

V2129

REPORT NUMBER: CAL-95-N02

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

**FORD MOTOR COMPANY
1995 FORD ASPIRE
4-DOOR HATCHBACK**

NHTSA NUMBER: MS0201

CALSPAN TEST NUMBER: 8227-2

September 14, 1994

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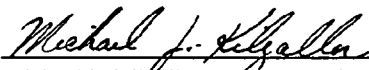
FINAL REPORT

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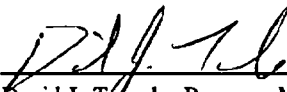
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National Highway Traffic Safety Administration
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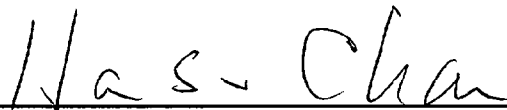

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<p>16. <i>Abstract</i></p> <p>A frontal load cell barrier test of a 1995 Ford Aspire 4-Door Hatchback was performed at the Calspan Advanced Technology Center Crash Test Facility in Buffalo, New York on September 14, 1994.</p> <p>The impact velocity was 56.9 kph and the temperature at the barrier face was 22.8°C. The maximum post test vehicle crush was 610 mm. The test vehicle was equipped with a 3-point continuous belt system at each of the front outboard seating positions. The vehicle was also equipped with supplemental airbags at each of the front outboard seating positions.</p> <p>With regard to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger complied with the head, chest and femur requirements.</p>					
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	PURPOSE AND TEST PROCEDURE	1-1
2	SUMMARY OF TEST	2-1
3	OCCUPANT AND VEHICLE INFORMATION	3-1
4	SUMMARY OF RESULTS FOR: FMVSS 212, "Windshield Mounting" FMVSS 219 (Partial), "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"	4-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA	B-1
APPENDIX C	PART 572 B/E DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION TESTS	C-1
APPENDIX D	DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION	D-1
APPENDIX E	VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS	E-1

LIST OF FIGURES

<u>Figure No.</u>		<u>Page No.</u>
1	Dummy Measurements for Front Seat Passengers	3-4
2	Seat Belt Positioning Data	3-6
3	Camera Positions for Frontal Impacts	3-8
4	Vehicle Target Locations	3-10
5	Load Cell Locations on Fixed Barrier	3-11
6	Vehicle Accelerometer Locations	3-12
7	Test Vehicle Measurements	3-13
8	FMVSS No. 212 - "Windshield Mounting" Data	4-2
9	FMVSS No. 219 (Partial) - "Windshield Intrusion" Data	4-3
10	Dummy Configuration Dimensions	C-3

LIST OF TABLES

<u>Table No.</u>		<u>Page No.</u>
1	General Test and Vehicle Data	2-2
2	Dummy Injury Criteria Values	3-2
3	Hybrid III Neck and Chest Data Sheet	3-3
4	Front Seat Occupant Measurements	3-5
5	Seat Belt Performance Assessment Test Data	3-7
6	High Speed Camera Locations	3-9
7	Vehicle Measurements	3-14
8	Accident Investigation Division Data	3-15
9	FMVSS No. 301-75 "Fuel System Integrity" Post Impact Test Data	4-4
10	FMVSS No. 301 - "Static Rollover" Data	4-5

Section 1

PURPOSE AND TEST PROCEDURE

This 56.9 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 56.9 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 MS0201

A load cell barrier consisting of 36 load cells was impacted by a 1995 Ford Aspire 4-Door Hatchback at a velocity of 56.9 kph. The test was performed at the Calspan Corporation Advanced Technology Center on September 14, 1994. 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. 45) was used in one previous test (MS0100) and injury criteria was not exceeded in that test. The right-front passenger ATD (Serial No. 245) was calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 84 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. Position #1 - Upper Neck Fy did not record accurately. Position #2 - Lap Belt Load Cell did not record accurately. Vehicle accelerometer #1(x) - Left Rear Seat Frame Member did not record. Vehicle Accelerometer #7(x) - Instrument Panel did not return to zero and should be regarded as questionable.

The driver's HIC was 487.4. The maximum chest deceleration over 3 milliseconds was 52.7 g's and maximum chest deflection was 38.5 mm. Femur loads were -6954.3 newtons on the left femur and -5957.9 newtons on the right femur.

The right front passenger's HIC was 720.3. Maximum chest deceleration over 3 milliseconds was 52.0 g's and maximum chest deflection was 32.1 mm. Femur loads were -6137.6 newtons on the left and -7721.0 newtons on the right.

Table 1

GENERAL TEST AND VEHICLE DATA

Vehicle Year/Make/Model/Body Style: 1995 Ford Aspire 4-Door Hatchback

NHTSA Test No.: MS0201 VIN.: KNJLT06H6R6131894

Body Color: Green Date of Manufacturer: May 12, 1994

Date Received: August 16, 1994 Odometer Reading: 172.1

Engine: 4 Cylinders; - C.I.D.; 1.3 Liters; - CC
 Gas; - Diesel; - Turbocharged;
- Longitudinal; Transverse;

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

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

Accessories: - A/C; - Pwr./Strg.; Pwr./Brks.; - Pwr./Wdo
- Tilt Wheel; - Pwr./Seats; - Cruise Control; - Other

Type of Occupant Restraint: 3-Point Restraint System with supplemental Driver and Passenger Airbags

DATA RECORDED FROM VEHICLE TIRE PLACARD:

Tire Pressure (at capacity): Front 220 kPa, Rear 220 kPa.

Recommended Tire Size: P165/70R13

Recommended Cold Tire Pressure: Front 220 kPa, Rear 220 kPa.

Tires on Vehicle: 165/70R13 Manufacturer: Yokohama

Number of Occupants: 2 Front; 2 Rear; - 3rd Seat; 4 TOTAL

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

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

Vehicle Capacity Weight (VCW) = 308 kgs. (A)

No. of Occupants x 68 kgs. = 272 kgs. (B)

Rated Cargo and Luggage Weight (RCLW) A-B = 36 kgs.

GVWR 1339 kgs. GAWR: Front 743 kgs. Rear 596 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>279</u>	kgs.	Right Rear	=	<u>186</u>	kgs.
Left Front	=	<u>295</u>	kgs.	Left Rear	=	<u>186</u>	kgs.
TOTAL FRONT WEIGHT:		<u>574</u>	kgs.	<u>61</u>	% of Total Vehicle Weight		
TOTAL REAR WEIGHT:		<u>372</u>	kgs.	<u>39</u>	% of Total Vehicle Weight		
TOTAL DELIVERED WEIGHT	=	<u>946</u>	kgs.				

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight	<u>946</u>	kgs.
VCW = Vehicle Capacity Weight	<u>308</u>	kgs.
DSC = Designated Seating Capacity	<u>4</u>	kgs.
RCLW = VCW - 68 (DSC) =	<u>36</u>	kgs.
Target Test Weight = UDW + RCLW + (2 dummies x 74.0 kgs.)		
Target Test Weight =	<u>1,130</u>	kgs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 30 KGS. CARGO:

Right Front	=	<u>318</u>	kgs.	Right Rear	=	<u>236</u>	kgs.
Left Front	=	<u>330</u>	kgs.	Left Rear	=	<u>240</u>	kgs.
TOTAL FRONT WEIGHT:		<u>648</u>	kgs.	<u>58</u>	% of Total Vehicle Weight		
TOTAL REAR WEIGHT:		<u>476</u>	kgs.	<u>42</u>	% of Total Vehicle Weight		
TOTAL TEST WEIGHT	=	<u>1,124</u>	kgs.				
Weight of ballast in vehicle trunk area	=	<u>0</u>	kgs.				

VEHICLE ATTITUDE (all dimensions in millimeters):

Delivered Attitude:	RF	<u>622</u>	LF	<u>617</u>	RR	<u>646</u>	LR	<u>648</u>
Test Attitude	RF	<u>603</u>	LF	<u>597</u>	RR	<u>590</u>	LR	<u>584</u>
Wheel Base:	<u>2382</u>	mm.;	C.G.	<u>1,009</u>	millimeters rearward of front wheel center.			

Remarks: 35 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: September 14, 1994 Time of Test: 12:44
 Ambient Temperature: 23 ° 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 = 56.9 kph, secondary = 56.8 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>3908</u>	C _L	<u>3978</u>	L	<u>3905</u>
	Post-test = R	<u>3364</u>	C _L	<u>3370</u>	L	<u>3370</u>
	Crush = R	<u>544</u>	C _L	<u>608</u>	L	<u>535</u>

Distance from front of test vehicle to point of impact:

R 734 C_L 747 L 757

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Airbag and Sunvisor</u>	<u>Airbag</u>
Chest	<u>No Contact</u>	<u>No Contact</u>
Abdomen	<u>No Contact</u>	<u>No Contact</u>
Left Knee	<u>Lower Dashpanel</u>	<u>Kneebolster</u>
Right Knee	<u>Lower Dashpanel</u>	<u>Kneebolster</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>Operable</u>	<u>Operable</u>	<u>-</u>	<u>-</u>
	<u>Front</u>		<u>Rear</u>	
<u>Seat Movement</u>	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Seat Back Failure	<u>None</u>	<u>None</u>	<u>-</u>	<u>-</u>
Seat Shift (mm.)	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>
<u>Glazing Damage</u>				
Backlight/Windshield:	<u>windshield sustained stress fractures but remained intact.</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.: MS0201 Vehicle: 1995 Ford Aspire 4-Door Hatchback

	MAXIMUM HEAD ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-50.8	4.4	21.3	52.6
Position #2 - Passenger	-70.0	19.4	16.3	71.5

	MAXIMUM CHEST ACCELERATION (g's)			
	X	Y	Z	R*
Position #1 - Driver	-54.3	-5.0	-10.2	52.7
Position #2 - Passenger	-53.8	-12.3	-14.9	52

* 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	-6954.3	-5957.9
Position #2 - Passenger	-6137.6	-7721

	MAXIMUM FORCE - SEAT BELT LOADS (nwt)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
Position #1 - Driver	7067.9	-	4783.4
Position #2 - Passenger	6485.3	N/A	-

	HEAD INJURY CRITERIA (HIC)			
	HIC**	t ₁ (mSec)	t ₂ (mSec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	487.4	54.48	90.36	45.0
Position #2 - Passenger	720.3	52.8	84.48	55.3

** 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: 1995 Ford Aspire 4-Door Hatchback

Vehicle NHTSA No.: MS0201 Test Date: September 14, 1994

MAXIMUM VALUES	DRIVER DUMMY ID #45:	PASSENGER DUMMY ID #245:
Neck Load X (nwt)	319.3	-912.9
Neck Load Y (nwt)	N/A	230.9
Neck Load Z (nwt)	1622.4	741.3
Neck Moment X (nwt-m)	-10.1	18.0
Neck Moment Y (nwt-m)	-36.8	144.8
Neck Moment Z (nwt-m)	9.8	30.0
Chest Deflection X (mm.)	-38.5	-32.1
Time of Max. Occurrence (msec)	62.6	72.1

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

Figure 1

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

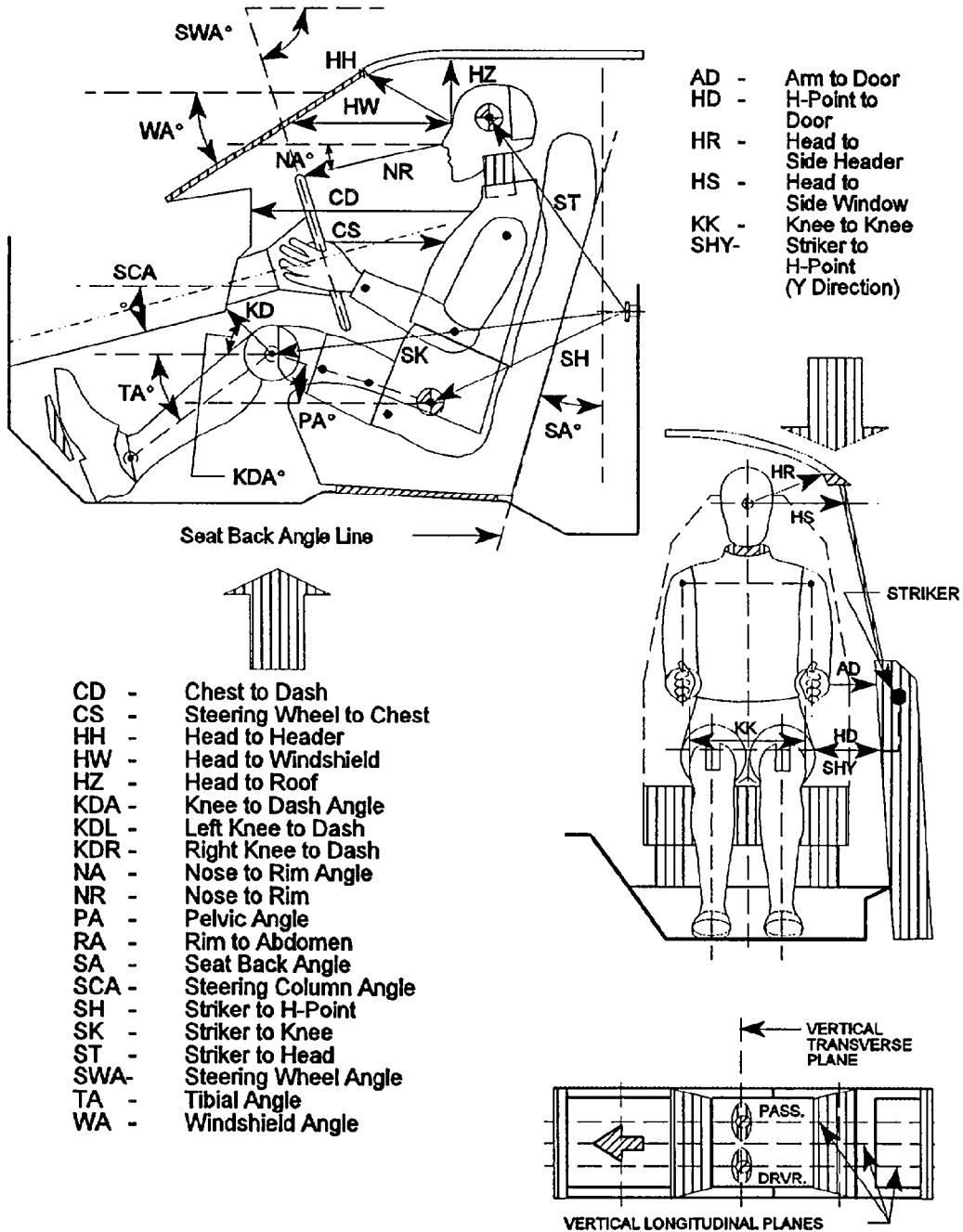


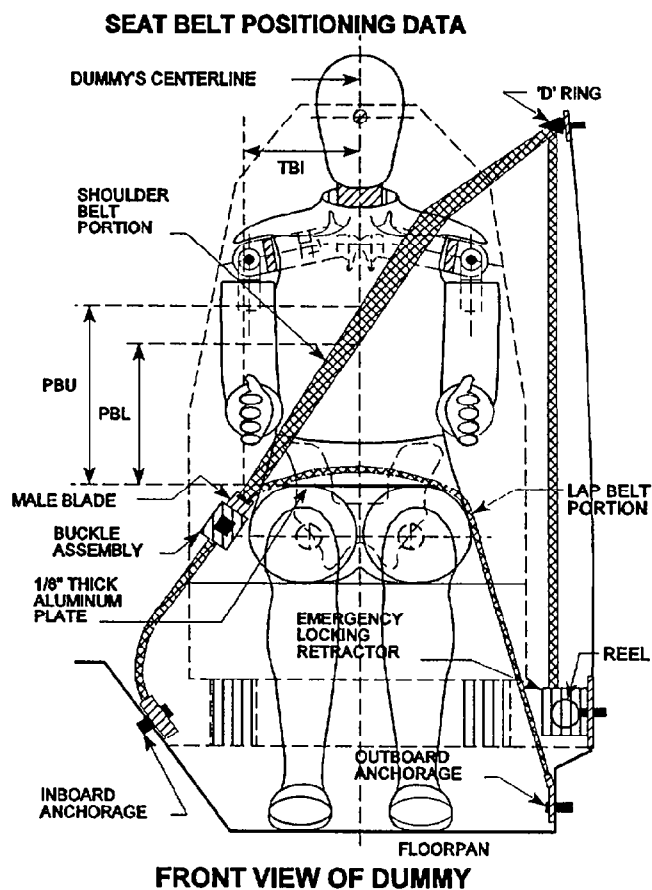
Table 4

FRONT SEAT OCCUPANT MEASUREMENTS

	DRIVER (Serial #45)			PASS. (Serial # 245)		
WA°	30°			N/A		
SWA°	61°			N/A		
SCA°	29°			N/A		
SA°	22° (3rd Notch from full upright)			22° (3rd Notch from full upright)		
HZ	183			178		
HH	257			264		
HW	477			470		
HR	203			190		
NR	373	Angle	17°	N/A		
CD	485			571		
CS	284			N/A		
RA	155			N/A		
KDL	140	Angle (KDA)	33°	152		
KDR	140			157	Angle (KDA)	21°
PA°	23°			25°		
TA°	33°			34°		
KK	305			292		
ST	561	Angle	13°	553	Angle	13°
SK	856	Angle	94°	609	Angle	94°
SH	208	Angle	126°	203	Angle	127°
SHY	216			225		
HS	205			198		
HD	140			132		
AD	76			74		

Figure 2

SEAT BELT POSITIONING DATA



	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	338	338
PBL-- Top surface of alum. plate to belt lower edge	254	254
<u>LAP BELT TENSION</u>	-	-
<u>SHOULDER BELT TENSION</u>	9 nwt	9 nwt

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>1783 mm</u>	<u>1778 mm</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>838 mm</u>	<u>838 mm</u>
Lap belt length as measured on Part 572 Dummy.	<u>736 mm</u>	<u>737 mm</u>
<u>SHOULDER BELT SPOOL-OFF DATA:</u>		
As determined by film analysis.	<u>50 mm</u>	<u>25 mm</u>
As determined mechanically.	<u>48 mm</u>	<u>30 mm</u>
As determined electronically.	<u>45 mm</u>	<u>22 mm</u>
<u>BELT STRETCH DATA:</u>		
Measured electronically between shoulder belt load cell and the "D" ring.	<u>0.0 mm/M</u>	<u>6.2 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 4

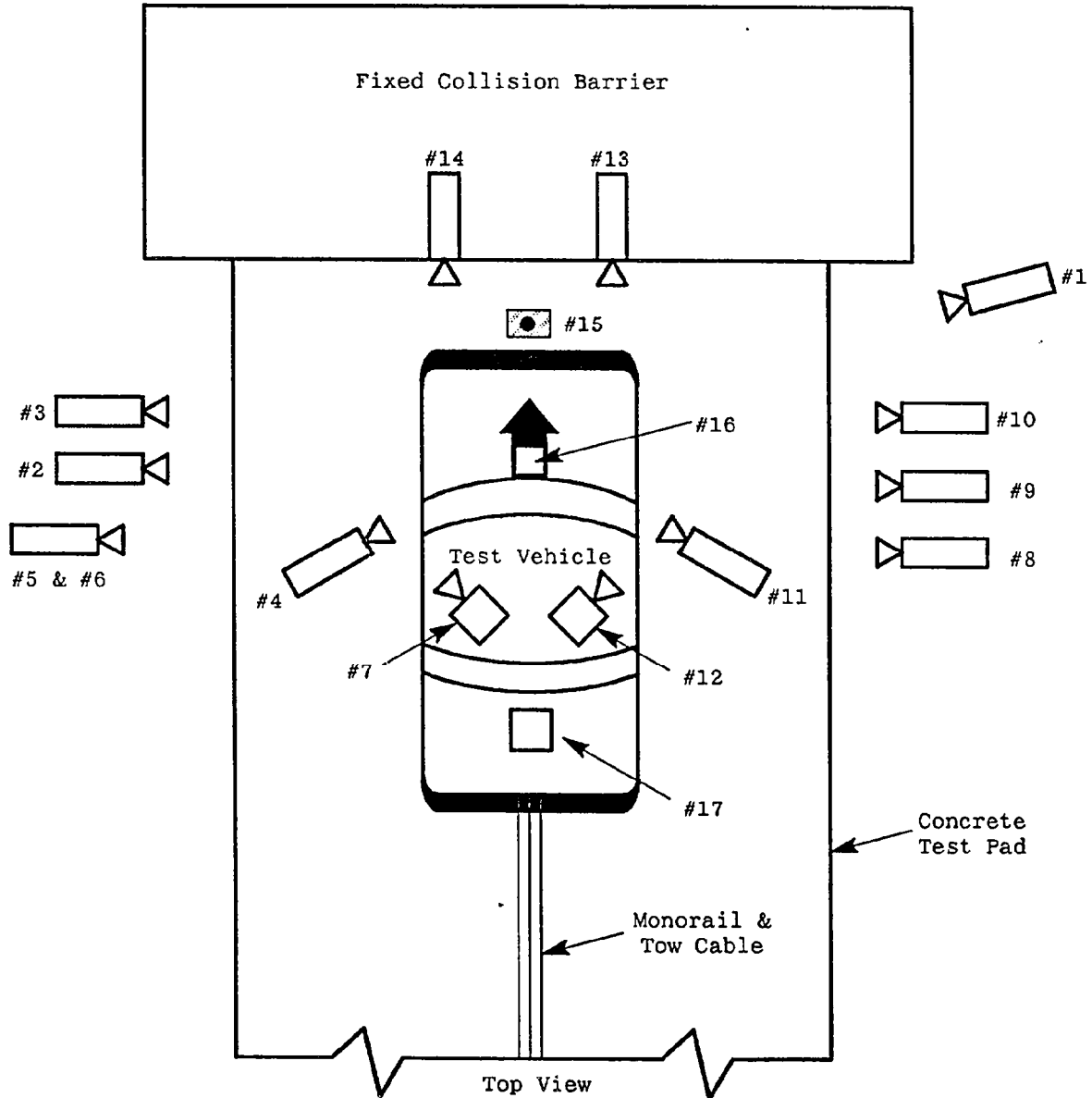


Table 6
HIGH-SPEED CAMERA LOCATIONS

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	5512	1499	1067	0	5125	13	1005
3	Left Side View	7214	737	1067	-4	6827	25	1005
4	Driver and Interior View	2642	2438	1803	-22	-	13	980
5	Steering Column (Bottom)	6452	1880	1193	-4	6065	25	900
6	Steering Column (Top)	6452	1880	1778	-10	6065	25	1010
7	Left Belt View	-	-	-	-	-	8	540
8	Overall Right Side View	5893	1702	1067	-4	5506	13	1080
9	Right Side View	7442	1448	1067	-3	7055	25	950
10	Right Passenger View	7849	1803	1499	-5	7462	35	1050
11	Right Passenger /Interior View	2491	2438	1854	-23	-	13	1010
12	Right Belt View	-	-	-	-	-	8	650
13	Passenger View	560	127	1778	-40	-	13	1000
14	Driver View	560	127	1778	-40	-	13	1000
15	Windshield View	0	0	3048	-60	-	13	1055
16	Pit View of Engine	0	510	-3058	90	-	13	690
17	Pit View of Fuel Tank	0	3440	-3048	90	-	13	660

Test No. MS0201 Vehicle: 1995 Ford Aspire 4-Door Hatchback

*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

** = referenced to horizontal plane

N.T. indicates No Timing

Figure 4

VEHICLE TARGET LOCATIONS

A	311
B	568
C	1213
D	1730
E	330
F	1397
G	756
H	756
I	156
J	1275
K	912
L	1035
M	330
N	146
O	754
P	756
Q	1035
R	900
S	1287

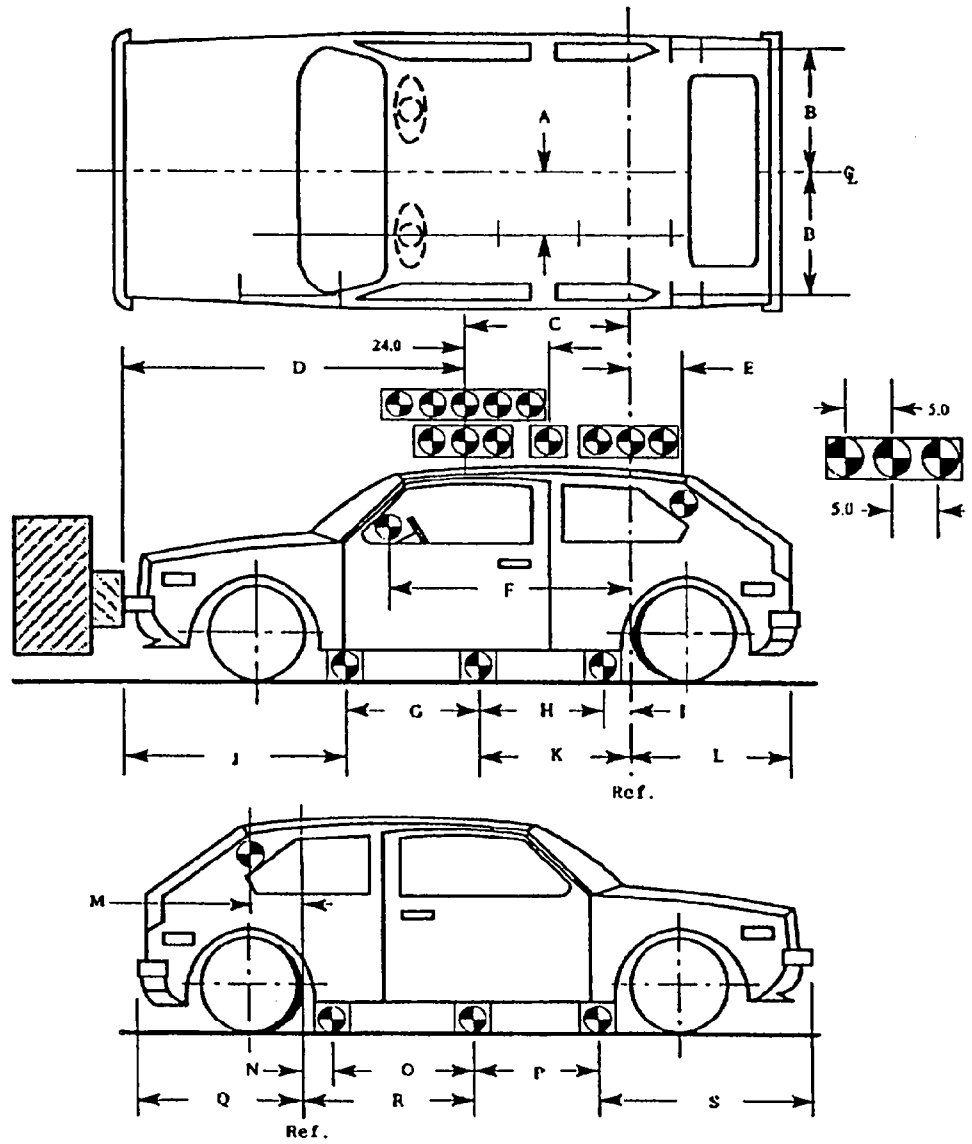
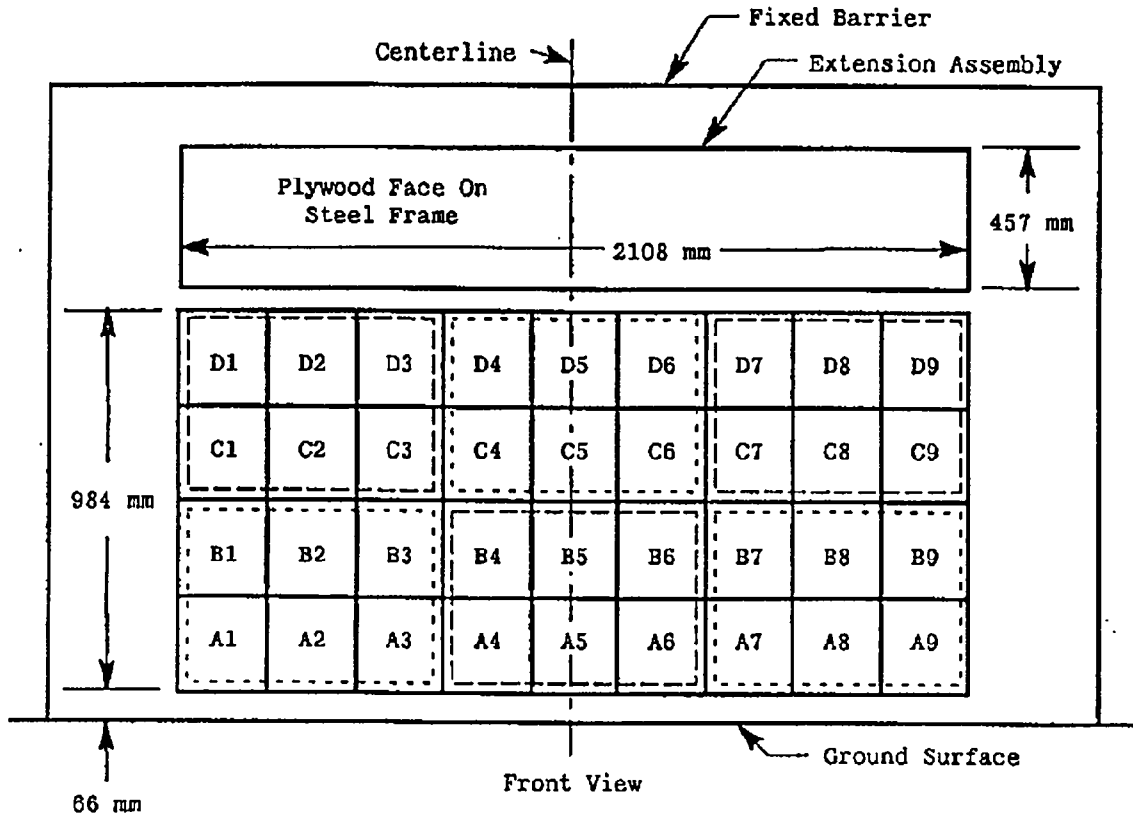


Figure 5

LOAD CELL LOCATIONS ON FIXED BARRIER



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

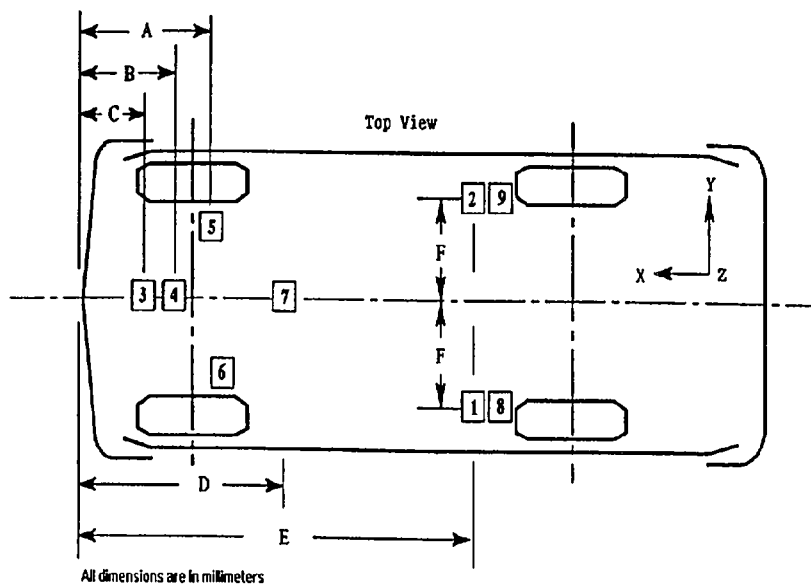
6 GROUPS OF 6 LOAD CELLS EACH

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=2540	Y=597
2	Right Rear Seat Crossmember [E/F]	X=2540	Y=597
3	Top of engine [C]	635	
4	Bottom of engine [B]	673	
5	Right Disc Brake Caliper [A]	889	
6	Left Disc Brake Caliper [A]	889	
7	Instrument Panel [D]	1483	
8	Left Rear Seat Crossmember [E/F]	X=2540	Y=597
9	Right Rear Seat Crossmember [E/F]	X=2540	Y=597

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

Figure 7

TEST VEHICLE MEASUREMENTS

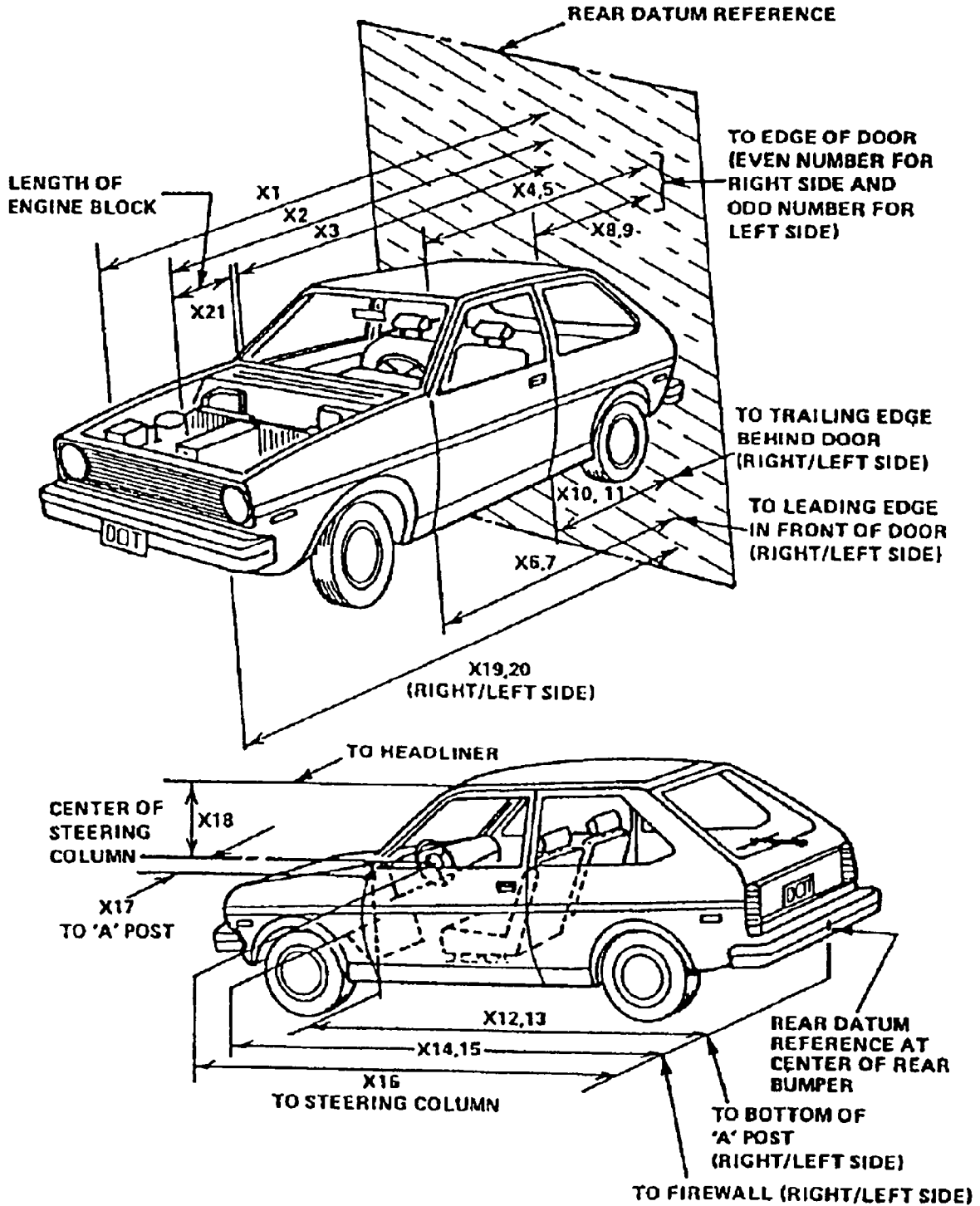


Table 7

VEHICLE MEASUREMENTS

No.		All Dimensions in mm		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	3978	3370	608
X2	Rear Surface of Vehicle to Front of Engine	3410	3180	230
X3	Rear Surface of Vehicle to Firewall	2960	2952	8
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	2700	2695	5
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	2700	2685	15
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	2650	2636	14
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	2655	2635	20
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	1700	1700	0
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	1705	1685	20
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	1705	1686	19
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	1704	1684	20
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	2695	2695	0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	2670	2664	6
X14	Rear Surface of Vehicle to Firewall, Right Side	2958	2910	48
X15	Rear Surface of Vehicle to Firewall, Left Side	2950	2920	30
X16	Rear Surface of Vehicle to Steering Column	2615	2329	286
X17	Center of Steering Column to "A" Post	400	410	-10
X18	Center of Steering Column to Headliner	430	390	40
X19	Rear Surface of Vehicle to Right Side of Front Bumper	3908	3364	544
X20	Rear Surface of Vehicle to Left Side of Front Bumper	3905	3370	535
X21	Length of Engine Block	310	310	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2815	2465	350
CD	Rear Surface of Vehicle to Center of Dash Panel	2827	2486	341
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2815	2470	345

Table 8

ACCIDENT INVESTIGATION DIVISION DATA
FOR 56.3 KPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Ford Aspire 4-Door Hatchback

Vehicle NHTSA No.: MS0201 VIN: KNJLT06H6R6131894

Model Year: 1995 Build Date: May 12, 1994 Test Date: September 14, 1994

Vehicle Size Category: Compact Test Weight: 1124 kgs.

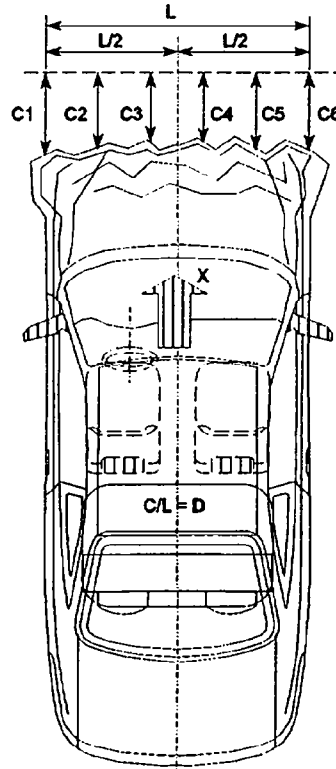
Wheel Base: 2382 mm; Front Overhang: 1281 mm;

Vehicle Overall Width: 1370 mm;

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions:

C1 = 484 mm
 C2 = 559 mm
 C3 = 594 mm
 C4 = 610 mm
 C5 = 574 mm
 C6 = 502 mm



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

Longitude Length of Damaged Region: $L =$ 1370 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 14 mm. molding.

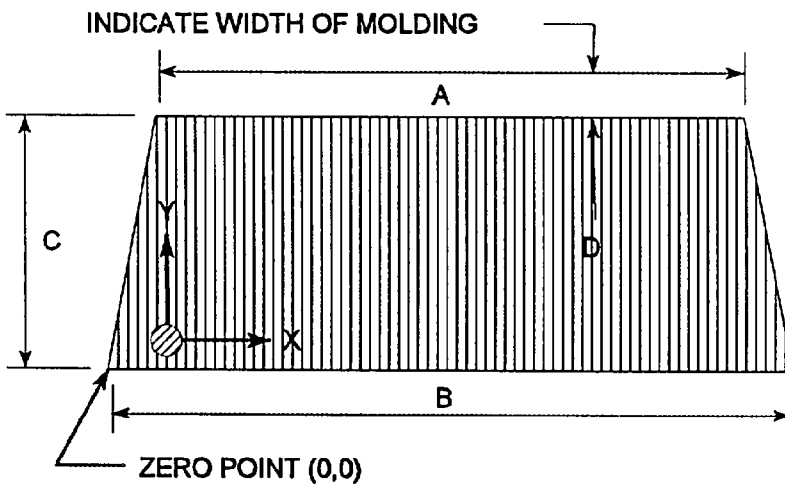
FMVSS 212 REQUIREMENTS:

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	1975	1975	100
LEFT SIDE	1975	1975	100
TOTAL	3,950	3,950	100

AREA OF RETENTION FAILURE:



DIMENSIONS	
A	1054 mm
B	1422 mm
C	737 mm
D	14 mm

FRONT VIEW OF WINDSHIELD

FAILURE DETAILS: None

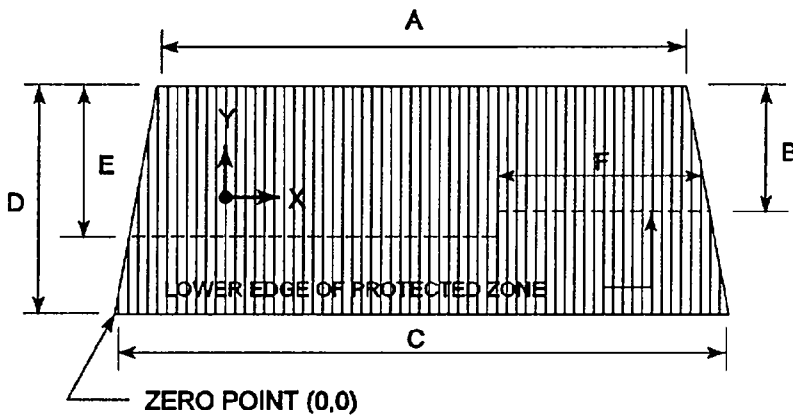
Figure 9

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	1054 mm
B	441 mm
C	1422 mm
D	737 mm
E	540 mm
F	648 mm

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.: MS0201 TEST DATE: September 14, 1994
VEHICLE MAKE/MODEL: 1995 Ford Aspire

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: ✓ 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

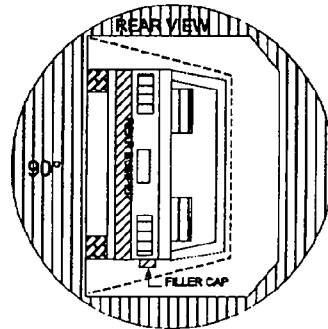
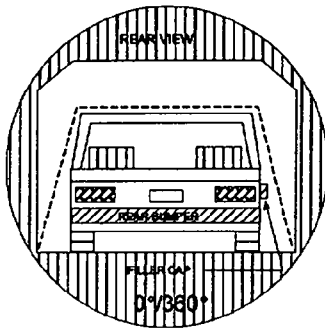
SOLVENT SPILLAGE DETAILS: None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:
0 - 90 deg.

VEHICLE NHTSA ID No.
MS0201



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time

(Spec. Range = 1 to 3 minutes)	<u>2</u>	minutes	<u>10</u>	seconds
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
TOTAL	<u>7</u>	minutes	<u>10</u>	seconds
Next whole minute interval	<u>8</u>	minutes	<u>0</u>	seconds

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

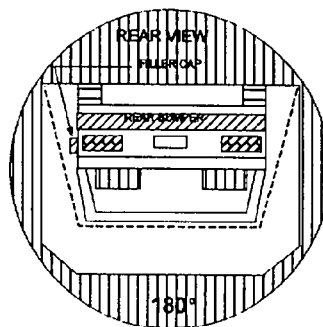
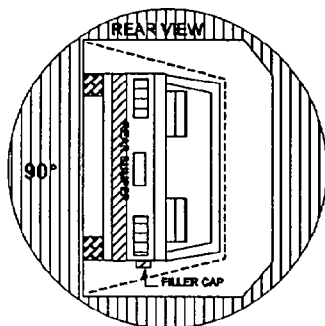
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

90 - 180 deg.

VEHICLE NHTSA ID No.

MS0201



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time

(Spec. Range = 1 to 3 minutes)

	<u>1</u>	minutes	<u>59</u>	seconds
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
TOTAL	<u>6</u>	minutes	<u>59</u>	seconds
Next whole minute interval	<u>7</u>	minutes	<u>0</u>	seconds

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

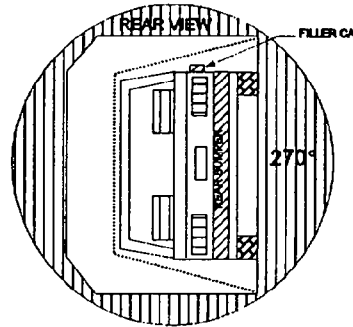
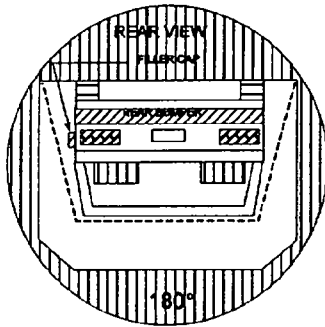
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

180 - 270 deg.

VEHICLE NHTSA ID No.

MS0201



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time

(Spec. Range = 1 to 3 minutes)

_____ 1 _____	minutes	_____ 38 _____	seconds
---------------	---------	----------------	---------

FMVSS 301 Position Hold Time +

_____ 5 _____	minutes	_____ 0 _____	seconds
---------------	---------	---------------	---------

TOTAL

_____ 6 _____	minutes	_____ 38 _____	seconds
---------------	---------	----------------	---------

Next whole minute interval

_____ 7 _____	minutes	_____ 0 _____	seconds
---------------	---------	---------------	---------

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

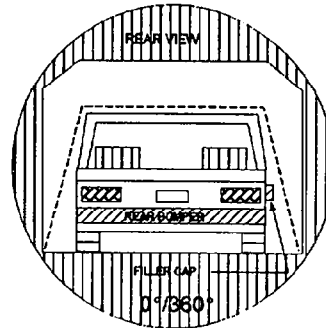
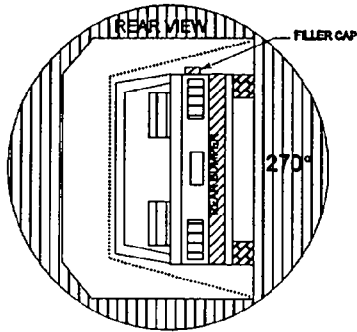
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

270 - 360 deg.

VEHICLE NHTSA ID No.

MS0201



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time

(Spec. Range = 1 to 3 minutes)

	<u>1</u>	minutes	<u>54</u>	seconds
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
TOTAL	<u>6</u>	minutes	<u>54</u>	seconds
Next whole minute interval	<u>7</u>	minutes	<u>0</u>	seconds

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

Appendix A
PHOTOGRAPHS

PHOTOGRAPHS

<u>Figure</u>	<u>Title</u>	<u>Page</u>
A-1	LOAD CELL LOCATIONS.	A-3
A-2	PRE-TEST FRONT VIEW	A-4
A-3	POST TEST FRONT VIEW.	A-5
A-4	PRE-TEST LEFT SIDE VIEW	A-6
A-5	POST TEST LEFT SIDE VIEW	A-7
A-6	PRE-TEST RIGHT SIDE VIEW	A-8
A-7	POST TEST RIGHT SIDE VIEW	A-9
A-8	PRE-TEST RIGHT FRONT THREE-QUARTER VIEW	A-10
A-9	POST TEST RIGHT FRONT THREE-QUARTER VIEW	A-11
A-10	PRE-TEST LEFT REAR THREE-QUARTER VIEW	A-12
A-11	POST TEST LEFT REAR THREE-QUARTER VIEW	A-13
A-12	PRE-TEST WINDSHIELD VIEW	A-14
A-13	POST TEST WINDSHIELD VIEW	A-15
A-14	PRE-TEST ENGINE COMPARTMENT VIEW	A-16
A-15	FUEL CAP VIEW	A-17
A-16	PRE-TEST FRONT UNDERBODY VIEW	A-18
A-17	POST TEST FRONT UNDERBODY VIEW	A-19
A-18	PRE-TEST FRONT SIDE UNDERBODY VIEW	A-20
A-19	POST TEST FRONT SIDE UNDERBODY VIEW	A-21
A-20	PRE-TEST REAR UNDERBODY VIEW	A-22
A-21	POST TEST REAR UNDERBODY VIEW	A-23
A-22	PRE-TEST DRIVER POSITION VIEW	A-24
A-23	POST TEST DRIVER POSITION VIEW	A-25
A-24	PRE-TEST PASSENGER POSITION VIEW	A-26
A-25	POST TEST PASSENGER POSITION VIEW.	A-27
A-26	PRE-TEST DRIVER AND INTERIOR VIEW	A-28
A-27	POST TEST DRIVER AND INTERIOR VIEW	A-29
A-28	PRE-TEST PASSENGER AND INTERIOR VIEW	A-30
A-29	POST TEST PASSENGER AND INTERIOR VIEW	A-31
A-30	PRE-TEST DRIVER HEAD LOCATION	A-32
A-31	PRE-TEST PASSENGER HEAD LOCATION	A-33
A-32	IMPACT VIEW	A-34

