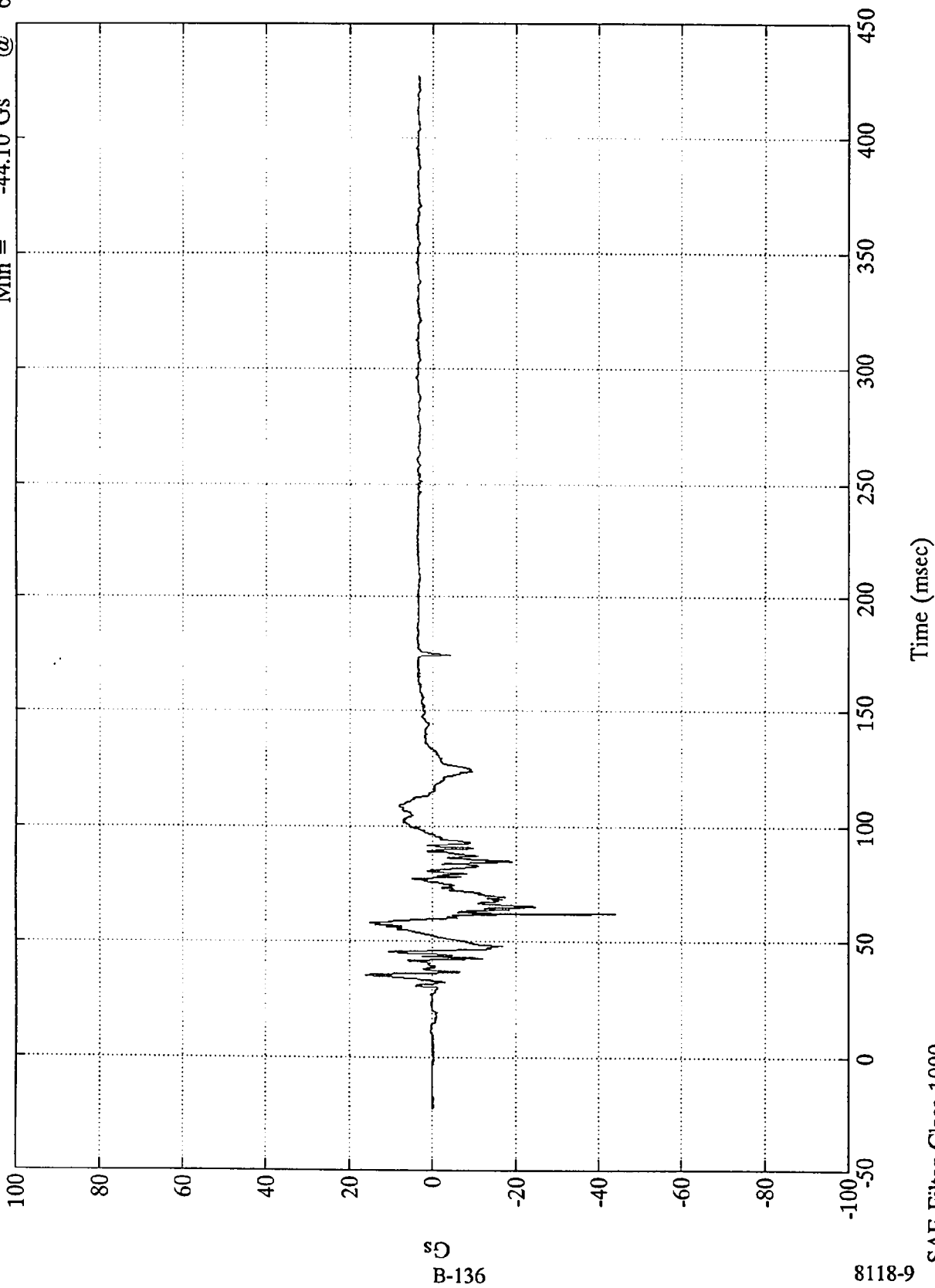
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P1 Pelvic Z

Max = 16.07 Gs @ 35.04 msec
Min = -44.10 Gs @ 62.40 msec



B-136

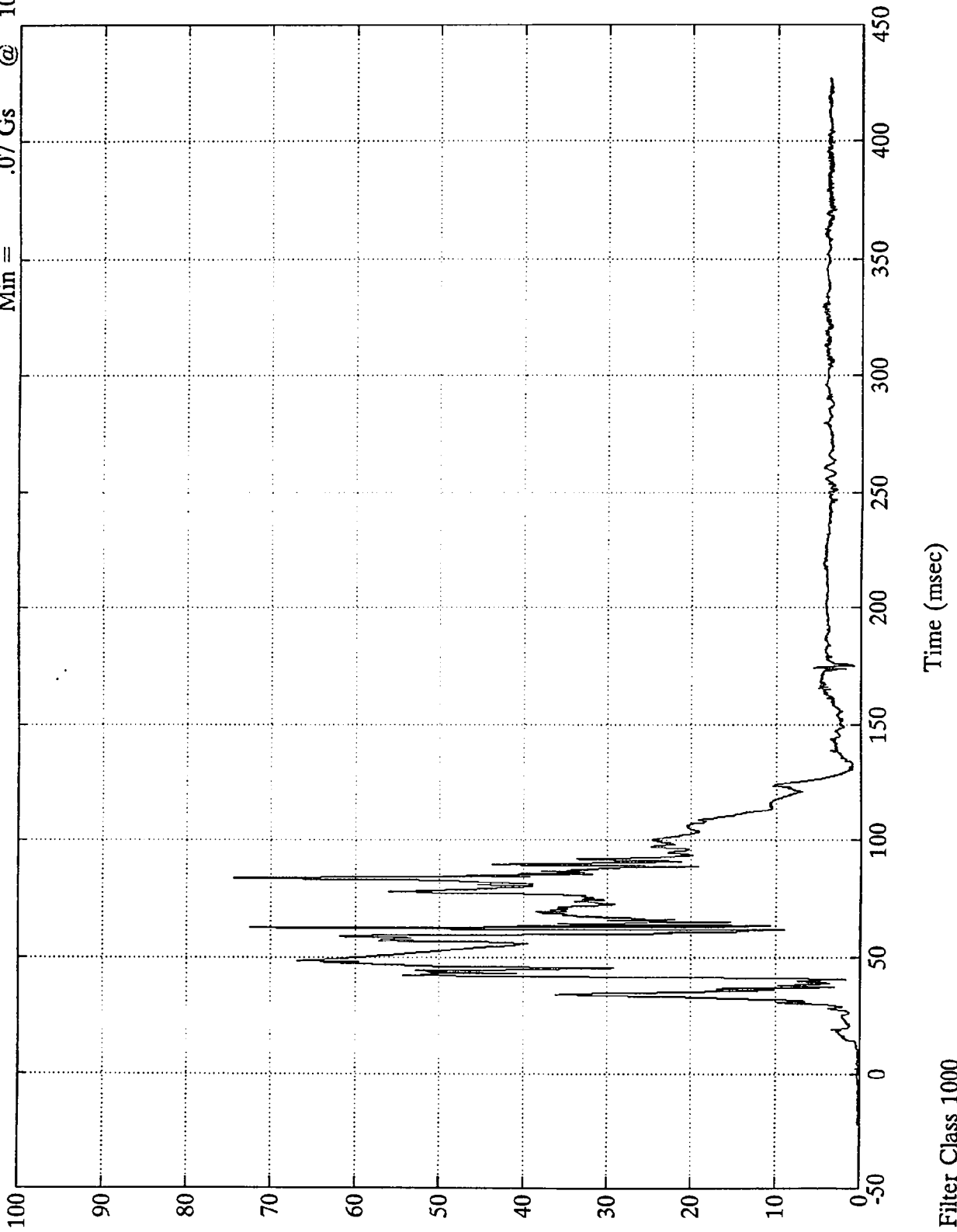
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P1 Pelvic Res.

Max = 74.45 Gs @ 83.87 msec
Min = .07 Gs @ 10.07 msec



B-137

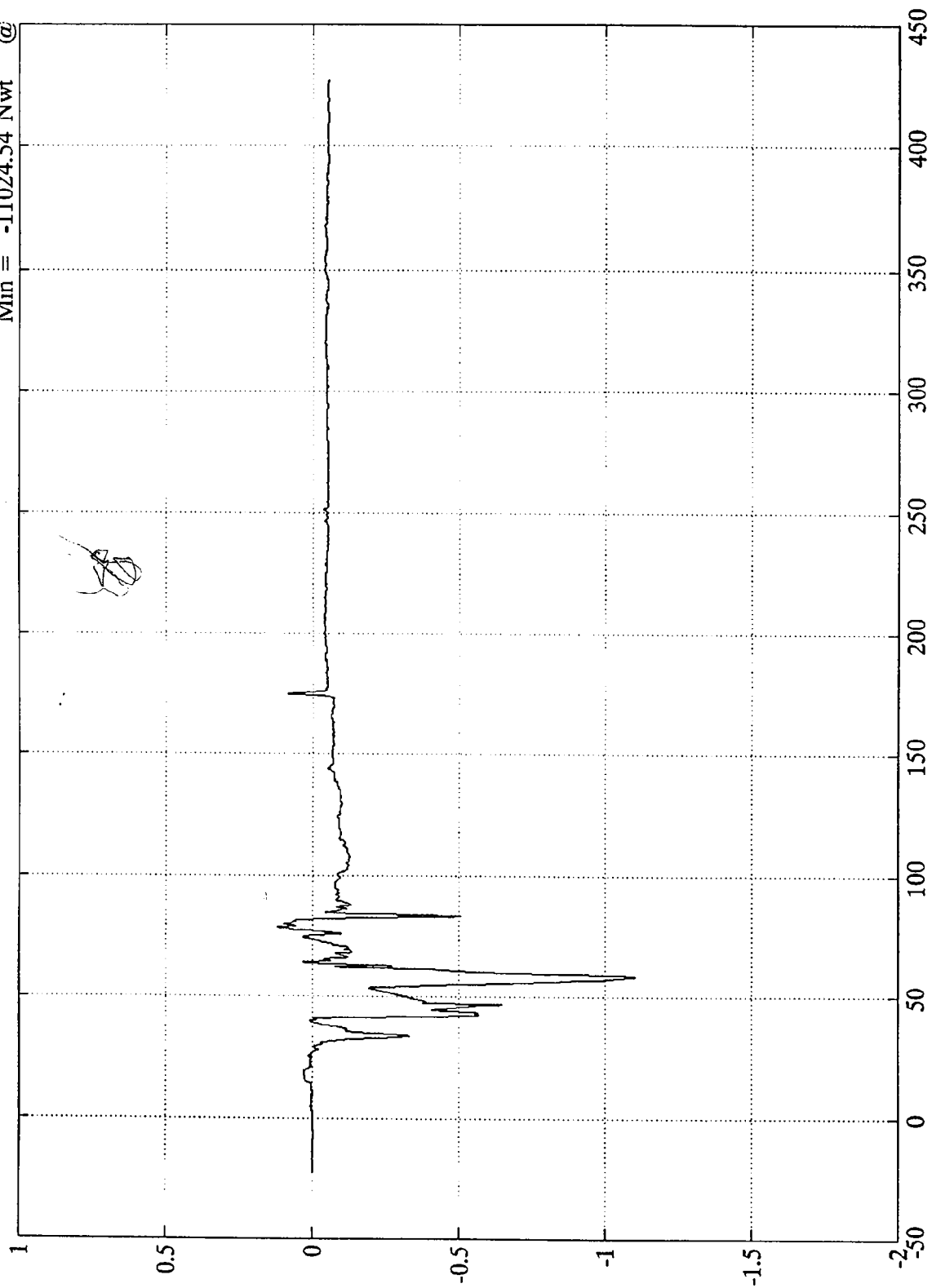
8118-9

VTV TEST #9

$\times 10^4$

Max = 1199.17 Nwt @ 78.60 msec
Min = -11024.54 Nwt @ 58.79 msec

V1-P1 Left Femur



Time (msec)

1N
B-138

8118-9

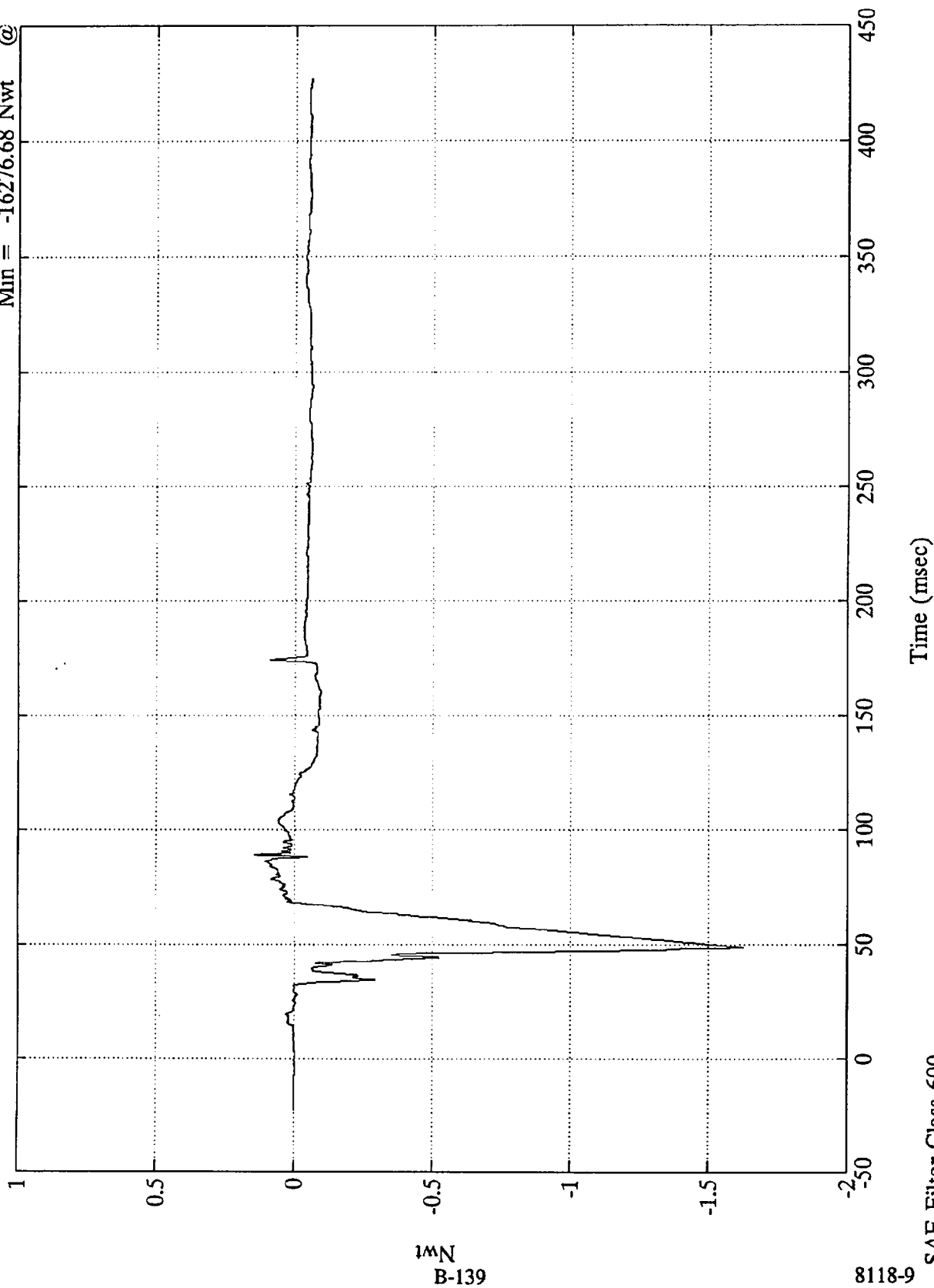
SAE Filter Class 600

VTV TEST #9

$\times 10^4$

V1-P1 Right Femur

Max = 1462.80 Nwt @ 89.27 msec
Min = -16276.68 Nwt @ 48.72 msec



B-139

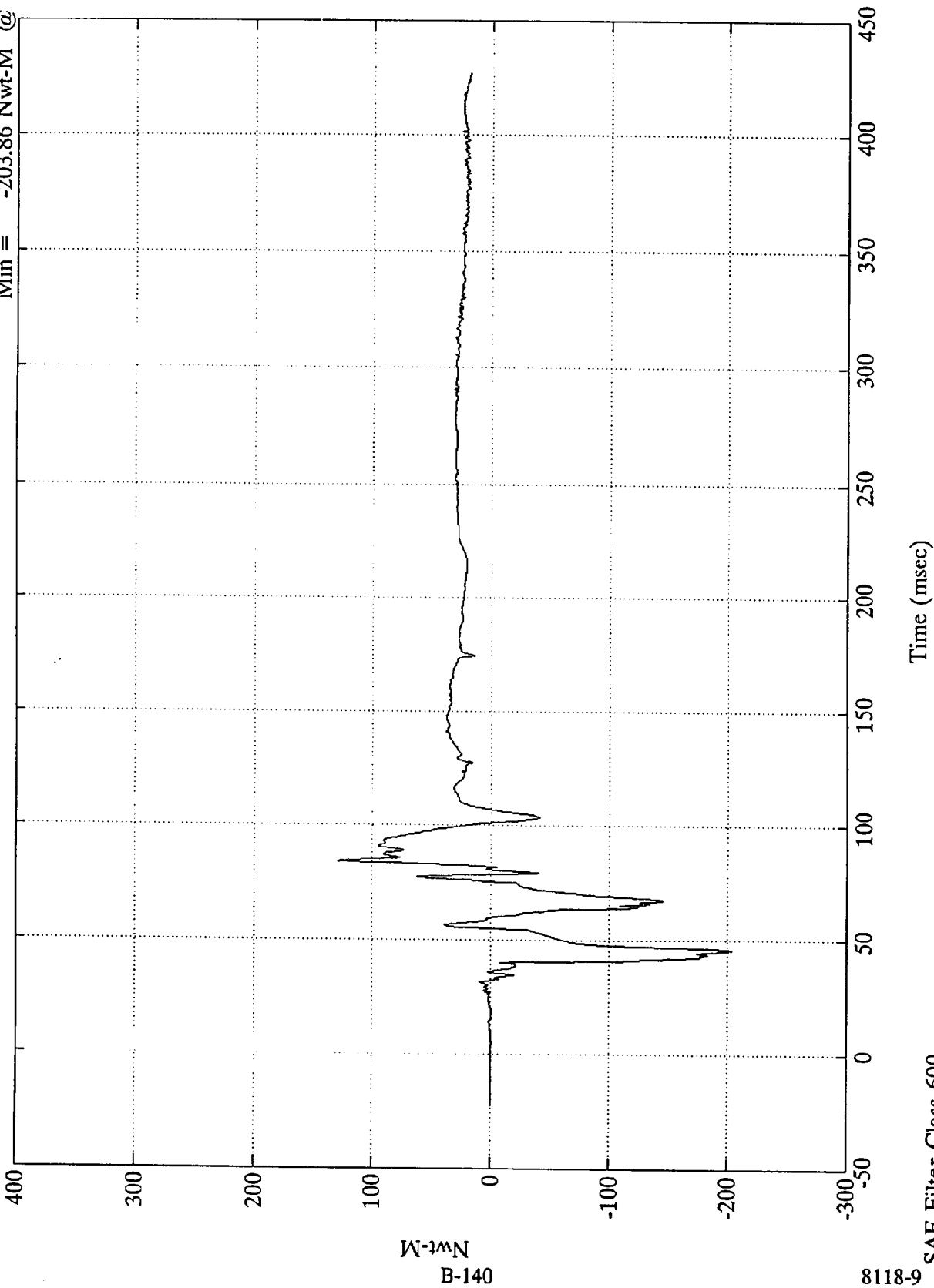
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P1 Lt Upper Tibia Mx

Max = 129.00 Nwt-M @ 83.76 msec
Min = -203.86 Nwt-M @ 45.60 msec



B-140

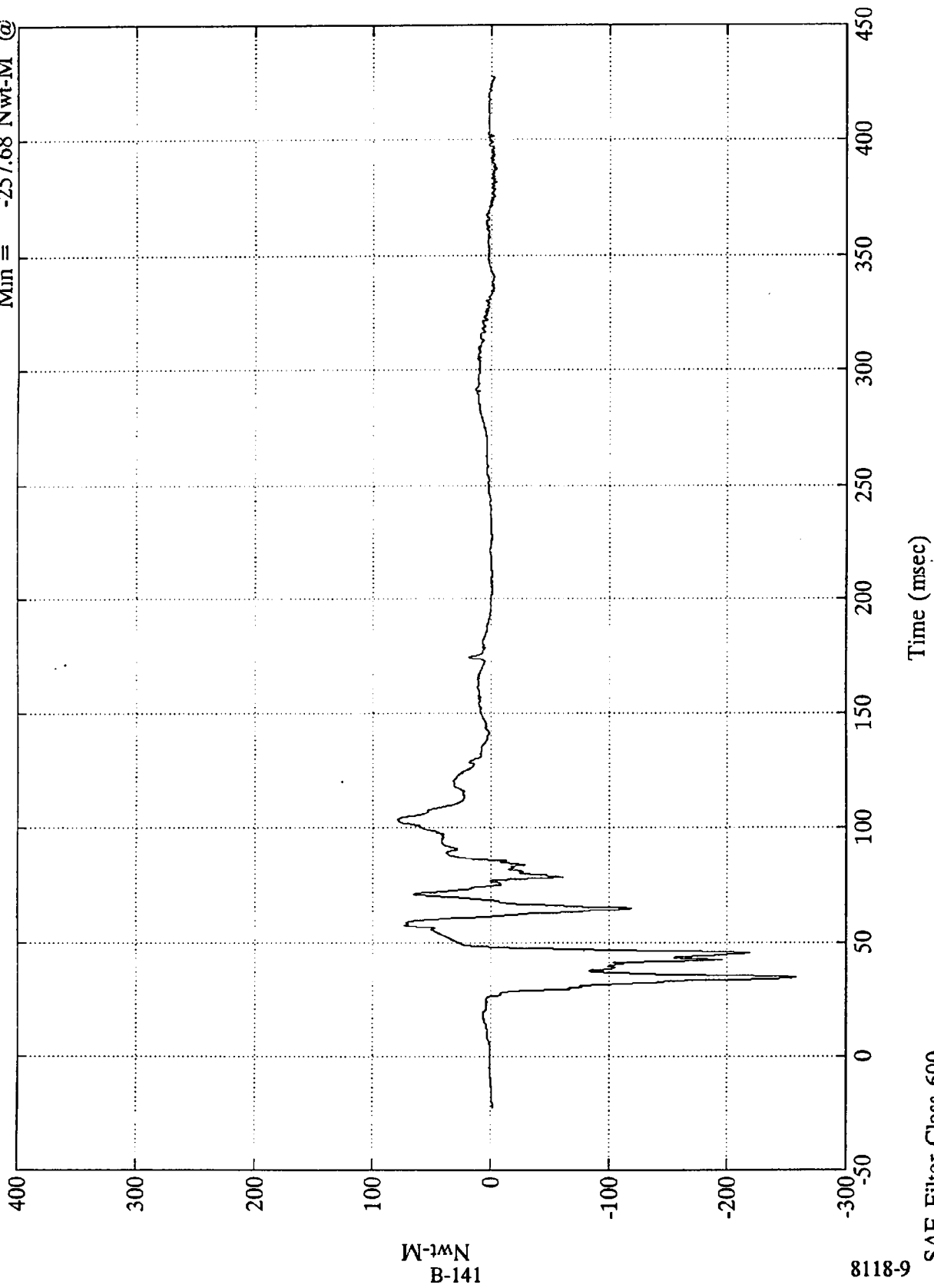
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P1 Lt Upper Tibia My

Max = 78.94 Nwt-M @ 103.68 msec
Min = -257.68 Nwt-M @ 34.56 msec



Nwt-M
B-141

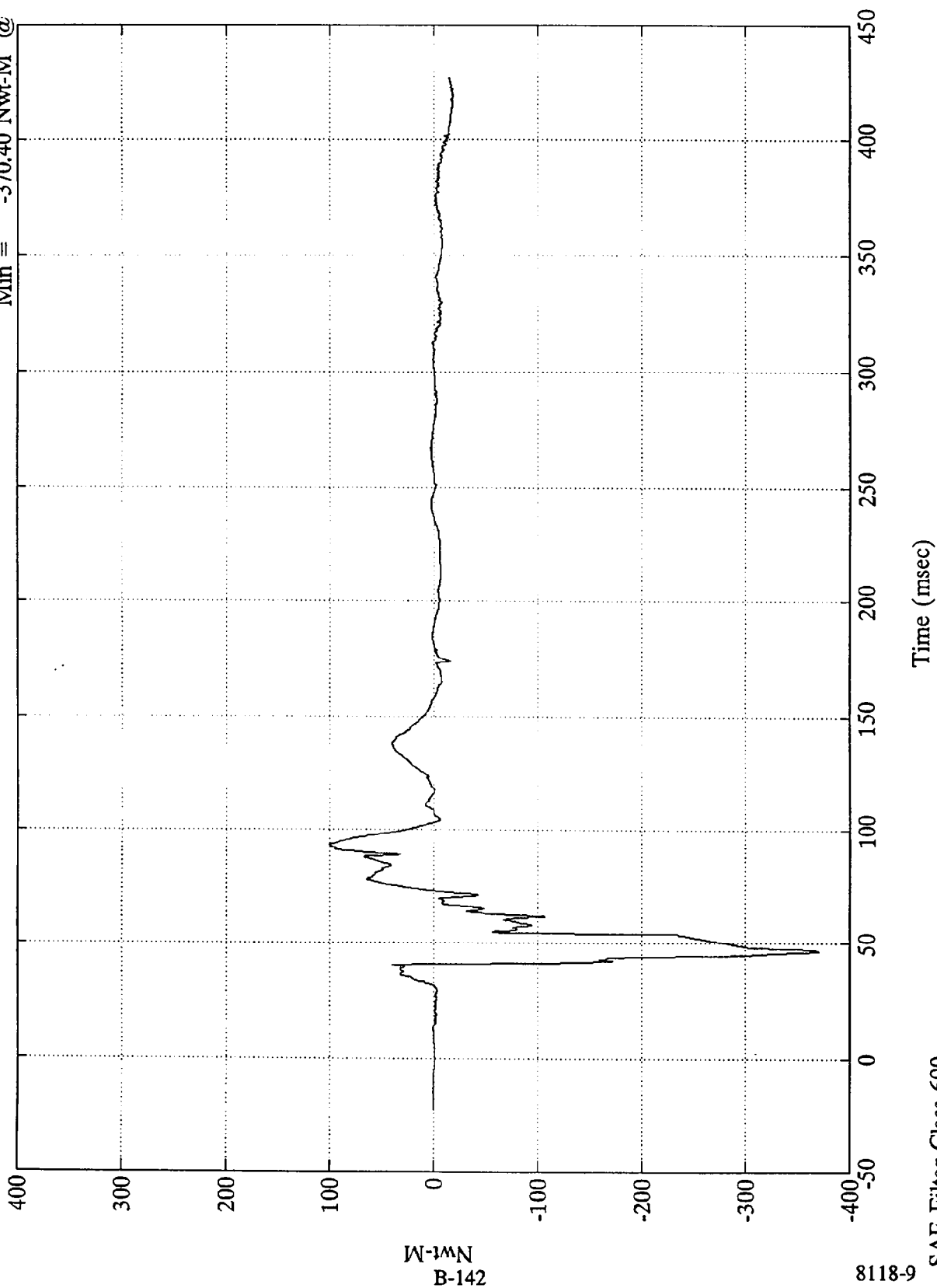
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P1 Rt Upper Tibia Mx

