

REPORT NUMBER: CAL-94-NO6

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

**GENERAL MOTORS CORPORATION
1994 PONTIAC GRAND PRIX SE
2-DOOR SEDAN**

NHTSA NUMBER: MR0106

CALSPAN TEST NUMBER: 8120-6

FEBRUARY 24, 1994

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FINAL REPORT

PREPARED FOR:

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16. <i>Abstract</i> A frontal load cell barrier test of a 1994 Pontiac Grand Prix 4-Door Sedan was performed at the Calspan Advanced Technology Center Crash Test Facility in Buffalo, New York on February 24, 1994. The impact velocity was 56.2 kph and the ambient temperature was -2 C. The maximum post-test vehicle crush was 592 mm. The test vehicle was equipped with an active 3-point restraint system at each of the front seating positions. The vehicle was also equipped with supplemental airbags at each of the front outboard seating positions, With regard to FMVSS 208 "Occupant Crash Protection" , injury criteria, both the driver and passenger appear to comply with the head, chest and femur requirements.					
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Section 1

PURPOSE AND TEST PROCEDURE

This 56.3 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 56.3 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 MR0106

A load cell barrier consisting of 36 load cells was impacted by a 1994 Pontiac Grand Prix SE at a velocity of 56.2 kph. The test was performed at the Calspan Corporation Advanced Technology Center on February 24, 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) and the right-front passenger ATD (Serial No. 150) were used in two previous tests (MR5400 and MP5204). Injury criteria were not exceeded in these tests. Certification details, along with instrumentation calibration data, are found in Appendix C and D.

The 83 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. Belt Spool-Out was not measured due to the location of the belts.

The driver's head struck the airbag, the HIC was 426.1. The maximum chest deceleration over 3 milliseconds was 51.9 g's and maximum chest deflection was 43.0 mm. Femur loads were -7112.4 newtons on the left femur and -6882.5 newtons on the right femur.

The right front passenger's HIC was 725.2. Maximum chest deceleration over 3 milliseconds was 55.1 g's and maximum chest deflection was 20.5 mm. Femur loads were -5563.5 newtons on the left and -4286.4 newtons on the right.

Table 1

GENERAL TEST AND VEHICLE DATA

Vehicle Year/Make/Model/Body Style: 1994 Pontiac Grand Prix SE

NHTSA Test No.: MR0106 VIN.: 1G2WJ12M5RF217975

Body Color: Blue Date of Manufacture: October, 1993

Date Received: January 31, 1994

Odometer Reading: 45.1 km.

Engine: 6 Cylinders; 191 C.I.D.; 3.1 Liters; - CC
X Gas; - Diesel; - Turbocharged
- Longitudinal; X Transverse

Transmission: 4 Speed; - Manual; X Automatic; - Overdrive

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

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

Type of Occupant Restraint: 3-Point belt restraint with driver and passenger airbags.

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

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

Recommended Tire Size: P215/60 R16

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

Tires on Vehicle: P215/60 R16 Manufacturer: Goodyear

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

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

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

Vehicle Capacity Weight (VCW) = 412 kgs. (A)

No. of Occupants x 68 kgs. = 340 kgs. (B)

Rated Cargo and Luggage Weight (RCLW) A-B = 72 kgs.

GVWR 1934 kgs. GAWR: Front 1095 kgs. Rear 839 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>476.3</u>	kgs.	Right Rear =	<u>235.9</u>	kgs.
Left Front =	<u>485.3</u>	kgs.	Left Rear =	<u>258.5</u>	kgs.
TOTAL FRONT WEIGHT =	<u>961.6</u>	kgs.	(<u>66</u>	% of Total Vehicle Weight)
TOTAL REAR WEIGHT =	<u>494.4</u>	kgs.	(<u>34</u>	% of Total Vehicle Weight)
TOTAL DELIVERED WEIGHT =	<u>1456</u>	kgs.			

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight	<u>1456</u>	kgs.
VCW = Vehicle Capacity Weight	<u>412</u>	kgs.
DSC = Designated Seating Capacity	<u>5</u>	
RCLW = VCW - 68 (DSC) =	<u>72</u>	kgs.
Target Test Weight = UDW + RCLW + (2 dummies x 74.4 kgs./ dummy)		
Target Test Weight =	<u>1676.8</u>	kgs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 73.5 KGS CARGO:

Right Front =	<u>512.6</u>	kgs.	Right Rear =	<u>335.7</u>	kgs.
Left Front =	<u>521.6</u>	kgs.	Left Rear =	<u>308.4</u>	kgs.
TOTAL FRONT WEIGHT =	<u>1034.2</u>	kgs.	(<u>62</u>	% of Total Vehicle Weight)
TOTAL REAR WEIGHT =	<u>644.1</u>	kgs.	(<u>38</u>	% of Total Vehicle Weight)
TOTAL TEST WEIGHT =	<u>1678.3</u>	kgs.			
Weight of ballast secured in vehicle trunk area =	<u>0</u>	kgs.			

VEHICLE ATTITUDE (all dimensions in mm):

Delivered Attitude:	RF	<u>734</u>	LF	<u>739</u>	RR	<u>734</u>	LR	<u>729</u>
Test Attitude:	RF	<u>720</u>	LF	<u>724</u>	RR	<u>691</u>	LR	<u>695</u>
Wheel Base:	<u>2730</u>	mm.;	C.G. =	<u>1048</u>	mm. rearward of front wheel C/L			

Remarks: 57.7 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:	<u>Frontal Barrier</u>	Impact Angle:	<u>0°</u>
Date of Test:	<u>February 24, 1994</u>	Time of Test:	<u>1:55 PM</u>
Ambient Temperature:	<u>-2</u>	° C at impact area	
Temperature in Occupant Compartment:	<u>21</u>	° C	
Windshield Molding Temperature:	<u>21</u>	° C	
Required Impact Velocity Range:	<u>55.5</u>	to	<u>57.1</u> kph
Impact Velocity: primary =	<u>56.2</u>	kph, secondary =	<u>56.1</u> kph
Distance From Front Bumper to Barrier Face When			
Entering Speed Trap:	<u>1321</u>	mm	
Exiting Speed Trap:	<u>305</u>	mm	

VEHICLE REBOUND AND CRUSH (mm):

Vehicle Length:	Pre-test = R	<u>4839</u>	C _L	<u>4950</u>	L	<u>4839</u>
	Post-test = R	<u>4247</u>	C _L	<u>4374</u>	L	<u>4348</u>
	Crush = R	<u>592</u>	C _L	<u>576</u>	L	<u>491</u>
Distance from front of test vehicle to point of impact:						
R	<u>495</u>	C _L	<u>415</u>	L	<u>424</u>	

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Face with airbag</u>	<u>Face with airbag</u>
Chest	<u>Airbag</u>	<u>Airbag</u>
Abdomen	<u>Airbag</u>	<u>Airbag</u>
Left Knee	<u>Dash panel</u>	<u>Glove box door</u>
Right Knee	<u>Dash panel</u>	<u>Glove box door</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>Yes</u>	<u>Yes</u>	<u>N/A</u>	<u>N/A</u>
	<u>Front</u>		<u>Rear</u>	
<u>Seat Movement</u>	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Seat Back Failure	<u>None</u>	<u>None</u>	<u>N/A</u>	<u>N/A</u>
Seat Shift (mm.)	<u>10mm forward</u>	<u>0.0</u>	<u>N/A</u>	<u>N/A</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.: MR0106 Vehicle: 1994 Pontiac Grand Prix SE 2-Door Sedan

	MAXIMUM HEAD ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-41.9	10.1	29.5	47.7
Position #2 - Passenger	-51.7	9.4	36.0	61.9

	MAXIMUM CHEST ACCELERATION (g's)			
	X	Y	Z	R*
Position #1 - Driver	-53.6	4.8	-8.6	51.9
Position #2 - Passenger	-56.7	-7.6	6.1	55.1

* 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	-7112.4	-6882.5
Position #2 - Passenger	-5563.5	-4286.4

	MAXIMUM FORCE - SEAT BELT LOADS (nwt)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
Position #1 - Driver	6355.7	-	505.9
Position #2 - Passenger	10048.8	1501.4	-

	HEAD INJURY CRITERIA (HIC)			
	HIC**	t ₁ (mSec)	t ₂ (mSec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	426.1	58.800	94.680	42.64
Position #2 - Passenger	725.2	62.880	98.760	52.75

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

Table 3

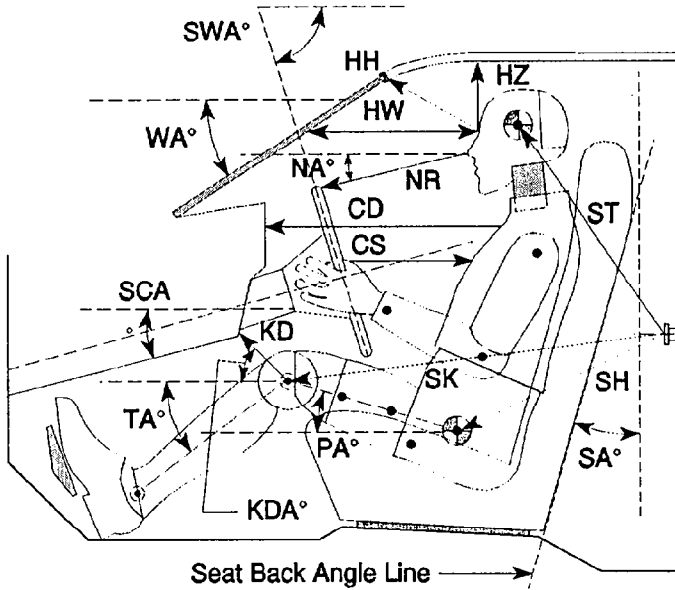
HYBRID III NECK AND CHEST DATA SHEETVehicle Year/Make/Model/Body Style: 1994 Pontiac Grand Prix SE 2-Door SedanVehicle NHTSA No.: MR0106 Test Date: February 24, 1994

MAXIMUM VALUES	DRIVER DUMMY ID # : 45	PASSENGER DUMMY ID # : 150
Neck Load X (nwt)	505.6	783.2
Neck Load Y (nwt)	-250.6	-258.9
Neck Load Z (nwt)	2015.2	1849.5
Neck Moment X (nwt-m)	-19.4	-16.8
Neck Moment Y (nwt-m)	36.9	44.4
Neck Moment Z (nwt-m)	-9.6	7.1
Chest Deflection X (mm.)	-43.0	-20.5
Time of Max. Occurrence (msec)	67.1	89.9

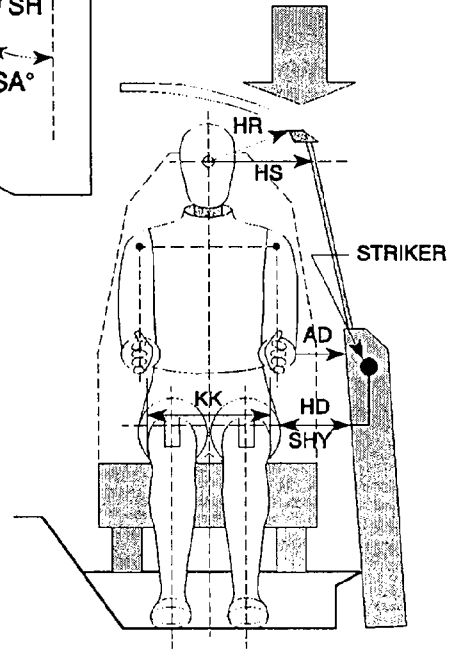
Note: All values listed occur during the primary impact event.

Figure 1

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



- AD - Arm to Door
- HD - H-Point to Door
- HR - Head to Side Header
- HS - Head to Side Window
- KK - Knee to Knee
- SHY- Striker to H-Point (Y Direction)



- CD - Chest to Dash
- CS - Steering Wheel to Chest
- HH - Head to Header
- HW - Head to Windshield
- HZ - Head to Roof
- KDA- Knee to Dash Angle
- KDL- Left Knee to Dash
- KDR- Right Knee to Dash
- NA - Nose to Rim Angle
- NR - Nose to Rim
- PA - Pelvic Angle
- RA - Rim to Abdomen
- SA - Seat Back Angle
- SCA- Steering Column Angle
- SH - Striker to H-Point
- SK - Striker to Knee
- ST - Striker to Head
- SWA- Steering Wheel Angle
- TA - Tibial Angle
- WA - Windshield Angle

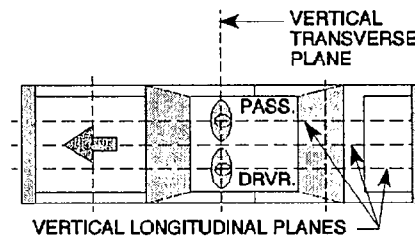


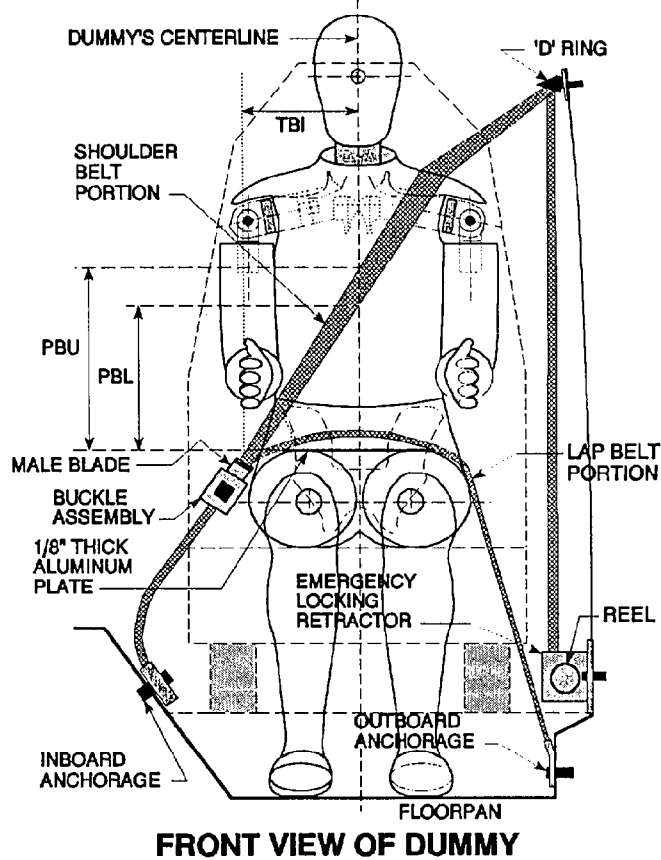
Table 4
FRONT SEAT OCCUPANT MEASUREMENTS

	DRIVER (Serial # 45)			PASS. (Serial # 150)		
WA°	25 °			25°		
SWA°	70 °			N/A		
SCA°	20 °			N/A		
SA°	26 °			26°		
HZ	155			150		
HH	325			325		
HW	540			537		
HR	260			264		
NR	345	Angle	13°	N/A		
CD	475			523		
CS	228			N/A		
RA	148			N/A		
KDL	150	Angle (KDA)	30°	168		
KDR	150			156	Angle (KDA)	40°
PA°	25°			25°		
TA°	35°			40°		
KK	300			210		
ST	640	Angle	30°	659	Angle	37°
SK	866	Angle	90°	902	Angle	93°
SH	515	Angle	106°	503	Angle	115°
SHY	280			260		
HS	310			330		
HD	121			100		
AD	120			118		

Figure 2

SEAT BELT POSITIONING DATA

SEAT BELT POSITIONING DATA



	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	325	310
PBL-- Top surface of alum. plate to belt lower edge	245	235
<u>LAP BELT TENSION</u>	retractor	retractor
<u>SHOULDER BELT TENSION</u>	retractor	retractor

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.	1950	1875
Shoulder belt length as measured on Part 572 Dummy.	1050	1030
Lap belt length as measured on Part 572 Dummy.	595	560
<u>SHOULDER BELT SPOOL-OFF DATA:</u>		
As determined by film analysis.	N/A	N/A
As determined mechanically.	82	75
As determined electronically.	N/A	N/A
<u>BELT STRETCH DATA:</u>		
Measured electronically between shoulder belt load cell and the "D" ring.	0.0 mm/M	5.7 mm/M
Measured mechanically.	0.0 mm/M	0.0 mm/M

All measurements in millimeters.

Figure 3
CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 4

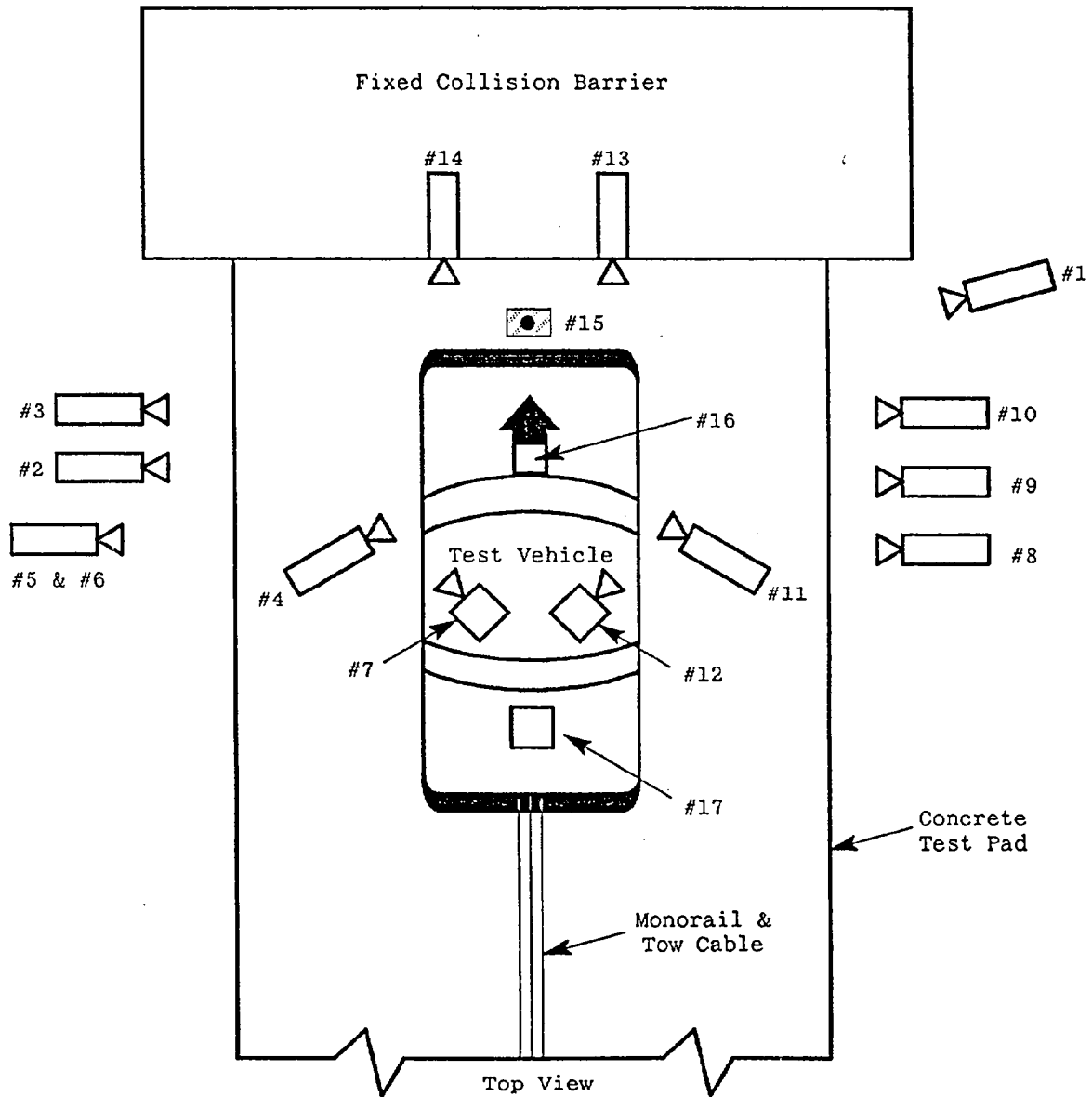


Table 6
HIGH-SPEED CAMERA LOCATIONS

Test No. X035-6-1374 Vehicle: 1994 Pontiac Grand Prix SE

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	5969	1803	1067	-3	5538	1030	
3	Left Side View	8788	1016	1041	-3	8357	995	
4	Driver and Interior View	2591	2972	1905	-22	-	1020	
5	Steering Column (Bottom)	6934	2083	1168	-5	6503	965	
6	Steering Column (Top)	6934	2083	1778	10	6503	1000	
7	Left Belt	-	-	-	-	-	N/A	
8	Overall Right Side	6172	2210	1067	-2	5741	1060	
9	Right Side View	8306	1702	1041	-2	7875	850	
10	Right Passenger View	7925	2108	1397	-4	7494	1000	
11	Passenger and Interior View	2692	2946	1854	-23	-	920	
12	Right Belt	-	-	-	-	-	N/A	
13	Passenger Front View	560	127	1778	-36	-	1020	
14	Driver Front View	560	127	1778	-35	-	1025	
15	Windshield View	0	0	3048	-45	-	1100	
16	Pit View of Engine	0	505	-3048	90	-	700	
17	Pit View of Fuel Tank	0	3432	-3048	90	-	720	

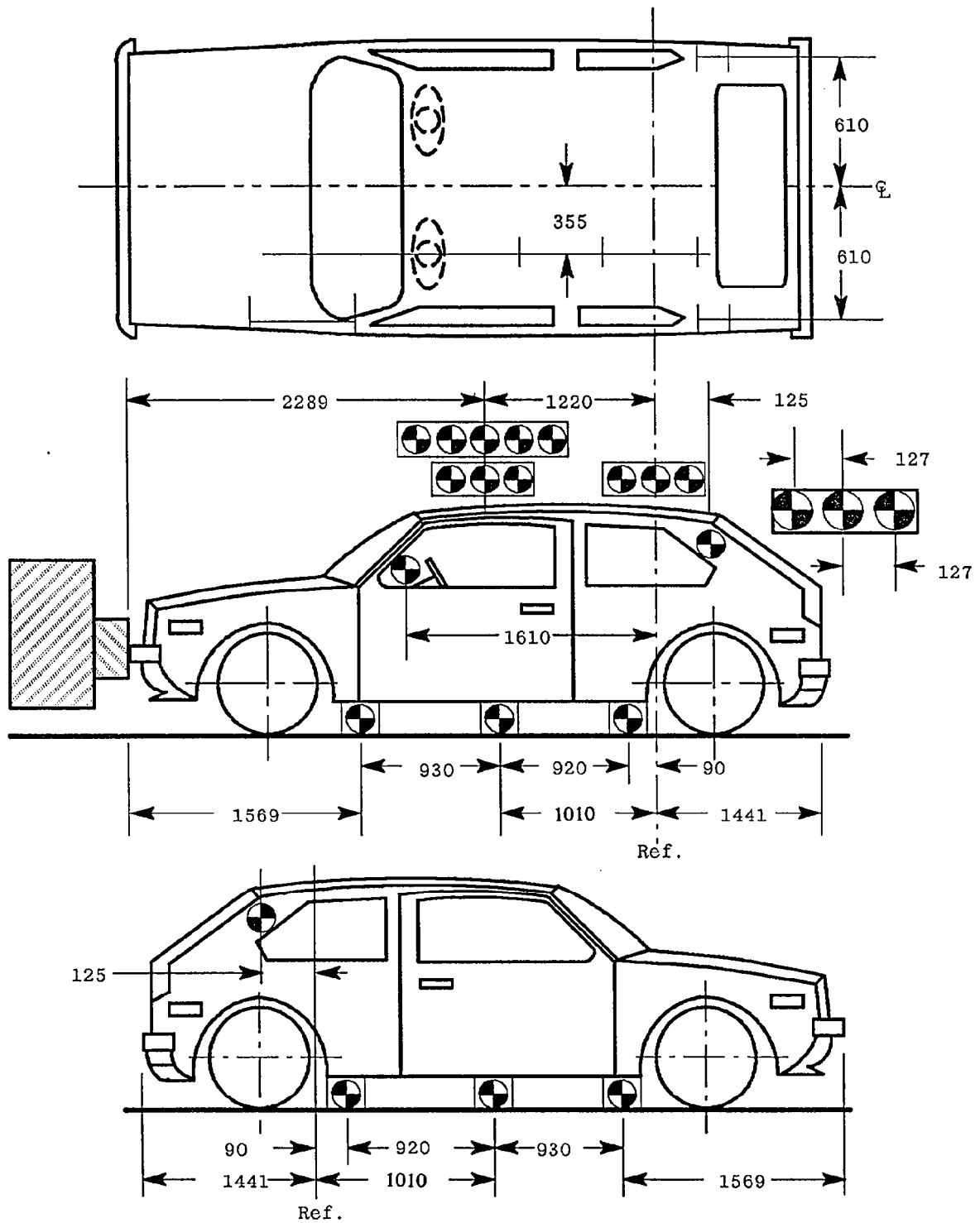
*X = film plane to monorail centerline ** = referenced to horizontal plane

Y = film plane to impact location N.T. indicates No Timing

Z = film plane to ground

Figure 4

VEHICLE TARGET LOCATIONS

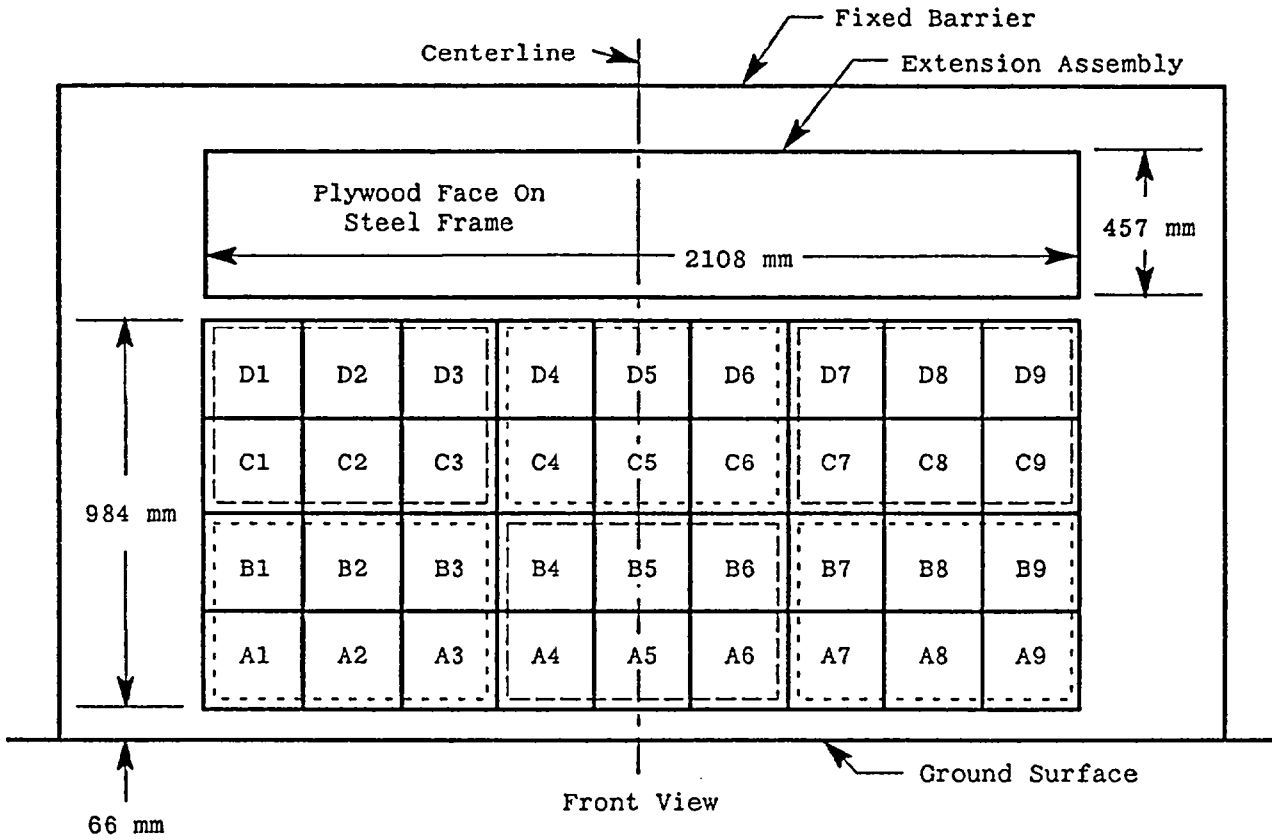


(Dimensions in millimeters)

figure 3

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

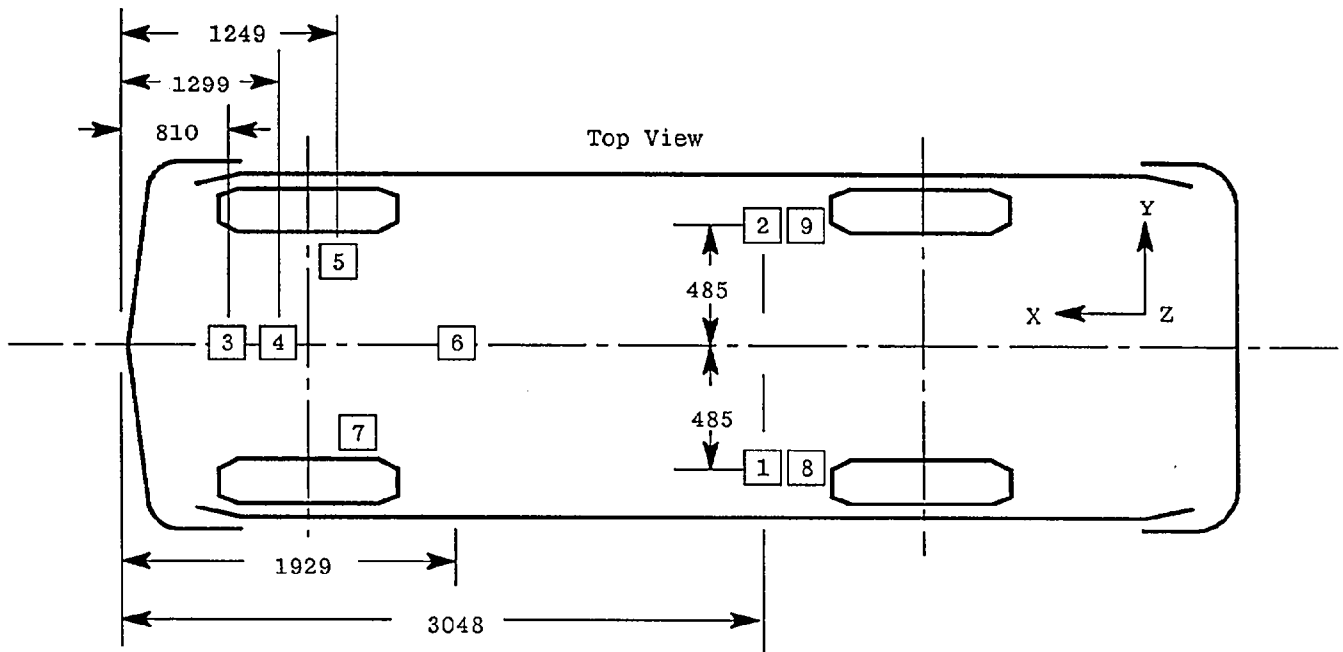
Group 4 C1 thru D3	Group 5 C4 thru D6	Group 6 C7 thru D9
Group 1 A1 thru B3	Group 2 A4 thru B6	Group 3 A7 thru B9

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



All dimensions are in millimeters

ACCELEROMETER NUMBER*	ACCELEROMETER LOCATION	LOCATION		
		X	Y	Z
1	Left Rear Seat Crossmember	✓		
2	Right Rear Seat Crossmember	✓		
3	Top of engine	✓		
4	Bottom of engine	✓		
5	Right Disc Brake Caliper	✓		
6	Left Disc Brake Caliper	✓		
7	Instrument Panel	✓		
8	Left Rear Seat Crossmember Redundant	✓		
9	Right Rear Seat Crossmember Redundant	✓		

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

TEST VEHICLE MEASUREMENTS

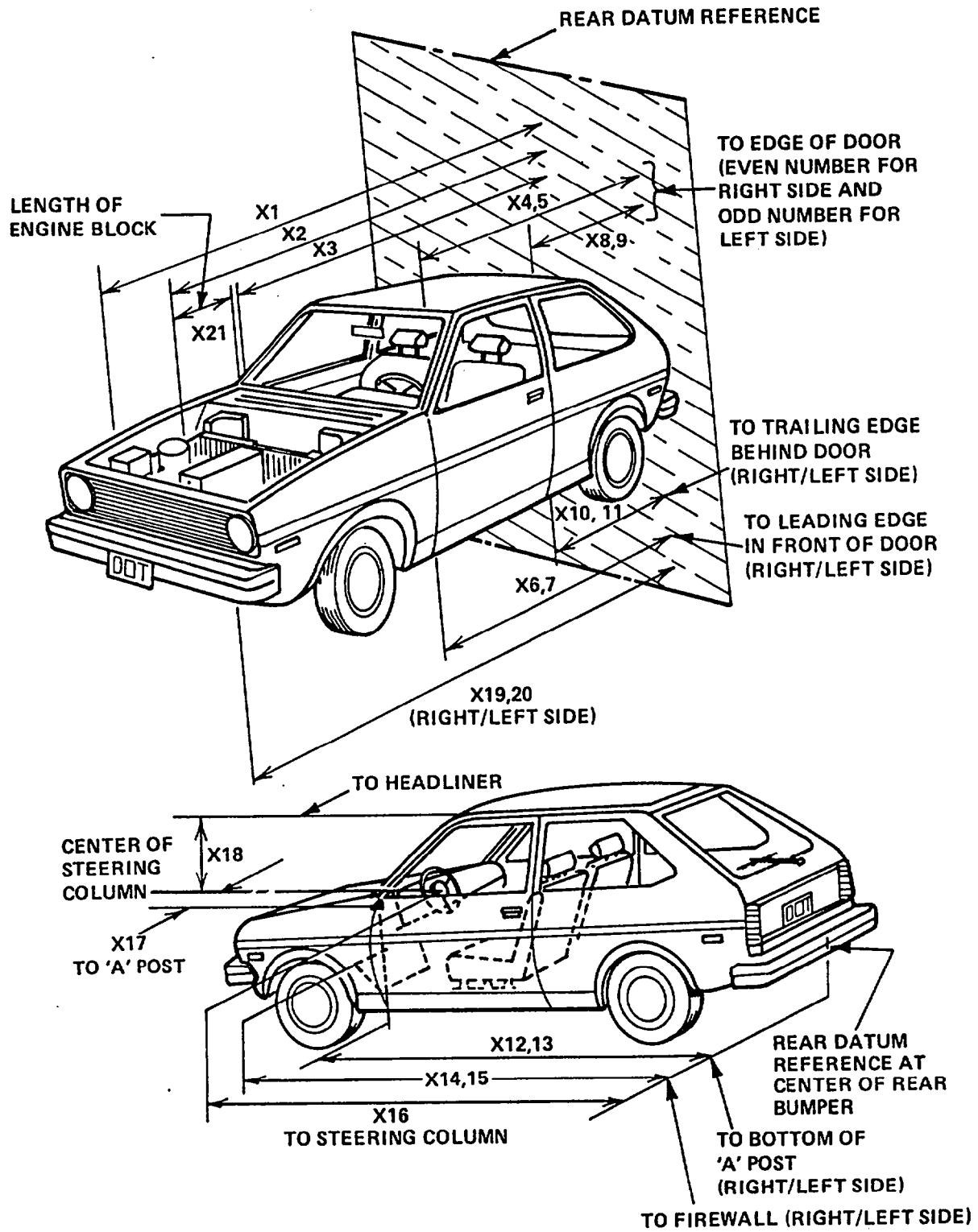


Table 7

VEHICLE MEASUREMENTS

No.		All Dimensions in mm		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	4950	4374	576
X2	Rear Surface of Vehicle to Front of Engine	4128	3904	224
X3	Rear Surface of Vehicle to Firewall	3696	3640	56
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3277	3261	16
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3289	3259	30
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3269	3269	0
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3272	3272	0
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	1961	1953	8
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	1969	1946	23
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	1966	1974	-8
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	1971	1966	5
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3221	3233	-12
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3223	3231	-8
X14	Rear Surface of Vehicle to Firewall, Right Side	3716	3663	53
X15	Rear Surface of Vehicle to Firewall, Left Side	3716	3658	58
X16	Rear Surface of Vehicle to Steering Column	2814	2827	-13
X17	Center of Steering Column to "A" Post	437	452	-15
X18	Center of Steering Column to Headliner	381	465	-84
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4839	4247	592
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4839	4349	490
X21	Length of Engine Block	457	457	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3023	2992	31
CD	Rear Surface of Vehicle to Center of Dash Panel	2997	2959	38
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3005	2959	46

ACCIDENT INVESTIGATION DIVISION DATA

FOR 56.3 KPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Pontiac Grand Prix SE 4-Door Sedan

Vehicle NHTSA No.: MR0106 VIN: 1G2WJ12M5RF217975

Model Year: 1994 Build Date: 10/93 Test Date: 2/24/94

Vehicle Size Category: Midsize Test Weight: 1678.3 Kgs

Vehicle Wheelbase: 2730 mm; Front Overhang: 1569 mm; Overall Width: 1220 mm

Collision Deformation Classification (CDC) Code: 12FDEW2

Crush Depth Dimensions;

C1 = 475 mm

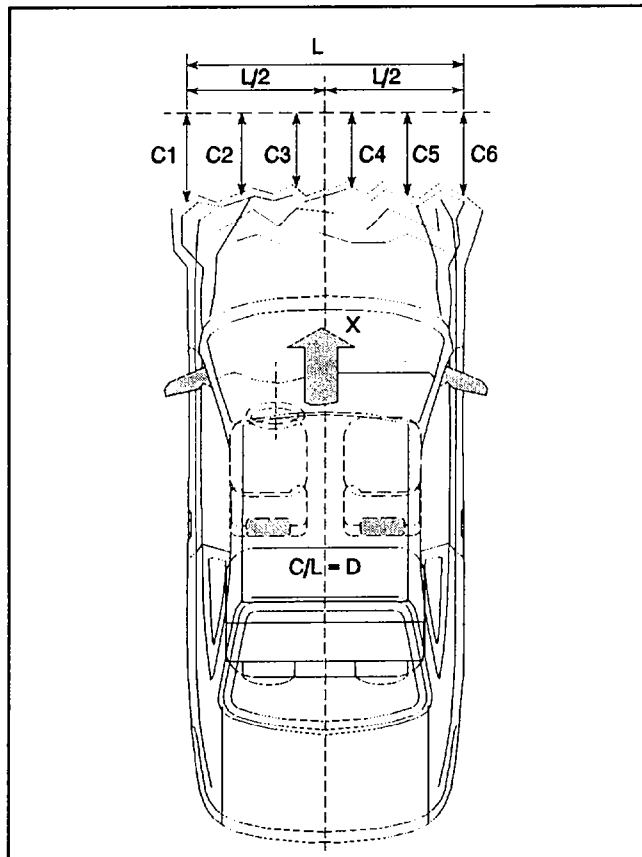
C2 = 511 mm

C3 = 544 mm

C4 = 589 mm

C5 = 582 mm

C6 = 582 mm



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

Length of Damaged Region: L = 1220 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.

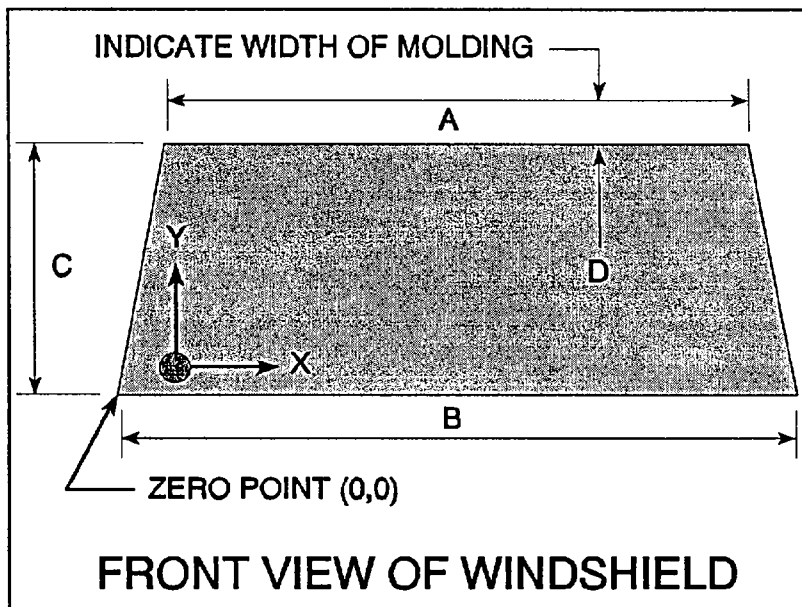
FMVSS 212 REQUIREMENTS:

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	2210	2210	100%
LEFT SIDE	2210	2210	100%
TOTAL	4420	4420	100%

AREA OF RETENTION FAILURE:



DIMENSIONS (MM)	
A	1240
B	1720
C	730
D	14

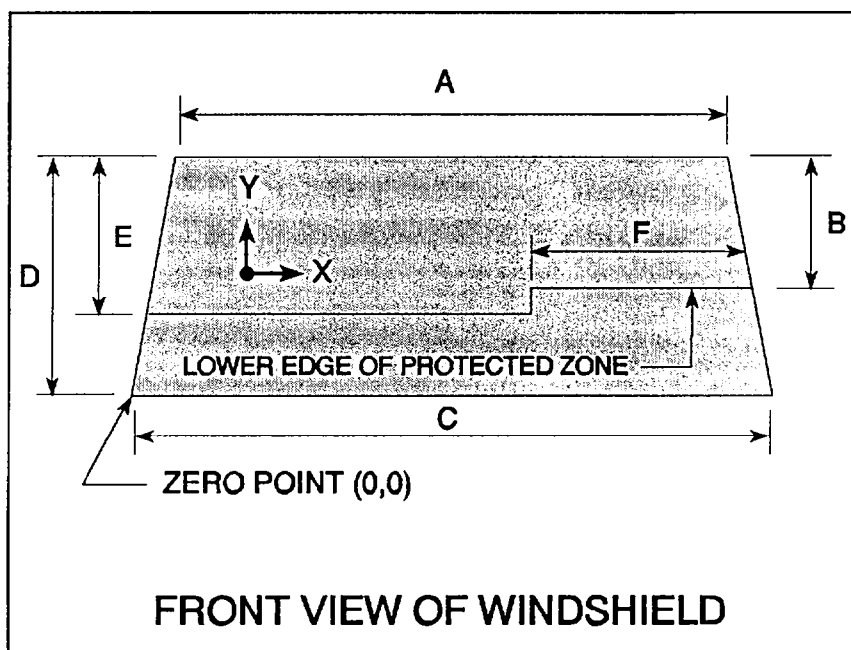
FAILURE DETAILS: None

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	1240
B	420
C	1720
D	730
E	540
F	915

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

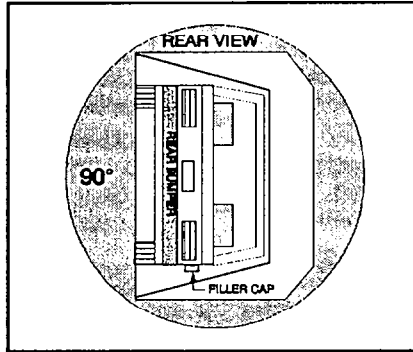
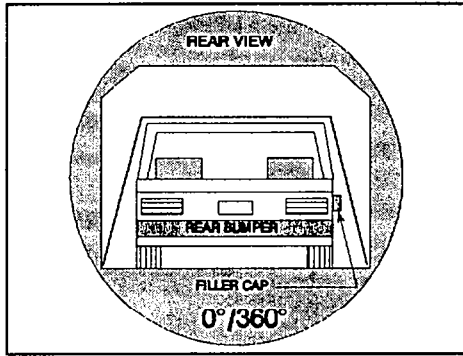
(Show location of penetration on the above sketch)

	COORDINATES	
	X	Y
1.		
2.		
3.		
4.		

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

Vehicle NHTSA ID No.
MR0106



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	<u>2</u>	minutes	<u>30</u>	seconds
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>00</u>	seconds
TOTAL	<u>7</u>	minutes	<u>30</u>	seconds
Next whole minute interval	<u>8</u>	minutes	<u>00</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):

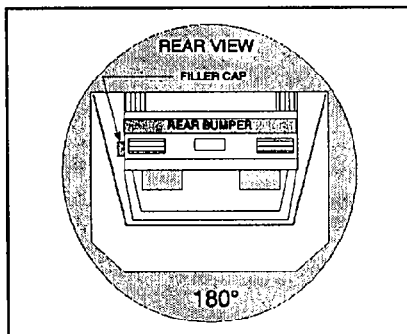
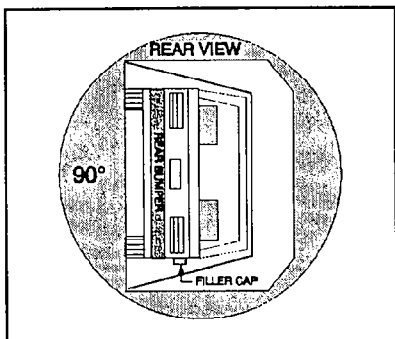
None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

Vehicle NHTSA ID No.
MR0106



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	2	minutes	30	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	7	minutes	30	seconds
Next whole minute interval	8	minutes	00	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.

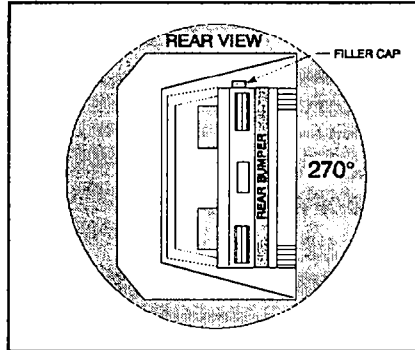
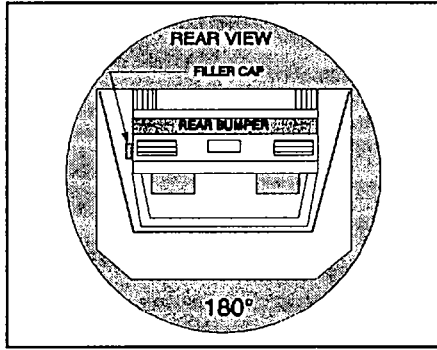
IV. SOLVENT SPILLAGE LOCATION(S):

None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

Vehicle NHTSA ID No.
MR0106



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	<u>2</u>	minutes	<u>30</u>	seconds
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>00</u>	seconds
TOTAL	<u>7</u>	minutes	<u>30</u>	seconds
Next whole minute interval	<u>8</u>	minutes	<u>00</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):

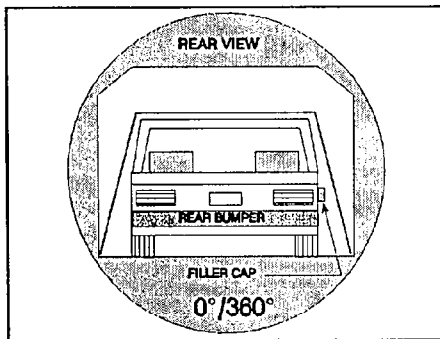
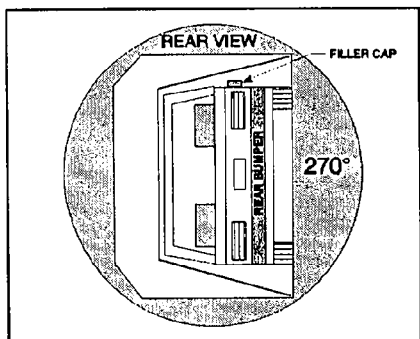
None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

Vehicle NHTSA ID No.
MR0106



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	2	minutes	30	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	7	minutes	30	seconds
Next whole minute interval	8	minutes	00	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>
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A-3	POST TEST FRONT VIEW.....	A-5
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A-23	POST TEST DRIVER POSITION VIEW.....	A-25
A-24	PRE-TEST PASSENGER POSITION VIEW.....	A-26
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A-31	PRE-TEST PASSENGER HEAD LOCATION.....	A-33
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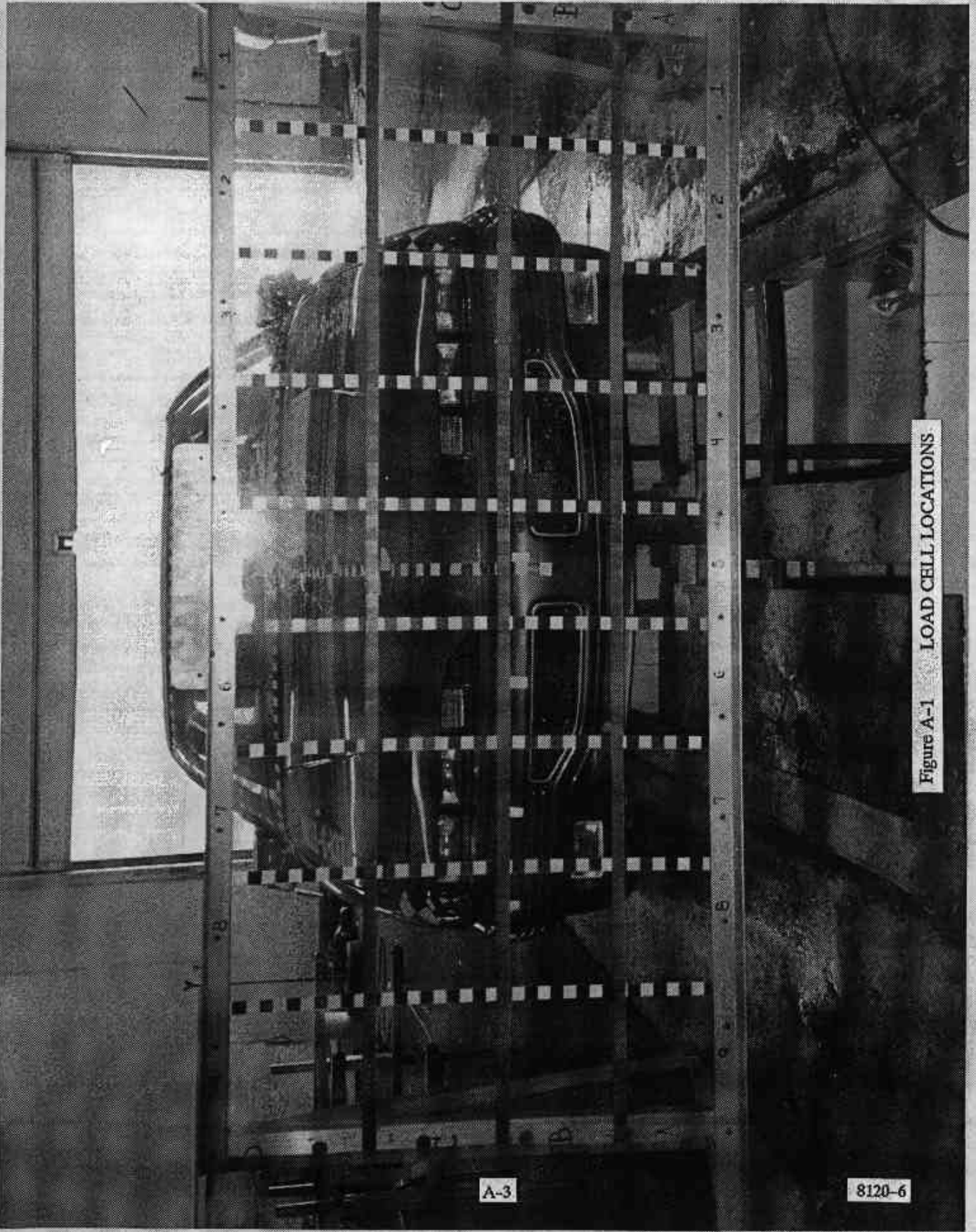


