

DOT # 1770

CALSPAN REPORT NUMBER: 7942-10

VEHICLE-TO-VEHICLE FRONTAL 70% OVERLAP
36 MPH IMPACT OF A
1992 CHEVROLET CORSICA LT 4-DOOR SEDAN AND A
1991 HONDA ACCORD DX 4-DOOR SEDAN

CALSPAN TEST NUMBER: Y43-9-1228

October 23, 1992

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FINAL REPORT

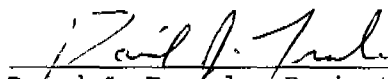
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16. Abstract A vehicle-to-vehicle frontal 36 mph test containing a 70% overlapped 1992 Chevrolet Corsica LT 4-Door Sedan into a 70.3% overlapped 1991 Honda Accord DX 4-Door Sedan was performed at the Calspan Corporation Advanced Technology Center Crash Test Facility in Buffalo, NY on October 23, 1992. Active impact speed was 36.5 mph for each vehicle and the ambient temperature at the time of impact was 64°F. Vehicle number one, a 1992 Chevrolet Corsica LT 4-Door Sedan, contained one Hybrid III dummy in the driver seating position. The dummy was restrained using the vehicle's 3-point seat belt restraint system along with a driver side airbag. The driver's HIC was 852 and 3 millisecond clipped chest g's were 57.2. The left femur load was 975 lbs. and right femur load was 1544 lbs. Vehicle number two, a 1991 Honda Accord DX 4-Door Sedan, contained one Hybrid III dummy in the driver seating position. The dummy was restrained using the vehicle's manual lap and automatic torso belts. The driver's HIC was 793. The 3 millisecond clipped chest g's were 57.0 with femur loads of 2569 and 1905 lbs. on the left and right femur, respectively.					
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Section 1
PURPOSE AND TEST PROCEDURE

This 36 mph offset frontal vehicle-to-vehicle impact test is part of the Crashworthiness Testing and Analysis Program sponsored by the Research and Special Programs Administration under Contract No. DTRS57-90-C-00104. The purpose of this Technical Task Directive (TTD 2) is to obtain responses from vehicles and restrained Hybrid III dummies during car-to-car overlapped frontal crashes.

This test was performed using a 1992 Chevrolet Corsica LT 4-Door Sedan and a 1991 Honda Accord DX 4-Door Sedan. The vehicles, each traveling at 36 mph, were positioned at a 70% overlap of the vehicle 1 width as measured at its widest point.

Vehicle number one, the Chevrolet Corsica, contained one Hybrid III dummy in the driver seating position. The dummy was restrained using the vehicle's air bag and 3-point seat belt restraint system.

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

Section 2
SUMMARY OF TEST

A 1992 Chevrolet Corsica LT 4-Door Sedan and a 1991 Honda Accord DX 4-Door Sedan were impacted into each other with each vehicle traveling 36.5 mph. The 1992 Chevrolet Corsica was offset such that 70% of its maximum width was engaged to the 1991 Honda Accord. Figure 1 of this report contains a sketch of the test layout. The test was performed at the Calspan Corporation Advanced Technology Center on October 23, 1992. Pre- and post-test photographs of both vehicles and dummies can be found in Appendix A of this report.

The vehicle-to-vehicle test was documented by one real-time camera and 15 high-speed cameras. Film analysis indicated the vehicles struck directly on the target point. Camera locations and other pertinent camera information can be found in Table 7 and Figure 12 of this report.

Vehicle 1, the 1992 Chevrolet Corsica LT, contained one Hybrid III 50th percentile male anthropomorphic test device (ATD) in the driver seating position. Vehicle 2 (1991 Honda Accord DX) contained one Hybrid III 50th percentile male ATD in the driver seating position. The ATDs were restrained using the vehicle's own restraint systems after being placed in the vehicle following the dummy placement instructions specified in the Laboratory Inducant Test Procedure.

Both ATDs were instrumented with head and chest triaxial accelerometers, chest potentiometer, left/right femur load cells, neck transducers, and upper and lower tibia transducers. The vehicle 1 ATD was equipped with an experimental thorax which measured deflection at 4 locations using 8 string potentiometers.

The 85 channels of data were recorded on seven 14-channel FM tape recorders. Appendix B contains the vehicle and dummy response data traces. Test anomalies can be found on page 2-2.

The driver's head in Vehicle 1 had a HIC value of 852. The maximum chest deceleration over 3 milliseconds was 57.2 g's. The femur loads were 975 lbs. on the left and 1544 lbs. on the right. The vehicle 1 torso belt load was 814 lbs.

In Vehicle 2, the driver's HIC was 794. The maximum chest deceleration over 3 milliseconds was 57.0 g's with 1.8 inches of deflection. The left femur load was 2569 lbs. and 1905 lbs. on the right femur load. The Vehicle 2 torso belt load was 2112 lbs.

TEST ANOMALIES

Vehicle 1

Driver lower right tibia force y transducer did not record accurately during test. Reason unknown.

Driver chest displacement potentiometer contained 60 Hz. cycle noise superimposed on the data.

Driver lower left tibia moment x transducer exceeded its measurement capacity at approximately 56 to 61 milliseconds.

Vehicle 2

Driver upper right tibia moment x transducer cable was damaged after approximately 50 milliseconds.

Section 3

VEHICLE AND OCCUPANT INFORMATION

Figure 1

VEHICLE-TO-VEHICLE OVERLAP LAYOUT

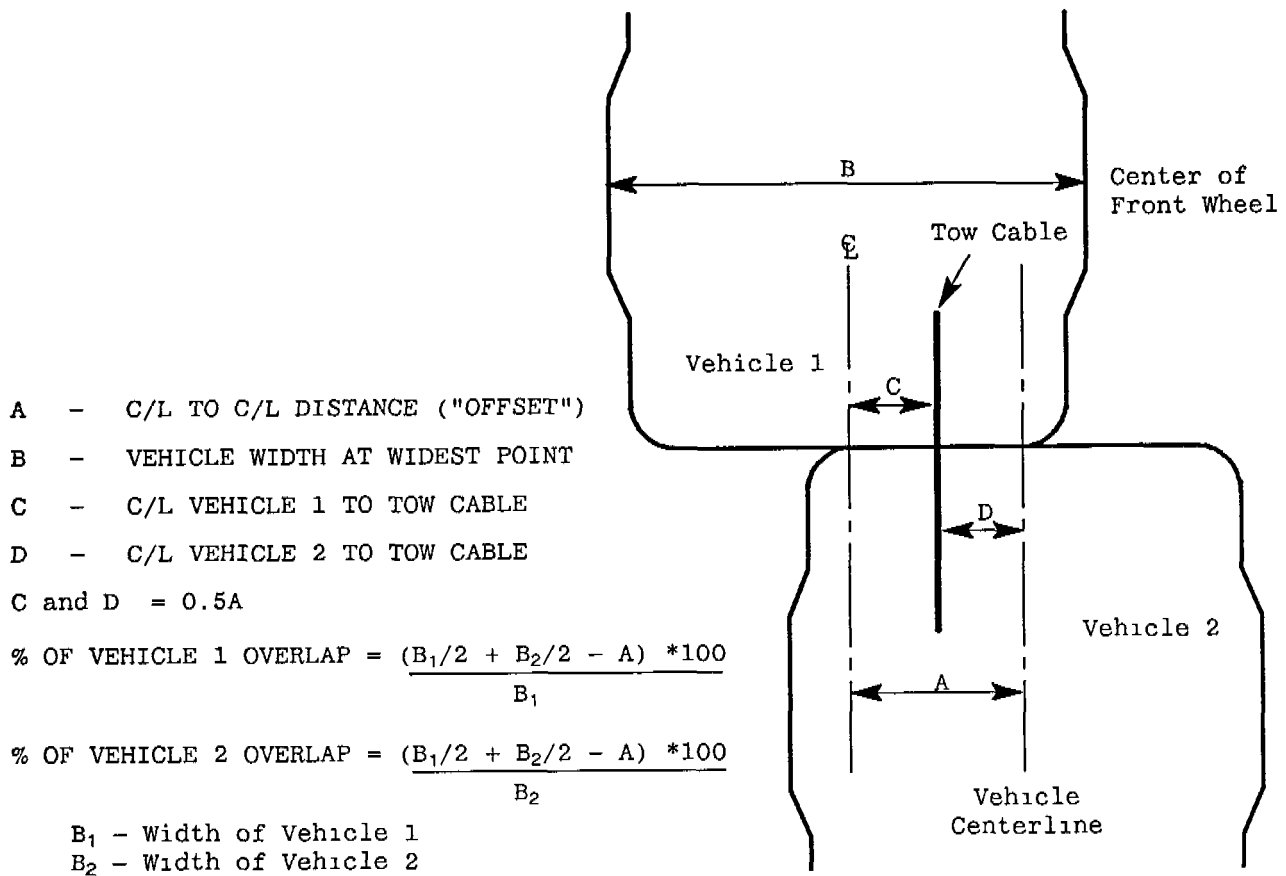


Table 1
VEHICLE-TO-VEHICLE OVERLAP MEASUREMENTS (in.)

Measurement Code	Vehicle 1 1992 Chevrolet Corsica	Vehicle 2 1991 Honda Accord
A	20.31	20.31
B	68.2	67.9
C	10.16	-
D	-	10.16
% Vehicle Overlap	70.0	70.3
Actual % Vehicle Overlap	70 0	70 3

VEHICLE ONE DATA

Table 2

GENERAL TEST AND VEHICLE 1 PARAMETER DATA

Vehicle Year/Make/Model/Body Style: 1992 Chevrolet Corsica LT 4-Door SedanNHTSA Test No.: - VIN.: 1G1LT5341NY194149Body Color: Blue Date of Manufacture: 02/92Engine: 4 Cylinders; - C.I.D.; 2.2 Liters; - CCX Gas; - Diesel; - Turbocharged- Longitudinal; X TransverseTransmission: 3 Speed; - Manual; X Automatic; - OverdriveFinal Drive: X Front Wheel; - Rear Wheel; - Four Wheel- A/C; X P/S; X P/B; - P/wdo;
ALB Disk & Drum- Tilt Wheel - P/seats; - Cruise ControlType of Occupant Restraint: Airbag; 3-point manual seat beltDATA RECORDED FROM VEHICLE'S TIRE PLACARD:Tire Pressure (at capacity): Front 30 psi, Rear 30 psiRecommended Tire Size P185/75R14Recommended Cold Tire Pressure: Front 30 psi, Rear 30 psiTires on Vehicle: P185/75R14; Manufacturer: Goodyear InvictaNumber of Occupants: 2 Front; 3 Rear; - 3rd Seat; 5 TOTALType of Front Seats: X Bucket; - Bench; - Split BenchType of Front Seat Back: - Fixed; X Adj. With X Lever - Rot. KnobVehicle Capacity Weight (VCW) = 891 lbs. (A)No. of Occupants x 150 lbs. = 750 lbs. (B)

Rated Cargo and Luggage

Weight (RCLW) A-B = 141 lbsGVWR 3635 lbs CAWR: Front 1904 lbs. Rear 1731 lbs

Table 2

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

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

Right Front = 850 lbs. Right Rear = 490 lbs.
 Left Front = 840 lbs. Left Rear = 500 lbs.
 TOTAL FRONT WEIGHT = 1690 lbs. (63.1% of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 990 lbs. (36.9% of Total Vehicle Weight)
 TOTAL DELIVERED WEIGHT = 2680 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMY:

Right Front = 780 lbs. Right Rear = 550 lbs.
 Left Front = 900 lbs. Left Rear = 640 lbs.
 TOTAL FRONT WEIGHT = 1680 lbs. (58.5% of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 1190 lbs. (41.4% of Total Vehicle Weight)
 TOTAL TEST WEIGHT = 2870 lbs.
 Weight of Ballast Secured in Vehicle Trunk Area = 0 lbs.

TEST VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 26.4: LF 26.3: RR 27.6: LR 27.3
 Test Attitude: RF 27.3: LF 26.6: RR 26.6: LR 25.6
 Vehicle's Wheel Base = 103.9 in.
 Location of Vehicle's C.G. = 42.8 inches rearward of front wheel center

Table 2

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

POST-IMPACT DATA:

Type of Test: 70% Overlapped Frontal Impact Angle: 0°
 Date of Test: October 23, 1992 Time of Test: 14:45
 Ambient Temperature: 64 °F at impact area
 Temperature in Occupant Compartment: 70 °F
 Windshield Molding Temperature: - °F
 Required Impact Velocity Range: 35.0 to 37.0 mph
 Impact Velocity: primary = 36.5 mph, secondary = 36.6 mph
 Distance From Front Bumper to Barrier Face When
 Entering Speed Trap: 52 inches
 Exiting Speed Trap: 12 inches

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	Face with airbag; <u>rear of head with headrest</u>	<u>N/A</u>
Chest	<u>Airbag</u>	<u>N/A</u>
Abdomen	<u>No contact</u>	<u>N/A</u>
Left Knee	<u>Lower dashpanel</u>	<u>N/A</u>
Right Knee	<u>Lower dashpanel</u>	<u>N/A</u>

COMMENTS:

Substantial instrument panel intrusion

	<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>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Seat Movement				
Seat Back Failure	<u>None</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Seat Shift (in)	<u>0.0</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>

Table 3
VEHICLE 1 DUMMY INJURY CRITERIA VALUES

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DUMMY (1)	-88	56	27	90	-57	15	16	57.2
DUMMY (2)	-	-	-	-	-	-	-	-
DUMMY (3)	-	-	-	-	-	-	-	-
DUMMY (4)	-	-	-	-	-	-	-	-

	MAXIMUM FORCE FEMUR LOAD (LBS.)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	1544	975
DUMMY (2)	-	-
DUMMY (3)	-	-
DUMMY (4)	-	-

	MAXIMUM FORCE SEAT BELT LOADS (LBS.)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)	814	-	-
DUMMY (2)	-	-	-
DUMMY (3)	-	-	-
DUMMY (4)	-	-	-

	HEAD INJURY CRITERIA (HIC)			
	HIC	t ₁ (SEC)	t ₂ (SEC)	Average Acceleration t ₁ TO t ₂
DUMMY (1)	851.5	.059400	.081600	68.2
DUMMY (2)	-	-	-	-
DUMMY (3)	-	-	-	-
DUMMY (4)	-	-	-	-

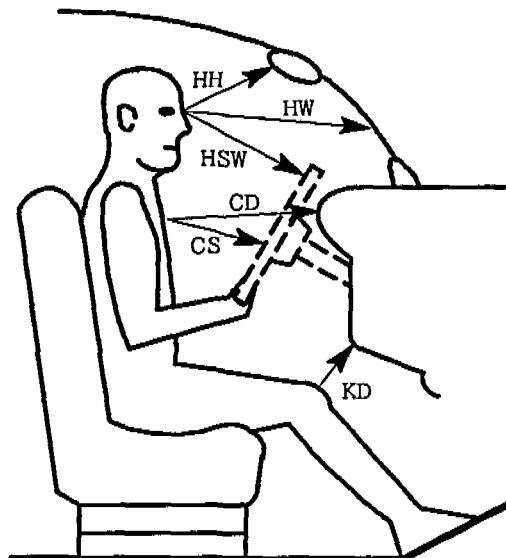
*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No 208

Figure 2

VEHICLE 1 OCCUPANT CLEARANCE DIMENSIONS (inches)

DRIVER	
HH	11.9
NW	23.7
NSW	13.8
NIP	19.6
NH	14.6
CD	19.5
CS	10.8
KDL	4.8
KDR	5.7
1	24.4
2	2.0
SA	See Note
PA	24°
ULA	114°
LLA	223°



H-POINT FROM TARGET POSITION	
Vertical	0.2" Below
Longitudinal	0.0"

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

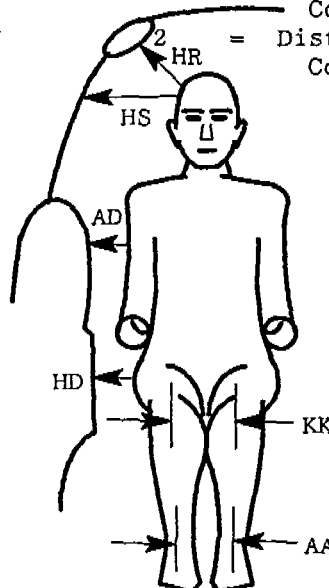
Angles taken relative to vertical

SA = Seat Back Angle

PA = Pelvic Angle

ULA = Upper Leg Angle

LLA = Lower Leg Angle



HR = Head to Side Roof

HS = Head to Side Window

AD = Arm to Door

HD = Hip to Door

KK = Knee to Knee

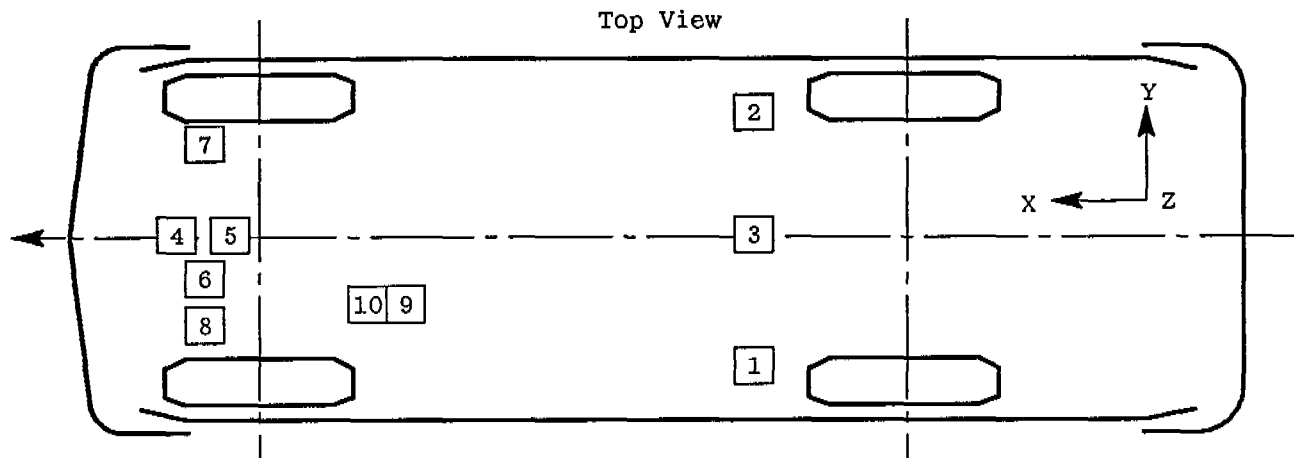
AA = Ankle to Ankle

DT = Dummy Temperature °F

DRIVER	
HR	6.8
HS	10.7
AD	3.9
HD	5.0
KK	9.4
AA	10.7
DT	70°F

Note. Seat back was positioned according to manufacturer specifications

Figure 3
SUMMARY OF VEHICLE 1 ACCELEROMETER DATA



Vehicle: 1992 Chevrolet Corsica LT 4-Door Sedan

Loc. No.	Description	Axis	Maximum Value (g's)*	
			"-"	"+"
1	Rear seat crossmember left side	x	-34	4
2	Rear seat crossmember right side	x	-32	2
3	Rear seat crossmember centerline, X	x	-36	6
3	Rear seat crossmember centerline, Y	y	-4	10
3	Rear seat crossmember centerline, Z	z	-15	12
4	Top of engine block	x	-84	30
4	Top of engine block	z	-2	15
5	Bottom of engine block	x	-114	90
6	Front suspension crossmember	x	-80	15
6	Front suspension crossmember	z	-20	22
7	Right front brake caliper	x	-49	4
8	Left front brake caliper	x	-158	41
9	Brake pedal	x	-130	59
9	Brake pedal	z	-32	36
10	Toe pan	x	-90	64

*Values filtered using SAE class 60 filter

Figure 4

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

Test Description: 36 mph Offset Frontal Vehicle-to-Vehicle Impact

Test Vehicle: 1992 Chevrolet Corsica LT 4-Door Sedan

Reference Plane: Vehicle plane at rear bumper

Accelerometer Description	LONGITUDINAL LOCATION (in.)		
	Pre-Test	Post-Test	Change
Rear seat crossmember left side	65.6	65.6	0.0
Rear seat crossmember right side	65.6	65.6	0.0
Rear seat crossmember centerline	68.6	68.6	0.0
Top of engine block	153.0	142.0	11.0
Bottom of engine block	144.2	136.5	7.7
Front suspension crossmember	133.3	129.1	4.2
Right front brake caliper	141.5	139.3	2.2
Left front brake caliper	141.5	125.1	16.4
Toe pan	128.8	118.9	9.9
Brake pedal	127.8	119.7	8.1

Figure 5
 VEHICLE 1 TARGET LOCATIONS
 (All dimensions in inches)

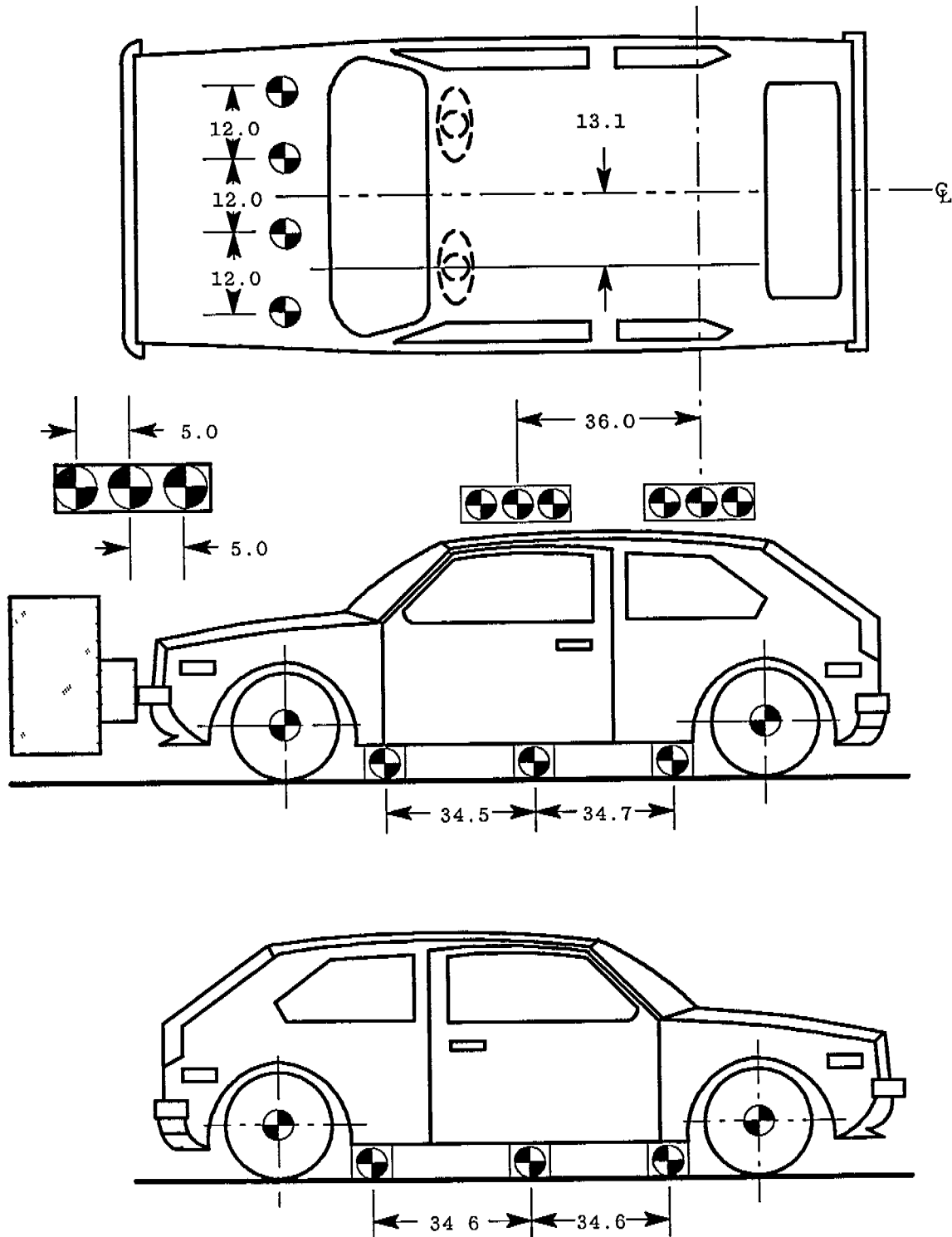
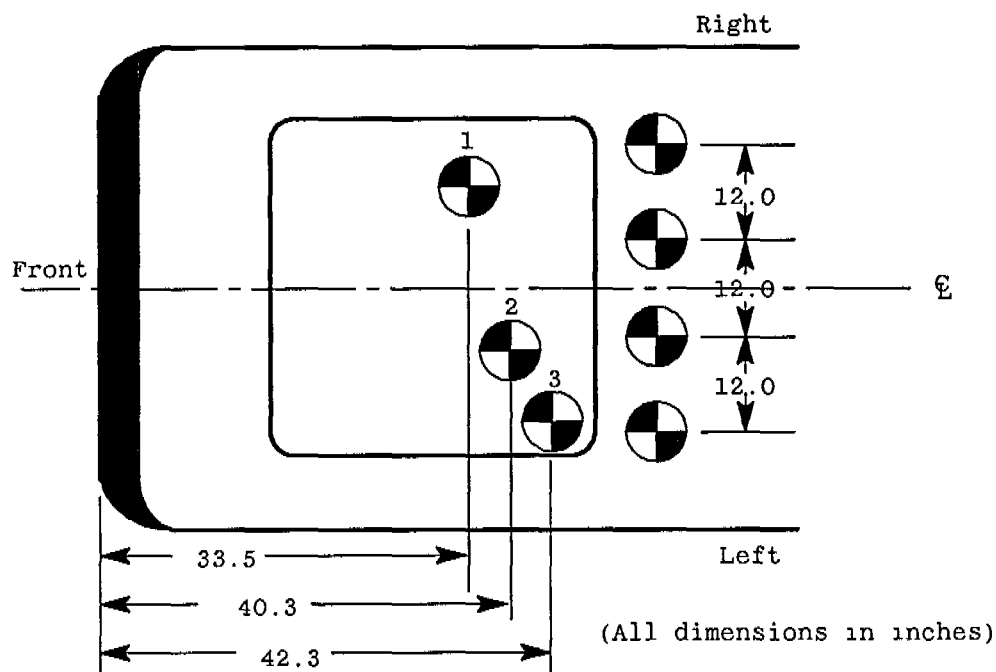


Figure 5

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



Note: Drawing not to scale.

Target 1: Accelerometer (Engine Top)
2: Brake Reservoir
3: Shock Mount

Figure 6

VEHICLE 1 MEASUREMENT POINTS

(All dimensions in inches)

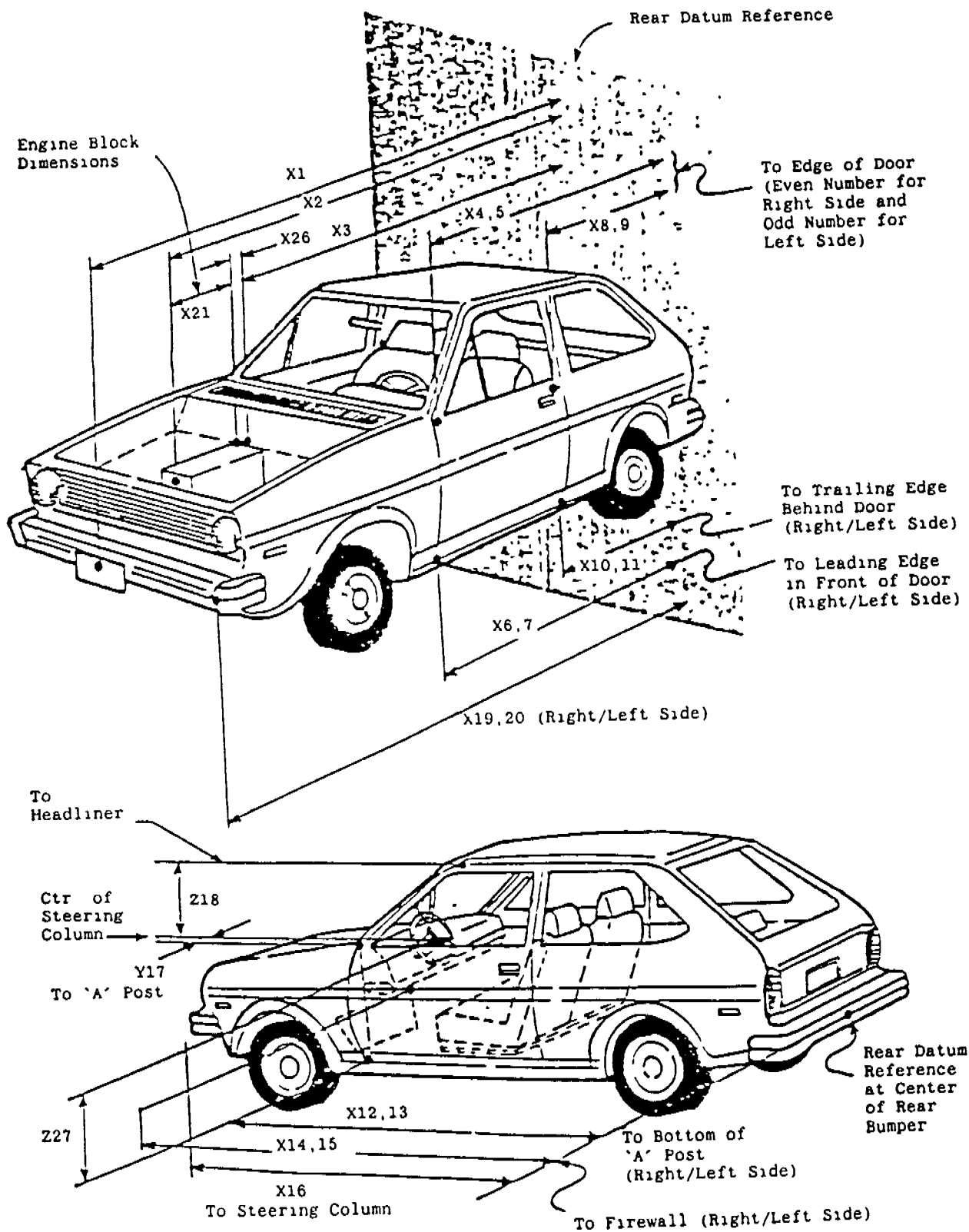


Figure 6
VEHICLE 1 MEASUREMENT POINTS (continued)

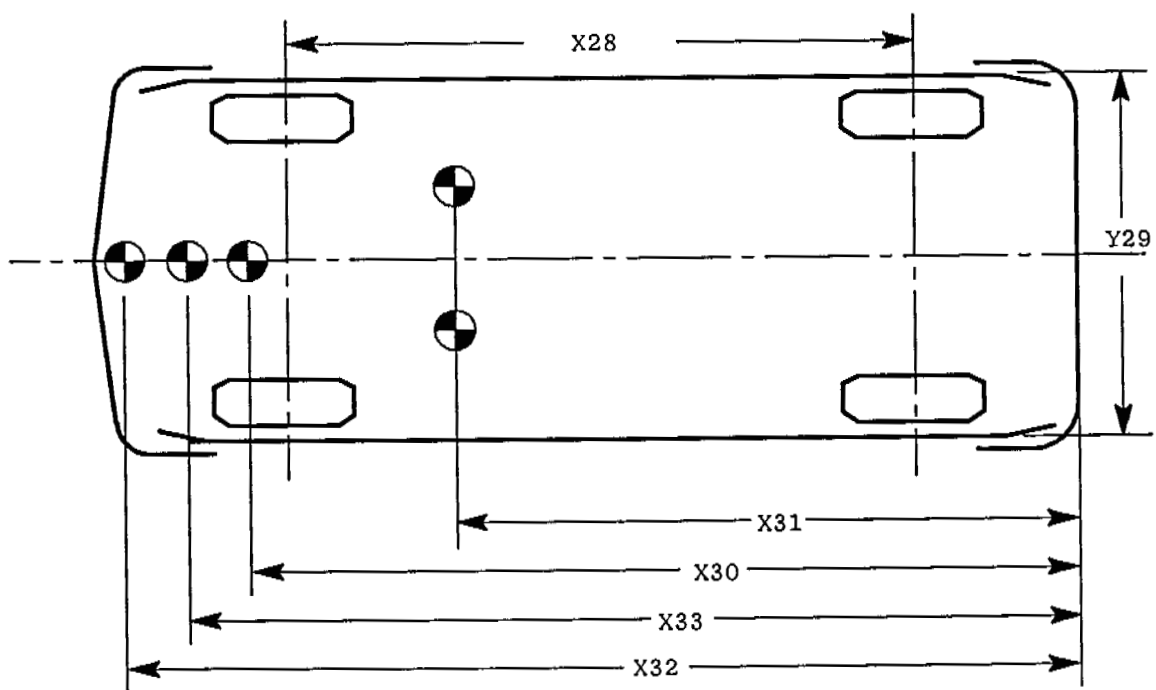
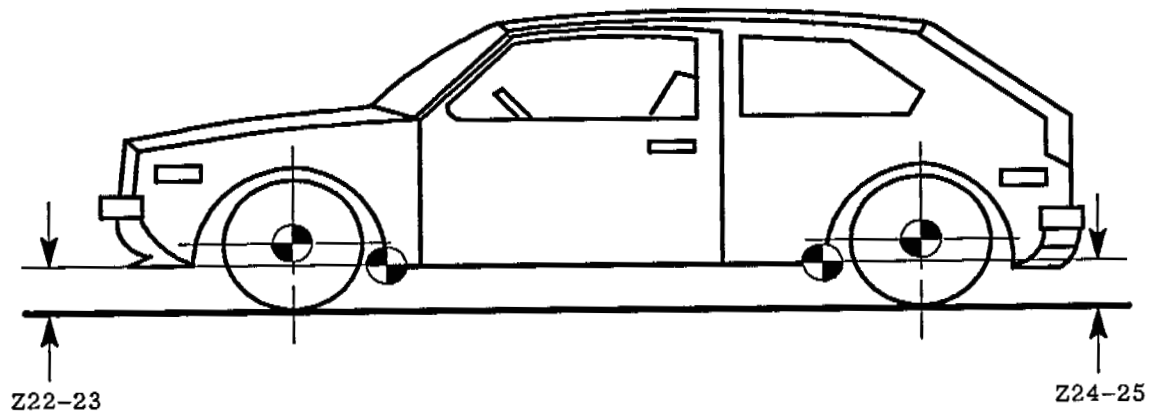


Table 4

VEHICLE 1 MEASUREMENTS

No.	TYPE OF MEASUREMENT	All Dimensions in Inches	
		Pre-Test	Post-Test
X1	Total Length of Vehicle at Centerline	183.5	152.5
X2	Rear Length of Vehicle at Centerline	155.5	145.2
X3	Rear Surface of Vehicle to Firewall	135.5	129.7
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	124.1	124.9
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	124.2	120.0
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	123.2	123.4
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	123.4	119.0
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	83.9	84.6
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	84.2	84.6
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	85.2	85.8
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	85.3	84.8
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	124.6	124.8
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	125.4	N/A
X14	Rear Surface of Vehicle to Firewall - Right Side	136.0	133.0
X15	Rear Surface of Vehicle to Firewall - Left Side	135.6	124.7
X16	Rear Surface of Vehicle to Steering Wheel Center	105.9	103.0
Y17	Steering Column to "A" Post	17.1	17.2

Table 4

VEHICLE 1 MEASUREMENTS (continued)

No.	TYPE OF MEASUREMENT	All Dimensions in Inches	
		Pre-Test	Post-Test
Z18	Rear of Windshield Header to Steering Wheel Column	16.3	17.4
X19	Rear Surface of Vehicle to Right Side of Front Bumper	179.0	175.2
X20	Rear Surface of Vehicle to Left Side of Front Bumper	179.2	142.2
X21	Width of Engine Block	13.0	13.0
Z22	Right Front Sill to Ground Plane	9.4	10.3
Z23	Left Front Sill to Ground Plane	9.3	3.5
Z24	Right Rear Sill to Ground Plane	9.9	11.8
Z25	Left Rear Sill to Ground Plane	9.4	6.5
X26	Firewall to Engine or Transaxle	7.3	0.0
Z27	Vertical Dim. from Door Sill to Centerline of Steering Column	19.8	25.2
X28	Wheelbase of Vehicle	103.5	Left - 84.0 Right - 104.6
Y29	Width of Vehicle at Maximum Width Point	68.6	68.8
X30	Rear Surface of Vehicle to Engine Target	145.2	135.1
X31	Rear Surface of Vehicle to Compartment Target	125.0	Left - 114.0 Right - 121.6
X32	Rear Surface of Vehicle to Bumper Target	171.4	153.2
X33	Rear Surface of Vehicle to Frame Crossmember	133.3	129.1

VEHICLE TWO DATA

Table 5

GENERAL TEST AND VEHICLE 2 PARAMETER DATA

Vehicle Year/Make/Model/Body Style: 1991 Honda Accord DX 4 Door Sedan

NHTSA Test No.: - VIN.: 1HGCB7546MA148795

Body Color: Blue Date of Manufacture: 5/91

Engine: 4 Cylinders; 132 C.I.D.; - Liters; - CC
✓ Gas; - Diesel; - Turbocharged
- Longitudinal; ✓ Transverse

Transmission. 5 Speed; ✓ Manual; - Automatic; ✓ Overdrive

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

Type of Occupant Restraint: Automatic torso belt and manual lap belt

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 29 psi, Rear 29 psi

Recommended Tire Size: P185 70R14 87S

Recommended Cold Tire Pressure: Front 29 psi, Rear 29 psi

Tires on Vehicle: P18570R1487S; Manufacturer: Goodyear

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

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

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

Vehicle Capacity Weight (VCW) = 850 lbs. (A)

No. of Occupants x 150 lbs. = 750 lbs. (B)

Rated Cargo and Luggage
Weight (RCLW) A-B = 100 lbs.

GVWR 3815 lbs. GAWR: Front 2050 lbs. Rear 1840 lbs

Table 5

GENERAL TEST AND VEHICLE 2 PARAMETER DATA (cont'd)

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

Right Front = 800 lbs. Right Rear = 560 lbs.
Left Front = 830 lbs. Left Rear = 540 lbs.
TOTAL FRONT WEIGHT = 1630 lbs. (59.7% of Total Vehicle Weight)
TOTAL REAR WEIGHT = 1110 lbs. (40.3% of Total Vehicle Weight)
TOTAL DELIVERED WEIGHT = 2730 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMY:

Right Front = 820 lbs. Right Rear = 620 lbs.
Left Front = 860 lbs. Left Rear = 720 lbs.
TOTAL FRONT WEIGHT = 1680 lbs (55.6% of Total Vehicle Weight)
TOTAL REAR WEIGHT = 1340 lbs (44.4% of Total Vehicle Weight)
TOTAL TEST WEIGHT = 3020 lbs.
Weight of Ballast Secured in Vehicle Trunk Area = 0 lbs.

TEST VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 27.0; LF 26.9; RR 26.8; LR 26.8
Test Attitude: RF 27.6; LF 27.0; RR 26.5; LR 25.7
Vehicle's Wheel Base = 107.0 in.
Location of Vehicle's C.G. = 47.4 inches rearward of front wheel center

Table 5

GENERAL TEST AND VEHICLE 2 PARAMETER DATA (cont'd)

POST-IMPACT DATA:

Type of Test: 70% Overlapped Frontal Impact Angle: 0.0°
 Date of Test: October 23, 1992 Time of Test: 14:45
 Ambient Temperature: 64 °F at impact area
 Temperature in Occupant Compartment: 70 °F
 Windshield Molding Temperature: - °F
 Required Impact Velocity Range: 35.0 to 37.0 mph
 Impact Velocity: primary = 36.5 mph, secondary = 36.6 mph
 Distance From Front Bumper to Barrier Face When
 Entering Speed Trap: 52 inches
 Exiting Speed Trap: 12 inches

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	Forehead with top left of steering wheel rim and horn pad <u>N/A</u>	<u>N/A</u>
Chest	Lower steering wheel rim <u>N/A</u>	<u>N/A</u>
Abdomen	No contact <u>N/A</u>	<u>N/A</u>
Left Knee	Lower dash <u>N/A</u>	<u>N/A</u>
Right Knee	Lower dash <u>N/A</u>	<u>N/A</u>

COMMENTS:

Windshield cracked throughout

	<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>N/A</u>	<u>N/A</u>	<u>N/A</u>
Seat Shift (in)	<u>0 0</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>

Table 6
VEHICLE 2 DUMMY INJURY CRITERIA VALUES

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DUMMY (1)	-85	31	72	107	-55	25	14	57.0
DUMMY (2)	-	-	-	-	-	-	-	-
DUMMY (3)	-	-	-	-	-	-	-	-
DUMMY (4)	-	-	-	-	-	-	-	-

	MAXIMUM FORCE FEMUR LOAD (LBS.)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	1905	2569
DUMMY (2)	-	-
DUMMY (3)	-	-
DUMMY (4)	-	-

	MAXIMUM FORCE SEAT BELT LOADS (LBS.)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)	2112	-	-
DUMMY (2)	-	-	-
DUMMY (3)	-	-	-
DUMMY (4)	-	-	-

	HEAD INJURY CRITERIA (HIC)			
	HIC	t ₁ (SEC)	t ₂ (SEC)	Average Acceleration t ₁ TO t ₂
DUMMY (1)	793.5	.061800	.097680	54.7
DUMMY (2)	-	-	-	-
DUMMY (3)	-	-	-	-
DUMMY (4)	-	-	-	-

*Defined as exceeding 0.003 sec duration

**As defined in FMVSS No. 208

Figure 7

VEHICLE 2 OCCUPANT CLEARANCE DIMENSIONS (inches)

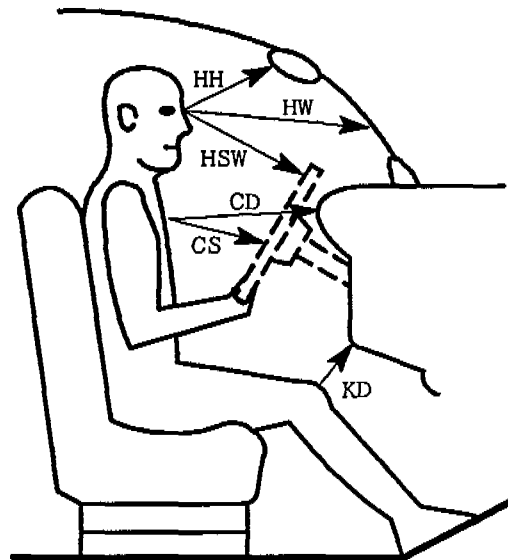
DRIVER	
HH	14.6
NW	25.9
NSW	18.2
NIP	22.6
NH	18.5
CD	21.9
CS	14.1
KDL	5.4
KDR	5.4
1	26.7
2	2.0
SA	See Note
PA	24°
ULA	108°
LLA	231°

H-POINT FROM TARGET POSITION	
Longitudinal	0 2" rearward
Vertical	0.0"

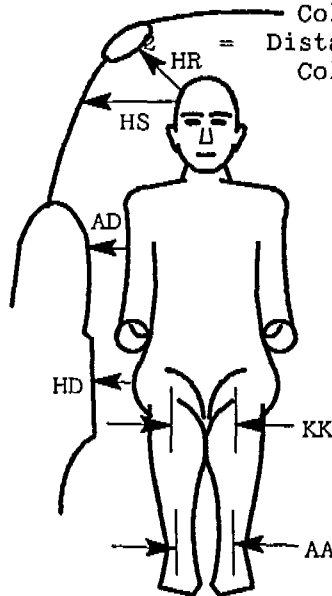
Angles taken relative to vertical
 SA = Seat Back Angle
 PA = Pelvic Angle
 ULA = Upper Leg Angle
 LLA = Lower Leg Angle

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

Note: Seat back was positioned in the 5th notch rearward of first locking position



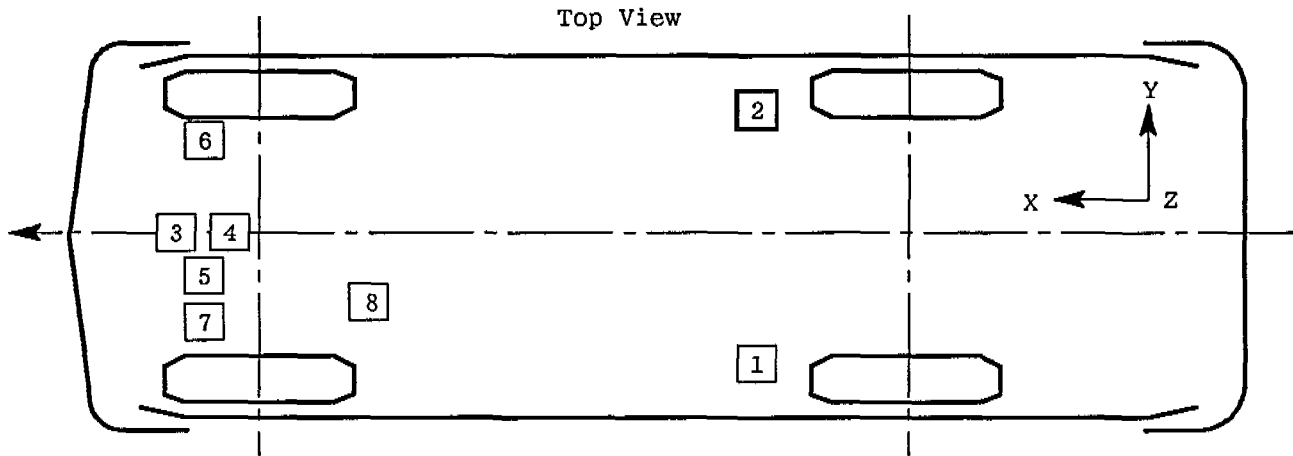
HH = Head to Windshield Header
 NW = Nose to Windshield
 NSW = Nose to Steering Wheel
 NIP = Nose to Instrument Panel
 NH = Nose to Steering Wheel Hub
 CD = Chest to Dash
 CS = Chest to Steering Wheel Hub
 KDL = Knee to Dash Left
 KDR = Knee to Dash Right
 1 = Head Target to Steering Column Target
 2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



DRIVER	
HR	6.3
HS	10.0
AD	3.8
HD	6.3
KK	9.7
AA	11.0
DT	70° F

Figure 8

SUMMARY OF VEHICLE 2 ACCELEROMETER DATA

Vehicle: 1991 Honda Accord DX 4-Door Sedan

Loc. No.	Description	Axis	Maximum Value (g's)*	
			"-"	"+"
1	Rear seat crossmember left side	x	-36	3
2	Rear seat crossmember right side	x	-39	3
3	Top of engine block	x	-126	31
3	Top of engine block	z	-9	20
4	Bottom of engine block	x	-109	49
5	Front suspension crossmember	x	-100	9
5	Front suspension crossmember	z	-32	34
6	Right front brake caliper	x	-61	93
7	Left front brake caliper	x	-46	8
8	Toe pan	x	-90	17

*Values filtered using SAE class 60 filter.

Figure 9

VEHICLE 2 PRE- AND POST-TEST POSITION OF TEST VEHICLE
ACCELEROMETER MOUNTING LOCATIONS

Test Description: 36 mph Offset Frontal Vehicle-to-Vehicle Impact

Test Vehicle: 1991 Honda Accord DX 4-Door Sedan

Reference Plane: Vehicle plane at rear bumper

Accelerometer Description	LONGITUDINAL LOCATION (in.)		
	Pre-Test	Post-Test	Change
✓ Rear seat crossmember left side	72.4	72.4	0.0
✓ Rear seat crossmember right side	72.4	72.4	0.0
✓ Top of engine block	157.4	146.6	10.8
Bottom of engine block	153.8	142.7	11.1
Front suspension crossmember	142.7	138.5	4.2
Right front brake caliper	146.8	144.5	2.3
Left front brake caliper	146.8	134.0	12.8
✓ Toe Pan	131.1	127.3	3.8

Figure 10
VEHICLE 2 TARGET LOCATIONS
(All dimensions in inches)

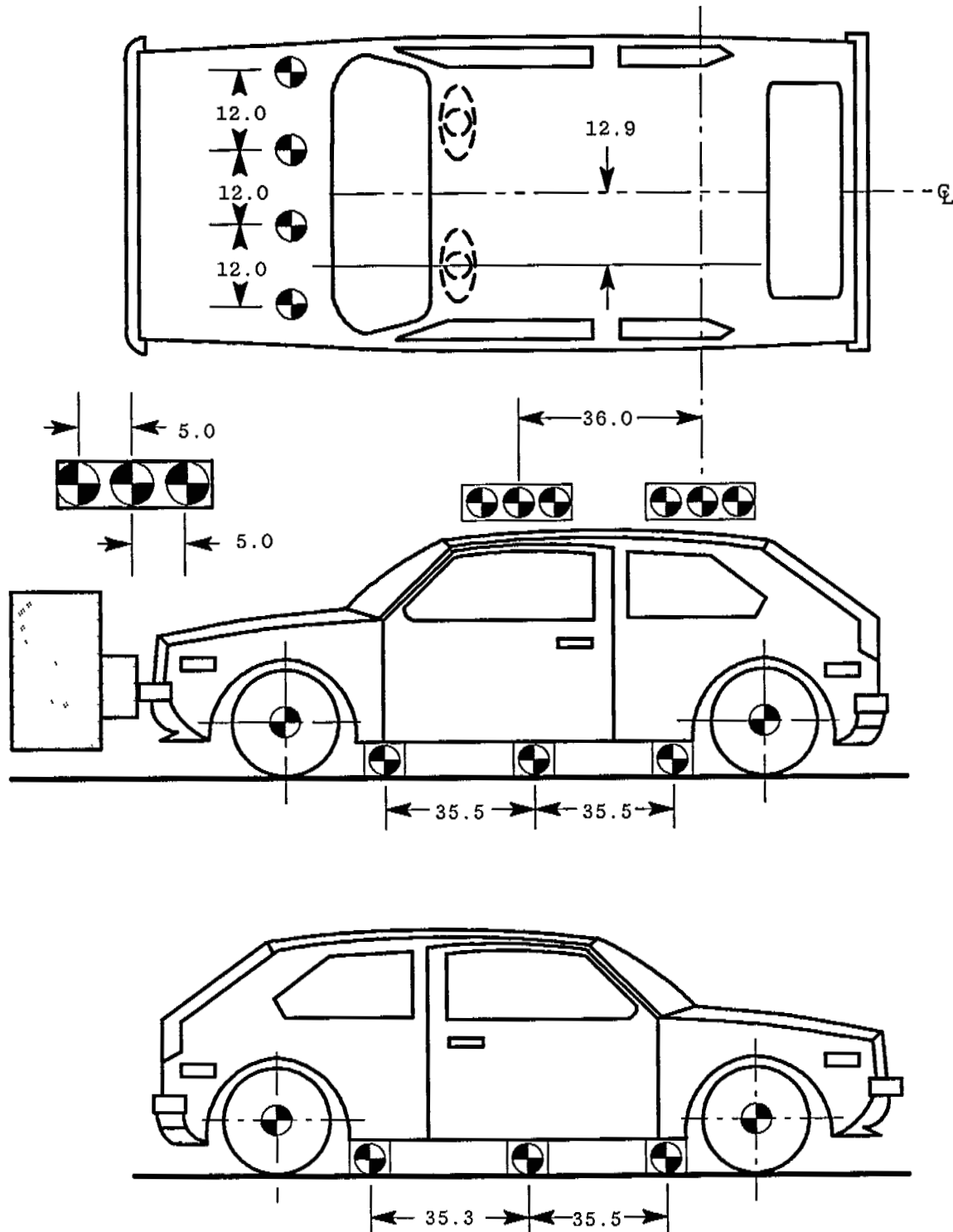
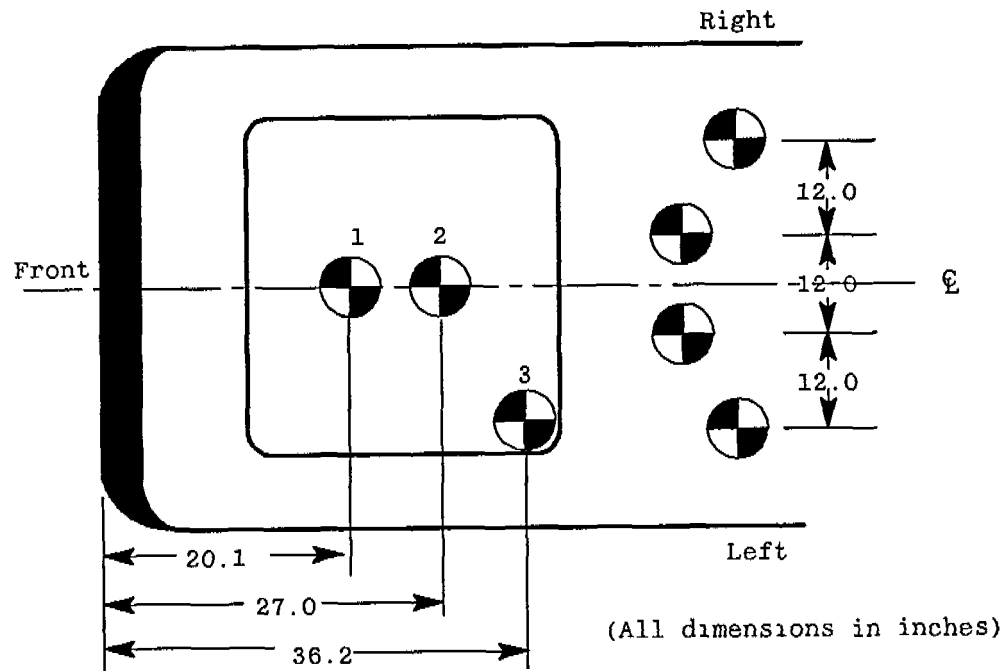


Figure 10

VEHICLE 2 TARGET LOCATIONS (continued)
(TOP VIEW OF HOOD AND ENGINE COMPARTMENT)



Note: Drawing not to scale.

Target 1: Exhaust Manifold
2: Accelerometer (Engine Top)
3: Shock Mount

Figure 11

VEHICLE 2 MEASUREMENT POINTS

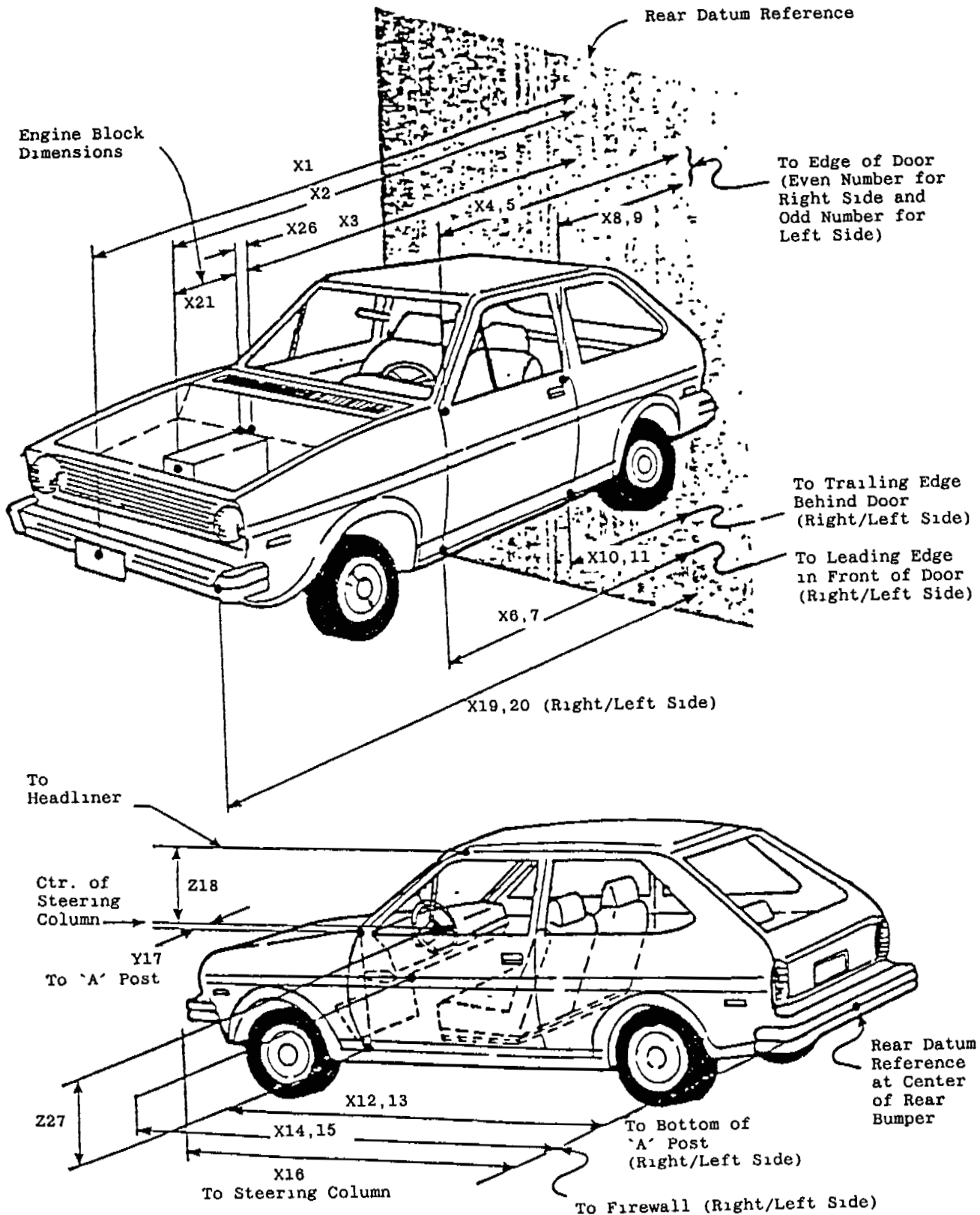


Figure 11
VEHICLE 2 MEASUREMENT POINTS (continued)

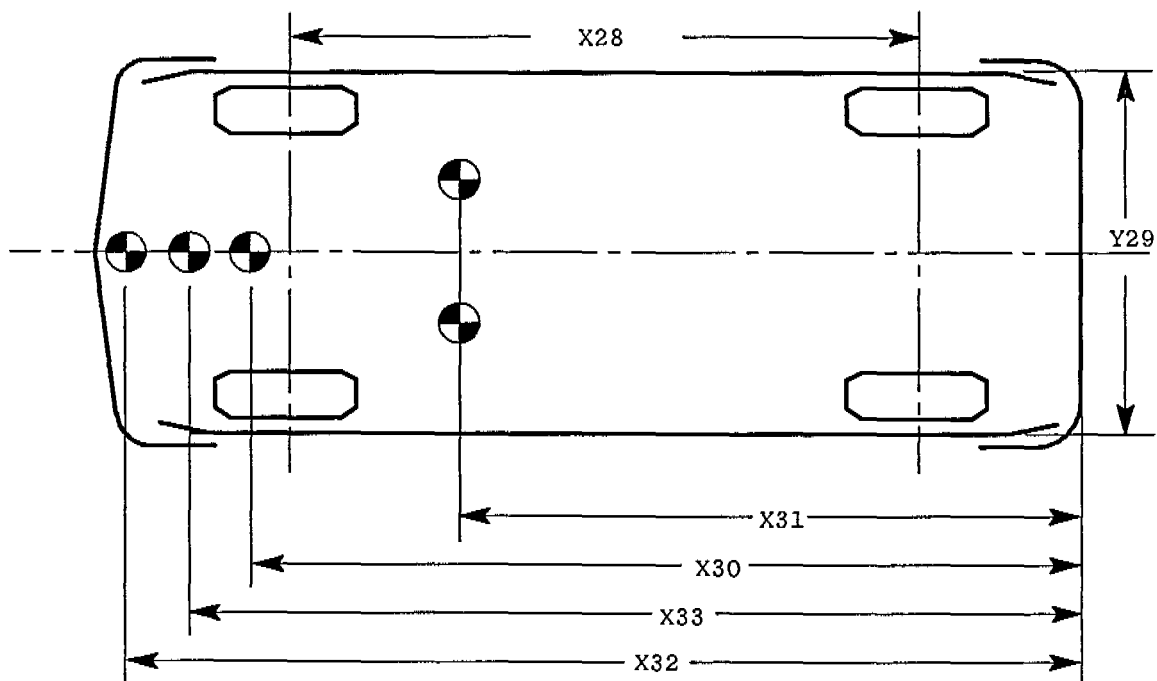
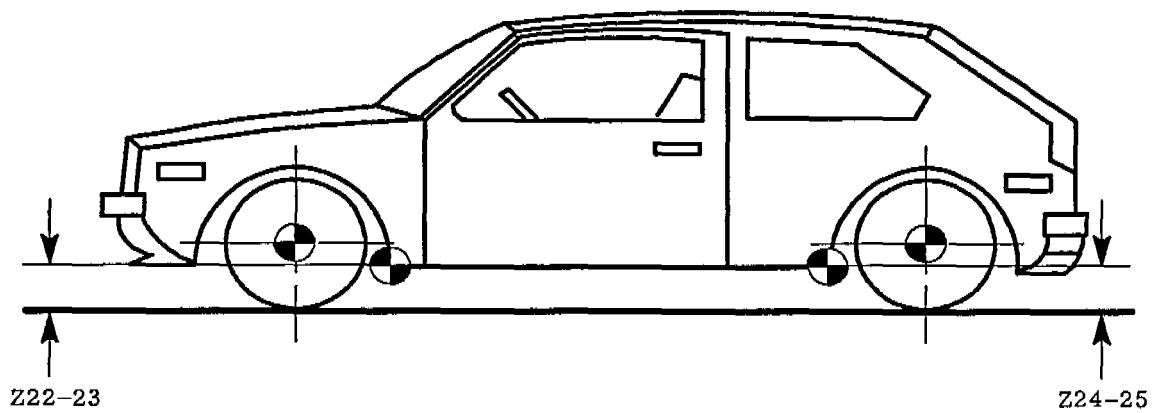


Table 7

VEHICLE 2 MEASUREMENTS

No	TYPE OF MEASUREMENT	All Dimensions in Inches	
		Pre-Test	Post-Test
X1	Total Length of Vehicle at Centerline	184.5	174.4
X2	Rear Length of Vehicle at Centerline	160.7	151.7
X3	Rear Surface of Vehicle to Firewall	140.8	136.8
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	127.5	127.4
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	127.4	122.8
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	128.4	128.0
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	128.3	123.8
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	85.7	85.5
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	85.6	84.2
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	86.9	86.3
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	86.6	85.0
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	128.0	127.5
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	128.4	N/A
X14	Rear Surface of Vehicle to Firewall - Right Side	140.6	137.5
X15	Rear Surface of Vehicle to Firewall - Left Side	140.0	132.7
X16	Rear Surface of Vehicle to Steering Wheel Center	109.6	105.3
Y17	Steering Column to "A" Post	15.3	17.4

Table 7

VEHICLE 2 MEASUREMENTS (continued)

No	TYPE OF MEASUREMENT	All Dimensions in Inches	
		Pre-Test	Post-Test
Z18	Rear of Windshield Header to Steering Wheel Center	18.0	19.2
X19	Rear Surface of Vehicle to Right Side of Front Bumper	180.0	182.0
X20	Rear Surface of Vehicle to Left Side of Front Bumper	179.7	161.7
X21	Width of Engine Block	17.3	17.3
Z22	Right Front Sill to Ground Plane	8.0	8.0
Z23	Left Front Sill to Ground Plane	7.6	0.5
Z24	Right Rear Sill to Ground Plane	8.3	9.0
Z25	Left Rear Sill to Ground Plane	7.8	7.8
X26	Firewall to Engine or Transaxle	2.5	0.0
Z27	Vertical Dim. from Door Sill to Centerline of Steering Column	19.8	23.6
X28	Wheelbase of Vehicle	107.0	Left - 94.5 Right - 108.0
Y29	Width of Vehicle at Maximum Width Point	67.3	67.3
X30	Rear Surface of Vehicle to Engine Target	153.8	142.7
X31	Rear Surface of Vehicle to Compartment Target	128.3	Left - 126.0 Right - 126.0
X32	Rear Surface of Vehicle to Bumper Target	176.6	169.0
X33	Rear Surface of Vehicle to Frame Crossmember	142.7	138.5

Figure 12
CAMERA POSITIONS FOR VTV OFFSET FRONTAL IMPACT

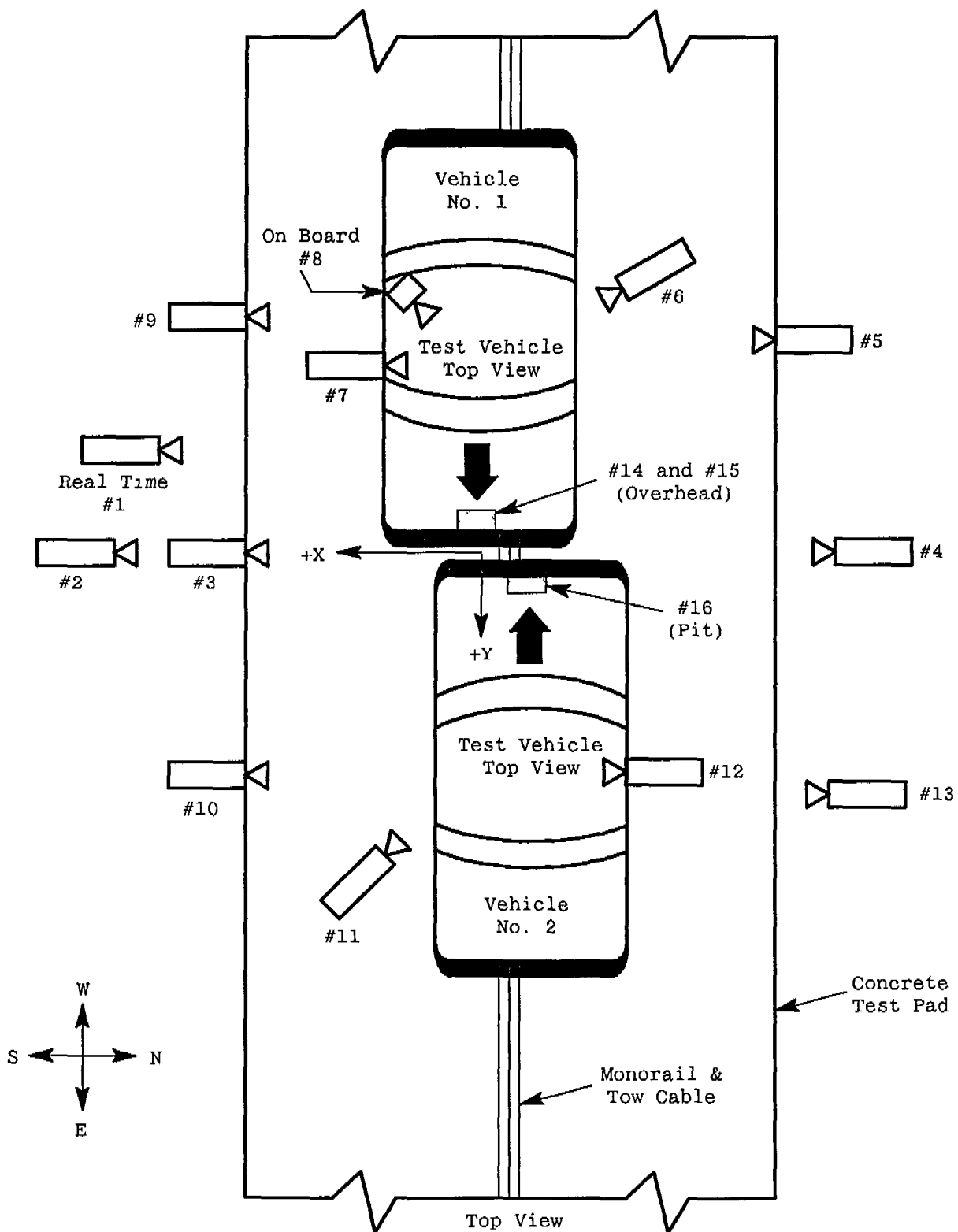


Table 8

HIGH-SPEED CAMERA LOCATIONS

Test No. Y43-9-1228 Vehicle 1992 Chevrolet Corsica LT 4-Door Sedan
1991 Honda Accord DX 4-Door Sedan

CAMERA NO	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	-	-	-	-	-	24
2	South Overall Camera	448	-9	70	-6	13	550
3	South Impact Point	320	0	41	-3	25	590
4	North Impact Point	-312	0	42	-2	25	610
5	Vehicle 1 Driver Side View	-379	-70	53	-1	25	580
6	Vehicle 1 Driver and Interior View	-107	-107	64	-14	13	570
7	Vehicle 1 Onboard Driver View	-	-	-	-	8	N.T.
8	Vehicle 1 Onboard Seat Belt View	-	-	-	-	8	850
9	Vehicle 1 Passenger Side View	549	-76	58	-3	35	760
10	Vehicle 2 Driver Side View	490	52	42	-3	35	750
11	Vehicle 2 Driver and Interior View	107	106	64	-15	13	570
12	Vehicle 2 Onboard Driver View	-	-	-	-	8	Did not run
13	Vehicle 2 Passenger Side View	-388	55	52	-2	25	590
14	Overhead Overall View	0	6	386	-90	13	595
15	Overhead Impact Point View	0	18	386	-90	25	605
16	Underbody View	0	0	-78	90	13	645

*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

** = referenced to horizontal plane

Figure 13
CRUSH PROFILE OF VEHICLE 1

Vehicle Make/Model/Body Style: 1992 Chevrolet Corsica LT 4-Door Sedan

Vehicle NHTSA No.: -; Vin: 1G1LT5341NY194149

Model Year: 1992; Build Date: 2/92; Test Date: 10/23/92

Test Weight: 2870 lbs

Vehicle Wheelbase: 103.9 in; Overall Width: 68.2 in.

Collision Deformation Classification (CDC) Code: 12FYEW4

Crush Depth C1= 37.4 inches

Dimensions: C2= 38.0 inches

C3= 36.3 inches

C4= 34.6 inches

C5= 18.2 inches

C6= 3.2 inches

Length of Damaged Region: L= 33.5 inches

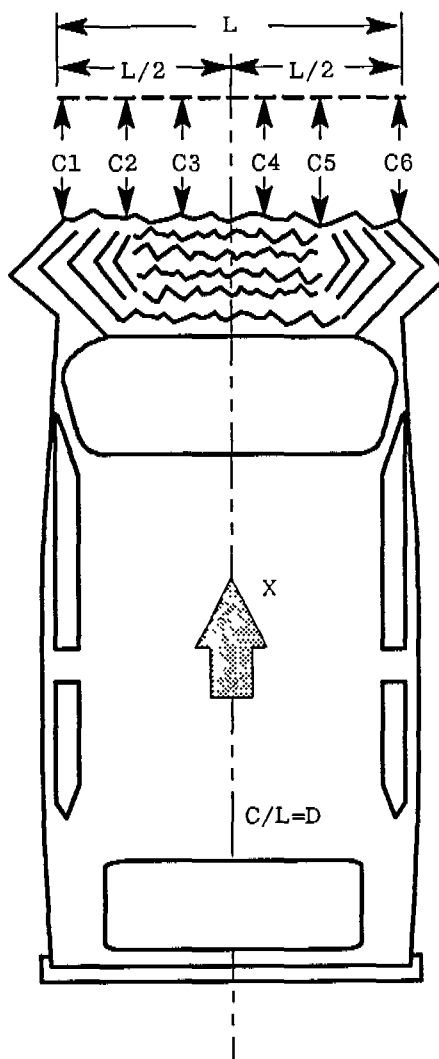


Figure 14
CRUSH PROFILE OF VEHICLE 2

Vehicle Make/Model/Body Style: 1991 Honda Accord DX 4-Door Sedan

Vehicle NHTSA No.: -; Vin: 1HGCB7546M148795

Model Year: 1991; Build Date: 5/91; Test Date: 10/23/92

Test Weight: 3020 lbs

Vehicle Wheelbase: 107.0 in; Overall Width: 67.9 in.

Collision Deformation Classification (CDC) Code: 12FYEW3

Crush Depth C1= 27.0 inches

Dimensions: C2= 24.8 inches

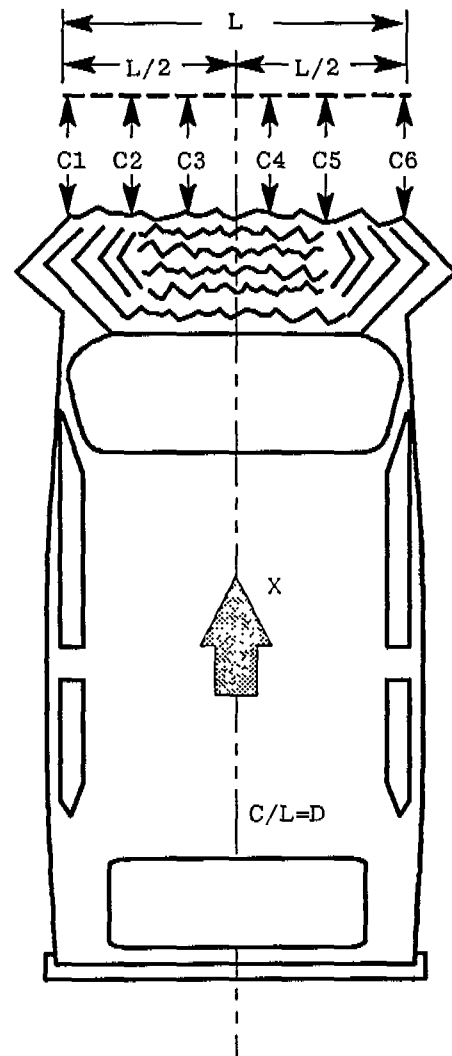
C3= 22.9 inches

C4= 16.5 inches

C5= 5.7 inches

C6= 0.00 inches

Length of Damaged
Region: L= 50.75 inches



Appendix A

PHOTOGRAPHS

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OVERALL TEST SETUP

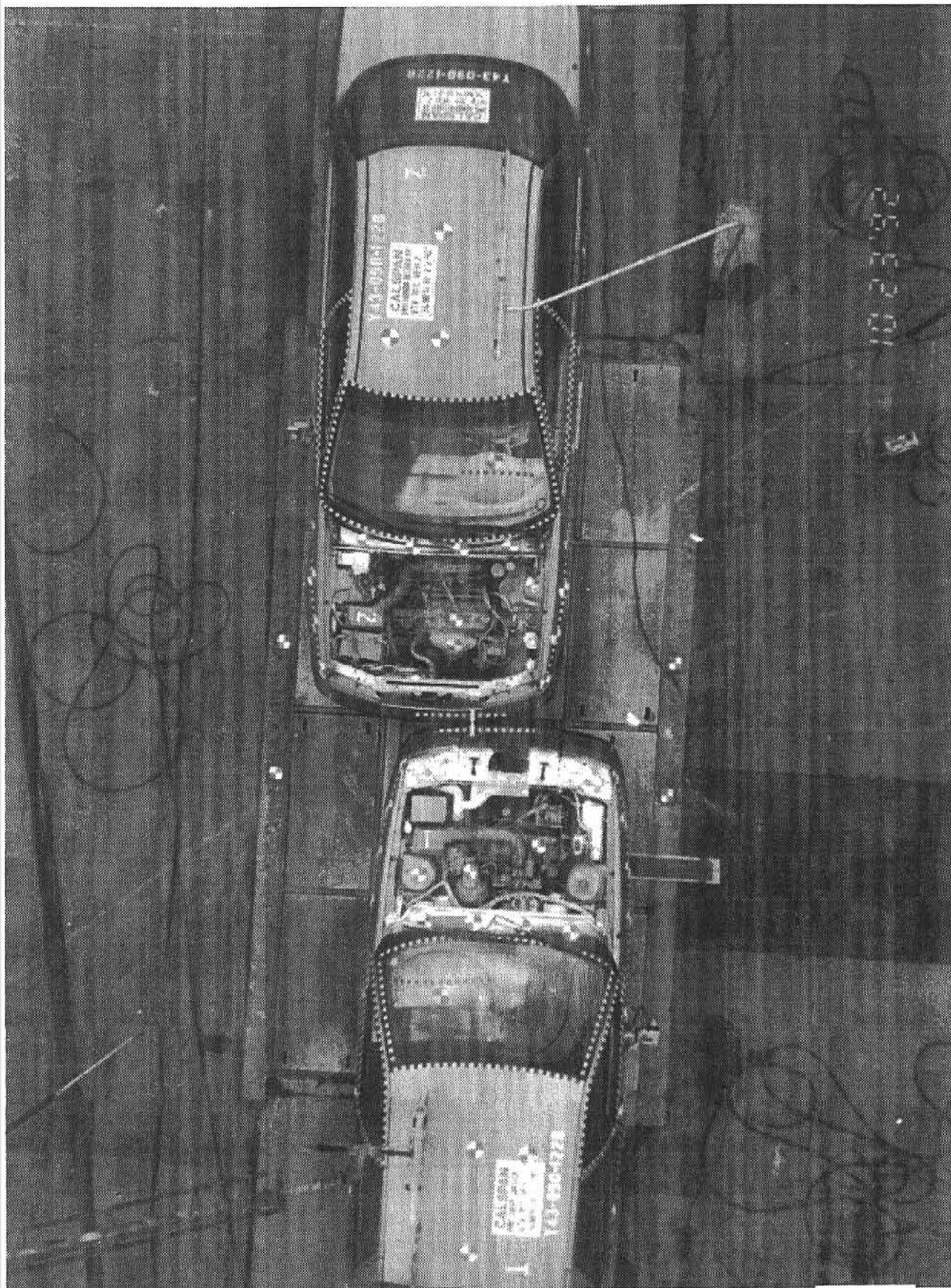
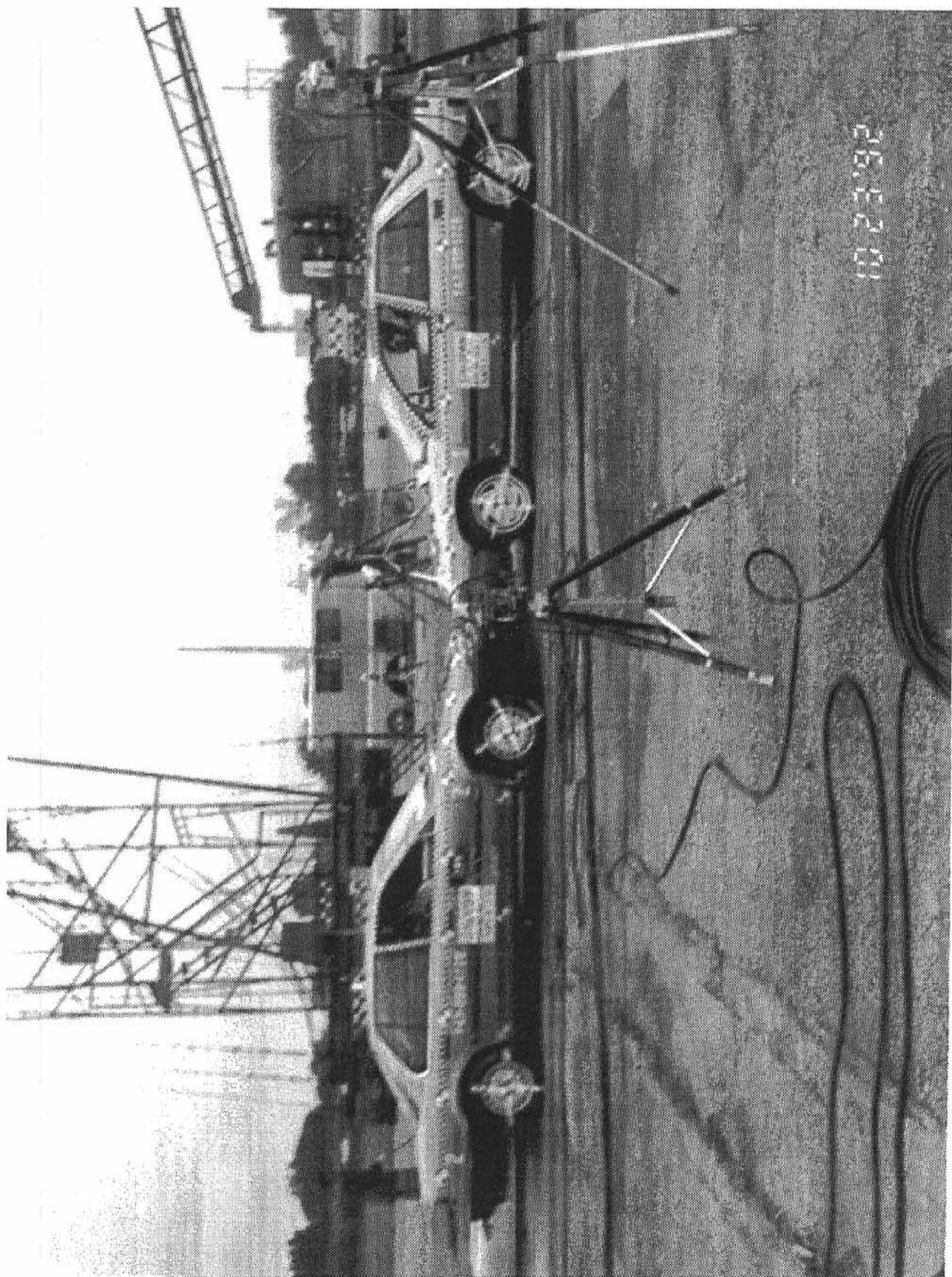


Figure A-1 PRE-TEST OVERHEAD VIEW



Figure A-2 POST-TEST OVERHEAD VIEW



002392

Figure A-3 PRE-TEST OVERALL SIDE VIEW

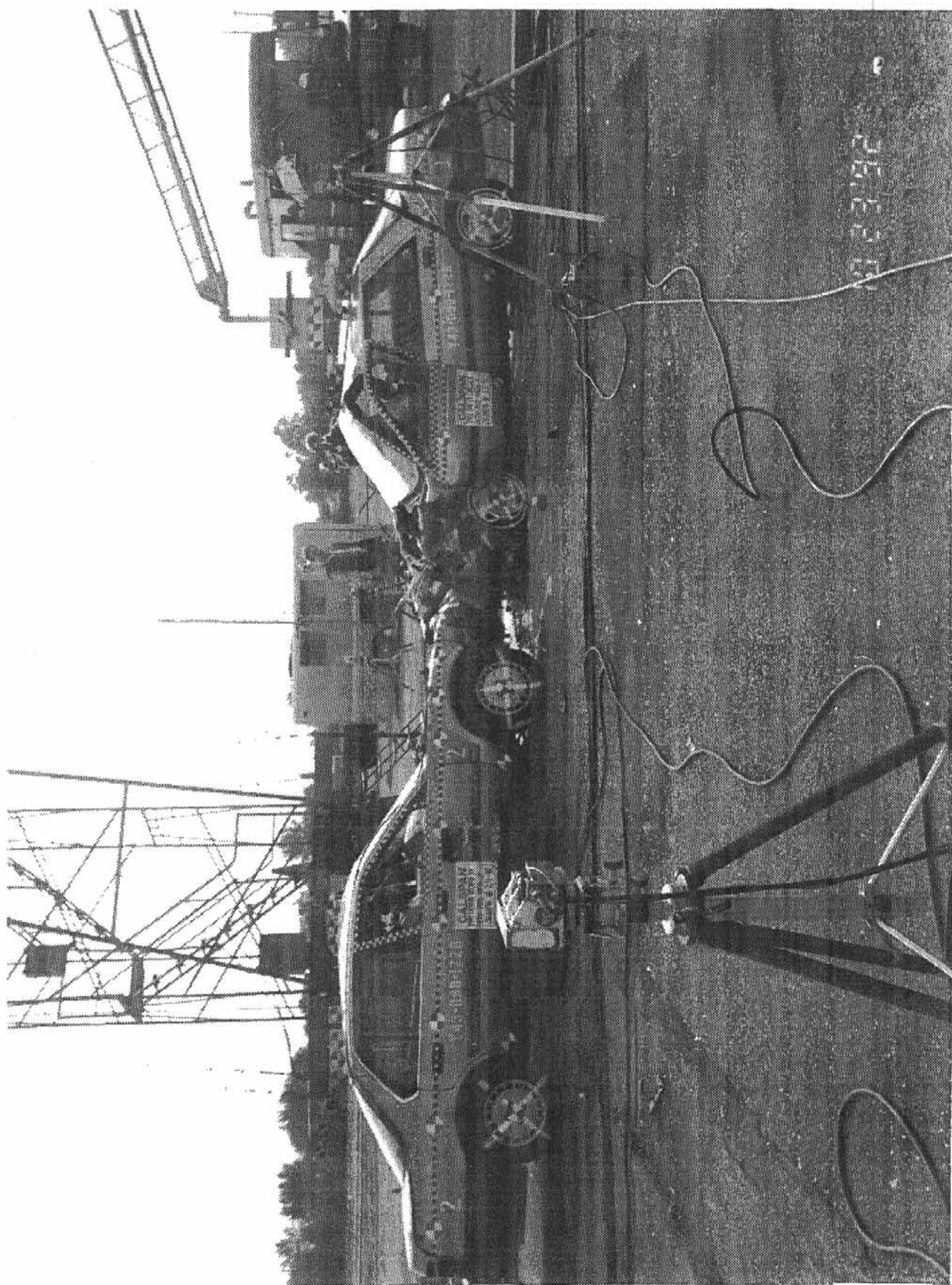


Figure A-4 POST-TEST OVERALL SIDE VIEW

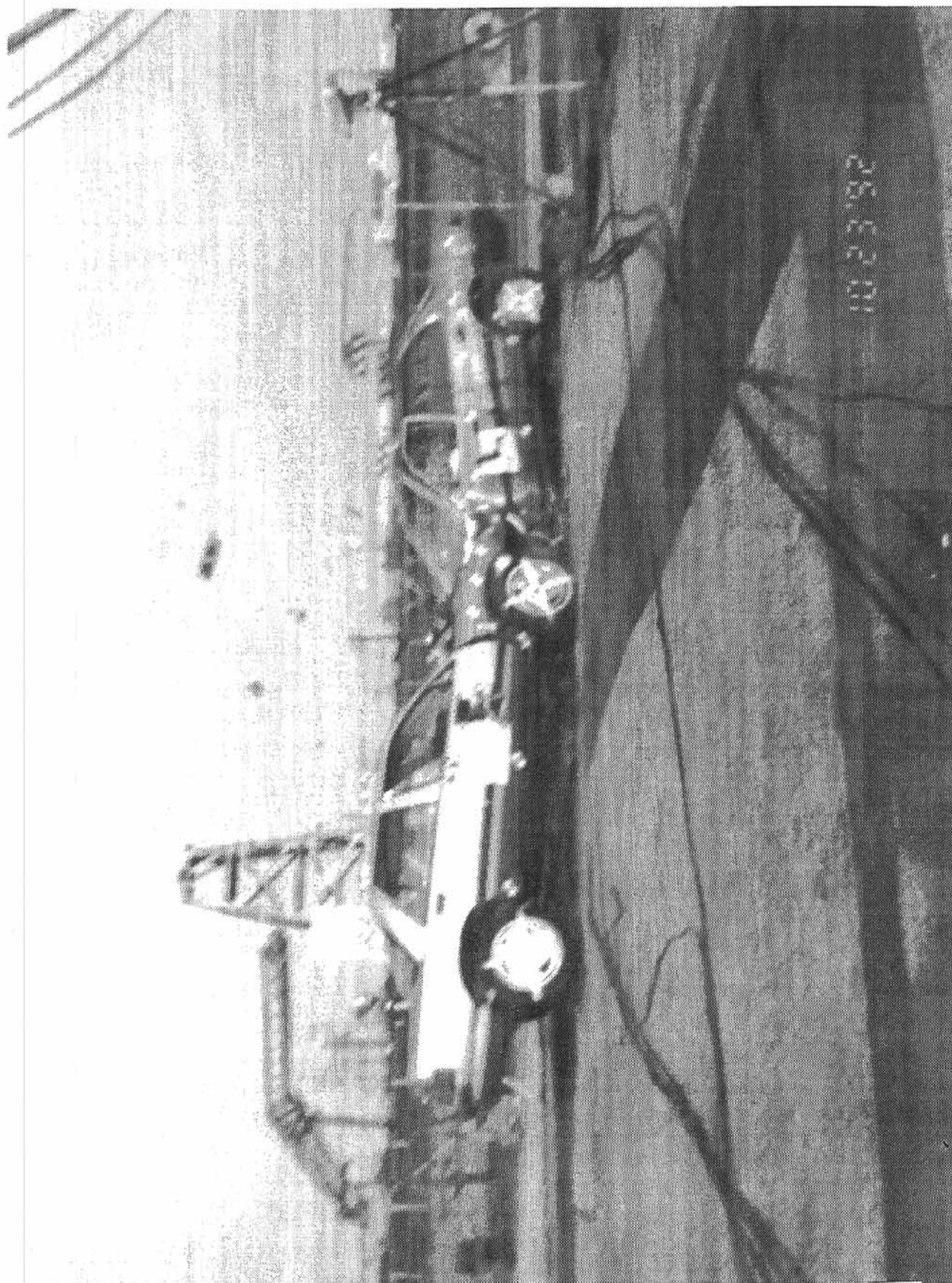


Figure A-5 IMPACT PHOTO

VEHICLE 1 PHOTOGRAPHS

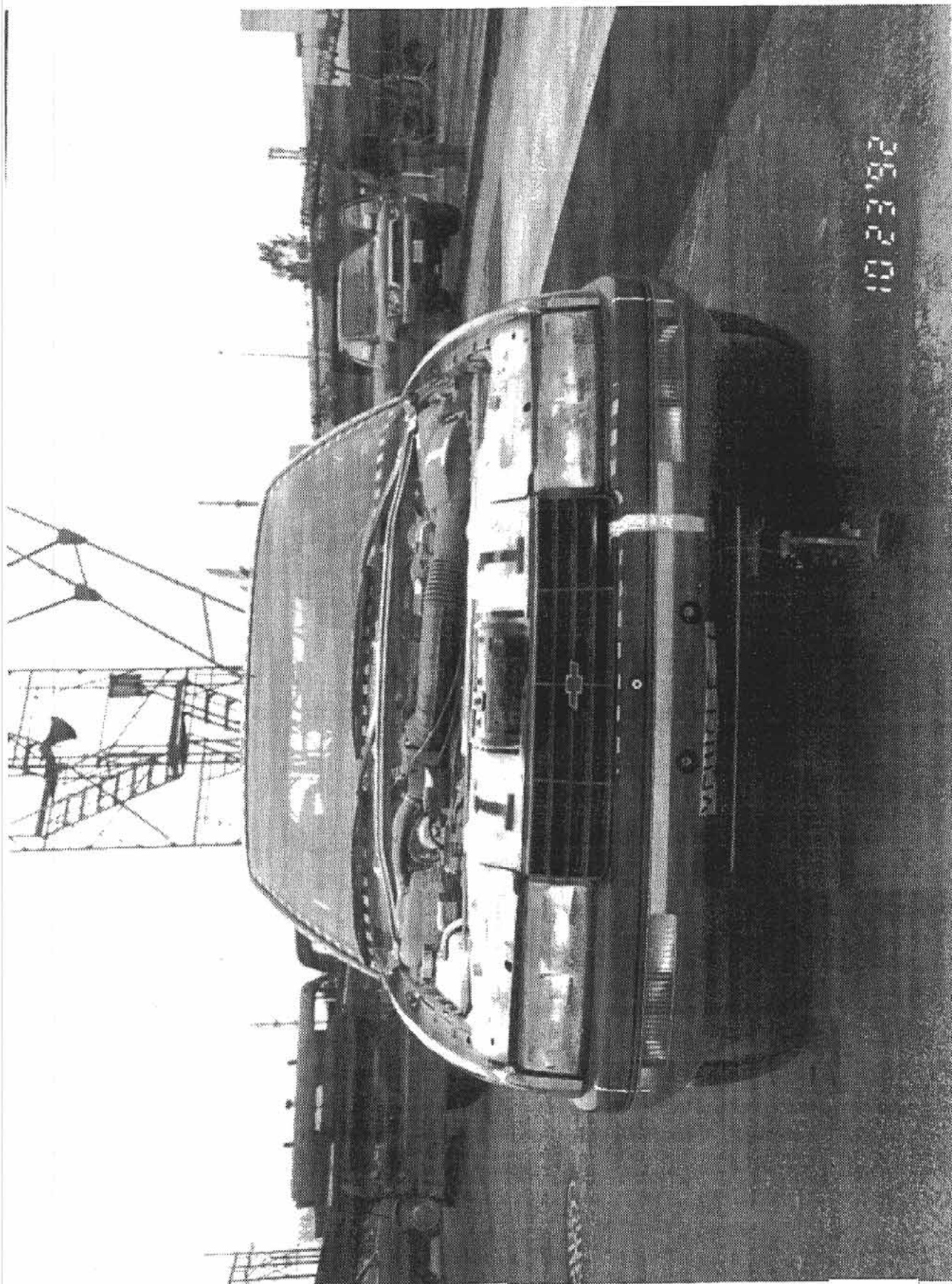


Figure A-6 VEHICLE 1 PRE-TEST FRONT VIEW

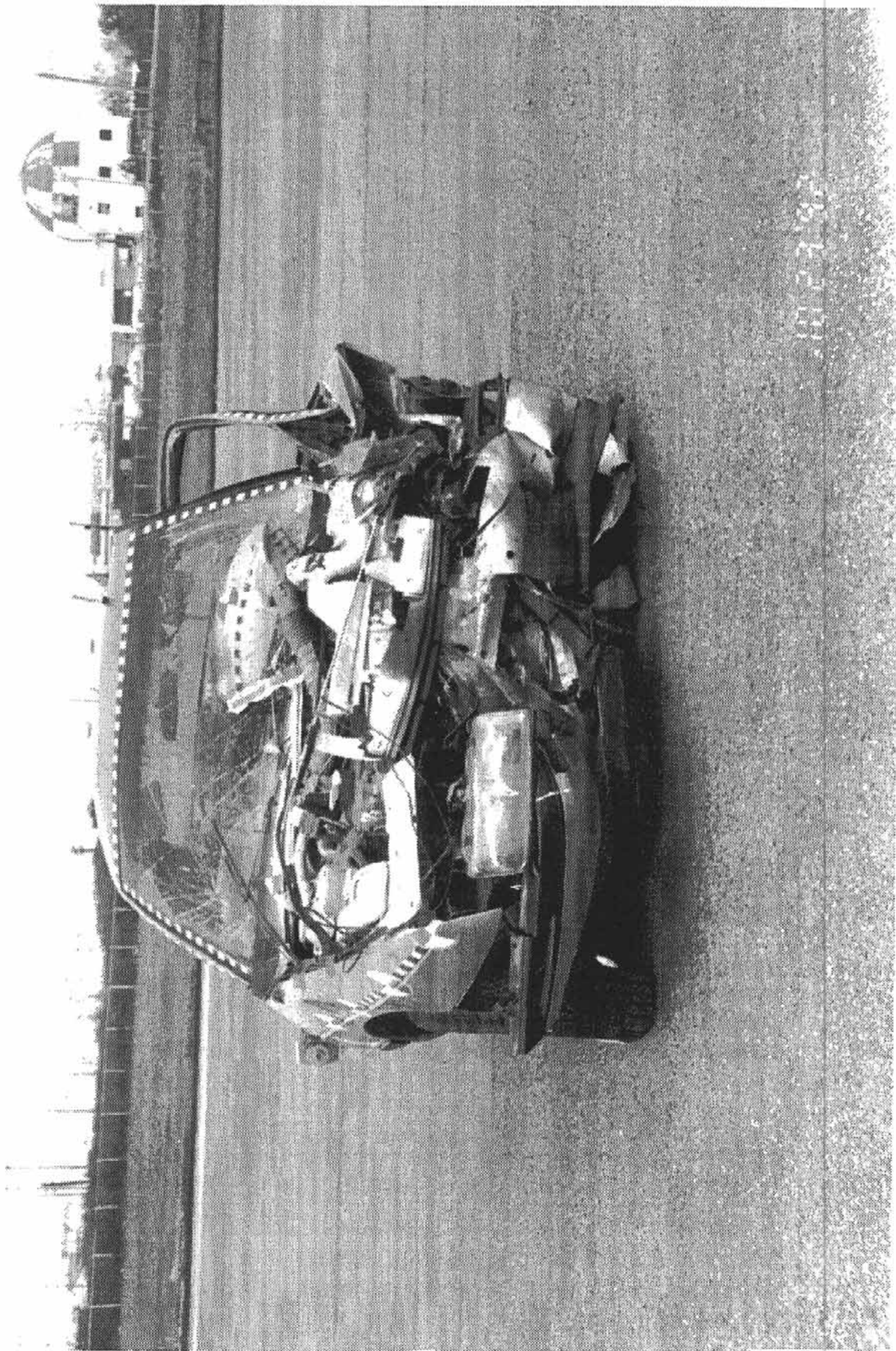


Figure A-7 VEHICLE 1 POST-TEST FRONT VIEW

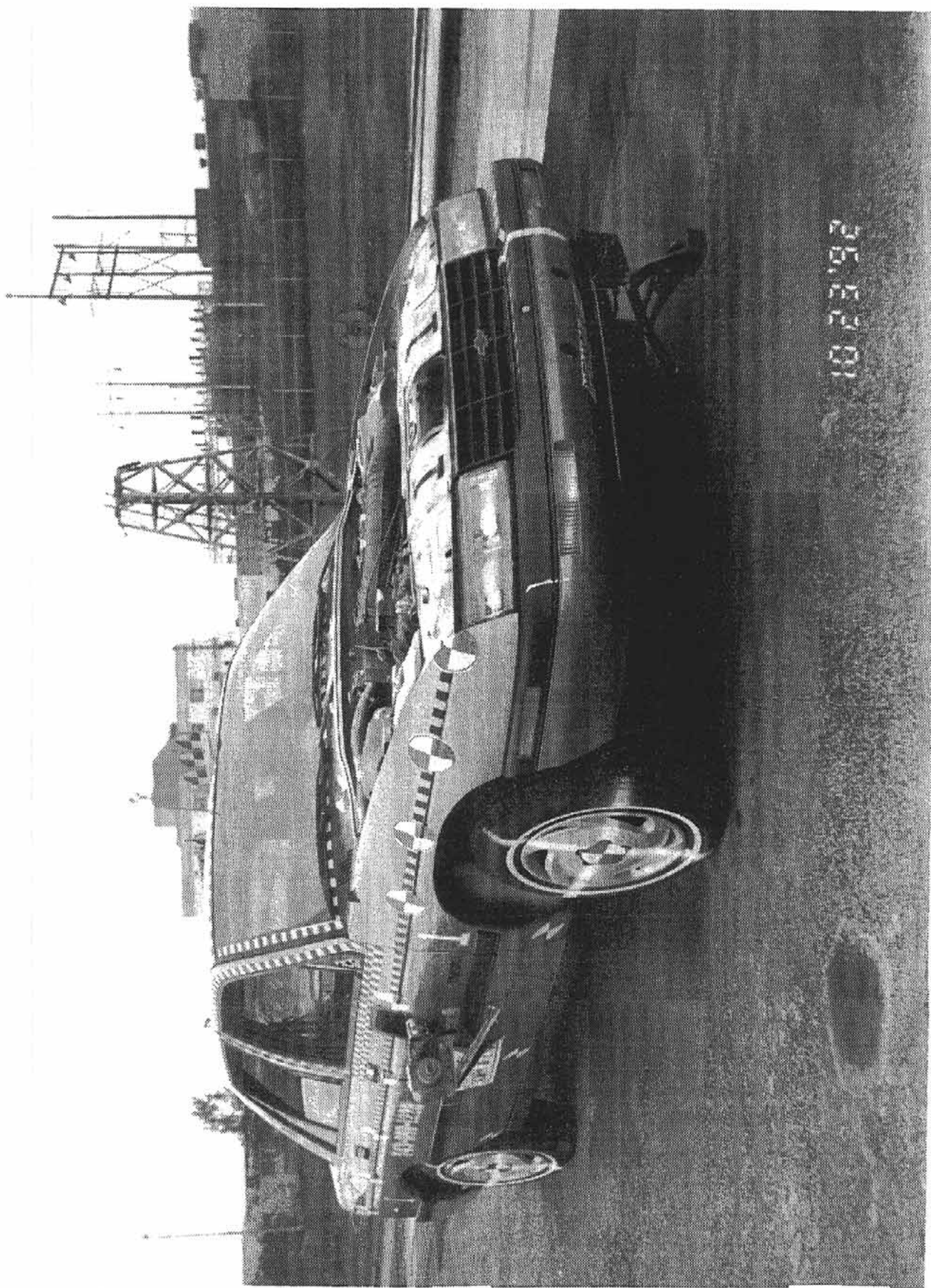


Figure A-8 VEHICLE 1 PRE-TEST FRONT RIGHT THREE QUARTER VIEW

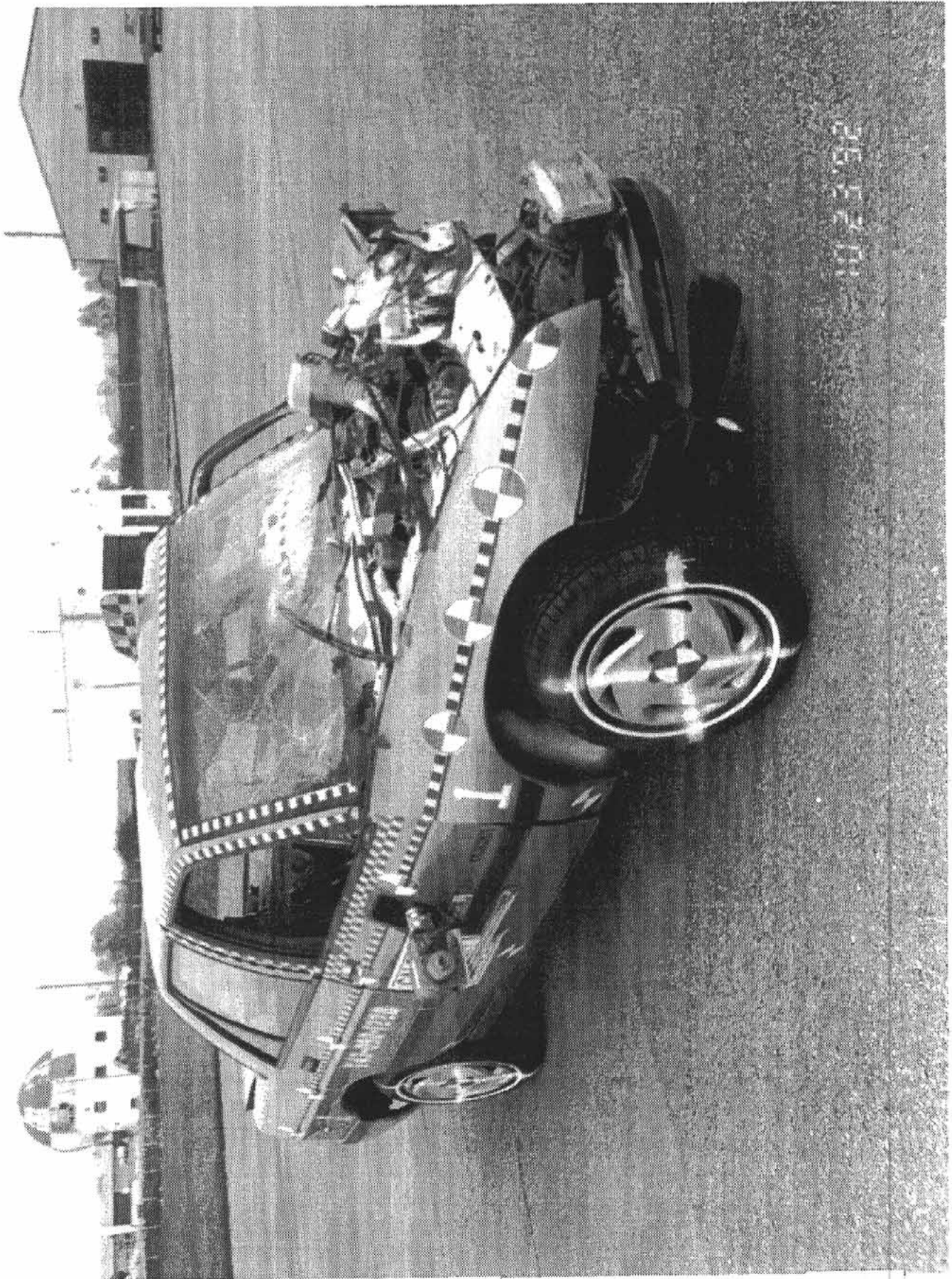


Figure A-9 VEHICLE 1 POST-TEST FRONT RIGHT THREE QUARTER VIEW

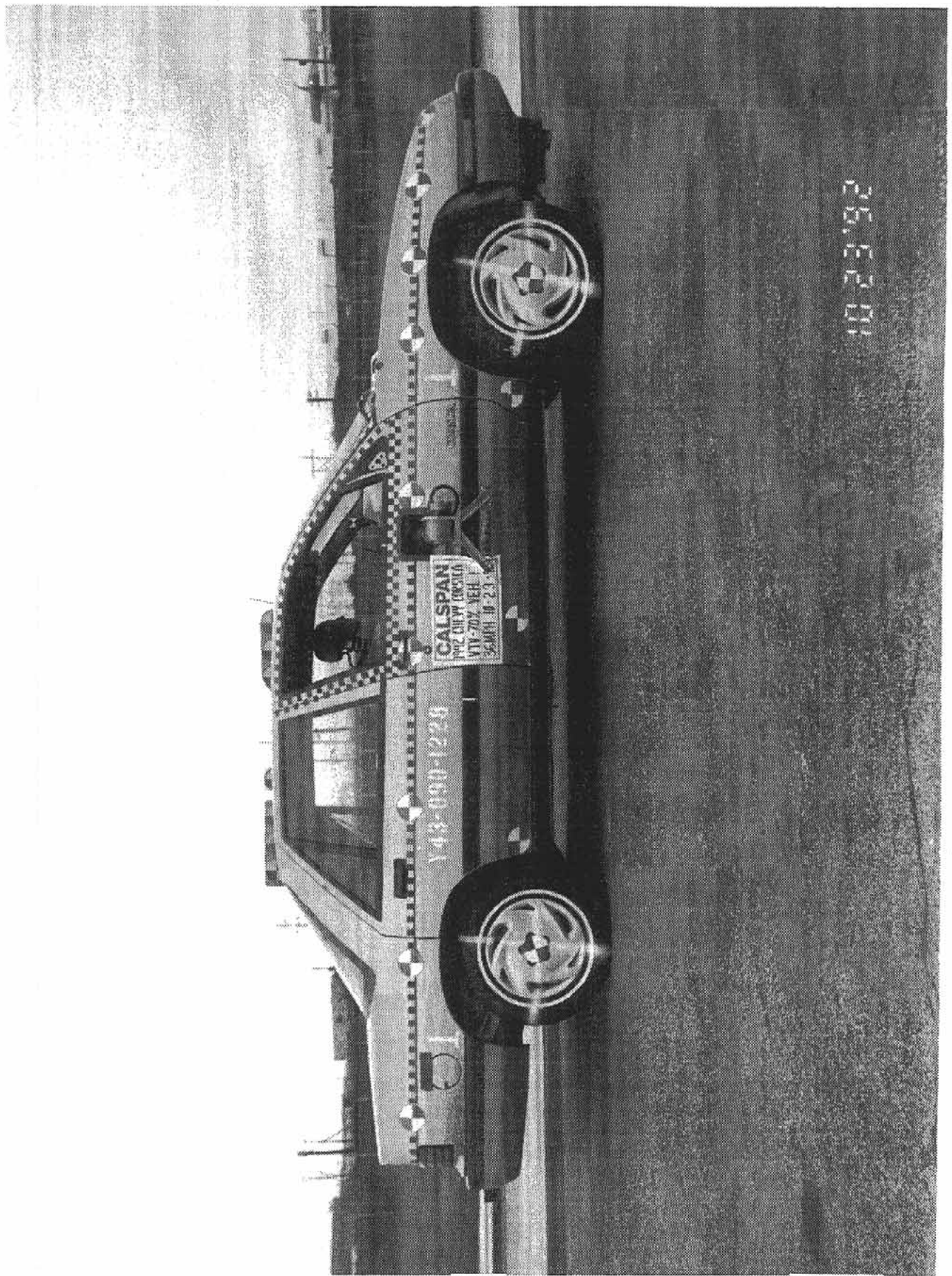


Figure A-10 VEHICLE 1 PRE-TEST RIGHT SIDE VIEW

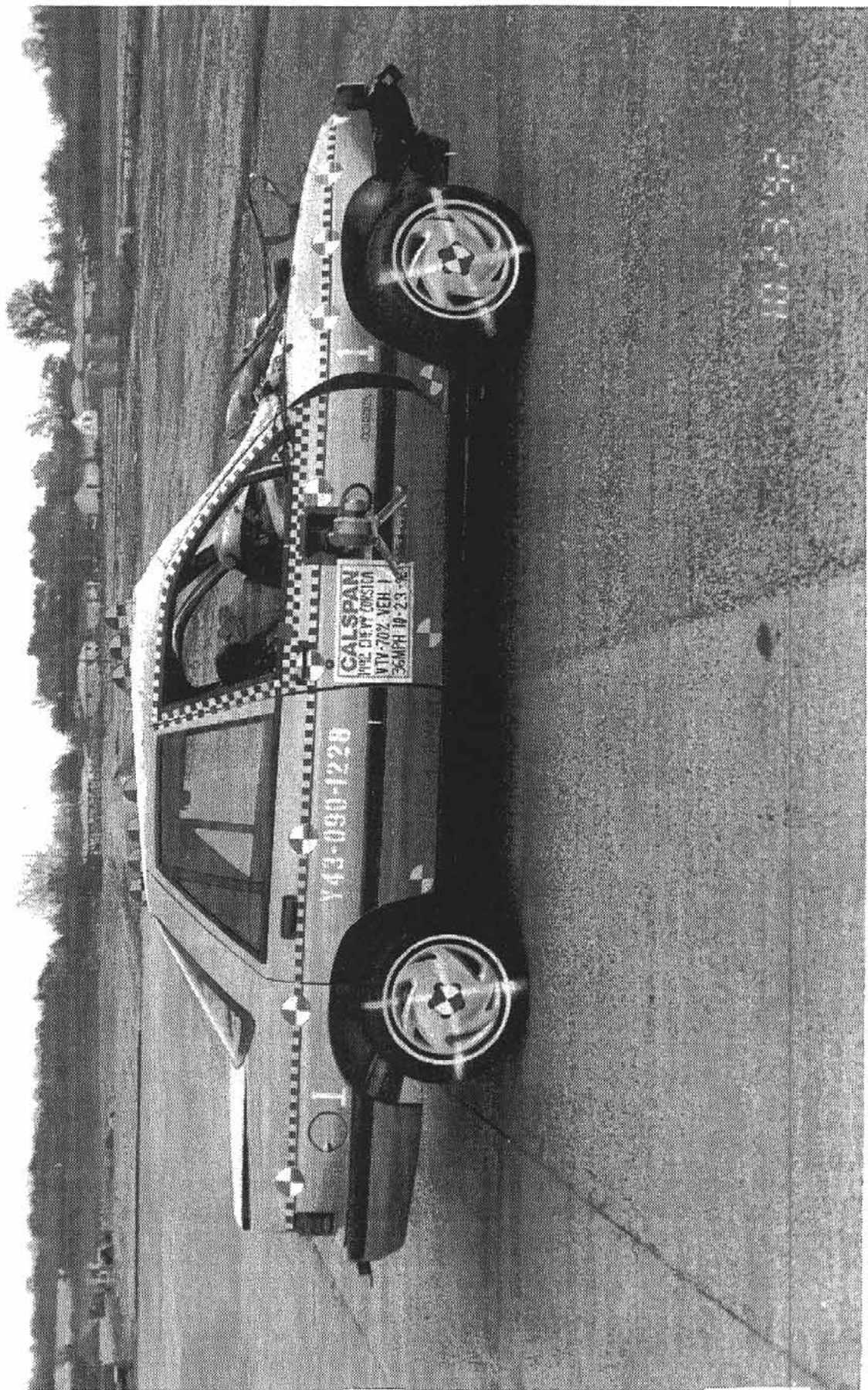


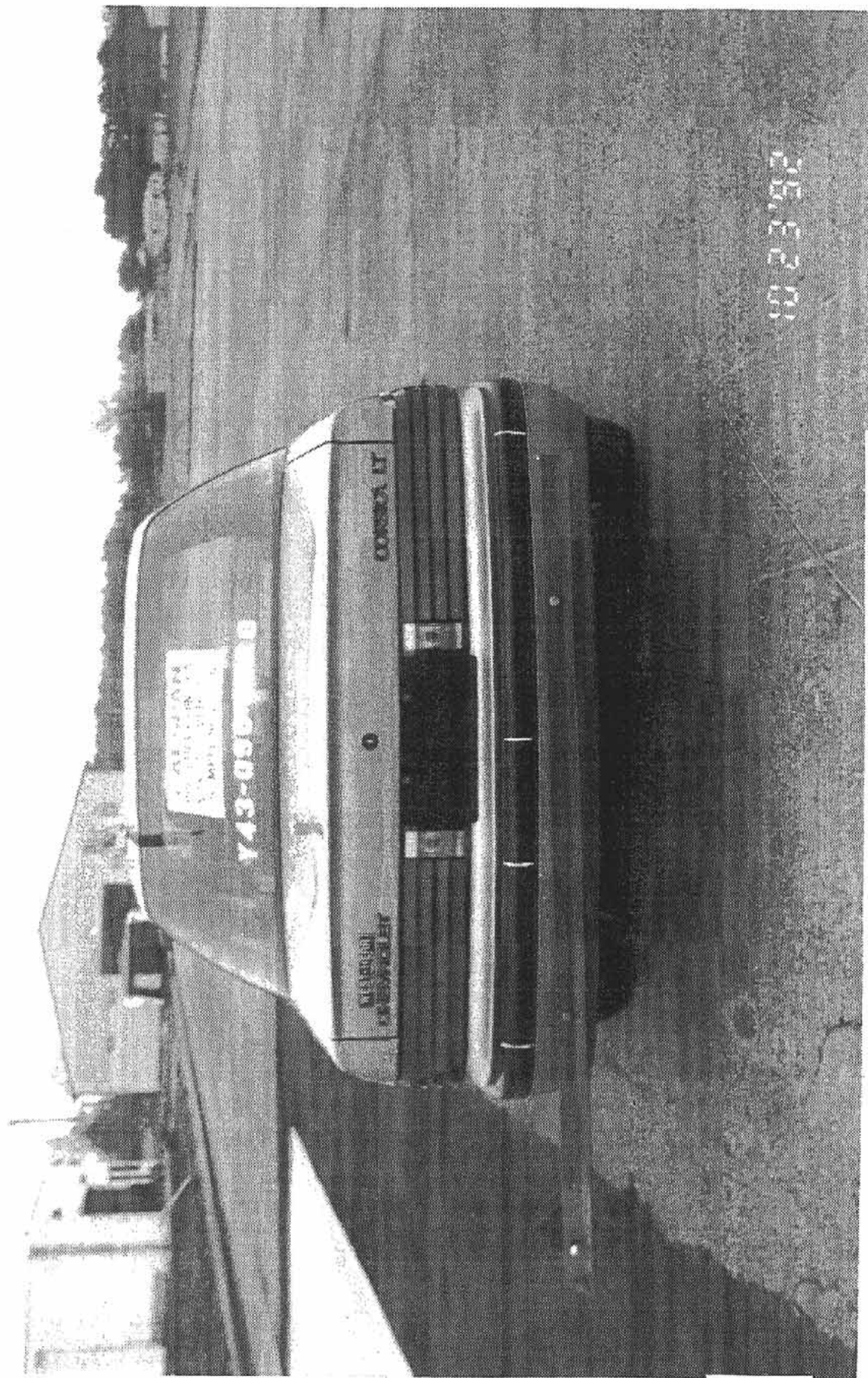
Figure A-11 VEHICLE 1 POST-TEST RIGHT SIDE VIEW