Max = 100.95 Nwt-M @ 92.76 msec
Min = -370.40 Nwt-M @ 46.44 msec



M-NWT
B-142

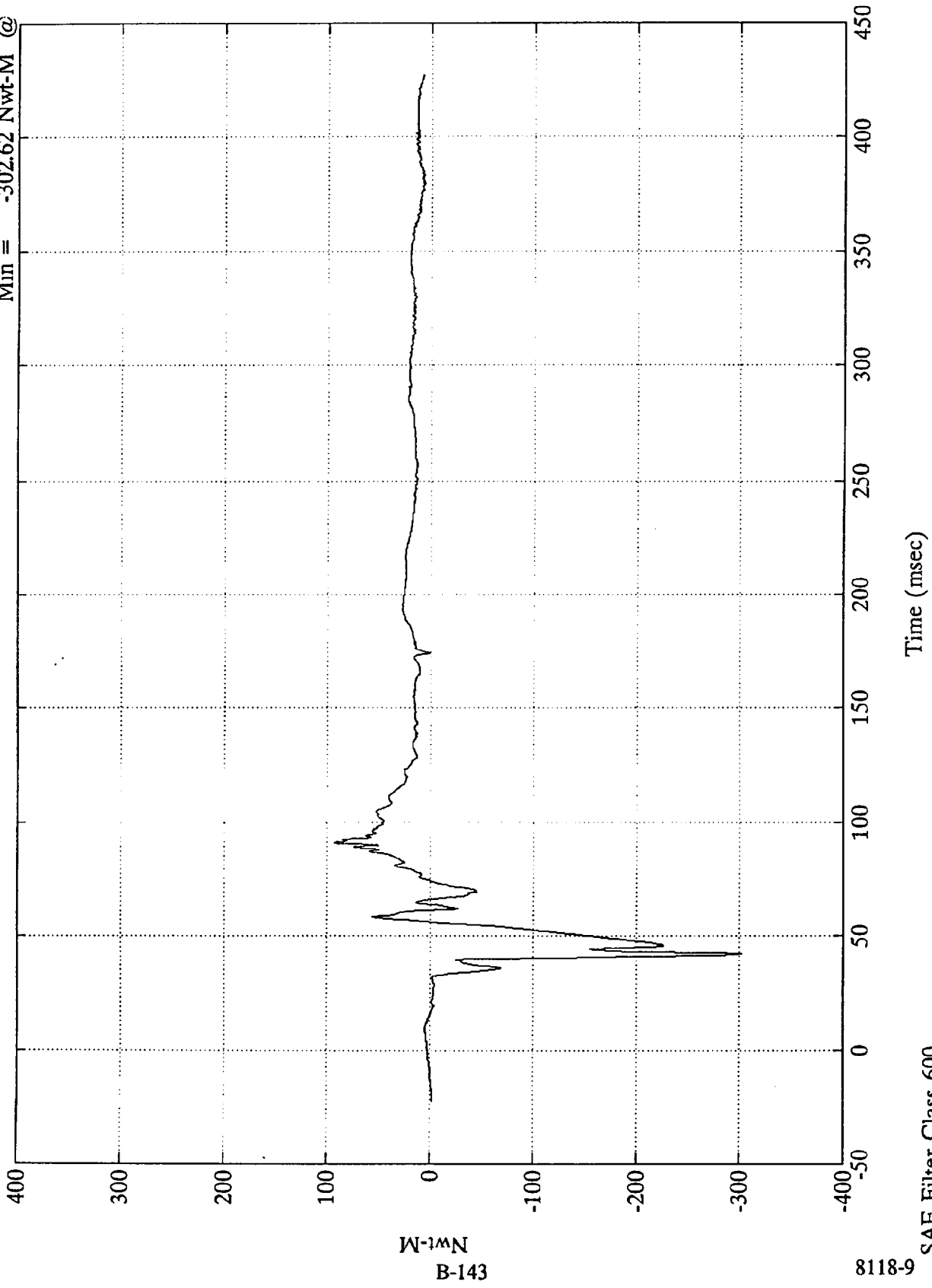
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P1 Rt Upper Tibia My

Max = 93.61 Nwt-M @ 91.31 msec
Min = -302.62 Nwt-M @ 42.24 msec



B-143

8118-9

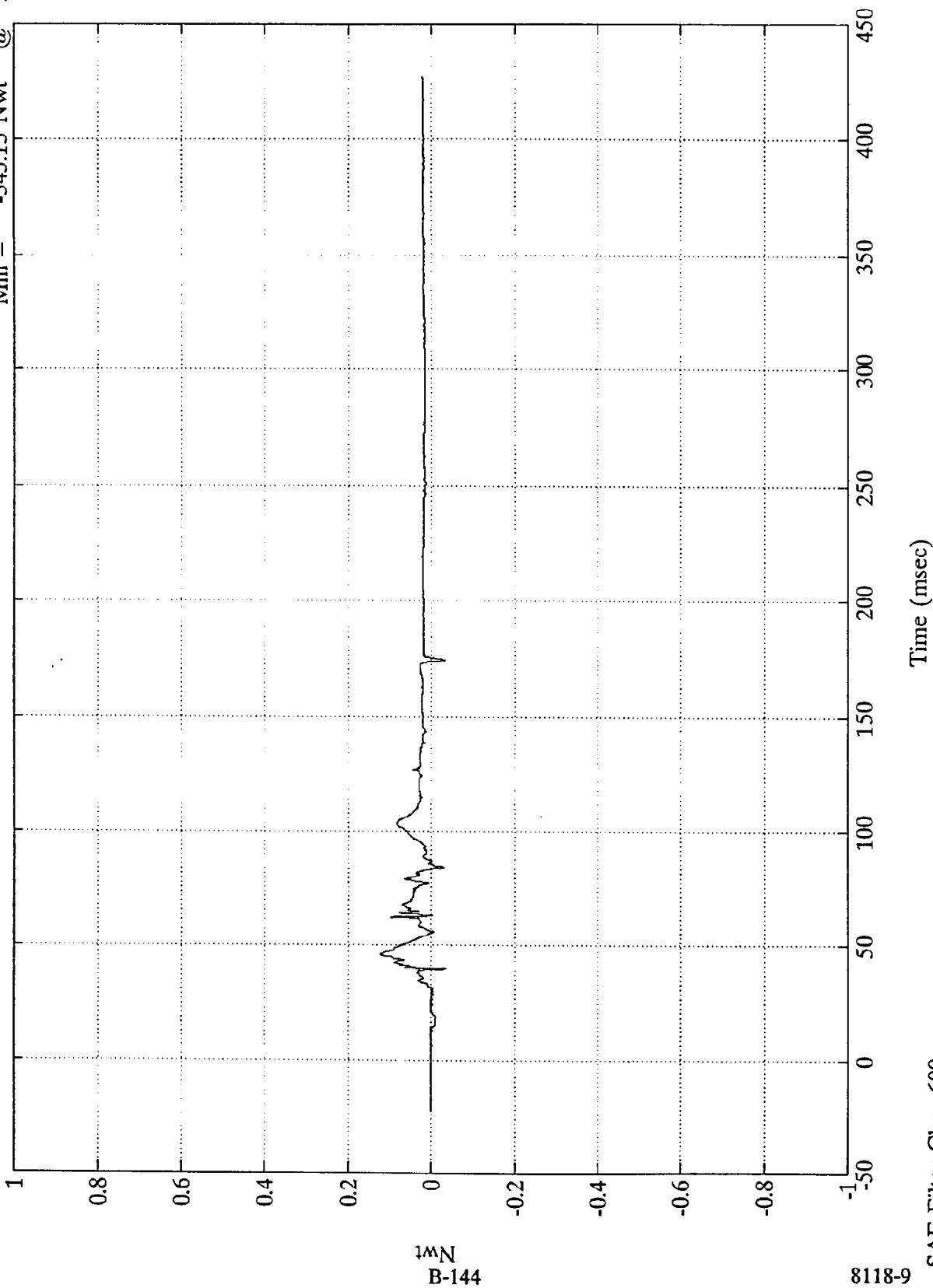
VTV TEST #9

$\times 10^4$

V1-P1 Lt Lower Tibia Fy

Max = 1225.49 Nwt @
Min = -345.15 Nwt @

45.96 msec
39.72 msec



1wN
B-144

8118-9

SAE Filter Class 600

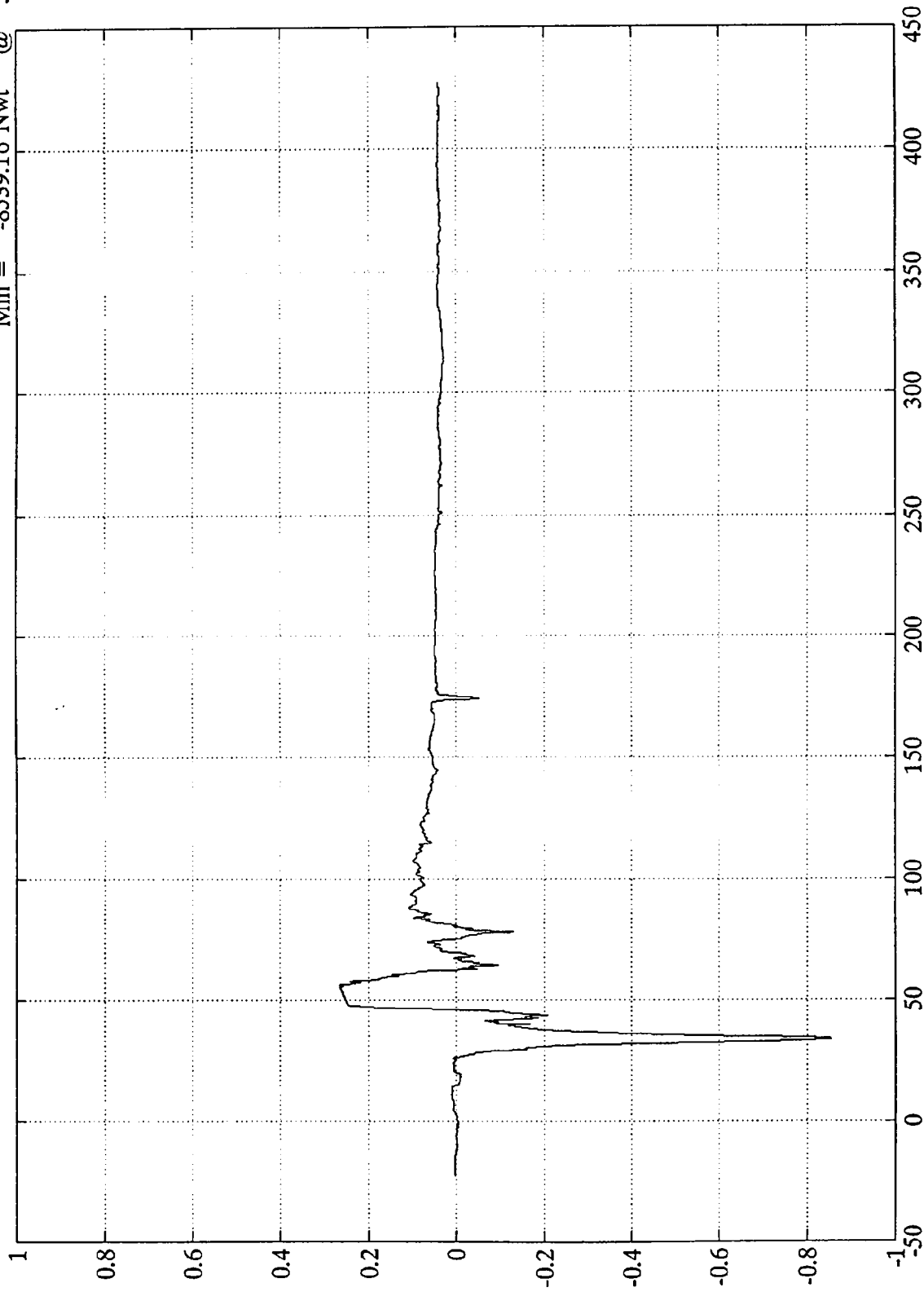
VTV TEST #9

x10⁴

V1-P1 Lt Lower Tibia Fz

Max = 2662.52 Nwt @
Min = -8539.16 Nwt @

55.20 msec
33.59 msec



B-145

8118-9

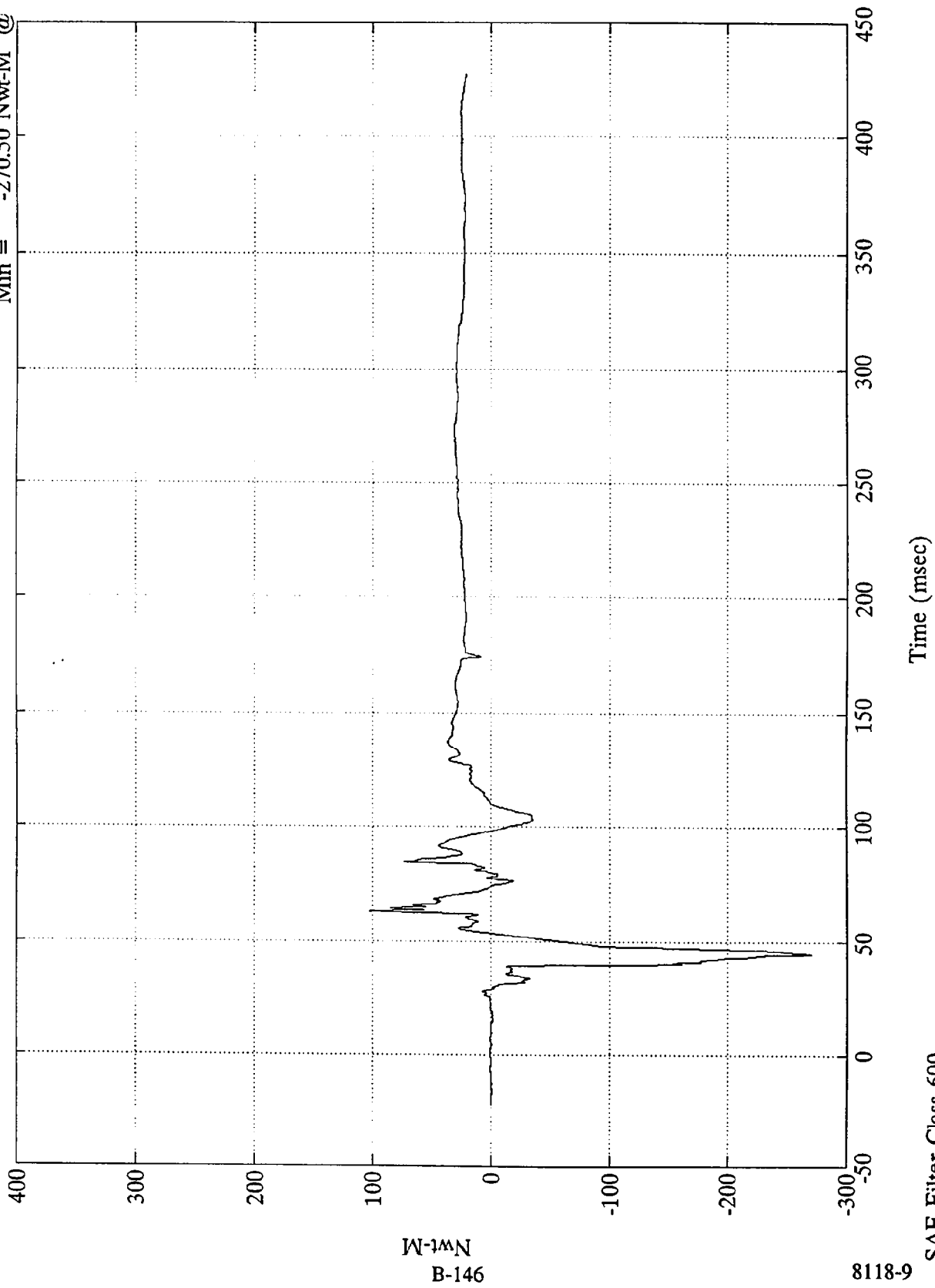
SAE Filter Class 600

Time (msec)