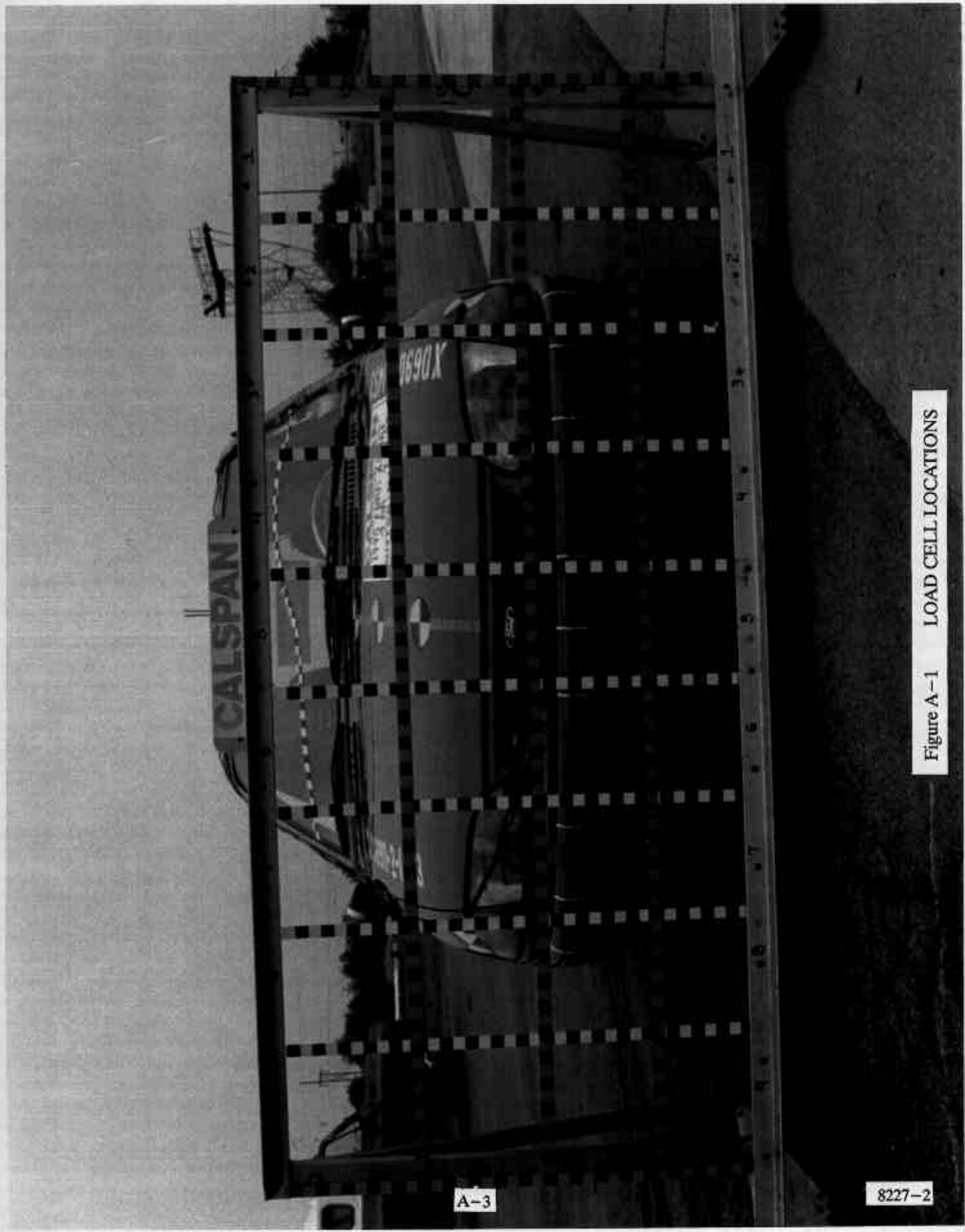


Figure A-1 LOAD CELL LOCATIONS

A-3

8227-2

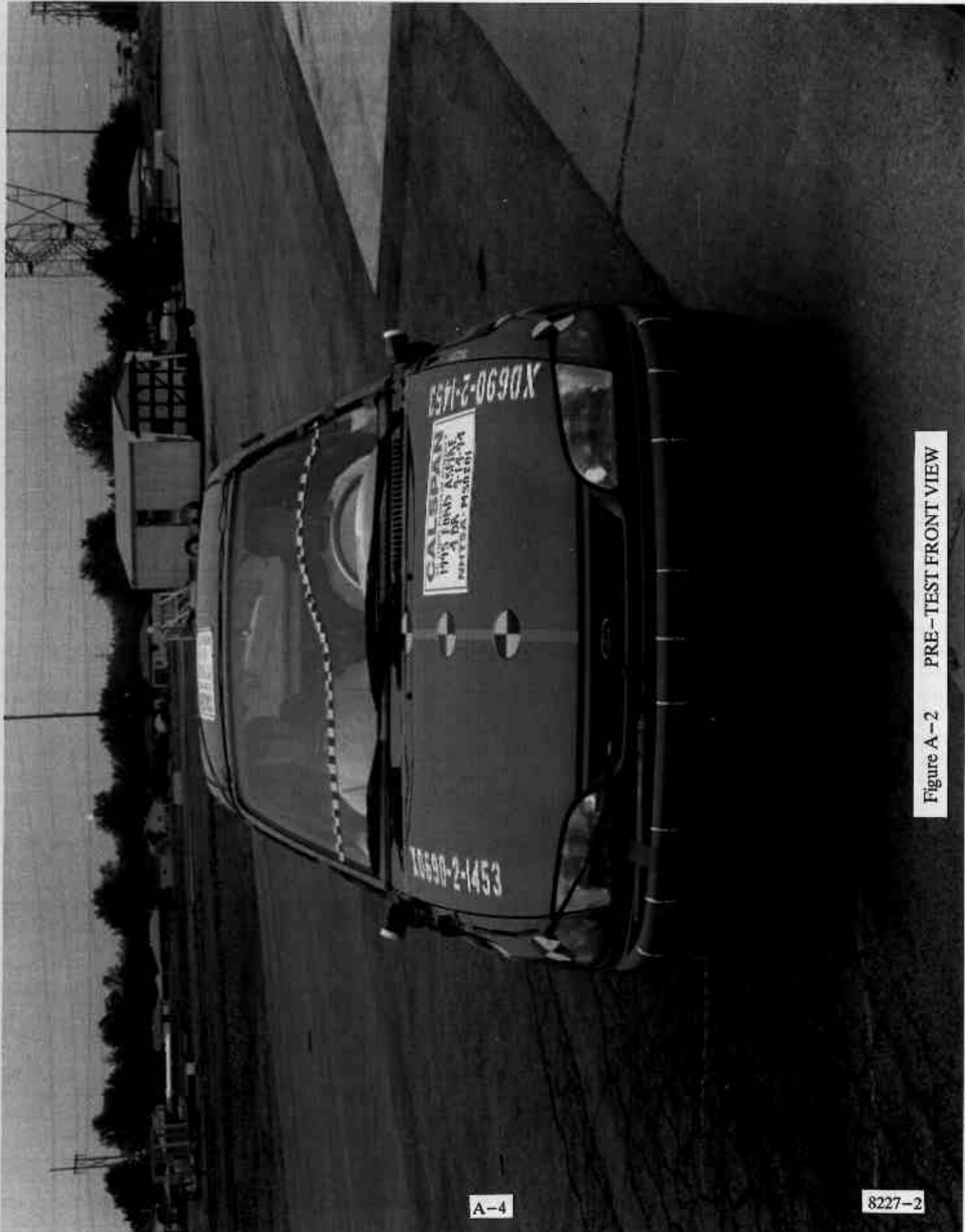


Figure A-2 PRE-TEST FRONT VIEW

A-4

8227-2



Figure A-3 POST TEST FRONT VIEW

A-5

8227-2

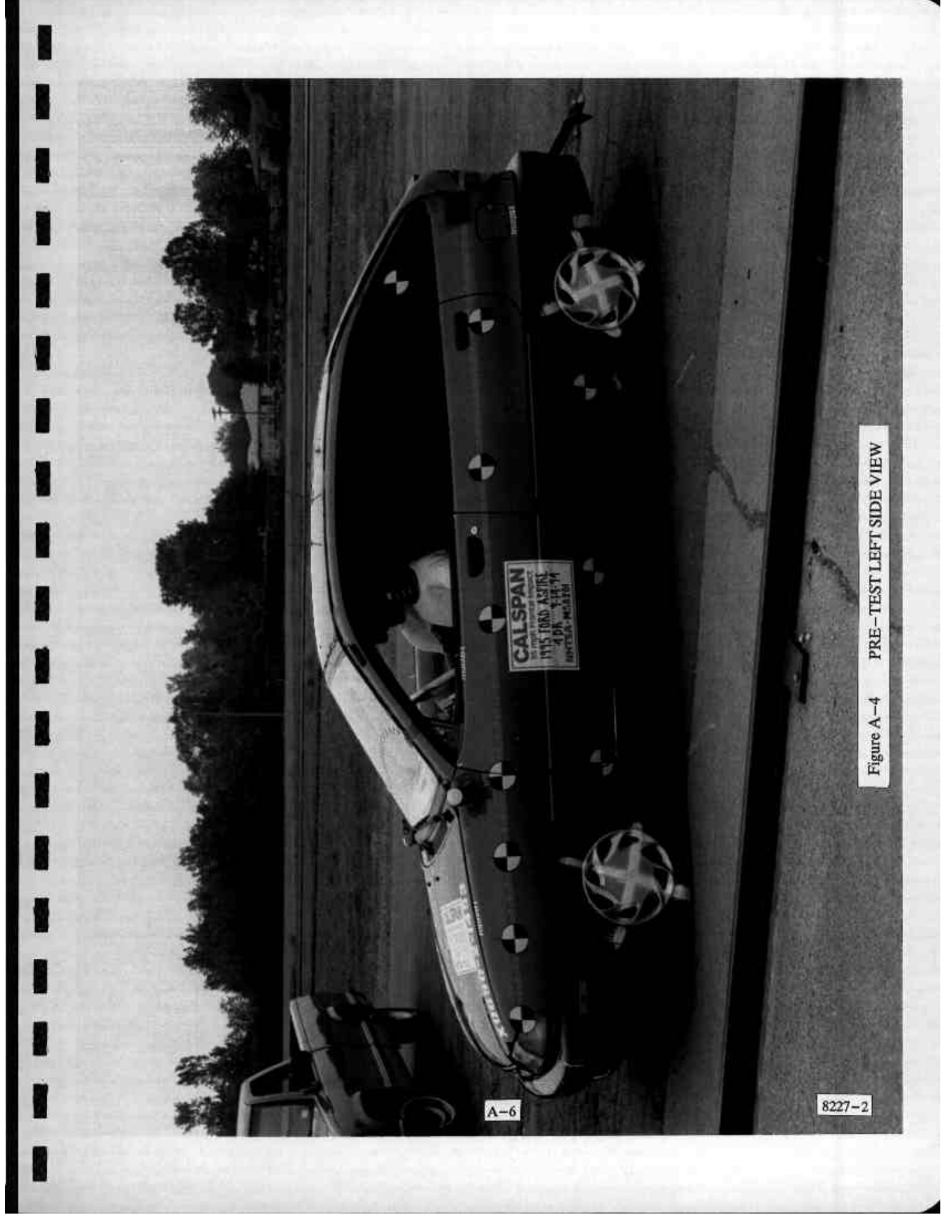


Figure A-4 PRE-TEST LEFT SIDE VIEW

A-6

8227-2

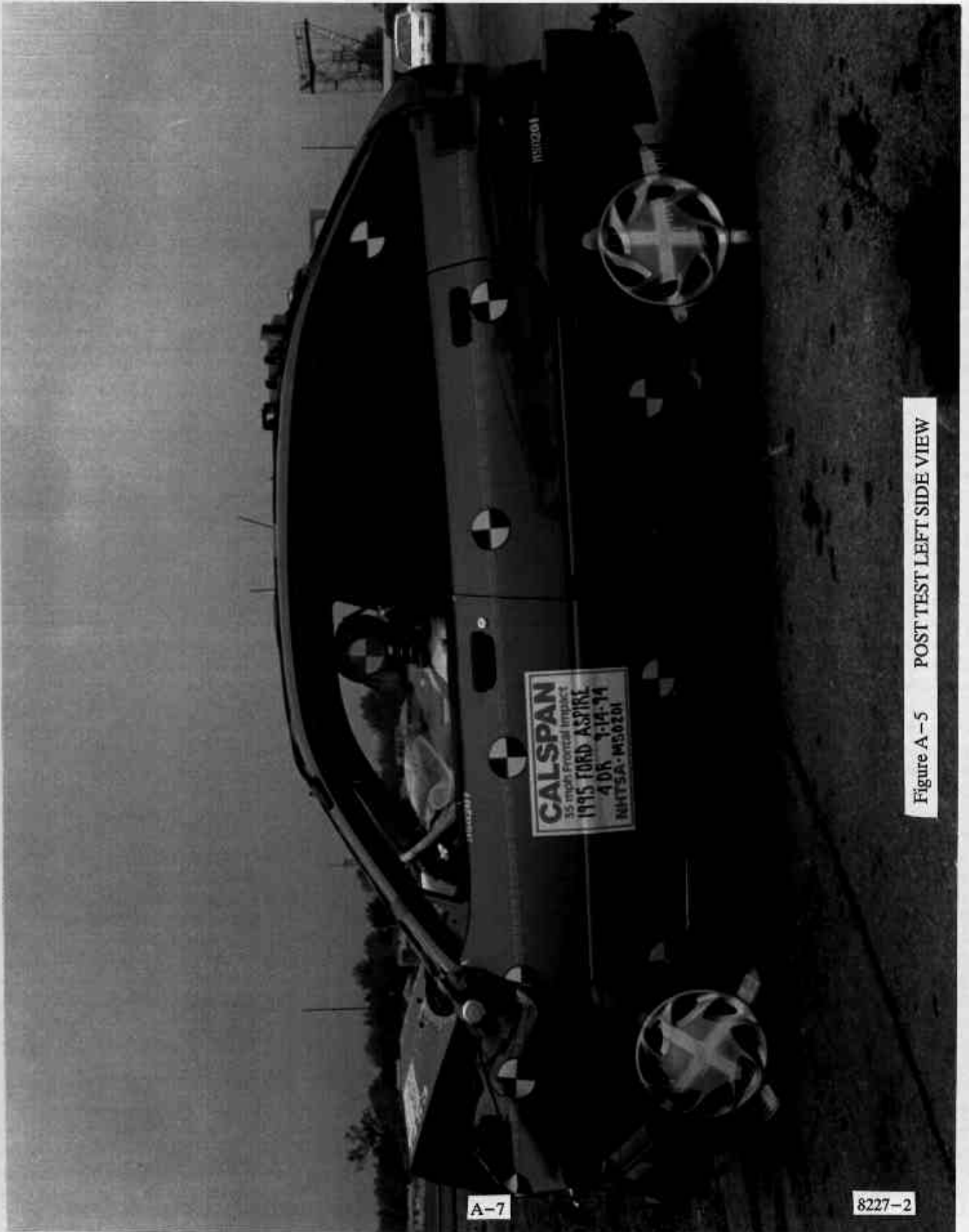


Figure A-5 POST TEST LEFT SIDE VIEW

A-7

8227-2



A-8

8227-2

Figure A-6 PRE-TEST RIGHT SIDE VIEW

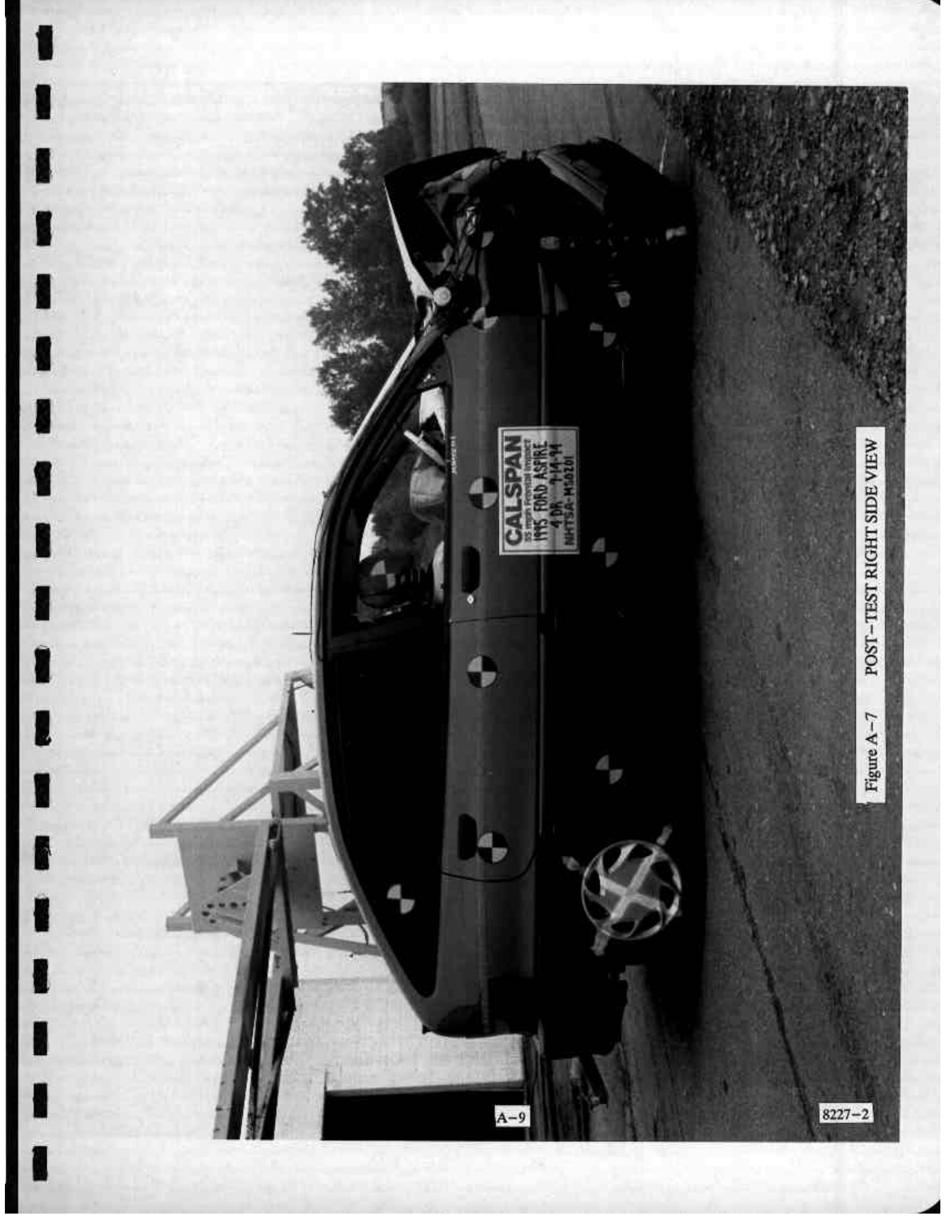


Figure A-7 POST-TEST RIGHT SIDE VIEW

A-9

8227-2

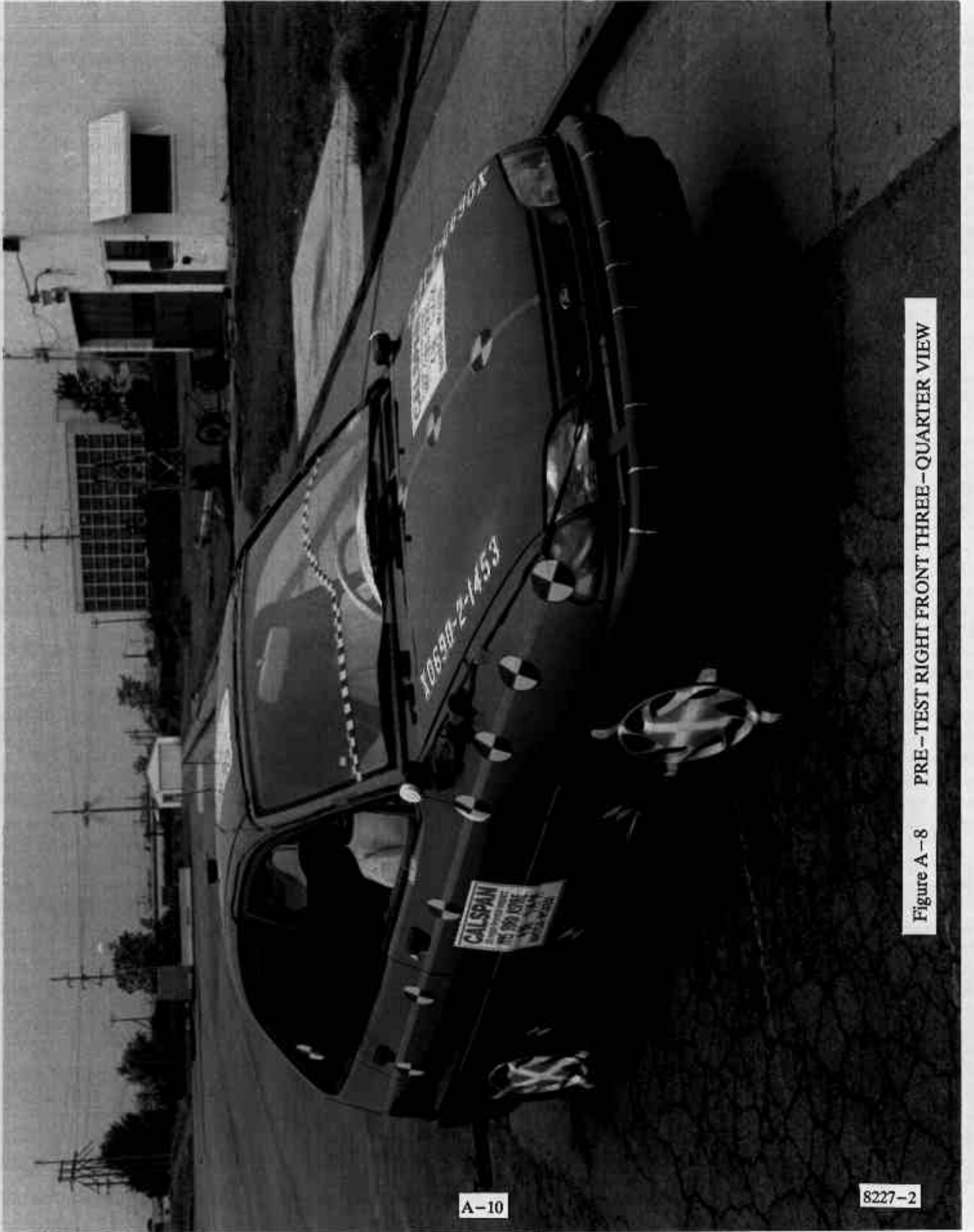


Figure A-8 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

8227-2

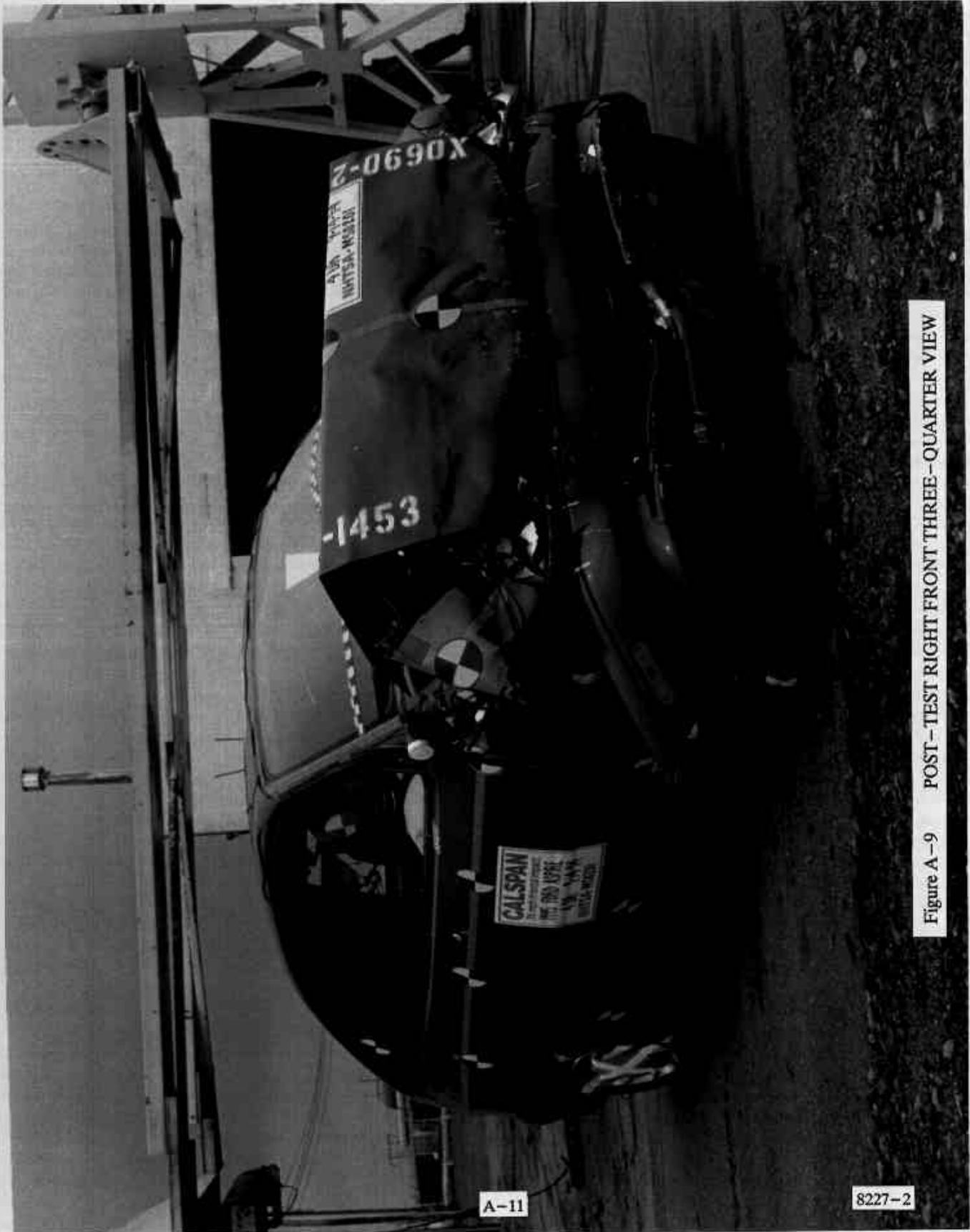


Figure A-9 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-11

8227-2

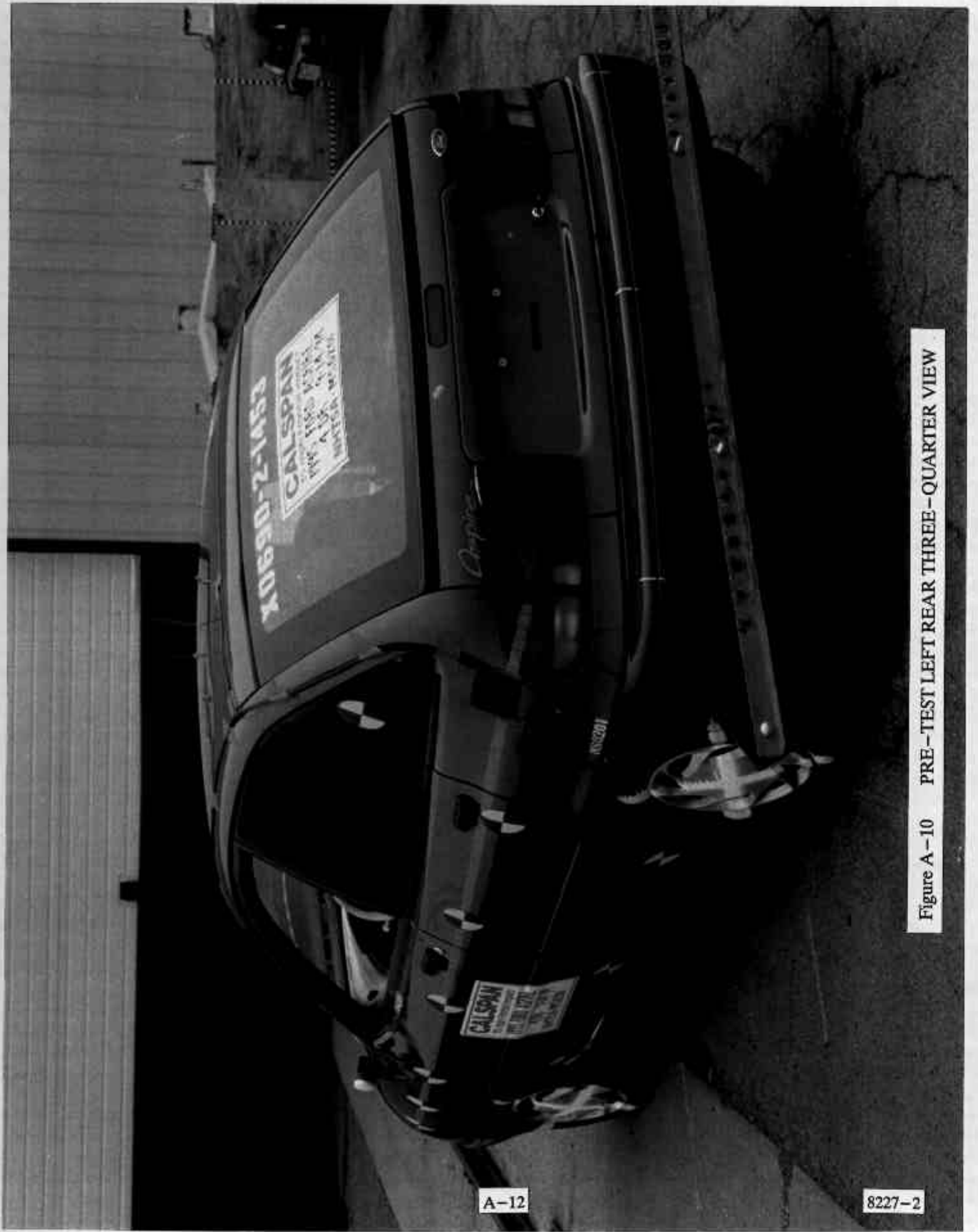


Figure A-10 PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-12

8227-2

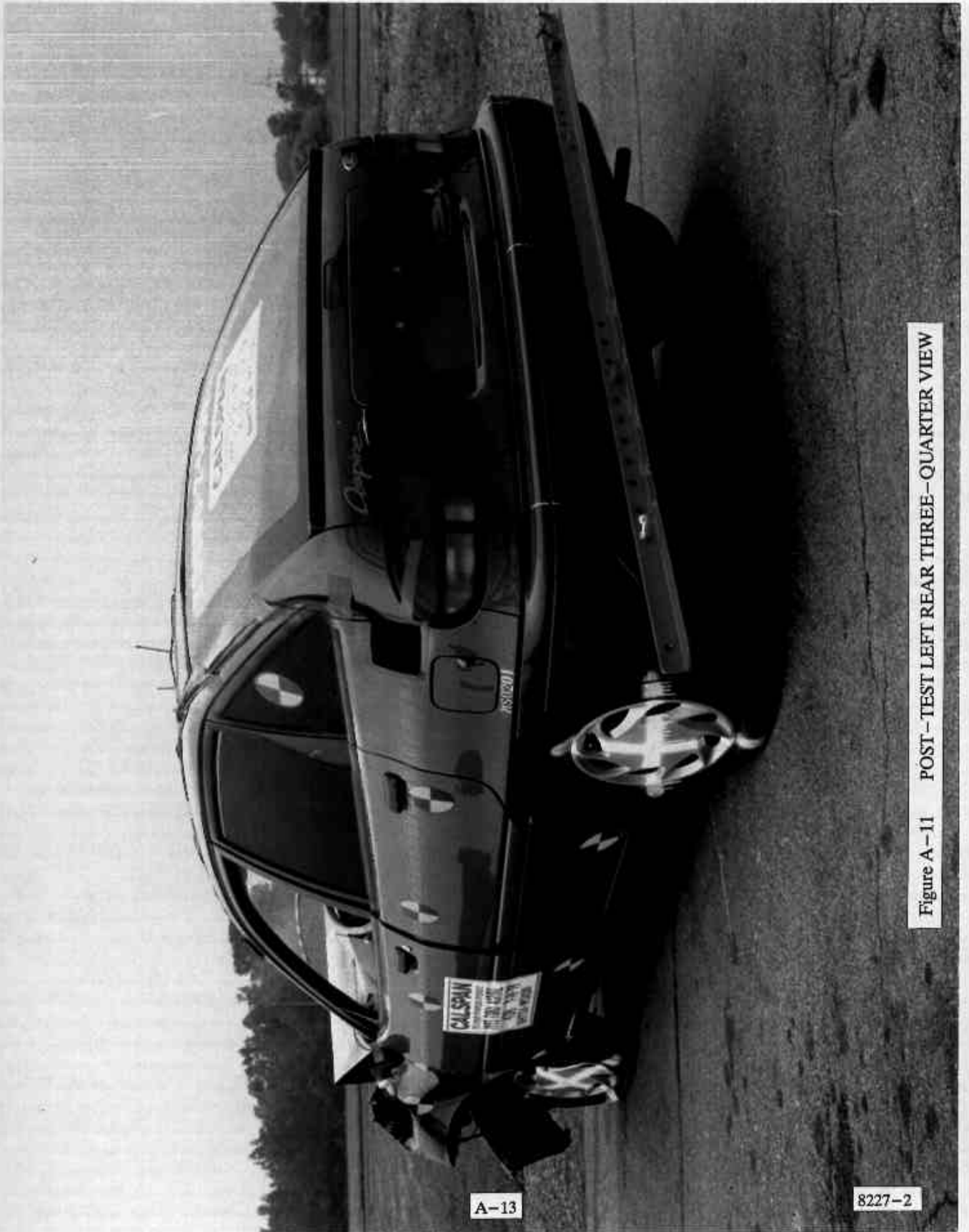


Figure A-11 POST-TEST LEFT REAR THREE-QUARTER VIEW

A-13

8227-2



Figure A-12 PRE-TEST WINDSHIELD VIEW

A-14

8227-2

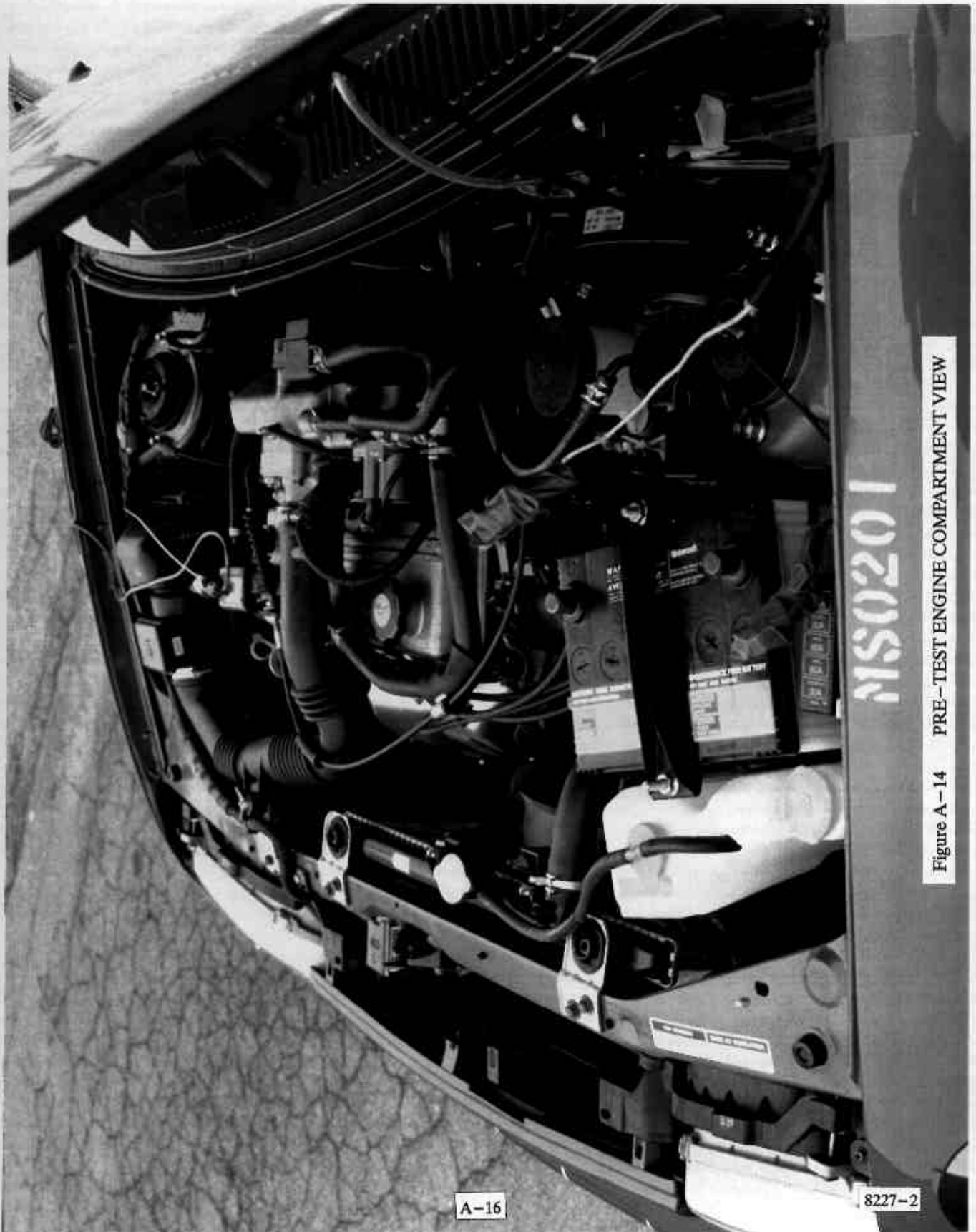


1995 FORD ASK
4 DR 9-1A
NHTSA-MS020

Figure A-13 POST-TEST WINDSHIELD VIEW

A-15

8227-2



MS0201

Figure A - 14 PRE-TEST ENGINE COMPARTMENT VIEW

A-16

8227-2

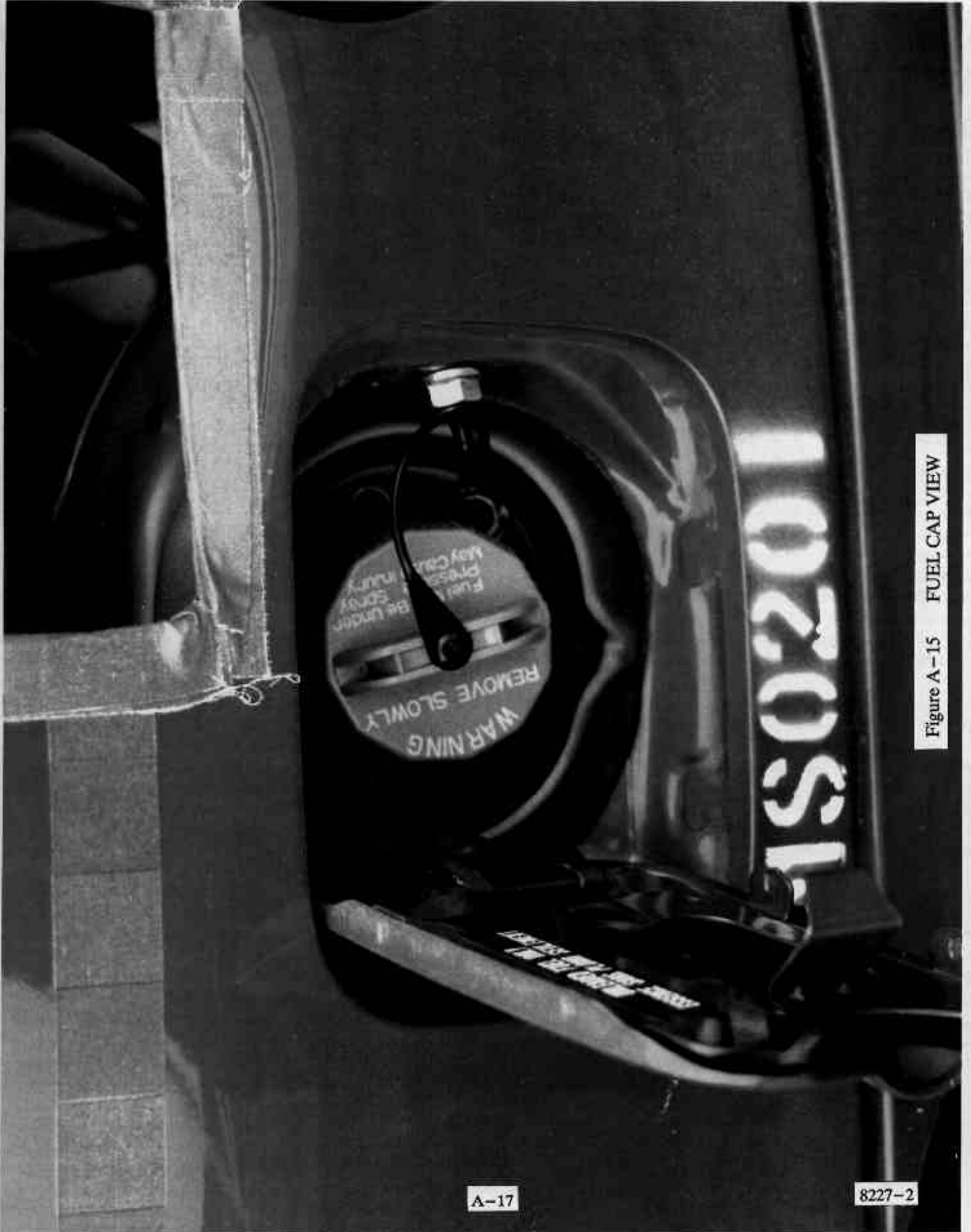


Figure A-15 FUEL CAP VIEW

A-17

8227-2

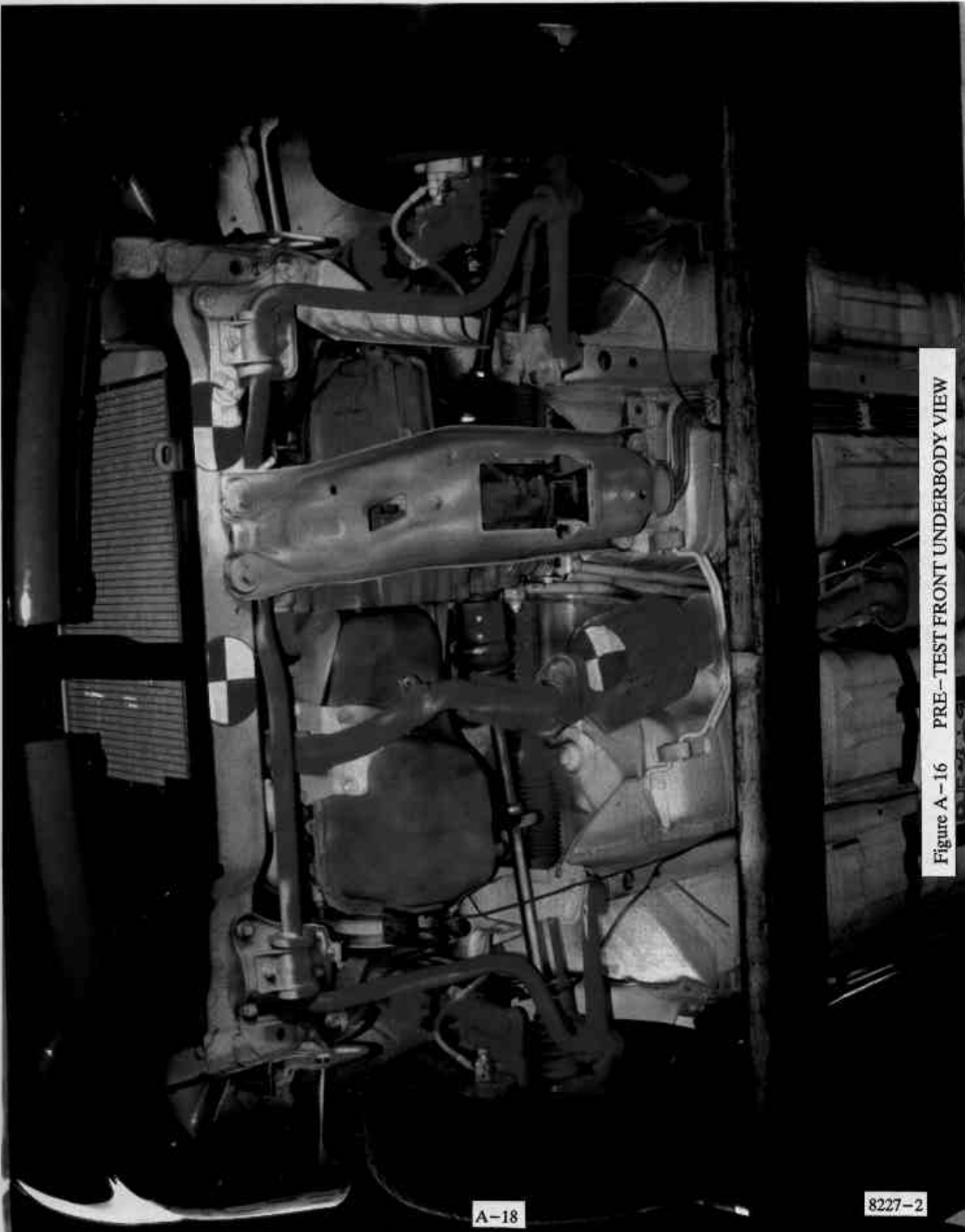


Figure A - 16 PRE-TEST FRONT UNDERBODY VIEW

A-18

8227-2



Figure A-17 POST-TEST FRONT UNDERBODY VIEW

A-19

8227-2

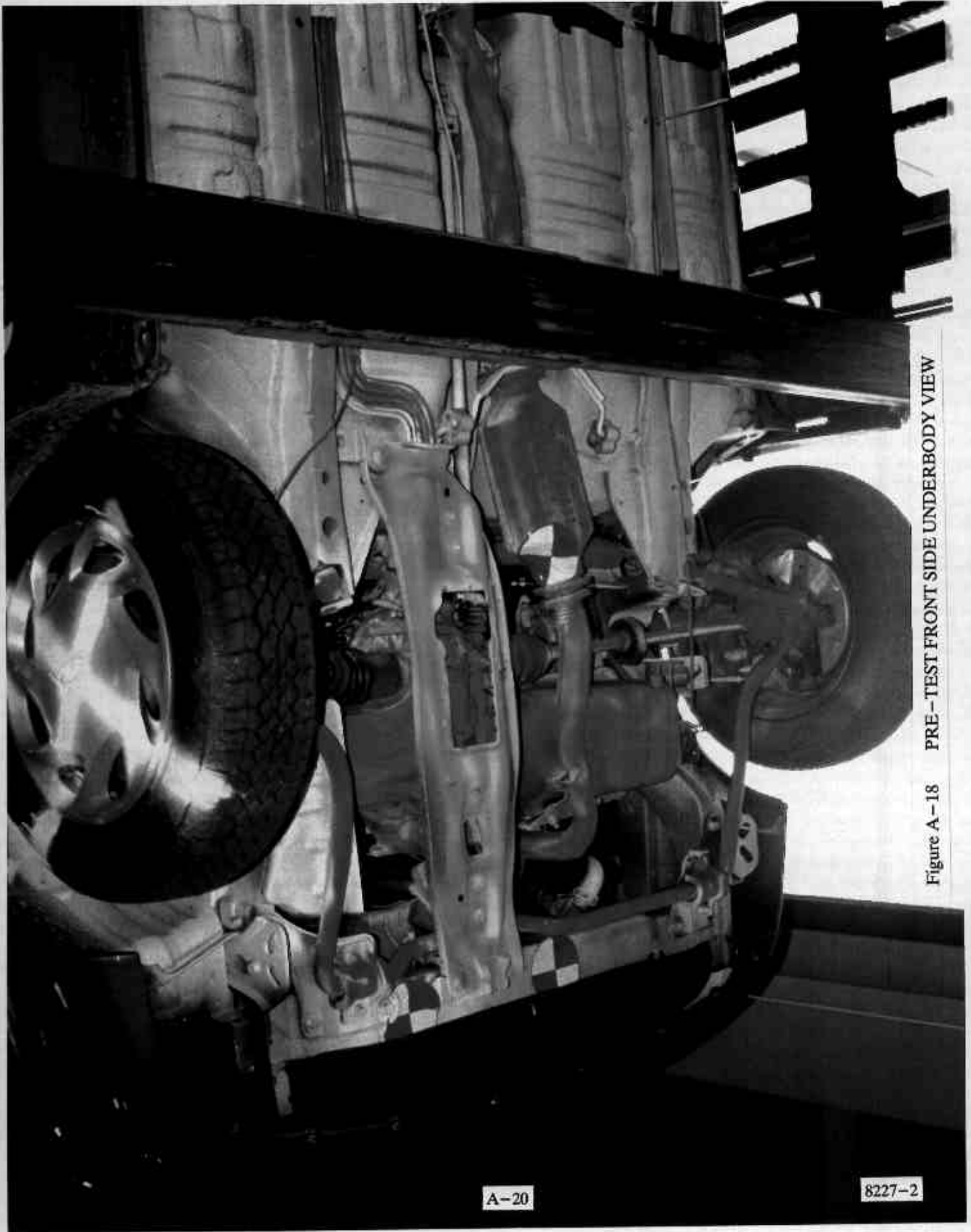


Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

A-20

8227-2

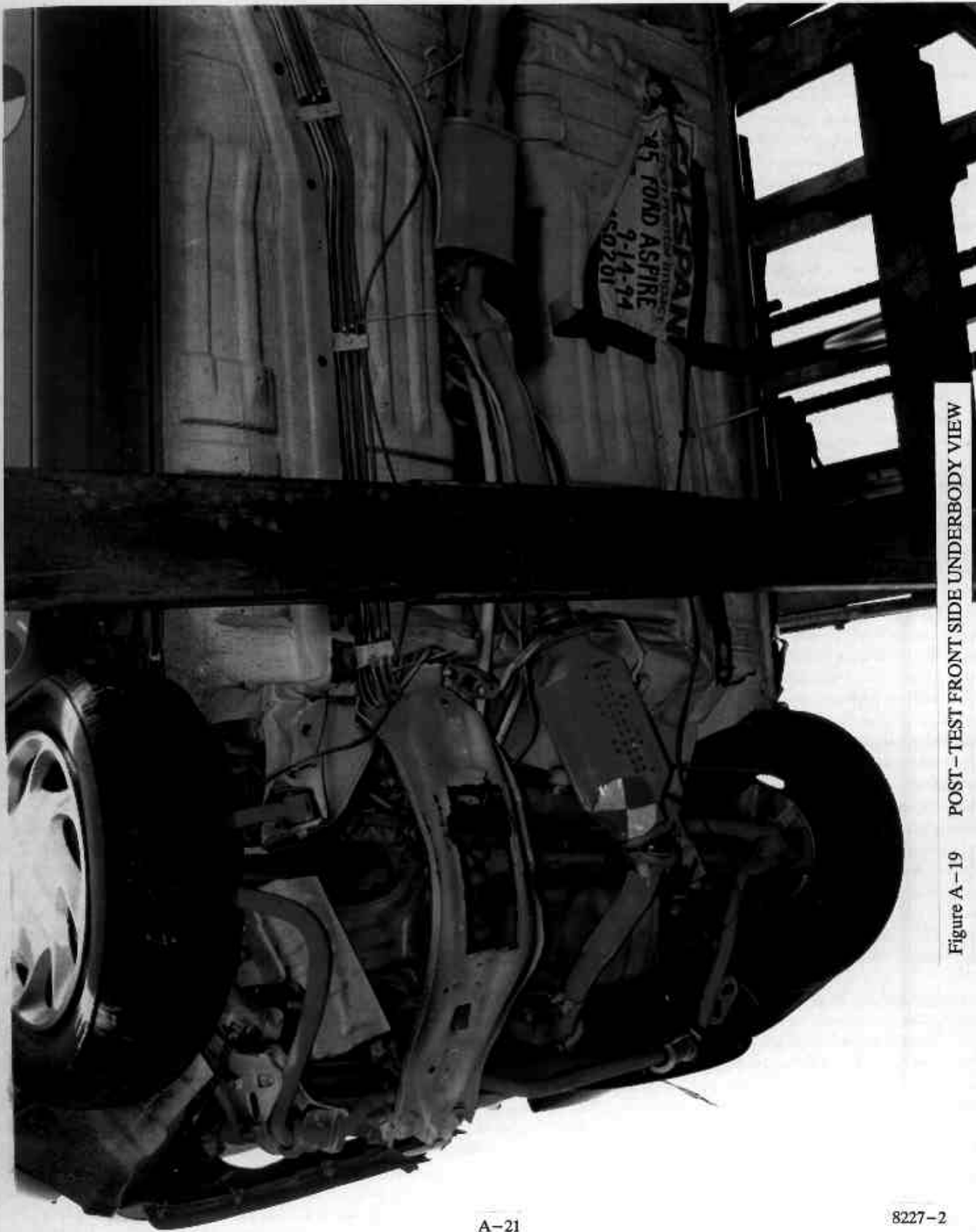


Figure A-19 POST - TEST FRONT SIDE UNDERBODY VIEW

A-21

8227-2



Figure A-20 PRE-TEST REAR UNDERBODY VIEW

A-22

8227-2

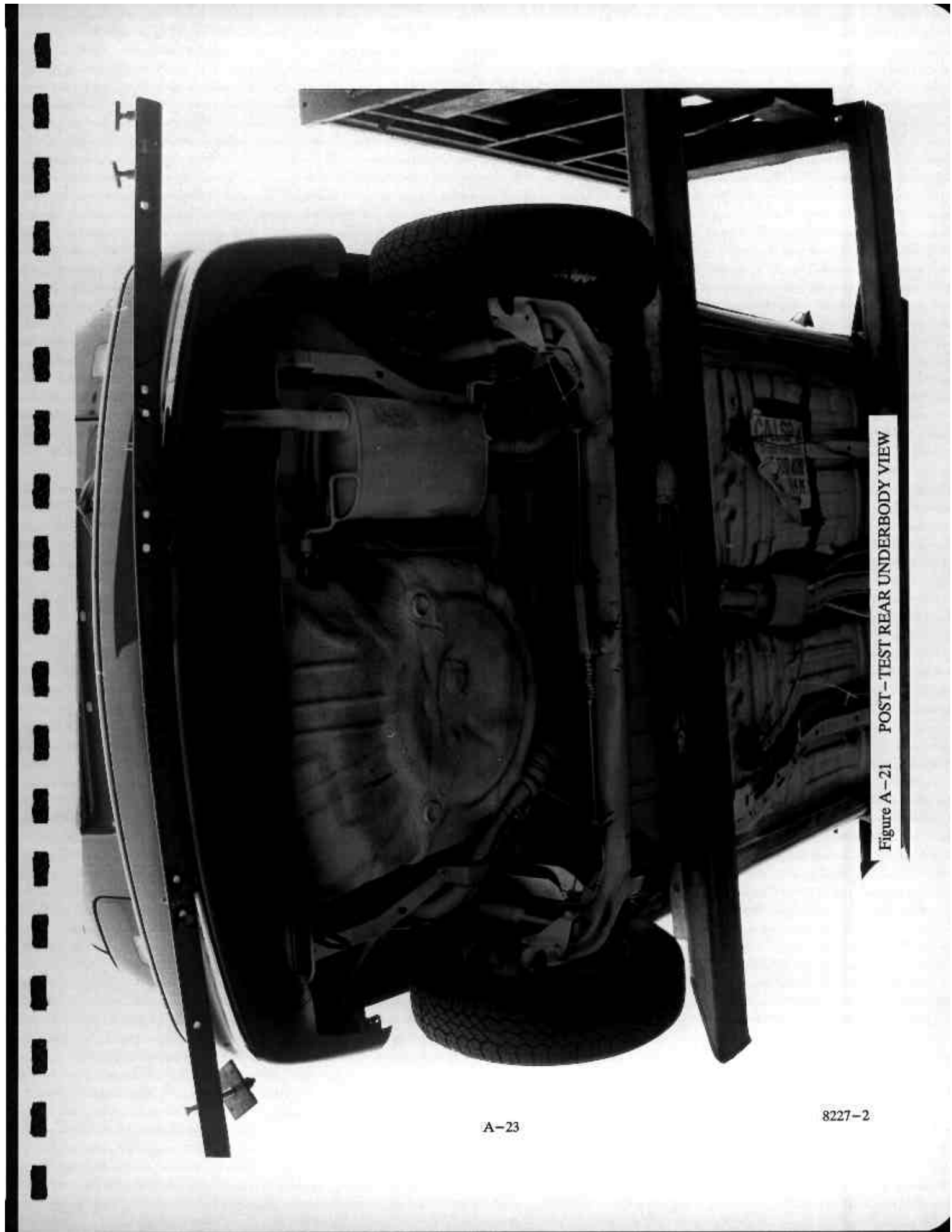


Figure A-21 POST - TEST REAR UNDERBODY VIEW

A-23

8227-2



Figure A-22 PRE-TEST DRIVER POSITION VIEW

A-24

8227-2



Figure A-23 POST - TEST DRIVER POSITION VIEW

A-25

8227-2



Figure A-24 PRE-TEST PASSENGER POSITION VIEW

A-26

8227-2



Figure A-25 POST-TEST PASSENGER POSITION VIEW

A-27

8227-2



Figure A-26 PRE-TEST DRIVER AND INTERIOR VIEW

NIS0201

A-28

8227-2



Figure A-27 POST-TEST DRIVER AND INTERIOR VIEW

A-29

8227-2



Figure A-28 PRE-TEST PASSENGER AND INTERIOR VIEW

A-30

8227-2



Figure A-29 POST-TEST PASSENGER AND INTERIOR VIEW

A-31

8227-2

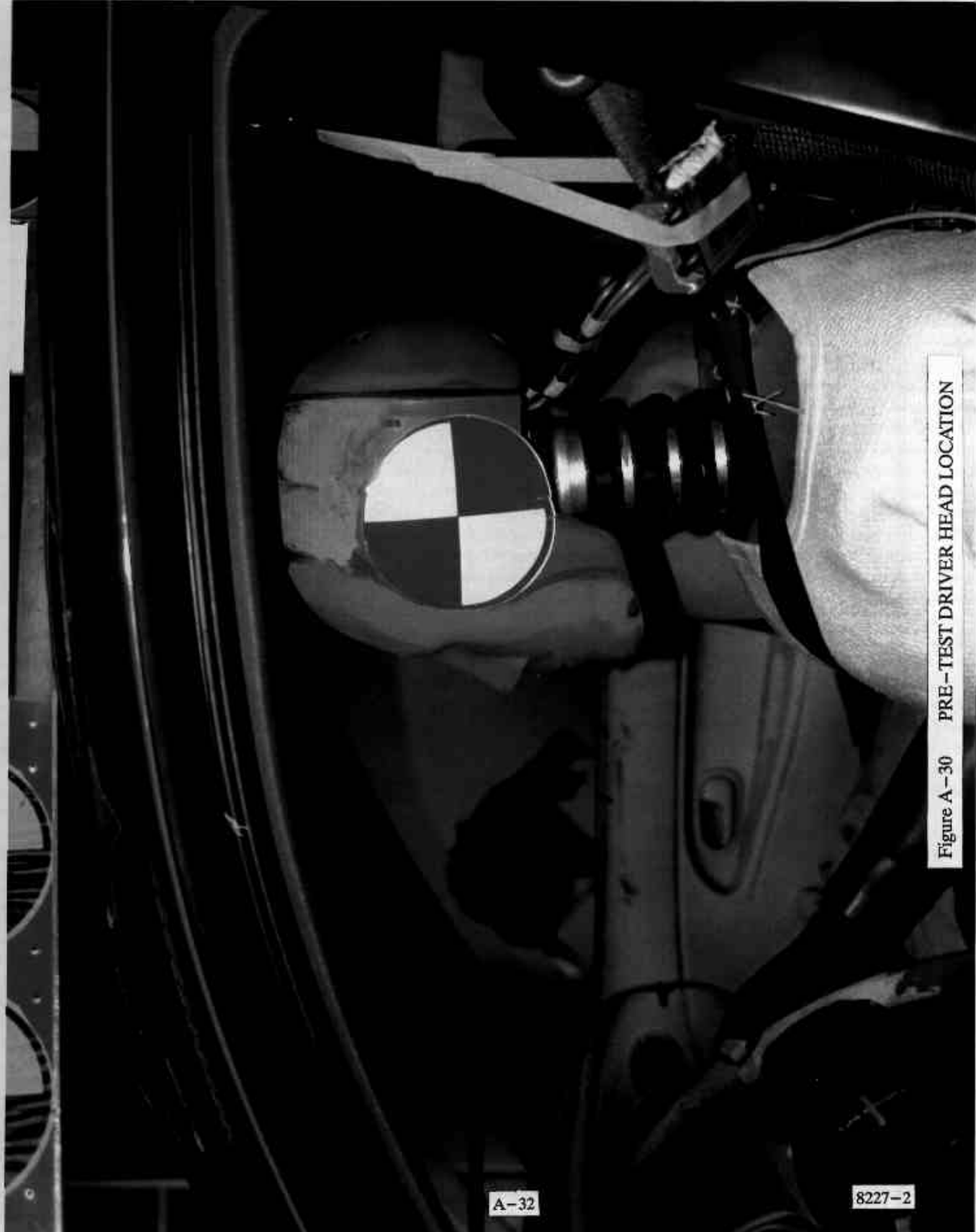


Figure A-30 PRE-TEST DRIVER HEAD LOCATION

A-32

8227-2



Figure A-31 PRE-TEST PASSENGER HEAD LOCATION

A-33

8227-2

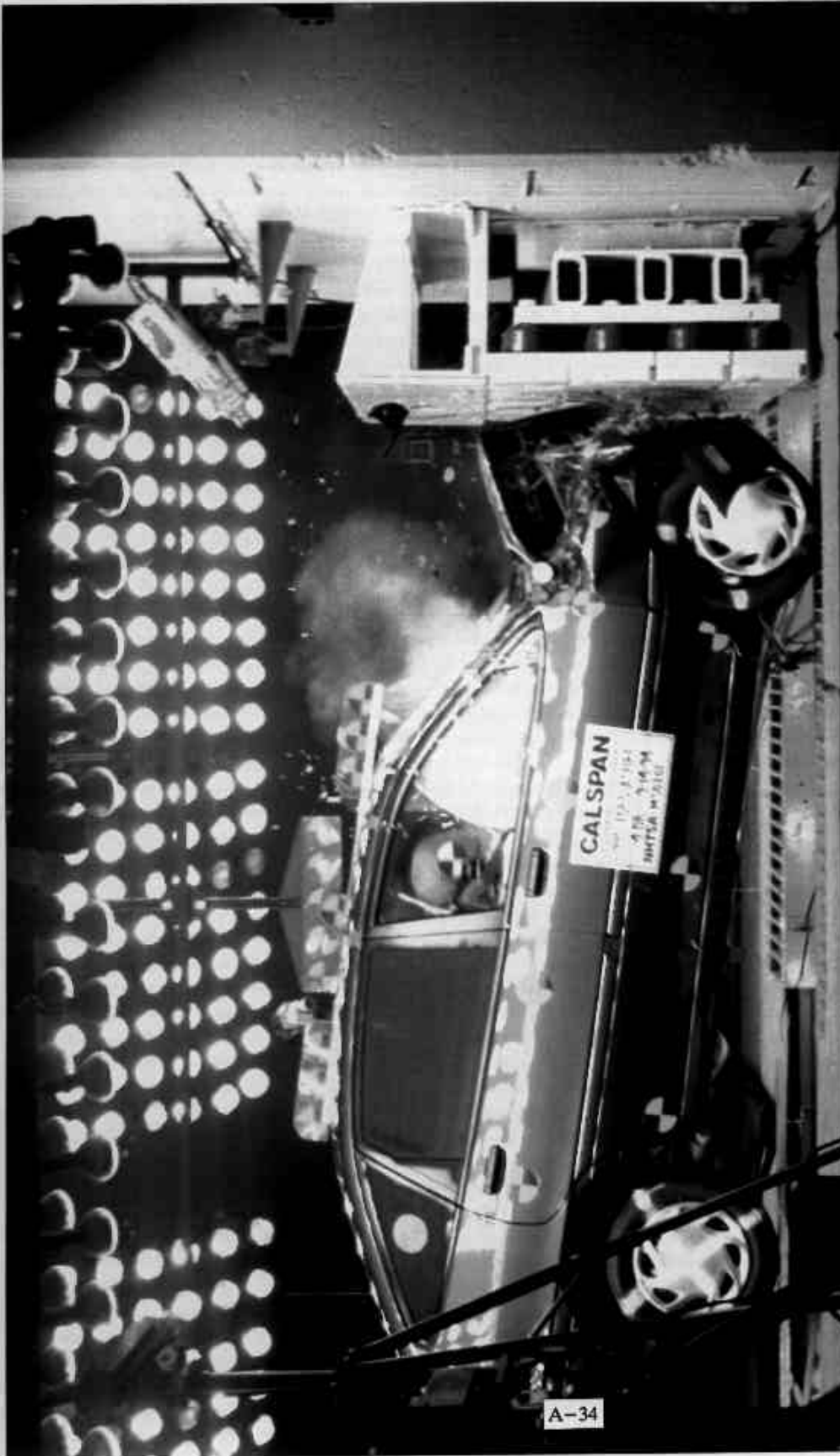


Figure A-32 IMPACT VIEW

A-34

8227-2

Appendix B

VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA

TEST NO. MS0201

VEHICLE DATA

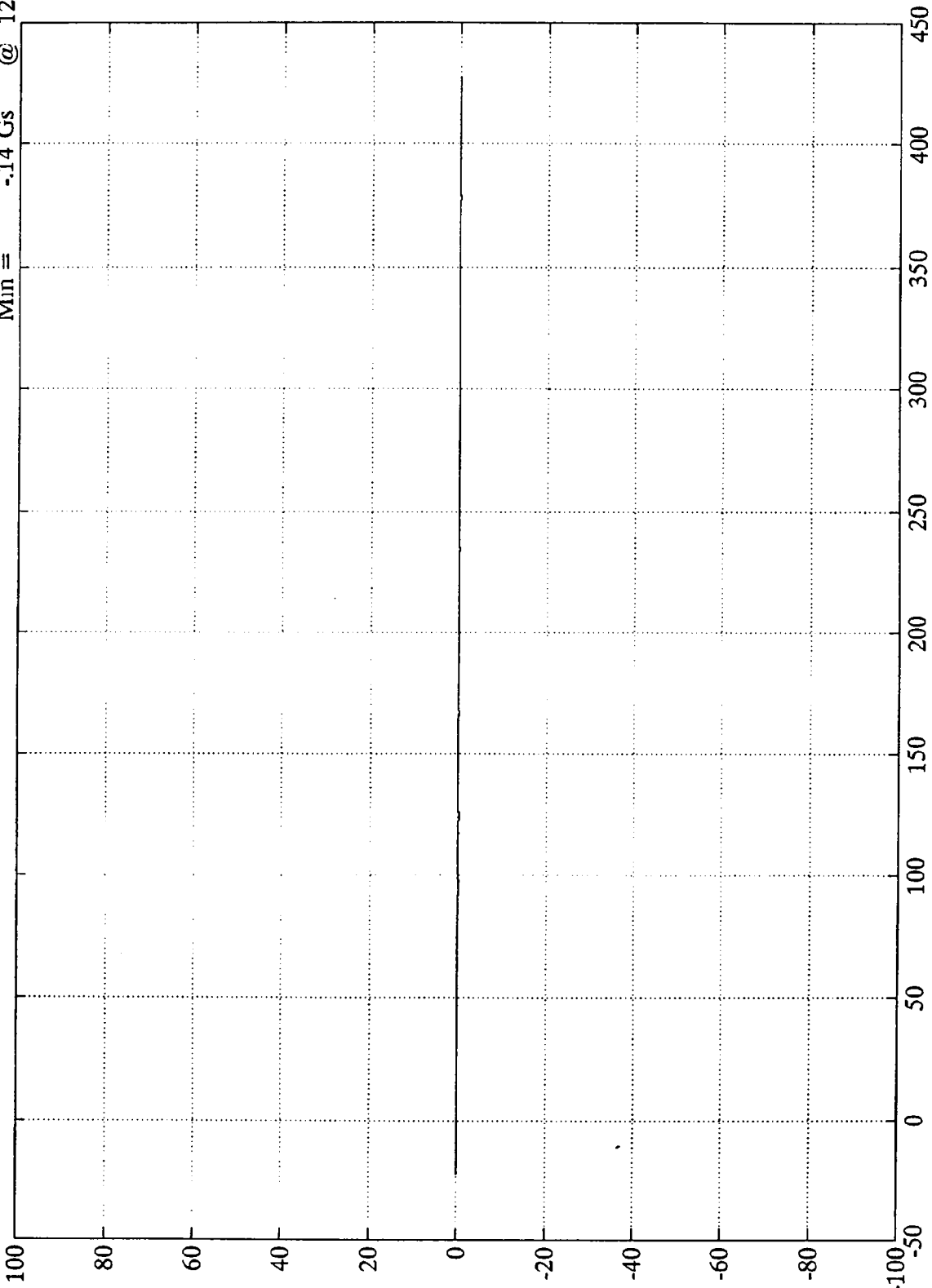
FILTER CHANNEL CLASS

60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = .10 Gs @ 372.36 msec
Min = -.14 Gs @ 124.56 msec

Acc. #1(x)



Time (msec)
No data recorded

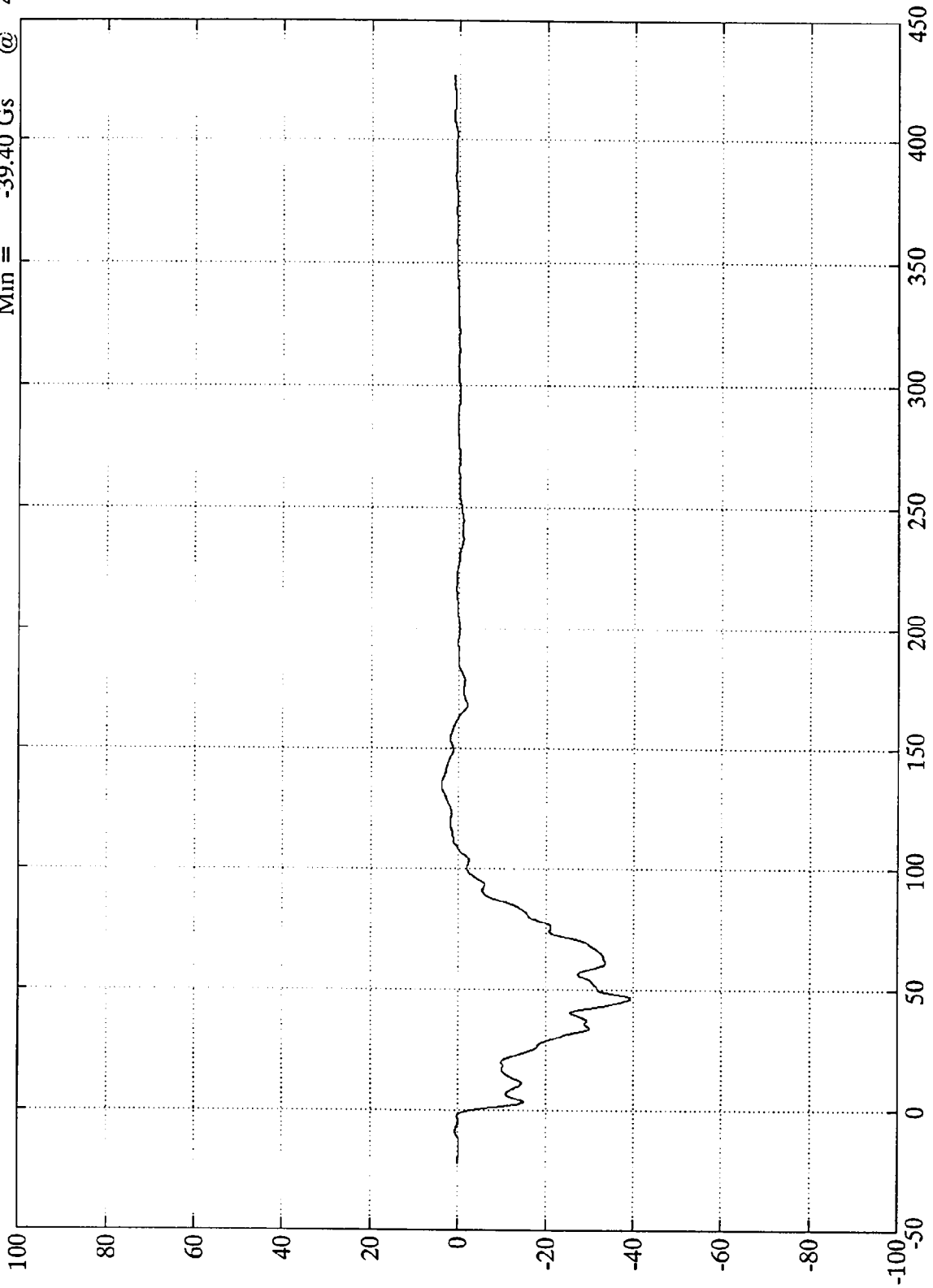
SAE Filter Class 60

g

NCAP TEST #2 - 1995 FORD ASPIRE

Acc. #2(x)

Max = 3.91 Gs @ 134.76 msec
Min = -39.40 Gs @ 46.44 msec



Time (msec)

SAE Filter Class 60

SD

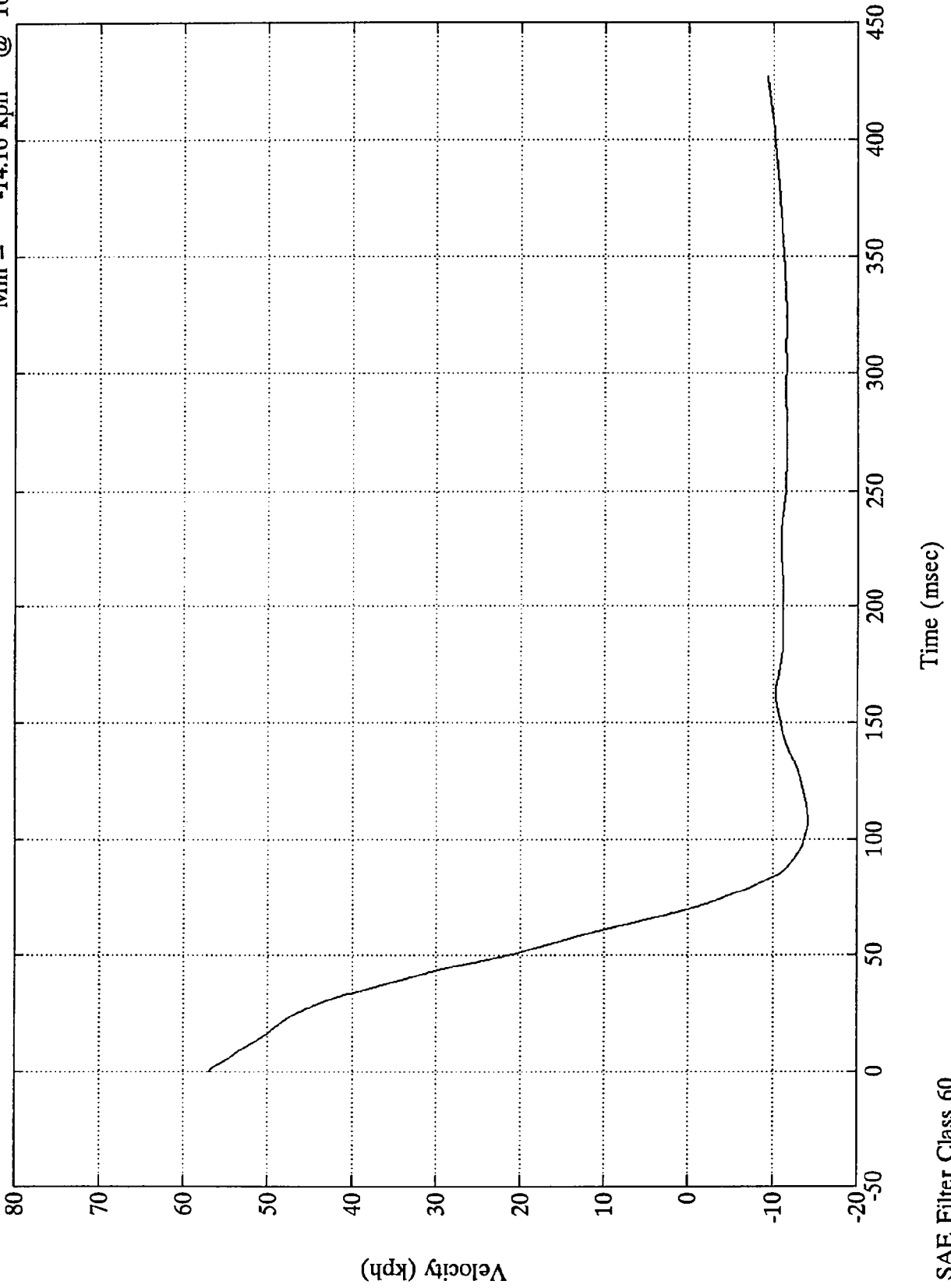
B-4

8227-2

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 56.97 kph @ -0.00 msec
Min = -14.16 kph @ 108.12 msec

Acc. #2(x)

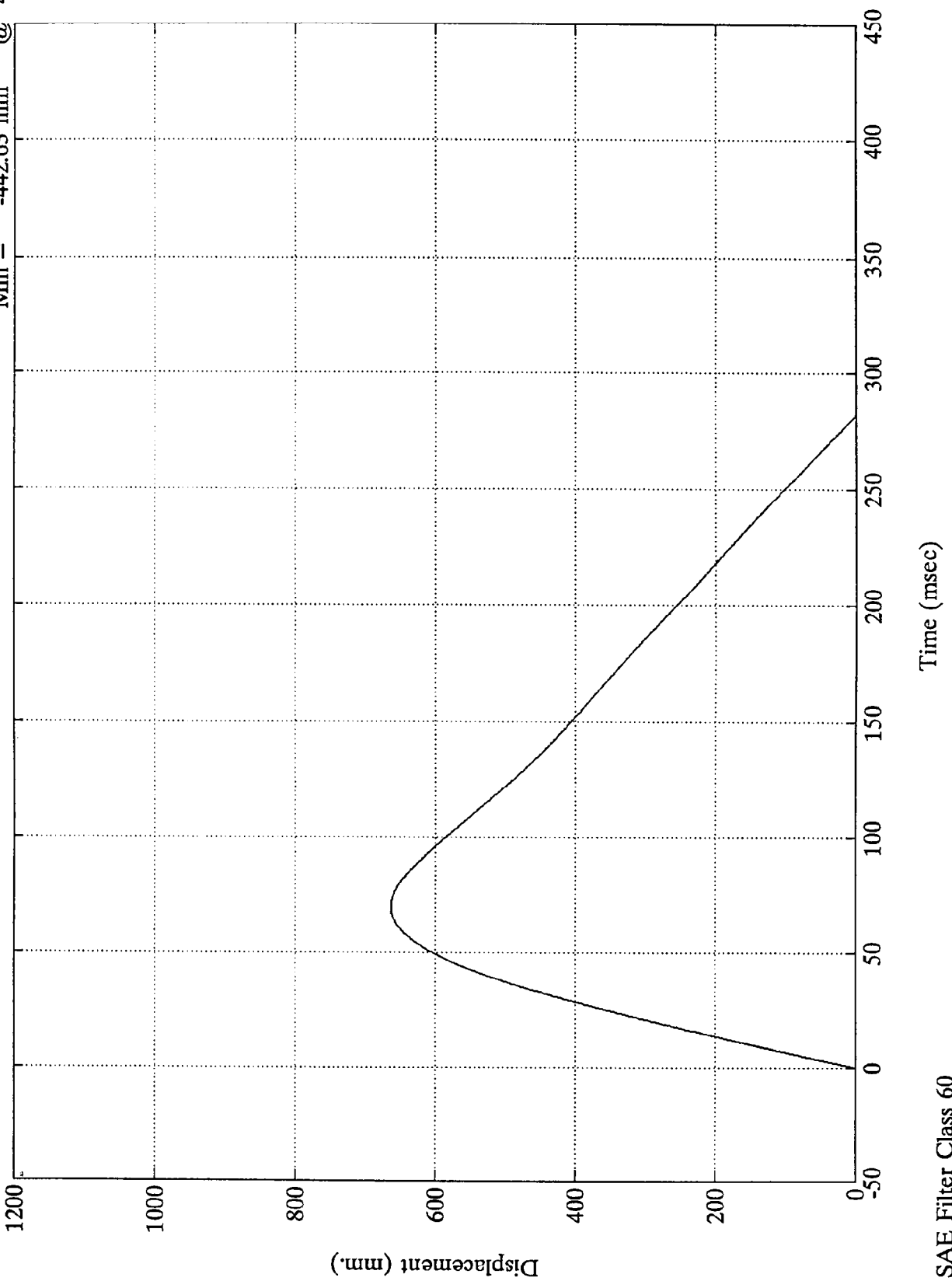


SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 663.94 mm @ 69.60 msec
Min = -442.63 mm @ 427.32 msec

Acc. #2(x)

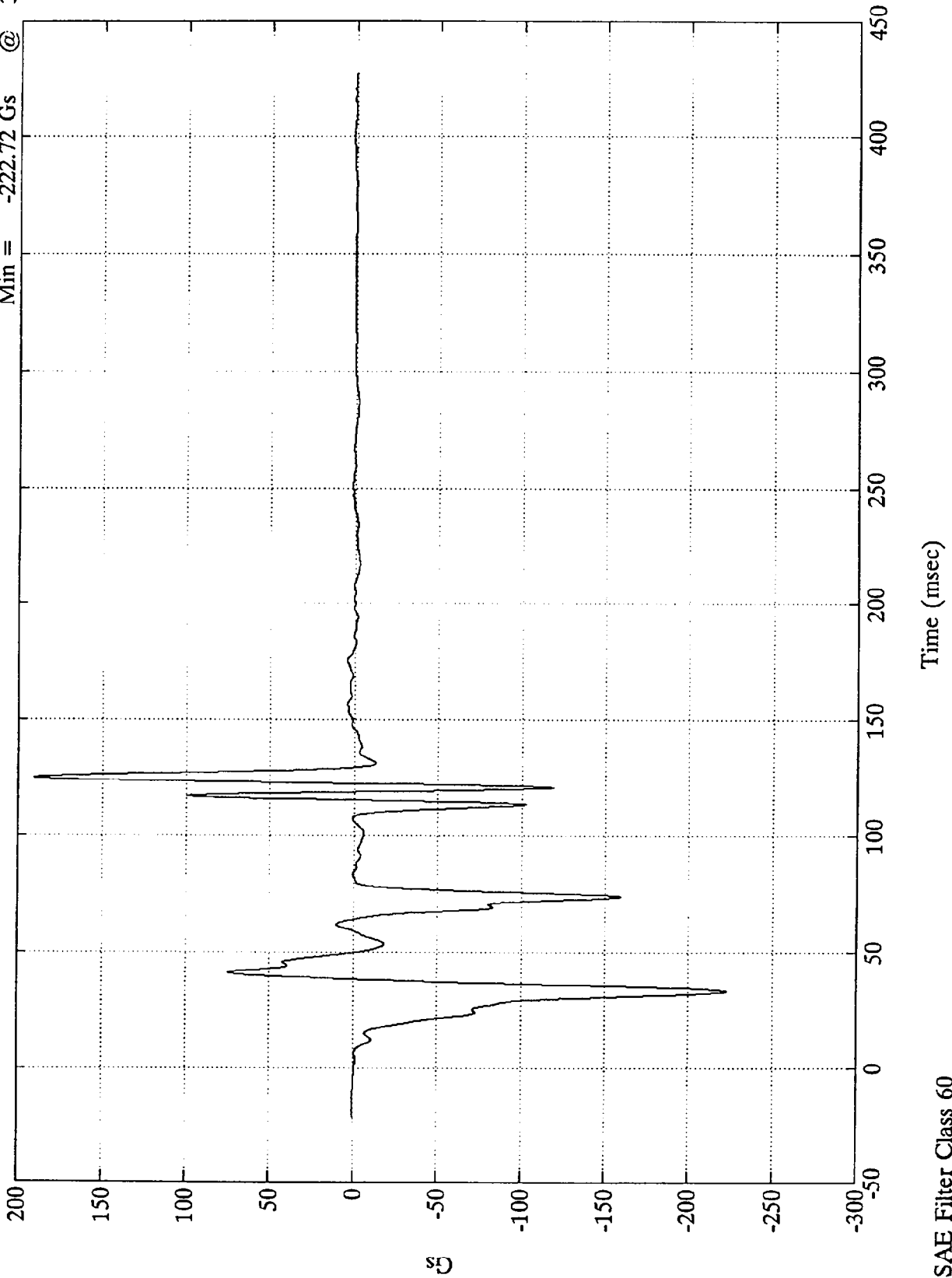


SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 190.60 Gs @ 125.16 msec
Min = -222.72 Gs @ 33.11 msec

Acc. #3(x)



B-7

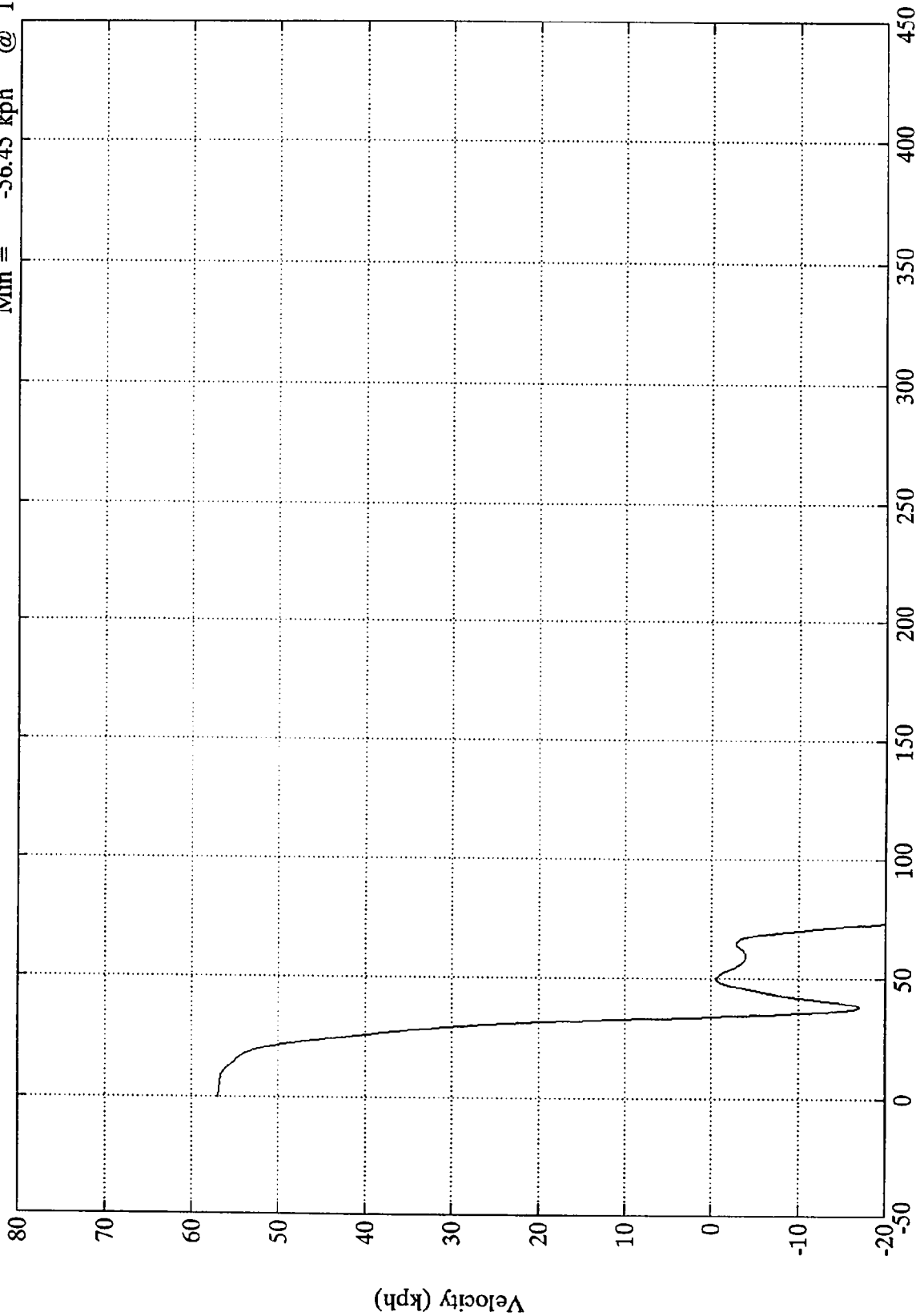
8227-2

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 56.97 kph @ -0.00 msec
Min = -56.45 kph @ 122.64 msec

Acc. #3(x)



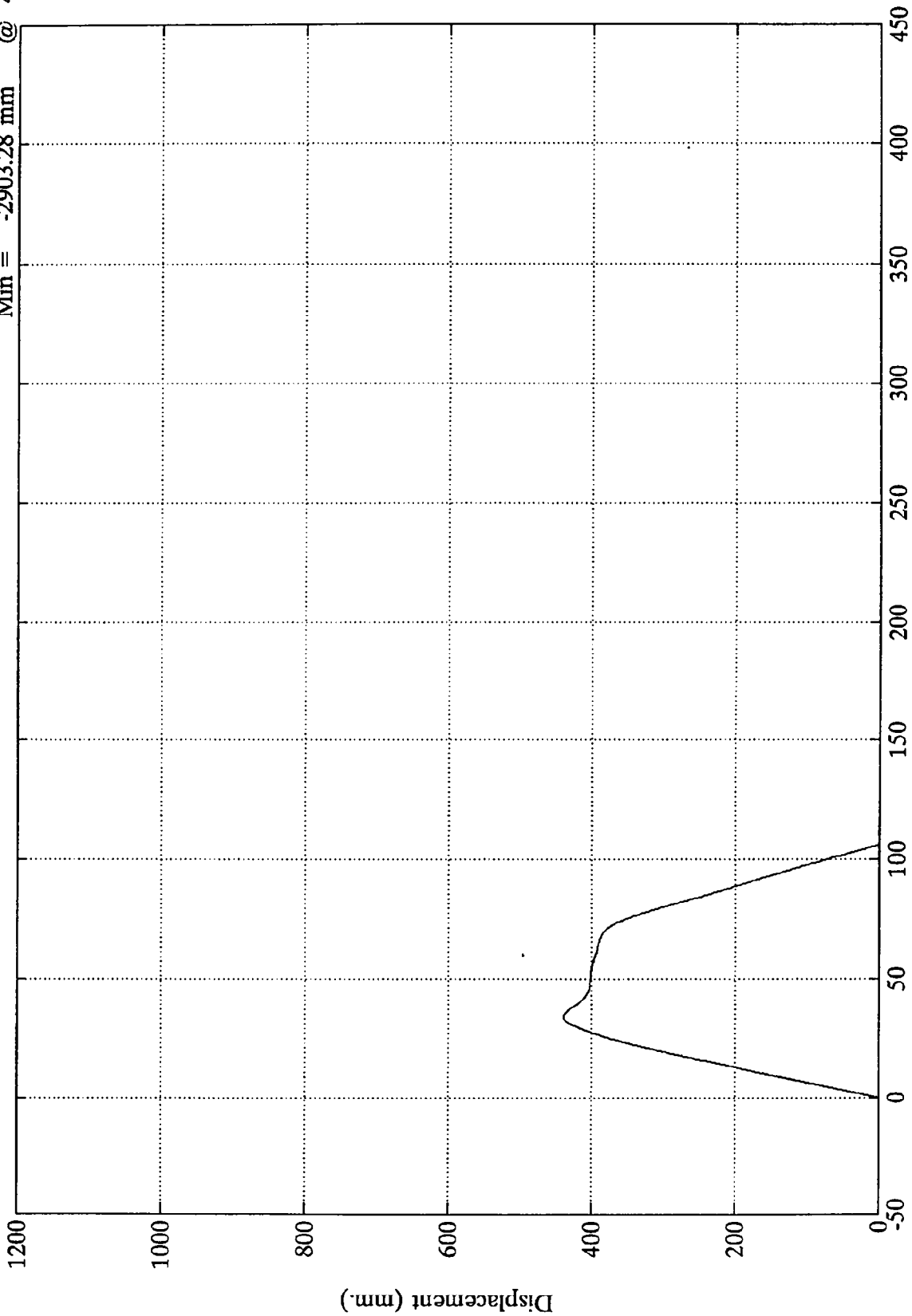
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 439.57 mm @ 33.84 msec
Min = -2903.28 mm @ 427.32 msec

Acc. #3(x)



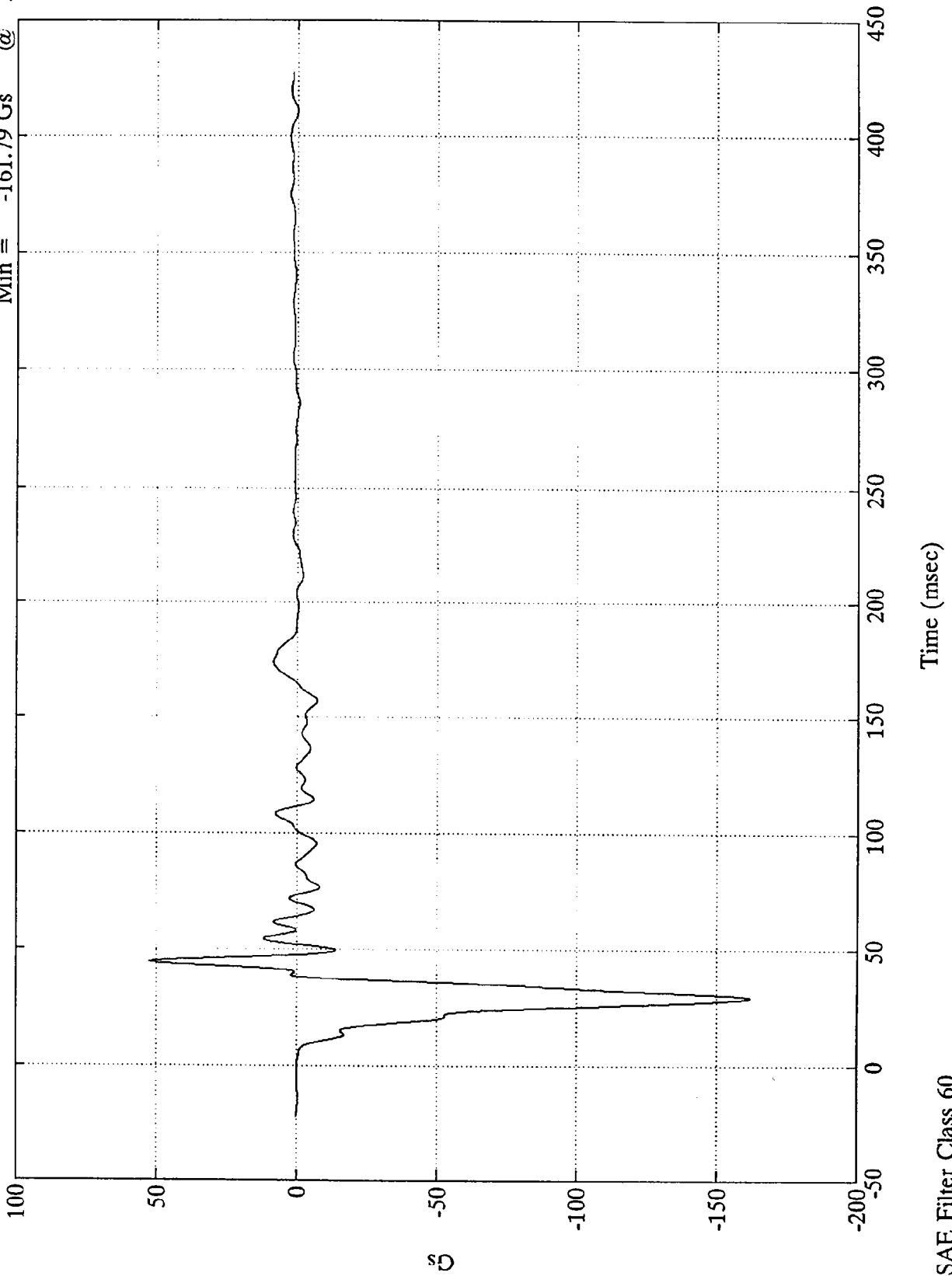
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Acc. #4(x)