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



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



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Figure A-14 VEHICLE 1 PRE-TEST REAR VIEW



Figure A-15 VEHICLE 1 POST-TEST REAR VIEW



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



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

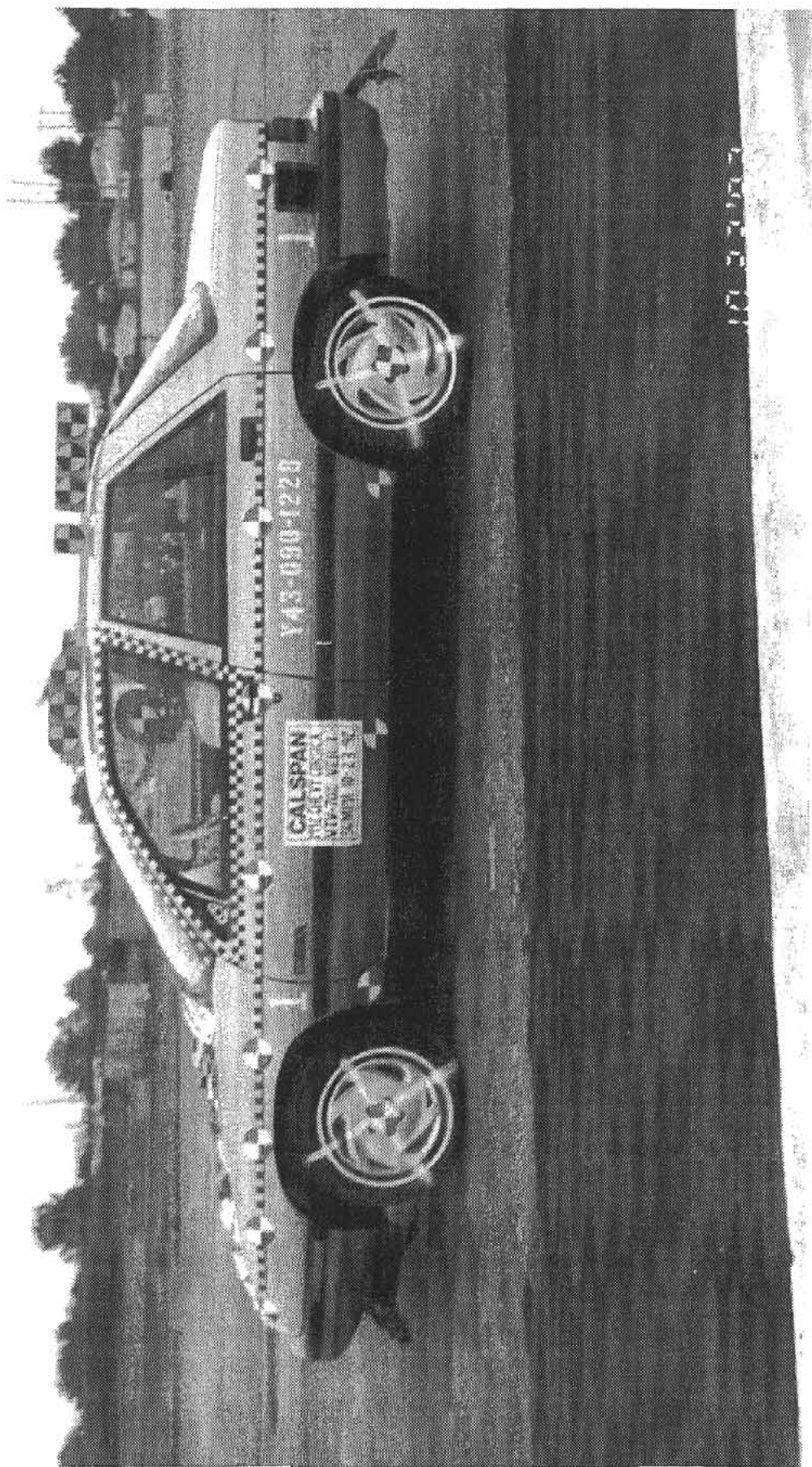
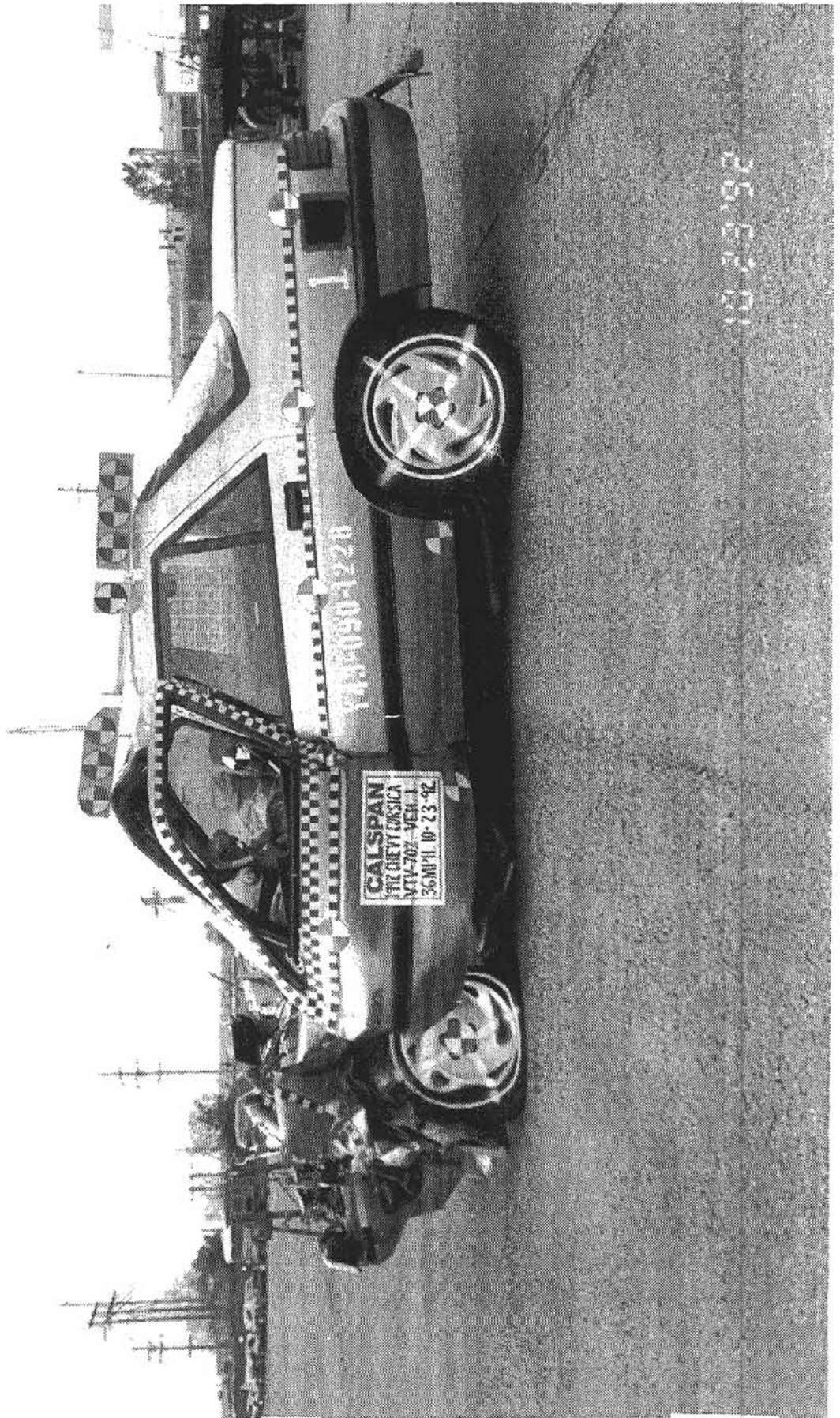


Figure A-18 VEHICLE 1 PRE-TEST LEFT SIDE VIEW



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

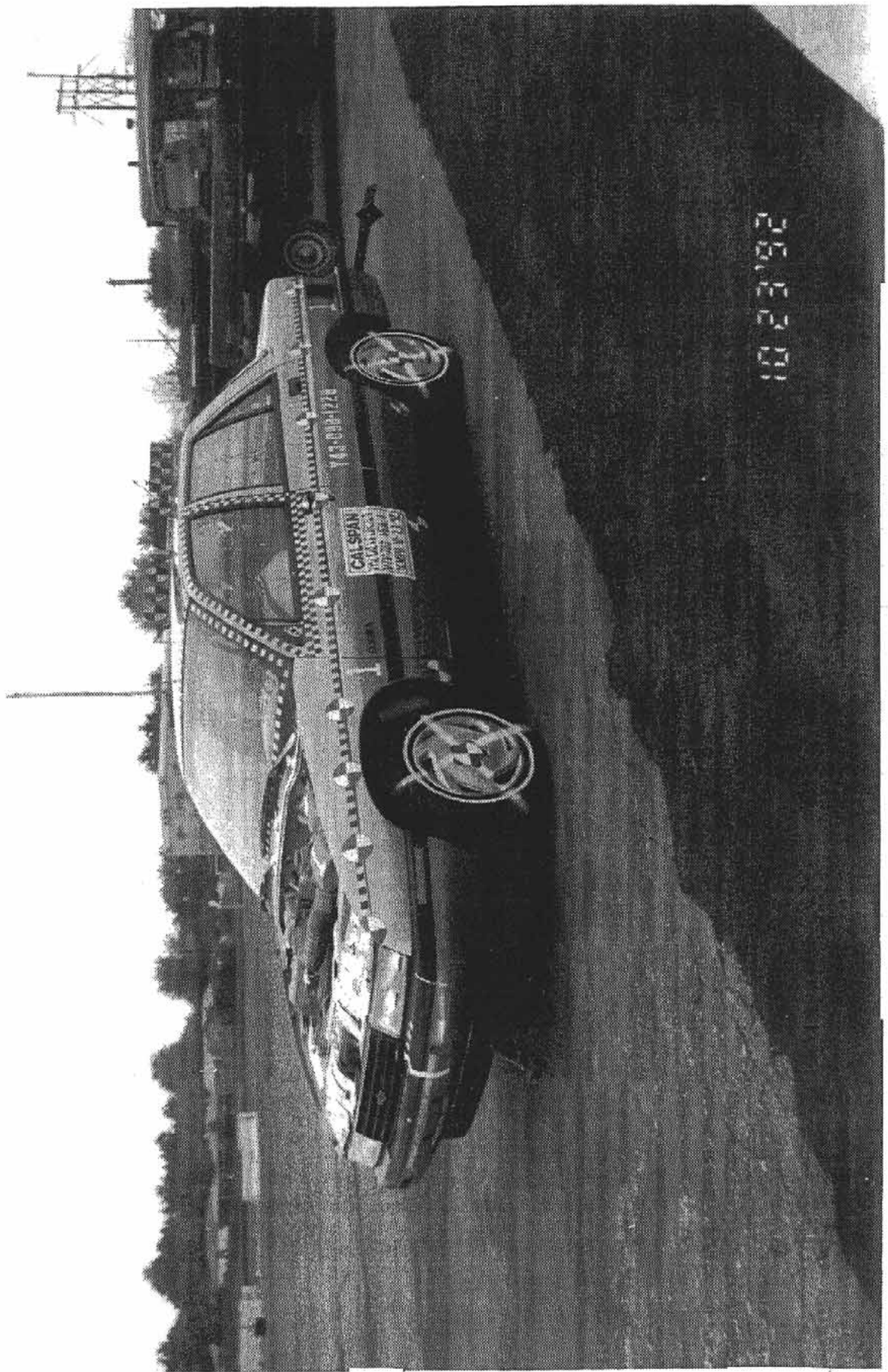


Figure A-20 VEHICLE 1 PRE-TEST FRONT LEFT THREE QUARTER VIEW



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

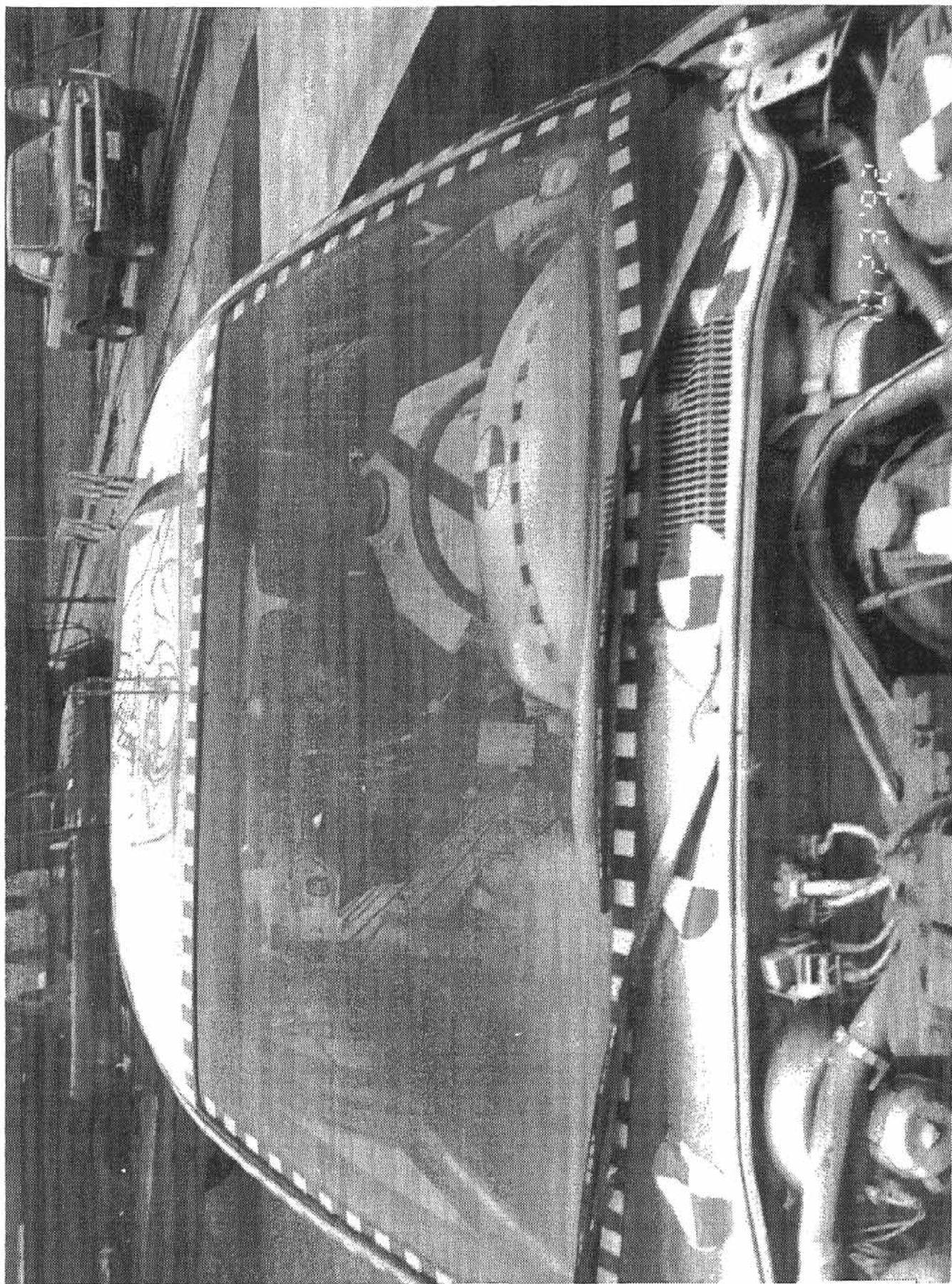


Figure A-22 VEHICLE 1 PRE-TEST WINDSHIELD VIEW

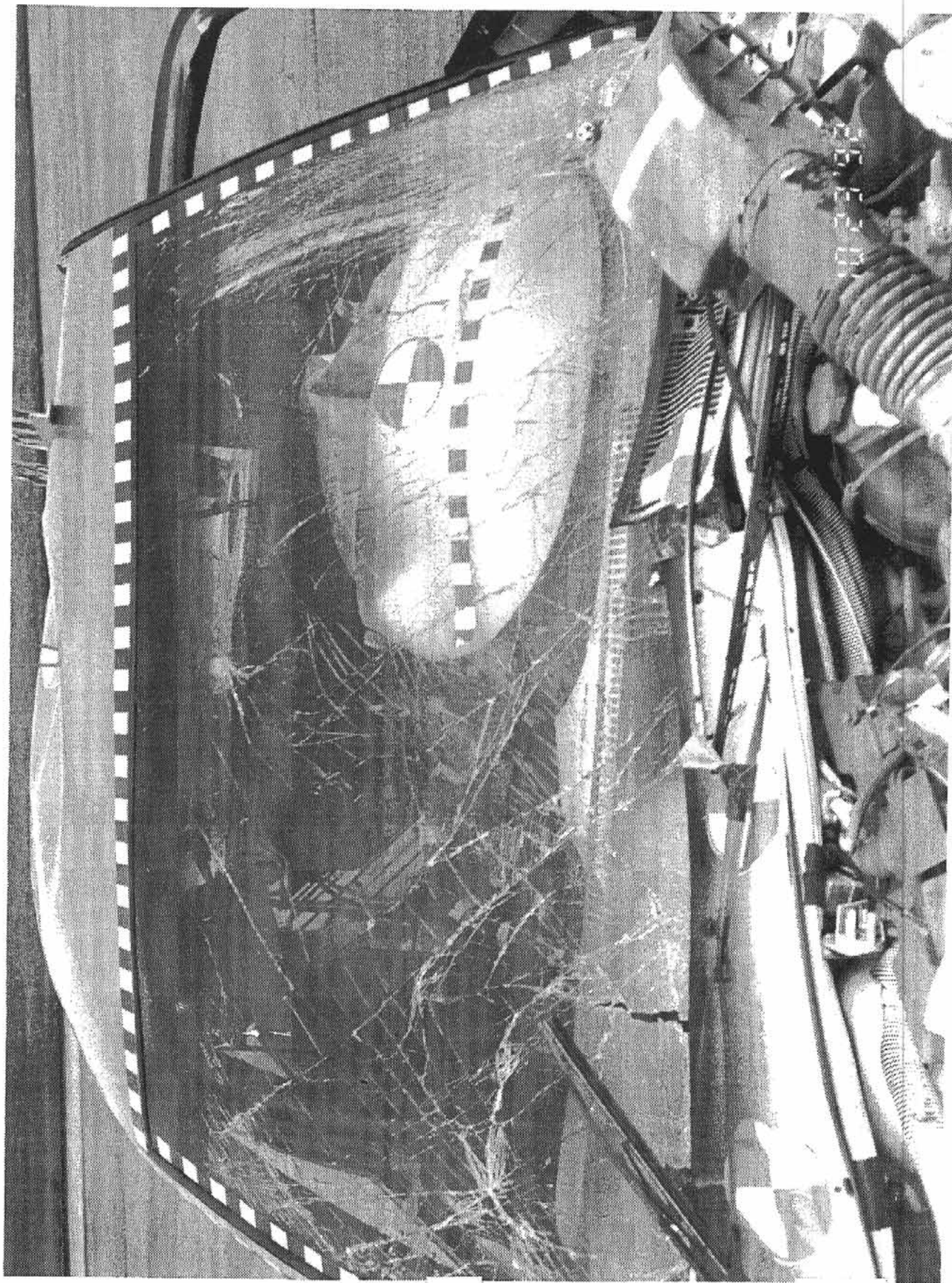


Figure A-23 VEHICLE 1 POST-TEST WINDSHIELD VIEW

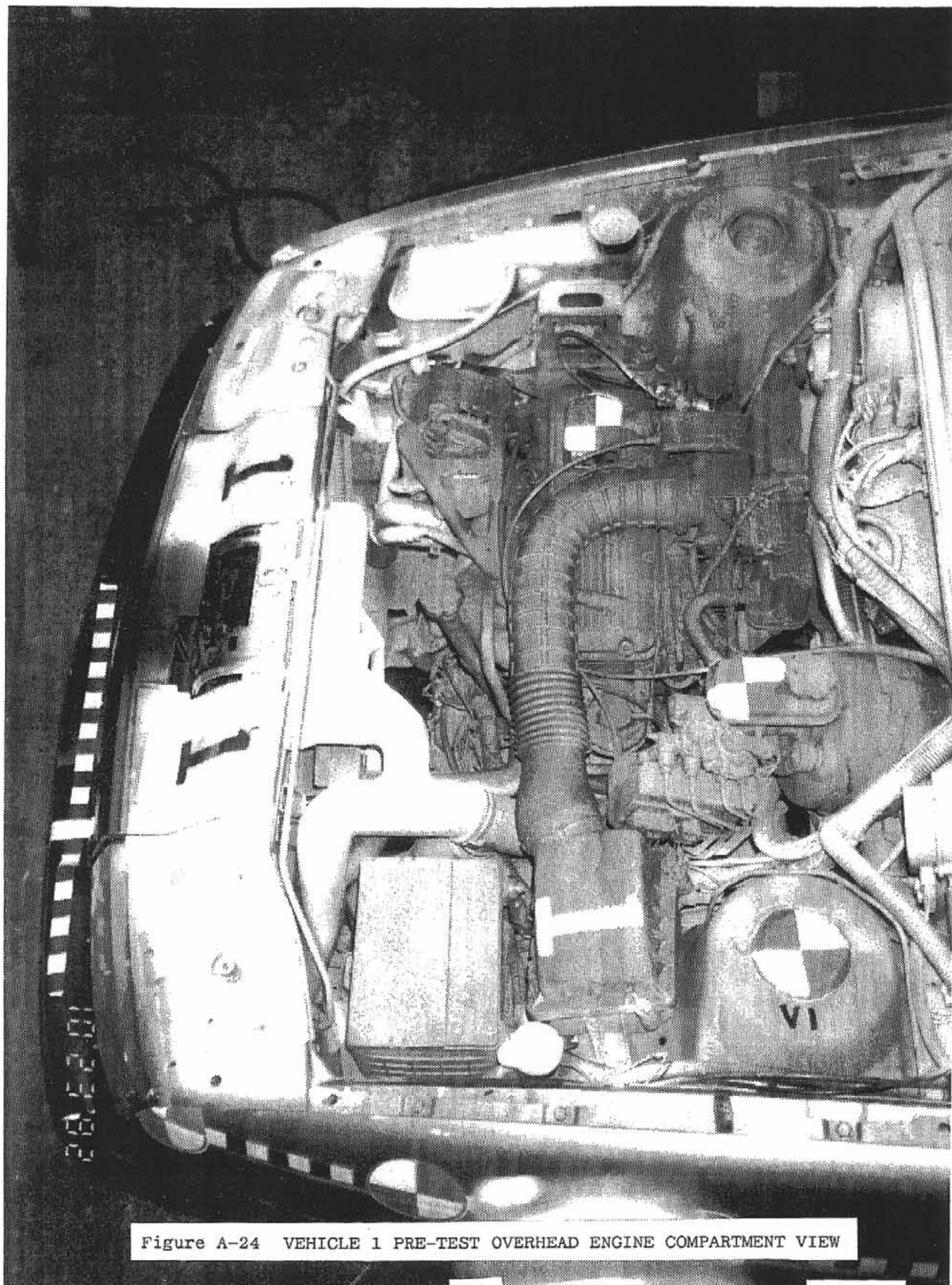


Figure A-24 VEHICLE 1 PRE-TEST OVERHEAD ENGINE COMPARTMENT VIEW



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

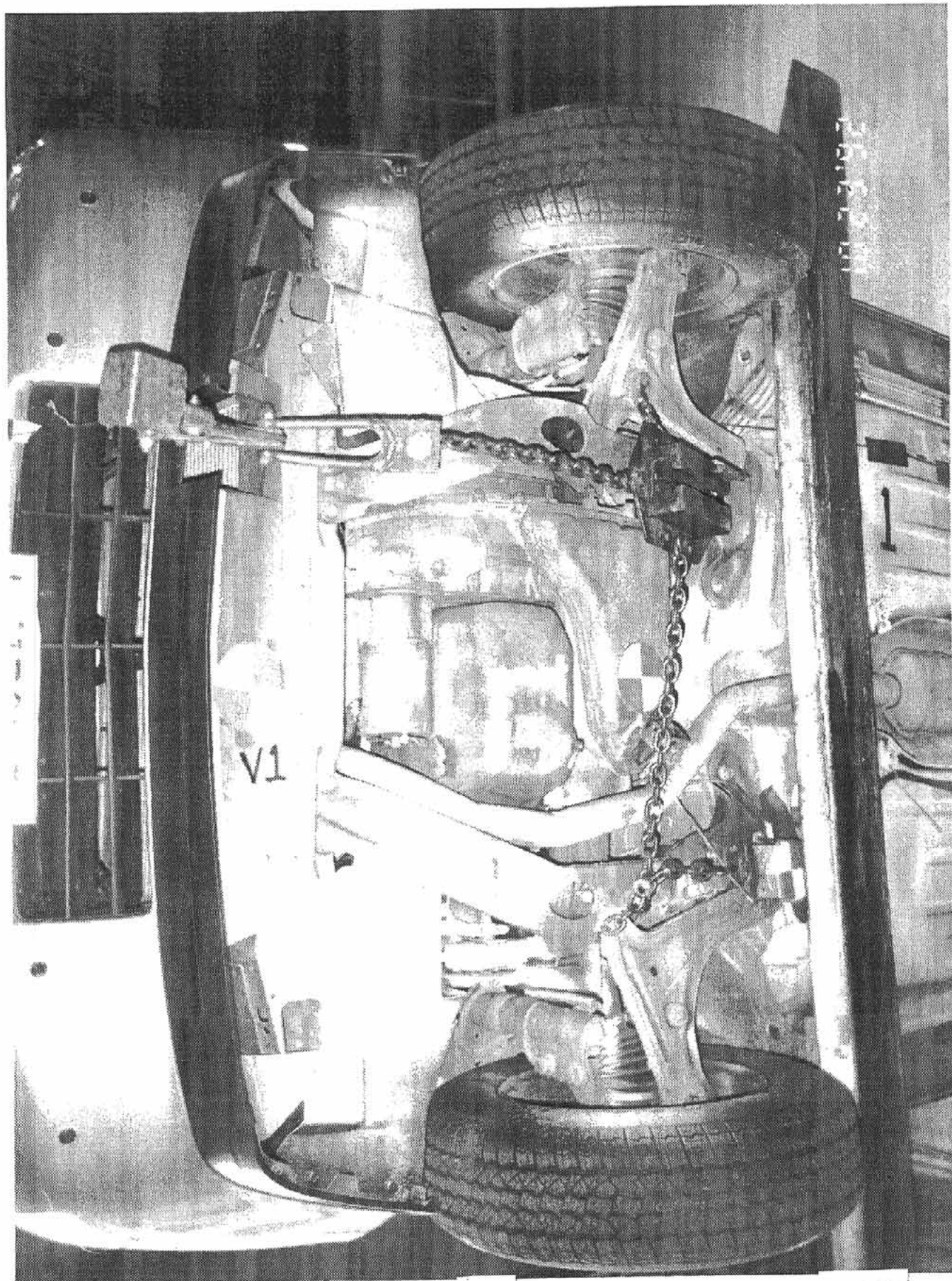


Figure A-26 VEHICLE 1 PRE-TEST UNDERBODY FRONT VIEW



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

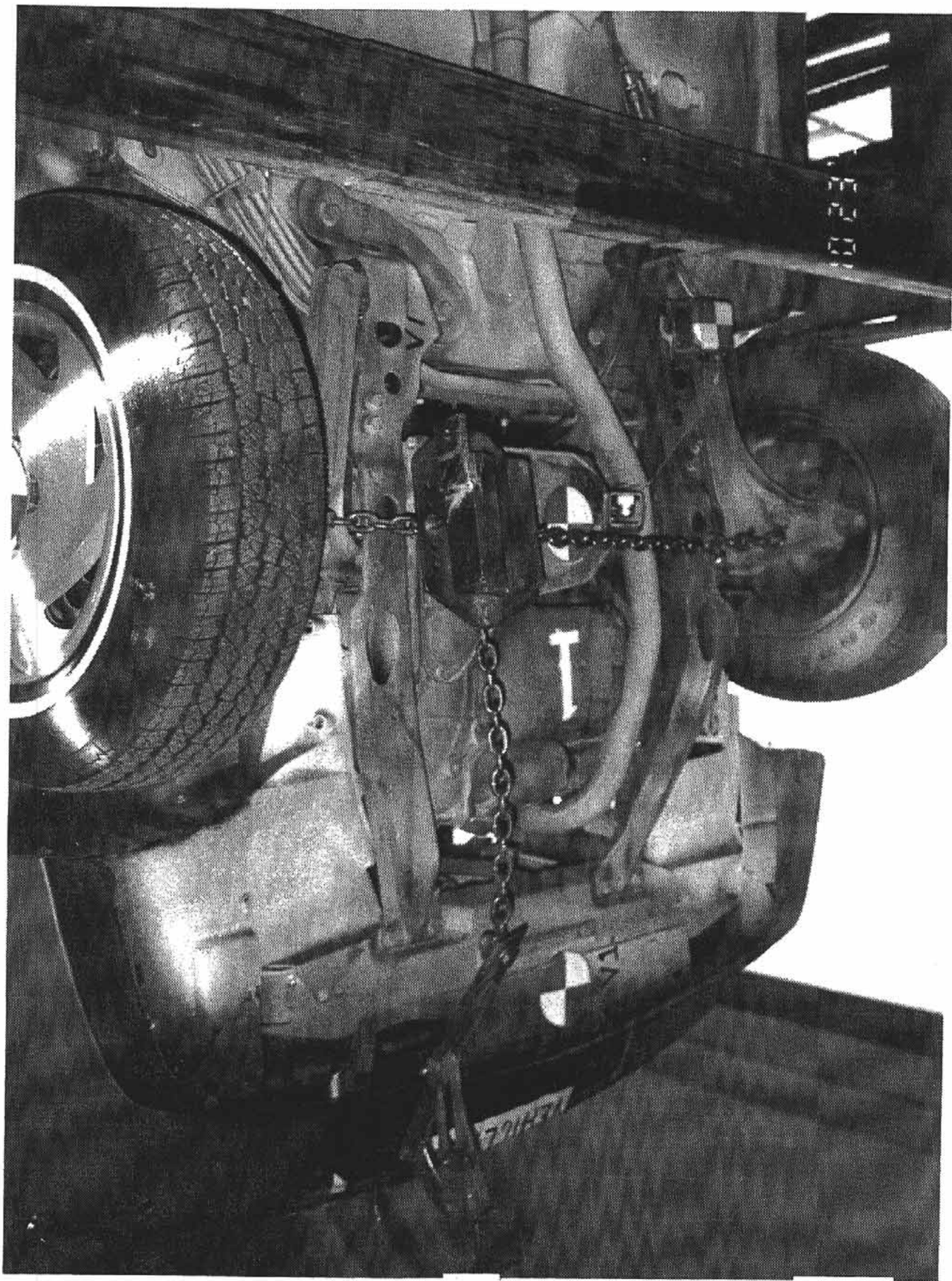


Figure A-28 VEHICLE 1 PRE-TEST UNDERBODY FRONT SIDE VIEW

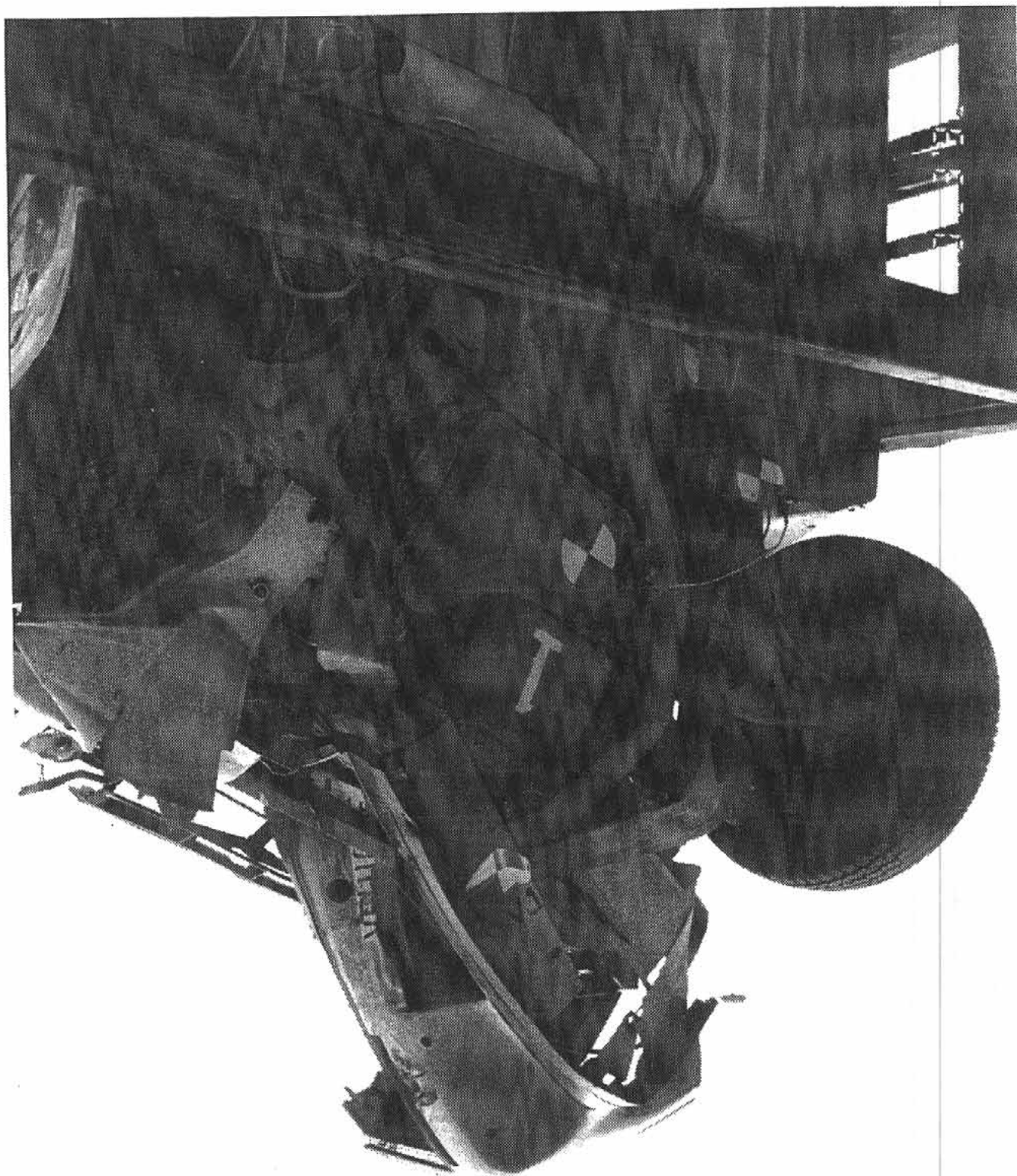


Figure A-29 VEHICLE 1 POST-TEST UNDERBODY FRONT SIDE VIEW

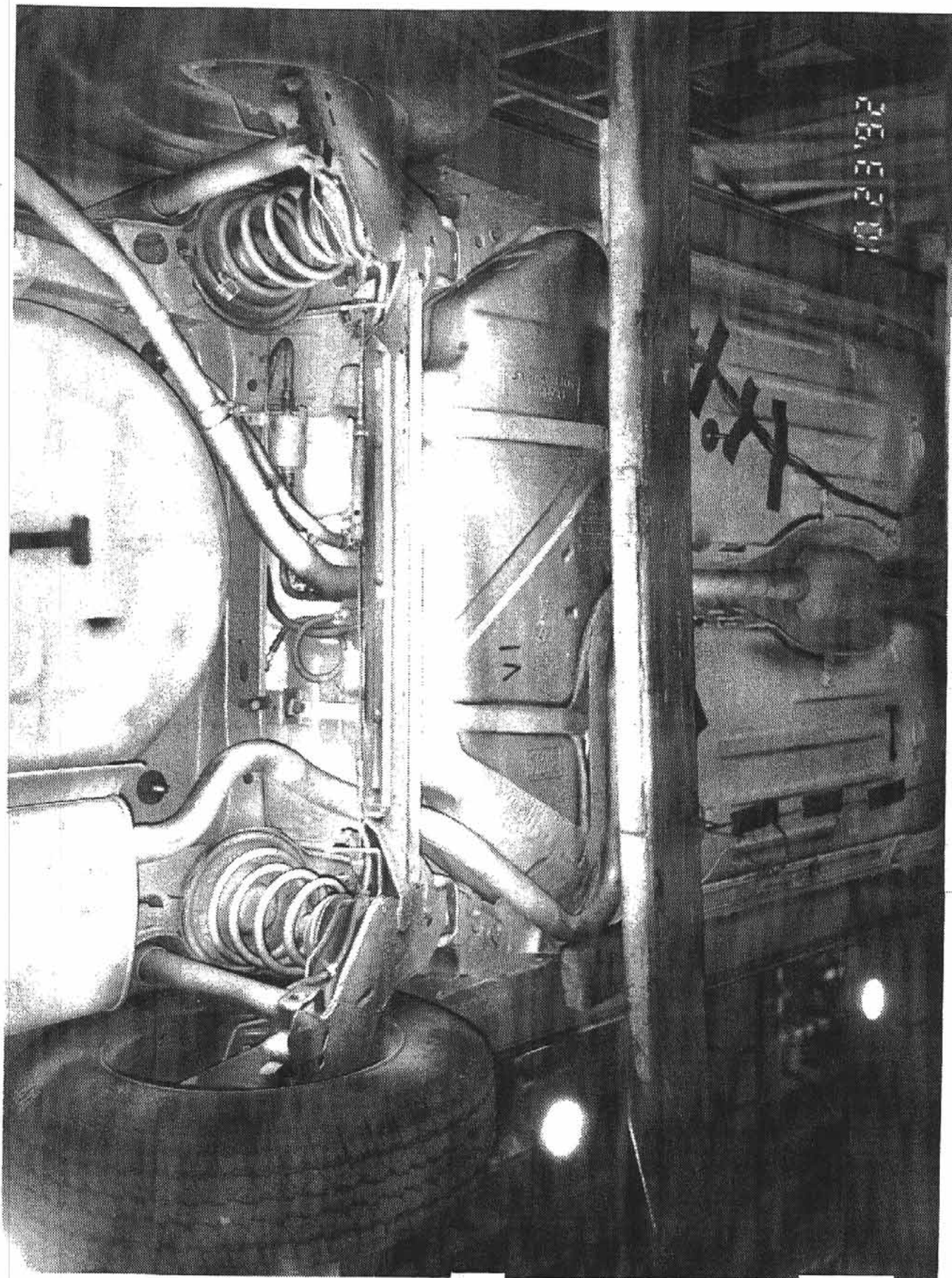


Figure A-30 VEHICLE 1 PRE-TEST UNDERBODY REAR VIEW

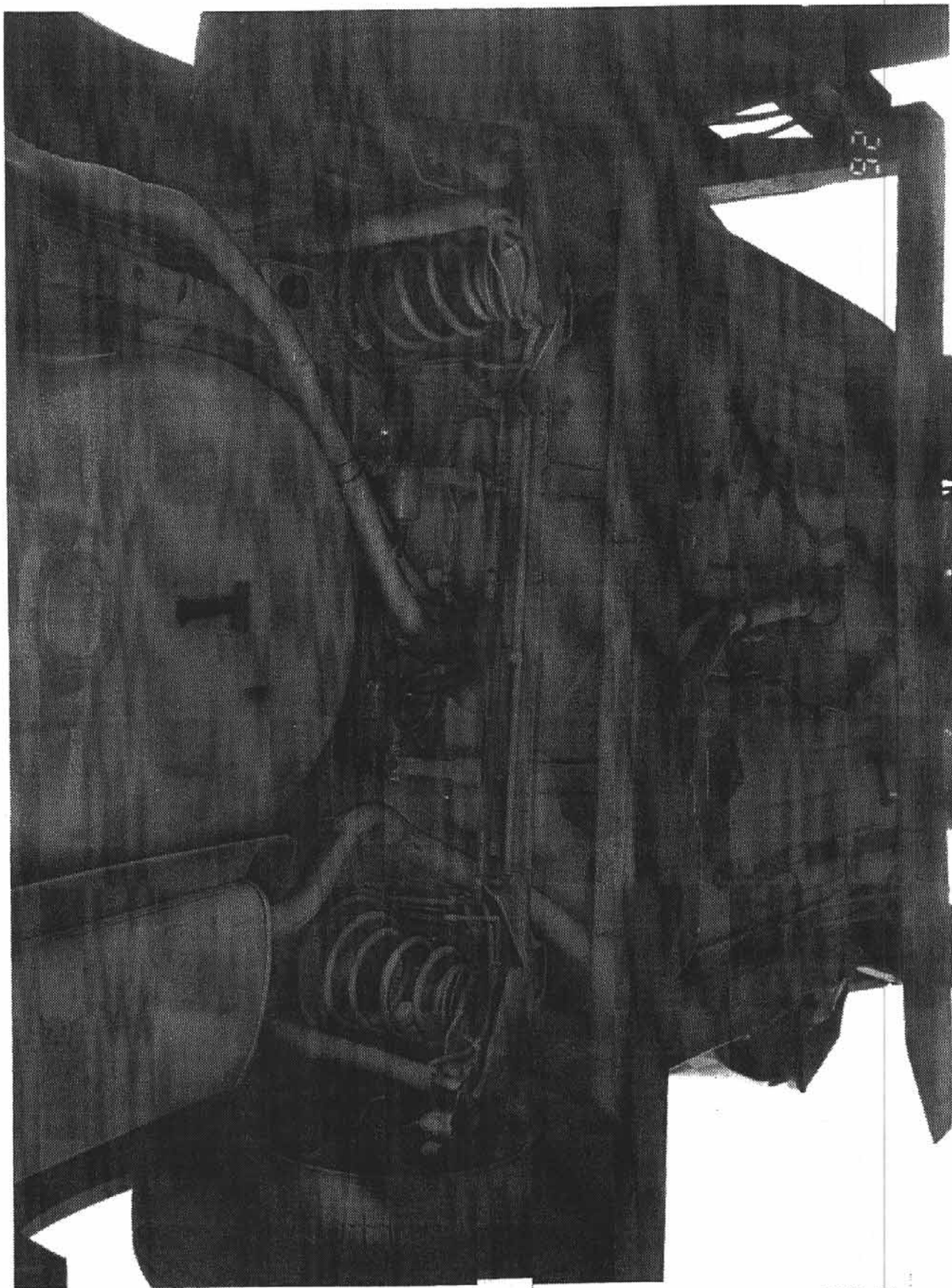


Figure A-31 VEHICLE 1 POST-TEST UNDERBODY REAR VIEW

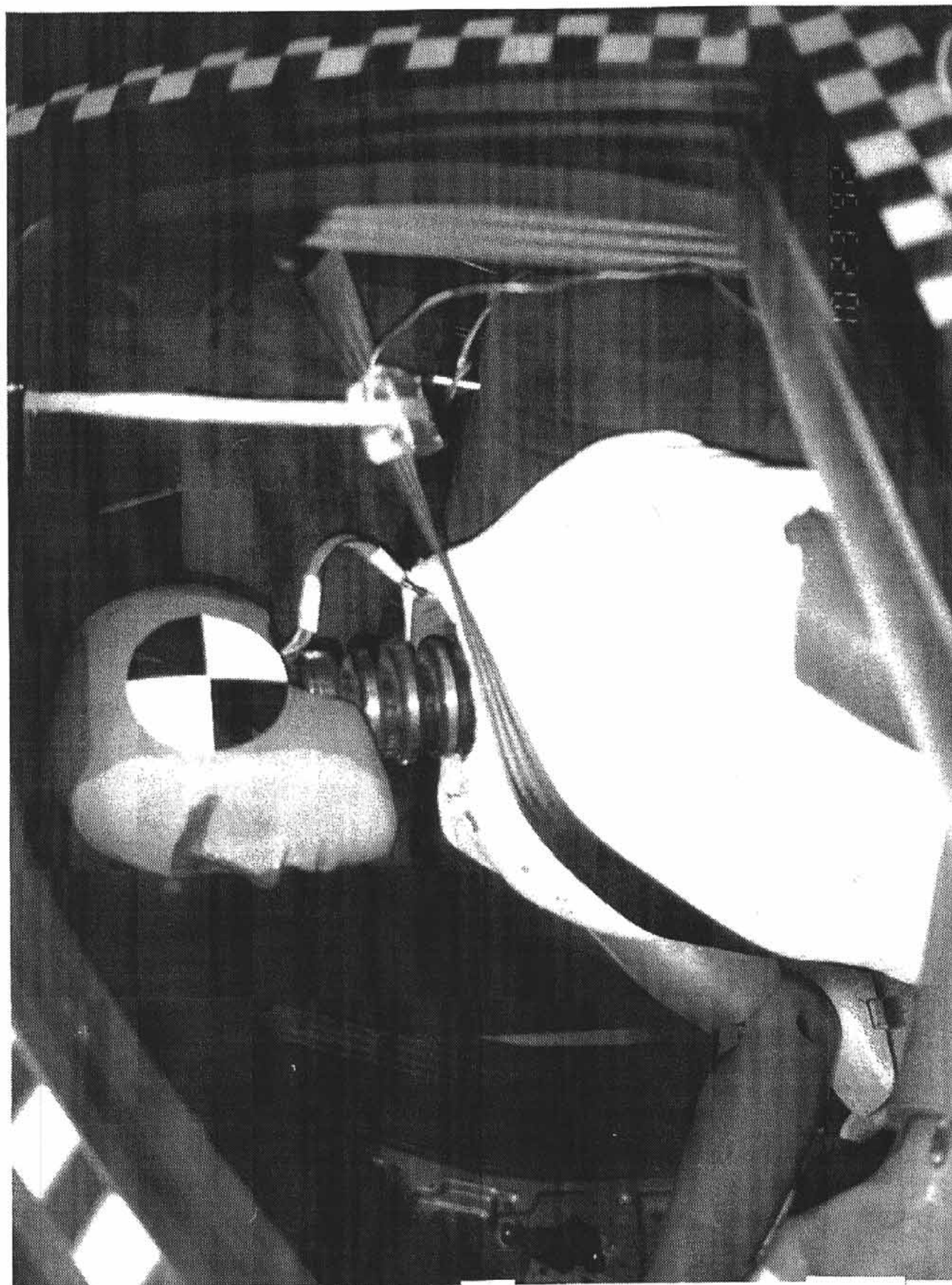


Figure A-32 VEHICLE 1 PRE-TEST DRIVER POSITION VIEW



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

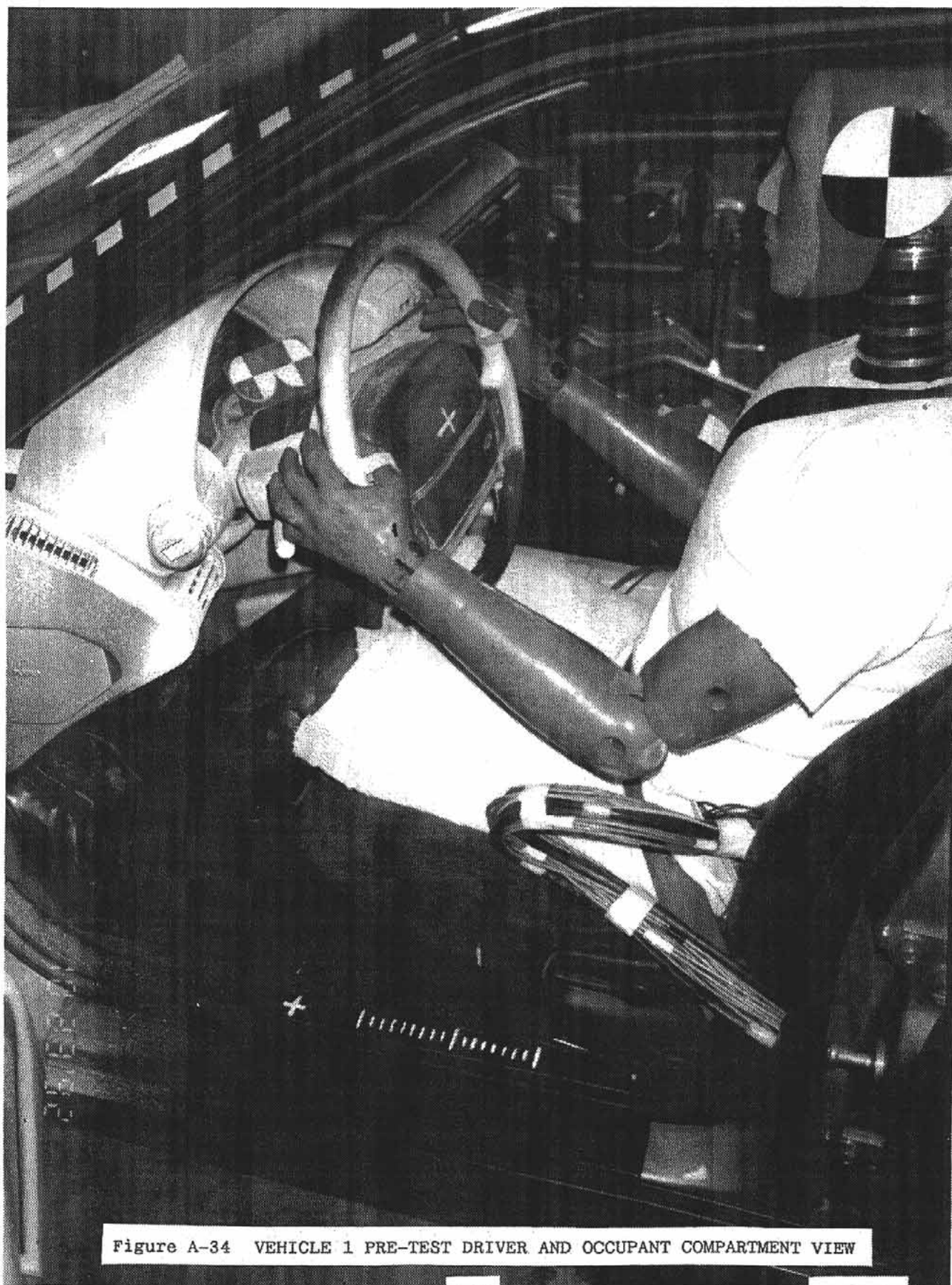


Figure A-34 VEHICLE 1 PRE-TEST DRIVER AND OCCUPANT COMPARTMENT VIEW



Figure A-35 VEHICLE 1 POST-TEST DRIVER AND OCCUPANT COMPARTMENT VIEW

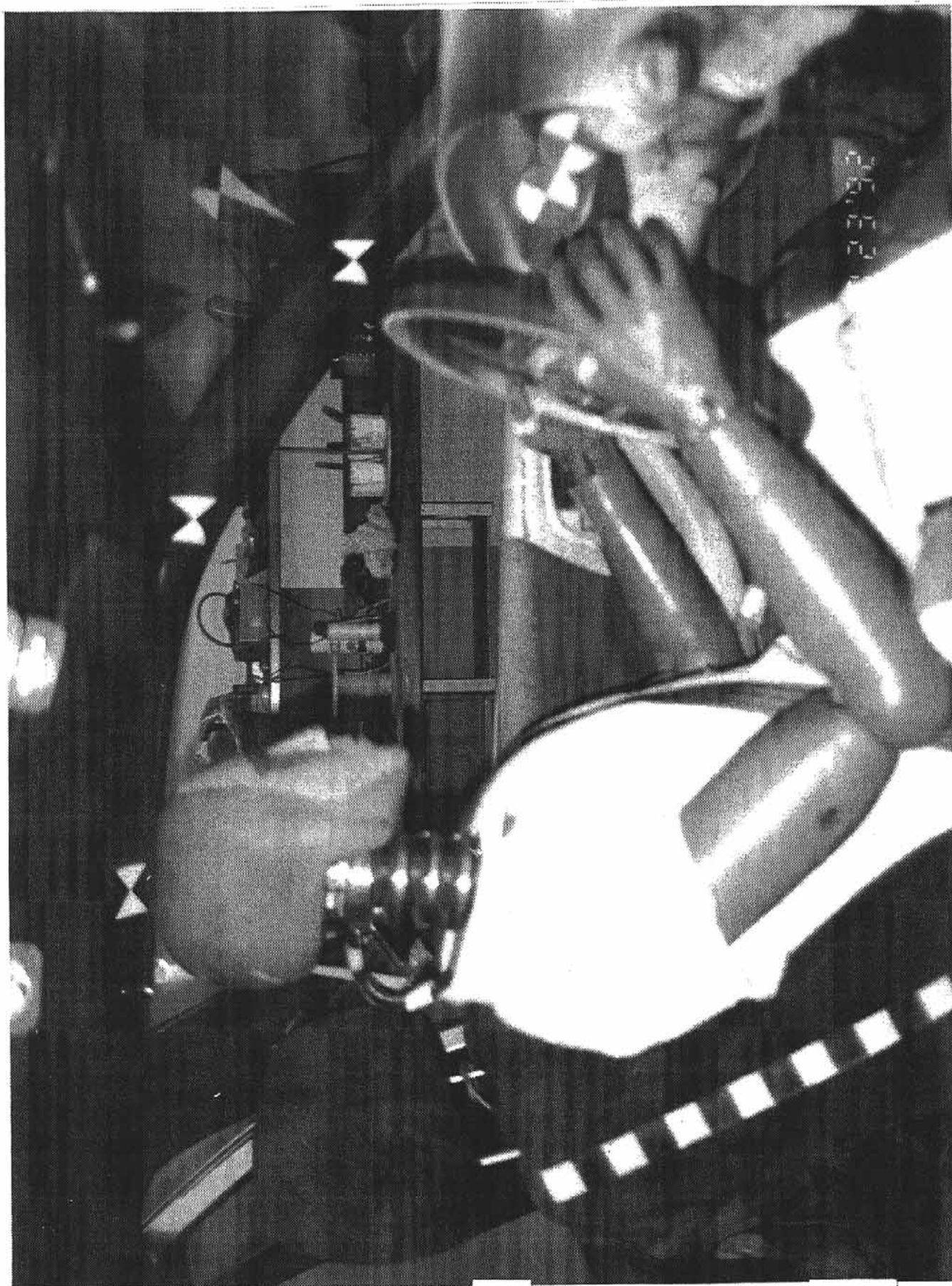


Figure A-36 VEHICLE 1 PRE-TEST DRIVER AND OCCUPANT COMPARTMENT
RIGHT SIDE VIEW



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

Figure A-38 VEHICLE 1 POST-TEST DRIVER AIRBAG VIEW
(Not Available)

VEHICLE 2 PHOTOGRAPHS

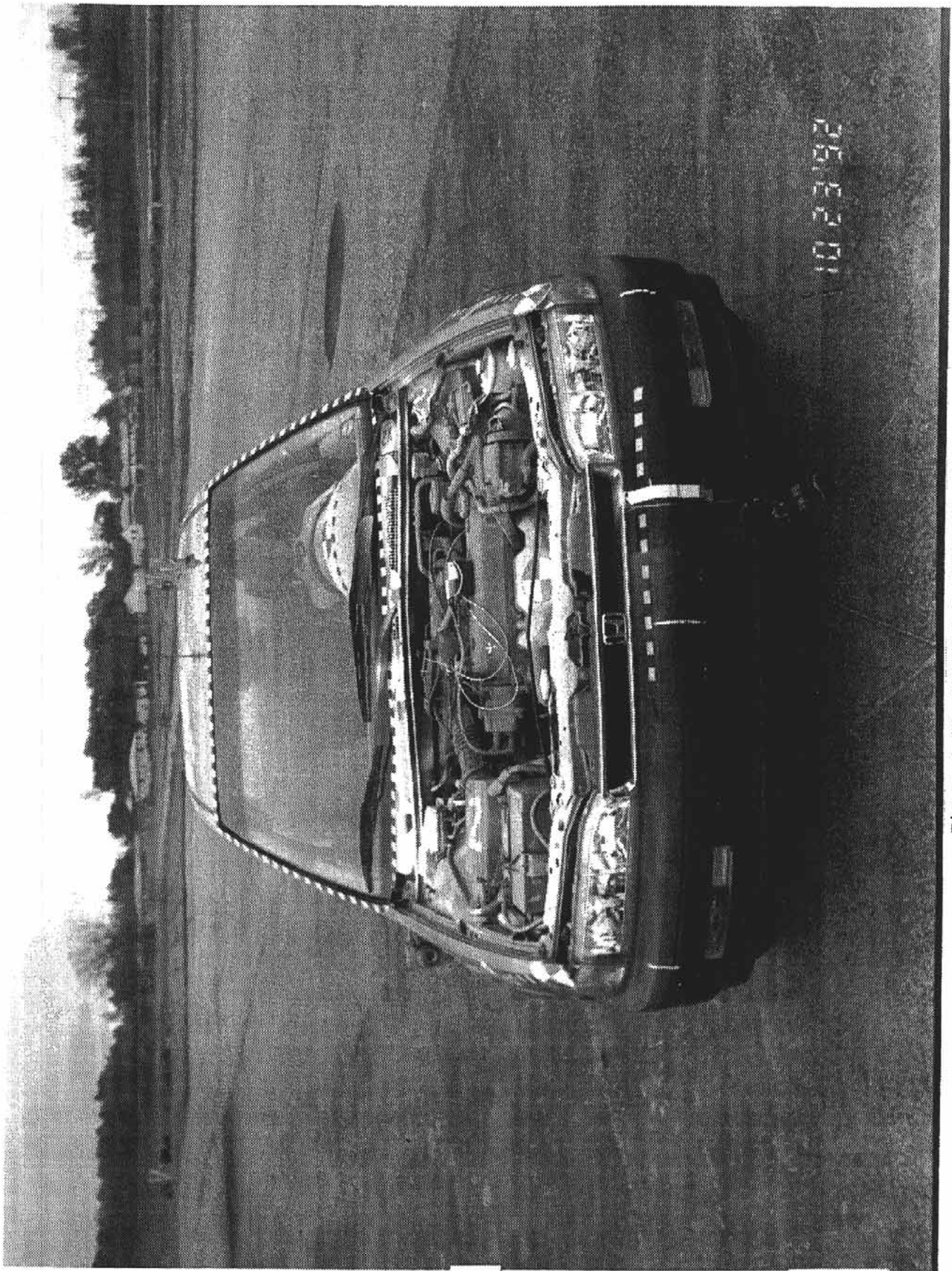


Figure A-39 VEHICLE 2 PRE-TEST FRONT VIEW



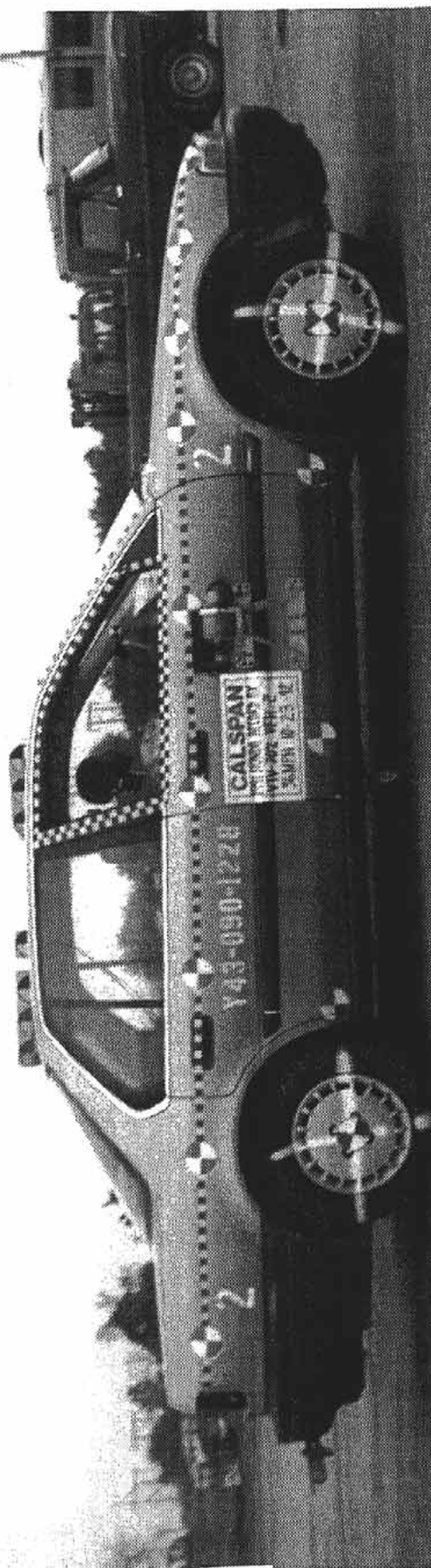
Figure A-40 VEHICLE 2 POST-TEST FRONT VIEW



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



Figure A-42 VEHICLE 2 POST-TEST FRONT RIGHT THREE QUARTER VIEW



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

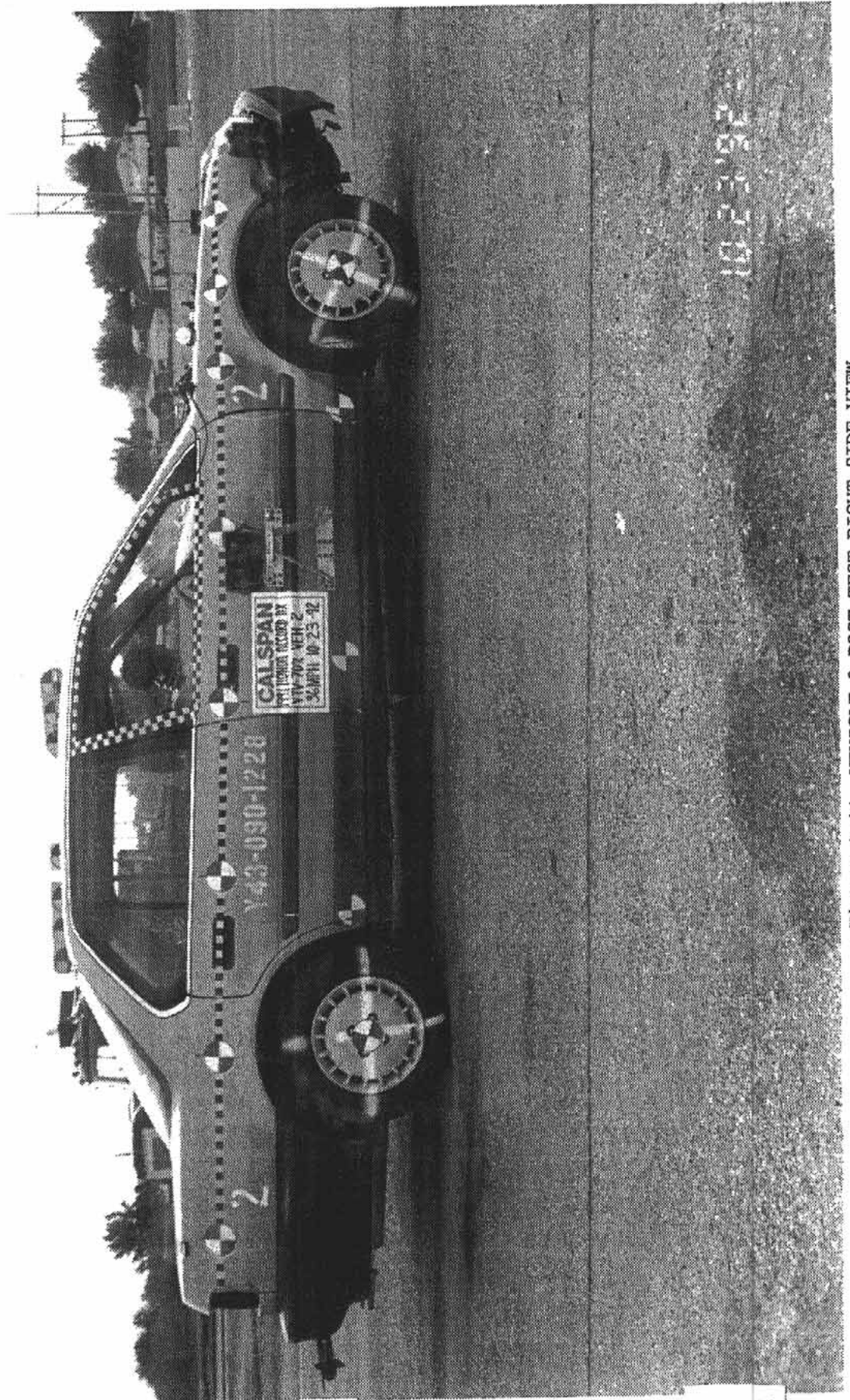


Figure A-44 VEHICLE 2 POST-TEST RIGHT SIDE VIEW

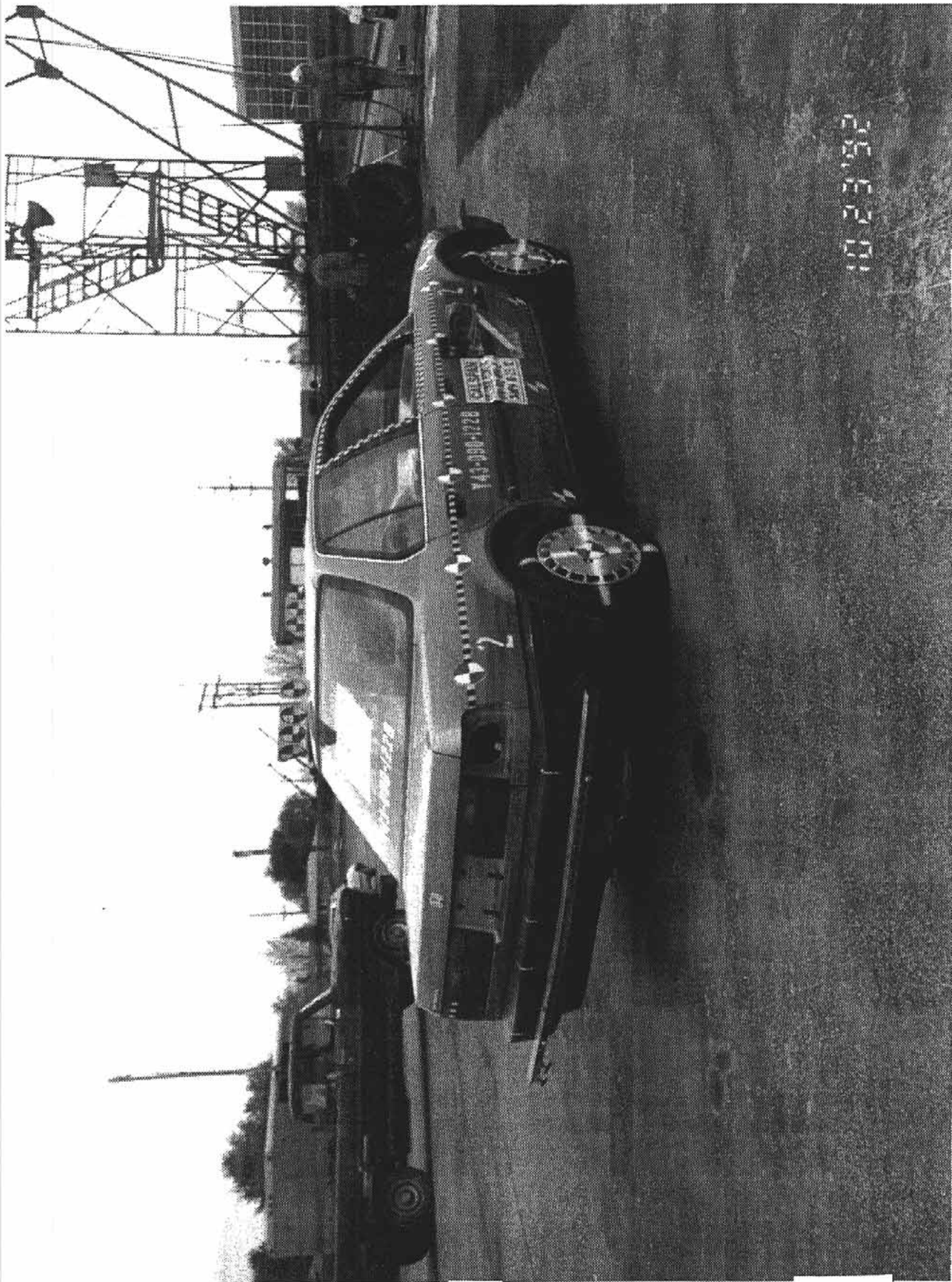


Figure A-45 VEHICLE 2 PRE-TEST REAR RIGHT THREE QUARTER VIEW

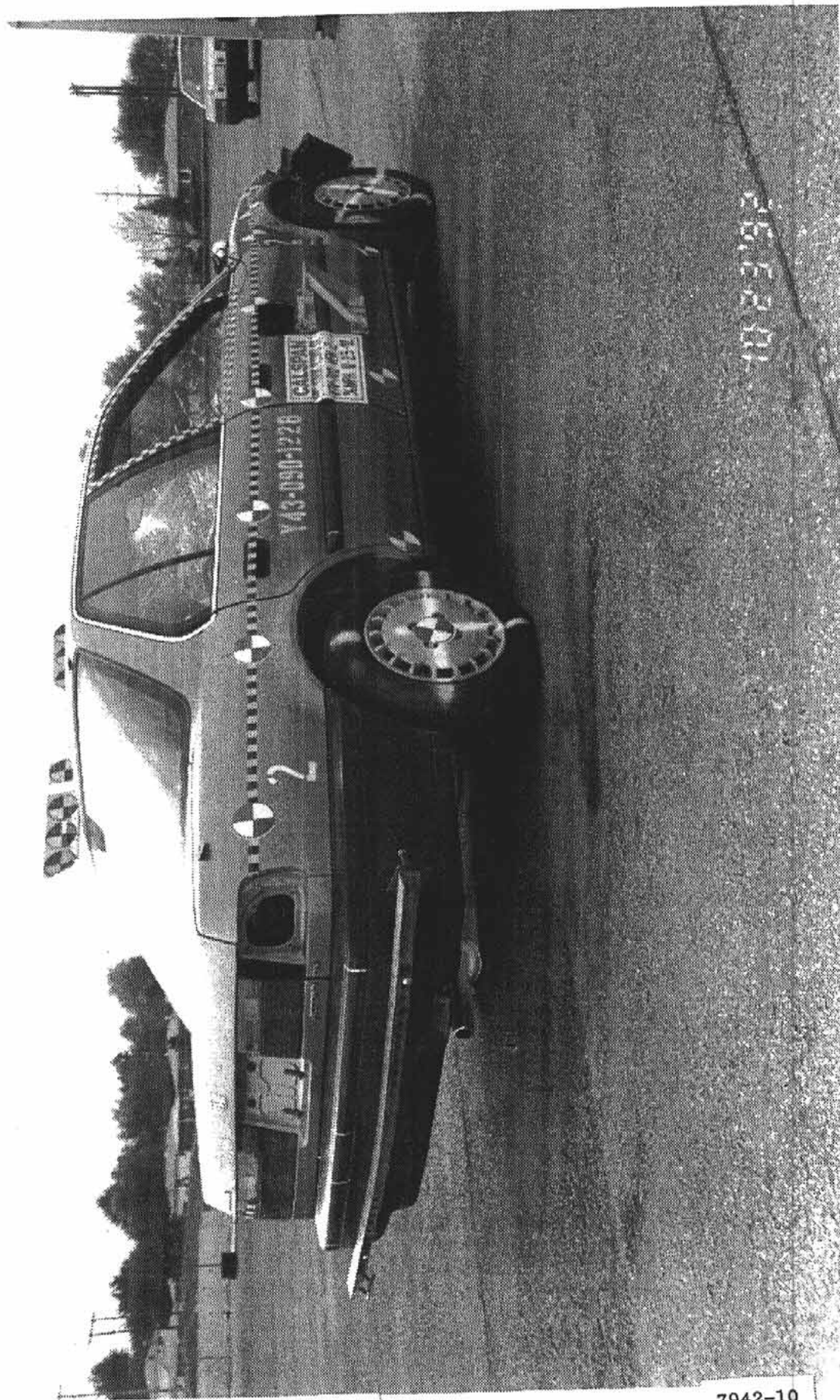


Figure A-46 VEHICLE 2 POST-TEST REAR RIGHT THREE QUARTER VIEW



Figure A-47 VEHICLE 2 PRE-TEST REAR VIEW

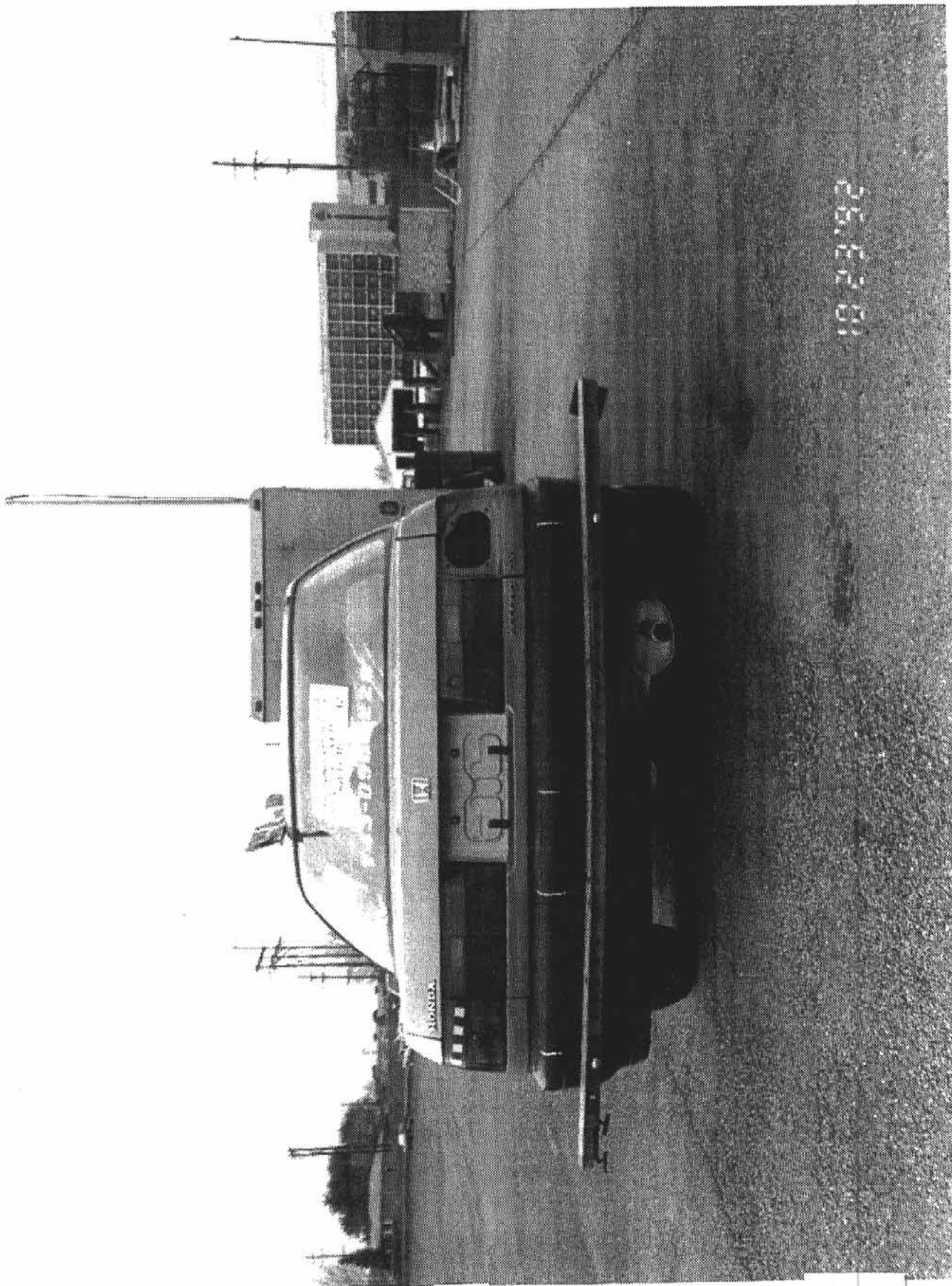


Figure A-48 VEHICLE 2 POST-TEST REAR VIEW



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



Figure A-50 VEHICLE 2 POST-TEST REAR LEFT THREE QUARTER VIEW

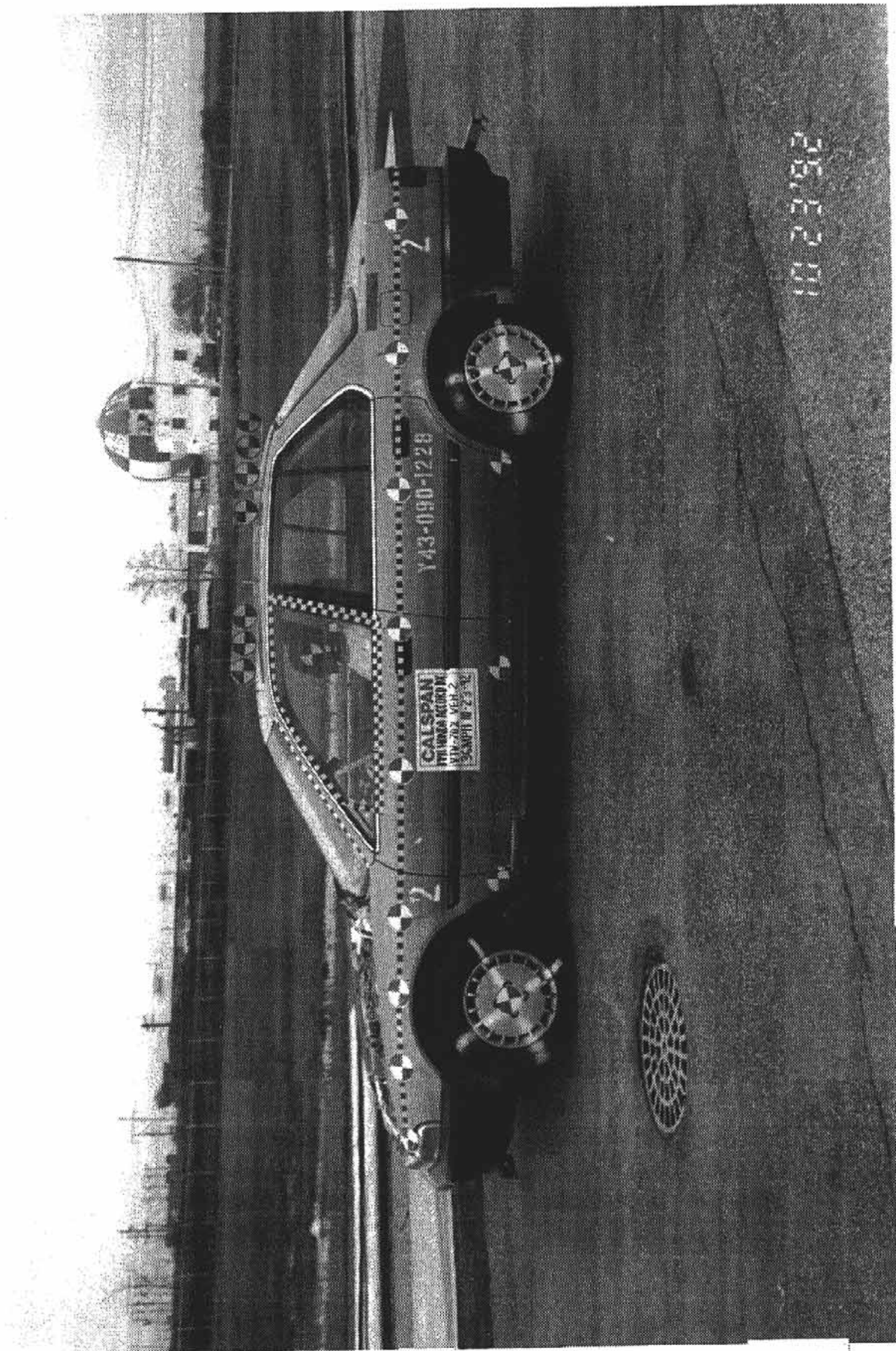


Figure A-51 VEHICLE 2 PRE-TEST LEFT SIDE VIEW



Figure A-52 VEHICLE 2 POST-TEST LEFT SIDE VIEW

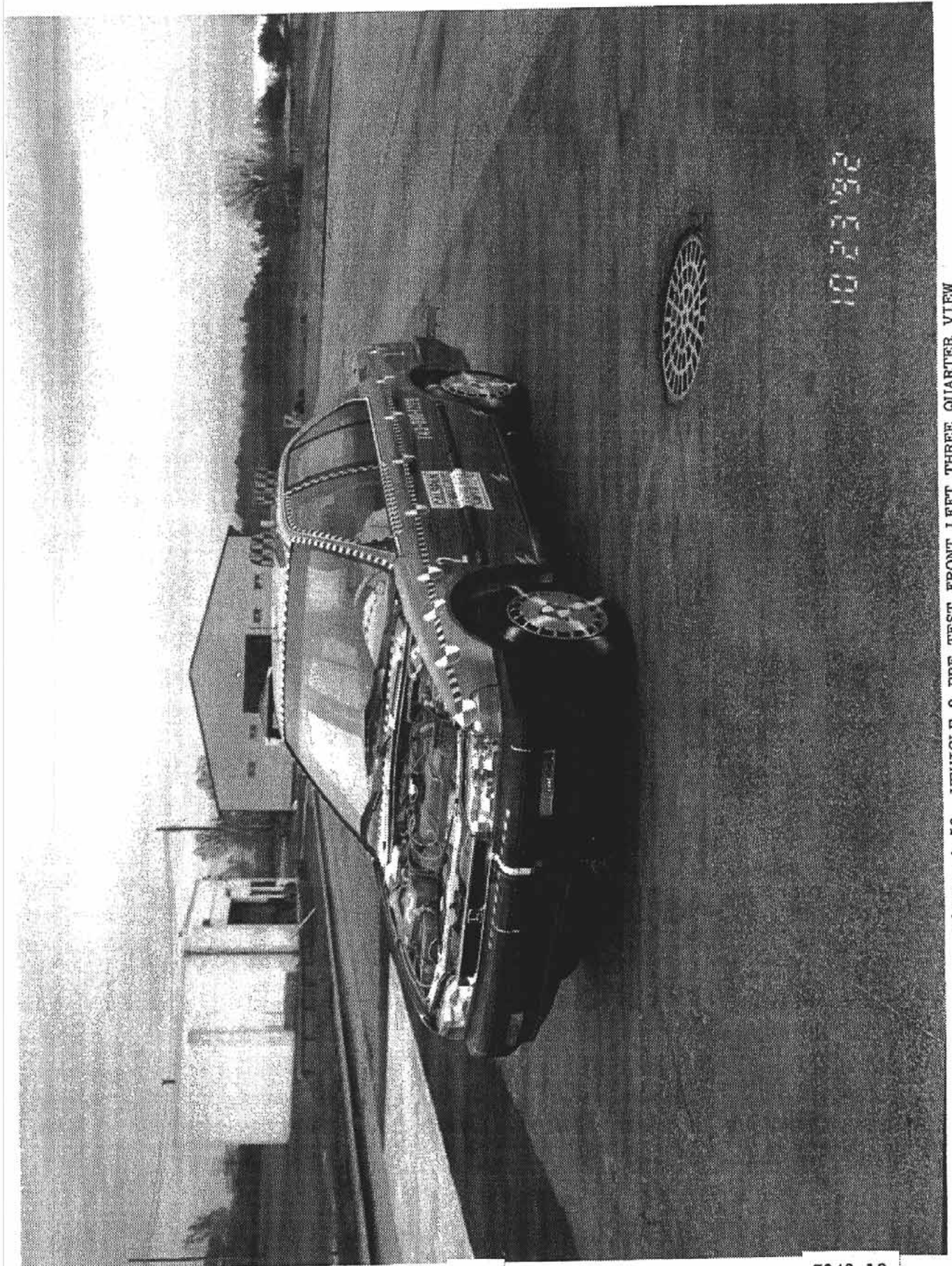


Figure A-53 VEHICLE 2 PRE-TEST FRONT LEFT THREE QUARTER VIEW



Figure A-54 VEHICLE 2 POST-TEST FRONT LEFT THREE QUARTER VIEW

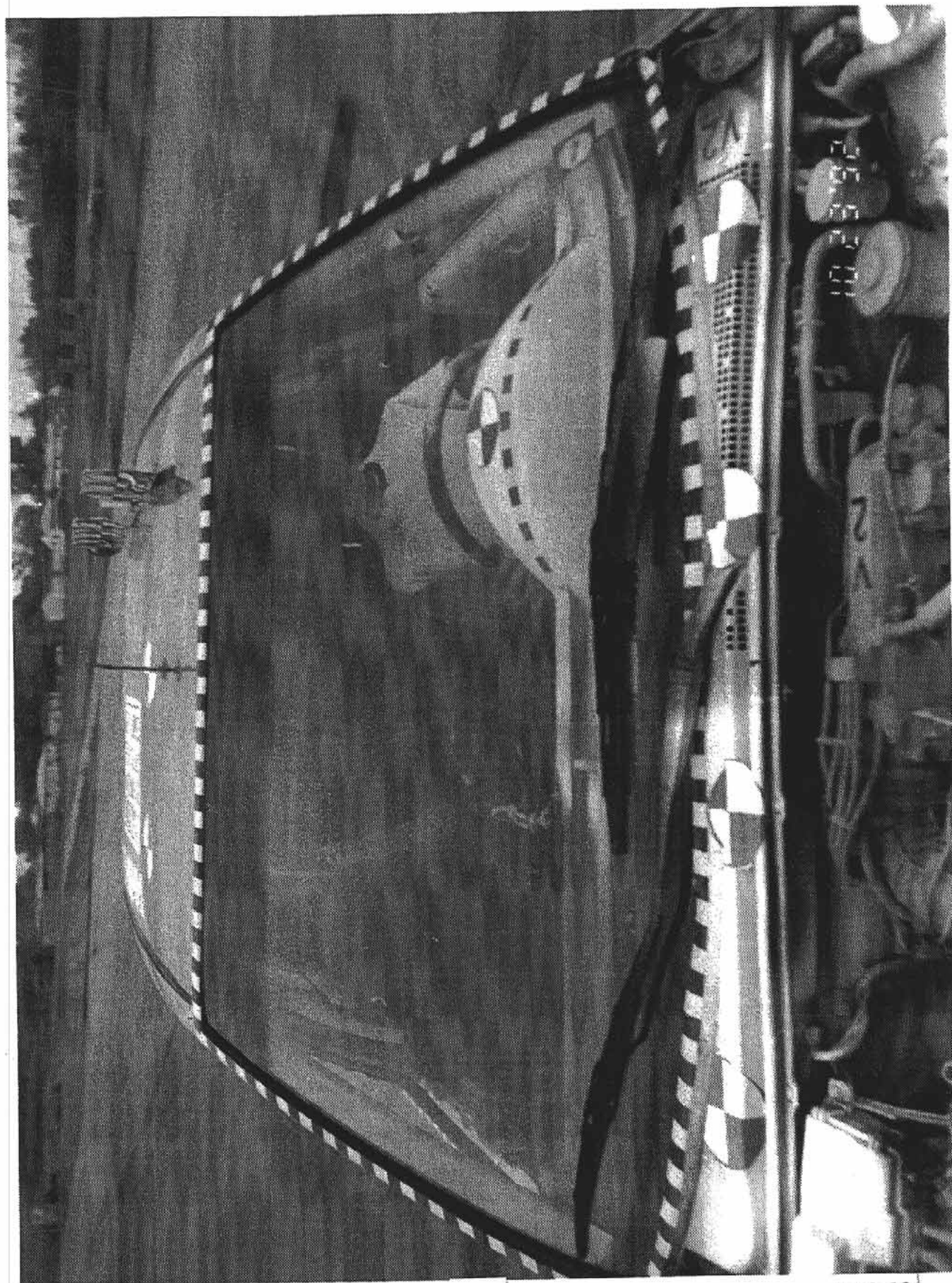


Figure A-55 VEHICLE 2 PRE-TEST WINDSHIELD VIEW

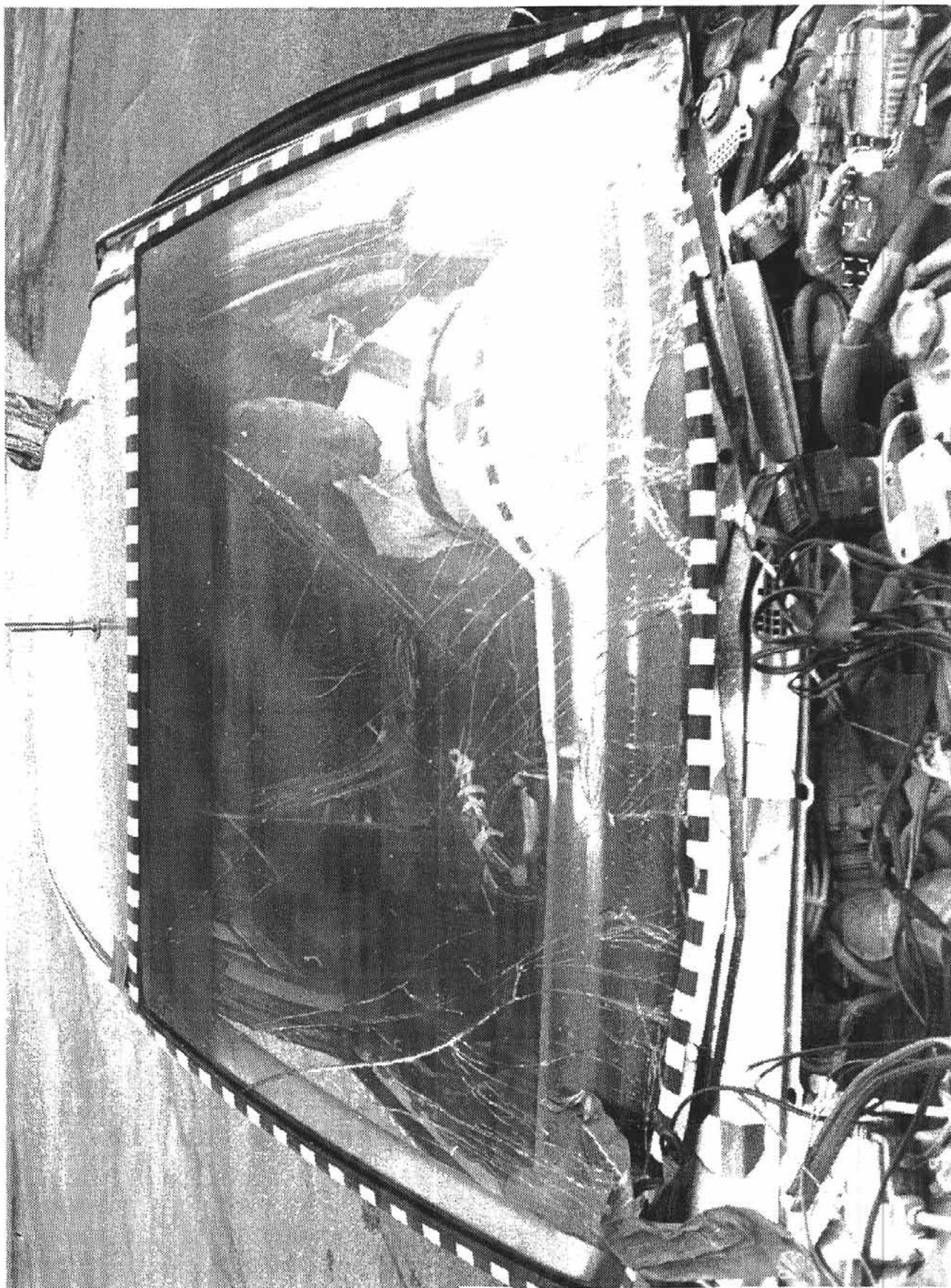


Figure A-56 VEHICLE 2 POST-TEST WINDSHIELD VIEW

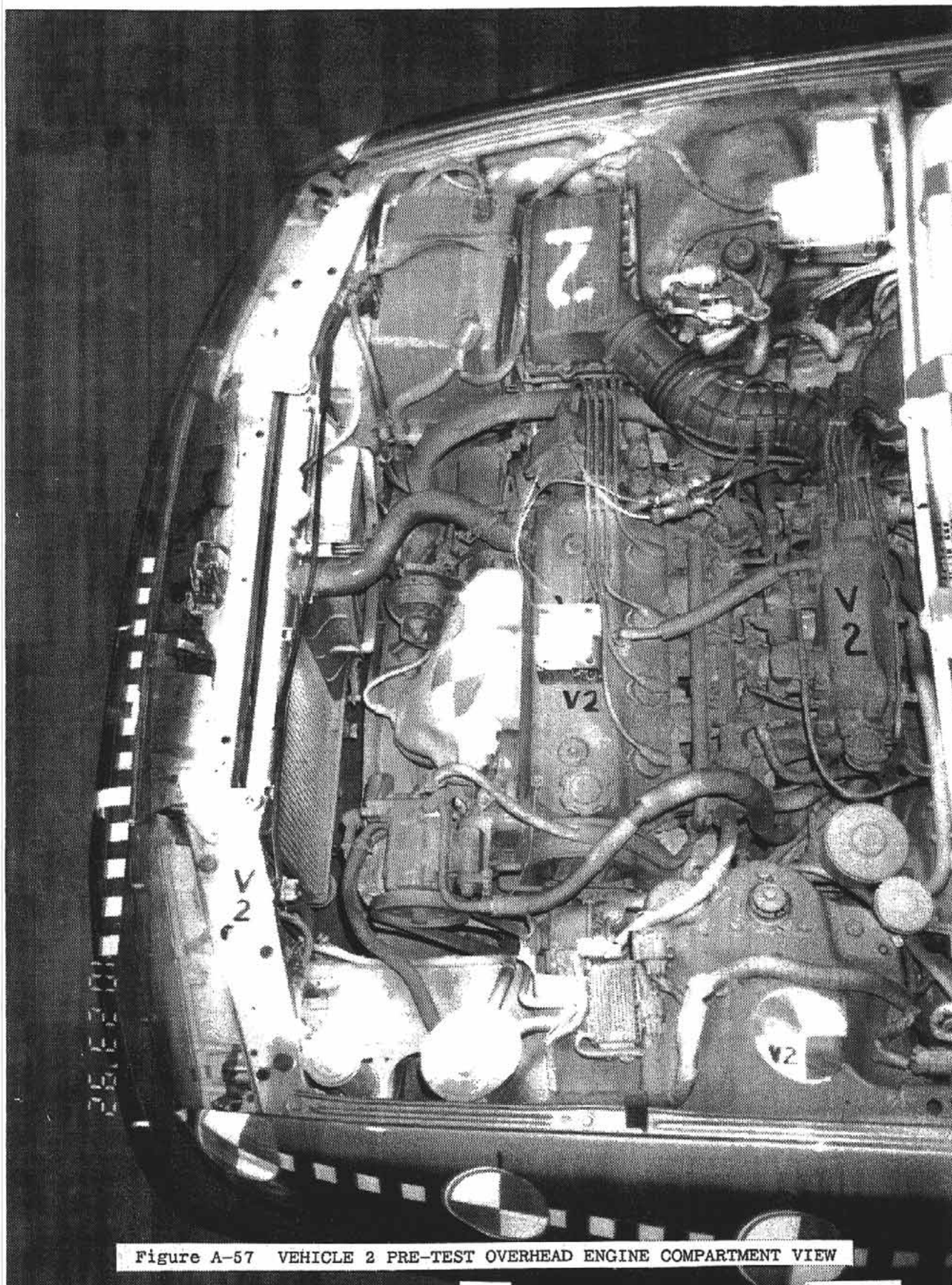


Figure A-57 VEHICLE 2 PRE-TEST OVERHEAD ENGINE COMPARTMENT VIEW



Figure A-58 VEHICLE 2 POST-TEST OVERHEAD ENGINE COMPARTMENT VIEW

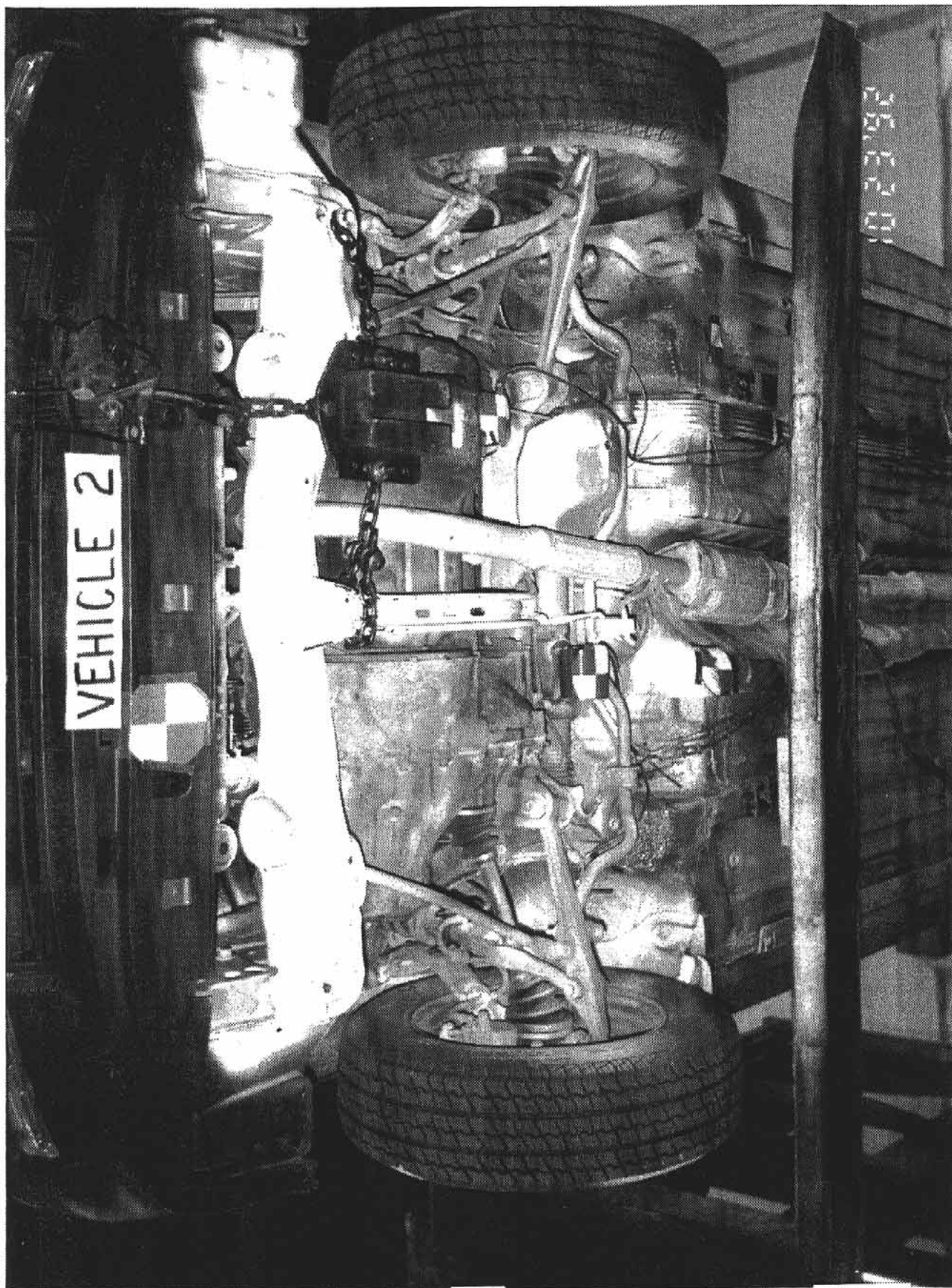


Figure A-59 VEHICLE 2 PRE-TEST UNDERBODY FRONT VIEW



Figure A-60 VEHICLE 2 POST-TEST UNDERBODY FRONT VIEW

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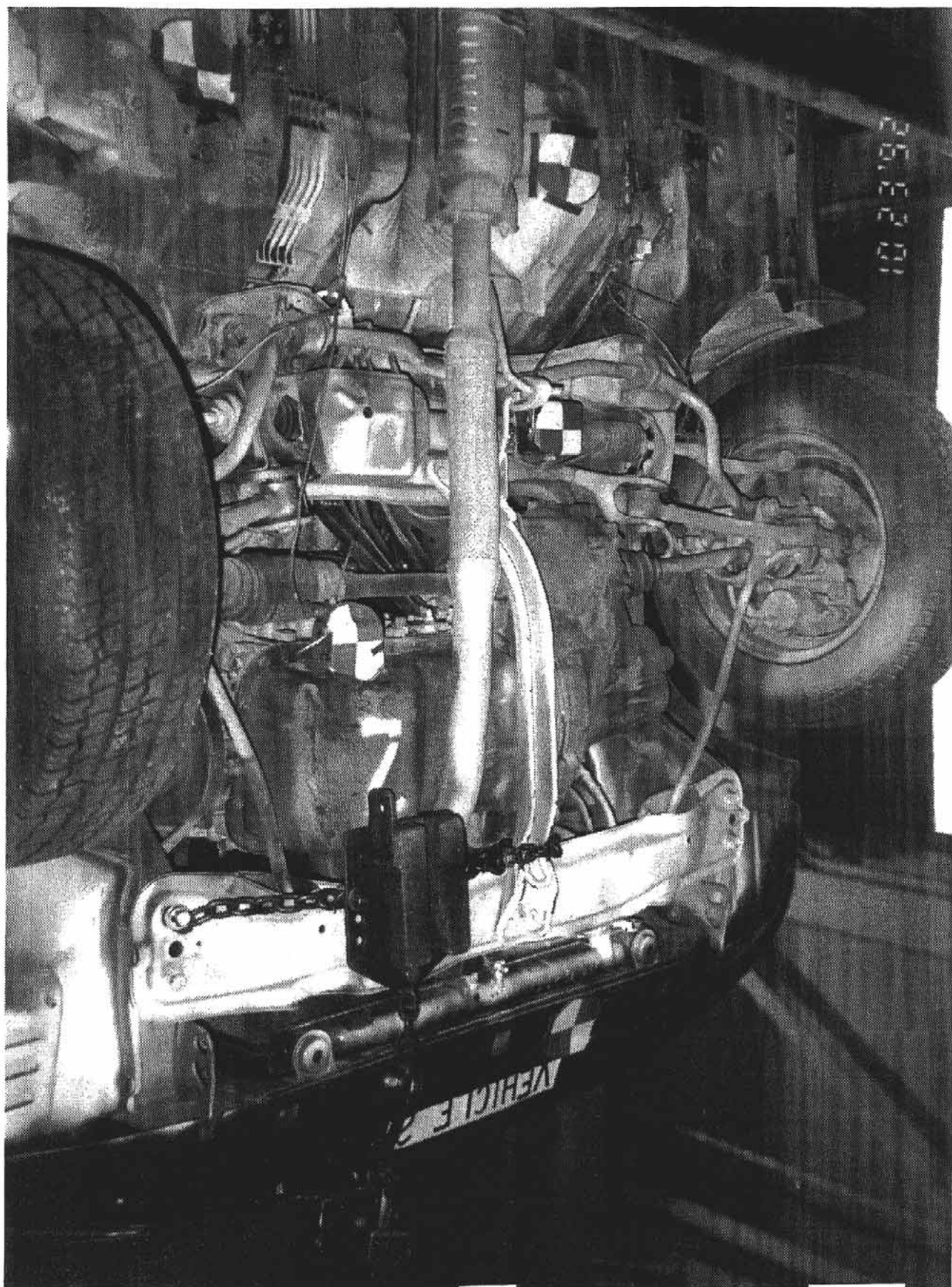