VTV TEST #9

Max = 102.78 Nwt-M @ 63.23 msec
Min = -270.50 Nwt-M @ 44.75 msec

V1-P1 Lt Lower Tibia Mx



B-146

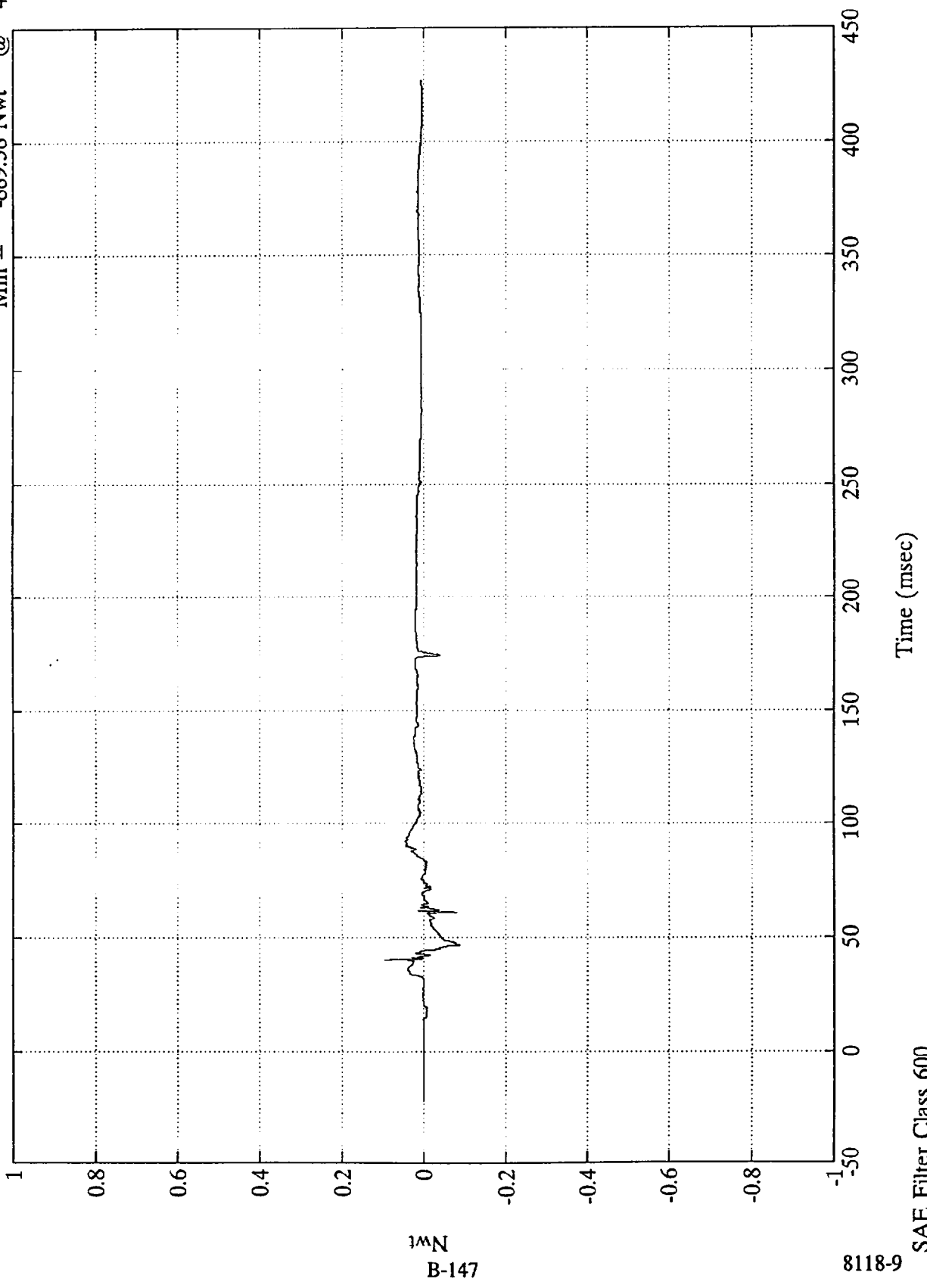
8118-9

SAE Filter Class 600

VTV TEST #9
x10⁴

V1-P1 Rt Lower Tibia Fy

Max = 955.93 Nwt @ 39.95 msec
Min = -889.38 Nwt @ 46.68 msec



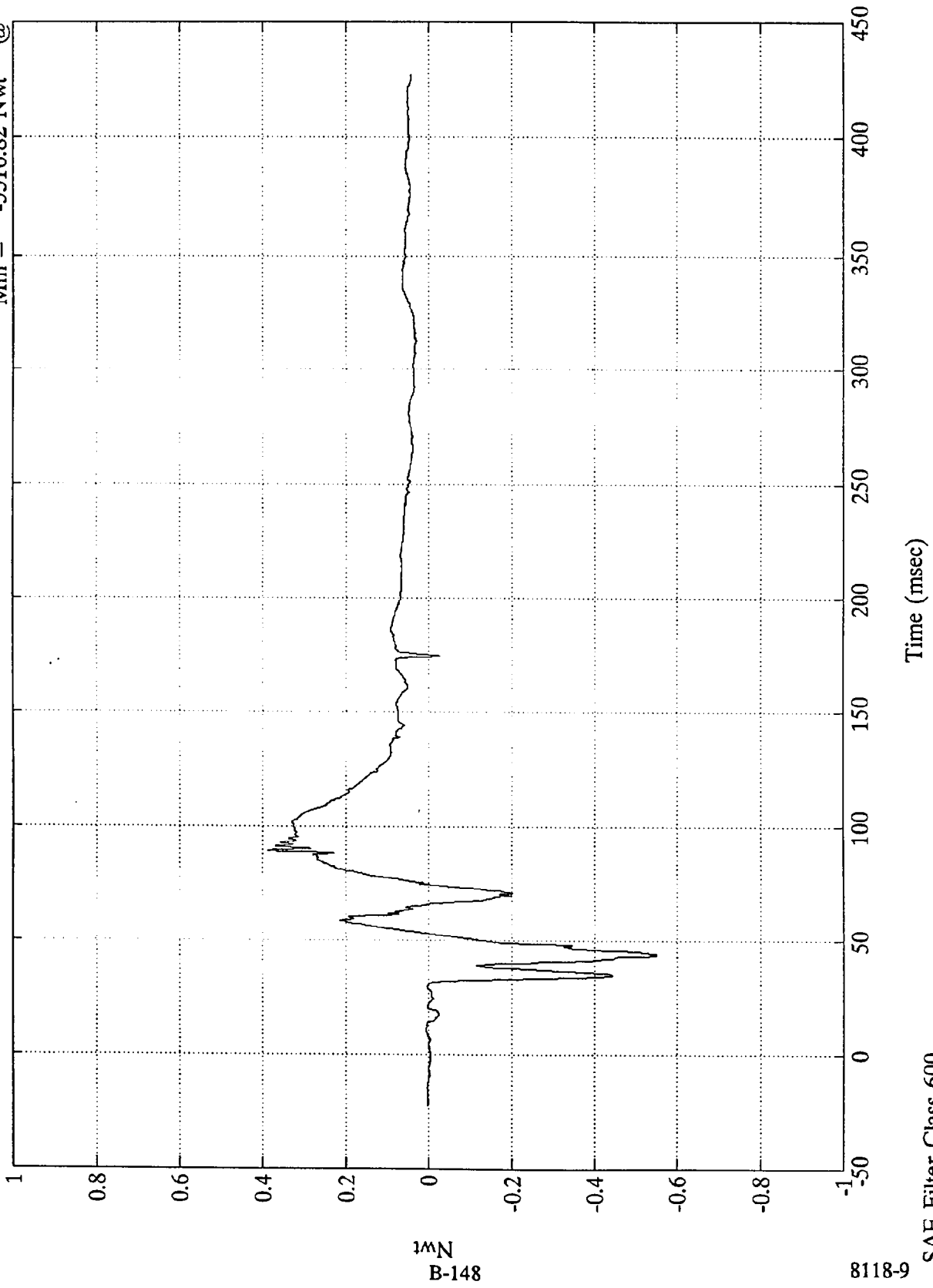
B-147

8118-9
SAE Filter Class 600

VTV TEST #9
x10⁴

Max = 3867.96 Nwt @ 89.27 msec
Min = -5510.82 Nwt @ 44.15 msec

V1-P1 Rt Lower Tibia Fz



B-148

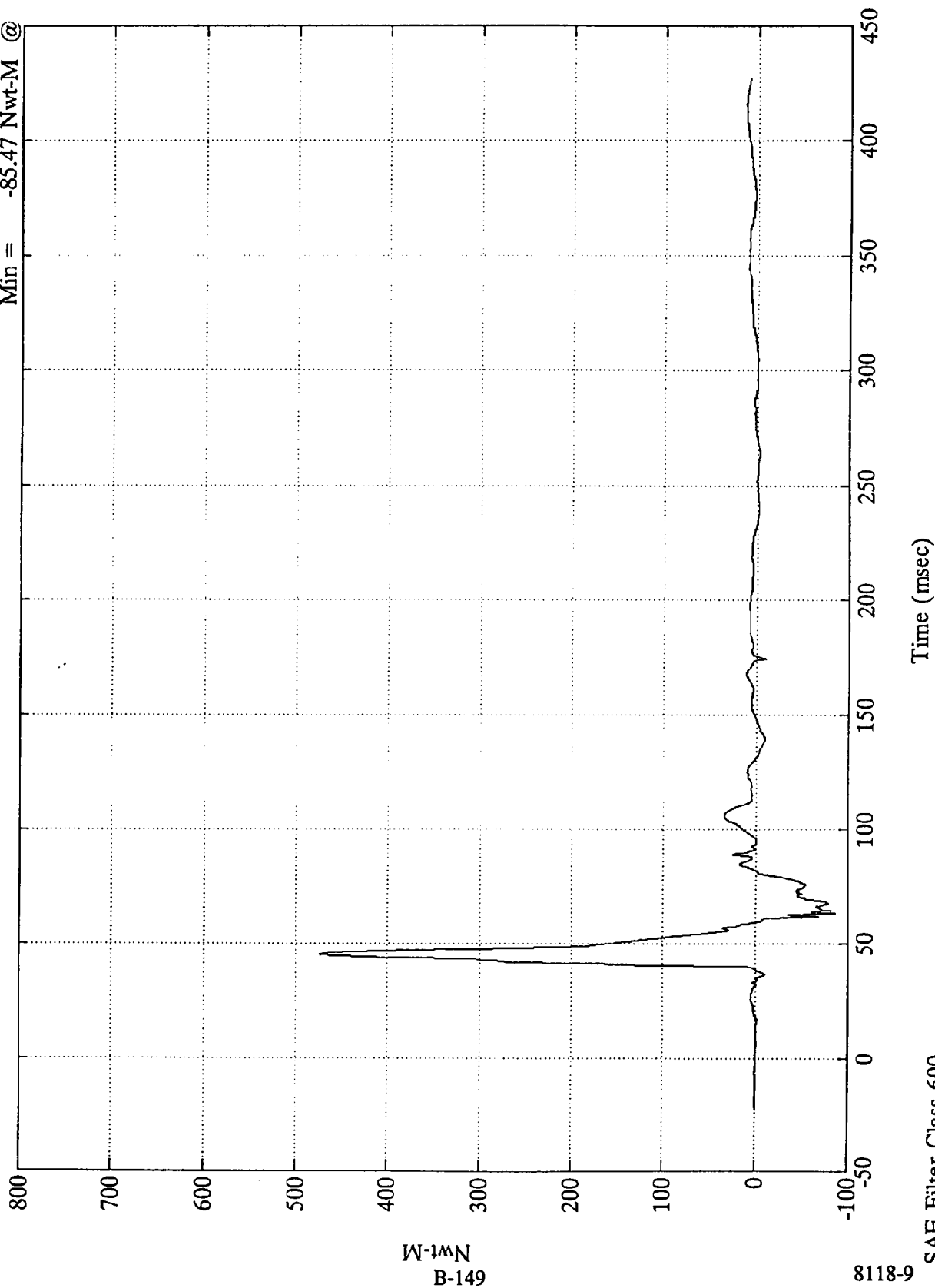
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P1 Rt Lower Tibia Mx

Max = 473.82 Nwt-M @ 45.00 msec
Min = -85.47 Nwt-M @ 63.23 msec



B-149
Nwt-M

8118-9

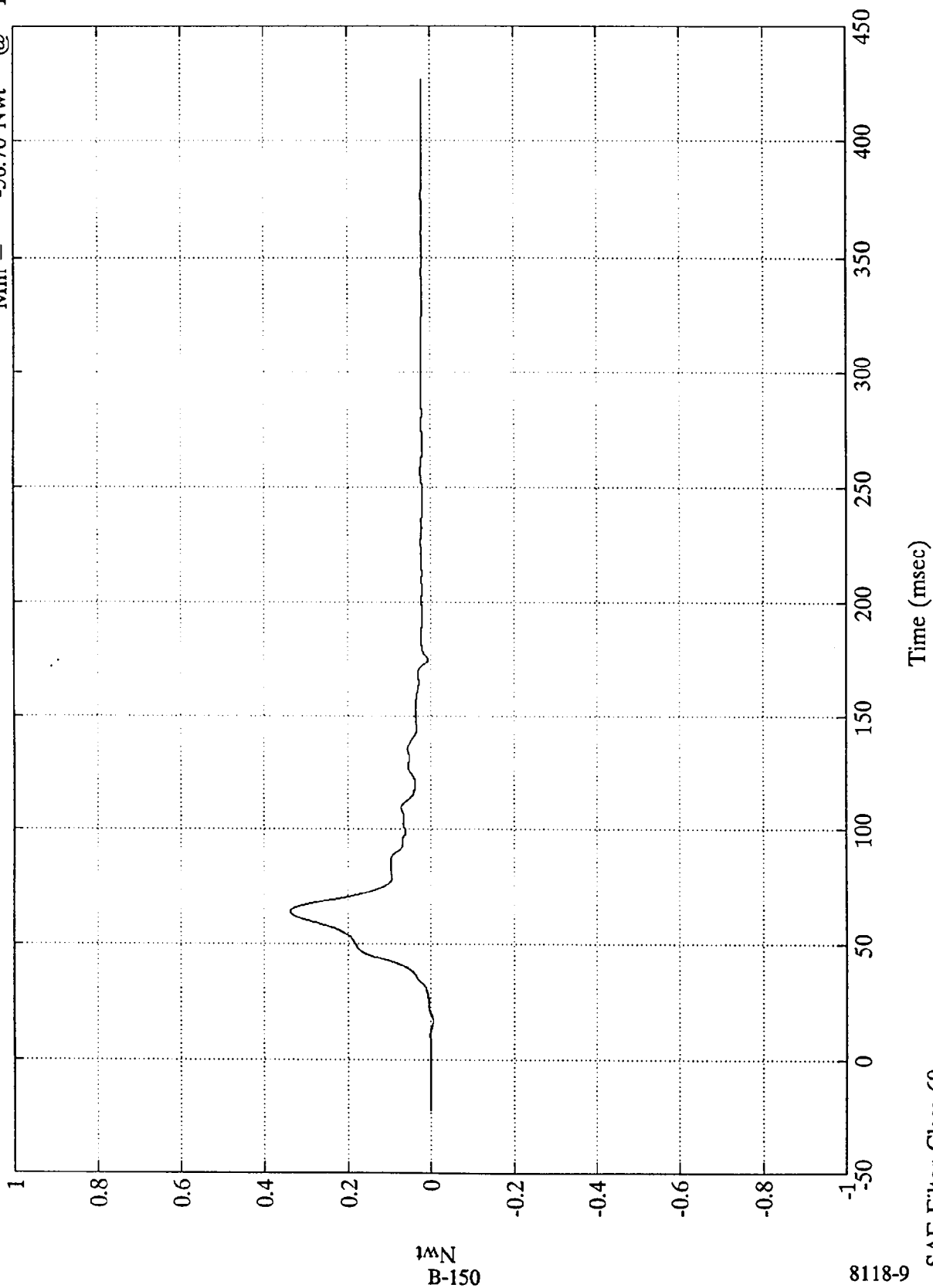
SAE Filter Class 600

VTV TEST #9

$\times 10^4$

Max = 3380.85 Nwt @ 64.44 msec
Min = -56.70 Nwt @ 16.79 msec

V1-P1 Torso Belt Load



Nwt
B-150

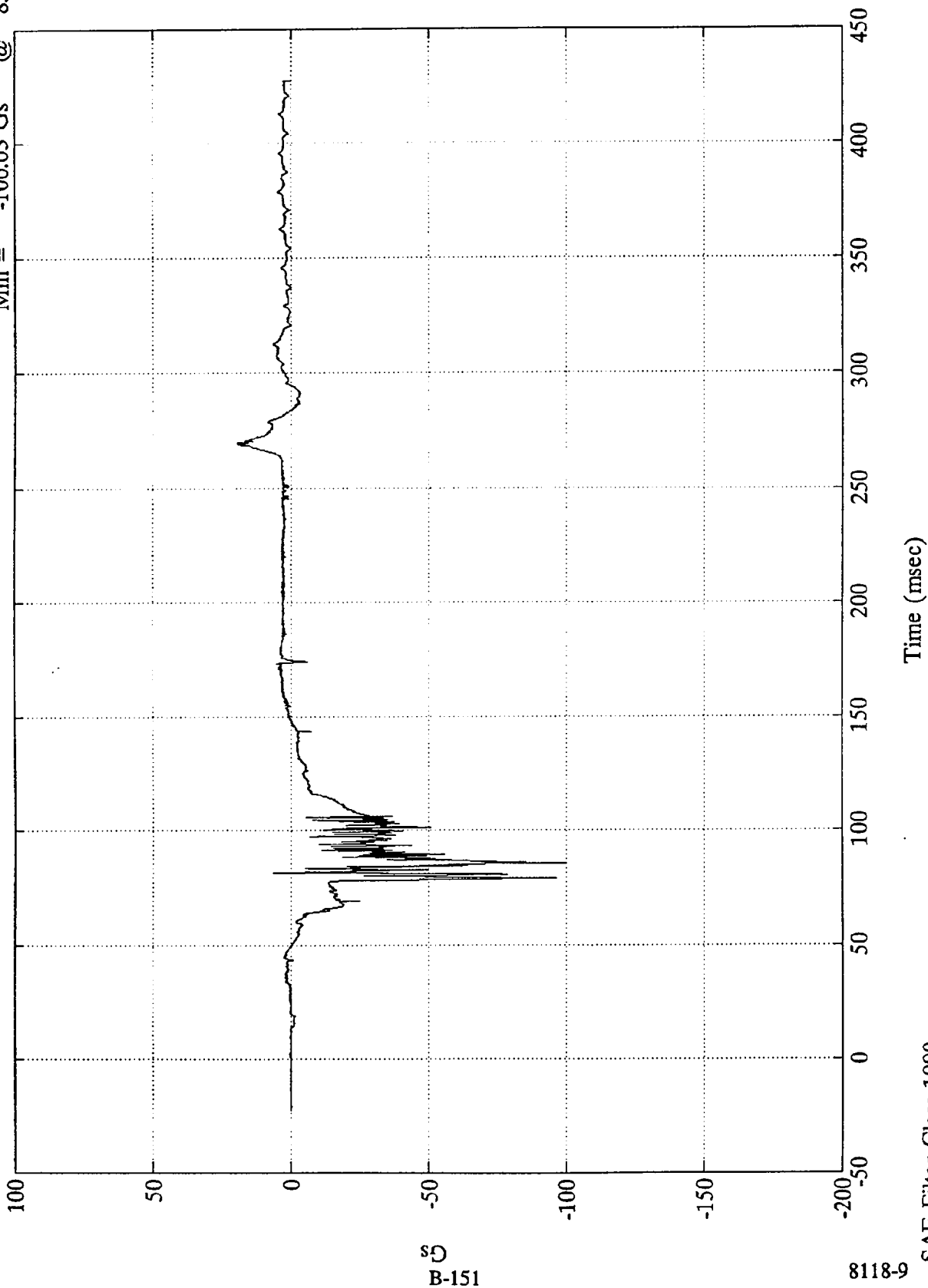
8118-9

SAE Filter Class 60

VTV TEST #9

V1-P2 Head X

Max = 19.65 Gs @ 269.63 msec
Min = -100.03 Gs @ 85.80 msec



B-151

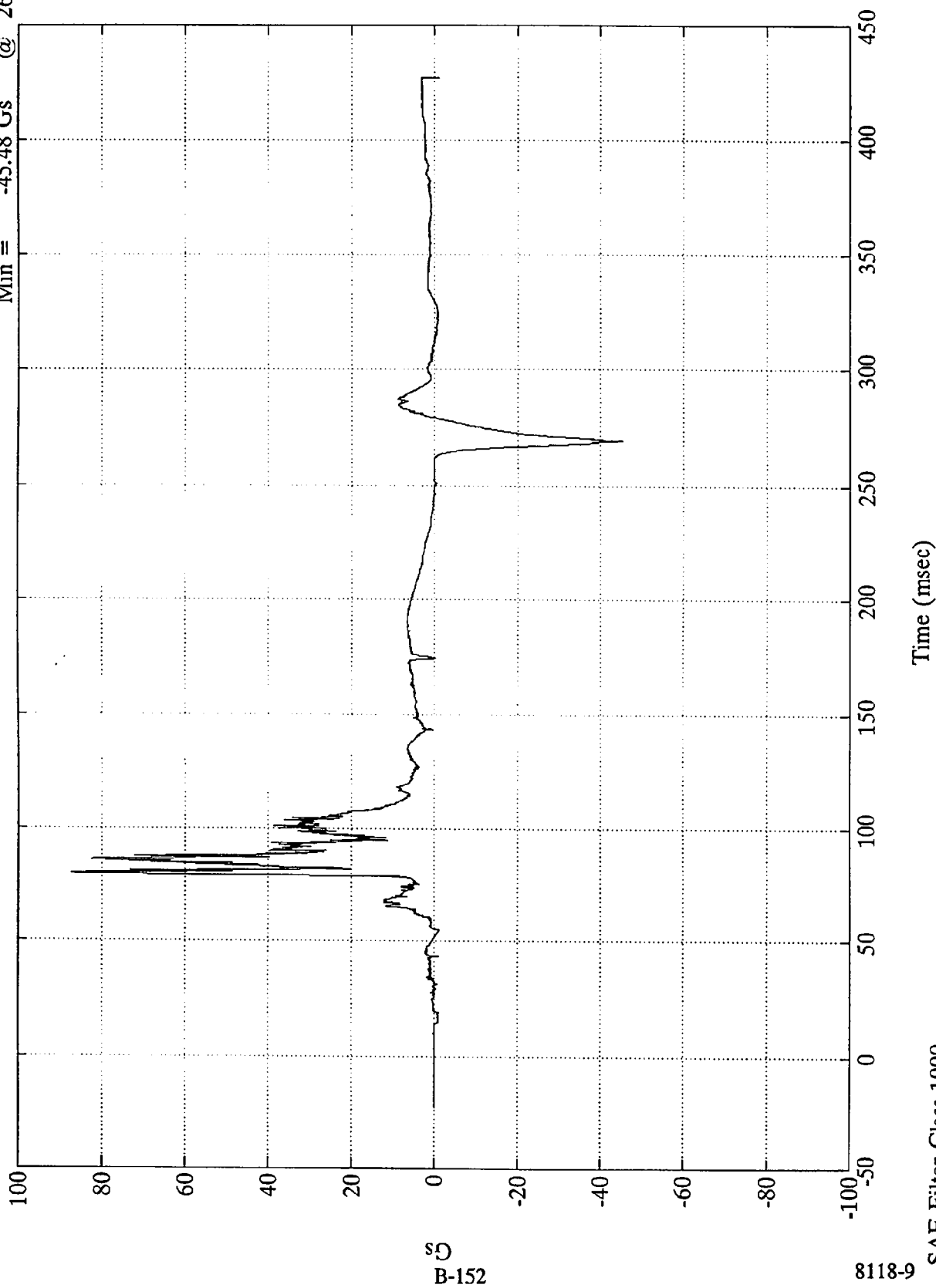
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P2 Head Y

Max =	87.32 Gs	@	79.68 msec
Min =	-45.48 Gs	@	269.76 msec



B-152

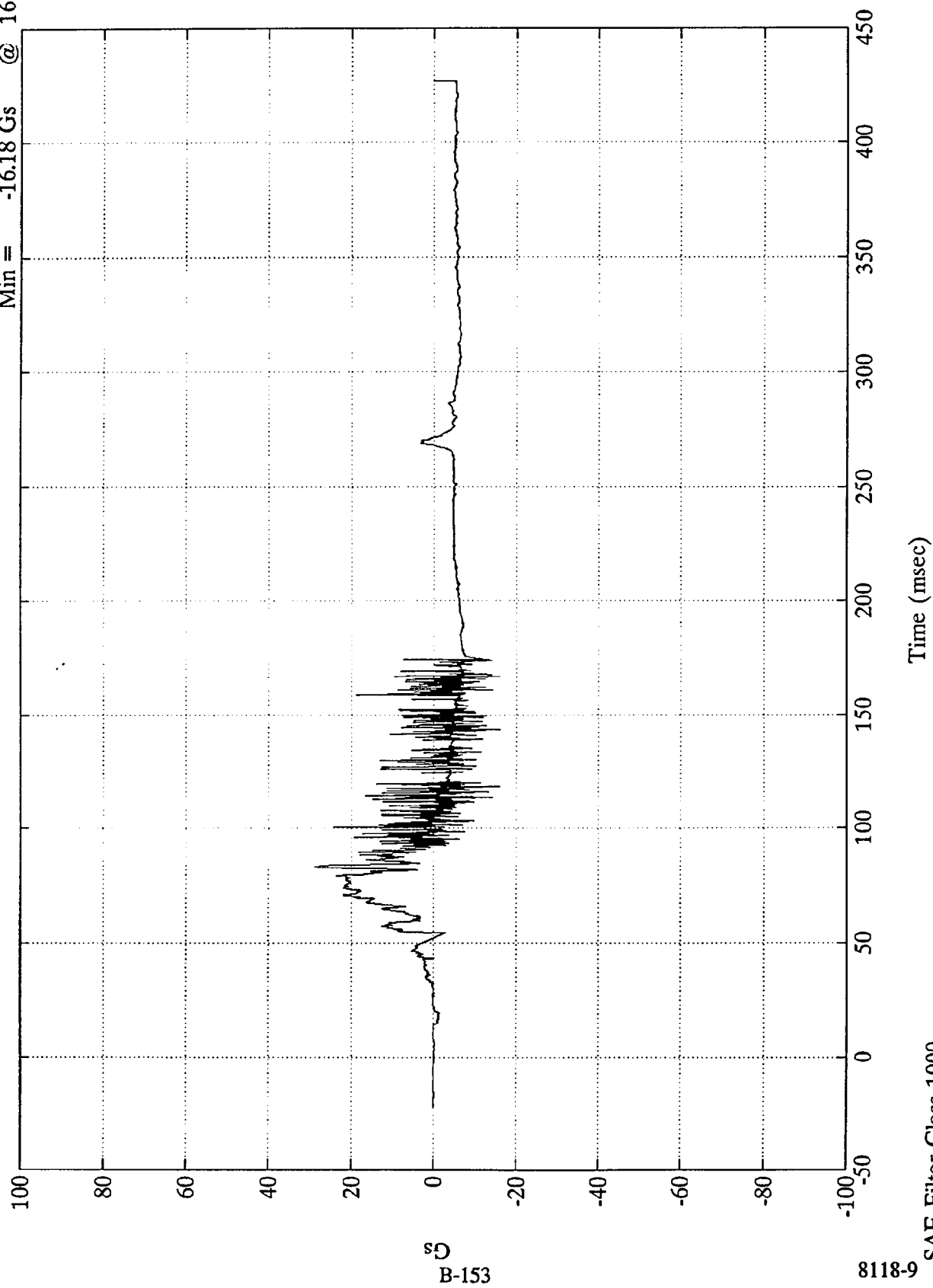
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P2 Head Z

Max = 28.86 Gs @ 83.16 msec
Min = -16.18 Gs @ 166.92 msec



B-153

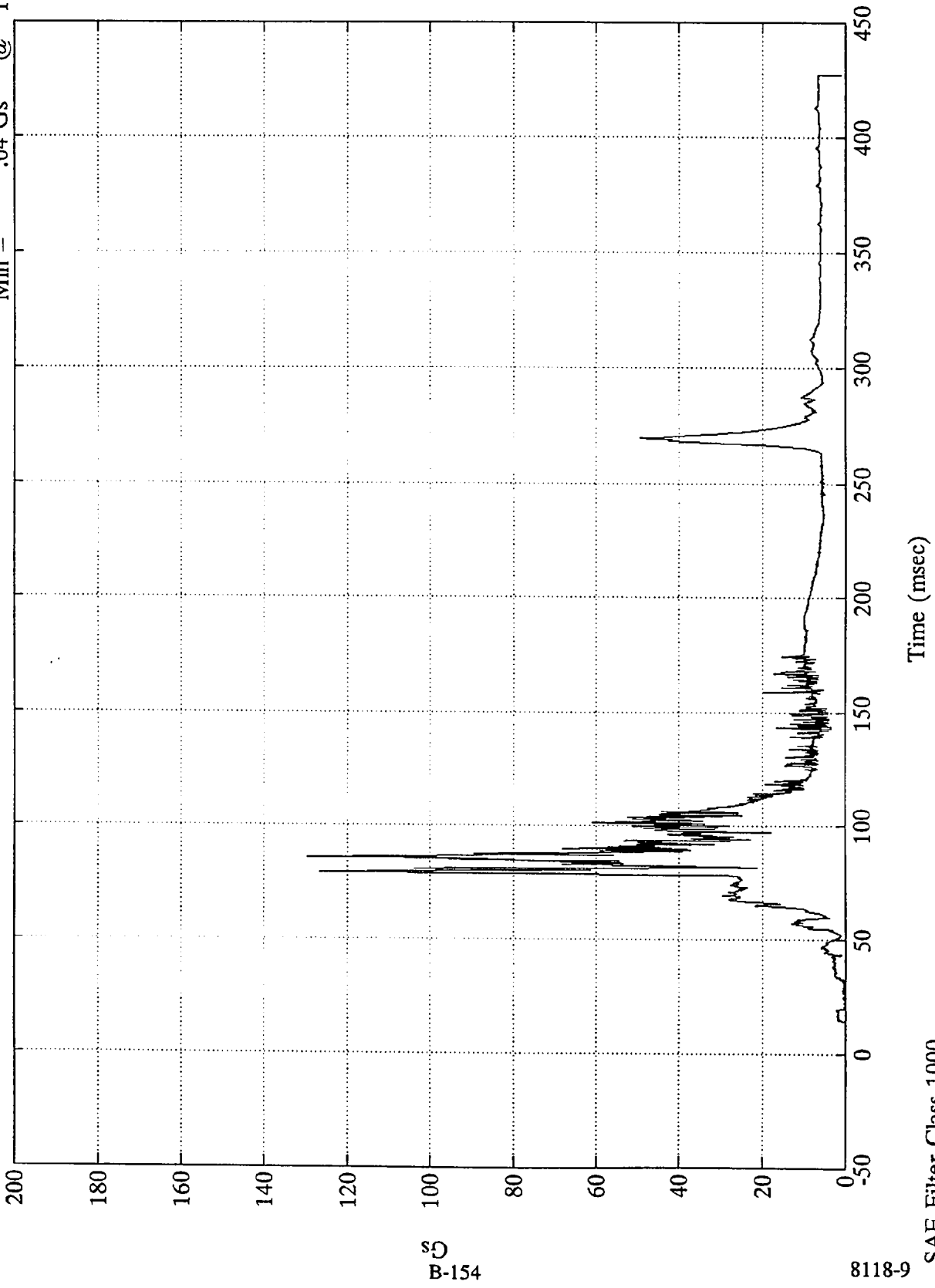
8118-9

SAE Filter Class 1000

VTV TEST #9

Max = 129.55 Gs @ 85.80 msec
Min = .04 Gs @ 10.43 msec

V1-P2 Head Resultant



B-154

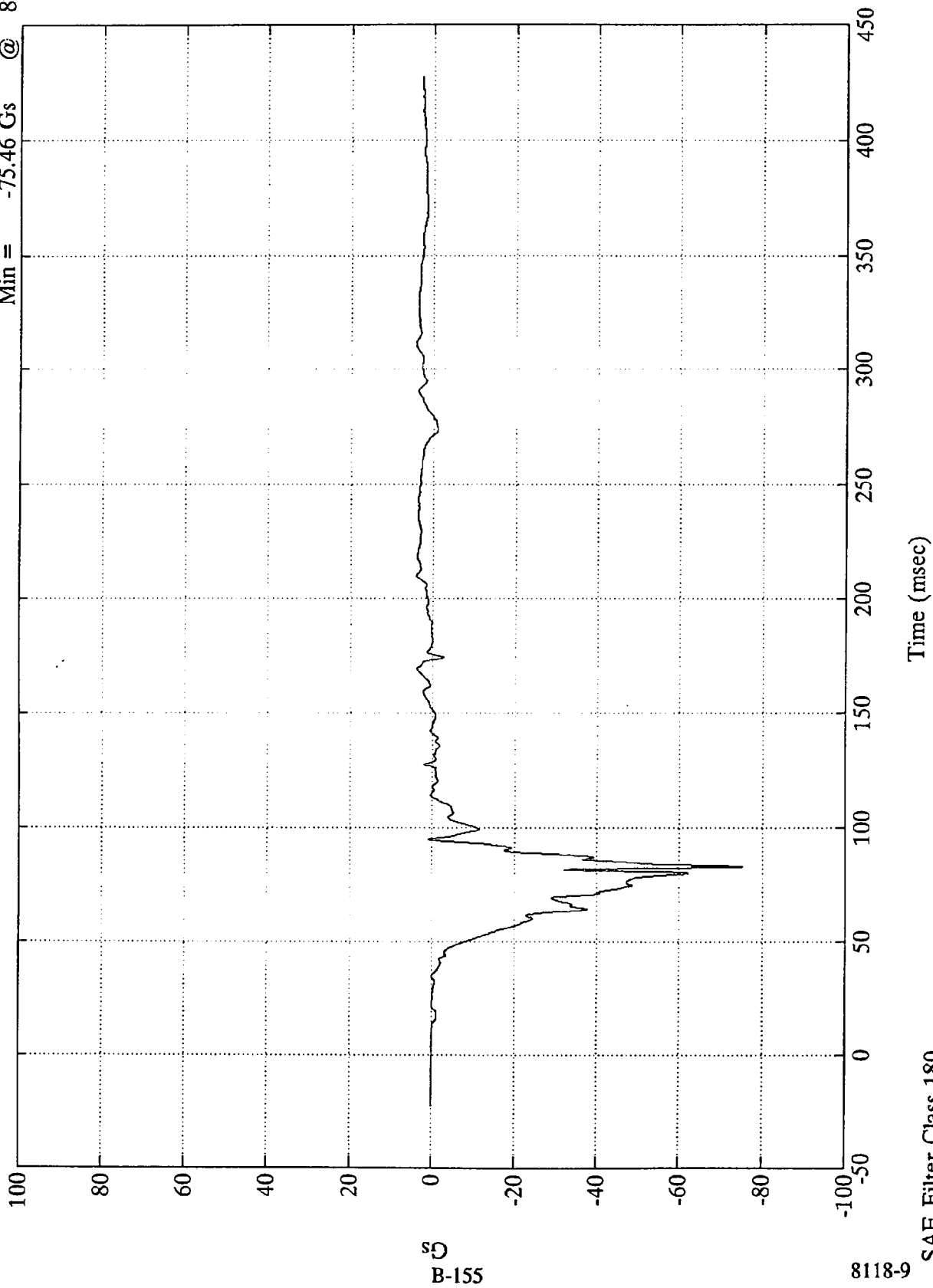
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P2 Chest X

