

REPORT NUMBER: CAL-96-N02

**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

**CHRYSLER CORPORATION
1996 DODGE RAM VAN 2500**

NHTSA NUMBER: MT0302

CALSPAN TEST NUMBER: 8313-2

December 5, 1995

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FINAL REPORT

PREPARED FOR:

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National Highway Traffic Safety Administration
Office of Market Incentives
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16. <i>Abstract</i> A frontal load cell barrier test of a 1996 Dodge Ram Van 2500 was performed at Calspan SRL Corporation crash test facility in Buffalo, New York, on December 5, 1995. The impact velocity was 55.7 kph and the temperature at the barrier face was 7°C. The maximum post-test vehicle crush was 545 mm. The driver's location was equipped with a 3-point pretension belt system. The driver's location was also equipped with a supplemental airbag restraint. The passenger's location was equipped with a 3-point restraint system. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" the driver dummy appears to exceed the maximum femur force criteria on the left femur.			
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Section 1

PURPOSE AND TEST PROCEDURE

This 55.7 kph frontal barrier impact test is part of the Composite FY 92 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-90-D-02121. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 55.7 kph frontal barrier impact test was conducted in accordance with the Office of Market Incentives (OMI) Laboratory Indicant Test procedure.

Section 2

SUMMARY OF TEST MT0302

A load cell barrier consisting of 36 load cells was impacted by a 1996 Dodge Ram Van 2500 at a velocity of 55.7 kph. The test was performed at the Calspan SRL Corporation on December 5, 1995. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by 1 real-time camera and 16 high-speed cameras. Camera locations and other pertinent camera information can be found in this report.

Two Part 572, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with head and chest triaxial accelerometers and right/left femur load cells. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver ATD (Serial No. 150) and the right-front passenger ATD (Serial No. 064) were used in one previous test (MT0105). Injury criteria were not exceeded in that test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 133 channels of data were recorded on a P.C. based data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces. Barrier load cell B2 did not record accurately. This data was not used to generate the load cell sums.

The driver's HIC was 873.9. The maximum chest deceleration over 3 milliseconds was 55.3 g's and maximum chest deflection was -33.3 mm. Femur loads were -11663.7 newtons on the left femur and -8577.3 newtons on the right femur.

The right front passenger's HIC was 764.0. Maximum chest deceleration over 3 milliseconds was 50.5 g's and maximum chest deflection was -35.0 mm. Femur loads were -2180.1 newtons on the left and -2041.9 newtons on the right.

Table 1

GENERAL TEST AND VEHICLE DATA

Vehicle Year/Make/Model/Body Style: 1996 Dodge Ram Van 2500

NHTSA Test No.: MT0302 VIN.: 2B7HB21X6TK115404

Body Color: Red Date of Manufacture: 10/95

Date Received: 11/29/95

Odometer Reading: 00094

Engine: 6 Cylinders; - C.I.D.; 3.9 Liters; - CC
X Gas; - Diesel; - Turbocharged
X Longitudinal; - Transverse

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

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

Accessories: - A/C; X P/S; X P/B; - P/wdo
- Tilt Wheel; - P/seats; - Cruise Control - Other

Type of Occupant Restraint: 3-point restraint system with supplemental driver side airbag. The driver's location had a pretensioner in the 3-point restraint.

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

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

Recommended Tire Size: P235/75 R15

Recommended Cold Tire Pressure: Front 241 kPa, Rear 241 kPa

Tires on Vehicle: P235/75 R15 Manufacturer: Michelin

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

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

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

Rated Cargo and Luggage Weight (RCLW) = 136 kgs.

GVWR 2403 kgs. GAWR: Front 1497 kgs. Rear 1679 kgs.

Table 1

GENERAL TEST AND VEHICLE DATA (cont'd)WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids) = UDW:

Right Front	=	<u>524.5</u>	kgs.	Right Rear	=	<u>405.5</u>	kgs.
Left Front	=	<u>520.0</u>	kgs.	Left Rear	=	<u>390.0</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>1,044.5</u>	kgs.	(<u>56.7</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>795.5</u>	kgs.	(<u>43.2</u> % of Total Vehicle Weight)			
TOTAL DELIVERED WEIGHT	=	<u>1,840.0</u>	kgs.				

CALCULATION FOR TARGET TEST WEIGHT:

RCLW = 136 kgs.

Target Test Weight = UDW + RCLW + (2 dummies x 74.4 kgs./ dummy)

Target Test Weight = 2124.8

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 130 KGS CARGO:

Right Front	=	<u>593</u>	kgs.	Right Rear	=	<u>473</u>	kgs.
Left Front	=	<u>594</u>	kgs.	Left Rear	=	<u>459</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>1,187</u>	kgs.	(<u>56.0</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>932</u>	kgs.	(<u>44.0</u> % of Total Vehicle Weight)			
TOTAL TEST WEIGHT	=	<u>2,119</u>	kgs.				

Weight of ballast secured in vehicle trunk area = 0 kgs.

VEHICLE ATTITUDE (all dimensions in mm):

Delivered Attitude:	RF	<u>817</u>	LF	<u>822</u>	RR	<u>835</u>	LR	<u>840</u>
Test Attitude:	RF	<u>800</u>	LF	<u>795</u>	RR	<u>823</u>	LR	<u>818</u>

Wheel Base: 3241 mm.; C.G. = 1426 mm. rearward of front wheel C/L

Remarks: 116.8 liters of stoddard solution was placed in the fuel tank.

Table 1

GENERAL TEST AND VEHICLE DATA (cont'd)POST -IMPACT DATA:

Type of Test: Frontal Barrier Impact Angle: 0°
 Date of Test: December 5, 1995 Time of Test: 14:07
 Ambient Temperature: 7 ° C at impact area
 Temperature in Occupant Compartment: 21 ° C
 Windshield Molding Temperature: 21 ° C
 Required Impact Velocity Range: 55.5 to 57.1 kph
 Impact Velocity: primary = 55.7 kph, secondary = 55.7 kph
 Distance From Front Bumper to Barrier Face When
 Entering Speed Trap: 1321 mm
 Exiting Speed Trap: 305 mm

VEHICLE REBOUND AND CRUSH (mm):

Vehicle Length:	Pre-test = R	<u>5105</u>	C _L	<u>5225</u>	L	<u>5080</u>
	Post-test = R	<u>4660</u>	C _L	<u>4680</u>	L	<u>4625</u>
	Crush = R	<u>445</u>	C _L	<u>545</u>	L	<u>455</u>

Distance from front of test vehicle to point of impact:

R	<u>255</u>	C _L	<u>259</u>	L	<u>277</u>
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VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Airbag</u>	<u>No contact</u>
Chest	<u>Airbag</u>	<u>No contact</u>
Abdomen	<u>No contact</u>	<u>No contact</u>
Left Knee	<u>Dash panel</u>	<u>Glove box</u>
Right Knee	<u>Dash panel</u>	<u>Glove box</u>

Table 1

GENERAL TEST AND VEHICLE DATA (cont'd)

	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Door Opening	<u>Not operable</u>	<u>Operable</u>	<u>-</u>	<u>-</u>
<u>Seat Movement</u>	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Seat Back Failure	<u>None</u>	<u>None</u>	<u>-</u>	<u>-</u>
Seat Shift (mm.)	<u>None</u>	<u>2 notches forward</u>	<u>-</u>	<u>-</u>
<u>Glazing Damage</u>				
Backlight/Windshield:	<u>None</u>			
Other Notable Impact Effects:	<u>None</u>			

Section 3

OCCUPANT AND VEHICLE INFORMATION

I.

DATA

1. Dummy Injury Criteria Data Summary
2. Dummy Positioning Data
3. Seat Belt Performance Assessment Data
4. Camera Locations
5. Vehicle Target Locations
6. Load Cell Barrier Data
7. Vehicle Accelerometer Data
8. Test Vehicle Measurements

Table 2

DUMMY INJURY CRITERIA VALUESNHTSA No.: MT0302 Vehicle: 1996 Dodge Ram Van 2500

	MAXIMUM HEAD ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-86.4	28.1	-31.7	86.9
Position #2 - Passenger	-56.6	4.1	55.2	59.7

	MAXIMUM CHEST ACCELERATION (g's)			
	X	Y	Z	R*
Position #1 - Driver	-72.6	9.9	14.8	55.3
Position #2 - Passenger	-52.0	-8.6	-20.4	50.5

* The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

	MAXIMUM FORCE - FEMUR LOAD (nwt)	
	LEFT FEMUR	RIGHT FEMUR
Position #1 - Driver	-11663.7	-8577.3
Position #2 - Passenger	-2180.1	-2041.9

	MAXIMUM FORCE - SEAT BELT LOADS (nwt)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
Position #1 - Driver	5809.6	-	2444.9
Position #2 - Passenger	9198.8	10256.9	-

	HEAD INJURY CRITERIA (HIC)			
	HIC**	t ₁ (mSec)	t ₂ (mSec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	873.9	54.12	75.84	69.48
Position #2 - Passenger	764.0	69.48	105.36	53.86

** HIC is as defined in FMVSS 208. The maximum time interval from t₁ to t₂ is 36 milliseconds.

Table 3

HYBRID III NECK AND CHEST DATA SHEET

Vehicle Year/Make/Model/Body Style: 1996 Dodge Ram Van 2500
 Vehicle NHTSA No.: MT0302 Test Date: December 5, 1995

MAXIMUM VALUES	DRIVER DUMMY ID #150:	PASSENGER DUMMY ID #064:
Neck Load X (nwt)	1008.6	2097.0
Neck Load Y (nwt)	-358.5	477.0
Neck Load Z (nwt)	4803.2	2509.5
Neck Moment X (nwt-m)	-35.9	-17.7
Neck Moment Y (nwt-m)	-98.9	120.0
Neck Moment Z (nwt-m)	-17.7	-11.6
Chest Deflection X (mm.)	-33.3	-35.0
Time of Max. Occurrence (msec)	56.9	81.4

Note: All values listed occur during the primary impact event.

Figure 1

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

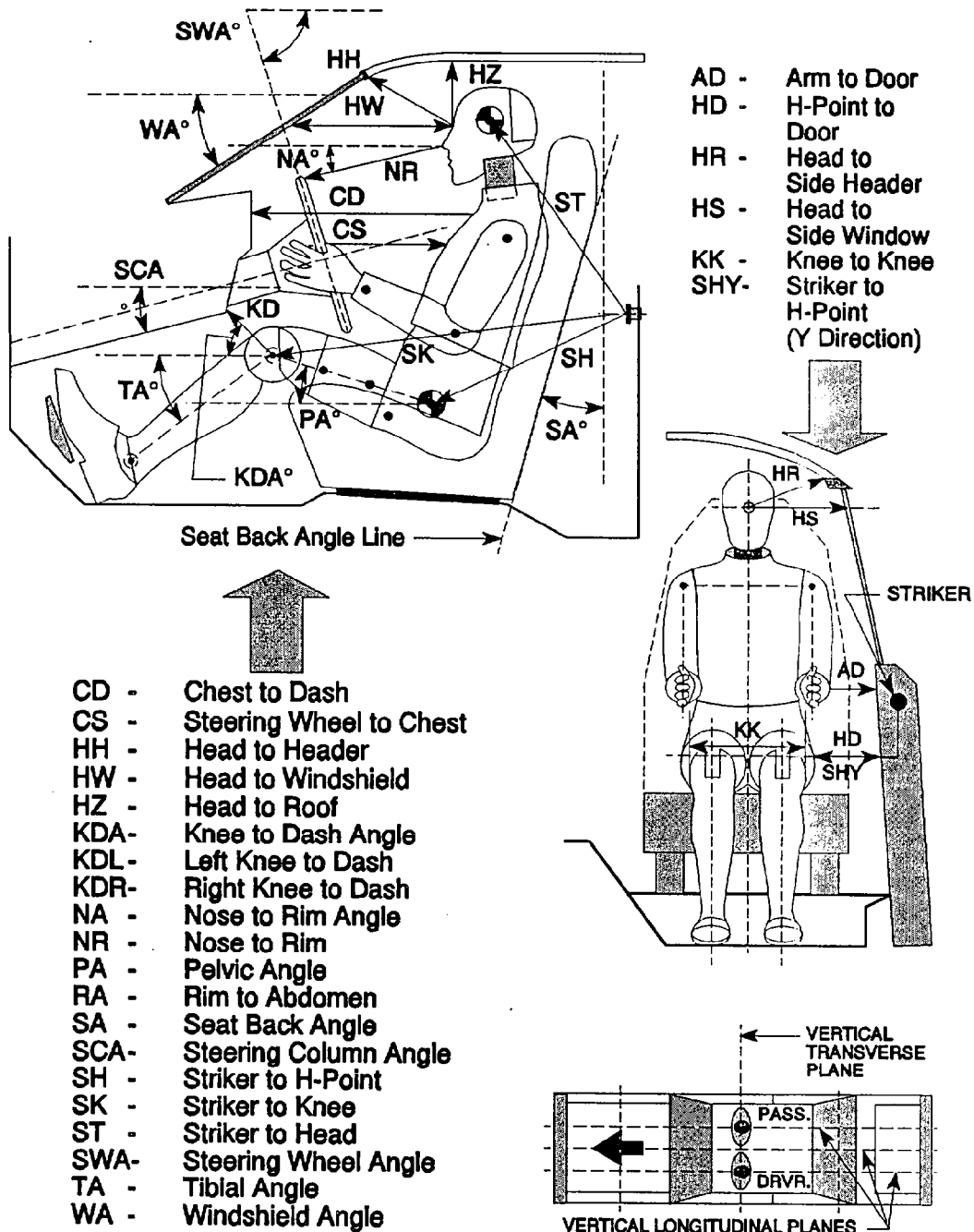


Table 4

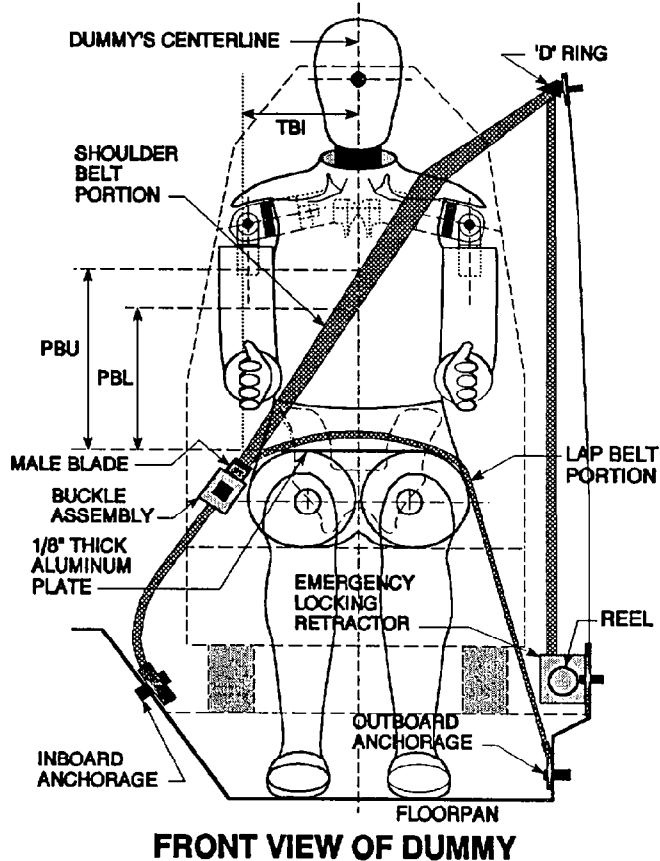
FRONT SEAT OCCUPANT MEASUREMENTS

	DRIVER (Serial #150)			PASS. (Serial # 064)		
WA°	40 deg.			N/A		
SWA°	52 deg.			N/A		
SCA°	38 deg.			N/A		
SA°	Fixed			Fixed		
HZ	227			234		
HH	554			710		
HW	637			815		
HR	201			250		
NR	384	Angle	15 deg.	N/A		
CD	524			720		
CS	231			N/A		
RA	110			N/A		
KDL	84	Angle (KDA)	23 deg.	252		
KDR	189			264	Angle (KDA)	12 deg.
PA°	21 deg.			N/A		
TA°	40 deg.			88 deg. right leg		
KK	302			181		
ST	699	Angle	8 deg.	N/A	Angle	N/A
SK	541	Angle	82 deg.	465	Angle	87 deg.
SH	107	Angle	100 deg.	61	Angle	100 deg.
SHY	162			116		
HS	340			300		
HD	76			110		
AD	15			56		

Figure 2

SEAT BELT POSITIONING DATA

SEAT BELT POSITIONING DATA



	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	350	340
PBL-- Top surface of alum. plate to belt lower edge	220	260
<u>LAP BELT TENSION</u>	2 lbs.	2 lbs.
<u>SHOULDER BELT TENSION</u>	-	-

Table 5

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

<u>BELT LENGTH DATA:</u>	<u>Driver</u>	<u>Passenger</u>
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	<u>2520 mm</u>	<u>2720 mm</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>970 mm</u>	<u>850 mm</u>
Lap belt length as measured on Part 572 Dummy.	<u>990 mm</u>	<u>1010 mm</u>
<u>SHOULDER BELT SPOOL-OFF DATA:</u>		
As determined by film analysis.	<u>N/A</u>	<u>101 mm</u>
As determined mechanically.	<u>20.0 mm</u>	<u>110 mm</u>
As determined electronically.	<u>20.0 mm</u>	<u>148.5 mm</u>
<u>BELT STRETCH DATA:</u>		
Measured electronically between shoulder belt load cell and the "D" ring.	<u>100 mm/M</u>	<u>192 mm/M</u>
Measured mechanically.	<u>0.0 mm/M</u>	<u>0.0 mm/M</u>

Figure 3

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 6.

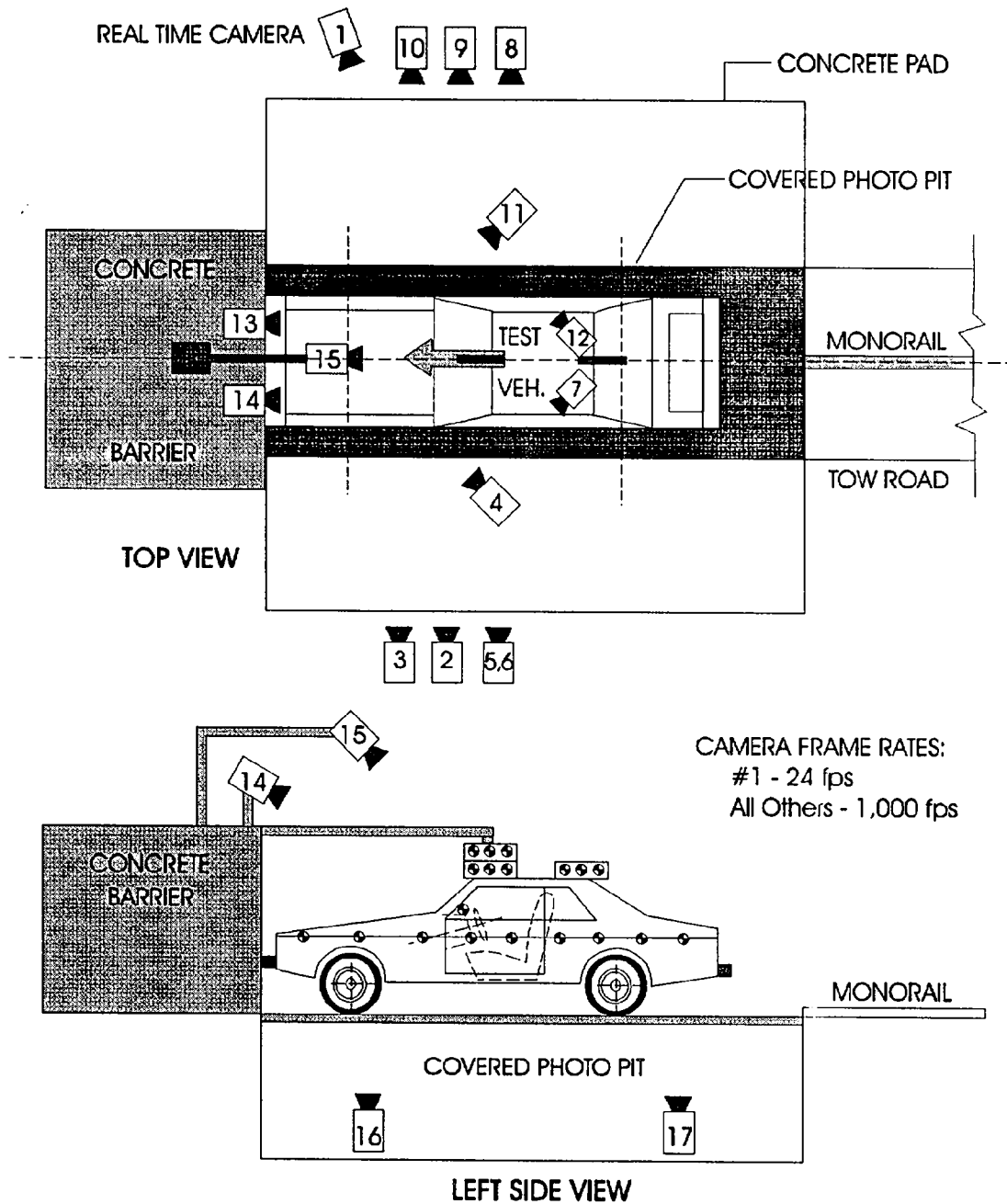


Table 6
HIGH-SPEED CAMERA LOCATIONS

Test No.		MT0302		Vehicle:		1996 Dodge Ram Van 2500		
CAMERA NO.	VIEW	CAMERA POSITIONS (MM.)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	6635	1726	1118	-1	6049	25	1015
3	Left Side View	8938	954	1044	-3	8352	13	1020
4	Driver and Interior View	4748	2607	2069	-10	--	25	1005
5	Steering Column (Bottom)	10061	653	1164	-2	9475	35	825
6	Steering Column (Top)	10061	653	1764	-4	9475	35	1050
7	Left Belt	-	-	-	-	-	8	700
8	Overall Right Side	6907	2055	1052	-1	6321	13	1055
9	Right Side View	8330	1229	1524	-2	7744	35	930
10	Right Passenger View	8655	1057	1285	-1	8069	25	810
11	Passenger and Interior View	4428	3013	1982	-9	-	25	1010
12	Right Belt	-	-	-	-	-	8	555
13	Passenger Front View	570	127	1778	-45	-	13	1010
14	Driver Front View	570	127	1778	-45	-	13	1115
15	Windshield View	0	0	3048	-60	-	13	1095
16	Pit View of Engine	0	505	-3048	90	-	13	1060
17	Pit View of Fuel Tank	0	3432	-3048	90	-	13	925

** = referenced to horizontal plane

N.T. indicates No Timing

*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

Figure 4

VEHICLE TARGET LOCATIONS

(Dimensions in millimeters)

A	510
B	870
C	710
D	1220
E	813
F	2987
G	1133
H	1132
I	105
J	1319
K	1237
L	1536
M	813
N	110
O	1130
P	1130
Q	1536
R	2260
S	1319

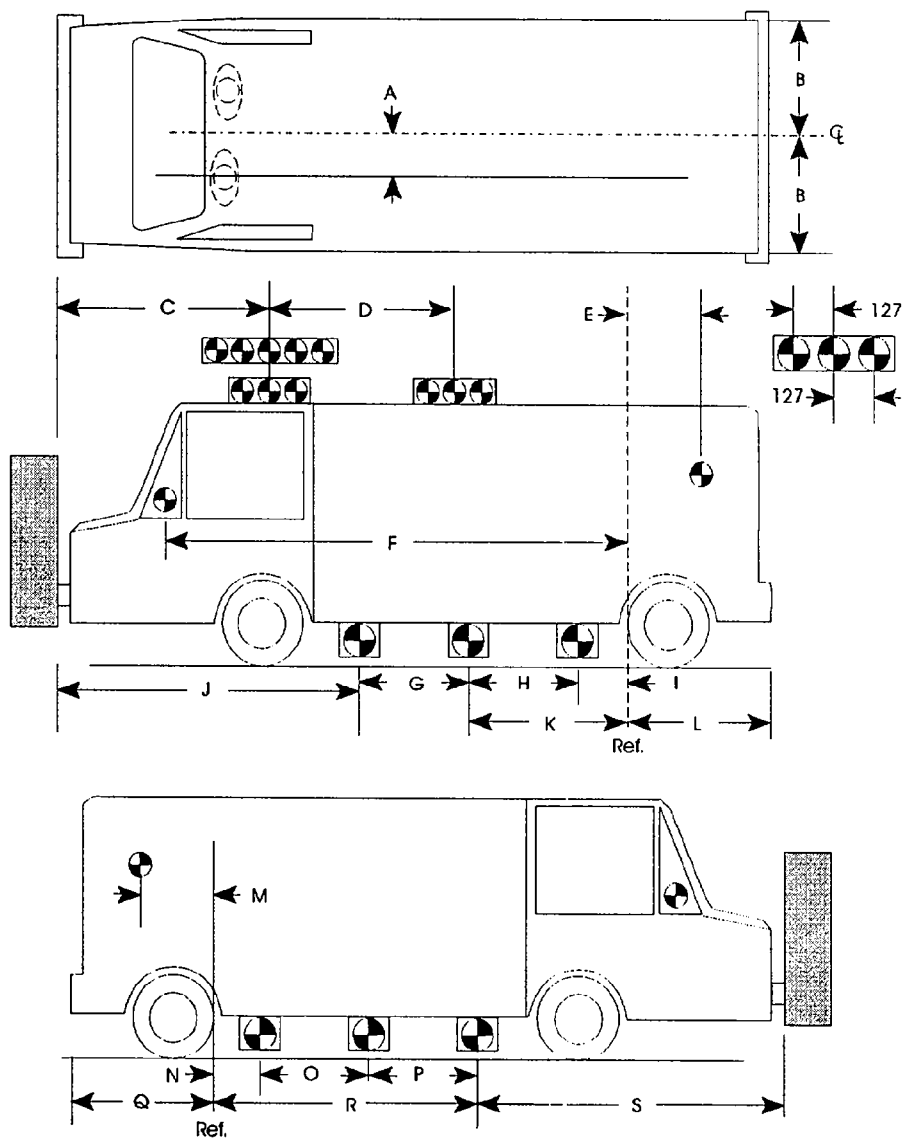
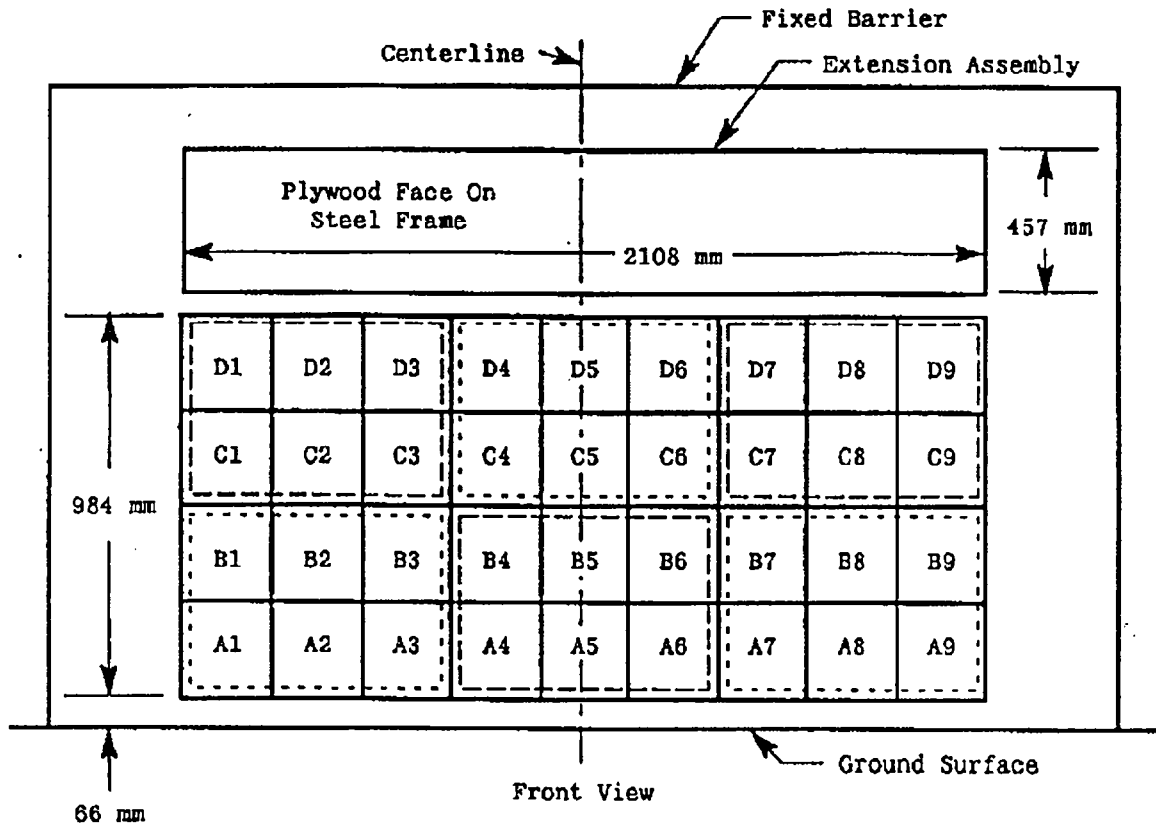


Figure 5

LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells
 4 Rows
 9 Columns
 6 Groupings (6 cells/group)



6 GROUPS OF 6 LOAD CELLS EACH

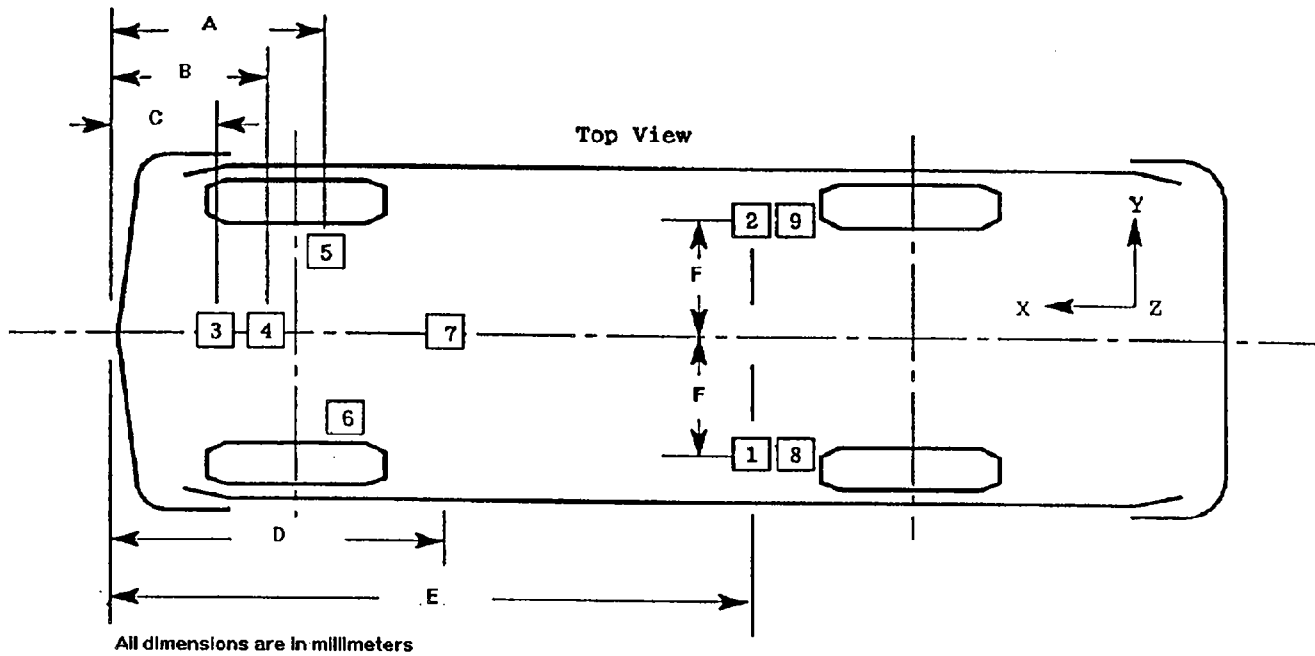
Group 4 C1 thru D3	Group 5 C4 thru D6	Group 6 C7 thru D9
Group 1 A1 thru B3	Group 2 A4 thru B6	Group 3 A7 thru B9

The following data is presented in Appendix B:

- (1) Data from 36 individual load cells
- (2) Total or Sum of 36 individual load cells
- (3) Data from 6 Groupings shown above (6 cells/group)

Figure 6

VEHICLE ACCELEROMETER LOCATIONS



ACCELEROMETER NUMBER*	ACCELEROMETER LOCATION	Distances From Vehicle Front	
		All dimensions in millimeters	
1	Left Rear Seat Crossmember [E/F]	X = 2114	Y = 800
2	Right Rear Seat Crossmember [E/F]	X = 2114	Y = 800
3	Top of engine [C]	1117	
4	Bottom of engine [B]	2174	
5	Right Disc Brake Caliper [A]	1094	
6	Left Disc Brake Caliper [A]	1094	
7	Instrument Panel [D]	1084	
8	Left Rear Seat Crossmember [E/F]	X = 2114	Y = 800
9	Right Rear Seat Crossmember [E/F]	X = 2114	Y = 800

* The accelerometer pack number can be correlated with the vehicle response data traces found in Appendix B.

Figure 7

TEST VEHICLE MEASUREMENTS

REAR DATUM REFERENCE

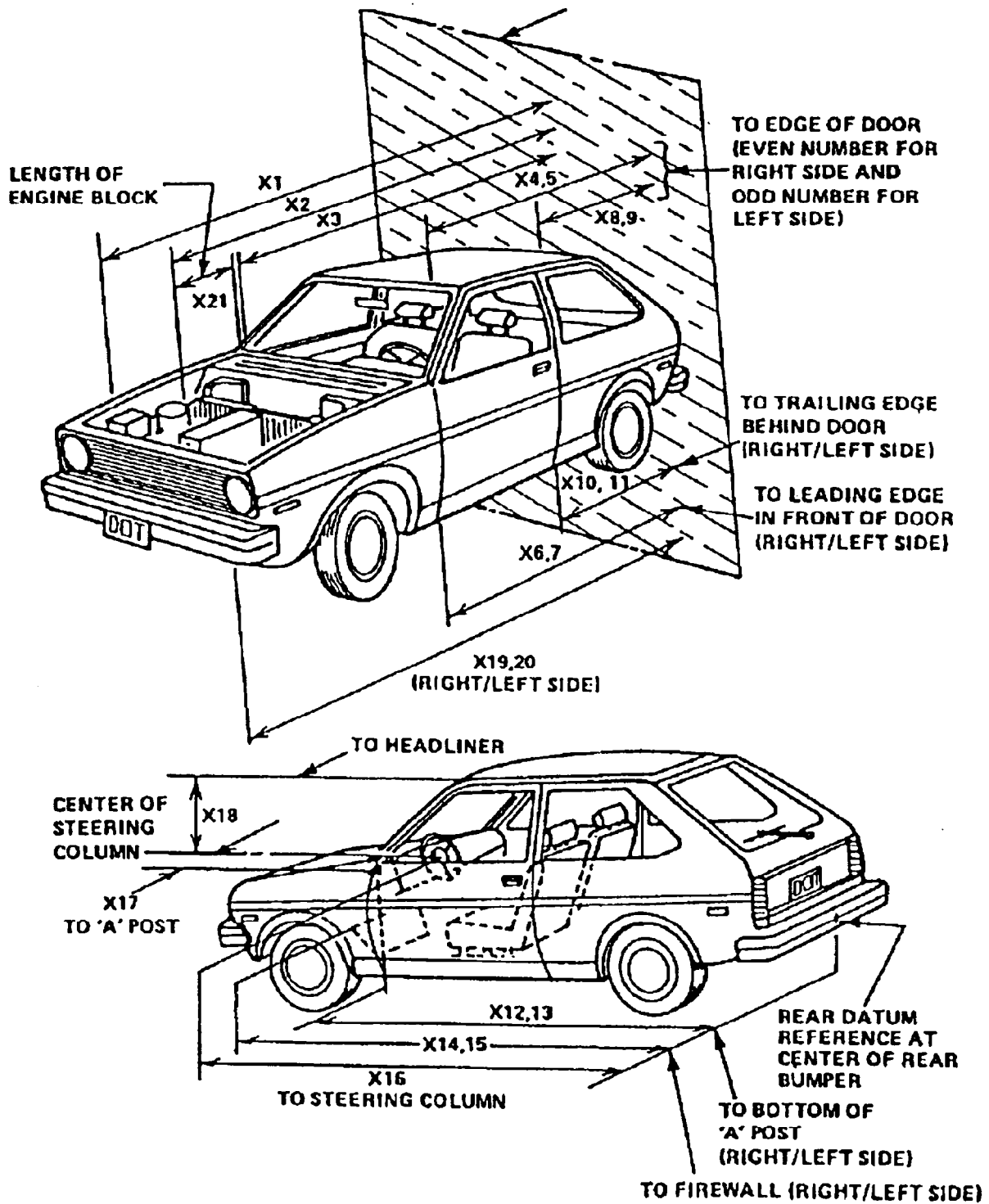


Table 7

VEHICLE MEASUREMENTS

No.		All Dimensions in mm		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	5225	4680	545
X2	Rear Surface of Vehicle to Front of Engine	4895	4592	303
X3	Rear Surface of Vehicle to Firewall	4515	4420	95
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	4370	4320	50
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	4355	4287	68
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	4374	4345	29
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	4350	4305	45
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	3350	3317	33
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	3332	3270	62
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	3338	3320	18
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	3316	3275	41
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3805	3790	15
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3780	3738	42
X14	Rear Surface of Vehicle to Firewall, Right Side	4435	4420	15
X15	Rear Surface of Vehicle to Firewall, Left Side	4525	4355	170
X16	Rear Surface of Vehicle to Steering Column	3890	3870	20
X17	Center of Steering Column to "A" Post	425	445	-20
X18	Center of Steering Column to Headliner	510	445	65
X19	Rear Surface of Vehicle to Right Side of Front Bumper	5105	4660	445
X20	Rear Surface of Vehicle to Left Side of Front Bumper	5080	4625	455
X21	Length of Engine Block	350	350	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	4160	4150	10
CD	Rear Surface of Vehicle to Center of Dash Panel	4150	4125	25
LD	Rear Surface of Vehicle to Left Side of Dash Panel	4170	4110	60

Table 8

ACCIDENT INVESTIGATION DIVISION DATA
FOR 56.3 KPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Dodge Ram Van 2500

Vehicle NHTSA No.: MT0302 VIN: 2B7HB21X6TK115404

Model Year: 1996 Build Date: 10/95 Test Date: December 5, 1995

Vehicle Size Category: Full size Test Weight: 2119 Kgs

Vehicle Wheelbase: 3241 mm; Front Overhang: 680 mm; Overall Width: 1840 mm

Collision Deformation Classification (CDC) Code: 12FDEW4

Crush Depth Dimensions:

C1 = 465 mm

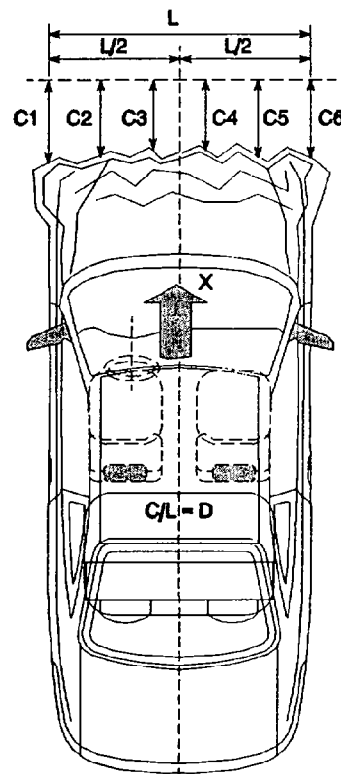
C2 = 490 mm

C3 = 520 mm

C4 = 520 mm

C5 = 480 mm

C6 = 440 mm



Midpoint of Damage: D = Vehicle Centerline
(Longitud.)

Longitude Length of Damaged Region: L = 1840 mm

Section 4

SUMMARY OF RESULTS OF FMVSS 212, 219 (Partial) AND 301

"Windshield Mounting" FMVSS No. 212 Data

"Windshield Zone Intrusion" FMVSS No. 219 Data

"Fuel System Integrity" FMVSS No. 301

Figure 8

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

Windshield is bonded in place and covered with 18 mm. molding.

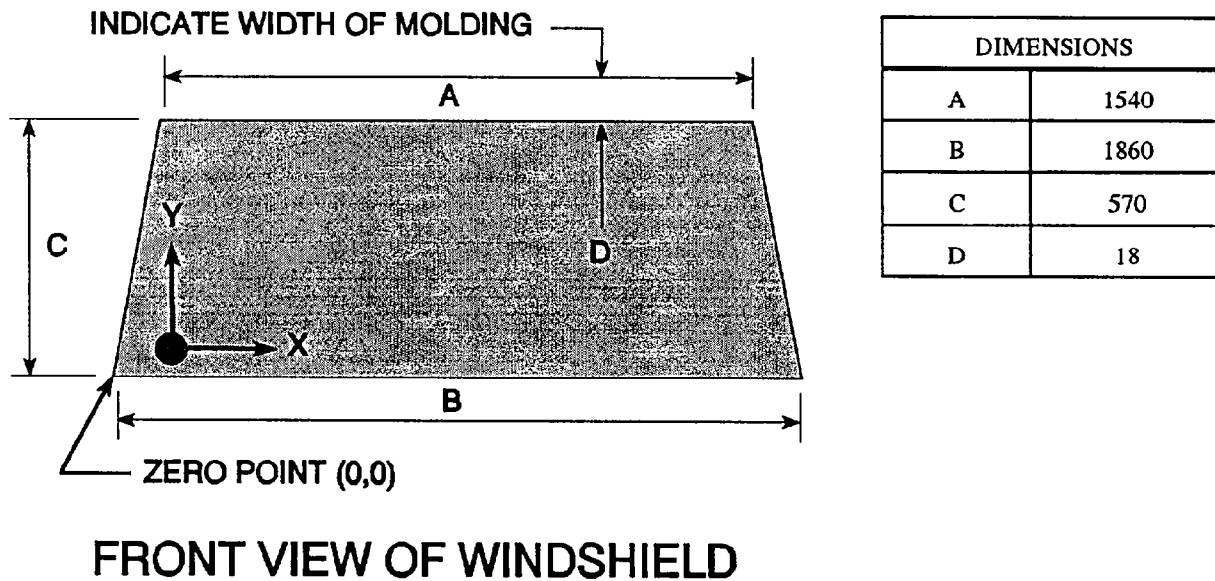
FMVSS 212 REQUIREMENTS:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of the windshield for vehicles equipped with automatic restraint systems for front occupants,

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST(mm)	
RIGHT SIDE	2270	2270	100
LEFT SIDE	2270	2270	100
TOTAL	4,540	4,540	100

AREA OF RETENTION FAILURE:



FAILURE DETAILS: None

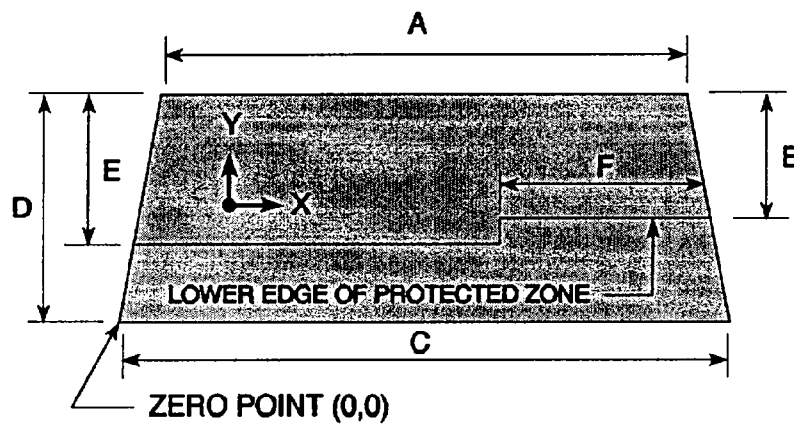
Figure 9

FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5" diameter rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. The locus of points is drawn on the inner surface of the windshield contacted by the sphere across the width of the instrument panel. From the outermost contactable points extend the locus line horizontally to the edges of the windshield, then draw a line on the inner surface of the windshield below and 1/2" distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection of this line onto the outer surface of the windshield.

FMVSS 219 TEST DATA: (Dimensions in mm)



DIMENSIONS	
A	1540
B	350
C	1860
D	570
E	440
F	1040

FRONT VIEW OF WINDSHIELD

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 1/4": None

(Show location of penetration on the above sketch)

COORDINATES		
	X	Y
1.		
2.		
3.		
4.		

Table 9

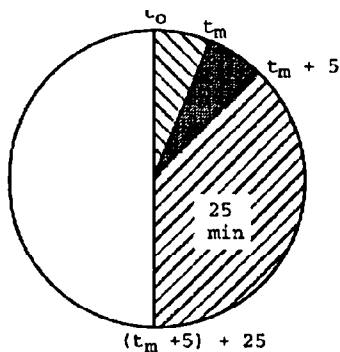
FMVSS NO. 301-75 "FUEL SYSTEM INTEGRITY" POST IMPACT TEST DATA

TEST VEHICLE NHTSA No.: MT0302 TEST DATE: December 5, 1995
VEHICLE MAKE/MODEL: 1996 Dodge Ram Van

The test vehicle was filled from 92% to 94% of the manufacture's "usable" capacity. The electric fuel pump was operating if it will operate without engine operation. Two Part 572 anthropomorphic test devices were located at each of the front designated seating positions.

=====

TEST VEHICLE IMPACT TYPE: X Frontal (35 mph)
- Oblique (30 mph) with _____ deg. barrier face first
 contacting _____
 (driver/passenger) side
- Rear Moving Barrier (30 mph)
- Lateral Moving Barrier (20 mph)

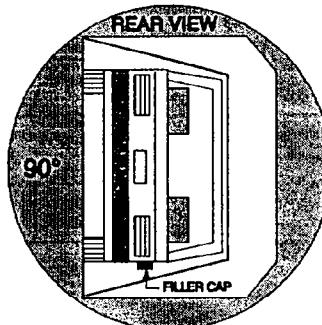
FUEL SPILLAGE MEASUREMENT:

1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

ACTUAL	MAX ALLOWED
0	1 oz.
0	5 oz.
0	1 oz./min.

SOLVENT SPILLAGE DETAILS: None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:Vehicle NHTSA ID No.
MT0302I.DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)2 minutes 50 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds**TOTAL**7 minutes 50 seconds

Next whole minute interval

8 minutes 00 secondsII.FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

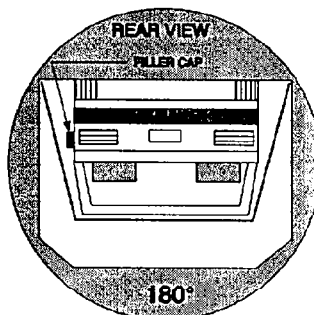
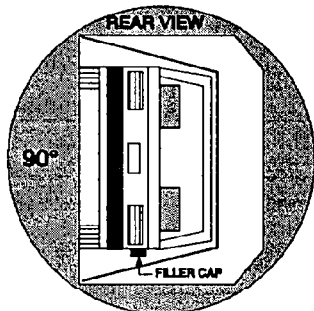
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S): None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:Vehicle NHTSA ID No.
MT0302I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)

2	minutes	30	seconds
5	minutes	00	seconds

FMVSS 301 Position Hold Time +

TOTAL

7	minutes	30	seconds
8	minutes	00	seconds

Next whole minute interval

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

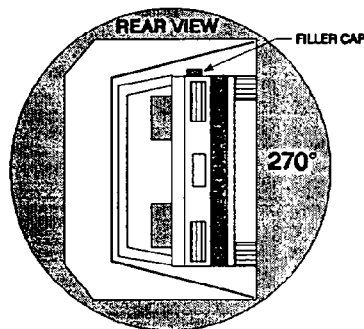
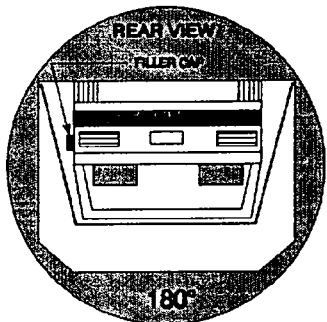
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S): None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:Vehicle NHTSA ID No.
MT0302I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)2 minutes 40 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds**TOTAL**7 minutes 40 seconds

Next whole minute interval

8 minutes 00 secondsII. FMVSS 301 REQUIREMENTS:(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

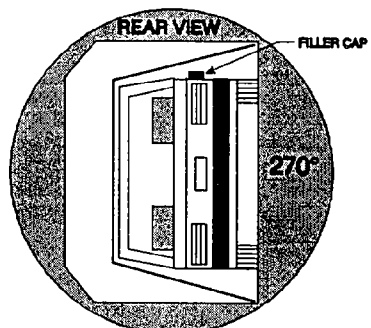
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S): None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:Vehicle NHTSA ID No.
MT0302I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)

2	minutes	30	seconds
5	minutes	00	seconds

FMVSS 301 Position Hold Time +

TOTAL

7	minutes	30	seconds
8	minutes	00	seconds

Next whole minute interval

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

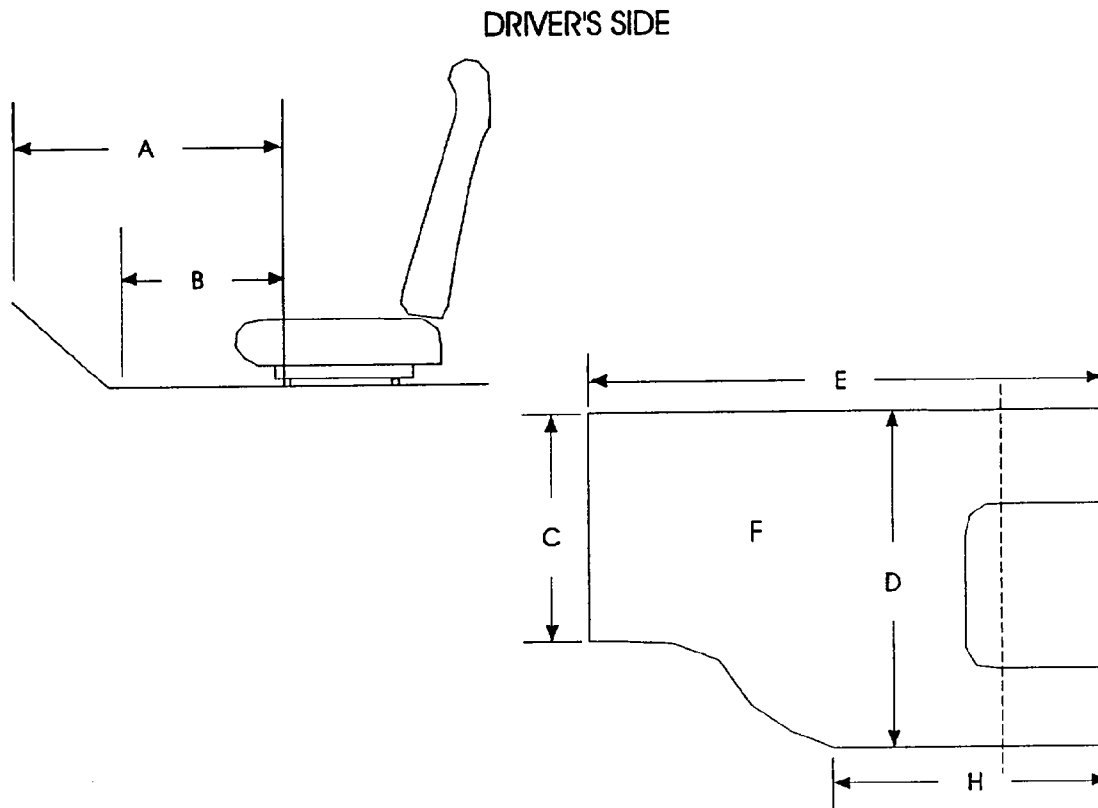
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S): None

Figure 10
DRIVER SIDE FLOORBOARD DEFORMATION

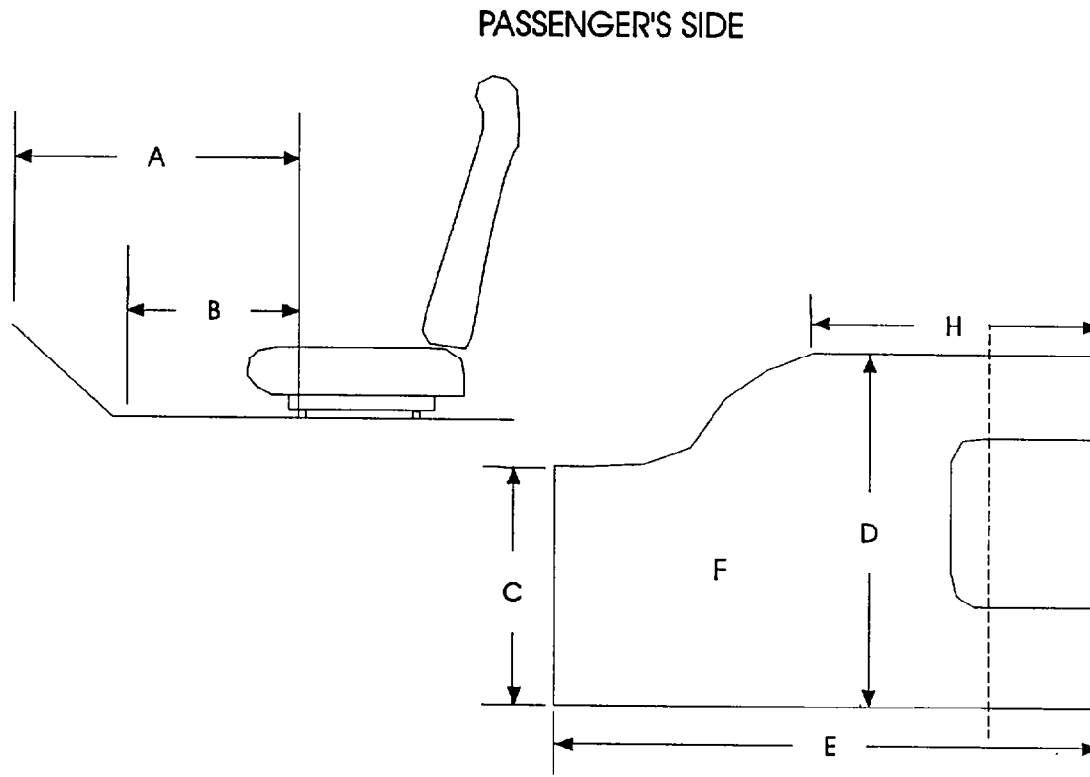


Measurement	Pre-Test	Post-Test	Difference
A	930	805	125
B	930	775	155
C	455	470	-15
D	465	450	15
E	840	760	80
H	365	480	-115
F (cm) ²	3858	3476	382

Units = mm

$$F = H \times D + (E - H) \times C$$

Figure 11
PASSENGER SIDE FLOORBOARD DEFORMATION

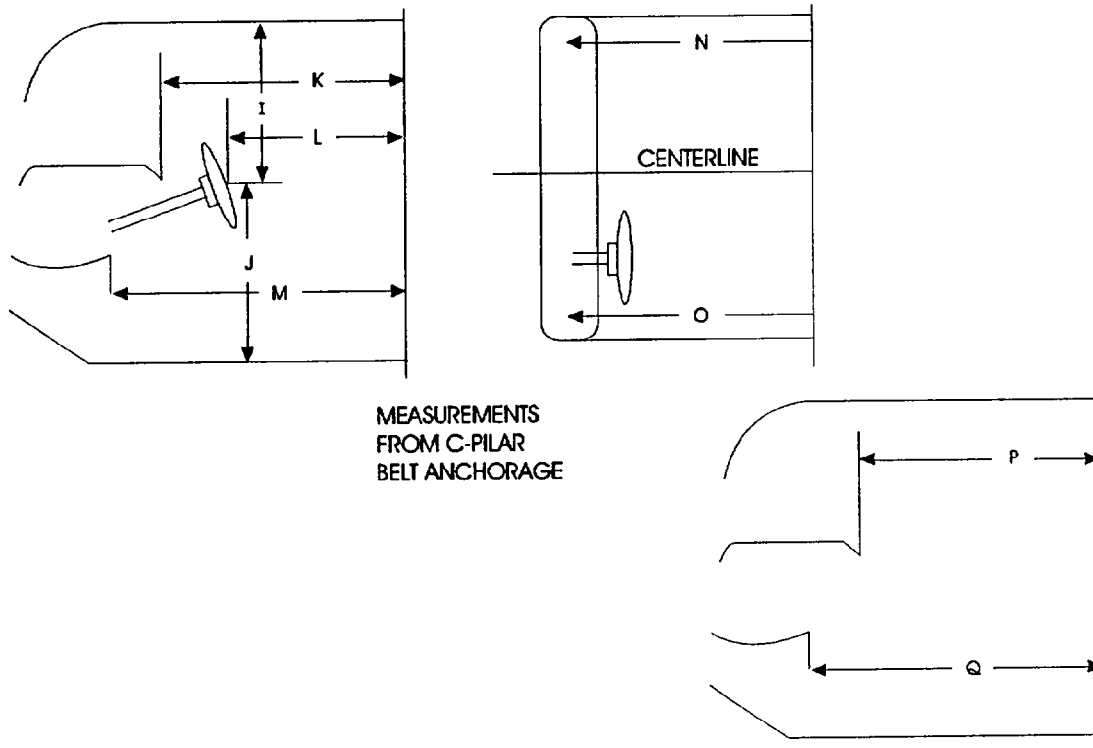


Measurement	Pre-Test	Post-Test	Difference
A	920	890	30
B	920	900	20
C	300	280	20
D	280	270	10
E	920	870	50
H	415	360	55
F (cm) ²	2667	2400	267

Units = mm

$$F = H \times D + (E - H) \times C$$

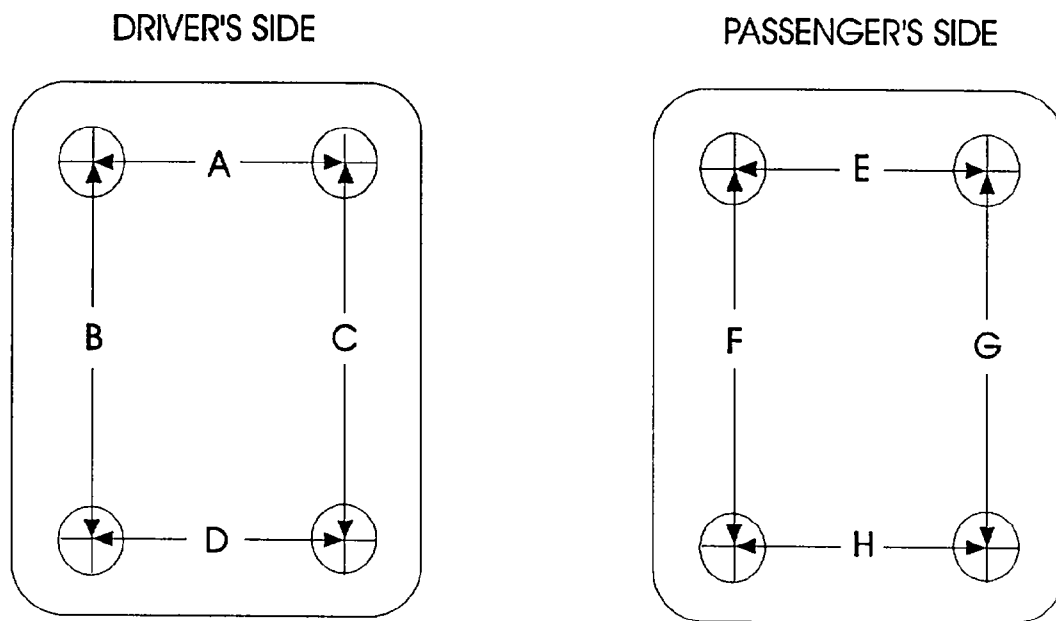
Figure 12
INTERIOR DEFORMATION



Measurement	Pre-Test	Post-Test	Difference
I	530	500	30
J	740	950	-210
K	2125	2094	31
L	1860	1845	15
M	2135	2075	60
N	2140	2130	10
O	2145	2065	80
P	2190	2160	30
Q	2130	2085	45

Units = mm

Figure 13
FLOORBOARD DEFORMATION



TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	300	300	0
B	372	370	2
C	400	395	5
D	325	330	-5
E	330	330	0
F	370	365	5
G	385	385	0
H	330	340	-10

Units = mm

Appendix A
PHOTOGRAPHS

PHOTOGRAPHS

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A-1	PRE-TEST FRONT VIEW.	A-3
A-2	POST TEST FRONT VIEW	A-4
A-3	PRE-TEST LEFT SIDE VIEW.	A-5
A-4	POST TEST LEFT SIDE VIEW	A-6
A-5	PRE-TEST RIGHT SIDE VIEW	A-7
A-6	POST TEST RIGHT SIDE VIEW	A-8
A-7	PRE-TEST RIGHT FRONT THREE-QUARTER VIEW	A-9
A-8	POST TEST RIGHT FRONT THREE-QUARTER VIEW	A-10
A-9	PRE-TEST LEFT REAR THREE-QUARTER VIEW	A-11
A-10	POST TEST LEFT REAR THREE-QUARTER VIEW	A-12
A-11	PRE-TEST WINDSHIELD VIEW	A-13
A-12	POST TEST WINDSHIELD VIEW	A-14
A-13	PRE-TEST ENGINE COMPARTMENT VIEW	A-15
A-14	FUEL CAP VIEW	A-16
A-15	POST TEST FRONT UNDERBODY VIEW	A-17
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A-18	PRE-TEST DRIVER POSITION VIEW	A-20
A-19	POST TEST DRIVER POSITION VIEW	A-21
A-20	PRE-TEST PASSENGER POSITION VIEW	A-22
A-21	POST TEST PASSENGER POSITION VIEW	A-23
A-22	PRE-TEST DRIVER AND INTERIOR VIEW	A-24
A-23	POST TEST DRIVER AND INTERIOR VIEW	A-25
A-24	PRE-TEST PASSENGER AND INTERIOR VIEW	A-26
A-25	POST TEST PASSENGER AND INTERIOR VIEW.	A-27
A-26	PRE-TEST DRIVER HEAD LOCATION	A-28
A-27	PRE-TEST PASSENGER HEAD LOCATION	A-29
A-28	ROLLOVER VIEW	A-30
A-29	IMPACT VIEW	A-31



Figure A-1 PRE-TEST FRONT VIEW



Figure A-2 POST-TEST FRONT VIEW

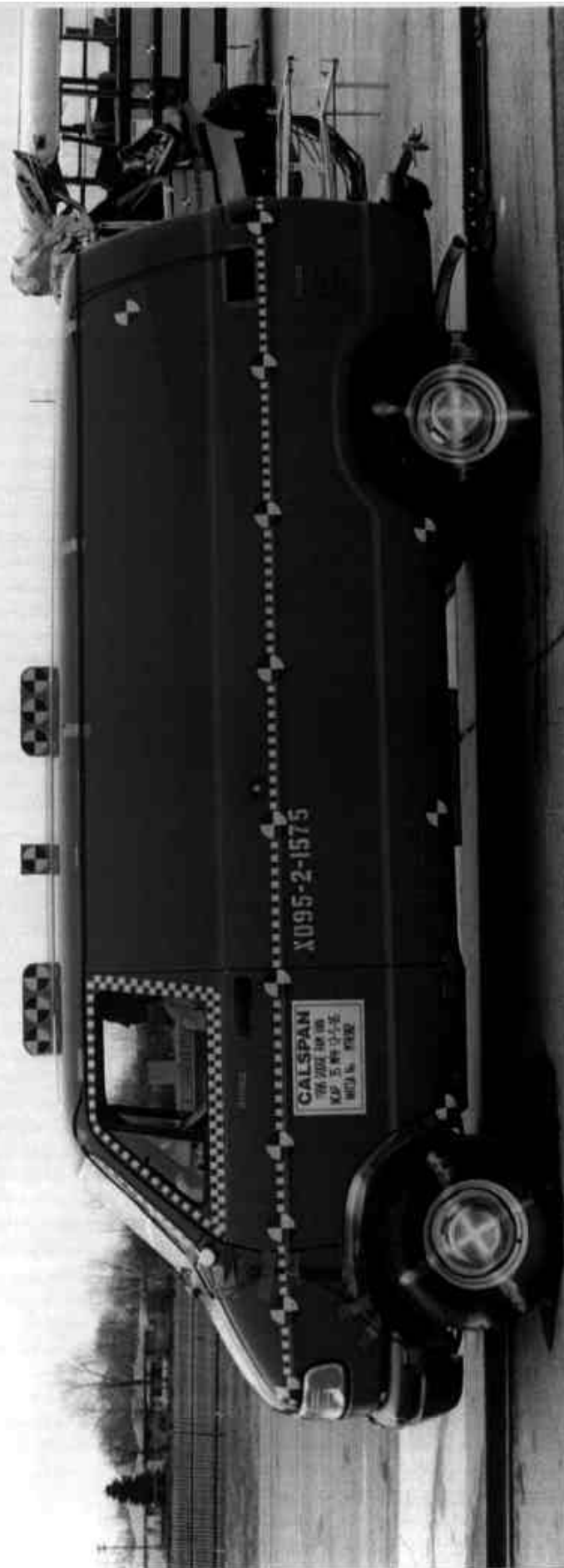


Figure A-3 PRE-TEST LEFT SIDE VIEW

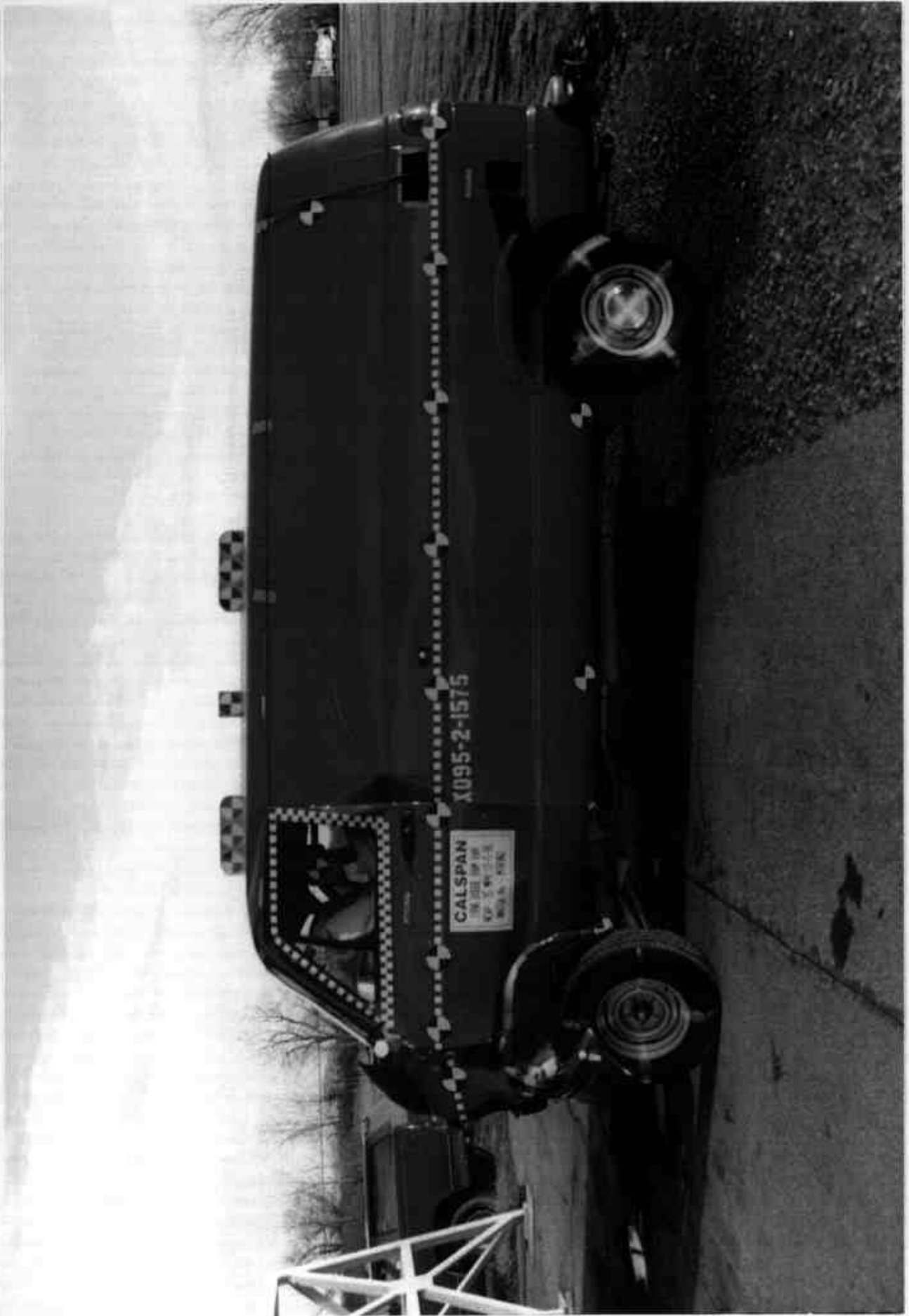


Figure A-4 POST-TEST LEFT SIDE VIEW

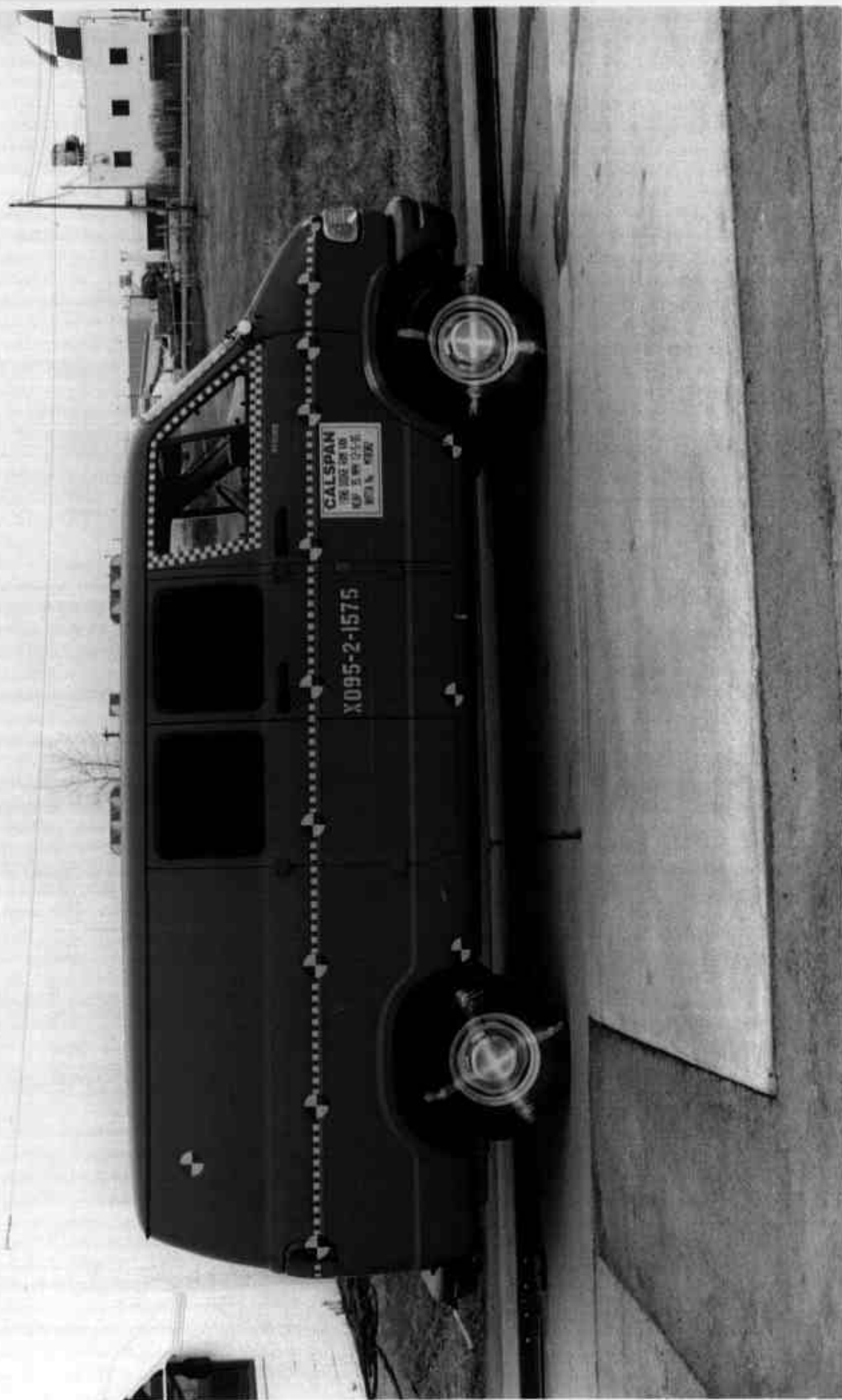


Figure A-5 PRE-TEST RIGHT SIDE VIEW

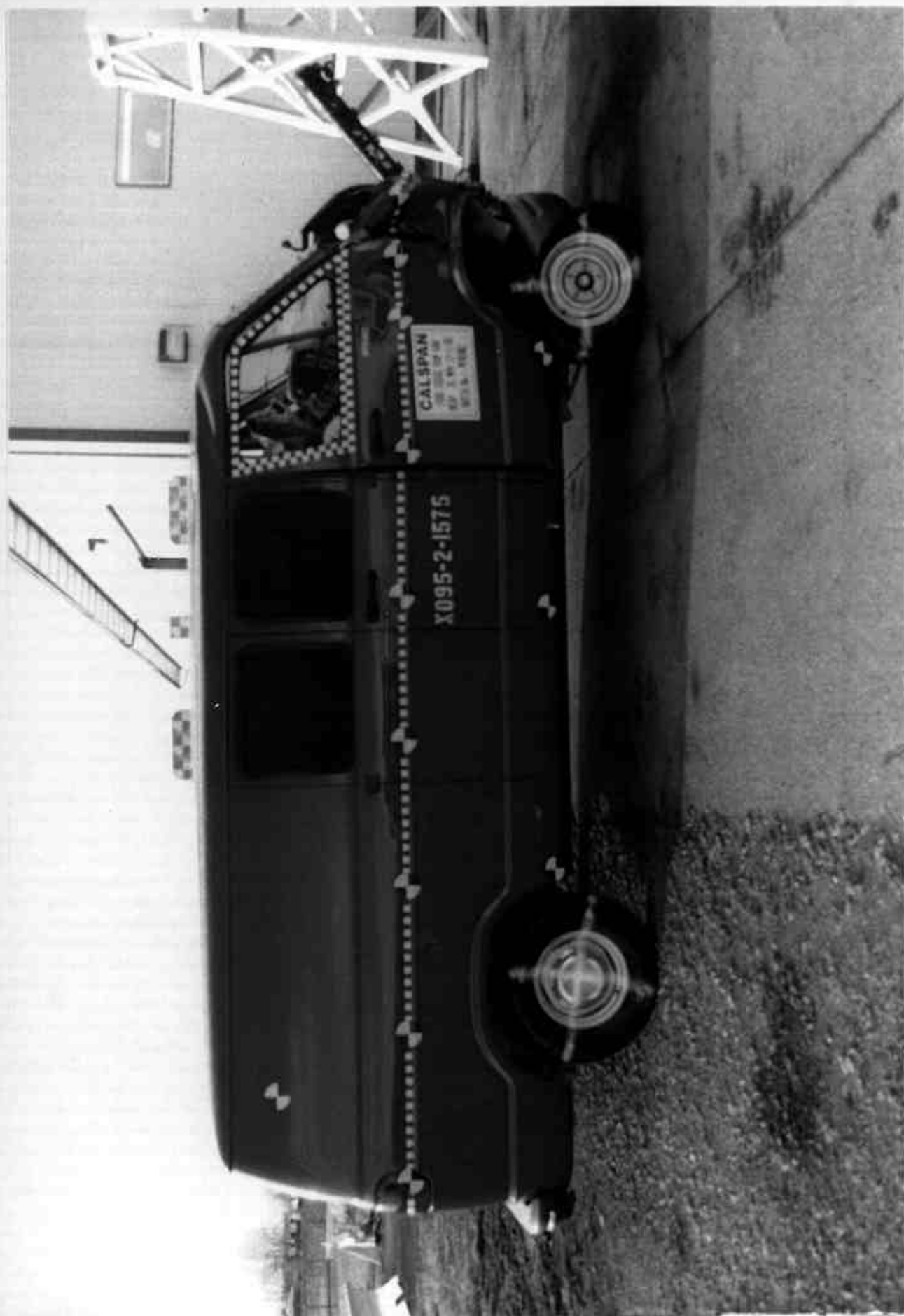


Figure A-6 POST-TEST RIGHT SIDE VIEW



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



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



Figure A-9 PRE-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-10 POST-TEST LEFT REAR THREE-QUARTER VIEW

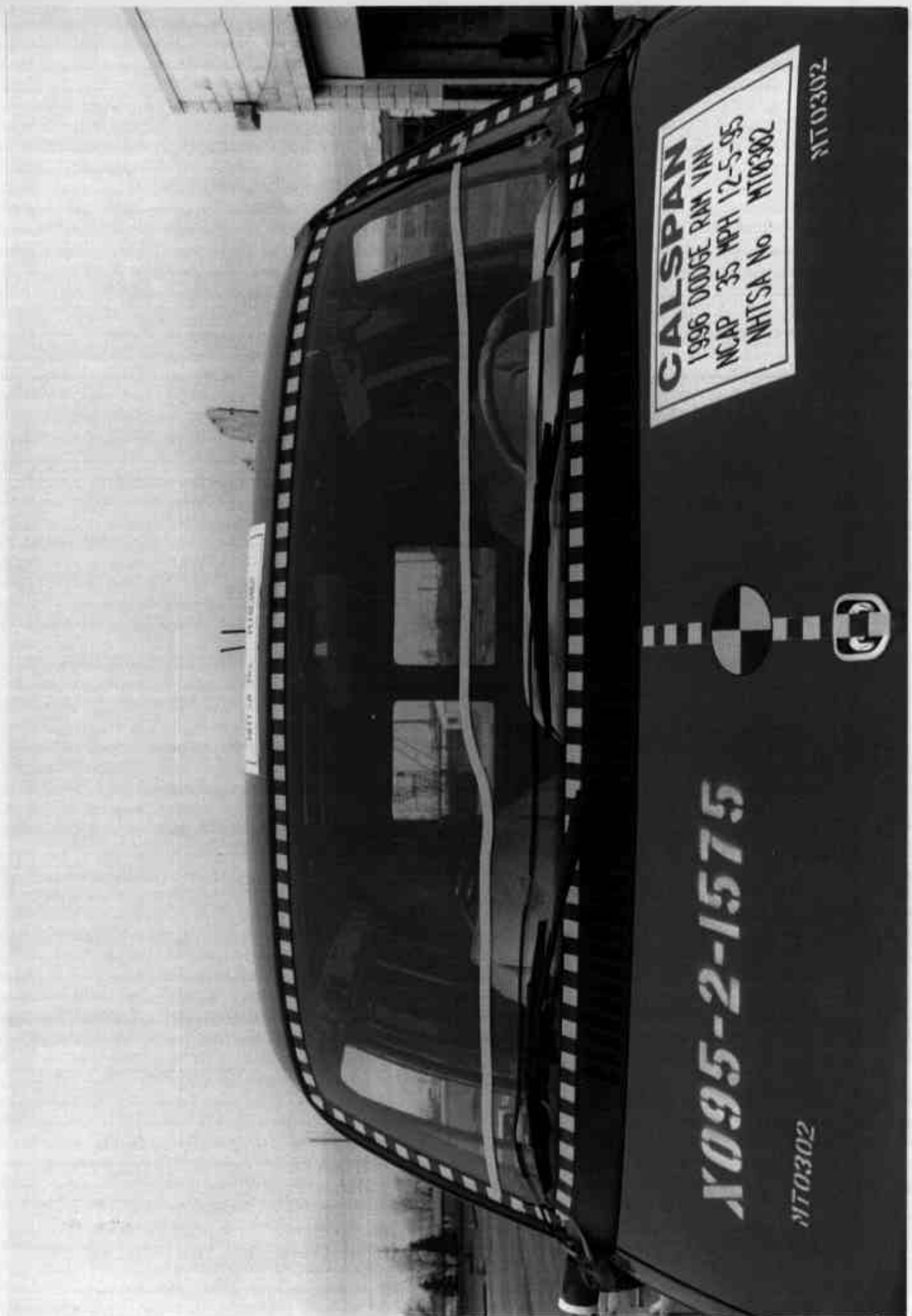


Figure A-11 PRE-TEST WINDSHIELD VIEW



Figure A-12 POST-TEST WINDSHIELD VIEW



Figure A-13 PRE-TEST ENGINE COMPARTMENT VIEW

MT0302

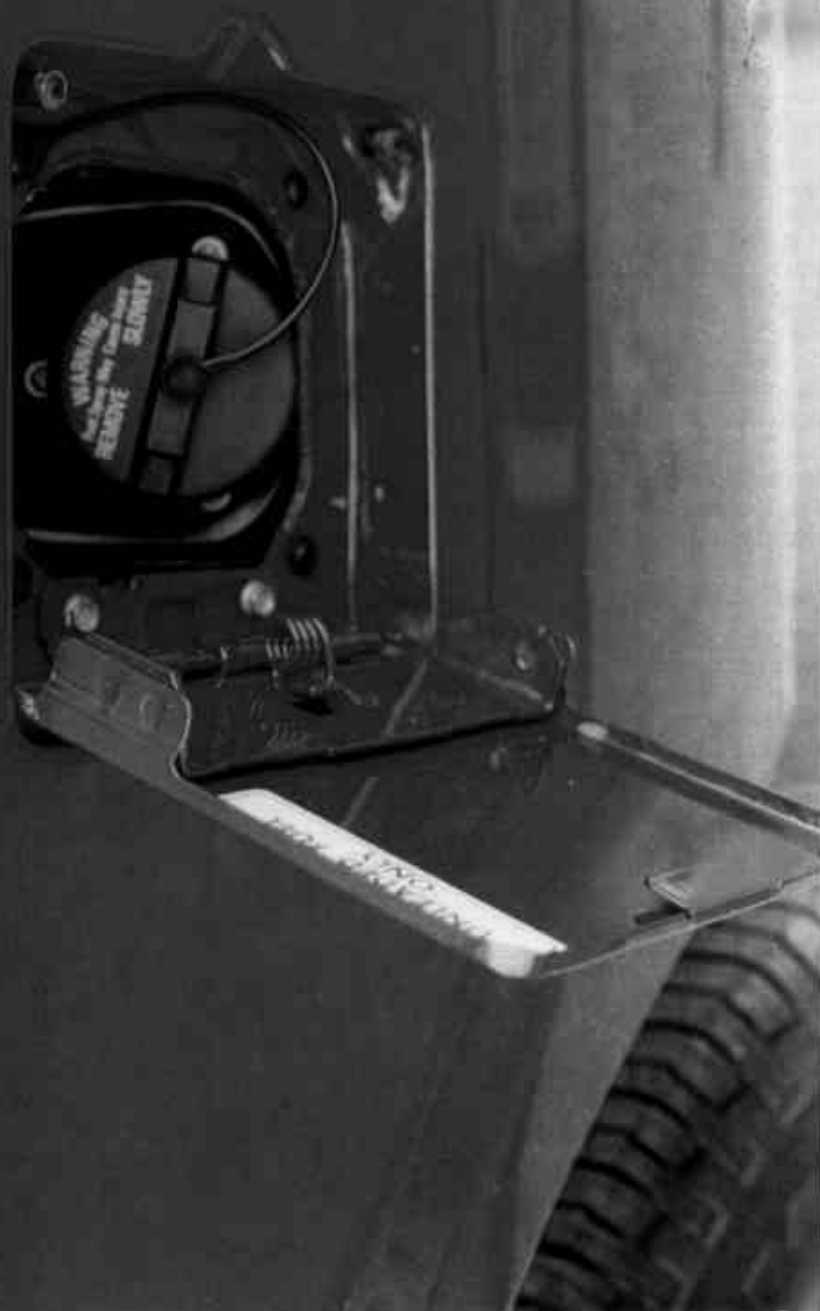


Figure A-14 FUEL CAP VIEW



Figure A-15 POST-TEST FRONT UNDERBODY VIEW



Figure A-16 POST-TEST FRONT SIDE UNDERBODY VIEW



Figure A-17 POST-TEST REAR UNDERBODY VIEW



Figure A-18 PRE-TEST DRIVER POSITION VIEW



Figure A-19 POST-TEST DRIVER POSITION VIEW



Figure A-20 PRE-TEST PASSENGER POSITION VIEW



Figure A-21 POST-TEST PASSENGER POSITION VIEW



Figure A-22 PRE-TEST DRIVER AND INTERIOR VIEW
A-24



Figure A-23 POST-TEST DRIVER AND INTERIOR VIEW



Figure A-24 PRE-TEST PASSENGER AND INTERIOR VIEW
A-26



Figure A-25 POST-TEST PASSENGER AND INTERIOR VIEW
A-27



Figure A-26 PRE-TEST DRIVER HEAD LOCATION



Figure A-27 PRE-TEST PASSENGER HEAD LOCATION

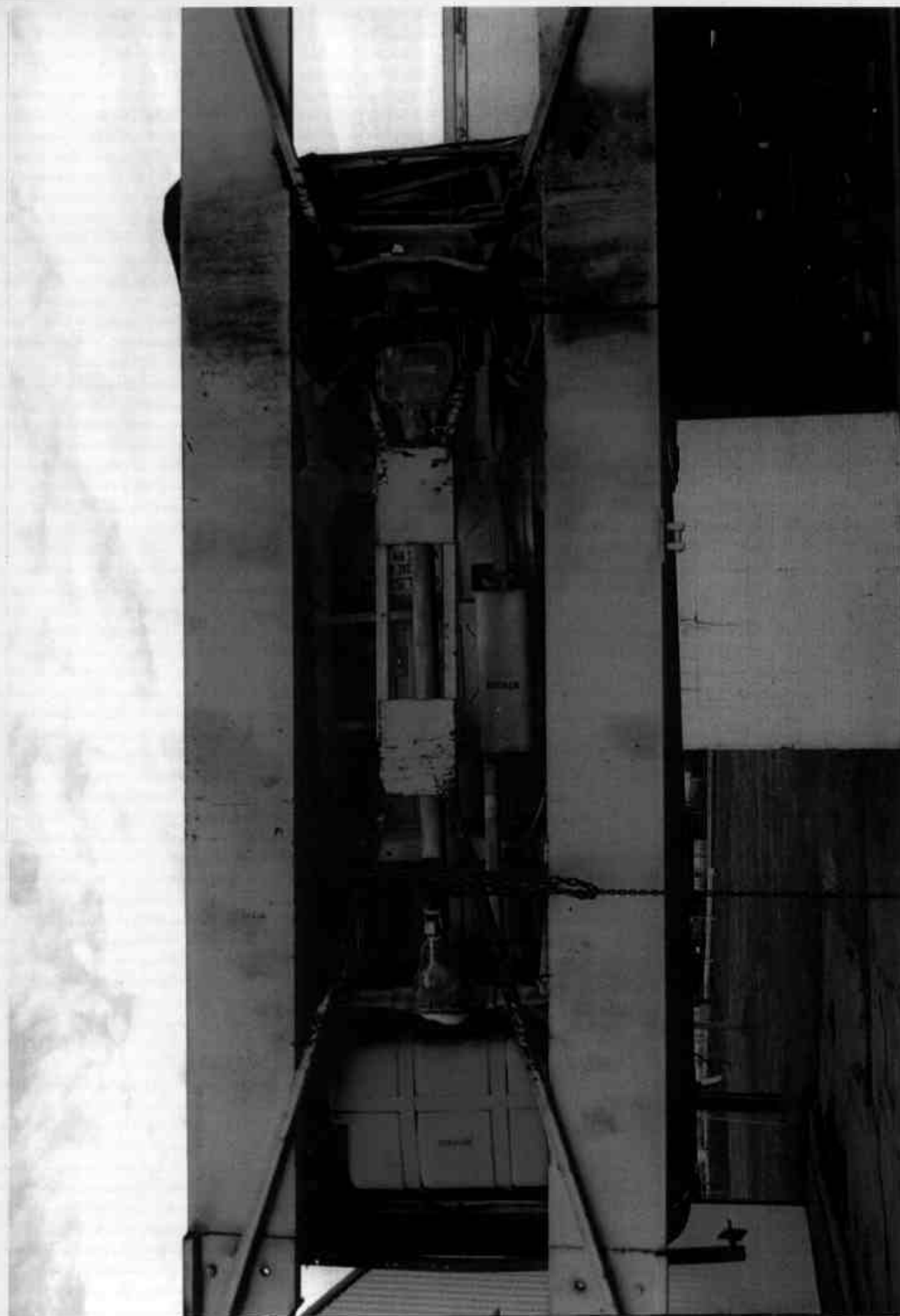


Figure A-28 ROLLOVER VIEW



Figure A-29 IMPACT VIEW

Appendix B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

TEST NO. MT0302

DUMMY DATA

CLASS	FILTER CHANNEL
Head Accelerations	1000
Chest Accelerations	180
Chest Displacements	60
Femur Forces	600
Belt Loads	60
Belt Displacements	180
Neck Forces	1000
Neck Moments	600

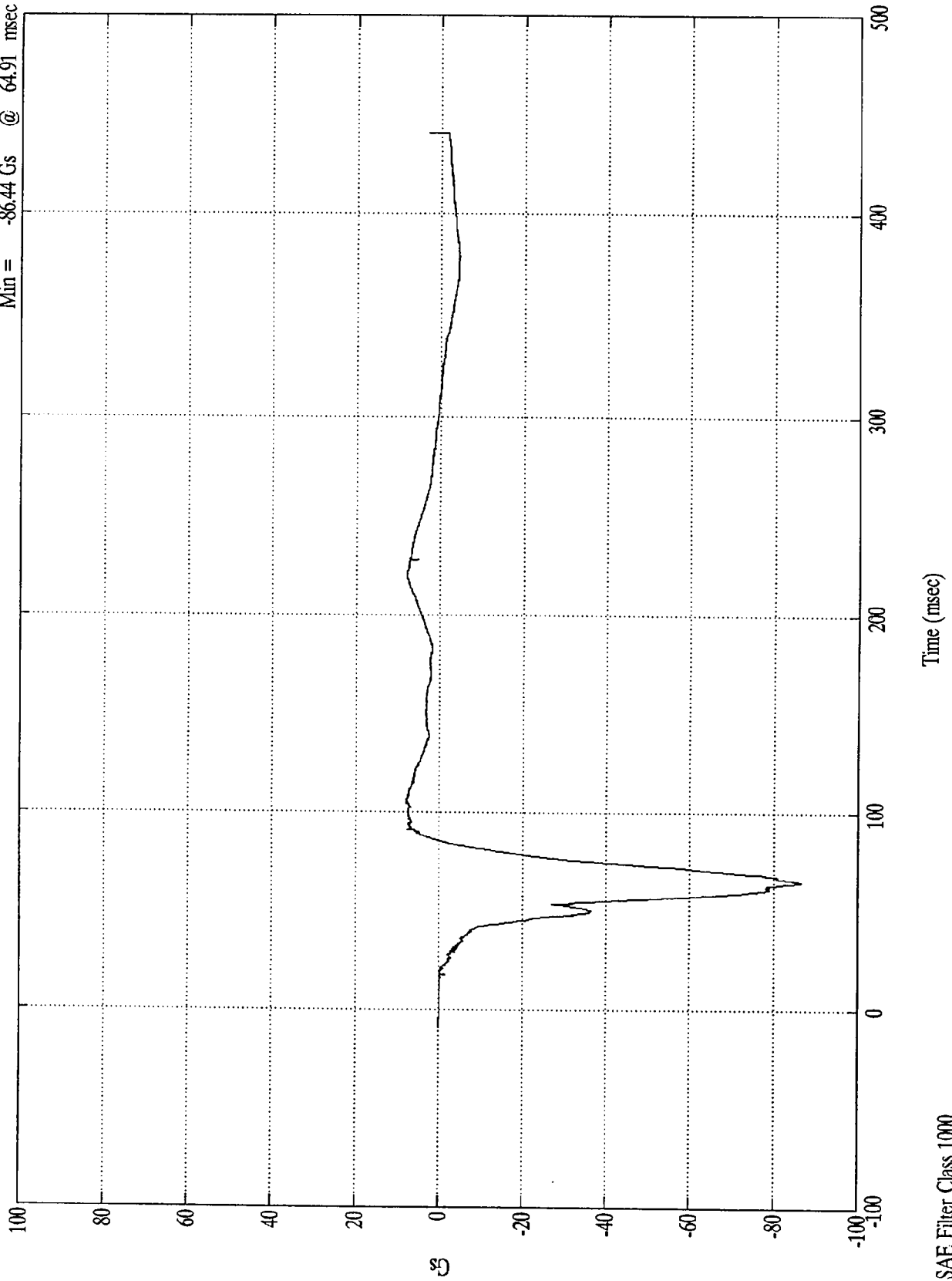
**Hybrid III Dummy Sign Conventions
Load Cells and Special Transducers**

Transducer	DOT/NHTSA Sign Convention (positive unless noted)
Upper Neck Load Cell	Fx Head forward Fy Head left Fz Neck in tension Mx Right ear to right shoulder My Chin to chest (flexion) Mz Chin to left shoulder (look left)
Chest Displacement Potentiometer	Compression is negative
Pelvic Load Cell (Lower Lumbar)	Fx Chest forward Fy Chest left Fz Spine in tension
Femur Load Cell	Compression is negative
Upper Tibia Load Cell (right and left leg)	Mx Support tibia, load right side center My Support tibia, load front (shin) center
Lower Tibia Load Cell (right and left leg)	Fy Foot right w/r to left Fz Tibia in tension Mx Support tibia, press right side center

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 7.87 Gs @ 221.04 msec
Min = -86.44 Gs @ 64.91 msec

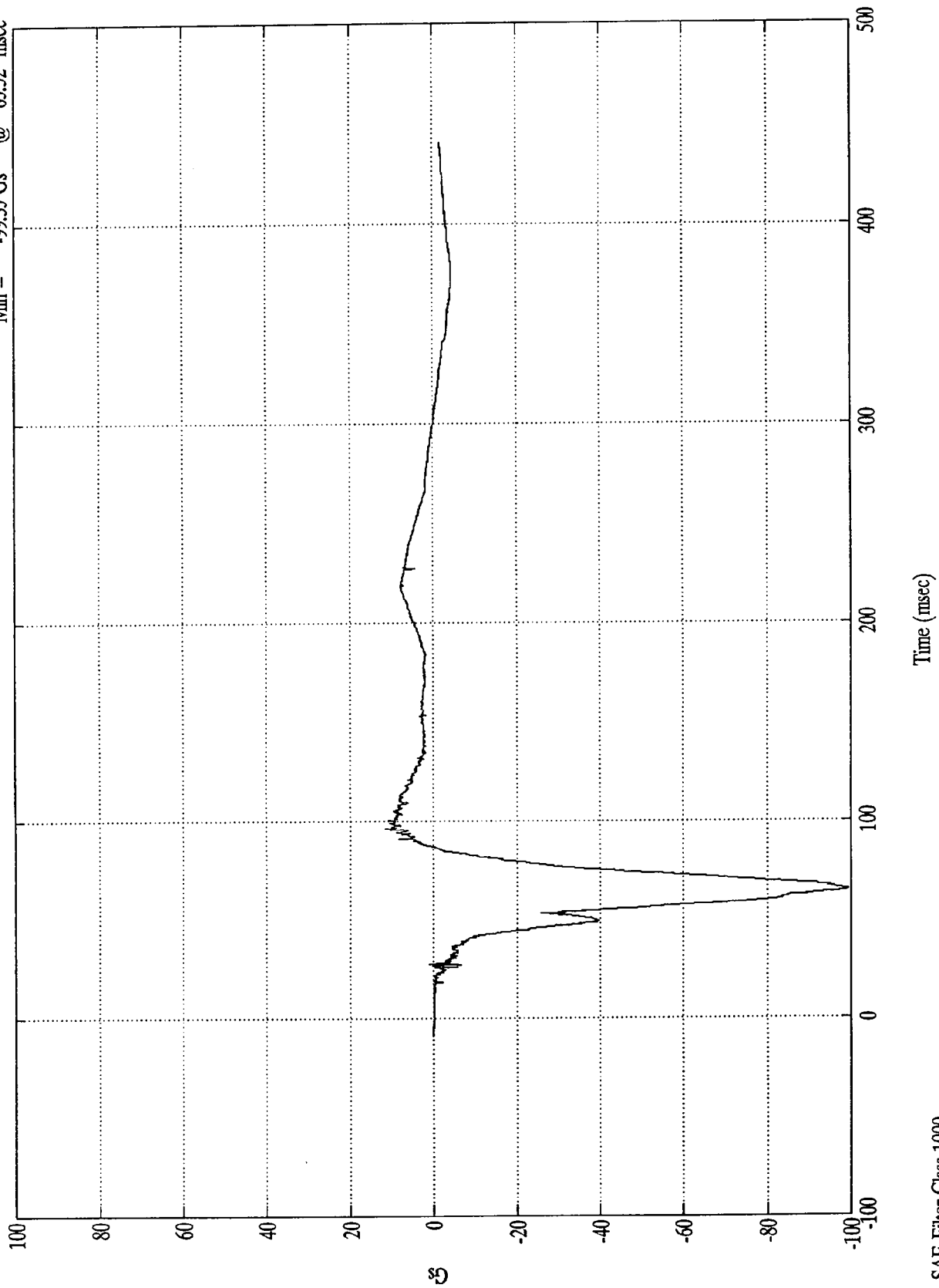
Pos. 1 Head X



NCAP TEST #2 - 1996 DODGE RAM VAN

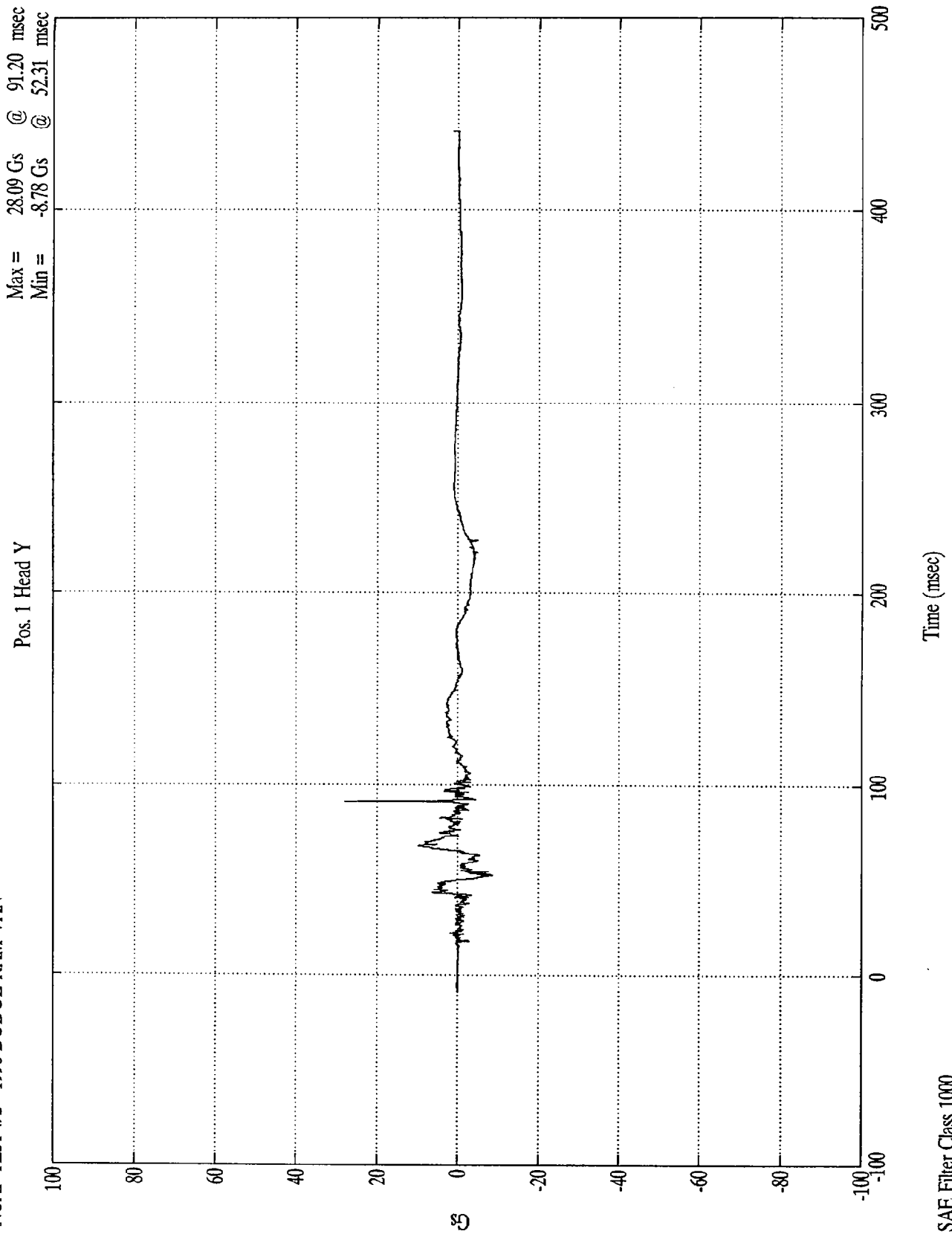
Pos. 1 Head X(R)