Figure A-61 VEHICLE 2 PRE-TEST UNDERBODY FRONT SIDE VIEW

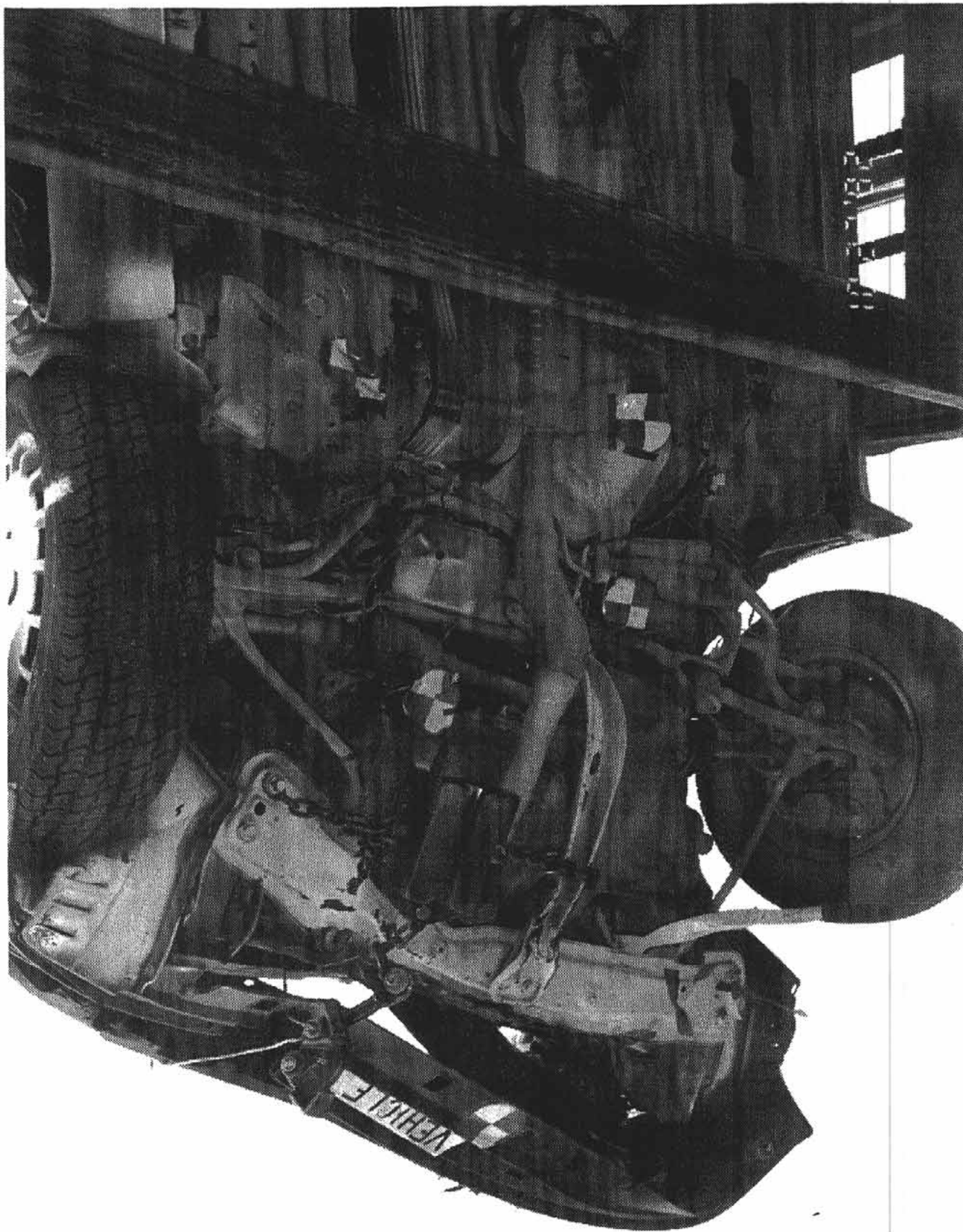


Figure A-62 VEHICLE 2 POST-TEST UNDERBODY FRONT SIDE VIEW

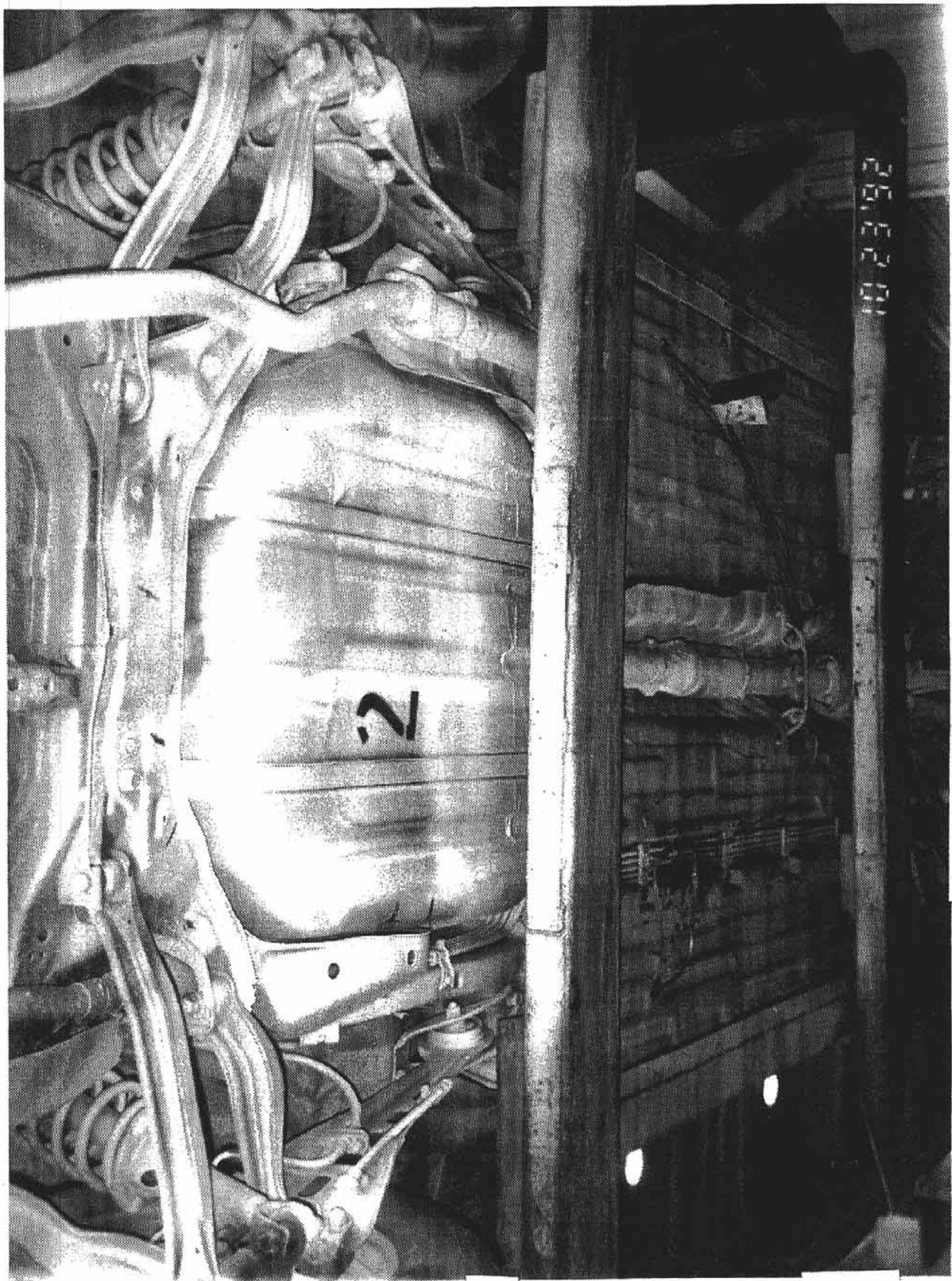


Figure A-63 VEHICLE 2 PRE-TEST UNDERBODY REAR VIEW

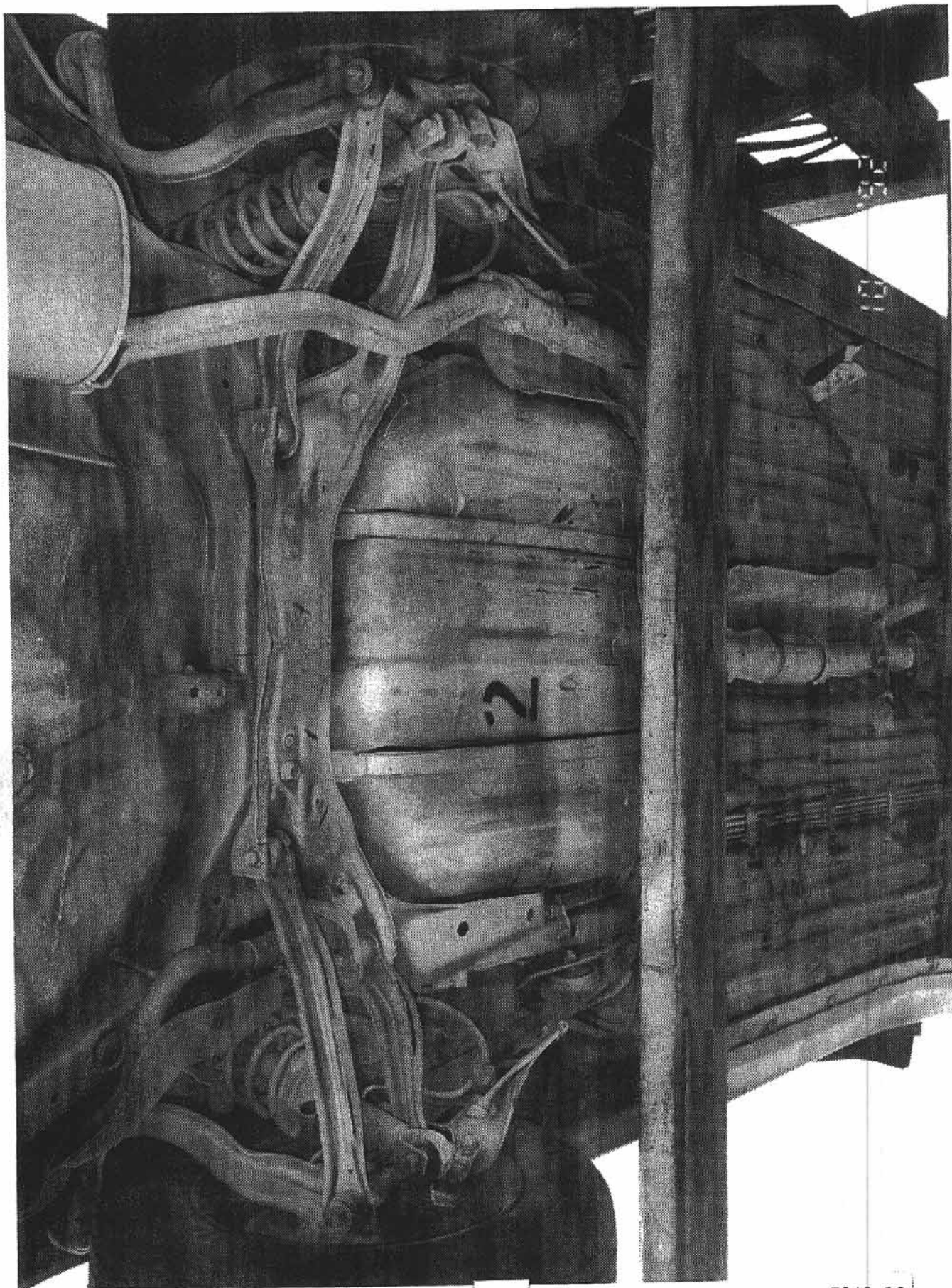


Figure A-64 VEHICLE 2 POST-TEST UNDERBODY REAR VIEW

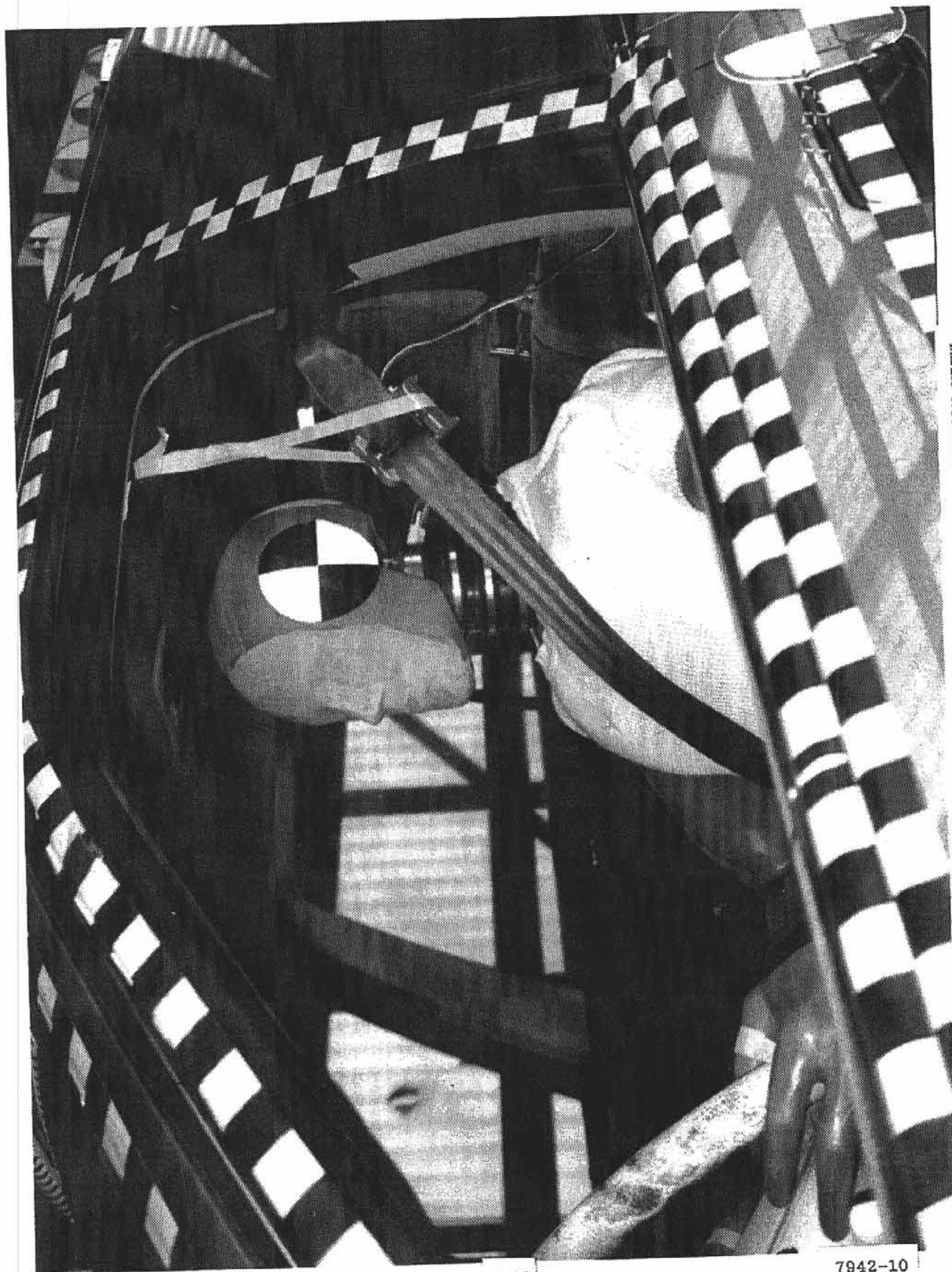


Figure A-65 VEHICLE 2 PRE-TEST DRIVER POSITION VIEW

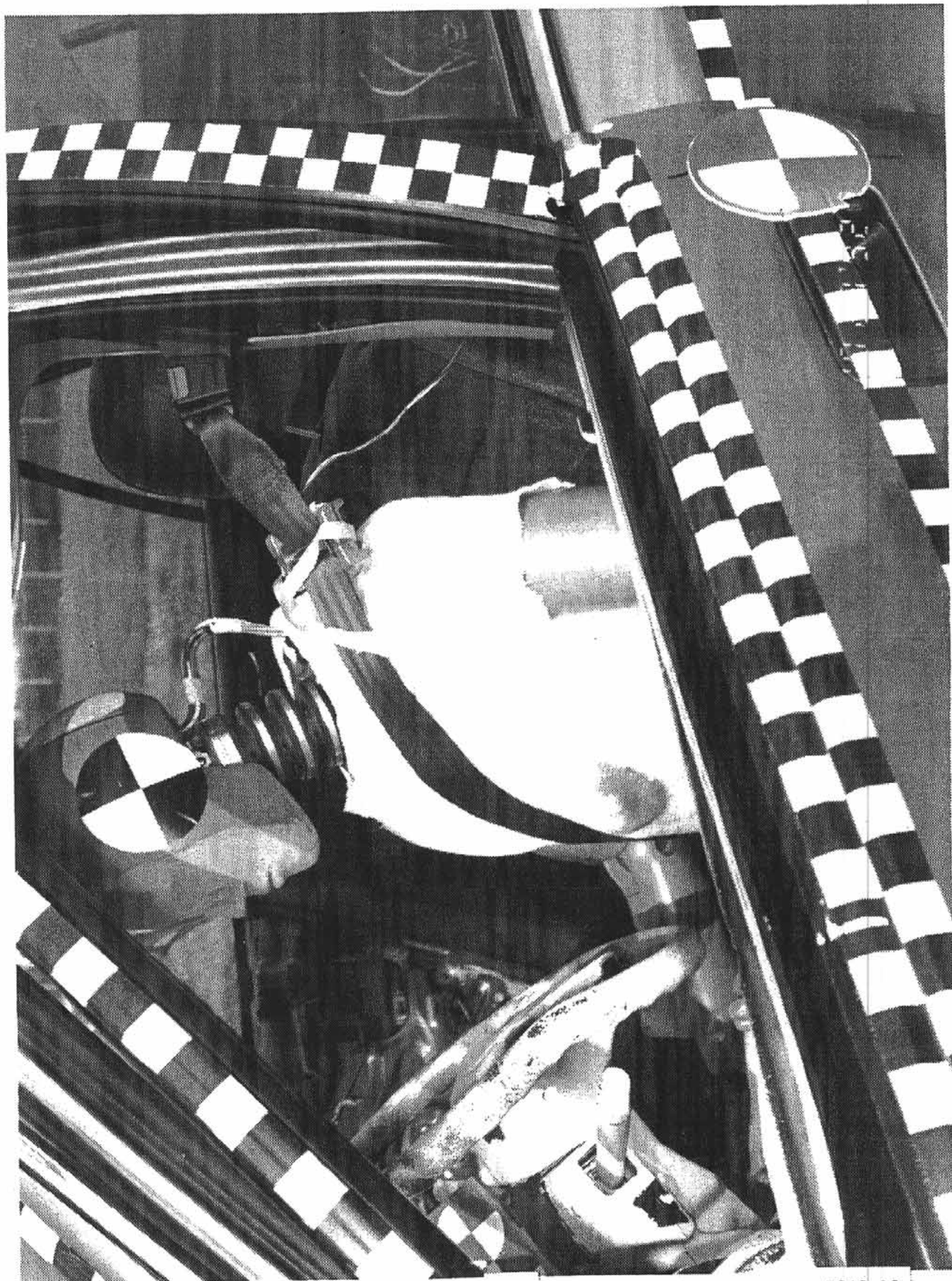


Figure A-66 VEHICLE 2 POST-TEST DRIVER POSITION VIEW



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



Figure A-68 VEHICLE 2 POST-TEST DRIVER AND OCCUPANT COMPARTMENT VIEW

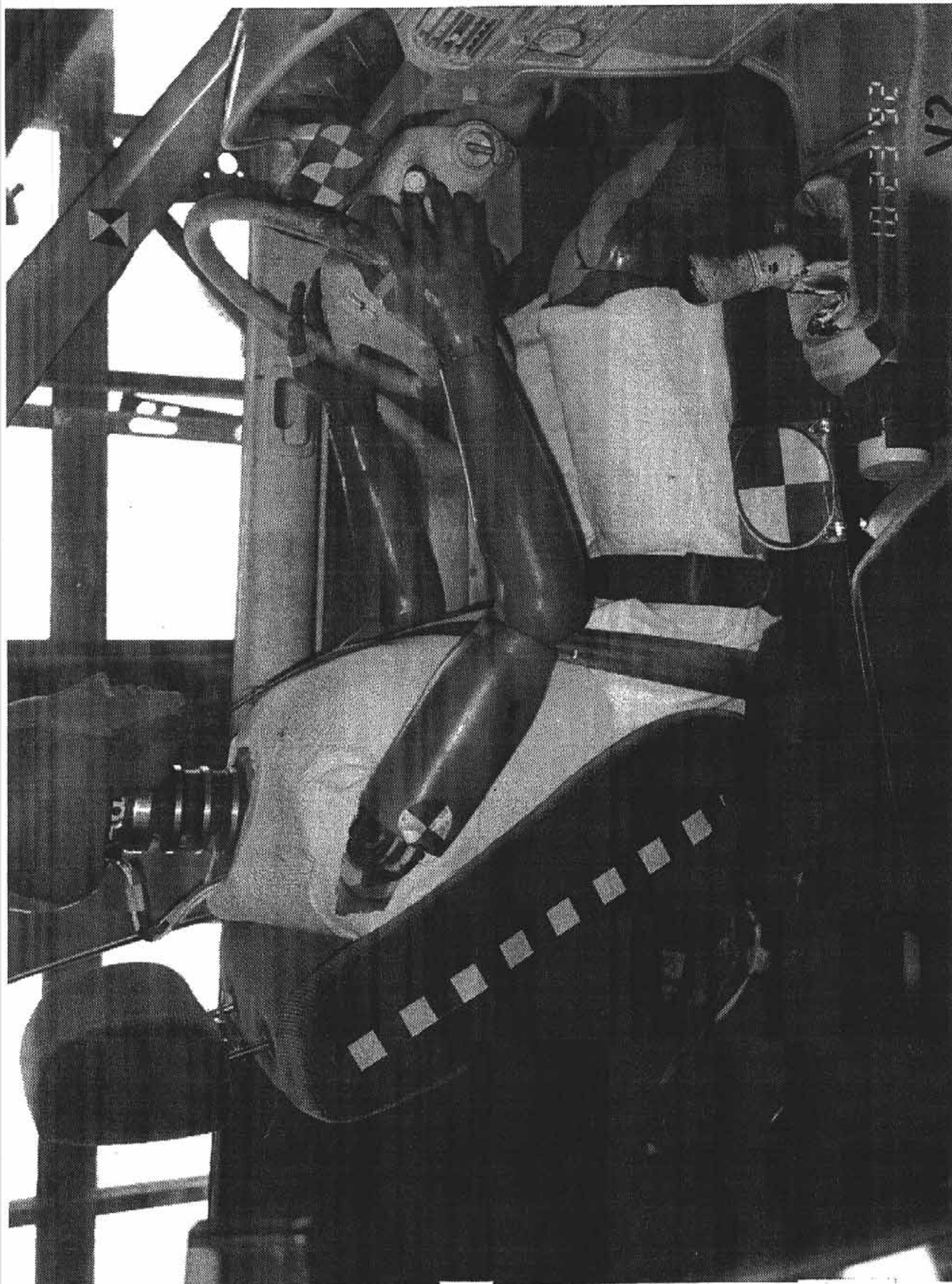


Figure A-69 VEHICLE 2 PRE-TEST DRIVER AND OCCUPANT COMPARTMENT
RIGHT SIDE VIEW



Figure A-70 VEHICLE 2 POST-TEST DRIVER AND OCCUPANT COMPARTMENT
RIGHT SIDE VIEW

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

Key: V1 - Vehicle 1
V2 - Vehicle 2

VEHICLE ONE DATA

1992 Chevrolet Corsica LT 4-Door Sedan

TEST NO. Y43-9-1228

VEHICLE DATA

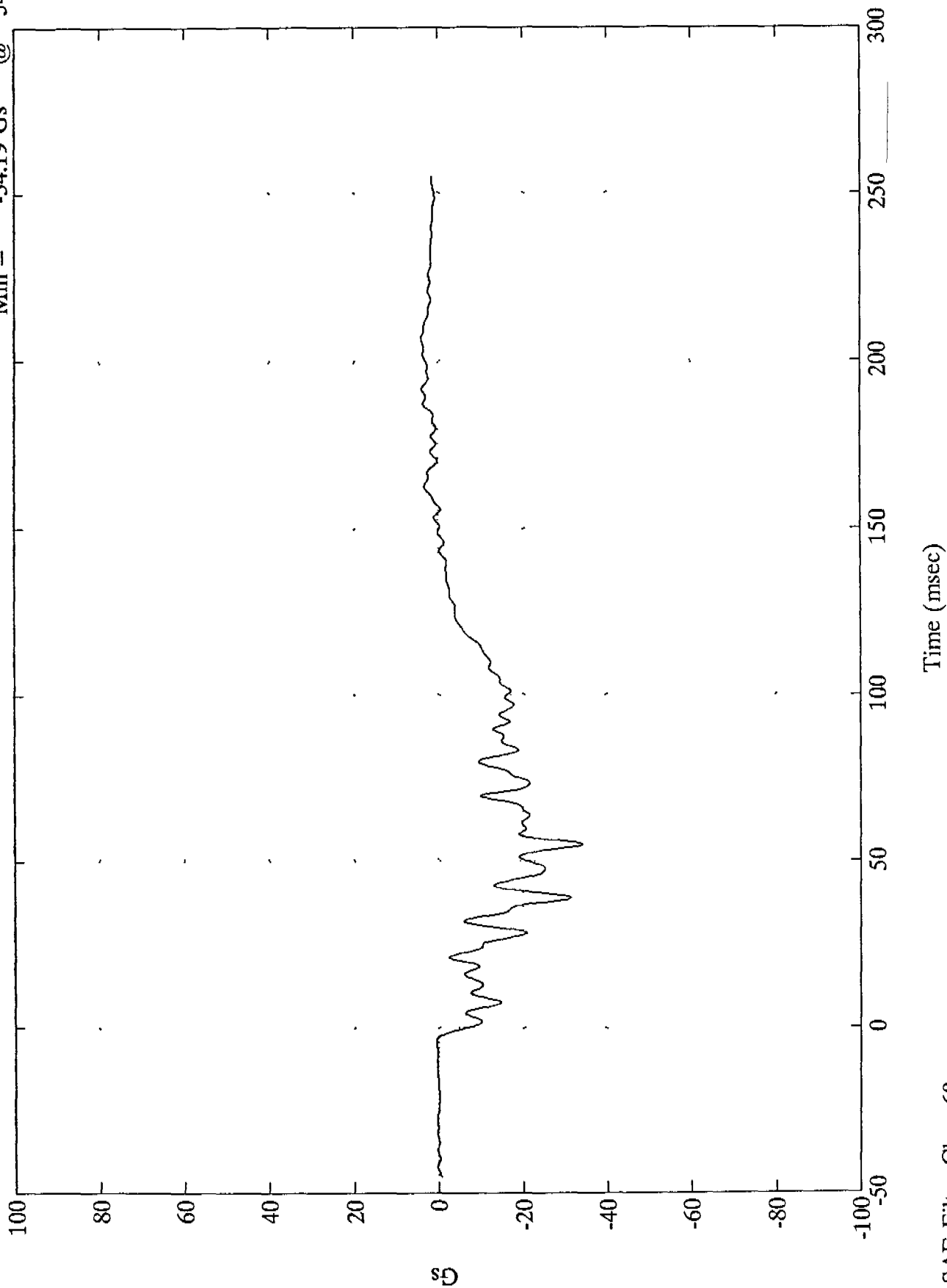
SAE FILTER CHANNEL CLASS

60

VTV TEST 9

Veh. 1 L R Seat (X)

Max = 3.88 Gs @ 206.40 msec
Min = -34.19 Gs @ 54.96 msec



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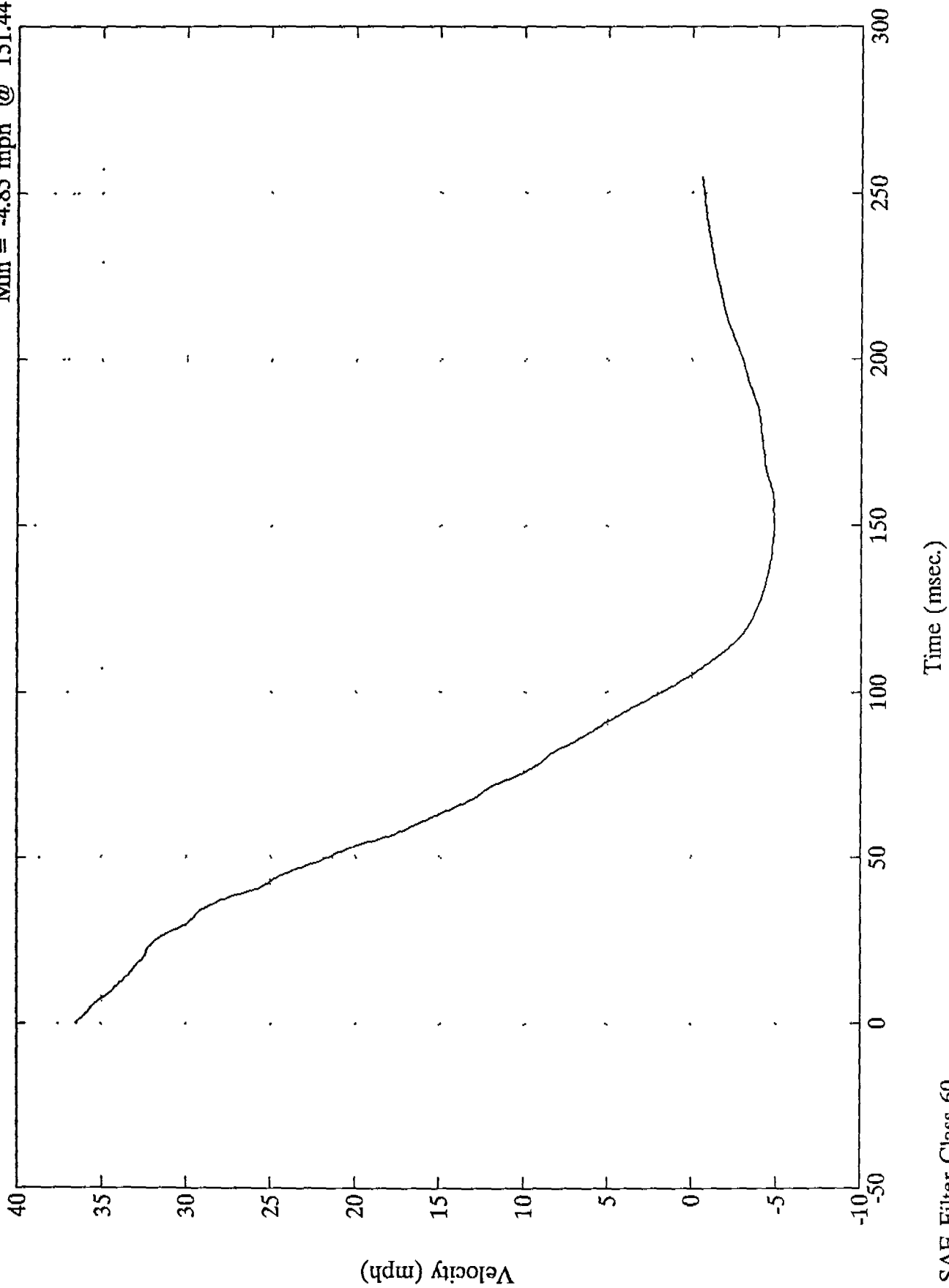
7942-10

SAE Filter Class 60

VTV TEST 9

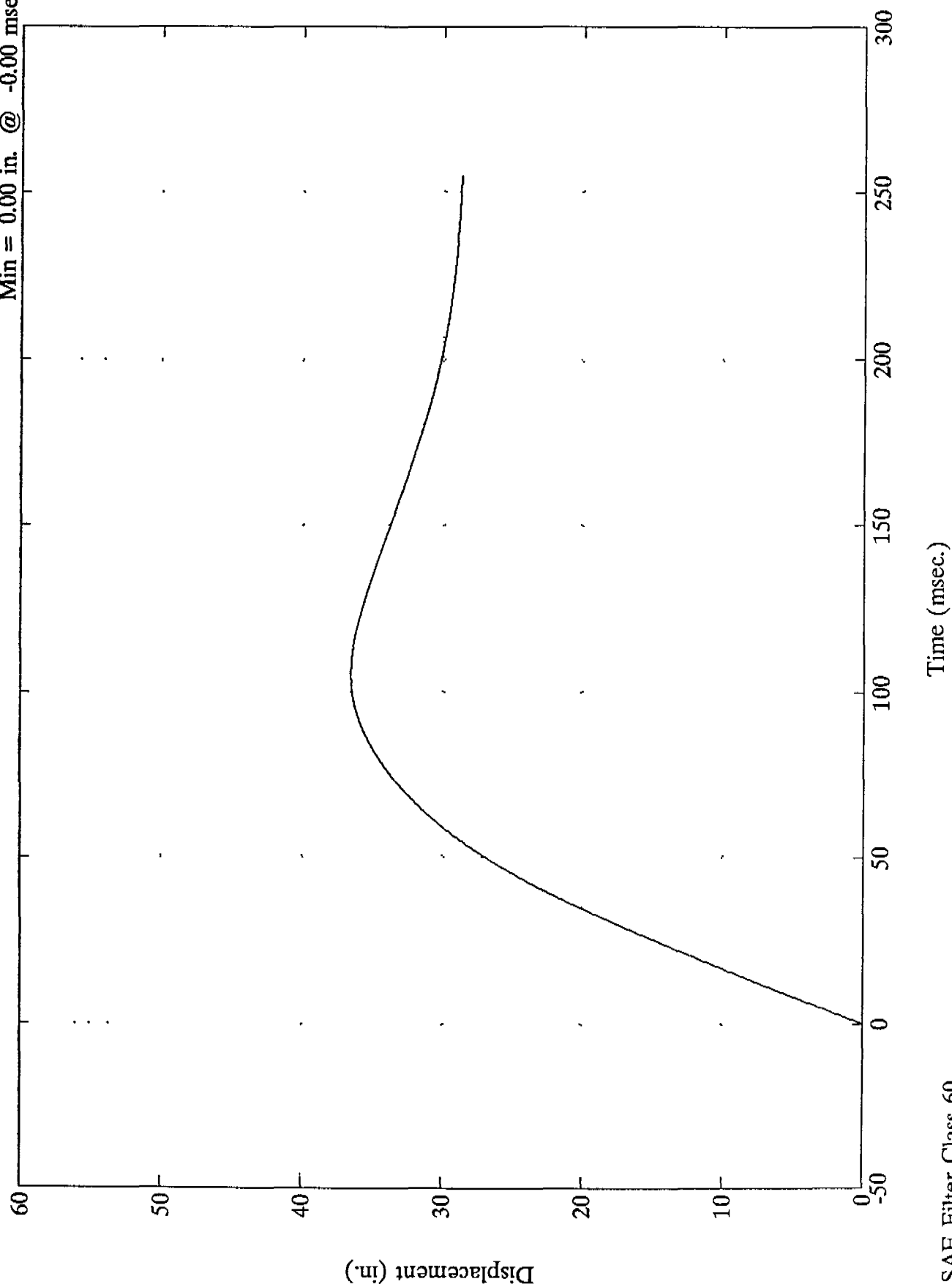
Veh. 1 L R Seat (X)

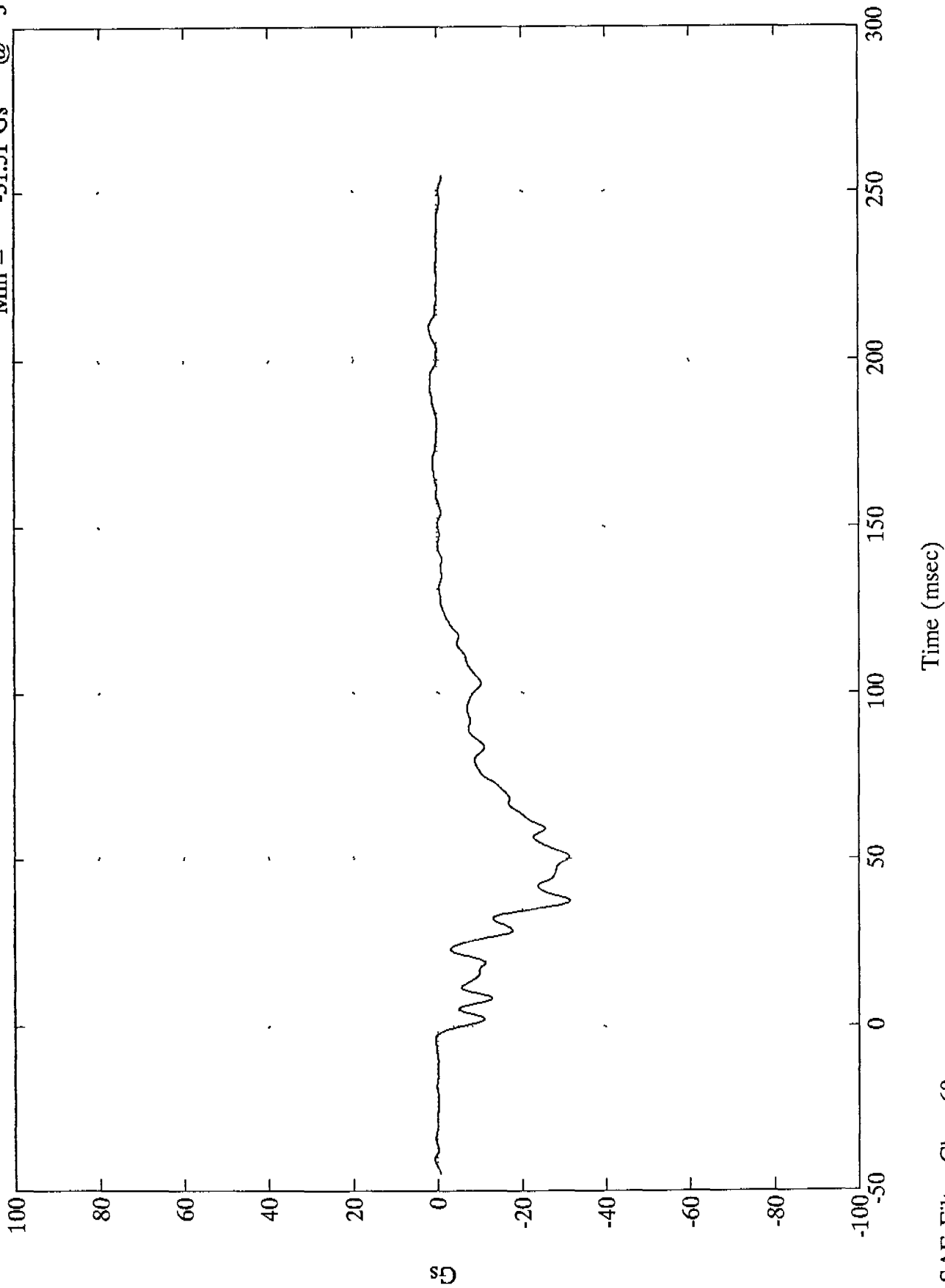
Max = 36.50 mph @ -0.00 msec
Min = -4.85 mph @ 151.44 msec



Veh. 1 L R Seat (X)

Max = 36.56 in. @ 106.80 msec
Min = 0.00 in. @ -0.00 msec

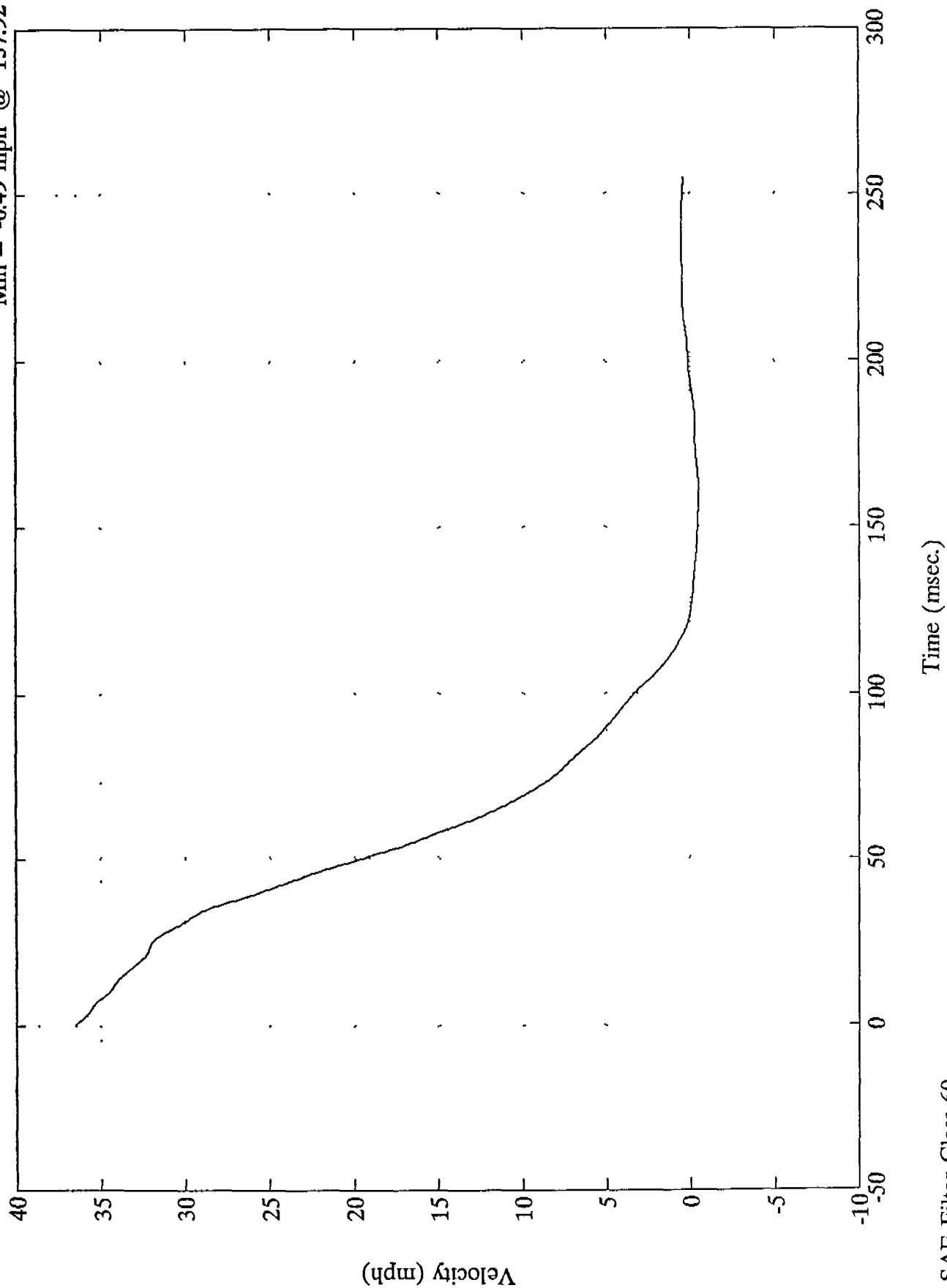




VTV TEST 9

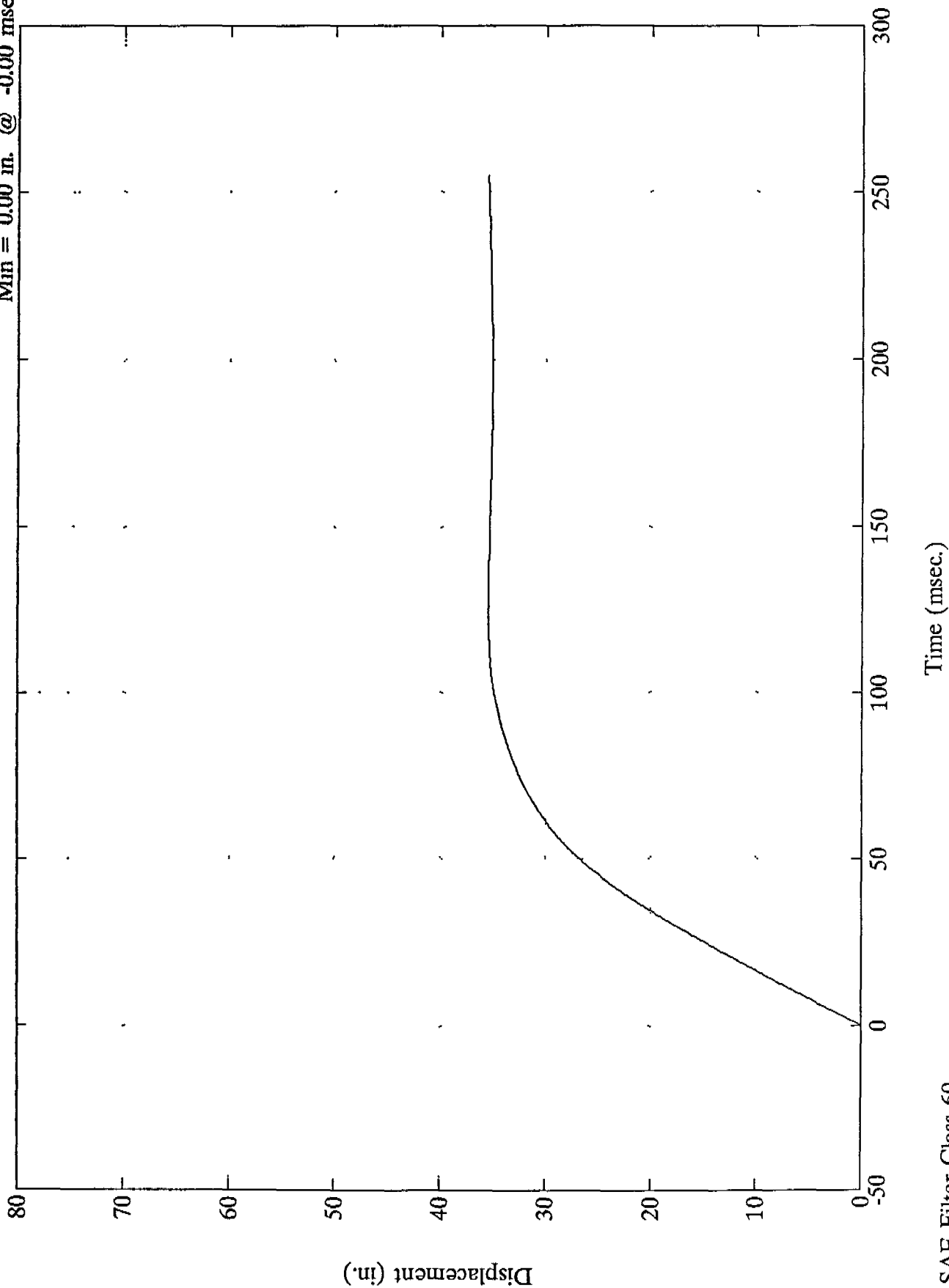
Veh. 1 R R Seat (X)

Max = 36.50 mph @ -0.00 msec
Min = -0.49 mph @ 157.92 msec



Veh. 1 R R Seat (X)

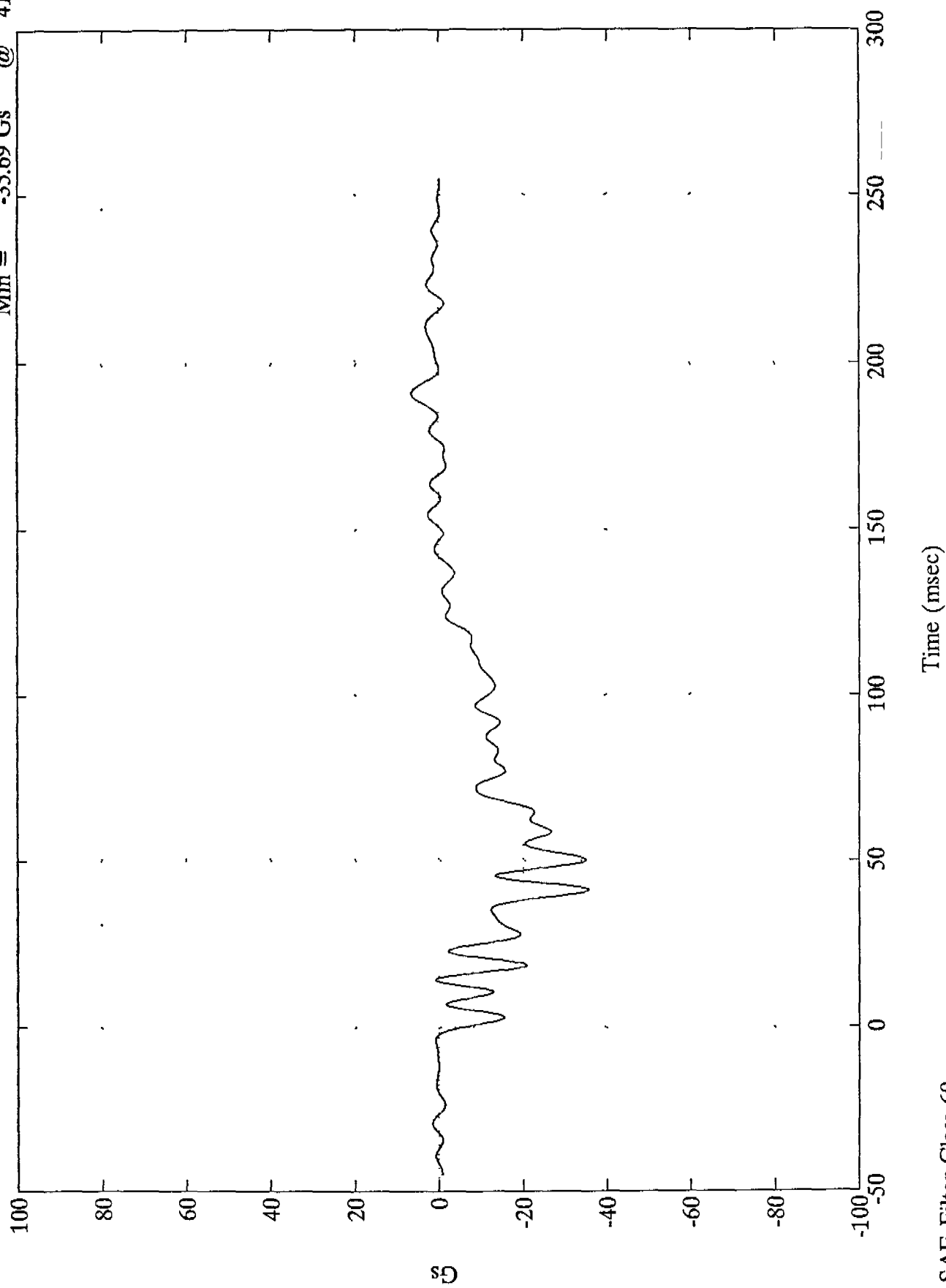
Max = 35.51 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



VTV TEST 9

Veh. 1 C/L Seat (X)

Max = 6.44 Gs @ 190.80 msec
Min = -35.69 Gs @ 41.15 msec



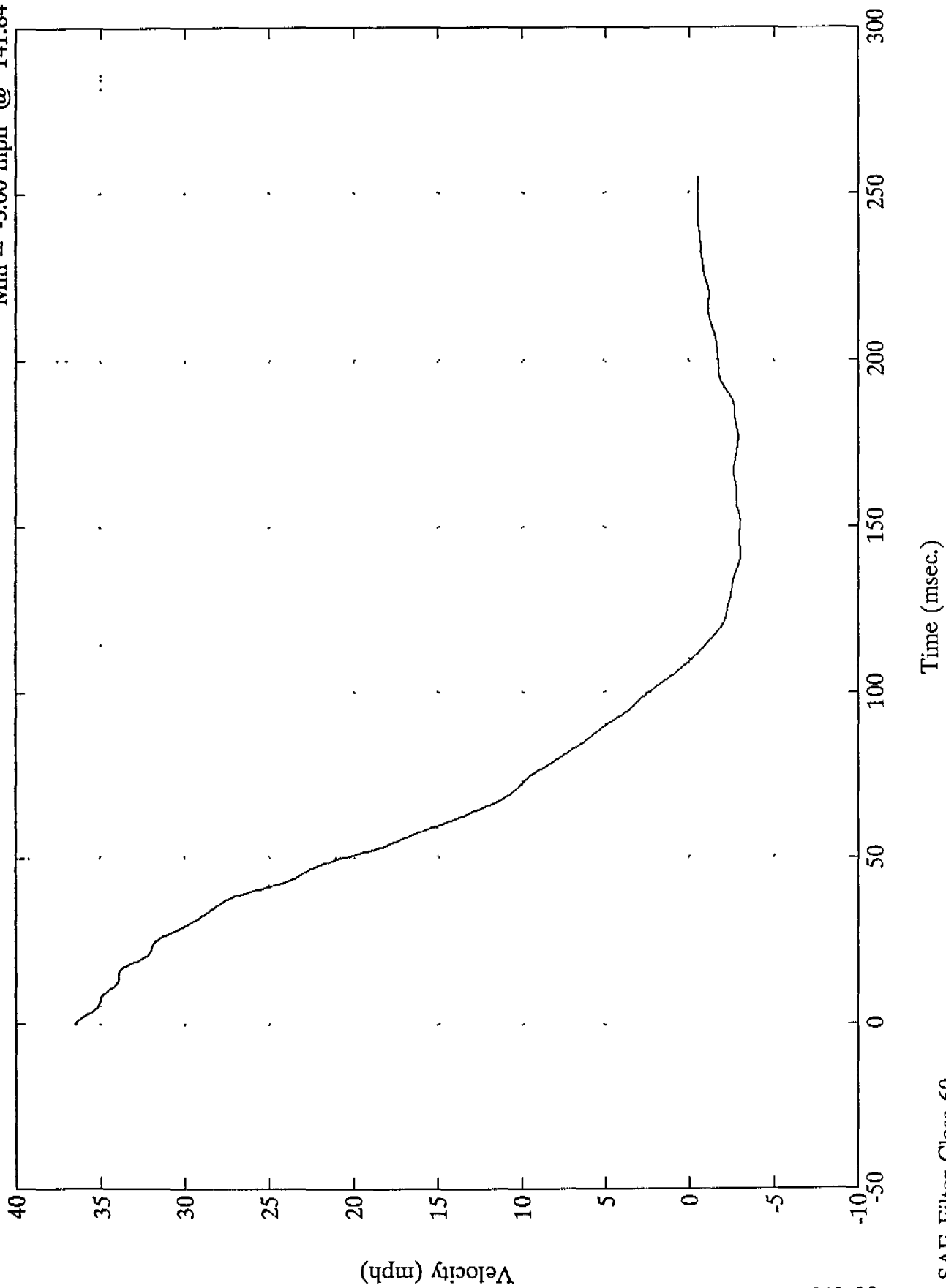
B-10

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SAE Filter Class 60

Veh. 1 C/L Seat (X)

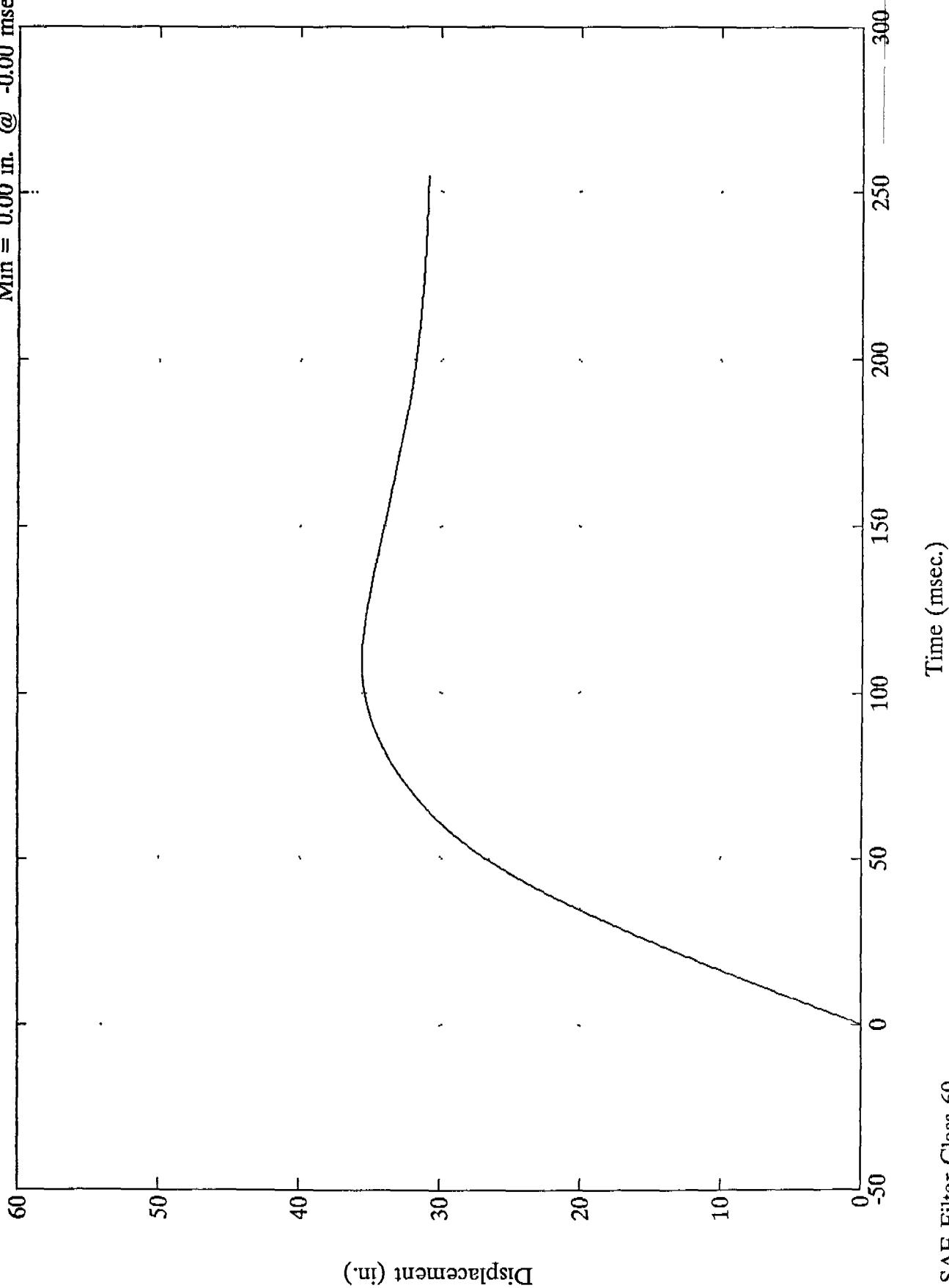
Max = 36.50 mph @ -0.00 msec
Min = -3.00 mph @ 141.84 msec



VTV TEST 9

Veh. 1 C/L Seat (X)

Max = 35.60 in. @ 110.16 msec
Min = 0.00 in. @ -0.00 msec



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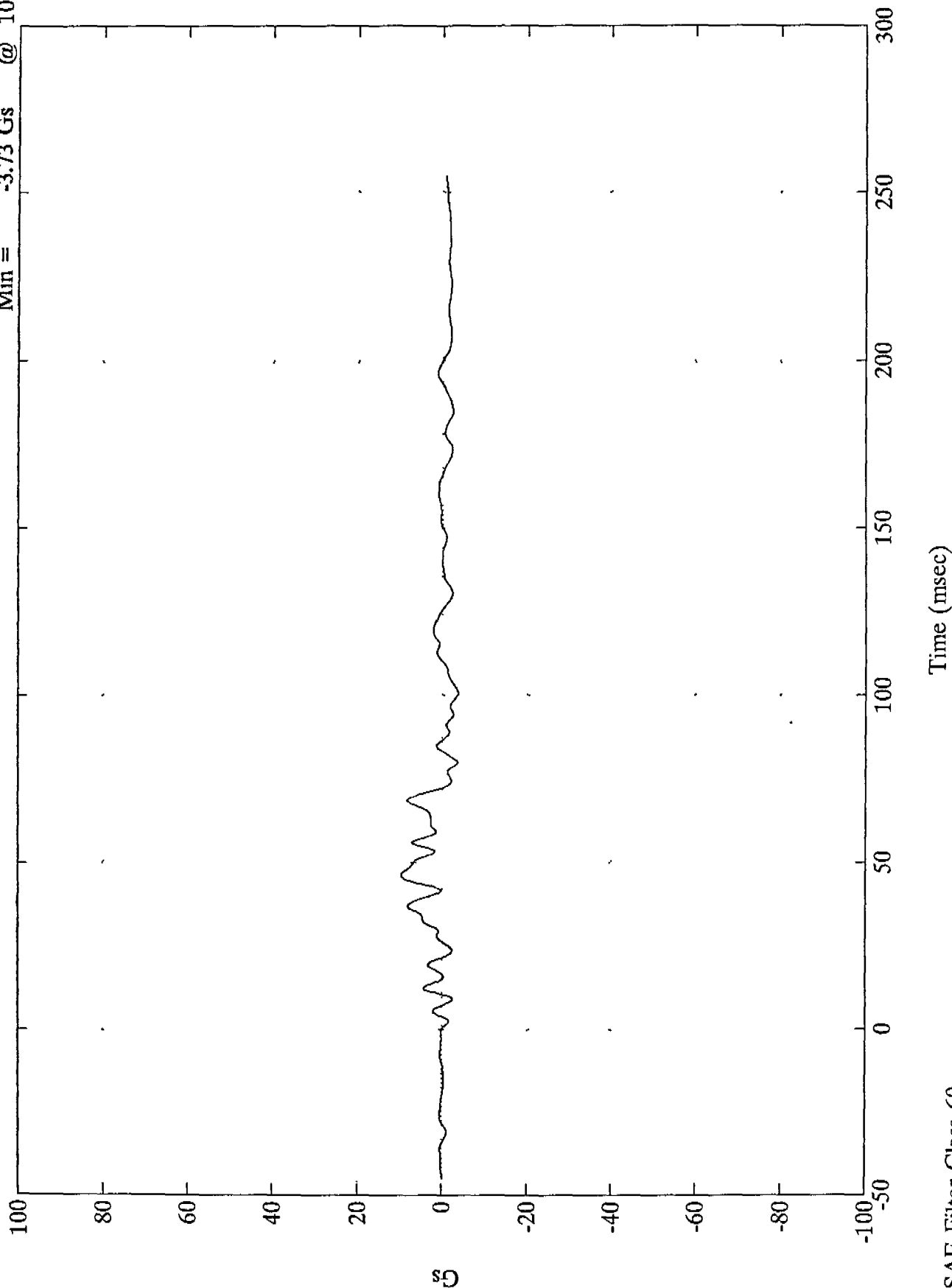
7942-10

SAE Filter Class 60

VTV TEST 9

Veh. 1 C/L Seat (Y)

Max = 9.72 Gs @ 46.20 msec
Min = -3.73 Gs @ 100.44 msec



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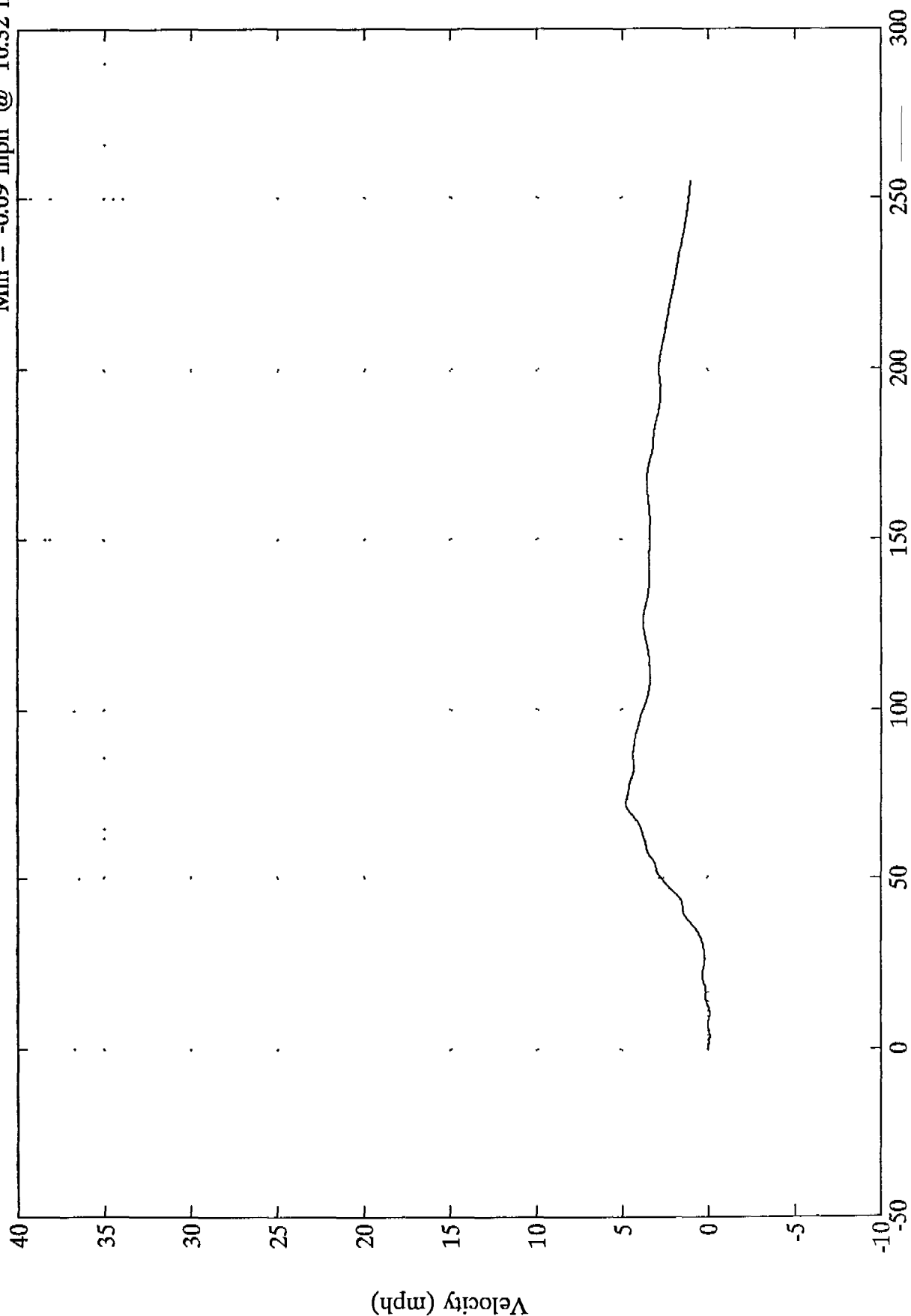
7942-10

SAE Filter Class 60

VTV TEST 9

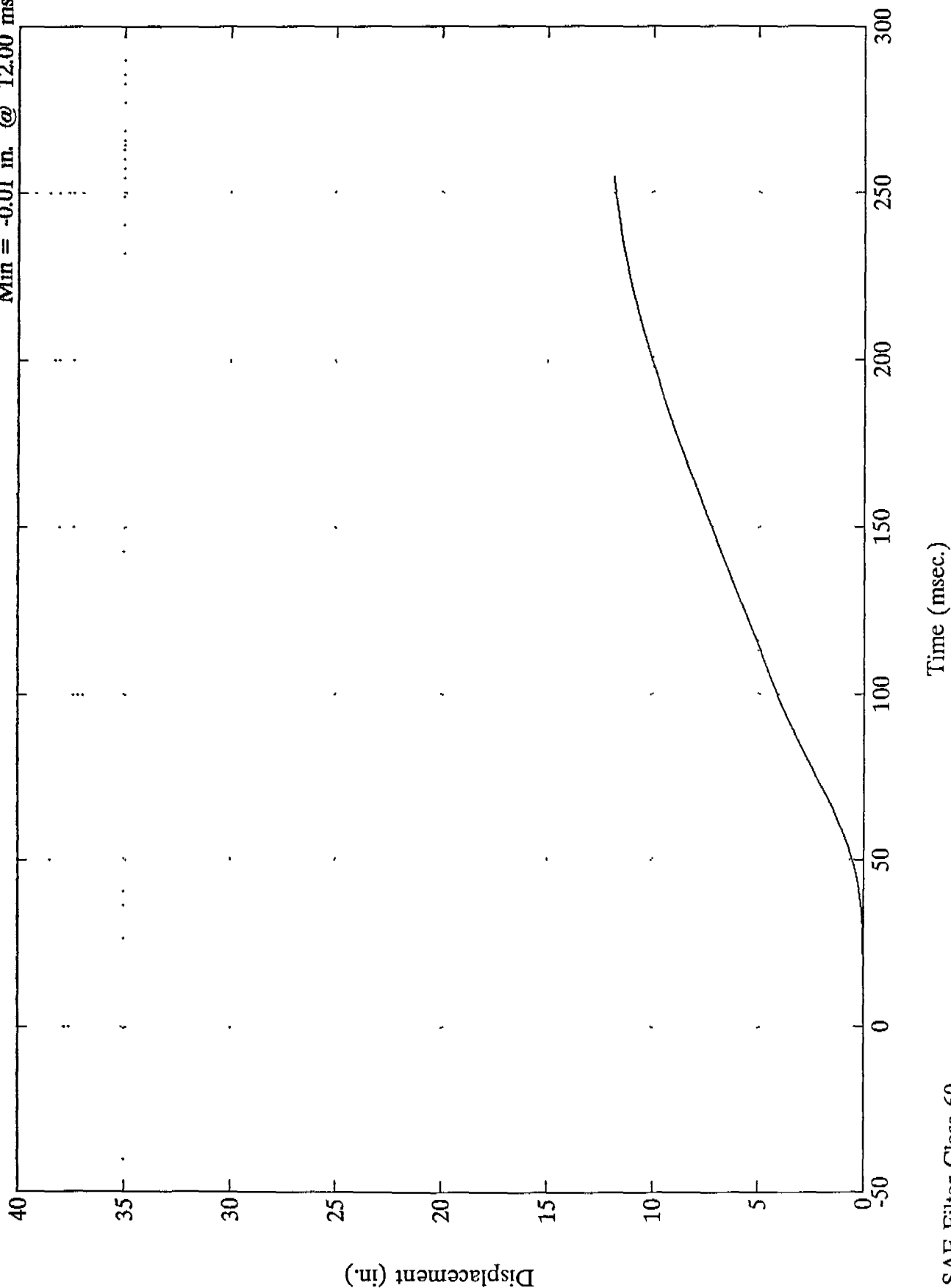
Max = 4.77 mph @ 72.24 msec
 Min = -0.09 mph @ 10.32 msec

Veh. 1 C/L Seat (Y)



Time (msec.)

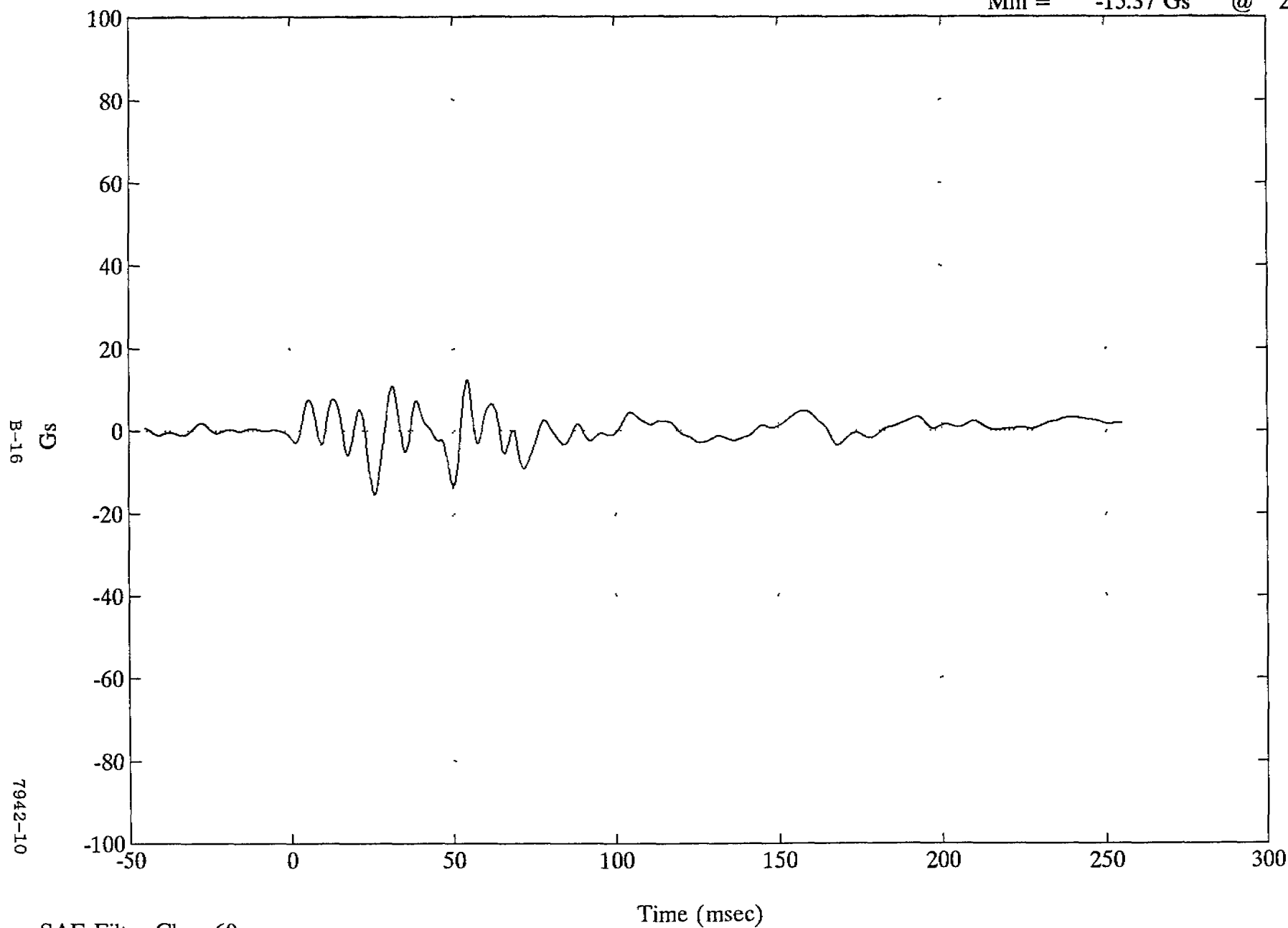
SAE Filter Class 60



VTV TEST 9

Veh. 1 C/L Seat (Z)

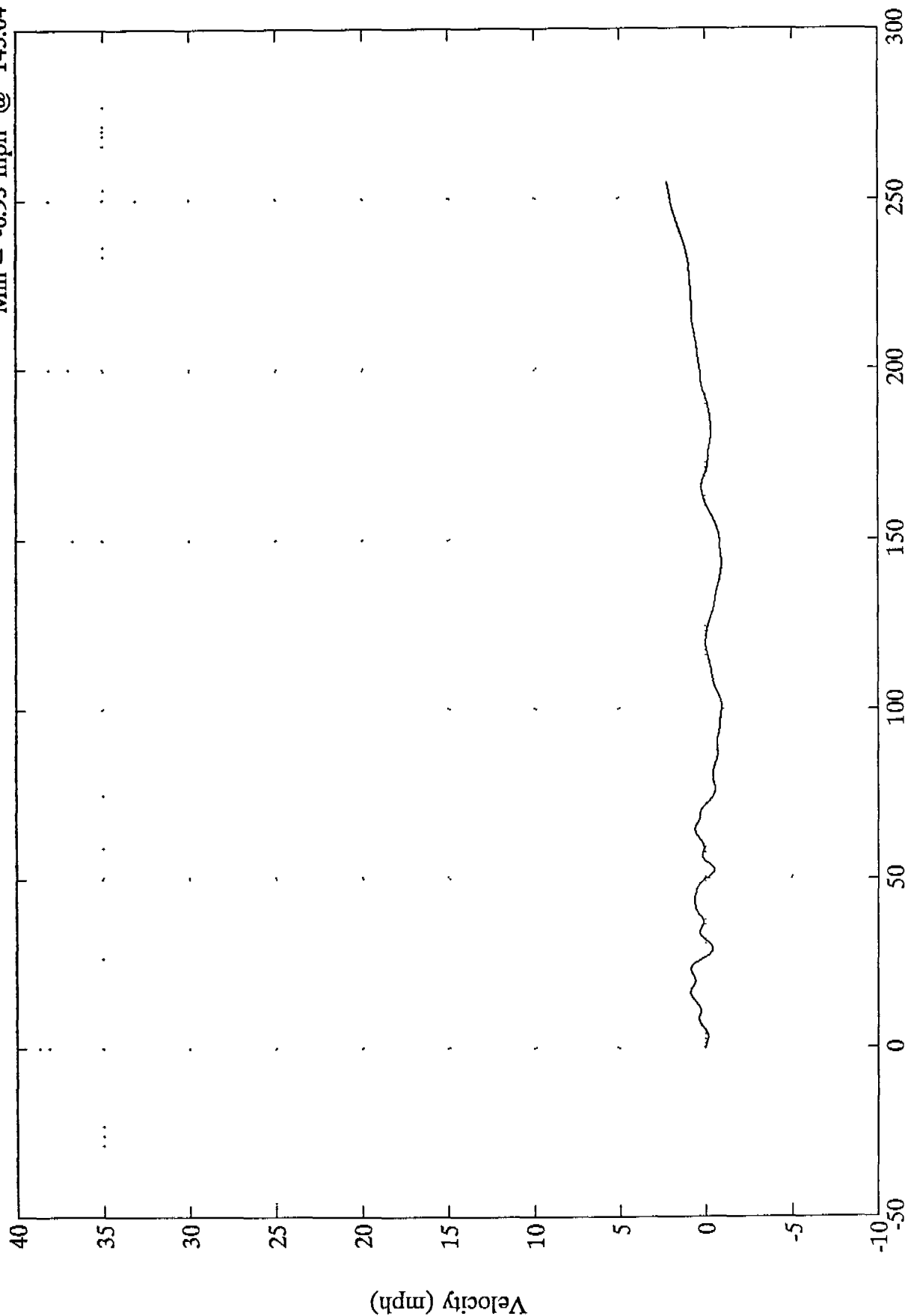
Max = 12.37 Gs @ 54.36 msec
Min = -15.37 Gs @ 25.92 msec



SAE Filter Class 60

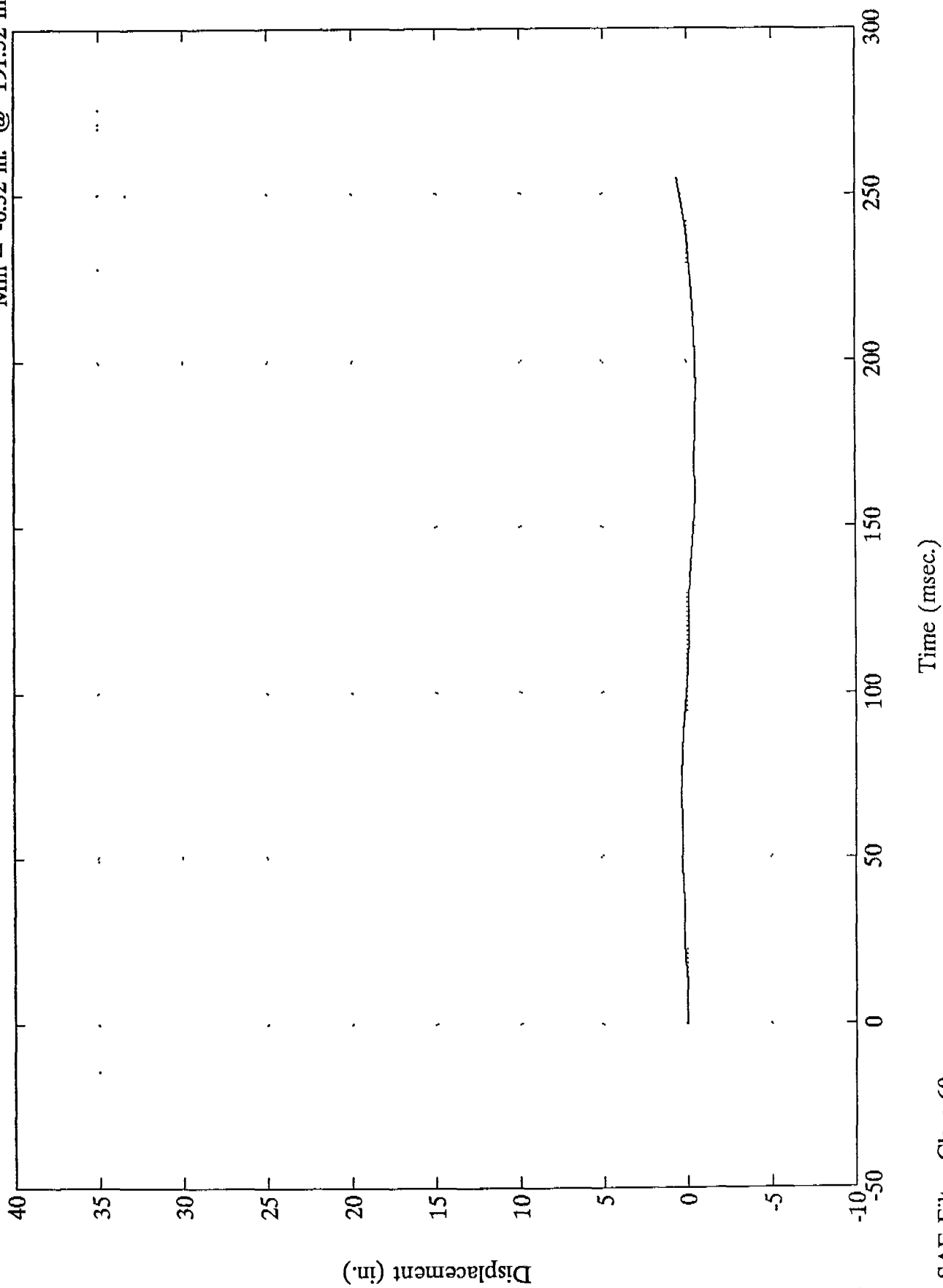
Veh. 1 C/L Seat (Z)

Max = 2.25 mph @ 254.88 msec
Min = -0.93 mph @ 143.04 msec



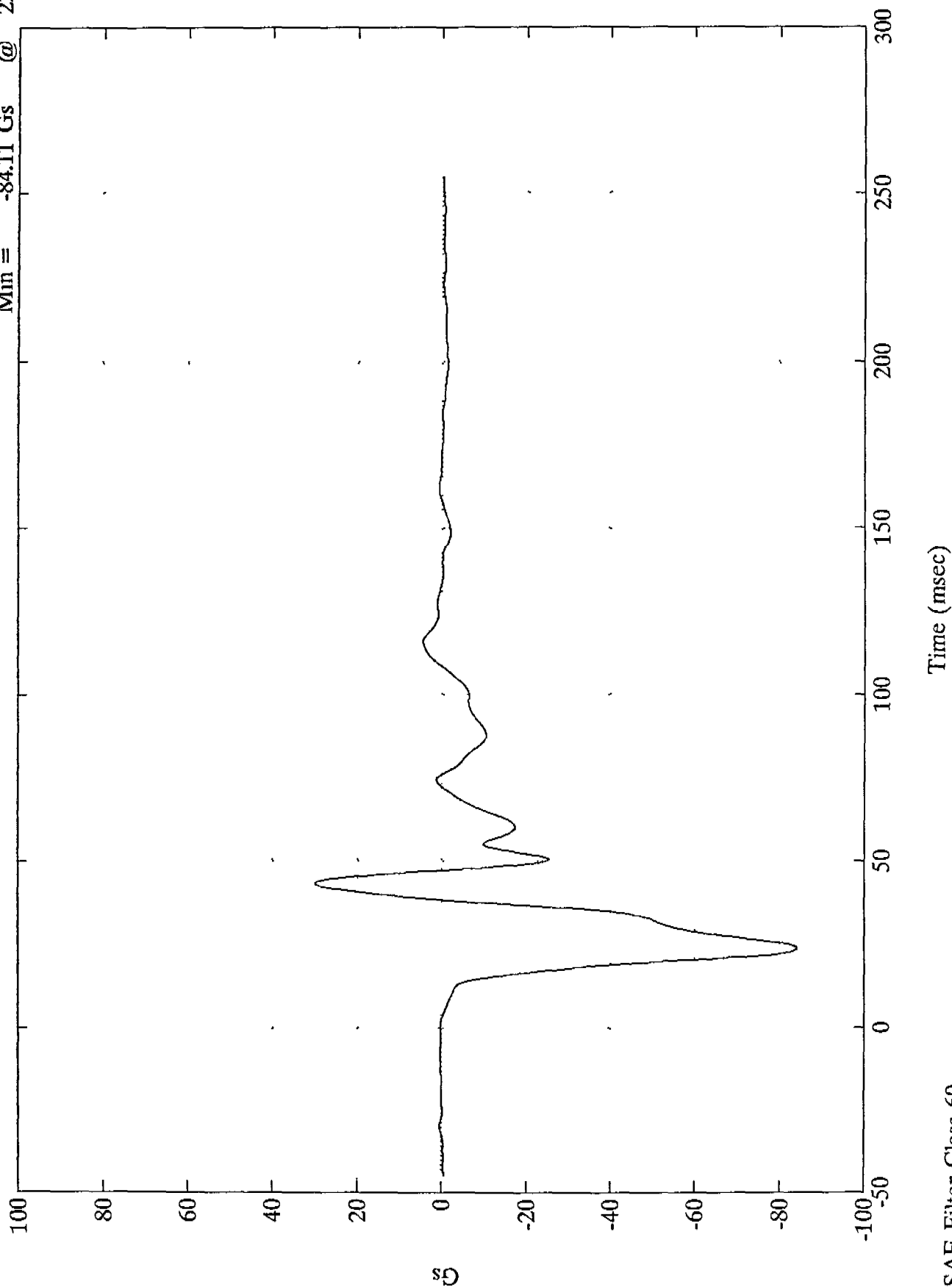
Time (msec.)