Max = 4.14 Gs @ 310.80 msec
Min = -75.46 Gs @ 82.68 msec



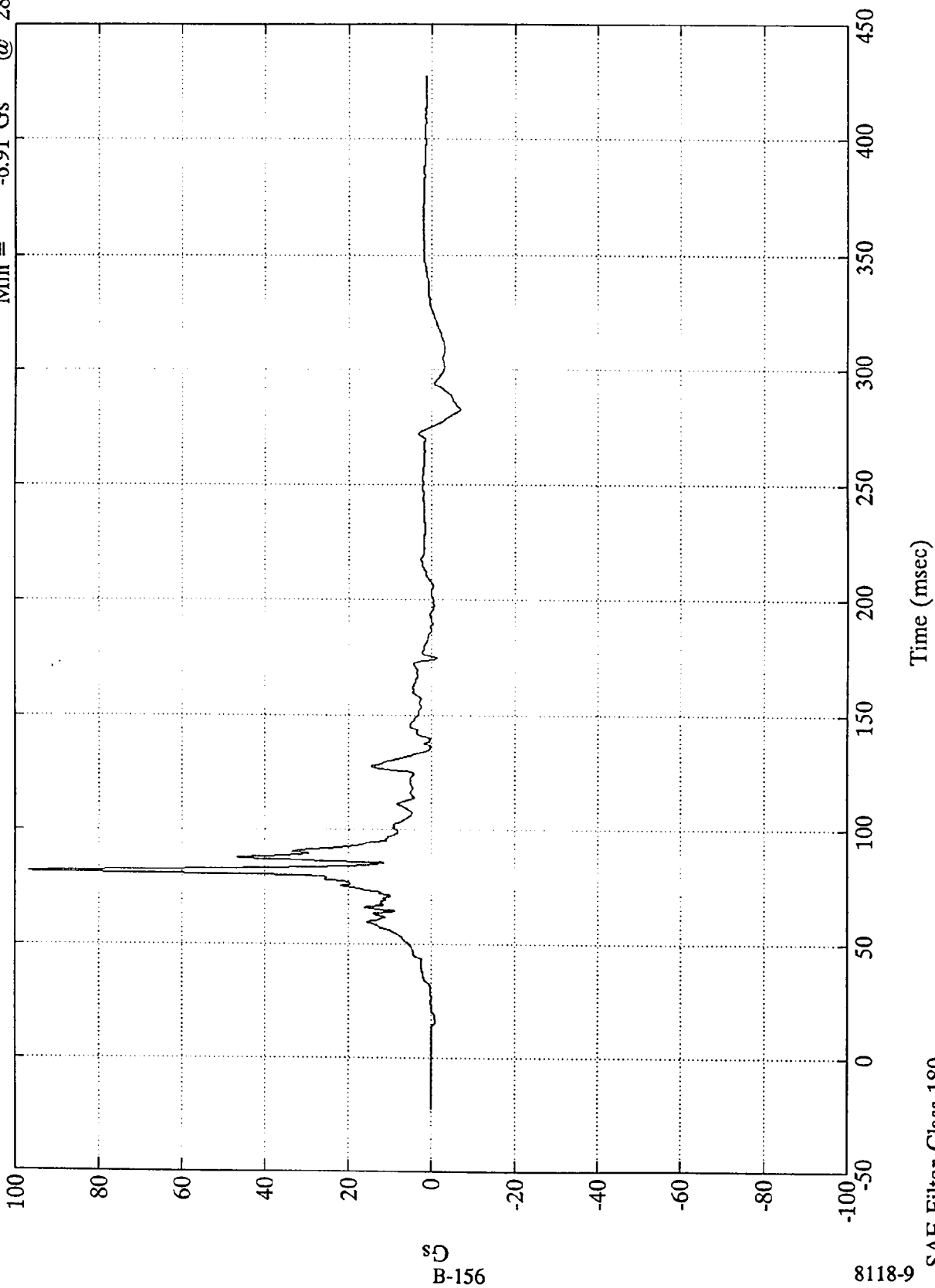
B-155

8118-9

SAE Filter Class 180

VTV TEST #9

V1-P2 Chest Y
Max = 96.58 Gs @ 81.48 msec
Min = -6.91 Gs @ 282.72 msec



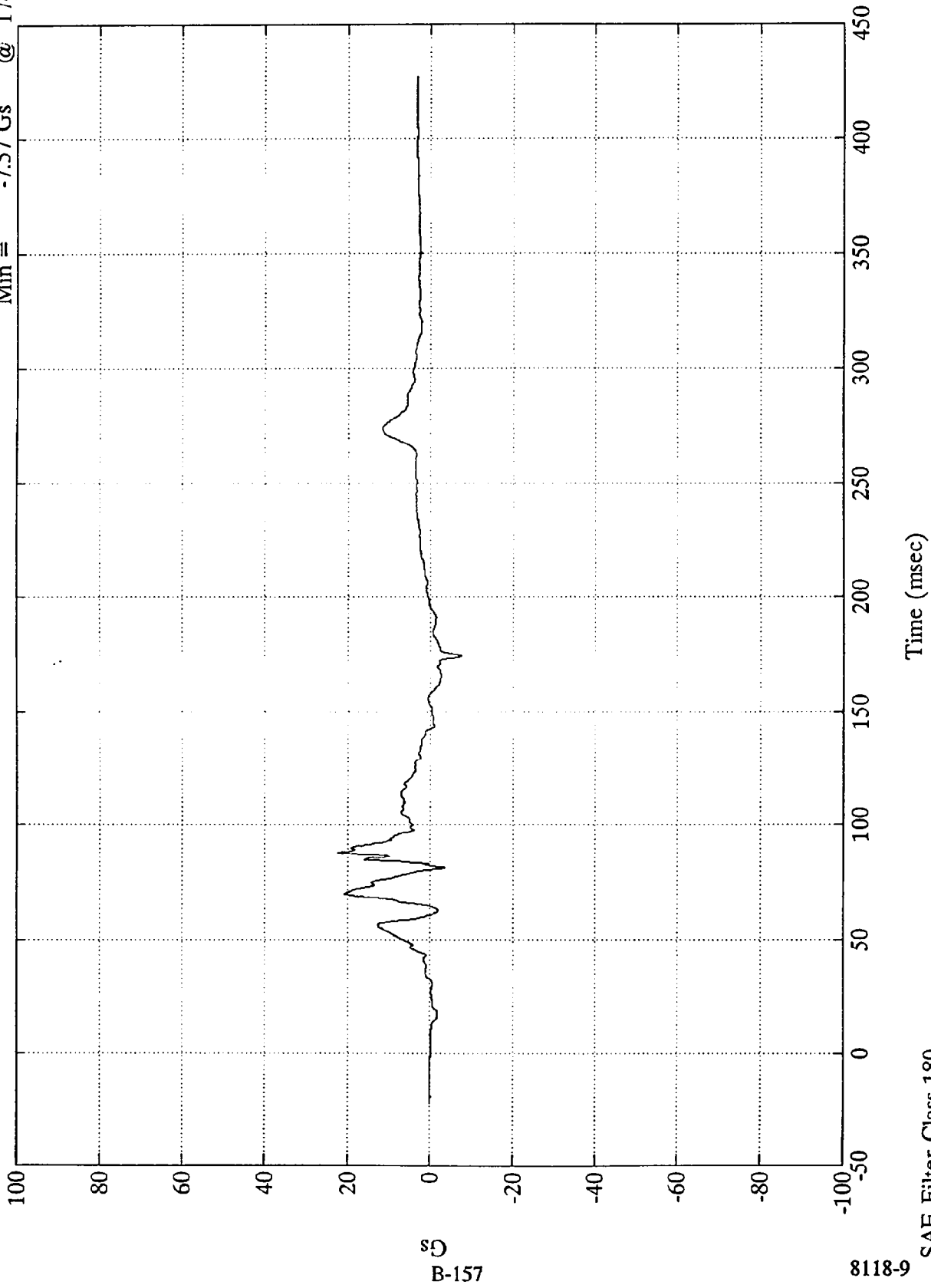
B-156

8118-9

SAE Filter Class 180

VTV TEST #9

V1-P2 Chest Z
Max = 22.42 Gs @ 87.59 msec
Min = -7.57 Gs @ 174.36 msec



B-157

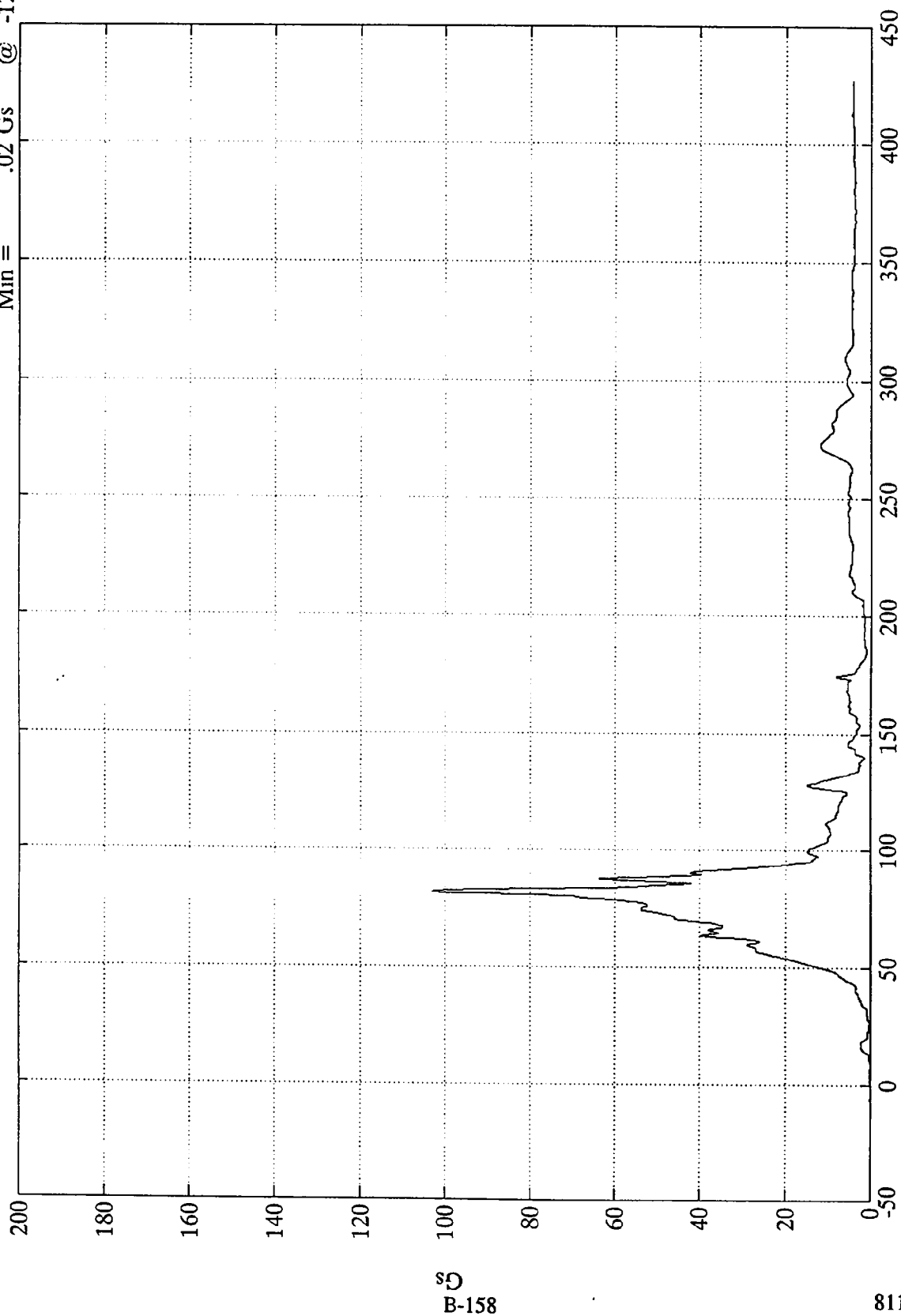
8118-9

SAE Filter Class 180

VTV TEST #9

Max = 103.25 Gs @ 81.60 msec
Min = .02 Gs @ -12.72 msec

V1-P2 Chest Resultant



Time (msec)

SAE Filter Class 180

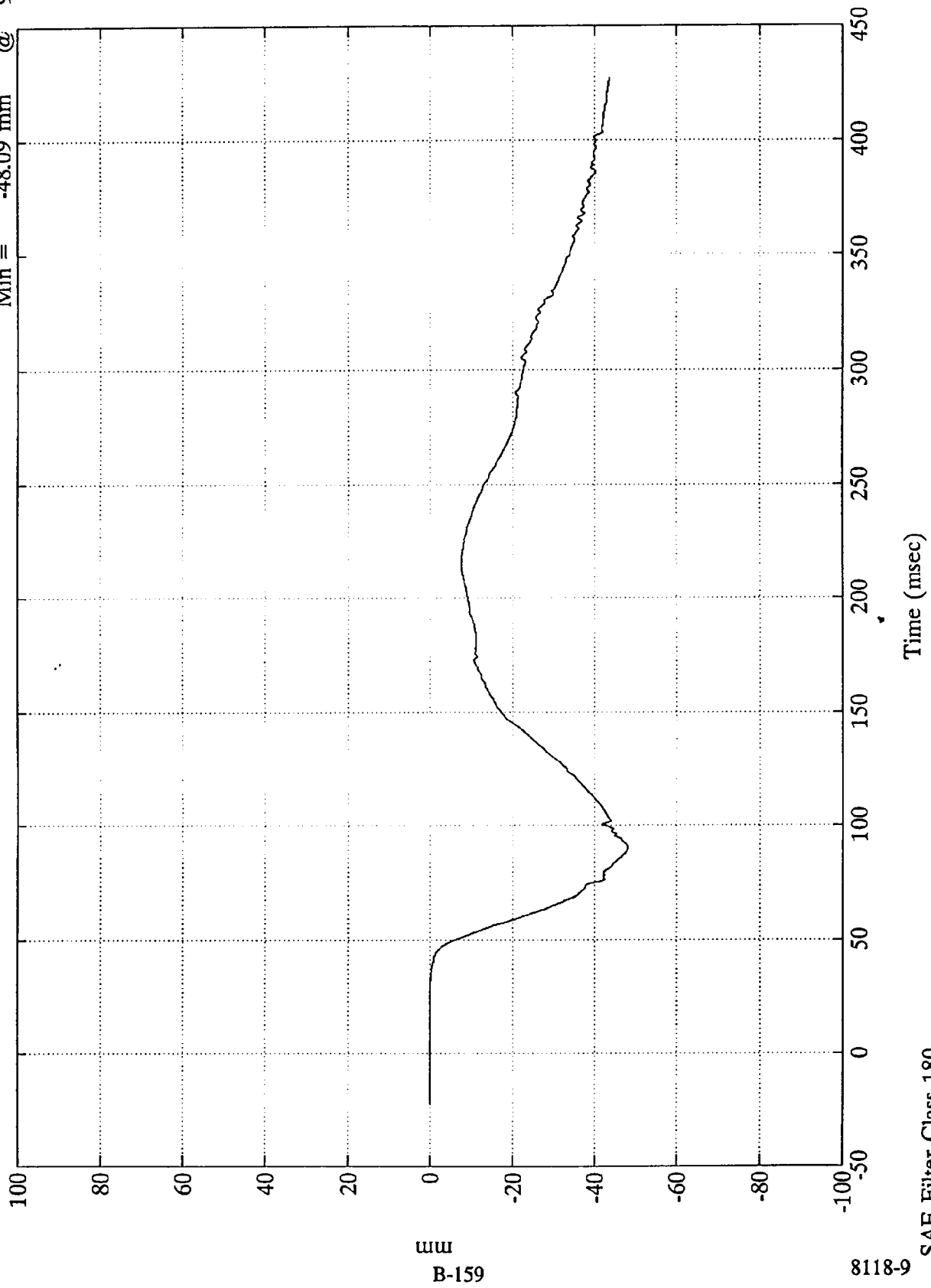
8118-9

B-158

VTV TEST #9

V1-P2 Chest Disp.