Max = 11.62 Gs @ 96.12 msec
Min = -99.35 Gs @ 65.52 msec



SAE Filter Class 1000

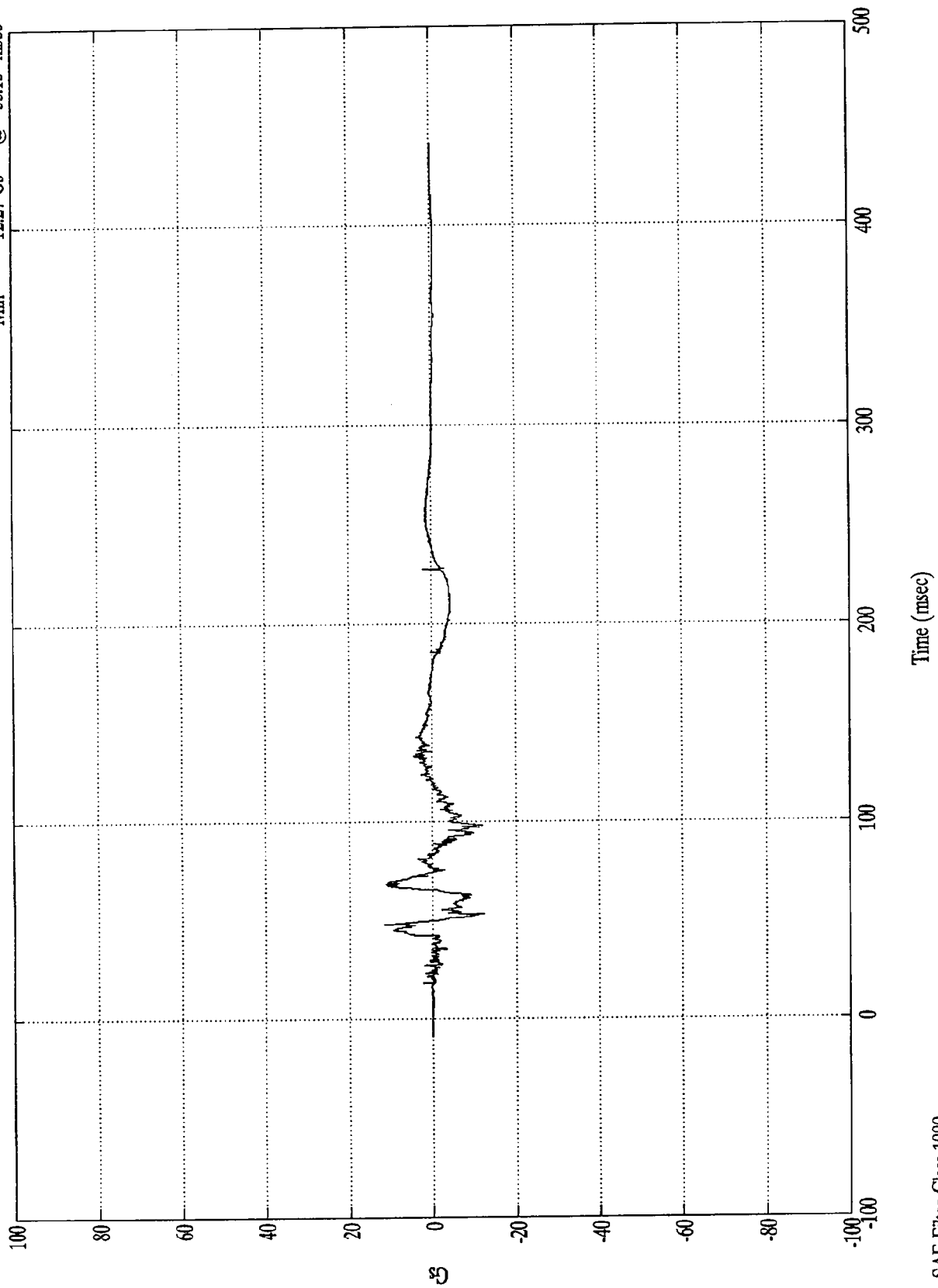
NCAP TEST #2 - 1996 DODGE RAM VAN



NCAP TEST #2 - 1996 DODGE RAM VAN

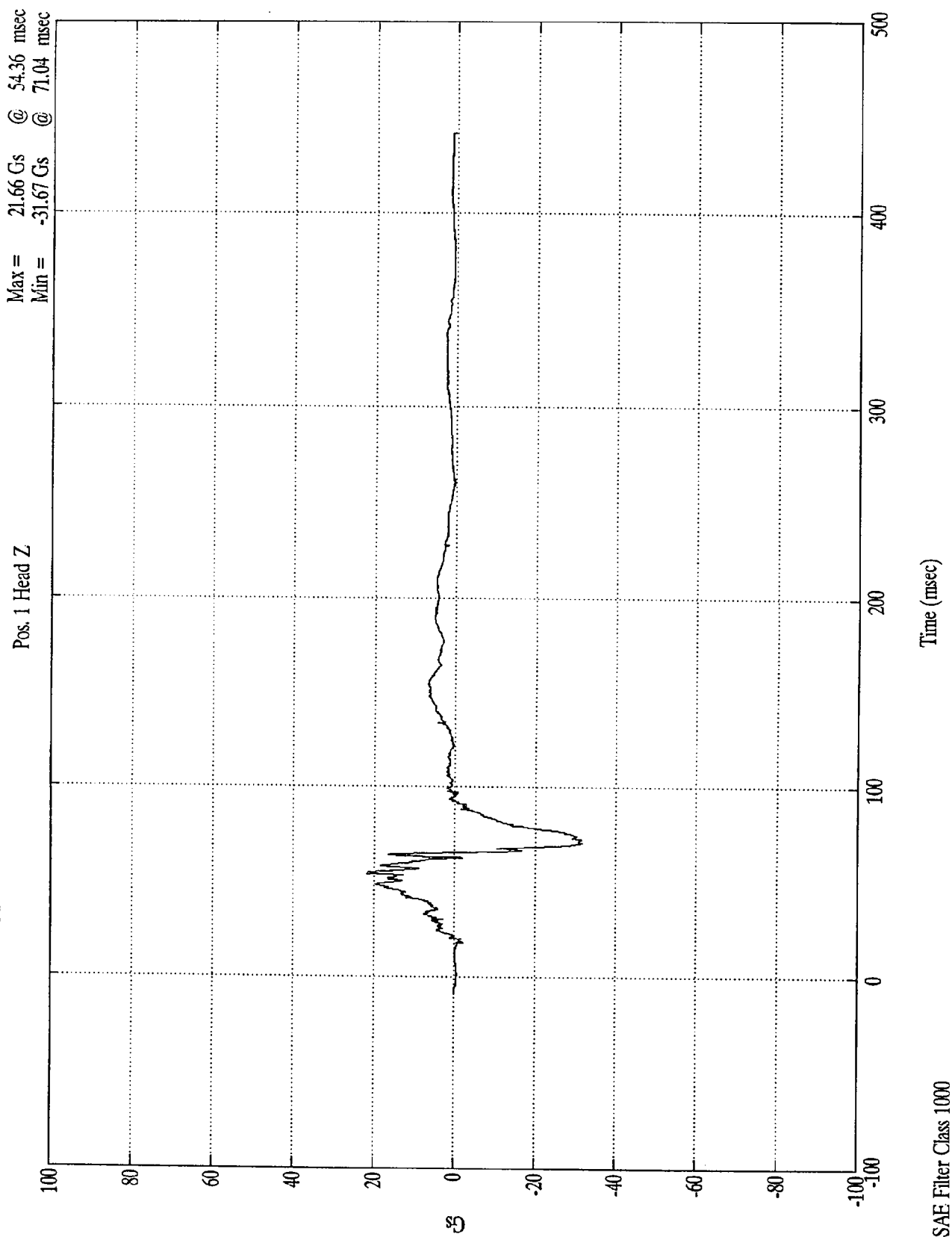
Pos. 1 Head Y(R)

Max = 11.56 Gs @ 48.24 msec
Min = -12.27 Gs @ 53.15 msec



SAE Filter Class 1000

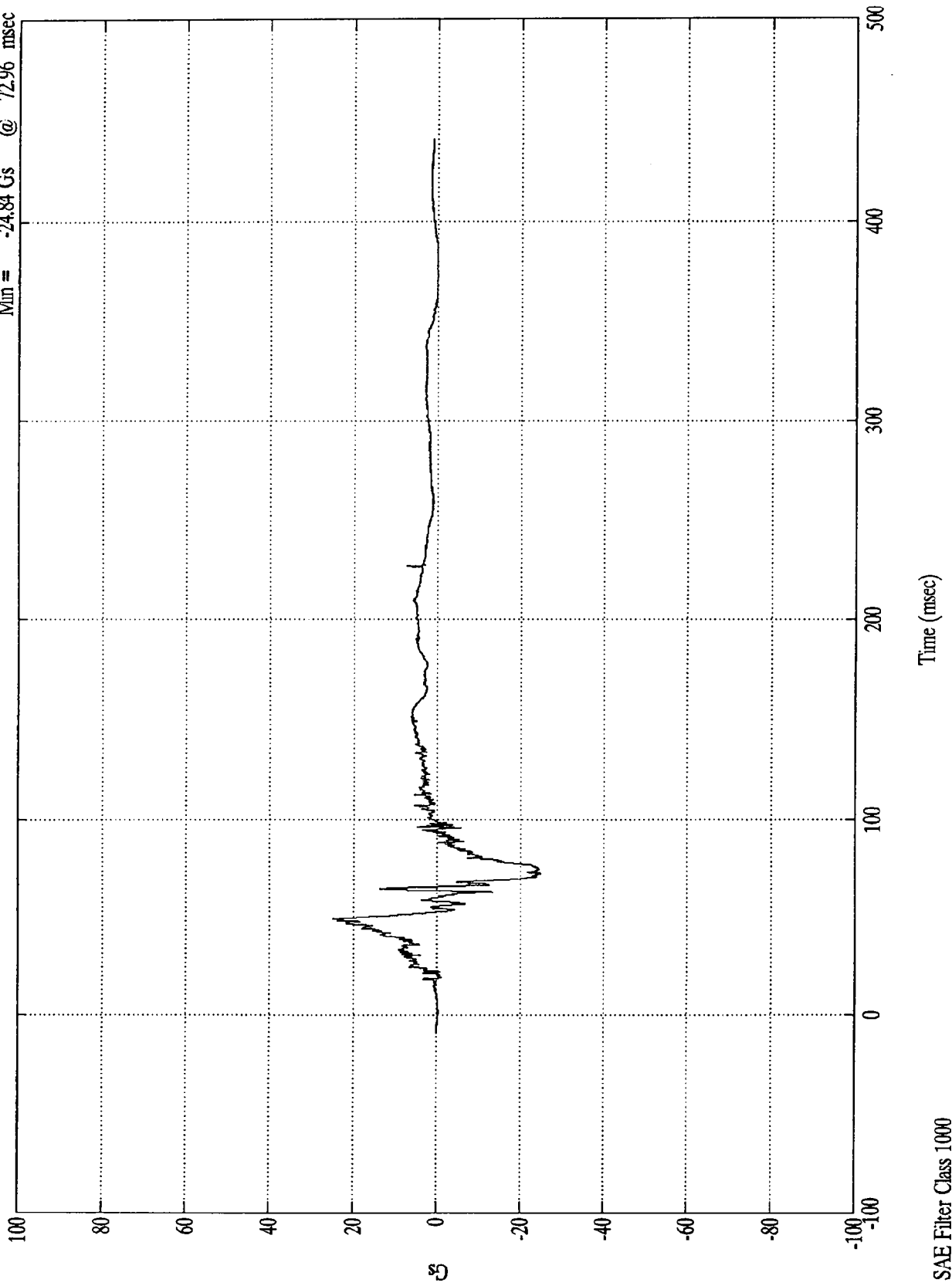
NCAP TEST #2 - 1996 DODGE RAM VAN



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Head Z(R)

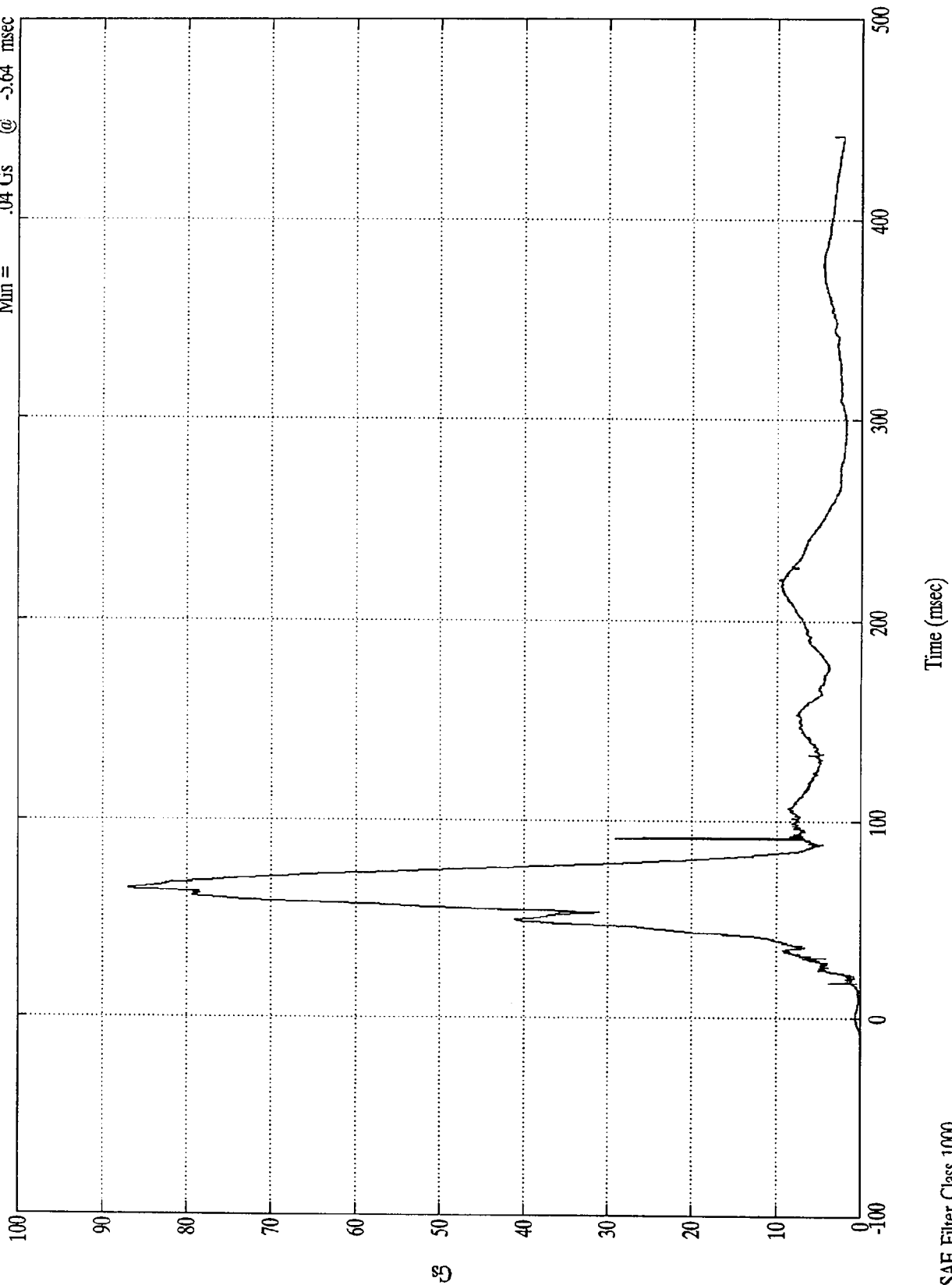
Max = 24.83 Gs @ 49.20 msec
Min = -24.84 Gs @ 72.96 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Head Resultant

Max = 86.94 Gs @ 64.91 msec
Min = .04 Gs @ -5.64 msec

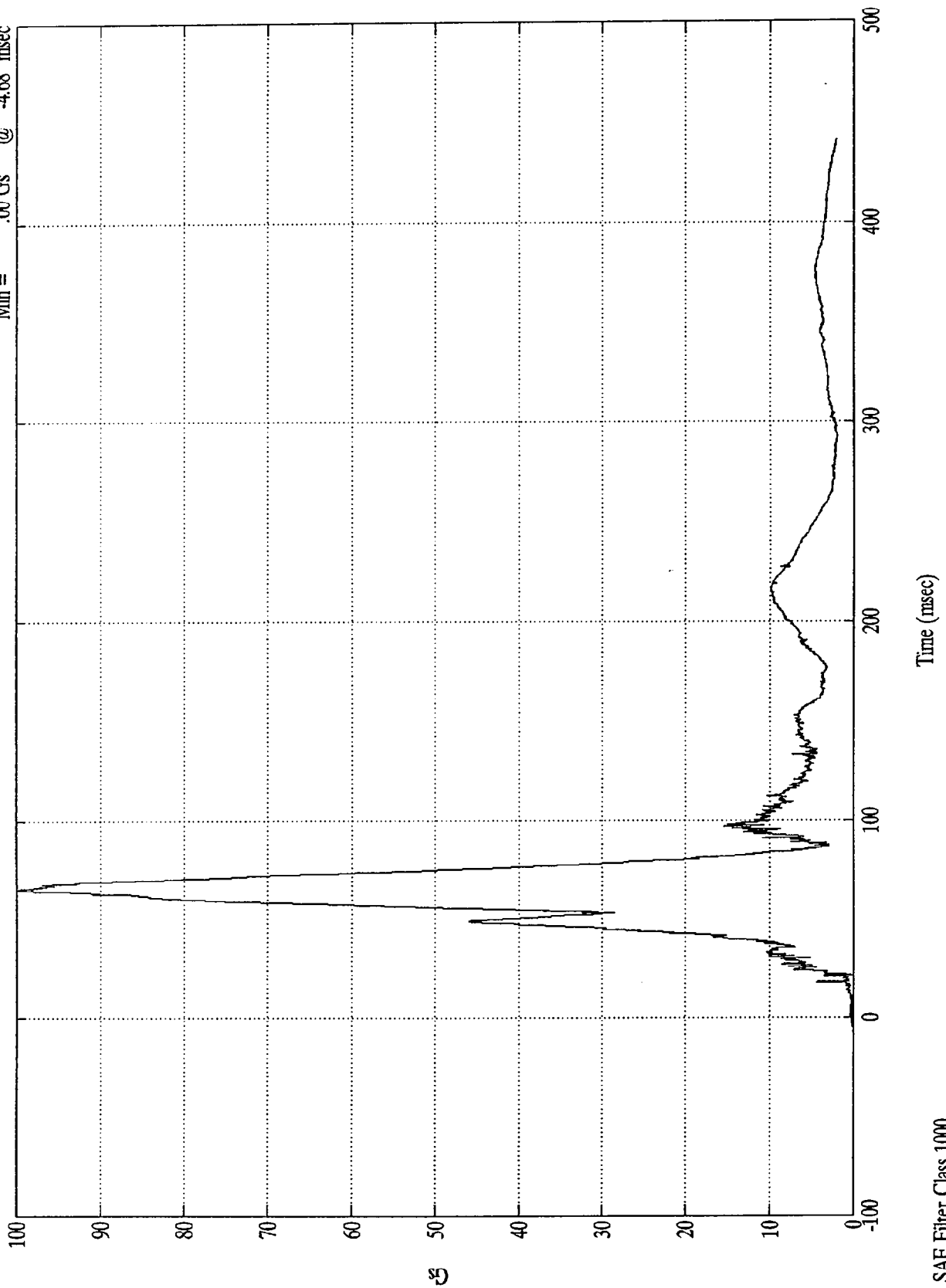


SAE Filter Class 1000

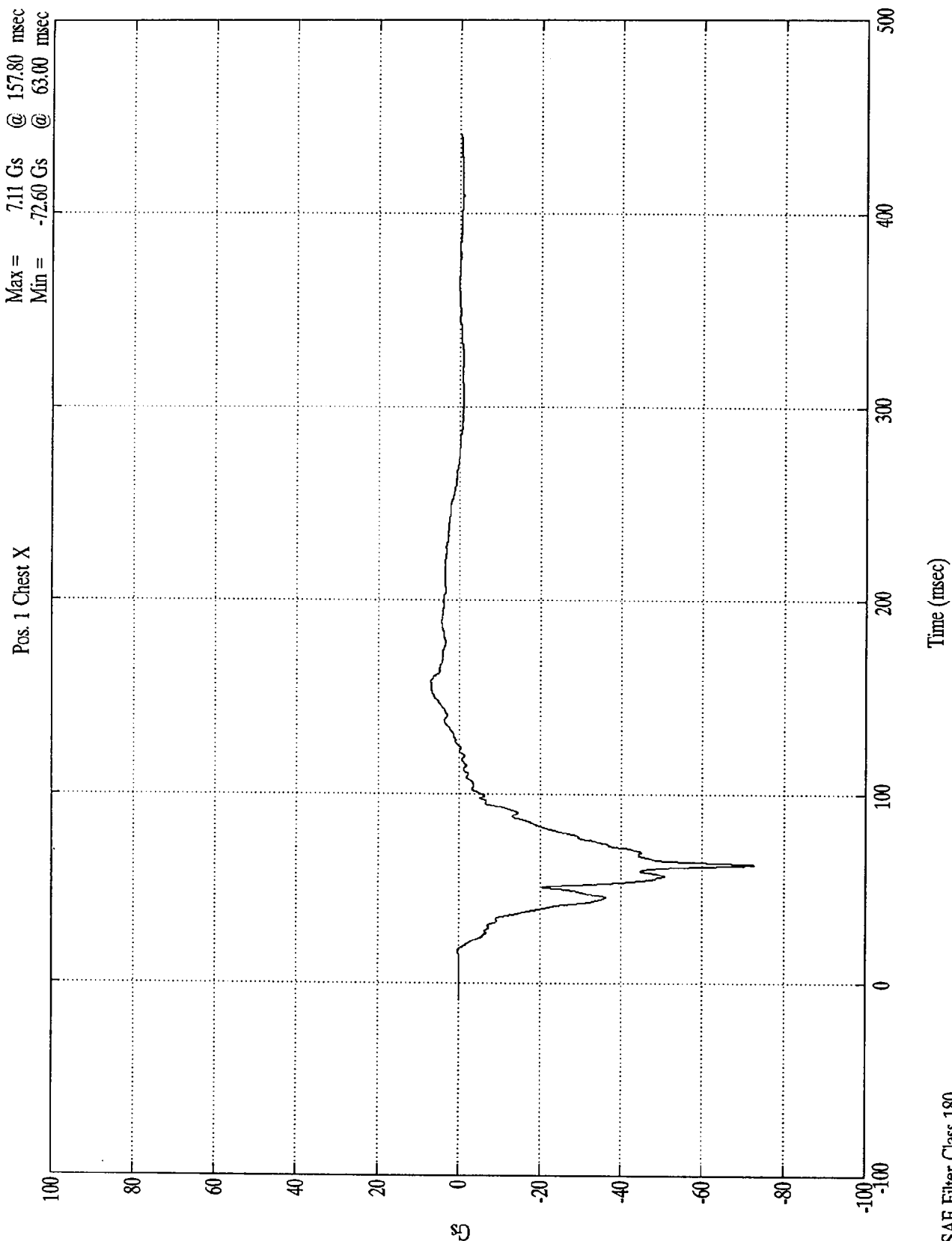
NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Head Resultant(RR)

Max = 99.78 Gs @ 65.04 msec
Min = .00 Gs @ -4.68 msec



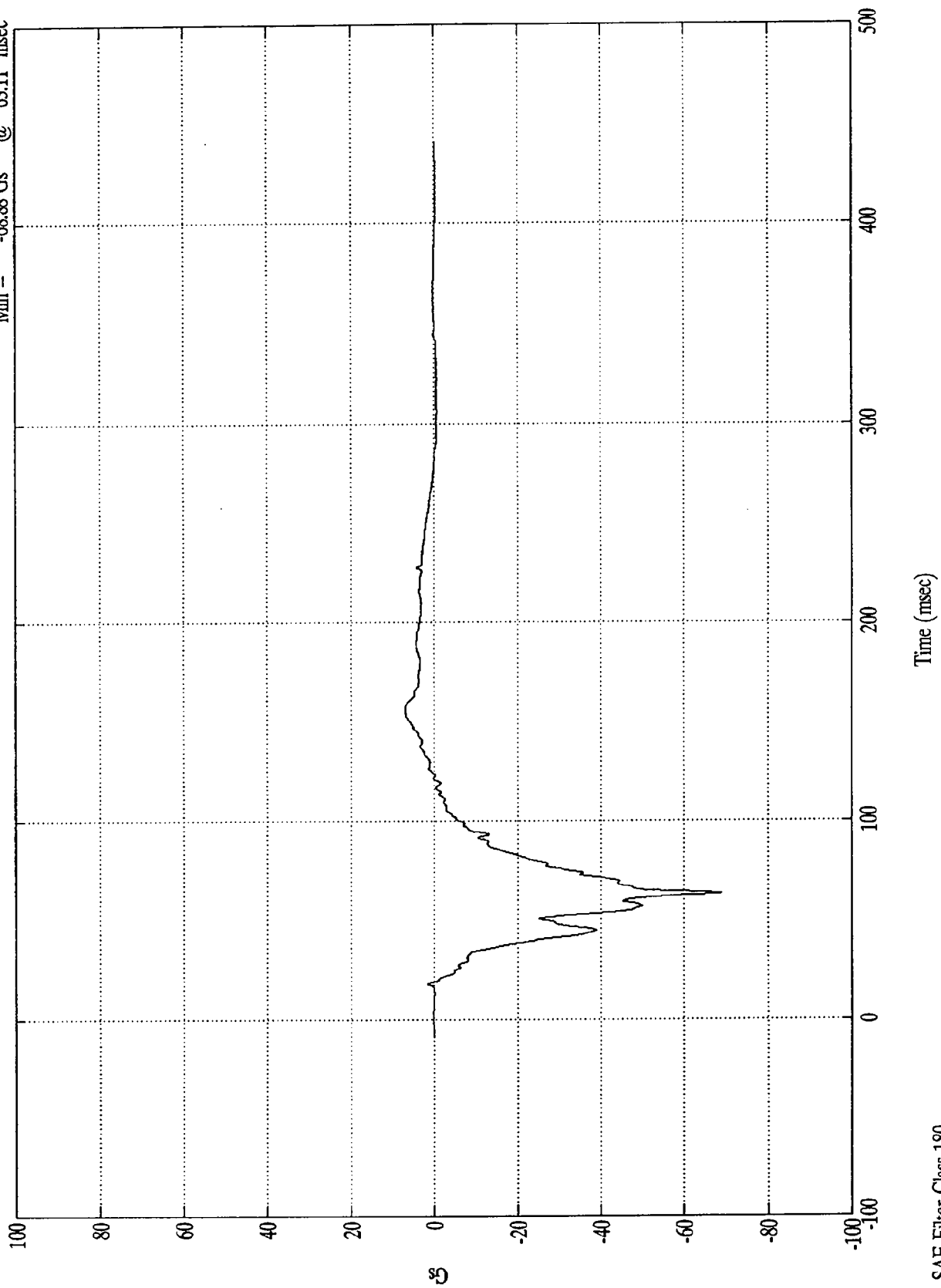
NCAP TEST #2 - 1996 DODGE RAM VAN



NCAP TEST #2 - 1996 DODGE RAM VAN

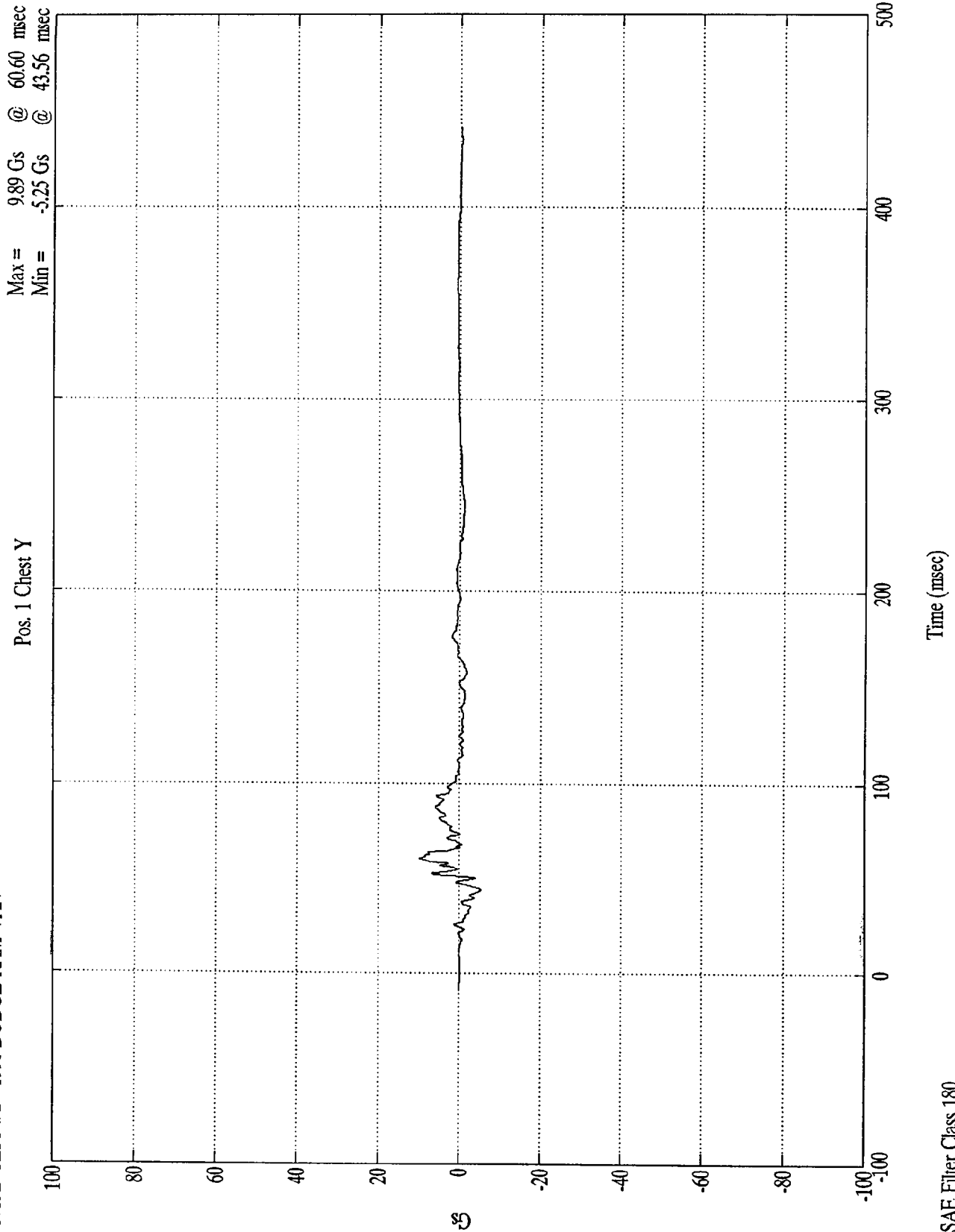
Pos. 1 Chest X(R)

Max = 7.03 Gs @ 157.56 msec
Min = -68.88 Gs @ 63.11 msec



SAE Filter Class 180

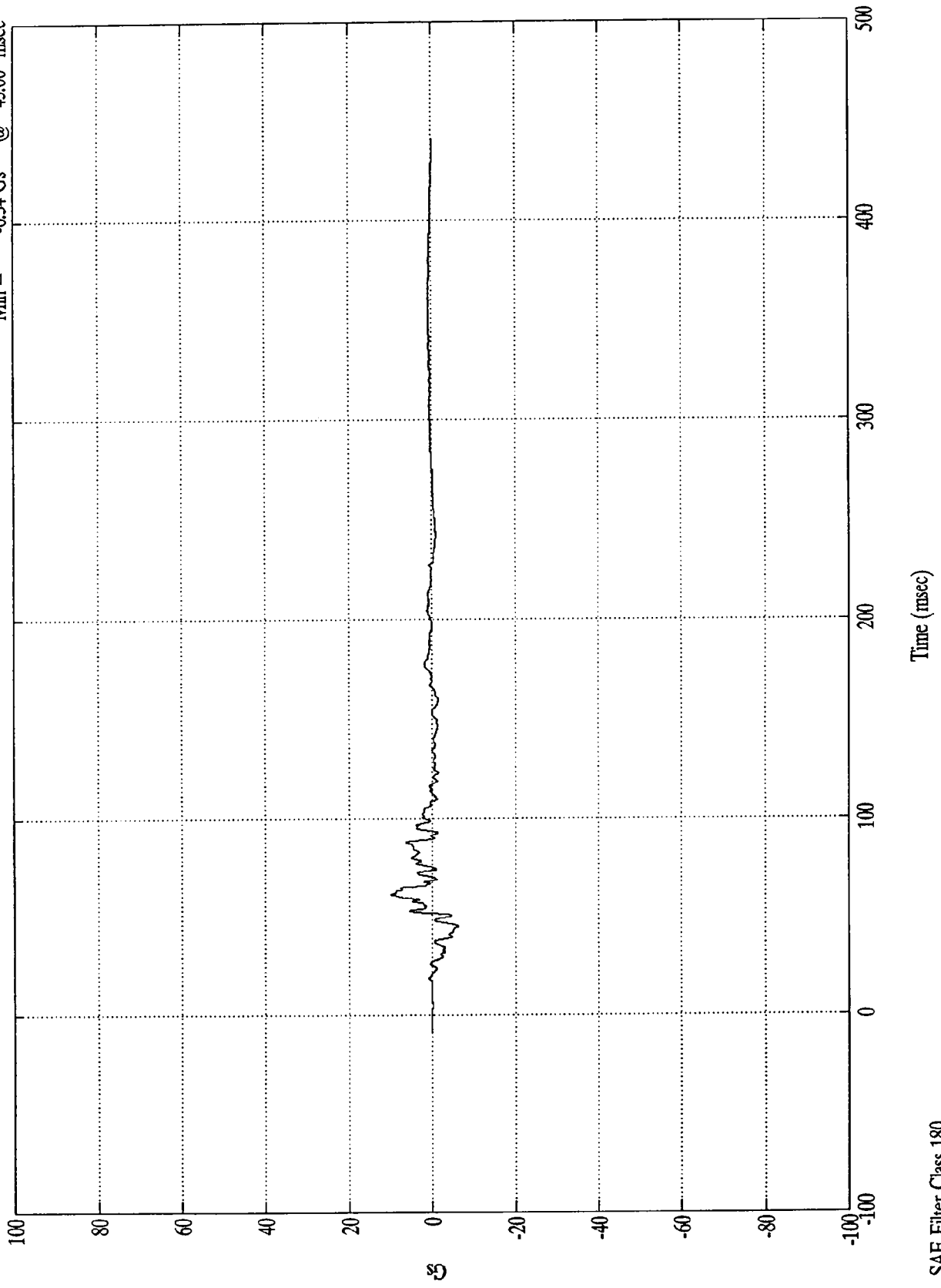
NCAP TEST #2 - 1996 DODGE RAM VAN



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Chest Y(R)

Max = 9.85 Gs @ 60.84 msec
Min = -6.34 Gs @ 45.00 msec

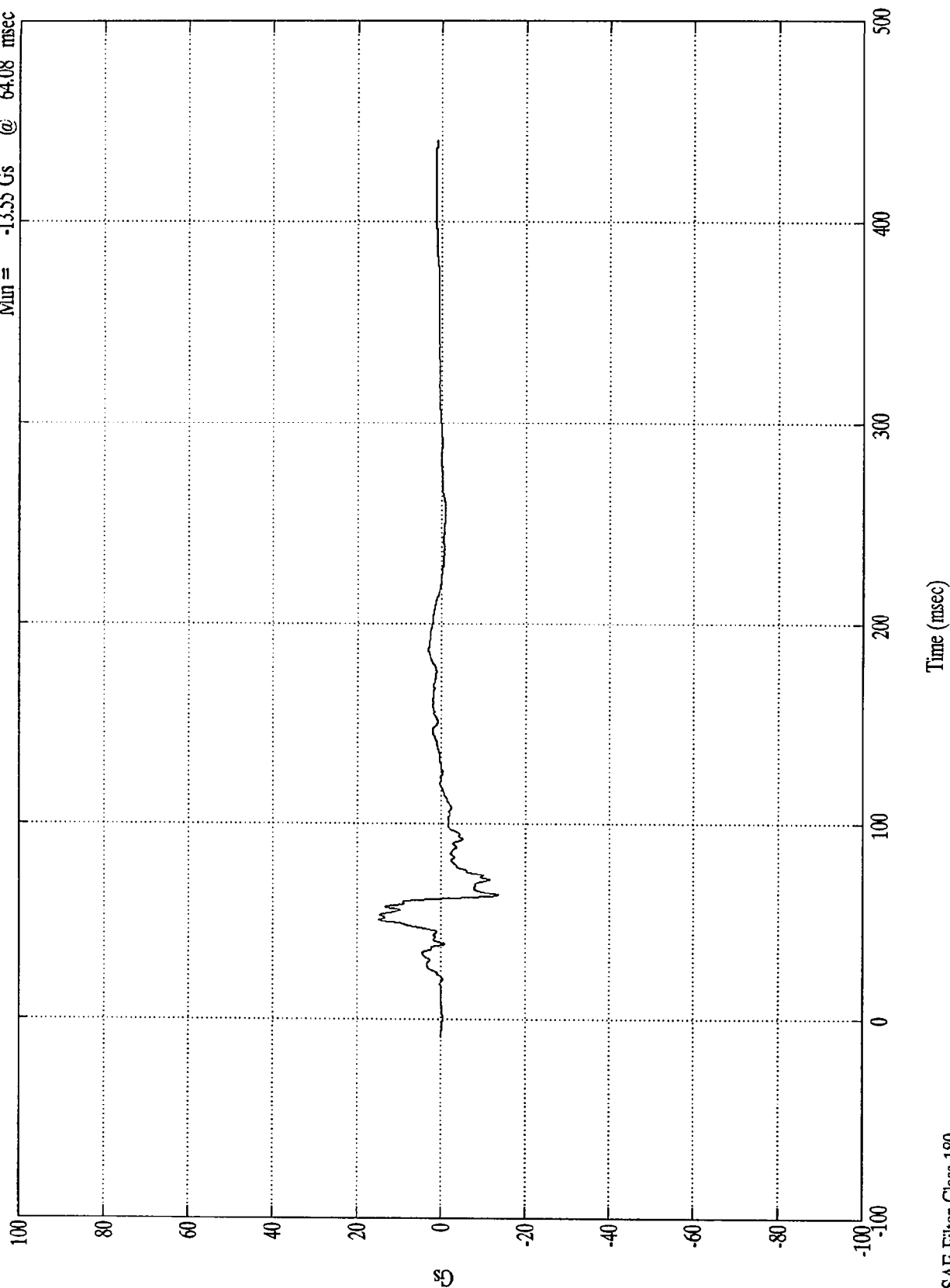


SAE Filter Class 180

NCAP TEST #2 - 1996 DODGE RAM VAN

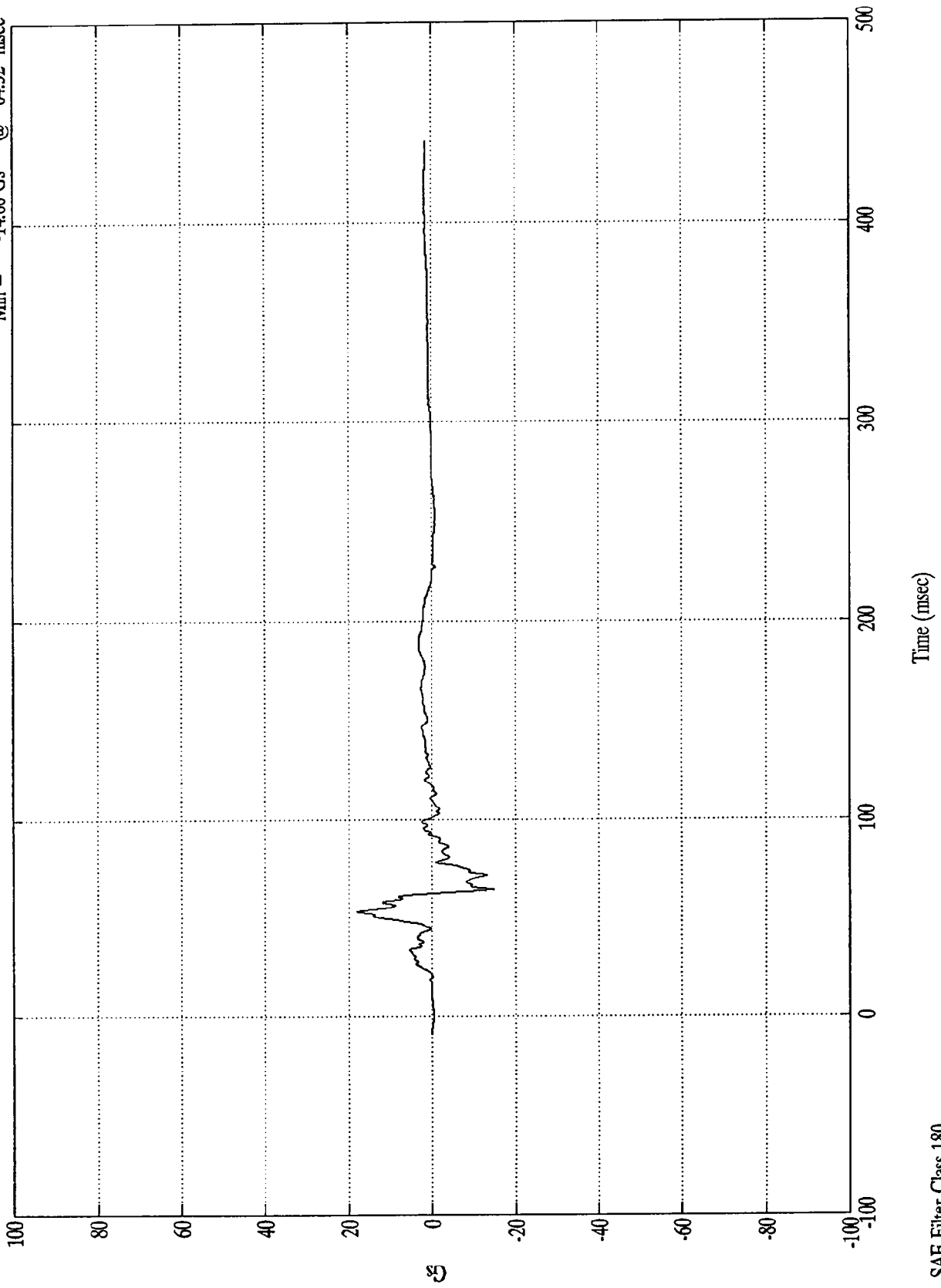
Max = 14.84 Gs @ 50.64 msec
Min = -13.55 Gs @ 64.08 msec

Pos. 1 Chest Z



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Chest Z(R)
Max = 18.06 Gs @ 53.28 msec
Min = -14.68 Gs @ 64.32 msec

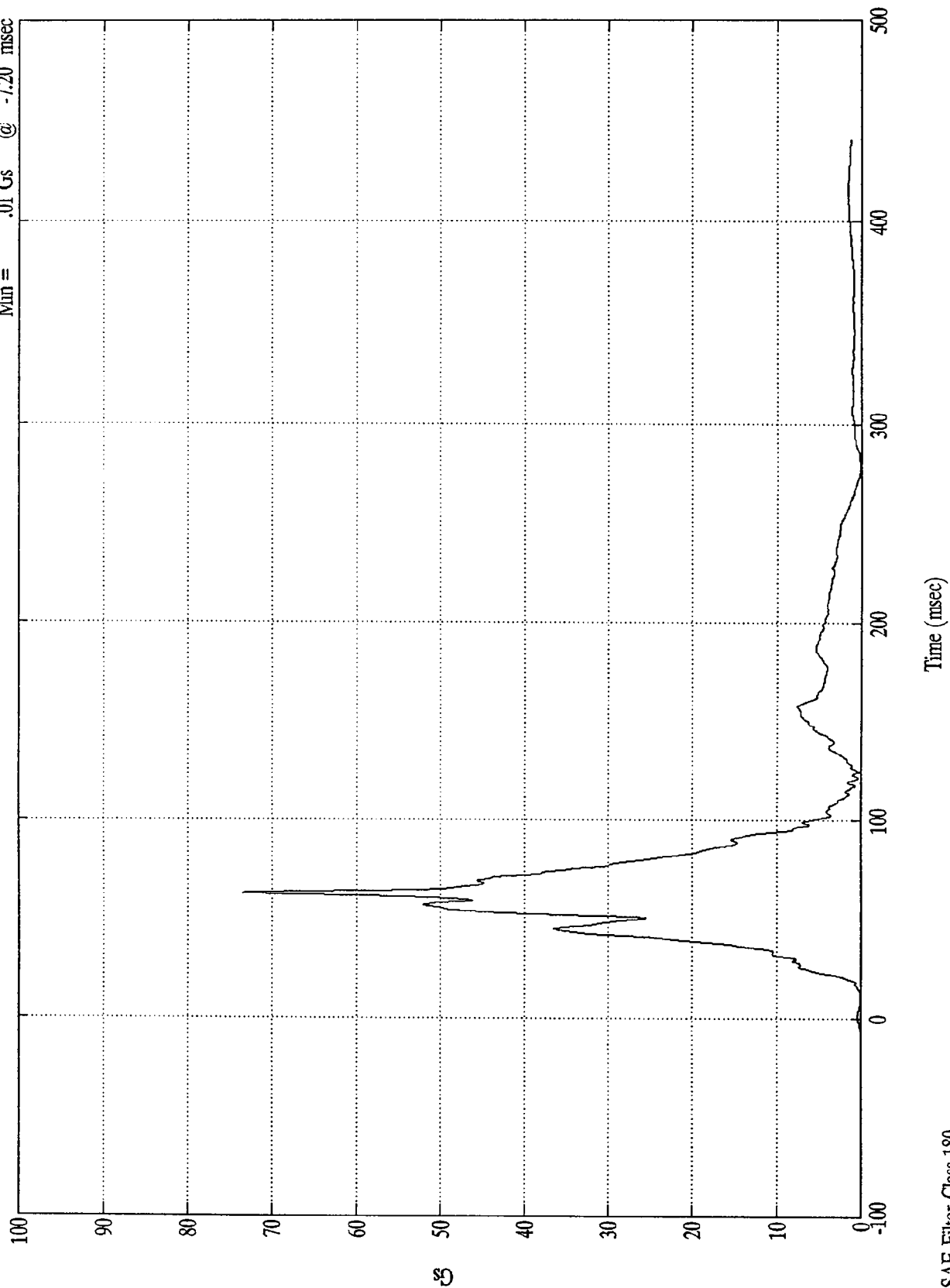


SAE Filter Class 180

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Chest Resultant

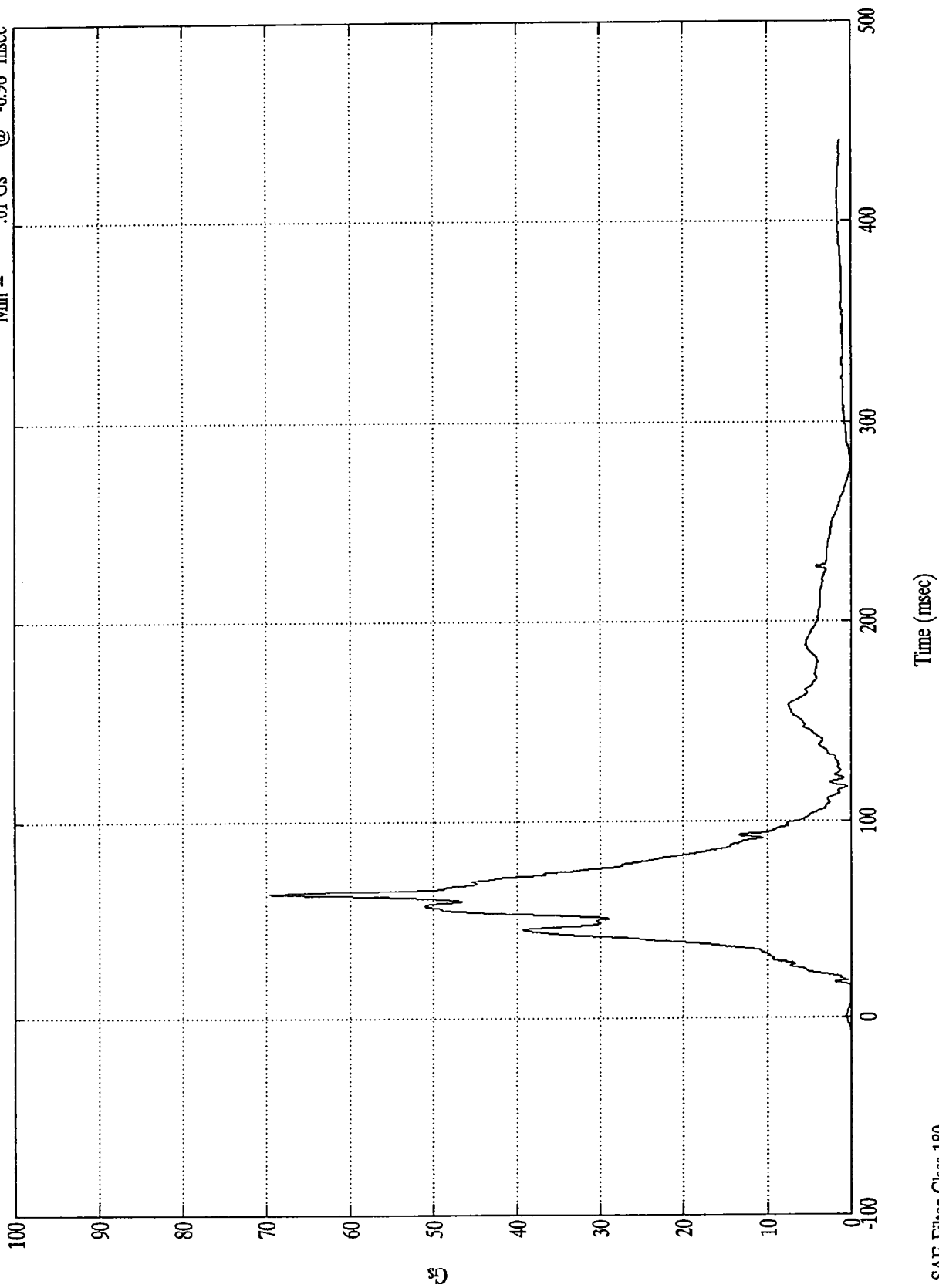
Max = 73.48 Gs @ 63.00 msec
Min = .01 Gs @ -7.20 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Chest Res(RR)

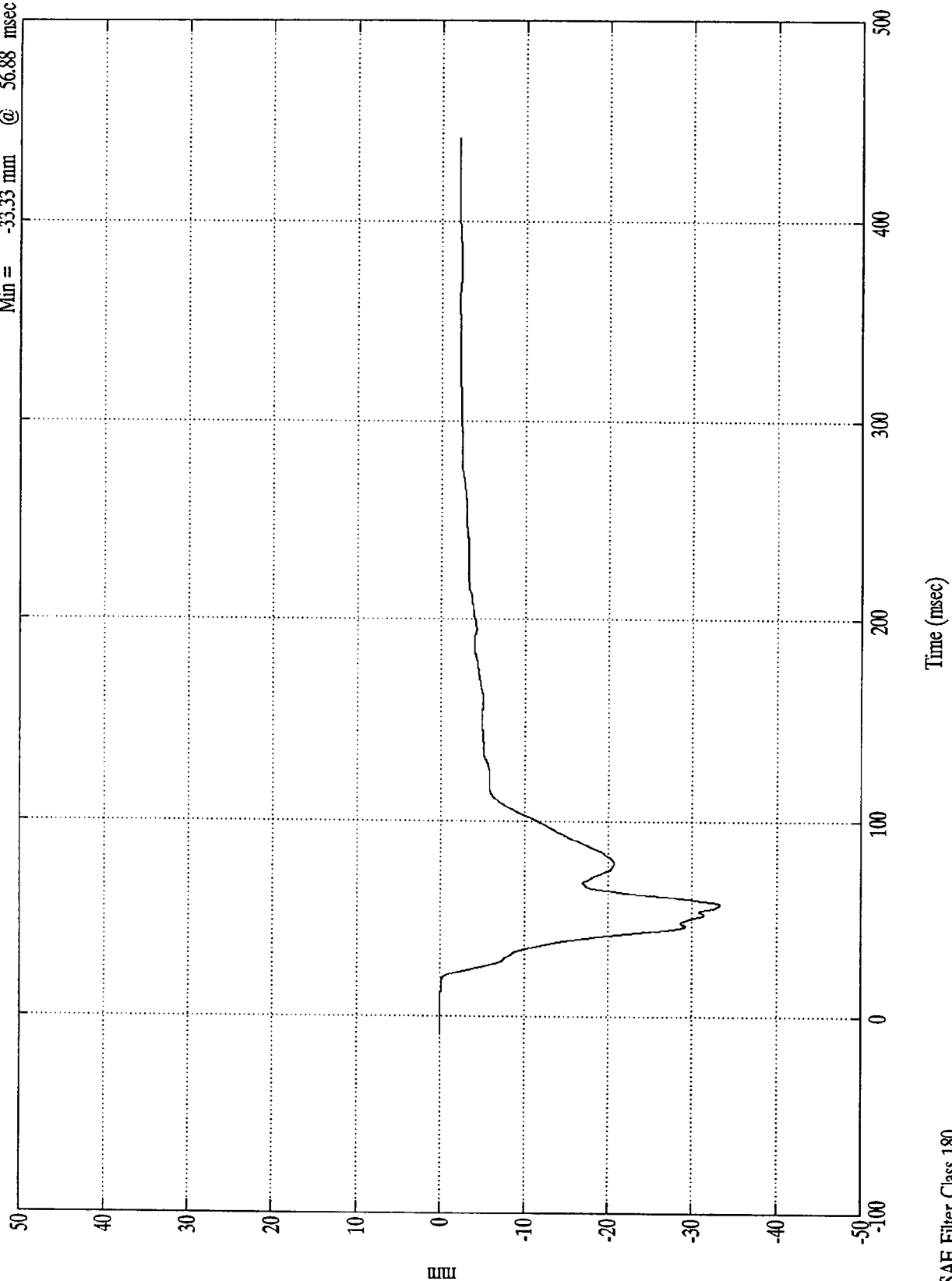
Max = 69.56 Gs @ 63.11 msec
Min = .01 Gs @ -6.96 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Chest Disp.

Max = .00 mm @ 6.59 msec
Min = -33.33 mm @ 56.88 msec

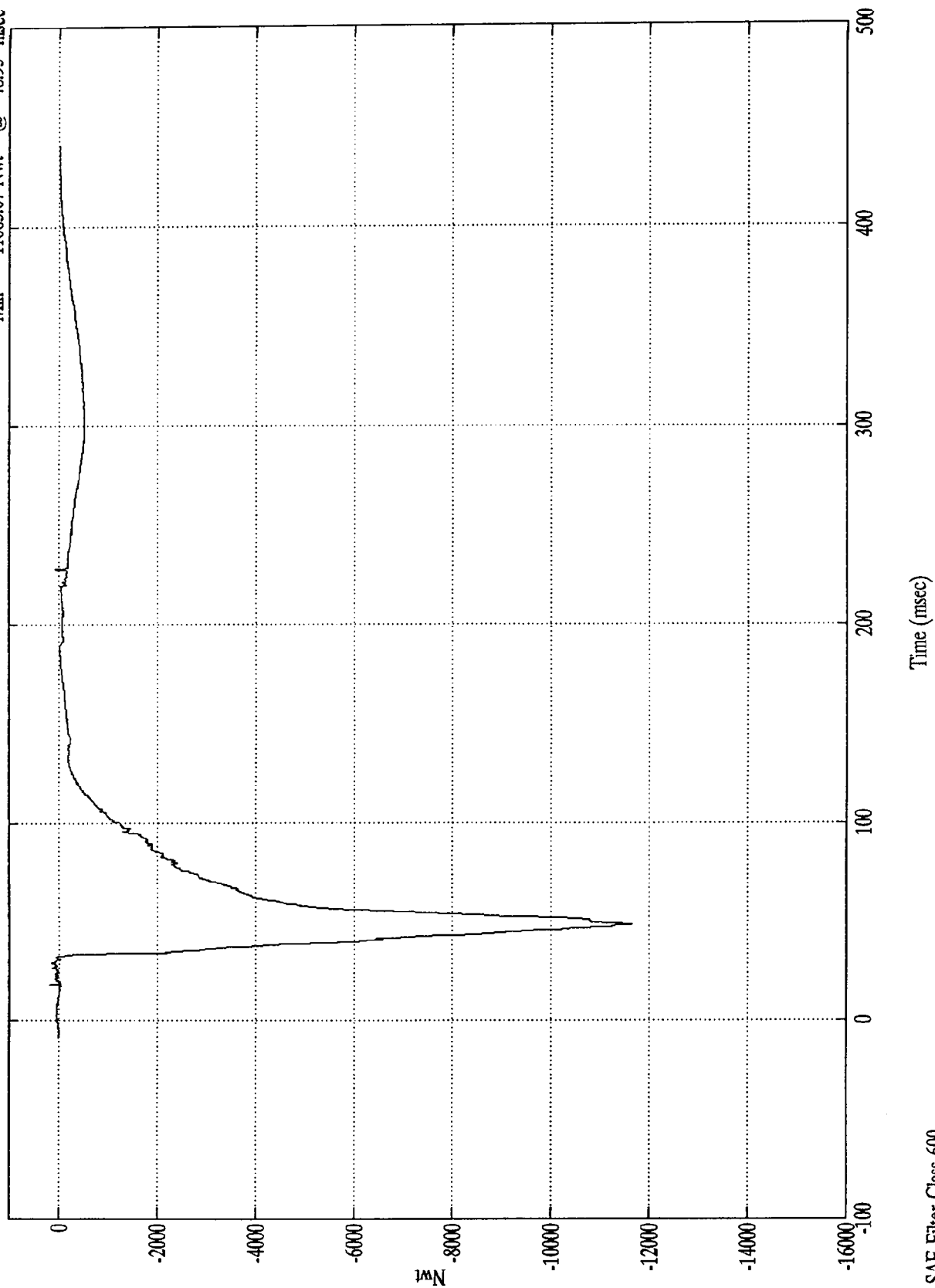


SAE Filter Class 180

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Left Femur

Max = 180.88 Nwt @ 18.24 msec
Min = -11663.67 Nwt @ 48.95 msec

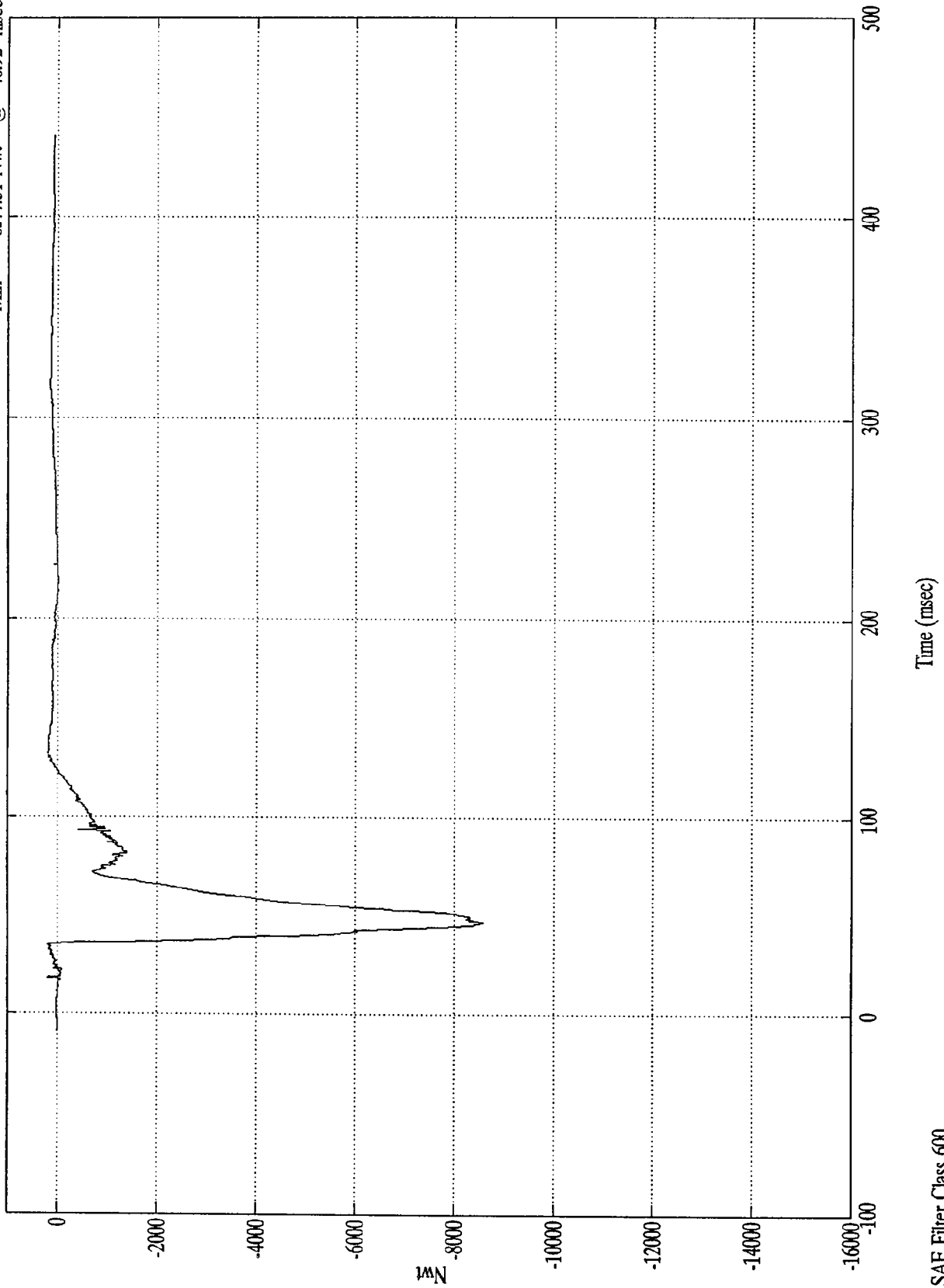


SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Right Femur

Max = 212.92 Nwt @ 34.91 msec
Min = -8577.31 Nwt @ 46.92 msec

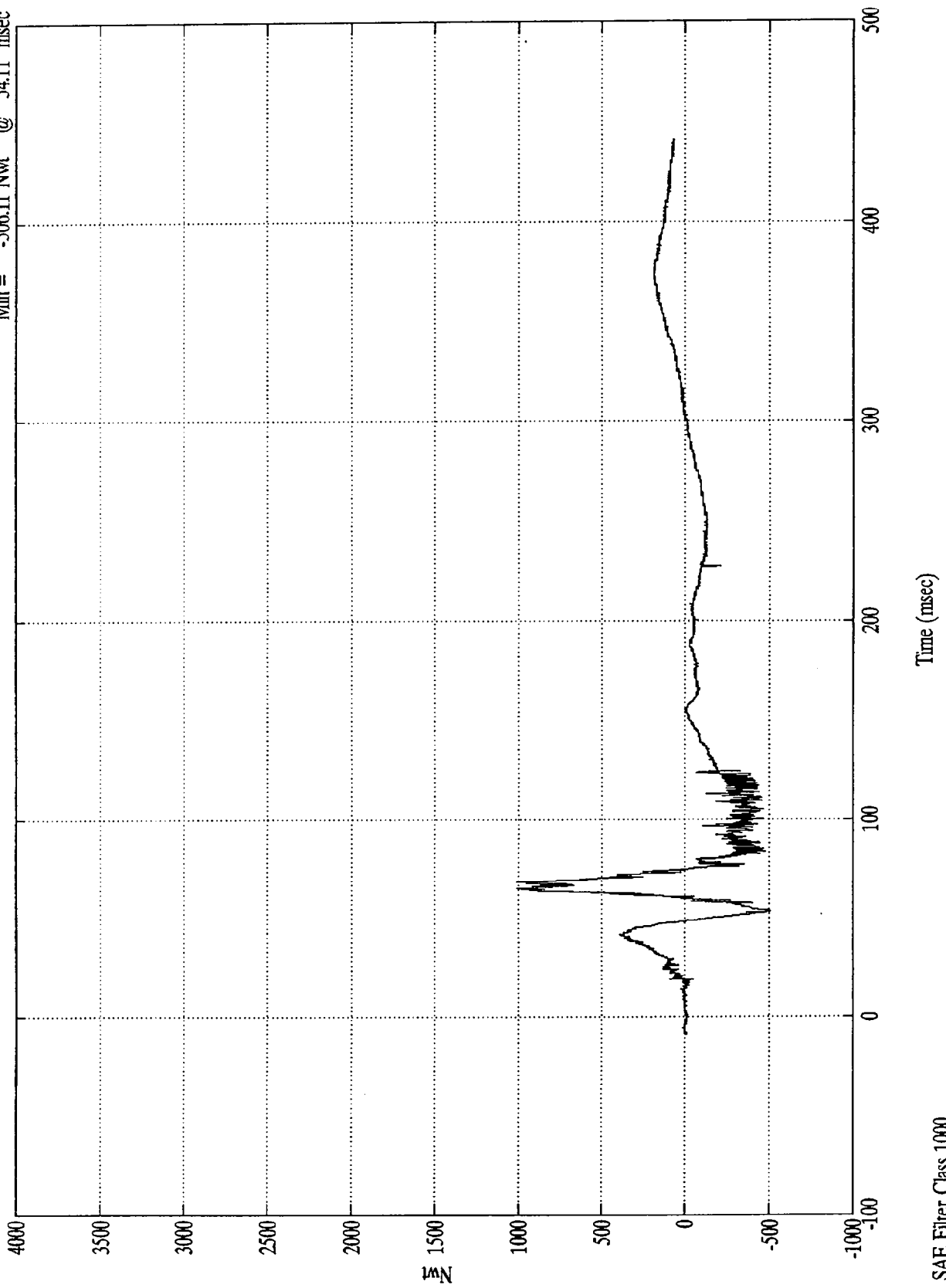


SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Upper Neck Fx

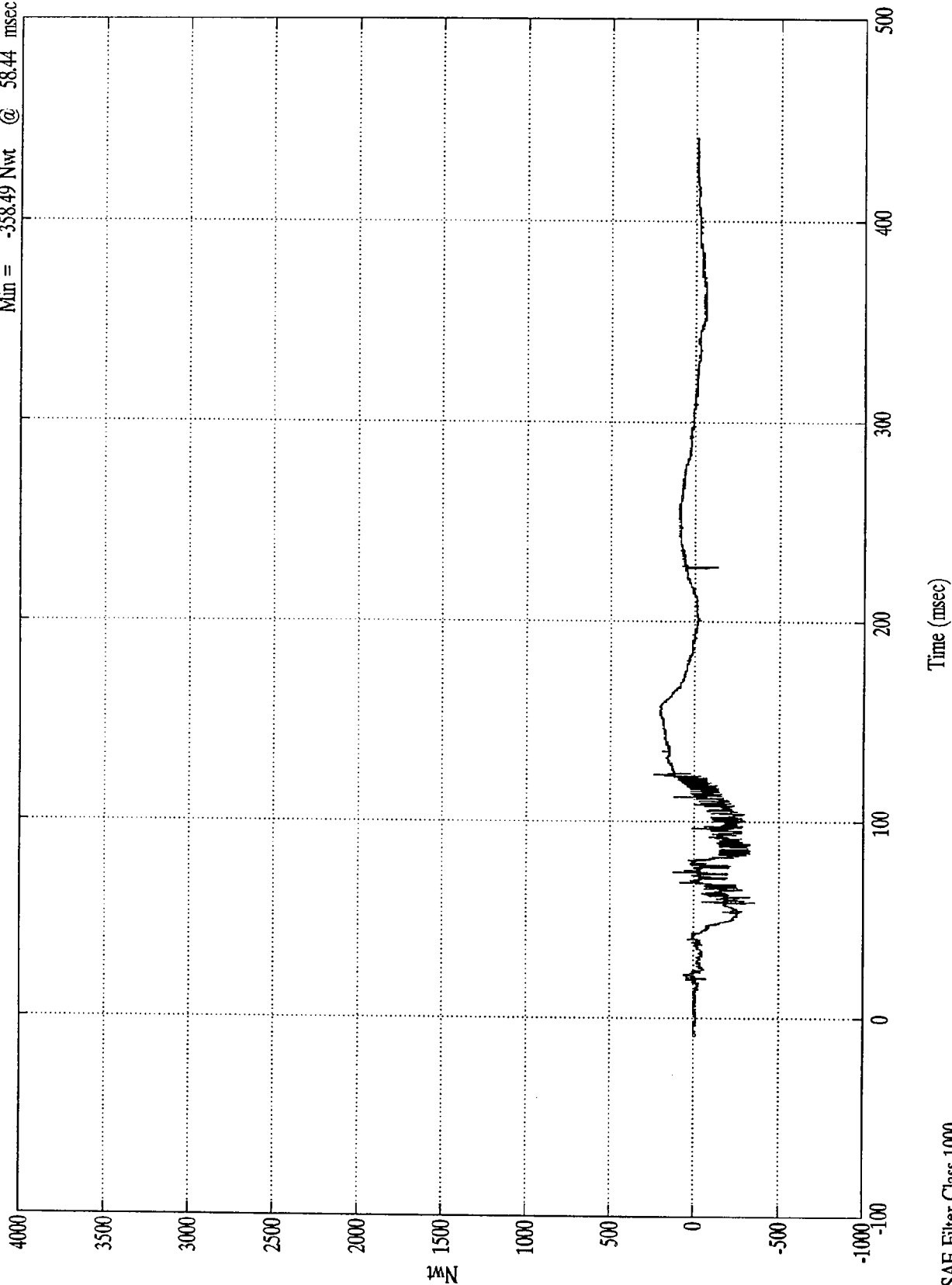
Max = 1008.57 Nwt @ 68.87 msec
Min = -506.11 Nwt @ 54.11 msec



NCAP TEST #2 - 19% DODGE RAM VAN

Pos. 1 Upper Neck Fy

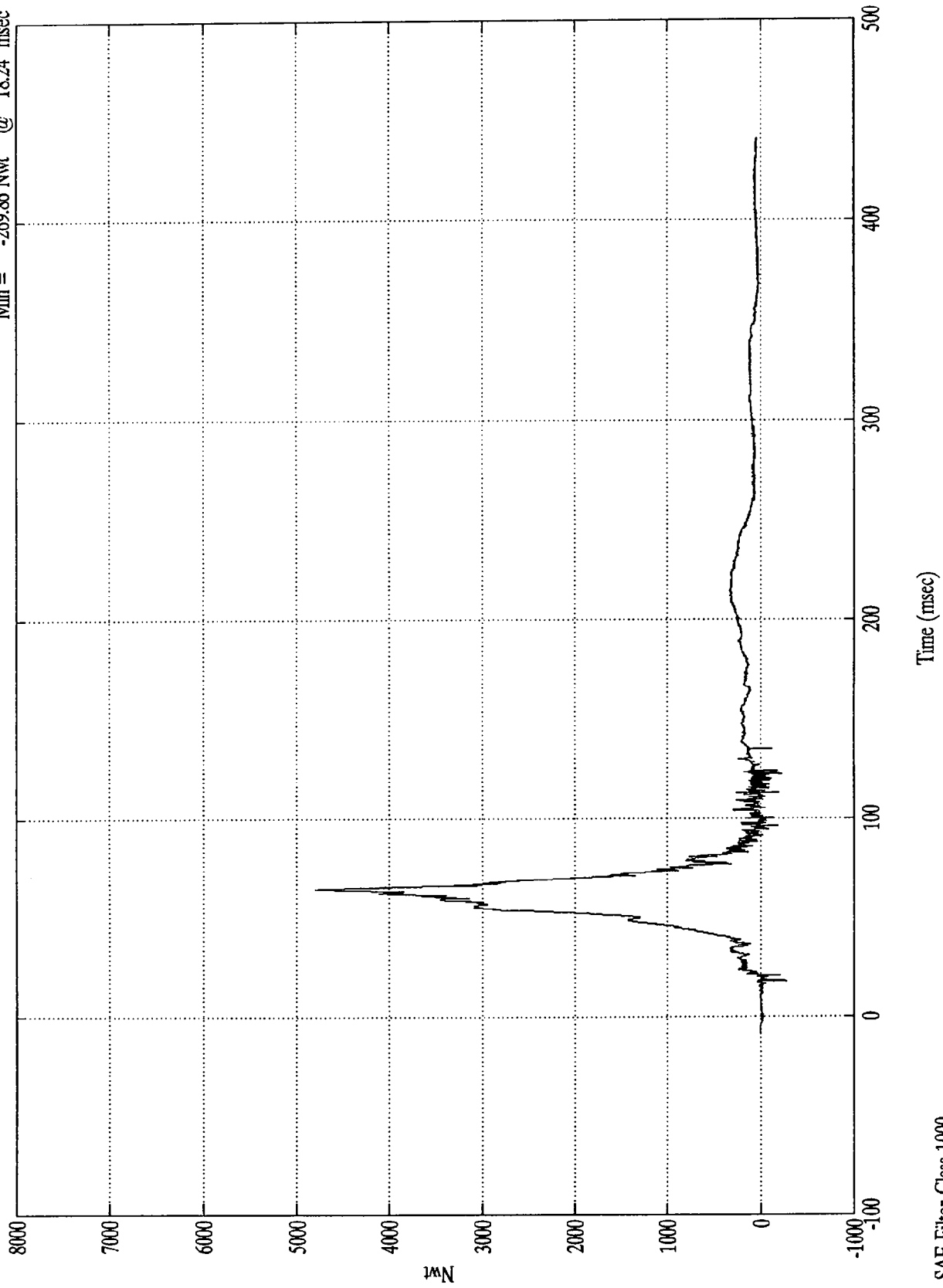
Max = 241.29 Nwt @ 124.08 msec
Min = -358.49 Nwt @ 58.44 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Upper Neck Fz

Max = 4803.22 Nwt @ 64.32 msec
Min = -269.86 Nwt @ 18.24 msec

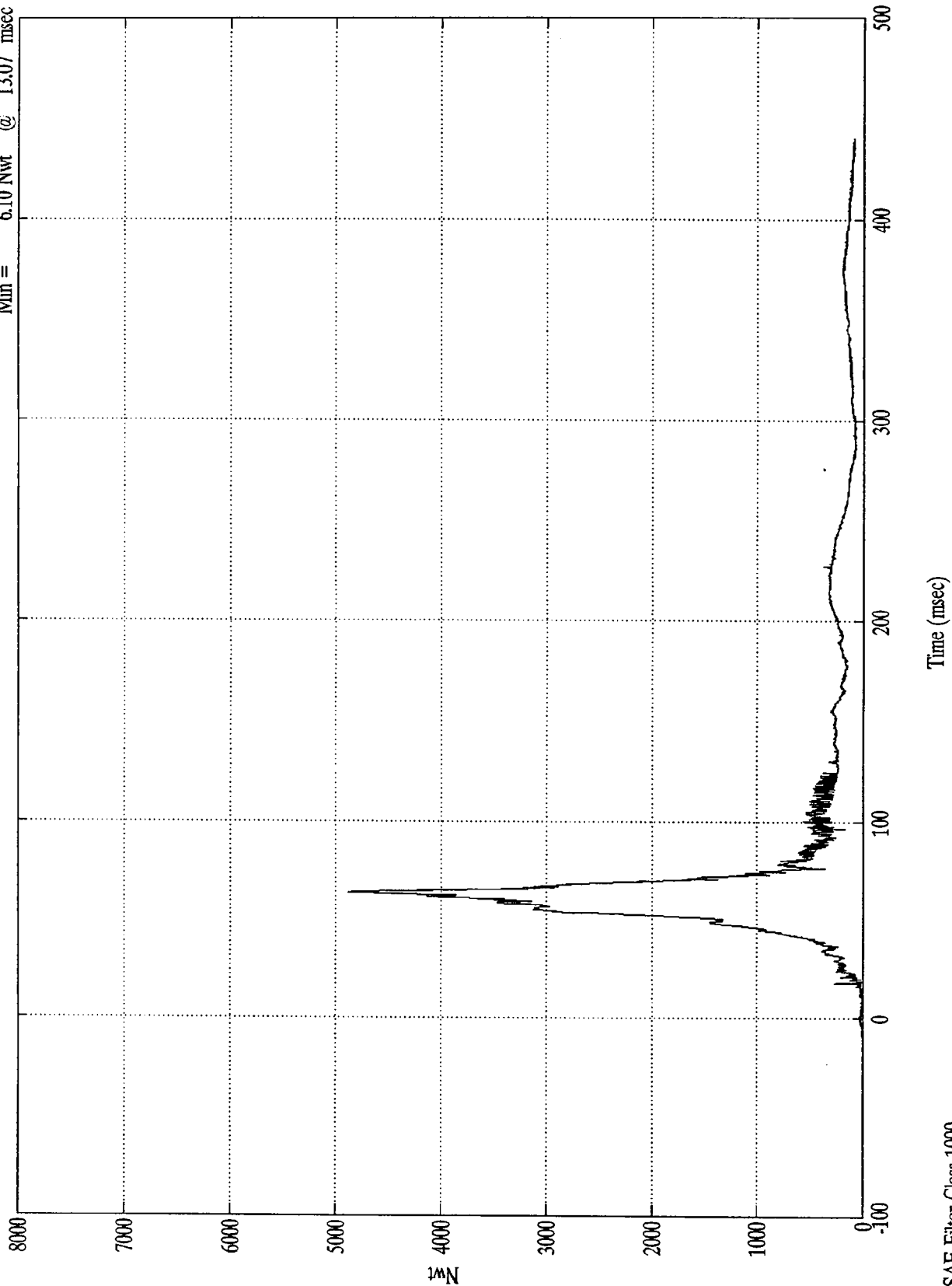


SAE Filter Class 1000

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Neck Force Res.

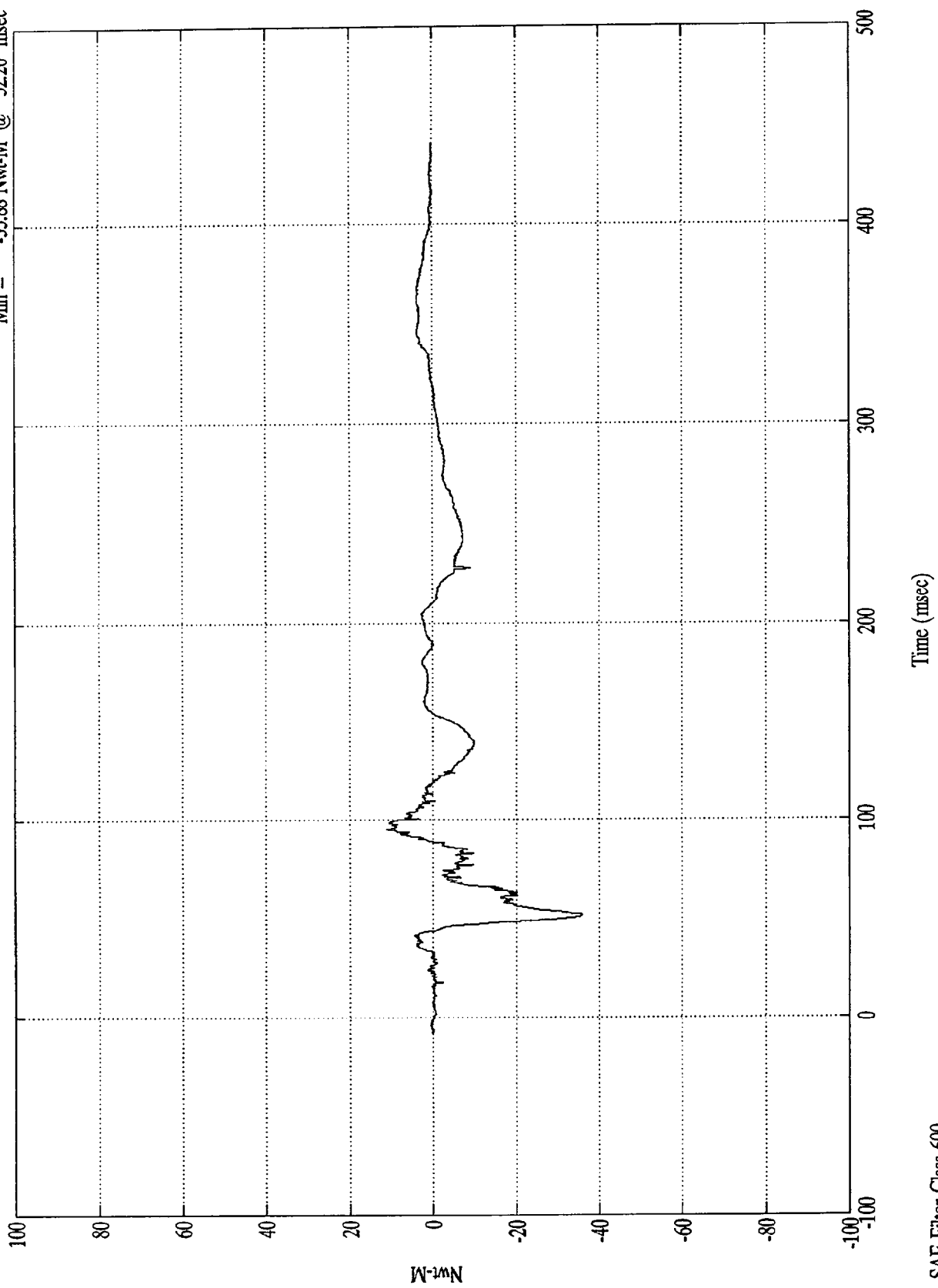
Max = 4885.20 Nwt @ 64.32 msec
Min = 6.10 Nwt @ 13.07 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Upper Neck Mx

Max = 11.30 Nwt-M @ 95.16 msec
Min = -35.88 Nwt-M @ 52.20 msec

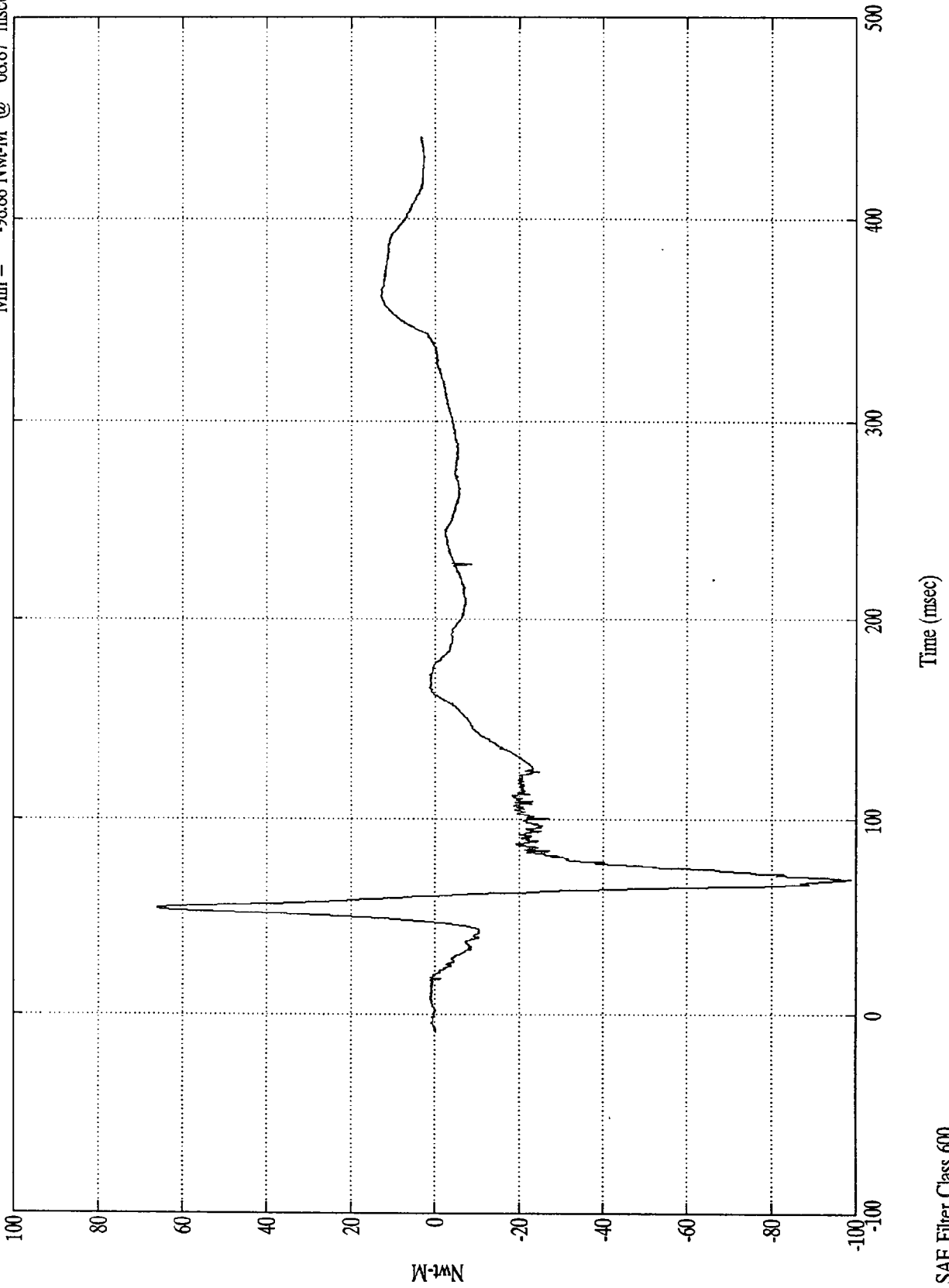


SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Upper Neck My

Max = 66.04 Nwt-M @ 54.00 msec
Min = -98.88 Nwt-M @ 68.87 msec

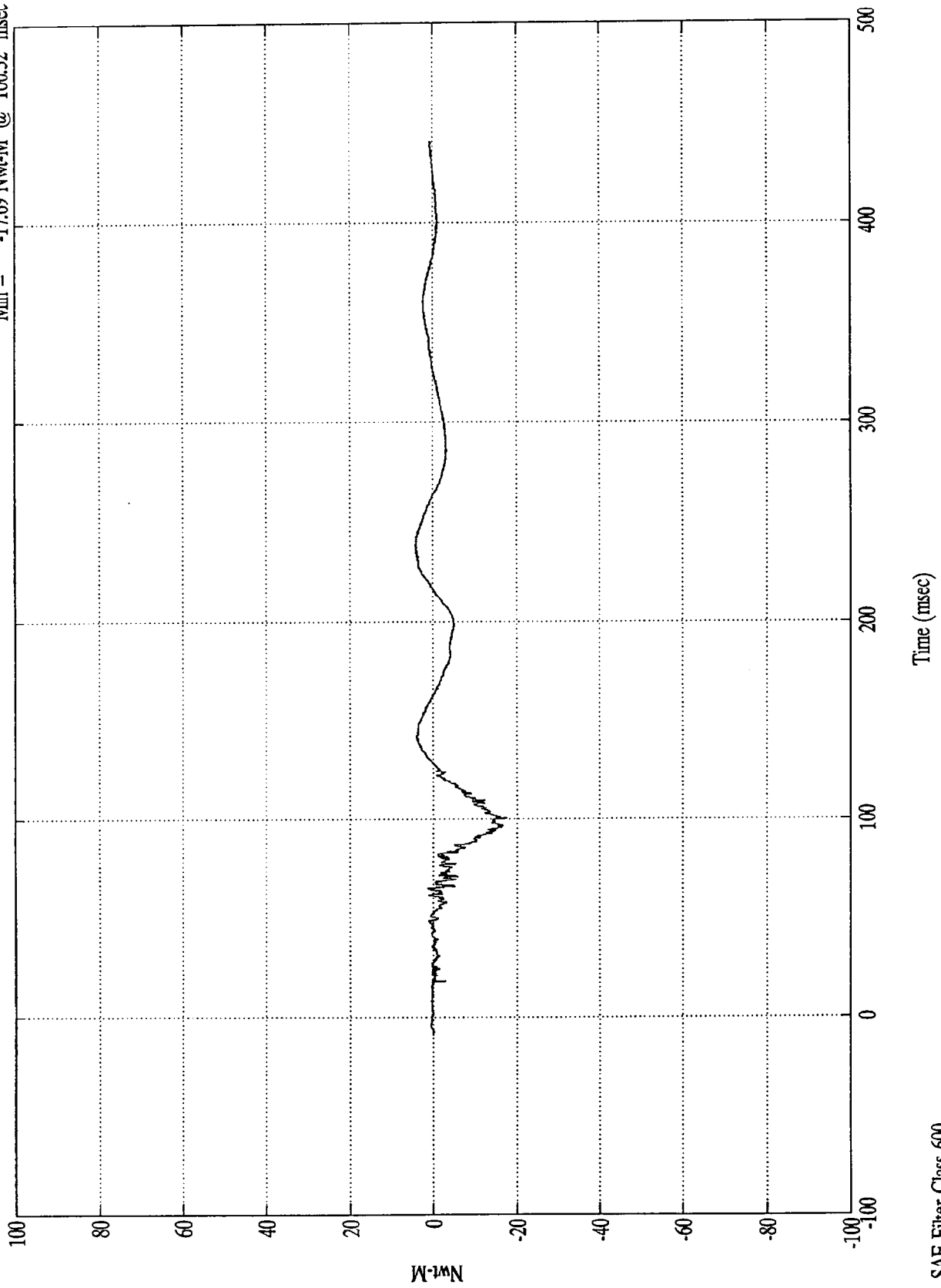


SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Upper Neck Mz

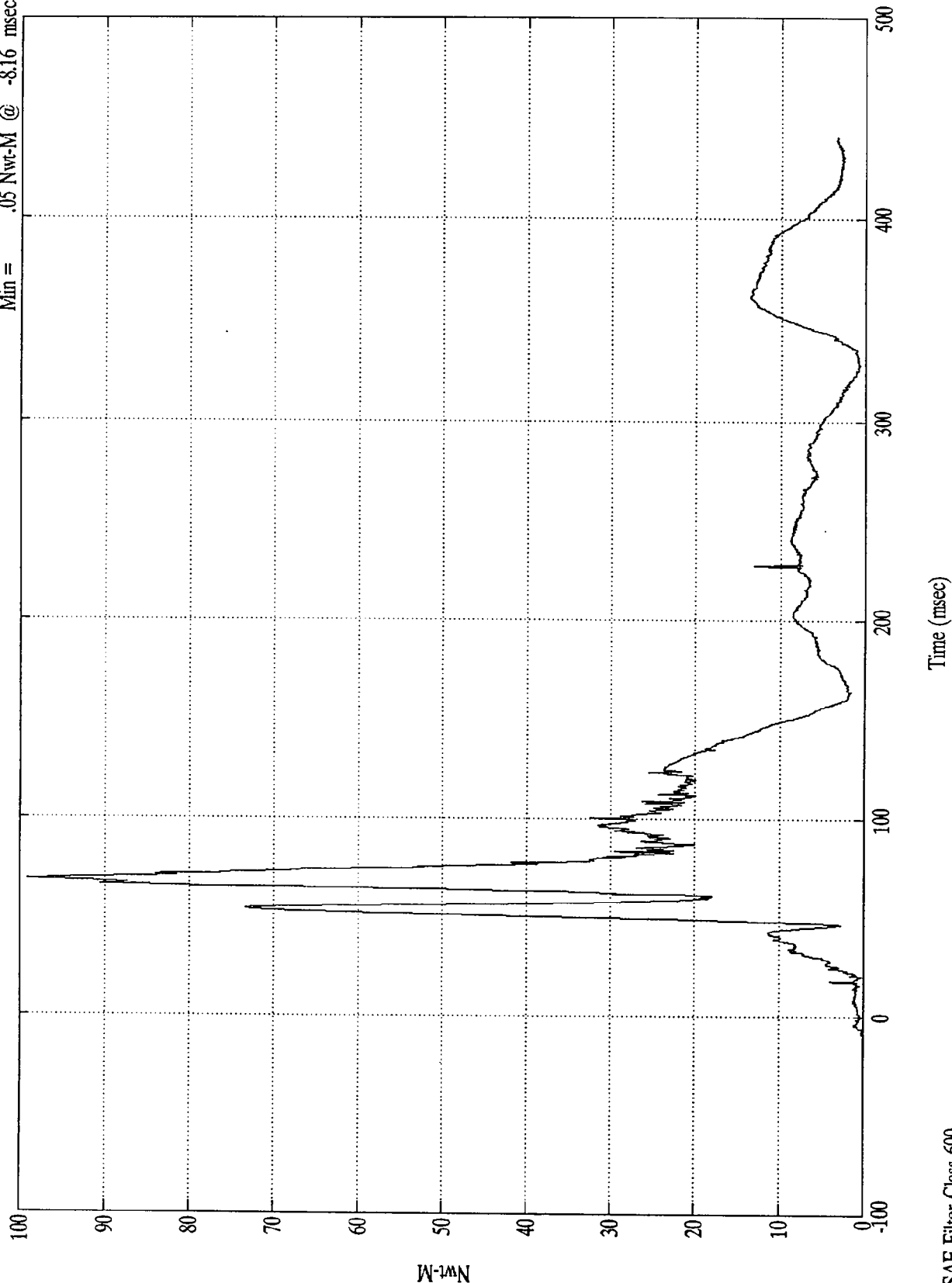
Max = 4.21 Nwt-M @ 238.56 msec
Min = -17.69 Nwt-M @ 100.32 msec



SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Neck Moment Res.
 Max = 99.16 Nwt-M @ 68.87 msec
 Min = .05 Nwt-M @ -8.16 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Pelvic (X)