SAE Filter Class 60



Veh. 1 Engine Top (X)

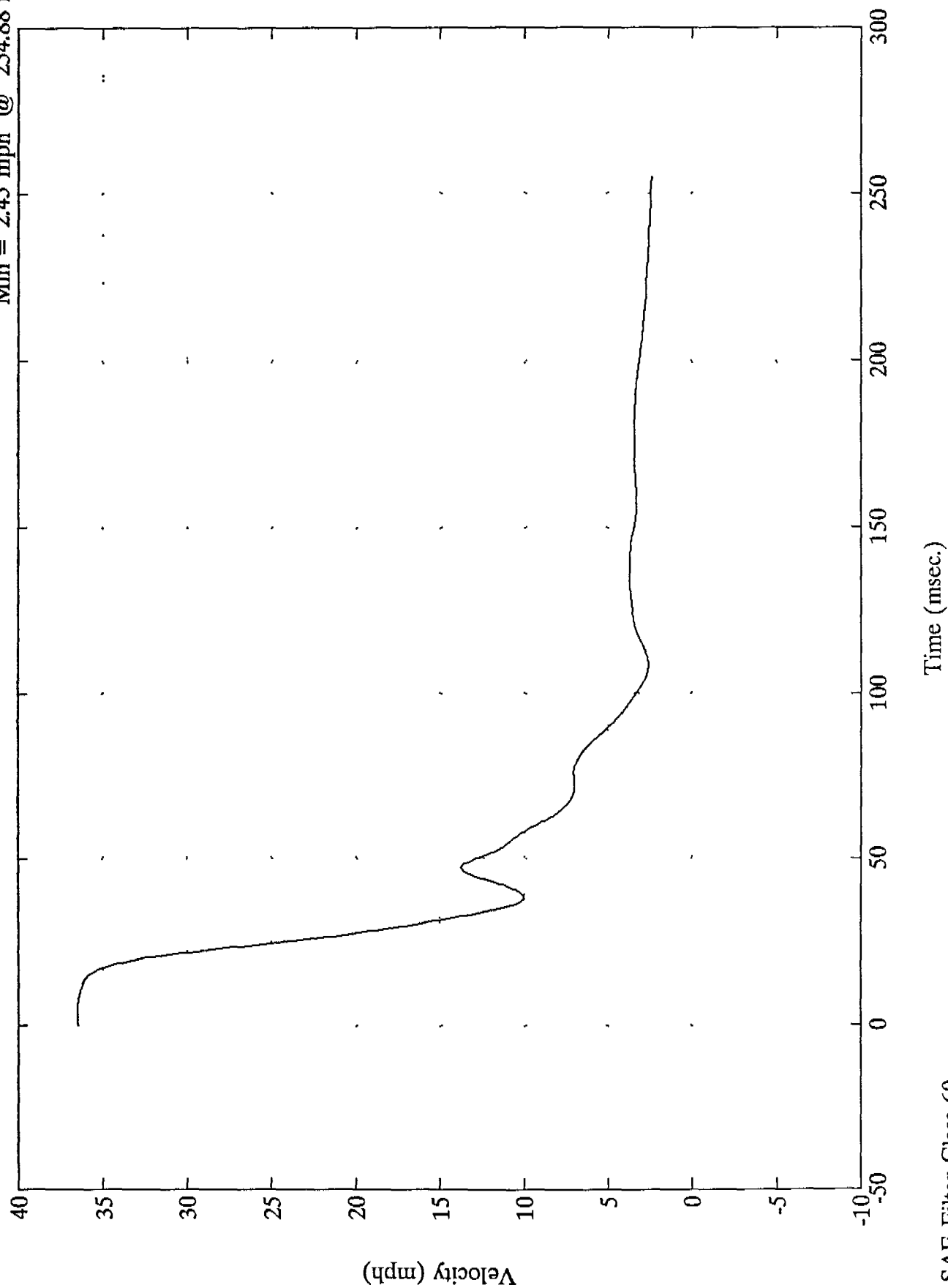
Max = 30.04 Gs @ 43.20 msec
Min = -84.11 Gs @ 23.87 msec

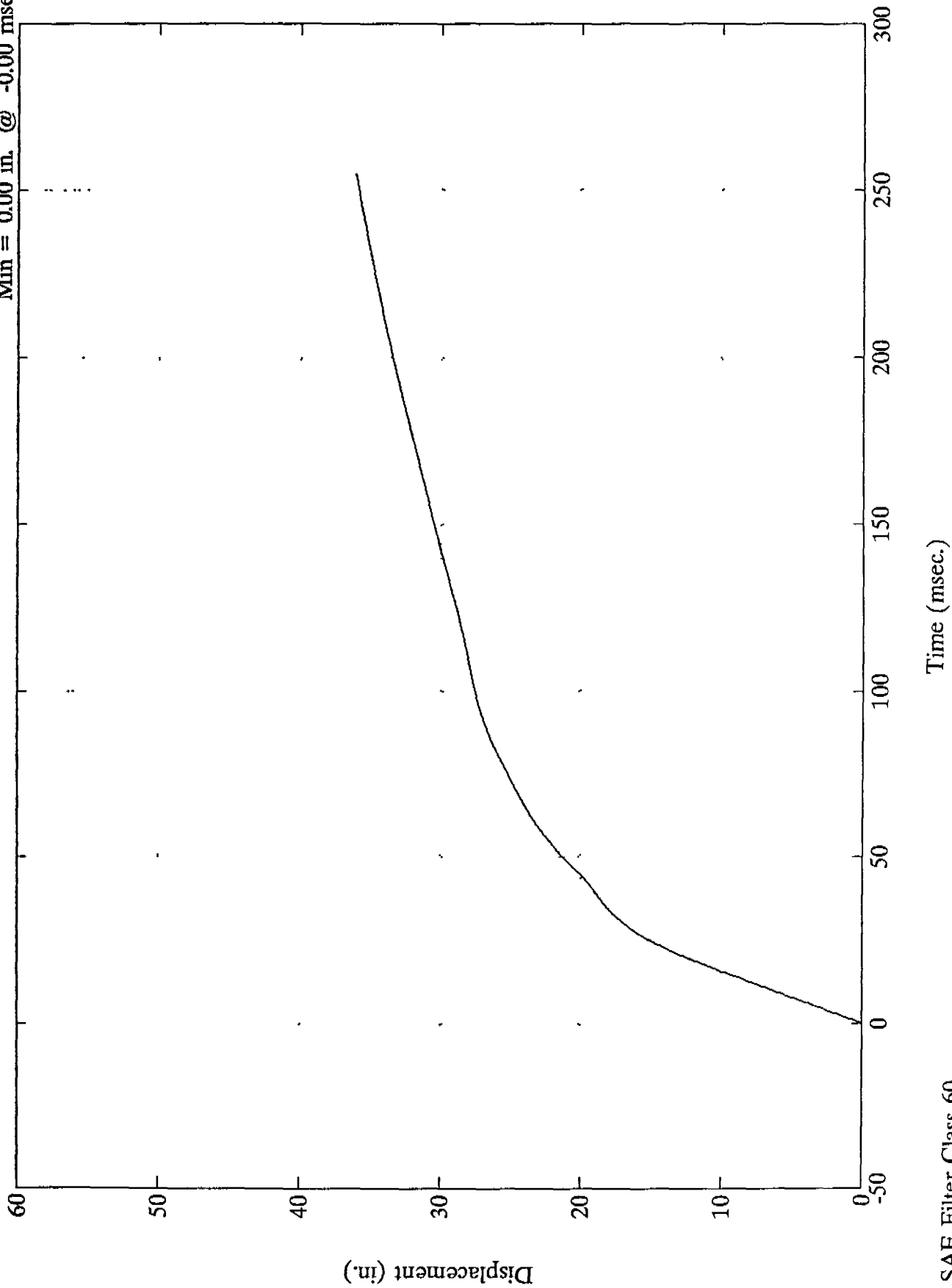


VTV TEST 9

Veh. 1 Engine Top (X)

Max = 36.51 mph @ 3.36 msec
Min = 2.45 mph @ 254.88 msec

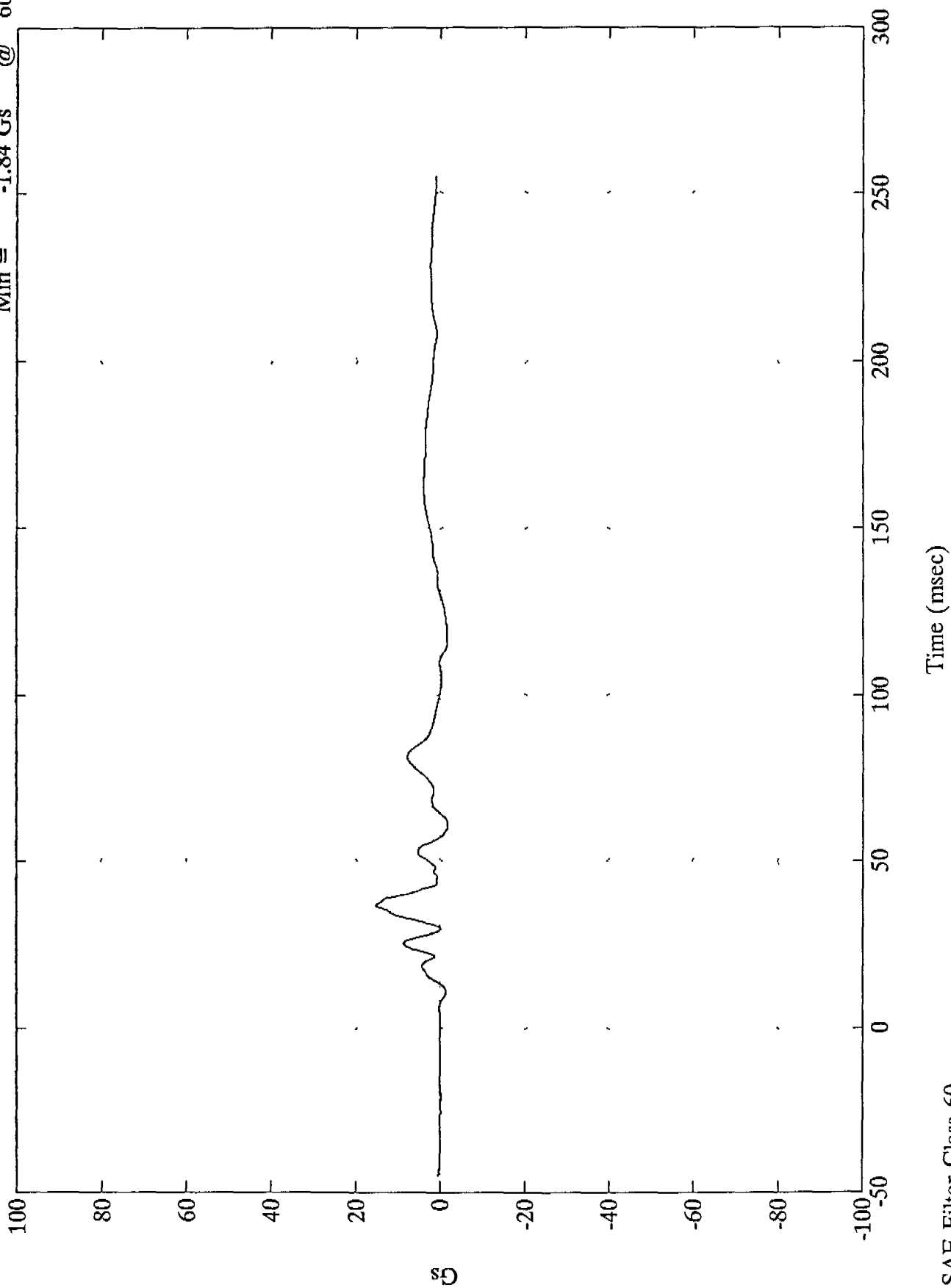


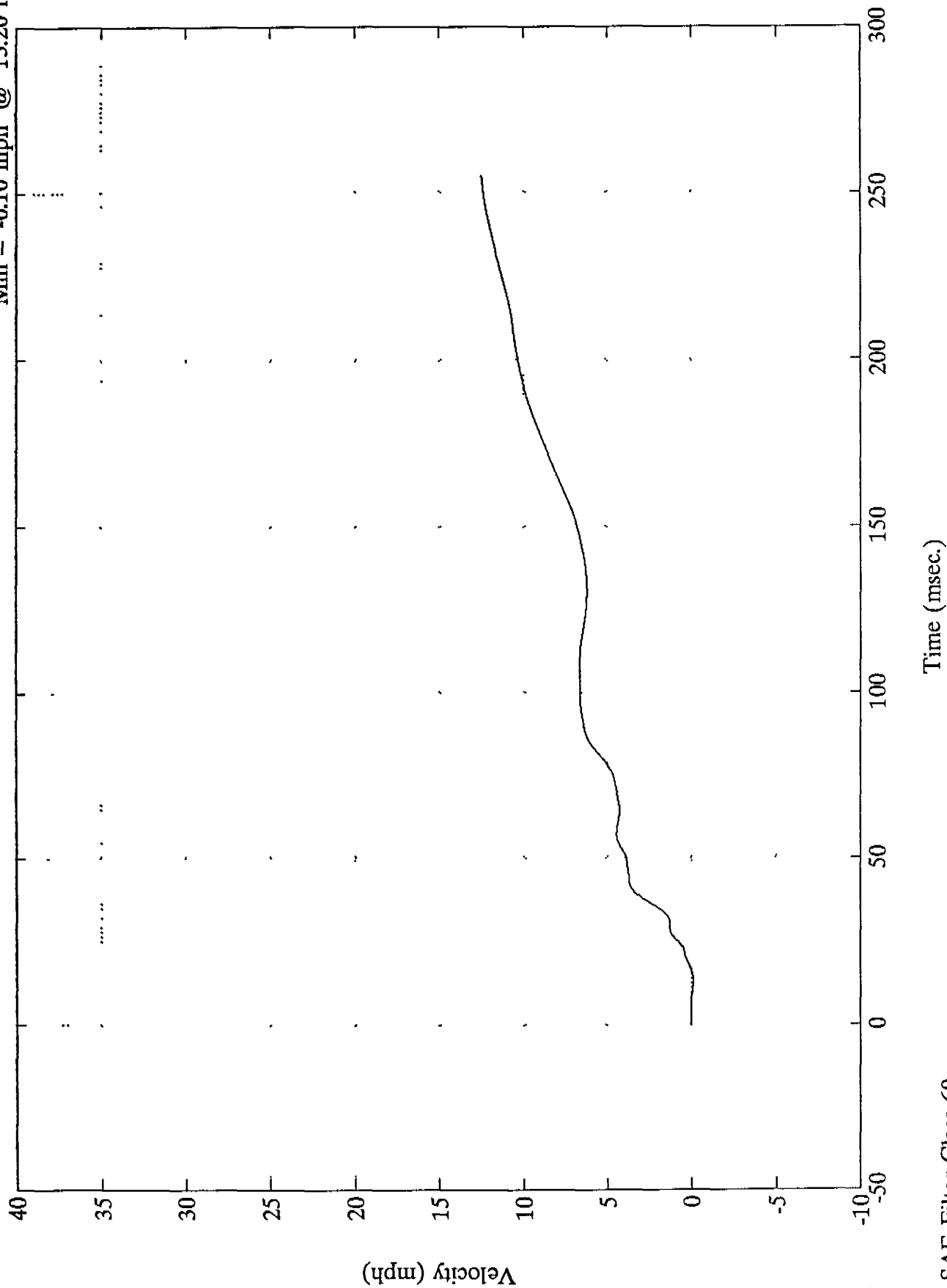


VTV TEST 9

Veh. 1 Engine Top (Z)

Max = 15.18 Gs @ 36.60 msec
Min = -1.84 Gs @ 60.48 msec

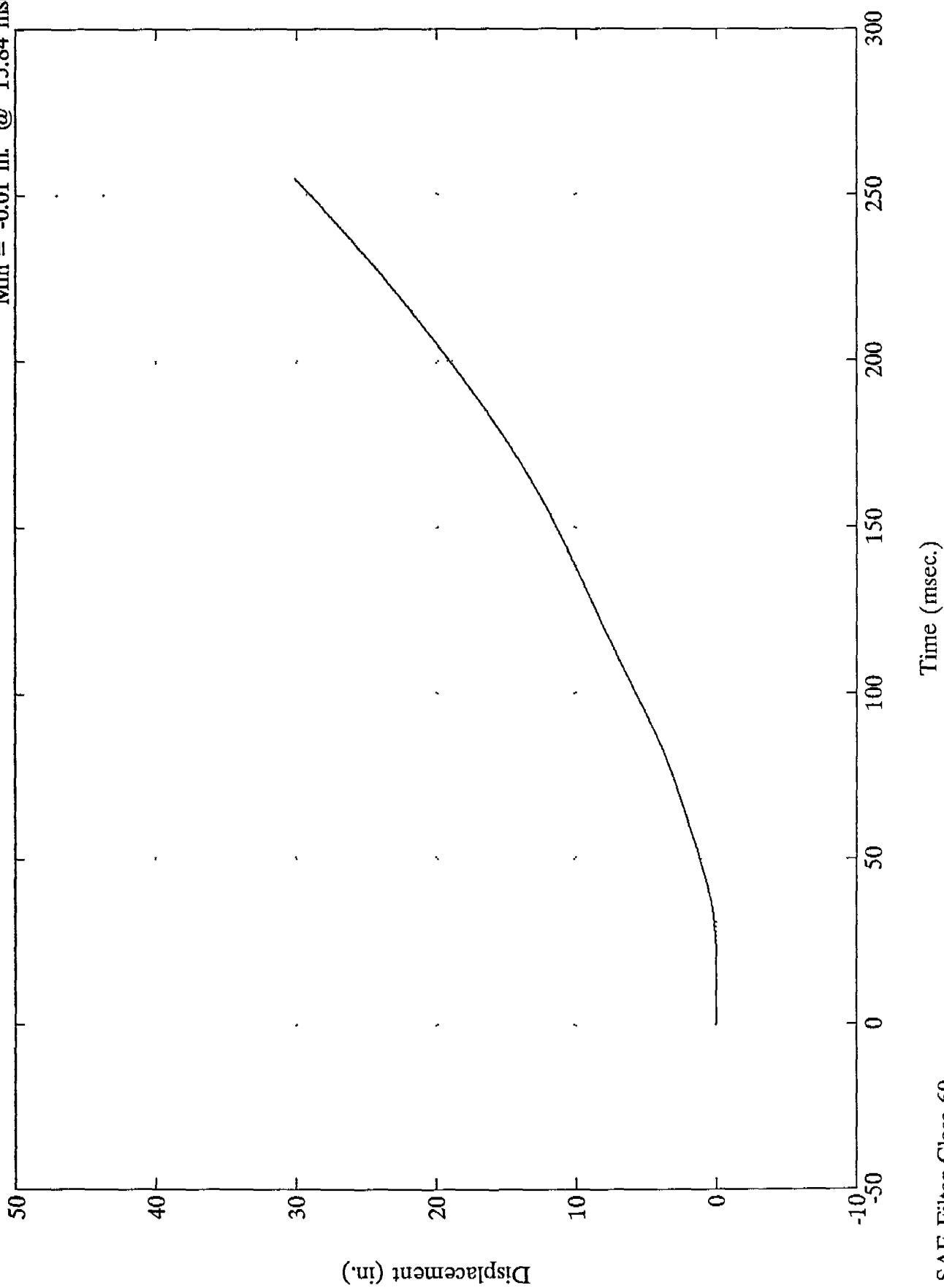




VTV TEST 9

Veh. 1 Engine Top (Z)

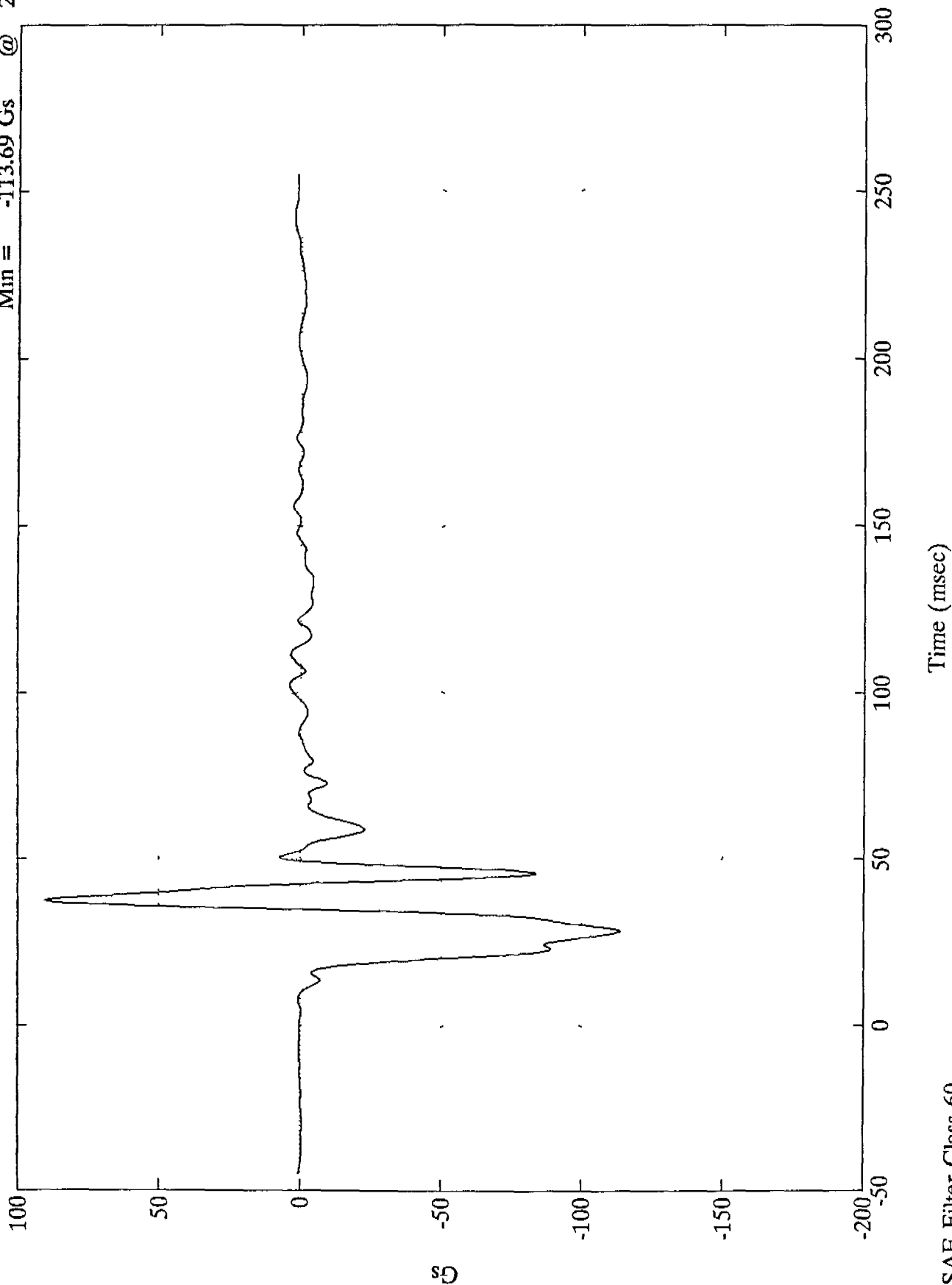
Max = 30.09 in. @ 254.88 msec
Min = -0.01 in. @ 15.84 msec



SAE Filter Class 60

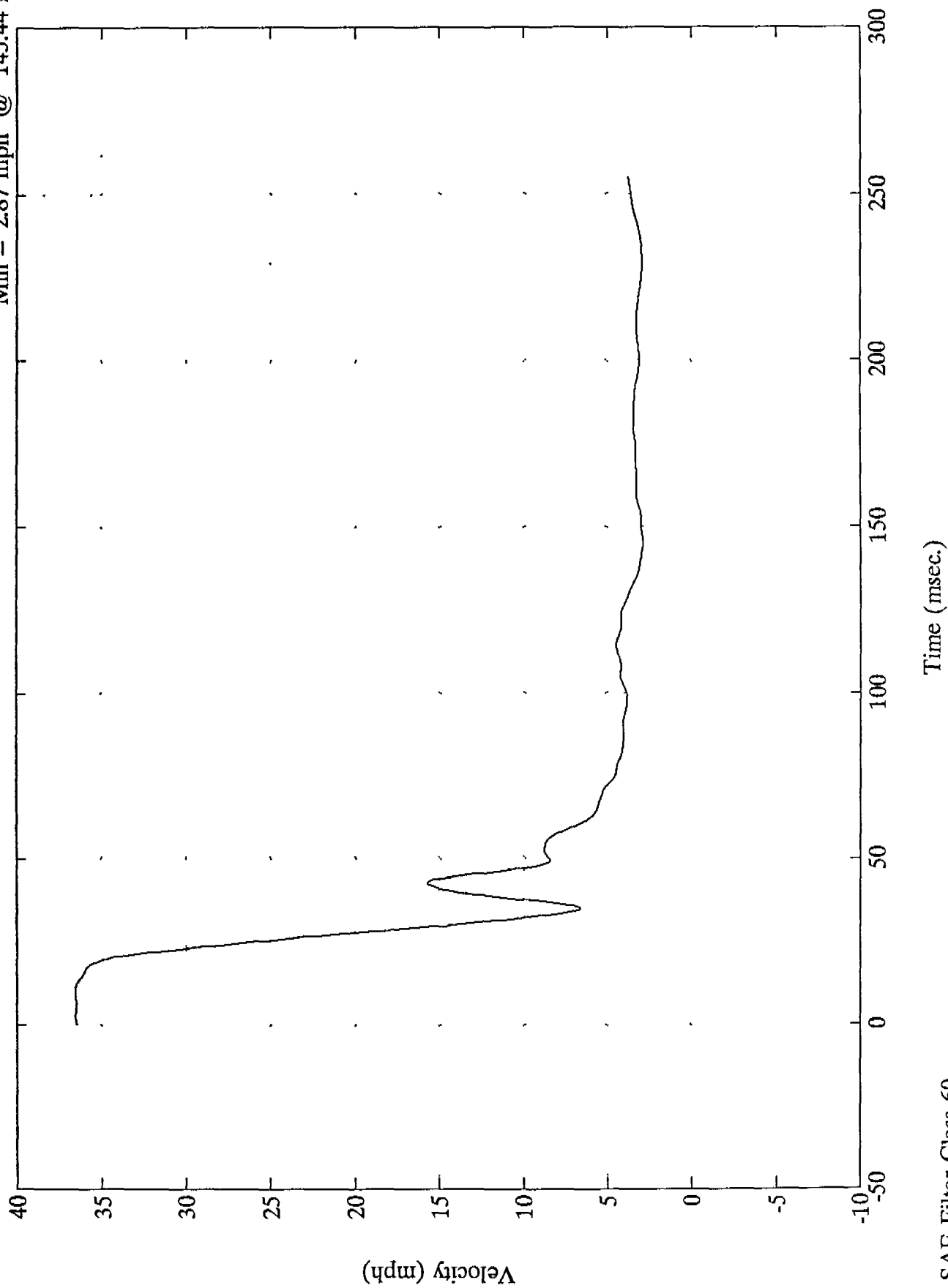
Veh. 1 Engine Bottom (X)

Max = 90.34 Gs @ 37.56 msec
Min = -113.69 Gs @ 28.44 msec

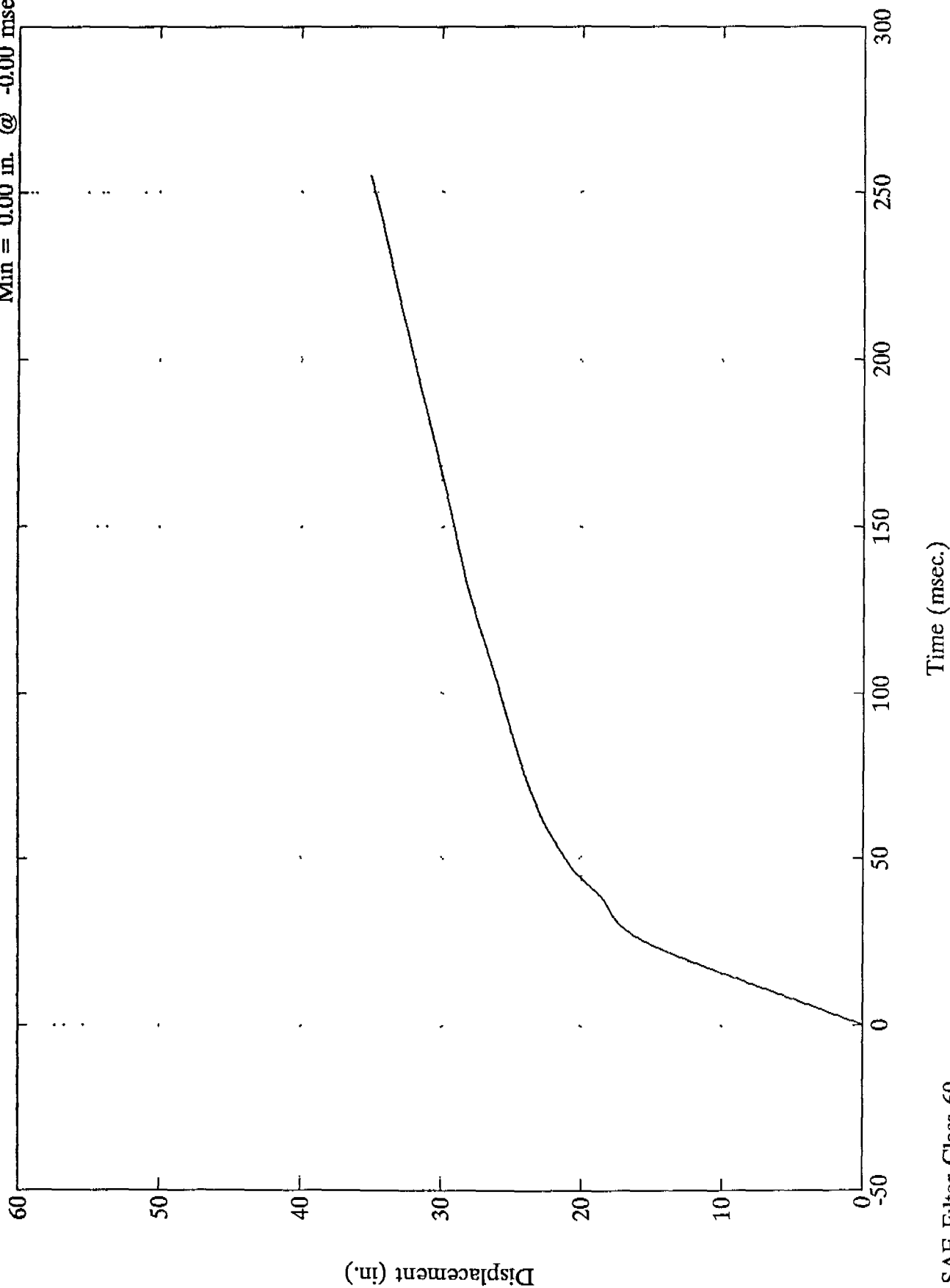


Veh. 1 Engine Bottom (X)

Max = 36.55 mph @ 10.32 msec
Min = 2.87 mph @ 145.44 msec



SAE Filter Class 60

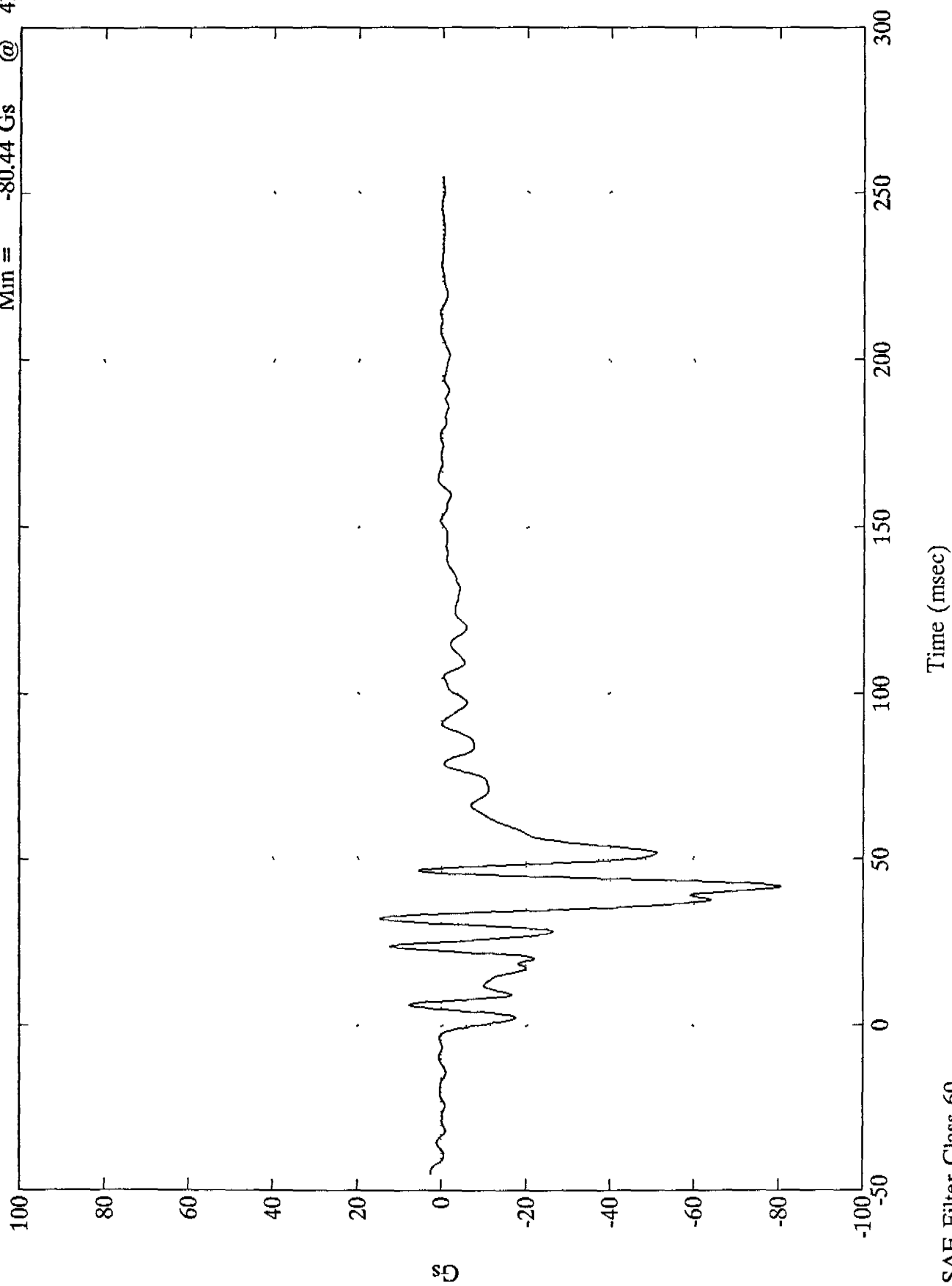


VTV TEST 9

Veh. 1 Front X Mem. (X)

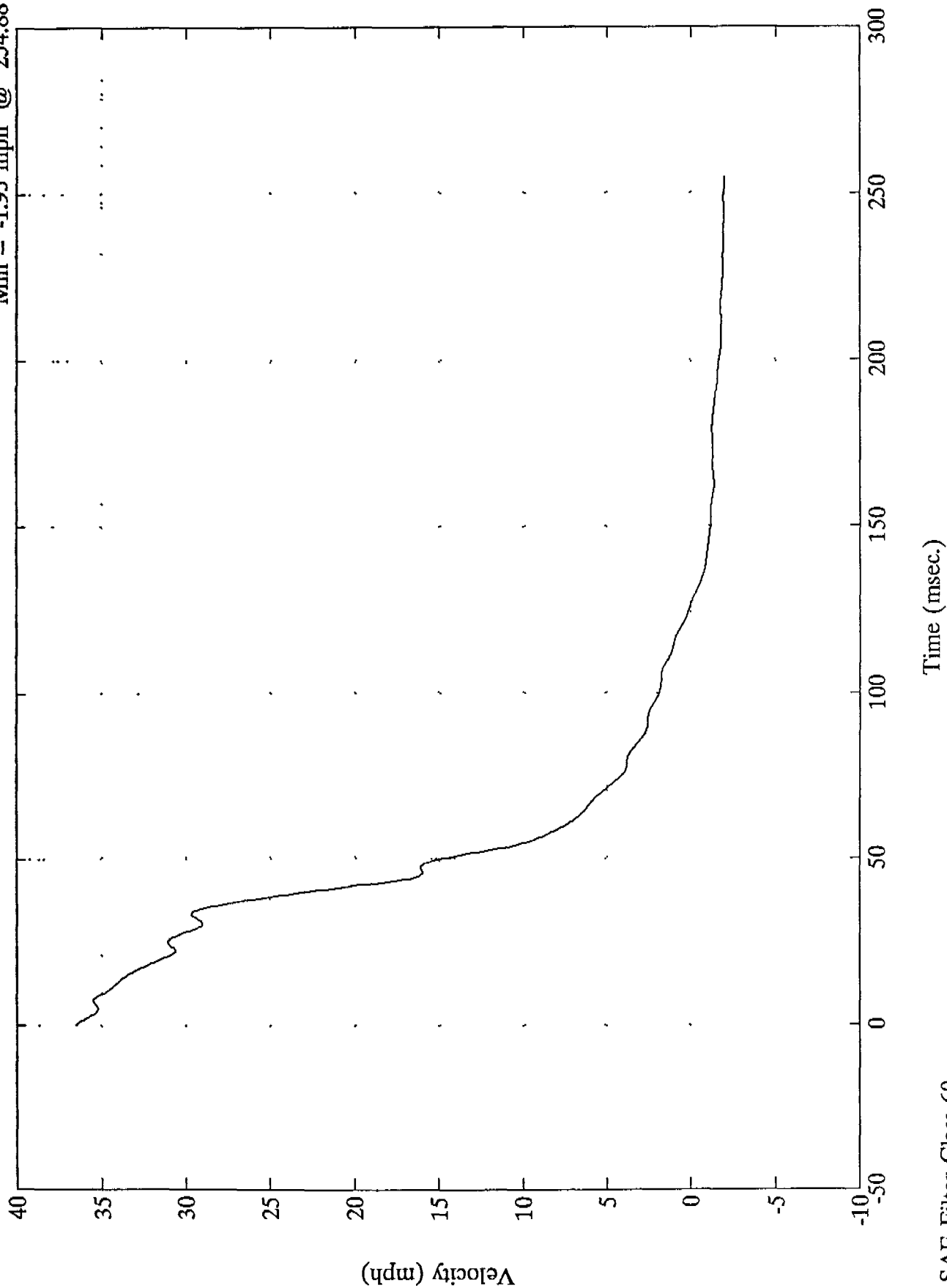
Max = 14.62 Gs @ 32.04 msec

Min = -80.44 Gs @ 41.76 msec



Veh. 1 Front X Mem. (X)

Max = 36.50 mph @ -0.00 msec
Min = -1.95 mph @ 254.88 msec



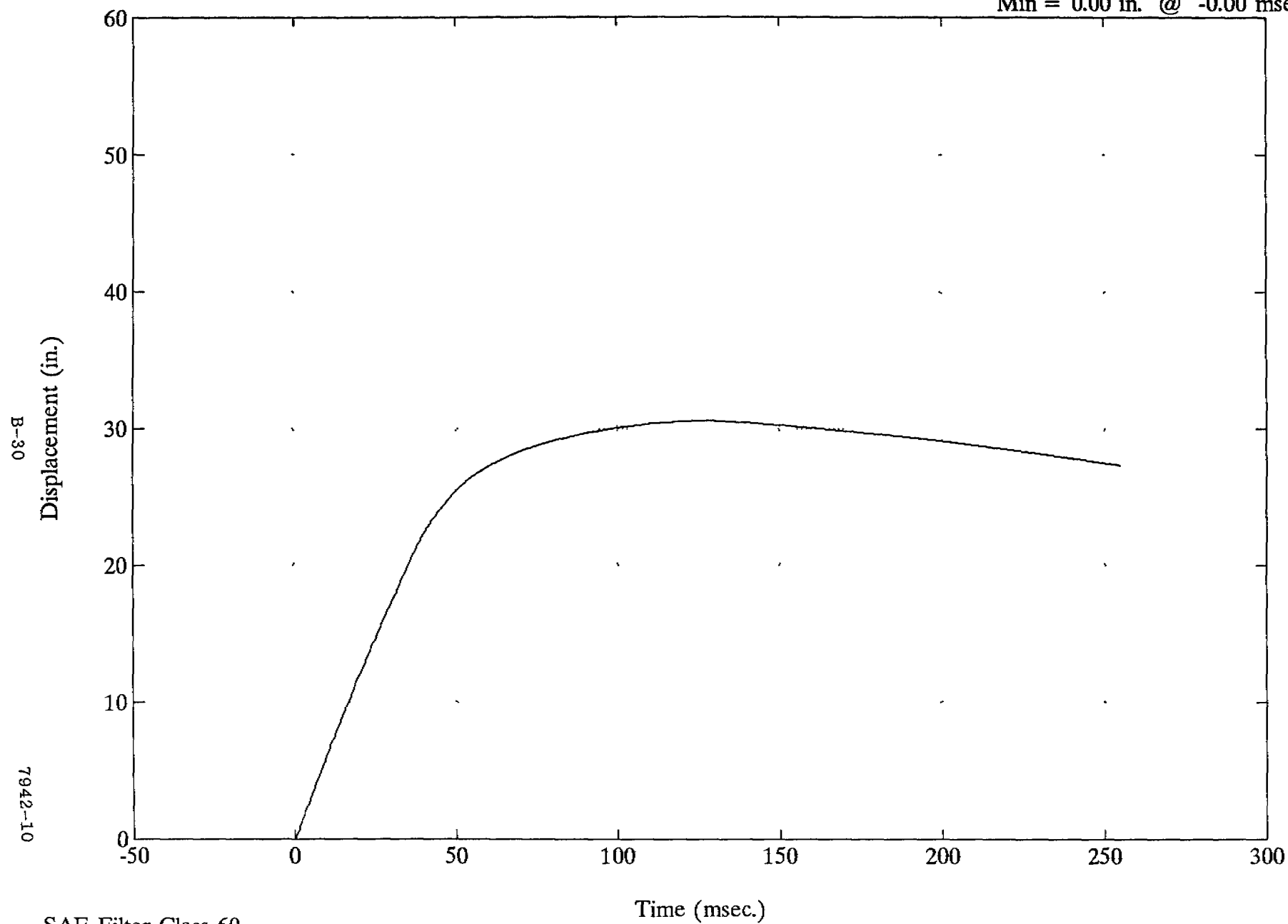
SAE Filter Class 60

VTV TEST 9

Veh. 1 Front X Mem. (X)

Max = 30.58 in. @ 130.08 msec

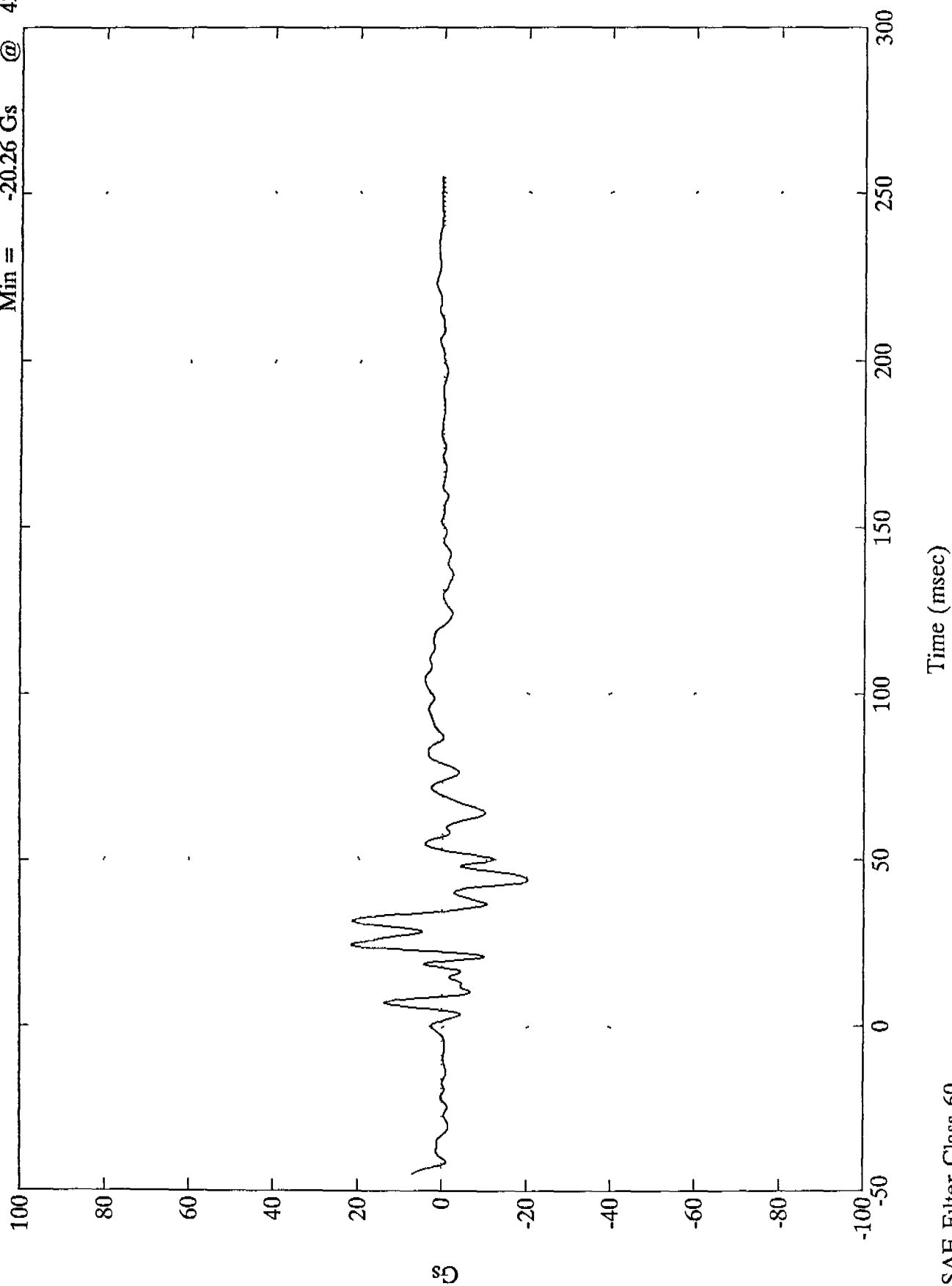
Min = 0.00 in. @ -0.00 msec



SAE Filter Class 60

Veh. 1 Front X Mem. (Z)

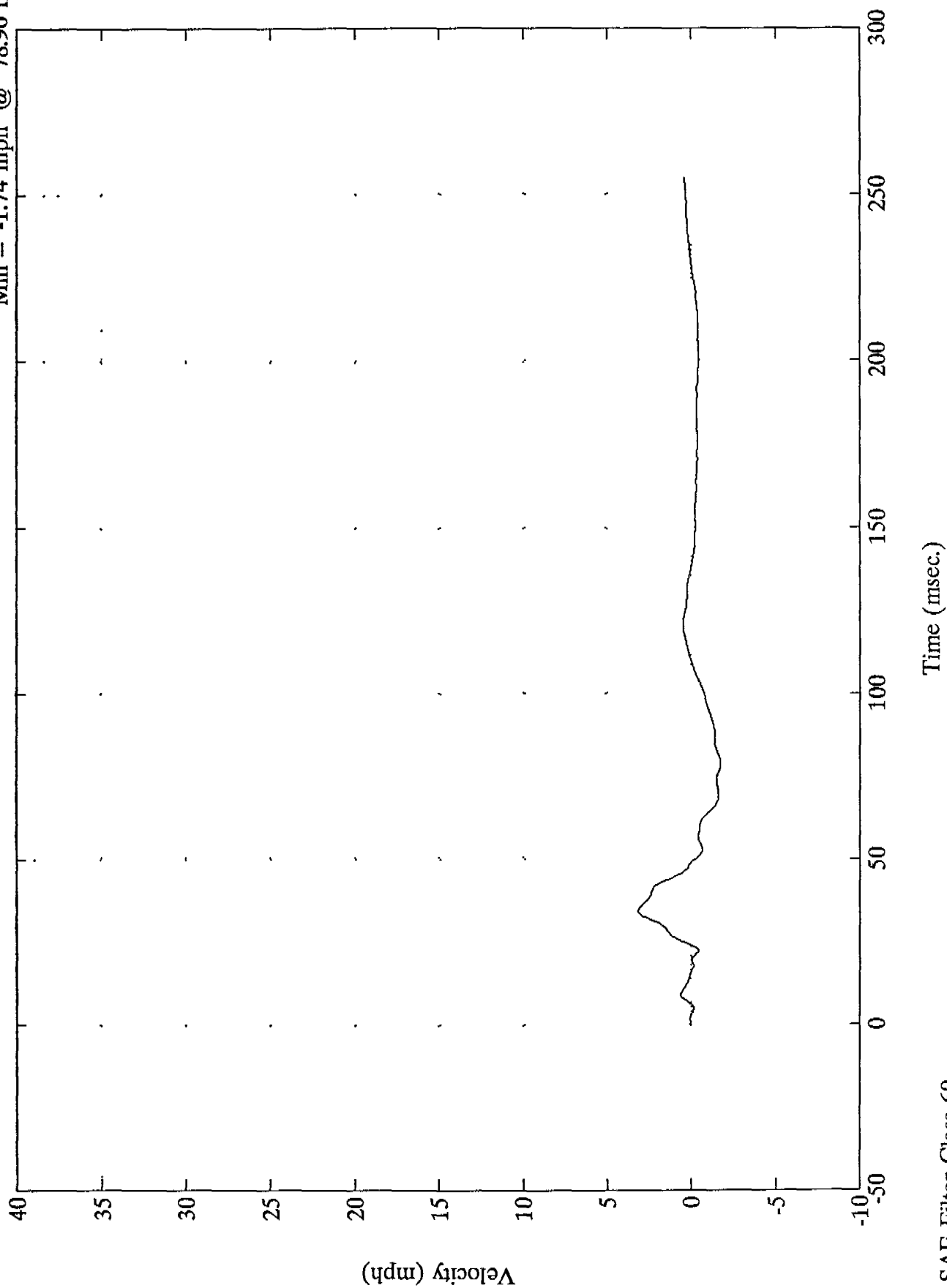
Max = 21.58 Gs @ 24.47 msec
Min = -20.26 Gs @ 43.91 msec



VTV TEST 9

Veh. 1 Front X Mem. (Z)

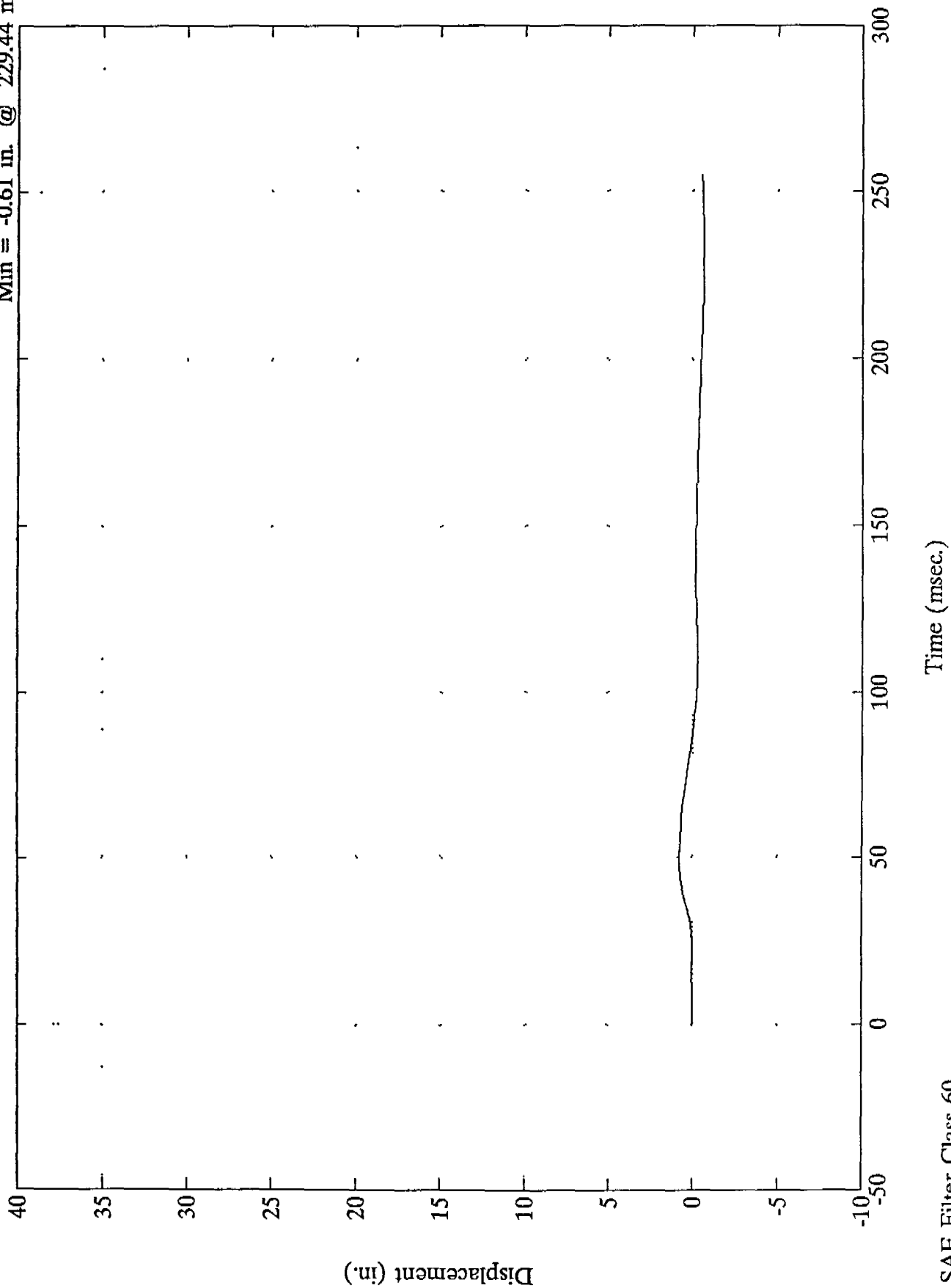
Max = 3.14 mph @ 34.56 msec
Min = -1.74 mph @ 78.96 msec



SAE Filter Class 60

Veh. 1 Front X Mem. (Z)

Max = 0.79 in. @ 49.20 msec
Min = -0.61 in. @ 229.44 msec

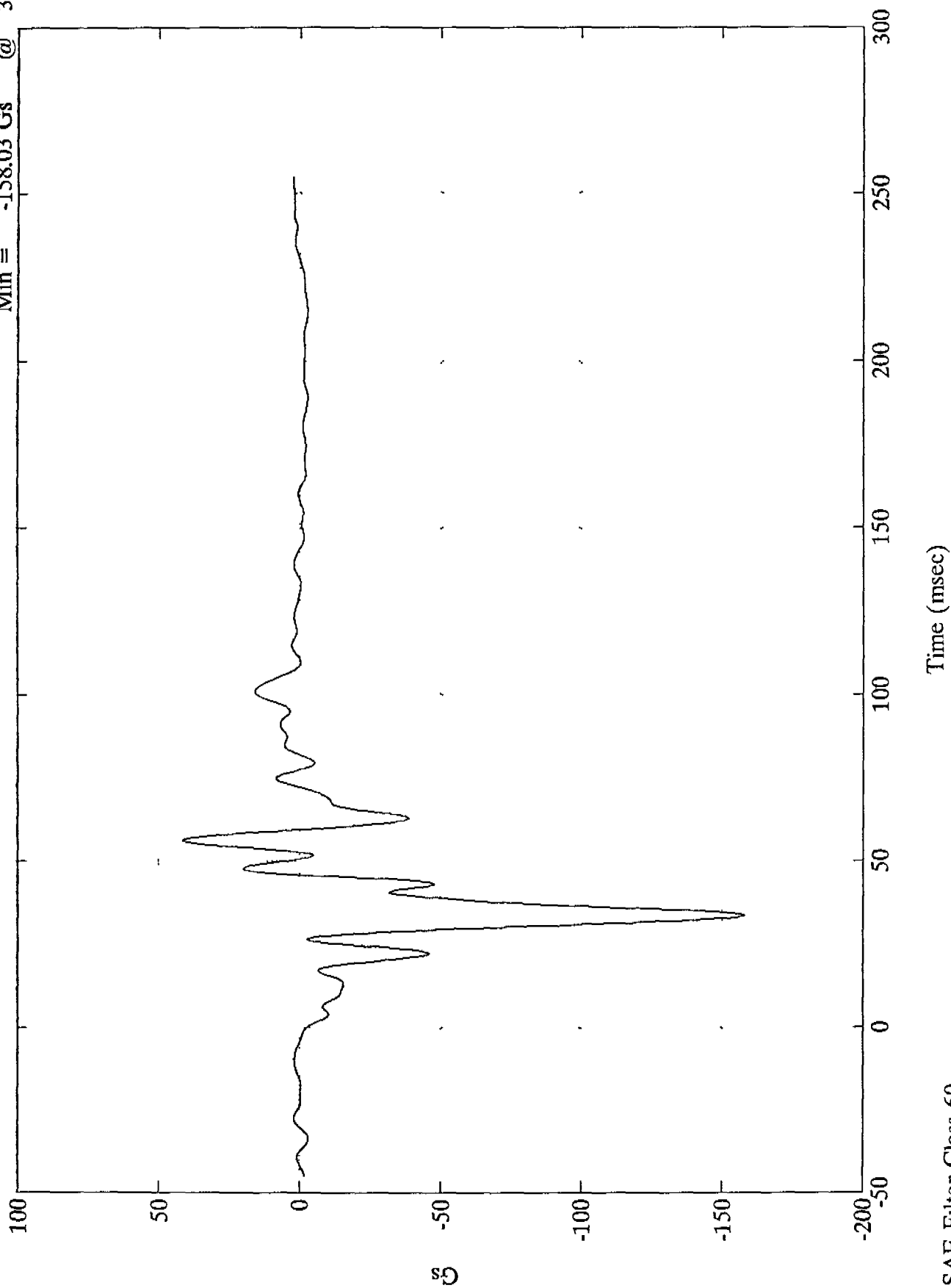


SAE Filter Class 60

VTV TEST 9

Veh. 1 Left Caliper (X)

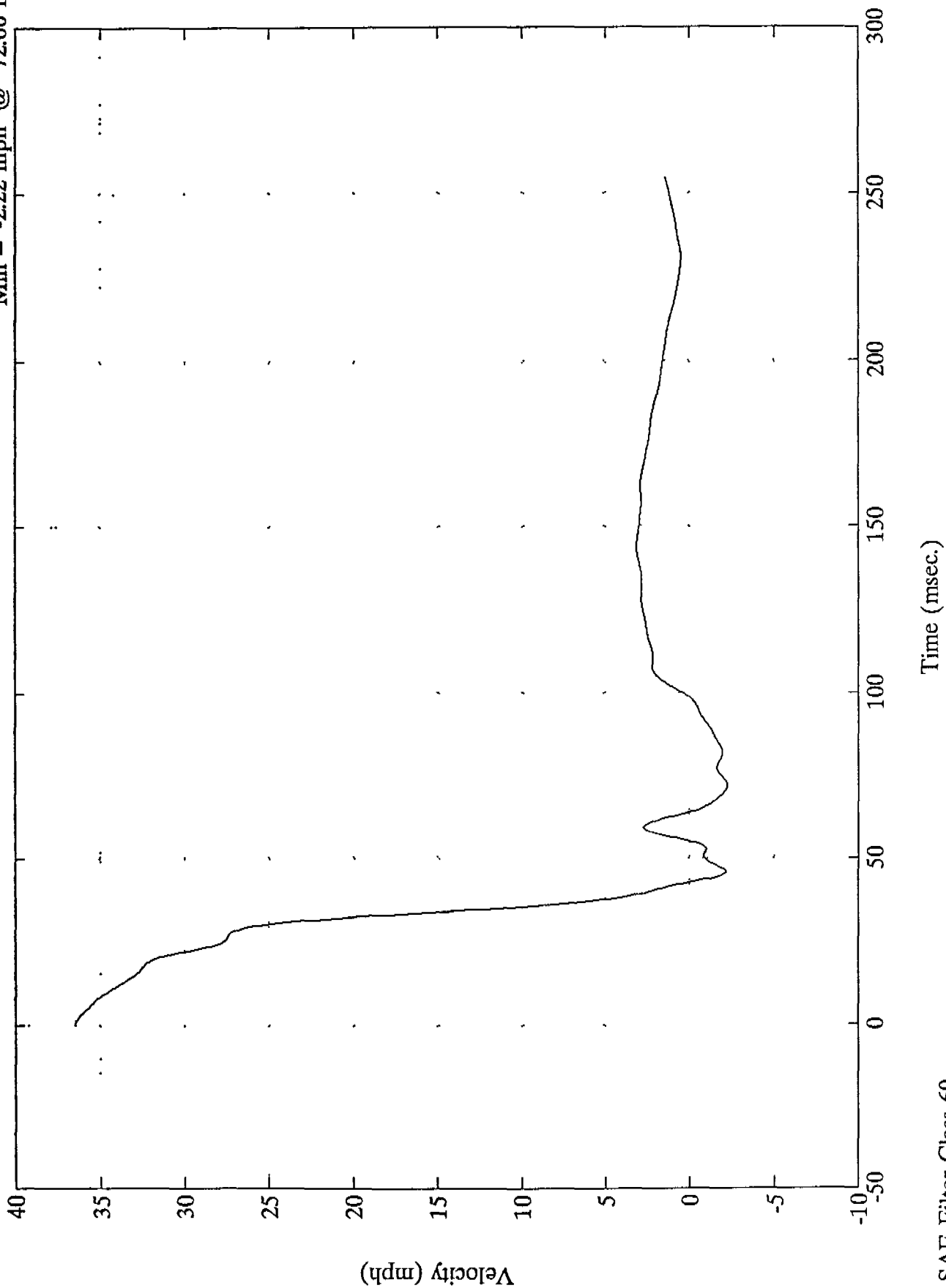
Max = 41.39 Gs @ 56.28 msec
Min = -158.03 Gs @ 33.59 msec



SAE Filter Class 60

Veh. 1 Left Caliper (X)

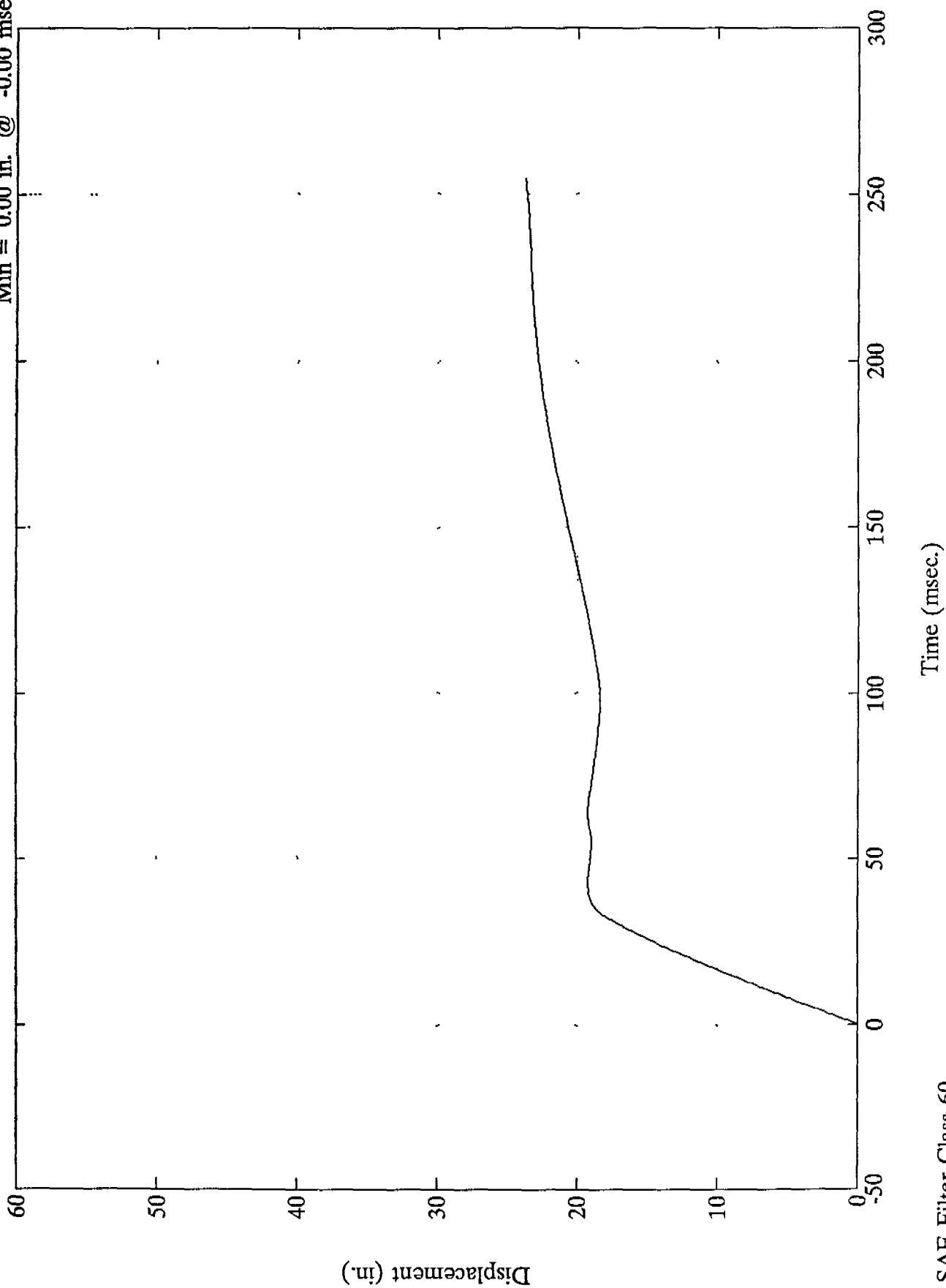
Max = 36.50 mph @ -0.00 msec
Min = -2.22 mph @ 72.00 msec



VTV TEST 9

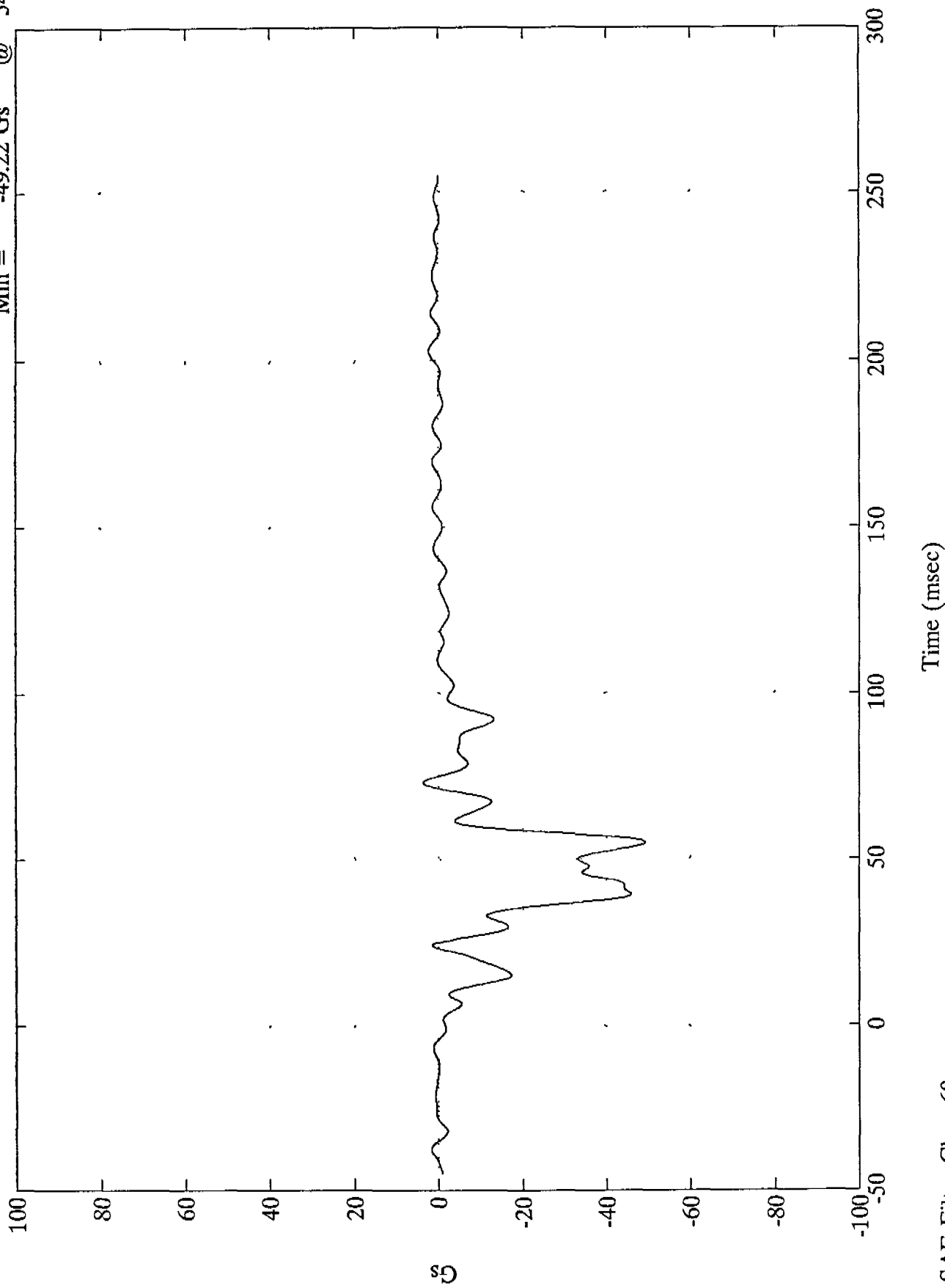
Veh. 1 Left Caliper (X)

Max = 23.76 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



Veh. 1 Right Caliper (X)

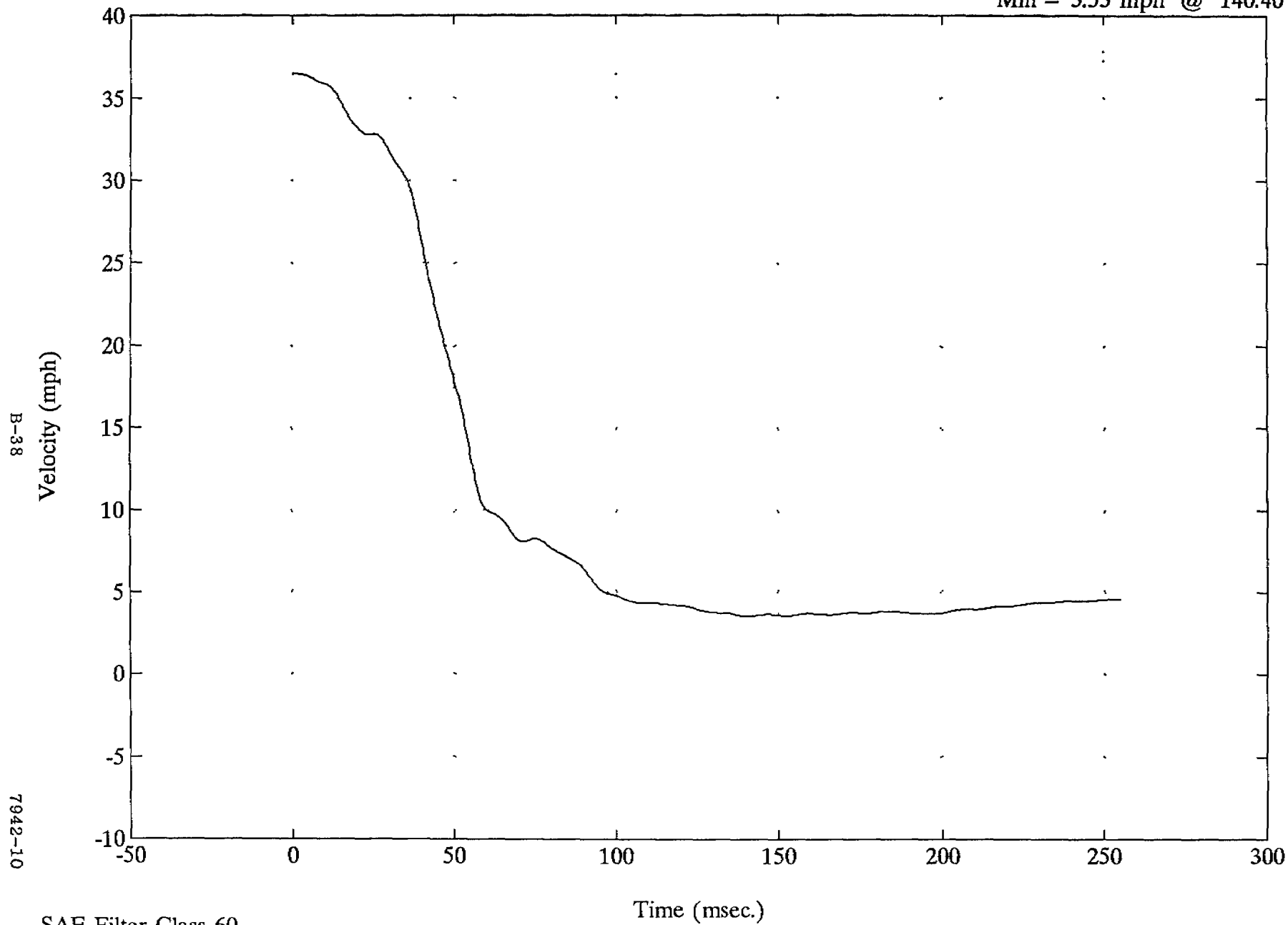
Max = 3.70 Gs @ 72.96 msec
Min = -49.22 Gs @ 54.84 msec

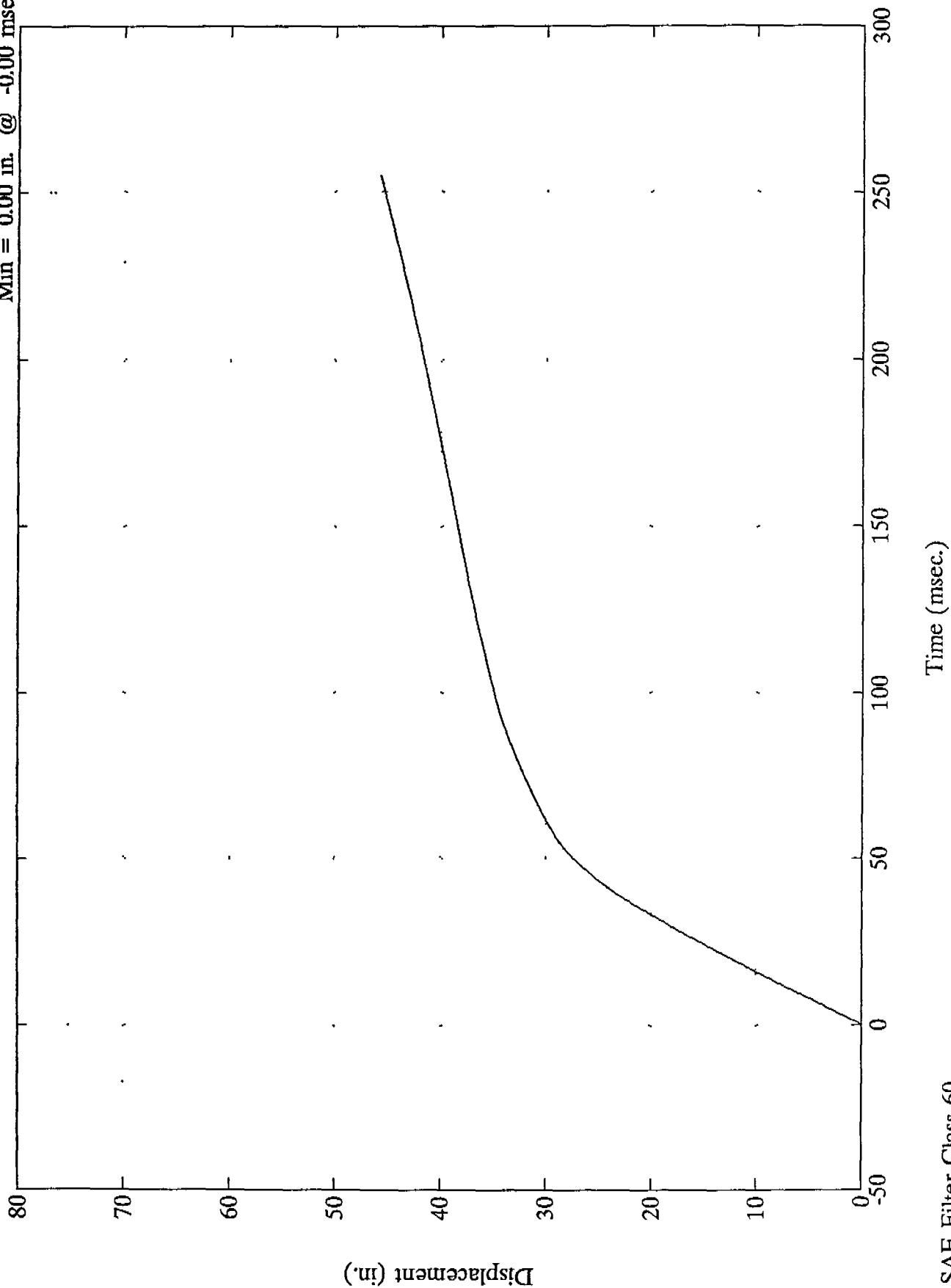


VTV TEST 9

Veh. 1 Right Caliper (X)

Max = 36.50 mph @ -0.00 msec
Min = 3.53 mph @ 140.40 msec

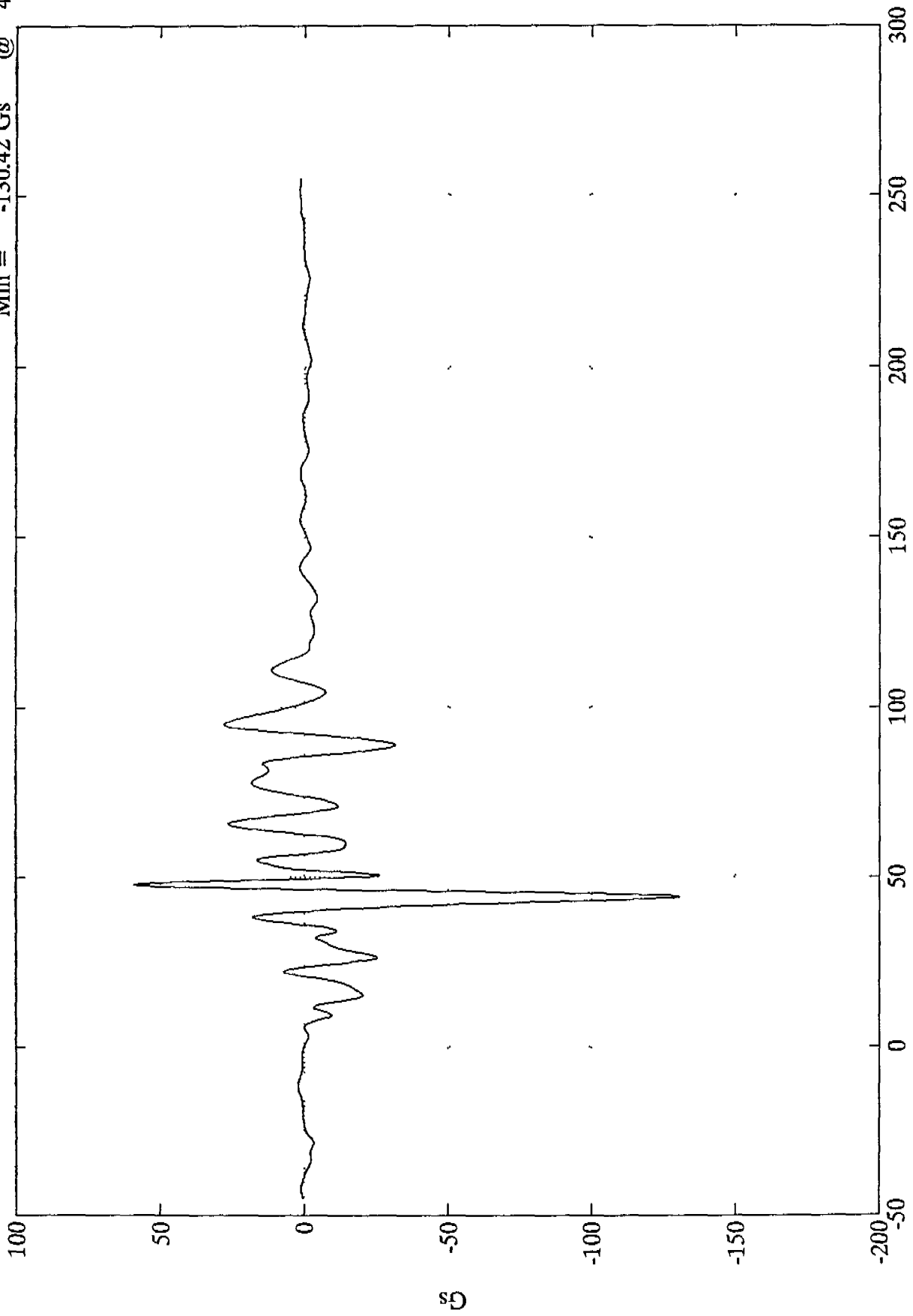




VTV TEST 9

Veh. 1 Brake Pedal (X)

Max = 59.25 Gs @ 47.76 msec
Min = -130.42 Gs @ 44.15 msec

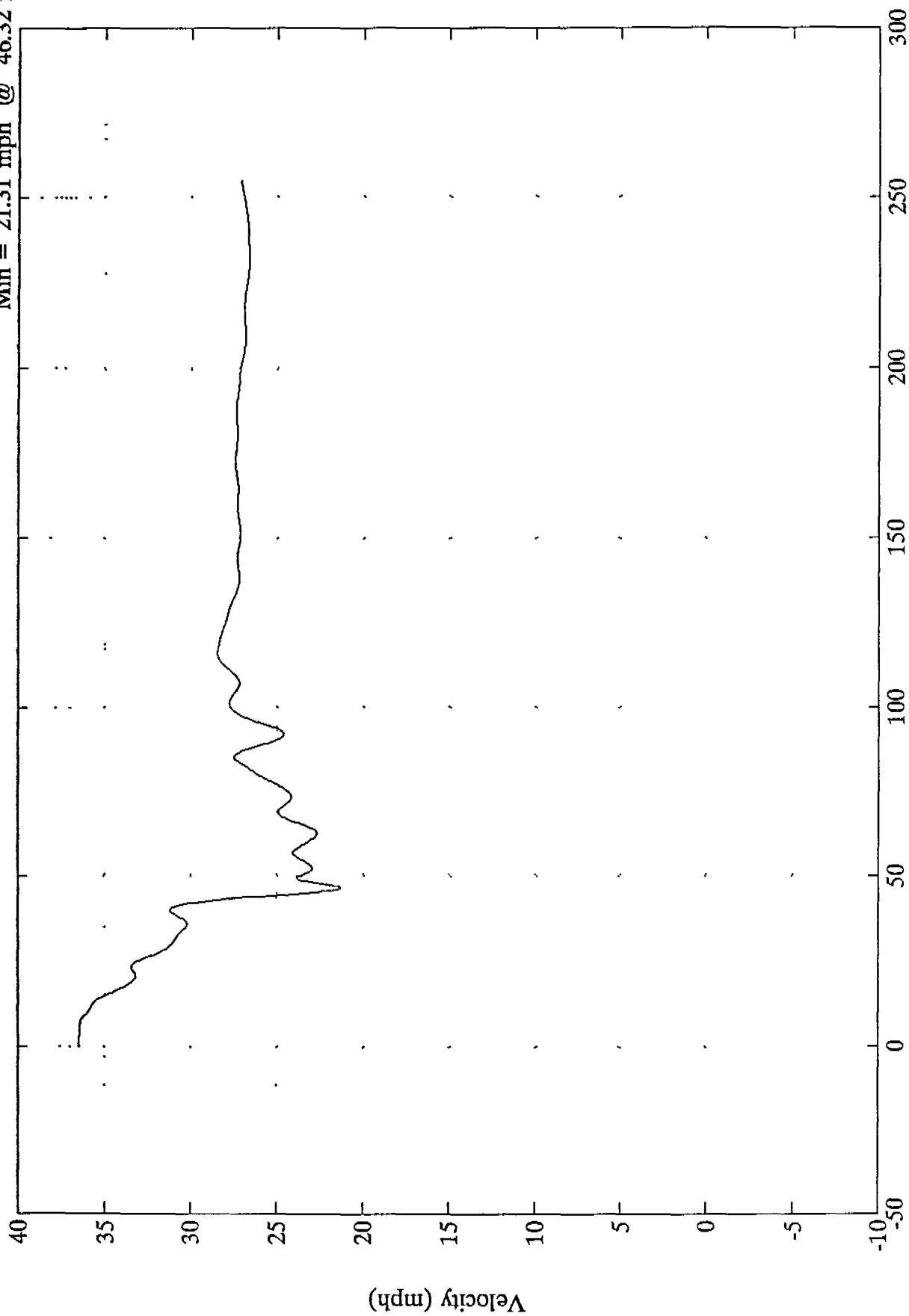


SAE Filter Class 60

Time (msec)

Veh. 1 Brake Pedal (X)

Max = 36.50 mph @ 0.96 msec
Min = 21.31 mph @ 46.32 msec



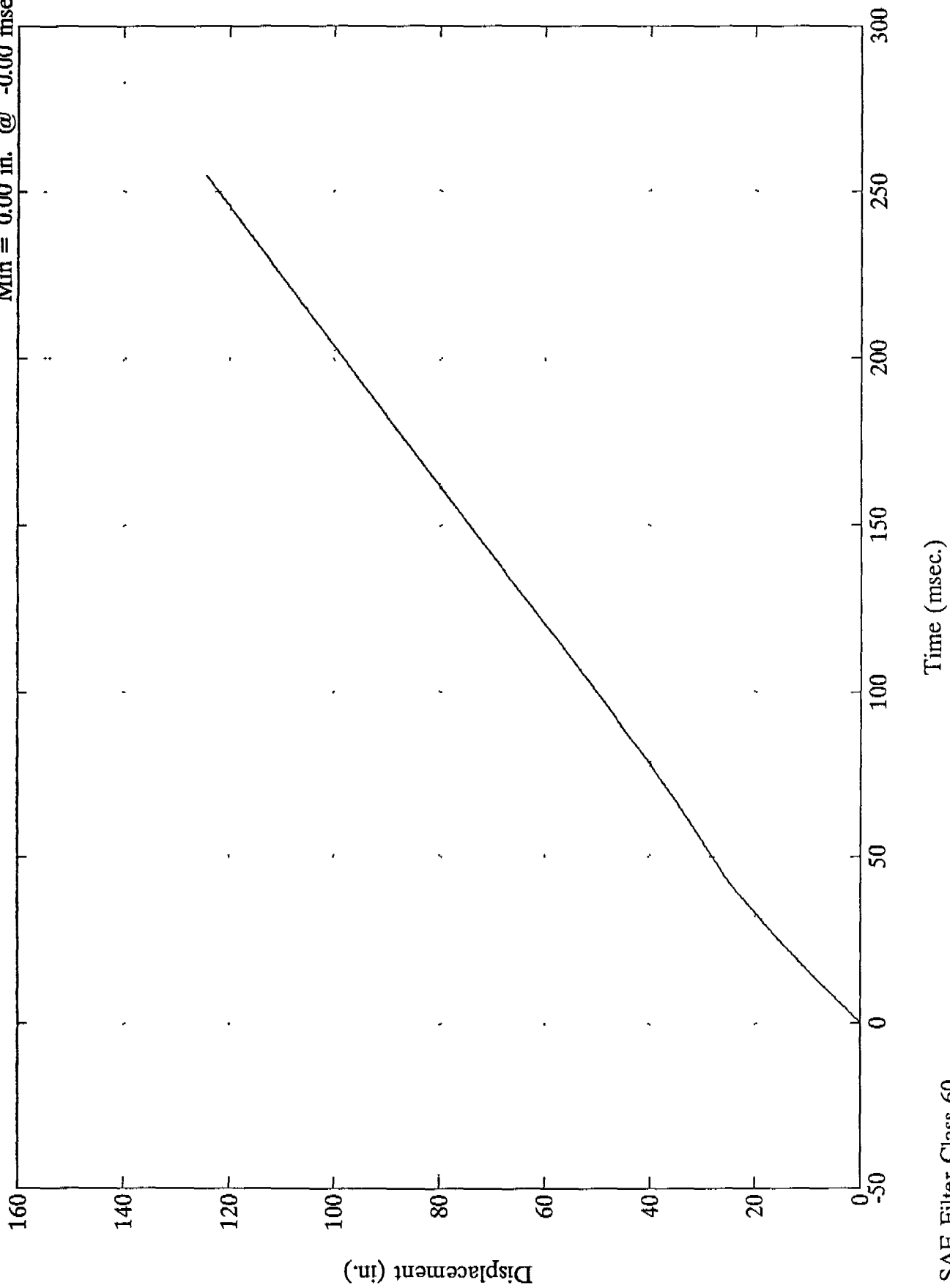
Time (msec.)

SAE Filter Class 60

VTV TEST 9

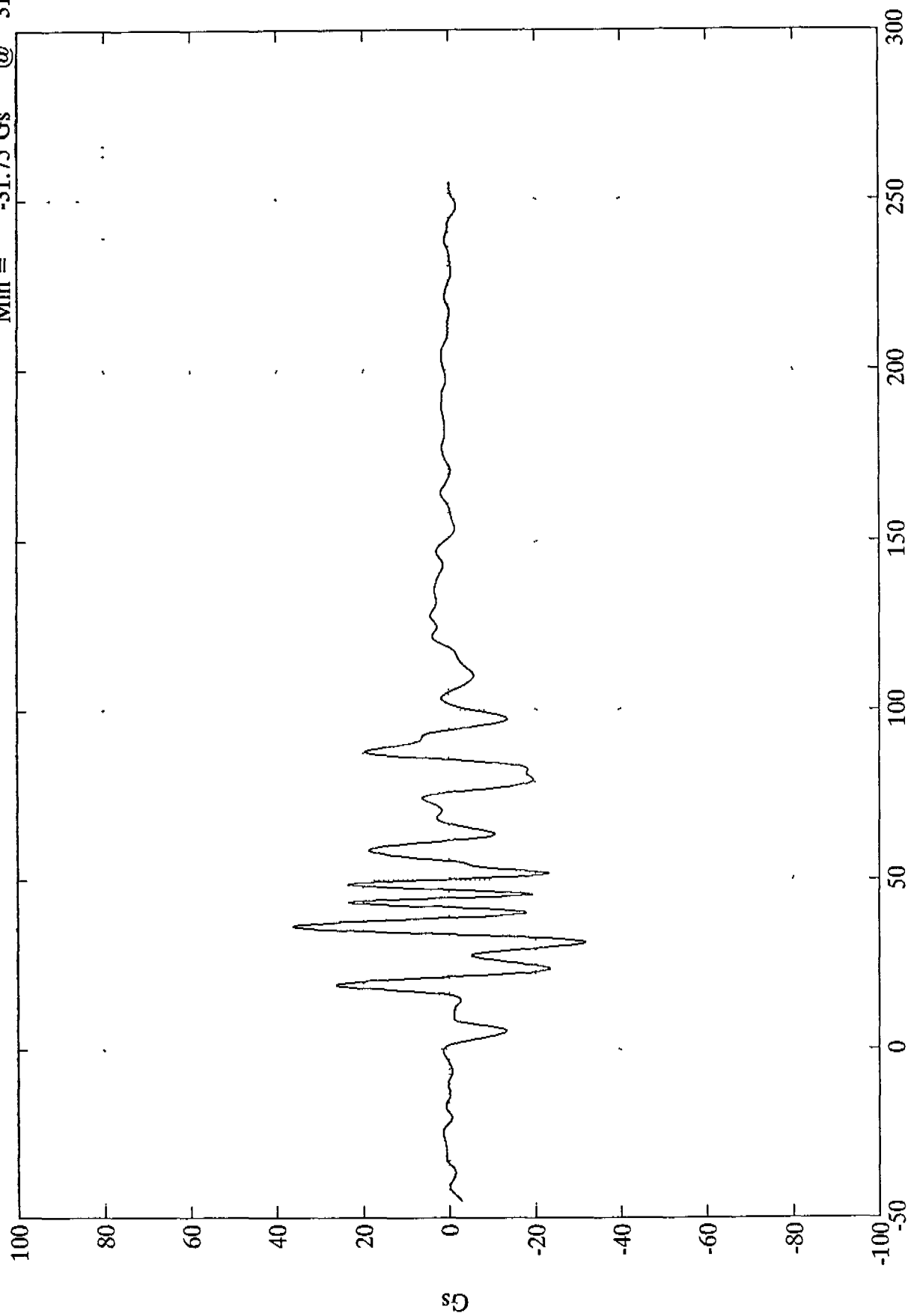
Veh. 1 Brake Pedal (X)

Max = 124.40 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



Veh. 1 Brake Pedal (Z)

Max = 36.29 Gs @ 36.24 msec
 Min = -31.75 Gs @ 31.44 msec



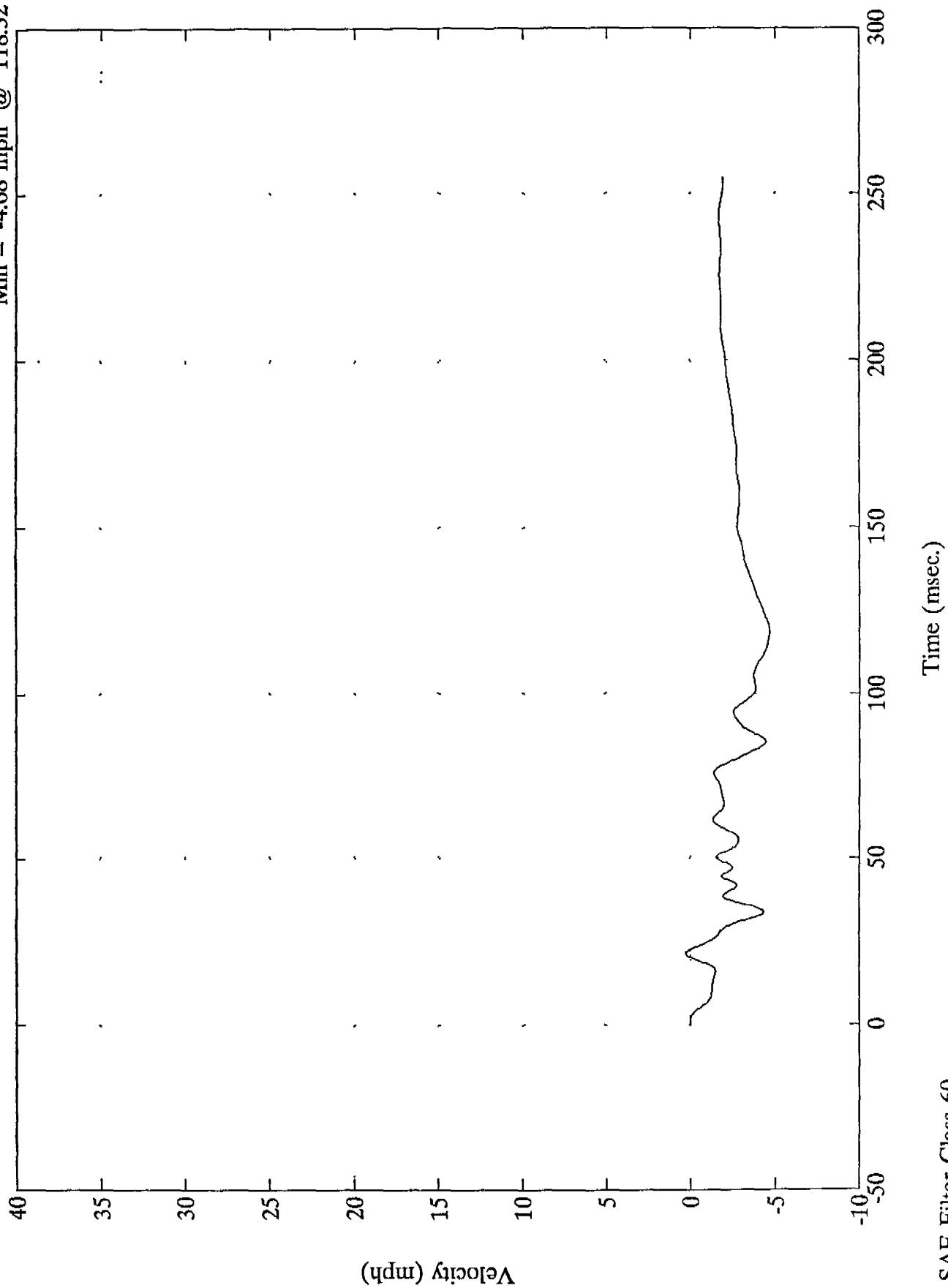
Time (msec)

SAE Filter Class 60

VTV TEST 9

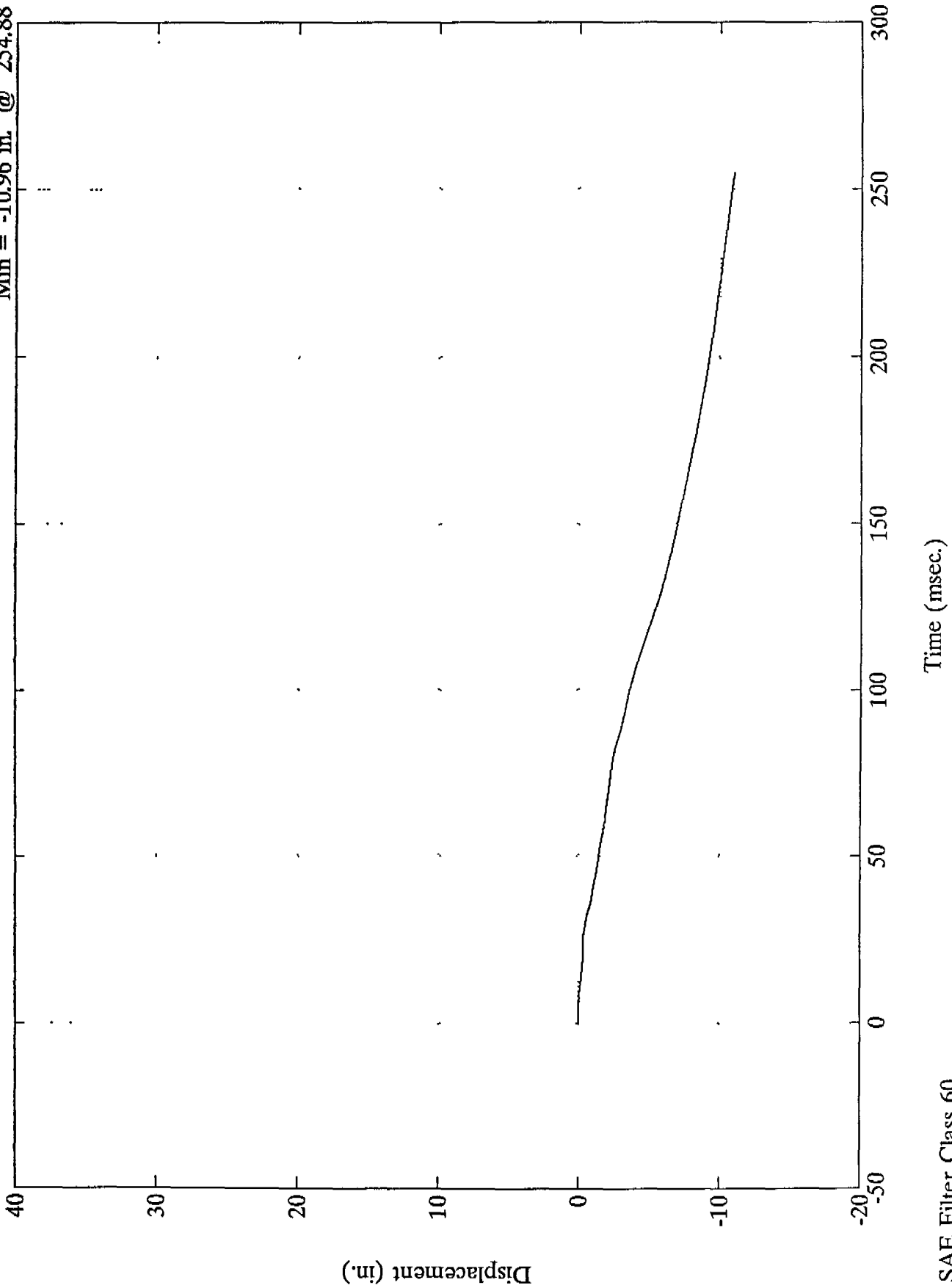
Veh. 1 Brake Pedal (Z)

Max = 0.31 mph @ 21.36 msec
Min = -4.68 mph @ 118.32 msec



Veh. 1 Brake Pedal (Z)

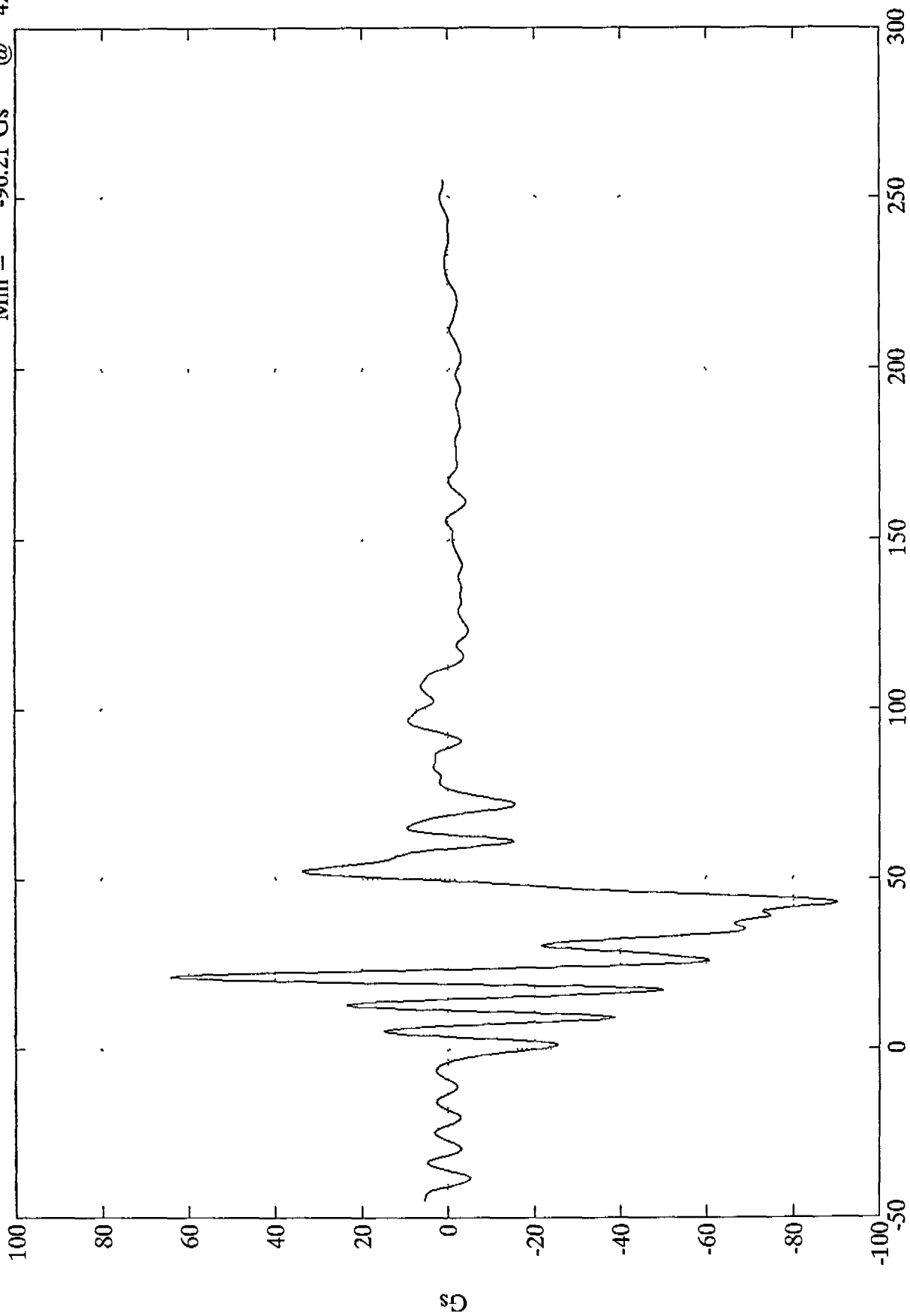
Max = 0.00 in. @ 1.92 msec
 Min = -10.96 in. @ 254.88 msec