Figure A-1 LOAD CELL LOCATIONS

A-3

8120-6



Figure A-2 PRE-TEST FRONT VIEW

A-4

8120-6

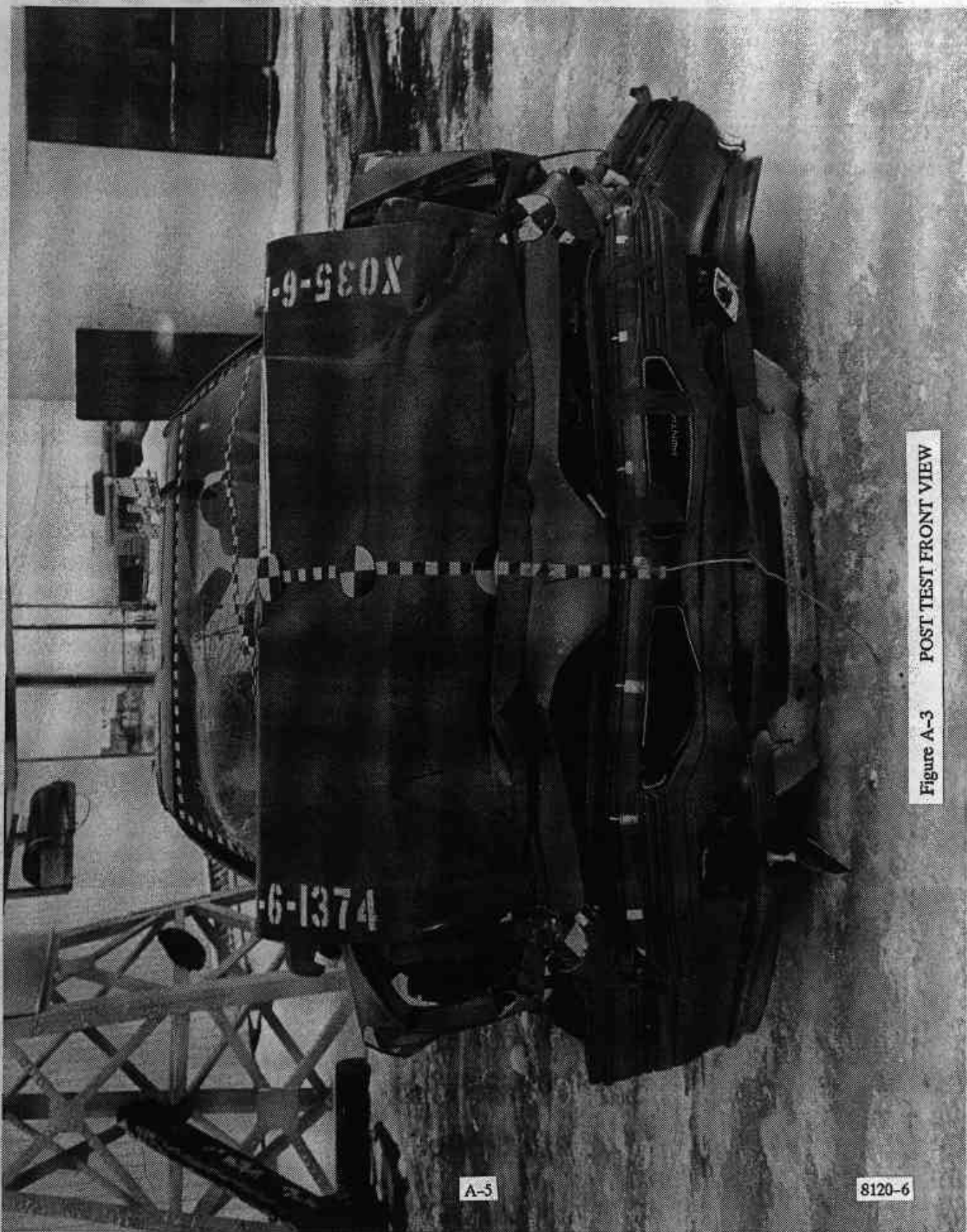


Figure A-3 POST TEST FRONT VIEW

A-5

8120-6

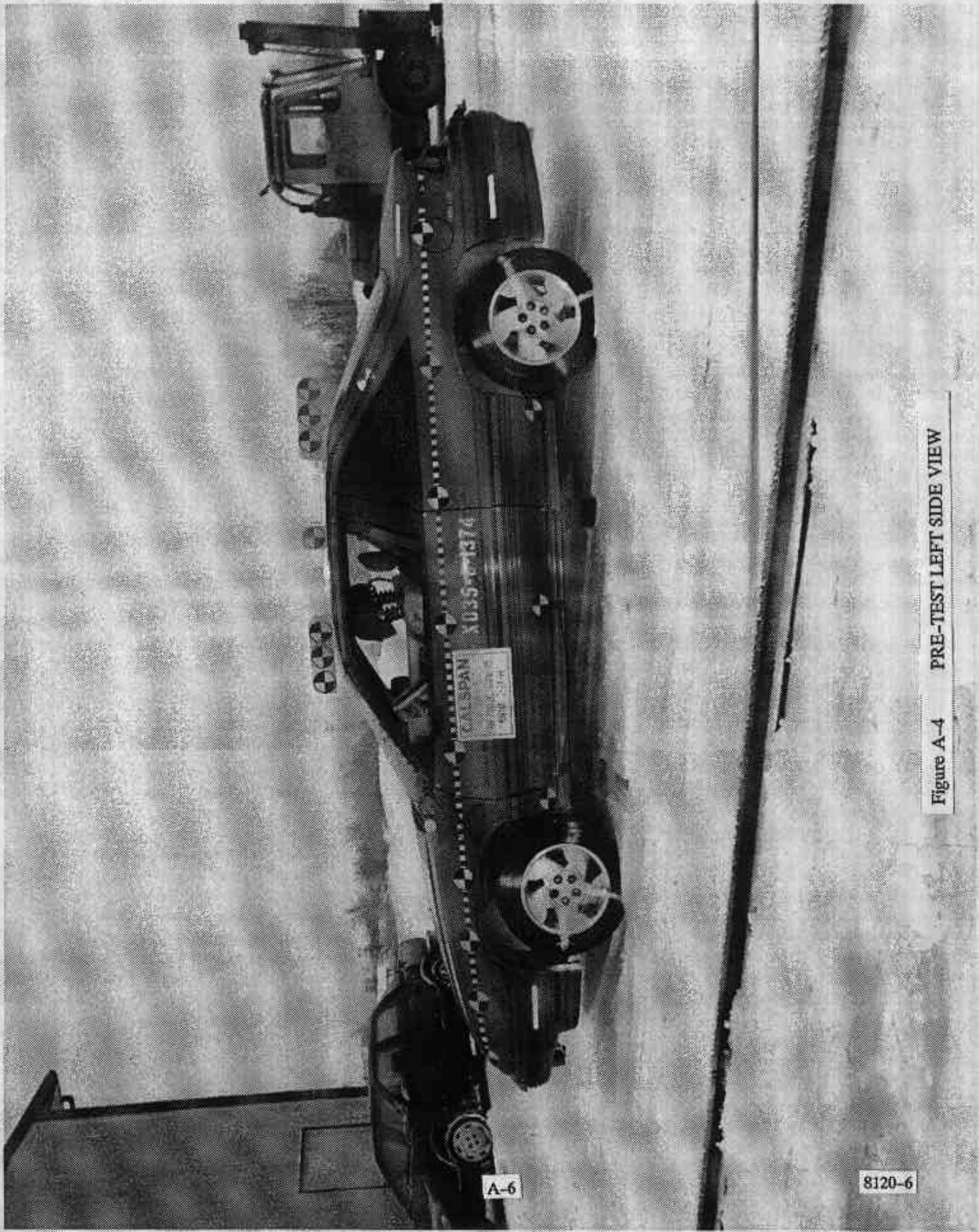


Figure A-4 PRE-TEST LEFT SIDE VIEW

A-6

8120-6

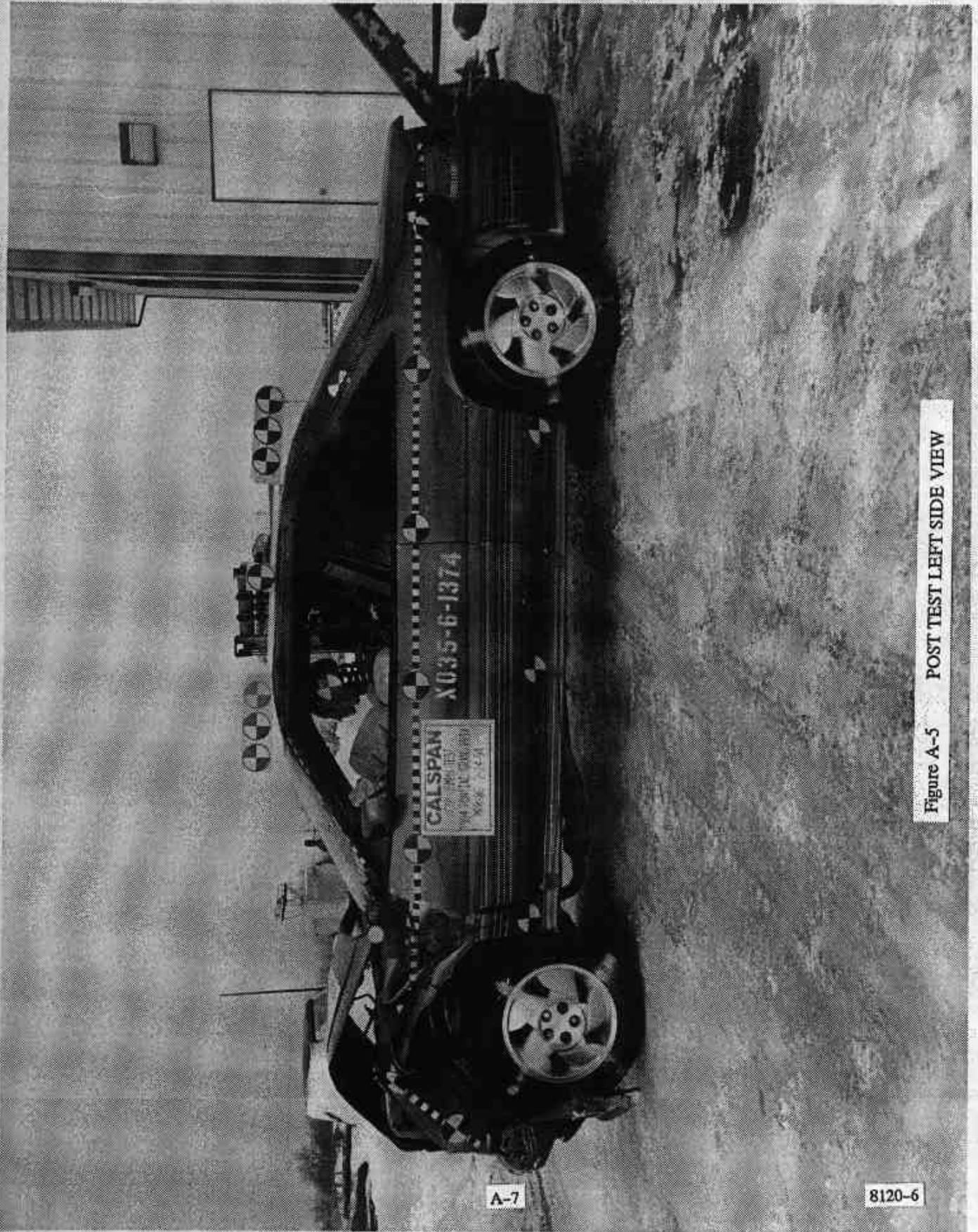


Figure A-5 POST TEST LEFT SIDE VIEW

A-7

8120-6

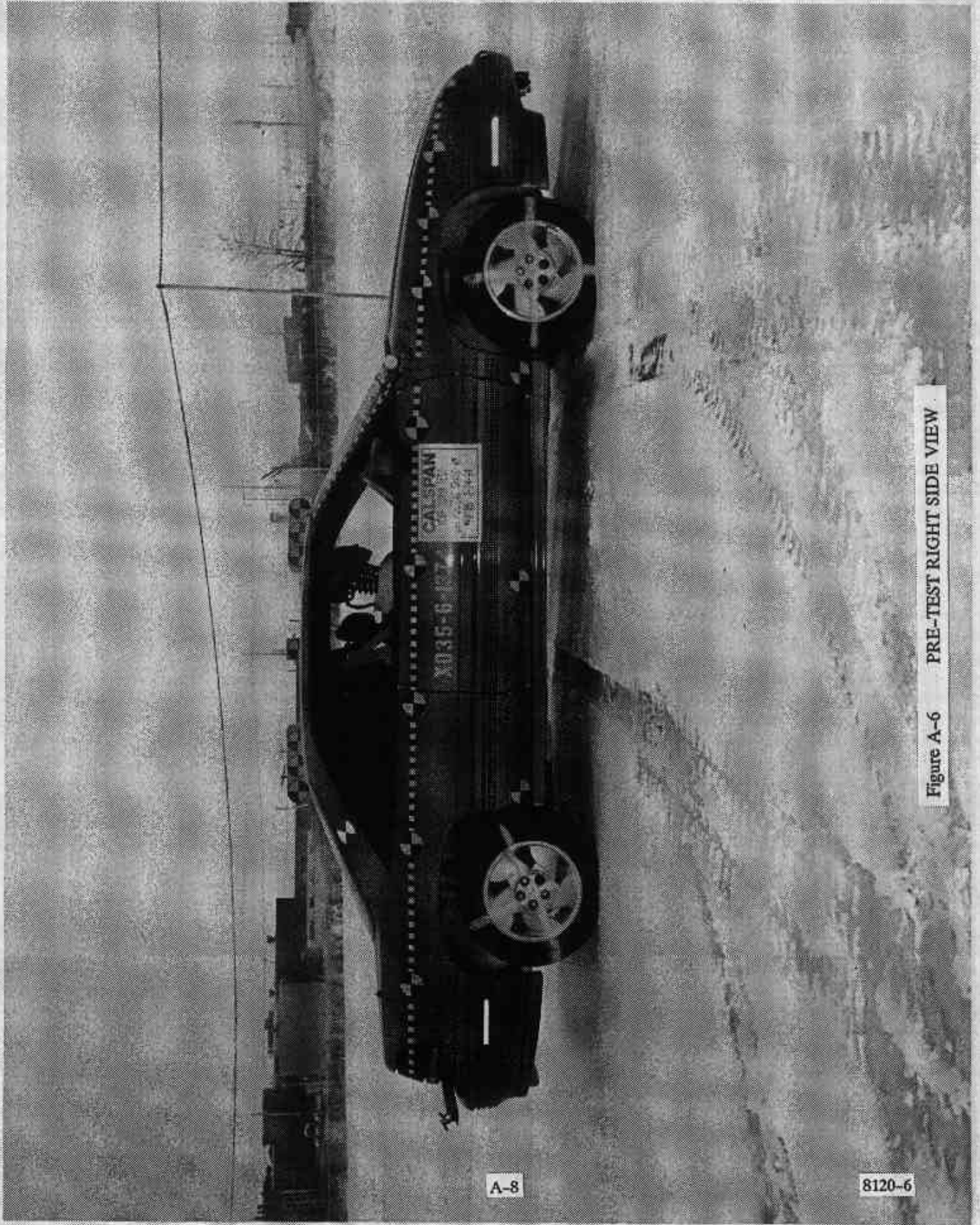


Figure A-6 PRE-TEST RIGHT SIDE VIEW

A-8

8120-6

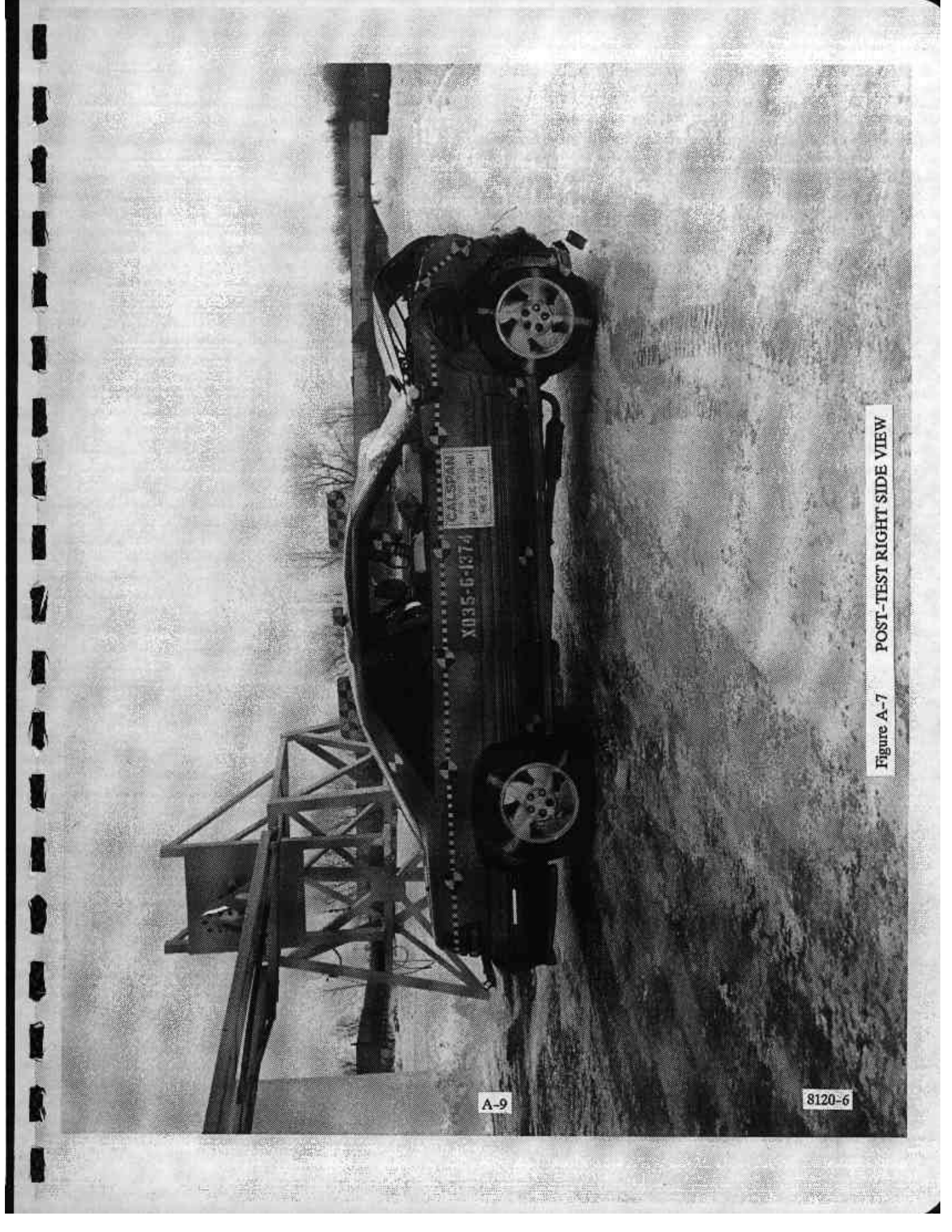


Figure A-7 POST-TEST RIGHT SIDE VIEW

A-9

8120-6

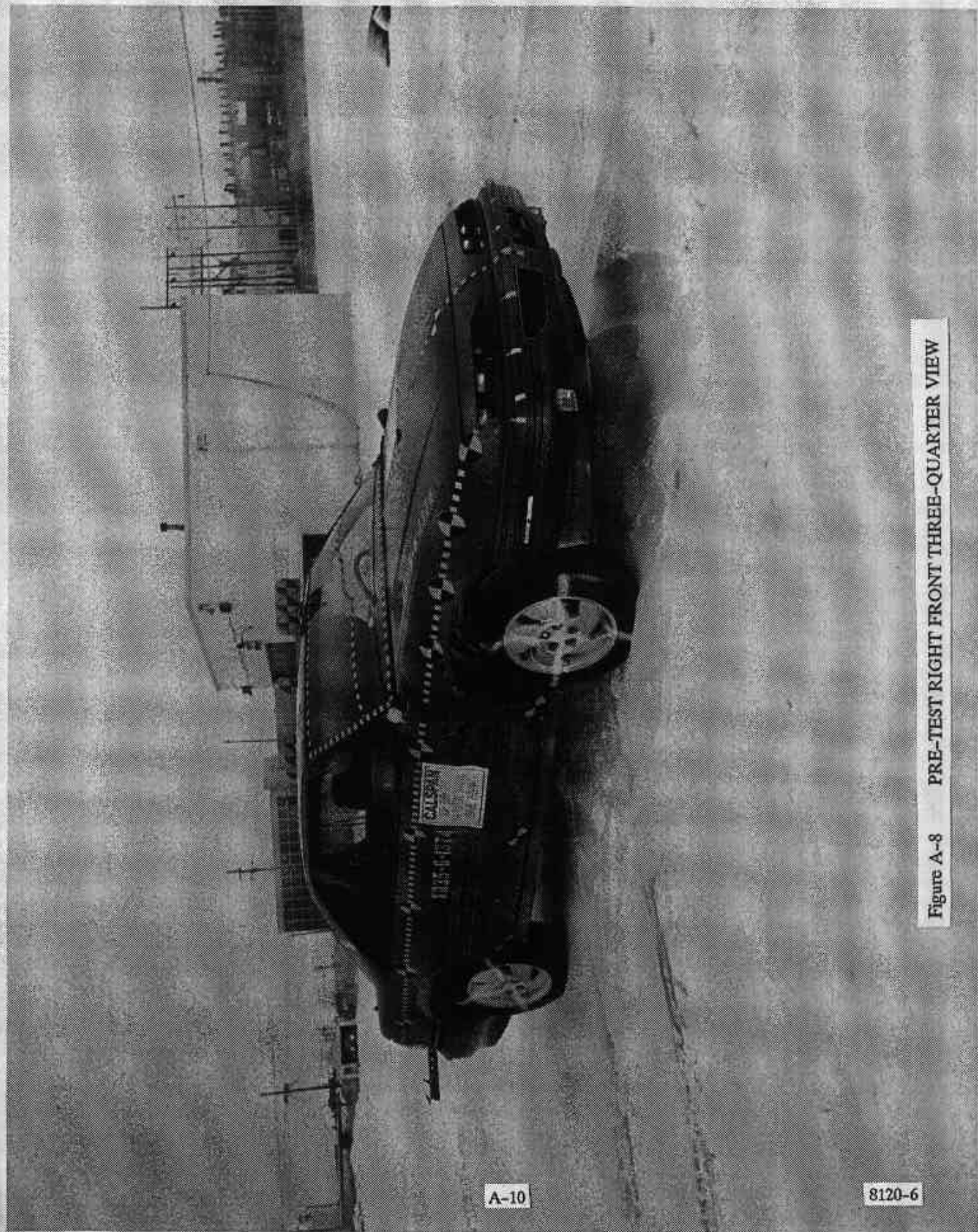


Figure A-8 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

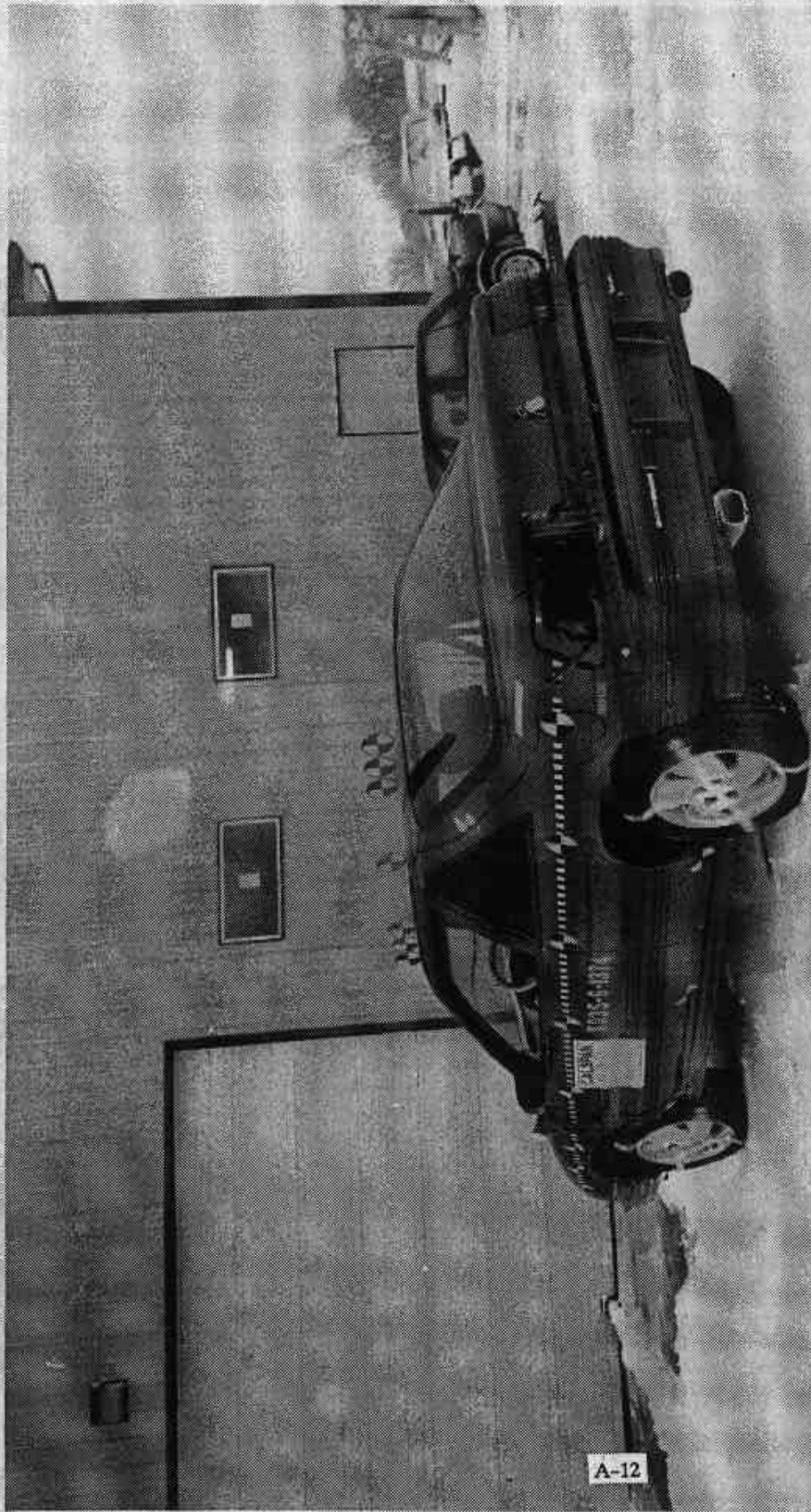
8120-6



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

A-11

8120-6



A-12

8120-6

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

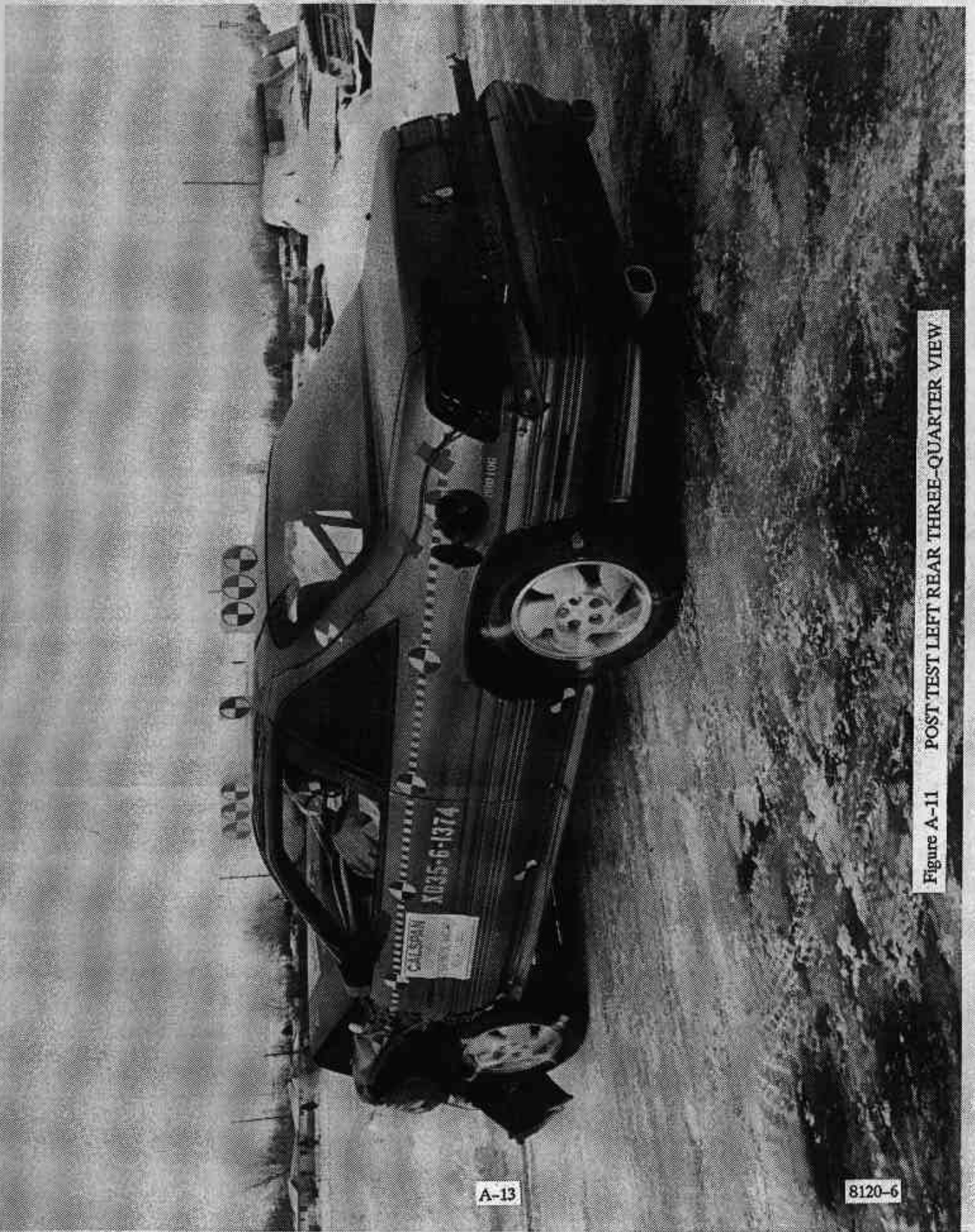
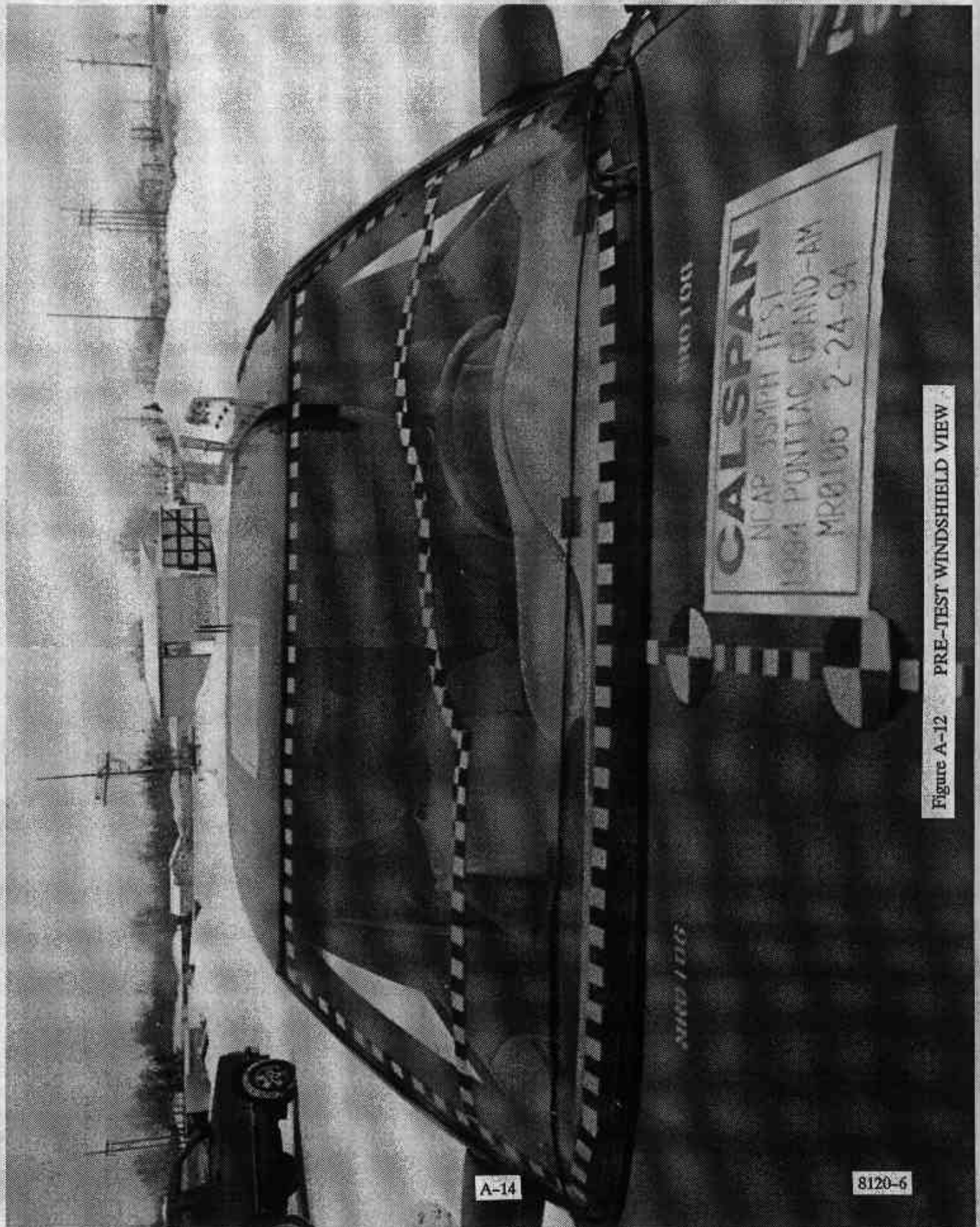


Figure A-11 POST TEST LEFT REAR THREE-QUARTER VIEW

A-13

8120-6



A-14

8120-6

Figure A-12 PRE-TEST WINDSHIELD VIEW



Figure A-13 POST TEST WINDSHIELD VIEW

A-15

8120-6

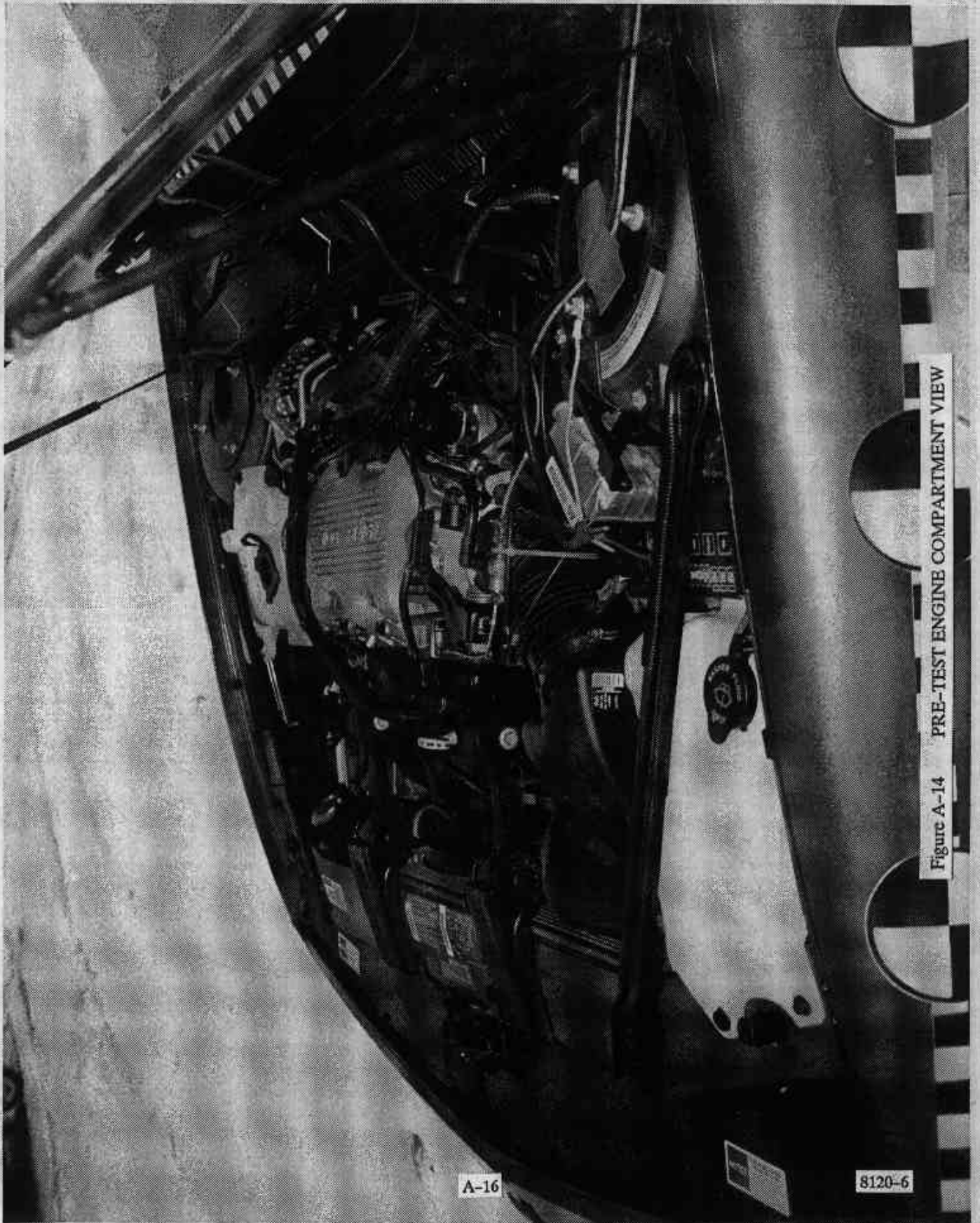
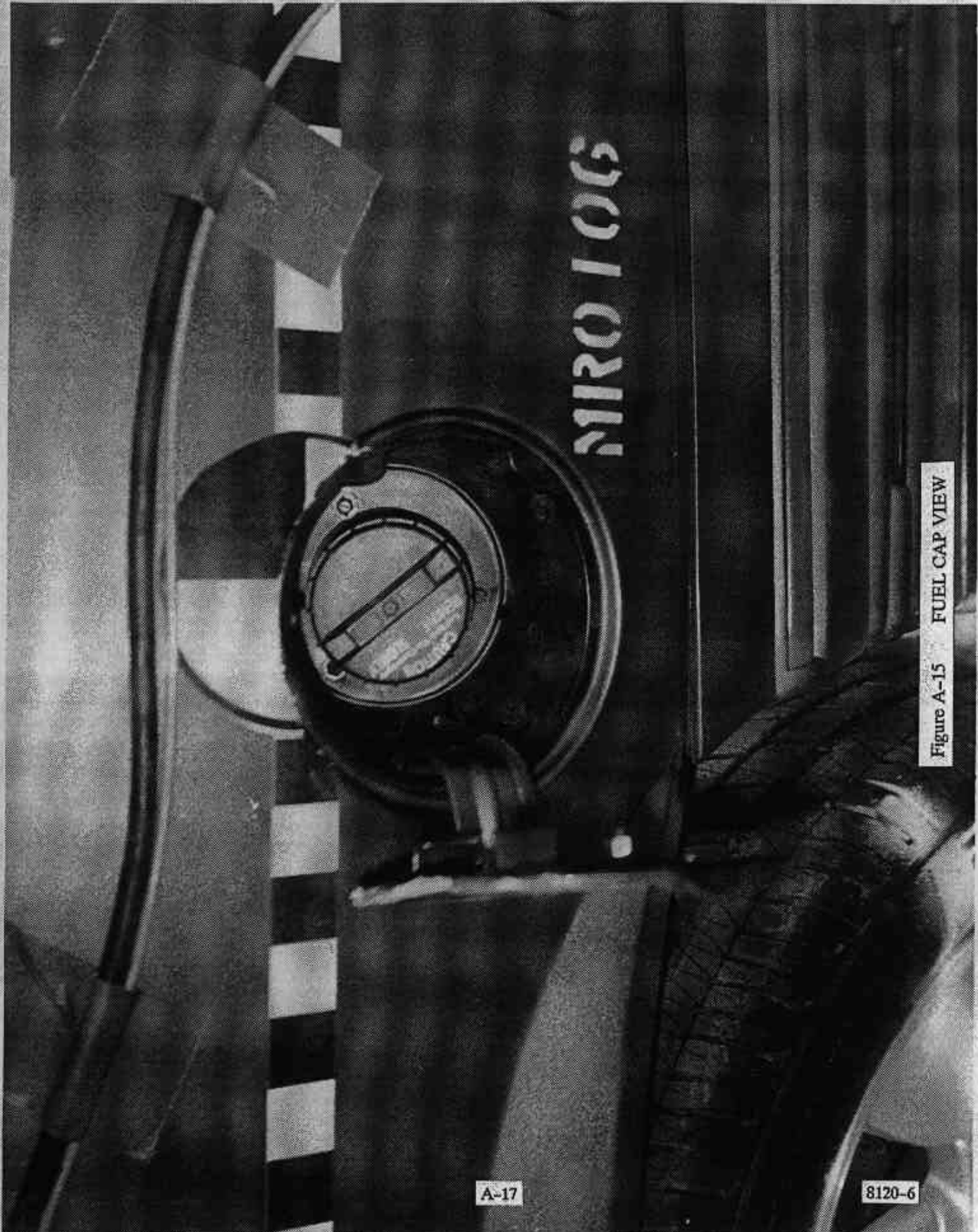


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

A-16

8120-6



MIRO LOG

Figure A-15 FUEL CAP VIEW

A-17

8120-6

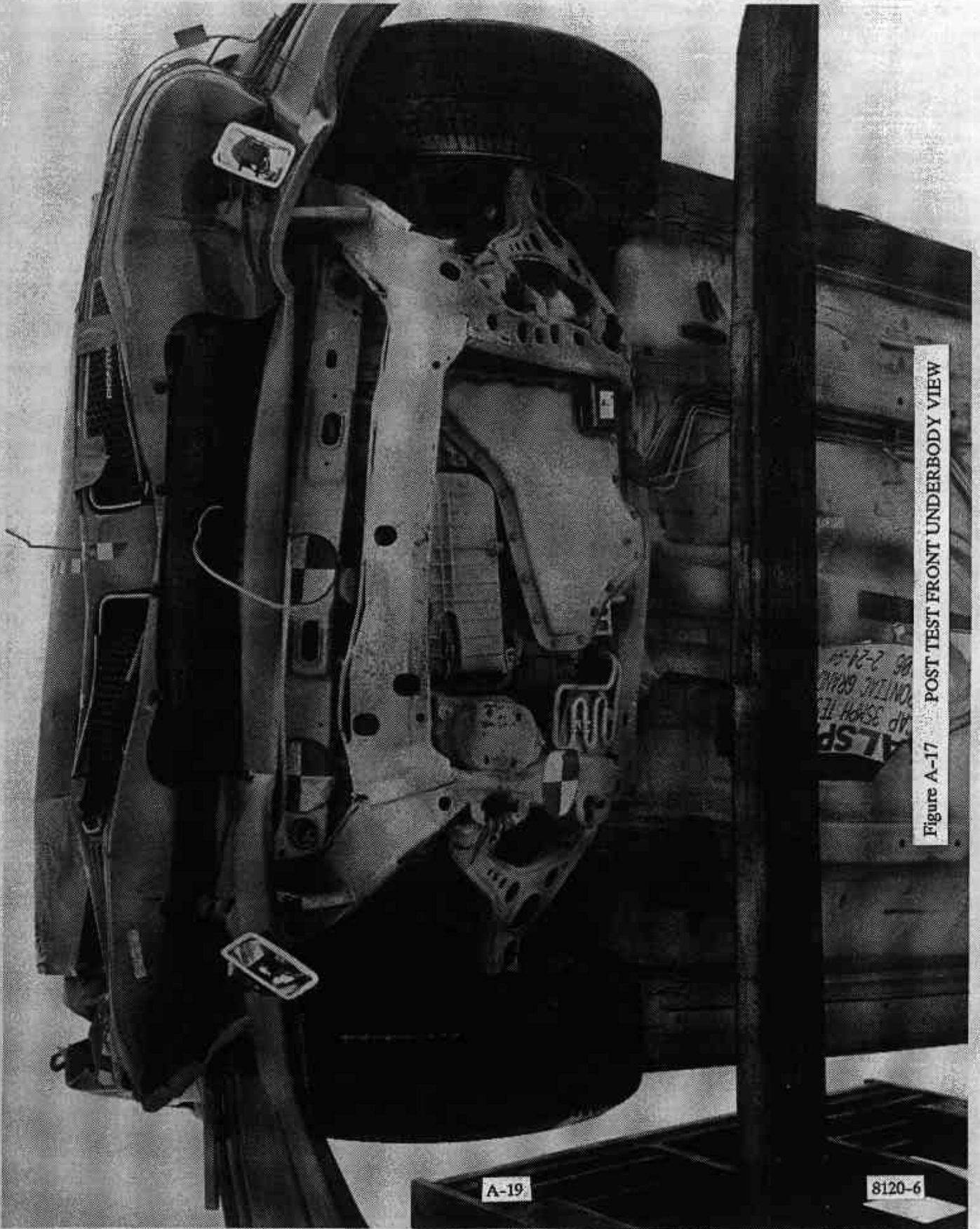


Figure A-16 PRE-TEST FRONT UNDERBODY VIEW

A-18

8120-6

Figure A-17 POST TEST FRONT UNDERBODY VIEW



A-19

8120-6



Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

A-20

8120-6



Figure A-19 POST TEST FRONT SIDE UNDERBODY VIEW

A-21

8120-6



Figure A-20 PRE-TEST REAR UNDERBODY VIEW

A-22

8120-6



Figure A-21 POST TEST REAR UNDERBODY VIEW

A-23

8120-6

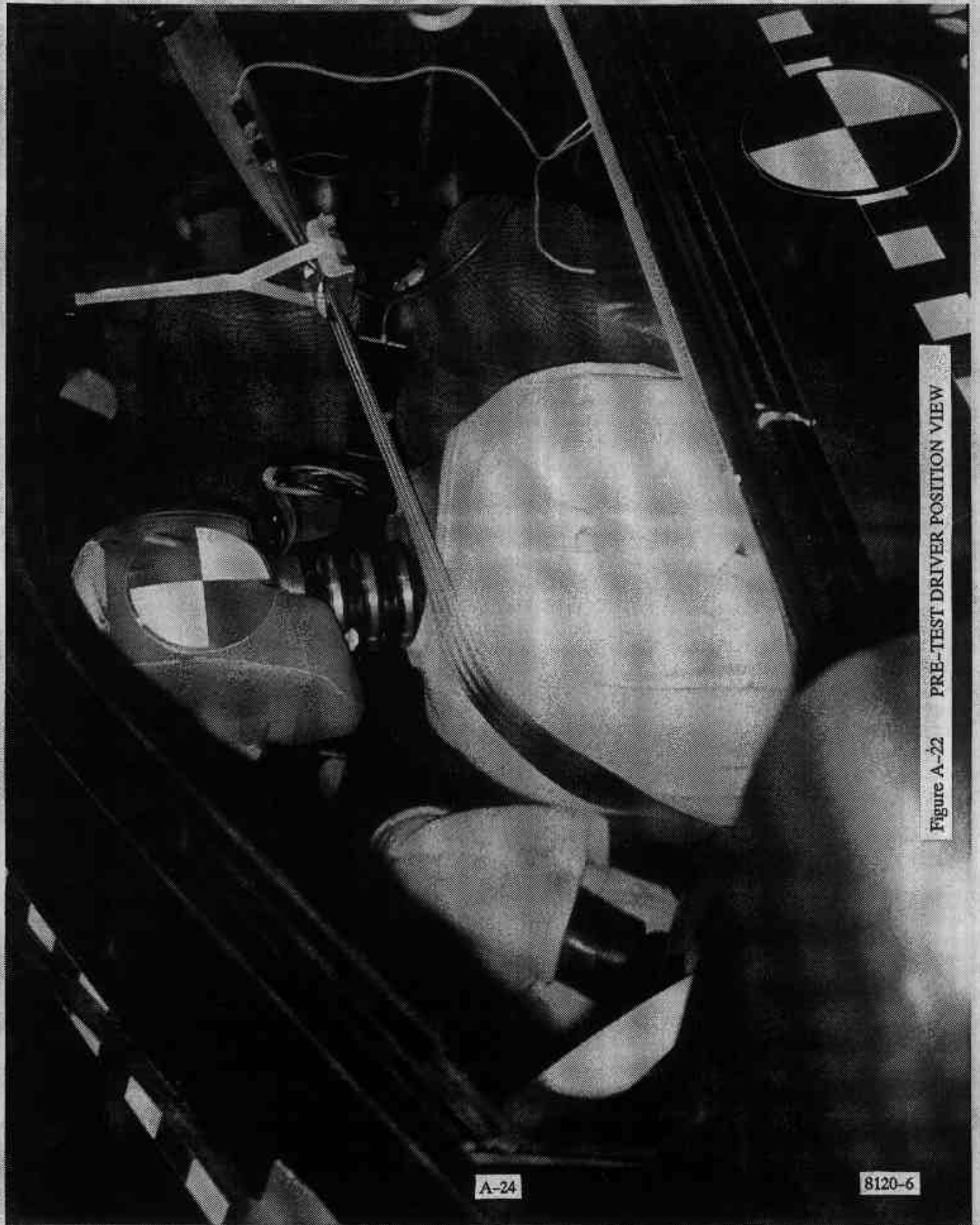


Figure A-22 PRE-TEST DRIVER POSITION VIEW

A-24

8120-6

Figure A-23 POST TEST DRIVER POSITION VIEW



A-25

8120-6



Figure A-24 PRE-TEST PASSENGER POSITION VIEW

A-26

8120-6

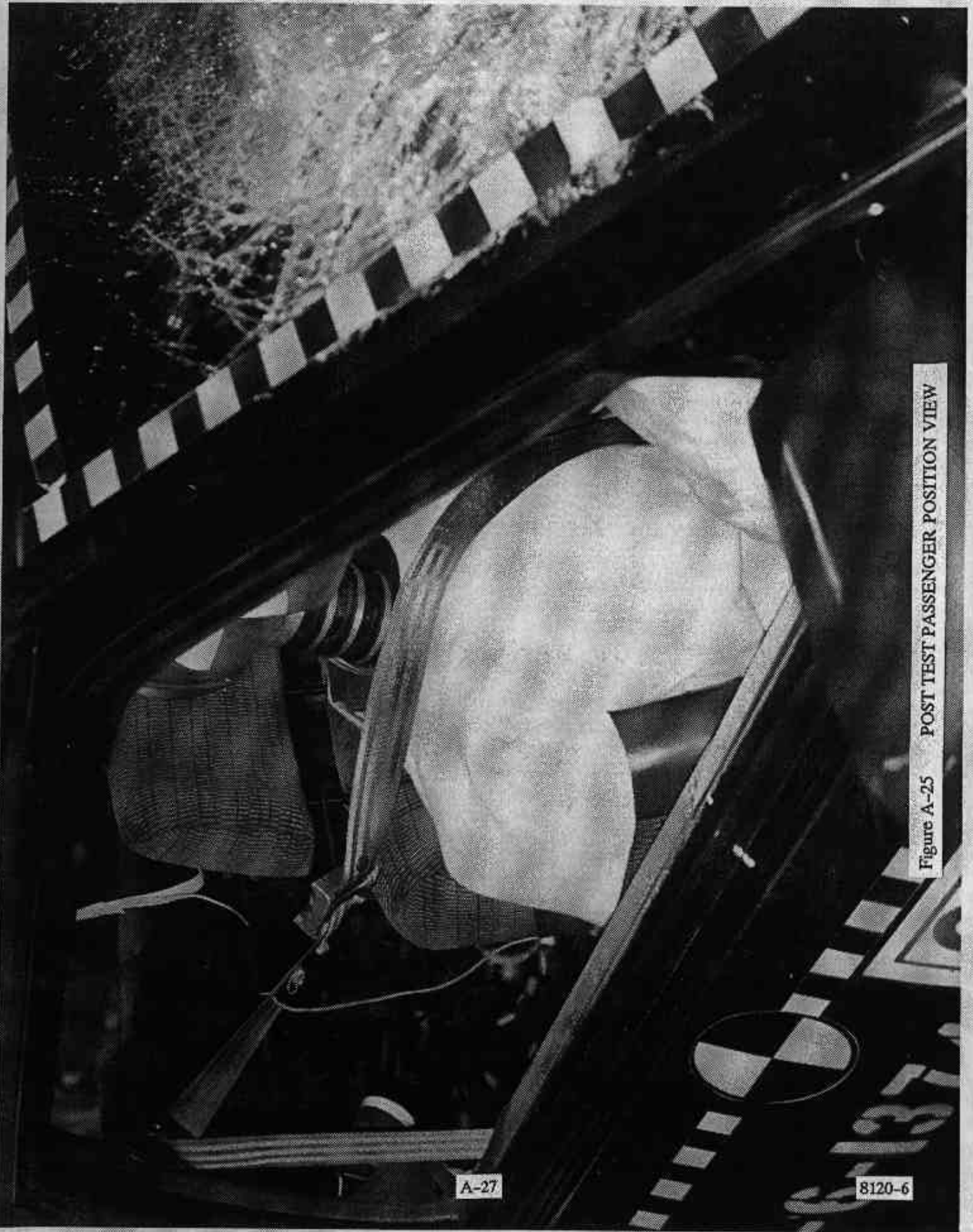


Figure A-25 POST TEST PASSENGER POSITION VIEW

A-27

8120-6

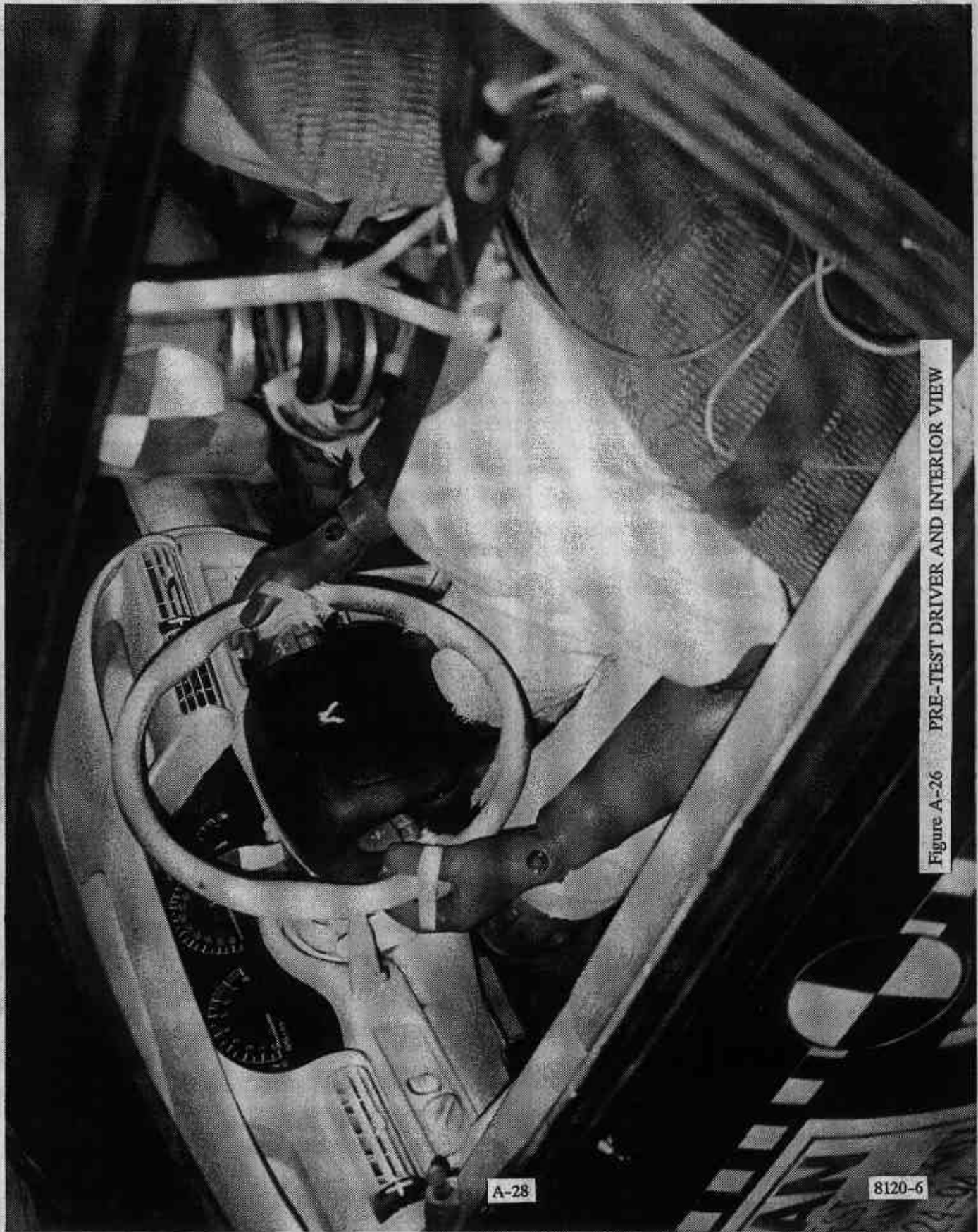


Figure A-26 PRE-TEST DRIVER AND INTERIOR VIEW

A-28

8120-6



Figure A-27 POST TEST DRIVER AND INTERIOR VIEW

A-29

8120-6

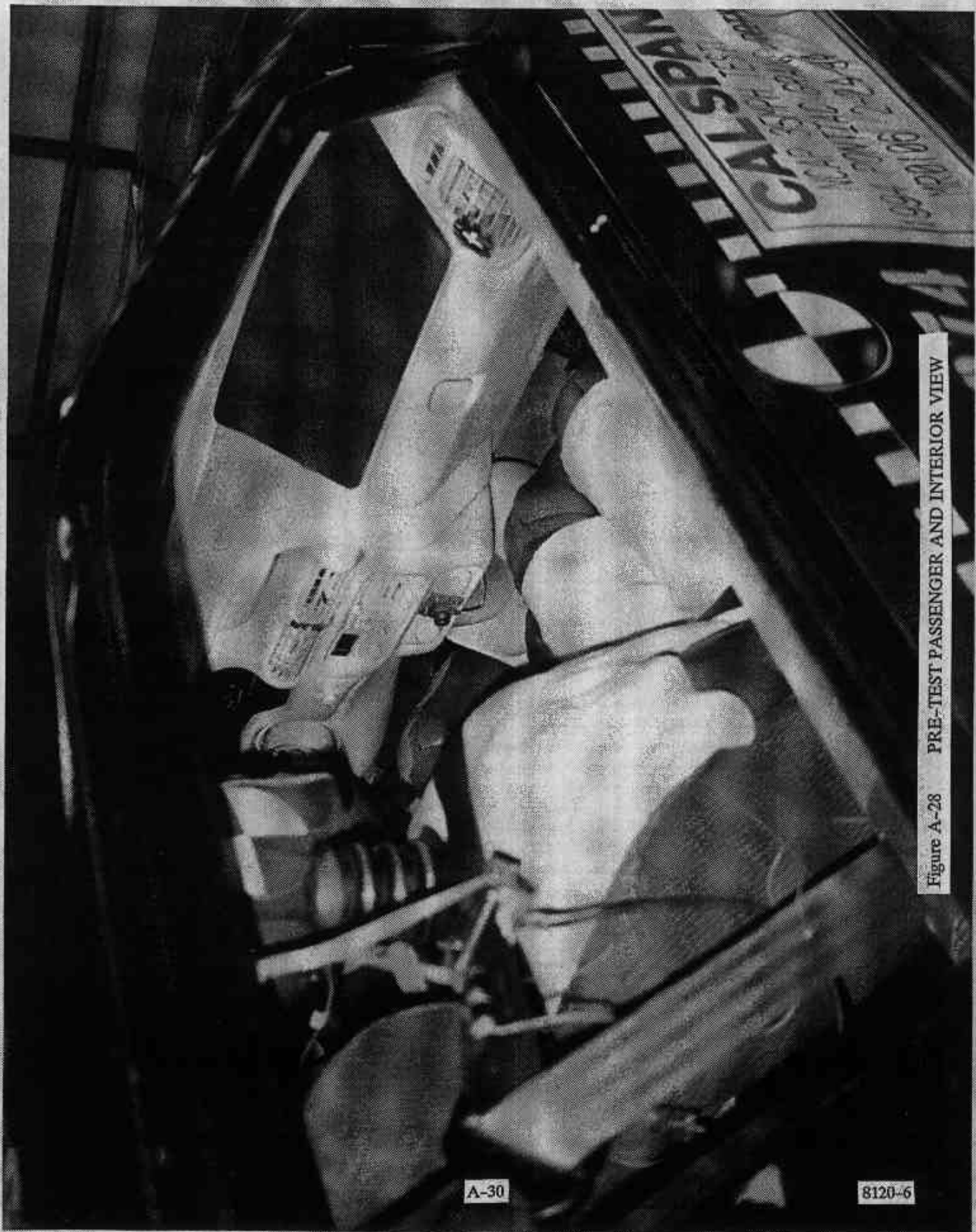


Figure A-28 PRE-TEST PASSENGER AND INTERIOR VIEW

A-30

8120-6



Figure A-29 POST TEST PASSENGER AND INTERIOR VIEW

A-31

8120-6

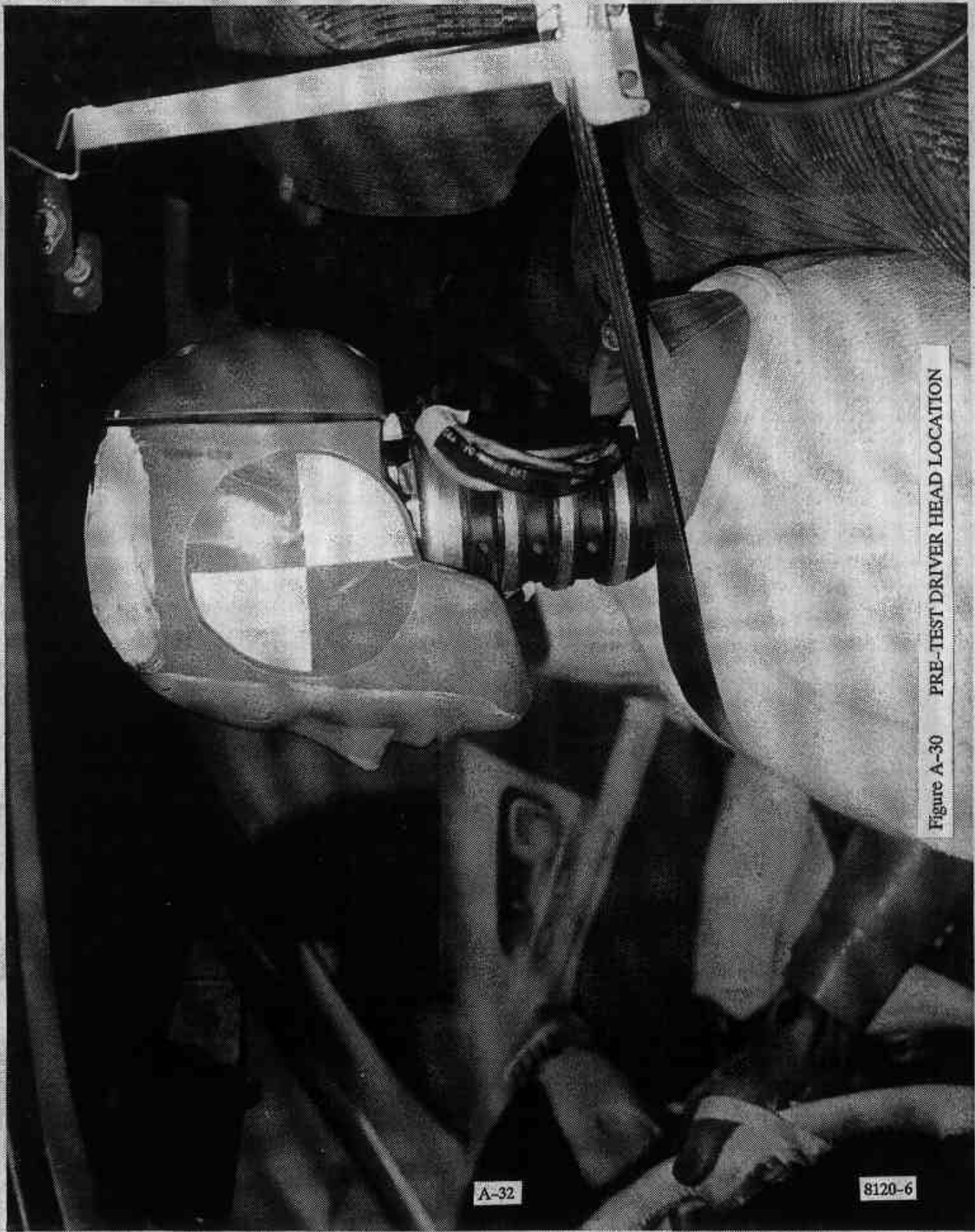


Figure A-30 PRE-TEST DRIVER HEAD LOCATION

A-32

8120-6

Figure A-31 PRE-TEST PASSENGER HEAD LOCATION



A-33

8120-6

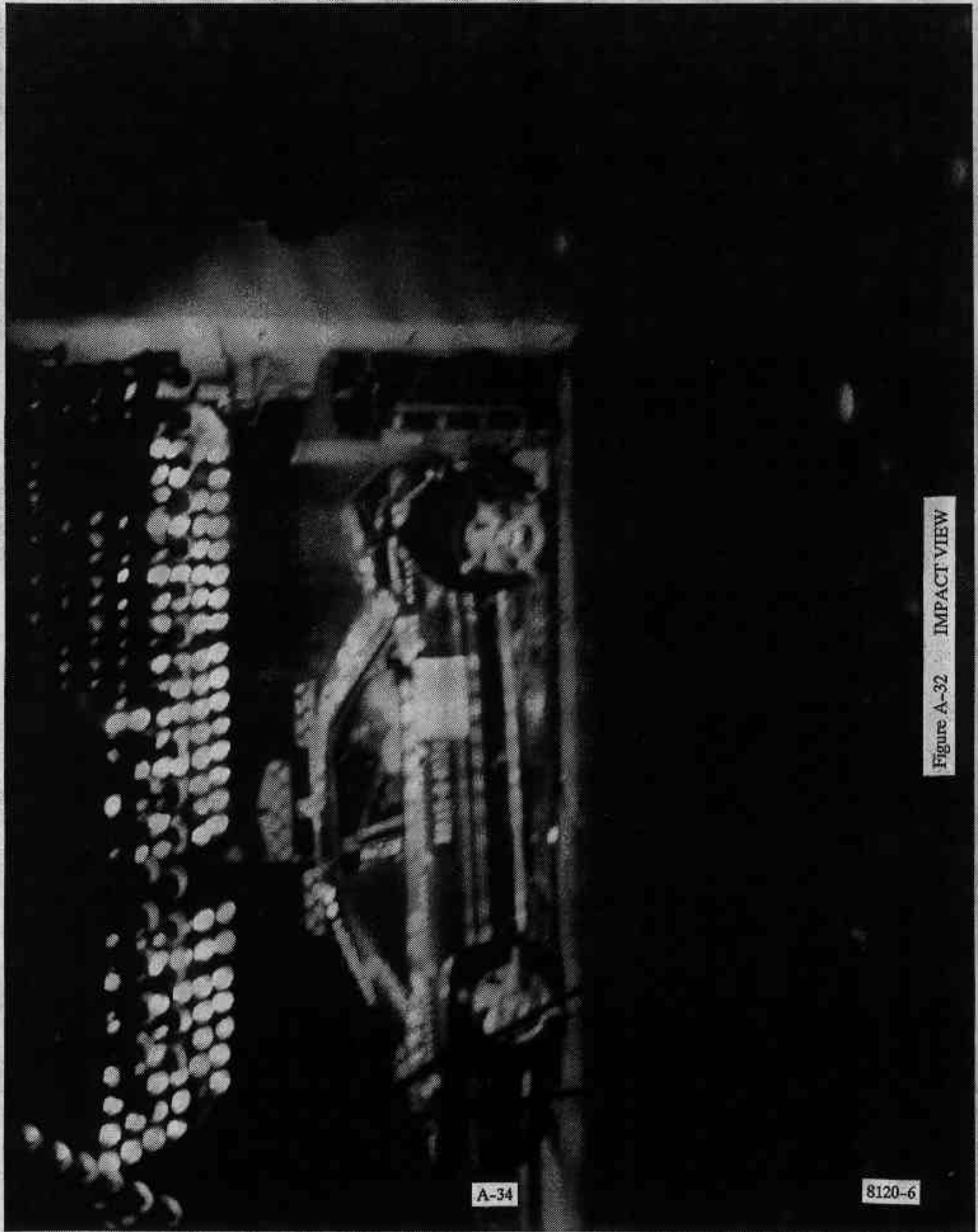


Figure A-32 IMPACT VIEW

A-34

8120-6

Appendix B

VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA

TEST NO. MR0106

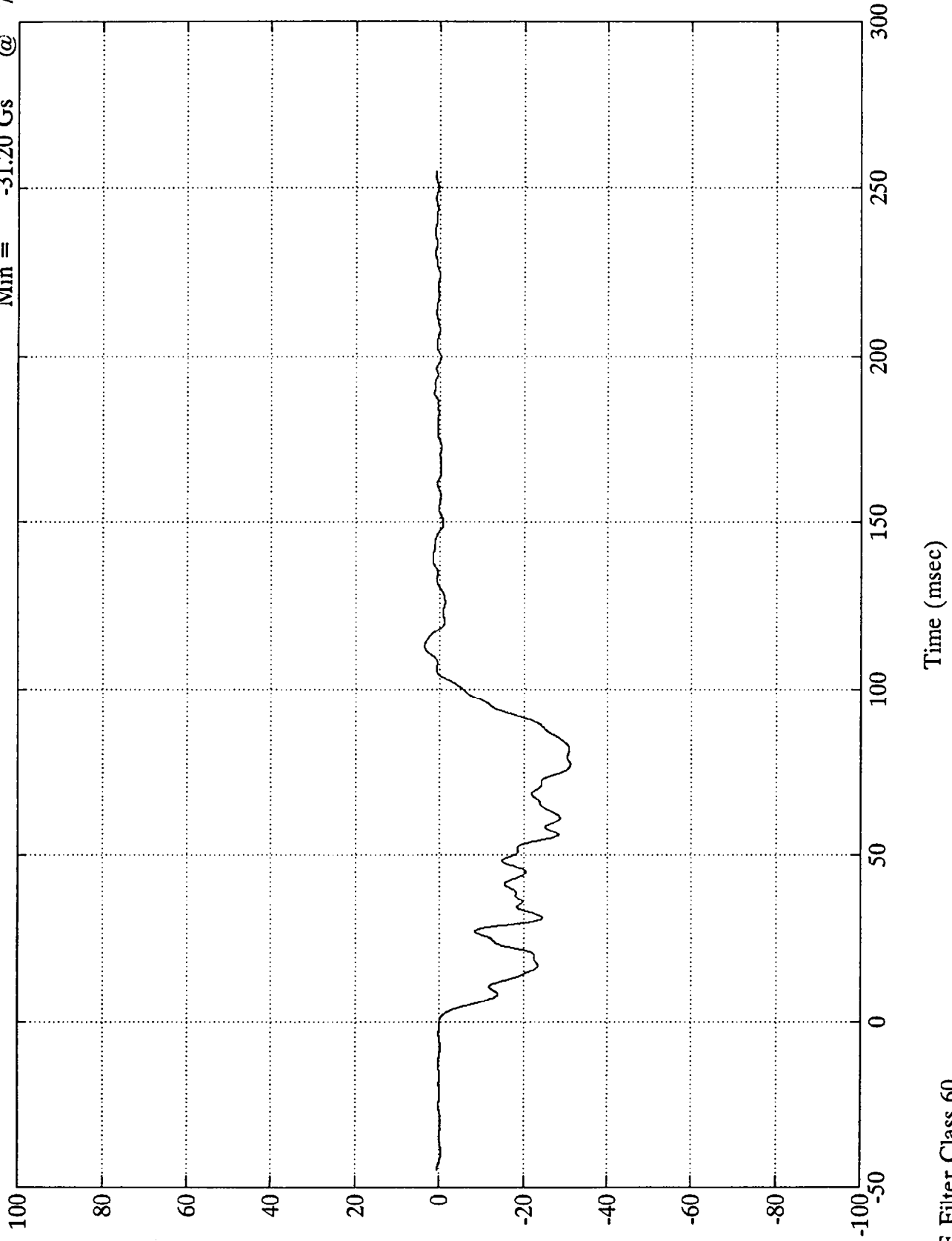
VEHICLE DATA

FILTER CHANNEL CLASS

60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #1(x)
Max = 3.59 Gs @ 112.68 msec
Min = -31.20 Gs @ 77.27 msec



B-3

8120-6

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 56.16 kph @ -0.00 msec
Min = -13.48 kph @ 103.67 msec

Acc. #1(x)

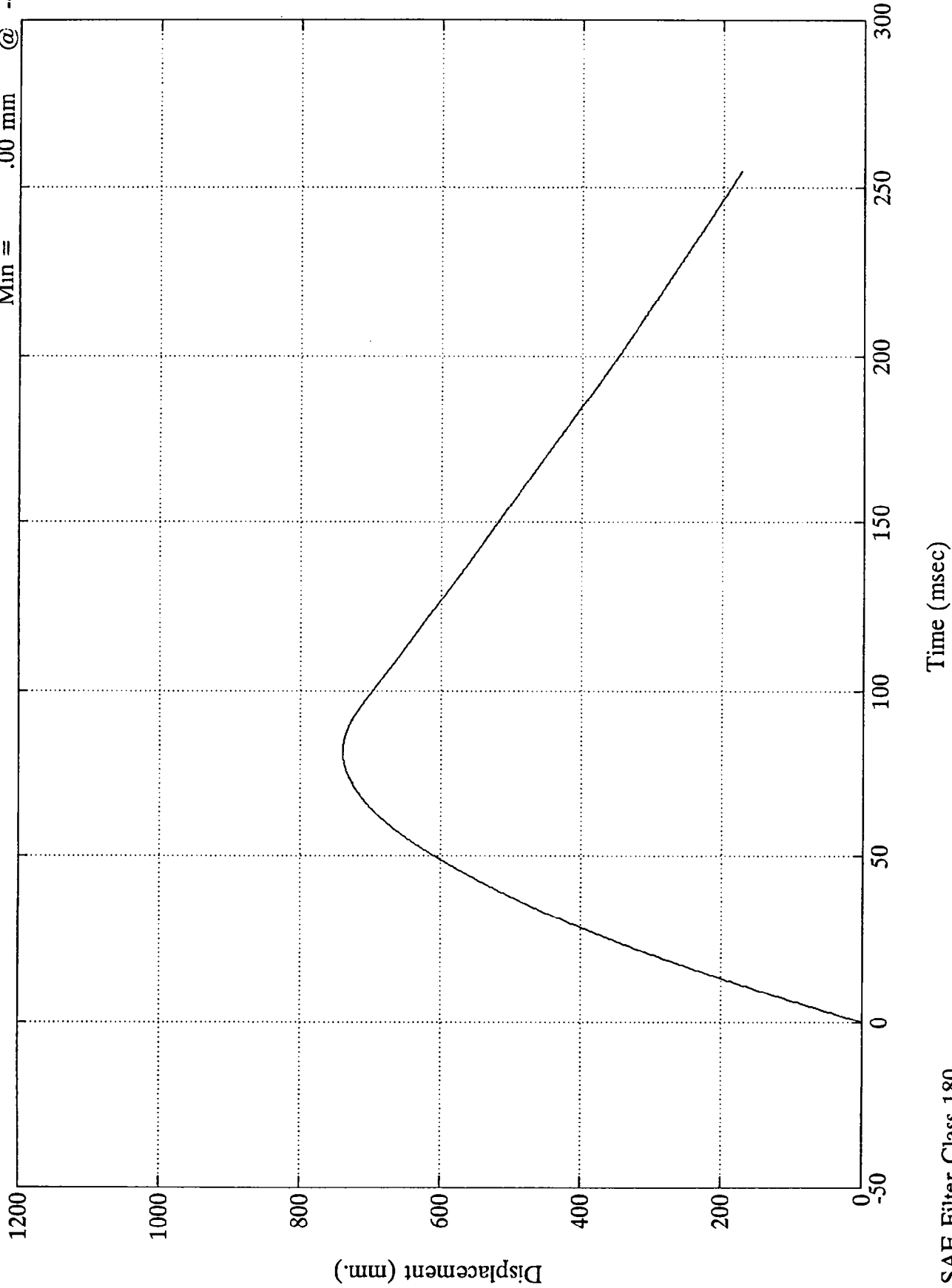


Time (msec)

SAE Filter Class 180

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

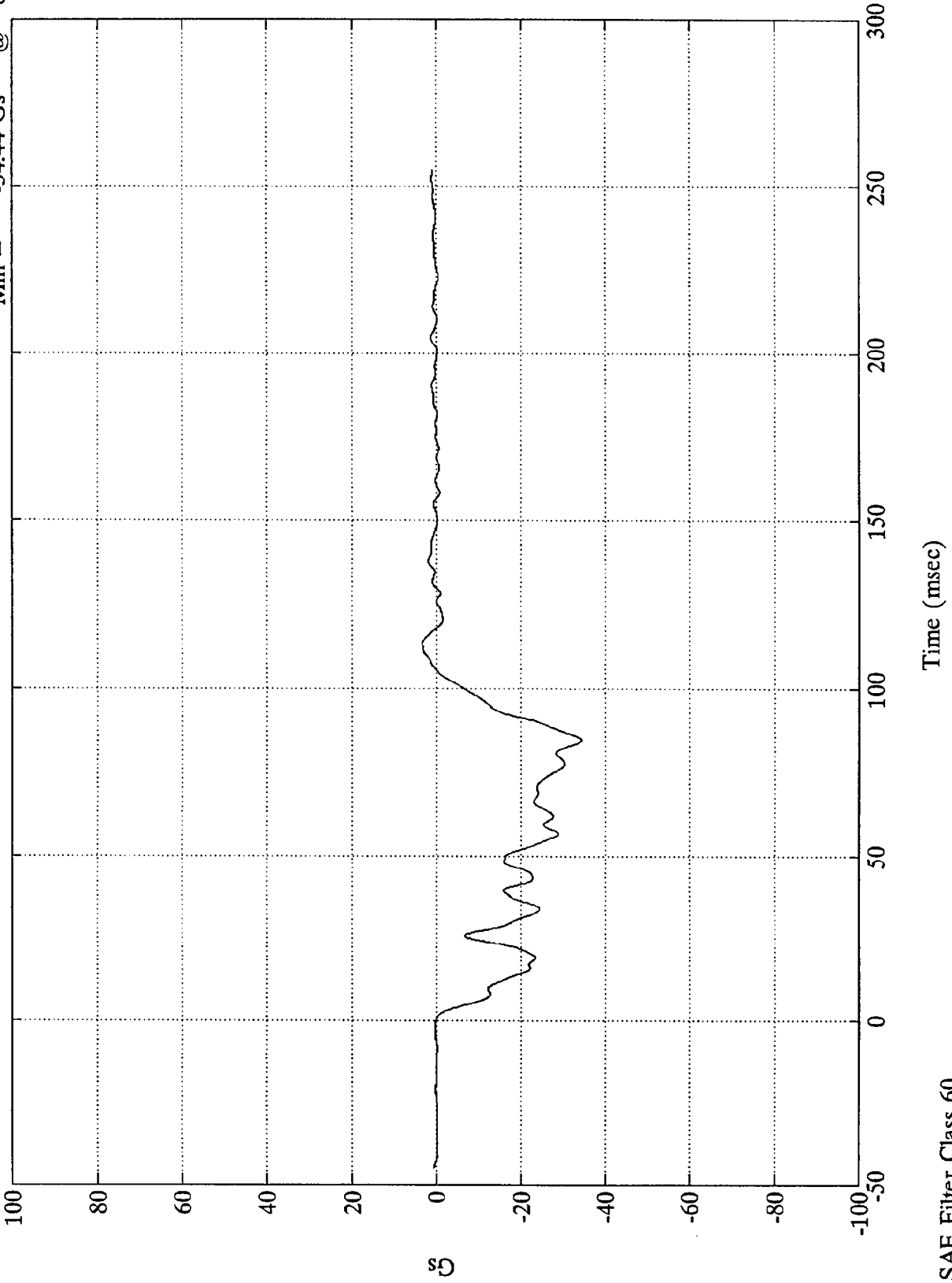
Acc. #1(x)
Max = 739.93 mm @ 81.36 ms
Min = .00 mm @ -44.88 ms



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #2(x)

Max = 3.34 Gs @ 113.28 msec
Min = -34.44 Gs @ 84.95 msec



B-6

8120-6

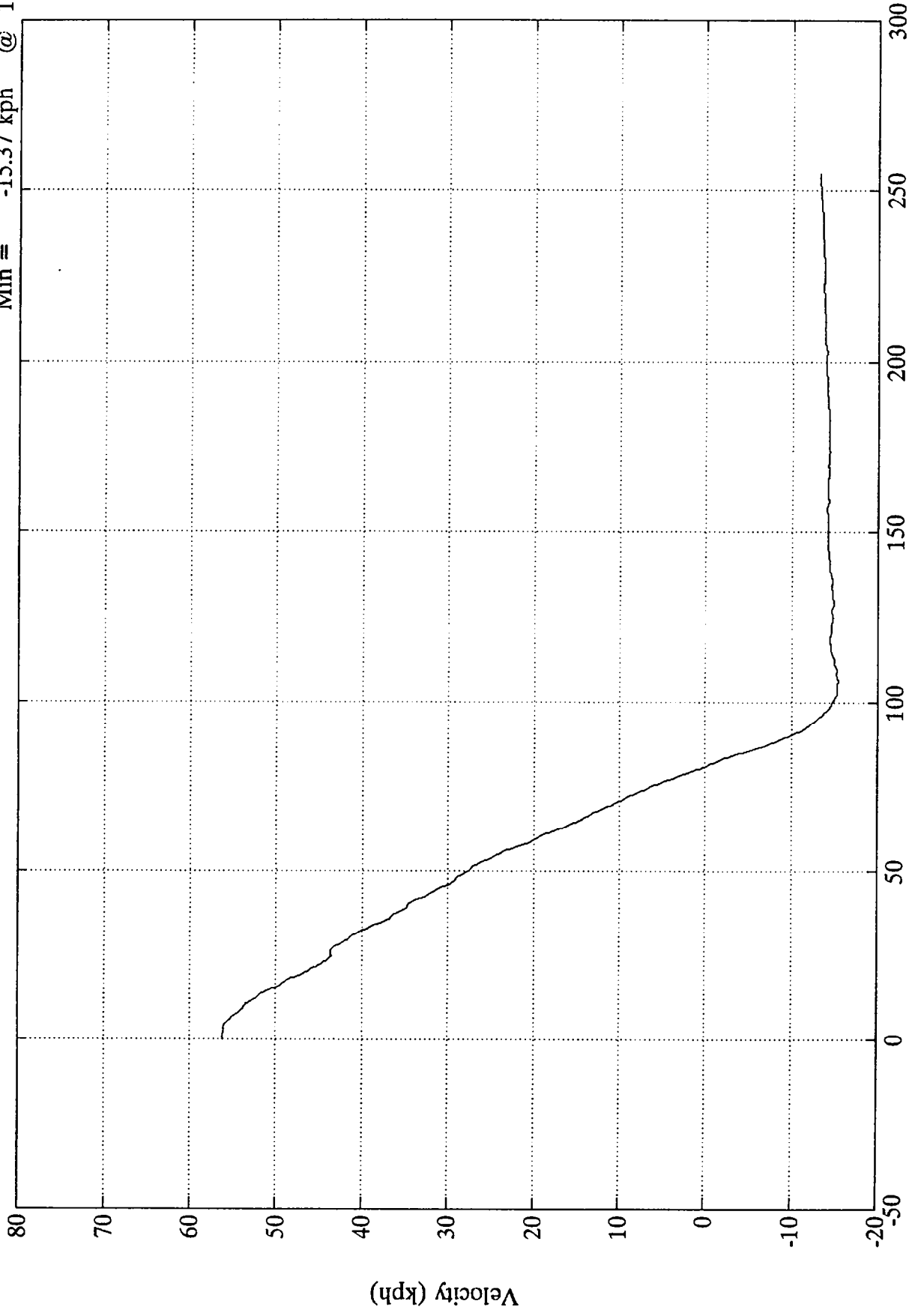
SAE Filter Class 60



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #2(x)

Max = 56.16 kph @ -0.00 msec
Min = -15.37 kph @ 106.32 msec

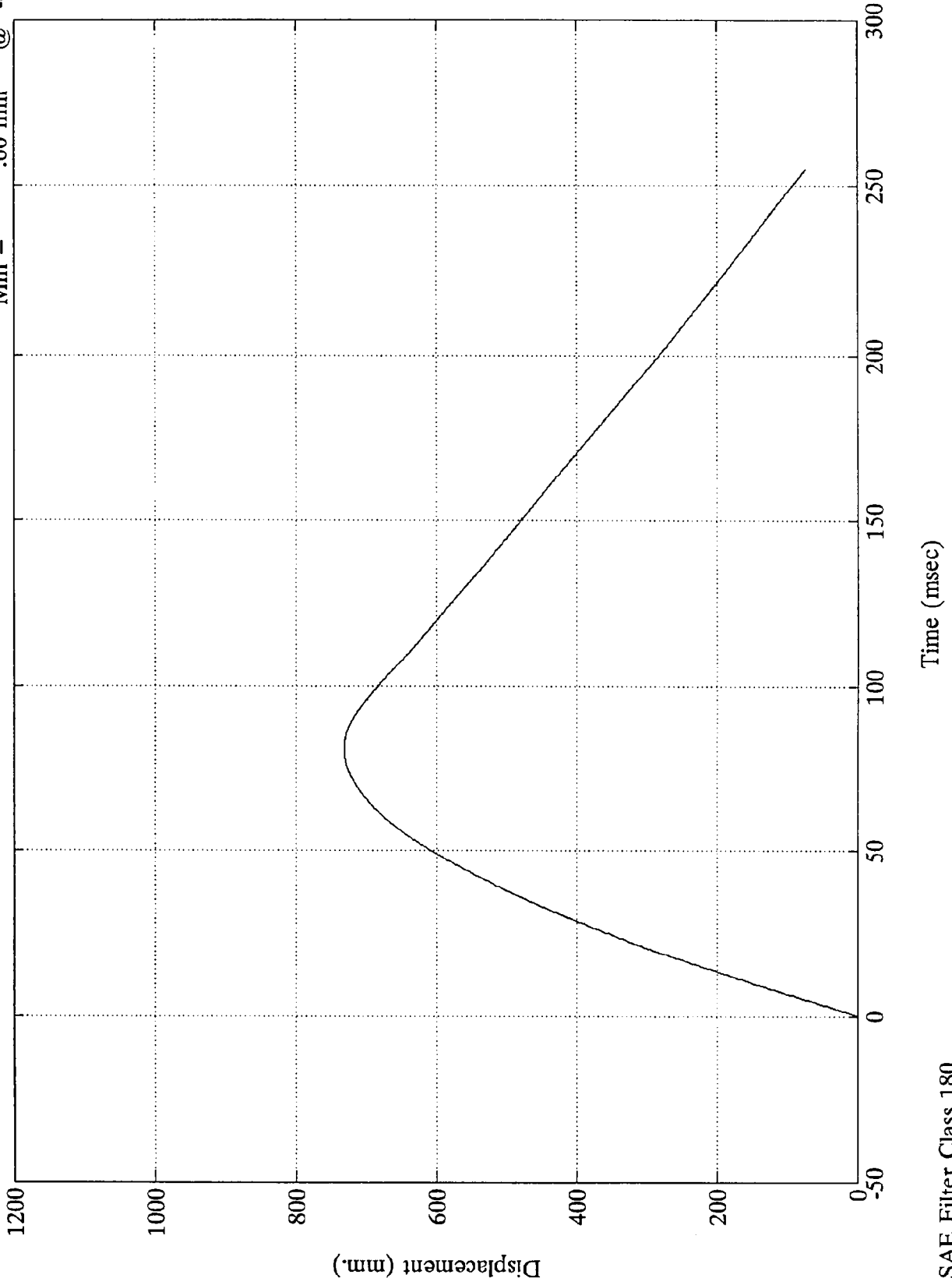


Time (msec)

SAE Filter Class 180

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #2(x) Max = 732.16 mm @ 80.64 msec
Min = .00 mm @ -44.88 msec



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

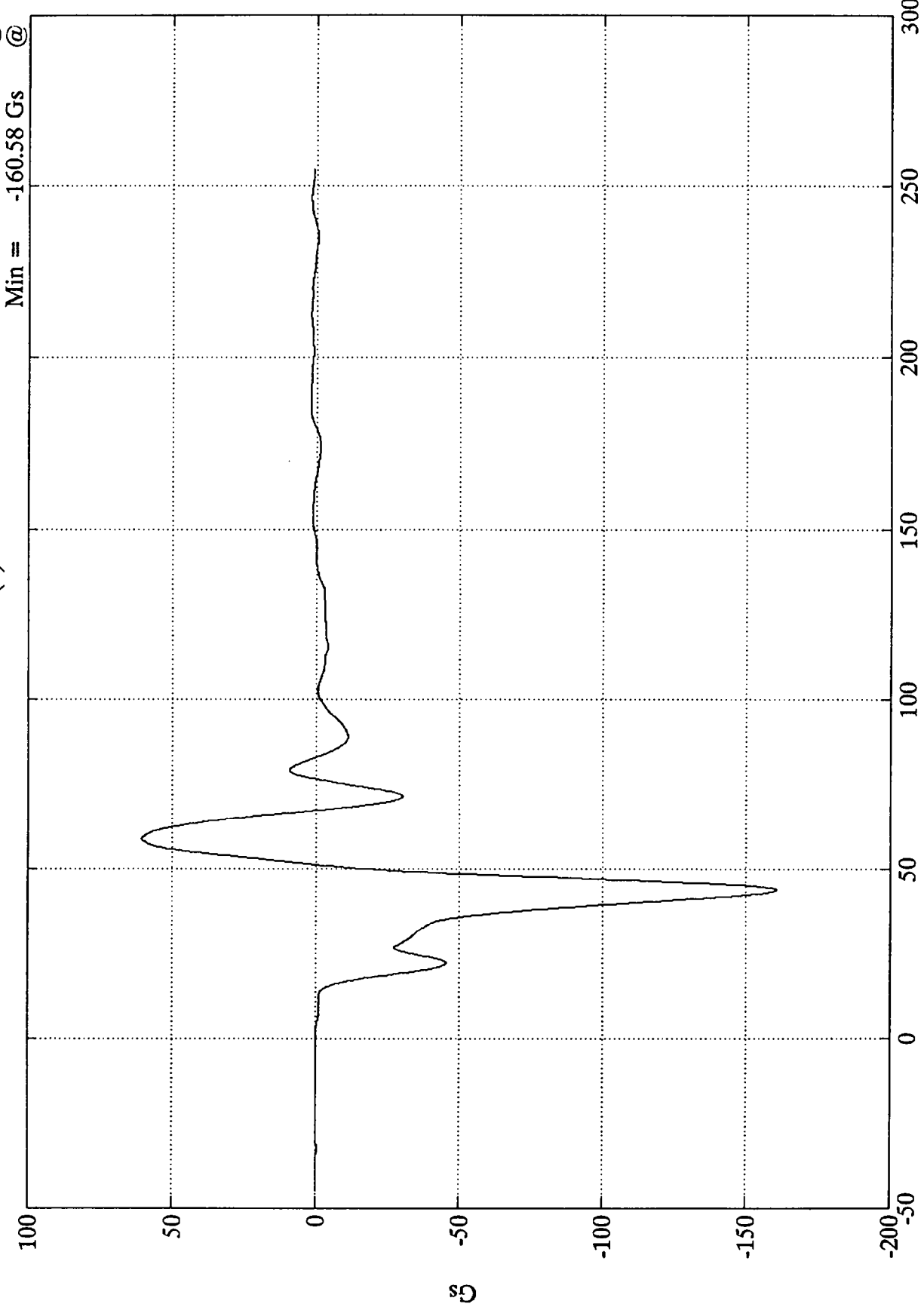
Acc. #3(x)

Max =

60.67 Gs

@

58.79 msec



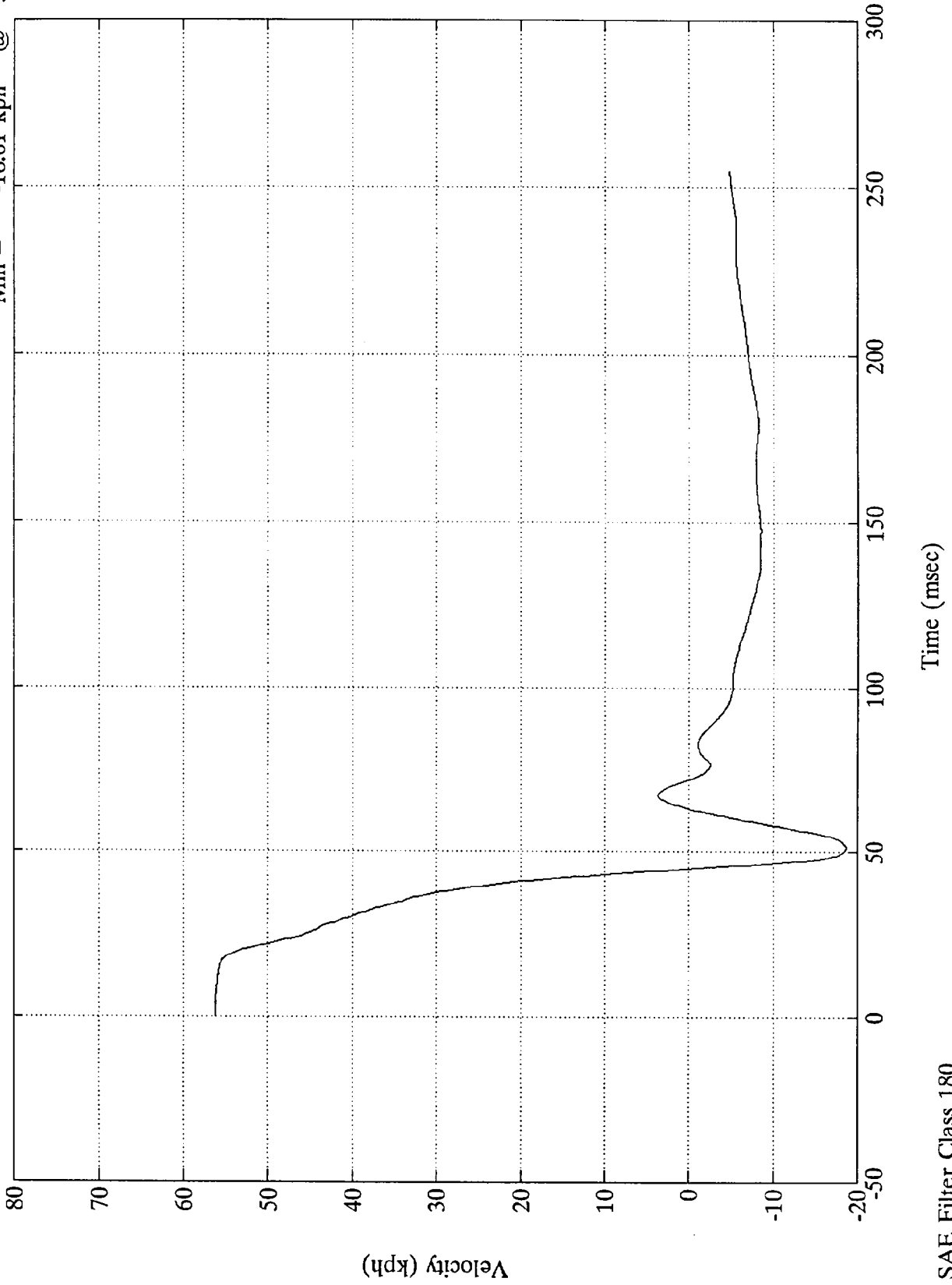
Time (msec)

