

REPORT NUMBER: CAL-95-N12

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

**GENERAL MOTORS CORPORATION
1995 CHEVROLET CAVALIER
4-DOOR SEDAN**

NHTSA NUMBER: MS0107

CALSPAN TEST NUMBER: 8227-12

February 17, 1995

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FINAL REPORT

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16. <i>Abstract</i> A frontal load cell barrier test of a 1995 Chevrolet Cavalier 4-Door Sedan was performed at Calspan Advanced Technology Center crash test facility in Buffalo, New York, on February 17, 1995. The impact velocity was 56.5 kph and the temperature at the barrier face was 21°C. The maximum post-test vehicle crush was 566 mm. The test vehicle was equipped with a 3-point continuous belt system at each of the front outboard seating positions. The test vehicle was also equipped with supplement airbags at each of the front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger complied with head, chest and femur requirements.			
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Section 1

PURPOSE AND TEST PROCEDURE

This 56.5 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 56.5 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 MS0107

A load cell barrier consisting of 36 load cells was impacted by a 1995 Chevrolet Cavalier 4-Door Sedan at a velocity of 56.5 kph. The test was performed at the Calspan Corporation Advanced Technology Center on February 17, 1995. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

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

Both ATDs were fully instrumented with head and chest triaxial accelerometers and right/left femur load cells. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver ATD (Serial No. 45) and the right-front passenger ATD (Serial No. 150) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 101 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. Accelerometer #4-Engine Bottom sustained a cut wire. Accelerometer #5-Right Caliber did not record accurately. Integration for these two channels were removed from this report.

The driver's HIC was 813.7. The maximum chest deceleration over 3 milliseconds was 52.3 g's and maximum chest deflection was 31.6 mm. Femur loads were -4745.6 newtons on the left femur and -6773.3 newtons on the right femur.

The right front passenger's HIC was 788.3. Maximum chest deceleration over 3 milliseconds was 51.9 g's and maximum chest deflection was 33.7 mm. Femur loads were -4642.8 newtons on the left and -2439.1 newtons on the right.

Table 1

GENERAL TEST AND VEHICLE DATA

Vehicle Year/Make/Model/Body Style: 1995 Chevrolet Cavalier 4-Door Sedan

NHTSA Test No.: MS0107 VIN.: 1G1JC5243S7115672

Body Color: Purple Date of Manufacture: 1/95

Date Received: 1/4/95

Odometer Reading: 00013

Engine: 4 Cylinders; - C.I.D.; 2.2 Liters; - CC
X Gas; - Diesel; - Turbocharged
- Longitudinal; X Transverse

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

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

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

Type of Occupant Restraint: 3-point restraint system with supplemental driver and passenger airbags.

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

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

Recommended Tire Size: P195/70R14

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

Tires on Vehicle: P195/70R14 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) = 400 kgs. (A)

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

Rated Cargo and Luggage Weight (RCLW) A-B = 60 kgs.

GVWR 1652 kgs. GAWR: Front 905 kgs. Rear 747 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>387</u>	kgs.	Right Rear	=	<u>228</u>	kgs.
Left Front	=	<u>399</u>	kgs.	Left Rear	=	<u>225</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>786</u>	kgs.	(<u>63.4</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>453</u>	kgs.	(<u>36.6</u> % of Total Vehicle Weight)			
TOTAL DELIVERED WEIGHT	=	<u>1,239</u>	kgs.				

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight	<u>1239</u>	kgs.
VCW = Vehicle Capacity Weight	<u>400</u>	kgs.
DSC = Designated Seating Capacity	<u>5</u>	
RCLW = VCW - 68 (DSC) =	<u>60</u>	kgs.
Target Test Weight = UDW + RCLW + (2 dummies x 74.4 kgs./ dummy)		
Target Test Weight =	<u>1447</u>	

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 46 KGS CARGO:

Right Front	=	<u>415</u>	kgs.	Right Rear	=	<u>296</u>	kgs.
Left Front	=	<u>432</u>	kgs.	Left Rear	=	<u>290</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>847</u>	kgs.	(<u>59.1</u> % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>586</u>	kgs.	(<u>40.9</u> % of Total Vehicle Weight)			
TOTAL TEST WEIGHT	=	<u>1,433</u>	kgs.				
Weight of ballast secured in vehicle trunk area	=	0	kgs.				

VEHICLE ATTITUDE (all dimensions in mm):

Delivered Attitude:	RF	<u>692</u>	LF	<u>686</u>	RR	<u>711</u>	LR	<u>711</u>
Test Attitude:	RF	<u>685</u>	LF	<u>684</u>	RR	<u>685</u>	LR	<u>675</u>
Wheel Base:	<u>2636</u>	mm.;	C.G. =	<u>1081</u>	mm. rearward of front wheel C/L			
Remarks:	53.5 liters of Stoddard solution was placed in the fuel tank.							

Table 1

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

Type of Test: Frontal Barrier Impact Angle: 0°
 Date of Test: February 17, 1995 Time of Test: 14:18
 Ambient Temperature: 21 ° C at impact area
 Temperature in Occupant Compartment: 21 ° C
 Windshield Molding Temperature: 21 ° C
 Required Impact Velocity Range: 55.5 to 57.1 kph
 Impact Velocity: primary = 56.5 kph, secondary = 56.5 kph
 Distance From Front Bumper to Barrier Face When
 Entering Speed Trap: 1321 mm
 Exiting Speed Trap: 305 mm

VEHICLE REBOUND AND CRUSH (mm):

Vehicle Length:	Pre-test = R	<u>4400</u>	C _L	<u>4565</u>	L	<u>4400</u>
	Post-test = R	<u>3970</u>	C _L	<u>4020</u>	L	<u>3990</u>
	Crush = R	<u>430</u>	C _L	<u>545</u>	L	<u>410</u>

Distance from front of test vehicle to point of impact:
 R 320 C_L 290 L 300

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Airbag</u>	<u>Airbag</u>
Chest	<u>Airbag</u>	<u>Airbag</u>
Abdomen	<u>Airbag</u>	<u>Airbag</u>
Left Knee	<u>Knee bolster</u>	<u>Glove box door</u>
Right Knee	<u>Knee bolster</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>Not operable</u>	<u>Not operable</u>	<u>Operable</u>	<u>Operable</u>
<u>Seat Movement</u>	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Seat Back Failure	<u>None</u>	<u>None</u>	<u>-</u>	<u>-</u>
Seat Shift (mm.)	<u>0.0</u>	<u>0.0</u>	<u>-</u>	<u>-</u>
<u>Glazing Damage</u>				
Backlight/Windshield:	<u>Windshield sustained stress fractures but remained intact.</u>			
Other Notable Impact Effects:	<u>None</u>			

Section 3

OCCUPANT AND VEHICLE INFORMATION

I.

DATA

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

Table 2

DUMMY INJURY CRITERIA VALUES

NHTSA No.: MS0107 Vehicle: 1995 Chevrolet Cavalier 4-Door Sedan

	MAXIMUM HEAD ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-71.7	-14.0	19.5	72.0
Position #2 - Passenger	-64.2	-26.1	37.8	73.2

	MAXIMUM CHEST ACCELERATION (g's)			
	X	Y	Z	R*
Position #1 - Driver	-53.3	-7.9	-11.0	52.3
Position #2 - Passenger	-52.2	4.4	7.4	51.9

* 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	-4745.6	-6773.3
Position #2 - Passenger	-4642.8	-2439.1

	MAXIMUM FORCE - SEAT BELT LOADS (nwt)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
Position #1 - Driver	6702.4	-	4784.8
Position #2 - Passenger	7583.3	5150.4	-

	HEAD INJURY CRITERIA (HIC)			
	HIC**	t ₁ (mSec)	t ₂ (mSec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	813.7	50.52	86.4	55.24
Position #2 - Passenger	788.3	57.6	93.48	54.54

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

Table 3

HYBRID III NECK AND CHEST DATA SHEET

Vehicle Year/Make/Model/Body Style: 1995 Chevrolet Cavalier 4-Door Sedan
 Vehicle NHTSA No.: MS0107 Test Date: February 17, 1995

MAXIMUM VALUES	DRIVER DUMMY ID #45:	PASSENGER DUMMY ID #150:
Neck Load X (nwt)	-961.4	-518.1
Neck Load Y (nwt)	-200.0	-250.0
Neck Load Z (nwt)	1924.0	1566.1
Neck Moment X (nwt-m)	19.2	16.8
Neck Moment Y (nwt-m)	-47.0	73.0
Neck Moment Z (nwt-m)	22.8	33.0
Chest Deflection X (mm.)	31.6	33.7
Time of Max. Occurrence (msec)	67.9	82.7

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

Figure 1

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

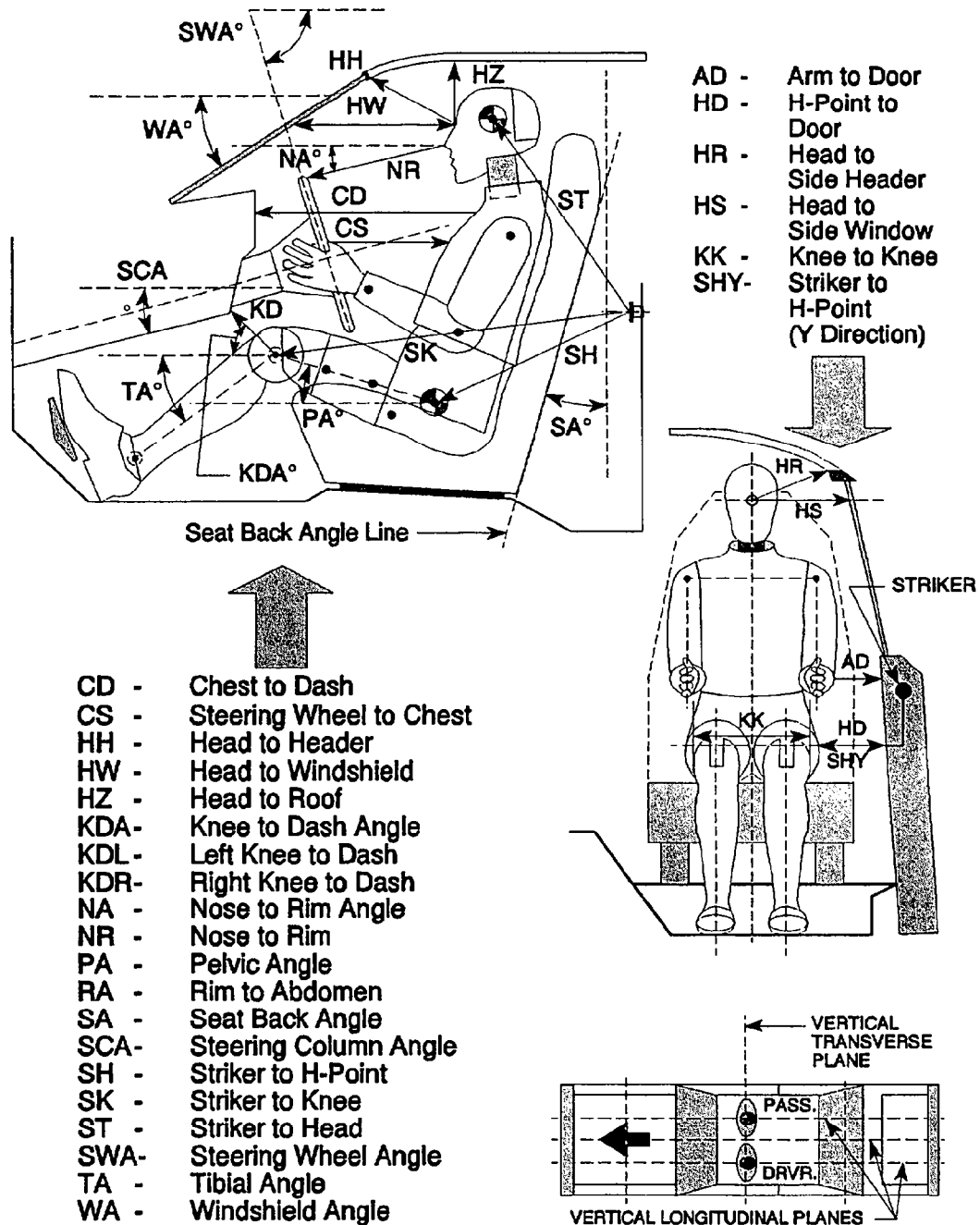


Table 4

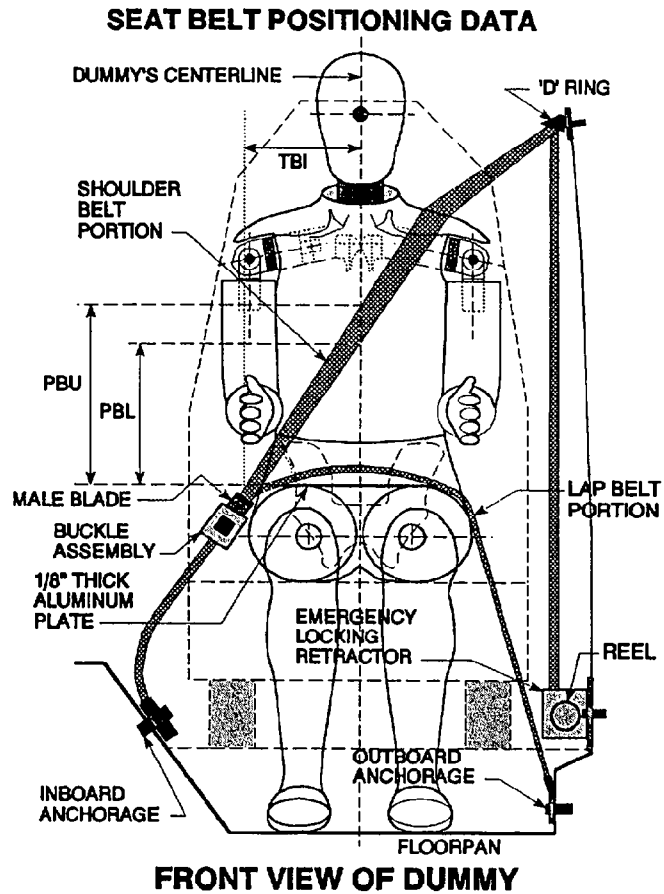
FRONT SEAT OCCUPANT MEASUREMENTS

	DRIVER (Serial #45)			PASS. (Serial # 150)		
WA°	25 deg.			N/A		
SWA°	68 deg.			N/A		
SCA°	22 deg.			N/A		
SA°	28 deg.			28 deg.		
HZ	170			160		
HH	285			285		
HW	555			545		
HR	195			198		
NR	367	Angle	10 deg.	N/A		
CD	503			475		
CS	308			N/A		
RA	188			N/A		
KDL	138	Angle (KDA)	35	140		
KDR	142			130	Angle (KDA)	40
PA°	24 deg.			24 deg.		
TA°	38 deg.			35 deg.		
KK	310			245		
ST	536	Angle	8 deg.	541	Angle	8 deg.
SK	594	Angle	92 deg.	594	Angle	90 deg.
SH	215	Angle	120 deg.	203	Angle	115 deg.
SHY	235			230		
HS	336			330		
HD	183			173		
AD	128			131		

All dimensions are in millimeters unless otherwise specified.

Figure 2

SEAT BELT POSITIONING DATA



	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	365	11.7
PBL-- Top surface of alum. plate to belt lower edge	260	8.5
<u>LAP BELT TENSION</u>	-	-
<u>SHOULDER BELT TENSION</u>	Retractor	Retractor

Table 5

SEAT BELT PERFORMANCE ASSESSMENT TEST DATABELT LENGTH DATA:

	<u>Driver</u>	<u>Passenger</u>
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	2030 mm	2080 mm
Shoulder belt length as measured on Part 572 Dummy.	740 mm	780 mm
Lap belt length as measured on Part 572 Dummy.	770 mm	780 mm

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis.	38 mm	40 mm
As determined mechanically.	42 mm	45 mm
As determined electronically.	45 mm	46 mm

BELT STRETCH DATA:

Measured electronically between shoulder belt load cell and the "D" ring.	7.7 mm/M	130 mm/M
Measured mechanically.	0.0	0.0

Figure 3

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 6.

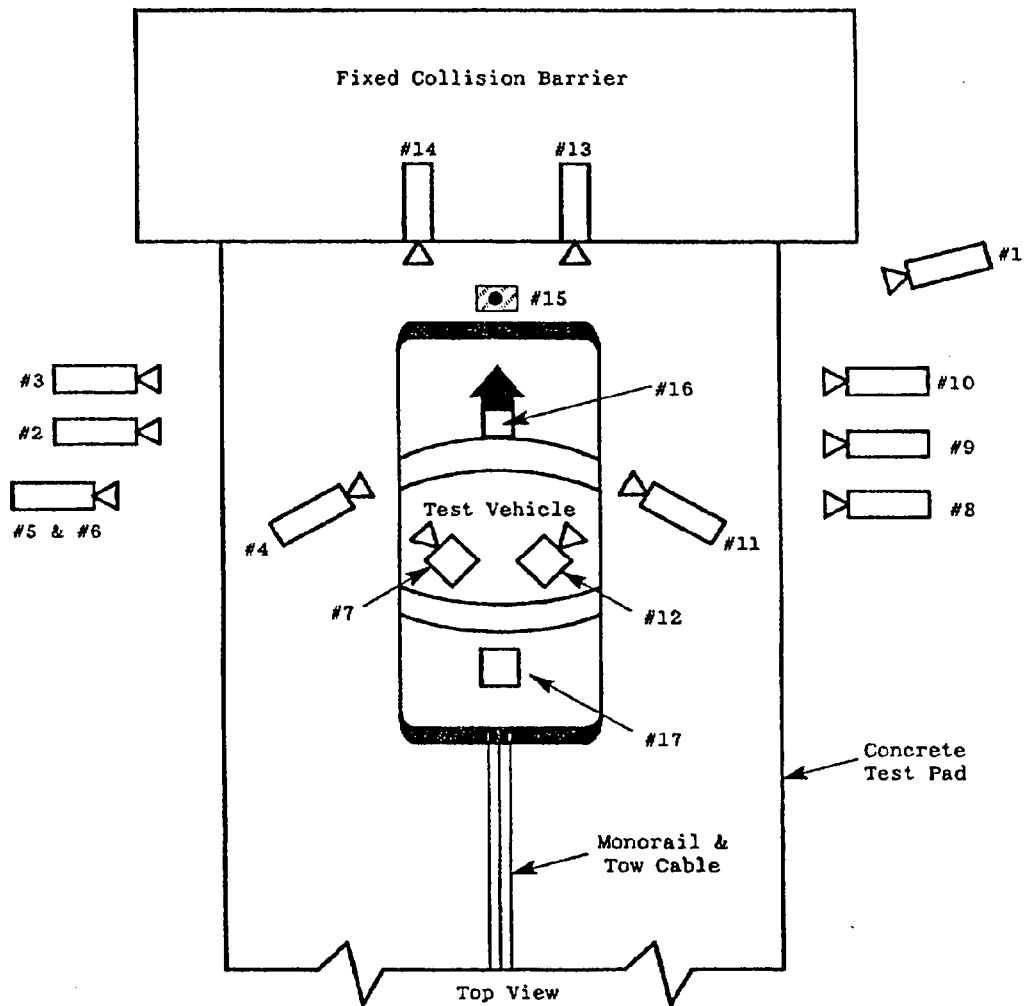


Table 6
HIGH-SPEED CAMERA LOCATIONS

Test No.	MS0107	Vehicle:	1995 Chevrolet Cavalier 4-Door Sedan					
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	6325	1651	1040	-2	5942	13	1010
3	Left Side View	8128	787	1040	-3	7745	25	1000
4	Driver and Interior View	2692	2870	1800	-16	-	13	970
5	Steering Column (Bottom)	7290	2007	1170	-3	6907	25	1110
6	Steering Column (Top)	7290	2007	1780	-8	6907	25	1110
7	Left Belt	-	-	-	-	-	8	600
8	Overall Right Side	6248	2032	1090	-2	5865	13	1060
9	Right Side View	8026	1575	1030	-2	7643	25	1040
10	Right Passenger View	7747	2006	1410	-4	7364	35	1080
11	Passenger and Interior View	2540	2896	1810	-21	-	13	1100
12	Right Belt	-	-	-	-	-	8	N.T.
13	Passenger Front View	560	127	1778	-35	-	13	1010
14	Driver Front View	560	127	1778	-35	-	13	1010
15	Windshield View	0	0	3048	-45	-	13	1060
16	Pit View of Engine	0	505	-3048	90	-	13	910
17	Pit View of Fuel Tank	0	3432	-3048	90	-	13	950

*X = film plane to monorail centerline
 Y = film plane to impact location
 Z = film plane to ground
 ** = referenced to horizontal plane
 N.T. indicates No Timing

Figure 4

VEHICLE TARGET LOCATIONS

(Dimensions in millimeters)

A	307
B	487
C	1220
D	1497
E	254
F	1470
G	872
H	870
I	95
J	1465
K	965
L	1263
M	254
N	103
O	865
P	875
Q	1263
R	968
S	1454

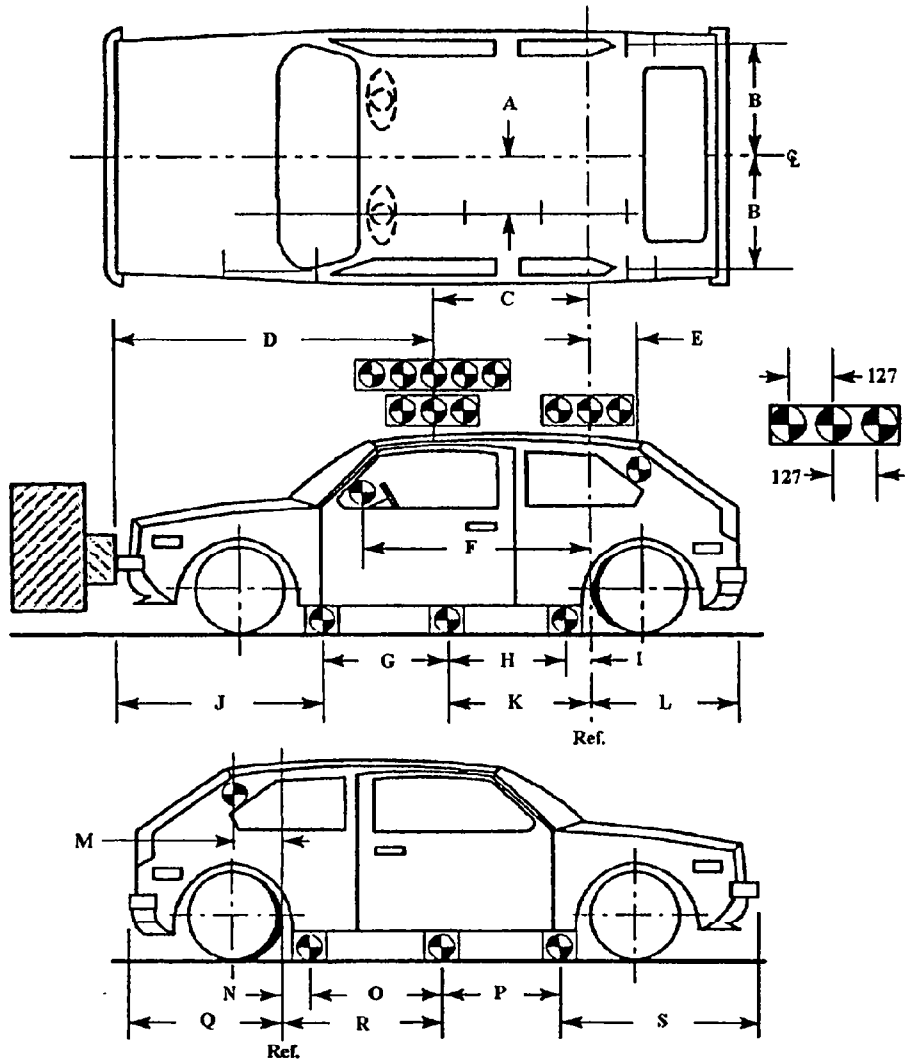
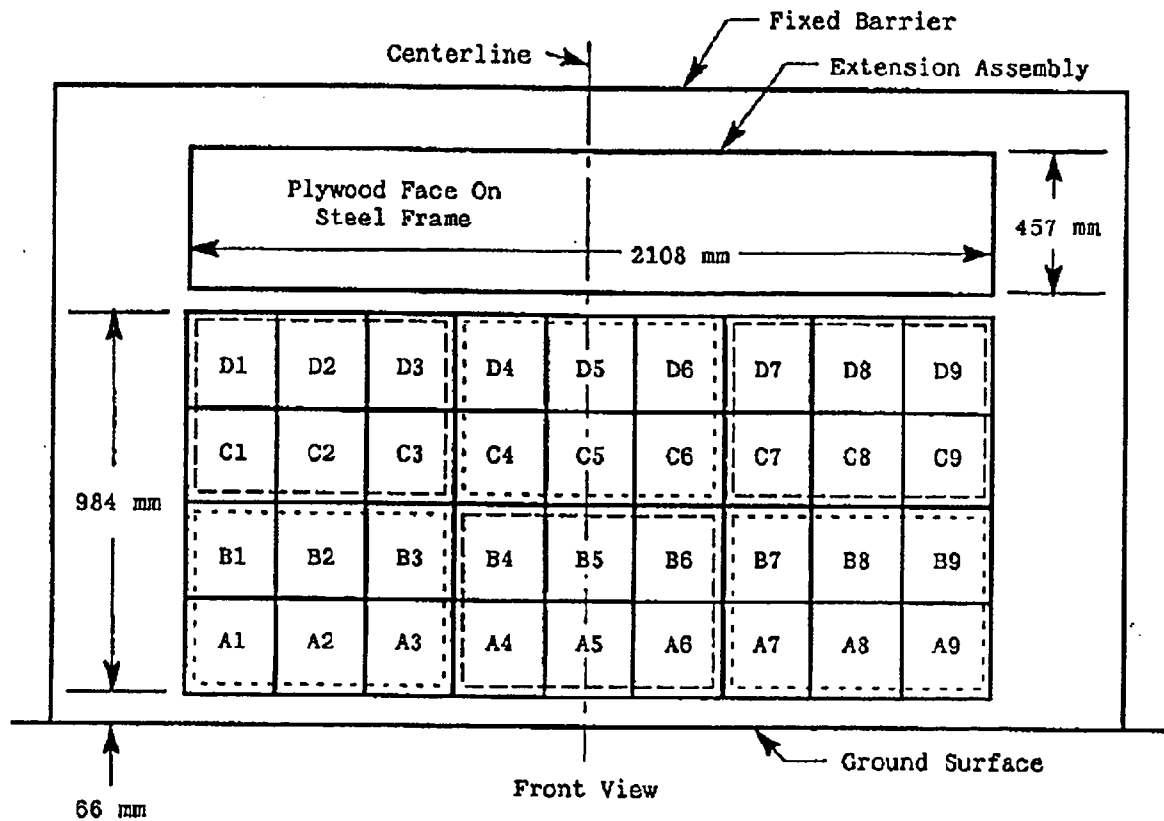


Figure 5

LOAD CELL LOCATIONS ON FIXED BARRIER

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



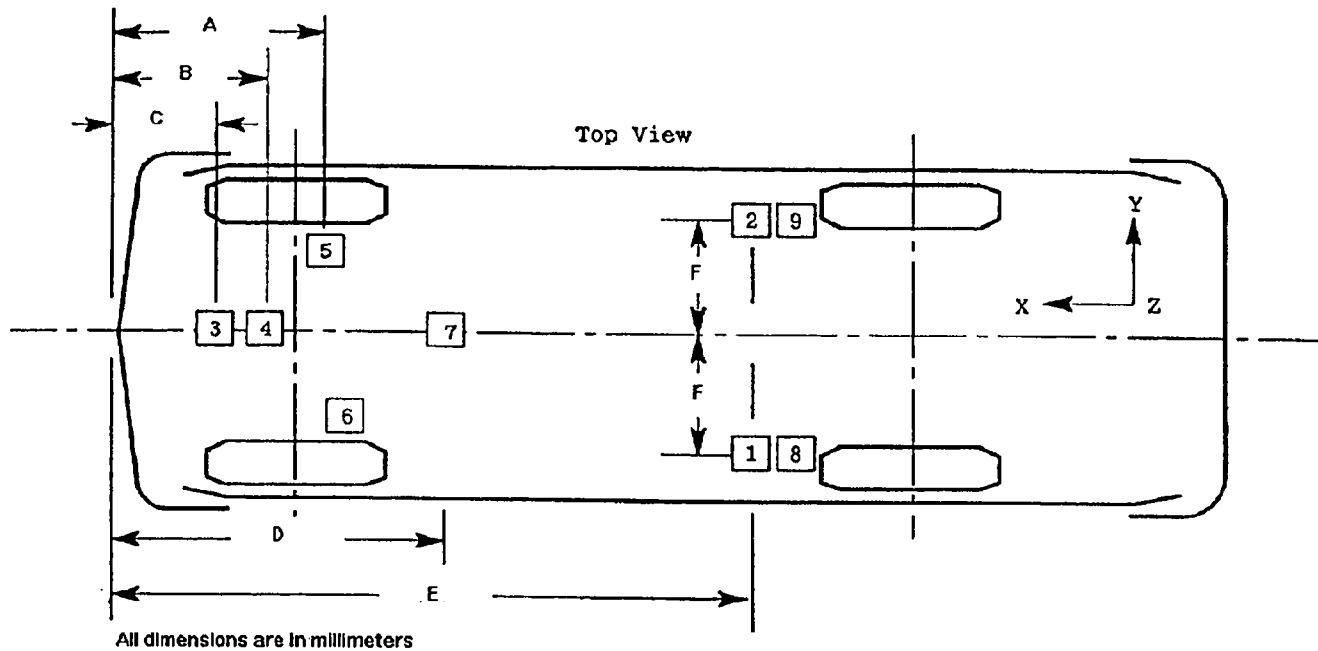
6 GROUPS OF 6 LOAD CELLS EACH

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

The following data is presented in Appendix B:

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

Figure 6

VEHICLE ACCELEROMETER LOCATIONS

ACCELEROMETER NUMBER*	ACCELEROMETER LOCATION	Distances From Vehicle Front	
		All dimensions in millimeters	
1	Left Rear Seat Crossmember [E/F]	X = 2827	Y = 370
2	Right Rear Seat Crossmember [E/F]	X = 2827	Y = 370
3	Top of engine [C]	780	
4	Bottom of engine [B]	N/A	
5	Right Disc Brake Caliper [A]	1048	
6	Left Disc Brake Caliper [A]	1067	
7	Instrument Panel [D]	1803	
8	Left Rear Seat Crossmember [E/F]	X = 2820	Y = 470
9	Right Rear Seat Crossmember [E/F]	X = 2831	Y = 470

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

Figure 7

TEST VEHICLE MEASUREMENTS

REAR DATUM REFERENCE

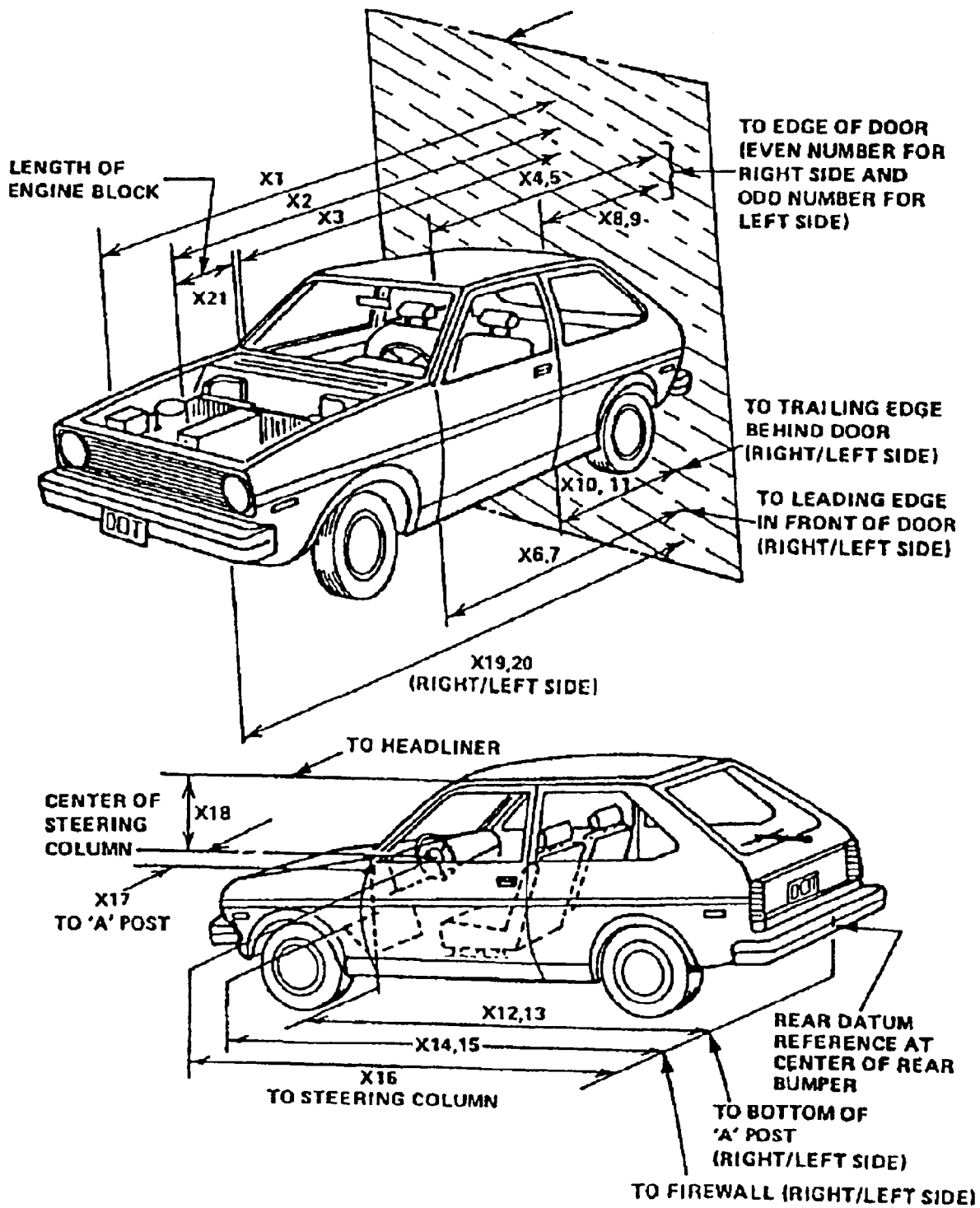


Table 7

VEHICLE MEASUREMENTS

No.		All Dimensions in mm		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	4565	4020	545
X2	Rear Surface of Vehicle to Front of Engine	3833	3590	243
X3	Rear Surface of Vehicle to Firewall	3450	3285	165
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3052	3052	0
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3050	3035	15
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3054	3038	16
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3048	3025	23
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2011	2005	6
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2013	2005	8
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2014	1998	16
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2008	1992	16
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3001	2995	6
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	2997	2979	18
X14	Rear Surface of Vehicle to Firewall, Right Side	3430	3265	165
X15	Rear Surface of Vehicle to Firewall, Left Side	3475	3360	115
X16	Rear Surface of Vehicle to Steering Column	2585	2583	2
X17	Center of Steering Column to "A" Post	375	375	0
X18	Center of Steering Column to Headliner	420	355	65
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4400	3970	430
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4400	3990	410
X21	Length of Engine Block	450	450	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2735	2692	43
CD	Rear Surface of Vehicle to Center of Dash Panel	2740	2703	37
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2750	2758	-8

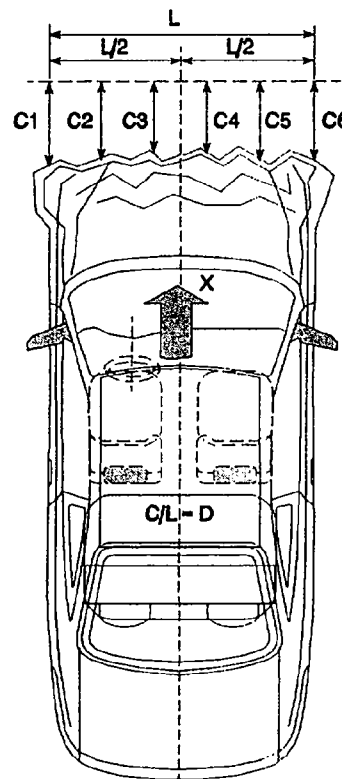
Table 8

ACCIDENT INVESTIGATION DIVISION DATA
FOR 56.3 KPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Chevrolet Cavalier 4-Door Sedan
 Vehicle NHTSA No.: MS0107 VIN: 1G1JC5243S7115672
 Model Year: 1995 Build Date: 1/95 Test Date: February 17, 1995
 Vehicle Size Category: Mid Size Test Weight: 1433 Kgs
 Vehicle Wheelbase: 2636 mm; Front Overhang: 1460 mm; Overall Width: 1545 mm
 Collision Deformation Classification (CDC) Code: 12FDEW2

Crush Depth Dimensions:

C1 = 350 mm
 C2 = 510 mm
 C3 = 550 mm
 C4 = 566 mm
 C5 = 500 mm
 C6 = 390 mm



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

Longitude Length of Damaged Region: L = 1545 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 20 mm molding.

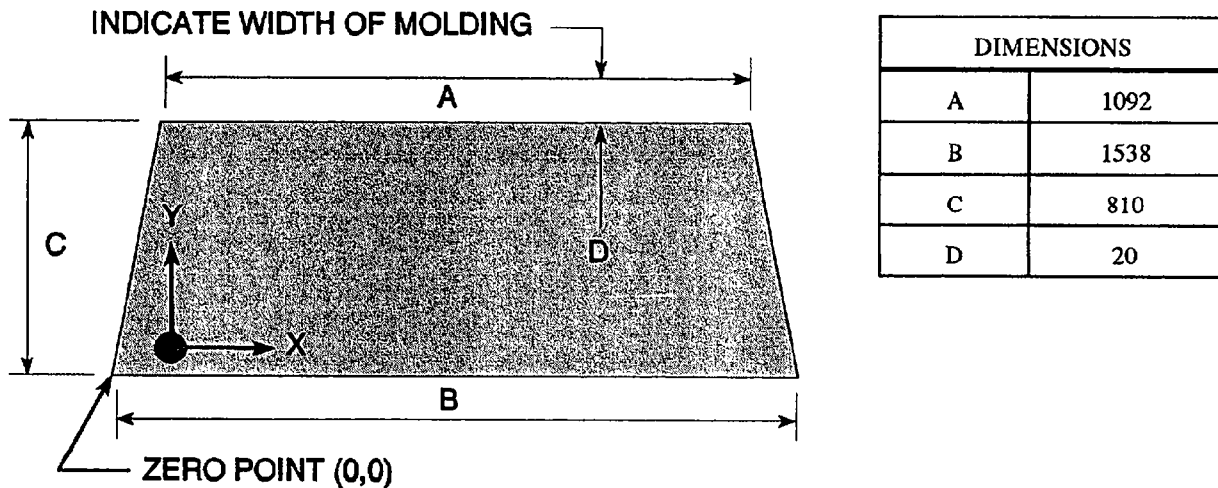
FMVSS 212 REQUIREMENTS:

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	2125	2125	100
LEFT SIDE	2125	2125	100
TOTAL	4,250	4,250	100

AREA OF RETENTION FAILURE:



FRONT VIEW OF WINDSHIELD

FAILURE DETAILS: None

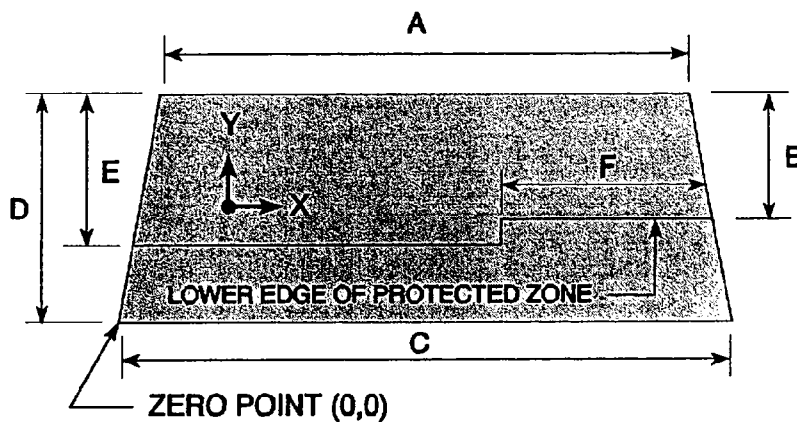
Figure 9

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

PROTECTED ZONE LOWER EDGE REQUIREMENT:

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

FMVSS 219 TEST DATA: (Dimensions in mm)



DIMENSIONS (mm)	
A	1092
B	495
C	1538
D	810
E	565
F	620

FRONT VIEW OF WINDSHIELD

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

(Show location of penetration on the above sketch)

	COORDINATES	
	X	Y
1.		
2.		
3.		
4.		

Table 9

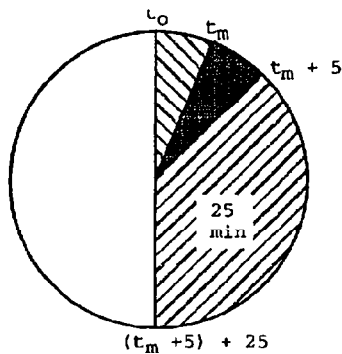
FMVSS NO. 301-75 "FUEL SYSTEM INTEGRITY" POST IMPACT TEST DATA

TEST VEHICLE NHTSA No.: MS0107 TEST DATE: February 17, 1995
VEHICLE MAKE/MODEL: 1995 Chevrolet Cavalier

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

=====

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

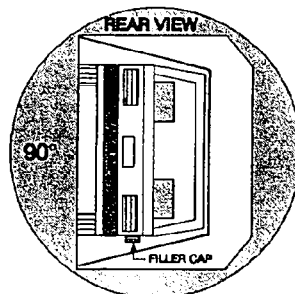
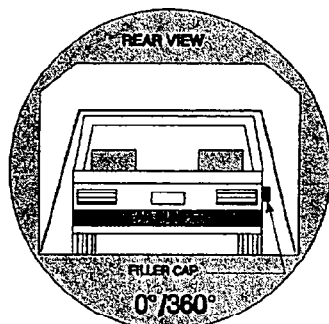
FUEL SPILLAGE MEASUREMENT:

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

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

SOLVENT SPILLAGE DETAILS: None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:Vehicle NHTSA ID No.
MS0107I. 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 secondsII. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

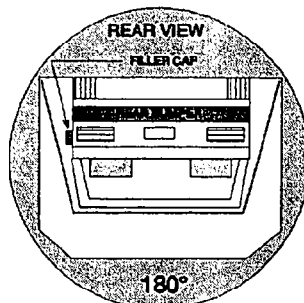
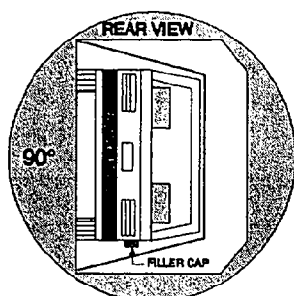
0	0	0	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET**TEST PHASE:**Vehicle NHTSA ID No.
MS0107**I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:**Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)2 minutes 40 seconds

FMVSS 301 Position Hold Time +

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

Next whole minute interval

8 minutes 00 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:

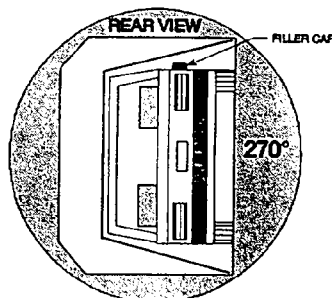
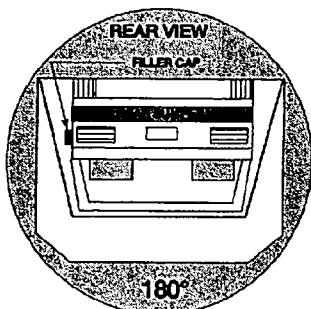
0	0	0	0
---	---	---	---

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 SHEETTEST PHASE:Vehicle NHTSA ID No.
MS0107I. 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 secondsII. FMVSS 301 REQUIREMENTS:(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

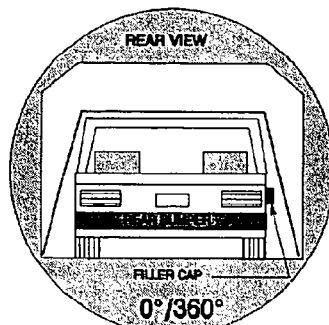
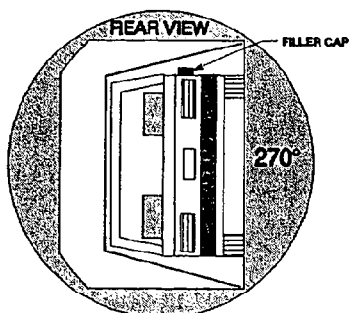
0	0	0	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:Vehicle NHTSA ID No.
MS0107I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)

2	minutes	20	seconds
---	---------	----	---------

FMVSS 301 Position Hold Time +

5	minutes	00	seconds
---	---------	----	---------

TOTAL

7	minutes	20	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

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A-3

8227-12

Figure A-1 LOAD CELL LOCATIONS

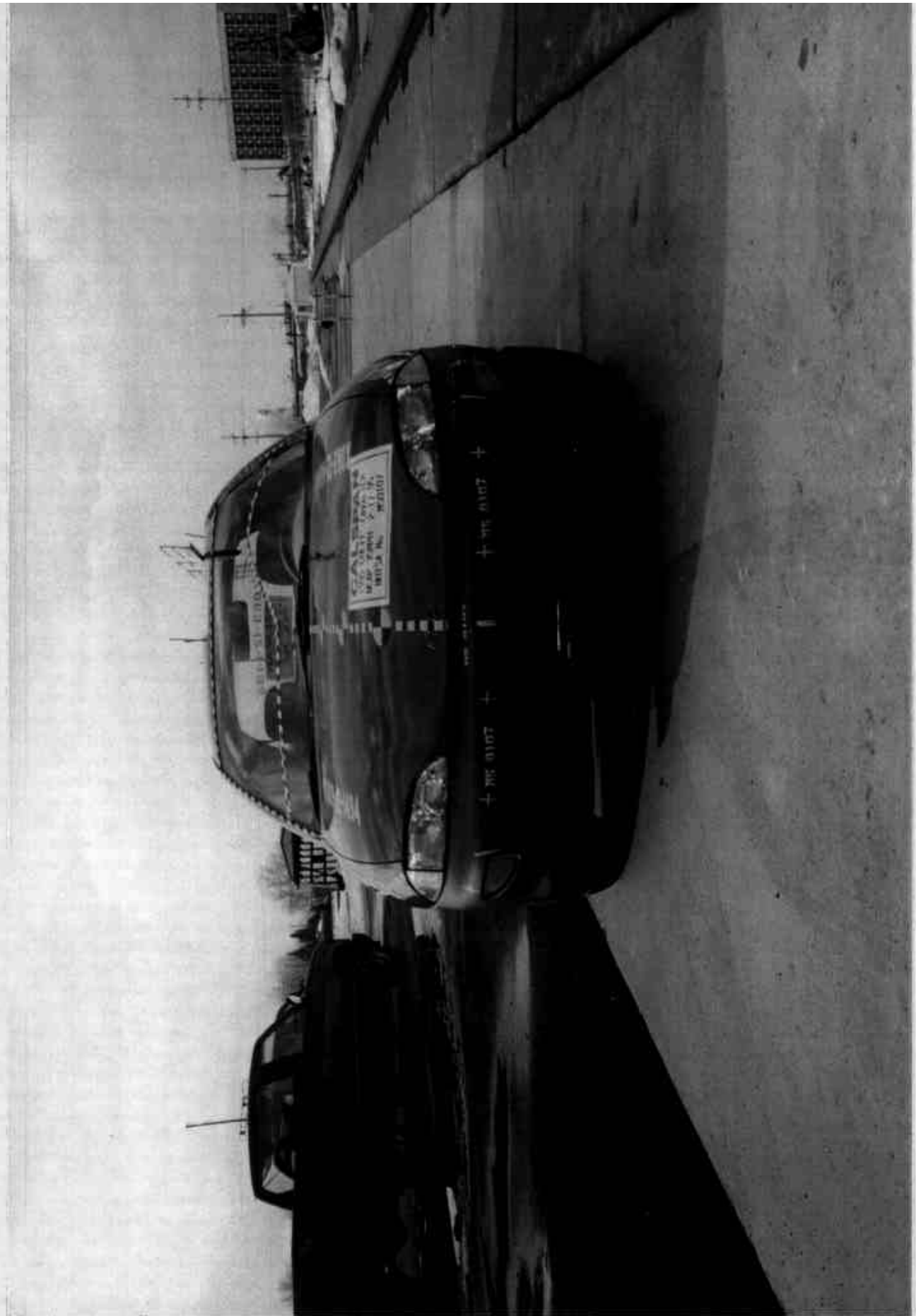


Figure A-2 PRE-TEST FRONT VIEW



Figure A-3 POST-TEST FRONT VIEW



Figure A-4 PRE-TEST LEFT SIDE VIEW



Figure A-5 POST-TEST LEFT SIDE VIEW

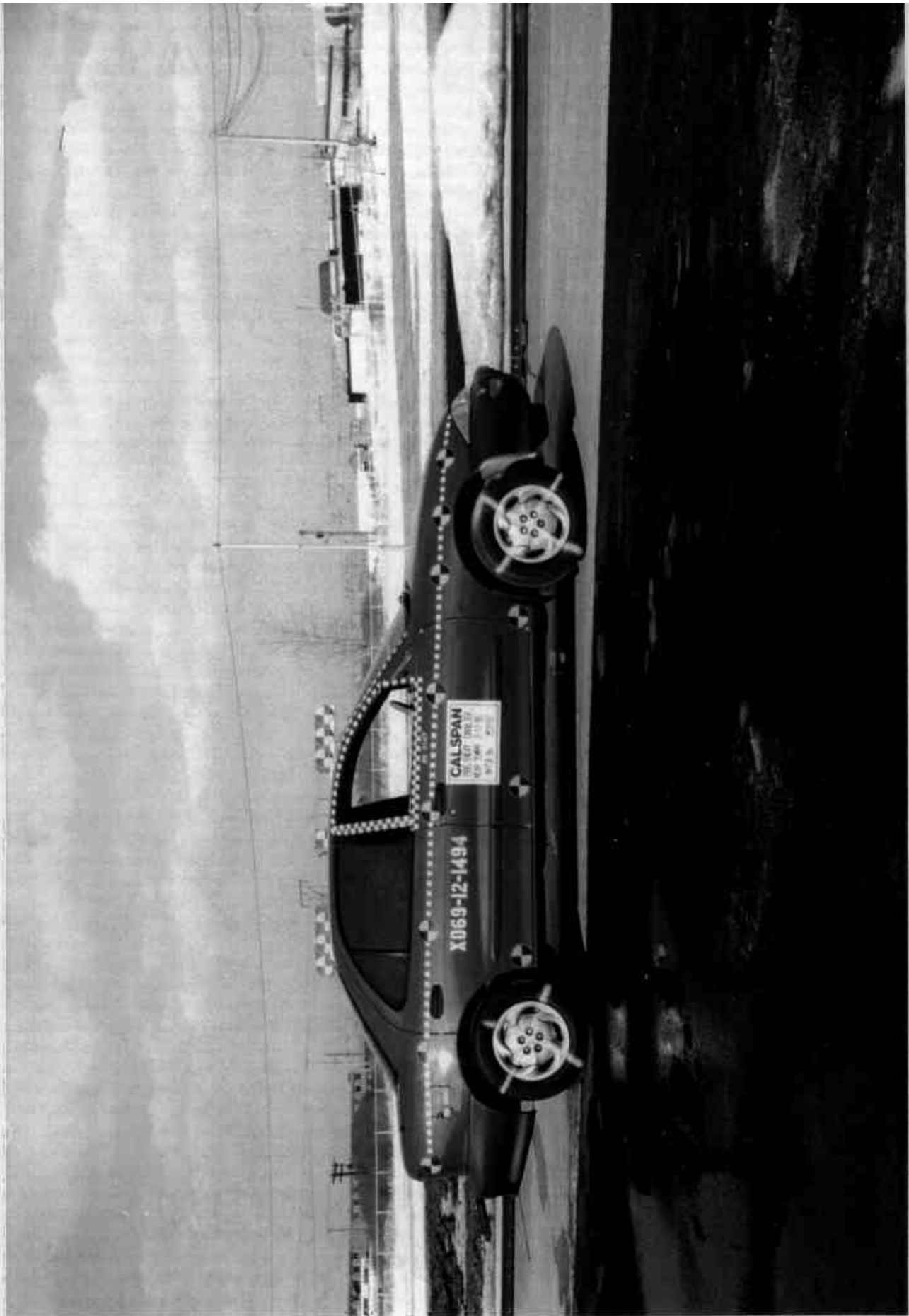


Figure A-6 PRE-TEST RIGHT SIDE VIEW

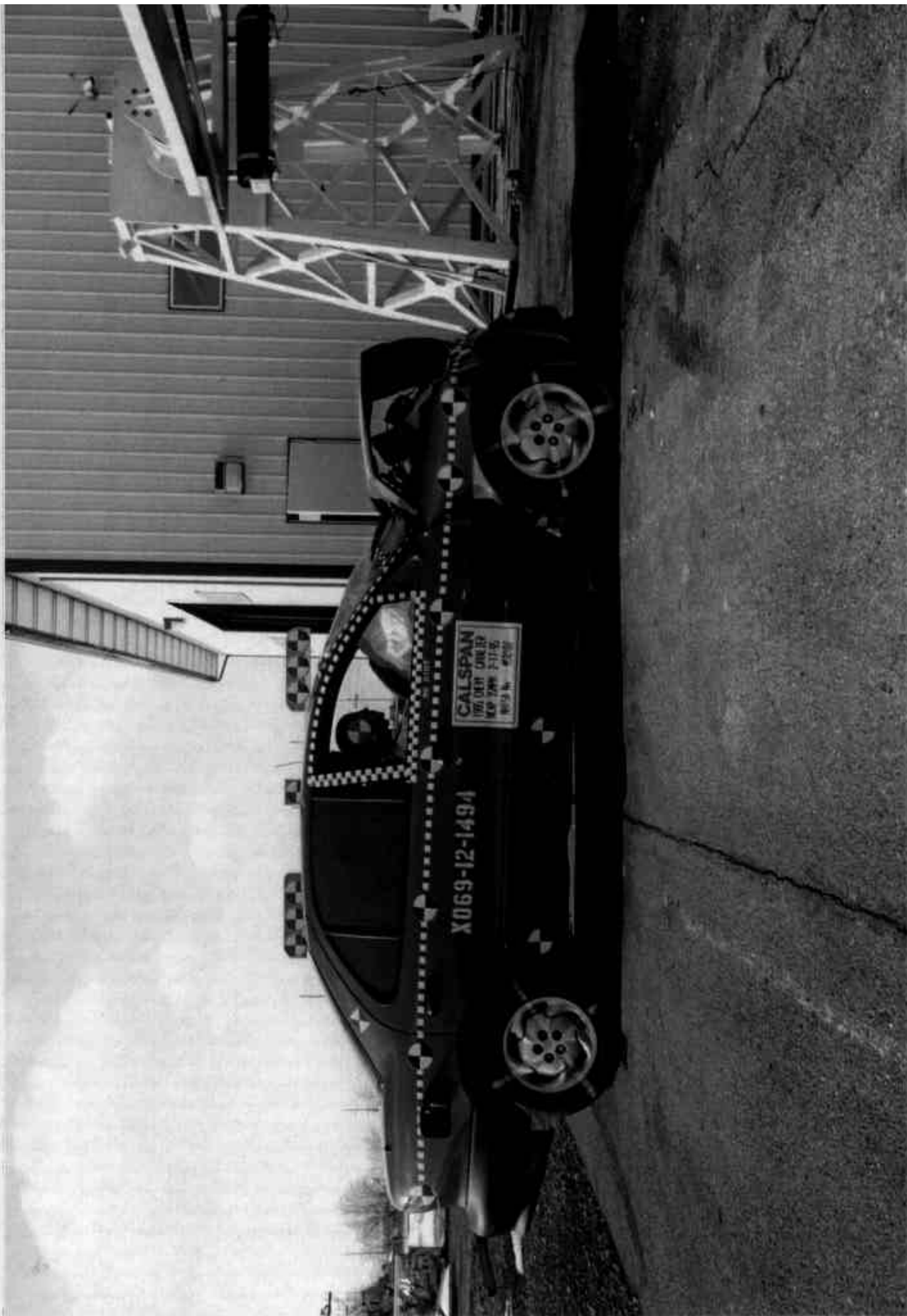


Figure A-7 POST-TEST RIGHT SIDE VIEW



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



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



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

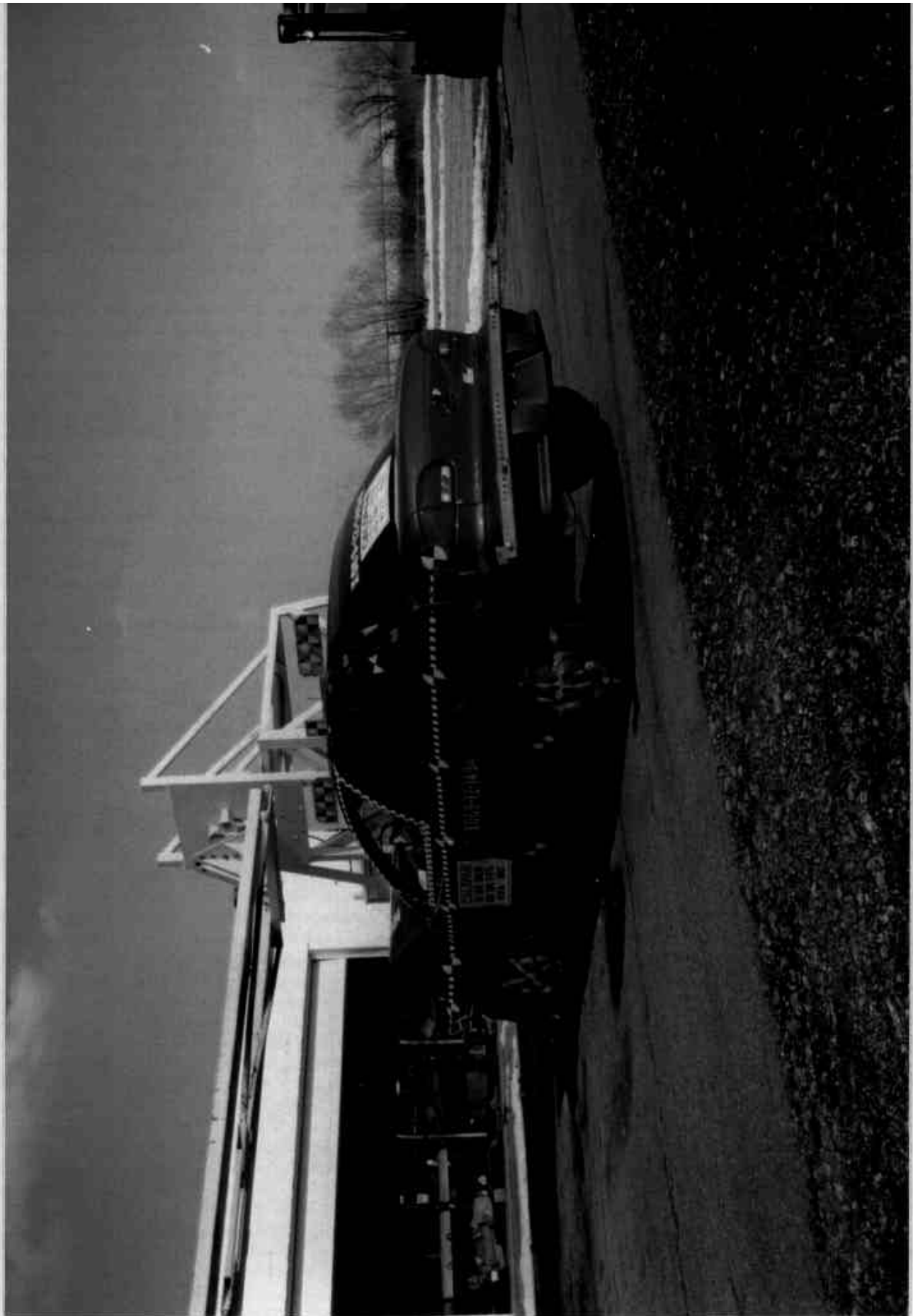


Figure A-11 POST-TEST LEFT REAR THREE-QUARTER VIEW

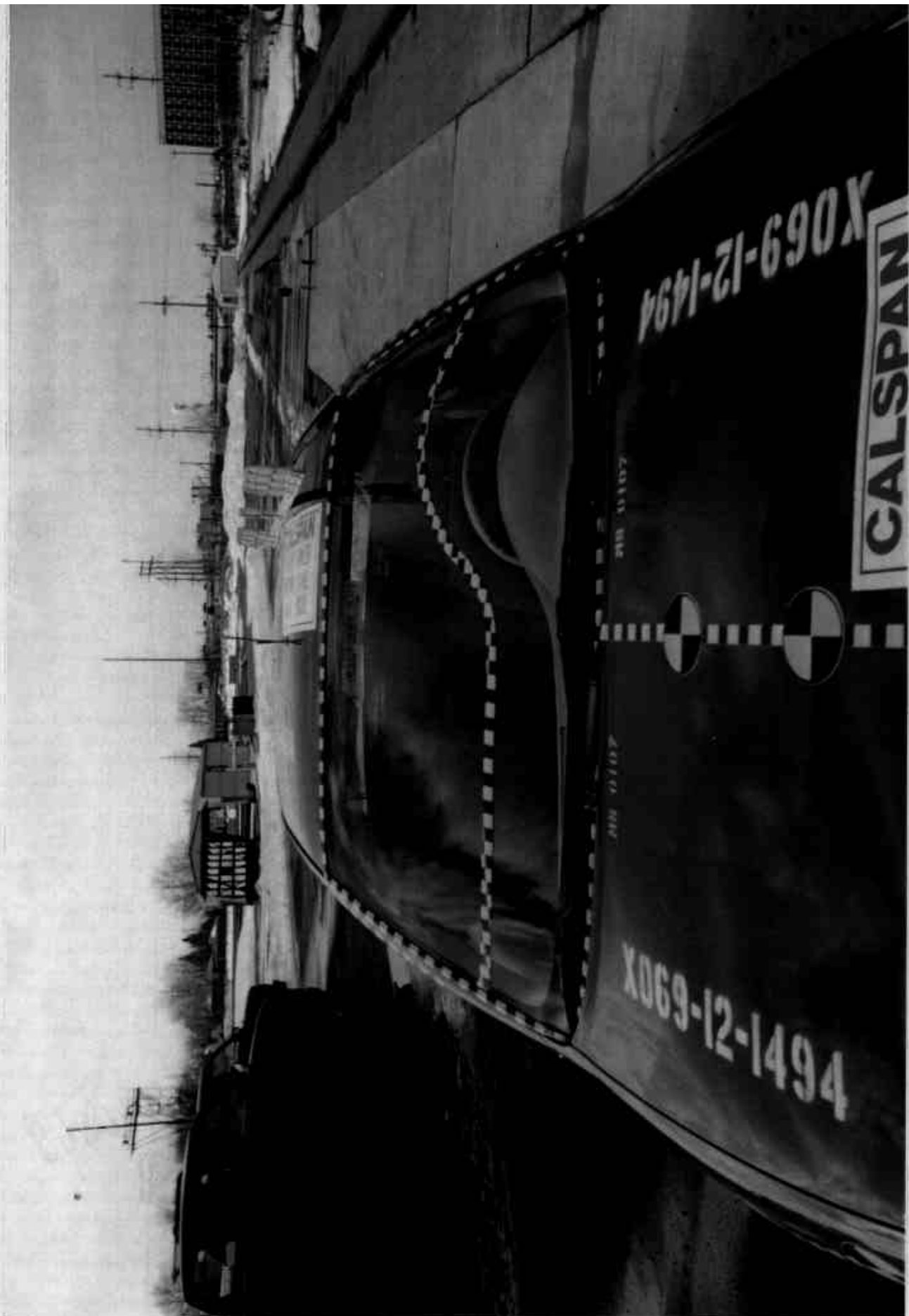


Figure A-12 PRE-TEST WINDSHIELD VIEW



Figure A-13 POST-TEST WINDSHIELD VIEW



Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-15 FUEL FILLER CAP



Figure A-16 PRE-TEST FRONT UNDERBODY VIEW



Figure A-17 POST-TEST FRONT UNDERBODY VIEW



Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

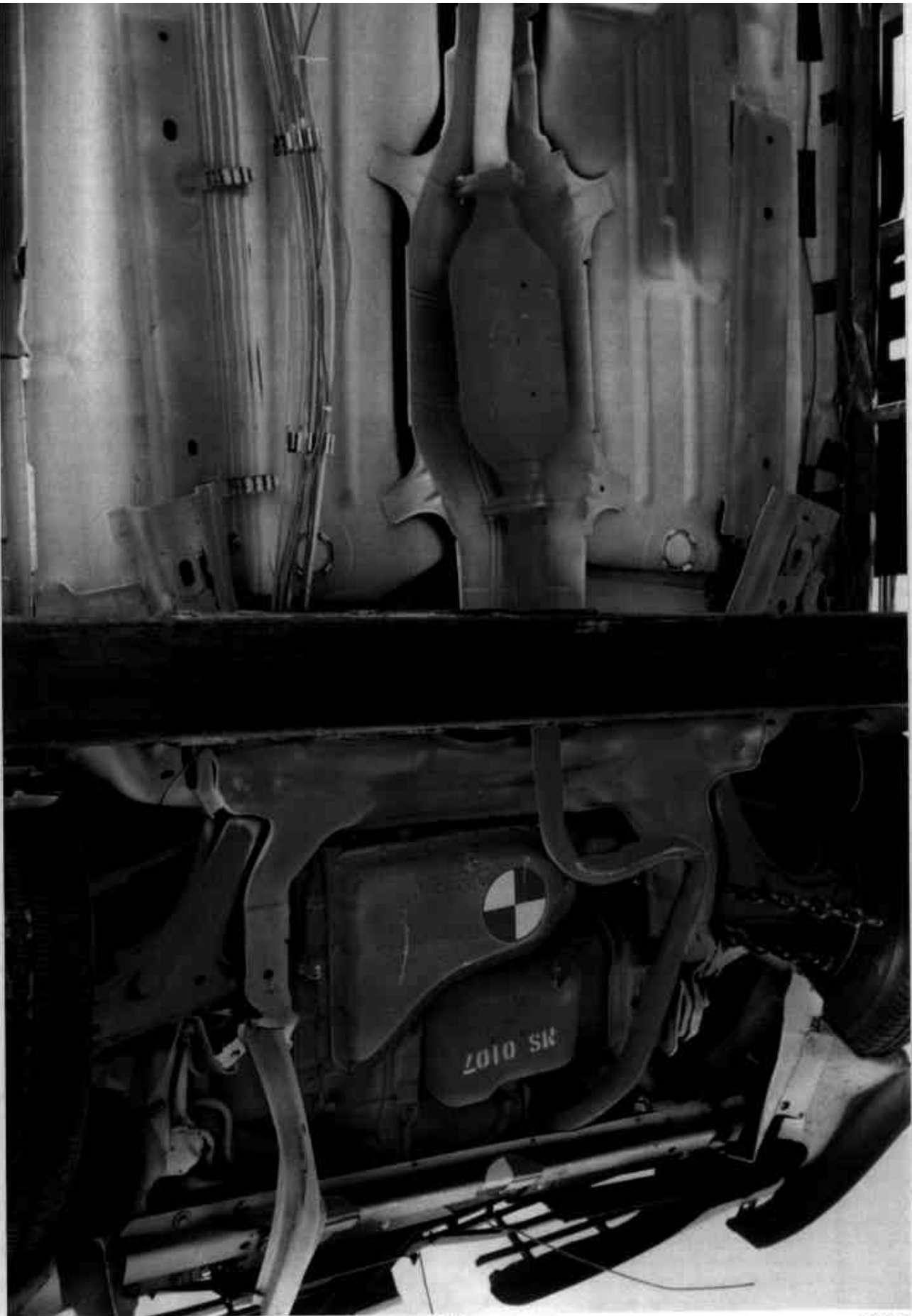


Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW



Figure A-20 PRE-TEST REAR UNDERBODY VIEW



Figure A-21 POST-TEST REAR UNDERBODY VIEW



Figure A-22 PRE-TEST DRIVER POSITION VIEW



Figure A-23 POST-TEST DRIVER POSITION VIEW



Figure A-24 PRE-TEST PASSENGER POSITION VIEW

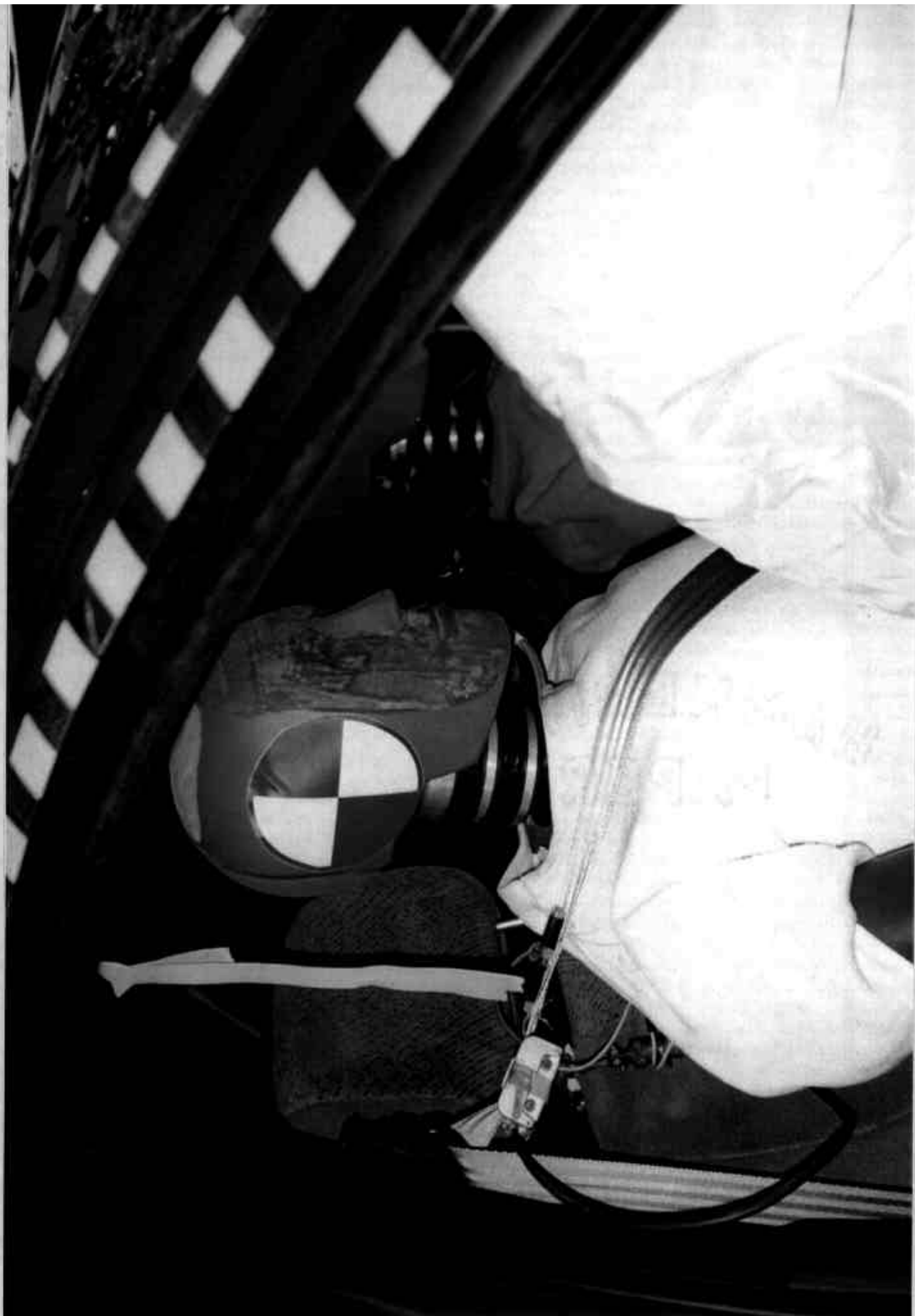


Figure A-25 POST-TEST PASSENGER POSITION VIEW



Figure A-26 PRE-TEST DRIVER DUMMY AND INTERIOR VIEW



Figure A-27 POST-TEST DRIVER DUMMY AND INTERIOR VIEW
A-29



Figure A-28 PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW



Figure A-29 POST-TEST PASSENGER DUMMY AND INTERIOR VIEW
A-31

8227-12



Figure A-30 PRE-TEST DRIVER HEAD LOCATION



Figure A-31 PRE-TEST PASSENGER HEAD LOCATION

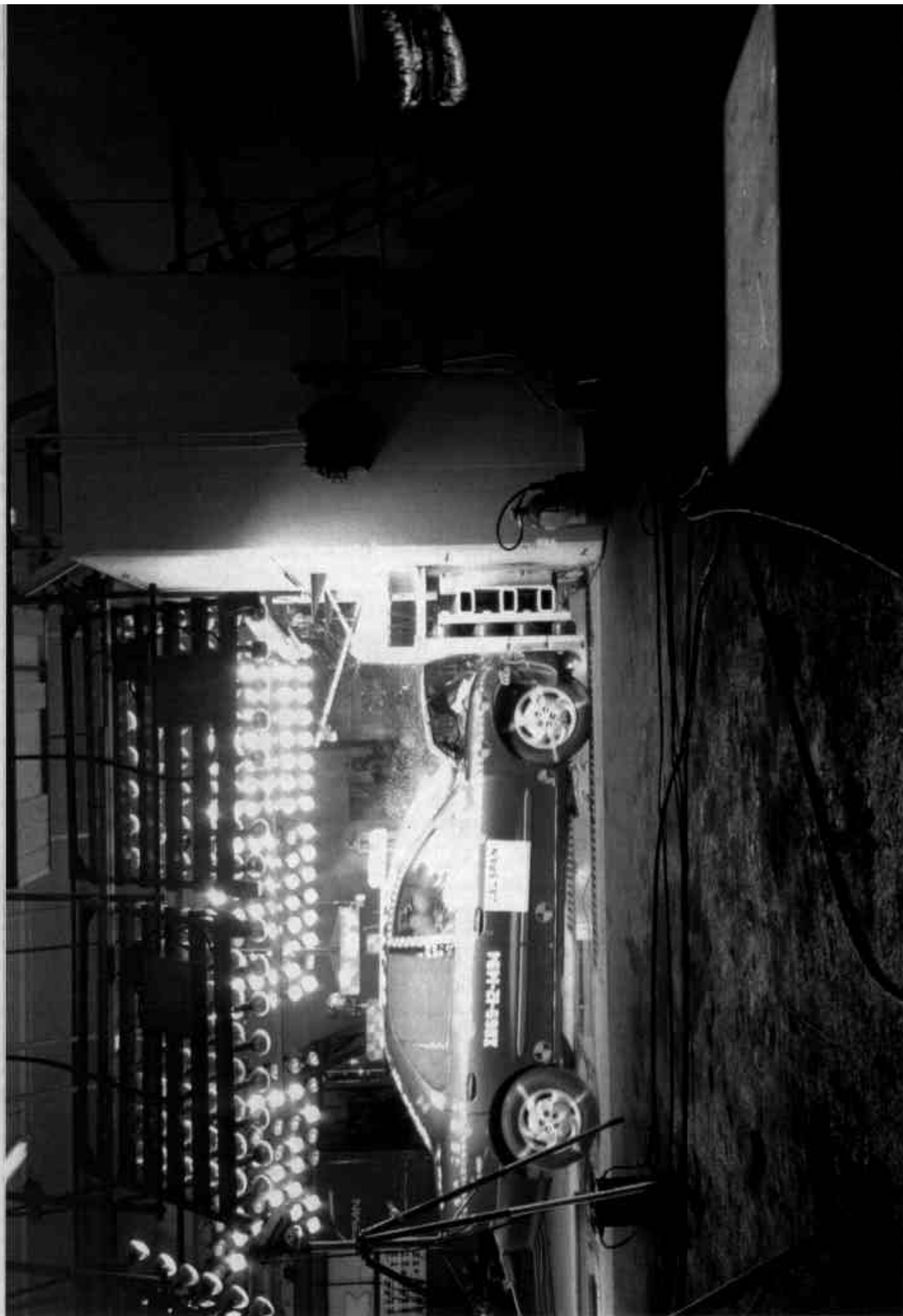


Figure A-32 VEHICLE IMPACT

Appendix B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

TEST NO. MS0107

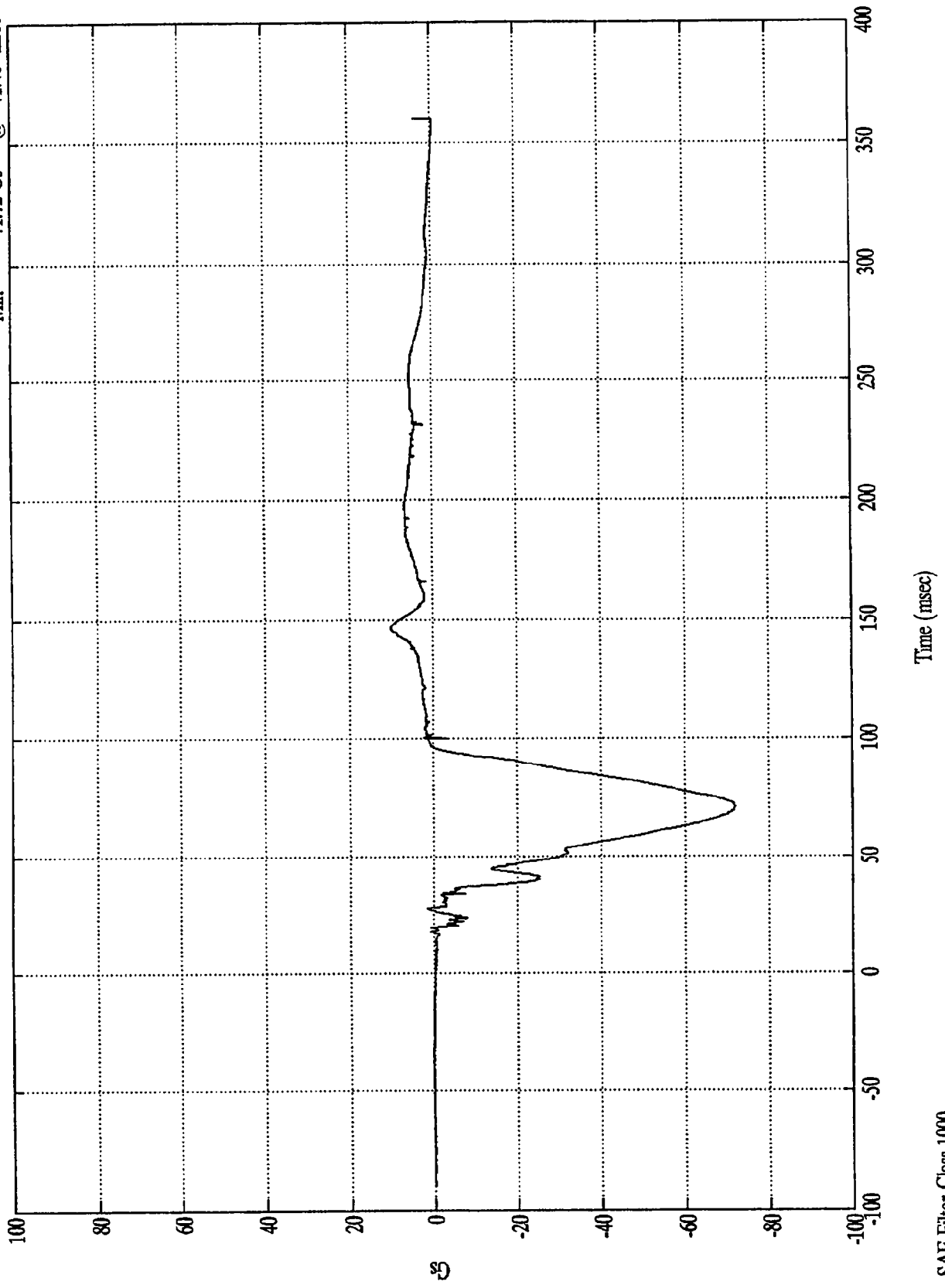
DUMMY DATA

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 #12 - 1995 CHEVROLET CAVALIER