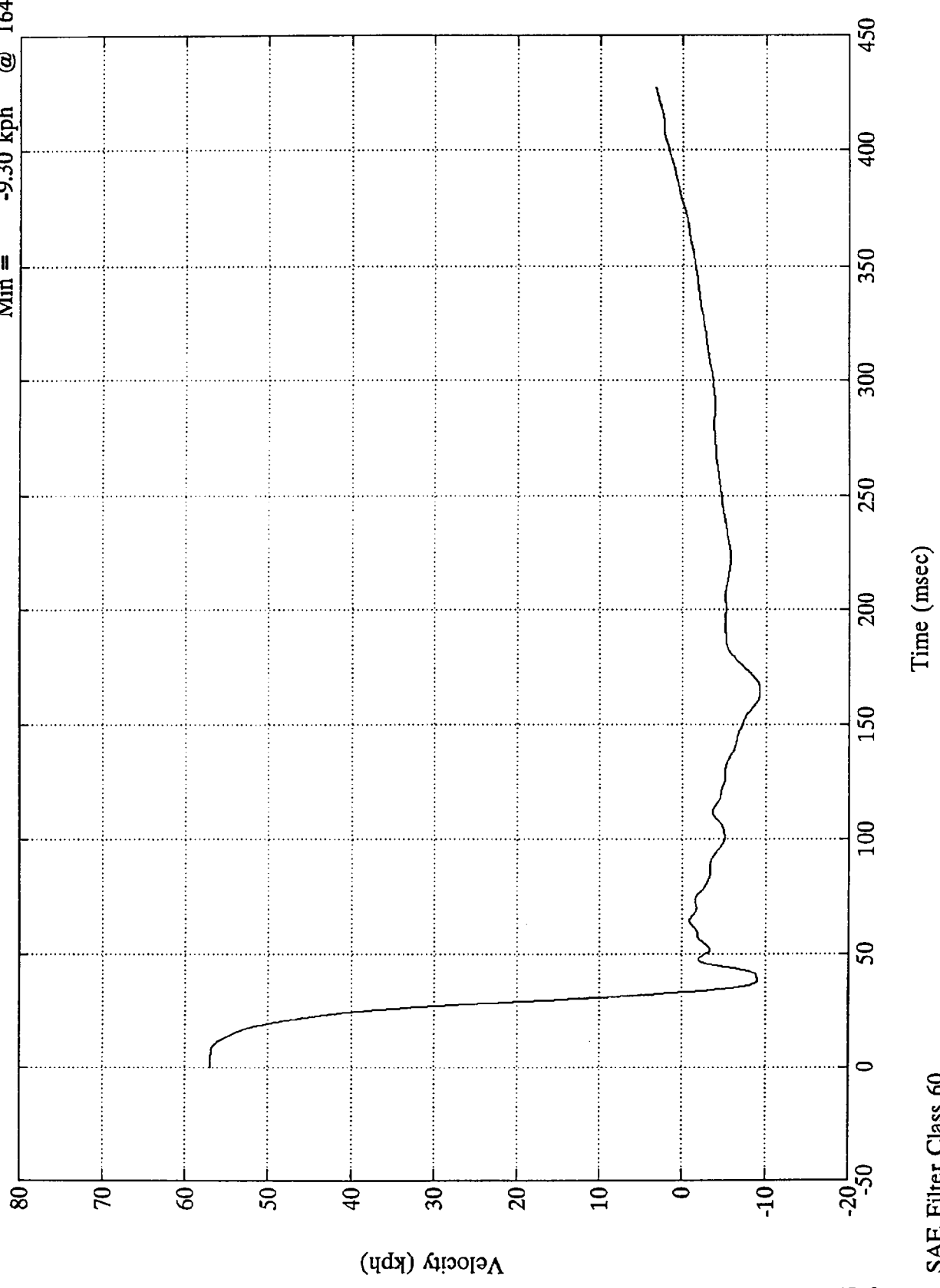
Max = 52.73 Gs @ 44.27 msec
Min = -161.79 Gs @ 29.04 msec



NCAP TEST #2 - 1995 FORD ASPIRE

Max = 56.97 kph @ 1.19 msec
Min = -9.30 kph @ 164.76 msec

Acc. #4(x)

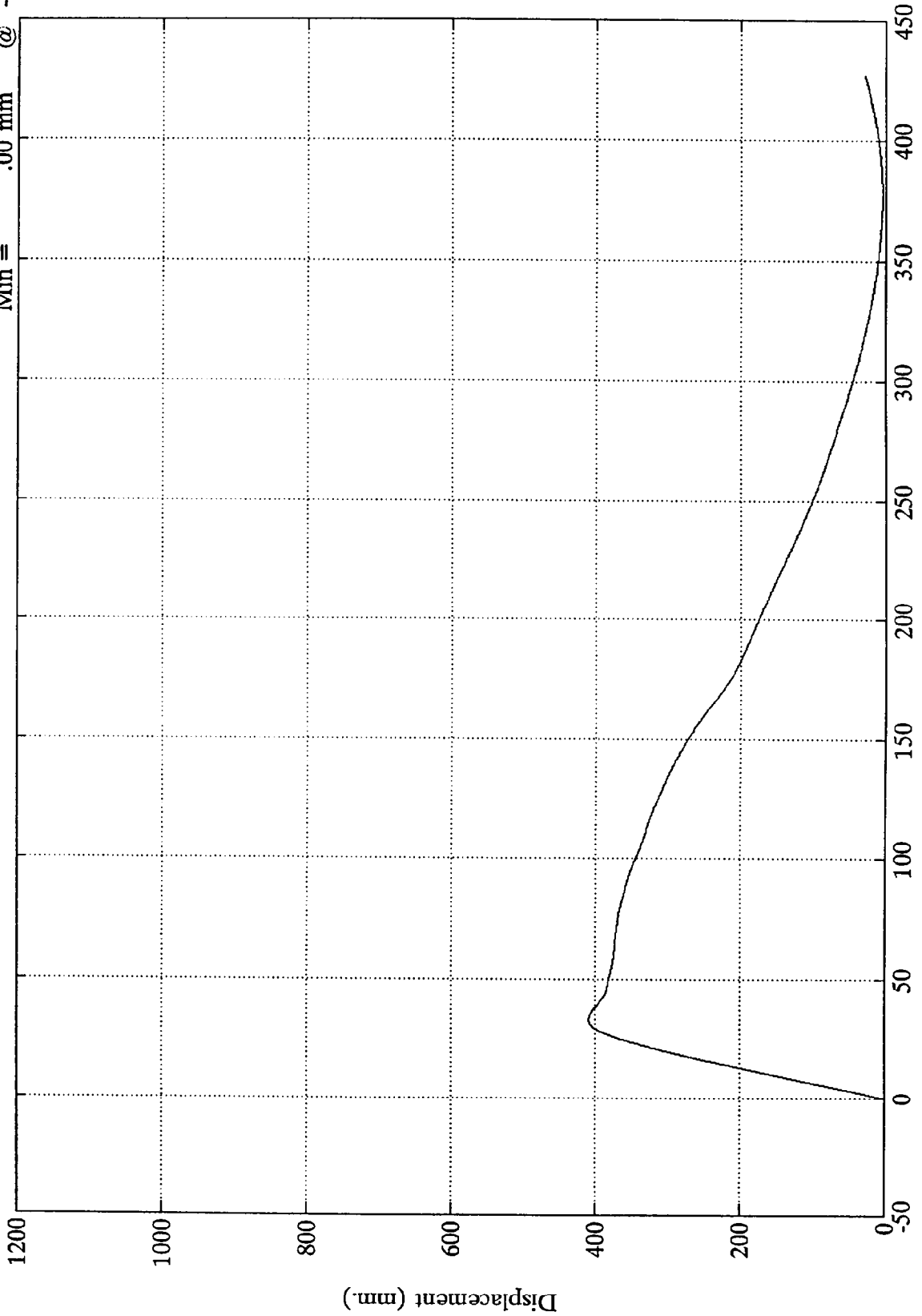


SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 409.27 mm @ 32.88 msec
Min = .00 mm @ -22.44 msec

Acc. #4(x)



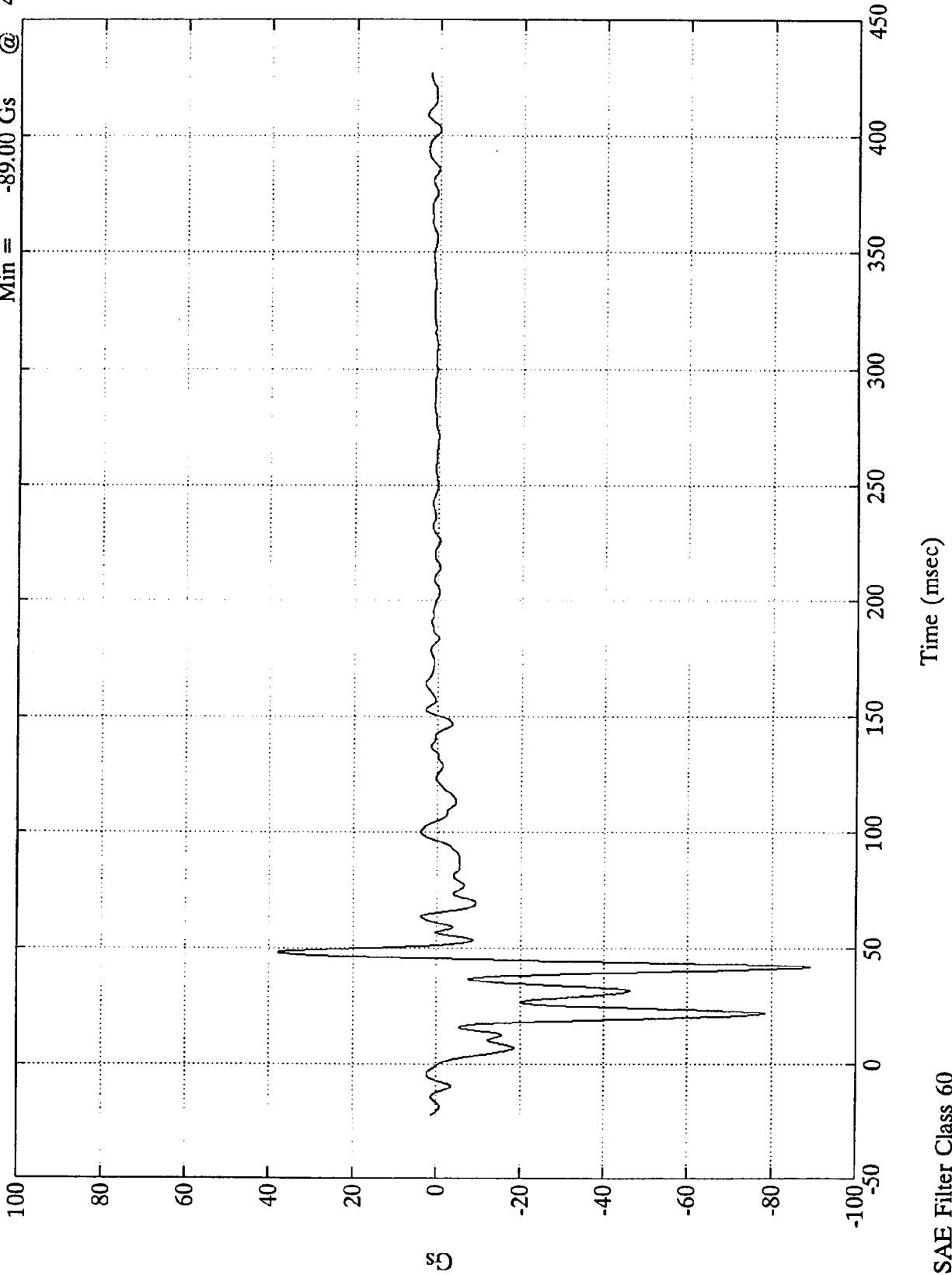
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Acc. #5(x)

Max = 38.00 Gs @ 48.00 msec
Min = -89.00 Gs @ 41.76 msec



sg
B-13

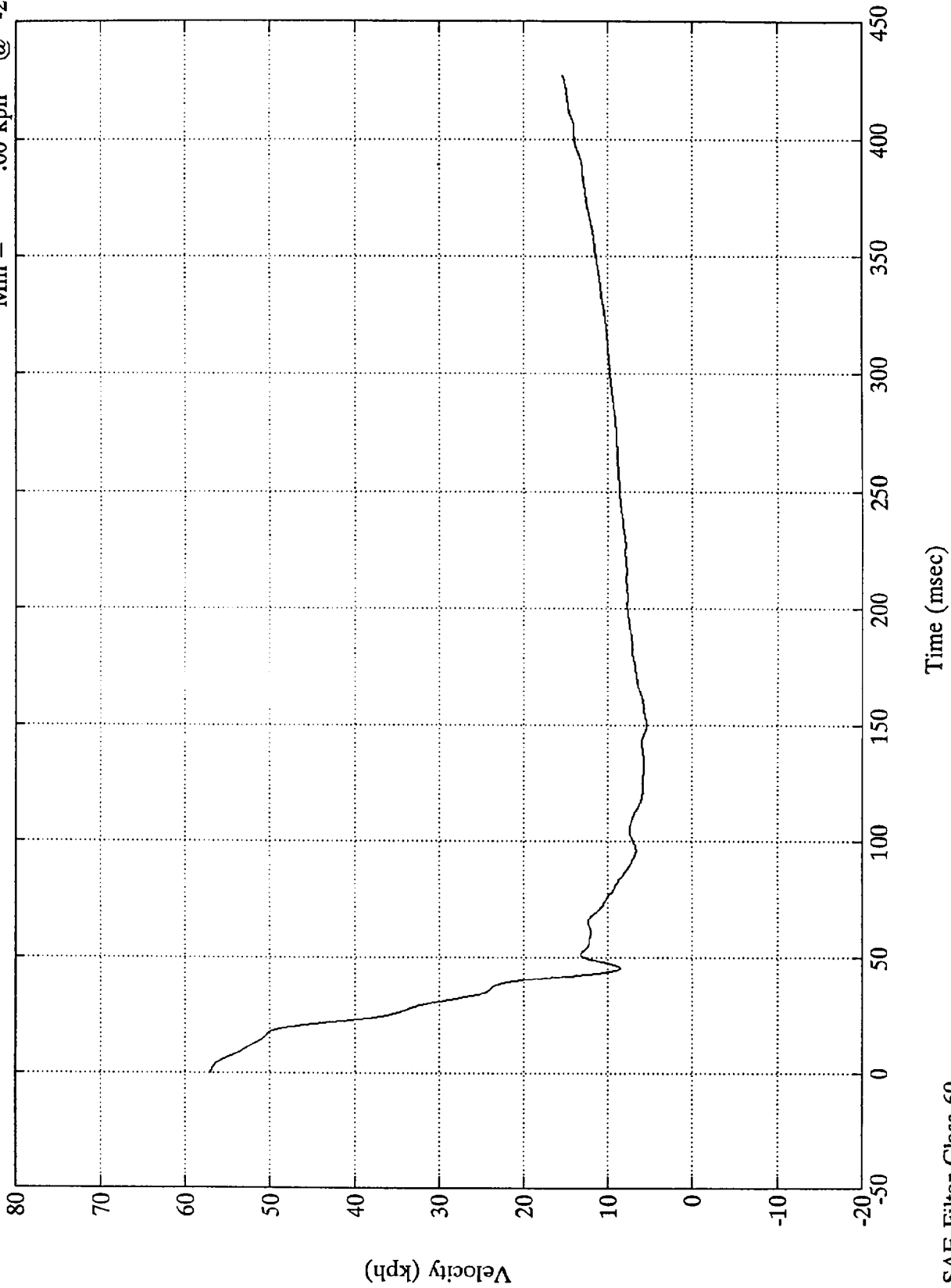
8227-2

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 56.97 kph @ -0.00 msec
Min = .00 kph @ -22.44 msec

Acc. #5(x)

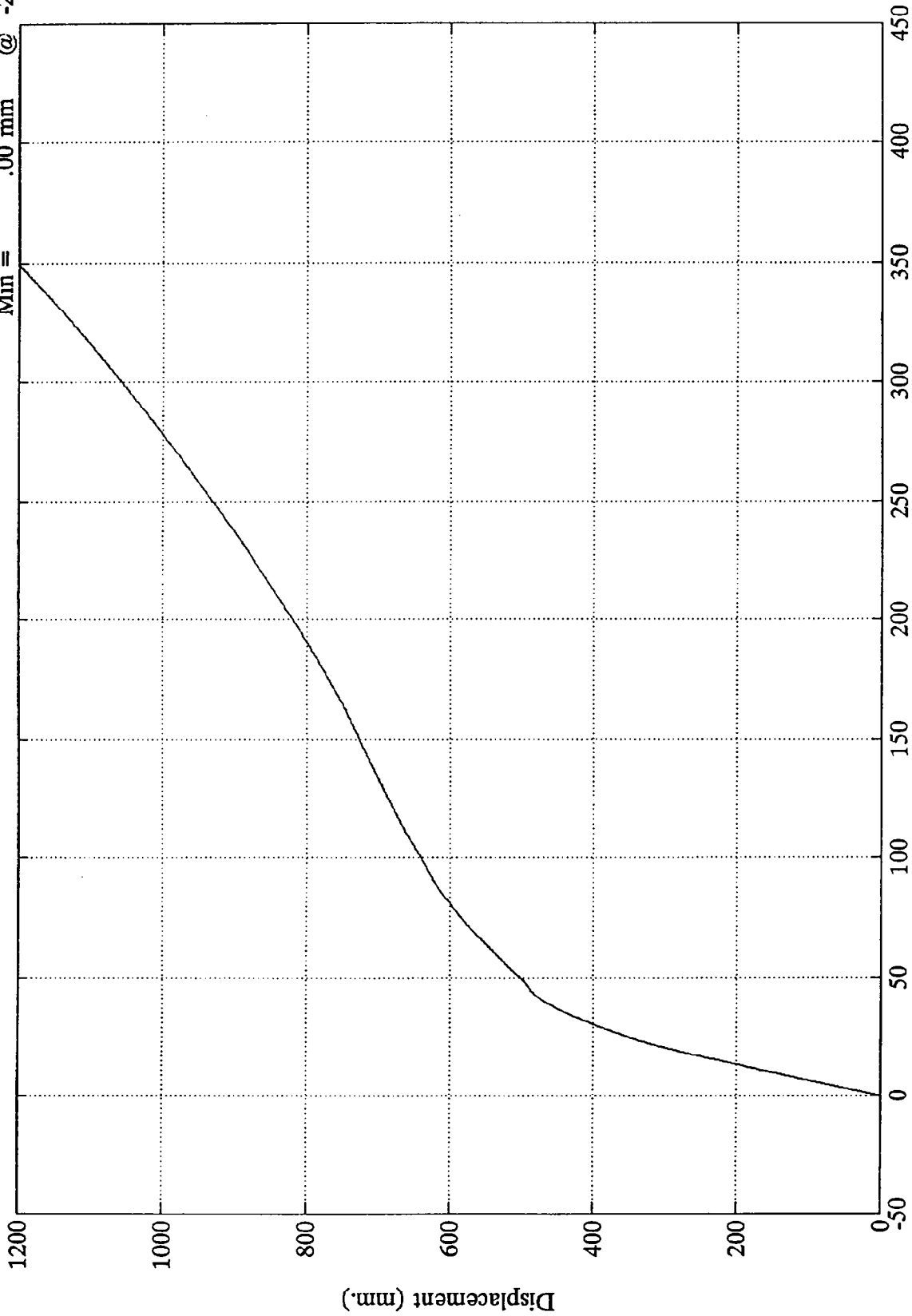


SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Acc. #5(x)

Max = 1487.10 mm @ 427.32 msec
Min = .00 mm @ -22.44 msec



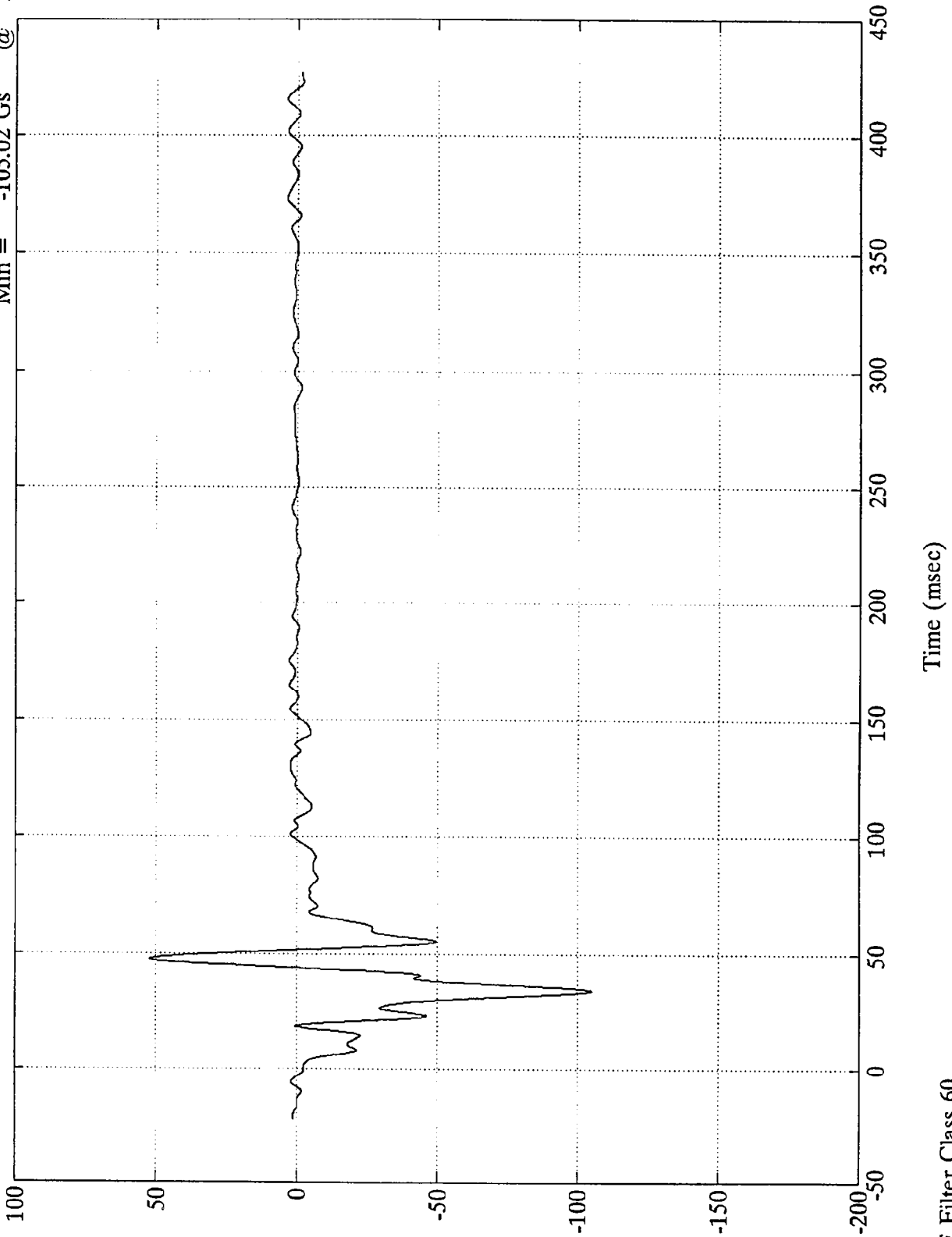
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 52.29 Gs @ 47.63 msec
Min = -105.02 Gs @ 34.20 msec

Acc. #6(x)



8227-2
B-16

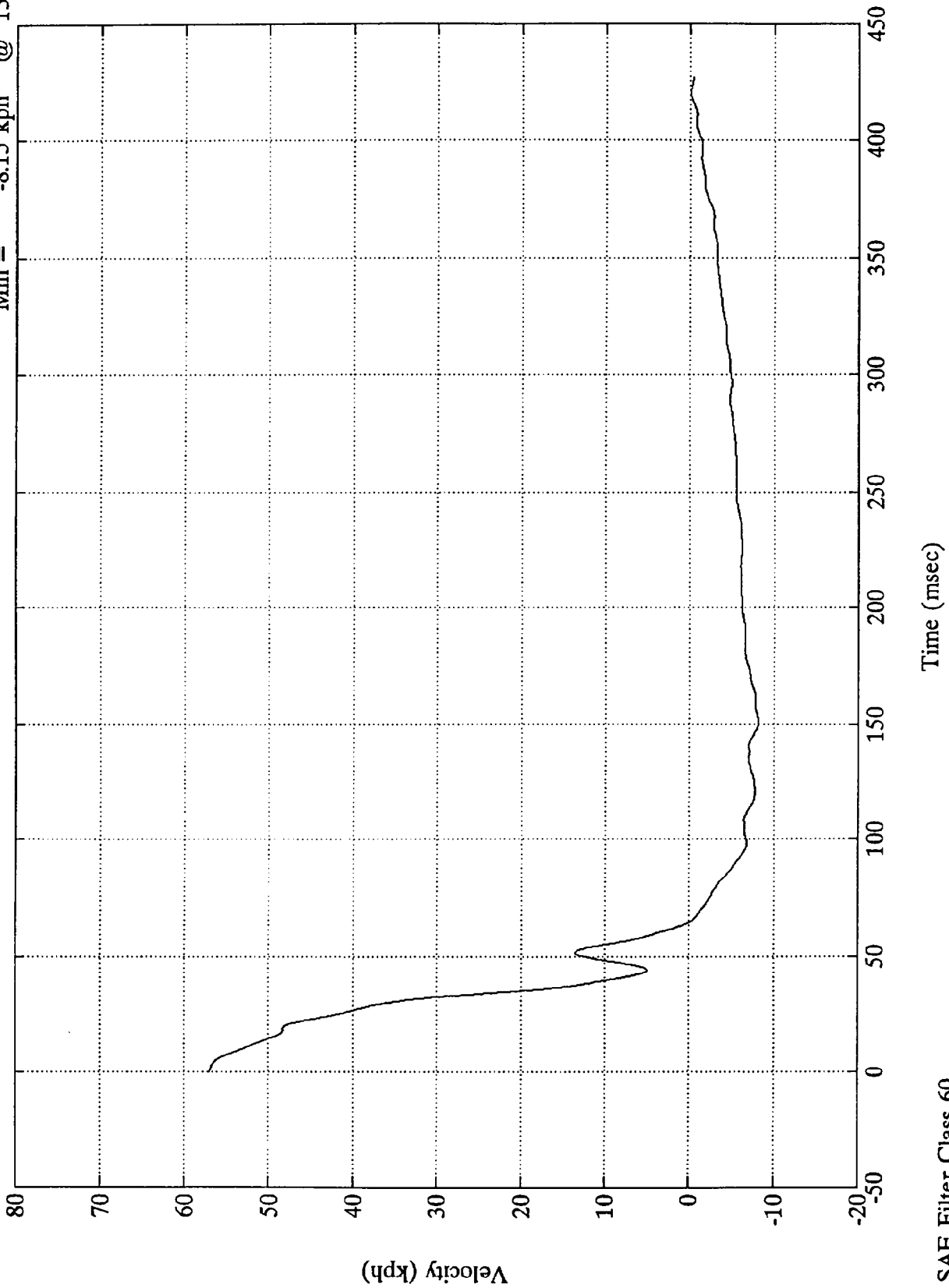
SAE Filter Class 60



NCAP TEST #2 - 1995 FORD ASPIRE

Max = 56.97 kph @ -0.00 msec
Min = -8.15 kph @ 151.44 msec

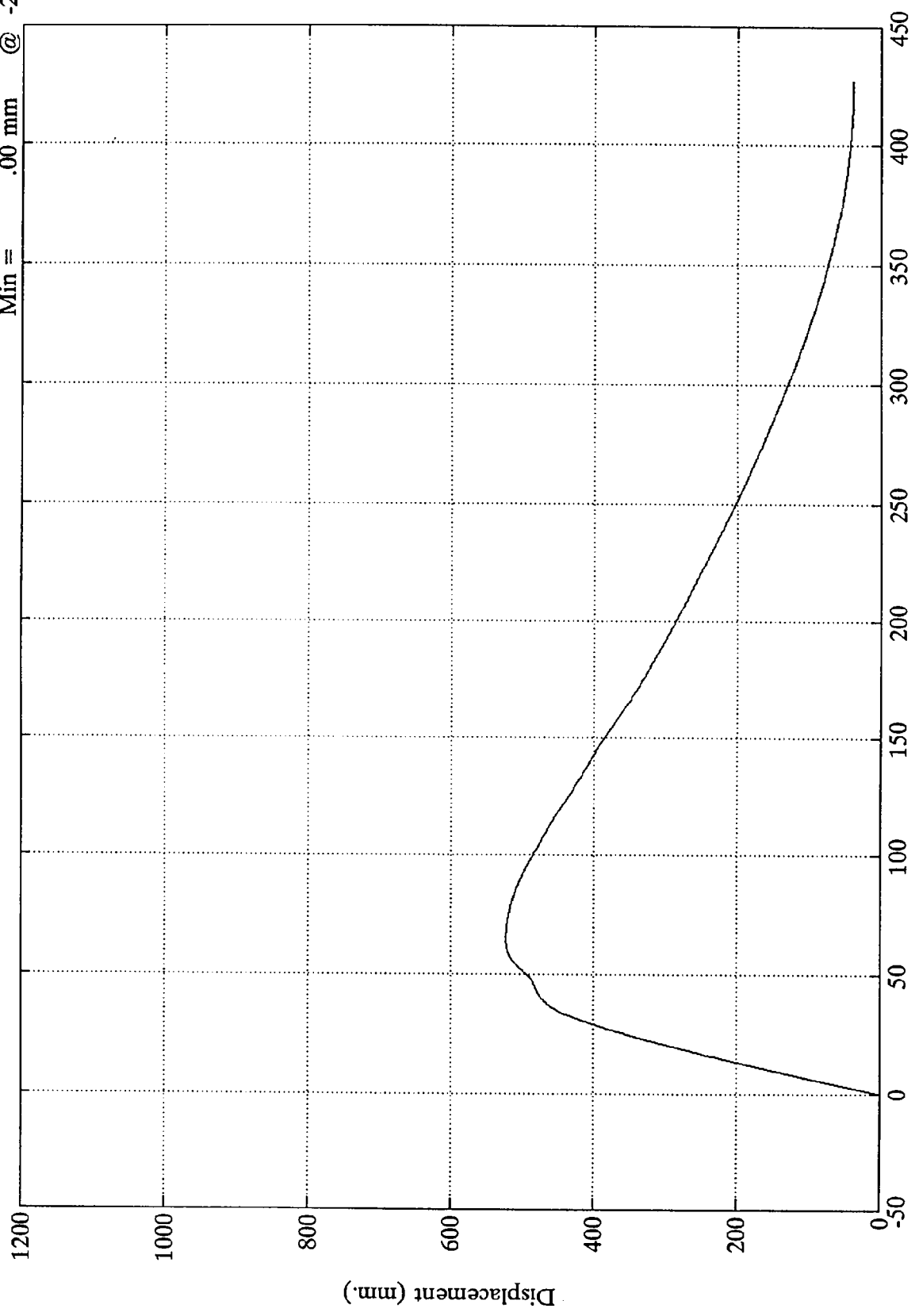
Acc. #6(x)



NCAP TEST #2 - 1995 FORD ASPIRE

Max = 523.32 mm @ 64.44 msec
Min = .00 mm @ -22.44 msec

Acc. #6(x)



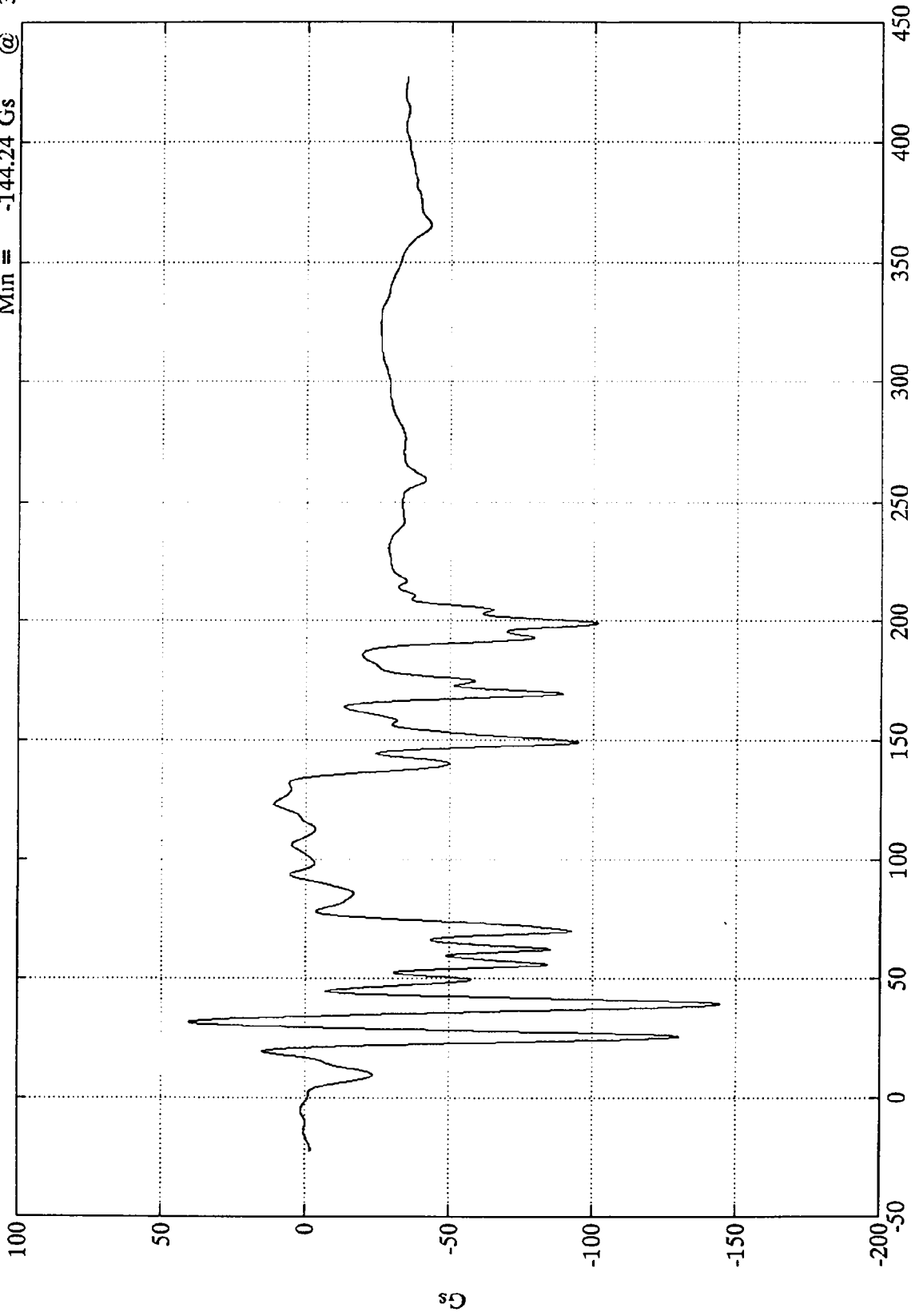
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 40.73 Gs @ 30.96 msec
Min = -144.24 Gs @ 38.75 msec

Acc. #7(x)



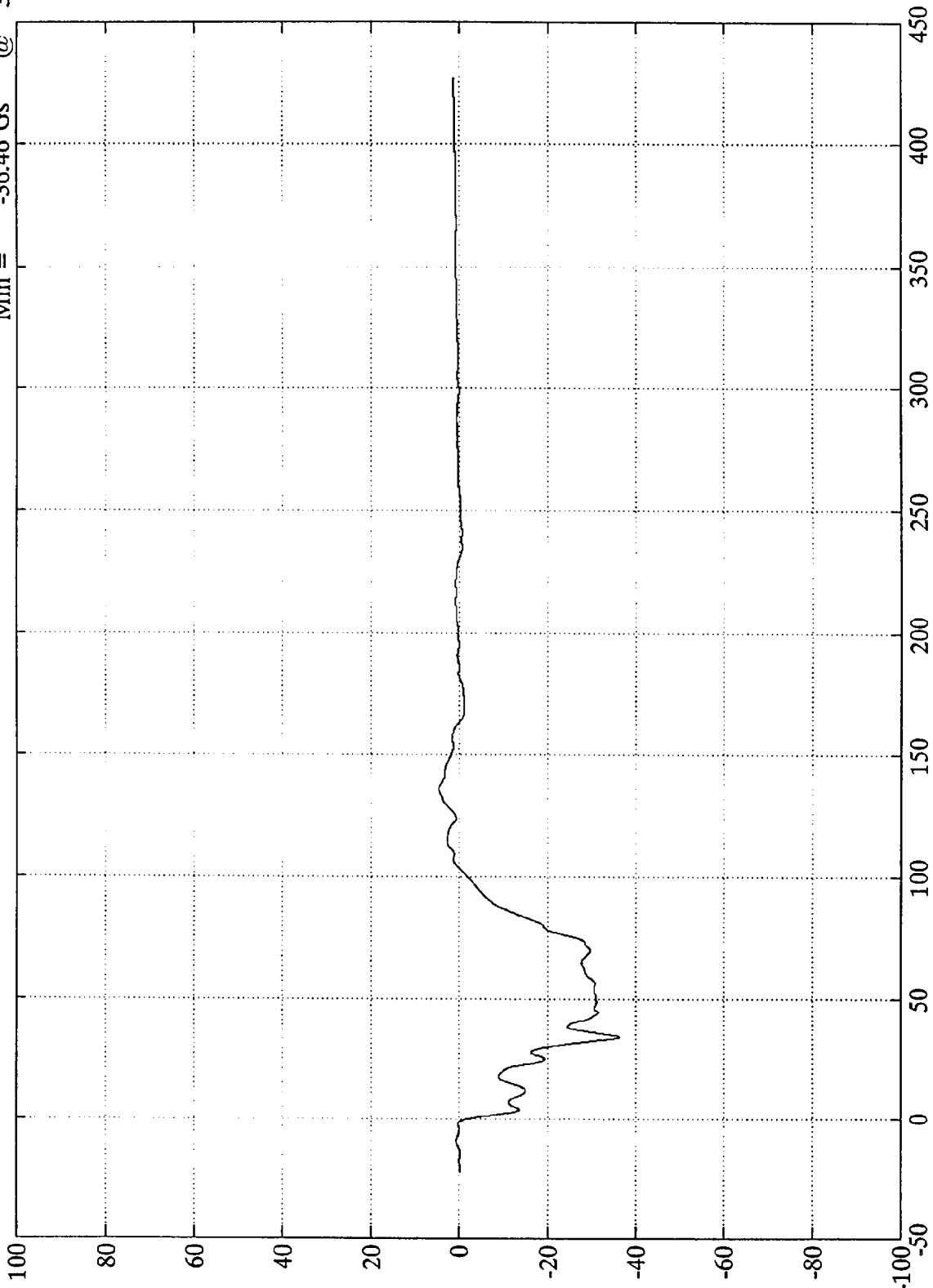
Time (msec)
Questionable data, data does not return to zero

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 4.63 Gs @ 135.95 msec
Min = -36.46 Gs @ 33.84 msec

Acc. #8(x)



8D
B-20

8227-2

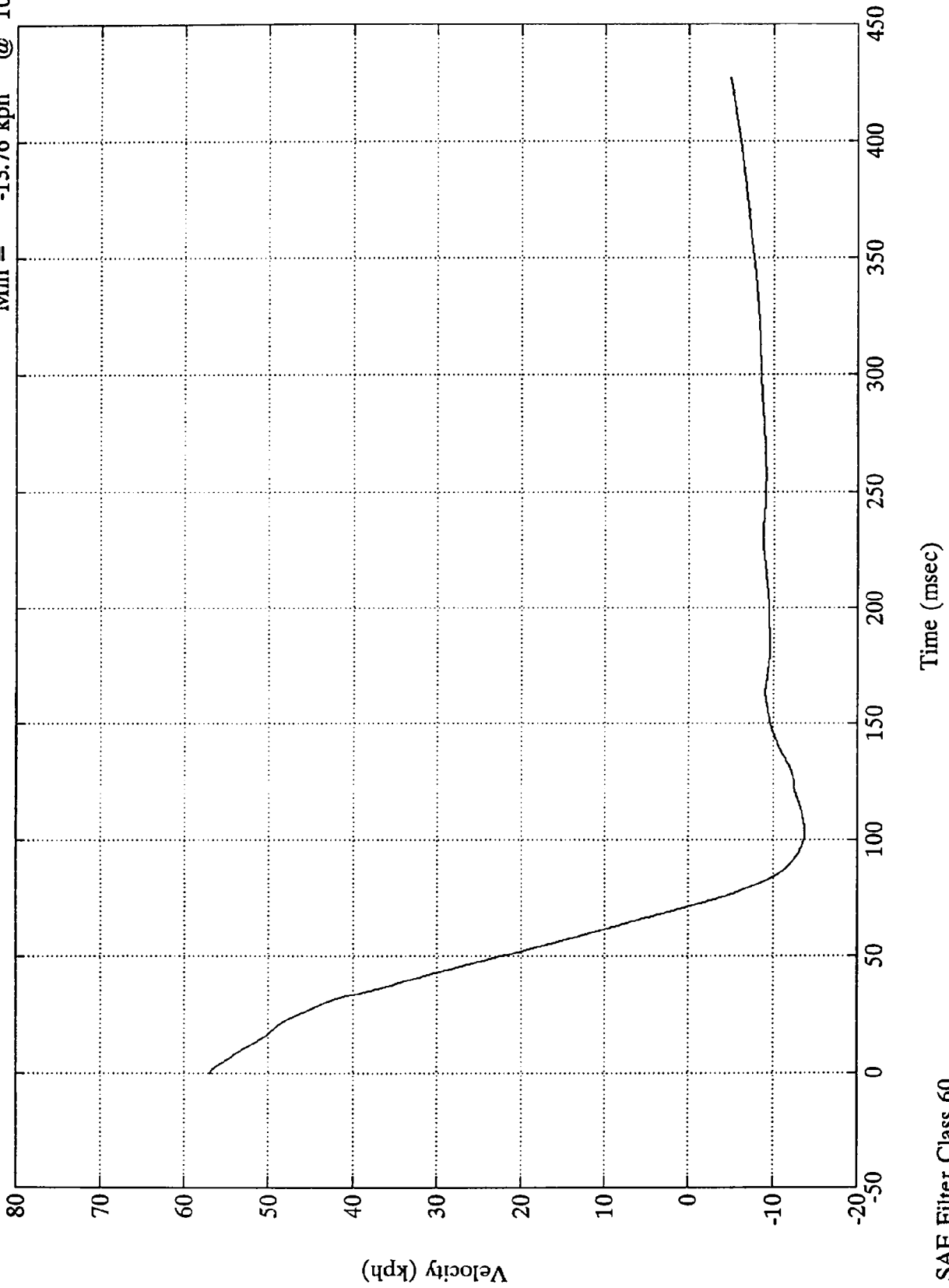
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 56.97 kph @ -0.00 msec
Min = -13.76 kph @ 103.56 msec

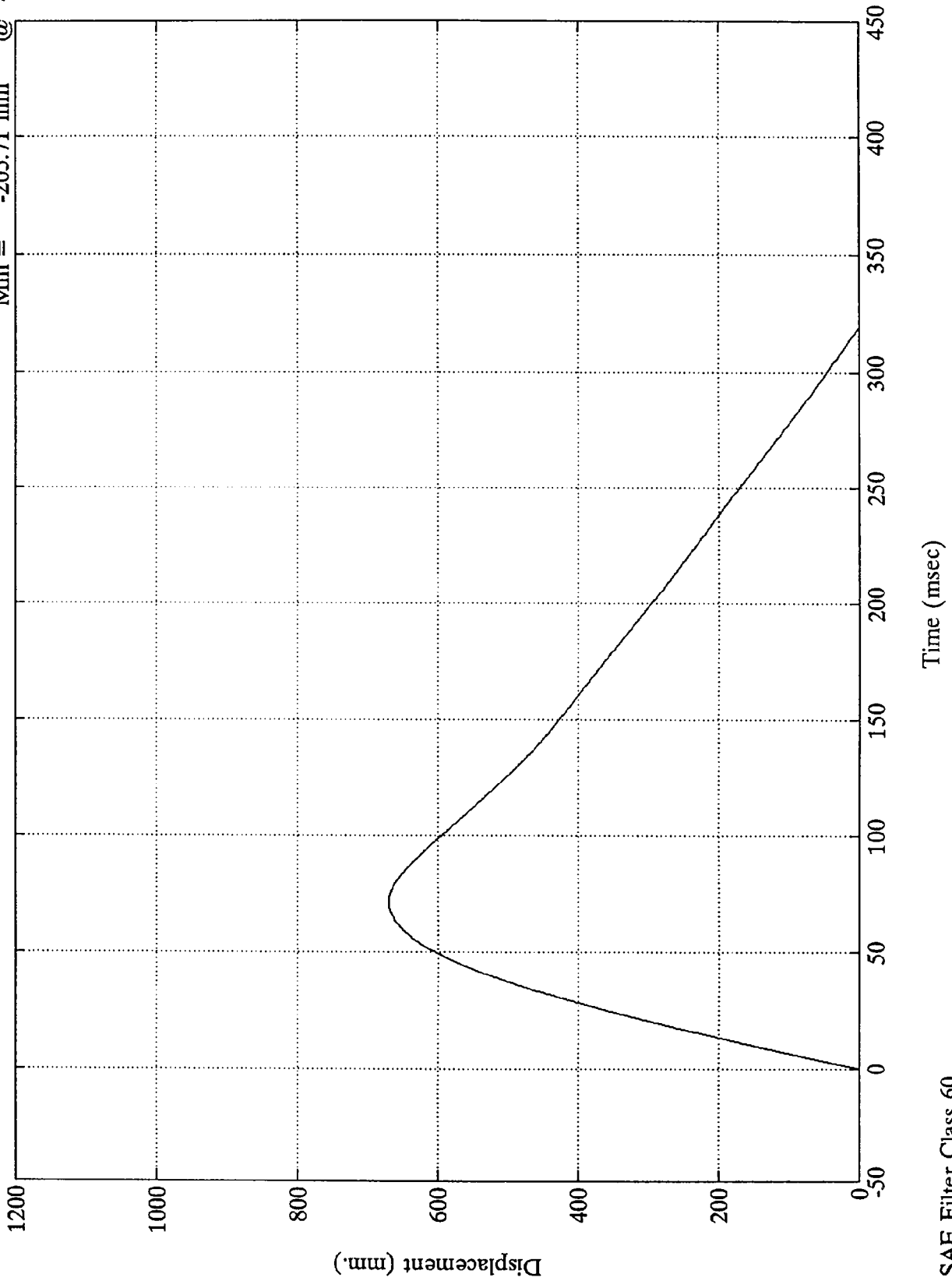
Acc. #8(x)



NCAP TEST #2 - 1995 FORD ASPIRE

Max = 670.13 mm @ 71.40 msec
Min = -205.71 mm @ 427.32 msec

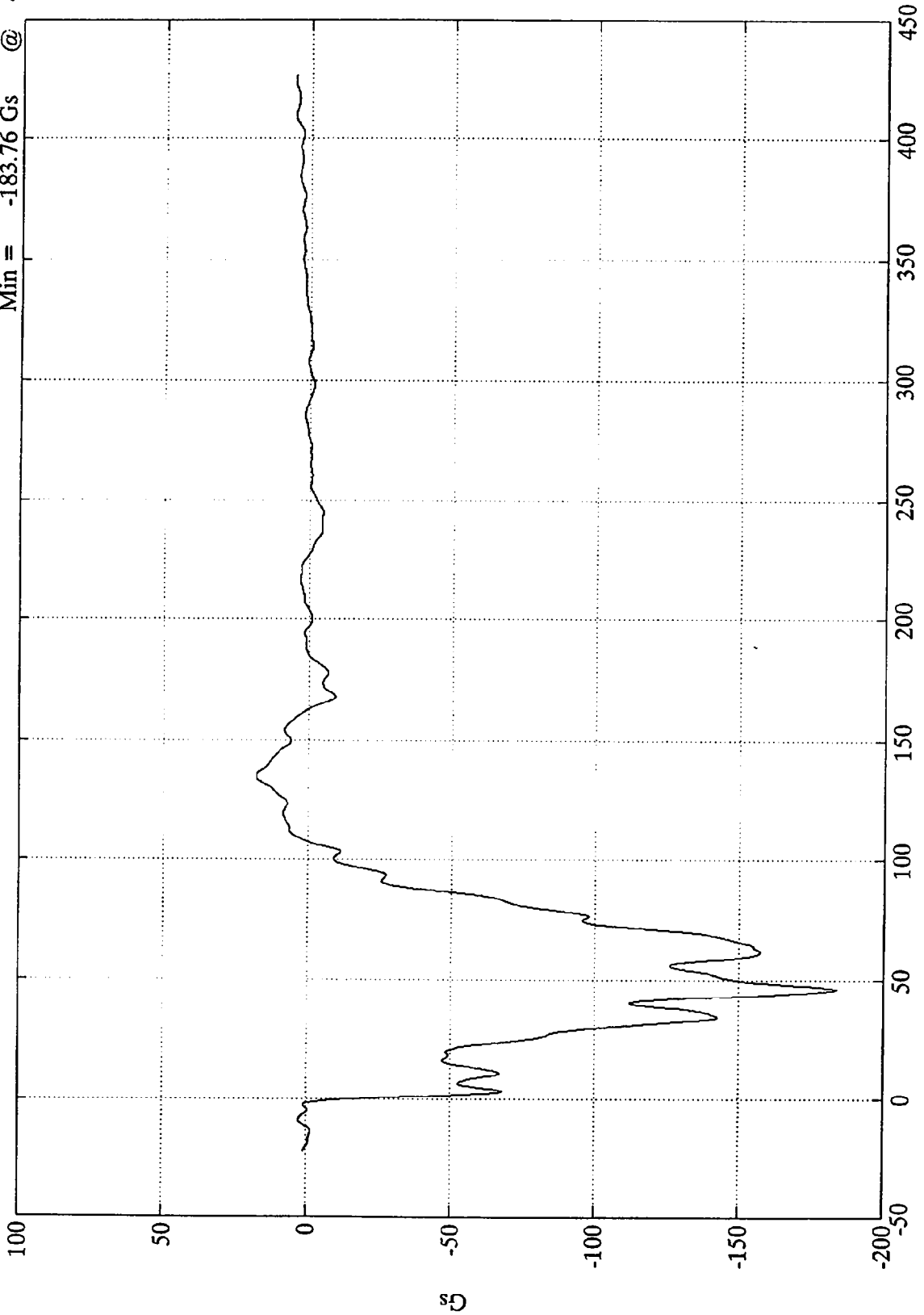
Acc. #8(x)



NCAP TEST #2 - 1995 FORD ASPIRE

Max = 17.99 Gs @ 134.64 msec
Min = -183.76 Gs @ 46.08 msec

Acc. #9(x)



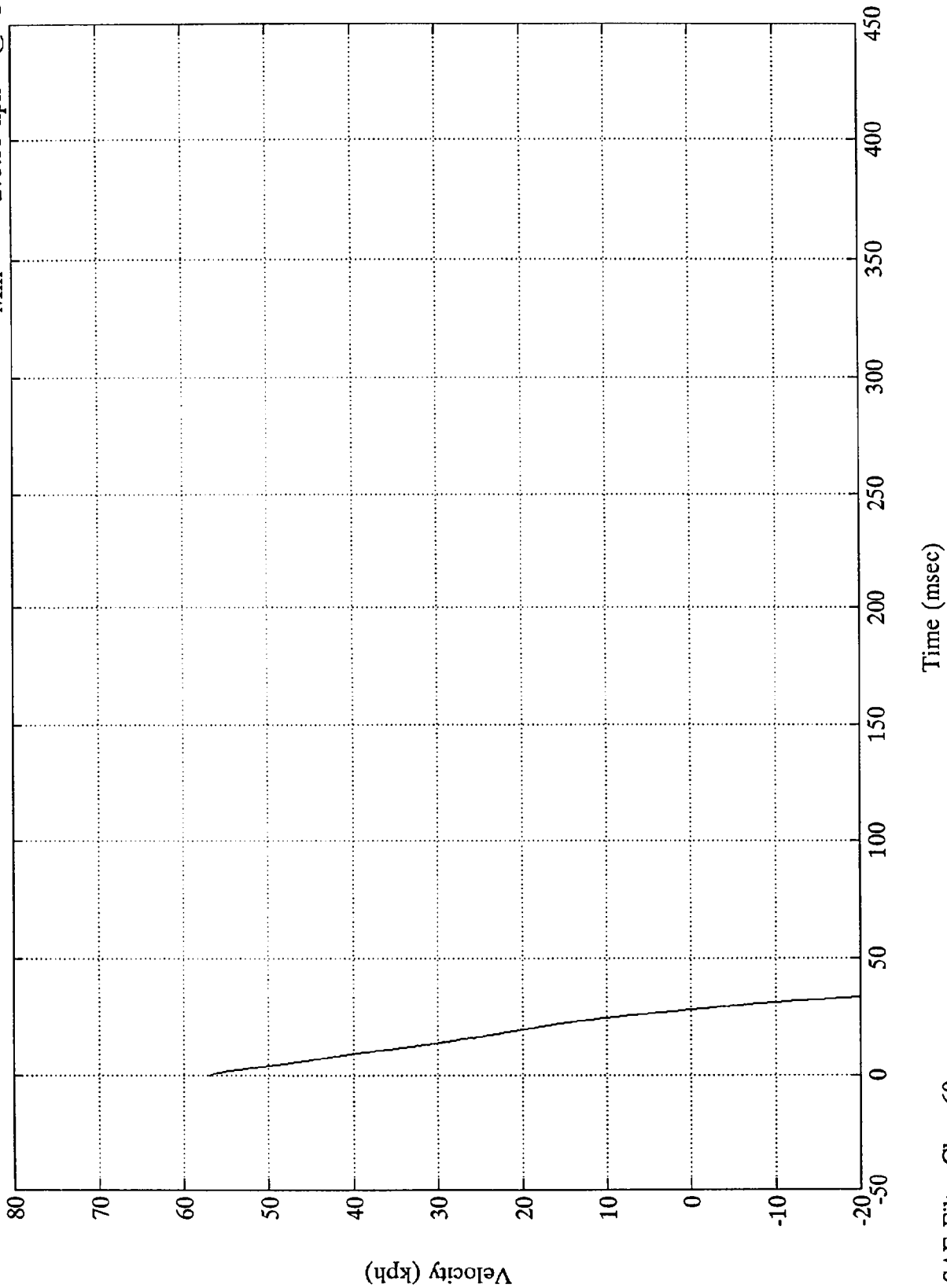
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Acc. #9(x)

Max = 56.97 kph @ -0.00 msec
Min = -273.33 kph @ 107.52 msec

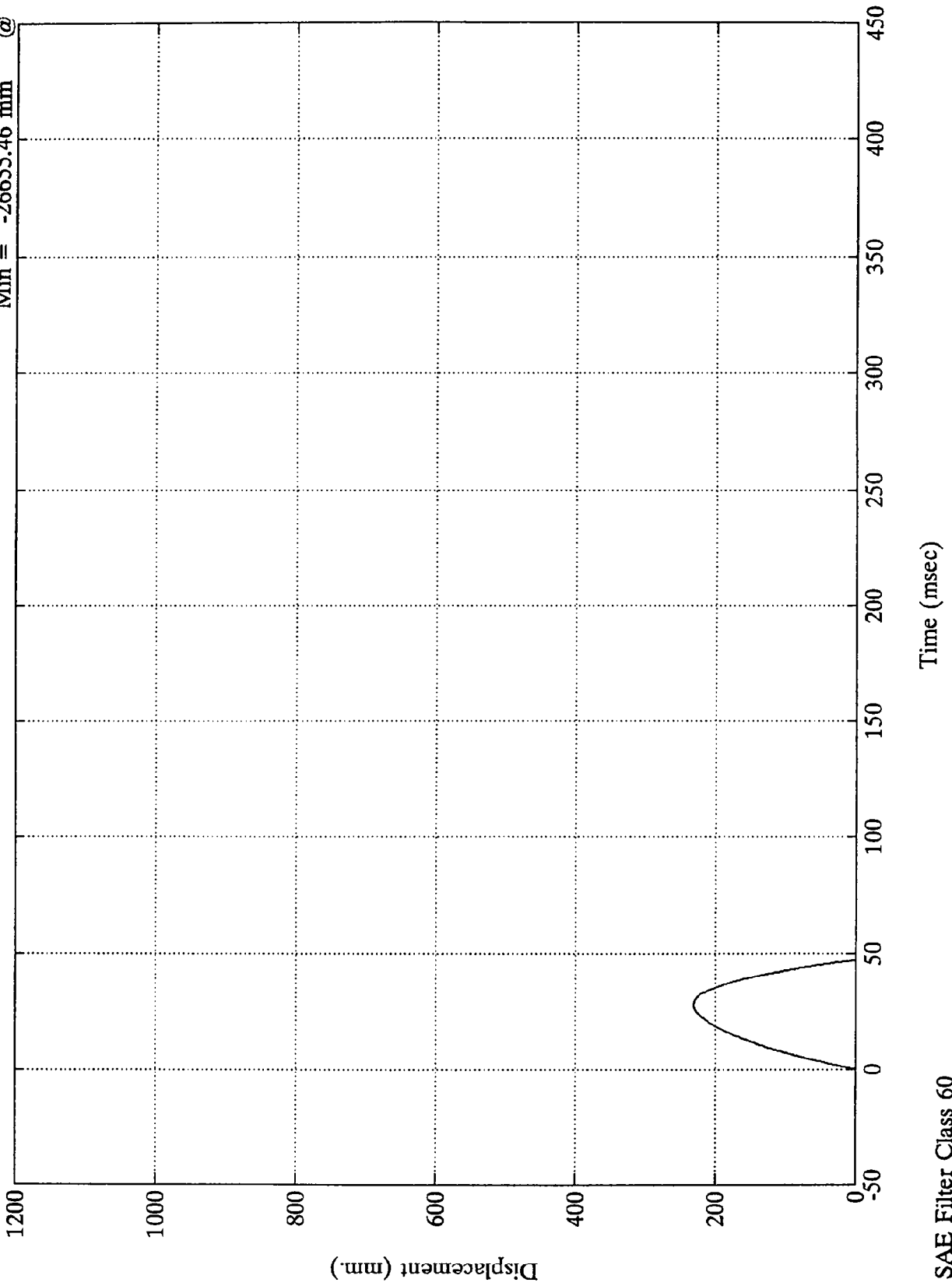


SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Acc. #9(x)

Max = 230.90 mm @ 27.72 msec
Min = -26655.46 mm @ 427.32 msec



TEST NO. MS0201

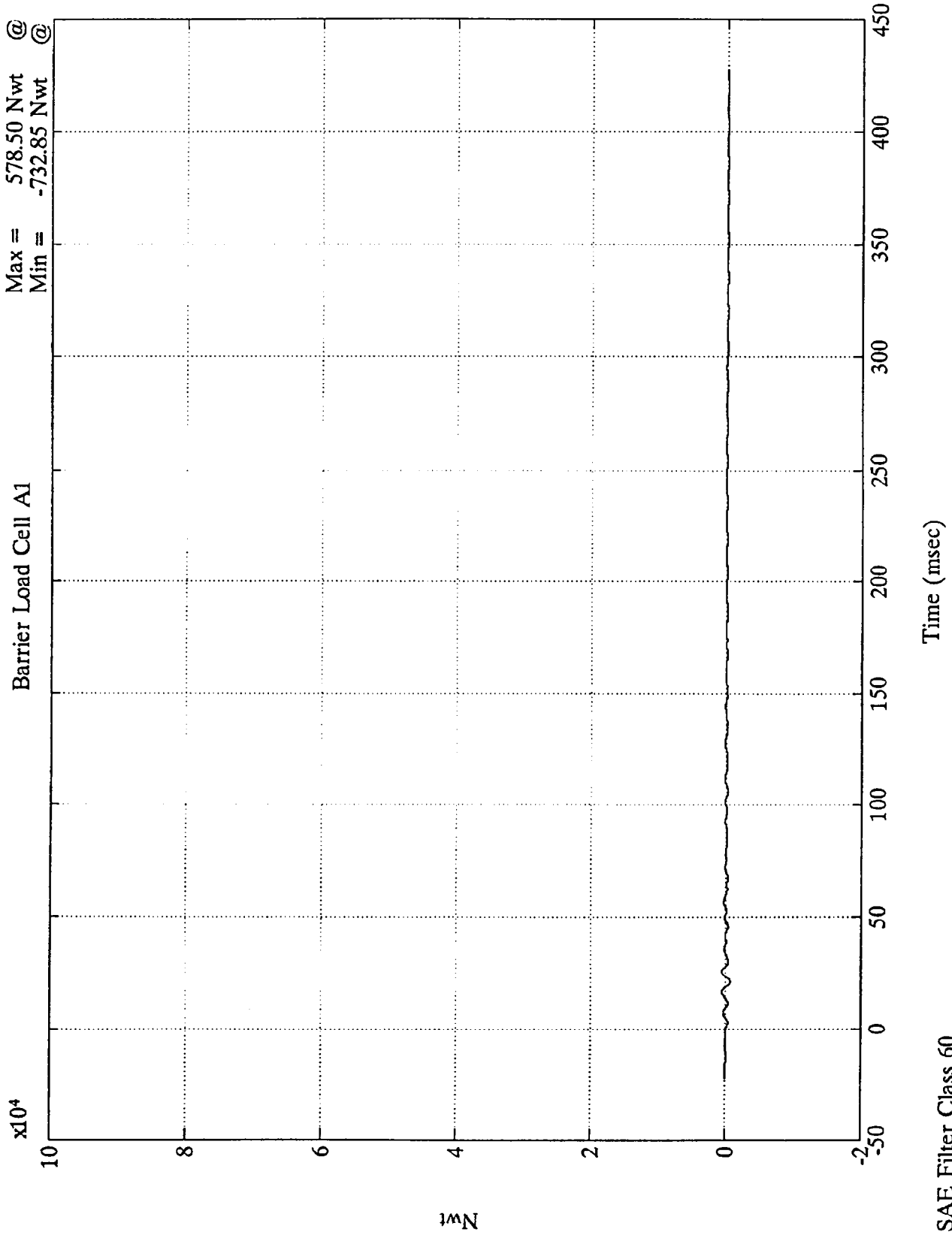
LOAD CELL BARRIER DATA

FILTER CHANNEL CLASS

60

NCAP TEST #2 - 1995 FORD ASPIRE

Barrier Load Cell A1
Max = 578.50 Nwt @ 25.32 msec
Min = -732.85 Nwt @ 21.00 msec



Nwt
B-27

8227-2

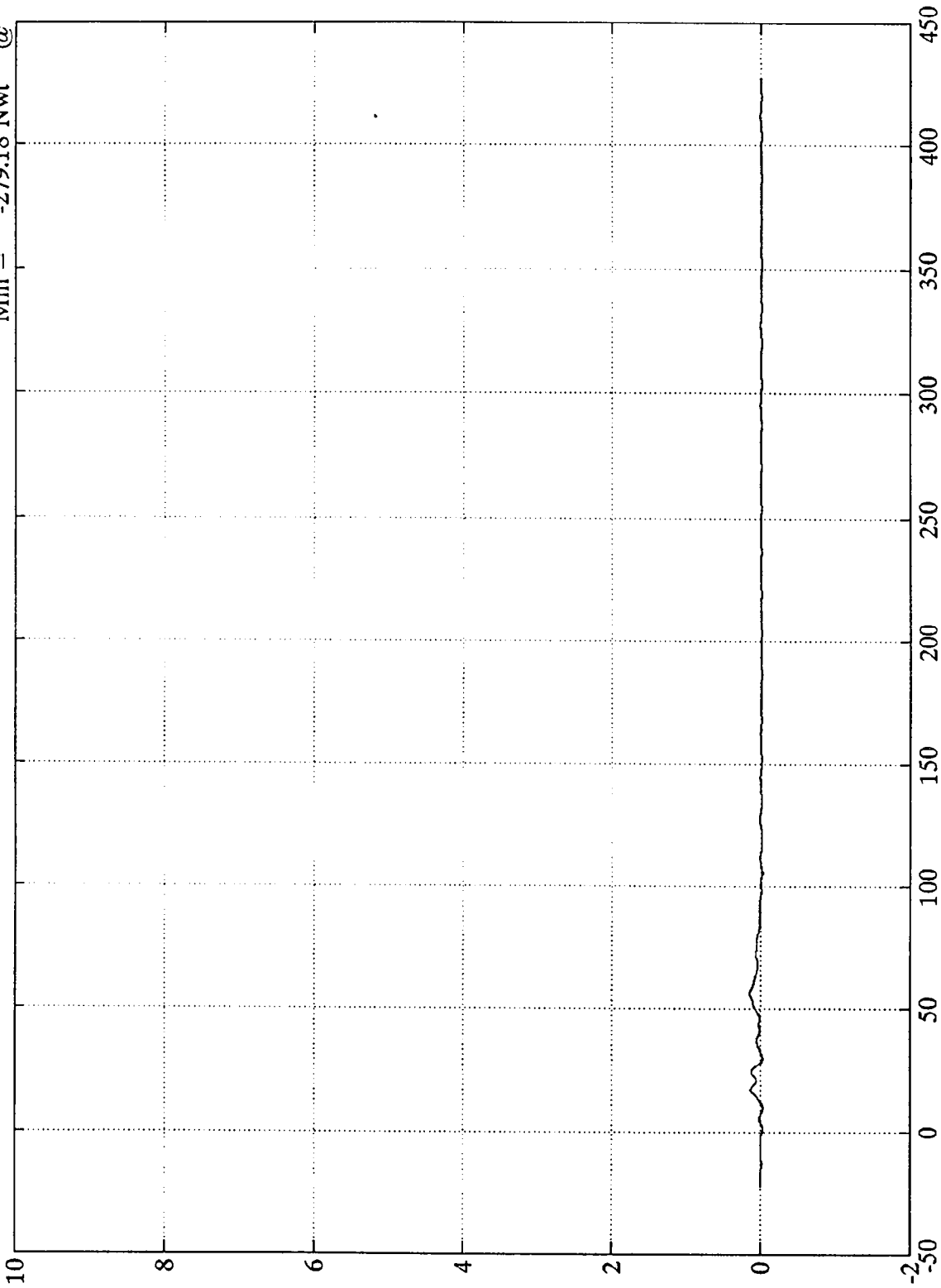
SAE Filter Class 60

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 1458.96 Nwt @ 56.16 msec
Min = -279.18 Nwt @ 9.47 msec

Barrier Load Cell A2



10⁴ N
B-28

Time (msec)

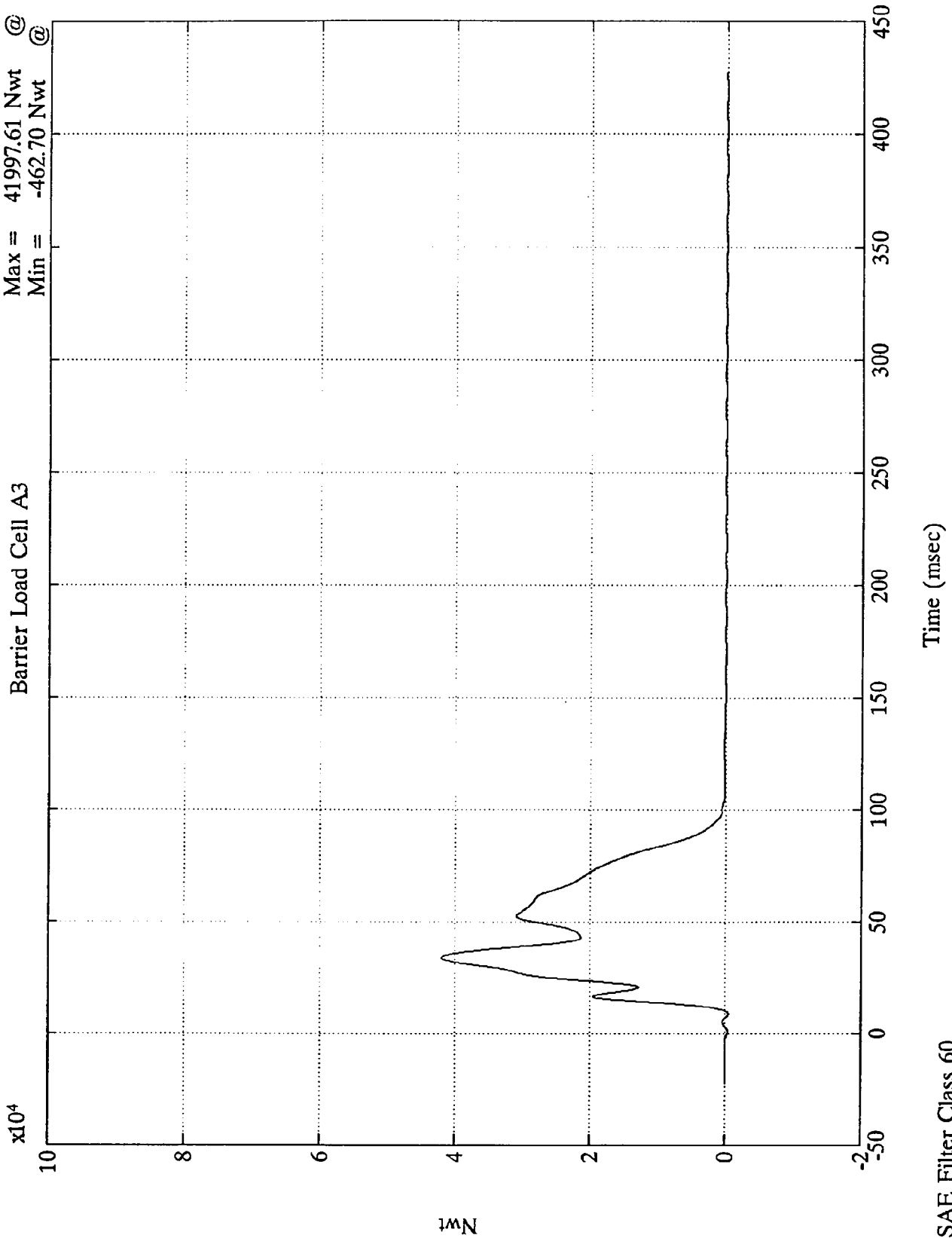
SAE Filter Class 60

8227-2

NCAP TEST #2 - 1995 FORD ASPIRE

Barrier Load Cell A3

Max = 41997.61 Nwt @ 33.72 msec
Min = -462.70 Nwt @ 8.63 msec



Nwt

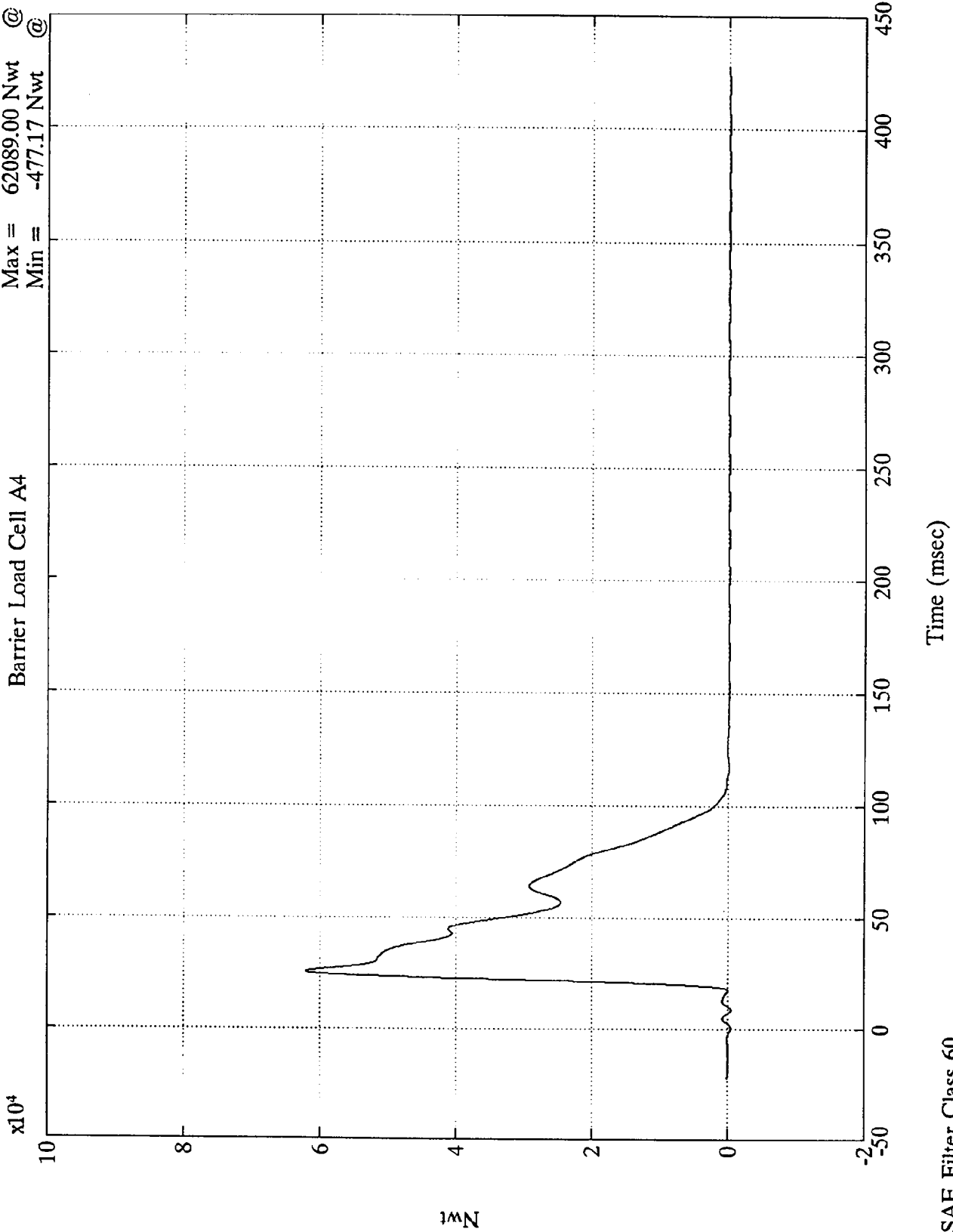
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 62089.00 Nwt @ 25.44 msec
Min = -477.17 Nwt @ 8.63 msec