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 56.17 kph @ 3.95 msec
Min = -18.61 kph @ 51.24 msec

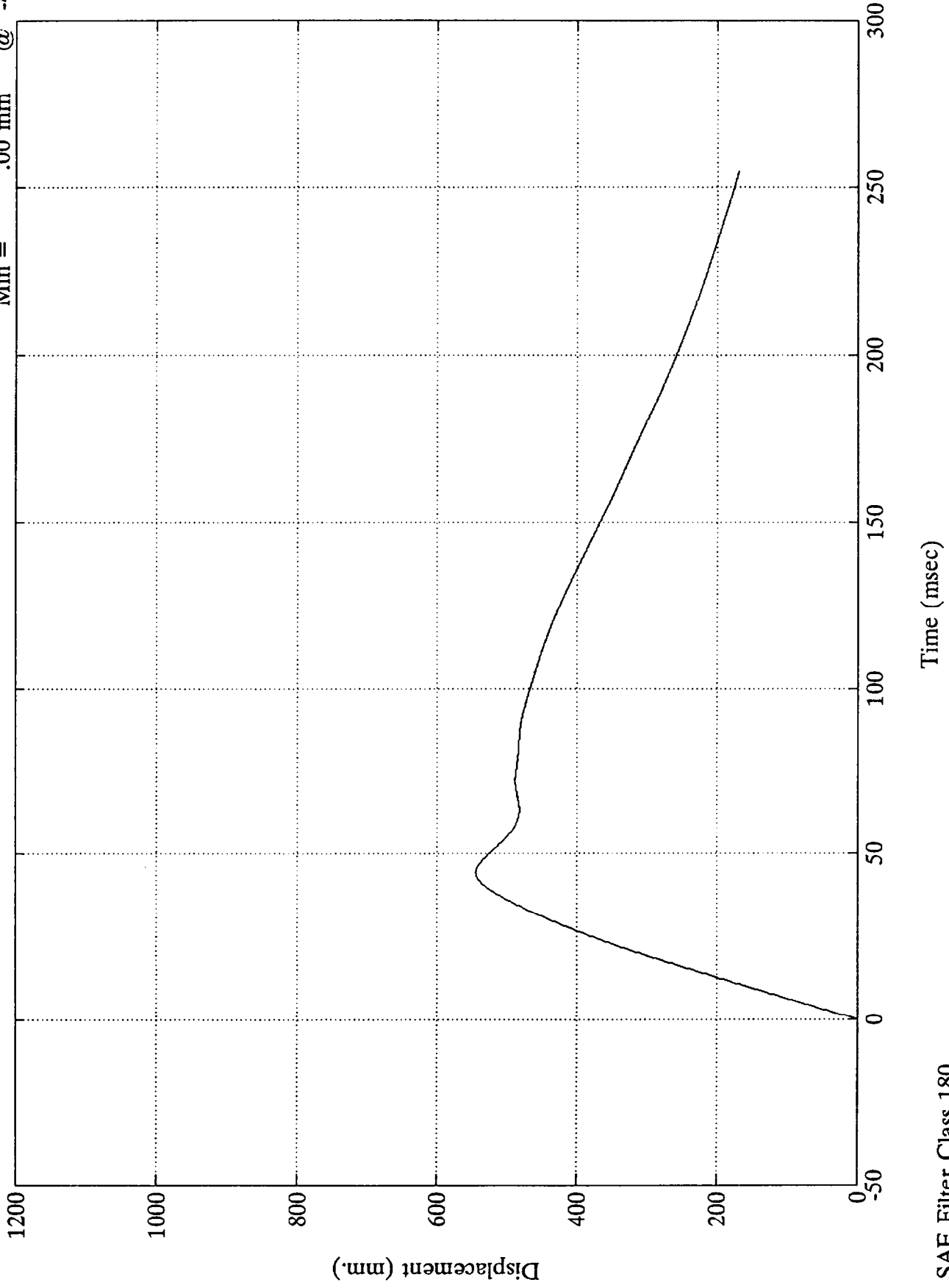
Acc. #3(x)



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #3(x)

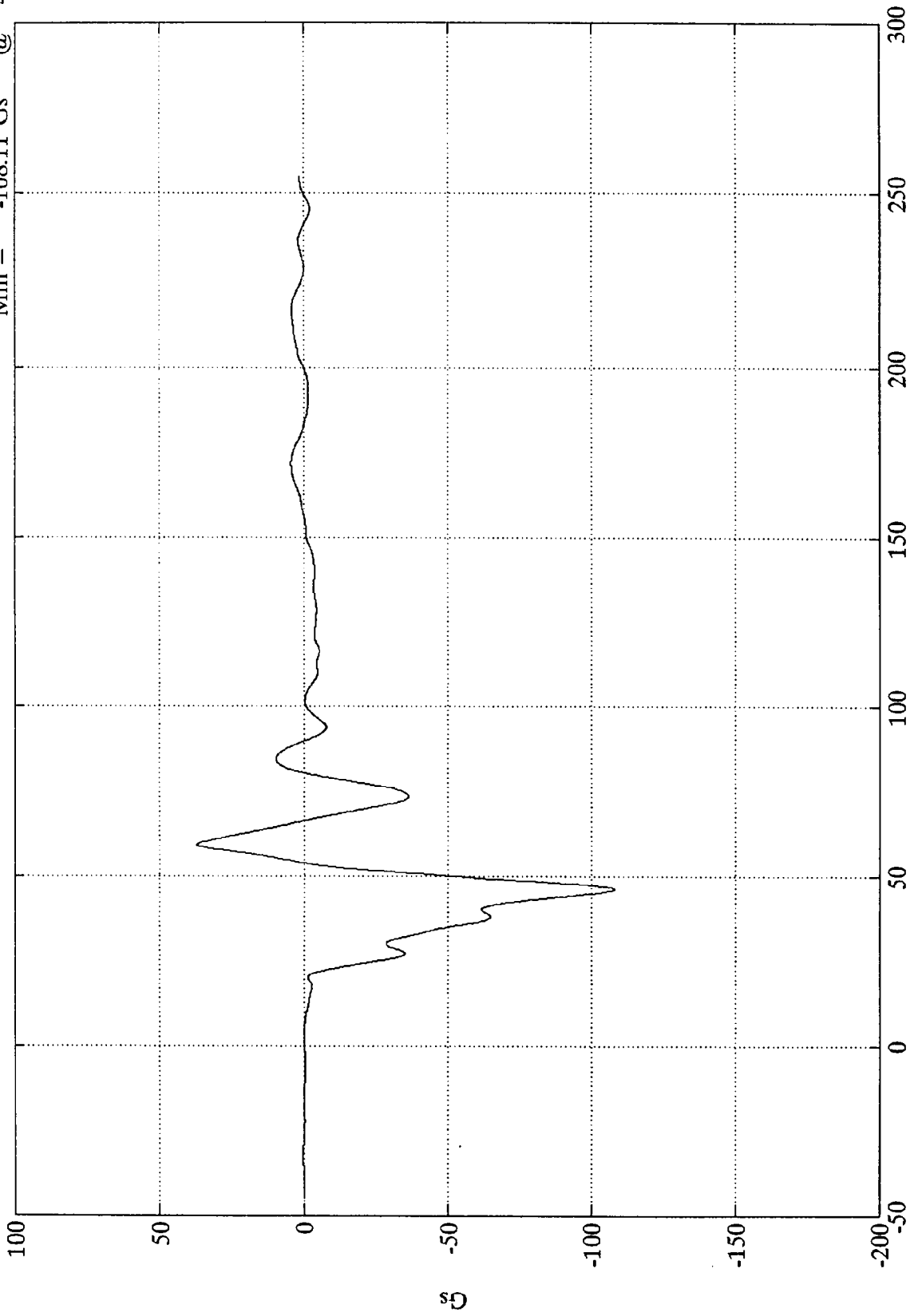
Max = 544.46 mm @ 44.39 ms
Min = .00 mm @ -44.88 ms



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #4(x)

Max = 37.24 Gs @ 59.27 msec
Min = -108.11 Gs @ 46.08 msec



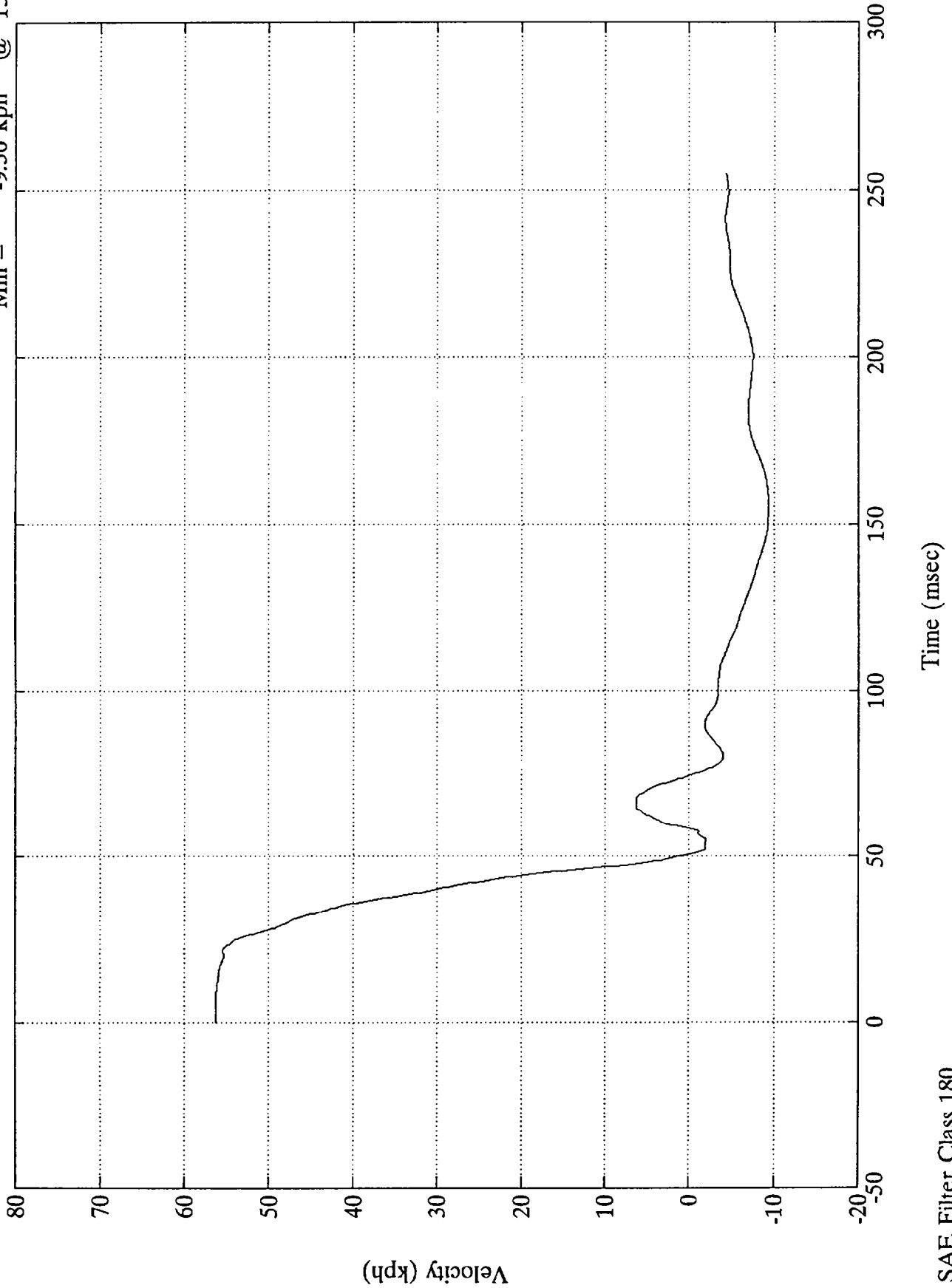
Time (msec)

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #4(x)

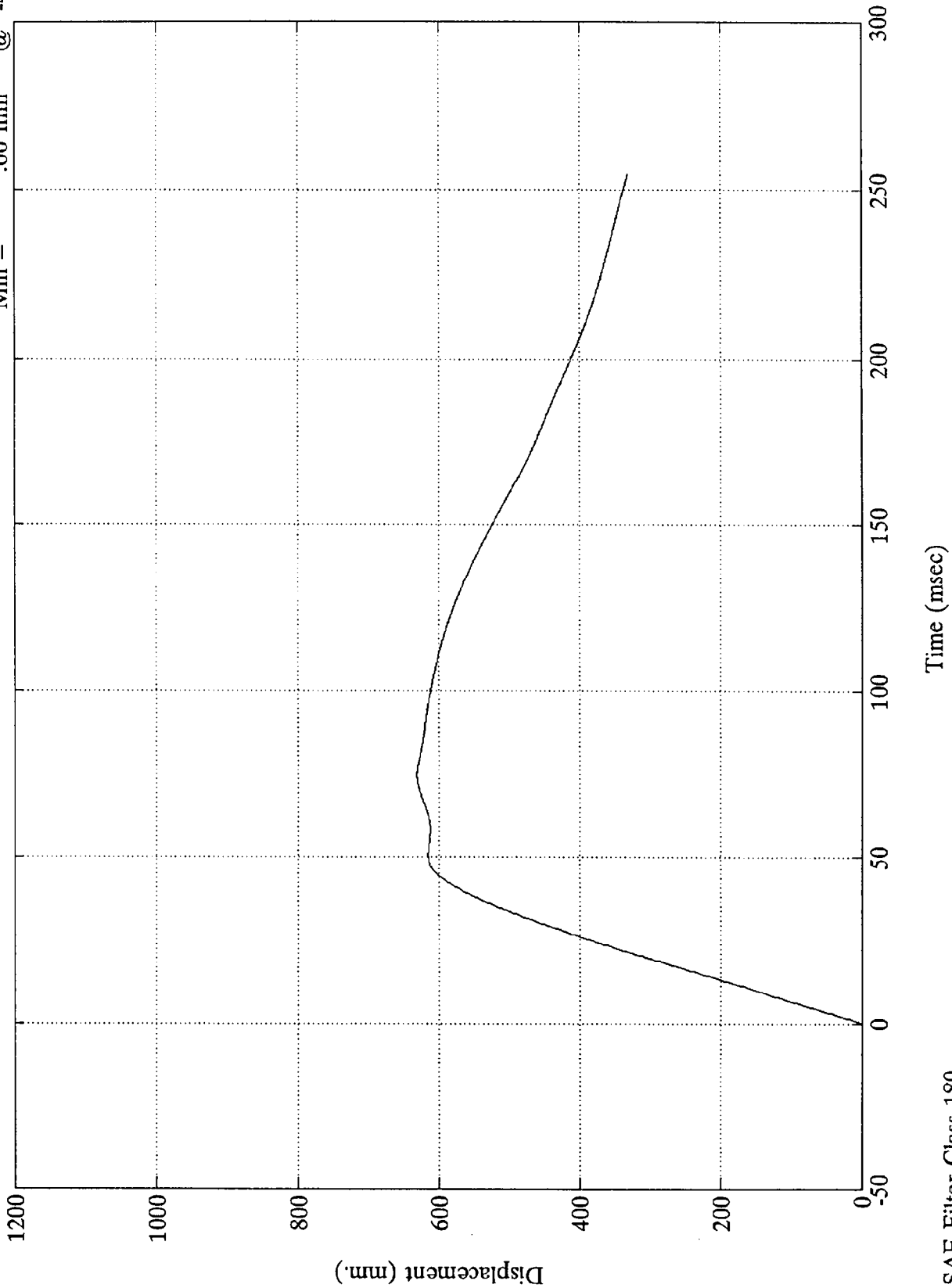
Max = 56.18 kph @ 3.35 msec
Min = -9.36 kph @ 155.52 msec



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 631.87 mm @ 74.51 msec
Min = .00 mm @ -44.88 msec

Acc. #4(x)



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

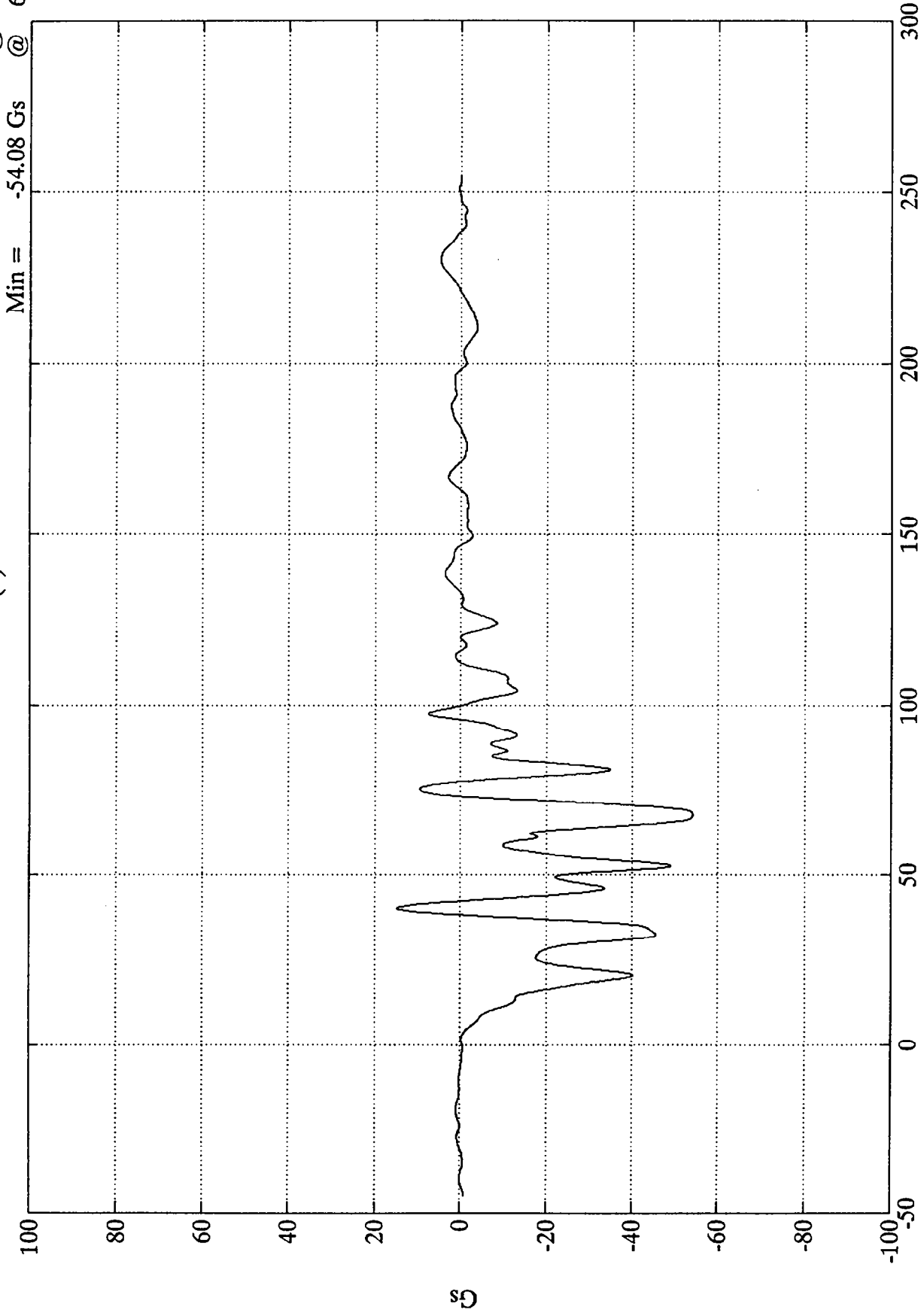
Acc. #5(x)

Max =

14.74 Gs

@

40.19 mse



Time (msec)

SAE Filter Class 60

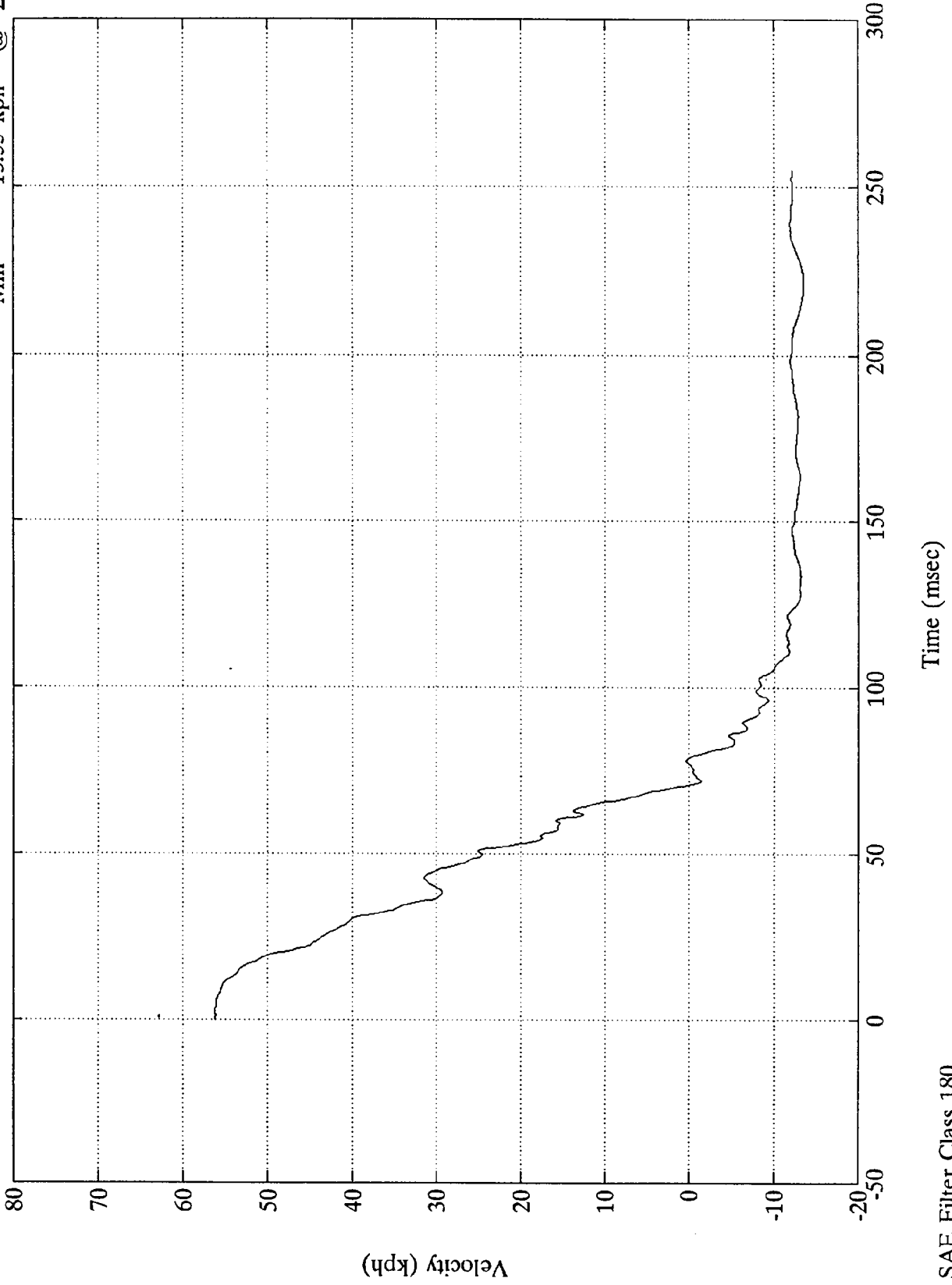
B-15

8120-6

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 56.17 kph @ 2.75 msec
Min = -13.55 kph @ 220.08 msec

Acc. #5(x)

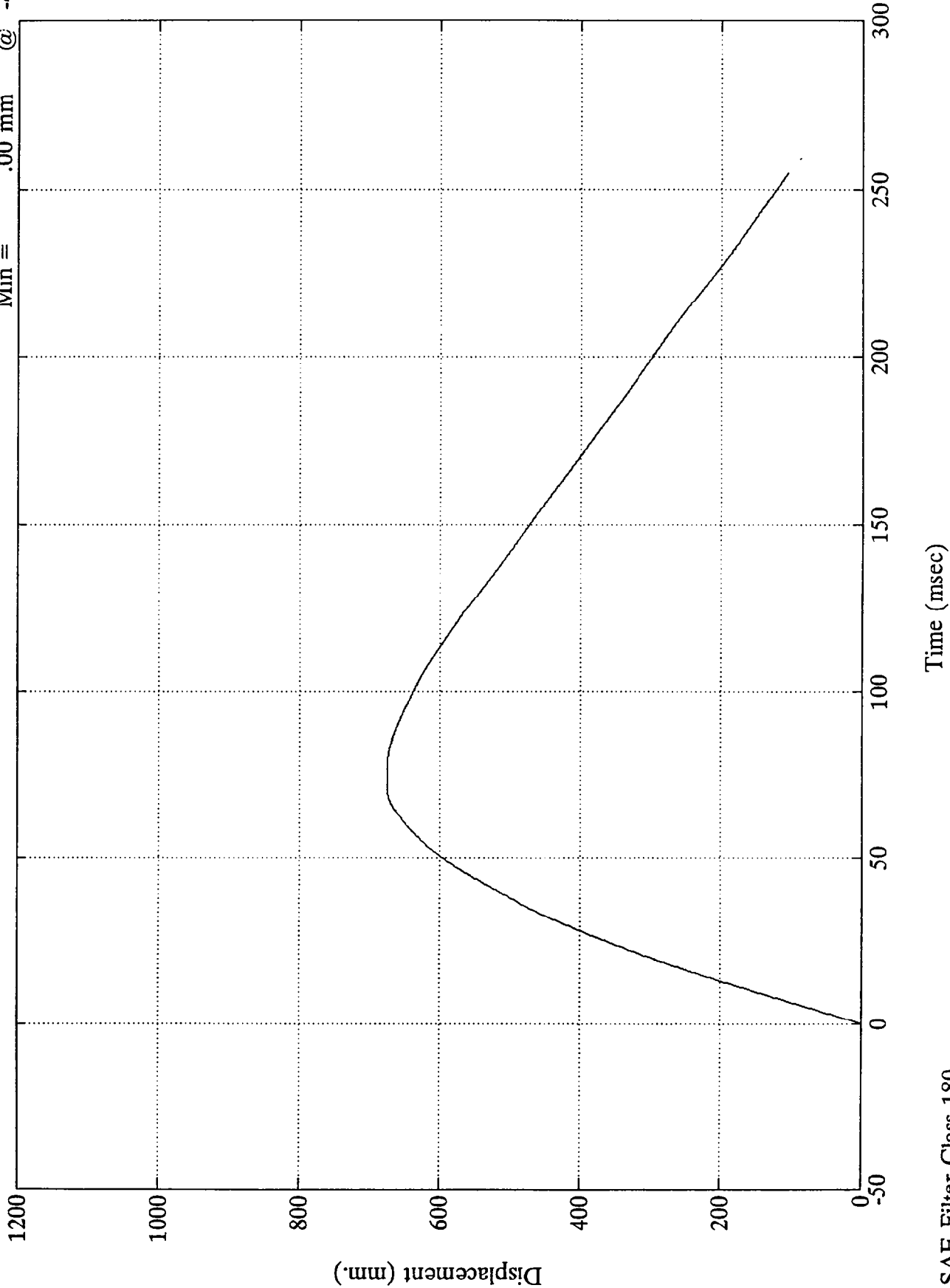


SAE Filter Class 180

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #5(x)

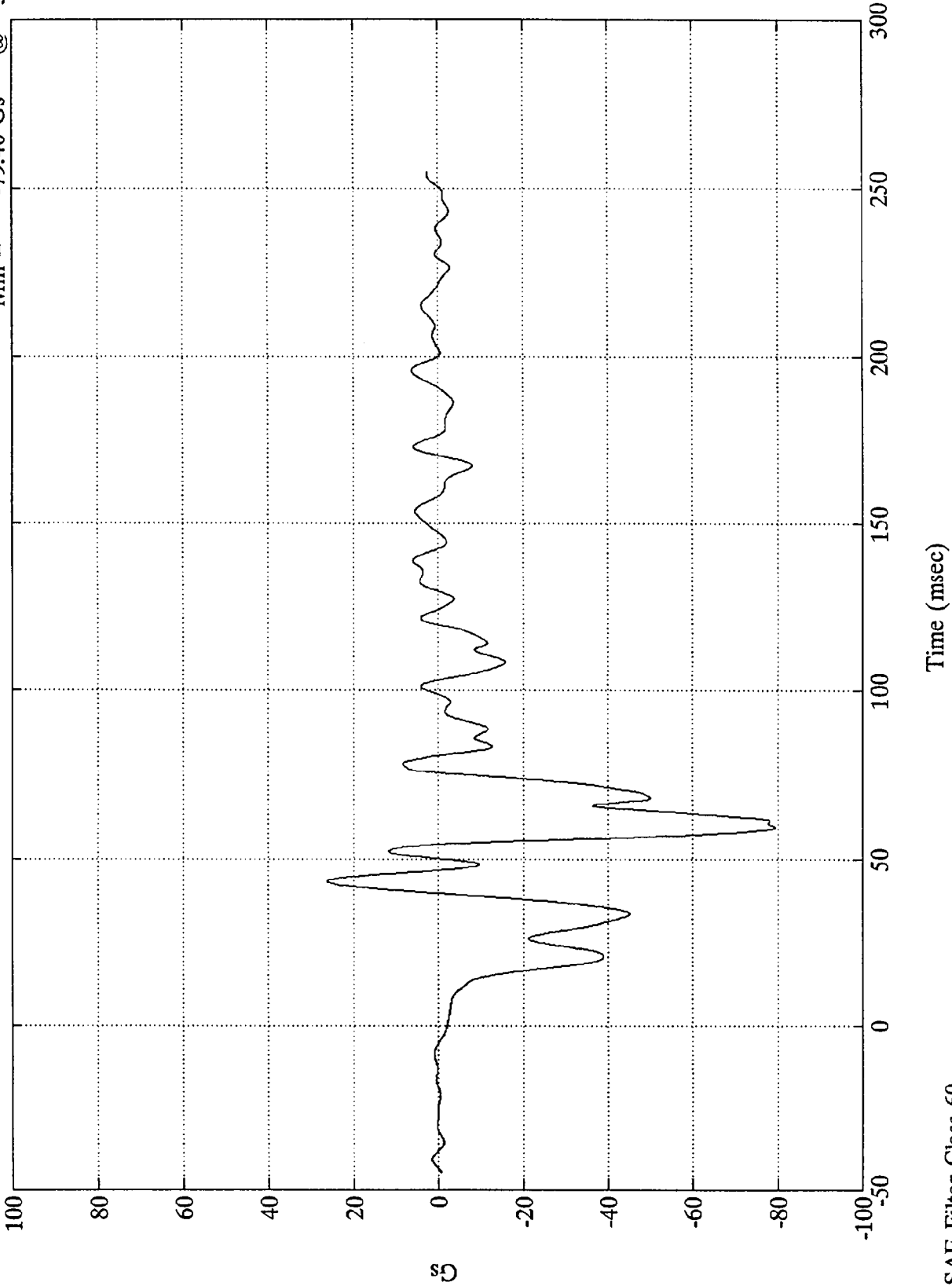
Max = 675.92 mm @ 70.92 ms
Min = .00 mm @ -44.88 msec



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #6(x)

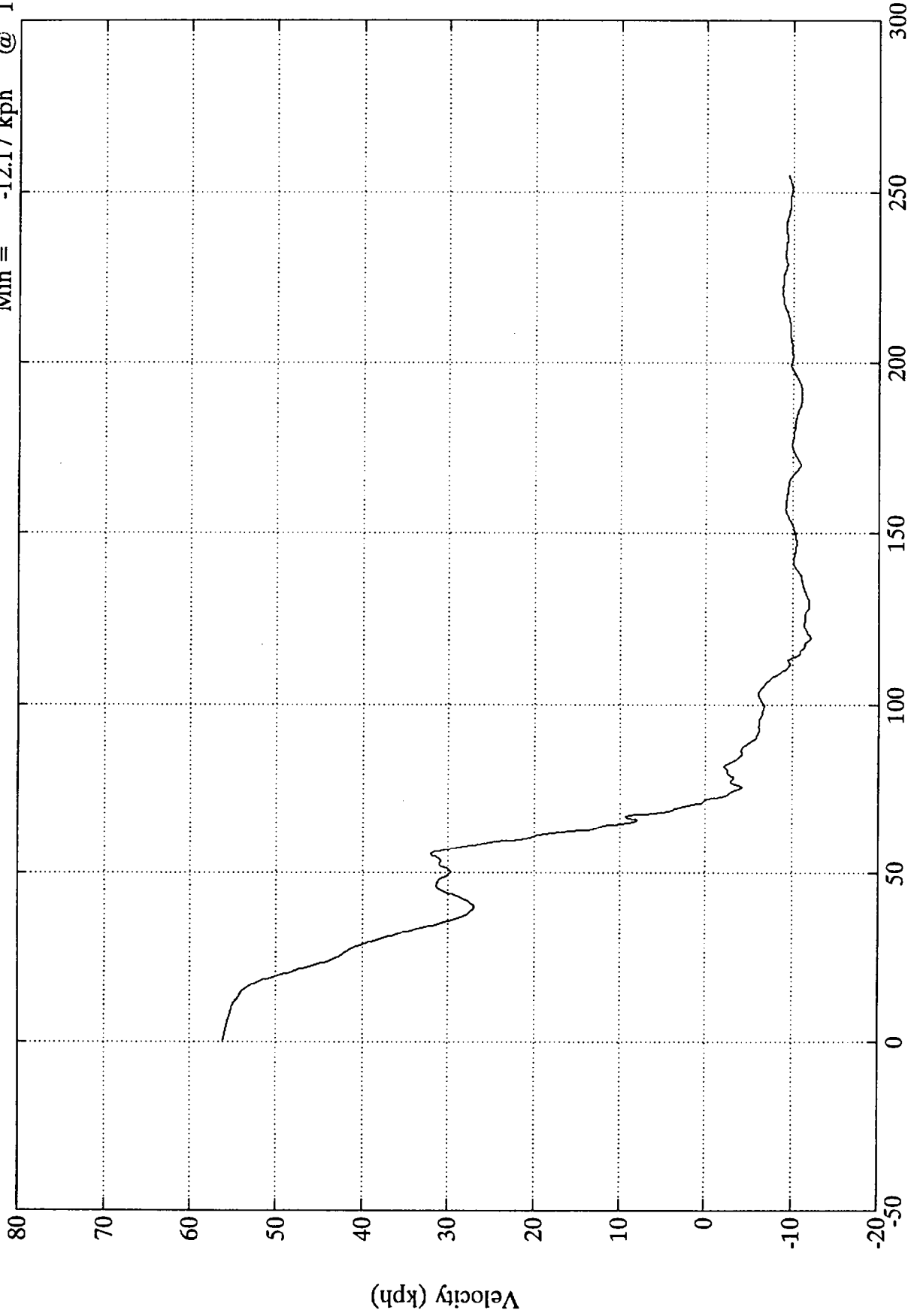
Max = 26.25 Gs @ 43.31 msec
Min = -79.40 Gs @ 59.64 msec



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #6(x)

Max = 56.16 kph @ -0.00 mse
Min = -12.17 kph @ 119.28 mse



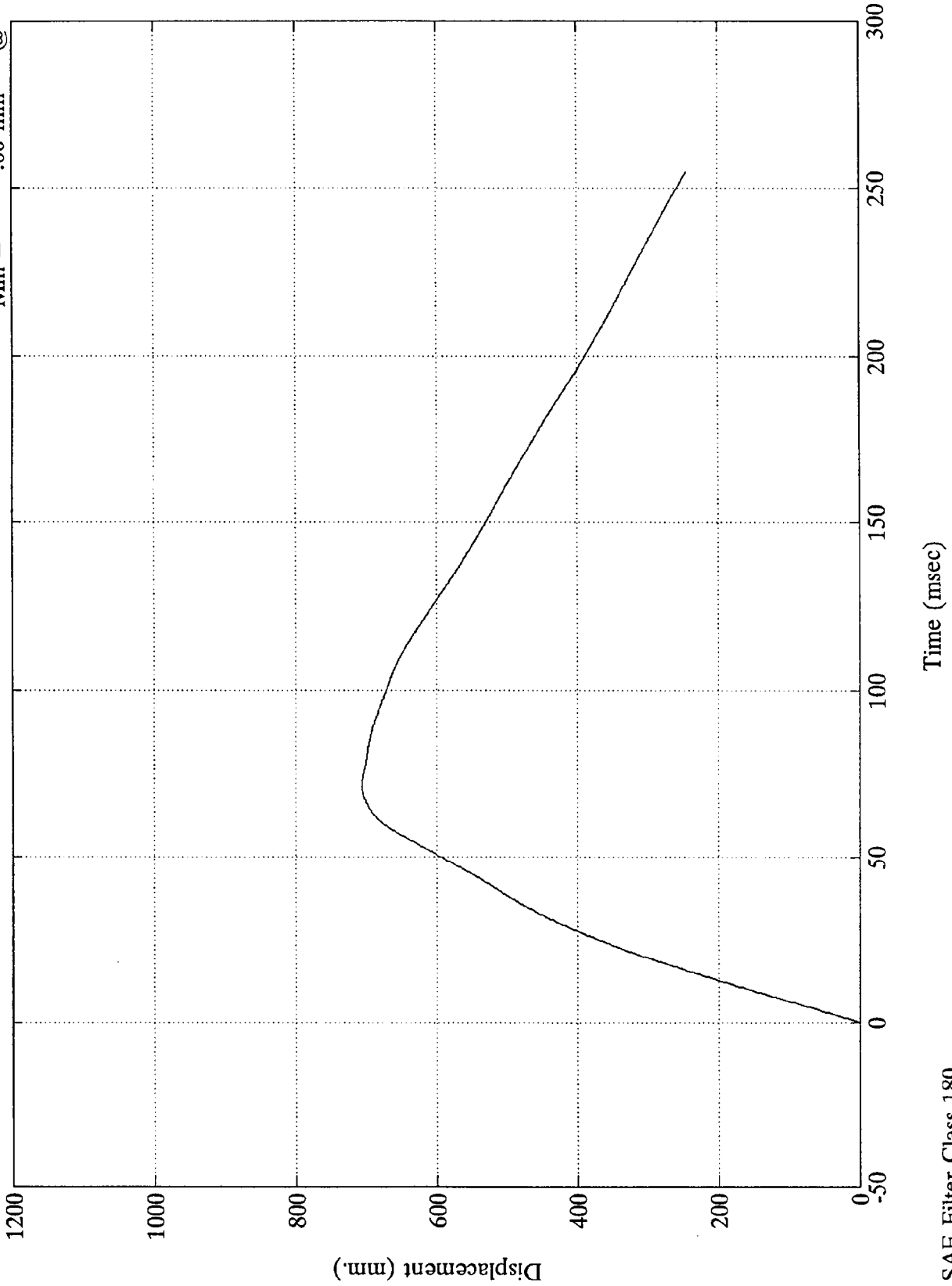
Time (msec)

SAE Filter Class 180

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

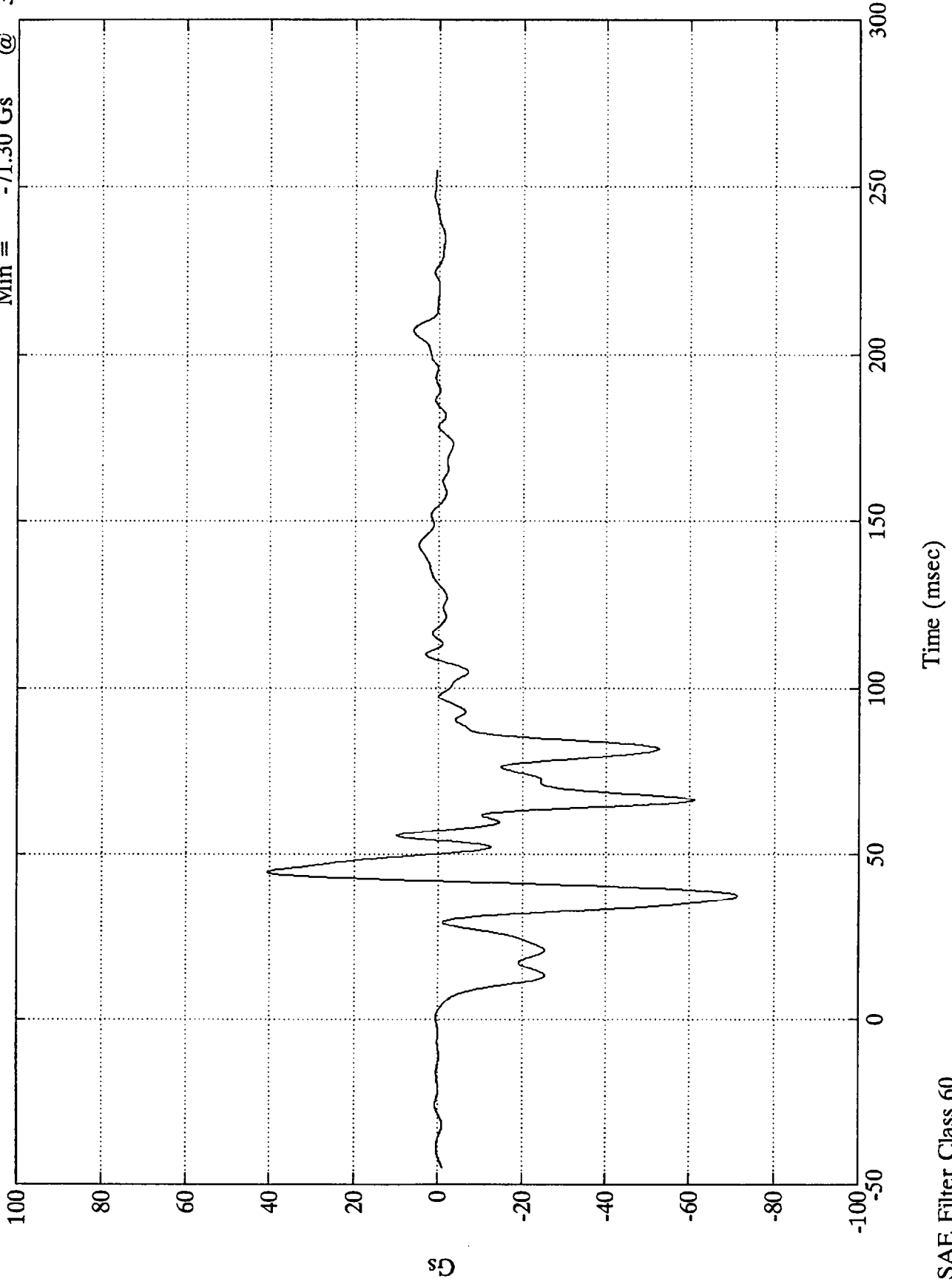
Max = 706.17 mm @ 71.52 msec
Min = .00 mm @ -44.88 msec

Acc. #6(x)



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

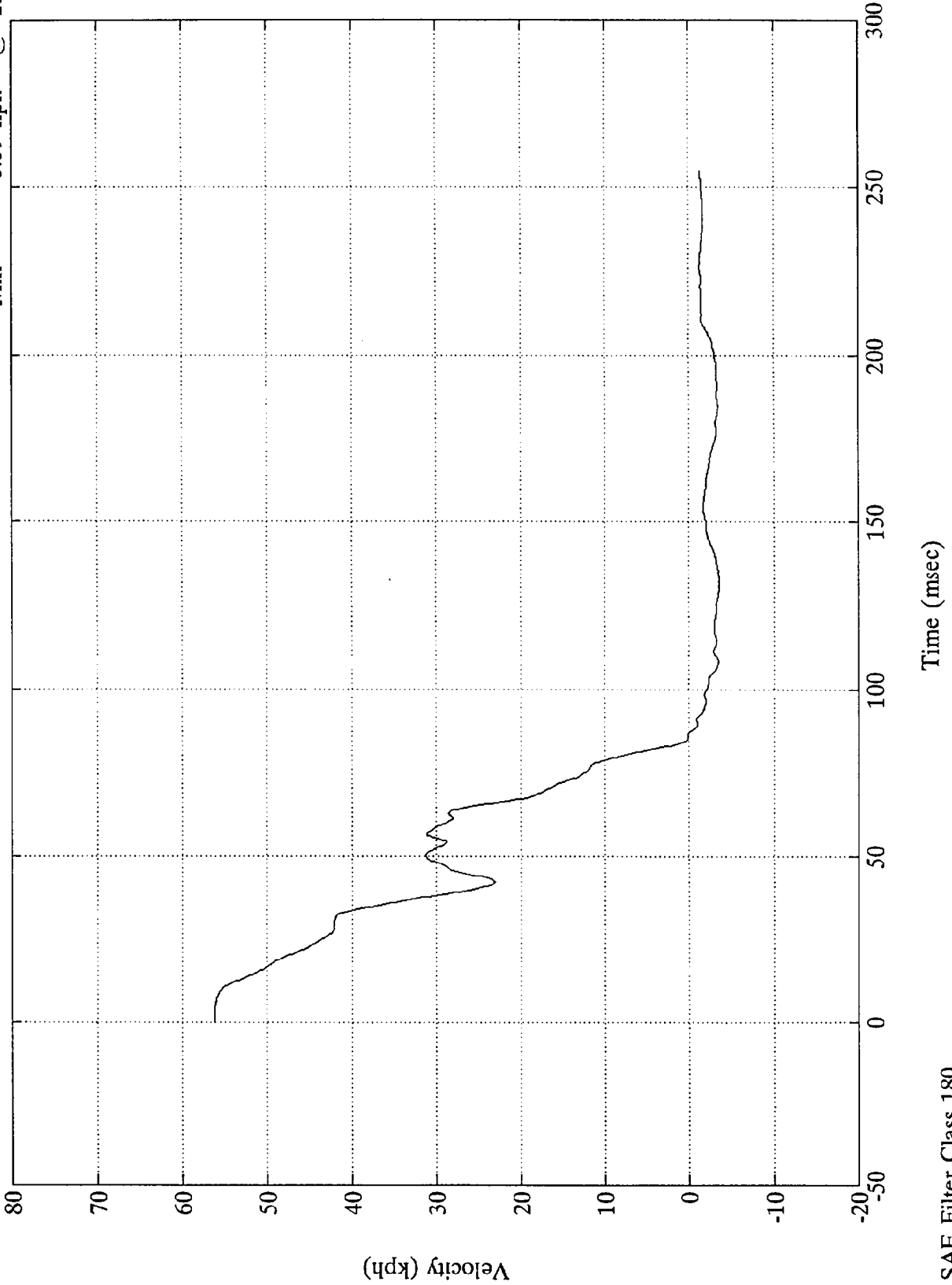
Acc. #7(x)
Max = 40.69 Gs @ 44.63 msec
Min = -71.30 Gs @ 37.56 msec



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 56.22 kph @ 2.87 msec
Min = -3.59 kph @ 130.56 msec

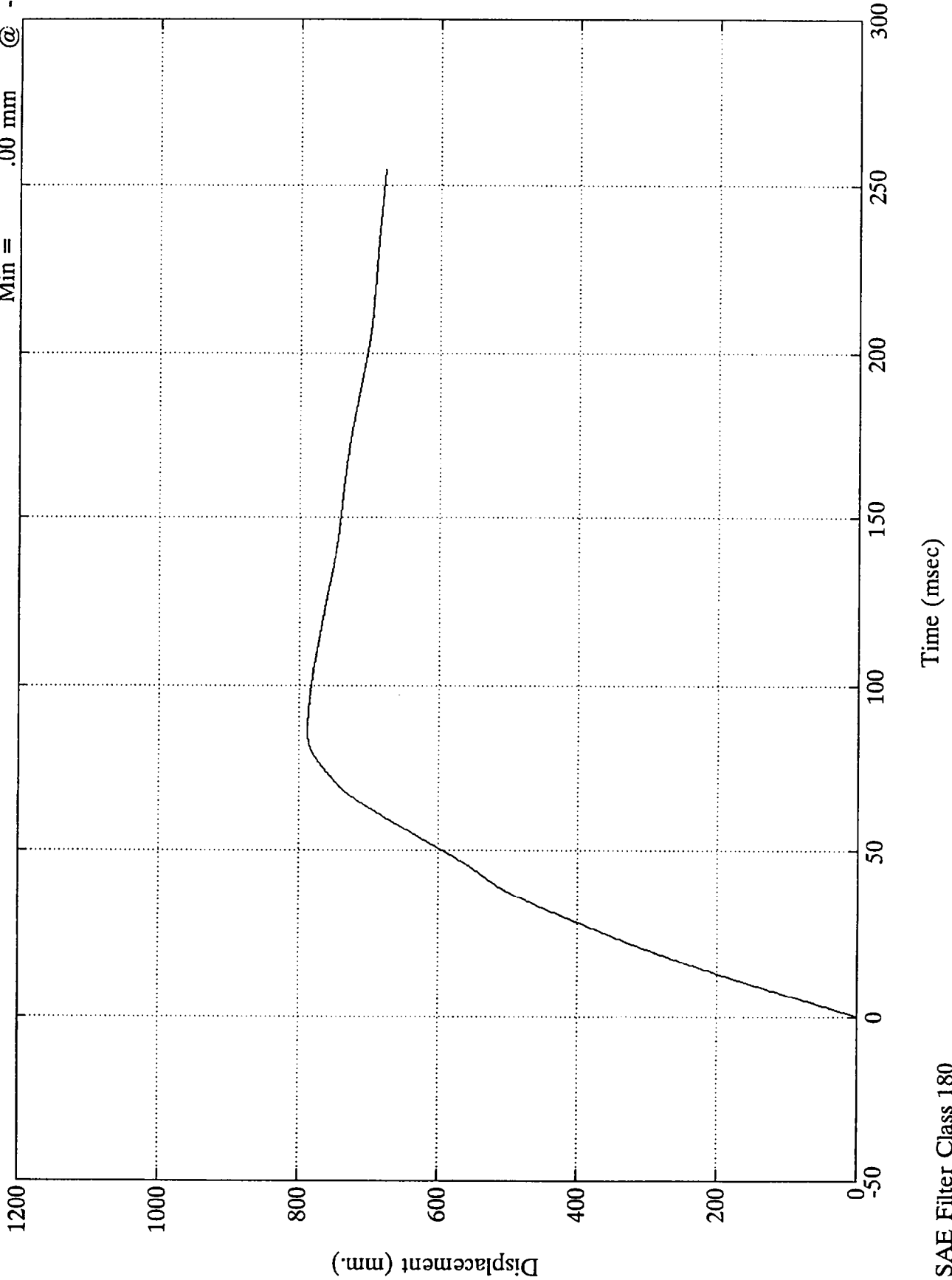
Acc. #7(x)



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #7(x)

Max = 787.89 mm @ 87.36 m:
Min = .00 mm @ -44.88 msec

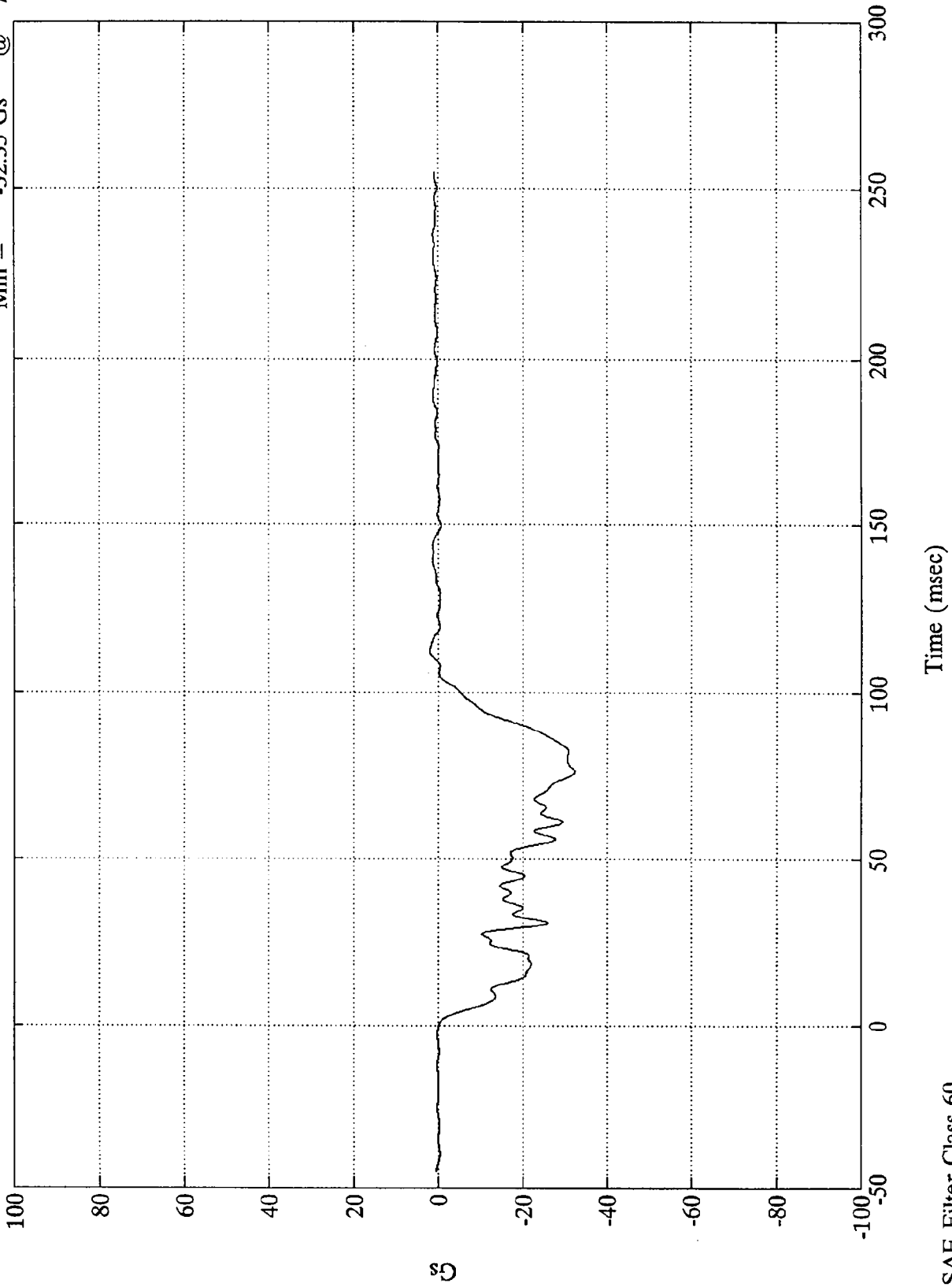


SAE Filter Class 180

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #8(x)

Max = 2.06 Gs @ 112.32 msec
Min = -32.35 Gs @ 76.20 msec



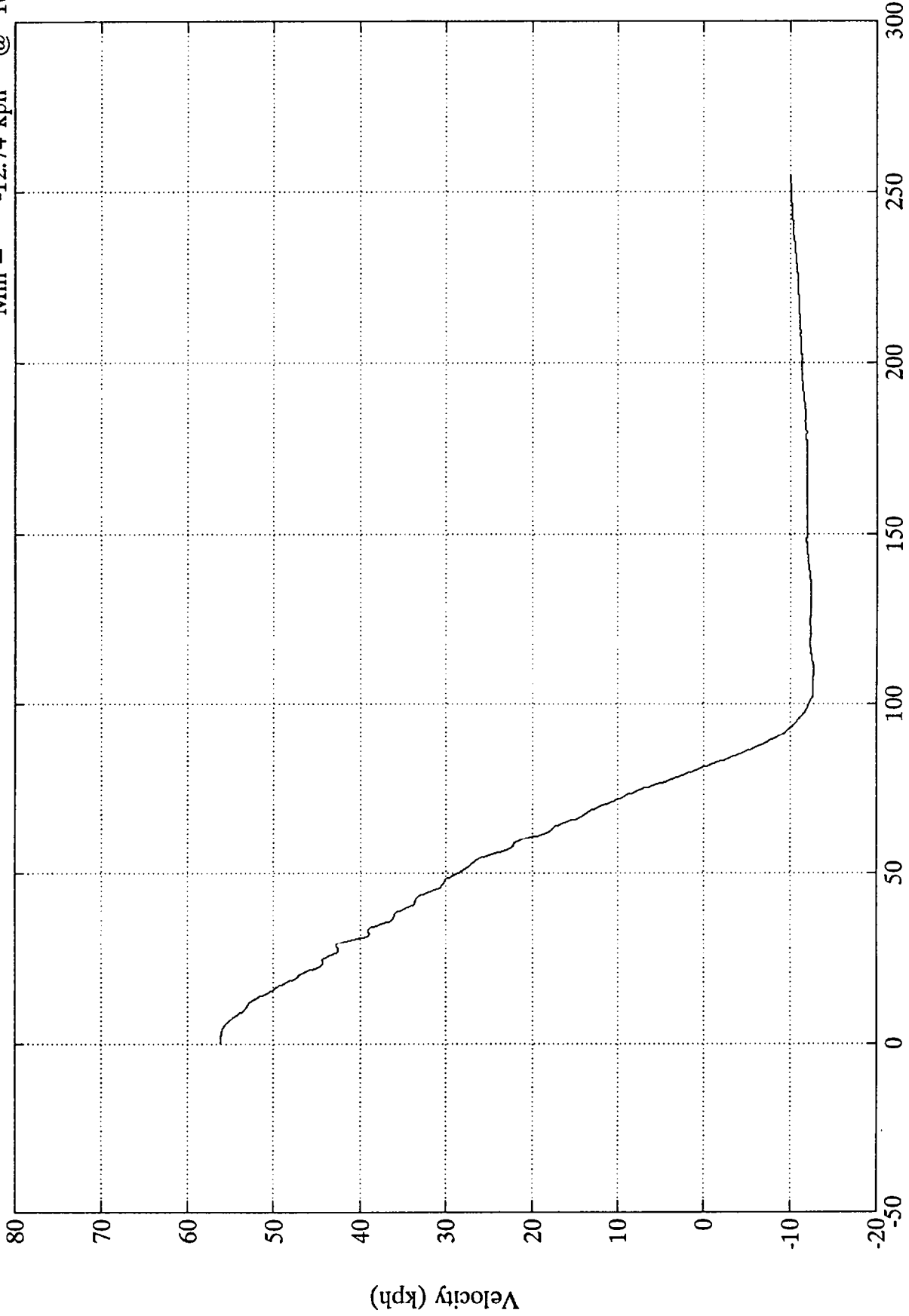
8120-6
B-24

SAE Filter Class 60



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

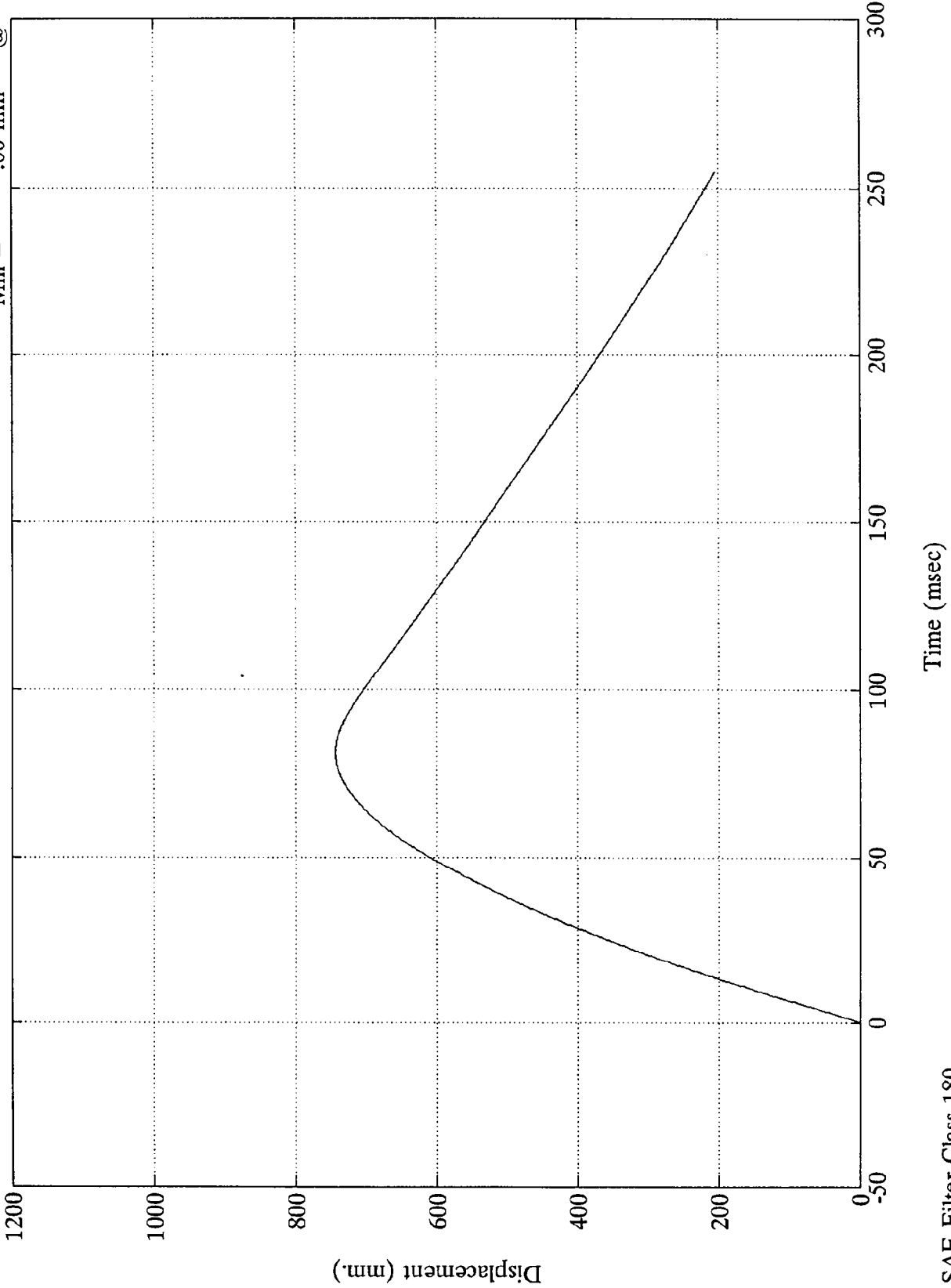
Acc. #8(x) Max = 56.16 kph @ -0.00 msec
Min = -12.74 kph @ 109.92 msec



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 743.82 mm @ 81.36 msec
Min = .00 mm @ -44.88 msec

Acc. #8(x)



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #9(x)

Max =

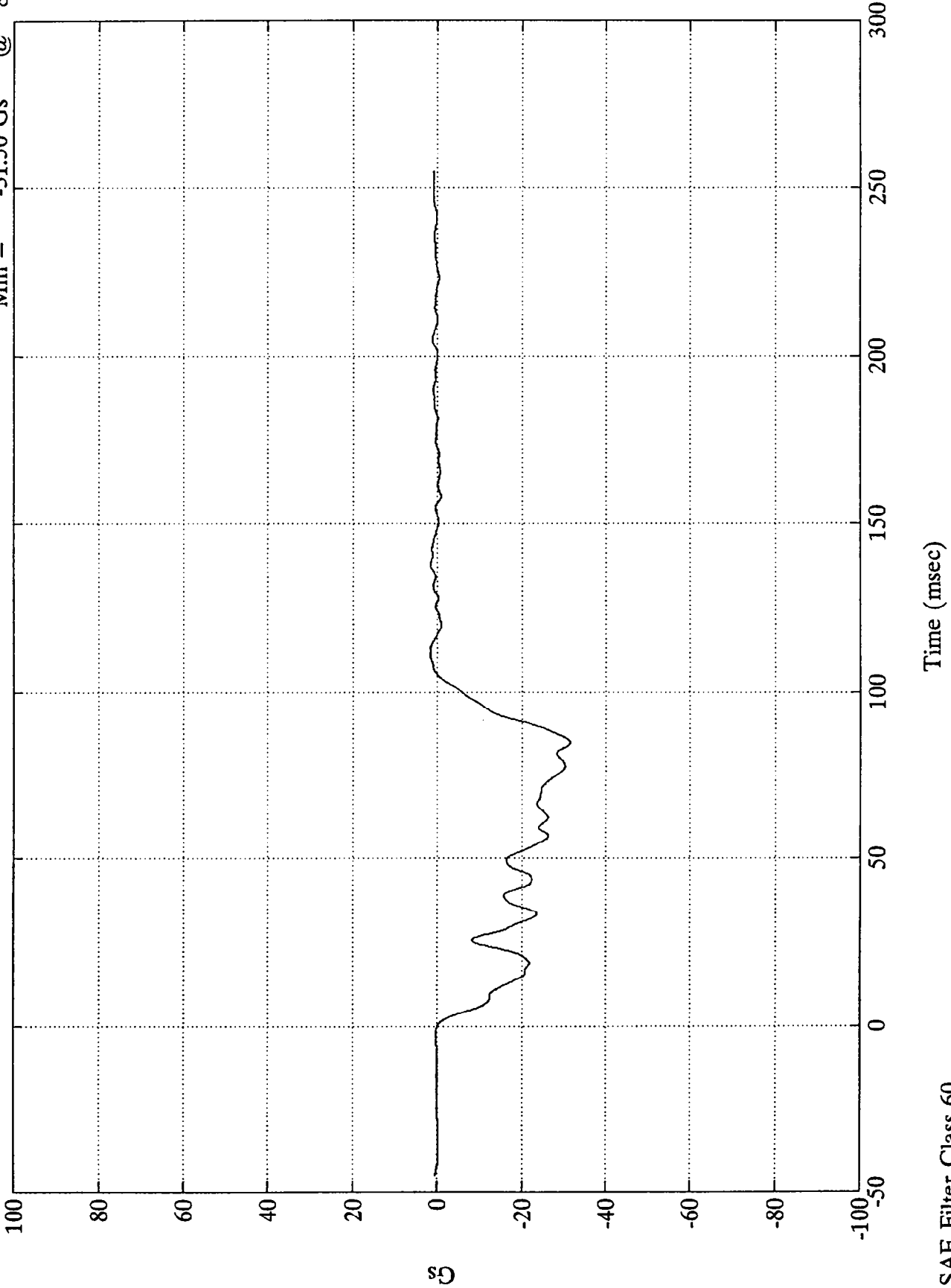
1.69 Gs

@ 137.75 msec

Min =

-31.50 Gs

@ 84.72 msec



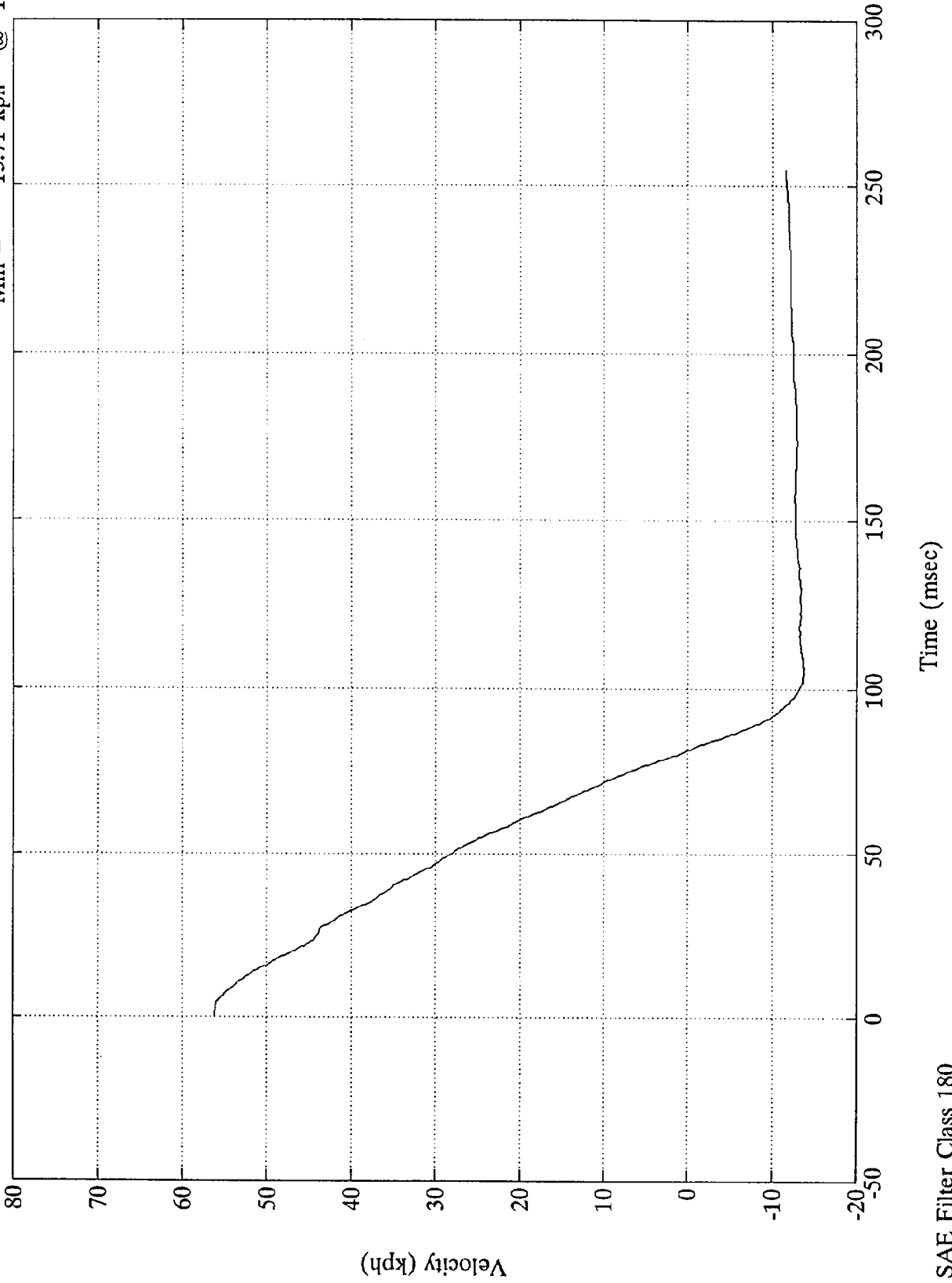
Time (msec)