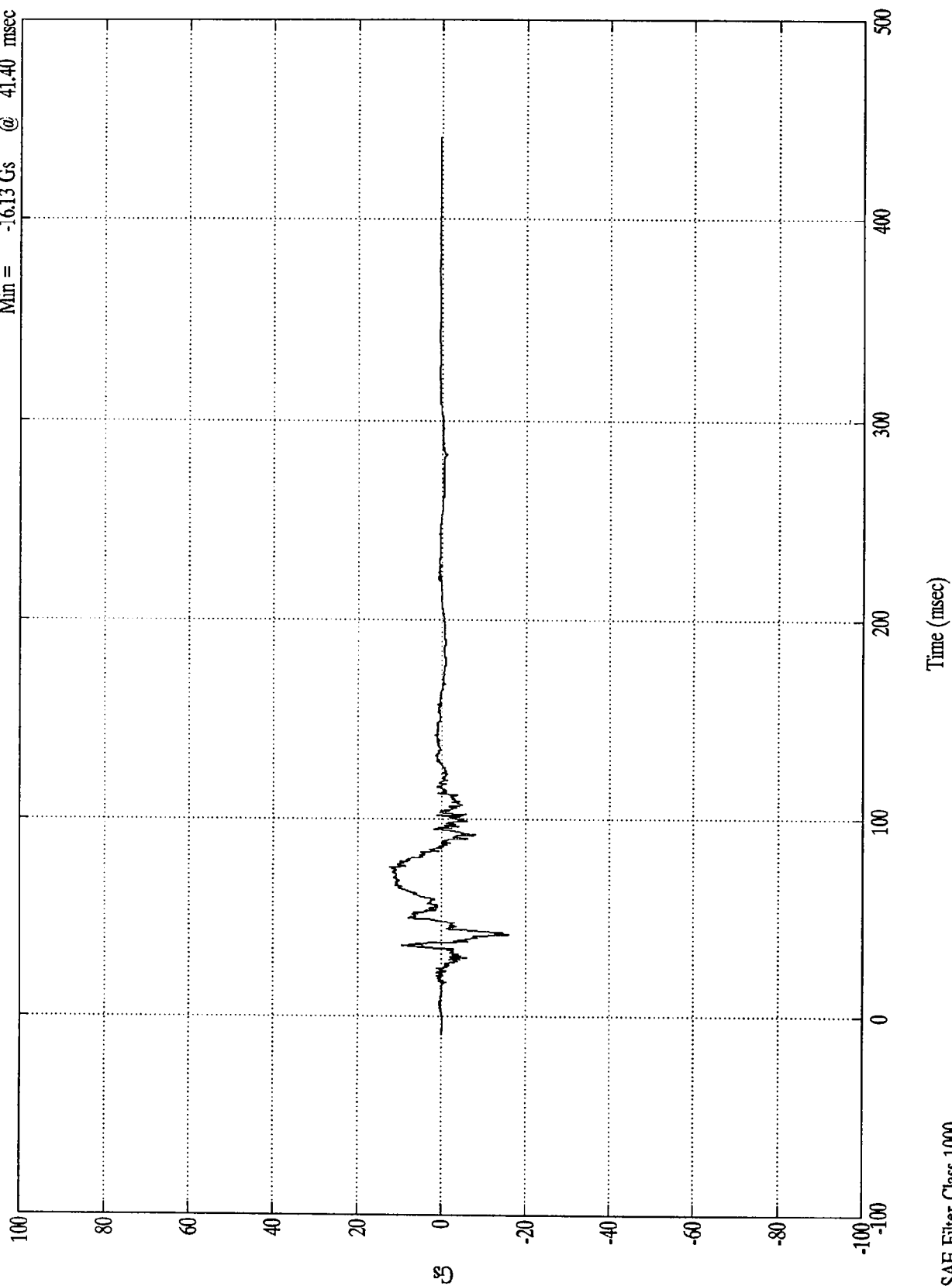
Max = 3.45 Gs @ 101.63 msec
Min = -84.81 Gs @ 48.24 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Pelvic (Y)

Max = 12.29 Gs @ 75.36 msec
Min = -16.13 Gs @ 41.40 msec

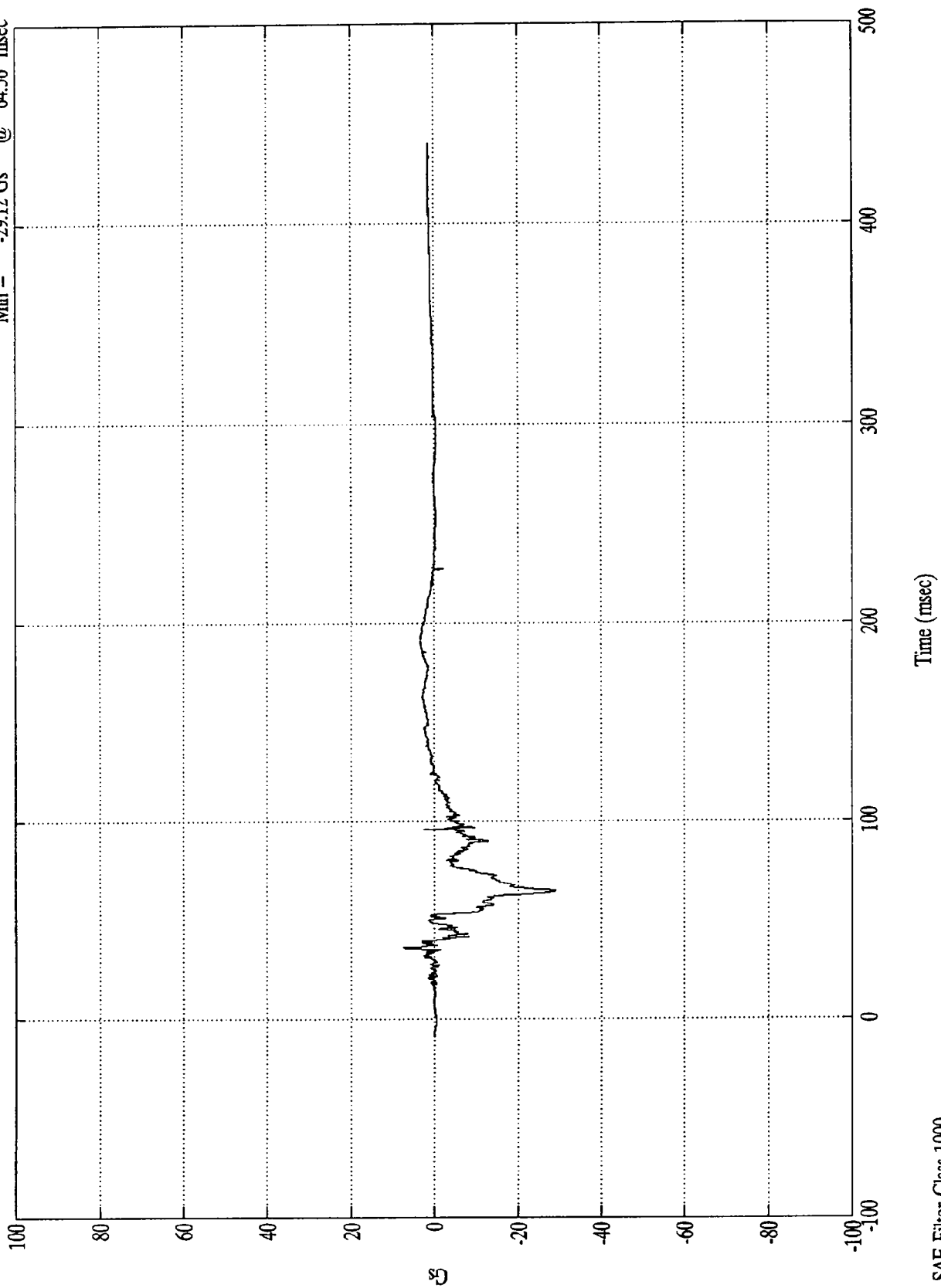


SAE Filter Class 1000

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Pelvic (Z)

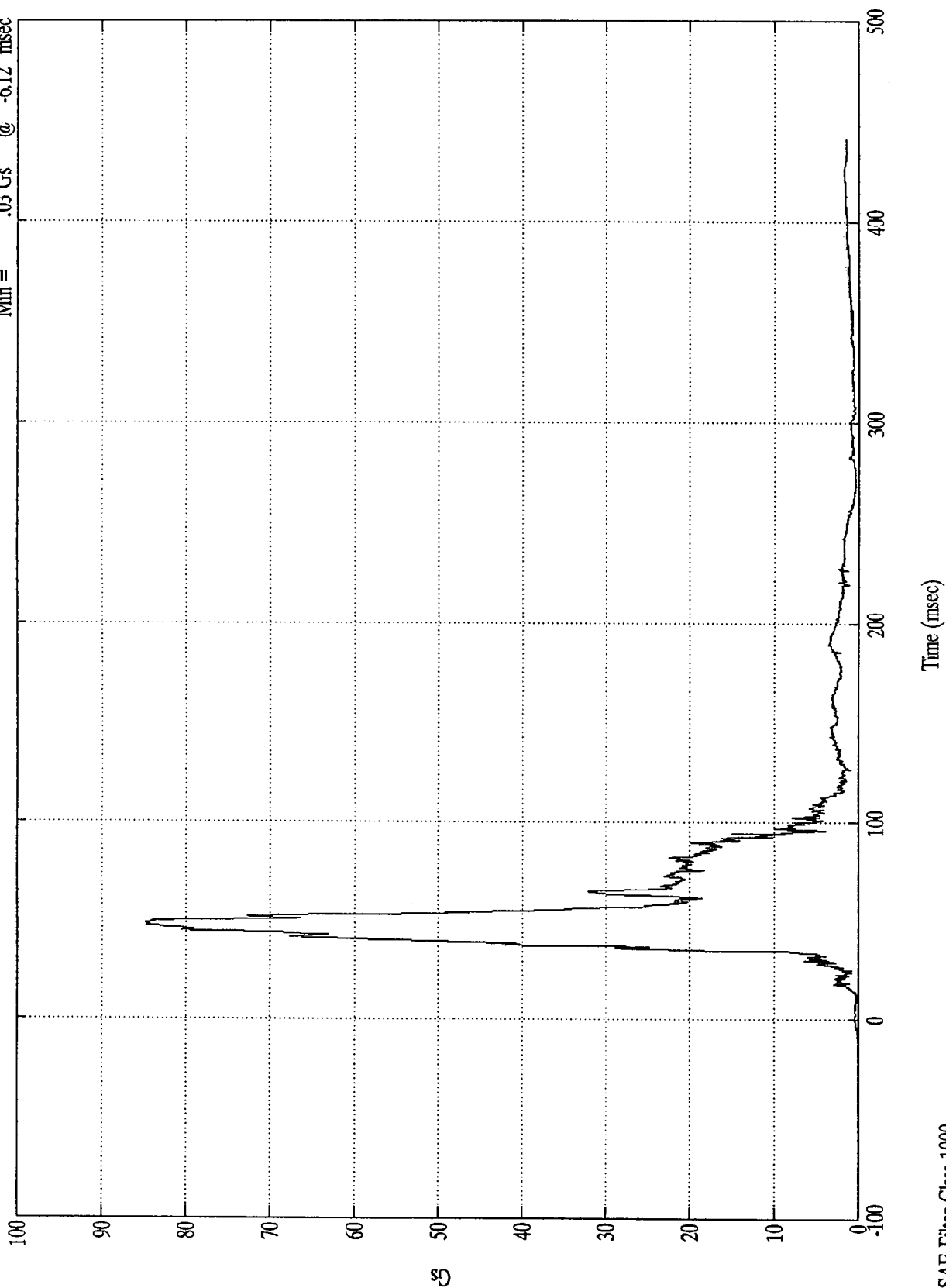
Max = 7.43 Gs @ 36.36 msec
Min = -29.12 Gs @ 64.56 msec



SAE Filter Class 1000

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Pelvic (R)
 Max = 84.81 Gs @ 48.24 msec
 Min = .03 Gs @ -6.12 msec

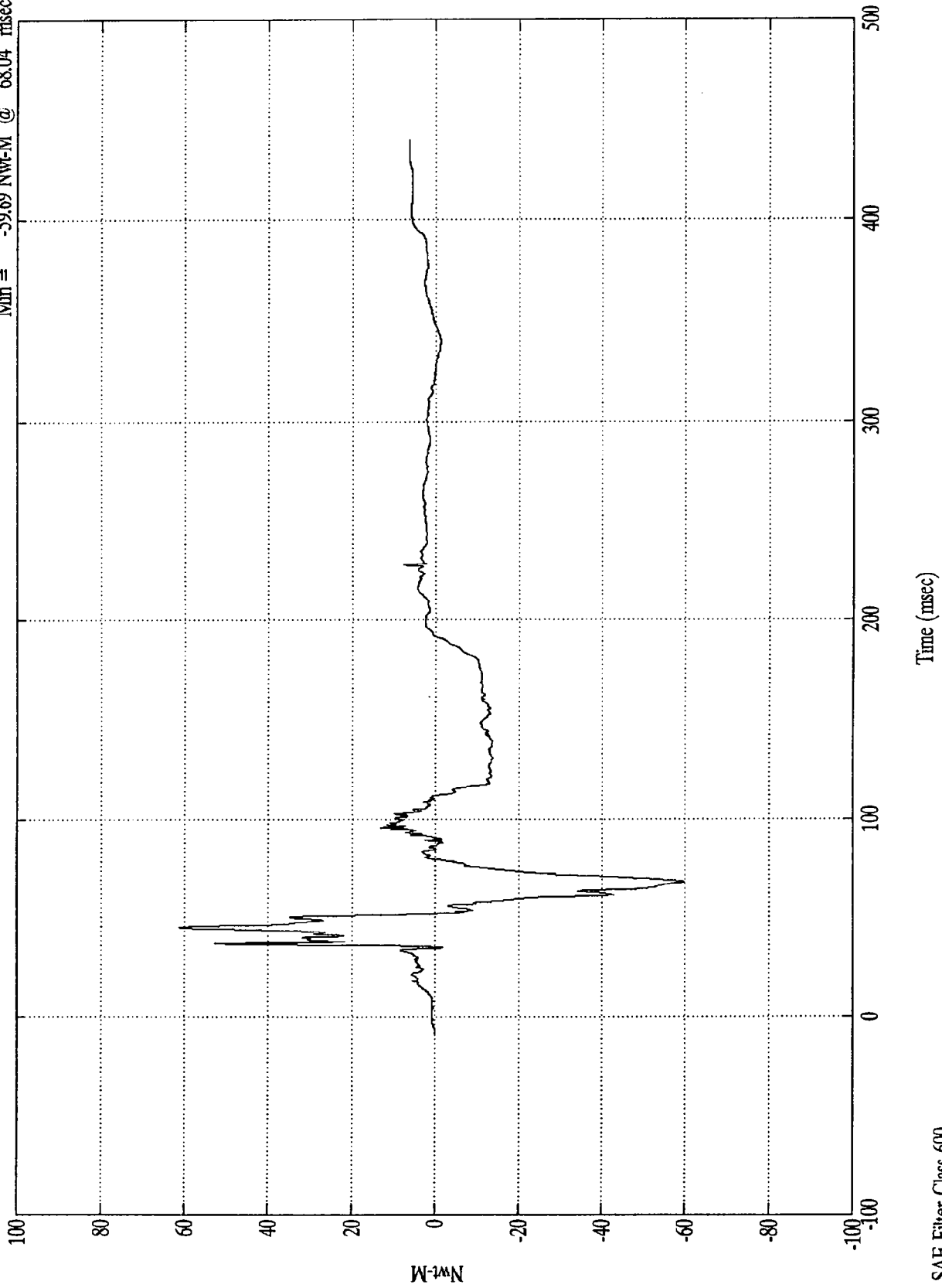


SAE Filter Class 1000

NCAP TEST #2 - 1996 DODGE RAM VAN

P1 Lt Upper Tibia Mx

Max = 61.41 Nwt-M @ 45.36 msec
Min = -59.69 Nwt-M @ 68.04 msec

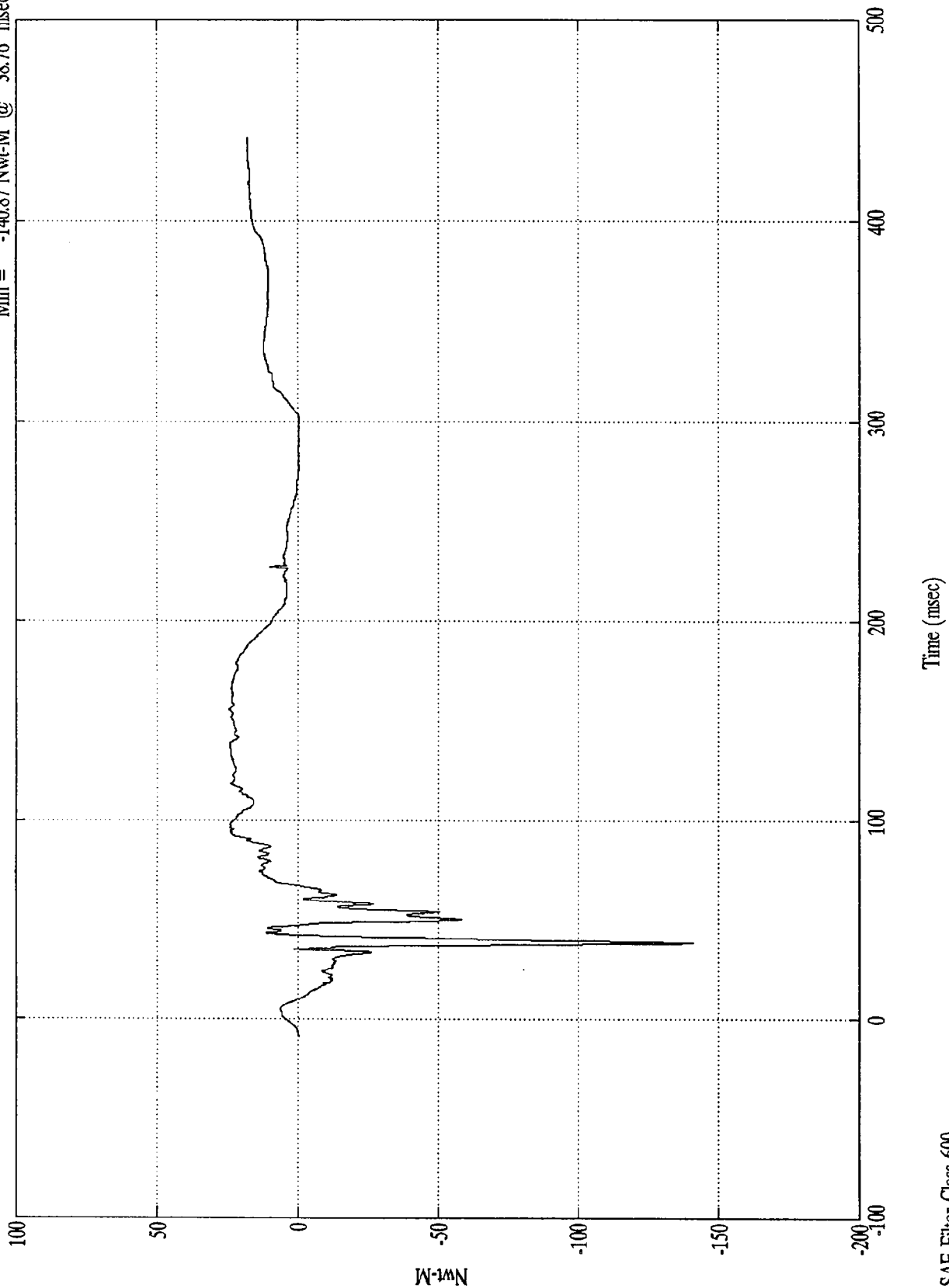


SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

P1 Lr Upper Tibia My

Max = 24.38 Nwt-M @ 155.28 msec
Min = -140.87 Nwt-M @ 38.76 msec



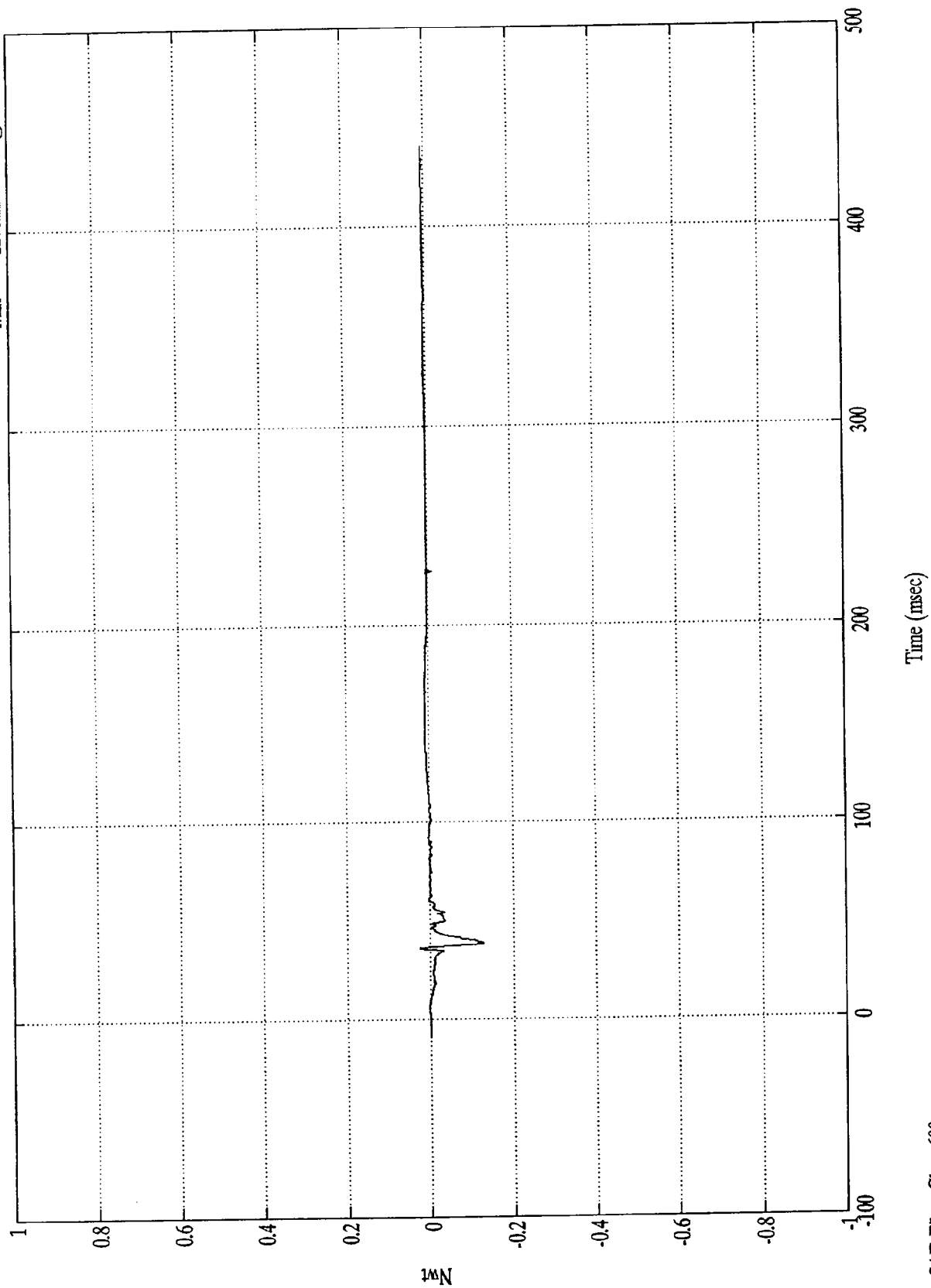
SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 258.04 Nwt @ 36.24 msec
Min = -1278.21 Nwt @ 38.76 msec

P1 Lt Lower Tibia Fy

$\times 10^4$

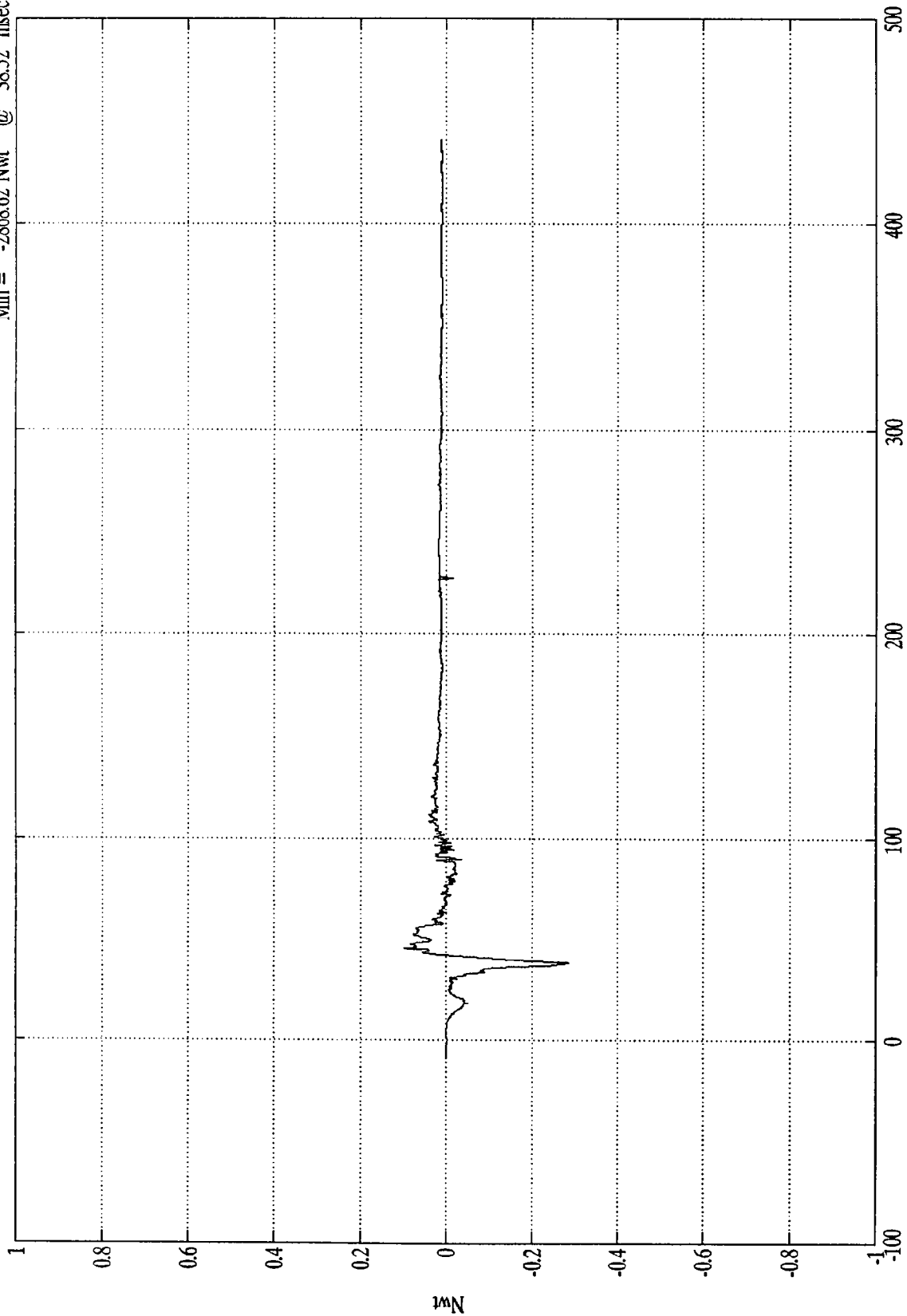


NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 987.93 Nwt @ 45.36 msec
 Min = -2868.62 Nwt @ 38.52 msec

P1 Lt Lower Tibia Fz

x10⁴



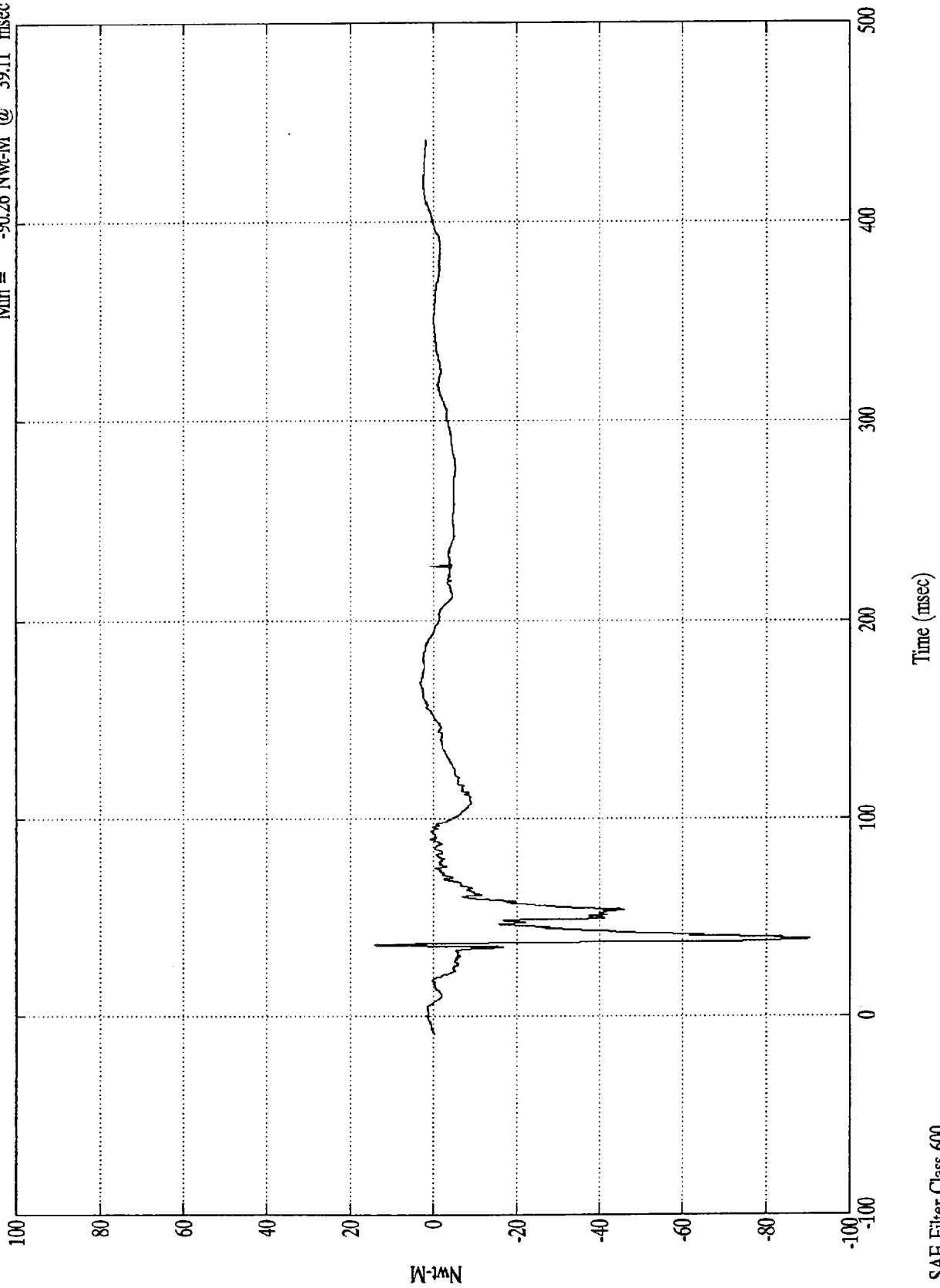
Time (msec)

SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 14.07 Nwt-M @ 36.24 msec
Min = -90.26 Nwt-M @ 39.11 msec

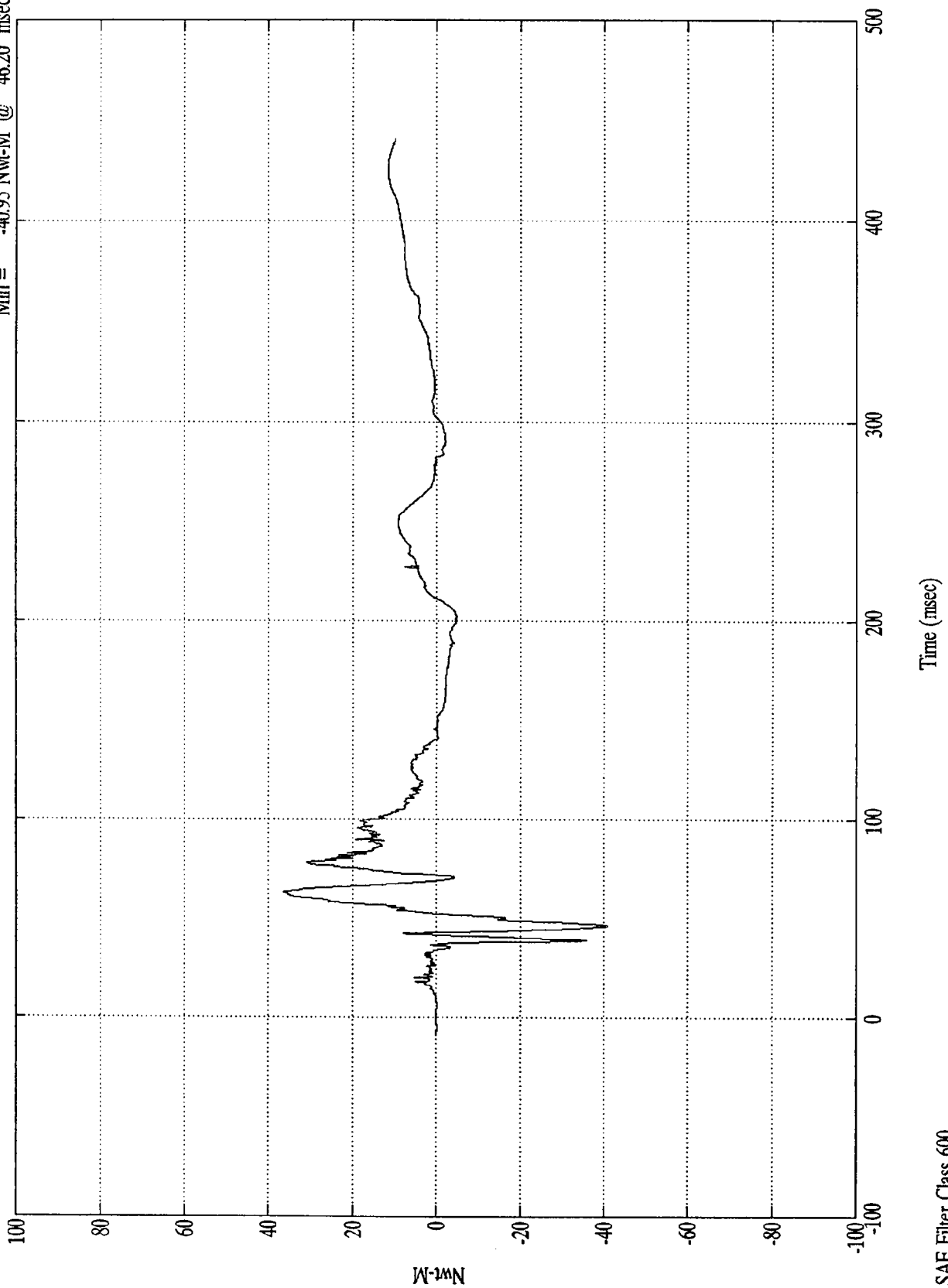
P1 Lt Lower Tibia Mx



NCAP TEST #2 - 1996 DODGE RAM VAN

P1 Rt Upper Tibia Mx

Max = 36.47 Nwt-M @ 63.48 msec
Min = -40.95 Nwt-M @ 46.20 msec

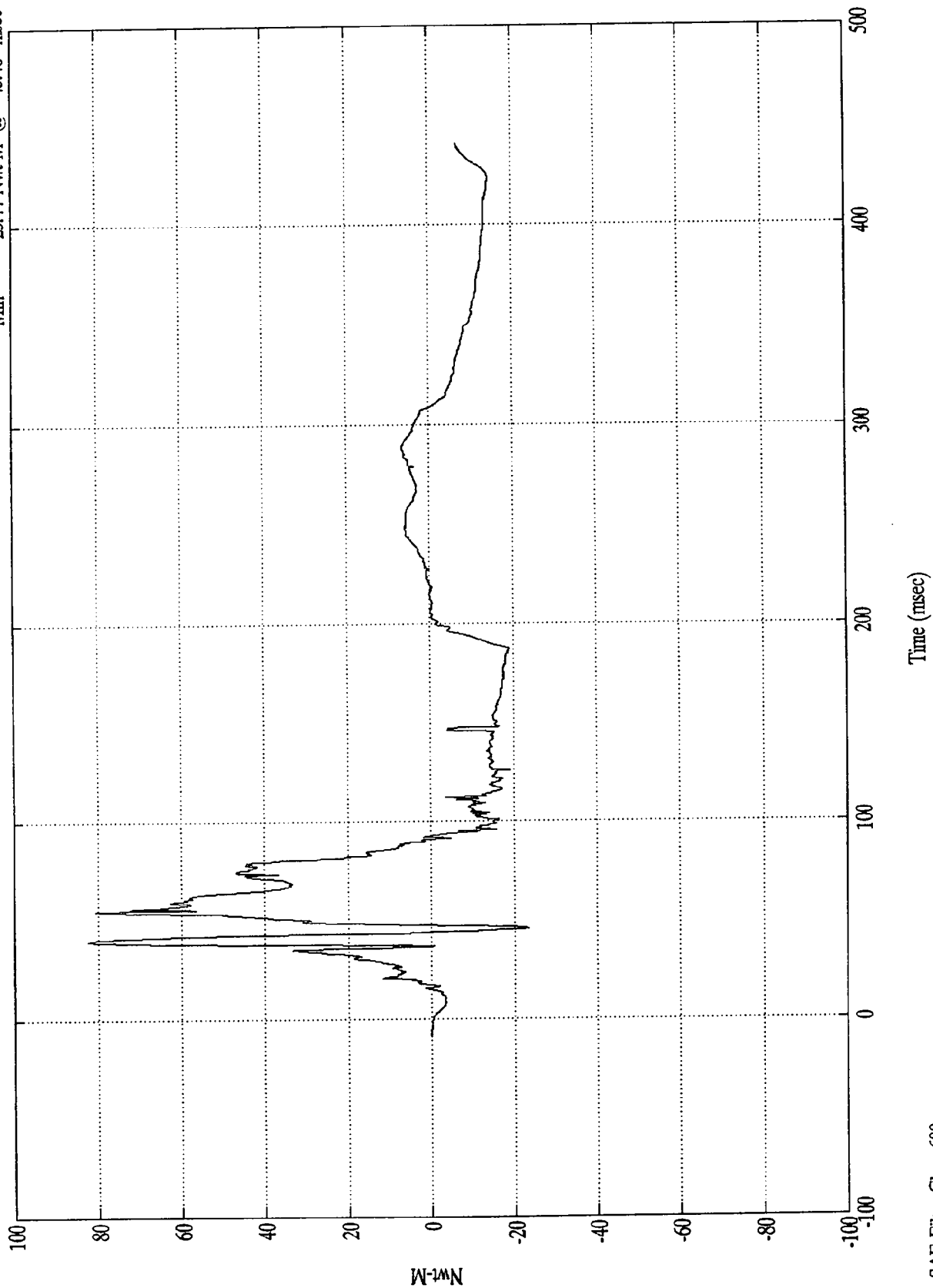


SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

P1 Rt Upper Tibia My

Max = 82.32 Nwt-M @ 39.84 msec
Min = -23.44 Nwt-M @ 45.48 msec



SAE Filter Class 600

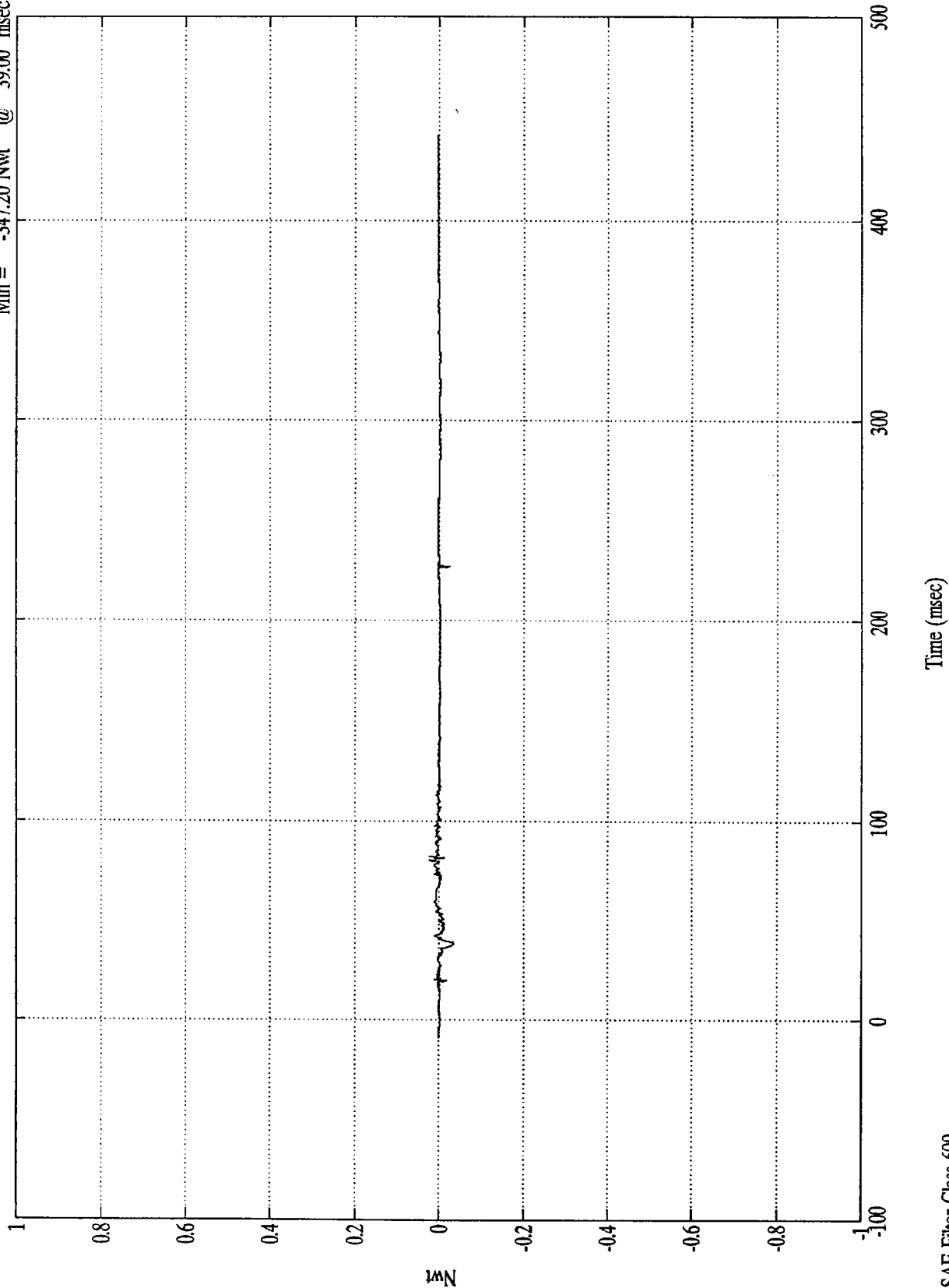
B-41

8313-2

NCAP TEST #2 - 1996 DODGE RAM VAN
x10⁴

P1 Rt Lower Tibia Fy

Max = 223.05 Nwt @ 80.52 msec
Min = -347.20 Nwt @ 39.00 msec

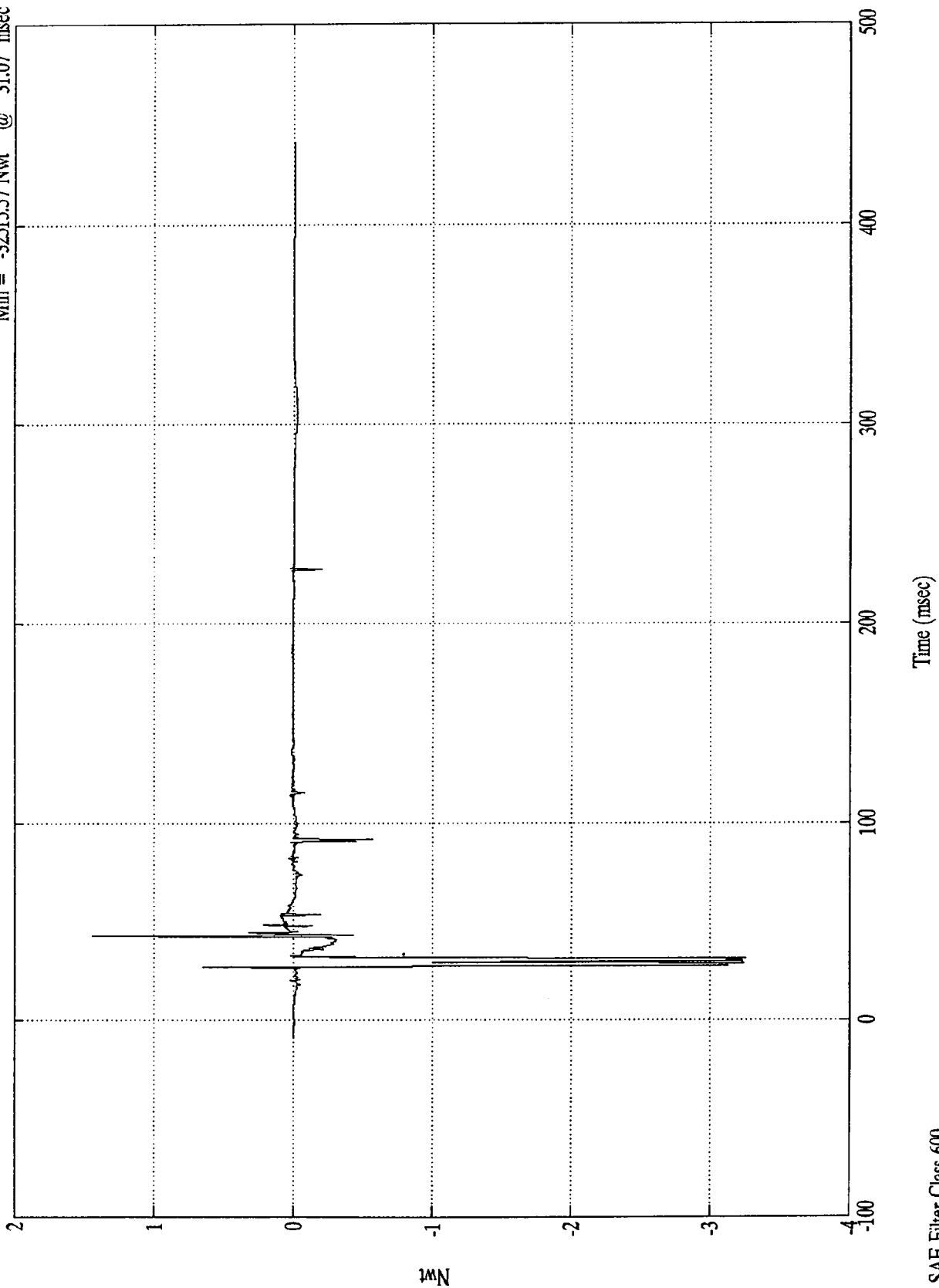


NCAP TEST #2 - 1996 DODGE RAM VAN

P1 Rt Lower Tibia Fz

Max = 14409.73 Nwt @ 42.48 msec
Min = -32515.57 Nwt @ 31.07 msec

$\times 10^4$



Nwt

SAE Filter Class 600

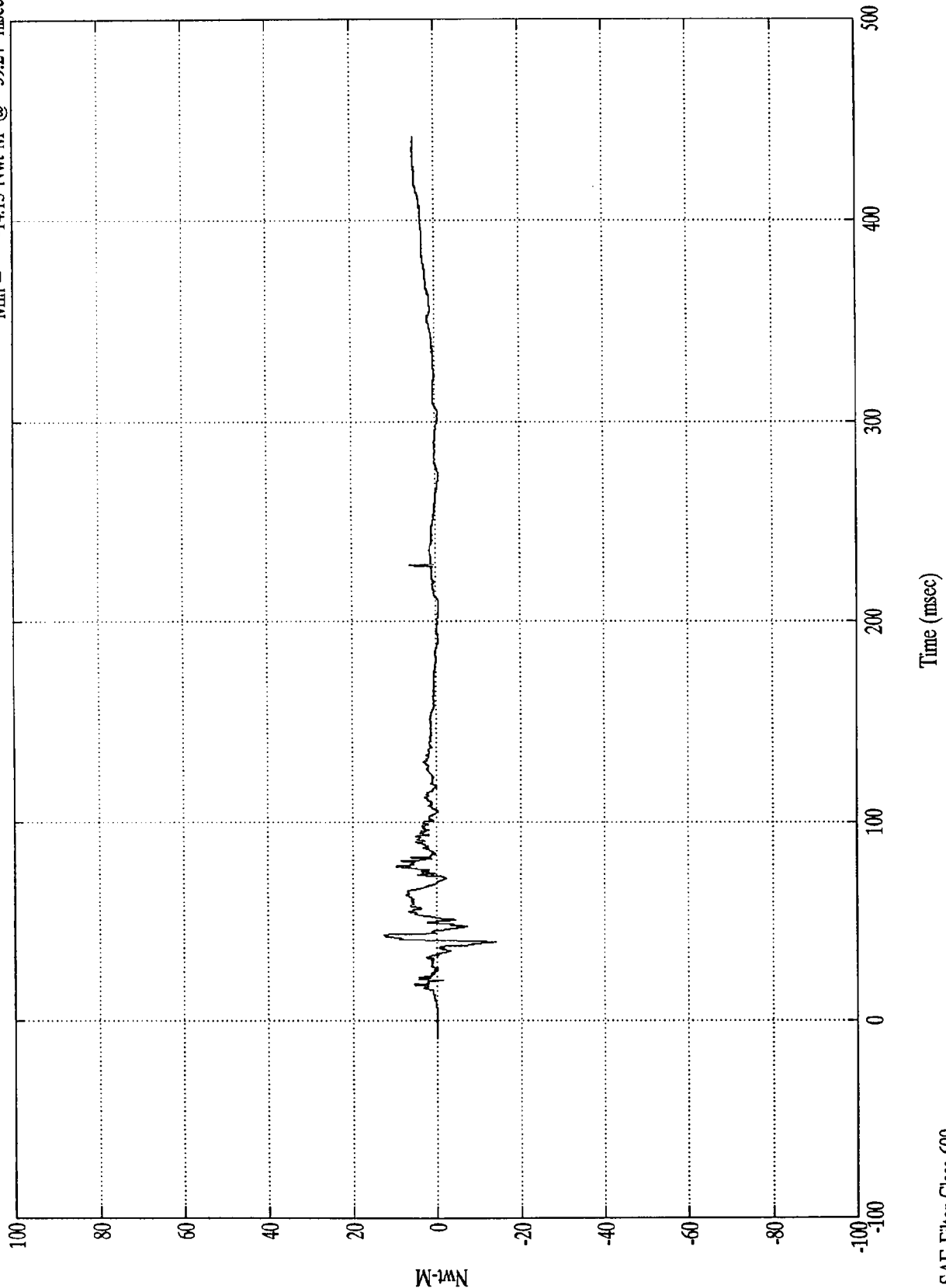
8313-2

B-43

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 12.48 Nwt-M @ 43.08 msec
Min = -14.15 Nwt-M @ 39.24 msec

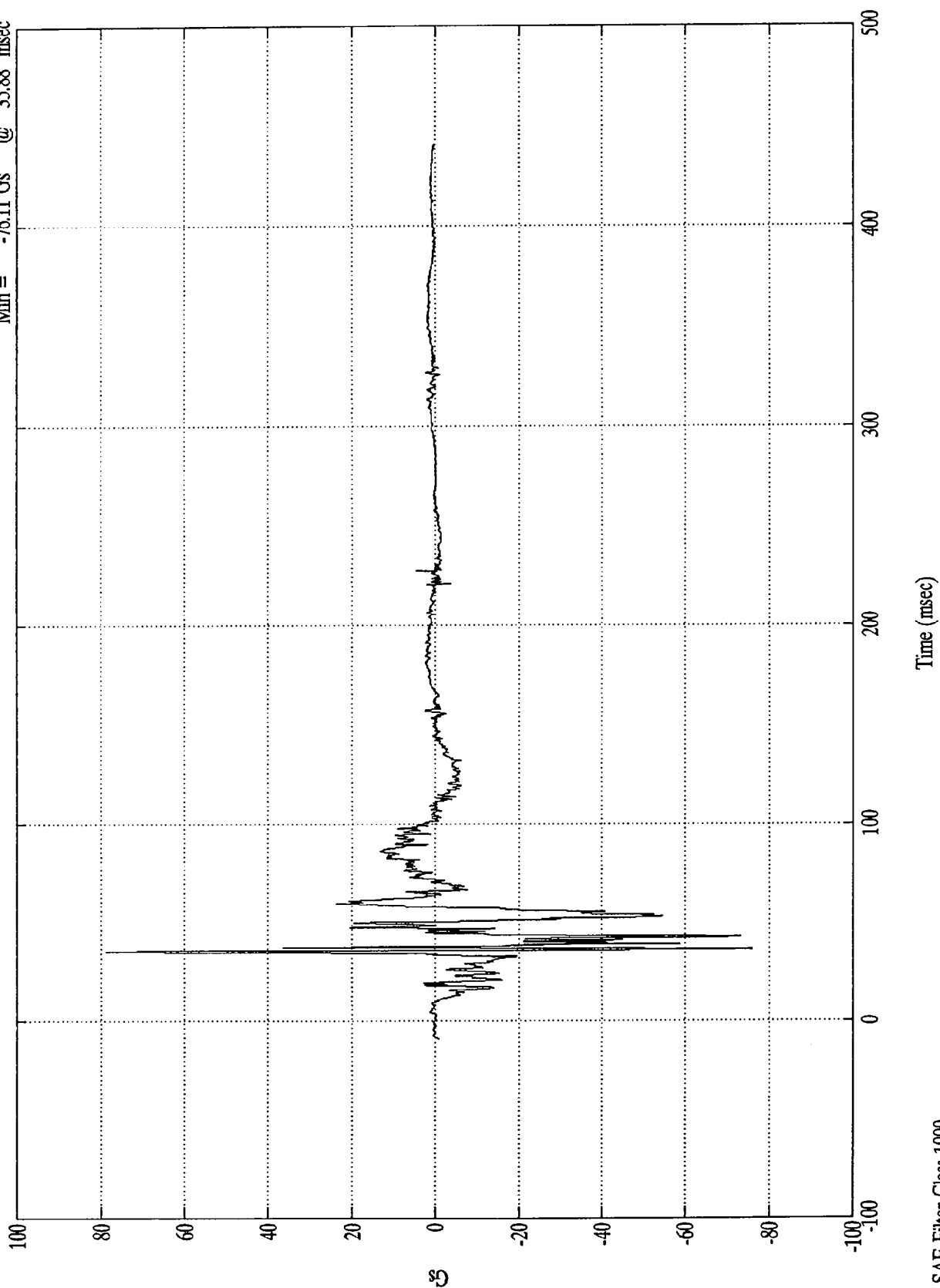
P1 Rt Lower Tibia Mx



SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

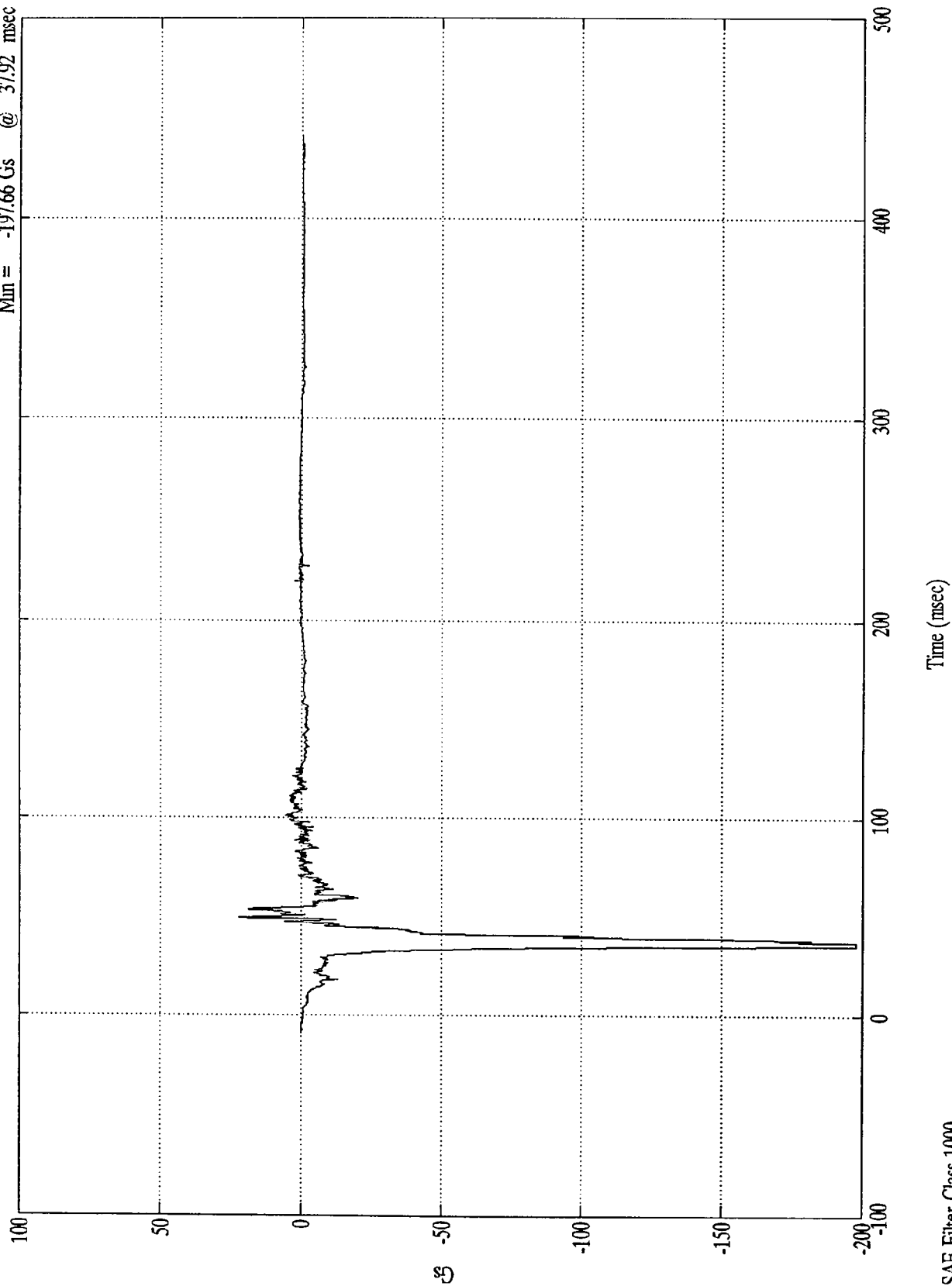
Pos. 1 L Foot Front Z
Max = 78.75 Gs @ 35.04 msec
Min = -76.11 Gs @ 35.88 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 22.09 Gs @ 49.56 msec
Min = -197.66 Gs @ 37.92 msec

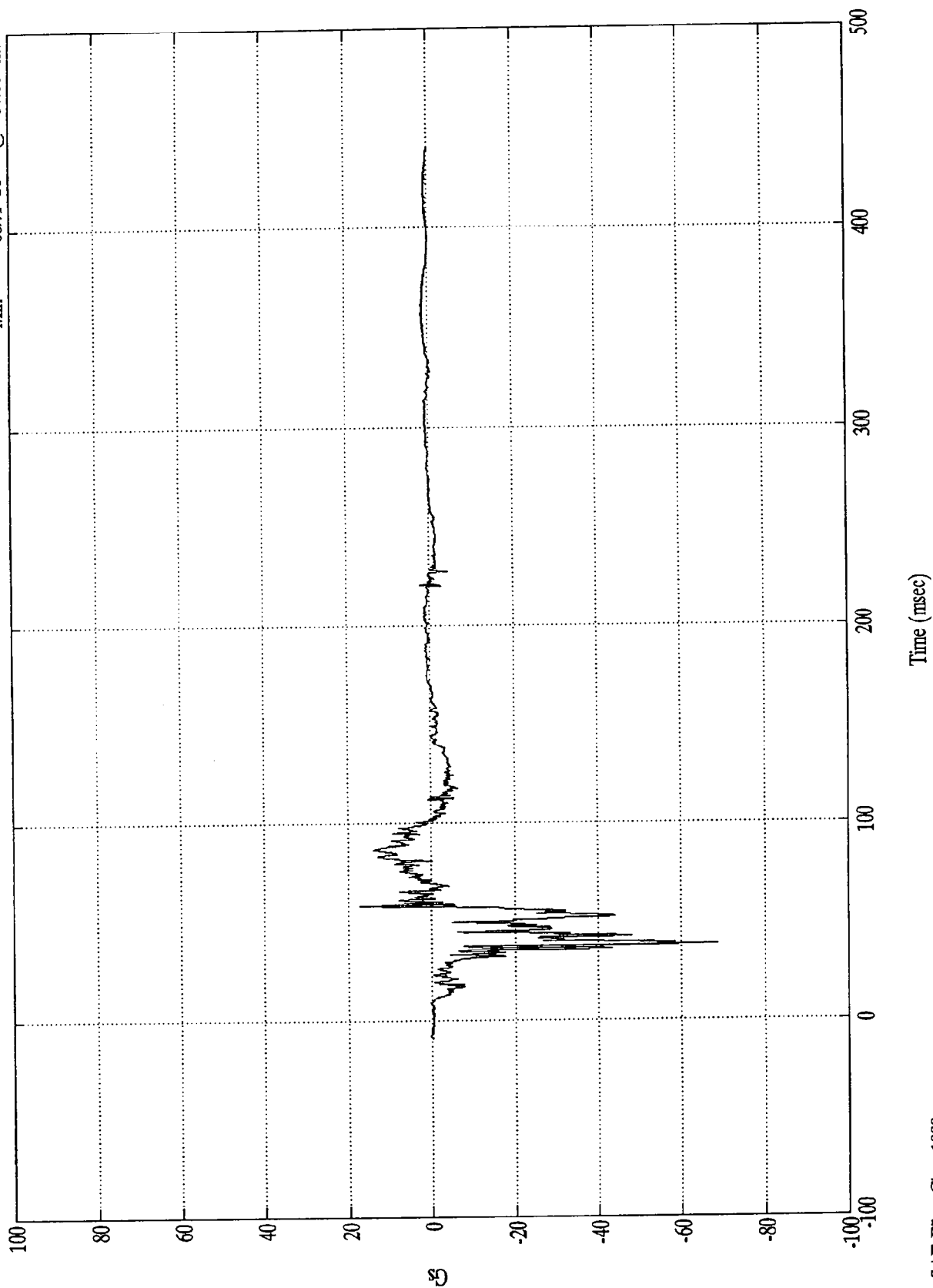
Pos. 1 L. Foot Rear X



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 L Foot Rear Z

Max = 17.20 Gs @ 57.60 msec
Min = -68.71 Gs @ 37.80 msec

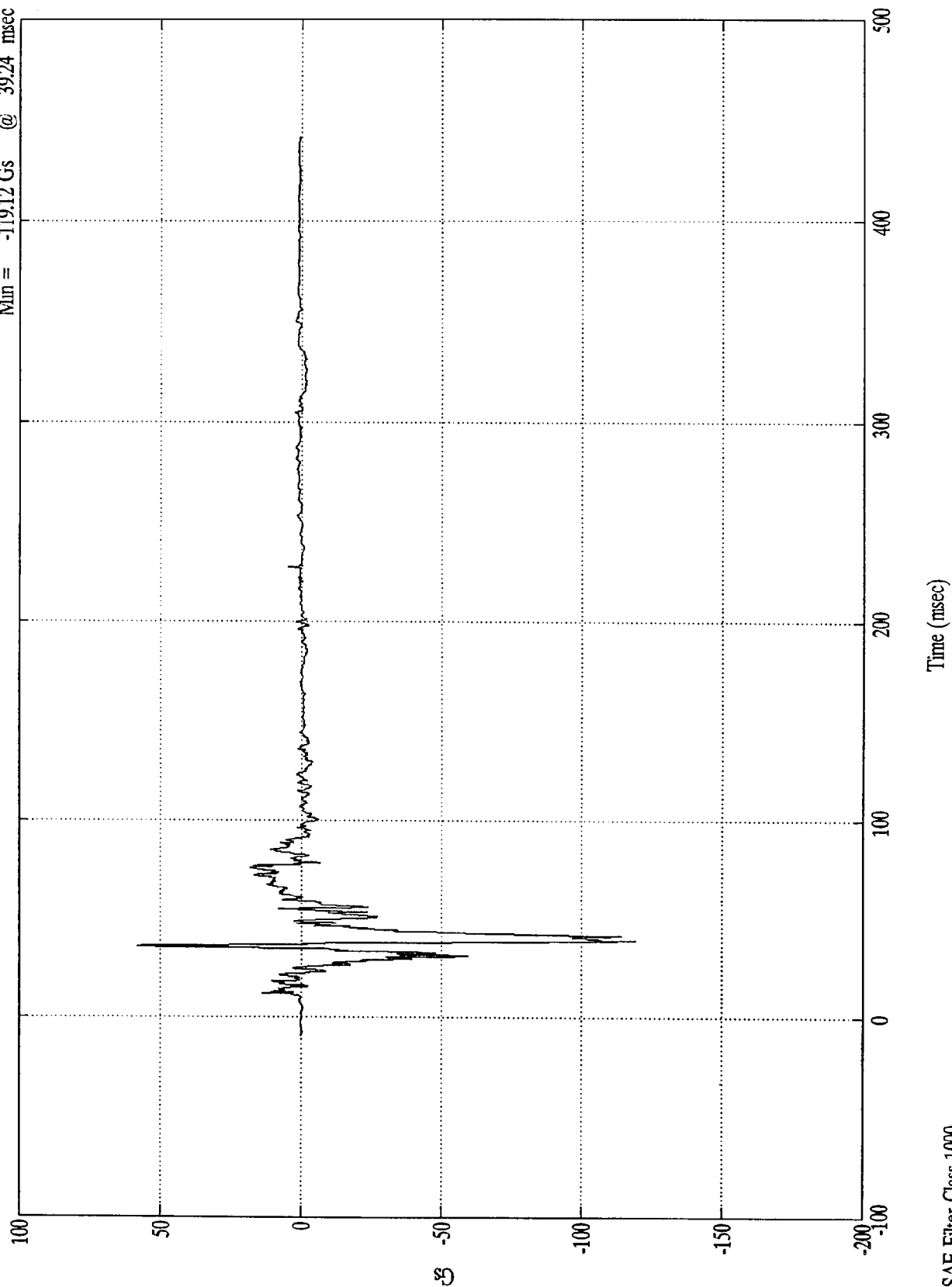


SAE Filter Class 1000

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 58.08 Gs @ 36.12 msec
Min = -119.12 Gs @ 39.24 msec

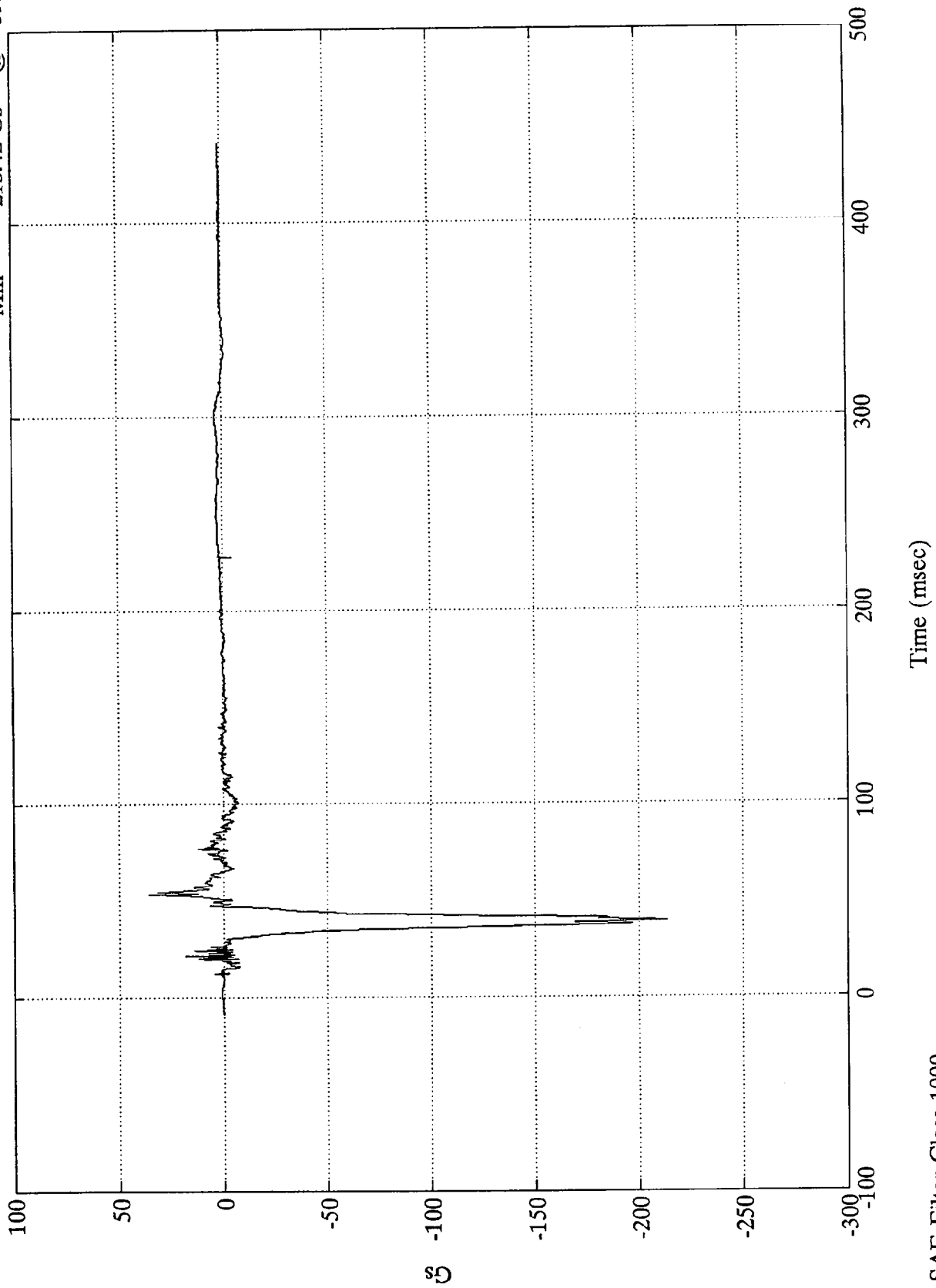
Pos. 1 R. Foot Front Z



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 R.Foot Rear X

Max = 35.84 Gs @ 53.40 msec
Min = -213.42 Gs @ 39.47 msec

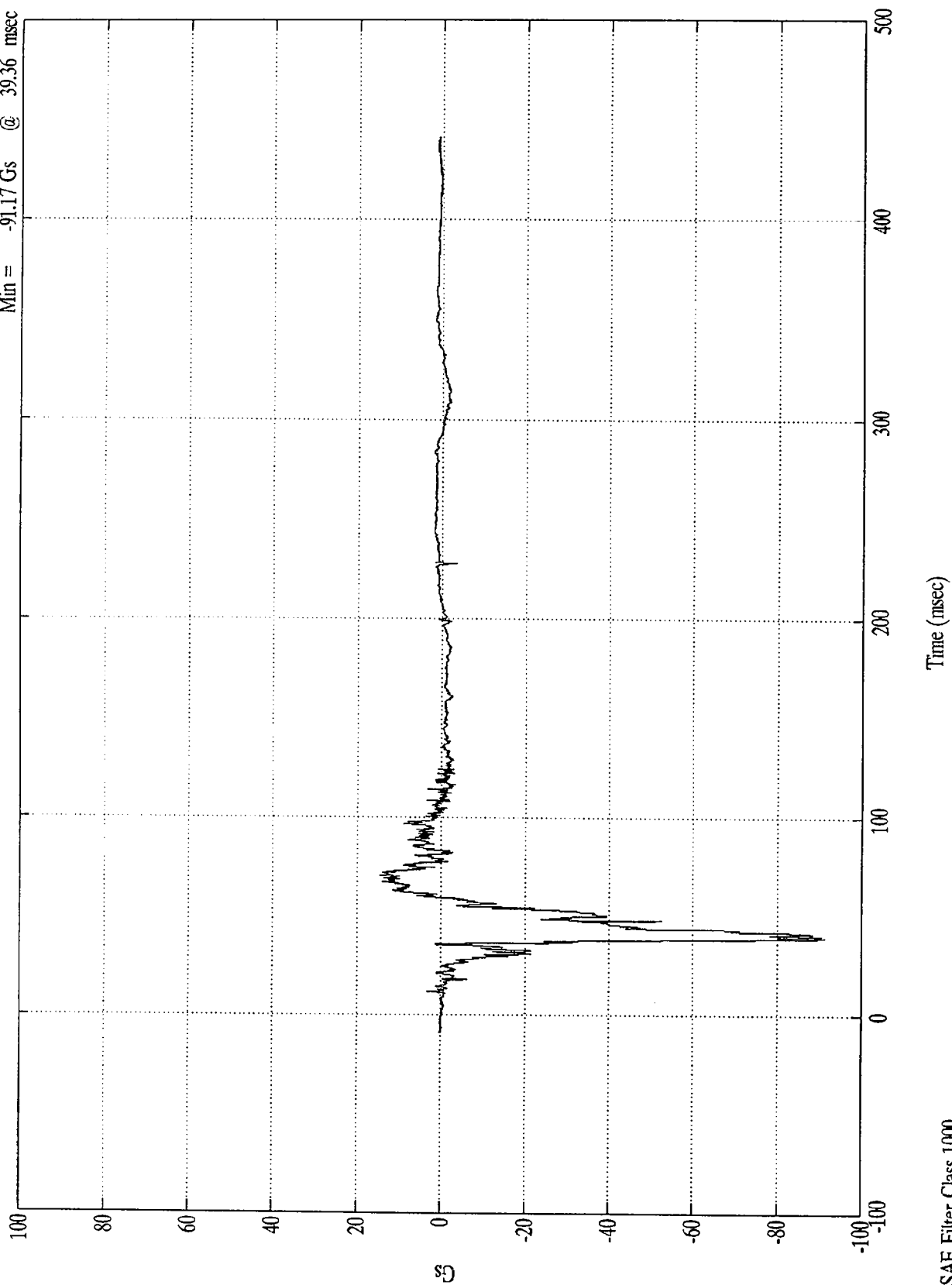


SAE Filter Class 1000

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 R.Foot Rear Z

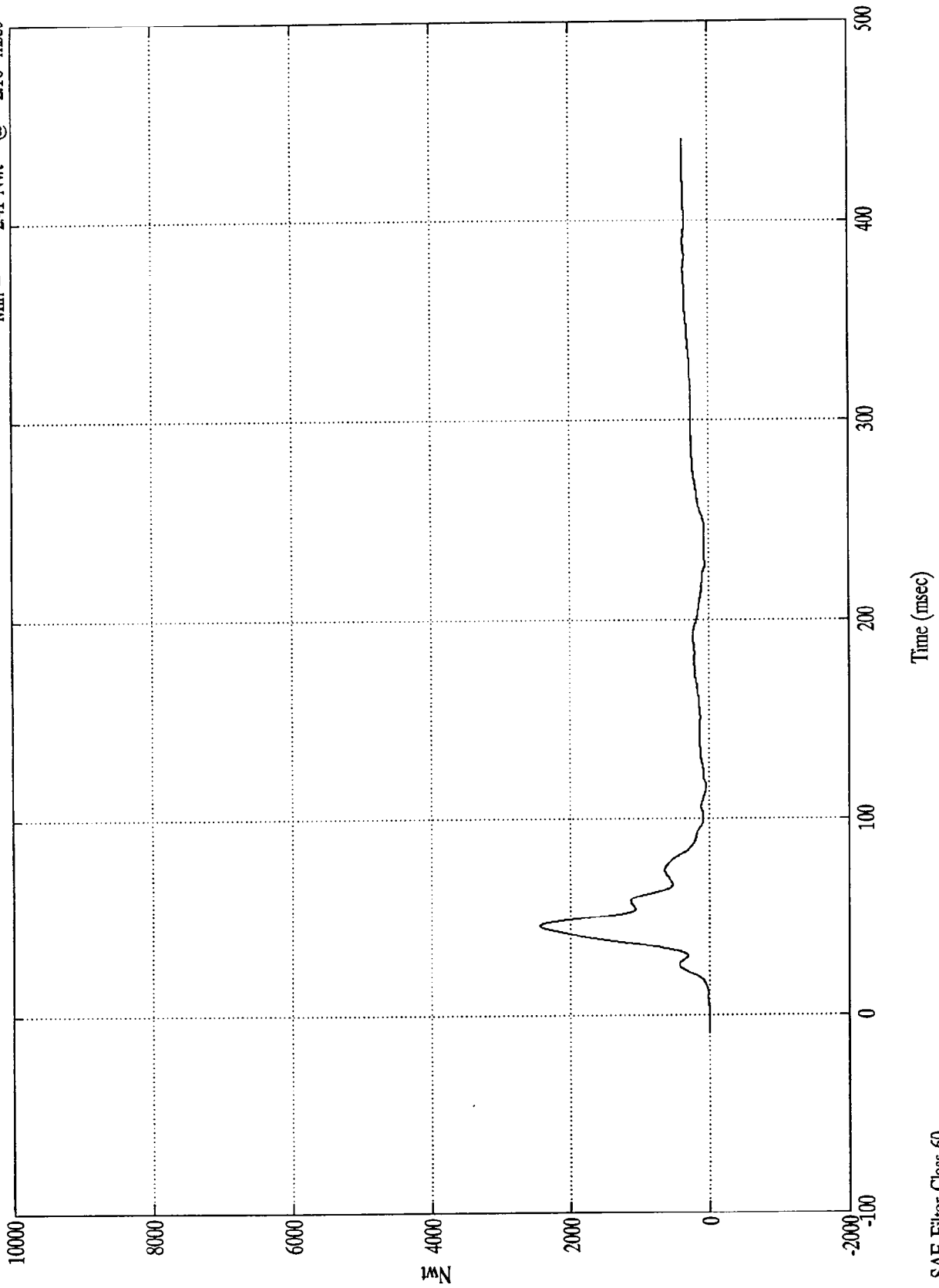
Max = 14.53 Gs @ 70.20 msec
Min = -91.17 Gs @ 39.36 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Left Belt Load

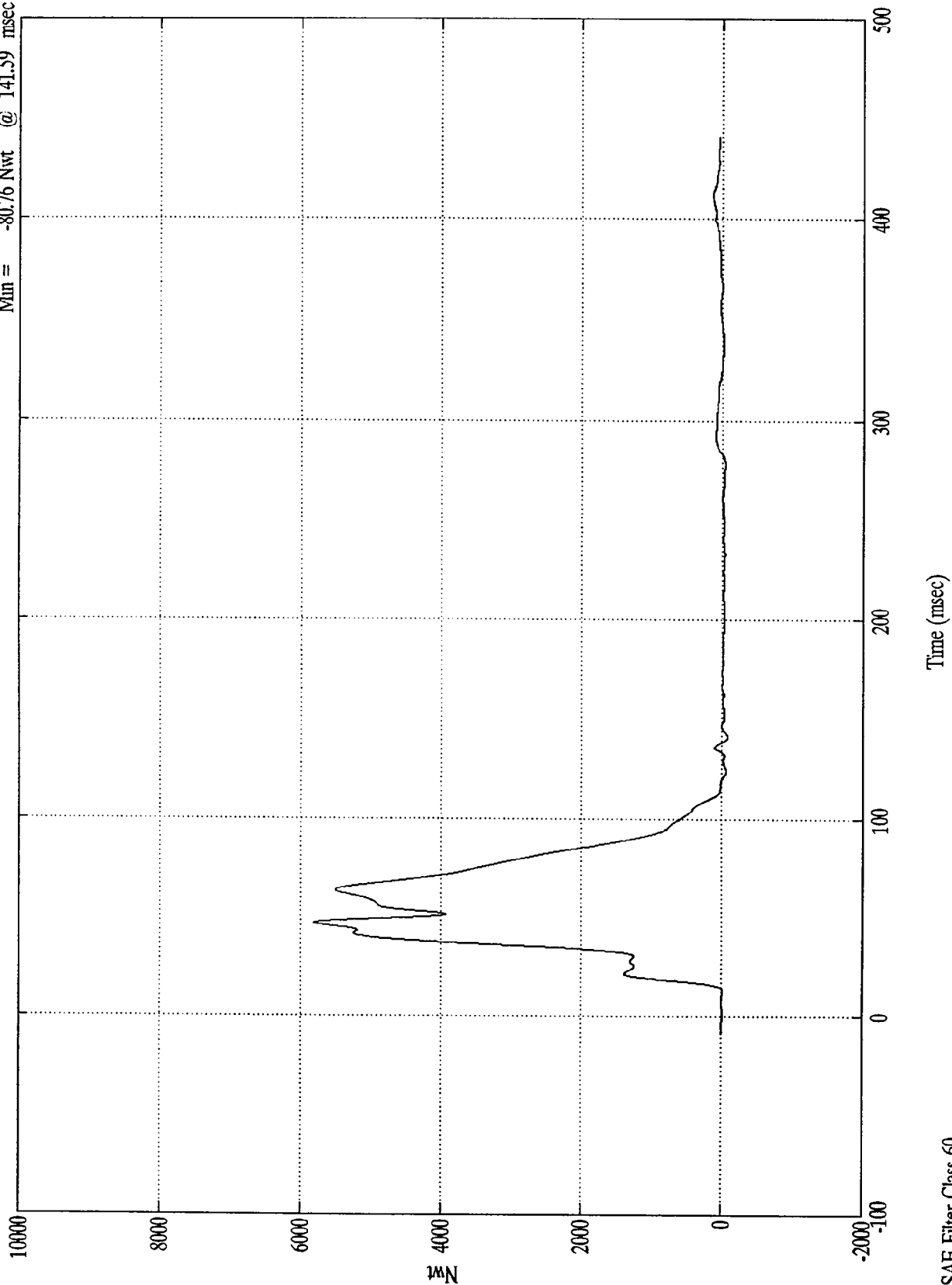
Max = 2444.94 Nwt @ 45.12 msec
Min = -2.41 Nwt @ -2.16 msec



SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

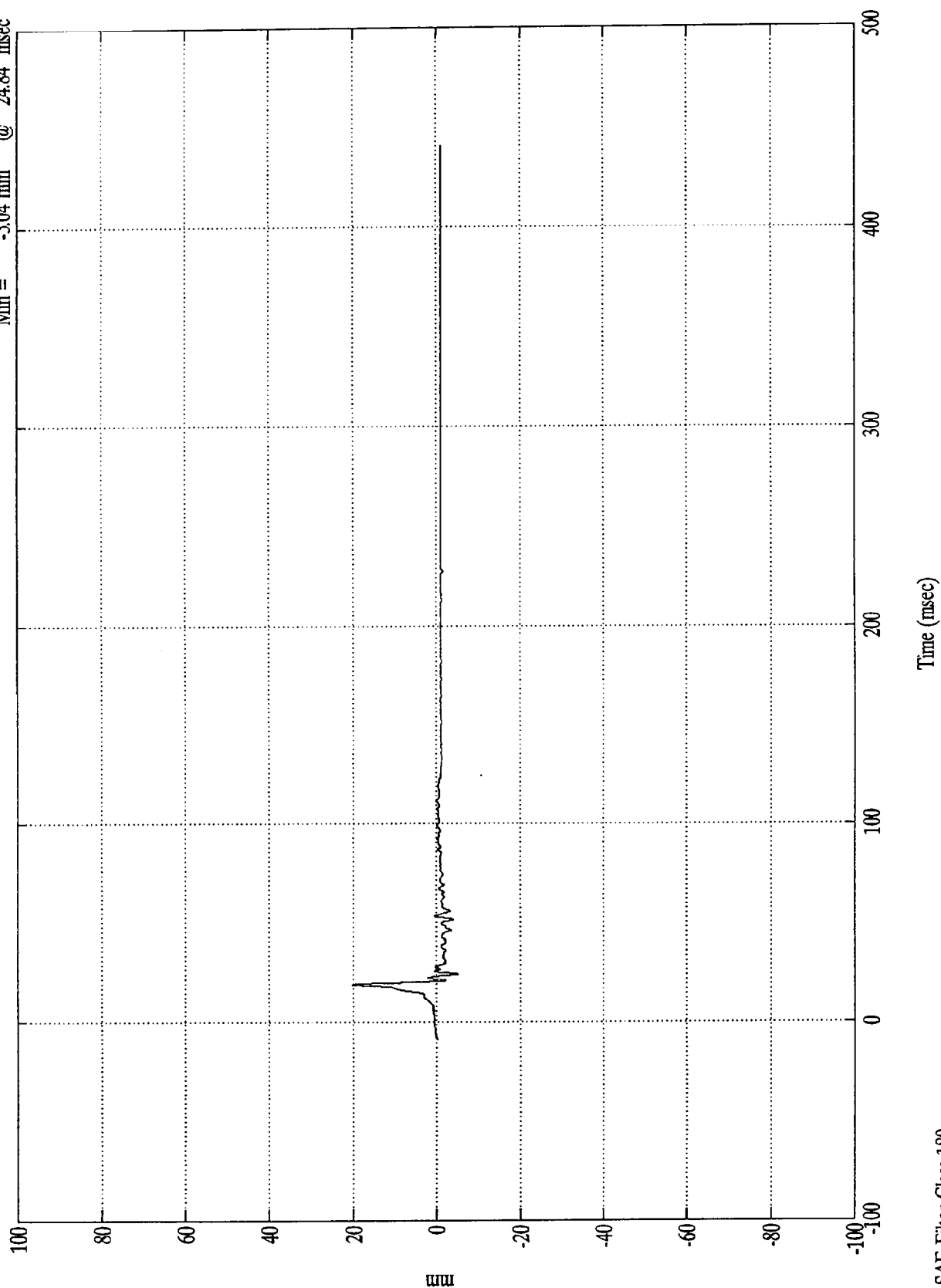
Pos. 1 Torso Belt Load
Max = 5809.64 Nwt @ 46.92 msec
Min = -80.76 Nwt @ 141.59 msec



NCAP TEST #2 - 19% DODGE RAM VAN

Pos. 1 Belt Spool Out

Max = 20.05 mm @ 19.68 msec
Min = -5.04 mm @ 24.84 msec

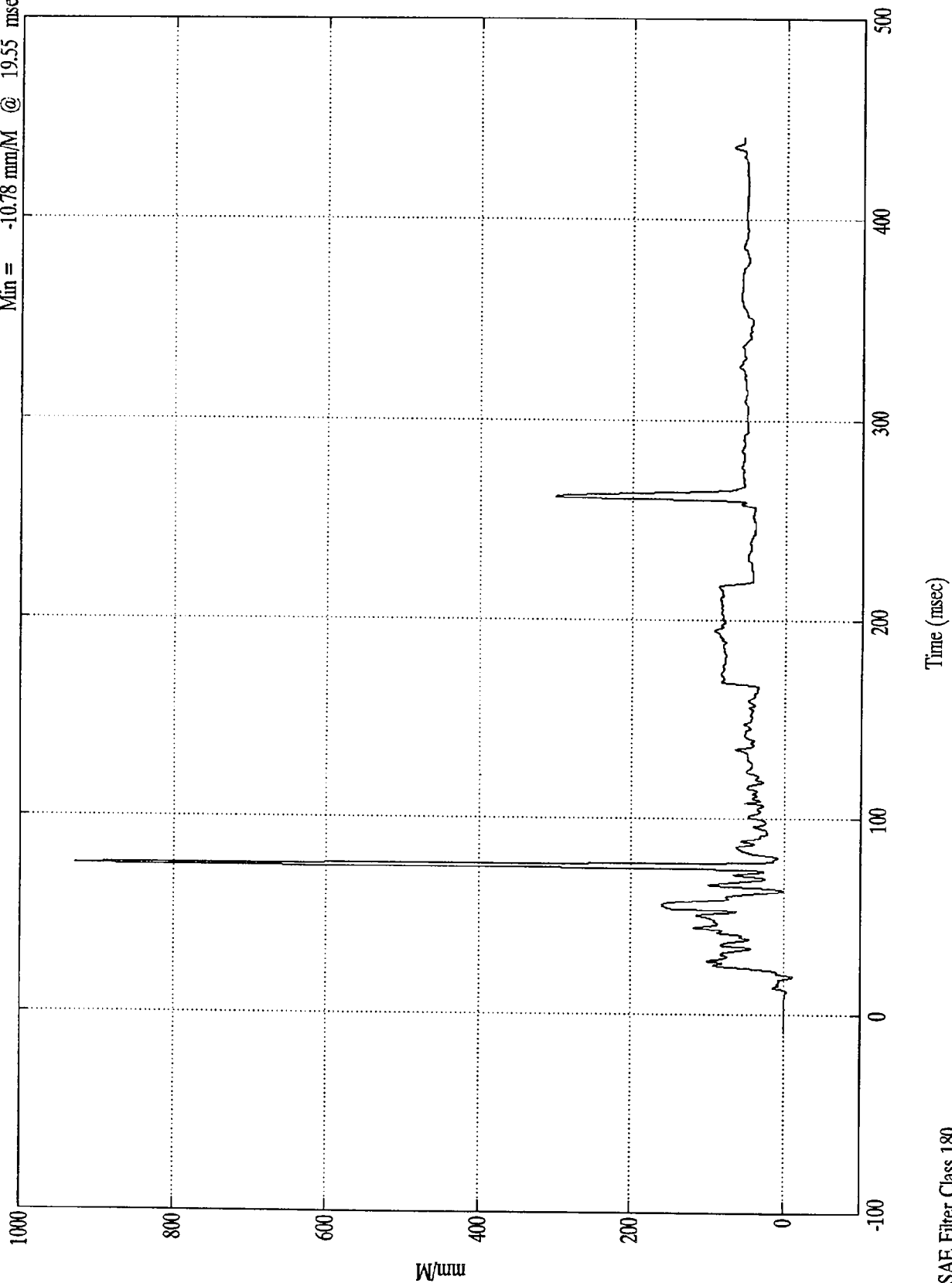


SAE Filter Class 180

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 1 Belt Elongation

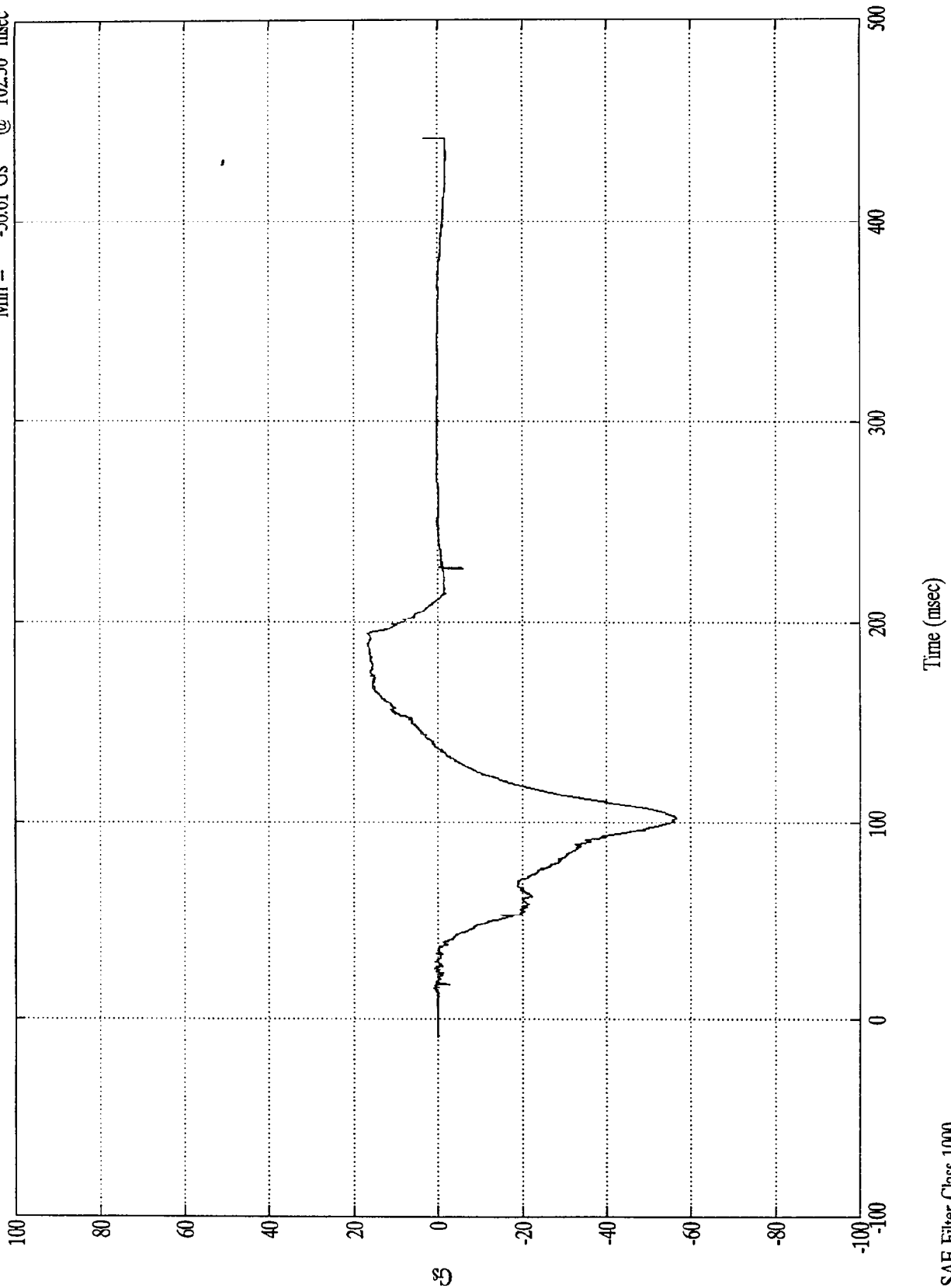
Max = 929.09 mm/M @ 75.47 msec
Min = -10.78 mm/M @ 19.55 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 16.73 Gs @ 194.40 msec
Min = -56.61 Gs @ 102.36 msec

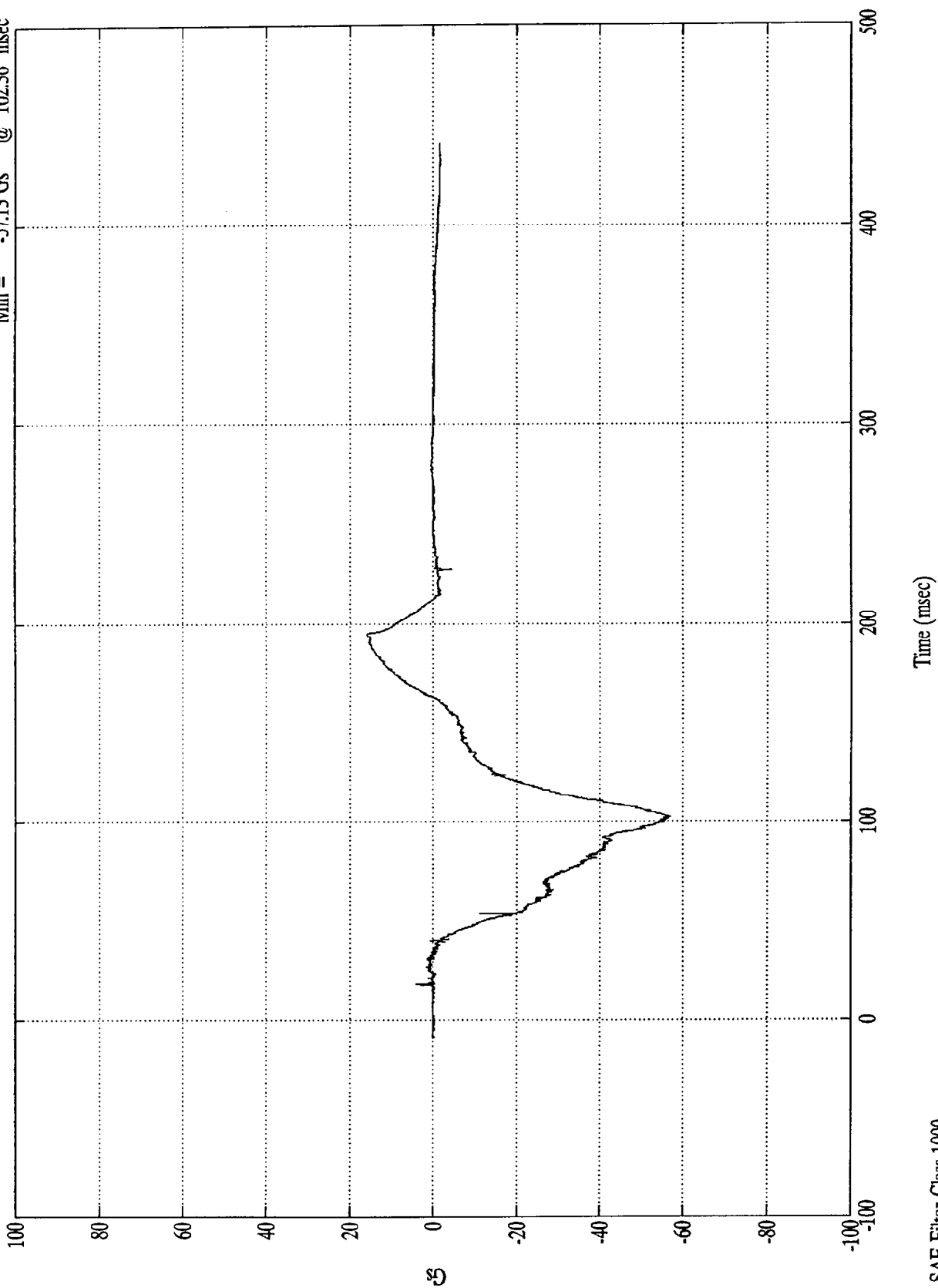
Pos. 2 Head X



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Head X(R)