Barrier Load Cell A4



1MN
B-30

8227-2

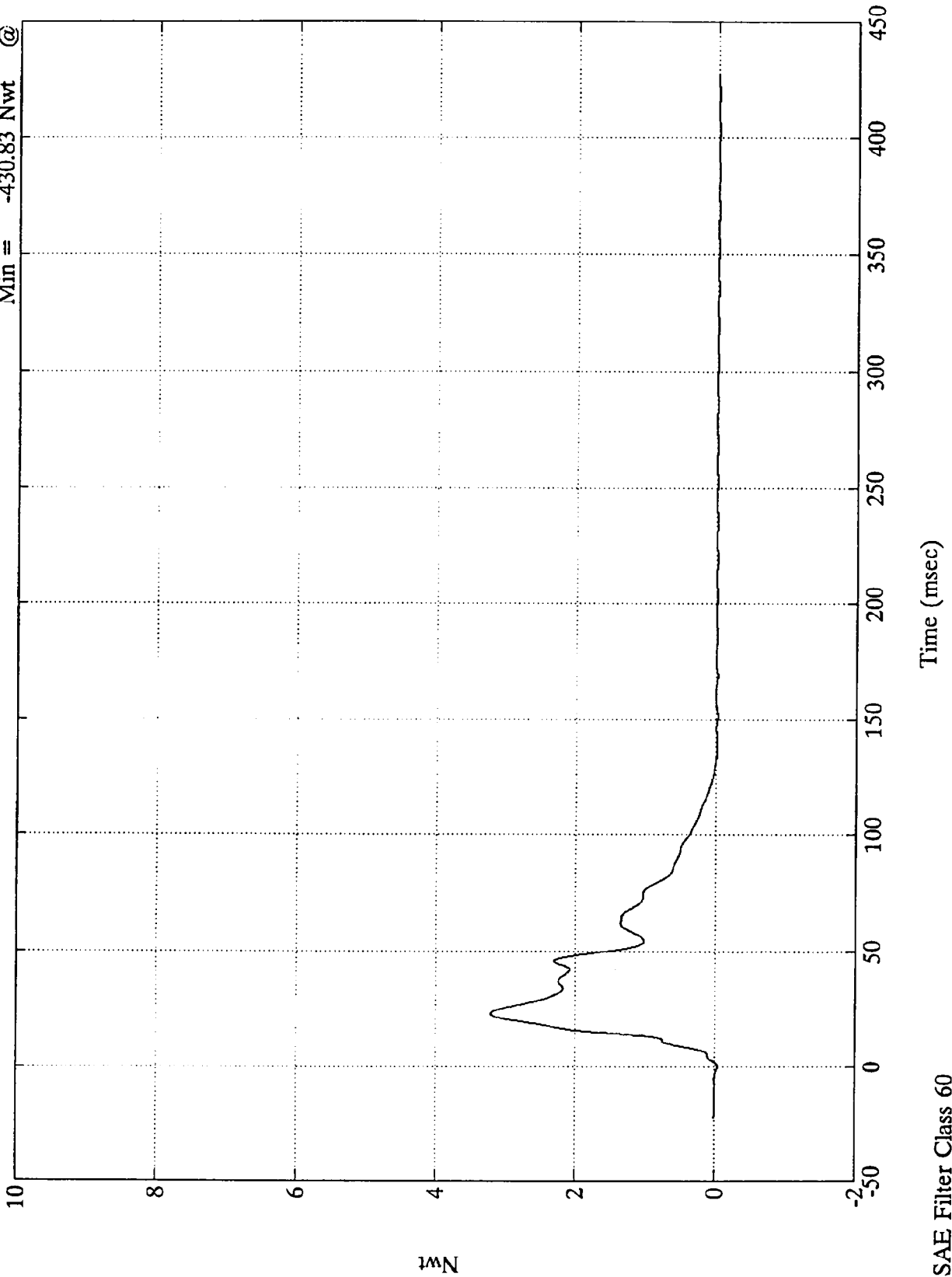
SAE Filter Class 60

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 32184.18 Nwt @ 23.15 msec
Min = -430.83 Nwt @ -0.00 msec

Barrier Load Cell A5



10N
B-31

8227-2

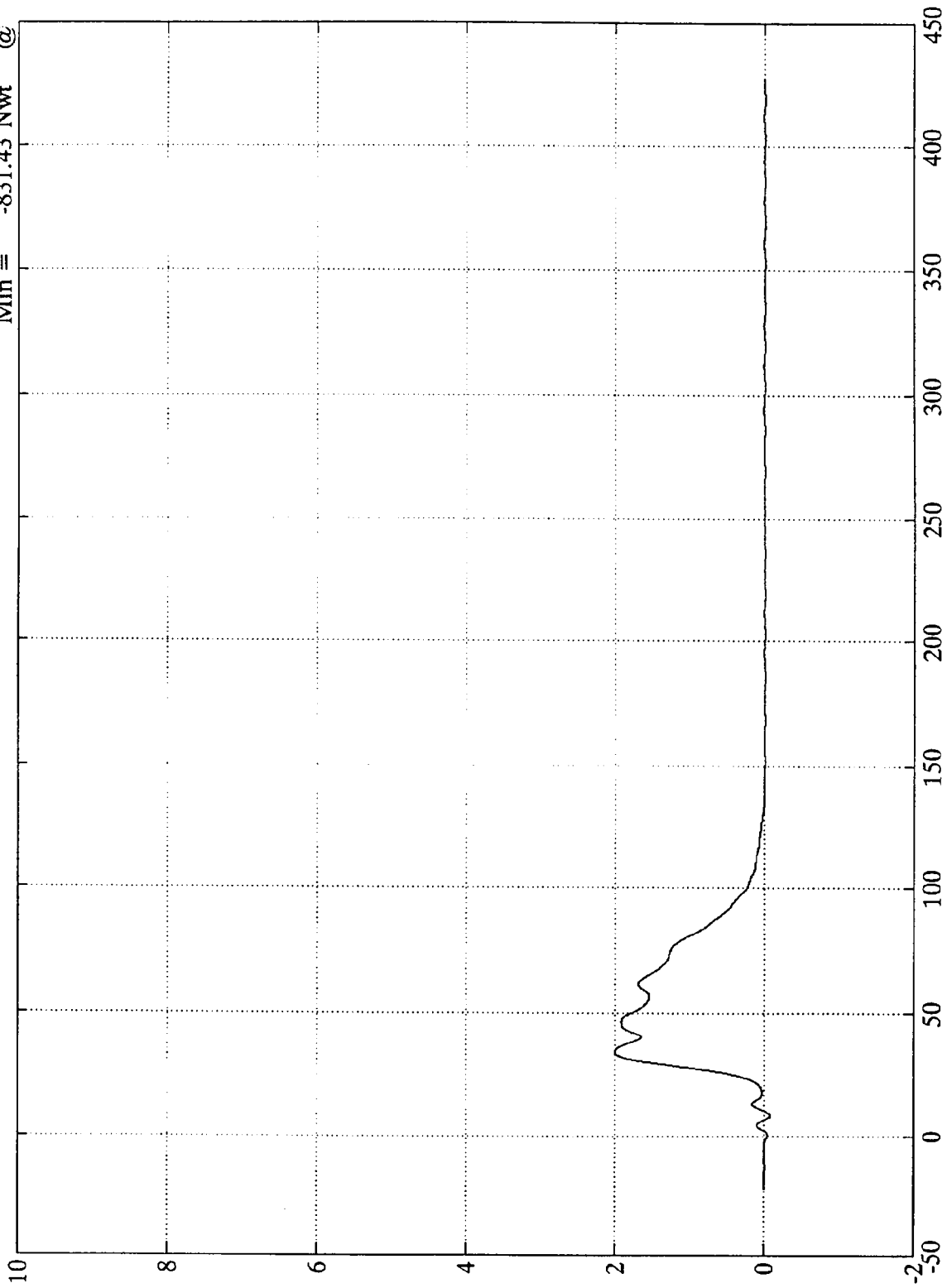
SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

$\times 10^4$

Barrier Load Cell A6

Max = 20018.58 Nwt @ 34.20 msec
Min = -831.43 Nwt @ 8.63 msec



Nwt
B-32

8227-2

Time (msec)

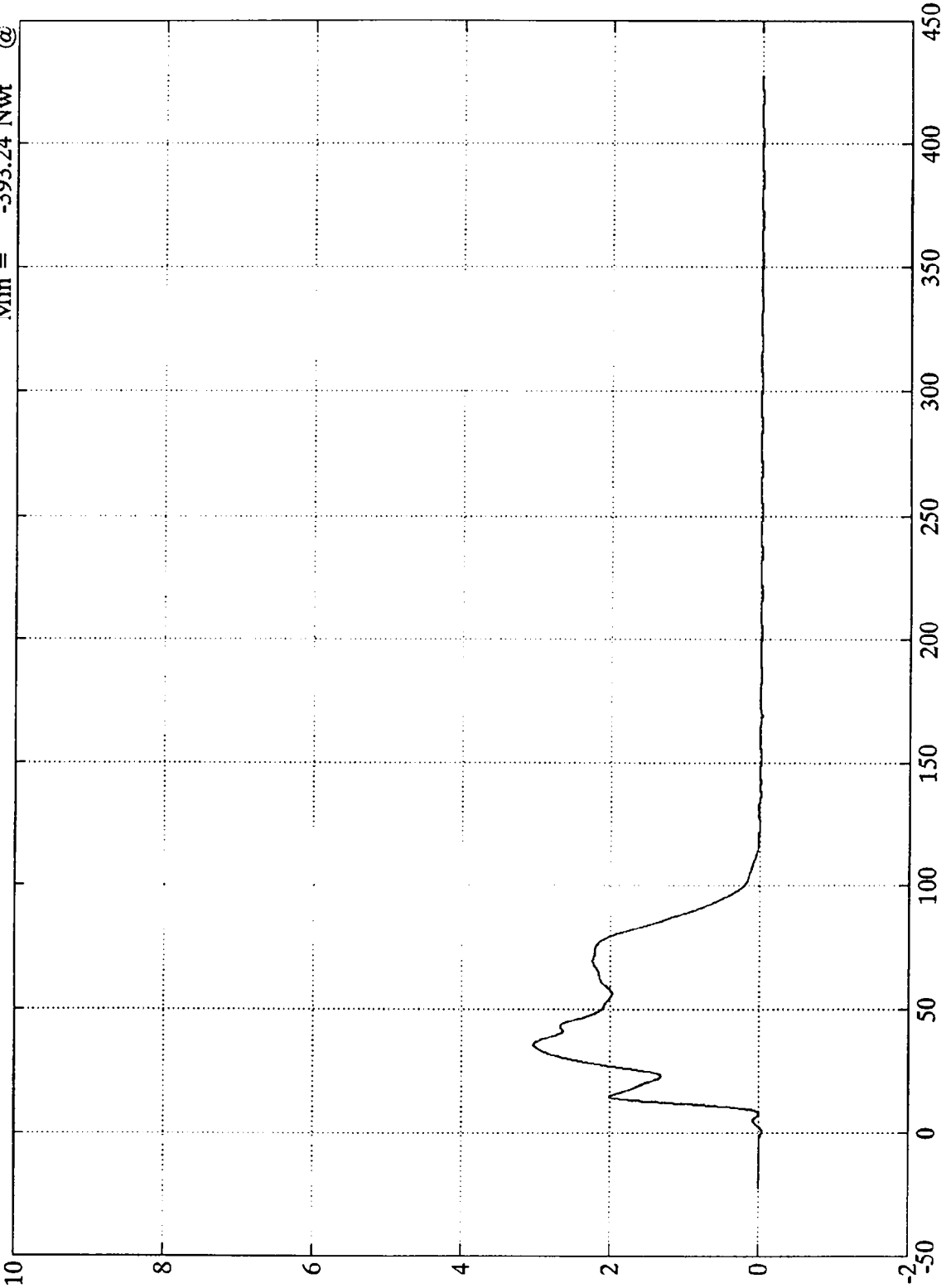
SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

x10⁴

Barrier Load Cell A7

Max = 30319.75 Nwt @ 35.39 msec
Min = -393.24 Nwt @ 0.47 msec



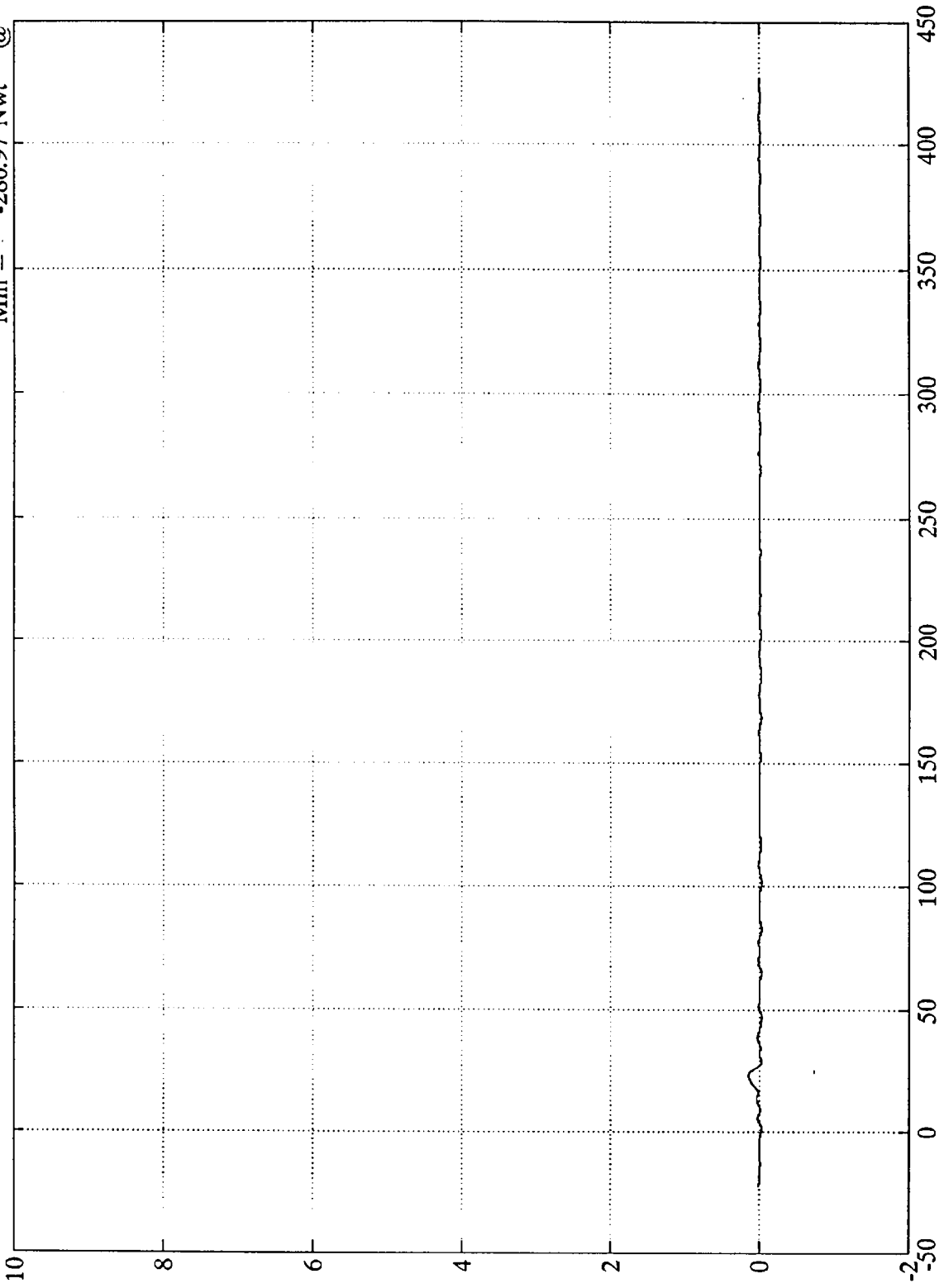
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Barrier Load Cell A8

Max = 1479.28 Nwt @ 23.15 msec
Min = -280.97 Nwt @ 28.68 msec



10⁴N
B-34

Time (msec)

SAE Filter Class 60

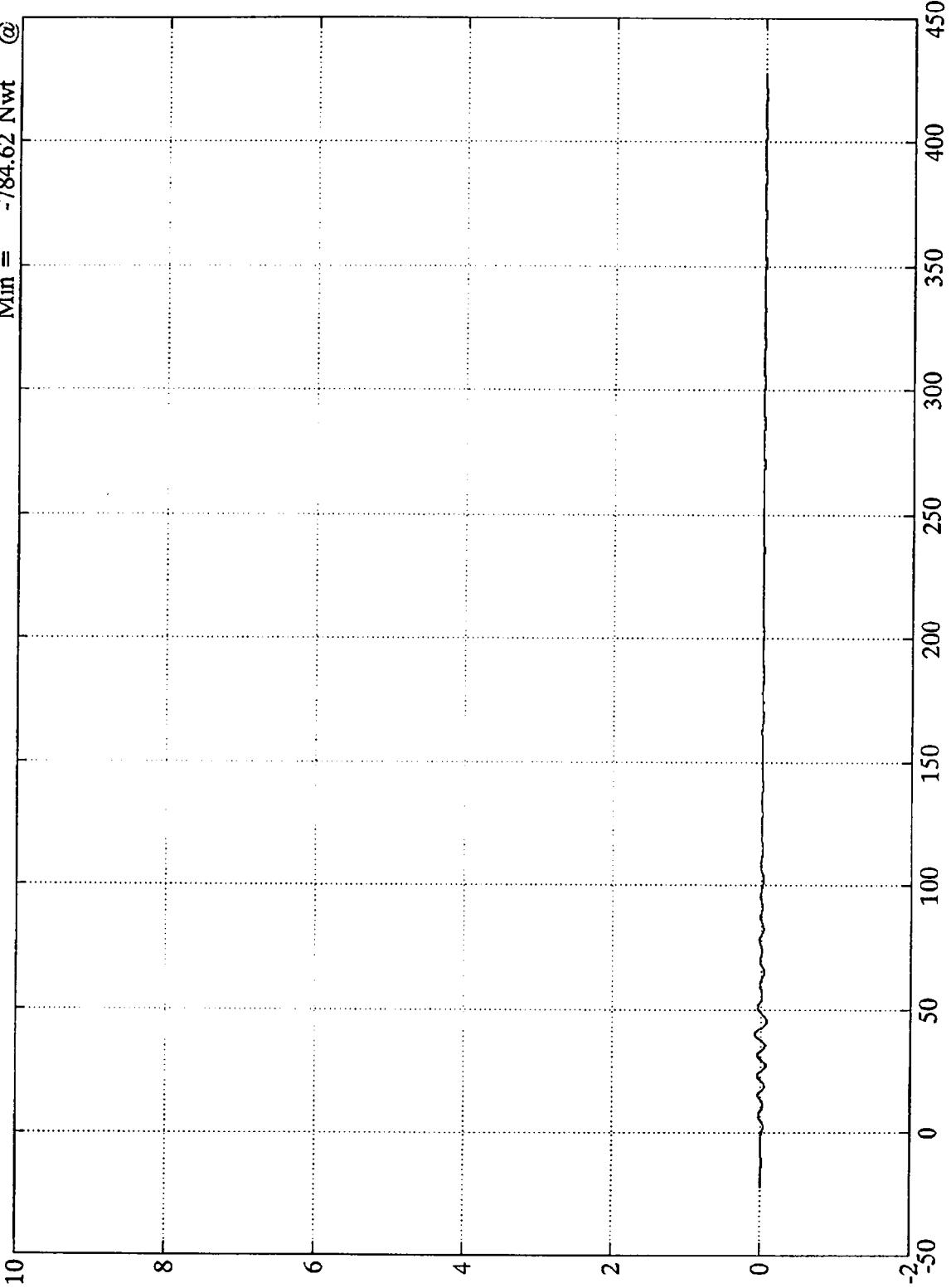
8227-2

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 774.40 Nwt @ 40.20 msec
Min = -784.62 Nwt @ 45.48 msec

Barrier Load Cell A9

x10⁴



Nwt
B-35

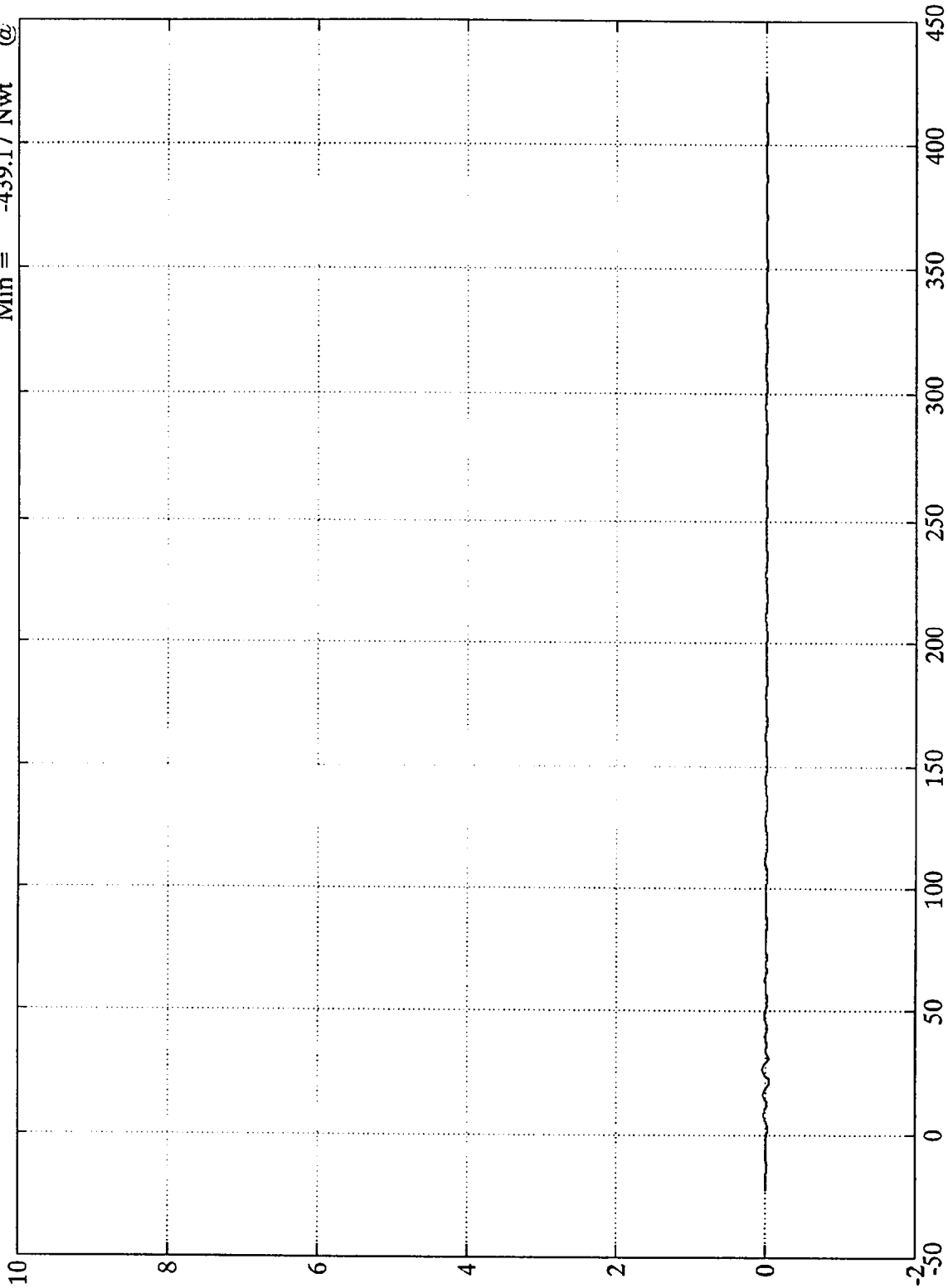
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 488.80 Nwt @ 26.04 msec
Min = -439.17 Nwt @ 21.23 msec

Barrier Load Cell B1



B-36

8227-2

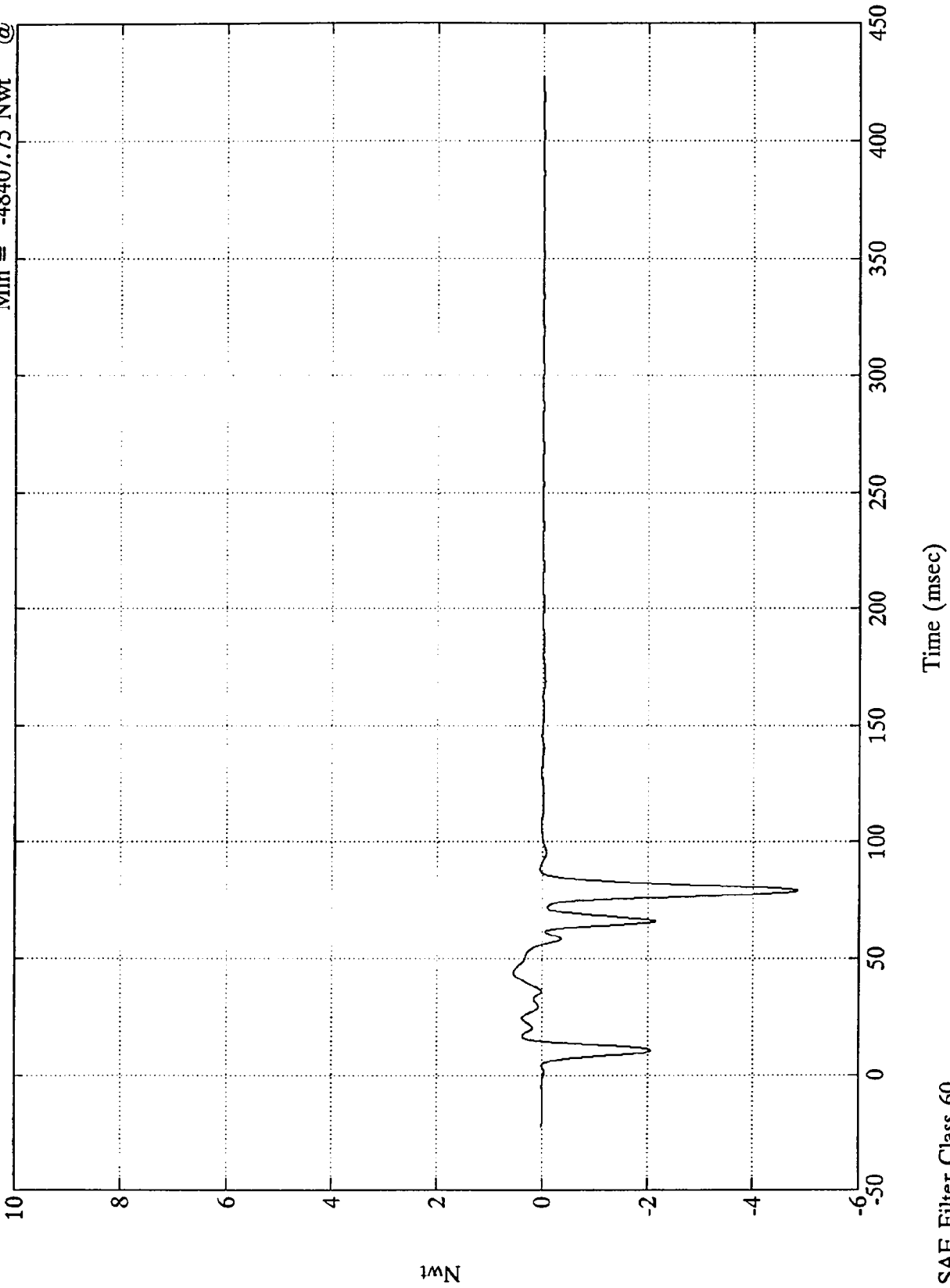
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 5496.92 Nwt @ 44.04 msec
Min = -48407.75 Nwt @ 78.84 msec

Barrier Load Cell B2



10⁴
N

SAE Filter Class 60

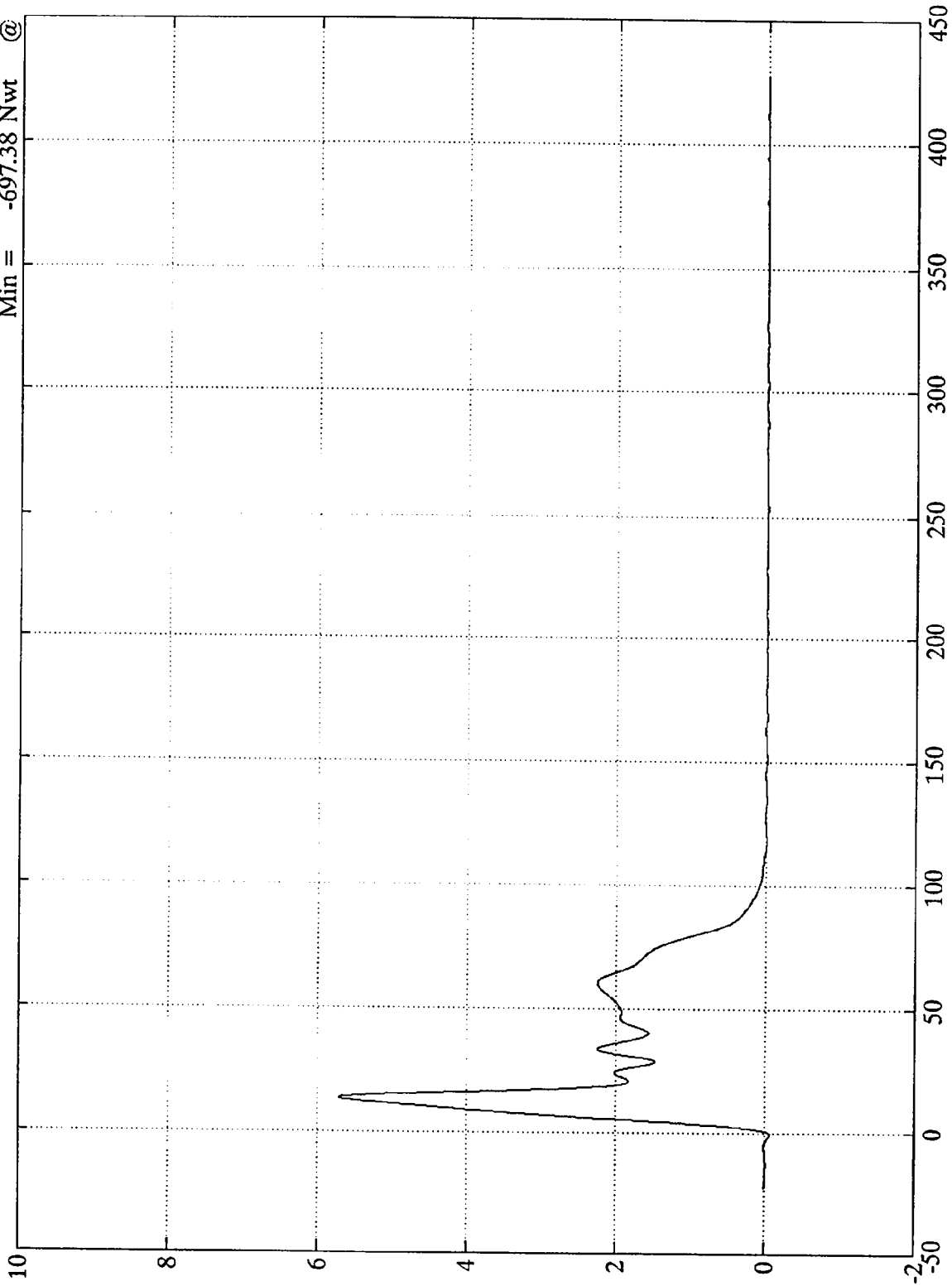
8227-2

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 57114.08 Nwt @ 13.43 msec
Min = -697.38 Nwt @ -0.84 msec

Barrier Load Cell B3

x10⁴



Time (msec)

SAE Filter Class 60

Nwt

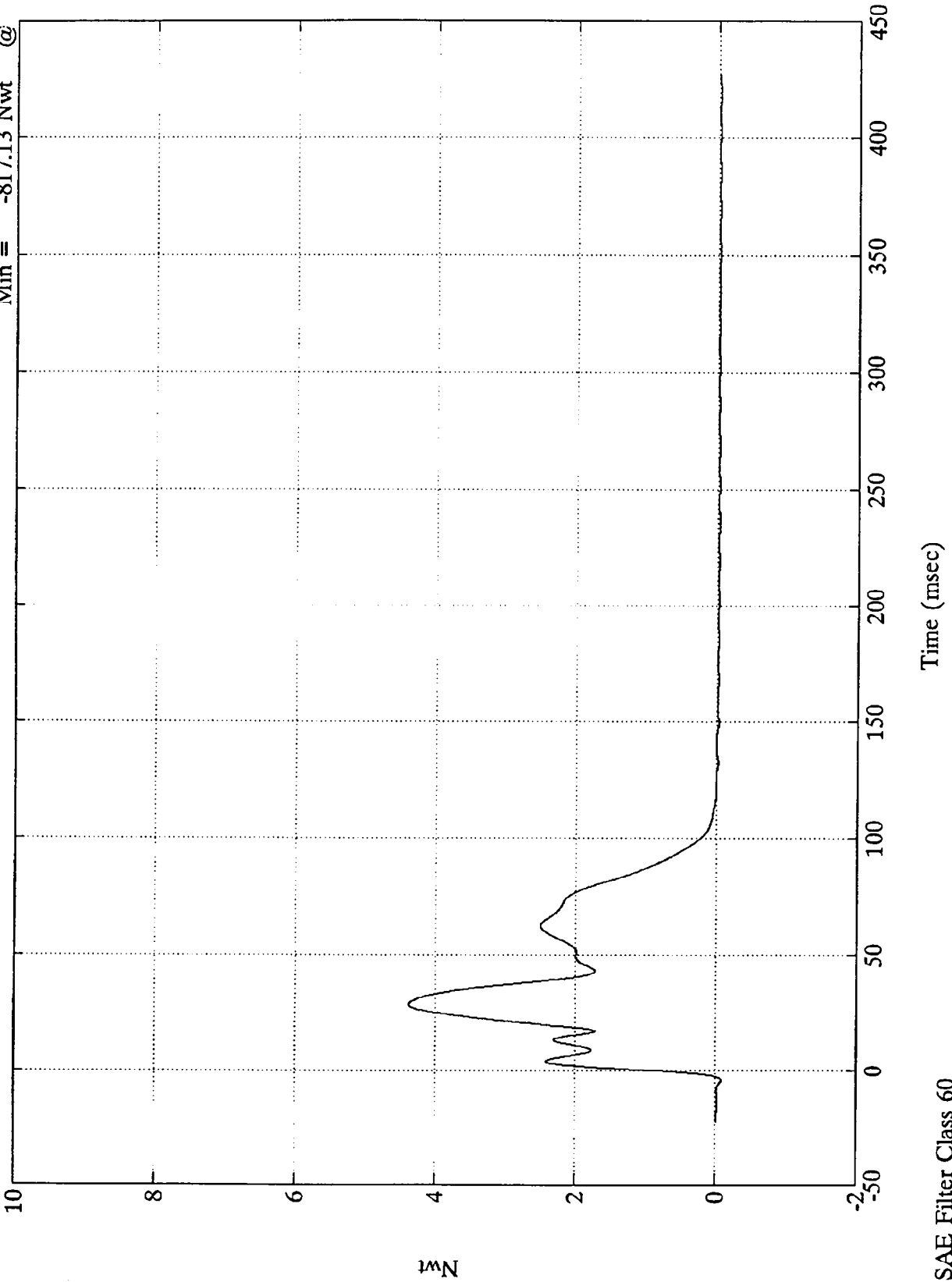
B-38

8227-2

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 43802.02 Nwt @ 28.31 msec
Min = -817.13 Nwt @ -4.20 msec

Barrier Load Cell B4



10 Nwt
B-39

8227-2

SAE Filter Class 60

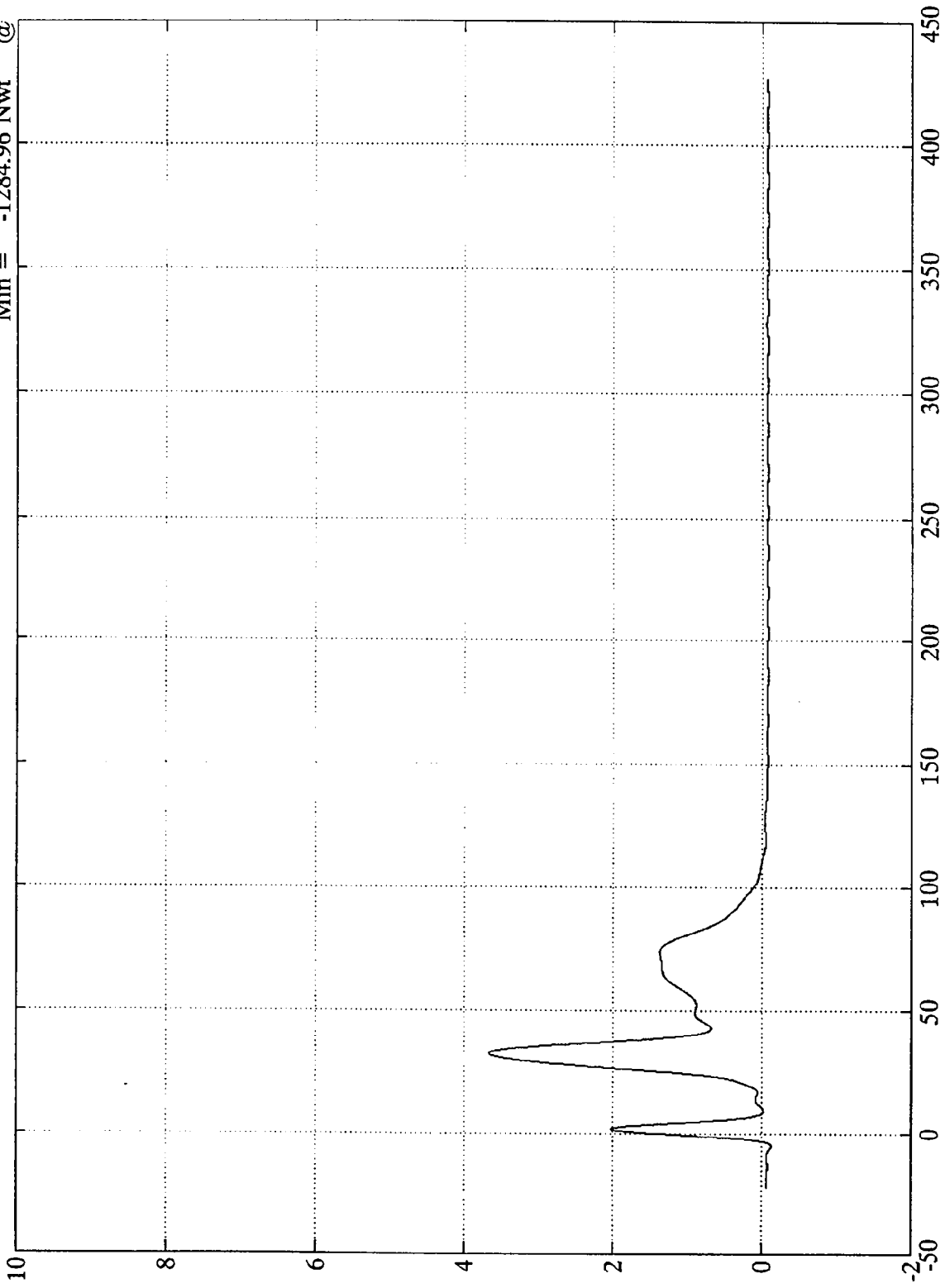
Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 36696.87 Nwt @ 32.15 msec
Min = -1284.96 Nwt @ -5.28 msec

Barrier Load Cell B5

$\times 10^4$



1wN
B-40

8227-2

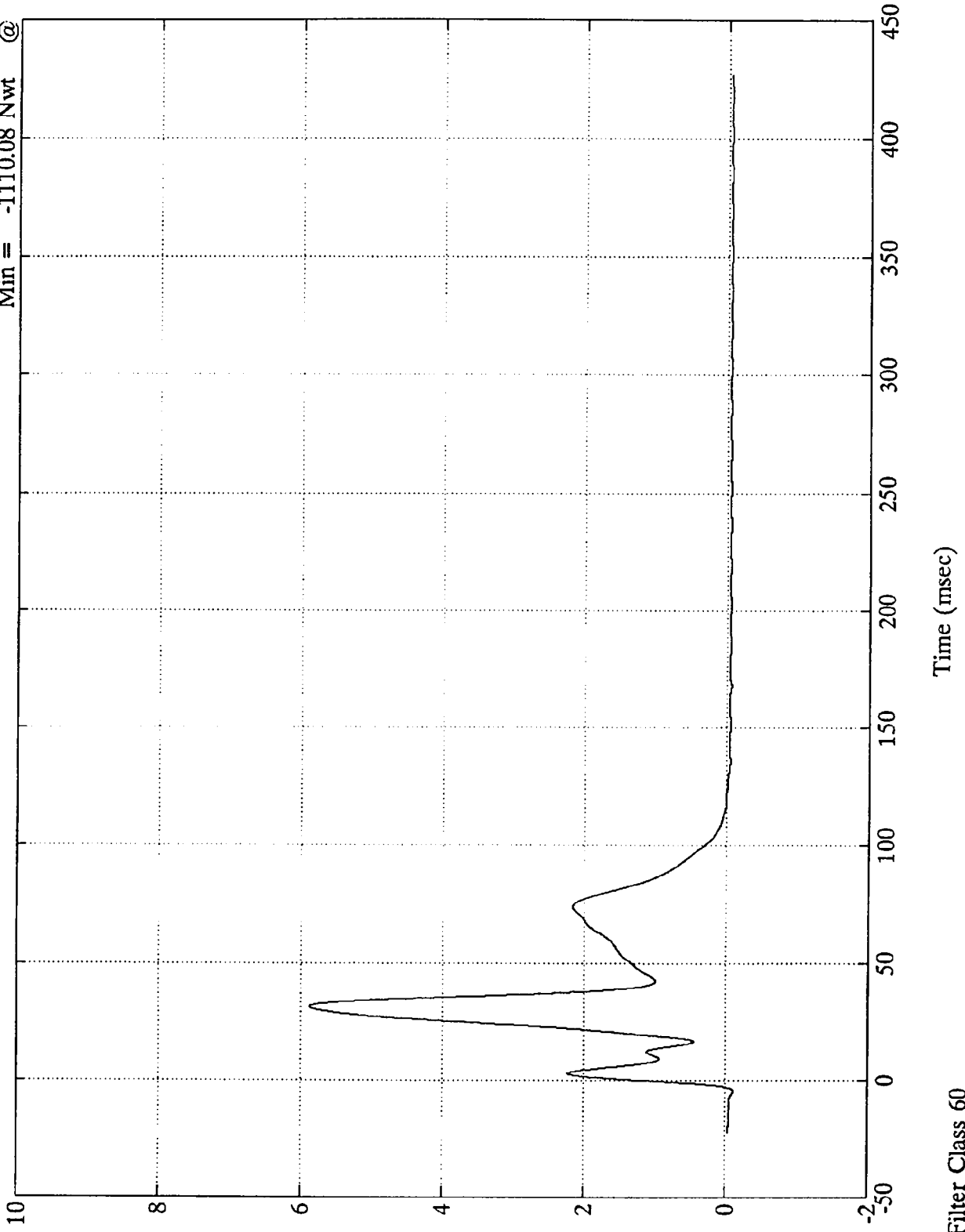
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 58831.73 Nwt @ 31.20 msec
Min = -11110.08 Nwt @ -4.80 msec

Barrier Load Cell B6



1N
B-41

8227-2

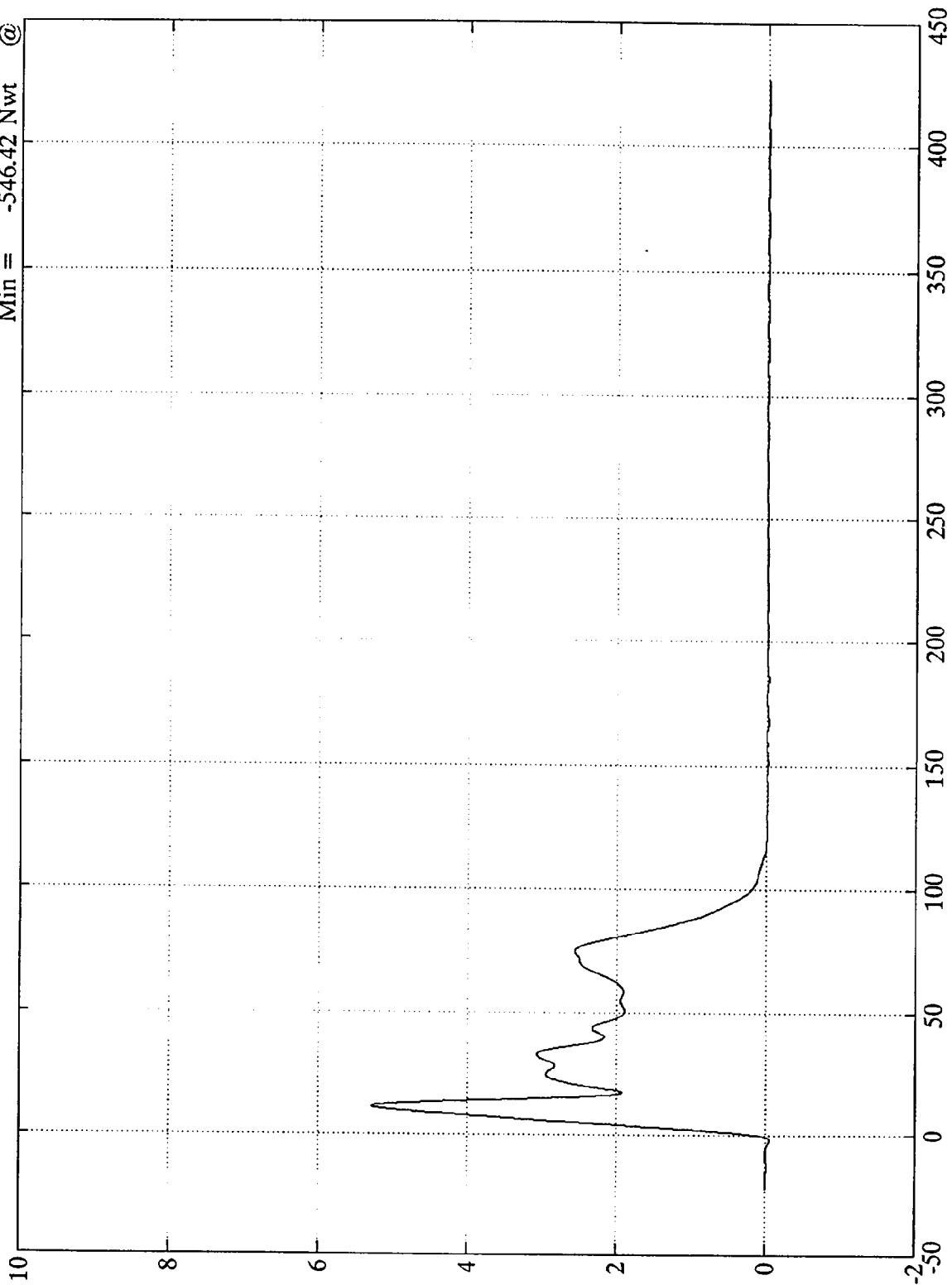
SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 52848.04 Nwt @ 11.28 msec
Min = -546.42 Nwt @ -2.52 msec

Barrier Load Cell B7

$\times 10^4$



1Nwt

B-42

8227-2

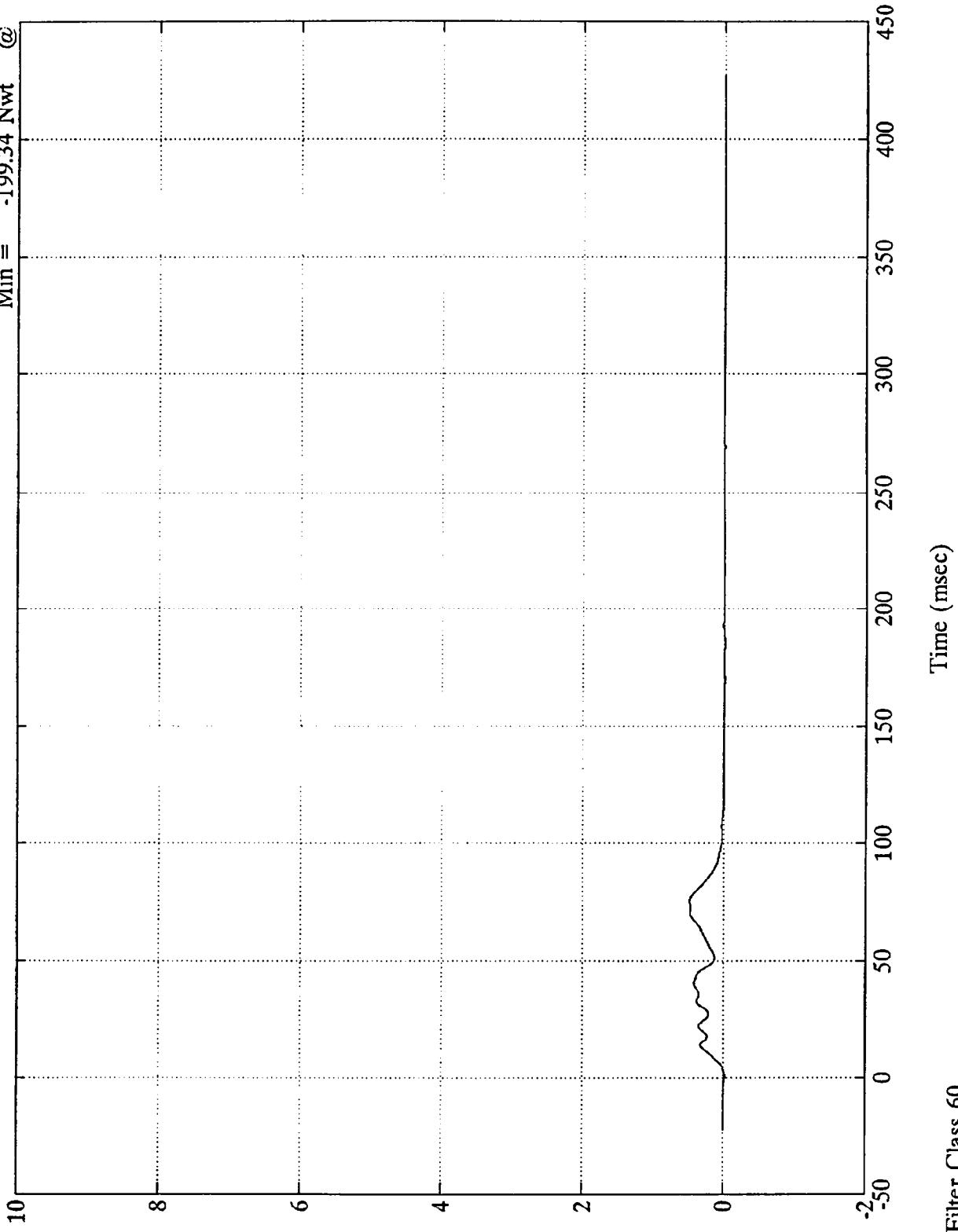
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 4796.35 Nwt @ 75.12 msec
Min = -199.34 Nwt @ 0.47 msec

Barrier Load Cell B8



1MN

B-43

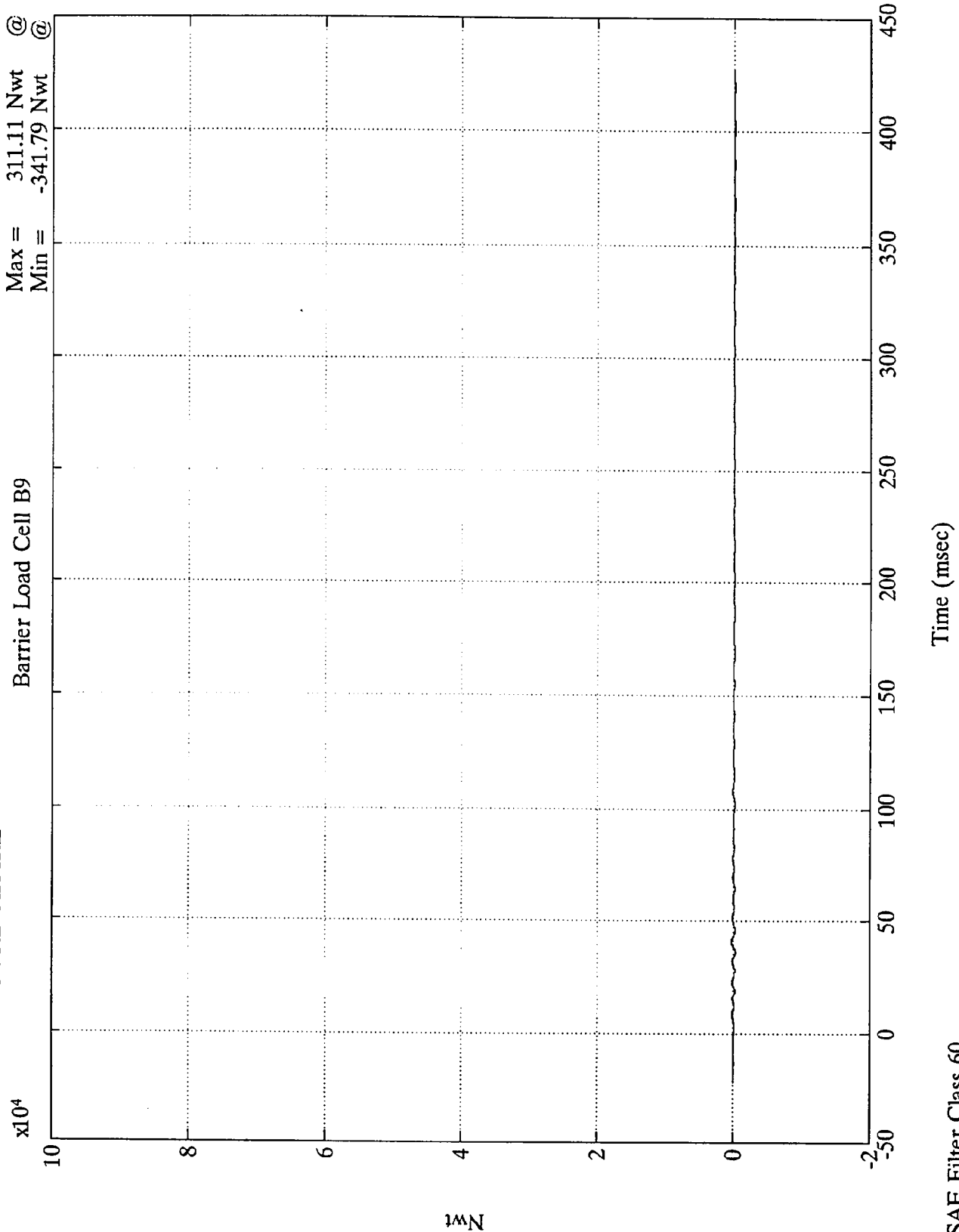
8227-2

SAE Filter Class 60

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Barrier Load Cell B9
Max = 311.11 Nwt @ 40.56 msec
Min = -341.79 Nwt @ 35.76 msec



1wN
B-44

8227-2

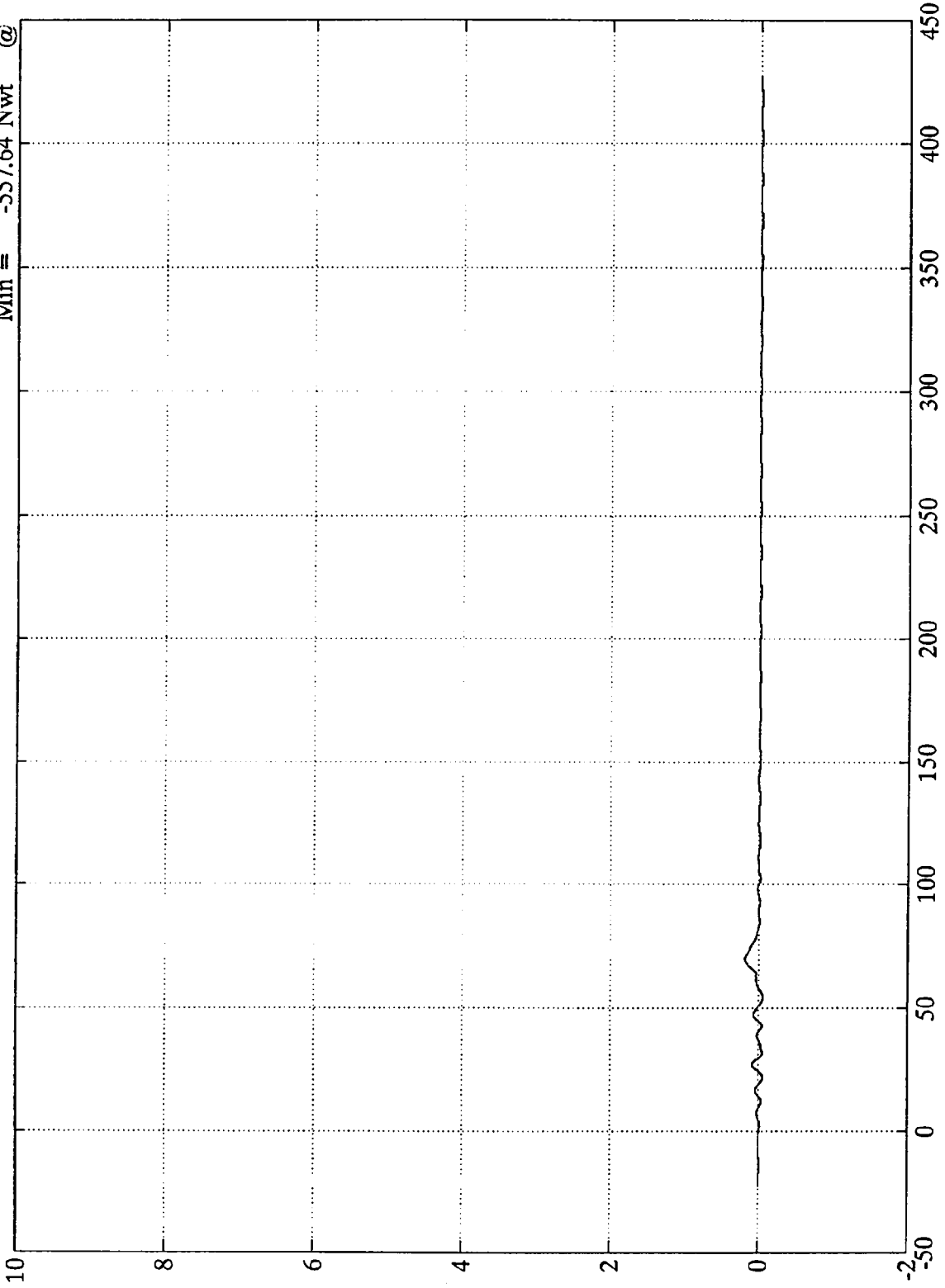
SAE Filter Class 60

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 1887.71 Nwt @ 69.83 msec
Min = -557.64 Nwt @ 21.95 msec

Barrier Load Cell C1



1MN
B-45

8227-2

Time (msec)

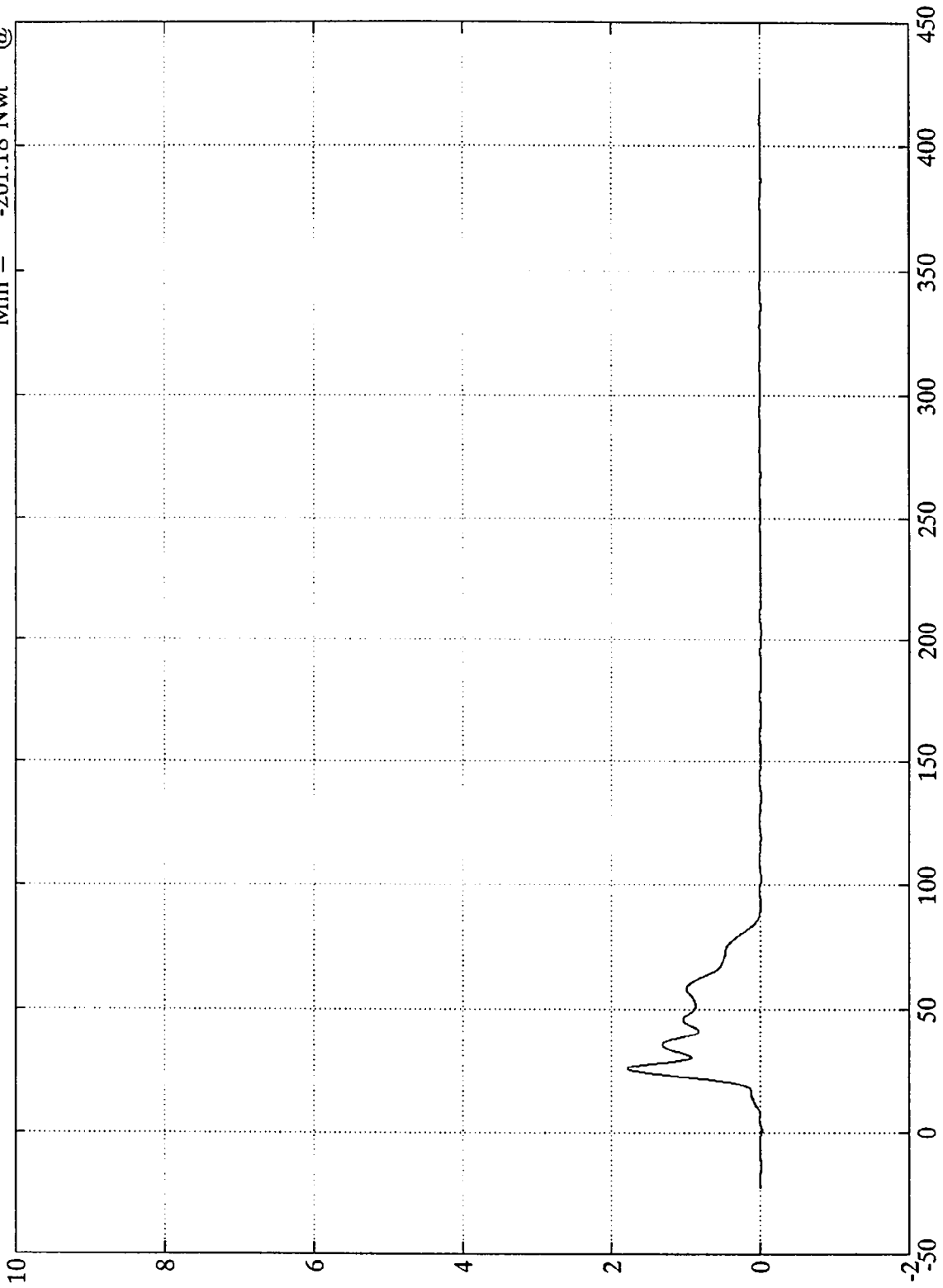
SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 17931.86 Nwt @
Min = -201.18 Nwt @

25.92 msec
0.71 msec

Barrier Load Cell C2



Time (msec)

SAE Filter Class 60

10N
B-46

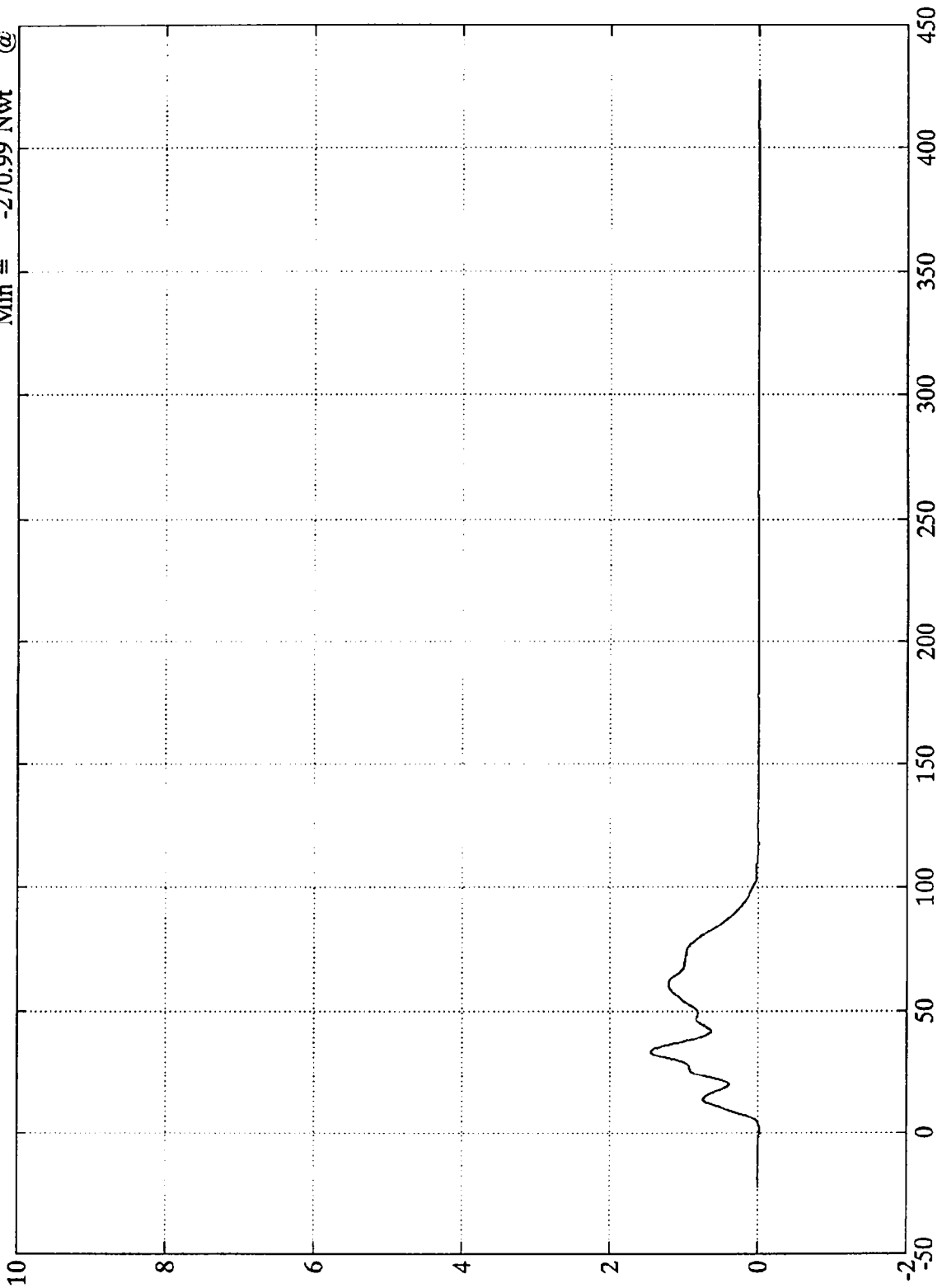
8227-2

NCAP TEST #2 - 1995 FORD ASPIRE

x10⁴

Barrier Load Cell C3

Max = 14539.90 Nwt @ 33.11 msec
Min = -270.99 Nwt @ 0.71 msec



13N
B-47

8227-2

Time (msec)

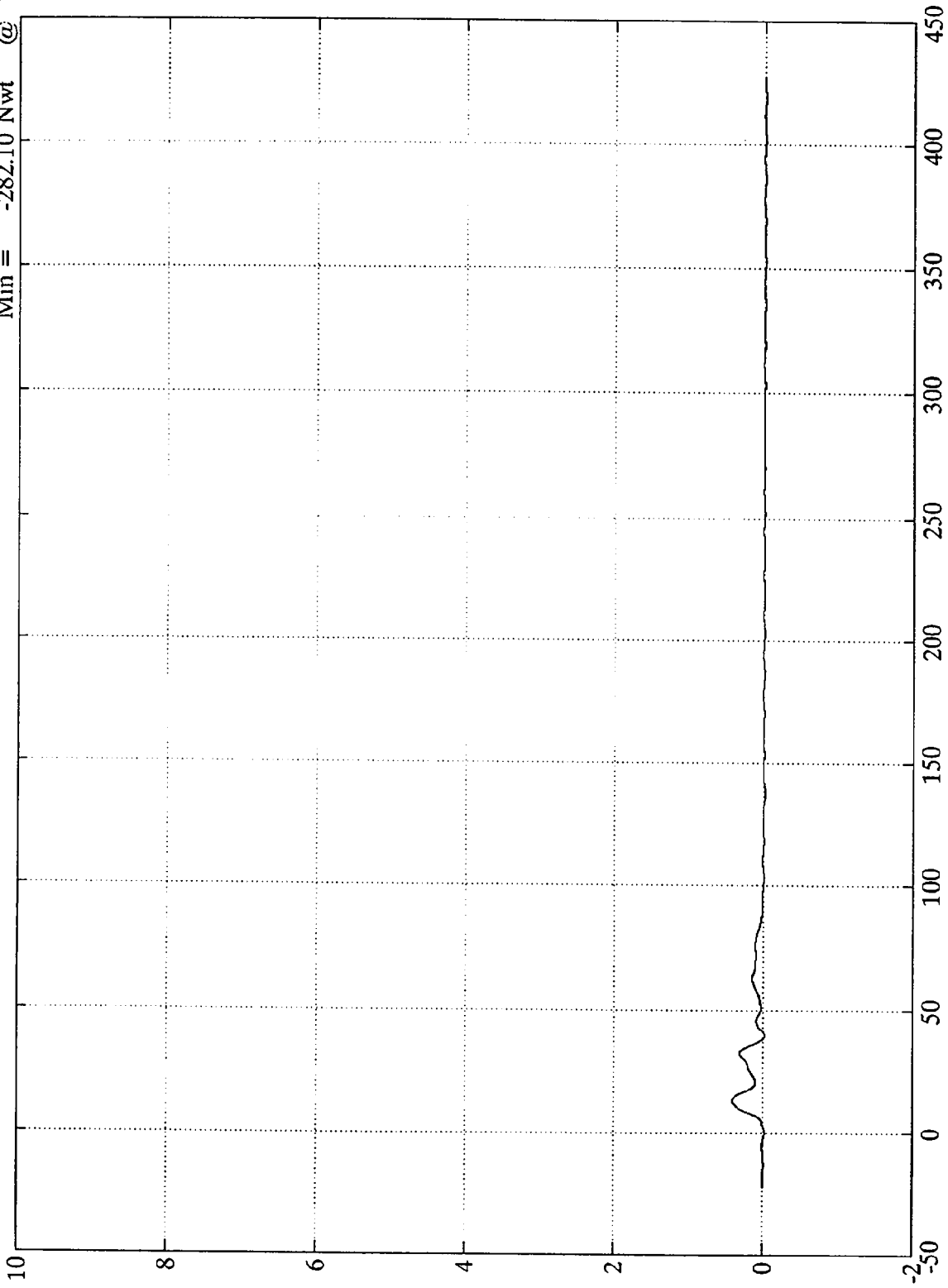
SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Barrier Load Cell C4