Max = 10.02 Gs @ 147.48 msec
Min = -71.72 Gs @ 71.40 msec

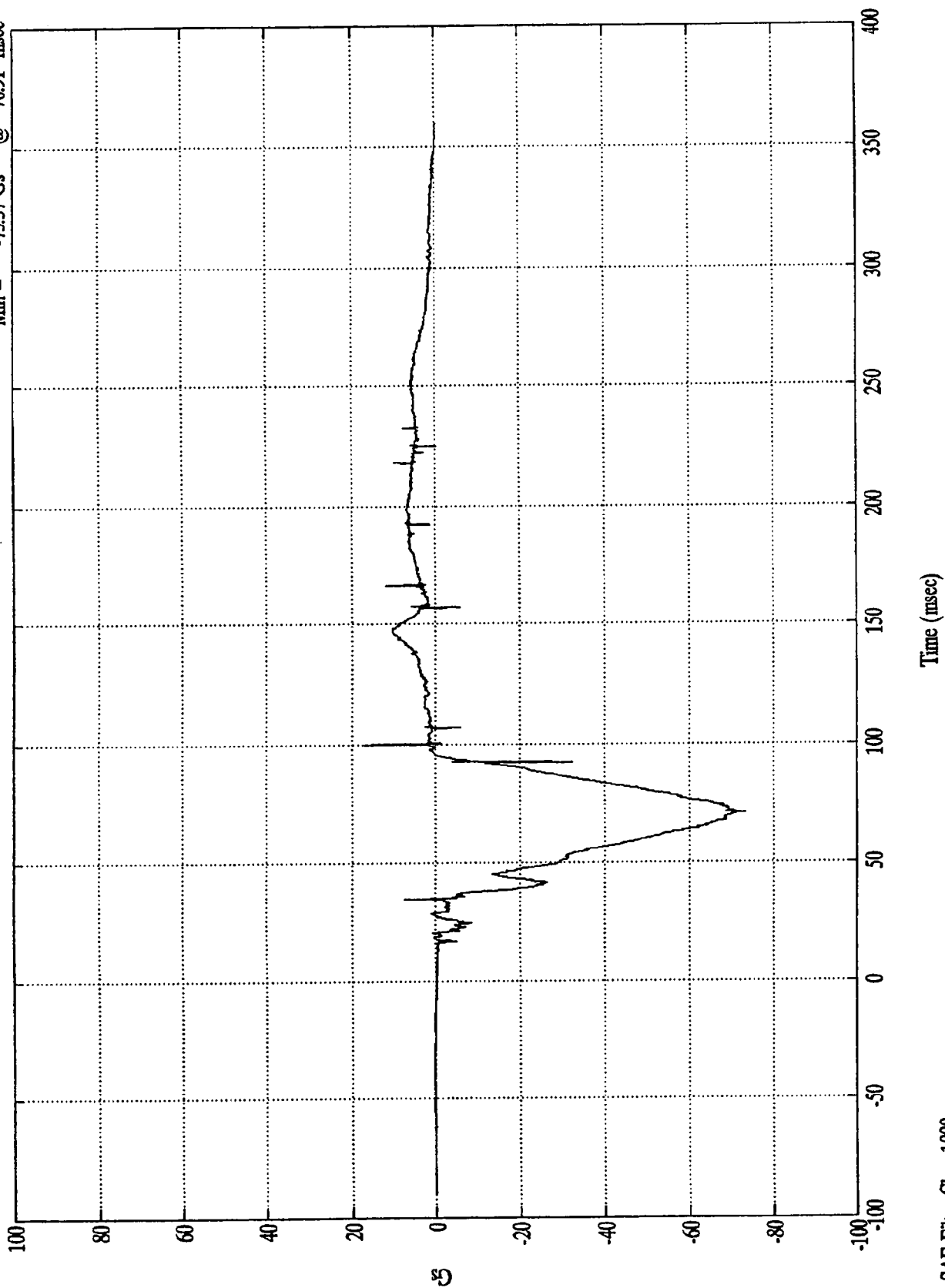
Pos. 1 Head X



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Head X(R)

Max = 16.97 Gs @ 100.08 msec
Min = -73.37 Gs @ 70.91 msec



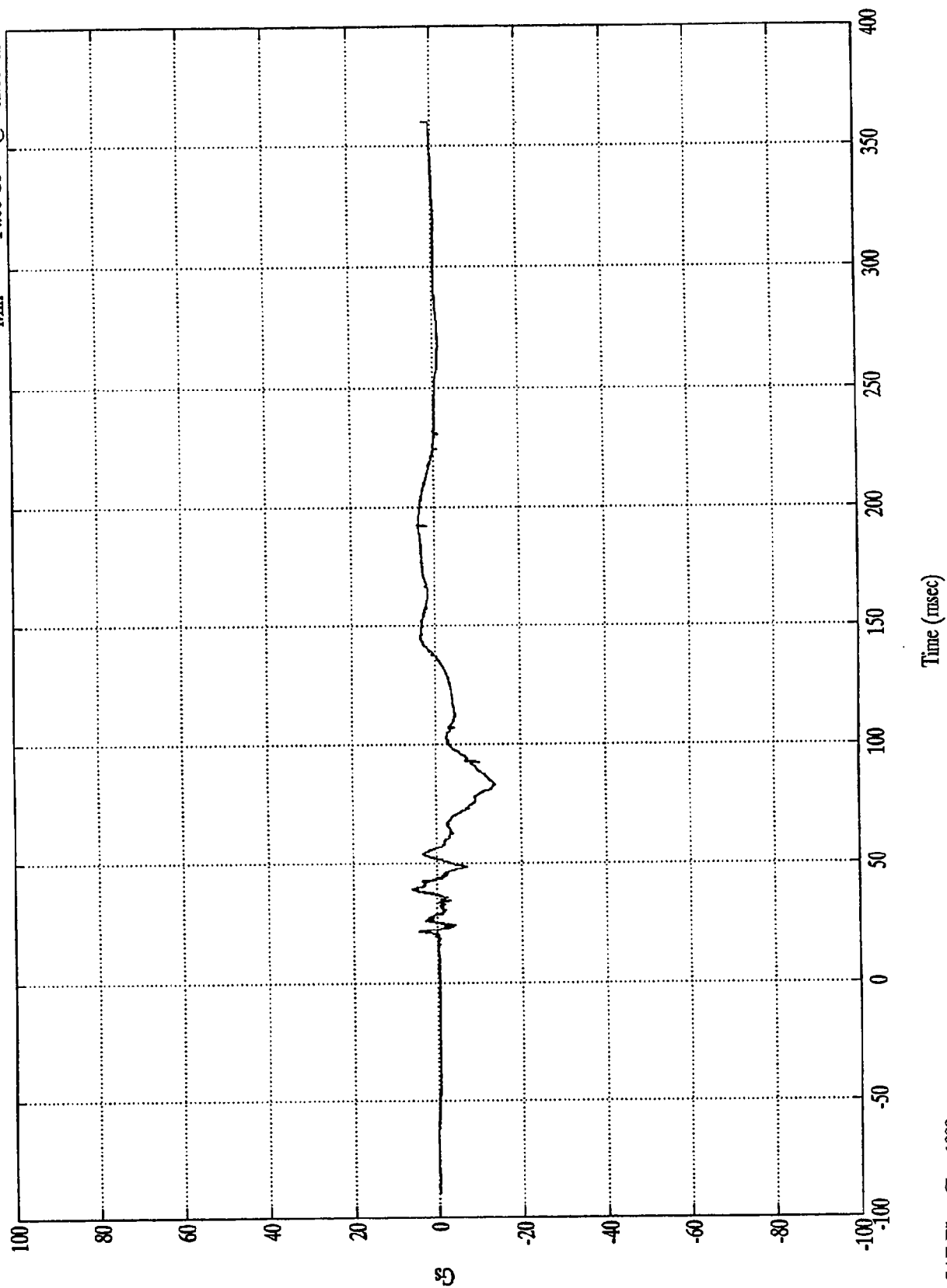
SAE Filter Class 1000

8227-12

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Head Y

Max = 5.97 Gs @ 39.23 msec
Min = -14.00 Gs @ 82.80 msec

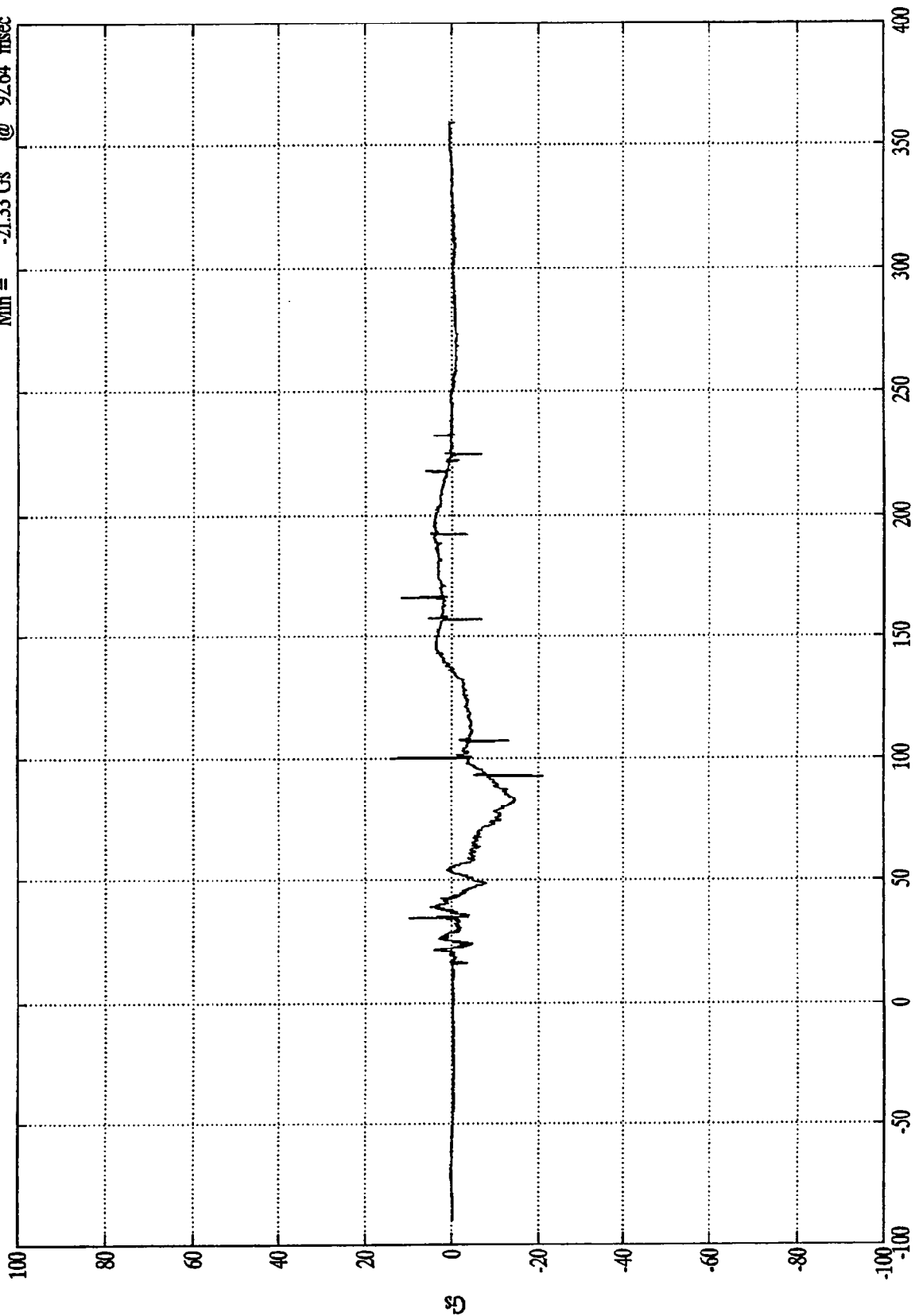


SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Head Y(R)

Max = 13.99 Gs @ 100.08 msec
Min = -21.33 Gs @ 92.64 msec

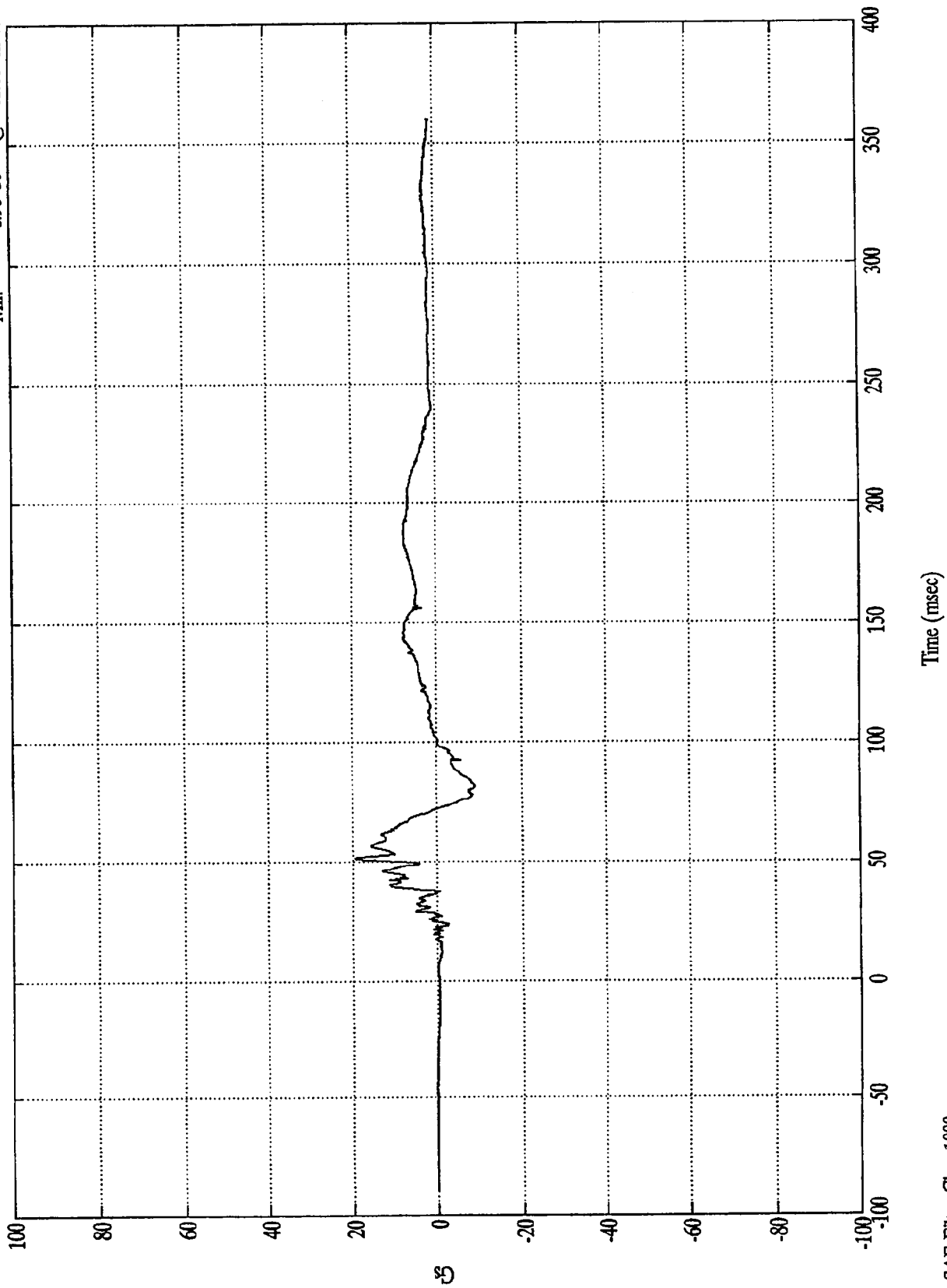


Time (msec)

SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Head Z
 Max = 19.47 Gs @ 51.72 msec
 Min = -8.98 Gs @ 81.60 msec

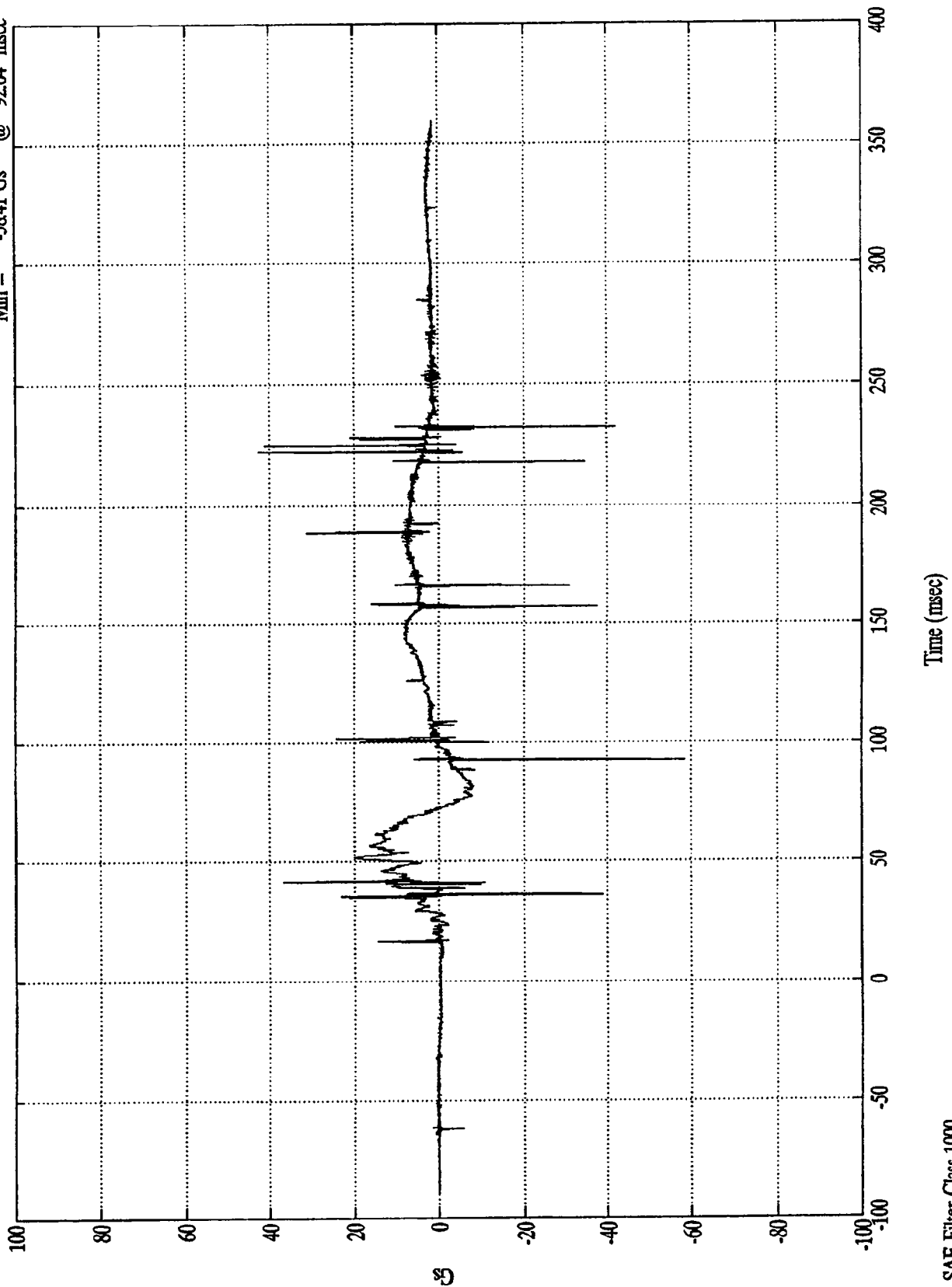


SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Head Z(R)

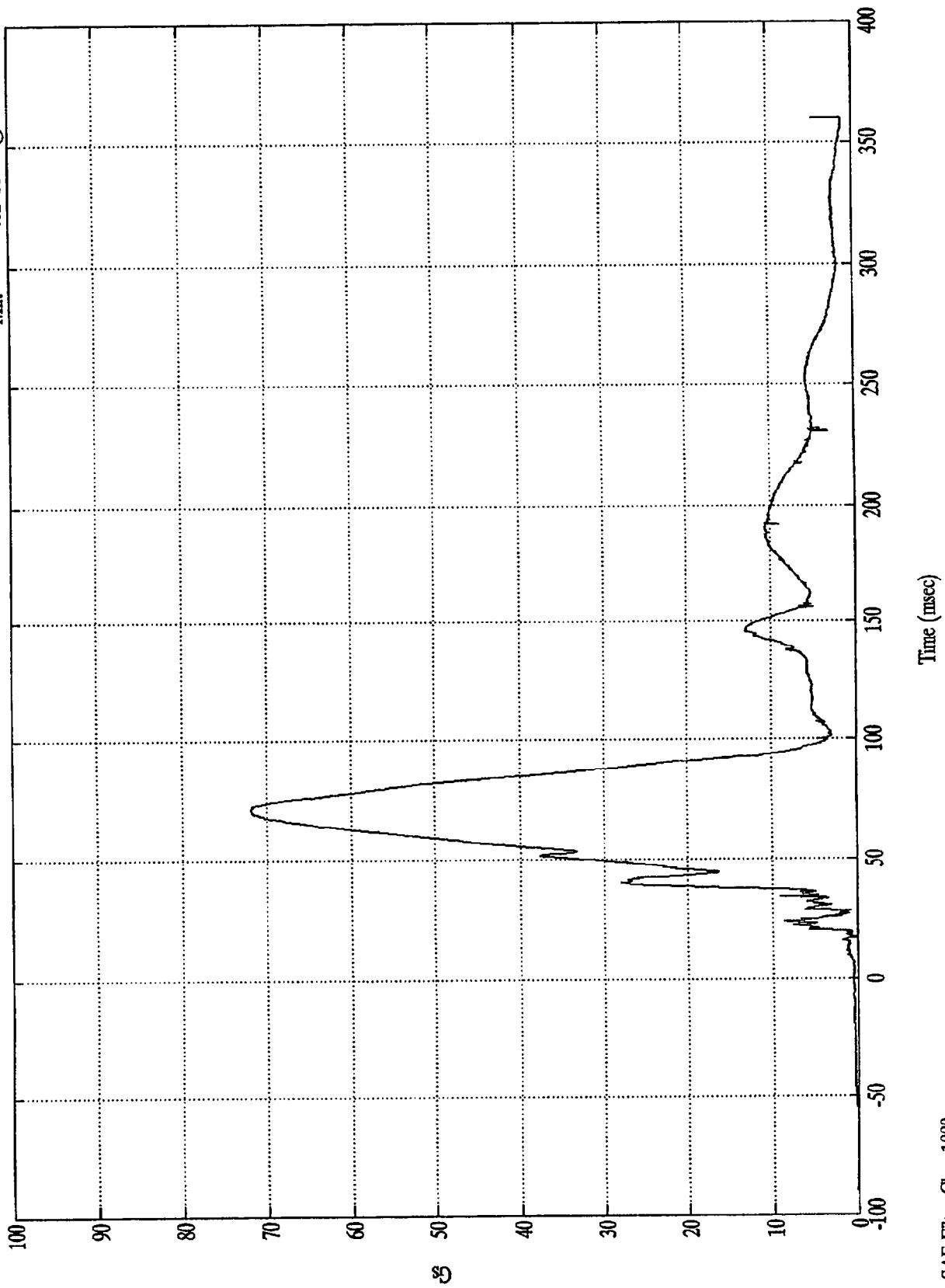
Max = 42.83 Gs @ 222.11 msec
Min = -58.41 Gs @ 92.64 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 71.96 Gs @ 71.40 msec
Min = .02 Gs @ -57.00 msec

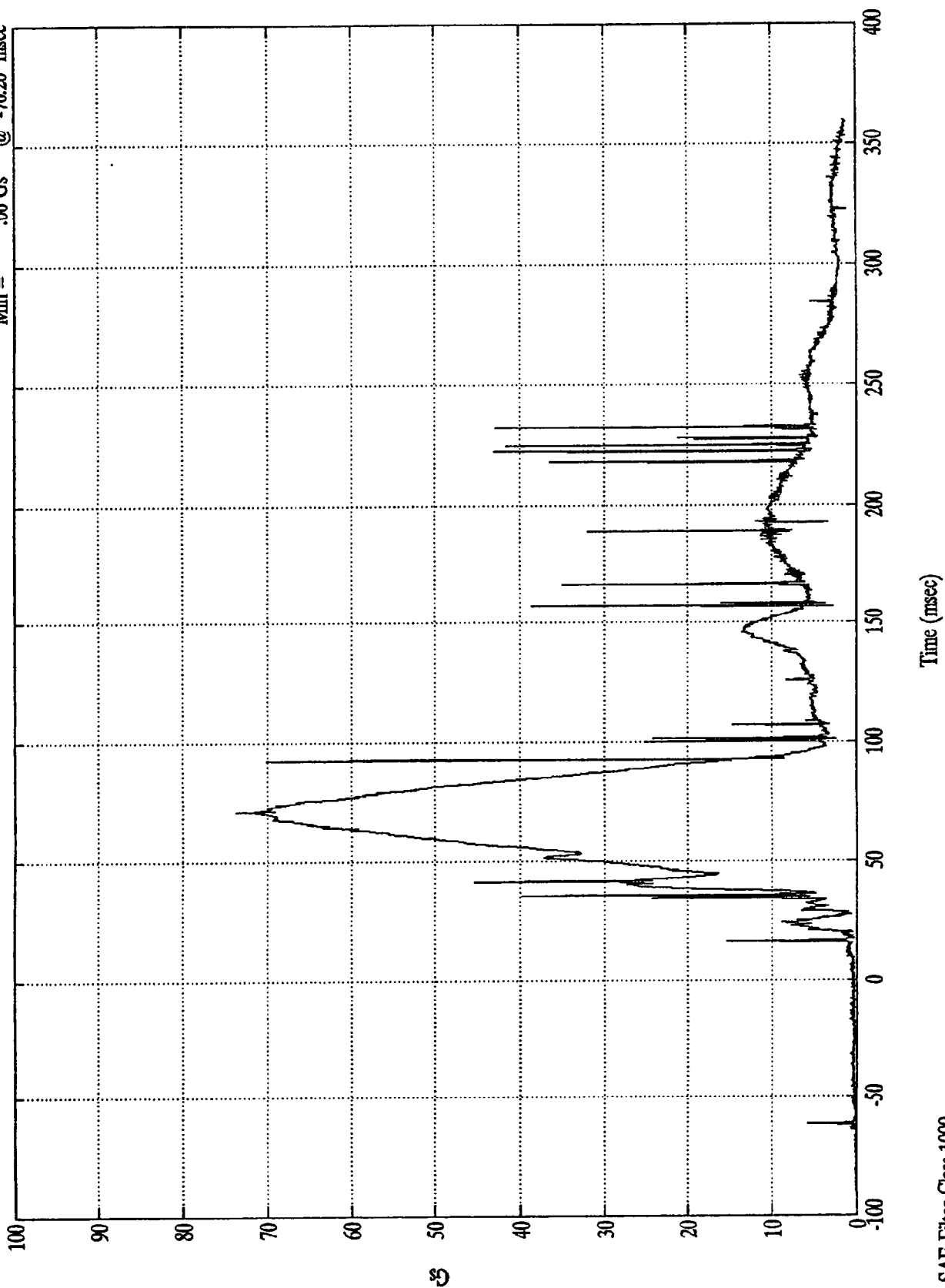
Pos. 1 Head Resultant



SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Head Resultant(R)
 Max = 73.70 Gs @ 70.91 msec
 Min = .06 Gs @ -76.20 msec

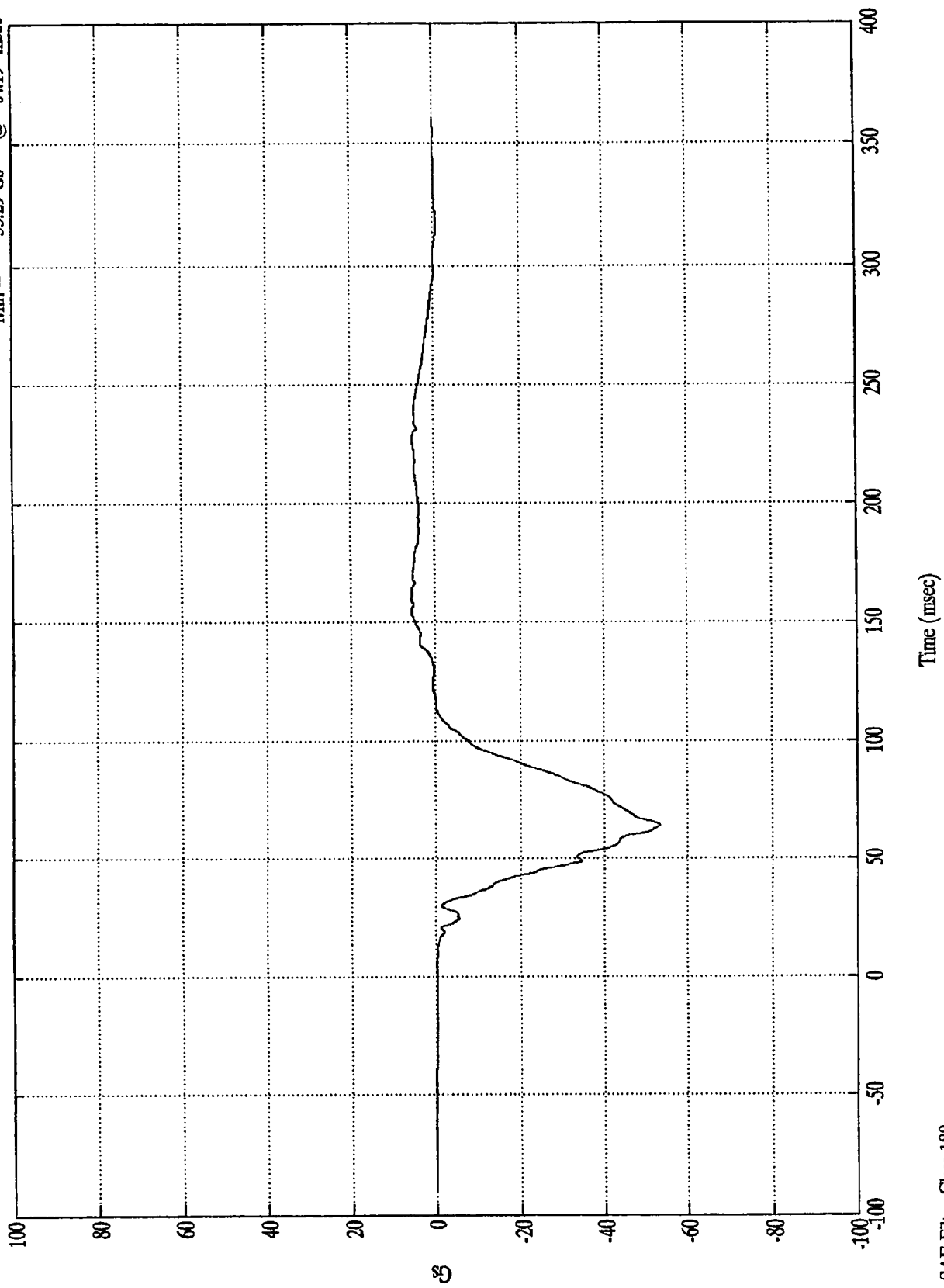


SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Chest X

Max = 5.52 Gs @ 159.83 msec
Min = -53.29 Gs @ 64.19 msec

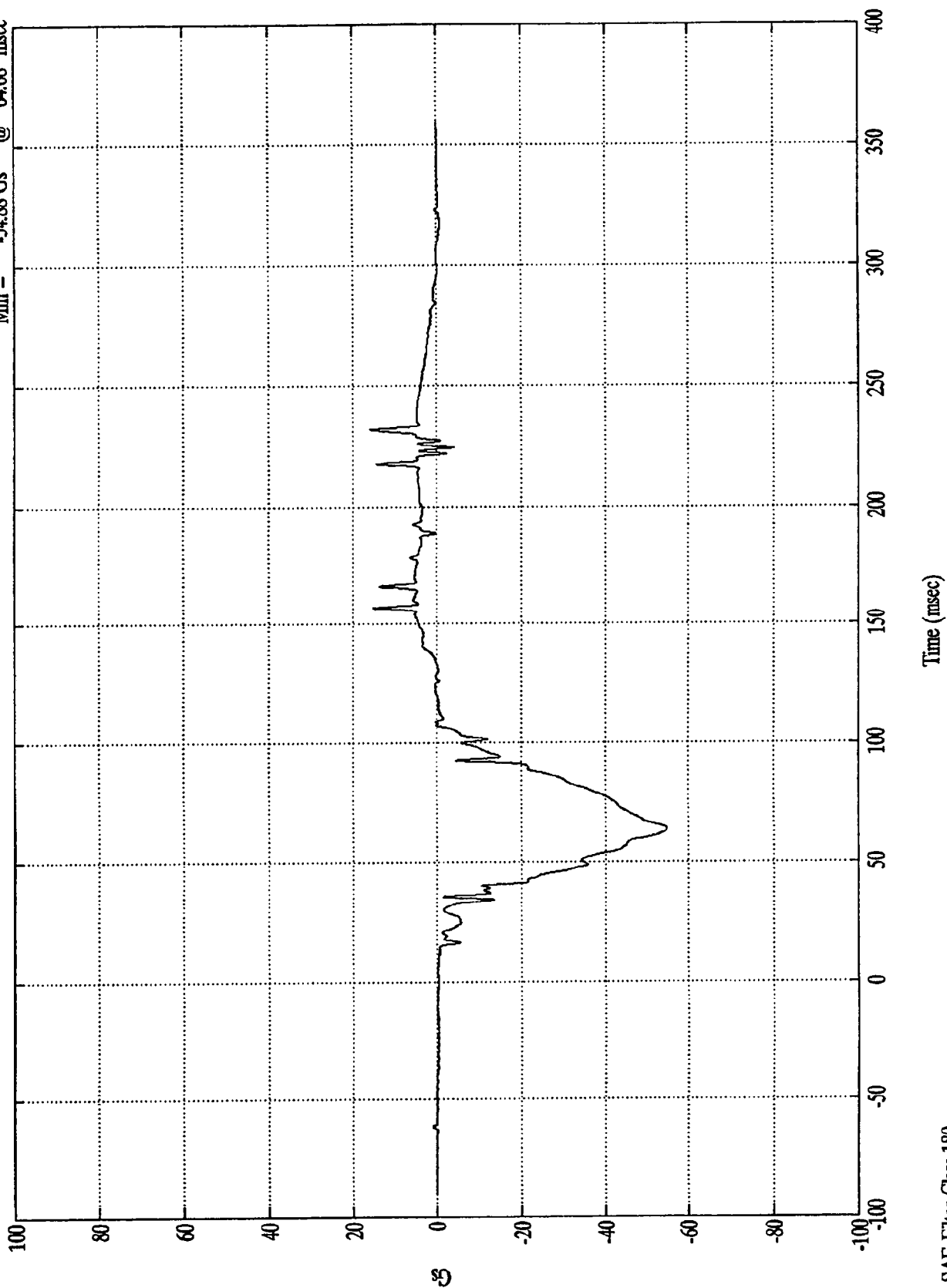


SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos.1 Chest X(R)

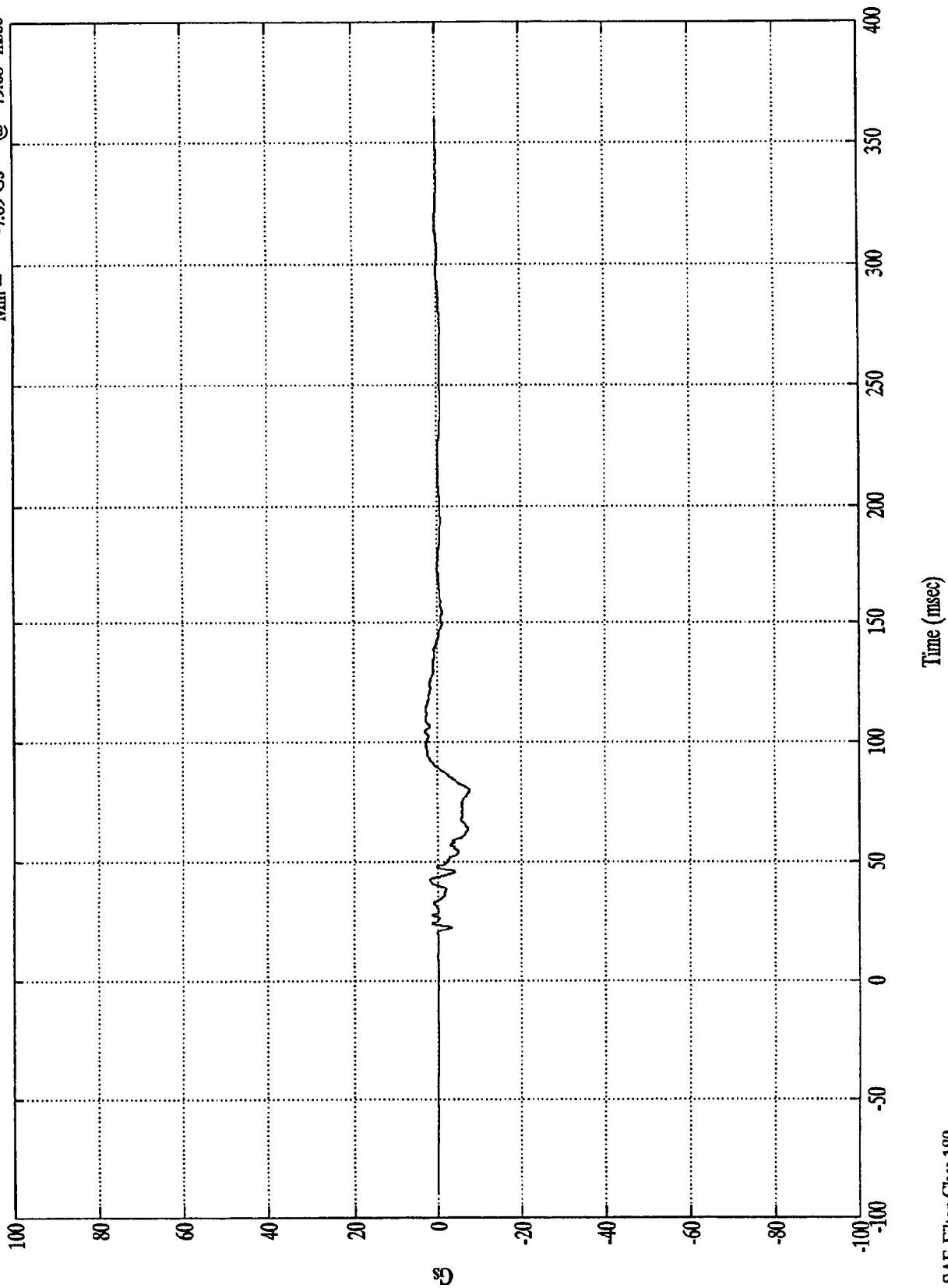
Max = 15.96 Gs @ 231.96 msec
Min = -54.88 Gs @ 64.08 msec



SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

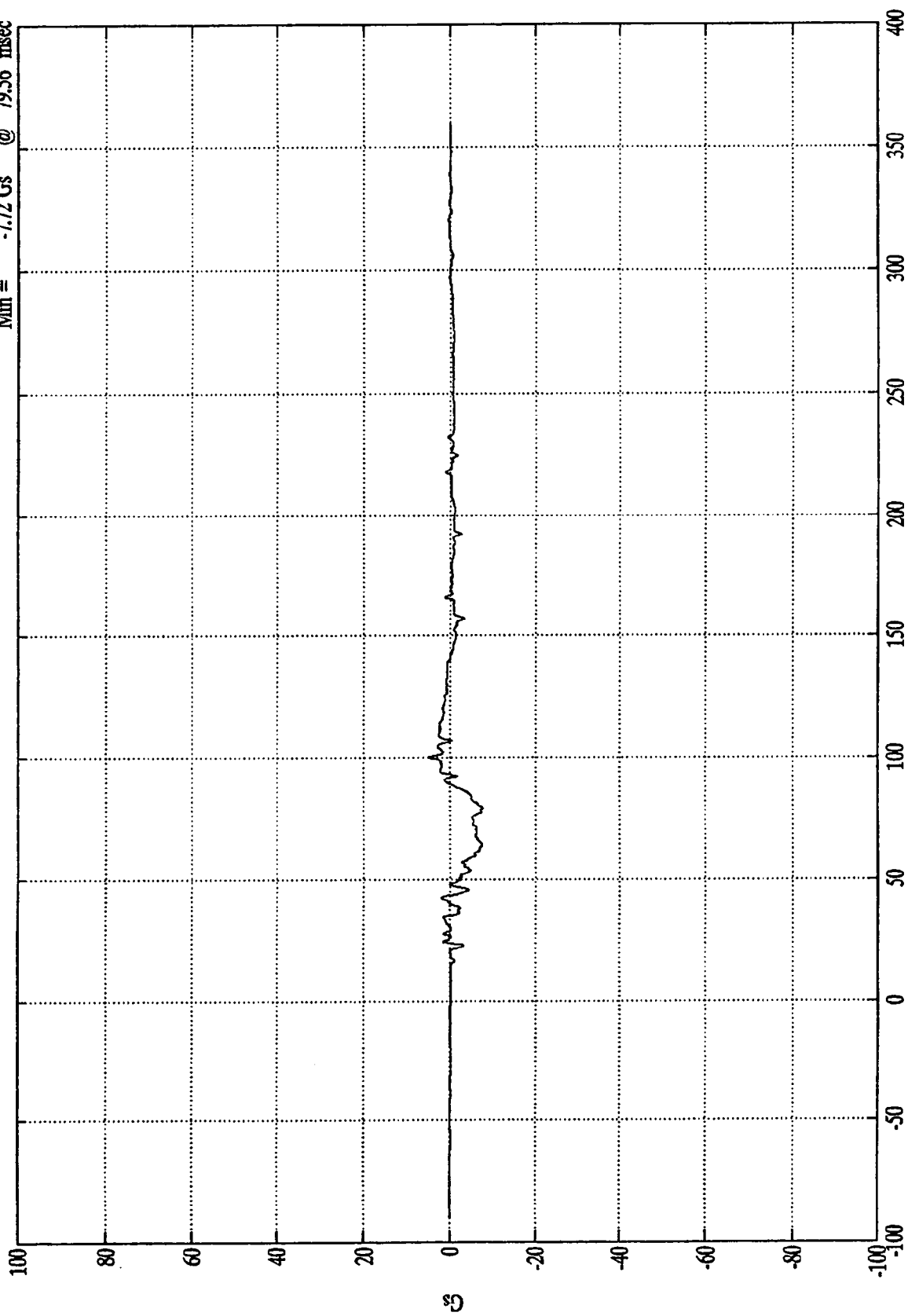
Pos. 1 Chest Y
 Max = 2.92 Gs @ 104.16 msec
 Min = -7.89 Gs @ 79.68 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 5.09 Gs @ 100.08 msec
Min = -7.72 Gs @ 79.56 msec

Pos. 1 Chest Y(R)

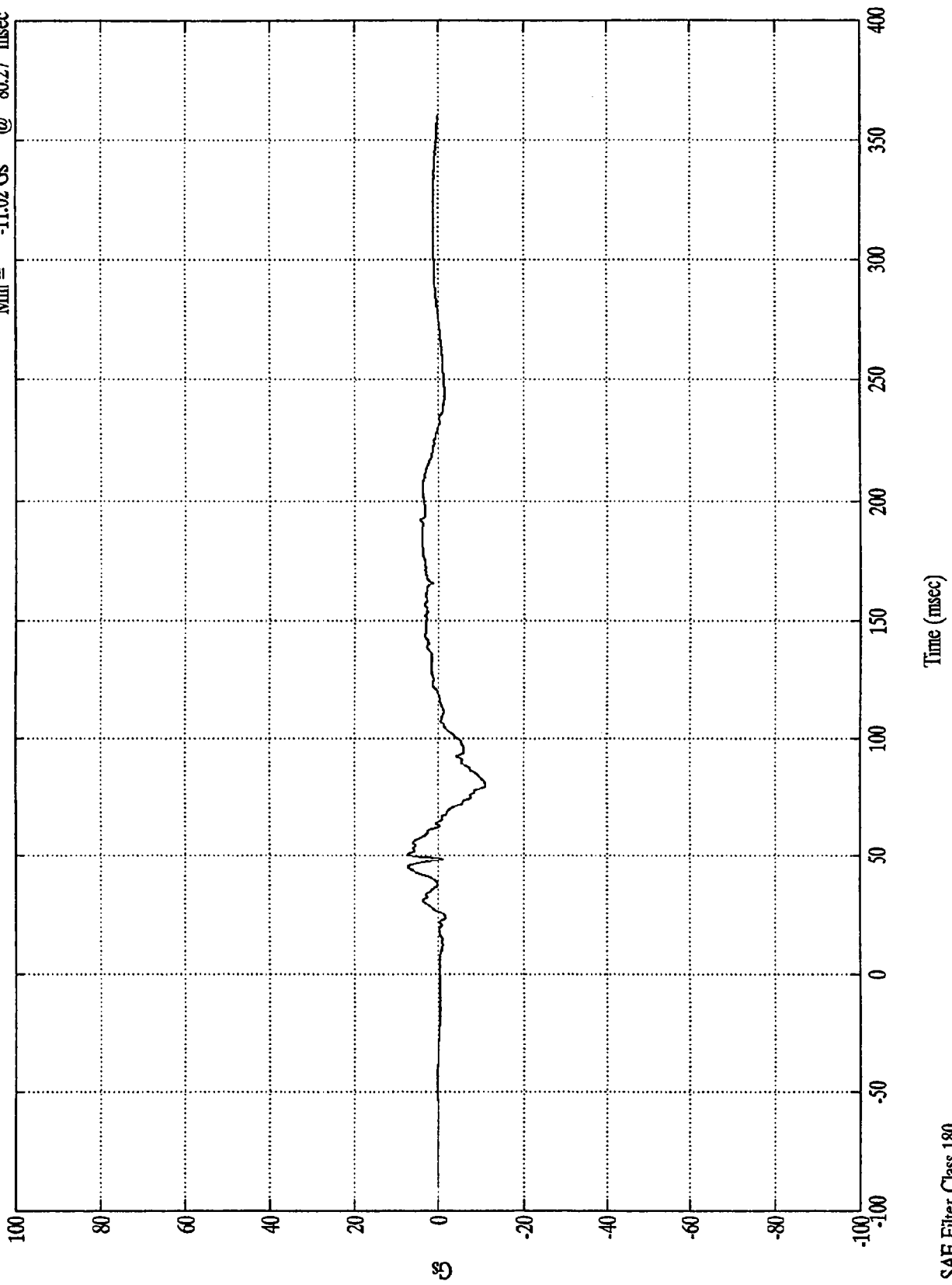


Time (msec)

SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

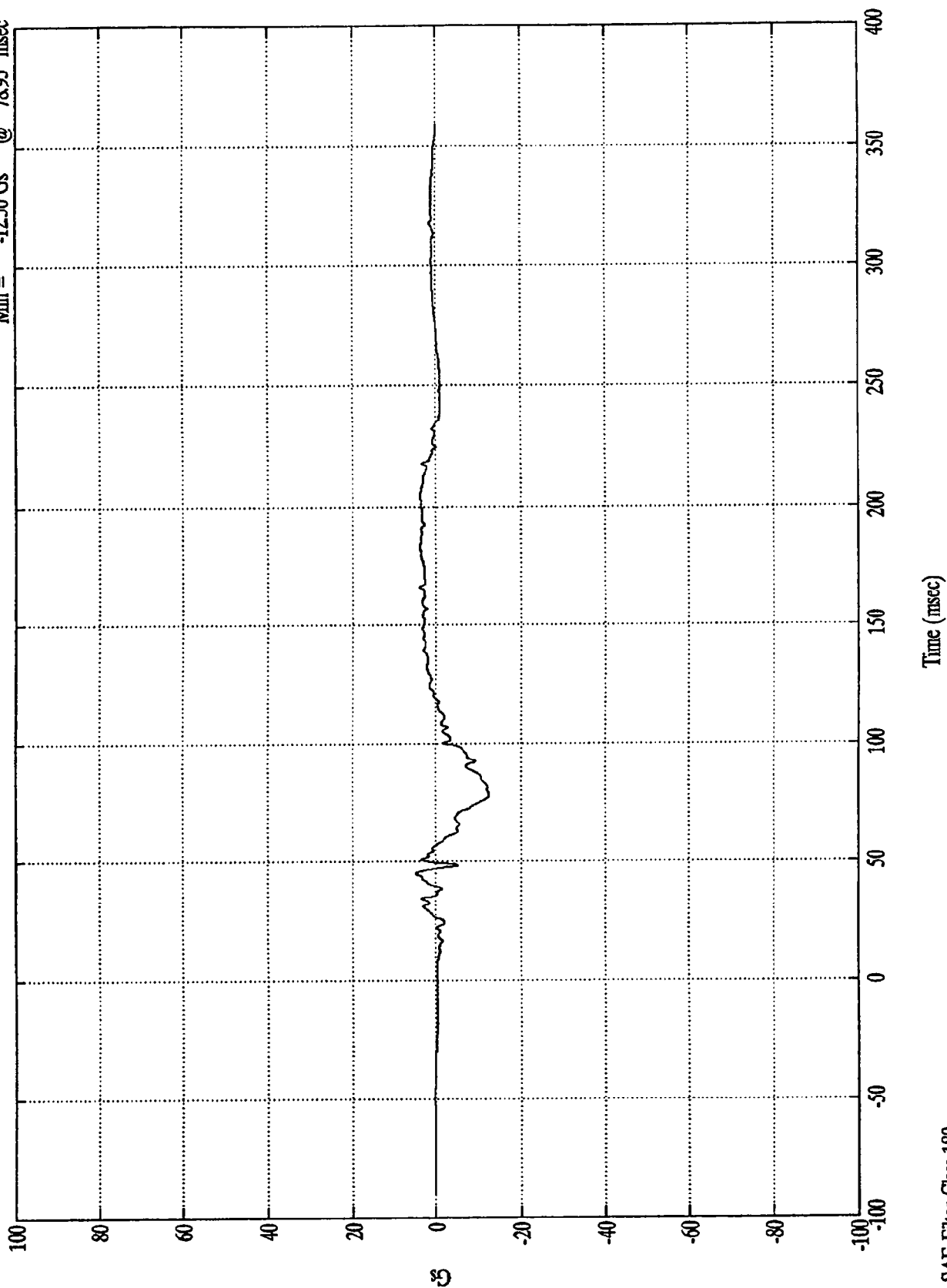
Pos. 1 Chest Z
Max = 7.22 Gs @ 50.64 msec
Min = -11.02 Gs @ 80.27 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 4.93 Gs @ 45.00 msec
Min = -12.50 Gs @ 78.95 msec

Pos. 1 Chest Z(R)

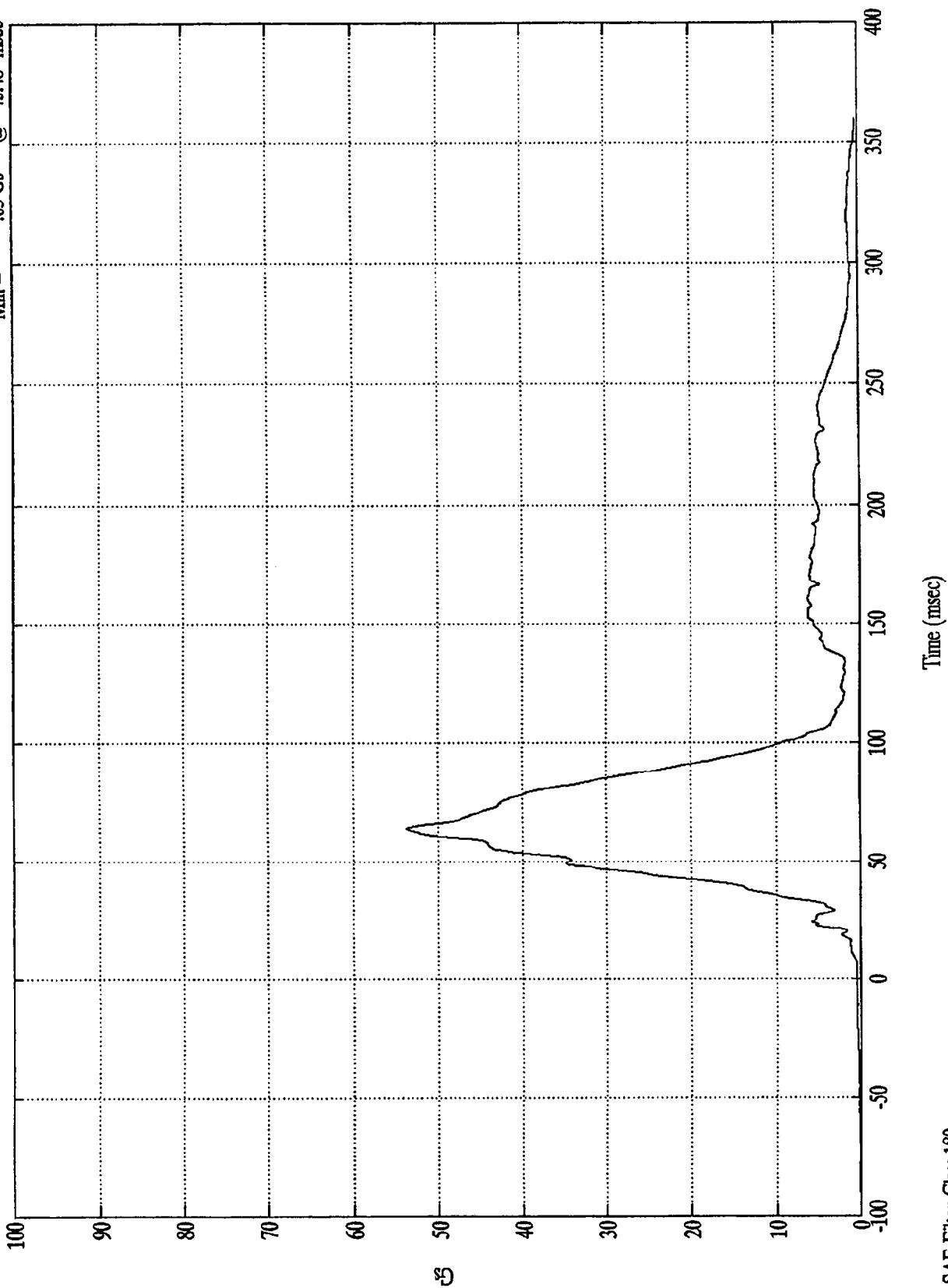


SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

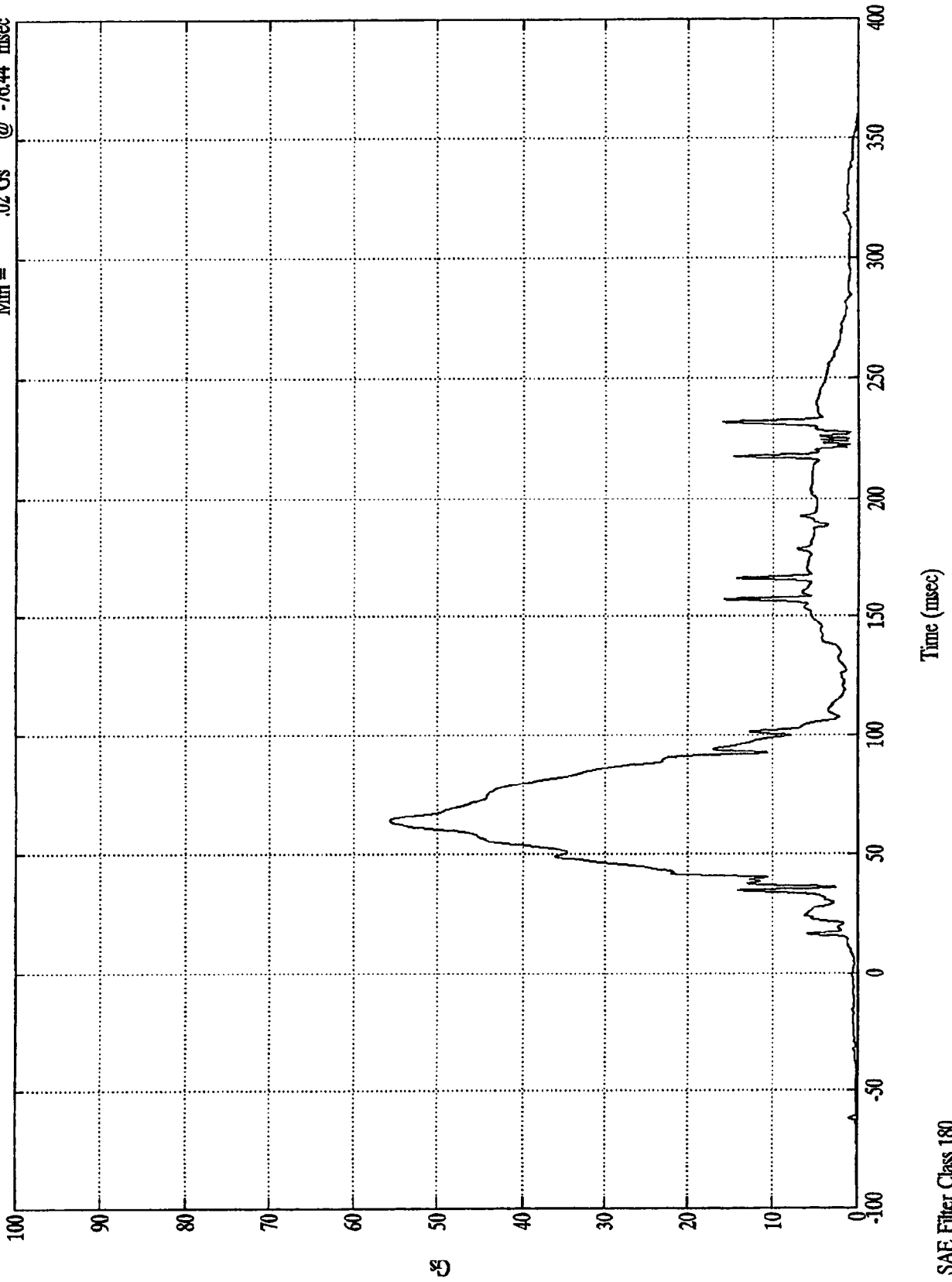
Pos. 1 Chest Resultant

Max = 53.79 Gs @ 64.08 msec
Min = .03 Gs @ -75.48 msec



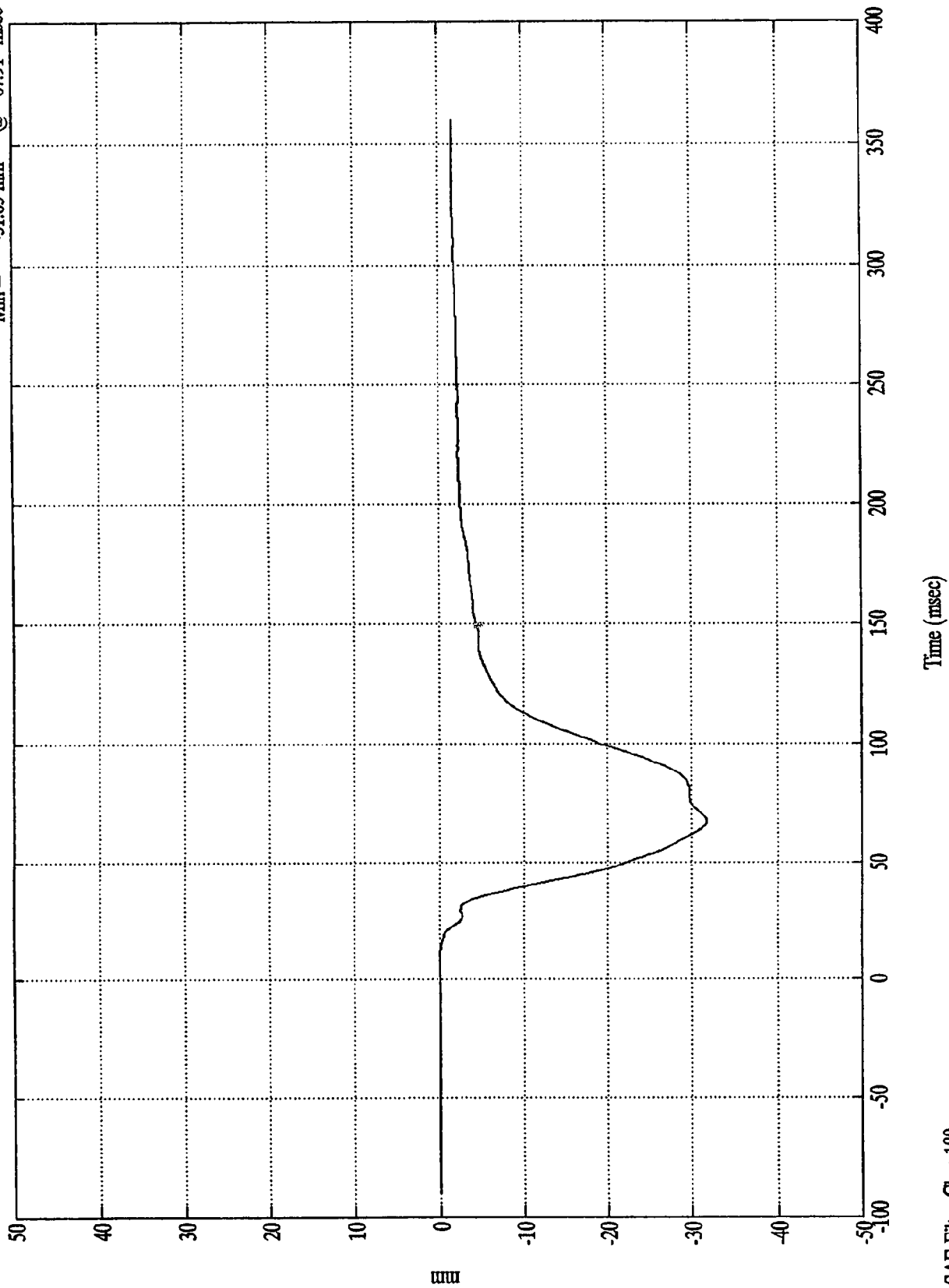
NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Chest Res(R)
 Max = 55.61 Gs @ 64.08 msec
 Min = .02 Gs @ -76.44 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

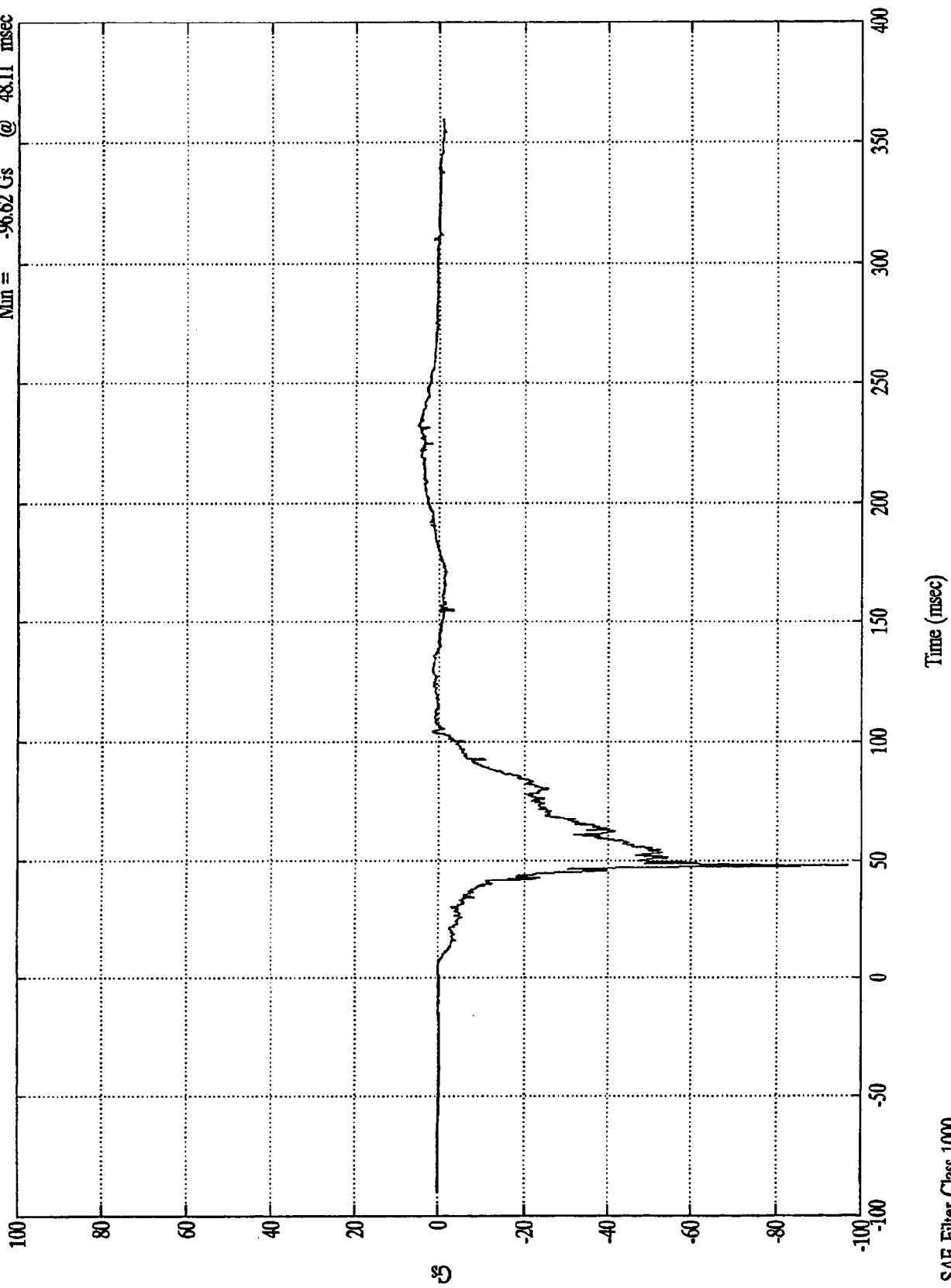
Pos. 1 Chest Disp.
Max = .02 mm @ -14.28 msec
Min = -31.63 mm @ 67.91 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Pelvic (X)