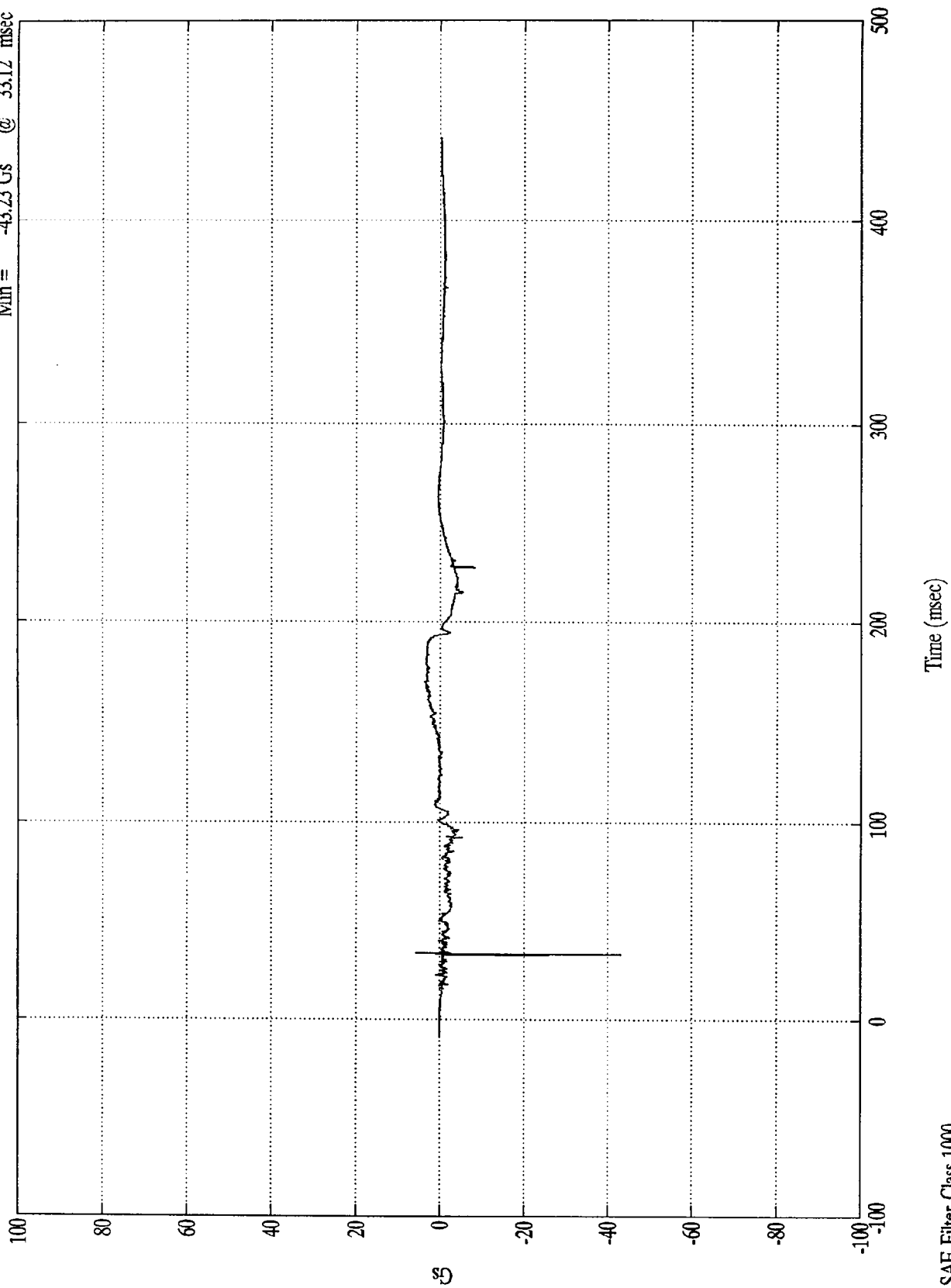
Max = 15.93 Gs @ 194.76 msec
Min = -57.13 Gs @ 102.36 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

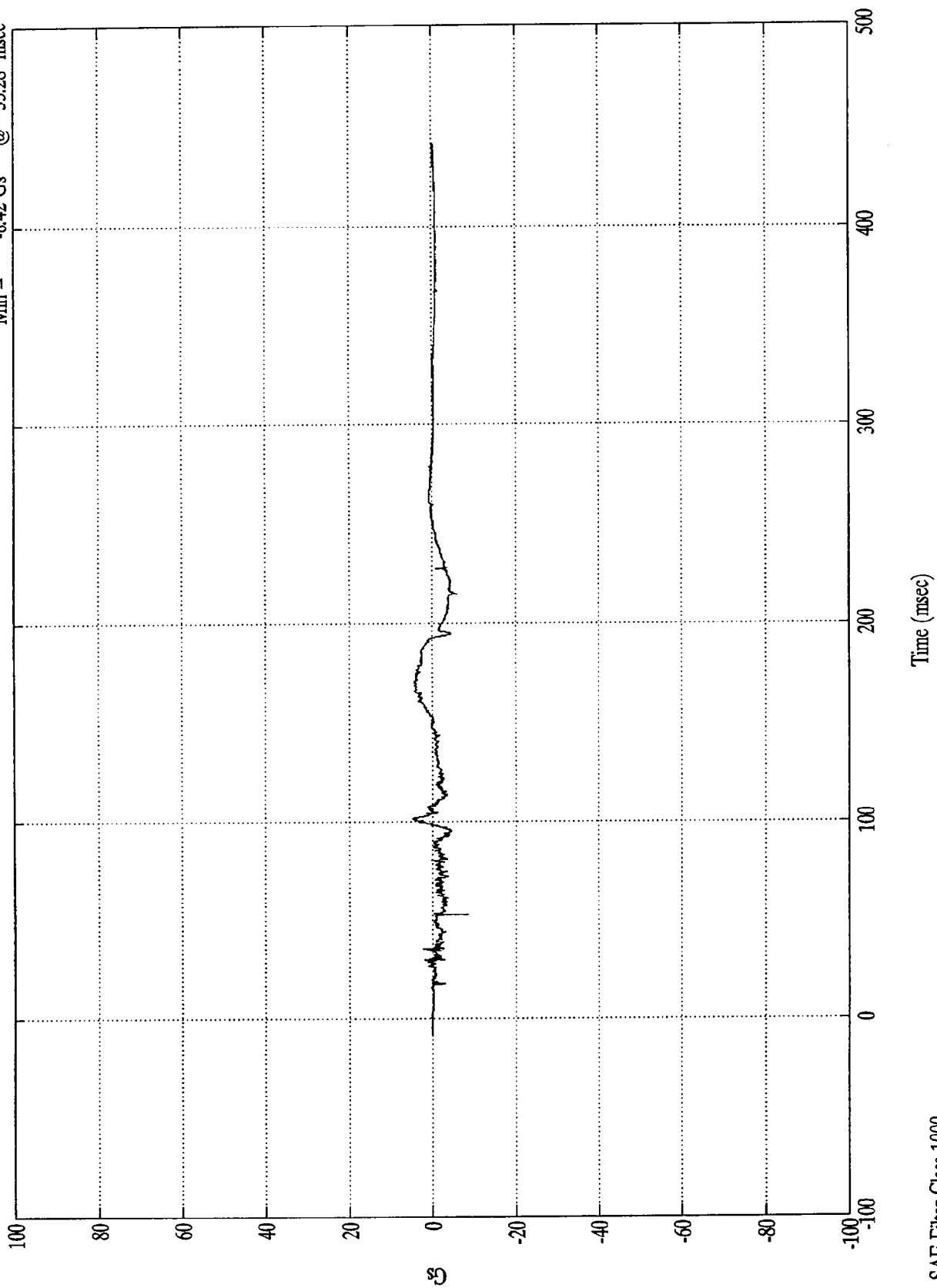
Pos. 2 Head Y

Max = 5.66 Gs @ 33.47 msec
Min = -43.23 Gs @ 33.12 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

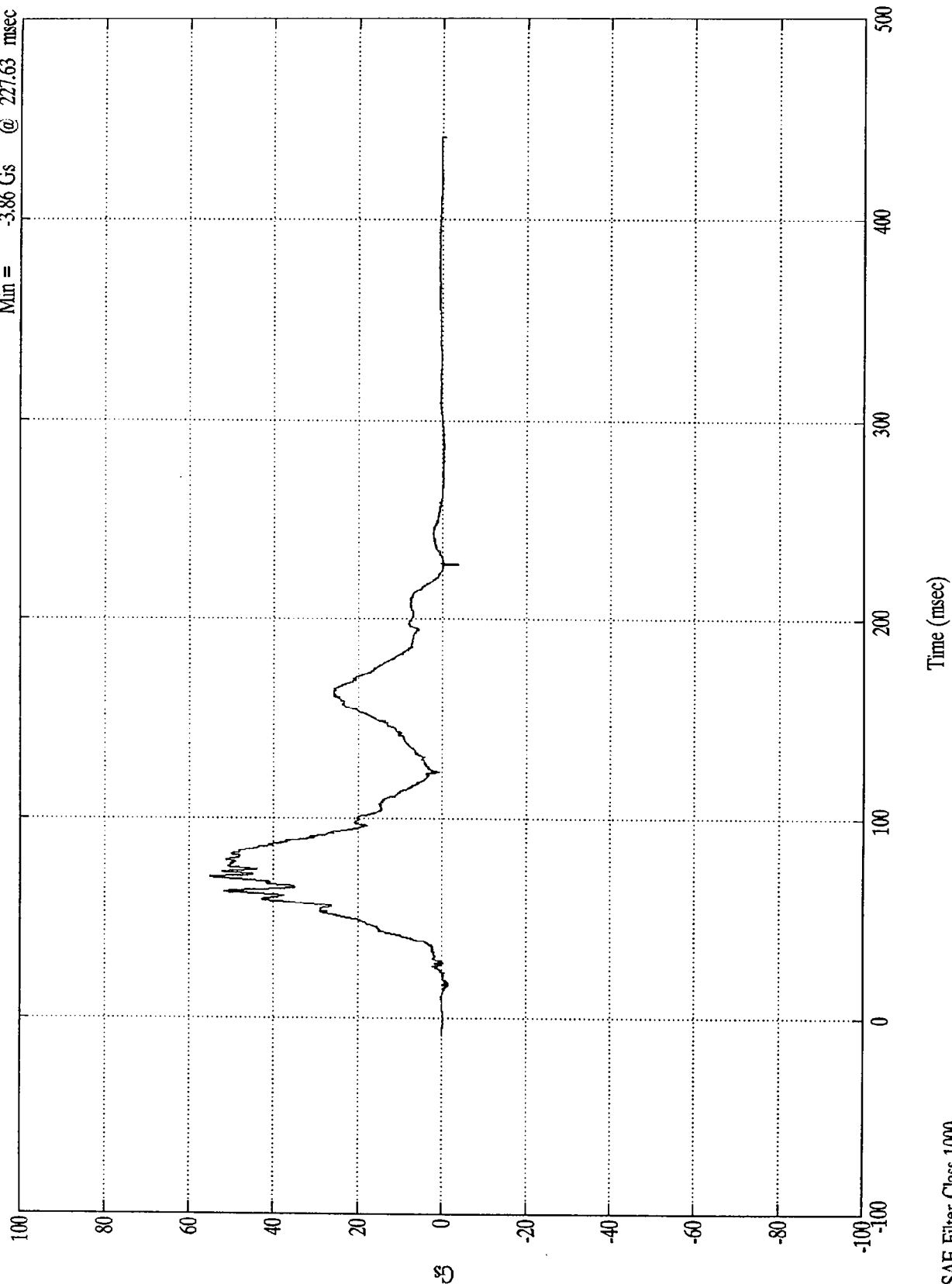
Pos. 2 Head Y(R)
Max = 4.75 Gs @ 101.28 msec
Min = -8.42 Gs @ 53.28 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 55.16 Gs @ 70.44 msec
Min = -3.86 Gs @ 227.63 msec

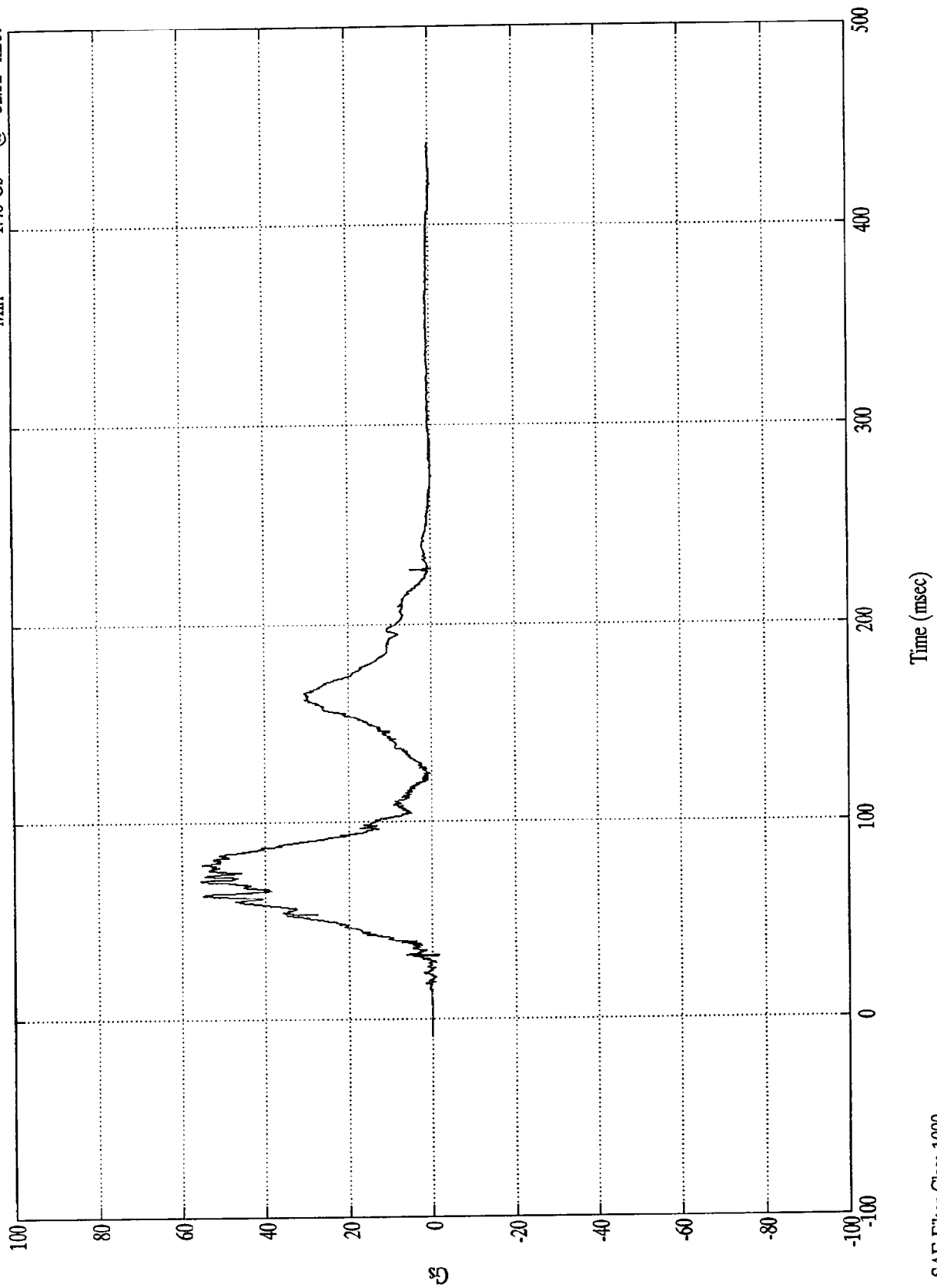
Pos. 2 Head Z



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Head Z(R)

Max = 55.47 Gs @ 70.68 msec
Min = -1.46 Gs @ 32.52 msec

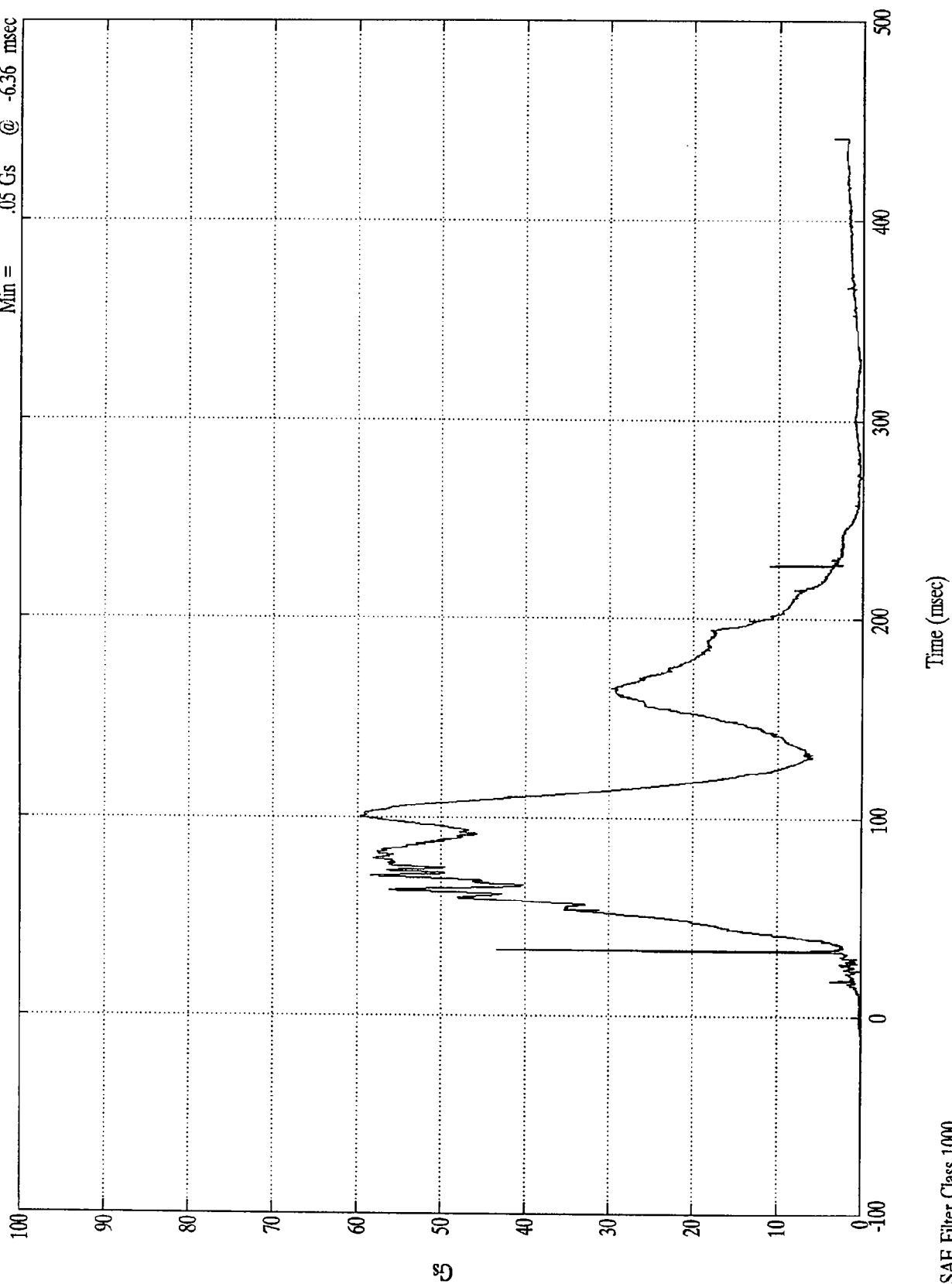


SAE Filter Class 1000

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Head Resultant

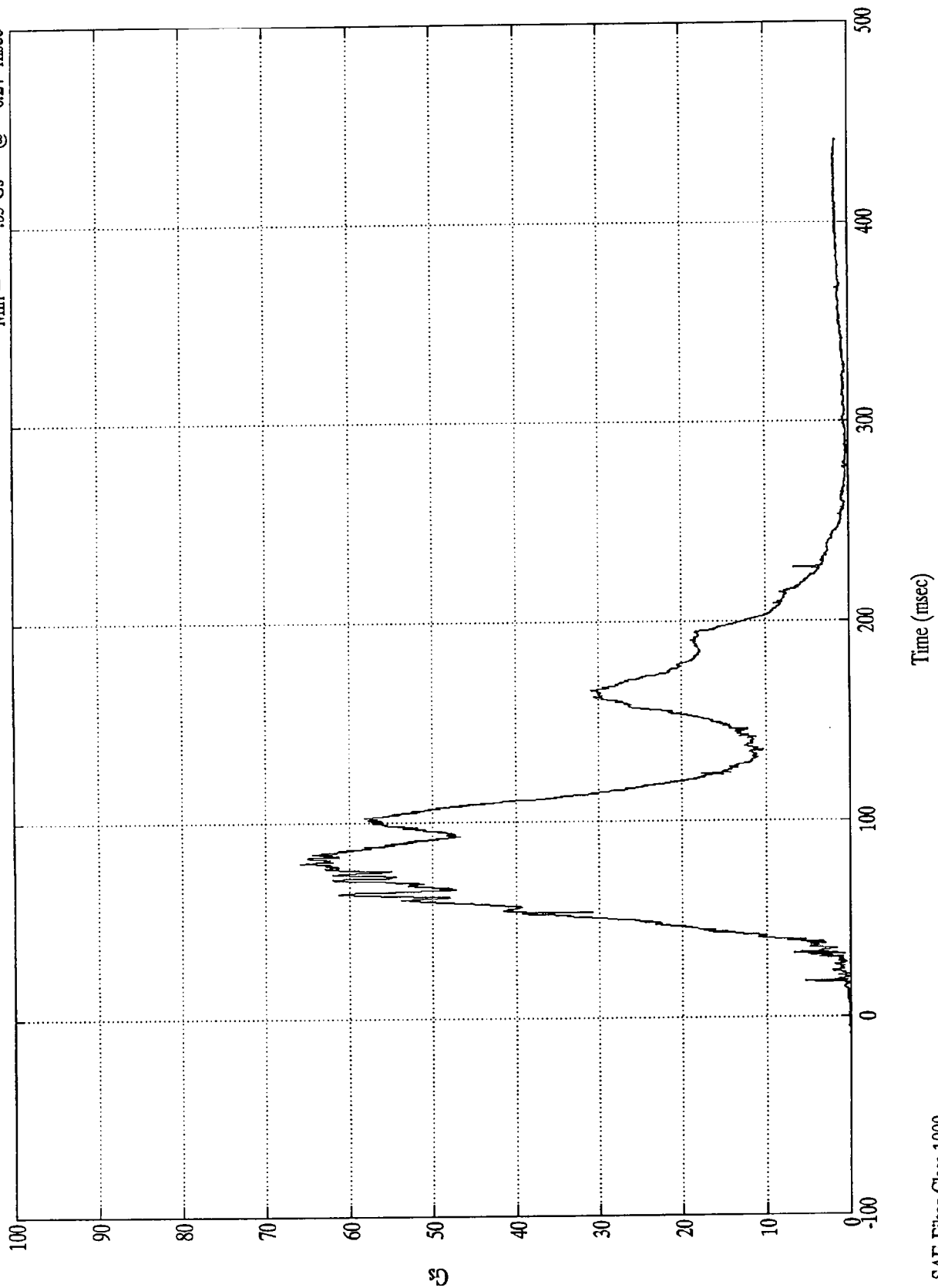
Max = 59.68 Gs @ 100.20 msec
Min = .05 Gs @ -6.36 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

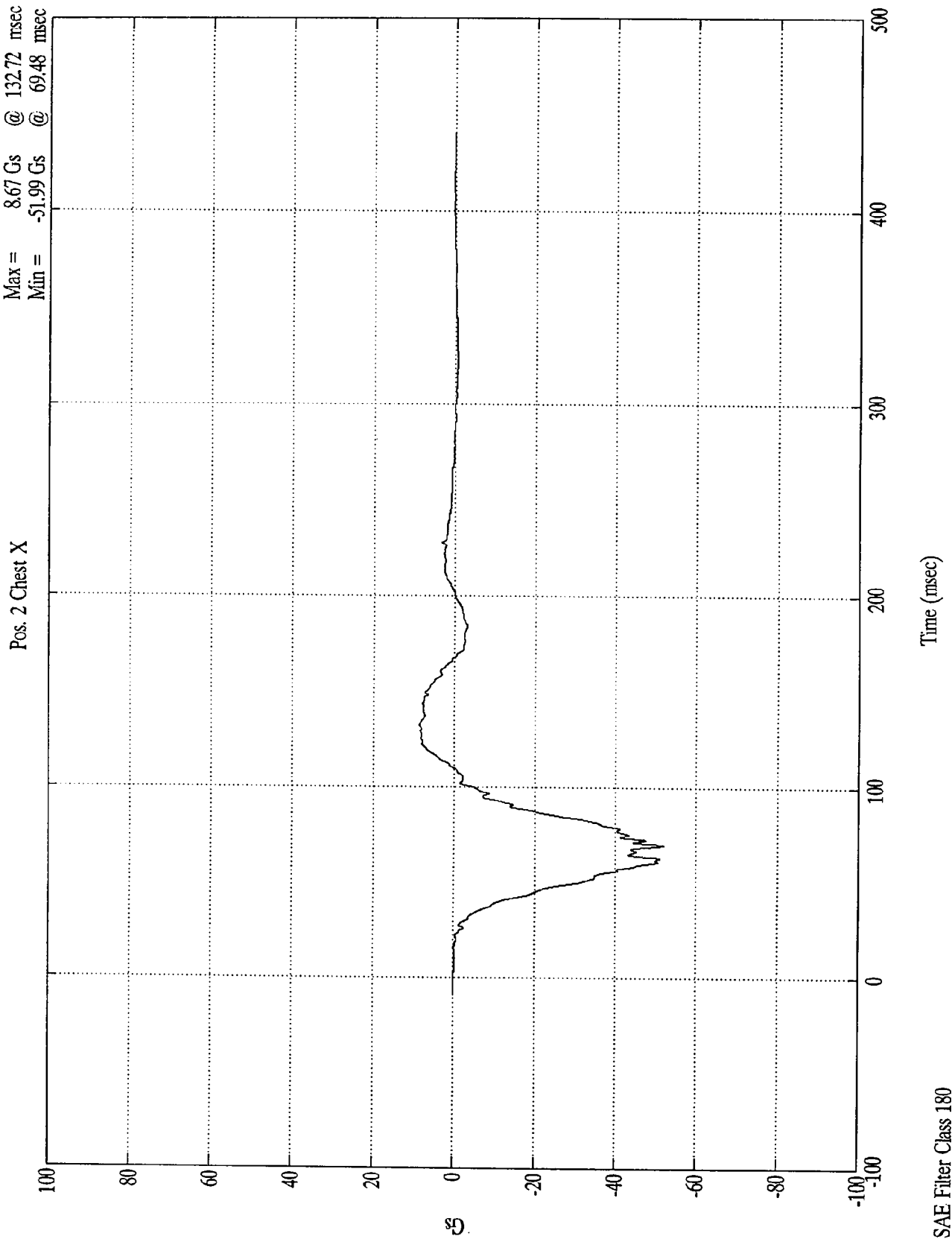
Pos. 2 Head Resultant(RR)

Max = 65.87 Gs @ 78.95 msec
Min = .05 Gs @ 6.24 msec



SAE Filter Class 1000

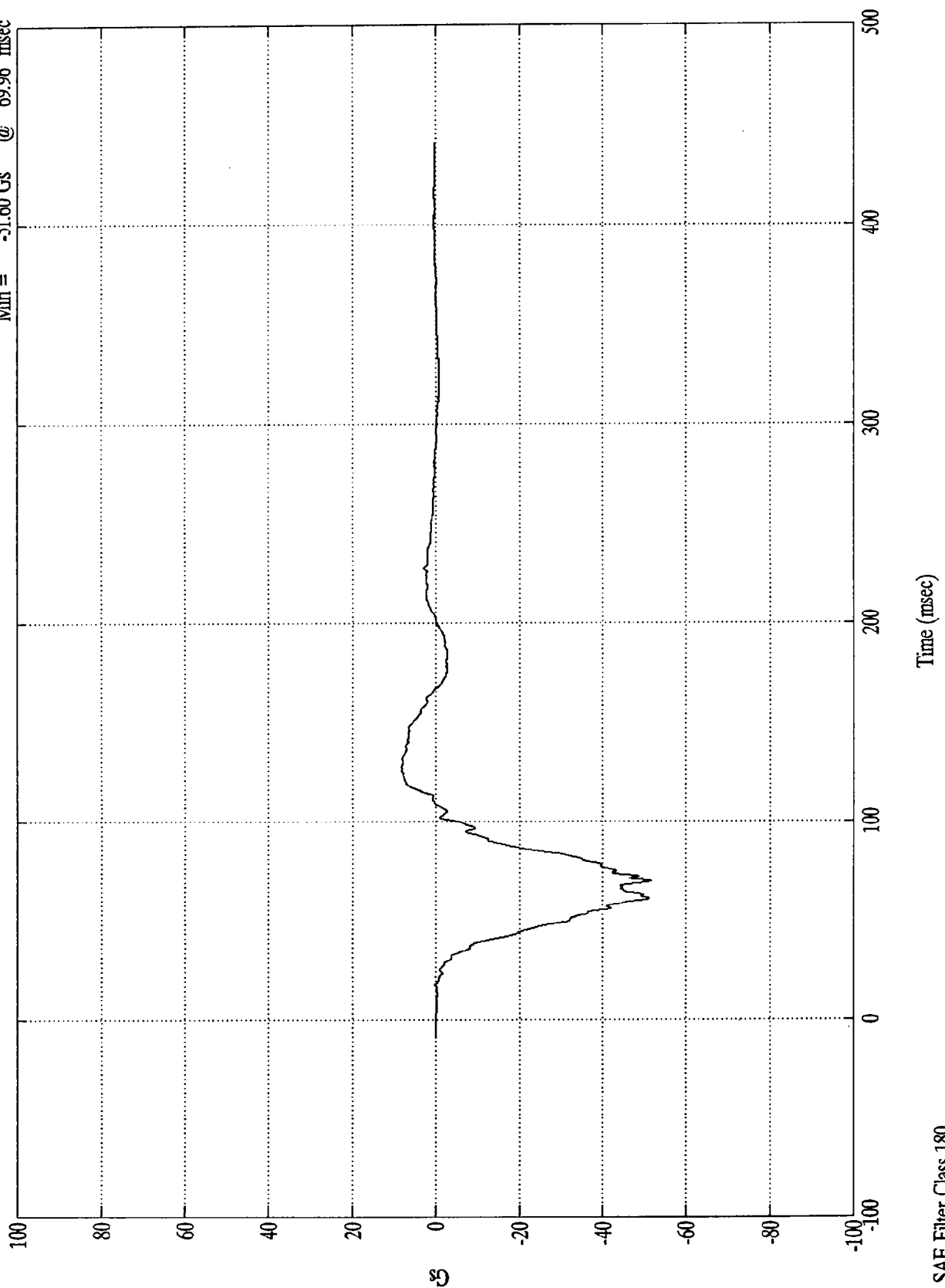
NCAP TEST #2 - 1996 DODGE RAM VAN



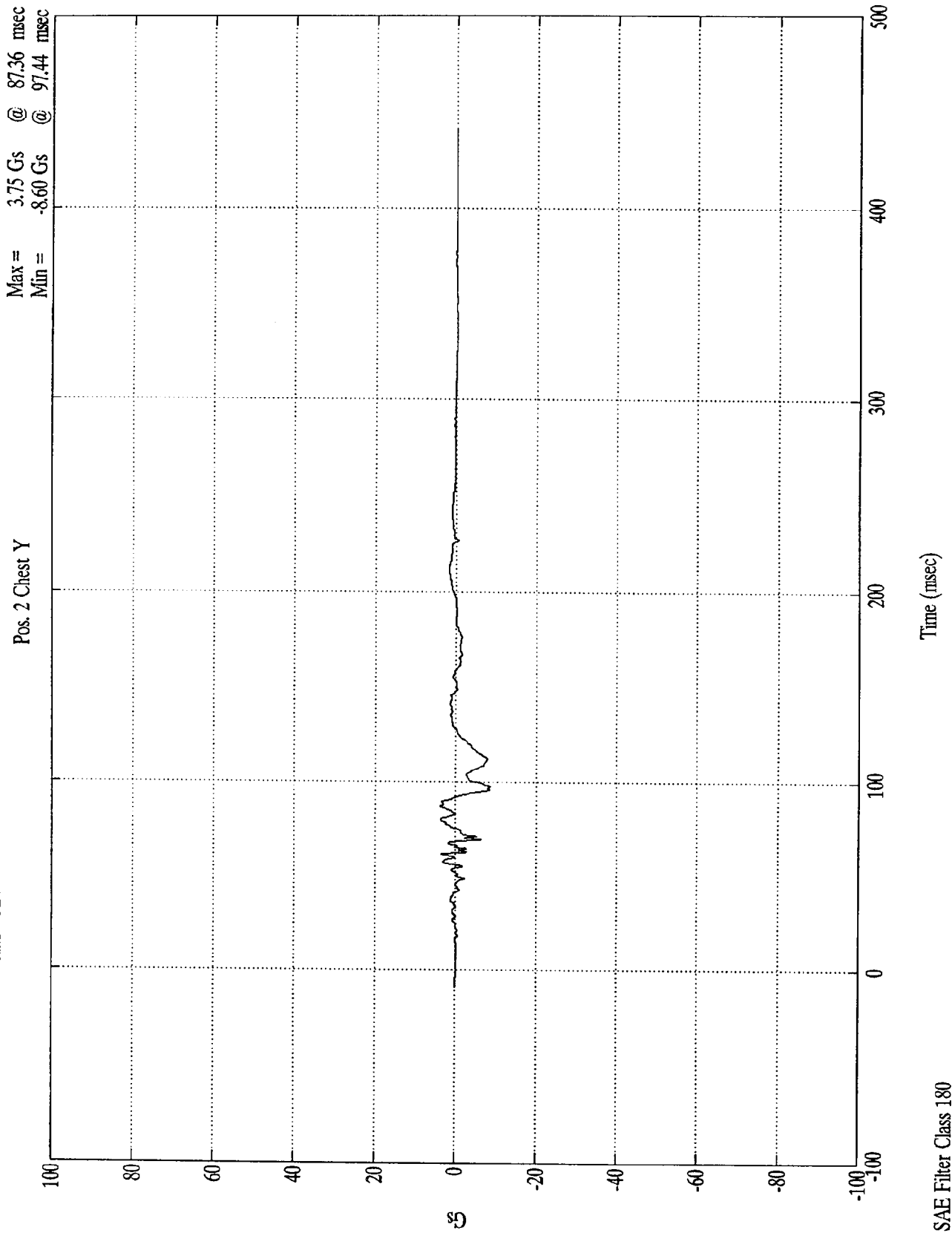
NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Chest X(R)

Max = 8.25 Gs @ 127.80 msec
Min = -51.60 Gs @ 69.96 msec



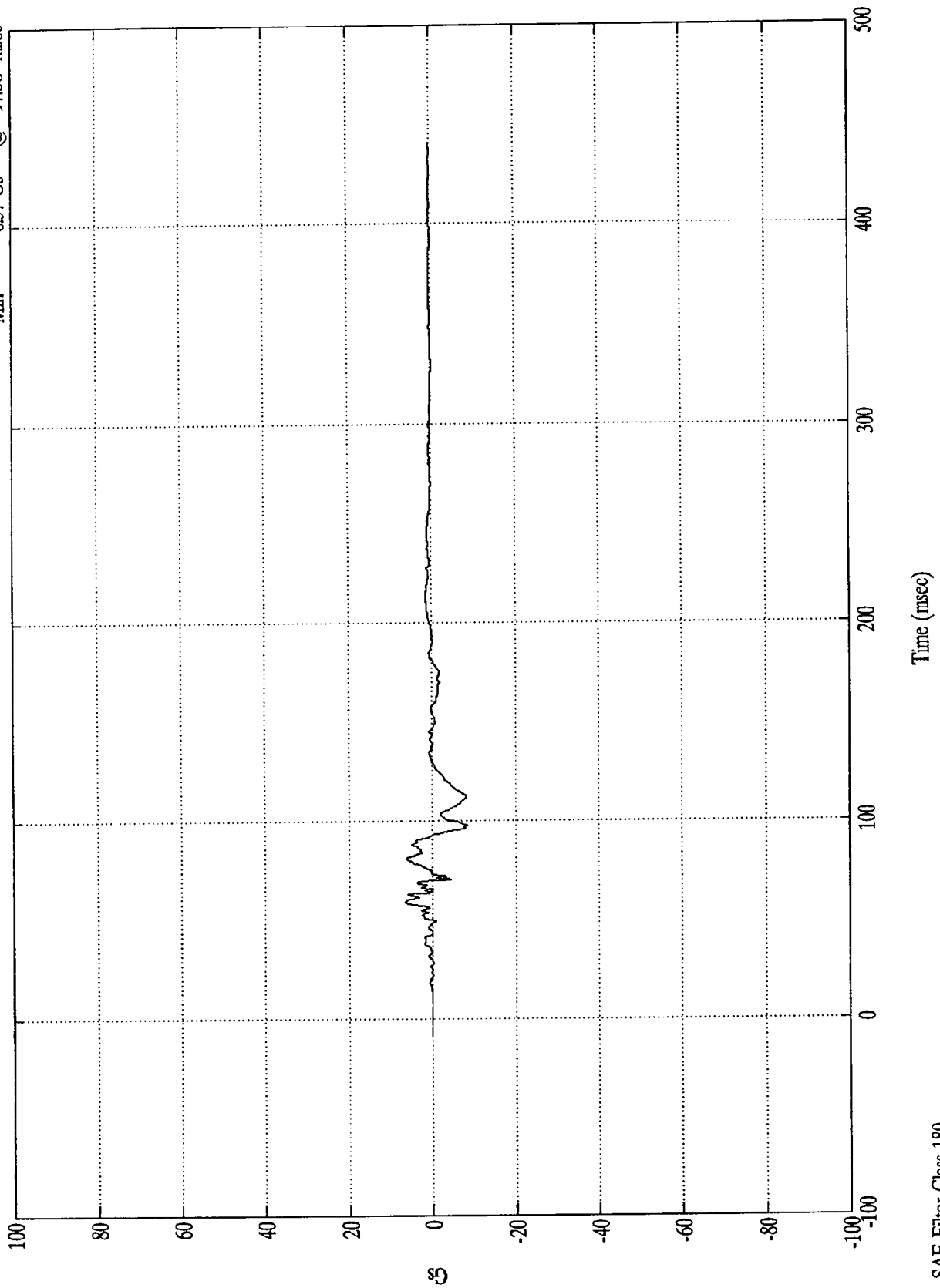
NCAP TEST #2 - 1996 DODGE RAM VAN



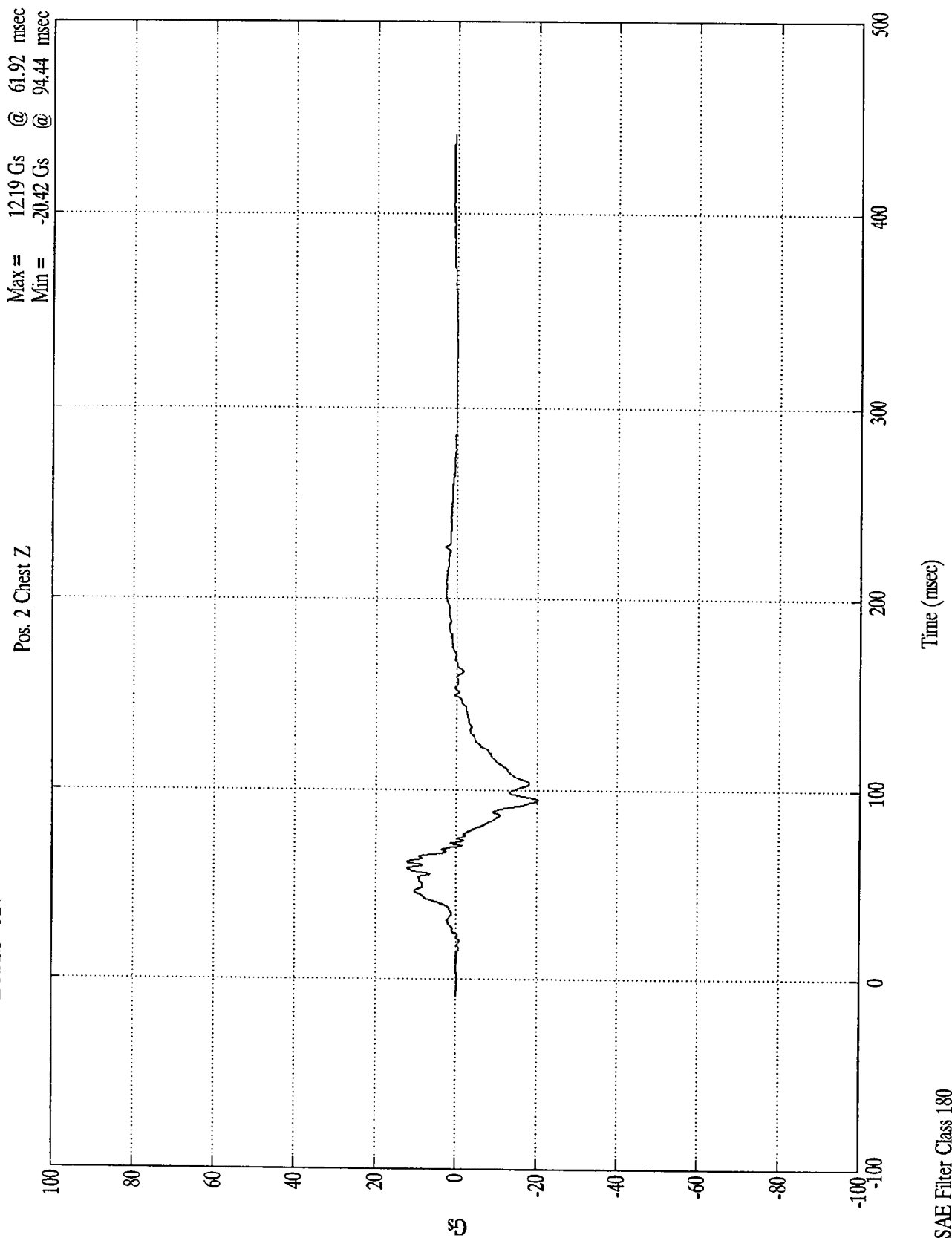
NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Chest Y(R)

Max = 6.55 Gs @ 58.31 msec
Min = -8.57 Gs @ 97.56 msec

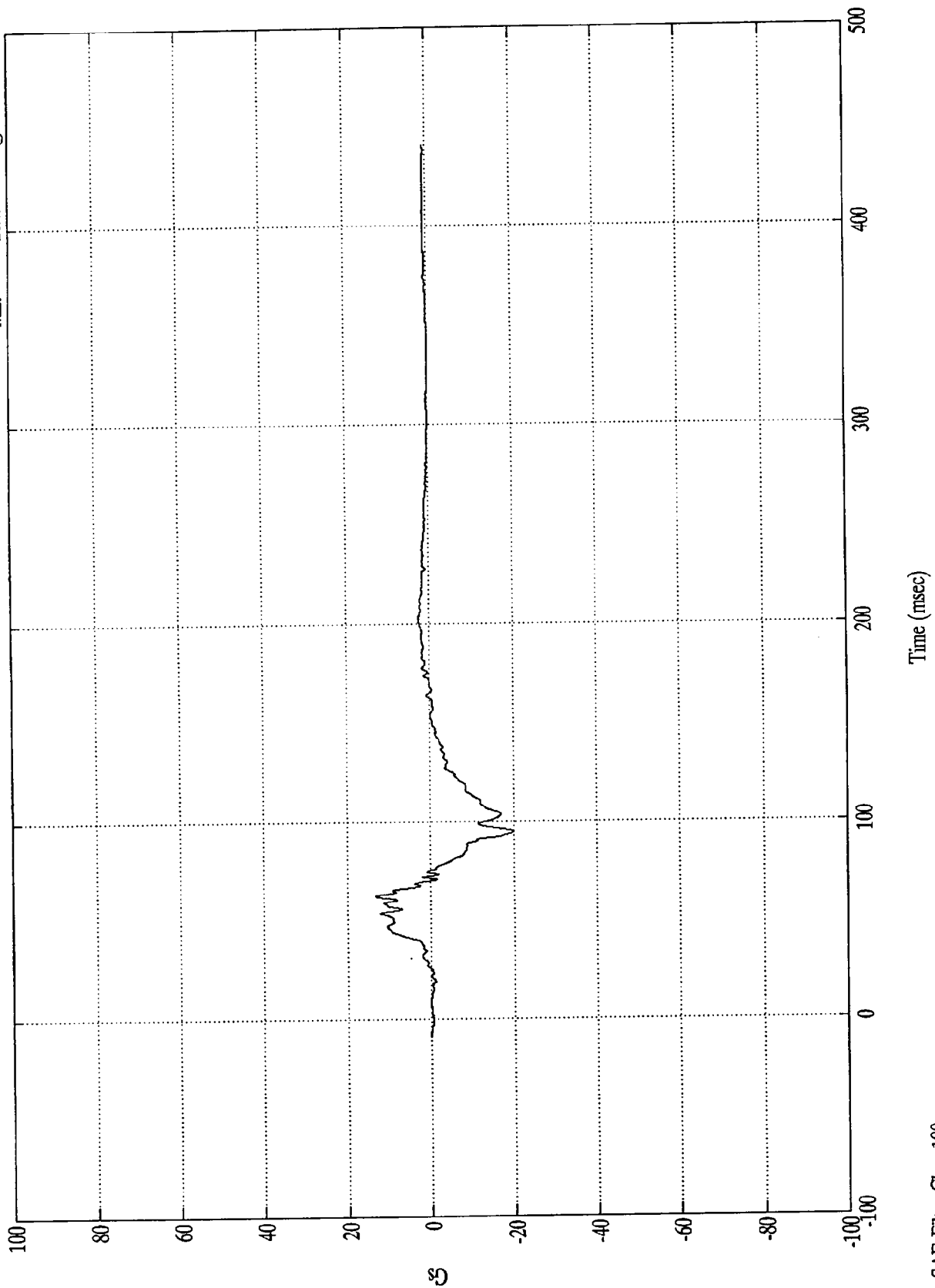


NCAP TEST #2 - 1996 DODGE RAM VAN



NCAP TEST #2 - 1996 DODGE RAM VAN

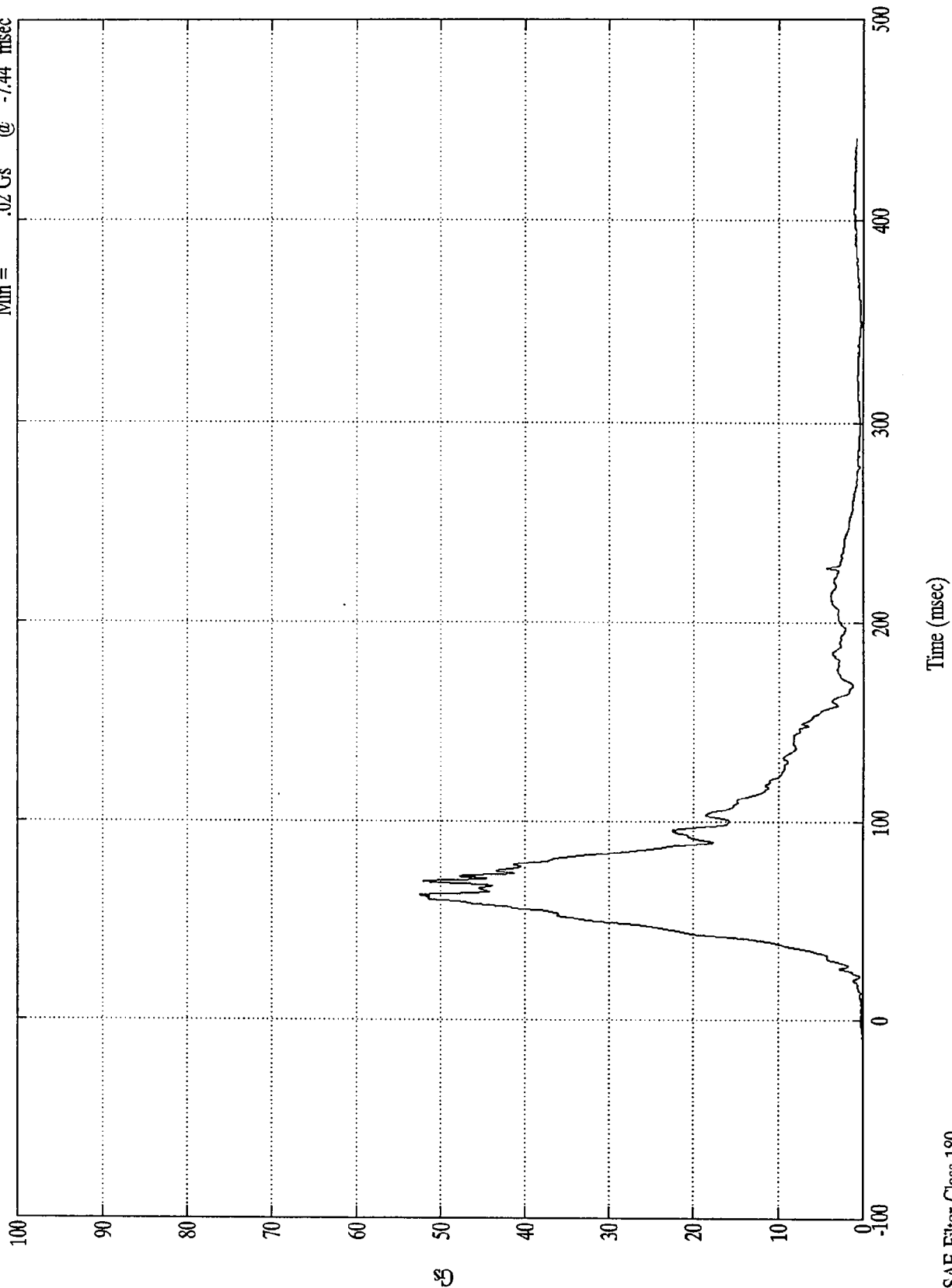
Pos. 2 Chest Z(R)
Max = 13.31 Gs @ 62.40 msec
Min = -20.02 Gs @ 94.80 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Chest Resultant

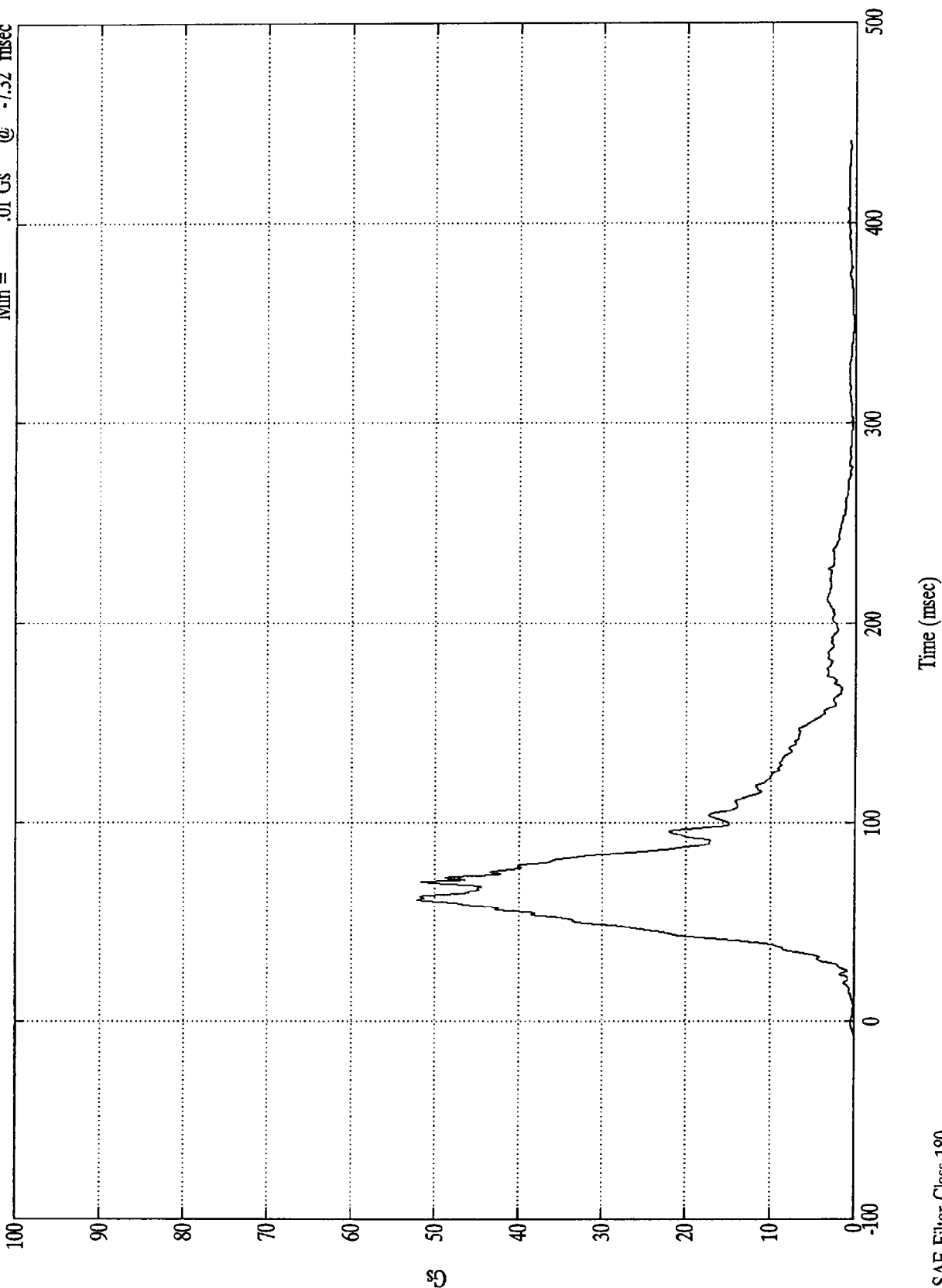
Max = 52.43 Gs @ 62.64 msec
Min = .02 Gs @ -7.44 msec



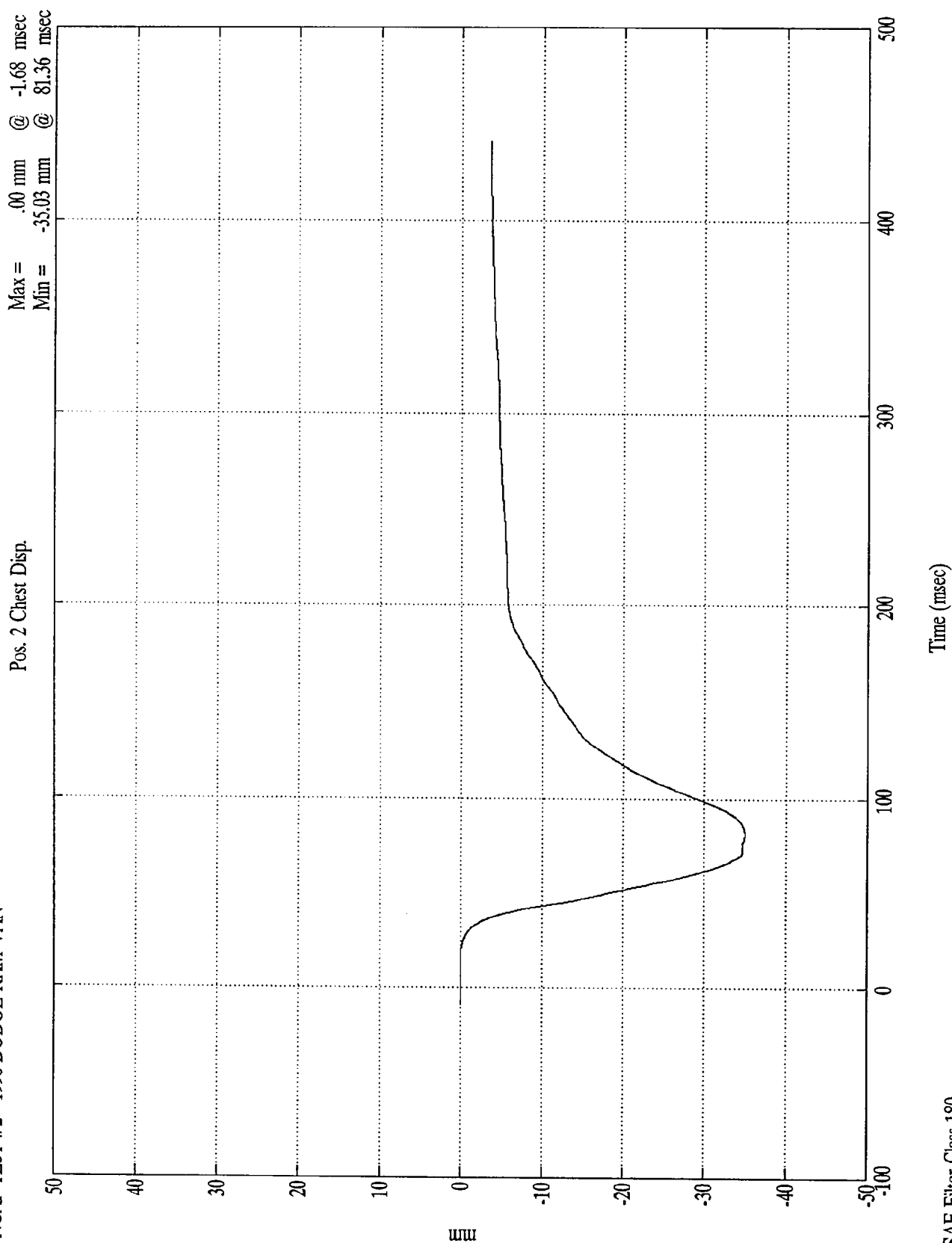
NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Chest Res(RR)

Max = 52.08 Gs @ 61.08 msec
Min = .01 Gs @ -7.32 msec

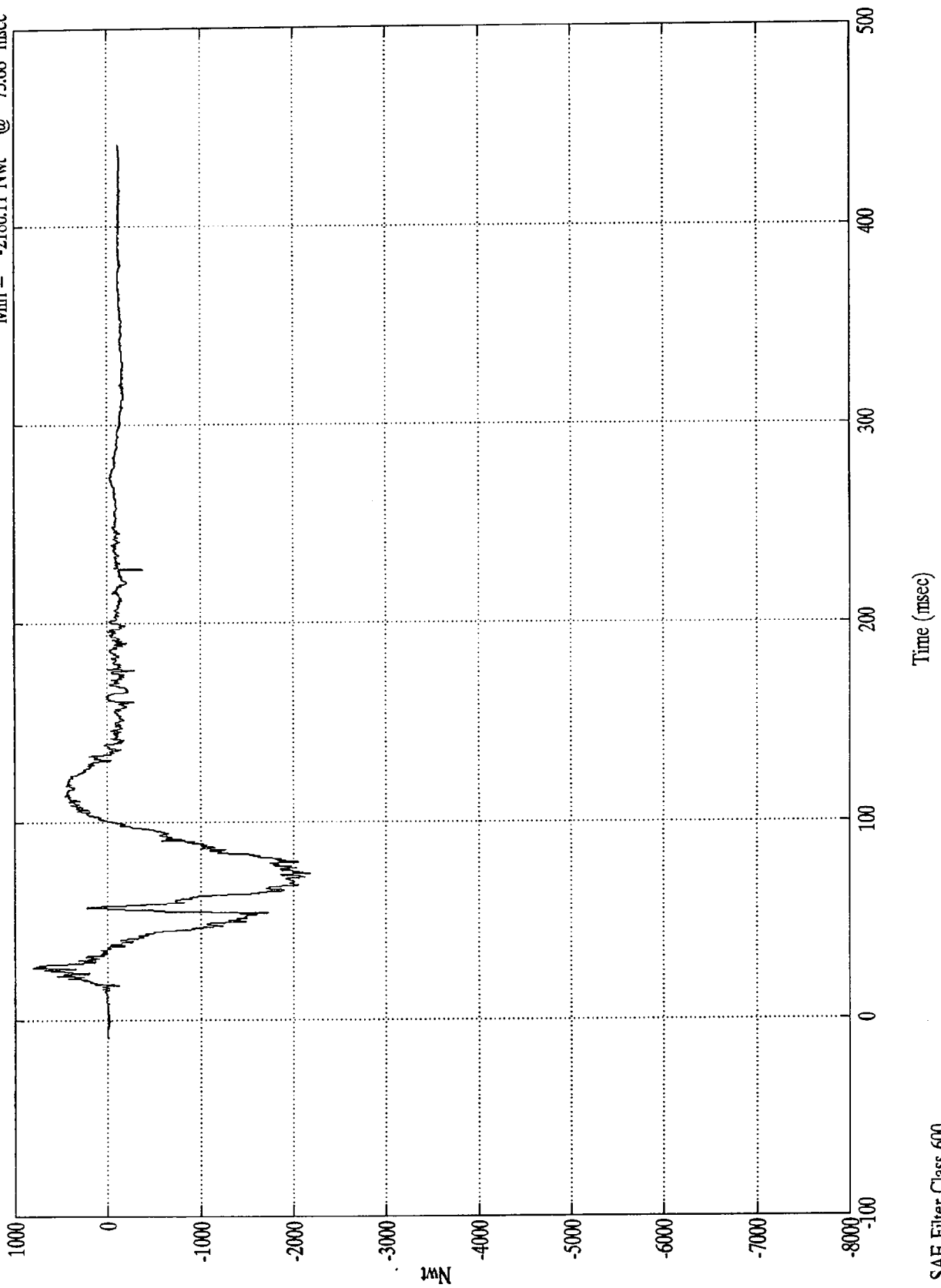


NCAP TEST #2 - 1996 DODGE RAM VAN



NCAP TEST #2 - 1996 DODGE RAM VAN

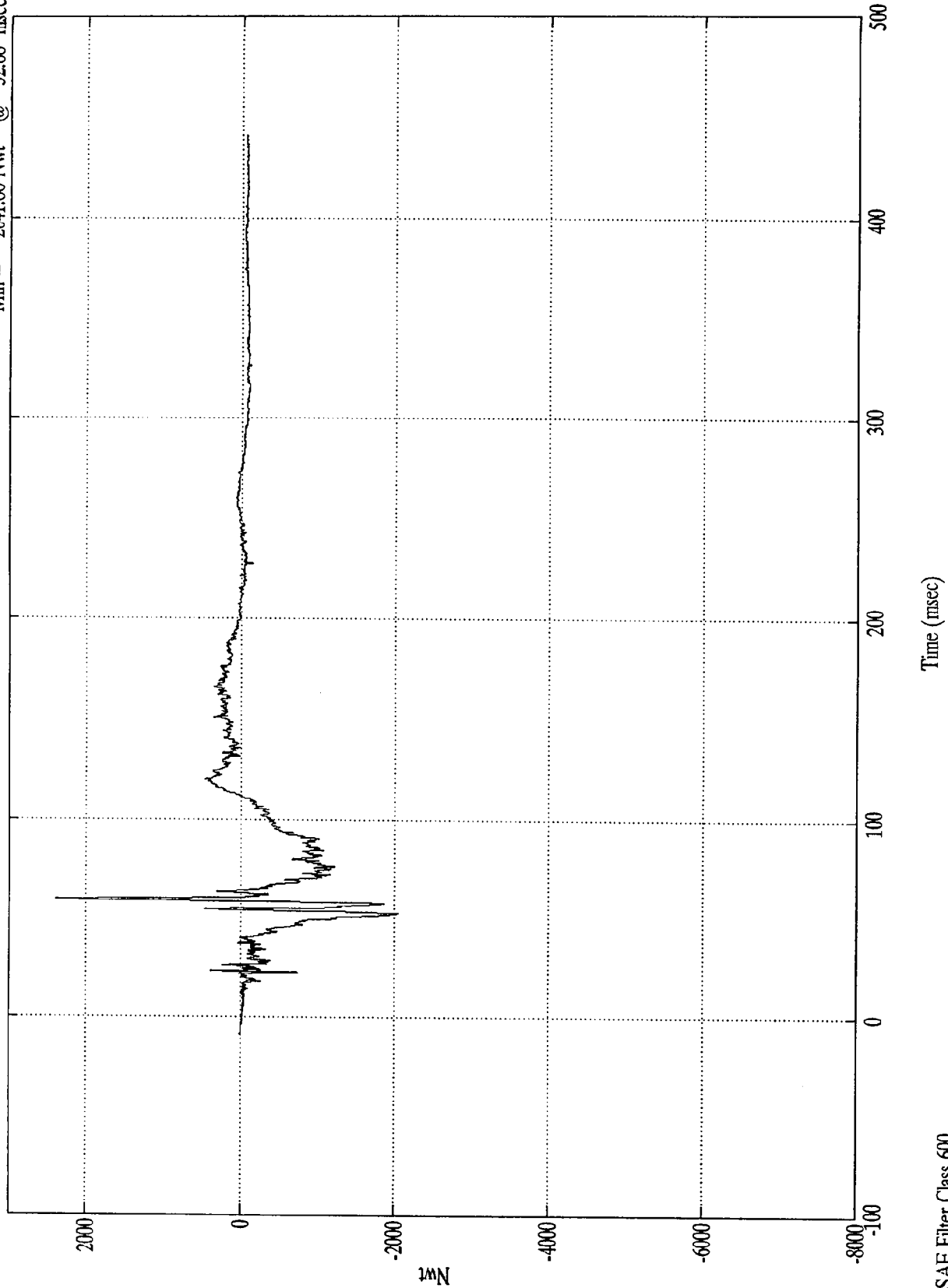
Pos. 2 Left Femur
Max = 811.17 Nwt @ 26.76 msec
Min = -2180.11 Nwt @ 73.68 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Right Femur

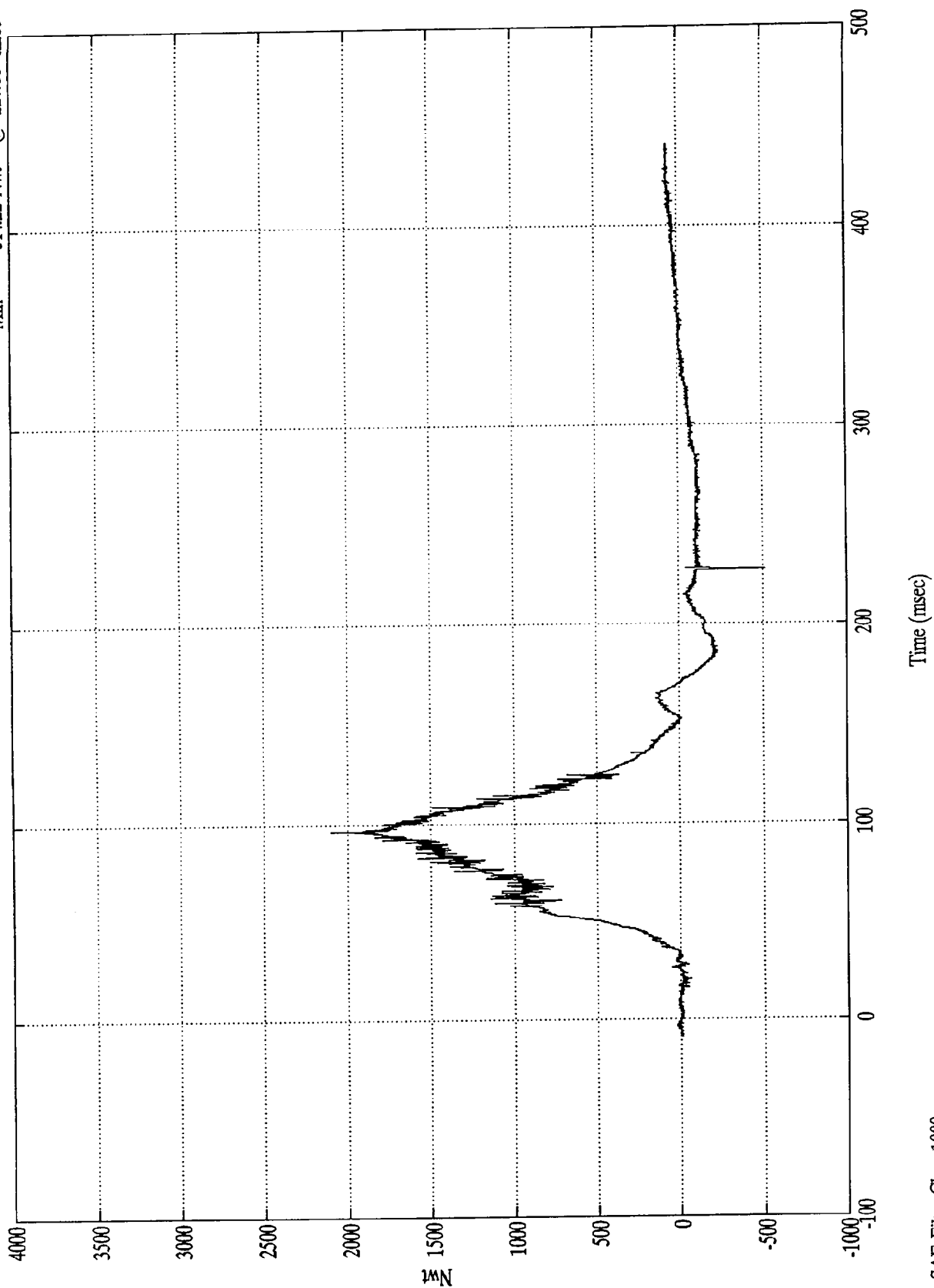
Max = 2403.24 Nwt @ 59.88 msec
Min = -2041.86 Nwt @ 52.68 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Upper Neck Fx

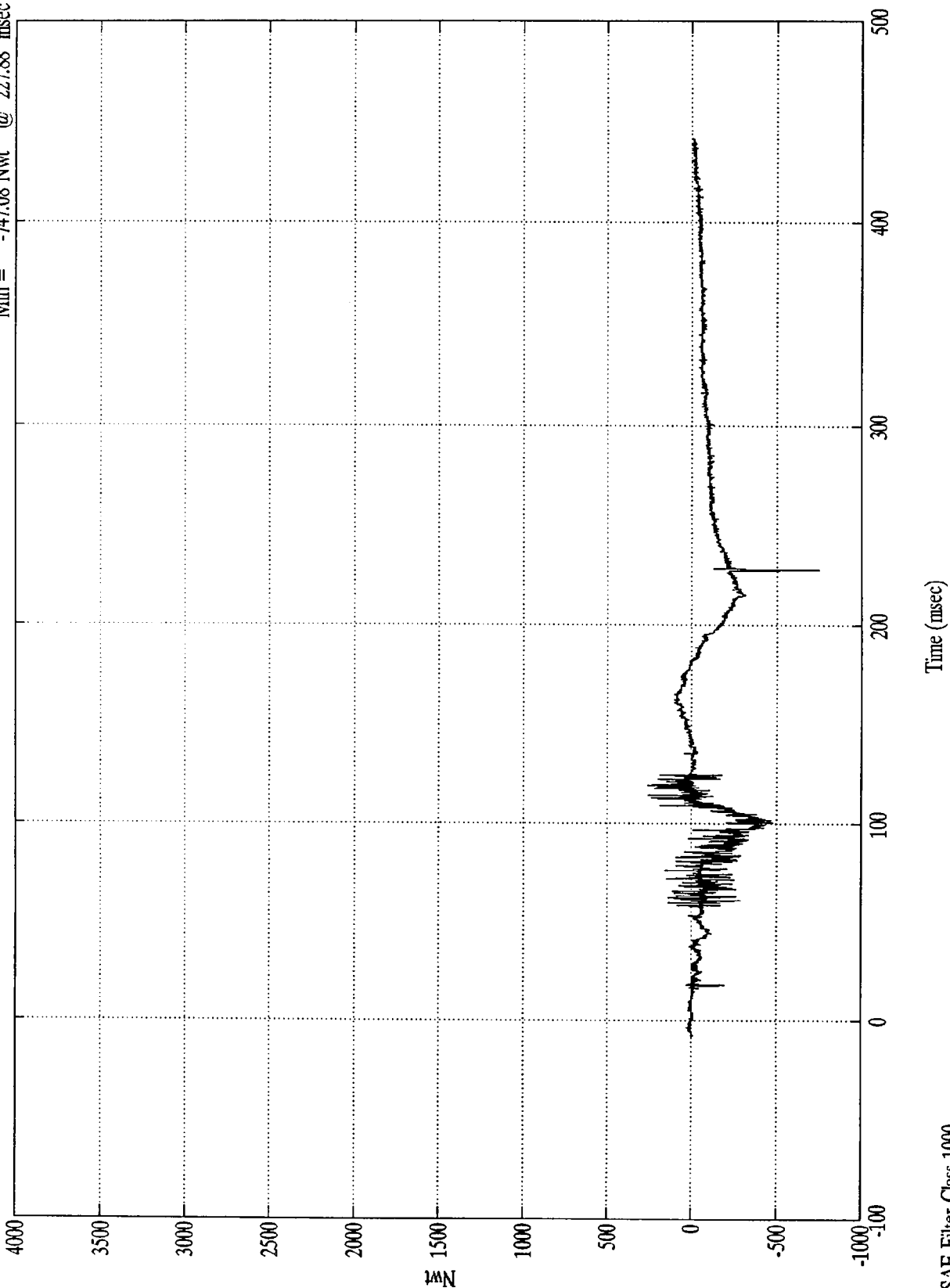
Max = 2097.02 Nwt @ 96.48 msec
Min = -514.22 Nwt @ 227.88 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Upper Neck Fy

Max = 259.98 Nwt @ 119.16 msec
Min = -747.08 Nwt @ 227.88 msec

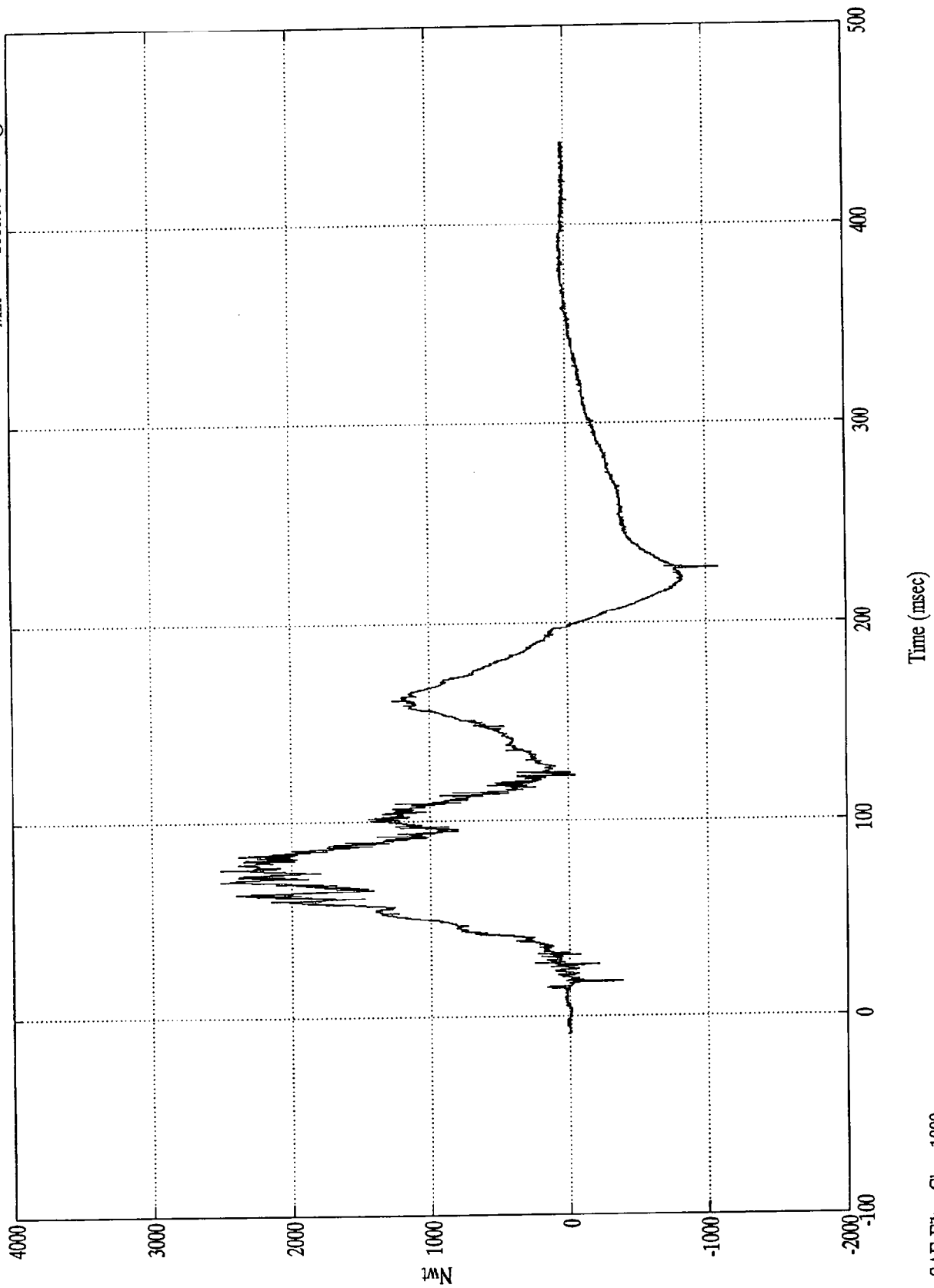


SAE Filter Class 1000

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Upper Neck Fz

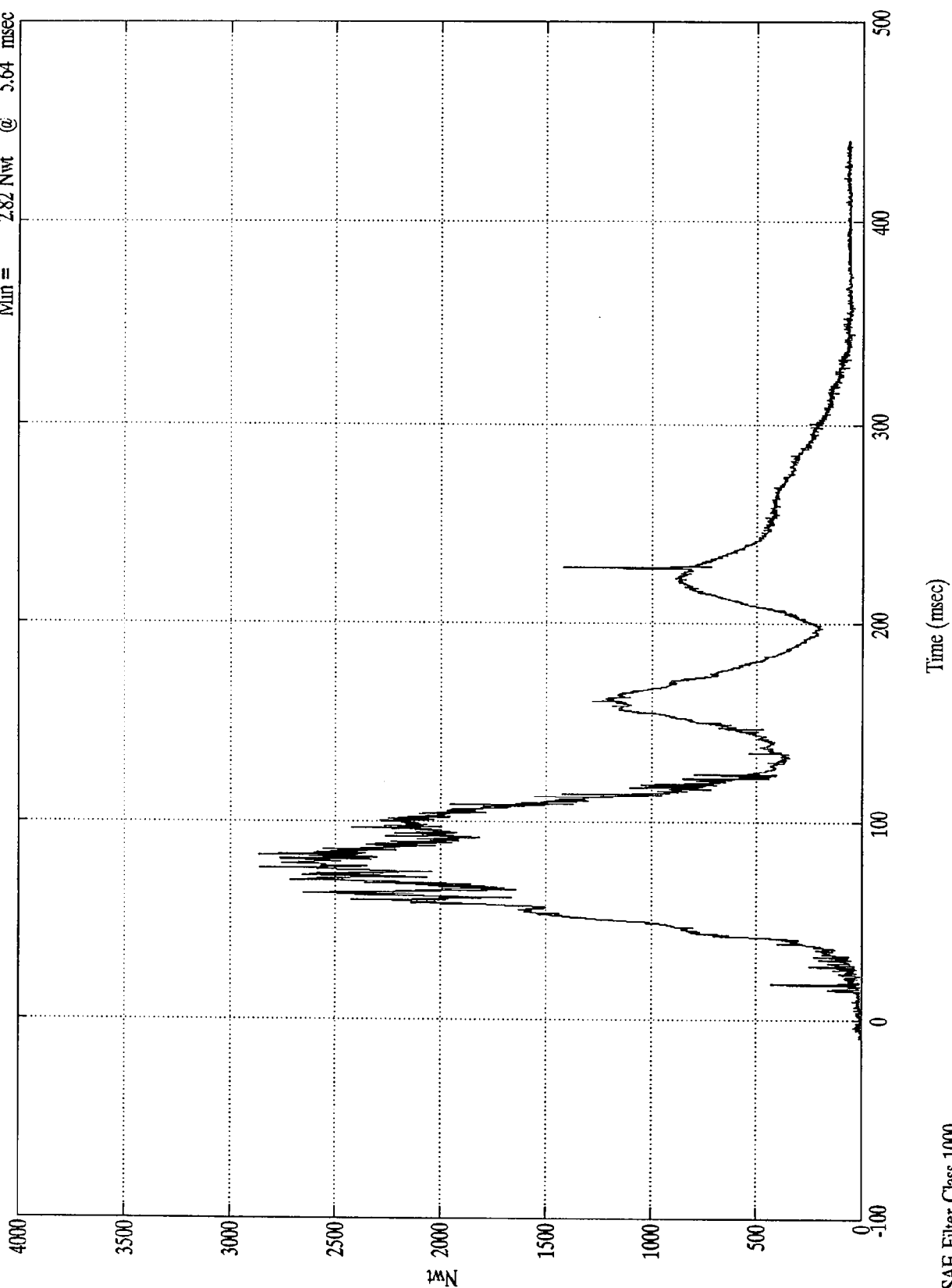
Max = 2509.51 Nwt @ 76.44 msec
Min = -1088.89 Nwt @ 227.88 msec



SAE Filter Class 1000

NCAP TEST #2 - 19% DODGE RAM VAN

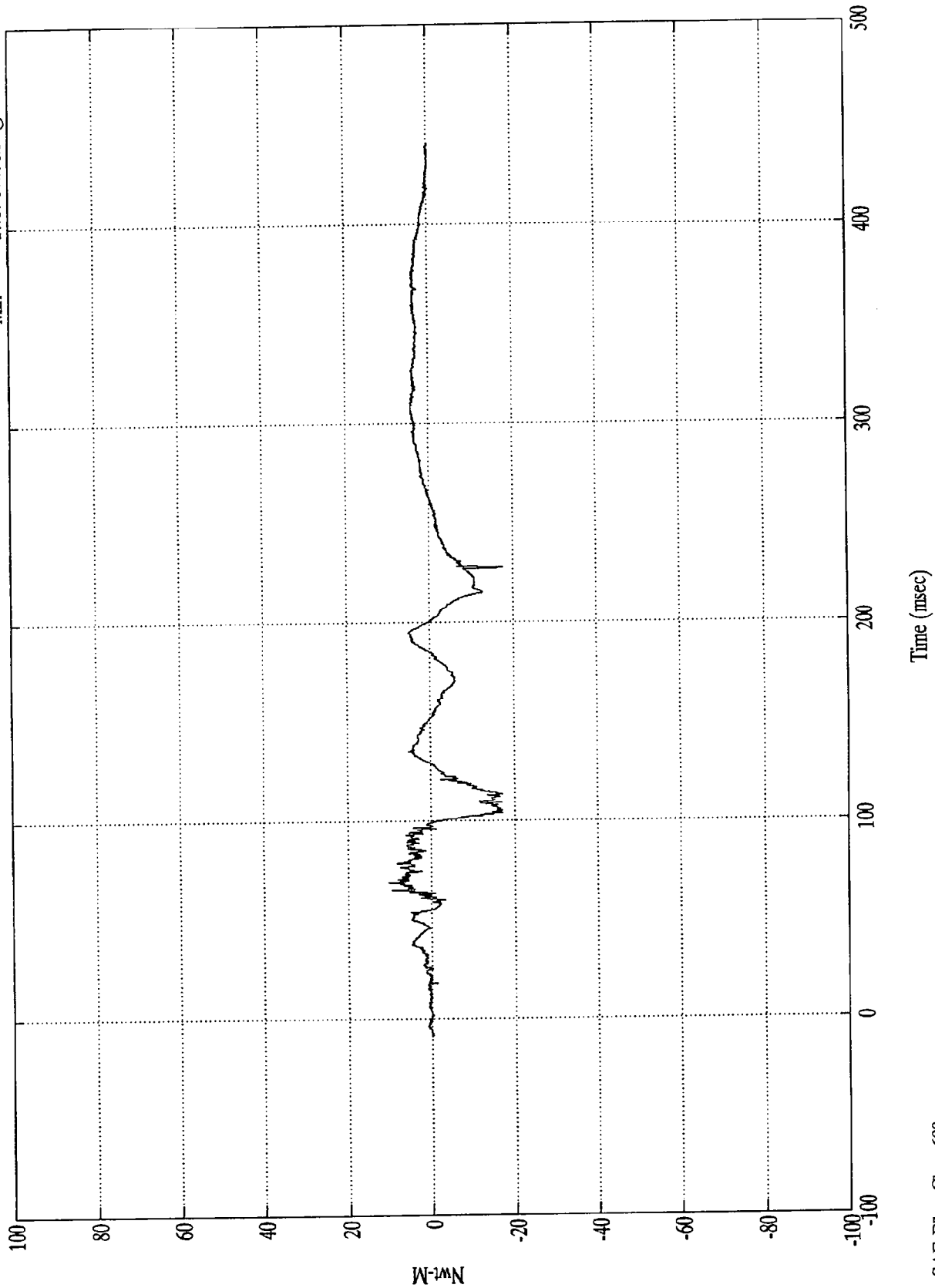
Pos. 2 Neck Force Res.
 Max = 2863.50 Nwt @ 83.16 msec
 Min = 2.82 Nwt @ 5.64 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Upper Neck Mx

Max = 10.37 Nwt-M @ 68.76 msec
Min = -17.67 Nwt-M @ 227.75 msec



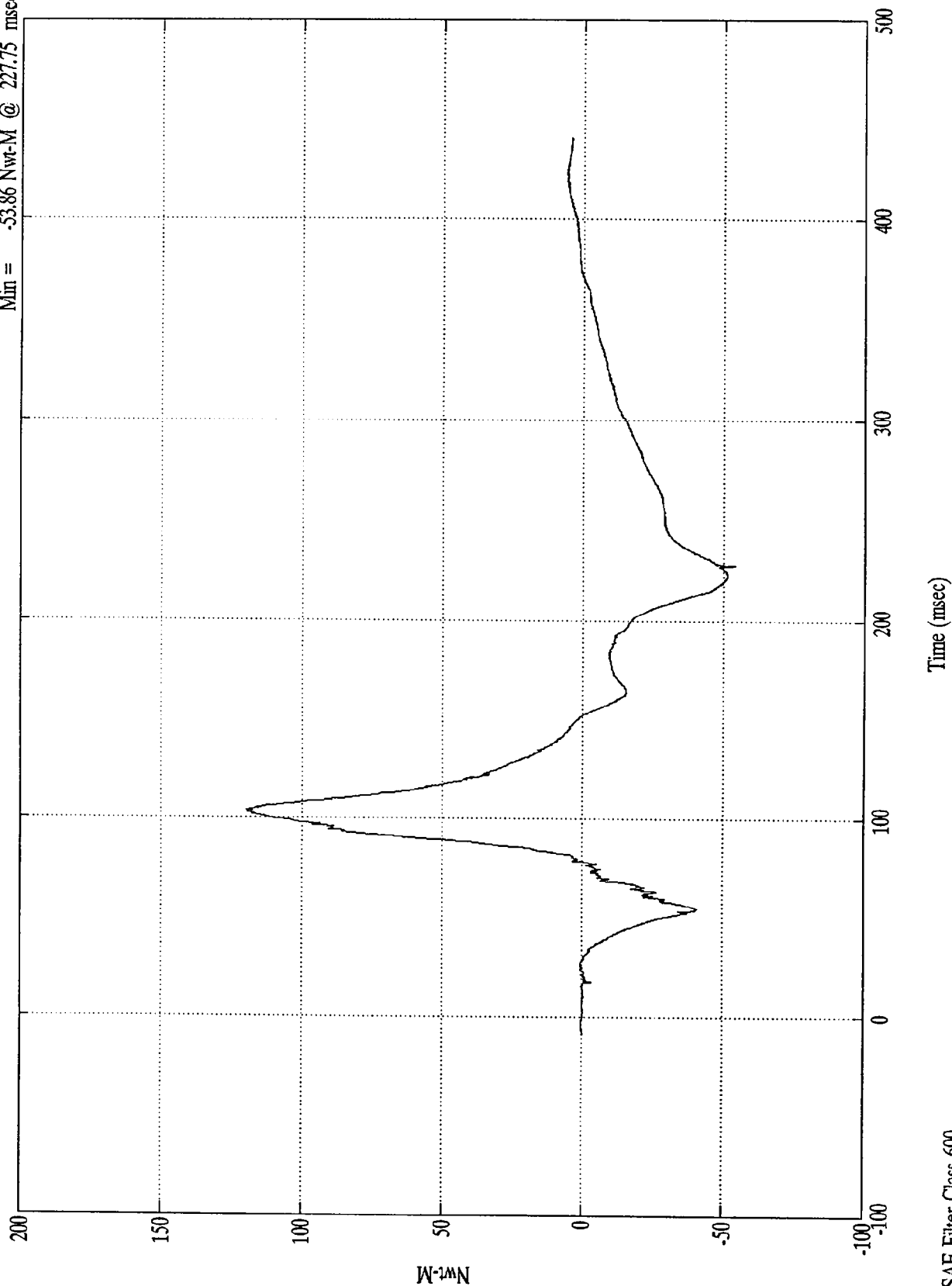
Nwt-M

SAE Filter Class 600

NCAP TEST #2 - 19% DODGE RAM VAN

Pos. 2 Upper Neck My

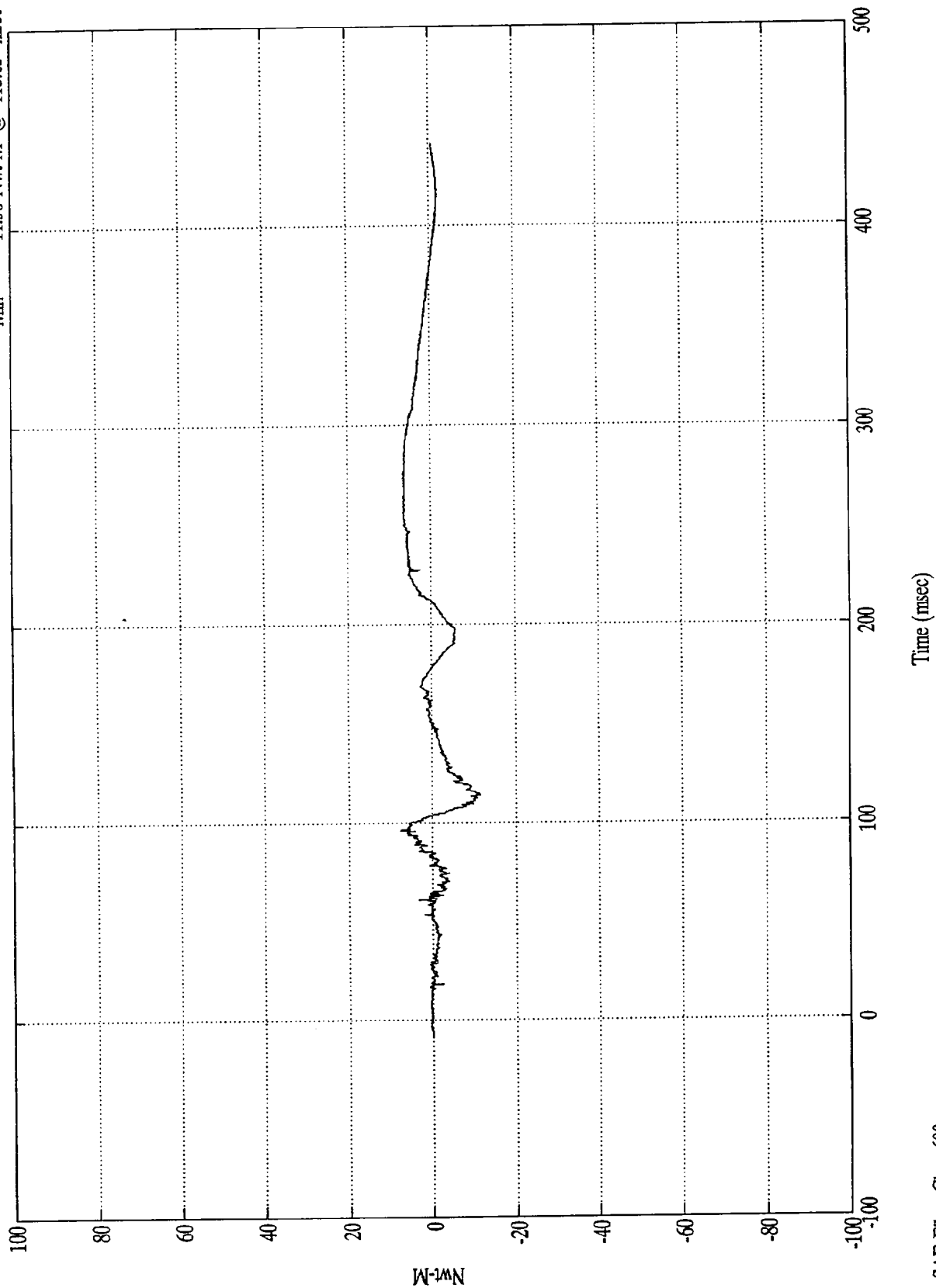
Max = 119.98 Nwt-M @ 104.27 msec
Min = -53.86 Nwt-M @ 227.75 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Upper Neck Mz

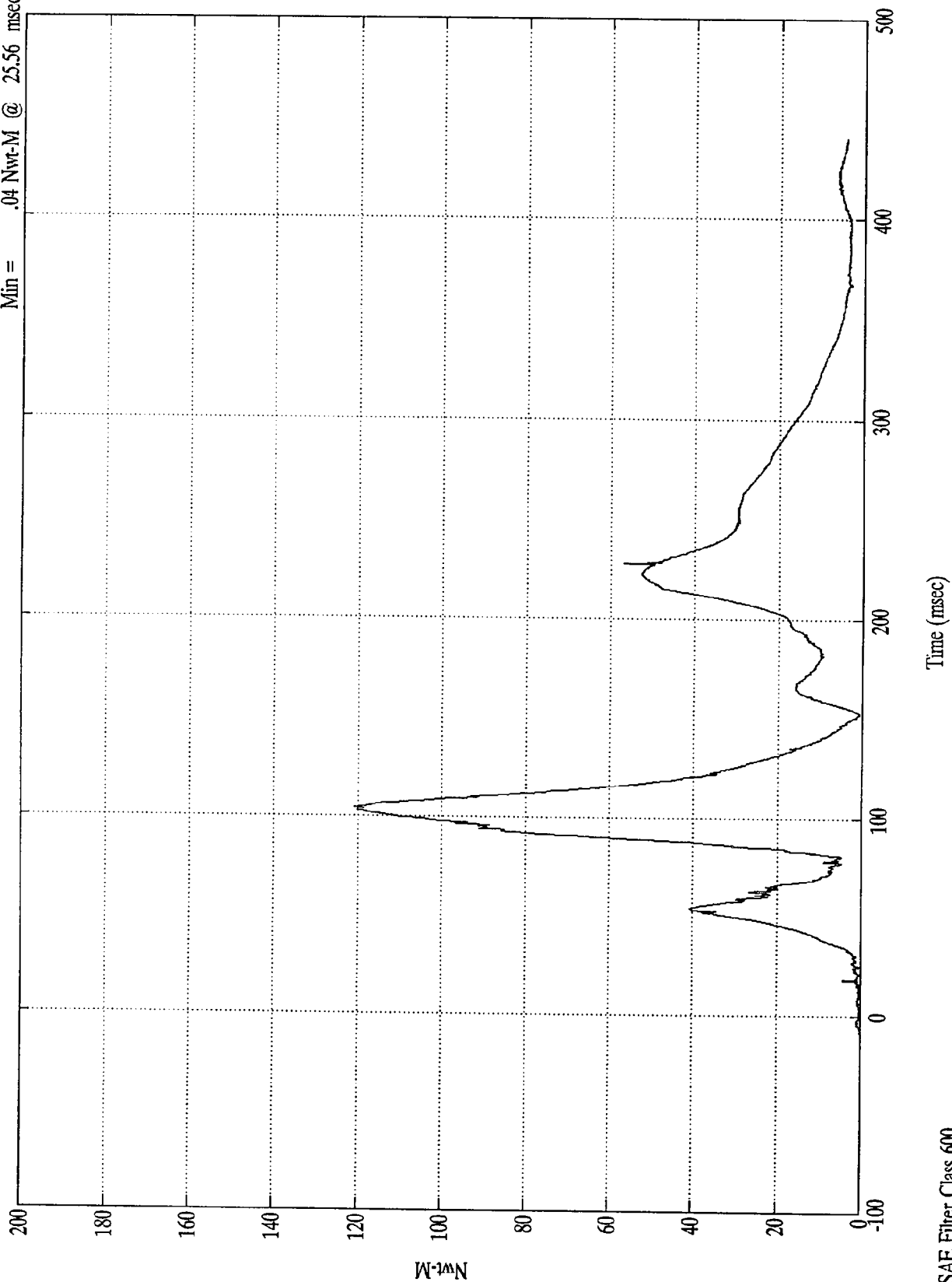
Max = 7.73 Nwt-M @ 96.36 msec
Min = -11.56 Nwt-M @ 113.63 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Neck Moment Res.