Max = 4058.92 Nwt @ 13.19 msec
Min = -282.10 Nwt @ 137.27 msec

x10⁴



Nwt
B-48

Time (msec)

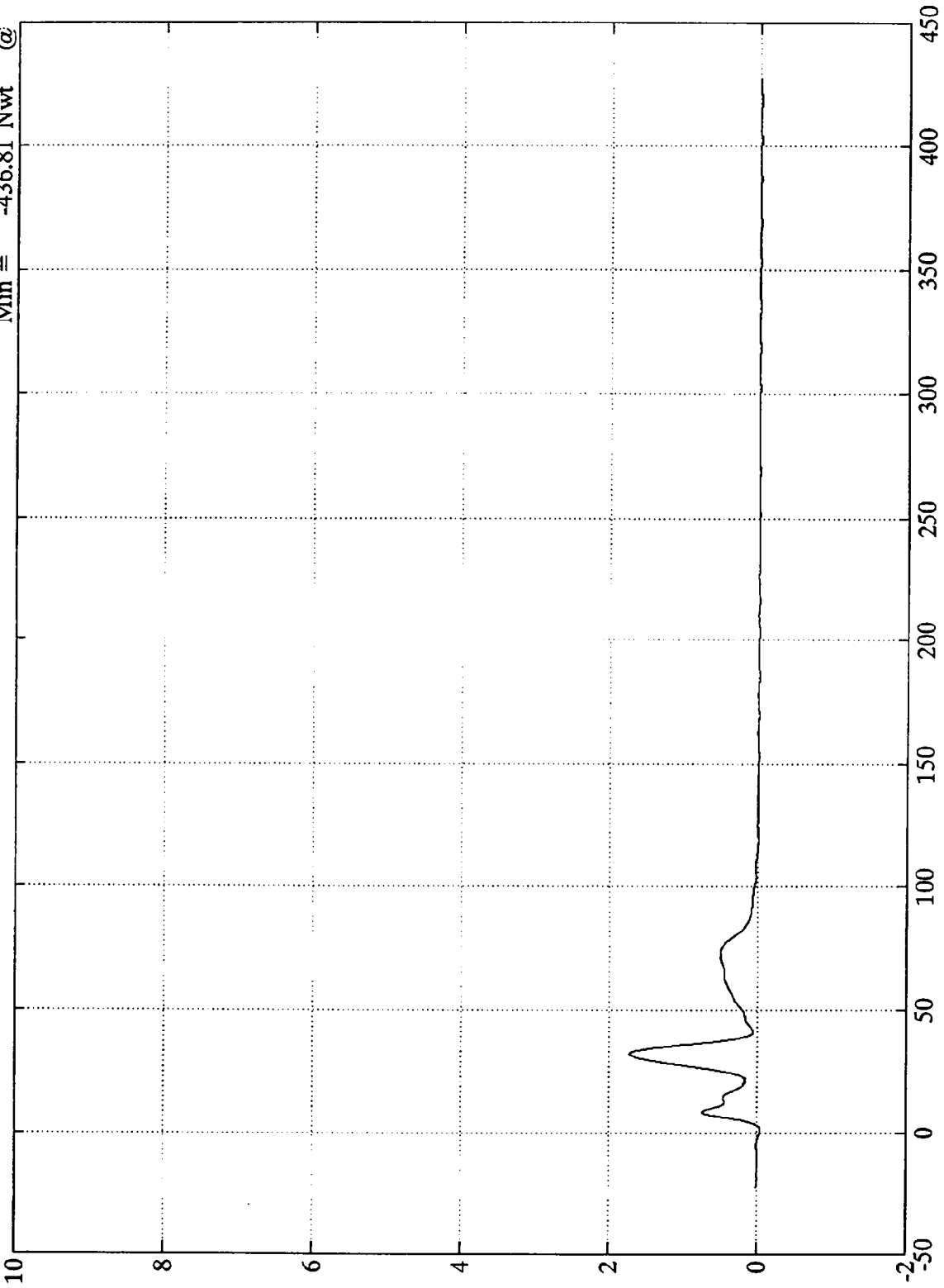
SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 17147.76 Nwt @ 32.04 msec
Min = -436.81 Nwt @ 0.83 msec

Barrier Load Cell C5

x10⁴



Time (msec)

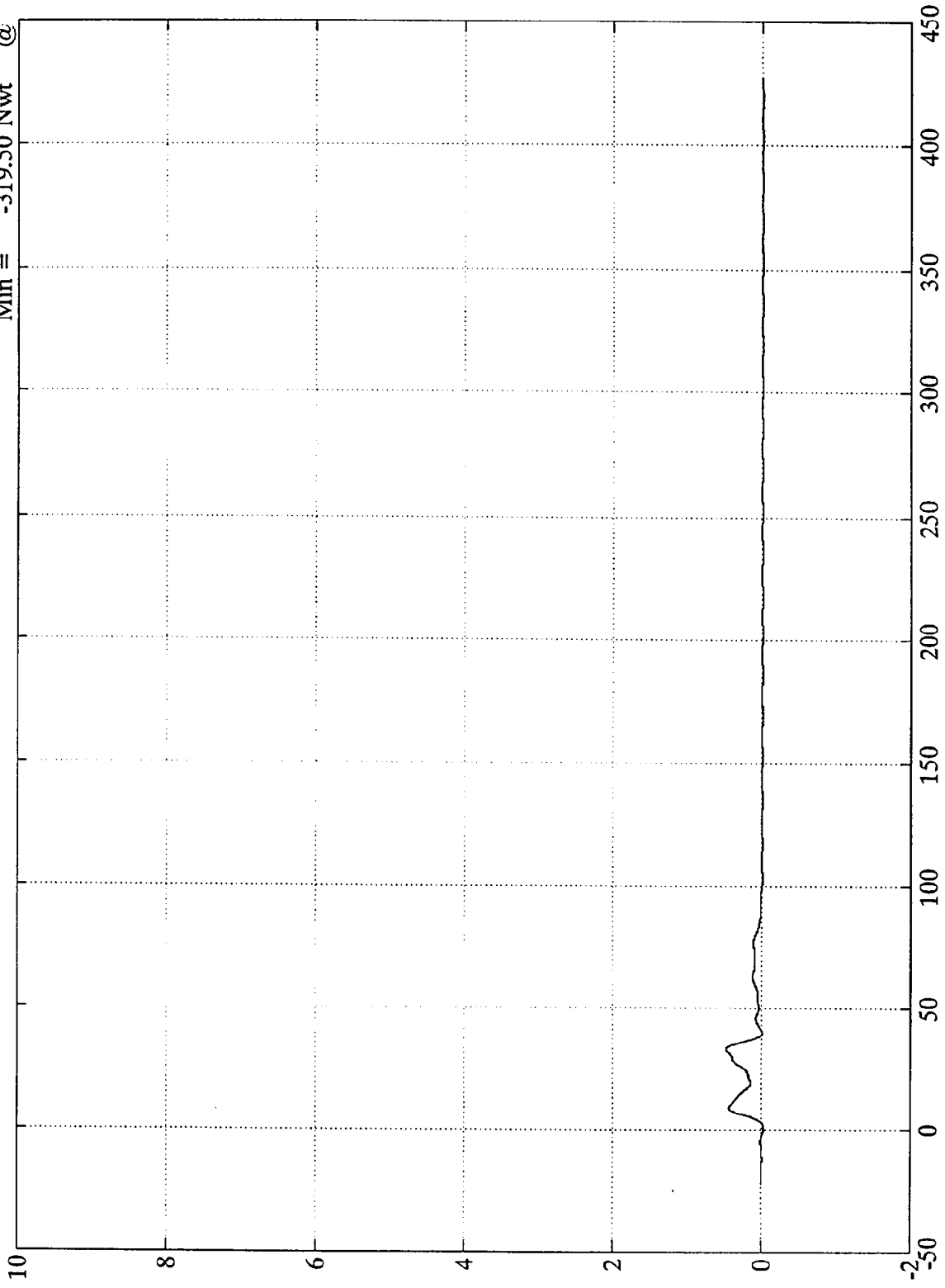
SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 4739.41 Nwt @
Min = -319.50 Nwt @

Barrier Load Cell C6

32.76 msec
0.47 msec



Time (msec)

SAE Filter Class 60

1MN
B-50

8227-2

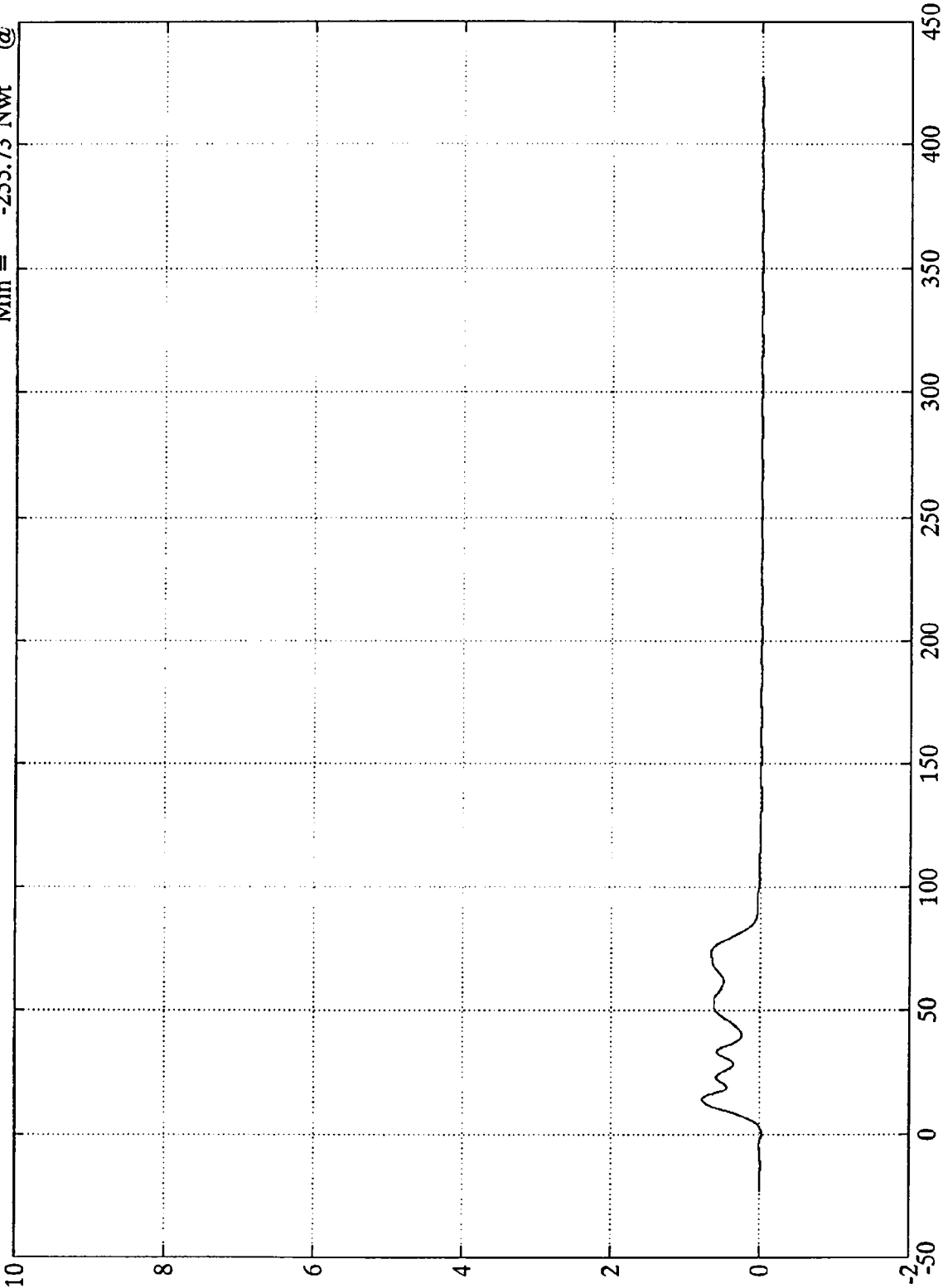
NCAP TEST #2 - 1995 FORD ASPIRE

$\times 10^4$

Barrier Load Cell C7

Max = 7801.43 Nwt @
Min = -255.73 Nwt @

14.03 msec
0.35 msec



Nwt
B-51

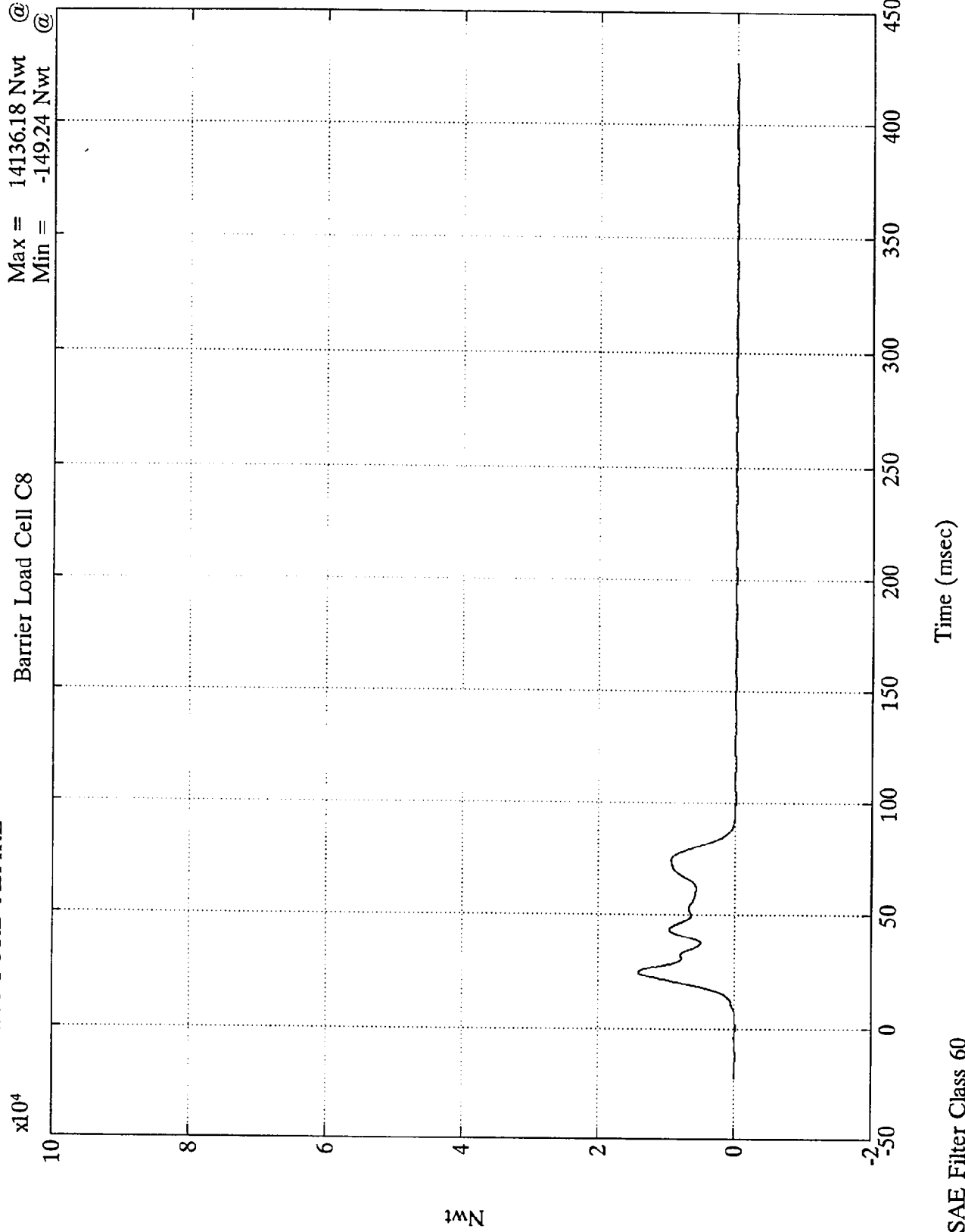
8227-2

Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Barrier Load Cell C8
Max = 14136.18 Nwt @ 24.60 msec
Min = -149.24 Nwt @ 102.24 msec



14N
B-52

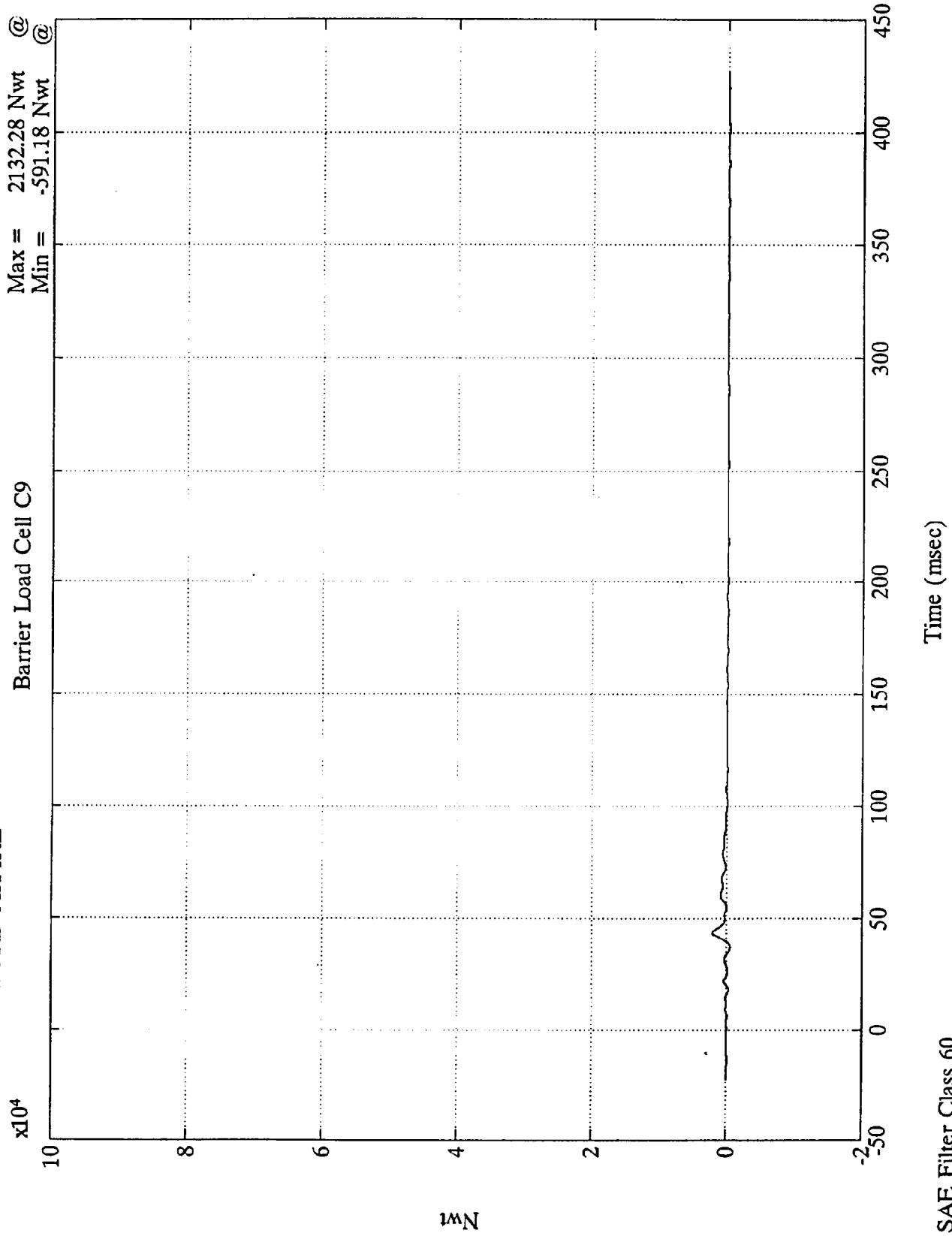
8227-2

SAE Filter Class 60



NCAP TEST #2 - 1995 FORD ASPIRE

Barrier Load Cell C9
Max = 2132.28 Nwt @ 43.43 msec
Min = -591.18 Nwt @ 37.08 msec



1MN
B-53

8227-2

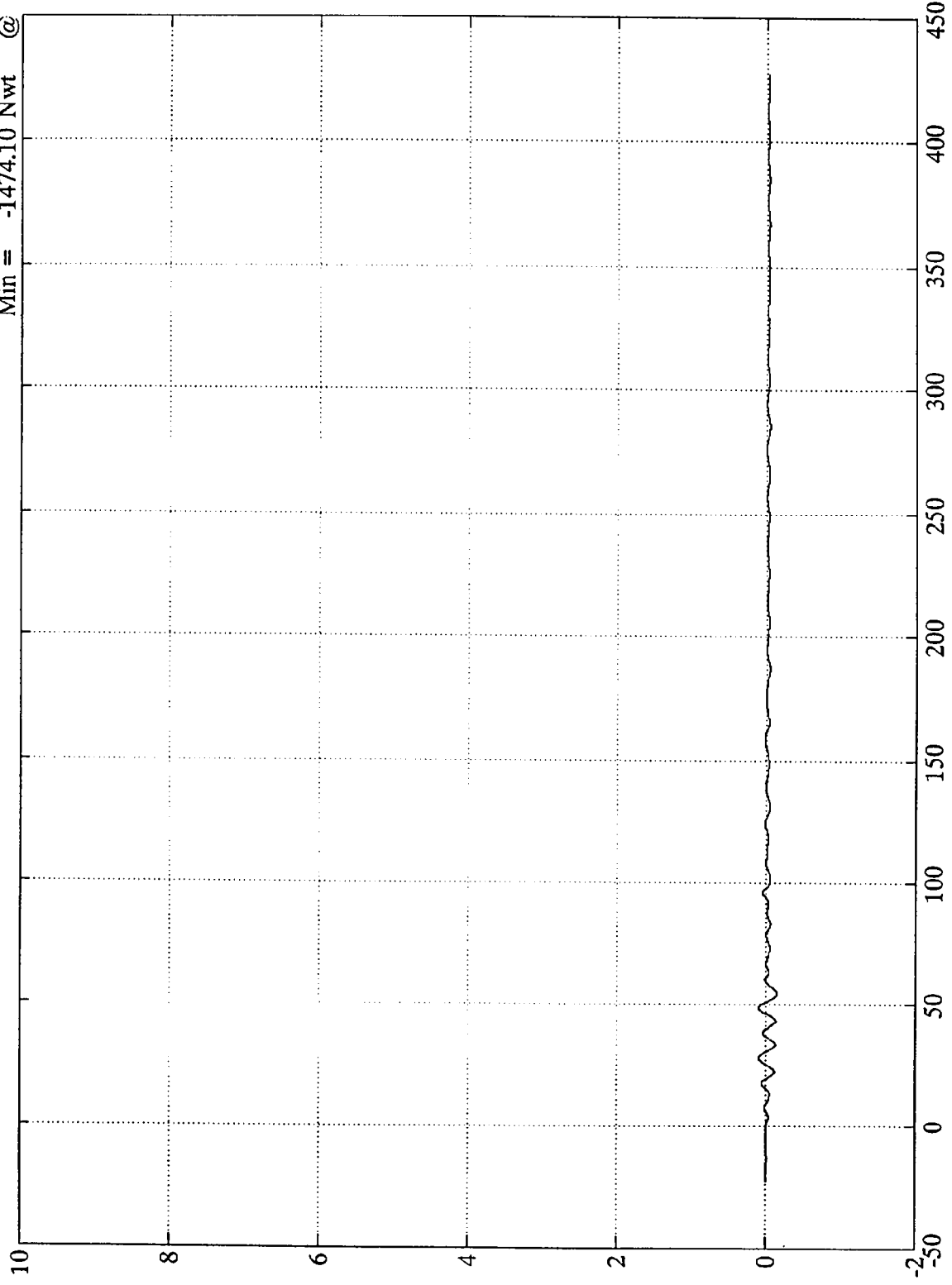
SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 959.84 Nwt @ 27.84 msec
Min = -1474.10 Nwt @ 54.36 msec

Barrier Load Cell D1

x10⁴



10N
B-54

8227-2

Time (msec)

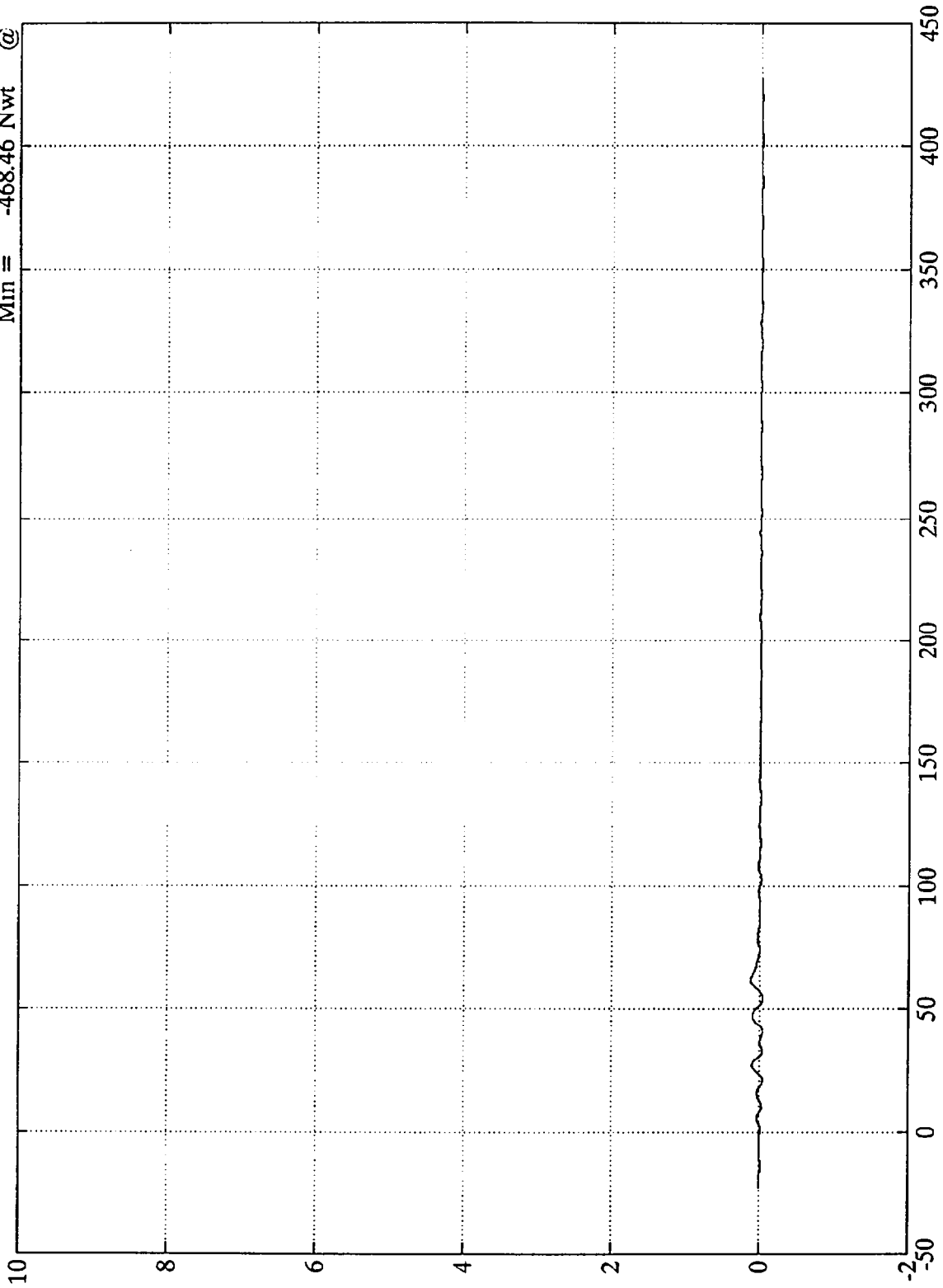
SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 1266.87 Nwt @ 61.44 msec
Min = -468.46 Nwt @ 21.23 msec

Barrier Load Cell D2

x10⁴



1Nwt
B-55

8227-2

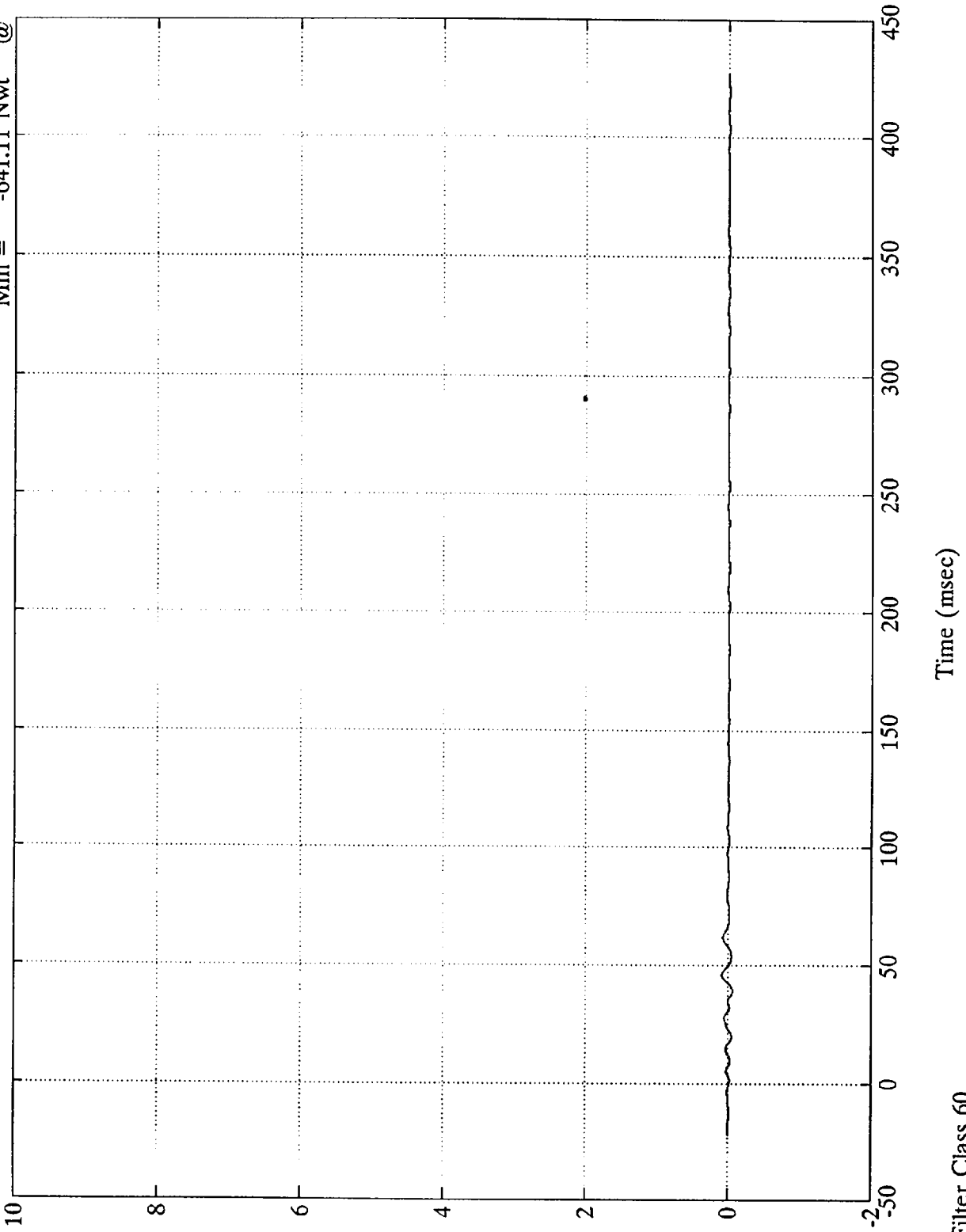
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Barrier Load Cell D3

Max = 920.09 Nwt @ 45.96 msec
Min = -641.11 Nwt @ 39.00 msec



1N
B-56

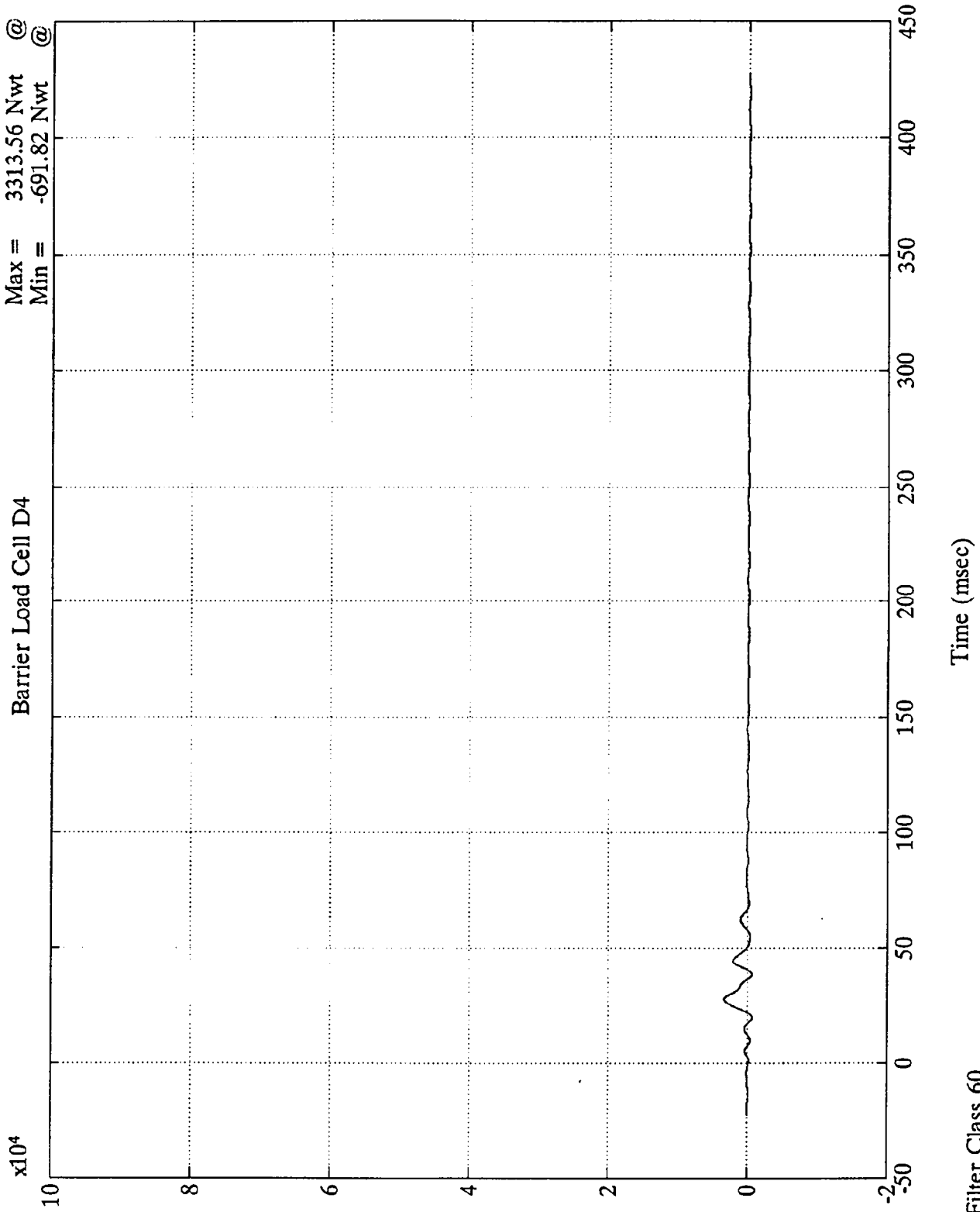
8227-2

SAE Filter Class 60



NCAP TEST #2 - 1995 FORD ASPIRE

Barrier Load Cell D4
Max = 3313.56 Nwt @ 27.84 msec
Min = -691.82 Nwt @ 19.79 msec



1MN
B-57

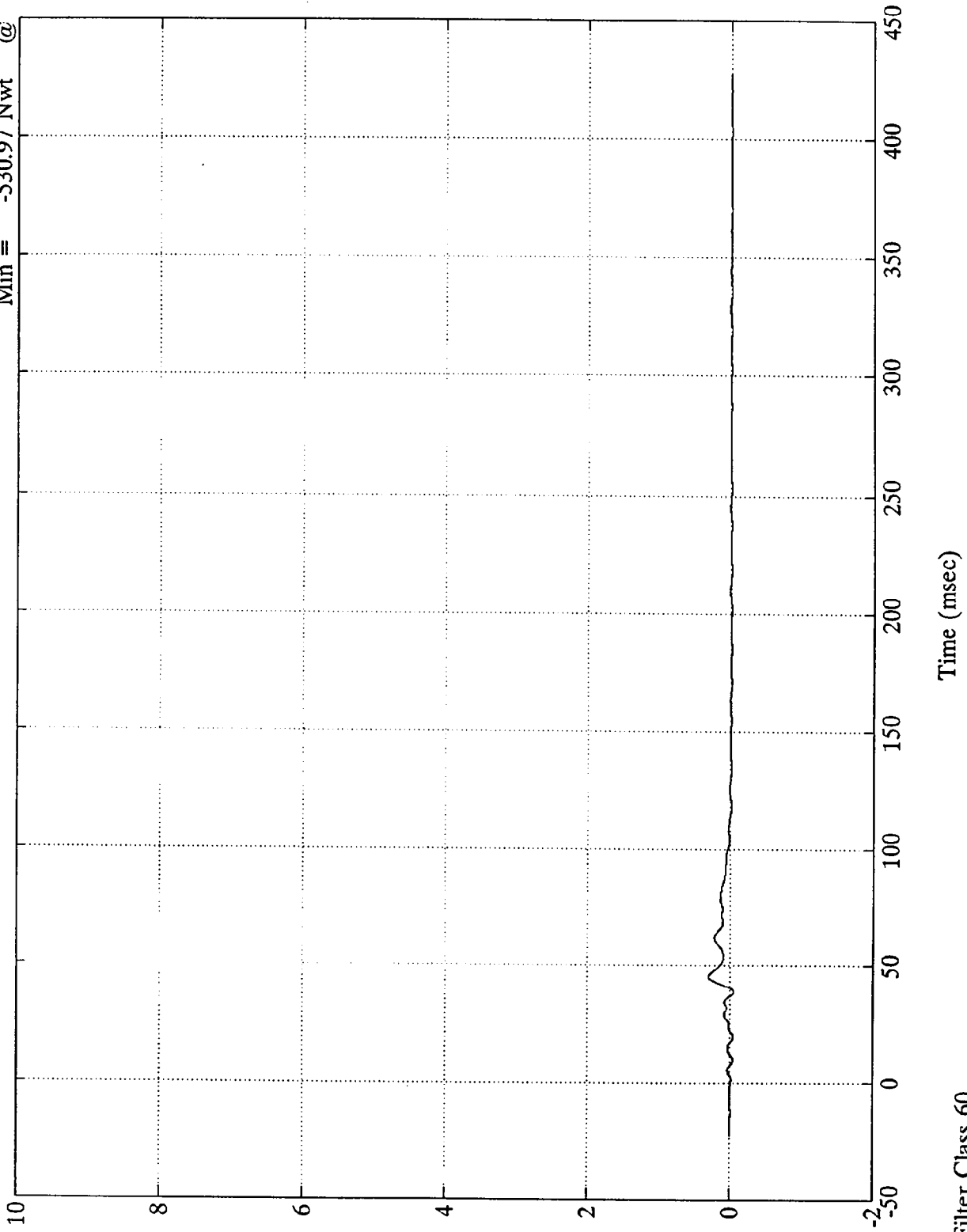
8227-2

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 2990.33 Nwt @ 45.12 msec
Min = -530.97 Nwt @ 38.52 msec

Barrier Load Cell D5



1N
B-58

8227-2

SAE Filter Class 60

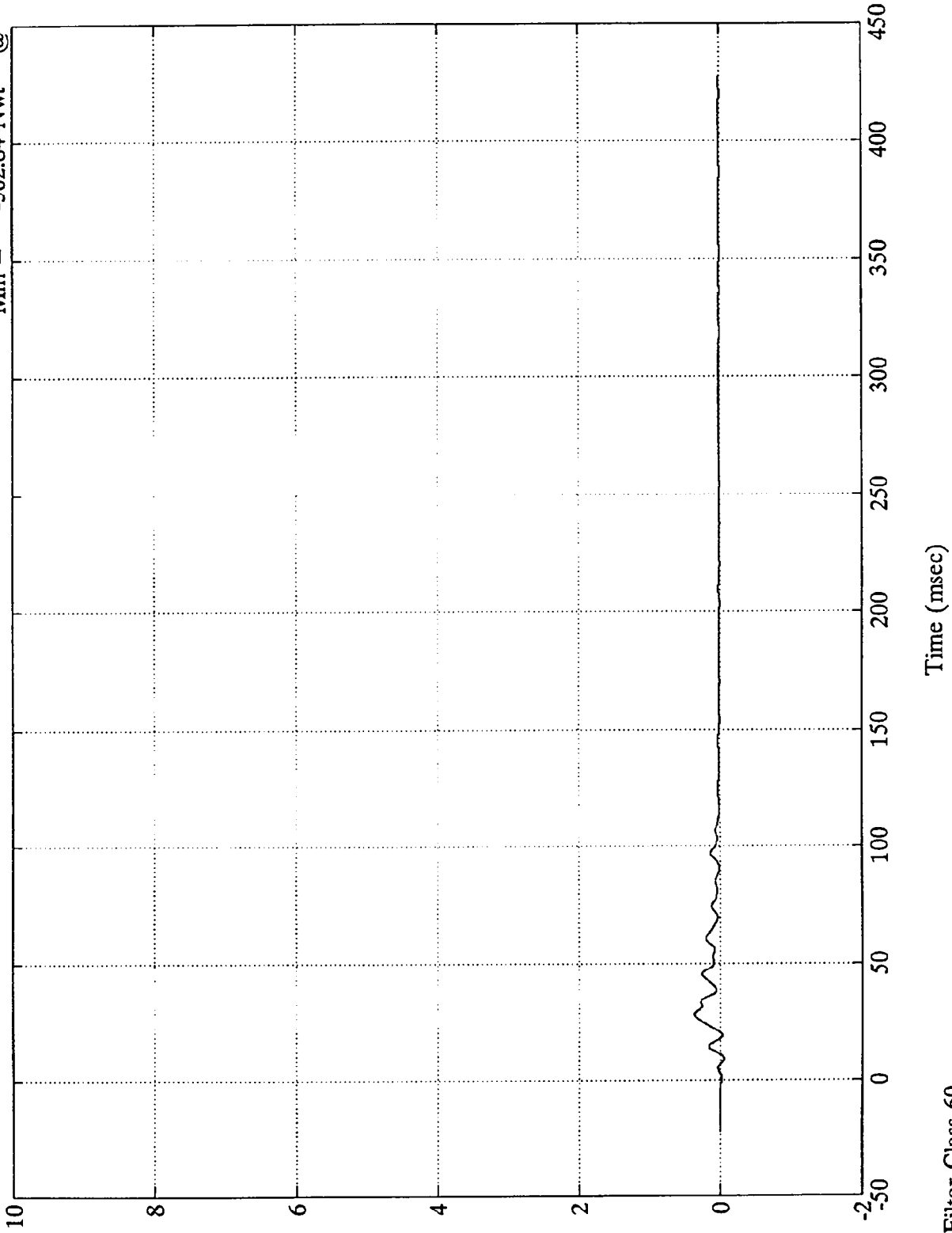
Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

x10⁴

Barrier Load Cell D6

Max = 3640.35 Nwt @ 28.31 msec
Min = -502.84 Nwt @ 9.47 msec



1MN
B-59

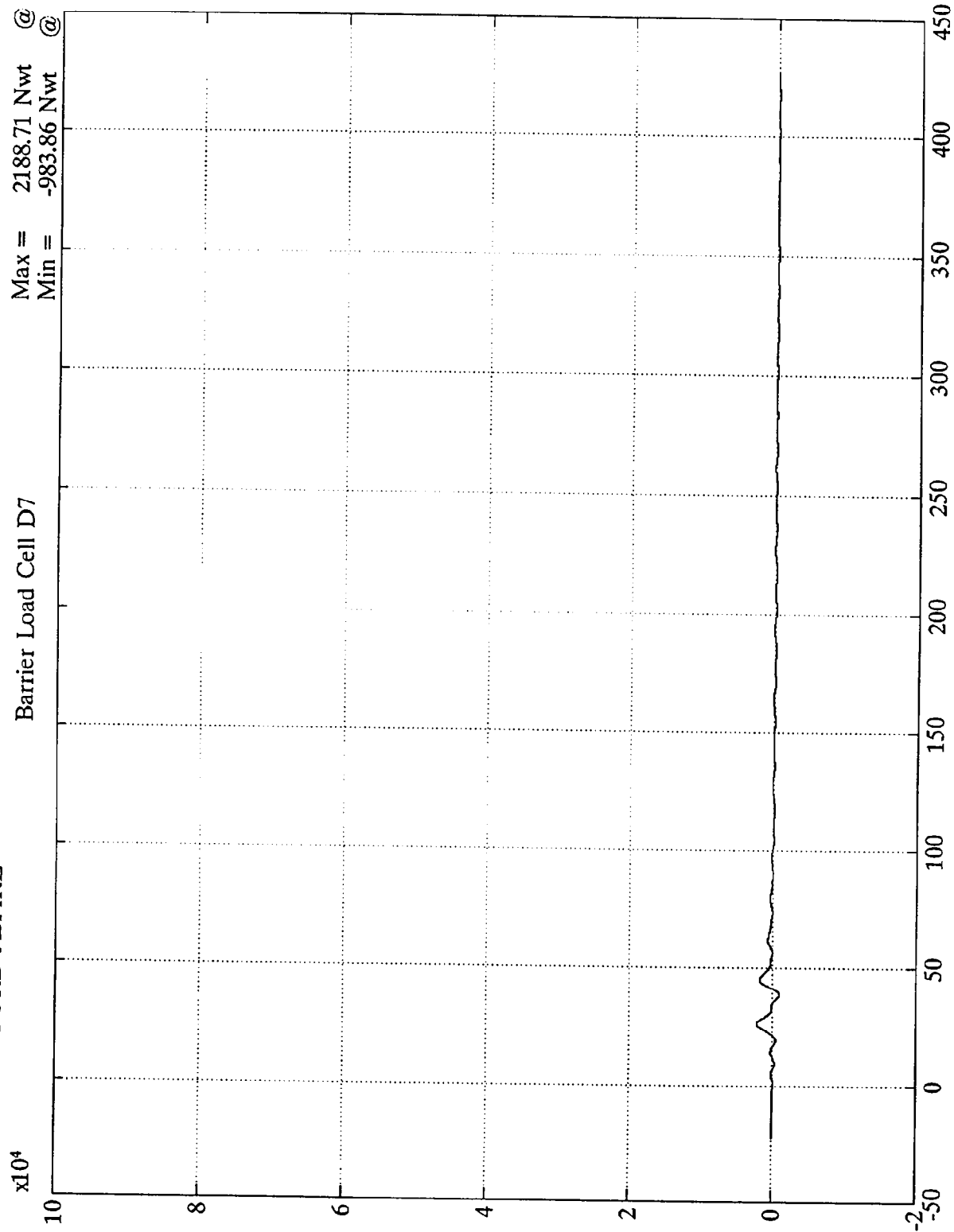
8227-2

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 2188.71 Nwt @ 26.04 msec
Min = -983.86 Nwt @ 38.40 msec

Barrier Load Cell D7



B-60

8227-2

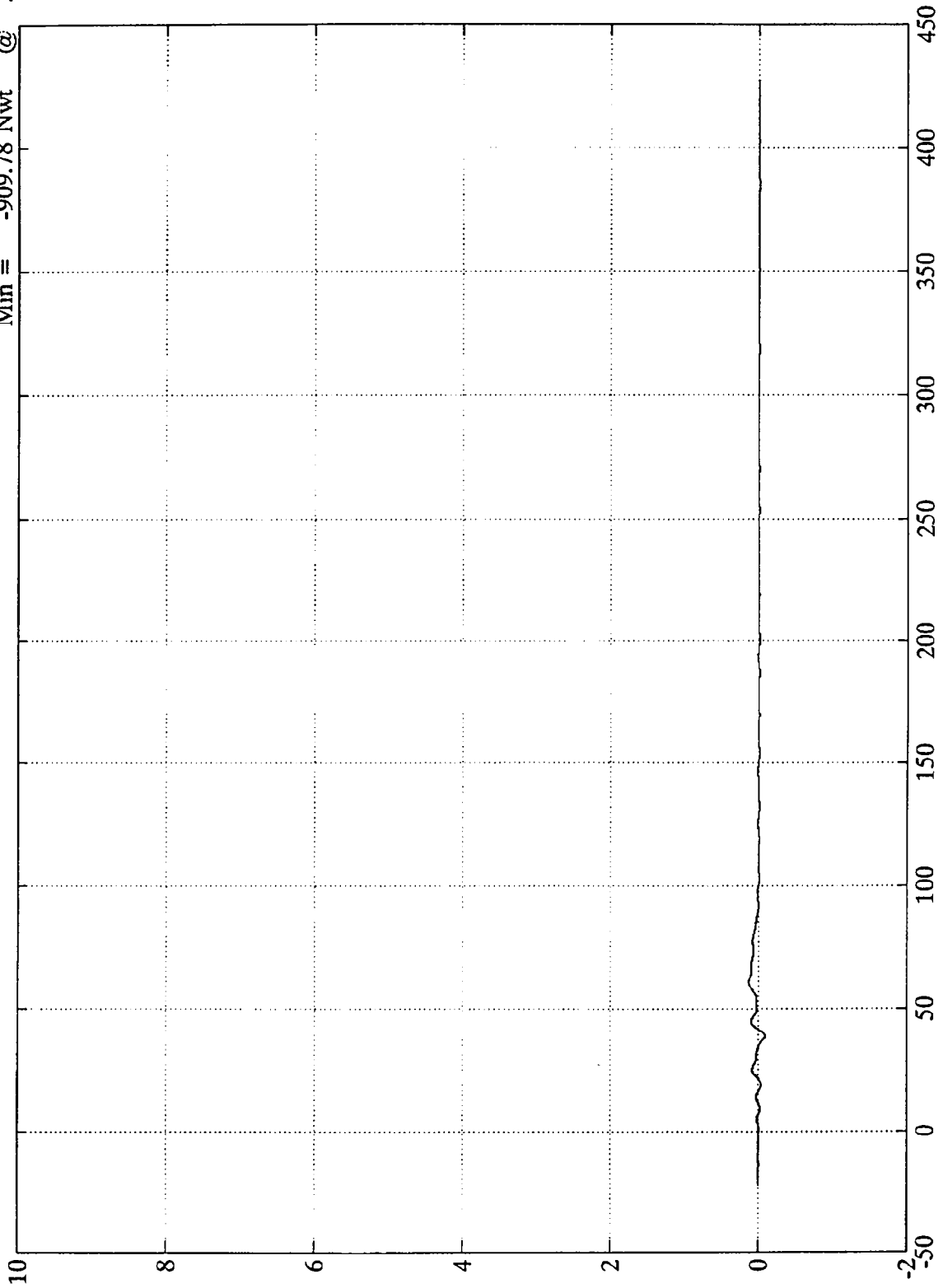
SAE Filter Class 60

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Barrier Load Cell D8

Max = 1328.85 Nwt @ 60.96 msec
Min = -909.78 Nwt @ 38.63 msec



10N
B-61

8227-2

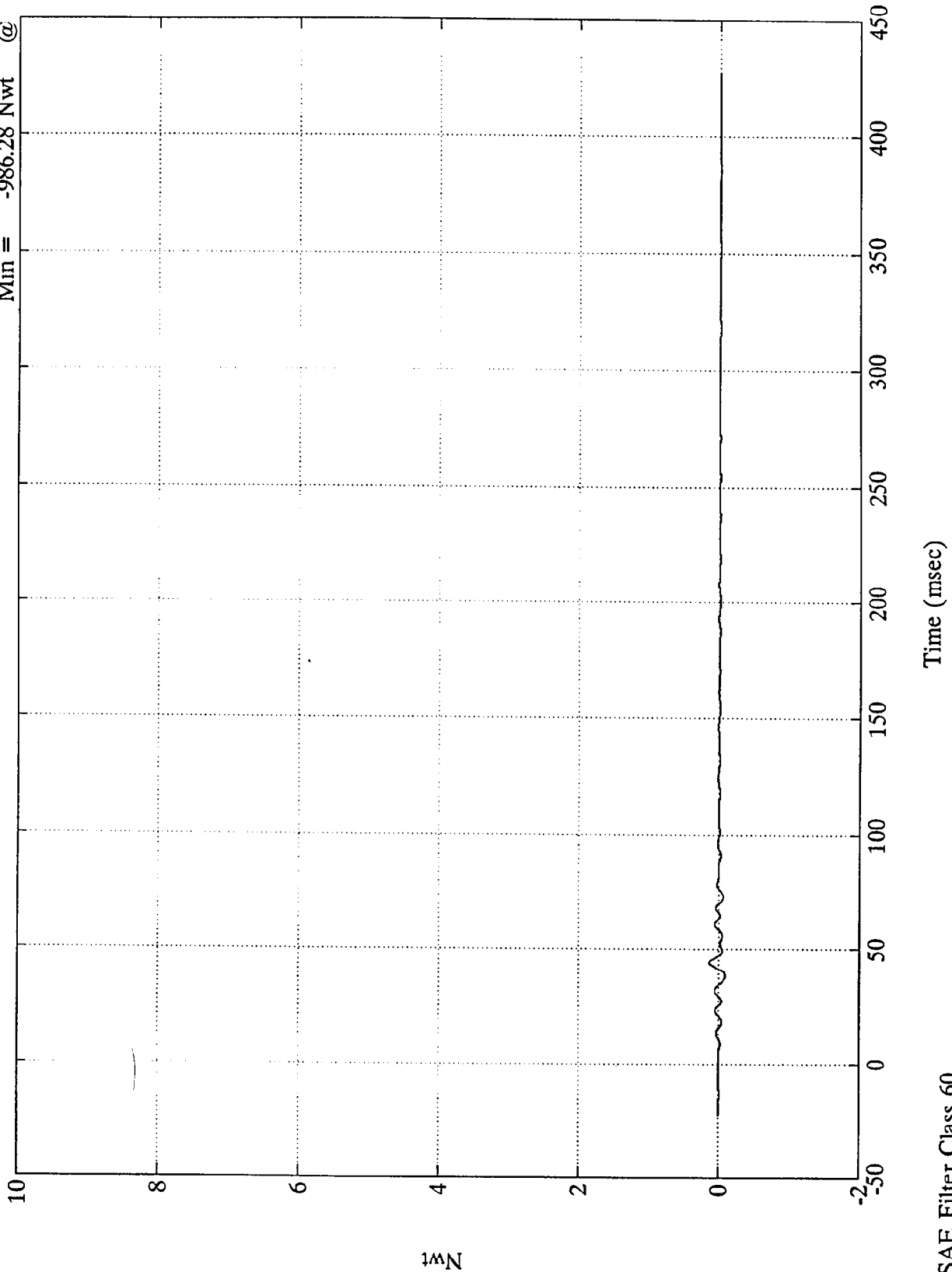
Time (msec)

SAE Filter Class 60

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 1345.42 Nwt @ 44.04 msec
Min = -986.28 Nwt @ 38.27 msec

Barrier Load Cell D9



10⁴
Nwt
B-62

8227-2

SAE Filter Class 60

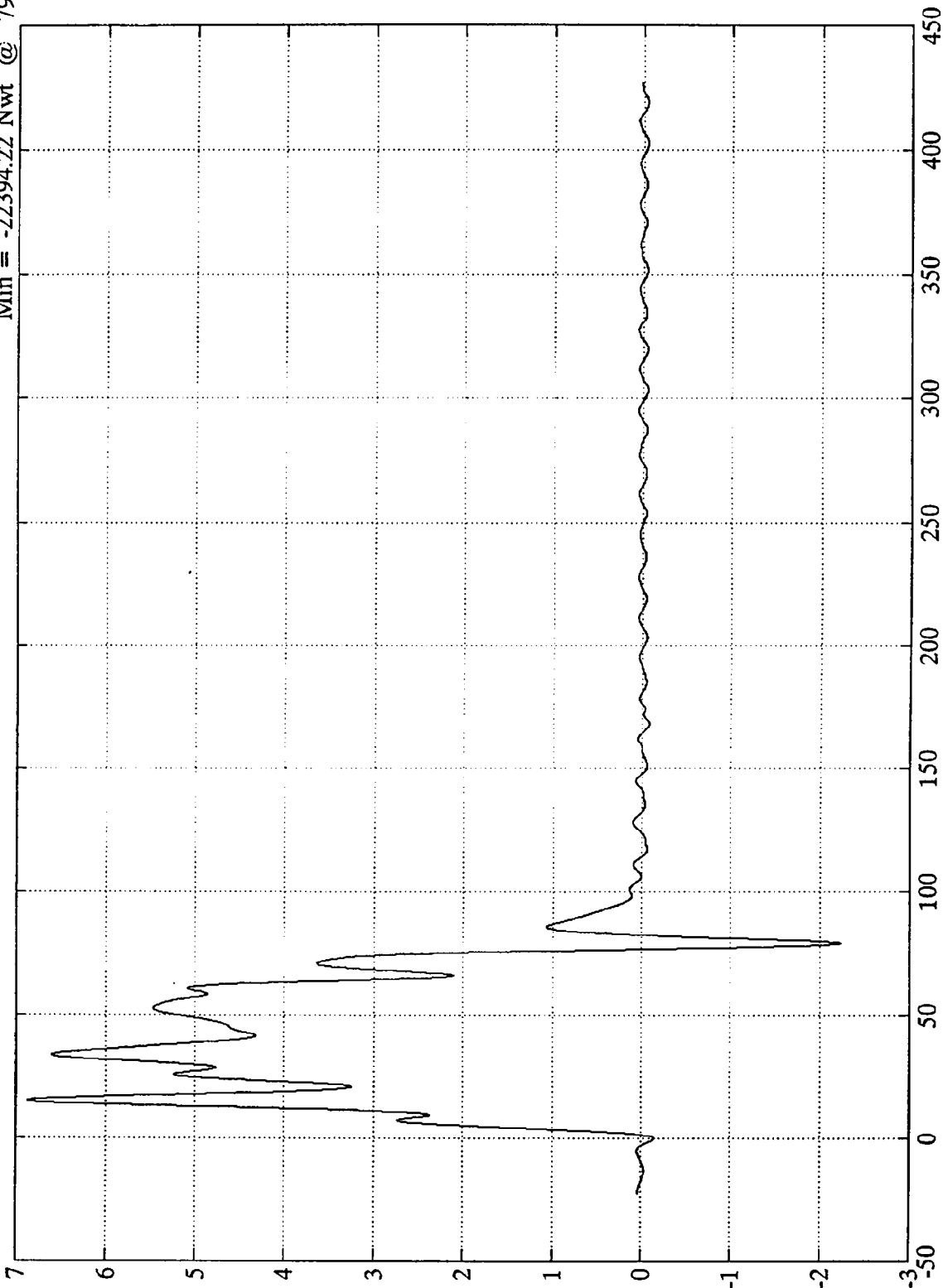
Time (msec)

NCAP TEST #2 - 1995 Ford Aspire

Group 1 Load Cell Sum

Max = 68795.83 Nwt @ 15.00 msec
Min = -22394.22 Nwt @ 79.08 msec

x10⁴



1MN
B-63

8227-2

SAE Filter Class 60

Time (msec)

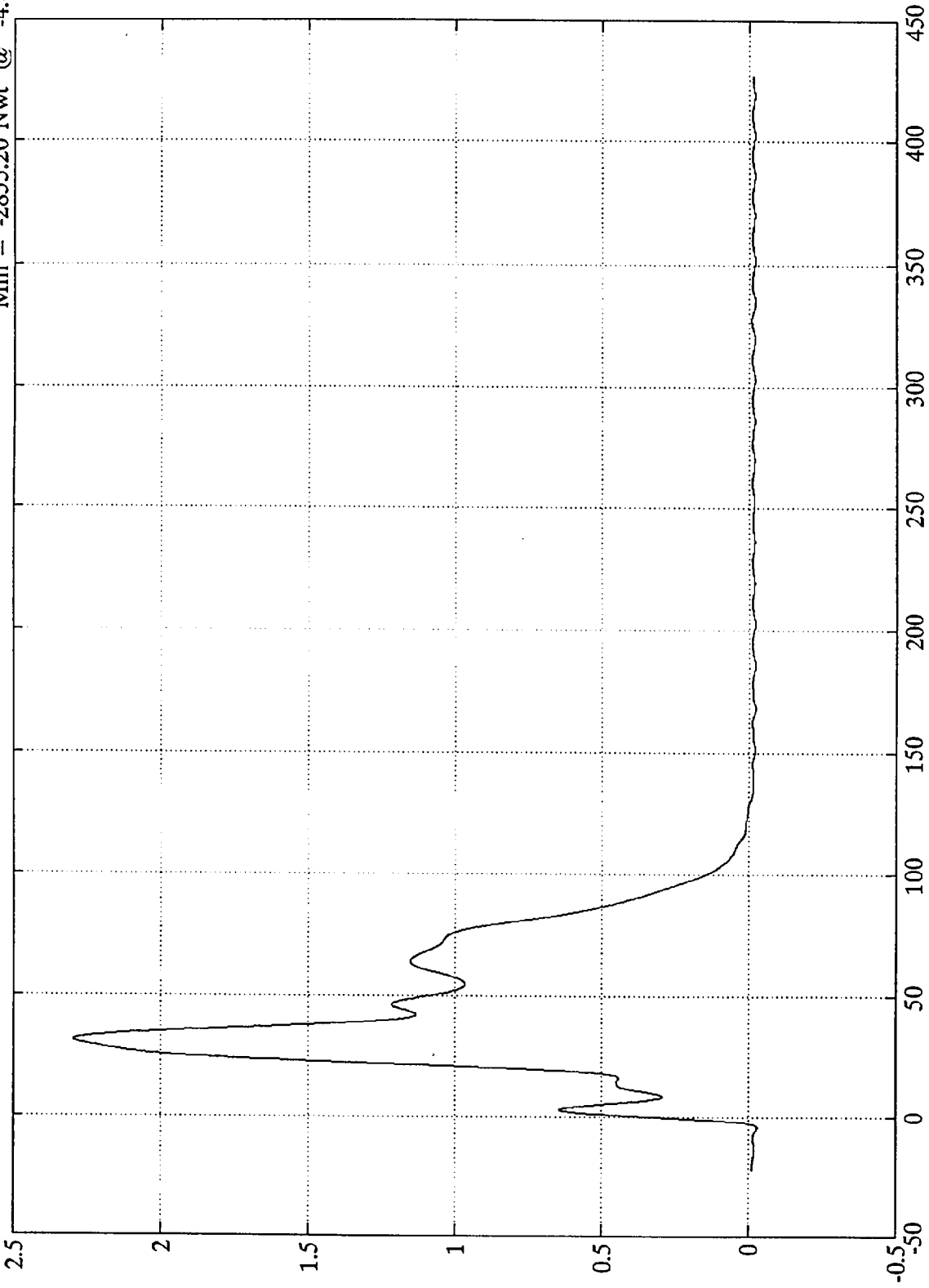
Load Cells (A1,A2,A3,B1,B2,B3)

NCAP TEST #2 - 1995 Ford Aspire

$\times 10^5$

Group 2 Load Cell Sum

Max = 229744.00 Nwt @ 31.44 msec
Min = -2855.20 Nwt @ -4.80 msec



B-64
Nwt

Time (msec)

SAE Filter Class 60

8227-2

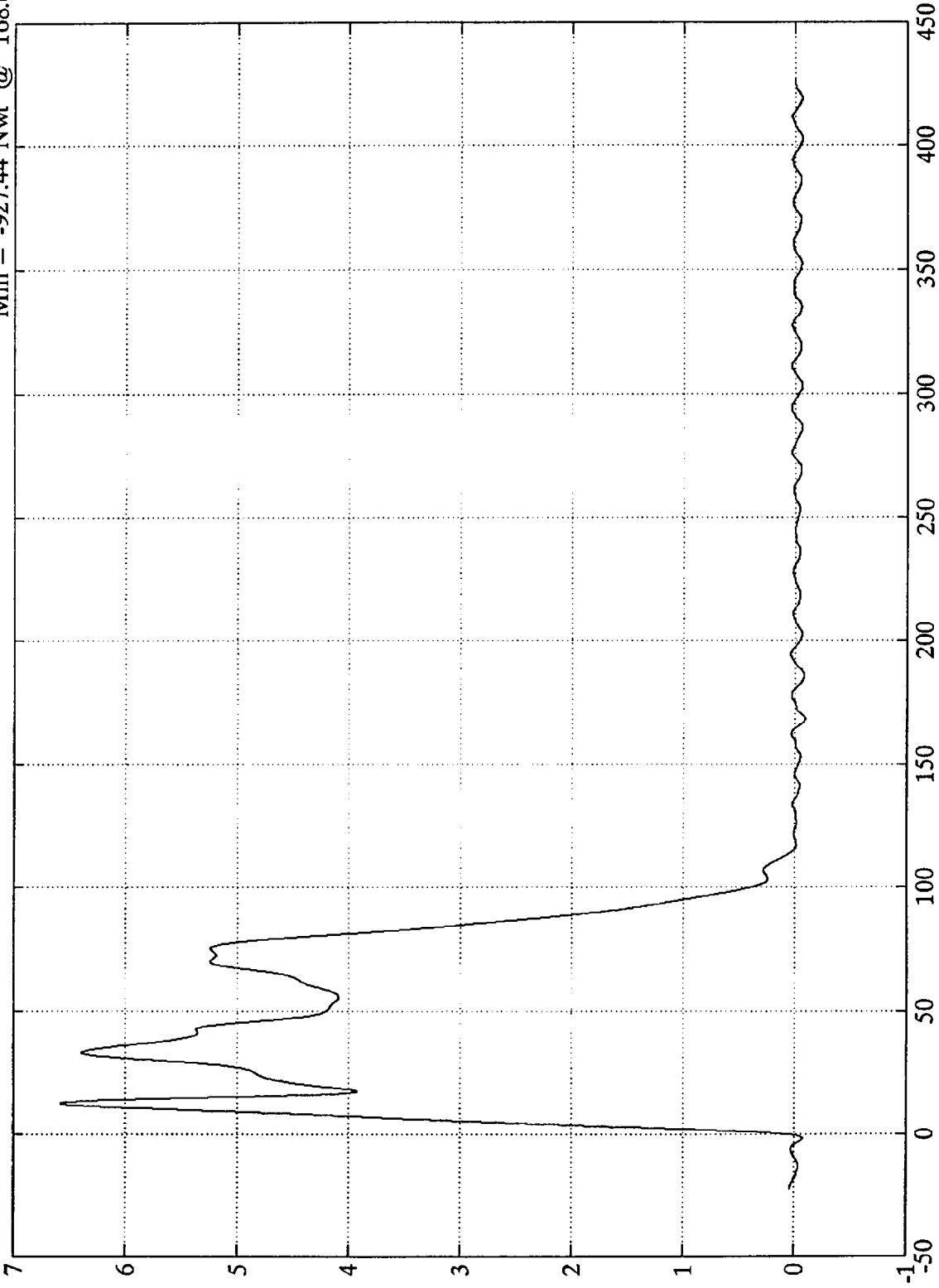


NCAP TEST #2 - 1995 Ford Aspire

Group 3 Load Cell Sum

Max = 65835.36 Nwt @ 12.72 msec
Min = -927.44 Nwt @ 168.60 msec

x10⁴



1MN
B-65

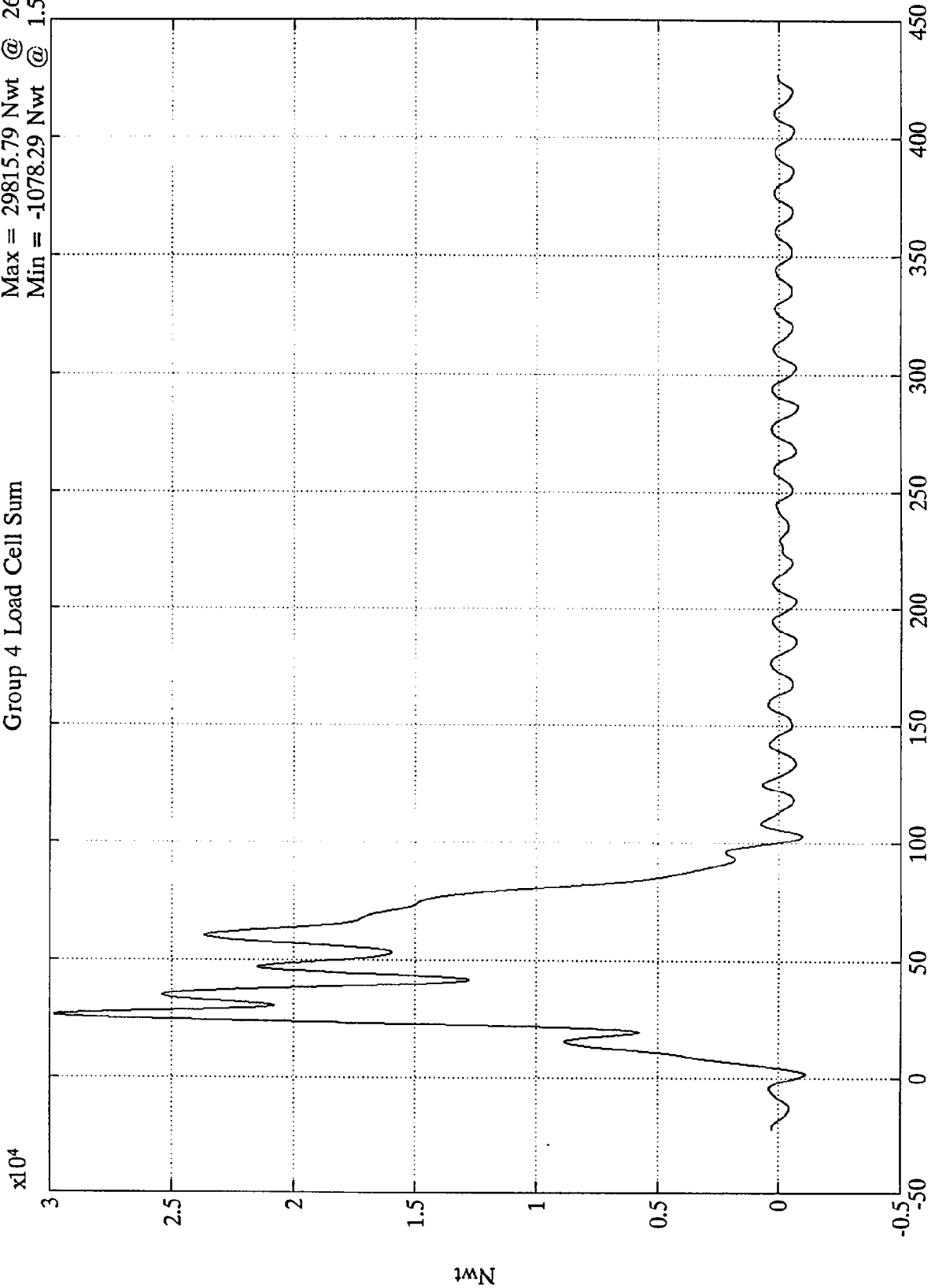
8227-2

SAE Filter Class 60
Time (msec)
Load Cells (A7,A8,A9,B7,B8,B9)

NCAP TEST #2 - 1995 Ford Aspire

Group 4 Load Cell Sum

Max = 29815.79 Nwt @ 26.40 msec
Min = -1078.29 Nwt @ 1.56 msec



Time (msec)

Load Cells (C1,C2,C3,D1,D2,D3)