VTV TEST 9

Veh. 1 Toe Pan (X)

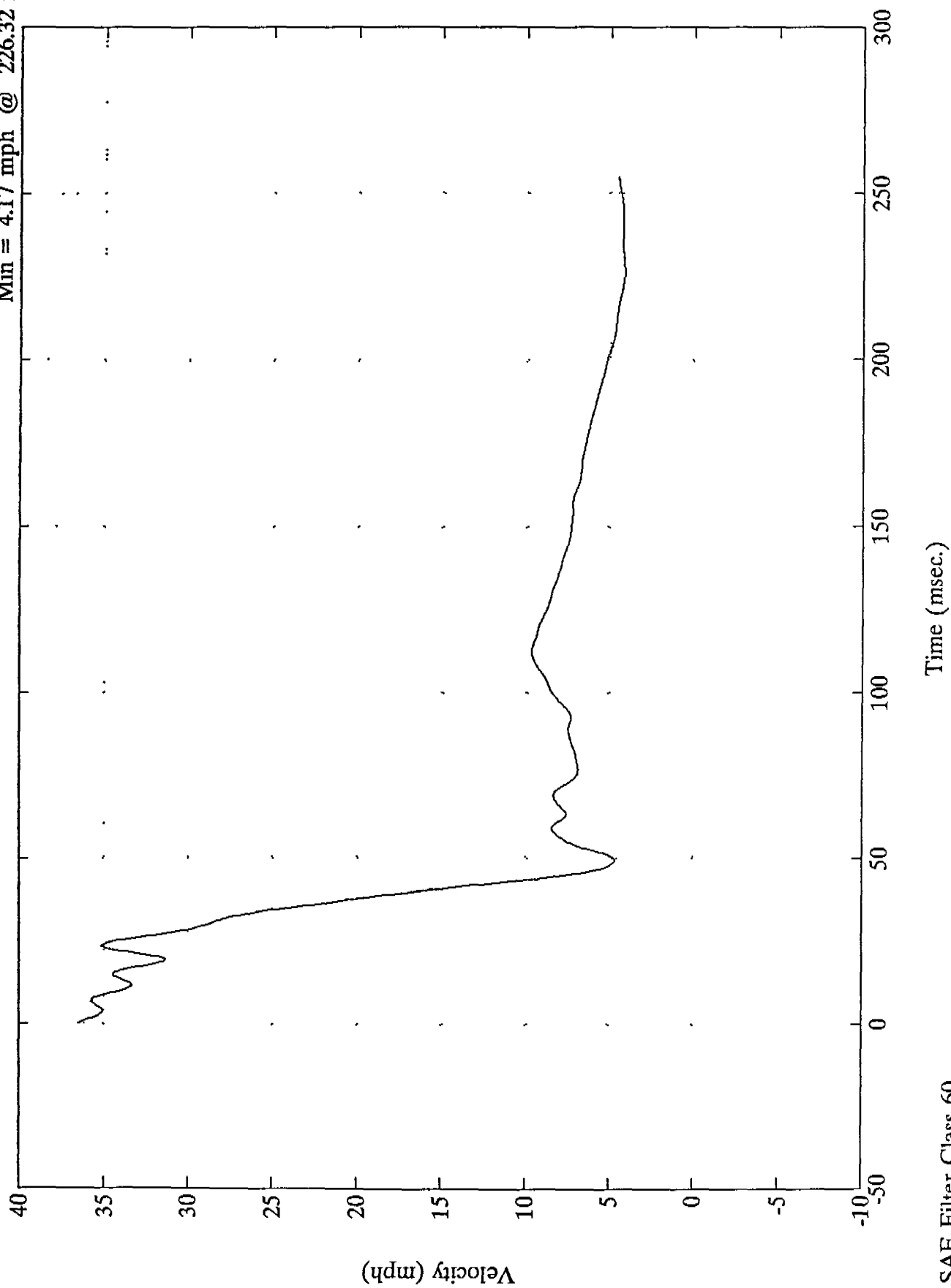
Max = 64.24 Gs @ 21.23 msec
Min = -90.21 Gs @ 42.95 msec



Time (msec)

SAE Filter Class 60

Veh. 1 Toe Pan (X)

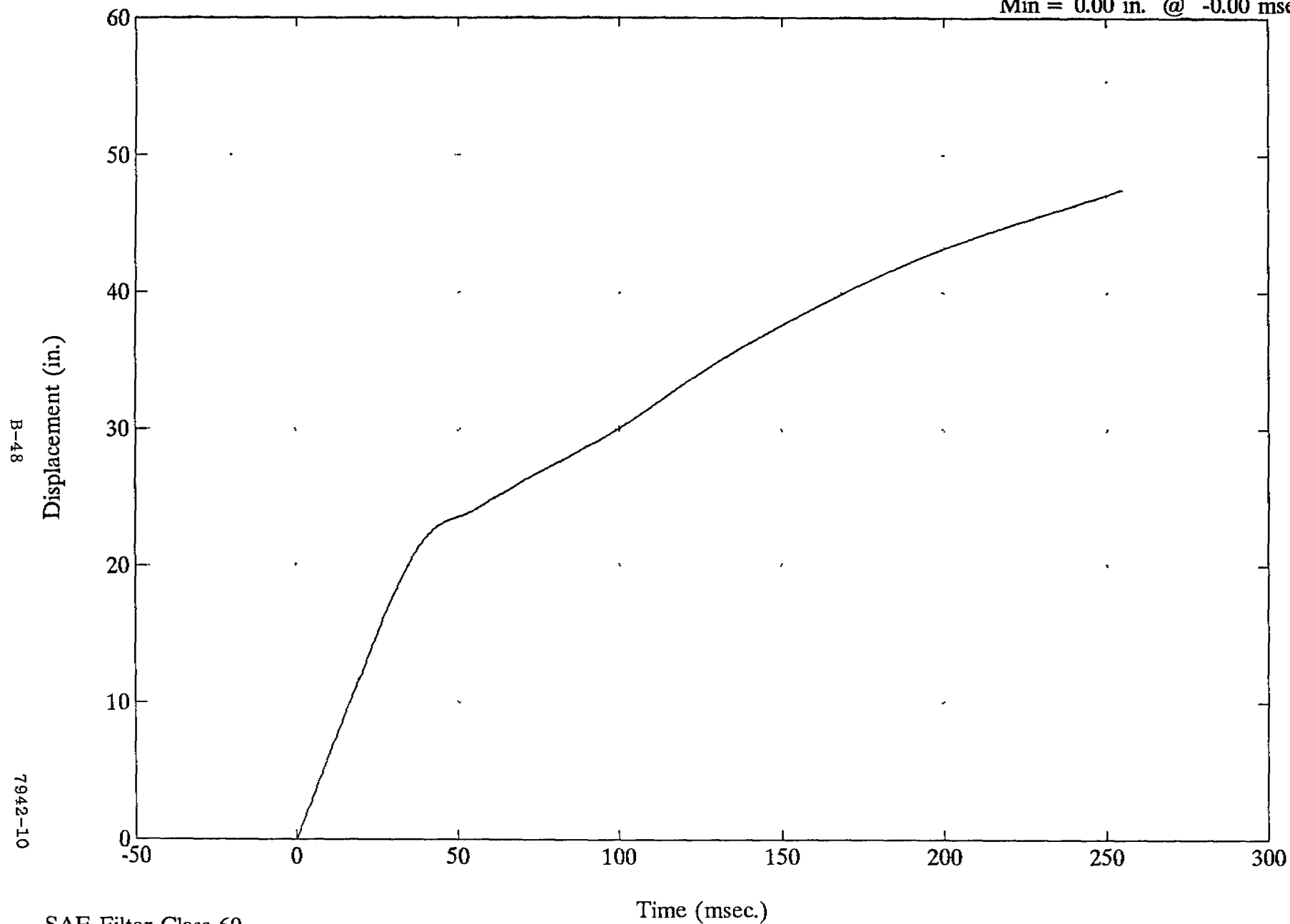
Max = 36.50 mph @ -0.00 msec
Min = 4.17 mph @ 226.32 msec

SAE Filter Class 60

VTV TEST 9

Veh. 1 Toe Pan (X)

Max = 47.49 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



SAE Filter Class 60

TEST NO. Y43-9-1228

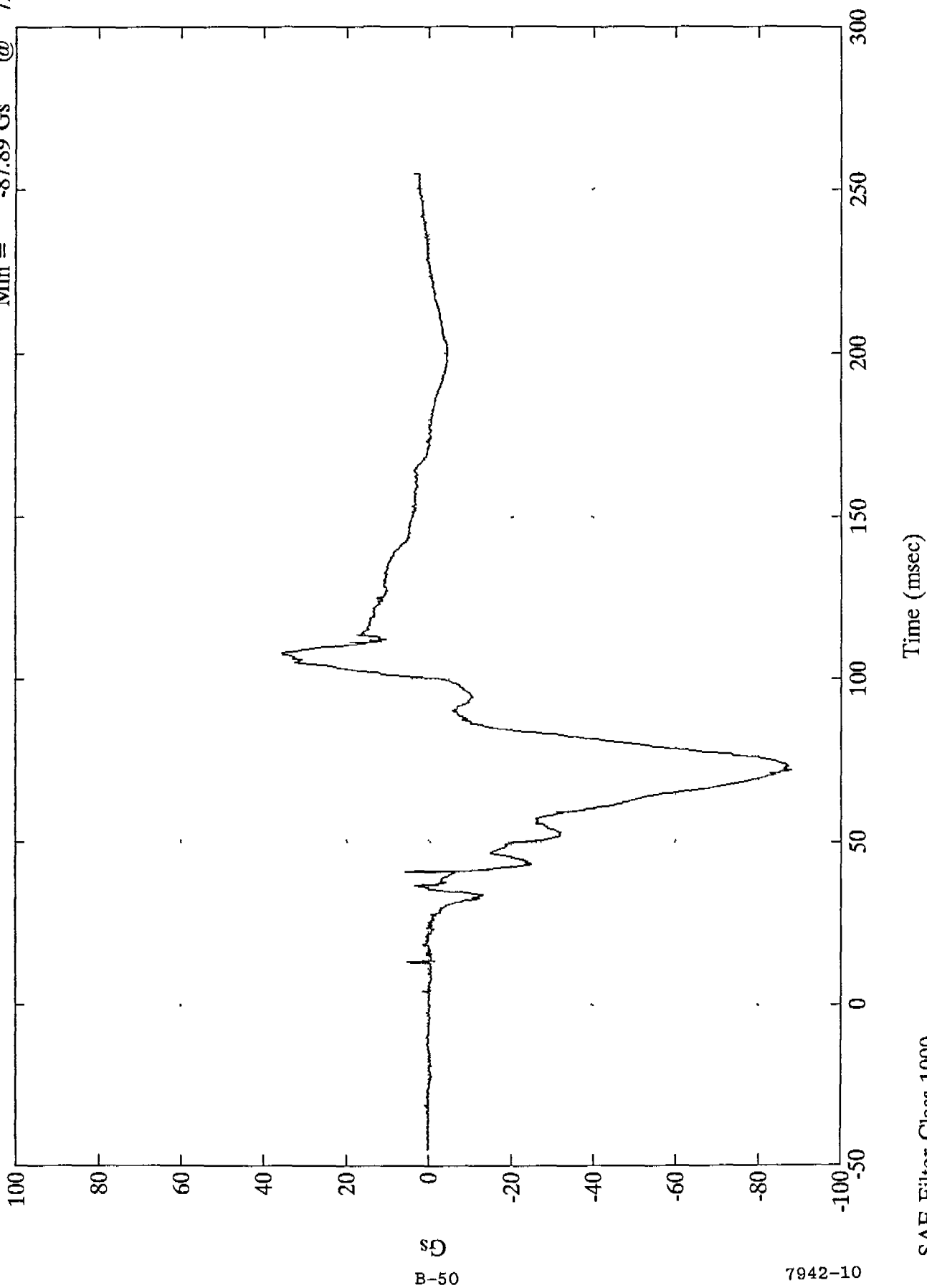
DUMMY DATA

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

Veh.1-Pos.1 Head X

Max = 35.58 Gs @ 107.76 msec
Min = -87.89 Gs @ 72.00 msec



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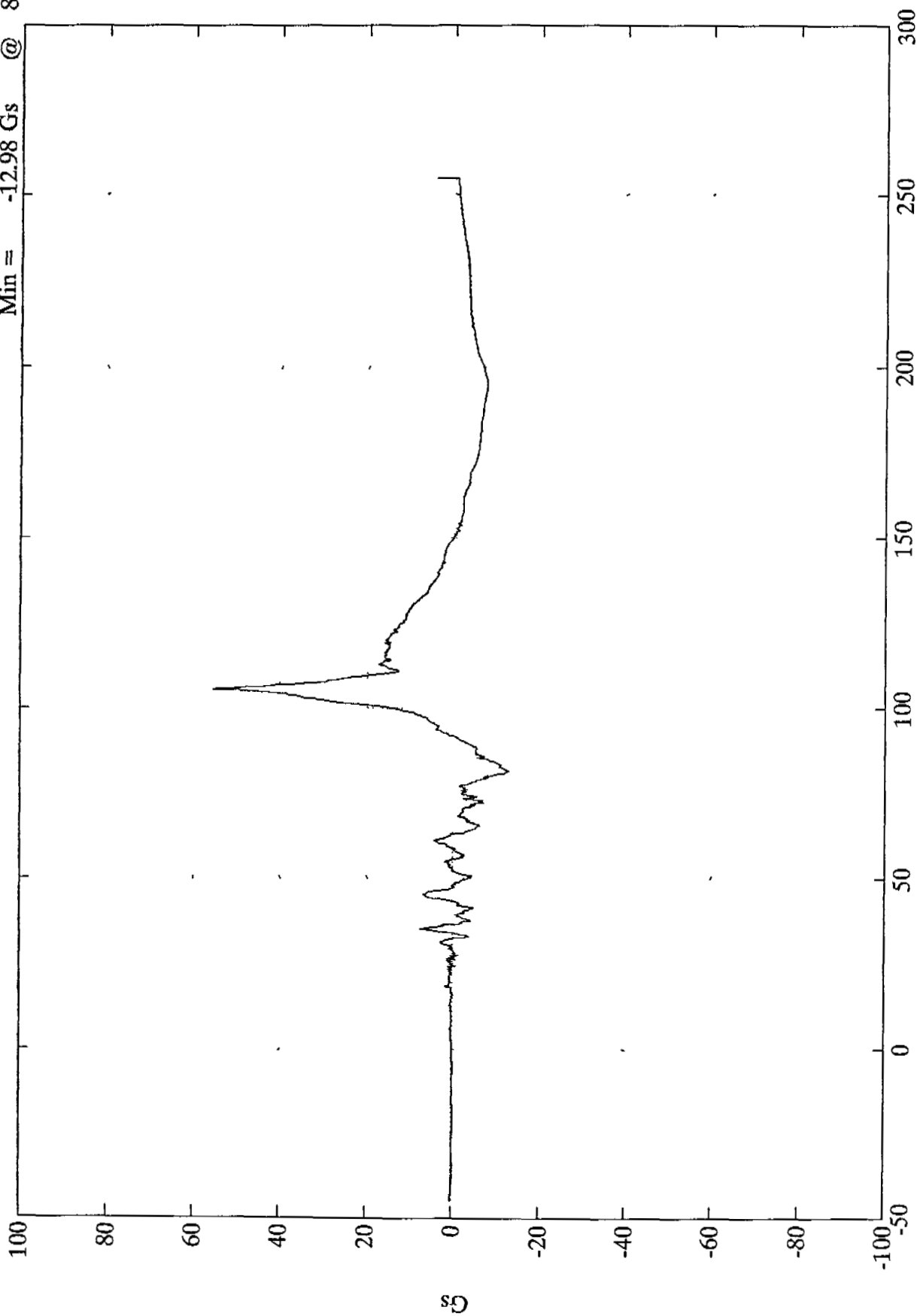
SAE Filter Class 1000

VTV TEST 9

Veh.1-Pos.1 Head Y

Max = 55.47 Gs @ 105.36 msec

Min = -12.98 Gs @ 81.60 msec



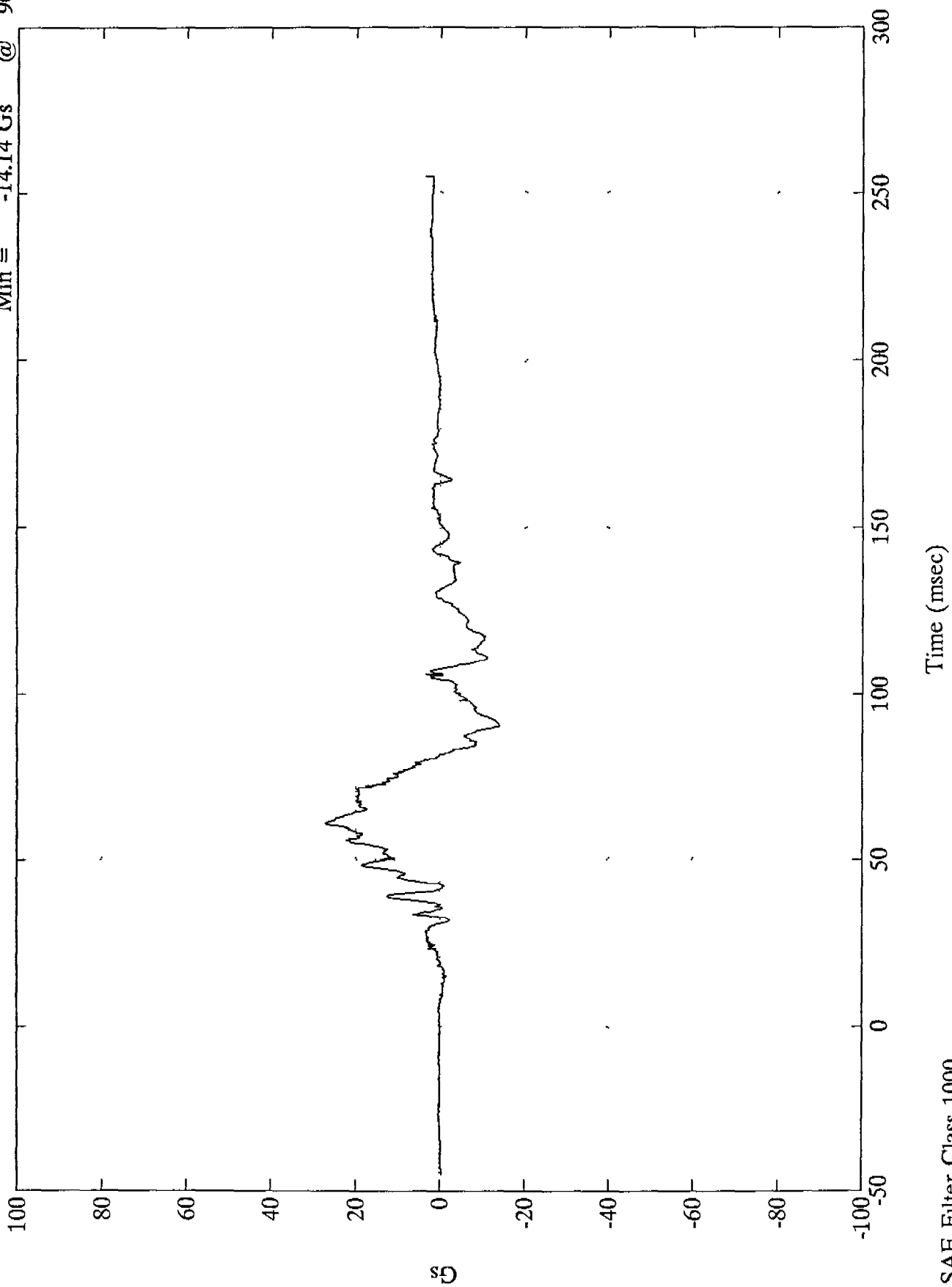
Time (msec)

SAE Filter Class 1000

VTV TEST 9

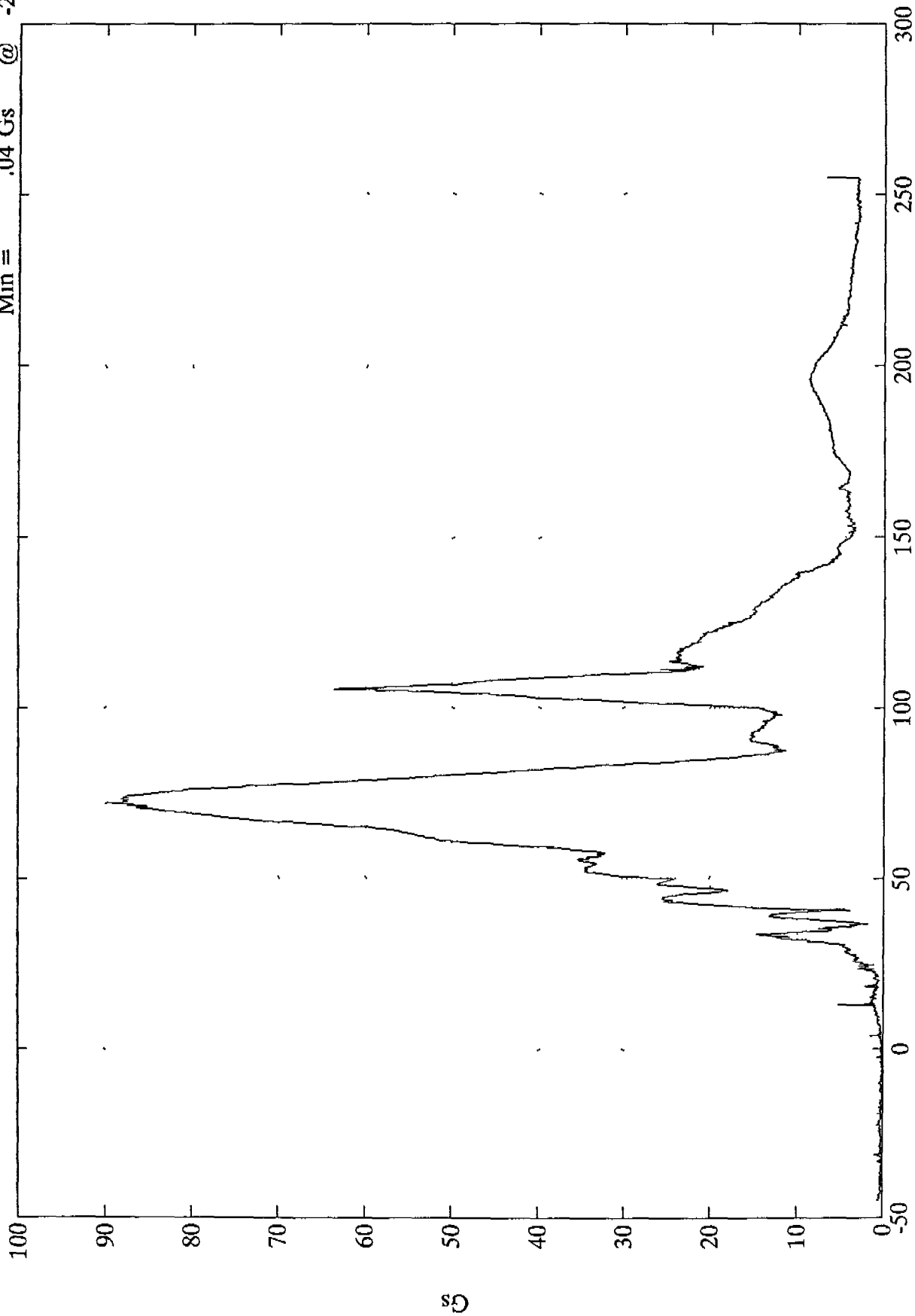
Veh.1-Pos.1 Head Z

Max =	27.06 Gs	@	60.84 msec
Min =	-14.14 Gs	@	90.36 msec



Veh.1-Pos.1 Head Result.

Max = 89.81 Gs @ 72.00 msec
Min = .04 Gs @ -2.28 msec

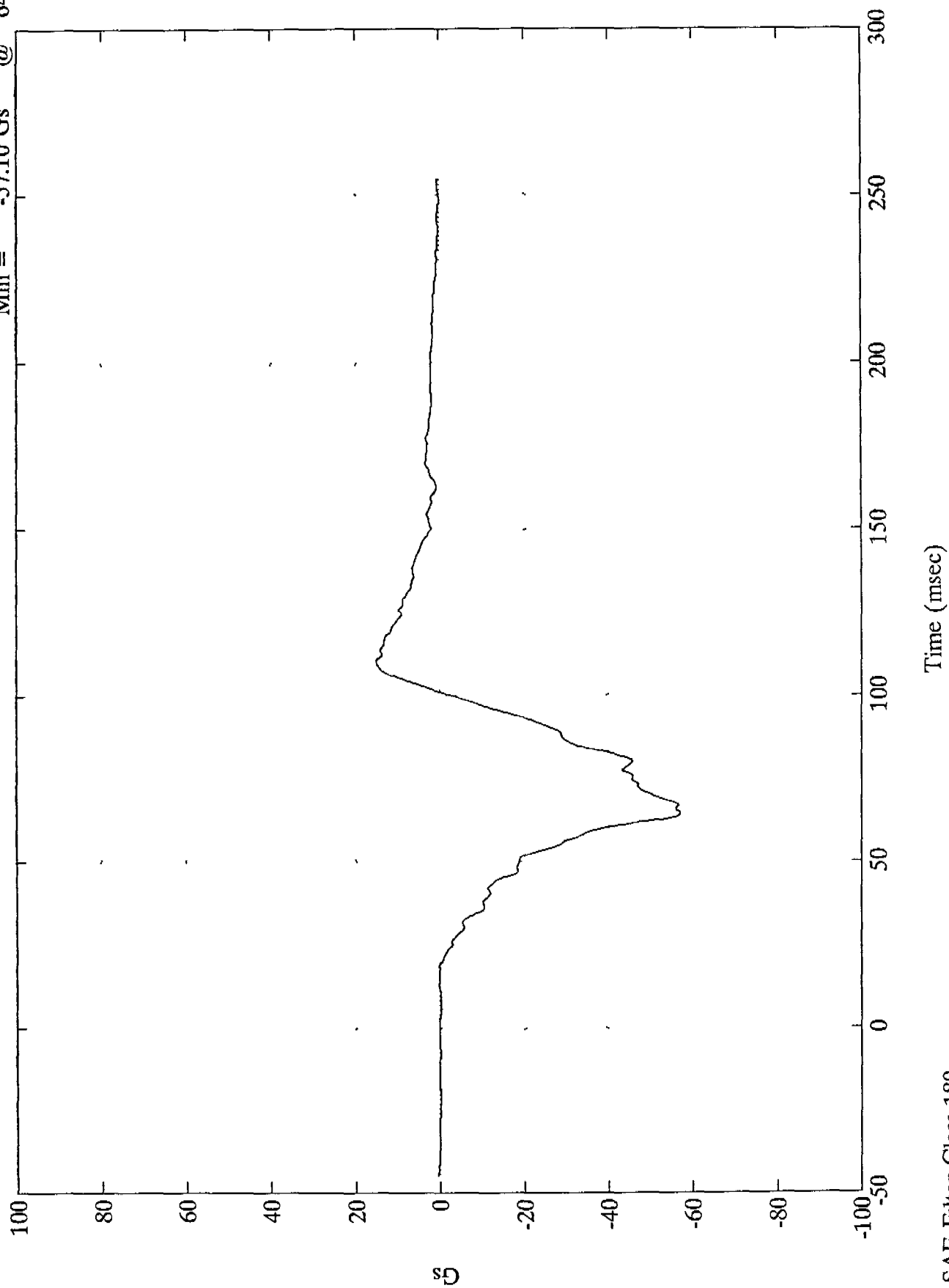


Time (msec)

SAE Filter Class 1000

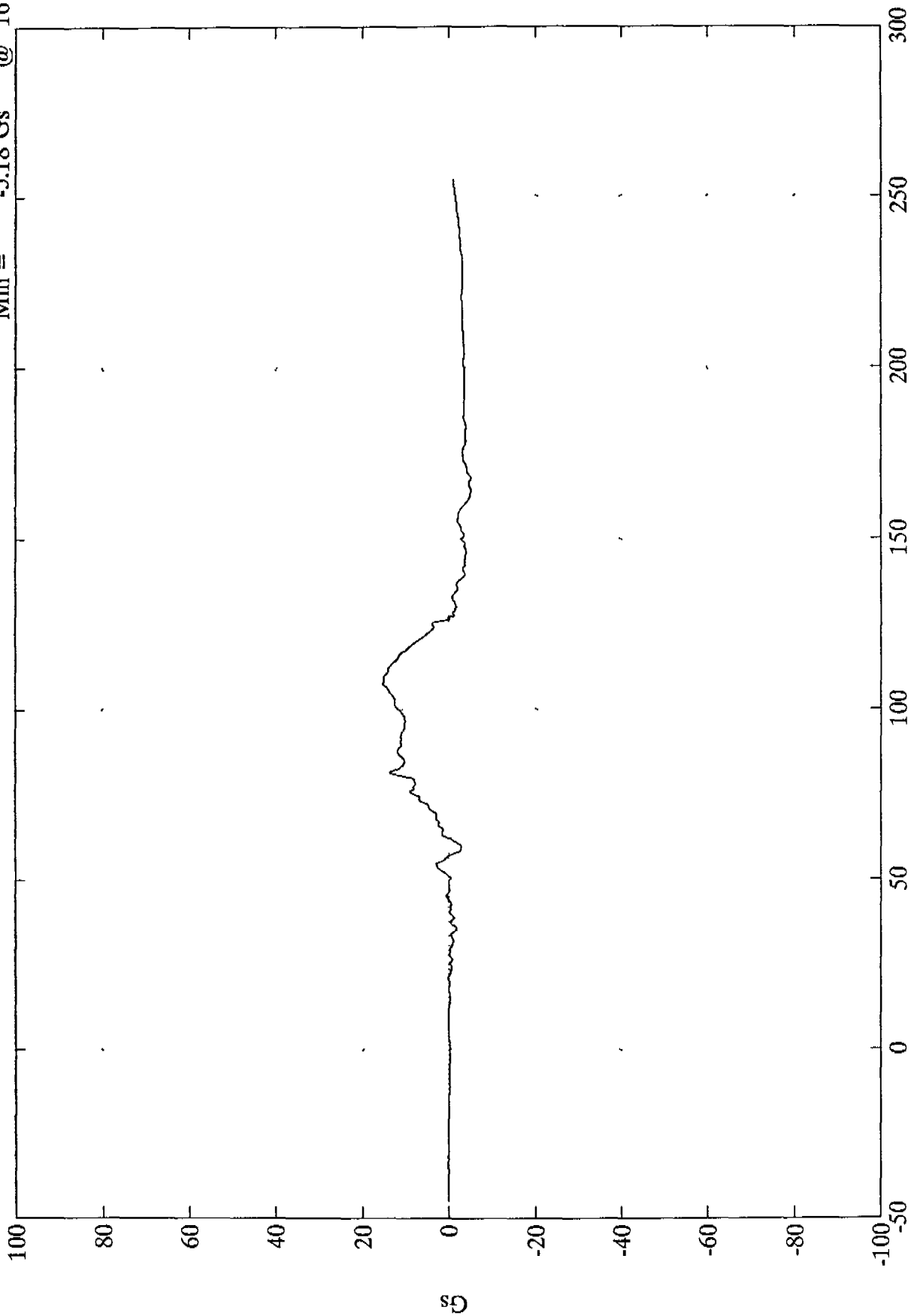
VTV TEST 9

Veh.1-Pos.1 Chest X
Max = 15.03 Gs @ 110.27 msec
Min = -57.10 Gs @ 64.31 msec



Veh.1-Pos.1 Chest Y

Max = 15.25 Gs @ 107.27 msec
Min = -5.18 Gs @ 167.88 msec



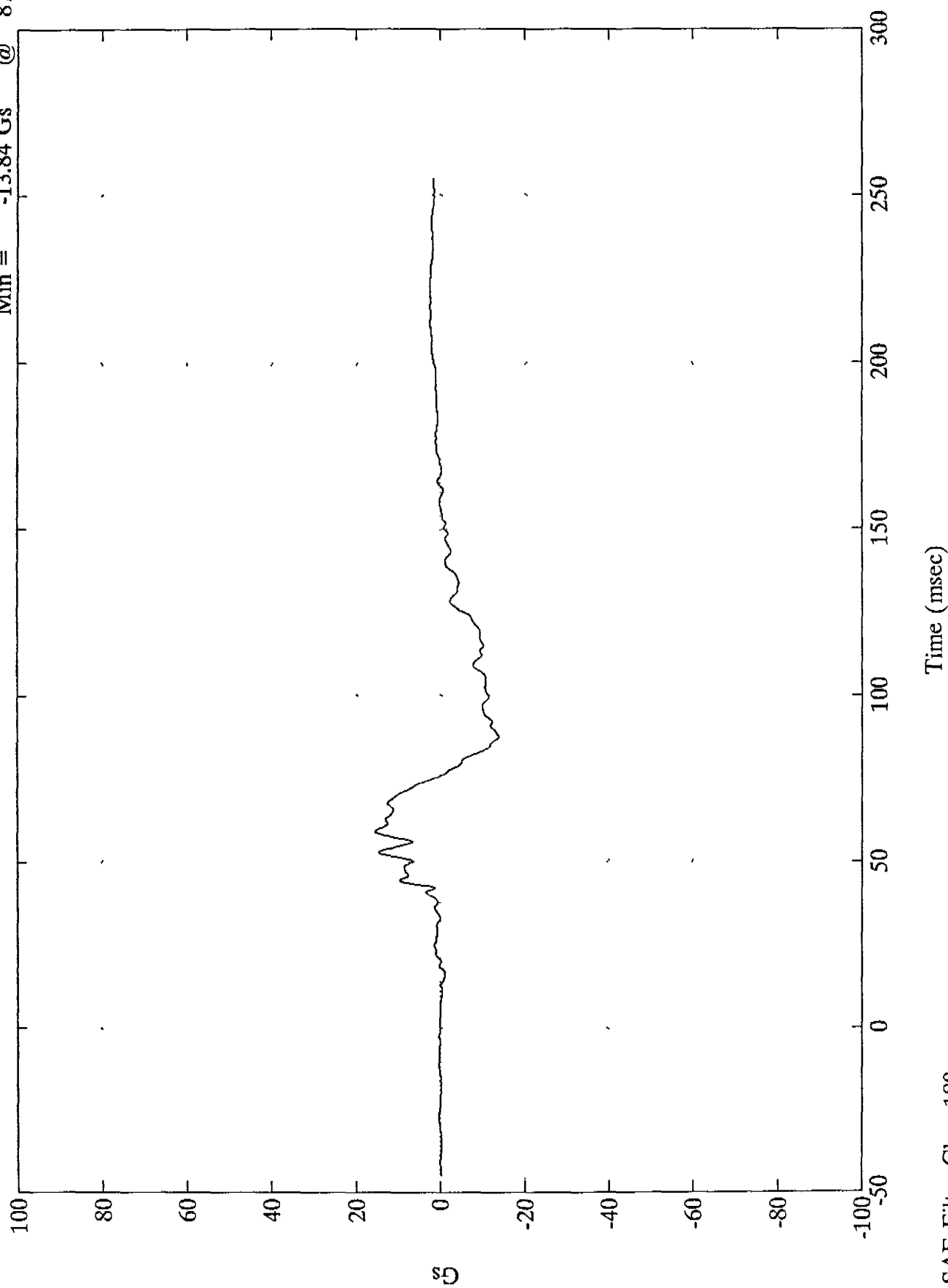
Time (msec)

SAE Filter Class 180

VTV TEST 9

Veh.1-Pos.1 Chest Z

Max = 15.52 Gs @ 59.27 msec
Min = -13.84 Gs @ 87.36 msec



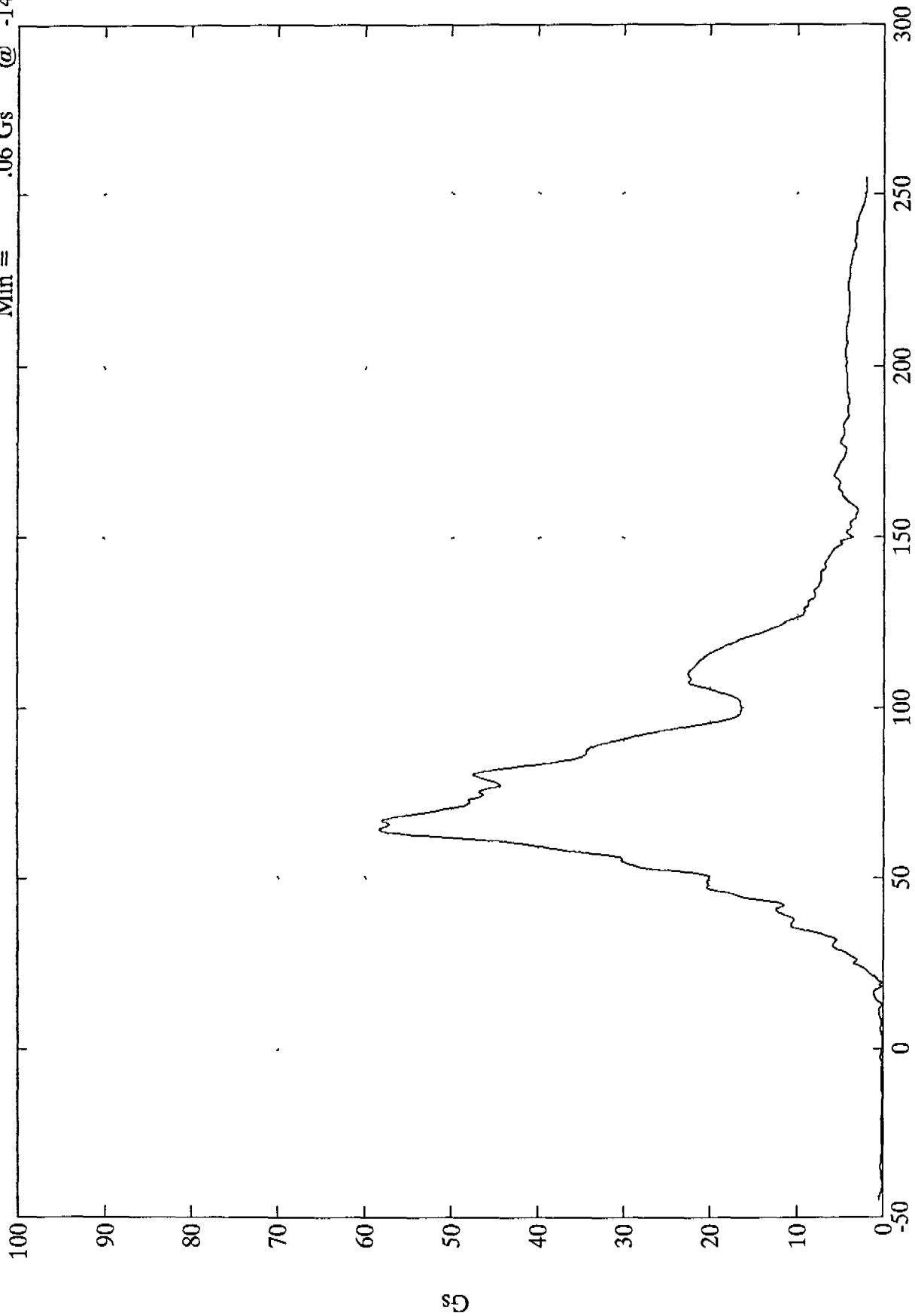
B-56

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SAE Filter Class 180

Veh.1-Pos.1 Chest Result.

Max = 58.30 Gs @ 64.31 msec
Min = .06 Gs @ -14.04 msec



Time (msec)

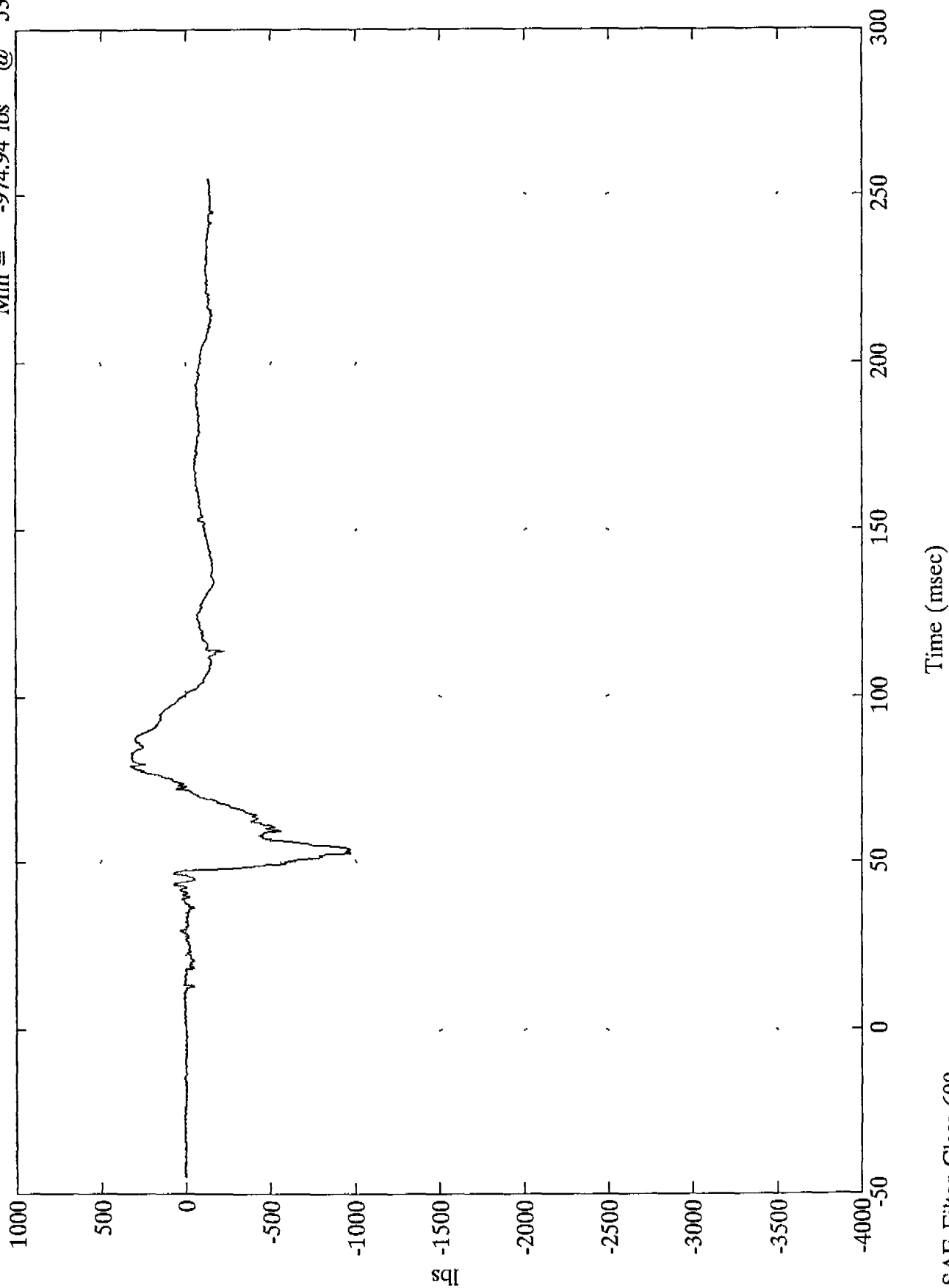
SAE Filter Class 180

Gs

VTV TEST 9

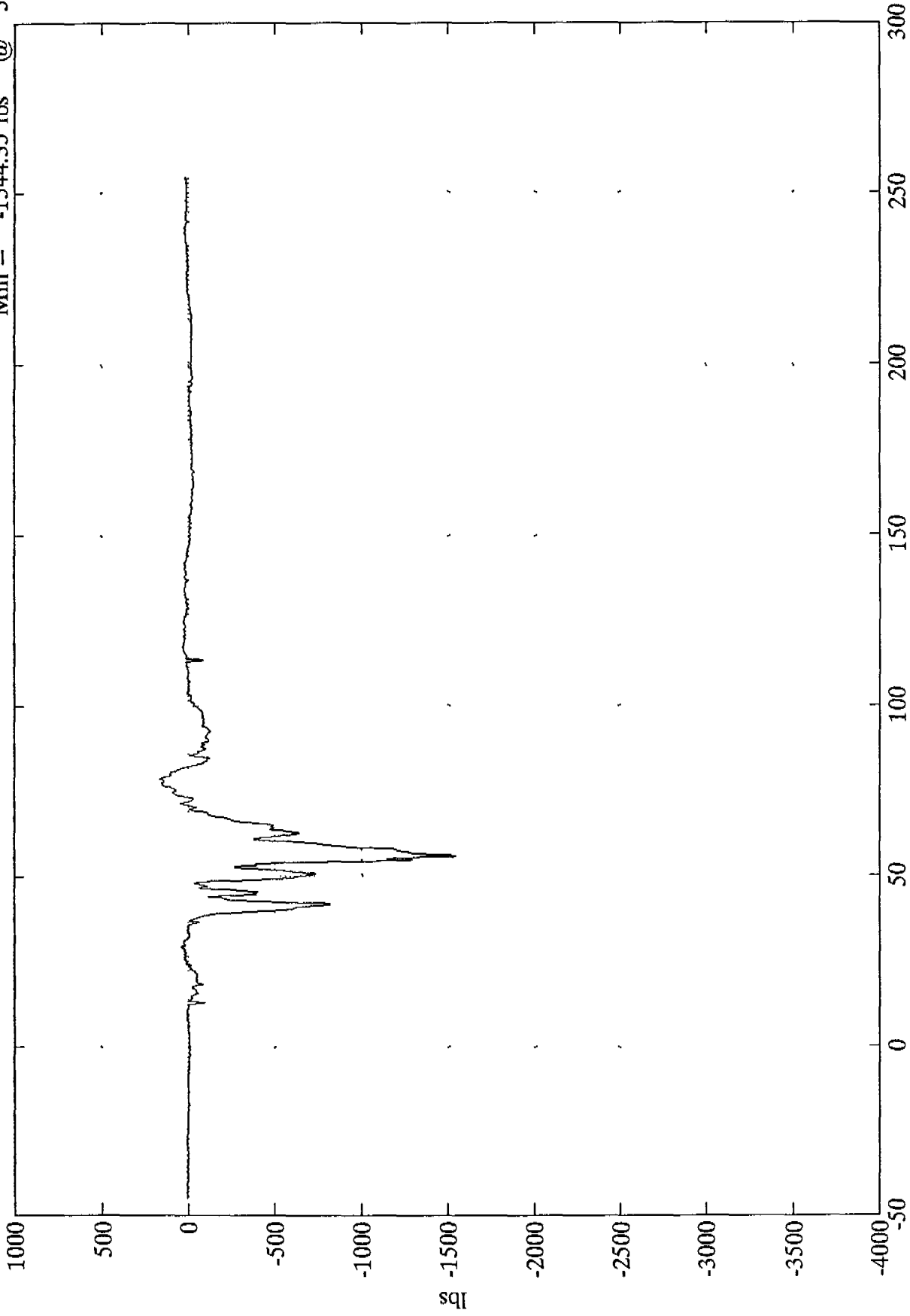
Veh.1-Pos.1 Left Femur

Max = 321.44 lbs @ 79.08 msec
Min = -974.94 lbs @ 53.63 msec



Veh.1-Pos.1 Right Femur

Max = 161.45 lbs @ 78.48 msec
Min = -1544.35 lbs @ 55.92 msec



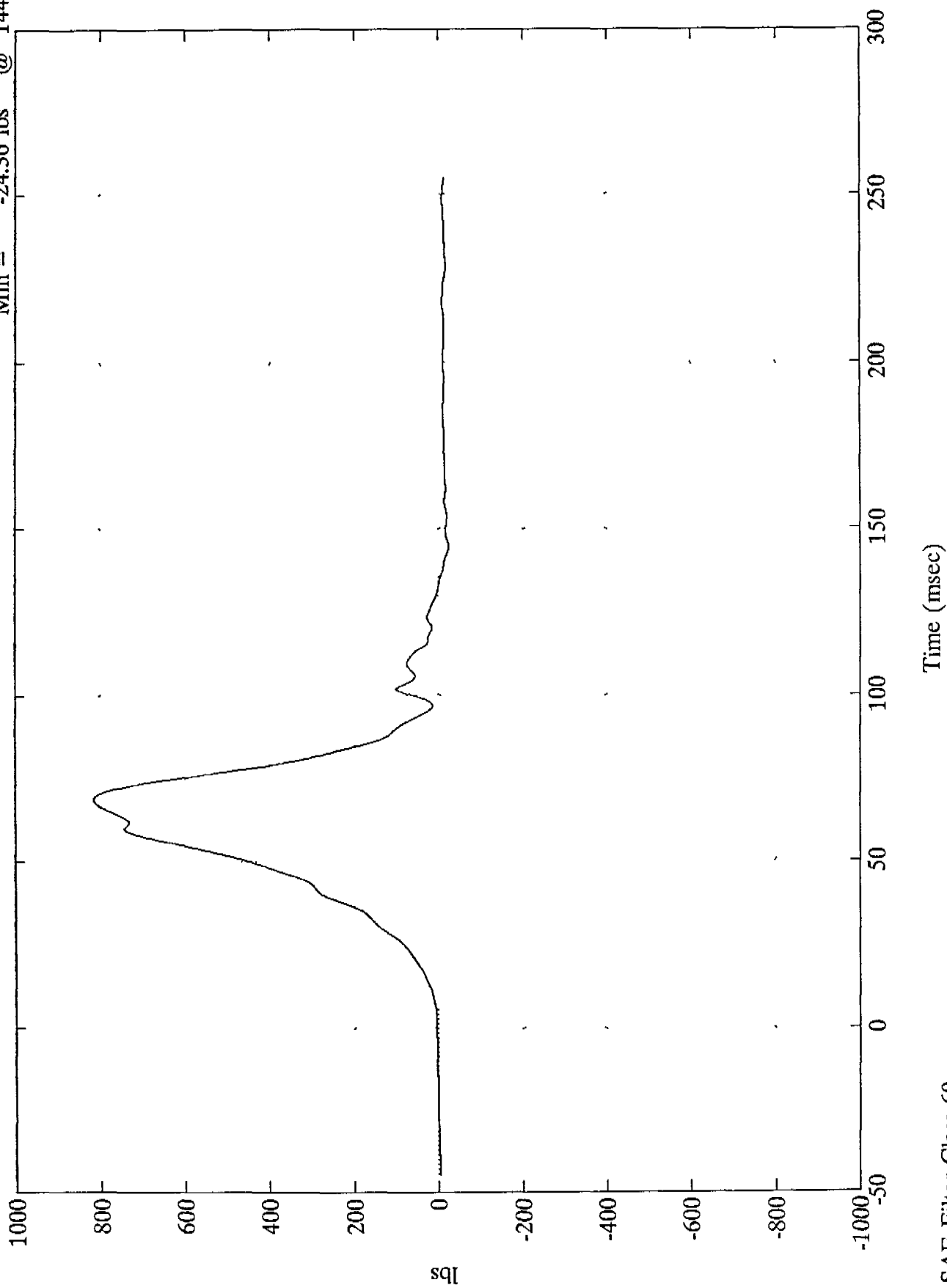
Time (msec)

SAE Filter Class 600

VTV TEST 9

Veh. 1 Torso Belt L.C.

Max = 814.28 lbs @ 68.63 msec
Min = -24.36 lbs @ 144.48 msec



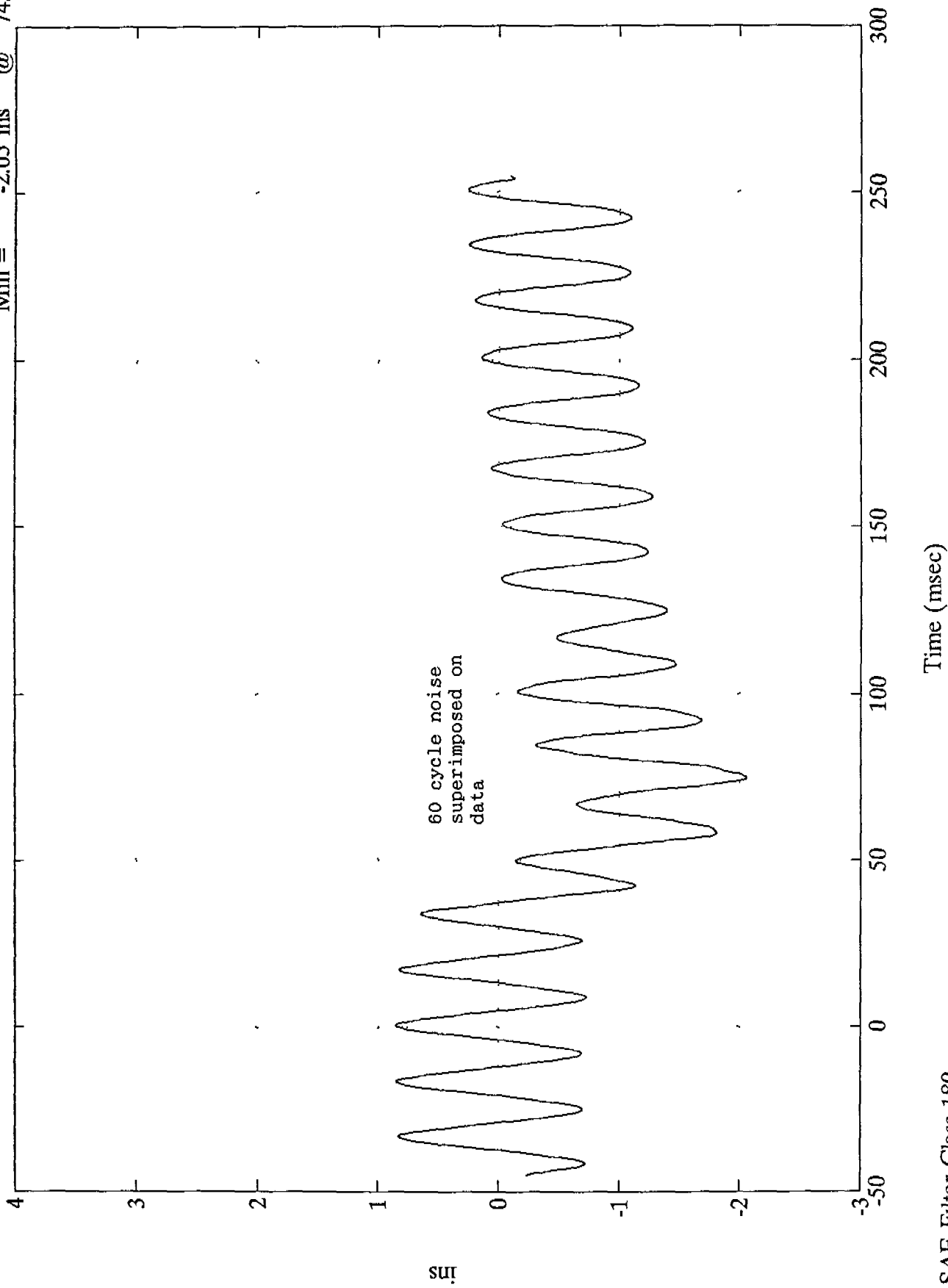
sq[lbs
B-60

7942-10

SAE Filter Class 60

Veh.1-Pos.1 Chest Displ.

Max = .85 ins @ 0.35 msec
Min = -2.05 ins @ 74.76 msec



SAE Filter Class 180

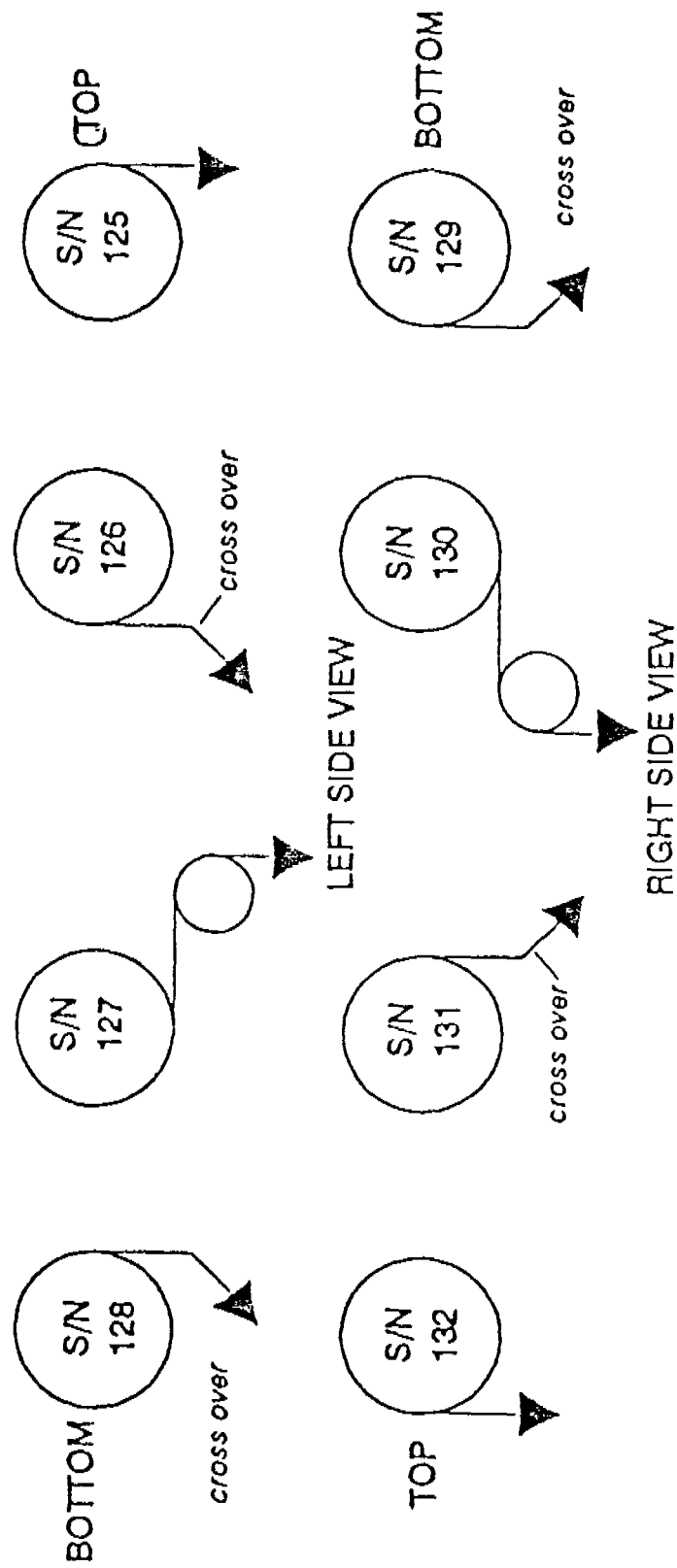
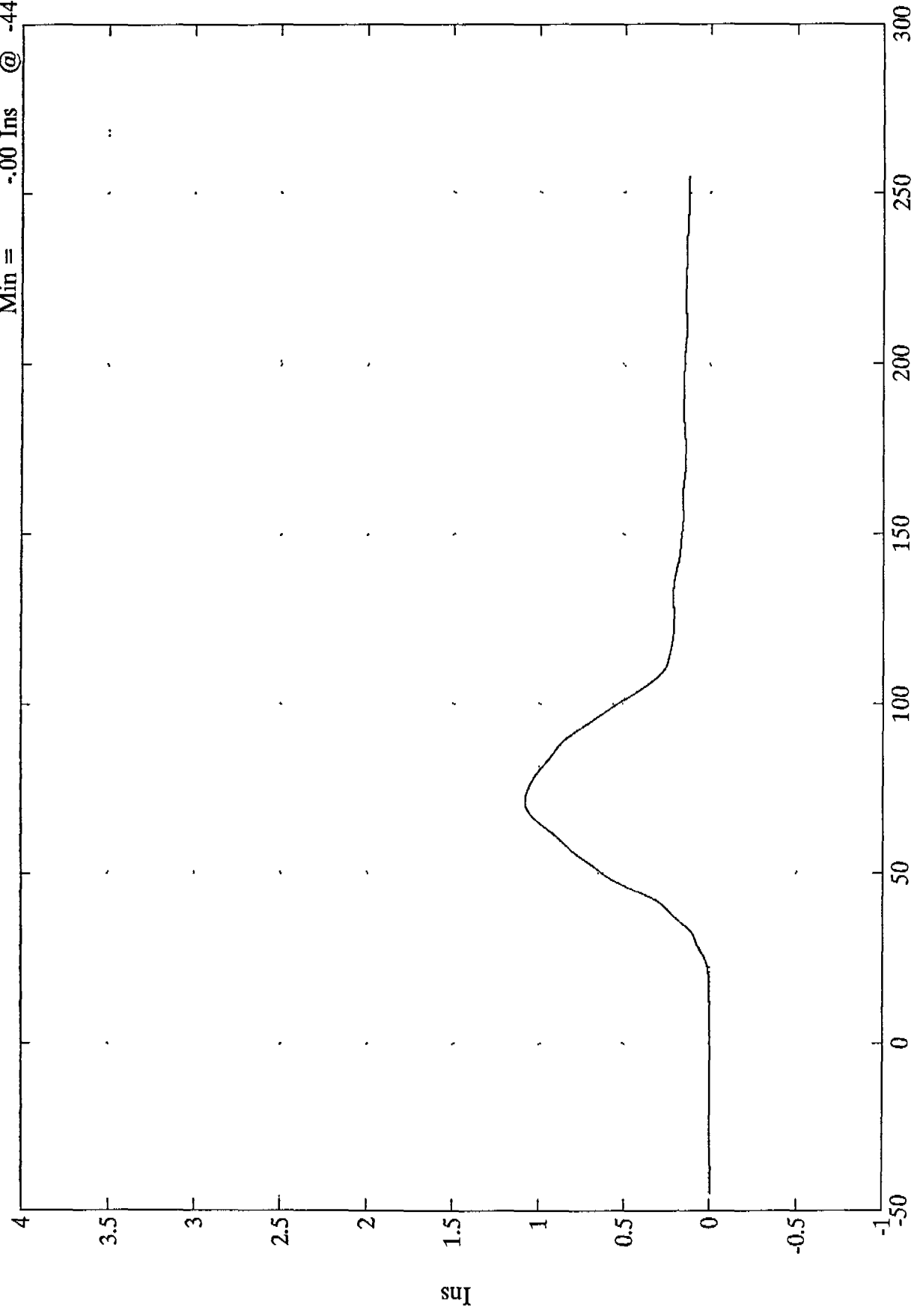


Figure 15 CHEST POTENTIOMETER CONFIGURATION

Veh. 1 Chest Disp. 125

Max = 1.08 Ins @ 71.27 msec
Min = -.00 Ins @ -44.40 msec



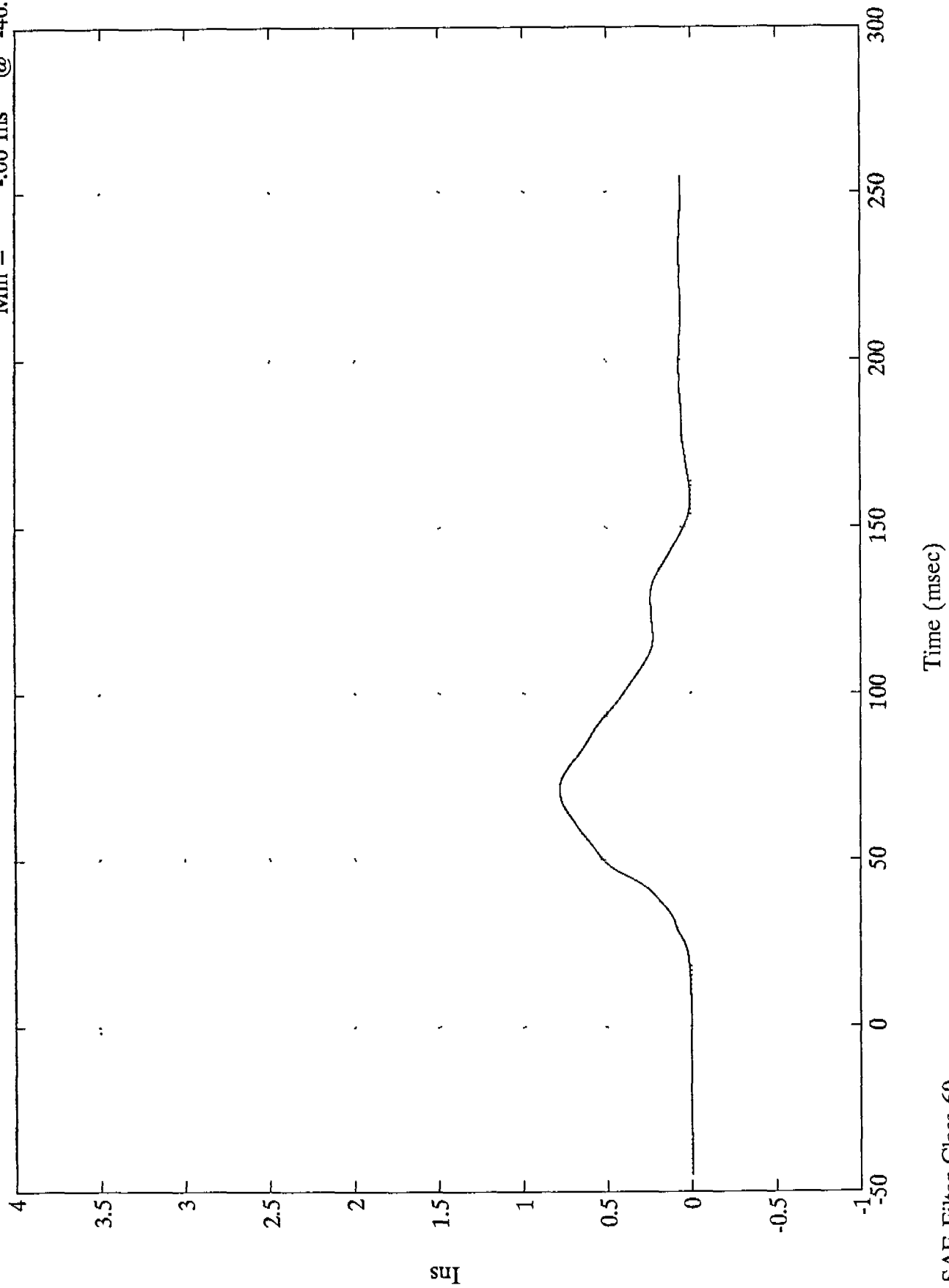
Time (msec)

SAE Filter Class 60

VTV TEST 9

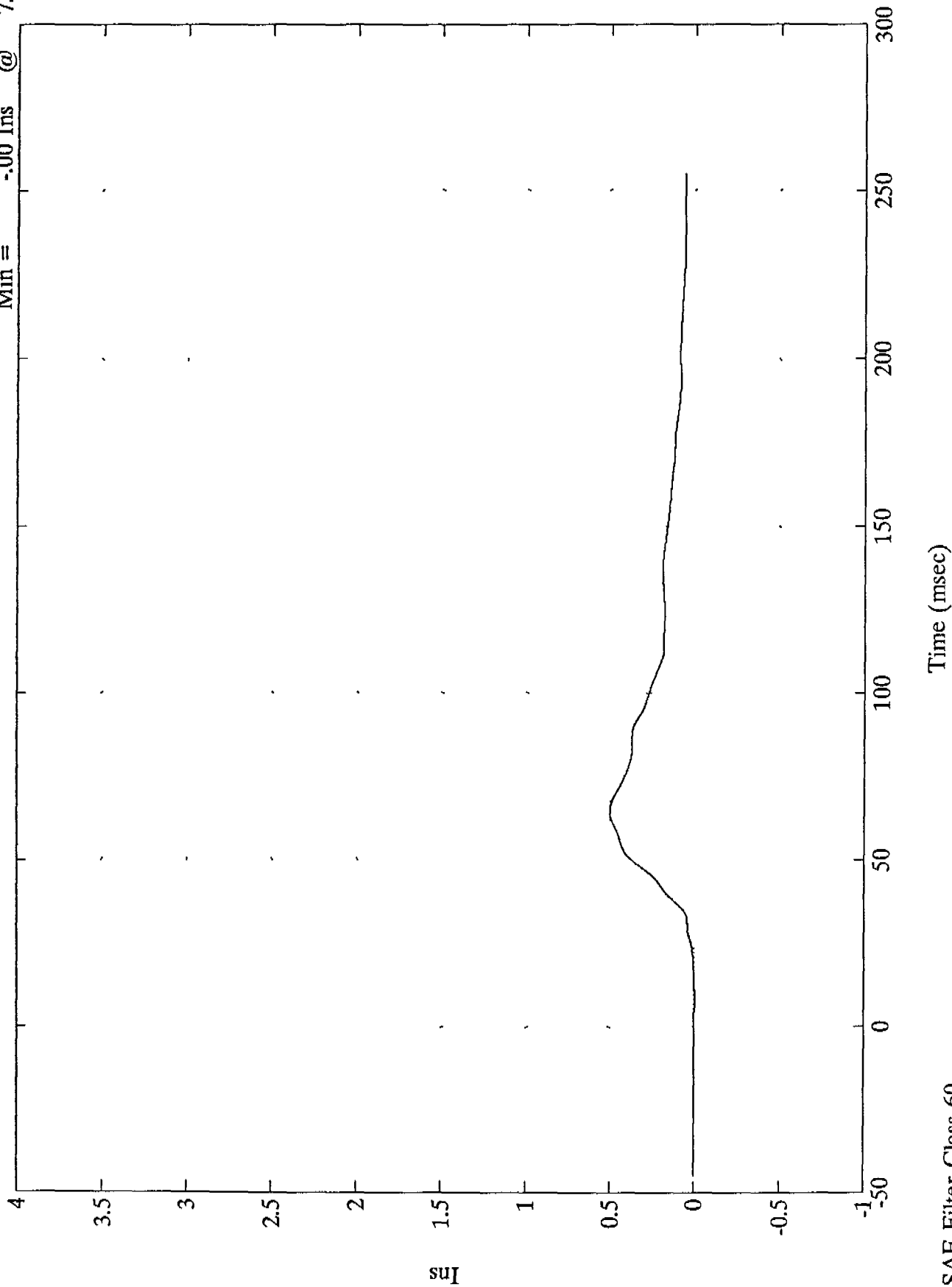
Veh. 1 Chest Disp. 126

Max = .78 Ins @ 71.16 msec
Min = -.00 Ins @ -40.31 msec



Veh. 1 Chest Disp. 127

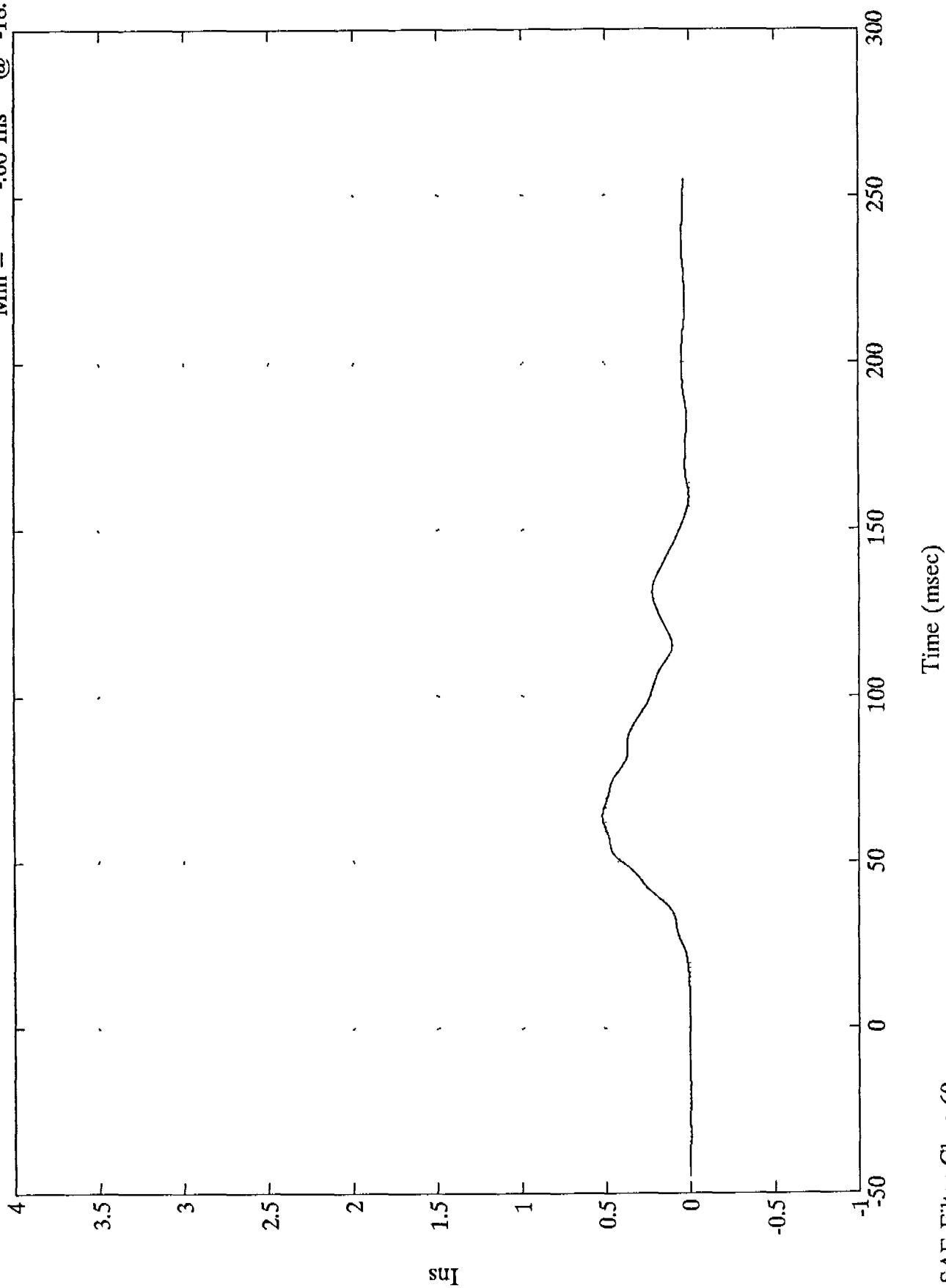
Max = .50 Ins @ 64.56 msec
Min = -.00 Ins @ 7.43 msec



VTV TEST 9

Veh. 1 Chest Disp 128

Max = .52 Ins @ 63.72 msec
Min = -.00 Ins @ -18.72 msec



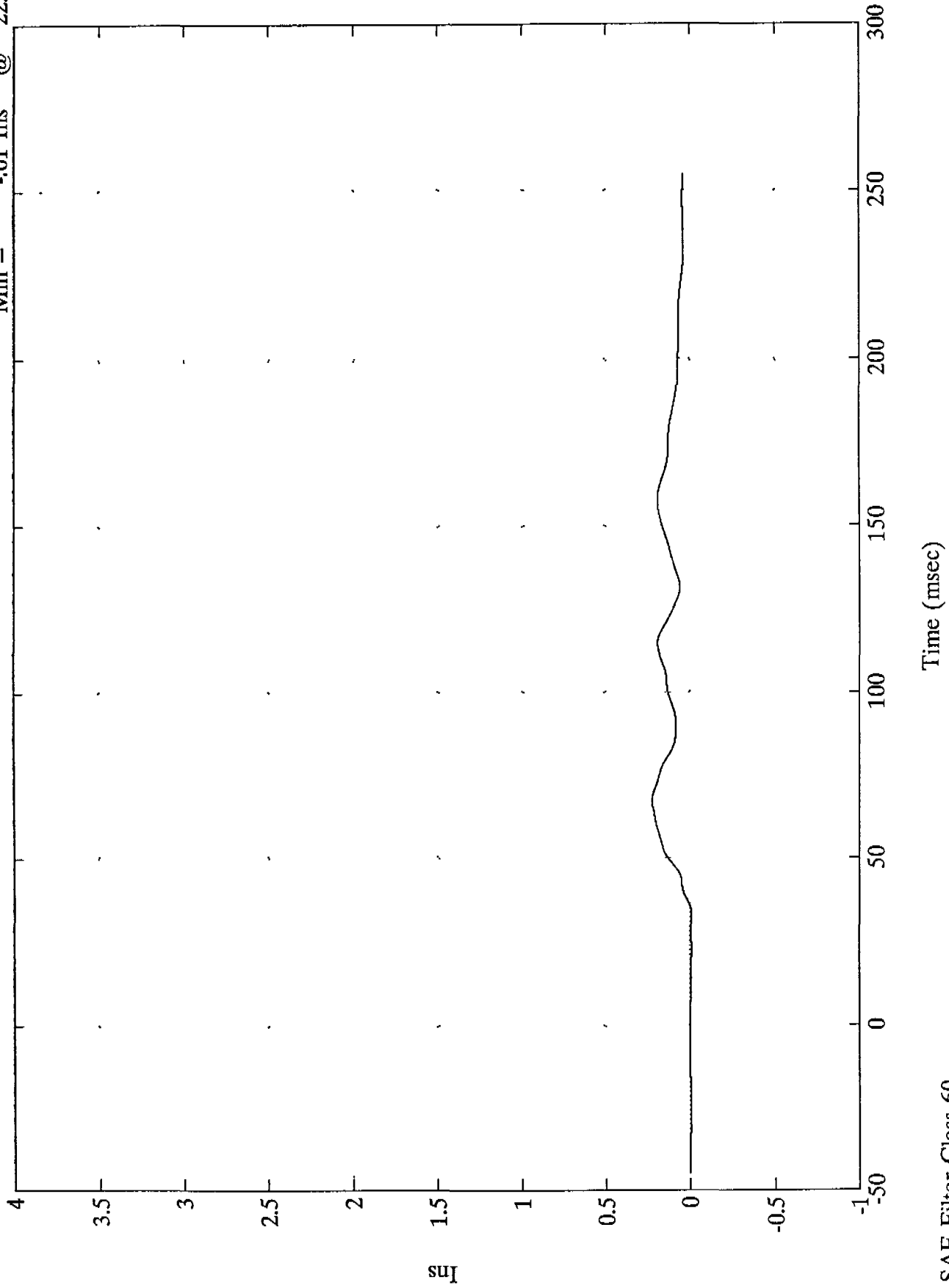
Ins
B-66

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SAE Filter Class 60

Veh. 1 Chest Disp 129

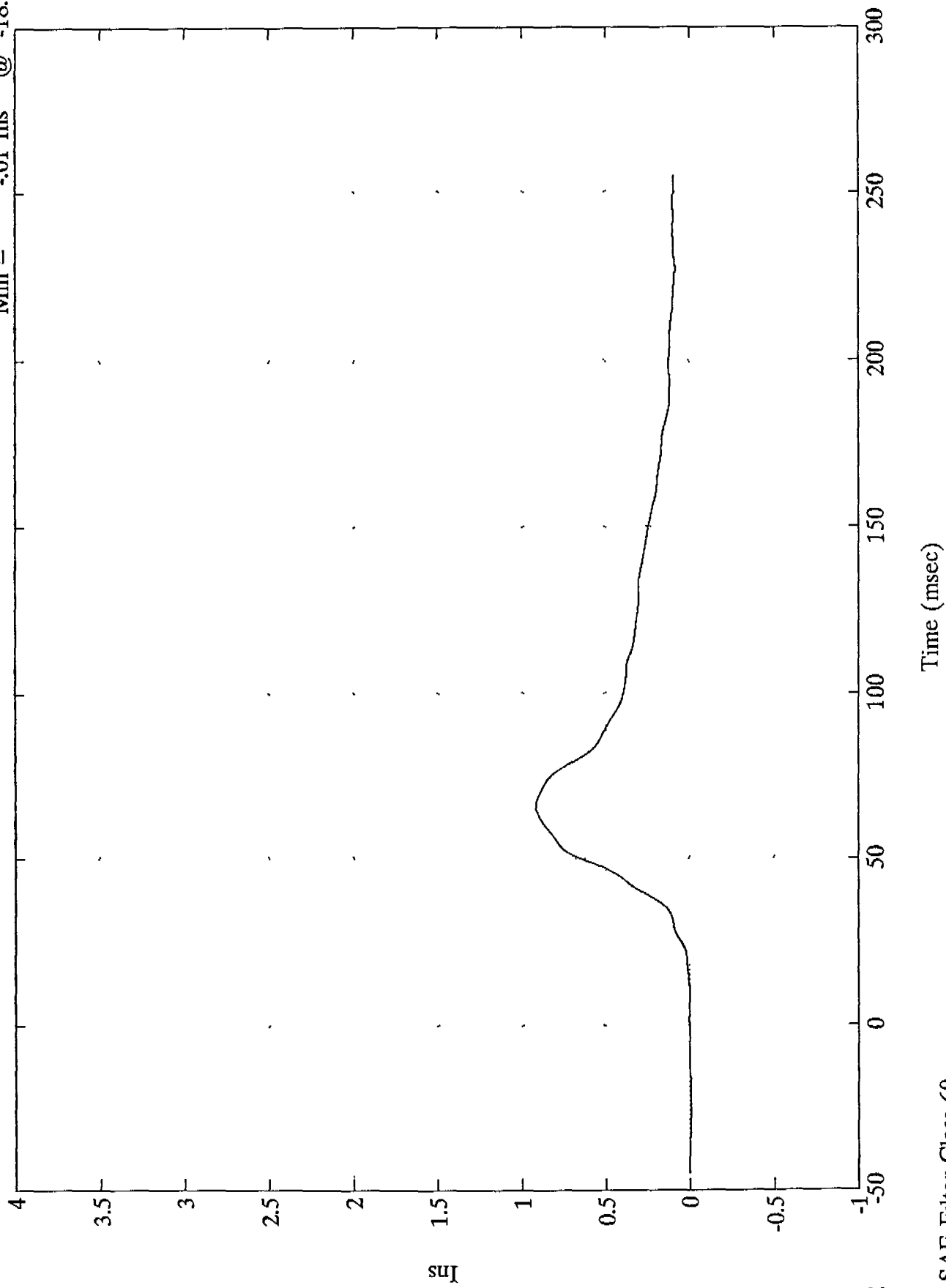
Max = .23 Ins @ 67.32 msec
 Min = -.01 Ins @ 22.68 msec



VTV TEST 9

Veh. 1 Chest Disp 130

Max = .92 Ins @ 66.00 msec
Min = -.01 Ins @ -18.60 msec

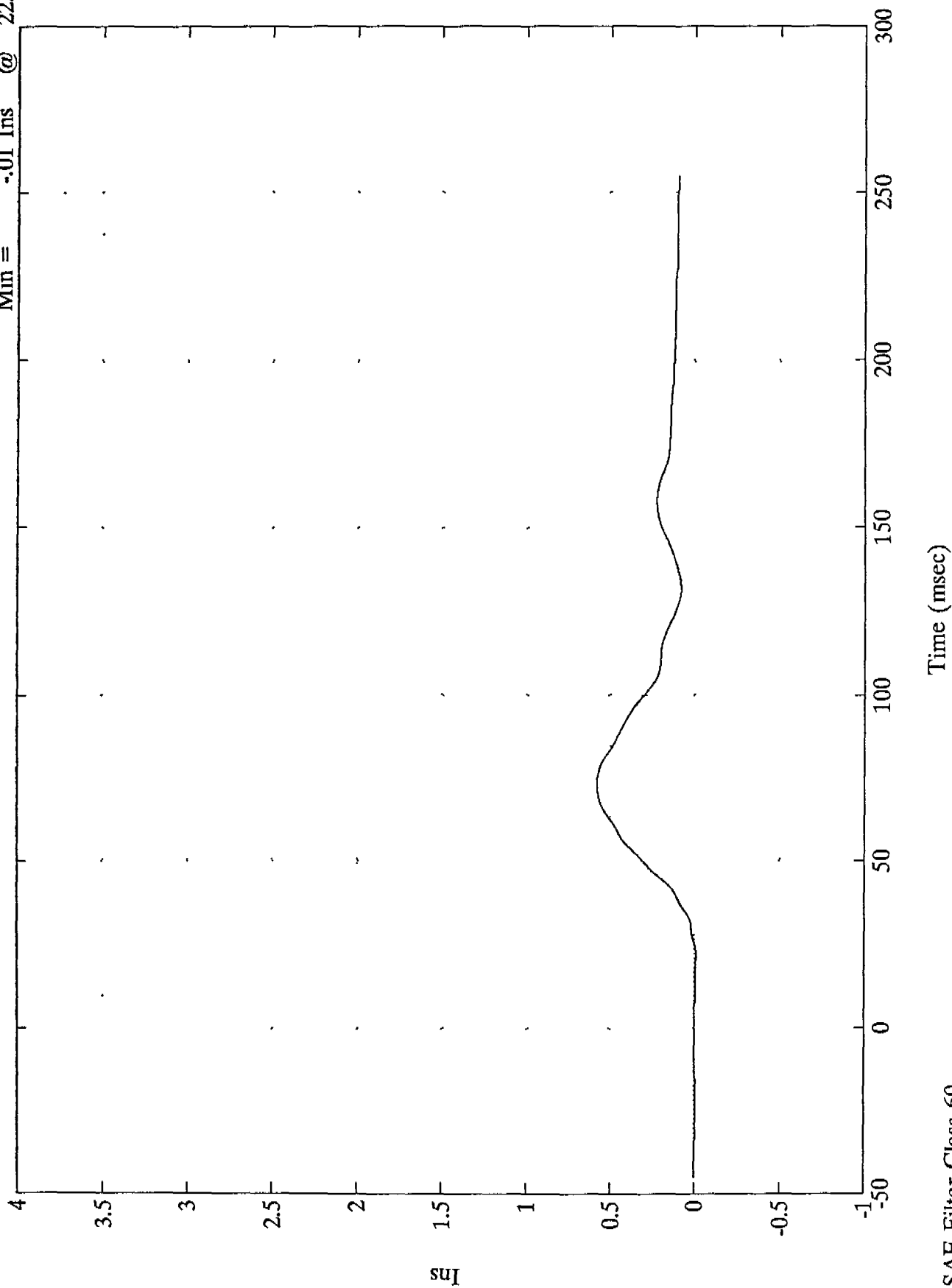


Ins
B-68

7942-10

SAE Filter Class 60

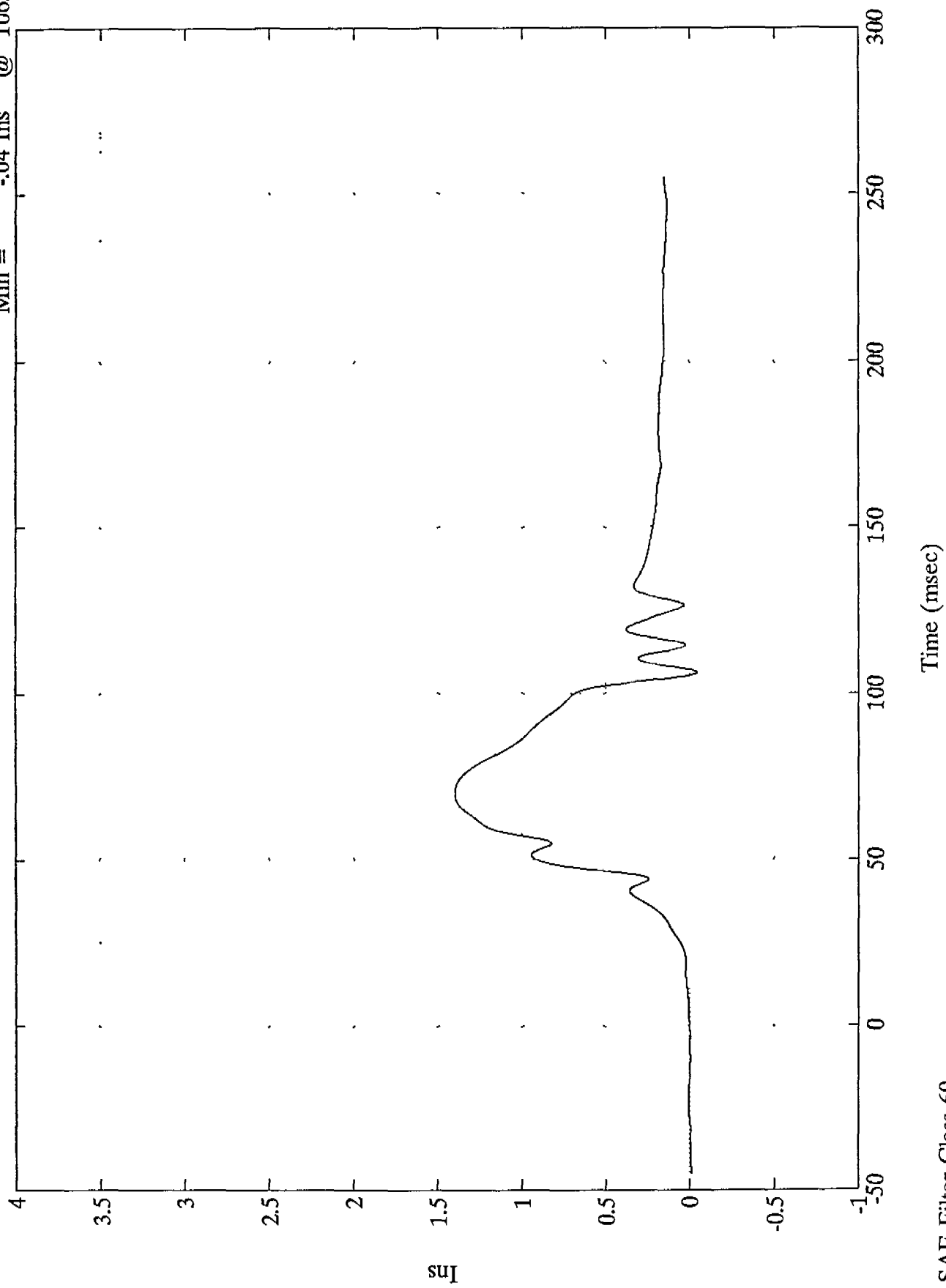
Veh. 1 Chest Disp 131 Max = .58 Ins @ 72.59 msec
 Min = -.01 Ins @ 22.07 msec



VTV TEST 9

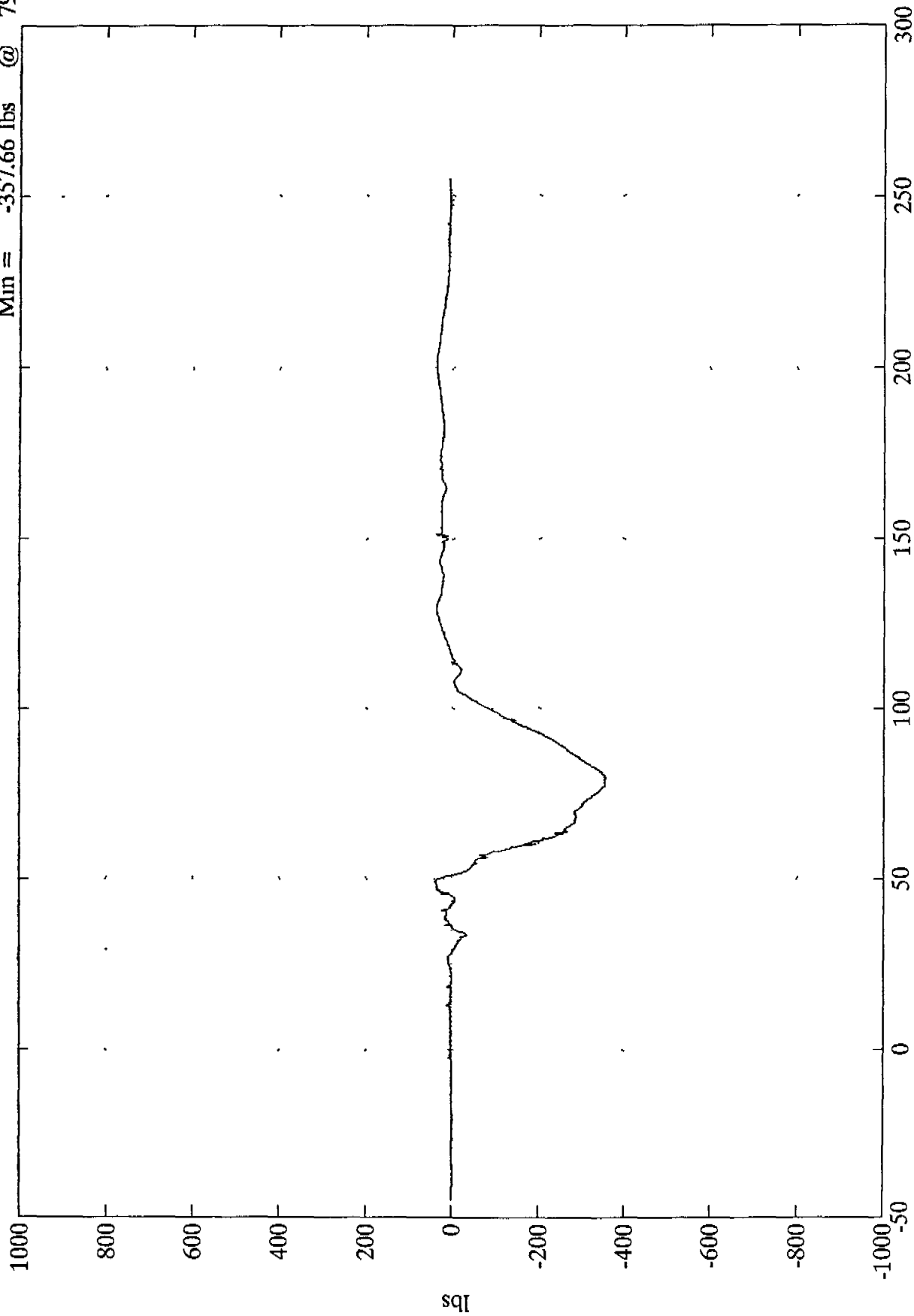
Veh. 1 Chest Disp 132

Max = 1.40 Ins @ 69.59 msec
Min = -.04 Ins @ 106.31 msec



Veh.1-Pos.1 Upper Neck Fx

Max = 40.04 lbs @ 49.07 msec
 Min = -357.66 lbs @ 79.68 msec

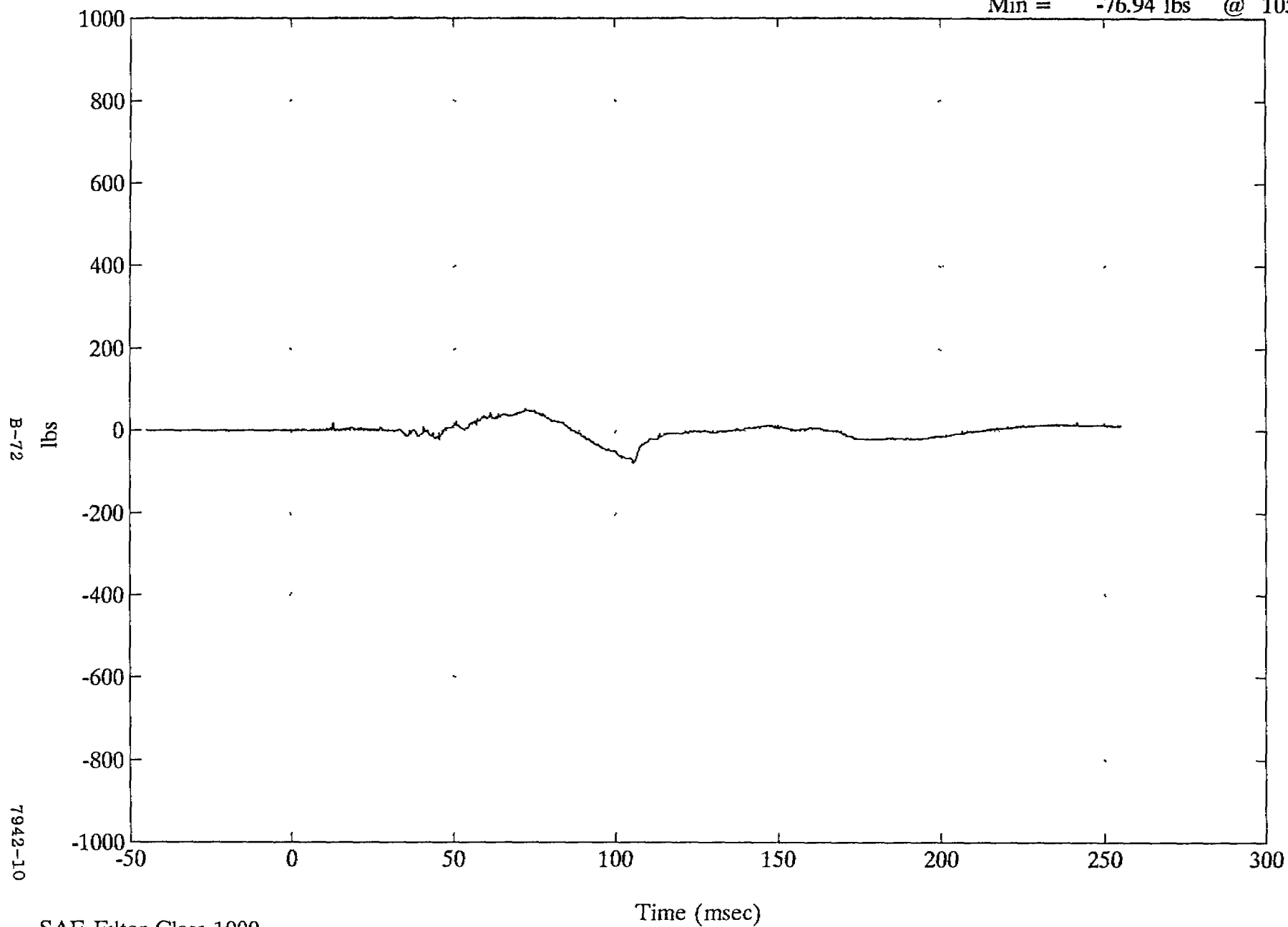


SAE Filter Class 1000

VTV TEST 9

Veh.1-Pos.1 Upper Neck Fy

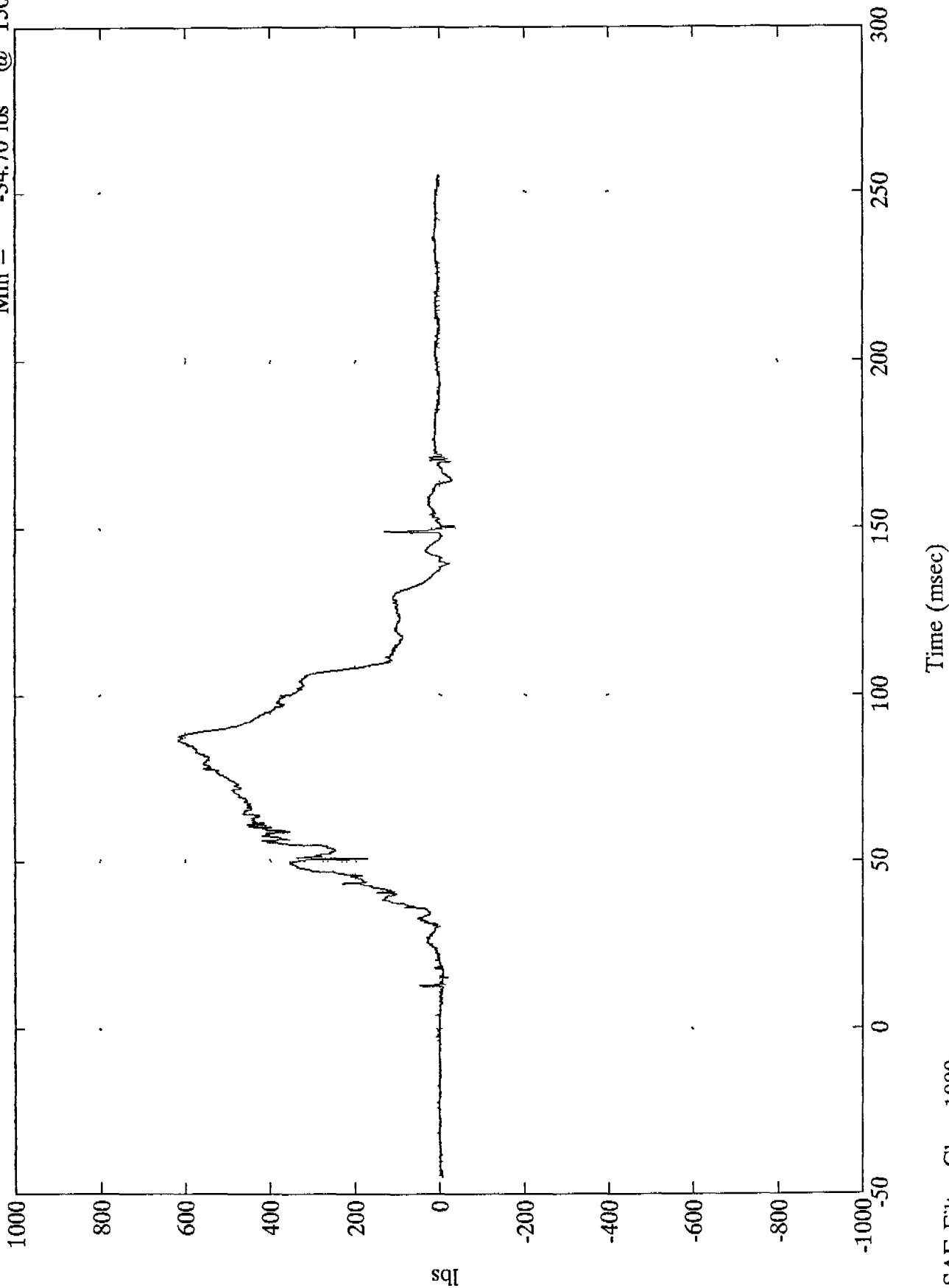
Max = 53.86 lbs @ 72.24 msec
Min = -76.94 lbs @ 105.59 msec