Max = 120.87 Nwt-M @ 104.27 msec
Min = .04 Nwt-M @ 25.56 msec

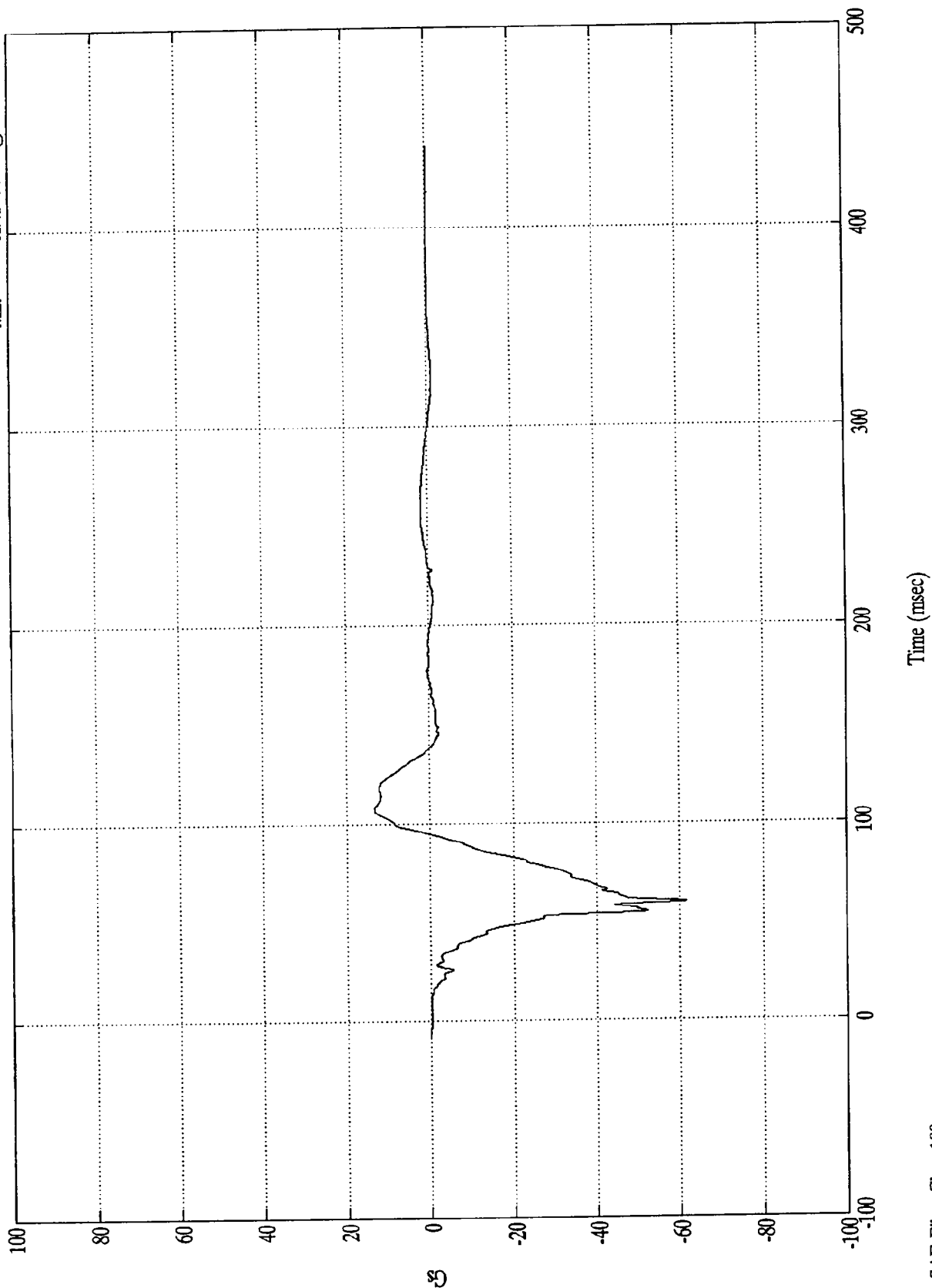


SAE Filter Class 600

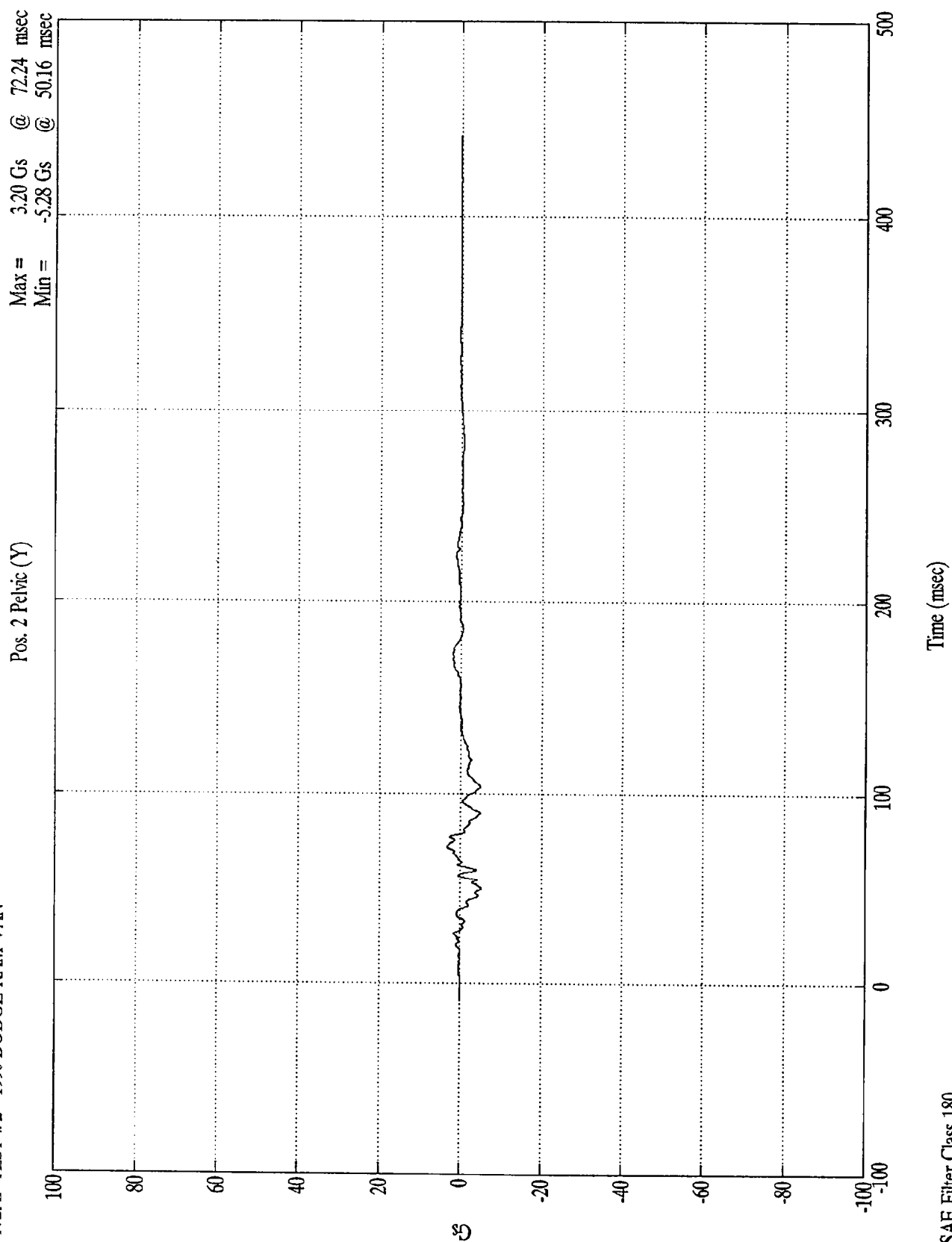
NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Pelvic (X)

Max = 13.20 Gs @ 108.12 msec
Min = -61.41 Gs @ 60.24 msec



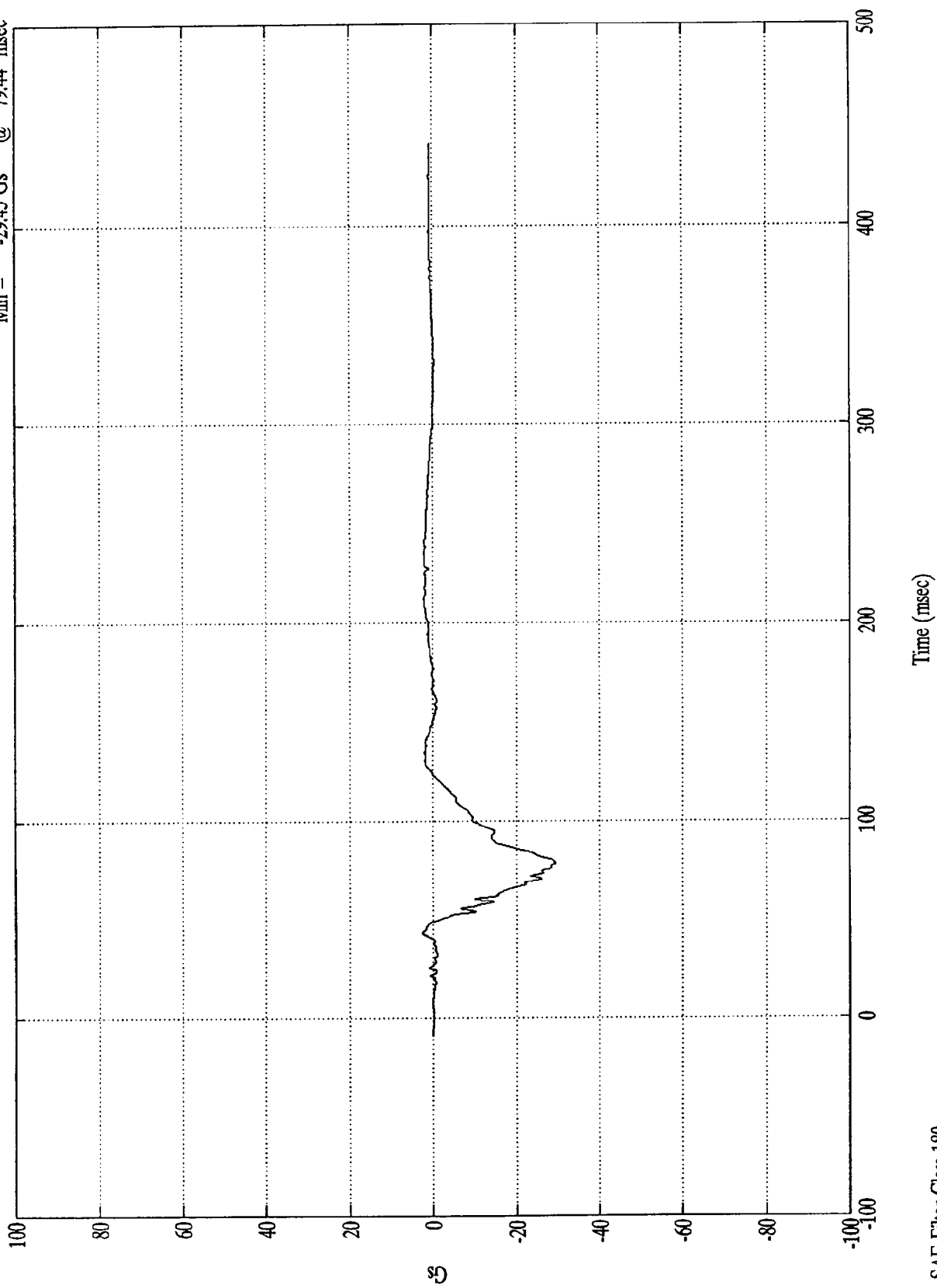
NCAP TEST #2 - 1996 DODGE RAM VAN



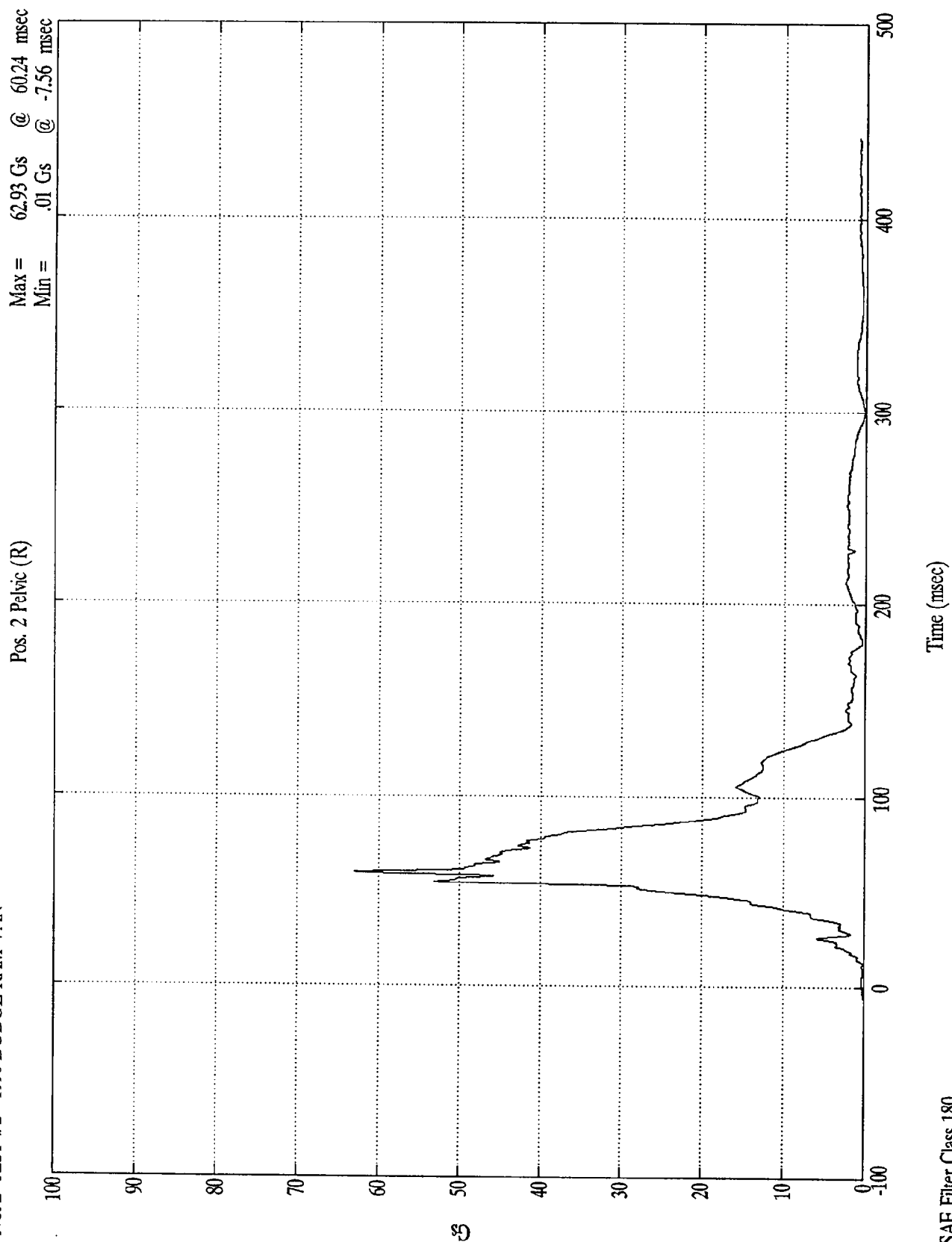
NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Pelvic (Z)

Max = 2.54 Gs @ 43.92 msec
Min = -29.45 Gs @ 79.44 msec



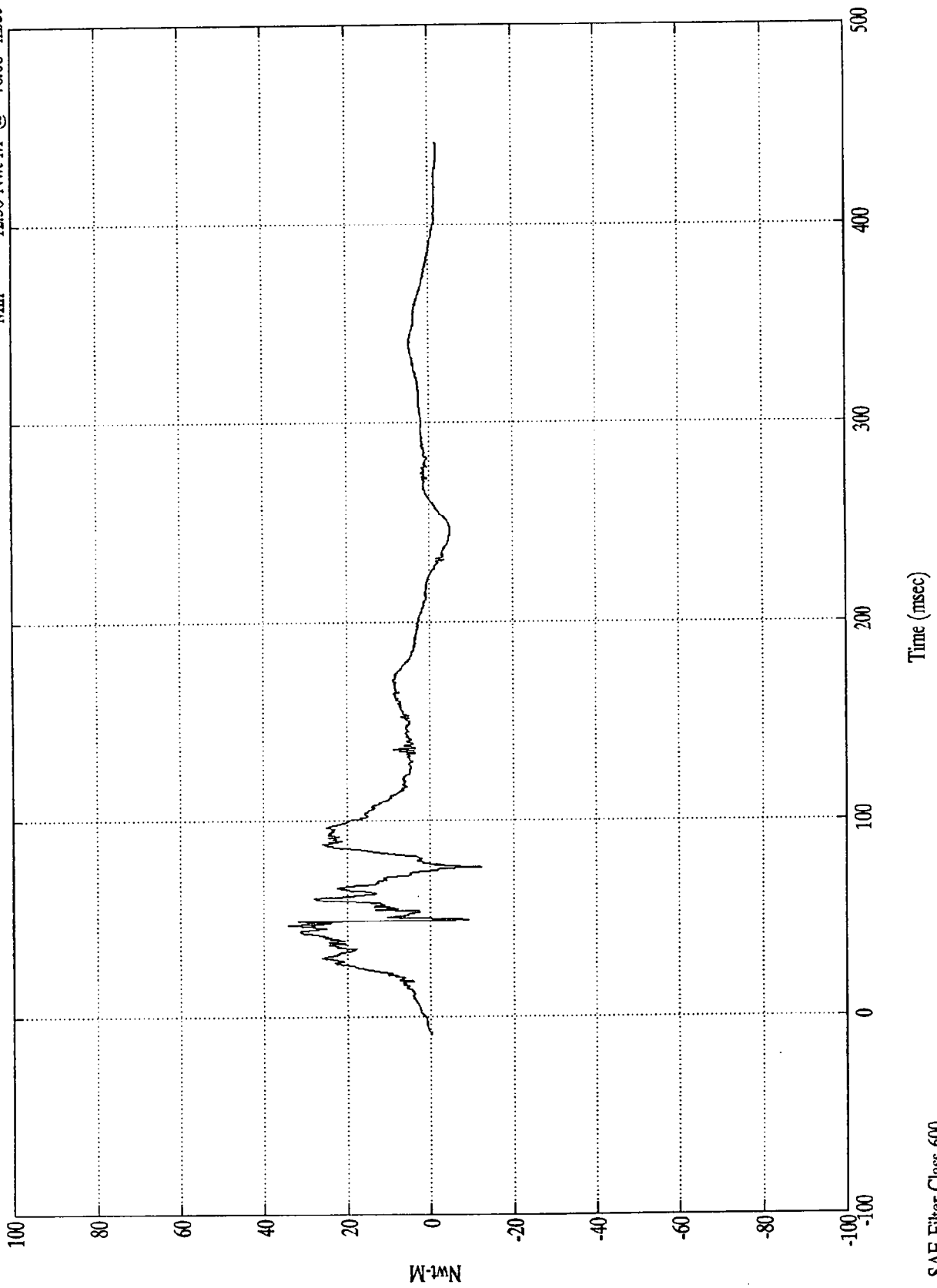
NCAP TEST #2 - 1996 DODGE RAM VAN



NCAP TEST #2 - 19% DODGE RAM VAN

Pos. 2 Lt Upper Tibia Mx

Max = 34.22 Nwt-M @ 46.32 msec
Min = -12.36 Nwt-M @ 76.08 msec



B-87

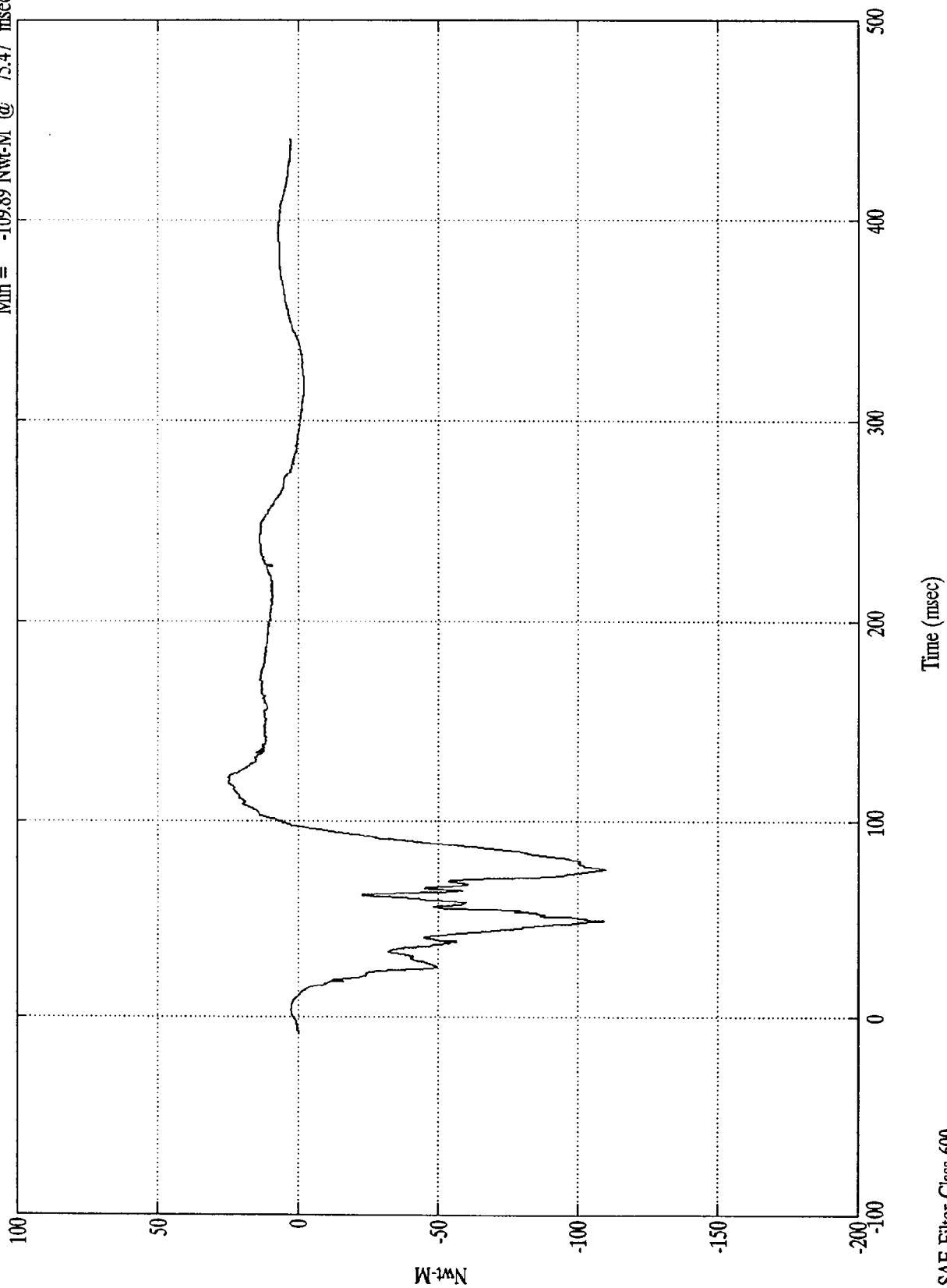
SAE Filter Class 600

8313-2

NCAP TEST #2 - 19% DODGE RAM VAN

Pos. 2 Lt Upper Tibia My

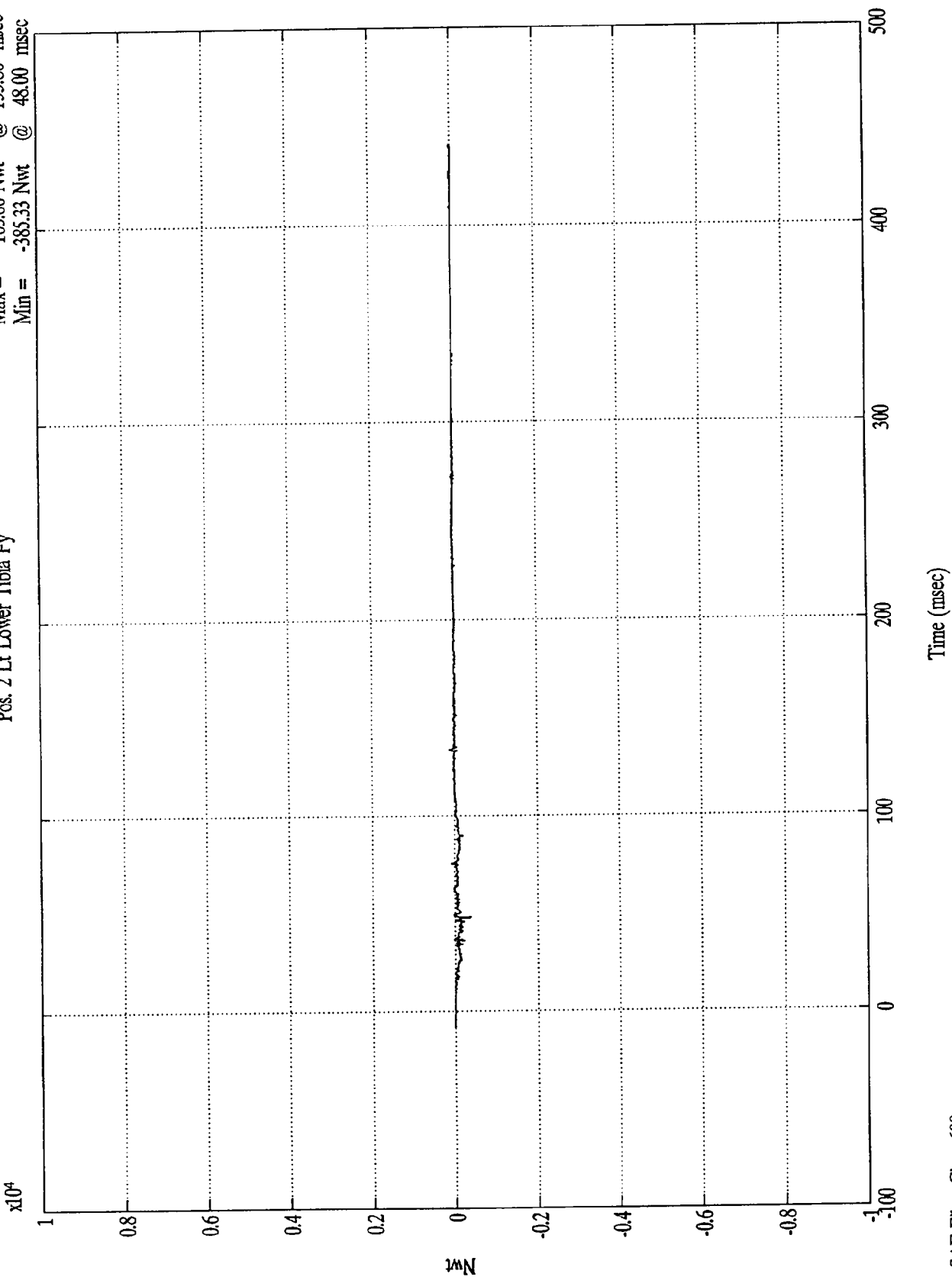
Max = 25.00 Nwt-M @ 119.88 msec
Min = -109.89 Nwt-M @ 75.47 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Lt Lower Tibia Fy

Max = 103.80 Nwt @ 133.80 msec
Min = -385.33 Nwt @ 48.00 msec



Nwt

Time (msec)

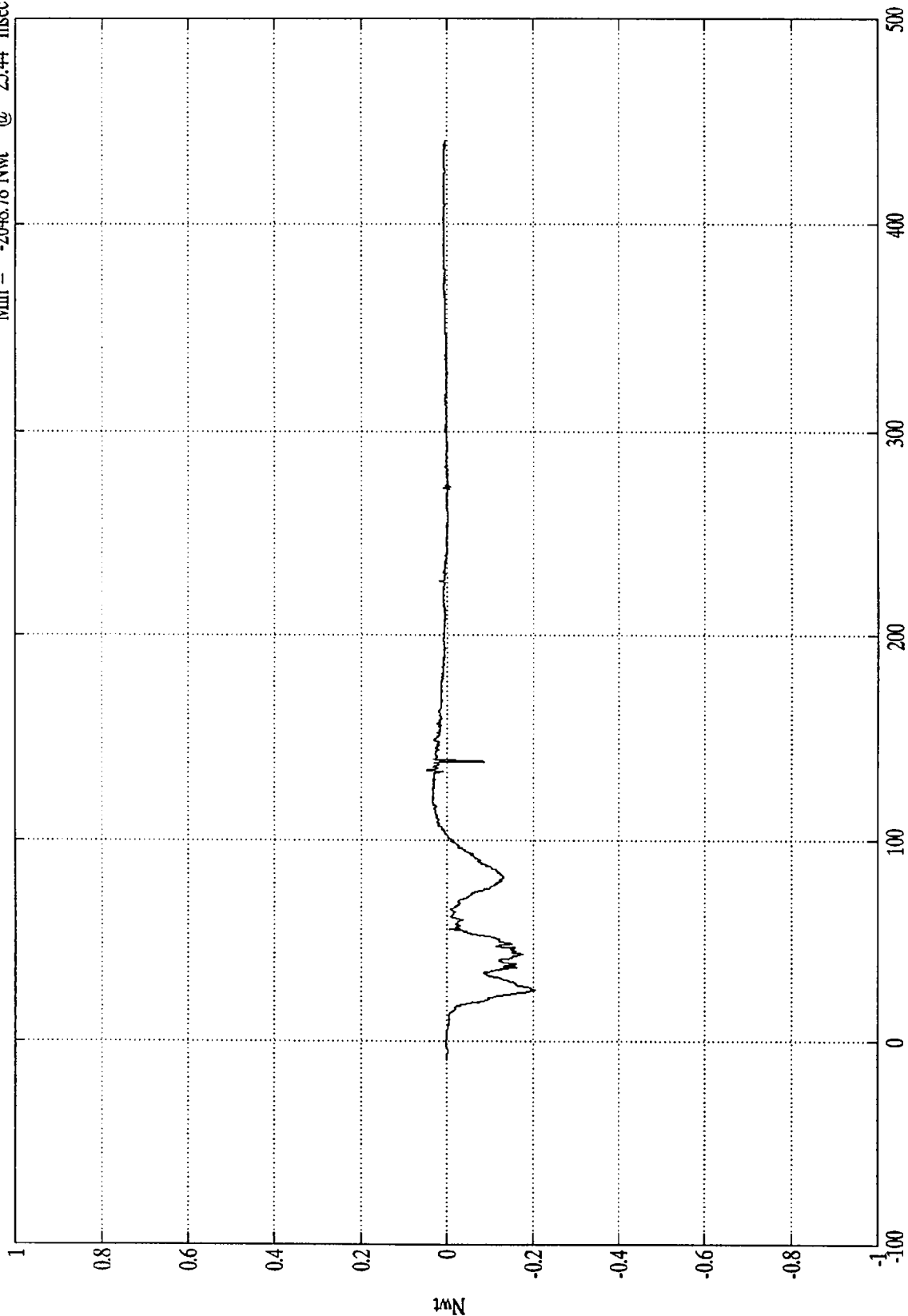
SAE Filter Class 600

NCAP TEST #2 - 19% DODGE RAM VAN

Max = 472.82 Nwt @ 133.91 msec
 Min = -2048.78 Nwt @ 25.44 msec

Pos. 2 Lt Lower Tibia Fz

x10⁴



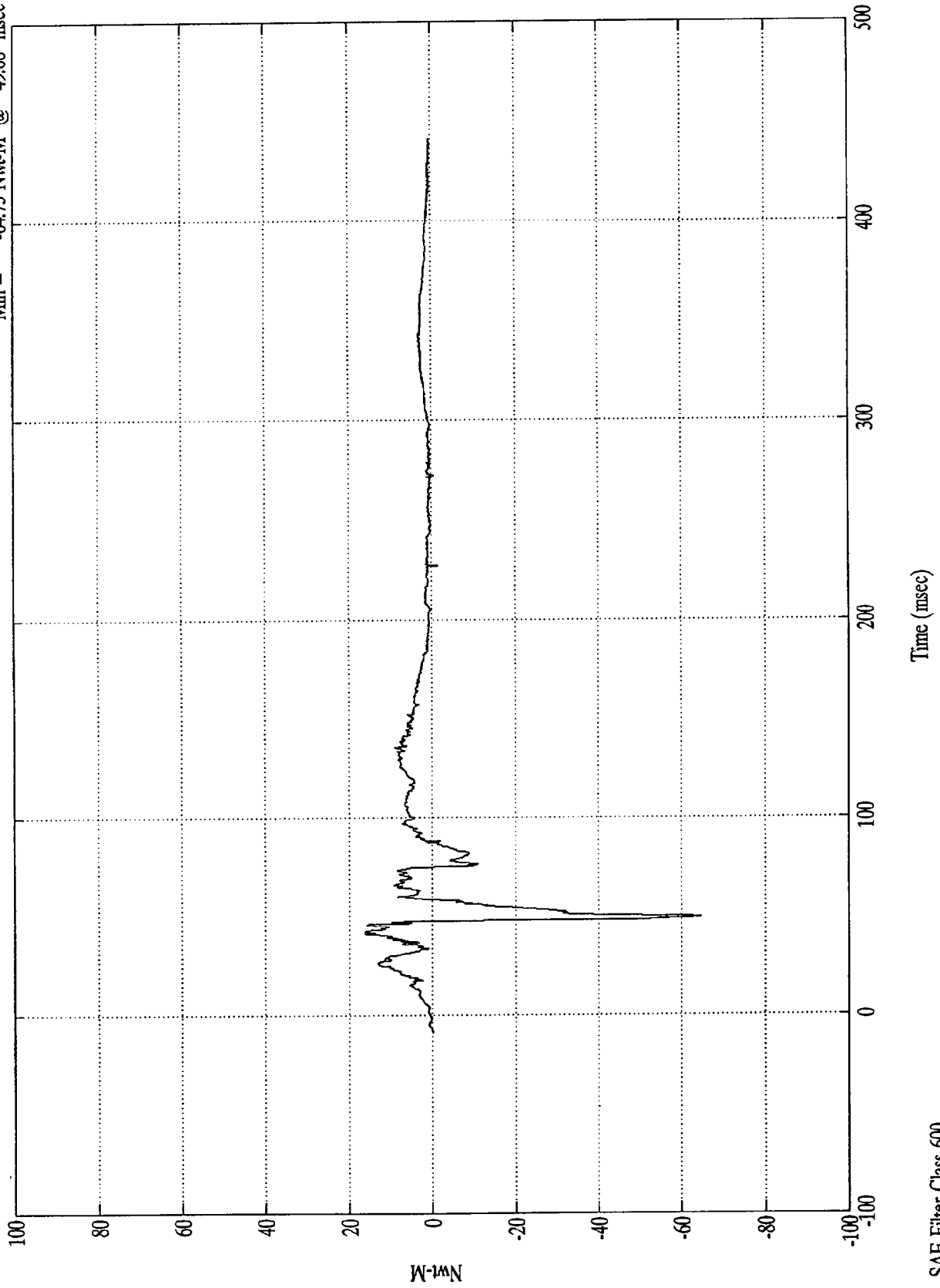
Time (msec)

SAE Filter Class 600

NCAP TEST #2 - 19% DODGE RAM VAN

Max = 16.06 Nwt-M @ 42.72 msec
Min = -64.73 Nwt-M @ 49.68 msec

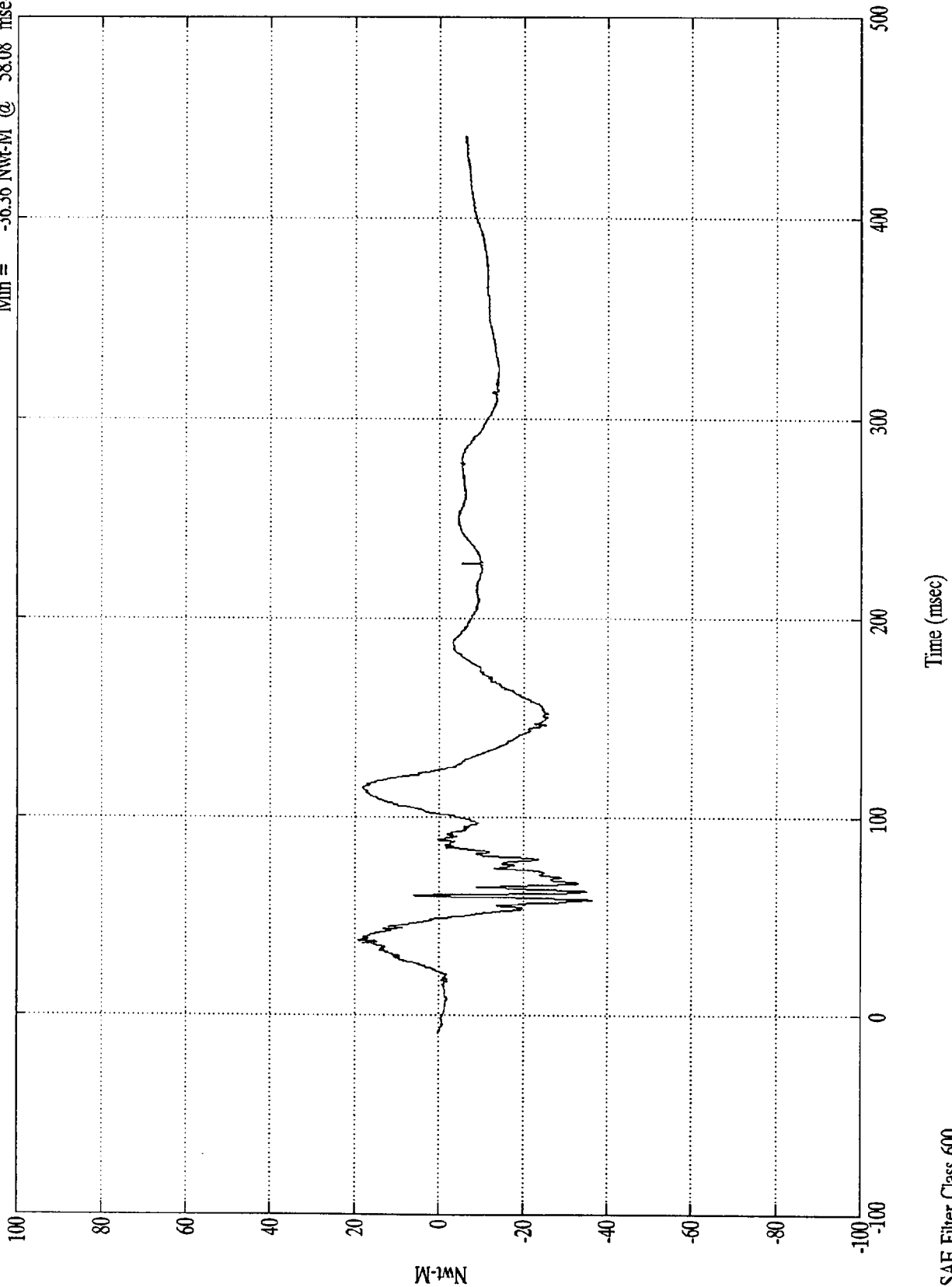
Pos. 2 Lt Lower Tibia Mx



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Rt Upper Tibia Mx

Max = 19.22 Nwt-M @ 37.68 msec
Min = -36.36 Nwt-M @ 58.08 msec

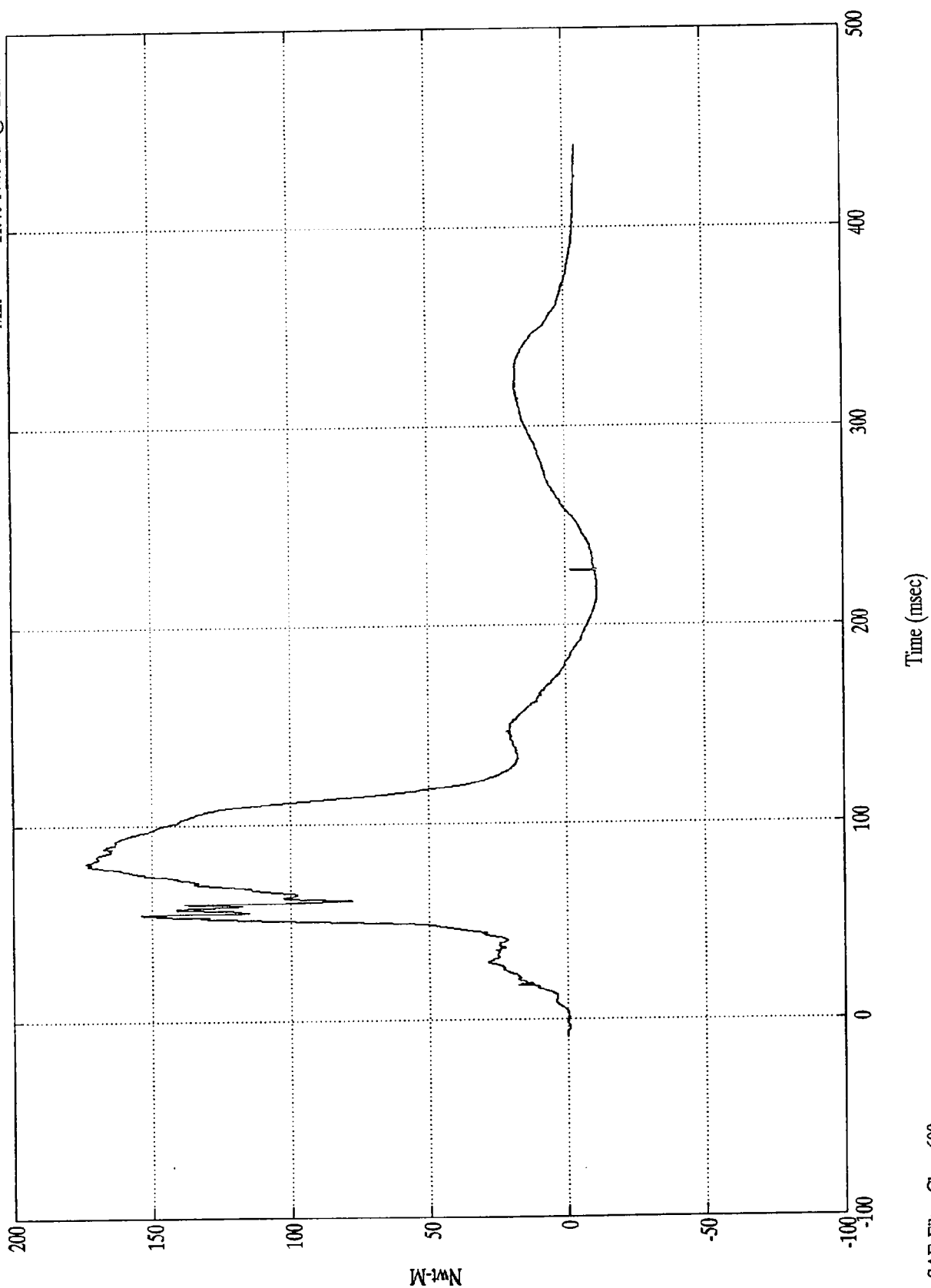


SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Rt Upper Tibia My

Max = 173.77 Nwt-M @ 81.12 msec
Min = -11.46 Nwt-M @ 214.92 msec



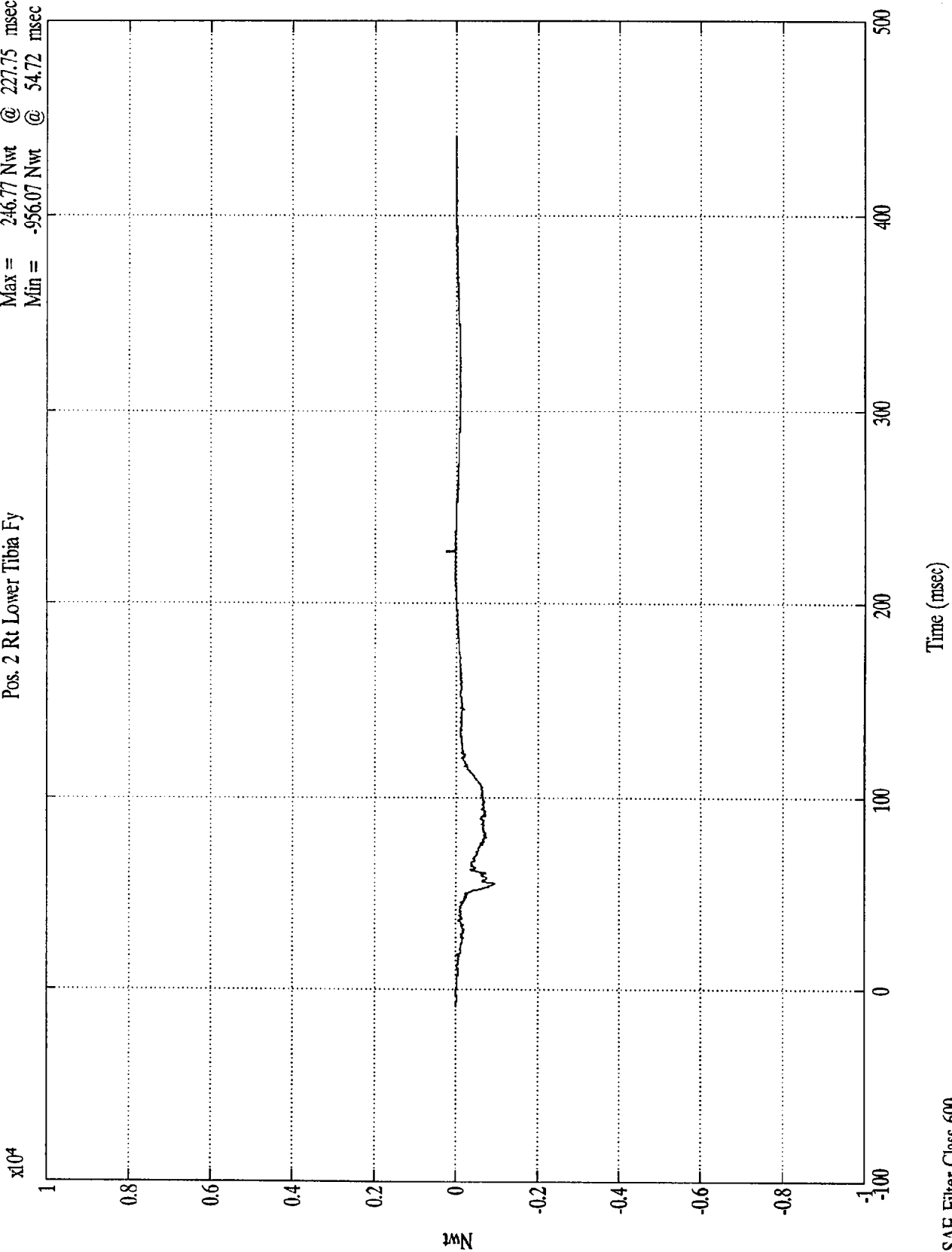
Nwt-M

SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Rt Lower Tibia Fy

Max = 246.77 Nwt @ 227.75 msec
Min = -956.07 Nwt @ 54.72 msec



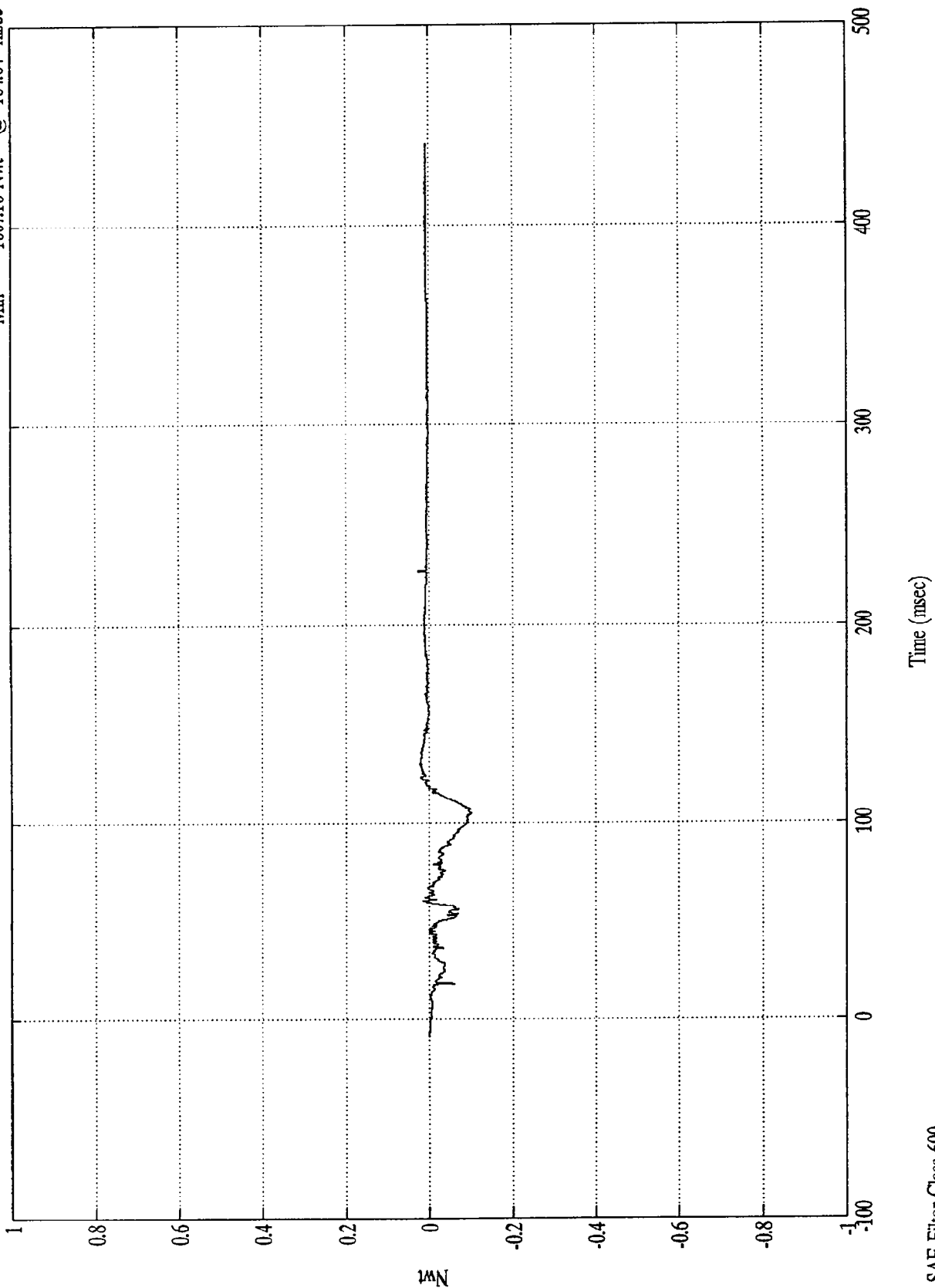
SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 275.80 Nwt @ 227.63 msec
Min = -1007.10 Nwt @ 104.64 msec

Pos. 2 Rt Lower Tibia Fz

$\times 10^4$

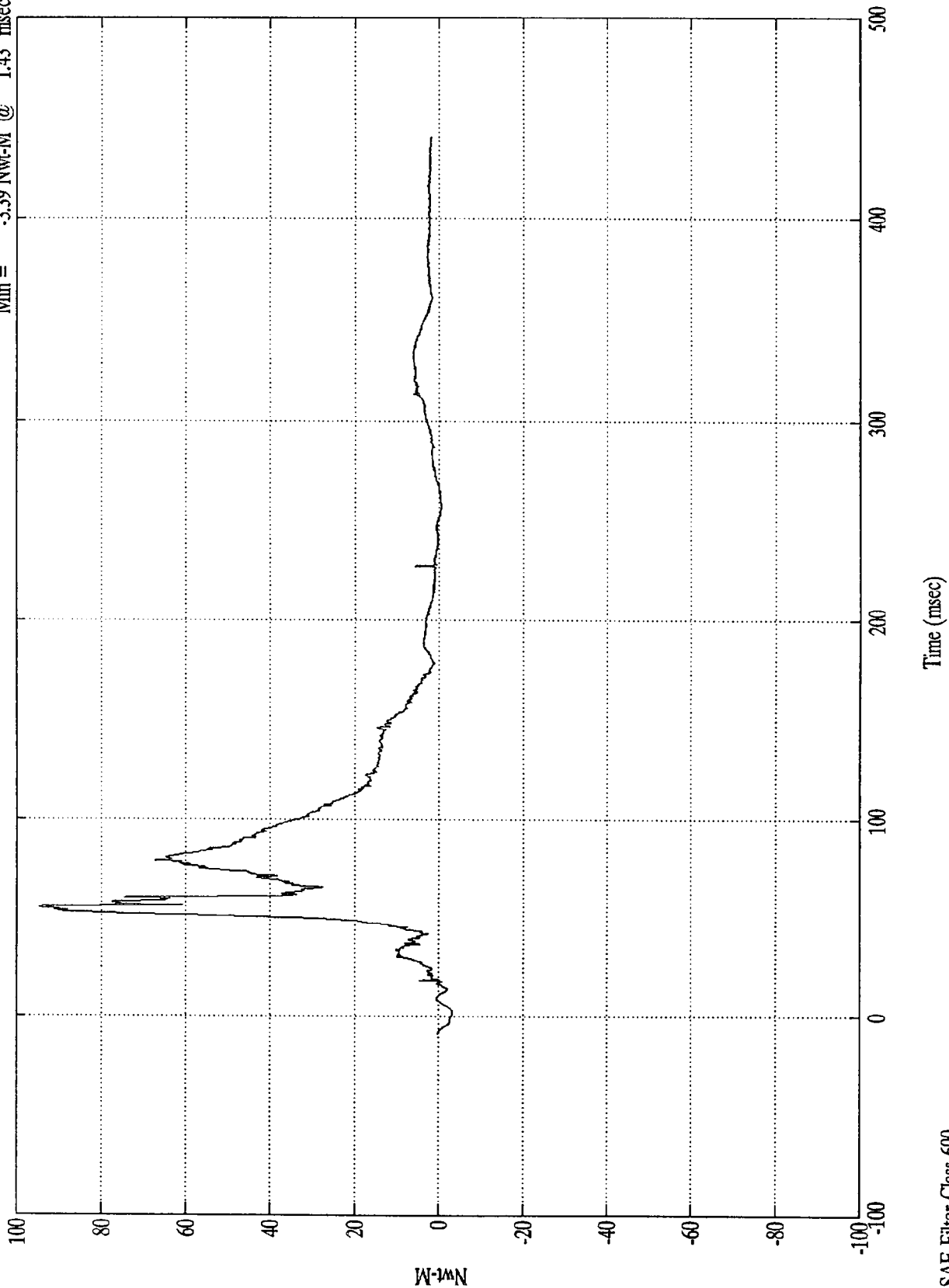


SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 94.55 Nwt-M @ 54.84 msec
Min = -3.39 Nwt-M @ 1.43 msec

Pos. 2 Rt Lower Tibia Mx

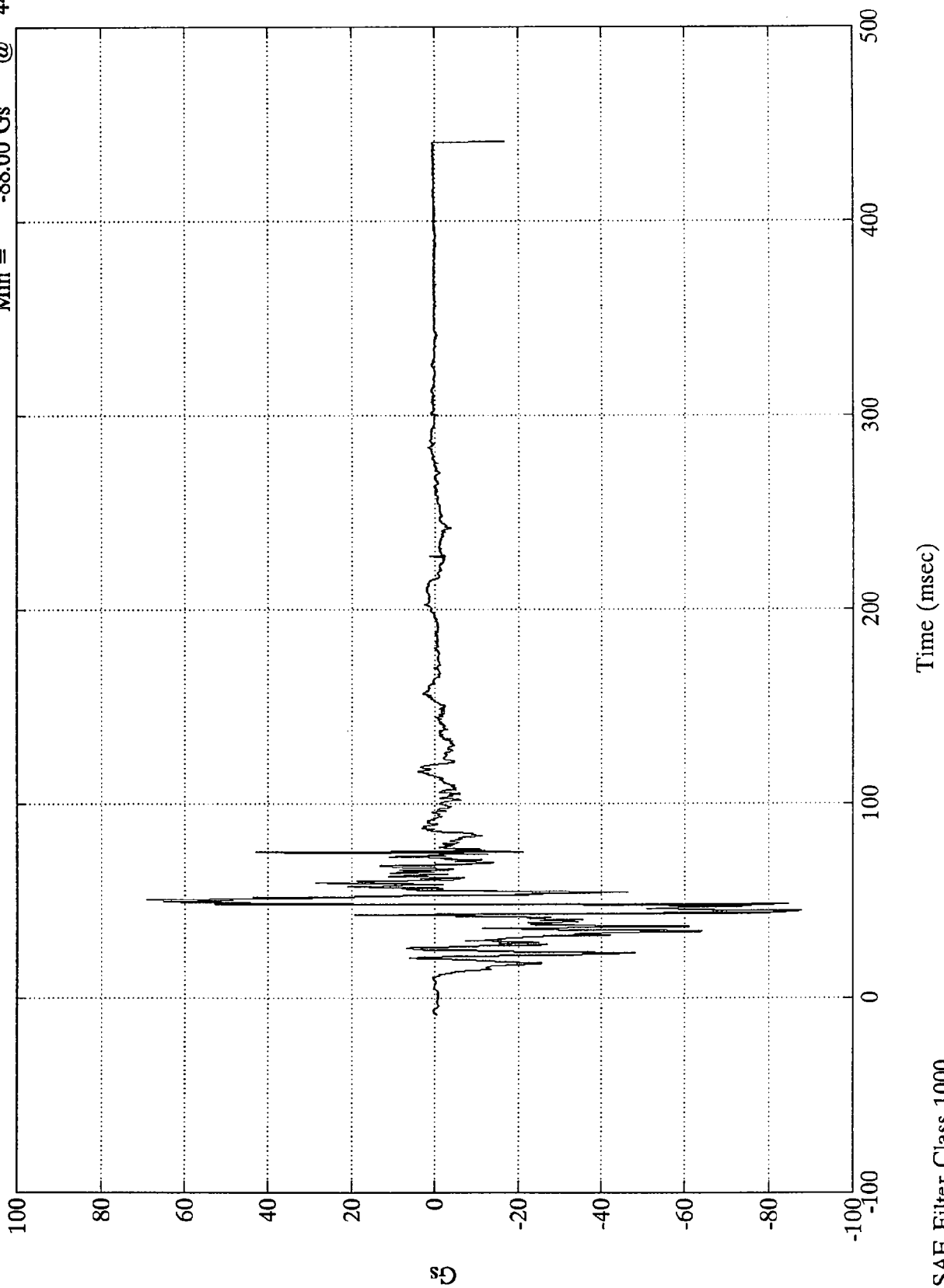


SAE Filter Class 600

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 69.22 Gs @ 50.52 msec
Min = -88.00 Gs @ 44.63 msec

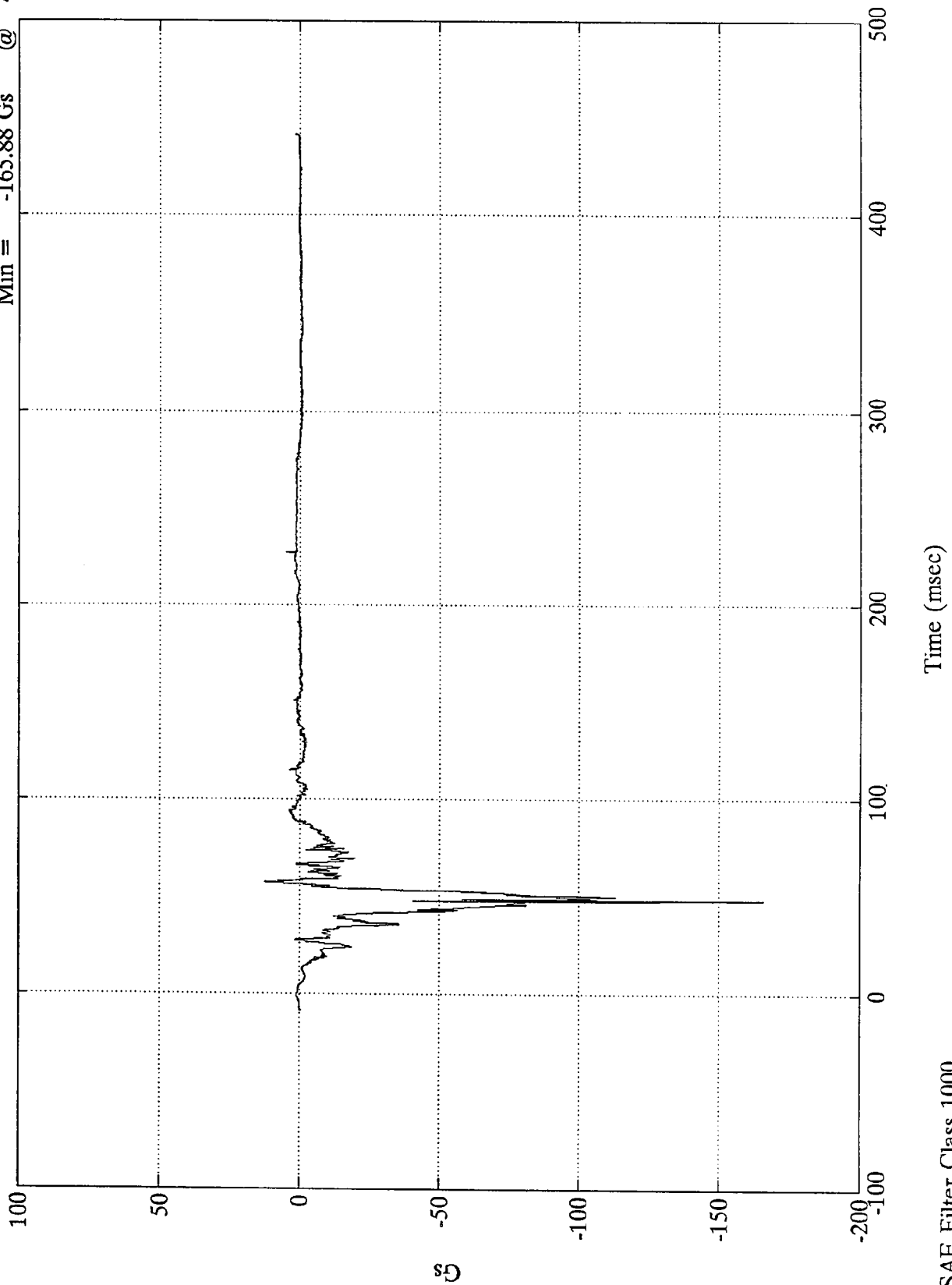
Pos. 2 L.Foot Front Z



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 L.Foot Rear X

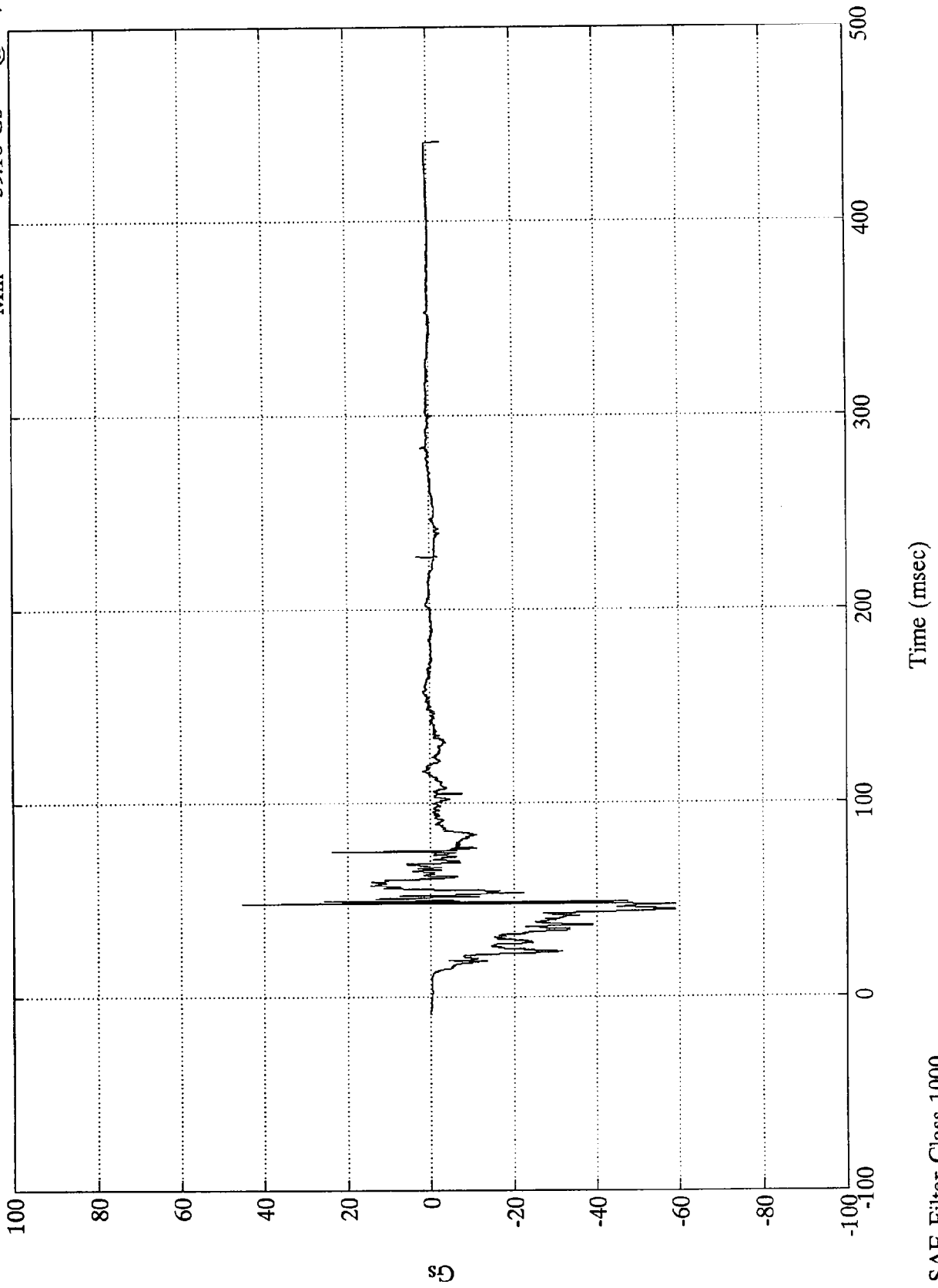
Max = 12.56 Gs @ 57.24 msec.
Min = -165.88 Gs @ 48.12 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 L.Foot Rear Z

Max = 45.30 Gs @ 47.88 msec
Min = -59.10 Gs @ 44.52 msec

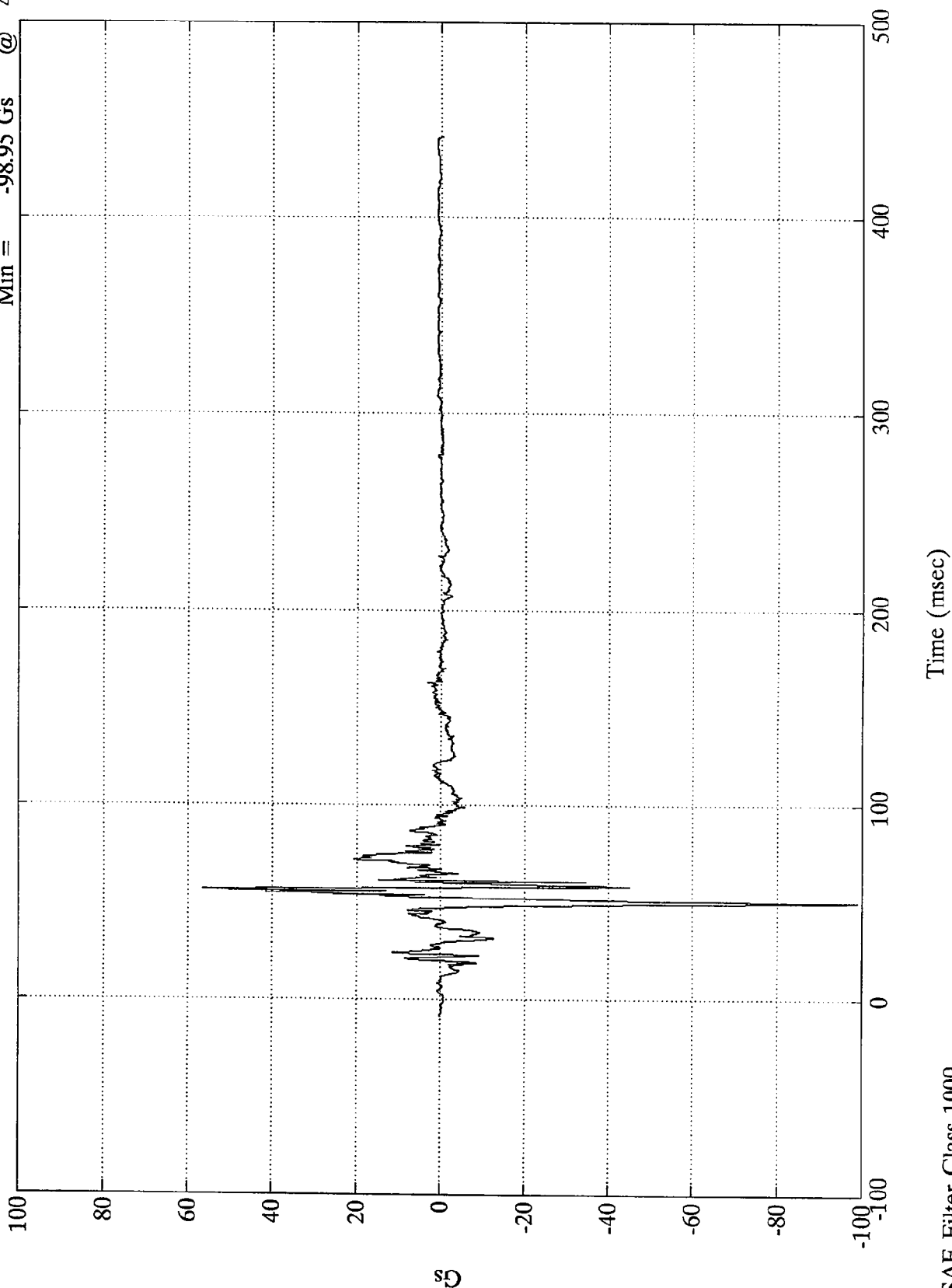


SAE Filter Class 1000

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 R.Foot Front Z

Max = 56.59 Gs @ 56.40 msec
Min = -98.95 Gs @ 49.92 msec



Gs

B-100

8313-2

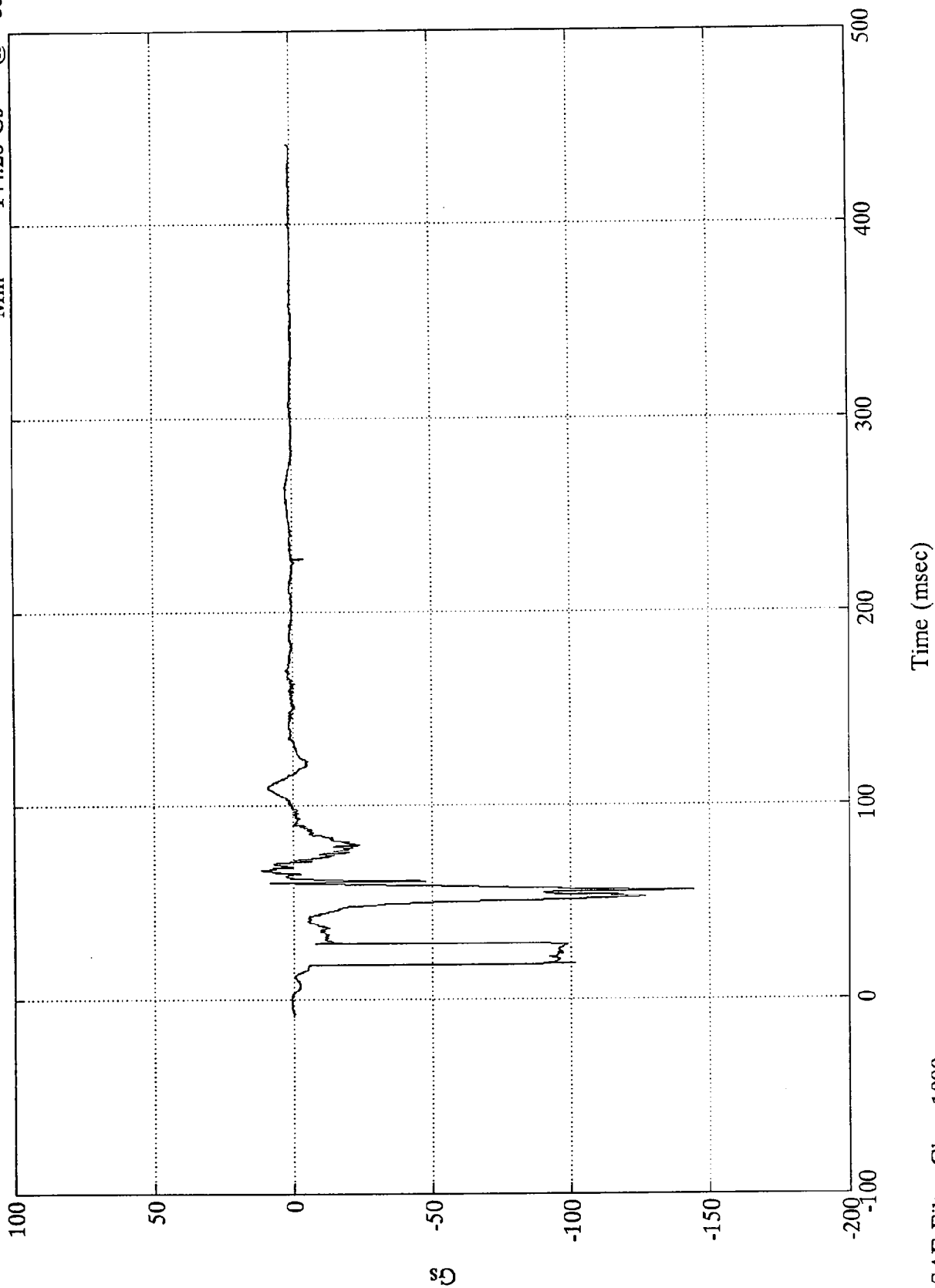
SAE Filter Class 1000

Time (msec)

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 R.Foot Rear X

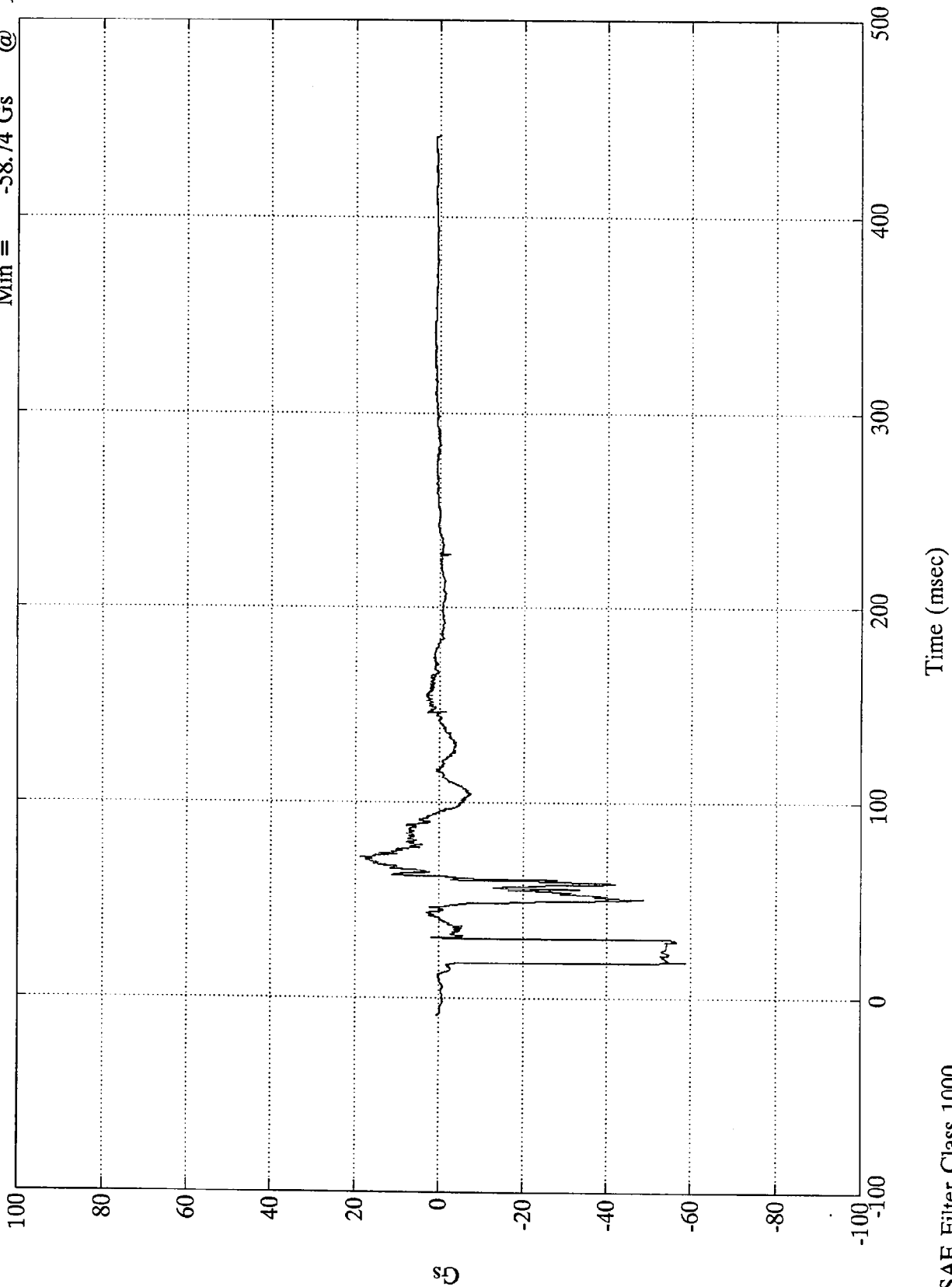
Max = 11.40 Gs @ 66.60 msec
Min = -144.20 Gs @ 55.92 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 R.Foot Rear Z

Max =	18.73 Gs	@	71.88 msec
Min =	-58.74 Gs	@	18.48 msec



Gs

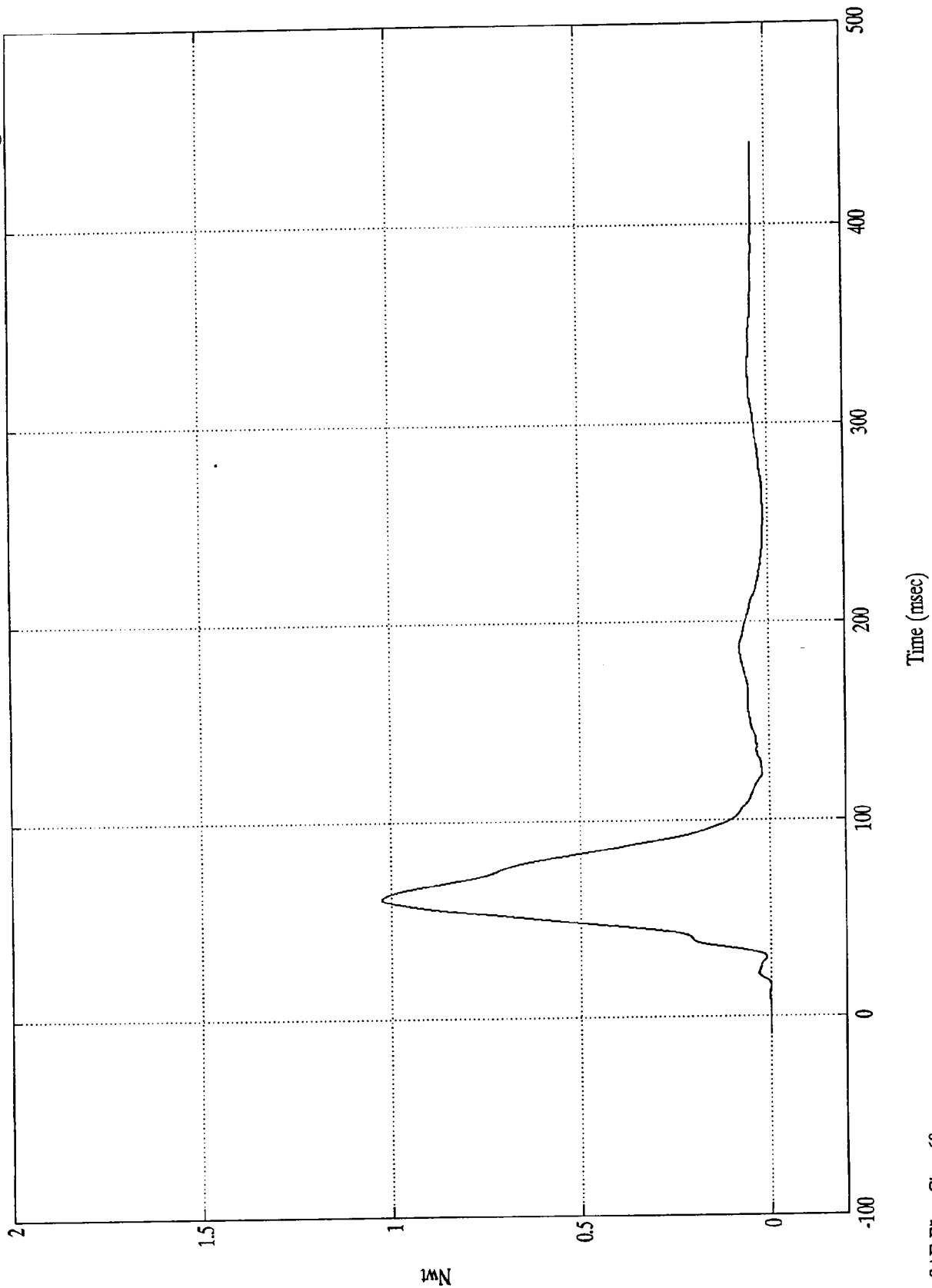
Time (msec)

SAE Filter Class 1000

NCAP TEST #2 - 1996 DODGE RAM VAN
x10⁴

Pos. 2 Right Belt Load

Max = 10256.92 Nwt @ 61.32 msec
Min = -6.80 Nwt @ 0.11 msec

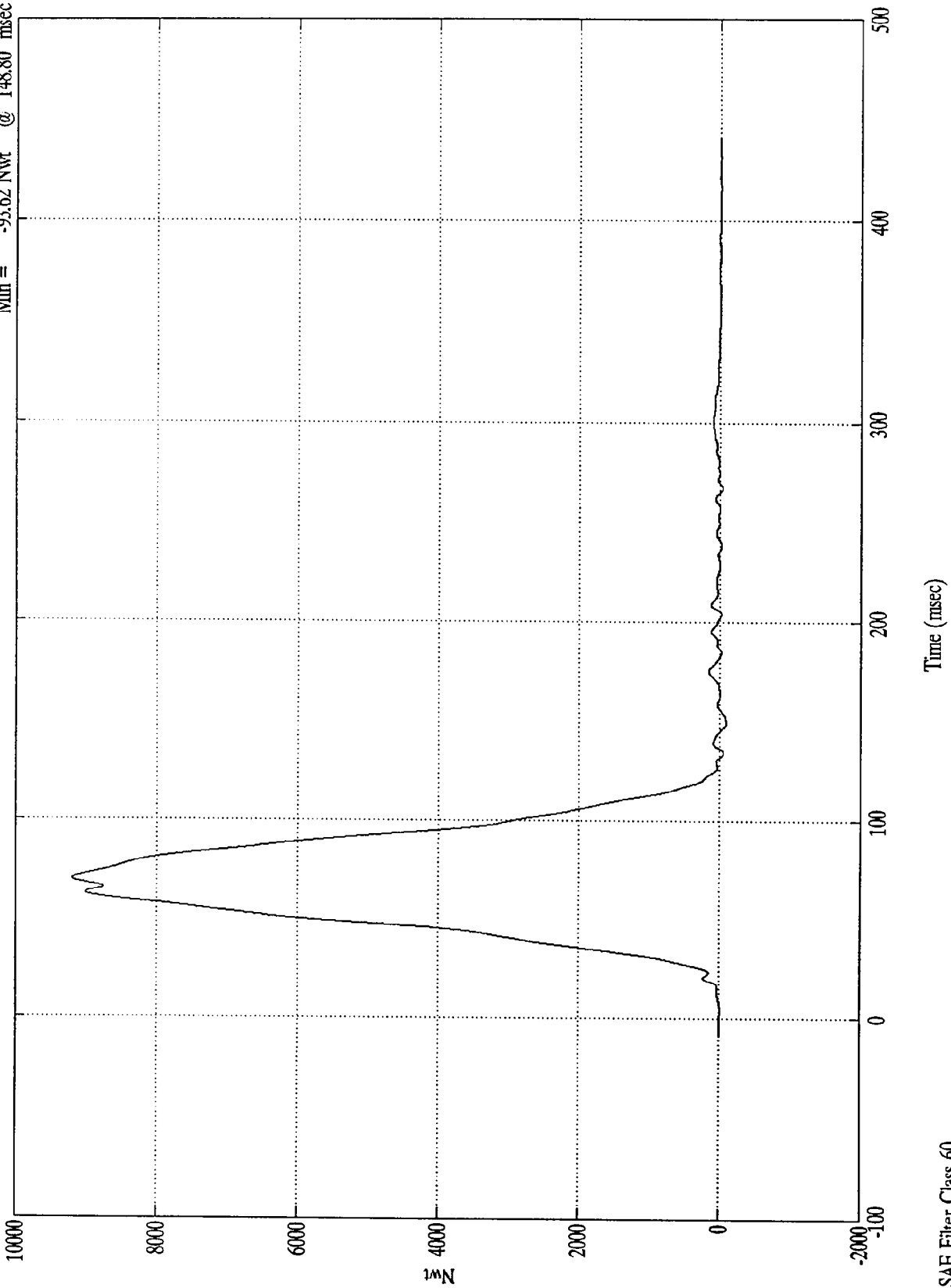


SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Torso Belt Load

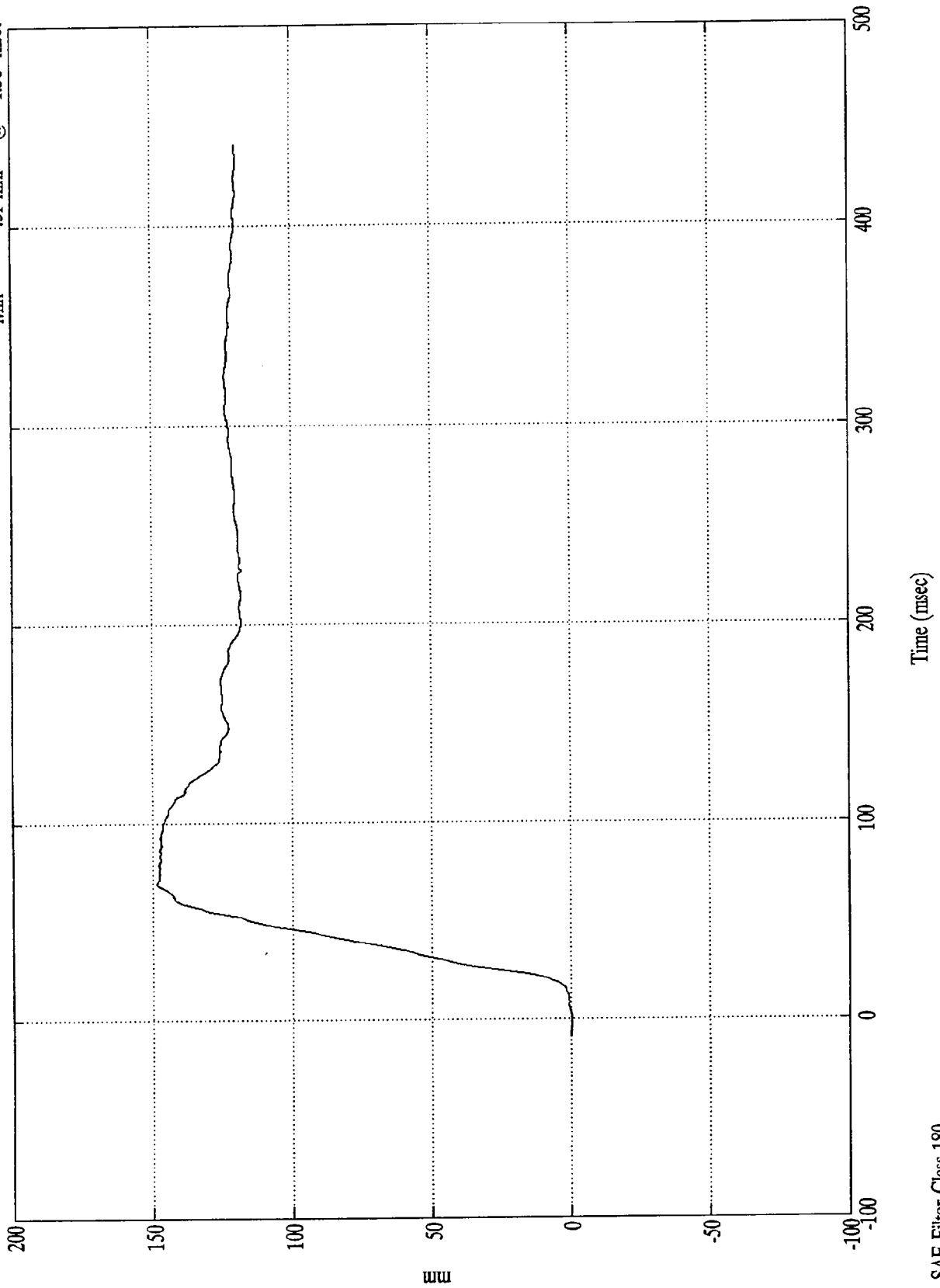
Max = 9198.78 Nwt @ 70.08 msec
 Min = -93.62 Nwt @ 148.80 msec



NCAP TEST #2 - 19% DODGE RAM VAN

Pos. 2 Belt Spool Out

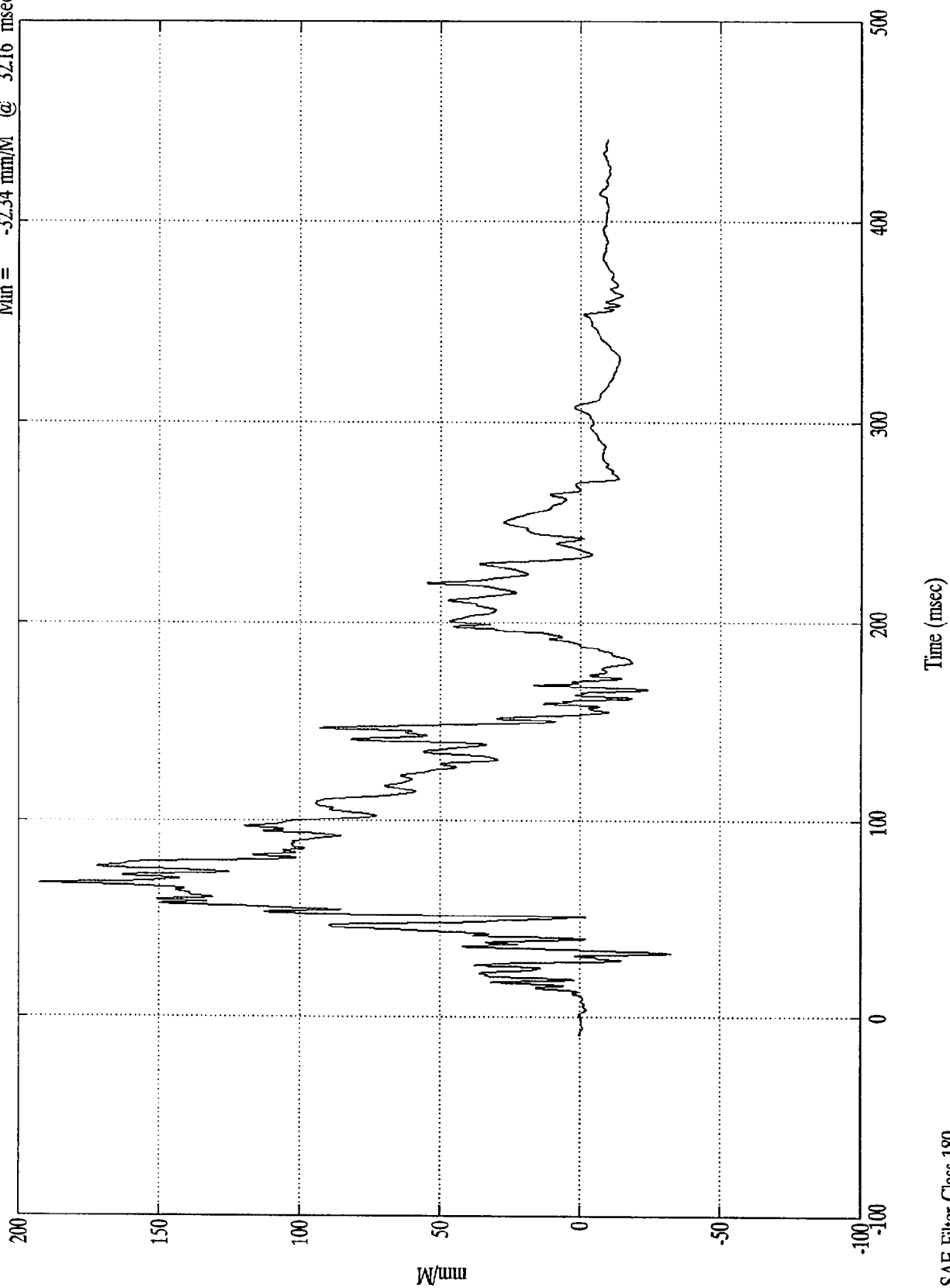
Max = 148.55 mm @ 69.00 msec
Min = -.31 mm @ -1.56 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Pos. 2 Belt Elongation

Max = 192.66 mm/M @ 68.16 msec
Min = -32.34 mm/M @ 32.16 msec



SAE Filter Class 180

TEST NO. MT0302

VEHICLE DATA

FILTER CHANNEL CLASS

Acceleration

60

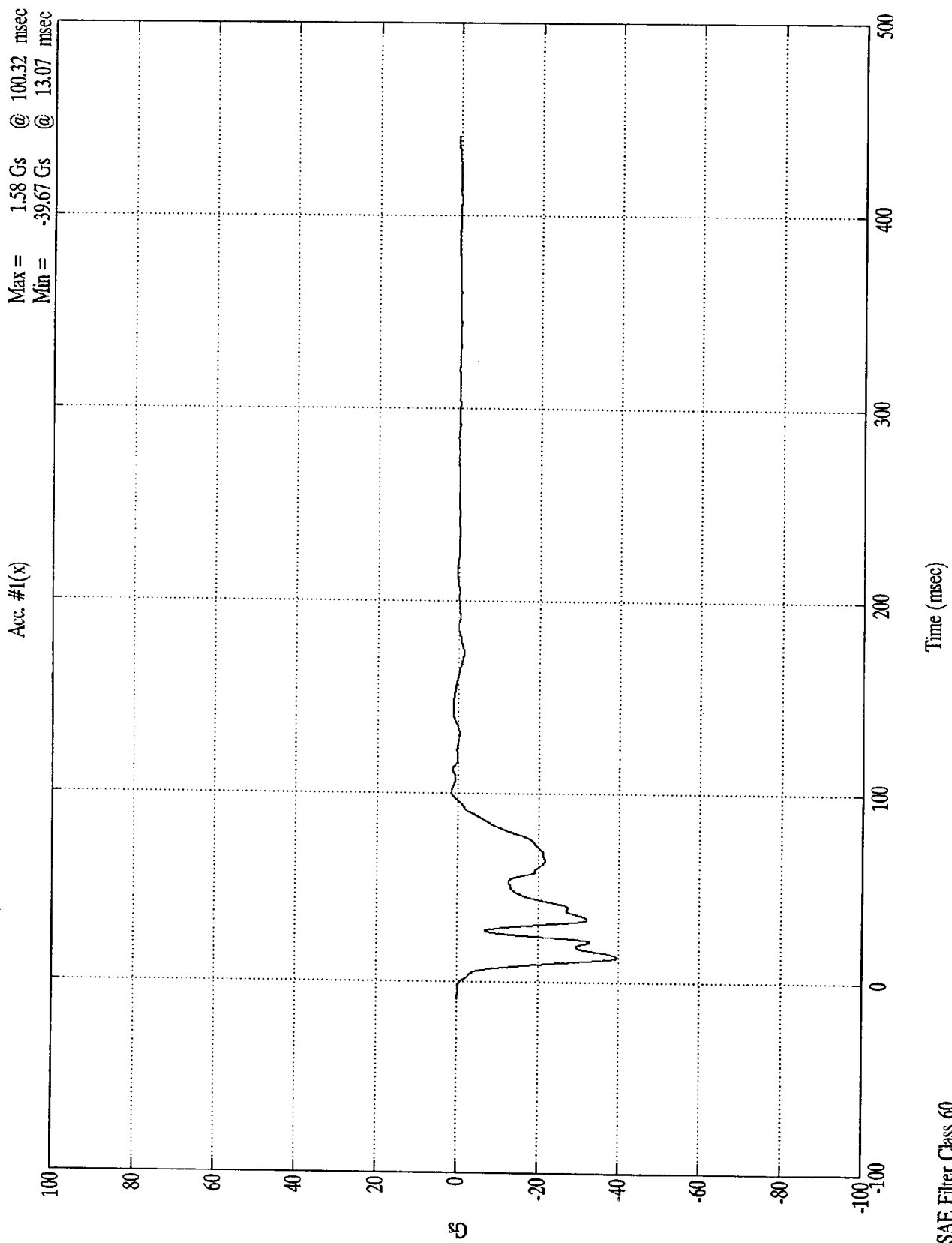
Velocity

180

Displacement

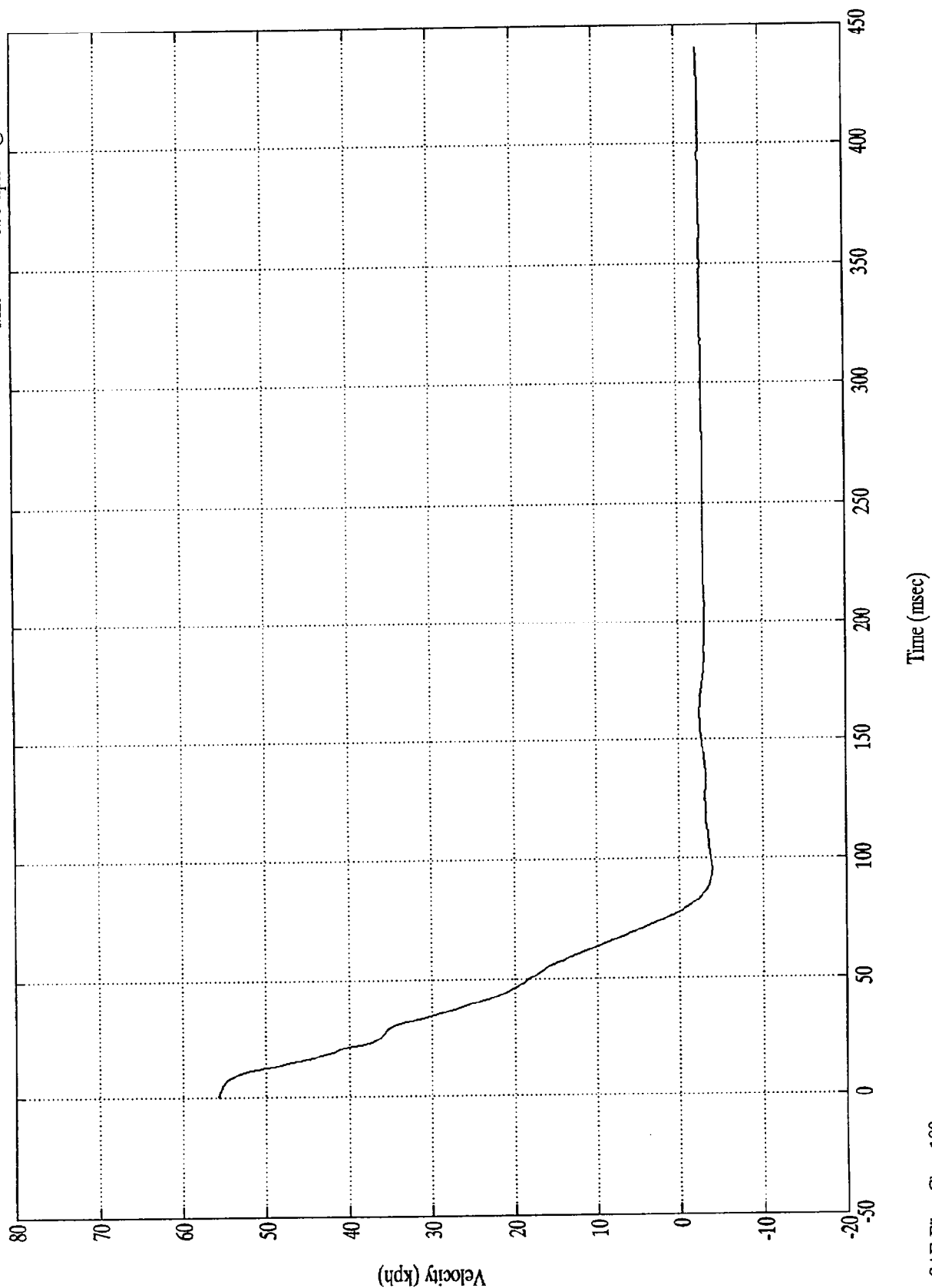
180

NCAP TEST #2 - 1996 DODGE RAM VAN



NCAP TEST #2 - 1996 DODGE RAM VAN

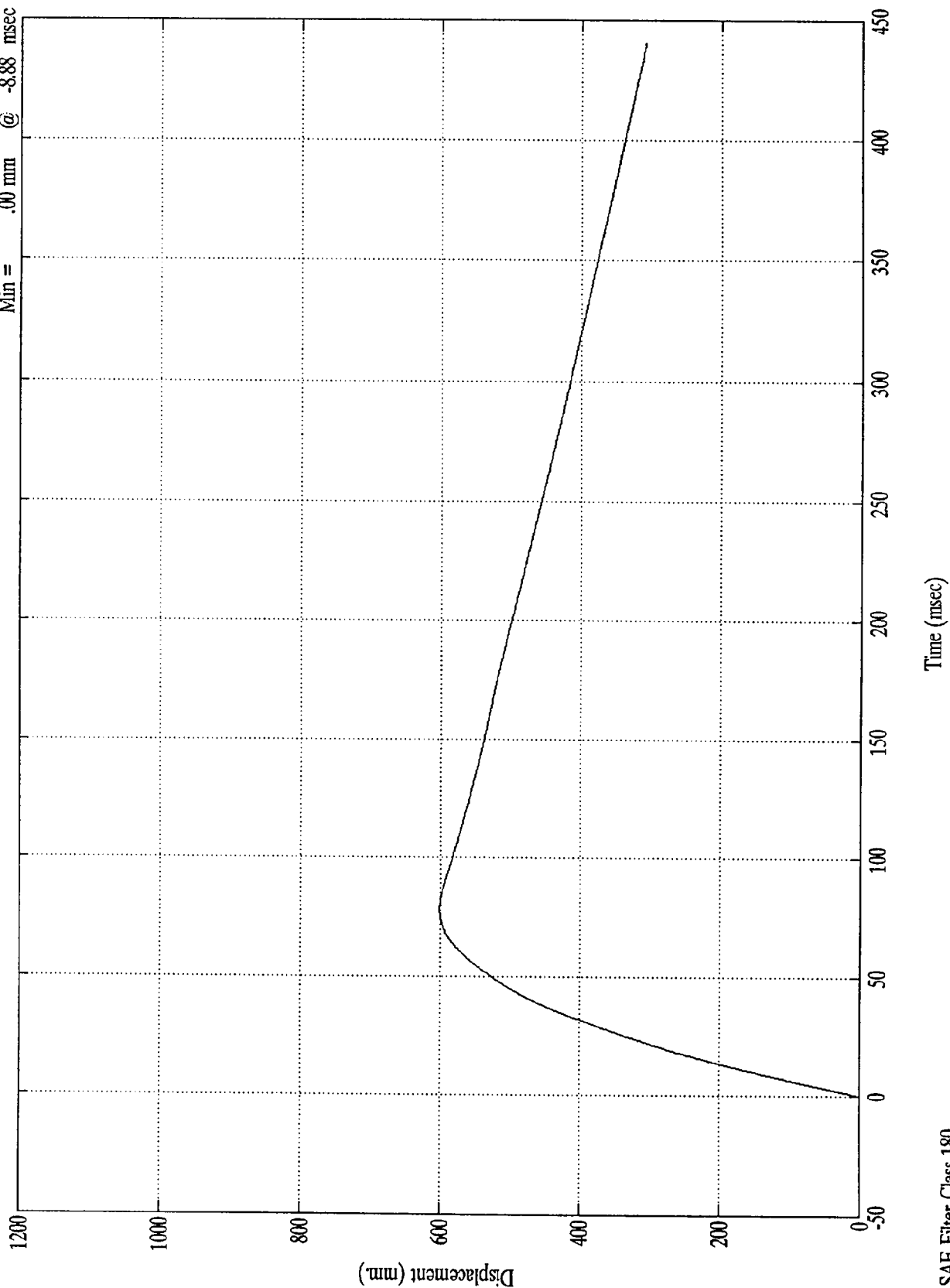
Acc. #1(x)
Max = 55.69 kph @ 0.71 msec
Min = -3.95 kph @ 96.48 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