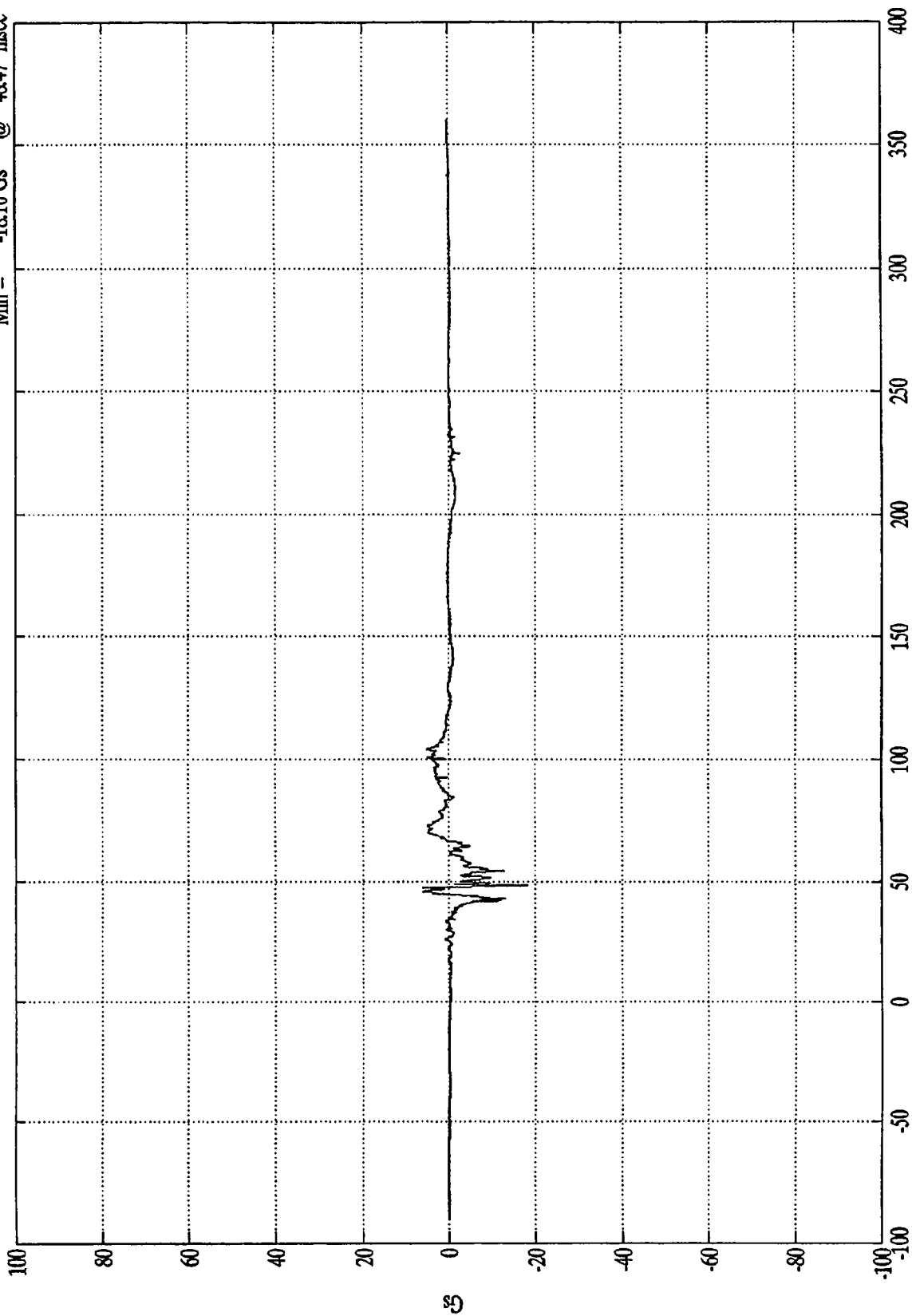
Max = 5.24 Gs @ 232.20 msec
Min = -96.62 Gs @ 48.11 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Pelvic (Y)

Max = 6.14 Gs @ 47.40 msec
Min = -18.10 Gs @ 48.47 msec



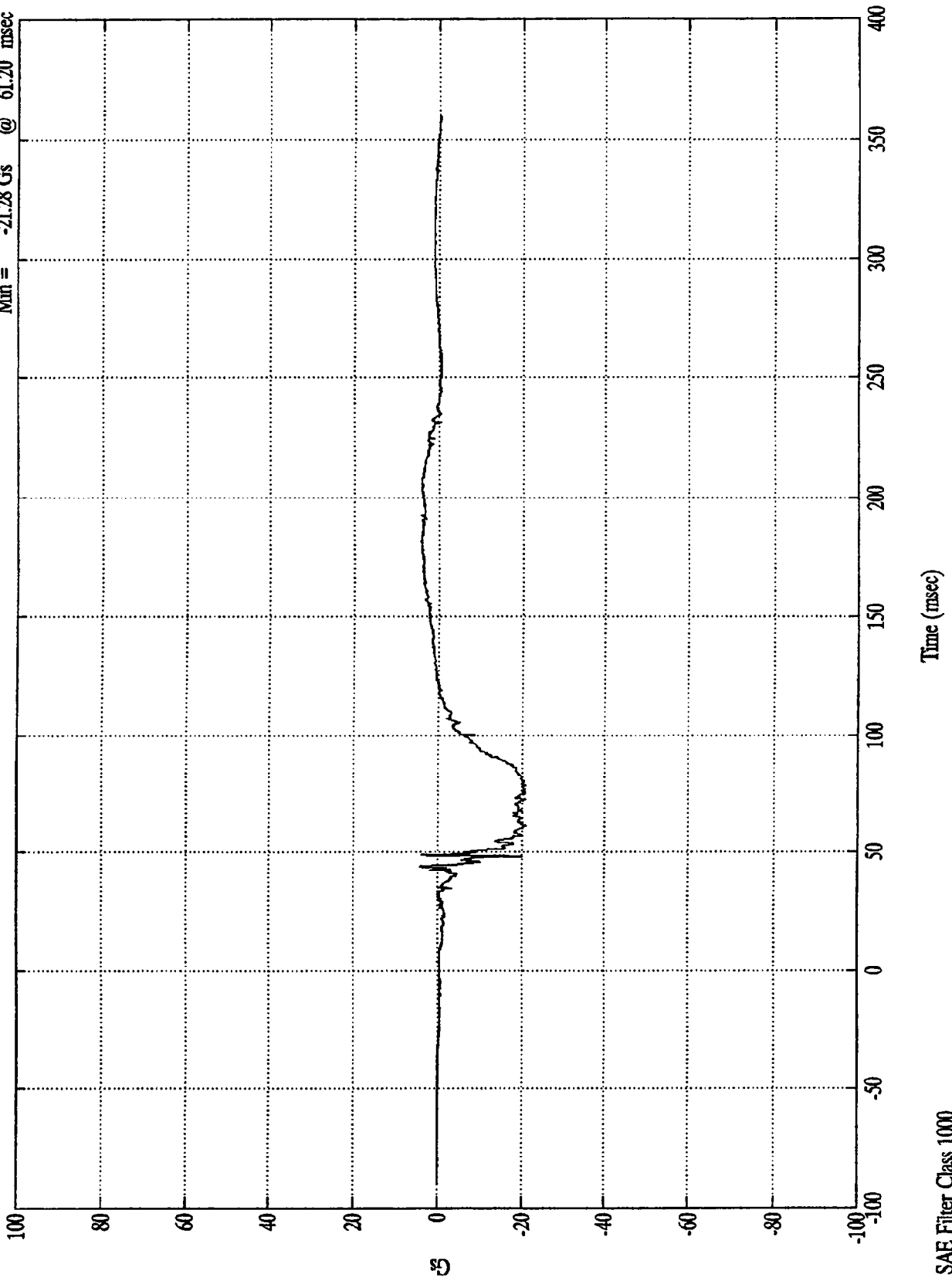
Time (msec)

SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

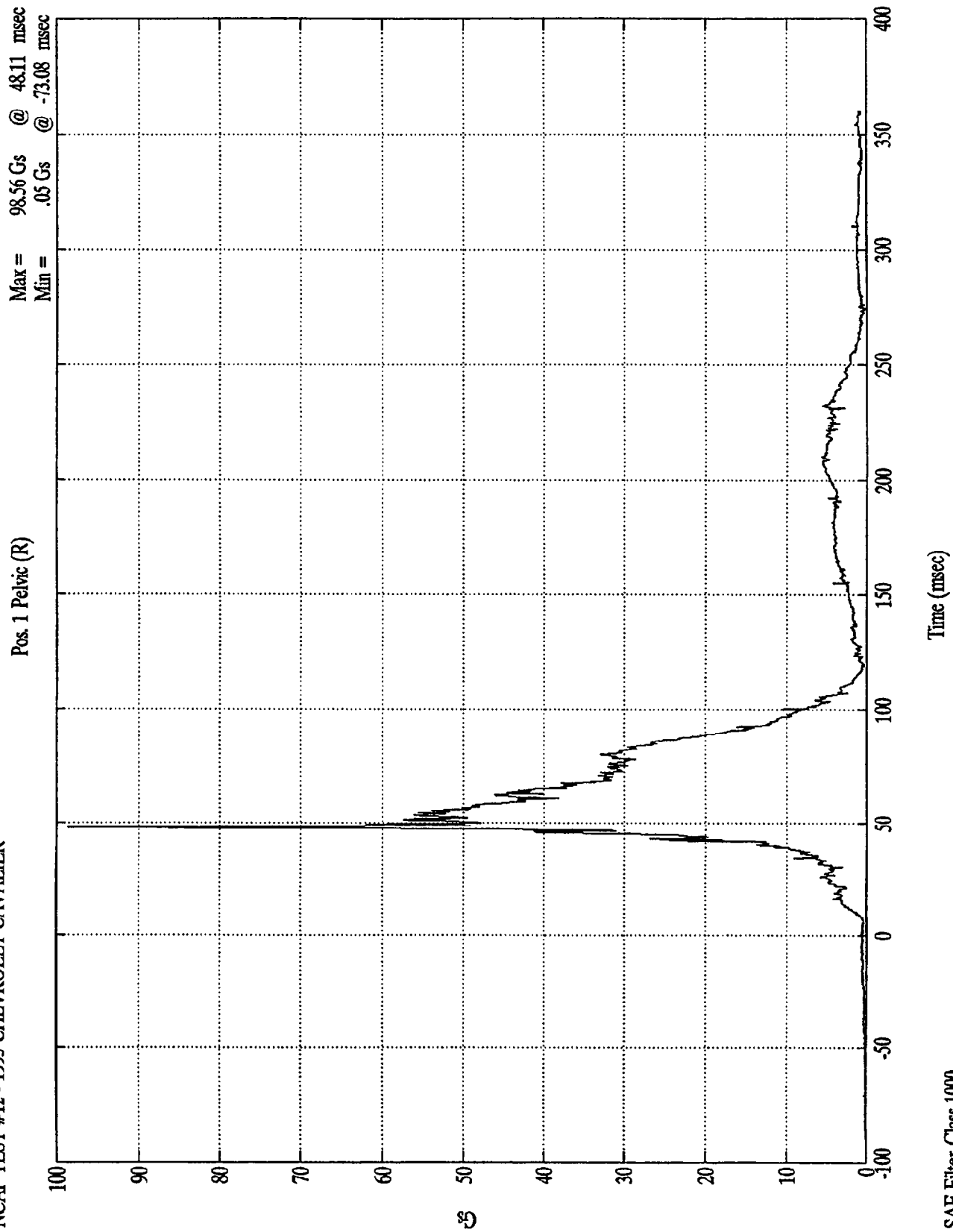
Pos. 1 Pelvic (Z)

Max = 4.34 Gs @ 192.36 msec
Min = -21.28 Gs @ 61.20 msec



SAE Filter Class 1000

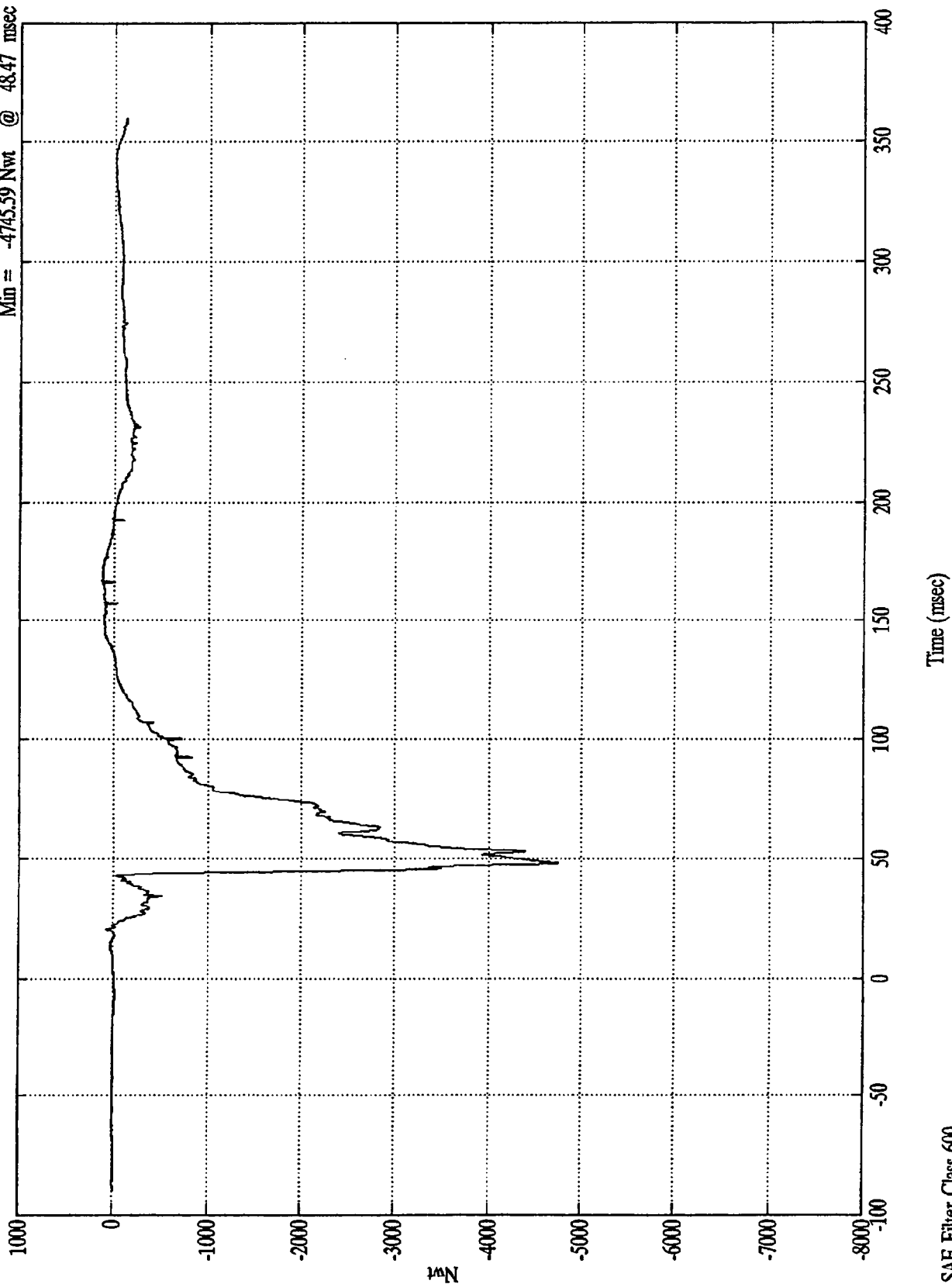
NCAP TEST #12 - 1995 CHEVROLET CAVALIER



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 129.75 Nwt @ 166.68 msec
Min = -4745.59 Nwt @ 48.47 msec

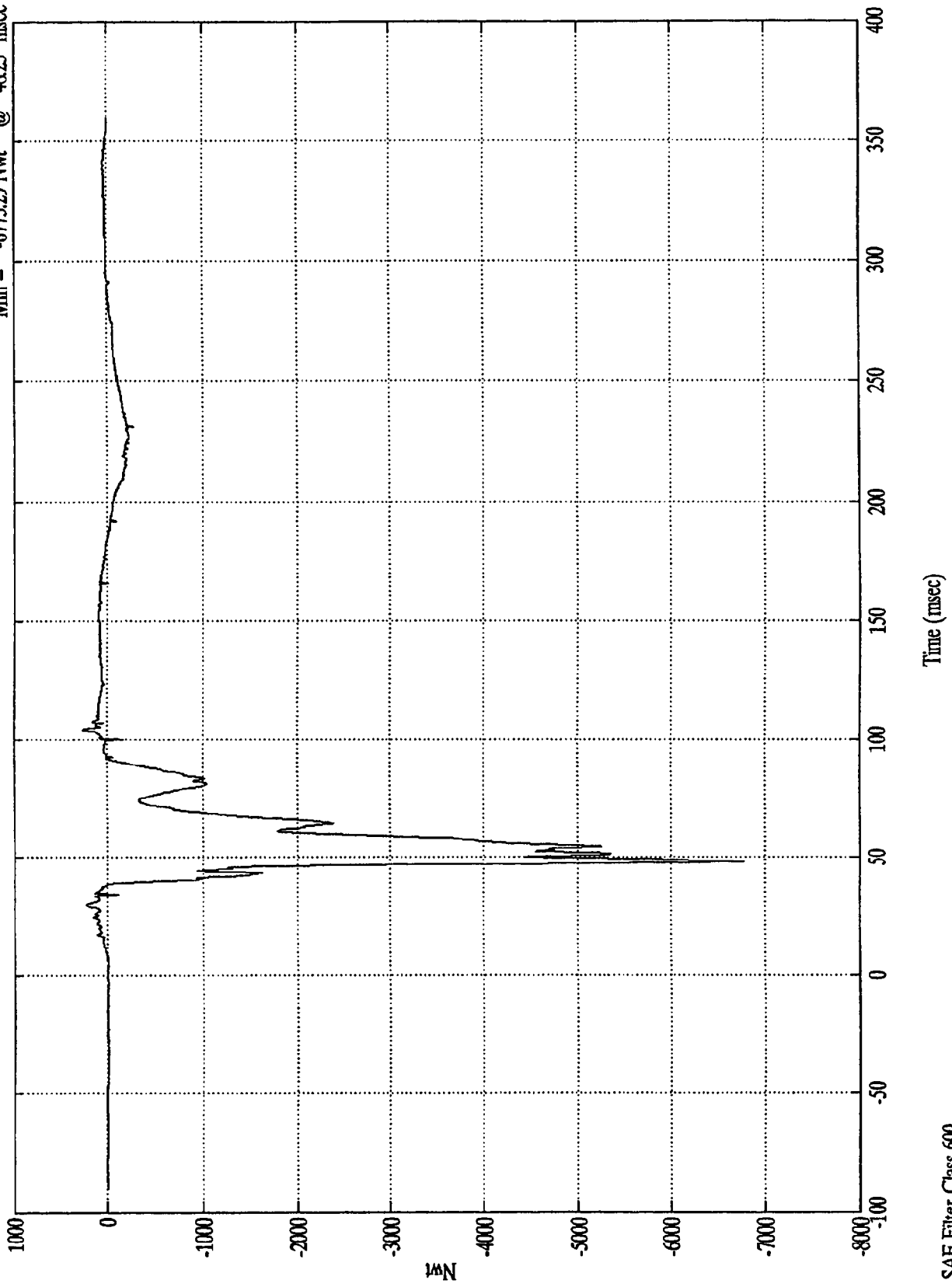
Pos. 1 Left Femur



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Right Femur

Max = 265.32 Nwt @ 104.04 msec
Min = -6773.29 Nwt @ 48.23 msec

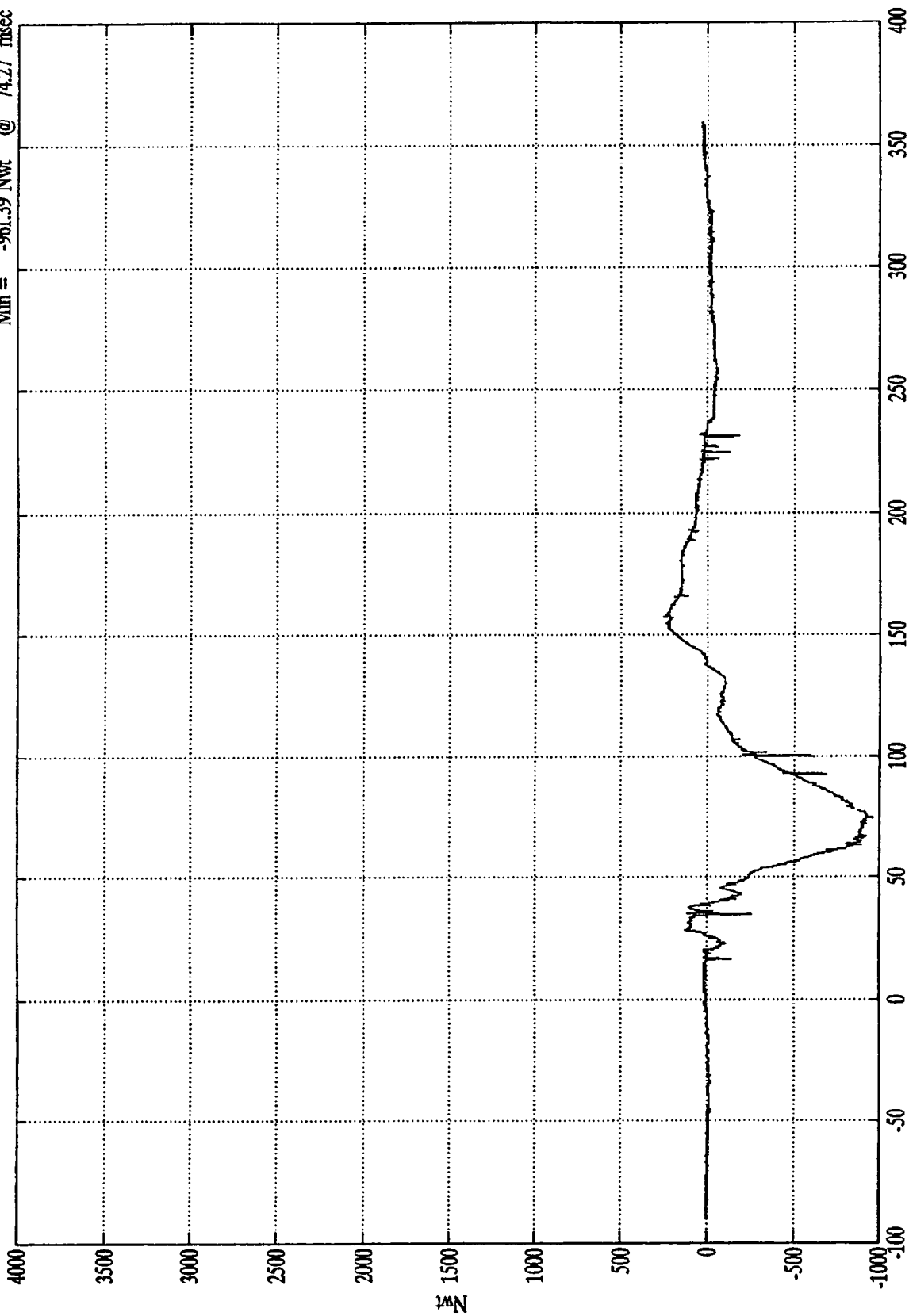


SAE Filter Class 600

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Upper Neck Fx

Max = 251.35 Nwt @ 157.56 msec
Min = -961.39 Nwt @ 74.27 msec



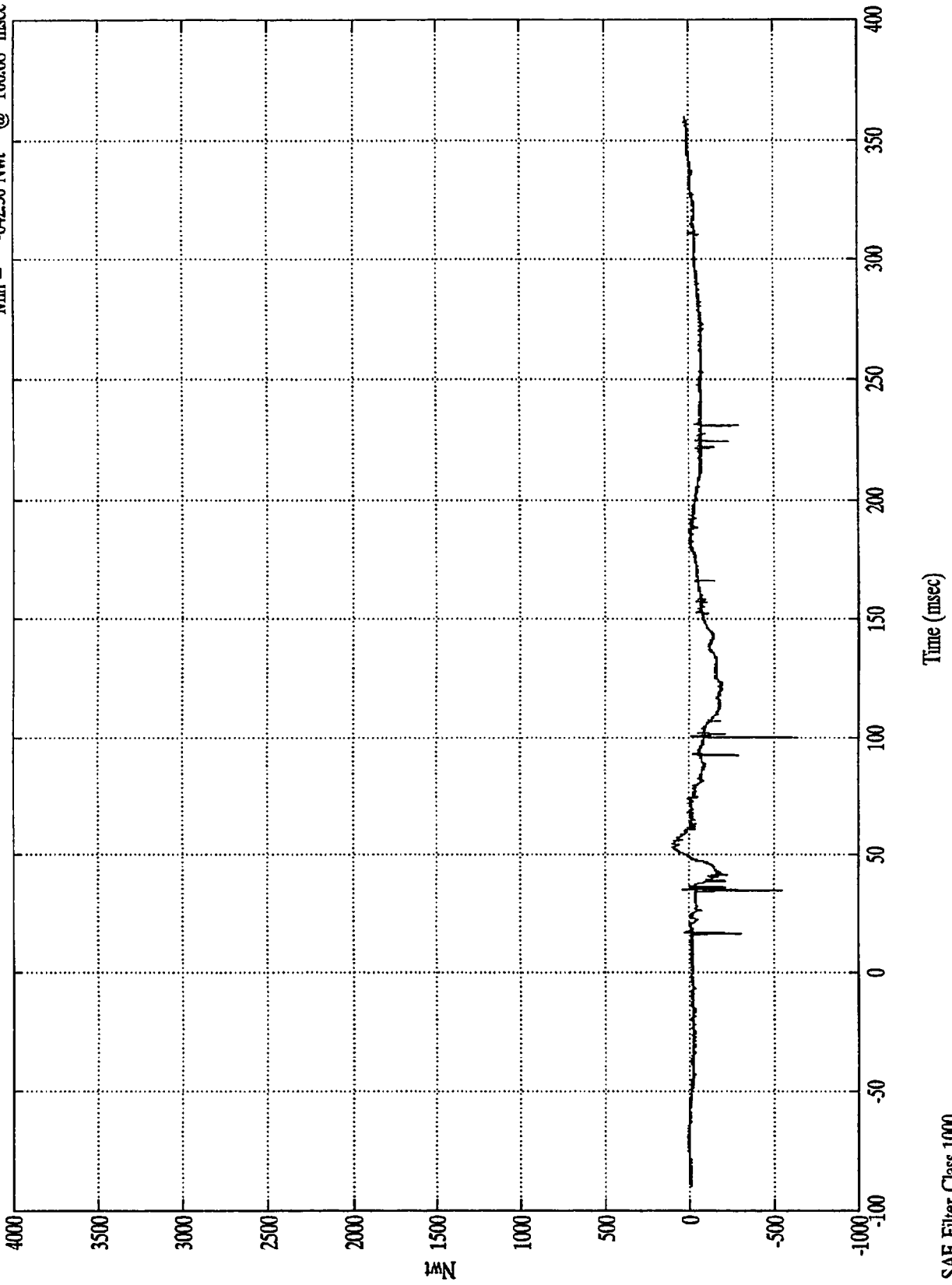
Time (msec)

SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Upper Neck Fy

Max = 103.33 Nwt @ 54.96 msec
Min = -642.30 Nwt @ 100.08 msec

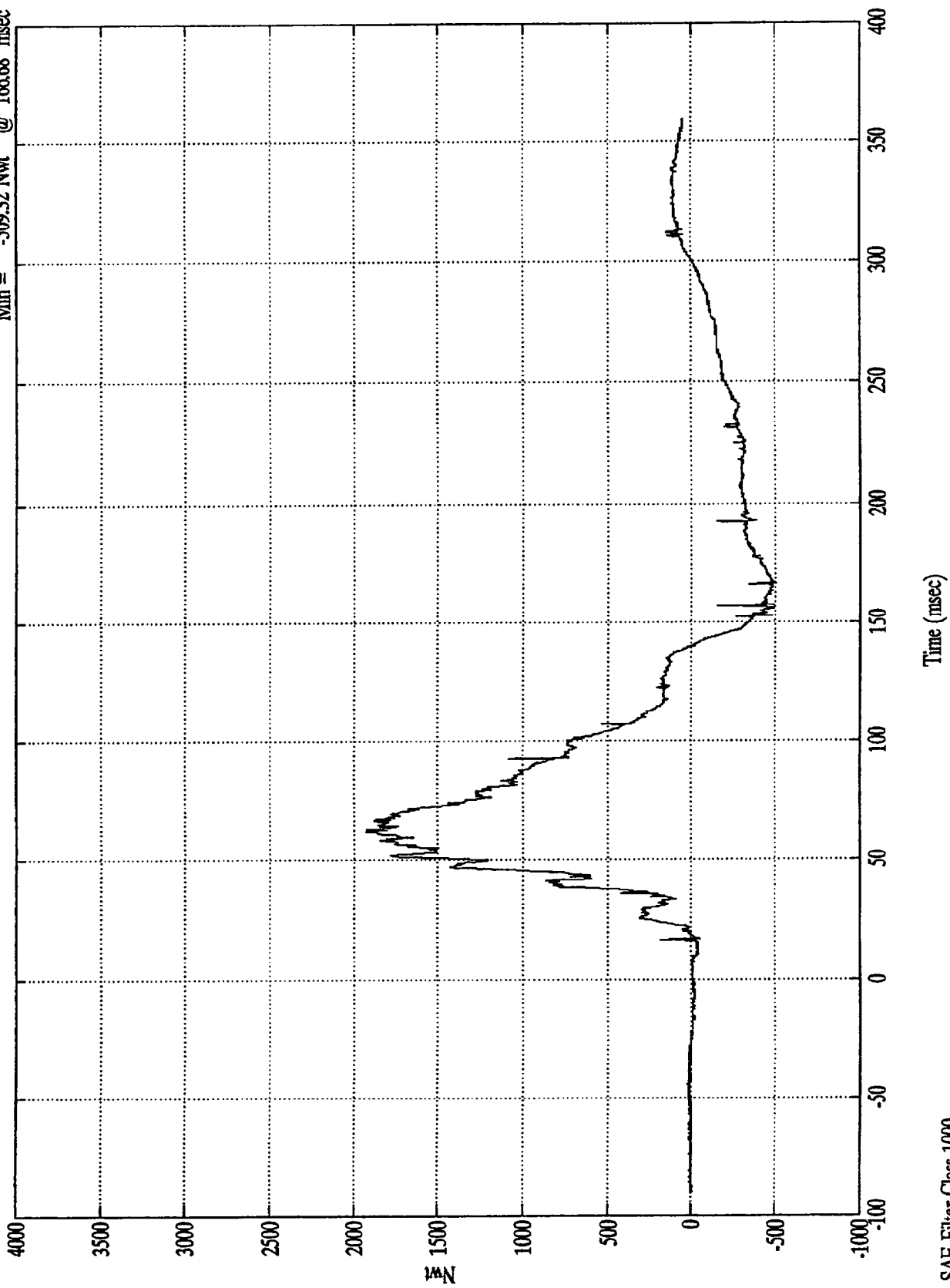


SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Upper Neck Fz

Max = 1924.02 Nwt @ 63.00 msec
Min = -509.32 Nwt @ 166.68 msec

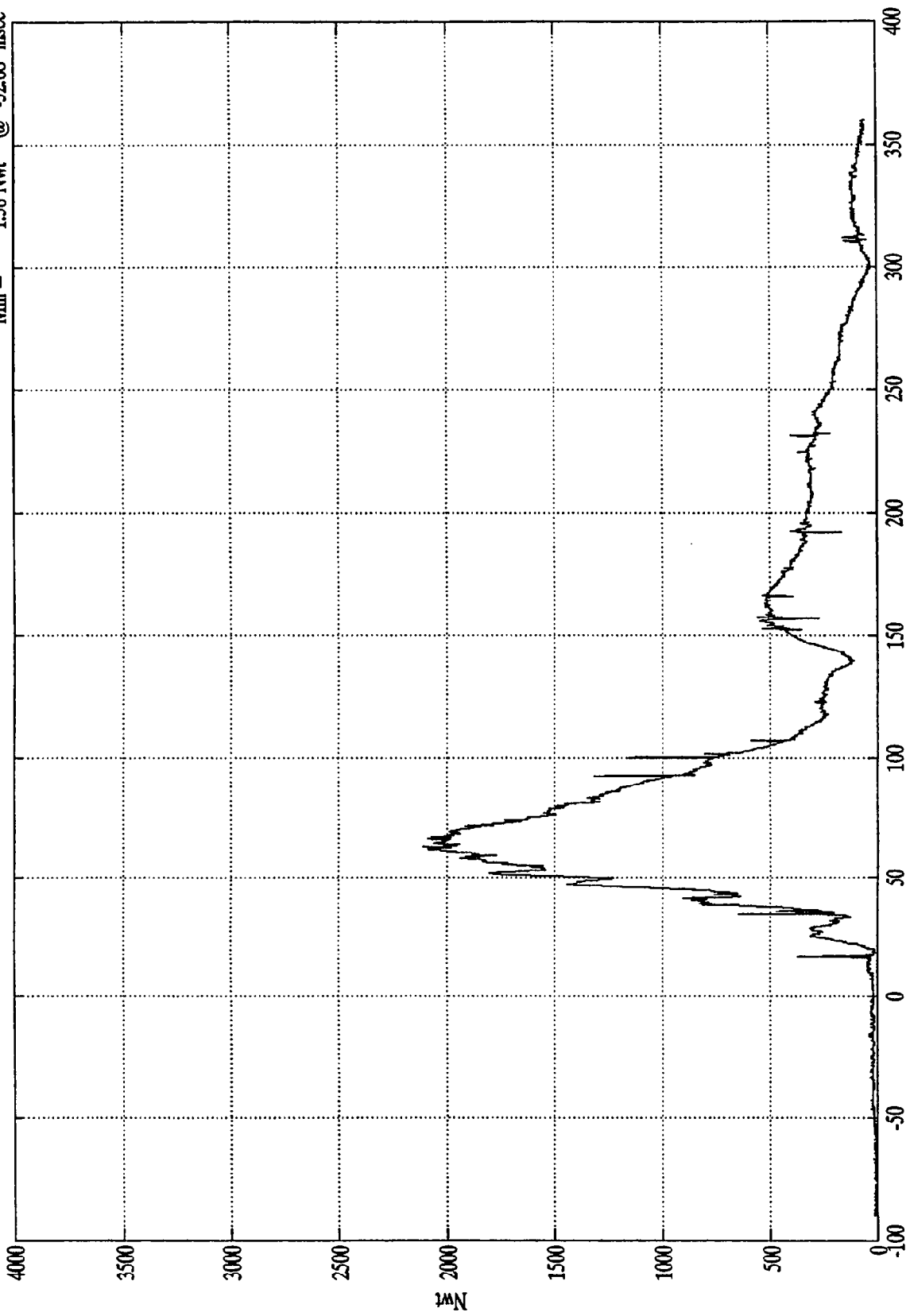


SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Neck Force Res.

Max = 2111.71 Nwt @ 63.11 msec
Min = 1.58 Nwt @ -52.68 msec



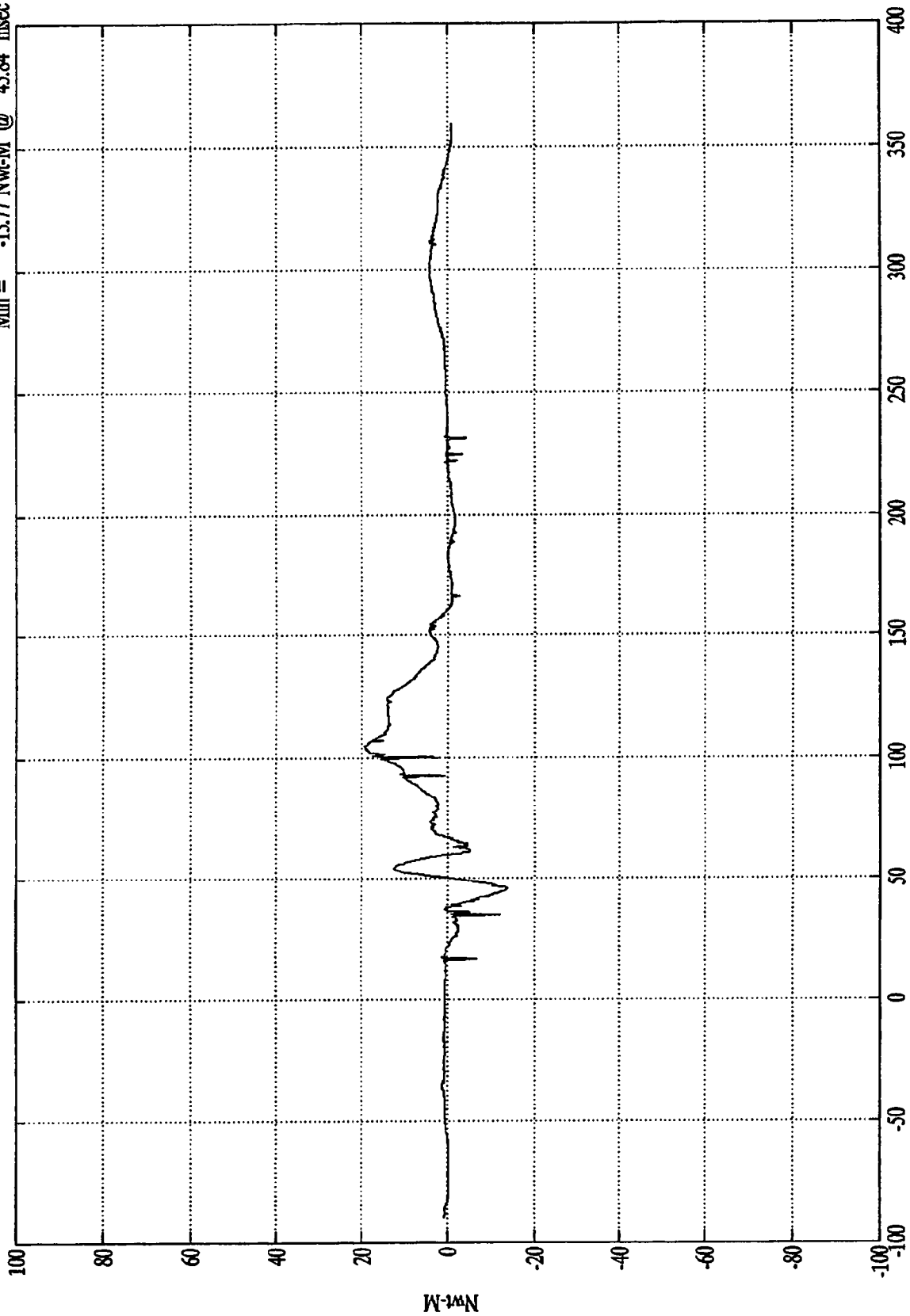
Time (msec)

SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Upper Neck Mx

Max = 19.21 Nwt-M @ 104.63 msec
Min = -13.77 Nwt-M @ 45.84 msec



Time (msec)

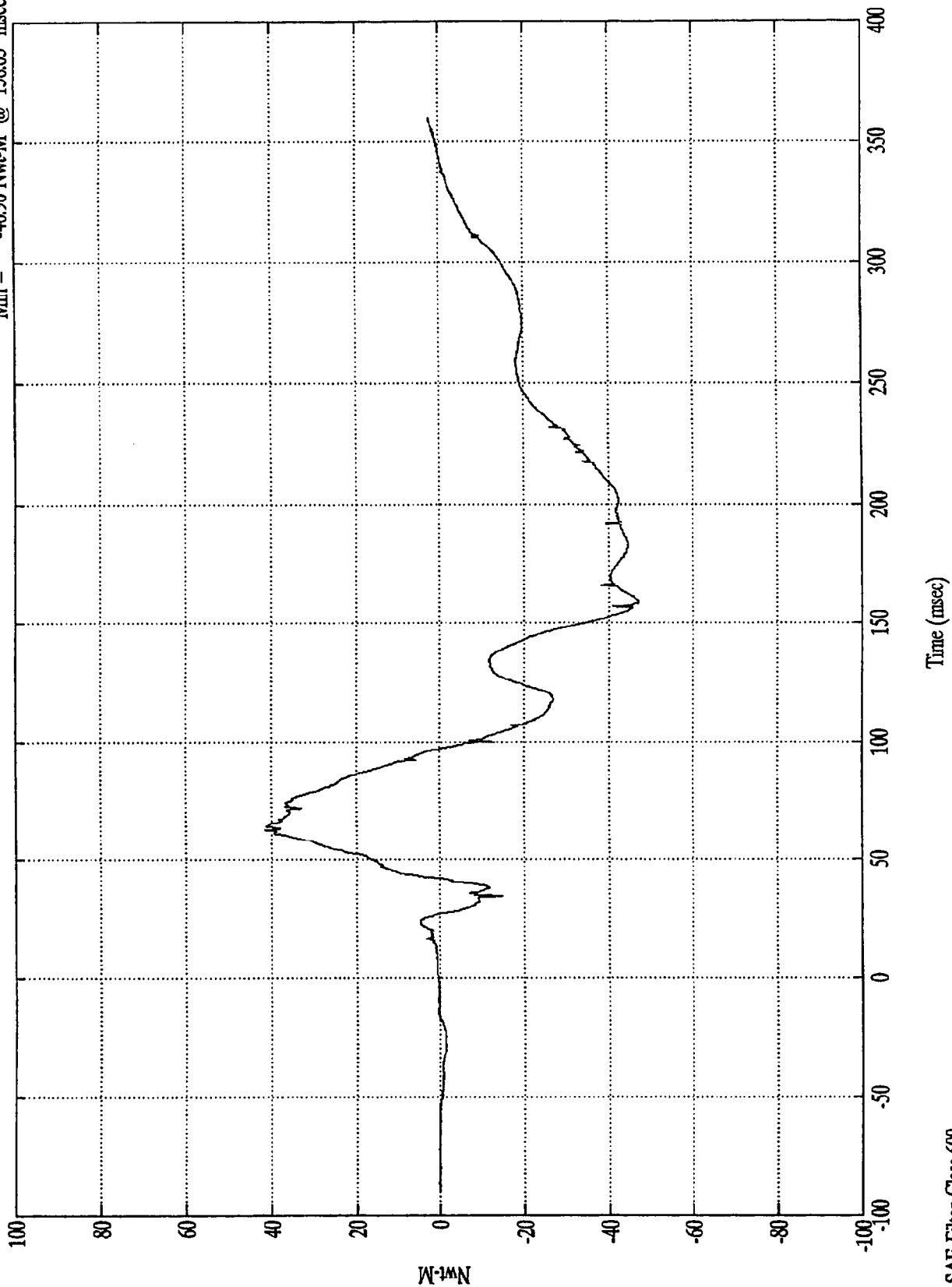
SAE Filter Class 600

Nwt-M

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Upper Neck My

Max = 41.61 Nwt-M @ 63.00 msec
Min = -46.96 Nwt-M @ 158.63 msec

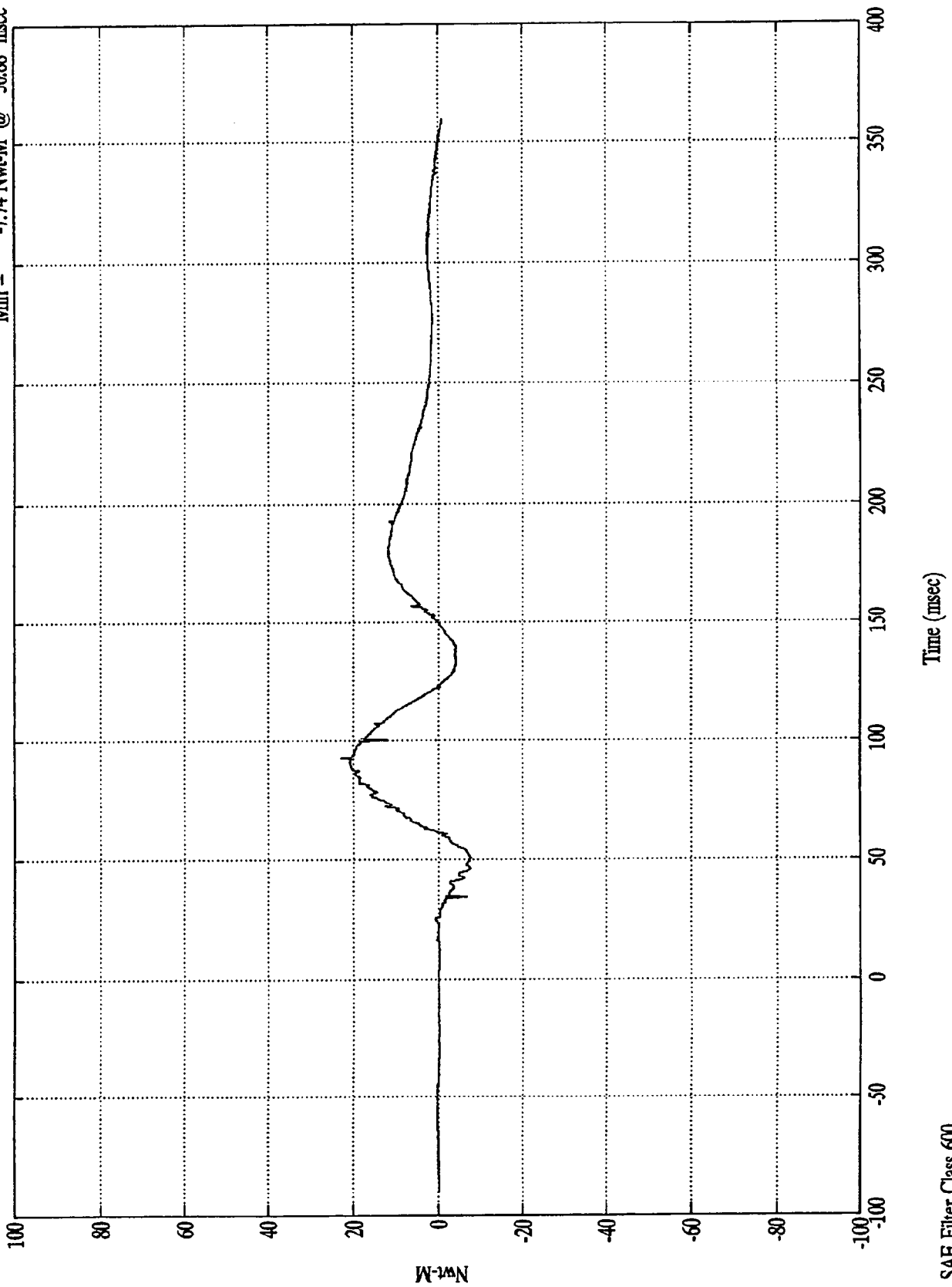


SAE Filter Class 600

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 1 Upper Neck Mz

Max = 22.79 Nwt-M @ 92.64 msec
Min = -7.74 Nwt-M @ 50.88 msec

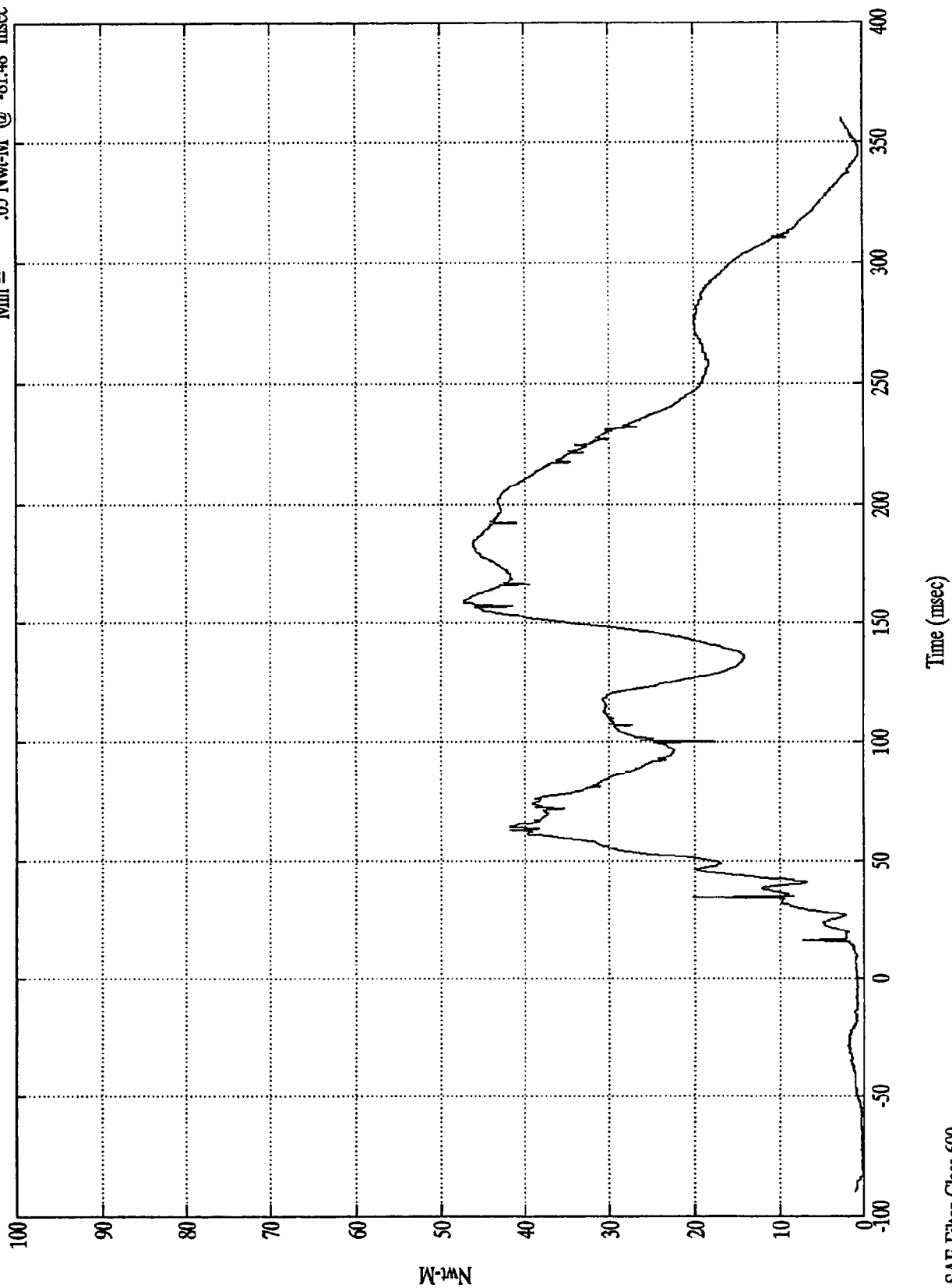


SAE Filter Class 600

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 47.25 Nwt-M @ 158.63 msec
 Min = .05 Nwt-M @ -81.48 msec

Pos. 1 Neck Moment Res.

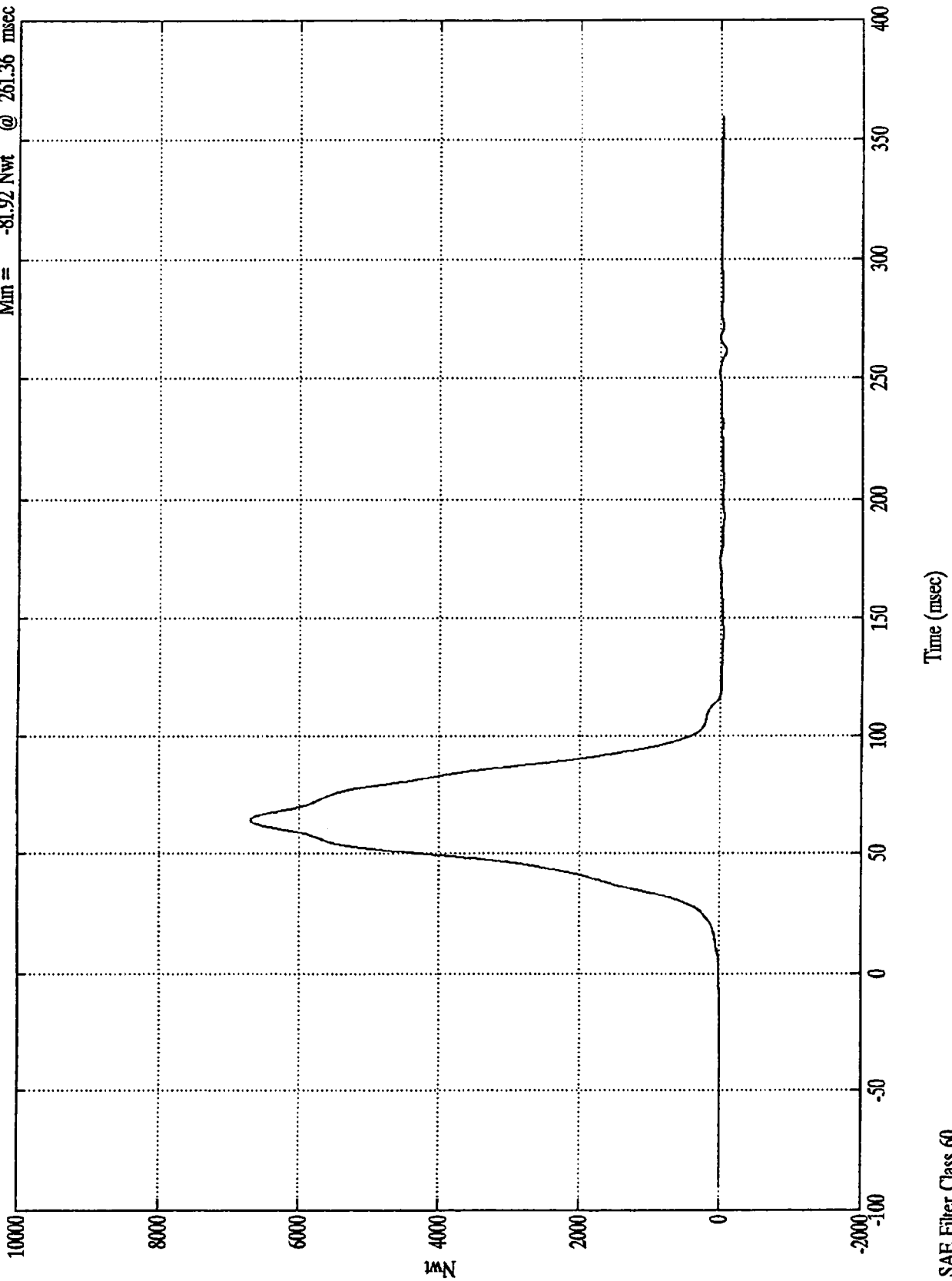


SAE Filter Class 600

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

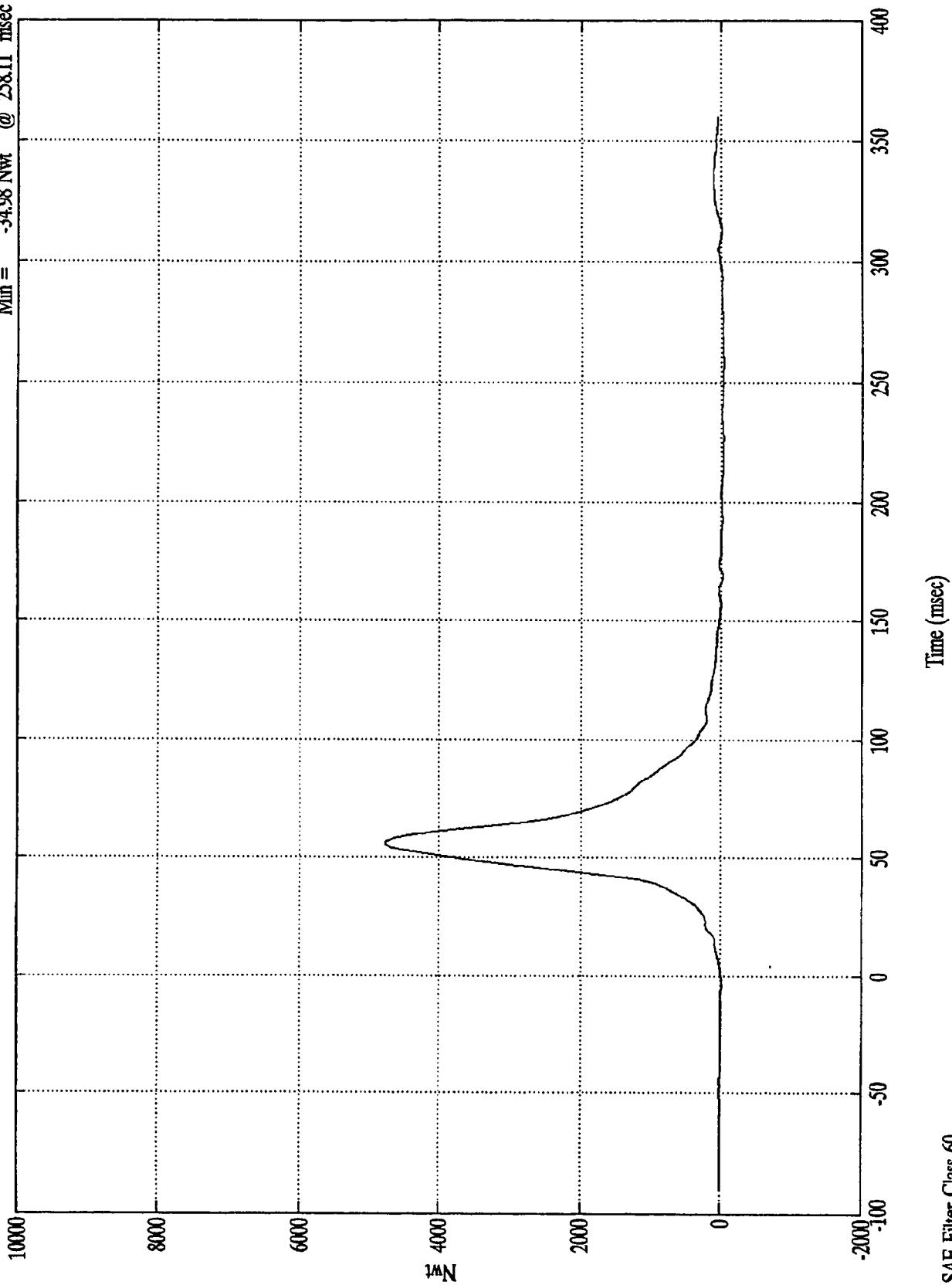
Max = 6702.40 Nwt @ 63.95 msec
Min = -81.92 Nwt @ 261.36 msec

Pos. 1 Torso Belt Load



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

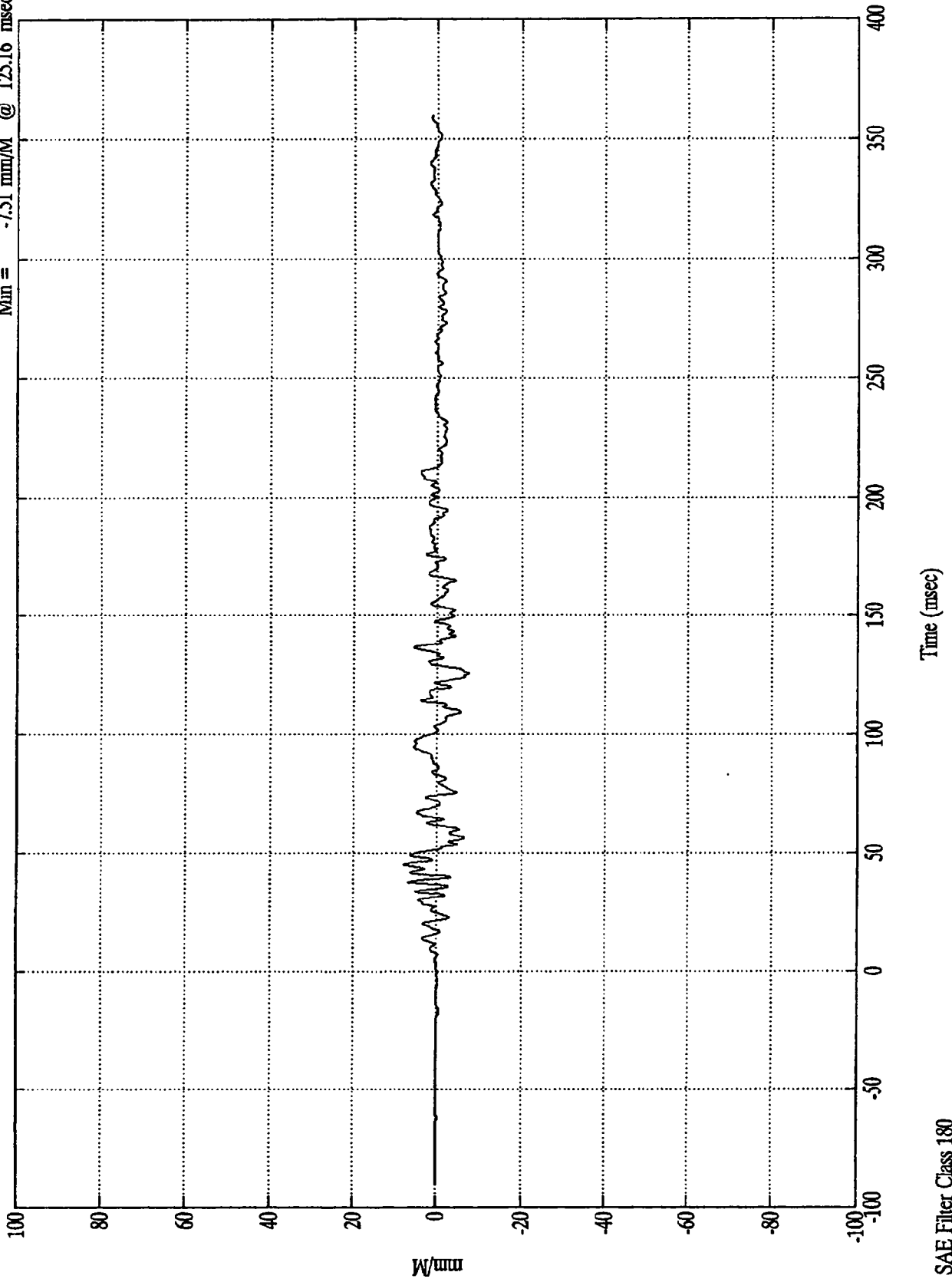
Pos. 1 Left Belt Load
Max = 4784.81 Nwt @ 55.92 msec
Min = -34.98 Nwt @ 258.11 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

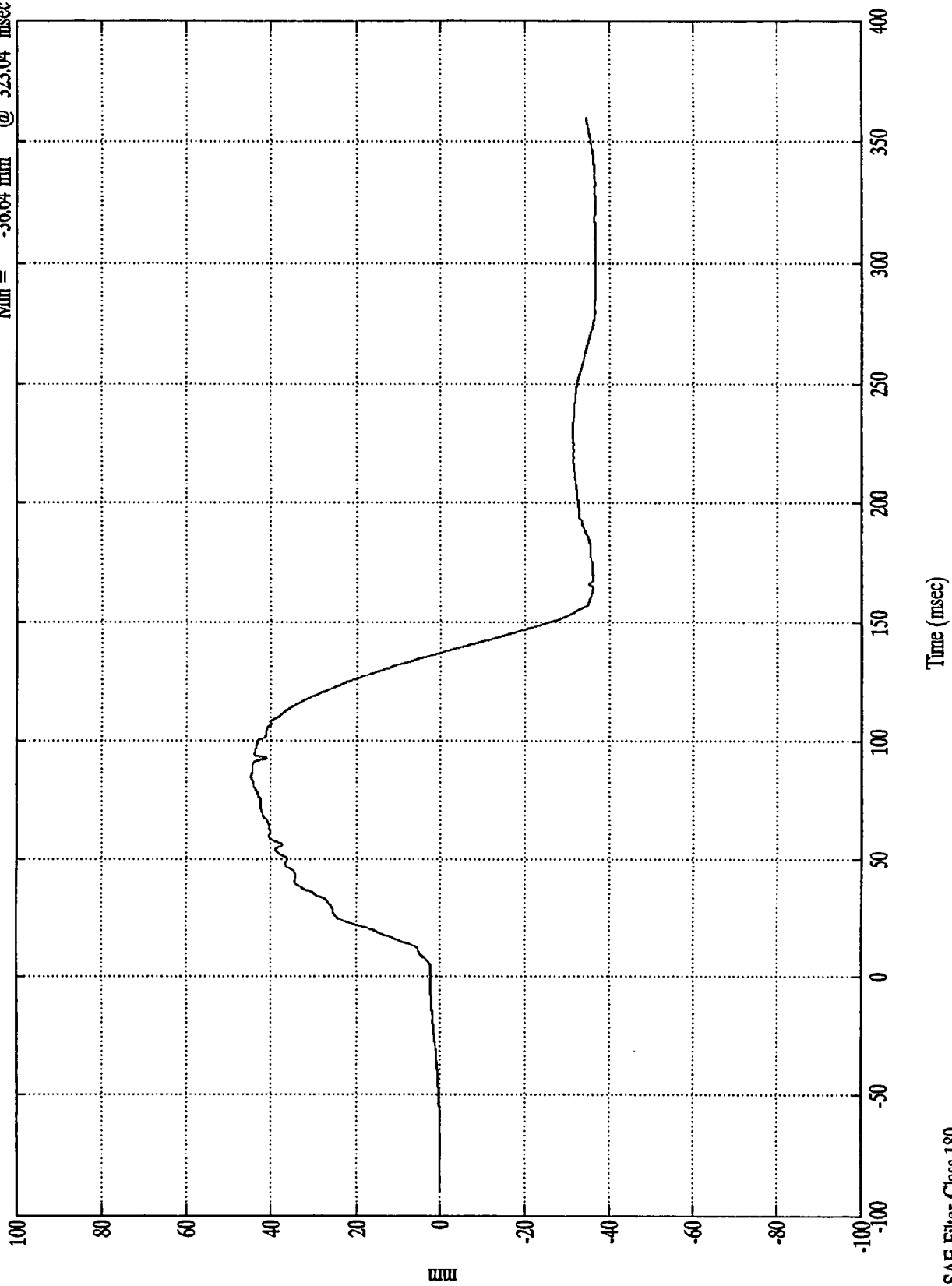
Pos. 1 Belt Elongation

Max = 7.77 mm/M @ 45.36 msec
Min = -7.51 mm/M @ 125.16 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

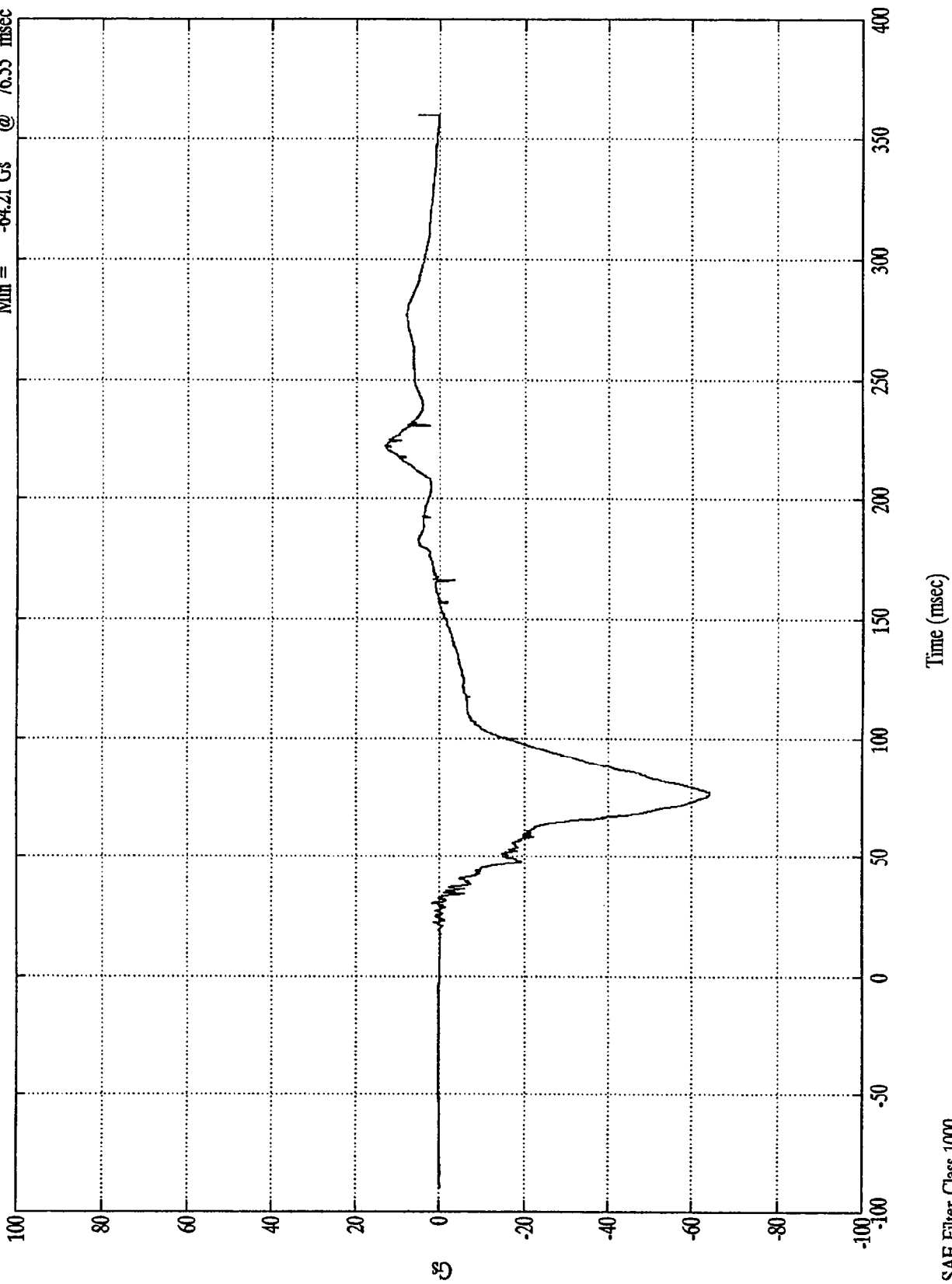
Pos. 1 Belt Spool Out
Max = 44.68 mm @ 84.59 msec
Min = -36.64 mm @ 323.04 msec



SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

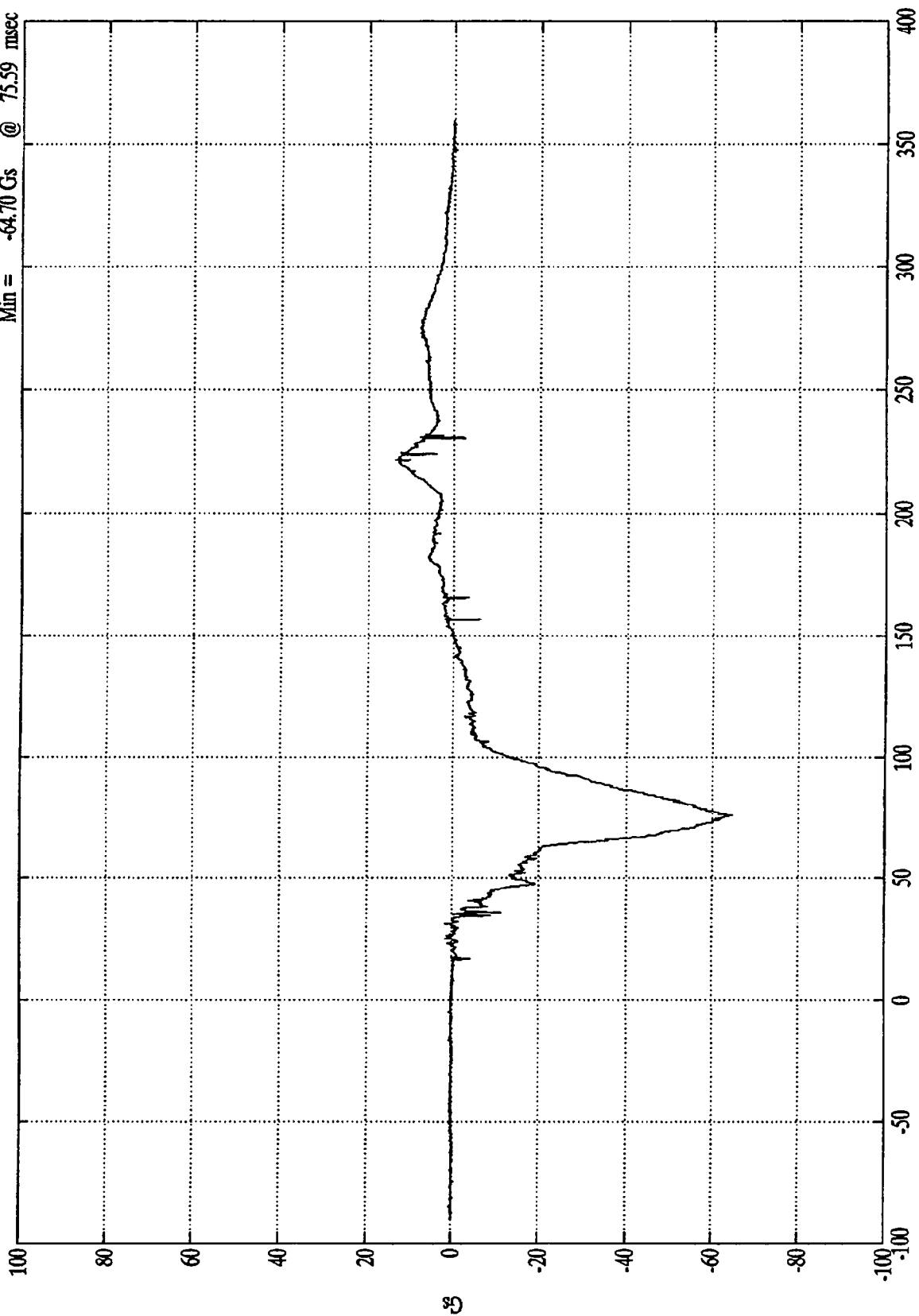
Pos. 2 Head X
Max = 13.19 Gs @ 222.36 msec
Min = -64.21 Gs @ 76.55 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Head X(R)

Max = 13.56 Gs @ 221.63 msec
Min = -64.70 Gs @ 75.59 msec

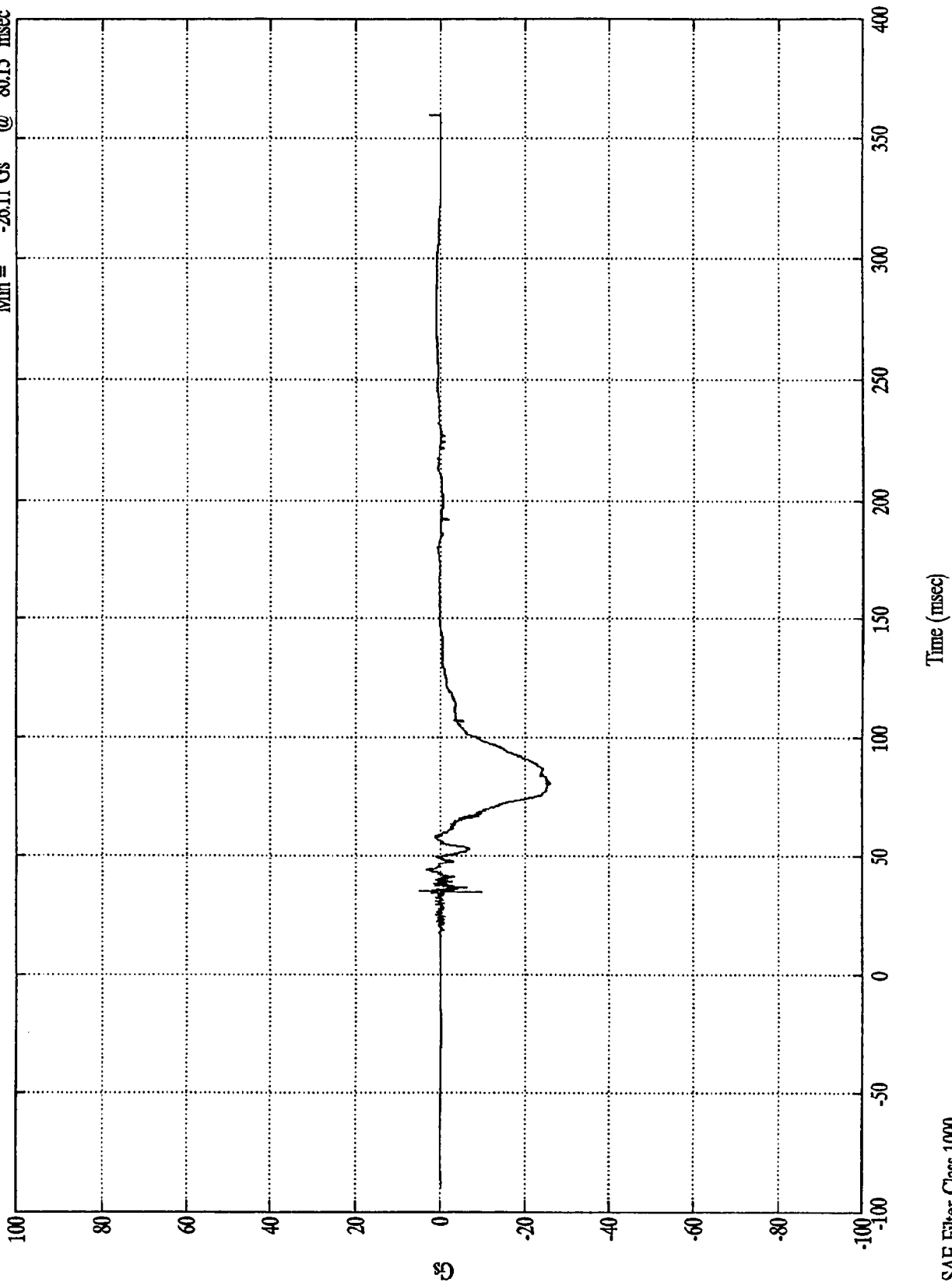


Time (msec)

SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Head Y
 Max = 5.05 Gs @ 34.79 msec
 Min = -26.11 Gs @ 80.15 msec

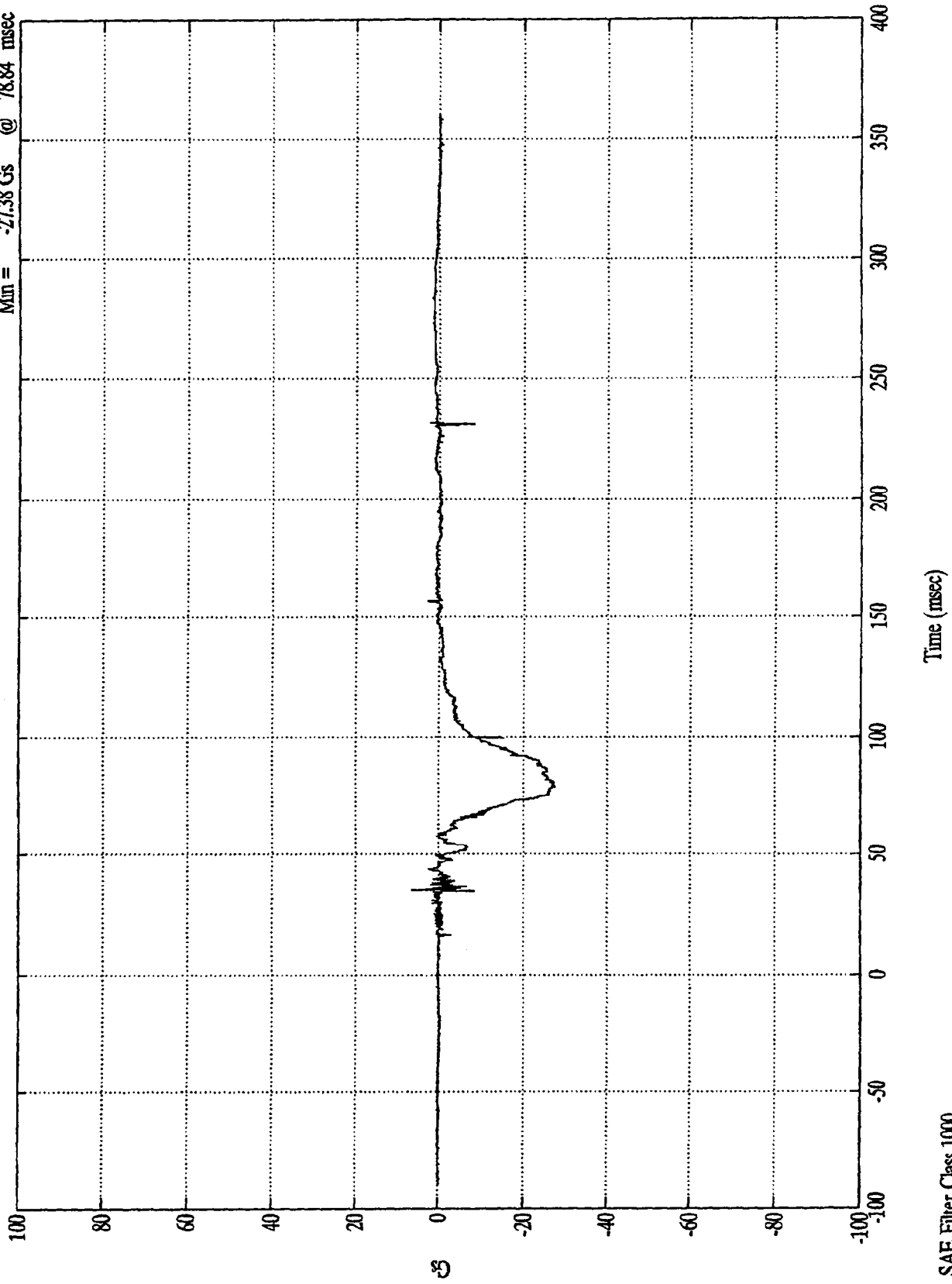


SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Head Y(R)

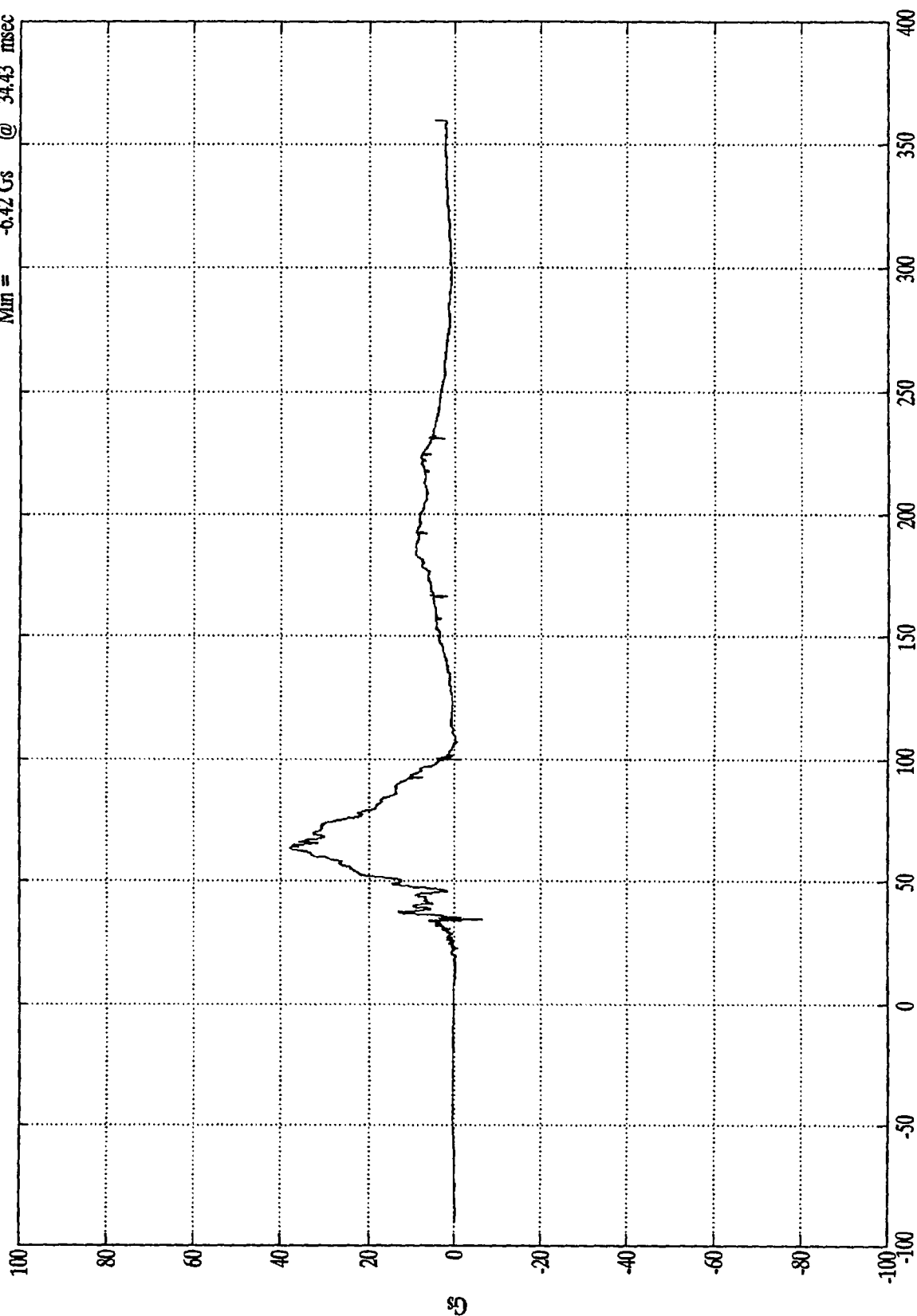
Max = 6.44 Gs @ 34.79 msec
Min = -27.38 Gs @ 78.84 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Head Z

Max = 37.82 Gs @ 63.84 msec
Min = -6.42 Gs @ 34.43 msec

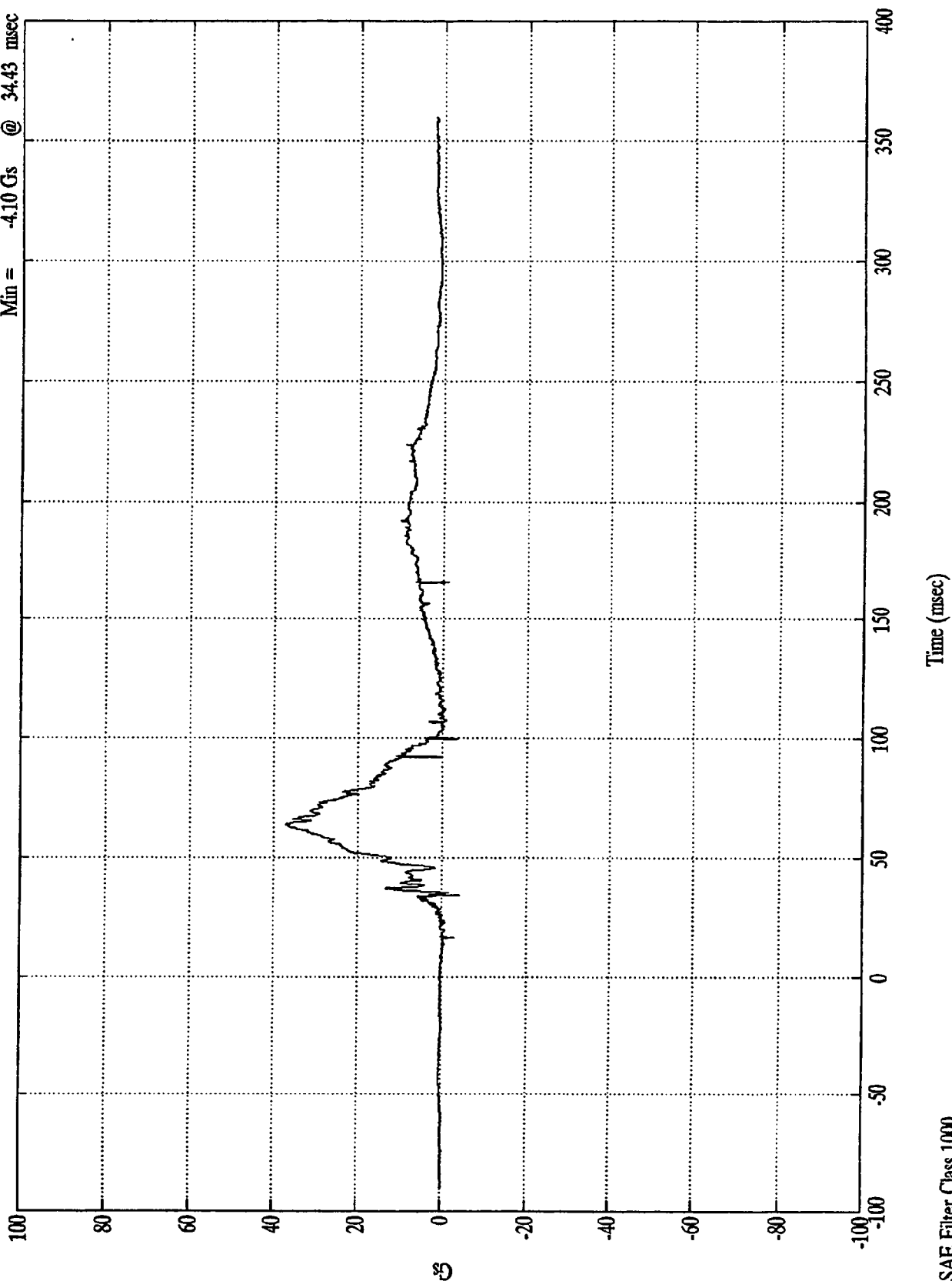


Time (msec)

SAE Filter Class 1000

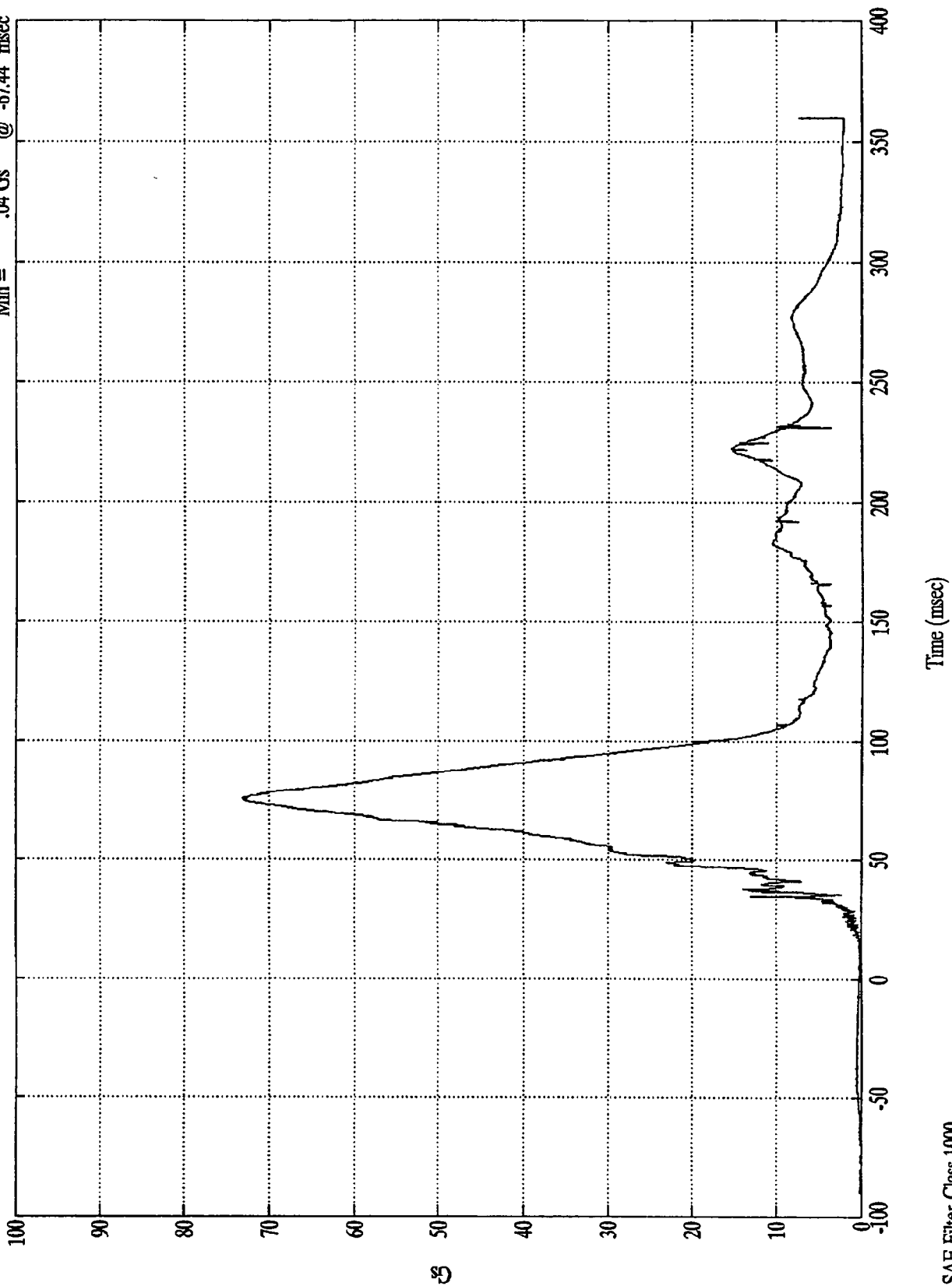
NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Head Z(R)
Max = 37.06 Gs @ 63.95 msec
Min = -4.10 Gs @ 34.43 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

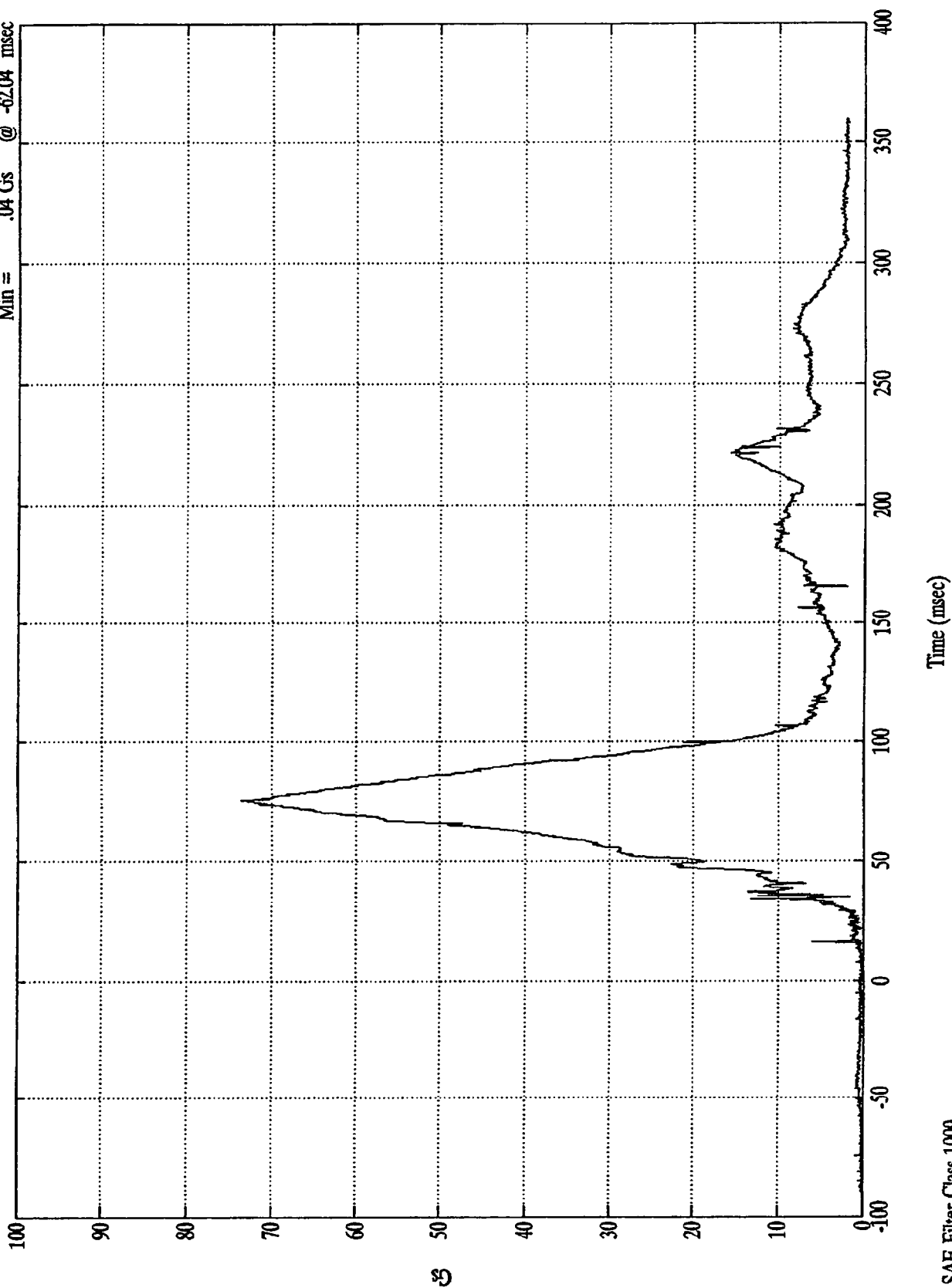
Pos. 2 Head Resultant
 Max = 73.22 Gs @ 75.47 msec
 Min = .04 Gs @ -57.44 msec



SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

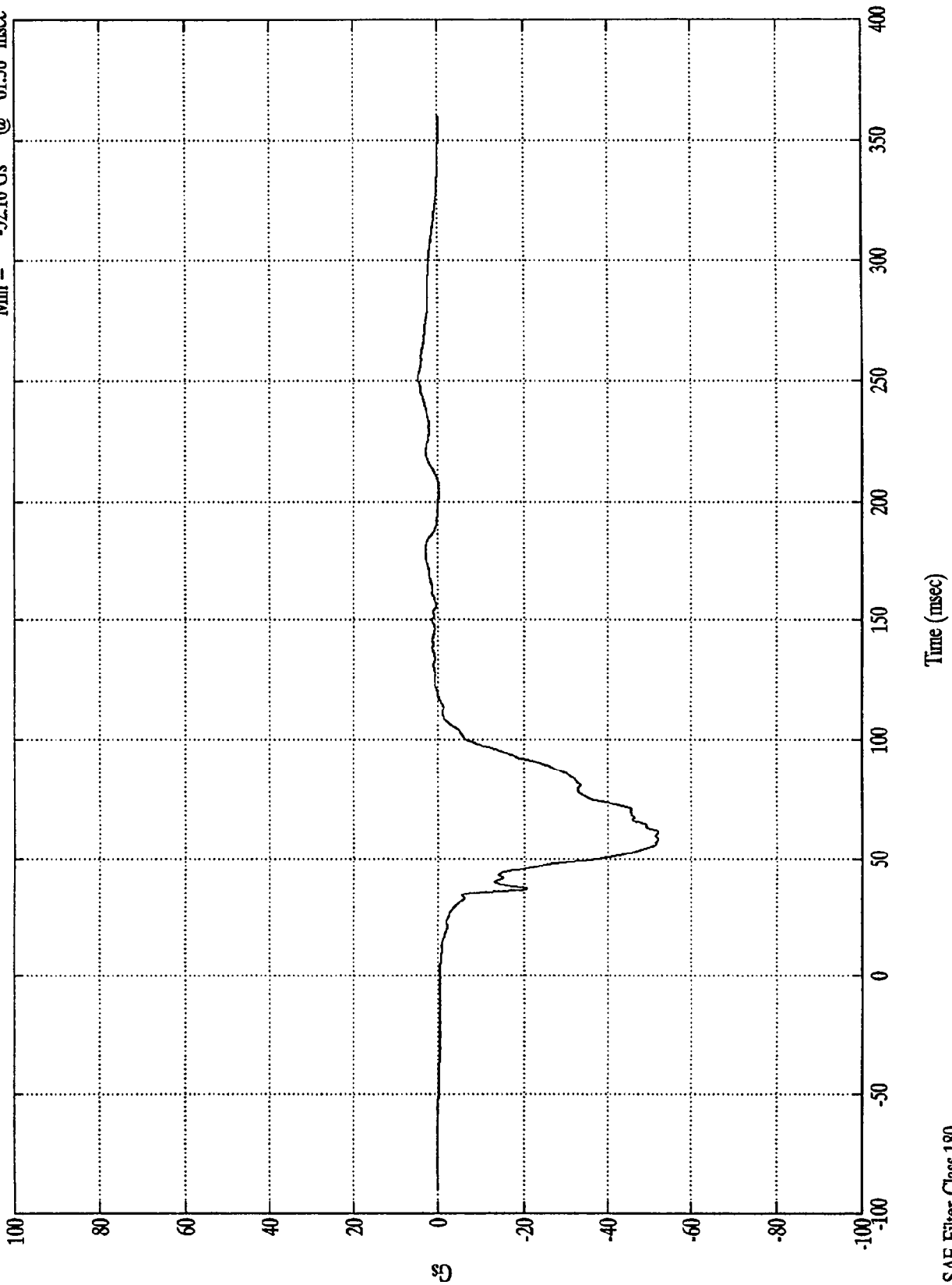
Pos. 2 Head Resultant(R)
Max = 73.56 Gs @ 75.59 msec
Min = .04 Gs @ -62.04 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 4.72 Gs @ 251.04 msec
Min = -52.16 Gs @ 61.56 msec

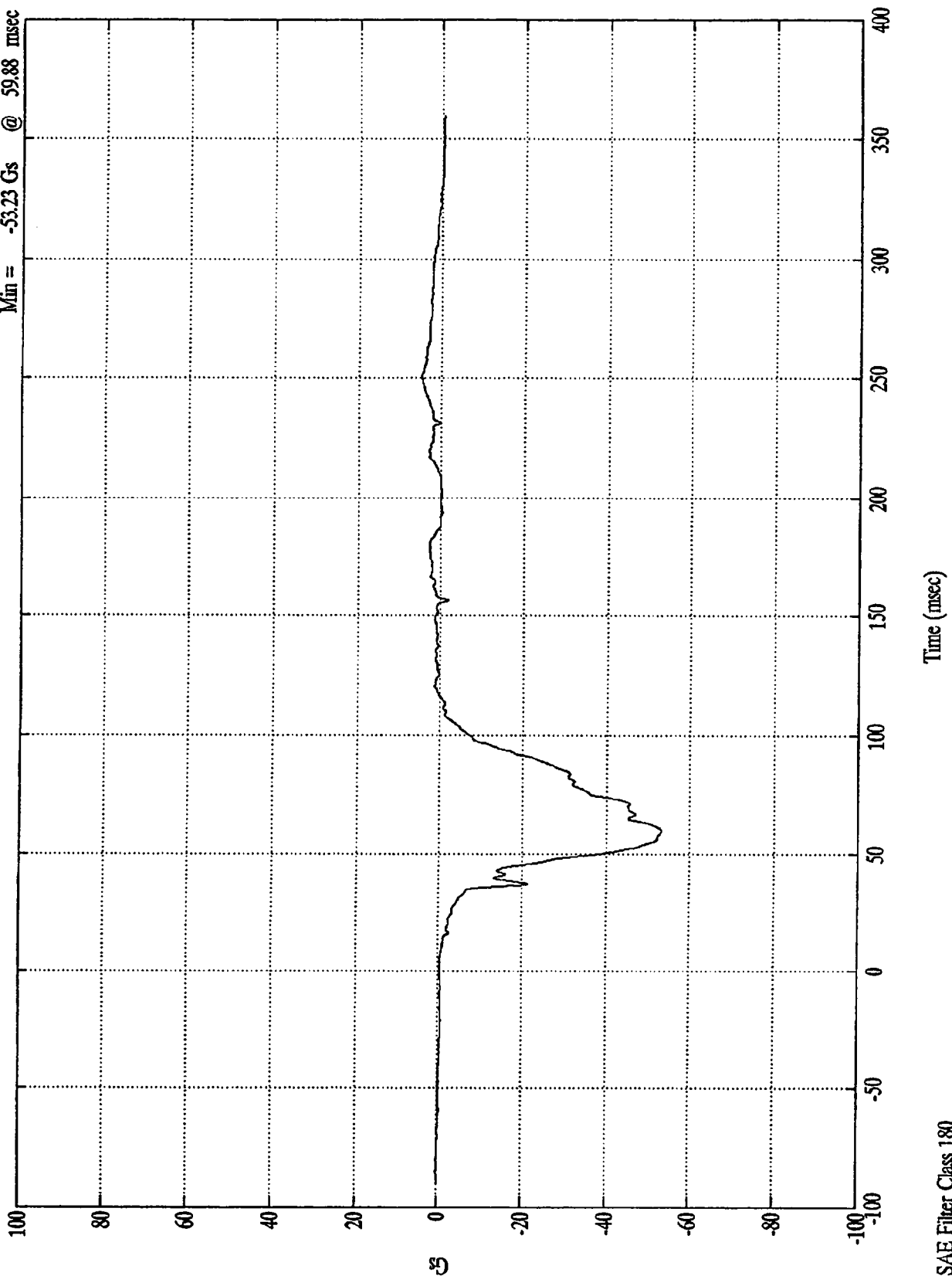
Pos. 2 Chest X



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

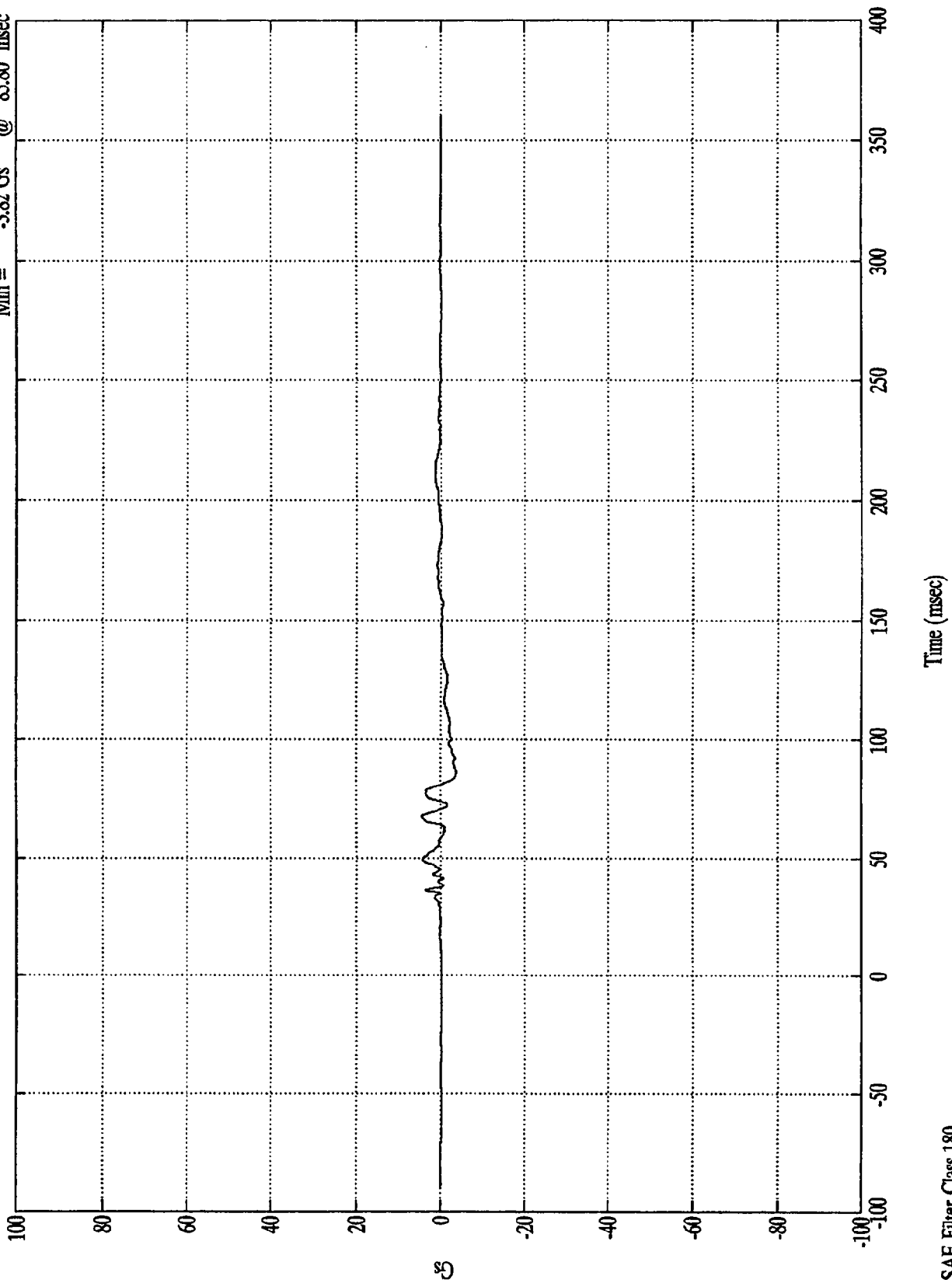
Pos. 2 Chest X(R)

Max = 4.70 Gs @ 250.91 msec
Min = -53.23 Gs @ 59.88 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

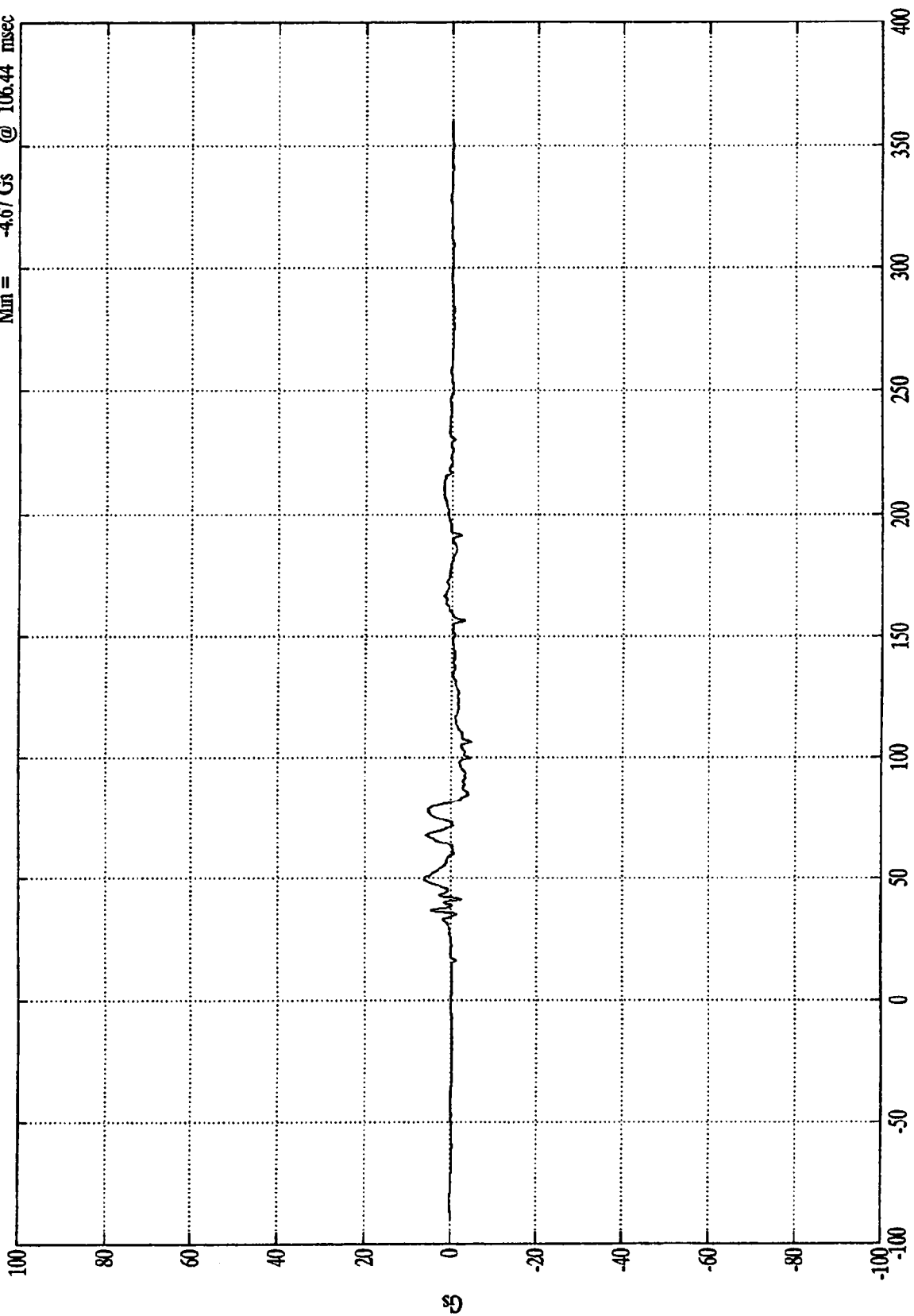
Pos. 2 Chest Y
Max = 4.42 Gs @ 67.44 msec
Min = -3.82 Gs @ 85.80 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Chest Y(R)

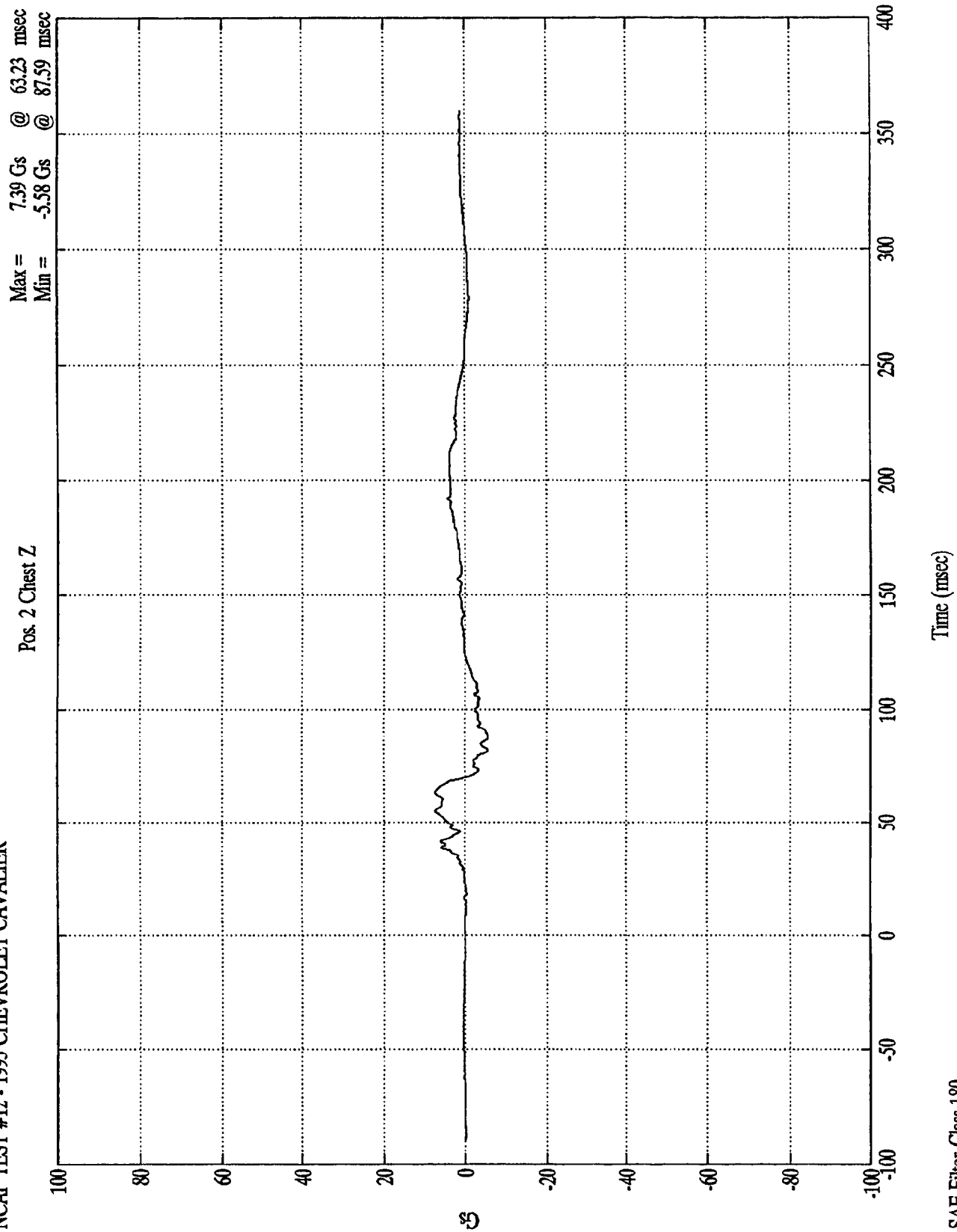
Max = 6.28 Gs @ 49.79 msec
Min = -4.67 Gs @ 106.44 msec



Time (msec)

SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

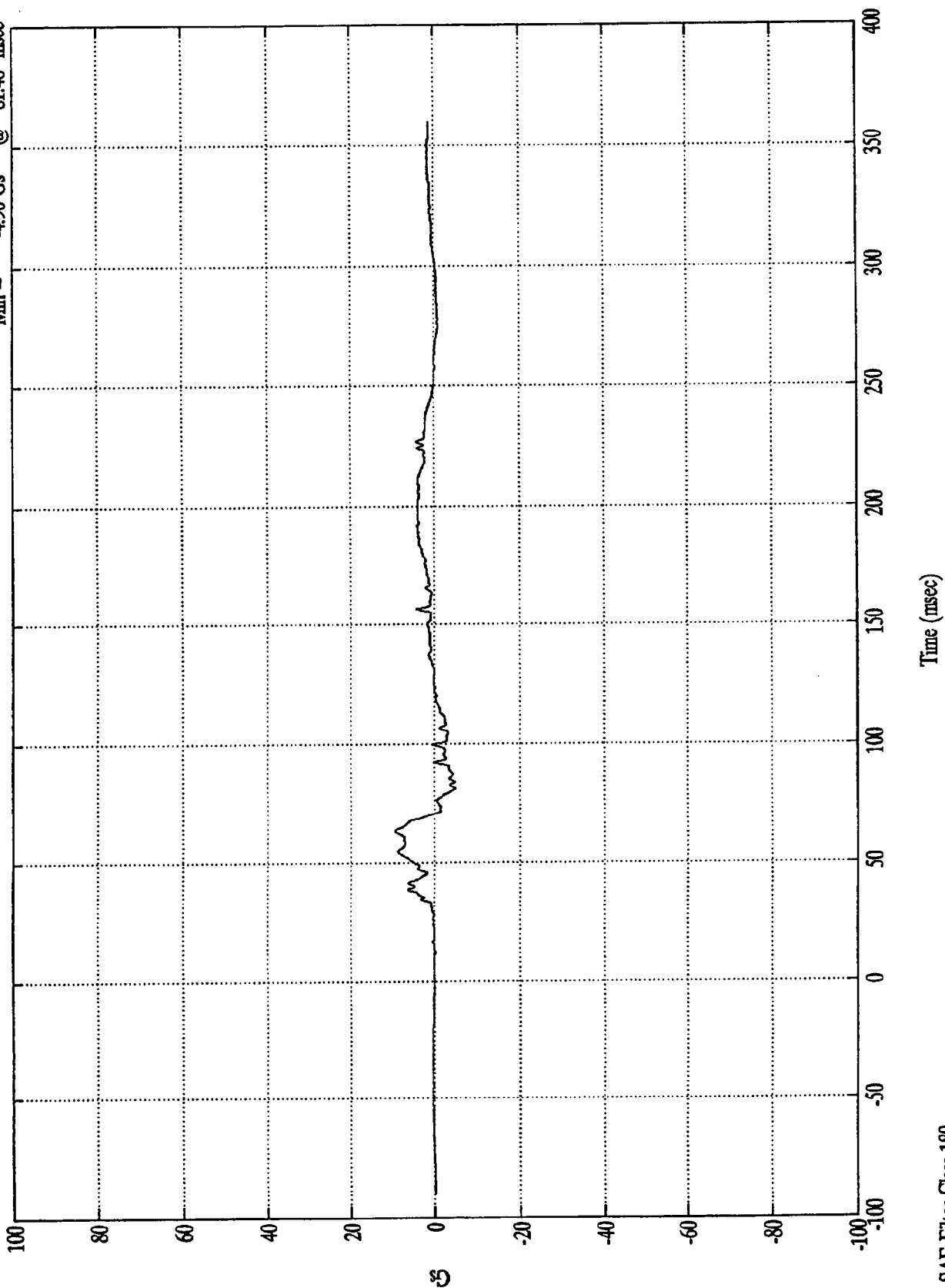


SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

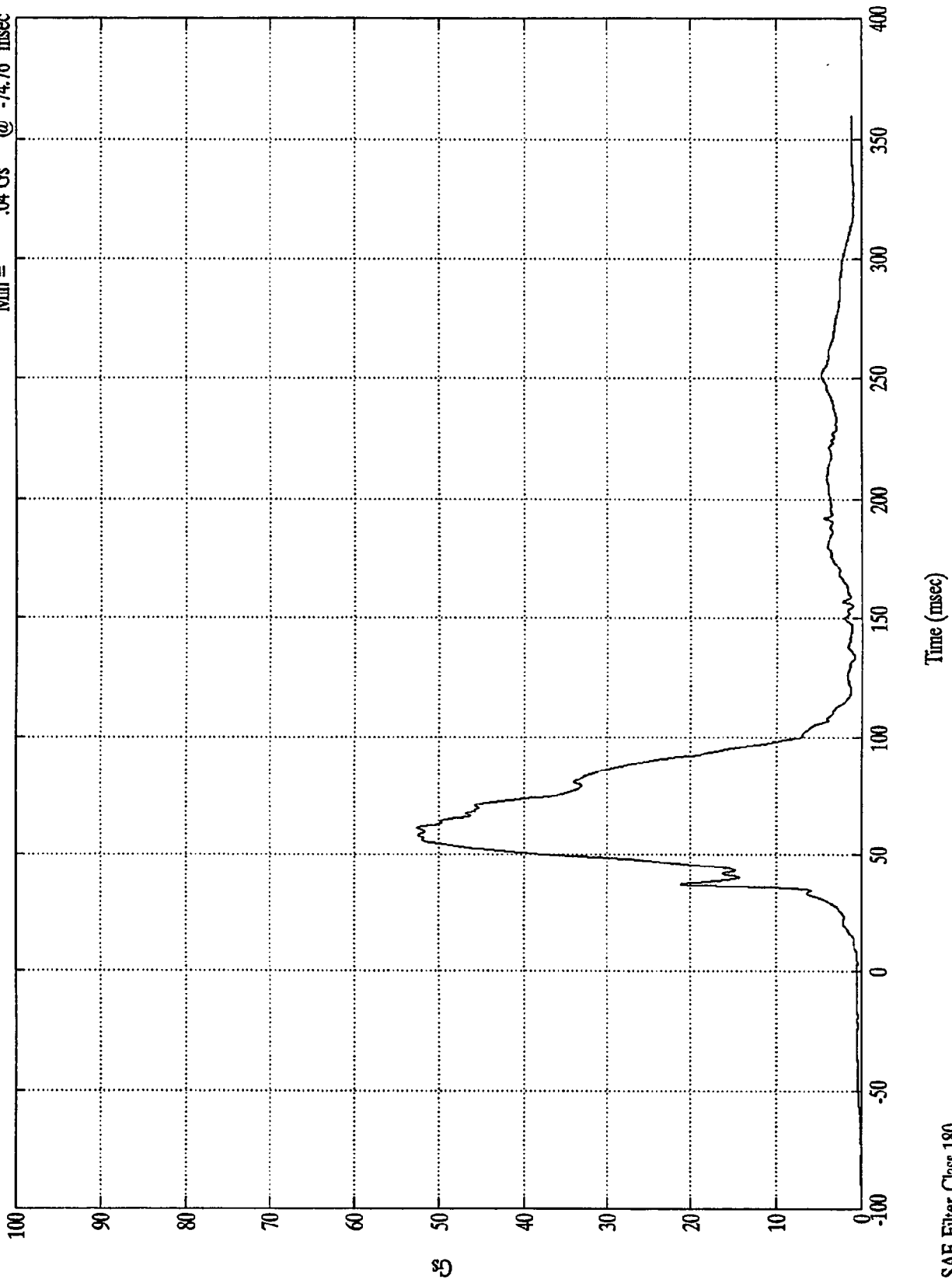
Pos. 2 Chest Z(R)

Max = 9.45 Gs @ 63.72 msec
Min = -4.90 Gs @ 81.48 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Chest Resultant
 Max = 52.56 Gs @ 61.56 msec
 Min = .04 Gs @ -74.76 msec

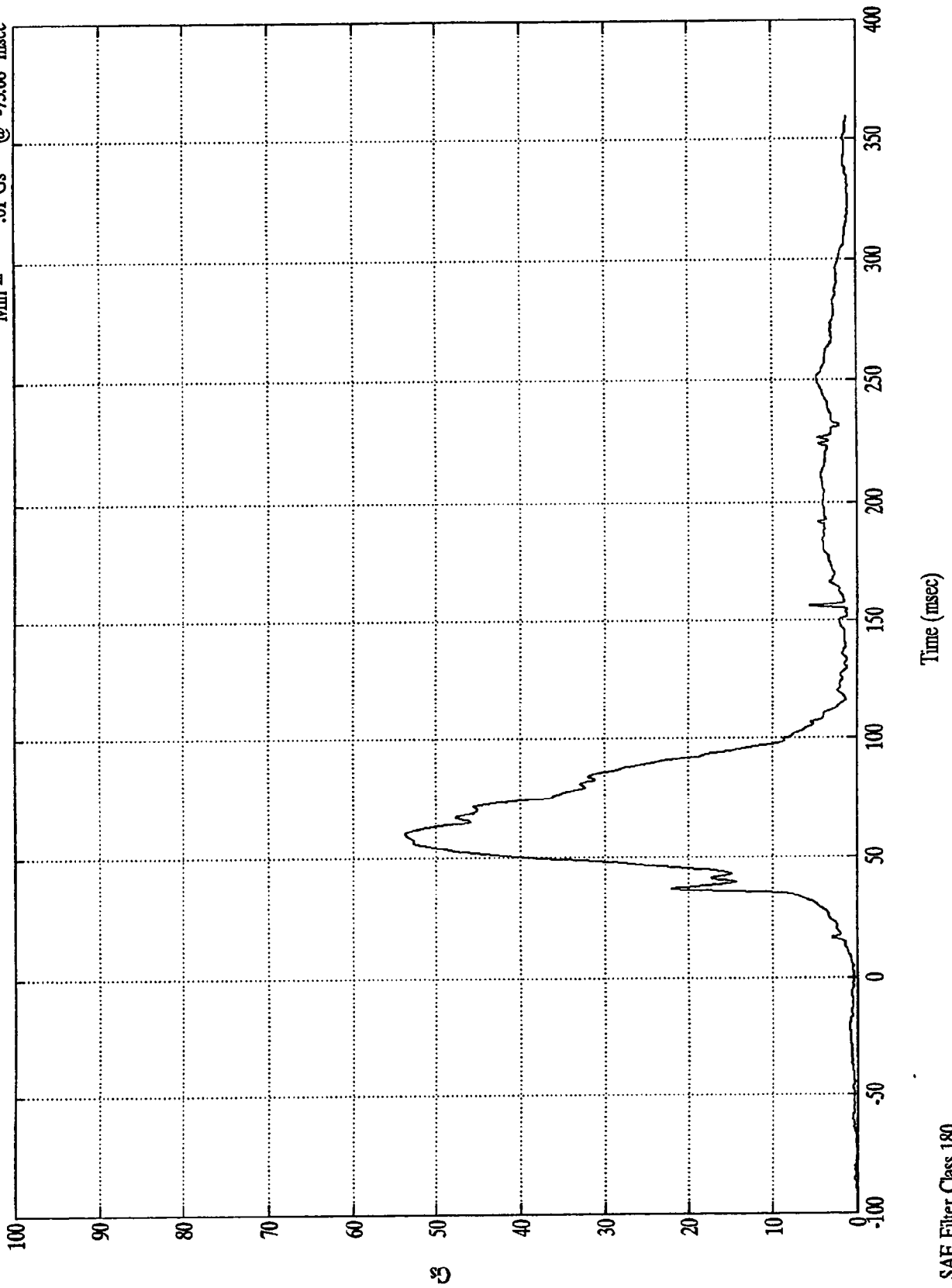


SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 53.73 Gs @ 59.88 msec
Min = .01 Gs @ -73.68 msec

Pos. 2 Chest Res(R)

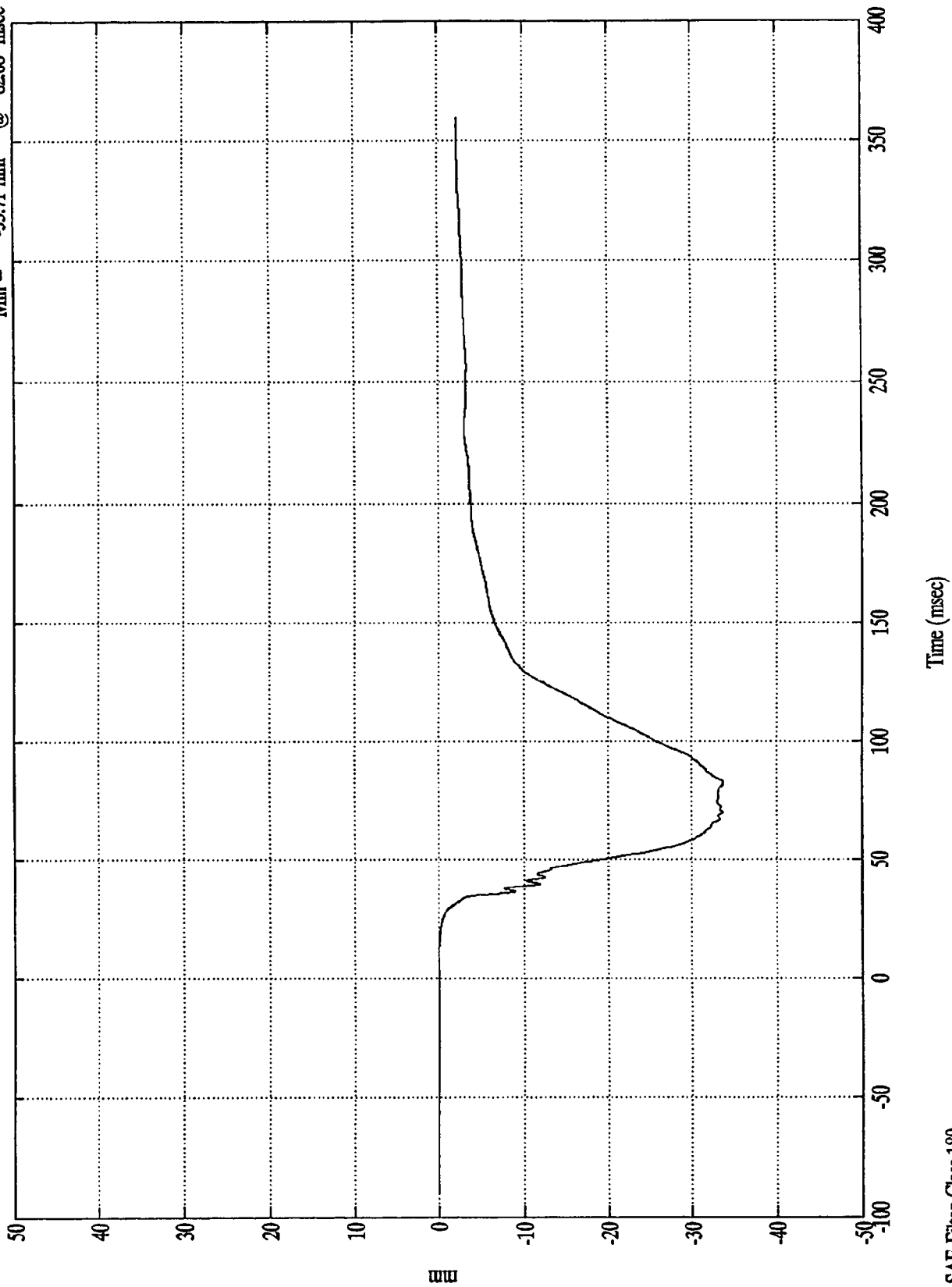


SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Chest Disp.

Max = .05 mm @ 4.55 msec
Min = -33.71 mm @ 82.68 msec

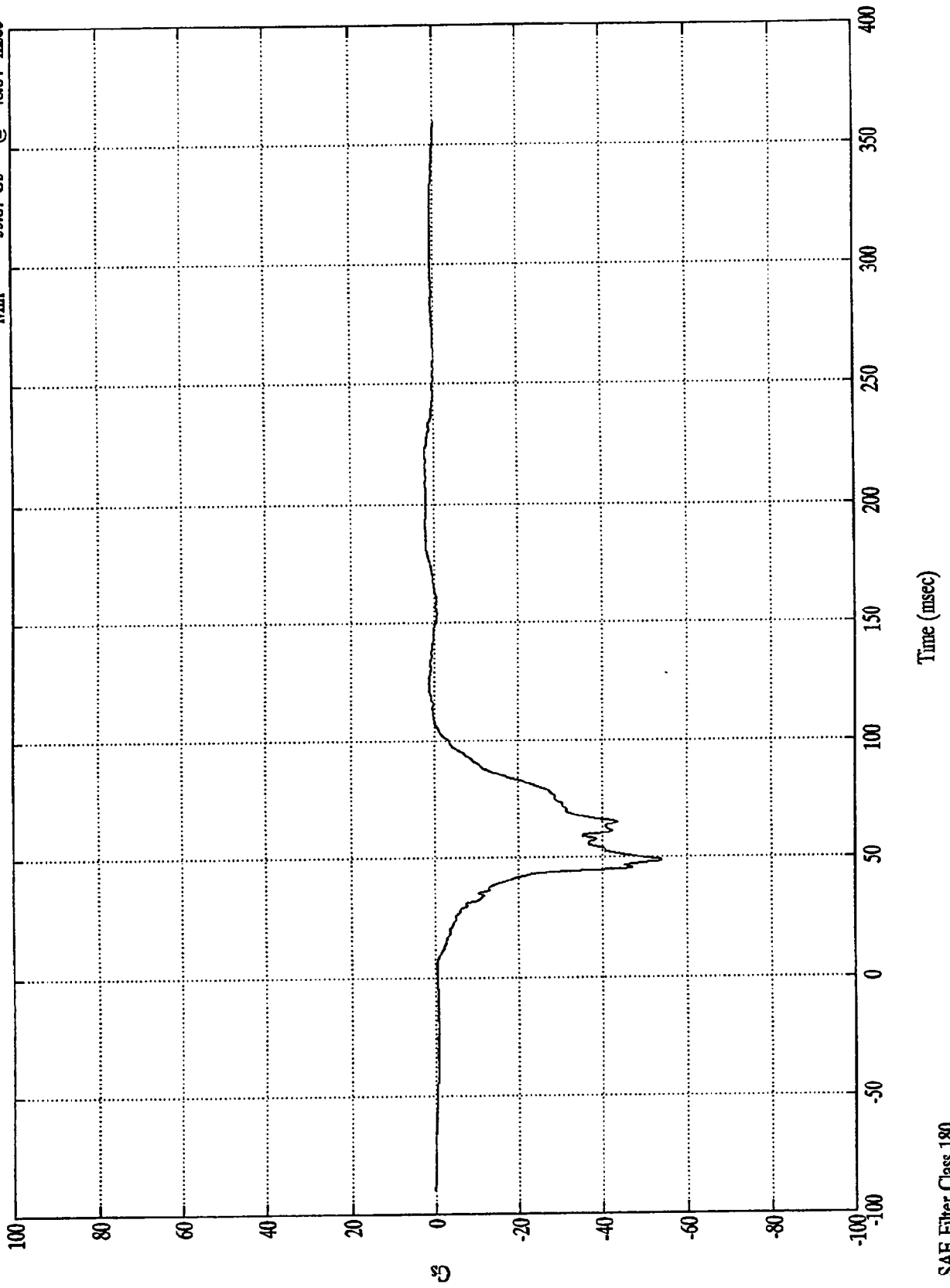


SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 2.34 Gs @ 192.36 msec
Min = -53.87 Gs @ 48.84 msec

Pos. 2 Pelvic (X)

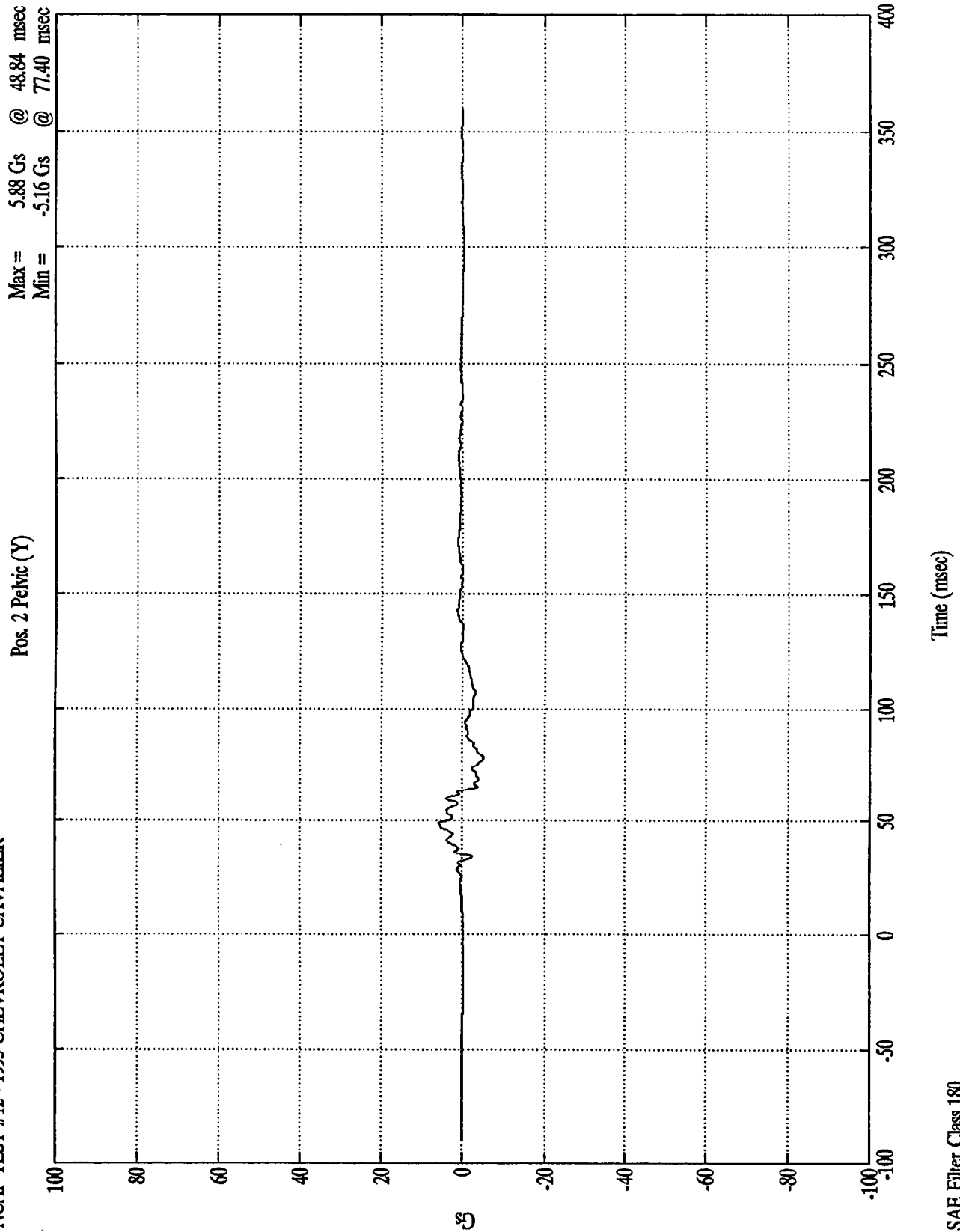


SAE Filter Class 180

8227-12

B-57

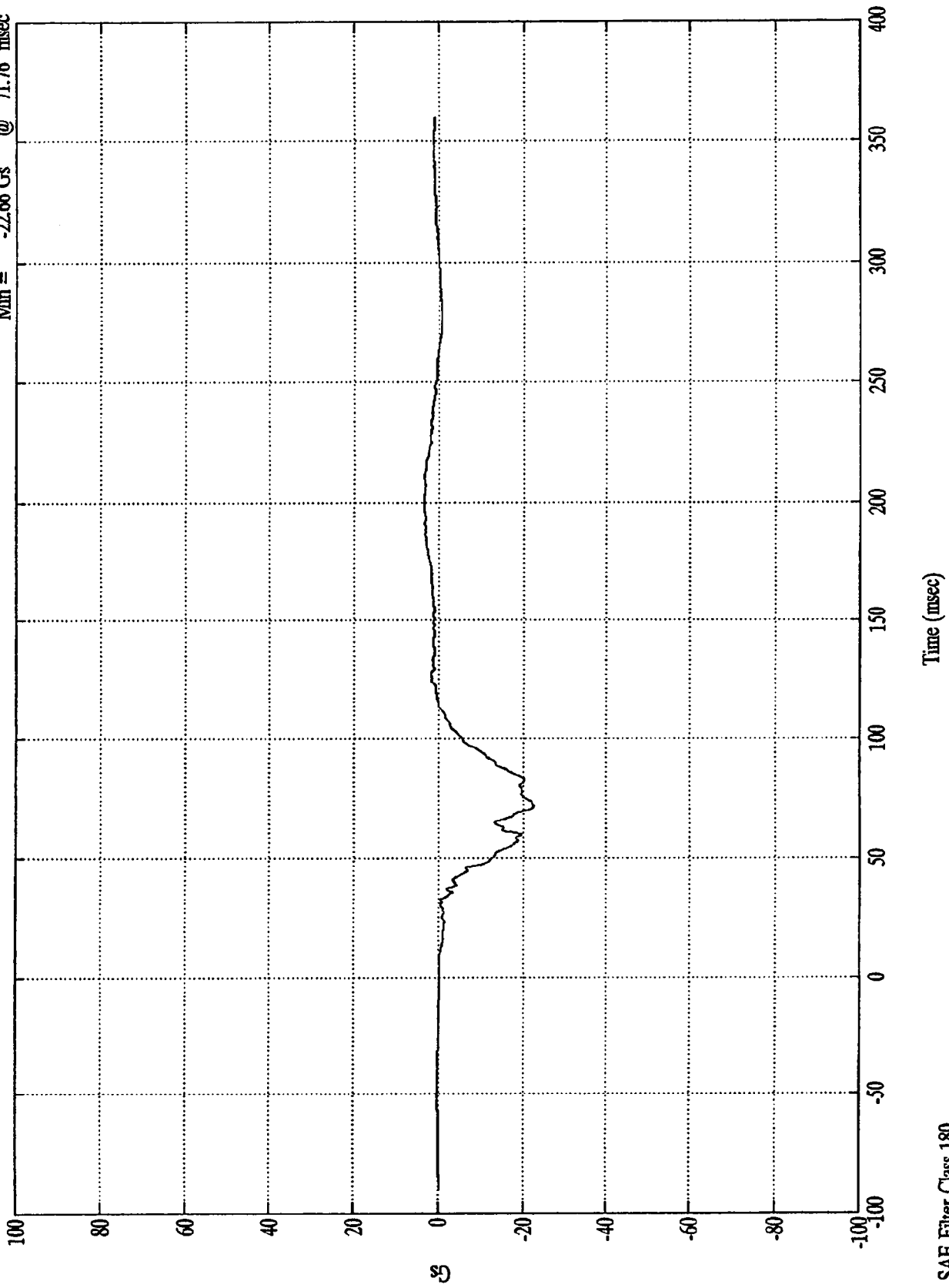
NCAP TEST #12 - 1995 CHEVROLET CAVALIER



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Pelvic (Z)