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

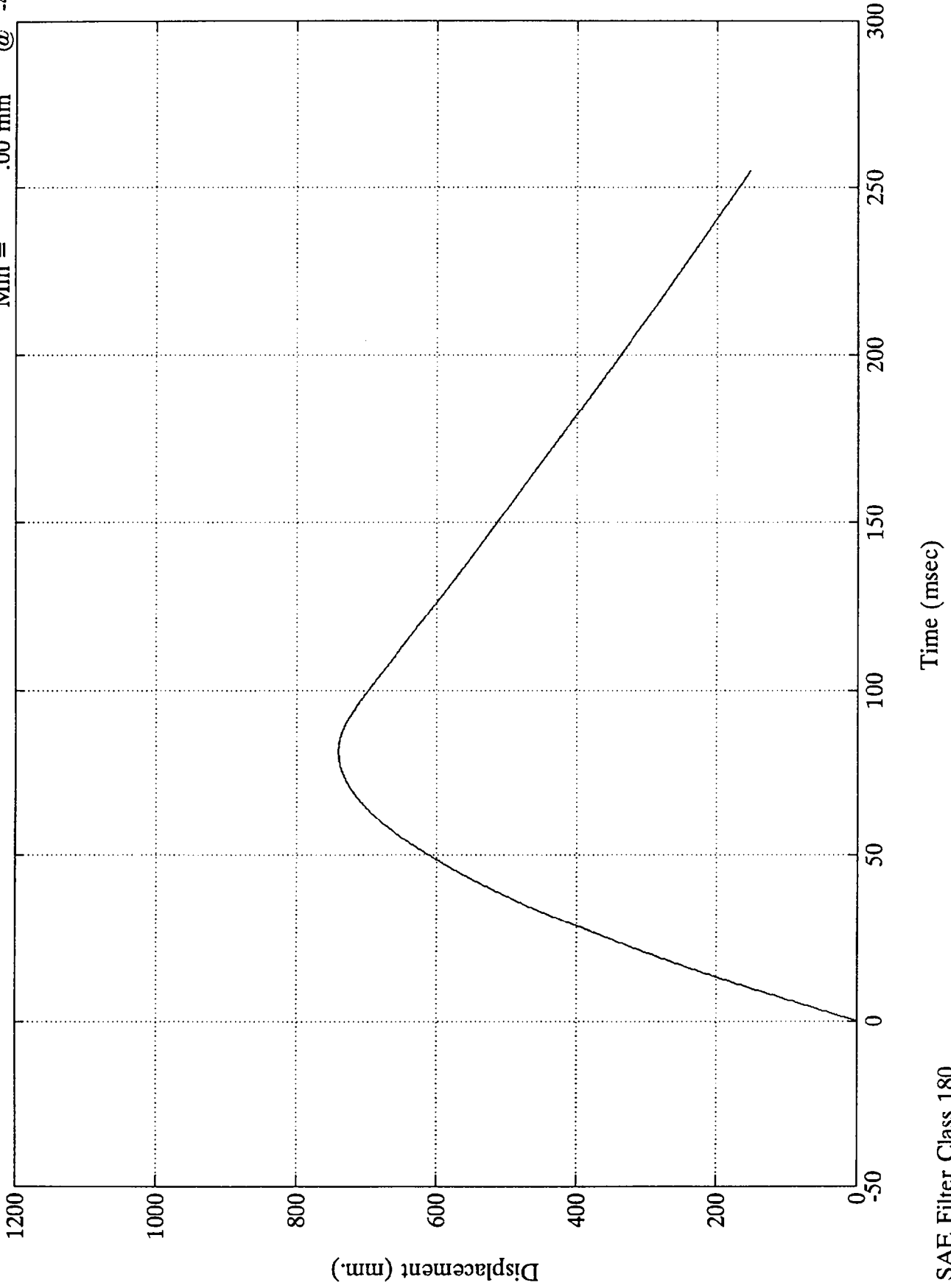
Max = 56.16 kph @ -0.00 msec
Min = -13.71 kph @ 105.96 msec

Acc. #9(x)



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Acc. #9(x)
Max = 740.57 mm @ 81.36 m
Min = .00 mm @ -44.88 ms



9-B

9-120-6

SAE Filter Class 180

TEST NO. MR0106

LOAD CELL BARRIER DATA

FILTER CHANNEL CLASS

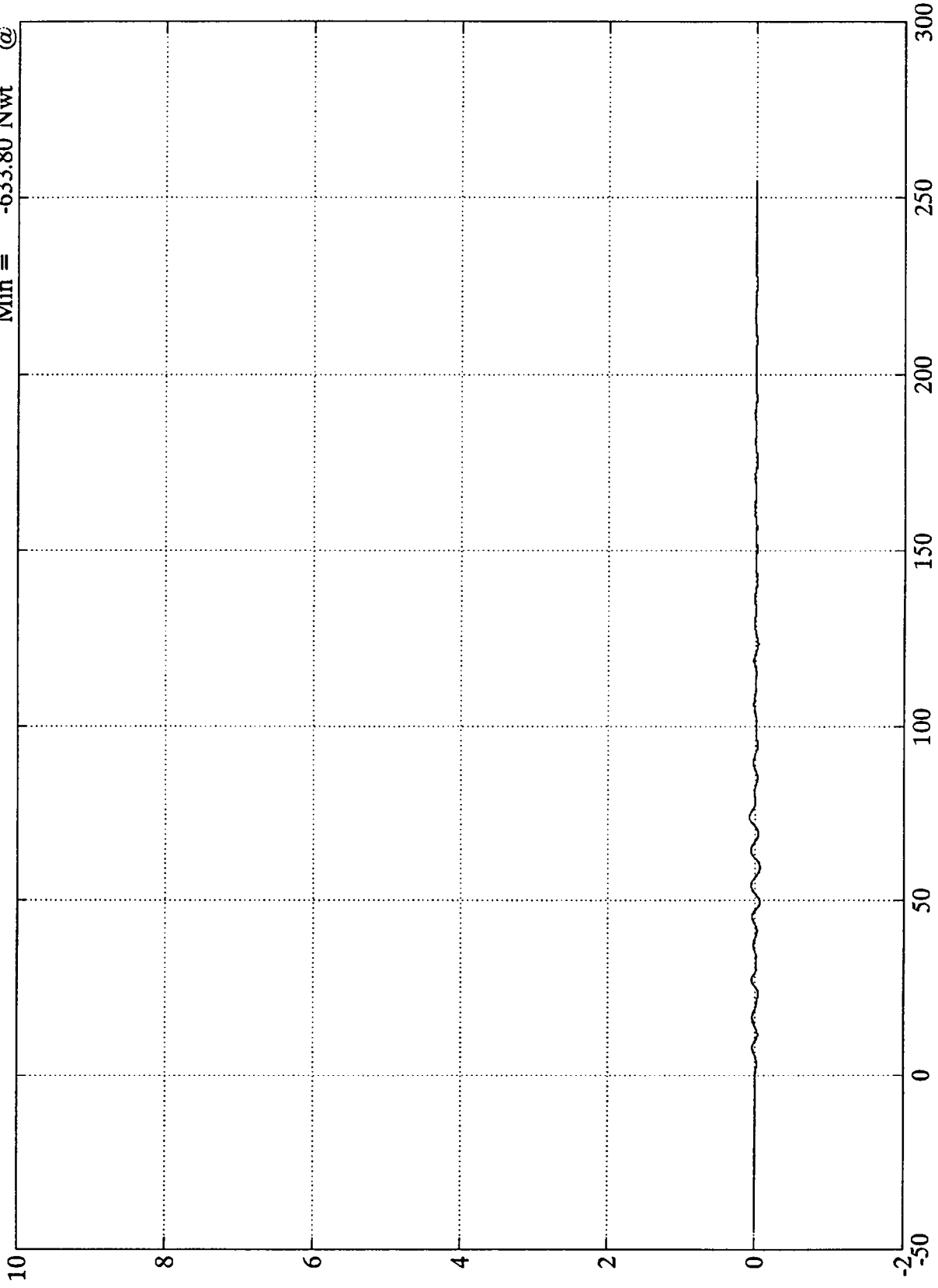
60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 855.66 Nwt @ 73.92 ms
Min = -633.80 Nwt @ 49.43 ms

Barrier Load Cell A1

$\times 10^4$

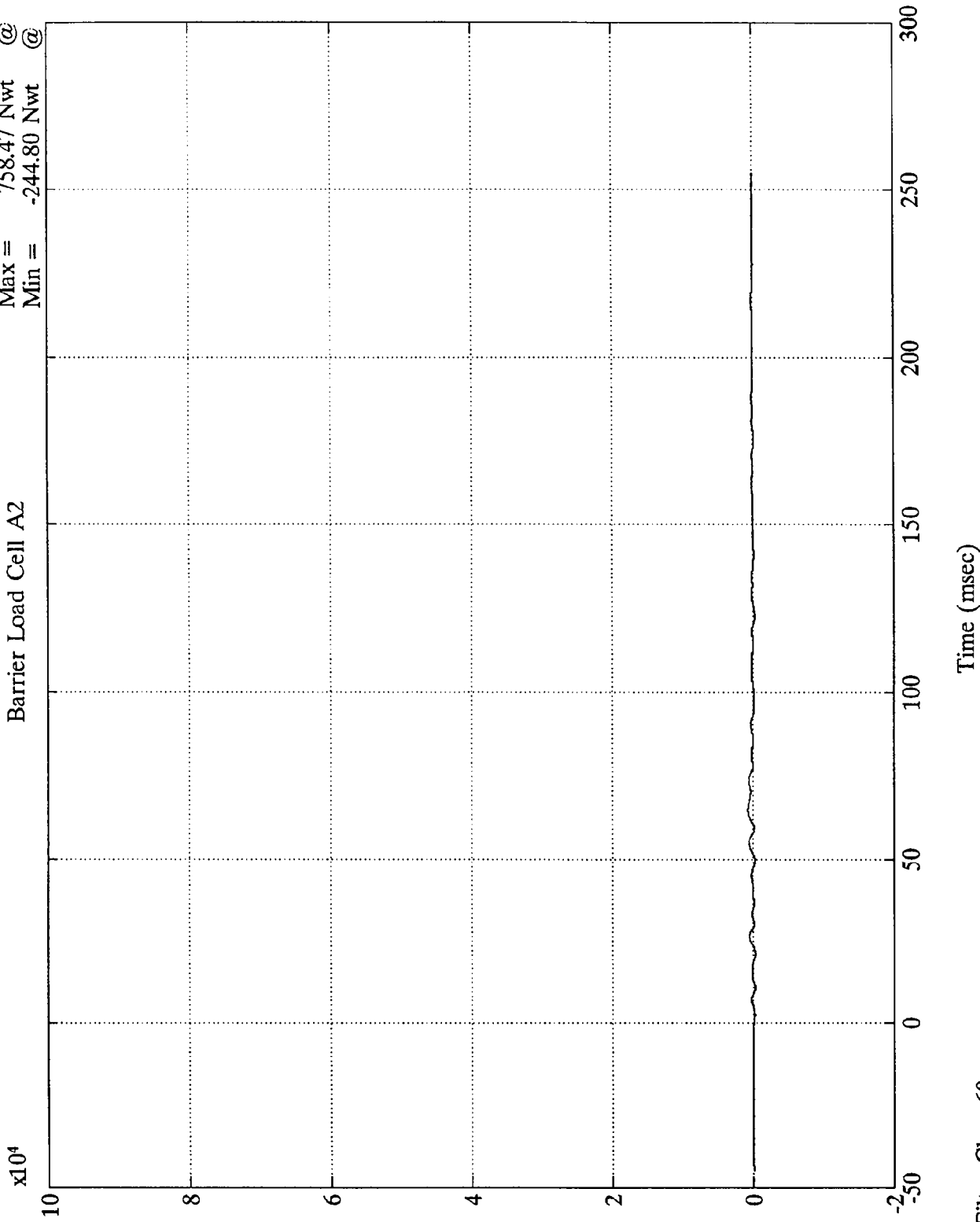


Nwt

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell A2
Max = 758.47 Nwt @ 64.80 msec
Min = -244.80 Nwt @ 21.35 msec

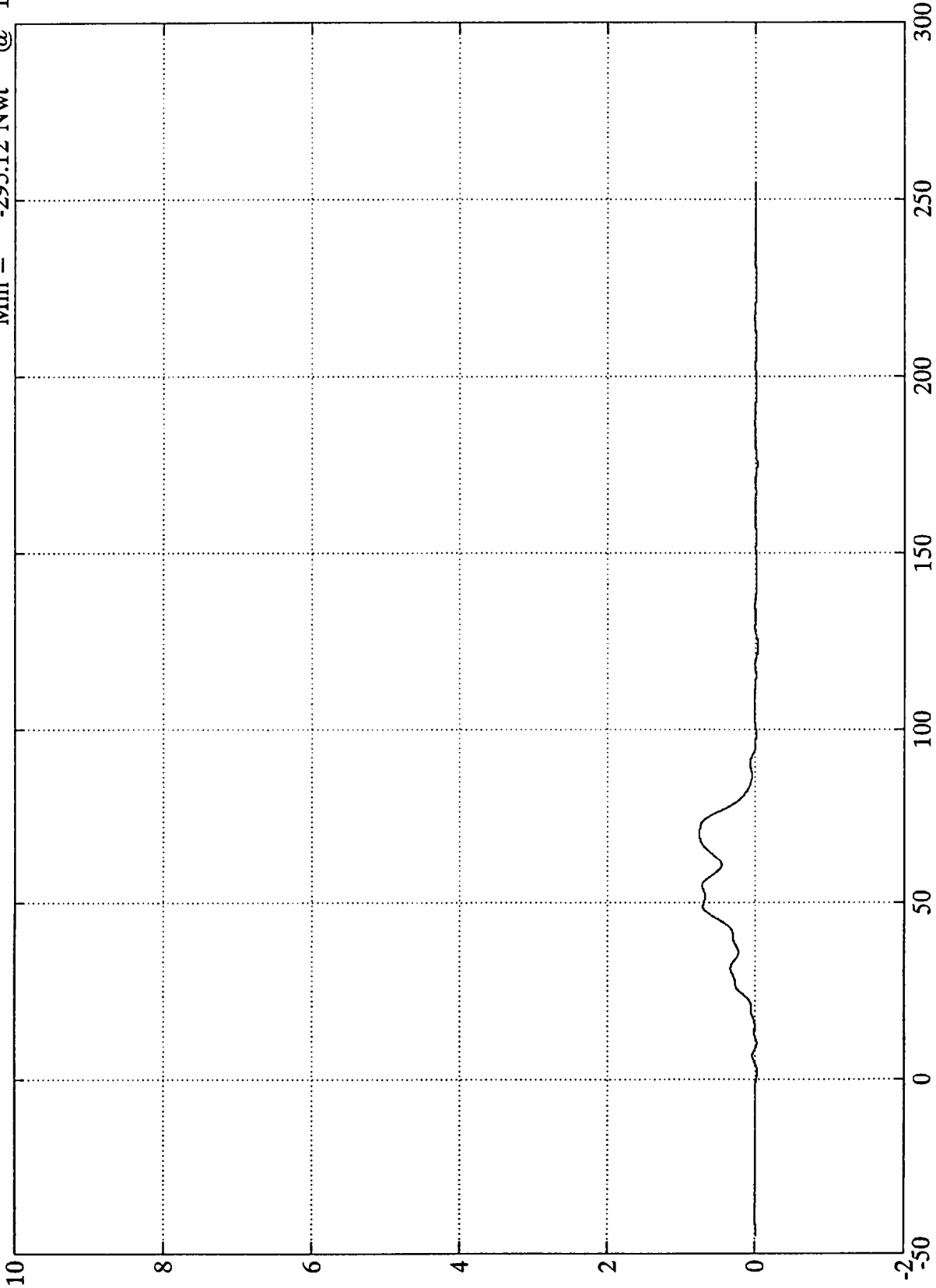


NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell A3

Max = 7522.54 Nwt @ 69.59 ms
Min = -295.12 Nwt @ 123.00 ms

$\times 10^4$



B-33

8120-6

SAE Filter Class 60

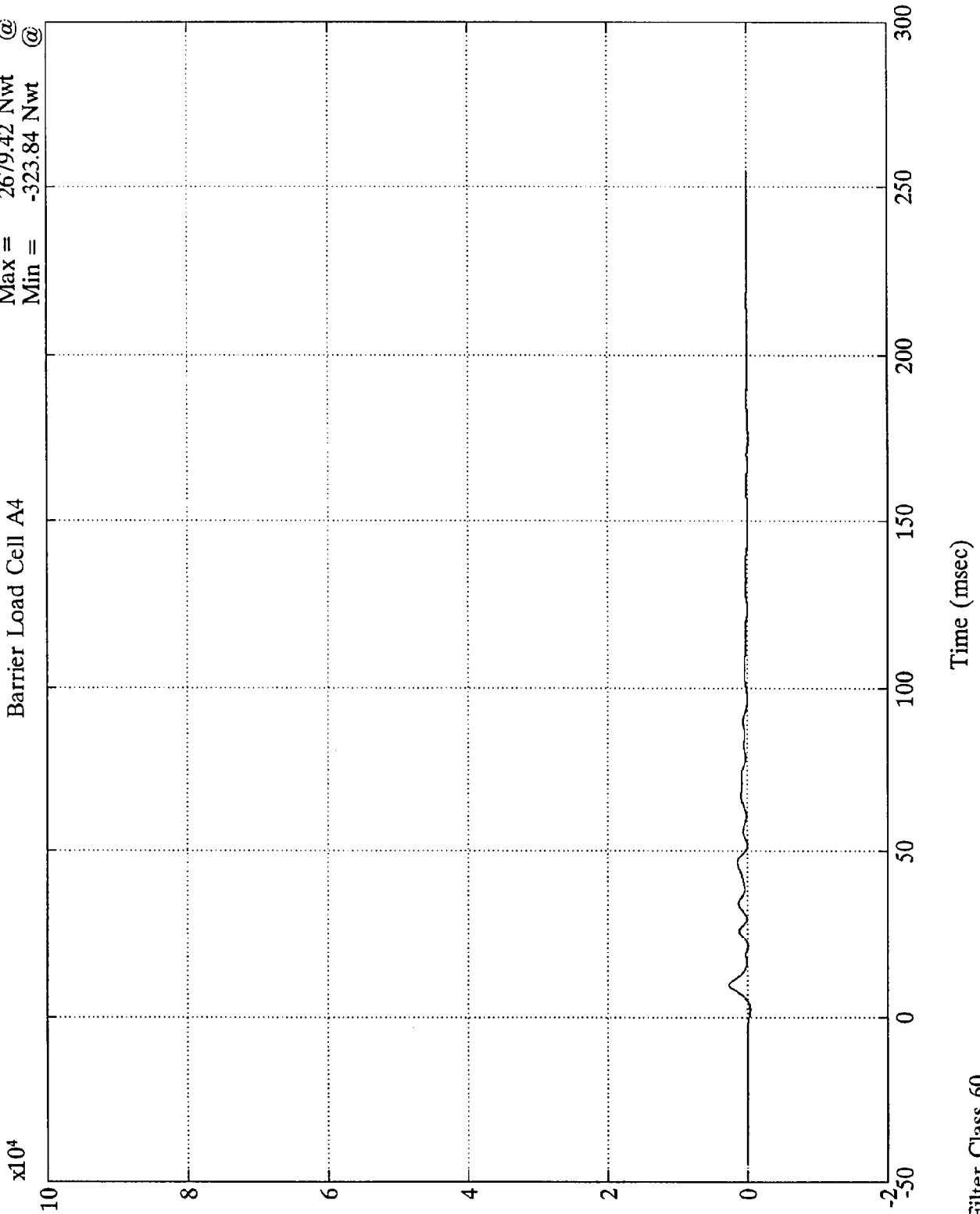
Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell A4

Max = 2679.42 Nwt @
Min = -323.84 Nwt @

9.59 msec
2.27 msec

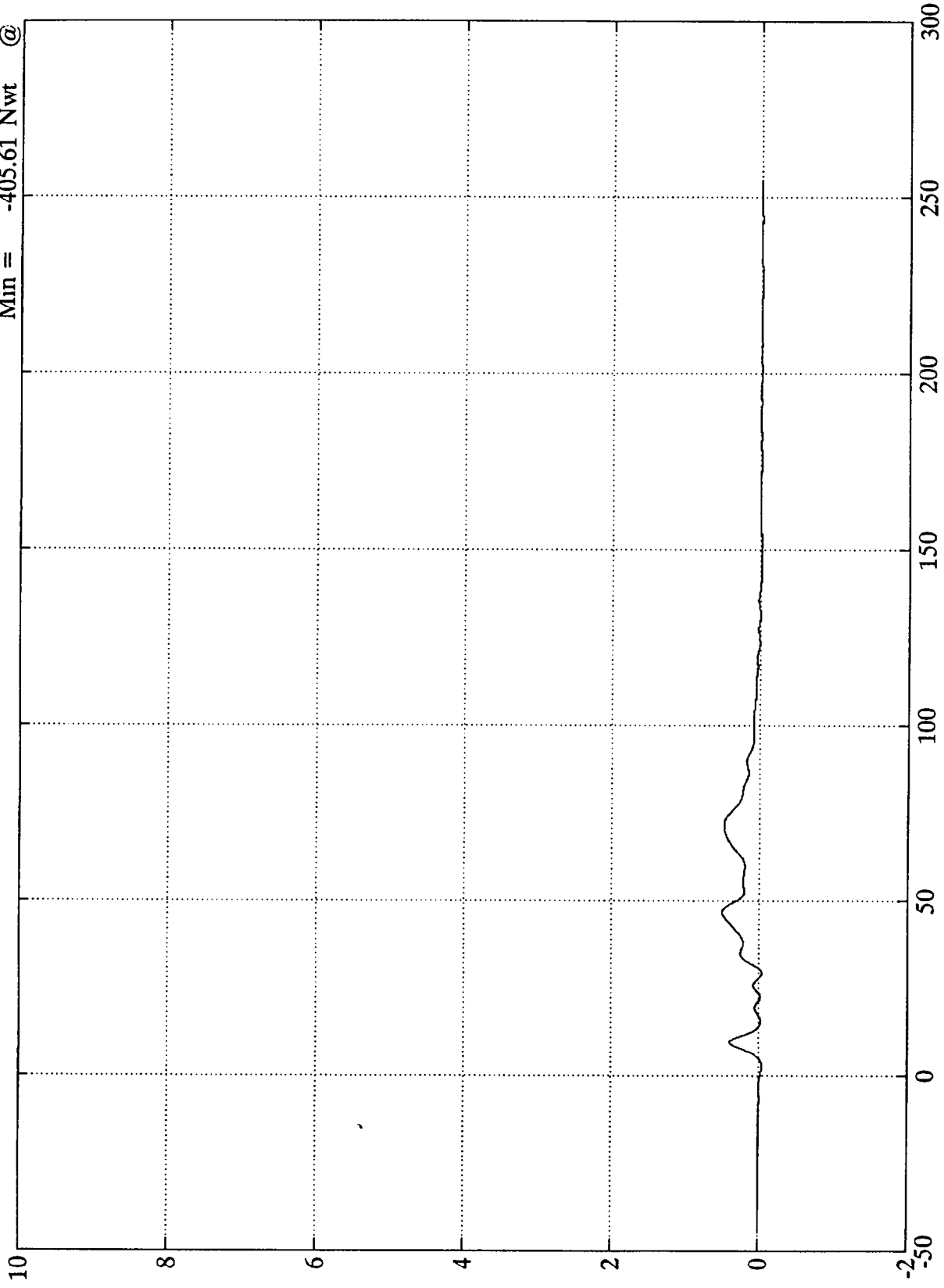


NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 4948.79 Nwt @ 46.79 ms
Min = -405.61 Nwt @ 2.51 msec

Barrier Load Cell A5

$\times 10^4$



Nwt
B-35

8120-6

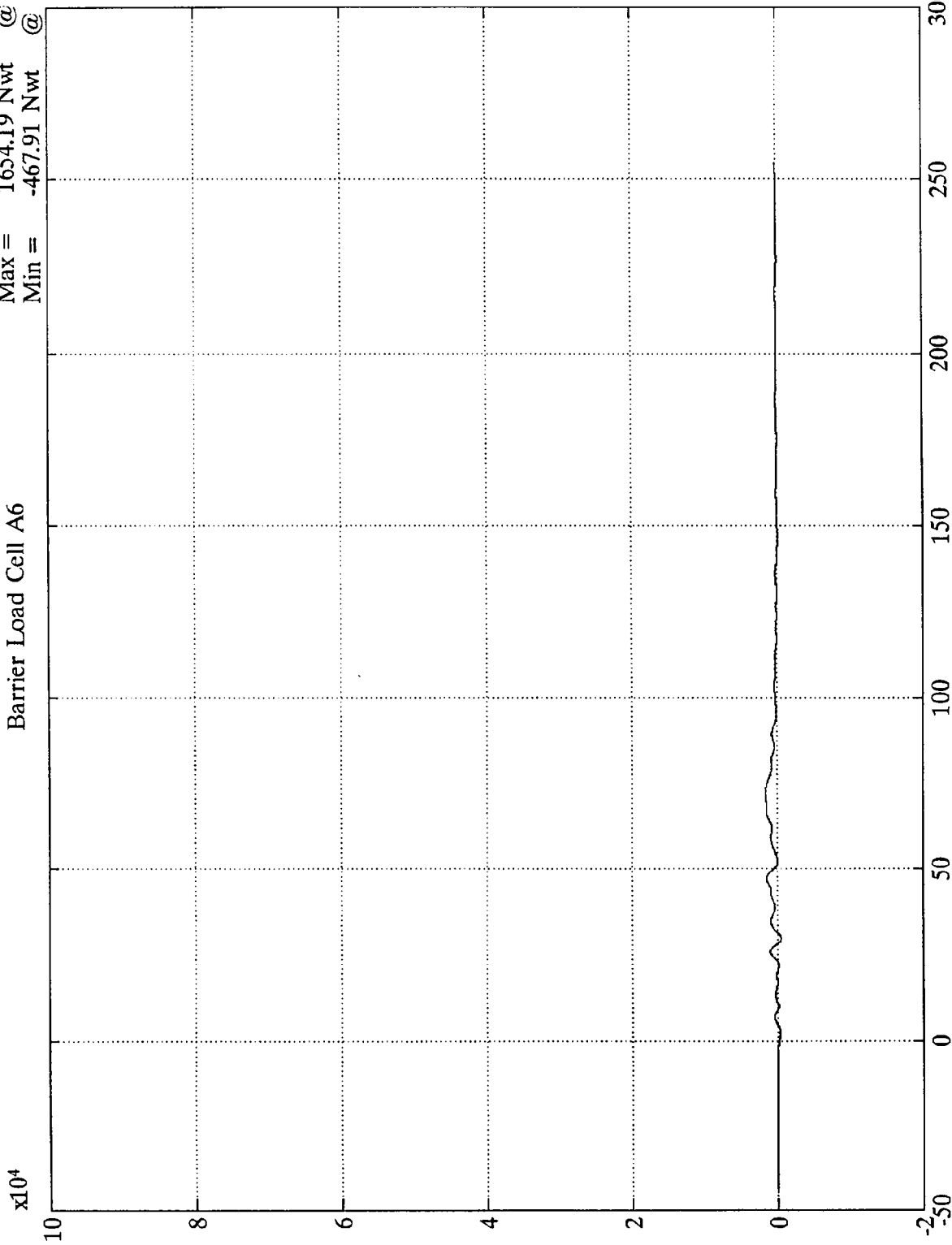
Time (msec)

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell A6

Max = 1654.19 Nwt @ 72.00 msec
Min = -467.91 Nwt @ 29.76 msec



1MN
B-36

8120-6

SAE Filter Class 60

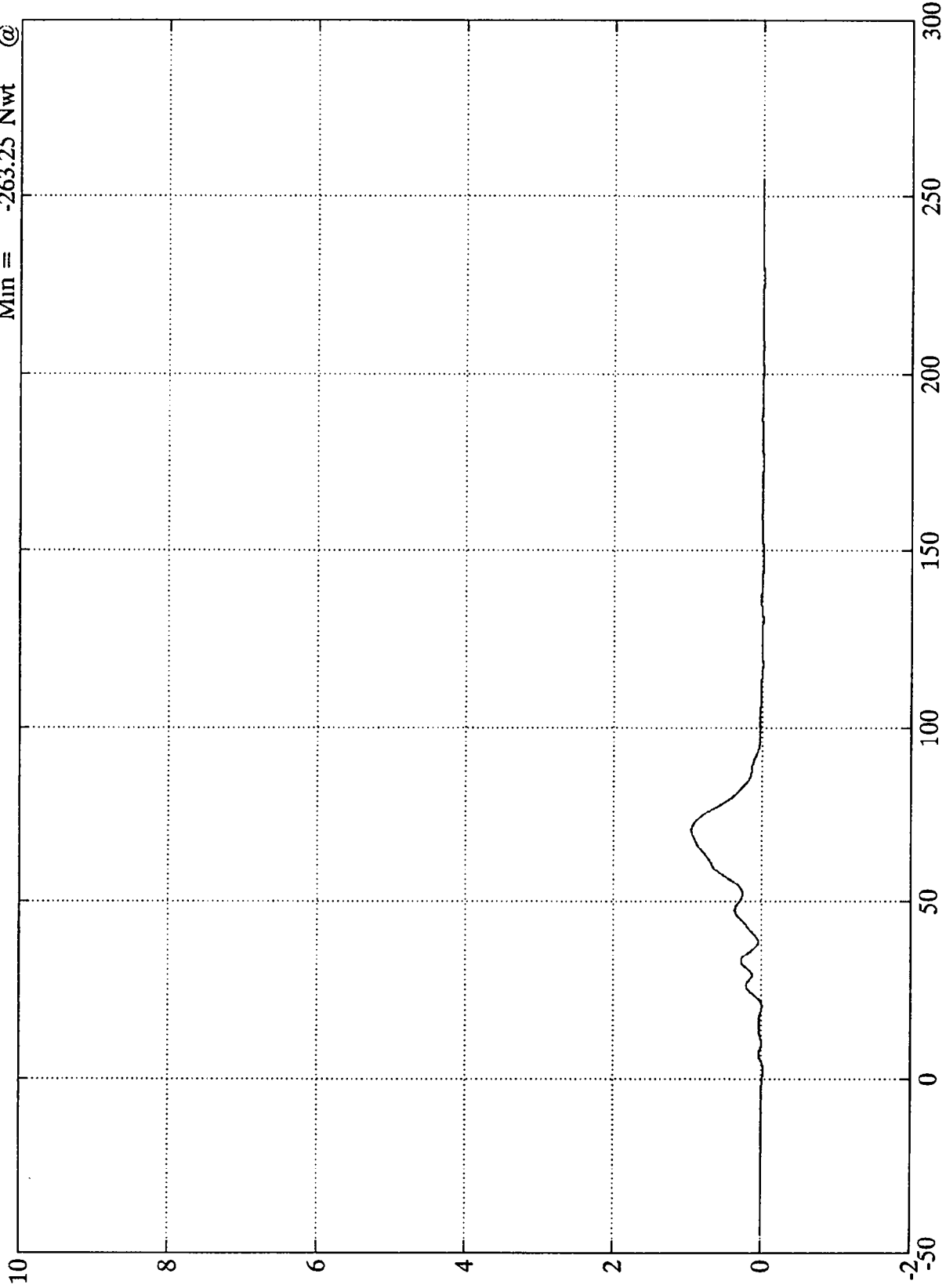
Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 9495.68 Nwt @ 70.55 m:
Min = -263.25 Nwt @ 2.27 mst

Barrier Load Cell A7

x10⁴



1MN
B-37

8120-6

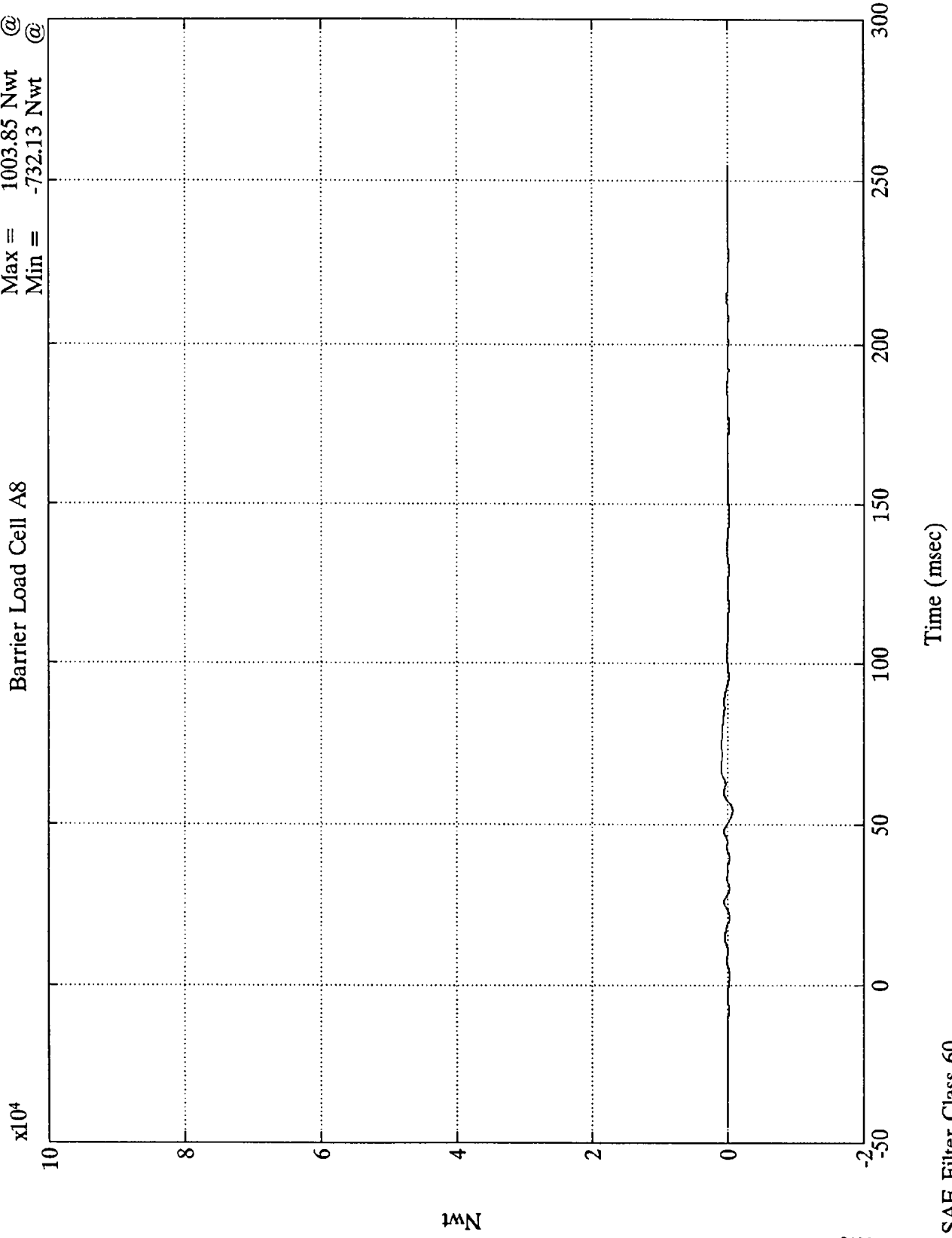
SAE Filter Class 60

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell A8

Max = 1003.85 Nwt @ 67.08 msec
Min = -732.13 Nwt @ 54.47 msec

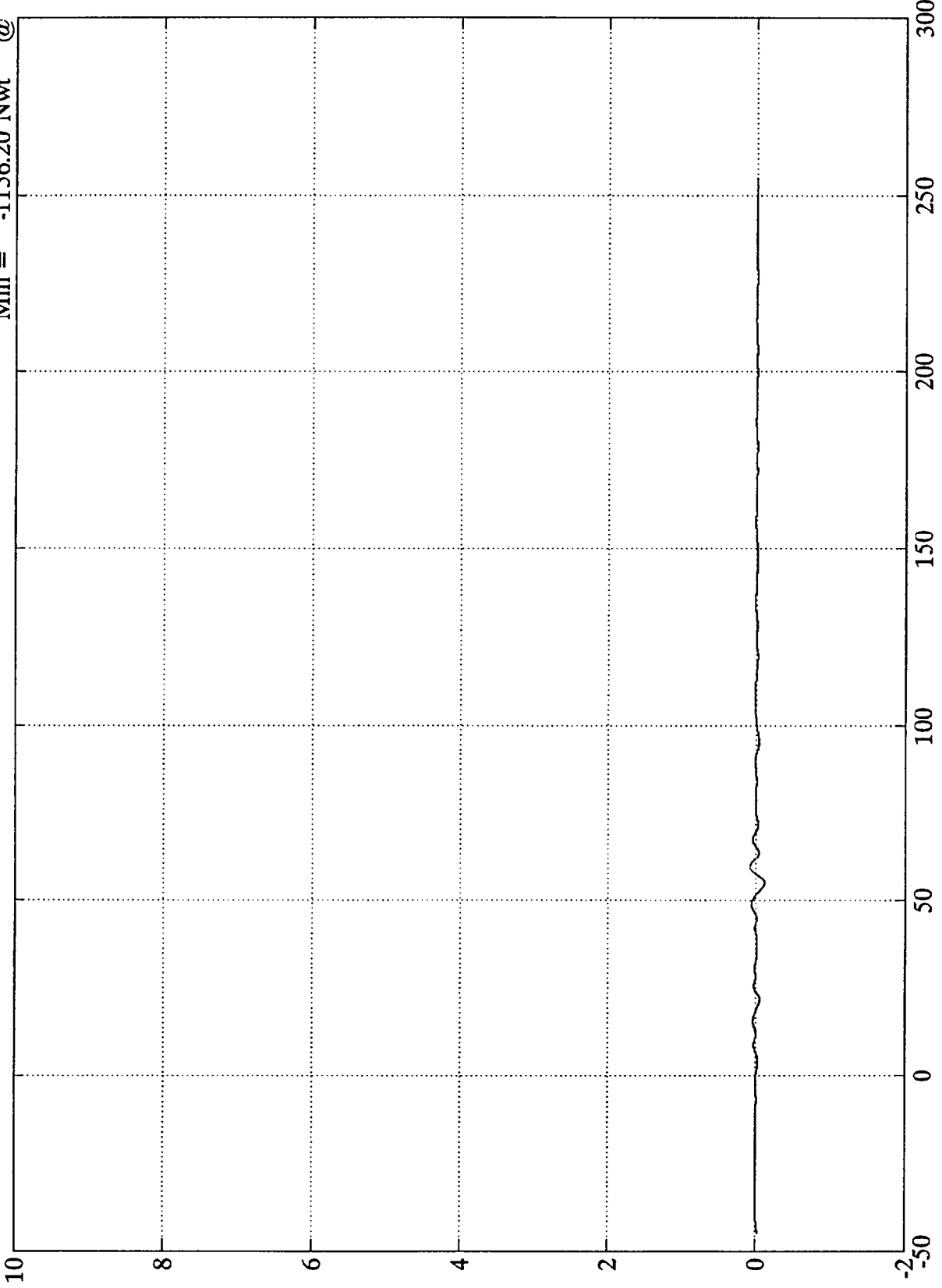


NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell A9

Max = 825.38 Nwt @ 59.64 ms
Min = -1156.20 Nwt @ 54.96 ms

x10⁴



Nwt

B-39

8120-6

SAE Filter Class 60

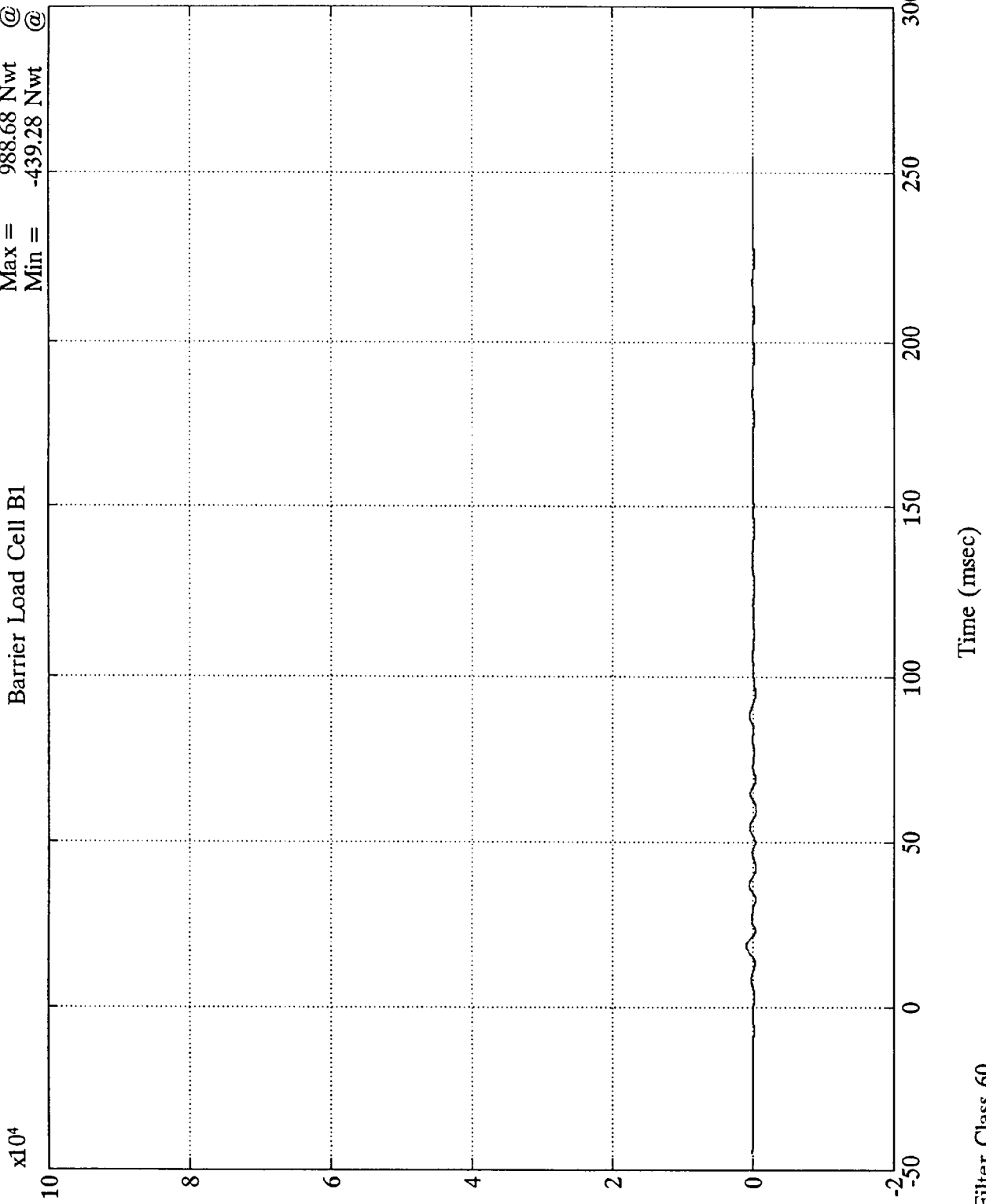
Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell B1

Max = 988.68 Nwt @
Min = -439.28 Nwt @

18.23 msec
59.88 msec



1wN
B-40

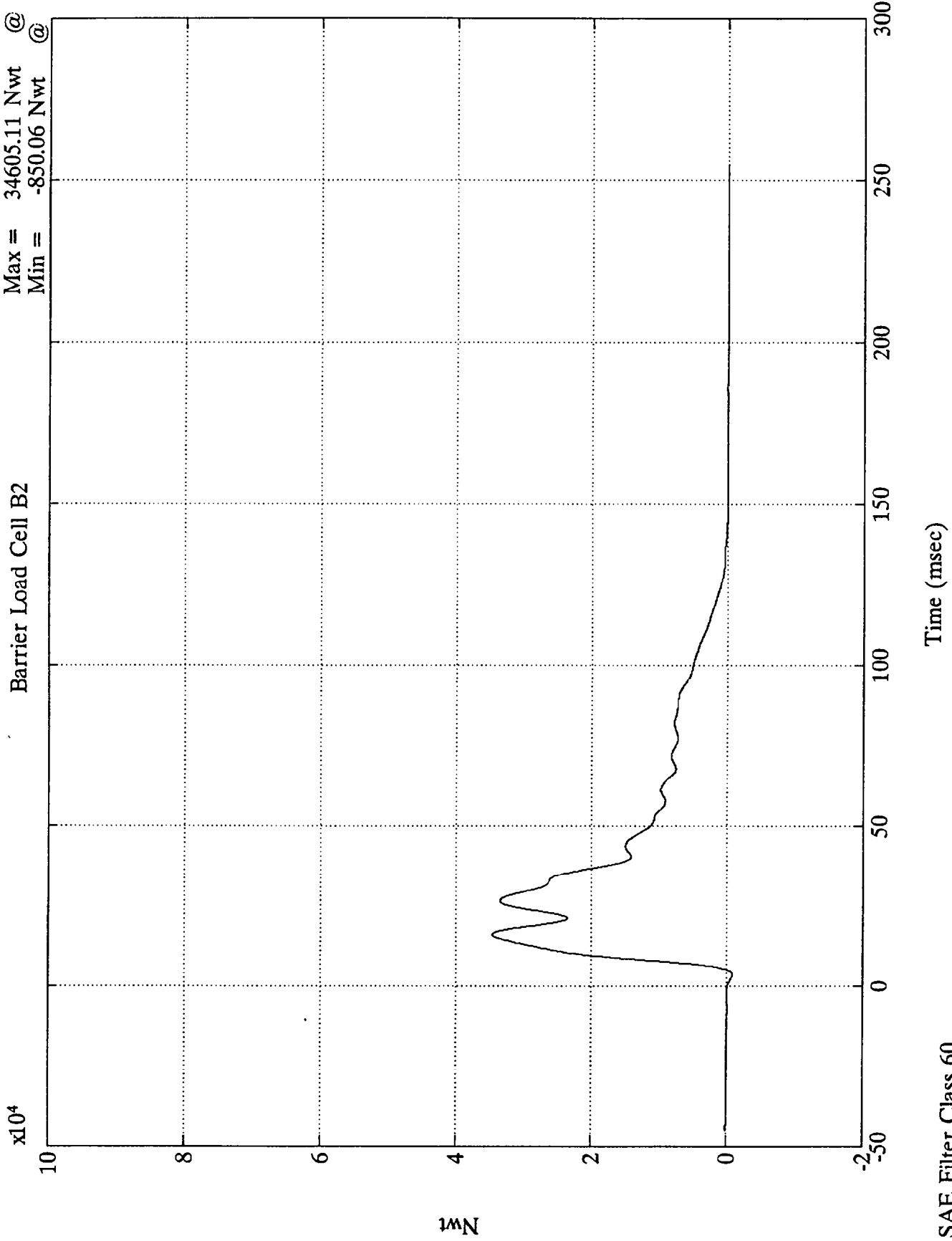
8120-6

SAE Filter Class 60

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell B2
Max = 34605.11 Nwt @ 15.95 m
Min = -850.06 Nwt @ 3.47 ms



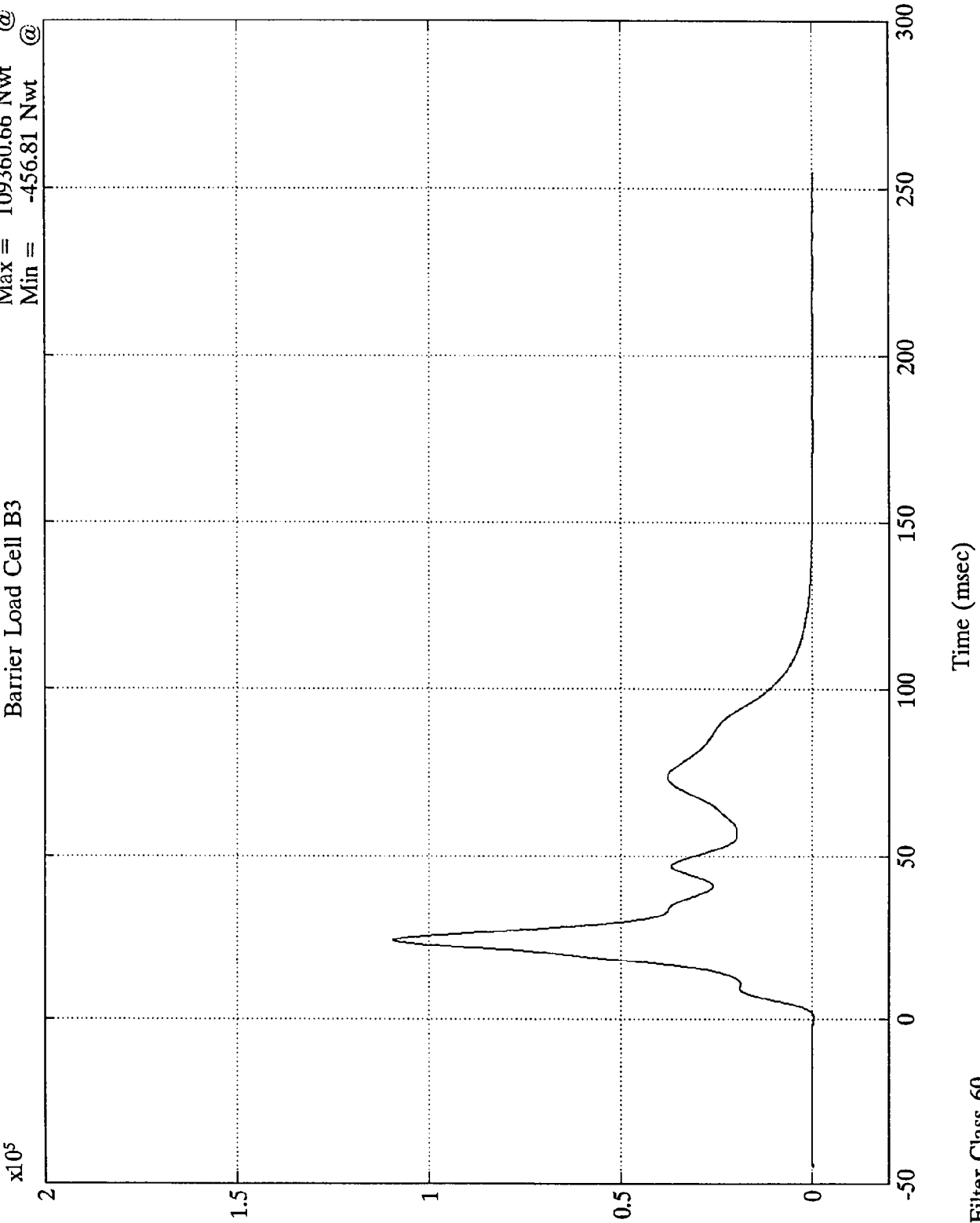
1Wt
B-41

8120-6

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell B3
Max = 109360.66 Nwt @ 24.00 msec
Min = -456.81 Nwt @ 0.23 msec



1Nwt
B-42

8120-6

SAE Filter Class 60

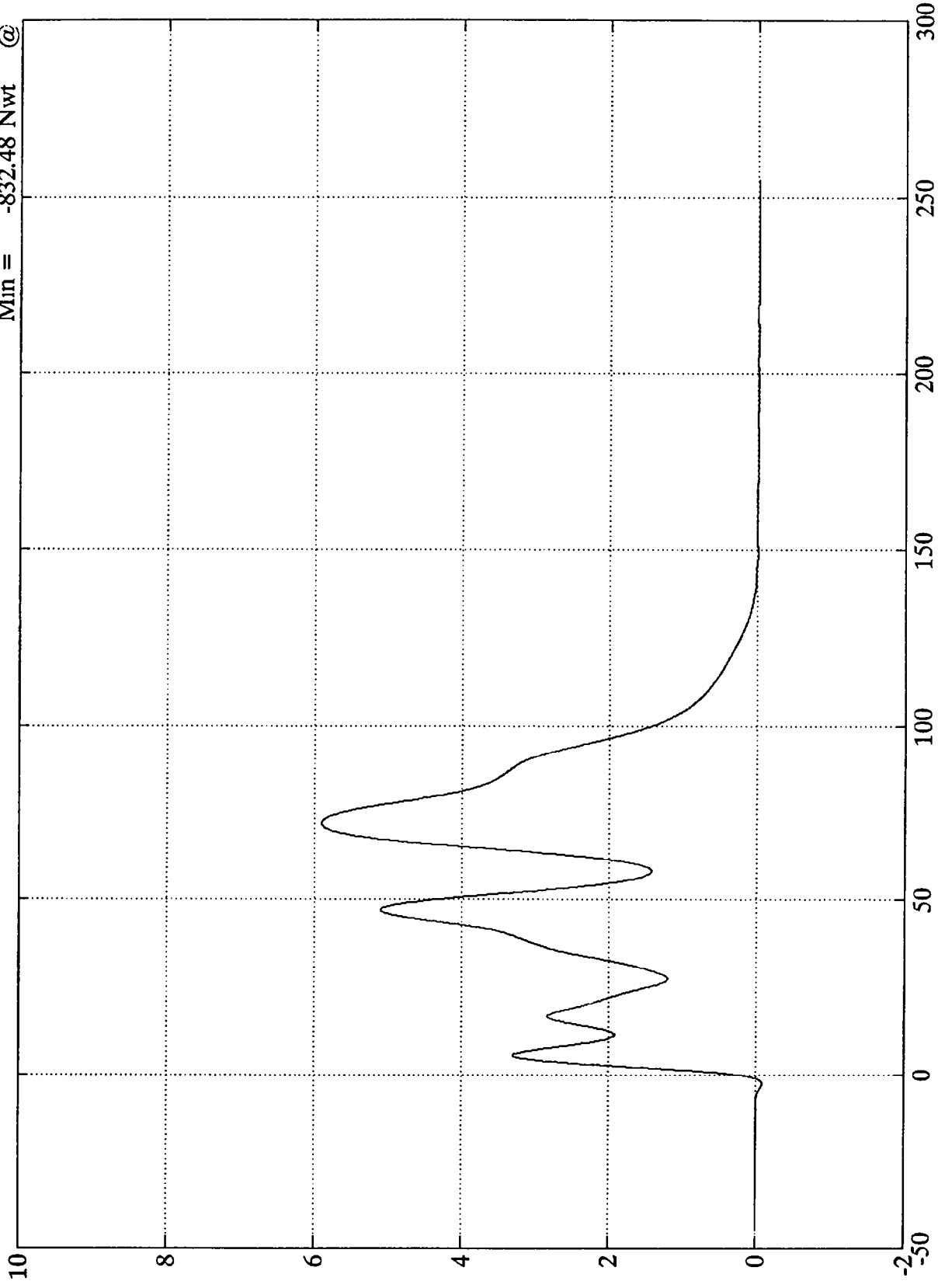


NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 59045.41 Nwt @ 72.00 m
Min = -832.48 Nwt @ -2.52 m/s

Barrier Load Cell B4

$\times 10^4$



Time (msec)

Nwt
B-43

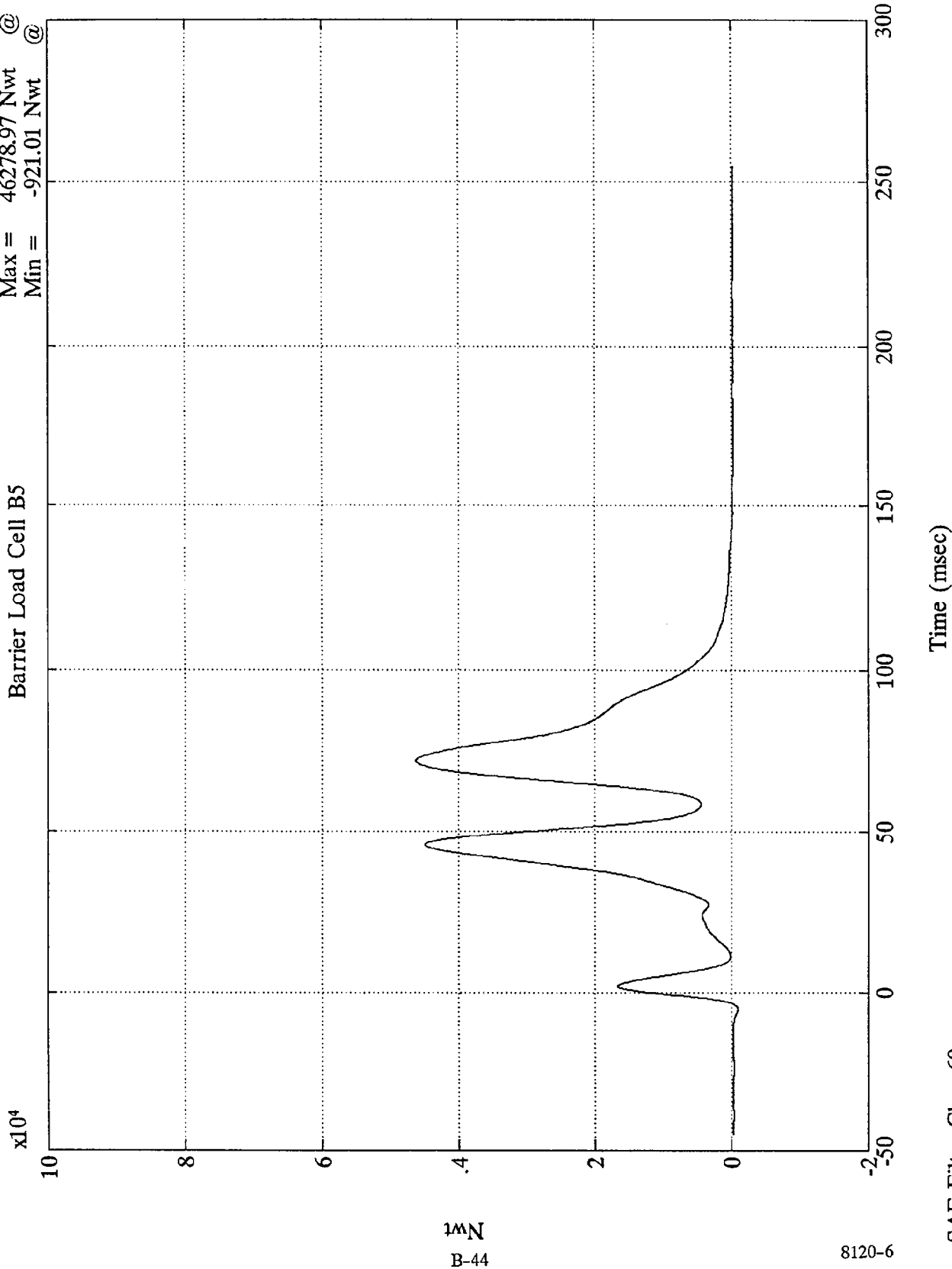
8120-6

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell B5

Max = 46278.97 Nwt @ 71.87 msec
Min = -921.01 Nwt @ -5.16 msec



B-44

8120-6

SAE Filter Class 60

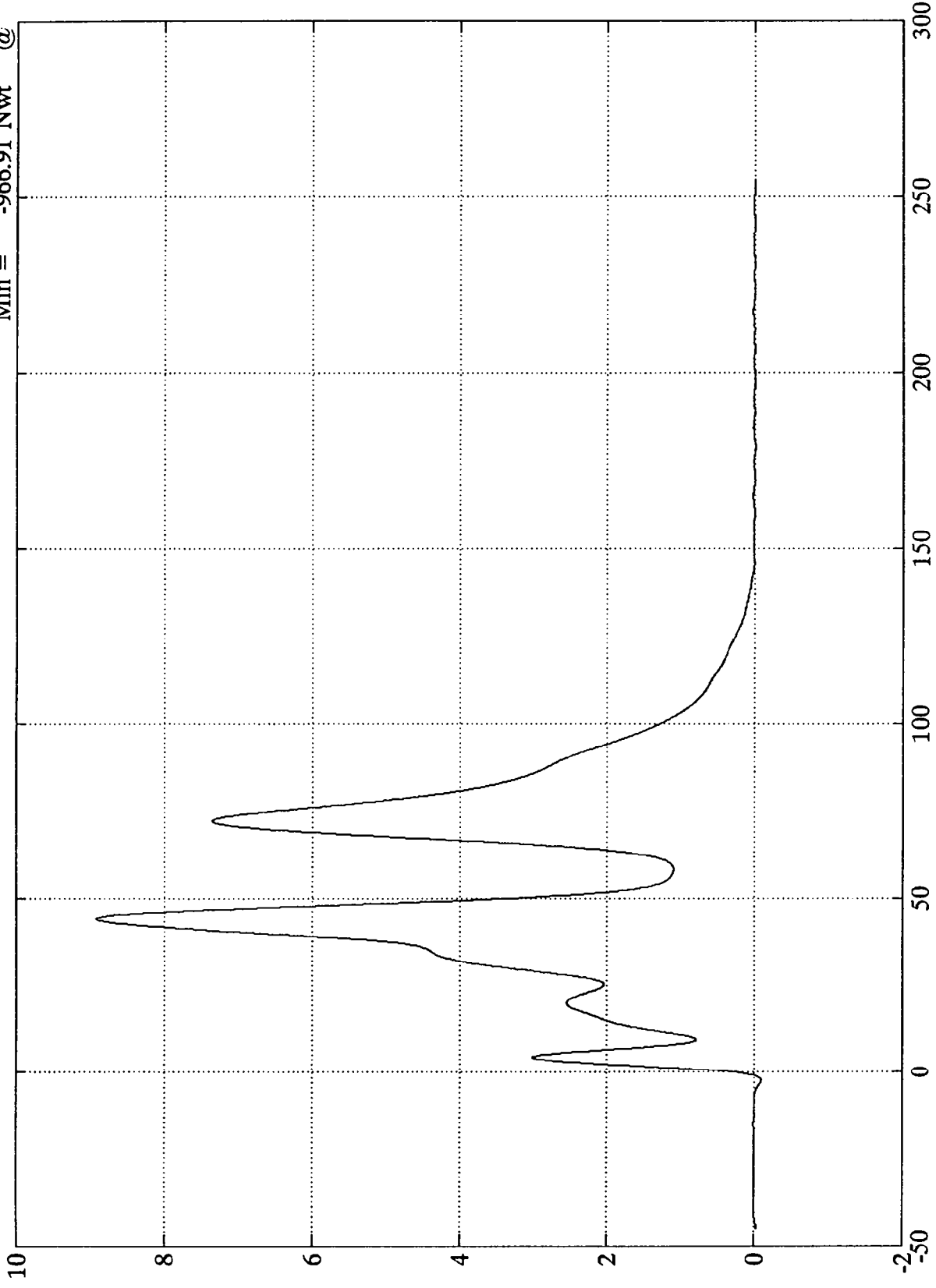


NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 89235.65 Nwt @ 44.27 m
Min = -966.91 Nwt @ -2.64 ms

Barrier Load Cell B6

$\times 10^4$



Time (msec)

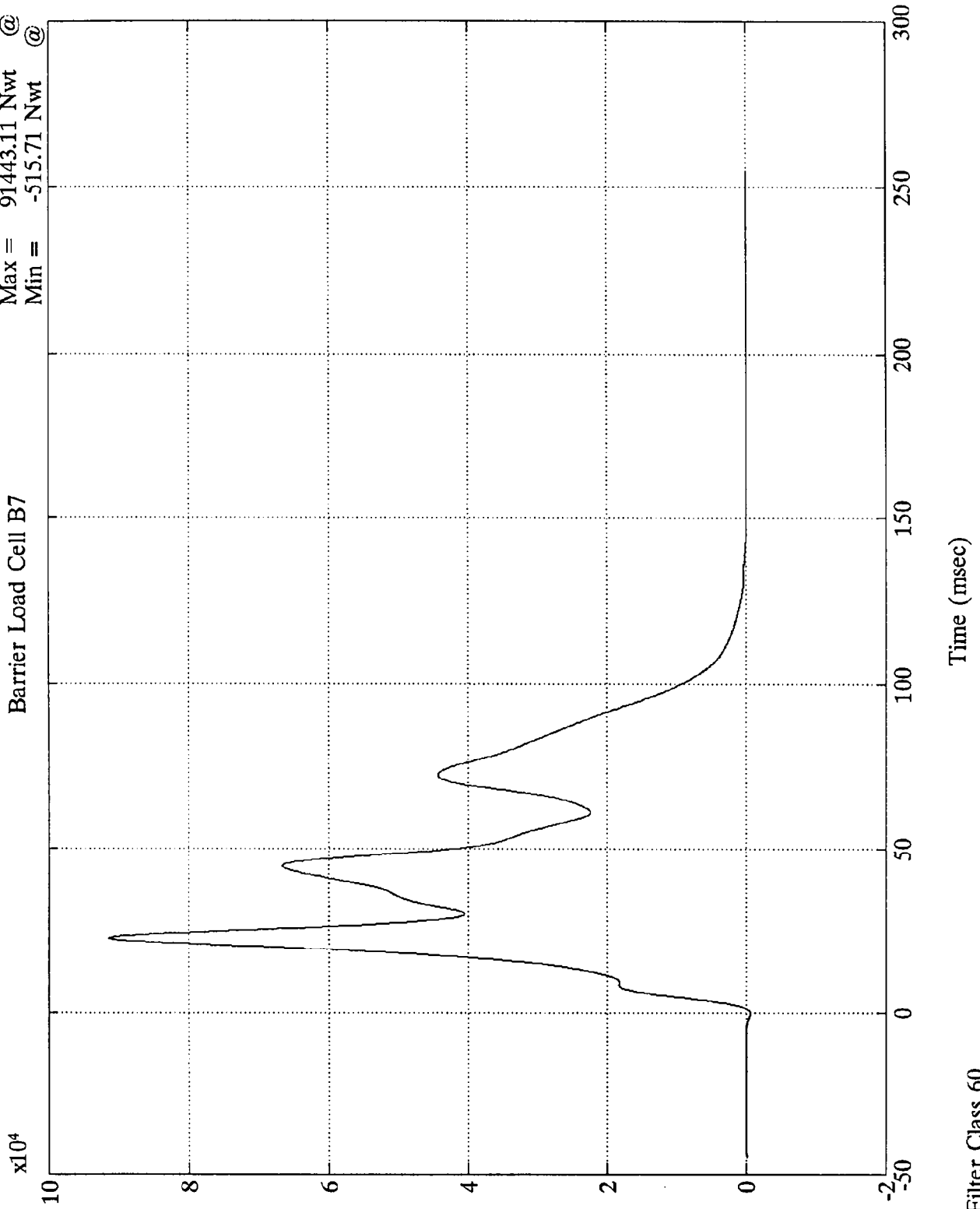
Nwt
B-45

SAE Filter Class 60

8120-6

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell B7
Max = 91443.11 Nwt @ 22.68 msec
Min = -515.71 Nwt @ -0.36 msec



10N
B-46

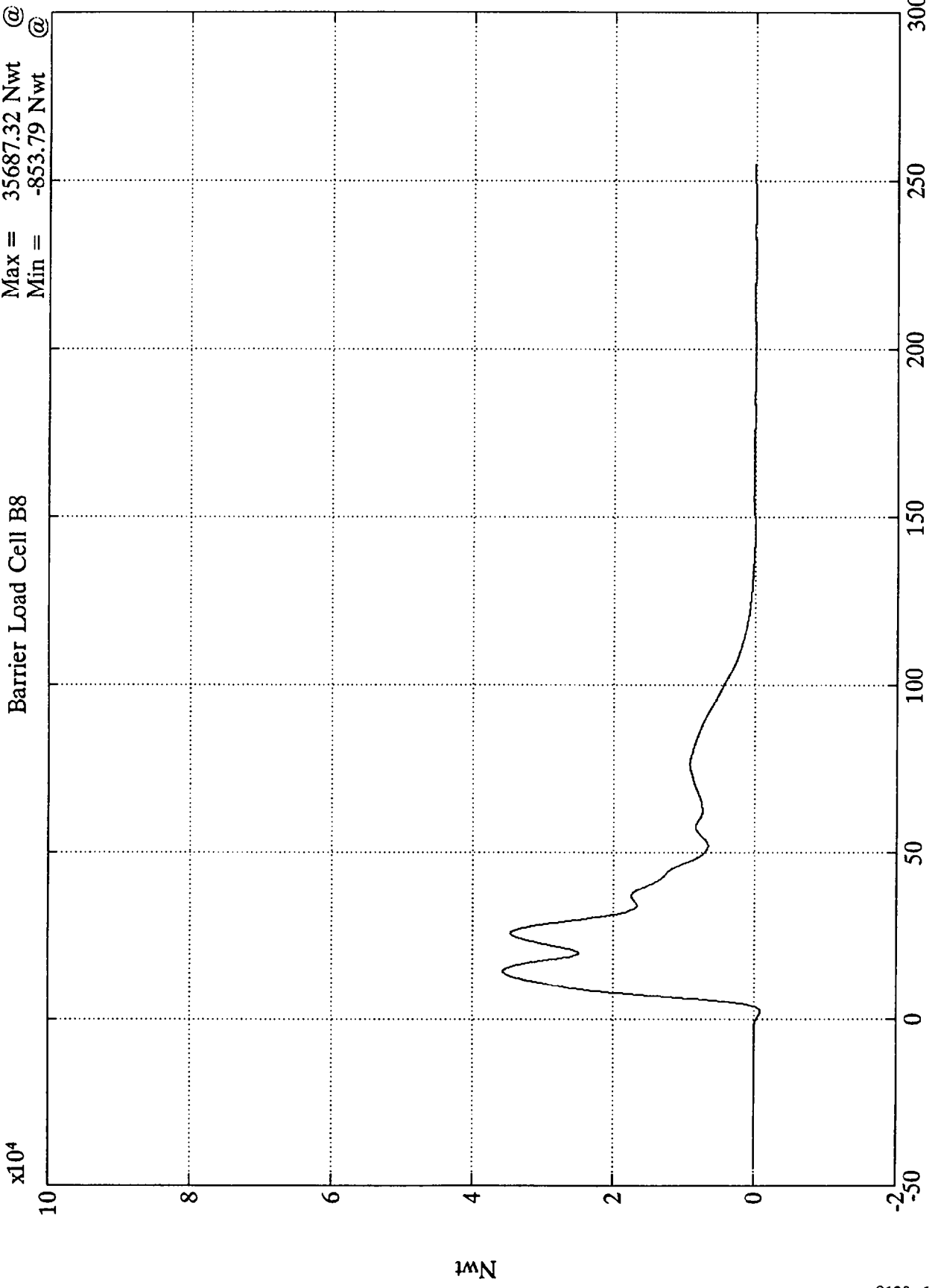
8120-6

SAE Filter Class 60



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell B8
Max = 35687.32 Nwt @ 14.39 ms
Min = -853.79 Nwt @ 2.27 ms



Nwt
B-47

Time (msec)

SAE Filter Class 60

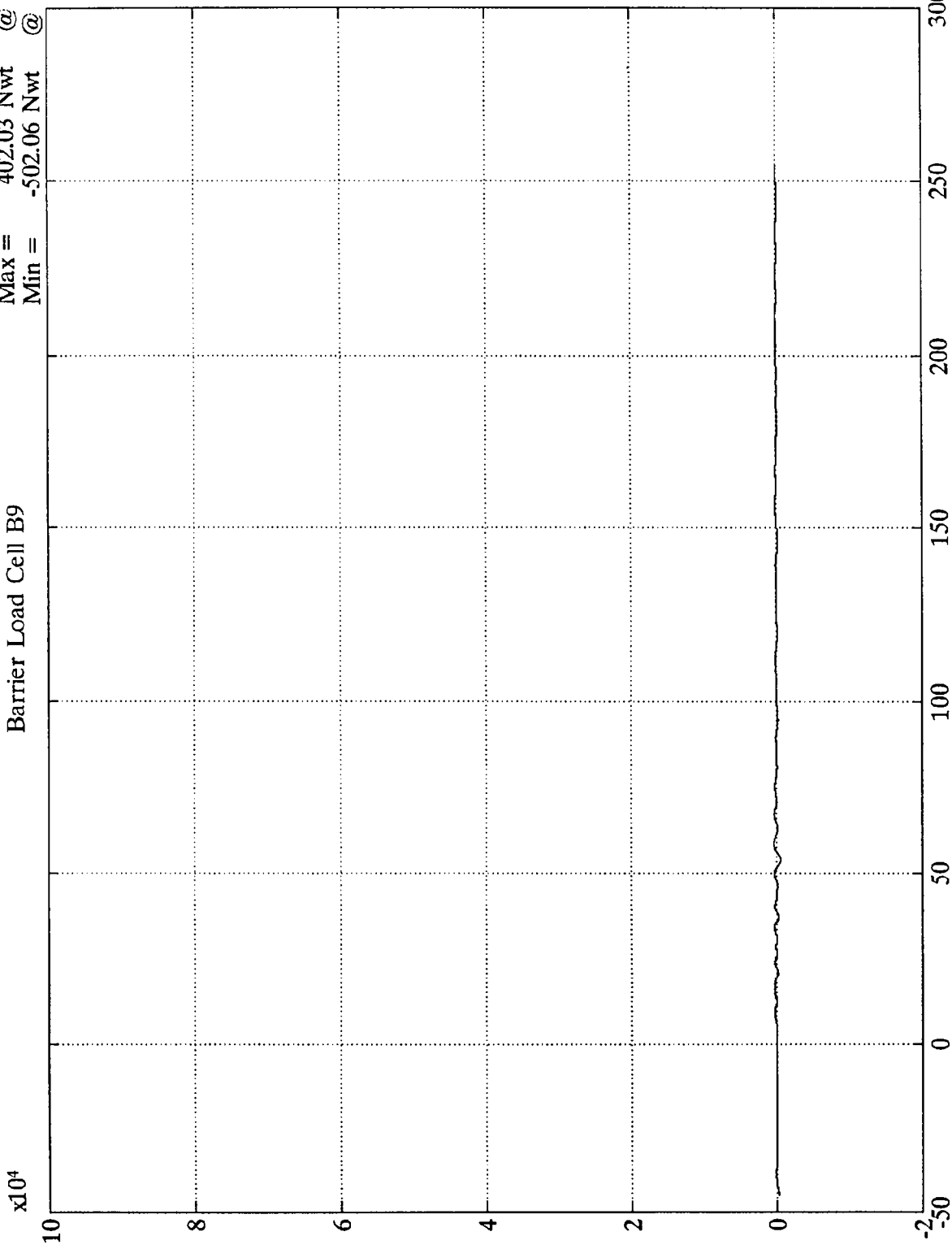
8120-6

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell B9

Max = 402.03 Nwt @
Min = -502.06 Nwt @

58.56 msec
54.00 msec



13N
B-48

8120-6

Time (msec)