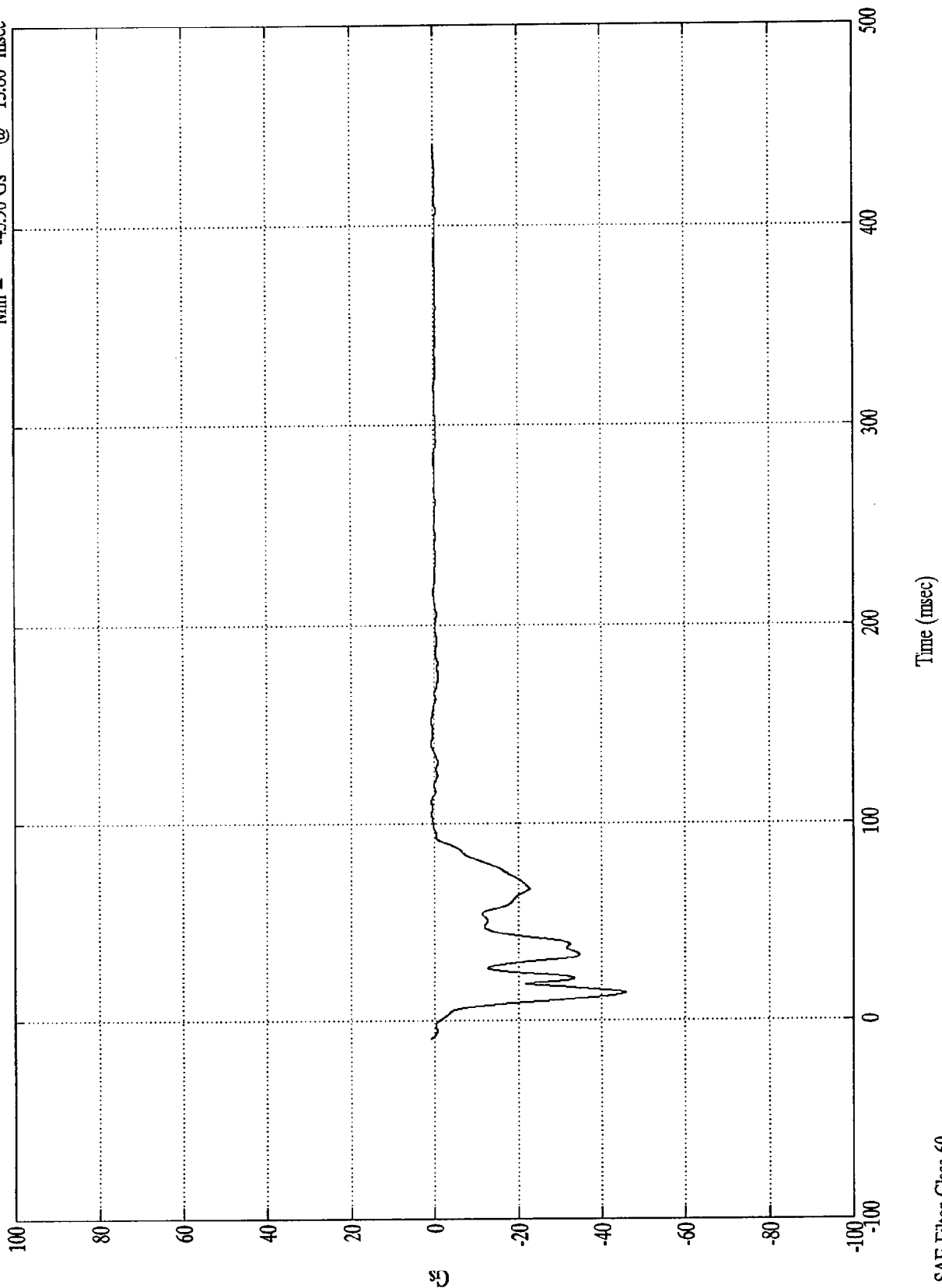
Max = 601.00 mm @ 77.88 msec
Min = .00 mm @ -8.88 msec

Acc. #1(x)



NCAP TEST #2 - 19% DODGE RAM VAN

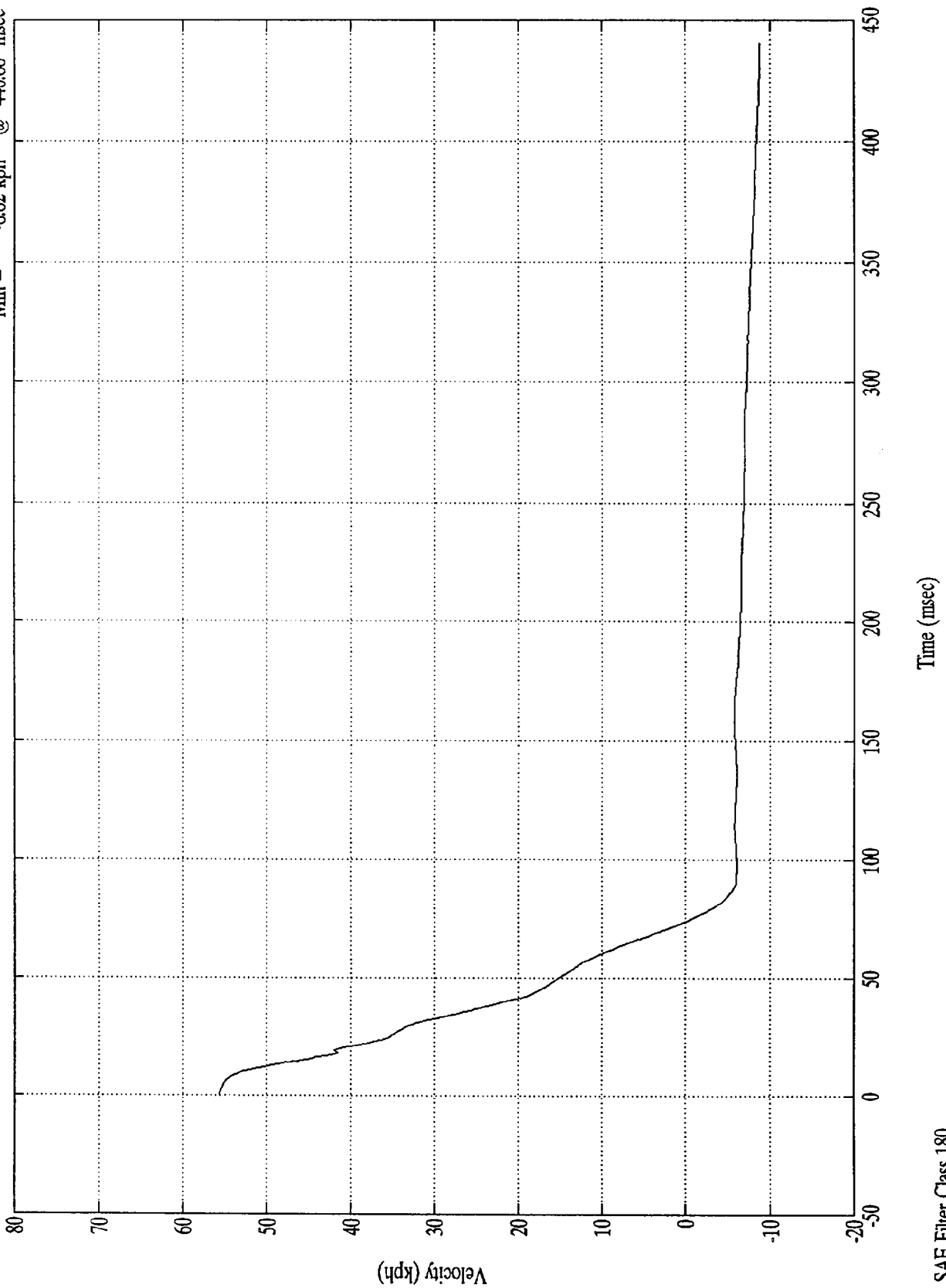
Acc. #2(x) Max = .91 Gs @ -8.88 msec
Min = -45.90 Gs @ 13.80 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 55.68 kph @ -0.00 msec
Min = -8.82 kph @ 440.88 msec

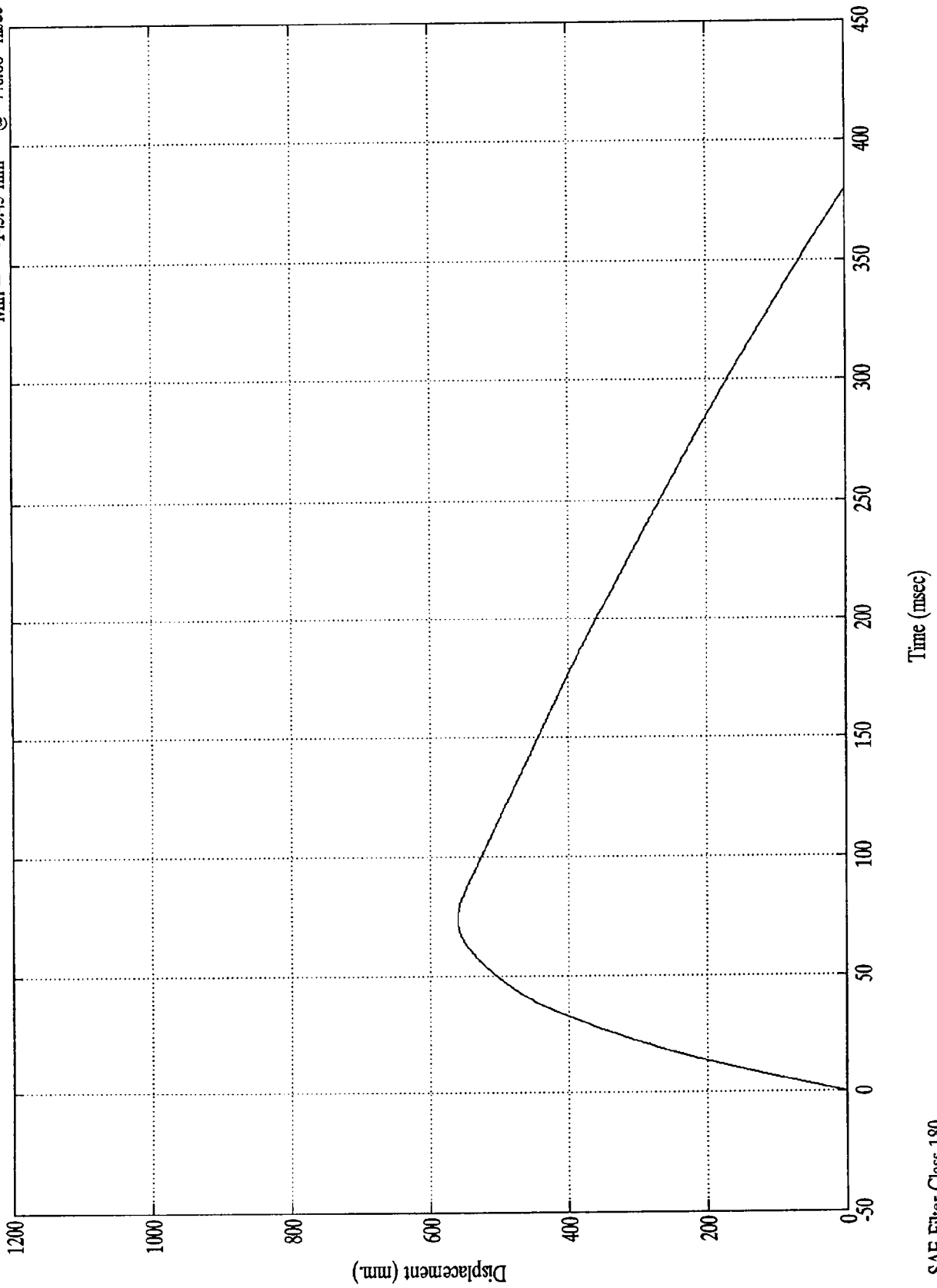
Acc. #2(x)



SAE Filter Class 180

NCAP TEST #2 - 1996 DODGE RAM VAN

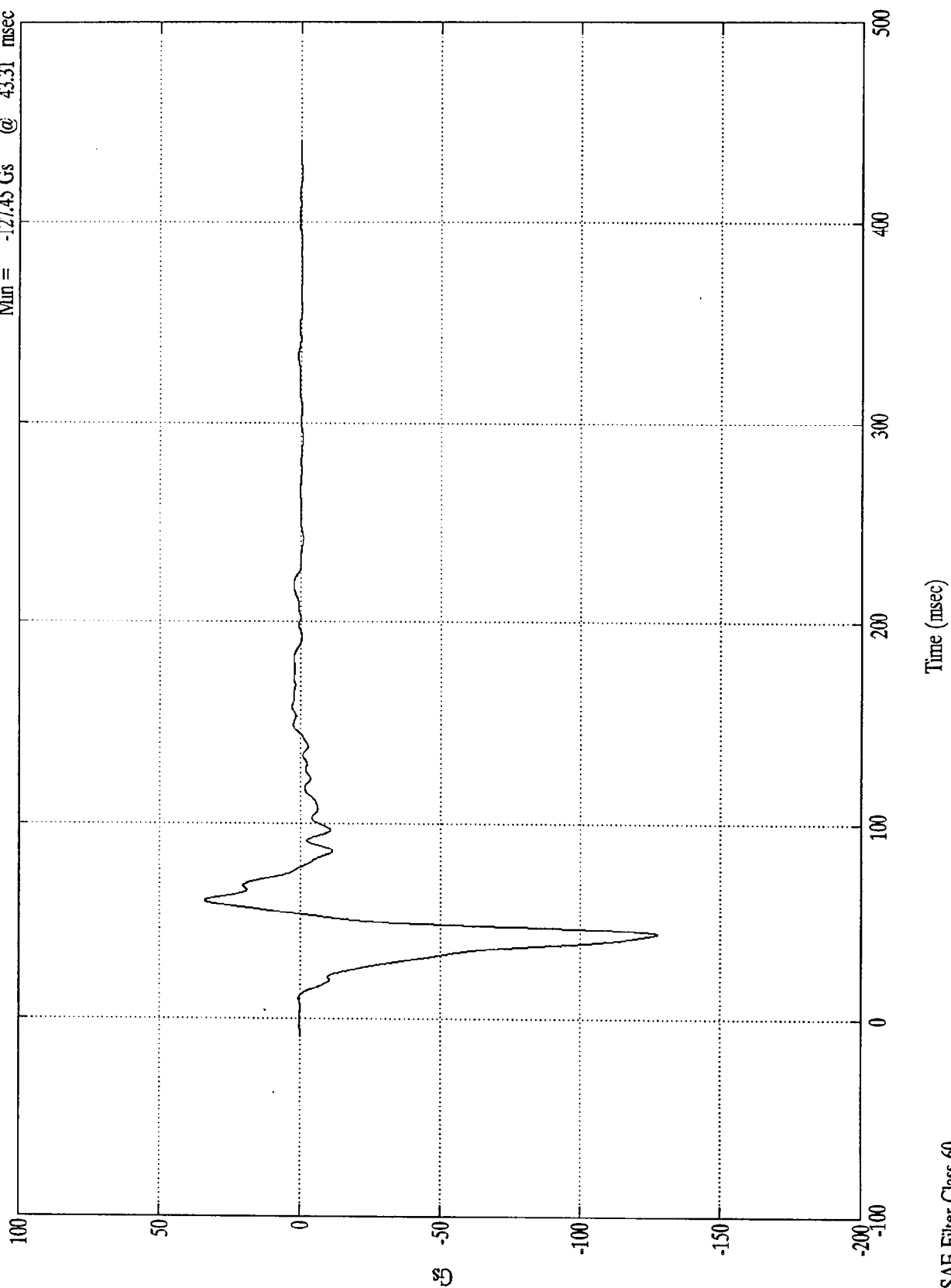
Acc. #2(x)
Max = 559.93 mm @ 74.04 msec
Min = -145.45 mm @ 440.88 msec



NCAP TEST #2 - 19% DODGE RAM VAN

Max = 34.05 Gs @ 60.48 msec
 Min = -127.45 Gs @ 43.31 msec

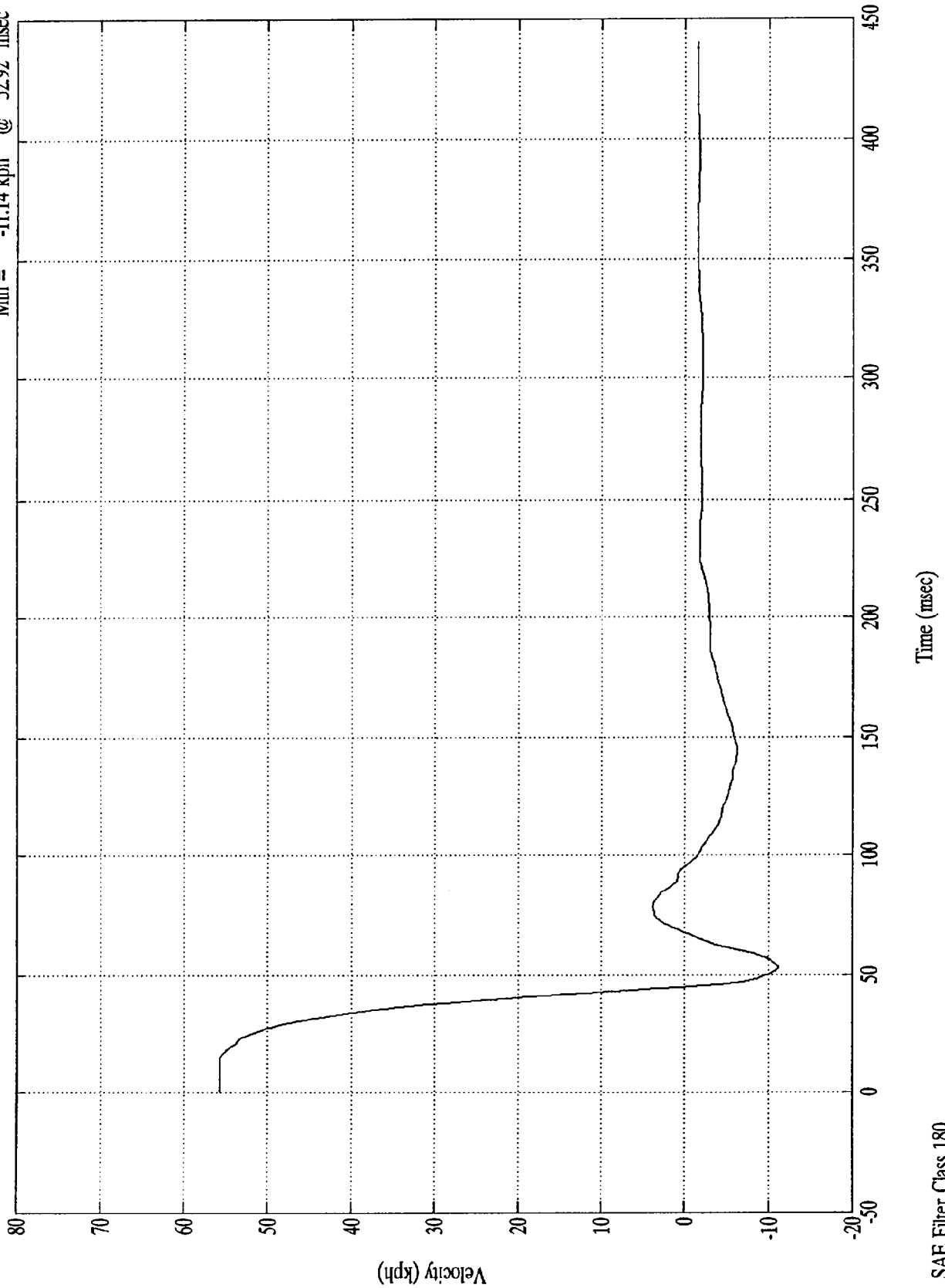
Acc. #3(x)



NCAP TEST #2 - 1996 DODGE RAM VAN

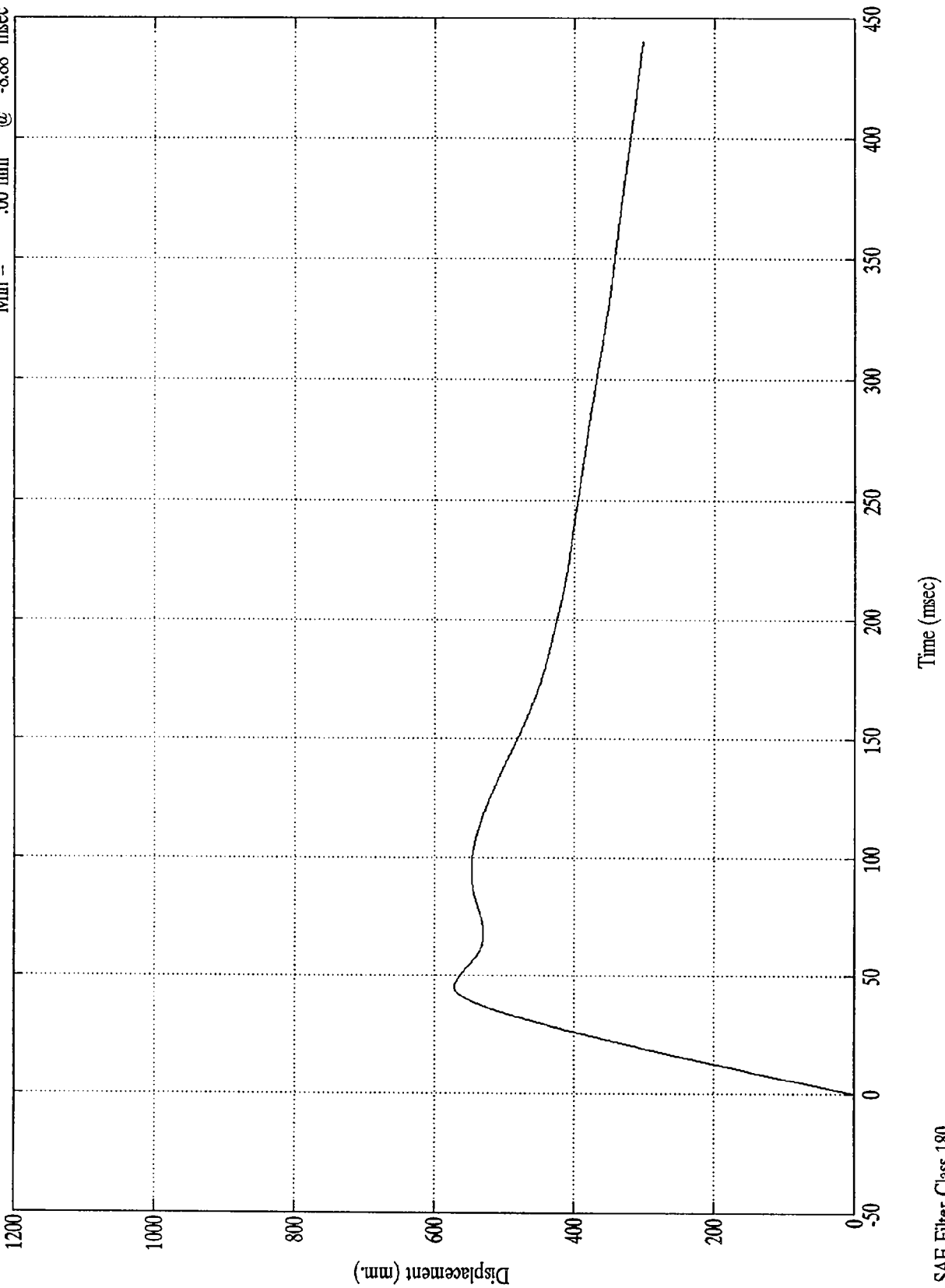
Acc. #3(x)

Max = 55.79 kph @ 12.24 msec
Min = -11.14 kph @ 52.92 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Acc. #3(x)
Max = 572.45 mm @ 45.12 msec
Min = .00 mm @ -8.88 msec

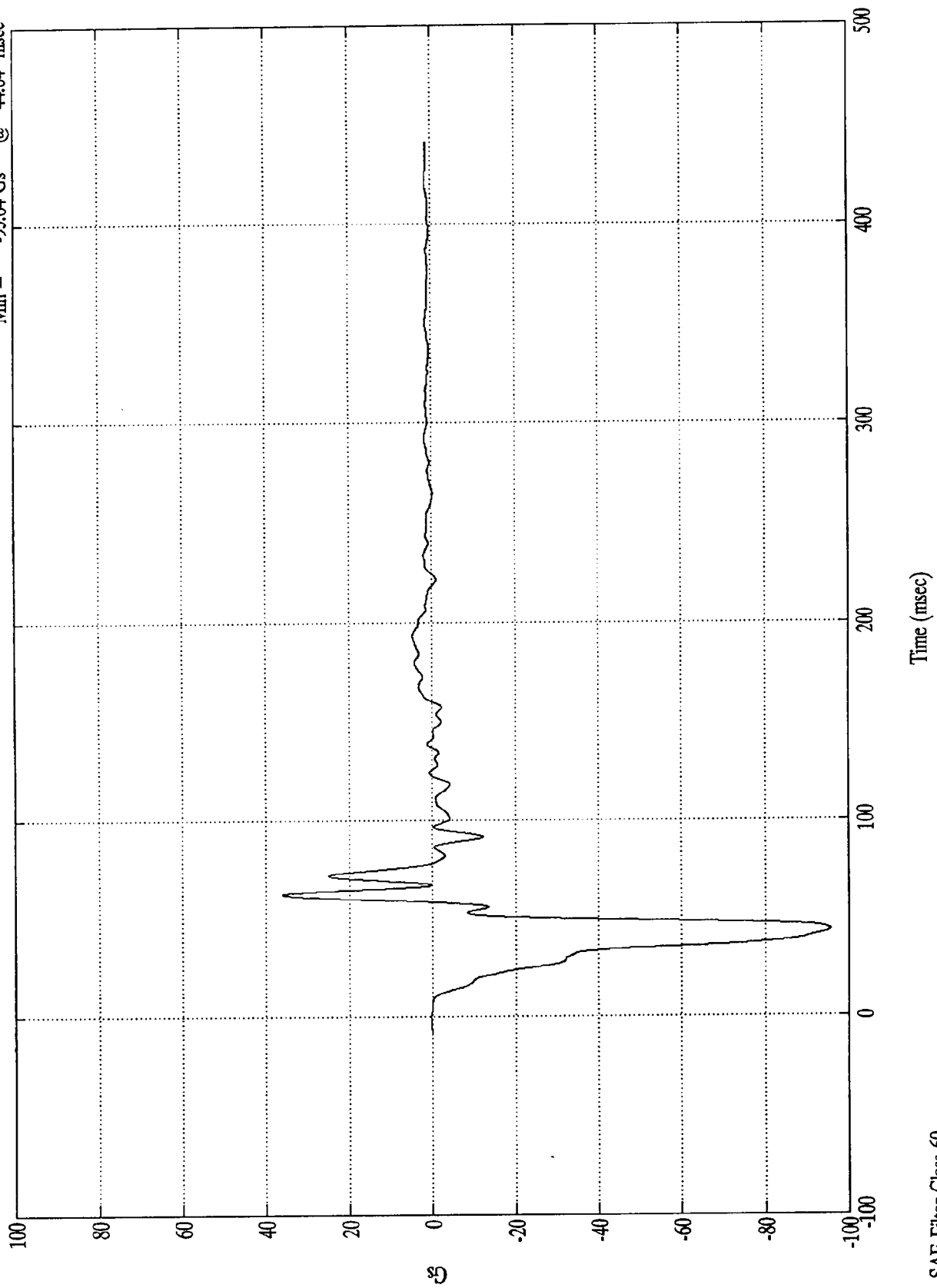


SAE Filter Class 180

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 36.13 Gs @ 62.40 msec
Min = -95.64 Gs @ 44.04 msec

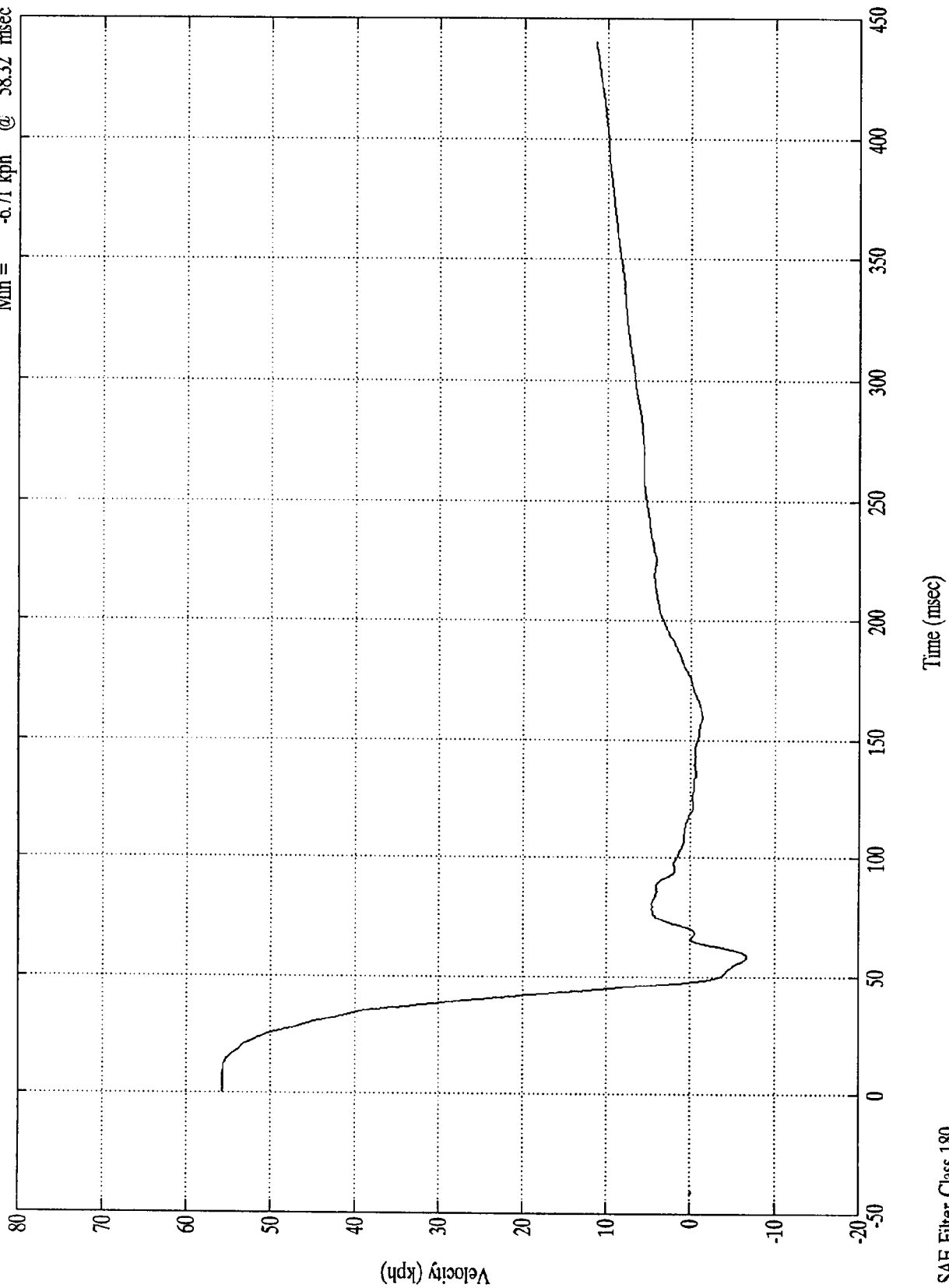
Acc. #4(x)



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 55.71 kph @ 7.44 msec
 Min = -6.71 kph @ 58.32 msec

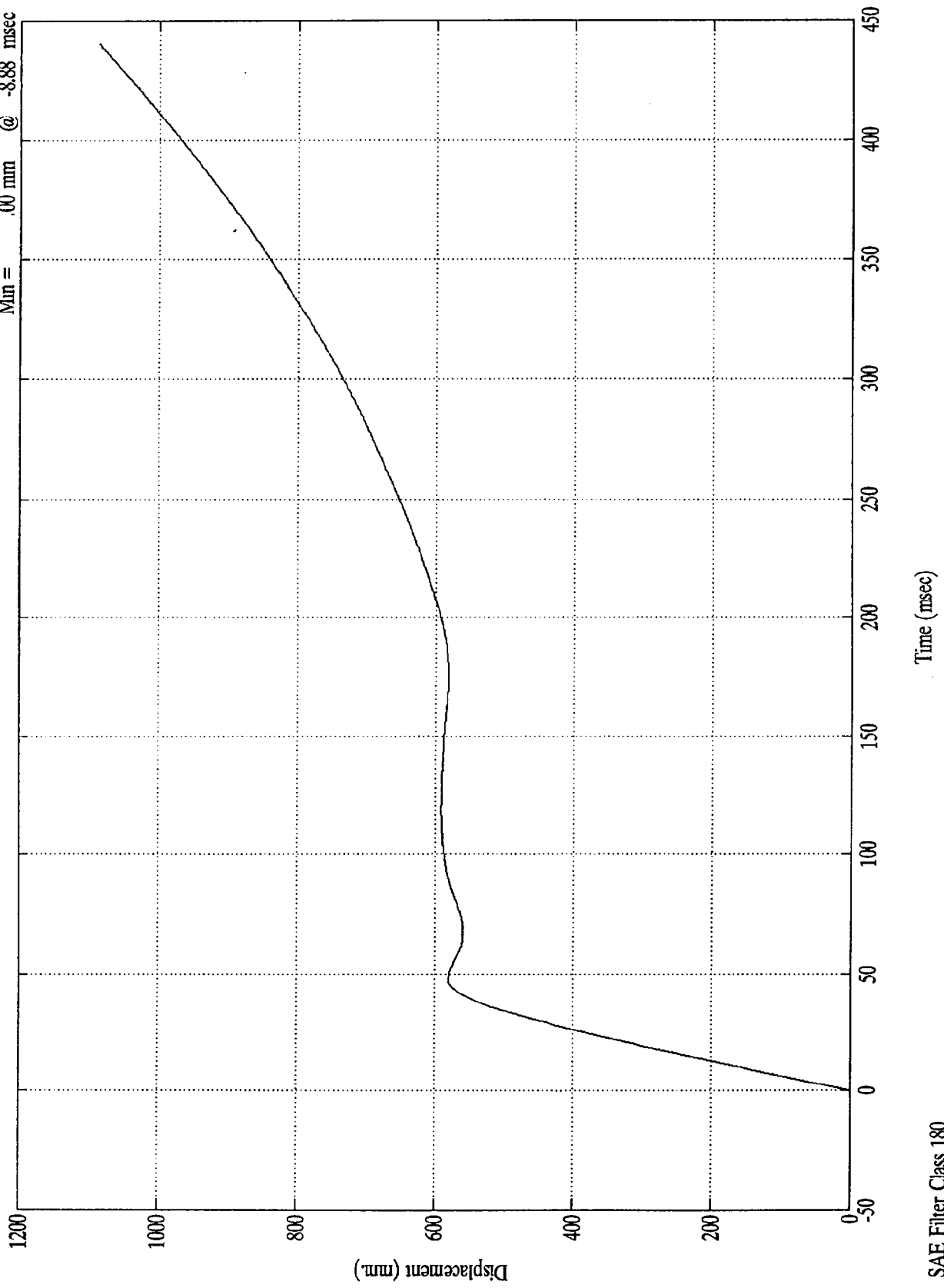
Acc. #4(x)



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 1088.85 mm @ 440.88 msec
Min = .00 mm @ -8.88 msec

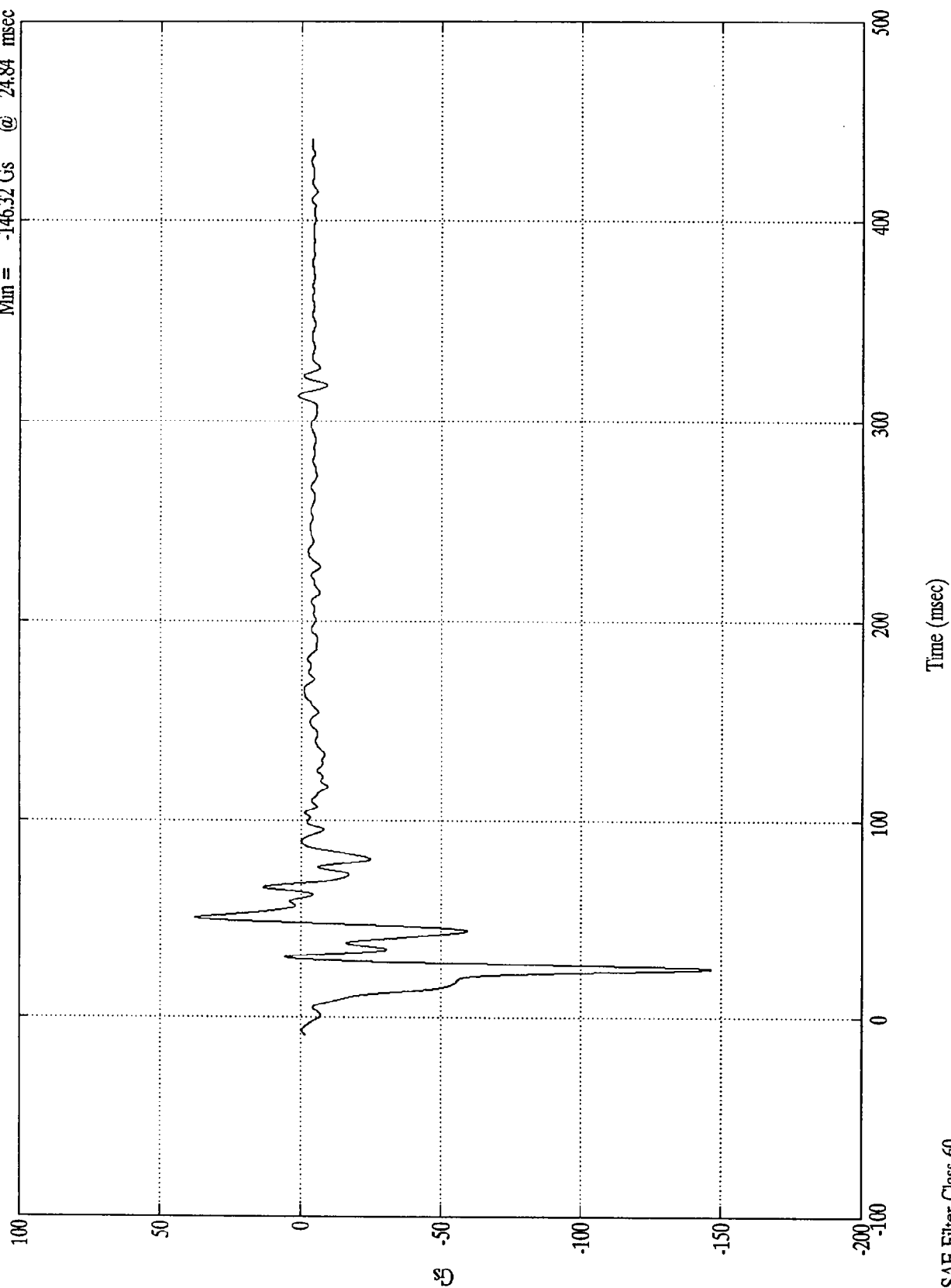
Acc. #4(x)



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 37.59 Gs @ 50.28 msec
Min = -146.32 Gs @ 24.84 msec

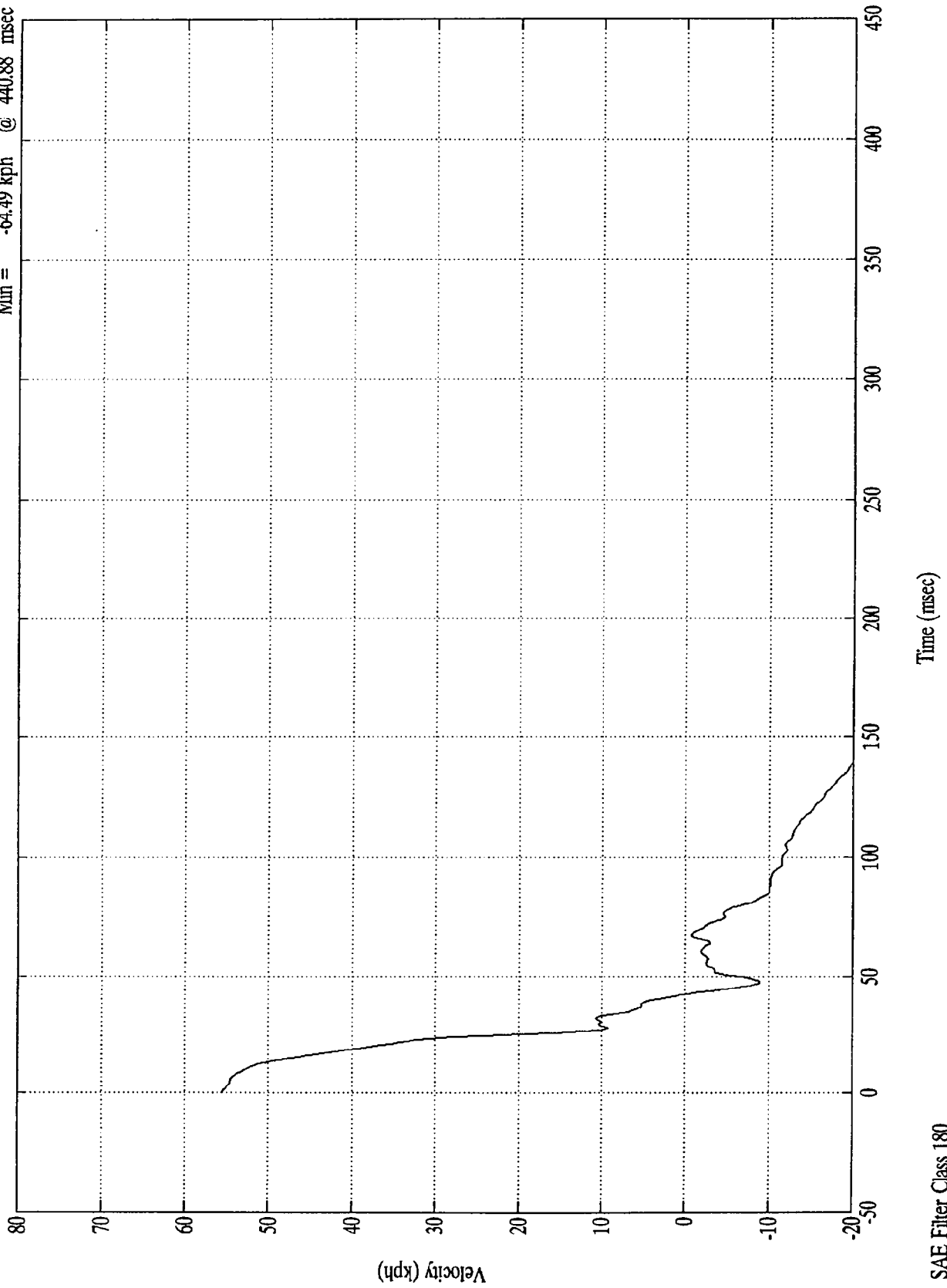
Acc. #5(x)



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 55.68 kph @ -0.00 msec
Min = -64.49 kph @ 440.88 msec

Acc. #5(x)

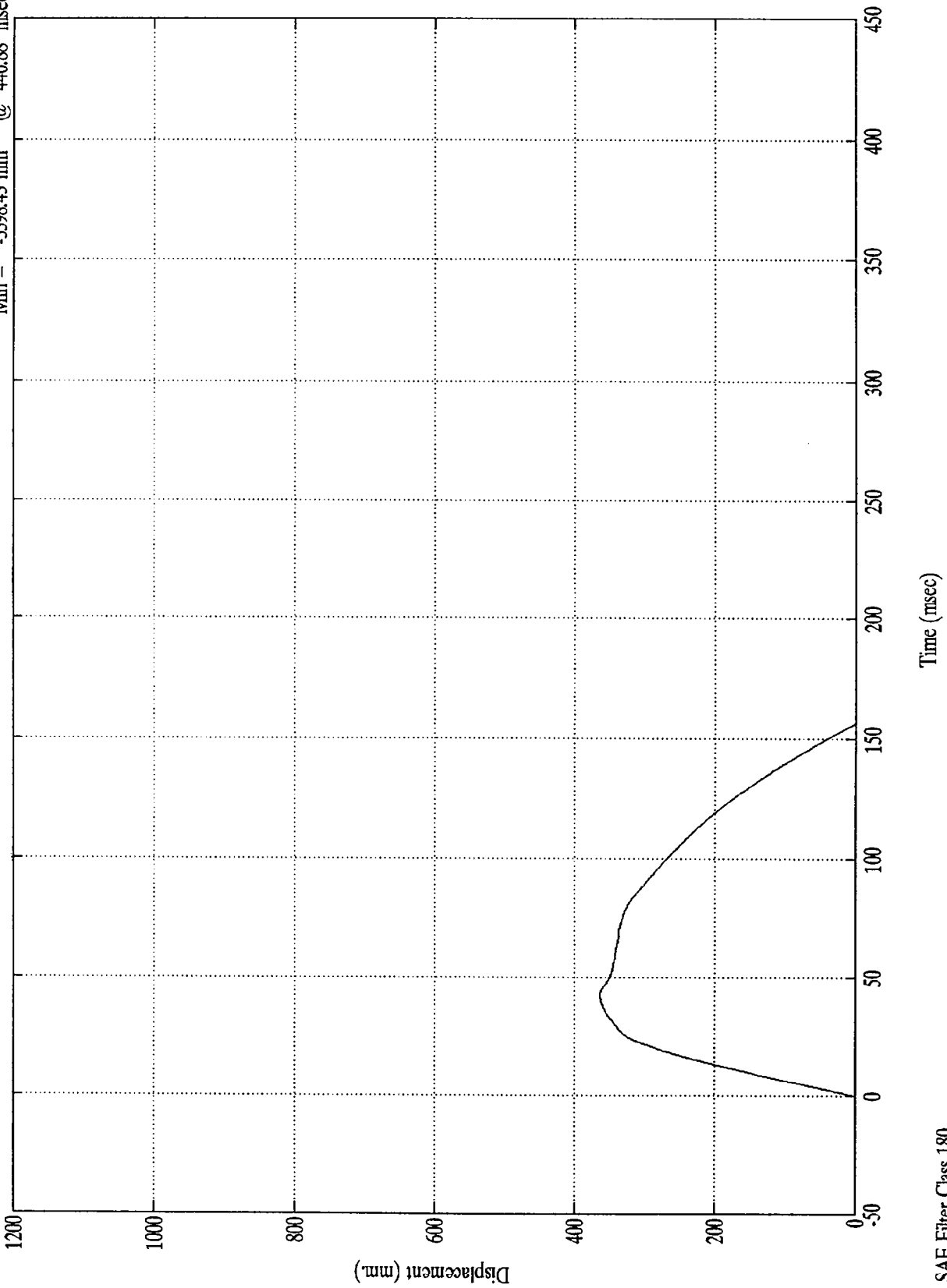


SAE Filter Class 180

NCAP TEST #2 - 1996 DODGE RAM VAN

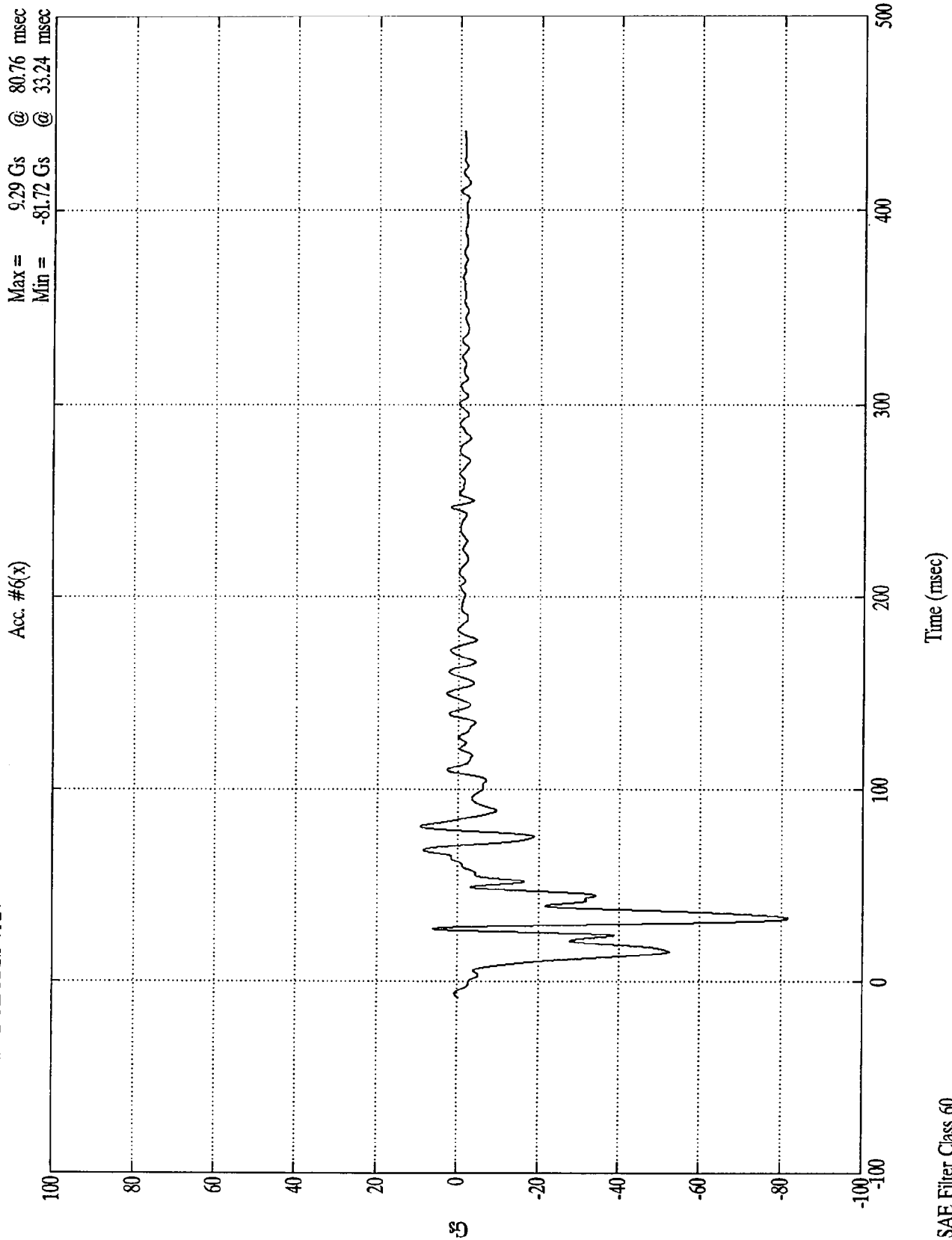
Acc. #5(x)

Max = 363.52 mm @ 42.36 msec
Min = -3398.43 mm @ 440.88 msec



SAE Filter Class 180

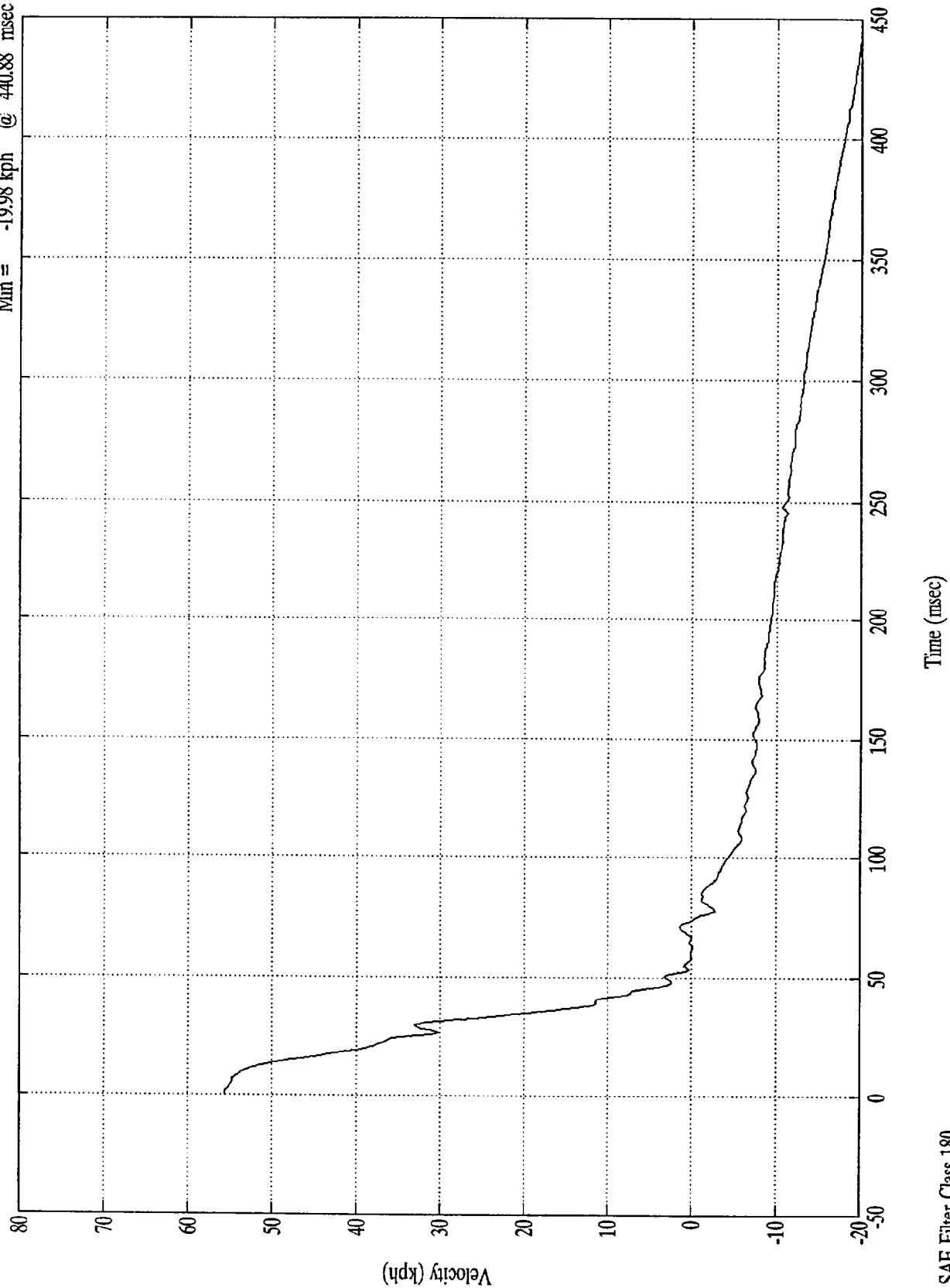
NCAP TEST #2 - 1996 DODGE RAM VAN



NCAP TEST #2 - 1996 DODGE RAM VAN

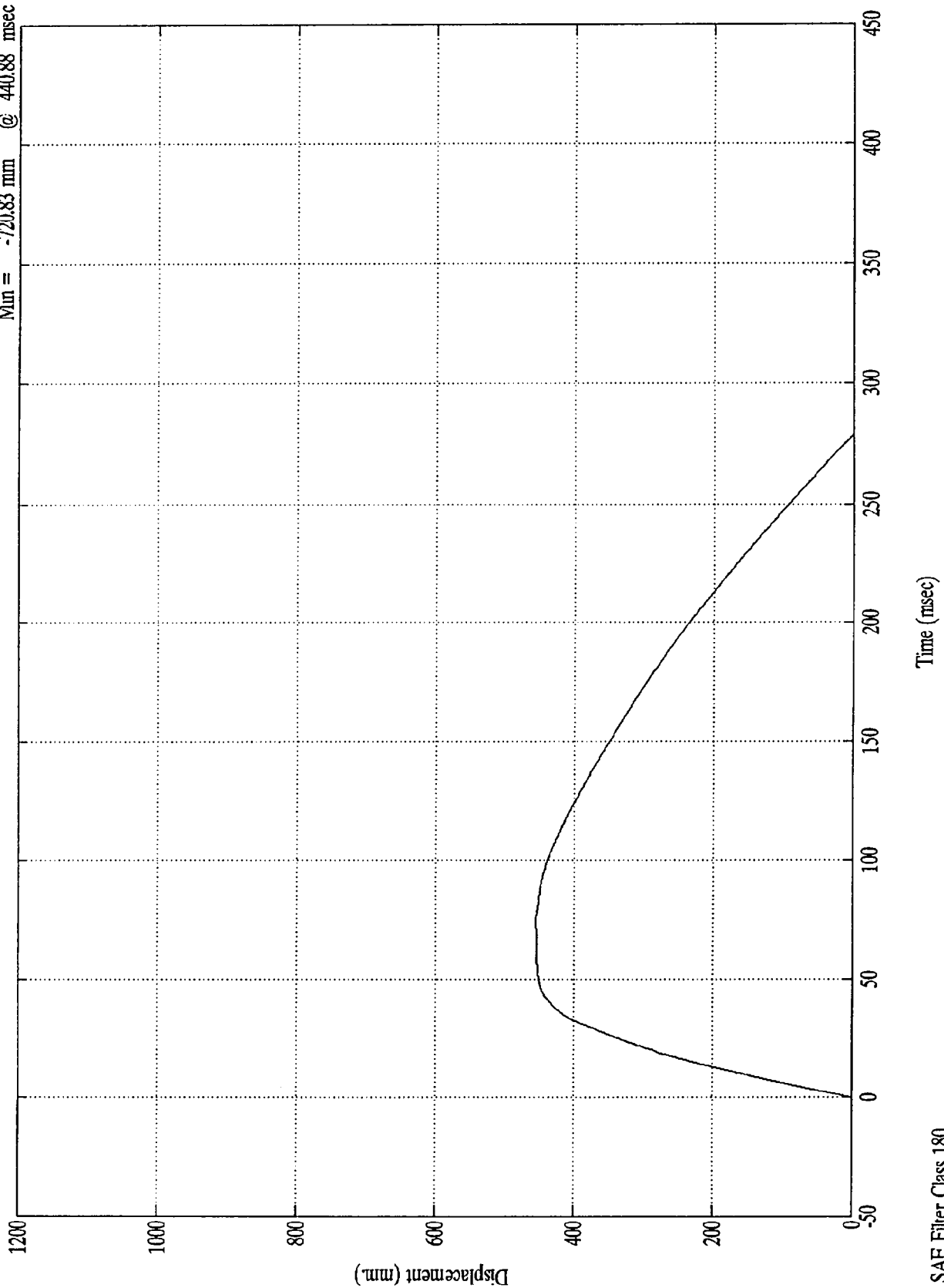
Max = 55.68 kph @ -0.00 msec
Min = -19.98 kph @ 440.88 msec

Acc. #6(x)



NCAP TEST #2 - 1996 DODGE RAM VAN

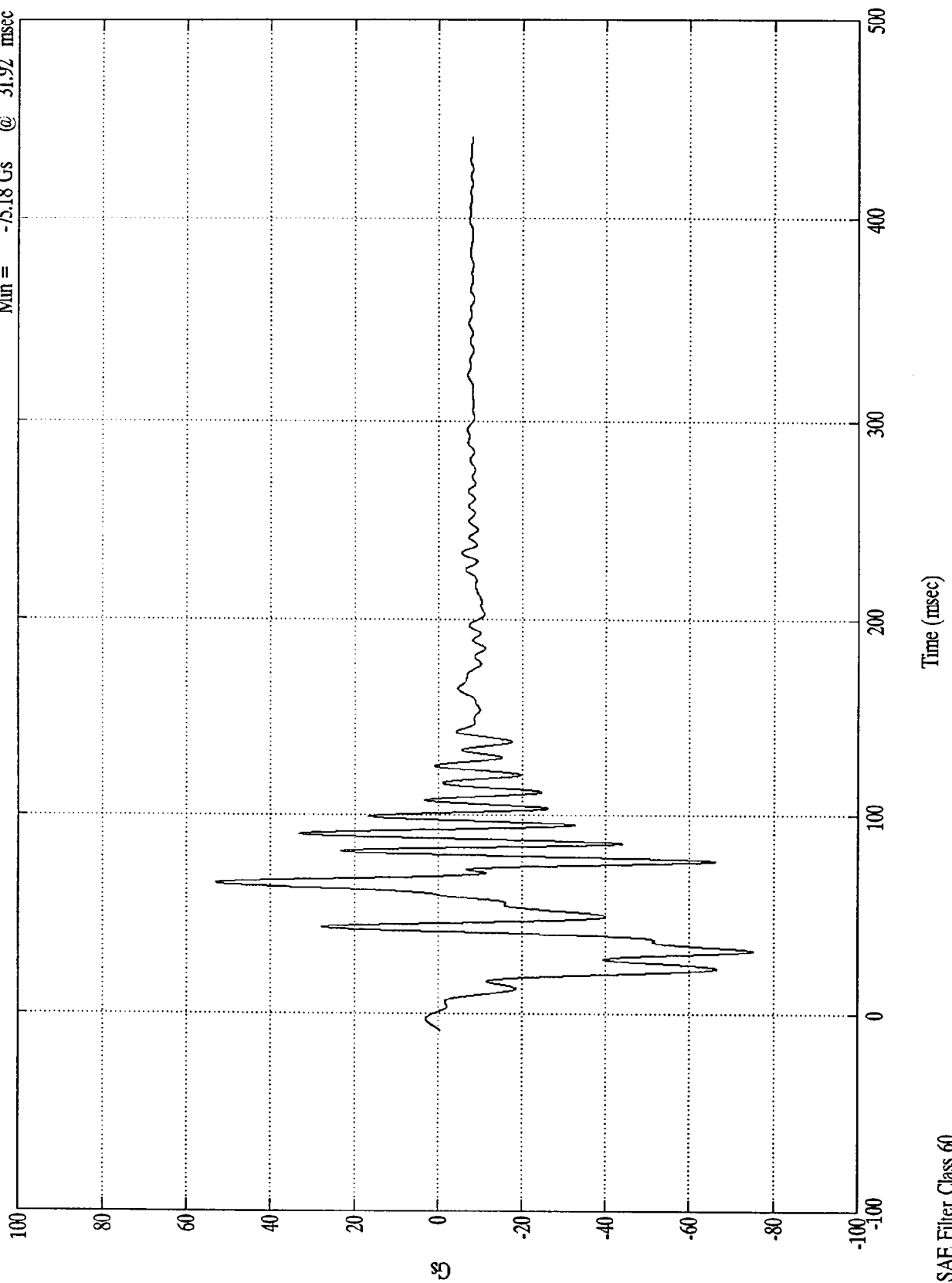
Acc. #6(x) Max = 455.14 mm @ 73.80 msec
Min = -720.83 mm @ 440.88 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 53.04 Gs @ 65.40 msec
 Min = -75.18 Gs @ 31.92 msec

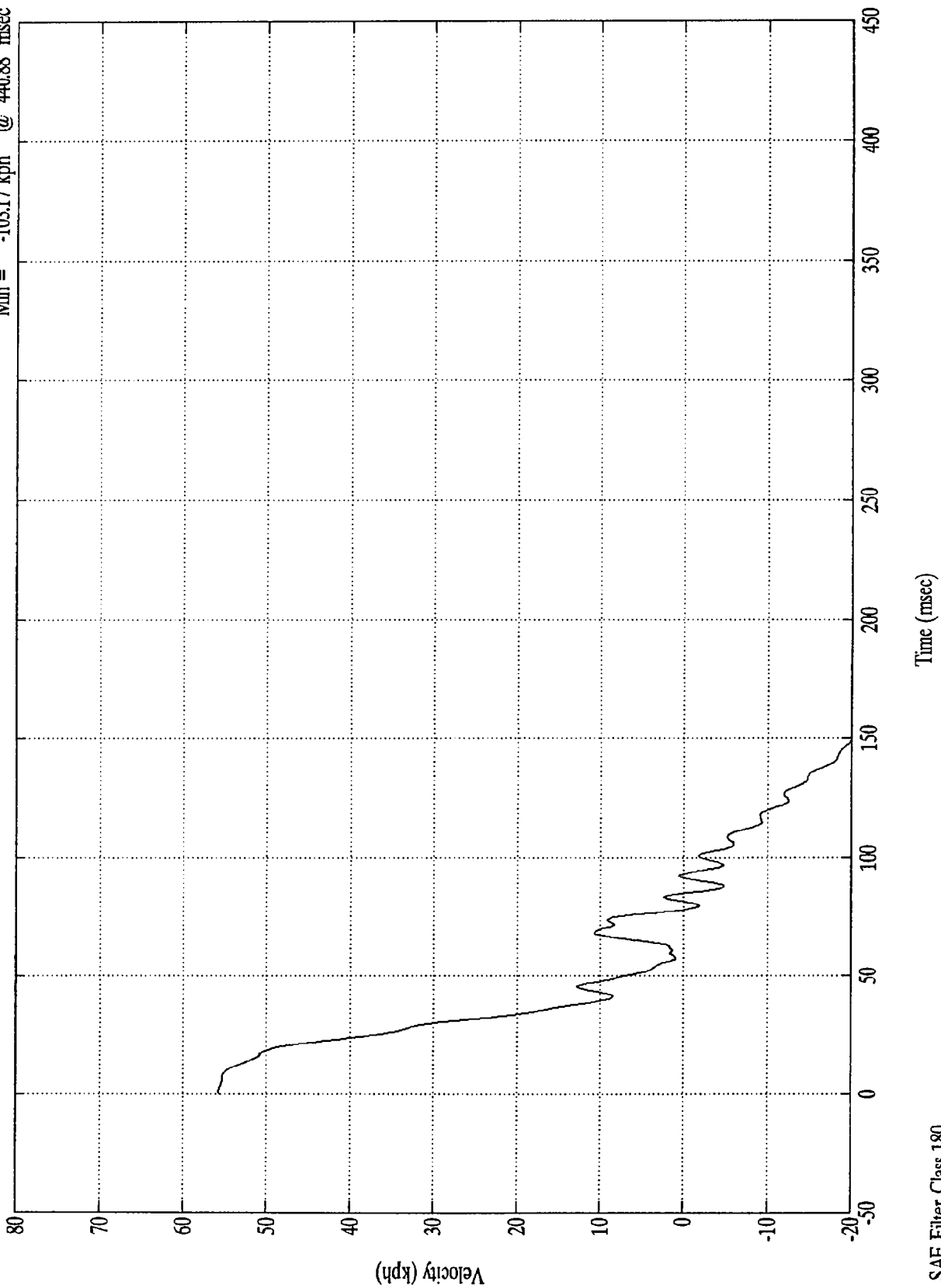
Acc. #7(x)



NCAP TEST #2 - 1996 DODGE RAM VAN

Acc. #7(x)

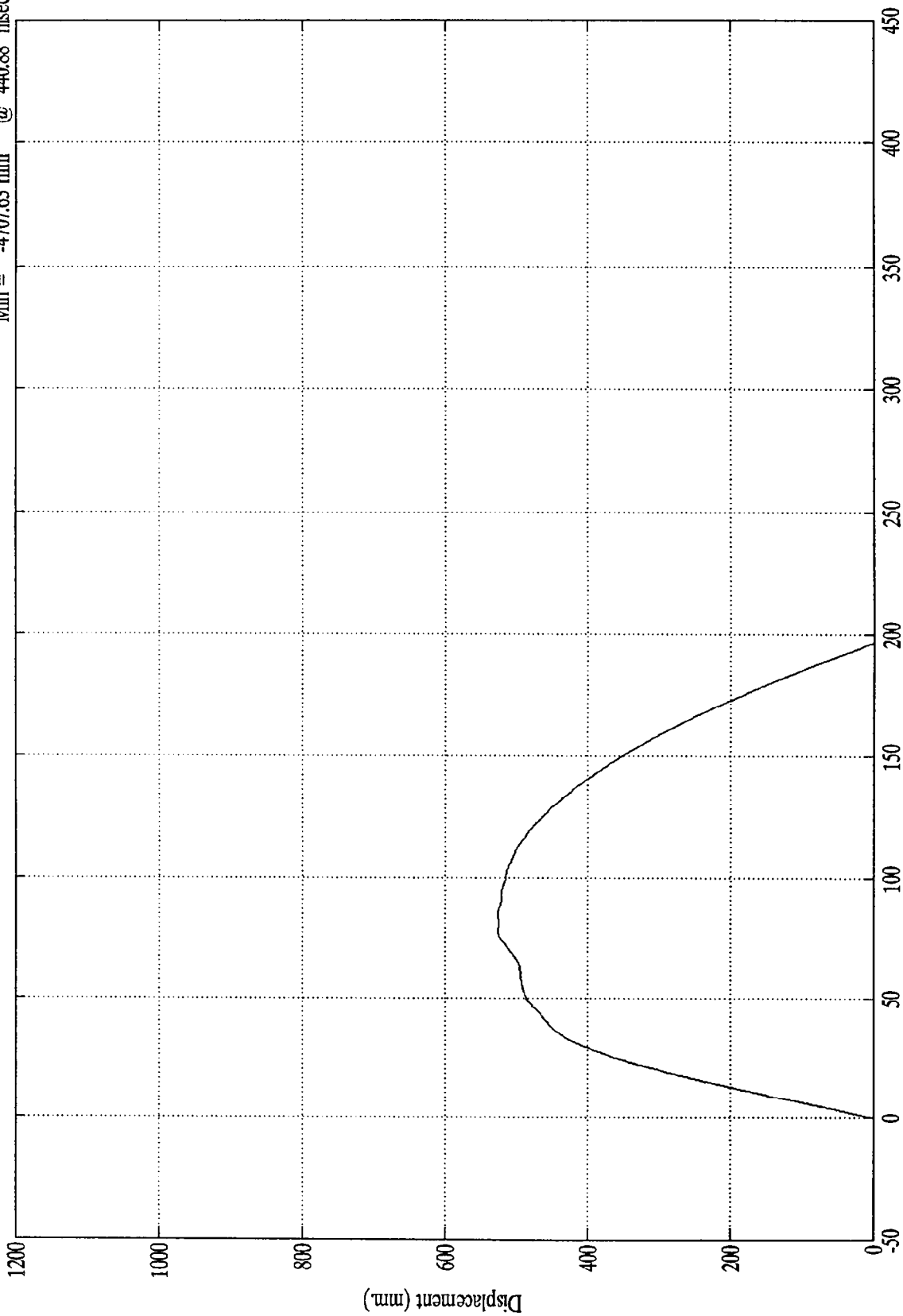
Max = 55.72 kph @ 0.95 msec
Min = -103.17 kph @ 440.88 msec



SAE Filter Class 180

NCAP TEST #2 - 19% DODGE RAM VAN

Acc. #7(x)
 Max = 526.40 mm @ 85.08 msec
 Min = -4707.63 mm @ 440.88 msec



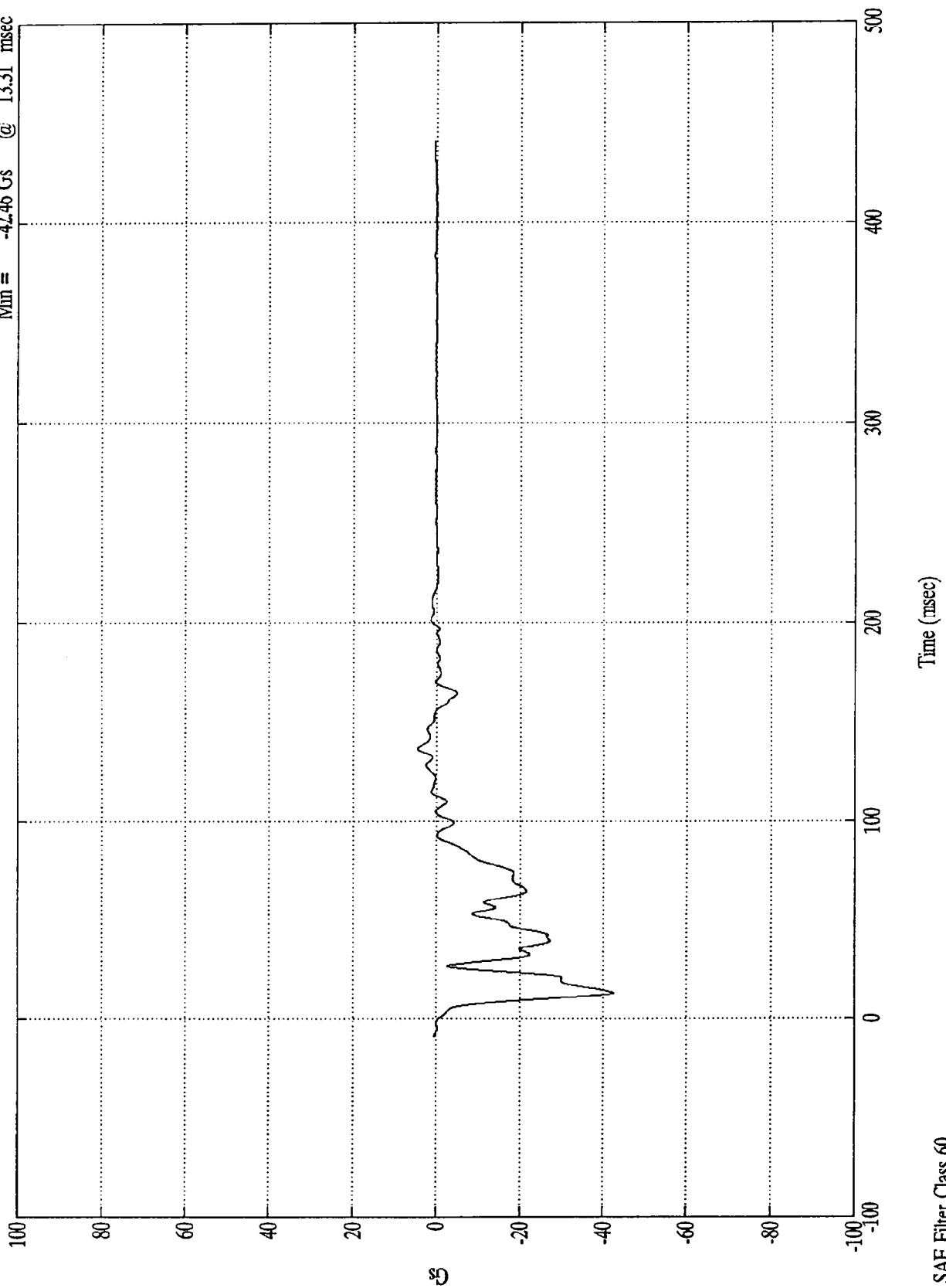
Time (msec)

SAE Filter Class 180

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 4.52 Gs @ 136.08 msec
Min = -42.46 Gs @ 13.31 msec

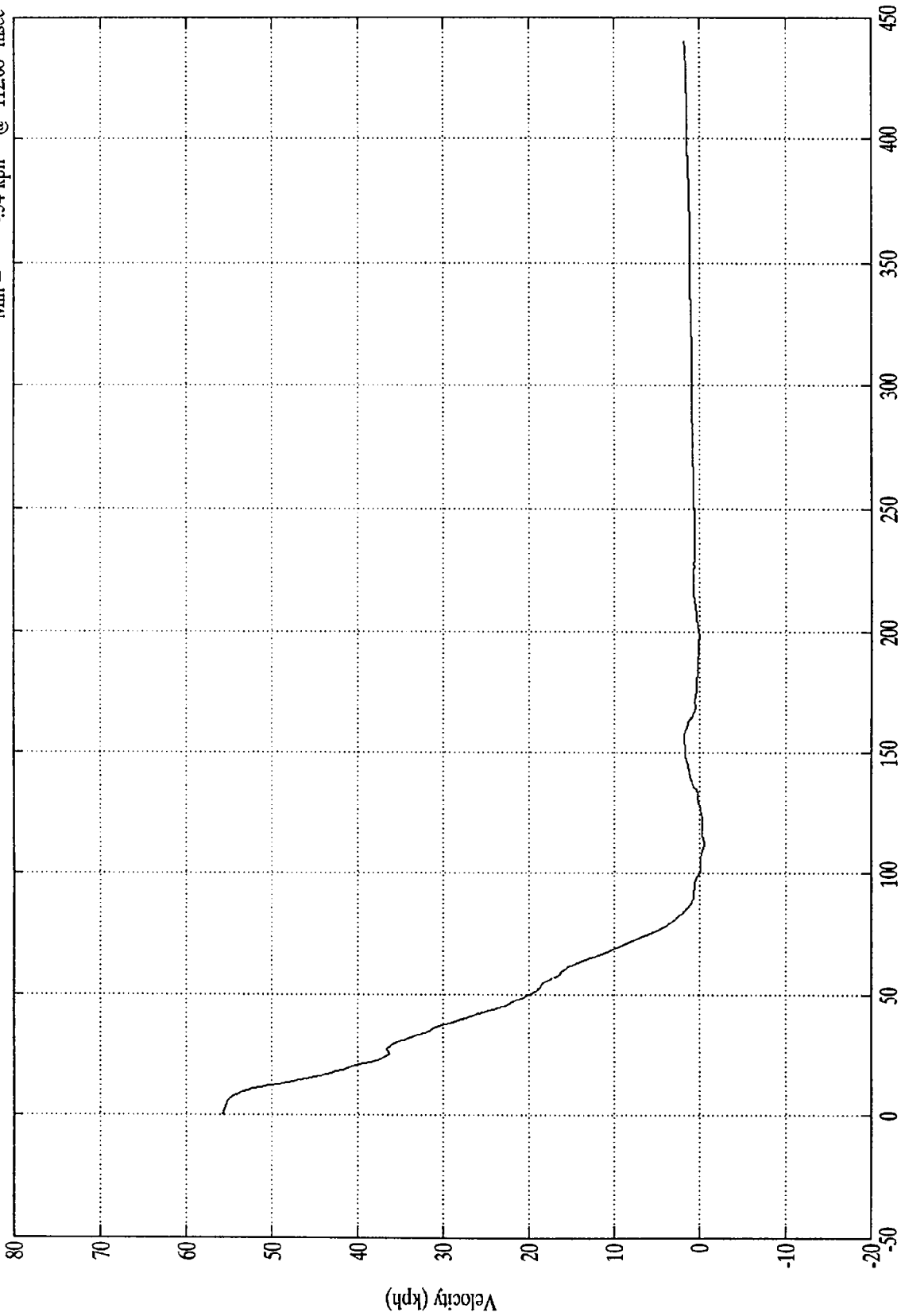
Acc. #8(x)



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 55.69 kph @ 0.59 msec
Min = -54 kph @ 112.68 msec

Acc. #8(x)



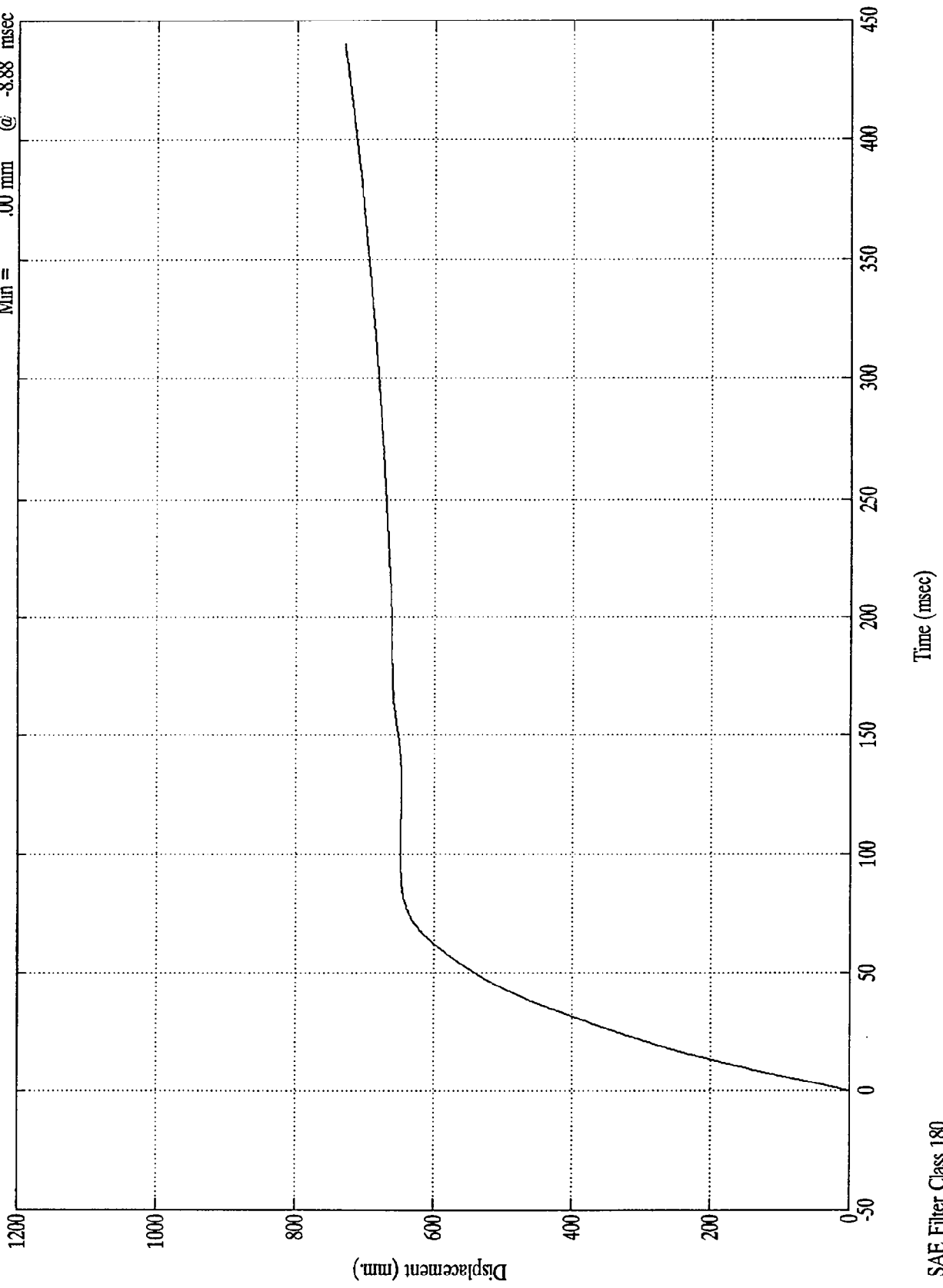
Time (msec)

SAE Filter Class 180

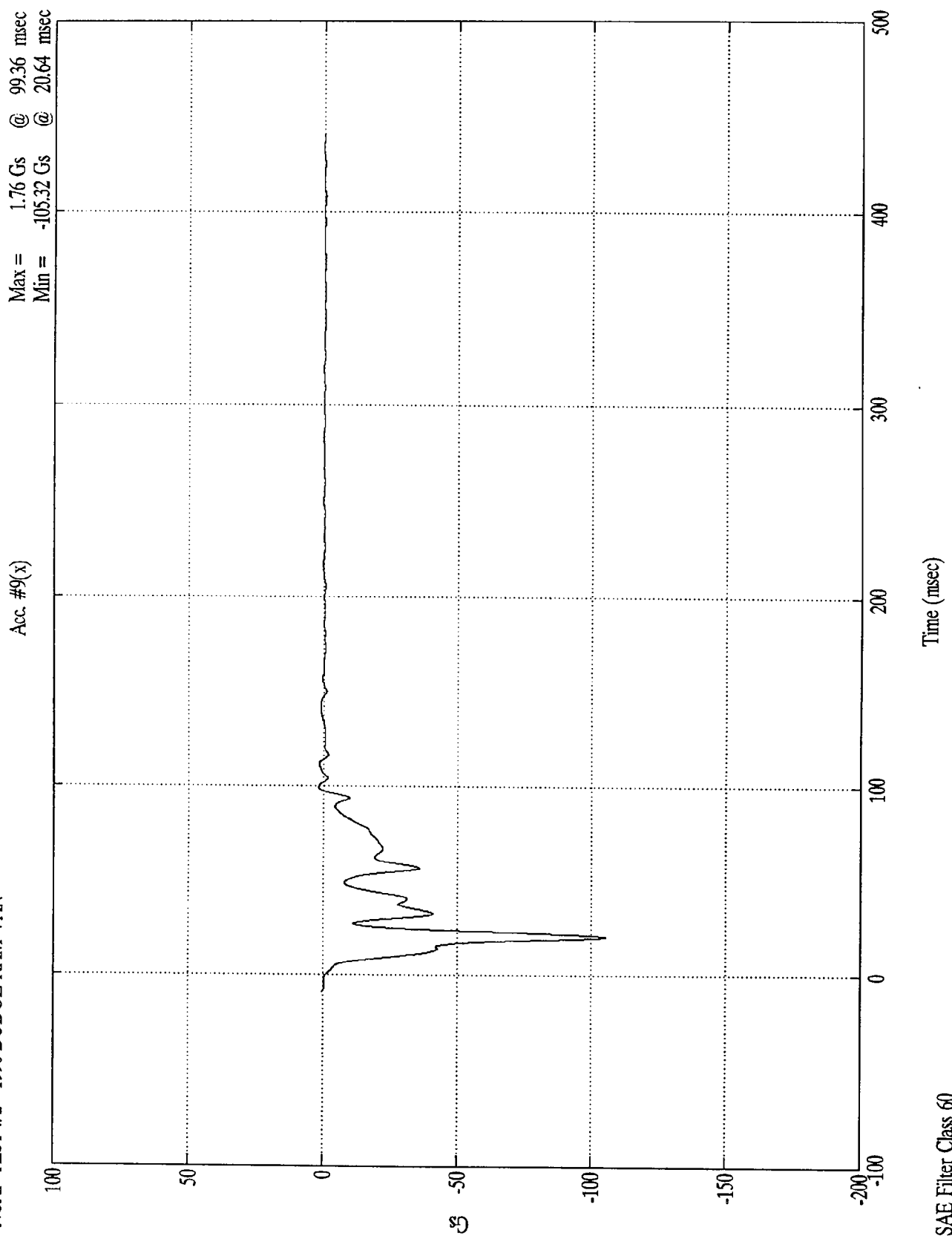
NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 731.21 mm @ 440.88 msec
Min = .00 mm @ -8.88 msec

Acc. #8(x)



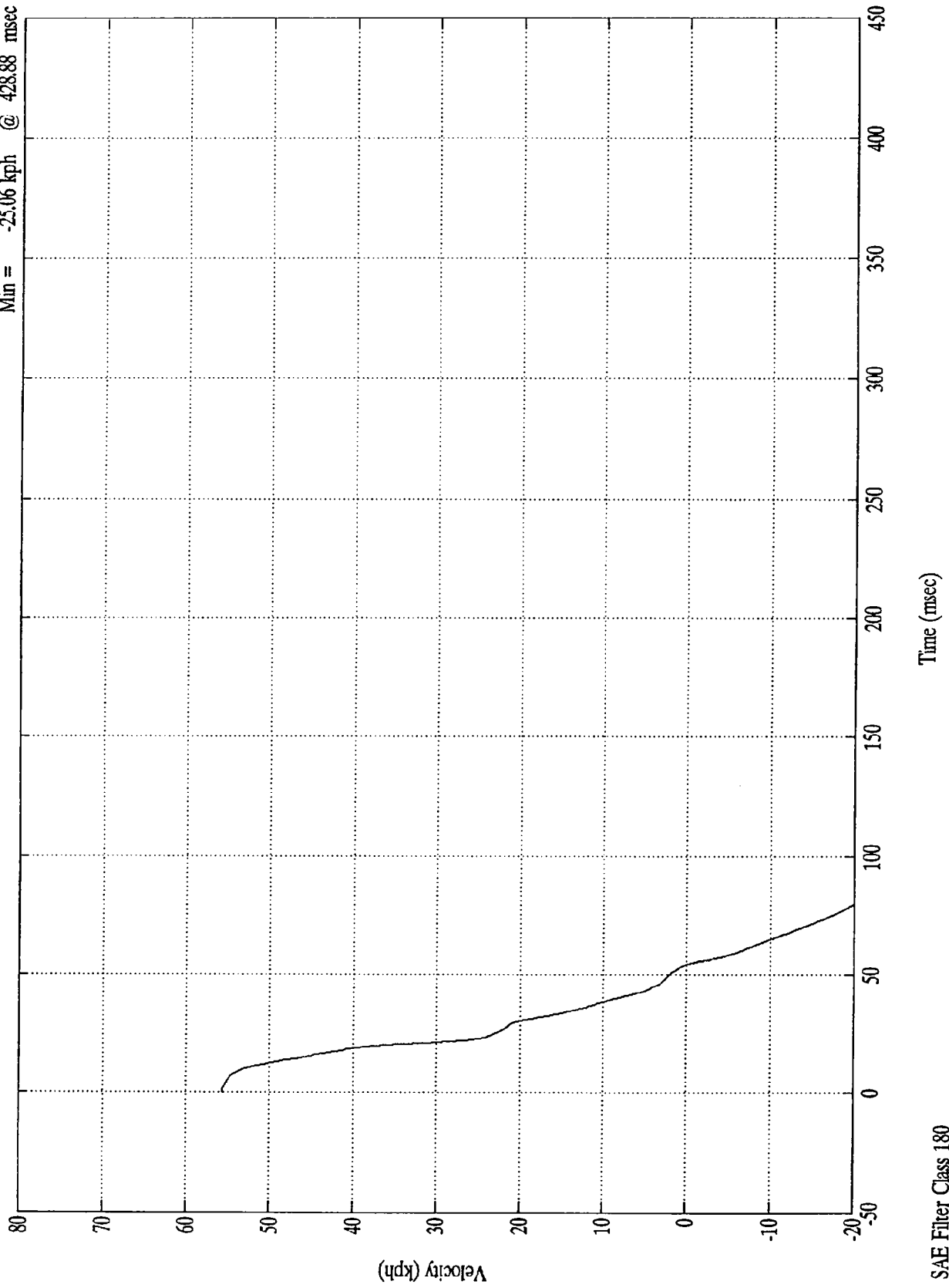
NCAP TEST #2 - 1996 DODGE RAM VAN



NCAP TEST #2 - 1996 DODGE RAM VAN

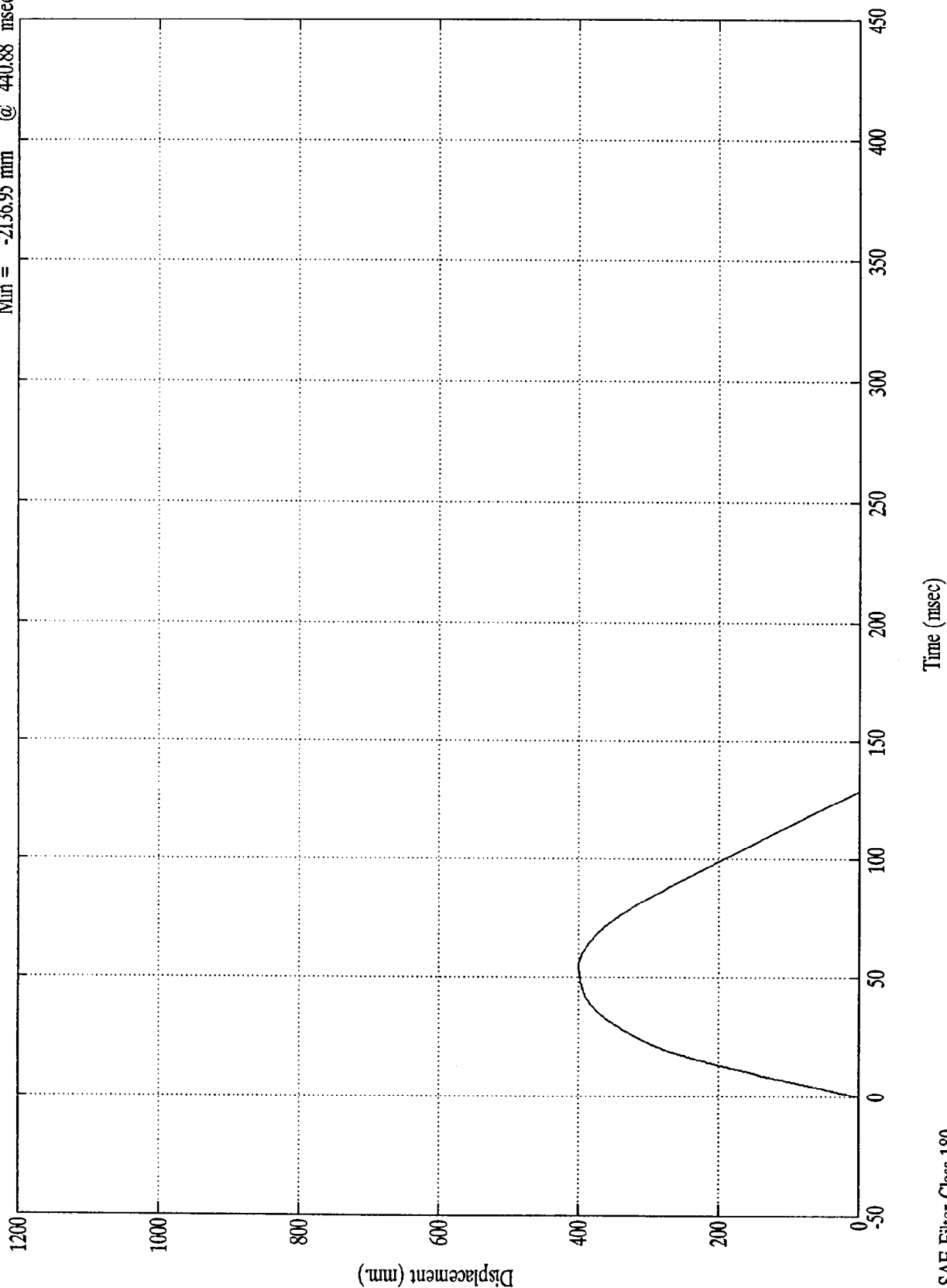
Max = 55.68 kph @ -0.00 msec
Min = -25.06 kph @ 428.88 msec