VTV TEST 9

Veh.1-Pos.1 Upper Neck Fz

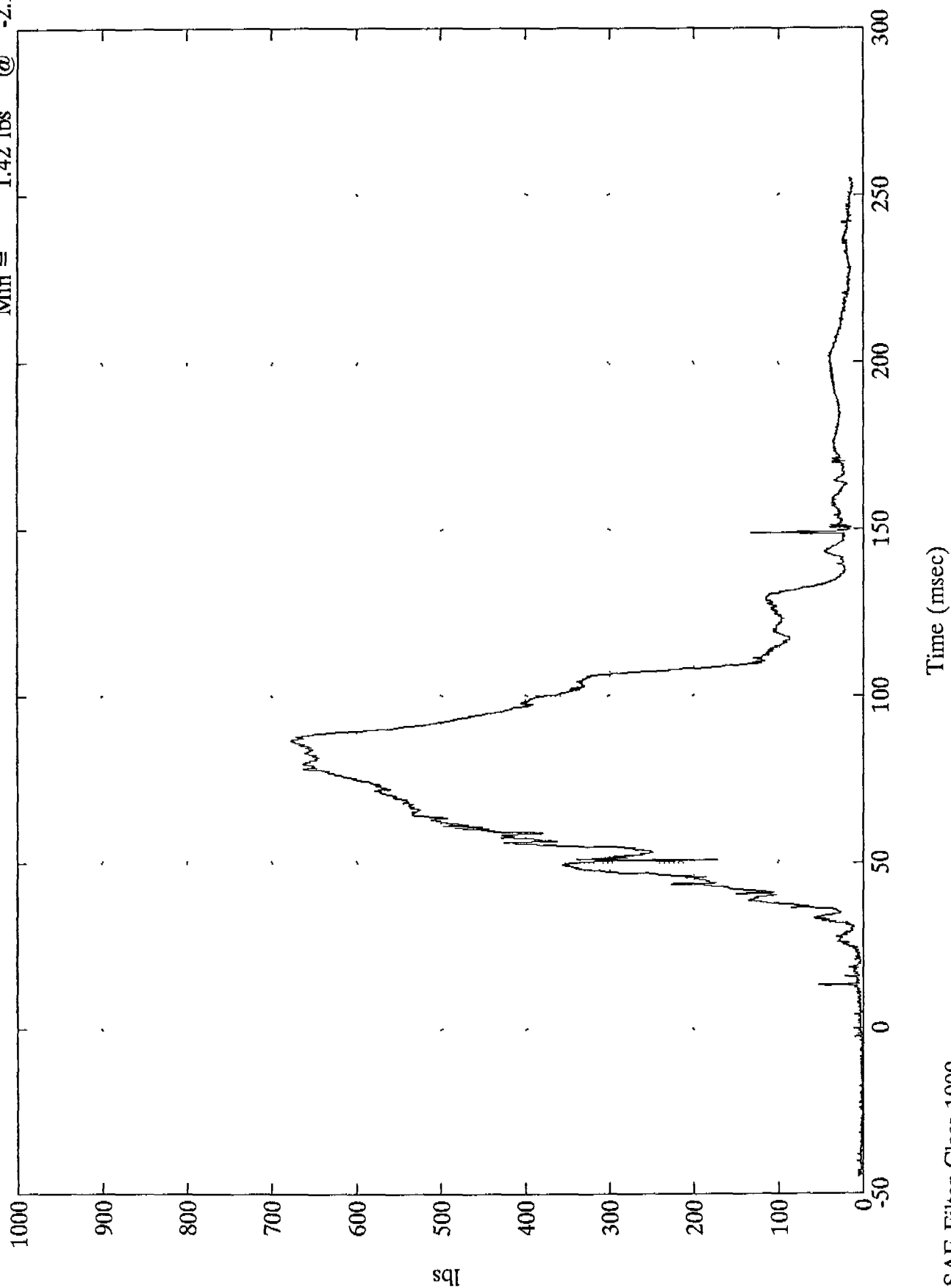
Max = 615.39 lbs @ 87.59 msec
Min = -34.70 lbs @ 150.47 msec



VTV TEST 9

Veh.1-Pos.1 Neck Force Re

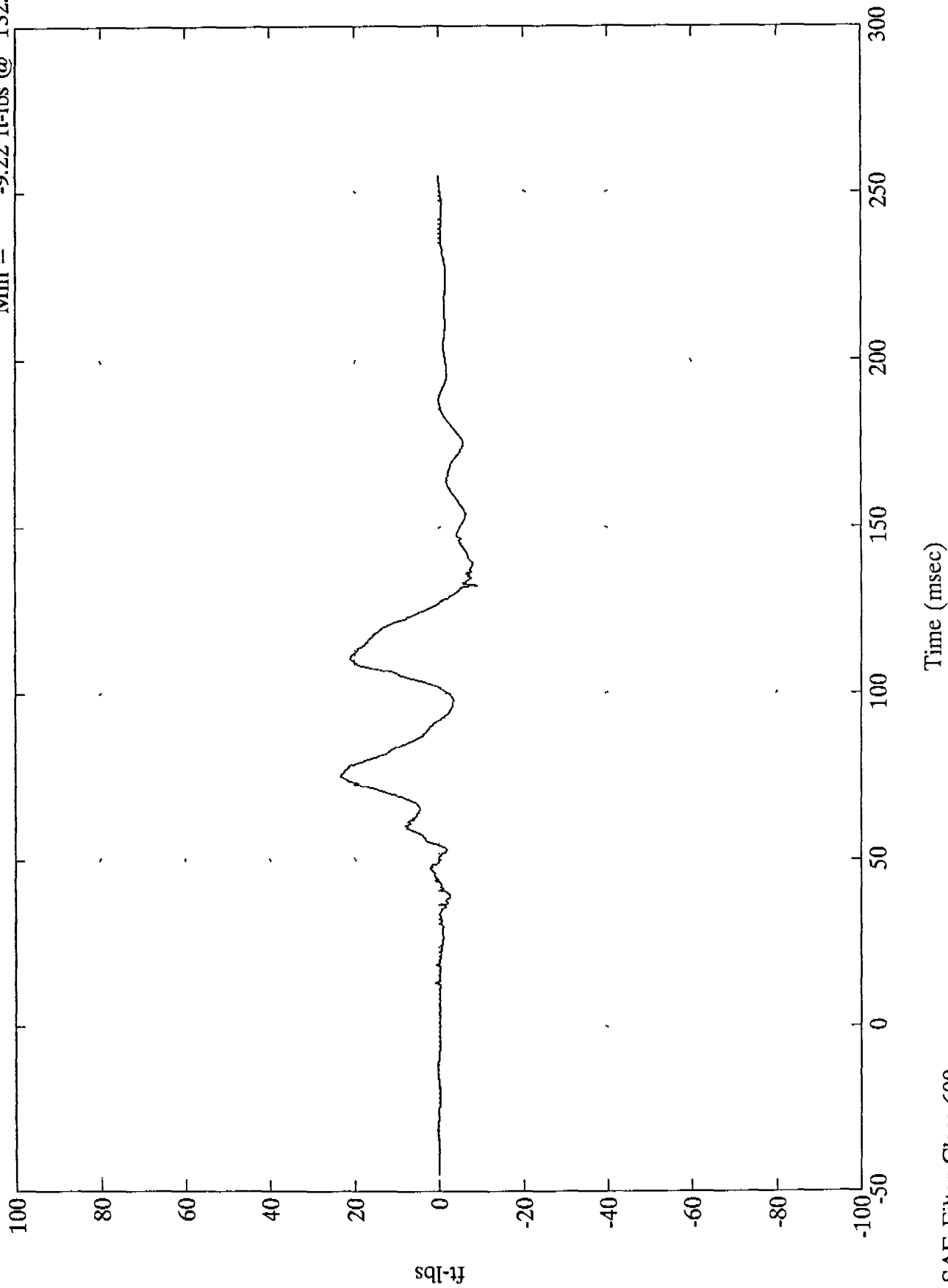
Max =	677.34 lbs	@	86.40 msec
Min =	1.42 lbs	@	-2.16 msec



VTV TEST 9

Veh.1-Pos.1 Upper Neck Mx

Max = 23.26 ft-lbs @ 75.12 msec
Min = -9.22 ft-lbs @ 132.60 msec



ft-lbs

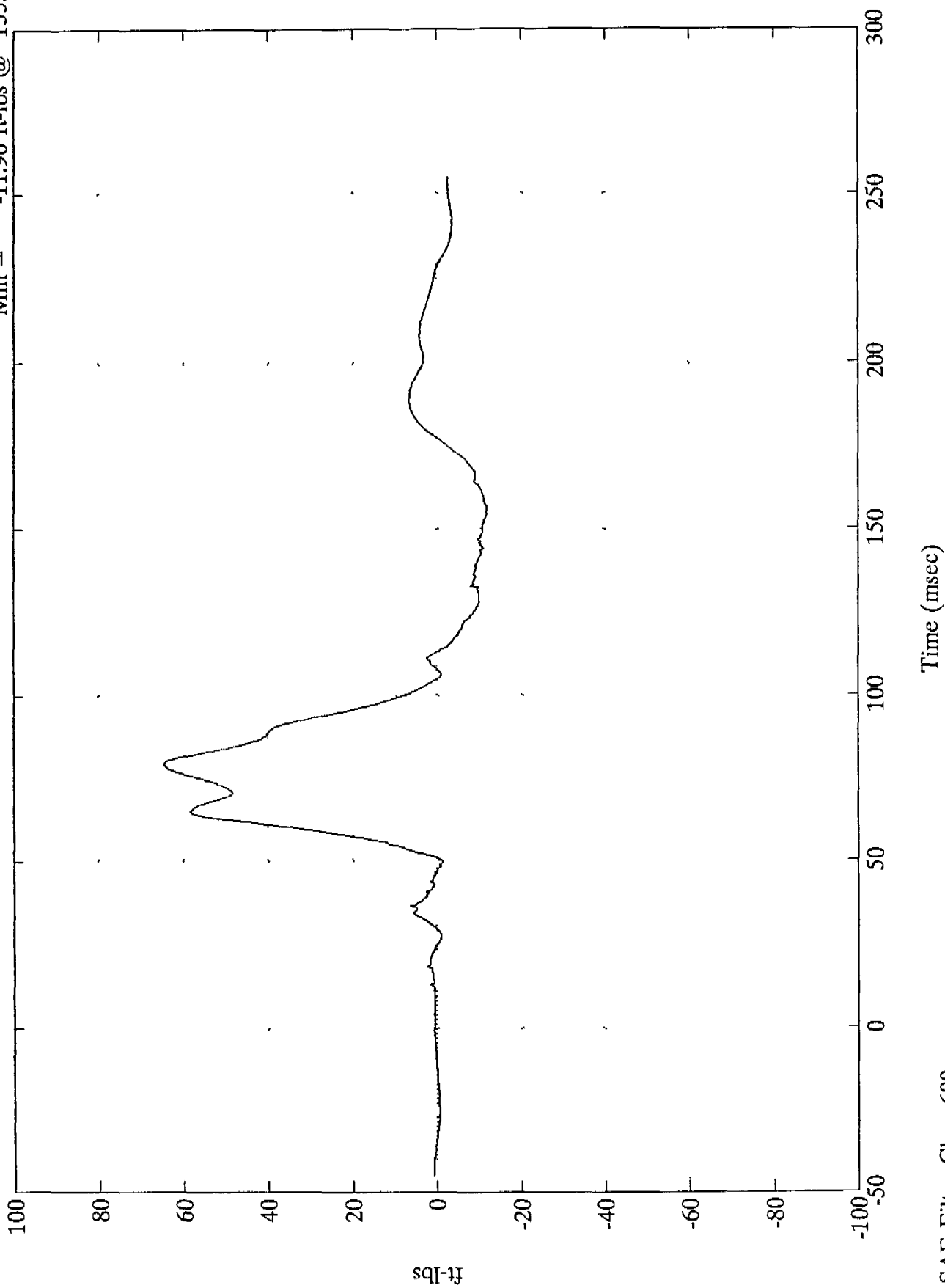
B-75

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SAE Filter Class 600

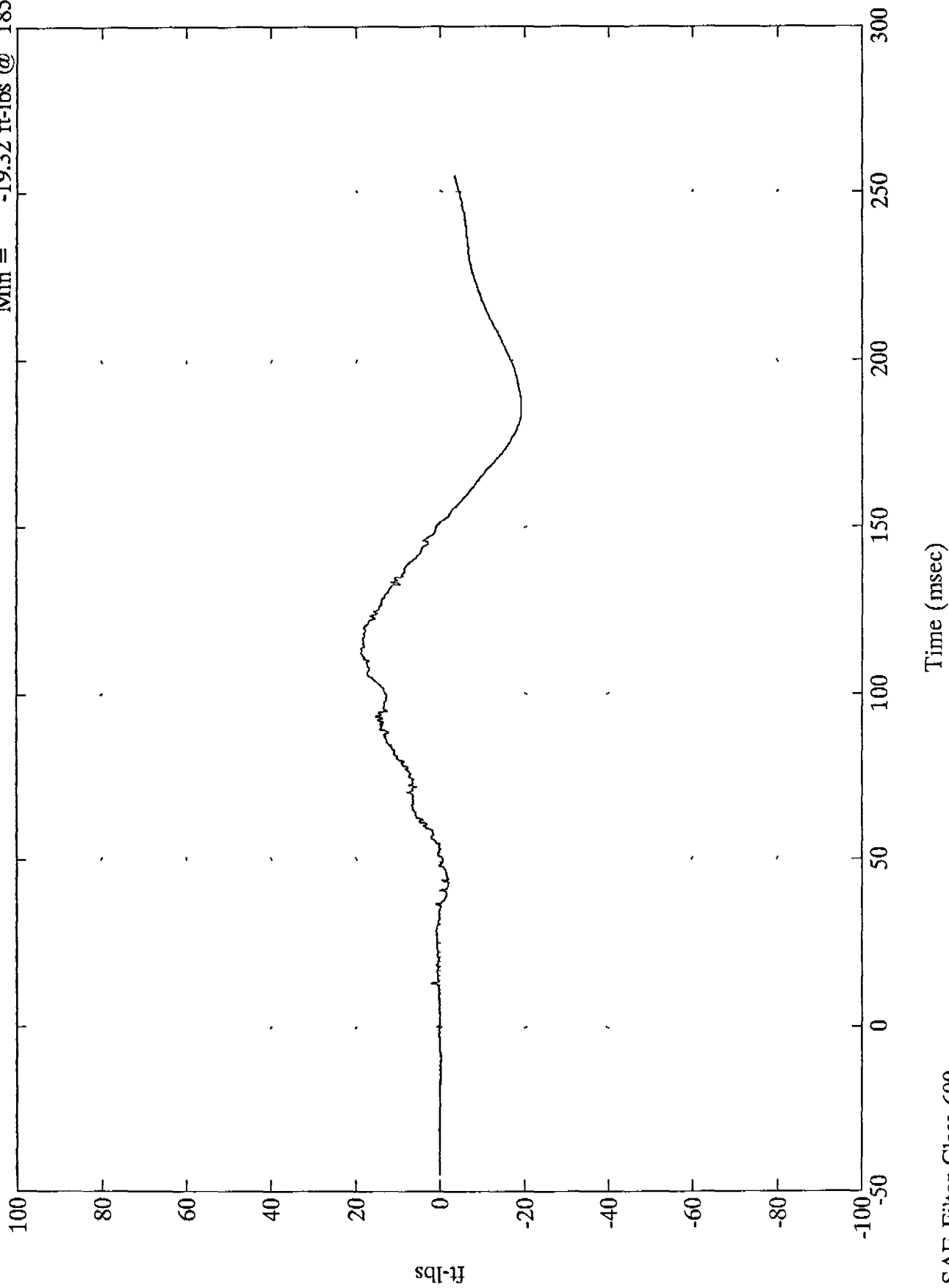
VTV TEST 9

Veh.1-Pos.1 Upper Neck My Max = 64.70 ft-lbs @ 79.31 msec
Min = -11.90 ft-lbs @ 155.40 msec



Veh.1-Pos.1 Upper Neck Mz

Max = 18.92 ft-lbs @ 113.52 msec
Min = -19.32 ft-lbs @ 185.16 msec



ft-lbs

B-77

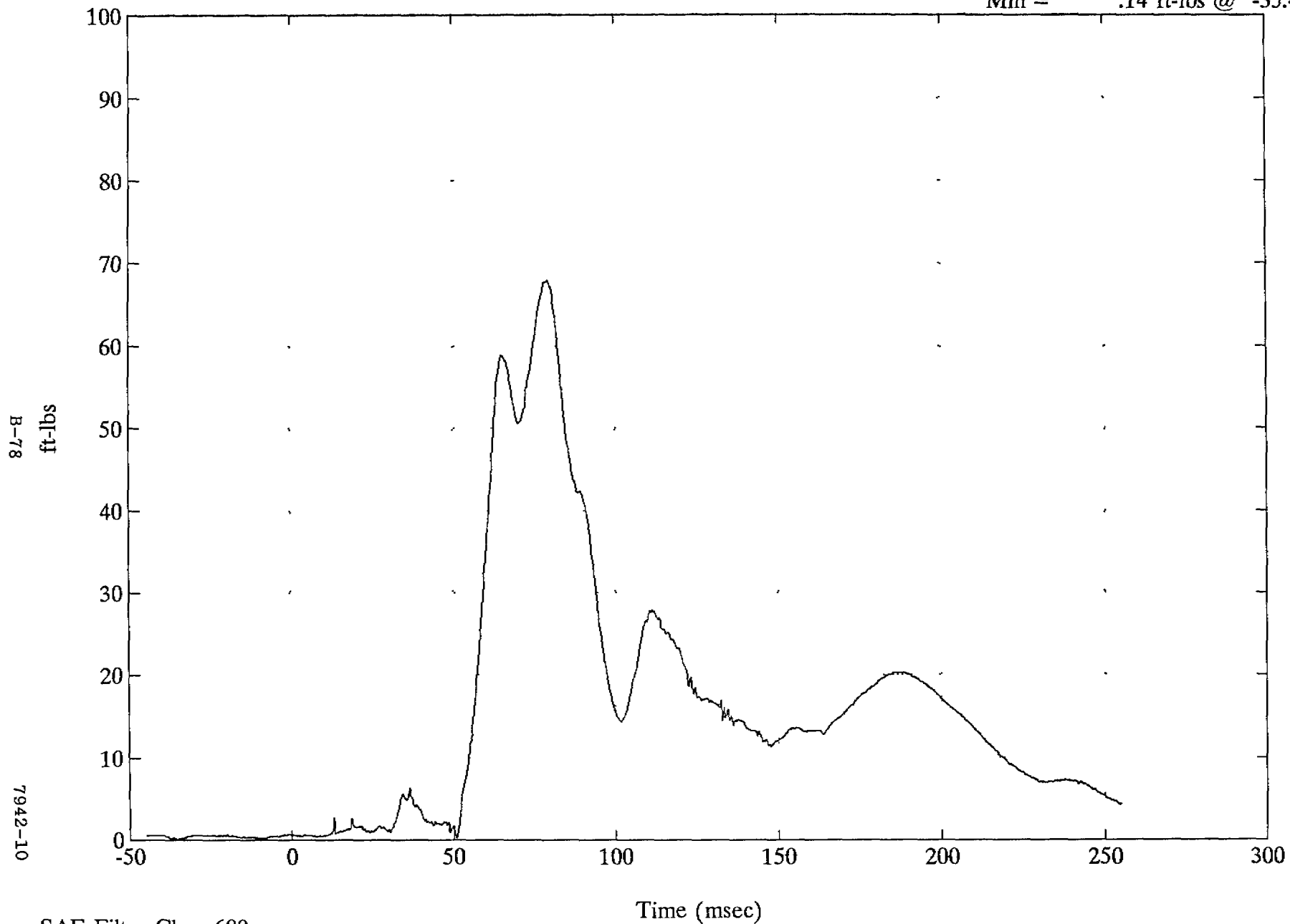
7942-10

SAE Filter Class 600

VTV TEST 9

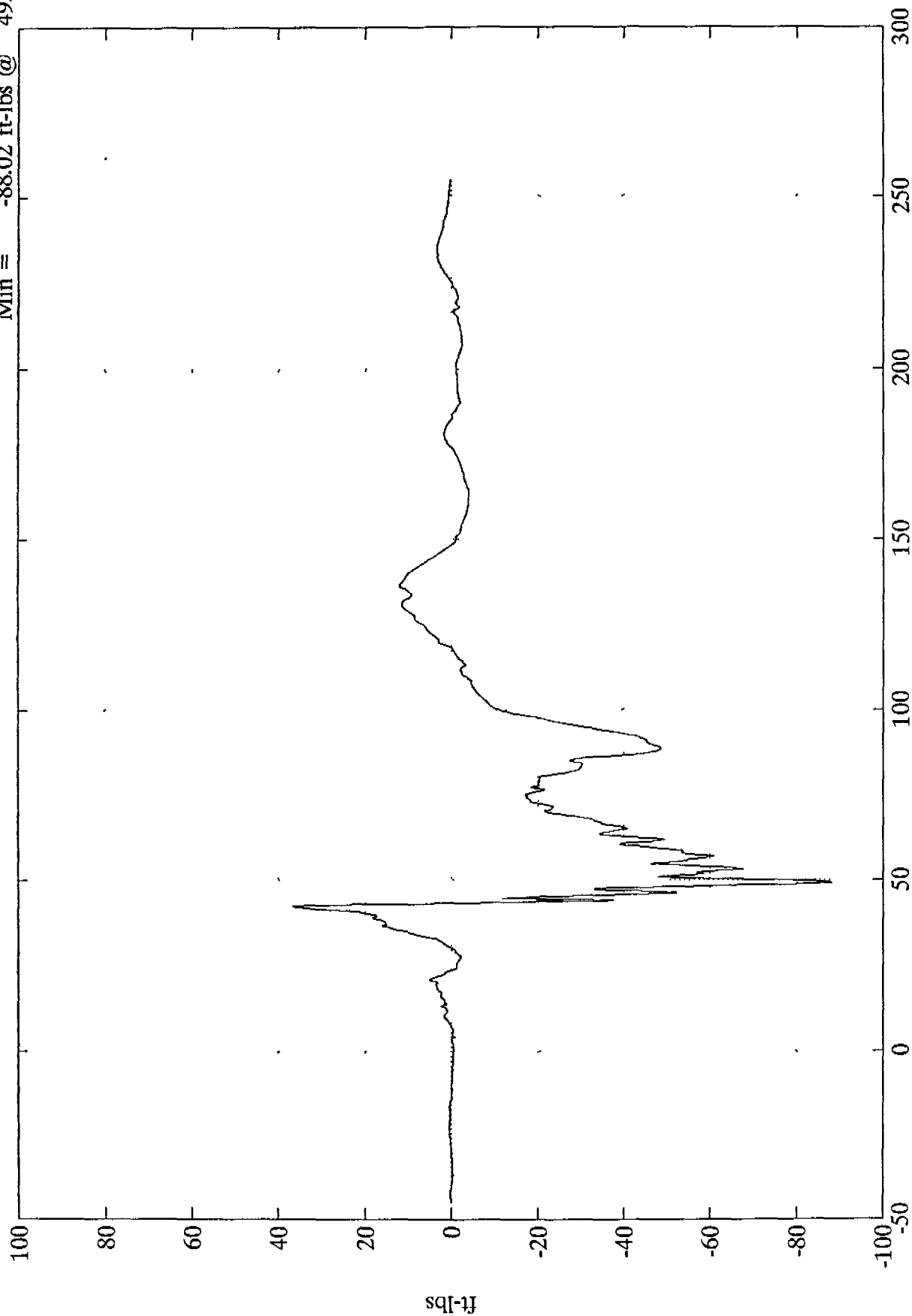
Veh.1-Pos.1 Neck Mom. Res

Max = 67.86 ft-lbs @ 79.19 msec
Min = .14 ft-lbs @ -35.40 msec



Veh.1-Pos.1 Lt U Tibia Mx

Max = 36.68 ft-lbs @ 42.36 msec
 Min = -88.02 ft-lbs @ 49.31 msec



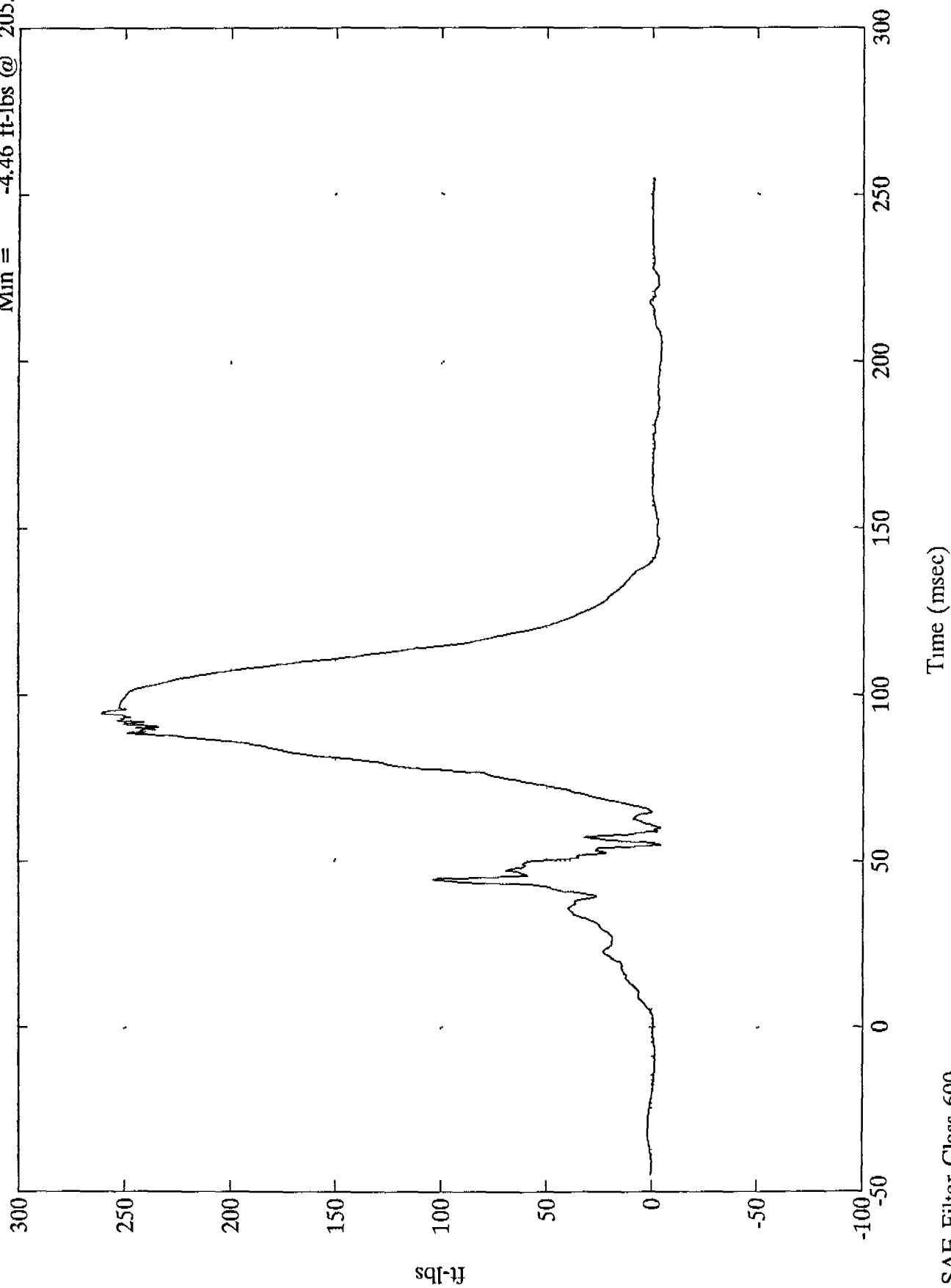
Time (msec)

SAE Filter Class 600

VTV TEST 9

Veh.1-Pos.1 Lt U Tibia My

Max = 260.60 ft-lbs @ 94.31 msec
Min = -4.46 ft-lbs @ 205.55 msec



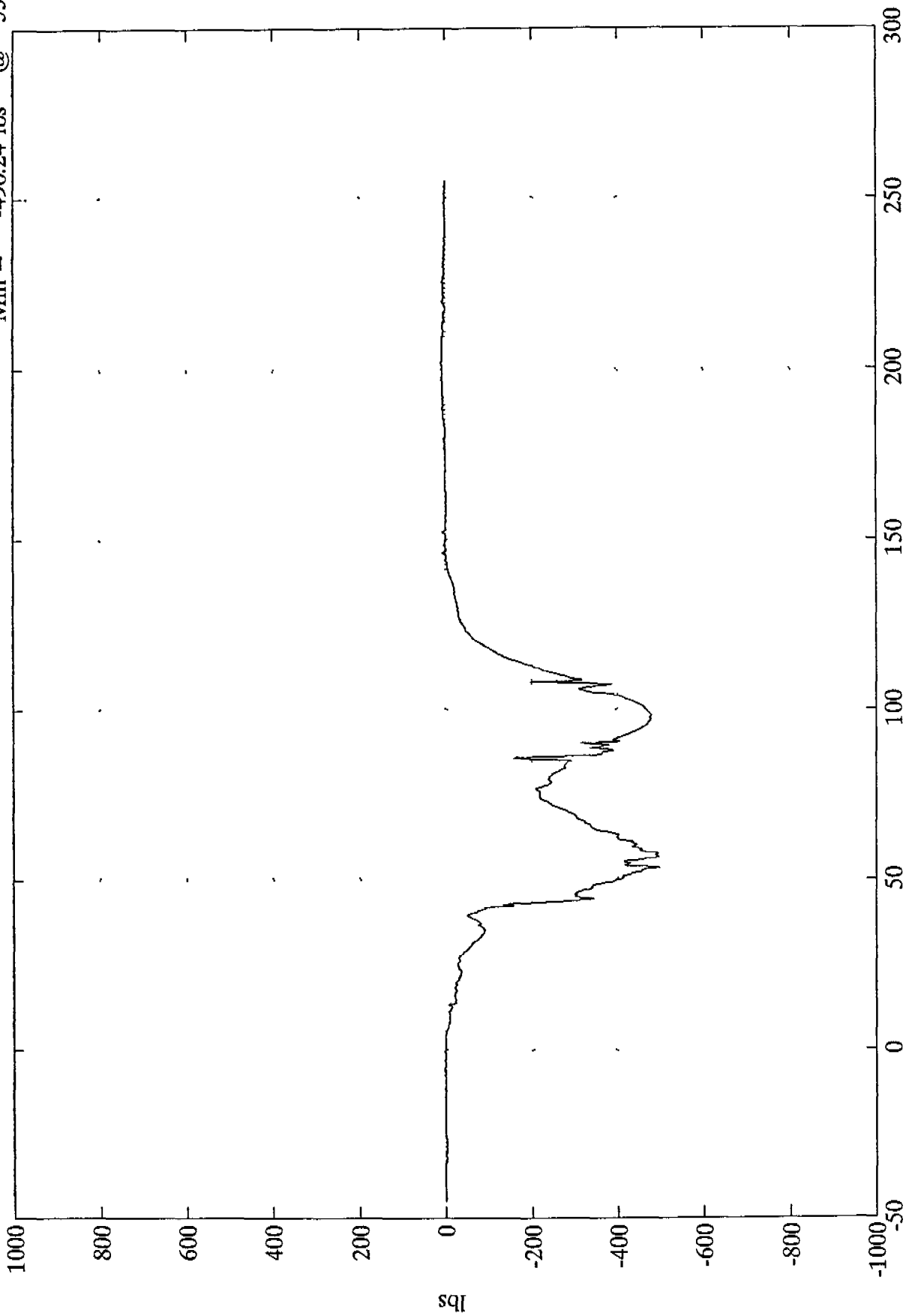
ft-lbs

B-80

7942-10

SAE Filter Class 600

Veh.1-Pos.1 Lt L Tibia Fy Max = 9.40 lbs @ 201.36 msec
 Min = -496.24 lbs @ 53.52 msec



Time (msec)

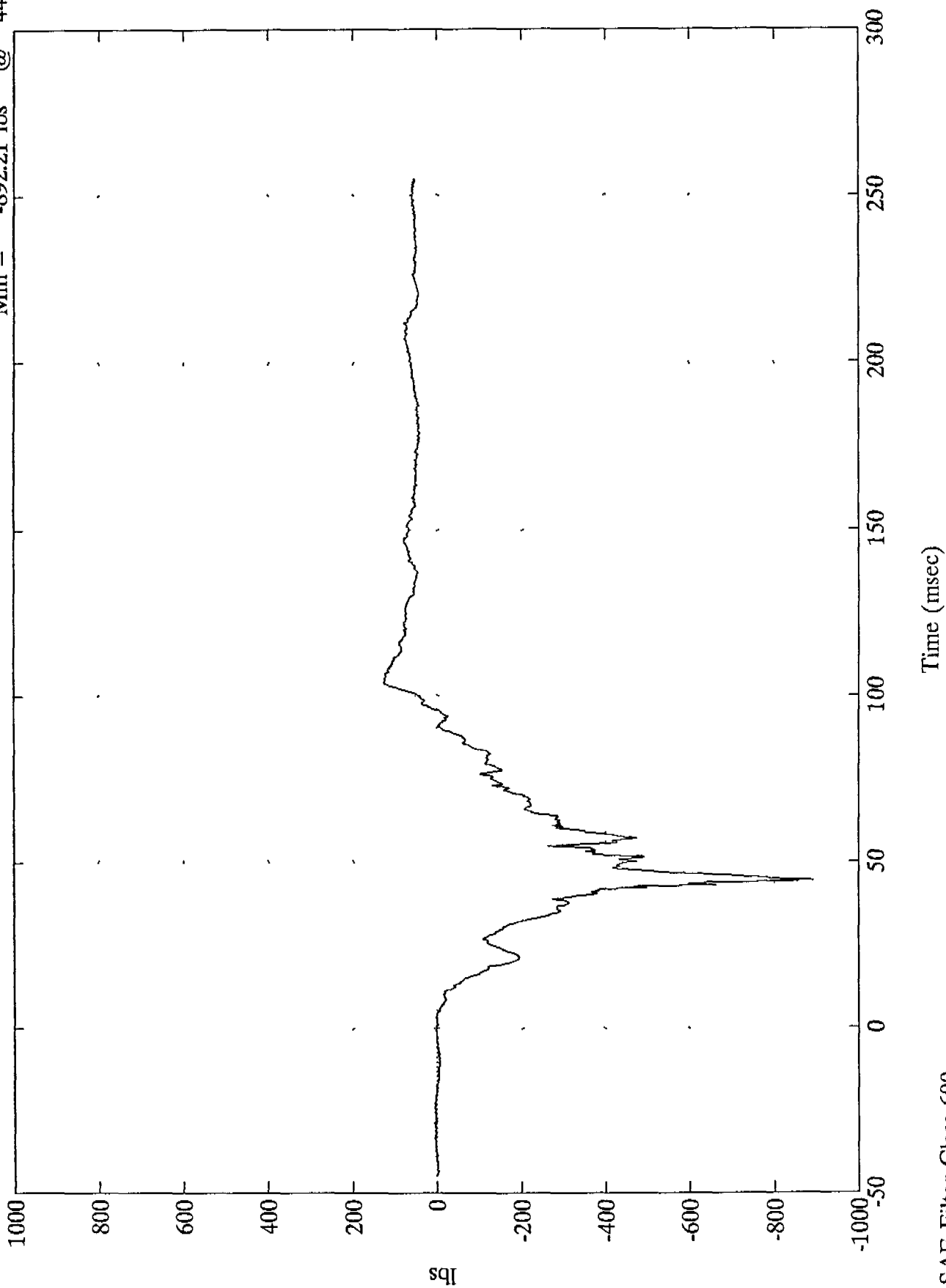
SAE Filter Class 600

VTV TEST 9

Veh.1-Pos.1 Lt L Tibia Fz

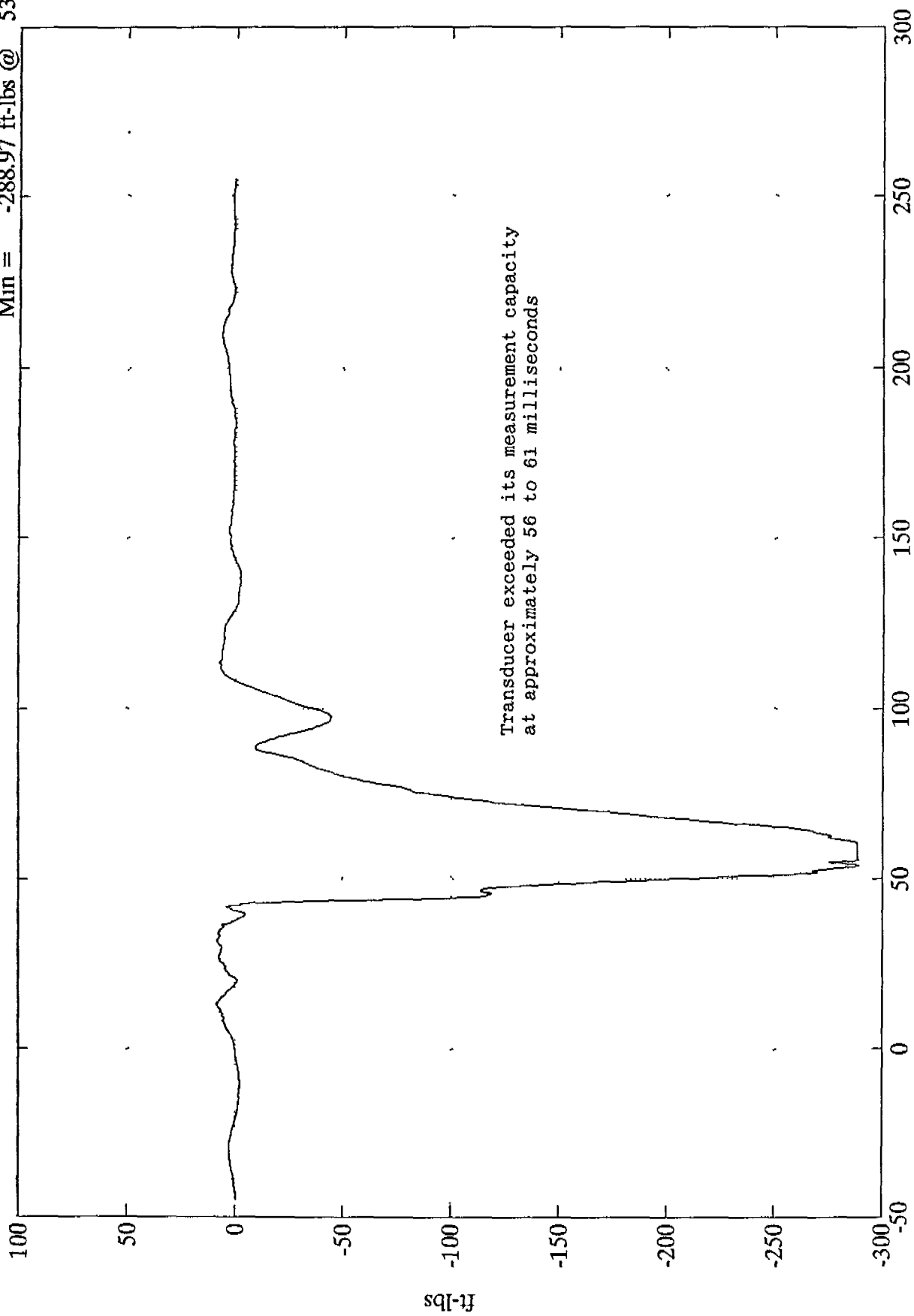
Max = 125.53 lbs @ 104.04 msec

Min = -892.21 lbs @ 44.39 msec



Veh.1-Pos.1 Lt L Tibia Mx

Max = 8.63 ft-lbs @ 12.83 msec
Min = -288.97 ft-lbs @ 53.88 msec



Time (msec)

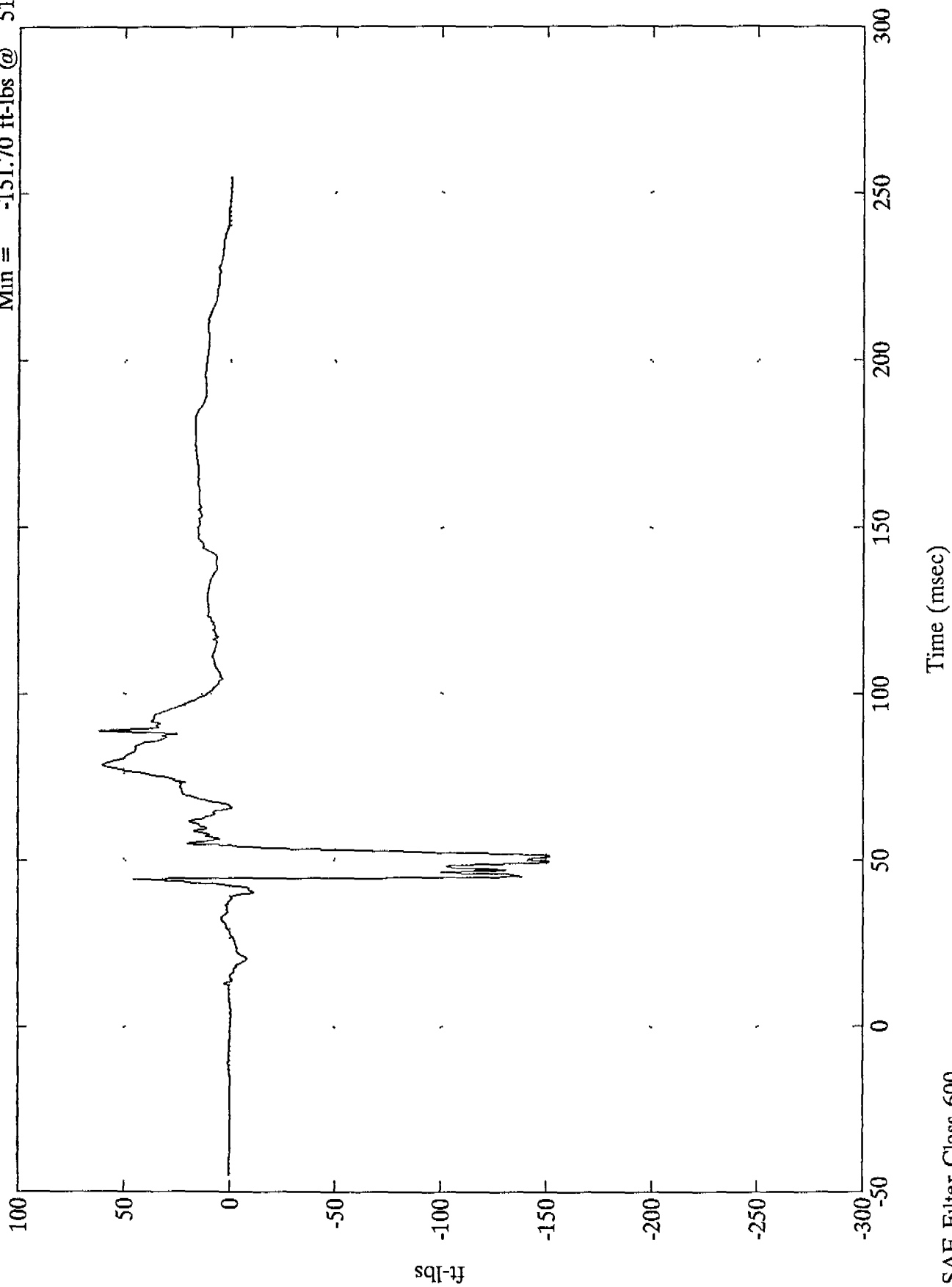
SAE Filter Class 600

ft-lbs

VTV TEST 9

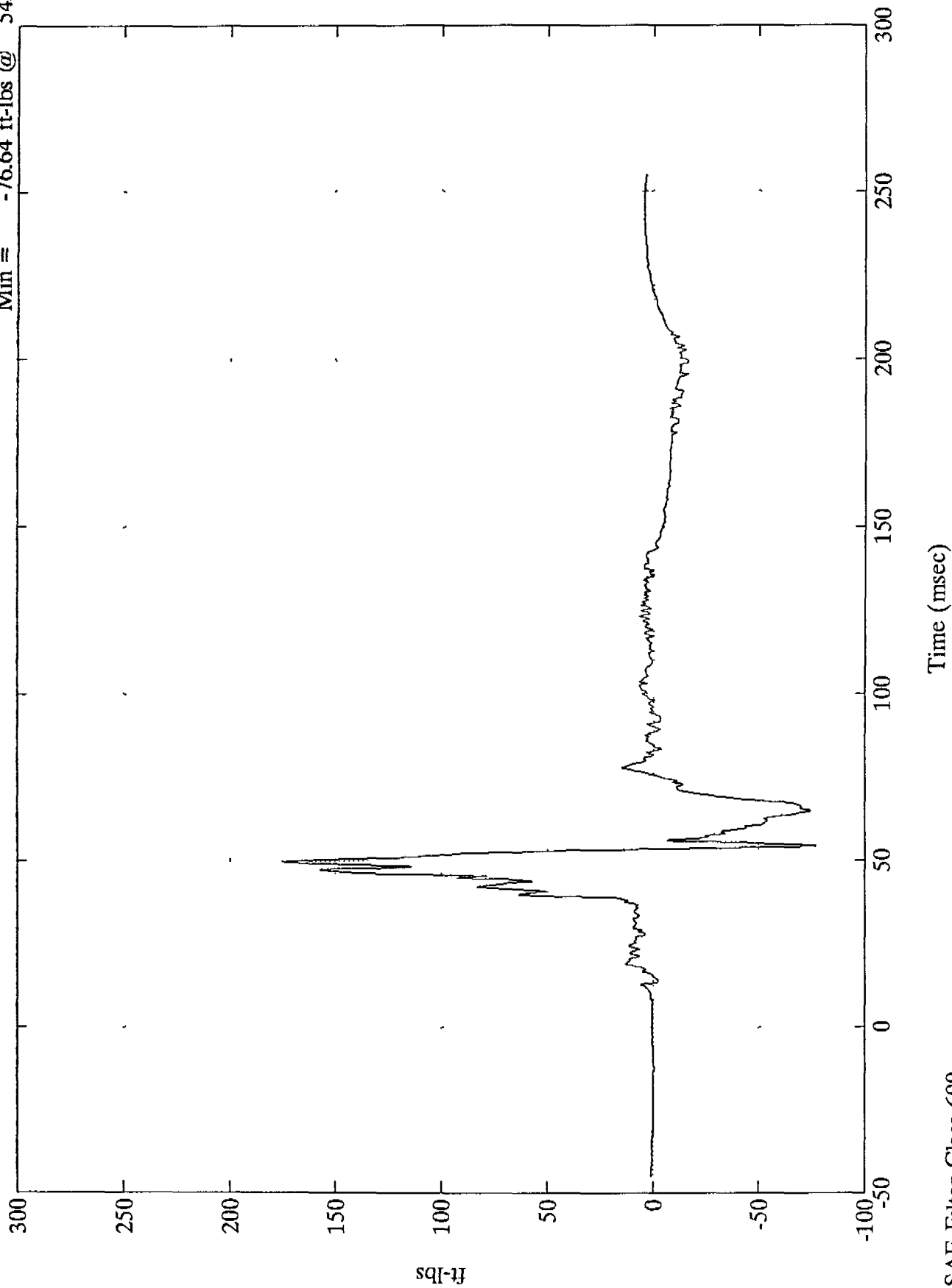
Veh.1-Pos.1 Rt U Tibia Mx

Max = 61.36 ft-lbs @ 88.80 msec
Min = -151.70 ft-lbs @ 51.24 msec



Veh.1-Pos.1 Rt U Tibia My

Max = 175.13 ft-lbs @ 49.68 msec
Min = -76.64 ft-lbs @ 54.47 msec

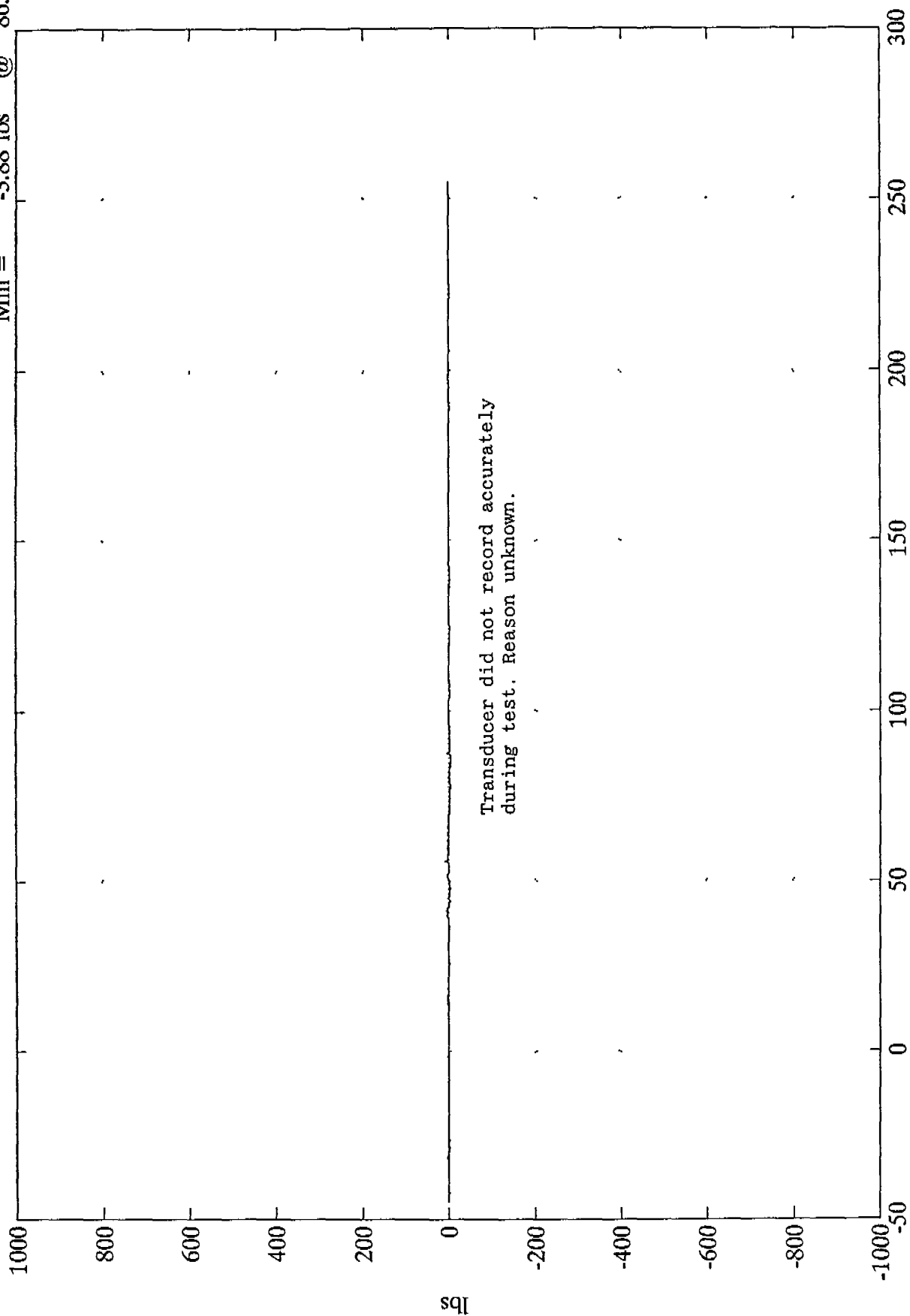


SAE Filter Class 600

VTV TEST 9

Veh.1-Pos.1 Rt L Tibia Fy

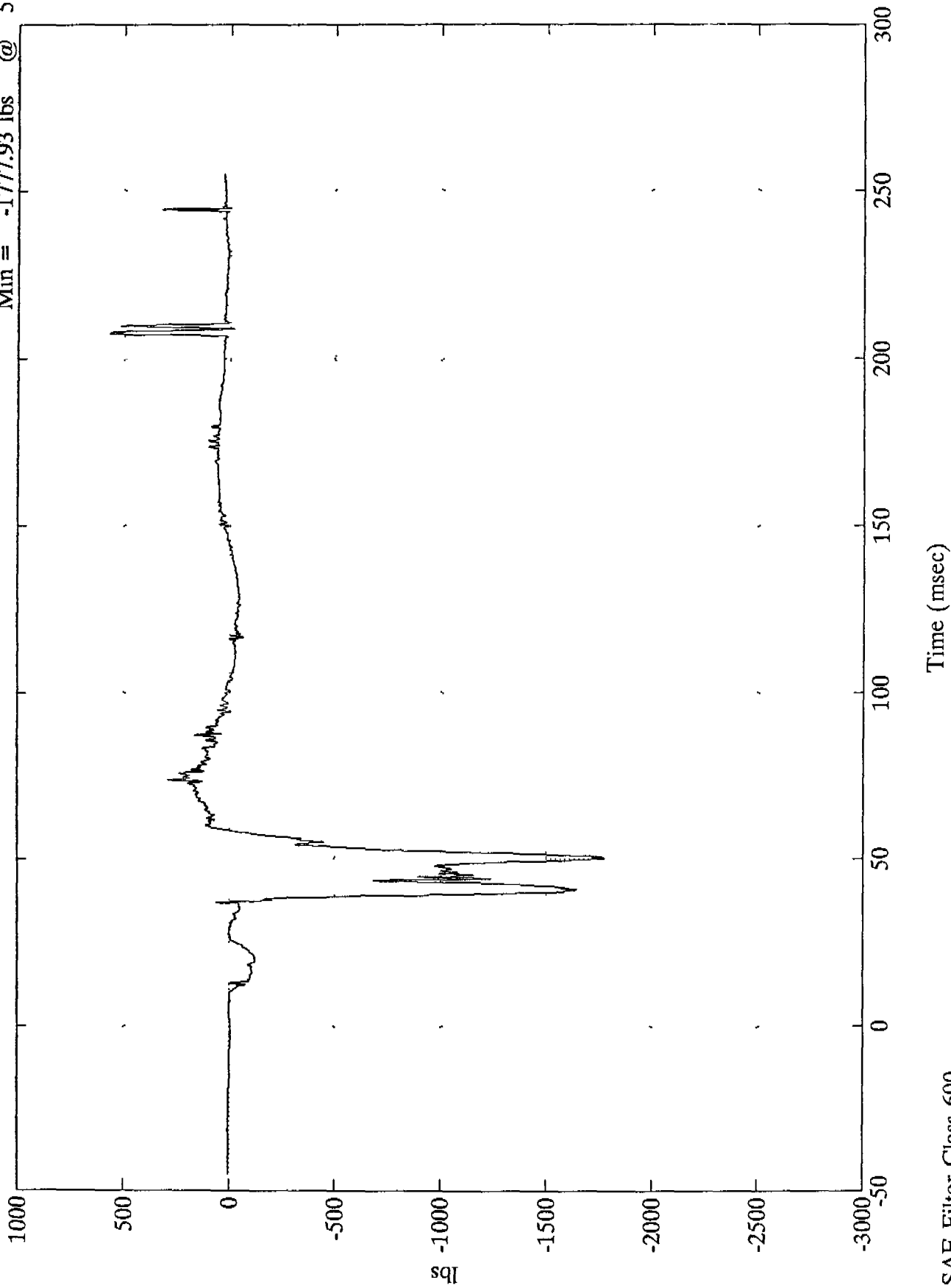
Max = 8.69 lbs @ 55.68 msec
 Min = -3.88 lbs @ 86.76 msec



SAE Filter Class 600

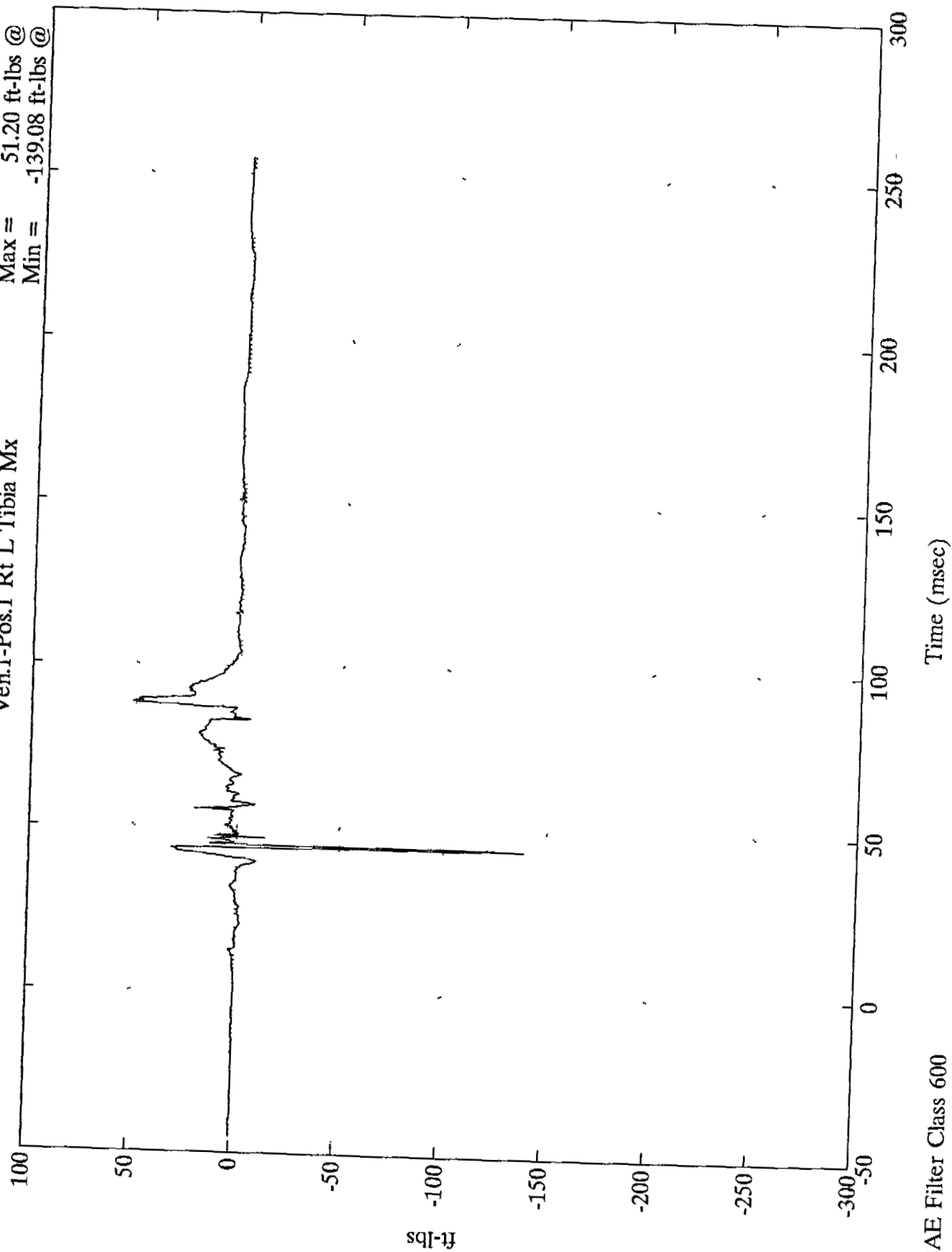
Time (msec)

Veh.1-Pos.1 Rt L Tibia Fz
 Max = 567.51 lbs @ 207.36 msec
 Min = -1777.93 lbs @ 50.28 msec



VTV TEST 9

Veh.1-Pos.1 Rt L Tibia Mx
Max = 51.20 ft-lbs @ 88.20 msec
Min = -139.08 ft-lbs @ 44.39 msec



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SAE Filter Class 600

VEHICLE TWO DATA

1991 Honda Accord DX 4-Door Sedan

TEST NO. Y43-9-1228

VEHICLE DATA

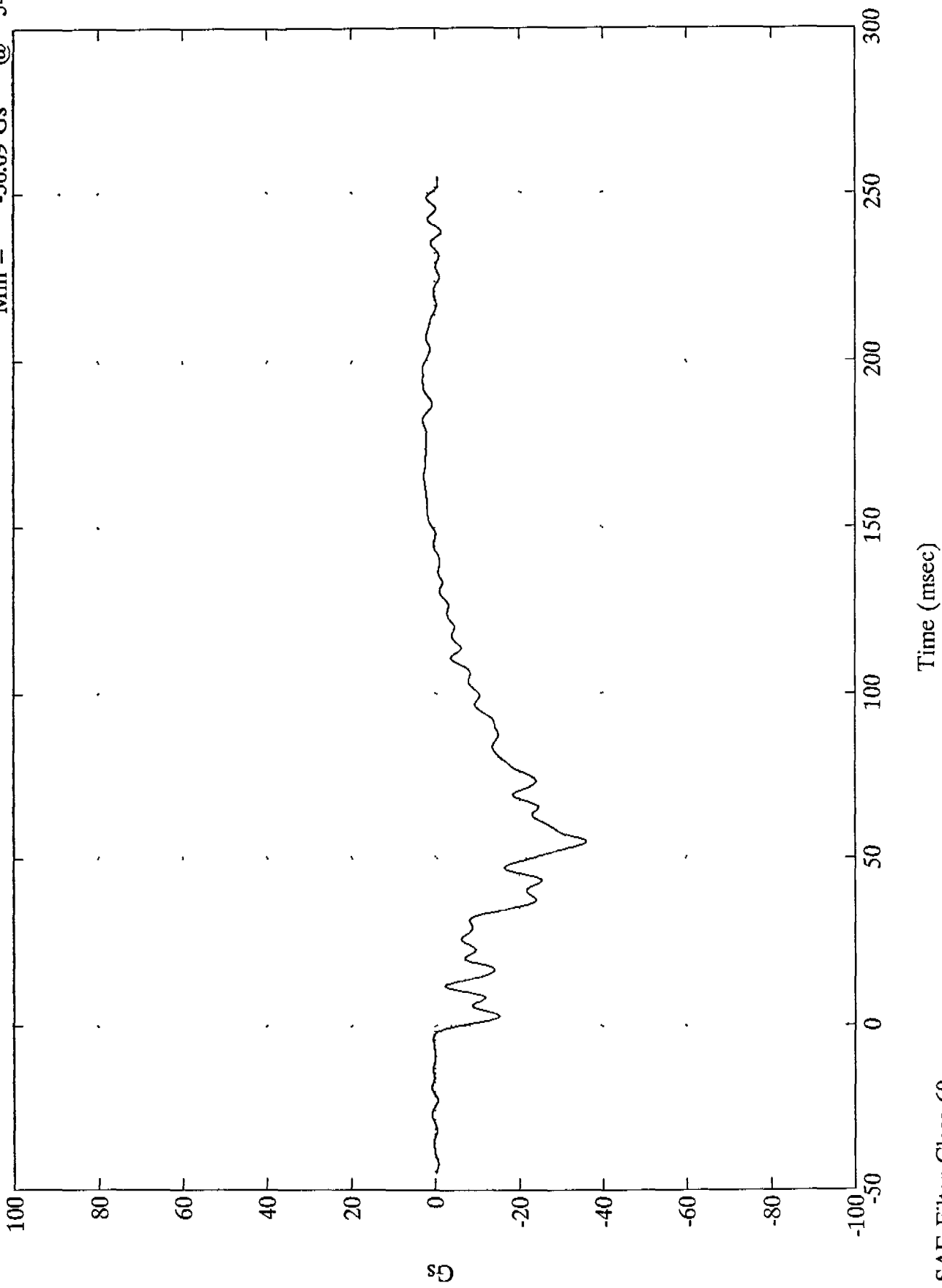
SAE FILTER CHANNEL CLASS

60

Veh. 2 L R Seat (X)

Max = 2.93 Gs
Min = -36.09 Gs

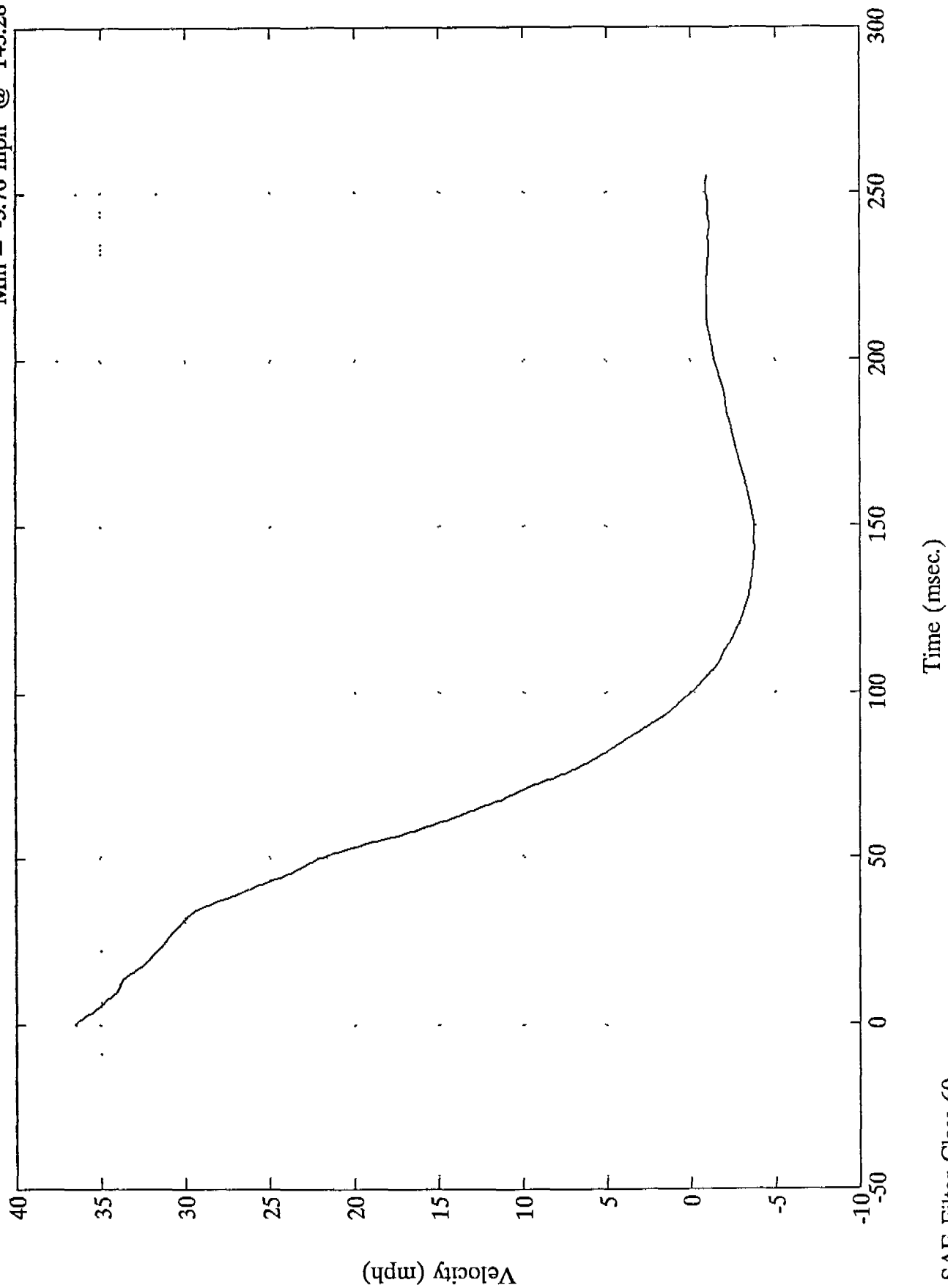
@ 197.27 msec
@ 54.96 msec



VTV TEST 9

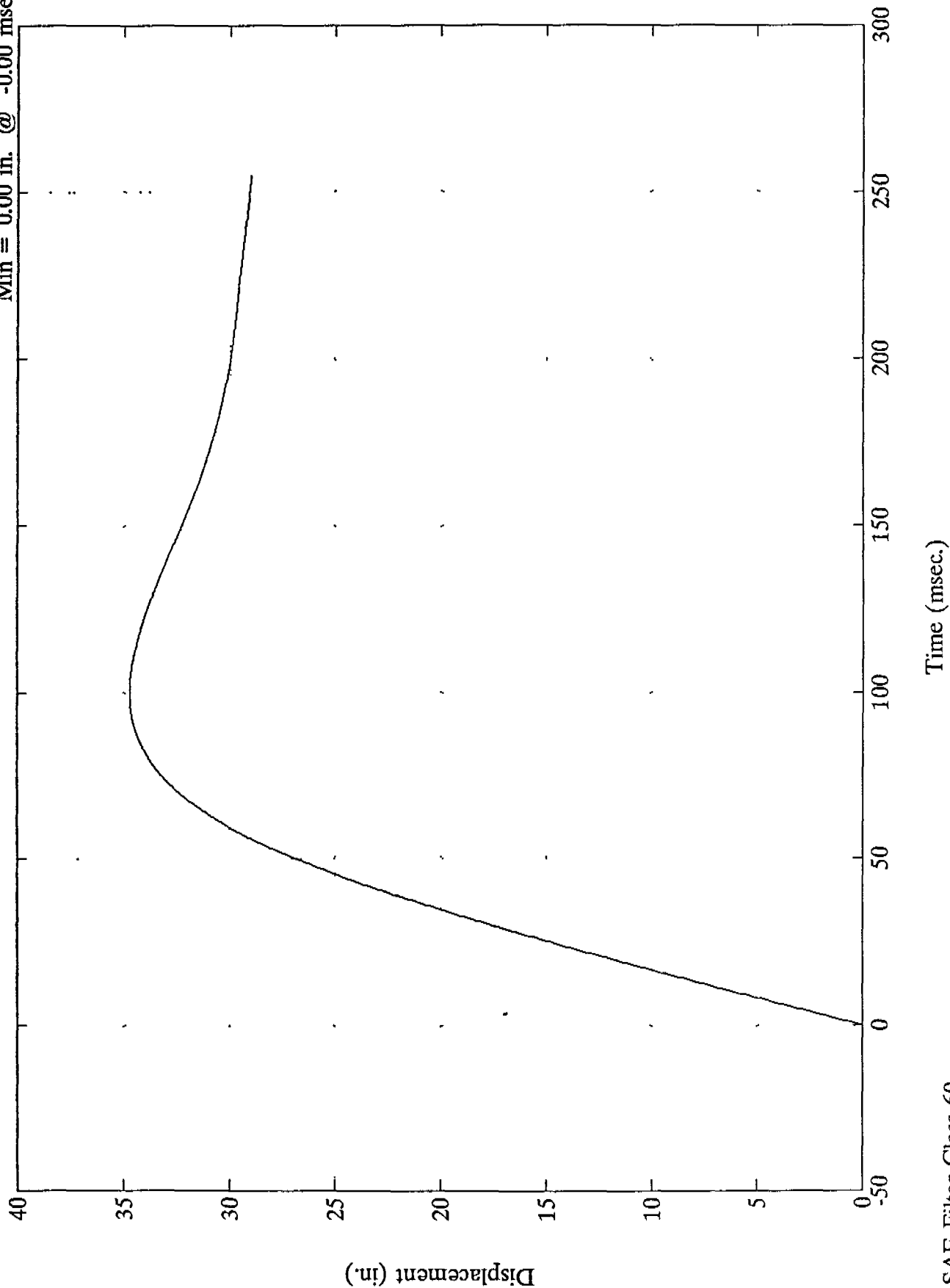
Veh. 2 L R Seat (X)

Max = 36.50 mph @ -0.00 msec
Min = -3.76 mph @ 143.28 msec



Veh. 2 L R Seat (X)

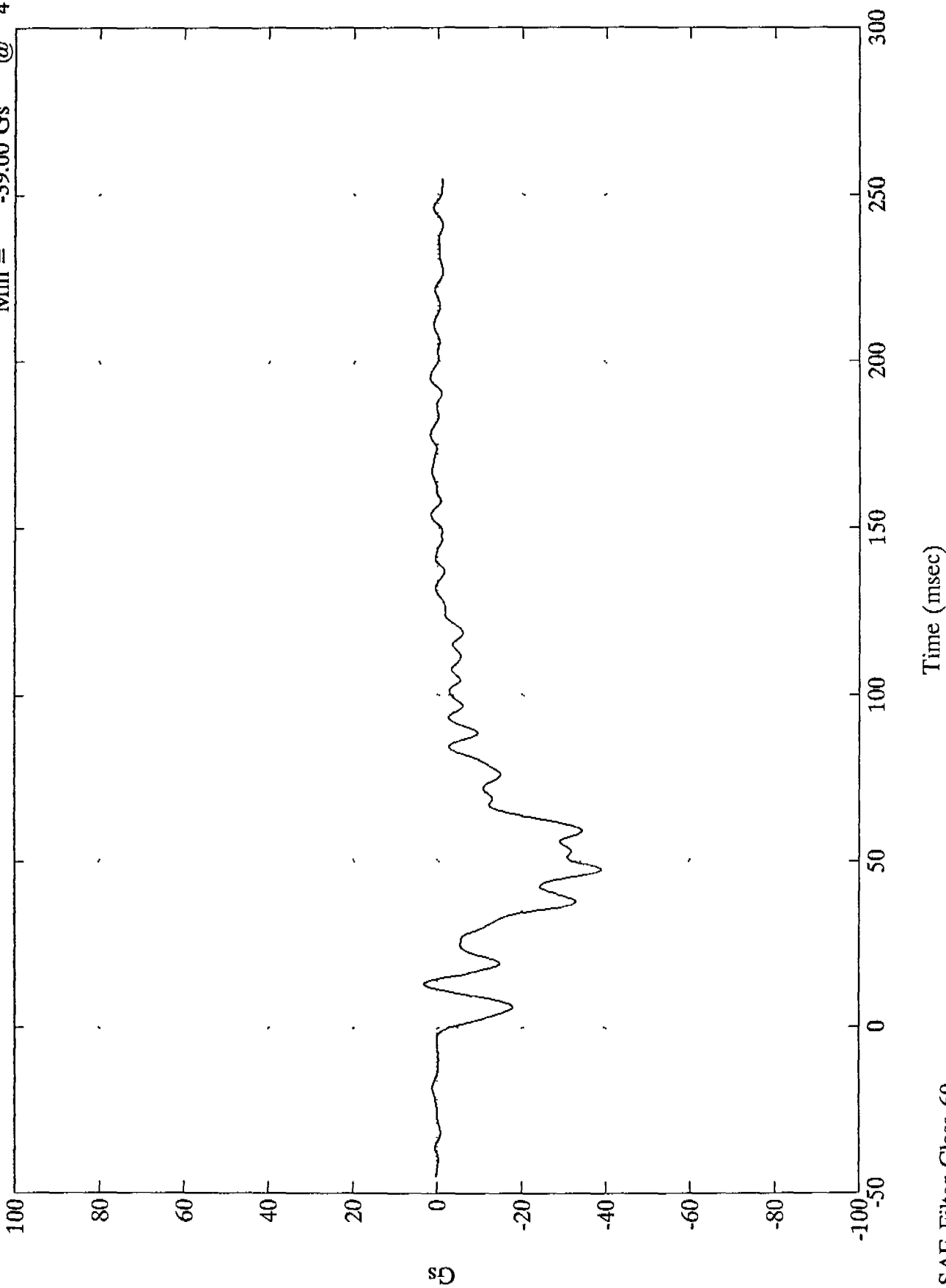
Max = 34.69 in. @ 101.52 msec
Min = 0.00 in. @ -0.00 msec



VTV TEST 9

Veh. 2 R R Seat (X)

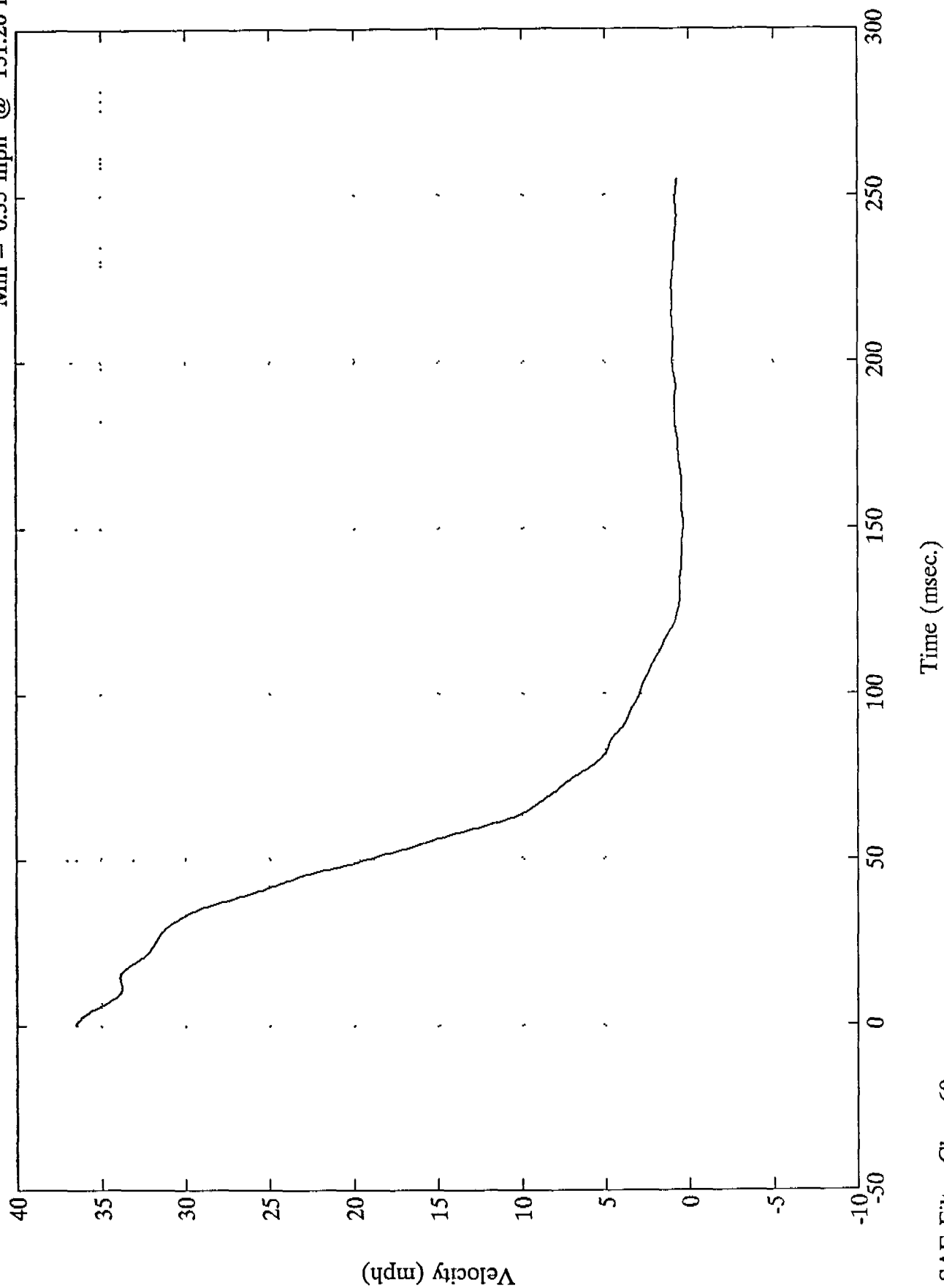
Max = 3.17 Gs @ 12.83 msec
Min = -39.00 Gs @ 47.52 msec



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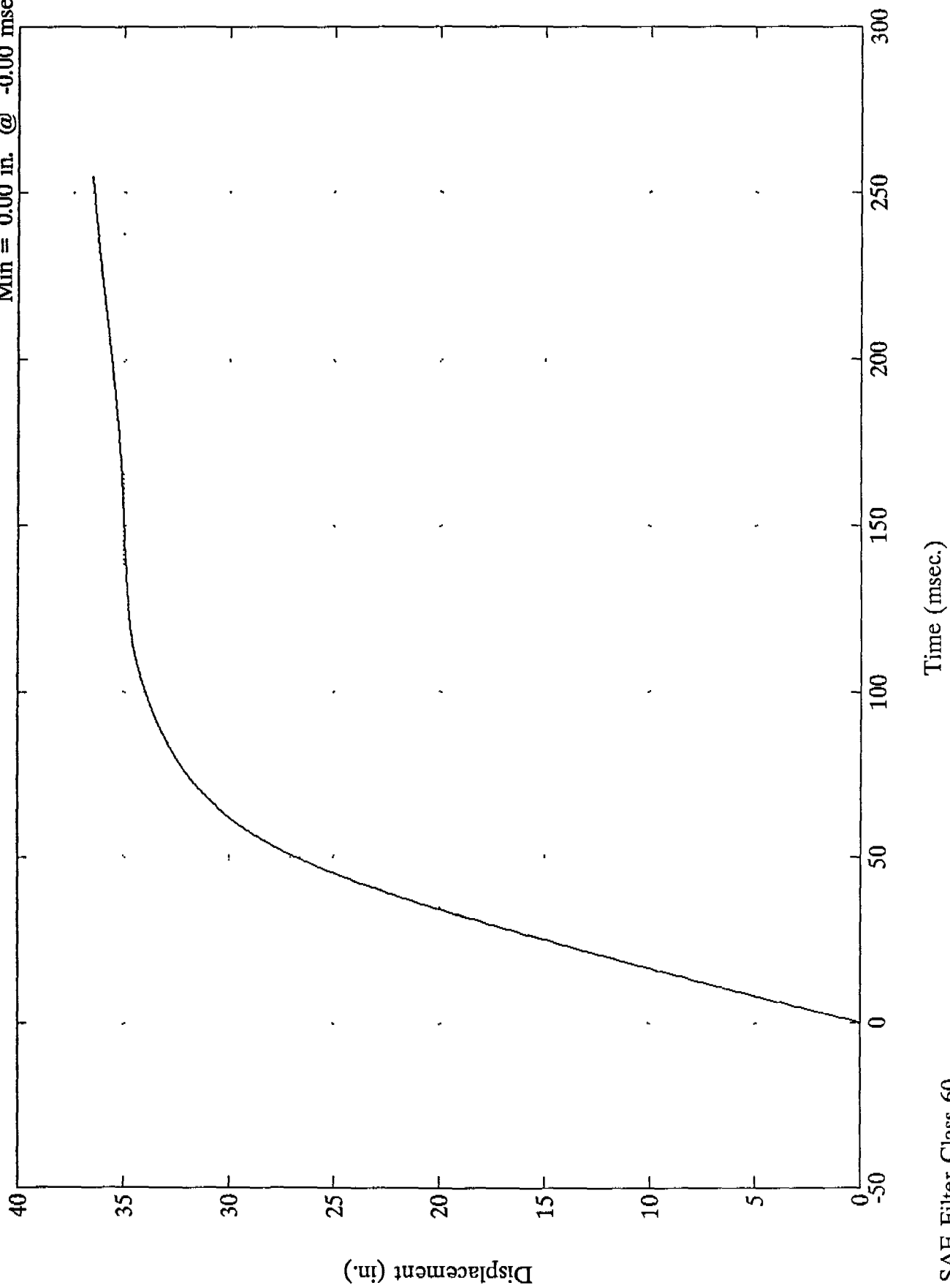
SAE Filter Class 60



VTV TEST 9

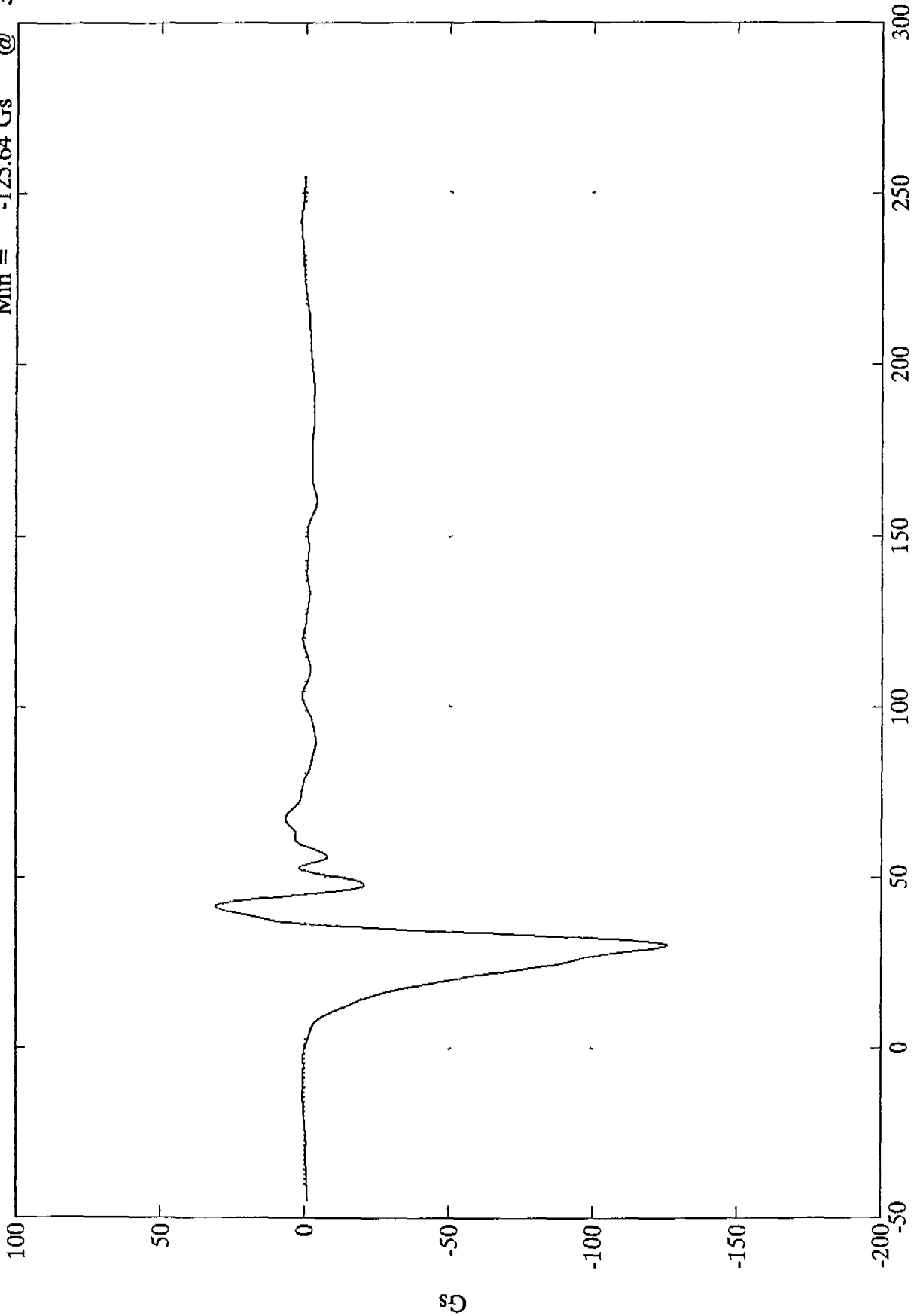
Veh. 2 R R Seat (X)

Max = 36.47 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



Veh. 2 Engine Top (X)

Max = 30.83 Gs @ 41.28 msec
Min = -125.64 Gs @ 30.12 msec



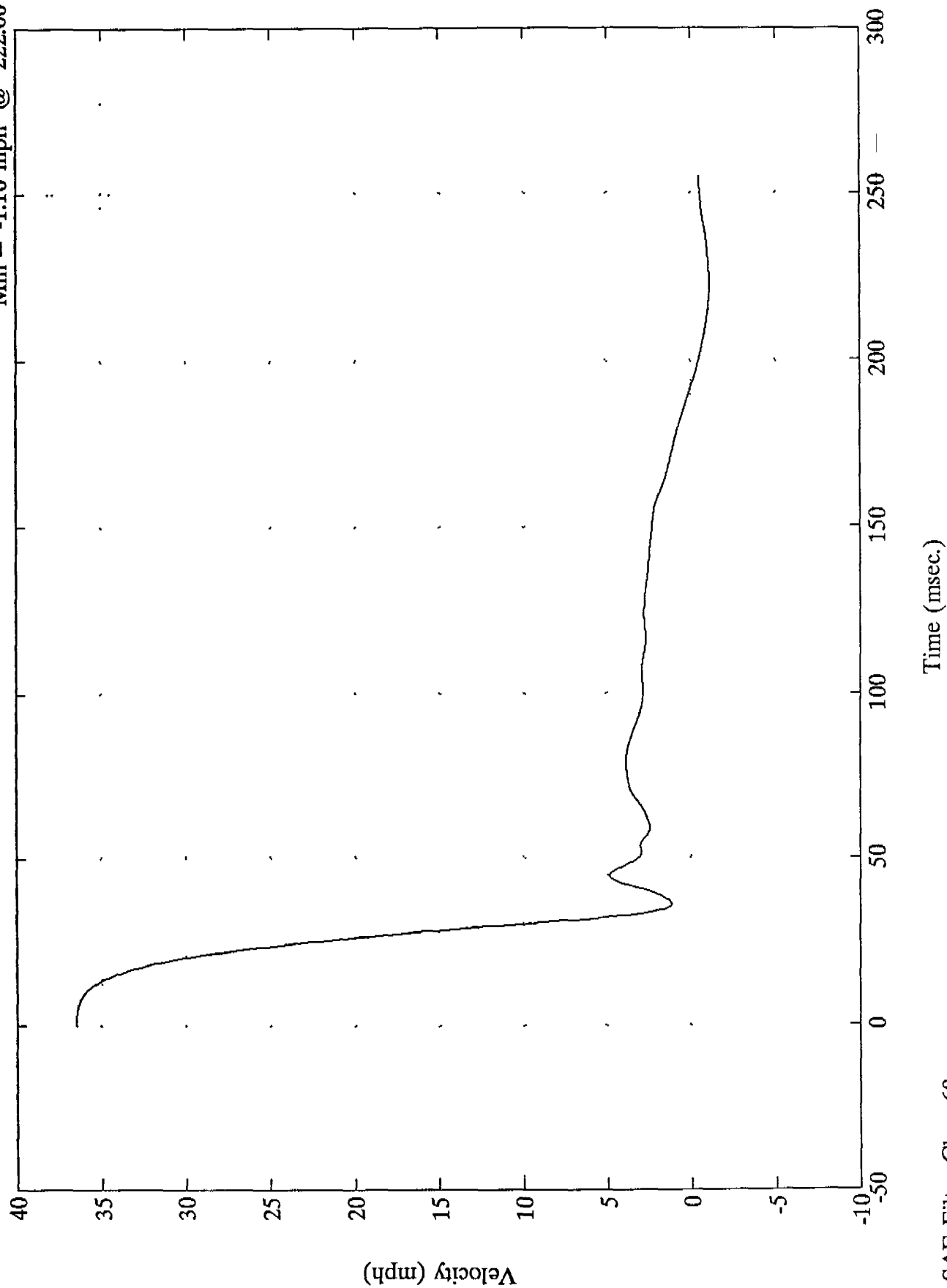
Time (msec)

SAE Filter Class 60

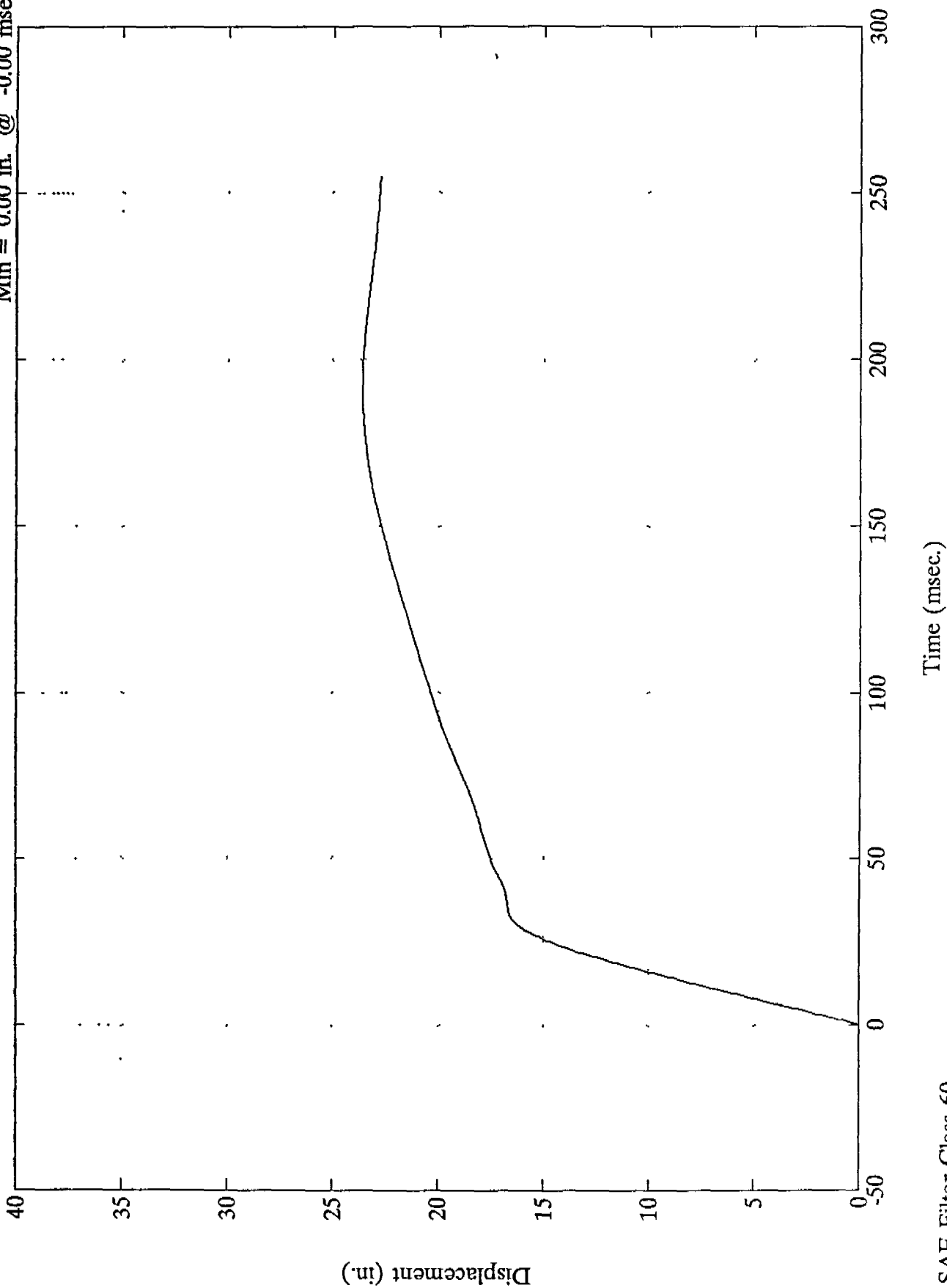
VTV TEST 9

Veh. 2 Engine Top (X)

Max = 36.50 mph @ 1.20 msec
Min = -1.10 mph @ 222.00 msec



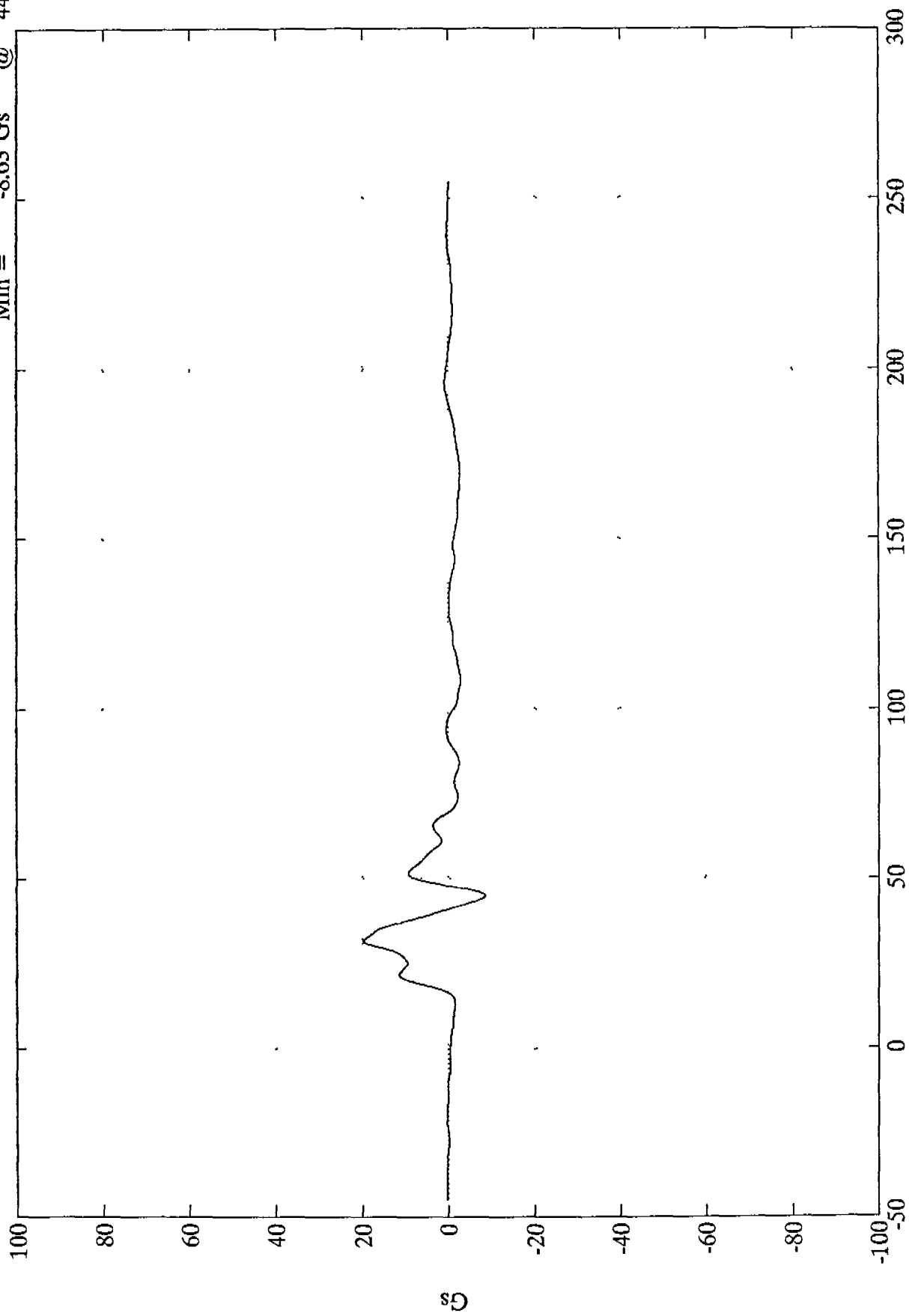
Veh. 2 Engine Top (X) Max = 23.64 in. @ 194.40 msec
Min = 0.00 in. @ -0.00 msec



VTV TEST 9

Veh. 2 Engine Top (Z)

Max = 19.68 Gs @ 31.44 msec
Min = -8.63 Gs @ 44.75 msec



B-100

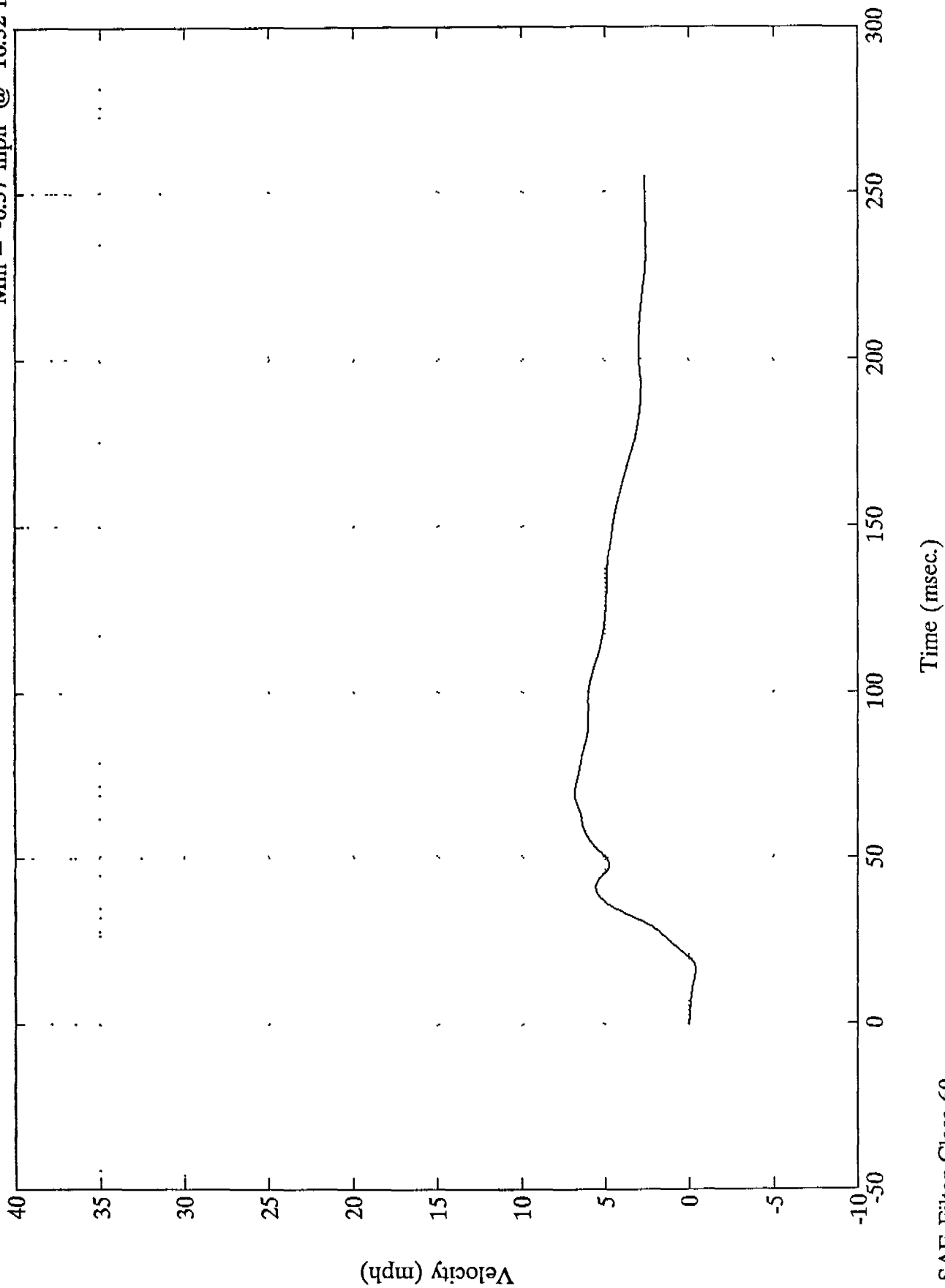
7942-10

Time (msec)