SAE Filter Class 60



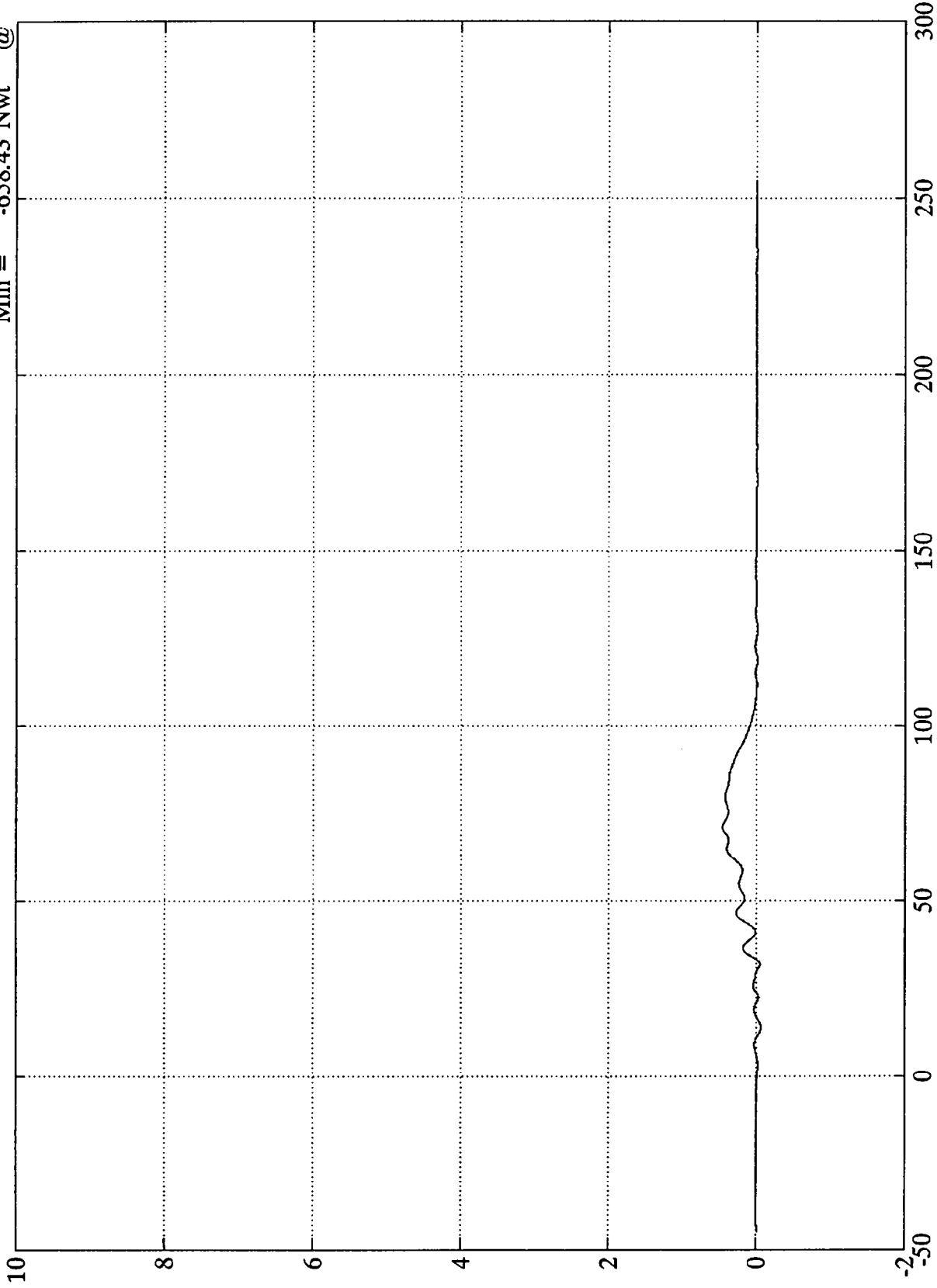
NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell C1

Max = 4565.03 Nwt @
Min = -658.43 Nwt @

71.16 ms
13.67 msec

x10⁴



Nwt
B-49

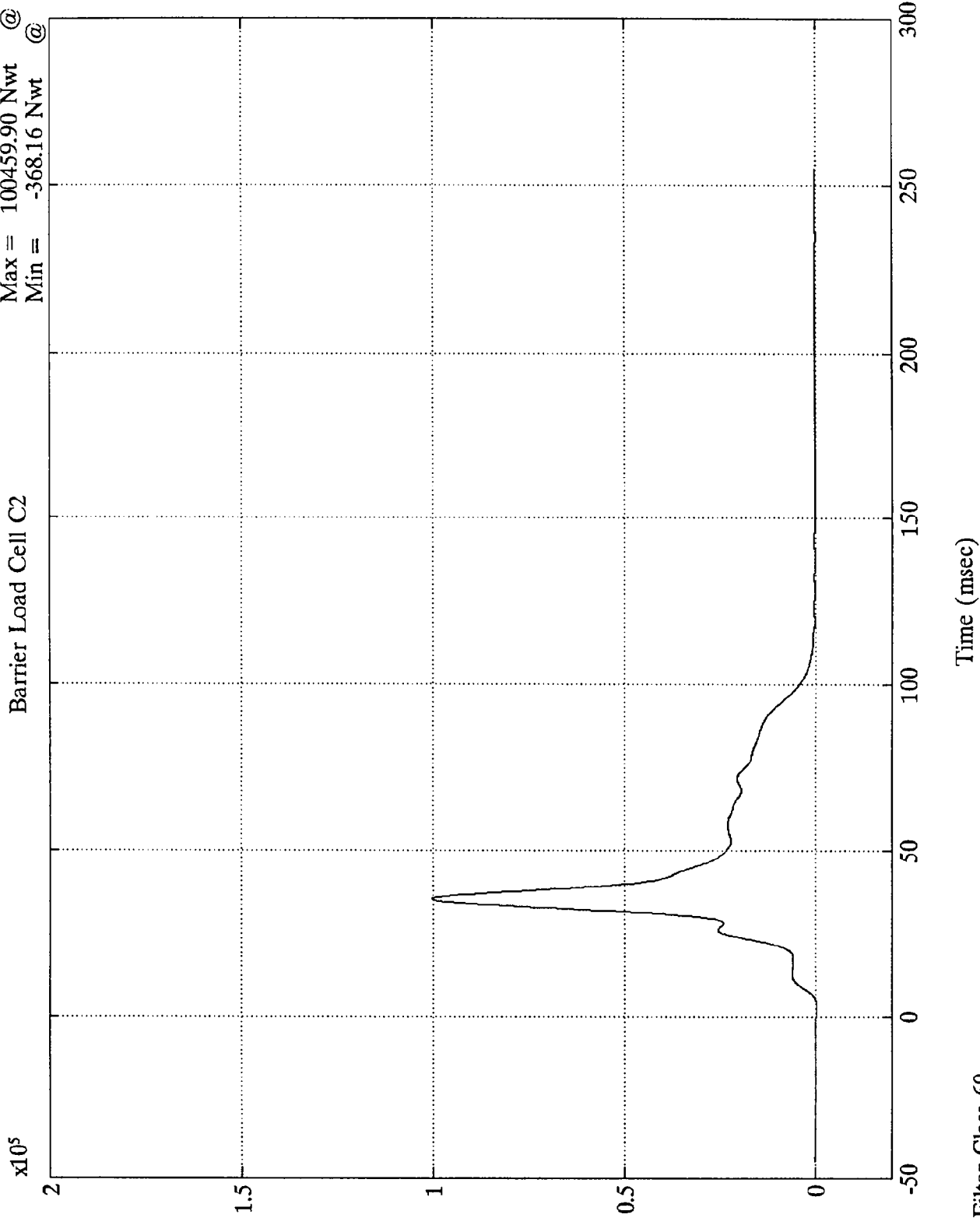
Time (msec)

SAE Filter Class 60

8120-6

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell C2
Max = 100459.90 Nwt @ 35.39 msec
Min = -368.16 Nwt @ 2.87 msec



10⁵ N
B-50

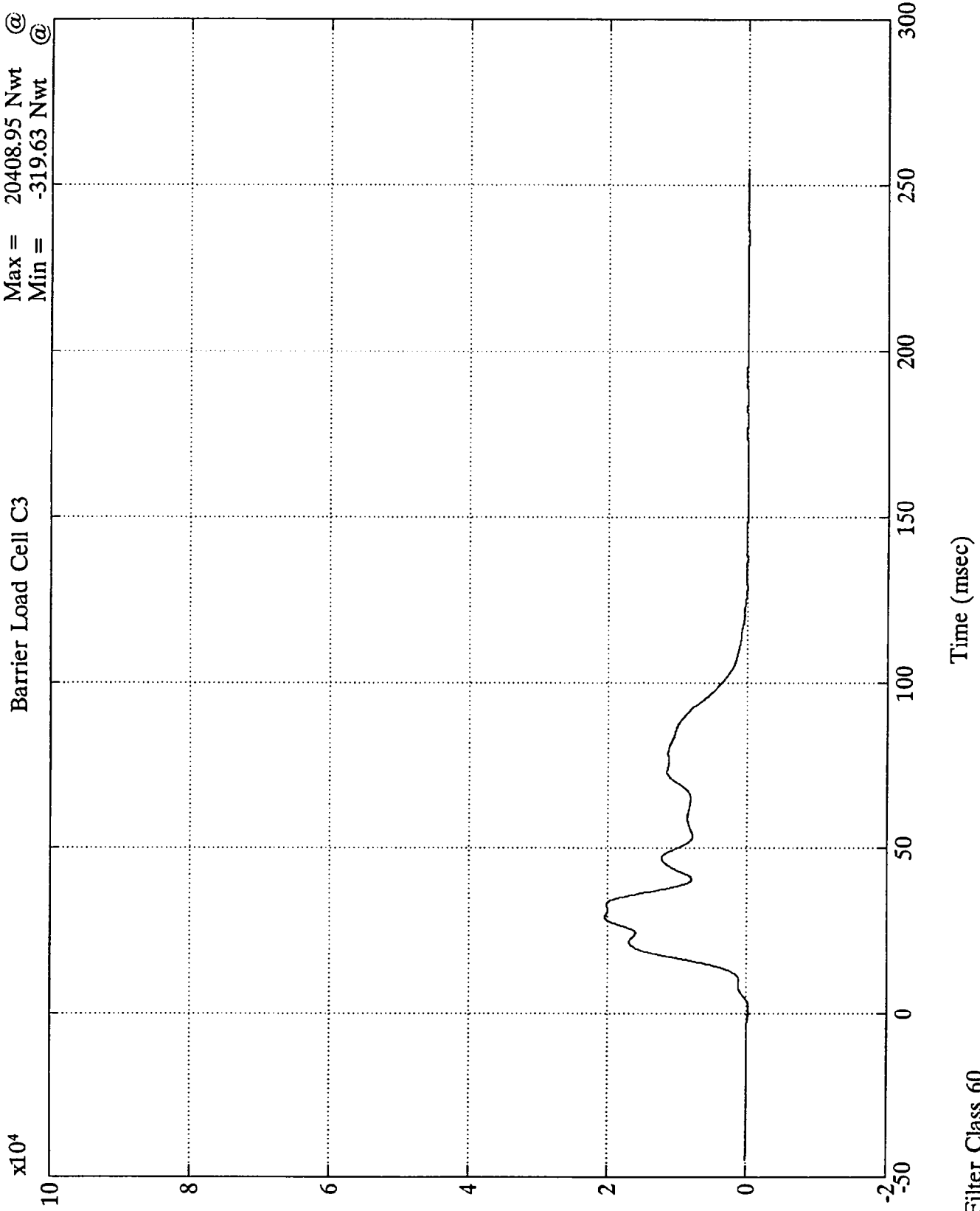
8120-6

SAE Filter Class 60

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell C3
Max = 20408.95 Nwt @ 29.15 π
Min = -319.63 Nwt @ 1.67 ms



10N
B-51

8120-6

SAE Filter Class 60

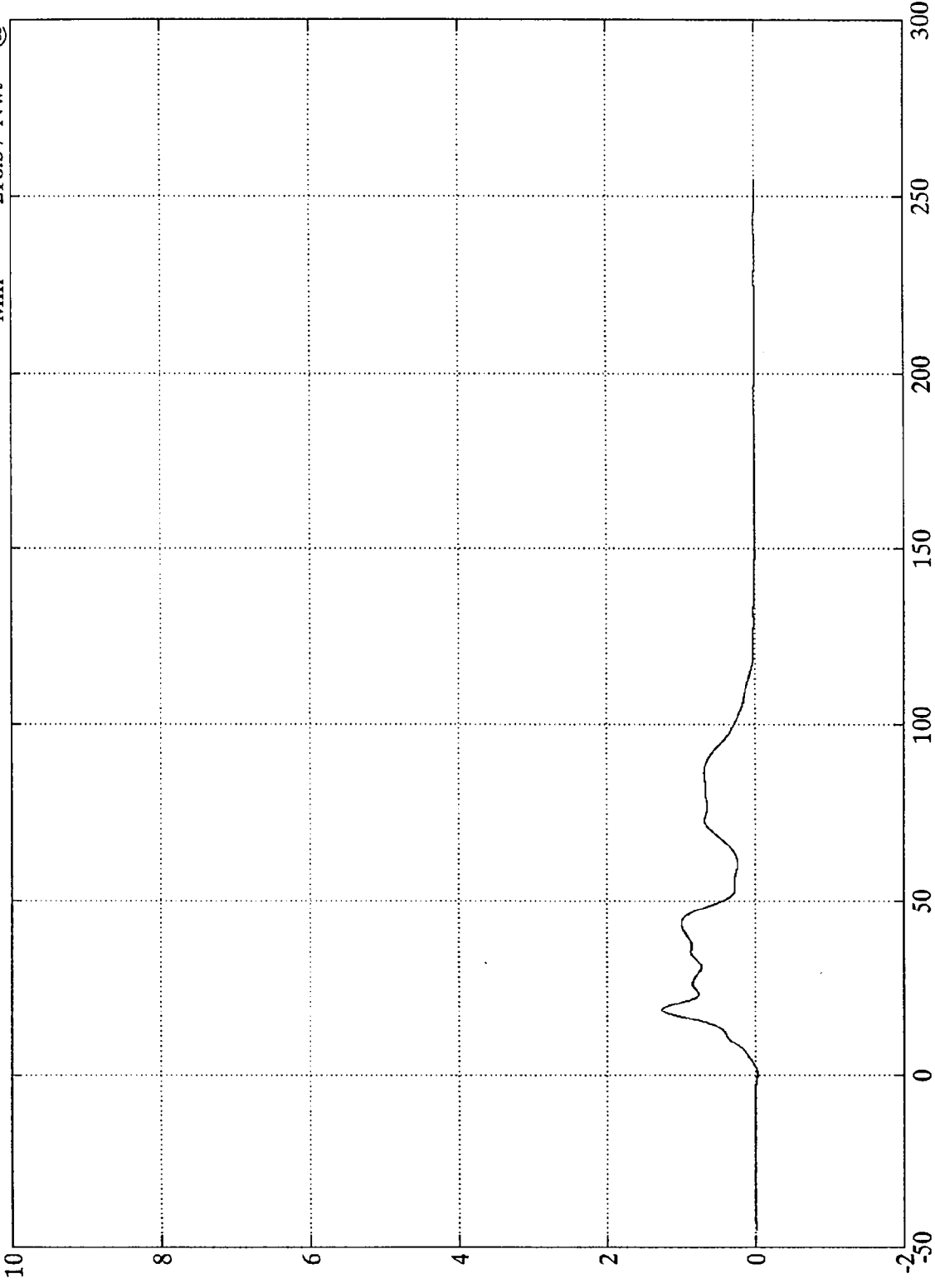
NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell C4

Max = 12656.02 Nwt @
Min = -216.57 Nwt @

18.47 msec
0.11 msec

x10⁴



1W
B-52

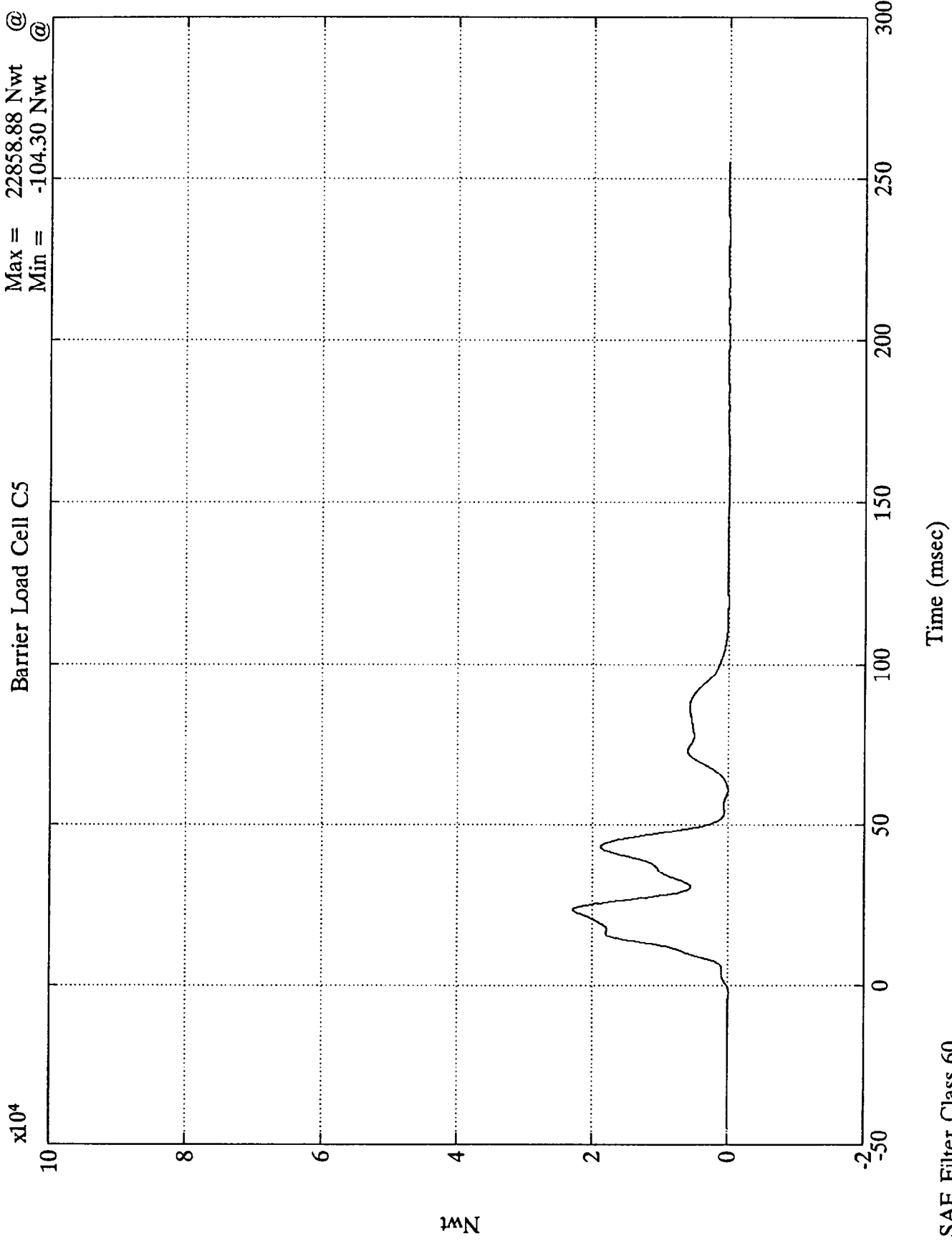
8120-6

Time (msec)

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell C5
Max = 22858.88 Nwt @ 23.76 π
Min = -104.30 Nwt @ -2.40 ms



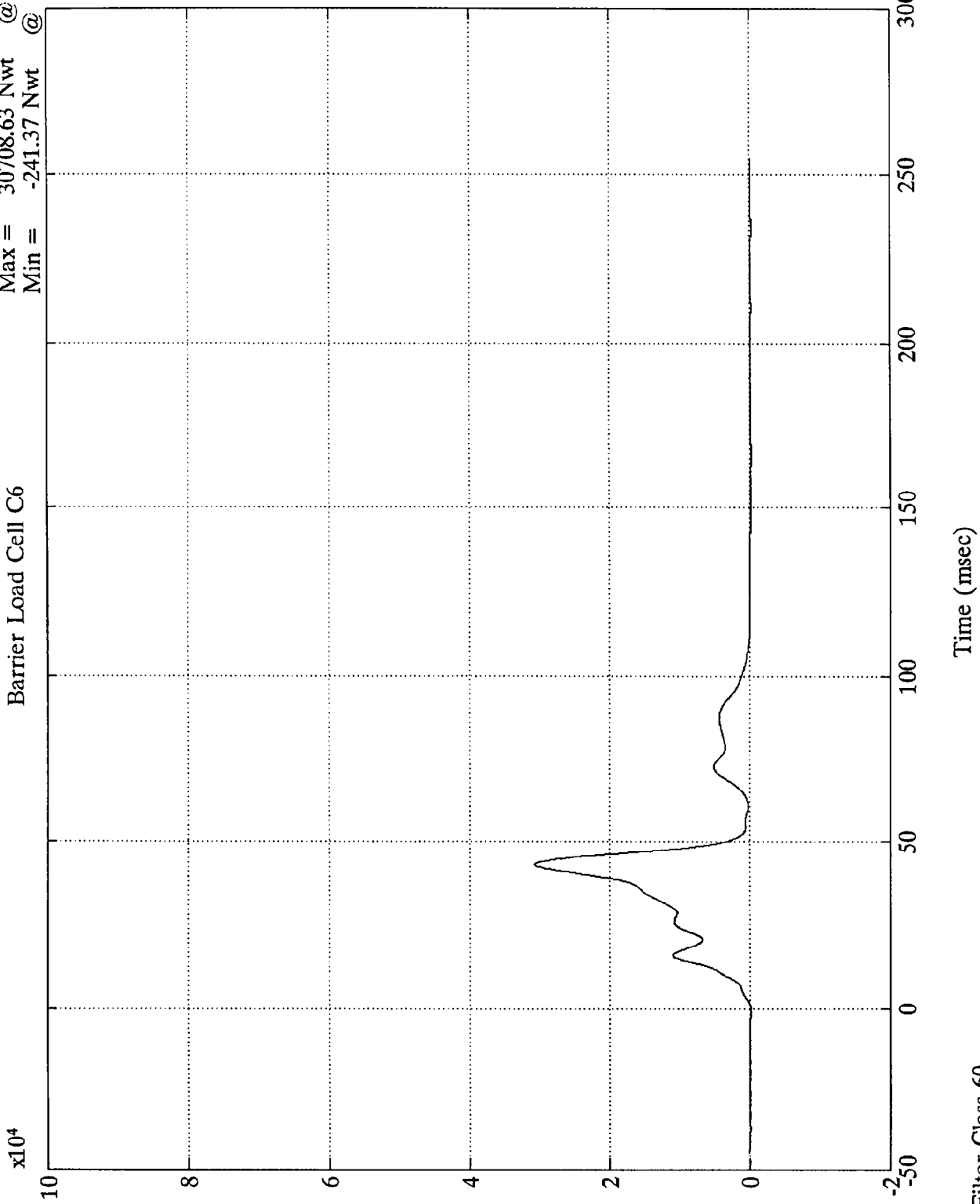
1Nwt
B-53

8120-6

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell C6
Max = 30708.63 Nwt @ 42.84 msec
Min = -241.37 Nwt @ 234.24 msec



13N
B-54

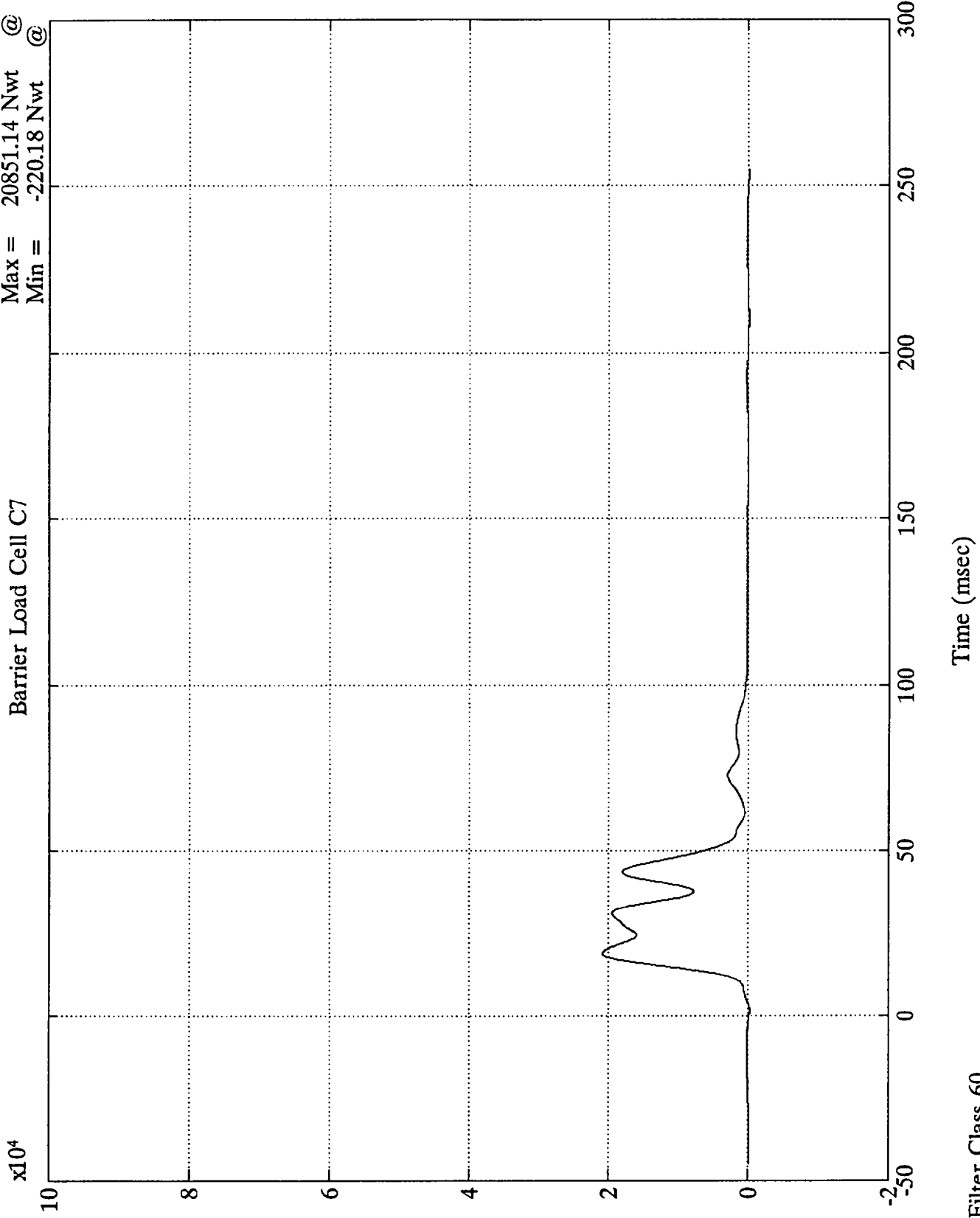
8120-6

SAE Filter Class 60



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell C7
Max = 20851.14 Nwt @ 19.07 m
Min = -220.18 Nwt @ 1.79 msec



Nwt
B-55

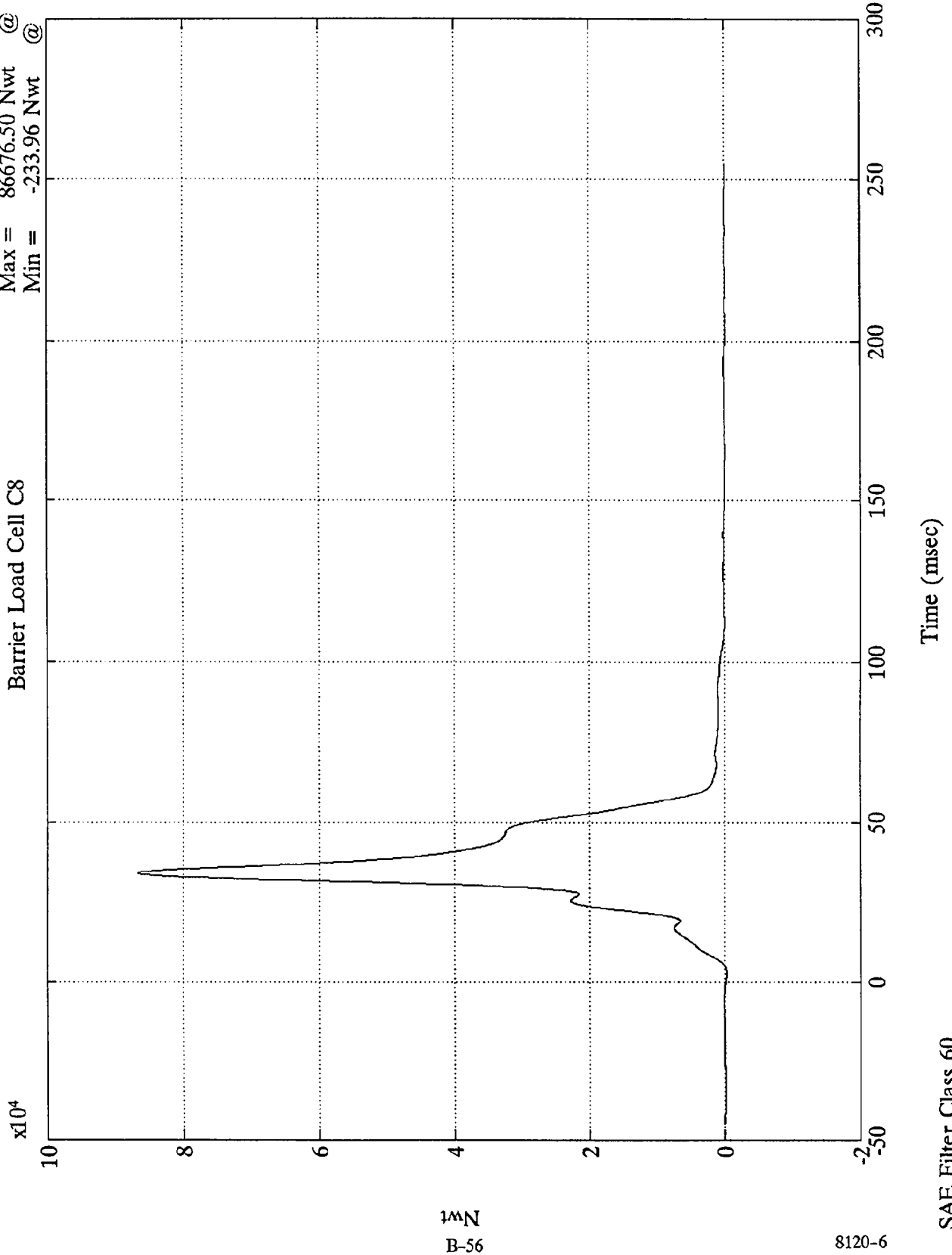
8120-6

SAE Filter Class 60

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell C8
Max = 86676.50 Nwt @ 33.95 msec
Min = -233.96 Nwt @ 2.51 msec



1kN
B-56

8120-6

SAE Filter Class 60

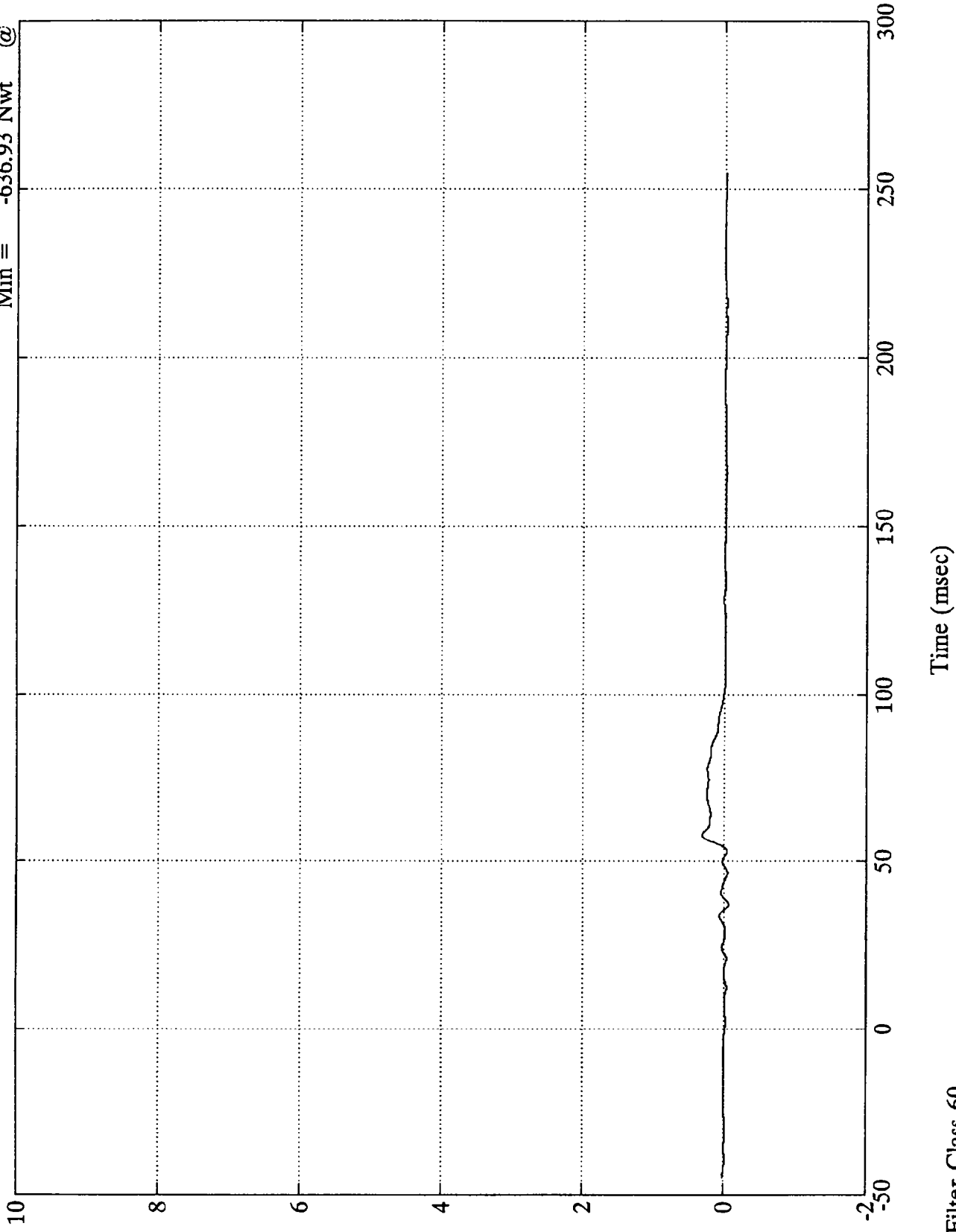


NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 3105.88 Nwt @ 57.60 ms
Min = -636.93 Nwt @ 37.31 ms

Barrier Load Cell C9

$\times 10^4$



Nwt
B-57

8120-6

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 1111.70 Nwt @ 37.68 msec
Min = -1700.81 Nwt @ 42.60 msec

Barrier Load Cell D1

@

Nwt

@

Nwt

@

msec

@

msec

@

msec

@

msec

@

msec

@

msec

@

msec

@

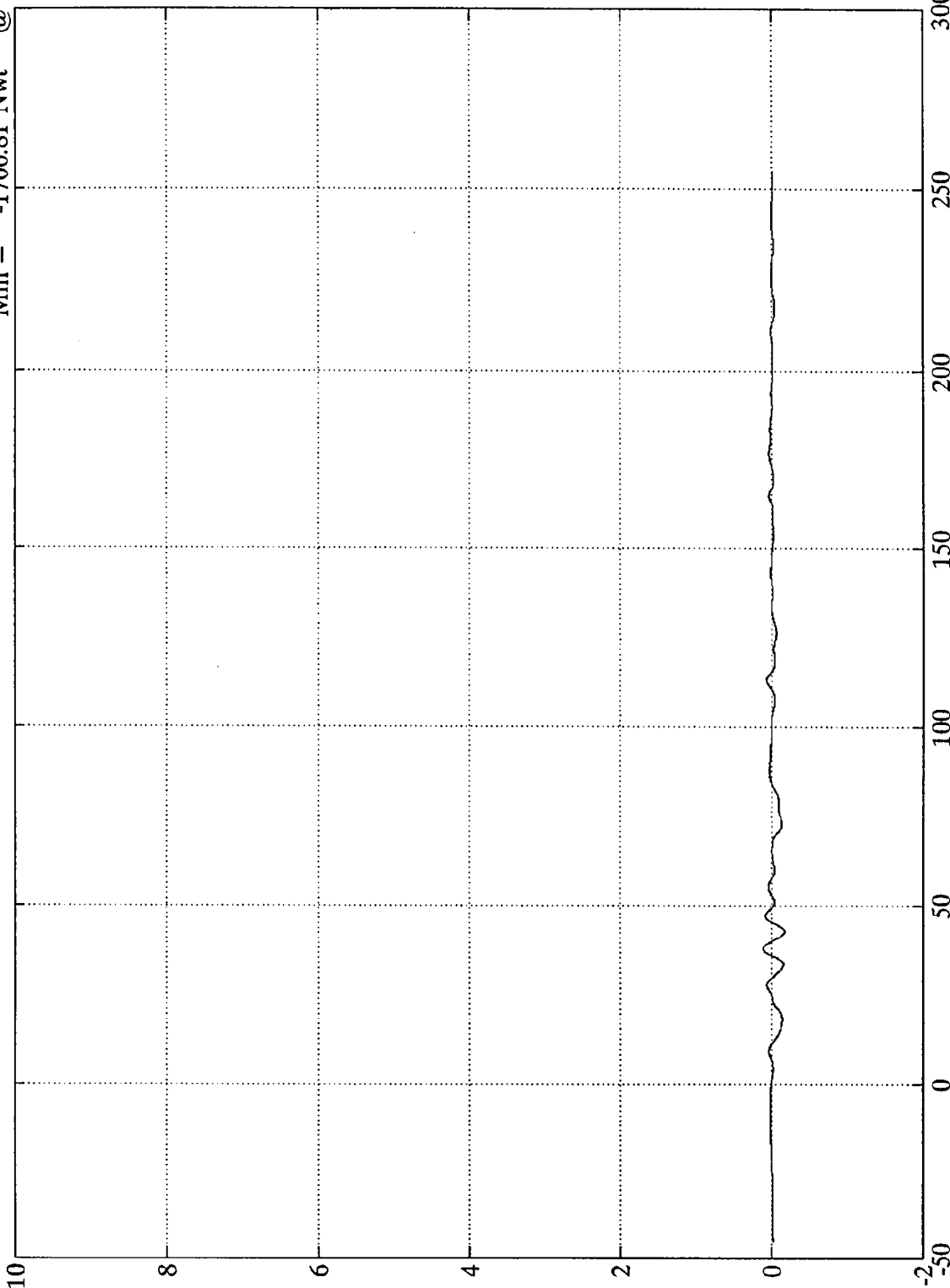
msec

@

msec

@

msec

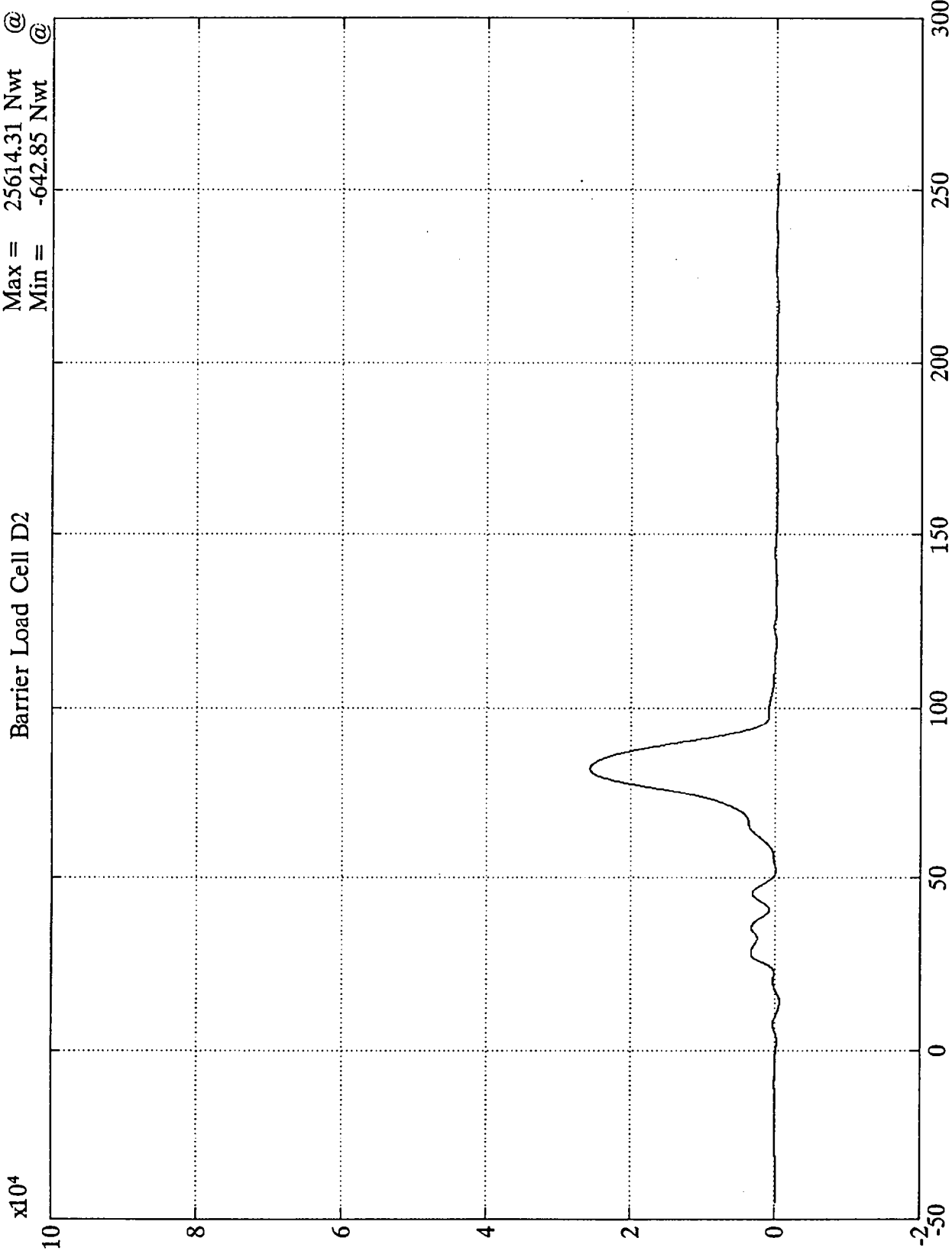


Time (msec)

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell D2
Max = 25614.31 Nwt @ 81.95 μ
Min = -642.85 Nwt @ 14.39 ms



B-59

8120-6

SAE Filter Class 60

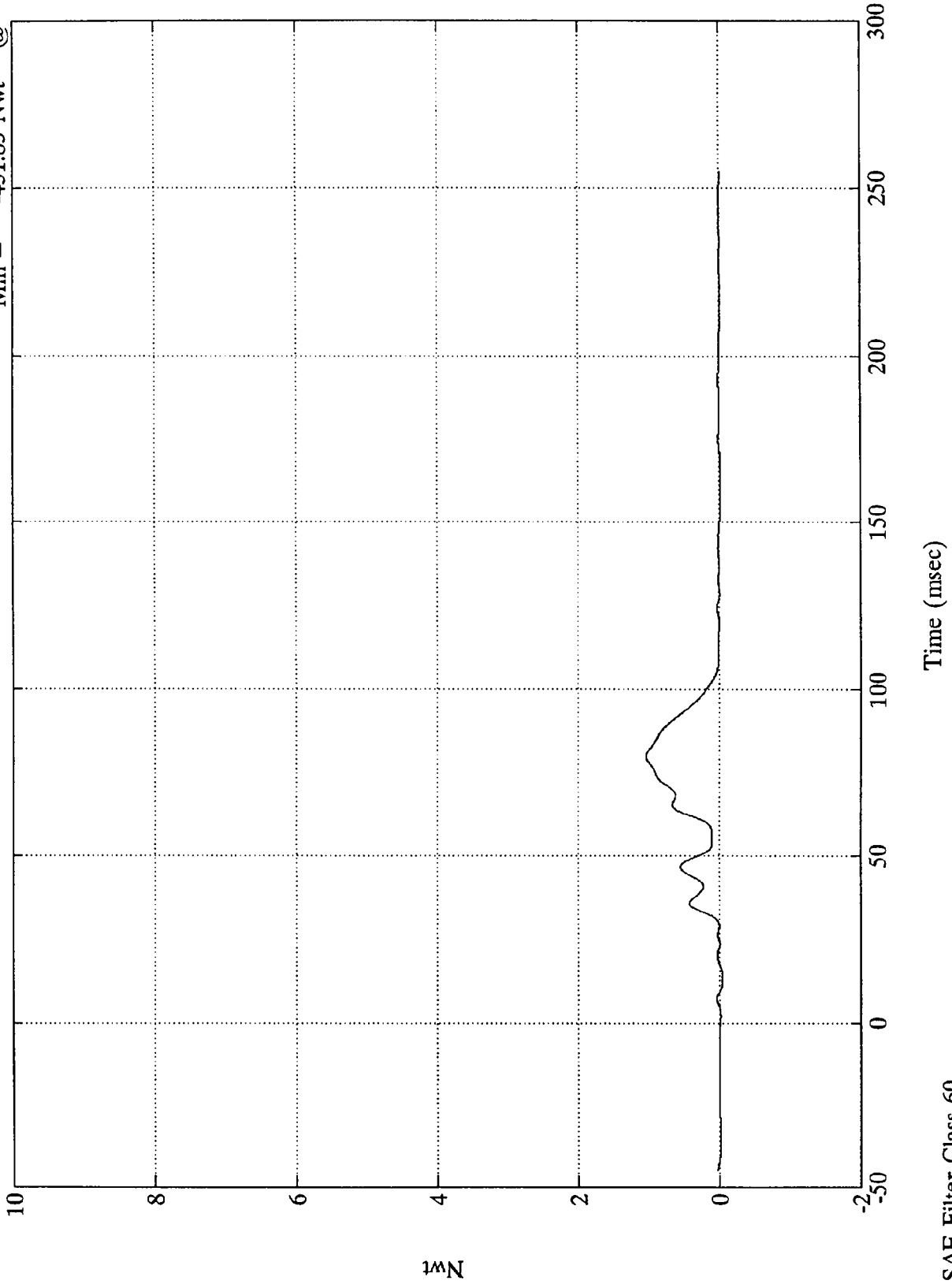
Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

$\times 10^4$

Barrier Load Cell D3

Max = 10390.03 Nwt @ 79.80 msec
Min = -451.83 Nwt @ 13.07 msec



10N
B-60

8120-6

SAE Filter Class 60

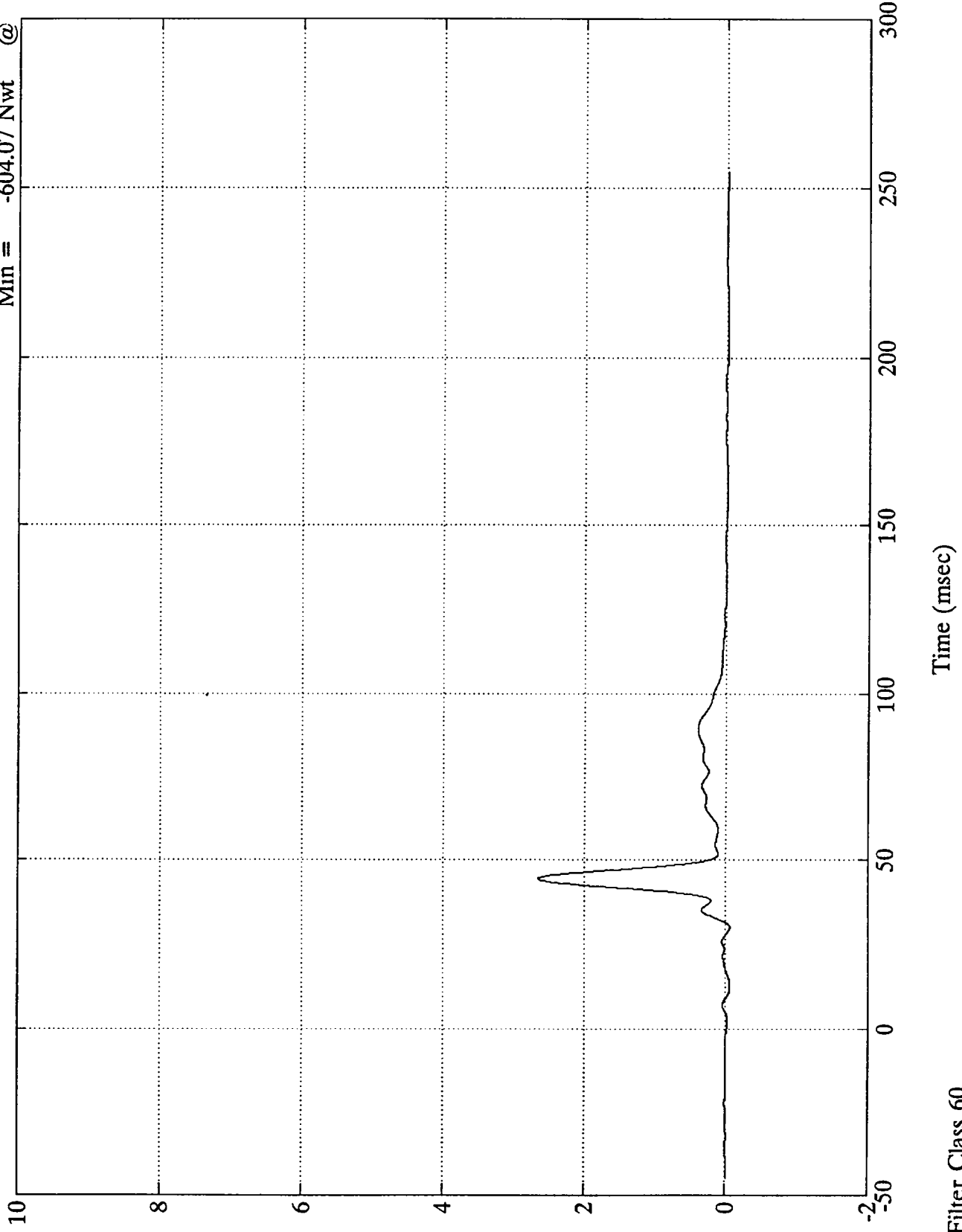


NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 26593.78 Nwt @ 44.39 m
Min = -604.07 Nwt @ 30.00 ms

Barrier Load Cell D4

$\times 10^4$



1N
B-61

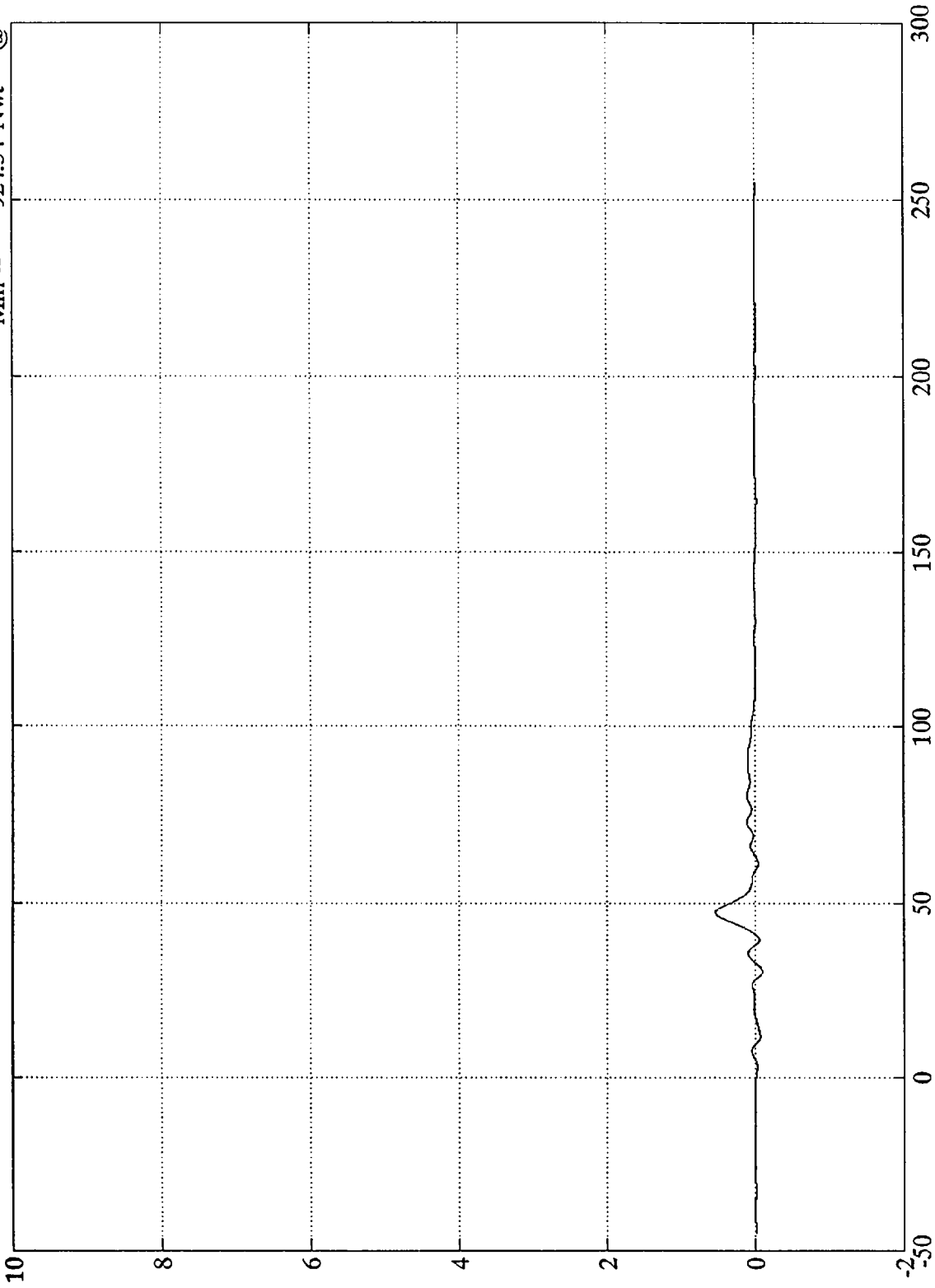
8120-6

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell D5

Max = 5408.75 Nwt @ 47.15 msec
Min = -924.54 Nwt @ 30.36 msec



1MN
B-62

Time (msec)

SAE Filter Class 60

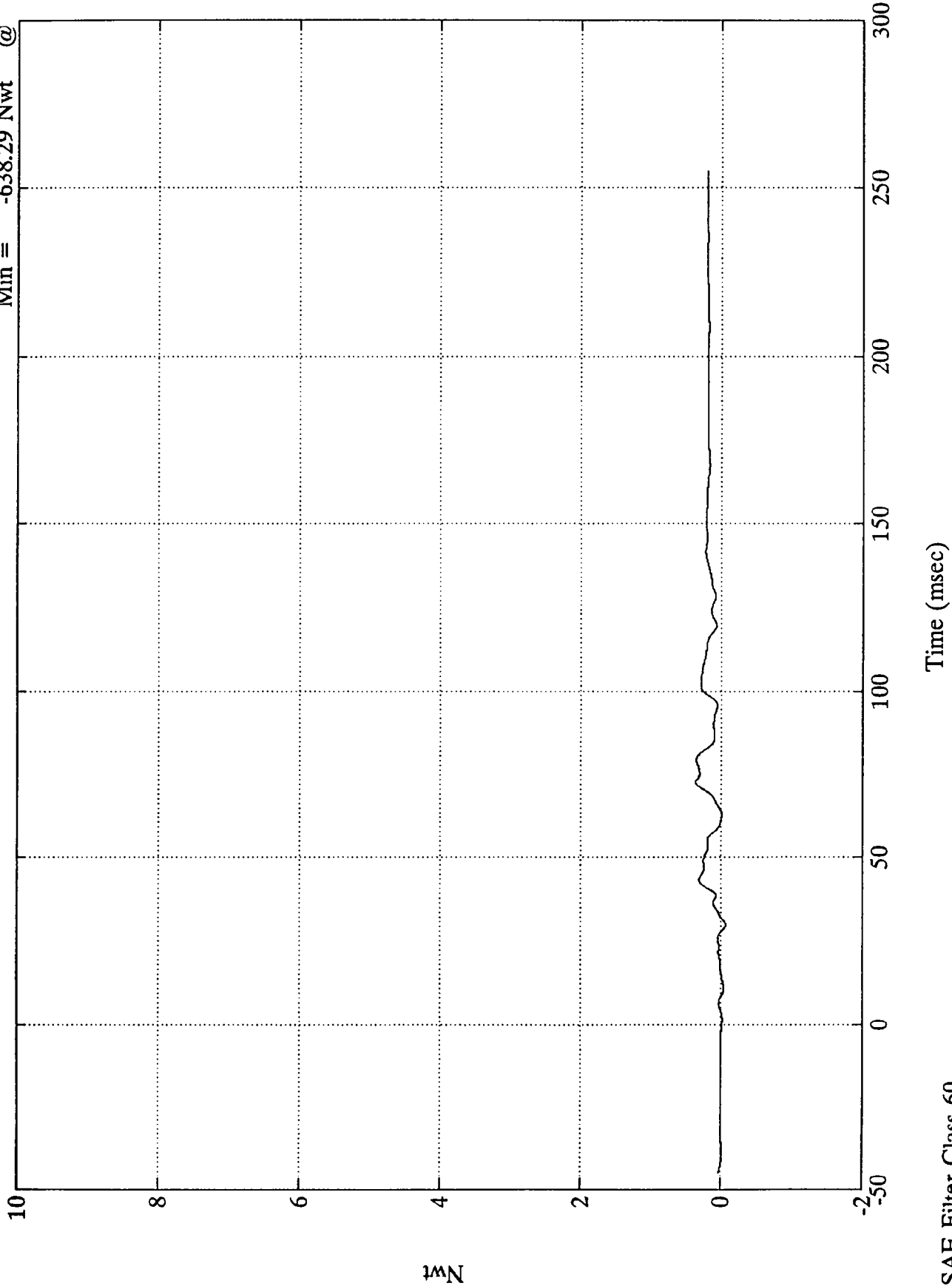
8120-6

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 3633.41 Nwt @ 72.48 ms
Min = -638.29 Nwt @ 29.76 ms

Barrier Load Cell D6

$\times 10^4$



Nwt
B-63

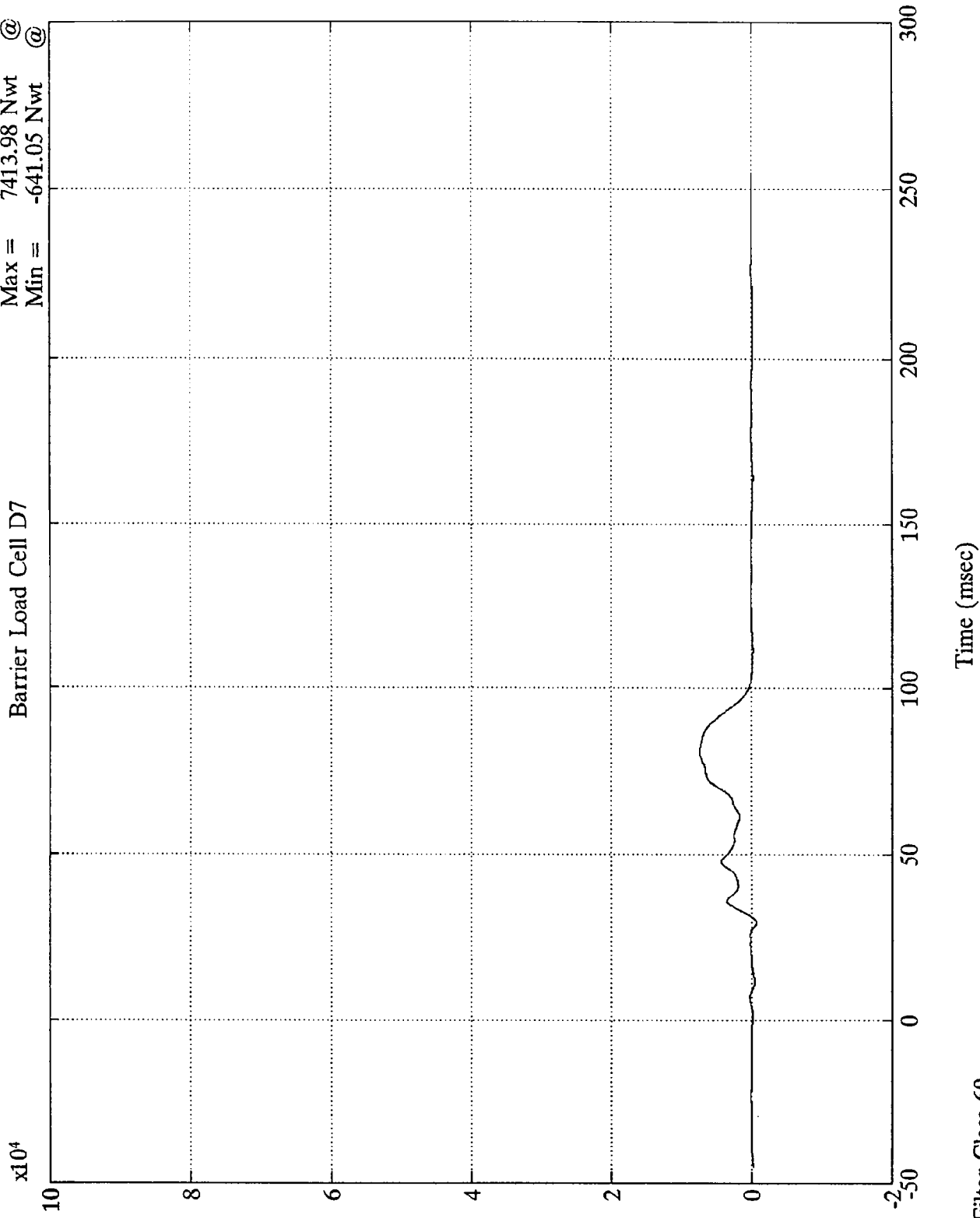
8120-6

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell D7

Max = 7413.98 Nwt @ 80.88 msec
Min = -641.05 Nwt @ 29.39 msec



1MN
B-64

8120-6

SAE Filter Class 60

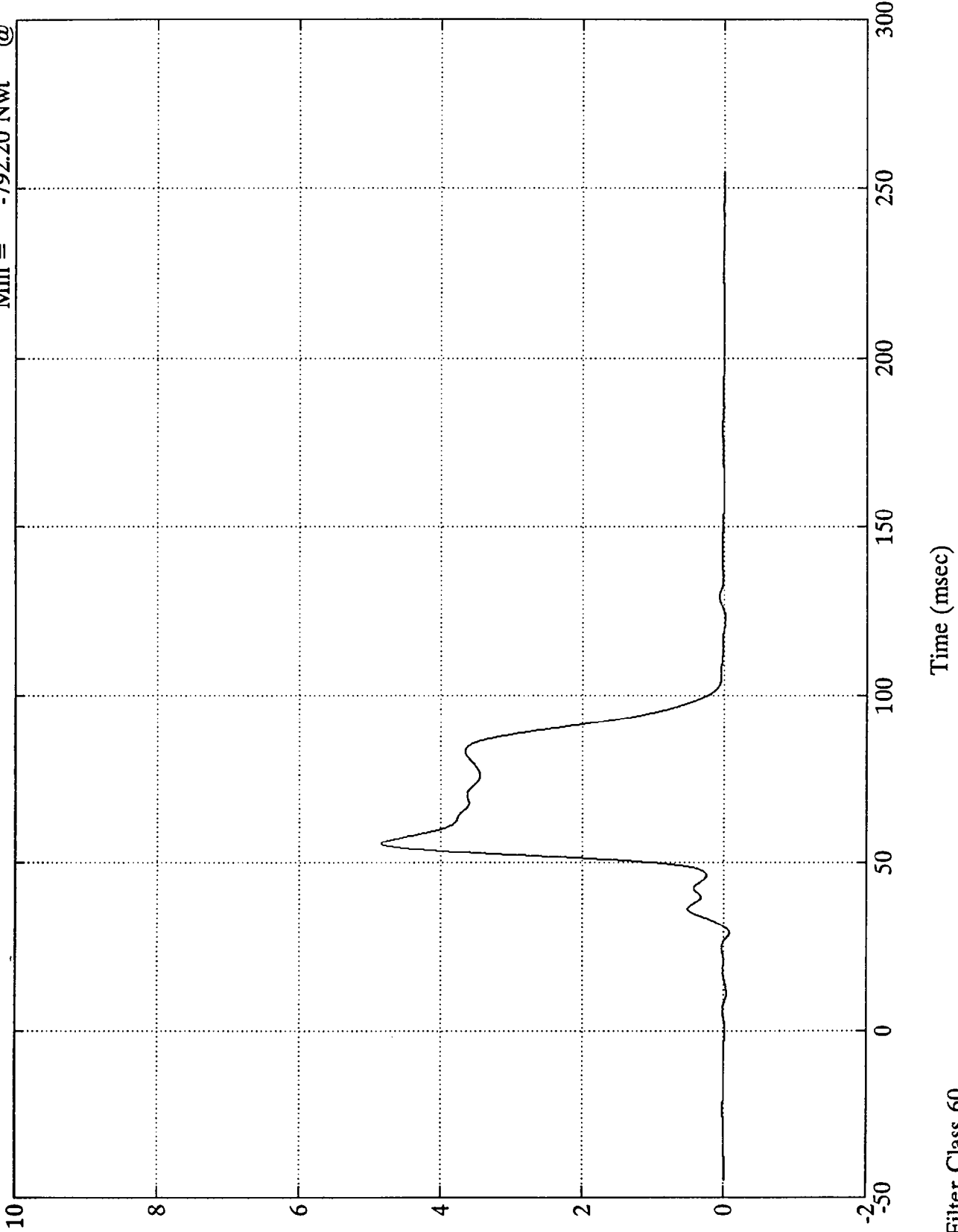
Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell D8

Max = 48492.84 Nwt @ 55.68 ms
Min = -792.20 Nwt @ 29.15 ms

$\times 10^4$



10N
B-65

8120-6

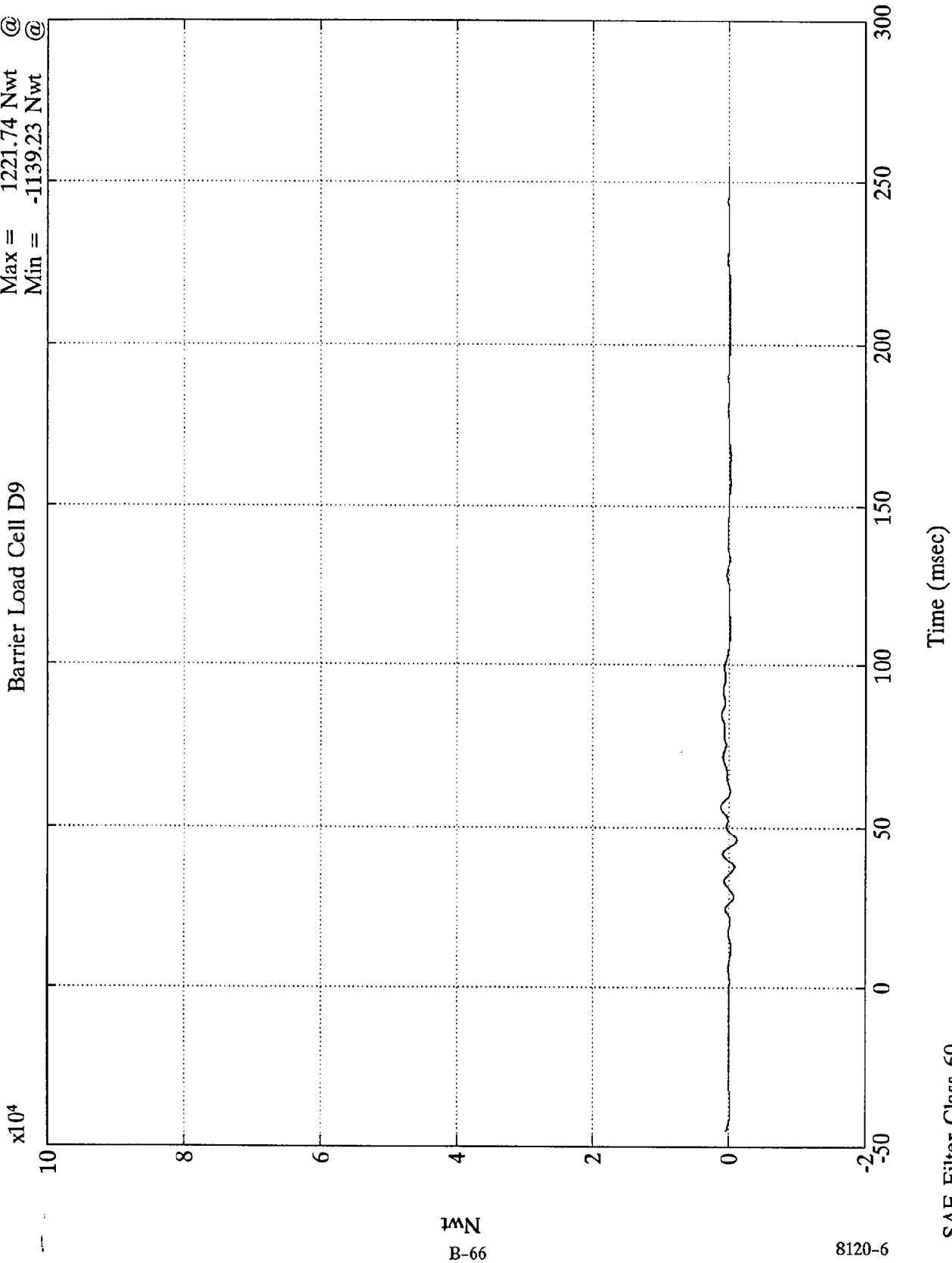
SAE Filter Class 60

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Barrier Load Cell D9

Max = 1221.74 Nwt @ 56.40 msec
Min = -1139.23 Nwt @ 46.20 msec



B-66

8120-6

SAE Filter Class 60

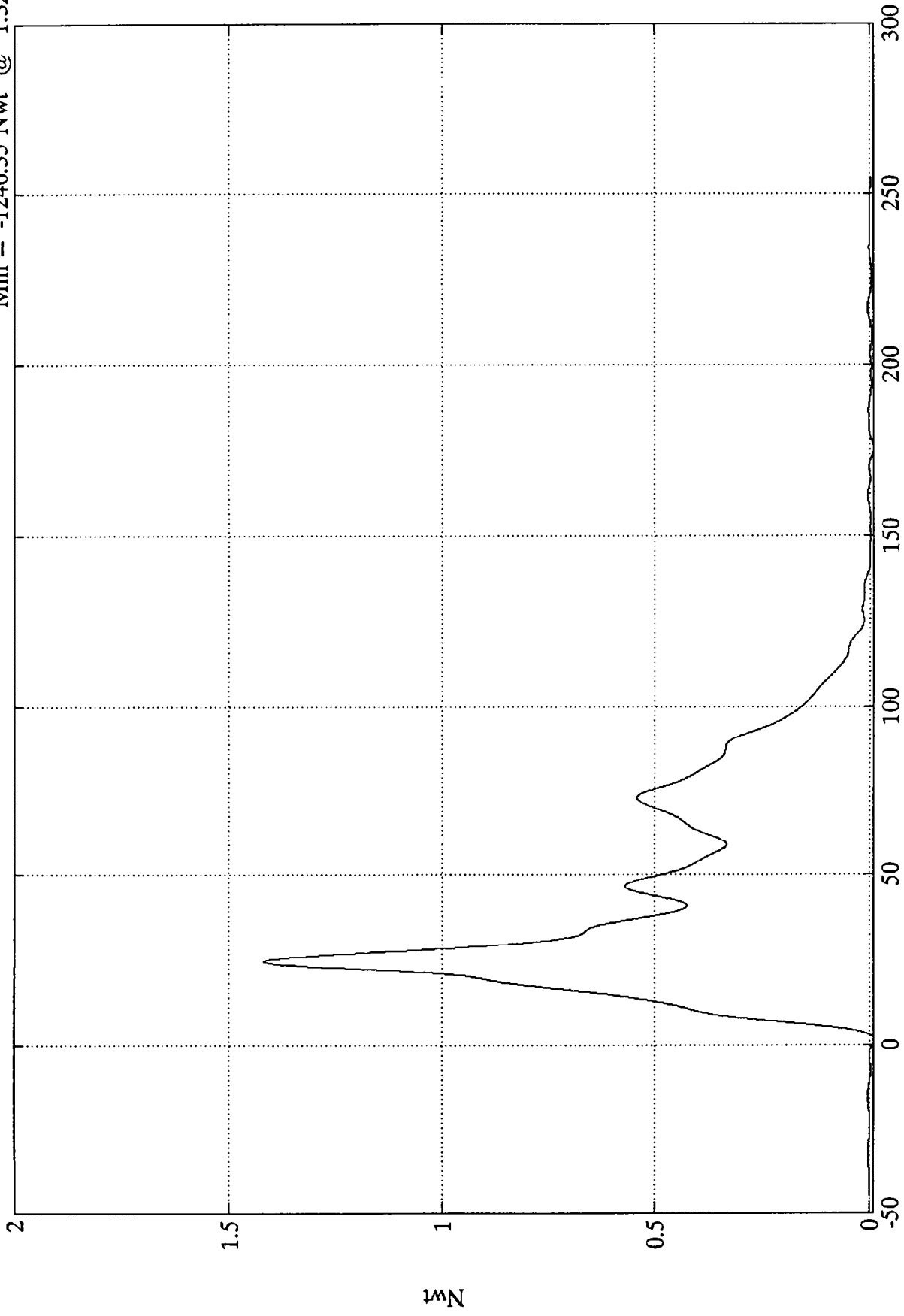


TEST #6 - 1994 ASC/MITSUBISHI 3000

Group 1 Load Cell Sum

Max = 141698.00 Nwt @ 24.48 msec
Min = -1240.35 Nwt @ 1.32 msec

$\times 10^5$



Time (msec)