Max = .12 mm @ 30.00 msec
Min = -48.09 mm @ 90.48 msec



mm
B-159

8118-9

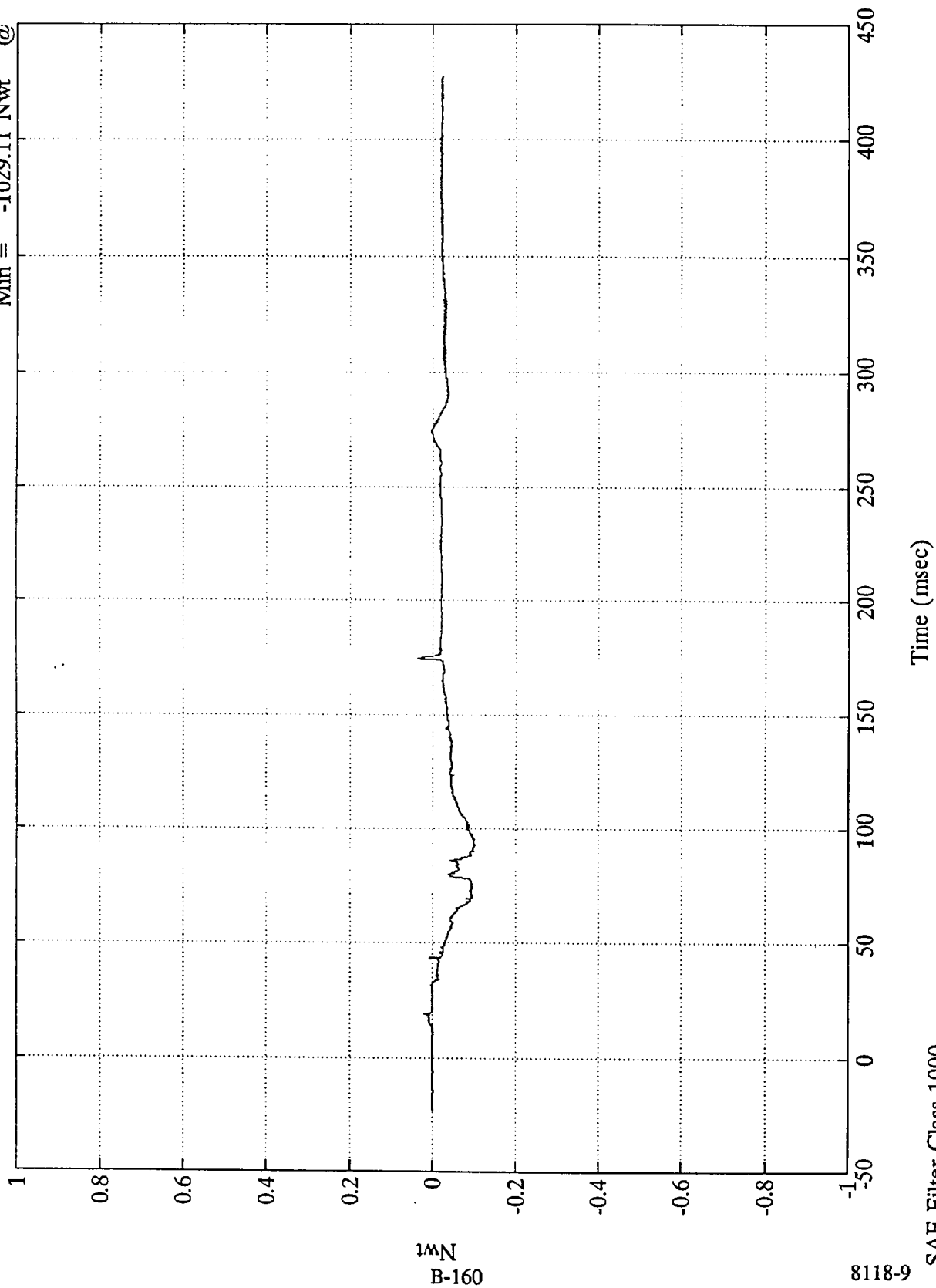
SAE Filter Class 180

VTV TEST #9

$\times 10^4$

V1-P2 Upper Neck Fx

Max = 353.33 Nwt @ 174.24 msec
Min = -1029.11 Nwt @ 95.64 msec



B-160

8118-9

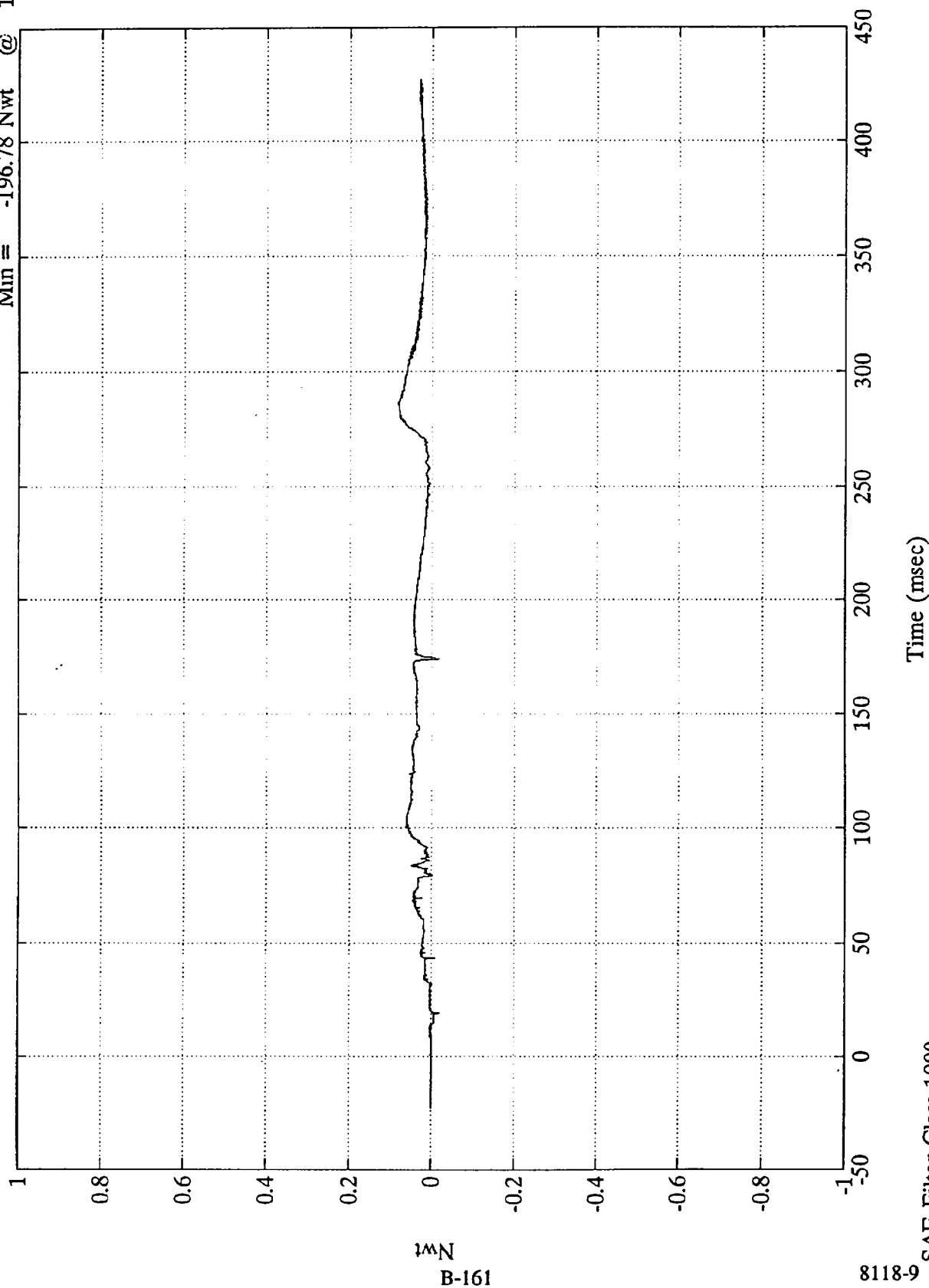
SAE Filter Class 1000

VTV TEST #9

$\times 10^4$

V1-P2 Upper Neck Fy

Max = 858.67 Nwt @ 286.44 msec
Min = -196.78 Nwt @ 19.20 msec



B-161

8118-9 SAE Filter Class 1000

VTV TEST #9

$\times 10^4$

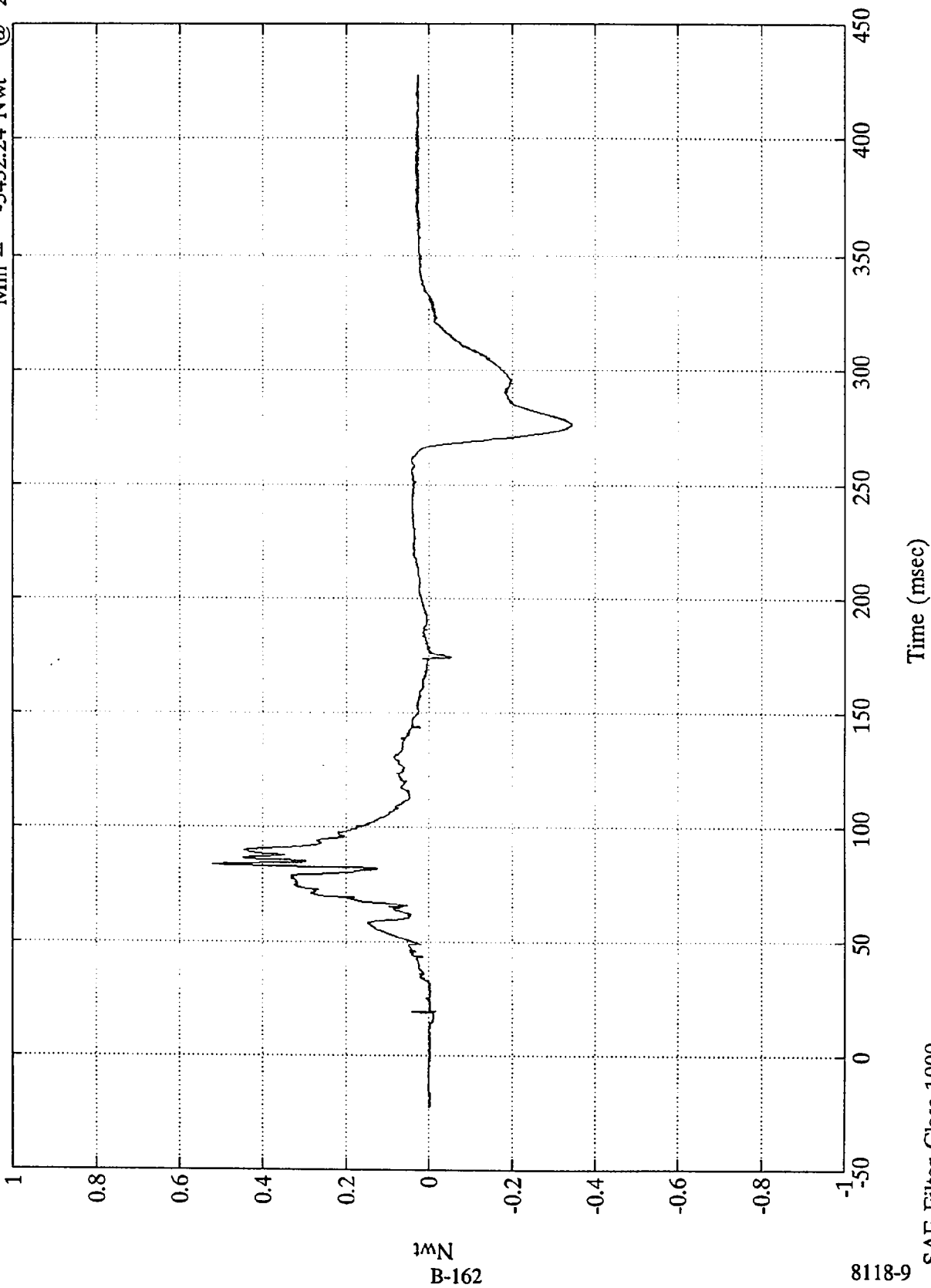
V1-P2 Upper Neck Fz

Max = 5226.11 Nwt

@ 83.52 msec

Min = -3432.24 Nwt

@ 276.60 msec



B-162

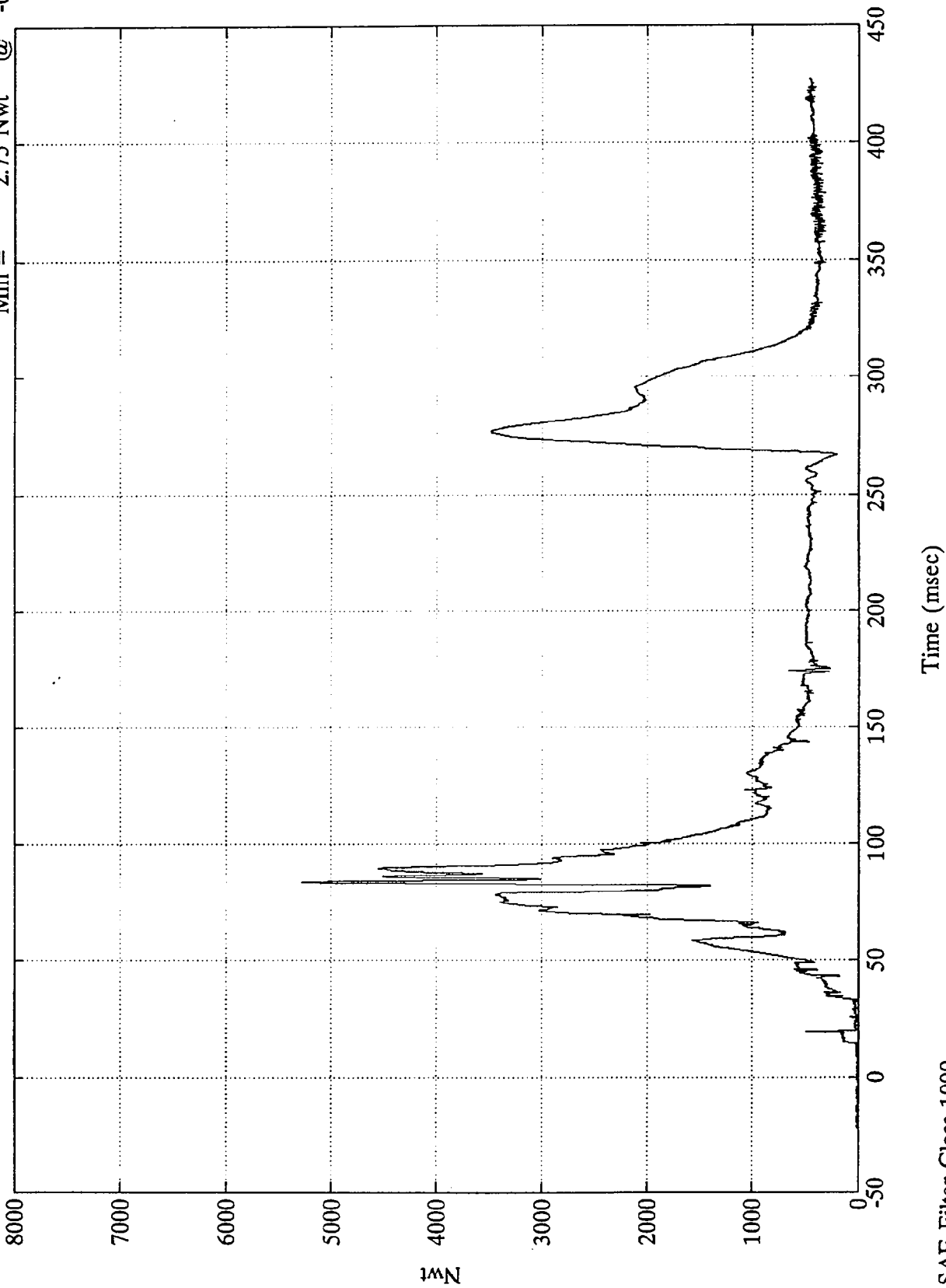
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P2 Upper Neck F(res)

Max = 5276.78 Nwt @ 83.52 msec
Min = 2.75 Nwt @ -0.48 msec



1Nwt

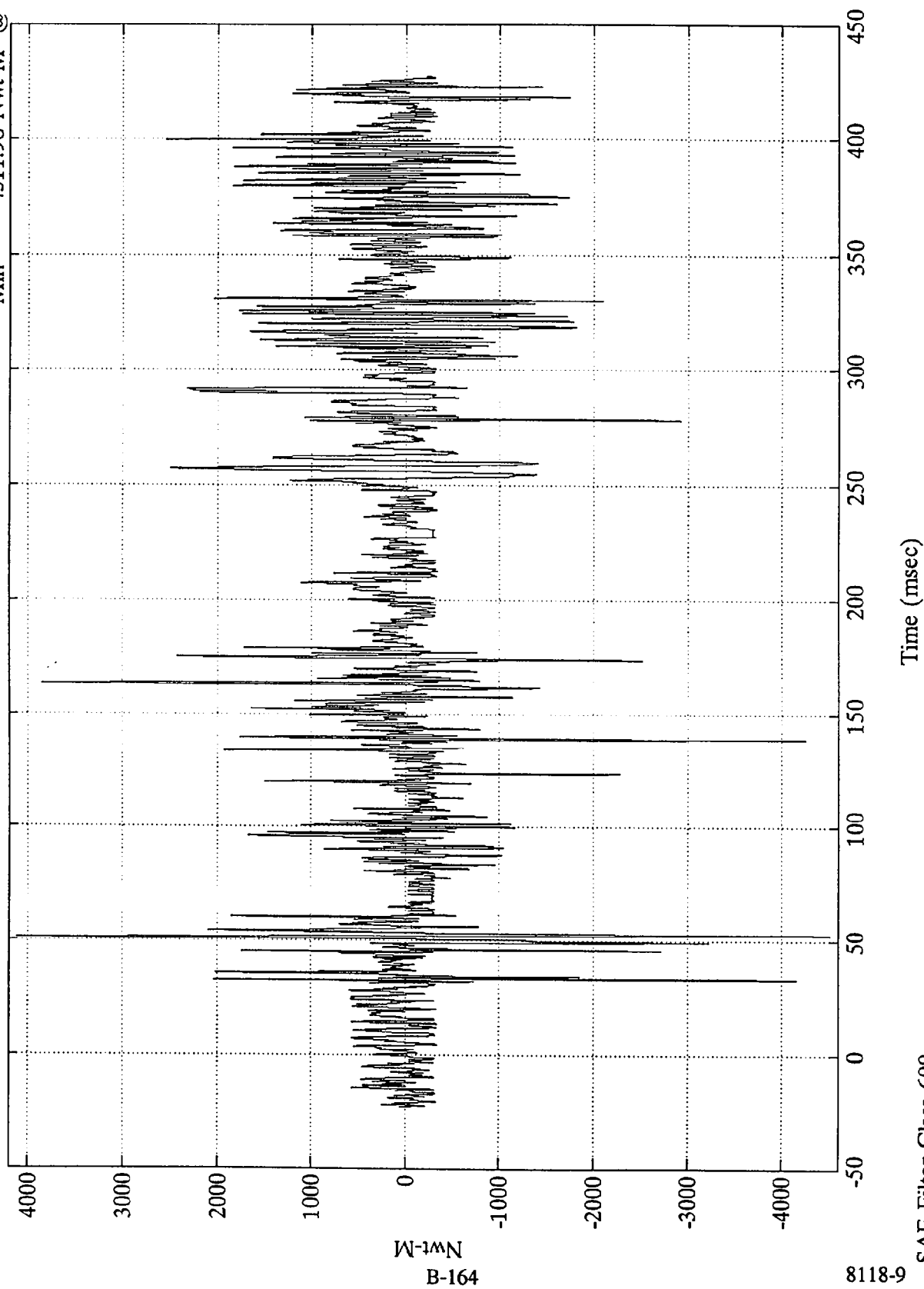
B-163

8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P2 Upper Neck Mx
 Max = 4125.22 Nwt-M @ 51.12 msec
 Min = -4511.98 Nwt-M @ 52.56 msec



B-164

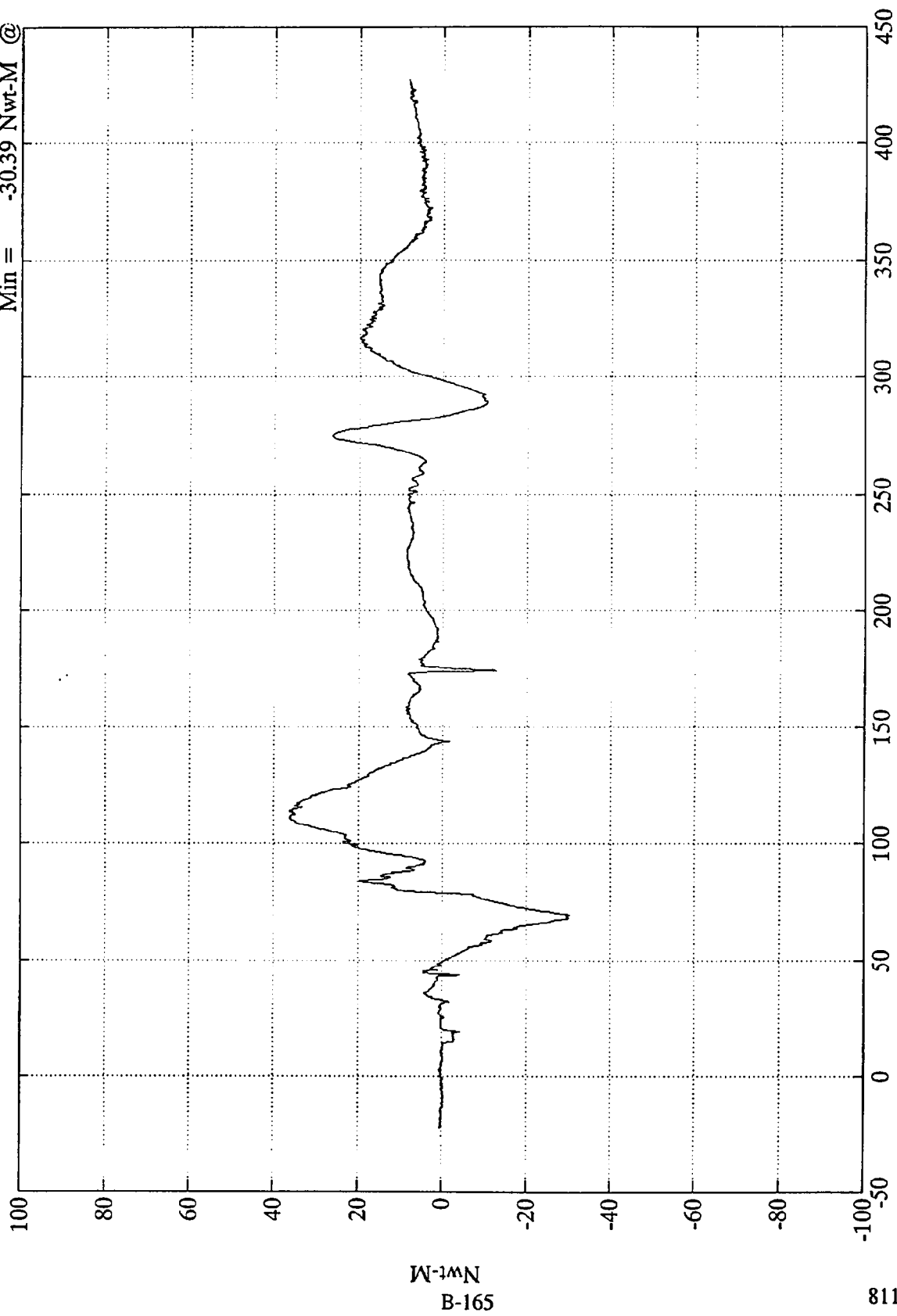
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P2 Upper Neck My

Max = 36.35 Nwt-M @ 113.63 msec
Min = -30.39 Nwt-M @ 69.48 msec



Time (msec)
Data not accurate, noise in channel

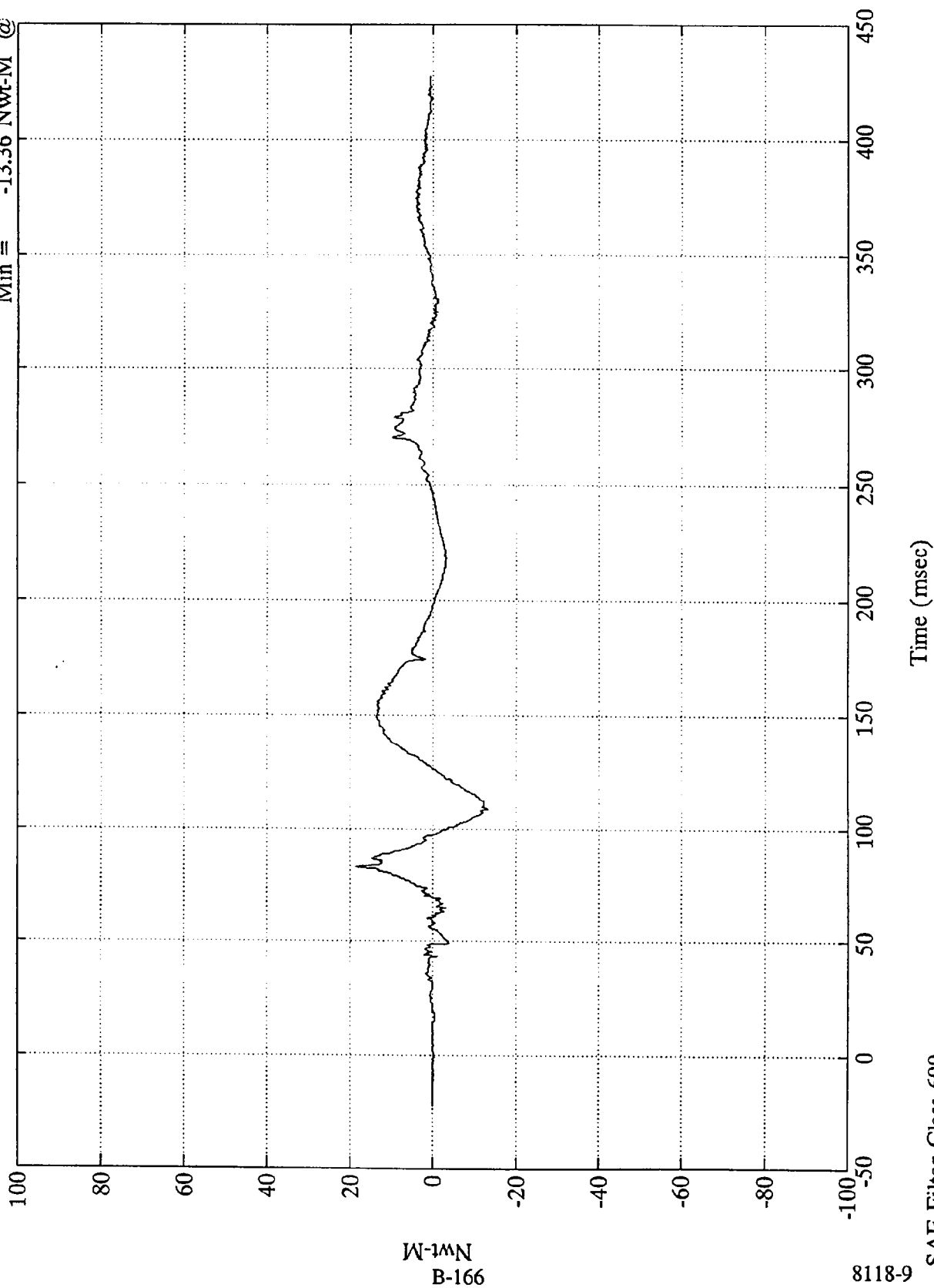
SAE Filter Class 600

8118-9

B-165

VTV TEST #9

V1-P2 Upper Neck Mz
Max = 18.58 Nwt-M @ 83.04 msec
Min = -13.36 Nwt-M @ 108.95 msec



Mwt-M
B-166

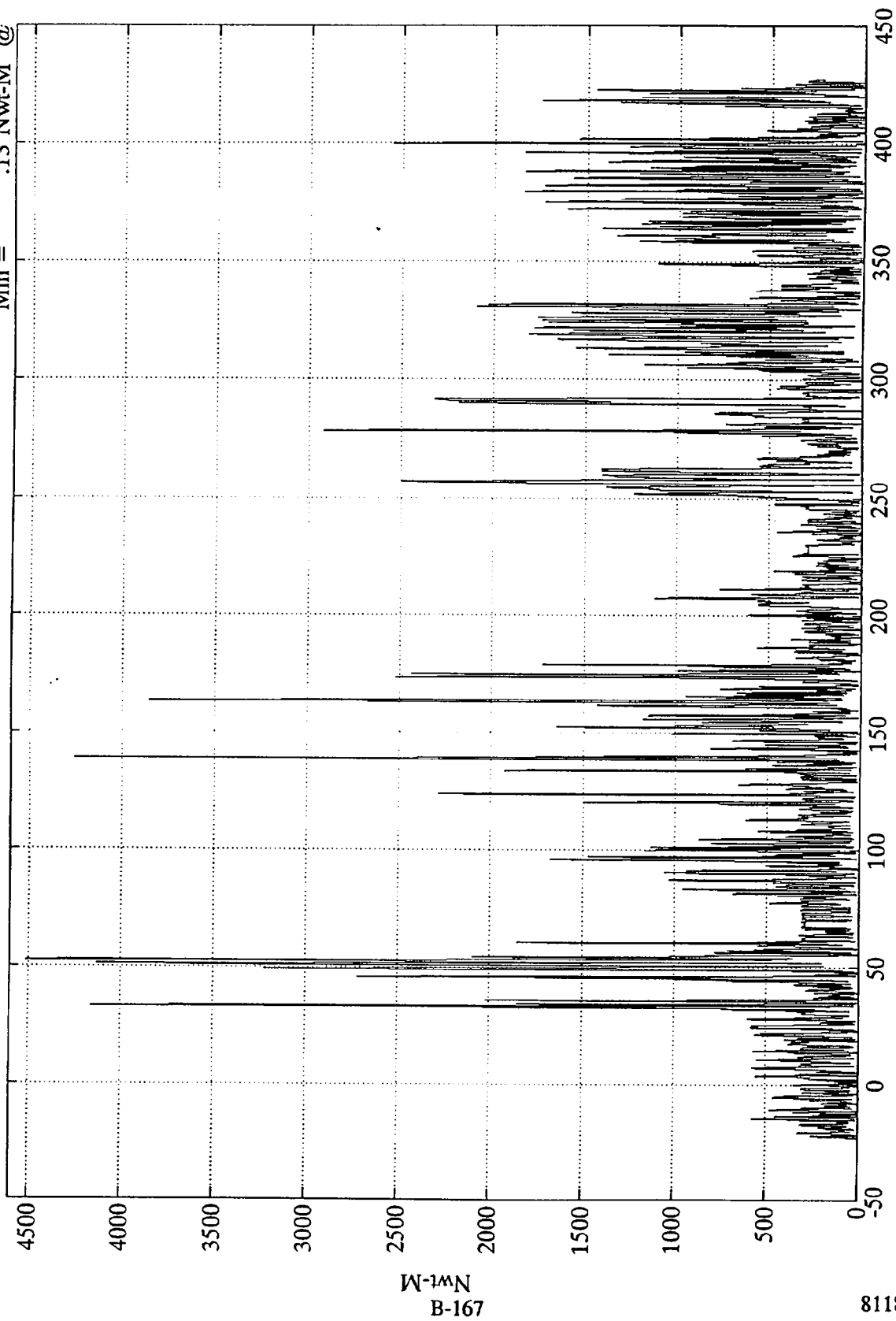
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P2 Upper Neck M(res)