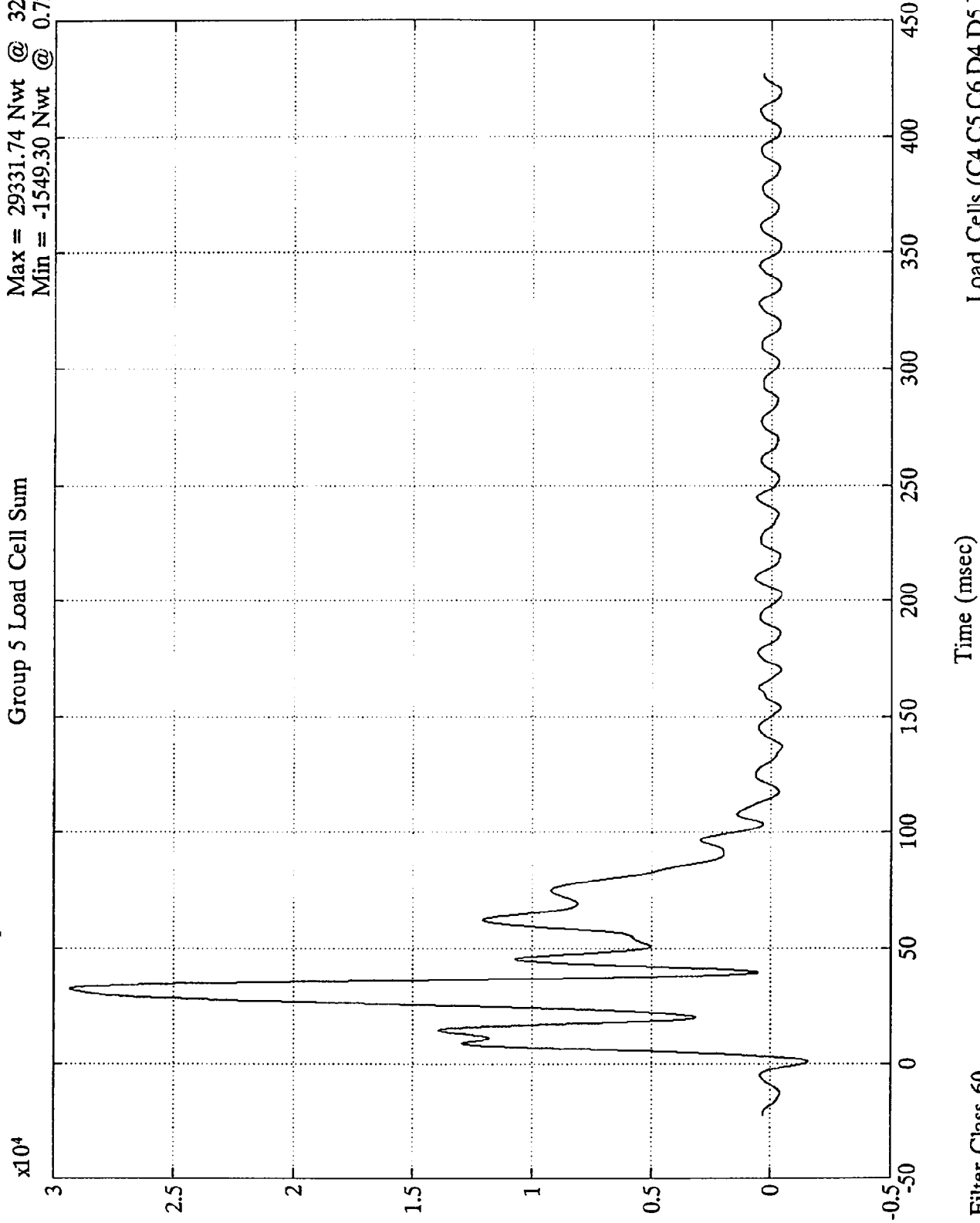
SAE Filter Class 60

Nwt
B-66

8227-2

NCAP TEST #2 - 1995 Ford Aspire

Group 5 Load Cell Sum
Max = 29331.74 Nwt @ 32.28 msec
Min = -1549.30 Nwt @ 0.72 msec



1N
B-67

8227-2

SAE Filter Class 60

Time (msec)

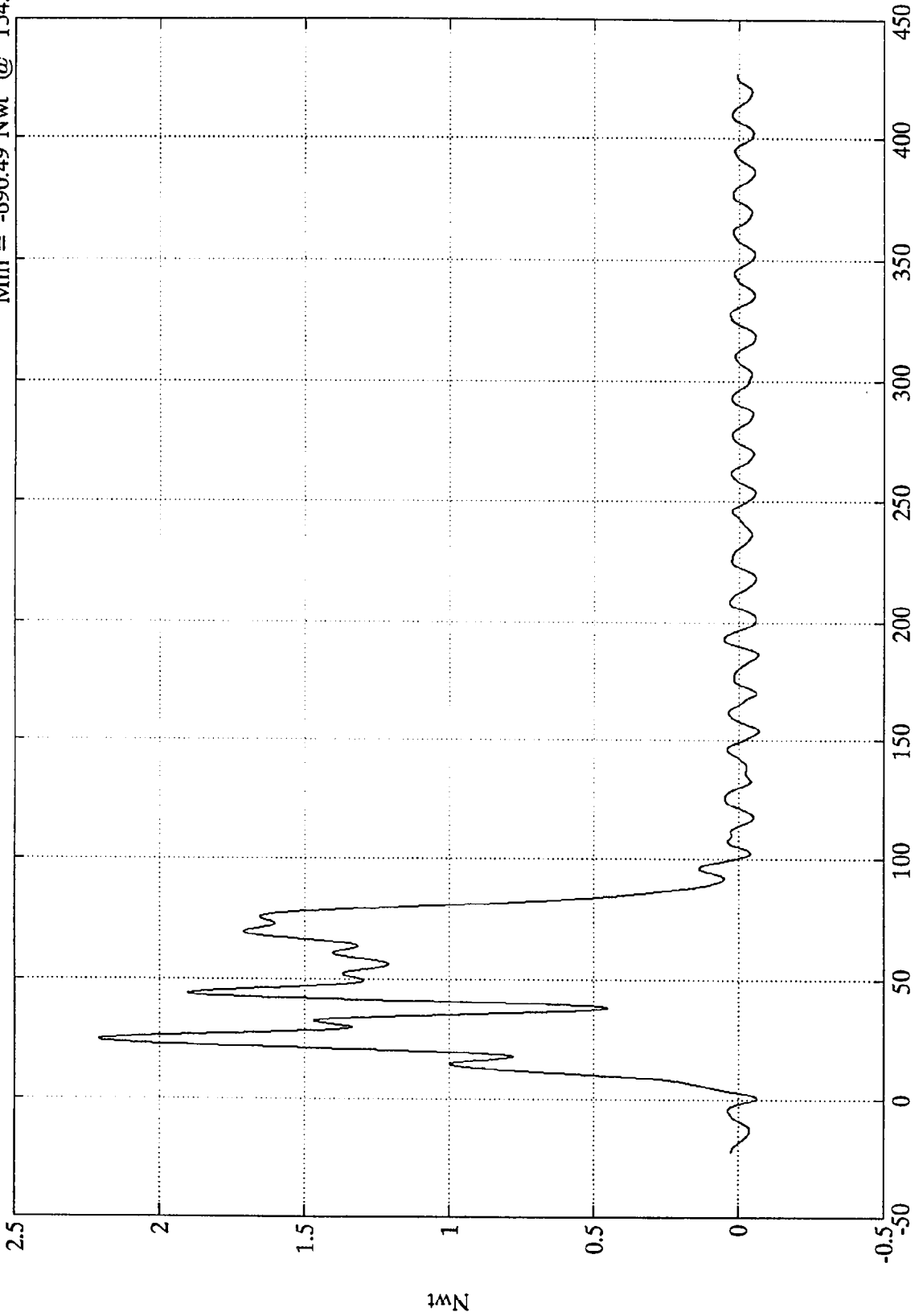
Load Cells (C4,C5,C6,D4,D5,D6)

NCAP TEST #2 - 1995 Ford Aspire

xl0⁴

Group 6 Load Cell Sum

Max = 22099.57 Nwt @ 24.24 msec
Min = -690.49 Nwt @ 154.08 msec



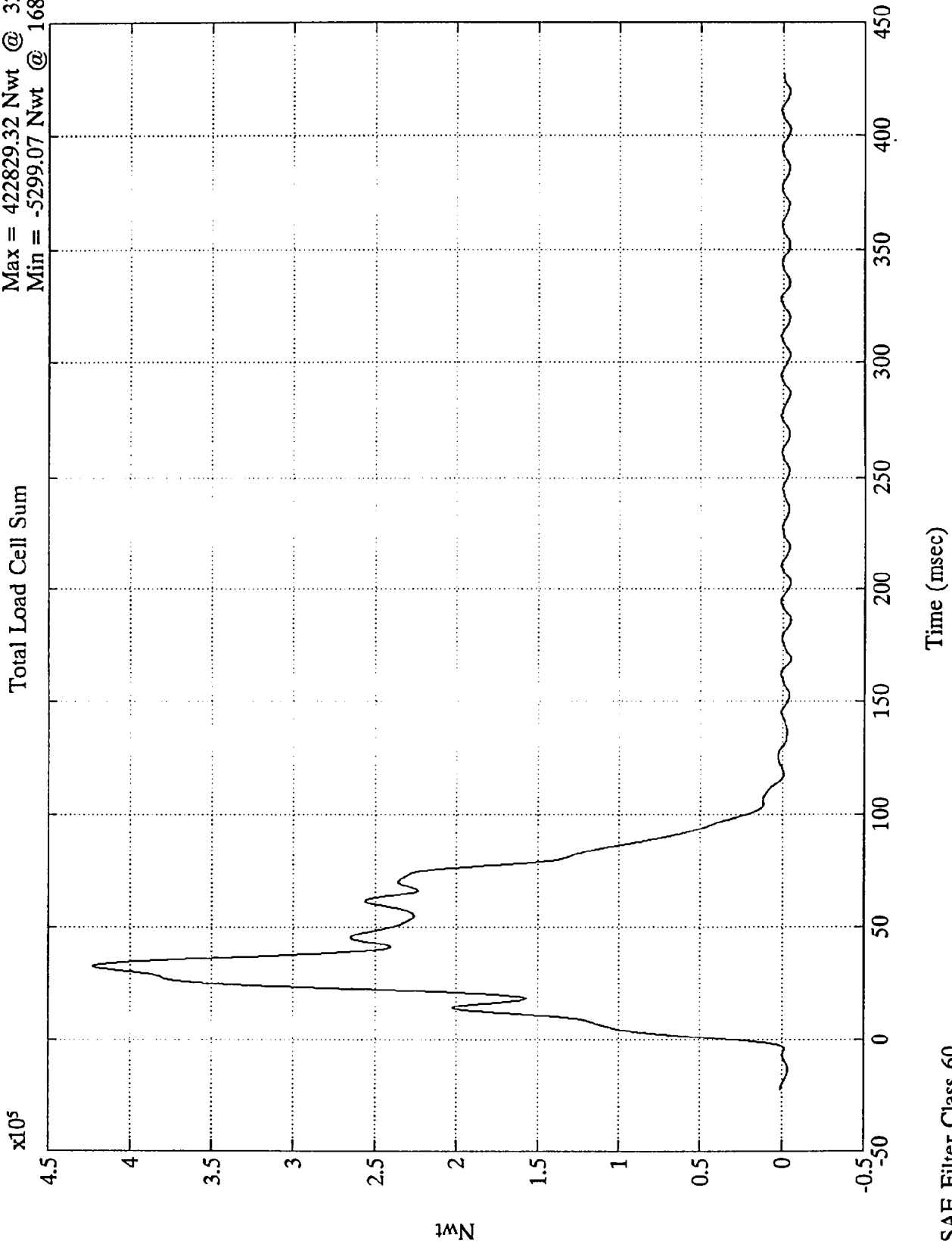
Time (msec)

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

SAE Filter Class 60

NCAP TEST #2 - 1995 Ford Aspire

Max = 422829.32 Nwt @ 32.52 msec
Min = -5299.07 Nwt @ 168.96 msec



Nwt
B-69

8227-2

SAE Filter Class 60

TEST NO. MS0201

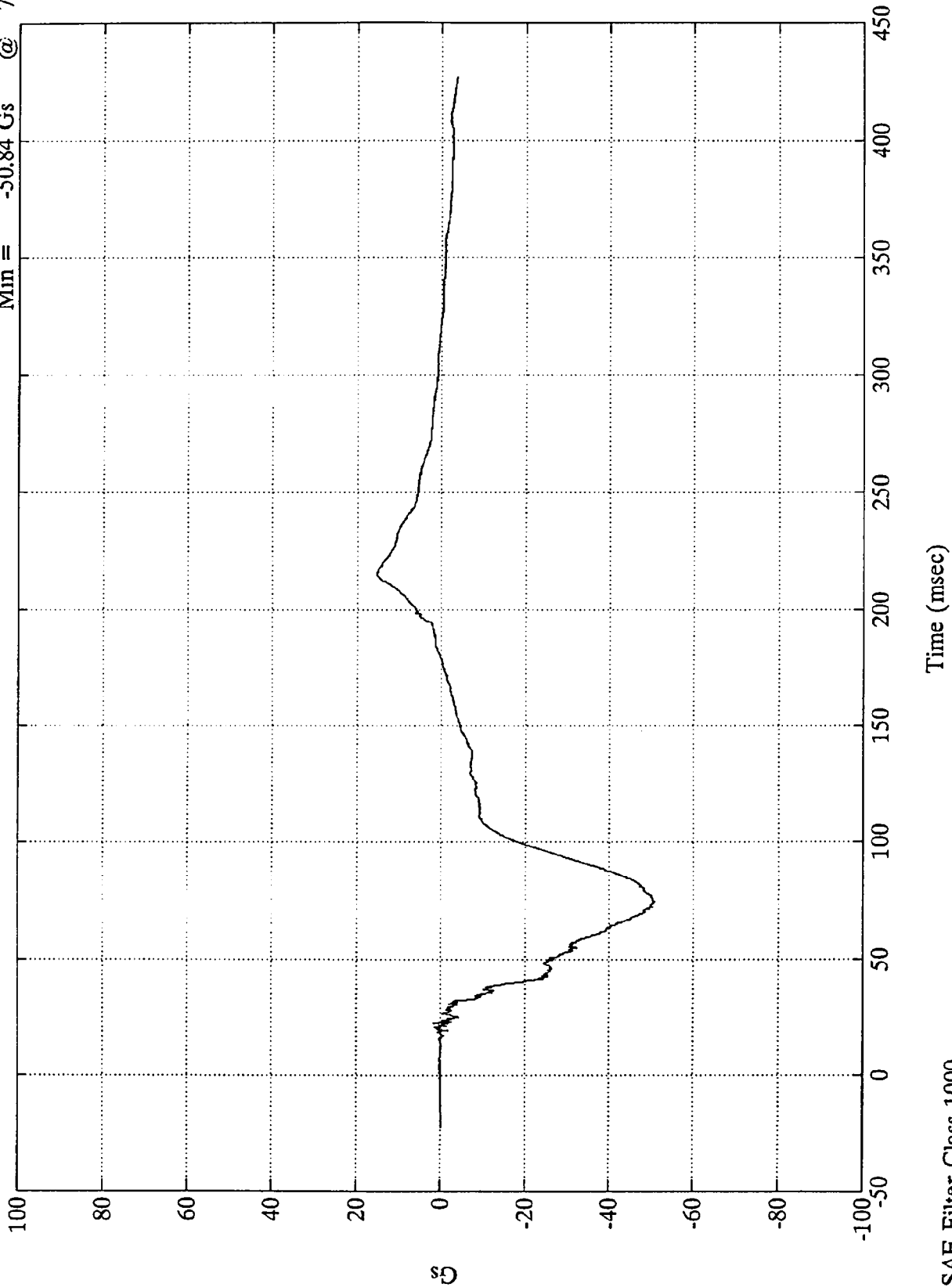
DUMMY DATA

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

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 15.33 Gs @ 216.00 msec
Min = -50.84 Gs @ 74.76 msec

Pos. 1 Head X



50

B-71

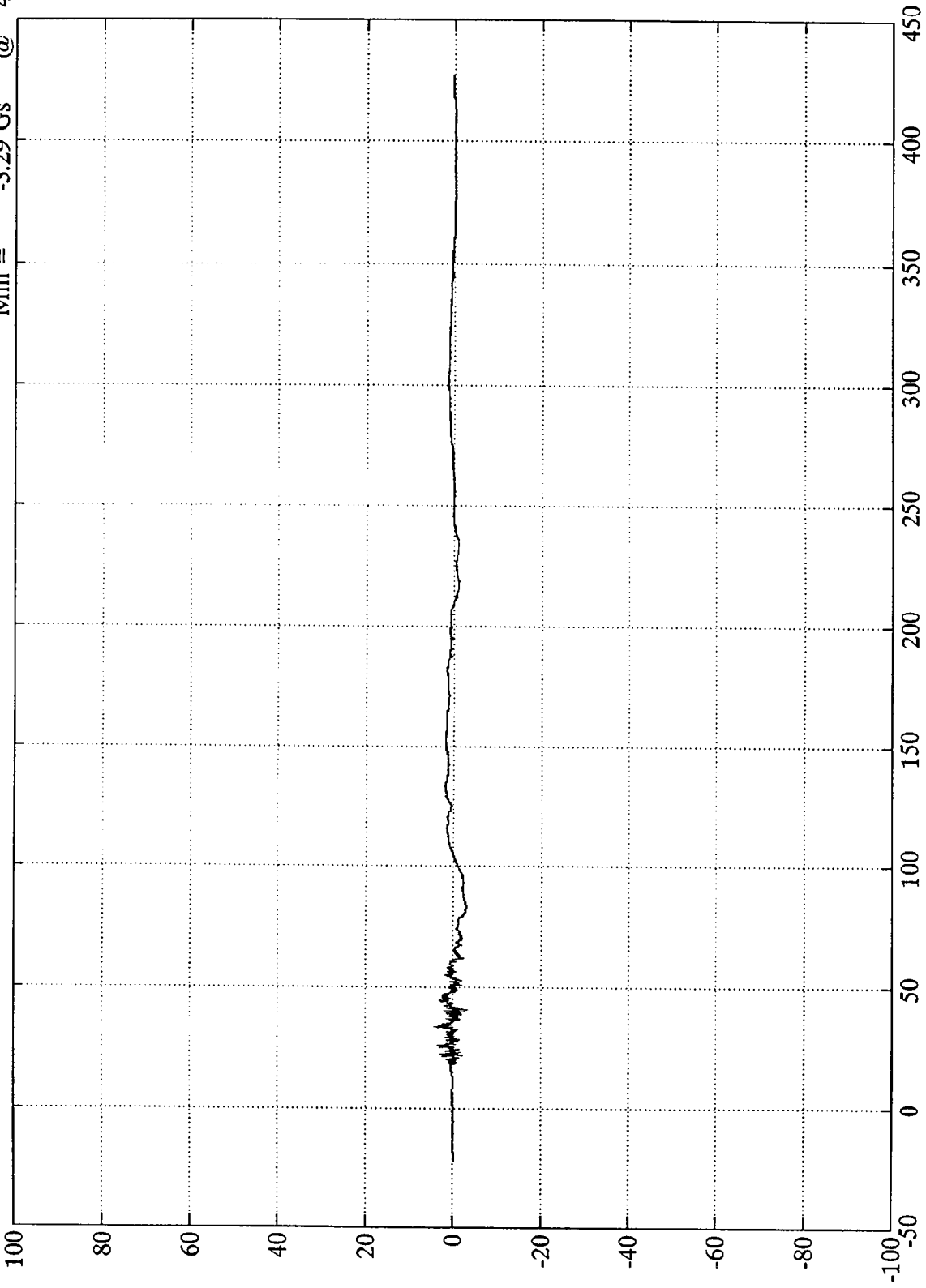
8227-2

SAE Filter Class 1000

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Head Y

Max = 4.35 Gs @ 33.24 msec
Min = -3.29 Gs @ 40.68 msec



82
B-72

8227-2

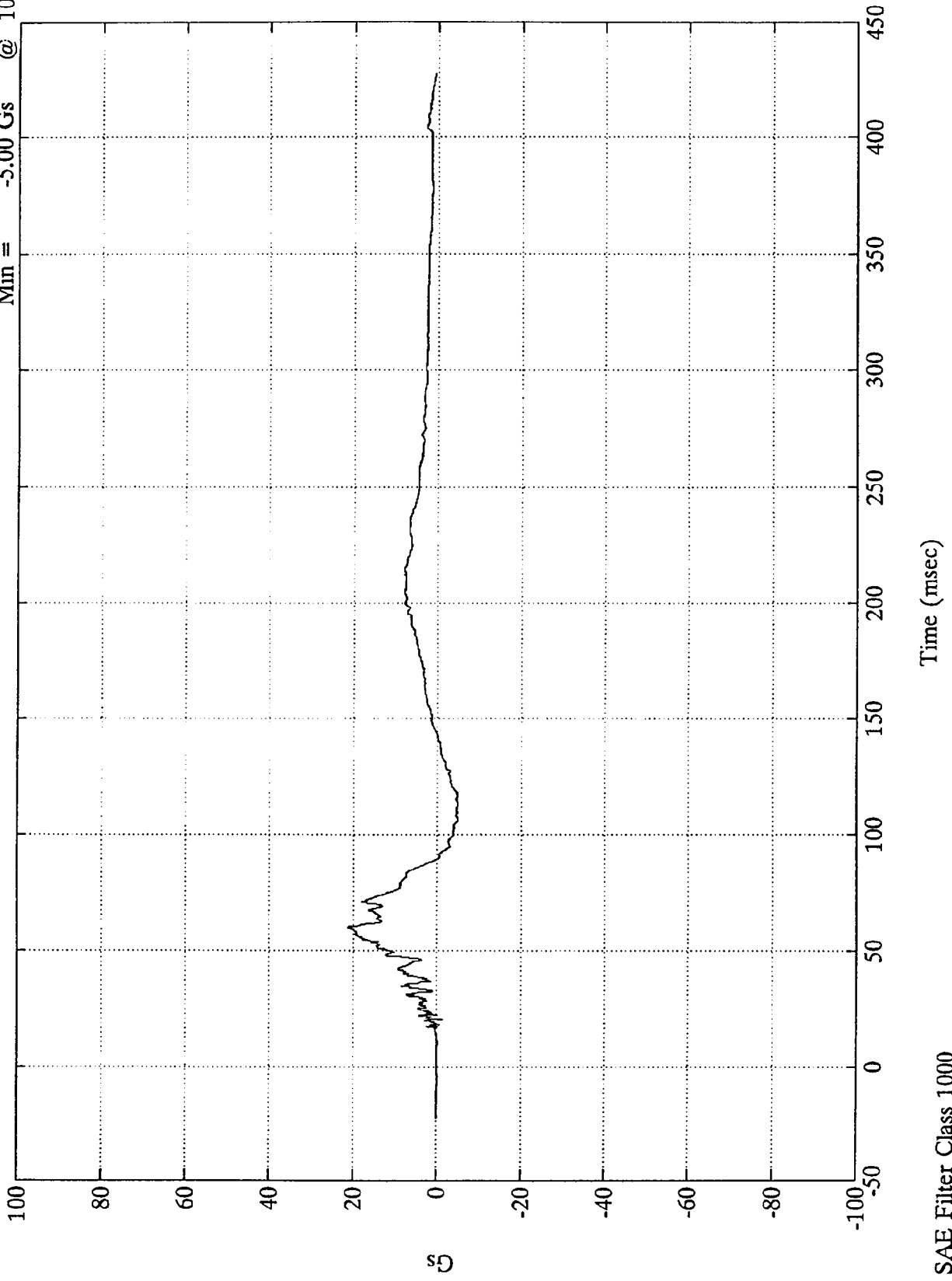
Time (msec)

SAE Filter Class 1000

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Head Z

Max = 21.30 Gs @ 59.88 msec
Min = -5.00 Gs @ 106.56 msec



B-73

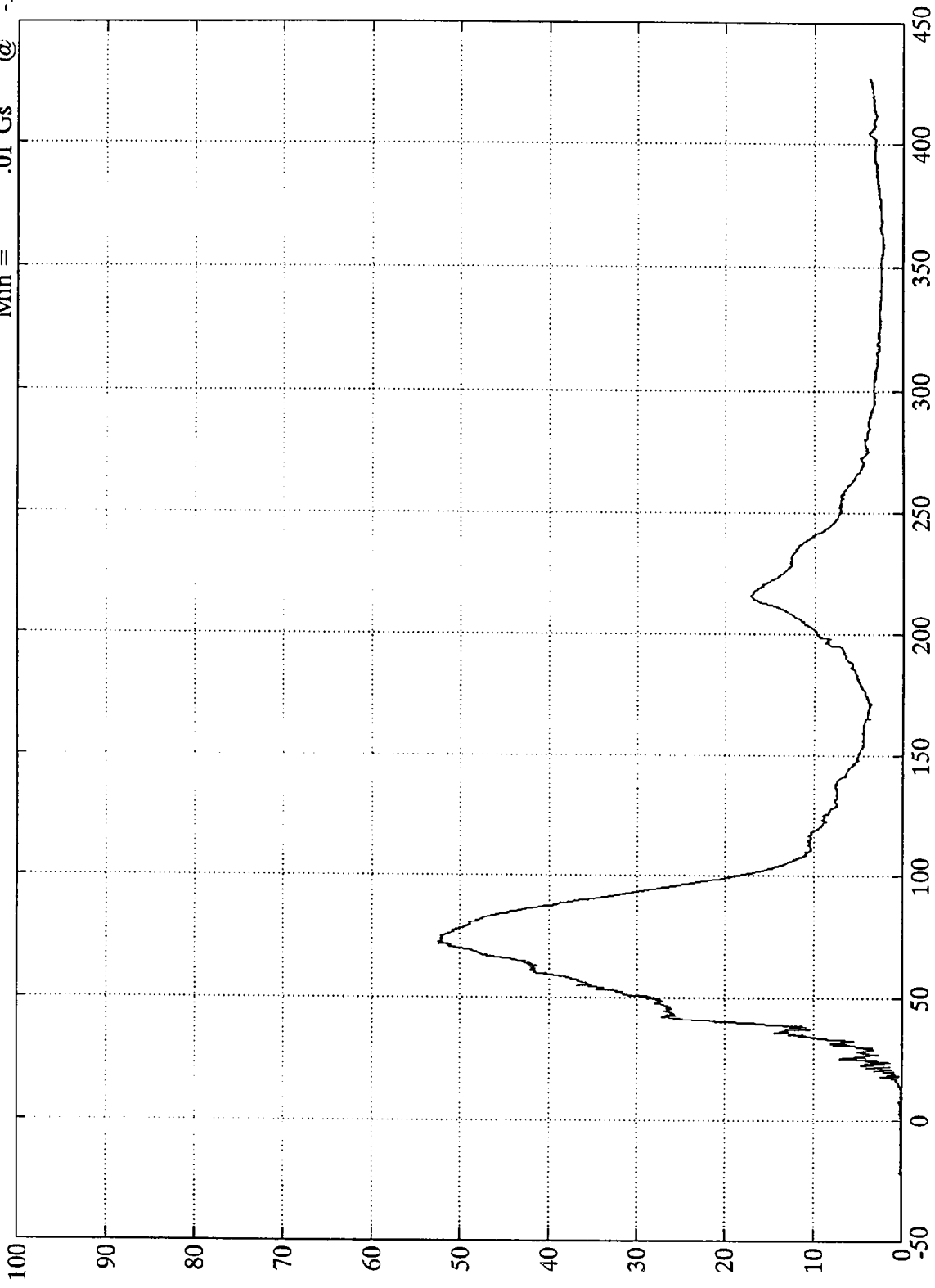
8227-2

SAE Filter Class 1000

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 52.62 Gs @ 72.24 msec
Min = .01 Gs @ -1.80 msec

Pos. 1 Head Resultant



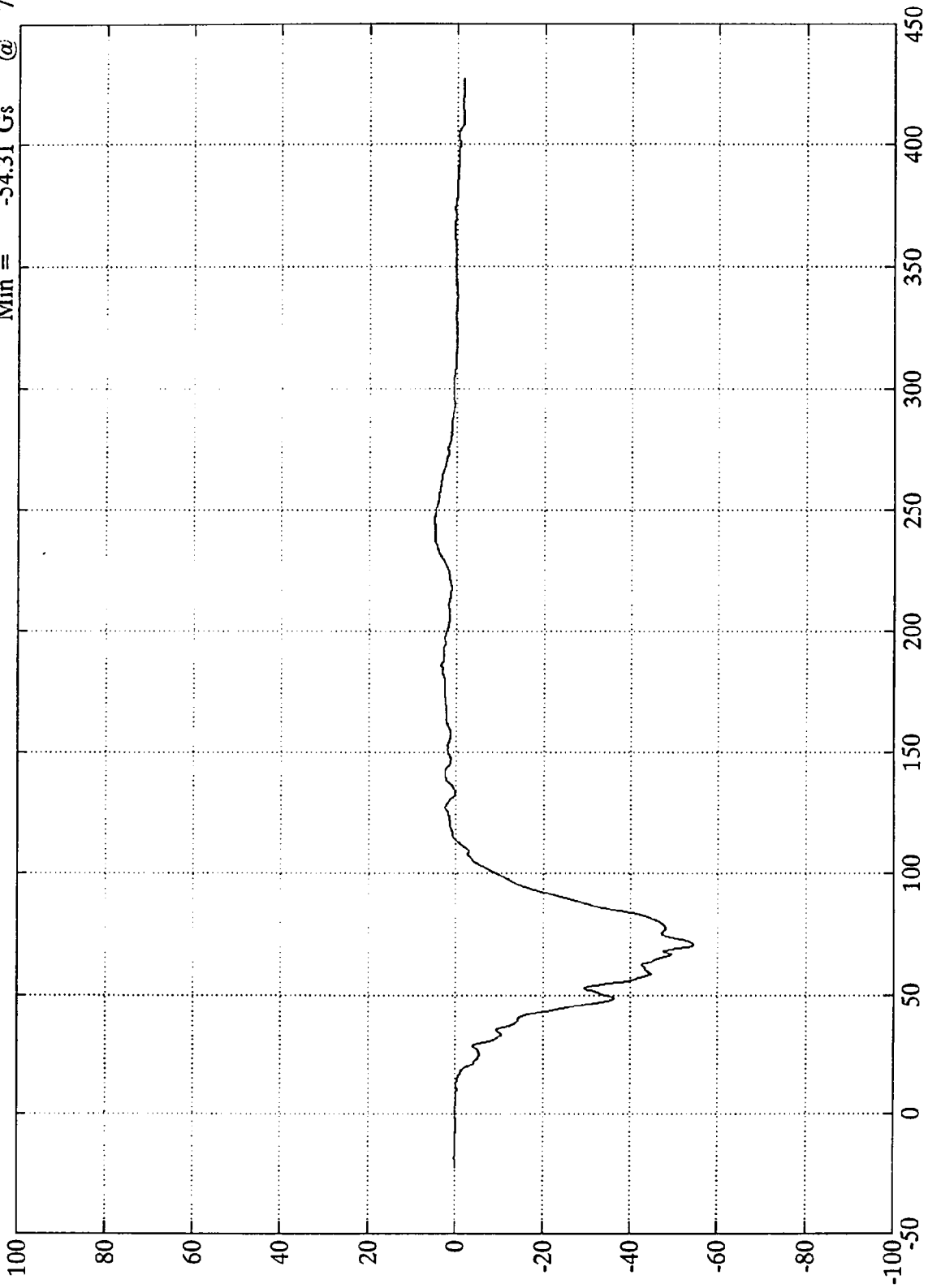
Time (msec)

SAE Filter Class 1000

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Chest X

Max = 5.11 Gs @ 246.36 msec
Min = -54.31 Gs @ 70.92 msec



Time (msec)

SAE Filter Class 180

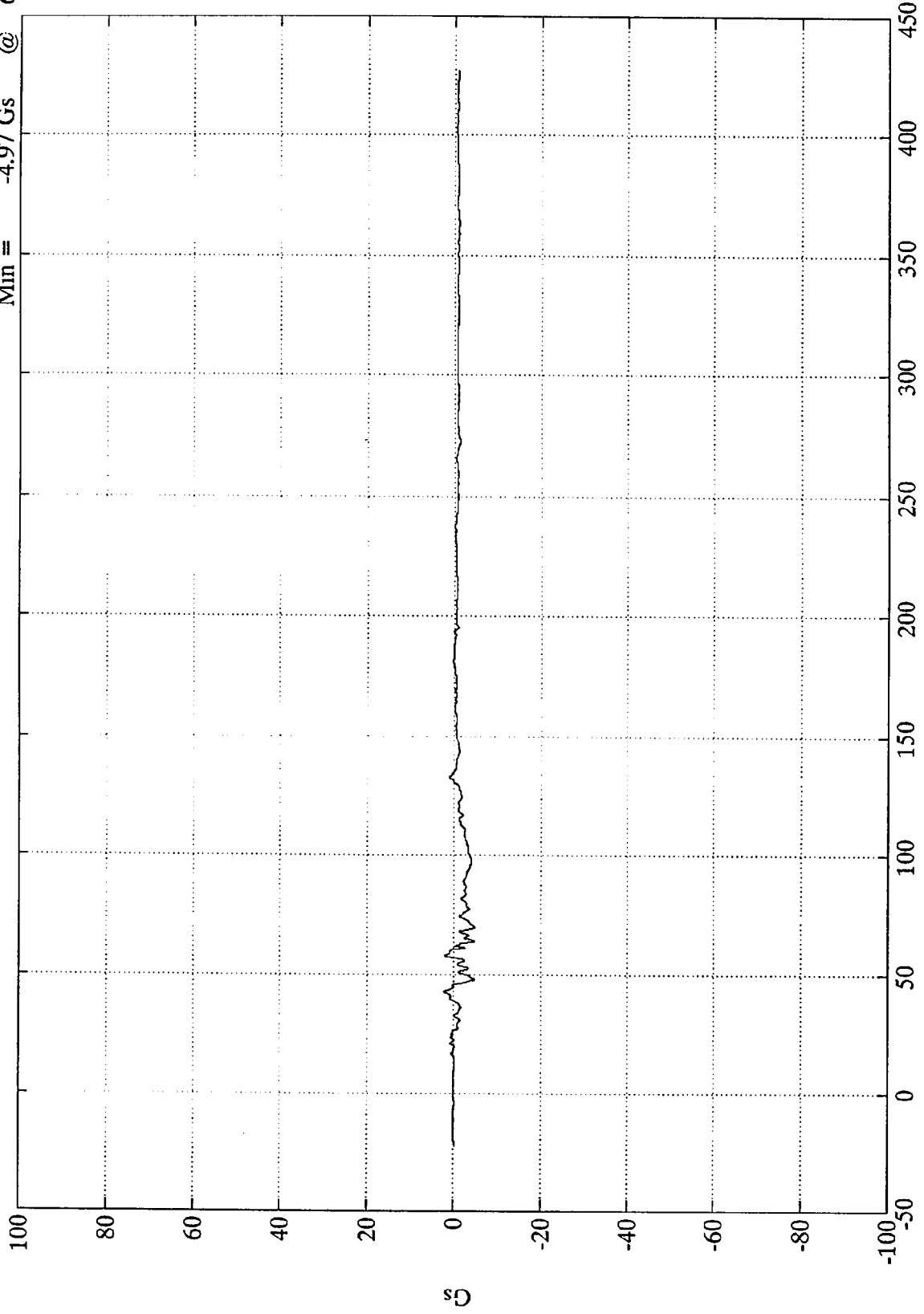
SD
B-75

8227-2

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Chest Y

Max = 2.26 Gs @ 42.84 msec
Min = -4.97 Gs @ 63.72 msec



B-76

8227-2

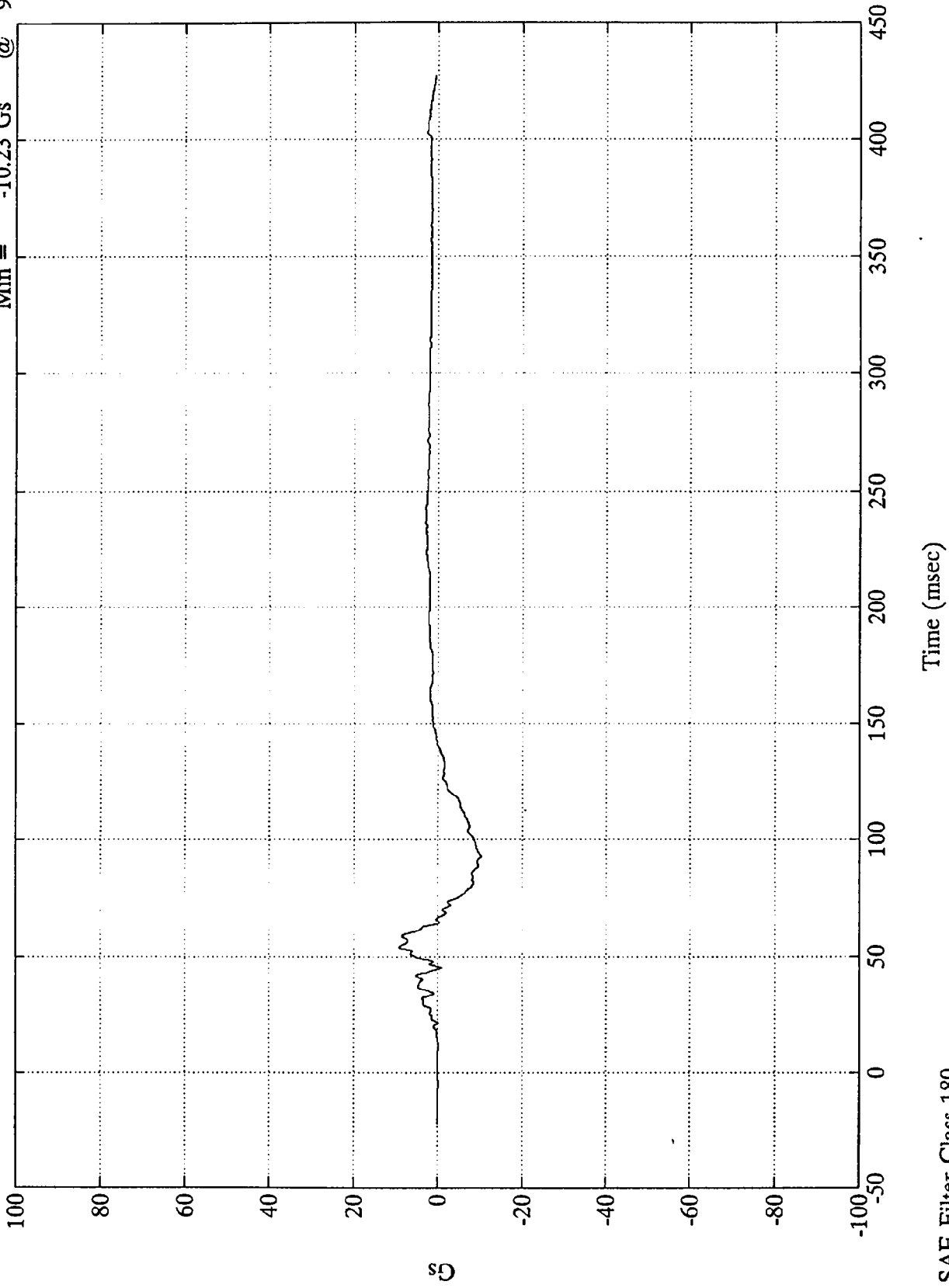
Time (msec)

SAE Filter Class 180

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Chest Z

Max = 9.20 Gs @ 53.88 msec
Min = -10.23 Gs @ 92.88 msec



B-77

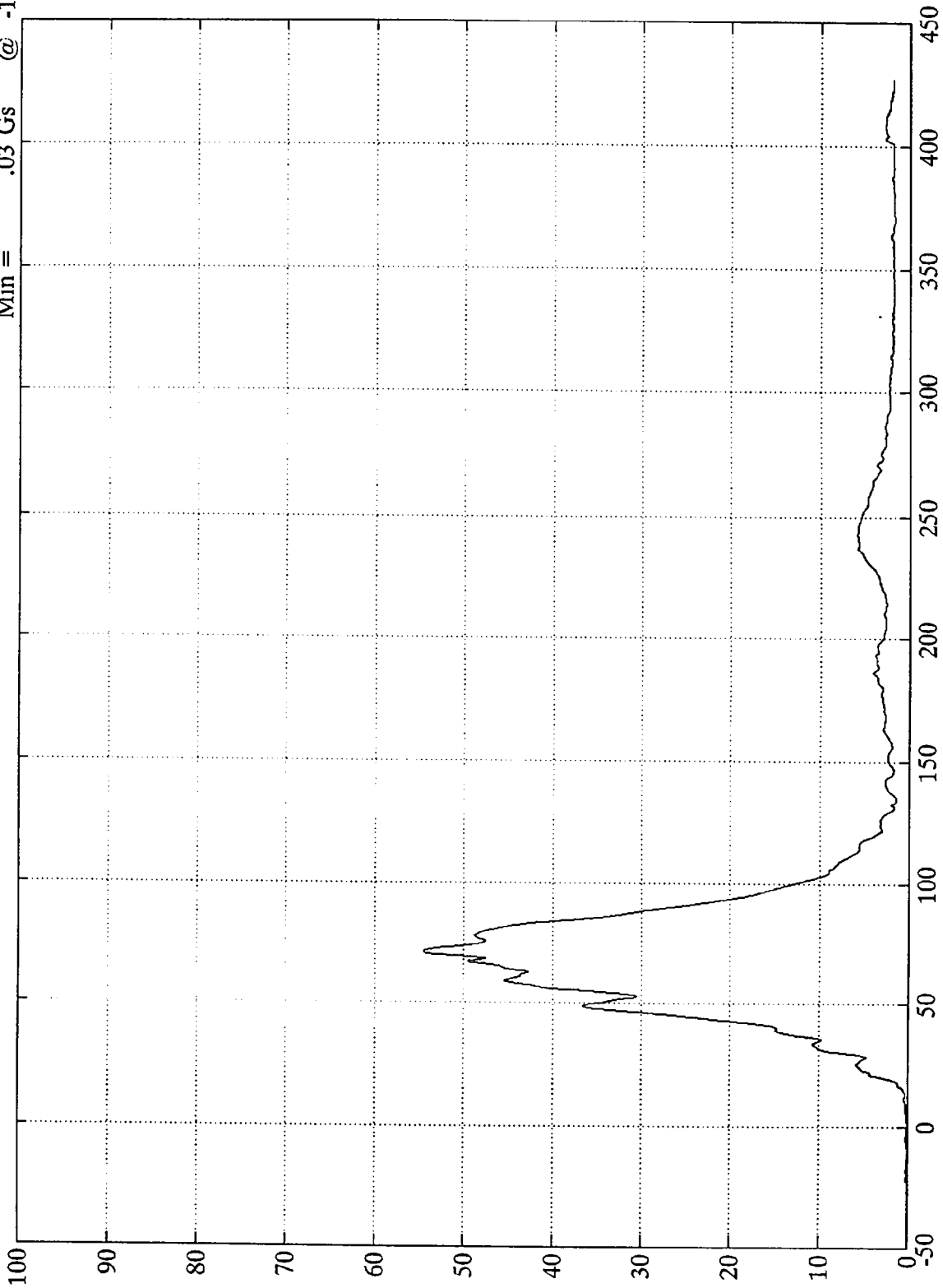
8227-2

SAE Filter Class 180

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Chest Resultant

Max = 54.50 Gs @ 70.44 msec
Min = .03 Gs @ -12.72 msec



SD
B-78

8227-2

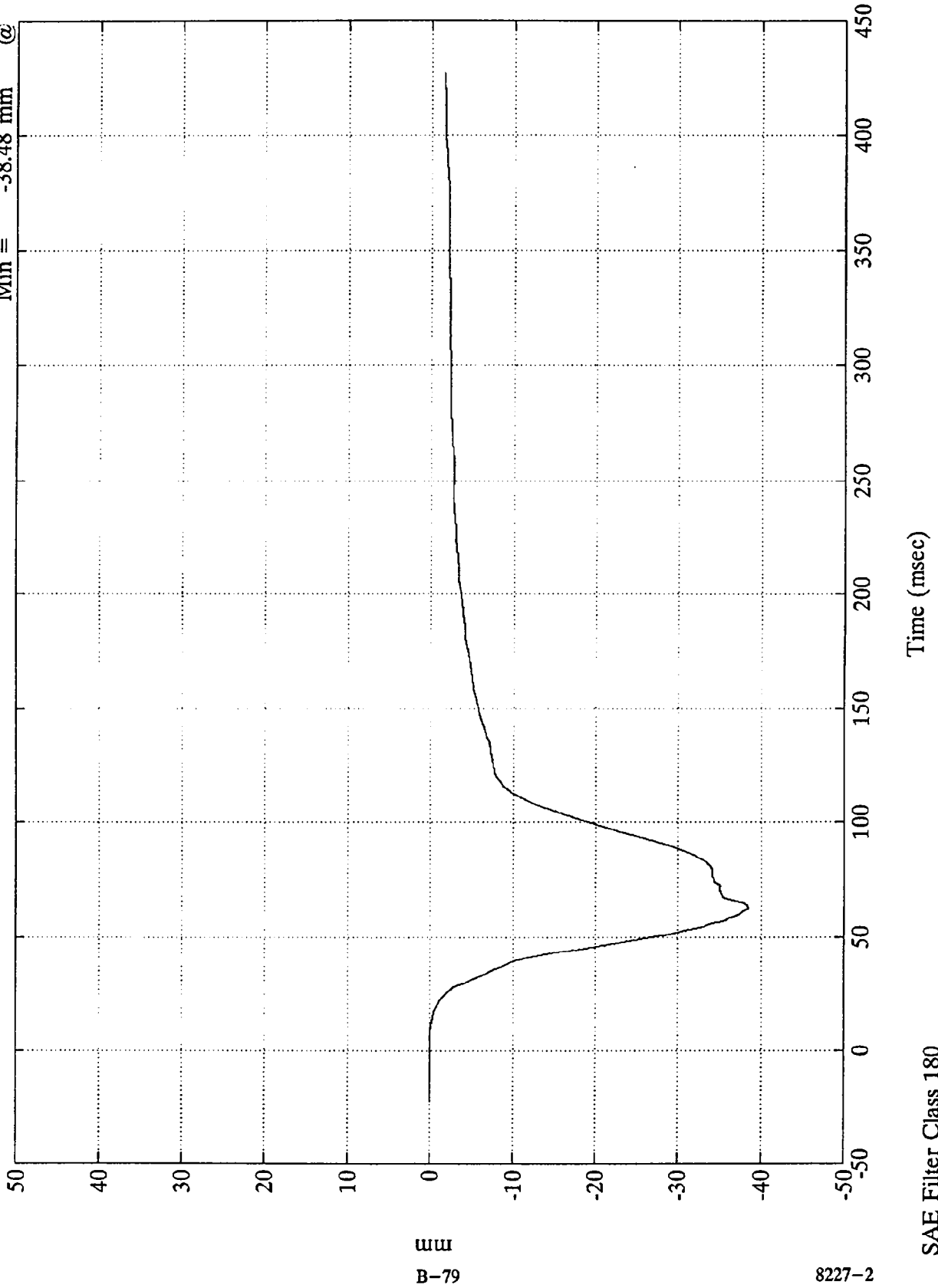
Time (msec)

SAE Filter Class 180

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Chest Disp.

Max = .01 mm @ 6.59 msec
Min = -38.48 mm @ 62.64 msec



B-79

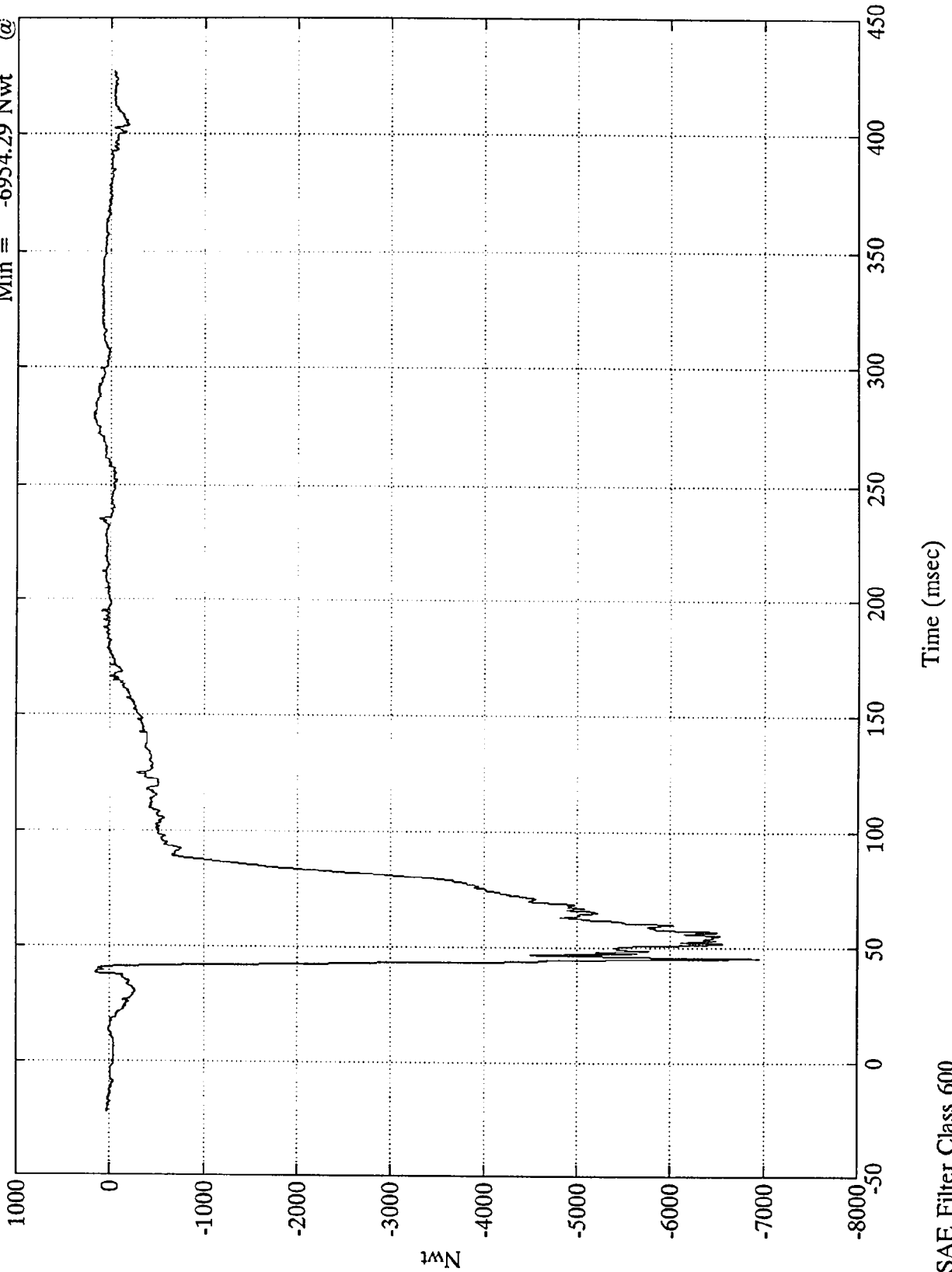
8227-2

SAE Filter Class 180

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Left Femur

Max = 183.83 Nwt @ 278.16 msec
Min = -6954.29 Nwt @ 45.12 msec



10N
B-80

8227-2

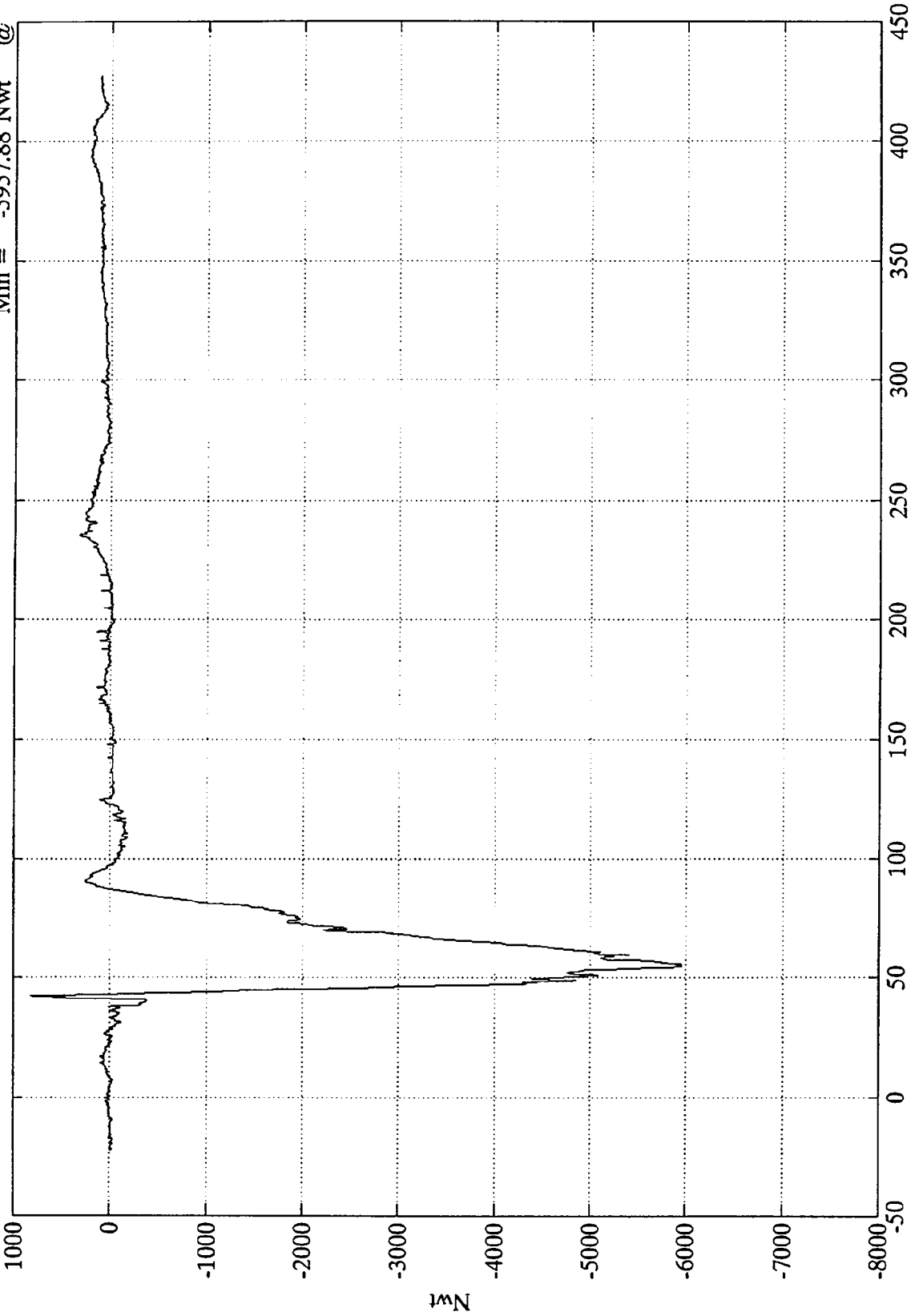
SAE Filter Class 600

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Right Femur

Max = 817.89 Nwt @ 42.12 msec
Min = -5957.88 Nwt @ 54.72 msec



B-81

8227-2

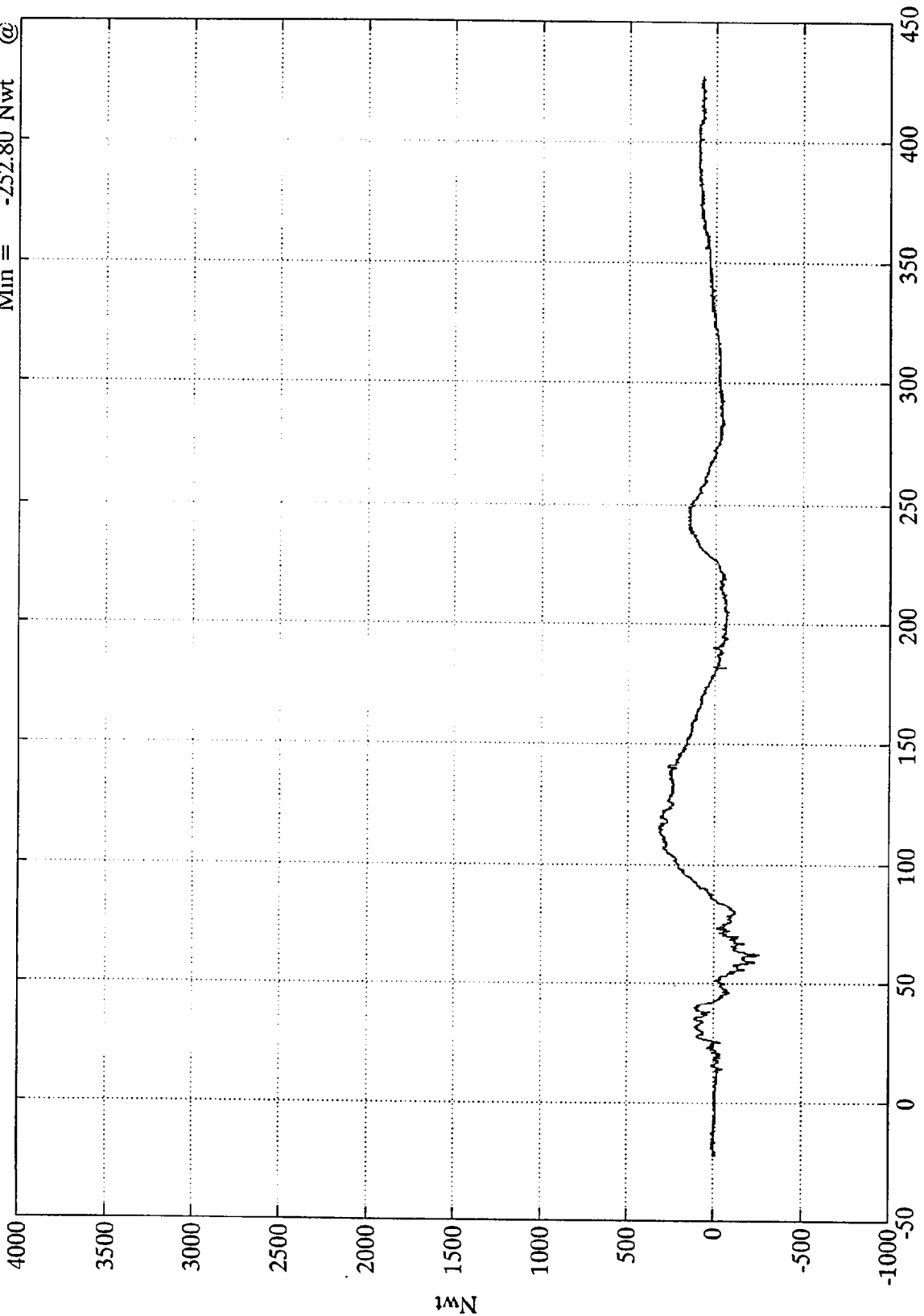
SAE Filter Class 600

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Upper Neck Fx

Max = 319.34 Nwt @ 115.80 msec
Min = -252.80 Nwt @ 62.15 msec



B-82

8227-2

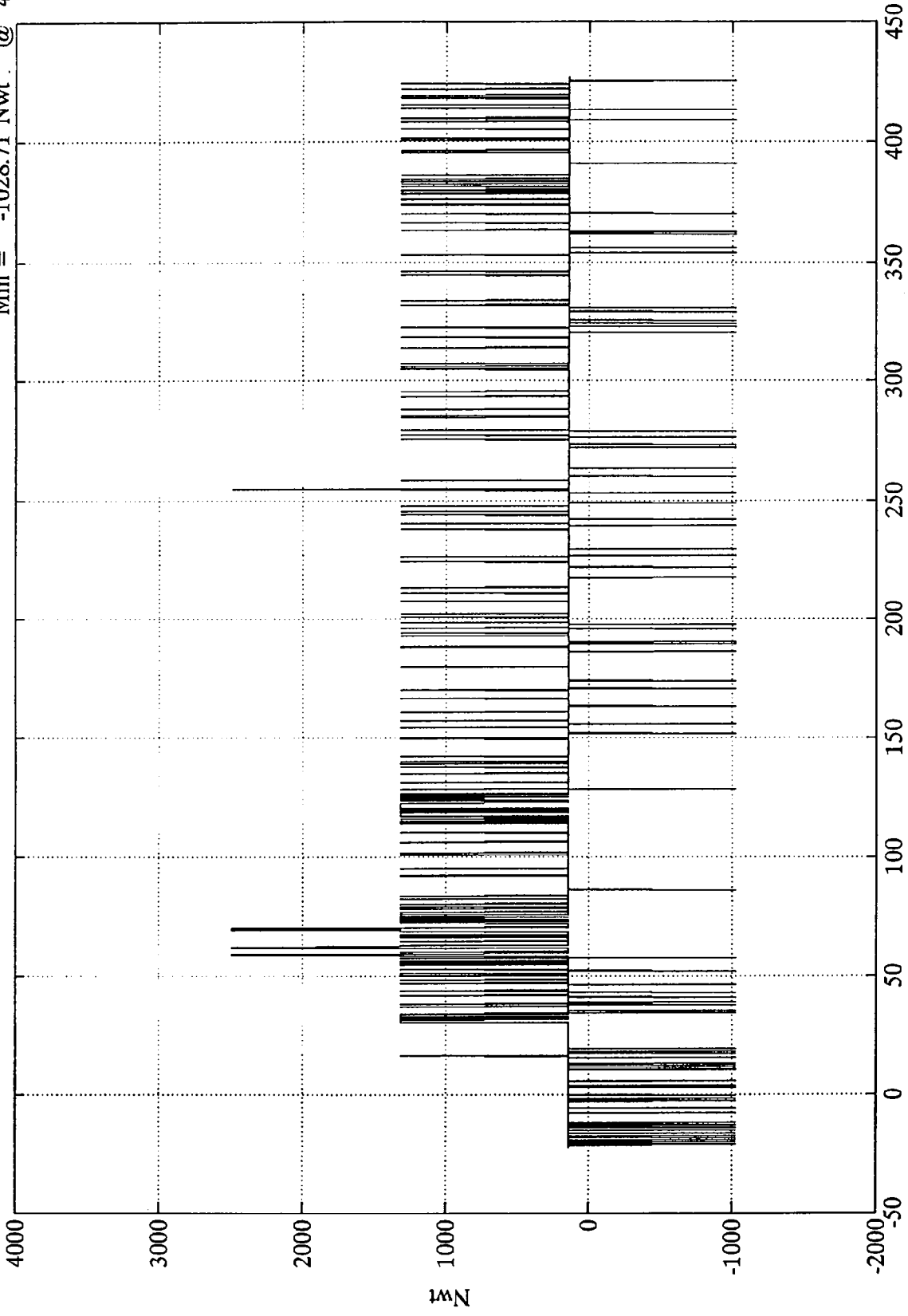
SAE Filter Class 1000

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Upper Neck Fy

Max = 2490.20 Nwt @ 254.88 msec
Min = -1028.71 Nwt @ 425.40 msec



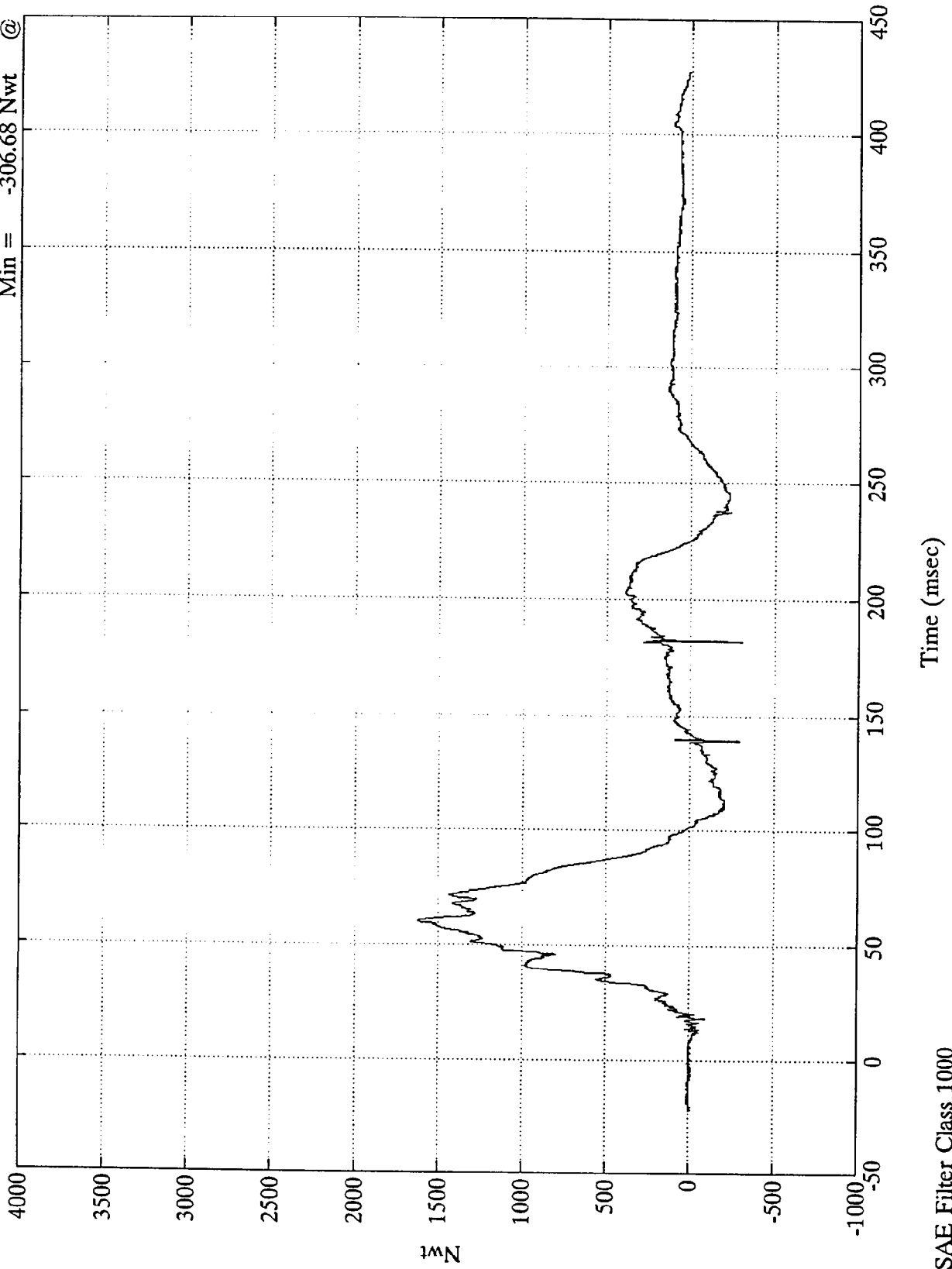
Time (msec)
No data recorded

SAE Filter Class 1000

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Upper Neck Fz

Max = 1622.35 Nwt @ 60.12 msec
Min = -306.68 Nwt @ 182.52 msec



B-84

8227-2

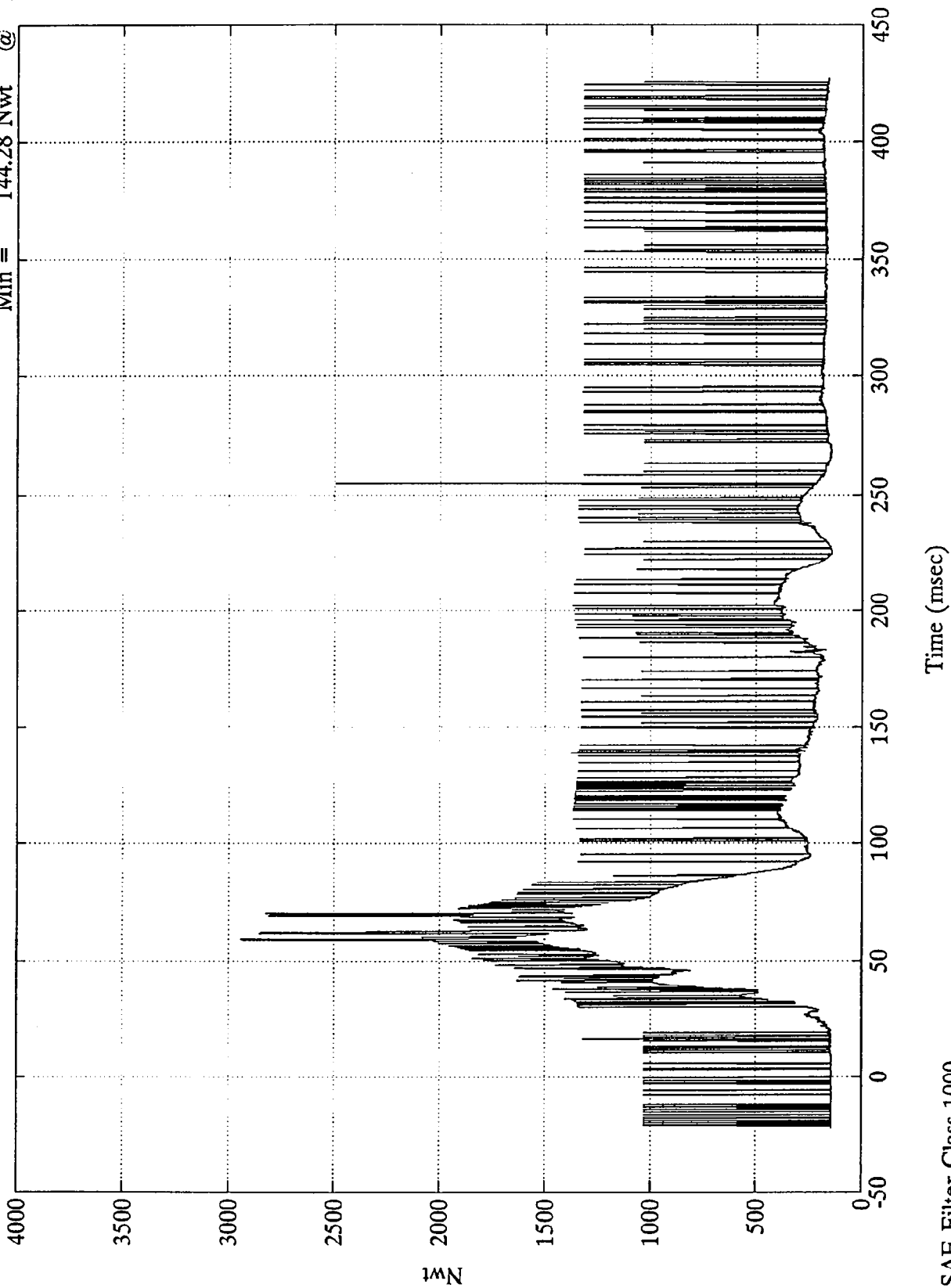
SAE Filter Class 1000



NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Neck Force Res.