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

SAE Filter Class 1000

14N
B-67

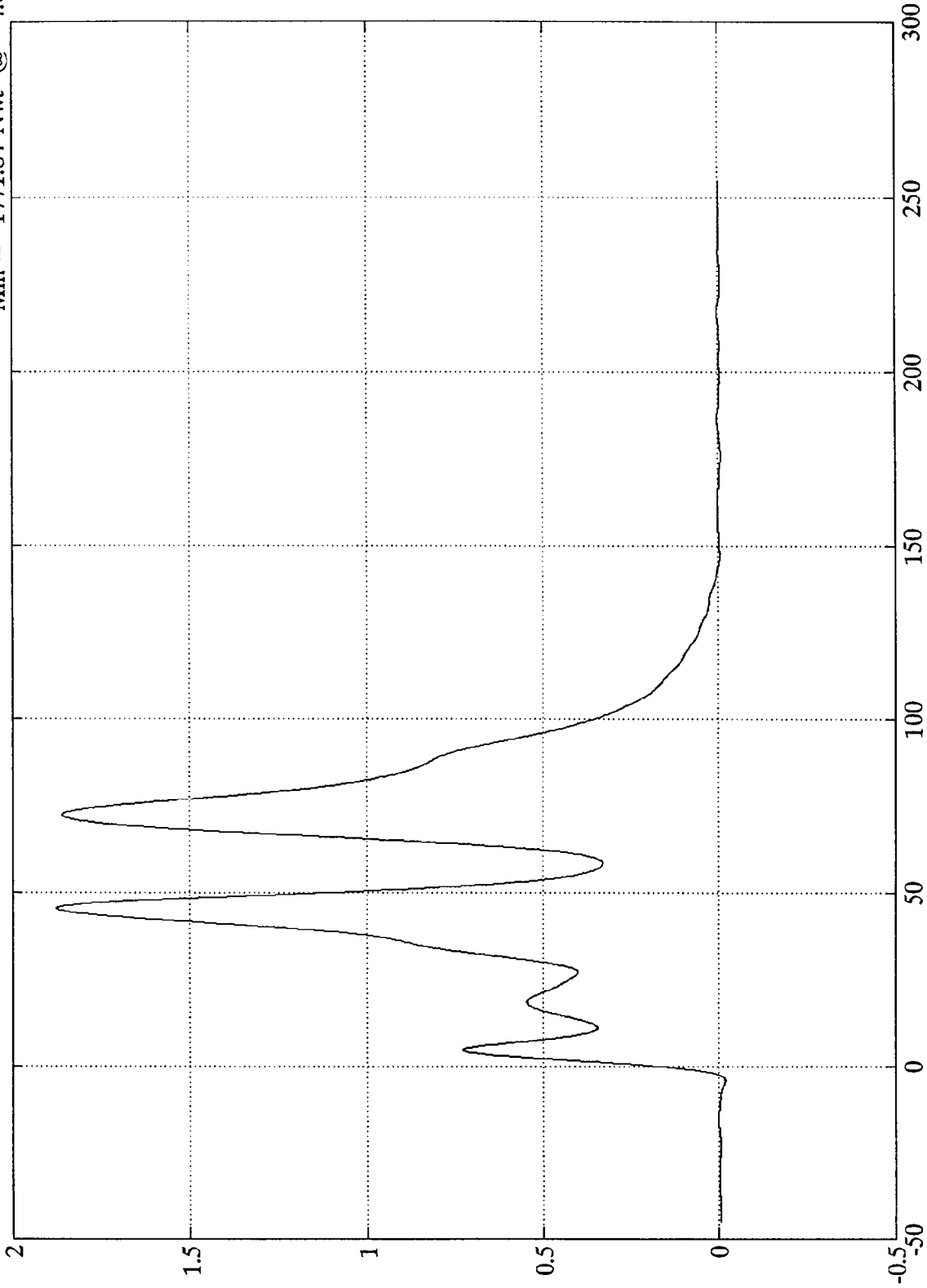
8120-6

TEST #6 - 1994 ASC/MITSUBISHI 3000

$\times 10^5$

Group 2 Load Cell Sum

Max = 187668.00 Nwt @ 45.24 msec
Min = -1771.84 Nwt @ -4.08 msec



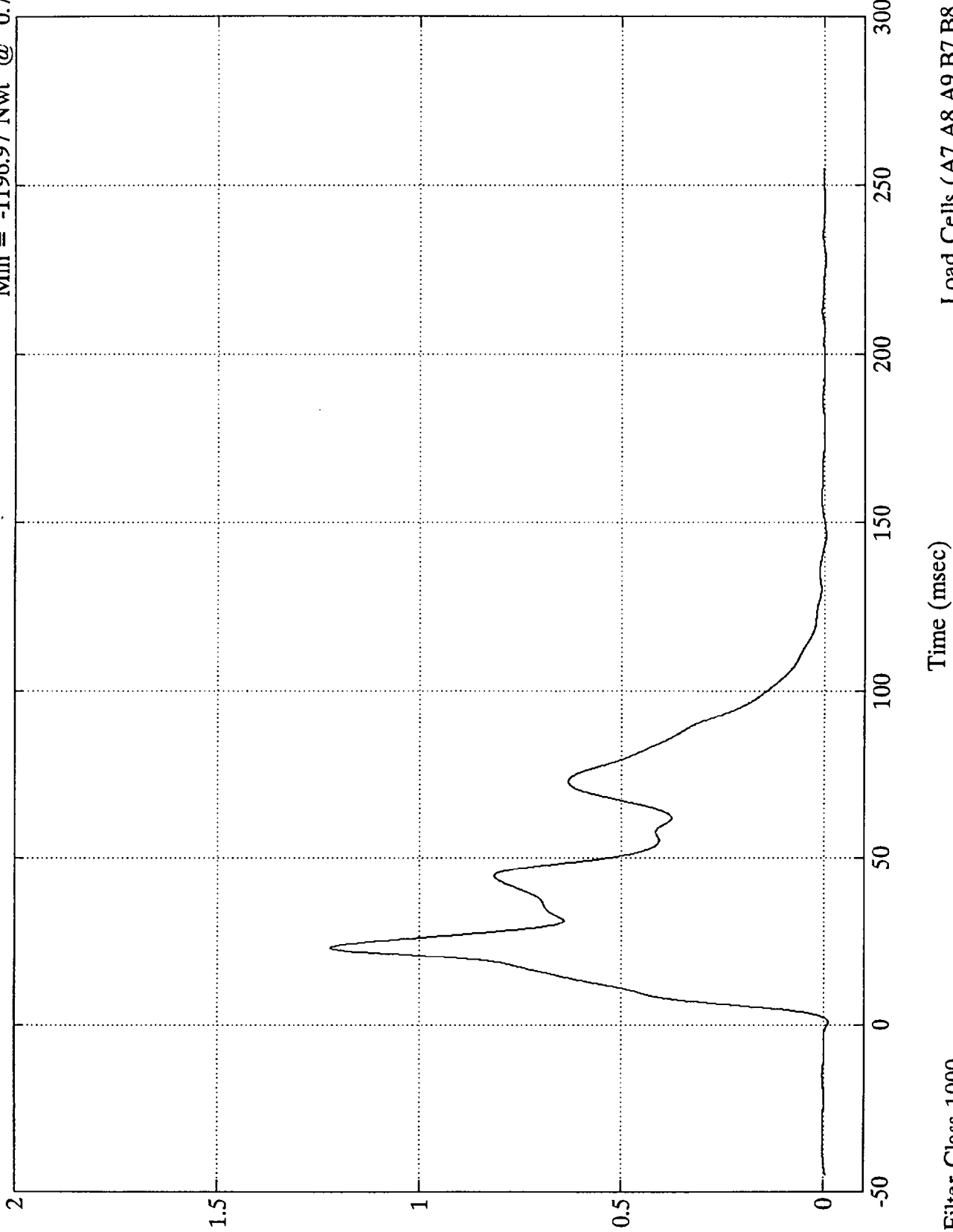
1MN
B-68

8120-6

SAE Filter Class 1000
Load Cells (A4,A5,A6,B4,B5,B6)

Max = 122146.00 Nwt @ 23.04 msec
Min = -1196.97 Nwt @ 0.72 msec

Group 3 Load Cell Sum



Time (msec)

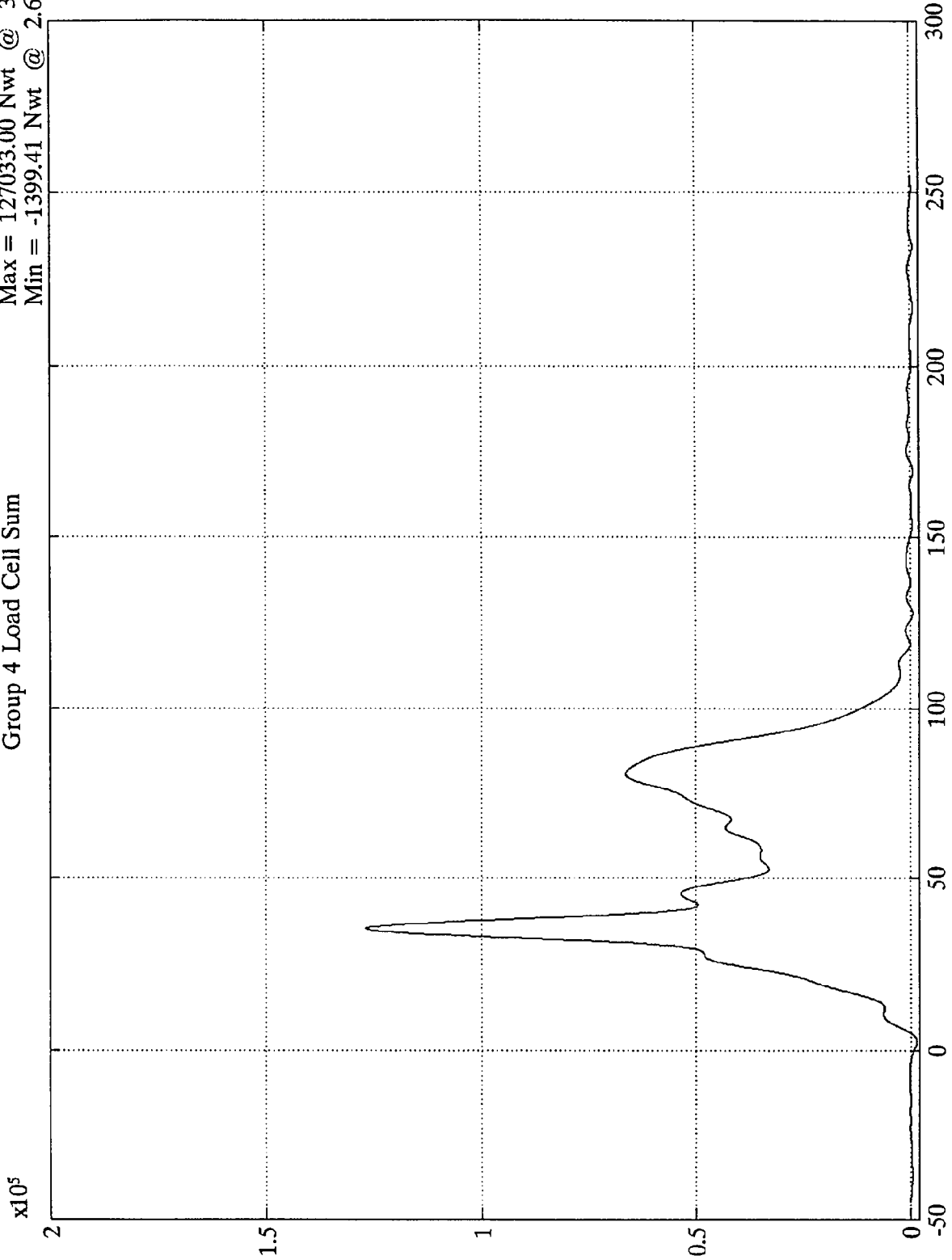
Load Cells (A7,A8,A9,B7,B8,B9)

SAE Filter Class 1000

TEST #6 - 1994 ASC/MITSUBISHI 3000

Group 4 Load Cell Sum

Max = 127033.00 Nwt @ 35.28 msec
Min = -1399.41 Nwt @ 2.64 msec



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

Time (msec)

SAE Filter Class 1000

10N
B-70

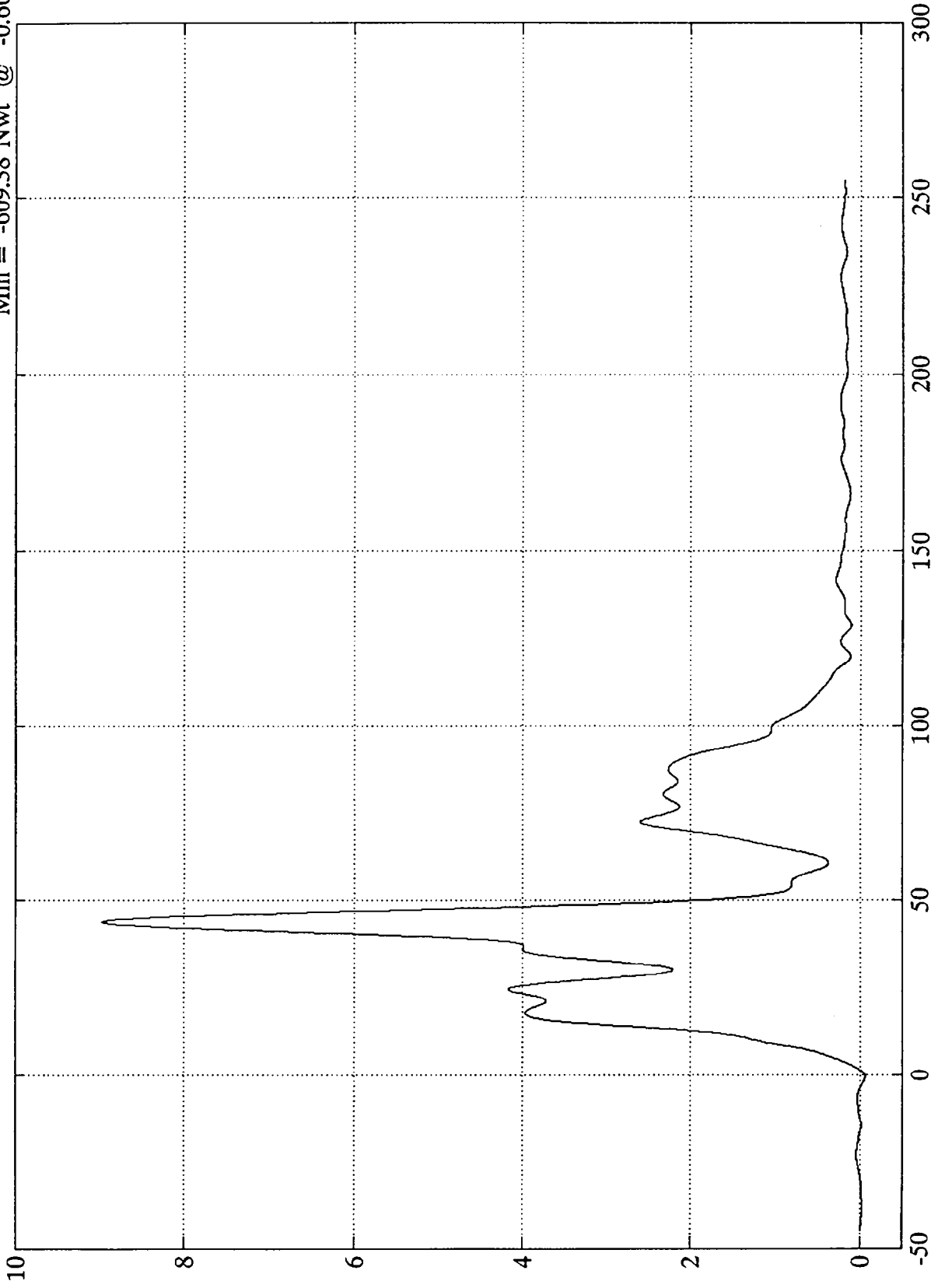
8120-6

TEST #6 - 1994 ASC/MITSUBISHI 3000

Max = 89778.10 Nwt @ 43.80 msec
Min = -609.38 Nwt @ -0.60 msec

Group 5 Load Cell Sum

$\times 10^4$



Time (msec)

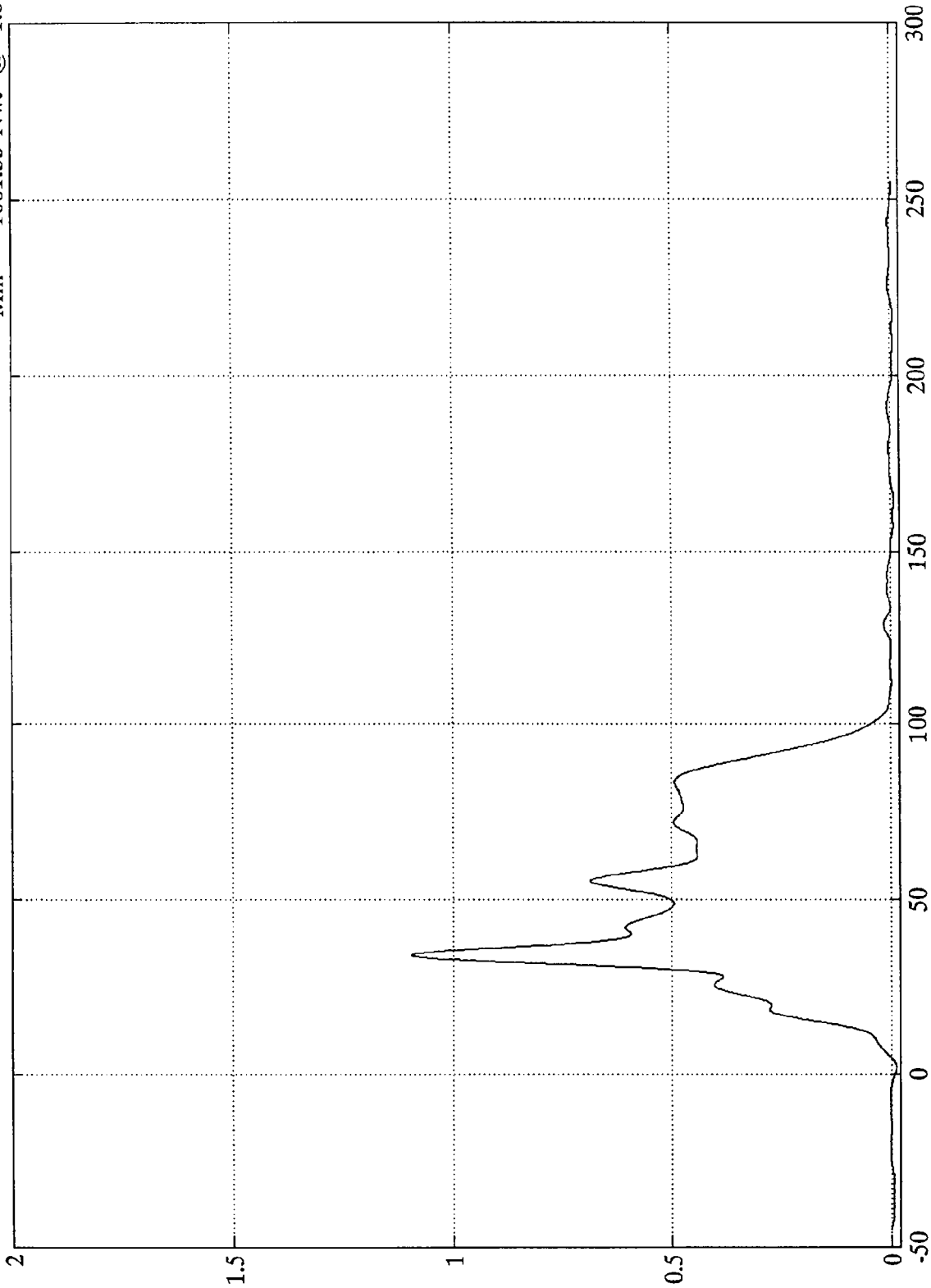
SAE Filter Class 1000

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

TEST #6 - 1994 ASC/MITSUBISHI 3000
x10⁵

Group 6 Load Cell Sum

Max = 109427.00 Nwt @ 33.96 msec
Min = -1001.35 Nwt @ 1.80 msec



Time (msec)

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

10N
B-72

8120-6

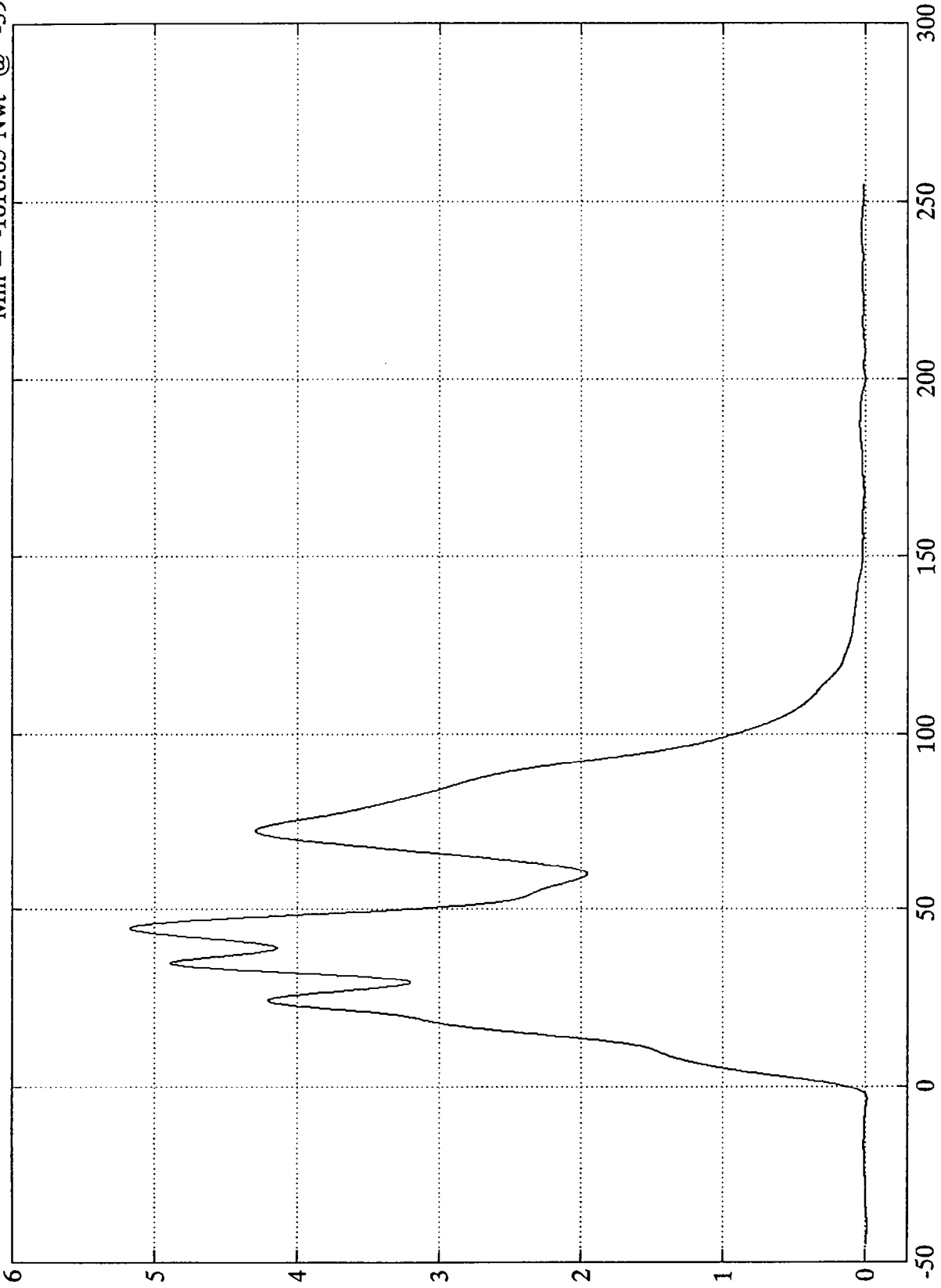
SAE Filter Class 1000

TEST #6 - 1994 ASC/MITSUBISHI 3000

Max = 517233.00 Nwt @ 44.64 msec
Min = -1616.65 Nwt @ -39.84 msec

Total Load Cell Sum

$\times 10^5$



1MN
B-73

8120-6

Time (msec)

SAE Filter Class 1000

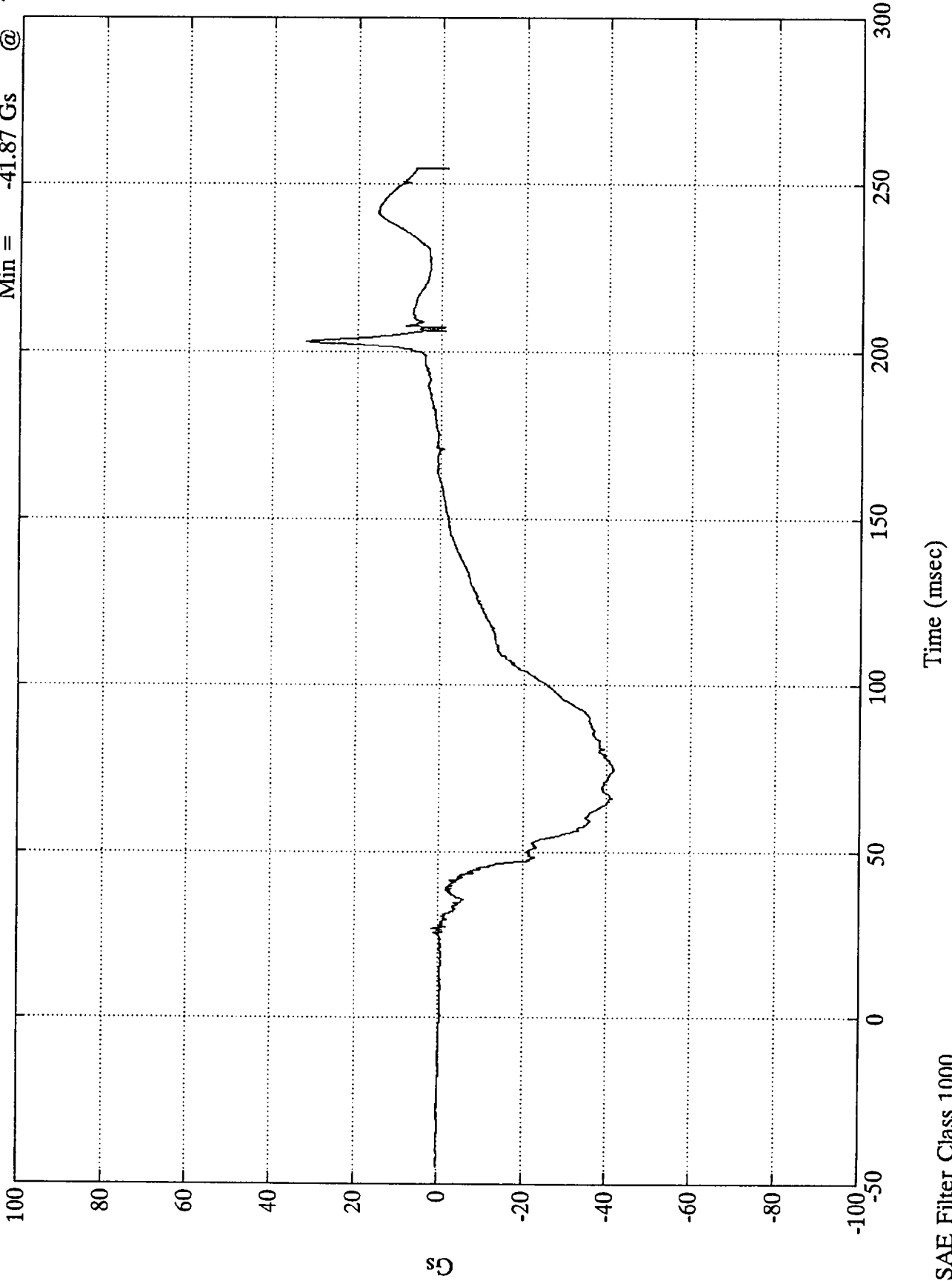
TEST NO. MR0106

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 #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Head X
Max = 32.19 Gs @ 203.04 msec
Min = -41.87 Gs @ 75.00 msec



B-75

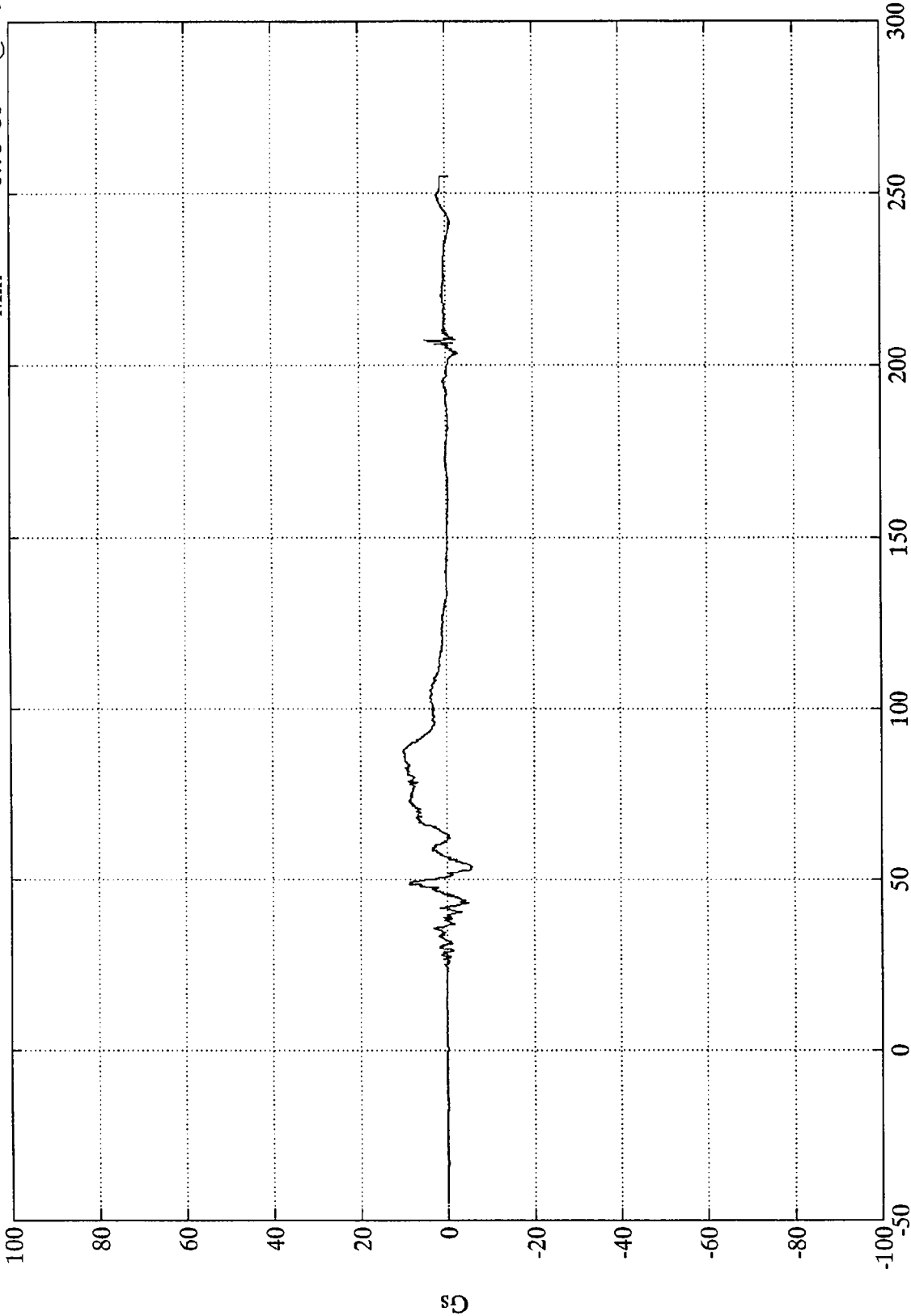
8120-6

SAE Filter Class 1000

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Head Y

Max = 10.13 Gs @ 87.24 msec
Min = -5.78 Gs @ 53.63 msec



Time (msec)

SAE Filter Class 1000

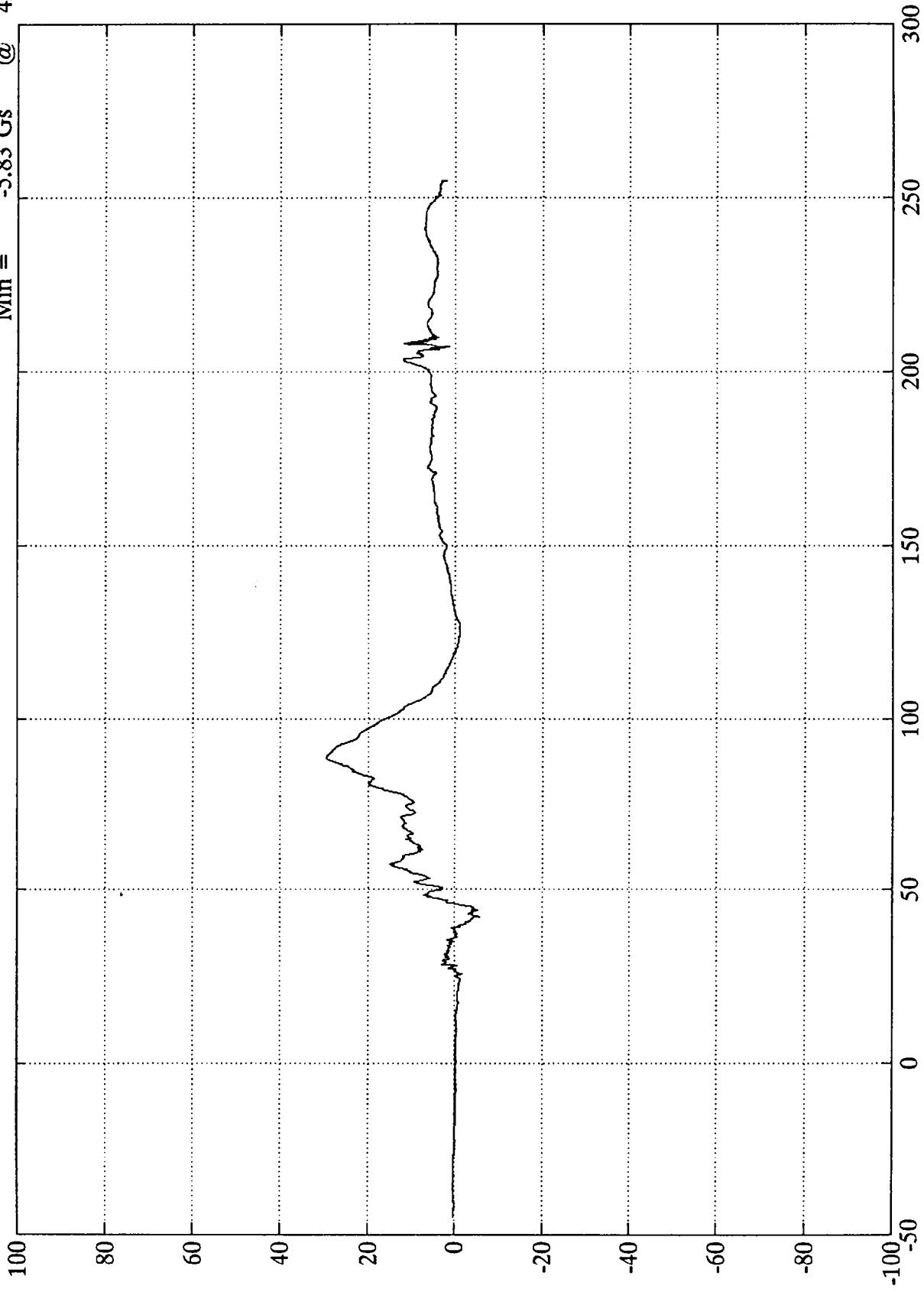
B-76

8120-6

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 29.49 Gs @ 88.80 msec
Min = -5.83 Gs @ 42.24 msec

Pos. 1 Head Z



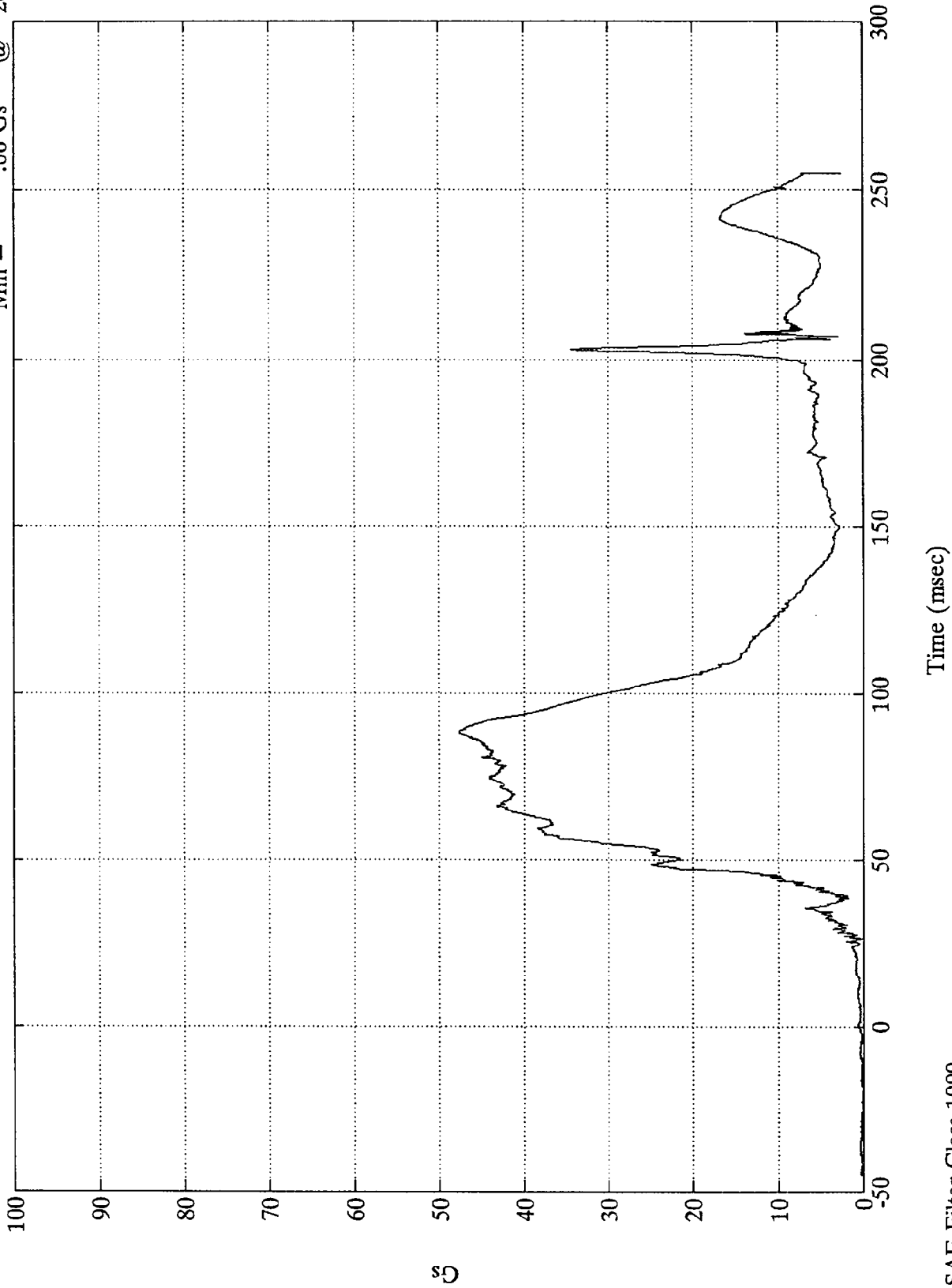
Time (msec)

SAE Filter Class 1000

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Head Resultant

Max = 47.72 Gs @ 88.44 msec
Min = .06 Gs @ 26.39 msec



B-78

8120-6

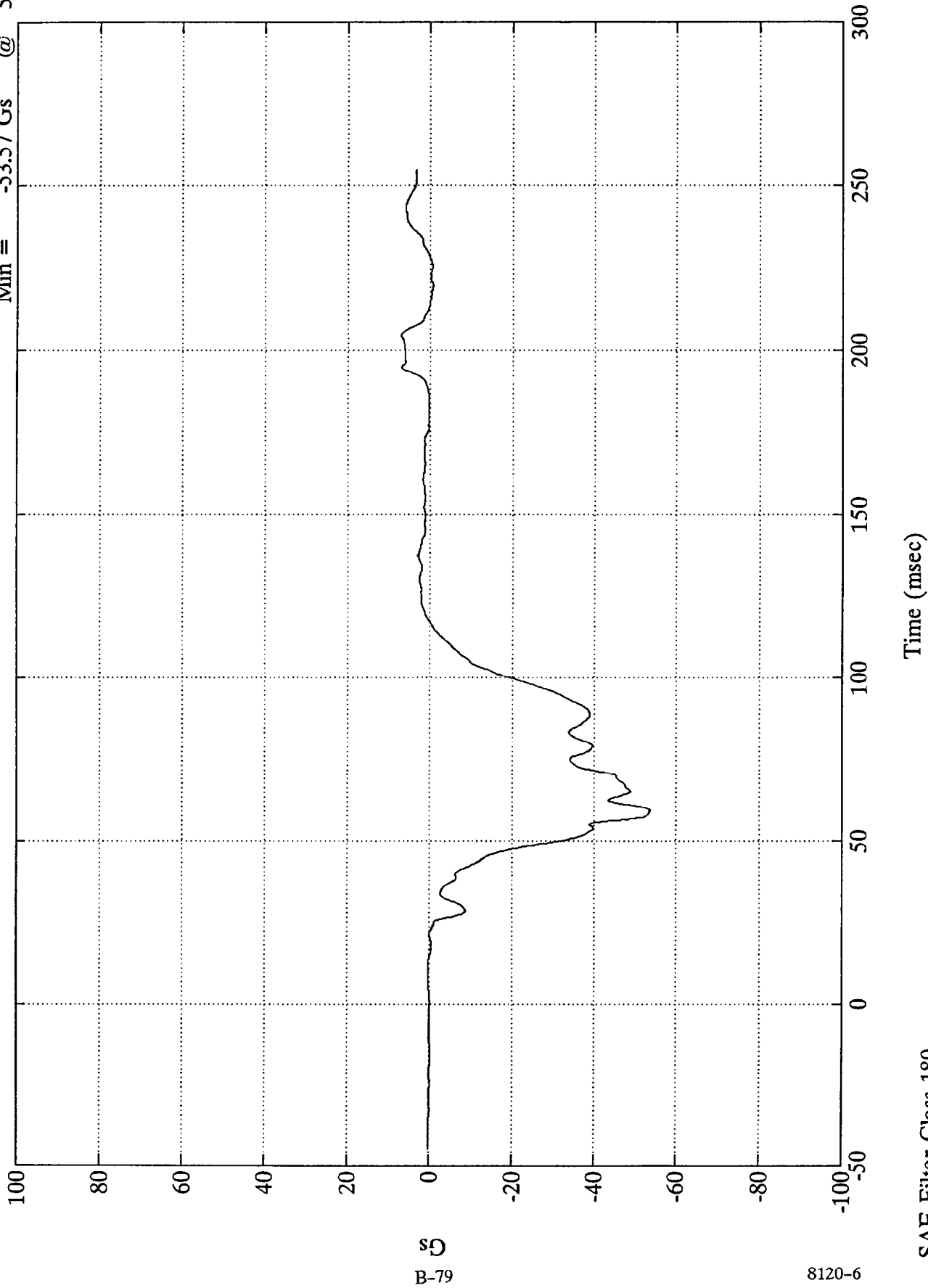
SAE Filter Class 1000

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 7.13 Gs @ 204.48 msec
Min = -53.57 Gs @ 59.27 msec

Pos. 1 Chest X



B-79

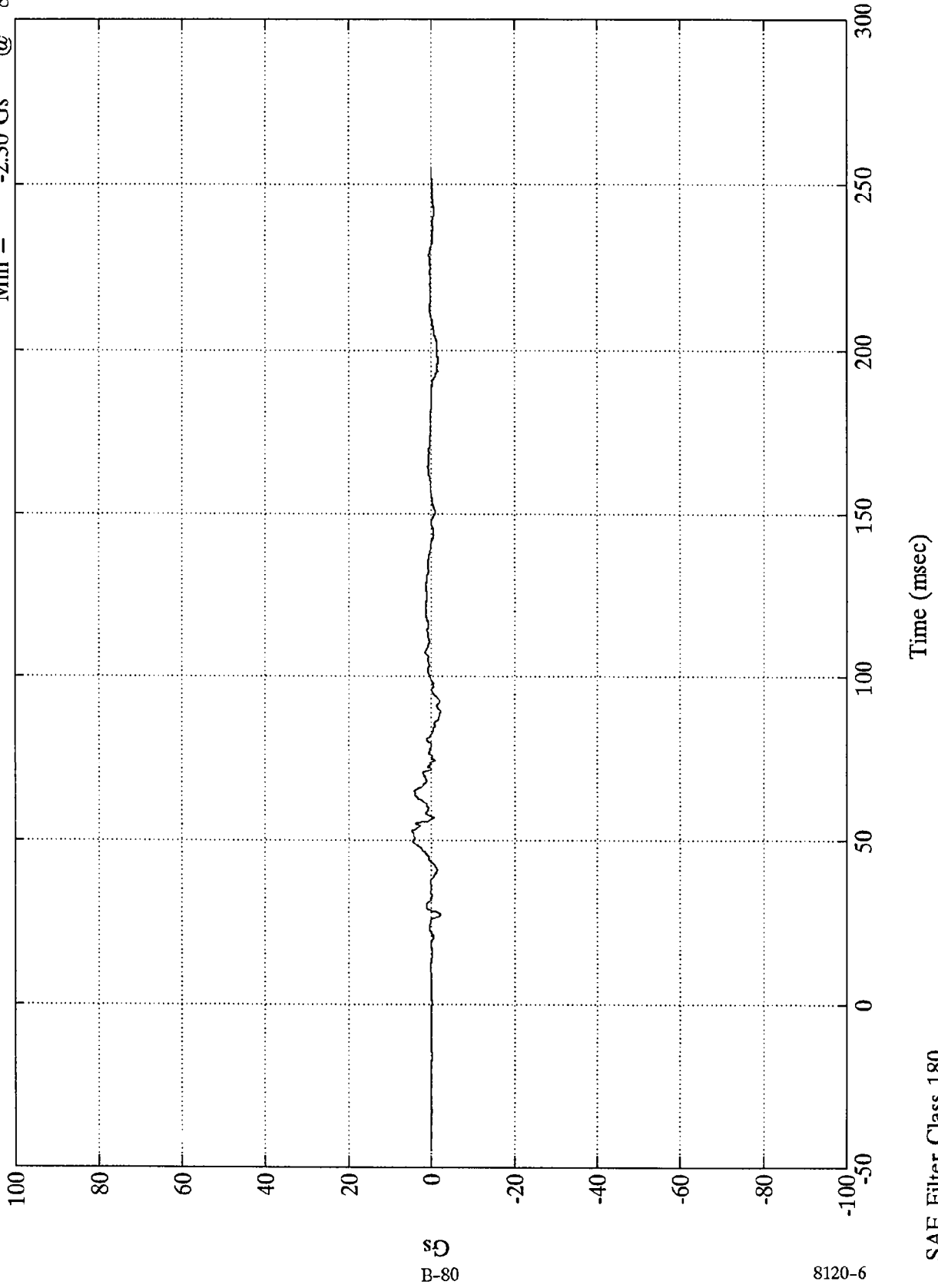
8120-6

SAE Filter Class 180

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Chest Y

Max = 4.76 Gs @ 52.79 msec
Min = -2.30 Gs @ 89.27 msec

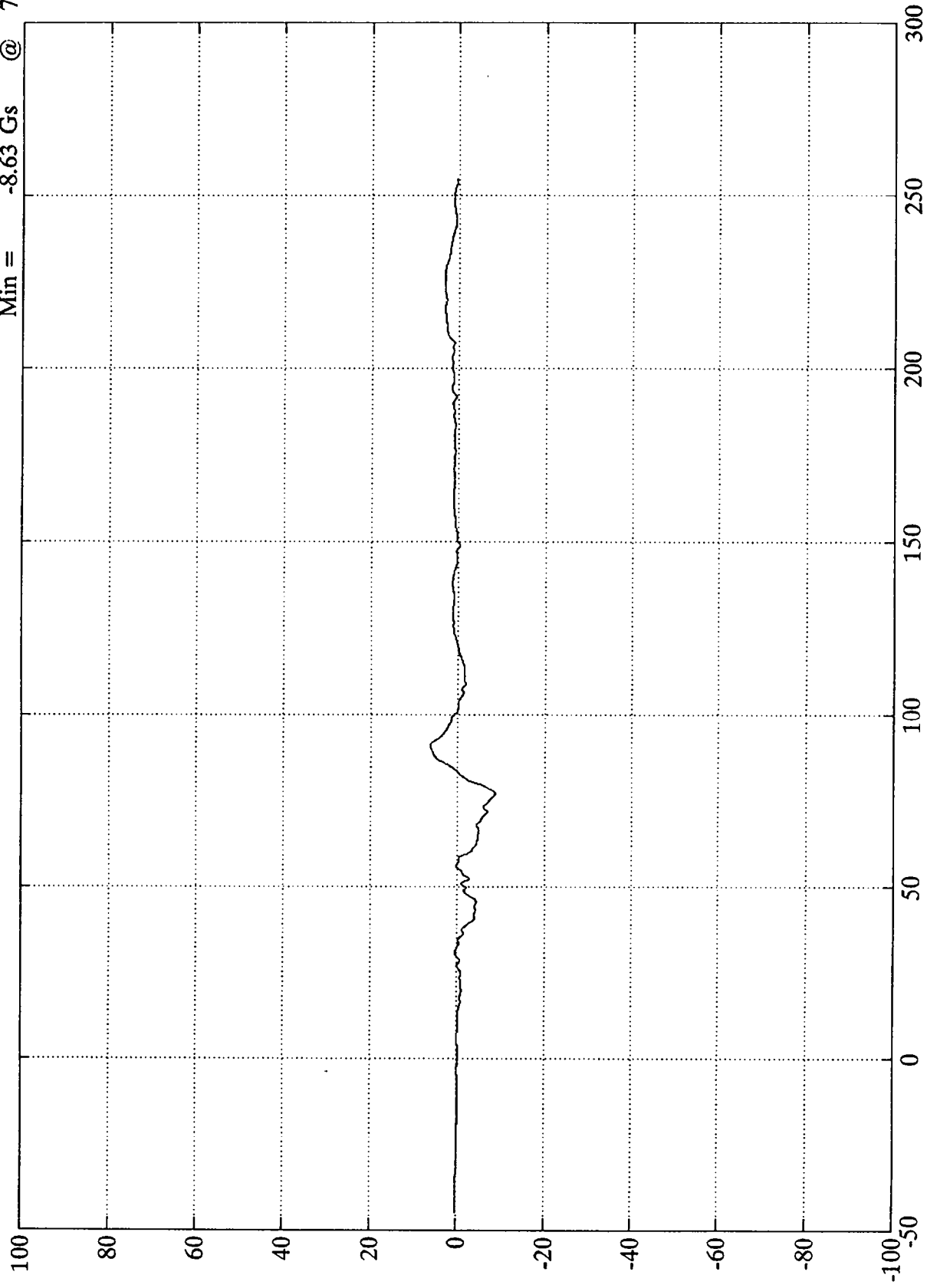


B-80

8120-6

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Chest Z
Max = 6.37 Gs @ 90.72 msec
Min = -8.63 Gs @ 76.92 msec



Time (msec)

SD
B-81

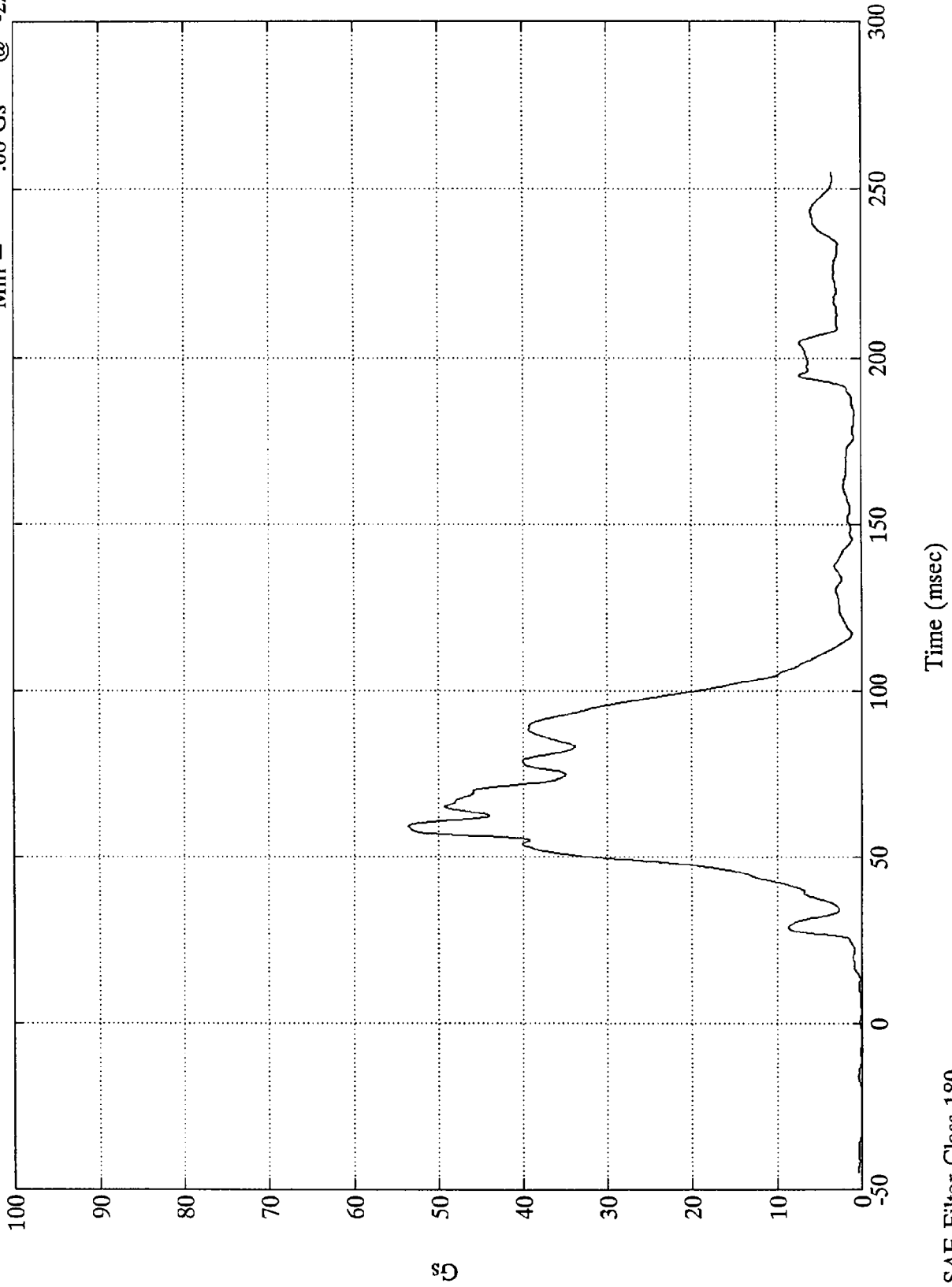
8120-6

SAE Filter Class 180

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Chest Resultant

Max = 53.60 Gs @ 59.27 msec
Min = .06 Gs @ -22.80 msec



8D
B-82

8120-6

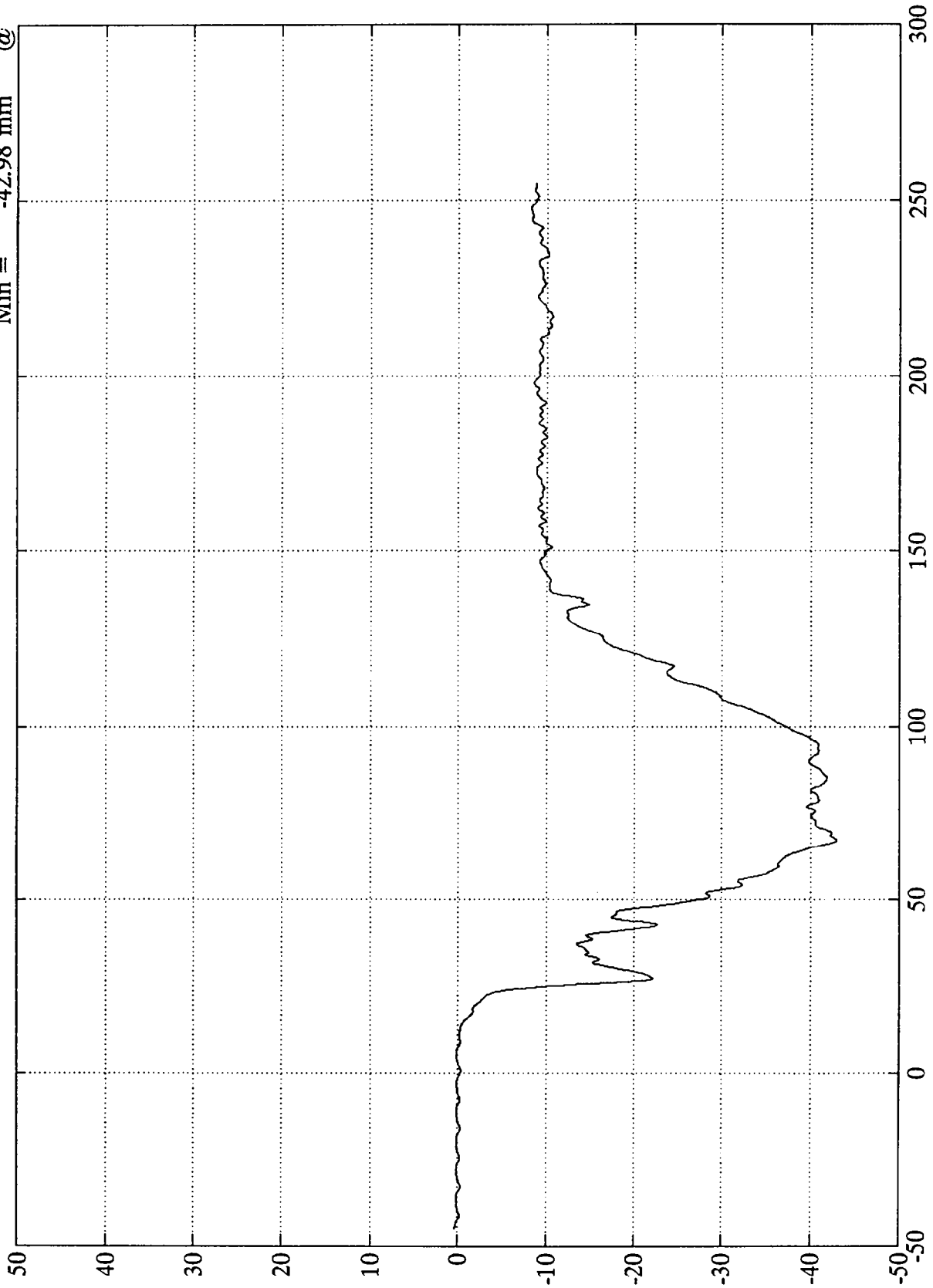
SAE Filter Class 180

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = .30 mm @
Min = -42.98 mm @

Pos. 1 Chest Disp.



Time (msec)

mm
B-83

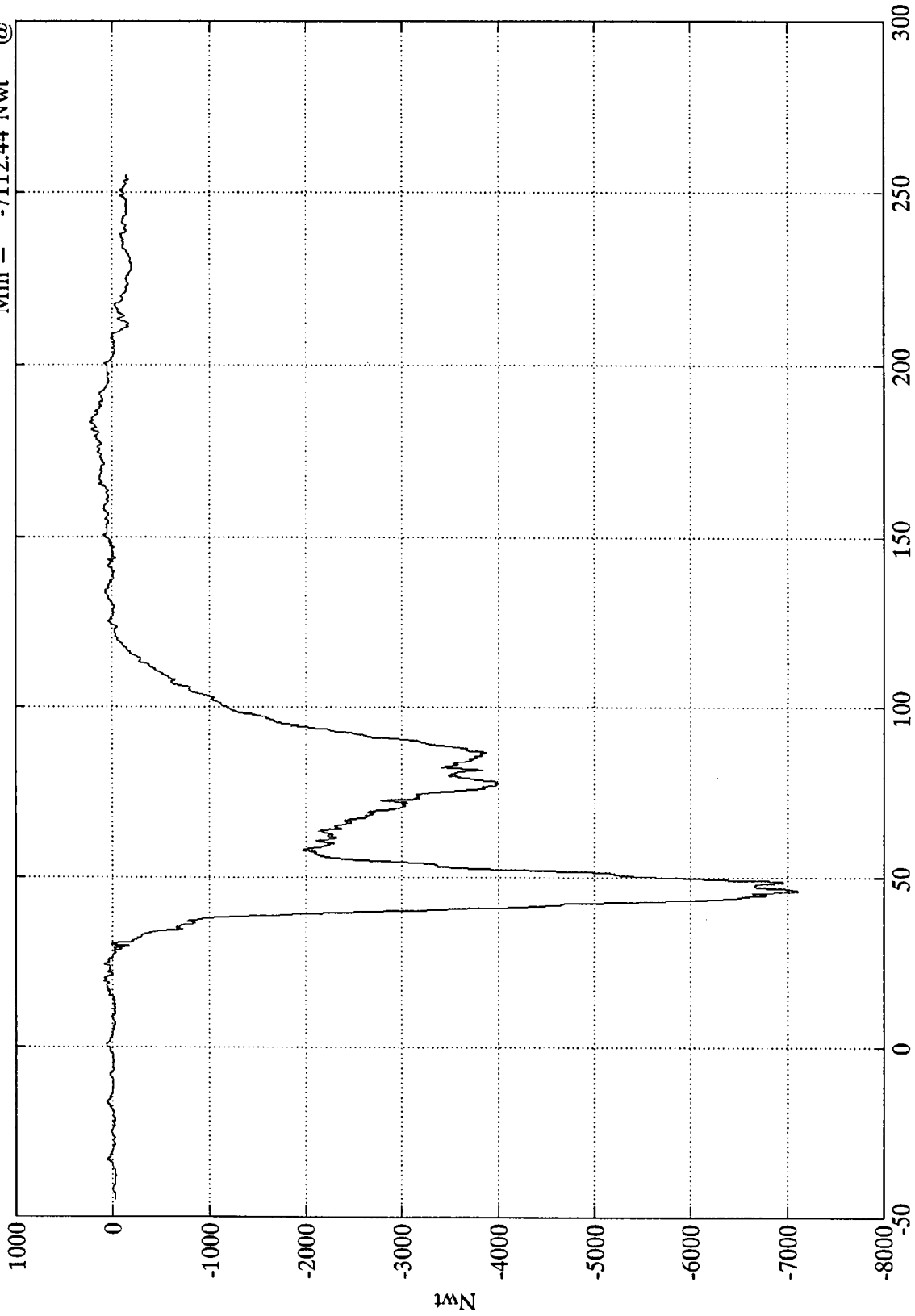
8120-6

SAE Filter Class 180

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Left Femur

Max = 234.16 Nwt @ 183.60 msec
Min = -7112.44 Nwt @ 46.20 msec



B-84

8120-6

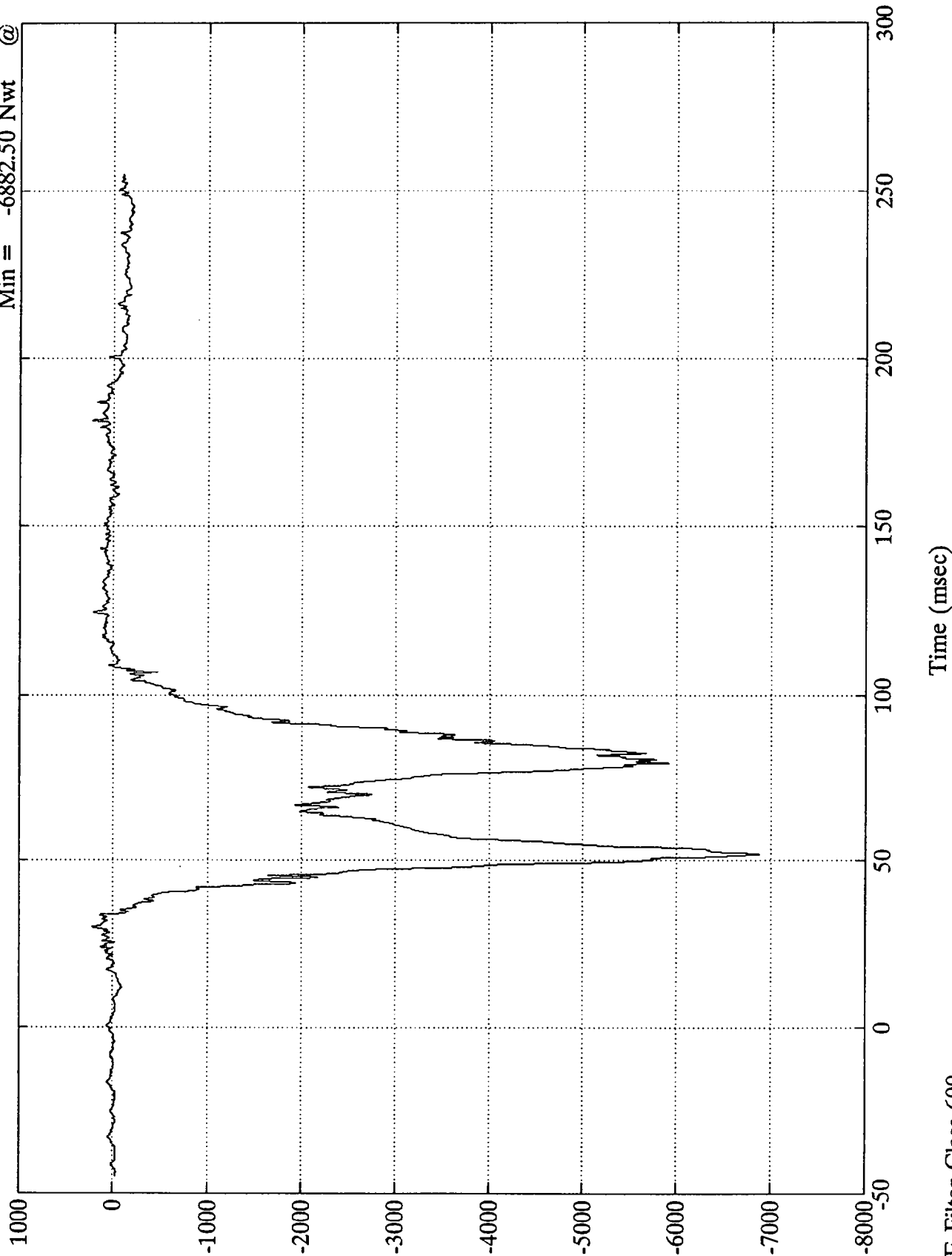
Time (msec)

SAE Filter Class 600

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Right Femur

Max = 231.60 Nwt @ 181.56 msec
Min = -6882.50 Nwt @ 51.84 msec



Nwt
B-85

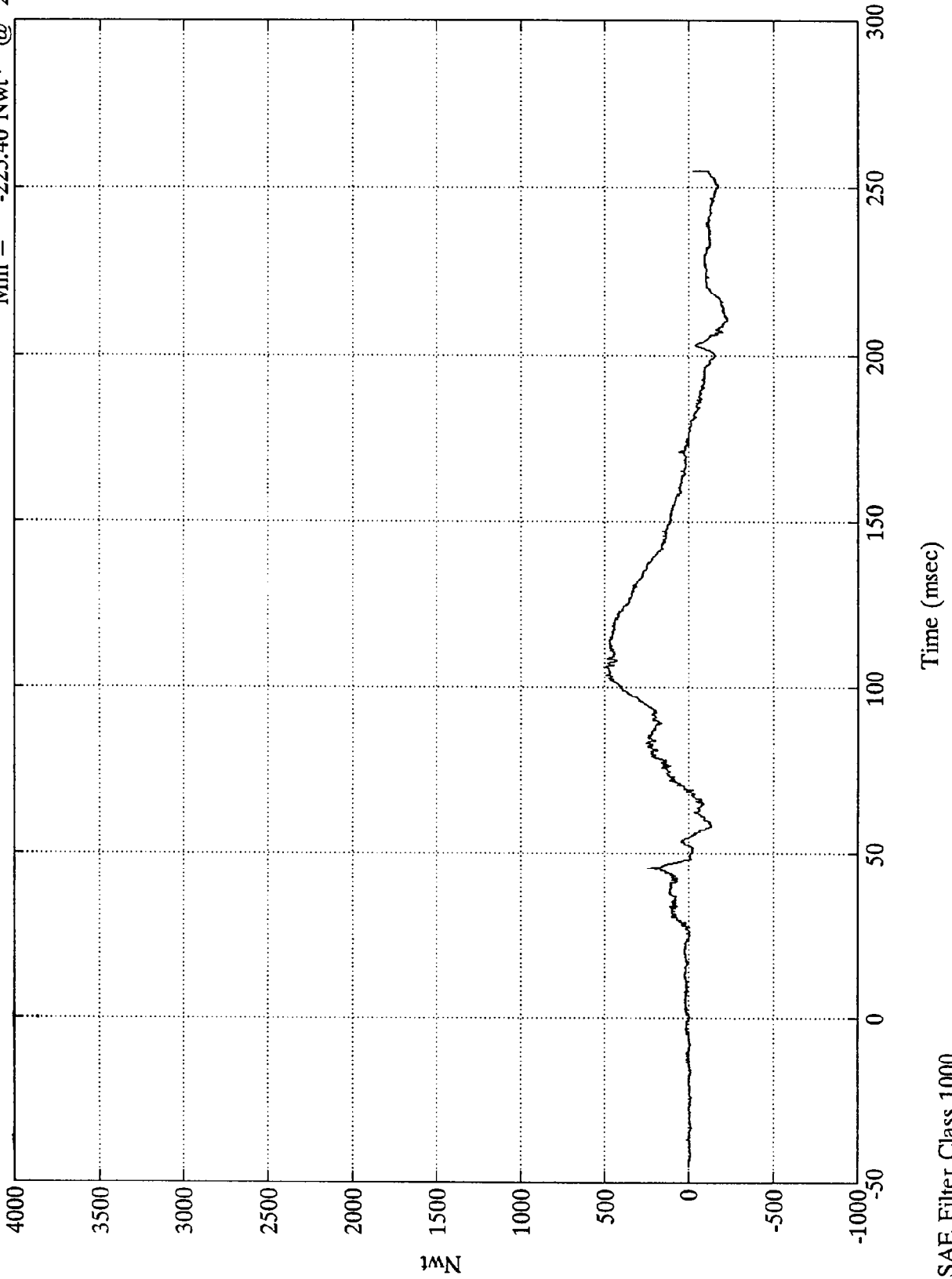
8120-6

SAE Filter Class 600

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Upper Neck Fx

Max = 505.58 Nwt @ 106.20 msec
Min = -225.40 Nwt @ 211.32 msec



B-86

8120-6

SAE Filter Class 1000

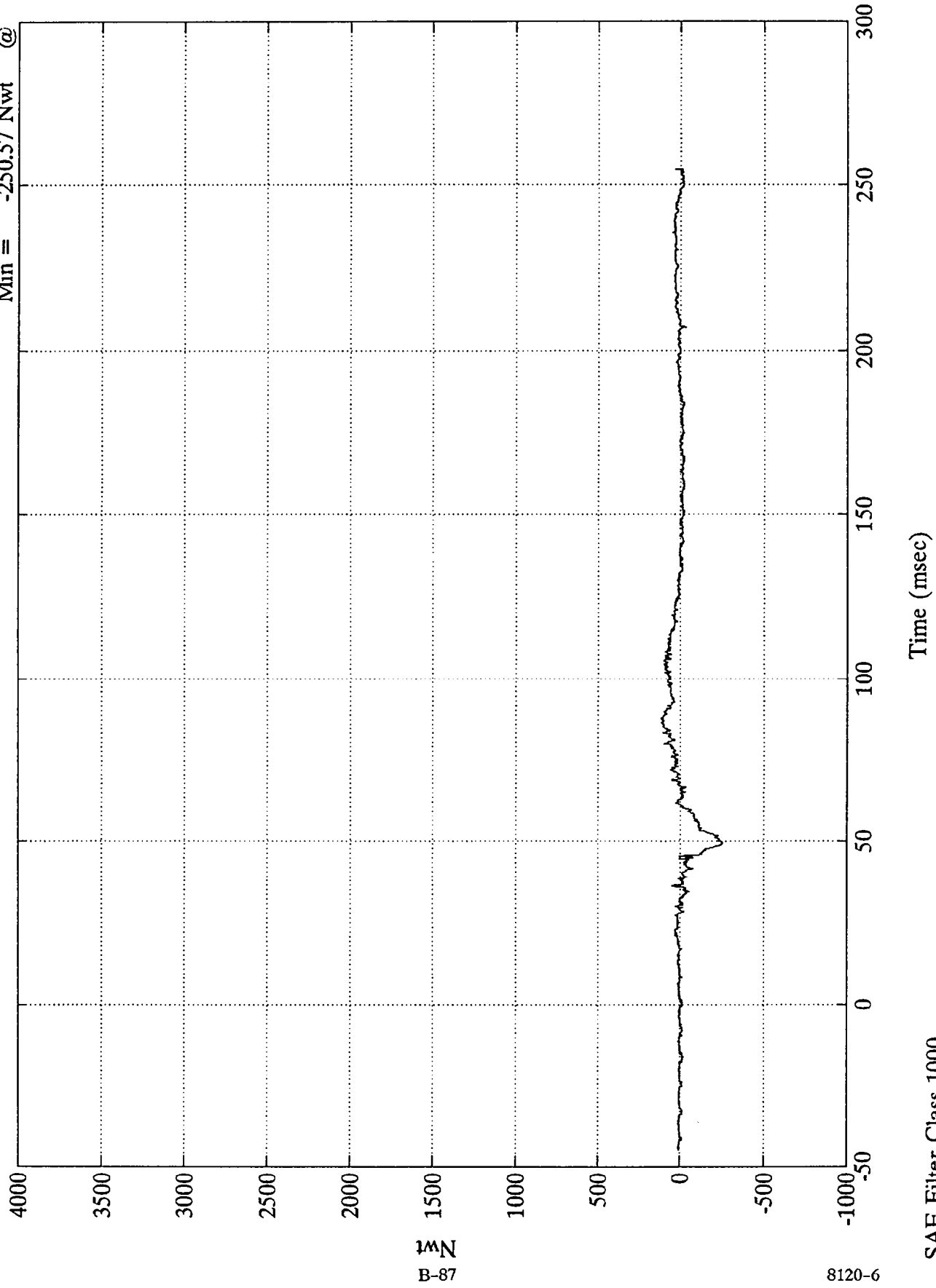
Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Upper Neck Fy

Max = 116.56 Nwt
Min = -250.57 Nwt

@ 88.08 msec
@ 49.68 msec



B-87

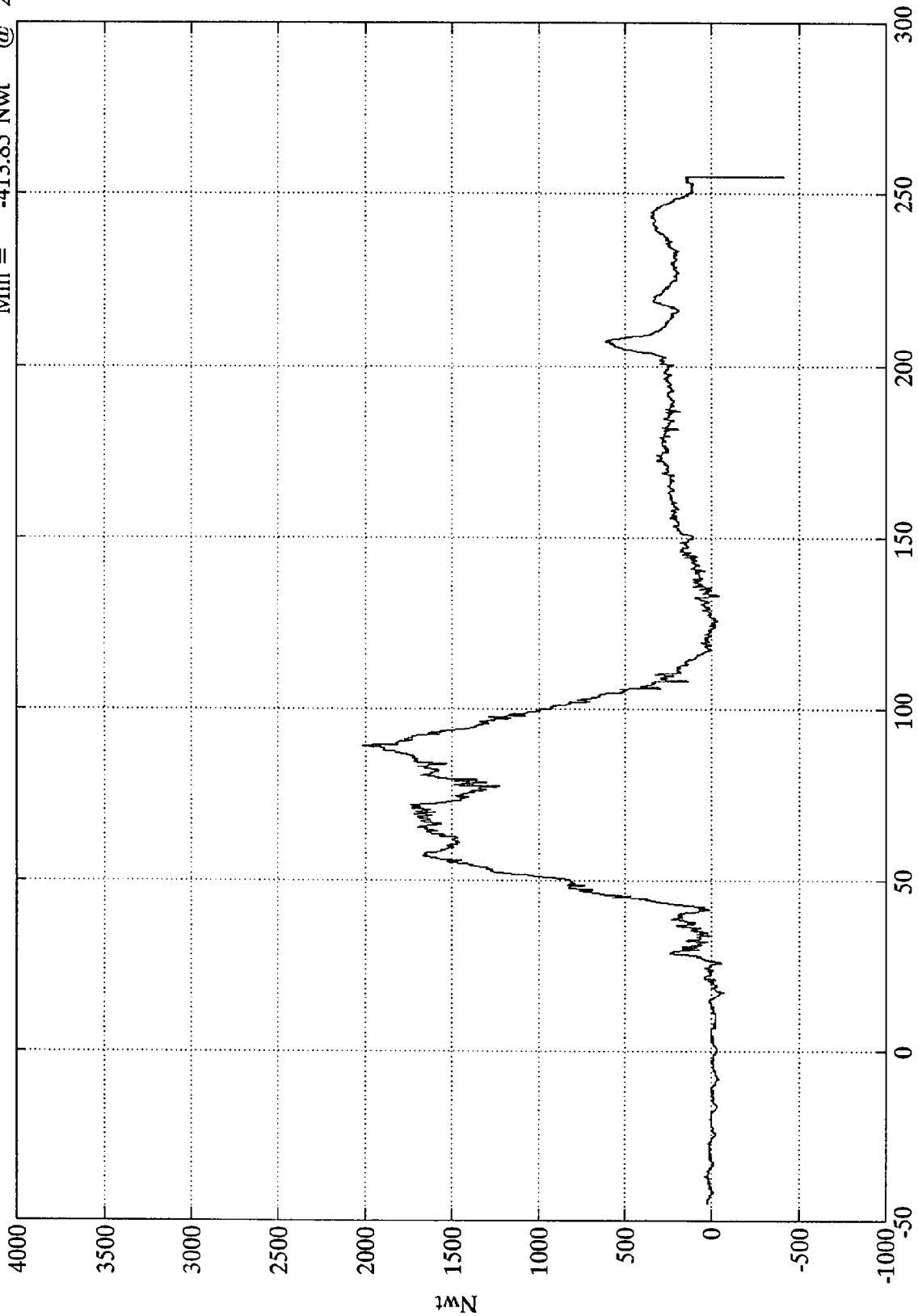
8120-6

SAE Filter Class 1000

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Upper Neck Fz

Max = 2015.21 Nwt @ 89.04 msec
Min = -413.85 Nwt @ 254.88 msec



B-88

8120-6

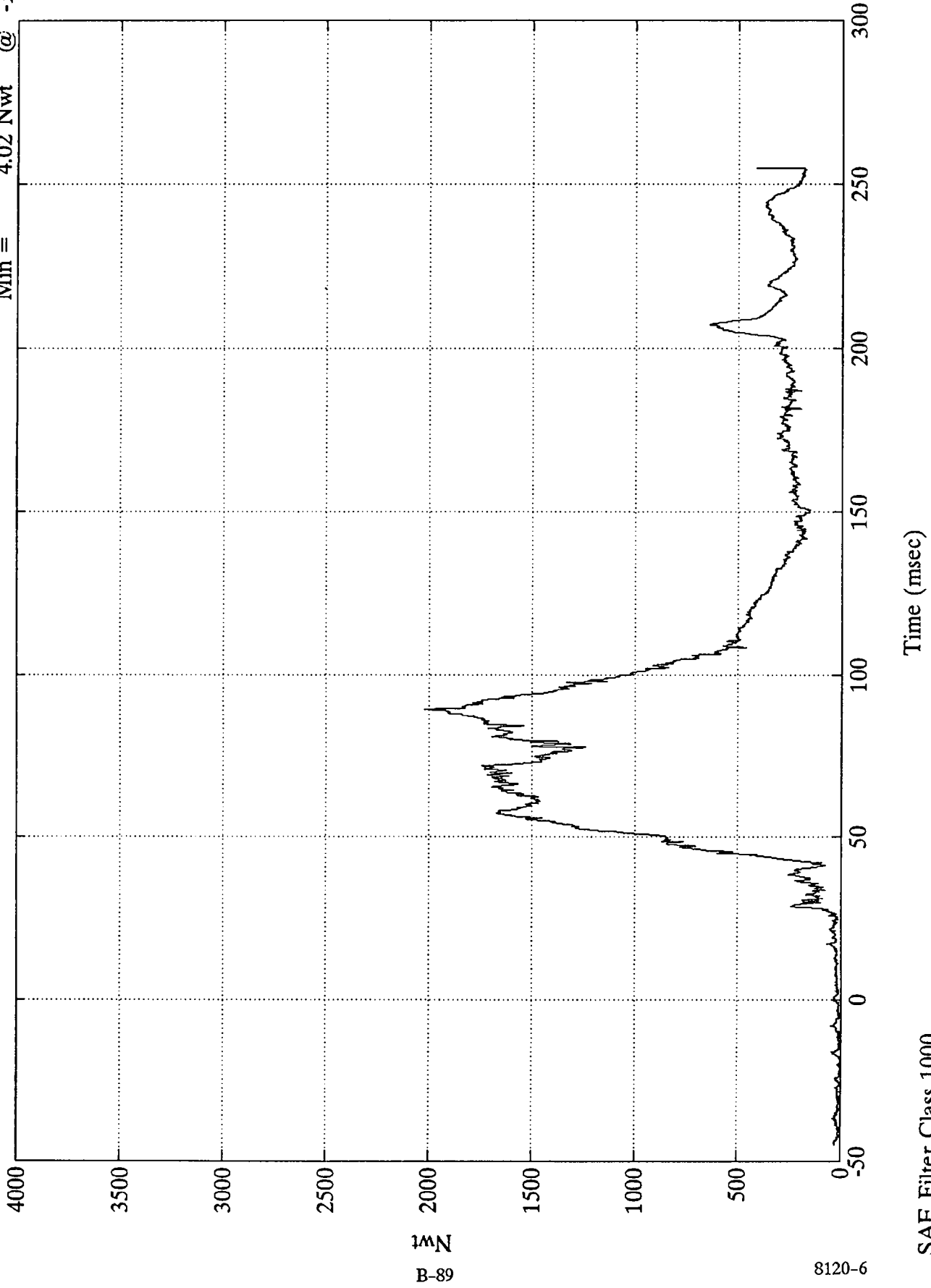
Time (msec)

SAE Filter Class 1000

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Neck Force Res.