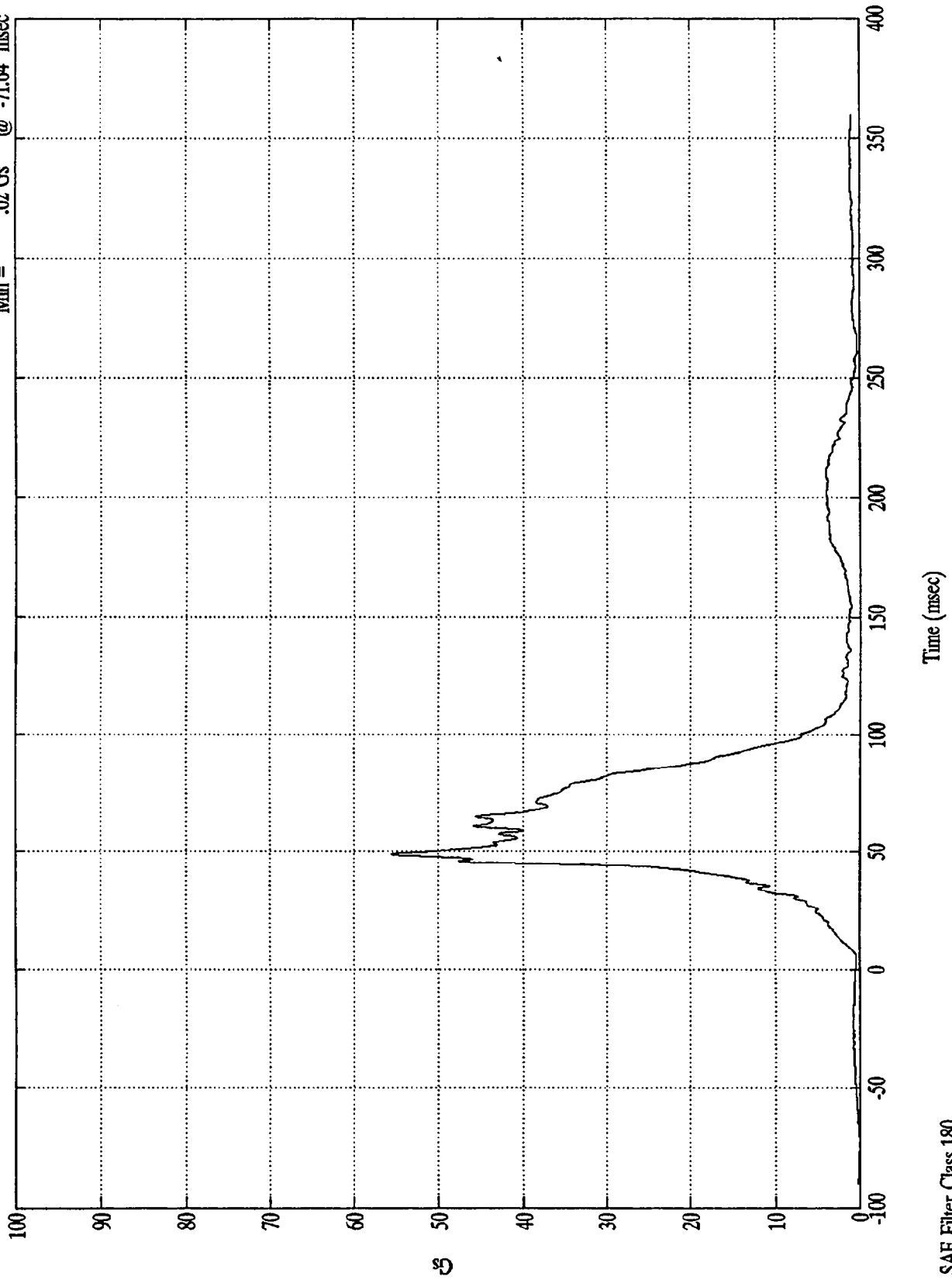
Max = 3.41 Gs @ 202.20 msec
Min = -22.66 Gs @ 71.76 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Pelvic (R)

Max = 55.48 Gs @ 48.84 msec
Min = .02 Gs @ -71.64 msec



B-60

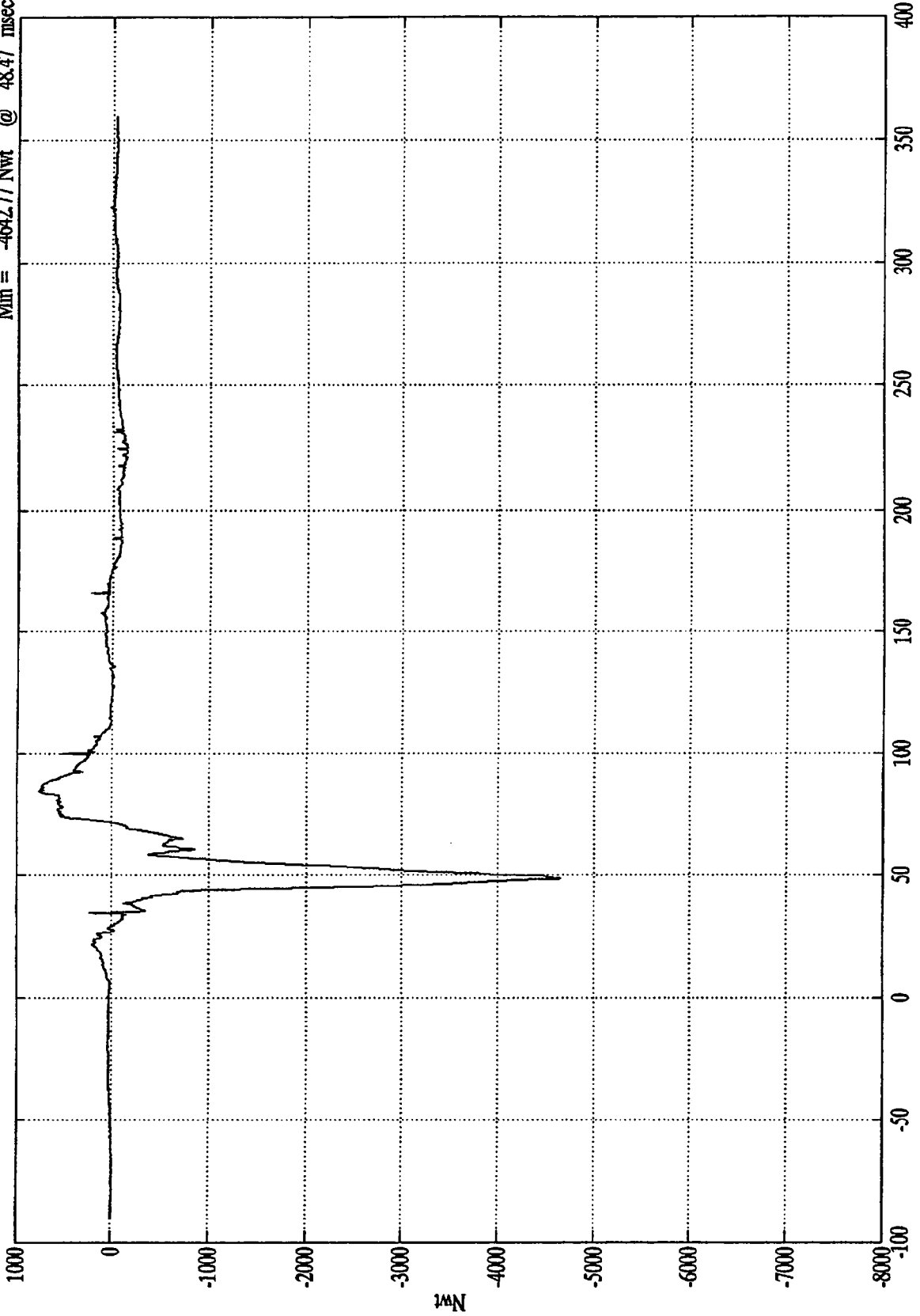
8227-12

SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 769.57 Nwt @ 84.72 msec
Min = -4642.77 Nwt @ 48.47 msec

Pos. 2 Left Femur

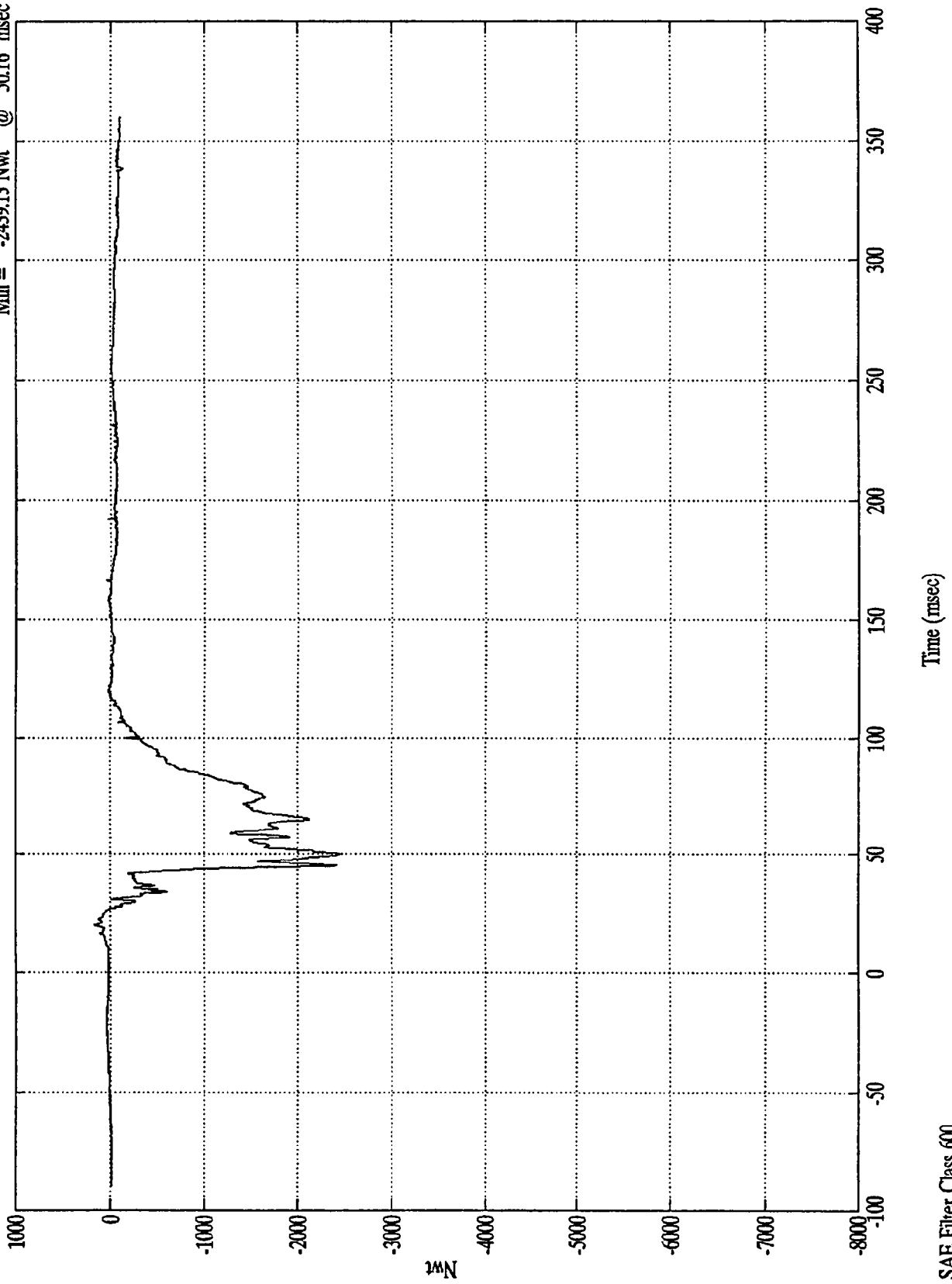


SAE Filter Class 600

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Right Femur

Max = 174.60 Nwt @ 19.79 msec
Min = -2439.13 Nwt @ 50.16 msec



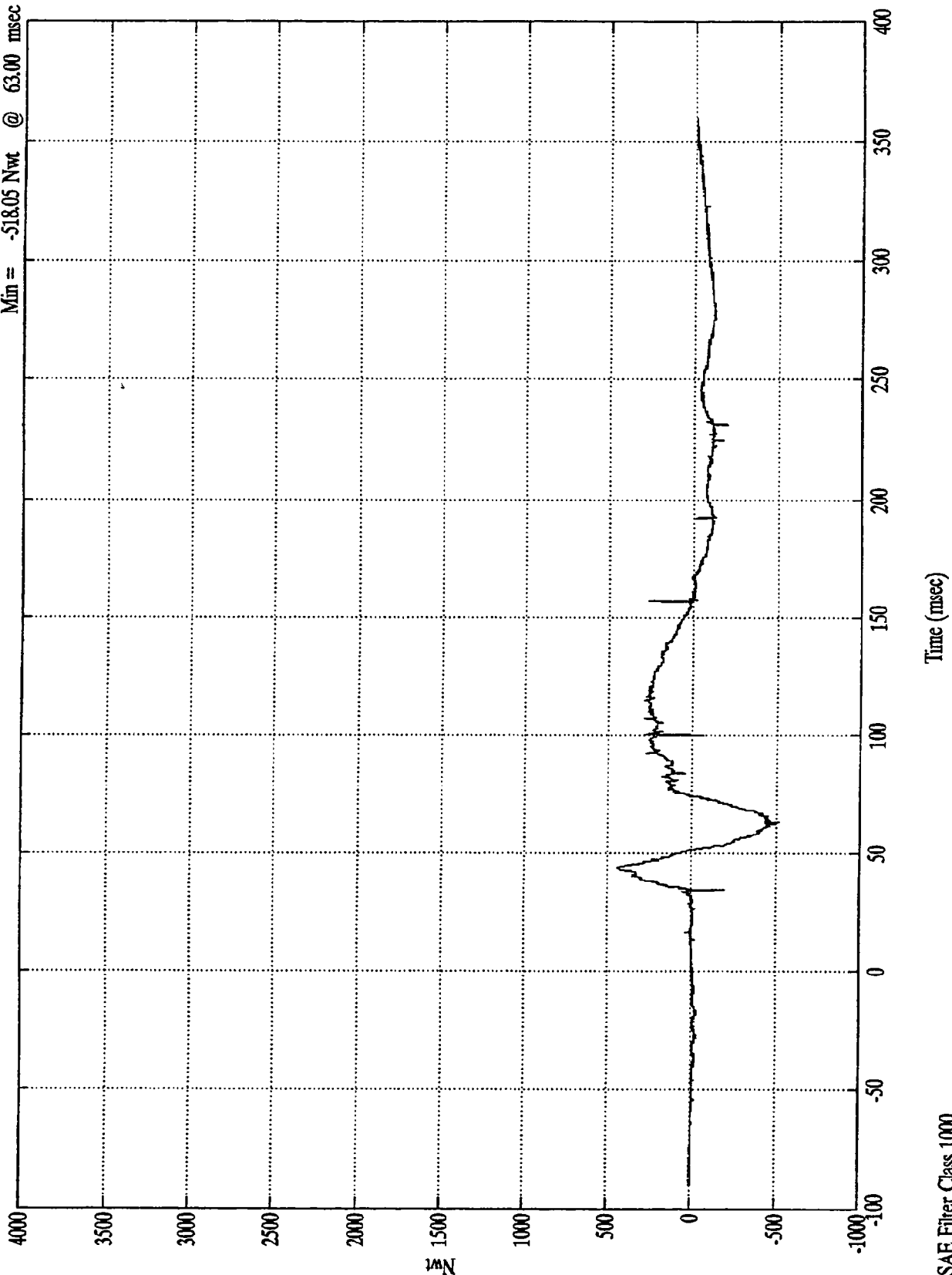
Nwt

Time (msec)

SAE Filter Class 600

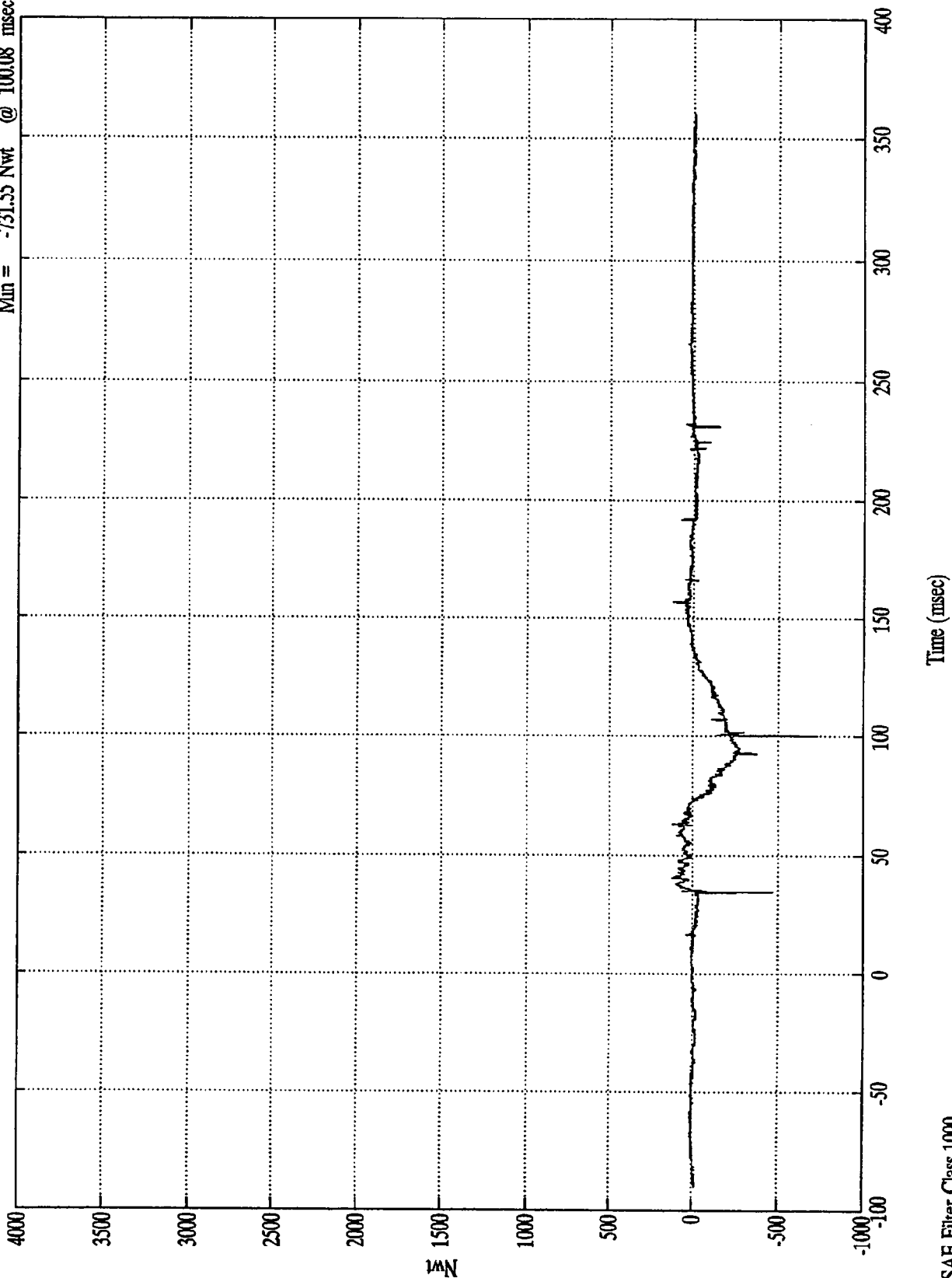
NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Upper Neck Fx
Max = 438.88 Nwt @ 44.15 msec
Min = -518.05 Nwt @ 63.00 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Upper Neck Fy
Max = 123.59 Nwt @ 157.08 msec
Min = -731.55 Nwt @ 100.08 msec

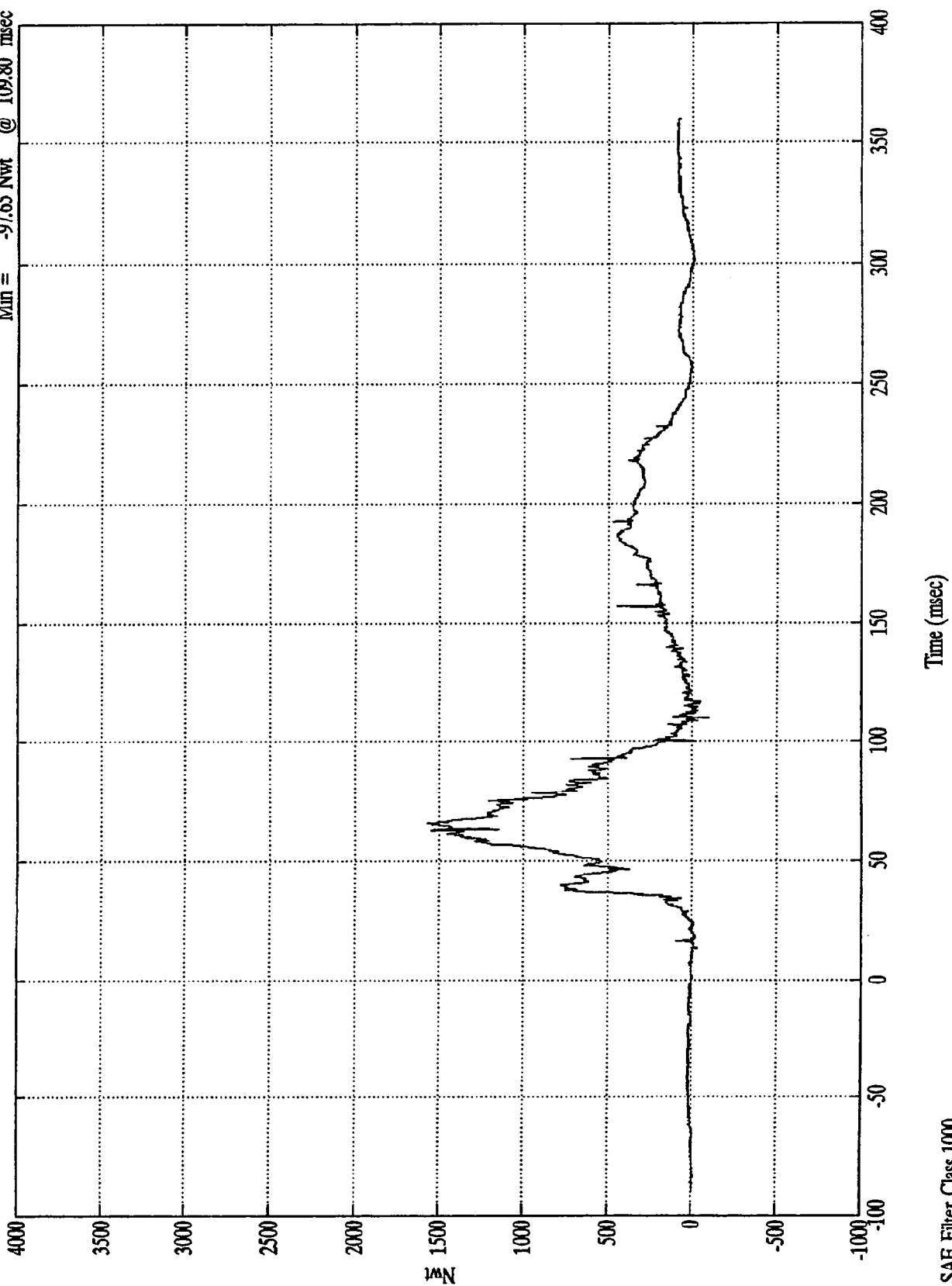


SAE Filter Class 1000

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Upper Neck Fz

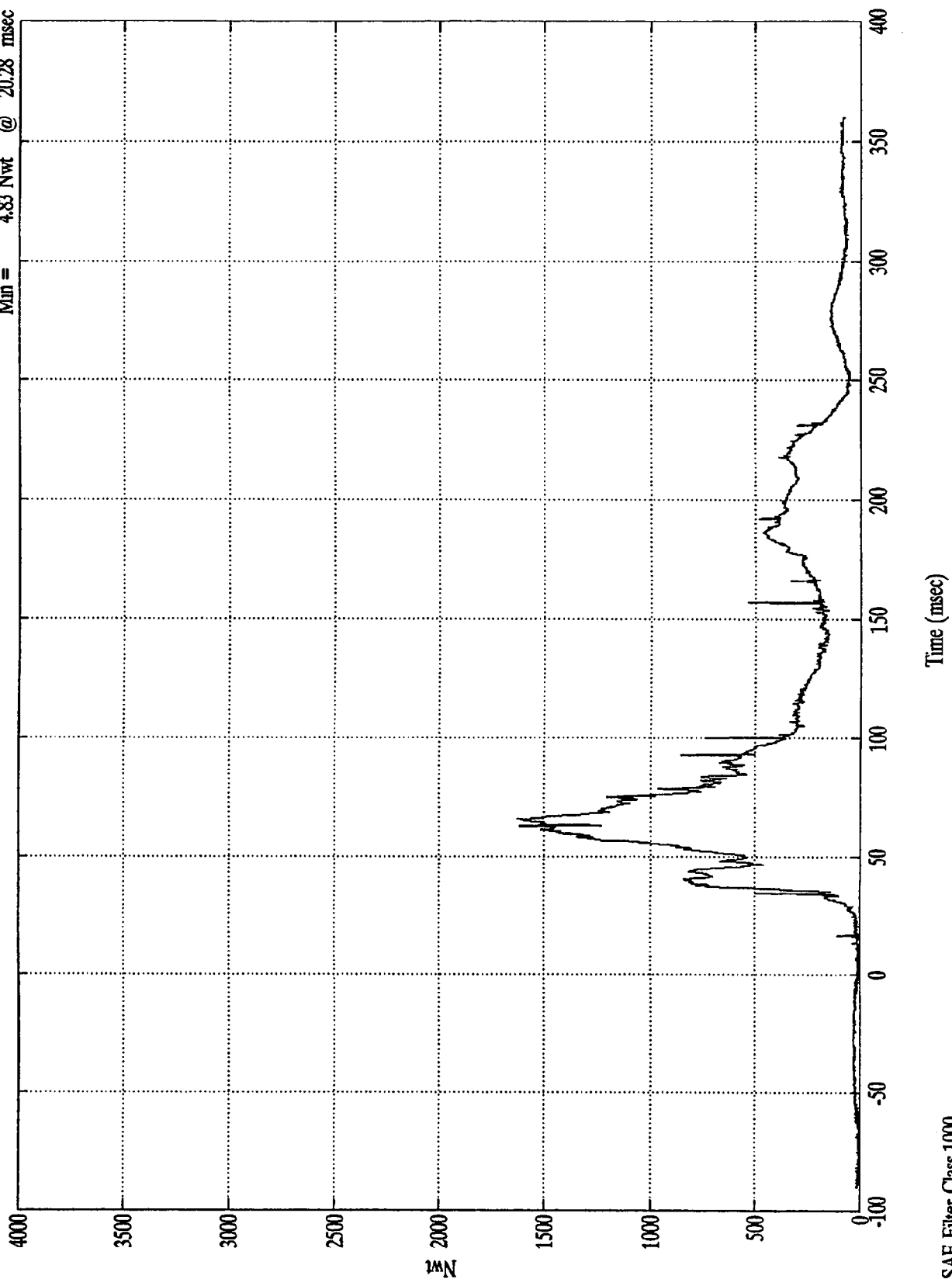
Max = 1566.09 Nwt @ 65.76 msec
Min = -97.65 Nwt @ 109.80 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

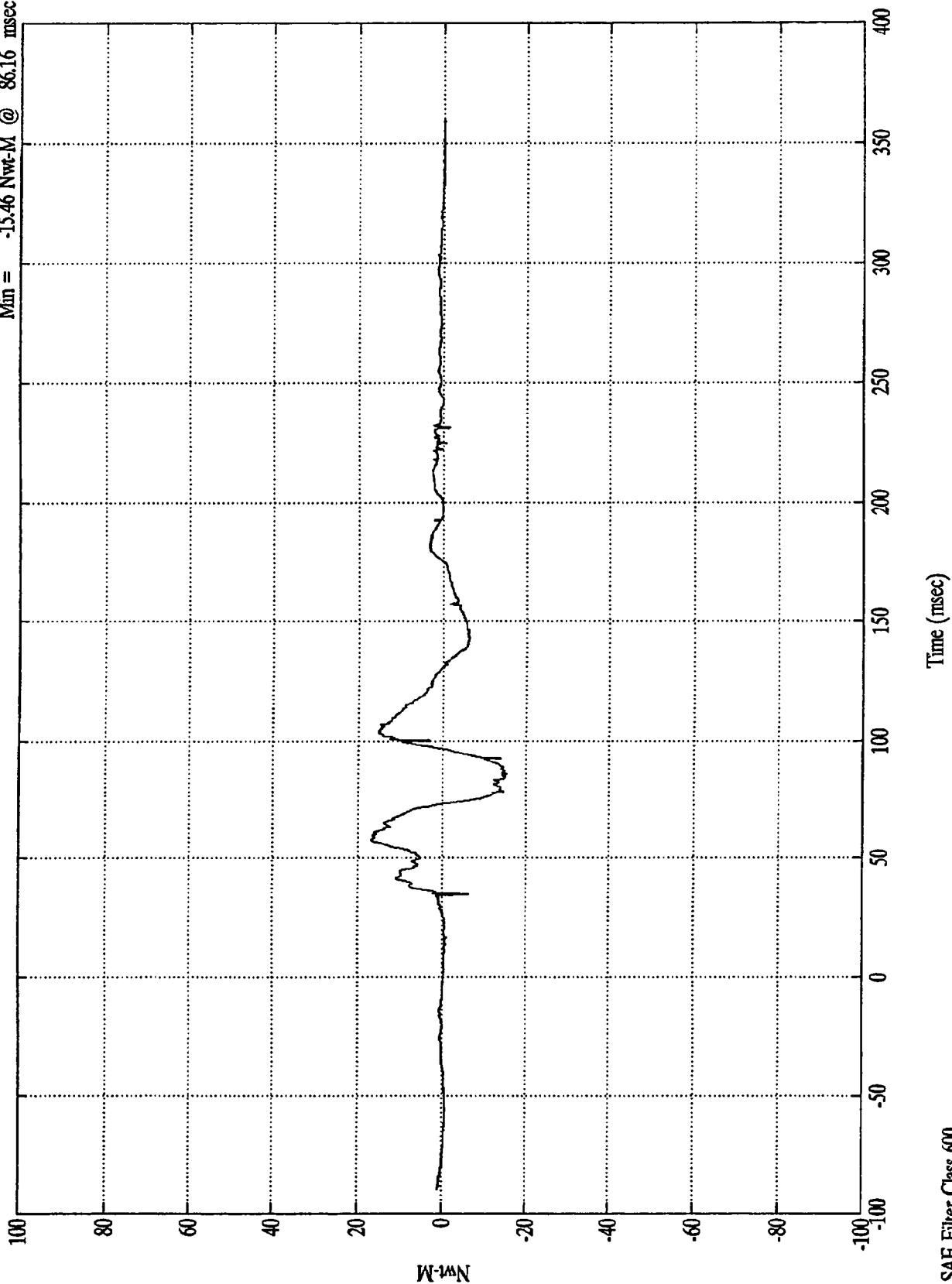
Max = 1624.94 Nwt @ 65.76 msec
Min = 4.83 Nwt @ 20.28 msec

Pos. 2 Neck Force Res.



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Upper Neck Mx
Max = 16.75 Nwt-M @ 57.72 msec
Min = -15.46 Nwt-M @ 86.16 msec



W-14N

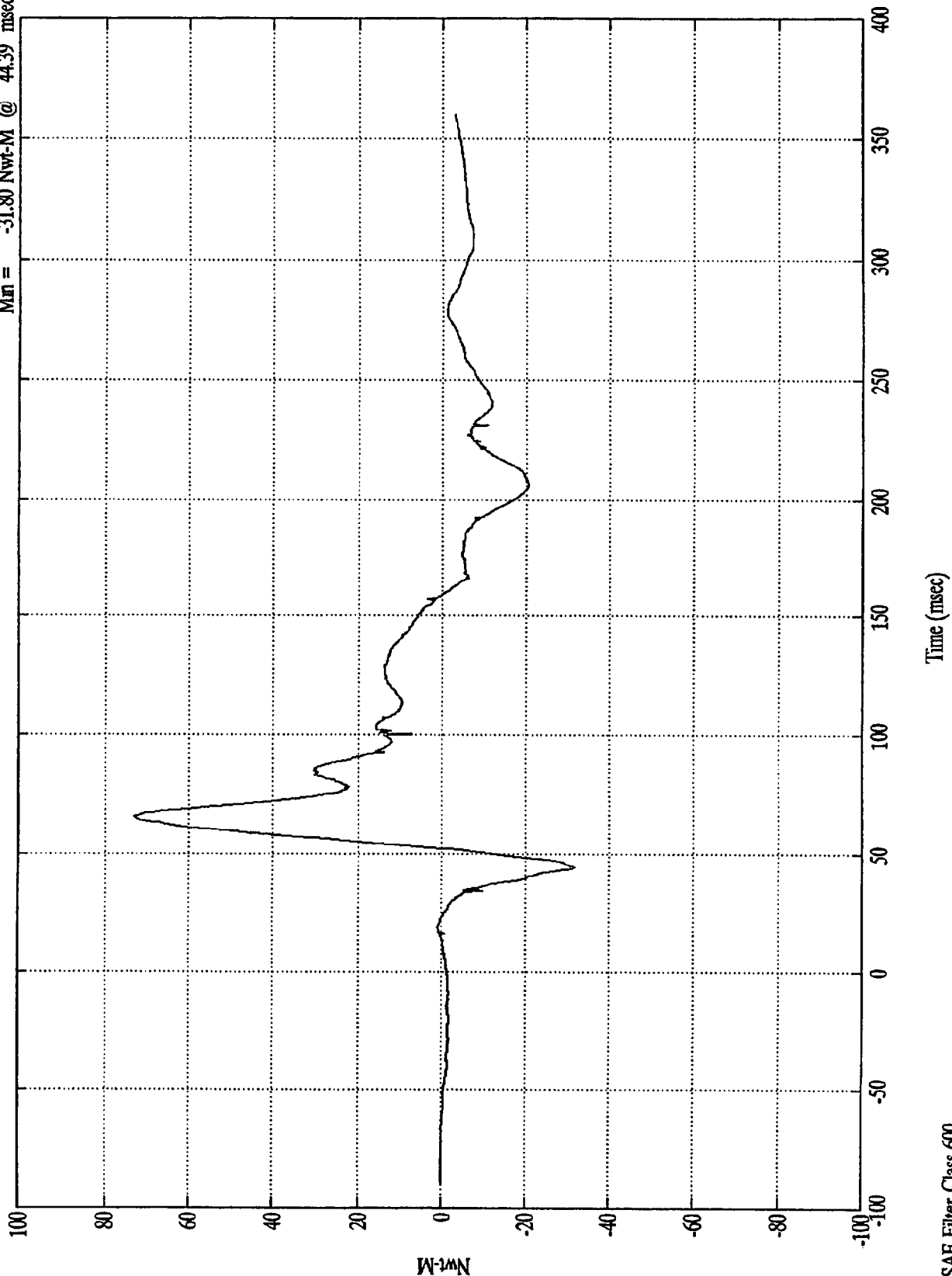
B-67

8227-12

SAE Filter Class 600

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Upper Neck My
 Max = 73.03 Nwt-M @ 65.87 msec
 Min = -31.80 Nwt-M @ 44.39 msec

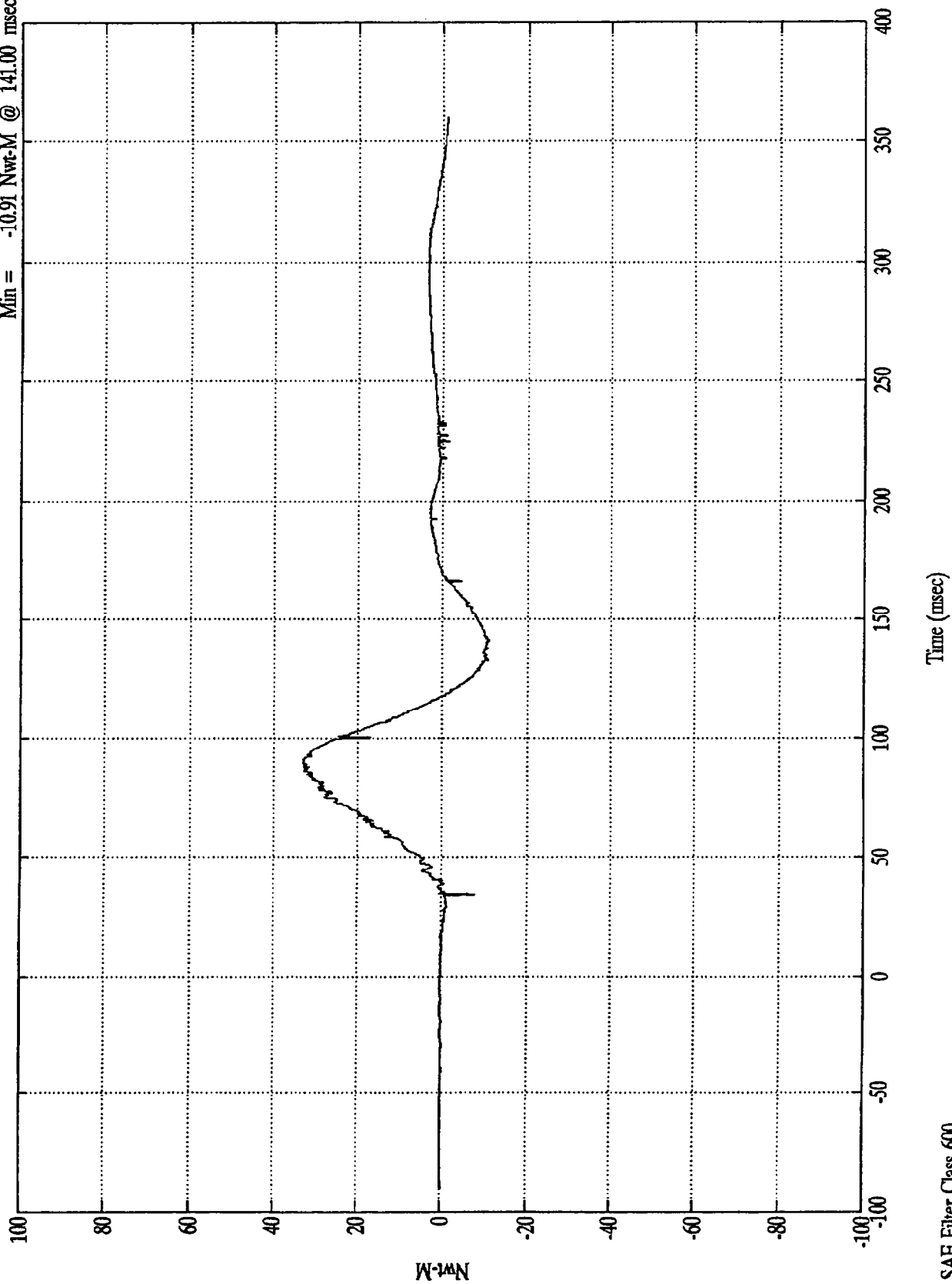


SAE Filter Class 600

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Upper Neck Mz

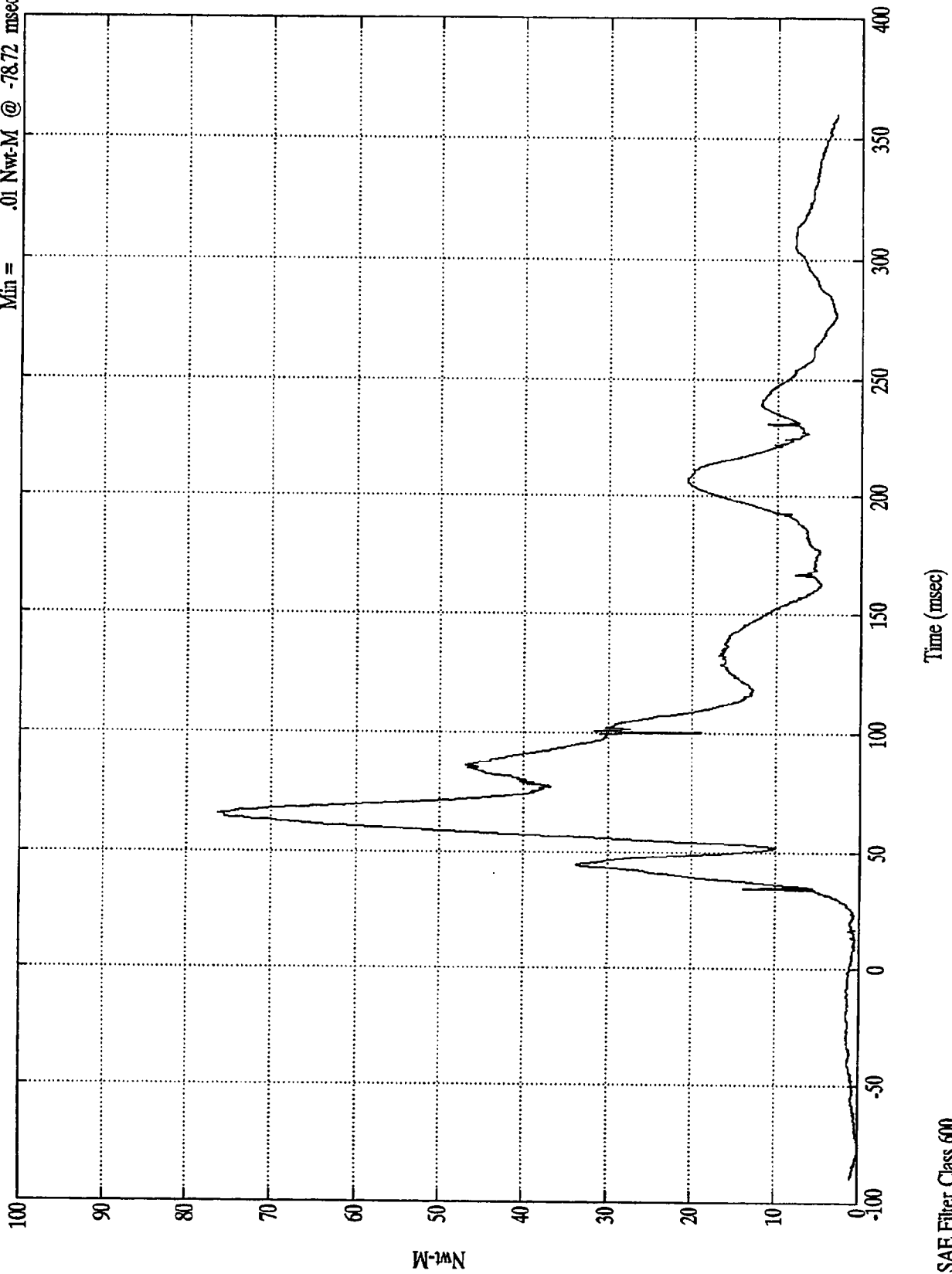
Max = 32.98 Nwt-M @ 89.88 msec
Min = -10.91 Nwt-M @ 141.00 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 76.30 Nwt-M @ 65.87 msec
Min = .01 Nwt-M @ -78.72 msec

Pos. 2 Neck Moment Res.



Nwt-M

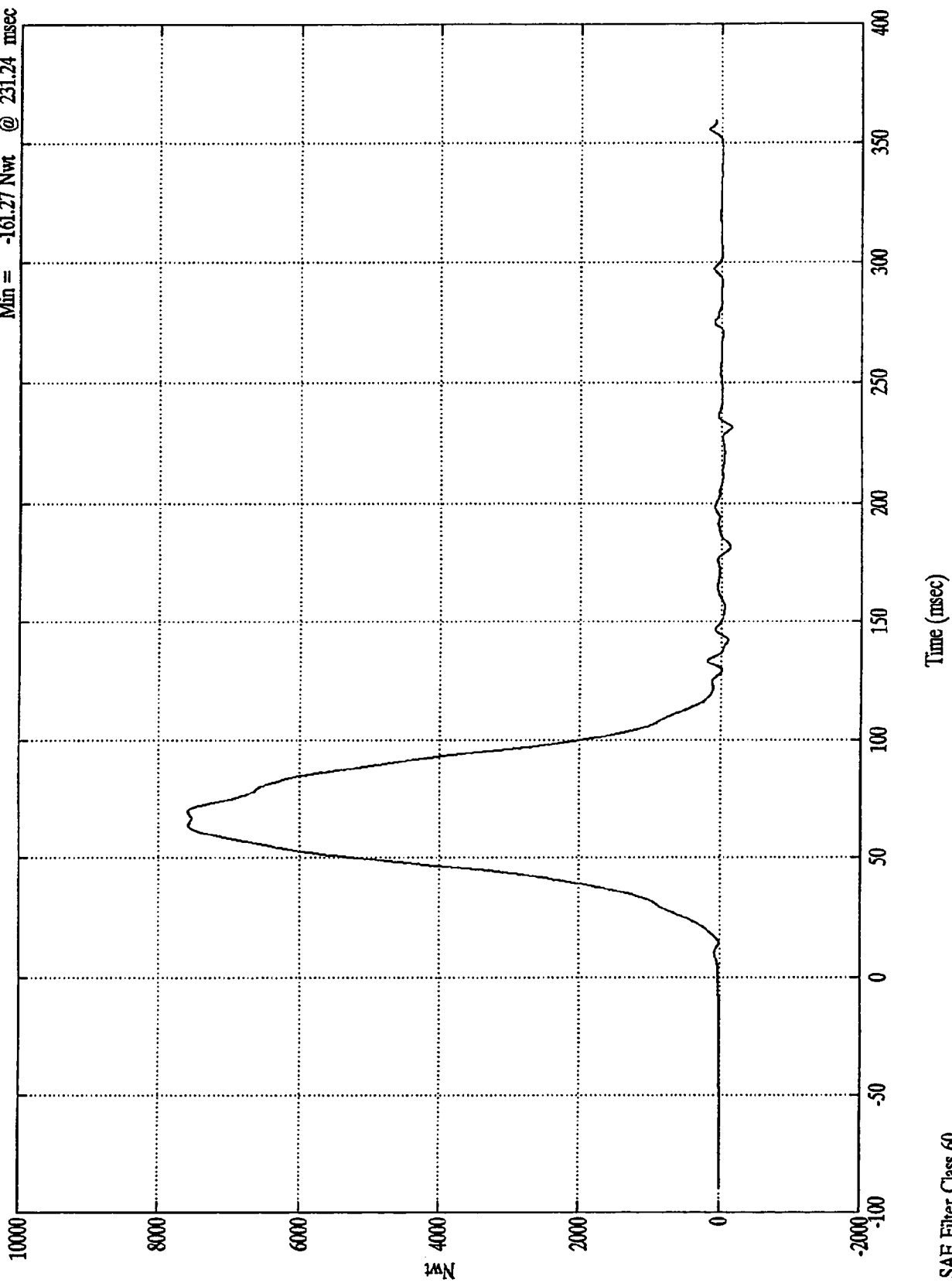
B-70

8227-12

SAE Filter Class 600

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

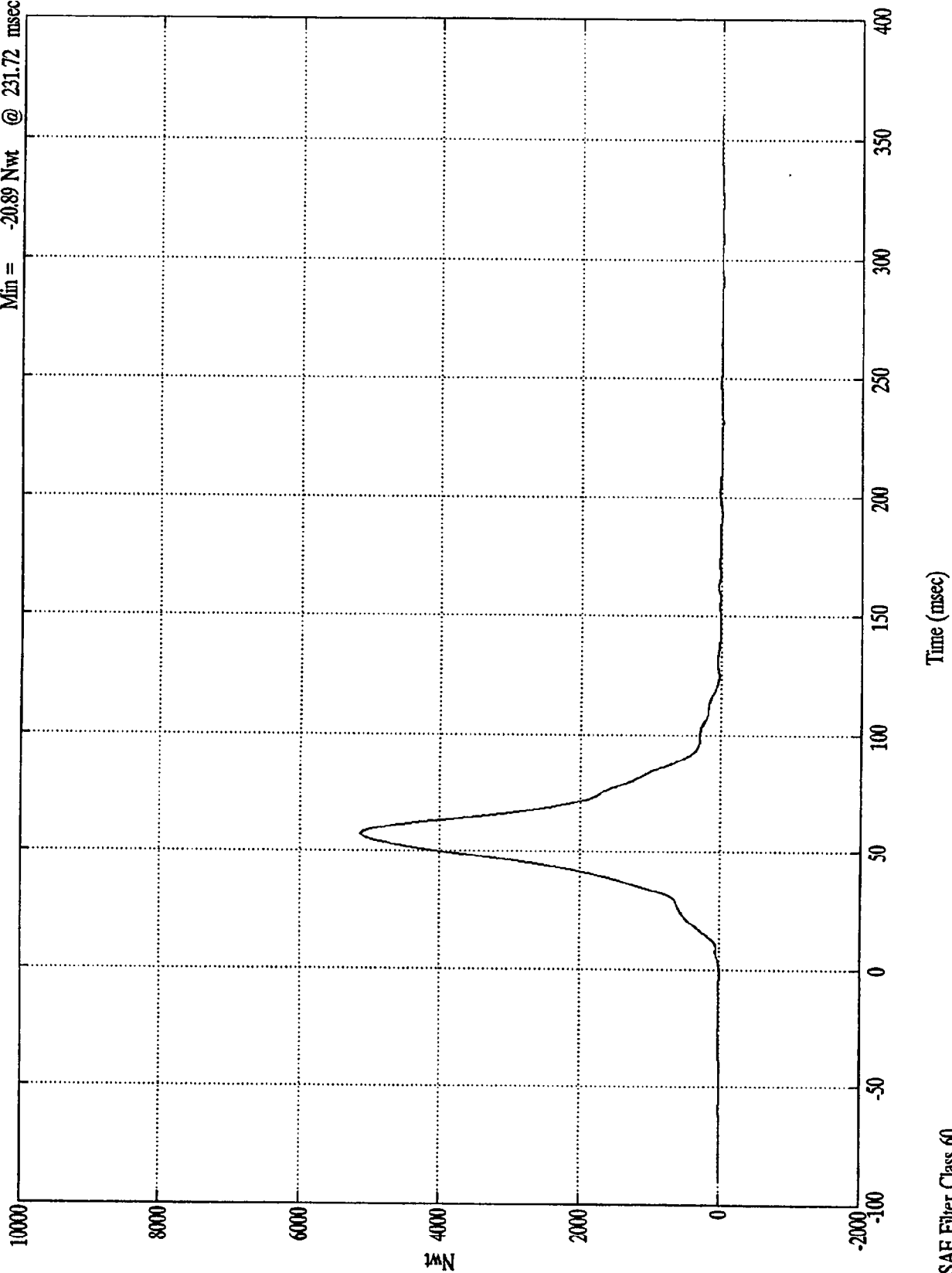
Pos. 2 Torso Belt Load
Max = 7583.31 Nwt @ 69.36 msec
Min = -161.27 Nwt @ 231.24 msec



SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Right Belt Load
Max = 5150.36 Nwt @ 57.11 msec
Min = -20.89 Nwt @ 231.72 msec

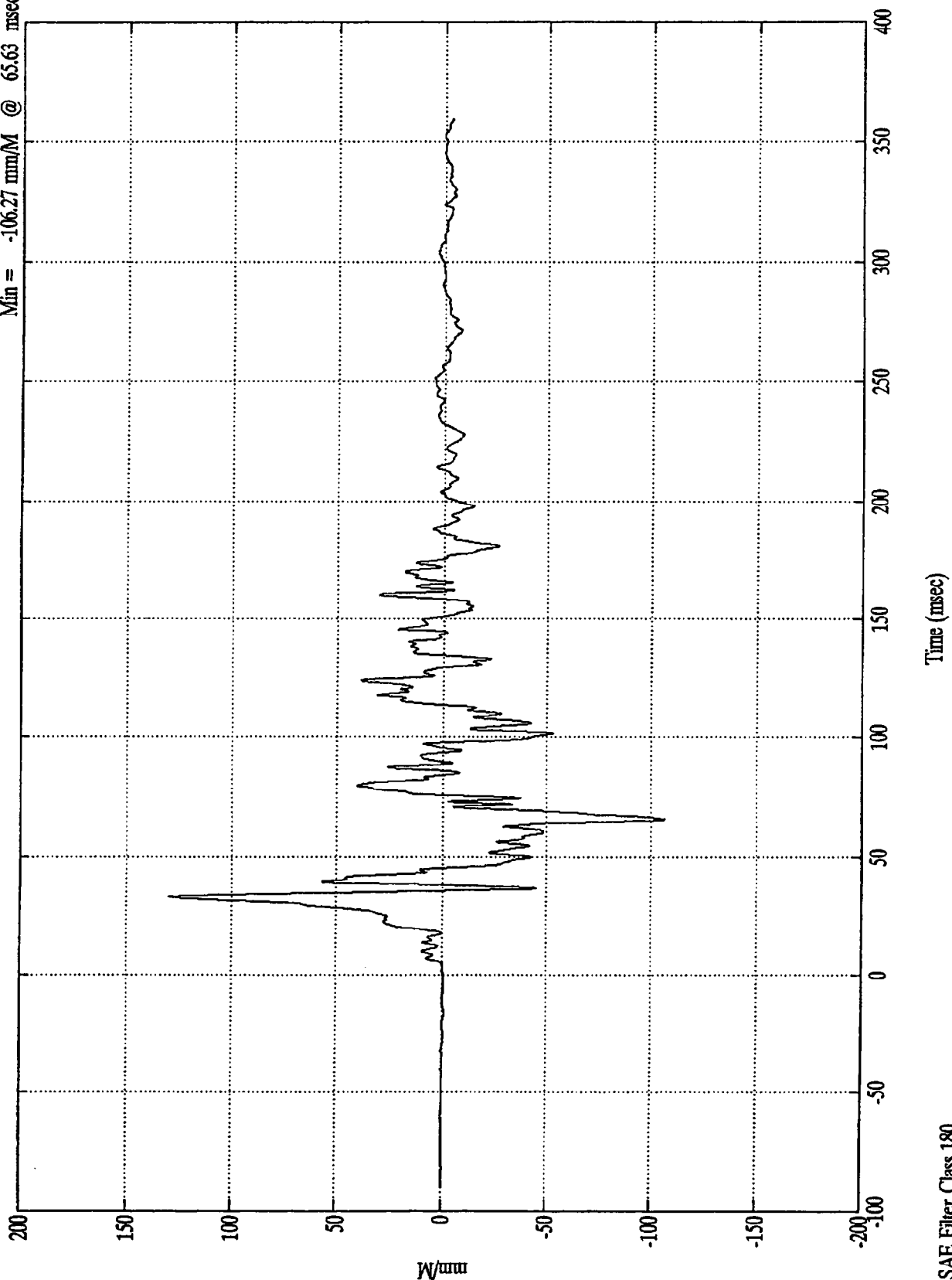


SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Pos. 2 Belt Elongation

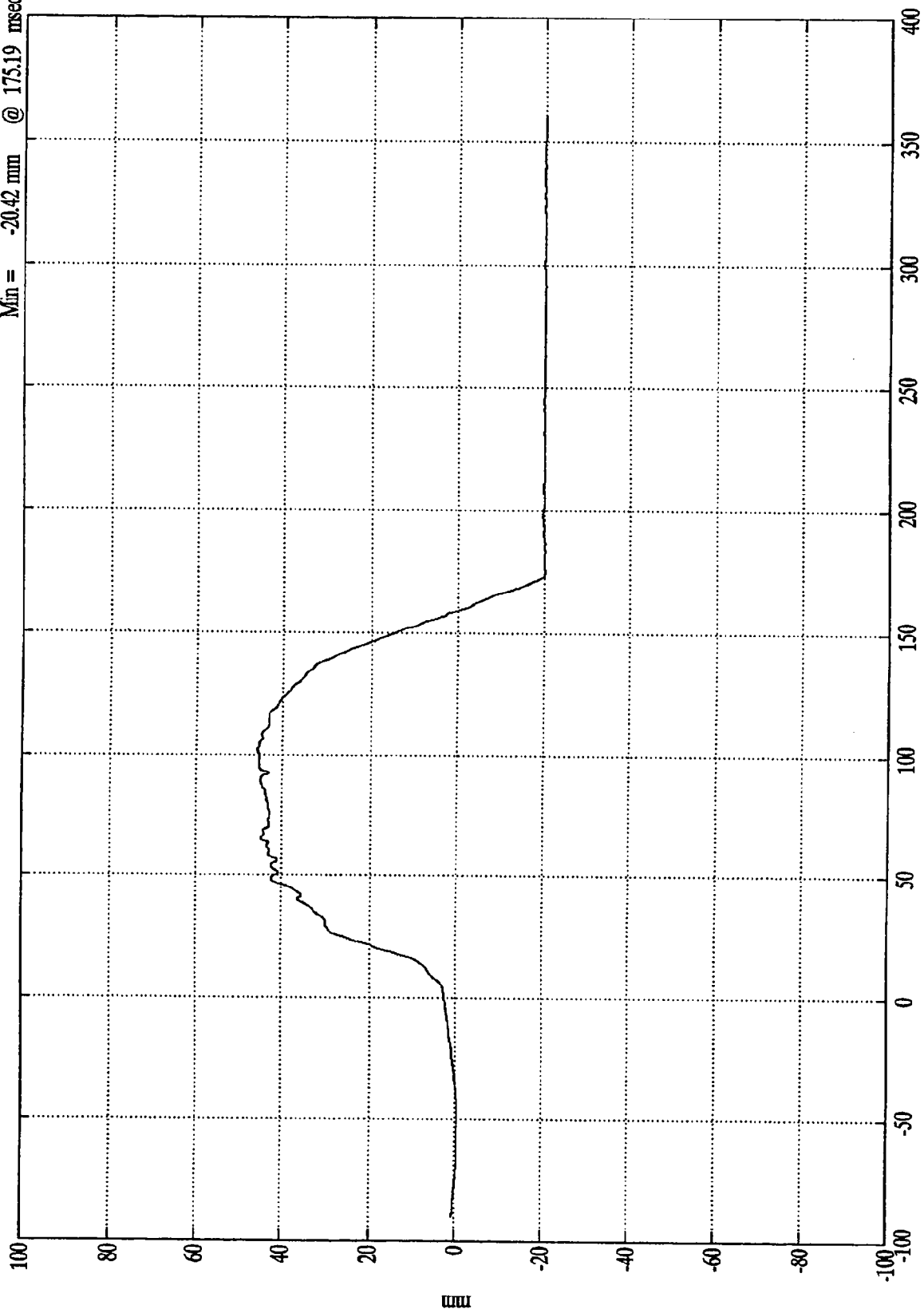
Max = 129.74 mm/M @ 33.11 msec
Min = -106.27 mm/M @ 65.63 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 45.87 mm @ 102.24 msec
Min = -20.42 mm @ 175.19 msec

Pos 2 Belt Spool Out



Time (msec)

SAE Filter Class 180

mm

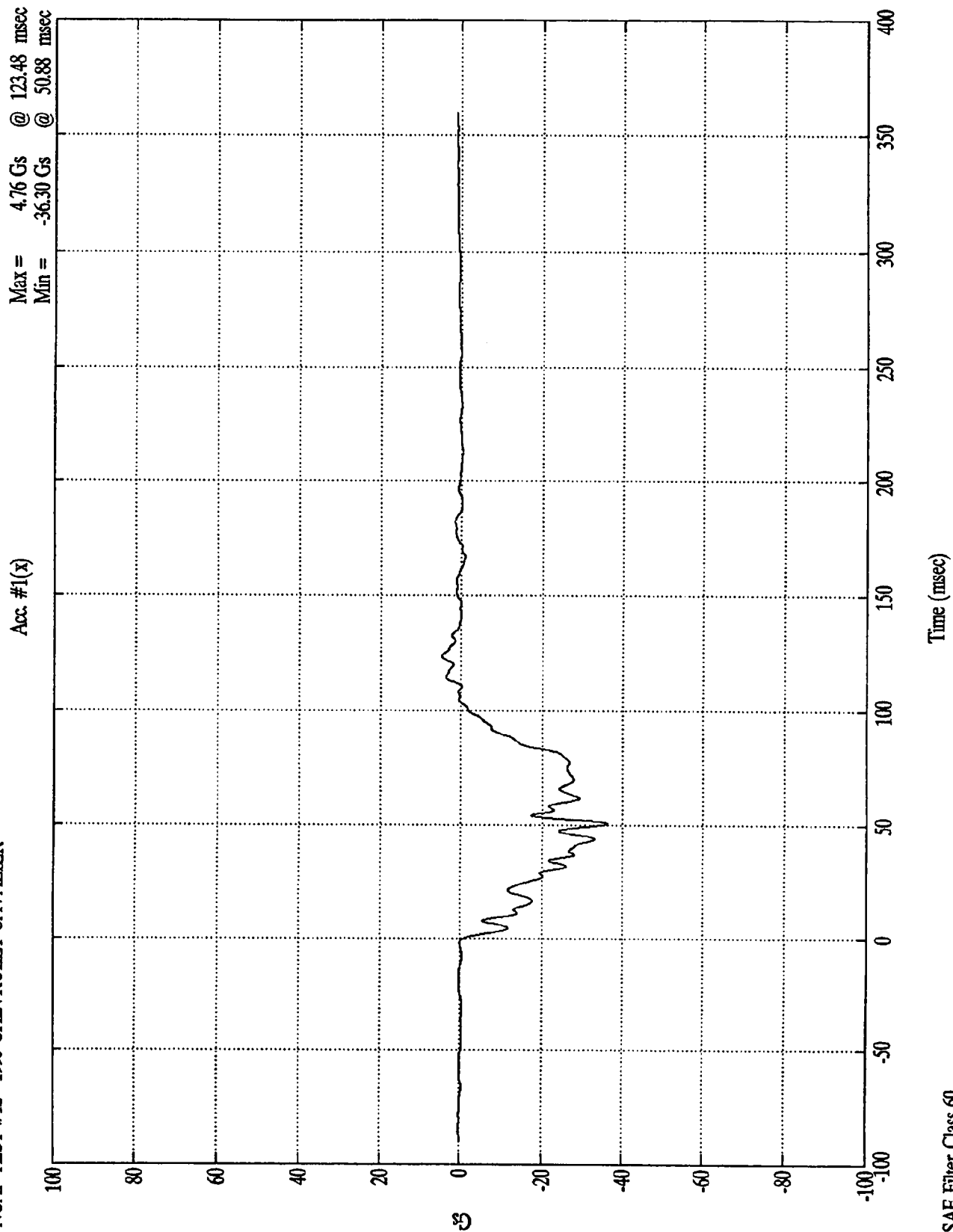
TEST NO. MS0107

VEHICLE DATA

FILTER CHANNEL CLASS

60

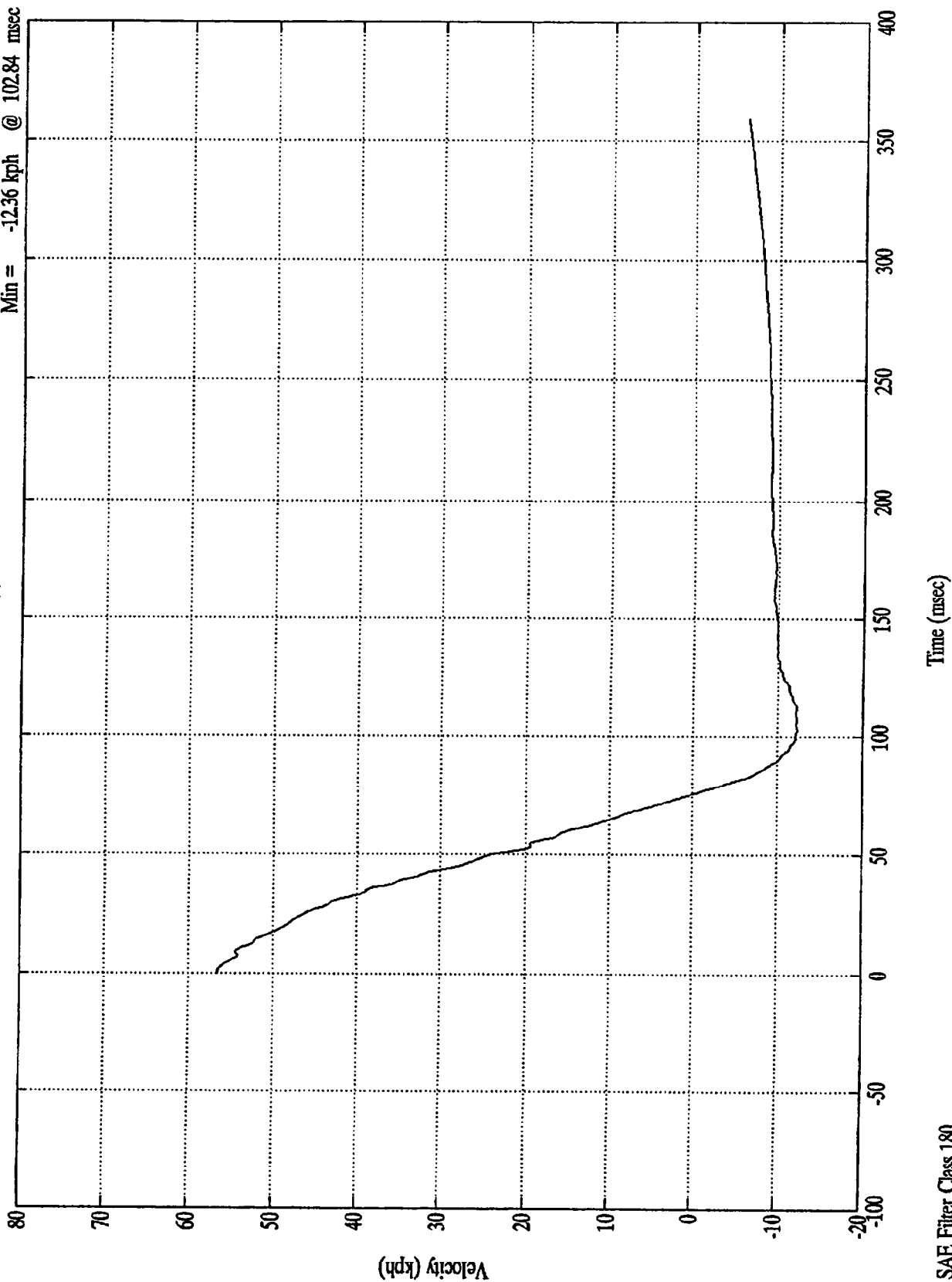
NCAP TEST #12 - 1995 CHEVROLET CAVALIER



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 56.49 kph @ -0.00 msec
Min = -12.36 kph @ 102.84 msec

Acc. #1(x)

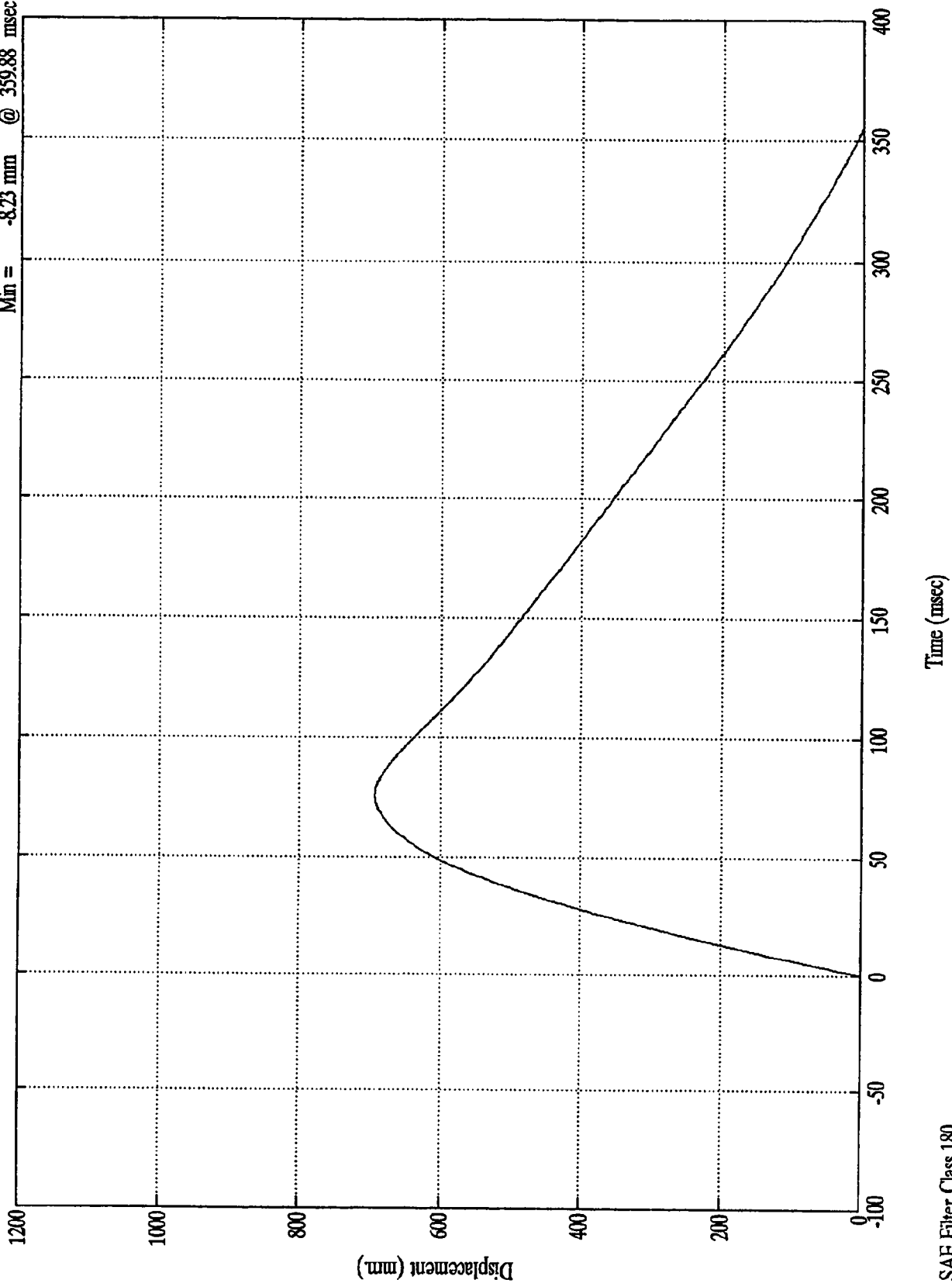


SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

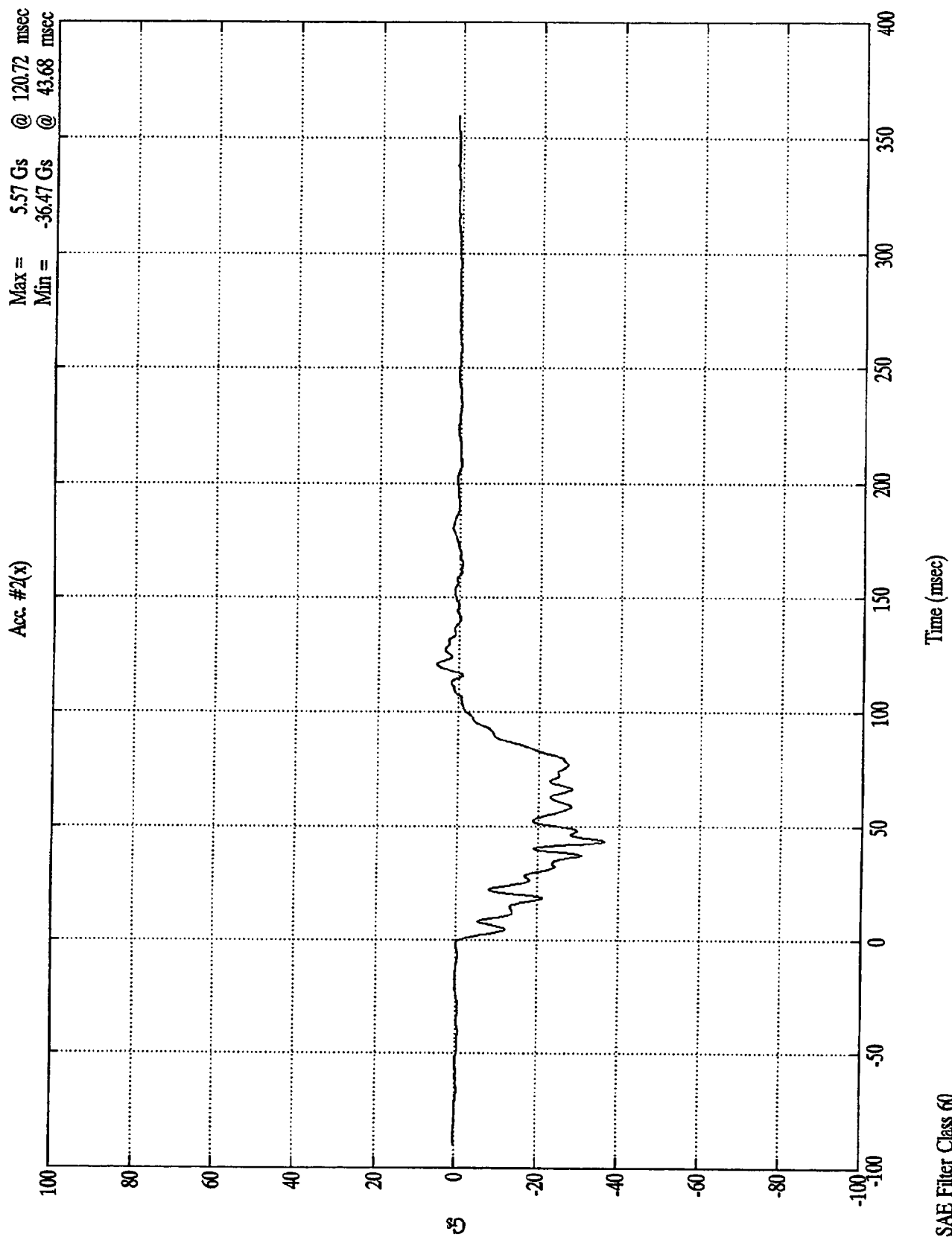
Max = 693.53 mm @ 75.72 msec
Min = -8.23 mm @ 359.88 msec