Max = 2938.65 Nwt @ 59.15 msec
Min = 144.28 Nwt @ 15.72 msec



B-85

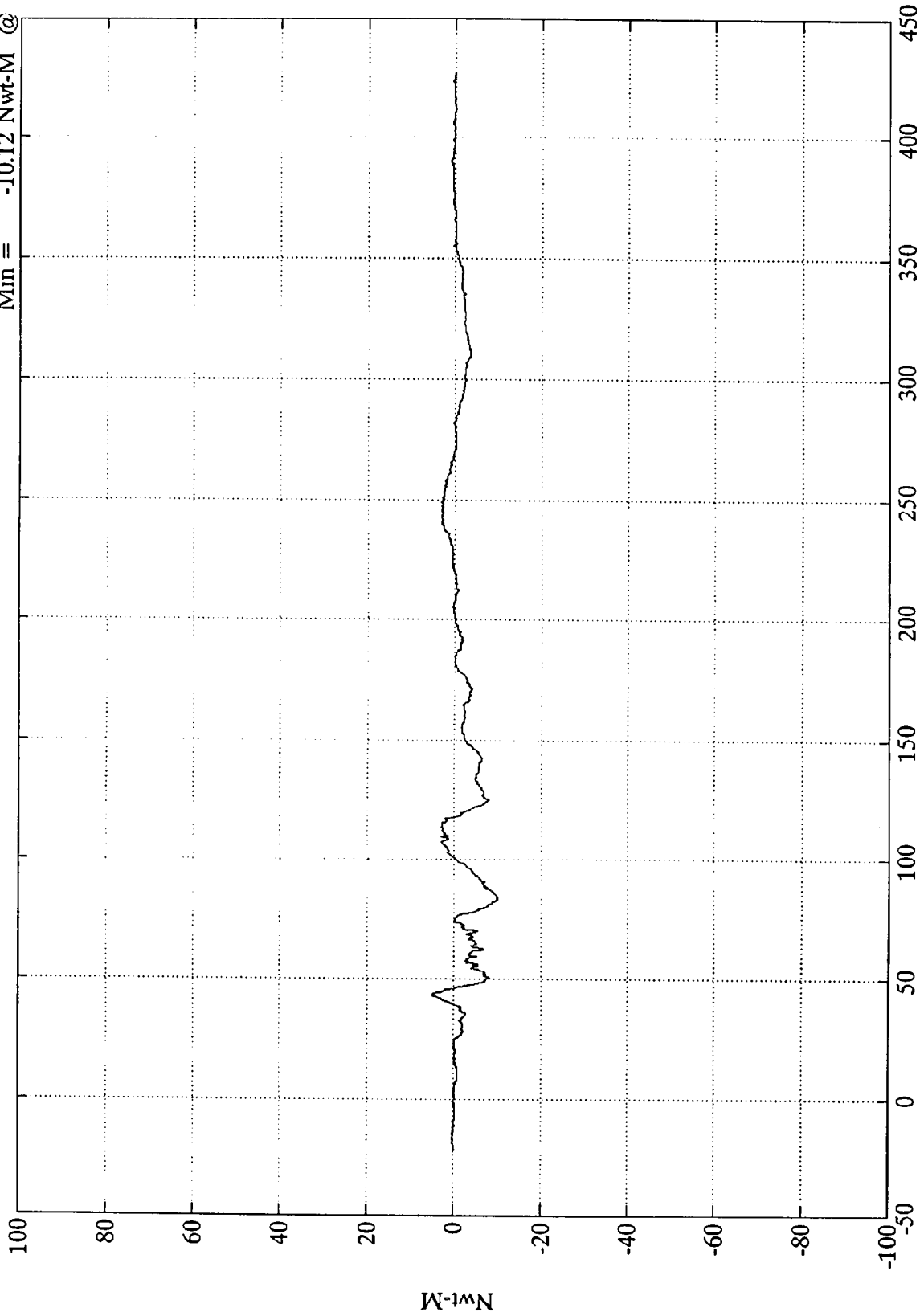
8227-2

SAE Filter Class 1000

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Upper Neck Mx

Max = 5.01 Nwt-M @ 43.56 msec
Min = -10.12 Nwt-M @ 83.40 msec



Time (msec)

SAE Filter Class 600

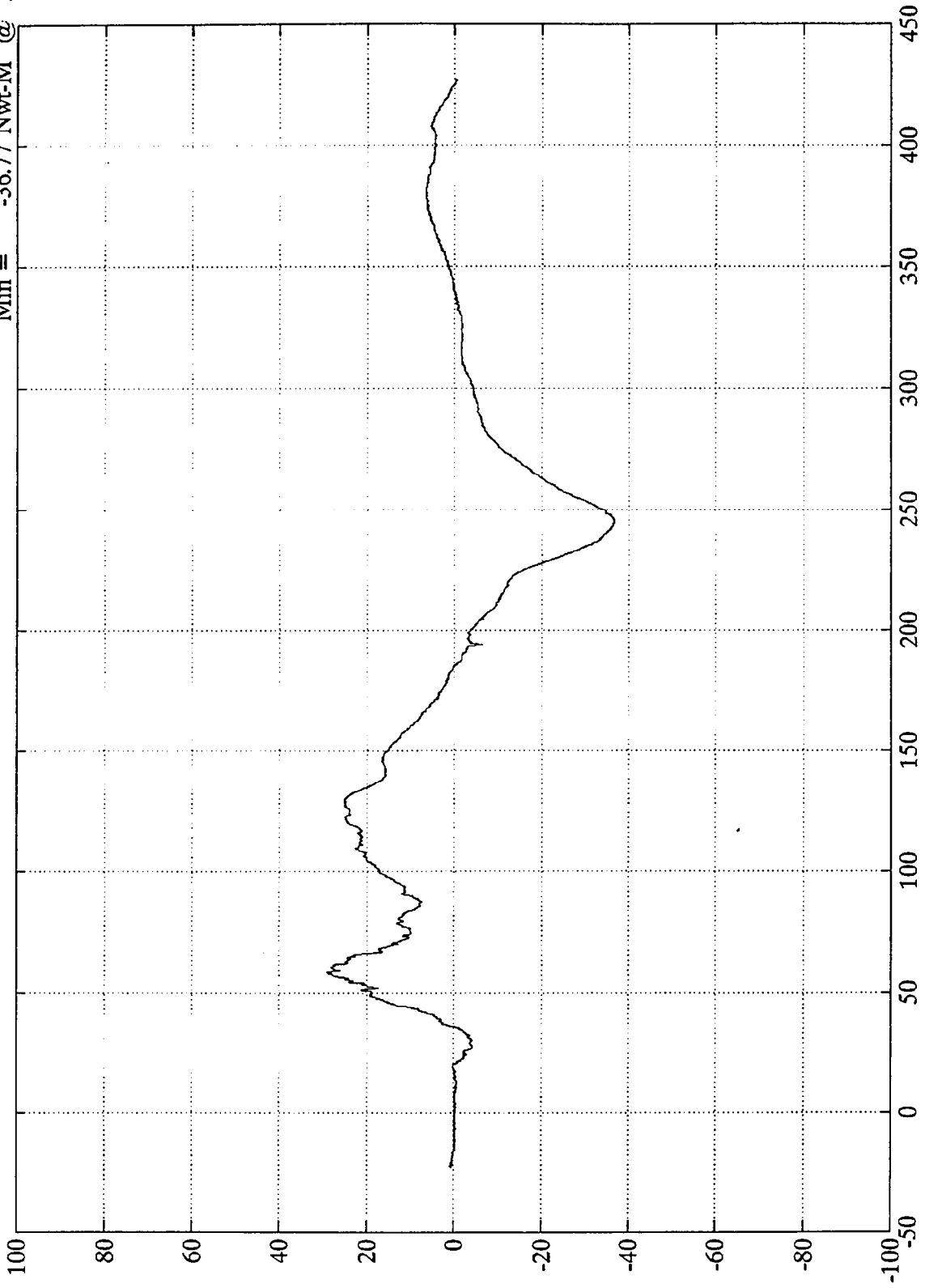
89-B
Nwt-M

8227-2

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Upper Neck My

Max = 29.06 Nwt-M @ 58.56 msec
Min = -36.77 Nwt-M @ 245.52 msec



Time (msec)

SAE Filter Class 600

Nwt-M

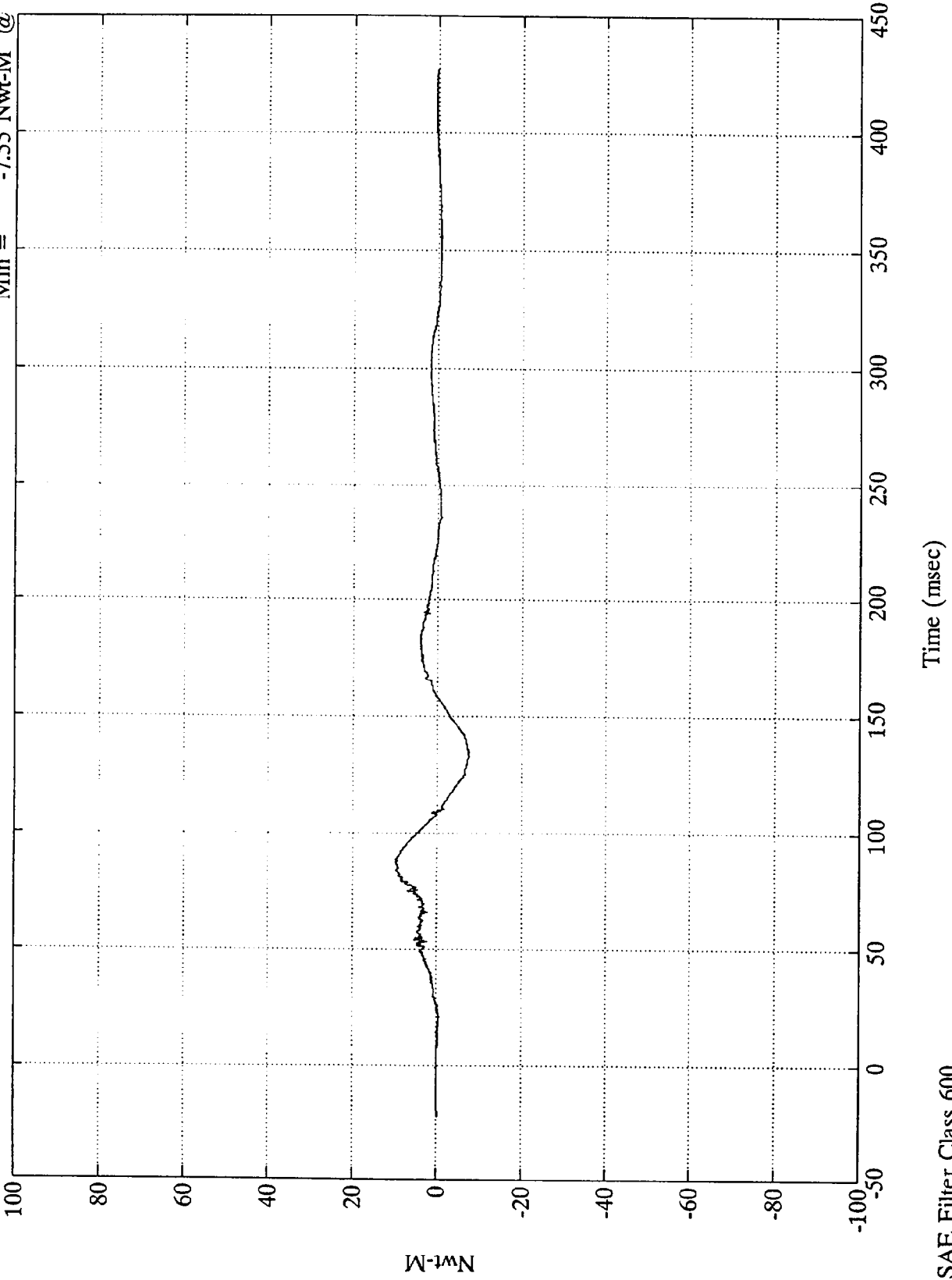
B-87

8227-2

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Upper Neck Mz

Max = 9.82 Nwt-M @ 87.84 msec
Min = -7.55 Nwt-M @ 133.08 msec



Nwt-M
B-88

8227-2

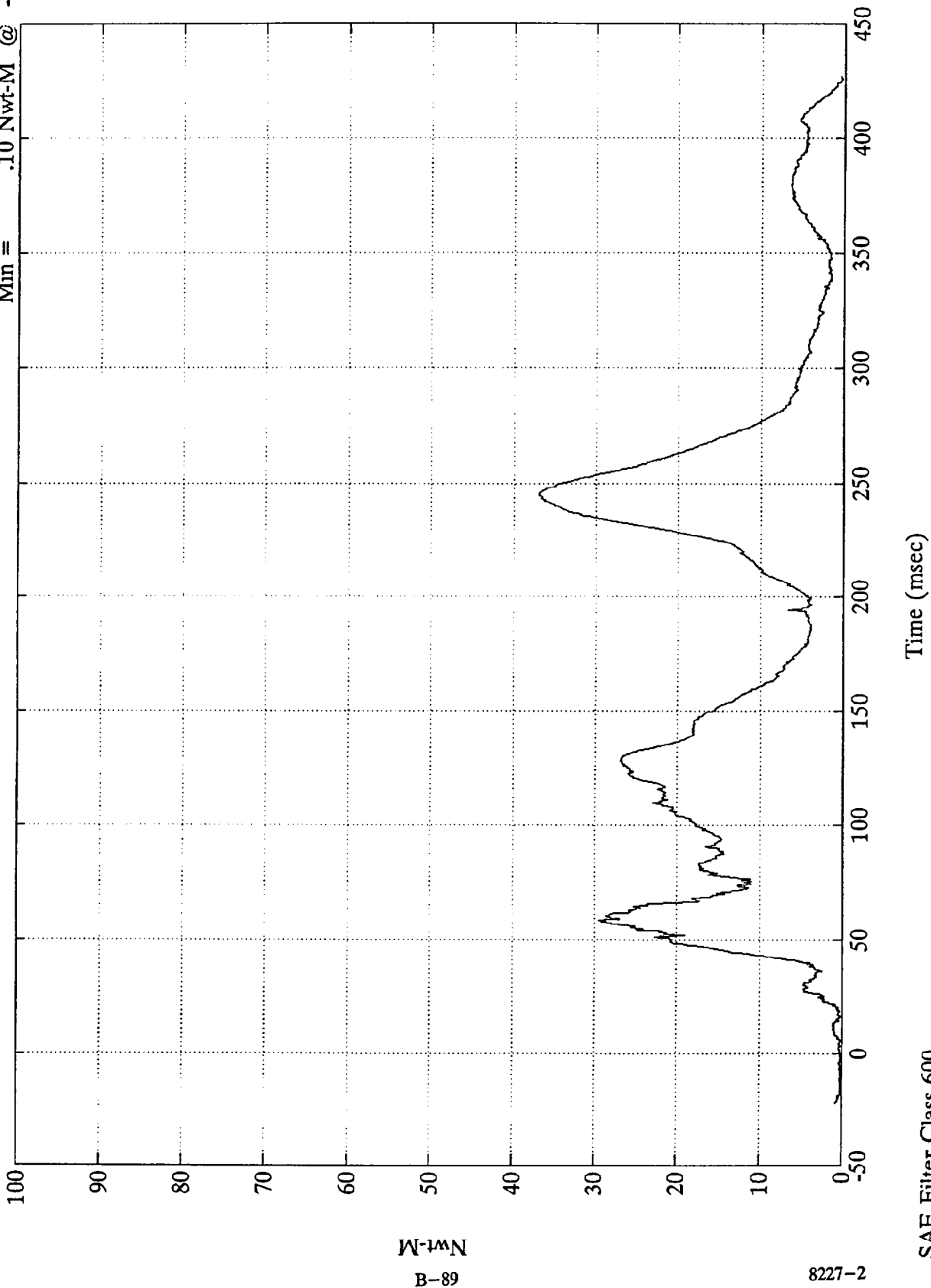
SAE Filter Class 600



NCAP TEST #2 - 1995 FORD ASPIRE

Max = 36.89 Nwt-M @ 245.52 msec
Min = .10 Nwt-M @ -10.32 msec

Pos. 1 Neck Moment Res.



B-89

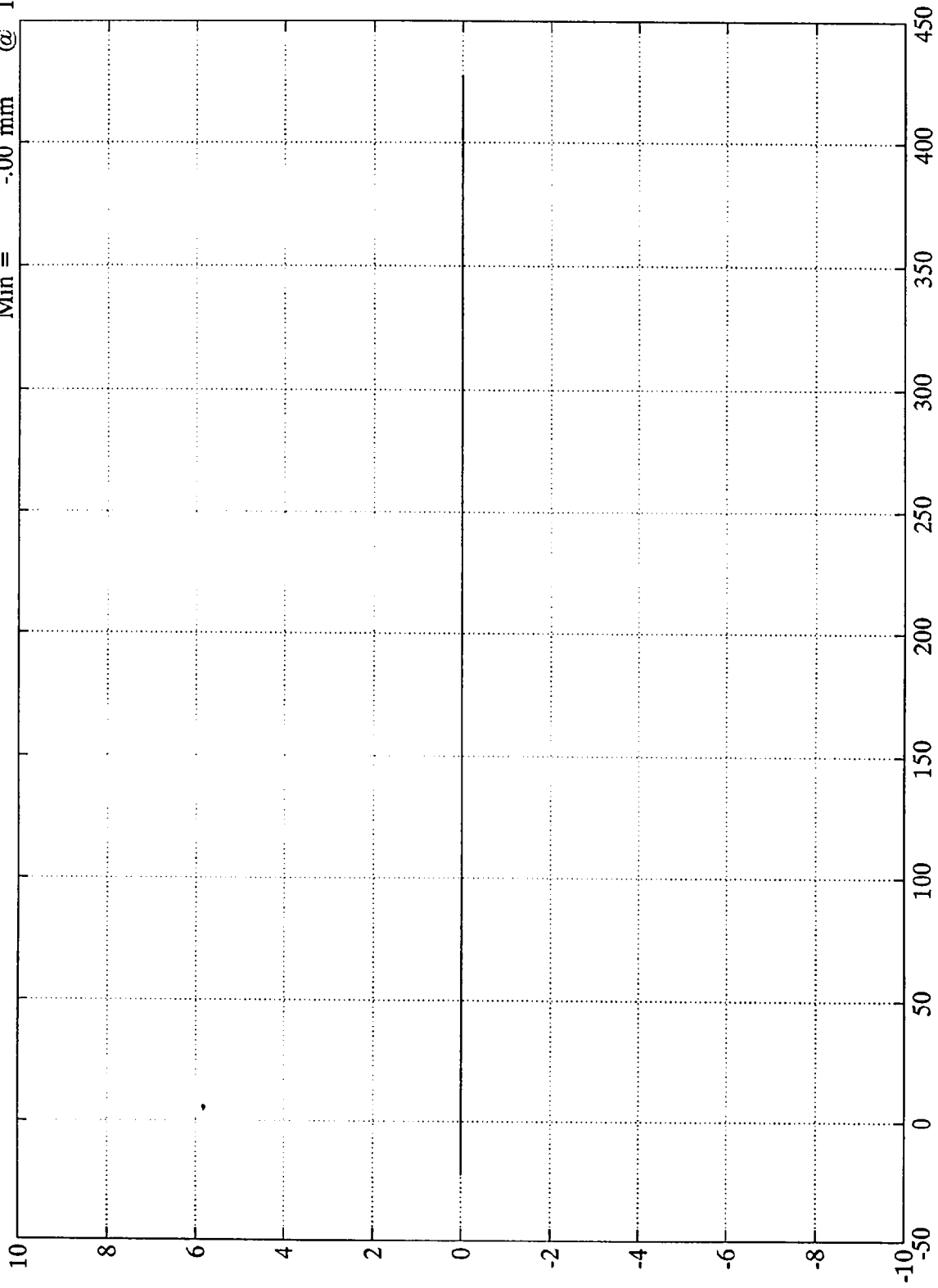
8227-2

SAE Filter Class 600

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Belt Elongation

Max = .01 mm @ 32.28 msec
Min = -.00 mm @ 199.08 msec



mm
B-90

8227-2

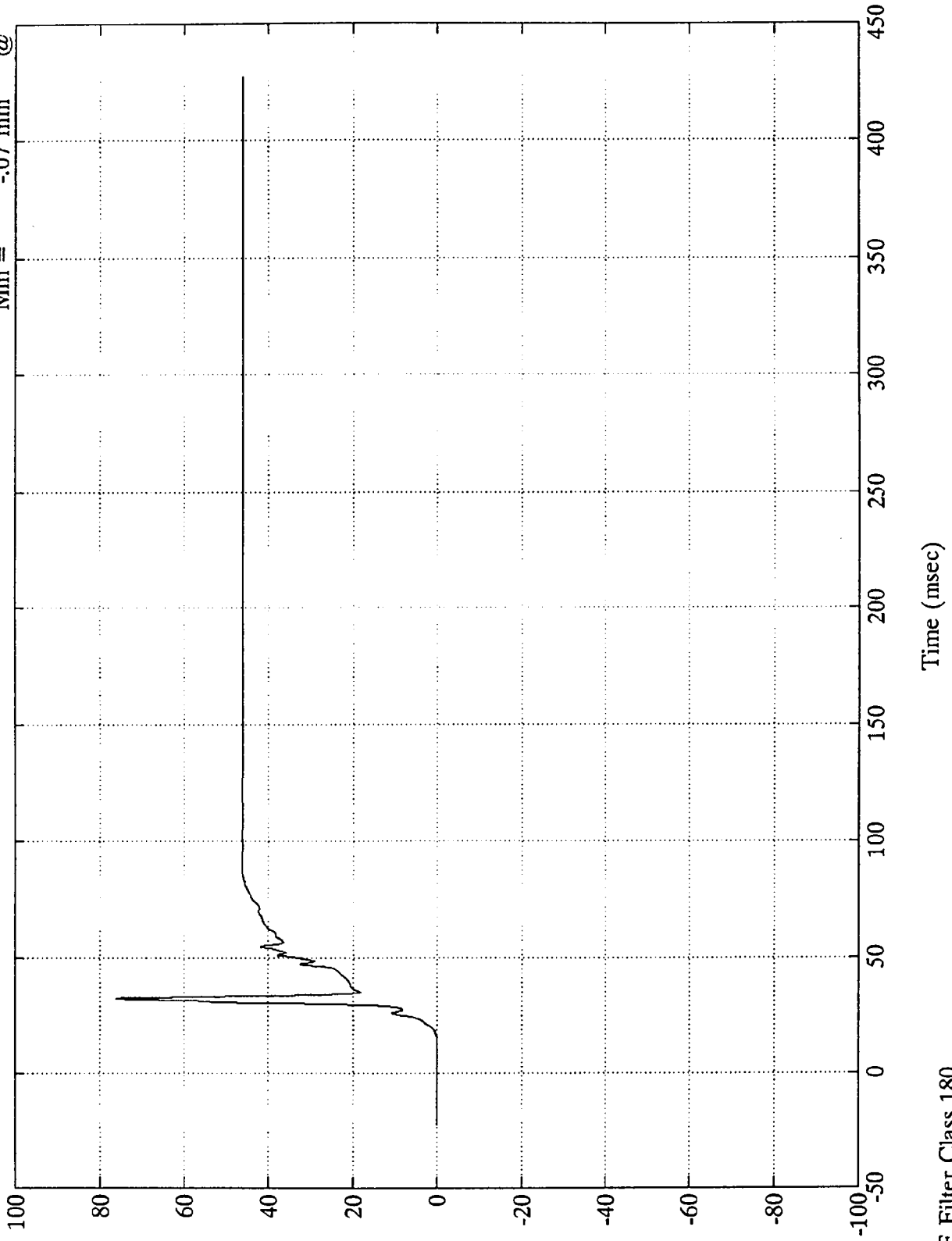
Time (msec)

SAE Filter Class 180

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Belt Spool Out

Max = 76.00 mm @ 32.15 msec
Min = -.07 mm @ 0.83 msec



mm
B-91

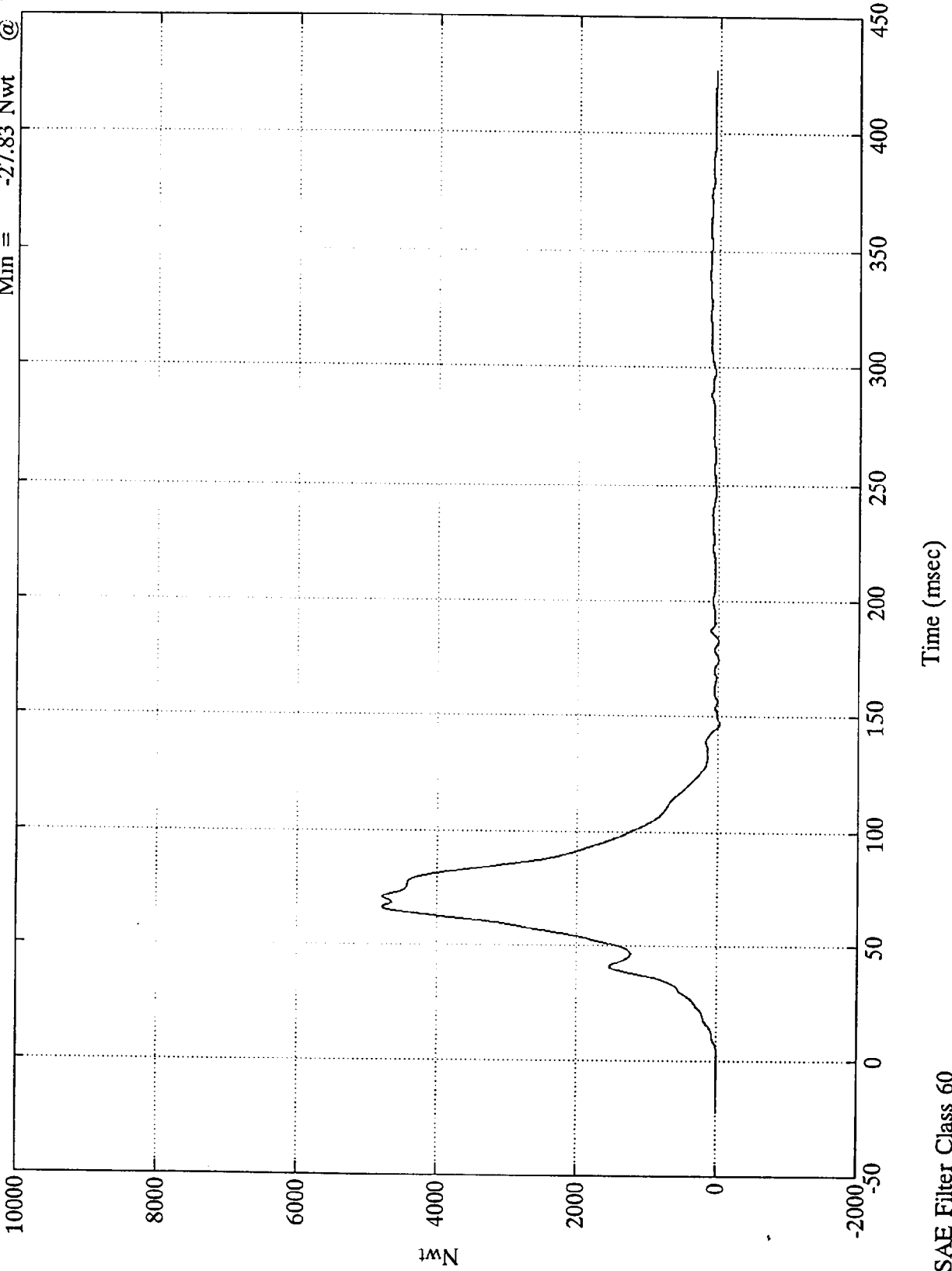
8227-2

SAE Filter Class 180

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Left Belt Load

Max = 4783.44 Nwt @ 66.00 msec
Min = -27.83 Nwt @ 146.52 msec



B-92

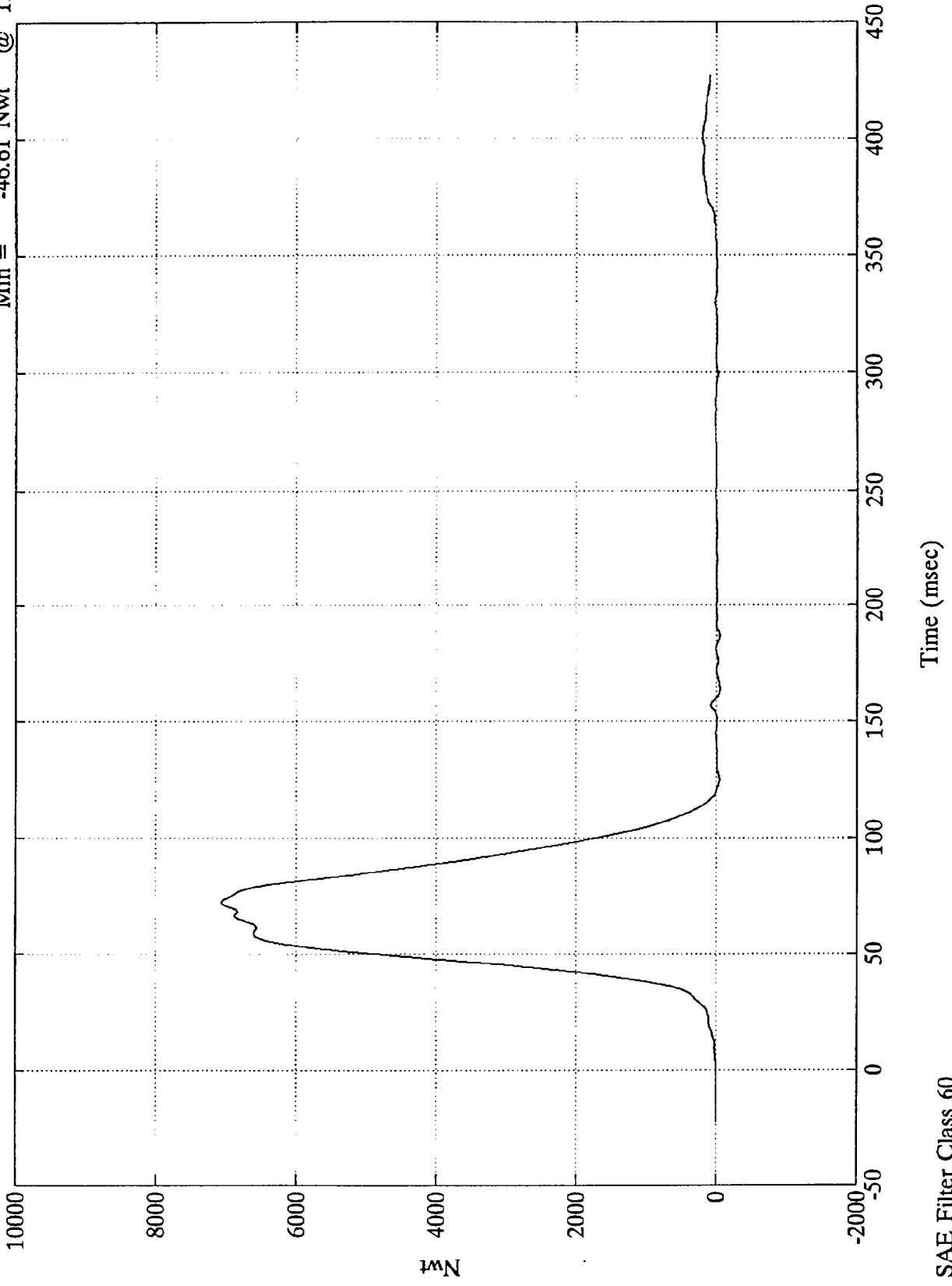
8227-2

SAE Filter Class 60

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 1 Torso Belt Load
Max = 7067.87 Nwt @ 72.36 msec
Min = -46.61 Nwt @ 125.04 msec



10000
8000
6000
4000
2000
0
-2000
Nwt
B-93

8227-2

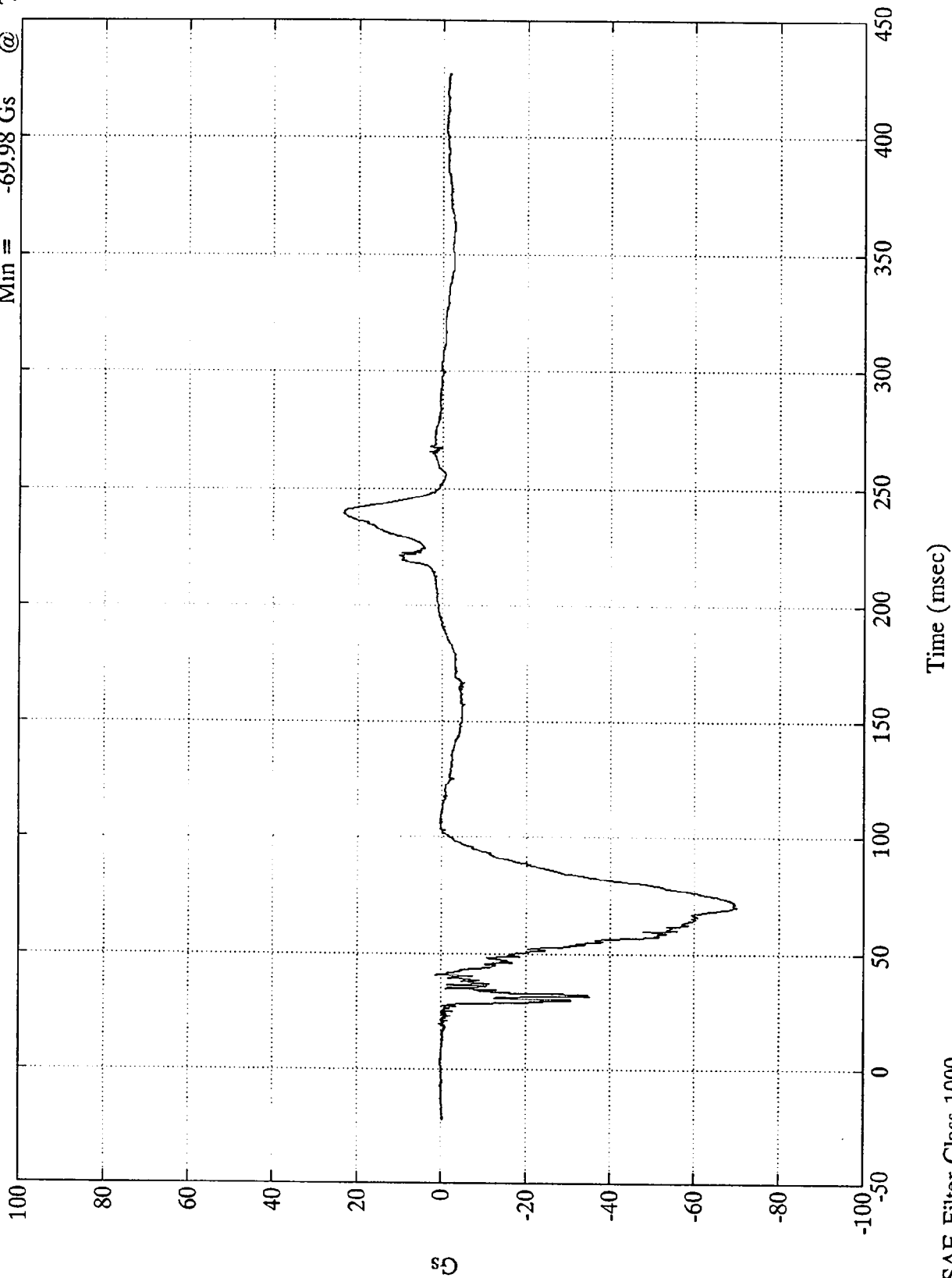
SAE Filter Class 60

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Head X

Max = 23.50 Gs @ 239.16 msec
Min = -69.98 Gs @ 70.20 msec



B-94

8227-2

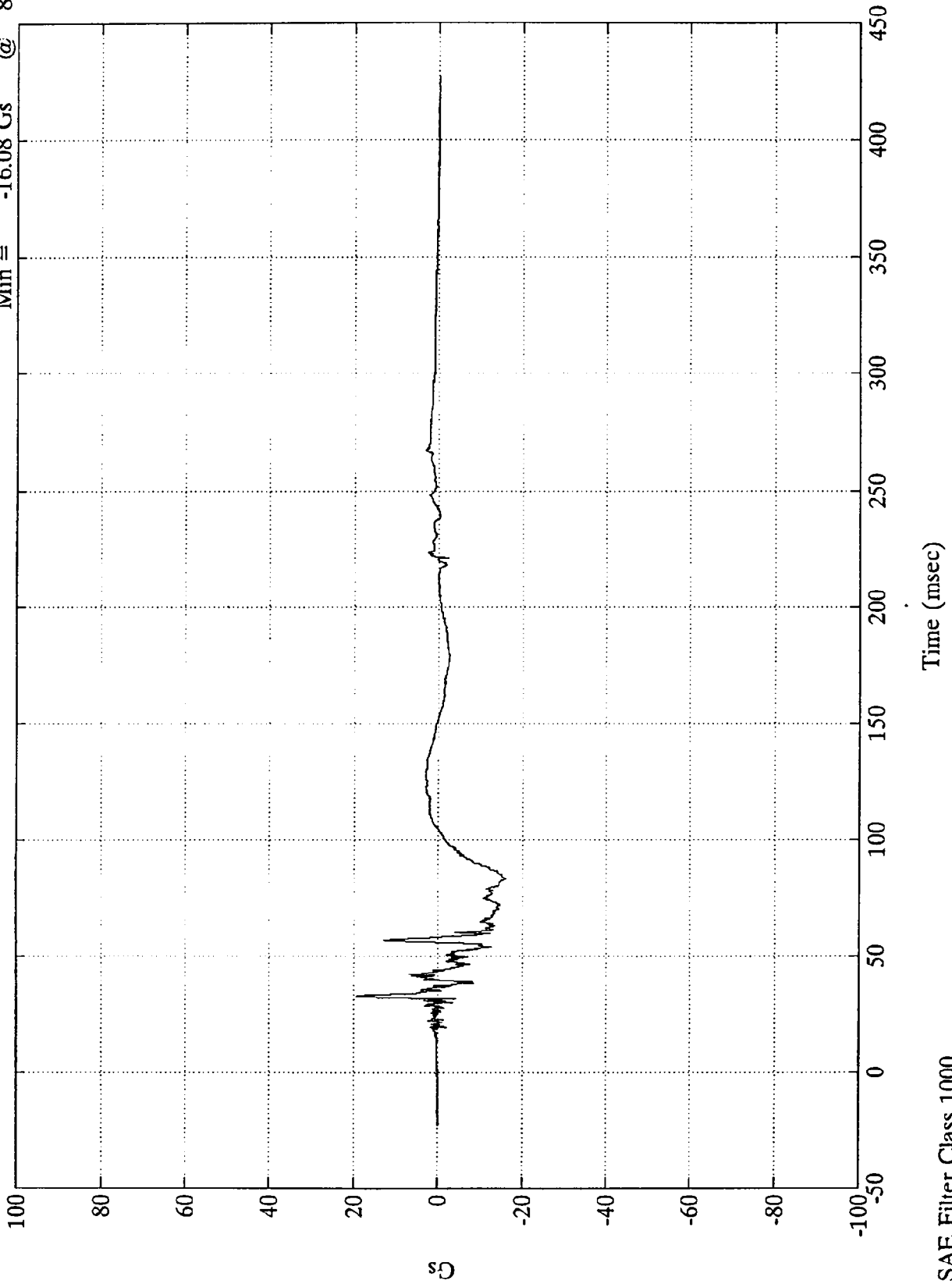
SAE Filter Class 1000

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Head Y

Max = 19.35 Gs @ 32.76 msec
Min = -16.08 Gs @ 83.16 msec



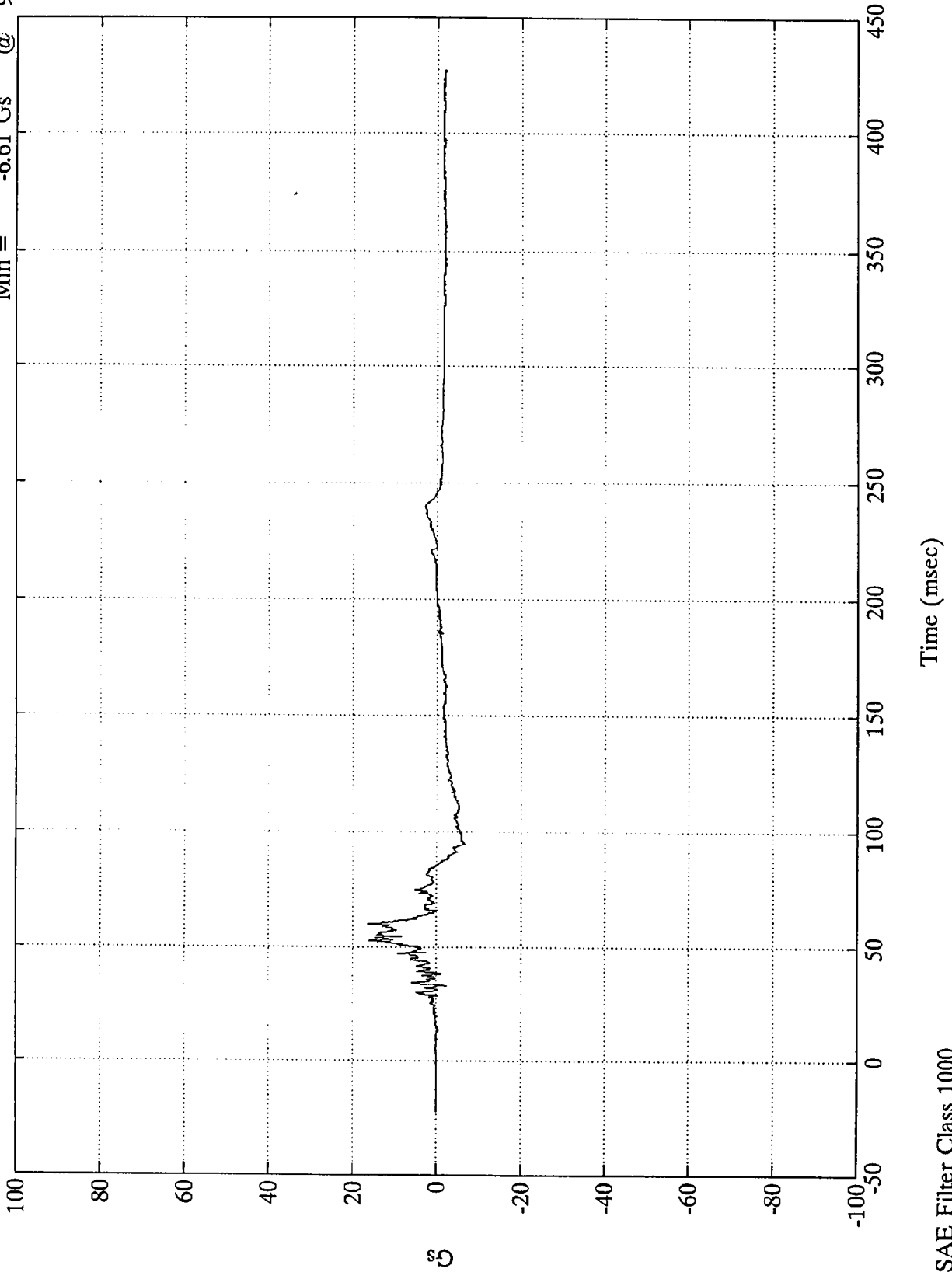
B-95

8227-2

SAE Filter Class 1000

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Head Z
Max = 16.30 Gs @ 60.00 msec
Min = -6.61 Gs @ 95.04 msec



B-96

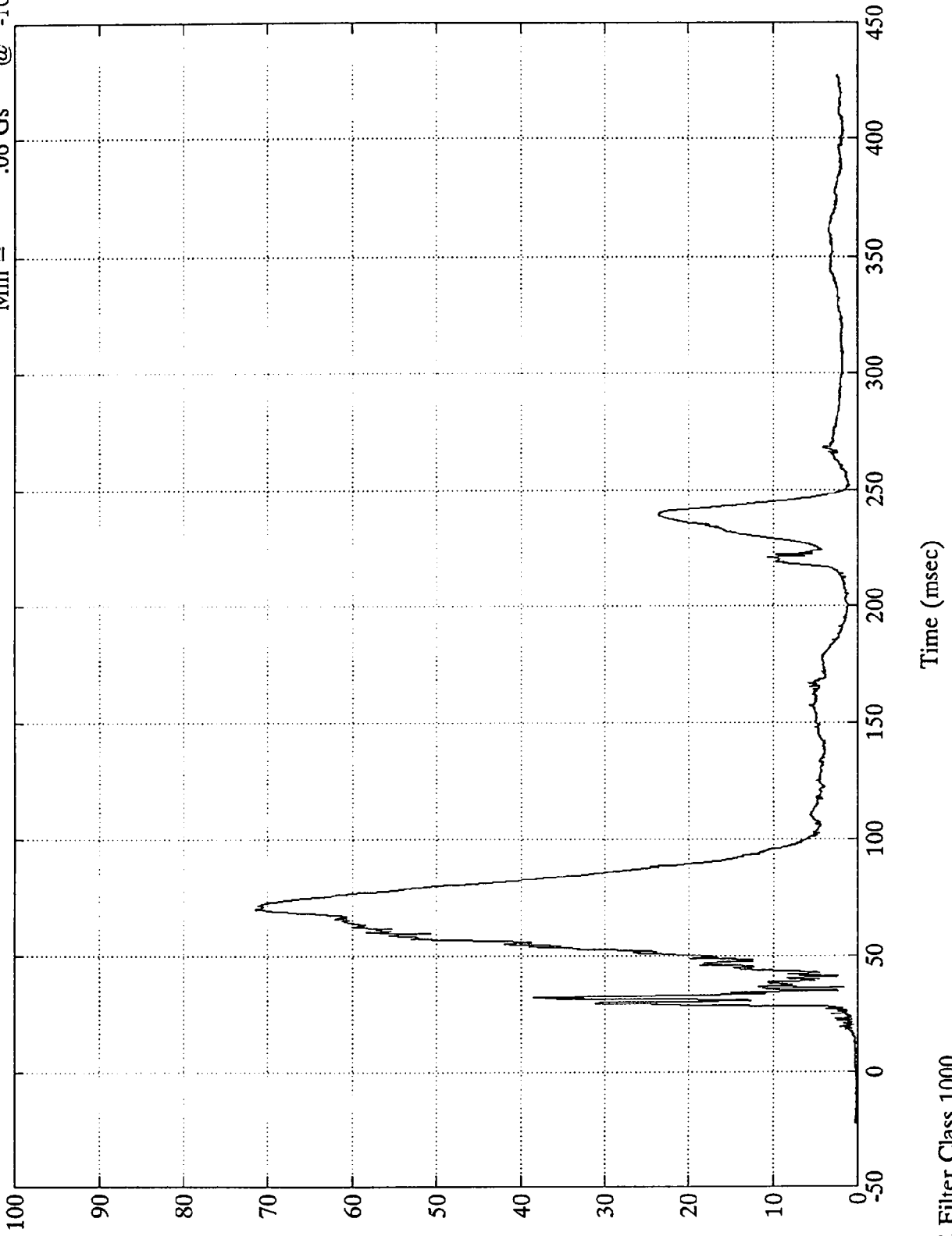
8227-2

SAE Filter Class 1000

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Head Resultant

Max = 71.49 Gs @ 69.96 msec
Min = .06 Gs @ -10.20 msec



89
B-97

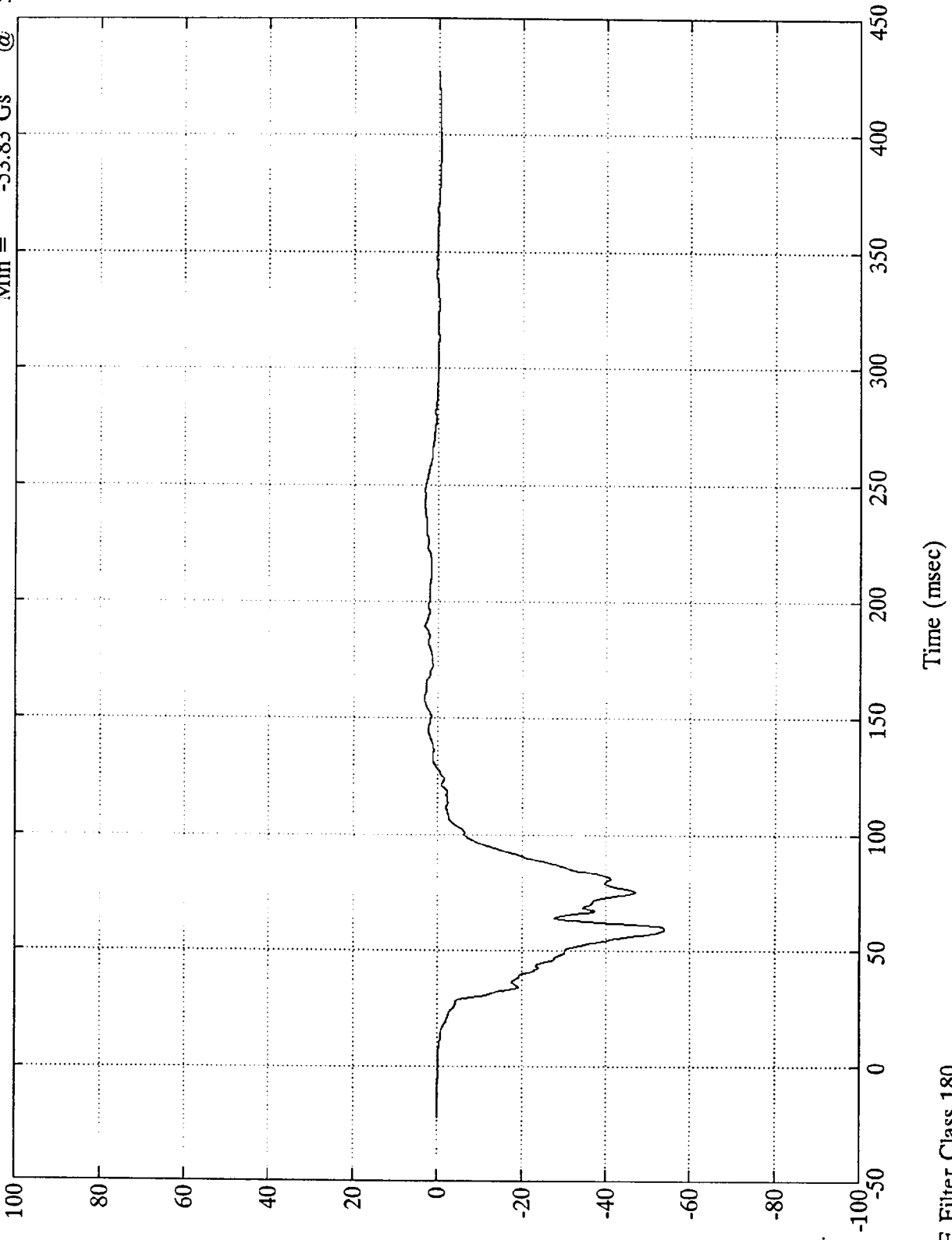
8227-2

SAE Filter Class 1000

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Chest X

Max = 3.16 Gs @ 242.16 msec
Min = -53.83 Gs @ 59.27 msec



SD
B-98

8227-2

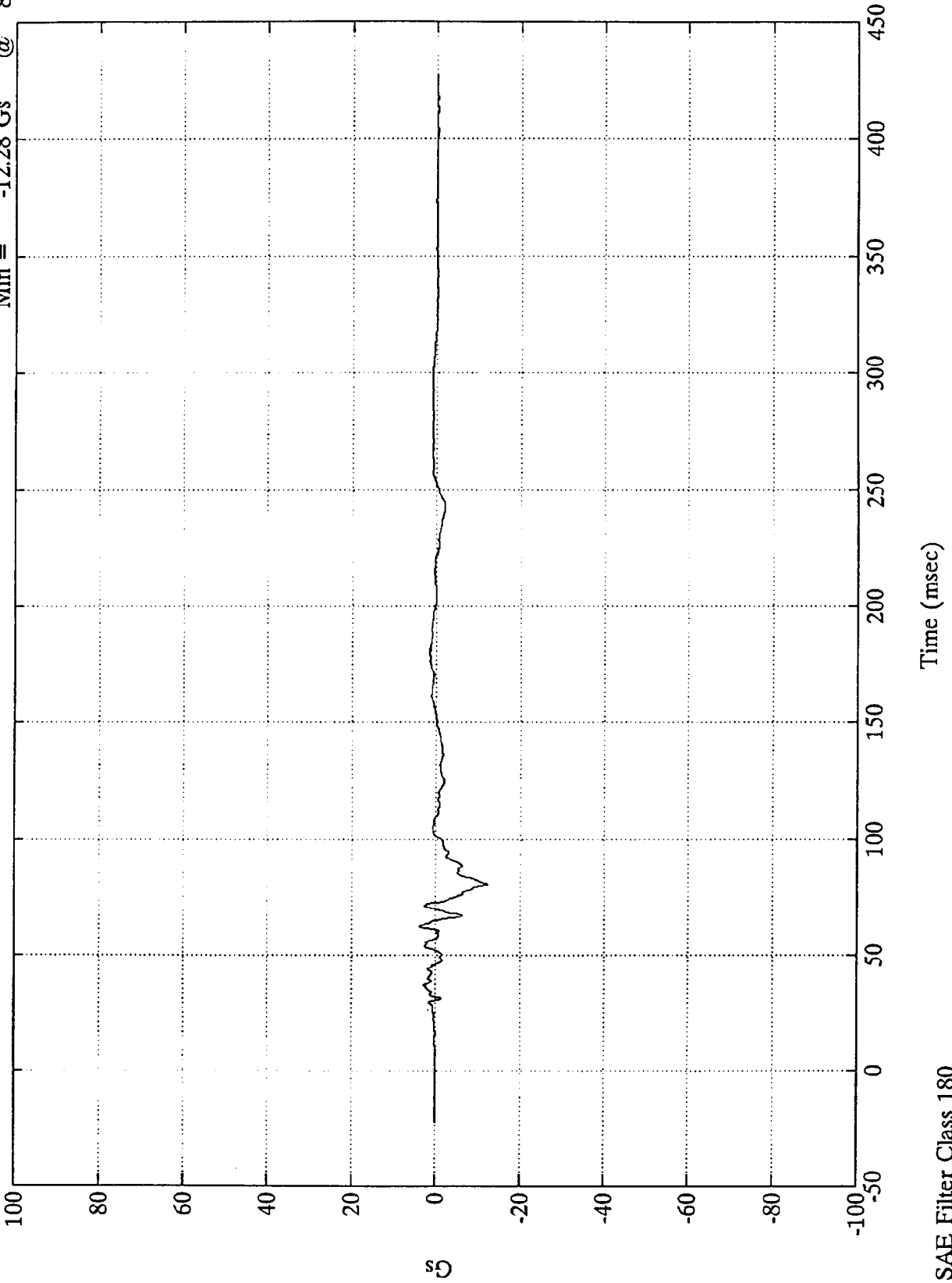
SAE Filter Class 180



NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Chest Y

Max = 3.79 Gs @ 62.28 msec
Min = -12.28 Gs @ 80.76 msec



SD
B-99

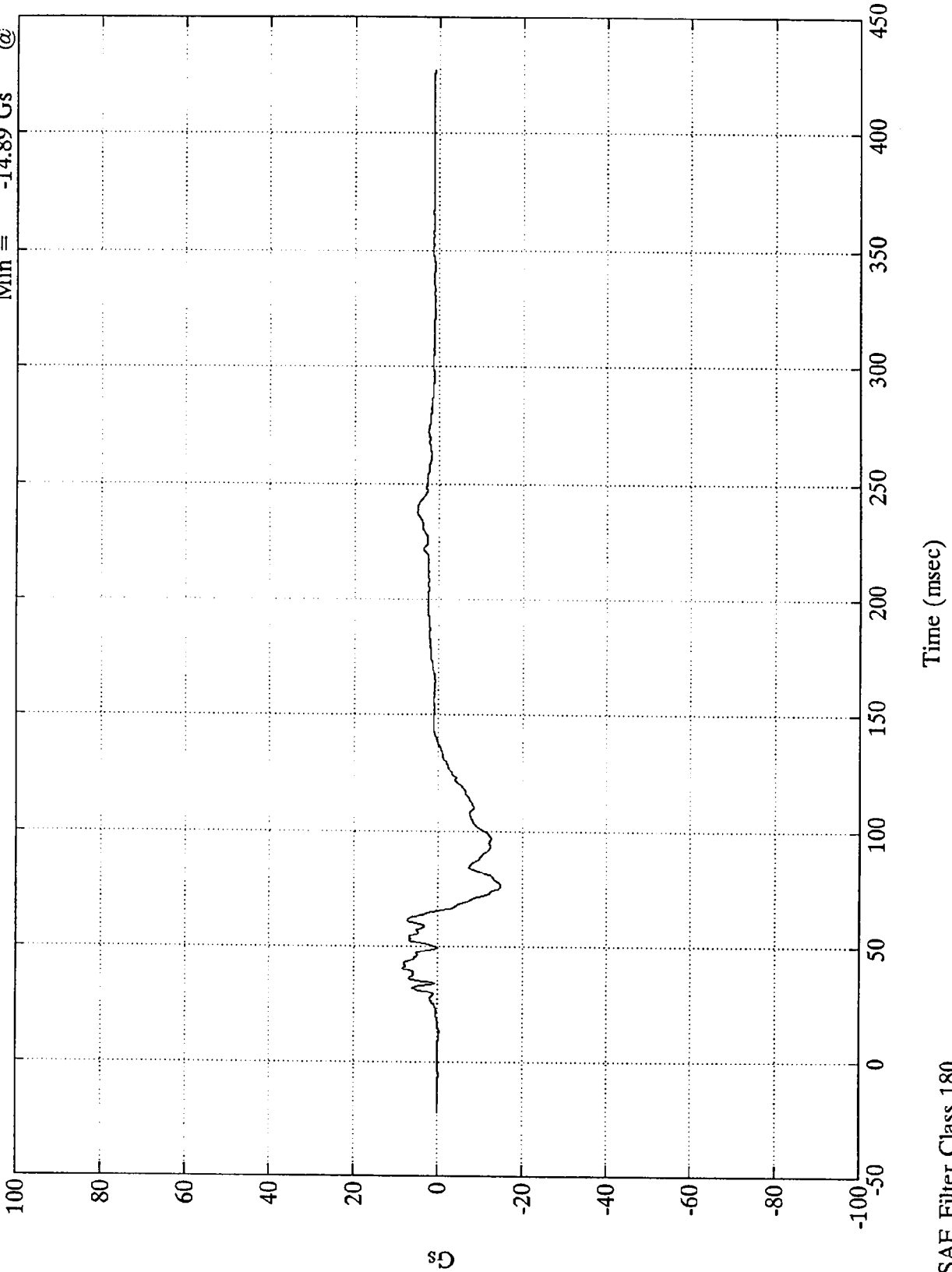
8227-2

SAE Filter Class 180

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Chest Z

Max = 8.42 Gs @ 40.44 msec
Min = -14.89 Gs @ 75.72 msec



B-100

8227-2

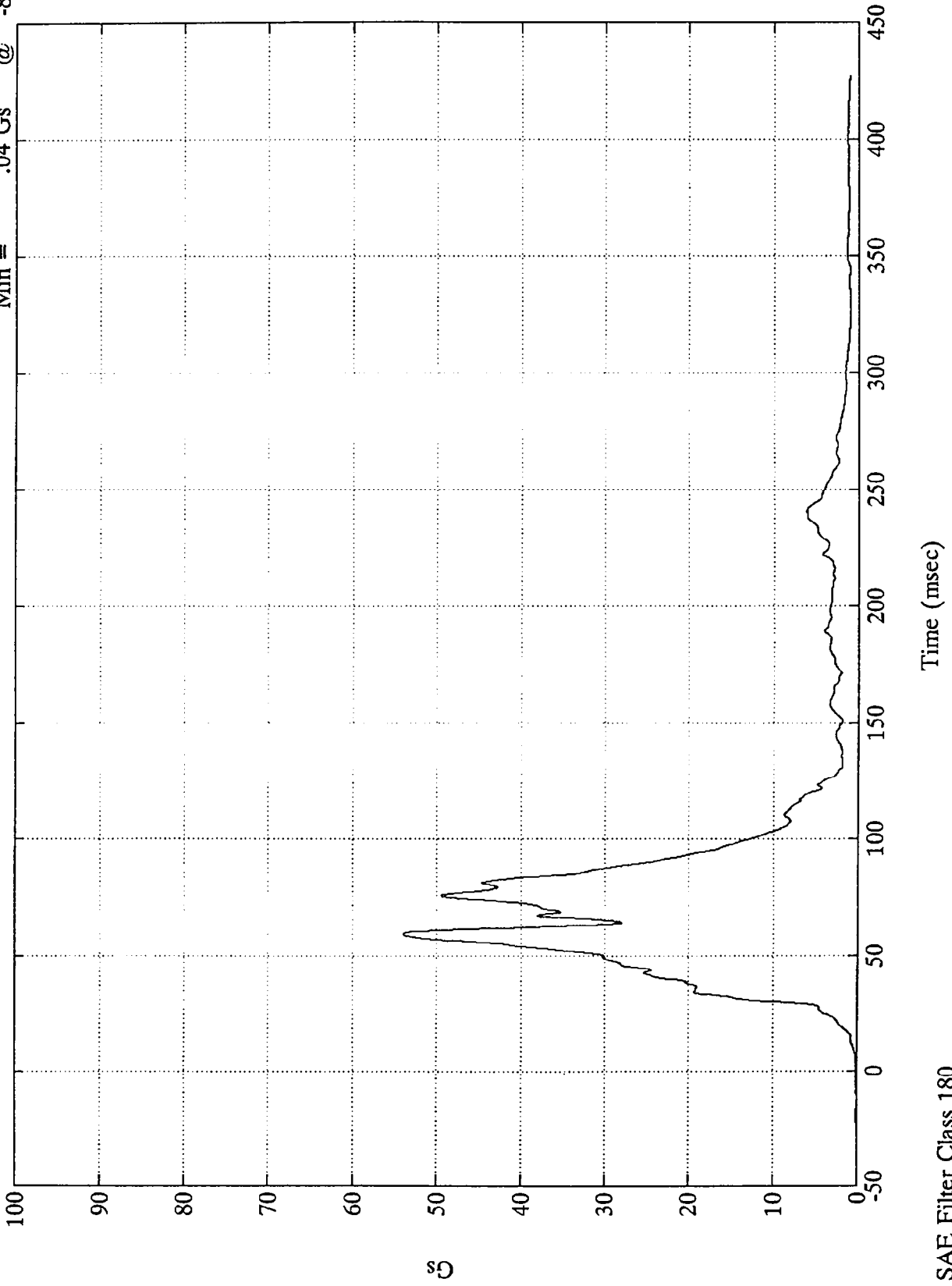
SAE Filter Class 180

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Chest Resultant

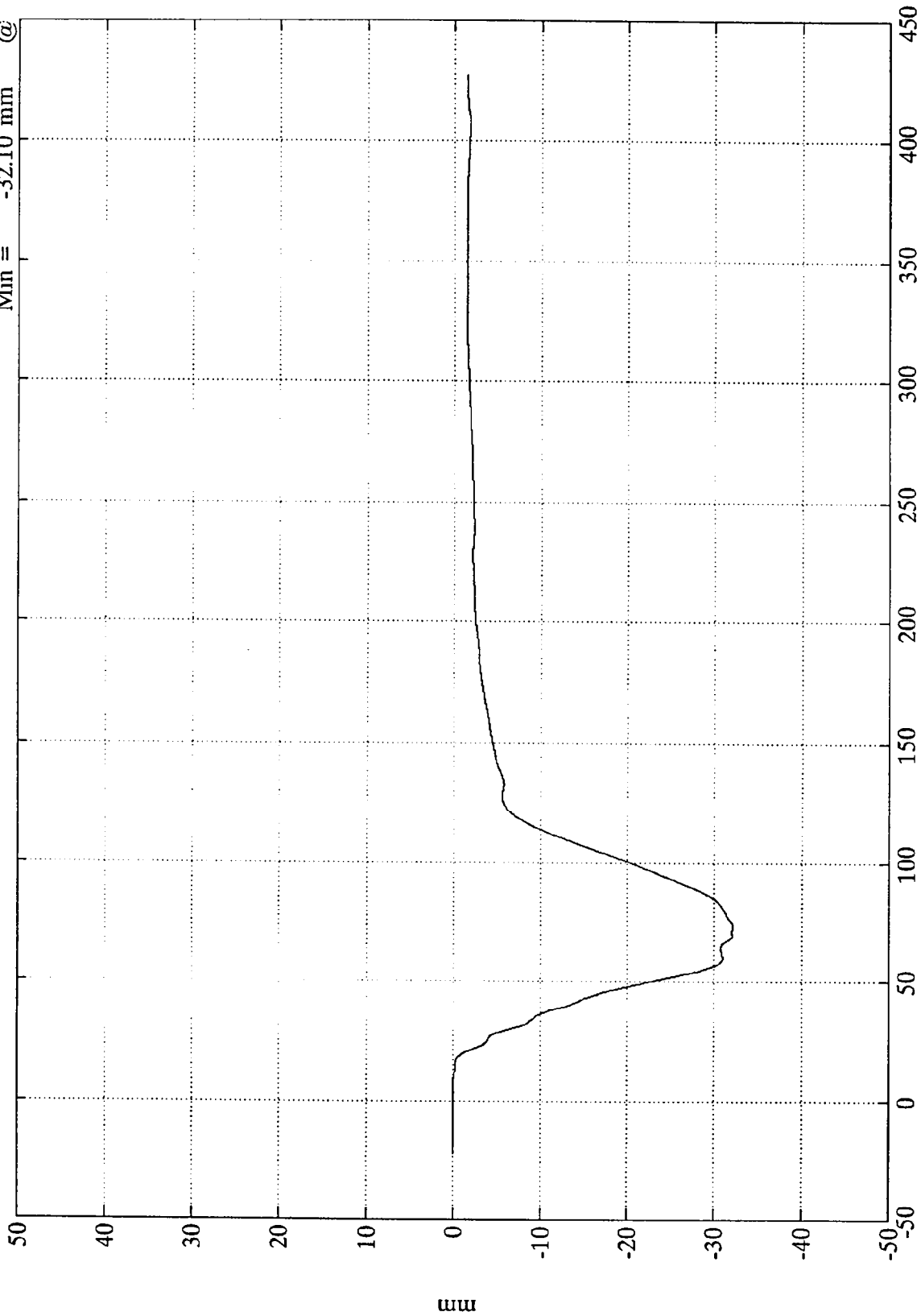
Max = 53.96 Gs @ 59.40 msec
Min = .04 Gs @ -8.28 msec



NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Chest Disp.