Acc. #9(x)



NCAP TEST #2 - 1996 DODGE RAM VAN

Acc. #9(x)
 Max = 399.84 mm @ 54.48 msec
 Min = -2136.95 mm @ 440.88 msec



TEST NO. MT0302

LOAD CELL BARRIER DATA

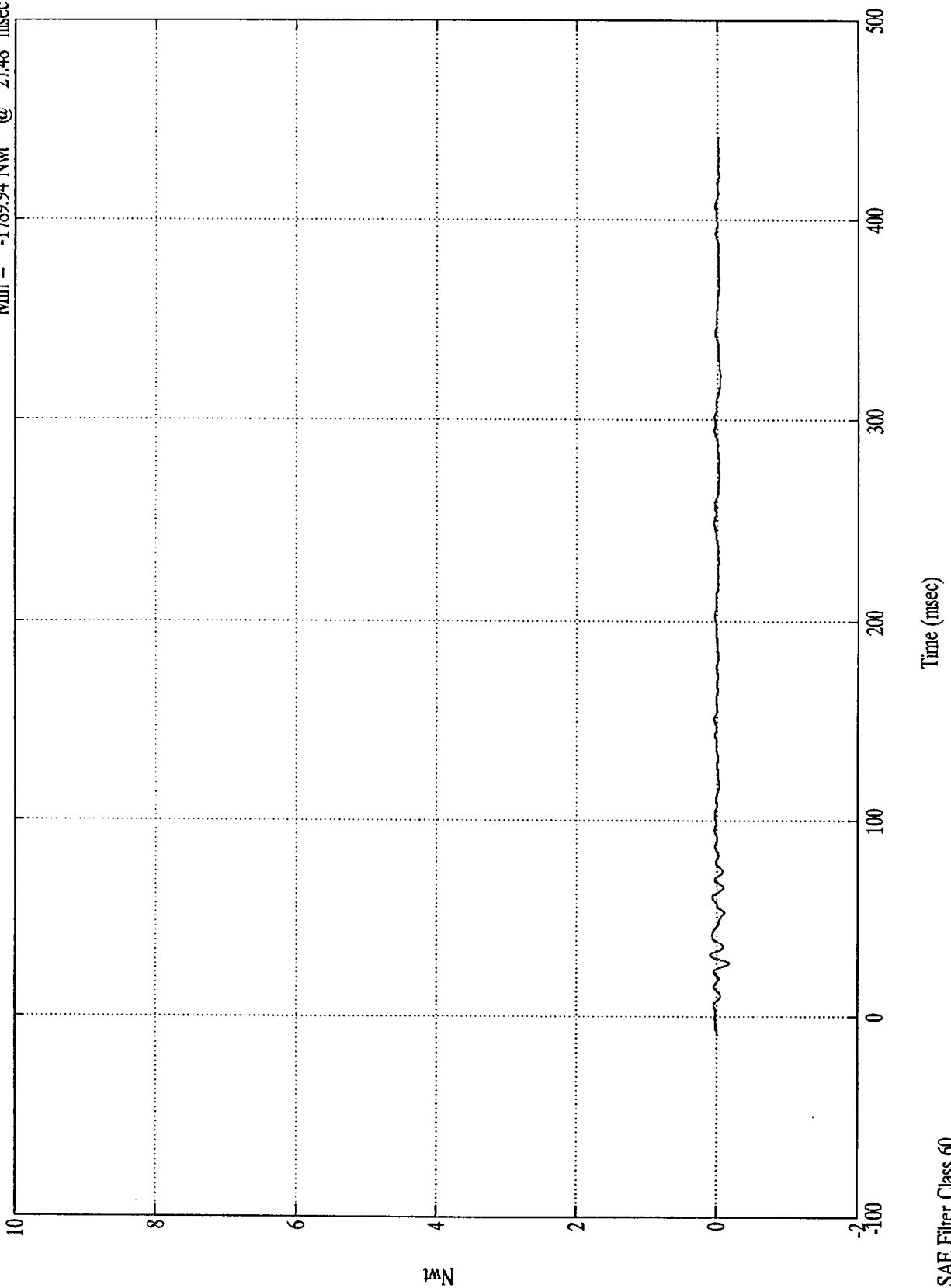
FILTER CHANNEL CLASS

60

NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell A1
 Max = 1003.73 Nwt @ 31.80 msec
 Min = -1789.94 Nwt @ 27.48 msec

Barrier Load Cell A1

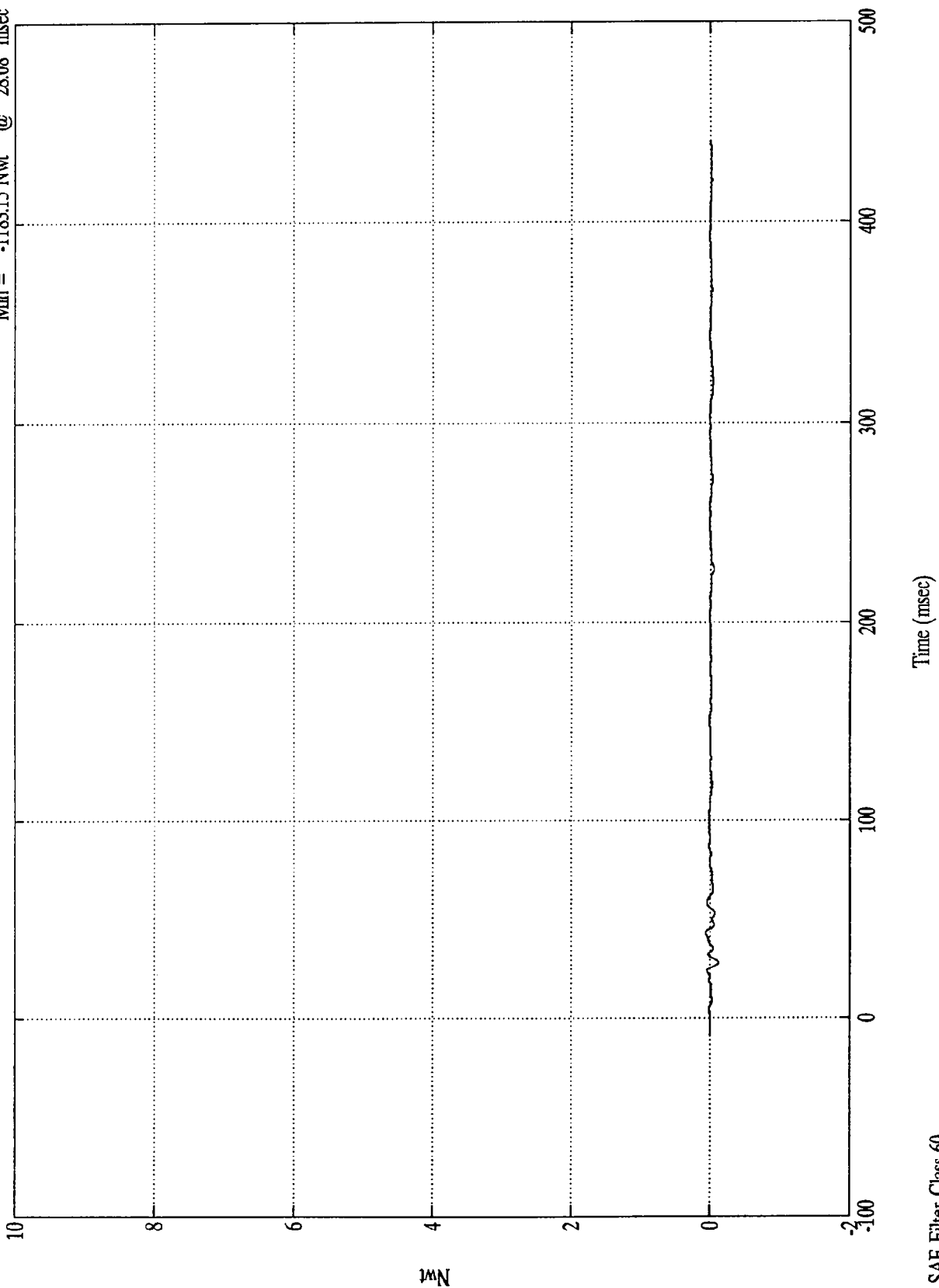


NCAP TEST #2 - 1996 DODGE RAM VAN

$\times 10^4$

Barrier Load Cell A2

Max = 683.11 Nwt @ 42.84 msec
Min = -1183.15 Nwt @ 28.08 msec



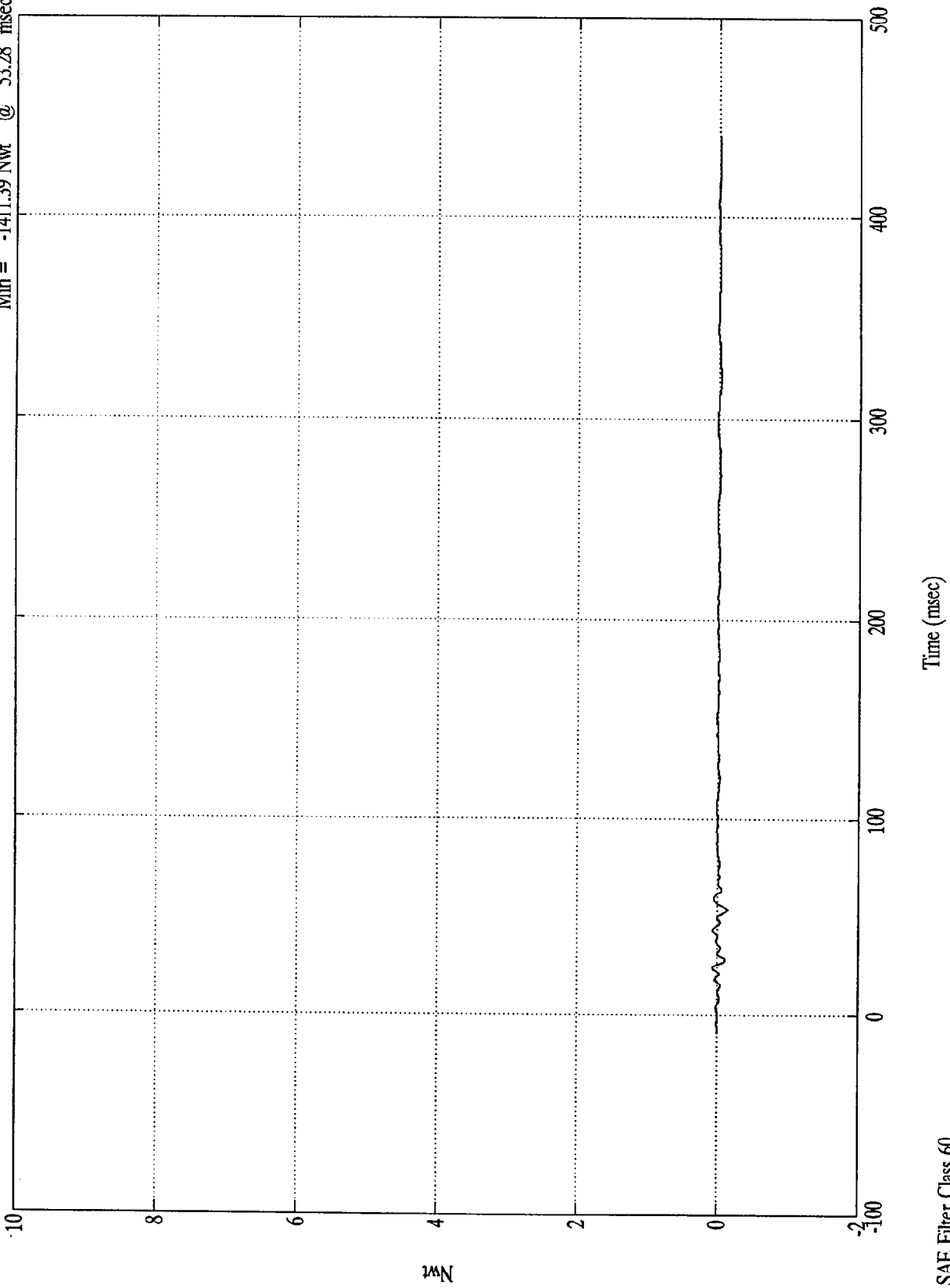
Nwt

SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 697.75 Nwt @ 24.36 msec
Min = -1411.39 Nwt @ 53.28 msec

Barrier Load Cell A3

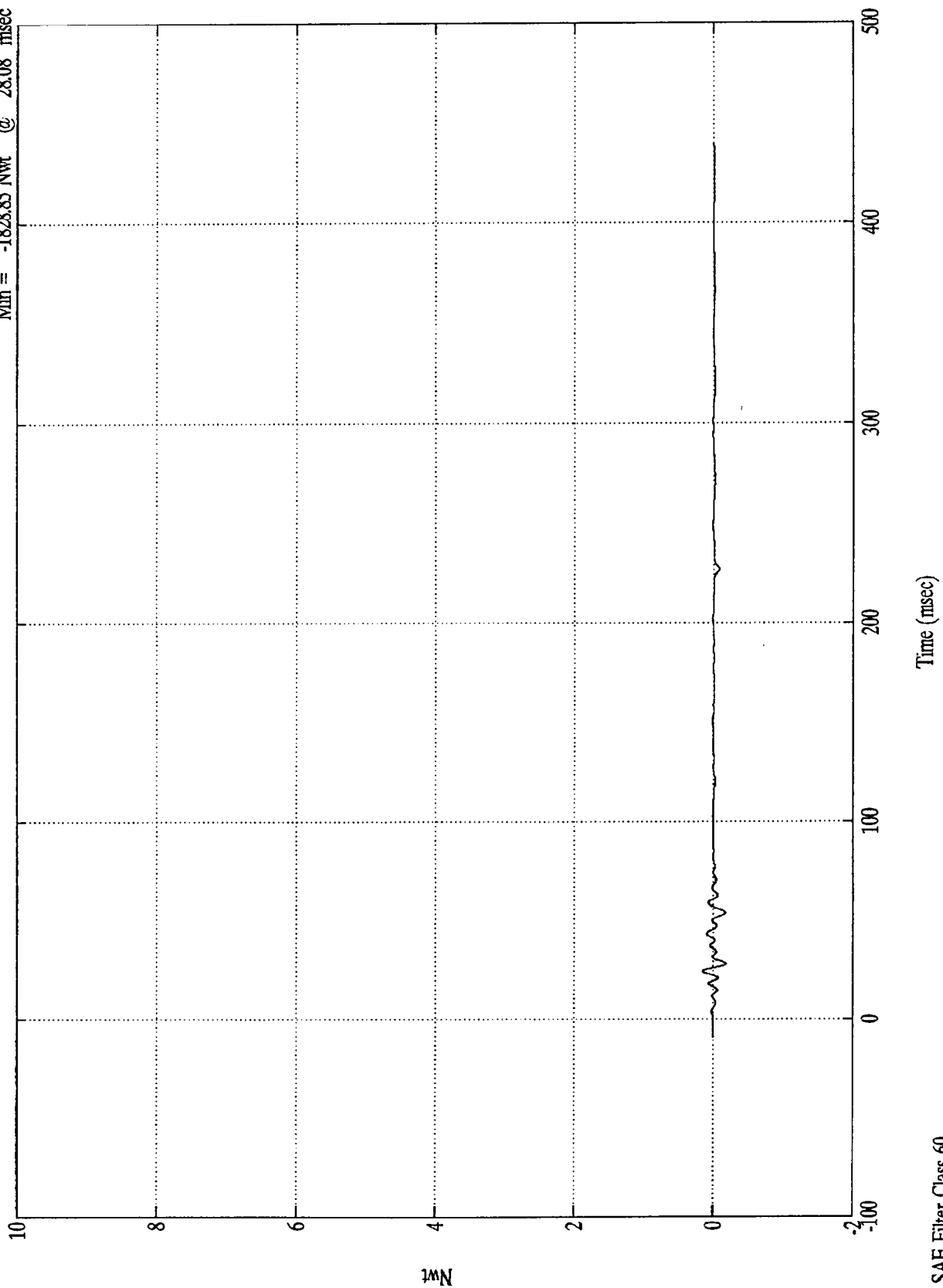


SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

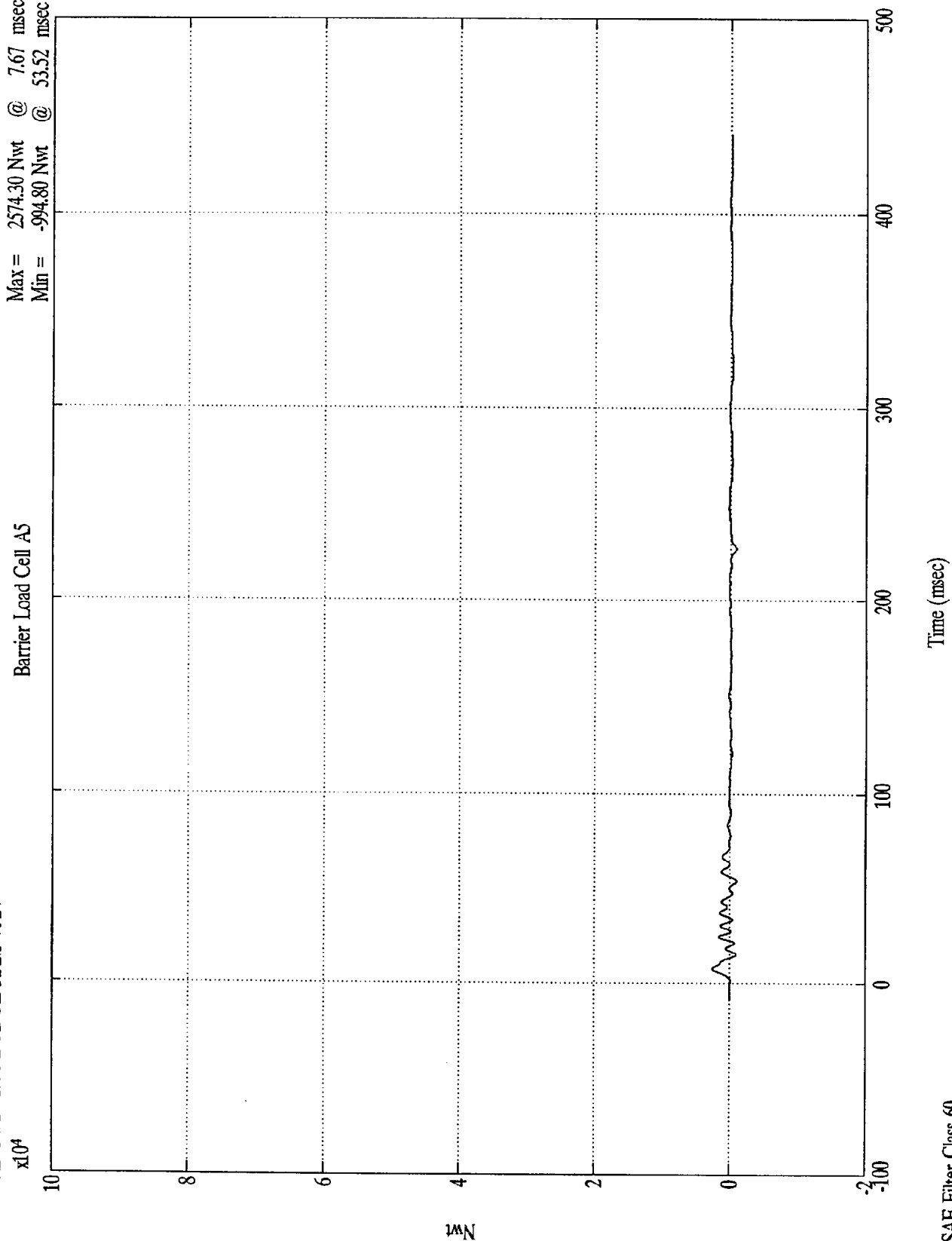
Barrier Load Cell A4
Max = 1484.32 Nwt @ 24.47 msec
Min = -1828.85 Nwt @ 28.08 msec

$\times 10^4$



NCAP TEST #2 - 1996 DODGE RAM VAN

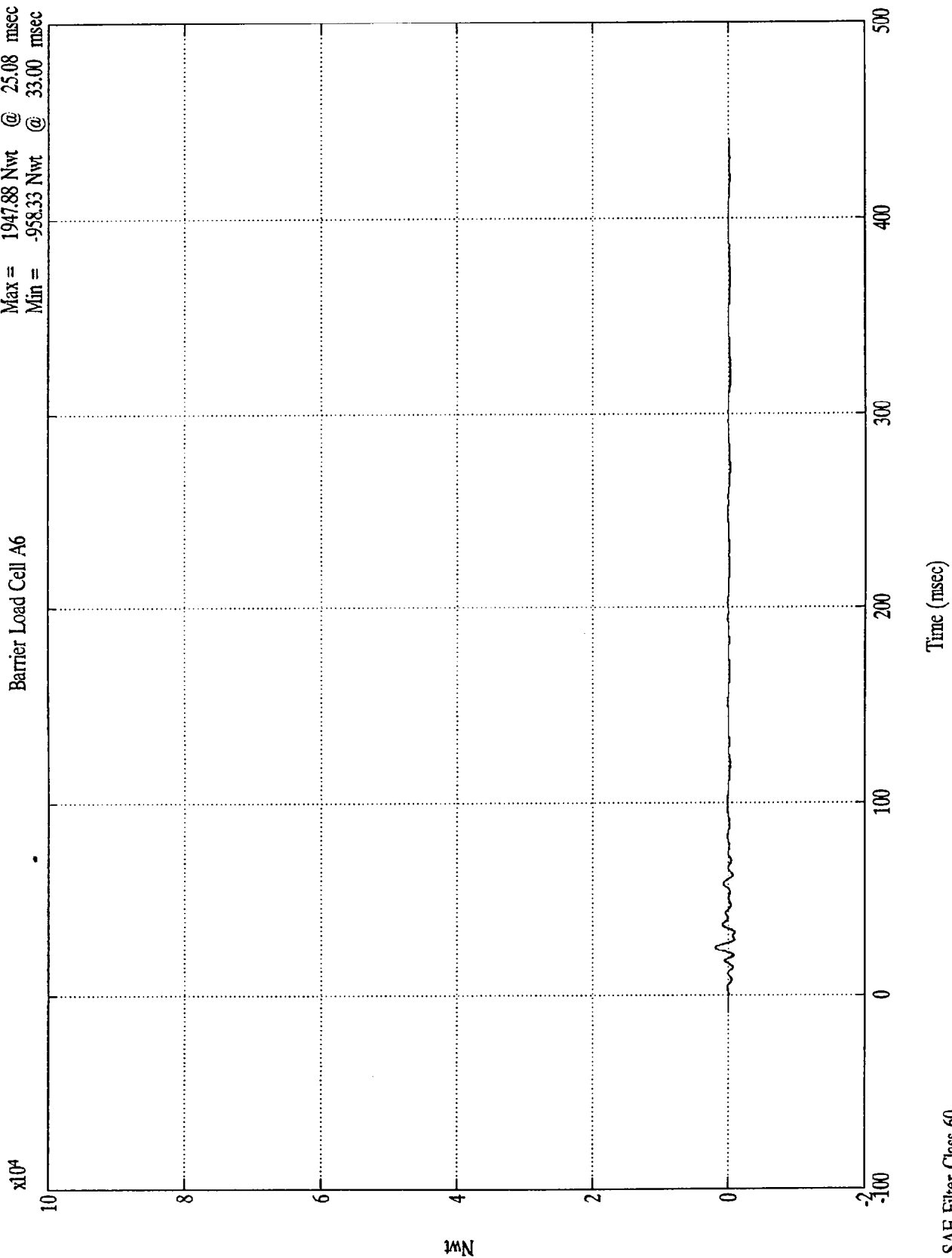
Barrier Load Cell A5
 Max = 2574.30 Nwt @ 7.67 msec
 Min = -994.80 Nwt @ 53.52 msec



SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

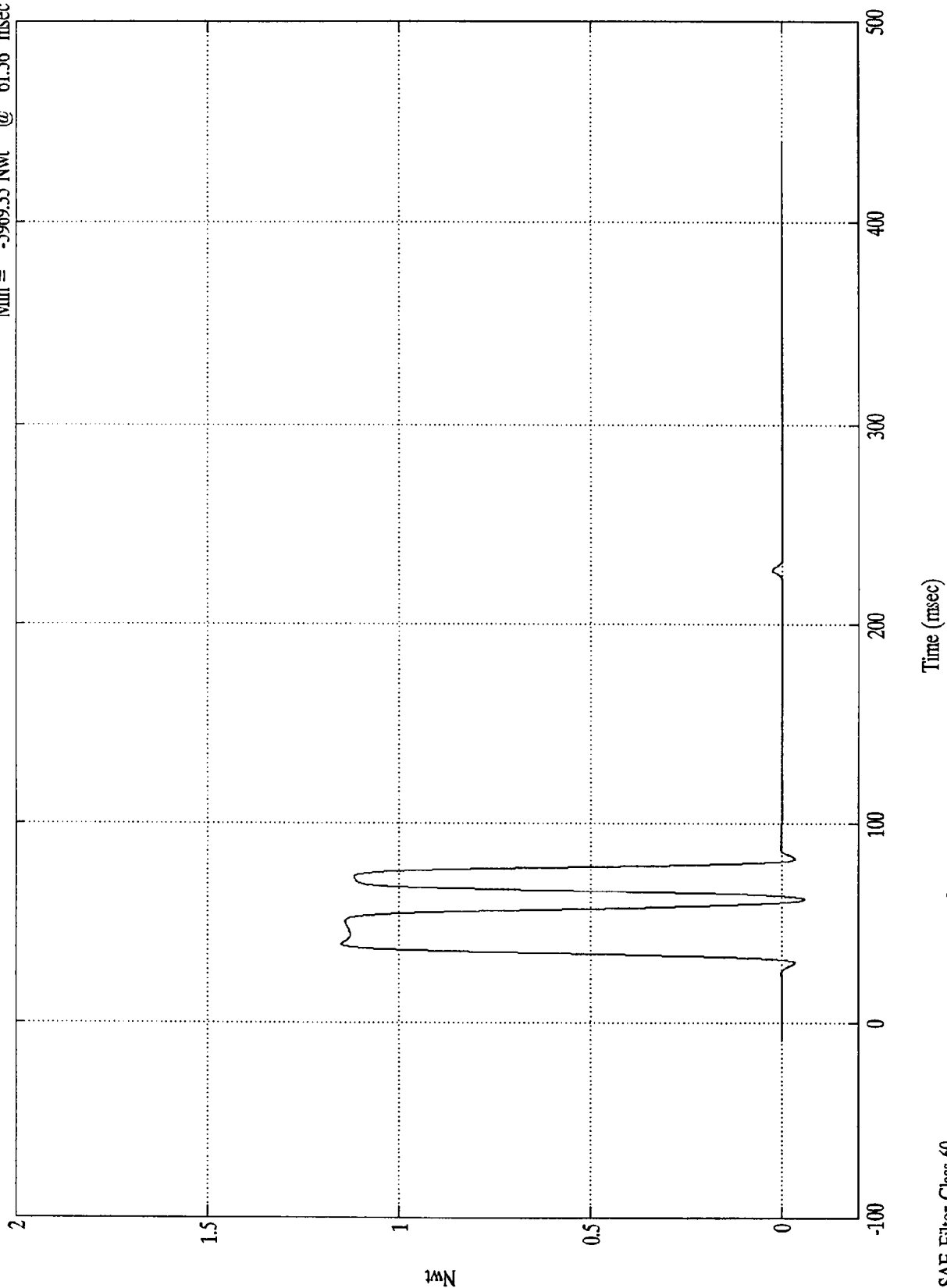
Barrier Load Cell A6
Max = 1947.88 Nwt @ 25.08 msec
Min = -958.33 Nwt @ 33.00 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

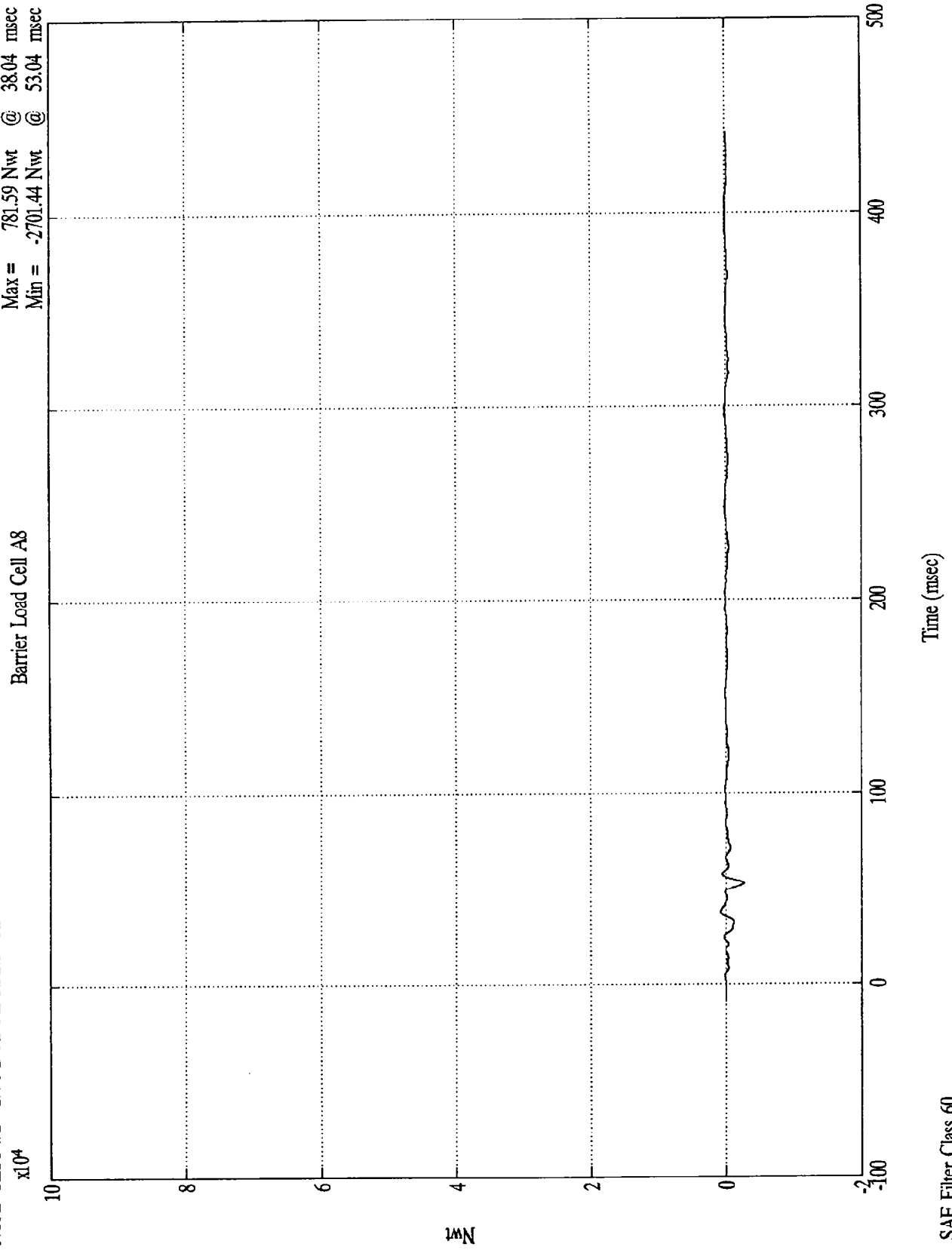
Barrier Load Cell A7
Max = 115260.58 Nwt @ 39.24 msec
Min = -5969.35 Nwt @ 61.56 msec

$\times 10^5$



NCAP TEST #2 - 1996 DODGE RAM VAN

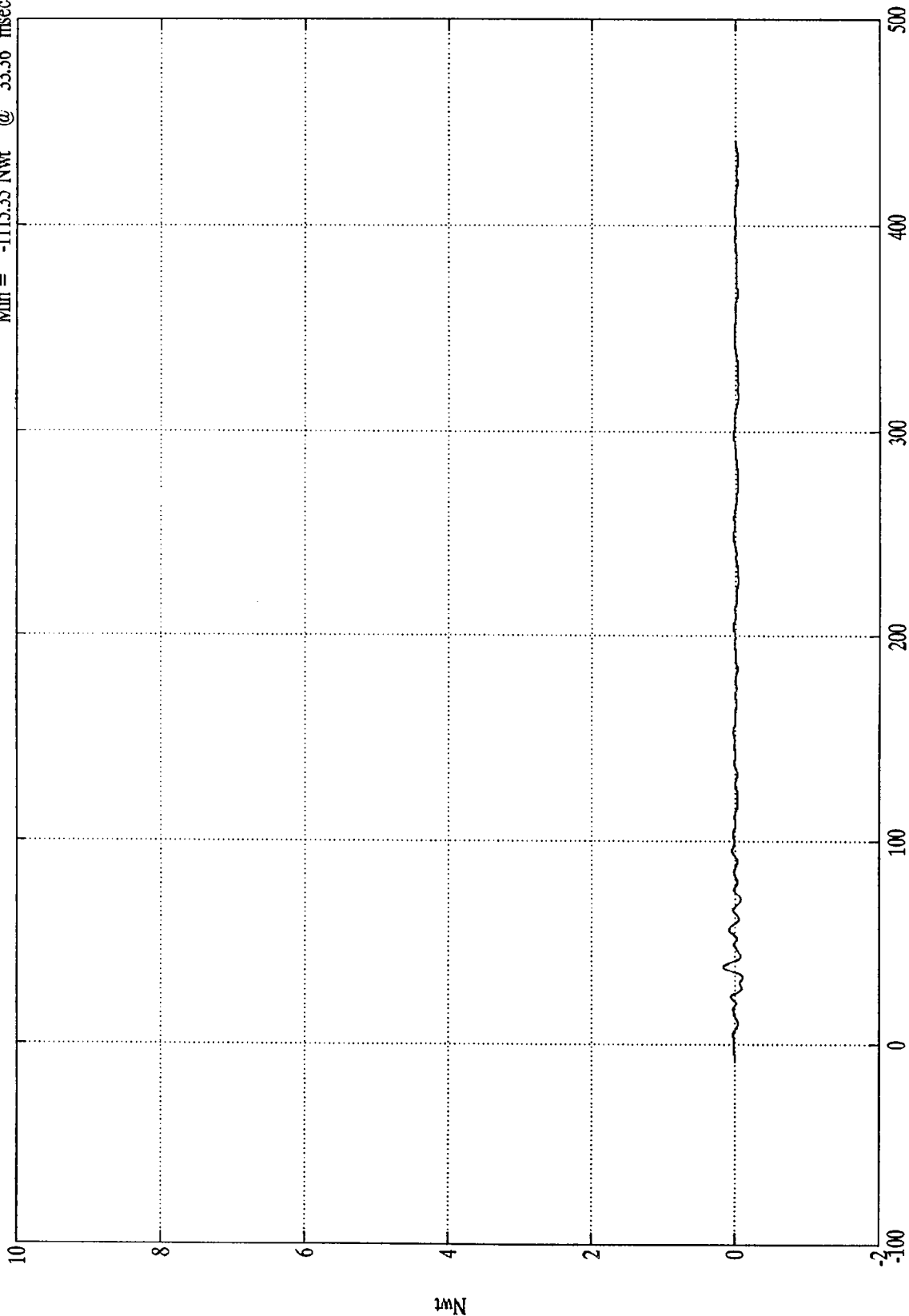
Barrier Load Cell A8
Max = 781.59 Nwt @ 38.04 msec
Min = -2701.44 Nwt @ 53.04 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell A9
 Max = 1602.72 Nwt @ 38.40 msec
 Min = -1115.35 Nwt @ 33.36 msec

x10⁴

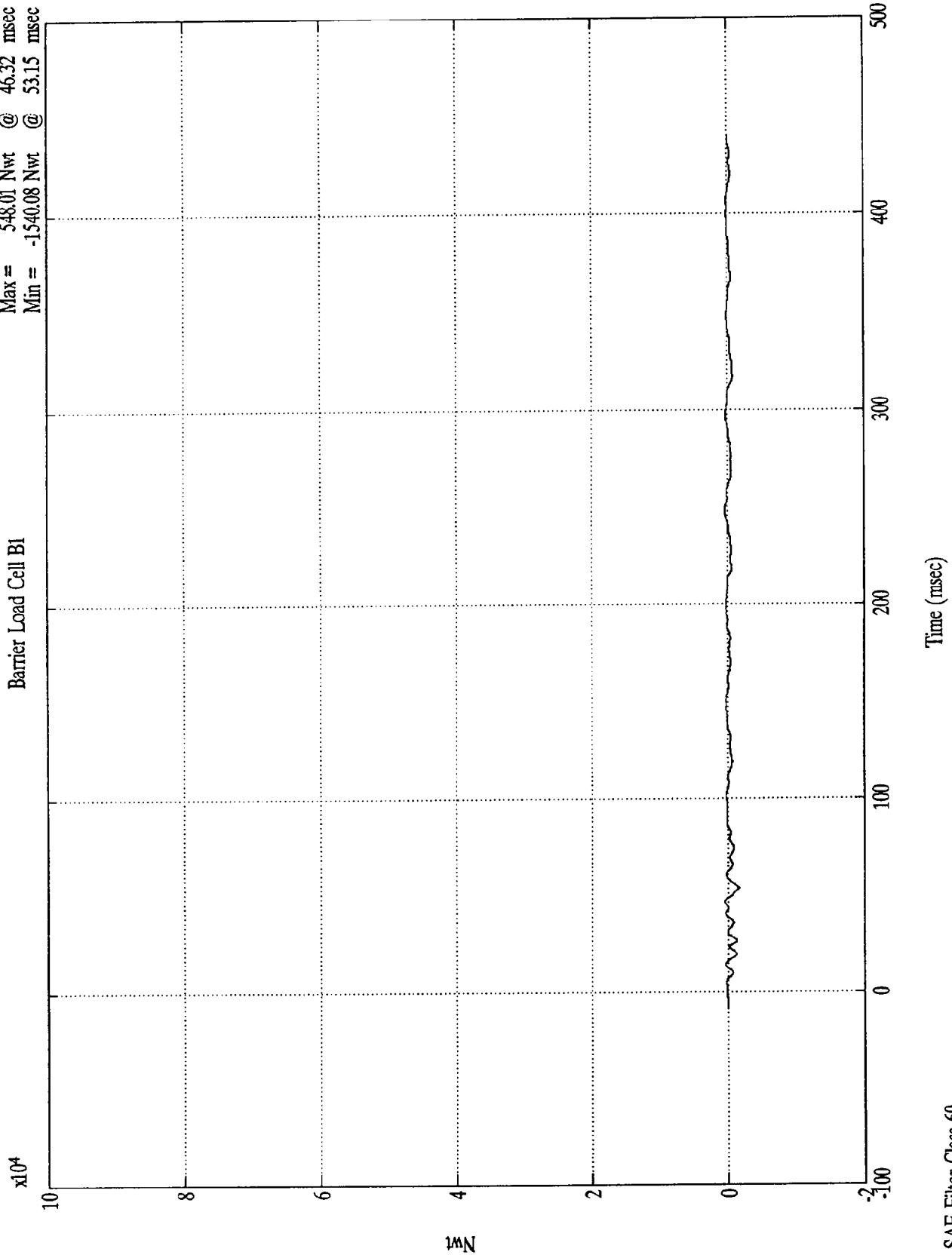


Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

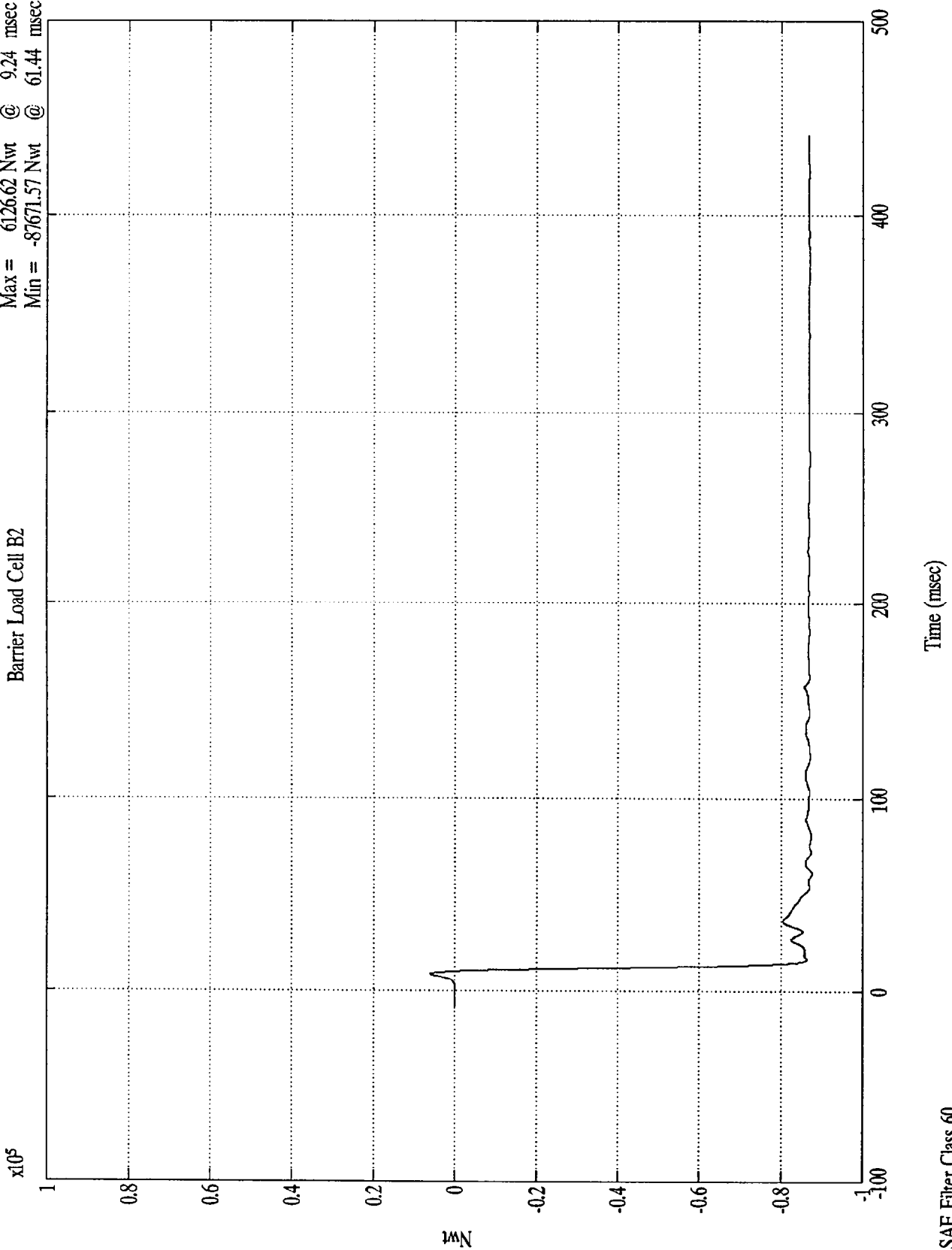
Barrier Load Cell B1
Max = 548.01 Nwt @ 46.32 msec
Min = -1540.08 Nwt @ 53.15 msec



SAE Filter Class 60

NCAP TEST #2 - 19% DODGE RAM VAN

Barrier Load Cell B2
Max = 6126.62 Nwt @ 9.24 msec
Min = -87671.57 Nwt @ 61.44 msec

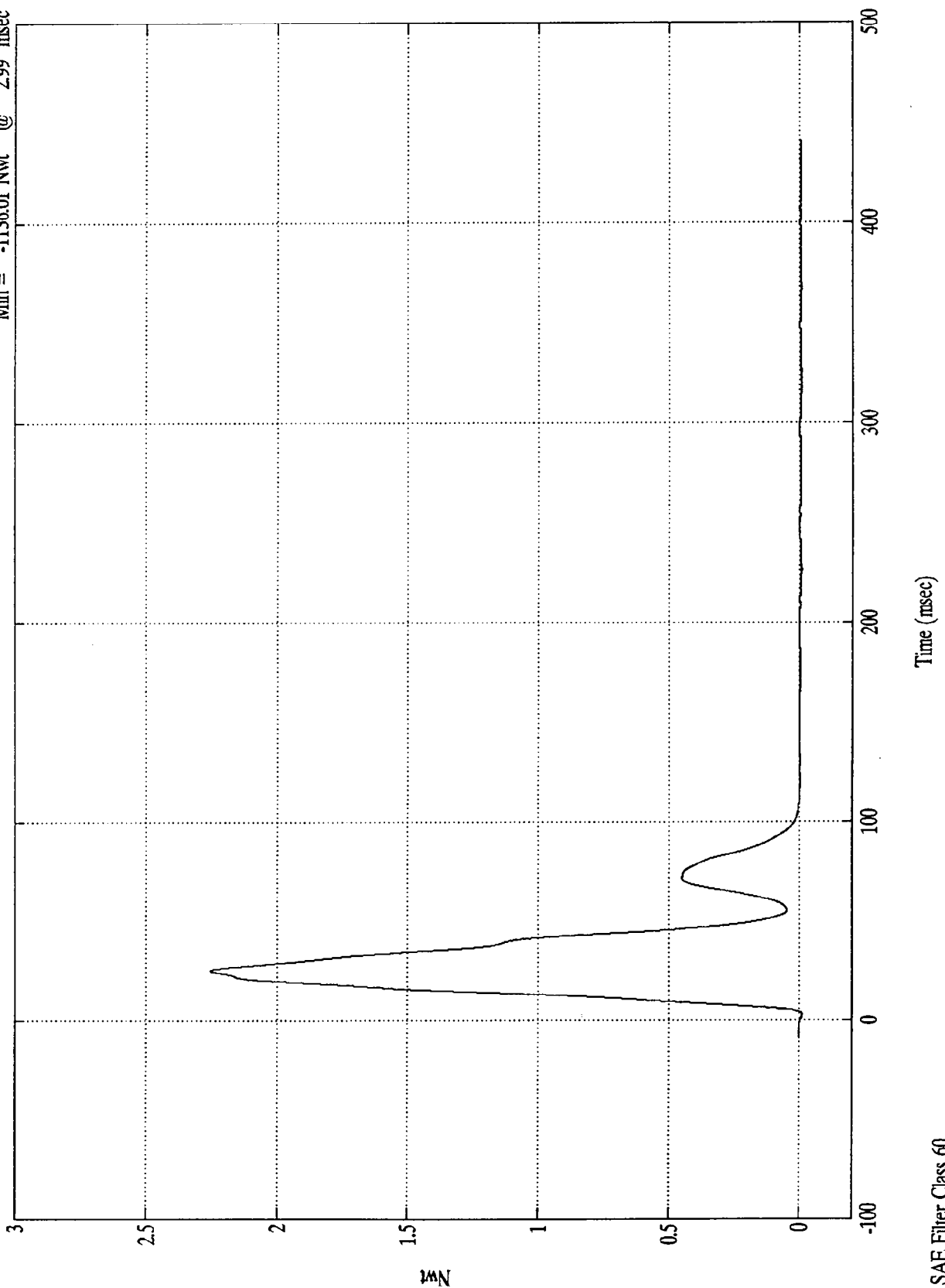


NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell B3

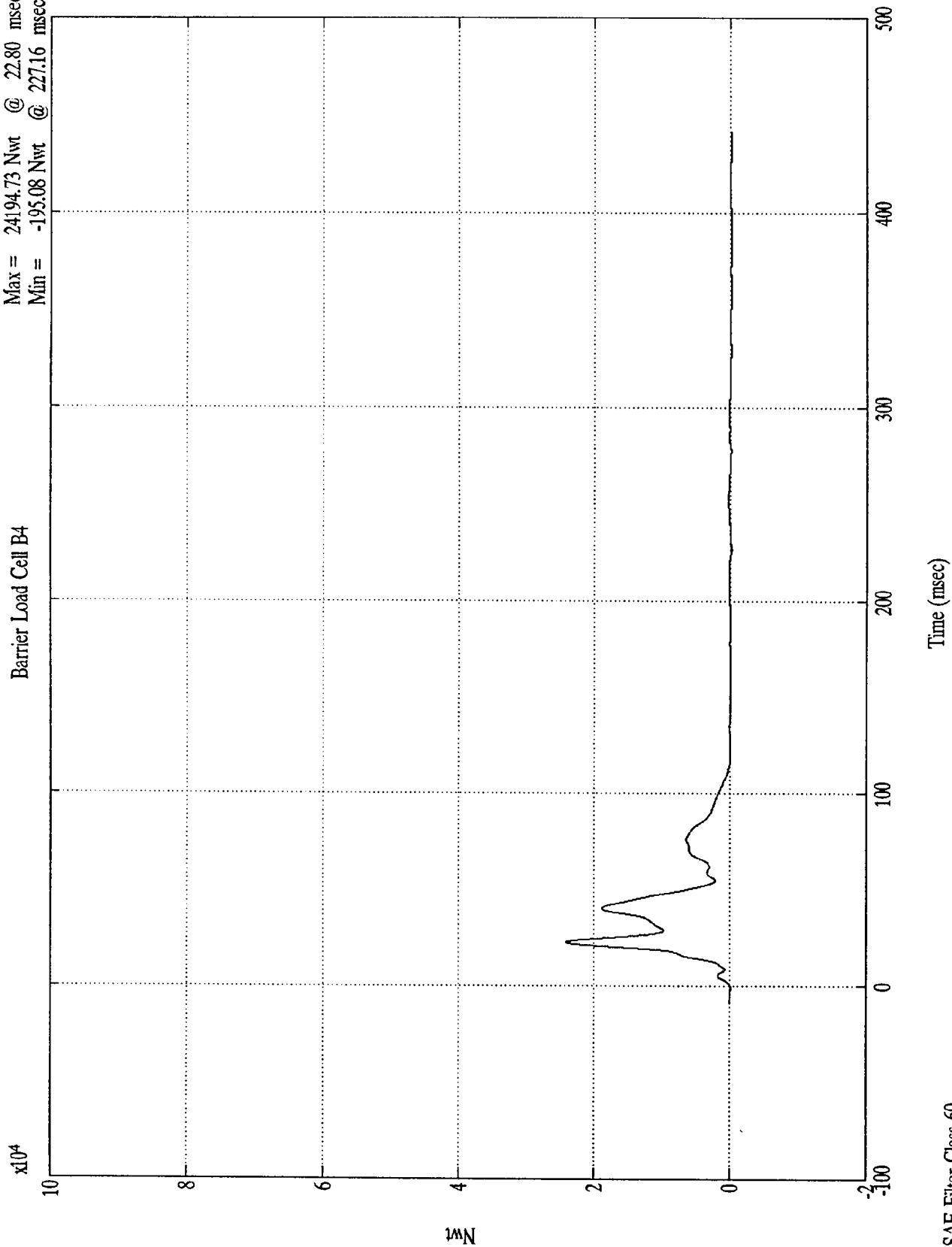
Max = 225285.25 Nwt @ 25.32 msec
Min = -1136.01 Nwt @ 2.99 msec

$\times 10^5$



NCAP TEST #2 - 1996 DODGE RAM VAN

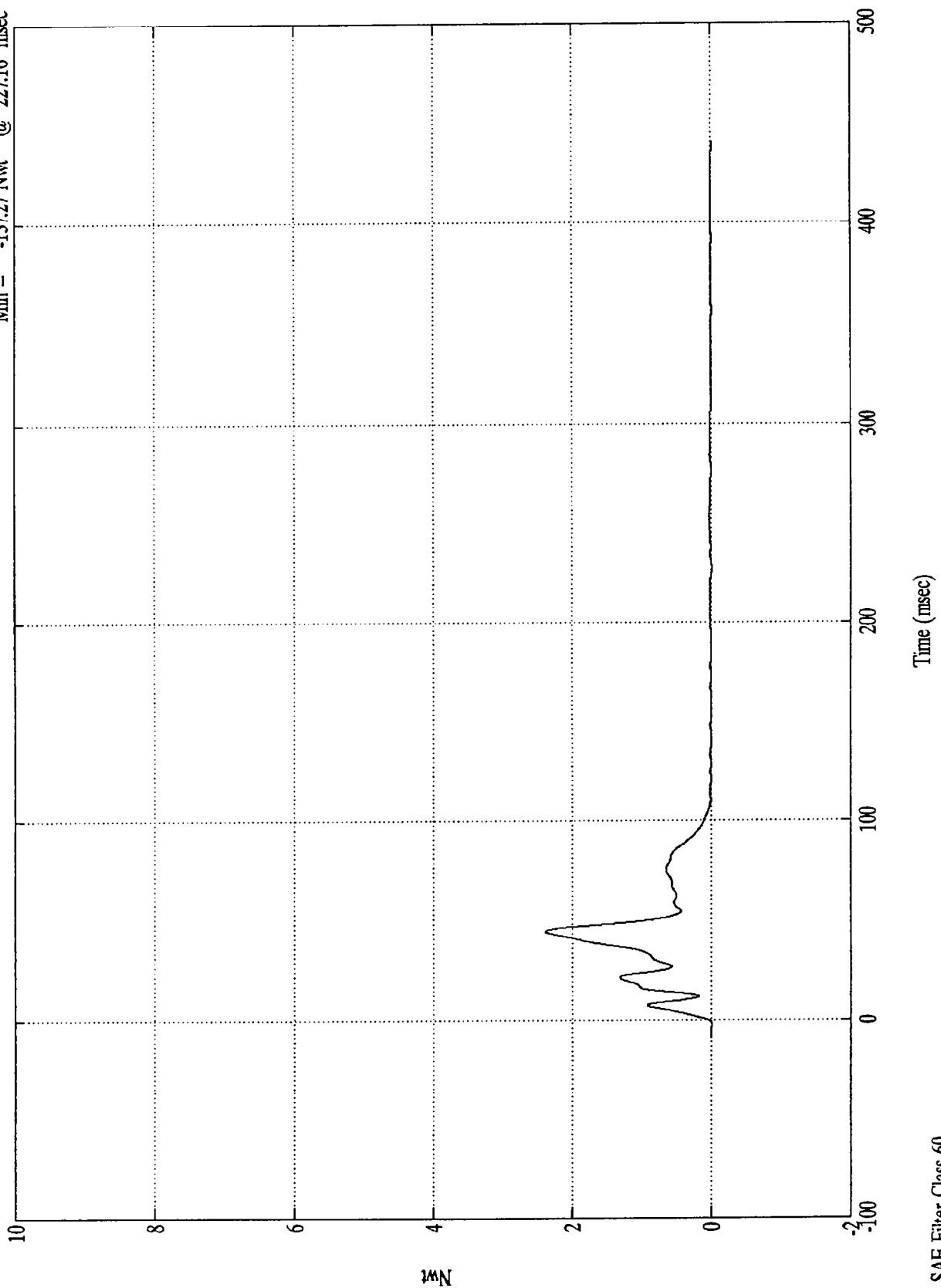
Barrier Load Cell B4
Max = 24194.73 Nwt @ 22.80 msec
Min = -195.08 Nwt @ 227.16 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell B5
 Max = 23852.17 Nwt @ 44.63 msec
 Min = -137.27 Nwt @ 227.16 msec

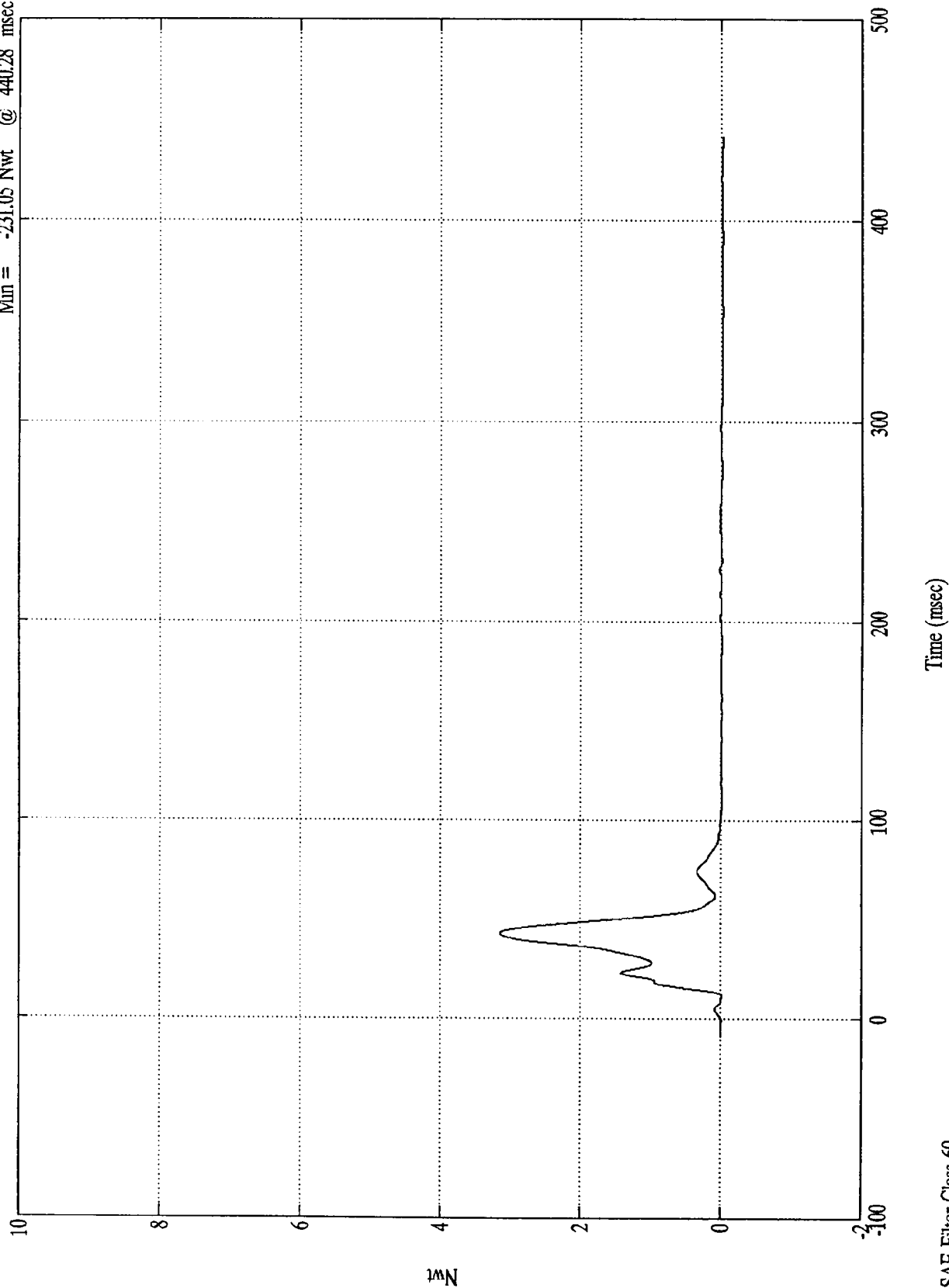
$\times 10^4$



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 31461.26 Nwt @ 42.72 msec
Min = -231.05 Nwt @ 440.28 msec

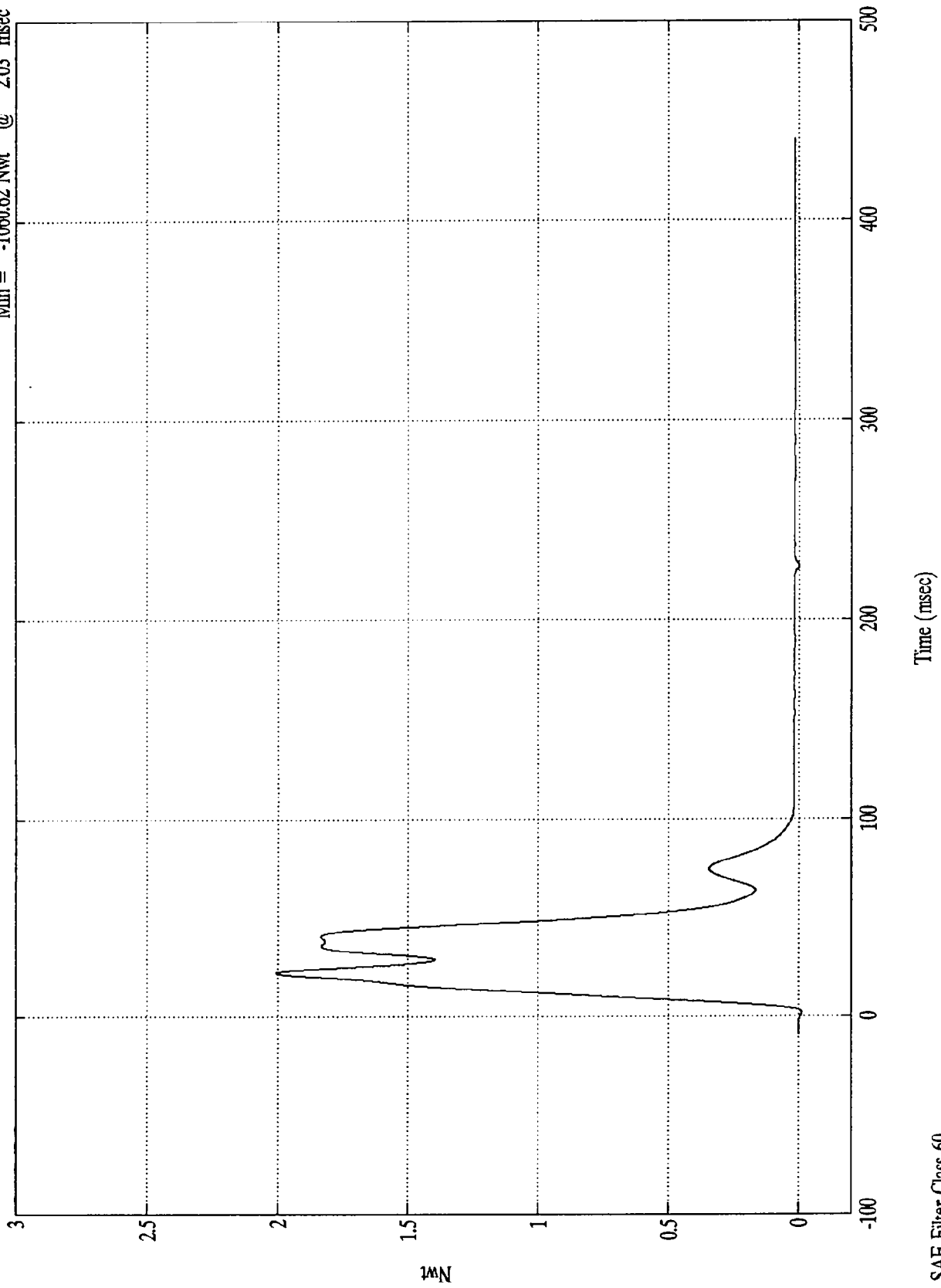
Barrier Load Cell B6



NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell B7
Max = 200584.32 Nwt @ 22.31 msec
Min = -1060.62 Nwt @ 2.03 msec

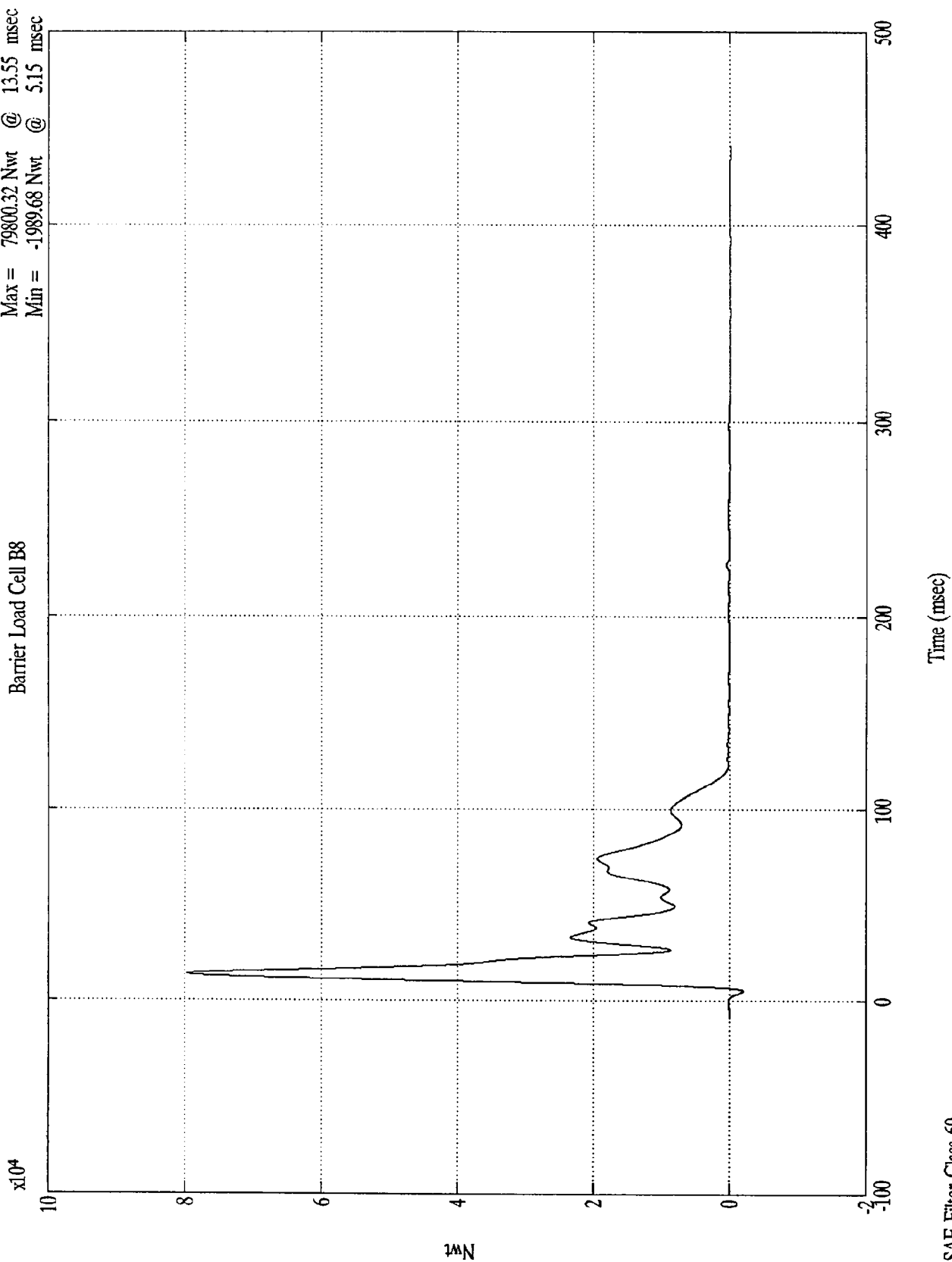
$\times 10^5$



NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell B8

Max = 79800.32 Nwt @ 13.55 msec
Min = -1989.68 Nwt @ 5.15 msec

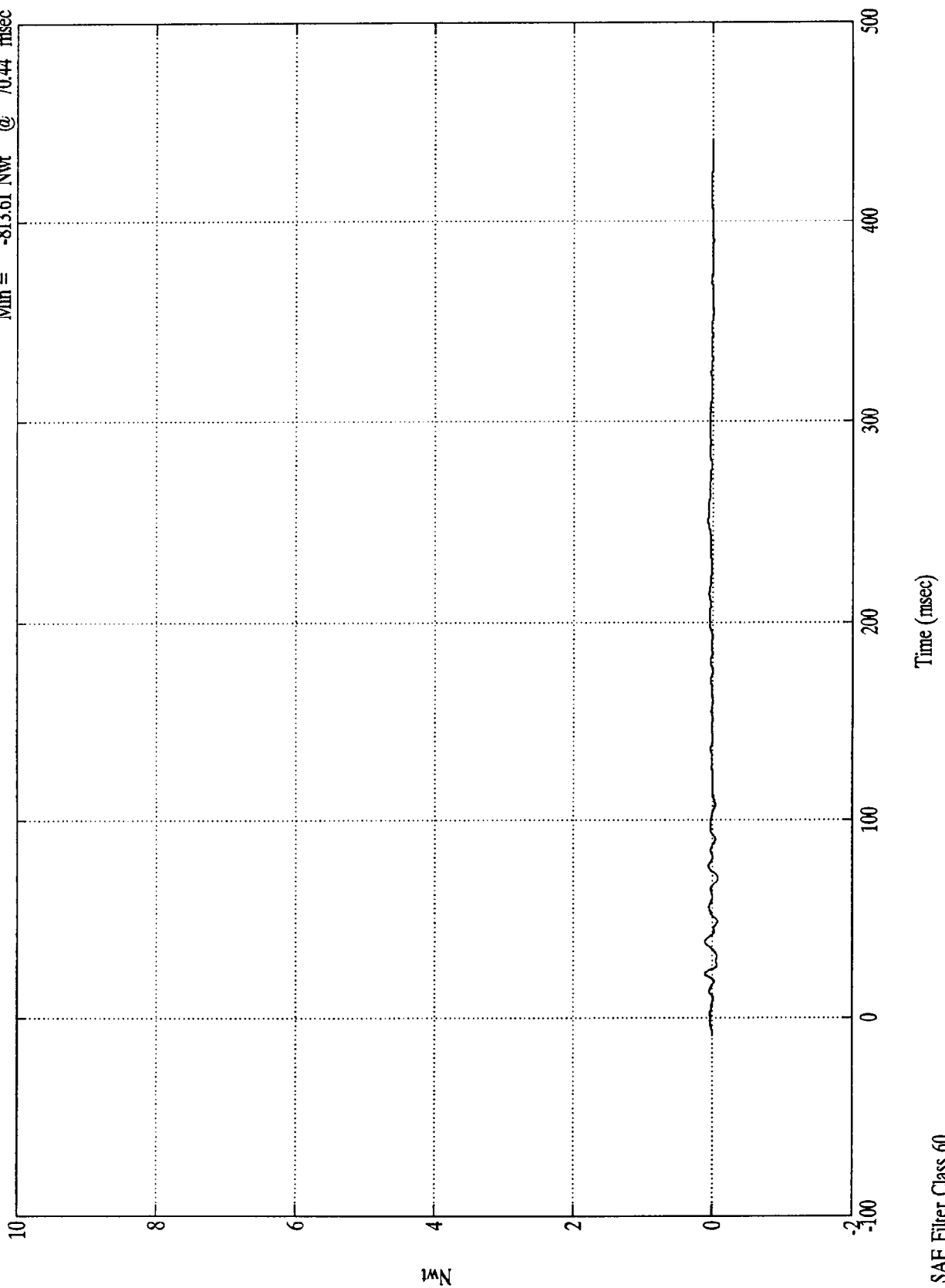


NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell B9

Max = 1084.58 Nwt @ 38.76 msec
Min = -813.61 Nwt @ 70.44 msec

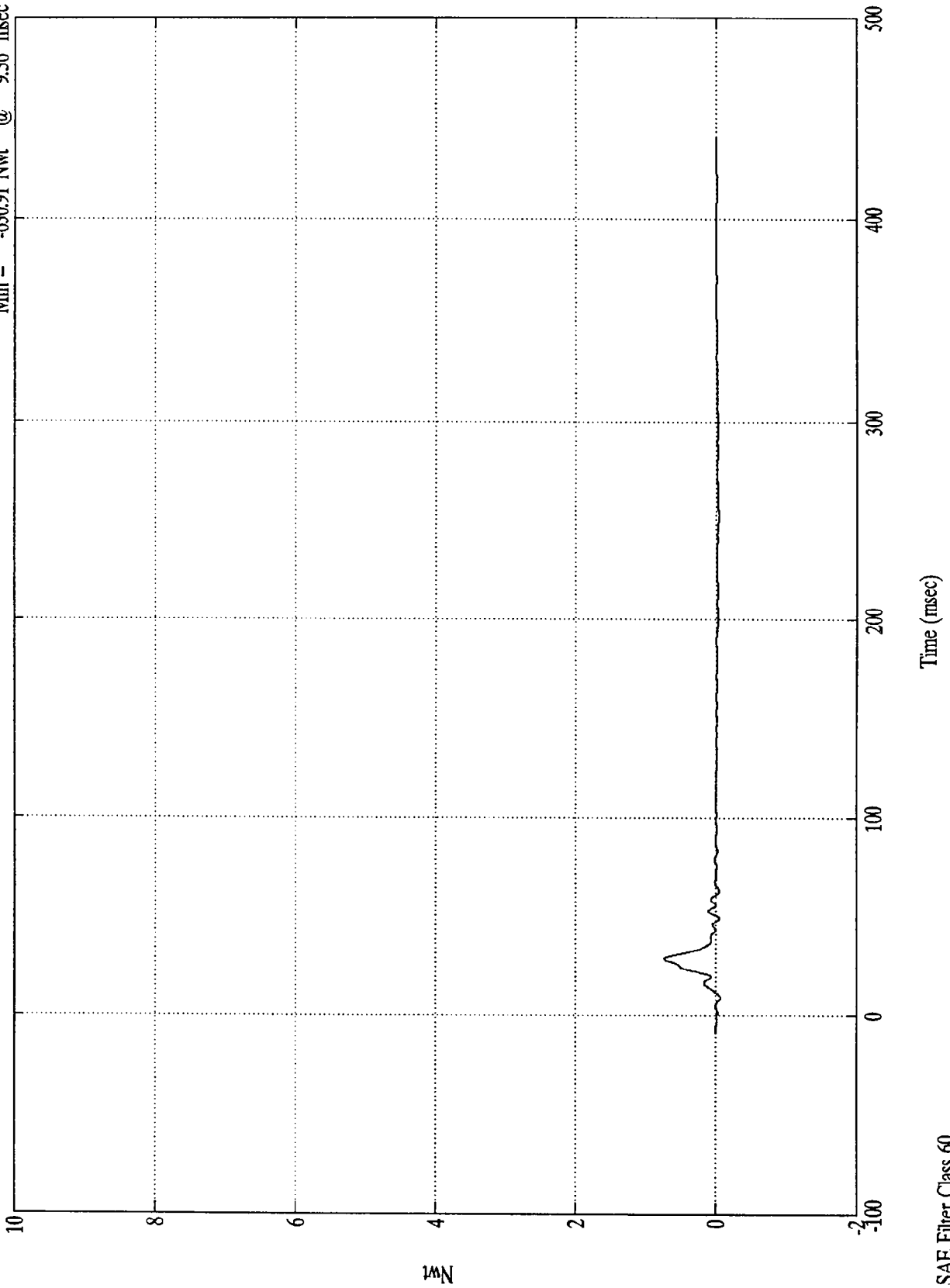
$\times 10^4$



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 7355.87 Nwt @ 28.92 msec
Min = -630.91 Nwt @ 9.36 msec

Barrier Load Cell C1

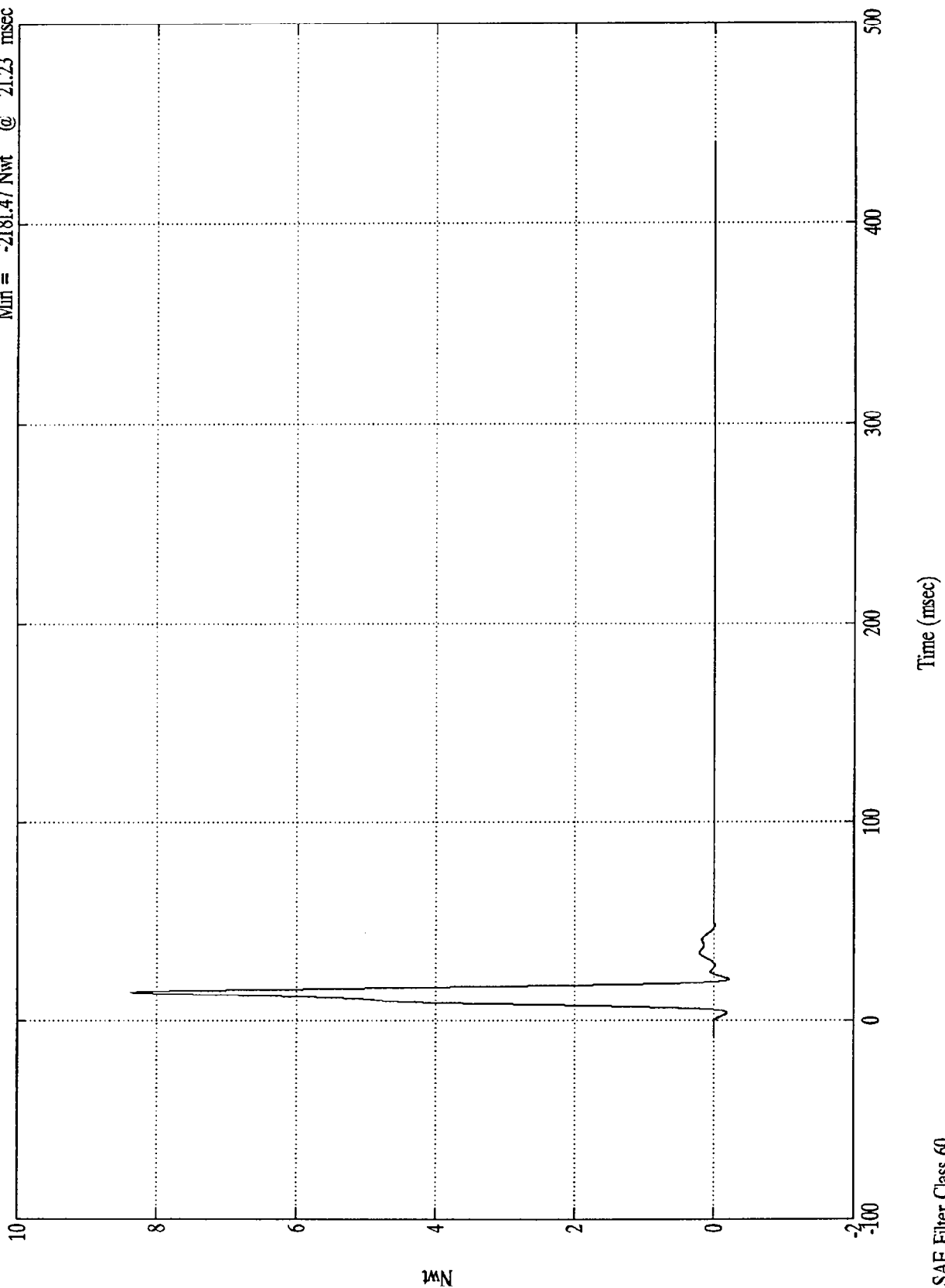


NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 83734.34 Nwt @ 14.76 msec
Min = -2181.47 Nwt @ 21.23 msec

Barrier Load Cell C2

$\times 10^4$

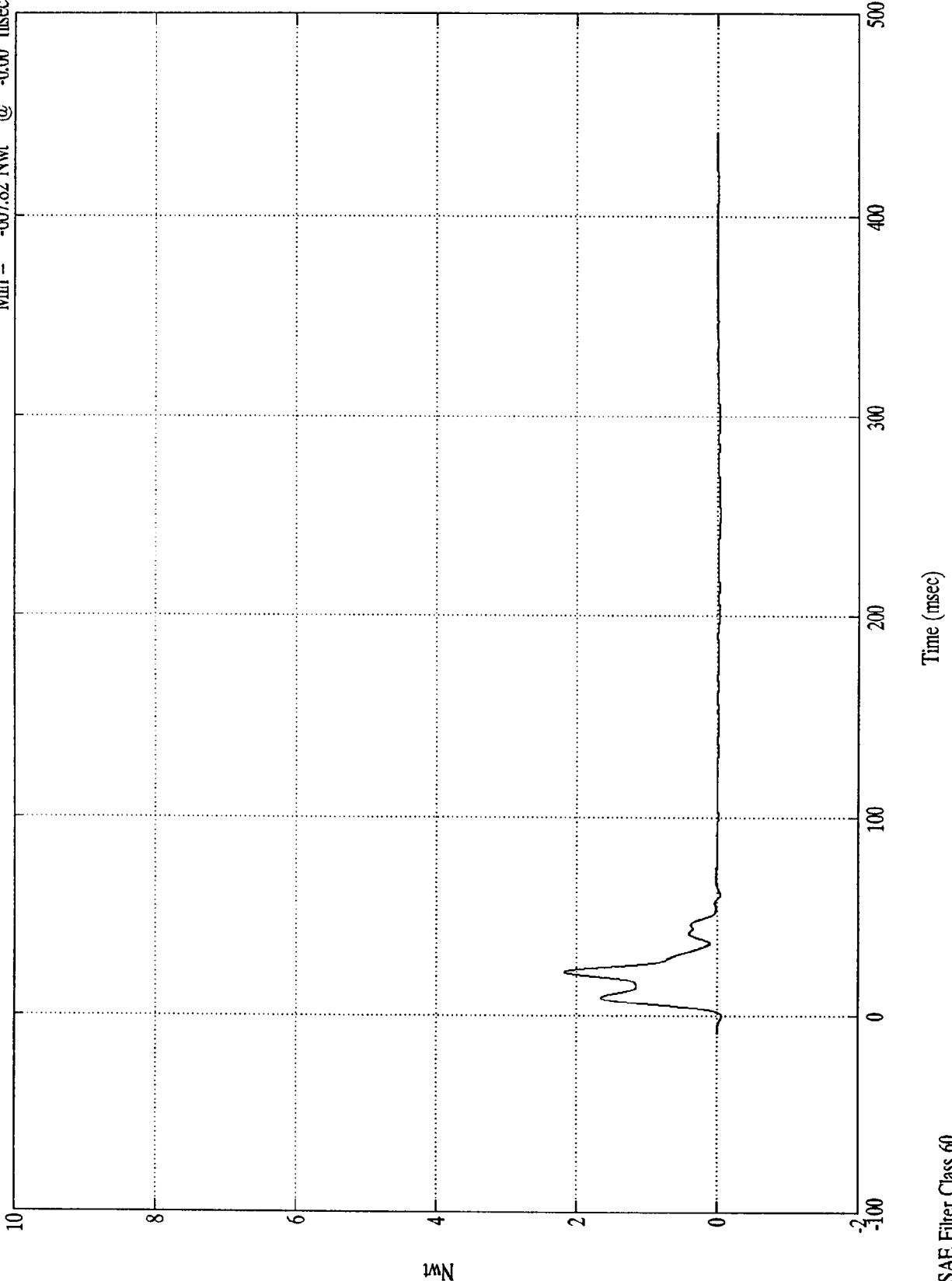


NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 21751.27 Nwt @ 22.31 msec
Min = -607.82 Nwt @ -0.00 msec

Barrier Load Cell C3

$\times 10^4$

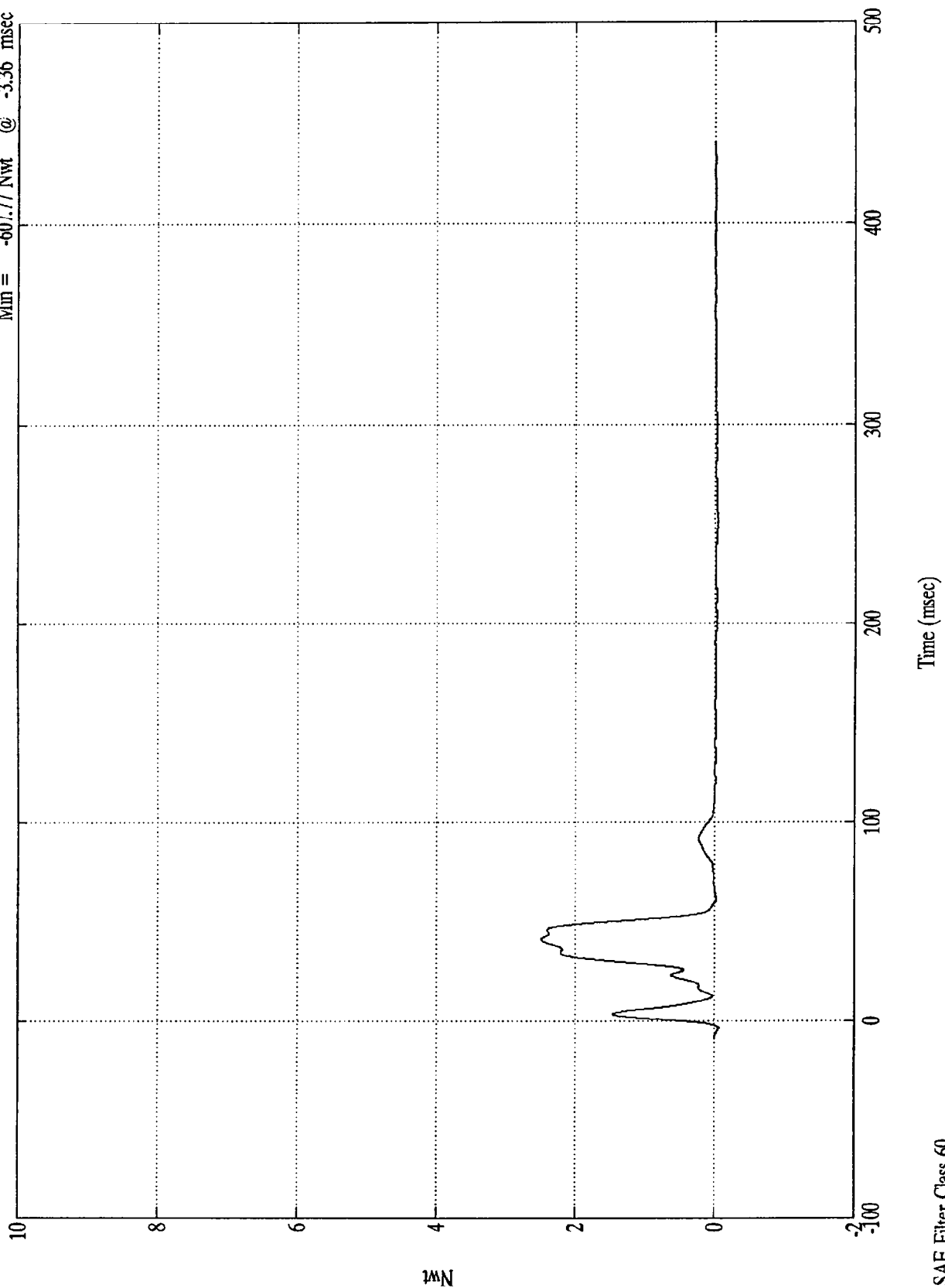


SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell C4
Max = 24906.10 Nwt @ 40.92 msec
Min = -607.77 Nwt @ -3.36 msec

$\times 10^4$

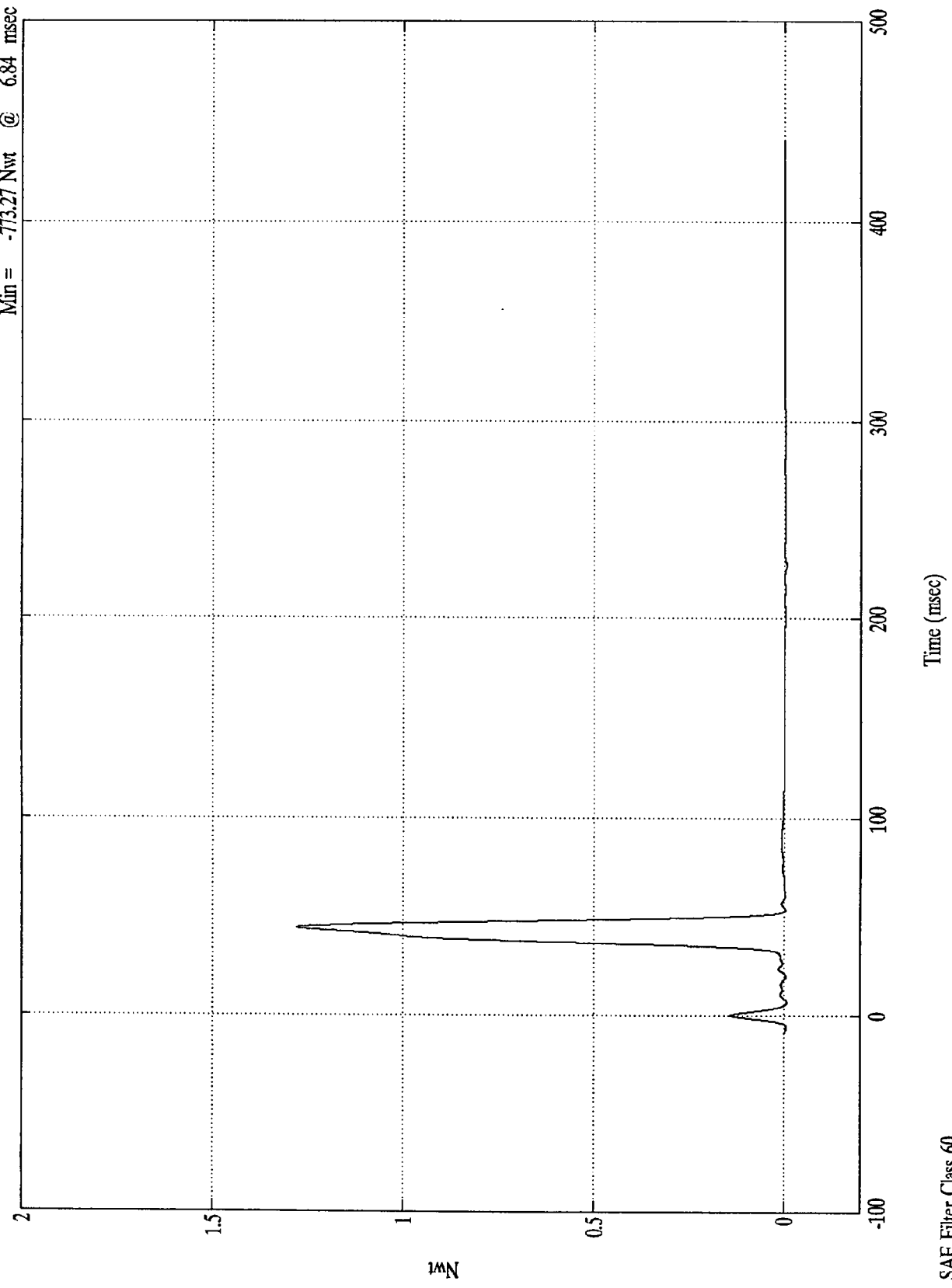


SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 128092.23 Nwt @ 44.40 msec
Min = -773.27 Nwt @ 6.84 msec

Barrier Load Cell C5

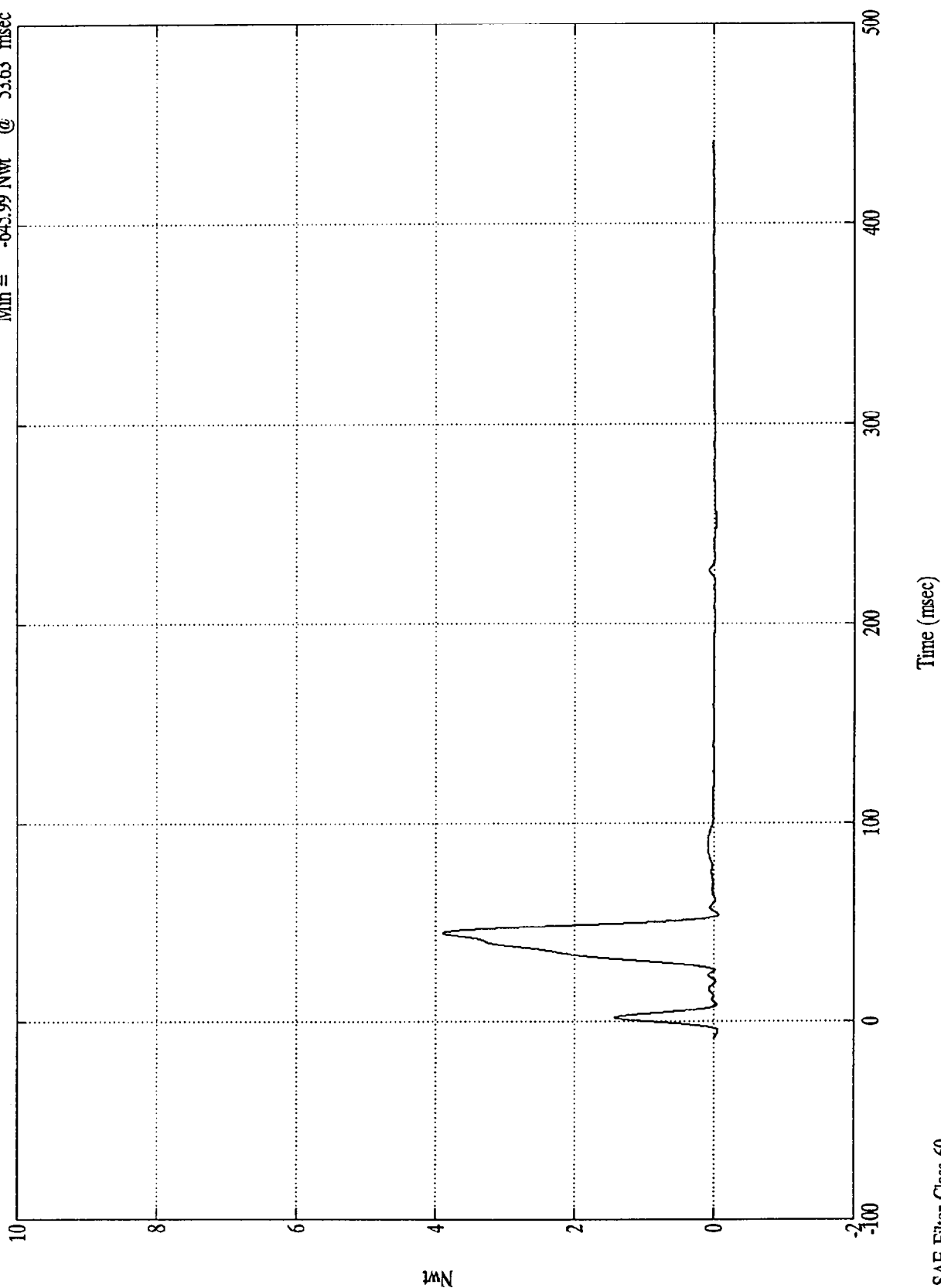


NCAP TEST #2 - 1996 DODGE RAM VAN

$\times 10^4$

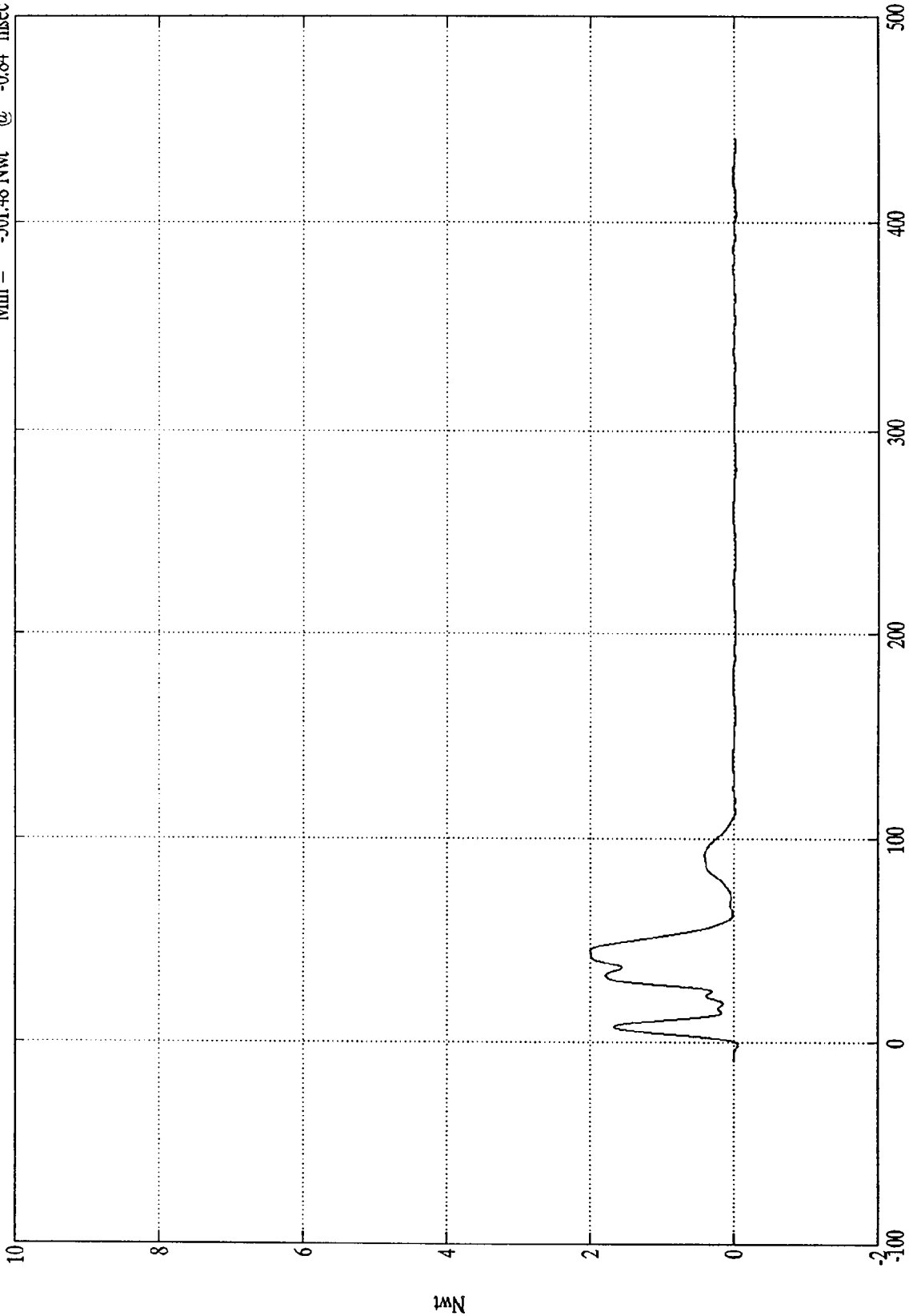
Barrier Load Cell C6

Max = 38990.62 Nwt @ 44.75 msec
Min = -645.99 Nwt @ 53.63 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell C7
Max = 20028.35 Nwt @ 44.88 msec
Min = -501.48 Nwt @ -0.84 msec