Acc. #1(x)



SAE Filter Class 180

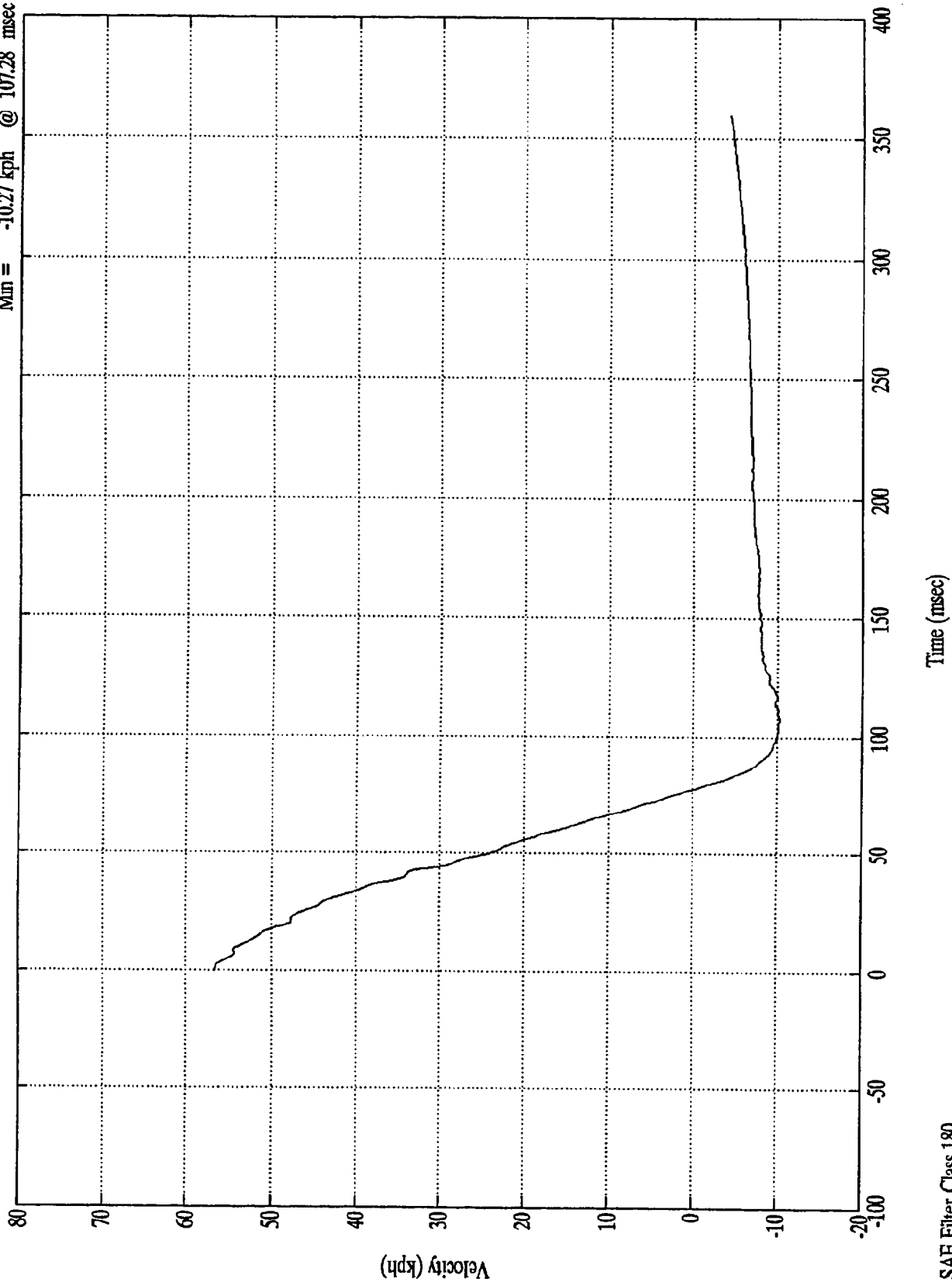
NCAP TEST #12 - 1995 CHEVROLET CAVALIER



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 56.49 kph @ -0.00 msec
Min = -10.27 kph @ 107.28 msec

Acc. #2(x)

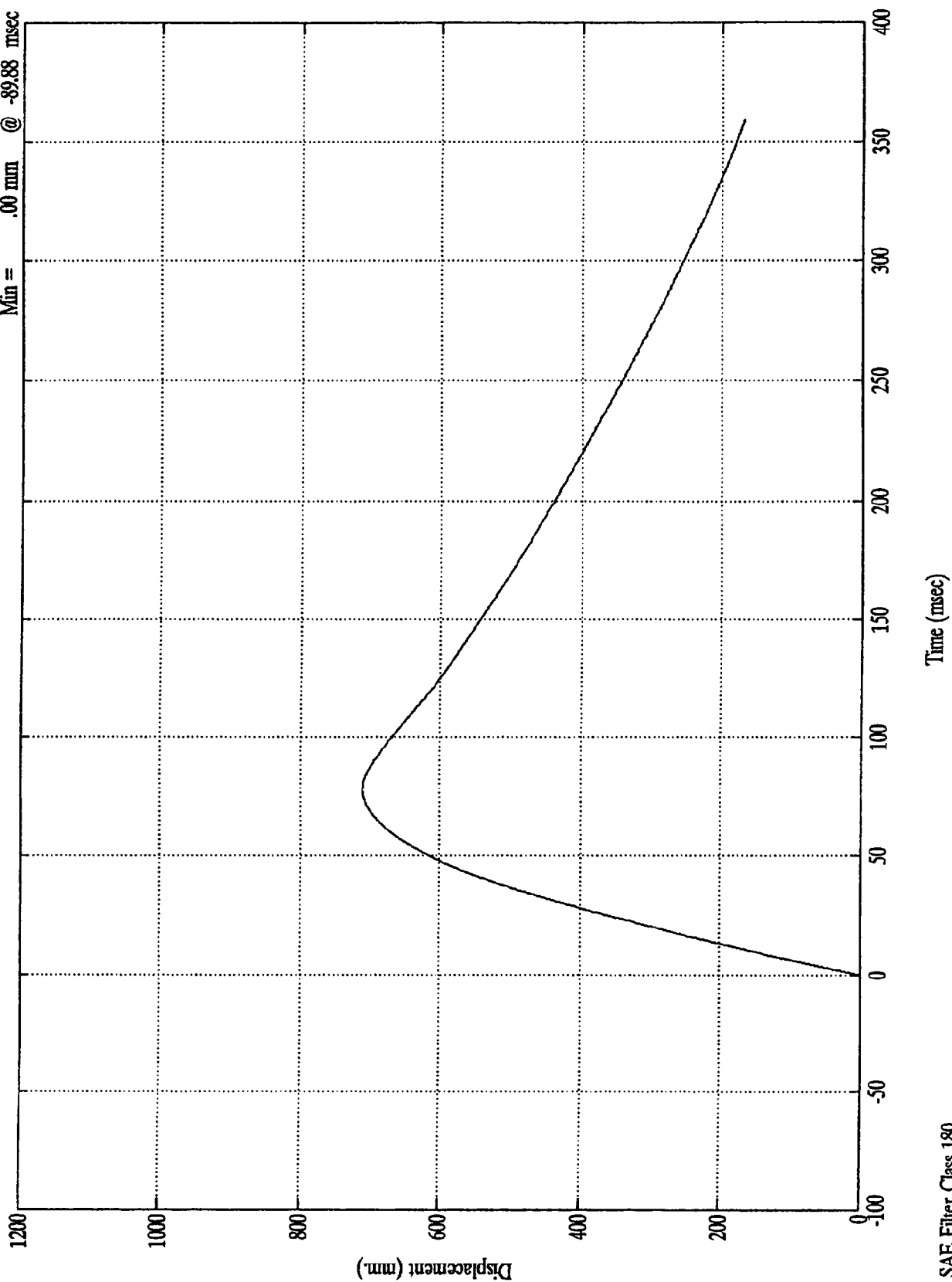


SAE Filter Class 180

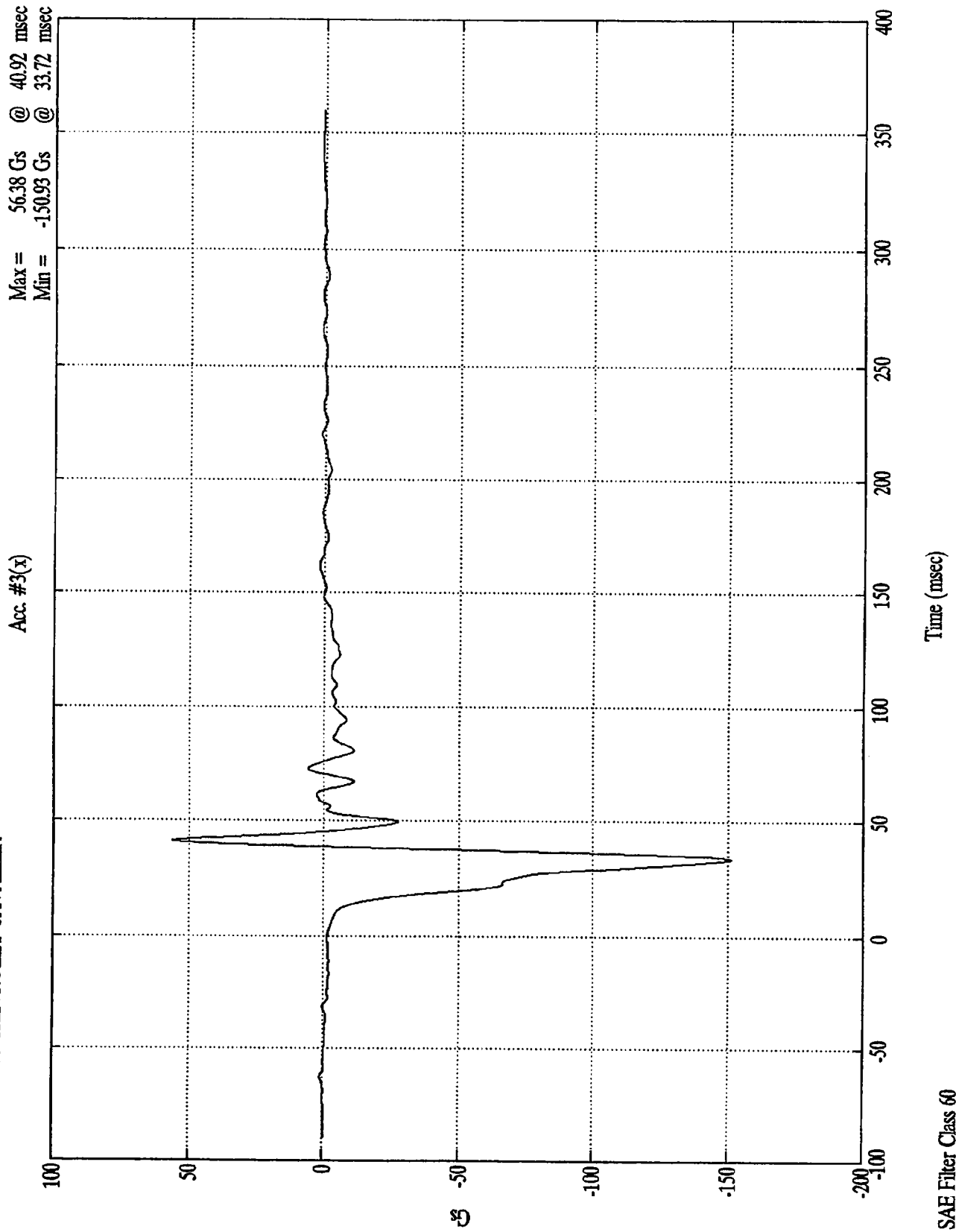
NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 710.98 mm @ 77.76 msec
Min = .00 mm @ -89.88 msec

Acc. #2(x)



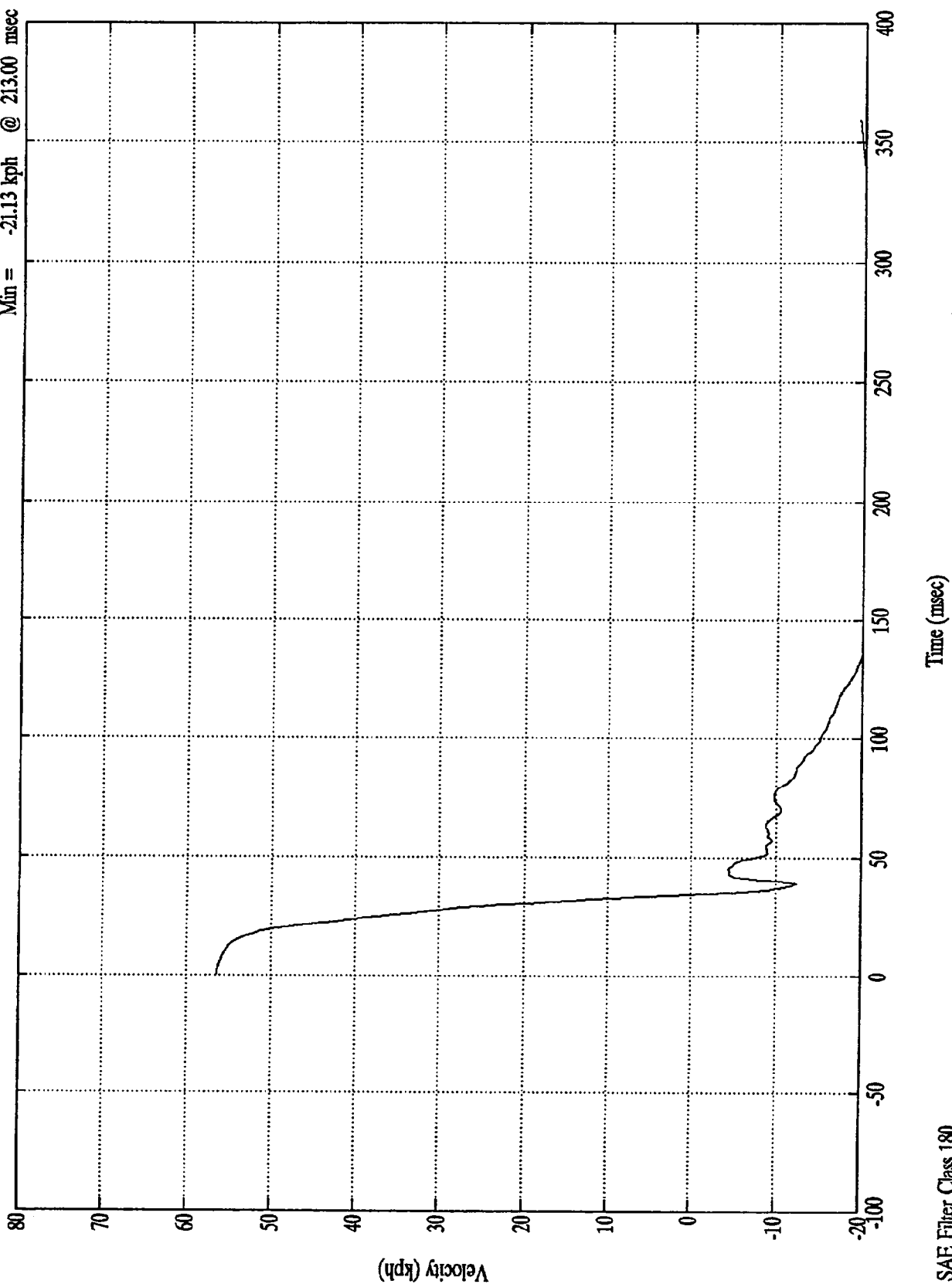
NCAP TEST #12 - 1995 CHEVROLET CAVALIER



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 56.49 kph @ -0.00 msec
Min = -21.13 kph @ 213.00 msec

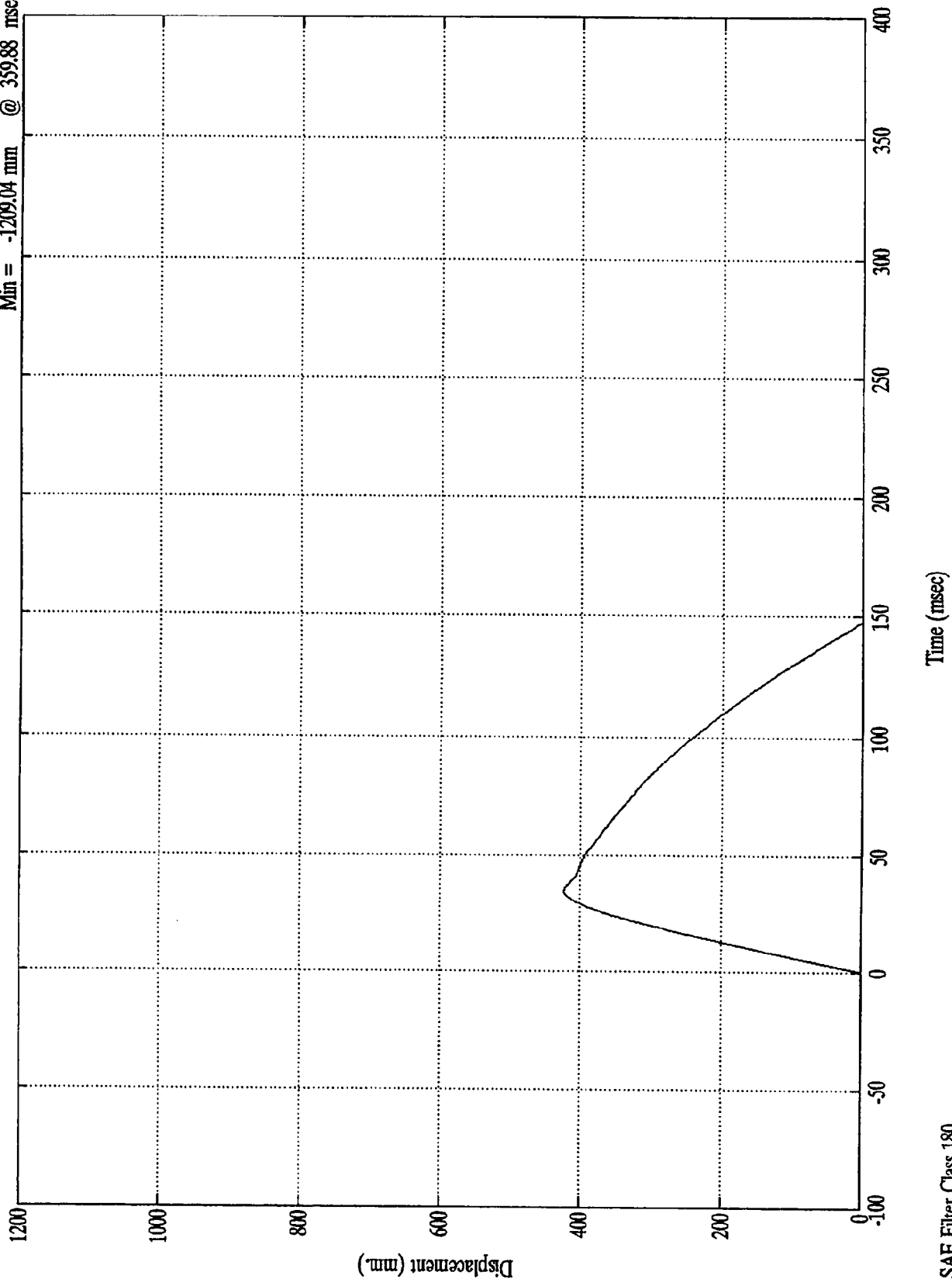
Acc. #3(x)



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

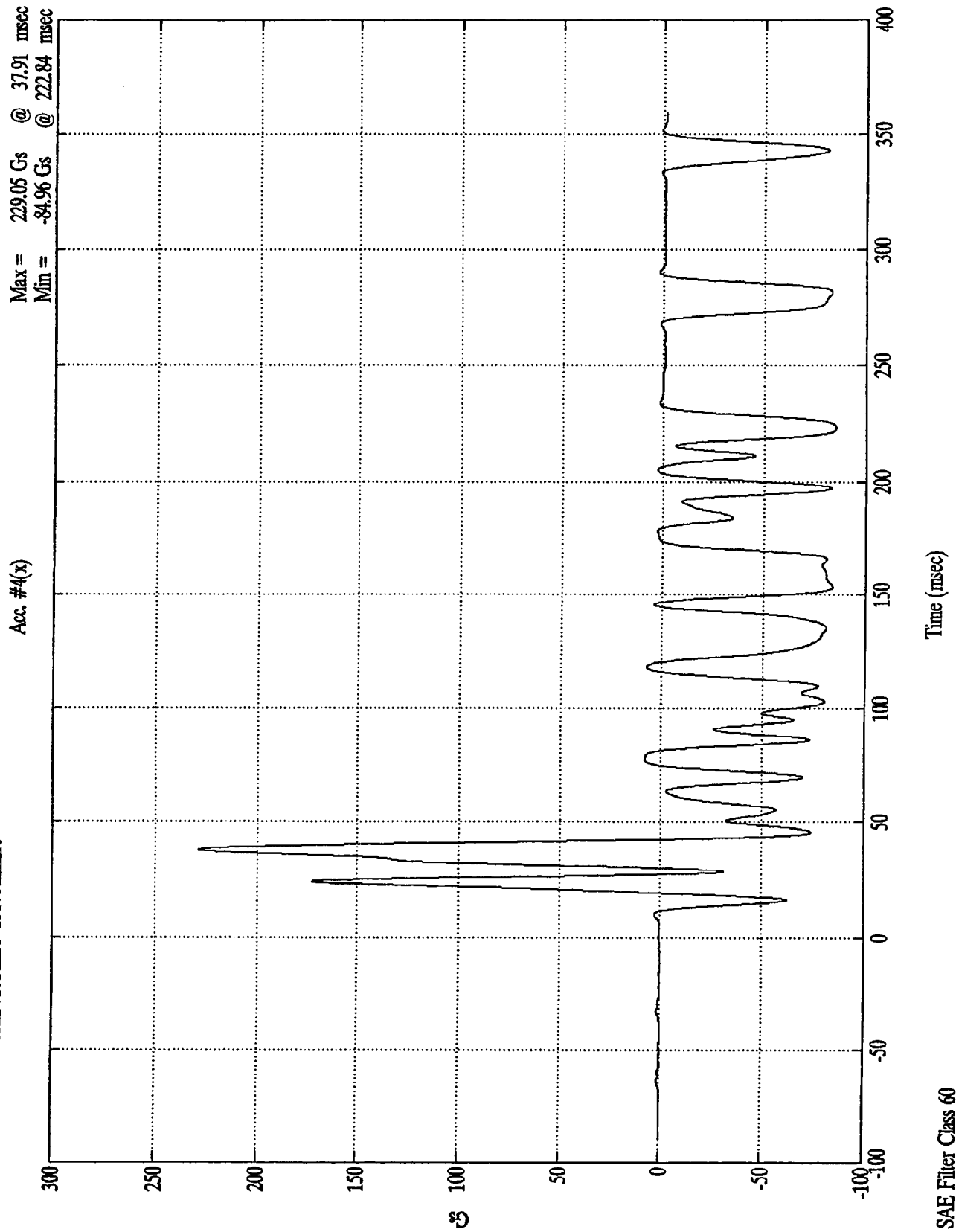
Max = 422.91 mm @ 34.55 msec
Min = -1209.04 mm @ 359.88 msec

Acc. #3(x)



SAE Filter Class 180

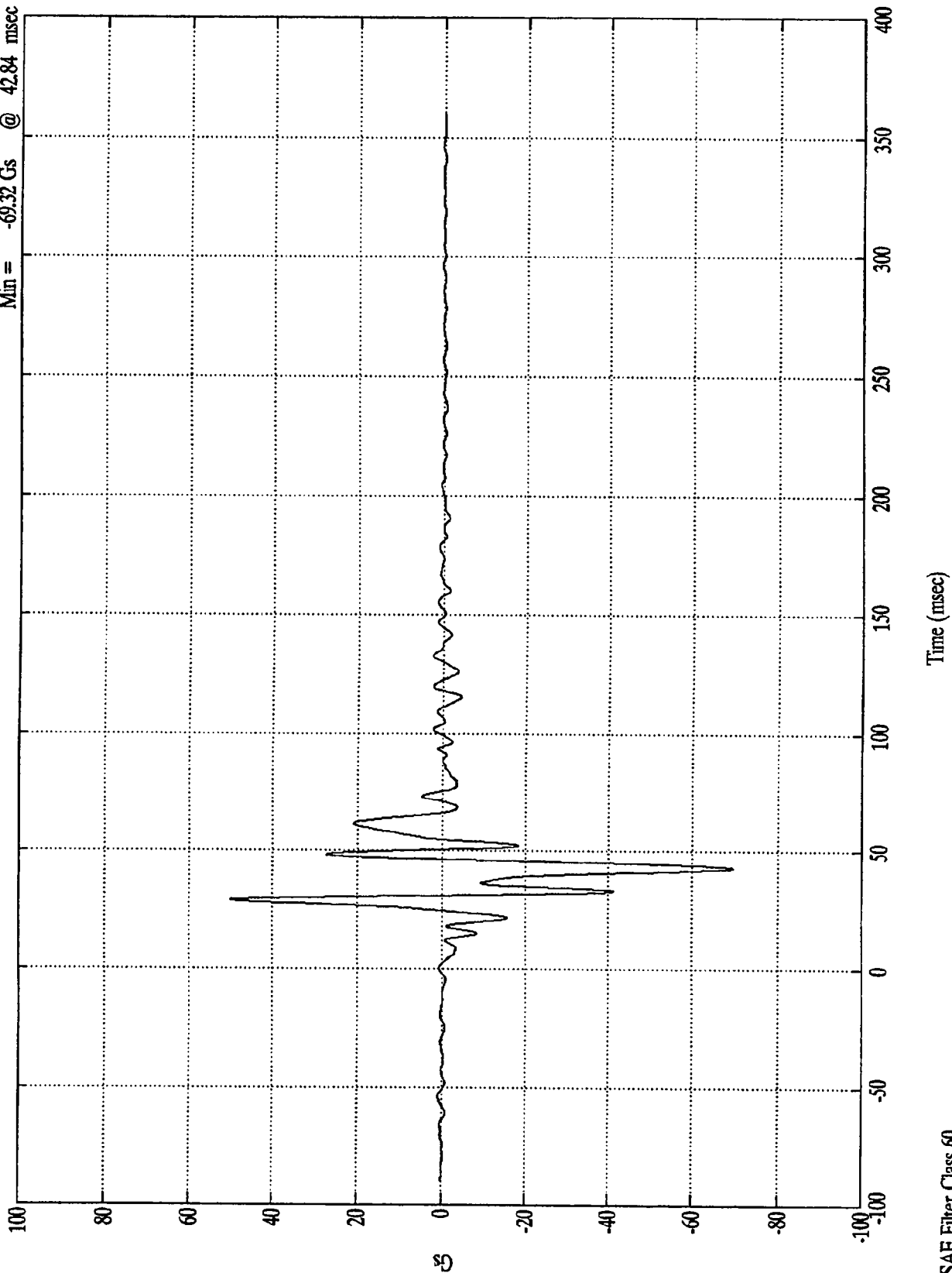
NCAP TEST #12 - 1995 CHEVROLET CAVALIER



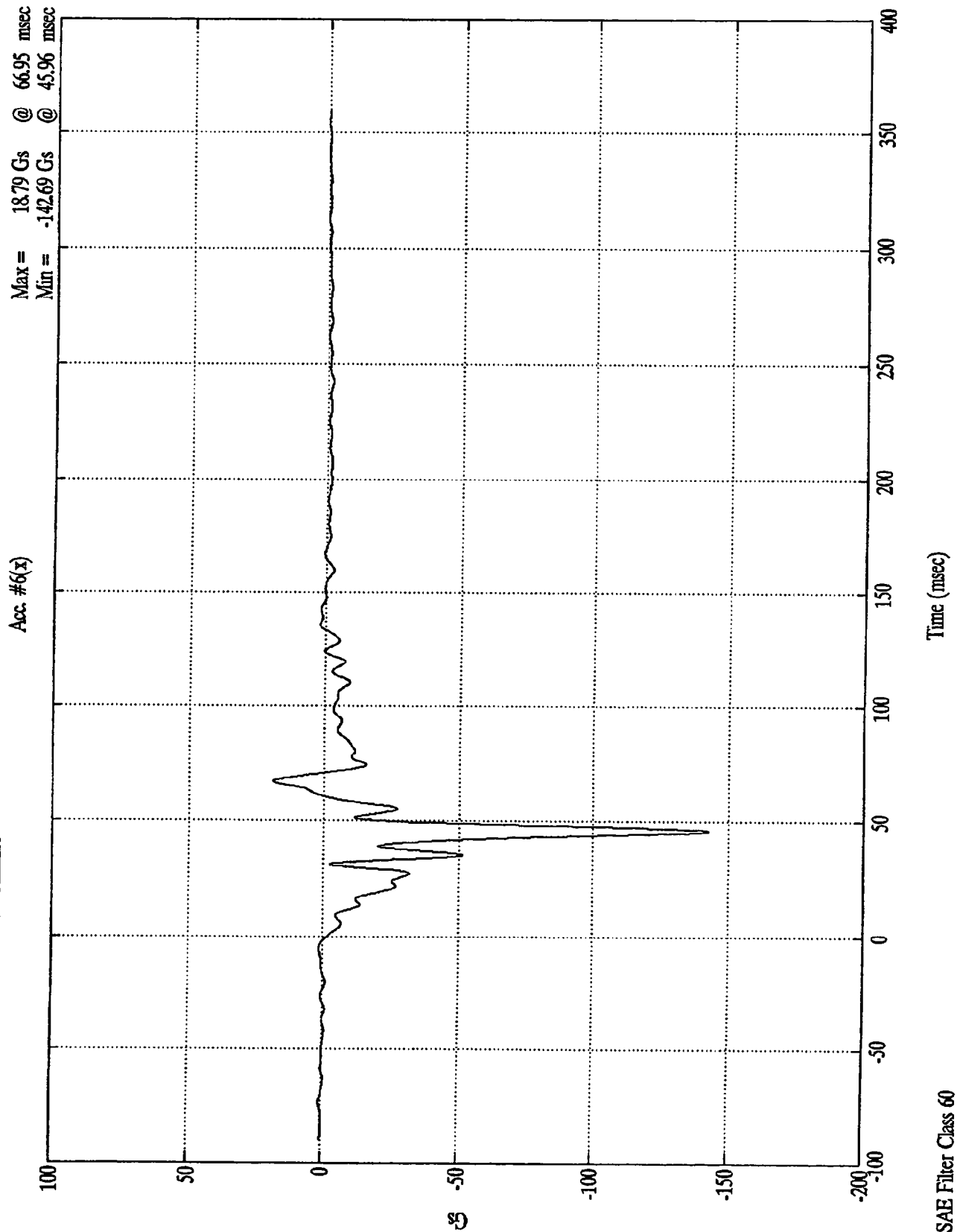
NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 50.19 Gs @ 28.68 msec
 Min = -69.32 Gs @ 42.84 msec

Acc. #5(x)



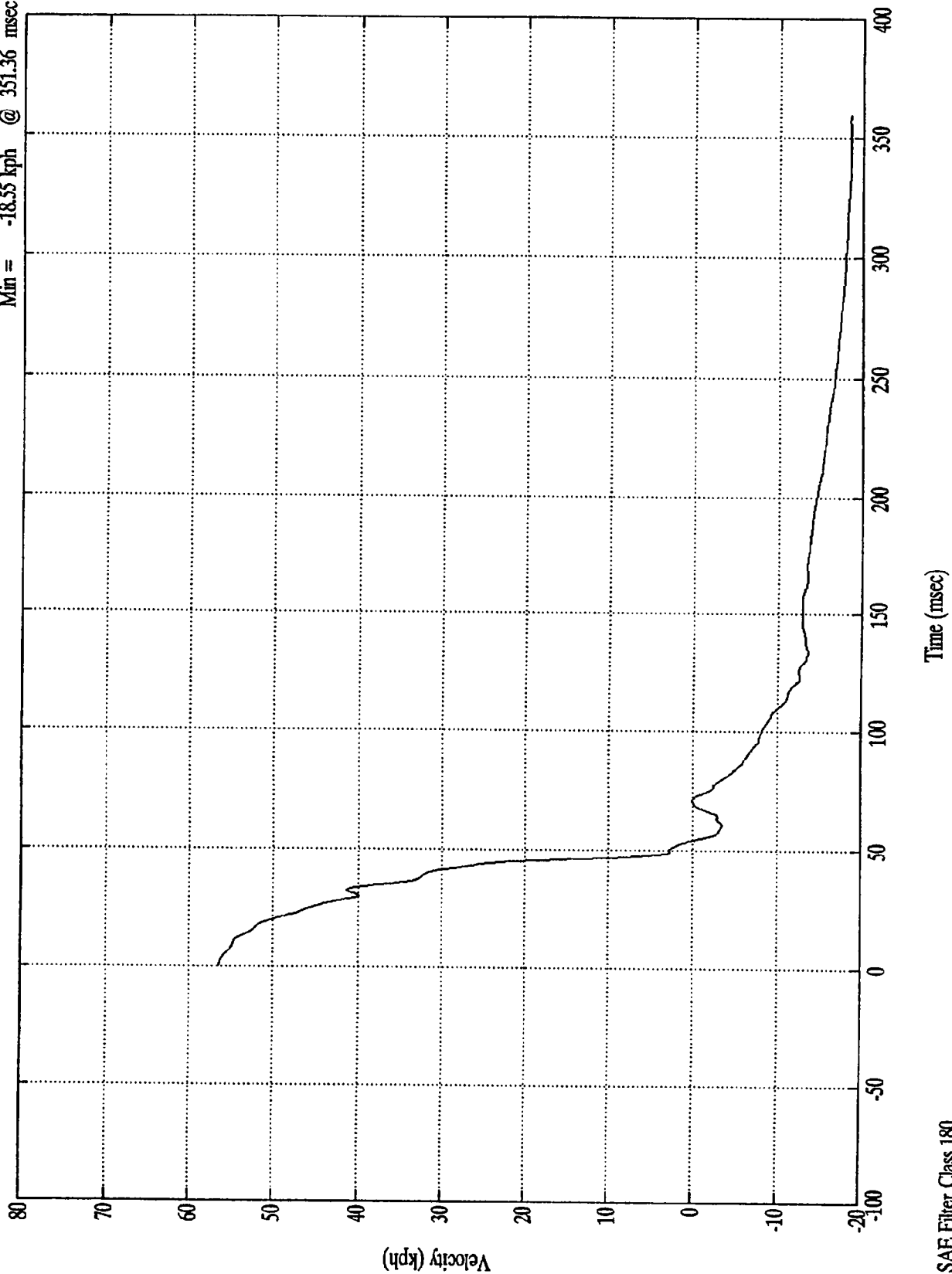
NCAP TEST #12 - 1995 CHEVROLET CAVALIER



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 56.49 kph @ -0.00 msec
Min = -18.55 kph @ 351.36 msec

Acc. #6(x)

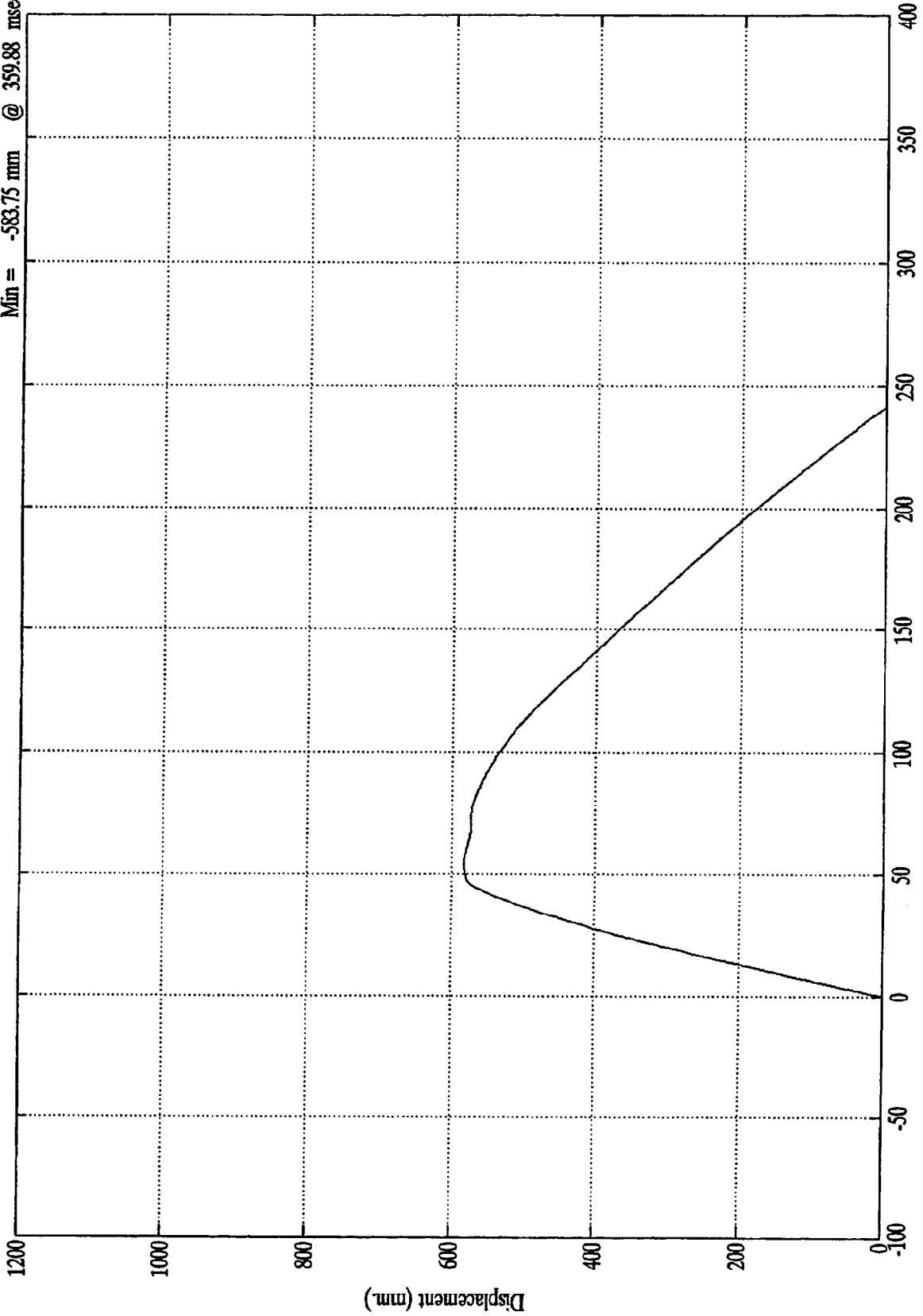


SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 582.82 mm @ 54.60 msec
Min = -583.75 mm @ 359.88 msec

Acc. #6(x)



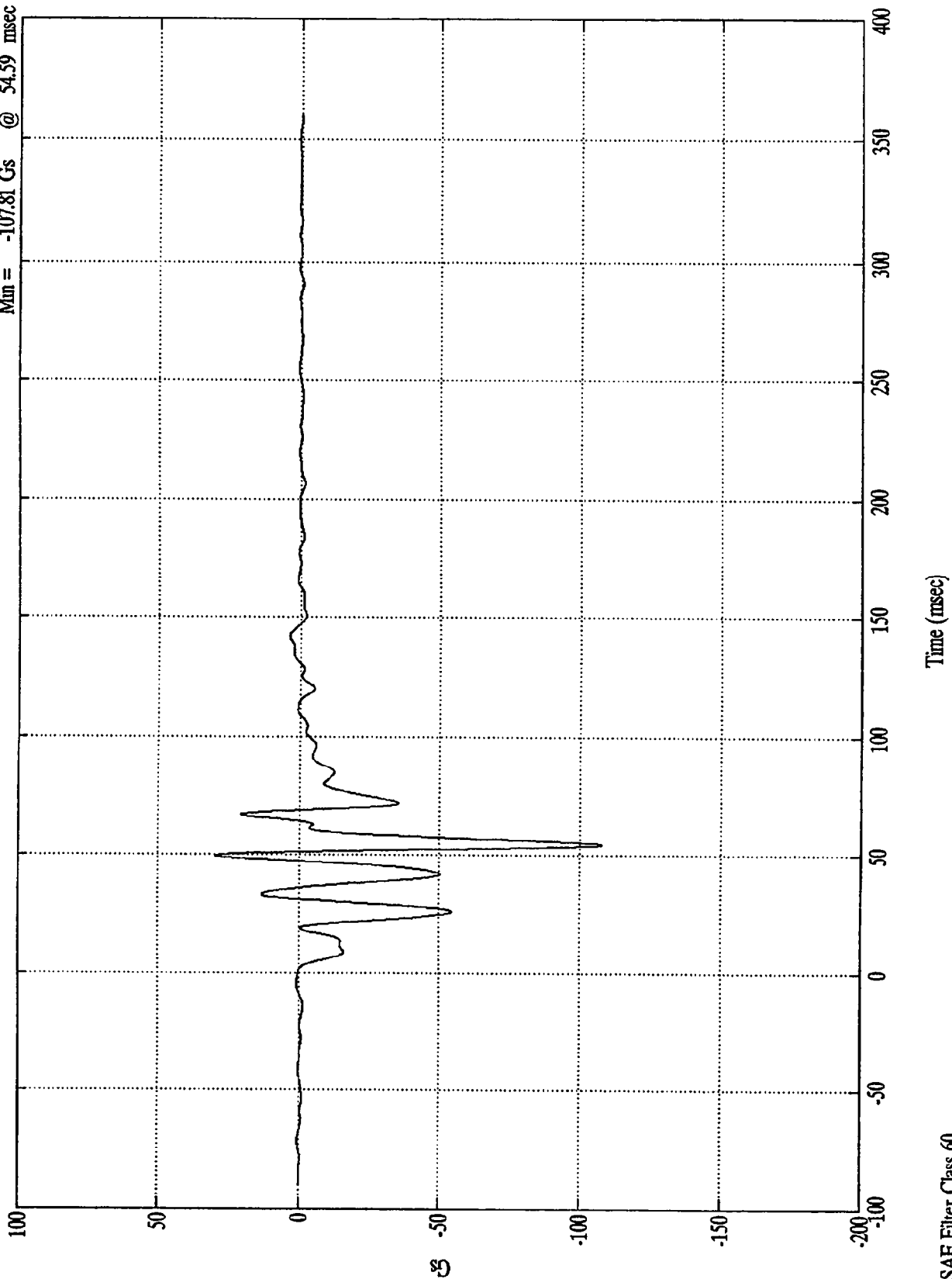
Time (msec)

SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 29.63 Gs @ 49.68 msec
Min = -107.81 Gs @ 54.59 msec

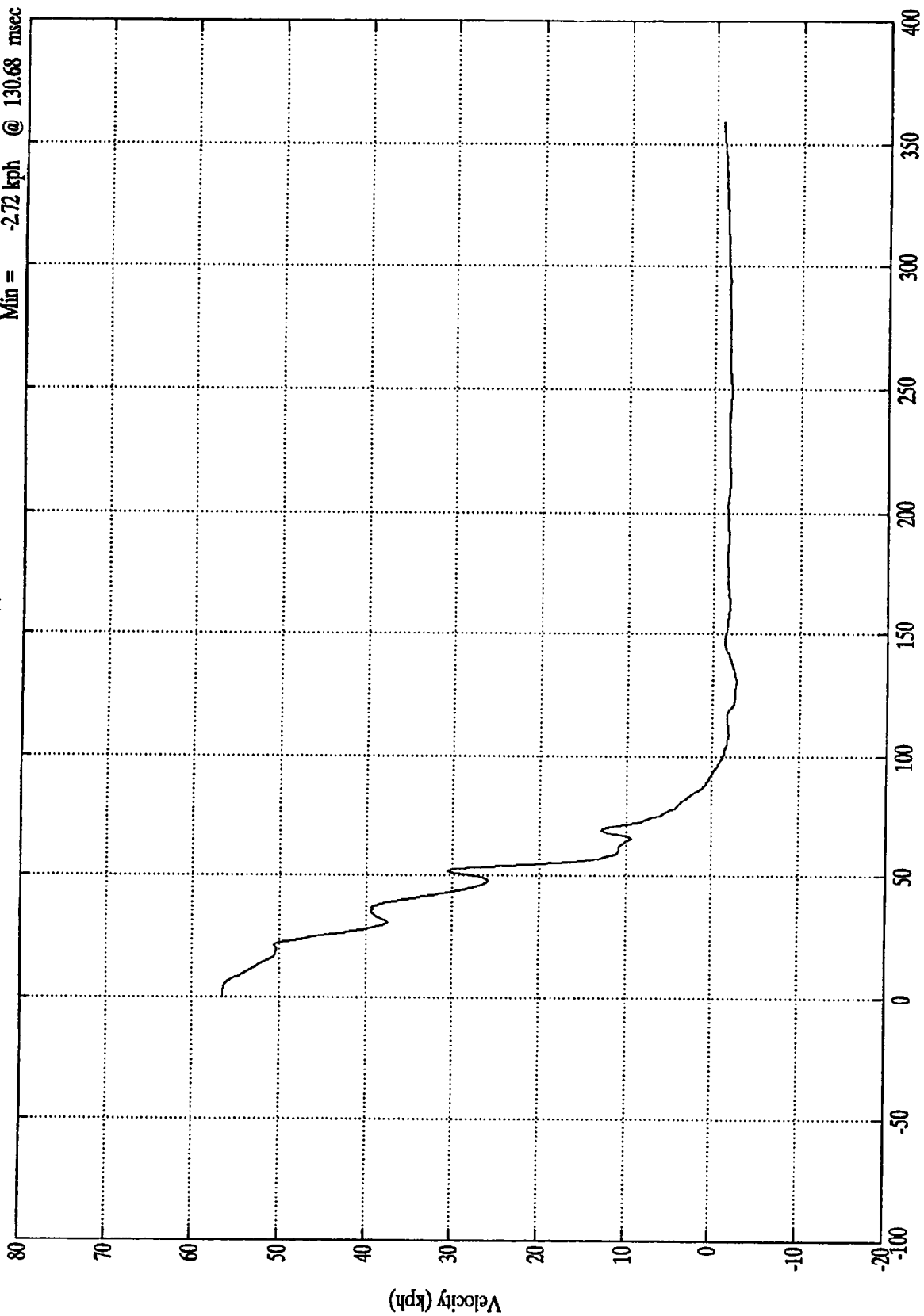
Acc. #7(x)



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 56.49 kph @ 0.95 msec
Min = -2.72 kph @ 130.68 msec

Acc. #7(x)



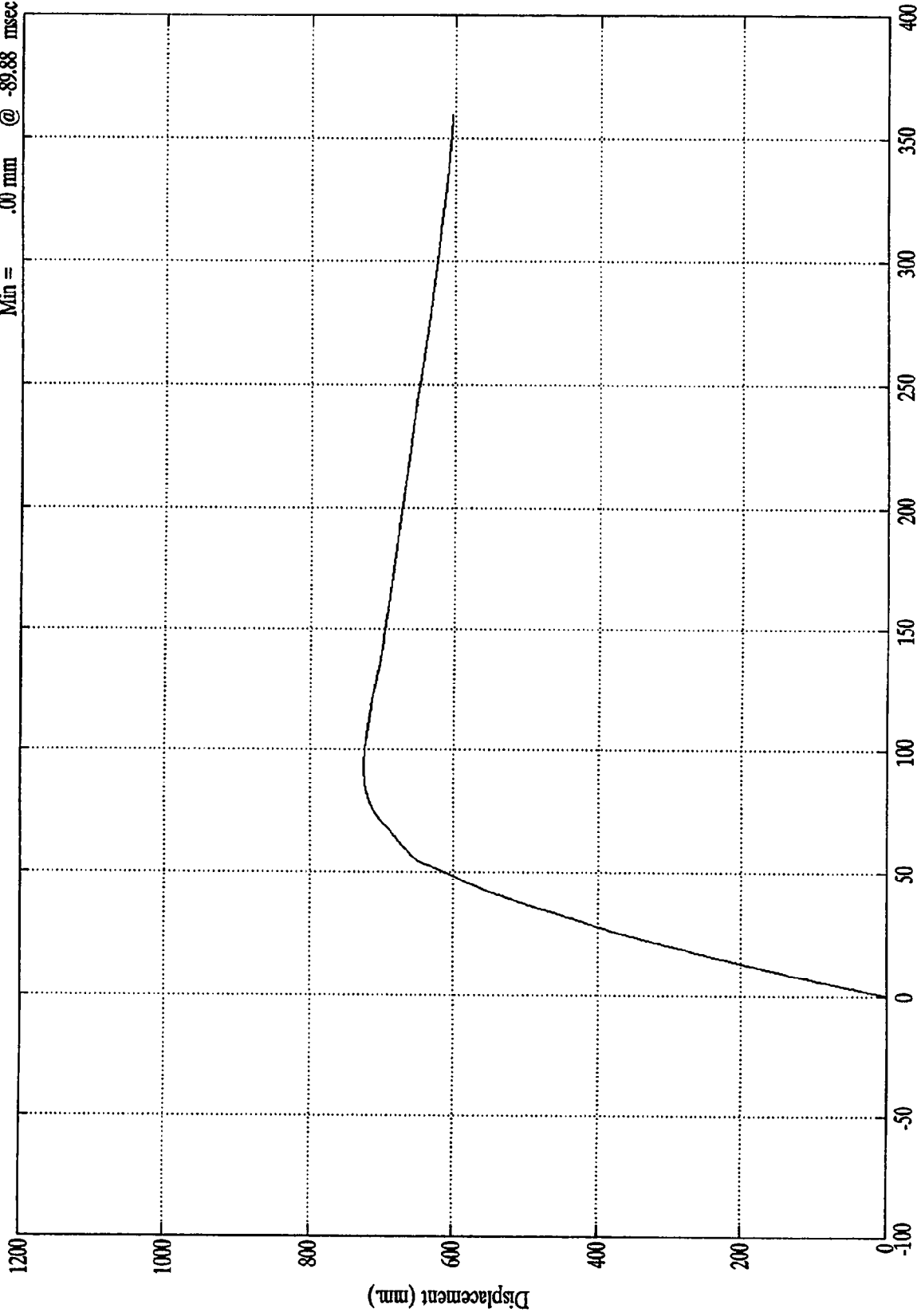
Time (msec)

SAE Filter Class 180

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 724.73 mm @ 93.35 msec
Min = .00 mm @ -89.88 msec

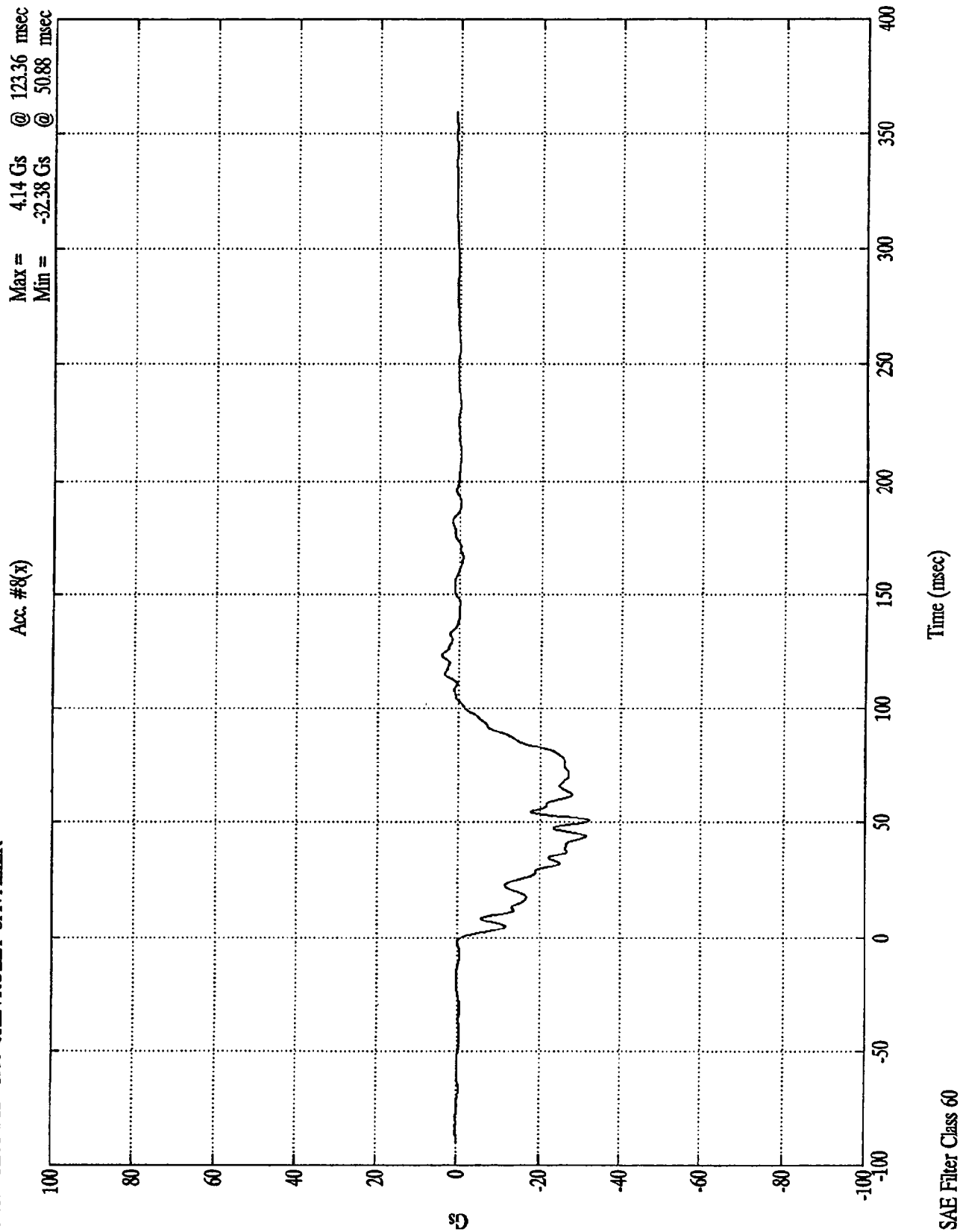
Acc. #7(x)



Time (msec)

SAE Filter Class 180

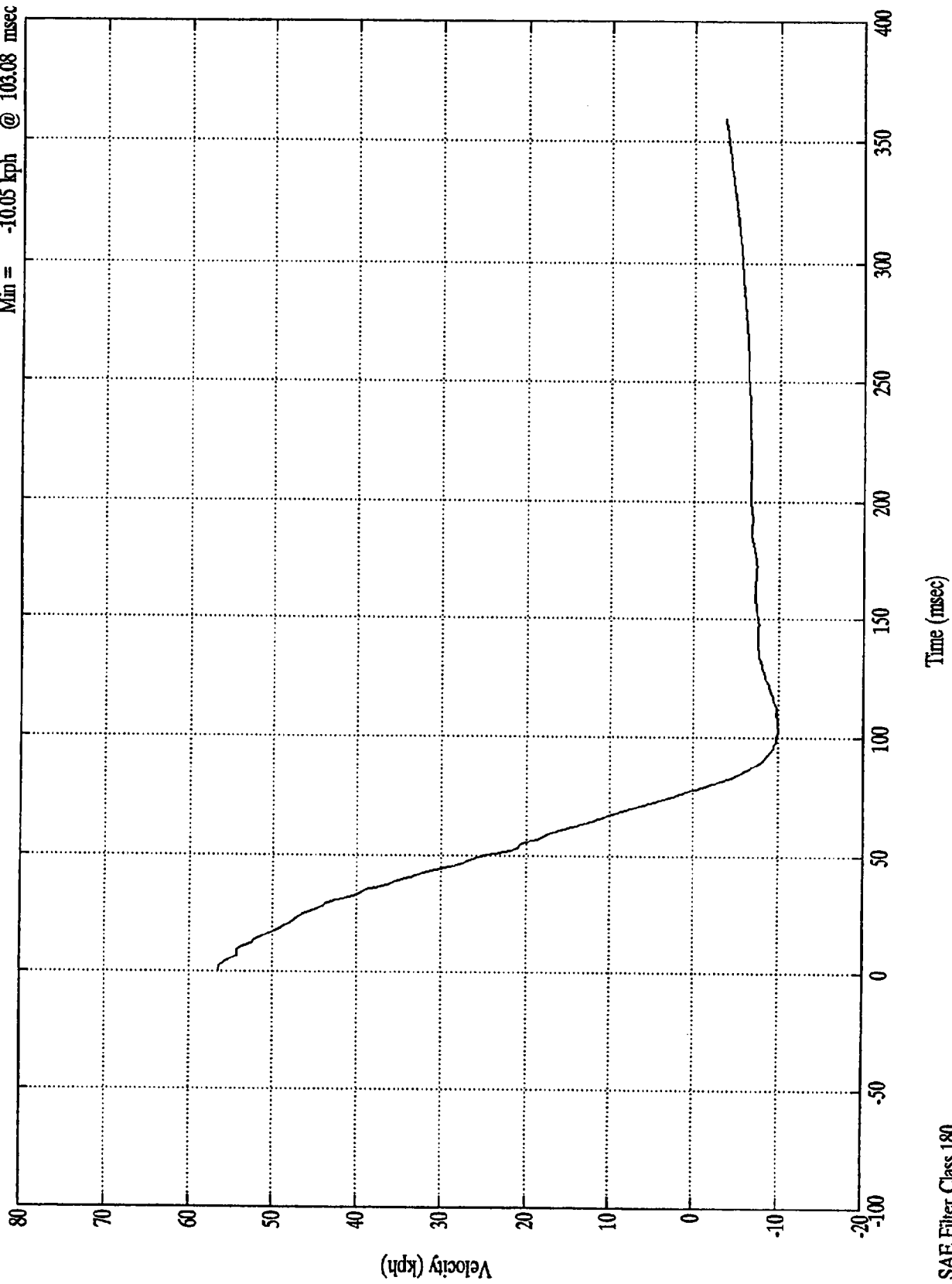
NCAP TEST #12 - 1995 CHEVROLET CAVALIER



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 56.49 kph @ -0.00 msec
Min = -10.05 kph @ 103.08 msec

Acc. #8(x)



SAE Filter Class 180

Time (msec)

Velocity (kph)

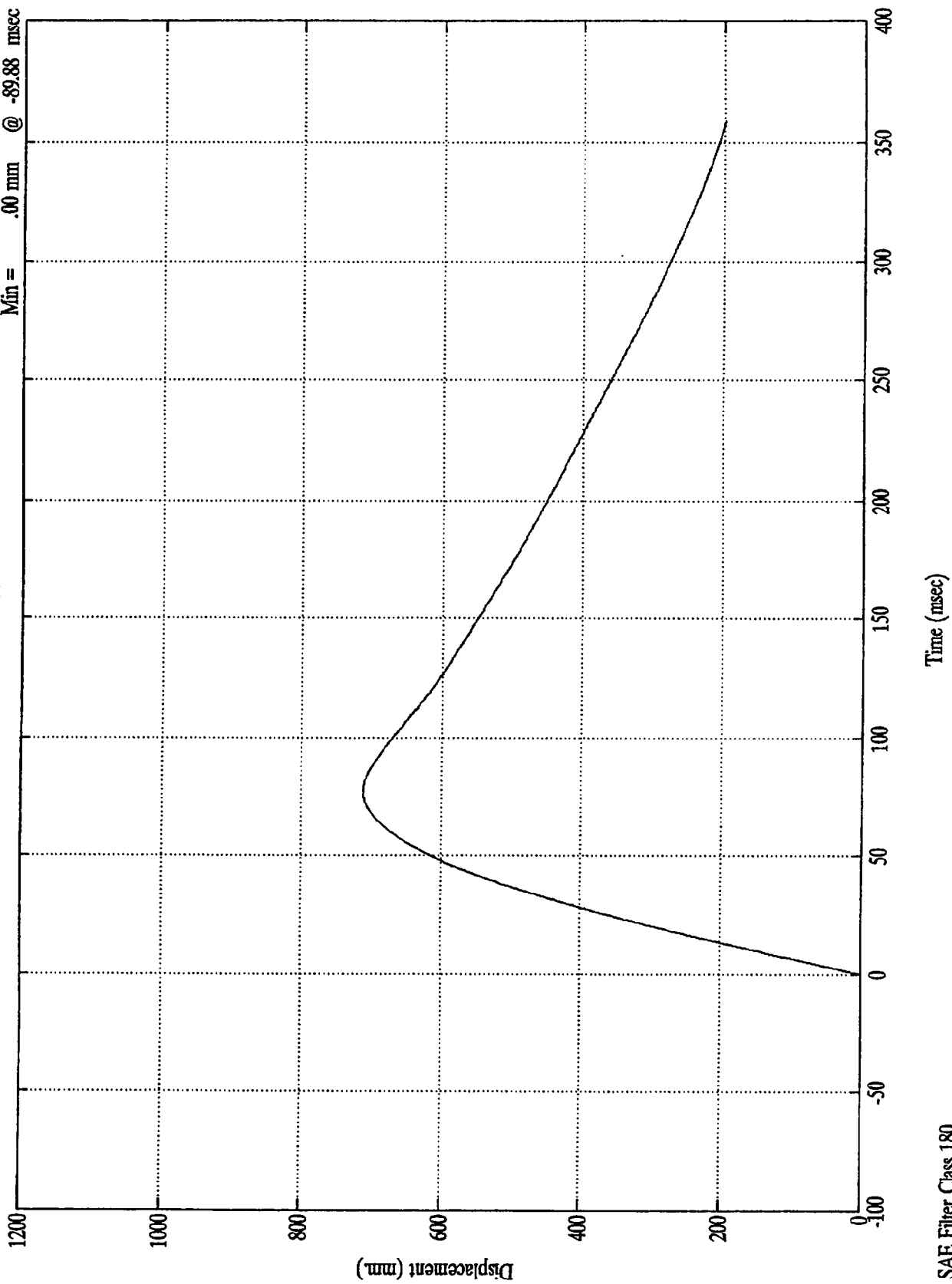
B-94

8227-12

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 712.17 mm @ 77.64 msec
Min = .00 mm @ -89.88 msec

Acc. #8(x)

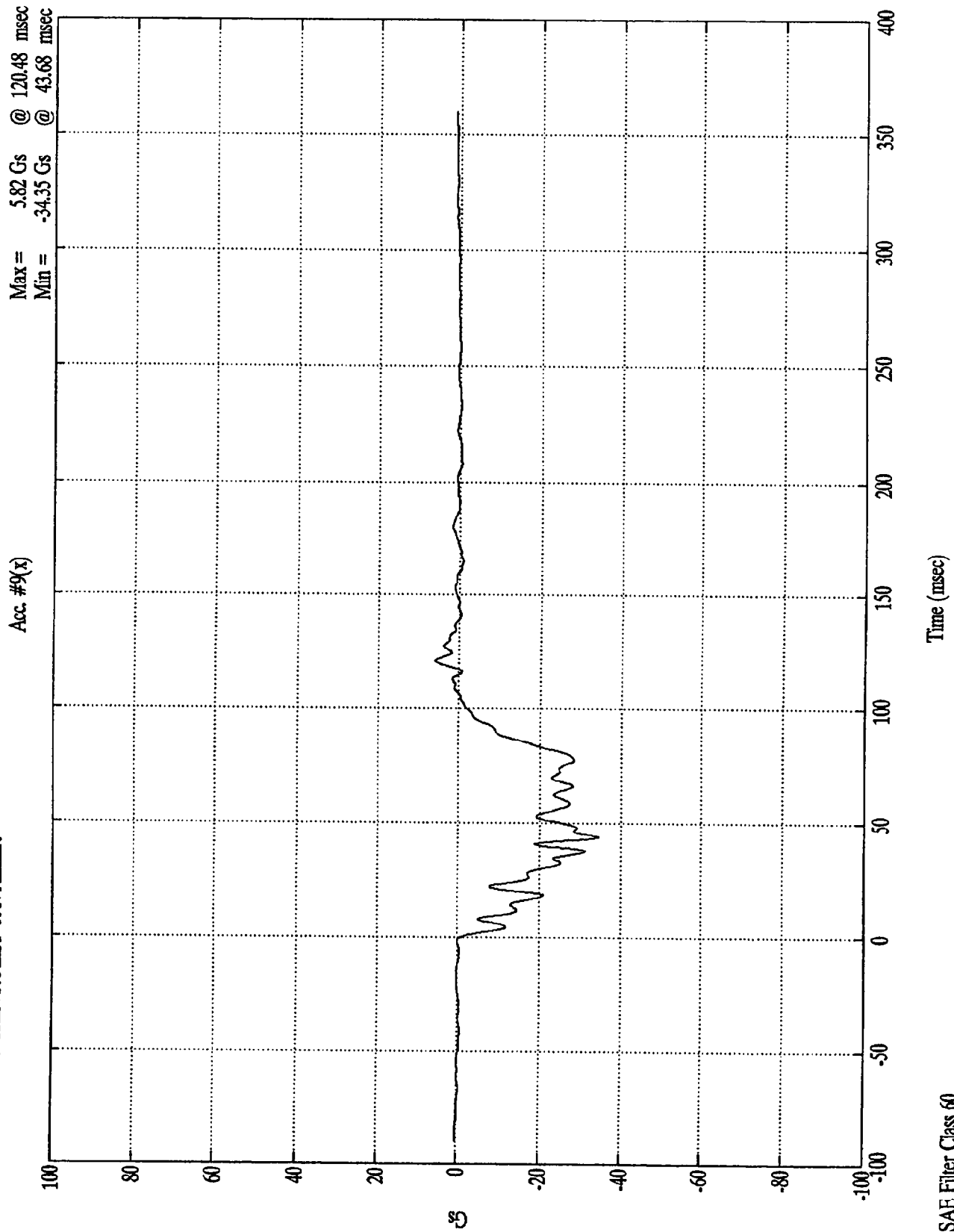


B-65

8227-12

SAE Filter Class 180

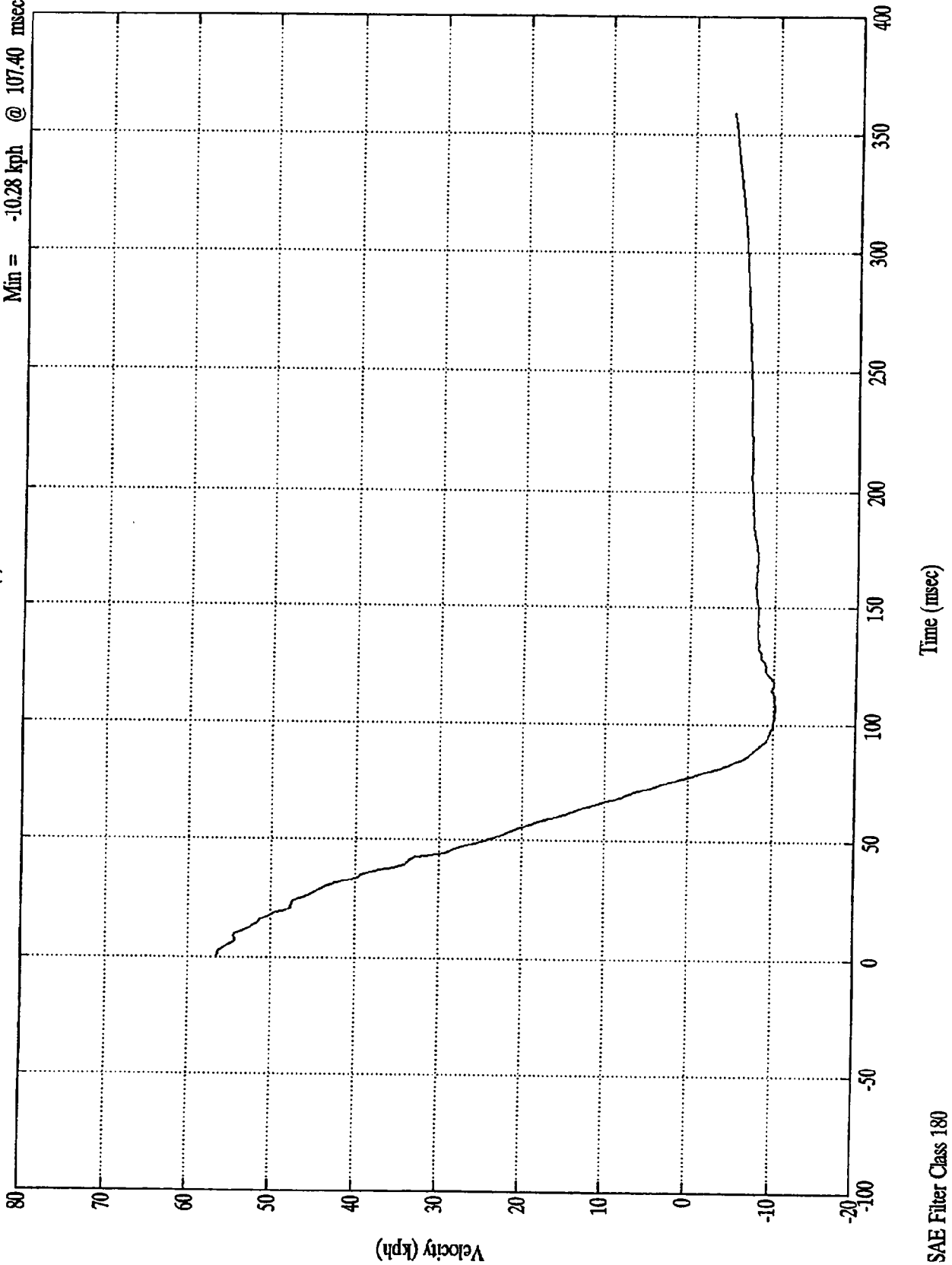
NCAP TEST #12 - 1995 CHEVROLET CAVALIER



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 56.49 kph @ -0.00 msec
Min = -10.28 kph @ 107.40 msec

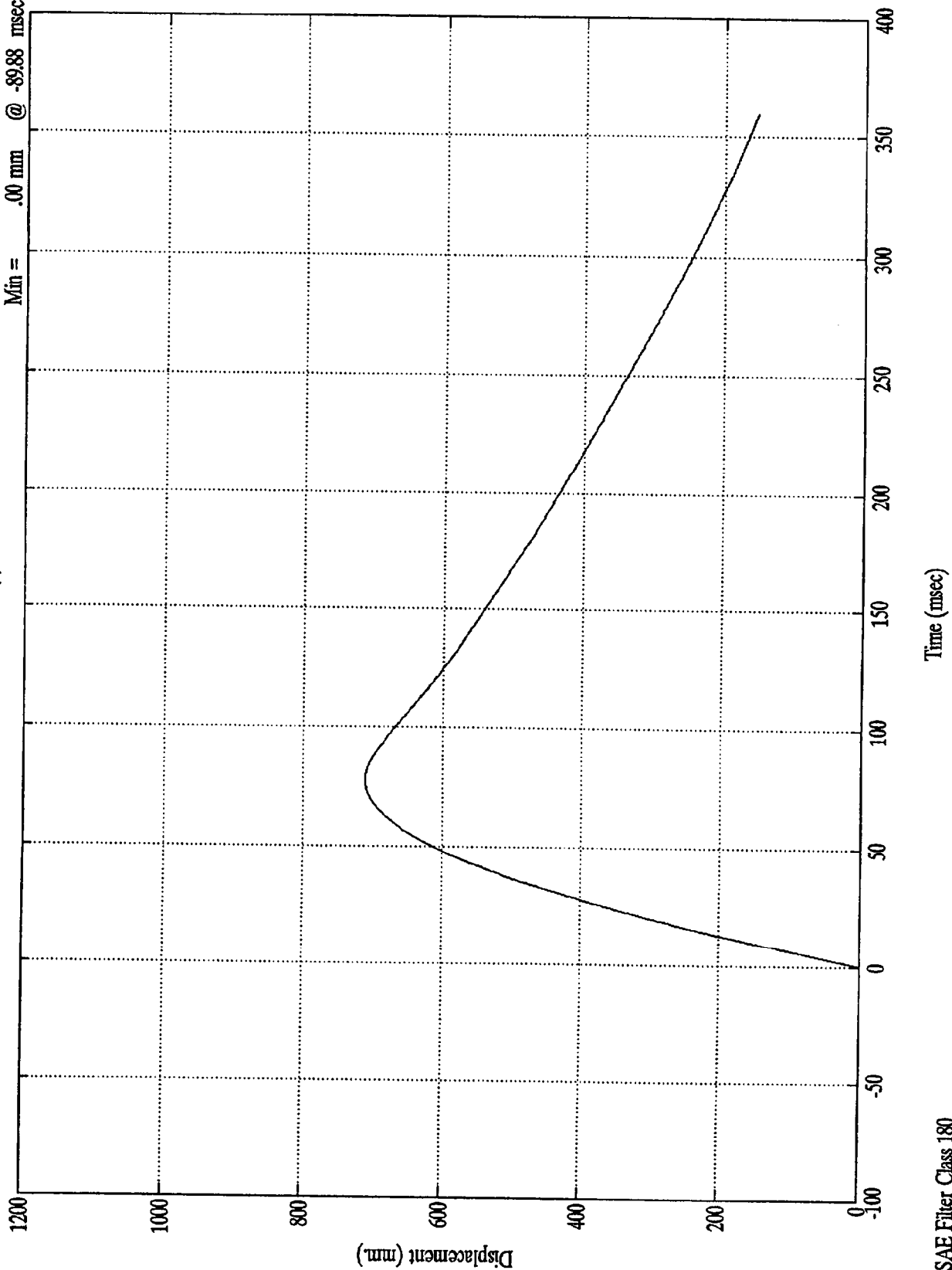
Acc. #9(x)