Max = 2023.79 Nwt @ 89.04 msec
Min = 4.02 Nwt @ -18.00 msec



B-89

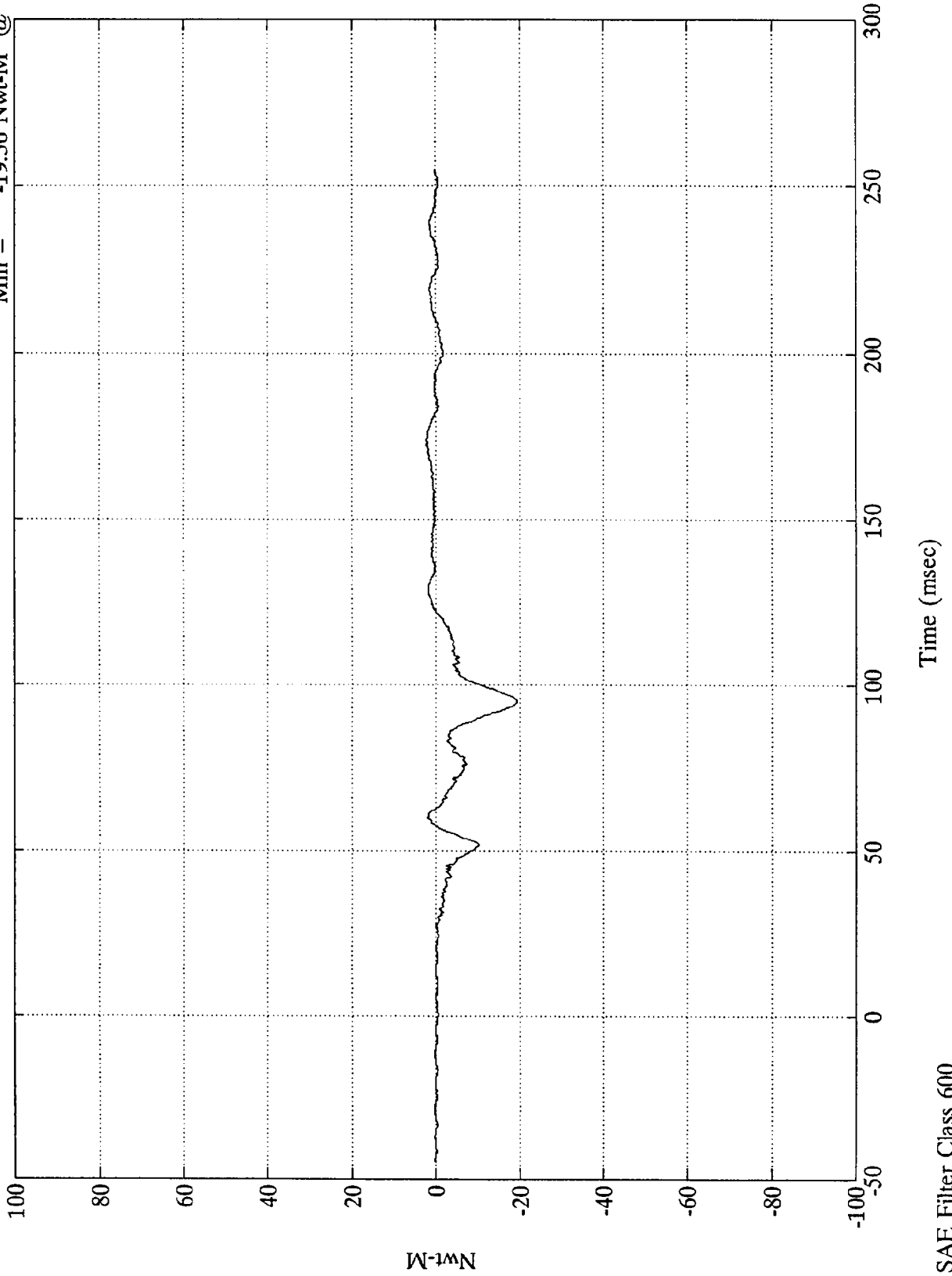
8120-6

SAE Filter Class 1000

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Upper Neck Mx

Max = 2.34 Nwt-M @ 174.12 msec
Min = -19.36 Nwt-M @ 95.04 msec



B-90
Nwt-M

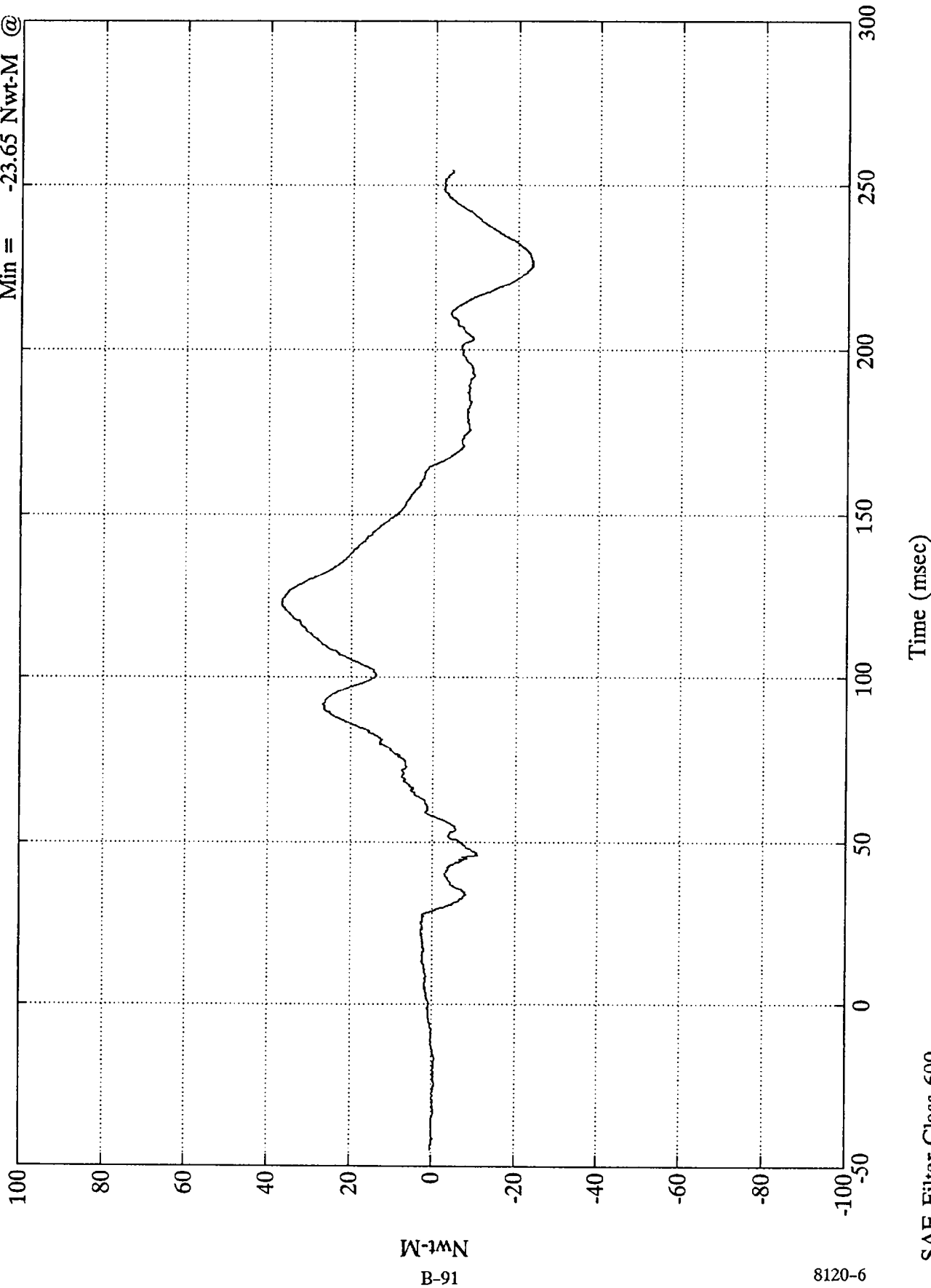
8120-6

SAE Filter Class 600

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Upper Neck My
Max = 36.87 Nwt-M @ 122.51 ms
Min = -23.65 Nwt-M @ 225.72 ms



B-91
W-1MN

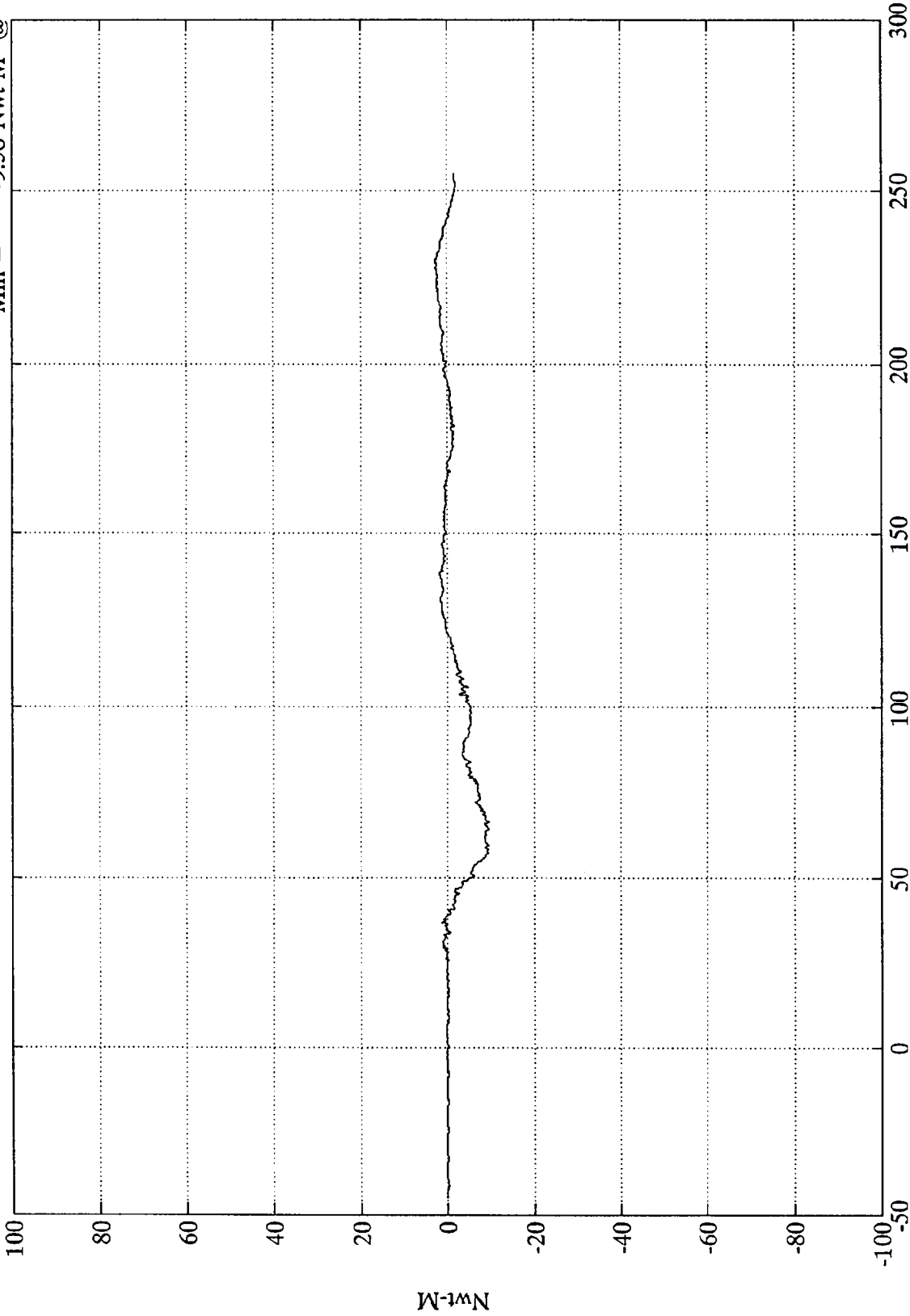
8120-6

SAE Filter Class 600

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Upper Neck Mz

Max = 2.71 Nwt-M @ 227.75 msec
Min = -9.58 Nwt-M @ 66.23 msec



B-92
Mz-M

Time (msec)

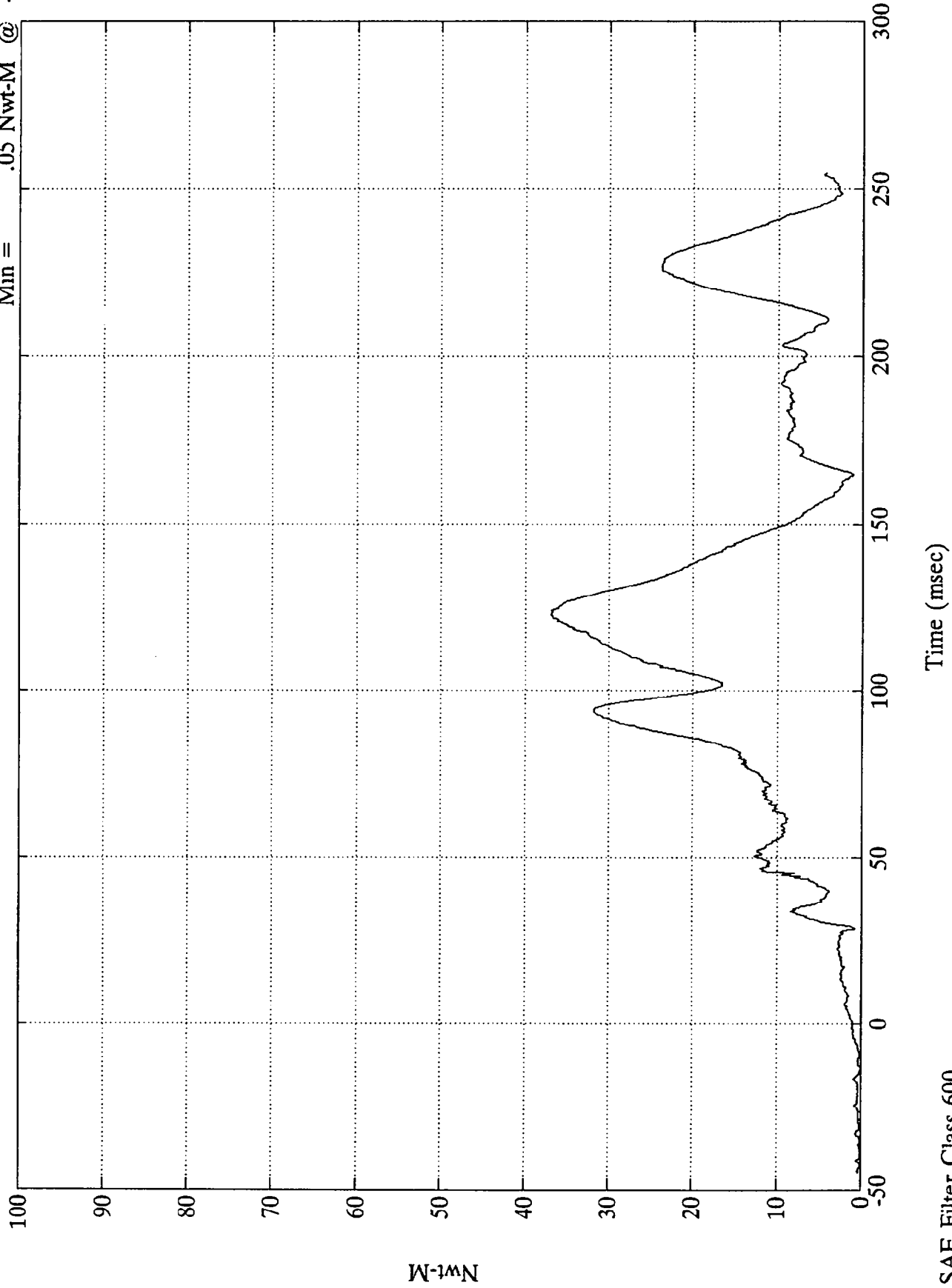
SAE Filter Class 600

8120-6

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Neck Moment Res.

Max = 36.88 Nwt-M @ 122.51 ms
Min = .05 Nwt-M @ -38.76 mse



Nwt-M
B-93

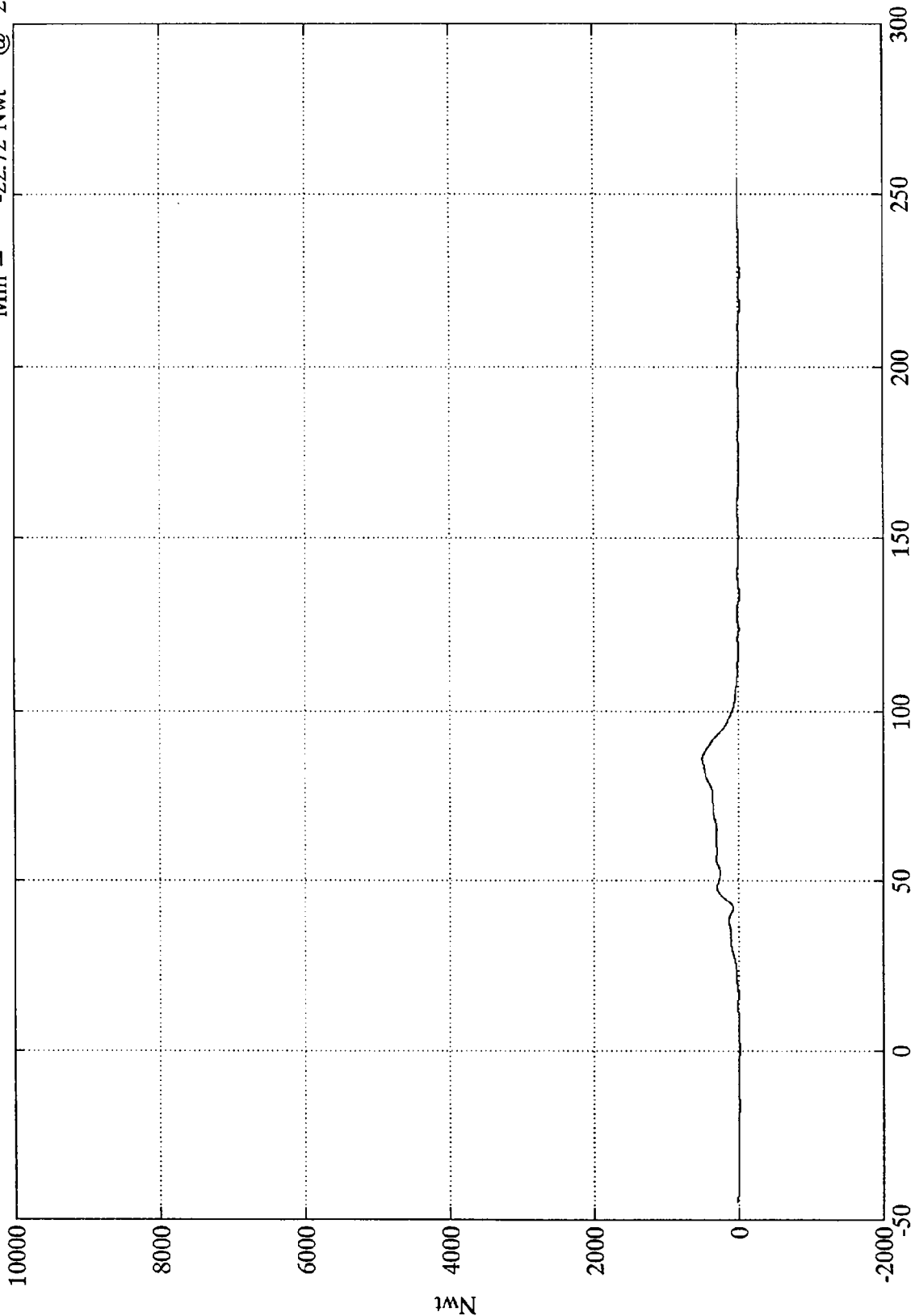
8120-6

SAE Filter Class 600

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Left Belt Load

Max = 505.86 Nwt @ 85.91 msec
Min = -22.72 Nwt @ 217.91 msec



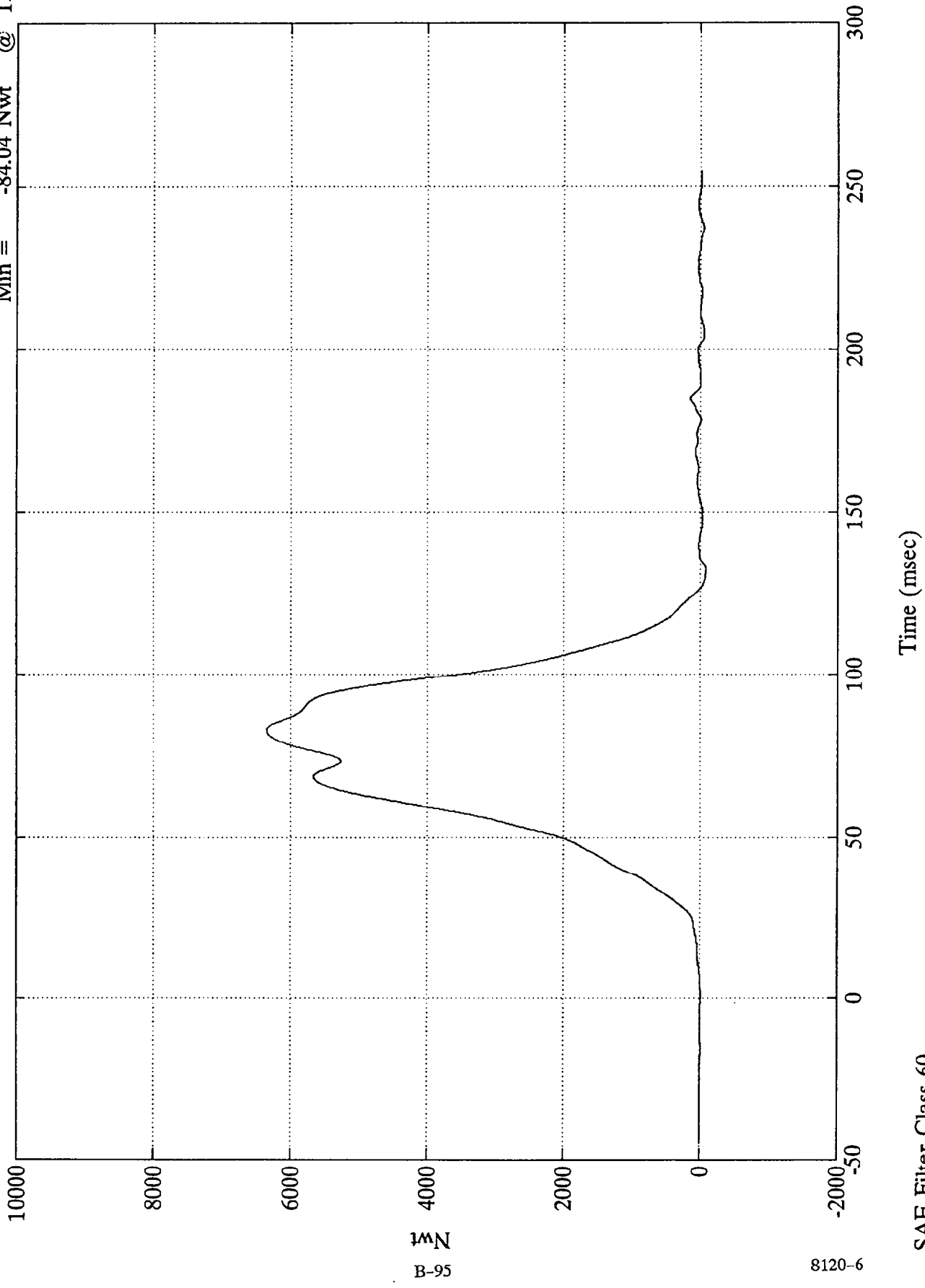
Time (msec)

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Torso Belt Load

Max = 6355.66 Nwt @ 82.56 ms
Min = -84.04 Nwt @ 132.60 mse



56-4
B-95

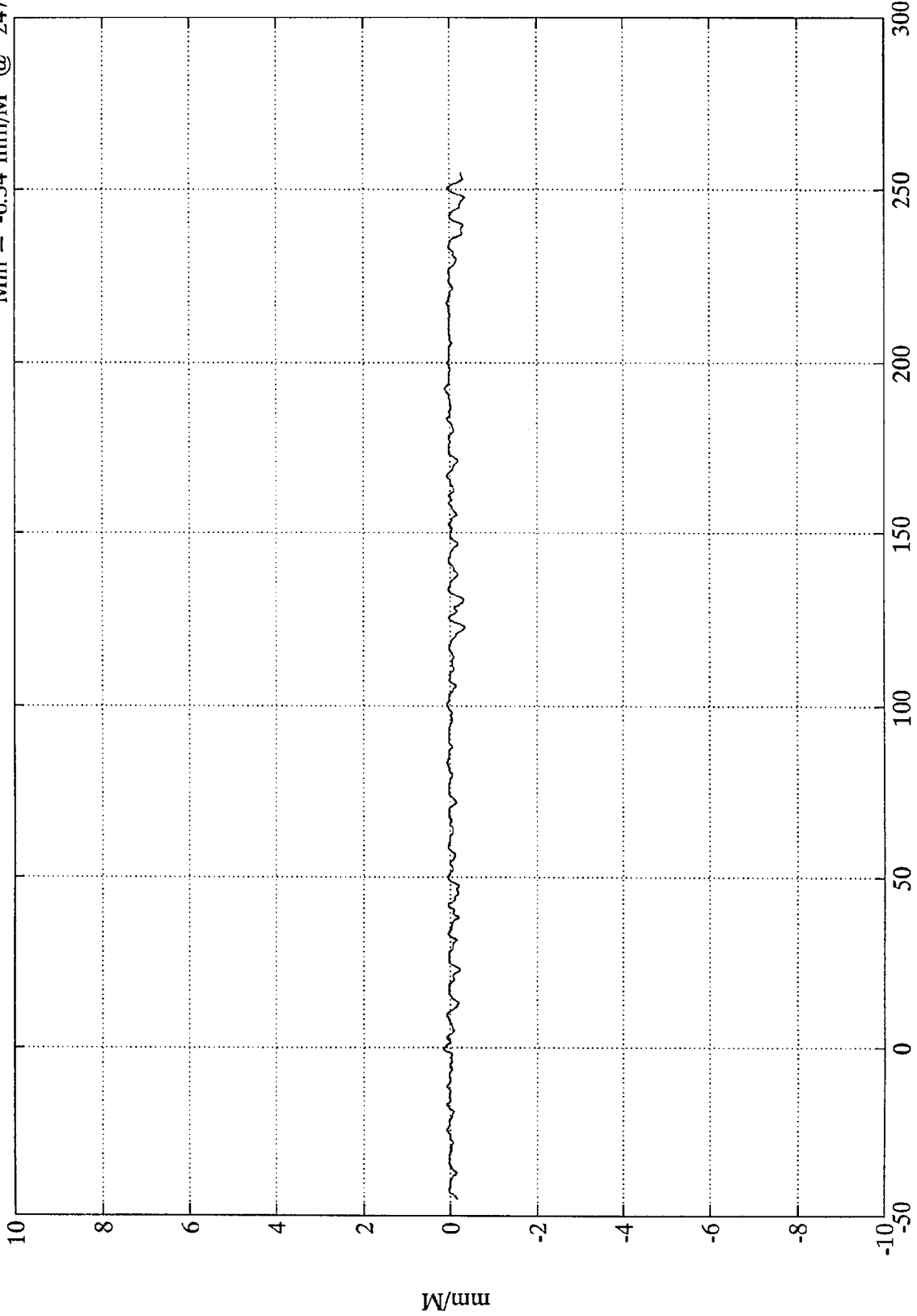
8120-6

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 1 Belt Elongation

Max = 0.16 mm/M @ -0.84 mSec
Min = -0.34 mm/M @ 247.80 mSec



B-96
mm/M

Time (msec)

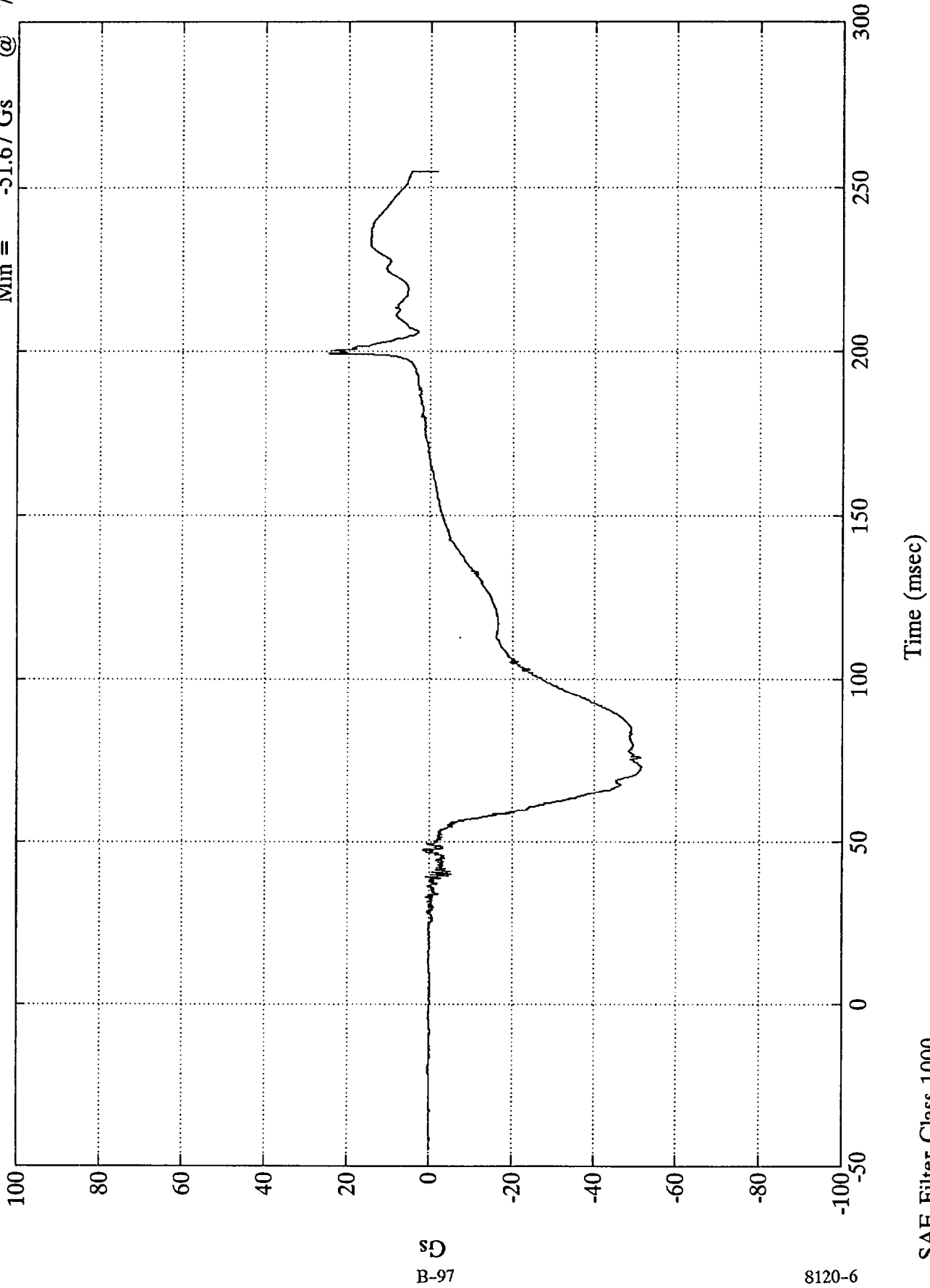
8120-6

SAE Filter Class 180

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 24.95 Gs @ 199.32 msec
Min = -51.67 Gs @ 73.20 msec

Pos. 2 Head X



B-97

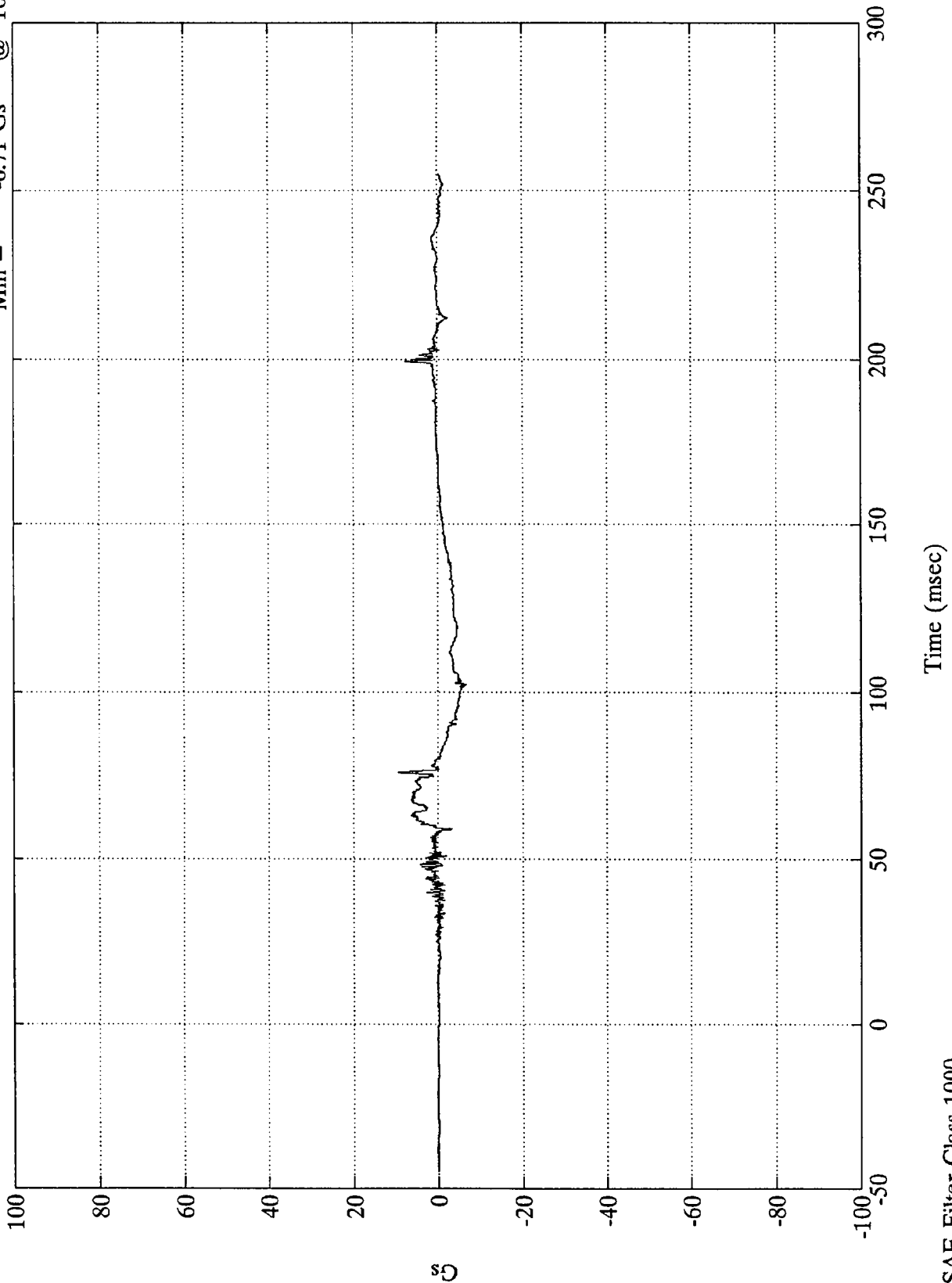
8120-6

SAE Filter Class 1000

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Head Y

Max = 9.42 Gs @ 75.72 msec
Min = -6.71 Gs @ 102.36 msec



B-98

8120-6

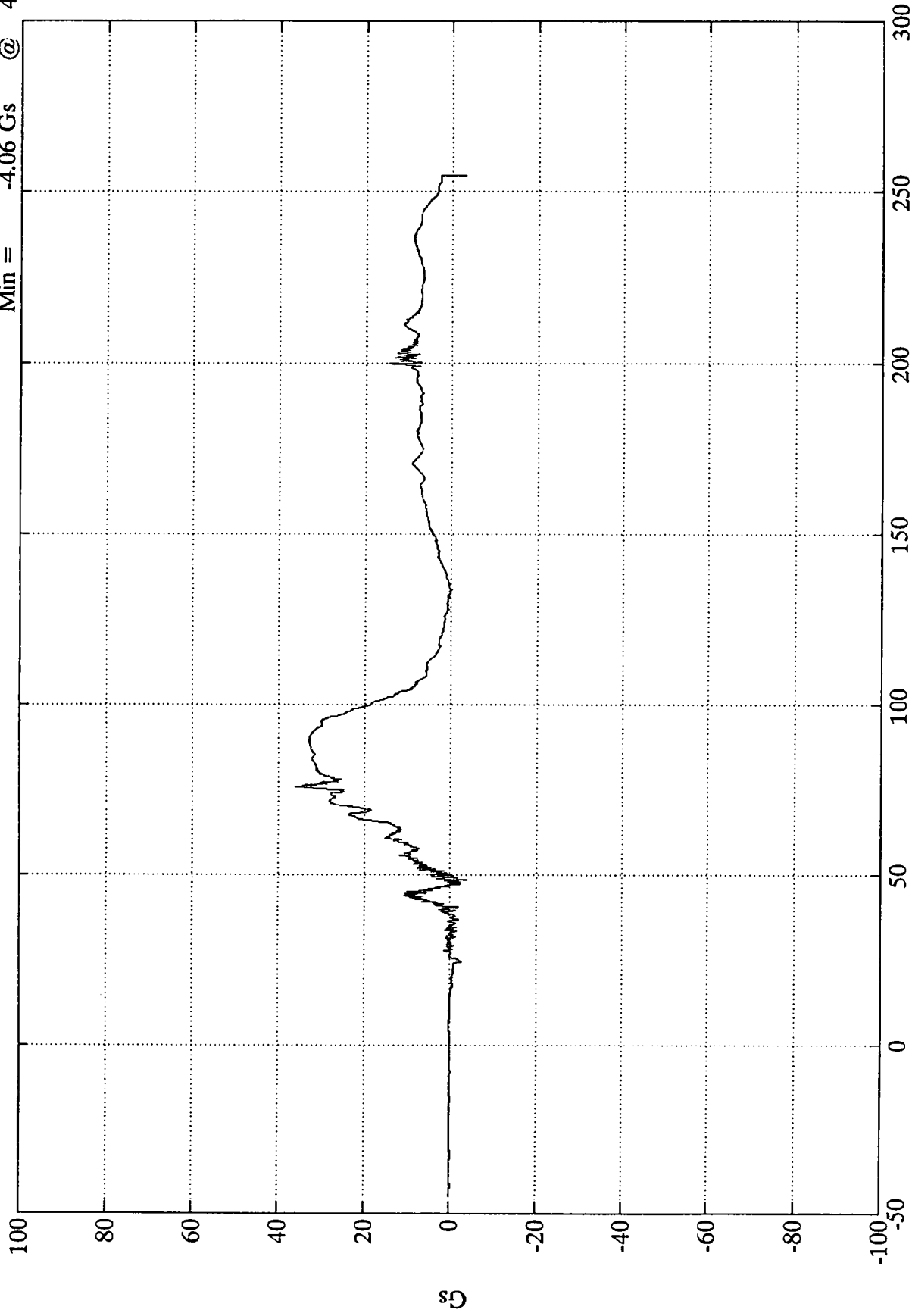
SAE Filter Class 1000

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 36.03 Gs @ 76.08 msec
Min = -4.06 Gs @ 48.59 msec

Pos. 2 Head Z



Time (msec)

SAE Filter Class 1000

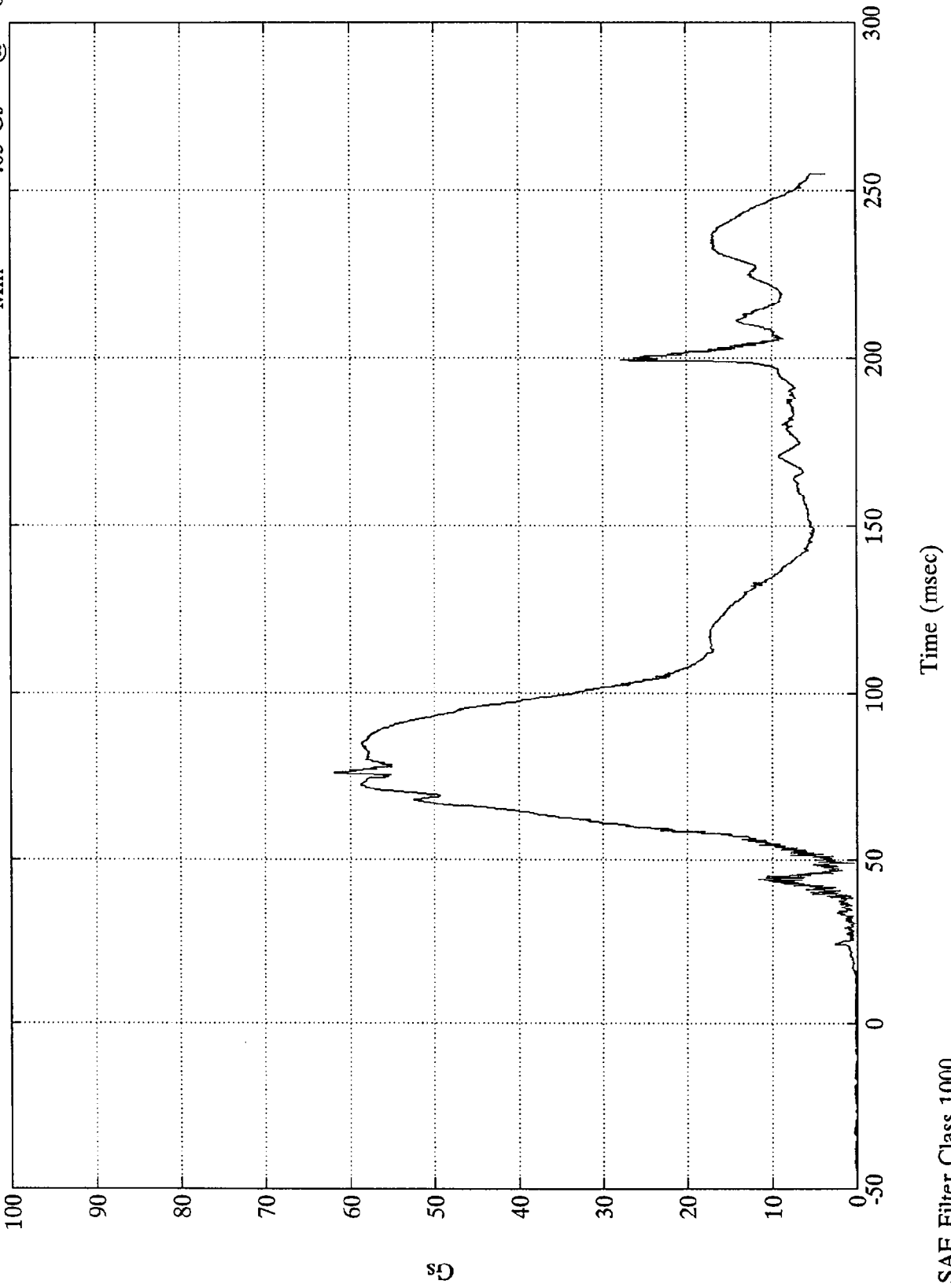
B-99

8120-6

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Head Resultant

Max = 61.86 Gs @ 75.84 msec
Min = .05 Gs @ -0.48 msec



B-100

8120-6

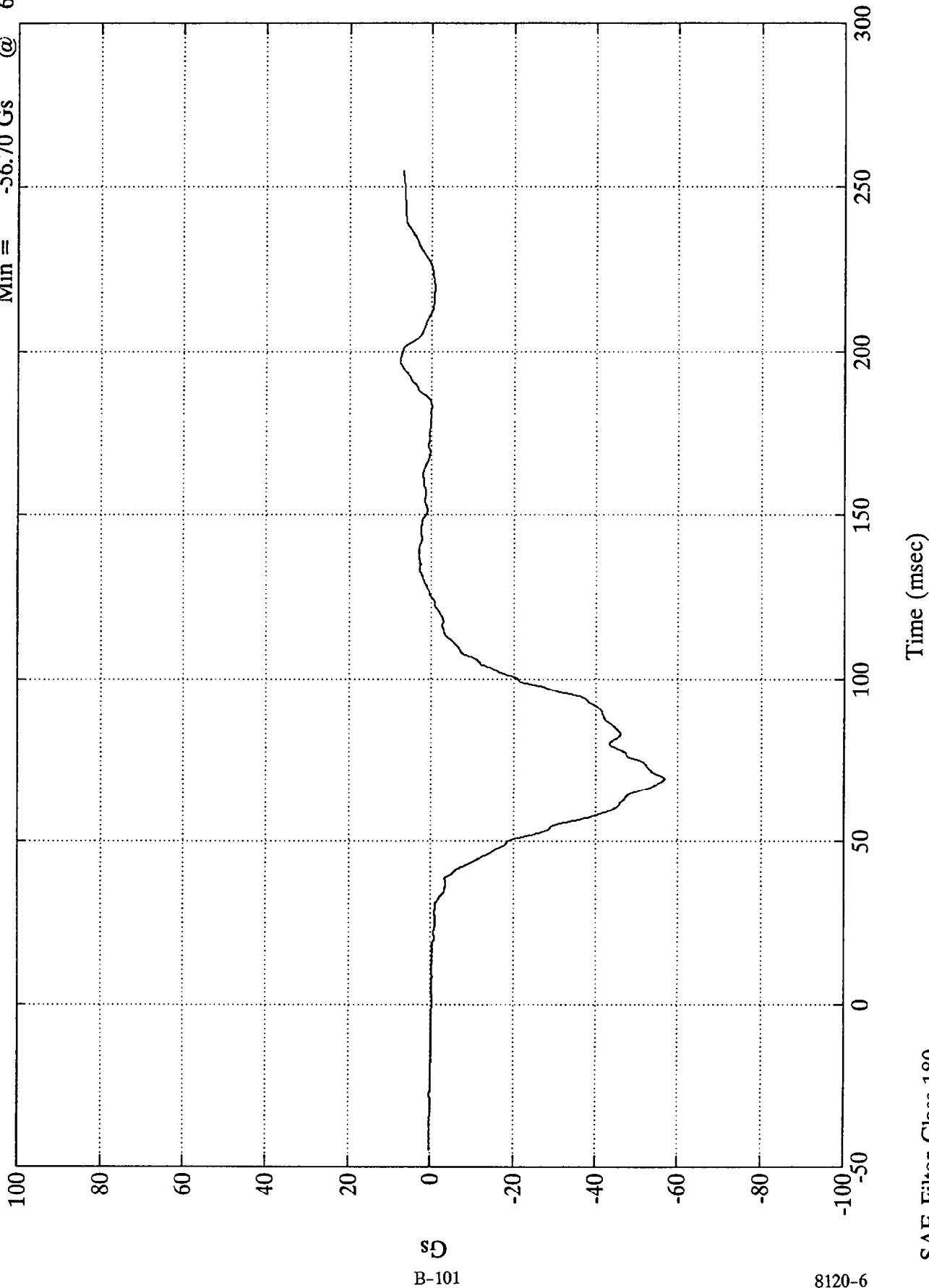
SAE Filter Class 1000

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 7.66 Gs @ 197.16 msec
Min = -56.70 Gs @ 69.24 msec

Pos. 2 Chest X



B-101

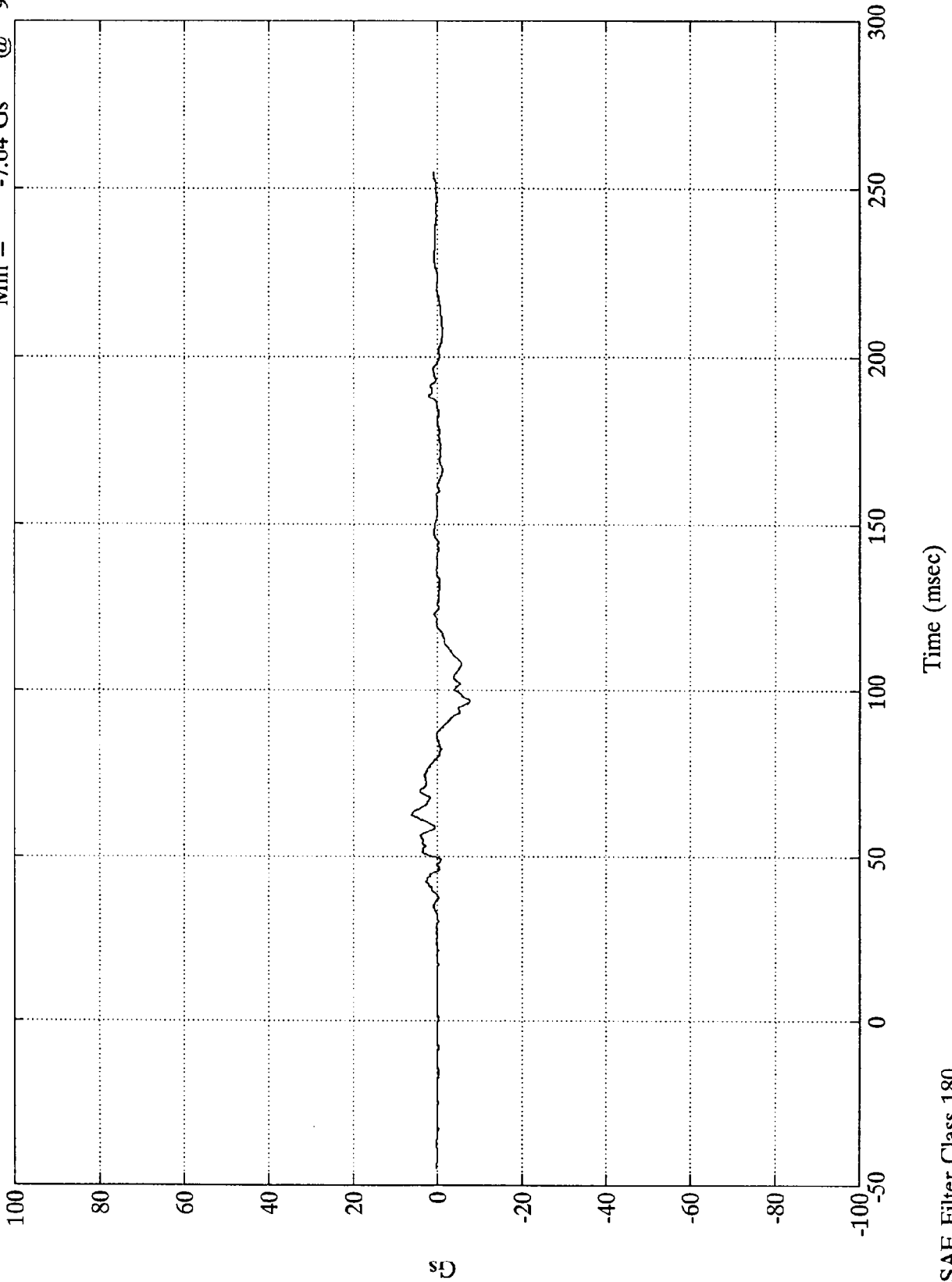
8120-6

SAE Filter Class 180

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Chest Y

Max = 6.18 Gs @ 62.64 msec
Min = -7.64 Gs @ 96.48 msec



B-102

8120-6

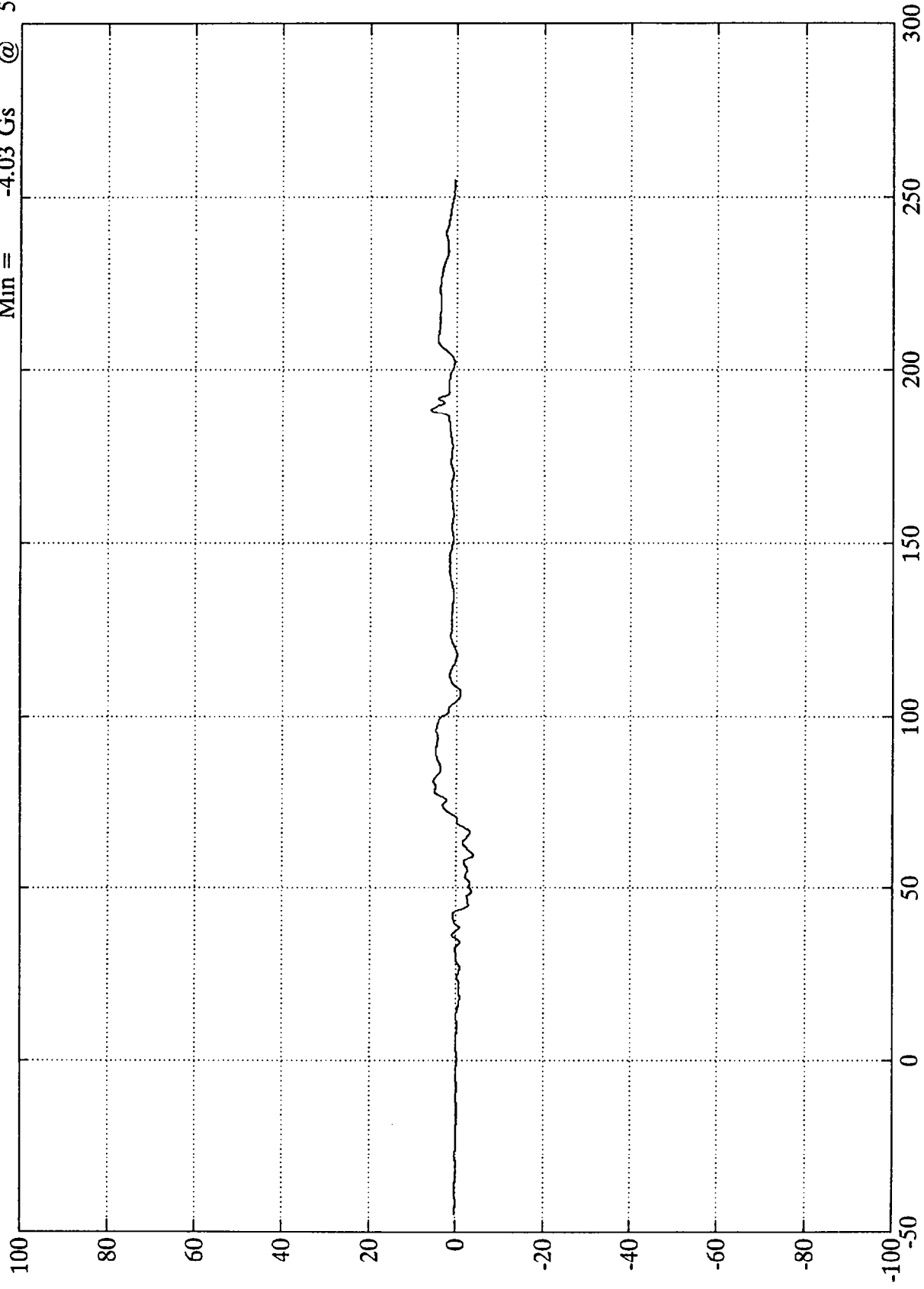
SAE Filter Class 180



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 6.07 Gs @ 188.27 msec
Min = -4.03 Gs @ 59.40 msec

Pos. 2 Chest Z



Time (msec)

g
B-103

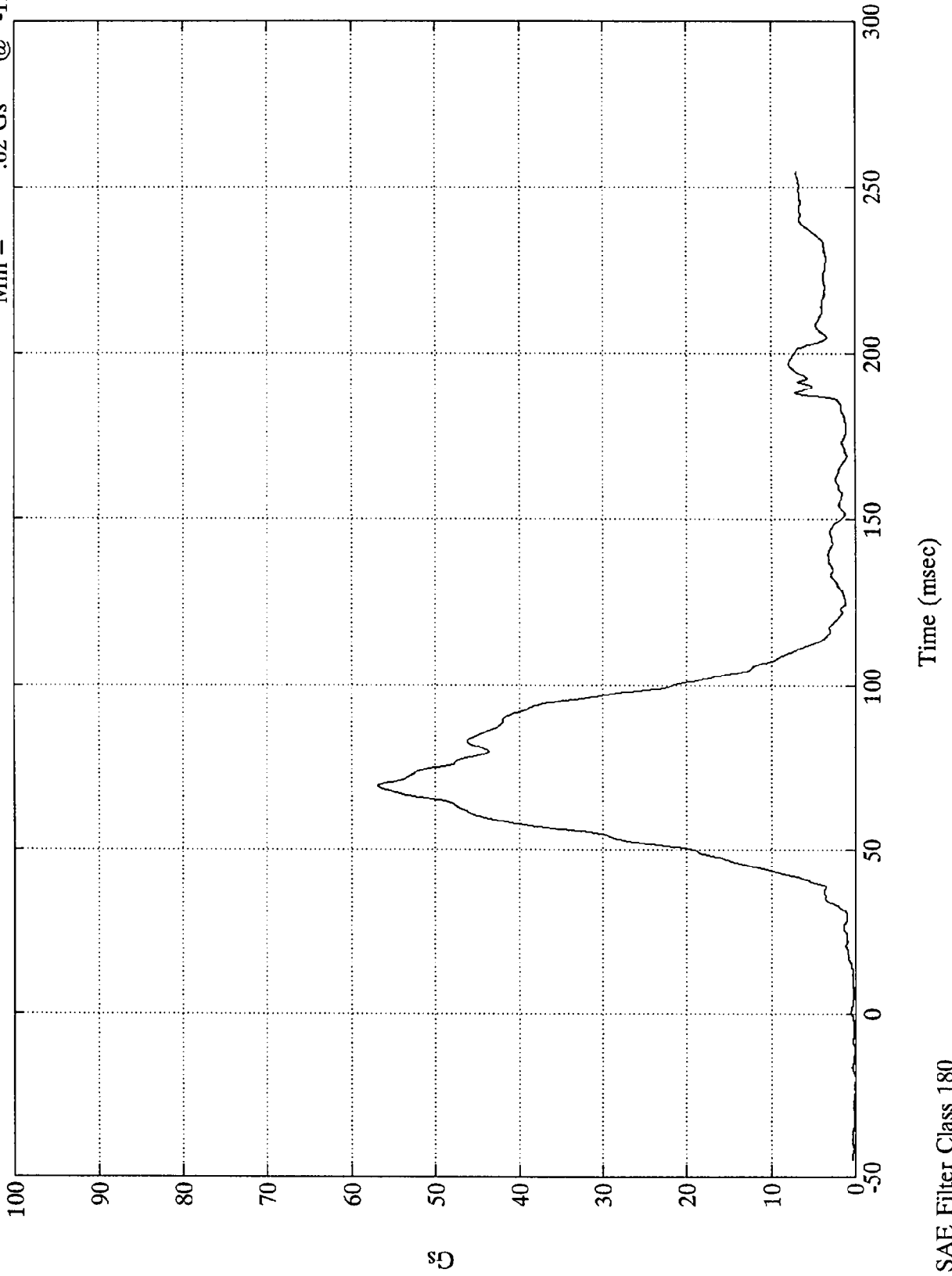
SAE Filter Class 180

8120-6

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Chest Resultant

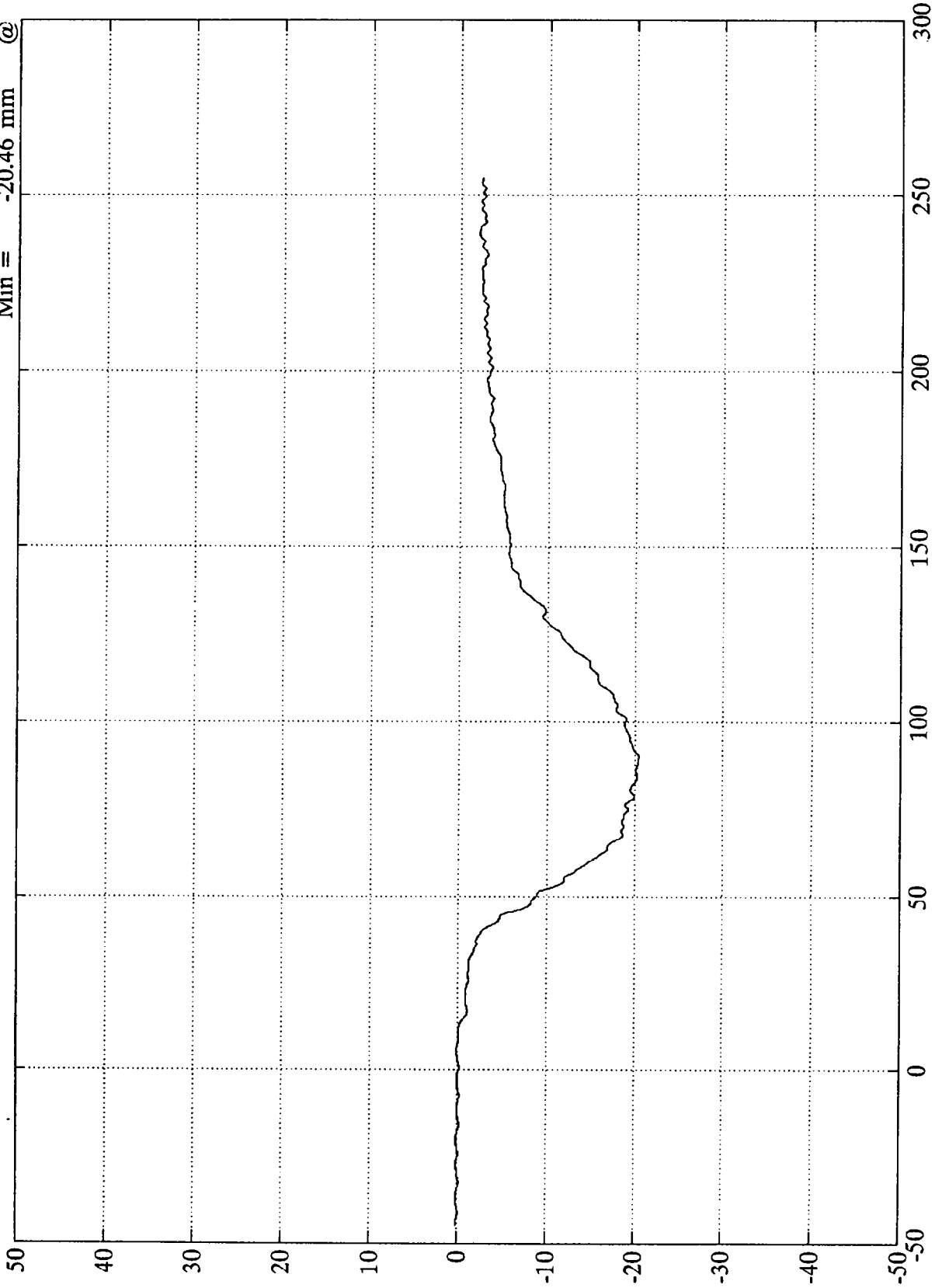
Max = 56.84 Gs @ 69.24 msec
Min = .02 Gs @ -19.92 msec



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = .14 mm @
Min = -20.46 mm @

Pos. 2 Chest Disp.