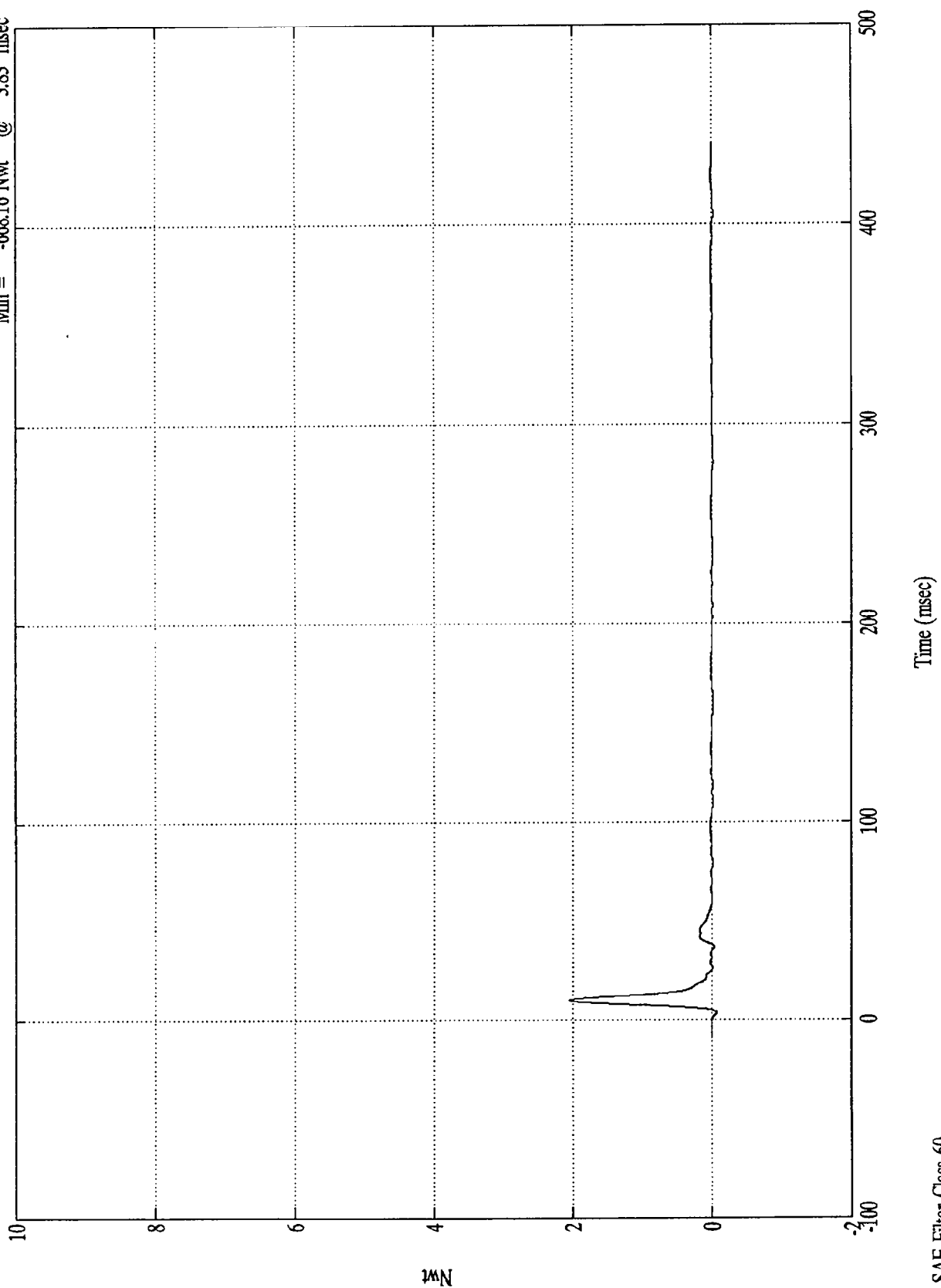
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

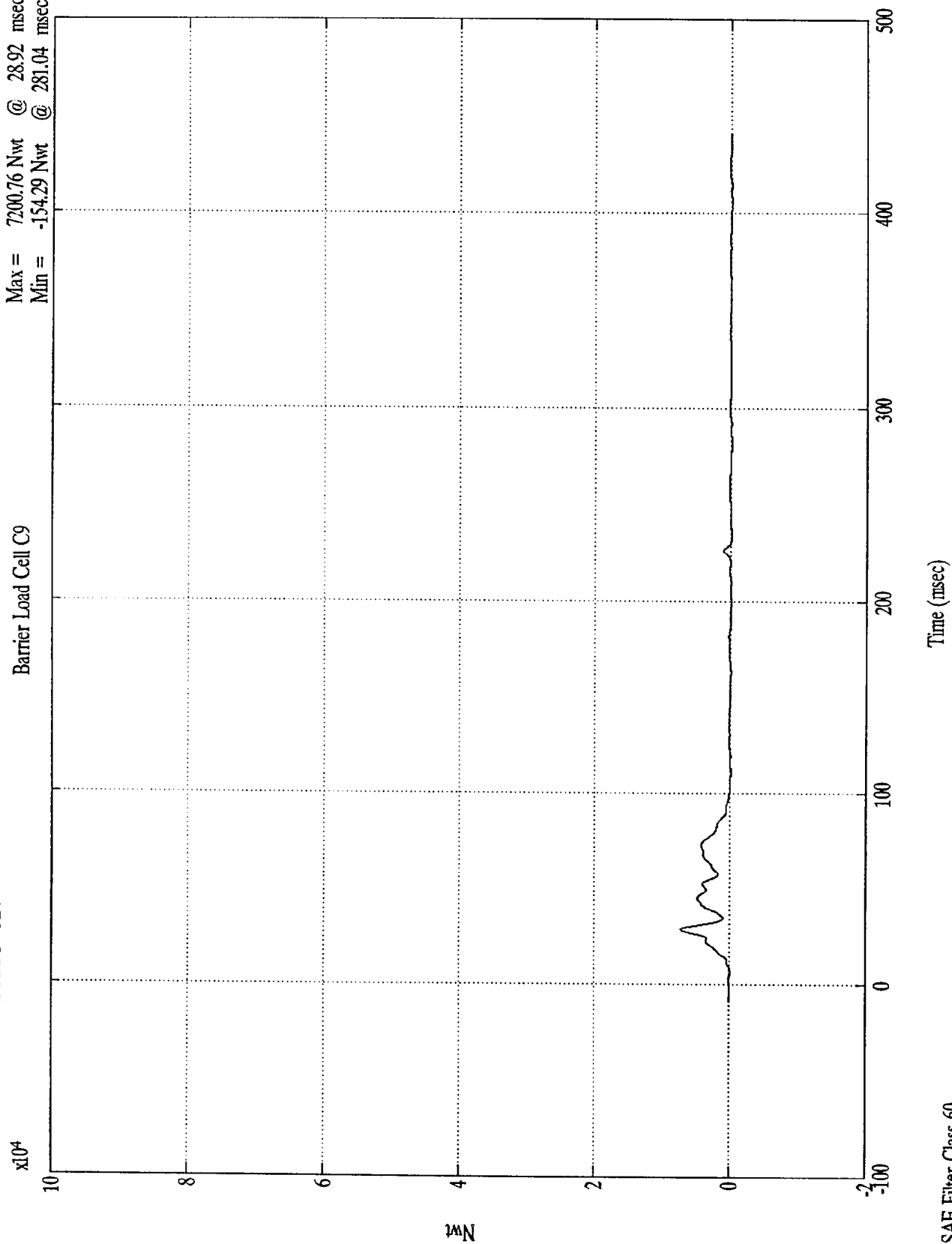
Barrier Load Cell C8
Max = 20514.36 Nwt @ 10.20 msec
Min = -668.16 Nwt @ 3.83 msec

$\times 10^4$



NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell C9
 Max = 7200.76 Nwt @ 28.92 msec
 Min = -154.29 Nwt @ 281.04 msec

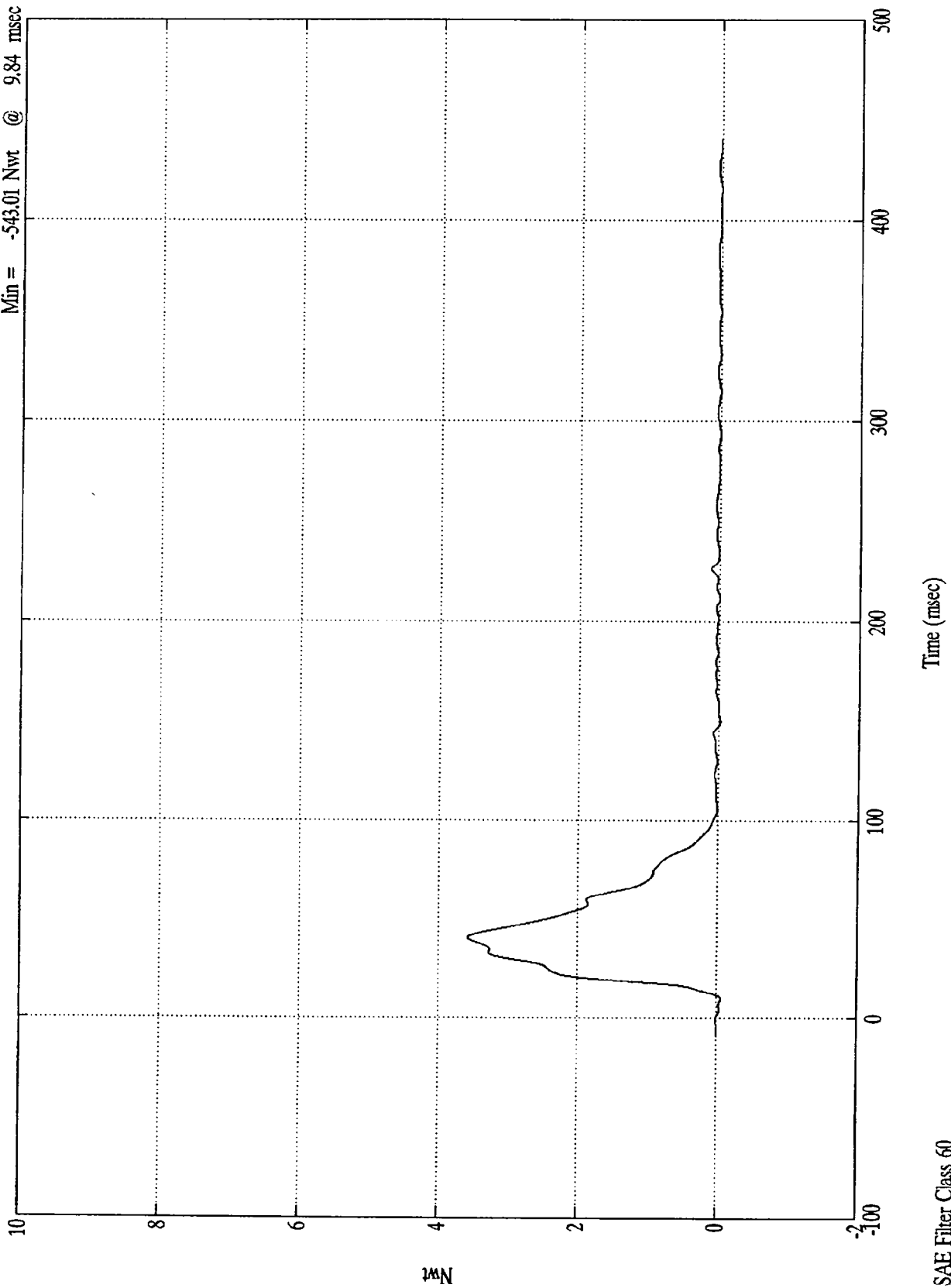


NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 35781.58 Nwt @ 40.56 msec
Min = -543.01 Nwt @ 9.84 msec

Barrier Load Cell D1

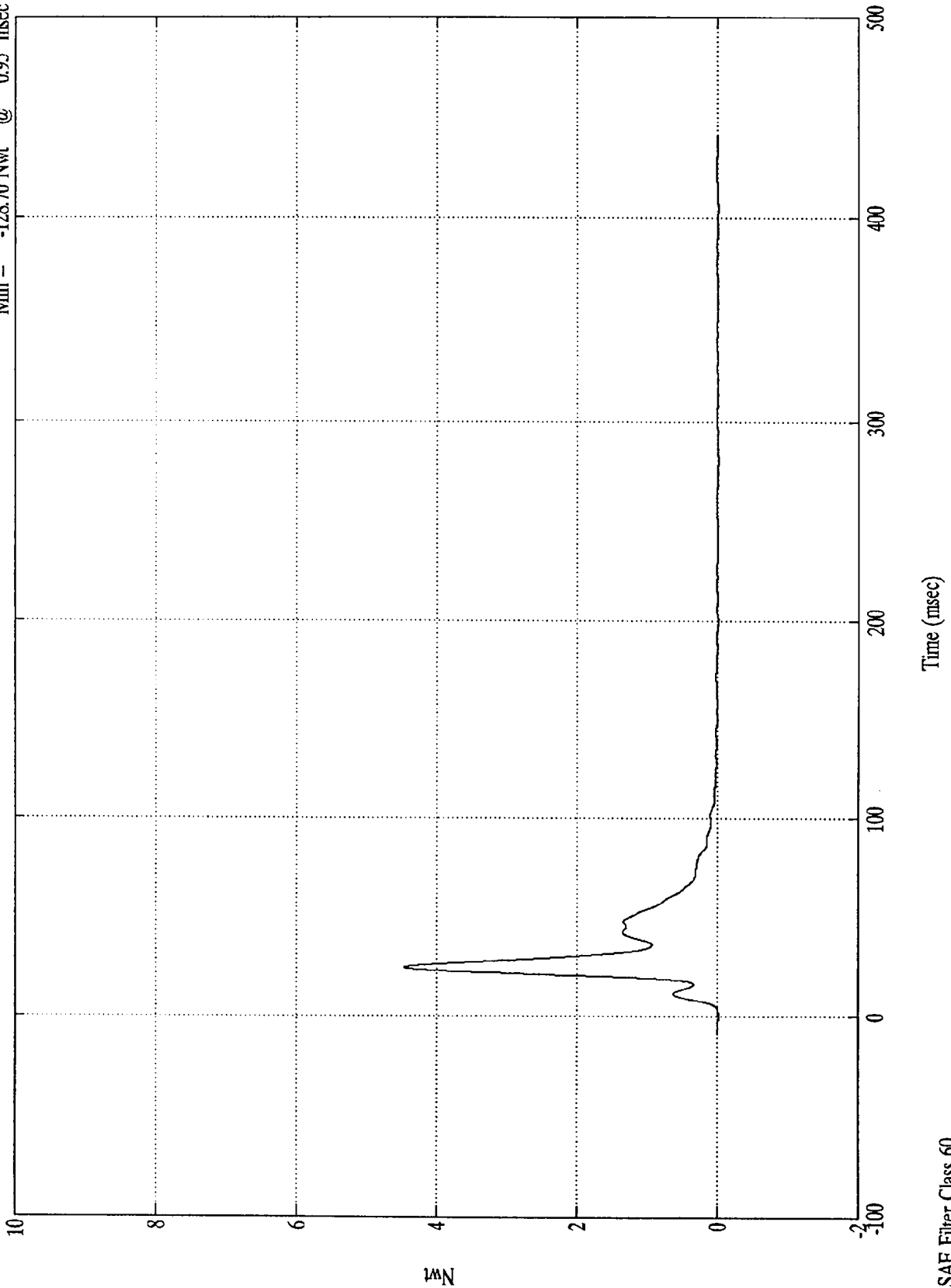
$\times 10^4$



NCAP TEST #2 - 1996 DODGE RAM VAN

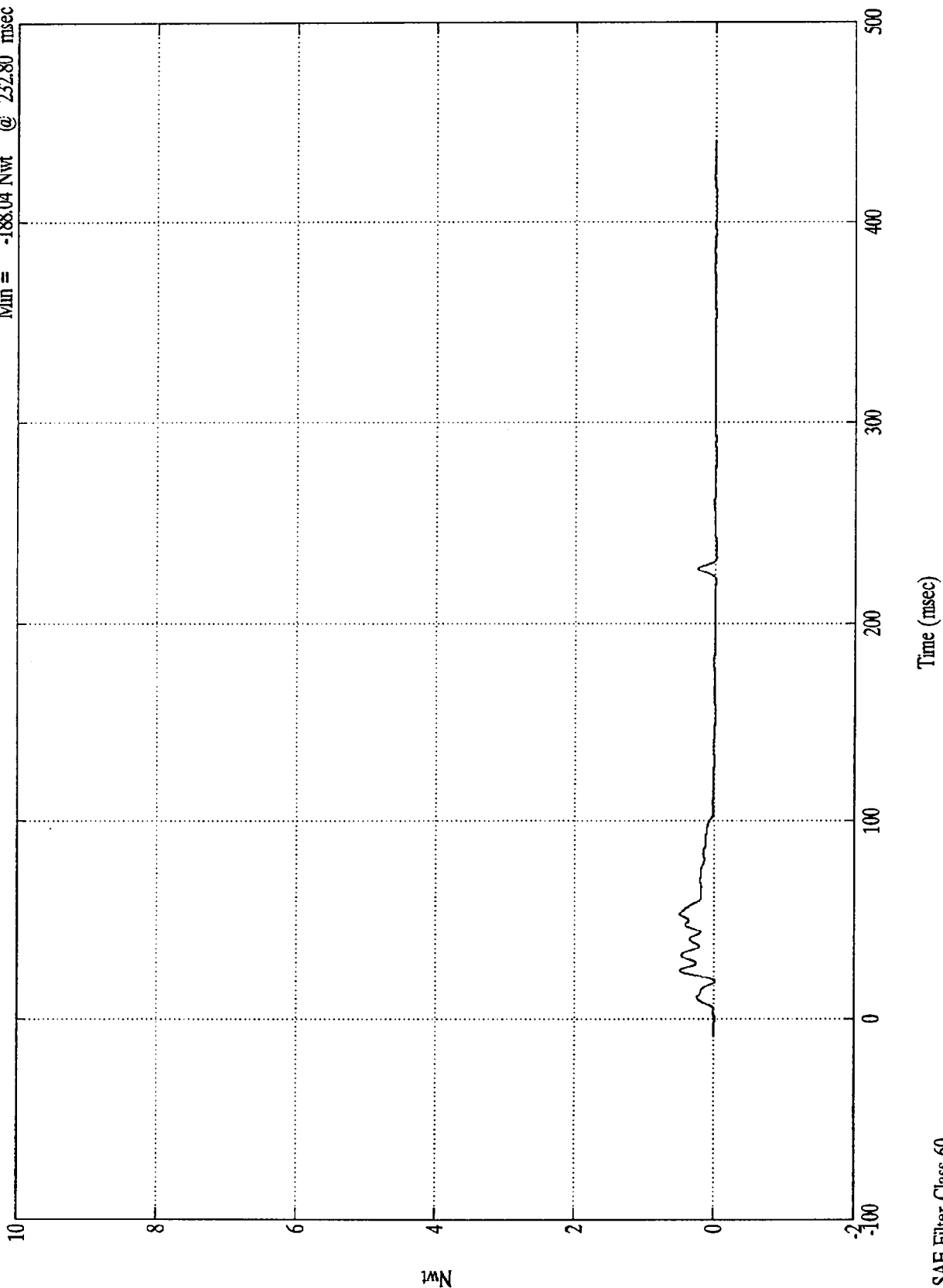
Max = 44704.57 Nwt @ 25.20 msec
Min = -128.70 Nwt @ 0.95 msec

Barrier Load Cell D2



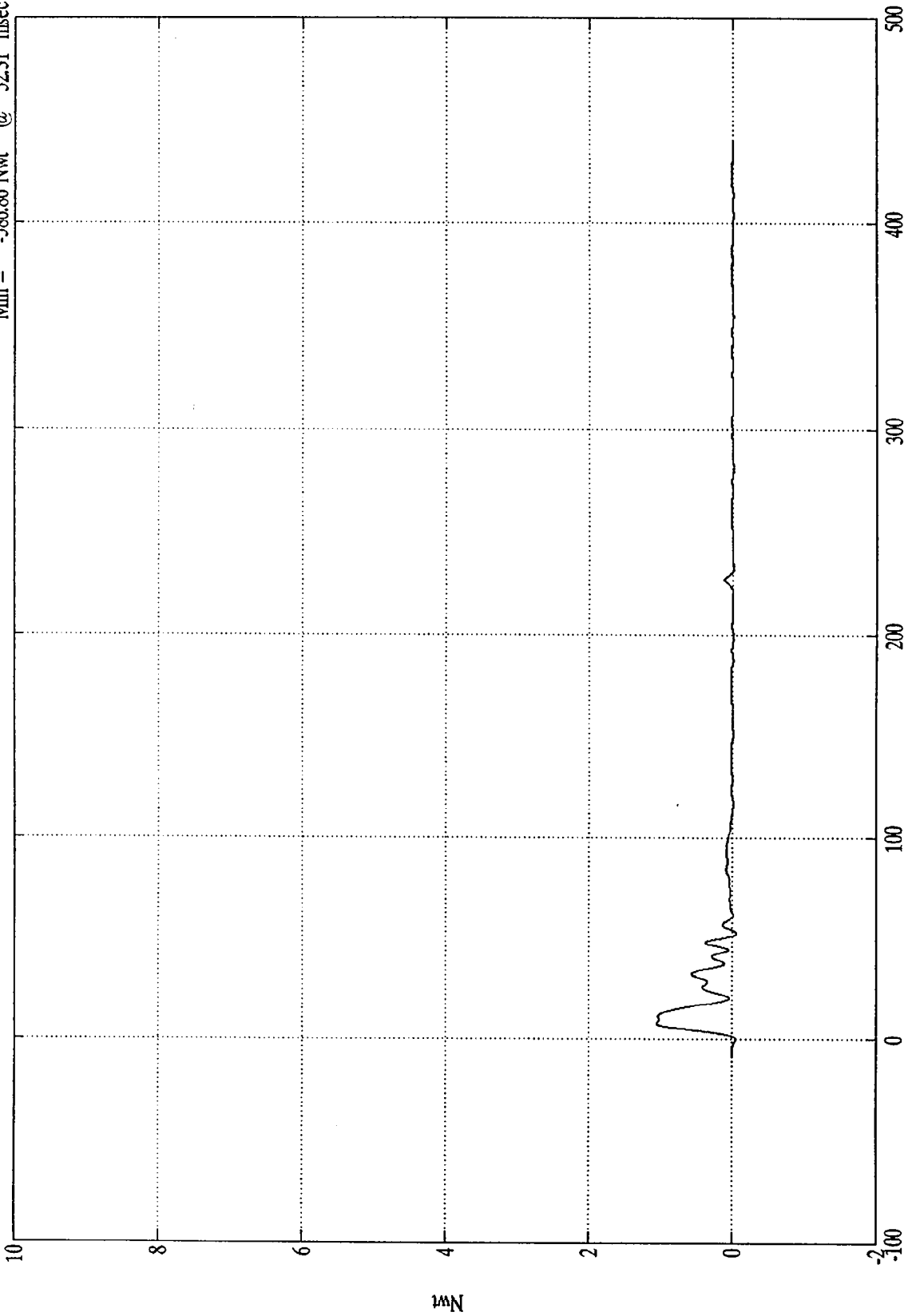
NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell D3
Max = 4916.35 Nwt @ 53.40 msec
Min = -188.04 Nwt @ 232.80 msec



NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell D4
 Max = 10514.99 Nwt @ 7.80 msec
 Min = -586.86 Nwt @ 52.31 msec



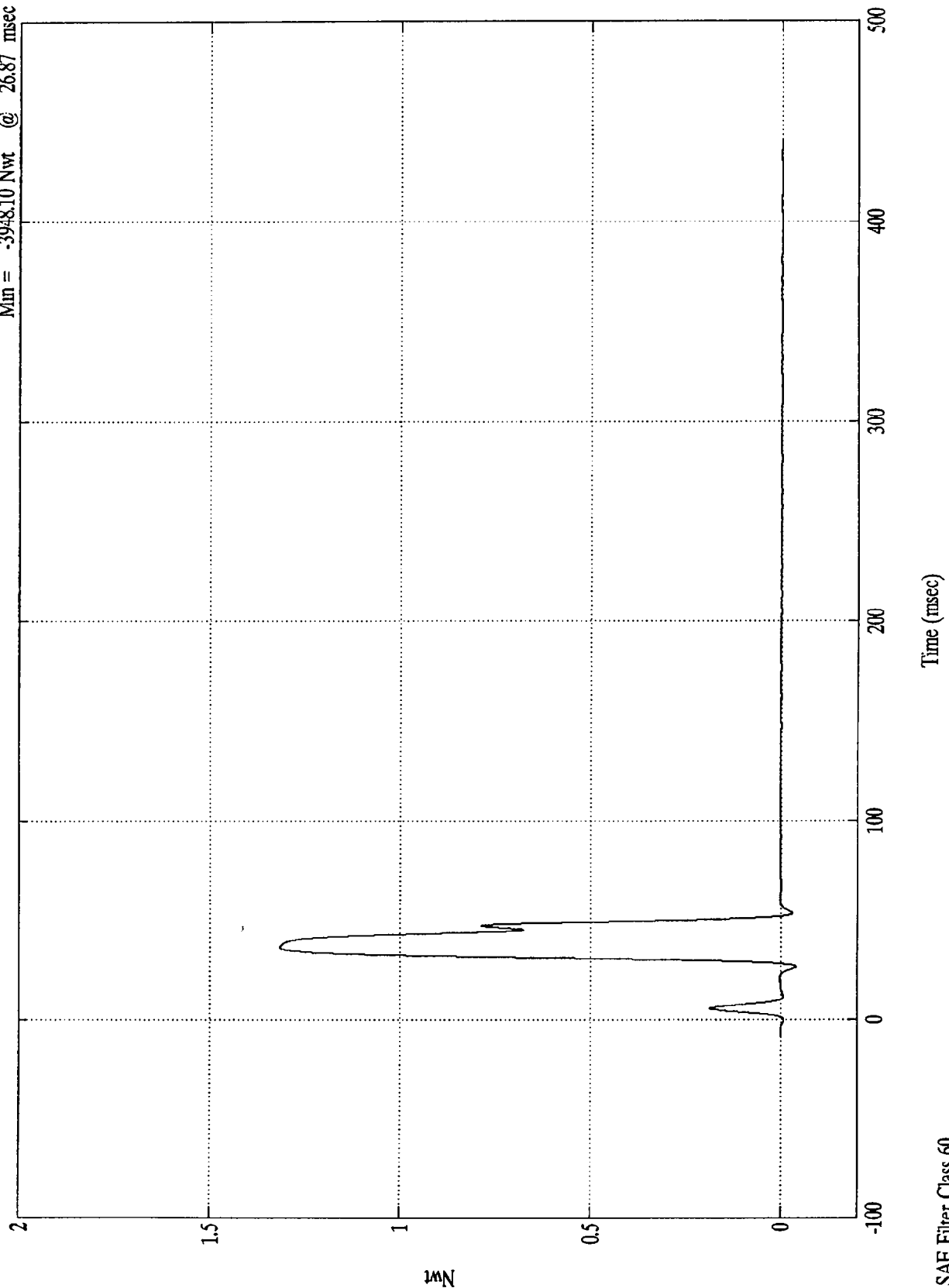
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell D5
Max = 131589.70 Nwt @ 36.24 msec
Min = -3948.10 Nwt @ 26.87 msec

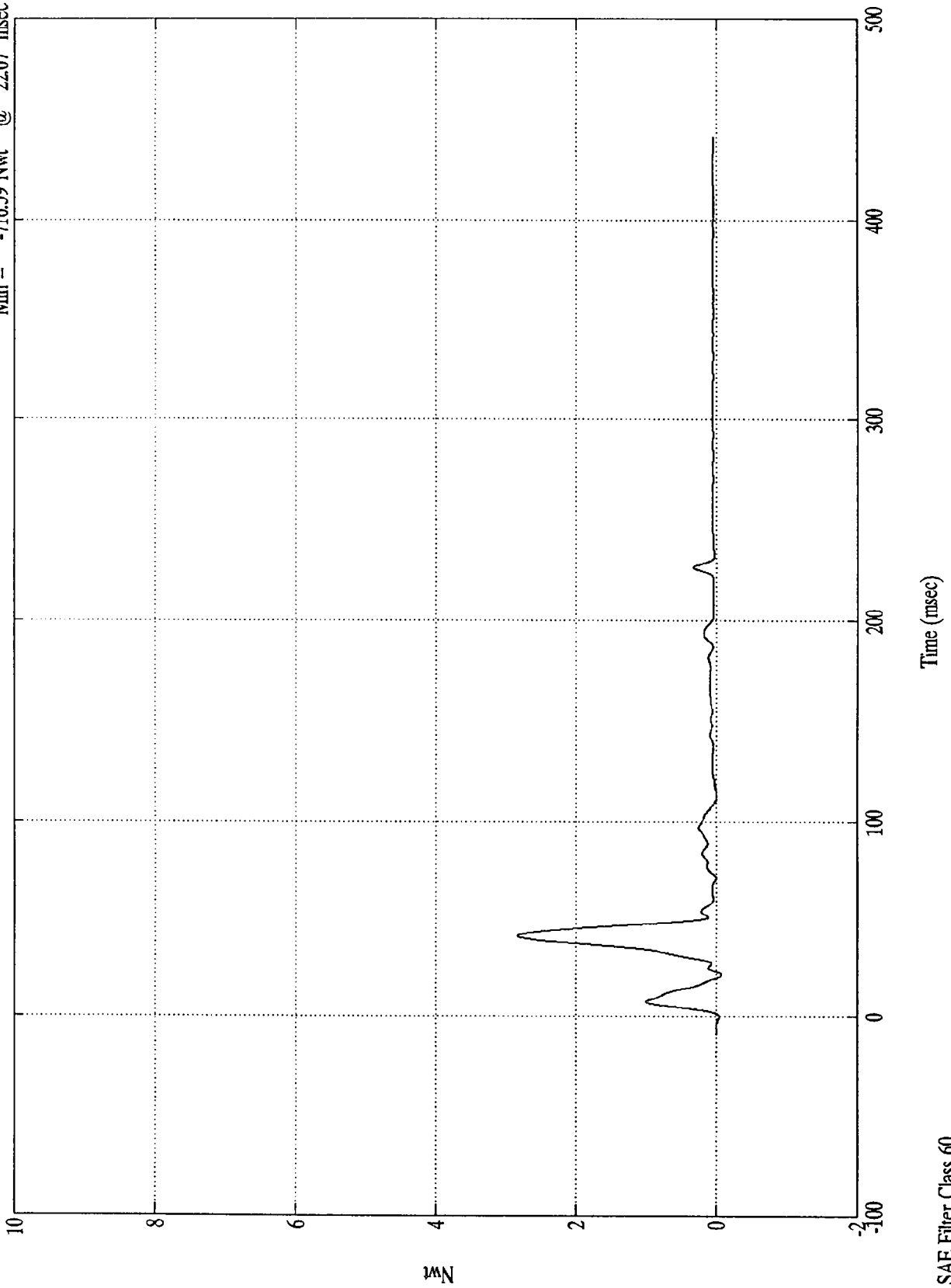
$\times 10^5$



NCAP TEST #2 - 1996 DODGE RAM VAN
x10⁴

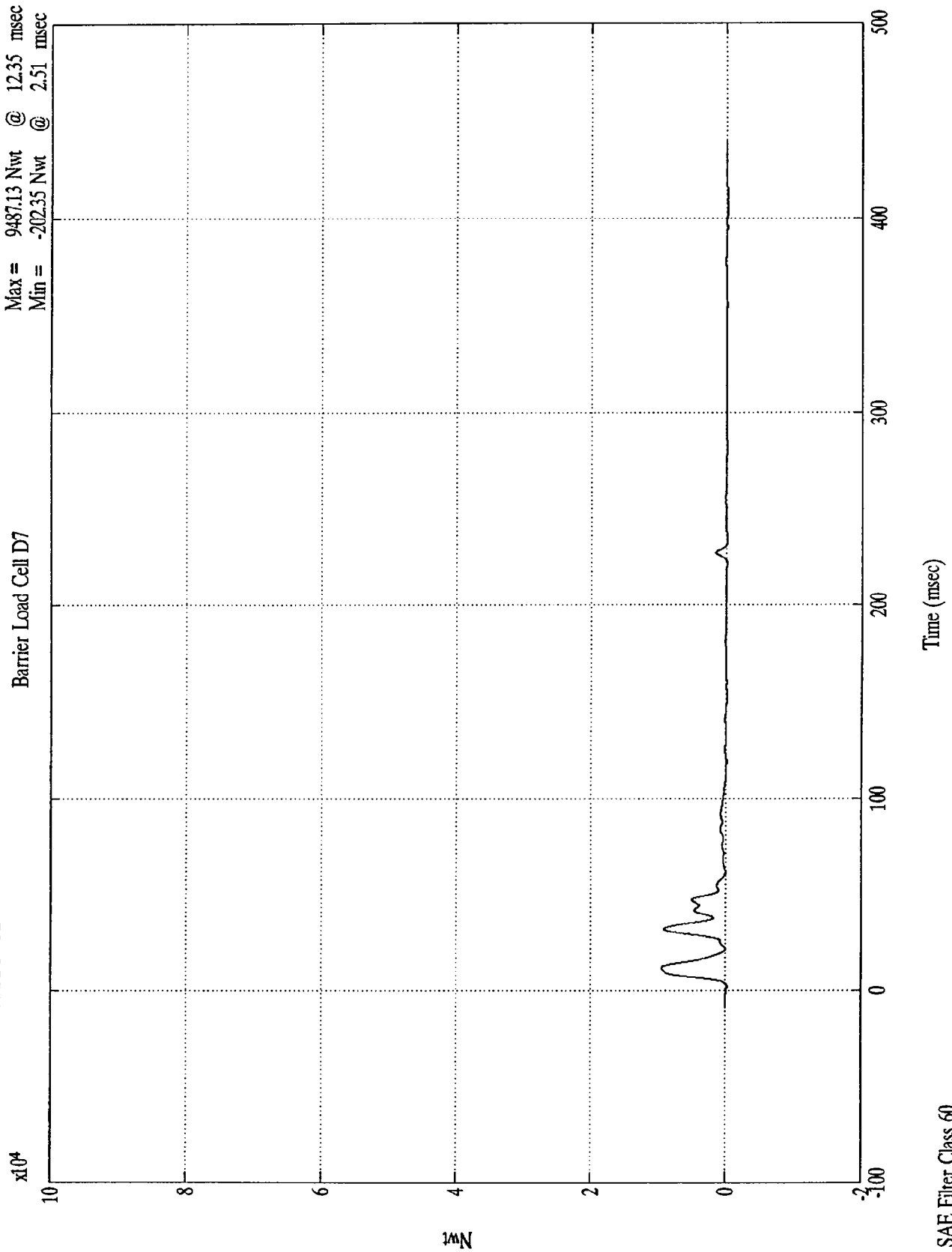
Max = 28383.99 Nwt @ 41.88 msec
Min = -716.59 Nwt @ 22.07 msec

Barrier Load Cell D6



NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell D7
Max = 9487.13 Nwt @ 12.35 msec
Min = -202.35 Nwt @ 2.51 msec

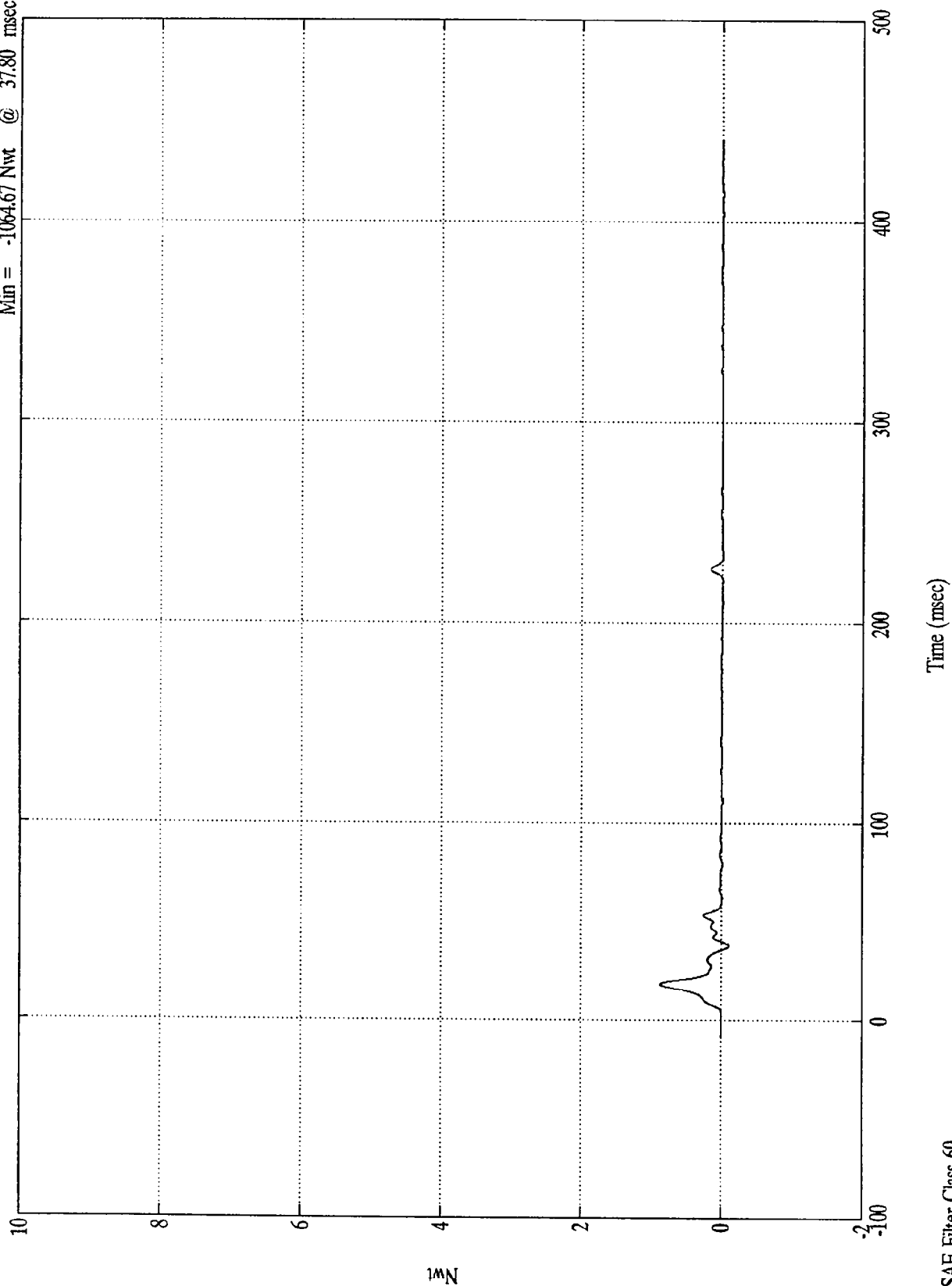


NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 8745.56 Nwt @ 18.48 msec
 Min = -1064.67 Nwt @ 37.80 msec

Barrier Load Cell D8

$\times 10^4$

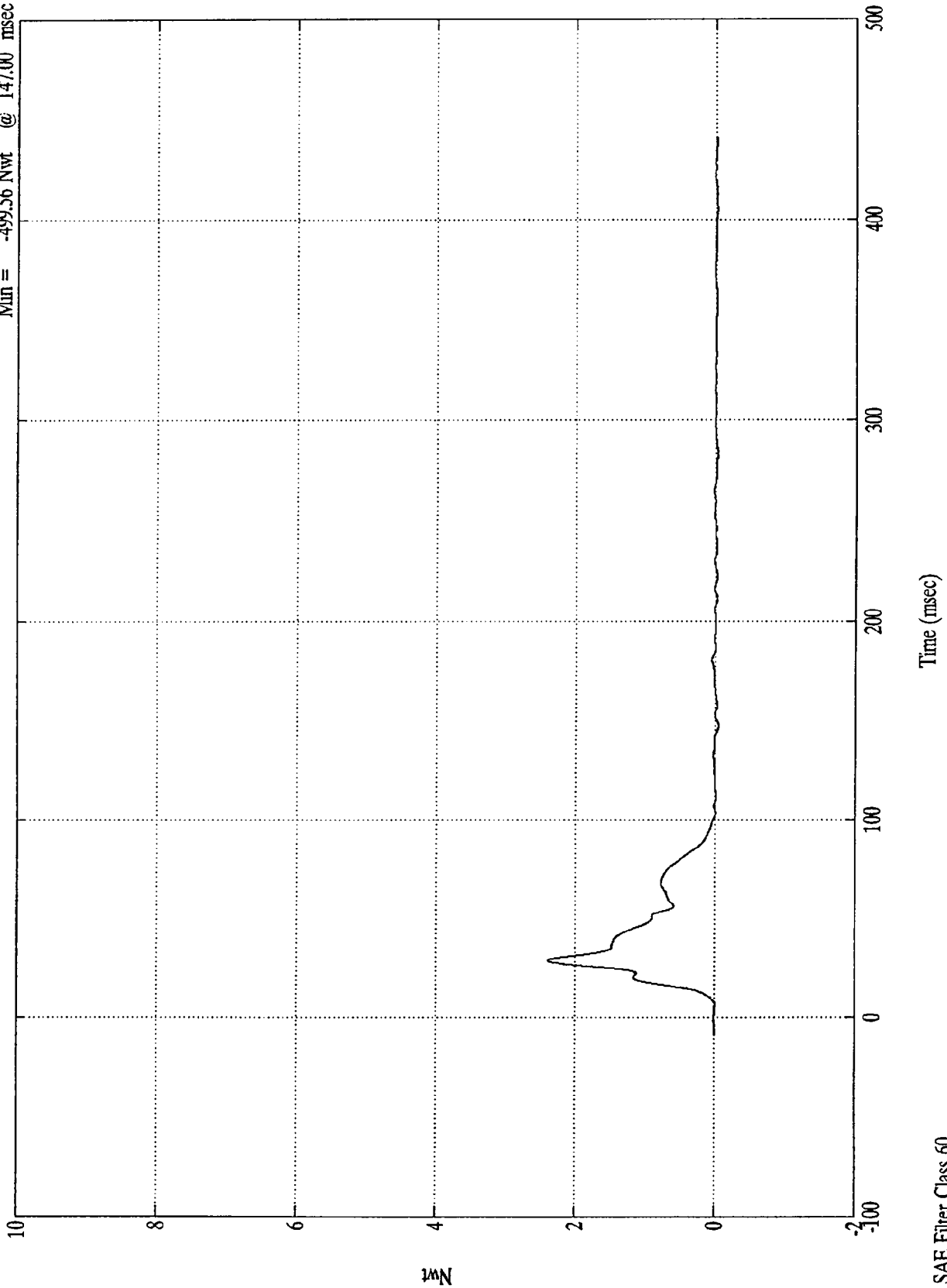


SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

Barrier Load Cell D9
Max = 23933.52 Nwt @ 30.00 msec
Min = -499.56 Nwt @ 147.00 msec

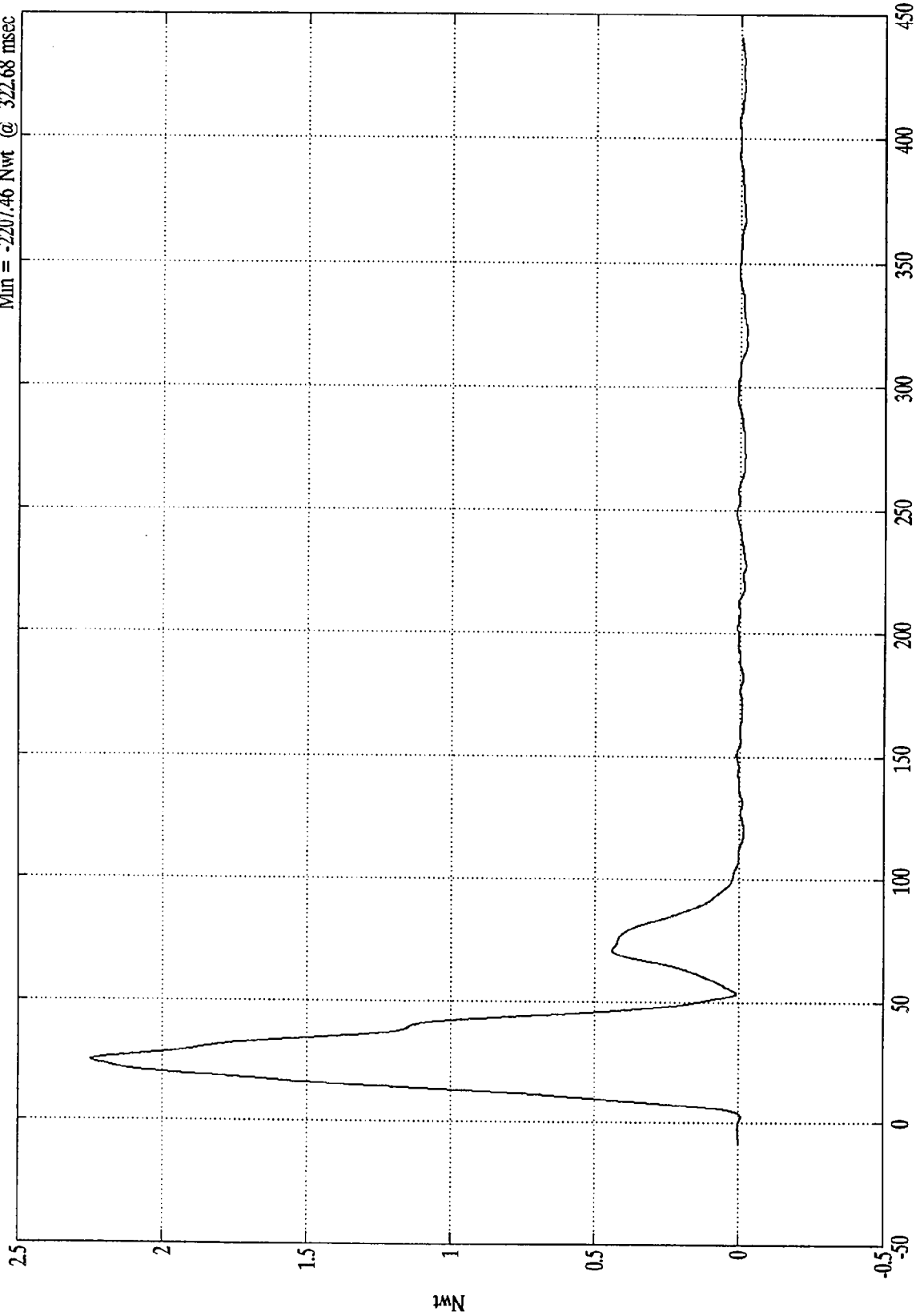
$\times 10^4$



NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 224989.58 Nwt @ 24.96 msec
Min = -2207.46 Nwt @ 322.68 msec

Group 1 Load Cell Sum

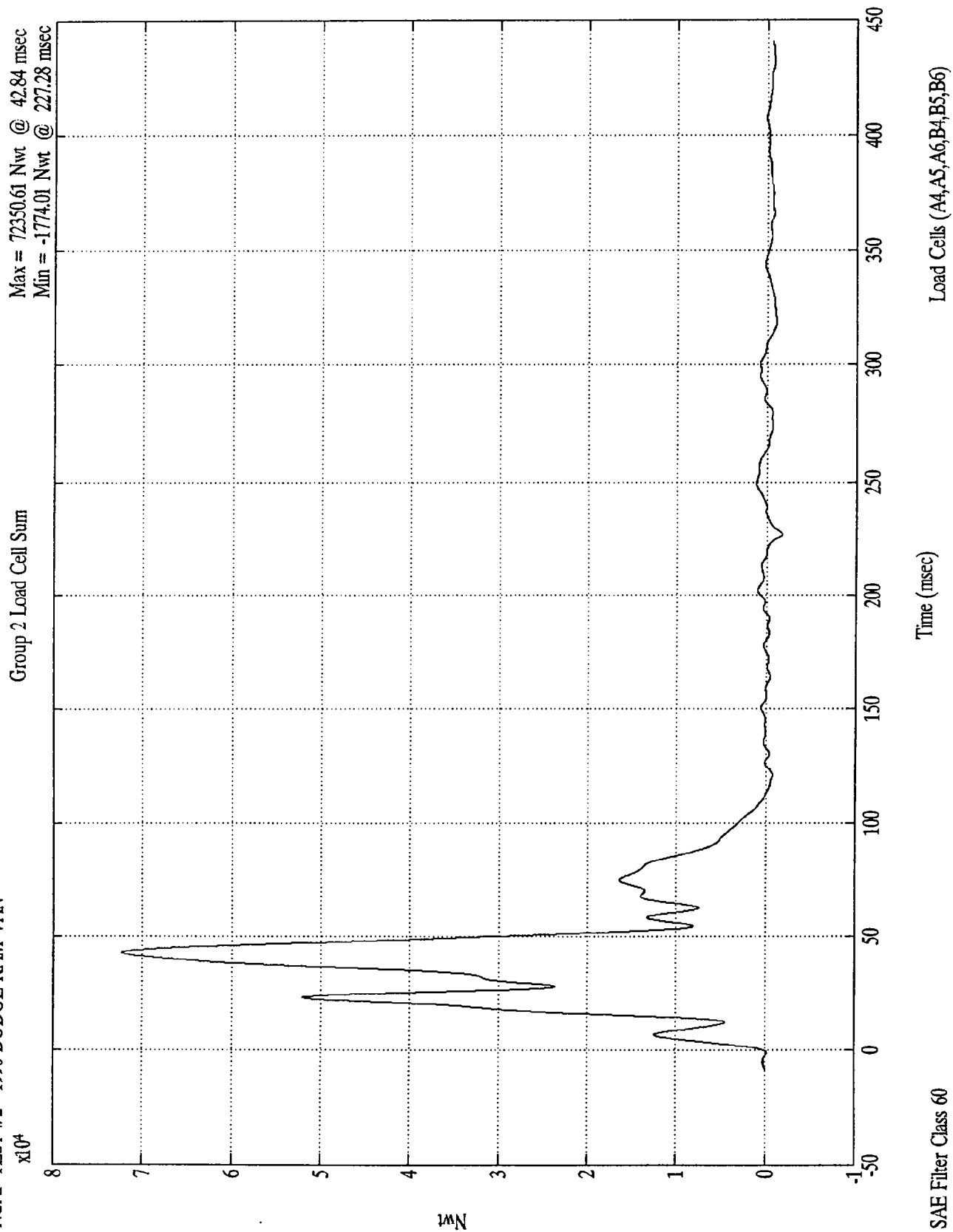


Load Cells (A1,A2,A3,B1,B3,)not (B2)

Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

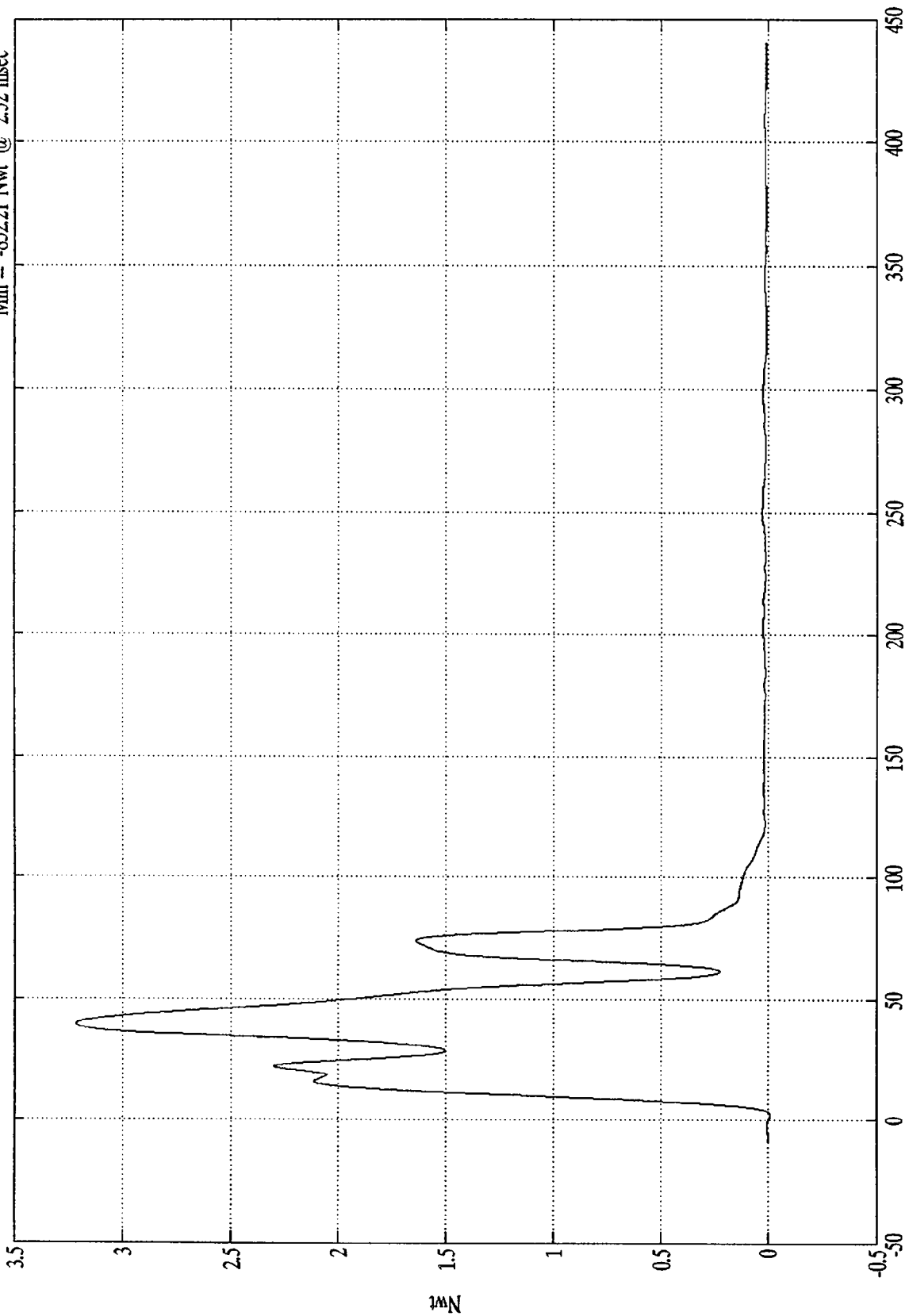


Nwt

NCAP TEST #2 - 1996 DODGE RAM VAN
x10⁵

Group 3 Load Cell Sum

Max = 321521.83 Nwt @ 39.48 msec
Min = -852.21 Nwt @ 2.52 msec



Time (msec)

Load Cells (A7,A8,A9,B7,B8,B9)

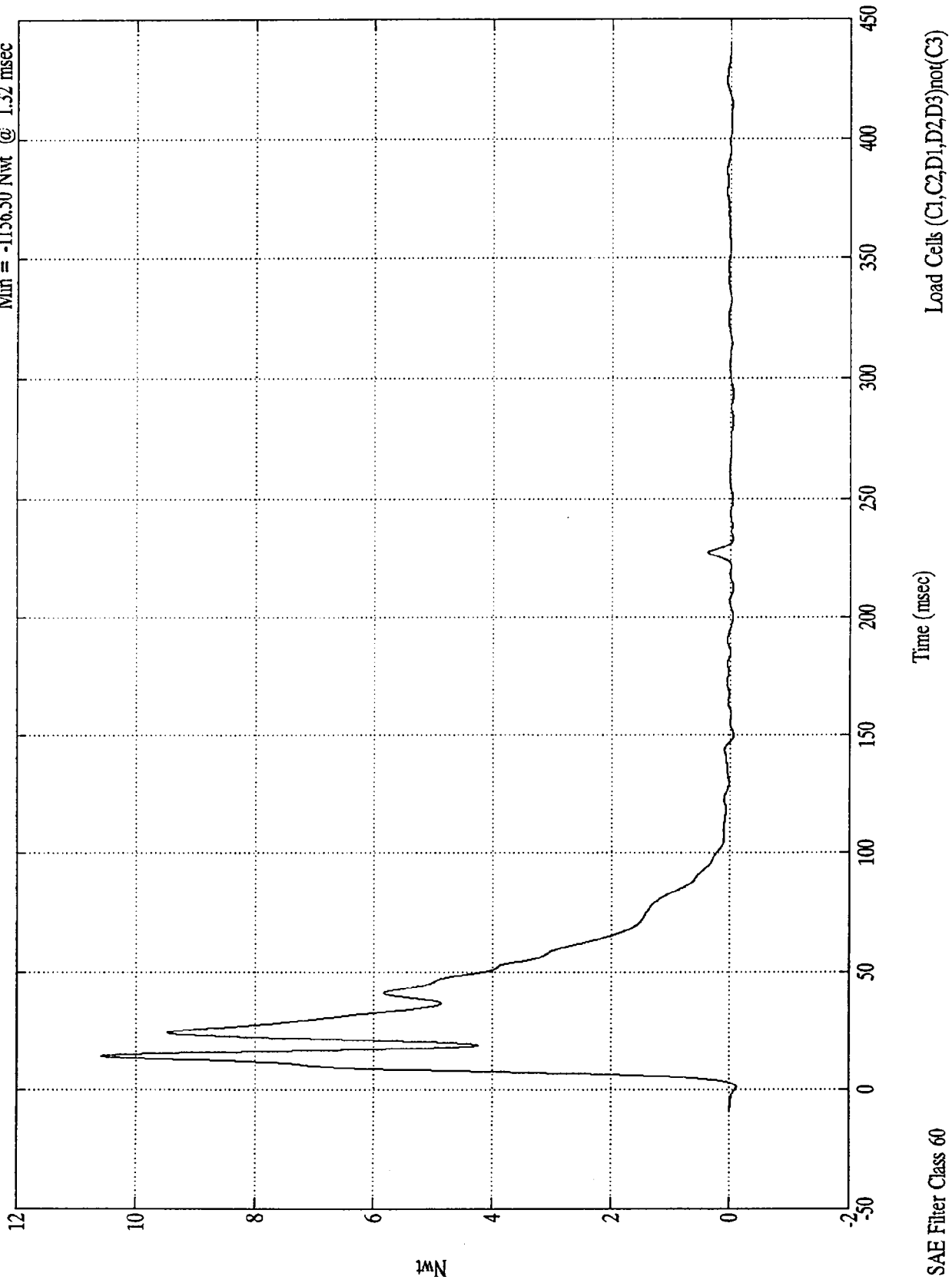
SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

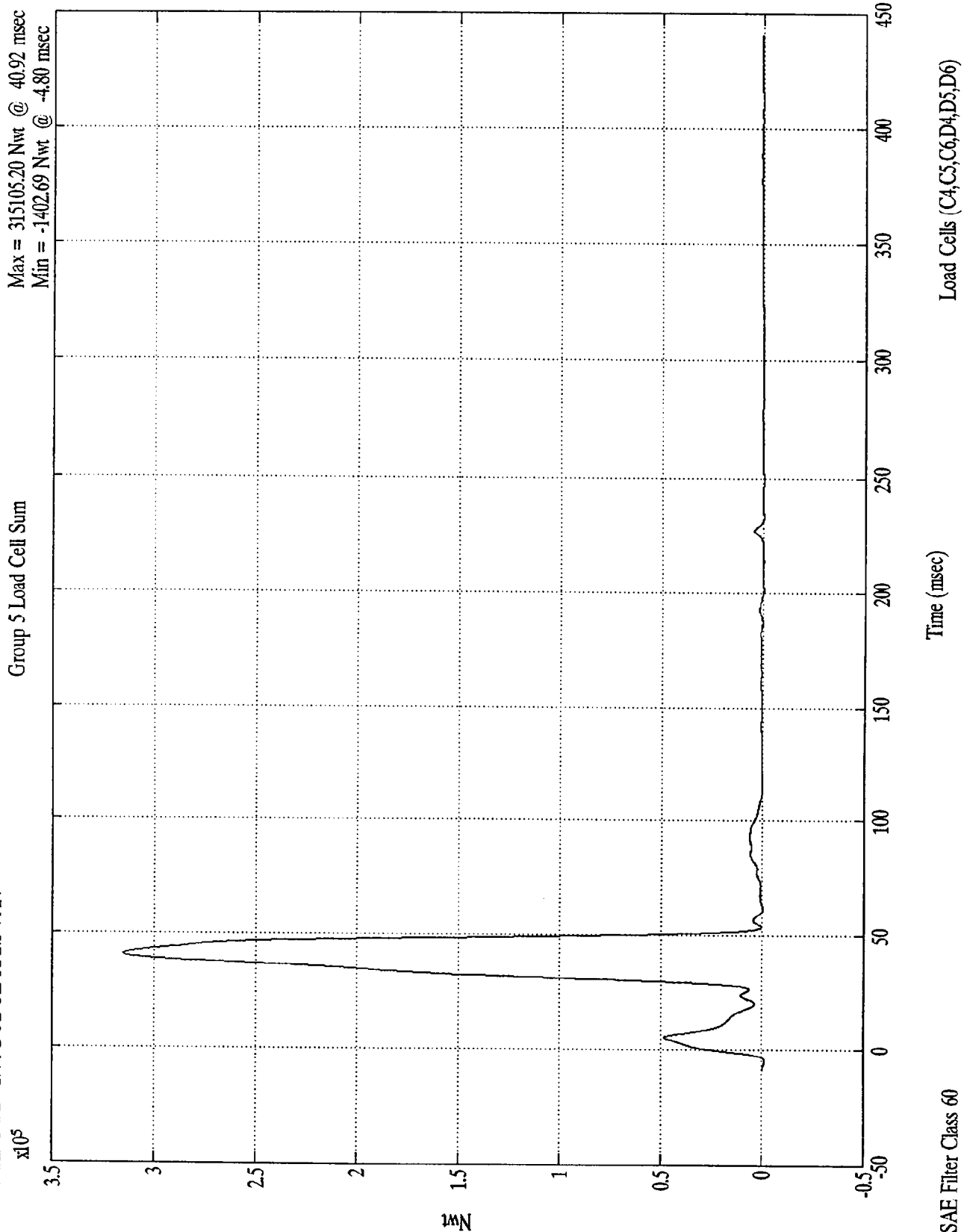
Group 4 Load Cell Sum

Max = 105837.60 Nwt @ 14.76 msec
Min = -1156.50 Nwt @ 1.32 msec

$\times 10^4$



NCAP TEST #2 - 19% DODGE RAM VAN

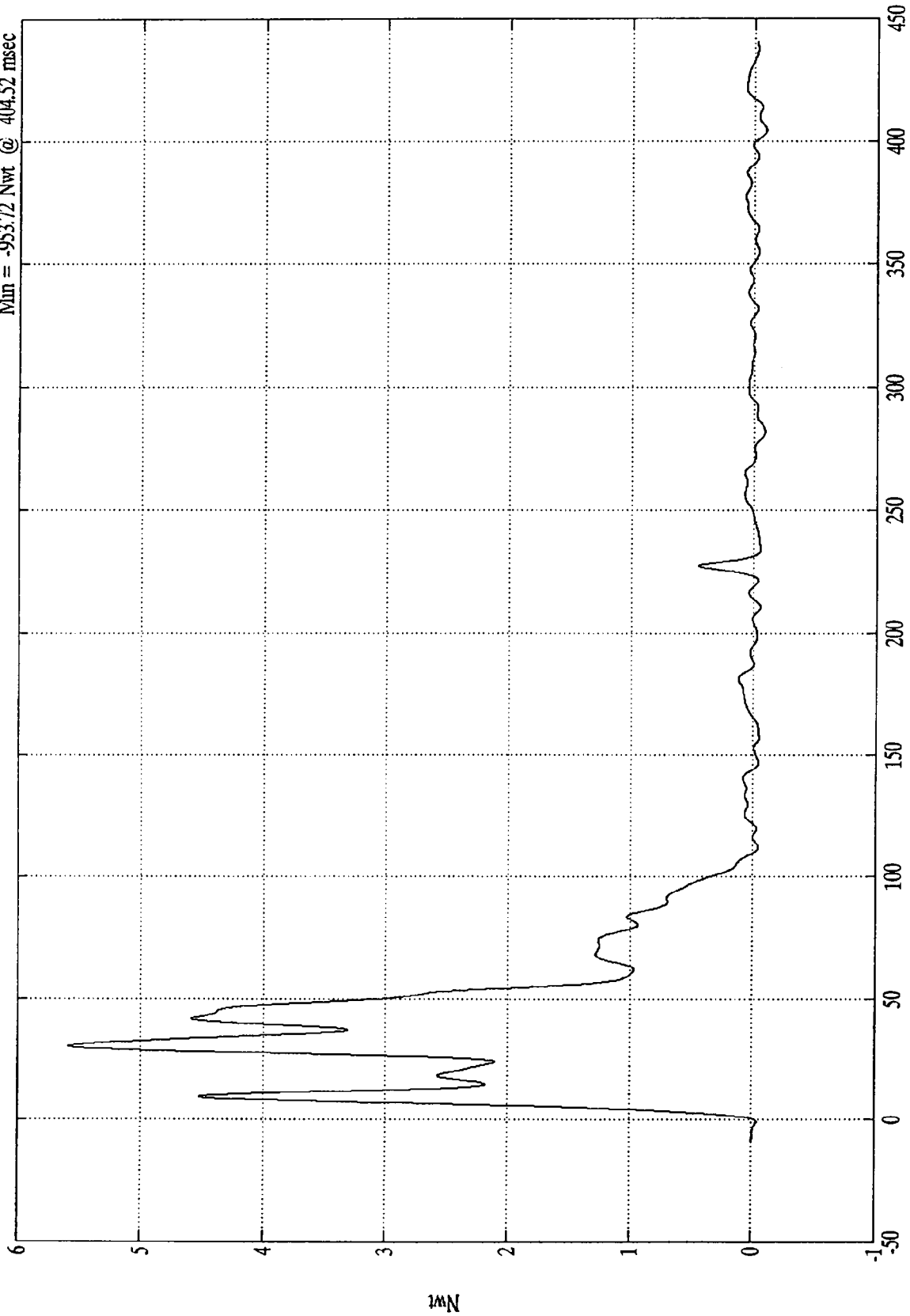


NCAP TEST #2 - 1996 DODGE RAM VAN

Group 6 Load Cell Sum

Max = 55854.74 Nwt @ 30.60 msec
Min = -953.72 Nwt @ 404.52 msec

$\times 10^4$



Time (msec)

Load Cells (C7,C8,C9,D7,D8,D9)

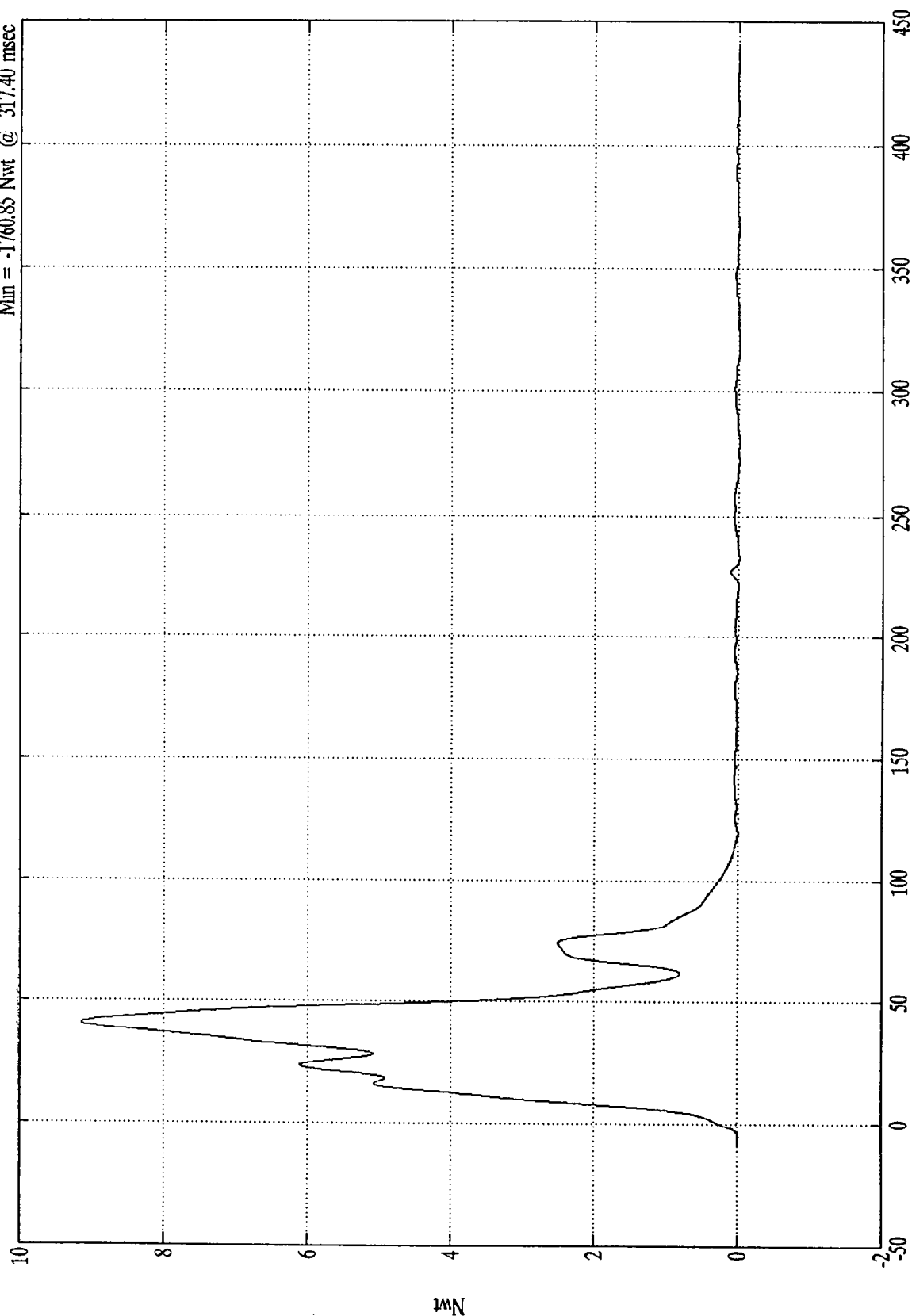
SAE Filter Class 60

NCAP TEST #2 - 1996 DODGE RAM VAN

Max = 914507.32 Nwt @ 40.56 msec
Min = -1760.85 Nwt @ 317.40 msec

Total Load Cell Sum

$\times 10^5$



Time (msec)

Load Cell B2 Did Not Record

SAE Filter Class 60

Appendix C
PART 572B/E 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 SRL Corporation. 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>
150	11/9/95
064	11/9/95

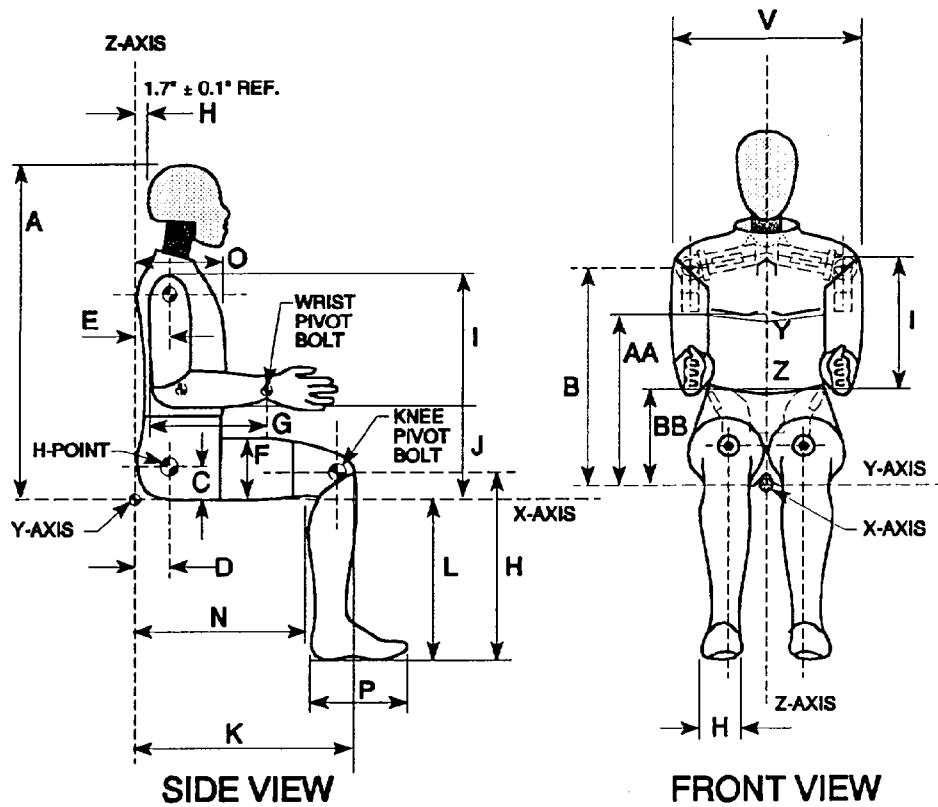
Electronic Test Equipment

The complement of signal conditioning, recording and display equipment, in conjunction with dummy certification testing, can be found in New Car Assessment and Standards Inducant Testing Final Report No. 6525-V-1.

Figure 14

DUMMY CONFIGURATION DIMENSIONS

**EXTERNAL DIMENSIONS
SPECIFICATIONS**



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

HYBRID III EXTERNAL DIMENSIONS

S/N 150 HUMANOID

DUMMY SERIAL NO. 150

DATE: 11/09/95

TEMPERATURE		21 DEG. C
RELATIVE HUMIDITY		32 %
LOCATION FOR CHEST CIRCUMFERENCE (AA)	429-434 mm	431 mm
LOCATION FOR WAIST CIRCUMFERENCE (BB)	226-231 mm	228 mm
CHEST CIRCUMFERENCE (Y)	970-1001 mm	998 mm
WAIST CIRCUMFERENCE (Z)	836-866 mm	863 mm
CHEST DEPTH (O)	213-229 mm	213 mm
H-POINT HEIGHT (C)	84-89 mm	86.4 mm
H-POINT FROM SEAT BACK (D)	135-140 mm	137 mm
SKULL CAP TO BACKLINE (H)	41-46 mm	43.2 mm
TOTAL SITTING HEIGHT (A)	879-889 mm	884 mm
THIGH CLEARANCE (F)	140-155 mm	142 mm
BUTTOCK KNEE LENGTH (K)	580-605 mm	594 mm
BUTTOCK POPLITAL LENGTH (N)	452-477 mm	470 mm
POPLITEAL LENGTH (L)	430-455 mm	452 mm
KNEE PIVOT HEIGHT (M)	485-501 mm	498 mm
FOOT LENGTH (P)	252-267 mm	256 mm
FOOT BREADTH (W)	91-107 mm	96.5 mm
SHOULDER PIVOT FROM BACKLINE (E)	84-94 mm	94 mm
SHOULDER BREADTH (V)	422-437 mm	429 mm
SHOULDER PIVOT HEIGHT (B)	505-521 mm	513 mm
ELBOW REST HEIGHT (J)	190-211 mm	205 mm
SHOULDER-ELBOW LENGTH (I)	330-345 mm	338 mm
BACK OF ELBOW TO WRIST PIVOT (G)	290-305 mm	292 mm

DUMMY MEETS SPECIFICATIONS

TECHNICIAN: BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
HEAD DROP TEST
HYBRID III

DATE : 11/6/95

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 150 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	38 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	235.4 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	6.5 G'S
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK FLEXION TEST
HYBRID III

DATE : 11/6/95

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 150 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5-22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY		10% - 70%	38 %
IMPACT VELOCITY		24.8 - 25.7 KPH	25.3 KPH
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	22.81 G'S
	20 MS	17.60 - 22.60 G'S	19.63 G'S
	30 MS	12.50 - 18.50 G'S	15.47 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	15.47 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	37 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	64.88 DEG.
	TIME	57 - 64 MS	57.63 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88 - 108 N-M	93.3 N-M
	TIME	47 - 58 MS	50.13 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	116 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	98.88 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST
HYBRID III

DATE : 11/6/95

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 150 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5 - 22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY		10% - 70%	38 %
IMPACT VELOCITY		21.4 - 22.3 KPH	22.2 KPH
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	17.29 G'S
	20 MS	14.00 - 19.00 G'S	16.21 G'S
	30 MS	11.00 - 16.00 G'S	14.52 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	14.52 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	42.88 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	81.59 DEG.
	TIME	72 - 82 MS	74.25 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-80.0/-52.9 N-M	-56.8 N-M
	TIME	65 - 79 MS	66.63 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	151.63 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	122.5 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 11/9/95

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN 150 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.5 - 22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	32 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	24.1 KPH
MAXIMUM DEFLECTION	64. - 73 mm	65 mm
MAXIMUM RESISTIVE FORCE	5160 - 5894 NEWTONS	5604 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	74.5 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 11/3/95

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 150 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	48 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4870 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 11/3/95

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 150 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	48 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4728 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY I.D. NUMBER: 150

A. DUMMY INSTRUMENTS

1. HEAD ACCELEROMETER

HX LONGITUDINAL

HY LATERAL

HZ VERTICAL

2. CHEST ACCELEROMETER

CX LONGITUDINAL

CY LATERAL

CZ VERTICAL

3. FEMUR LOAD CELLS

LEFT SIDE

RIGHT SIDE

MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
ENDEVCO	ADL98	10/95	4/96
ENDEVCO	AE8K0	10/95	4/96
ENDEVCO	ADMB6	10/95	4/96
ENDEVCO	A26A	10/95	4/96
ENDEVCO	A27A	10/95	4/96
ENDEVCO	A51A	10/95	4/96
GSE	951	6/95	12/95
GSE	952	6/95	12/95

**B. CALIBRATION LABORATORY
INSTRUMENTS**

1. PENDULUM ACC.

**2. TEST PROBE
ACCELEROMETER**

**3. LUMBAR FLEXION TEST
PUSH FORCE GAUGE**

**4. ABDOMINAL COMPRESS.
TEST FORCE GAUGE**

**5. ABDOMINAL COMPRESS.
TEST FORCE GAUGE**

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

HYBRID III EXTERNAL DIMENSIONS

S/N 064 HUMANOID

DUMMY SERIAL NO. 064

DATE: 11/09/95

TEMPERATURE		21 DEG. C
RELATIVE HUMIDITY		32 %
LOCATION FOR CHEST CIRCUMFERENCE (AA)	429-434 mm	432 mm
LOCATION FOR WAIST CIRCUMFERENCE (BB)	226-231 mm	229 mm
CHEST CIRCUMFERENCE (Y)	970-1001 mm	985 mm
WAIST CIRCUMFERENCE (Z)	836-866 mm	843 mm
CHEST DEPTH (O)	213-229 mm	216 mm
H-POINT HEIGHT (C)	84-89 mm	86.3 mm
H-POINT FROM SEAT BACK (D)	135-140 mm	137 mm
SKULL CAP TO BACKLINE (H)	41-46 mm	43.2 mm
TOTAL SITTING HEIGHT (A)	879-889 mm	884 mm
THIGH CLEARANCE (F)	140-155 mm	152 mm
BUTTOCK KNEE LENGTH (K)	580-605 mm	599 mm
BUTTOCK POPLITAL LENGTH (N)	452-477 mm	470 mm
POPLITEAL LENGTH (L)	430-455 mm	442 mm
KNEE PIVOT HEIGHT (M)	485-501 mm	495 mm
FOOT LENGTH (P)	252-267 mm	257 mm
FOOT BREADTH (W)	91-107 mm	96.5 mm
SHOULDER PIVOT FROM BACKLINE (E)	84-94 mm	88.9 mm
SHOULDER BREADTH (V)	422-437 mm	427 mm
SHOULDER PIVOT HEIGHT (B)	505-521 mm	518 mm
ELBOW REST HEIGHT (J)	190-211 mm	203 mm
SHOULDER-ELBOW LENGTH (I)	330-345 mm	338 mm
BACK OF ELBOW TO WRIST PIVOT (G)	290-305 mm	295 mm

DUMMY MEETS SPECIFICATIONS

TECHNICIAN: BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

HEAD DROP TEST

HYBRID III

DATE : 11/6/95

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 064 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	38 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	237.1 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	7.6 G'S
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK FLEXION TEST
HYBRID III

DATE : 11/6/95

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 064 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5-22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY		10% - 70%	38 %
IMPACT VELOCITY		24.8 - 25.7 KPH	25.1 KPH
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	24.08 G'S
	20 MS	17.60 - 22.60 G'S	19.4 G'S
	30 MS	12.50 - 18.50 G'S	16.28 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	16.28 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	36.25 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	68.89 DEG.
	TIME	57 - 64 MS	61.13 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88 - 108 N-M	88.9 N-M
	TIME	47 - 58 MS	51.5 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	119.63 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	105.88 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST
HYBRID III

DATE : 11/6/95

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 064 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5 - 22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY		10% - 70%	38 %
IMPACT VELOCITY		21.4 - 22.3 KPH	21.6 KPH
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	18.08 G'S
	20 MS	14.00 - 19.00 G'S	17.44 G'S
	30 MS	11.00 - 16.00 G'S	14.28 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	14.28 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	41.38 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	97 DEG.
	TIME	72 - 82 MS	78.13 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-80.0/-52.9 N-M	-53.8 N-M
	TIME	65 - 79 MS	70.13 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	159.88 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	129.25 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 11/8/95

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN 064 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.5 - 22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	34 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	23.8 KPH
MAXIMUM DEFLECTION	64 - 73 mm	64.3 mm
MAXIMUM RESISTIVE FORCE	5160 - 5894 NEWTONS	5640 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	75.4 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 11/3/95

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 064 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	40 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	5395 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 11/3/95

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 064 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	48 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	5480 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN BRIAN SWIECICKI

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY I.D. NUMBER: 064

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	AD4A9	10/95	4/96
ENDEVCO	AE8T7	10/95	4/96
ENDEVCO	AF5R1	10/95	4/96
ENDEVCO	AE8R7	10/95	4/96
ENDEVCO	AF5H9	10/95	4/96
ENDEVCO	AH5L8	10/95	4/96
GSE	418	7/95	1/96
GSE	419	7/95	1/96

B. CALIBRATION LABORATORY
INSTRUMENTS

1. PENDULUM ACC.

2. TEST PROBE
ACCELEROMETER

3. LUMBAR FLEXION TEST
PUSH FORCE GAUGE

4. ABDOMINAL COMPRESS.
TEST FORCE GAUGE

5. ABDOMINAL COMPRESS.
TEST FORCE GAUGE

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

Appendix D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head				
X	ADL98	ENDEVCO	10/95	4/96
Y	AE8K0	ENDEVCO	10/95	4/96
Z	ADMB6	ENDEVCO	10/95	4/96
Chest				
X	A26A	ENDEVCO	10/95	4/96
Y	A27A	ENDEVCO	10/95	4/96
Z	A51A	ENDEVCO	10/95	4/96
Right Femur Load Cell	952	GSE	6/95	12/95
Left Femur Load Cell	951	GSE	6/95	12/95
Neck Load Cell	269	DENTON	11/95	5/96
X	269	DENTON	11/95	5/96
Y	269	DENTON	11/95	5/96
Z	269	DENTON	11/95	5/96
Neck Moment	269	DENTON	11/95	5/96
X	269	DENTON	11/95	5/96
Y	269	DENTON	11/95	5/96
Z	269	DENTON	11/95	5/96
Chest Deflection Gauge	150	HUMANOID	7/95	1/96
Hybrid III Use Only				
Lap Belt Load Cells	706	LEBOW	7/95	1/96
Shoulder Belt Load Cells	707	LEBOW	7/95	1/96
Spool-Out Potentiometer	M7	MAGNETEK	11/95	5/96
Belt Stretch Transducer	E6	CALSPAN	11/95	5/96

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head				
X (R)	AC827	ENDEVCO	9/95	3/96
Y (R)	AC8F6	ENDEVCO	10/95	4/96
Z (R)	ACCW0	ENDEVCO	9/95	3/96
Chest				
X (R)	AHRC9	ENDEVCO	10/95	4/96
Y (R)	AC7W8	ENDEVCO	8/95	2/96
Z (R)	ACC06	ENDEVCO	10/95	4/96
Pelvic				
X	AL6N5	ENDEVCO	6/95	12/95
Y	AL6R7	ENDEVCO	6/95	12/95
Z	A12C	ENDEVCO	6/95	12/95
Left Upper Tibia	38	DENTON	6/95	12/95
Left Upper Tibia	38	DENTON	6/95	12/95
Left Lower Tibia	32	DENTON	6/95	12/95
Left Lower Tibia	32	DENTON	6/95	12/95
Left Lower Tibia	32	DENTON	6/95	12/95
Right Upper Tibia	45	DENTON	6/95	12/95
Right Upper Tibia	45	DENTON	6/95	12/95
Right Lower Tibia	41	DENTON	6/95	12/95
Right Lower Tibia	41	DENTON	6/95	12/95
Right Lower Tibia	41	DENTON	6/95	12/95

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(6 Month Calibration Minimum)

DRIVER DUMMY		Serial #	Manufacture	Calibration	
				Last	Next
Left Foot Front	Z	AET34	ENDEVCO	9/95	3/96
Left Foot Rear	X	AKD93	ENDEVCO	9/95	3/96
Left Foot Rear	Z	AEW70	ENDEVCO	9/95	3/96
Right Foot Front	Z	AET76	ENDEVCO	7/95	1/96
Right Foot Rear	X	AA4C5	ENDEVCO	7/95	1/96
Right Foot Rear	Z	AET22	ENDEVCO	7/95	1/96

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head				
X	AD4A9	ENDEVCO	10/95	4/96
Y	AE8T7	ENDEVCO	10/95	4/96
Z	AF5R1	ENDEVCO	10/95	4/96
Chest				
X	AE8R7	ENDEVCO	10/95	4/96
Y	AF5H9	ENDEVCO	10/95	4/96
Z	AH5L8	ENDEVCO	10/95	4/96
Right Femur Load Cell	419	GSE	7/95	1/96
Left Femur Load Cell	418	GSE	7/95	1/96
Neck Load Cell	446	DENTON	11/95	5/96
X	446	DENTON	11/95	5/96
Y	446	DENTON	11/95	5/96
Z	446	DENTON	11/95	5/96
Neck Moment	446	DENTON	11/95	5/96
X	446	DENTON	11/95	5/96
Y	446	DENTON	11/95	5/96
Z	446	DENTON	11/95	5/96
Chest Deflection Gauge	064	HUMANOID	11/95	5/96
Hybrid III Use Only				
Lap Belt Load Cells	710	LEBOW	7/95	1/96
Shoulder Belt Load Cells	711	LEBOW	7/95	1/96
Spool-Out Potentiometer	M8	MAGNETEK	11/95	5/96
Belt Stretch Transducer	E7	CALSPAN	11/95	5/96

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head	X (R)	ENDEVCO	10/95	4/96
	Y (R)	ENDEVCO	10/95	4/96
	Z (R)	ENDEVCO	10/95	4/96
Chest	X (R)	ENDEVCO	8/95	2/96
	Y (R)	ENDEVCO	8/95	2/96
	Z (R)	ENDEVCO	8/95	2/96
Pelvic	X	ENDEVCO	6/95	12/95
	Y	ENDEVCO	6/95	12/95
	Z	ENDEVCO	6/95	12/95
Left Upper Tibia	Mx	DENTON	6/95	12/95
	My	DENTON	6/95	12/95
	Fy	DENTON	6/95	12/95
Left Lower Tibia	Fz	DENTON	6/95	12/95
	Mx	DENTON	6/95	12/95
	My	DENTON	6/95	12/95
Right Upper Tibia	Mx	DENTON	6/95	12/95
	My	DENTON	6/95	12/95
	Fy	DENTON	6/95	12/95
Right Lower Tibia	Fz	DENTON	6/95	12/95
	Mx	DENTON	6/95	12/95
	My	DENTON	6/95	12/95

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #	Manufacture	Calibration	
			Last	Next
Left Foot Front Z	AEW29	ENDEVCO	10/95	4/96
Left Foot Rear X	AEYW0	ENDEVCO	9/95	3/96
Left Foot Rear Z	AEW71	ENDEVCO	8/95	2/96
Right Foot Front Z	AEWE3	ENDEVCO	7/95	1/96
Right Foot Rear X	AEWJ5	ENDEVCO	7/95	1/96
Right Foot Rear Z	AEWK1	ENDEVCO	7/95	1/96

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(6 Month Calibration Minimum)

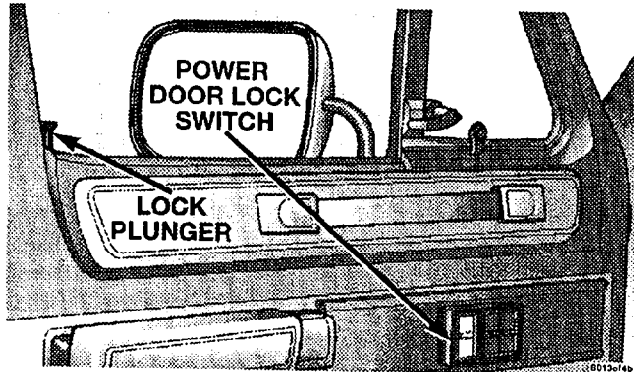
	Serial #	Manufacturer	Calibration	
			Last	Next
Left Seat Rear Crossmember	X85	ICS	12/95	6/96
Right Rear Seat Crossmember	X91	ICS	10/95	4/96
Top of Engine	X31	ICS	10/95	4/96
Bottom of Engine	AZ71	CEC	8/95	2/96
Left Disc Brake Caliper	A147	CEC	9/95	3/96
Right Disc Brake Caliper	A129	CEC	9/95	3/96
Instrument Panel	A69	CEC	9/95	3/96
Left Seat Rear Crossmember (R)	X28	ICS	10/95	4/96
Right Seat Rear Crossmember (R)	X26	ICS	11/95	5/96

Appendix E

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

Power Door Locks

All doors equipped with power door locks can be locked or unlocked from inside by the lock button on either of the front doors. Push button down to lock, up to unlock. Side and rear cargo doors will lock only when the doors are closed or the delay door lock feature is activated.



WARNING!

For personal security and safety in the event of an accident, lock the vehicle doors when you drive as well as when you park and leave the vehicle.

OCCUPANT RESTRAINTS

One of the most important safety features in your vehicle is the restraint system. This system includes the front and rear seat belts. Your seat belts can also be used to hold infant and child restraint systems if you will be carrying children too small for adult-size belts.

Please pay close attention to the information in this section. It tells you how to use your restraint system properly to keep you and your passengers as safe as possible.

WARNING!

In a collision you and your passengers can suffer much greater injuries if you are not properly buckled up. You can strike parts of the inside of the vehicle or other passengers, or you can be thrown out of the vehicle. Always be sure you and others in your vehicle are buckled up properly.

Buckle up even though you are an excellent driver. Even on short trips. Someone else on the road may be a poor driver and cause a collision which involves you. And this can happen far from home or on your own street.

Research has shown that seat belts save lives. And they can reduce the seriousness of injuries in a collision. Some of the worst injuries happen when people are thrown from the vehicle. Seat belts provide protection against that, and they reduce the risk of injury caused by striking the inside of the vehicle. Everyone in a motor vehicle needs to be buckled up all the time.

Unibelts

The outboard front and rear seats of your vehicle have combination lap/shoulder belts, or unibelts. The retractor is designed to lock during very sudden stops or impacts. This feature allows the shoulder part of the belt to move freely with you under normal conditions. But in a collision, the belt will lock and reduce the risk of your striking the inside of the vehicle or being thrown out.

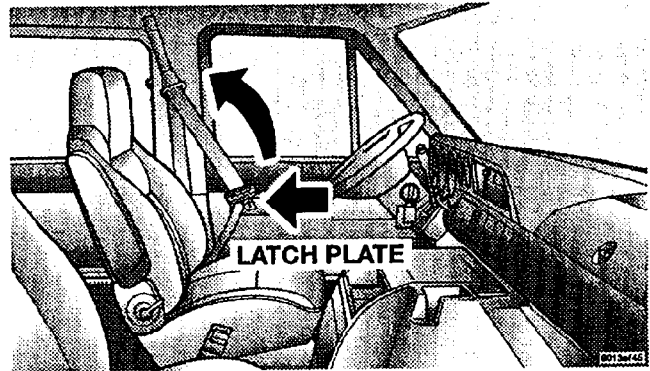
WARNING!

Wearing a seat belt incorrectly is dangerous. Seat belts are designed to go around the large bones of your body. These are the strongest parts of your body and can take the forces of a collision the best. Wearing your belt in the wrong place could make your injuries in a collision much worse. You might suffer internal injuries, or you could even slide out of part of the belt. Follow these instructions to wear your seat belt safely and to keep your passengers safe, too.

Unibelt Operating Instructions

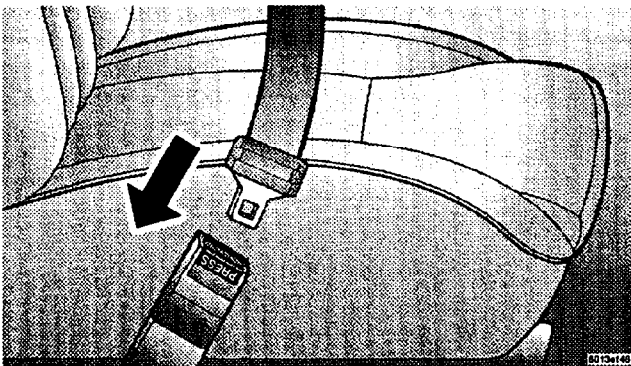
1. Enter the vehicle and close the door. Sit back and adjust the seat.

2. The latch plate of the belt is above the back of your seat. Grasp the latch plate and pull out the belt. Slide the latch plate up the webbing as far as necessary to make the belt go around your lap.



18 THINGS TO KNOW BEFORE STARTING YOUR VEHICLE

3. When the belt is long enough to fit, insert the latch plate into the buckle until you hear a "click".



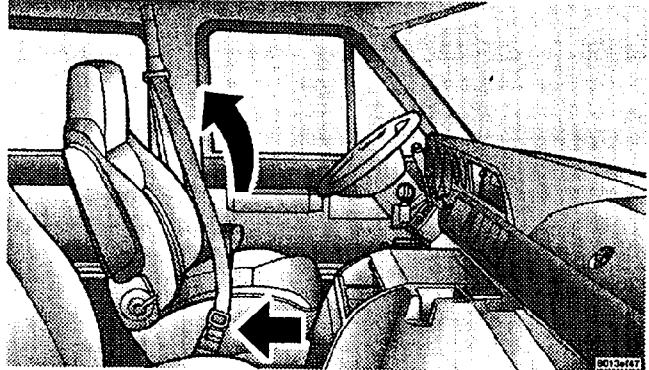
WARNING!

A belt buckled into the wrong buckle will not protect you properly. The lap portion could ride too high on your body, possibly causing internal injuries. Always buckle your belt into the buckle nearest you.

WARNING!

- A belt that is too loose will not protect you as well. In a sudden stop you could move too far forward, increasing the possibility of injury. Wear your seat belt snugly.
- A shoulder belt worn under your arm is very dangerous. Your body could fall into the inside surfaces of the vehicle in a collision, increasing head and neck injury. And a belt worn under the arm can cause internal injuries. Ribs aren't as strong as shoulder bones. Wear the belt over your shoulder so that your strongest bones will take the force in a collision.
- A lap belt worn too high can increase the risk of internal injury in a collision. The belt forces won't be at the strong hip and pelvic bones, but across your abdomen. Always wear the lap part as low as possible and keep it snug.

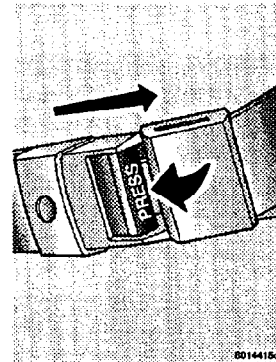
4. Position the lap belt across your thighs, below your abdomen. If you need the lap portion tighter, pull up a bit on the shoulder part. A snug belt reduces the risk of sliding under the belt in a collision.



5. Position the shoulder belt on your chest so that it is comfortable and not resting on your neck. The retractor will withdraw any slack in the belt.

WARNING!

A twisted belt can't do its job as well. In a collision it could even cut into you. Be sure your belt is straight. If you can't straighten a belt in your vehicle, take it to your dealer and have it fixed.



6. To release the belt, push the red button marked "Press" on the buckle. The belt will automatically retract to its stowed position.

If necessary, slide the latch plate down the webbing to allow the belt to retract fully.

WARNING!

A frayed or torn belt could rip apart in a collision and leave you with no protection. Inspect the belt system periodically, checking for cuts, frays, or loose parts. Damaged parts must be replaced immediately. Do not disassemble or modify the system. Seat belt assemblies must be replaced after an accident if they have been damaged (bent retractor, torn webbing, etc.).

Shoulder Belt Upper Anchorage

A yellow label has been placed on the inboard side of the driver's shoulder belt under its upper anchorage cover. After a collision of certain severity, where the driver's seat belt is in use, the shoulder belt will extend downward from its upper anchorage cover. A yellow label will then be exposed. When any part of this label becomes visible, the seat belt must be replaced.



NOTE: After a collision in which the driver's airbag has been deployed, the driver's seat belt must be replaced regardless of whether the yellow shoulder belt label is visible or not.