Max = 4511.98 Nwt-M @ 52.56 msec
Min = .13 Nwt-M @ 14.03 msec



Time (msec)
Data not accurate, noise in channel

SAE Filter Class 600

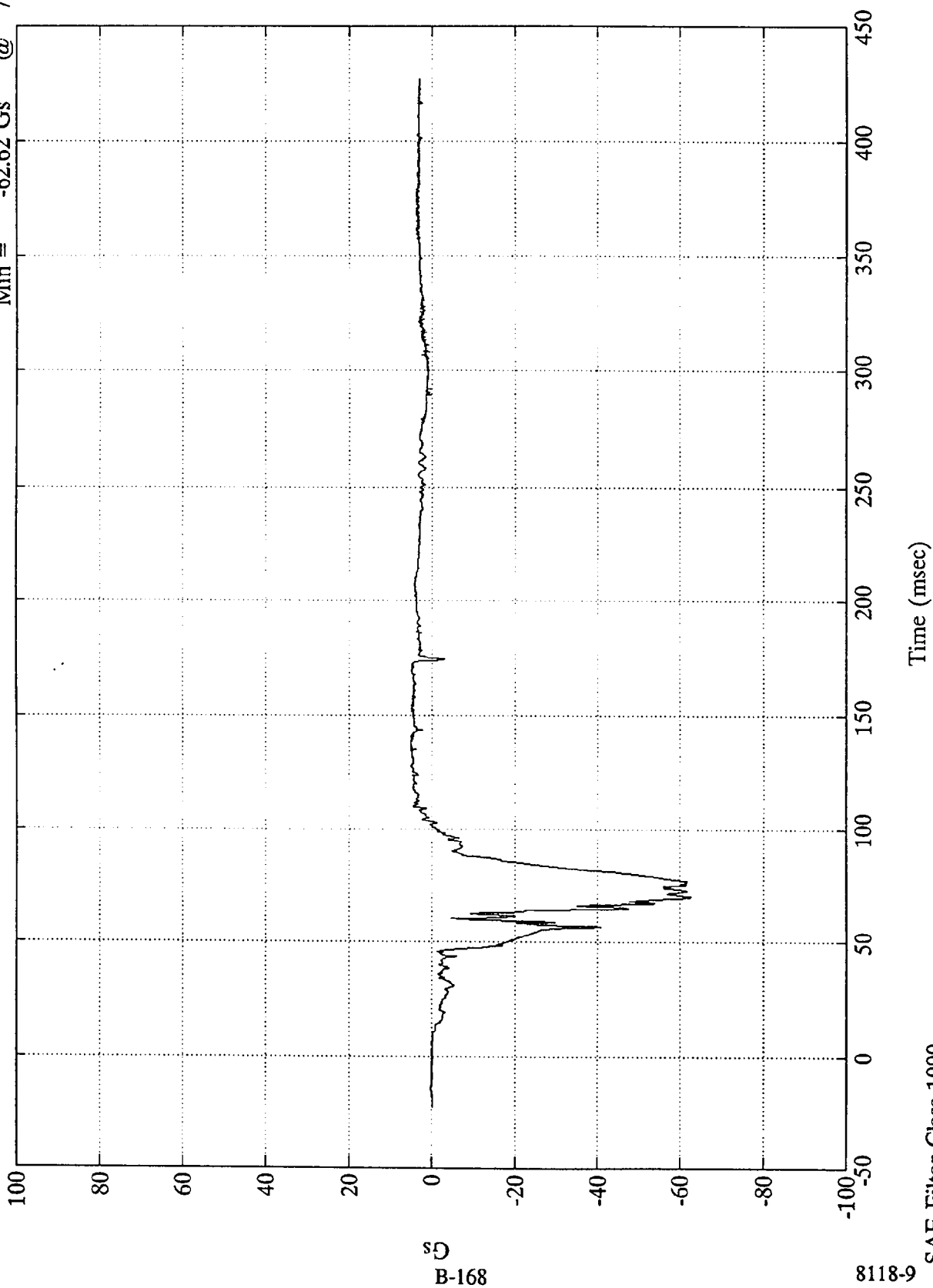
8118-9

B-167

VTV TEST #9

V1-P2 Pelvic X

Max = 5.20 Gs @ 138.60 msec
Min = -62.62 Gs @ 70.08 msec



B-168

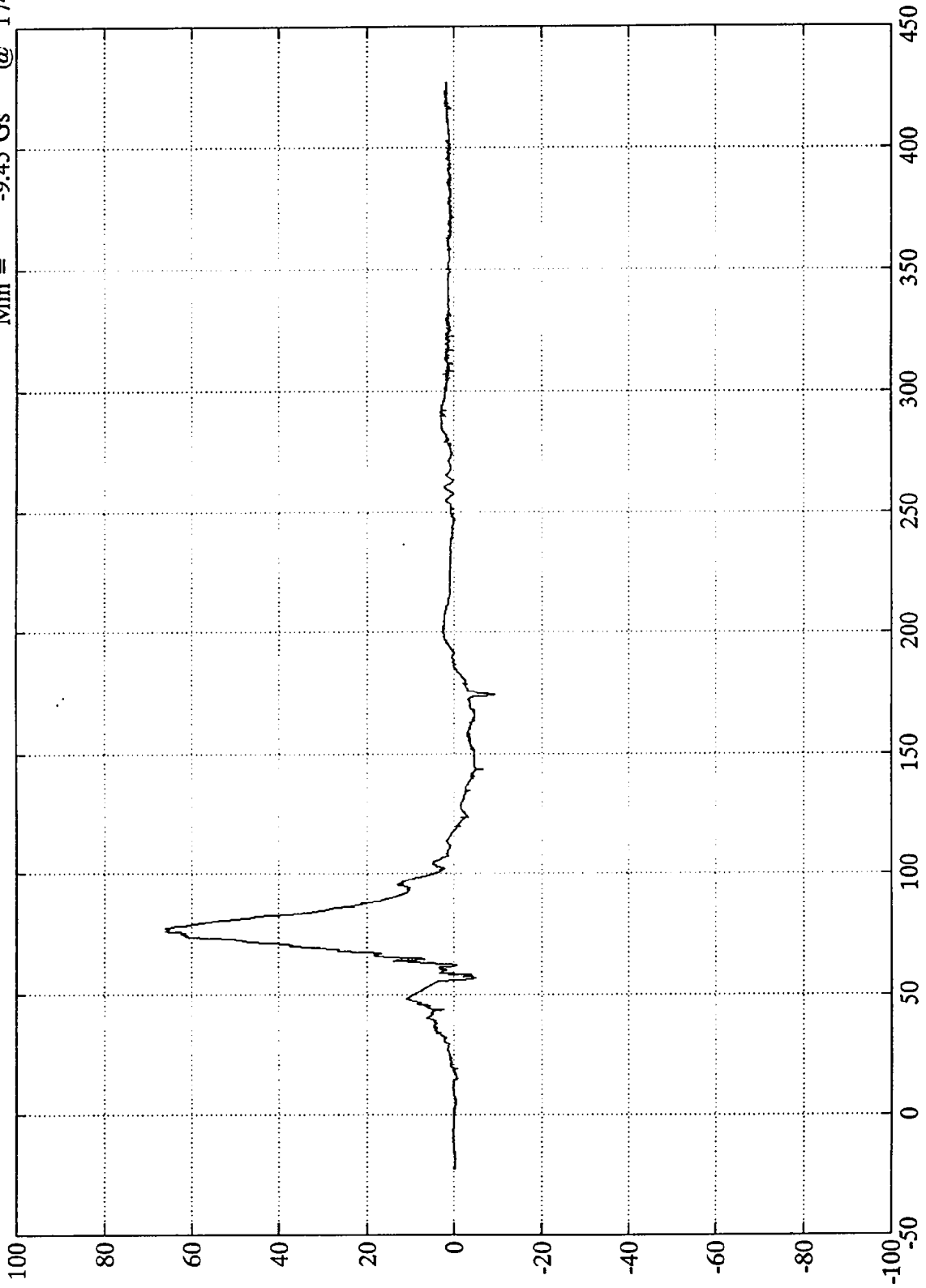
8118-9

SAE Filter Class 1000

VTV TEST #9

V1-P2 Pelvic Y

Max = 66.08 Gs @ 76.92 msec
Min = -9.45 Gs @ 174.48 msec



Time (msec)

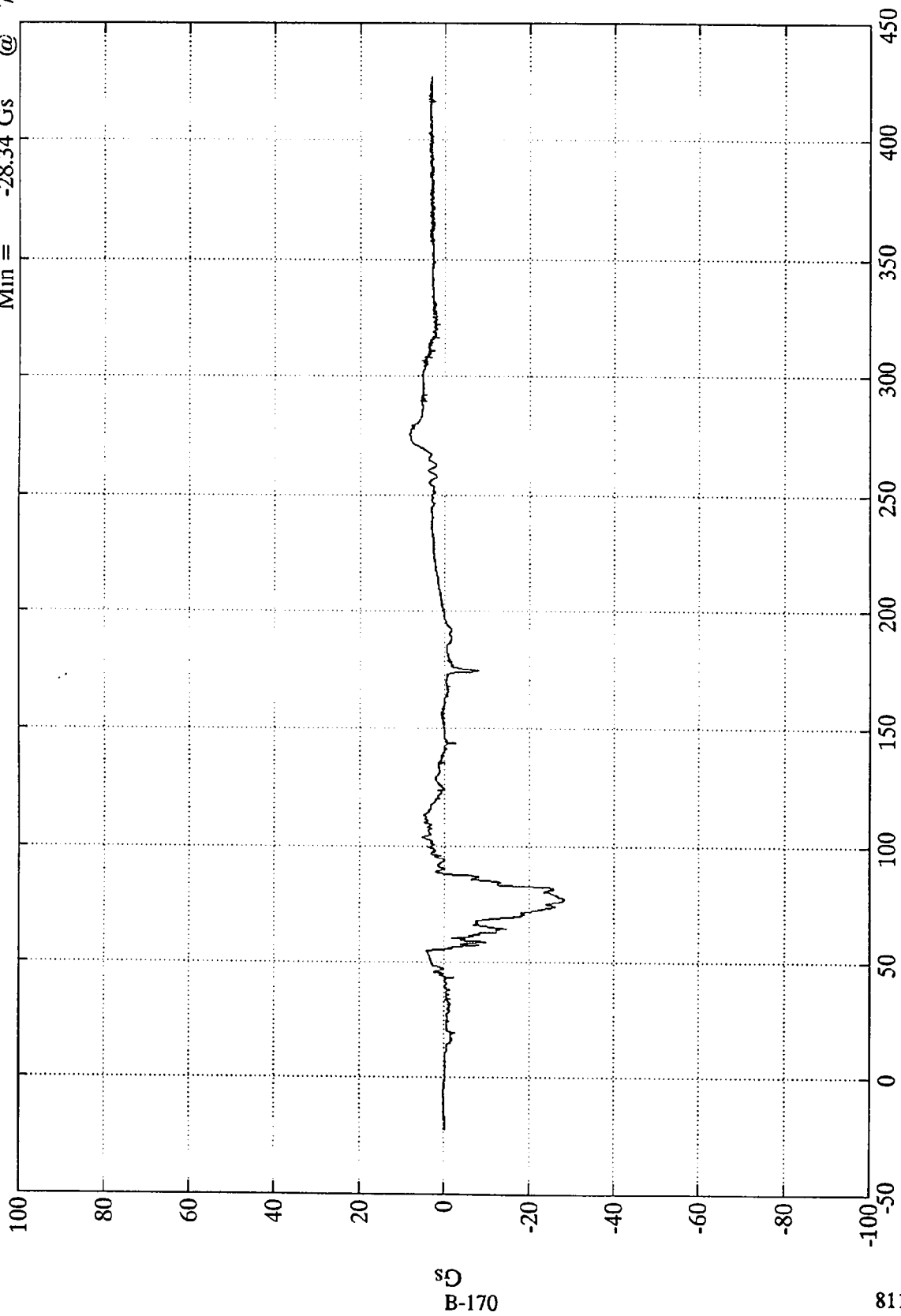
SD
B-169

8118-9
SAE Filter Class 1000

VTV TEST #9

V1-P2 Pelvic Z

Max = 8.28 Gs @ 276.24 msec
Min = -28.34 Gs @ 77.52 msec



Time (msec)

SAE Filter Class 1000

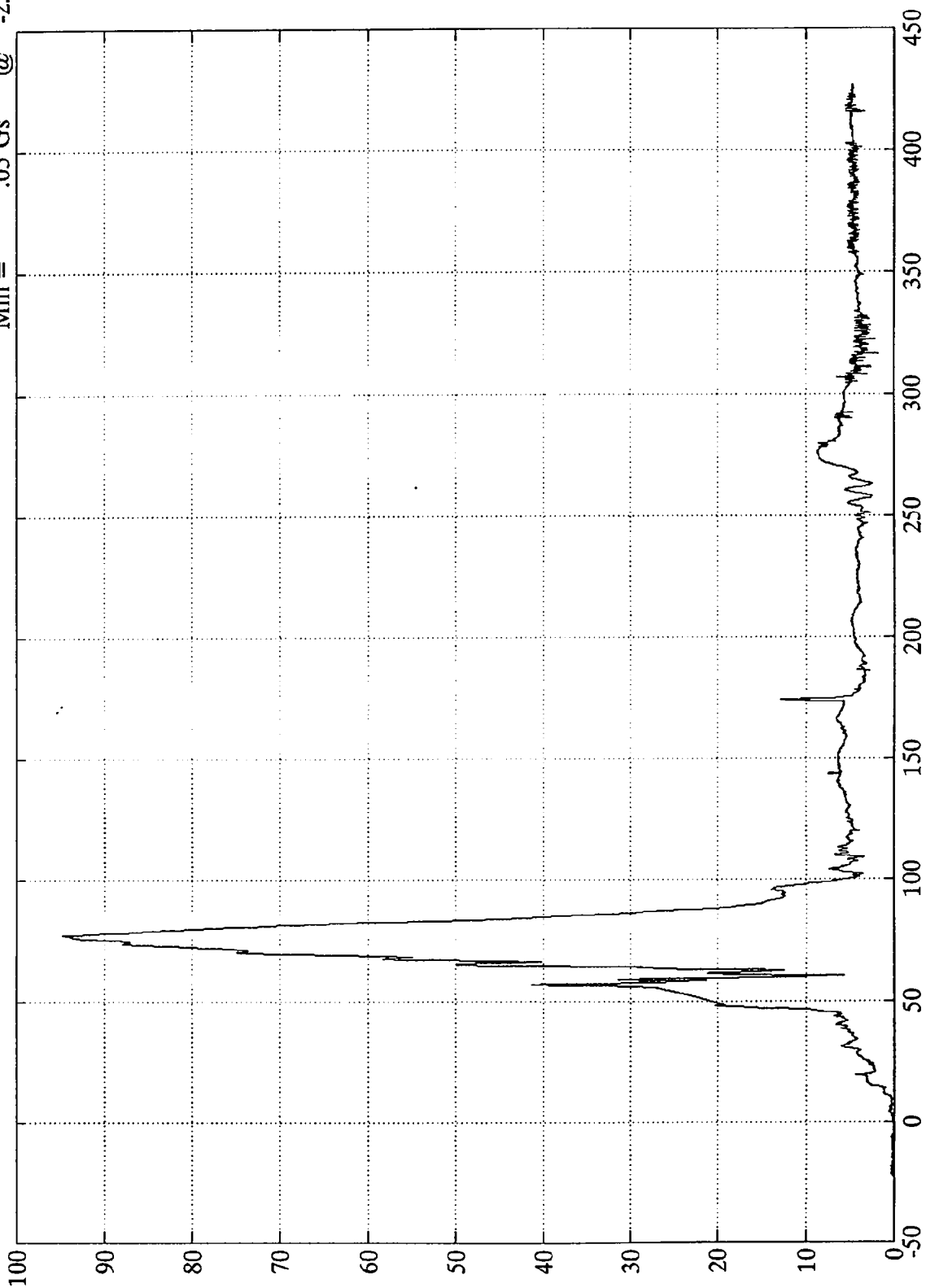
8118-9

B-170

VTV TEST #9

V1-P2 Pelvic Res.

Max = 94.77 Gs @ 76.92 msec
Min = .05 Gs @ -2.04 msec



Time (msec)

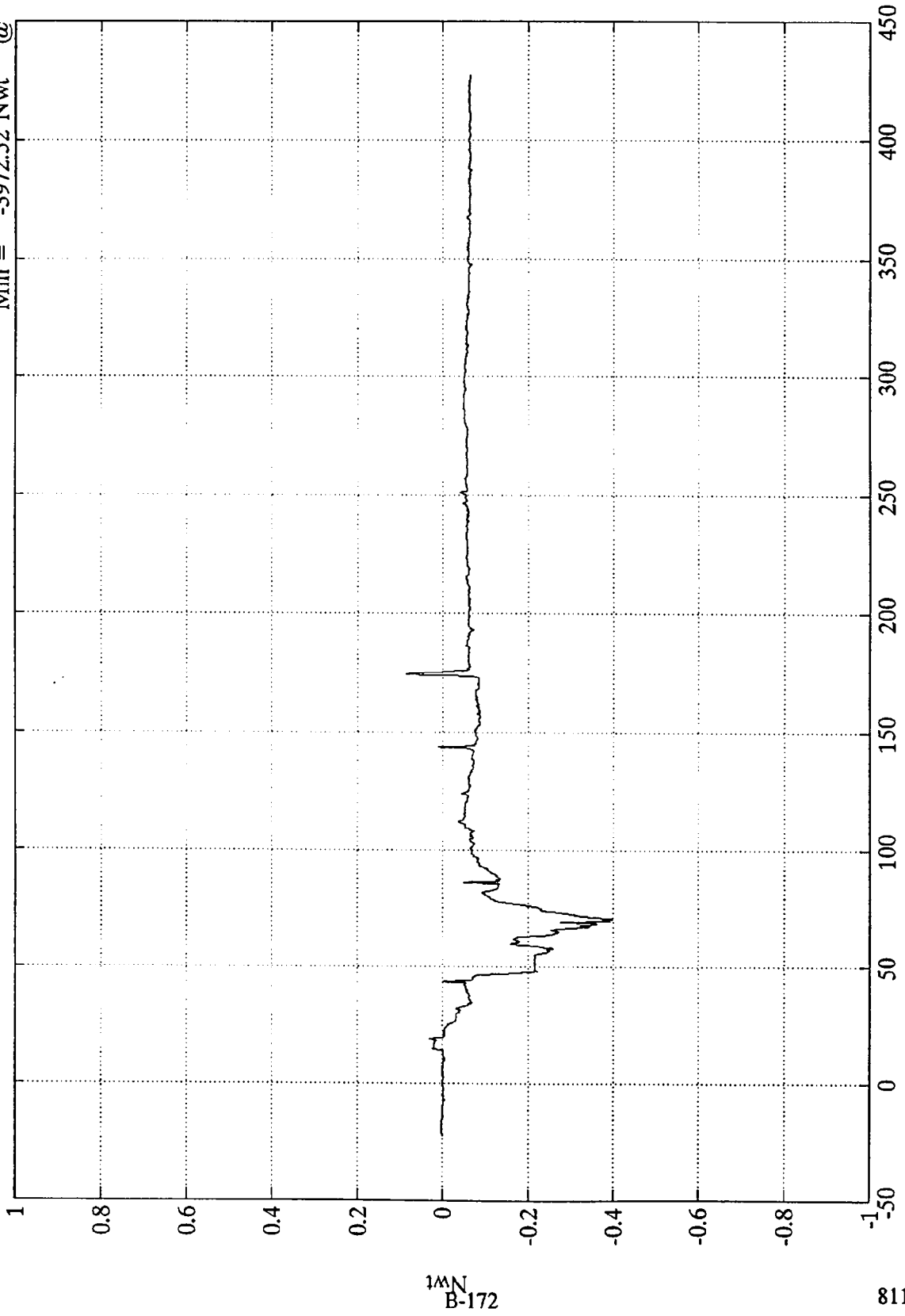
8118-9
B-171

SAE Filter Class 1000

VTV TEST #9
x10⁴

V1-P2 Left Femur

Max = 861.90 Nwt @ 174.24 msec
Min = -3972.52 Nwt @ 70.92 msec



10⁴ Nwt
B-172

Time (msec)

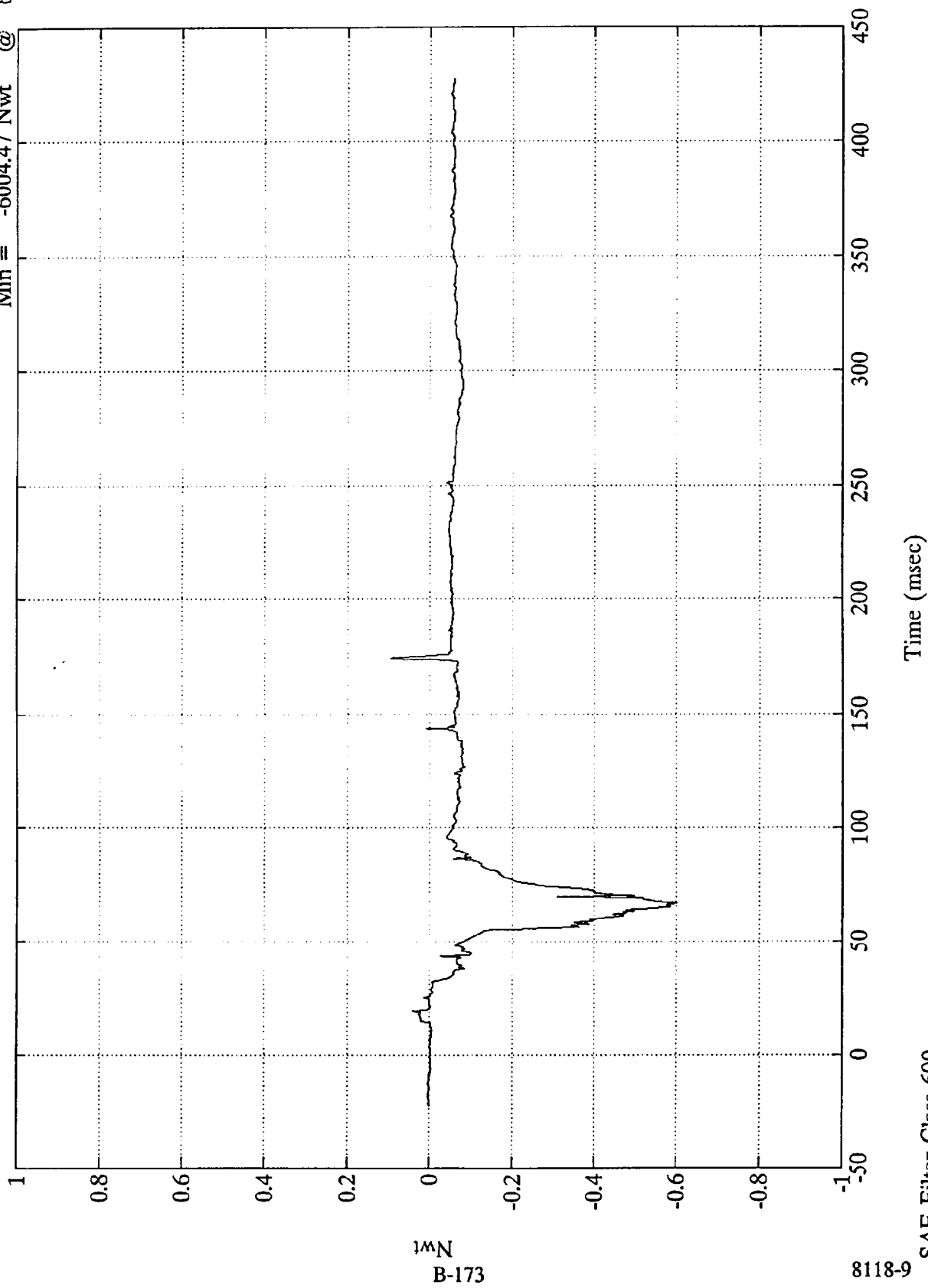
8118-9
SAE Filter Class 600

VTV TEST #9

$\times 10^4$

V1-P2 Right Femur

Max = 954.70 Nwt @ 174.36 msec
Min = -6004.47 Nwt @ 66.72 msec



B-173

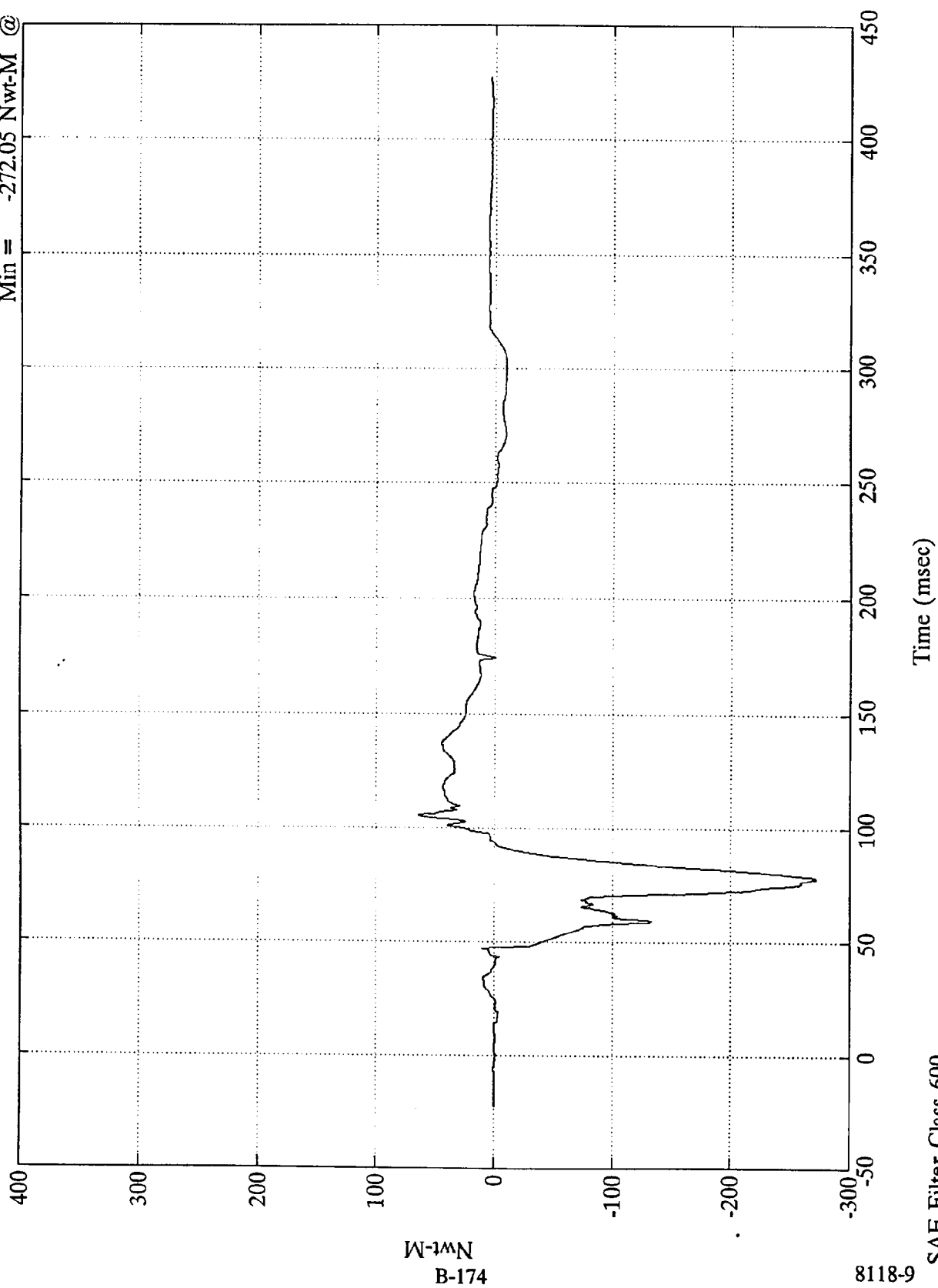
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P2 Lt Upper Tibia Mx