Time (msec)

mm
B-105

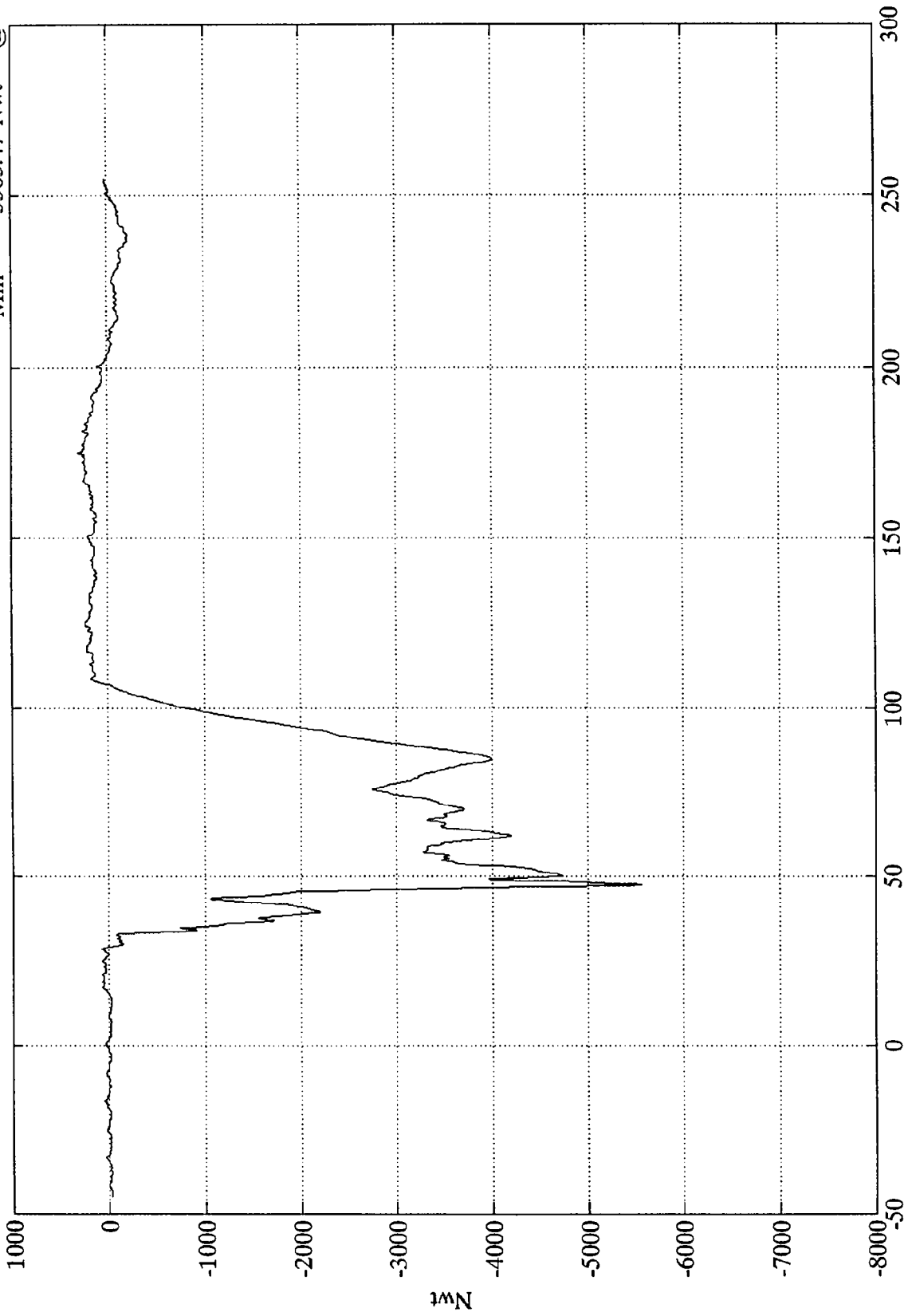
8120-6

SAE Filter Class 180

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Max = 306.60 Nwt @ 175.19 msec
Min = -5563.47 Nwt @ 47.40 msec

Pos. 2 Left Femur



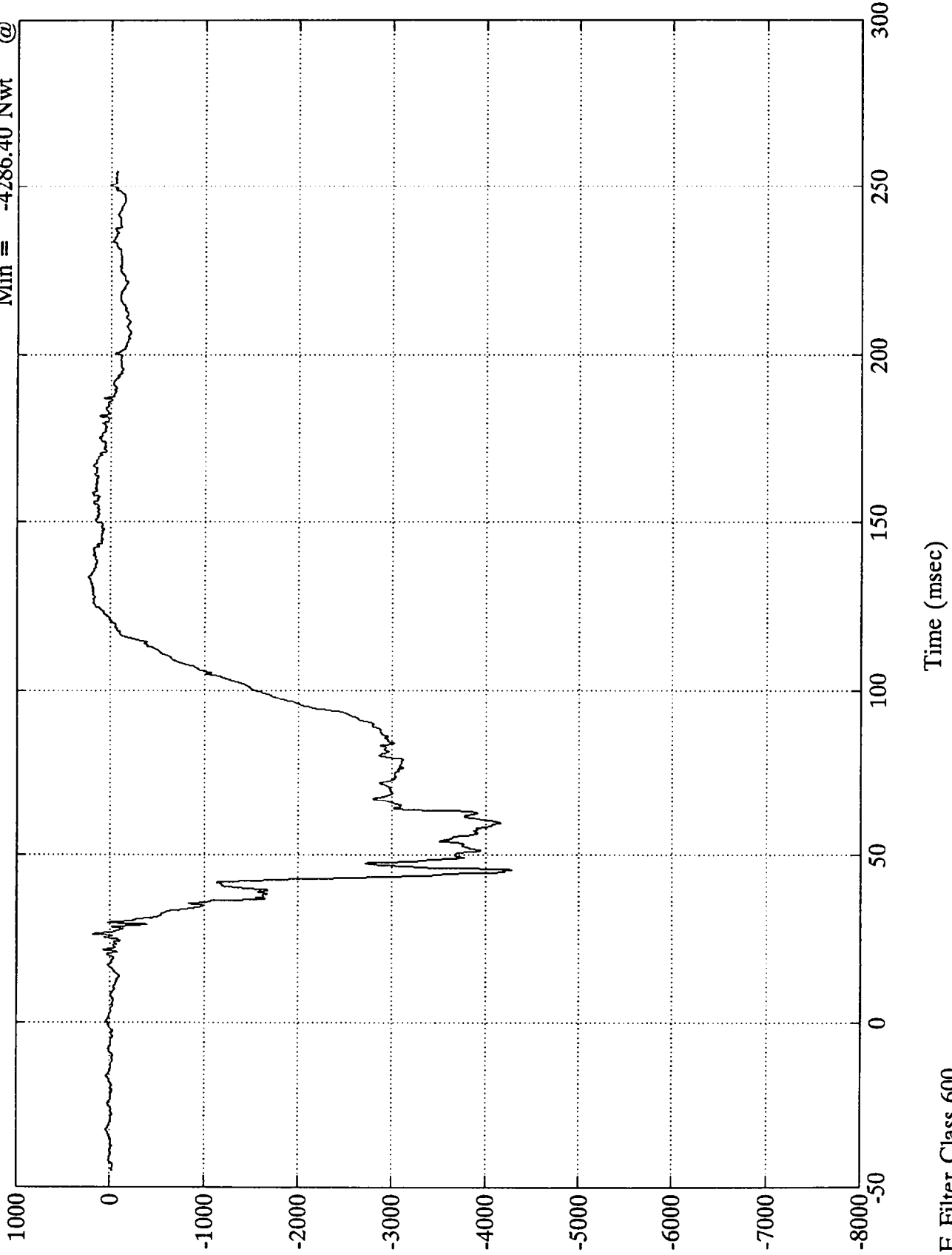
Time (msec)

SAE Filter Class 600

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Right Femur

Max = 235.08 Nwt @ 133.80 mse
Min = -4286.40 Nwt @ 45.60 mse



1Nwt
B-107

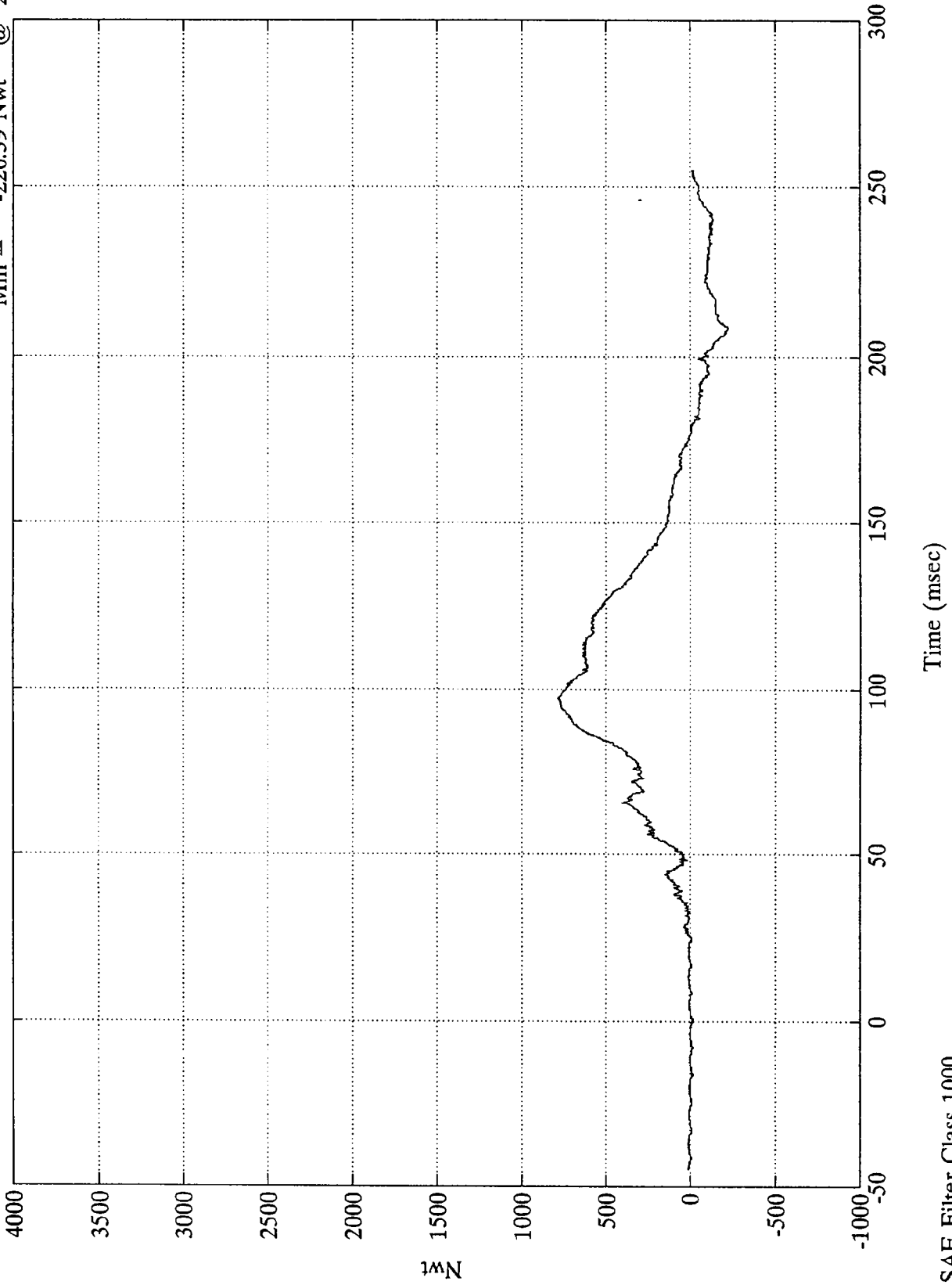
8120-6

SAE Filter Class 600

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Upper Neck Fx

Max = 783.20 Nwt @ 97.44 msec
Min = -220.39 Nwt @ 208.80 msec



1kN
B-108

8120-6

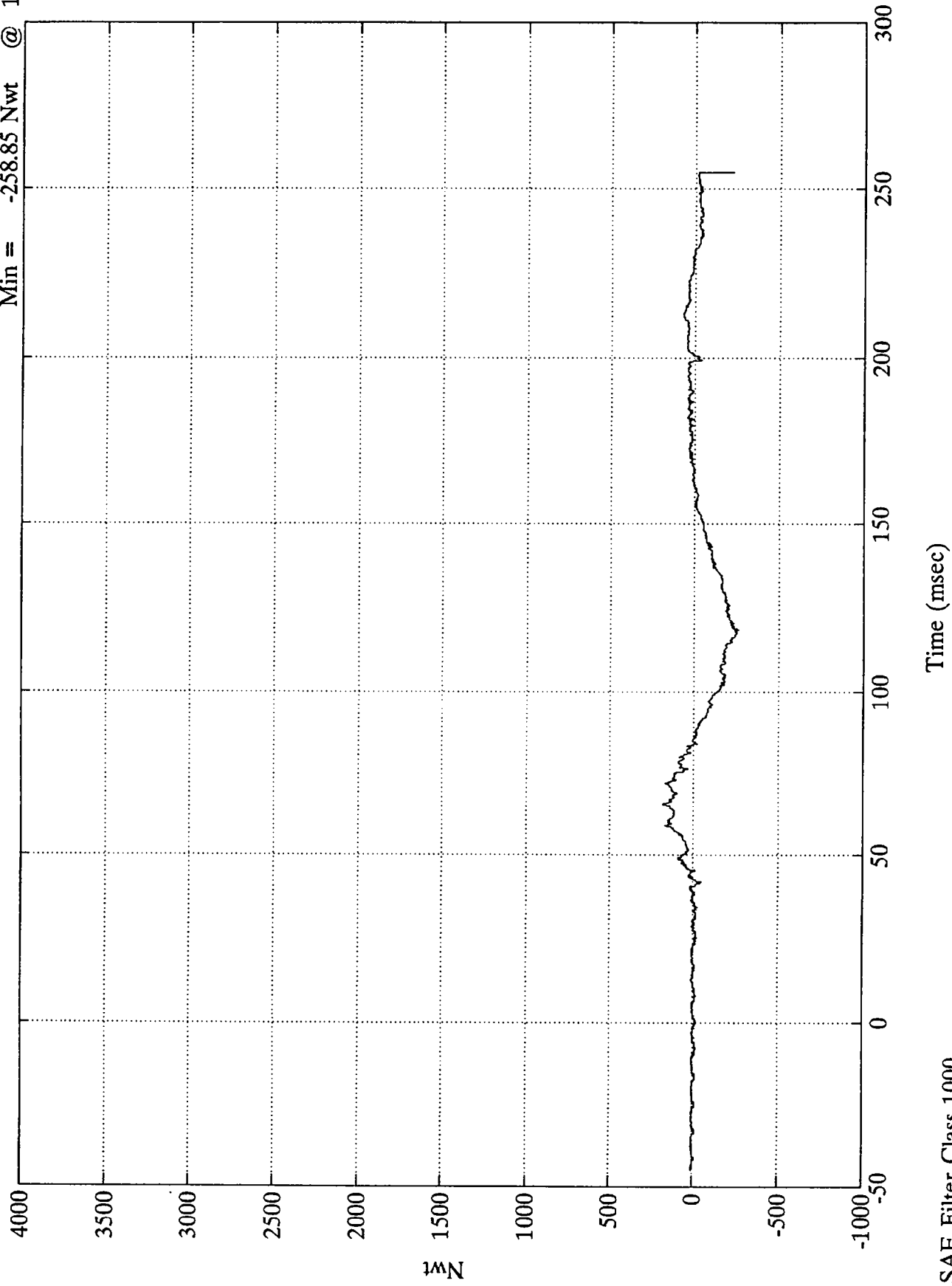
SAE Filter Class 1000

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Upper Neck Fy

Max = 181.36 Nwt @ 65.52 msec
Min = -258.85 Nwt @ 118.44 msec



B-109

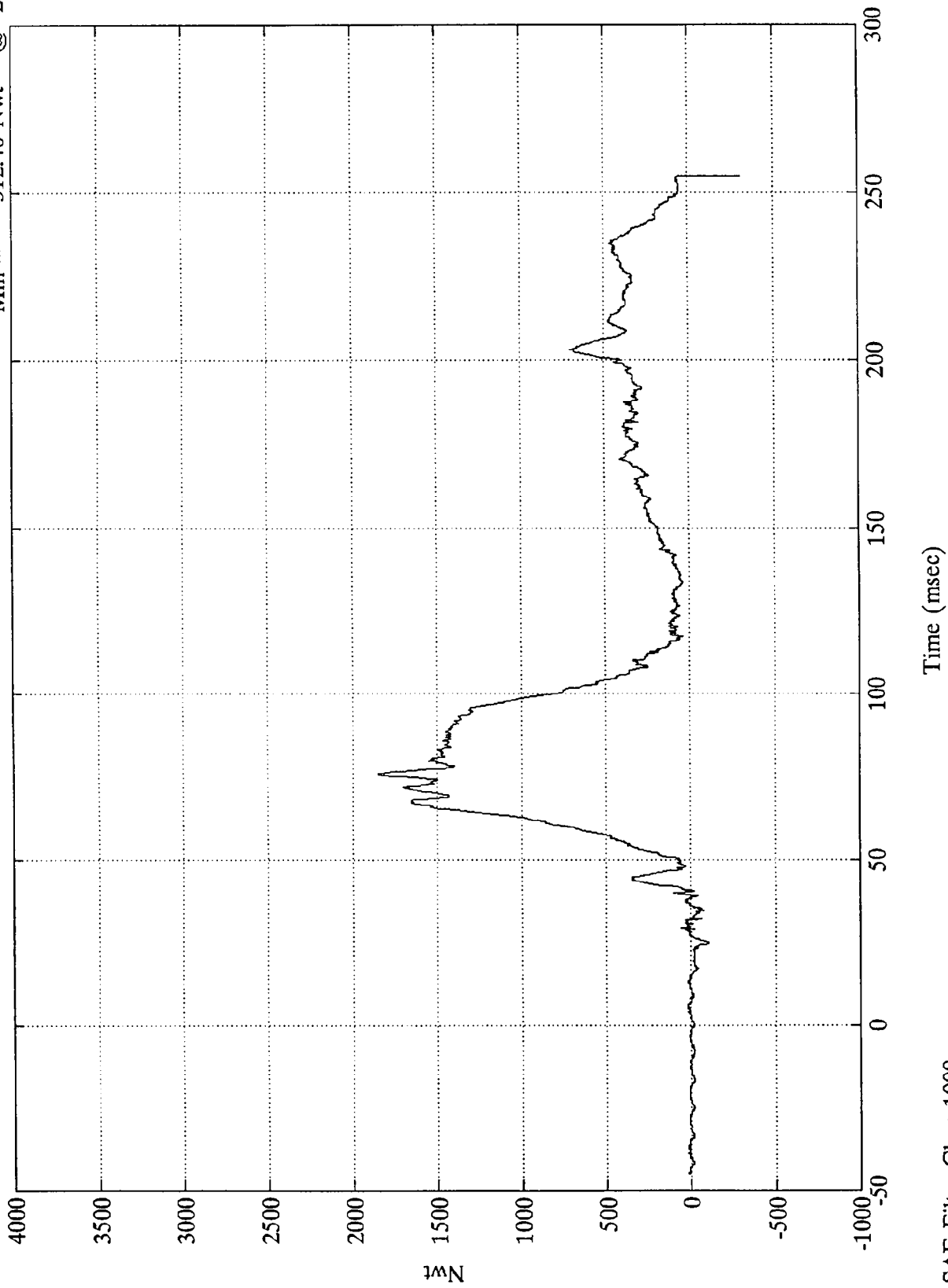
8120-6

SAE Filter Class 1000

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Upper Neck Fz

Max = 1849.51 Nwt @ 75.95 msec
Min = -312.40 Nwt @ 254.88 msec



B-110

8120-6

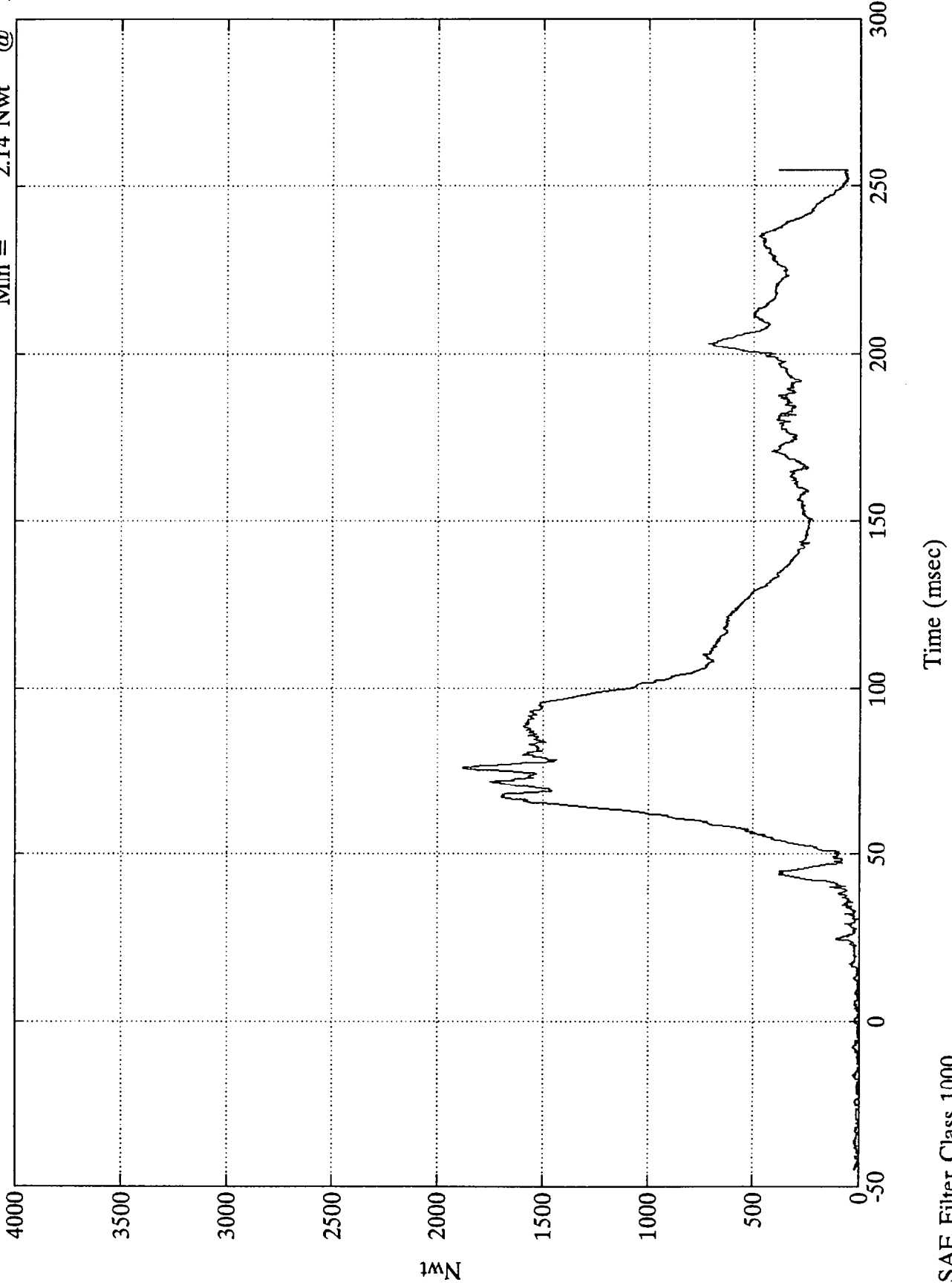
SAE Filter Class 1000

Time (msec)

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Neck Force Res.

Max = 1880.89 Nwt @ 75.84 msec
Min = 2.14 Nwt @ 10.67 msec



1kN
B-111

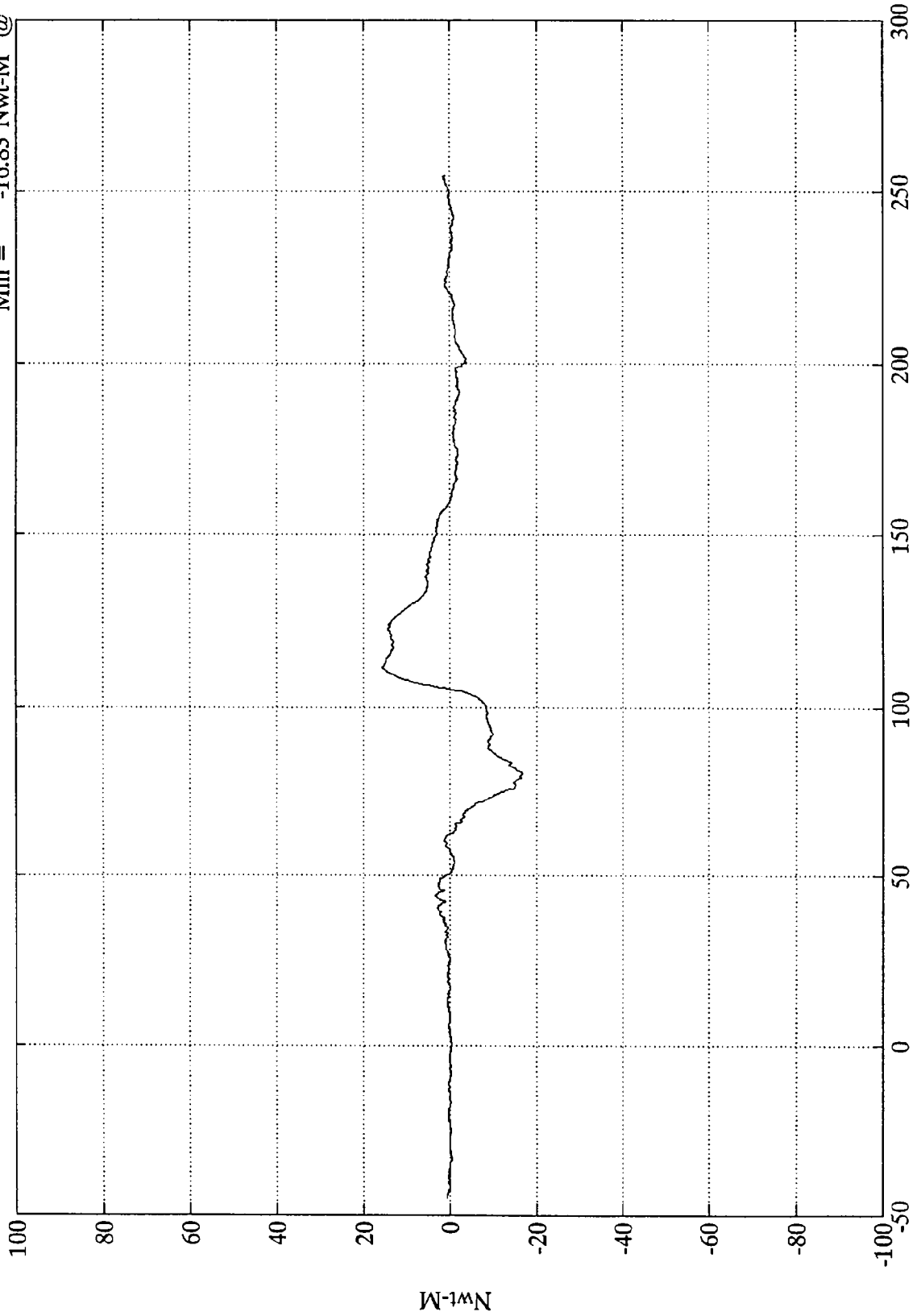
8120-6

SAE Filter Class 1000

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Upper Neck Mx

Max = 15.64 Nwt-M @ 111.72 msec
Min = -16.83 Nwt-M @ 80.88 msec



B-112
M-14N

8120-6

SAE Filter Class 600

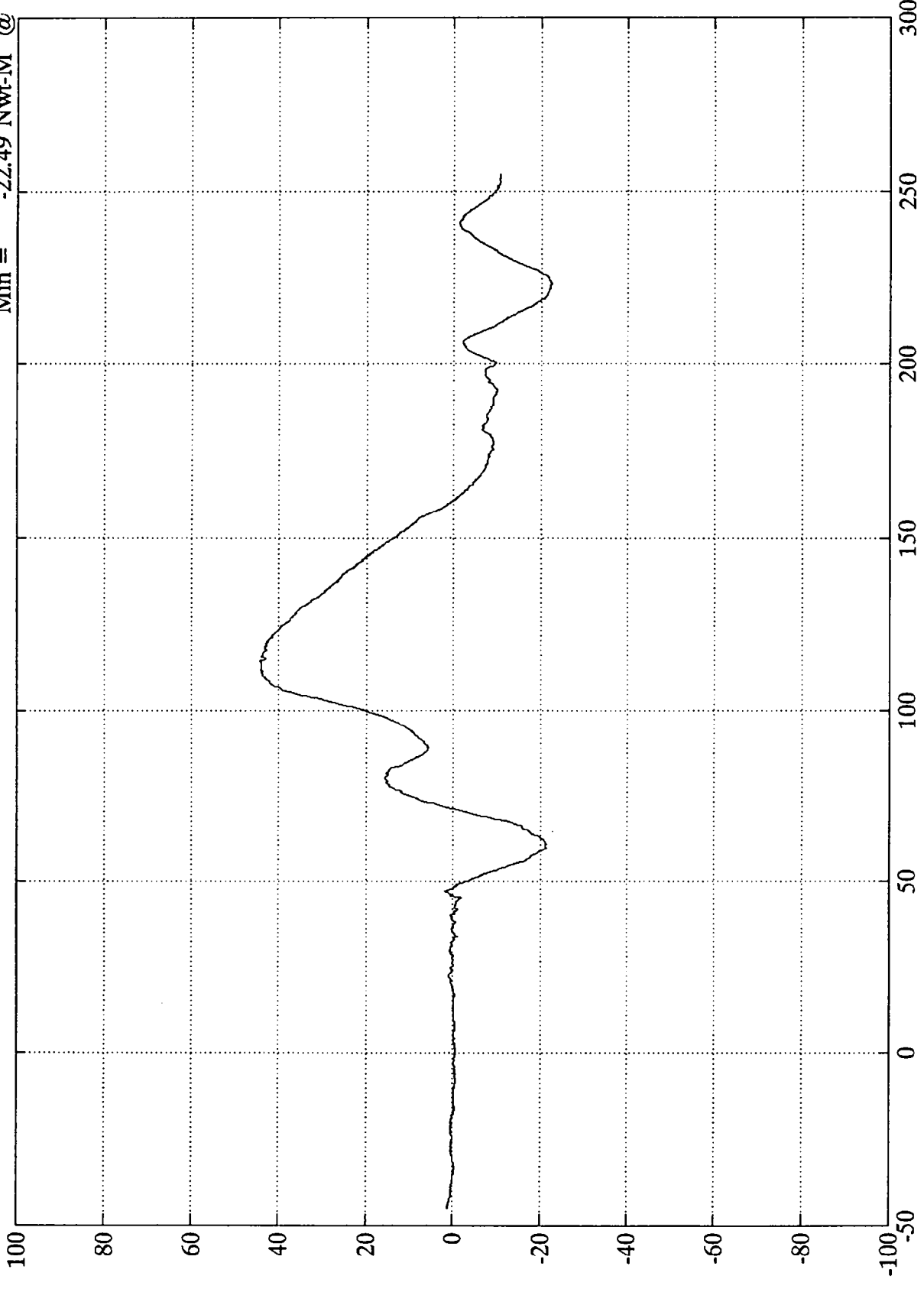
Time (msec)



NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Upper Neck My

Max = 44.43 Nwt-M @ 114.12 ms
Min = -22.49 Nwt-M @ 223.20 ms



B-113
Nwt-M

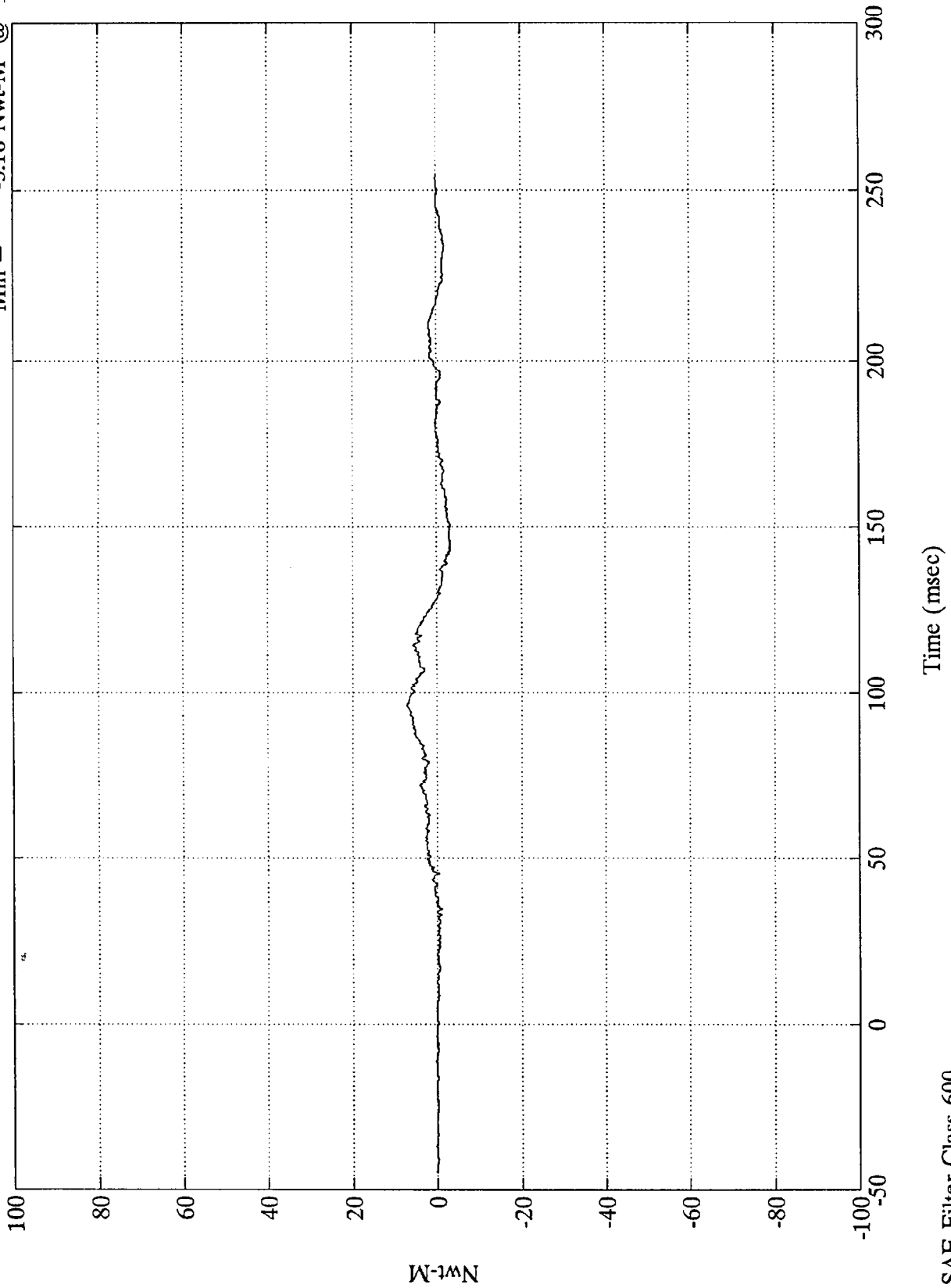
Time (msec)

SAE Filter Class 600

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Upper Neck Mz

Max = 7.12 Nwt-M @ 96.00 msec
Min = -3.16 Nwt-M @ 143.16 msec



Mz-Nwt

B-114

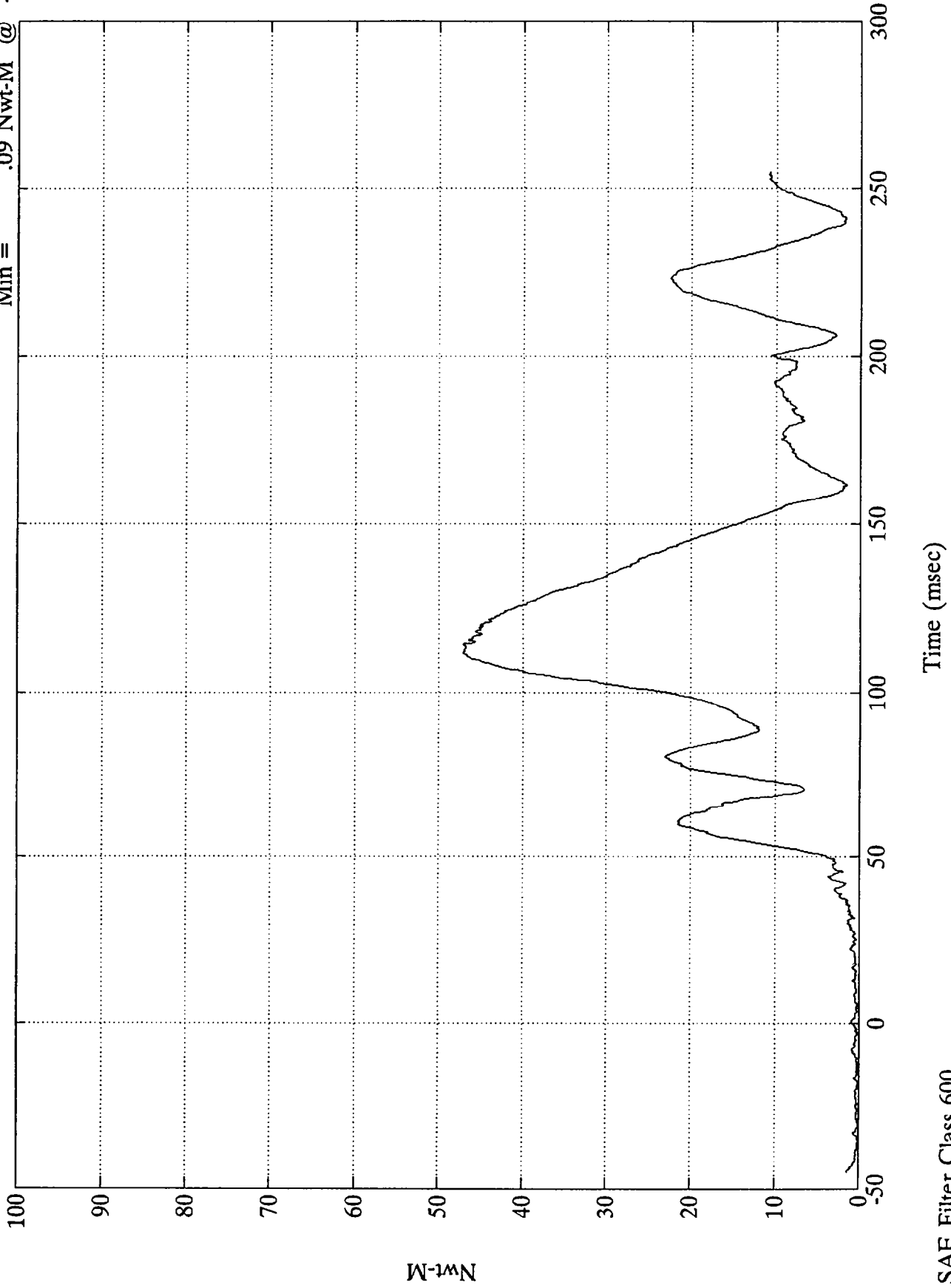
8120-6

SAE Filter Class 600

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Neck Moment Res.

Max = 47.12 Nwt-M @ 114.12 ms
Min = .09 Nwt-M @ -30.84 mse



B-115

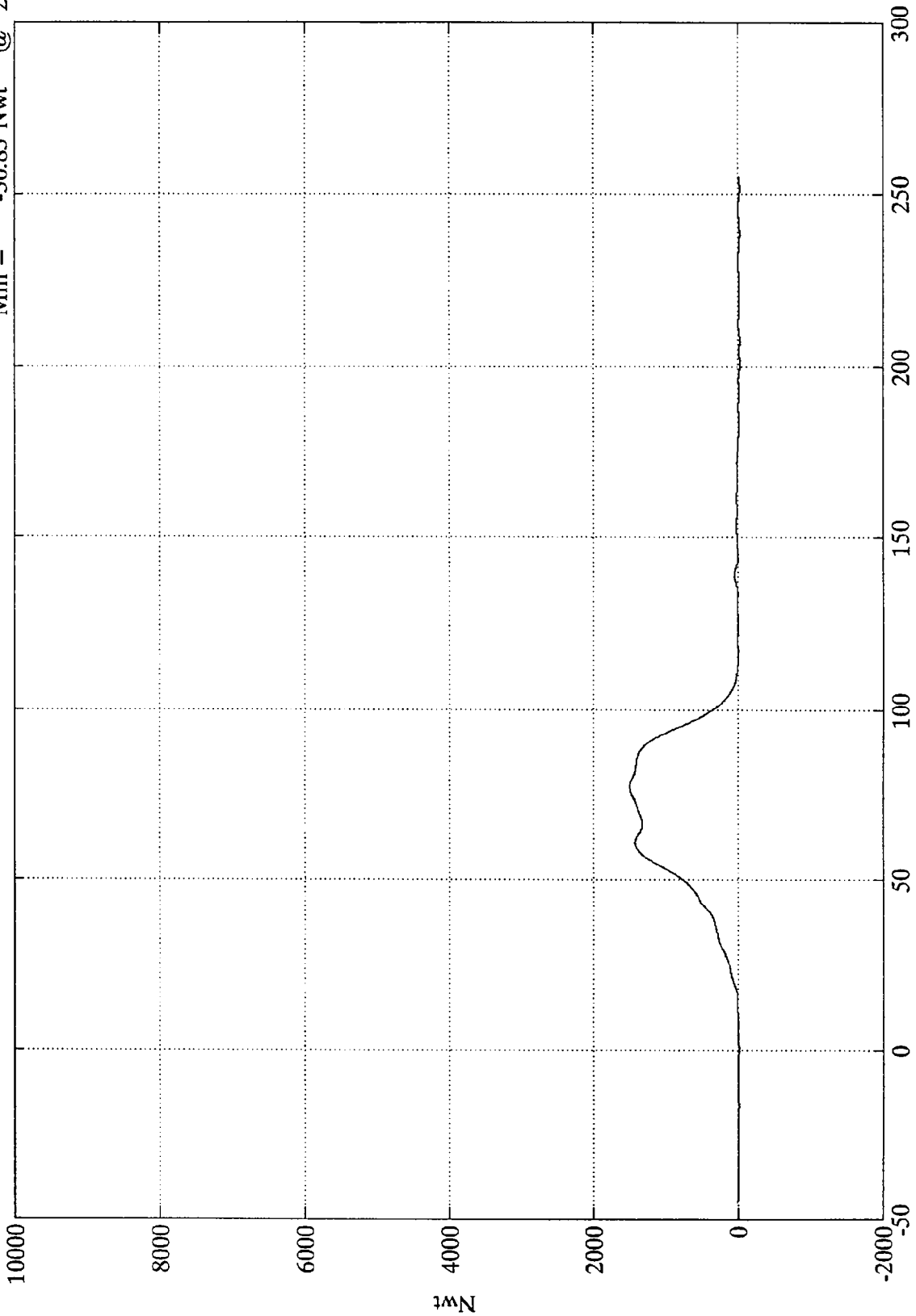
8120-6

SAE Filter Class 600

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Right Belt Load

Max = 1501.44 Nwt @ 77.27 msec
Min = -30.83 Nwt @ 200.76 msec



Time (msec)

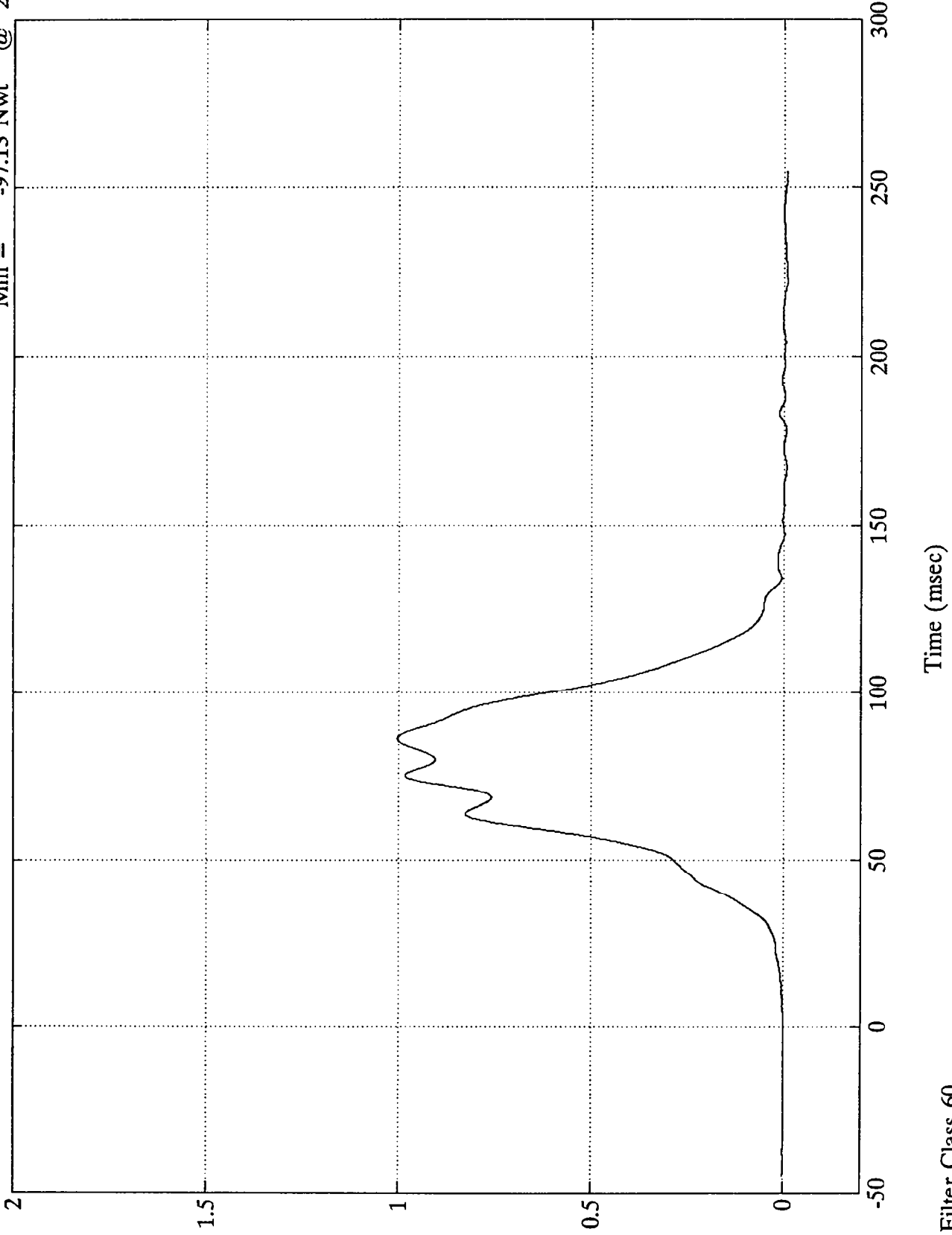
SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

x10⁴

Pos. 2 Torso Belt Load

Max = 10048.77 Nwt @ 86.28 msec
Min = -97.13 Nwt @ 222.36 msec



11N
B-117

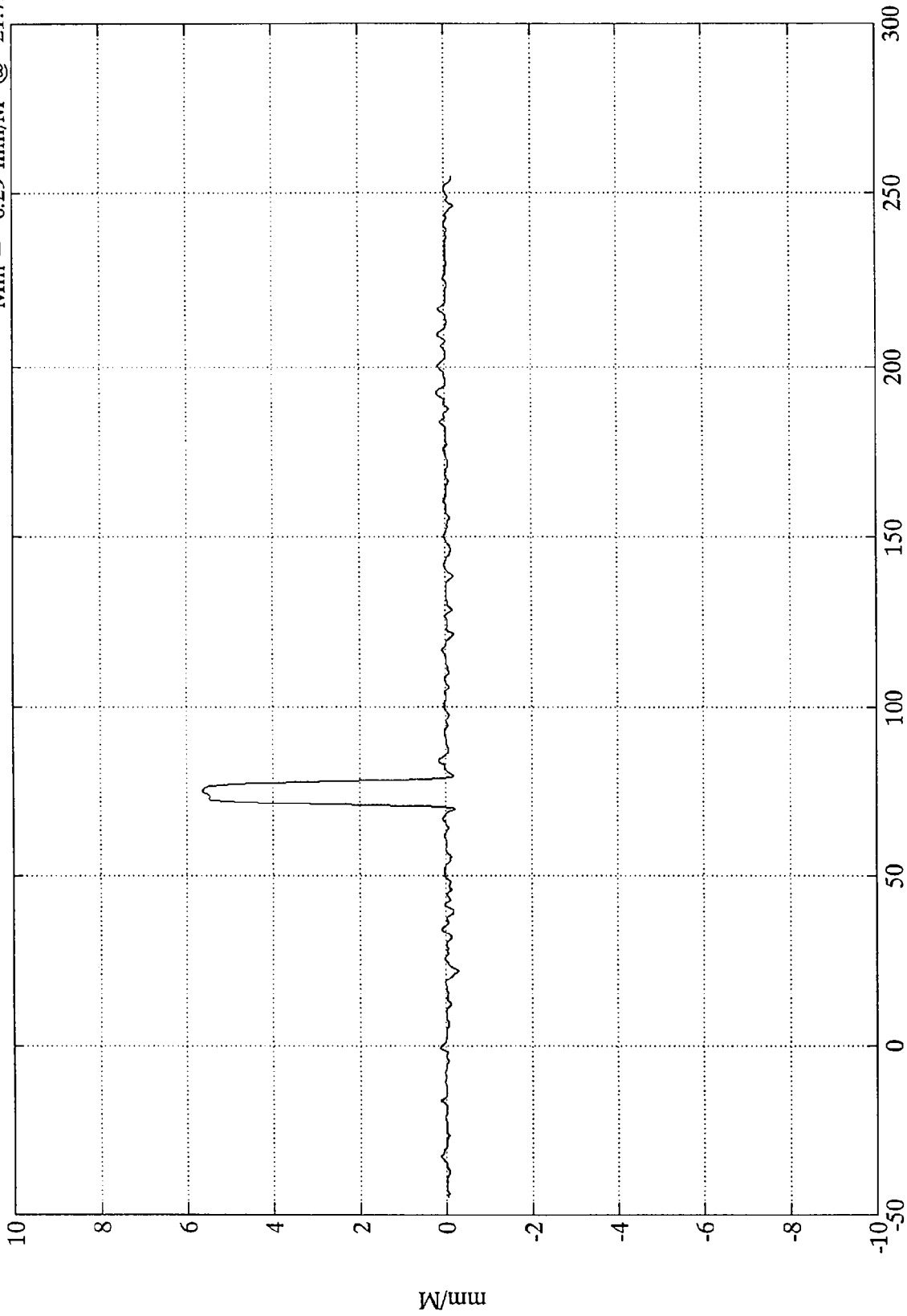
8120-6

SAE Filter Class 60

NCAP TEST #6 - 1994 PONTIAC GRAND PRIX

Pos. 2 Belt Elongation

Max = 5.64 mm/M @ 75.12 mSec
Min = -0.29 mm/M @ 21.72 mSec



B-118

8120-6

Time (msec)

SAE Filter Class 180

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:

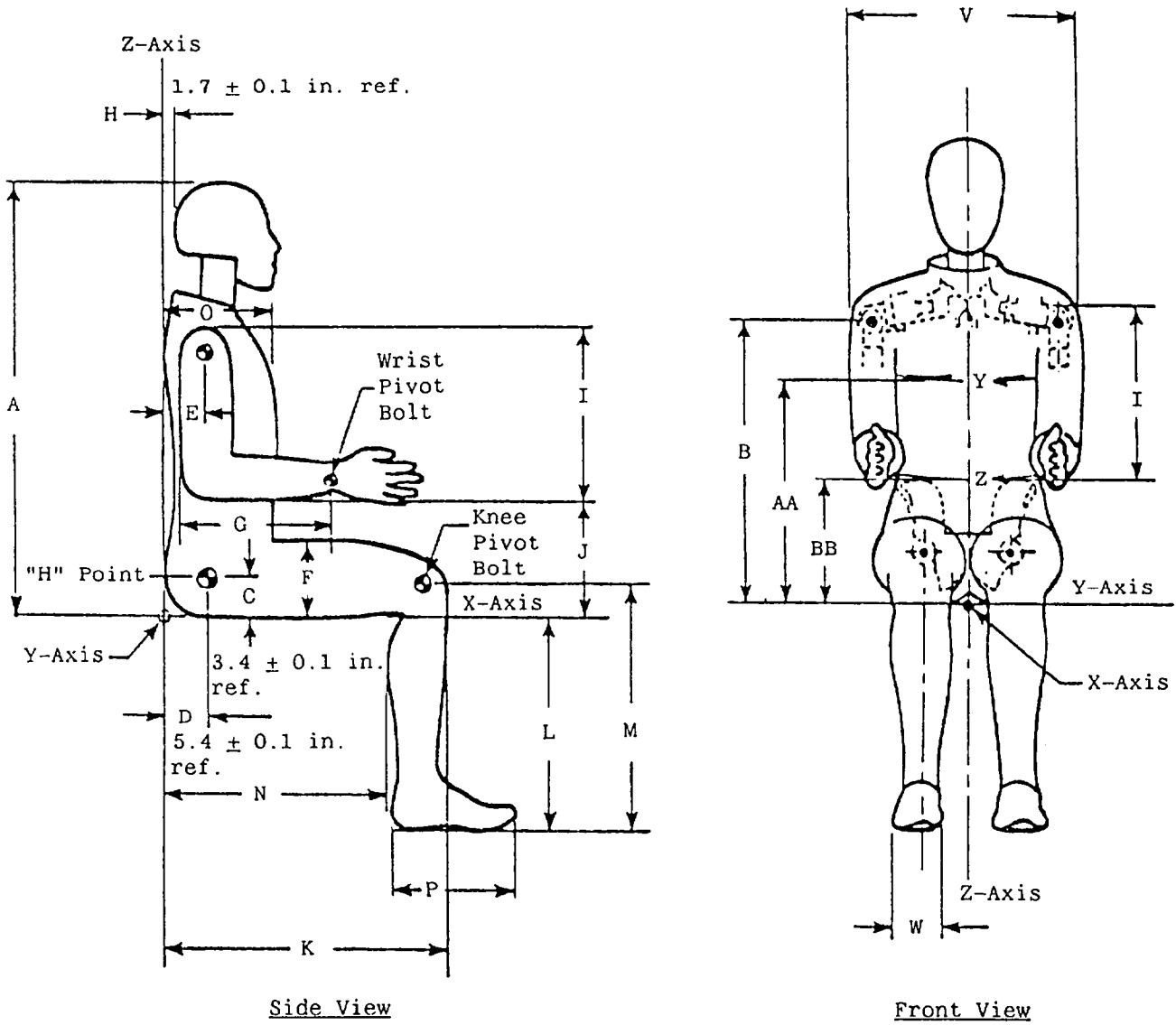
<u>Serial No.</u>	<u>Completion Date</u>
45	9-25-93
150	11-2-93

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: 9/25/93

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 : 9/9/93

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 45 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	51 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	231.3 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	10.6 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 : 9/24/93

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 45 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5-22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY		10% - 70%	45 %
IMPACT VELOCITY		24.8 - 25.7 KPH	24.9 KPH
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	26.03 G'S
	20 MS	17.60 - 22.60 G'S	22.51 G'S
	30 MS	12.50 - 18.50 G'S	17.08 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	17.08 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	37.13 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	72.93 DEG.
	TIME	57 - 64 MS	57.88 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88 - 108 N-M	102.74 N-M
	TIME	47 - 58 MS	50.5 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	119.75 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	99.38 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
 TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST

HYBRID III

DATE : 9/24/93

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 45 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5 - 22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY		10% - 70%	50 %
IMPACT VELOCITY		21.4 - 22.3 KPH	22.0 KPH
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	17.71 G'S
	20 MS	14.00 - 19.00 G'S	16.78 G'S
	30 MS	11.00 - 16.00 G'S	15.0 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	18.15 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	45.38 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	90.83 DEG.
	TIME	72 - 82 MS	78 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-80.0/-52.9 N-M	-66.47 N-M
	TIME	65 - 79 MS	70.63 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	158.5 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	130.75 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 9/9/93

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN 45

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%	48 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	23.7 KPH
MAXIMUM DEFLECTION	64 - 73 mm	64.3 mm
MAXIMUM RESISTIVE FORCE	4804 - 5538 NEWTONS	5431 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	72.2 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 9/9/93

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 45 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	50 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4430 - 6965 N	4786 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 9/9/93

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 45 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	50 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4430 - 6965 N	4781 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY I.D. NUMBER: 45

A. DUMMY INSTRUMENTS

	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER				
HX LONGITUDINAL	ENDEVCO	A28F	10/93	4/94
HY LATERAL	ENDEVCO	A08A	10/93	4/94
HZ VERTICAL	ENDEVCO	ADL42	10/93	4/94
2. CHEST ACCELEROMETER				
CX LONGITUDINAL	ENDEVCO	A84J	10/93	4/94
CY LATERAL	ENDEVCO	A57G	10/93	4/94
CZ VERTICAL	ENDEVCO	ER74	10/93	4/94
3. FEMUR LOAD CELLS				
LEFT SIDE	GSE	311	11/93	5/94
RIGHT SIDE	GSE	312	11/93	5/94

B. CALIBRATION LABORATORY INSTRUMENTS

	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. PENDULUM ACC.	CEC	A160	1/94	7/94
2. TEST PROBE ACCELEROMETER	CEC	A161	1/94	7/94
3. LUMBAR FLEXION TEST PUSH FORCE GAUGE	TRANS- DUCER INC	20051	11/93	5/94
4. ABDOMINAL COMPRESS. TEST FORCE GAUGE	BLH	72952	11/93	5/94
5. ABDOMINAL COMPRESS. TEST FORCE GAUGE	CIC	567-11	11/93	5/94

HYBRID III EXTERNAL DIMENSIONS

S/N 150 HUMANOID

DUMMY SERIAL NO. 150

DATE: 11/2/93

TEMPERATURE		20.5 DEG. C
RELATIVE HUMIDITY		36 %
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	88 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	881 mm
THIGH CLEARANCE (F)	140-155 mm	142 mm
BUTTOCK KNEE LENGTH (K)	580-605 mm	591 mm
BUTTOCK POPLITAL LENGTH (N)	452-477 mm	470 mm
POPLITEAL LENGTH (L)	430-455 mm	452 mm
KNEE PIVOT HEIGHT (M)	485-501 mm	500 mm
FOOT LENGTH (P)	252-267 mm	259 mm
FOOT BREADTH (W)	91-107 mm	96 mm
SHOULDER PIVOT FROM BACKLINE (E)	84-94 mm	94 mm
SHOULDER BREADTH (V)	422-437 mm	429 mm
SHOULDER PIVOT HEIGHT (B)	505-521 mm	513 mm
ELBOW REST HEIGHT (J)	190-211 mm	208 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 : 9/23/93

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN: 150 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	53 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	254.9 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	9.8 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 : 11/2/93

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN:150 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5-22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY		10% - 70%	35 %
IMPACT VELOCITY		24.8 - 25.7 KPH	25 KPH
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	25.77 G'S
	20 MS	17.60 - 22.60 G'S	20.83 G'S
	30 MS	12.50 - 18.50 G'S	16.96 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	16.96 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	40.25 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	70.12 DEG.
	TIME	57 - 64 MS	60.5 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88 - 108 N-M	103.2 N-M
	TIME	47 - 58 MS	53.25 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	120.38 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	97.88 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
 TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST
 HYBRID III

DATE : 1/2/93

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN:150 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5 - 22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY		10% - 70%	34 %
IMPACT VELOCITY		21.4 - 22.3 KPH	22.16 KPH
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	18.13 G'S
	20 MS	14.00 - 19.00 G'S	16.66 G'S
	30 MS	11.00 - 16.00 G'S	13.99 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	15.53 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	46 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	92.25 DEG.
	TIME	72 - 82 MS	74.88 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-80.0/-52.9 N-M	-79.78 N-M
	TIME	65 - 79 MS	69.38 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	152.5 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	128 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 9/22/93

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN 150 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.5 - 22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	50 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	23.7 KPH
MAXIMUM DEFLECTION	64 - 73 mm	65.5 mm
MAXIMUM RESISTIVE FORCE	4804 - 5538 NEWTONS	5471 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	75.1 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 10/21/93

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN: 150 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	41 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4430 - 6965 N	4892 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 10/21/93

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 2

HY3 SN: 150 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	41 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4430 - 6965 N	5048 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY I.D. NUMBER: 150

A. DUMMY INSTRUMENTS

	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER				
HX LONGITUDINAL	ENDEVCO	A26A	10/93	4/94
HY LATERAL	ENDEVCO	A51A	10/93	4/94
HZ VERTICAL	ENDEVCO	A27A	10/93	4/94
2. CHEST ACCELEROMETER				
CX LONGITUDINAL	ENDEVCO	FB32L	10/93	4/94
CY LATERAL	ENDEVCO	A33A	10/93	4/94
CZ VERTICAL	ENDEVCO	AF480	10/93	4/94
3. FEMUR LOAD CELLS				
LEFT SIDE	GSE	551	11/93	5/94
RIGHT SIDE	GSE	552	11/93	5/94

B. CALIBRATION LABORATORY INSTRUMENTS

	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. PENDULUM ACC.	CEC	A160	1/94	7/94
2. TEST PROBE ACCELEROMETER	CEC	A161	1/94	7/94
3. LUMBAR FLEXION TEST PUSH FORCE GAUGE	TRANS- DUCER INC	20051	11/93	5/94
4. ABDOMINAL COMPRESS. TEST FORCE GAUGE	BLH	72952	11/93	5/94
5. ABDOMINAL COMPRESS. TEST FORCE GAUGE	CIC	567-11	11/93	5/94

Appendix D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head	A28F	ENDEVCO	10/93	4/94
X				
Y	A08A	ENDEVCO	10/93	4/94
Z	ADL42	ENDEVCO	10/93	4/94
Chest	A84J	ENDEVCO	10/93	4/94
X				
Y	A57G	ENDEVCO	10/93	4/94
Z	ER74	ENDEVCO	10/93	4/94
Right Femur Load Cell	312	GSE	11/93	5/94
Left Femur Load Cell	311	GSE	11/93	5/94
Neck Load Cell	269	DENTON	10/93	4/94
X				
Y	269	DENTON	10/93	4/94
Z	269	DENTON	10/93	4/94
Neck Moment	269	DENTON	10/93	4/94
X				
Y	269	DENTON	10/93	4/94
Z	269	DENTON	10/93	4/94
Chest Deflection Gauge	45	HUMANOID	2/94	8/94
Hybrid III Use Only				
Lap Belt Load Cells	706	LEBOW	11/93	5/94
Shoulder Belt Load Cells	707	LEBOW	11/93	5/94
Spool-Out Potentiometer	N/A	SERVONIC INST.	-	-
Belt Stretch Transducer	E5	CALSPAN	2/94	8/94

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head	A2GA	ENDEVCO	10/93	4/94
X				
Y	A51A	ENDEVCO	10/93	4/94
Z	A27A	ENDEVCO	10/93	4/94
Chest	FB32L	ENDEVCO	10/93	4/94
X				
Y	A33A	ENDEVCO	10/93	4/94
Z	AG7A	ENDEVCO	10/93	4/94
Right Femur Load Cell	552	GSE	11/93	5/94
Left Femur Load Cell	551	GSE	11/93	5/94
Neck Load Cell	076	DENTON	10/93	4/94
X				
Y	076	DENTON	10/93	4/94
Z	076	DENTON	10/93	4/94
Neck Moment	076	DENTON	10/93	4/94
X				
Y	076	DENTON	10/93	4/94
Z	076	DENTON	10/93	4/94
Chest Deflection Gauge	150	HUMANOID	2/94	8/94
Hybrid III Use Only				
Lap Belt Load Cells	710	LEBOW	11/93	5/94
Shoulder Belt Load Cells	711	LEBOW	11/93	5/94
Spool-Out Potentiometer	N/A	SERVONIC INST.	-	-
Belt Stretch Transducer	E1	CALSPAN	2/94	8/94

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(6 Month Calibration Minimum)

	Serial #	Manufacturer	Calibration	
			Last	Next
Left Seat Rear Crossmember	A69	CEC	12/93	6/94
Right Rear Seat Crossmember	A151	CEC	10/93	4/94
Top of Engine	A149	CEC	10/93	4/94
Bottom of Engine	AN11	CEC	10/93	4/94
Left Disc Brake Caliper	A147	CEC	10/93	4/94
Right Disc Brake Caliper	A150	CEC	9/93	3/94
Instrument Panel	A44	CEC	9/93	3/94
Left Rear Crossmember Rdnt.	A70	CEC	12/93	6/94
Right Rear Crossmember Rdnt.	A164	CEC	12/93	6/94

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS



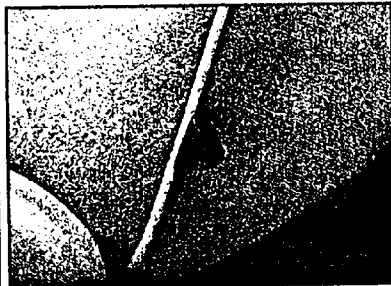
Seats & Restraint Systems



Head Restraints

Slide the head restraint up or down so that the top of the restraint is closest to the top of your ears.

This position reduces the chance of a neck injury in a crash.



Seatback Latches (Two-Door Model)

In two-door Pontiacs, the front seat folds forward to let people get into the back seat.

Your seatback will move back and forth freely, unless you come to a sudden stop. Then it will lock in place.

There's one time the seatback may not fold without some help from you. That's if your vehicle is parked going down a fairly steep hill.

To fold a seatback forward, push the seatback toward the rear as you lift this latch. Then the seatback will fold forward. The latch must be down for the seat to work properly.

■ Safety Belts: They're For Everyone

This part of the manual tells you how to use safety belts properly. It also tells you some things you should not do with safety belts.

And it explains the Supplemental Restraint System, or "air bag" system.

⚠ CAUTION:

Don't let anyone ride where they can't wear a safety belt properly. If you are in a crash and you're not wearing a safety belt, your injuries can be much worse. You can hit things inside the vehicle or be ejected from it. You can be seriously injured or killed. In the same crash, you might not be if you are buckled up. Always fasten your safety belt, and check that your passengers' belts are fastened properly too.

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This figure lights up as a reminder to buckle up. (See "Safety Belt Reminder Light" in the Index.)

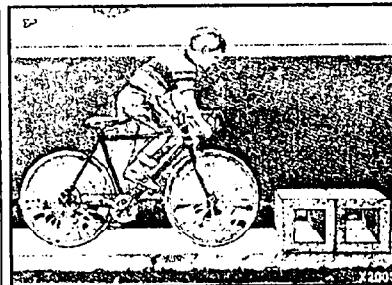
In many states and Canadian provinces, the law says to wear safety belts. Here's why: They work.



You never know if you'll be in a crash. If you do have a crash, you don't know if it will be a bad one.

A few crashes are mild, and some crashes can be so serious that even buckled up a person wouldn't survive. But most crashes are in between. In many of them, people who buckle up can survive and sometimes walk away. Without belts they could have been badly hurt or killed.

After more than 25 years of safety belts in vehicles, the facts are clear. In most crashes buckling up does matter ... a lot!



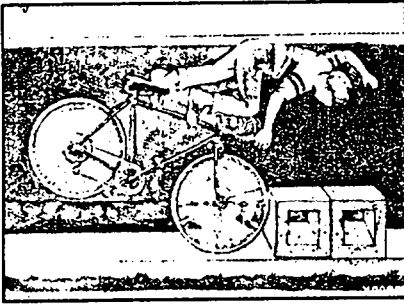
Why Safety Belts Work

When you ride in or on anything, you go as fast as it goes.

For example, if the bike is going 10 mph (16 km/h), so is the child.

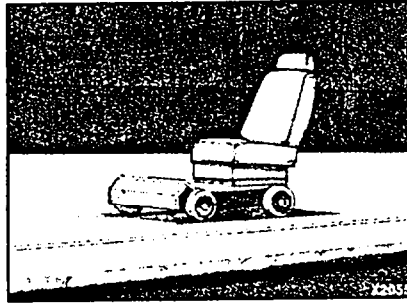
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Seats & Restraint Systems

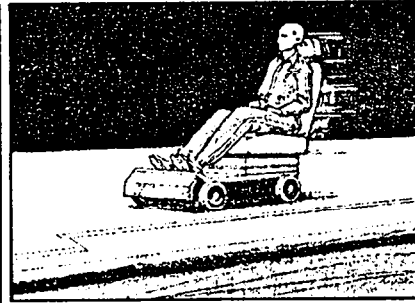


Why Safety Belts Work (CONT.)

When the bike hits the block, it stops. But the child keeps going!

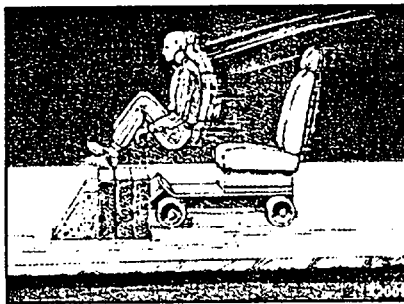


Take the simplest vehicle. Suppose it's just a seat on wheels.



Put someone on it.

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Get it up to speed. Then stop the vehicle
The rider doesn't stop.



The person keeps going until stopped by something.

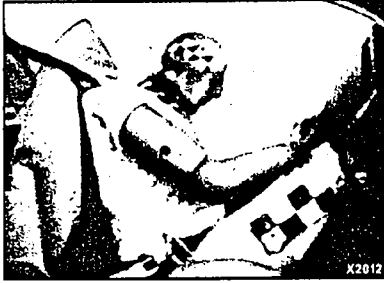
In a real vehicle, it could be the windshield ...



or the instrument panel ...

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Seats & Restraint Systems



Why Safety Belts Work (CONT.)

or the safety belts!

With safety belts, you slow down as the vehicle does. You get more time to stop. You stop over more distance, and your strongest bones take the forces. That's why safety belts make such good sense.

■ Here Are Questions Many People Ask About Safety Belts -- and the Answers

Q: Won't I be trapped in the vehicle after an accident if I'm wearing a safety belt?

A: You could be -- whether you're wearing a safety belt or not. But you can easily unbuckle a safety belt, even if you're upside down. And your chance of being conscious during and after an accident, so you can unbuckle and get out, is much greater if you are belted.

Q: Why don't they just put in air bags so people won't have to wear safety belts?

A: Air bags, or Supplemental Restraint Systems, are in some vehicles today and will be in more of them in the future. But they are supplemental systems only -- so they work with safety belts, not instead of them. Every air bag system ever offered for sale has required the use of safety belts. Even if you're in a vehicle that has air bags, you still have to buckle up to get the most protection. That's true not only in frontal collisions, but especially in side and other collisions.

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Q: If I'm a good driver, and I never drive far from home, why should I wear safety belts?

A: You may be an excellent driver, but if you're in an accident -- even one that isn't your fault -- you and your passengers can be hurt. Being a good driver doesn't protect you from things beyond your control, such as bad drivers.

Most accidents occur within 25 miles (40 km) of home. And the greatest number of serious injuries and deaths occur at speeds of less than 40 mph (65 km/h). Safety belts are for everyone.



Safety Belt Reminder Light

When the key is turned to "Run" or "Start," a chime will come on for about eight seconds to remind people to fasten their safety belts, unless the driver's safety belt is already buckled. The safety belt light will also come on and stay on until the driver's belt is buckled.

■ How To Wear Safety Belts Properly

Adults

This section is only for people of adult size.

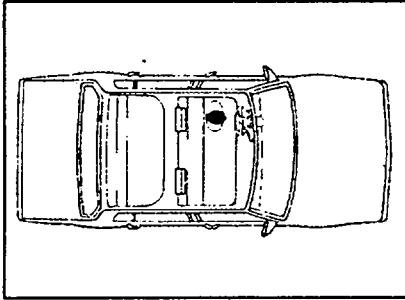
Be aware that there are special things to know about safety belts and children. And there are different rules for smaller children and babies. If a child will be riding in your Pontiac, see the section after this one, called "Children." Follow those rules for everyone's protection.

First, you'll want to know which restraint systems your vehicle has.

We'll start with the driver position.

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Seats & Restraint Systems



■ *Driver Position (Two Door Model)*

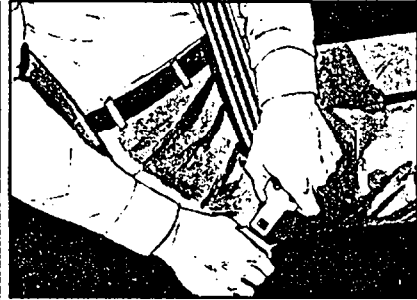
This section describes the driver's restraint system. If you have a four door model, see "Driver Position (Four Door Model)" later in this part.



Lap-Shoulder Belt (Two Door Model)

The driver has a lap-shoulder belt. Here's how to wear it properly.

1. Close and lock the door.
2. Adjust the seat (to see how, see "Seat Controls" in the Index) so you can sit up straight.



3. Pick up the latch plate and pull the belt across you. Don't let it get twisted.
4. Push the latch plate into the buckle until it clicks. Pull up on the latch plate to make sure it is secure.

Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

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