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 710.50 mm @ 77.64 msec
Min = .00 mm @ -89.88 msec

Acc. #9(x)



TEST NO. MS0107

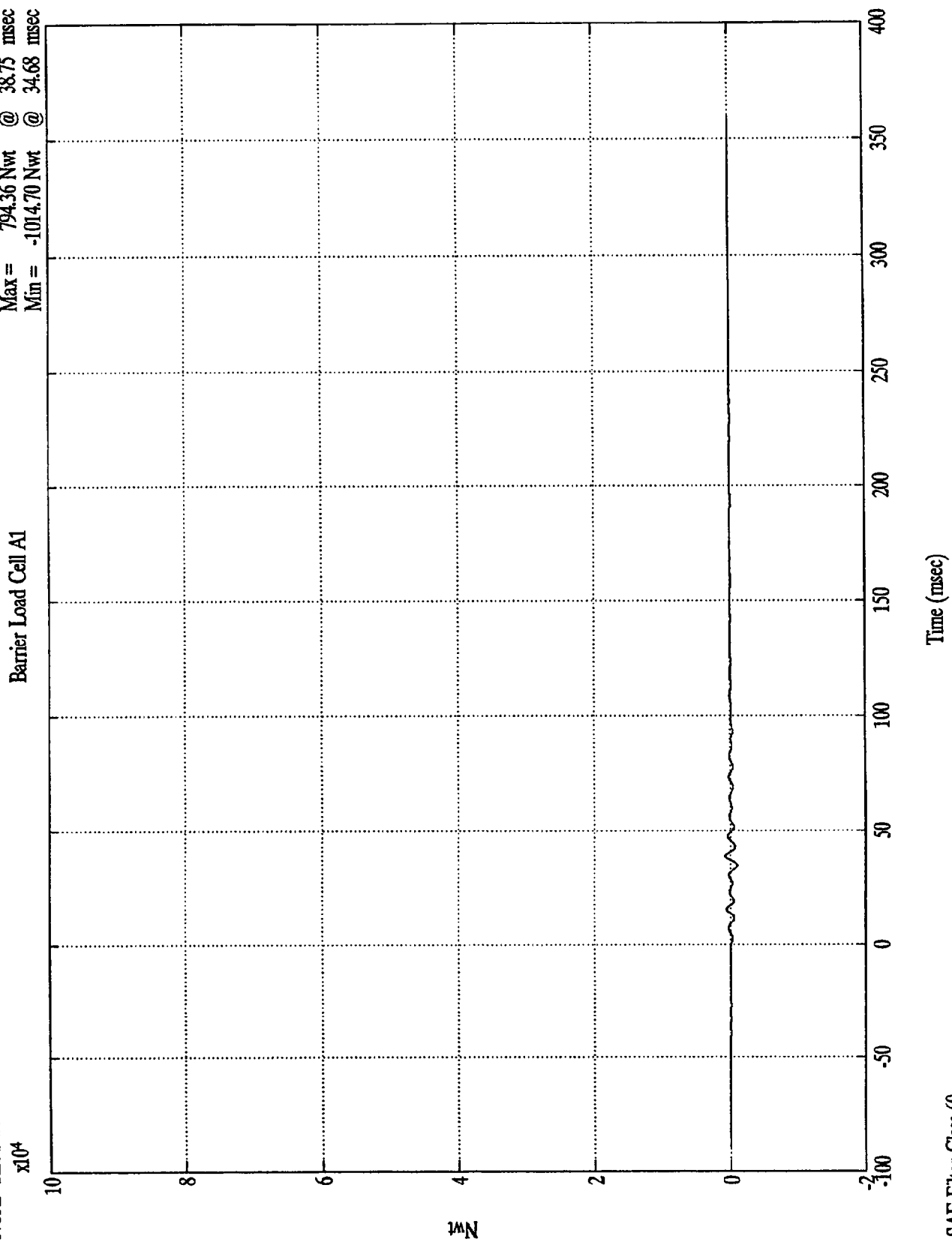
LOAD CELL BARRIER DATA

FILTER CHANNEL CLASS

60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell A1
 Max = 794.36 Nwt @ 38.75 msec
 Min = -1014.70 Nwt @ 34.68 msec



Nwt

Time (msec)

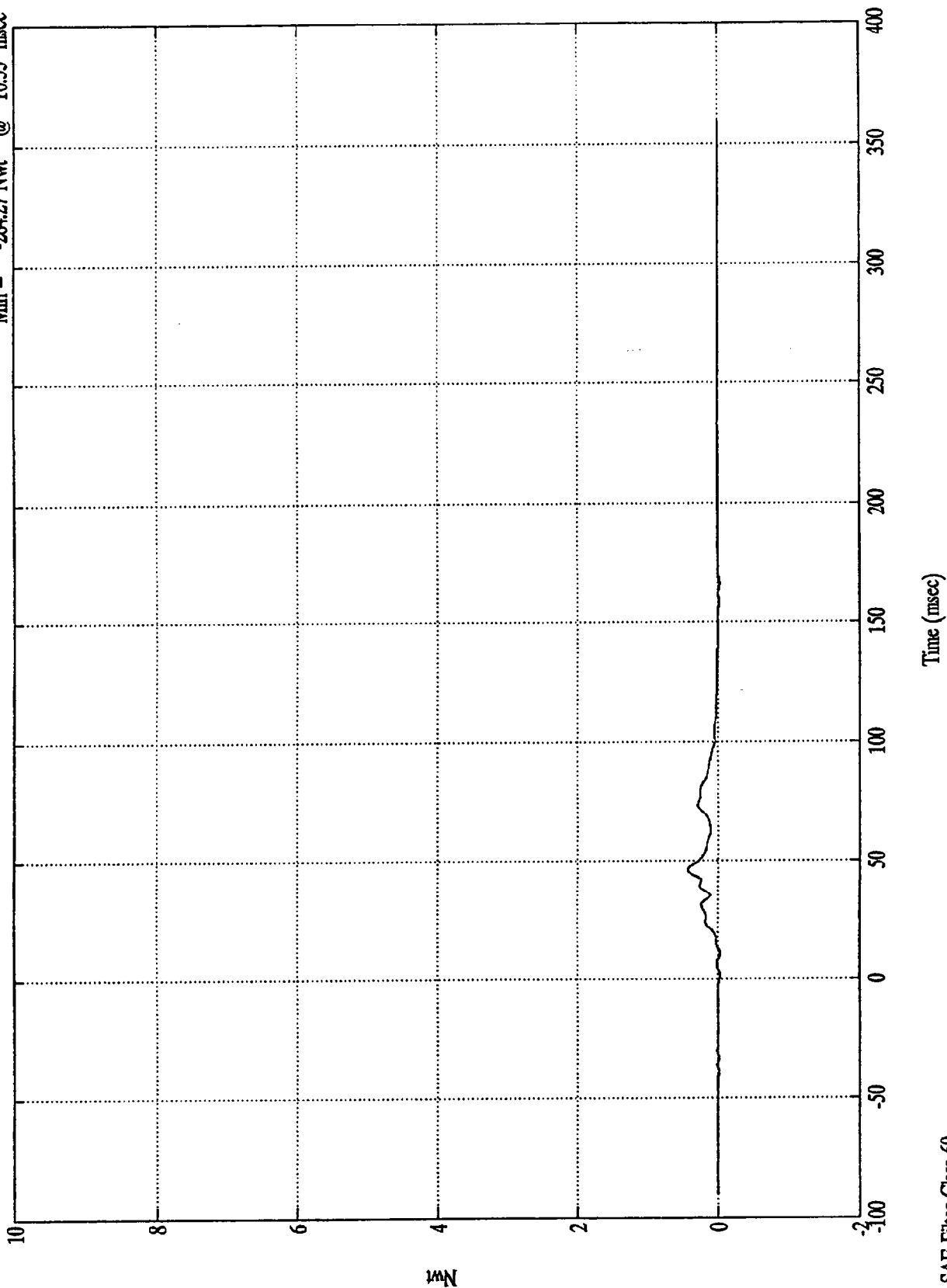
SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 4360.59 Nwt @ 46.31 msec
Min = -284.27 Nwt @ 10.55 msec

Barrier Load Cell A2

$\times 10^4$



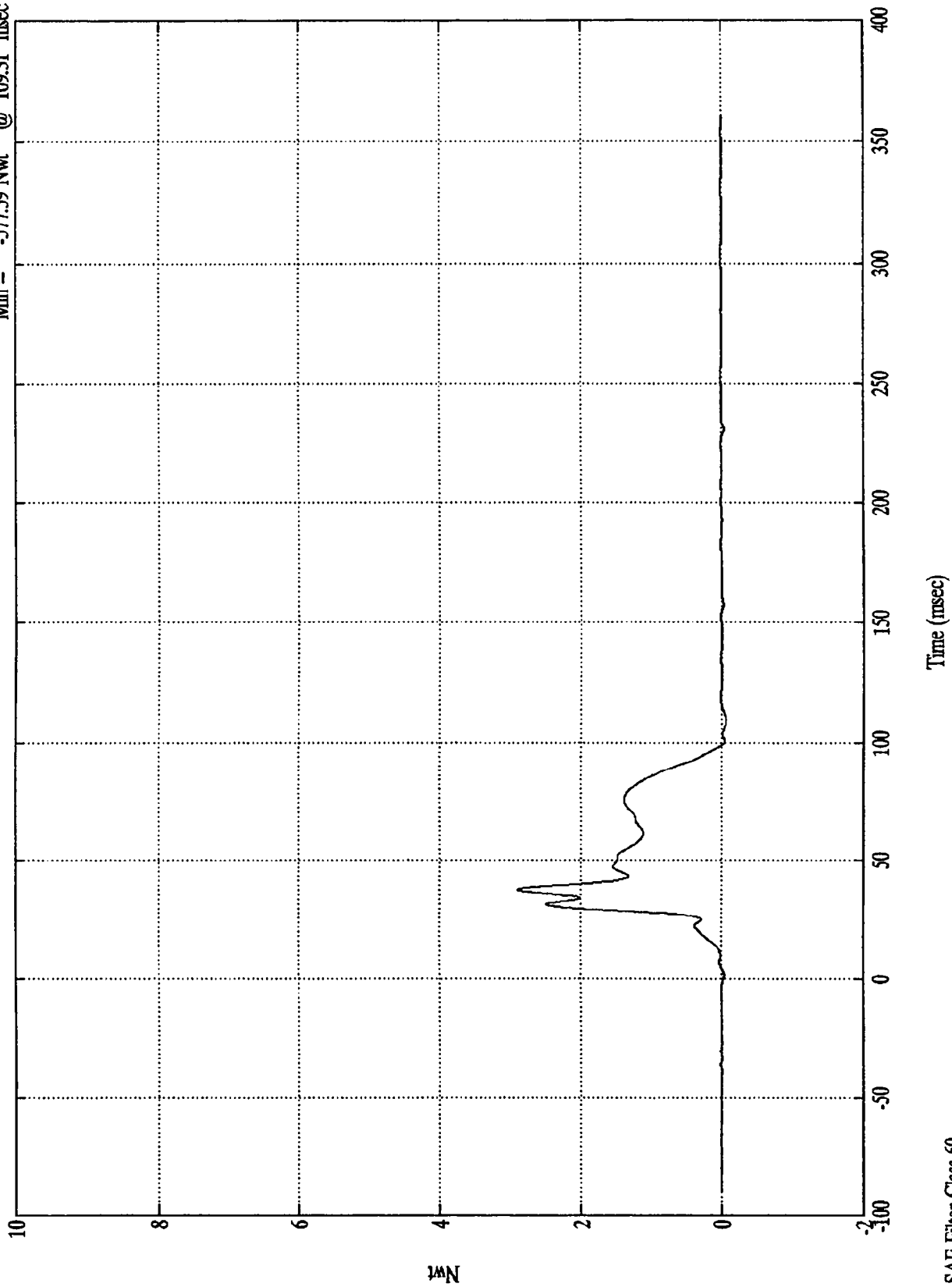
Nwt

Time (msec)

SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell A3
Max = 29120.23 Nwt @ 37.20 msec
Min = -577.59 Nwt @ 109.31 msec



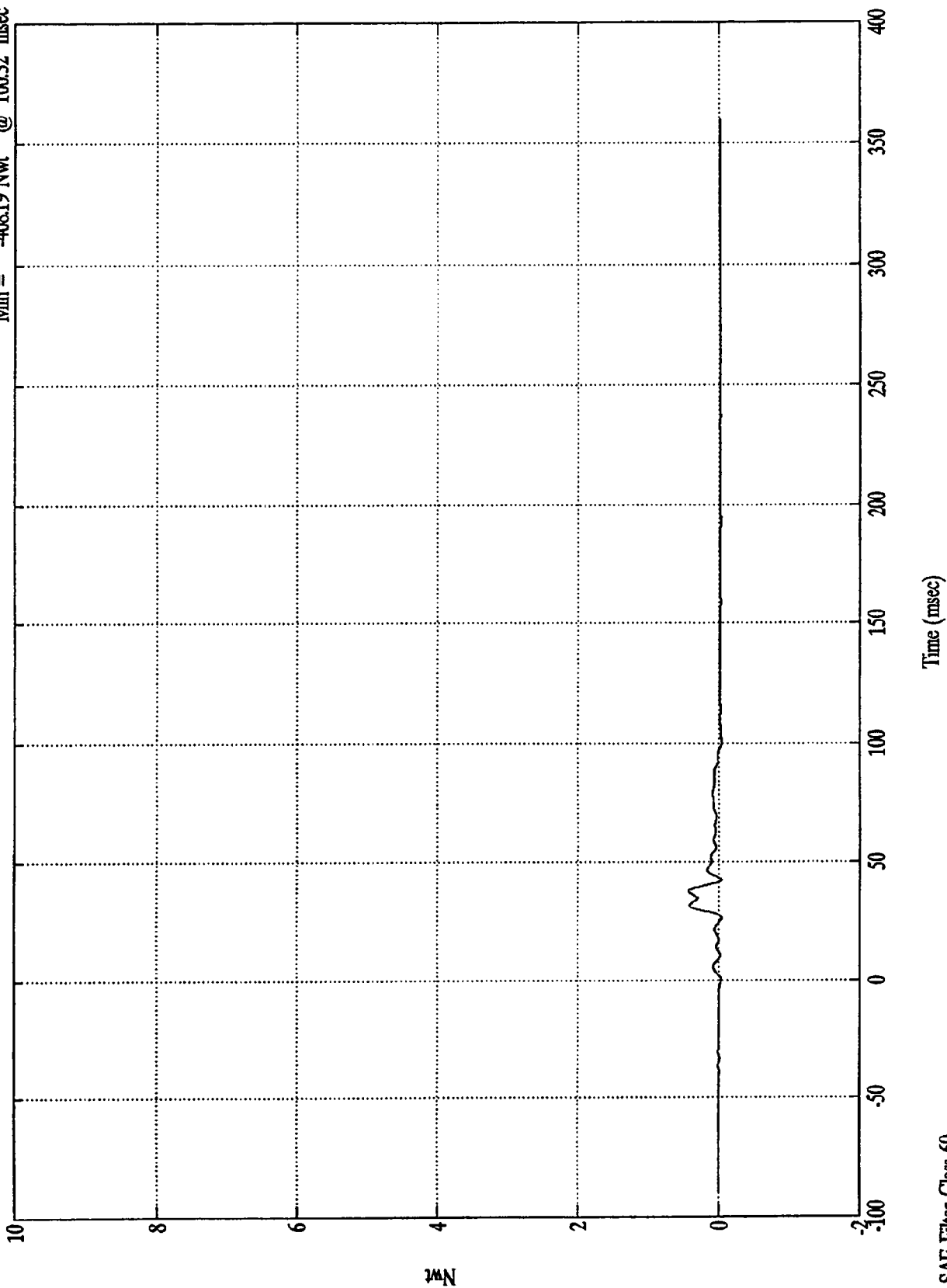
SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 4369.90 Nwt @ 37.56 msec
Min = -408.19 Nwt @ 100.32 msec

Barrier Load Cell A4

$\times 10^4$



Nwt

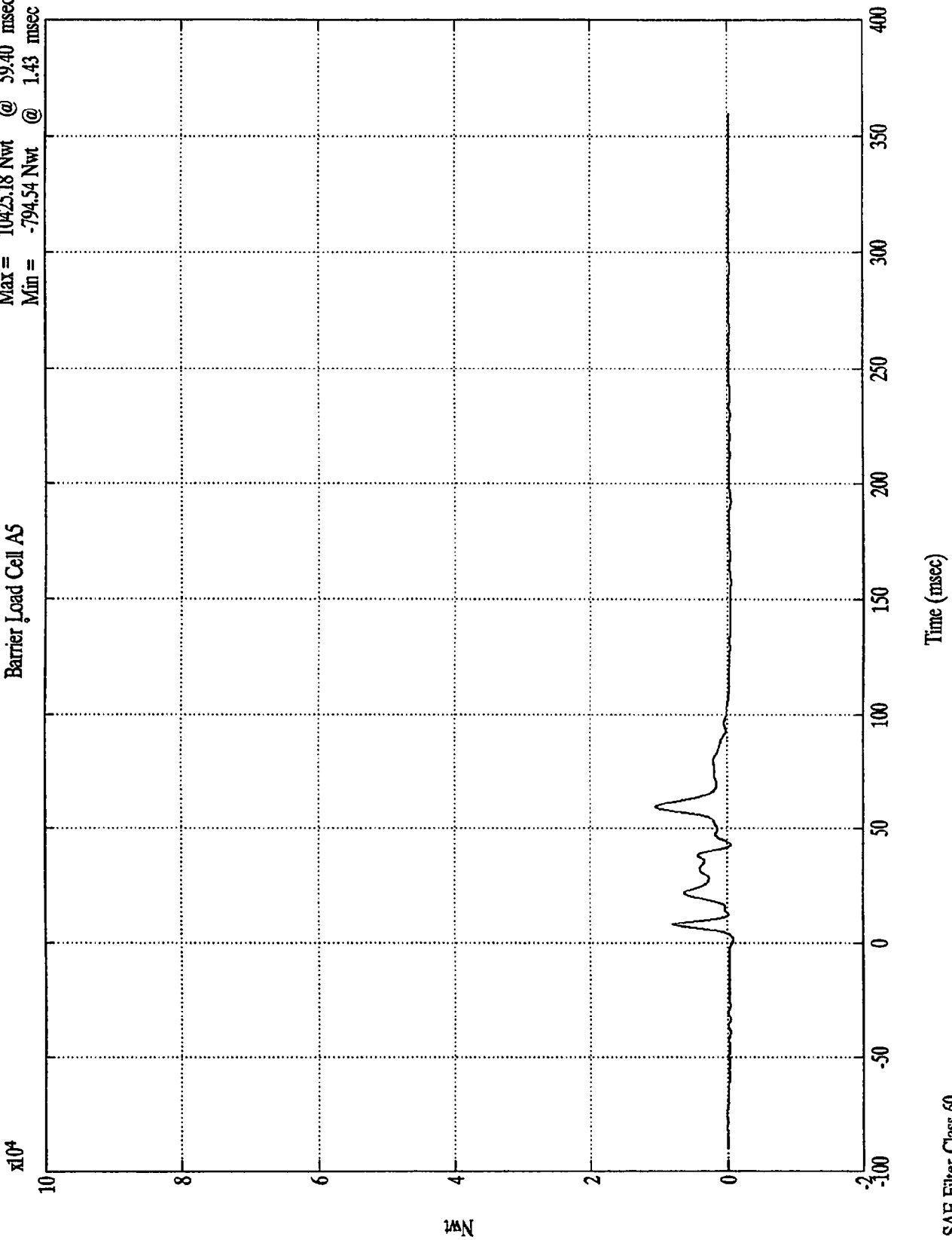
Time (msec)

SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell A5

Max = 10425.18 Nwt @ 59.40 msec
Min = -794.54 Nwt @ 1.43 msec



Nwt

B-104

SAE Filter Class 60

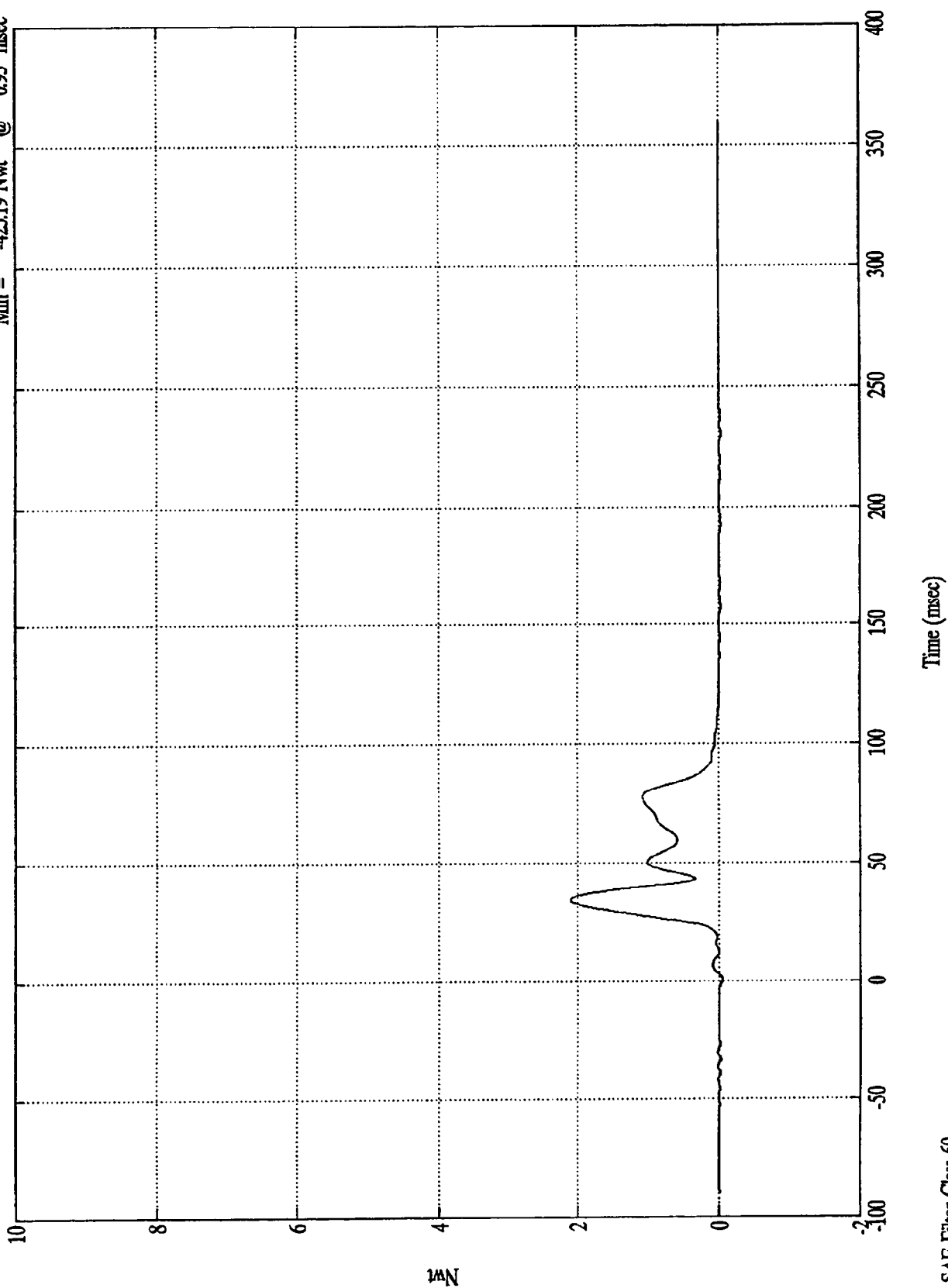
8227-12

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell A6
Max = 21009.87 Nwt @ 34.43 msec
Min = -425.19 Nwt @ 0.95 msec

Barrier Load Cell A6

$\times 10^4$



10N

B-105

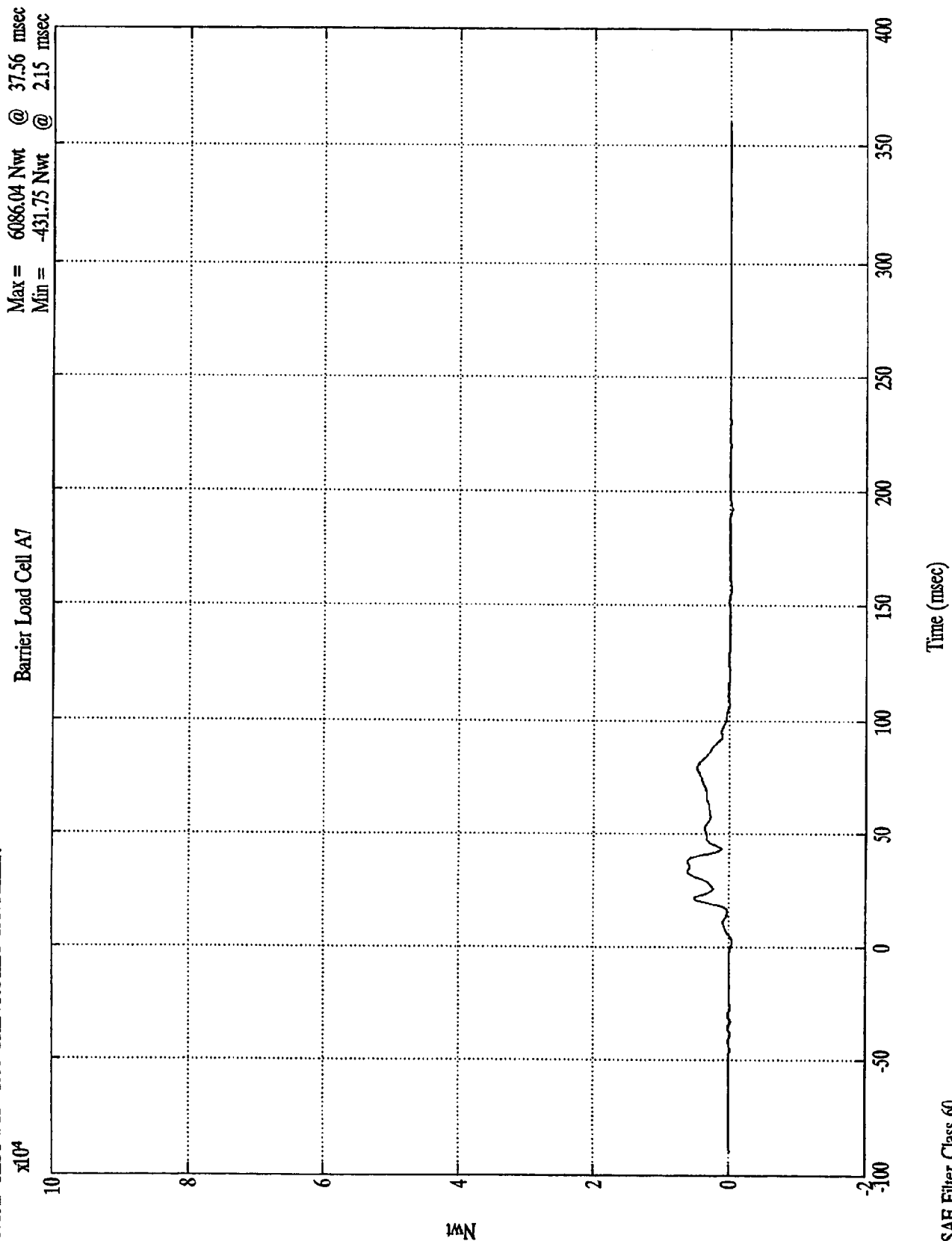
8227-12

SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 6086.04 Nwt @ 37.56 msec
Min = -431.75 Nwt @ 2.15 msec

Barrier Load Cell A7



Nwt

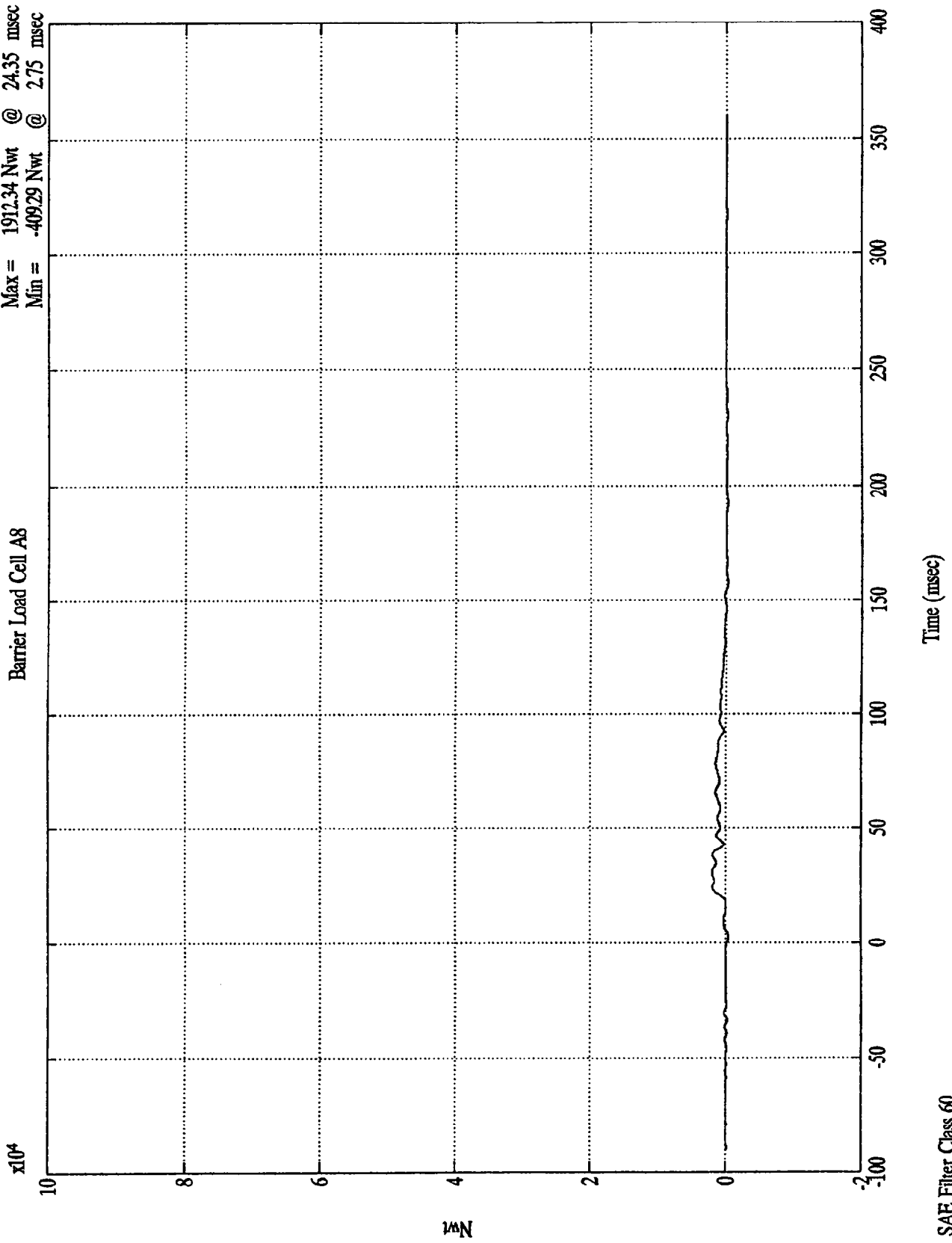
Time (msec)

SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

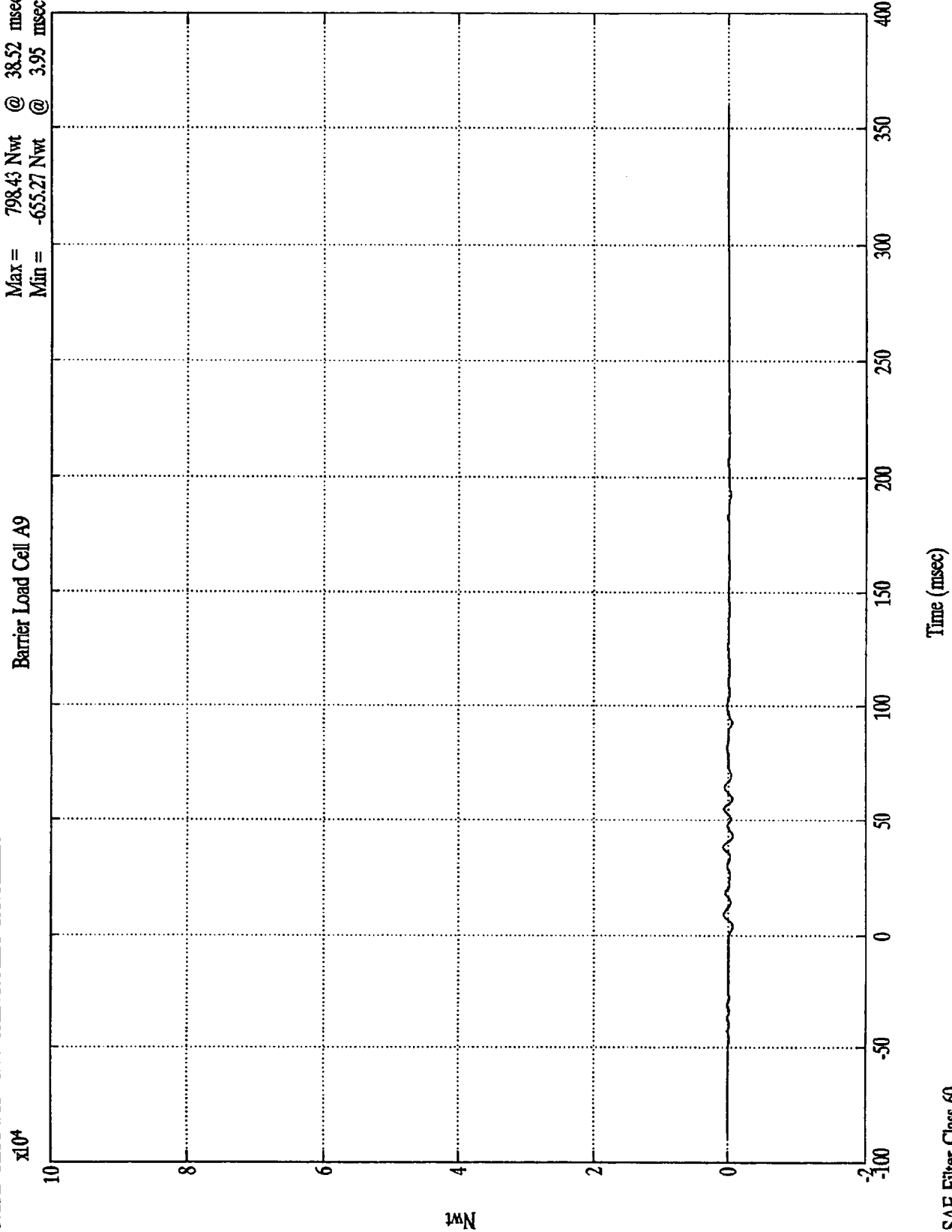
Max = 1912.34 Nwt @ 24.35 msec
Min = -409.29 Nwt @ 2.75 msec

Barrier Load Cell A8



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell A9
Max = 798.43 Nwt @ 38.52 msec
Min = -655.27 Nwt @ 3.95 msec



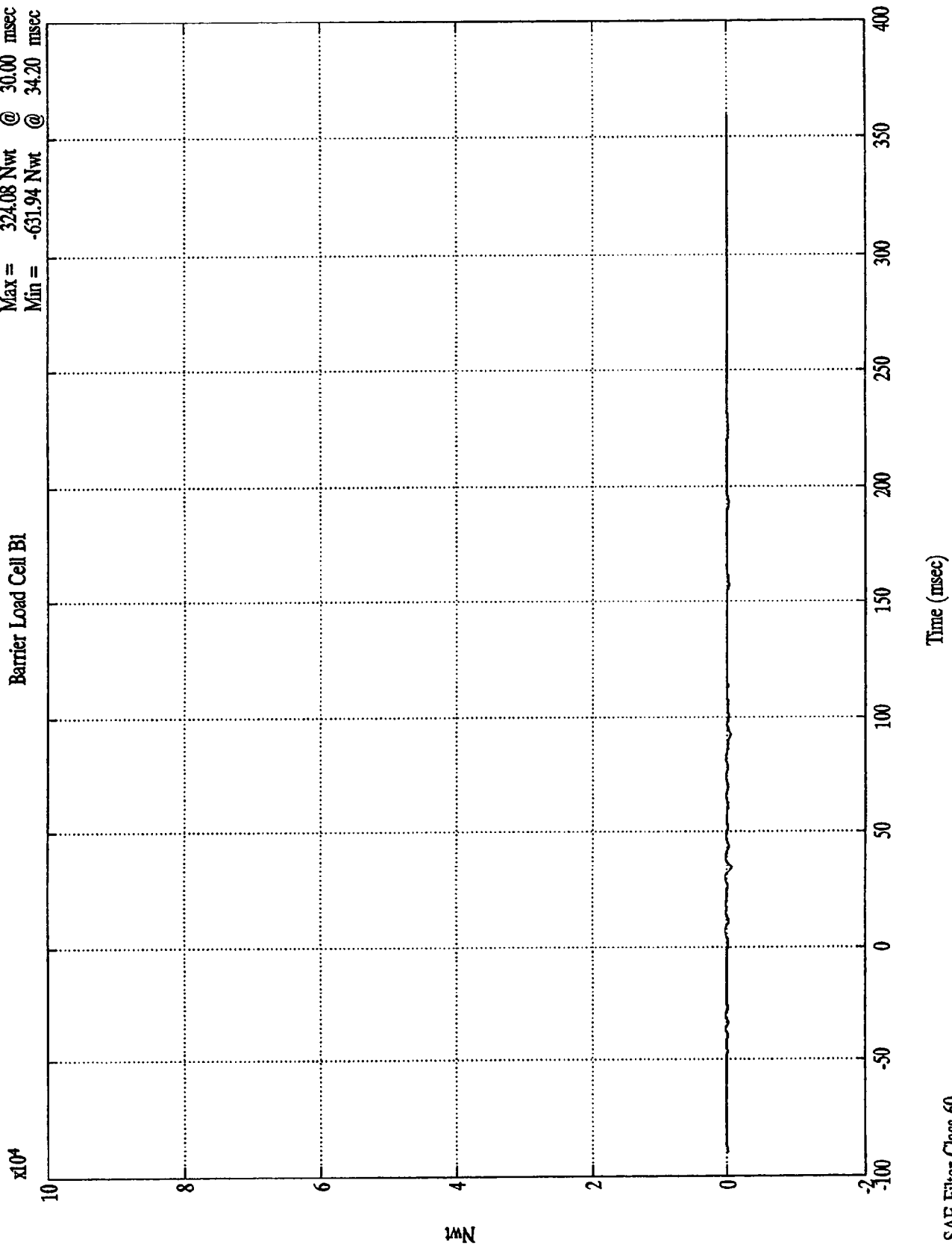
Nwt

Time (msec)

SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell B1
Max = 324.08 Nwt @ 30.00 msec
Min = -631.94 Nwt @ 34.20 msec



Nwt

Time (msec)

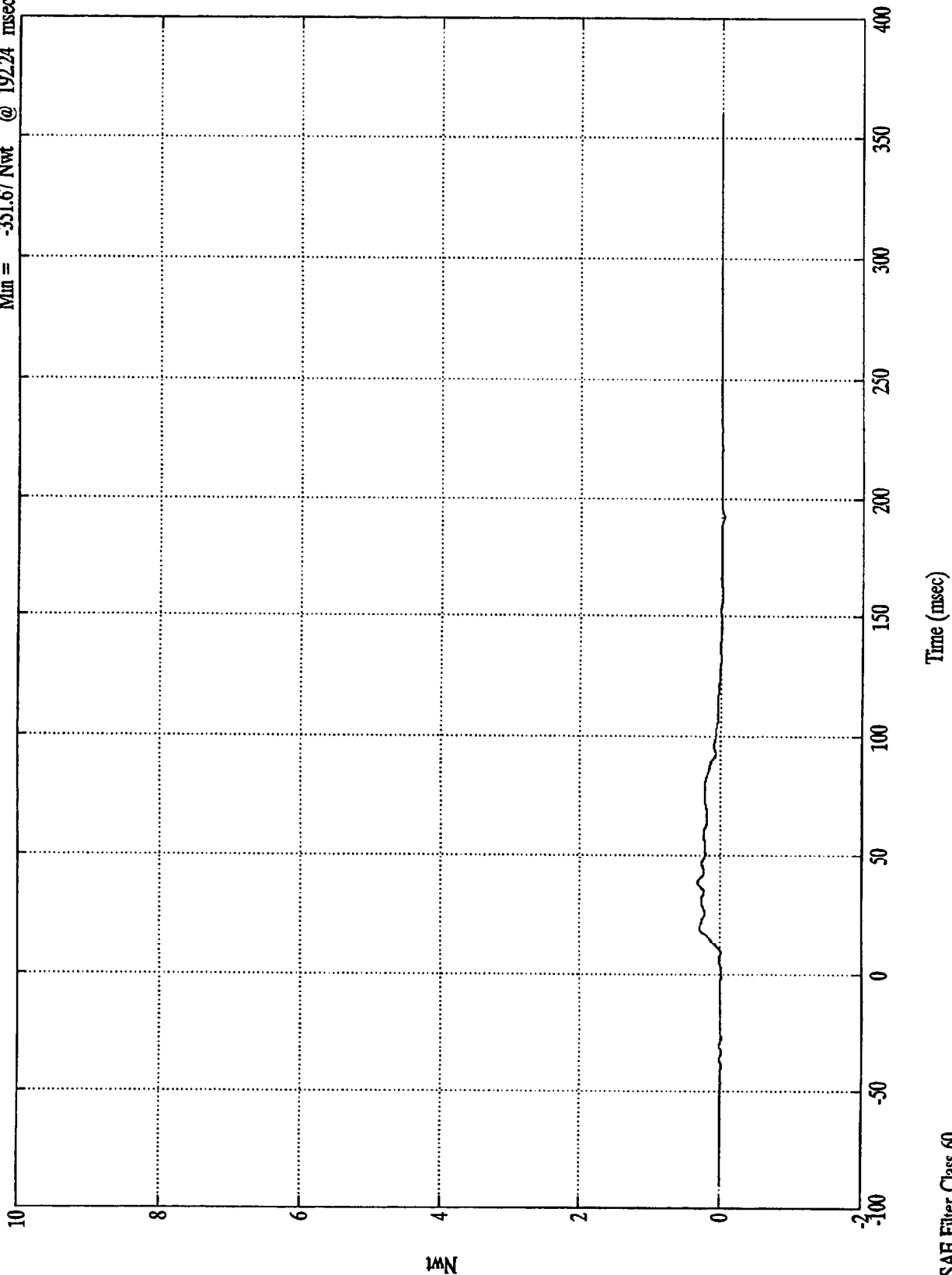
SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 3181.33 Nwt @ 38.52 msec
Min = -351.67 Nwt @ 192.24 msec

Barrier Load Cell B2

$\times 10^4$



SAE Filter Class 60

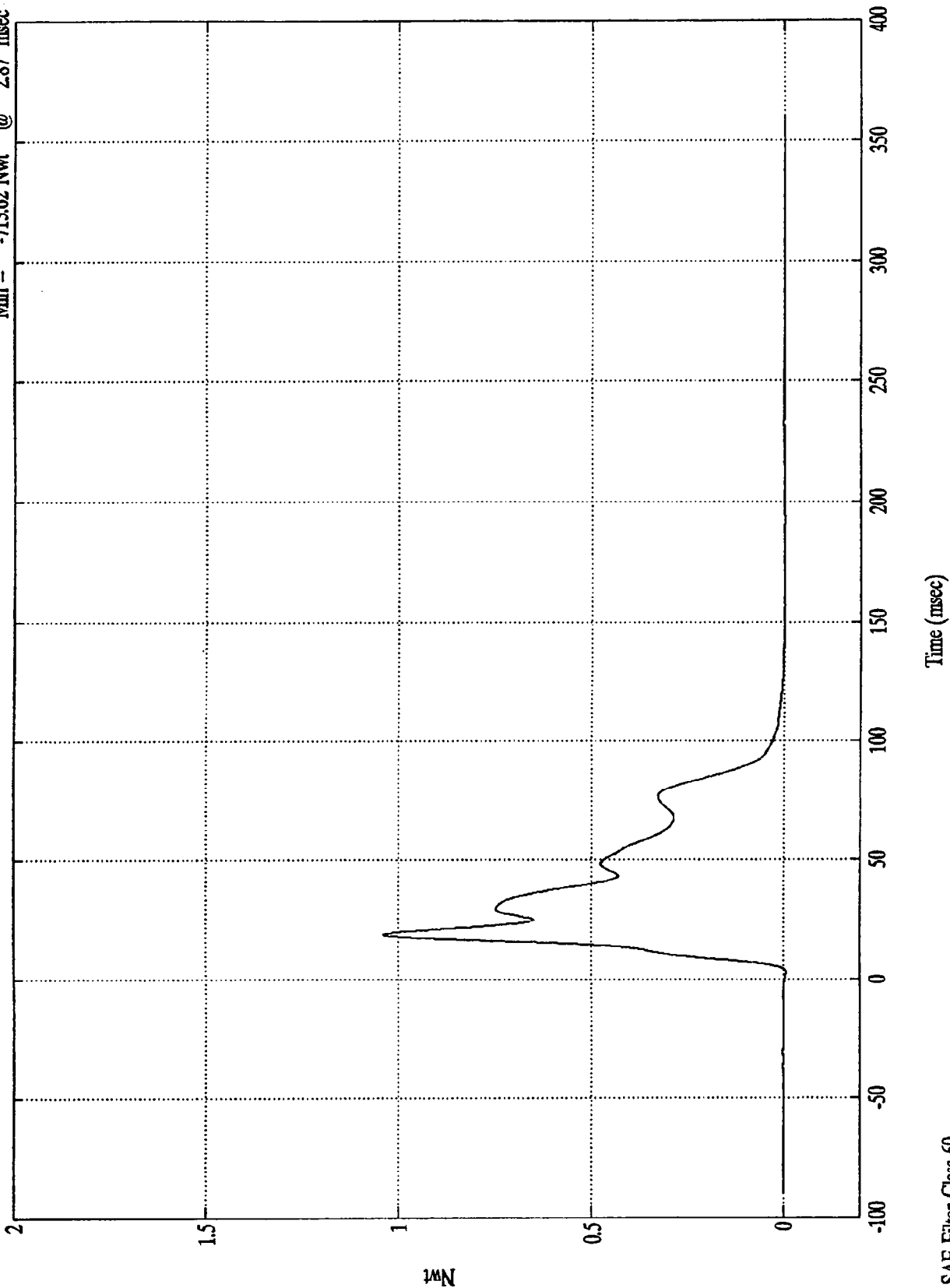
Nwt

Time (msec)

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell B3
 Max = 103946.50 Nwt @ 18.71 msec
 Min = -713.62 Nwt @ 2.87 msec

$\times 10^5$



Nwt

Time (msec)

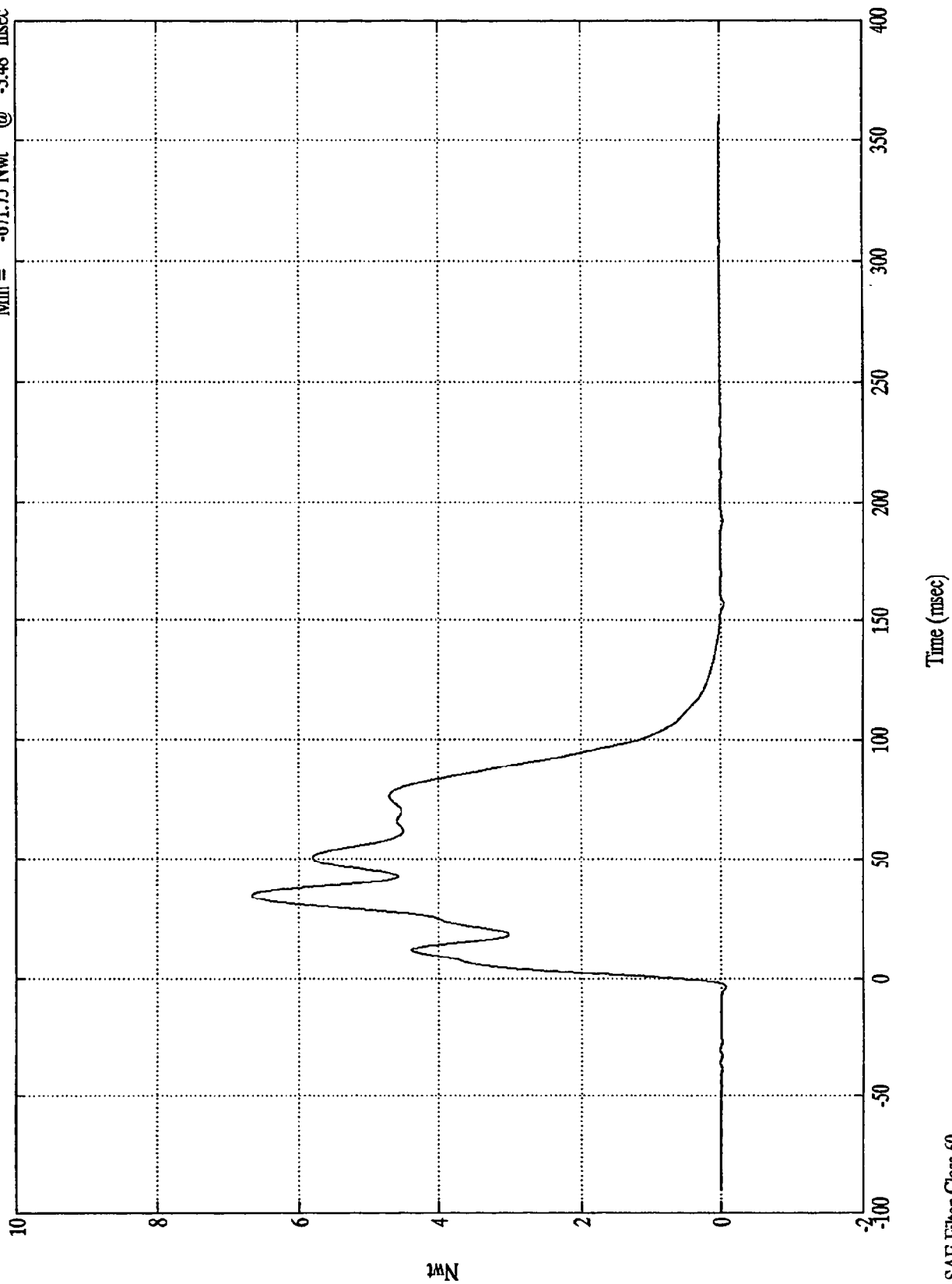
SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 66740.67 Nwt @ 34.68 msec
Min = -671.75 Nwt @ -3.48 msec

Barrier Load Cell B4

x10⁴



Nwt

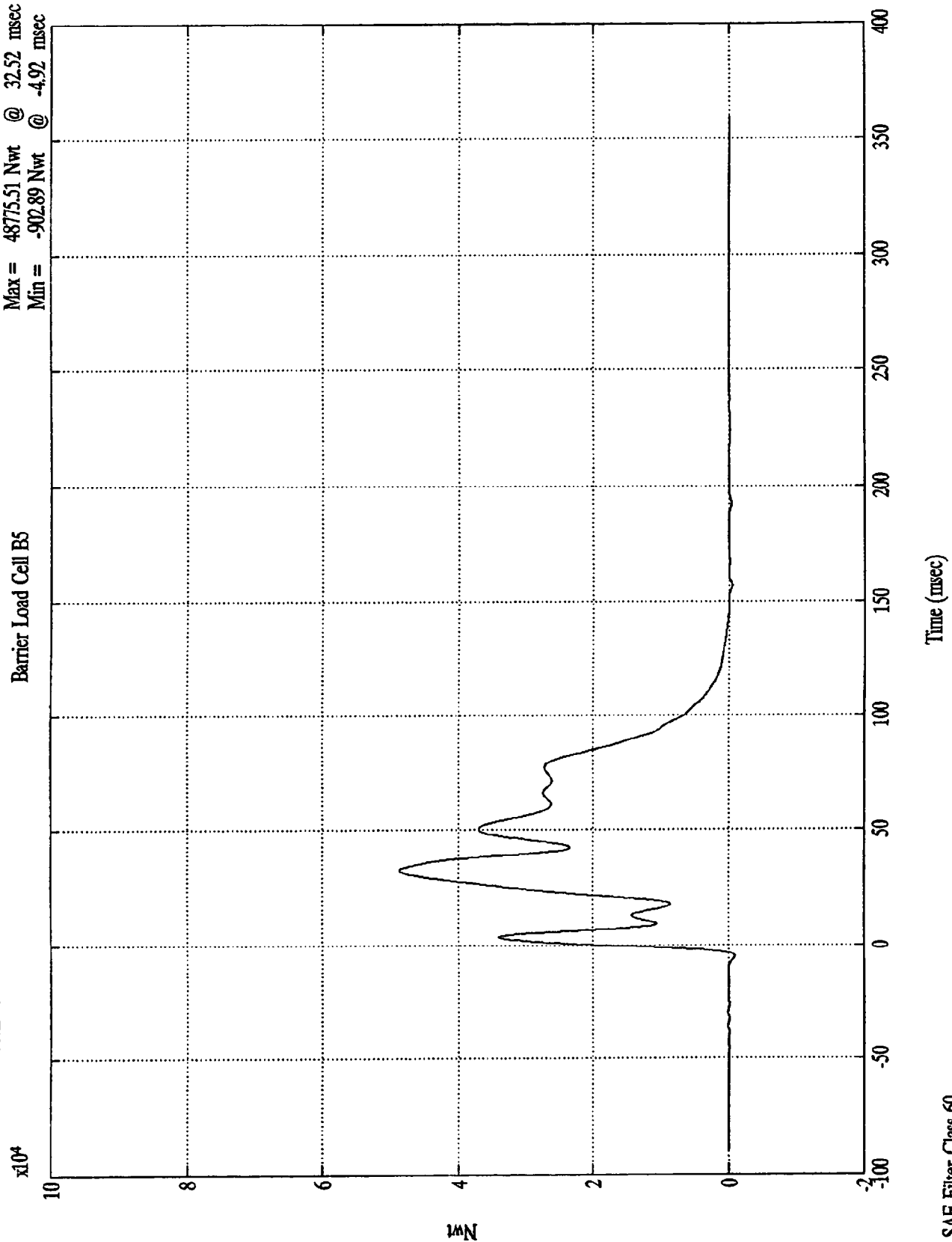
Time (msec)

SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell B5

Max = 48775.51 Nwt @ 32.52 msec
Min = -902.89 Nwt @ -4.92 msec



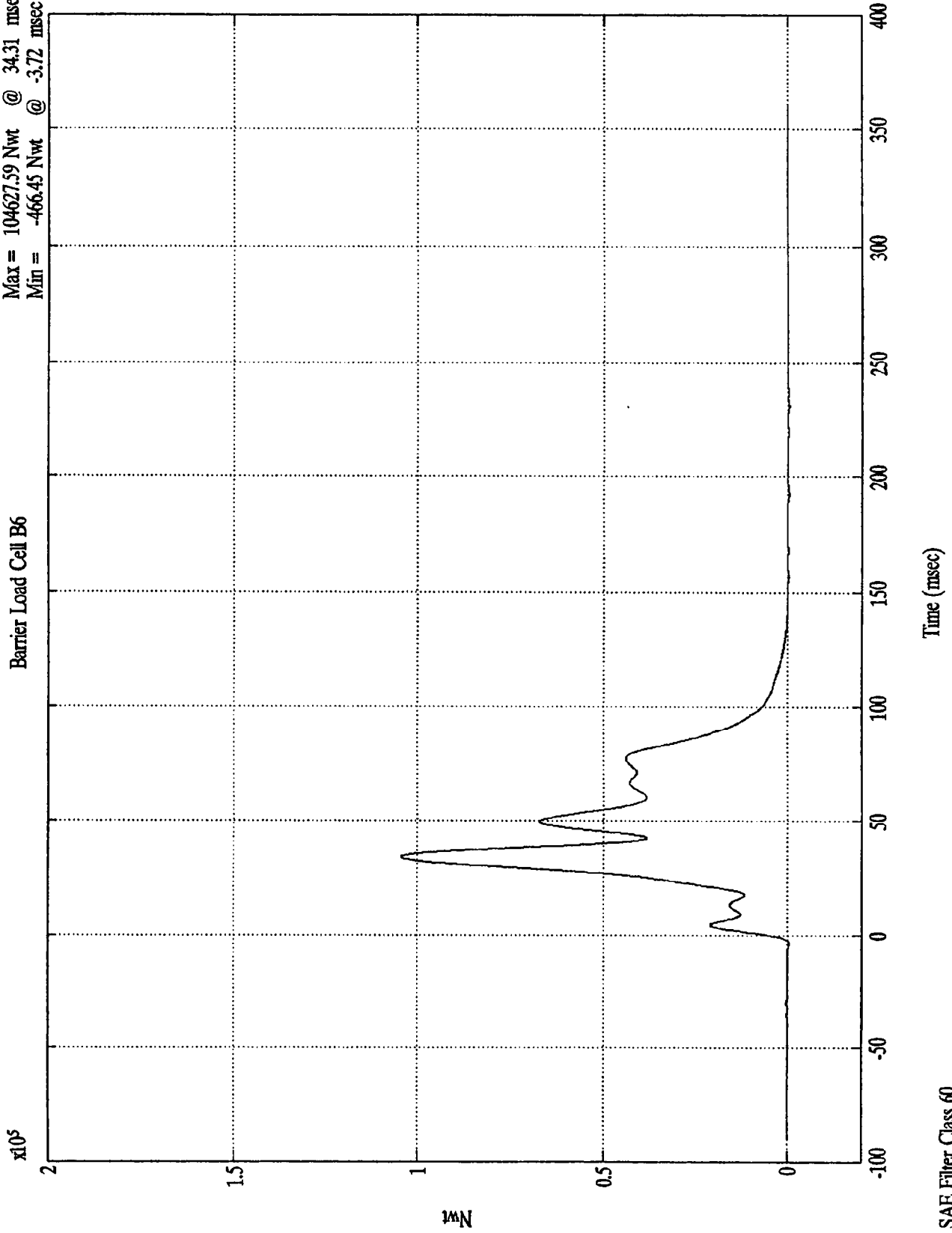
Nwt

Time (msec)

SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell B6
 Max = 104627.59 Nwt @ 34.31 msec
 Min = -466.45 Nwt @ -3.72 msec

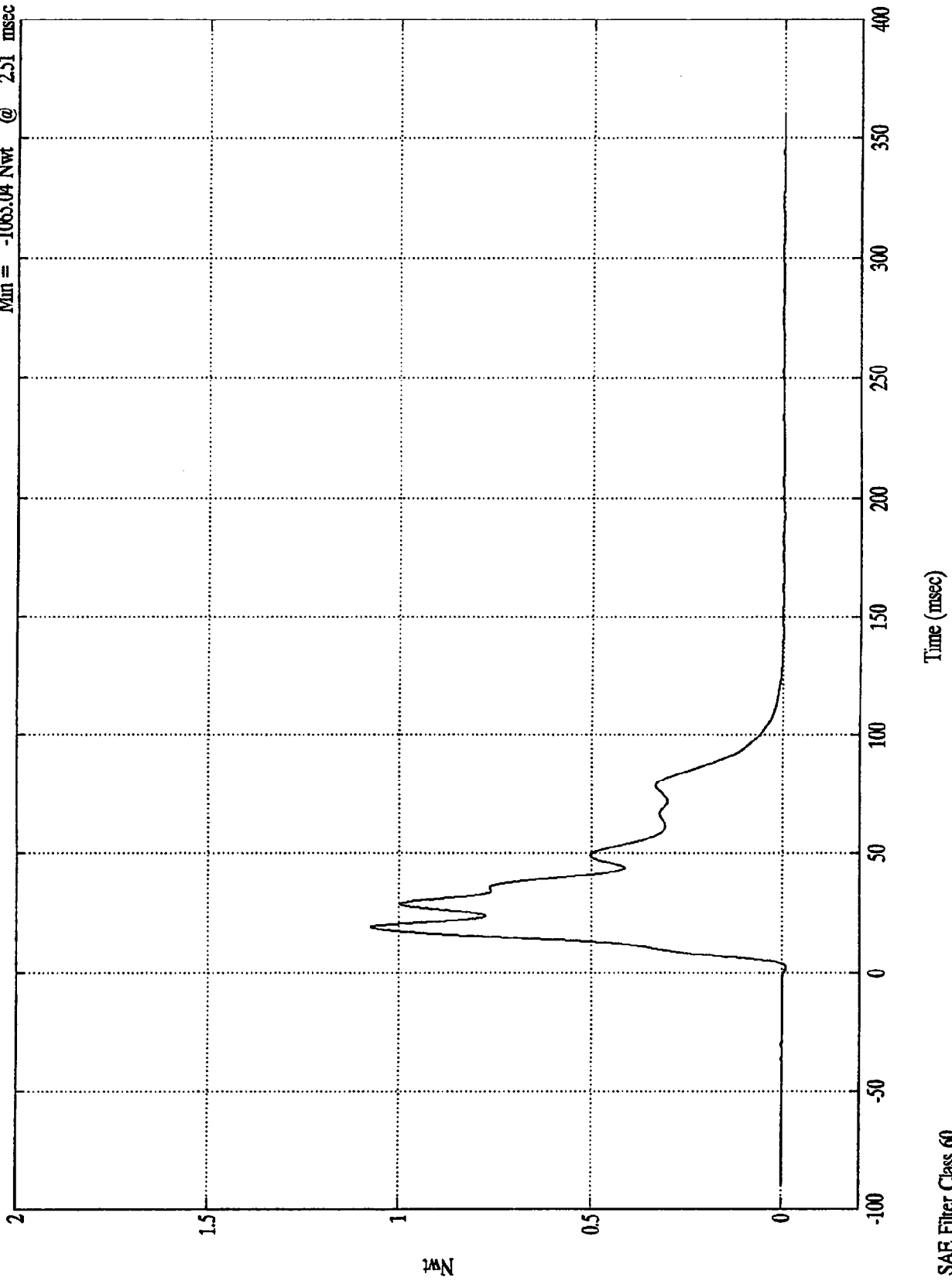


NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 107582.45 Nwt @ 19.19 msec
Min = -1065.04 Nwt @ 2.51 msec

Barrier Load Cell B7

$\times 10^5$

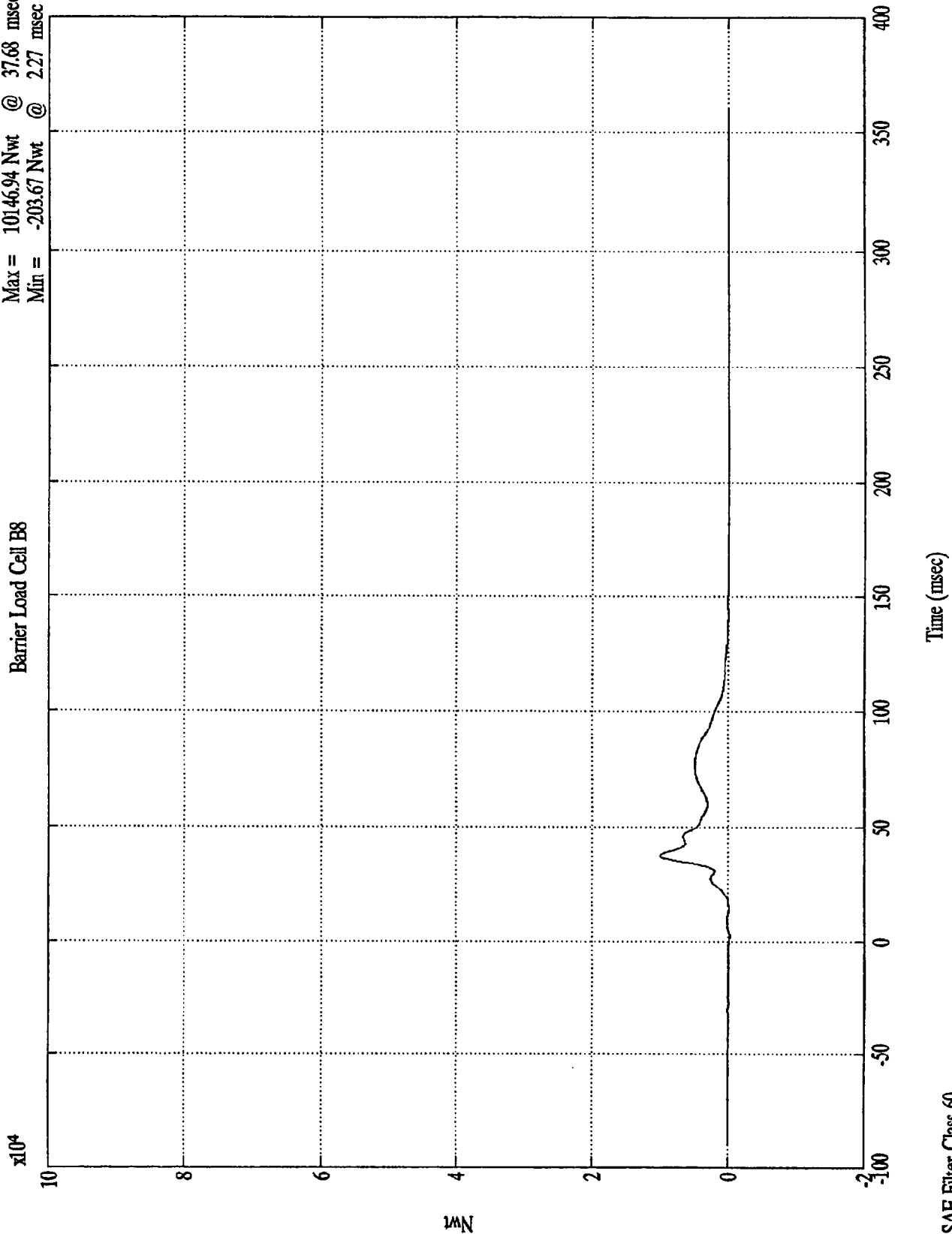


SAB Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

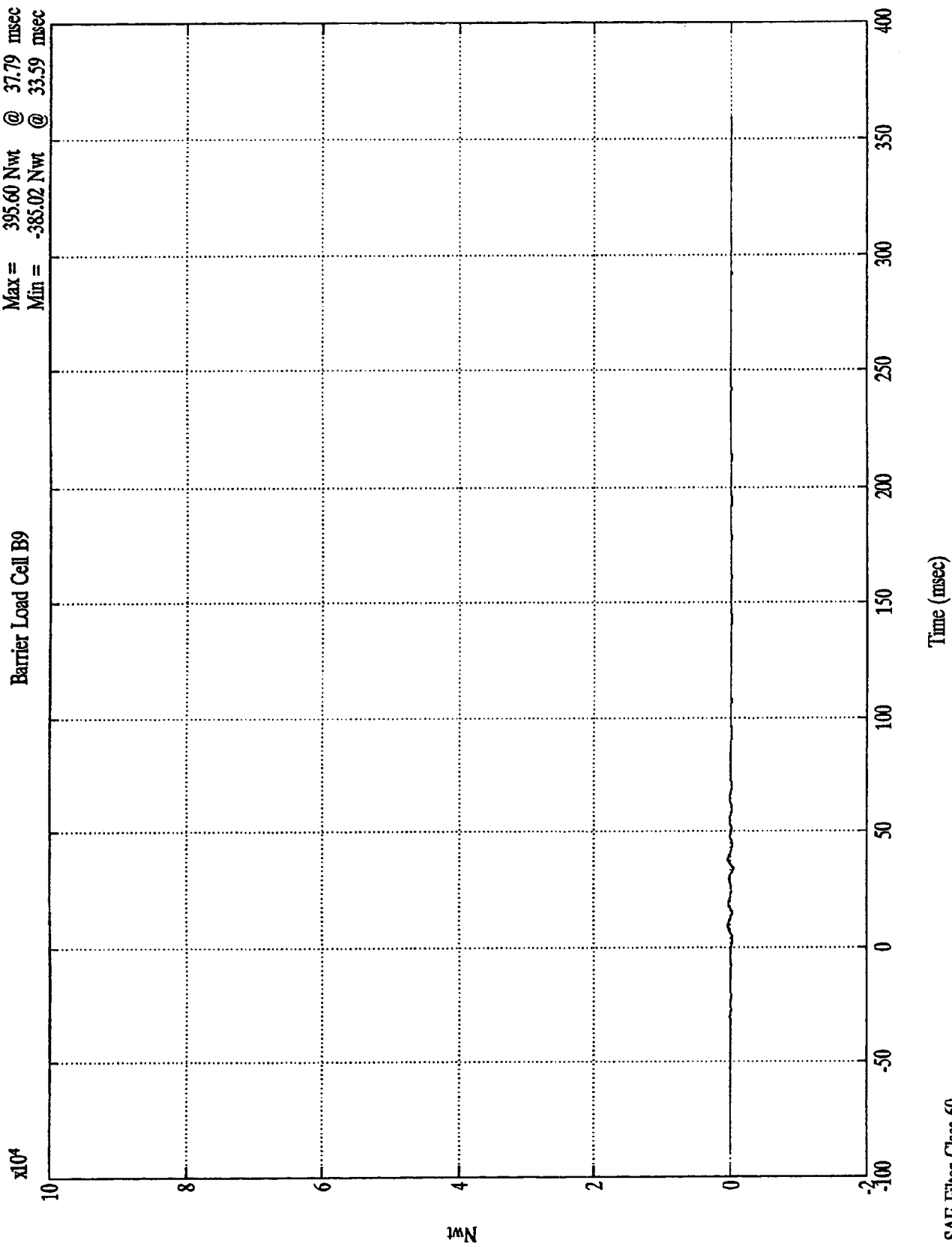
Max = 10146.94 Nwt @ 37.68 msec
Min = -203.67 Nwt @ 2.27 msec

Barrier Load Cell B8



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell B9
 Max = 395.60 Nwt @ 37.79 msec
 Min = -385.02 Nwt @ 33.59 msec