Max = 64.24 Nwt-M @ 105.60 msec
Min = -272.05 Nwt-M @ 78.36 msec



B-174

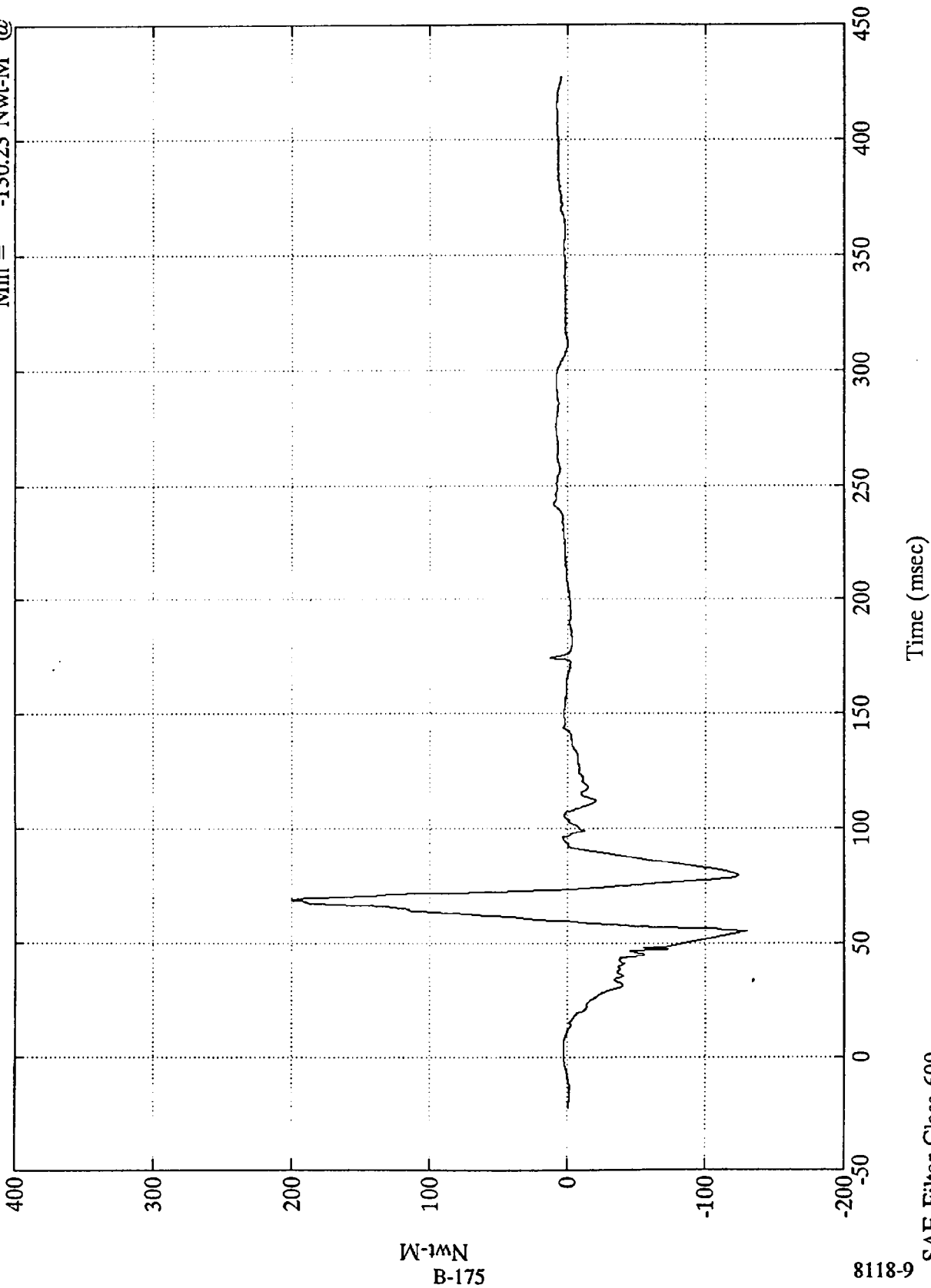
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P2 Lt Upper Tibia My

Max = 199.96 Nwt-M @ 68.52 msec
Min = -130.23 Nwt-M @ 55.20 msec



SAE Filter Class 600

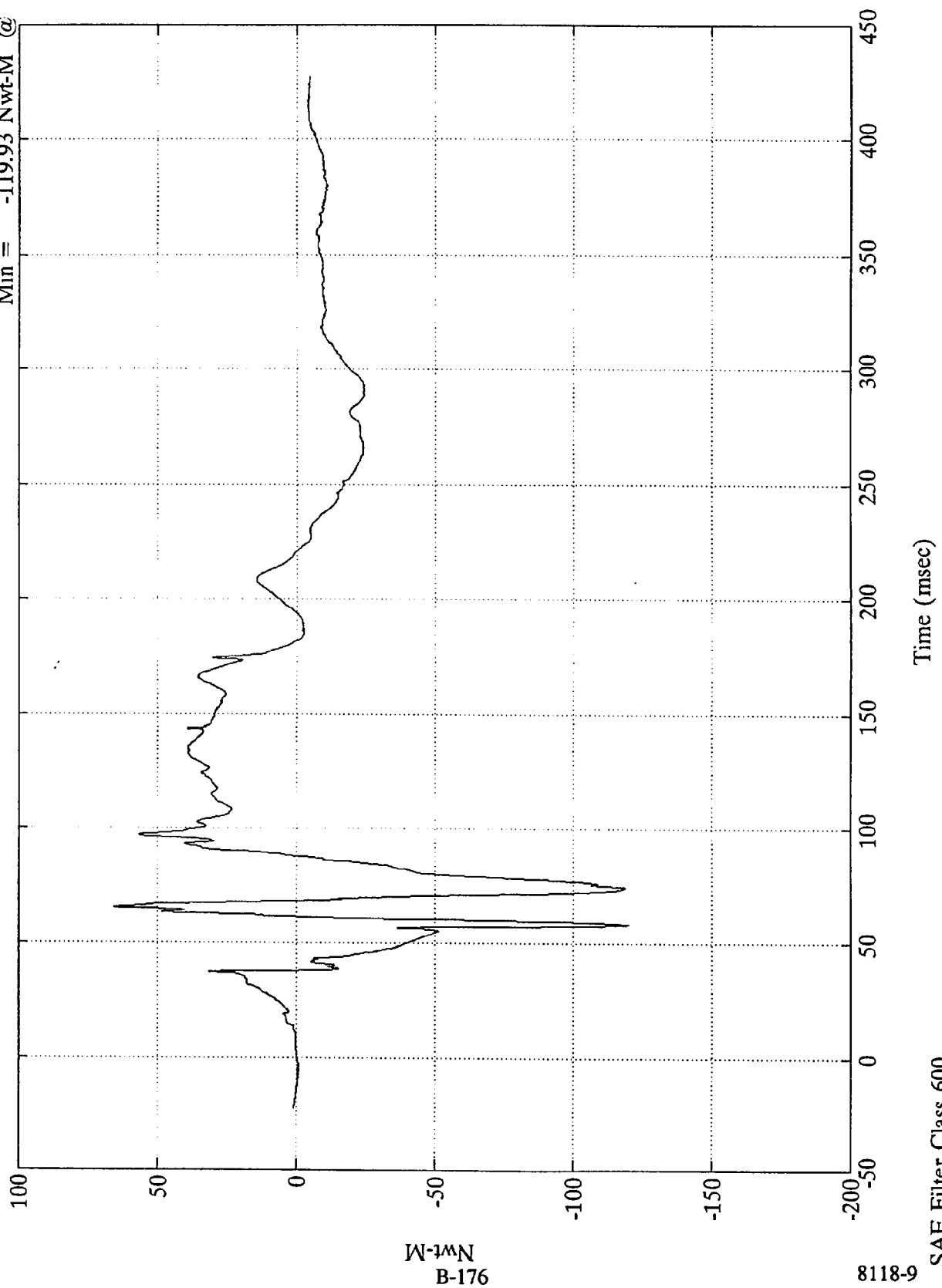
8118-9

B-175

VTV TEST #9

V1-P2 Rt Upper Tibia Mx

Max = 65.89 Nwt-M @ 65.40 msec
Min = -119.93 Nwt-M @ 58.43 msec



B-176
Nwt-M

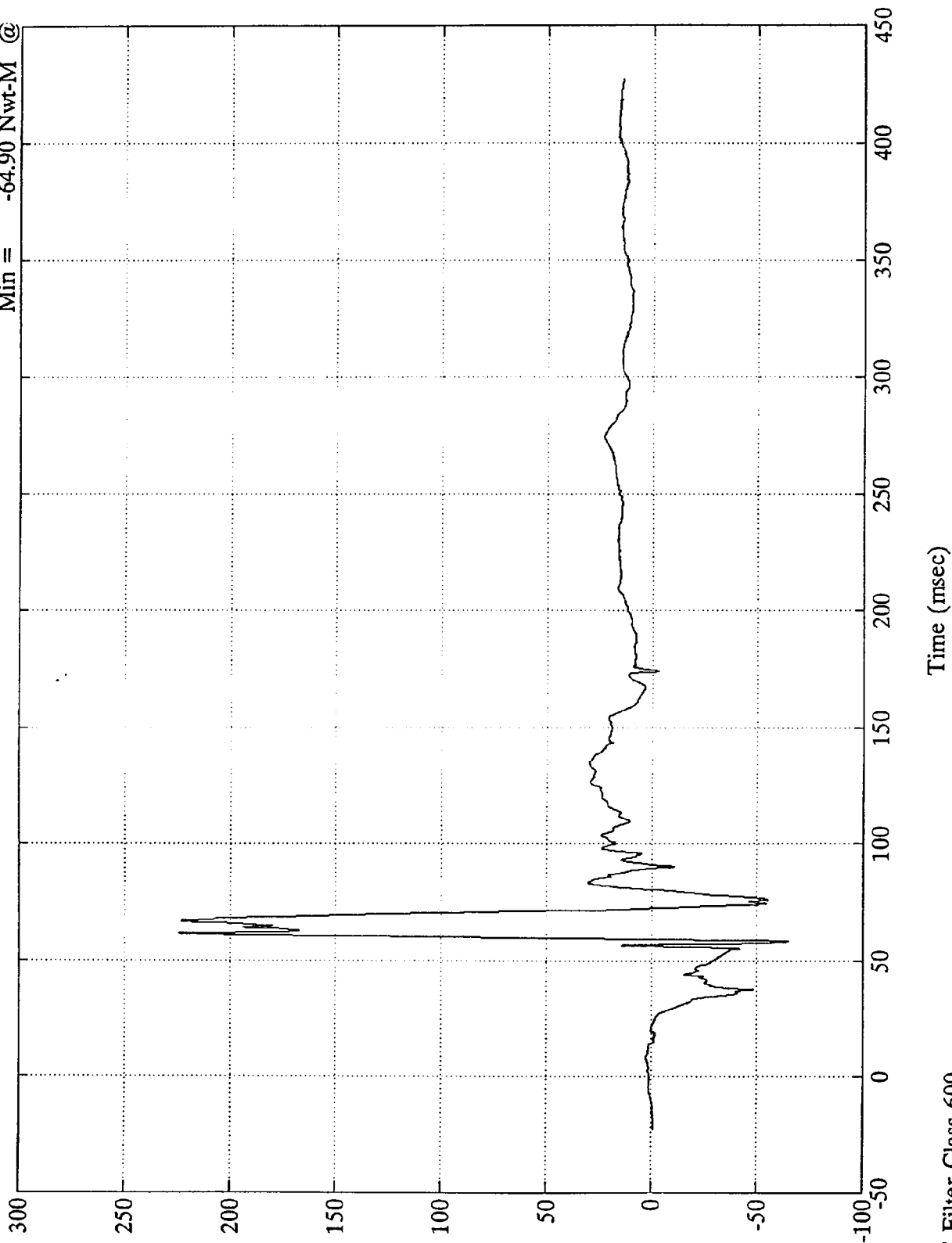
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P2 Rt Upper Tibia My

Max = 224.52 Nwt-M @ 61.56 msec
Min = -64.90 Nwt-M @ 58.43 msec



Nwt-M
B-177

8118-9

SAE Filter Class 600

VTV TEST #9

$\times 10^4$

V1-P2 Lt Lower Tibia Fy

Max =

1050.63 Nwt

@

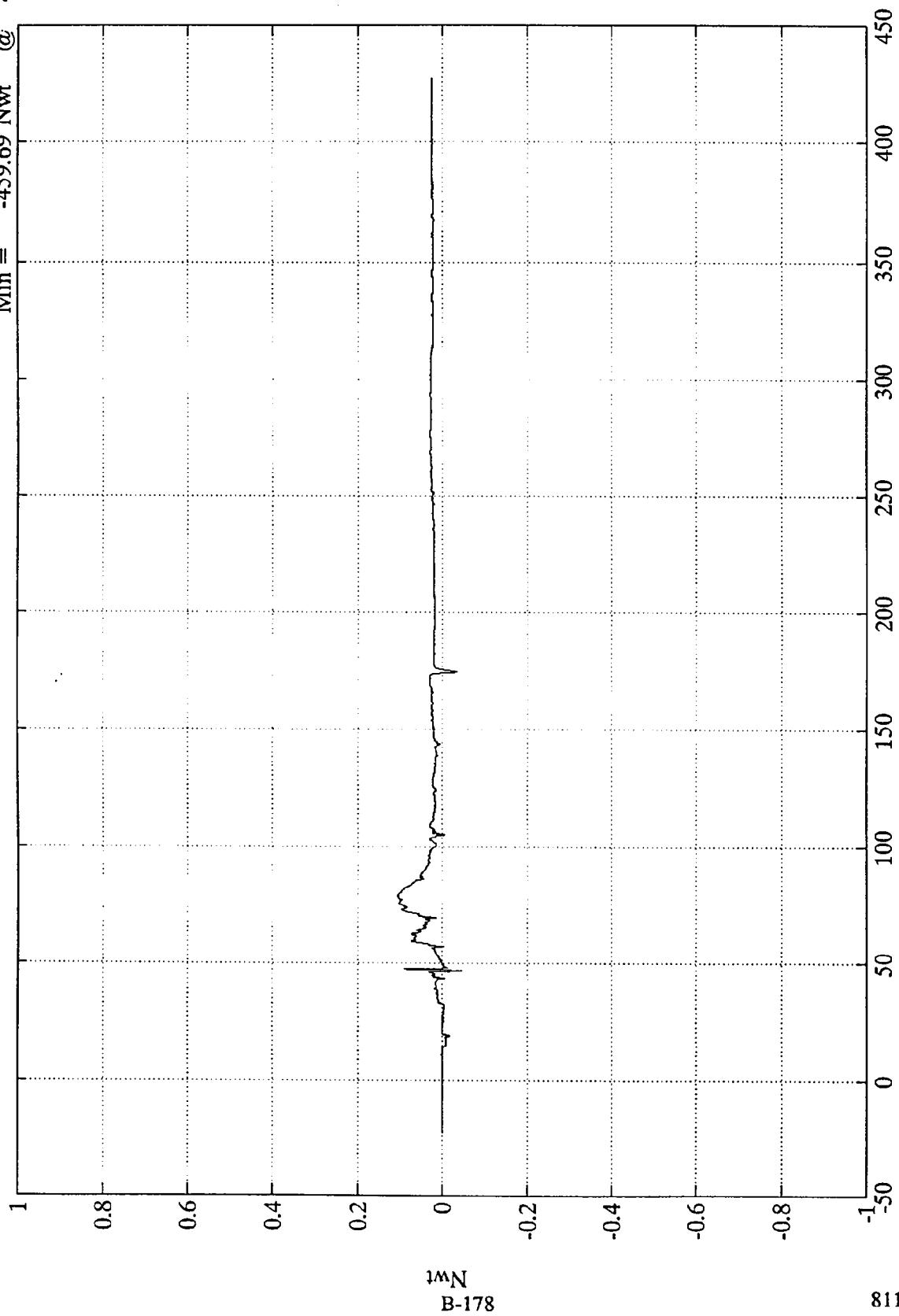
78.48 msec

Min =

-459.69 Nwt

@

46.80 msec



1wN
B-178

Time (msec)

8118-9

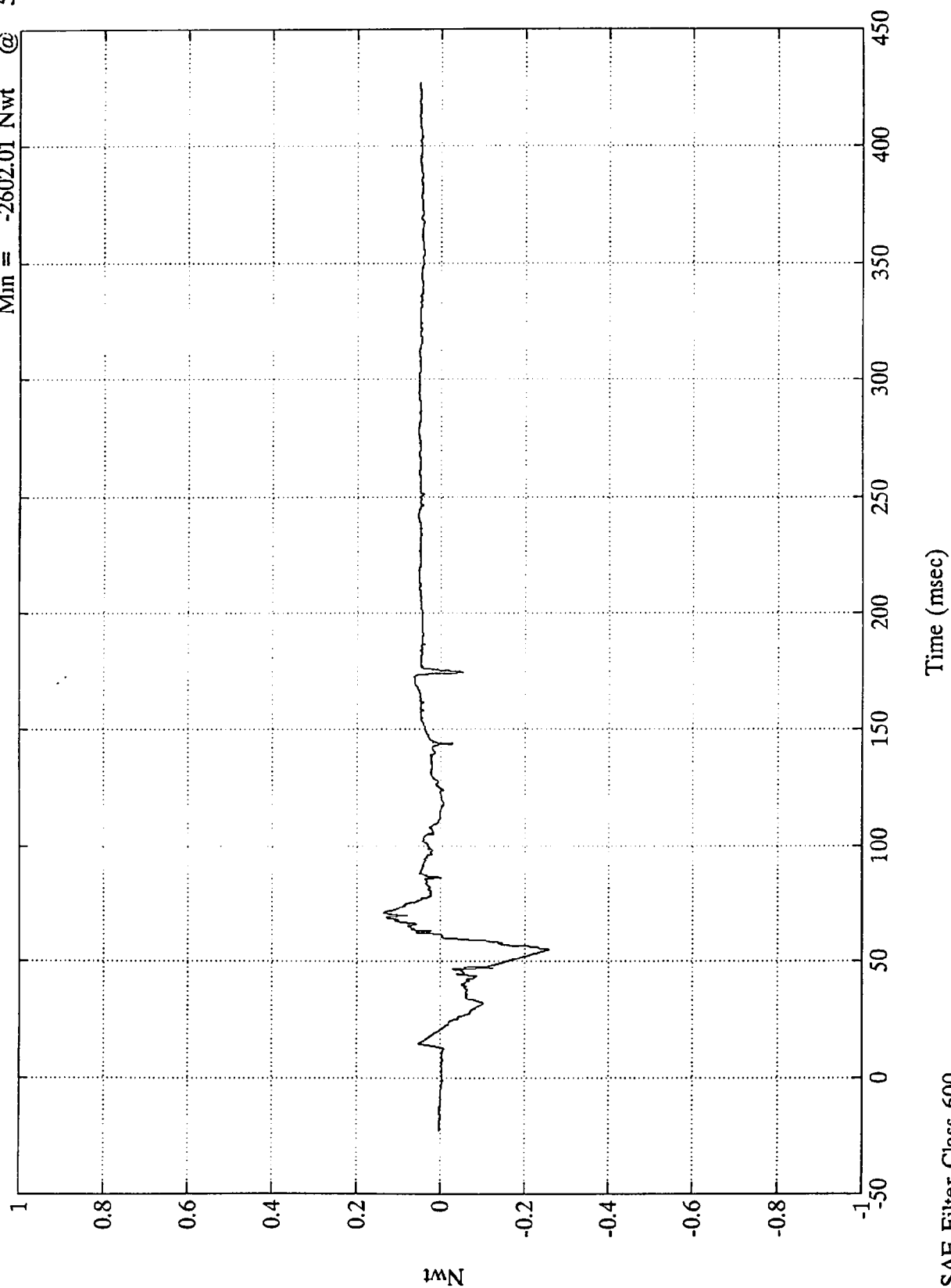
SAE Filter Class 600

VTV TEST #9

$\times 10^4$

V1-P2 Lt Lower Tibia Fz

Max = 1337.97 Nwt @ 70.79 msec
Min = -2602.01 Nwt @ 54.96 msec



1Nwt

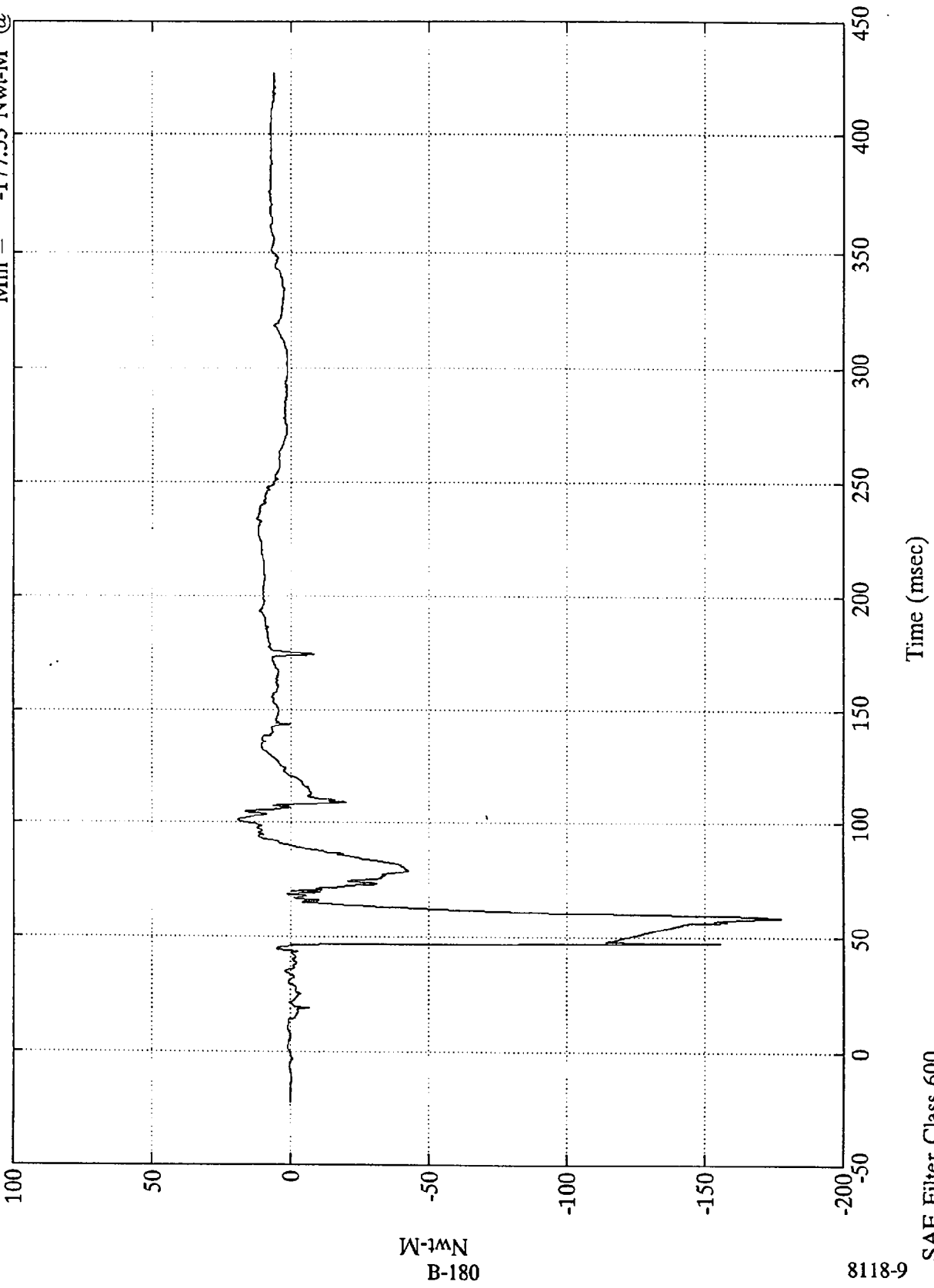
B-179

8118-9

SAE Filter Class 600

VTV TEST #9

V1-P2 Lt Lower Tibia Mx
Max = 19.16 Nwt-M @ 101.04 msec
Min = -177.53 Nwt-M @ 58.68 msec