SAE Filter Class 60

Max = 6.80 mph @ 69.36 msec
 Min = -0.37 mph @ 16.32 msec

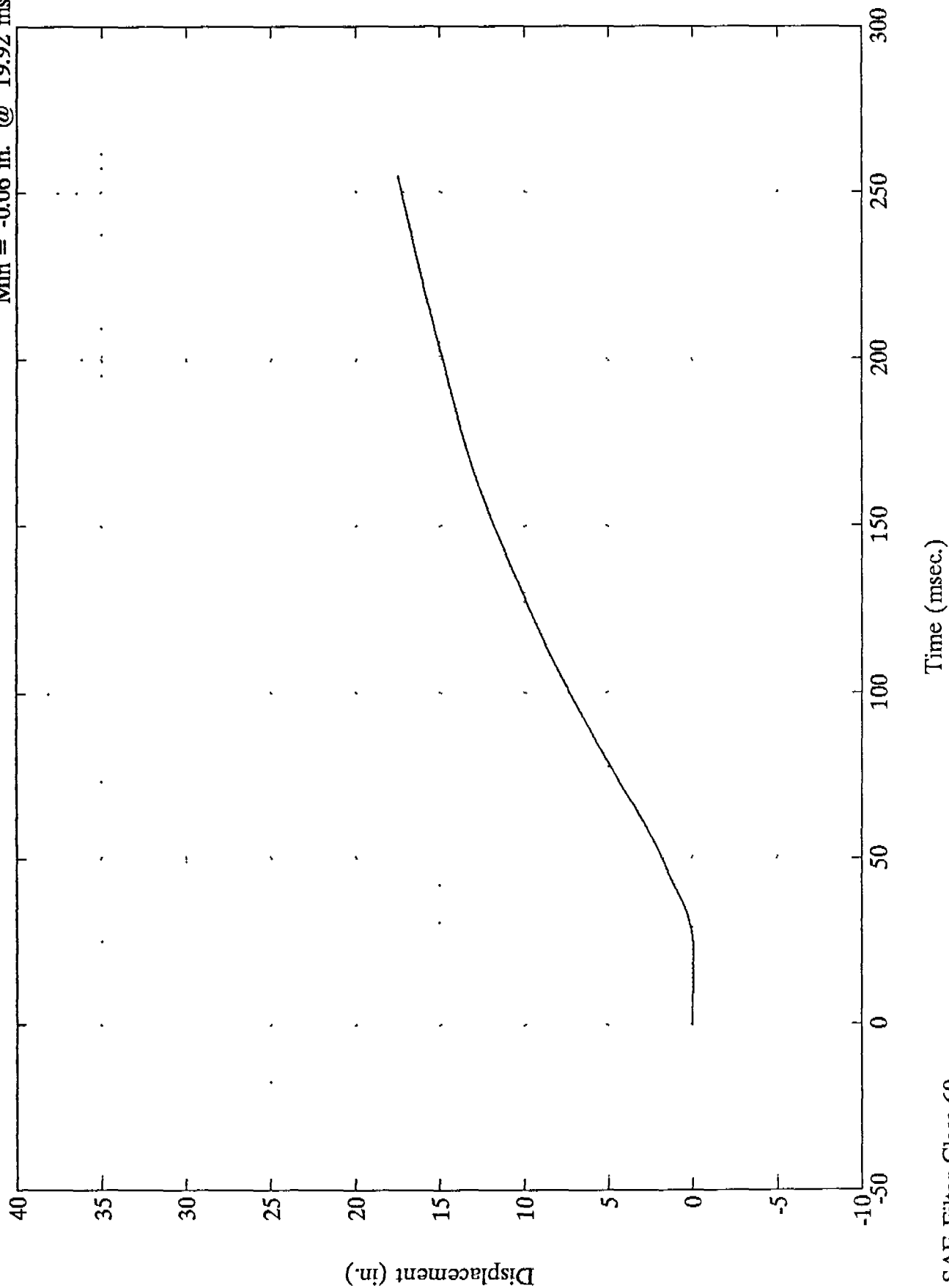
Veh. 2 Engine Top (Z)



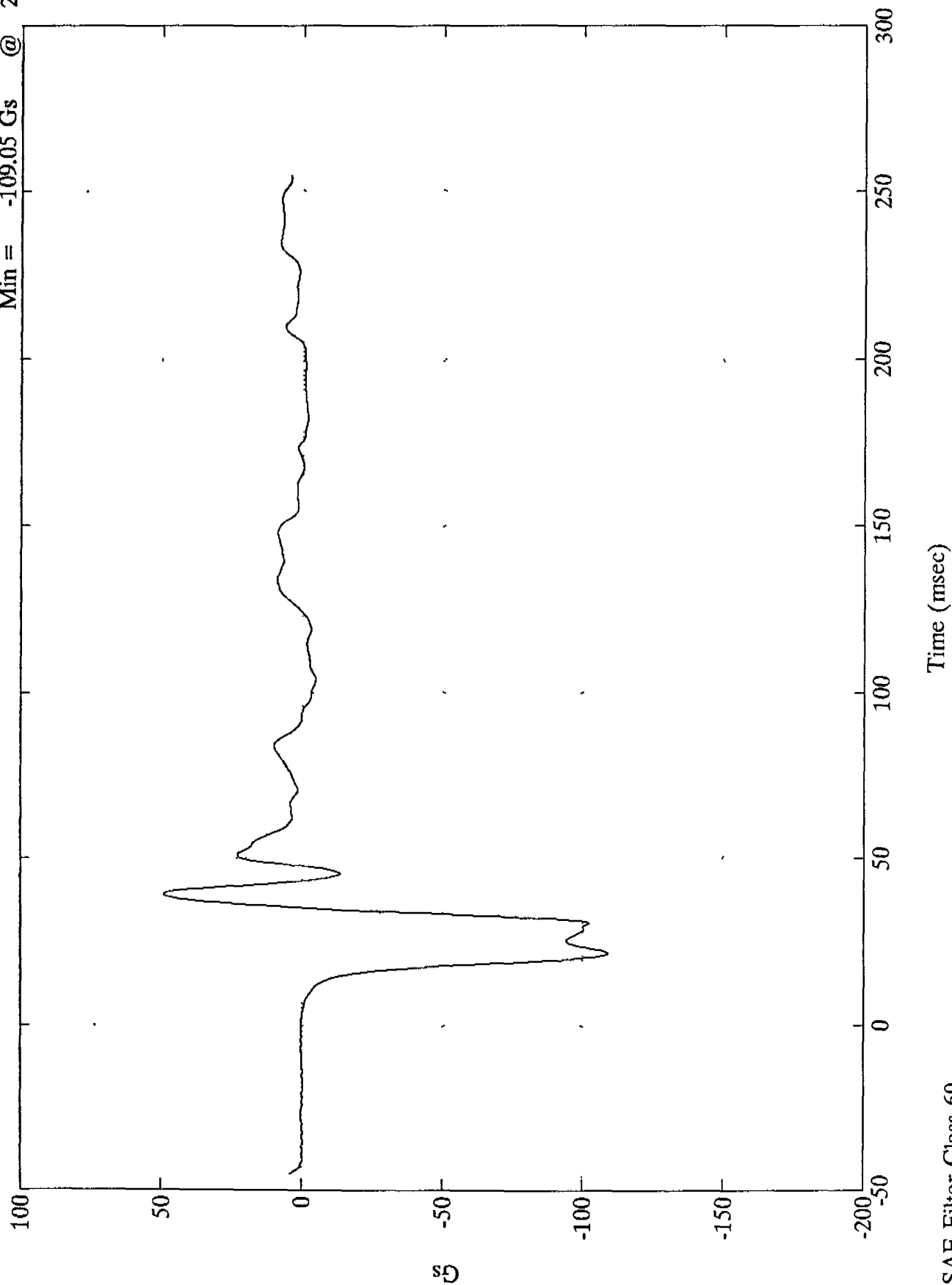
VTV TEST 9

Veh. 2 Engine Top (Z)

Max = 17.48 in. @ 254.88 msec
Min = -0.06 in. @ 19.92 msec



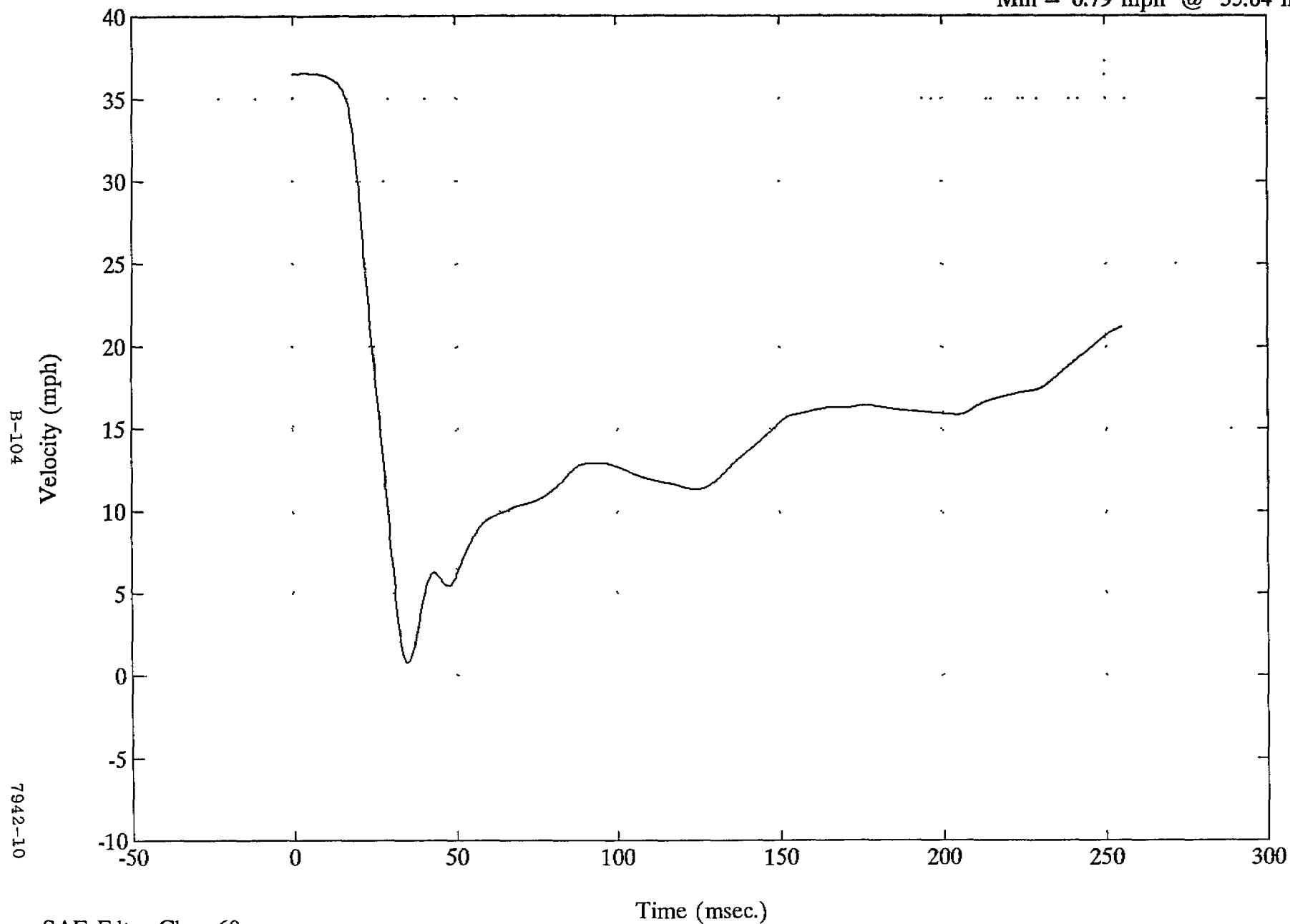
Veh. 2 Engine Bottom (X) Max = 49.12 Gs @ 39.00 msec
Min = -109.05 Gs @ 21.47 msec

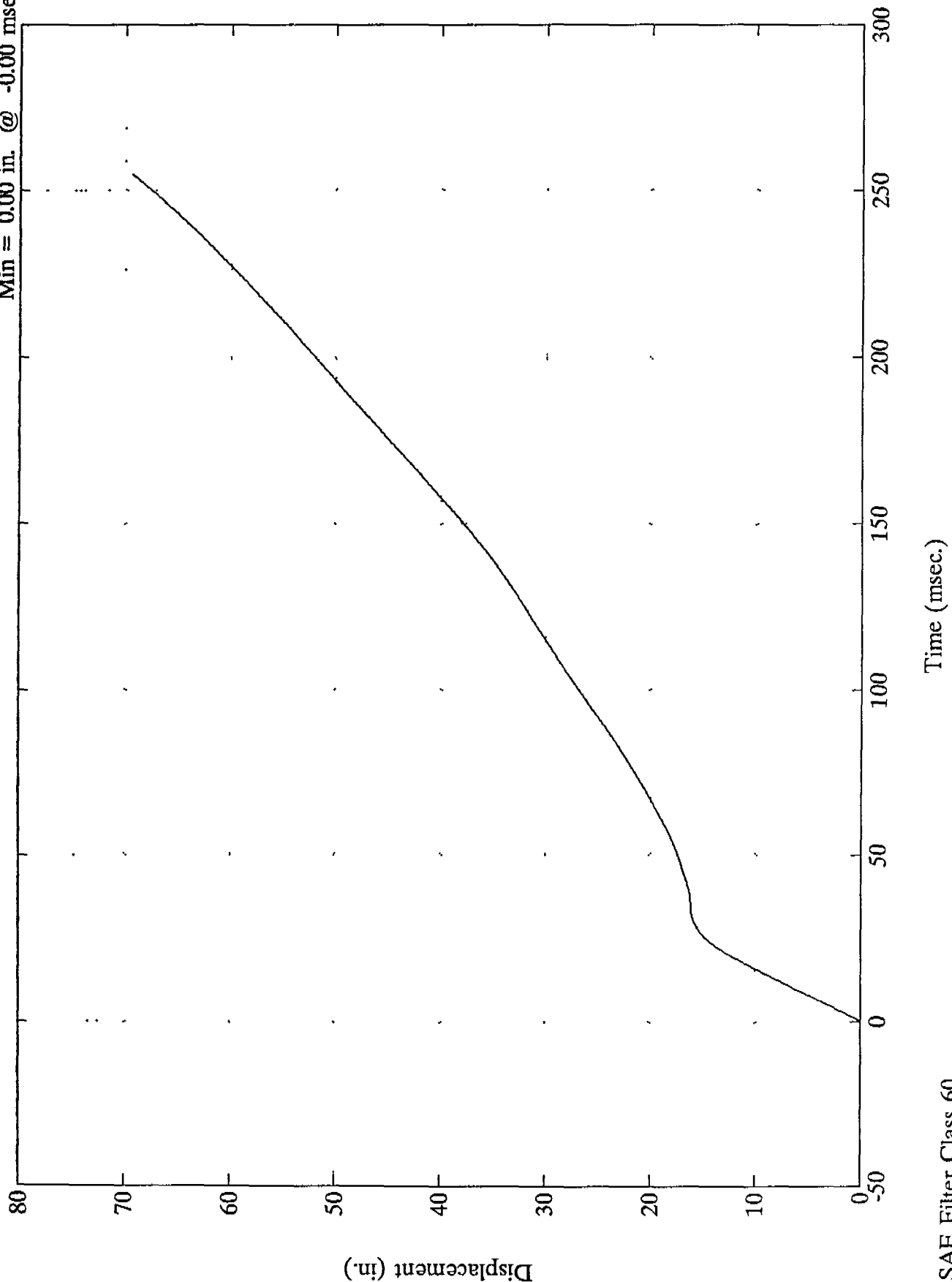


VTV TEST 9

Veh. 2 Engine Bottom (X)

Max = 36.52 mph @ 4.56 msec
Min = 0.79 mph @ 35.04 msec

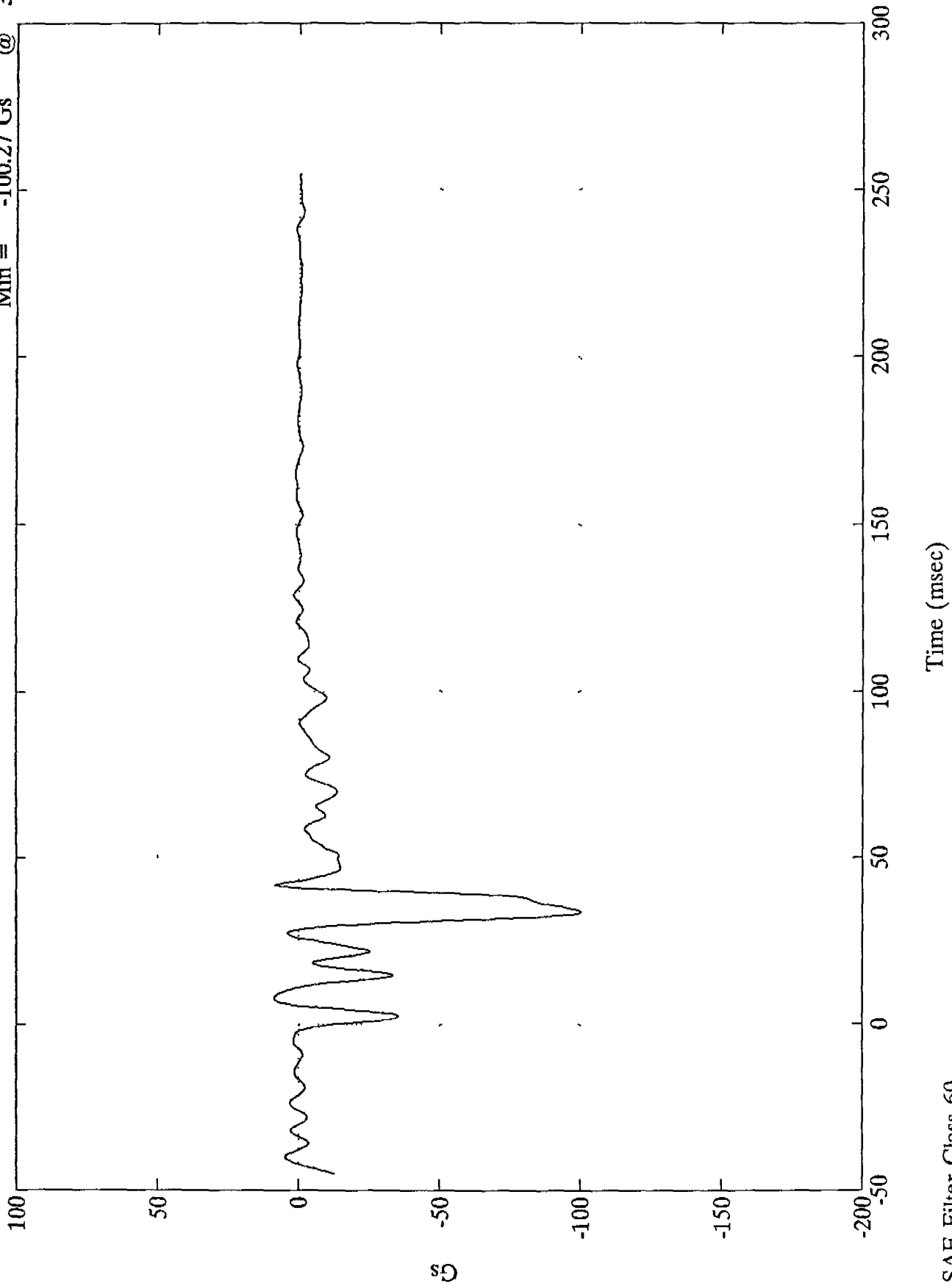




VTV TEST 9

Veh. 2 Front X Mem. (X)

Max = 8.83 Gs @ 7.67 msec
Min = -100.27 Gs @ 33.59 msec



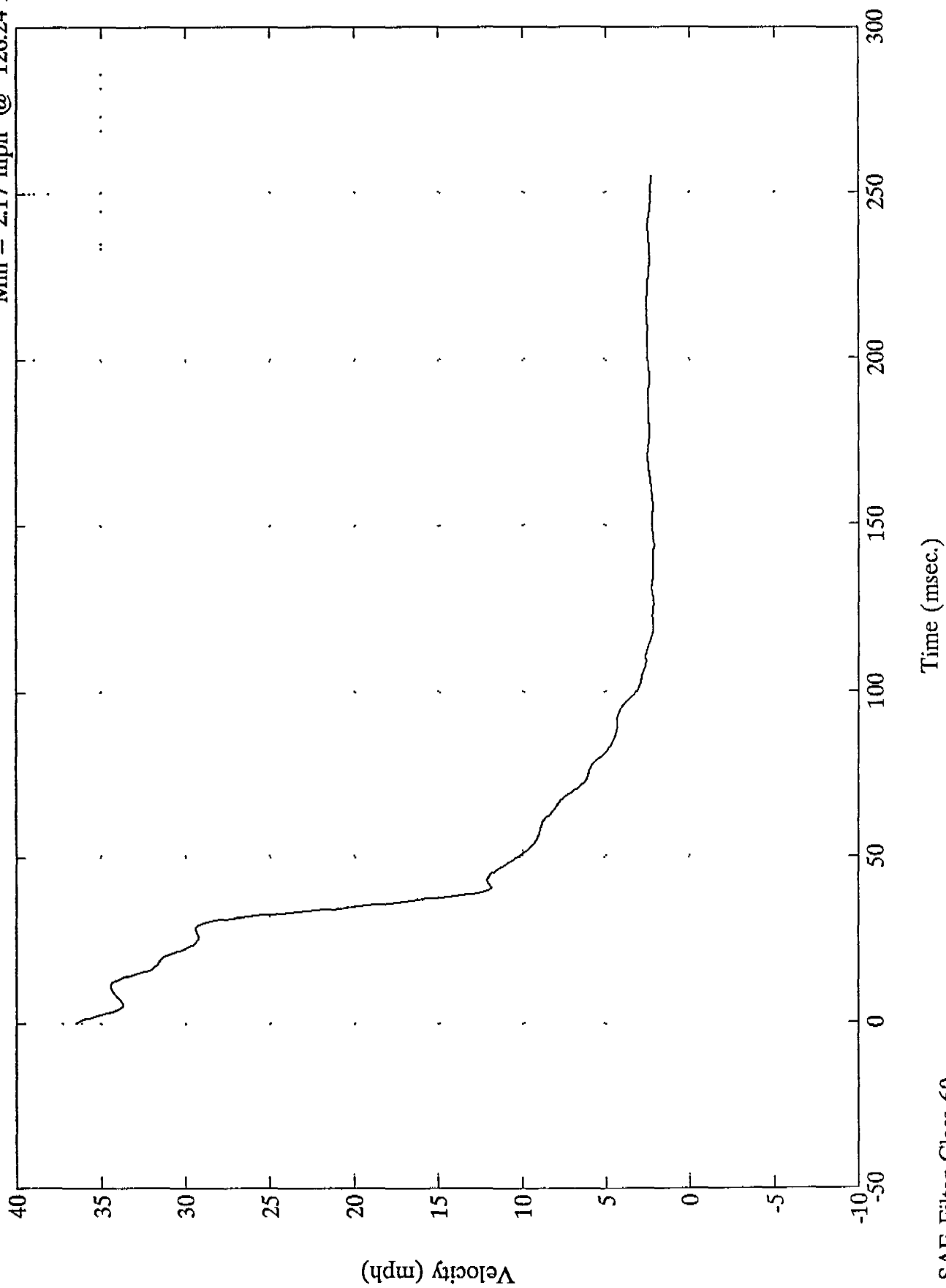
B-106

7942-10

SAE Filter Class 60

Veh. 2 Front X Mem. (X)

Max = 36.50 mph @ -0.00 msec
Min = 2.17 mph @ 126.24 msec

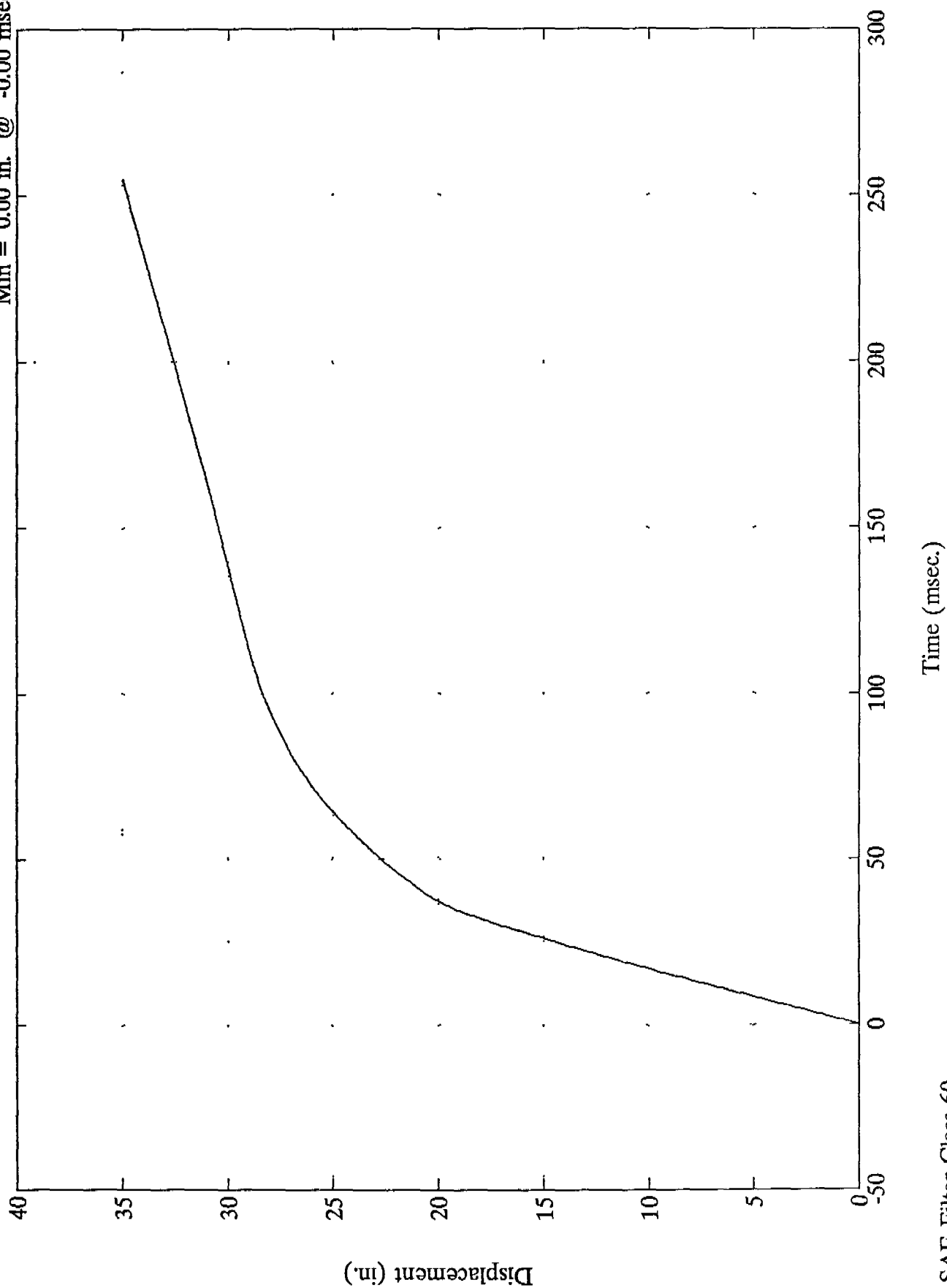


SAE Filter Class 60

VTV TEST 9

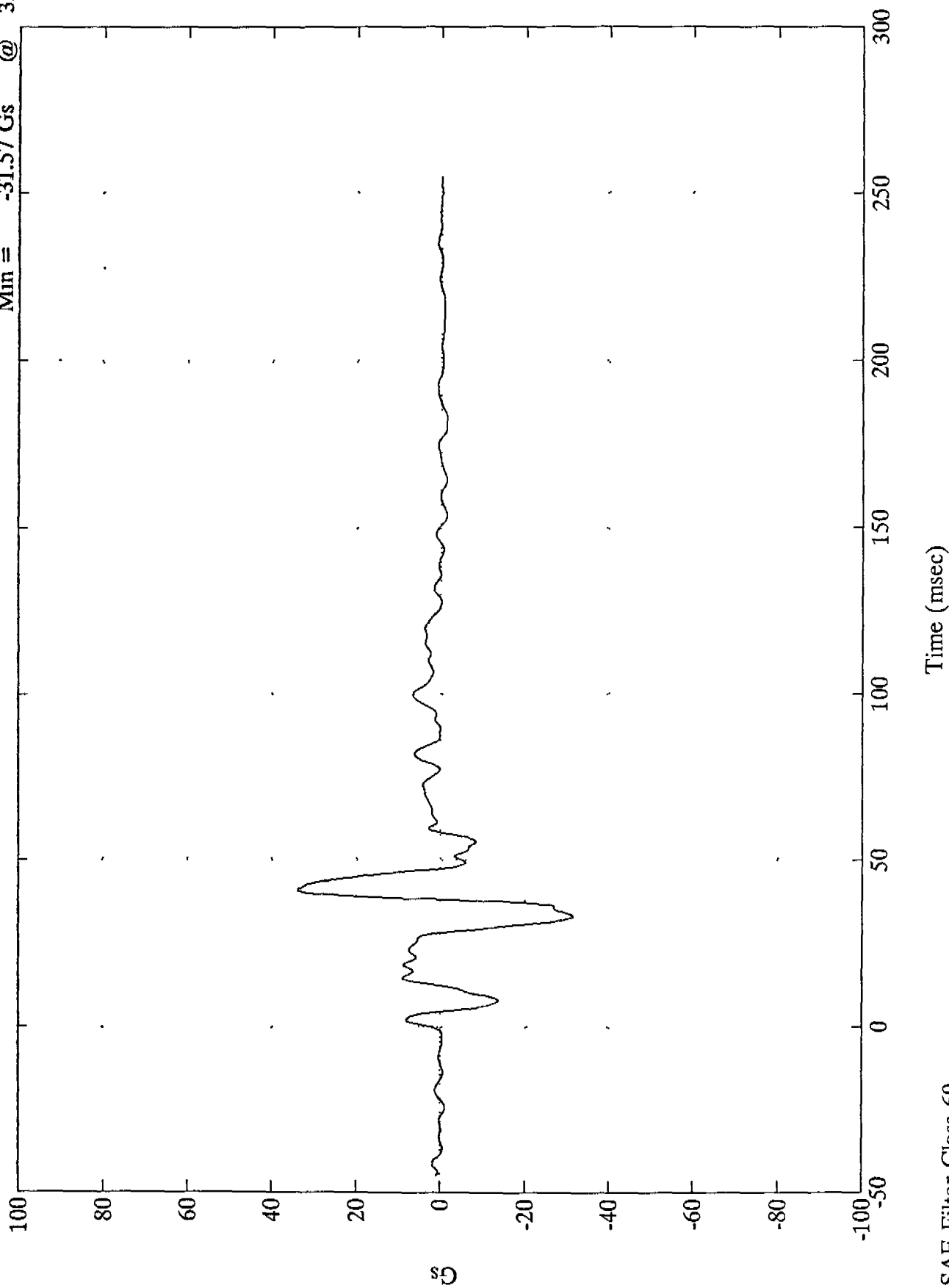
Veh. 2 Front X Mem. (X)

Max = 34.97 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



Veh. 2 Front X Mem. (Z)

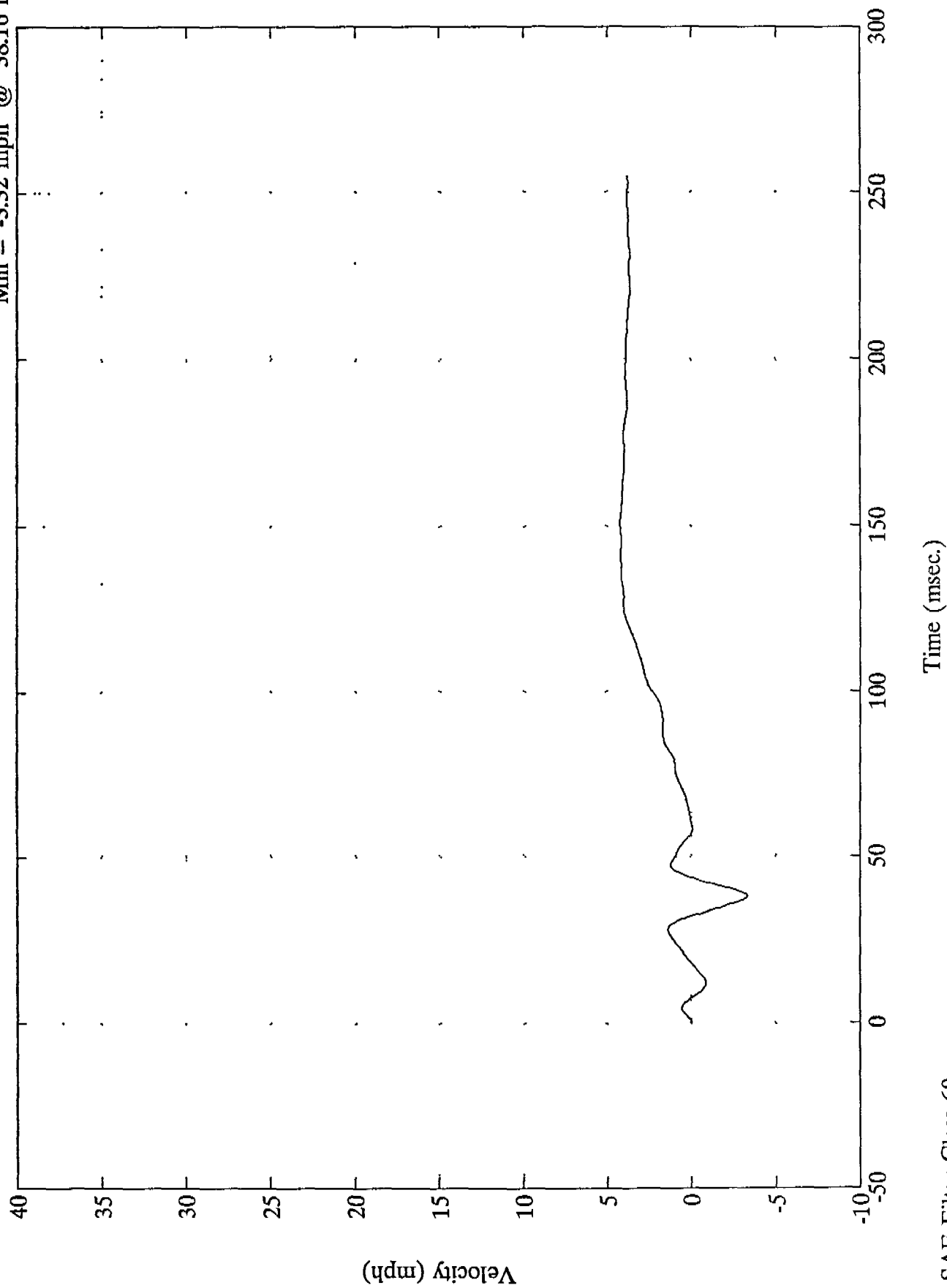
Max = 33.90 Gs @ 41.04 msec
Min = -31.57 Gs @ 33.11 msec

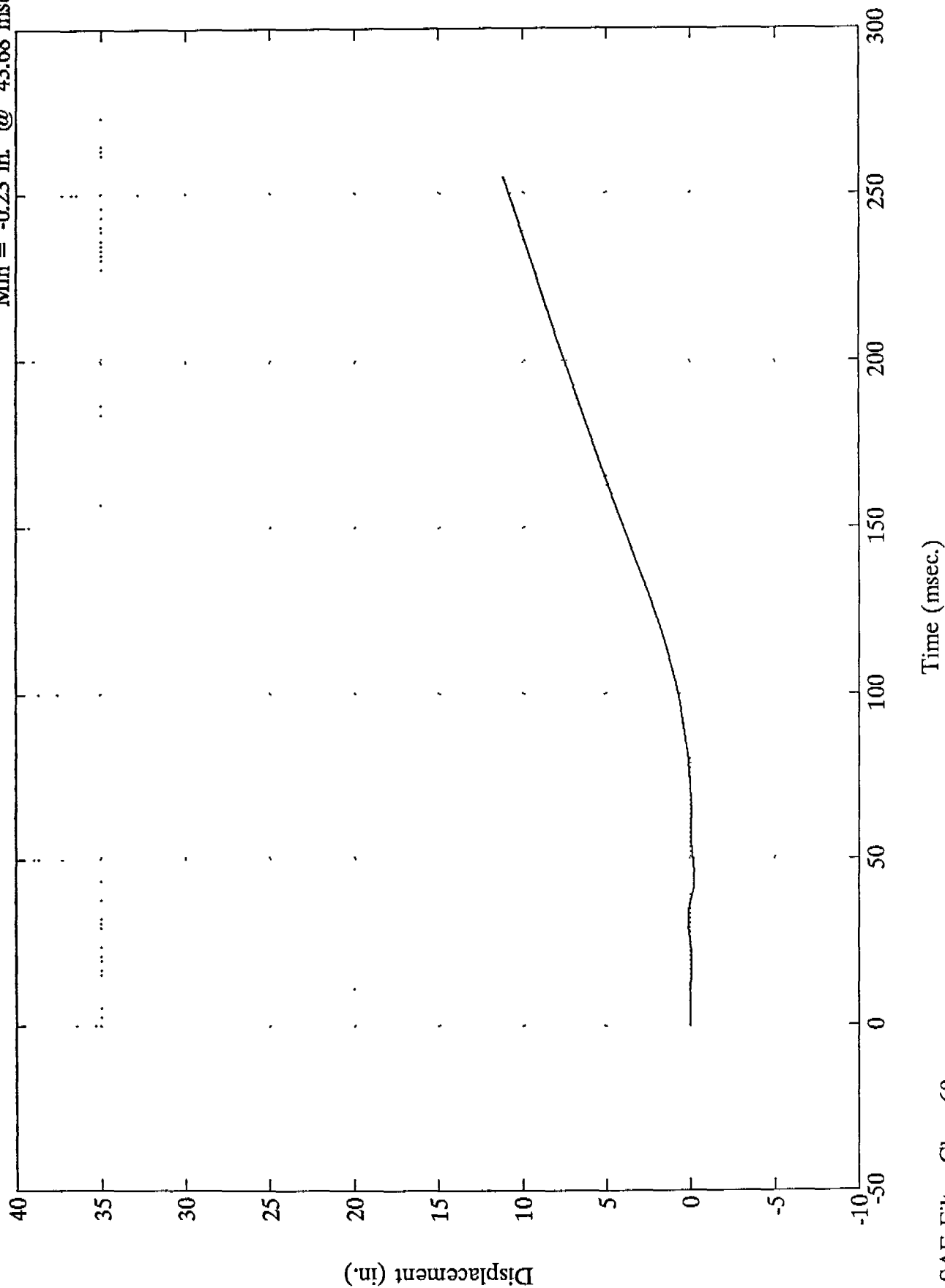


VTV TEST 9

Veh. 2 Front X Mem. (Z)

Max = 4.25 mph @ 150.72 msec
Min = -3.32 mph @ 38.16 msec

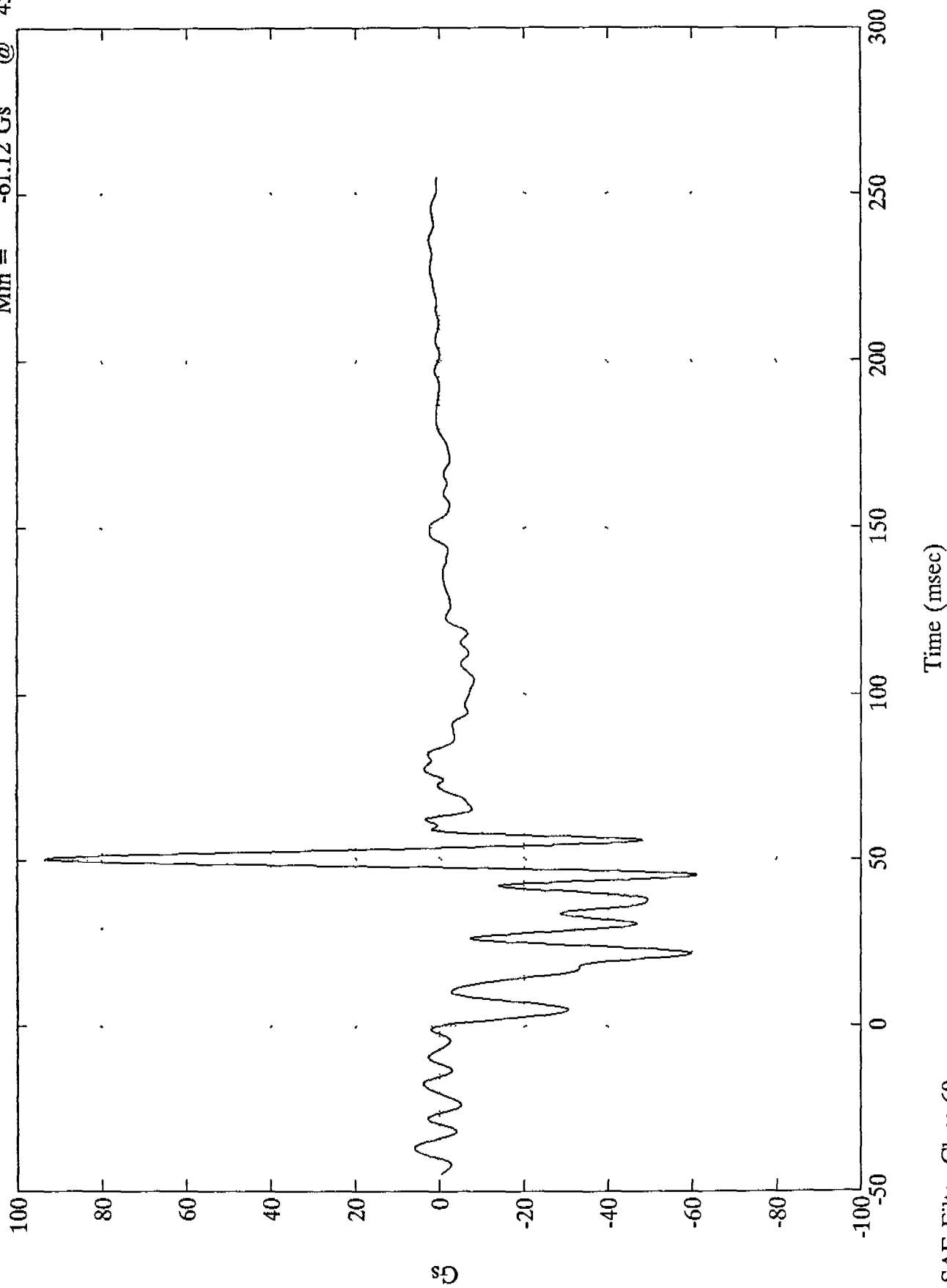




VTV TEST 9

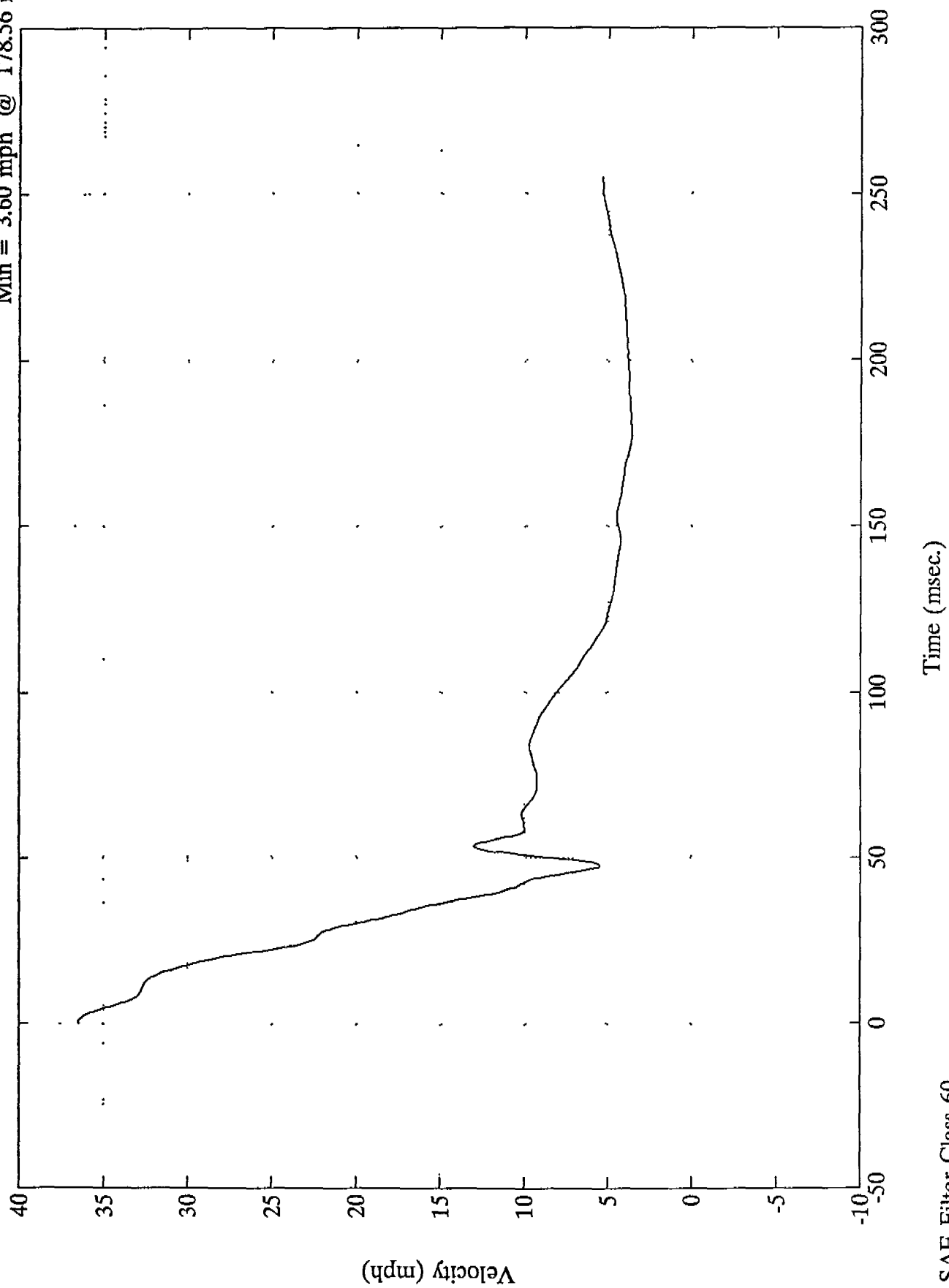
Veh. 2 Left Caliper (X)

Max = 93.39 Gs @ 50.40 msec
Min = -61.12 Gs @ 45.24 msec



Veh. 2 Left Caliper (X)

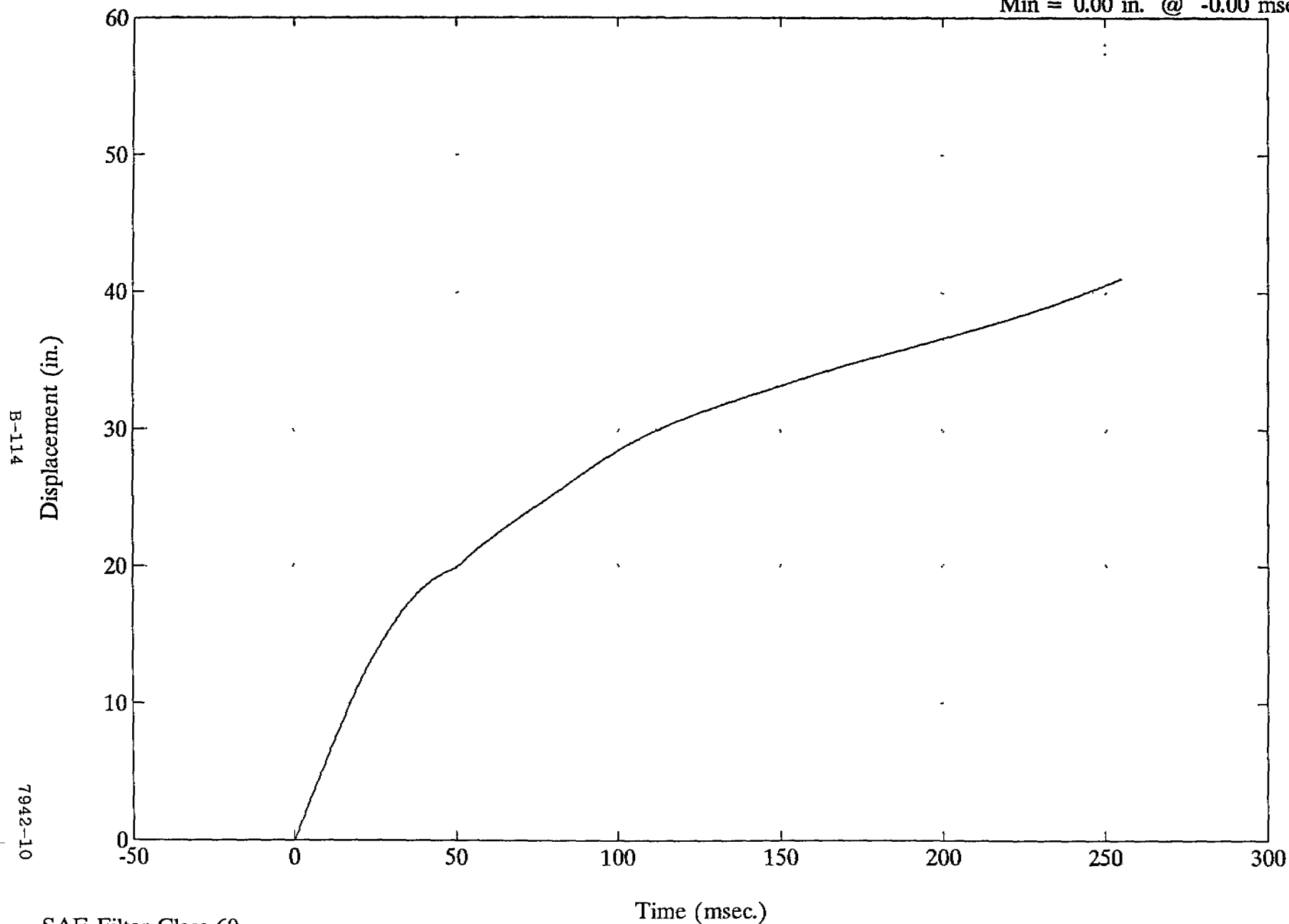
Max = 36.50 mph @ 0.24 msec
Min = 3.60 mph @ 178.56 msec



VTV TEST 9

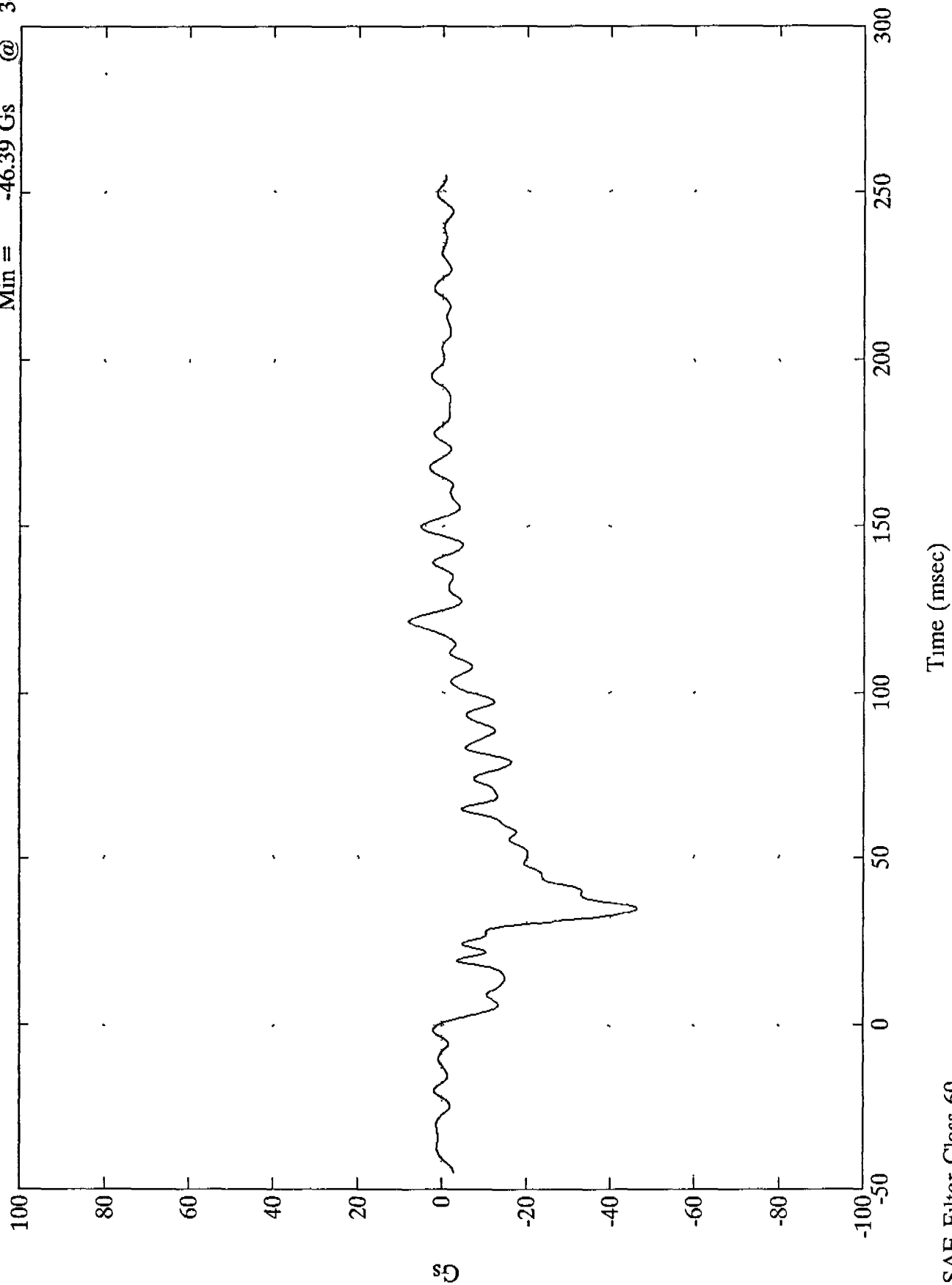
Veh. 2 Left Caliper (X)

Max = 41.01 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



Veh. 2 Right Caliper (X)

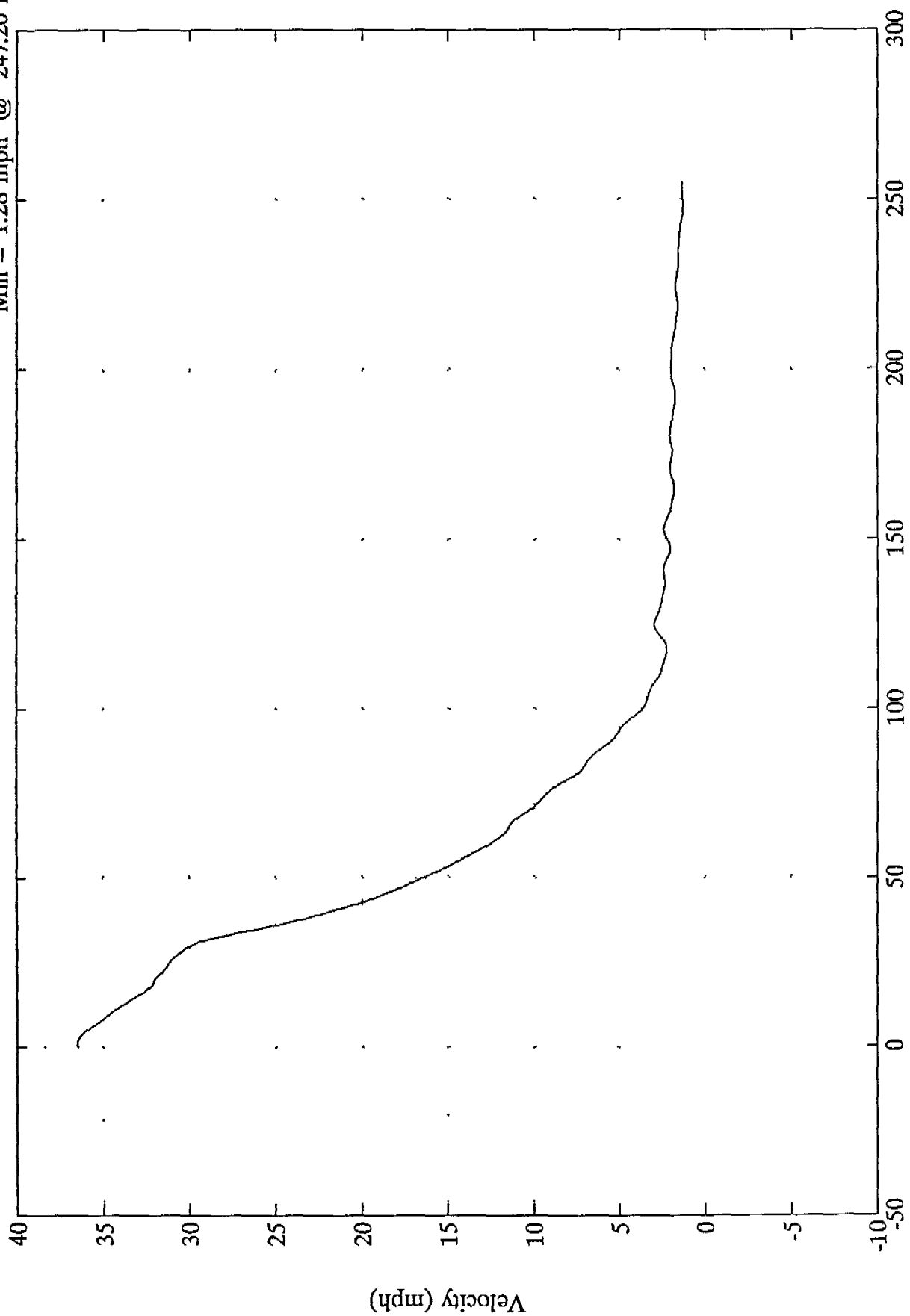
Max = 7.98 Gs @ 121.31 msec
Min = -46.39 Gs @ 34.79 msec



VTV TEST 9

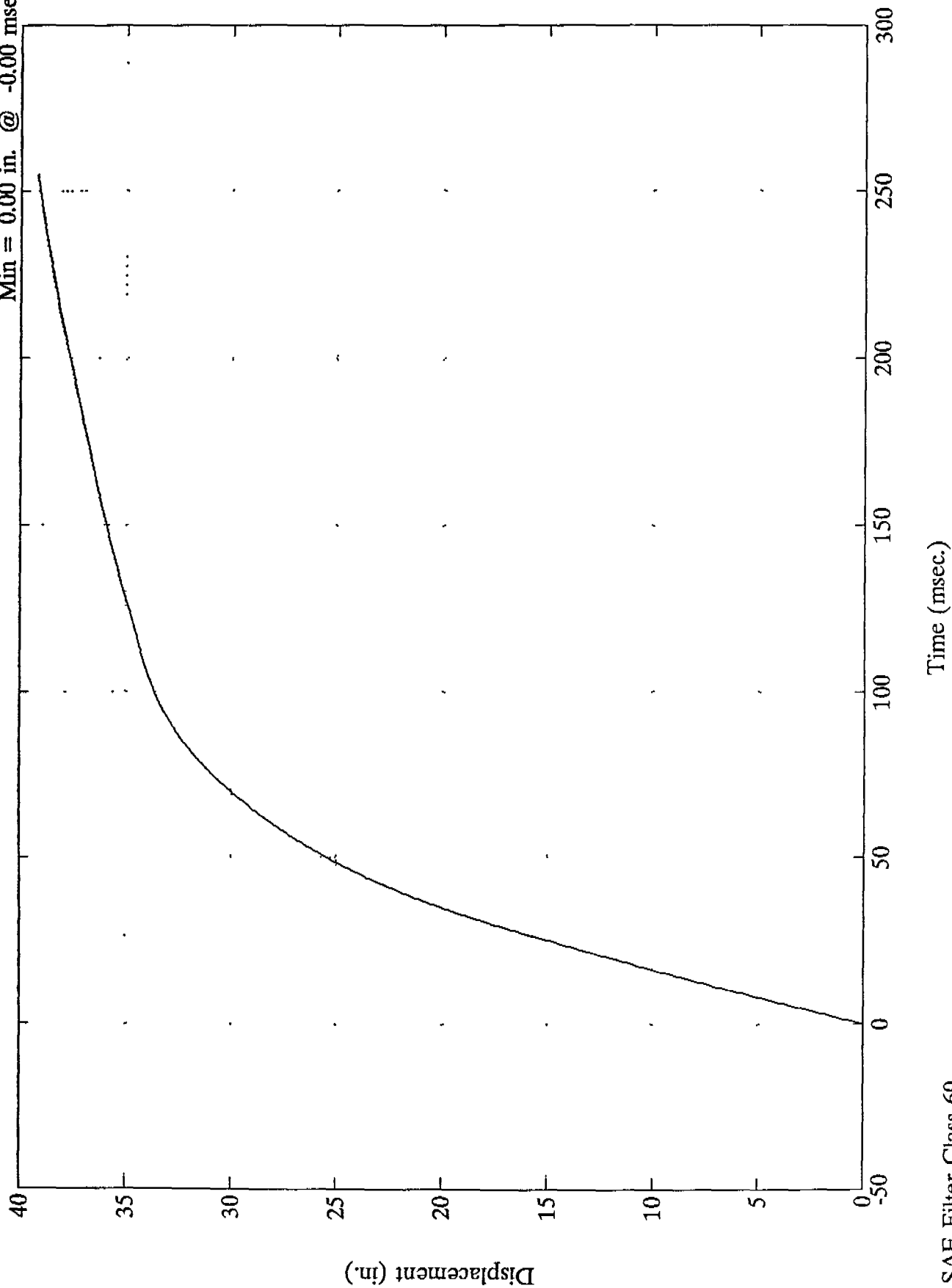
Veh. 2 Right Caliper (X)

Max = 36.50 mph @ 0.72 msec
Min = 1.28 mph @ 247.20 msec



Veh. 2 Right Caliper (X)

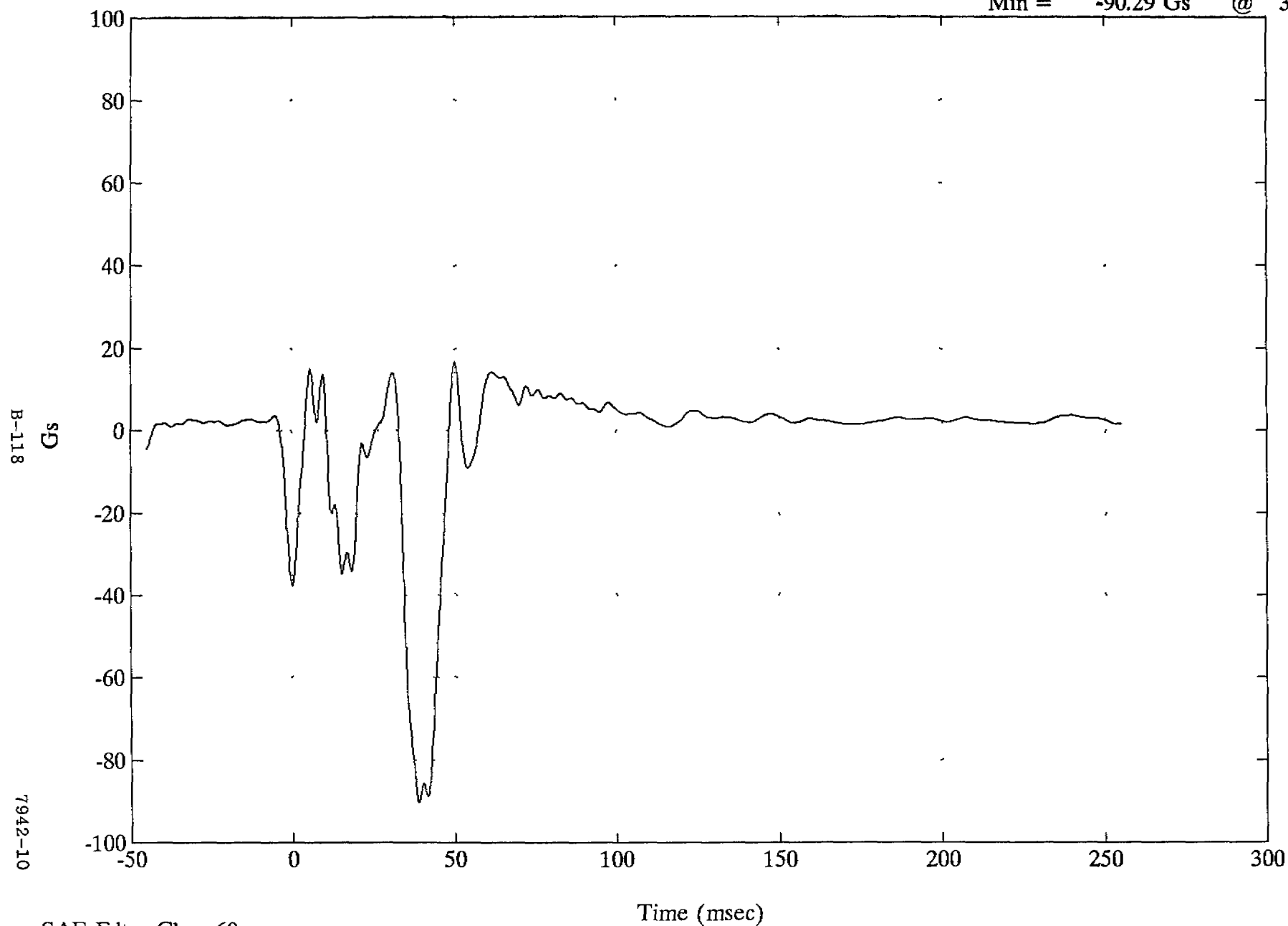
Max = 39.22 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



VTV TEST 9

Veh. 2 Toe Pan (X)

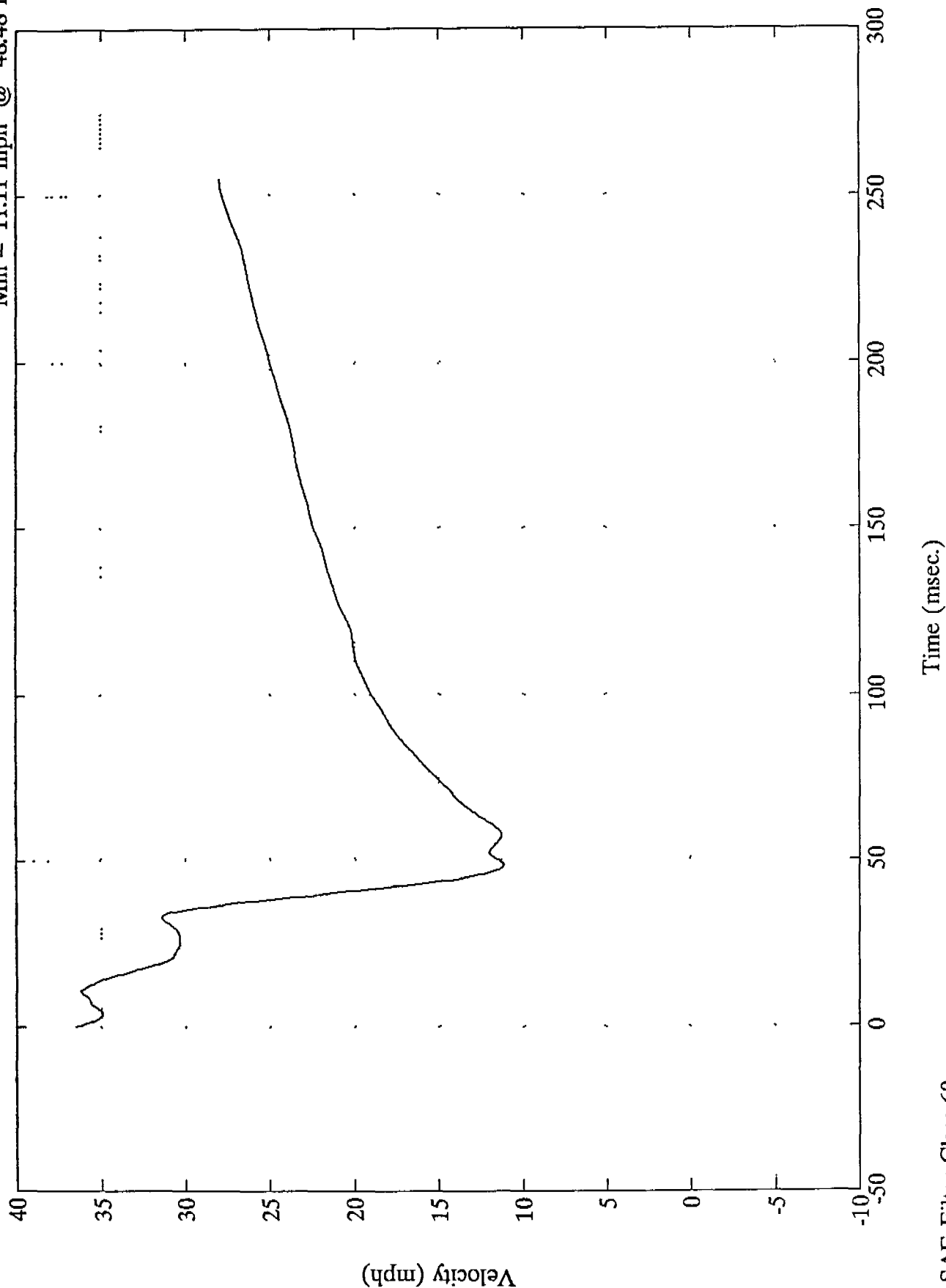
Max = 16.73 Gs @ 50.04 msec
Min = -90.29 Gs @ 38.75 msec



SAE Filter Class 60

Veh. 2 Toe Pan (X)

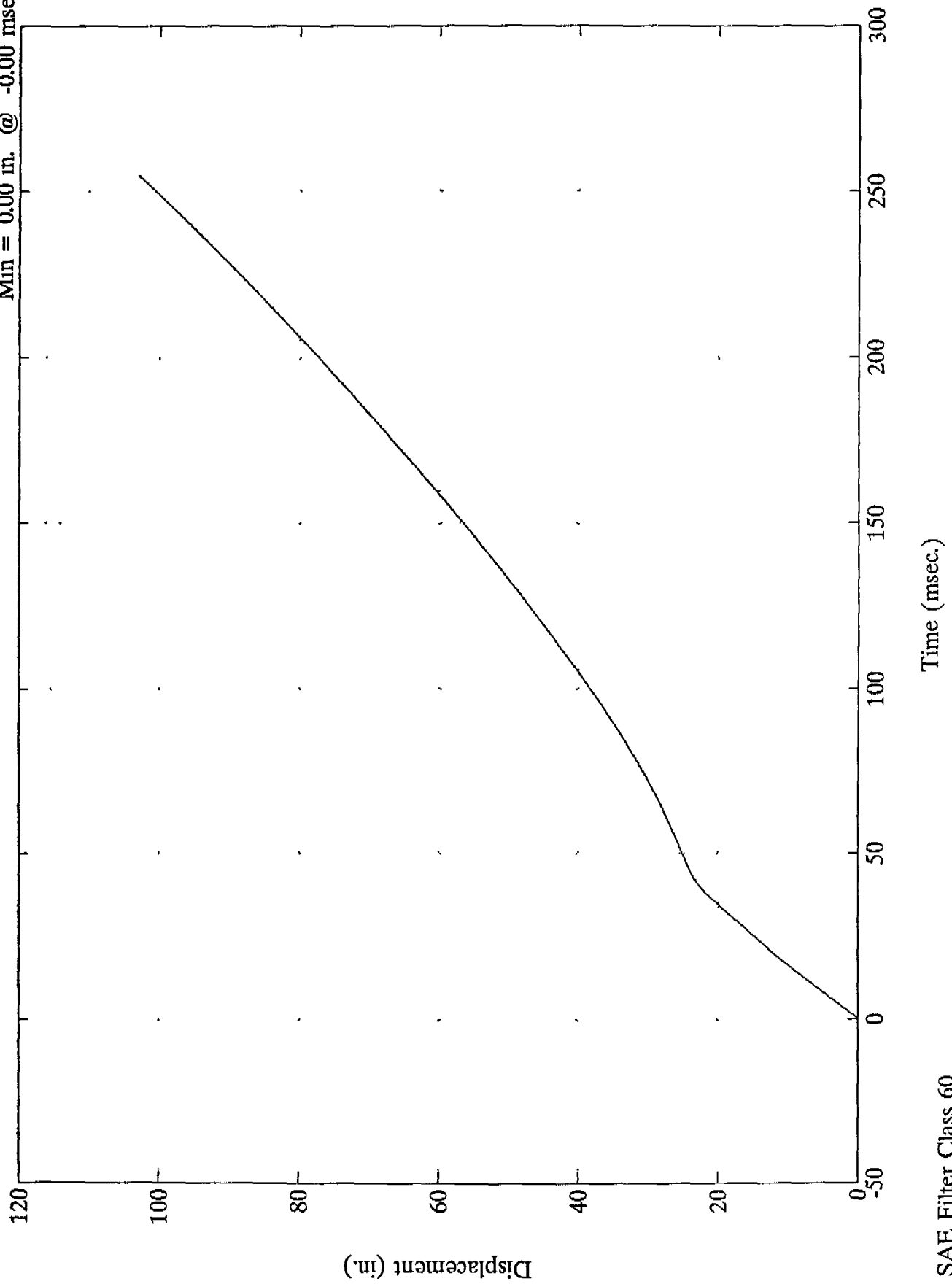
Max = 36.50 mph @ -0.00 msec
Min = 11.11 mph @ 48.48 msec



VTV TEST 9

Veh. 2 Toe Pan (X)

Max = 103.00 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



TEST NO. Y43-9-1228

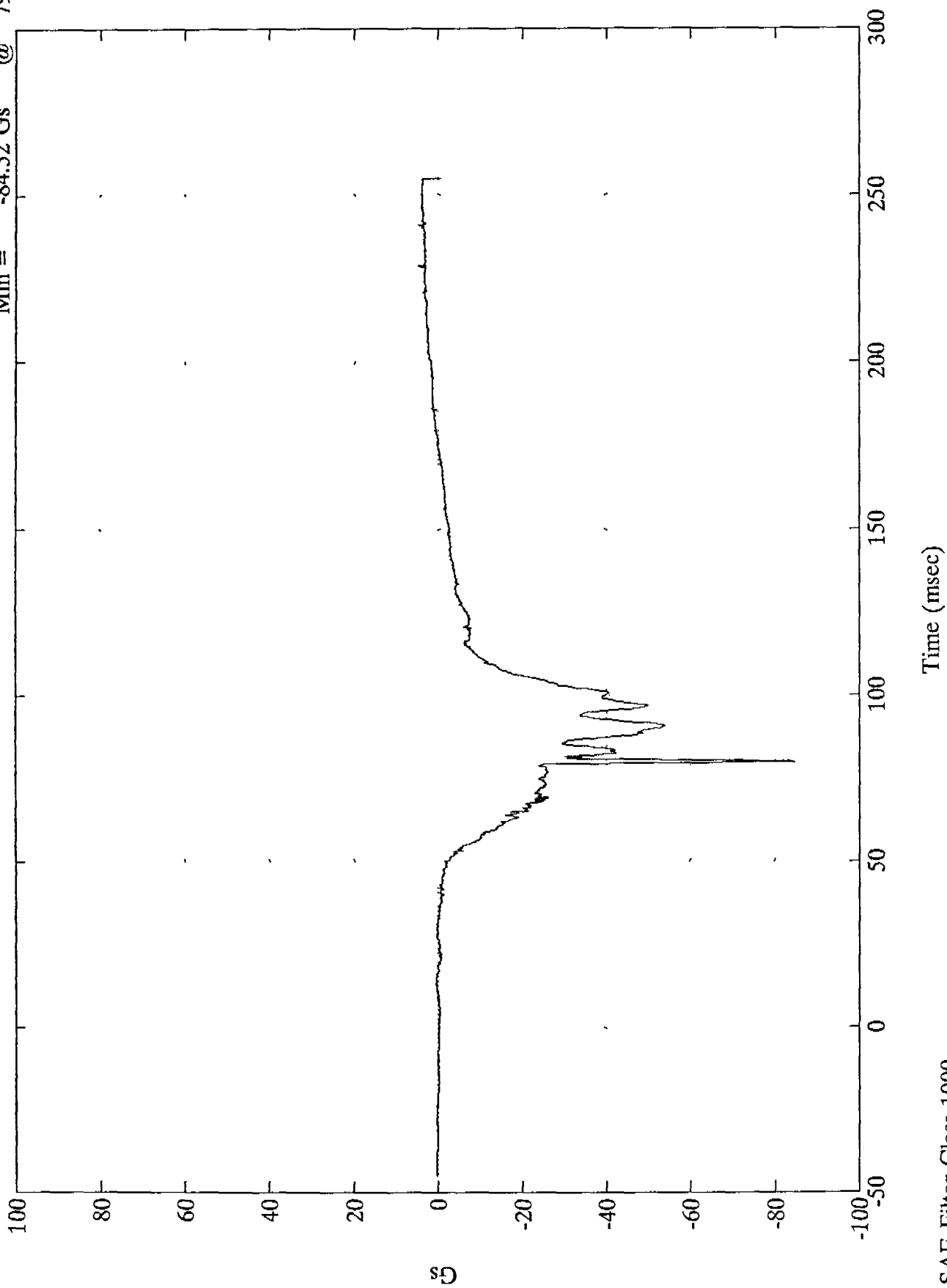
DUMMY DATA

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

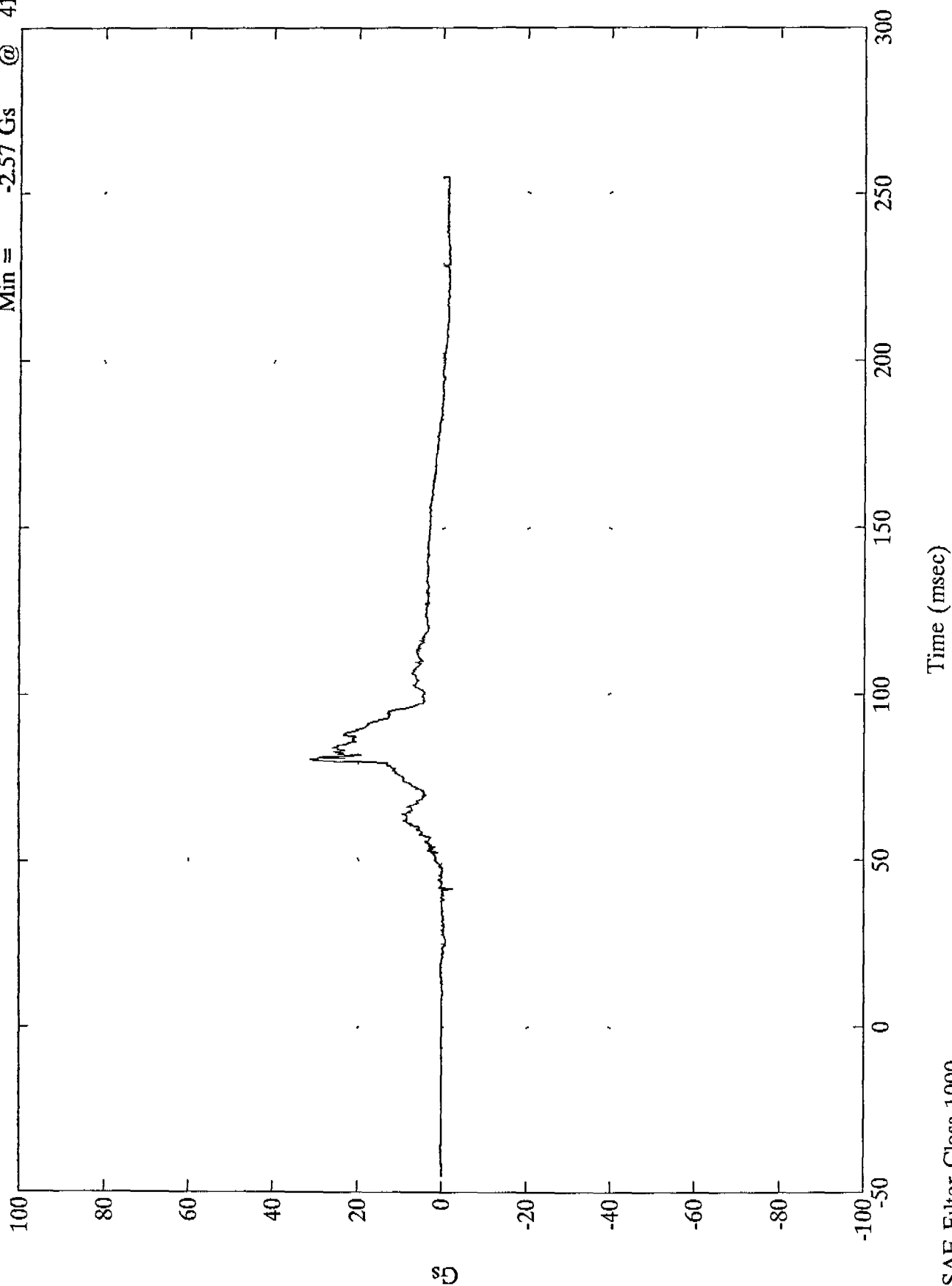
Veh.2-Pos.1 Head X

Max = 4.79 Gs @ 228.48 msec
Min = -84.52 Gs @ 79.91 msec



VTV TEST 9

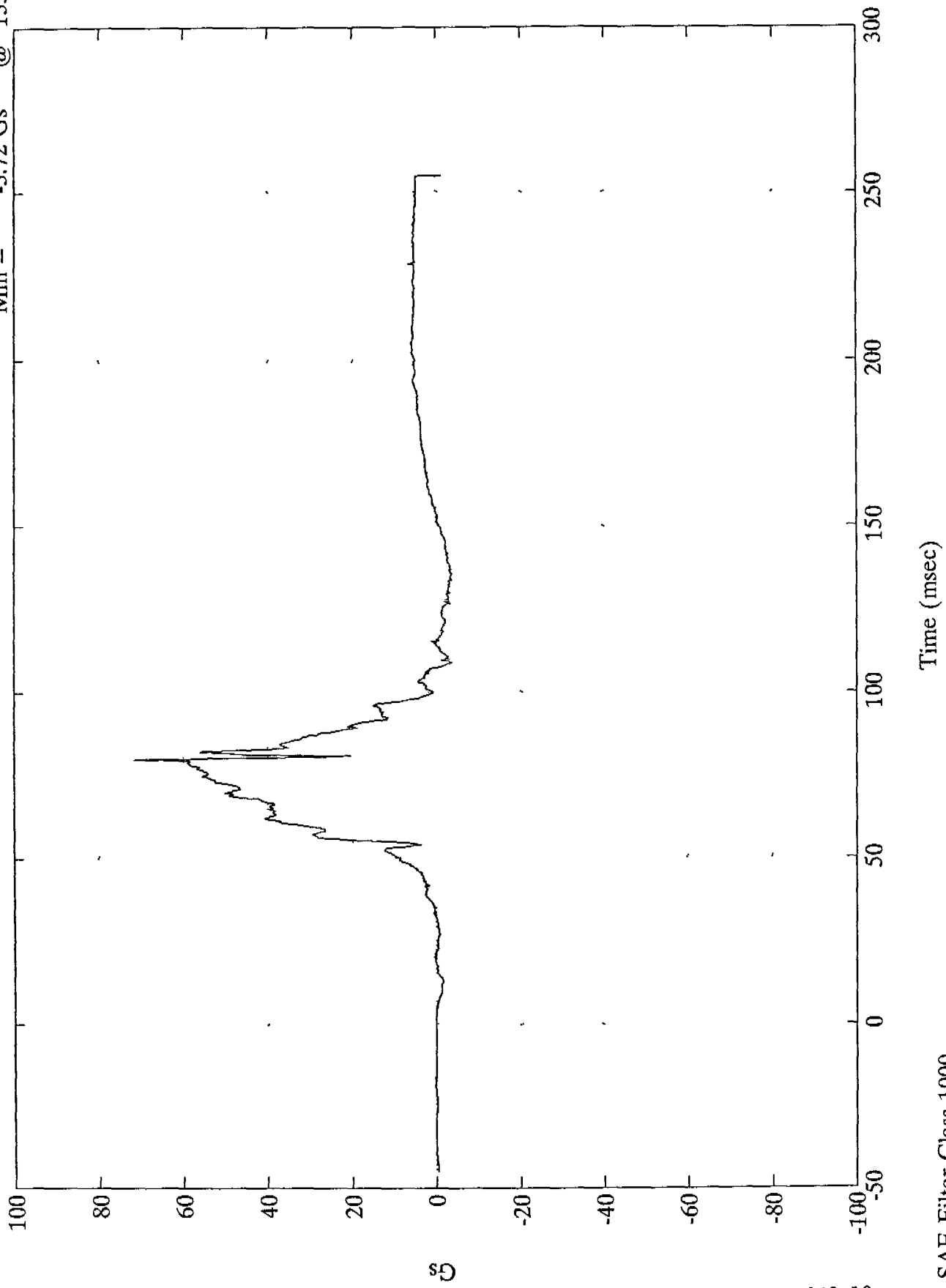
Veh.2-Pos.1 Head Y Max = 31.45 Gs @ 80.27 msec
Min = -2.57 Gs @ 41.52 msec



VTV TEST 9

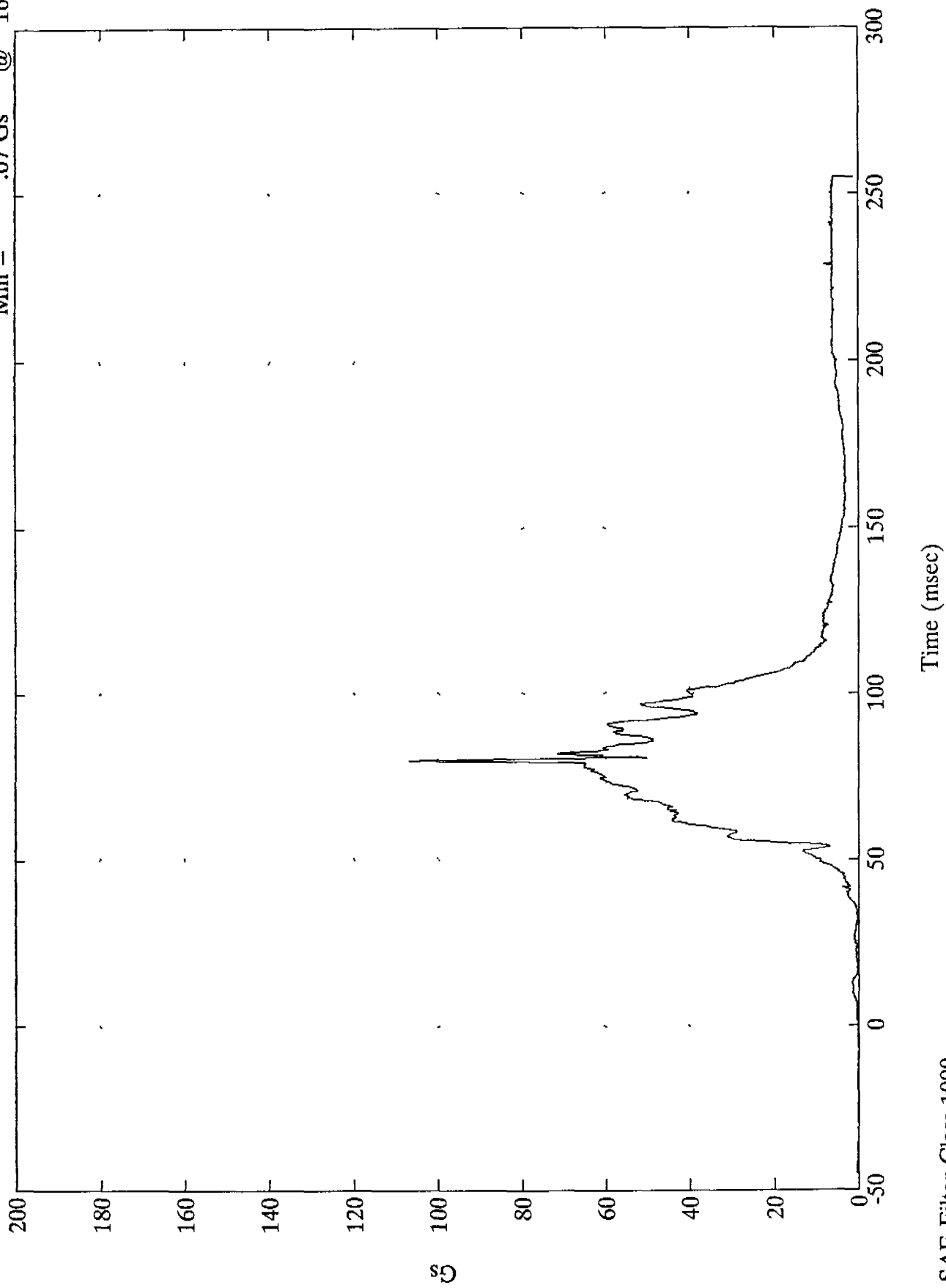
Veh.2-Pos.1 Head Z

Max = 71.55 Gs @ 79.56 msec
Min = -3.72 Gs @ 135.47 msec



Veh.2-Pos.1 Head Result.

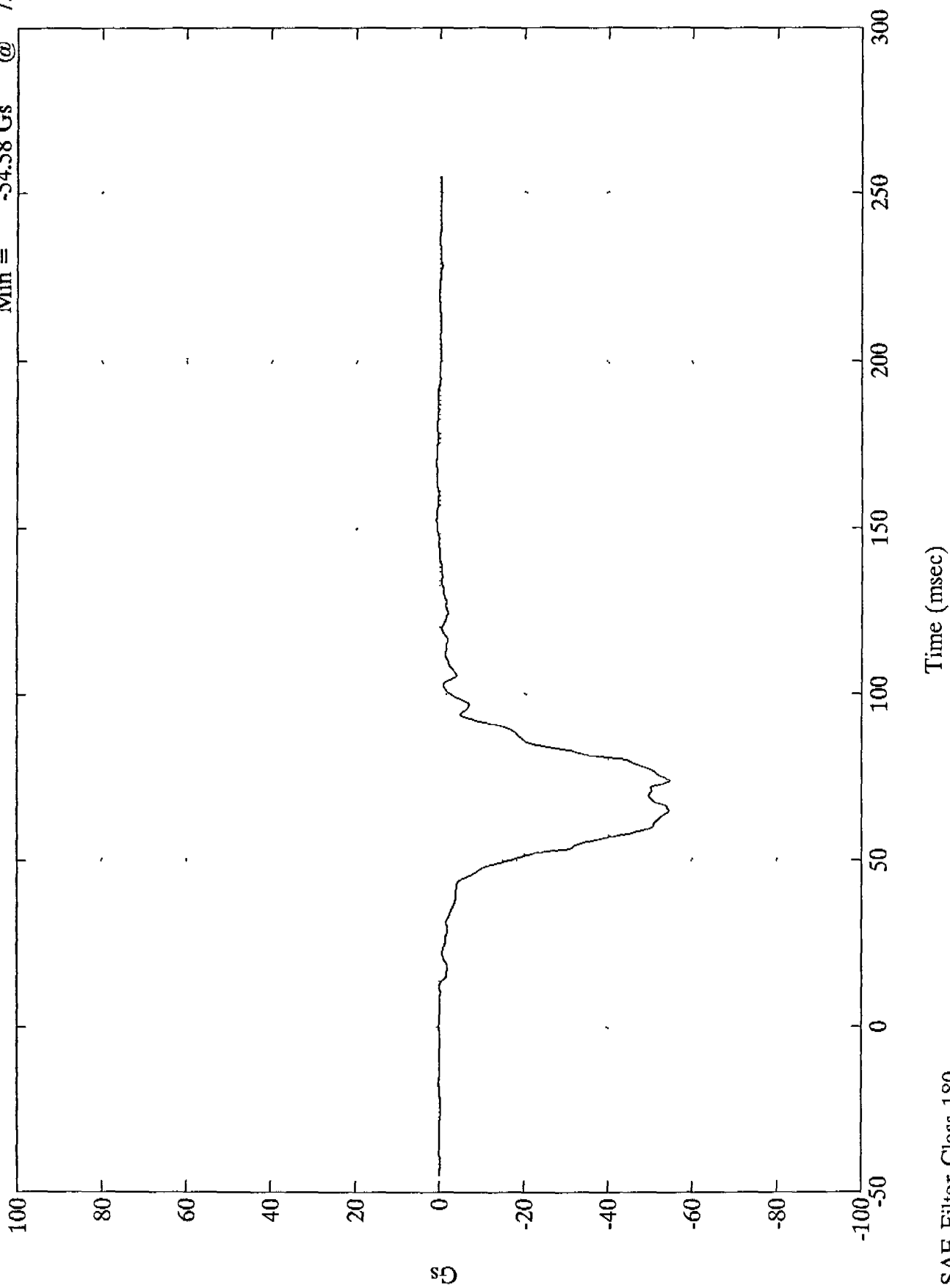
Max = 106.83 Gs @ 79.91 msec
 Min = .07 Gs @ 16.31 msec



VTV TEST 9

Veh.2-Pos.1 Chest X

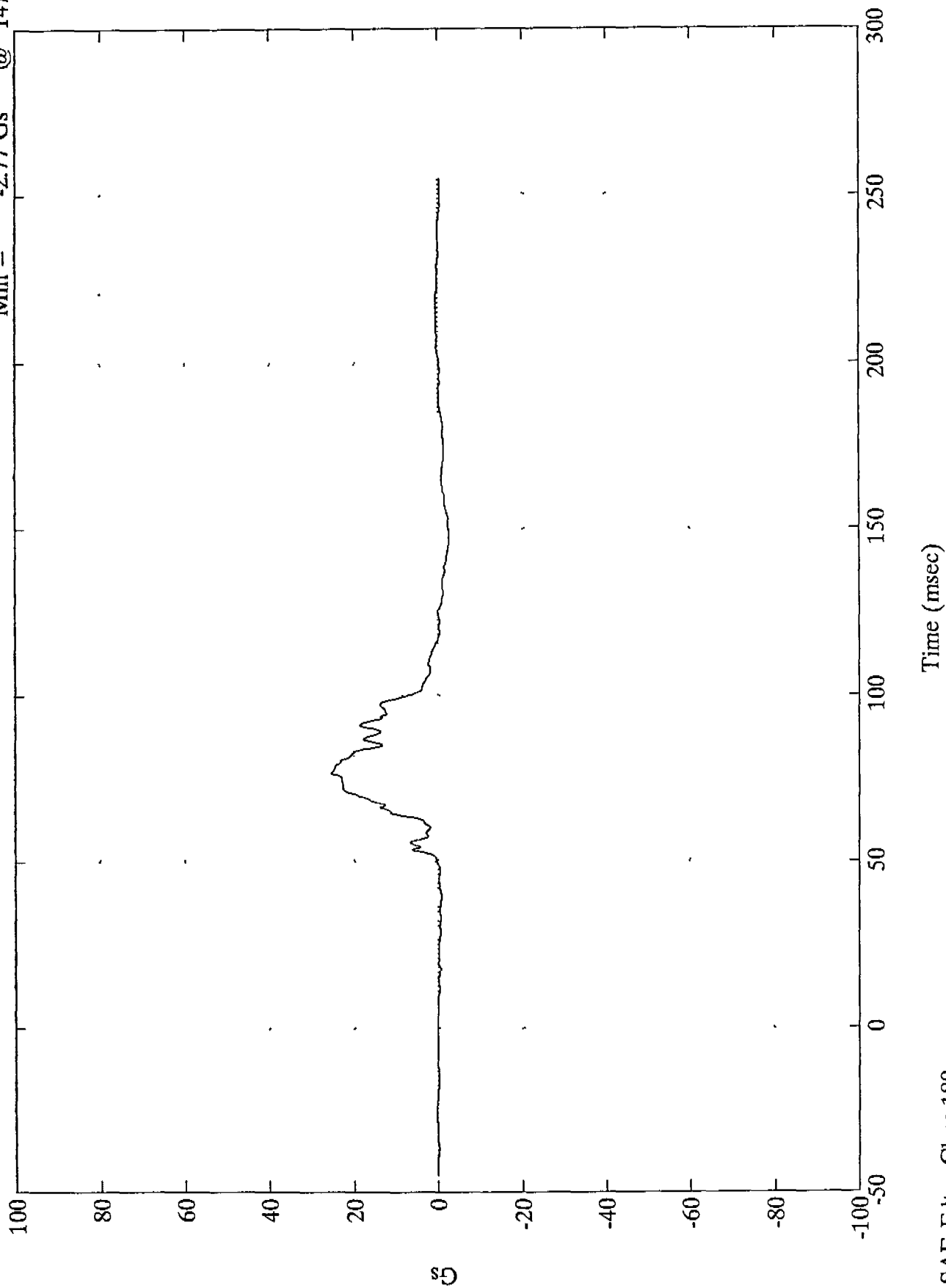
Max = .86 Gs @ 169.08 msec
Min = -54.58 Gs @ 73.92 msec



VTV TEST 9

Veh.2-Pos.1 Chest Y

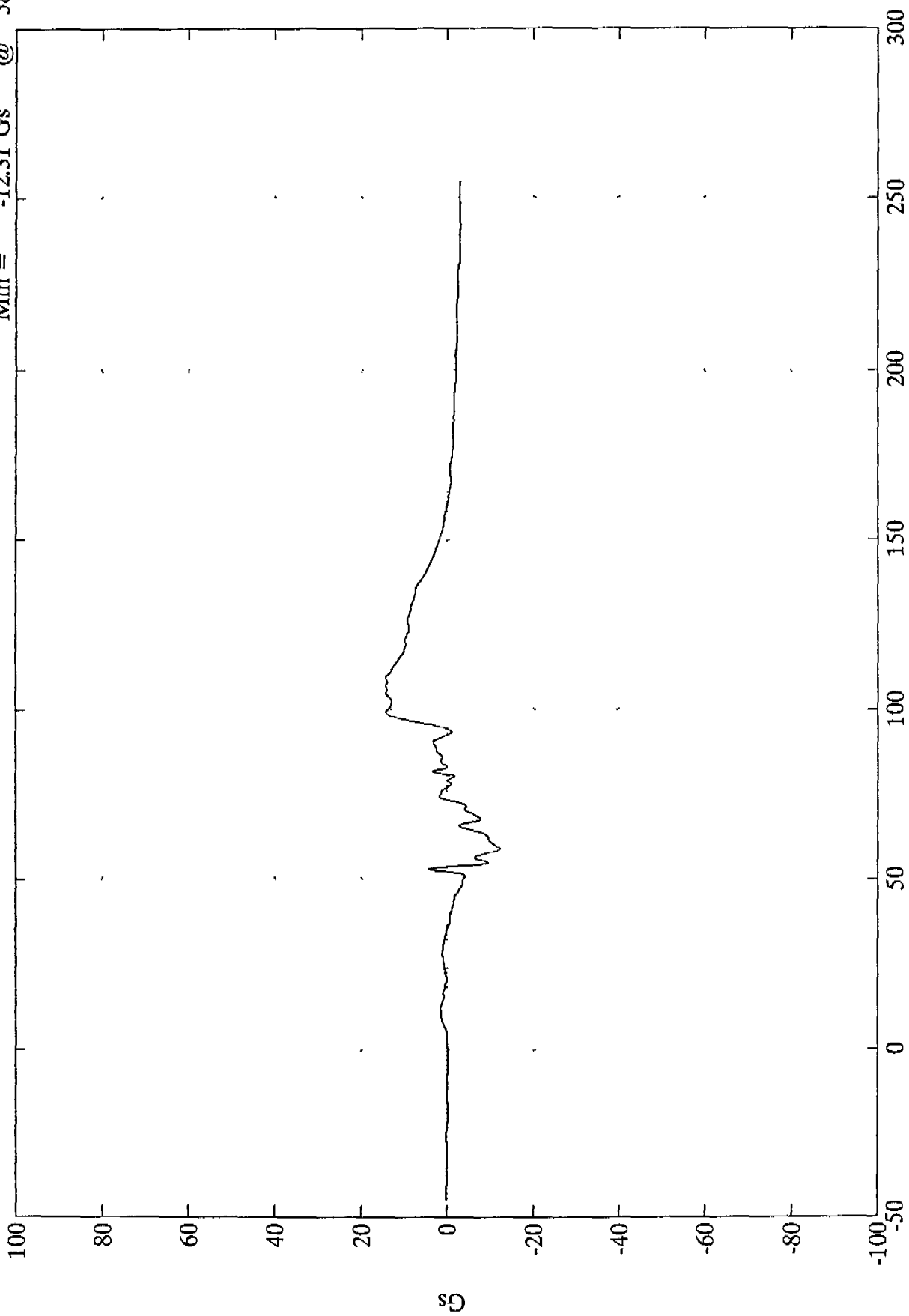
Max = 25.30 Gs @ 76.55 msec
Min = -2.77 Gs @ 147.84 msec



VTV TEST 9

Veh.2-Pos.1 Chest Z

Max =	14.39 Gs	@	109.31 msec
Min =	-12.31 Gs	@	58.91 msec



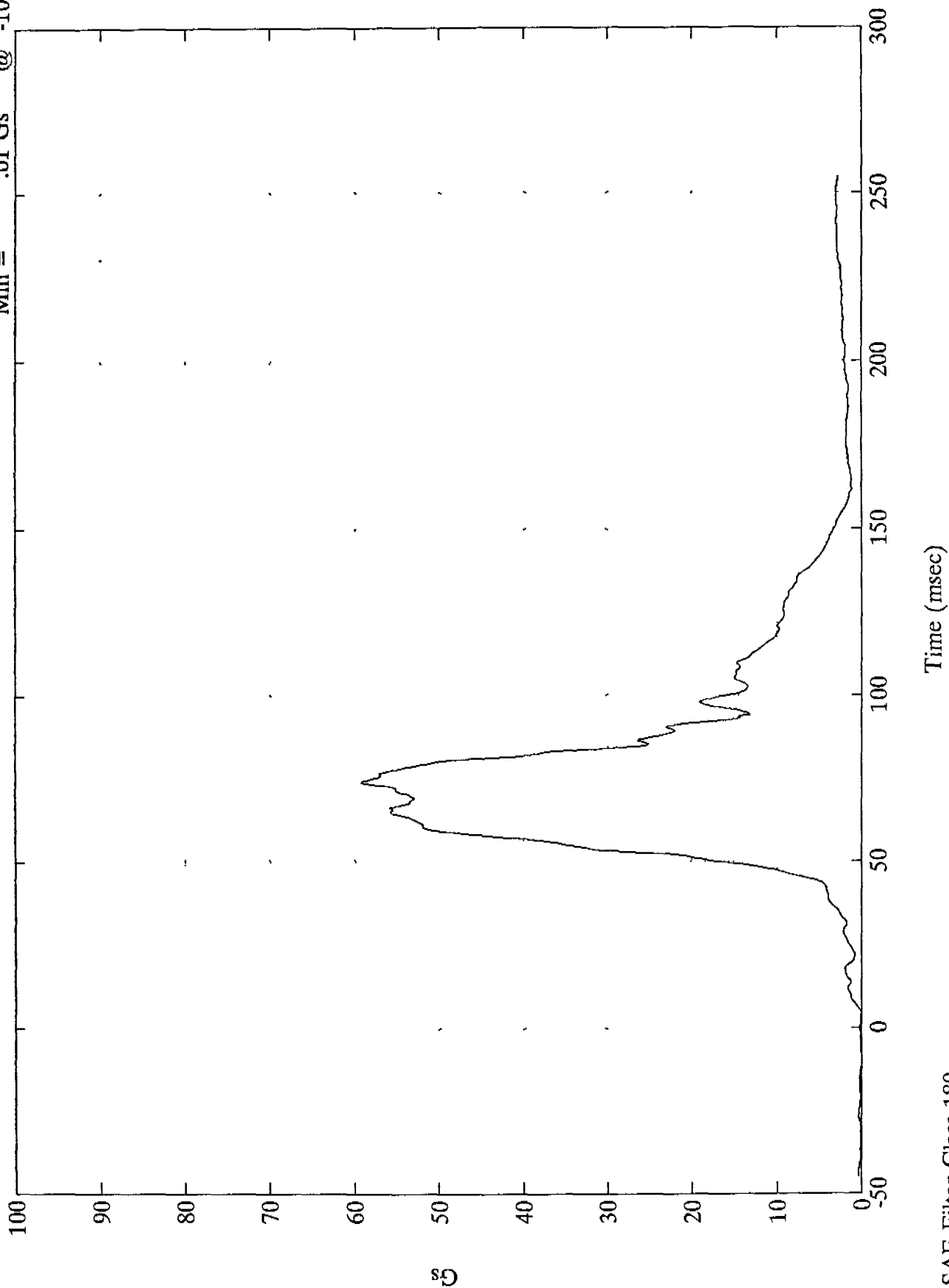
Time (msec)

SAE Filter Class 180

VTV TEST 9

Veh.2-Pos.1 Chest Result.