Max = .01 mm @ 7.67 msec
Min = -32.10 mm @ 72.12 msec



B-102

8227-2

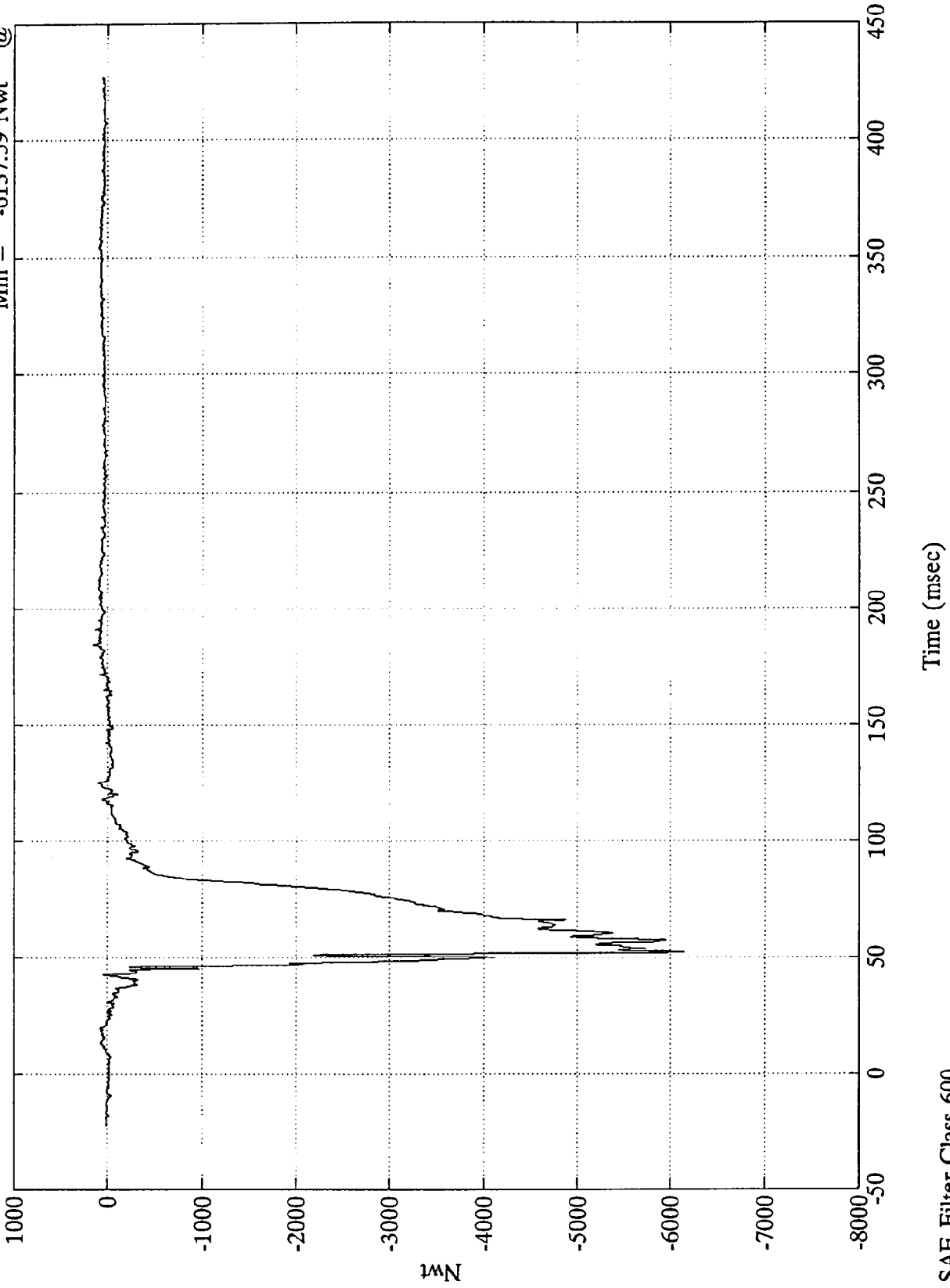
SAE Filter Class 180

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Max = 160.77 Nwt @ 184.55 msec
Min = -6137.59 Nwt @ 52.44 msec

Pos. 2 Left Femur



1N

B-103

8227-2

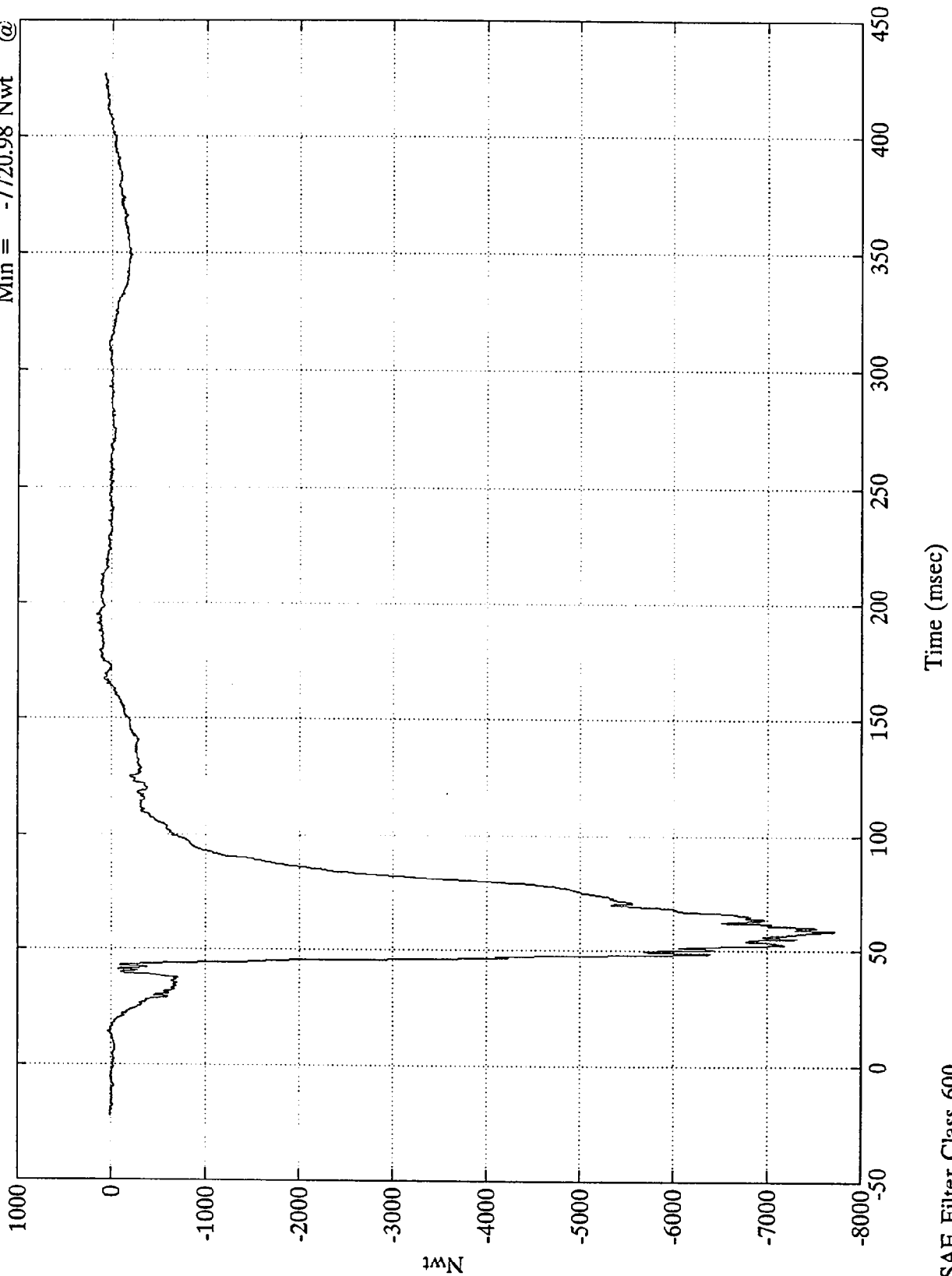
SAE Filter Class 600

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Right Femur

Max = 169.59 Nwt @ 195.12 msec
Min = -7720.98 Nwt @ 58.31 msec



Nwt

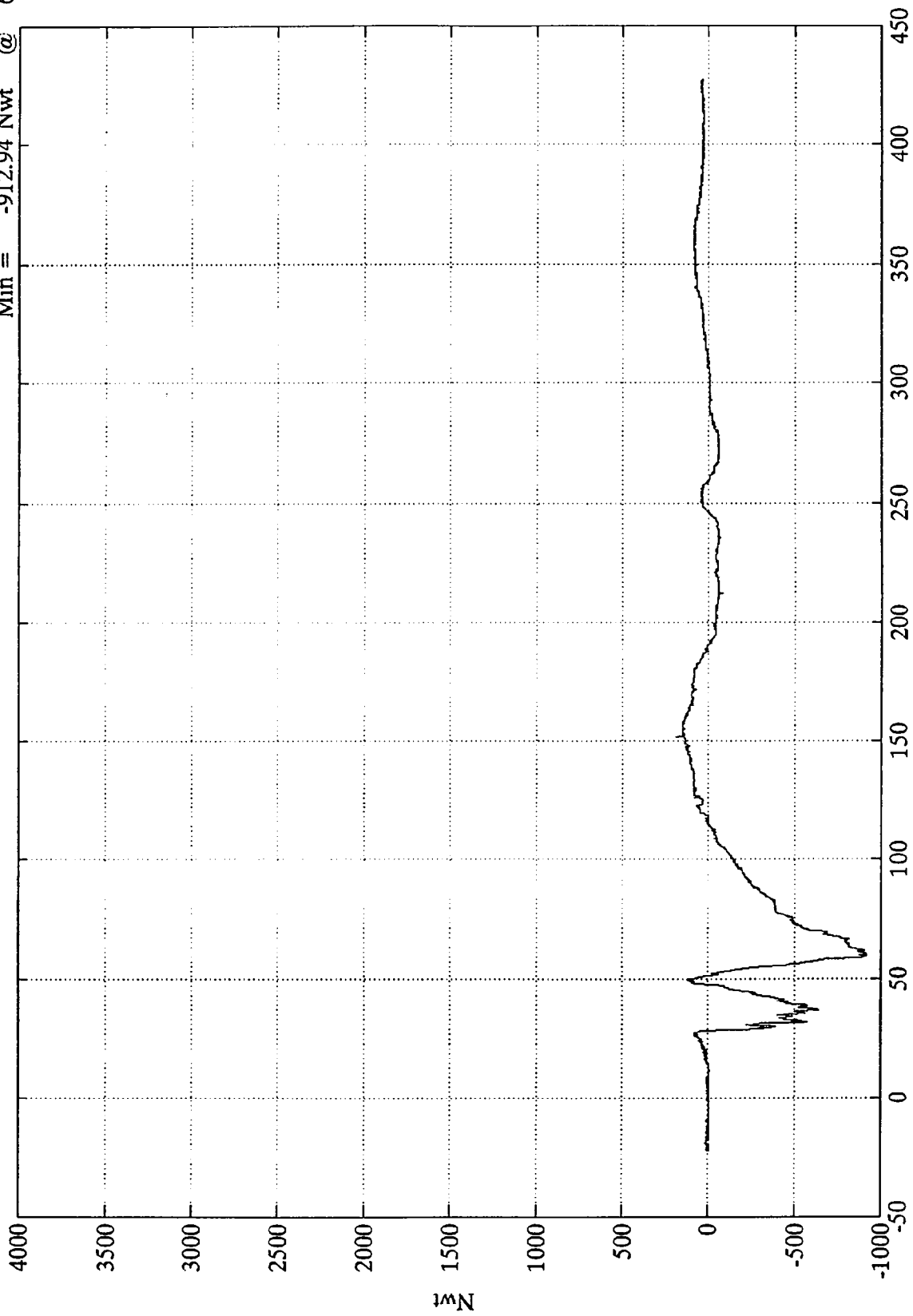
Time (msec)

SAE Filter Class 600

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Upper Neck Fx

Max = 188.15 Nwt @ 151.68 msec
Min = -912.94 Nwt @ 60.72 msec



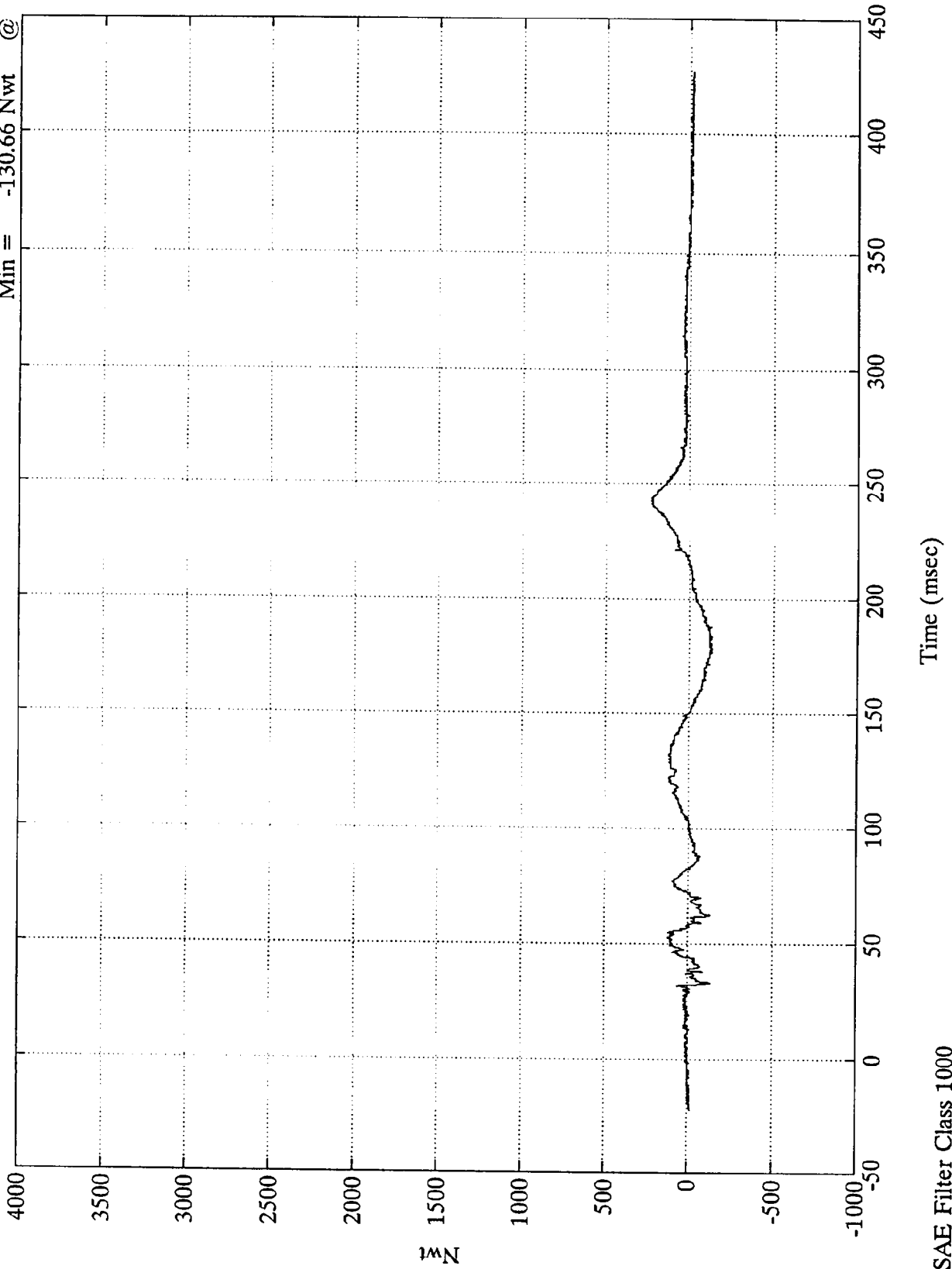
Time (msec)

SAE Filter Class 1000

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Upper Neck Fy

Max = 230.78 Nwt @ 243.48 msec
Min = -130.66 Nwt @ 188.04 msec



1mN
B-106

8227-2

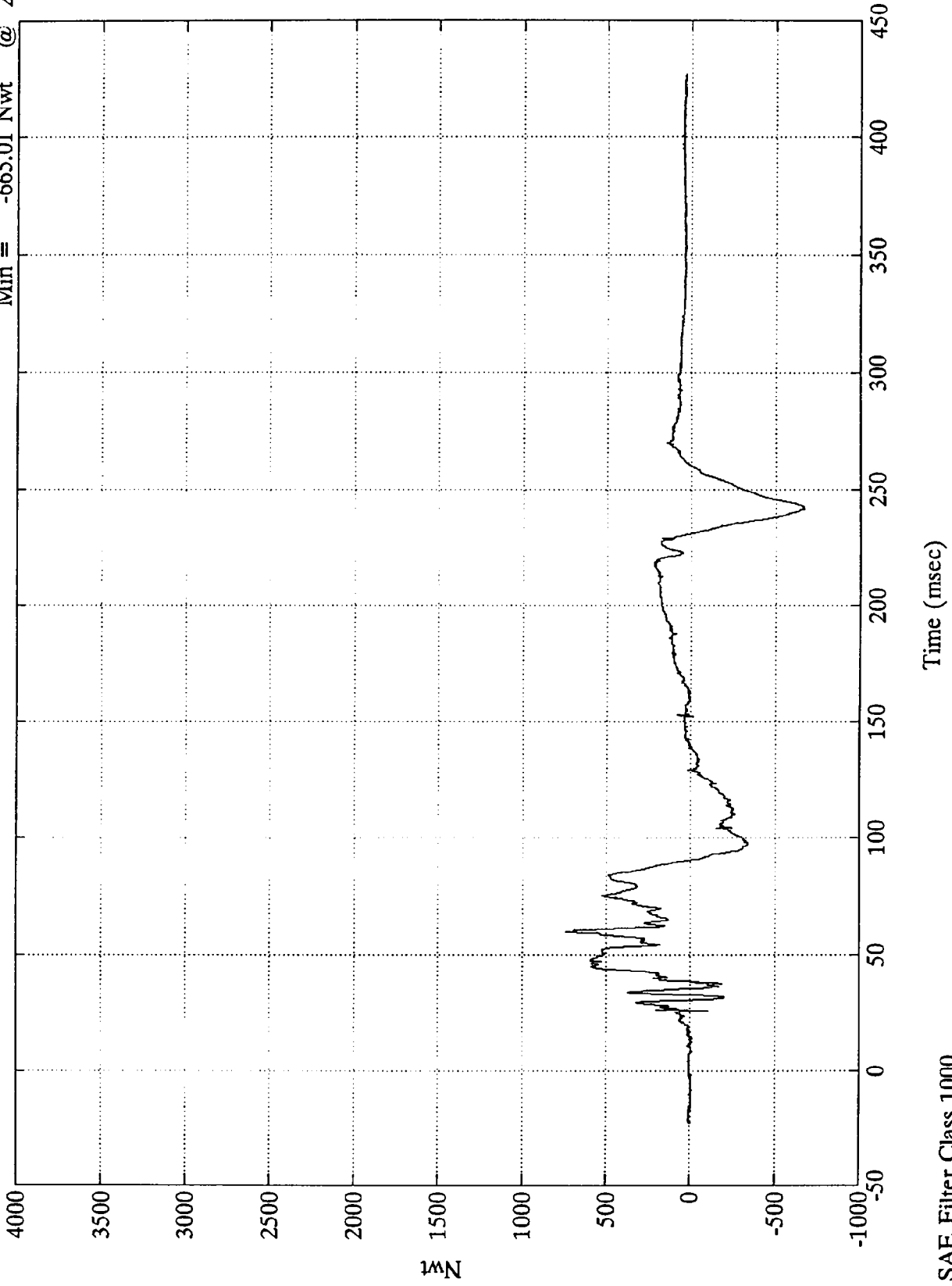
SAE Filter Class 1000

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Upper Neck Fz

Max = 741.27 Nwt @ 59.76 msec
Min = -665.01 Nwt @ 242.16 msec



1MN

B-107

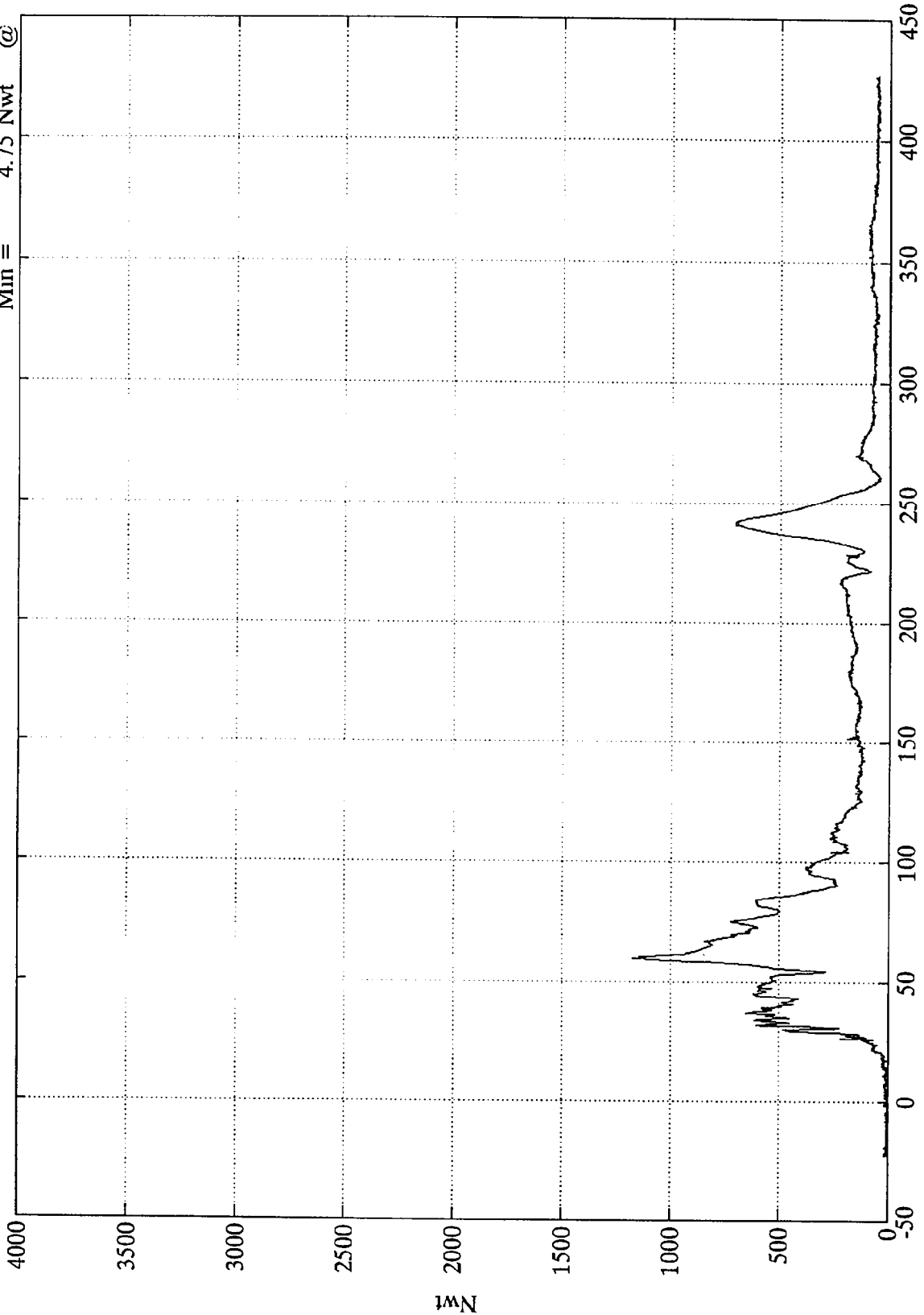
8227-2

SAE Filter Class 1000

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Neck Force Res.

Max = 1176.30 Nwt @ 59.76 msec
Min = 4.75 Nwt @ 14.15 msec



1mN

B-108

8227-2

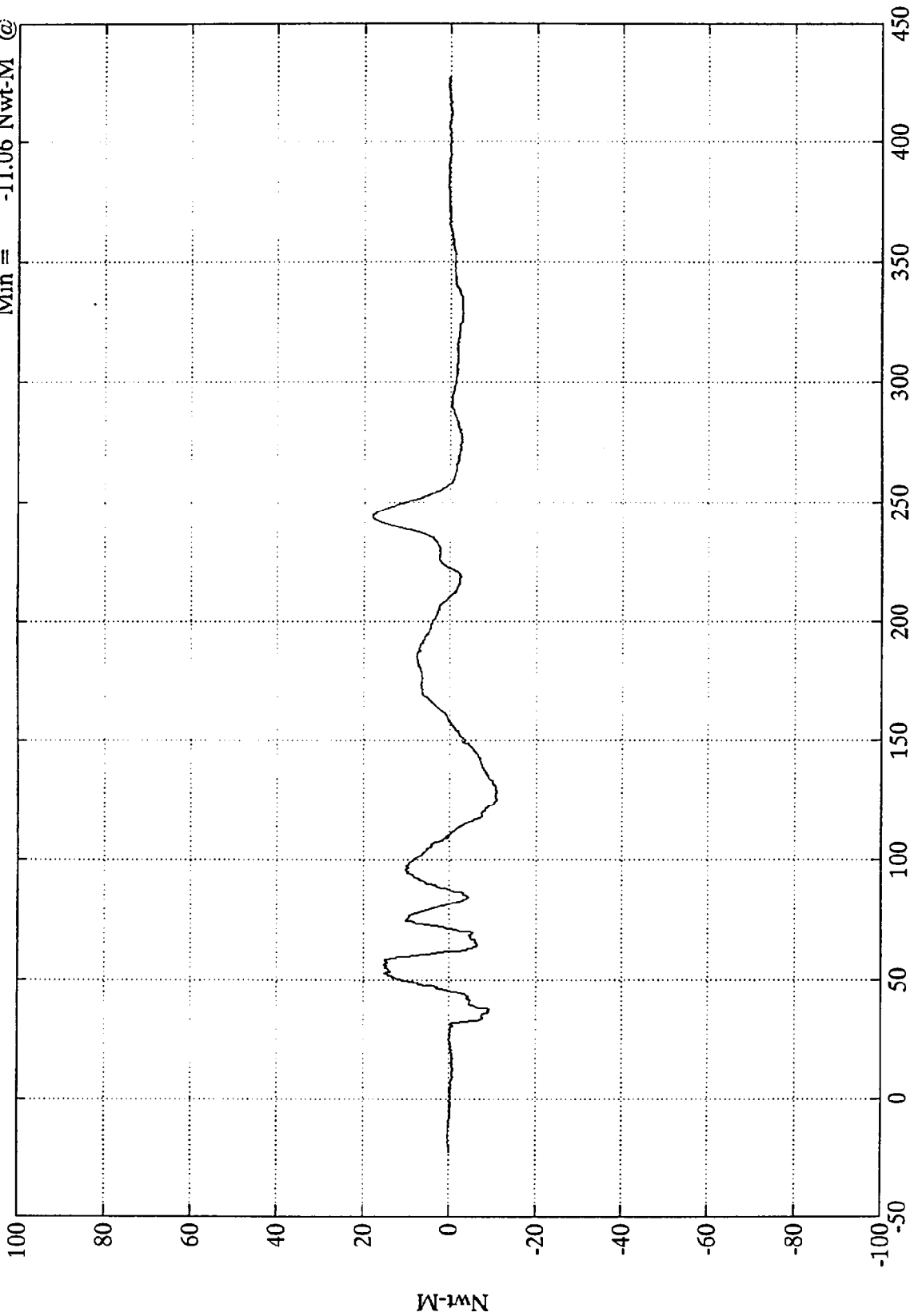
Time (msec)

SAE Filter Class 1000

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Upper Neck Mx

Max = 18.00 Nwt-M @ 244.20 msec
Min = -11.06 Nwt-M @ 125.16 msec



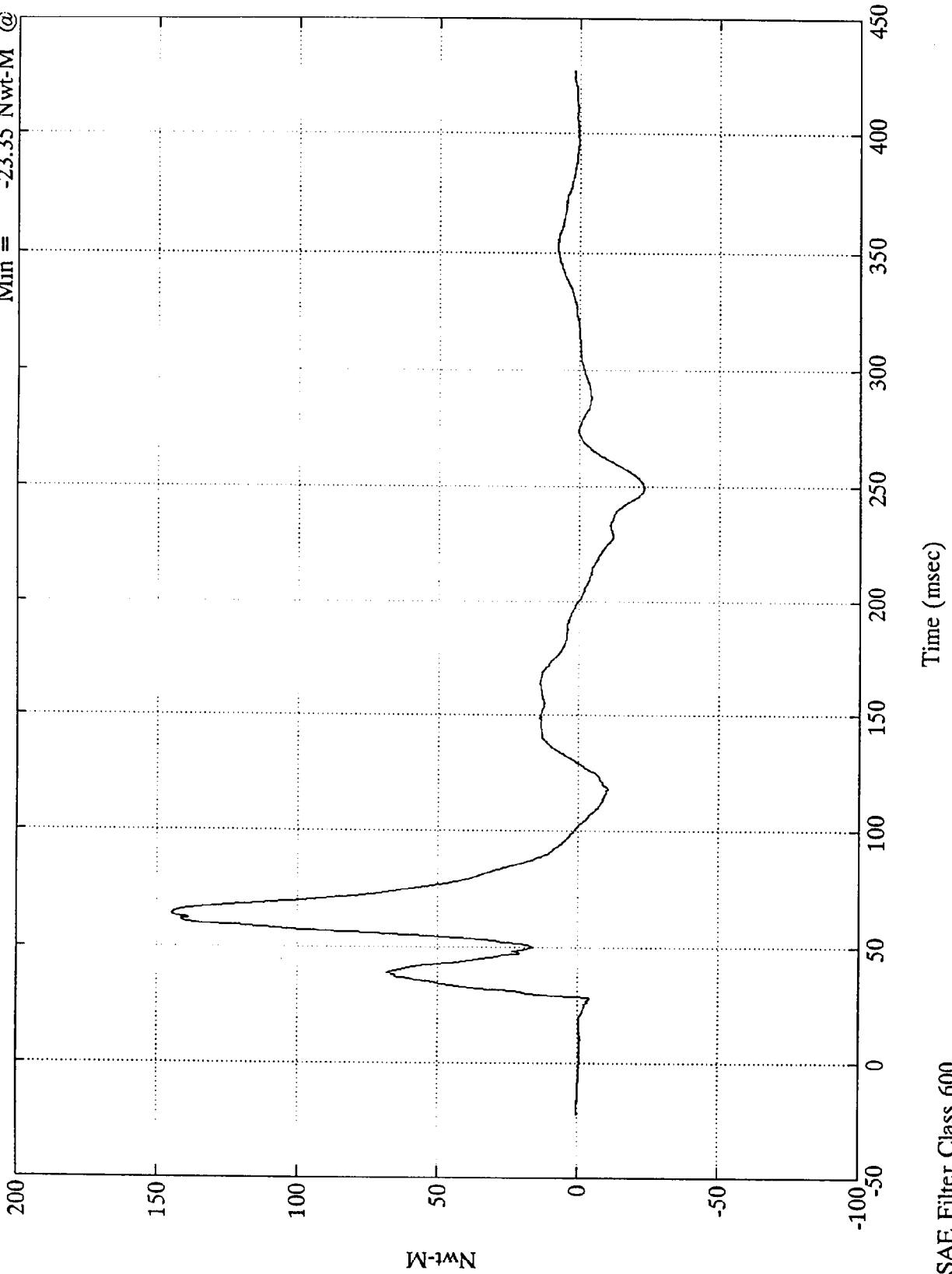
Time (msec)

SAE Filter Class 600

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Upper Neck My

Max = 144.78 Nwt-M @ 63.95 msec
Min = -23.35 Nwt-M @ 249.60 msec



Nwt-M

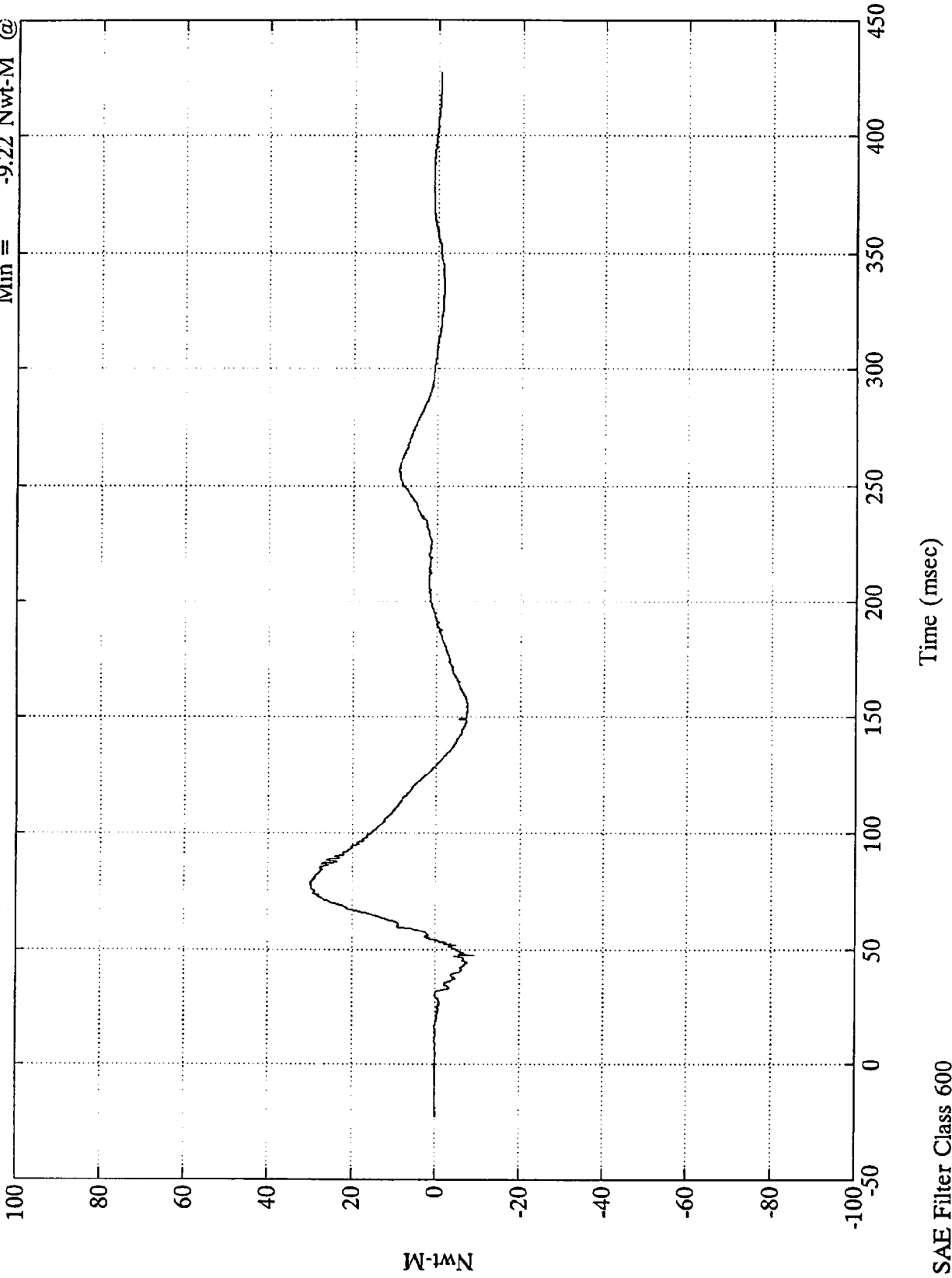
Time (msec)

SAE Filter Class 600

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Upper Neck Mz

Max = 30.02 Nwt-M @ 79.19 msec
Min = -9.22 Nwt-M @ 47.63 msec



Mz-Nwt-M
B-111

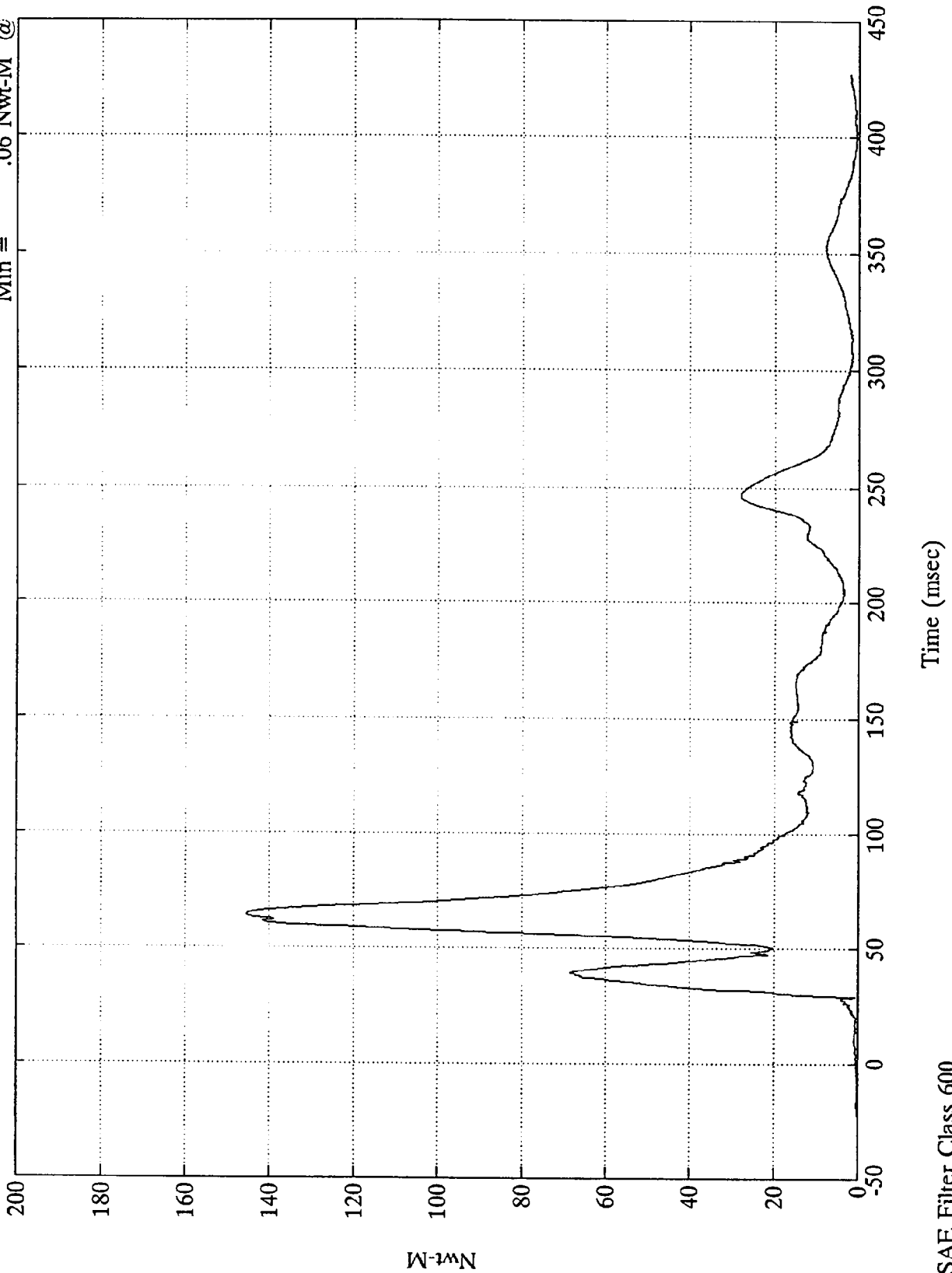
8227-2

SAE Filter Class 600

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Neck Moment Res.

Max = 145.47 Nwt-M @ 63.95 msec
Min = .06 Nwt-M @ -11.76 msec



Nwt-M

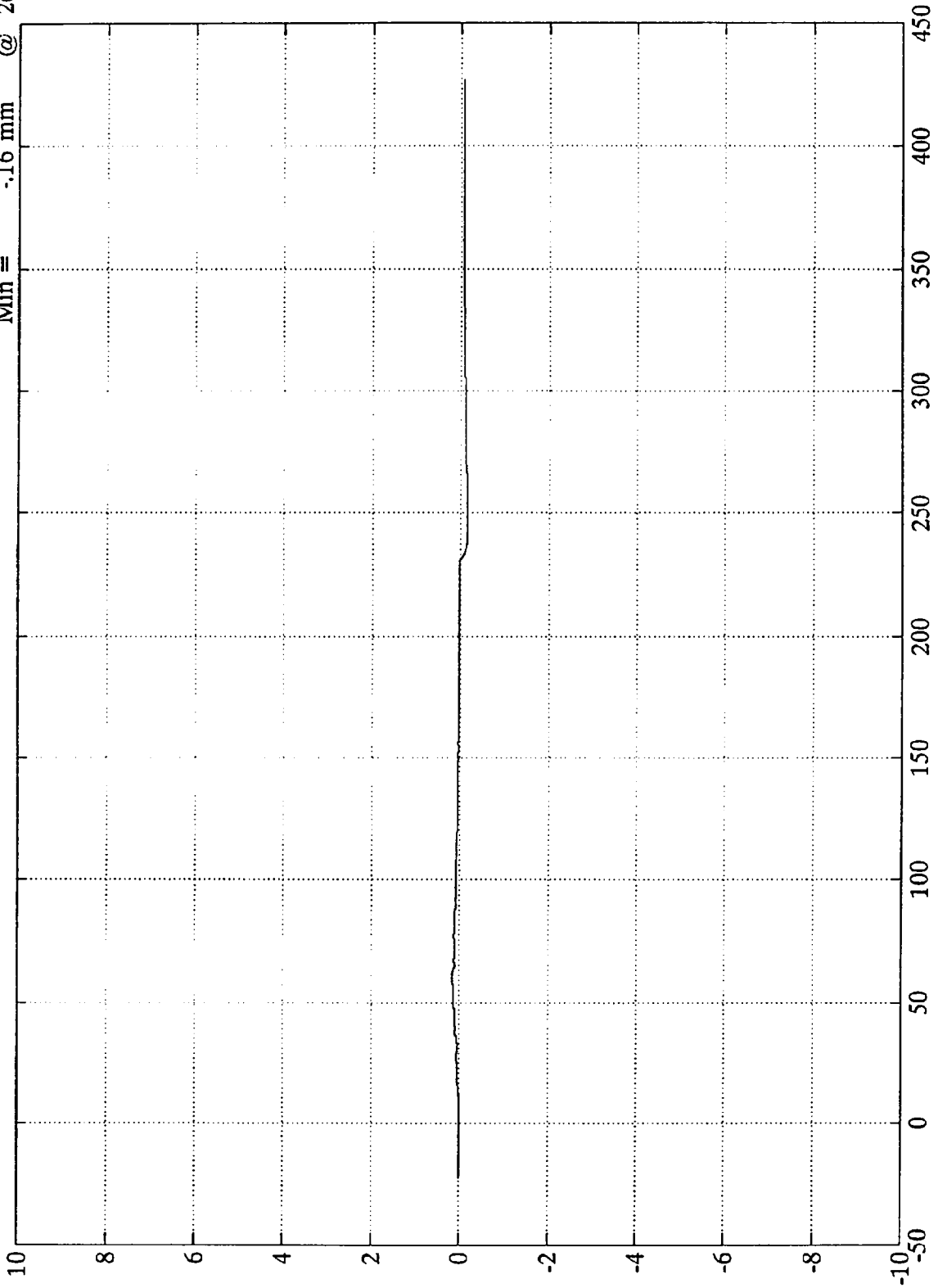
Time (msec)

SAE Filter Class 600

NCAP TEST #2 - 1995 FORD ASPIRE

Max = .16 mm @ 59.15 msec
Min = -.16 mm @ 264.96 msec

Pos. 2 Belt Elongation



mm
B-113

8227-2

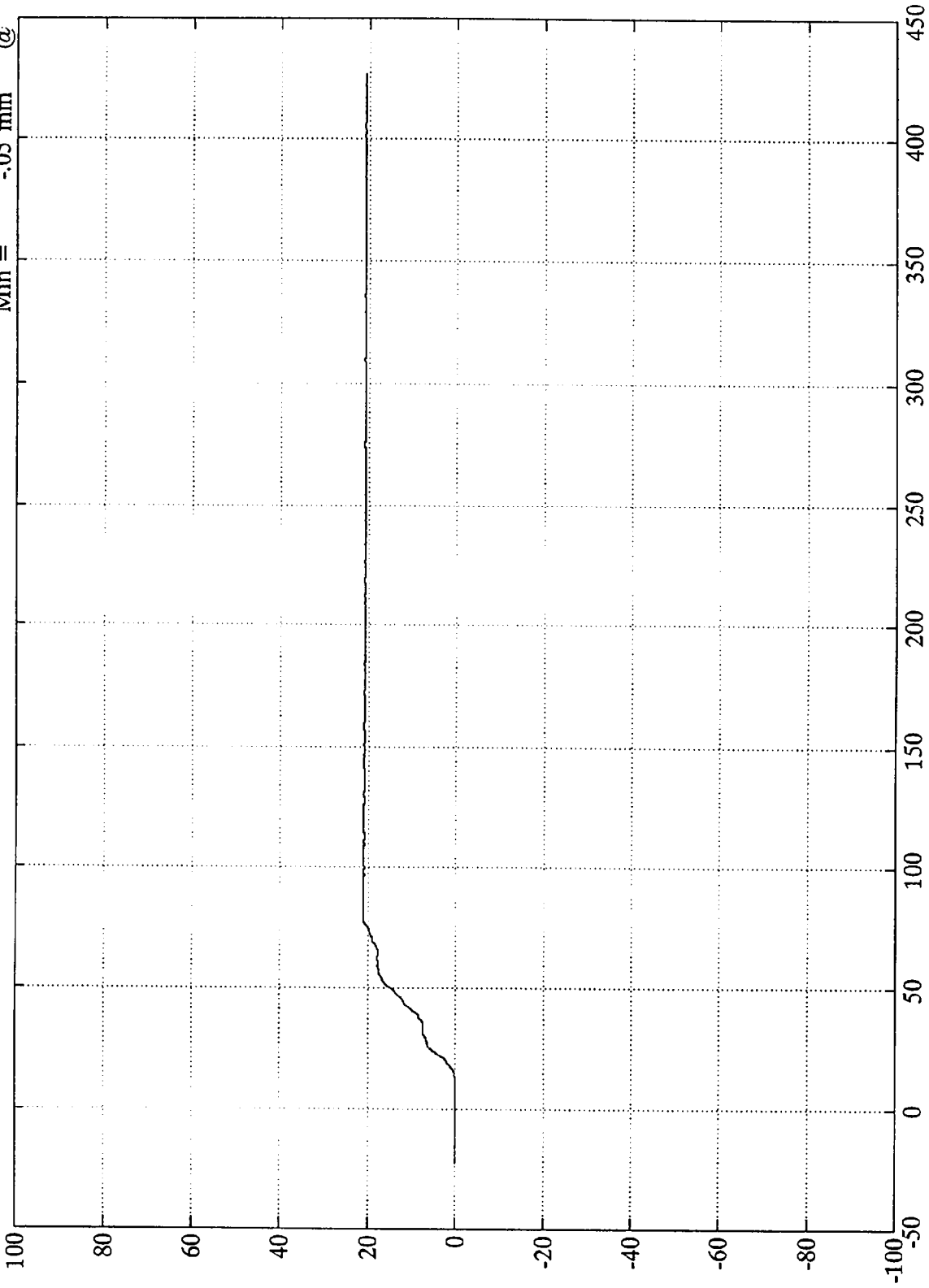
SAE Filter Class 180

Time (msec)

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Belt Spool Out

Max = 21.16 mm @ 121.20 msec
Min = -0.05 mm @ 0.23 msec



mm
B-114

Time (msec)

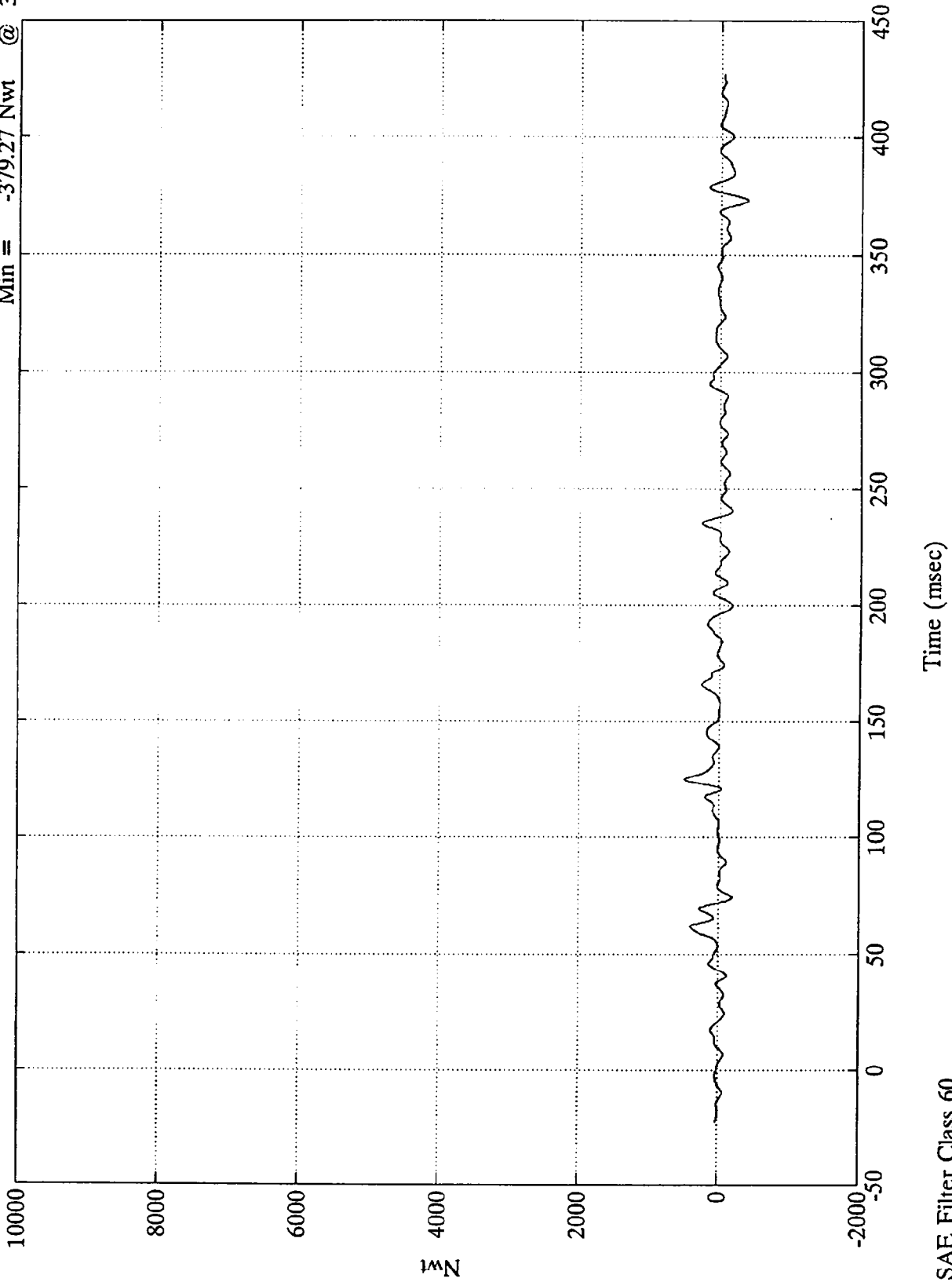
SAE Filter Class 180

8227-2

NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Right Belt Load

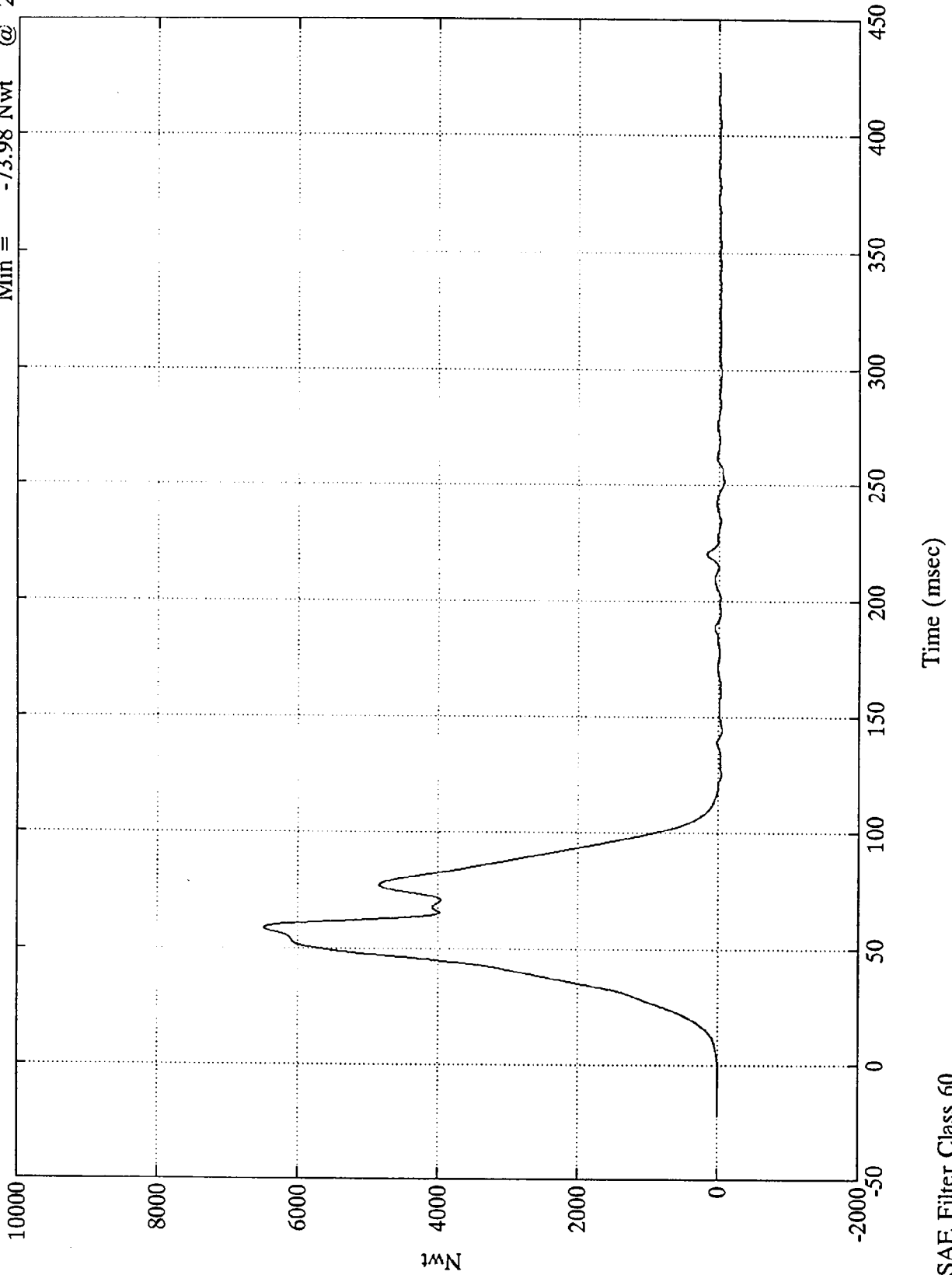
Max = 492.64 Nwt @ 124.80 msec
Min = -379.27 Nwt @ 373.08 msec



NCAP TEST #2 - 1995 FORD ASPIRE

Pos. 2 Torso Belt Load

Max = 6485.30 Nwt @ 58.79 msec
Min = -73.98 Nwt @ 251.28 msec



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 Corporation, Advanced Technology Center. A summary of the test results, and Part 572 specifications are included in this Appendix.

Dummy serial numbers and certification dates are:

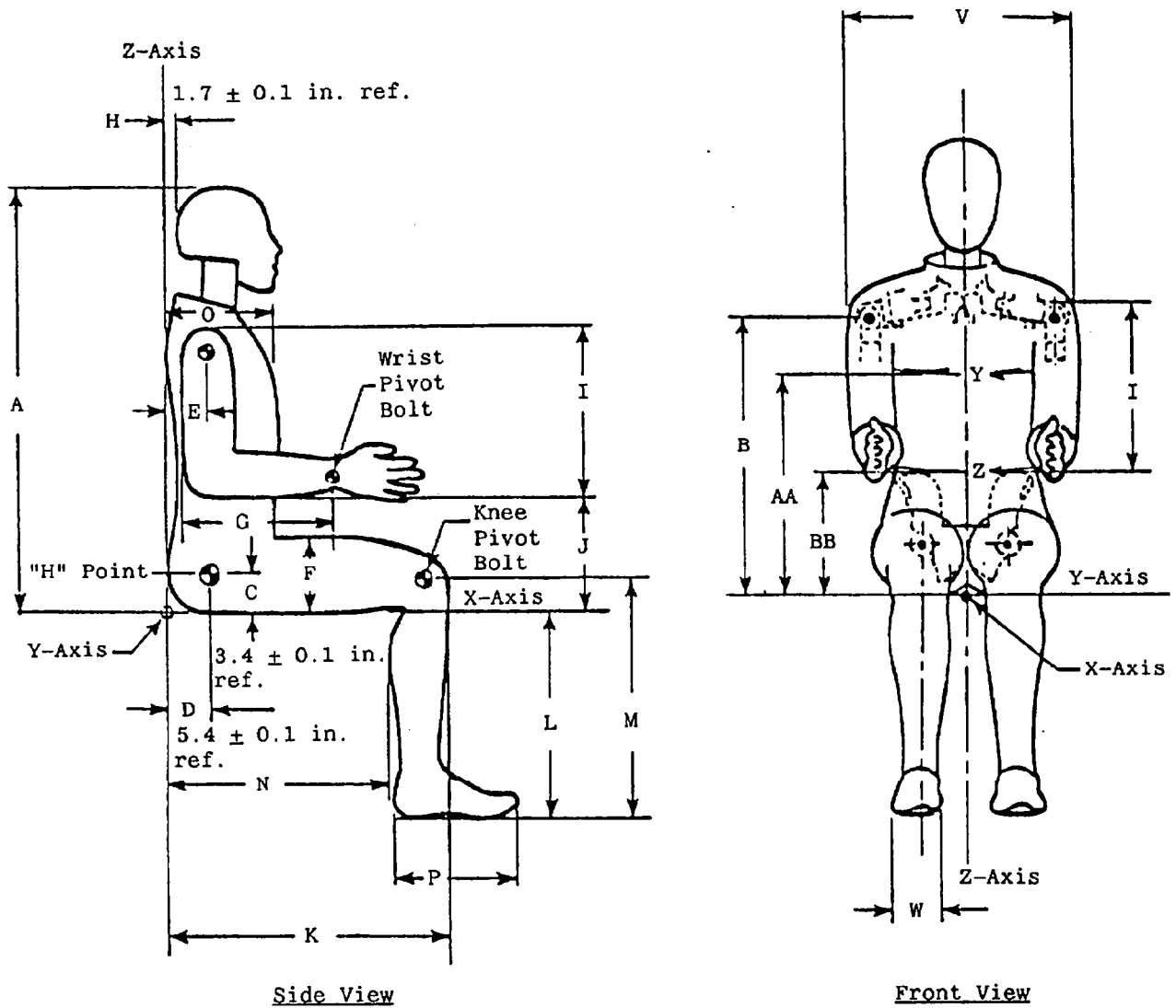
<u>Serial No.</u>	<u>Completion Date</u>
45	8-15-94
245	9-10-94

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 Indicant Testing Final Report No. 6525-V-1.

Figure 7

DUMMY CONFIGURATION DIMENSIONS



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.

HYBRID III EXTERNAL DIMENSIONS

S/N 45 HUMANOID

DUMMY SERIAL NO. 45

DATE: 8/15/94

TEMPERATURE		20.5 DEG. C
RELATIVE HUMIDITY		51 %
LOCATION FOR CHEST CIRCUMFERENCE (AA)	429-434 mm	432 mm
LOCATION FOR WAIST CIRCUMFERENCE (BB)	226-231 mm	228 mm
CHEST CIRCUMFERENCE (Y)	970-1001 mm	1000 mm
WAIST CIRCUMFERENCE (Z)	815-866 mm	866 mm
CHEST DEPTH (O)	213-229 mm	213 mm
H-POINT HEIGHT (C)	84-89 mm	89 mm
H-POINT FROM SEAT BACK (D)	135-140 mm	137 mm
SKULL CAP TO BACKLINE (H)	41-46 mm	43 mm
TOTAL SITTING HEIGHT (A)	879-889 mm	879 mm
THIGH CLEARANCE (F)	140-155 mm	147 mm
BUTTOCK KNEE LENGTH (K)	580-605 mm	602 mm
BUTTOCK POPLITAL LENGTH (N)	452-477 mm	475 mm
POPLITEAL LENGTH (L)	430-455 mm	447 mm
KNEE PIVOT HEIGHT (M)	485-501 mm	487 mm
FOOT LENGTH (P)	252-267 mm	259 mm
FOOT BREADTH (W)	91-107 mm	101 mm
SHOULDER PIVOT FROM BACKLINE (E)	84-94 mm	94 mm
SHOULDER BREADTH (V)	422-437 mm	426 mm
SHOULDER PIVOT HEIGHT (B)	505-521 mm	510 mm
ELBOW REST HEIGHT (J)	190-211 mm	195 mm
SHOULDER-ELBOW LENGTH (I)	330-345 mm	337 mm
BACK OF ELBOW TO WRIST PIVOT (G)	290-305 mm	292 mm

DUMMY MEETS SPECIFICATIONS

TECHNICIAN: IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

HEAD DROP TEST

HYBRID III

DATE : 8/10/94

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 045 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	47 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	232 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	5.1 G'S
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
 TRANSPORTATION RESEARCH DEPARTMENT
NECK FLEXION TEST
 HYBRID III

DATE : 8/9/94

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN:045 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5-22.2 DEG. C	22 DEG. C
RELATIVE HUMIDITY		10% - 70%	51 %
IMPACT VELOCITY		24.8 - 25.7 KPH	25.2 KPH
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	26.7 G'S
	20 MS	17.60 - 22.60 G'S	22.4 G'S
	30 MS	12.50 - 18.50 G'S	16.71 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	16.71 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	37.38 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	76.73 DEG.
	TIME	57 - 64 MS	59.88 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88 - 108 N-M	104 N-M
	TIME	47 - 58 MS	52.38 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	119.38 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	99.88 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
 TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST
 HYBRID III

DATE : 8/9/94

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN:045 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5 - 22.2 DEG. C	22 DEG. C
RELATIVE HUMIDITY		10% - 70%	50 %
IMPACT VELOCITY		21.4 - 22.3 KPH	22 KPH
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	18.6 G'S
	20 MS	14.00 - 19.00 G'S	17.77 G'S
	30 MS	11.00 - 16.00 G'S	15.31 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	15.31 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	44.38 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	94.32 DEG.
	TIME	72 - 82 MS	75.63 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-80.0/-52.9 N-M	-74.5 N-M
	TIME	65 - 79 MS	69.88 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	154.25 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	131.25 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 3/1/94

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN 045 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.5 - 22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	27 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	23.7 KPH
MAXIMUM DEFLECTION	64 - 73 mm	65 mm
MAXIMUM RESISTIVE FORCE	5160 - 5894 NEWTONS	5880 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	70.1 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 3/3/94

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 045 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	29 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	5026 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 3/3/94

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 045 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	29 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	5204 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

HYBRID III EXTERNAL DIMENSIONS

S/N 245 HUMANOID

DUMMY SERIAL NO. 245

DATE: 9/10/94

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

DUMMY MEETS SPECIFICATIONS

TECHNICIAN: IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

HEAD DROP TEST

HYBRID III

DATE : 8/30/94

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN: 245 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	49 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	249.7 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	6.9 G'S
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
 TRANSPORTATION RESEARCH DEPARTMENT
NECK FLEXION TEST
 HYBRID III

DATE : 8/31/94

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN:245 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5-22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY		10% - 70%	53 %
IMPACT VELOCITY		24.8 - 25.7 KPH	25.2 KPH
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	26.61 G'S
	20 MS	17.60 - 22.60 G'S	22.43 G'S
	30 MS	12.50 - 18.50 G'S	16.78 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	16.78 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	41.25 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	72.41 DEG.
	TIME	57 - 64 MS	59.13 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88 - 108 N-M	103.3 N-M
	TIME	47 - 58 MS	54.13 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	118.63 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	97 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
 TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST

HYBRID III

DATE : 9/2/

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN:245 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5 - 22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY		10% - 70%	52 %
IMPACT VELOCITY		21.4 - 22.3 KPH	22 KPH
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	19.36 G'S
	20 MS	14.00 - 19.00 G'S	18.55 G'S
	30 MS	11.00 - 16.00 G'S	15.82 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	15.82 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	45.25 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	88.82 DEG.
	TIME	72 - 82 MS	73.13 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-80.0/-52.9 N-M	-78.25 N-M
	TIME	65 - 79 MS	68 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	147 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	123.63 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 8/29/94

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN 245 H.S. THORAX

CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.5 - 22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	50 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	23.7 KPH
MAXIMUM DEFLECTION	64 - 73 mm	64.8 mm
MAXIMUM RESISTIVE FORCE	5160 - 5894 NEWTONS	5813 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	73.2 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 9/9/94

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN: 245 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	56 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	5186 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 9/9/94

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN: 245 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	56 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4830 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

Appendix D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #45	Manufacturer	Calibration	
			Last	Next
Head				
X	AF5B3	ENDEVCO	4/94	10/94
Y	AF5F7	ENDEVCO	8/94	2/95
Z	AF5E1	ENDEVCO	8/94	2/95
Chest				
X	A12C	ENDEVCO	4/94	10/94
Y	A60C	ENDEVCO	4/94	10/94
Z	A84G	ENDEVCO	4/94	10/94
Right Femur Load Cell	952	GSE	7/94	1/95
Left Femur Load Cell	951	GSE	7/94	1/95
Neck Load Cell				
X	269	DENTON	9/94	3/95
Y	269	DENTON	9/94	3/95
Z	269	DENTON	9/94	3/95
Neck Moment				
X	269	DENTON	9/94	3/95
Y	269	DENTON	9/94	3/95
Z	269	DENTON	9/94	3/95
Chest Deflection Gauge	45	HUMANOID	8/94	2/95
Hybrid III Use Only				
Lap Belt Load Cells	711	LEBOW	7/94	1/95
Shoulder Belt Load Cells	712	LEBOW	7/94	1/95
Spool-Out Potentiometer	42	SERVONIC INST.	9/94	3/95
Belt Stretch Transducer	E1	CALSPAN	8/94	2/95

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #245	Manufacturer	Calibration	
			Last	Next
Head				
X	ADL50	ENDEVCO	8/94	2/95
Y	A59J	ENDEVCO	8/94	2/95
Z	A73A	ENDEVCO	8/94	2/95
Chest				
X	ADL98	ENDEVCO	8/94	2/95
Y	AC209	ENDEVCO	8/94	2/95
Z	ADMB6	ENDEVCO	8/94	2/95
Right Femur Load Cell	955	GSE	7/94	1/95
Left Femur Load Cell	954	GSE	7/94	1/95
Neck Load Cell				
X	076	DENTON	9/94	3/95
Y	076	DENTON	9/94	3/95
Z	076	DENTON	9/94	3/95
Neck Moment				
X	076	DENTON	9/94	3/95
Y	076	DENTON	9/94	3/95
Z	076	DENTON	9/94	3/95
Chest Deflection Gauge	245	HUMANOID	8/94	2/95
Hybrid III Use Only				
Lap Belt Load Cells	714	LEBOW	7/94	1/95
Shoulder Belt Load Cells	715	LEBOW	7/94	1/95
Spool-Out Potentiometer	52	SERVONIC INST.	9/94	3/95
Belt Stretch Transducer	E5	CALSPAN	8/94	2/95

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS

(6 Month Calibration Minimum)

	Serial #	Manufacturer	Calibration	
			Last	Next
Left Seat Rear Crossmember	A197	CEC	7/94	1/95
Right Rear Seat Crossmember	A29	CEC	7/94	1/95
Top of Engine	A175	CEC	7/94	1/95
Bottom of Engine	A69	CEC	3/94	9/94
Left Disc Brake Caliper	A73	CEC	5/94	11/94
Right Disc Brake Caliper	A185	CEC	7/94	1/95
Instrument Panel	A152	CEC	5/94	11/94
Left Rear Crossmember (R)	A89	CEC	7/94	1/95
Right Rear Crossmember (R)	A178	CEC	9/94	3/95

Appendix E

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

Safety Restraints

Using Safety Restraints Properly

Safety Belts

The use of safety belts help to restrain you and your passengers in case of a collision. In most states and in Canada, the law requires their use. We strongly recommend that you use them every time you travel in your vehicle.

Safety belts provide best restraint when:

- the seatback is upright
- the occupant is sitting upright (not slouched)
- the lap belt is snug and low on the hips
- the shoulder belt is snug against the chest
- the knees are straight forward

Your vehicle has combination lap and shoulder belts for front and rear seat passengers.

See the following sections for directions on how to properly use these safety belts. Also see *Safety Restraints for Children* in this chapter for special instructions about using safety belts for children.

Warning: Make sure that you and your passengers, including pregnant women, wear safety belts. Be sure that the lap belt portion of your safety belt fits snugly and as low as possible around the hips. If safety belts are not used properly, the risk of you or your passengers being injured in a collision greatly increases.

Warning: Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around your neck over the inside shoulder. Never use a single belt for more than one person. Failure to follow these precautions could increase the risk and/or severity of injury in a collision.

Do not allow any people to ride in the cargo area of your vehicle. People who are not riding in seats with their safety belts fastened are much more likely to be injured in a collision.

Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

Warning: Never use a single belt for more than one person or across more than one seating position. This greatly increases the risk that one or both of the people will be injured in a collision. Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue that are designed to be used as a pair.

Warning: Lock the doors of your vehicle before driving to lessen the risk of the door coming open in a collision.

Warning: Always drive and ride with your seatback upright and the lap belt portion of your safety belt snug and low across the hips. This will reduce the risk of serious injury to the abdomen or neck that could be caused by sliding under the safety belts in a collision.

Children should always ride with the seatback in the fully upright position. When the seatback is not fully upright, there is a greater risk that the child will slide under the safety belt and be seriously injured in a collision.

Safety Belt Maintenance

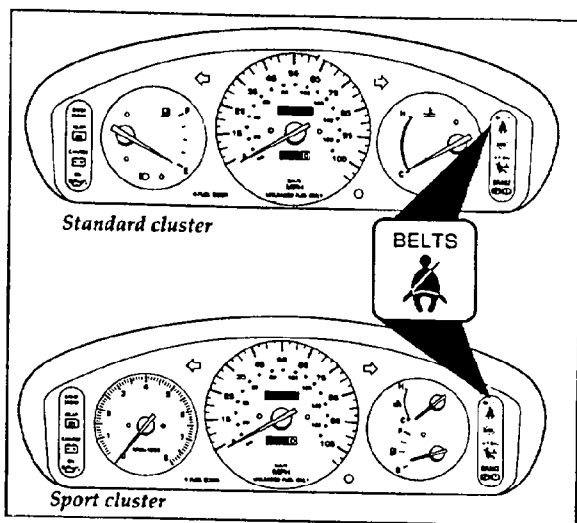
Check the safety belt systems periodically to make sure that they work properly and are not damaged.

Warning: All safety belt assemblies, including retractors, buckles, front seat belt buckle support assemblies (slide bar) (if so equipped), and attaching hardware, should be inspected after any collision. Ford recommends that all safety belt assemblies used in vehicles involved in a collision be replaced. However, if the collision was minor and a qualified technician finds that the belts do not show damage and continue to operate properly, they do not need to be replaced. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

Safety Belt Warning Light/Chime

This warning light and chime remind you to fasten your safety belt.

- If the driver does not fasten the safety belt before the ignition is turned to ON, the chime will sound for four (4) to eight (8) seconds, and the light will illuminate for one (1) to two (2) minutes, or until the safety belt is fastened.
- If the driver fastens the safety belt before the ignition is turned to ON, the chime will not sound and the light will not illuminate.



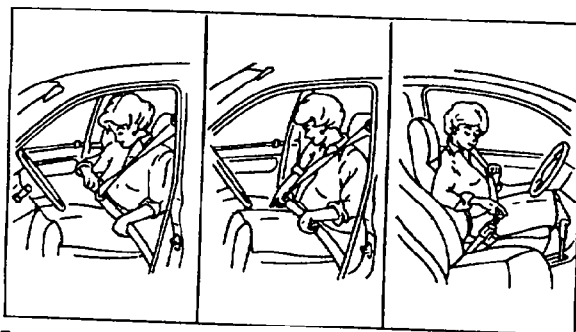
Safety belt warning lamp location

Front and Rear Seat Combination Lap and Shoulder Belts

While in motion, the combination lap and shoulder belt adjusts to your movement. However, if you brake hard, turn hard, or if your vehicle receives an impact of 5 mph (8 km/h) or more, the lap and shoulder belt locks and helps reduce your forward movement.

After you get into your vehicle, close the door and lock it. Then adjust the seat to the position that suits you best.

To fasten the belt, find the long strap of the belt near the door, pull it across your shoulder and chest, and insert the tongue into the proper buckle on your seat until you hear a snap and feel it lock. Be sure to use the correct buckle and check to make sure the buckle is securely fastened.



Fastening the safety belt

Adjust the lap part of the belt by pulling up on the shoulder belt until the lap belt fits snugly and as low as possible around your hips.

Warning: Front and rear seat occupants, including pregnant women, should wear safety belts for optimum protection in an accident.

Warning: Make sure that the lap portion of the safety belt is as low around your hips as possible. Do not wear the lap belt around your waist. If you do not use the lap belts properly, the risk of being injured in a collision greatly increases.

Warning: Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around the neck over the inside shoulder. Never use a single belt for more than one person. Failure to follow these precautions could increase the risk and/or severity of injury in a collision.

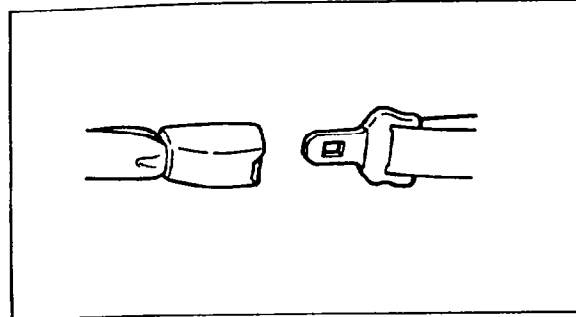
To reduce the risk of sliding under the lap belt during a collision, always drive and ride with seatbacks in the upright position. If the lap belt slips above the hip-bone during a collision and applies force directly to the soft areas of the abdomen, it will increase the risk of serious injury. The seatbacks and the belts provide best restraint when the seatback is upright, the occupant is sitting upright in the seat (not slouching), the lap belt is snug and low on the hips, the shoulder belt is snug against the chest and the knees are straight forward.

Children should always ride with the seatback in the fully upright position. When the seatback is not fully upright, there is a greater risk that the child will slide under the safety belt and be seriously injured in a collision.

28

To unfasten the belt:

1. Push the release button on the buckle. This allows the tongue to unlatch from the buckle.



Unfastening the lap and shoulder belt

2. While the belt retracts, guide the tongue to its original position. If you do not guide the tongue, it may strike you or part of the vehicle.

Important For Your Safety

Before driving, read the label on the back of the sun visor (U.S. vehicles) or on the headliner (Canadian vehicles).

Passenger Seat Lap/Shoulder Belt Retractors (Dual Locking Modes)

Your Aspire is equipped with dual locking mode retractors for all passengers, located on the upper end of the lap/shoulder belts.

29

The retractor modes function as follows:

Vehicle Sensitive (Emergency) Locking Mode

In this operating mode, the retractor will allow the occupant freedom of movement, locking tight only on hard braking, hard cornering, or impacts of approximately 5 mph (8 km/h) or more. The retractor cannot be made to lock by jerking on the belt.

Automatic Locking Mode

In this operating mode, the retractor will remain locked and does not allow the occupant freedom of movement.

This mode **must be used** when installing a child seat. To switch the retractor from the emergency locking mode to the automatic locking mode, perform the following steps:

1. Buckle the lap/shoulder belt.
2. Pull on the belt until all of the stored belt is out of the retractor and a click is heard.
3. Allow the belt to retract. A clicking sound will be heard as the belt retracts. This indicates that the retractor is in the automatic locking mode.
4. Pull to remove slack in the belt while you push down on the child seat.

NOTE: When the lap/shoulder belt is unbuckled and allowed to retract completely, the retractor will switch to the vehicle sensitive (emergency) locking mode.

The automatic locking mode is activated whenever all of the belt webbing is pulled out of the retractor.

While in this mode, the belt will retract or tighten but cannot be pulled back out to obtain more length. To disengage the automatic locking mode, unbuckle the belt and allow the webbing to retract fully.

Refer to the section called *Using the dual locking mode retractor when installing a child safety seat* later in this chapter for more detailed information.

How to Untwist or Unjam a Safety Belt Retractor

If you should jam the lap belt retractor by allowing the belt to retract when it is twisted, you can free the webbing with this procedure:

1. Work the belt slowly out of its holder as far as it will go and untwist the belt or remove the object that is jamming the belt. Let the belt retract.
2. Then, pull the belt out and let it retract several times to make sure that the belt works properly.

Procedure to Correct a Twisted Safety Belt at the "D" Ring (if so equipped) Front and/or Rear Seating Positions

NOTE: The restraint system shown in the following figures may be different than your vehicle. However, use these figures and this procedure to correct a twisted safety belt at any outboard seating position that has a "D" ring.

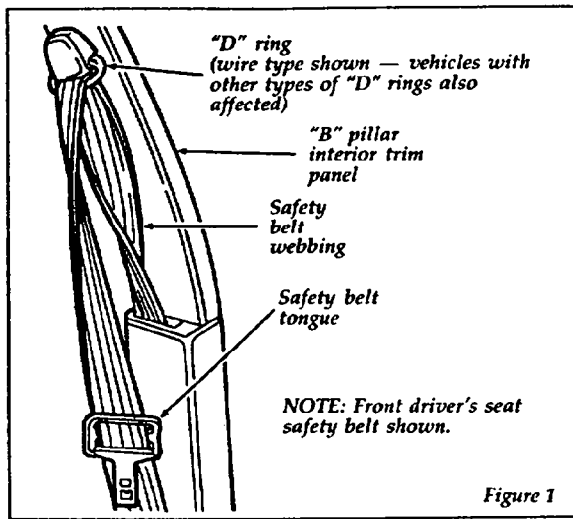


Figure 1

1. Grasp the belt webbing at the "D" ring. See Figure 2.

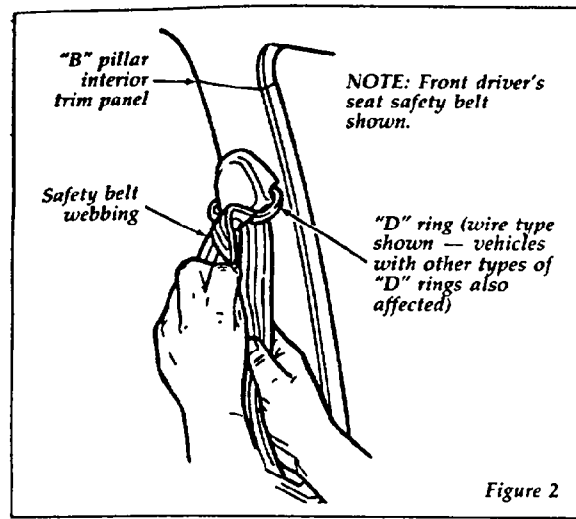


Figure 2

2. Rotate and fold the belt webbing over itself as required to remove the twist.
3. Feed the folded portion of the belt through the "D" ring.
4. When completed, safety belt should look like Figure 3.