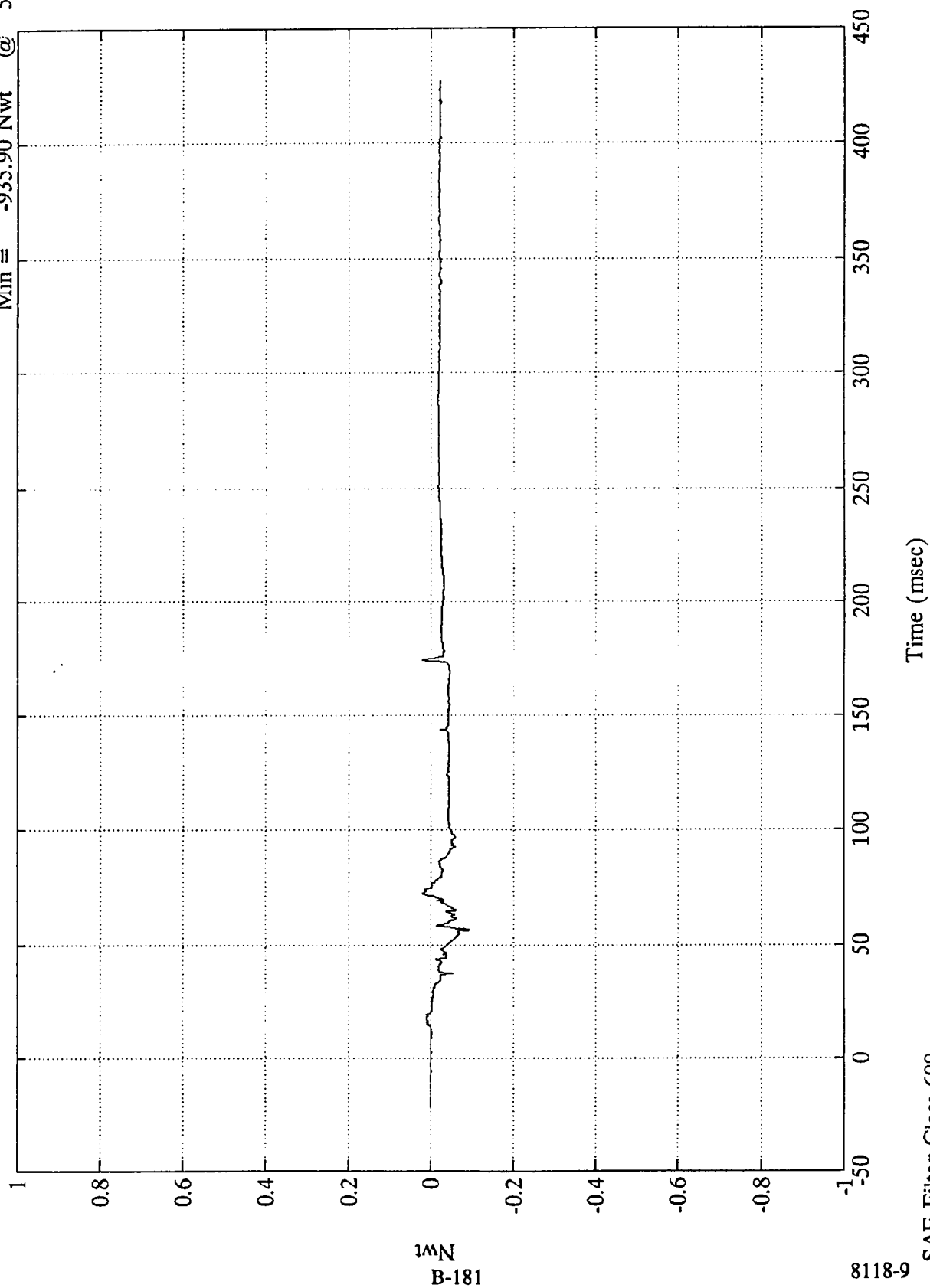
Nwt-M
B-180

VTV TEST #9

$\times 10^4$

V1-P2 Rt Lower Tibia Fy

Max = 236.08 Nwt @ 174.24 msec
Min = -935.90 Nwt @ 56.88 msec



B-181

8118-9

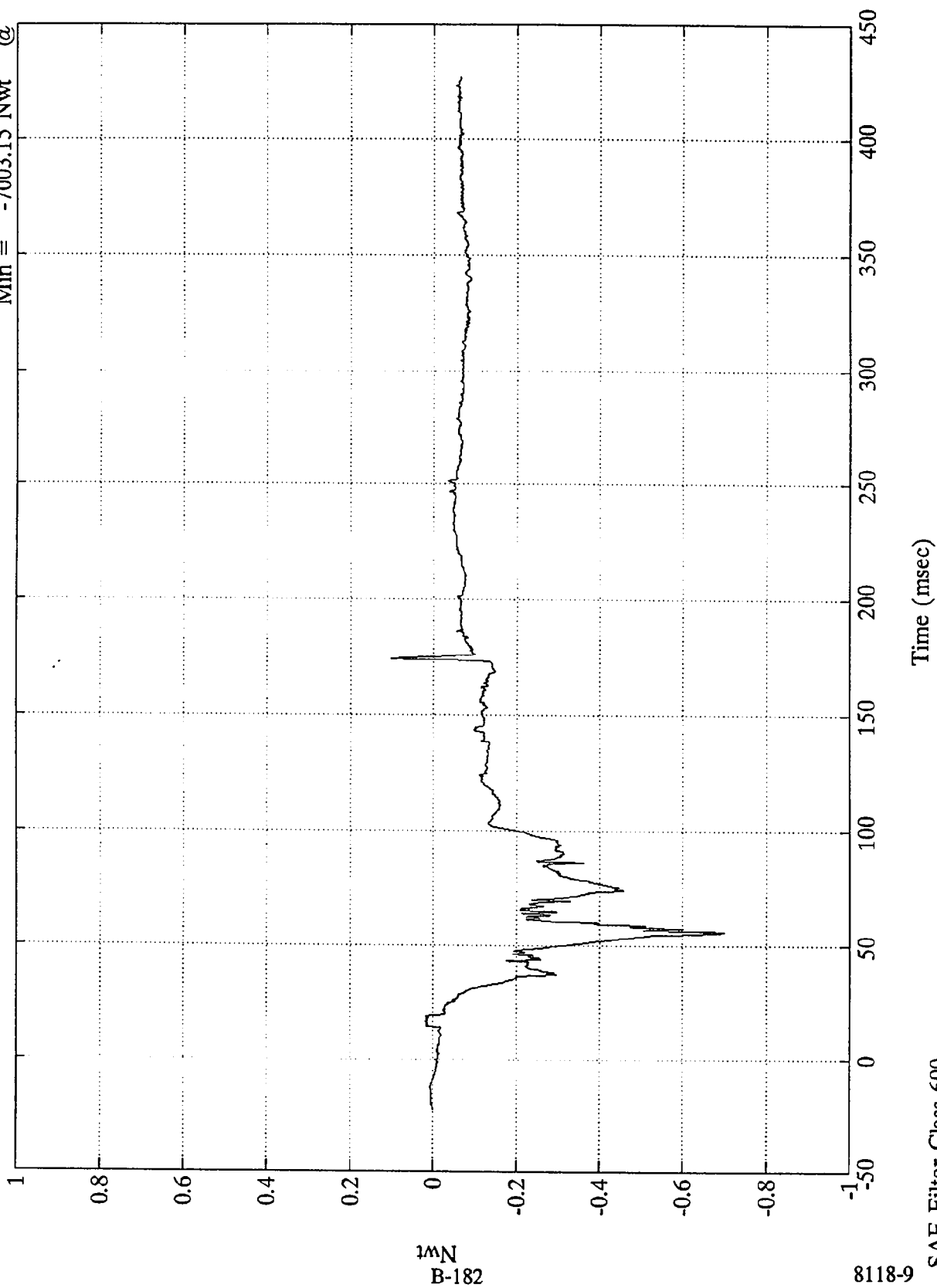
SAE Filter Class 600

VTV TEST #9

$\times 10^4$

V1-P2 Rt Lower Tibia Fz

Max = 1024.38 Nwt @ 174.24 msec
Min = -7003.15 Nwt @ 56.04 msec



B-182

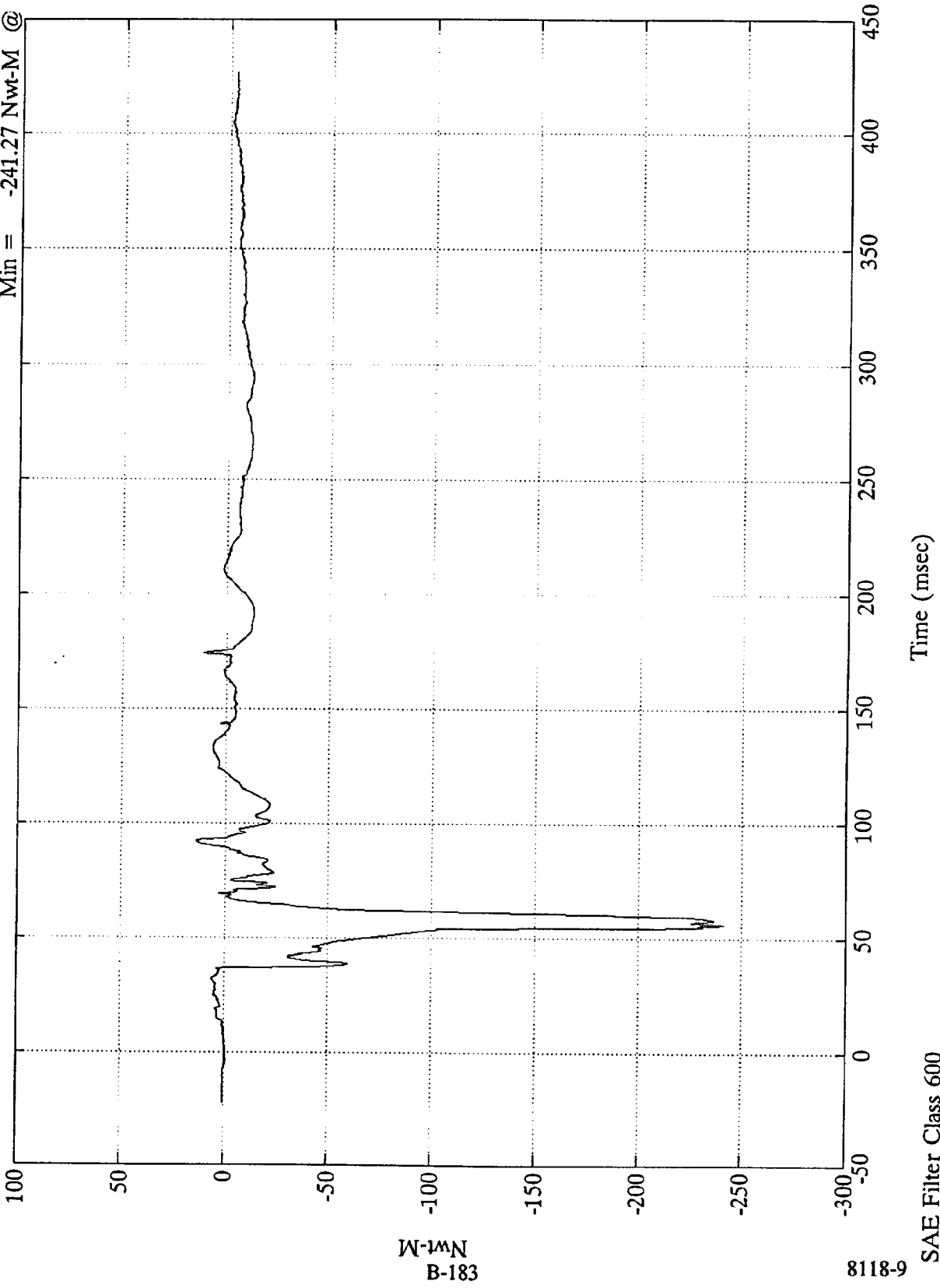
8118-9

SAE Filter Class 600

VTV TEST #9

V1-P2 Rt Lower Tibia Mx

Max = 13.86 Nwt-M @ 92.27 msec
Min = -241.27 Nwt-M @ 56.04 msec



Nwt-M
B-183

8118-9

SAE Filter Class 600

APPENDIX C

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

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

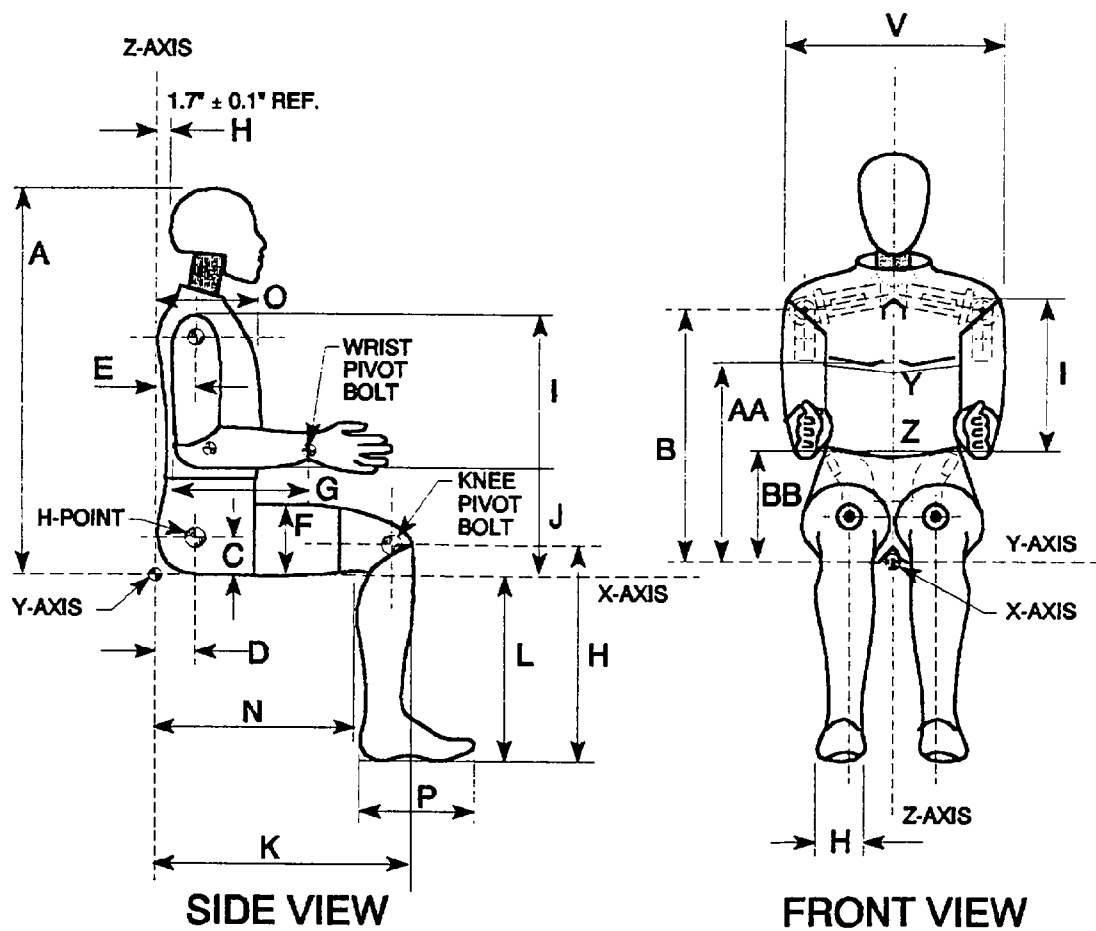
The tests were conducted at the Dummy Certification Test Facility of Calspan Corporation, Advanced Technology Center. A summary of the test results, and Part 572 specifications are included in the Appendix.

Dummy serial numbers and certification dates are:

<u>Serial No.</u>	<u>Completion Date</u>
150	3-22-94
245	9-10-94

FIGURE 9

EXTERNAL DIMENSIONS SETUP SPECIFICATIONS



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

VEHICLE 1, POSITION 1 - DRIVER DUMMY

Manufacturer: Humanoid

Serial No.: 150

HYBRID III EXTERNAL DIMENSIONS

S/N 150 HUMANOID

DUMMY SERIAL NO. 150

DATE: 3/22/94

TEMPERATURE		69 DEG. F
RELATIVE HUMIDITY		31 %
LOCATION FOR CHEST CIRCUMFERENCE (AA)	16.9-17.1 IN	17.0 IN
LOCATION FOR WAIST CIRCUMFERENCE (BB)	8.9-9.1 IN	9.0 IN
CHEST CIRCUMFERENCE (Y)	38.2-39.4 IN	39.3 IN
WAIST CIRCUMFERENCE (Z)	32.1-34.1 IN	34.0 IN
CHEST DEPTH (O)	8.4-9.0 IN	8.4 IN
H-POINT HEIGHT (C)	3.3-3.5 IN	3.5 IN
H-POINT FROM SEAT BACK (D)	5.3-5.5 IN	5.4 IN
SKULL CAP TO BACKLINE (H)	1.6-1.8 IN	1.7 IN
TOTAL SITTING HEIGHT (A)	34.6-35.0 IN	34.7 IN
THIGH CLEARANCE (F)	5.5-6.1 IN	5.6 IN
BUTTOCK KNEE LENGTH (K)	22.8-23.8 IN	23.3 IN
BUTTOCK POPLITAL LENGTH (N)	17.8-18.8 IN	18.5 IN
POPLITEAL LENGTH (L)	16.9-17.9 IN	17.8 IN
KNEE PIVOT HEIGHT (M)	19.1-19.7 IN	19.7 IN
FOOT LENGTH (P)	9.9-10.5 IN	10.2 IN
FOOT BREADTH (W)	3.6-4.2 IN	3.8 IN
SHOULDER PIVOT FROM BACKLINE (E)	3.3-3.7 IN	3.7 IN
SHOULDER BREADTH (V)	16.6-17.2 IN	16.9 IN
SHOULDER PIVOT HEIGHT (B)	19.9-20.5 IN	20.2 IN
ELBOW REST HEIGHT (J)	7.5-8.3 IN	8.2 IN
SHOULDER-ELBOW LENGTH (I)	13.0-13.6 IN	13.3 IN
BACK OF ELBOW TO WRIST PIVOT (G)	11.4-12.0 IN	11.5 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN: IVAN MINKIEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

HEAD DROP TEST

HYBRID III

DATE : 3/3/94

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 150 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	29 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	239.5 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	4.9 G'S
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

NECK FLEXION TEST

HYBRID III

DATE : 3/22/94

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN:150 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70 DEG. F
RELATIVE HUMIDITY		10% - 70%	33 %
IMPACT VELOCITY		22.60 - 23.40 FPS	23.1 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	23.98 G'S
	20 MS	17.60 - 22.60 G'S	22.24 G'S
	30 MS	12.50 - 18.50 G'S	18.43 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	18.43 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	40.38 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	73.87 DEG.
	TIME	57 - 64 MS	59.5 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.-LBS.	77.92 FT.-LBS.
	TIME	47 - 58 MS	54.38 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	117.25 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	97.13 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

NECK FLEXION TEST

HYBRID III

DATE : 3/22/94

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN:150 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70 DEG. F
RELATIVE HUMIDITY		10% - 70%	33 %
IMPACT VELOCITY		22.60 - 23.40 FPS	20.2 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	17.6 G'S
	20 MS	17.60 - 22.60 G'S	16.79 G'S
	30 MS	12.50 - 18.50 G'S	15.51 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	15.51 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	43.75 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	88.19 DEG.
	TIME	57 - 64 MS	76.25 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.-LBS.	-51.43 FT.-LBS.
	TIME	47 - 58 MS	71.63 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	152.88 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	131.25 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 3/1/94

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN 150 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	69 - 72 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	26 %
PENDULUM VELOCITY	21.6 - 22.4 FT/SEC	21.6 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.53 INCHES
MAXIMUM RESISTIVE FORCE	1160 - 1325 POUNDS	1311 POUNDS
INTERNAL HYSTERESIS	69% - 85%	72.1 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 3/3/94

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 150 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	29 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.0 FT/SEC
PEAK KNEE IMPACT FORCE	1060 - 1300 LBS.	1178 LBS.
PROBE WEIGHT	11 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 3/3/94

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 150 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	29 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.0 FT/SEC
PEAK KNEE IMPACT FORCE	1060 - 1300 LBS.	1144 LBS.
PROBE WEIGHT	11 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY I.D. NUMBER: 150

A. DUMMY INSTRUMENTS

1. HEAD ACCELEROMETER

HX LONGITUDINAL

HY LATERAL

HZ VERTICAL

2. CHEST ACCELEROMETER

CX LONGITUDINAL

CY LATERAL

CZ VERTICAL

3. FEMUR LOAD CELLS

LEFT SIDE

RIGHT SIDE

MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
ENDEVCO	AF5B3	8/94	2/95
ENDEVCO	AF5F7	8/94	2/95
ENDEVCO	AF5E1	8/94	2/95
ENDEVCO	A12C	4/94	10/94
ENDEVCO	A60C	4/94	10/94
ENDEVCO	A84G	4/94	10/94
GSE	951	7/94	1/95
GSE	952	7/94	1/95

B. CALIBRATION LABORATORY
INSTRUMENTS

1. PENDULUM ACC.

2. TEST PROBE
ACCELEROMETER

3. LUMBAR FLEXION TEST
PUSH FORCE GAUGE

4. ABDOMINAL COMPRESS.
TEST FORCE GAUGE

5. ABDOMINAL COMPRESS.
TEST FORCE GAUGE

MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
CEC	A160	6/94	12/94
CEC	A161	7/94	1/95
TRANS- DUCER INC	20051	6/94	12/94
BLH	72952	6/94	12/94
CIC	567-11	6/94	12/94

VEHICLE 1, POSITION 2 - FRONT PASSENGER DUMMY

Manufacturer: Humanoid

Serial No.: 245

HYBRID III EXTERNAL DIMENSIONS

S/N 245 HUMANOID

DUMMY SERIAL NO. 245

DATE: 9/10/94

TEMPERATURE		20.5 DEG. C
RELATIVE HUMIDITY		51 %
LOCATION FOR CHEST CIRCUMFERENCE (AA)	429-434 mm	431 mm
LOCATION FOR WAIST CIRCUMFERENCE (BB)	226-231 mm	228 mm
CHEST CIRCUMFERENCE (Y)	970-1001 mm	998 mm
WAIST CIRCUMFERENCE (Z)	815-866 mm	863 mm
CHEST DEPTH (O)	213-229 mm	213 mm
H-POINT HEIGHT (C)	84-89 mm	89 mm
H-POINT FROM SEAT BACK (D)	135-140 mm	137 mm
SKULL CAP TO BACKLINE (H)	41-46 mm	43 mm
TOTAL SITTING HEIGHT (A)	879-889 mm	889 mm
THIGH CLEARANCE (F)	140-155 mm	152 mm
BUTTOCK KNEE LENGTH (K)	580-605 mm	596 mm
BUTTOCK POPLITAL LENGTH (N)	452-477 mm	464 mm
POPLITEAL LENGTH (L)	430-455 mm	447 mm
KNEE PIVOT HEIGHT (M)	485-501 mm	487 mm
FOOT LENGTH (P)	252-267 mm	256 mm
FOOT BREADTH (W)	91-107 mm	96 mm
SHOULDER PIVOT FROM BACKLINE (E)	84-94 mm	89 mm
SHOULDER BREADTH (V)	422-437 mm	426 mm
SHOULDER PIVOT HEIGHT (B)	505-521 mm	518 mm
ELBOW REST HEIGHT (J)	190-211 mm	205 mm
SHOULDER-ELBOW LENGTH (I)	330-345 mm	335 mm
BACK OF ELBOW TO WRIST PIVOT (G)	290-305 mm	294 mm

DUMMY MEETS SPECIFICATIONS

TECHNICIAN: IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

HEAD DROP TEST

HYBRID III

DATE : 8/30/94

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 245 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	49 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	249.7 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	6.9 G'S
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST

HYBRID III

DATE : 9/2/94

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN:245 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	69 DEG. F
RELATIVE HUMIDITY		10% - 70%	52 %
IMPACT VELOCITY		19.50 - 20.30 FPS	20.1 FPS
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	19.36 G'S
	20 MS	14.00 - 19.00 G'S	18.55 G'S
	30 MS	11.00 - 16.00 G'S	15.82 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	15.82 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	45.25 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	88.82 DEG.
	TIME	72 - 82 MS	73.13 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-59.0/-39.0 FT.-LBS.	-57.71 FT.-LBS.
	TIME	65 - 79 MS	68 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	147 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	123.63 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

NECK FLEXION TEST

HYBRID III

DATE : 8/31/94

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN:245 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70 DEG. F
RELATIVE HUMIDITY		10% - 70%	53 %
IMPACT VELOCITY		22.60 - 23.40 FPS	23 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	26.61 G'S
	20 MS	17.60 - 22.60 G'S	22.43 G'S
	30 MS	12.50 - 18.50 G'S	16.78 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	16.78 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	41.25 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	72.41 DEG.
	TIME	57 - 64 MS	59.13 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.-LBS.	76.18 FT.-LBS.
	TIME	47 - 58 MS	54.13 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	118.63 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	97 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 8/29/94

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN 245 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	69 - 72 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	50 %
PENDULUM VELOCITY	21.6 - 22.4 FT/SEC	21.6 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.55 INCHES
MAXIMUM RESISTIVE FORCE	1160 - 1325 POUNDS	1307 POUNDS
INTERNAL HYSTERESIS	69% - 85%	73.2 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 9/9/94

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 245 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	56 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.0 FT/SEC
PEAK KNEE IMPACT FORCE	1060 - 1300 LBS.	1166 LBS.
PROBE WEIGHT	11 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 9/9/94

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 245 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	56 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.0 FT/SEC
PEAK KNEE IMPACT FORCE	1060 - 1300 LBS.	1086 LBS.
PROBE WEIGHT	11 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY I.D. NUMBER: 045

A. DUMMY INSTRUMENTS

1. HEAD ACCELEROMETER

HX LONGITUDINAL

HY LATERAL

HZ VERTICAL

2. CHEST ACCELEROMETER

CX LONGITUDINAL

CY LATERAL

CZ VERTICAL

3. FEMUR LOAD CELLS

LEFT SIDE

RIGHT SIDE

MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
ENDEVCO	ADL50	8/94	2/95
ENDEVCO	A59J	8/94	2/95
ENDEVCO	A73A	8/94	2/95
ENDEVCO	ADL98	8/94	2/95
ENDEVCO	AC209	8/94	2/95
ENDEVCO	ADMB6	8/94	2/95
GSE	954	7/94	1/95
GSE	955	7/94	1/95

B. CALIBRATION LABORATORY
INSTRUMENTS

1. PENDULUM ACC.

2. TEST PROBE
ACCELEROMETER

3. LUMBAR FLEXION TEST
PUSH FORCE GAUGE

4. ABDOMINAL COMPRESS.
TEST FORCE GAUGE

5. ABDOMINAL COMPRESS.
TEST FORCE GAUGE

MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
CEC	A160	6/94	12/94
CEC	A161	7/94	1/95
TRANS- DUCER INC	20051	6/94	12/94
BLH	72952	6/94	12/94
CIC	567-11	6/94	12/94