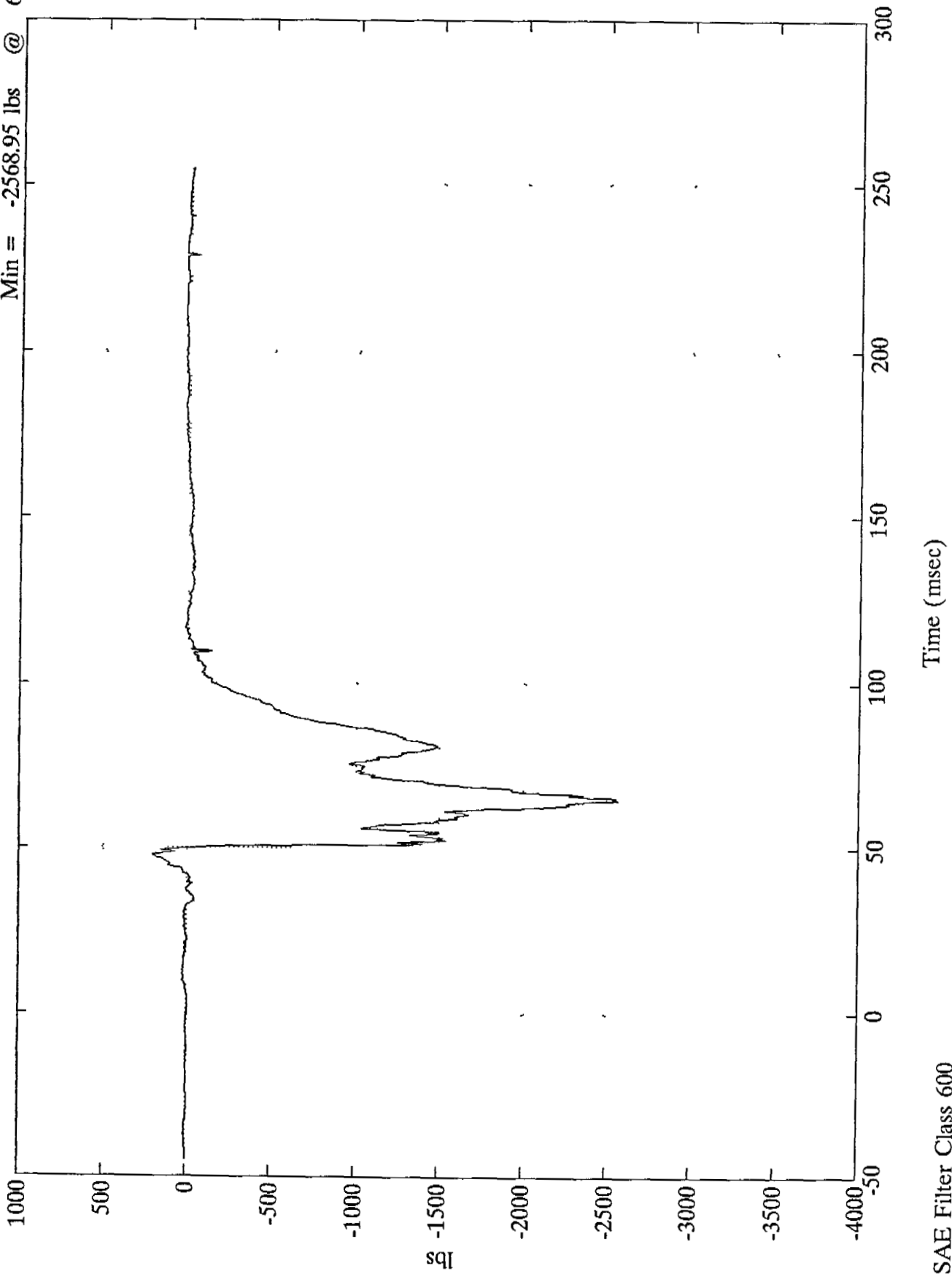
Max = 59.20 Gs @ 74.04 msec
Min = .01 Gs @ -10.08 msec

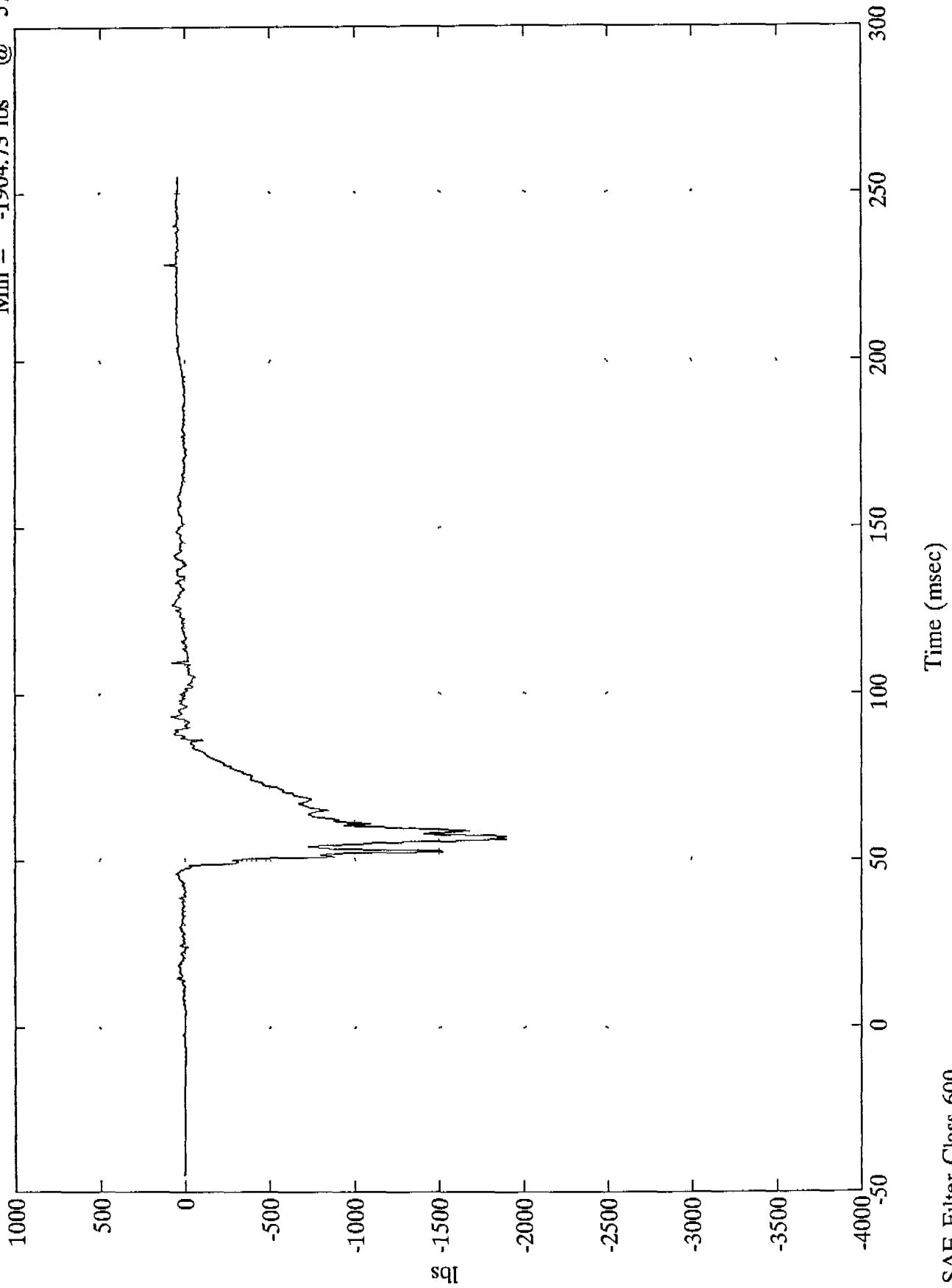


VTV TEST 9

Veh.2-Pos.1 Left Femur

Max = 201.12 lbs @ 47.63 msec
Min = -2568.95 lbs @ 64.56 msec

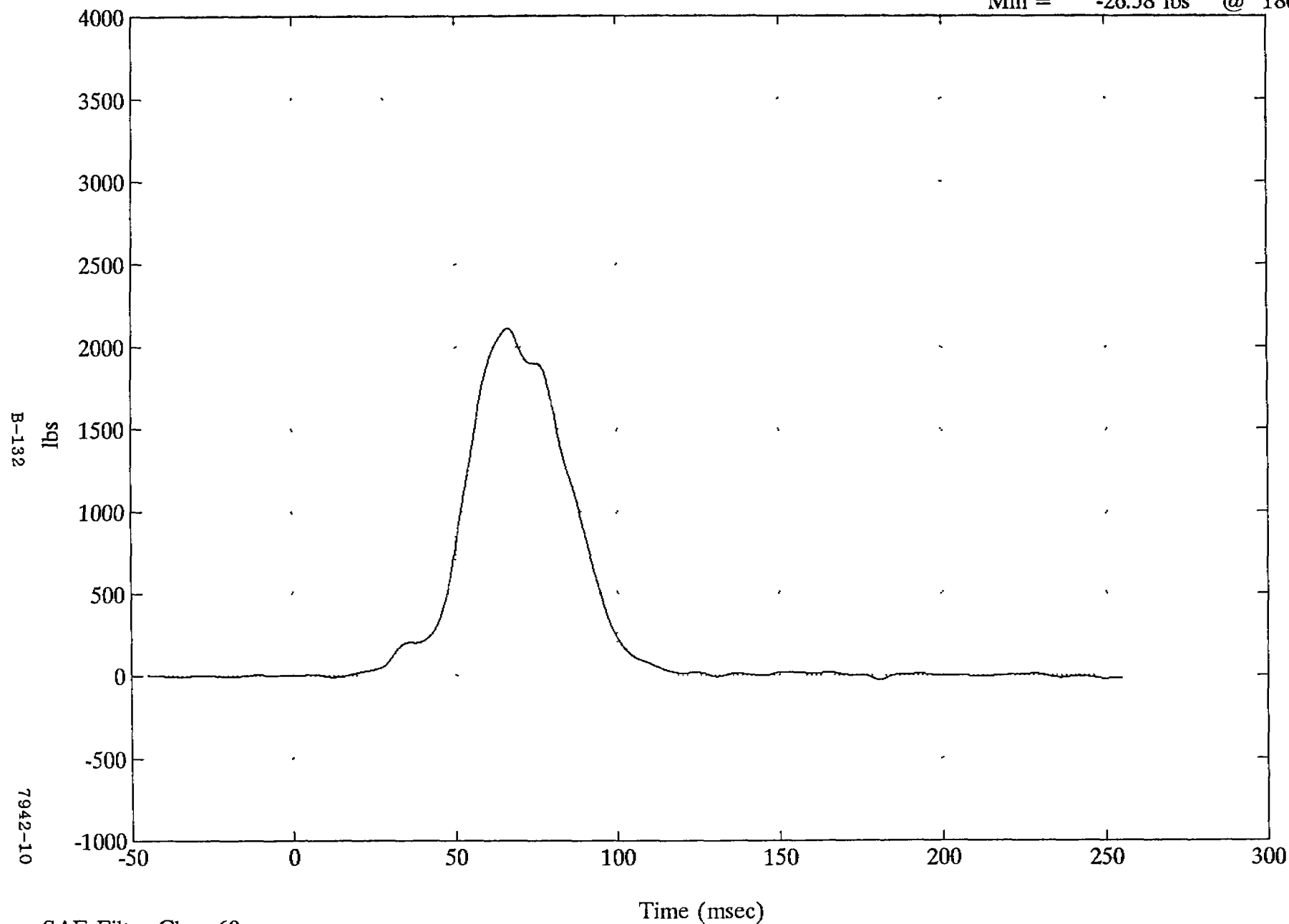




VTV TEST 9

Veh. 2 Torso Belt L.C.

Max = 2111.49 lbs @ 66.23 msec
Min = -26.58 lbs @ 180.24 msec

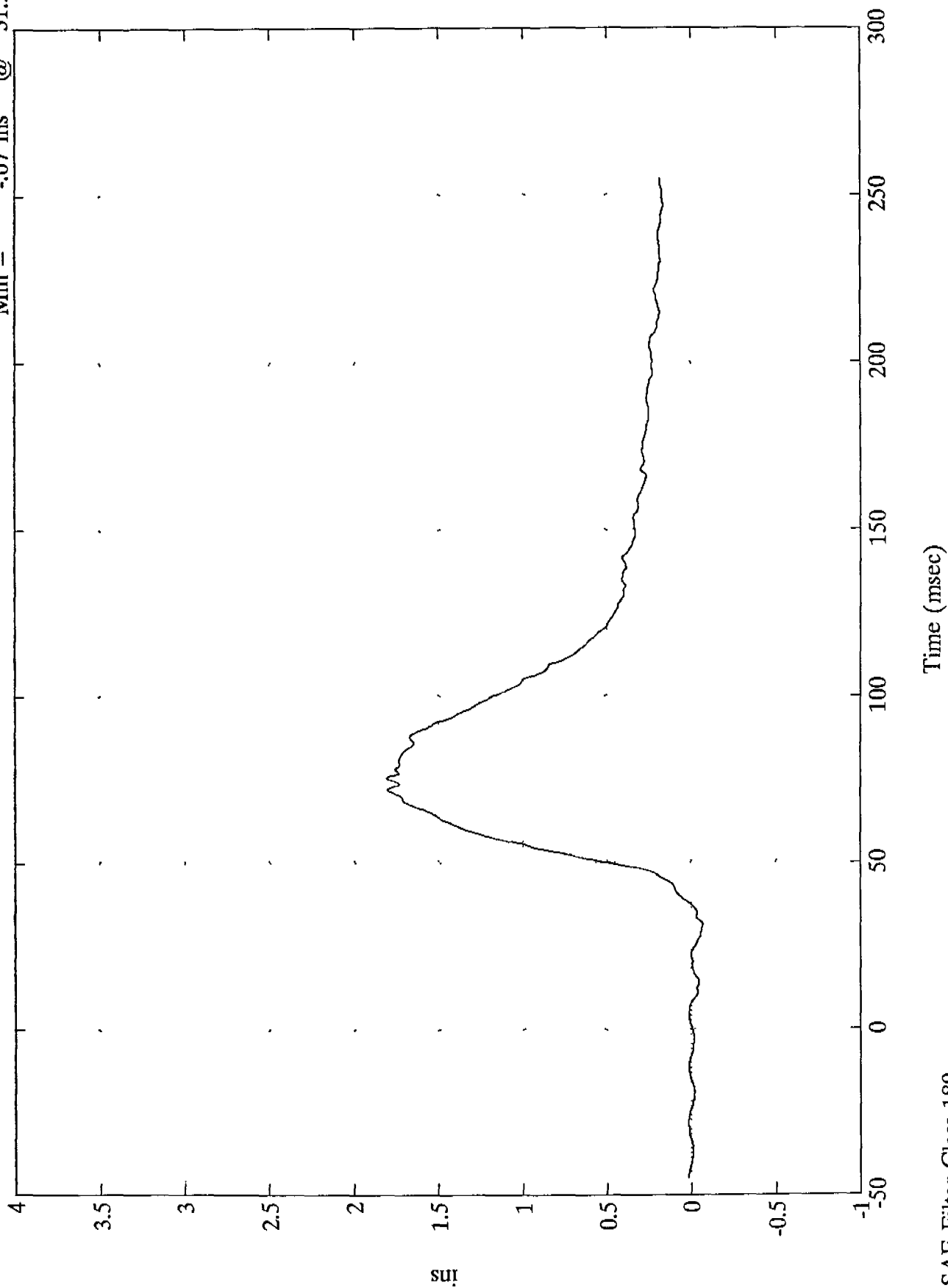


SAE Filter Class 60

VTV TEST 9

Veh.2-Pos.1 Chest Displ.

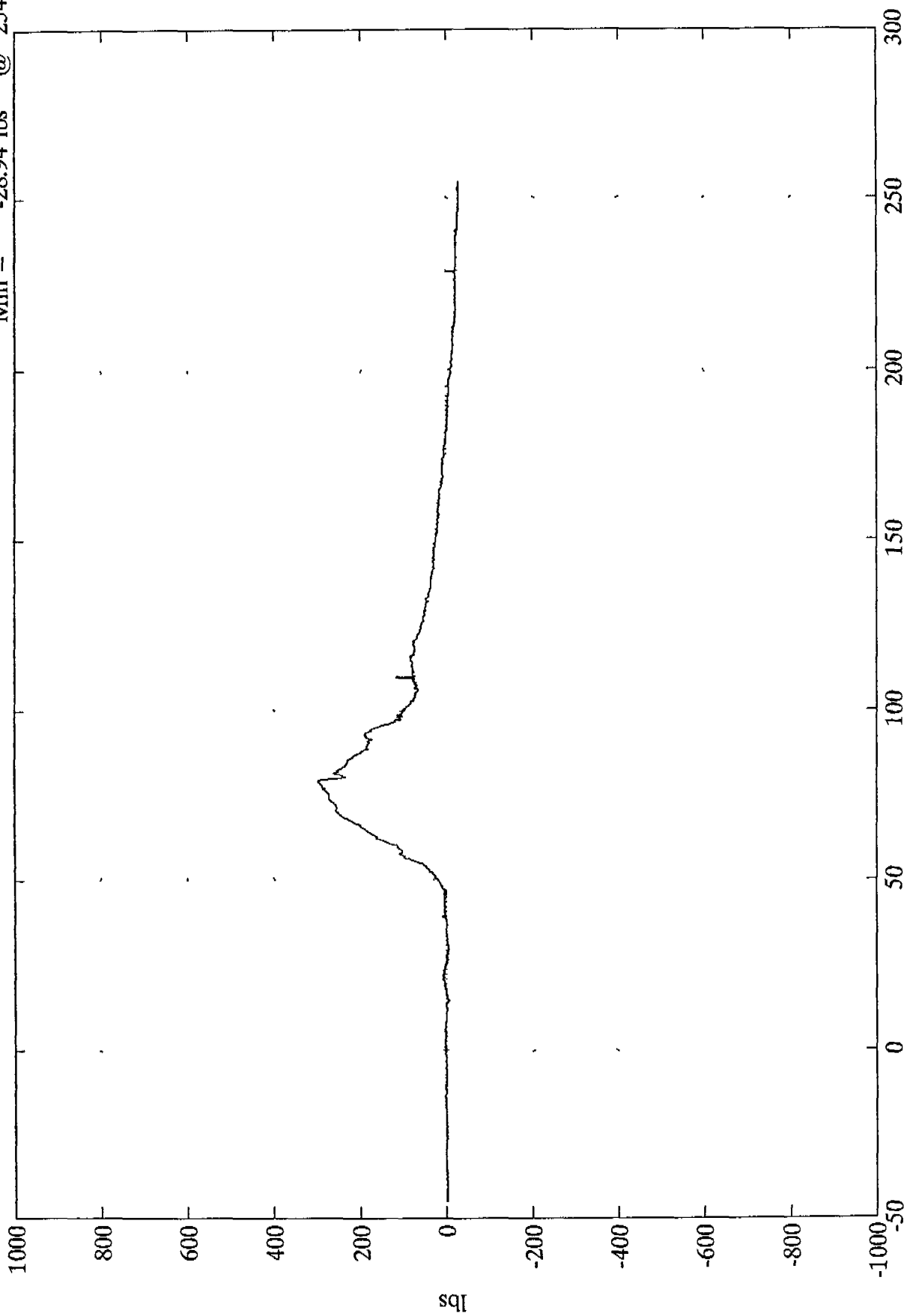
Max = 1.81 ins @ 75.23 msec
Min = -.07 ins @ 31.31 msec



VTV TEST 9

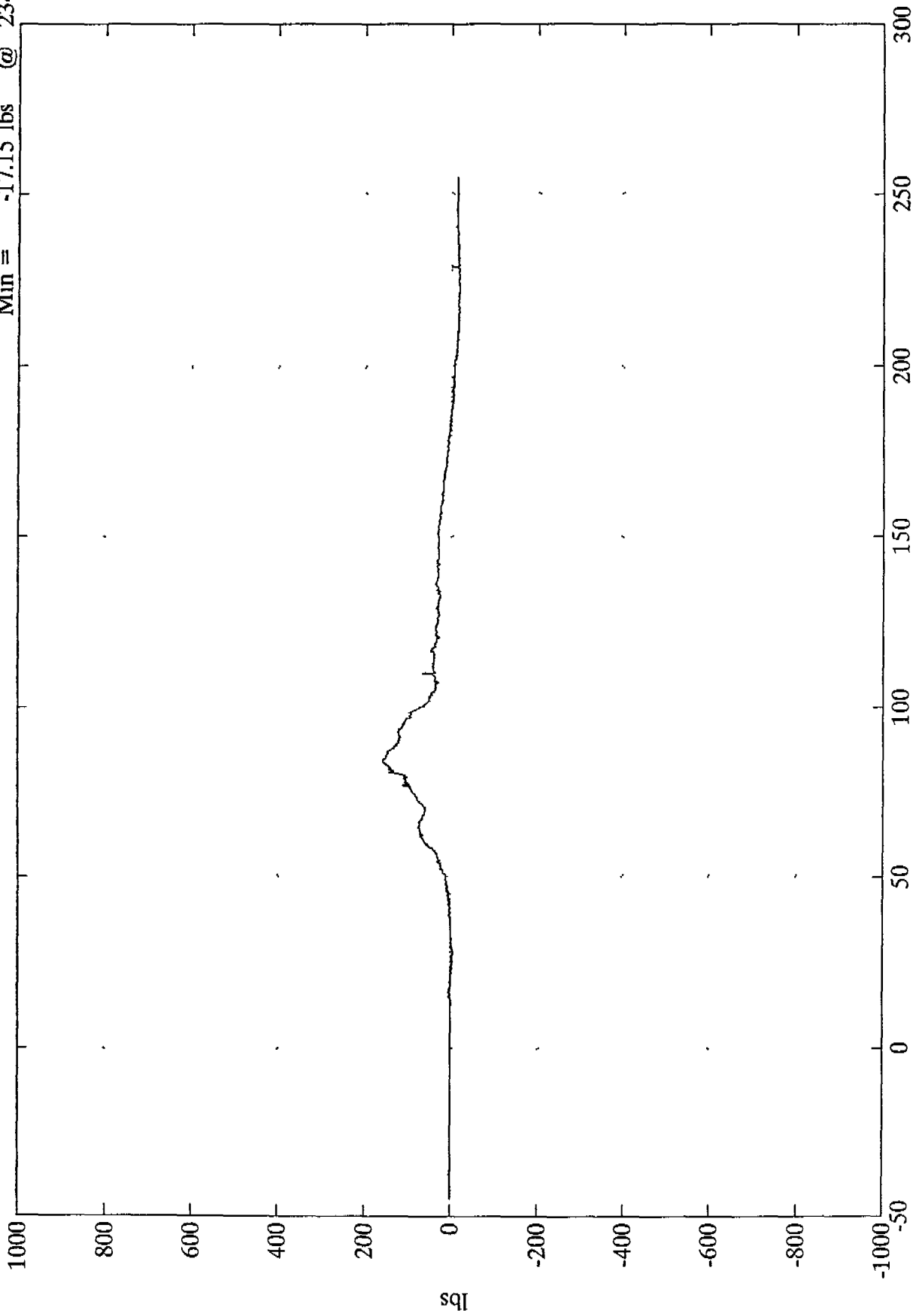
Veh.2-Pos.1 Upper Neck Fx

Max = 298.93 lbs @ 78.95 msec
Min = -28.94 lbs @ 254.88 msec



Veh.2-Pos.1 Upper Neck Fy

Max = 157.63 lbs @ 84.24 msec
Min = -17.15 lbs @ 234.12 msec



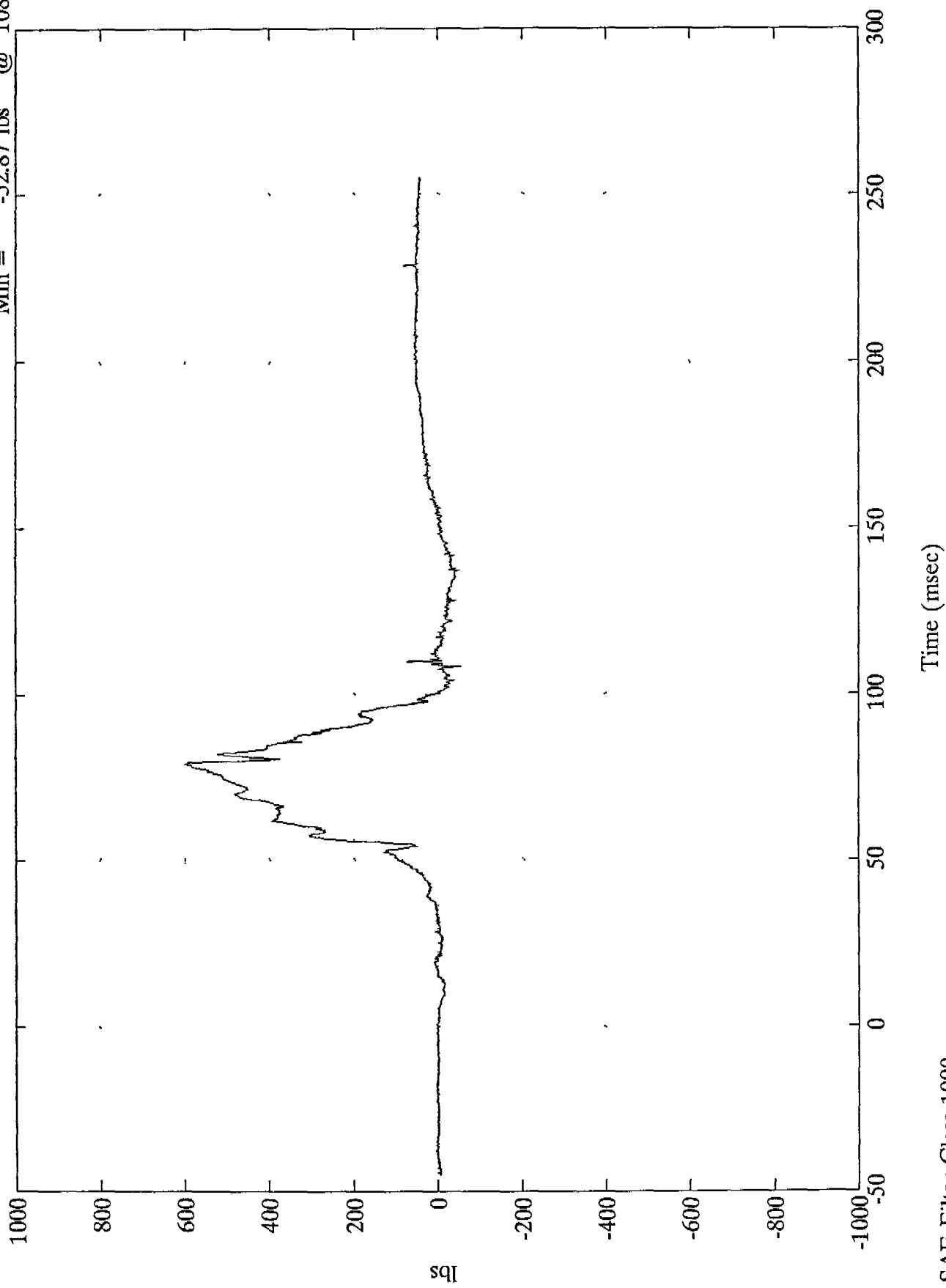
Time (msec)

SAE Filter Class 1000

VTV TEST 9

Veh.2-Pos.1 Upper Neck Fz

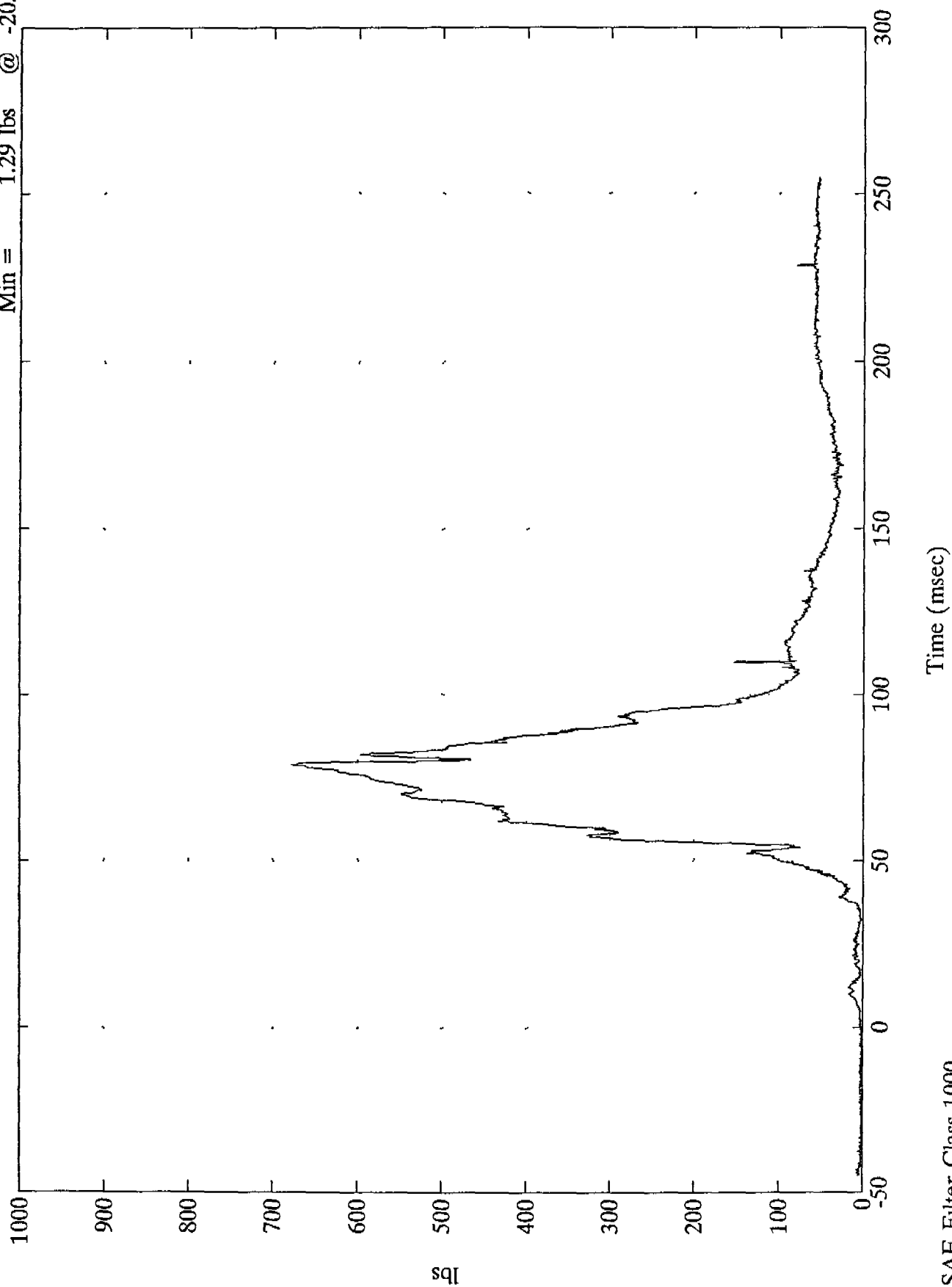
Max = 598.70 lbs @ 78.84 msec
Min = -52.87 lbs @ 108.00 msec



VTV TEST 9

Veh.2-Pos.1 Neck Force Re

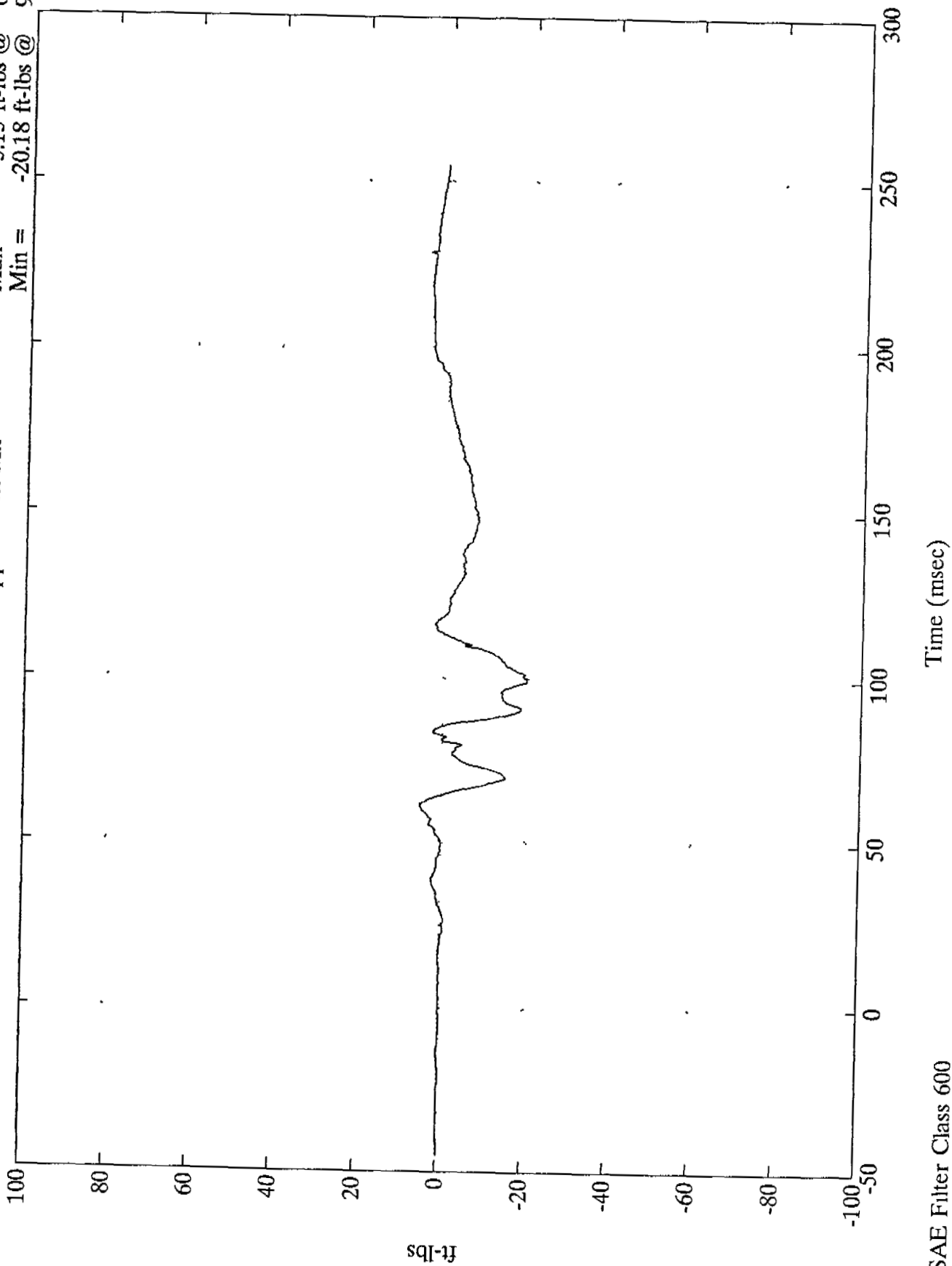
Max = 678.20 lbs @ 78.84 msec
Min = 1.29 lbs @ -20.64 msec



VTV TEST 9

Veh.2-Pos.1 Upper Neck Mx

Max = 5.15 ft-lbs @ 61.08 msec
Min = -20.18 ft-lbs @ 99.24 msec



sqi-1j

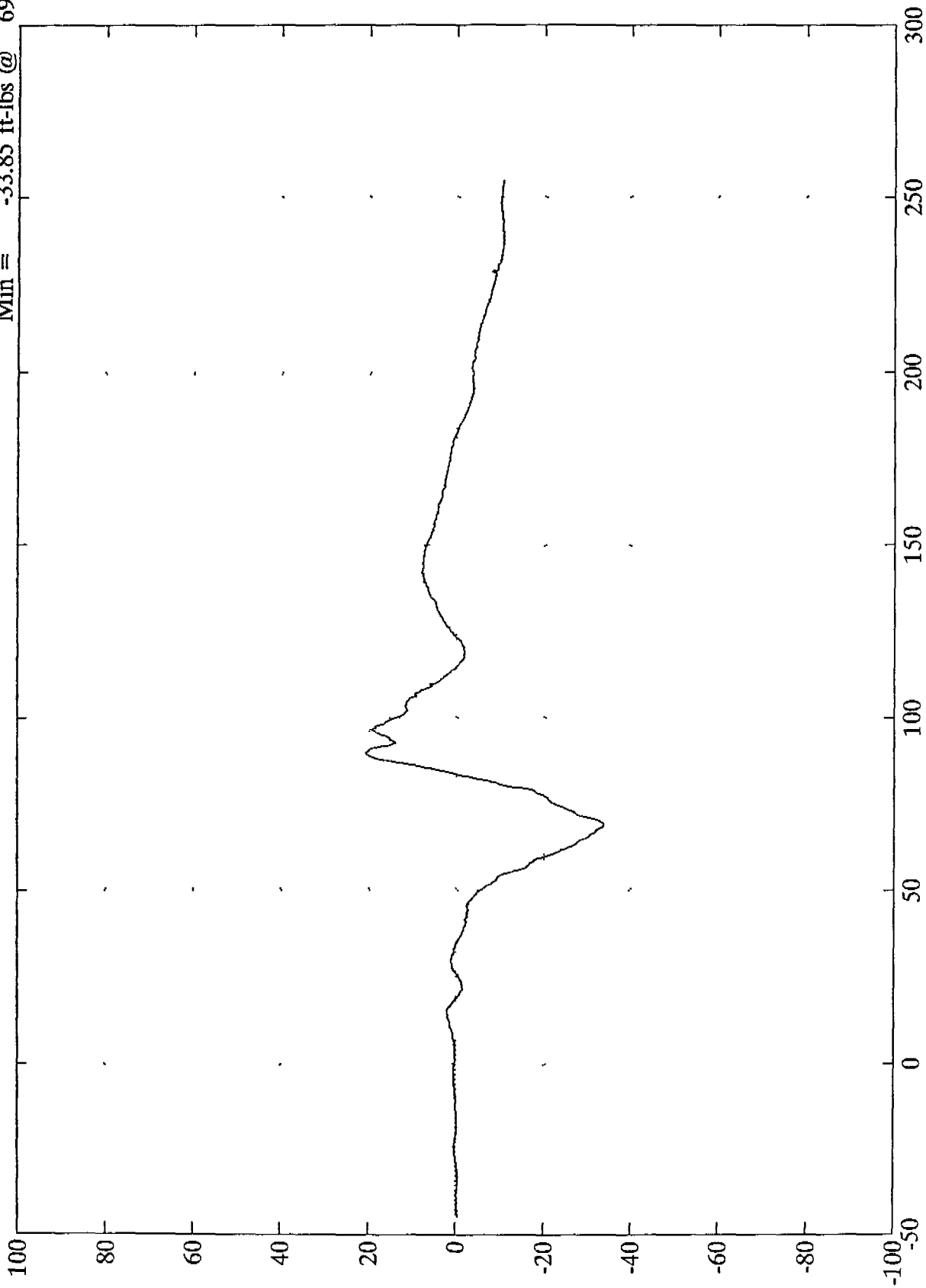
B-138

7942-10

SAE Filter Class 600

Veh.2-Pos.1 Upper Neck My

Max = 20.68 ft-lbs @ 89.63 msec
 Min = -33.85 ft-lbs @ 69.00 msec



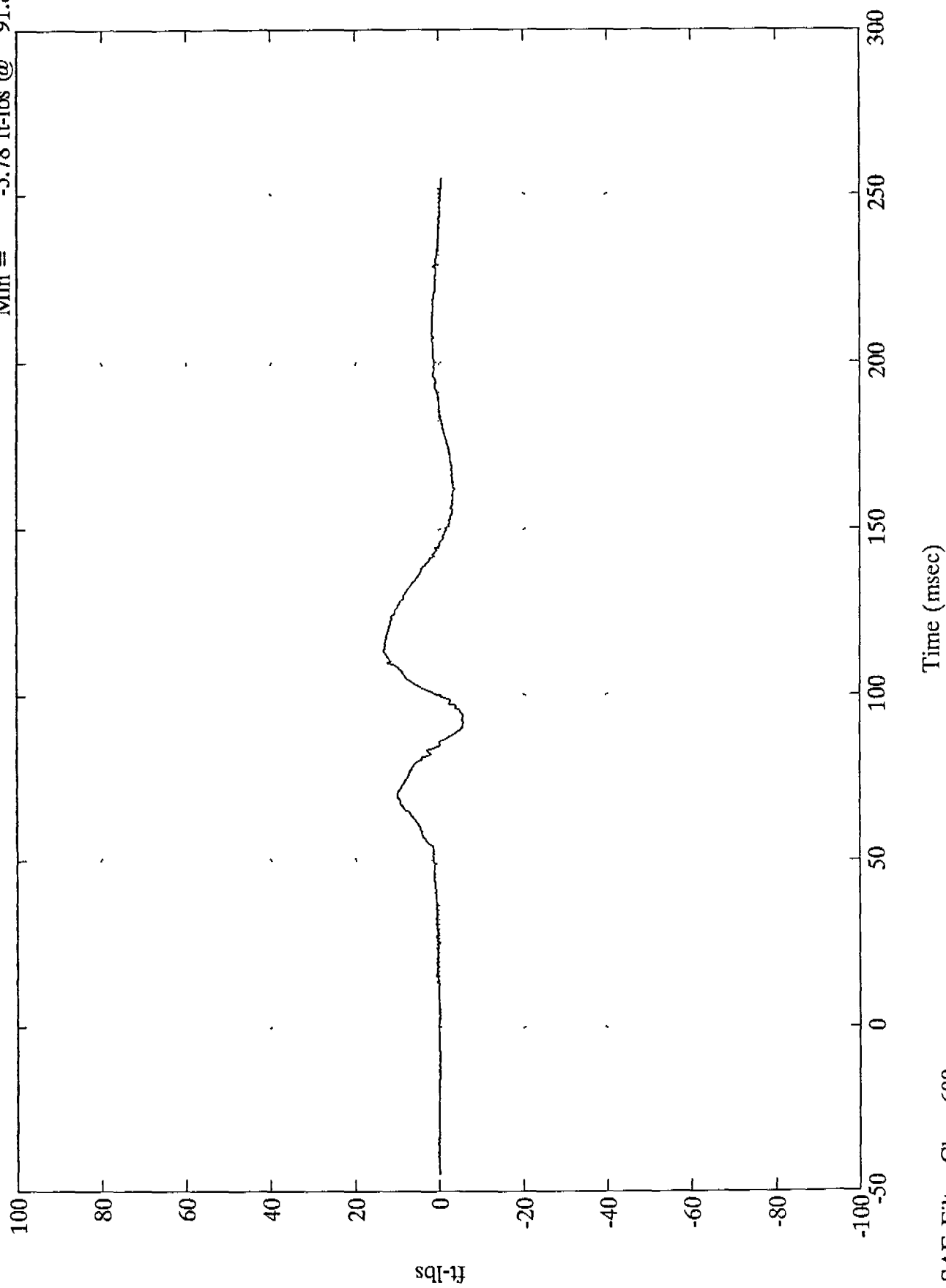
Time (msec)

SAE Filter Class 600

VTV TEST 9

Veh.2-Pos.1 Upper Neck Mz

Max = 13.24 ft-lbs @ 113.28 msec
Min = -5.78 ft-lbs @ 91.80 msec



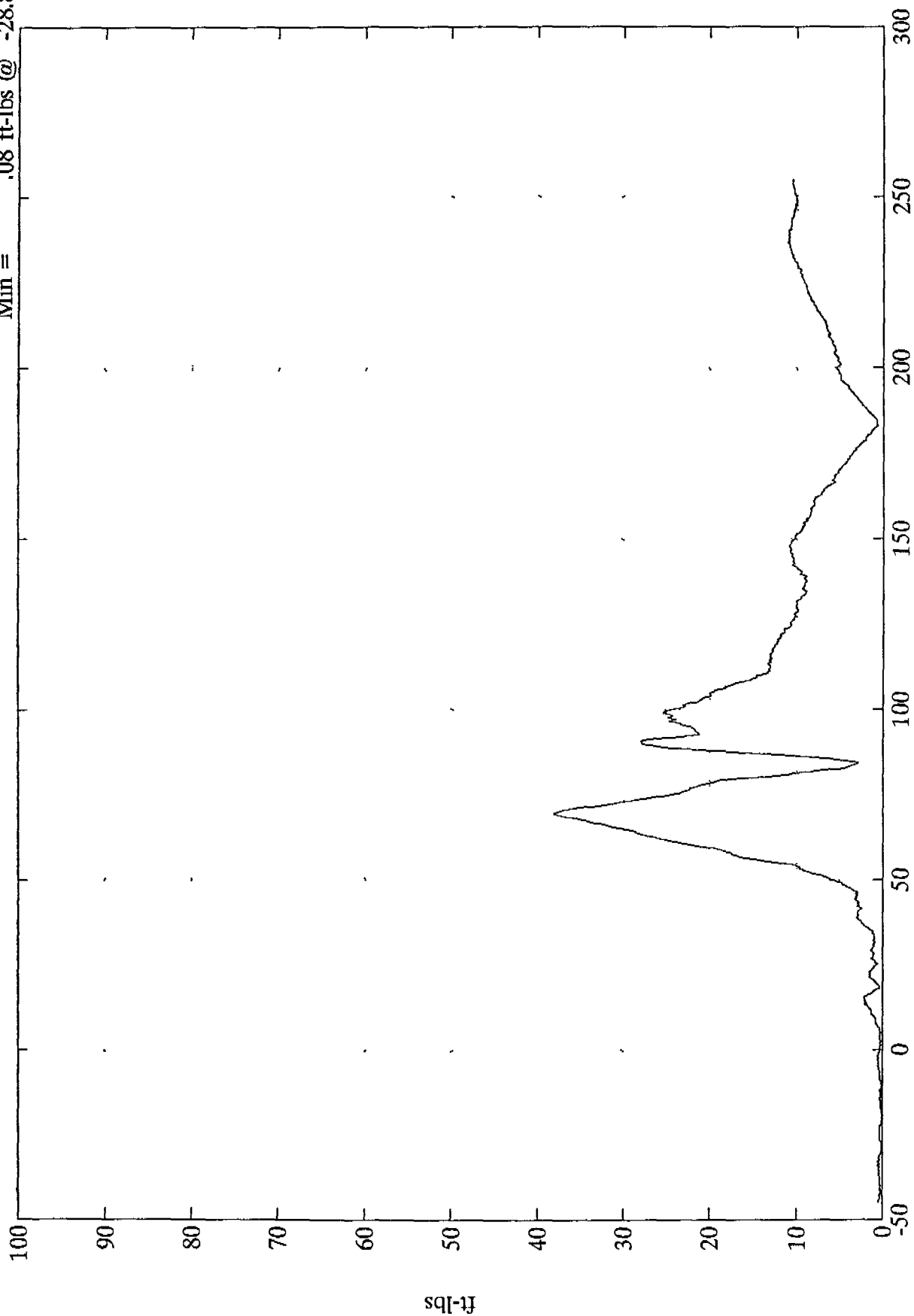
sq[1-f
B-140

7942-10

SAE Filter Class 600

Veh.2-Pos.1 Neck Mom. Res

Max = 38.07 ft-lbs @ 69.36 msec
Min = .08 ft-lbs @ -28.80 msec



sq[-1]

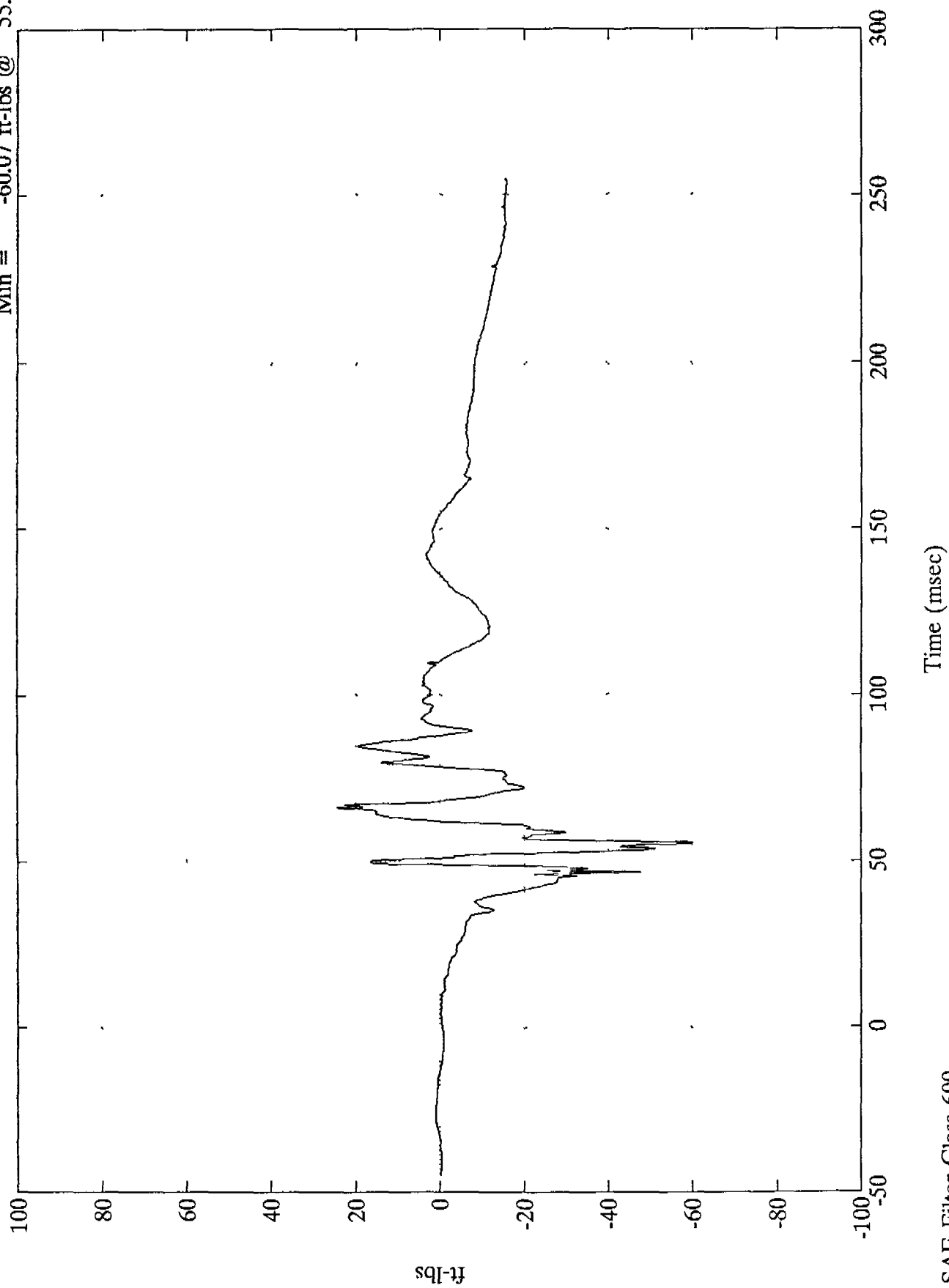
Time (msec)

SAE Filter Class 600

VTV TEST 9

Veh.2-Pos.1 Lt U Tibia Mx

Max = 24.47 ft-lbs @ 66.11 msec
Min = -60.07 ft-lbs @ 55.32 msec



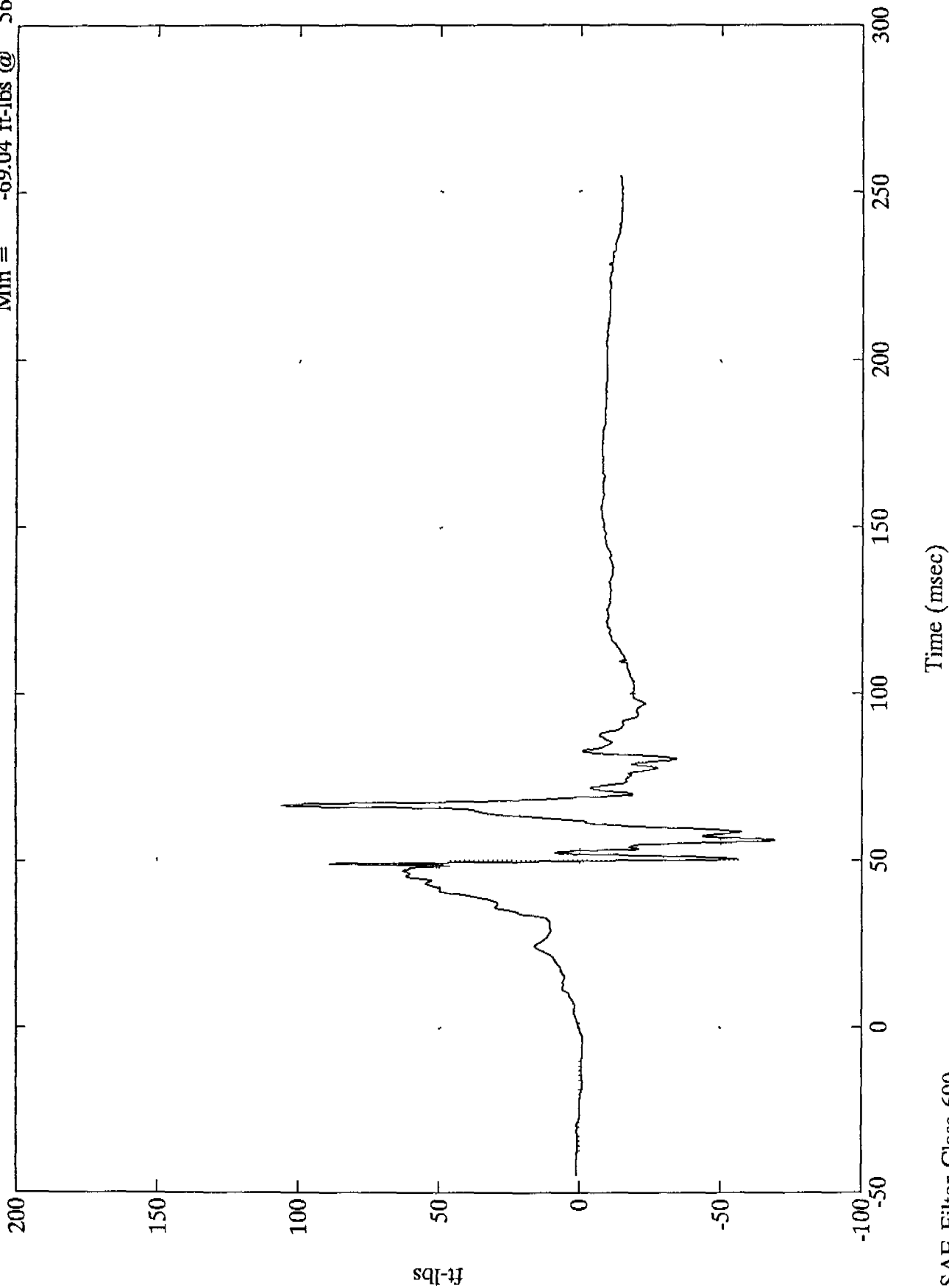
B-142

7942-10

SAE Filter Class 600

Veh.2-Pos.1 Lt U Tibia My

Max = 106.12 ft-lbs @ 66.48 msec
Min = -69.04 ft-lbs @ 56.04 msec



ft-lbs

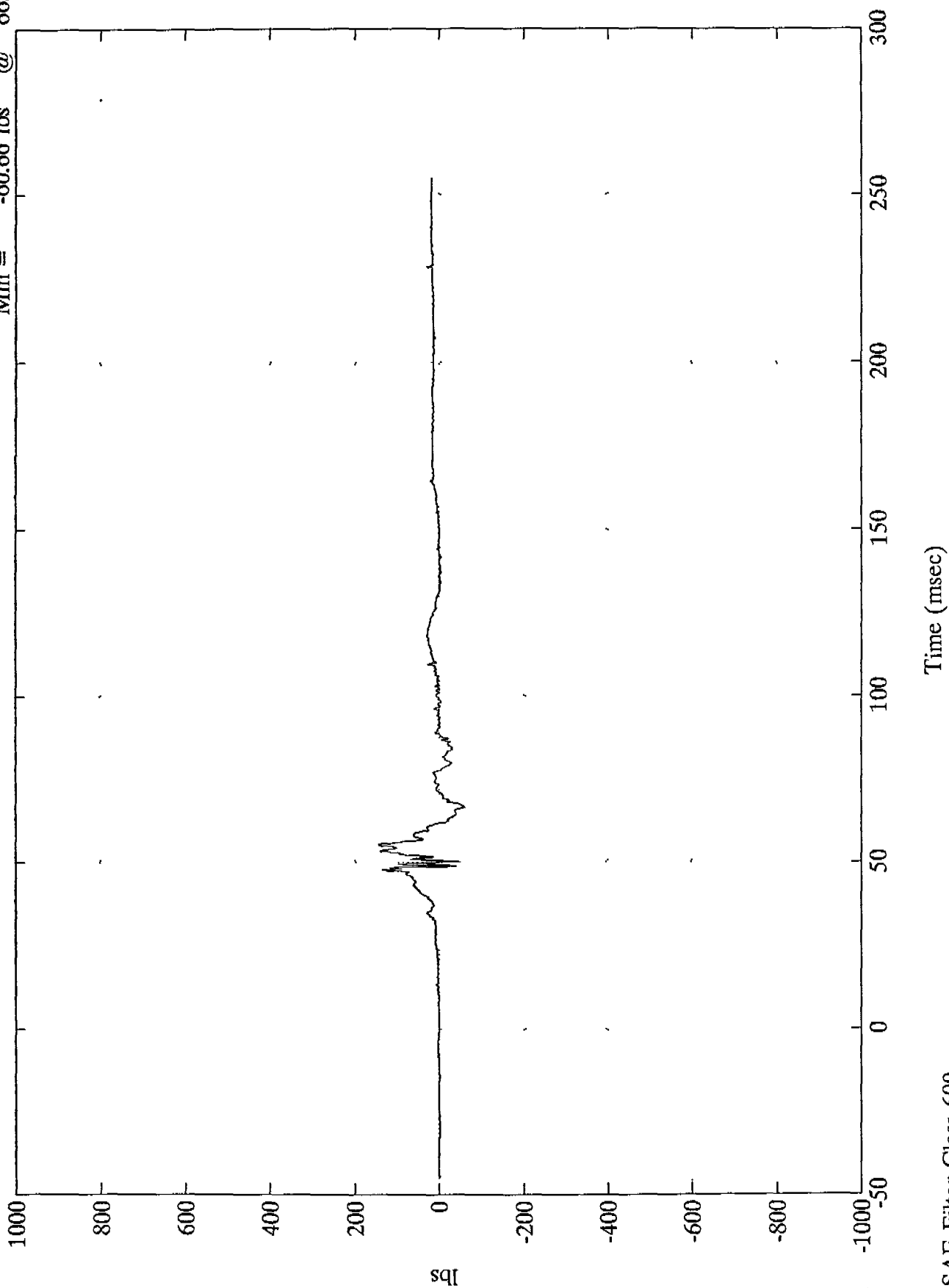
B-143

7942-10

SAE Filter Class 600

VTV TEST 9

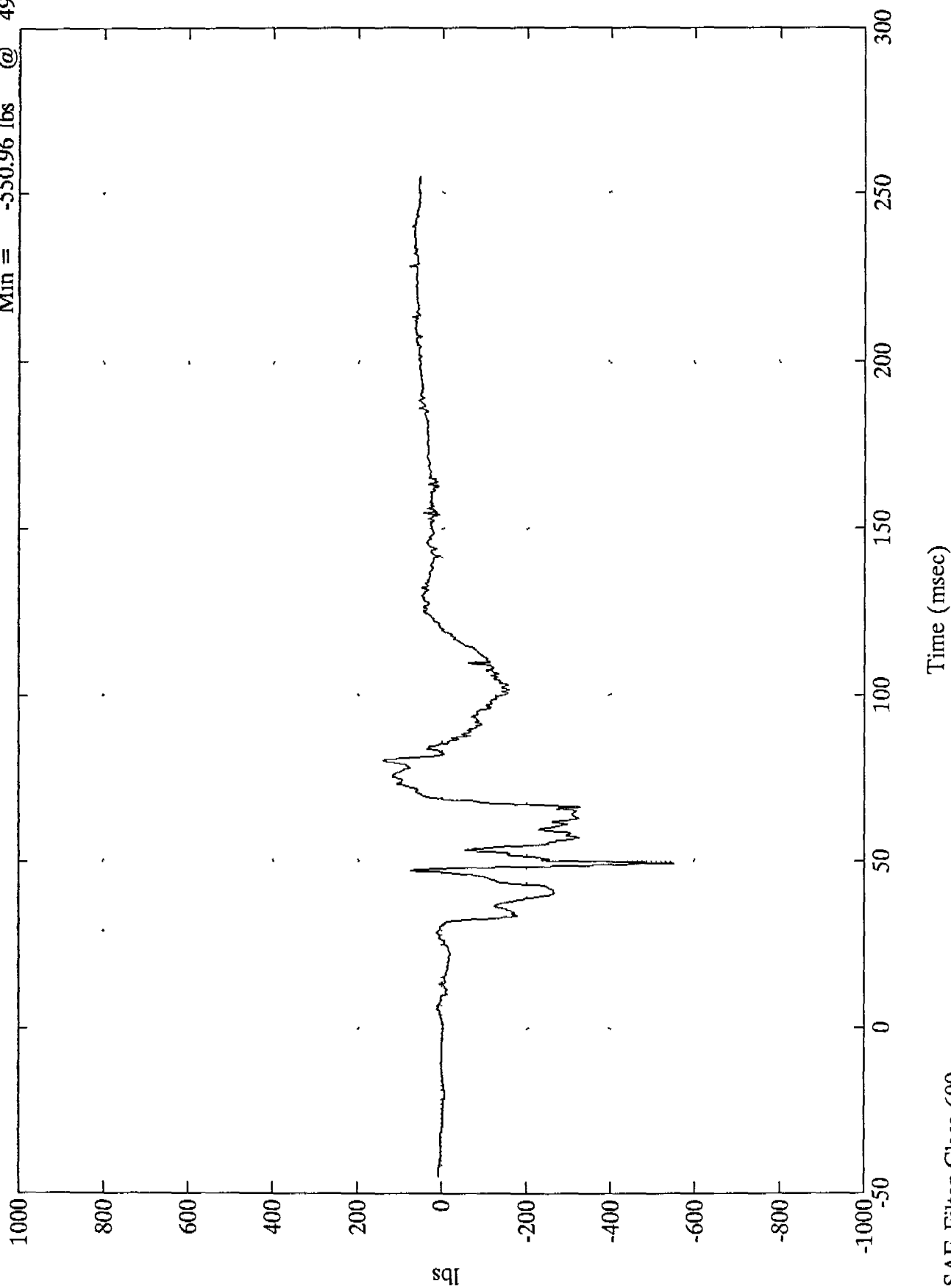
Veh.2-Pos.1 Lt L Tibia Fy
Max = 144.37 lbs @ 55.20 msec
Min = -60.66 lbs @ 66.60 msec



VTV TEST 9

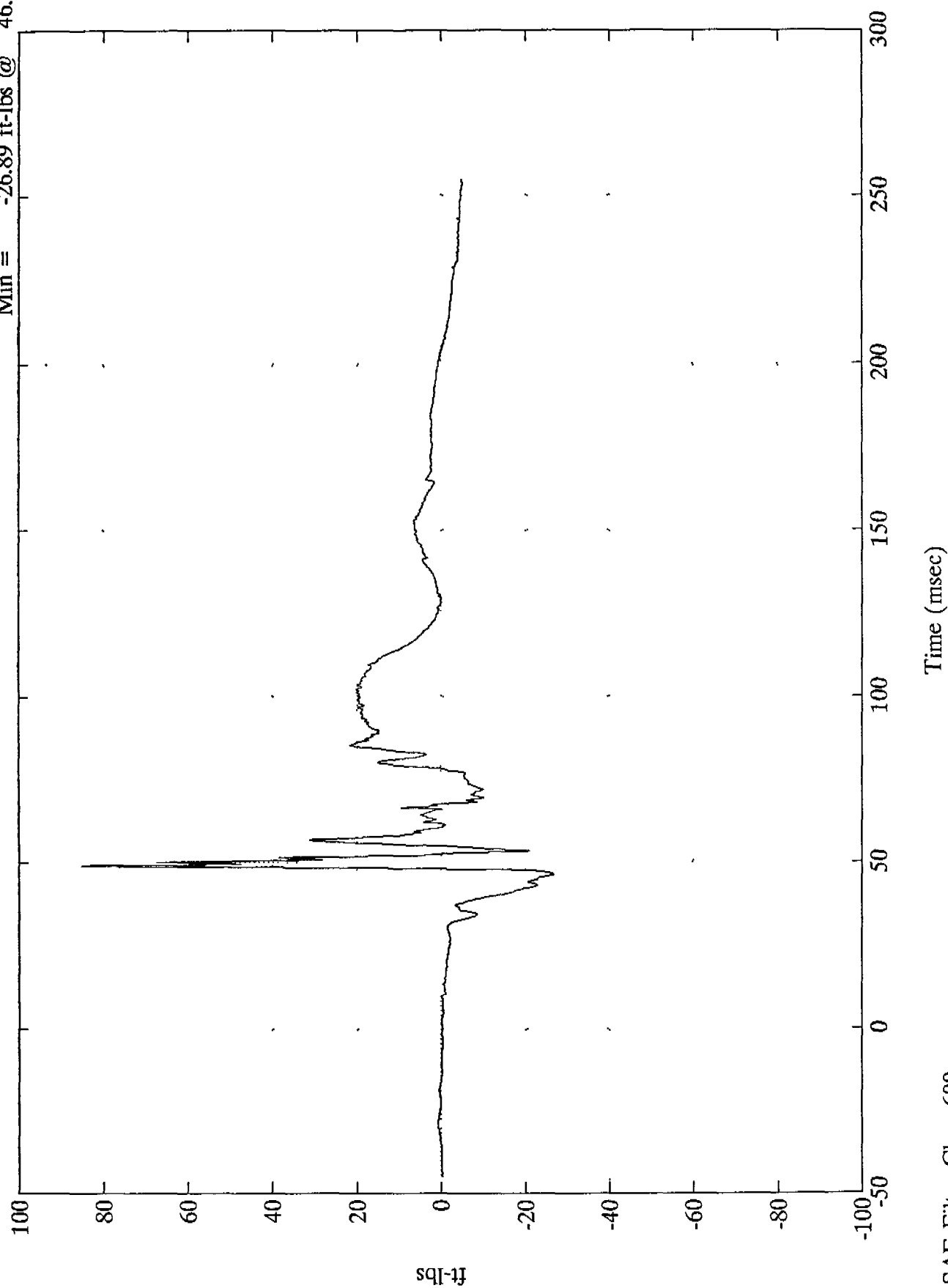
Veh.2-Pos.1 Lt L Tibia Fz

Max = 138.99 lbs @ 80.27 msec
Min = -550.96 lbs @ 49.31 msec



VTV TEST 9

Veh.2-Pos.1 Lt L Tibia Mx
Max = 85.11 ft-lbs @ 48.95 msec
Min = -26.89 ft-lbs @ 46.31 msec



sq[1-1j

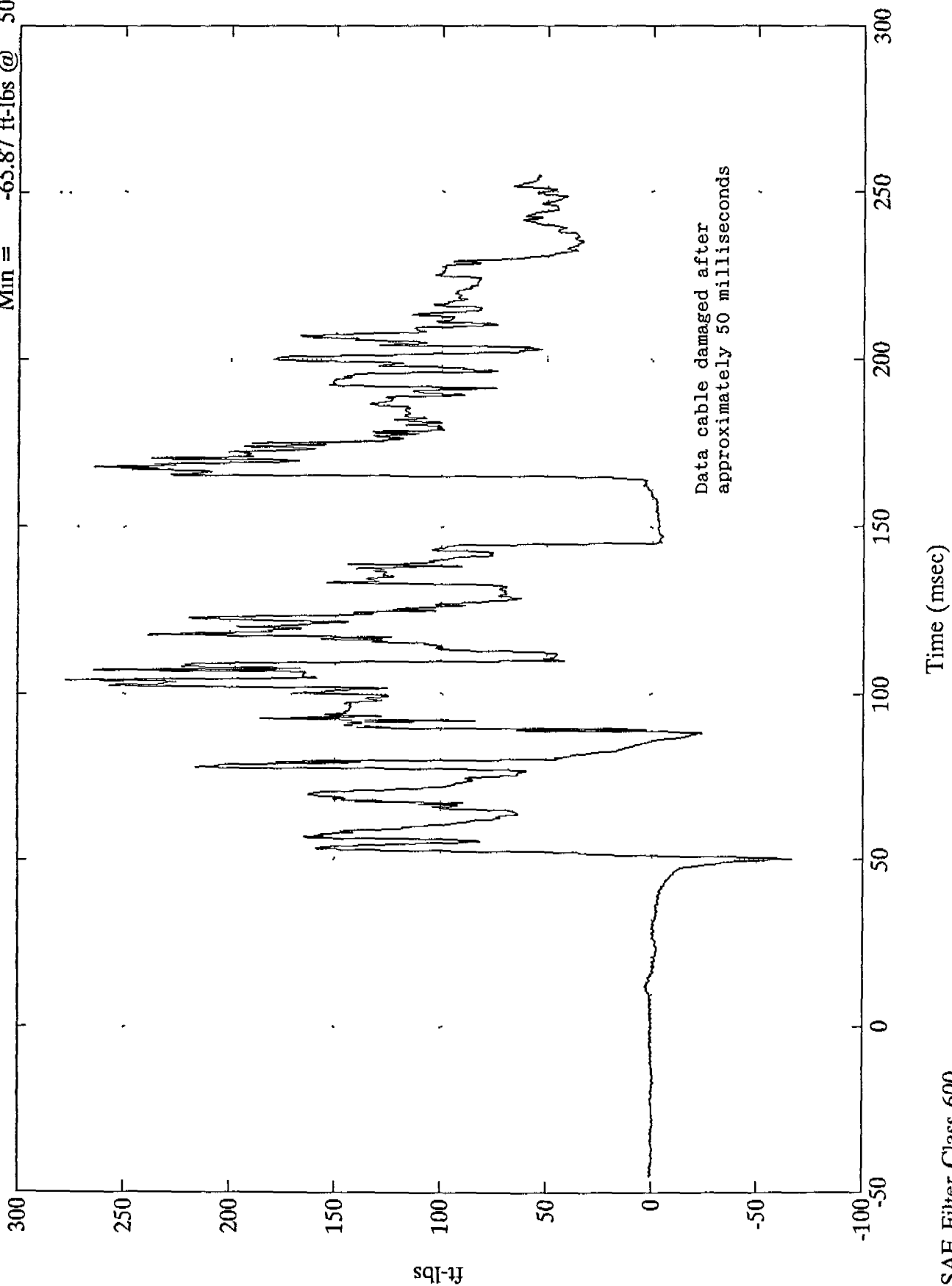
B-146

7942-10

SAE Filter Class 600

Veh.2-Pos.1 Rt U Tibia Mx

Max = 277.21 ft-lbs @ 104.16 msec
Min = -65.87 ft-lbs @ 50.28 msec

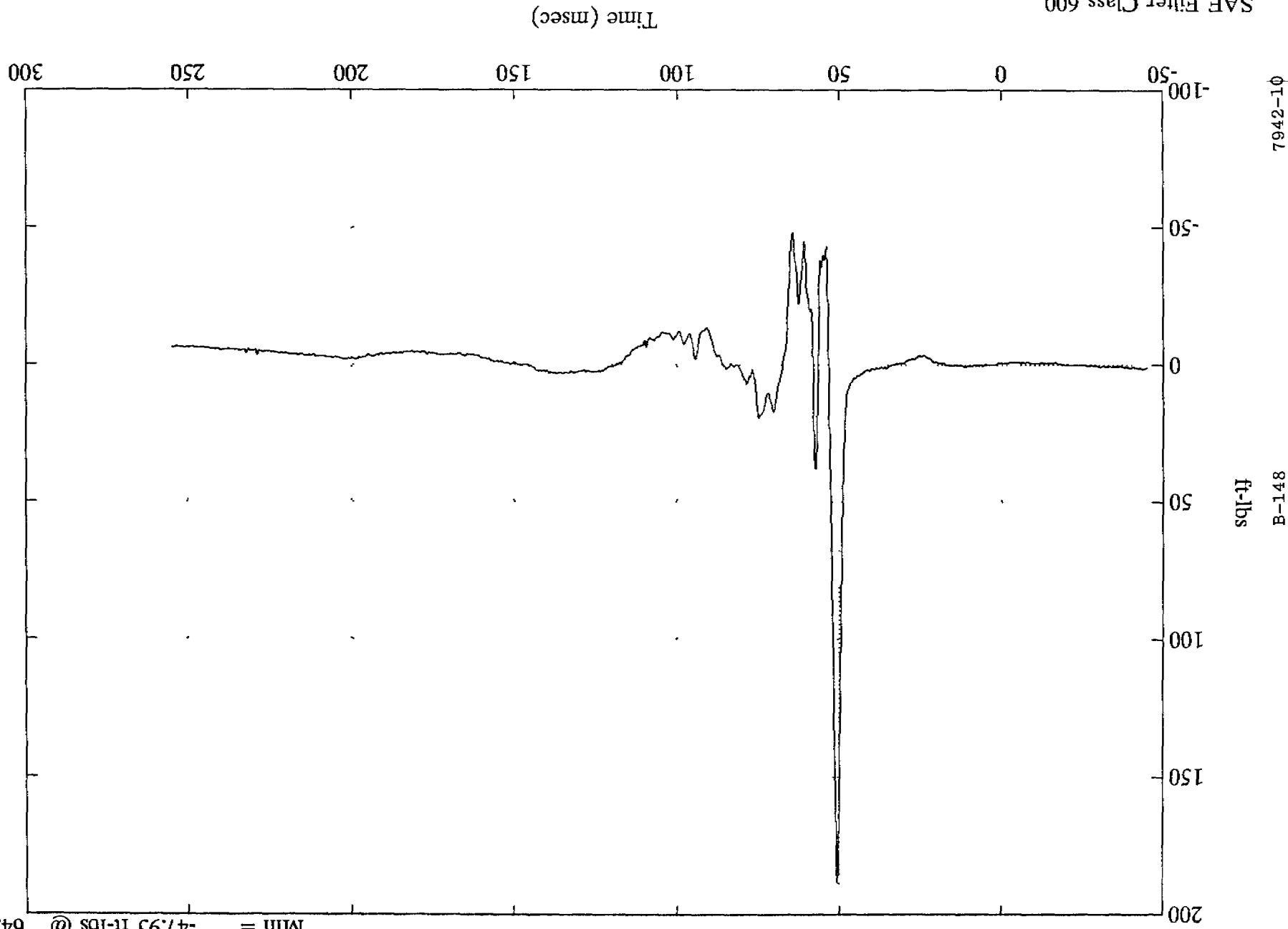


SAE Filter Class 600

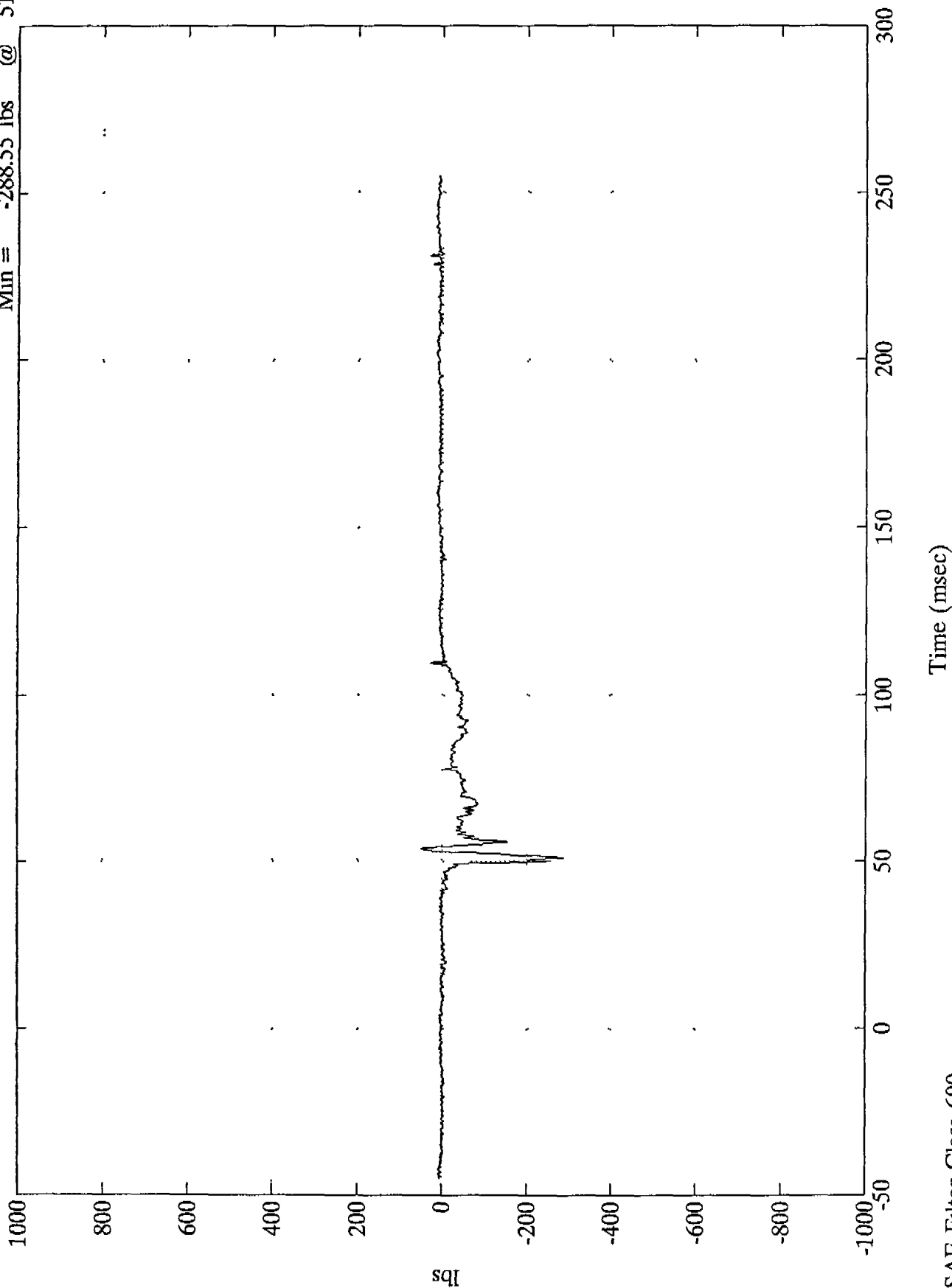
VTV TEST 9

Veh.2-Pos.1 Rt U Tibia My

Max = 188.34 ft-lbs @ 50.64 msec
Min = -47.95 ft-lbs @ 64.31 msec



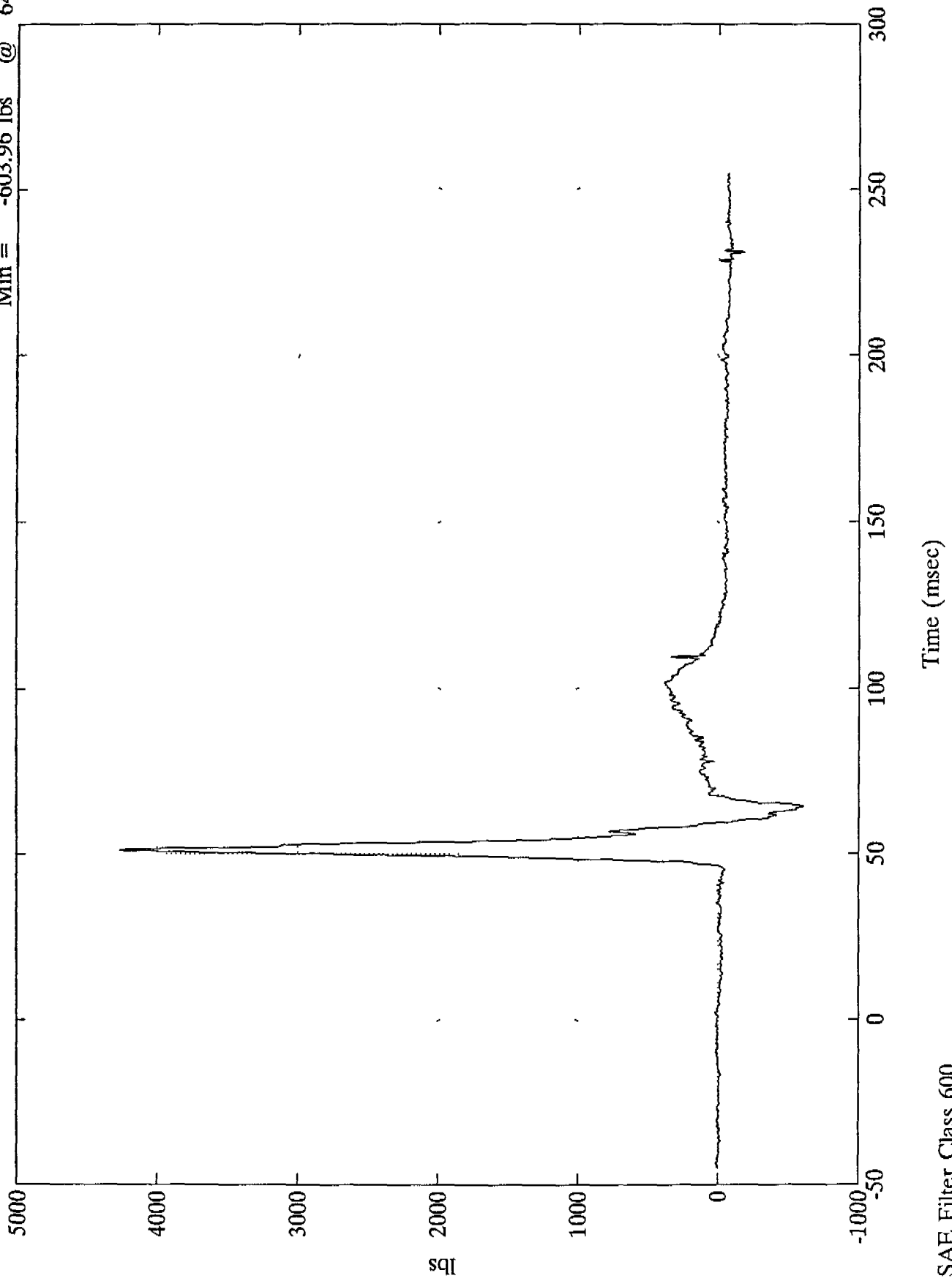
Veh.2-Pos.1 Rt L Tibia Fy Max = 49.18 lbs @ 53.63 msec
 Min = -288.55 lbs @ 51.12 msec



VTV TEST 9

Veh.2-Pos.1 Rt L Tibia Fz

Max = 4260.05 lbs @ 51.12 msec
Min = -603.96 lbs @ 64.08 msec

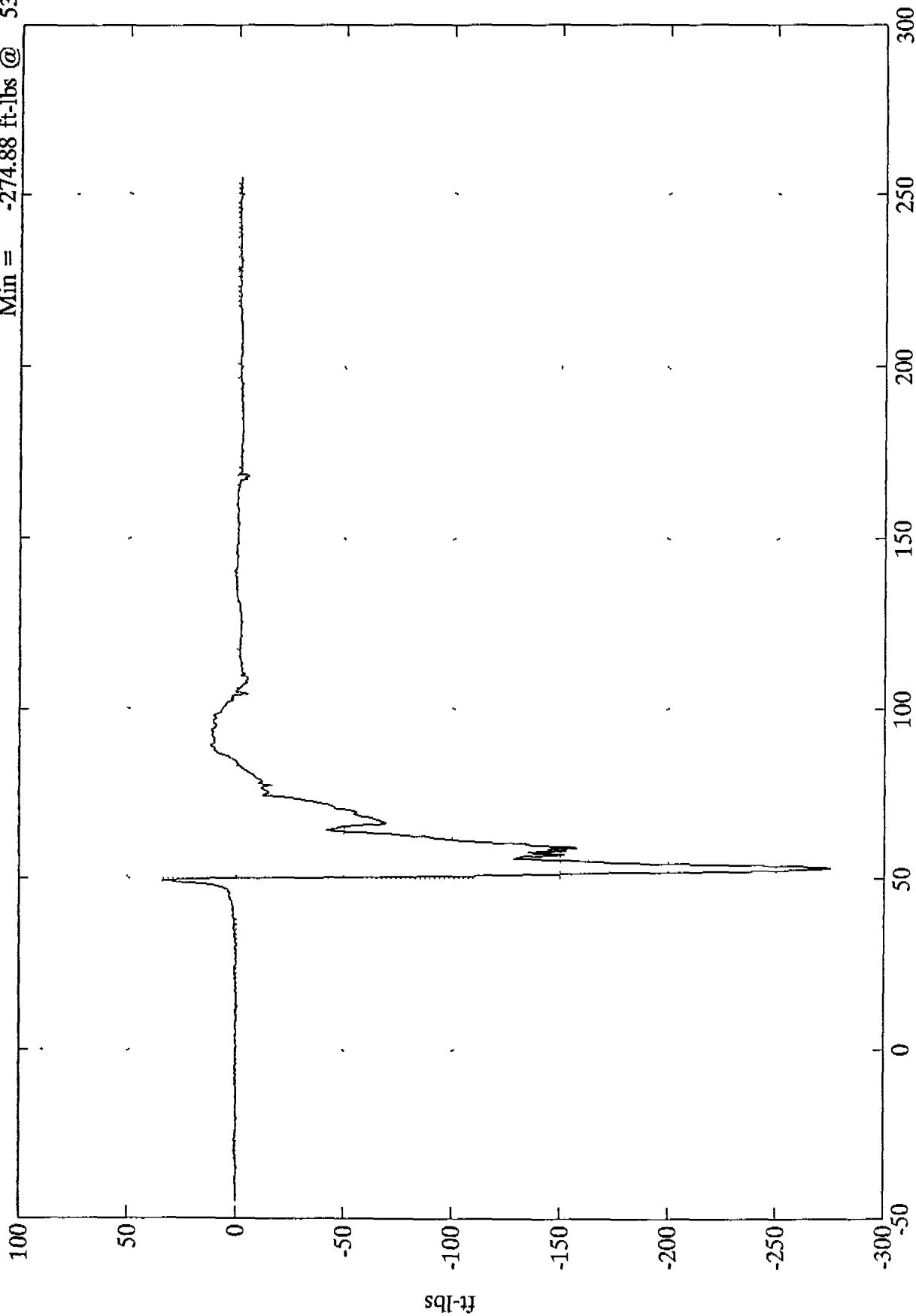


B-150

7942-10

SAE Filter Class 600

Veh.2-Pos.1 Rt L Tibia Mx
 Max = 33.76 ft-lbs @ 49.31 msec
 Min = -274.88 ft-lbs @ 53.15 msec



SAE Filter Class 600

Appendix C

PART 572E DUMMY CONFIGURATION

AND PERFORMANCE VERIFICATION DATA SHEETS

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

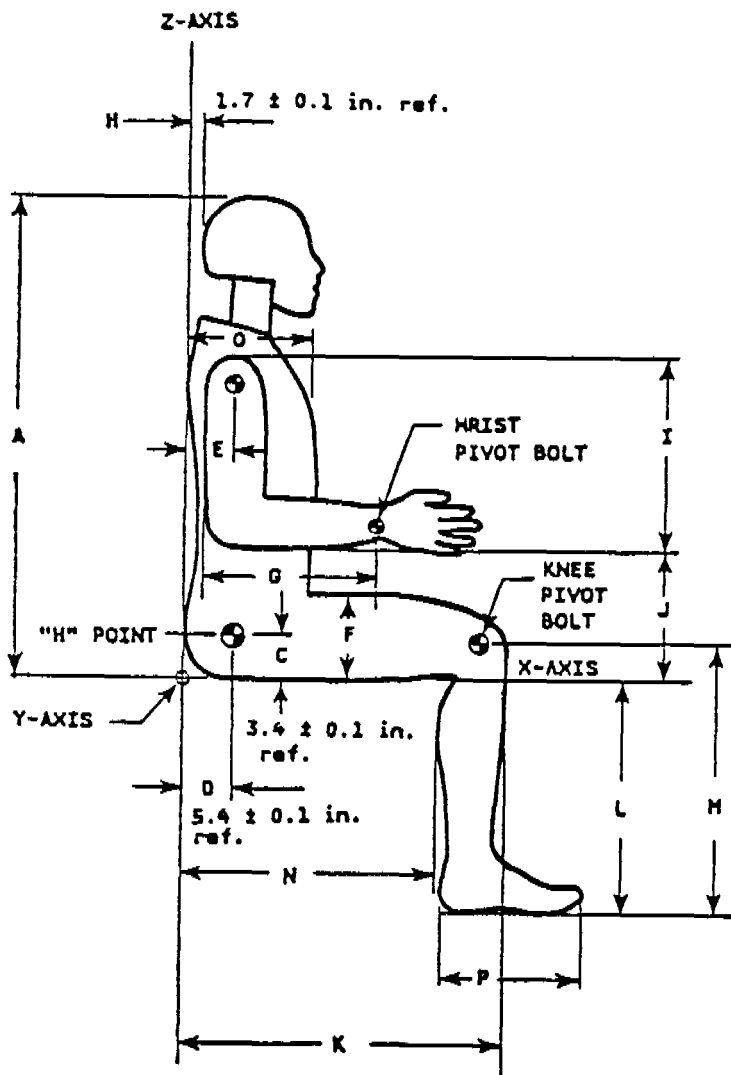
The tests were conducted at the Dummy Certification Test Facility of Calspan Corporation, Advanced Technology Center. A summary of the test results, and Part 572 specifications are included in this Appendix.

Dummy serial numbers and certification dates are:

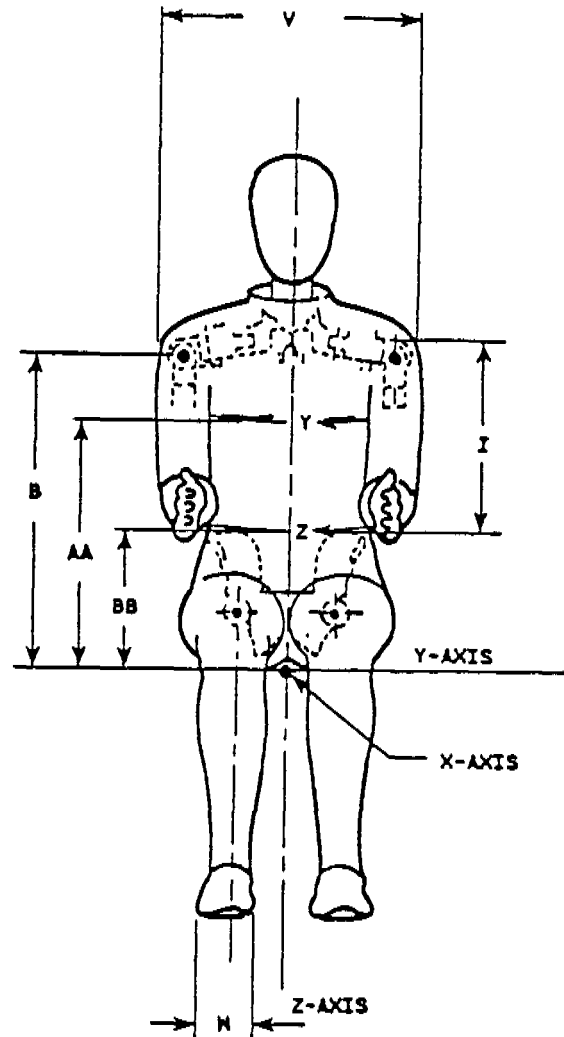
<u>Serial No</u>	<u>Completion Date</u>
341	6-23-92
342	6-25-92

Figure 16

EXTERNAL DIMENSIONS SETUP SPECIFICATIONS



SIDE VIEW



FRONT VIEW

NOTE: FIGURE IS REFERENCED TO THE ERECT SEATED POSITION. THE CURVED LUMBAR DOES NOT ALLOW THE BYBRID III TO BE POSITIONED IN A PERFECT ERECT ATTITUDE.

VEHICLE 1, POSITION 1 - DRIVER DUMMY

Manufacturer: Humanoid

Serial No.: 341

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY I.D. NUMBER: 341

A. DUMMY INSTRUMENTS

	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER				
HX LONGITUDINAL	ENDEVCO	ER74	9/92	3/93
HY LATERAL	ENDEVCO	A57G	9/92	3/93
HZ VERTICAL	ENDEVCO	A84J	9/92	3/93
2. CHEST ACCELEROMETER				
CX LONGITUDINAL	ENDEVCO	A33A	7/92	1/93
CY LATERAL	ENDEVCO	A67A	7/92	1/93
CZ VERTICAL	ENDEVCO	FB32L	5/92	11/92
3. FEMUR LOAD CELLS				
LEFT SIDE	GSE	548	5/92	11/92
RIGHT SIDE	GSE	549	5/92	11/92

B. CALIBRATION LABORATORY INSTRUMENTS

	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. PENDULUM ACC.	CEC	A160	7/92	1/93
2. TEST PROBE ACCELEROMETER	CEC	A161	7/92	1/93
3. LUMBAR FLEXION TEST PUSH FORCE GAUGE	TRANS- DUCER INC	20051	7/92	1/93
4. ABDOMINAL COMPRESS. TEST FORCE GAUGE	BLH	72952	7/92	1/93
5. ABDOMINAL COMPRESS. TEST FORCE GAUGE	CIC	567-11	7/92	1/93

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

HEAD DROP TEST

HYBRID III

DATE : 6/9/92

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 341 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	41 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	225.7 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	6.4 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 : 6/23/92

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN:341 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	69 DEG. F
RELATIVE HUMIDITY		10% - 70%	44 %
IMPACT VELOCITY		22.60 - 23.40 FPS	22.8 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	23.34 G'S
	20 MS	17.60 - 22.60 G'S	21.5 G'S
	30 MS	12.50 - 18.50 G'S	18.44 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	18.44 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	40.75 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	69.06 DEG.
	TIME	57 - 64 MS	58.25 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.-LBS.	73.23 FT.-LBS.
	TIME	47 - 58 MS	53.75 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	113.38 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	103 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST
HYBRID III

DATE : 6/23/92

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN:341 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	69 DEG. F
RELATIVE HUMIDITY		10% - 70%	43 %
IMPACT VELOCITY		19.50 - 20.30 FPS	20.0 FPS
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	18.13 G'S
	20 MS	14.00 - 19.00 G'S	18.07 G'S
	30 MS	11.00 - 16.00 G'S	15.97 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	15.97 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	44.13 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	92.04 DEG.
	TIME	72 - 82 MS	75 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-59.0/-39.0 FT.-LBS.	-51.74 FT.-LBS.
	TIME	65 - 79 MS	70.5 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	149.13 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	133.63 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 5/22/92

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN 341 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	69 - 72 DEG. F	71 DEG. F
RELATIVE HUMIDITY	10% - 70%	38 %
PENDULUM VELOCITY	21.6 - 22.4 FT/SEC	21.6 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.54 INCHES
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1222 POUNDS
INTERNAL HYSTERESIS	69% - 85%	72.2 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 6/2/92

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 341 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	43 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.0 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1089 LBS.
PROBE WEIGHT	11 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 6/3/92

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 341 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	44 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.0 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1060 LBS.
PROBE WEIGHT	11 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

HYBRID III EXTERNAL DIMENSIONS

S/N 341 HUMANOID

DUMMY SERIAL NO. 341

DATE: 8/25/92

TEMPERATURE		71 DEG. F
RELATIVE HUMIDITY		50 %
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	39.2 IN
WAIST CIRCUMFERENCE (Z)	32.1-34.1 IN	33.2 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	6.0 IN
BUTTOCK KNEE LENGTH (K)	22.8-23.8 IN	23.8 IN
BUTTOCK POPLITAL LENGTH (N)	17.8-18.8 IN	18.5 IN
POPLITEAL LENGTH (L)	16.9-17.9 IN	17.4 IN
KNEE PIVOT HEIGHT (M)	19.1-19.7 IN	19.6 IN
FOOT LENGTH (P)	9.9-10.5 IN	10.3 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	16.7 IN
SHOULDER PIVOT HEIGHT (B)	19.9-20.5 IN	20.1 IN
ELBOW REST HEIGHT (J)	7.5-8.3 IN	8.1 IN
SHOULDER-ELBOW LENGTH (I)	13.0-13.6 IN	13.2 IN
BACK OF ELBOW TO WRIST PIVOT (G)	11.4-12.0 IN	11.4 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN: IVAN MINKEWICZ

VEHICLE 2, POSITION 1 - DRIVER DUMMY

Manufacturer: Humanoid

Serial No.: 342

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY I.D. NUMBER: 342

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	A39J	9/92	3/93
ENDEVCO	A33F	9/92	3/93
ENDEVCO	A27F	9/92	3/93
ENDEVCO	A28F	8/92	2/93
ENDEVCO	EP58	7/92	1/93
ENDEVCO	A08A	7/92	1/93
GSE	311	5/92	11/92
GSE	312	5/92	11/92

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	7/92	1/93
CEC	A161	7/92	1/93
TRANS- DUCER INC	20051	7/92	1/93
BLH	72952	7/92	1/93
CIC	567-11	7/92	1/93

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
HEAD DROP TEST
HYBRID III

DATE : 6/9/92

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 342 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	41 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	253.3 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	2.5 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 : 6/24/92

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN:342 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	69 DEG. F
RELATIVE HUMIDITY		10% - 70%	46 %
IMPACT VELOCITY		22.60 - 23.40 FPS	22.7 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	24.26 G'S
	20 MS	17.60 - 22.60 G'S	21.69 G'S
	30 MS	12.50 - 18.50 G'S	18.46 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	18.46 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	39.63 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	69.31 DEG.
	TIME	57 - 64 MS	58.13 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.-LBS.	70.47 FT.-LBS.
	TIME	47 - 58 MS	53 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.25 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	101.75 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST
HYBRID III

DATE : 6/25/92

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN:342 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	69 DEG. F
RELATIVE HUMIDITY		10% - 70%	50 %
IMPACT VELOCITY		19.50 - 20.30 FPS	20.1 FPS
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	18.76 G'S
	20 MS	14.00 - 19.00 G'S	17.49 G'S
	30 MS	11.00 - 16.00 G'S	15.17 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	15.17 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	45.13 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	91.84 DEG.
	TIME	72 - 82 MS	74.5 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-59.0/-39.0 FT.-LBS.	-51.81 FT.-LBS.
	TIME	65 - 79 MS	69.63 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	148.5 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	131 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 5/27/92

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN 342 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	69 - 72 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	41 %
PENDULUM VELOCITY	21.6 - 22.4 FT/SEC	21.6 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.51 INCHES
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1242 POUNDS
INTERNAL HYSTERESIS	69% - 85%	72.9 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 6/3/92

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 342 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	42 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.0 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1163 LBS.
PROBE WEIGHT	11 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 6/3/92

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 342 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	42 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.0 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1067 LBS.
PROBE WEIGHT	11 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

HYBRID III EXTERNAL DIMENSIONS

S/N 342 HUMANOID

DUMMY SERIAL NO. 342

DATE: 8/25/92

TEMPERATURE		71 DEG. F
RELATIVE HUMIDITY		50 %
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	39.2 IN
WAIST CIRCUMFERENCE (Z)	32.1-34.1 IN	33.4 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	34.9 IN
THIGH CLEARANCE (F)	5.5-6.1 IN	6.0 IN
BUTTOCK KNEE LENGTH (K)	22.8-23.8 IN	23.6 IN
BUTTOCK POPLITAL LENGTH (N)	17.8-18.8 IN	18.2 IN
POPLITEAL LENGTH (L)	16.9-17.9 IN	17.8 IN
KNEE PIVOT HEIGHT (M)	19.1-19.7 IN	19.4 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	3.5 IN
SHOULDER BREADTH (V)	16.6-17.2 IN	16.8 IN
SHOULDER PIVOT HEIGHT (B)	19.9-20.5 IN	20.3 IN
ELBOW REST HEIGHT (J)	7.5-8.3 IN	8.2 IN
SHOULDER-ELBOW LENGTH (I)	13.0-13.6 IN	13.2 IN
BACK OF ELBOW TO WRIST PIVOT (G)	11.4-12.0 IN	11.5 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN: IVAN MINKEWICZ