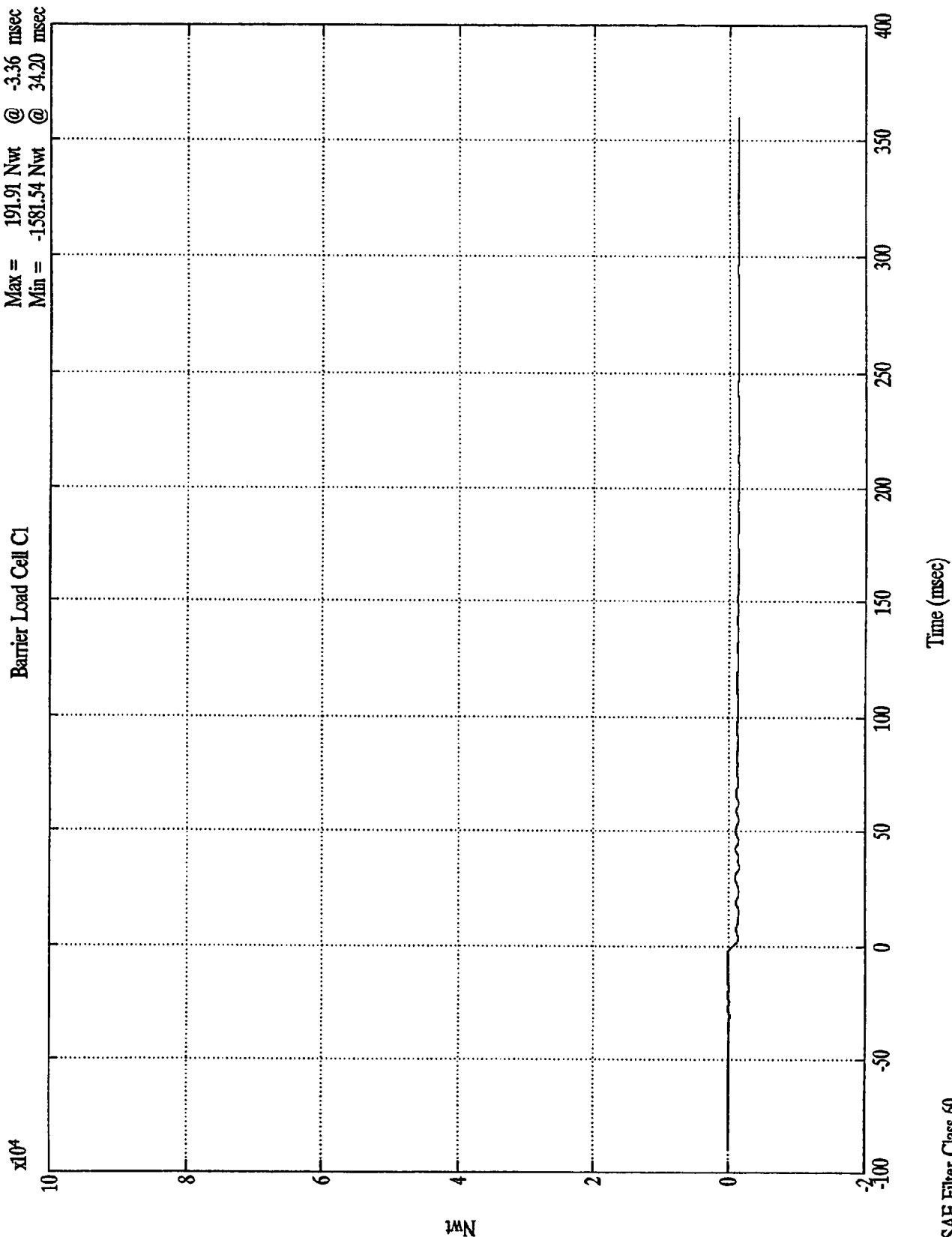
Nwt

Time (msec)

SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell C1
Max = 191.91 Nwt @ -3.36 msec
Min = -1581.54 Nwt @ 34.20 msec



SAE Filter Class 60

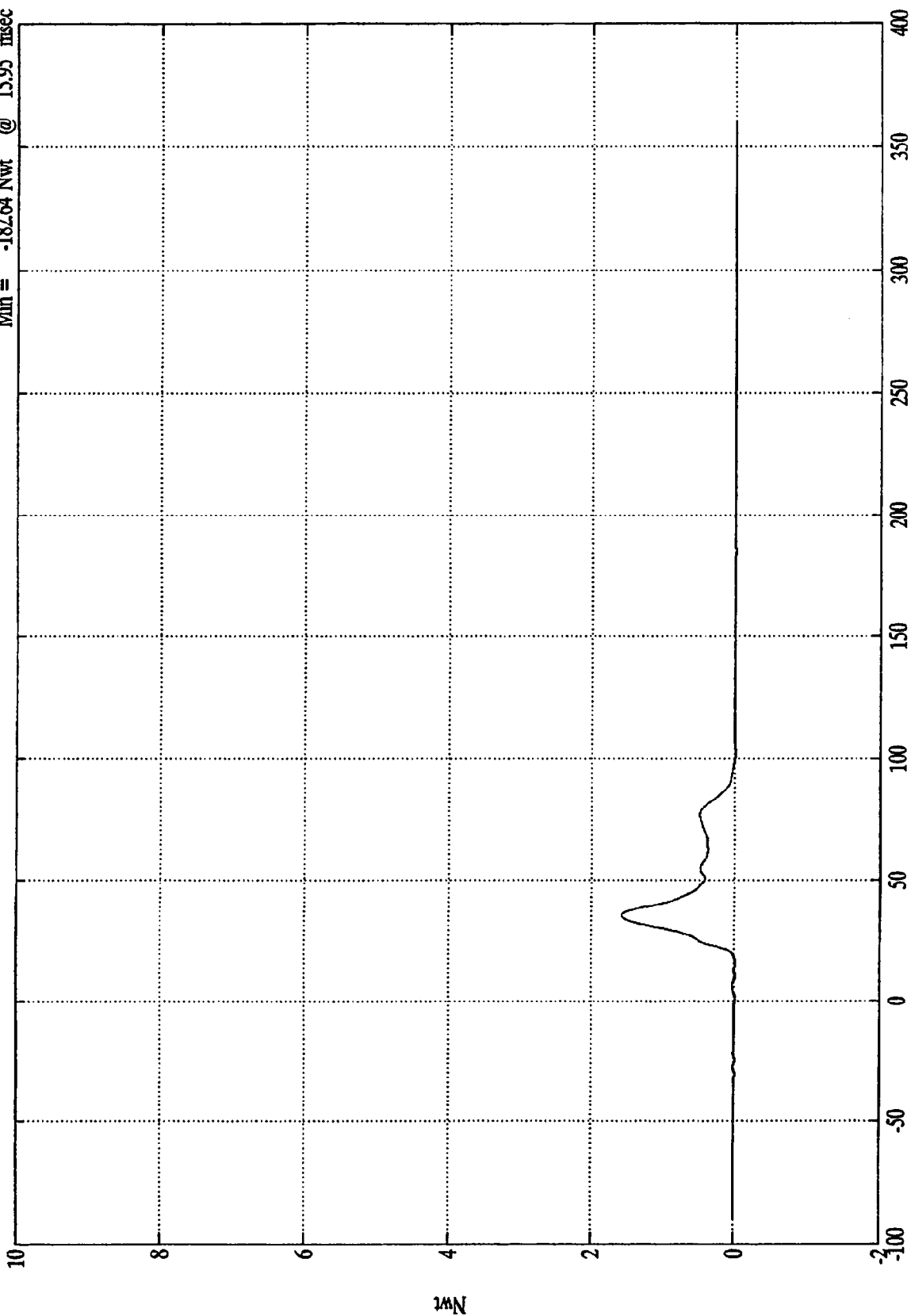
10N

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 15772.71 Nwt @ 35.51 msec
Min = -182.64 Nwt @ 15.95 msec

Barrier Load Cell C2

$\times 10^4$



Time (msec)

SAE Filter Class 60

Nwt

B-119

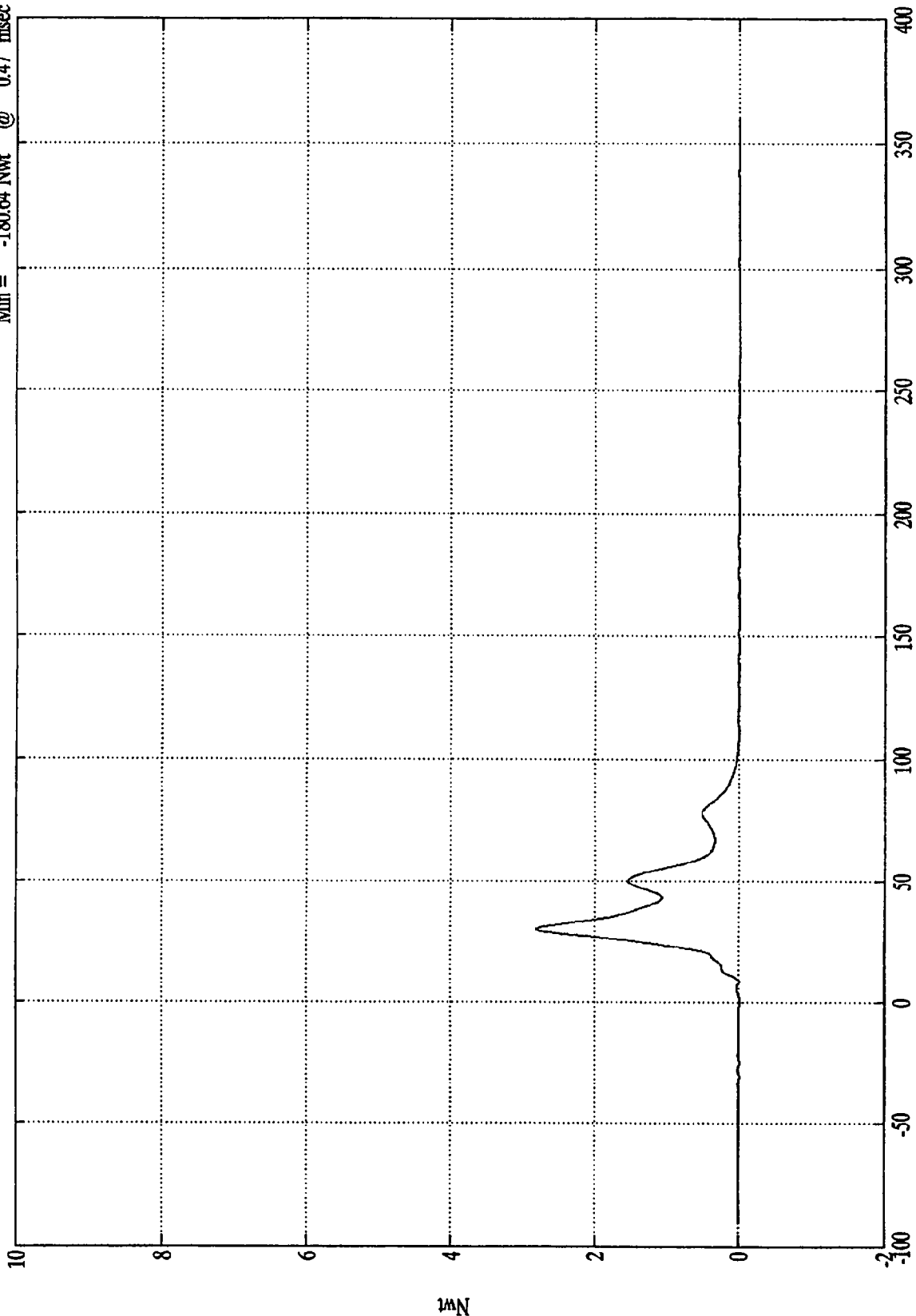
8227-12

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 28255.05 Nwt @ 30.23 msec
Min = -180.64 Nwt @ 0.47 msec

Barrier Load Cell C3

$\times 10^4$



Time (msec)

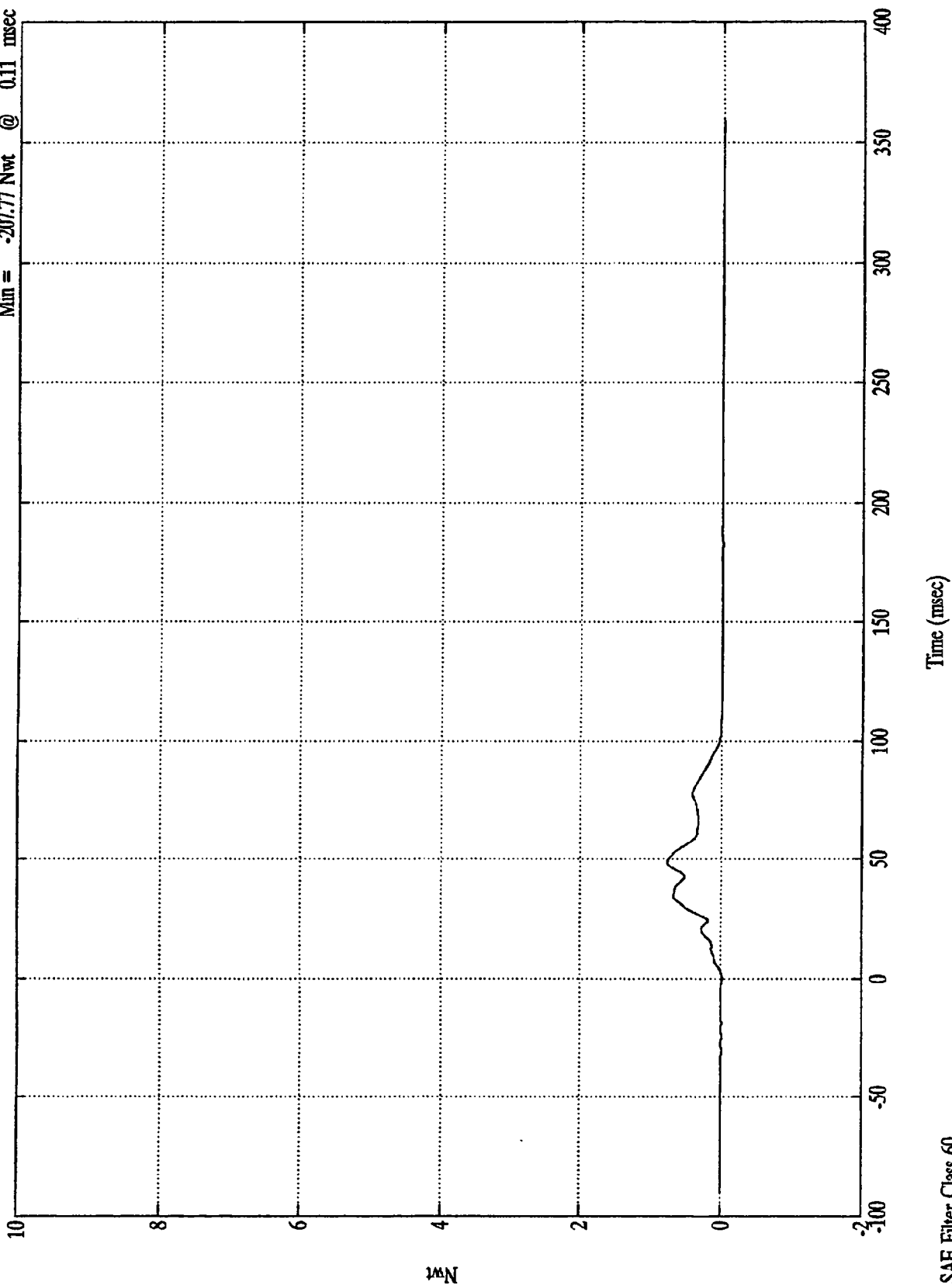
SAE Filter Class 60

Nwt

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 7670.86 Nwt @ 48.72 msec
 Min = -207.77 Nwt @ 0.11 msec

Barrier Load Cell C4

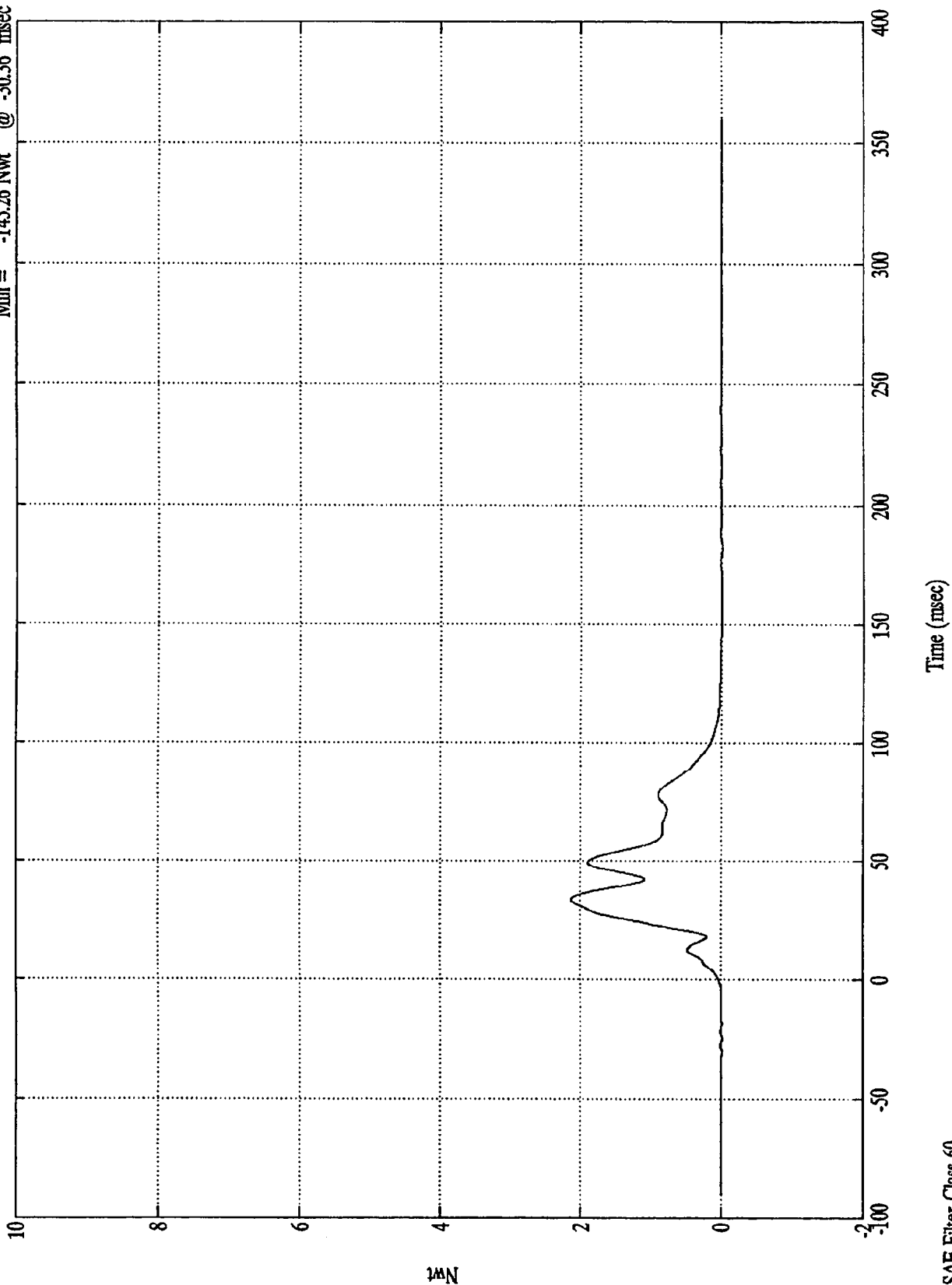


SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 21373.27 Nwt @ 33.47 msec
Min = -145.26 Nwt @ -30.36 msec

Barrier Load Cell C5



SAE Filter Class 60

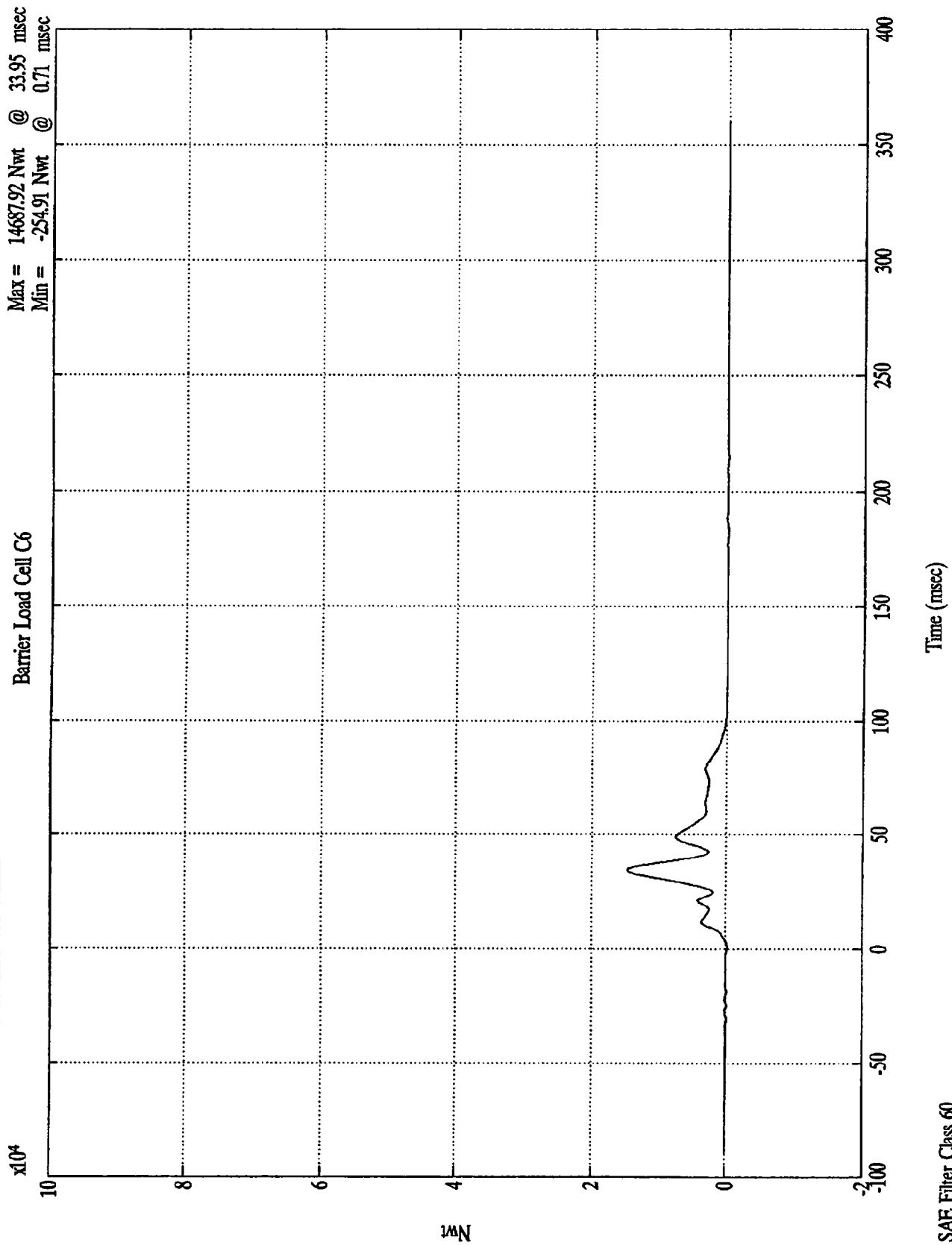
10N

B-122

8227-12

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

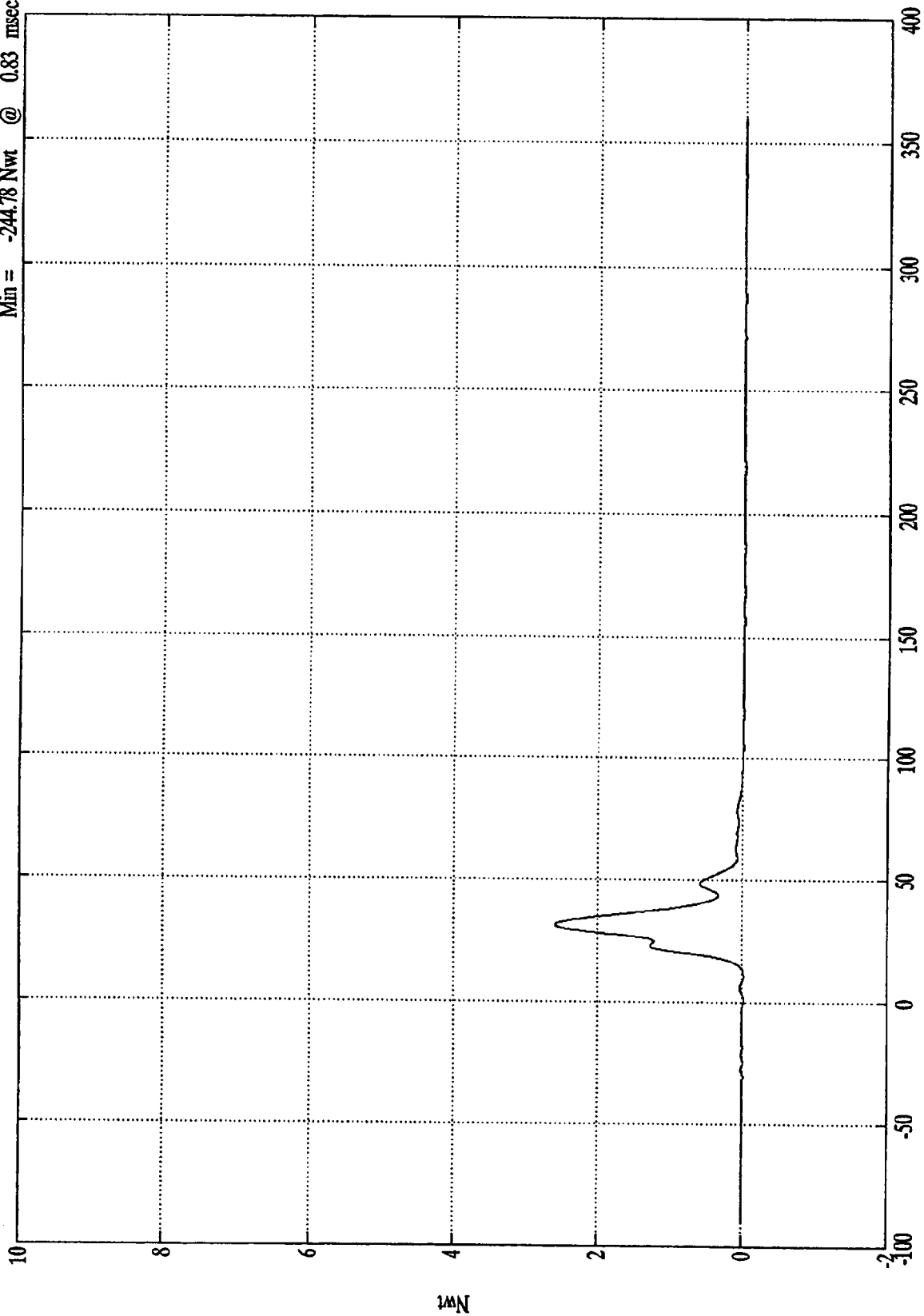
Barrier Load Cell C6
Max = 14687.92 Nwt @ 33.95 msec
Min = -254.91 Nwt @ 0.71 msec



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 25833.22 Nwt @ 30.95 msec
Min = -244.78 Nwt @ 0.83 msec

Barrier Load Cell C7



Time (msec)

SAE Filter Class 60

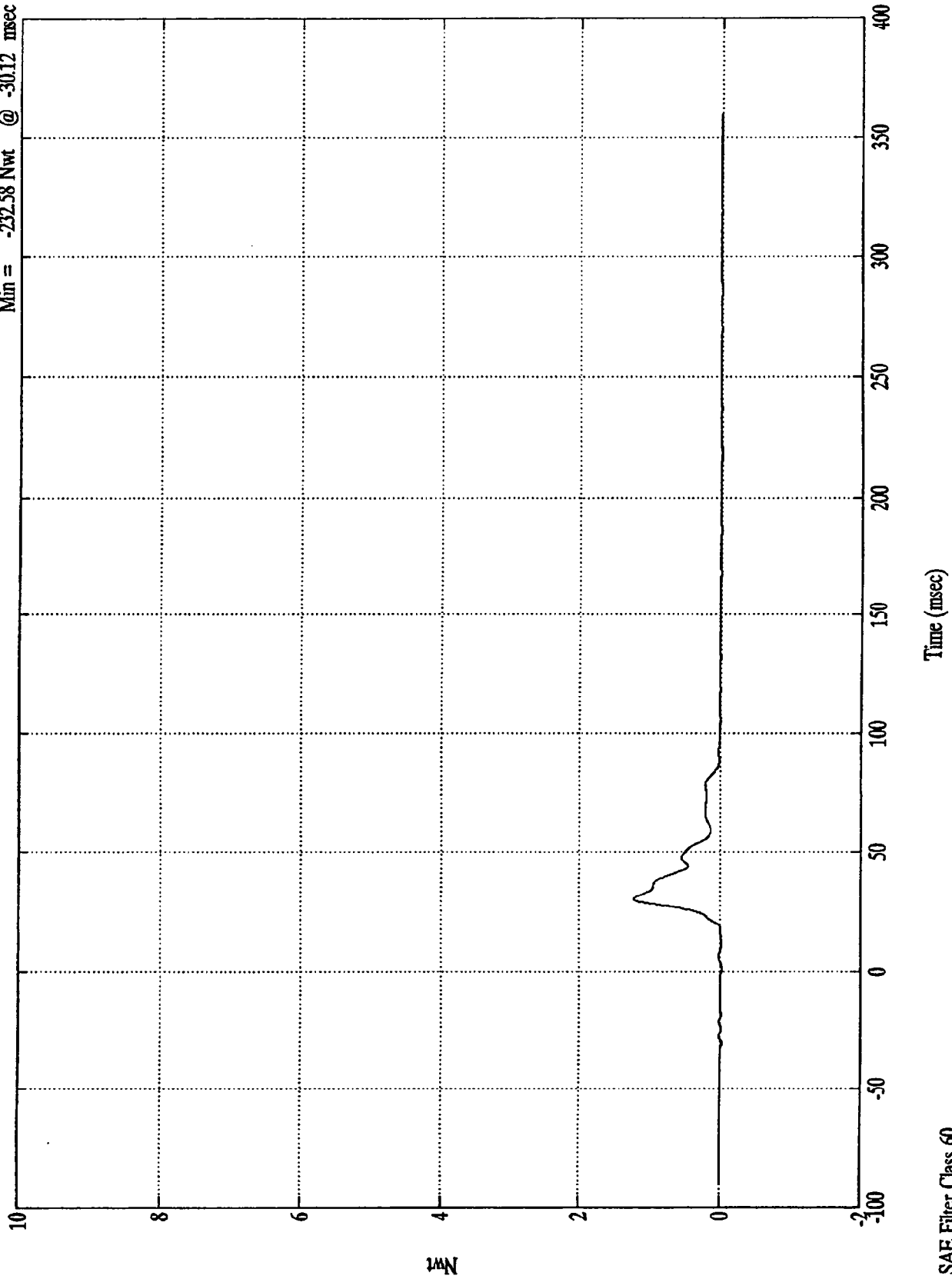
Nwt

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 12283.09 Nwt @ 30.23 msec
Min = -232.58 Nwt @ -30.12 msec

Barrier Load Cell C8

$\times 10^4$

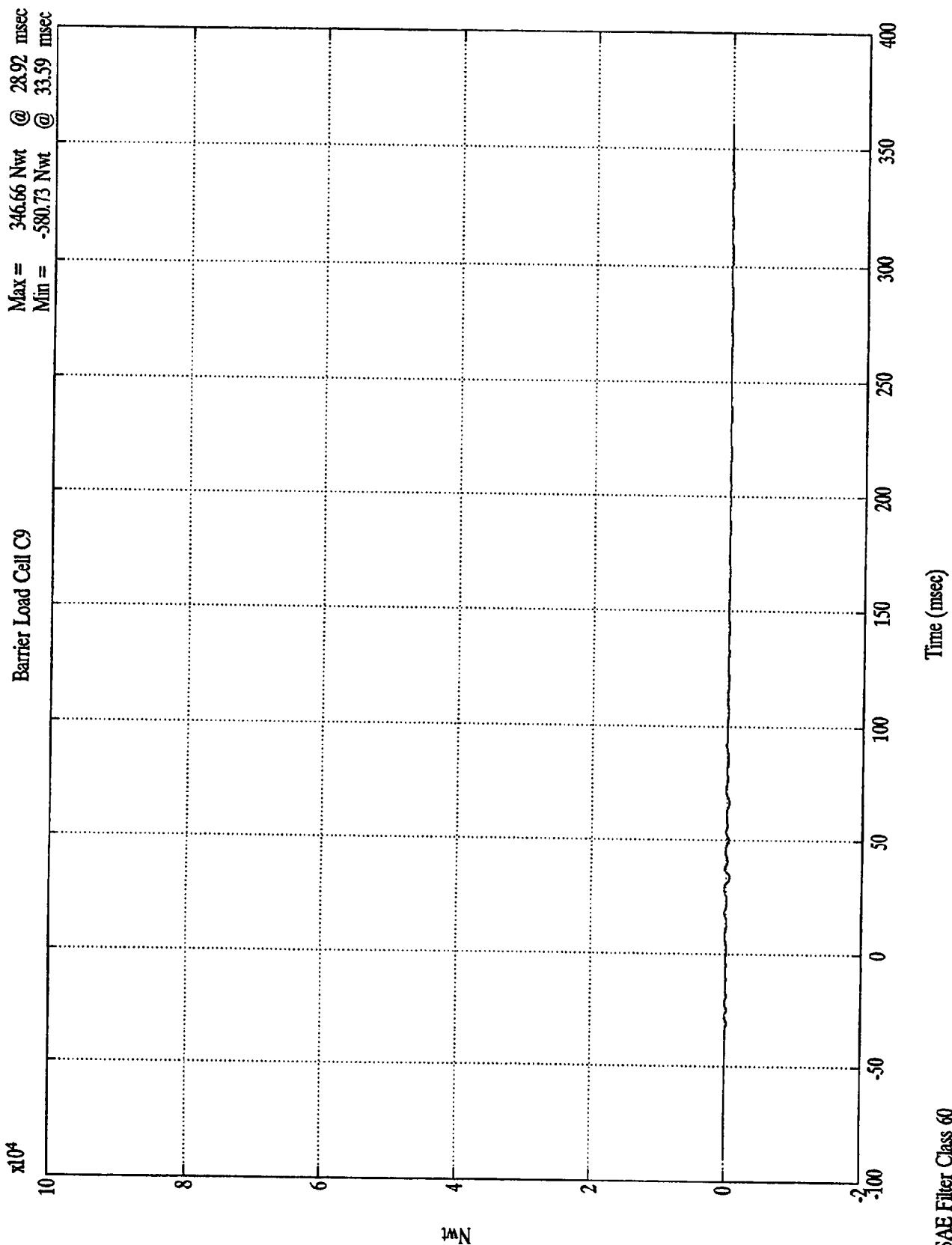


Nwt

Time (msec)

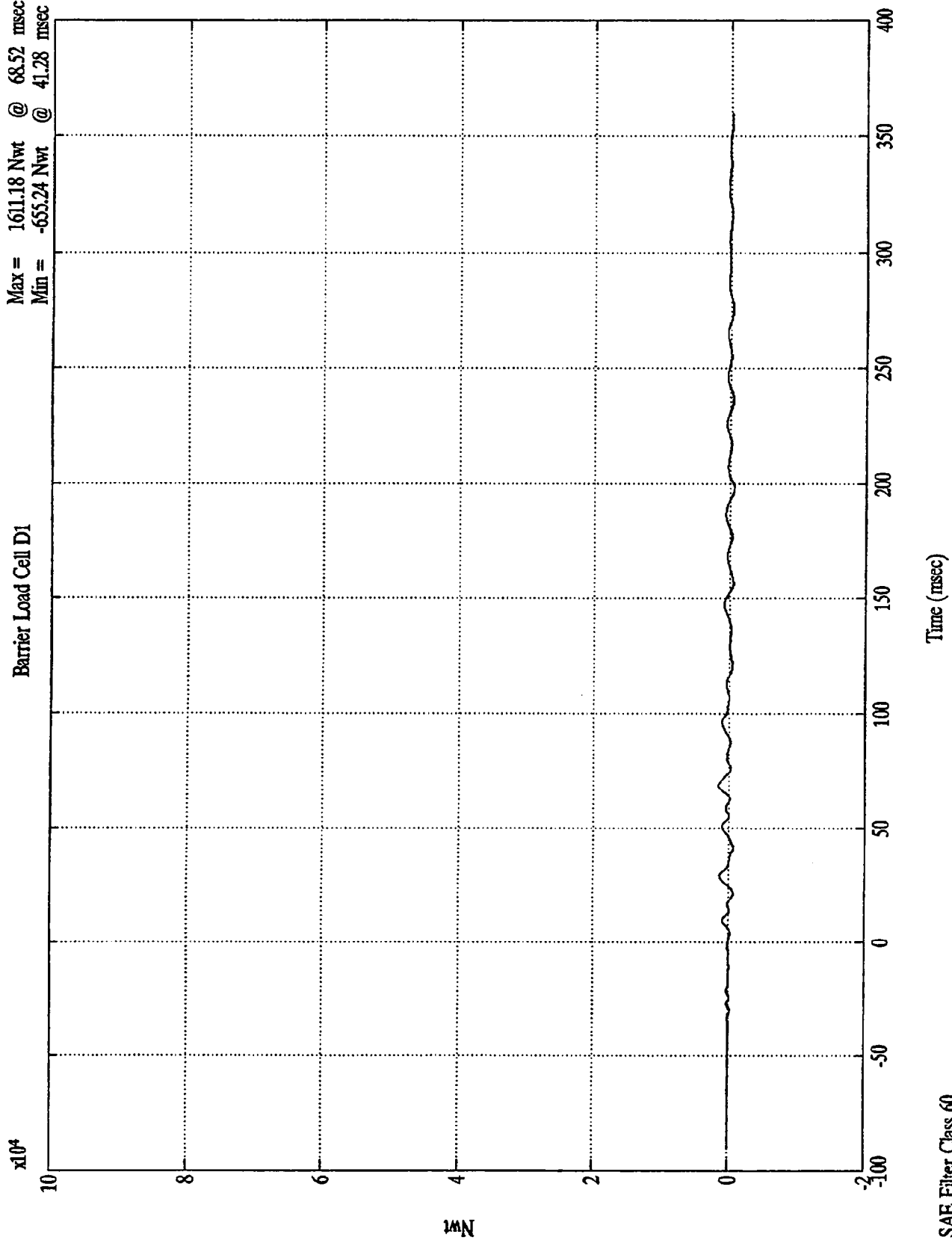
SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell D1
Max = 1611.18 Nwt @ 68.52 msec
Min = -655.24 Nwt @ 41.28 msec



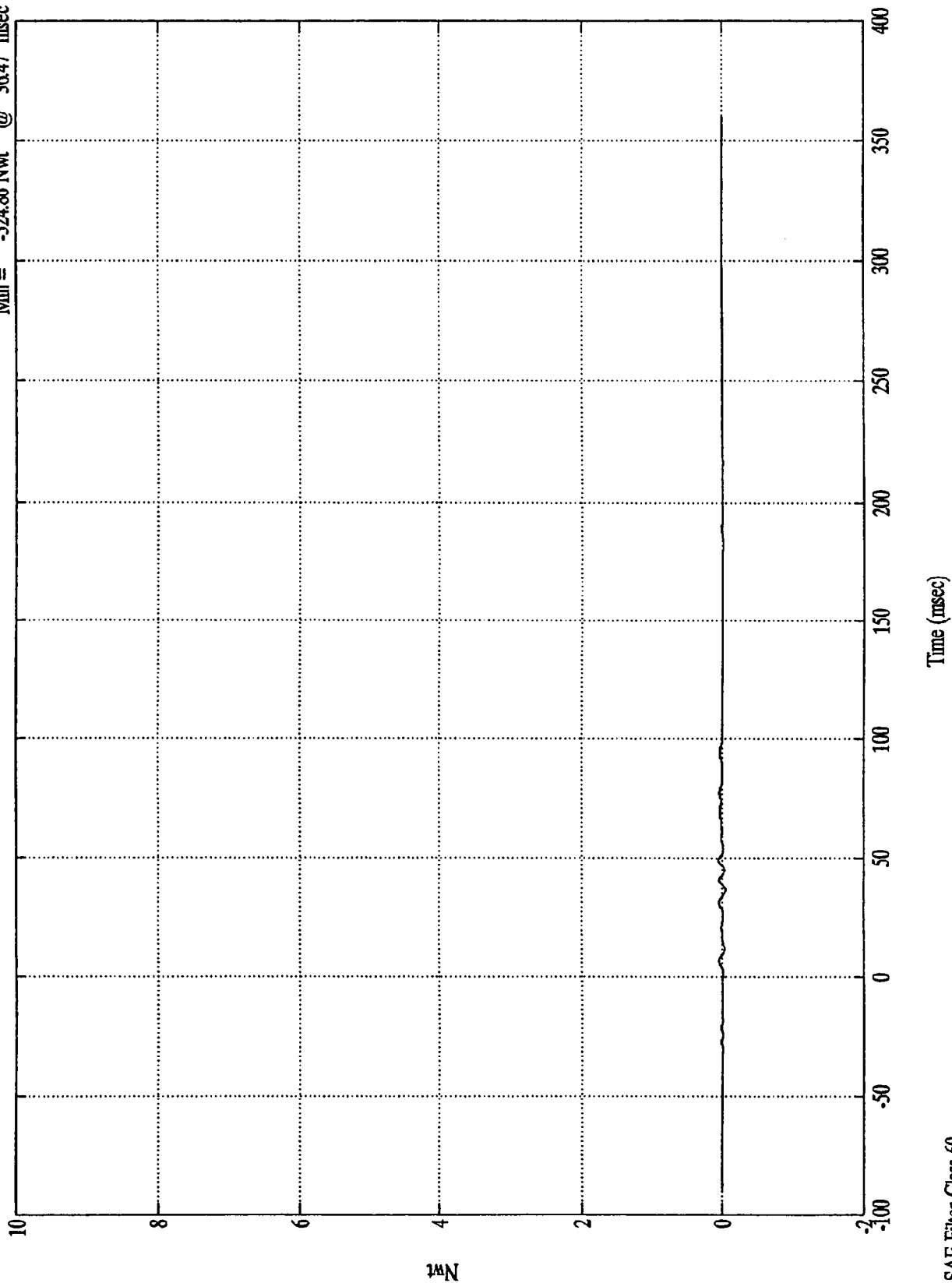
Nwt

Time (msec)

SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell D2
 Max = 524.41 Nwt @ 49.07 msec
 Min = -524.86 Nwt @ 36.47 msec



10⁴N

B-128

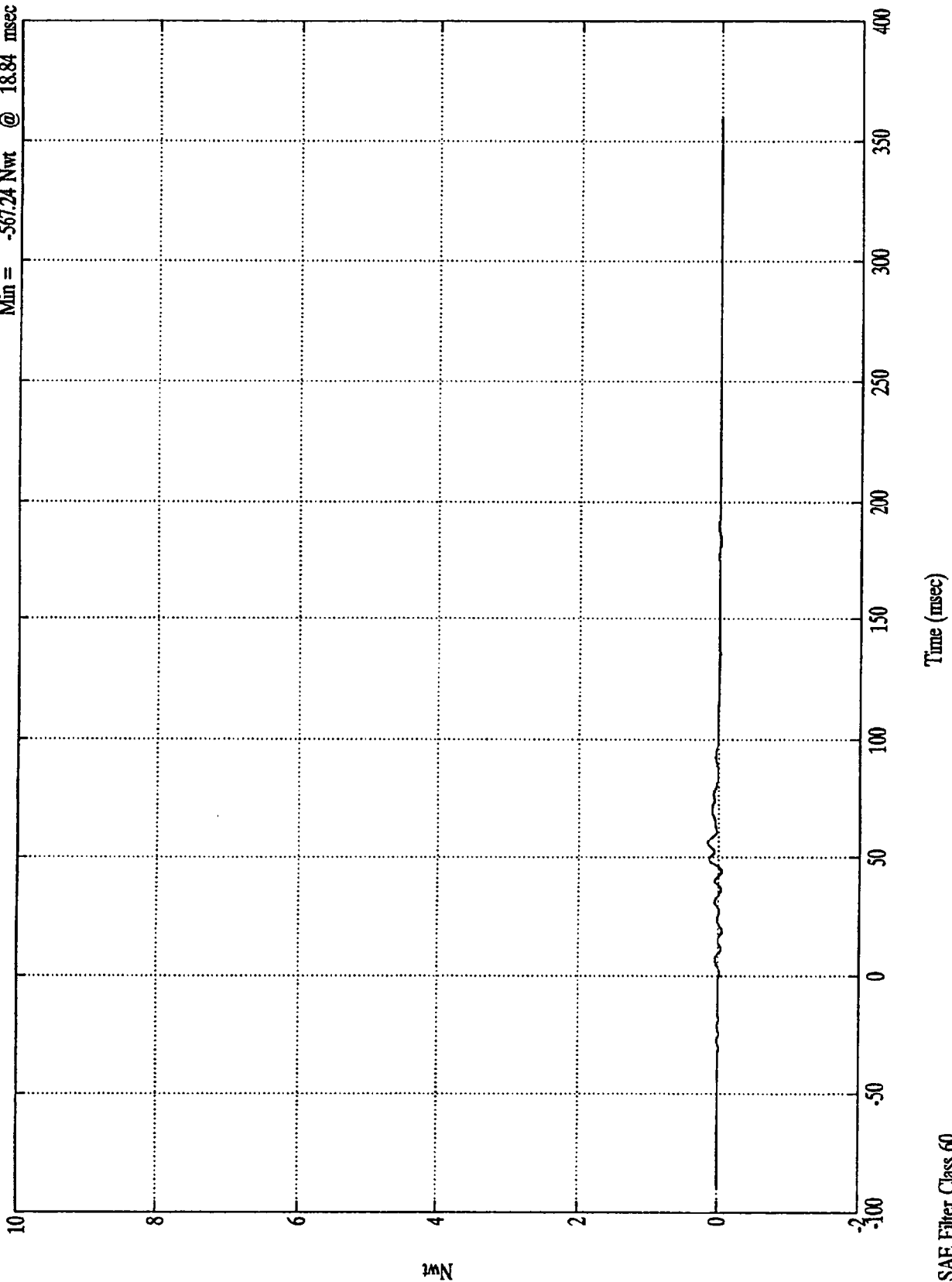
8227-12

SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 1580.73 Nwt @ 56.28 msec
Min = -567.24 Nwt @ 18.84 msec

Barrier Load Cell D3



SAE Filter Class 60

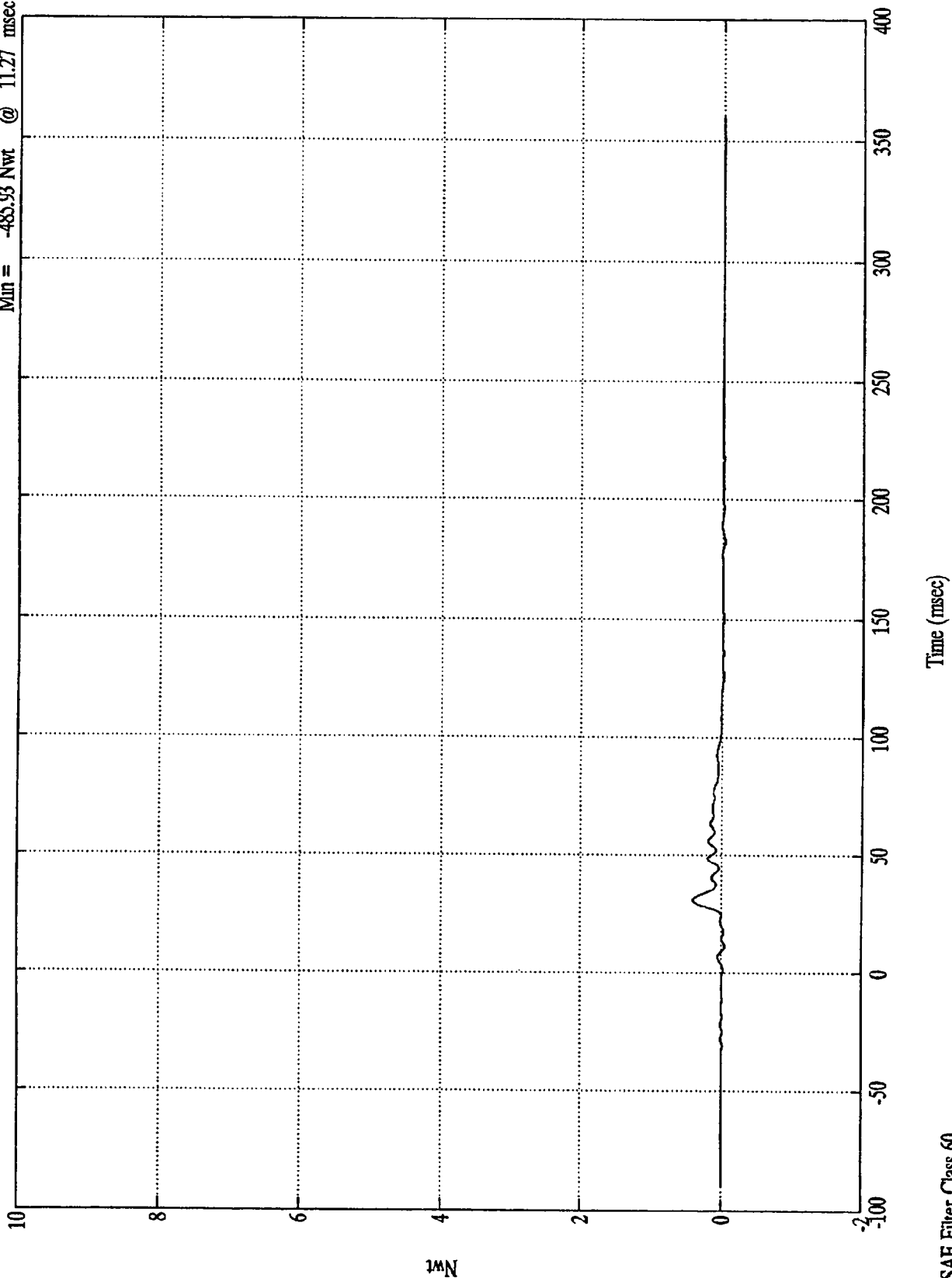
Nwt

Time (msec)

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 4111.28 Nwt @ 30.84 msec
Min = -485.93 Nwt @ 11.27 msec

Barrier Load Cell D4

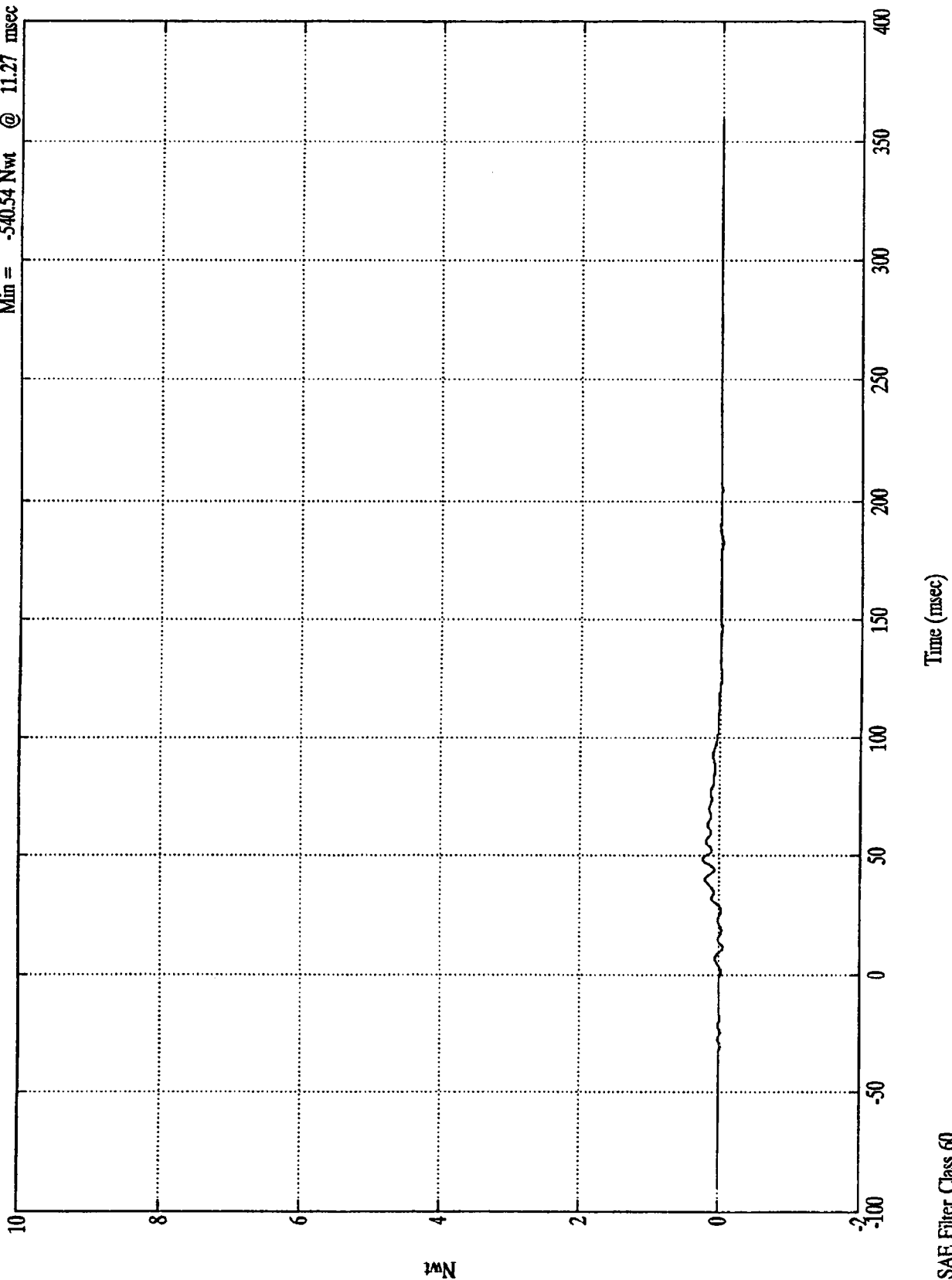


SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 2416.56 Nwt @ 48.59 msec
Min = -540.54 Nwt @ 11.27 msec

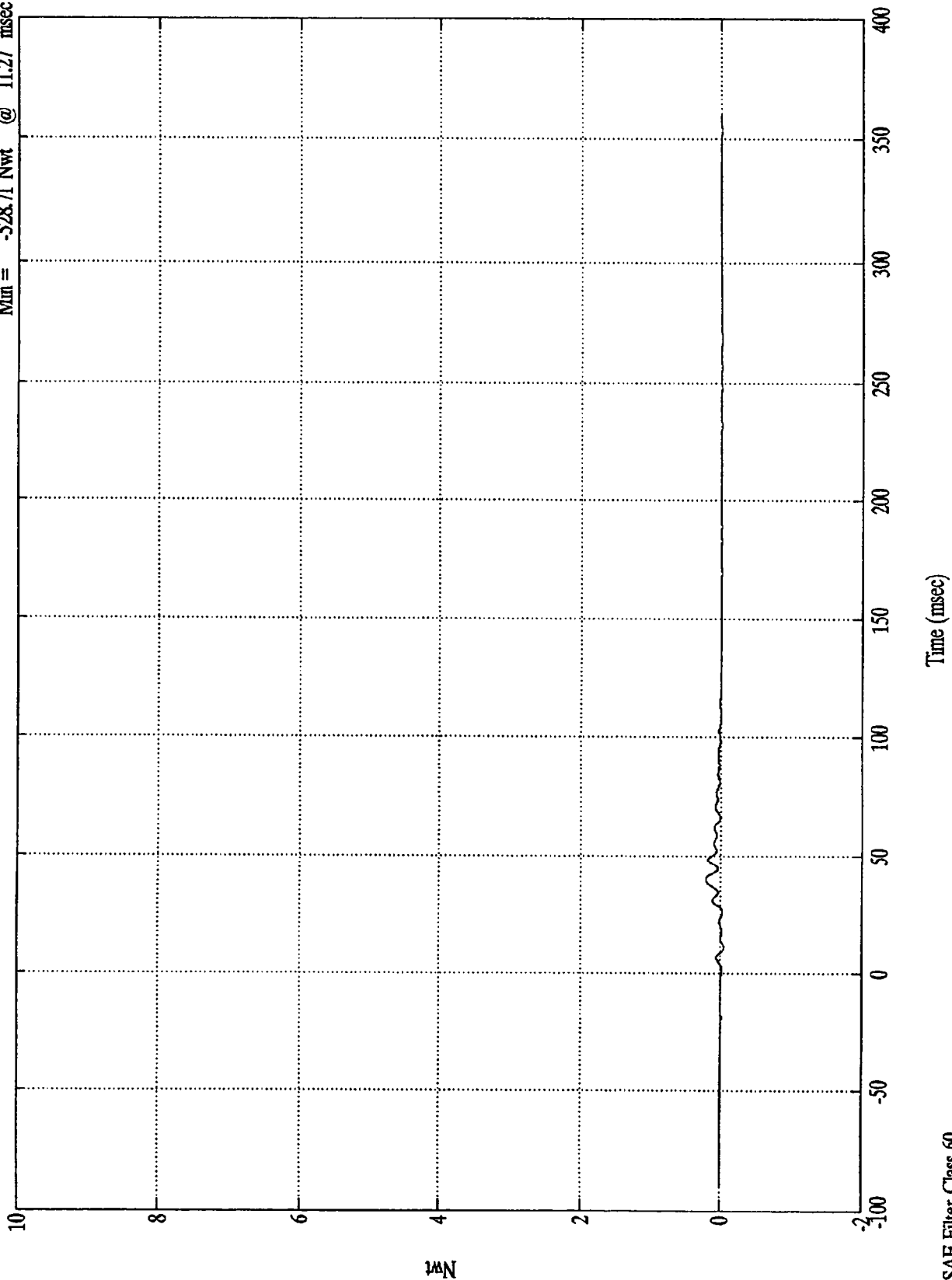
Barrier Load Cell D5



SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Barrier Load Cell D6
 Max = 2088.00 Nwt @ 40.19 msec
 Min = -528.71 Nwt @ 11.27 msec



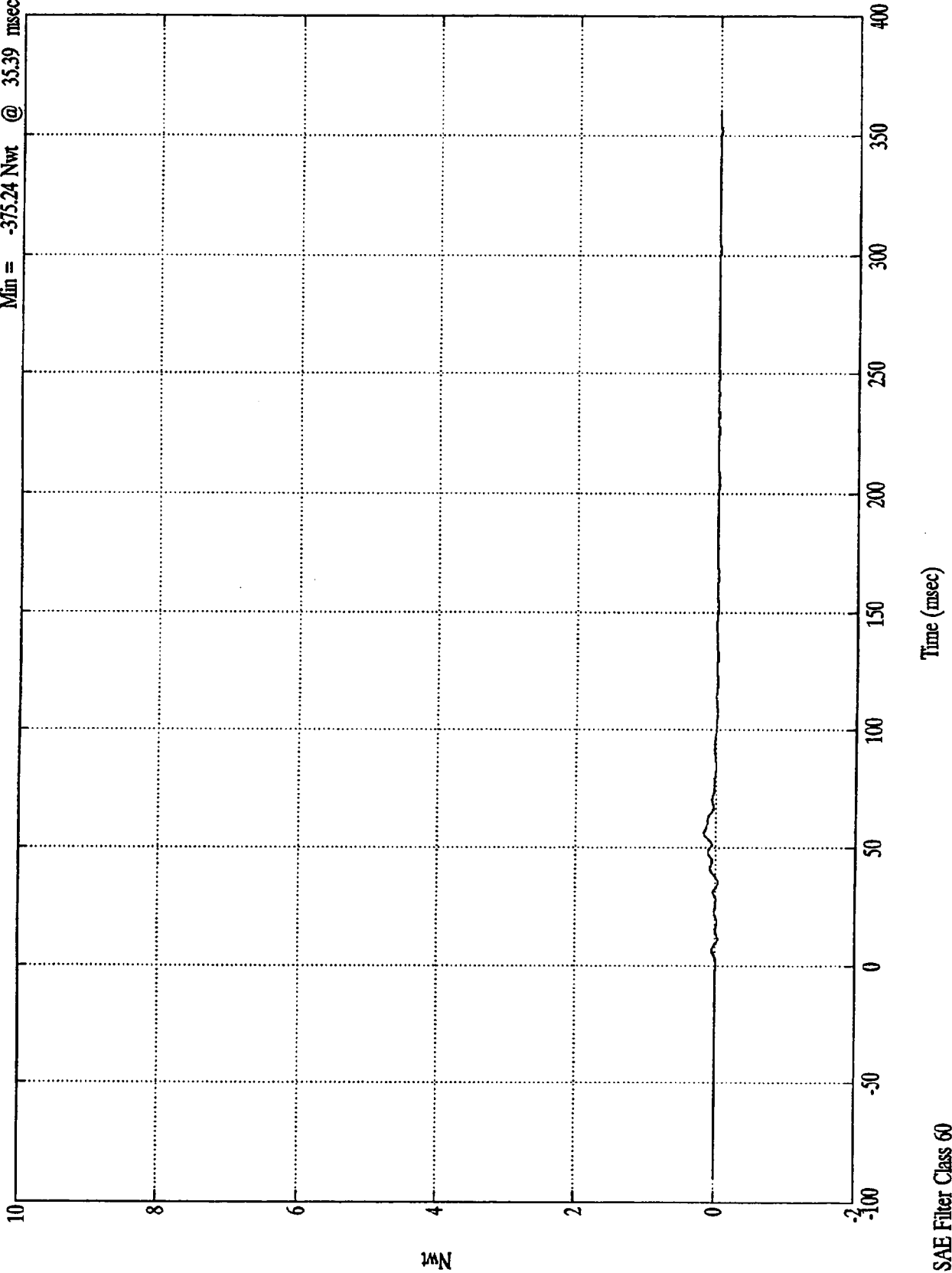
SAE Filter Class 60

14N

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 1761.18 Nwt @ 56.04 msec
Min = -375.24 Nwt @ 35.39 msec

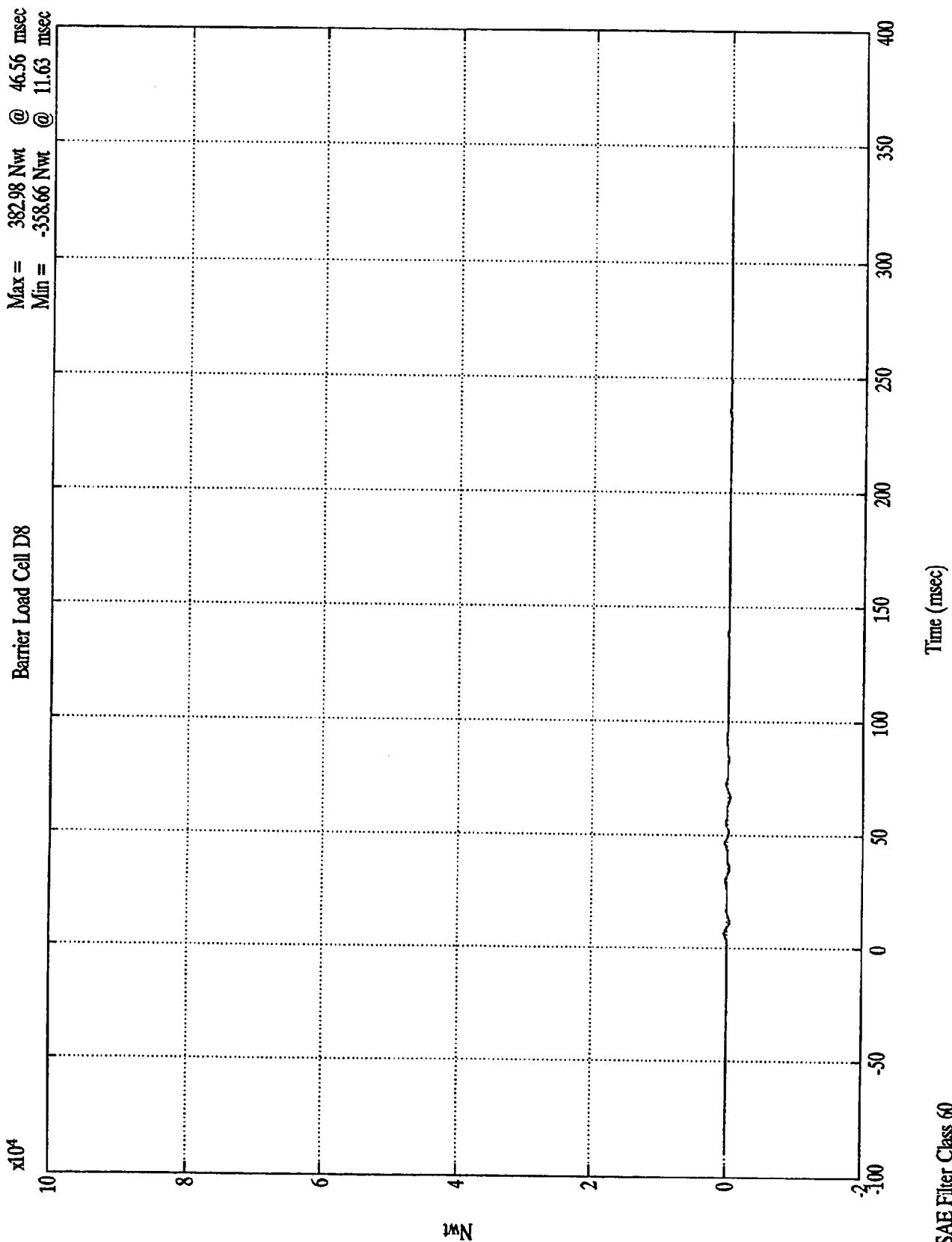
Barrier Load Cell D7



Nwt

Time (msec)

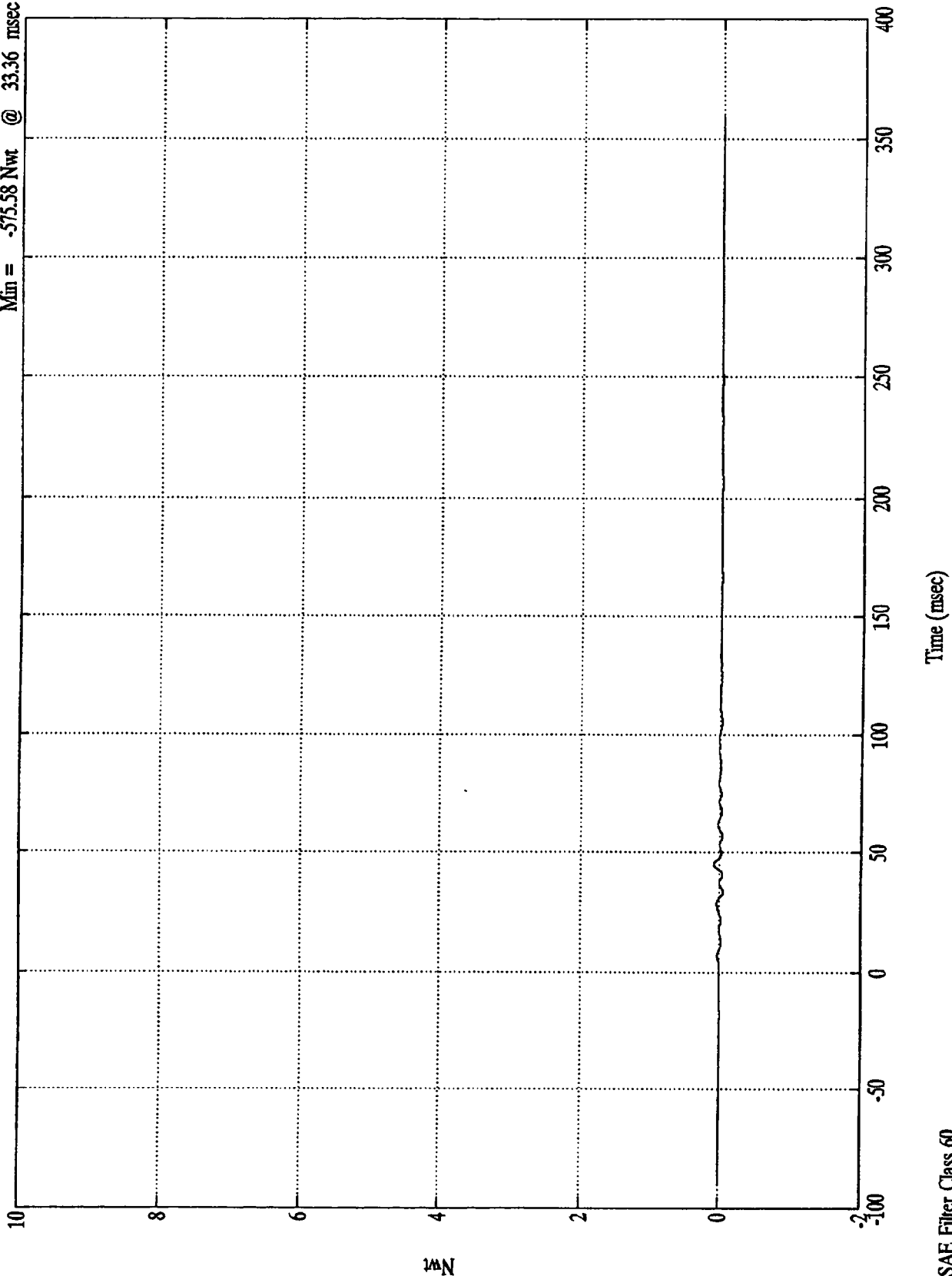
NCAP TEST #12 - 1995 CHEVROLET CAVALIER



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 809.43 Nwt @ 45.12 msec
Min = -575.58 Nwt @ 33.36 msec

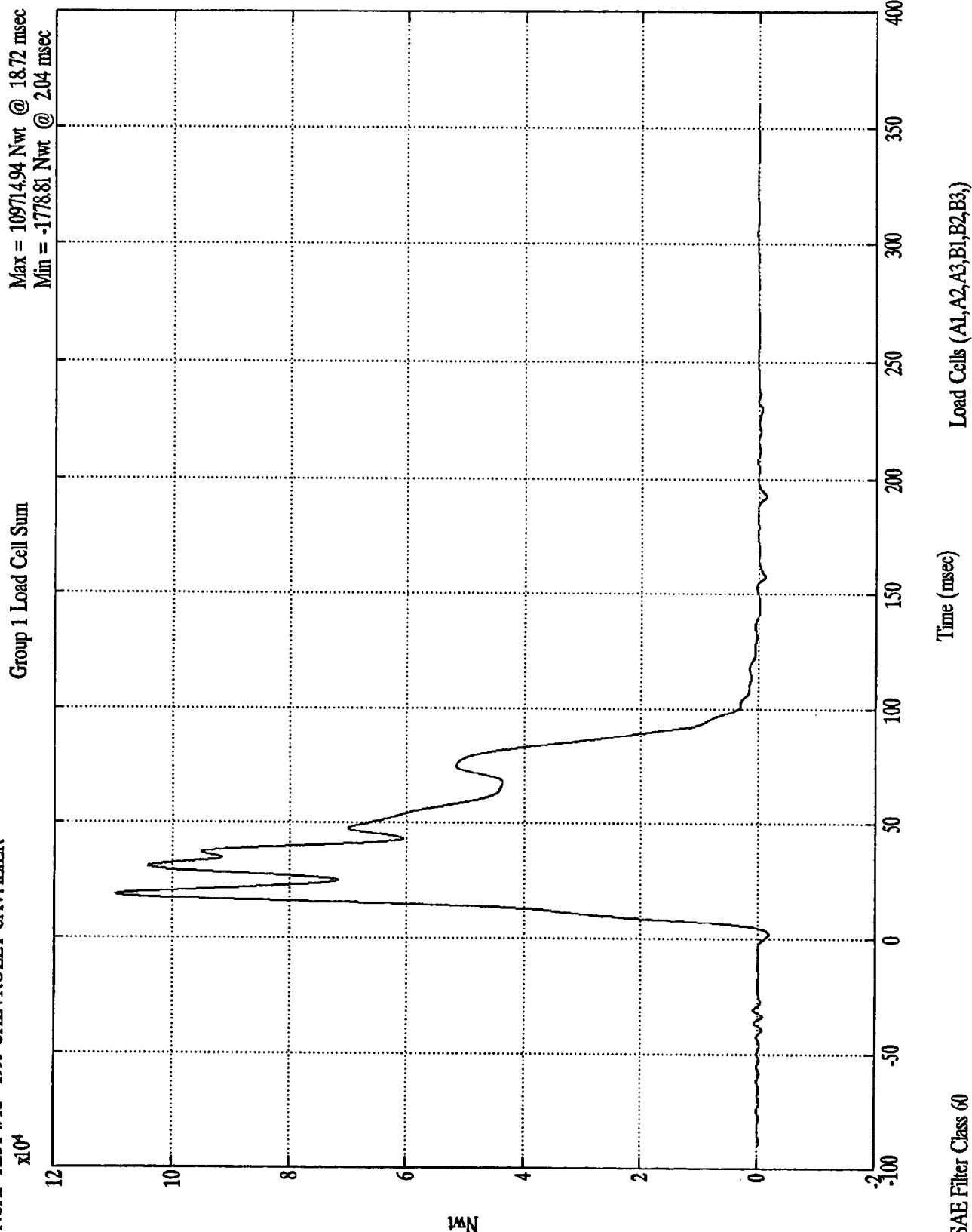
Barrier Load Cell D9



NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 109714.94 Nwt @ 18.72 msec
Min = -1778.81 Nwt @ 2.04 msec

Group 1 Load Cell Sum

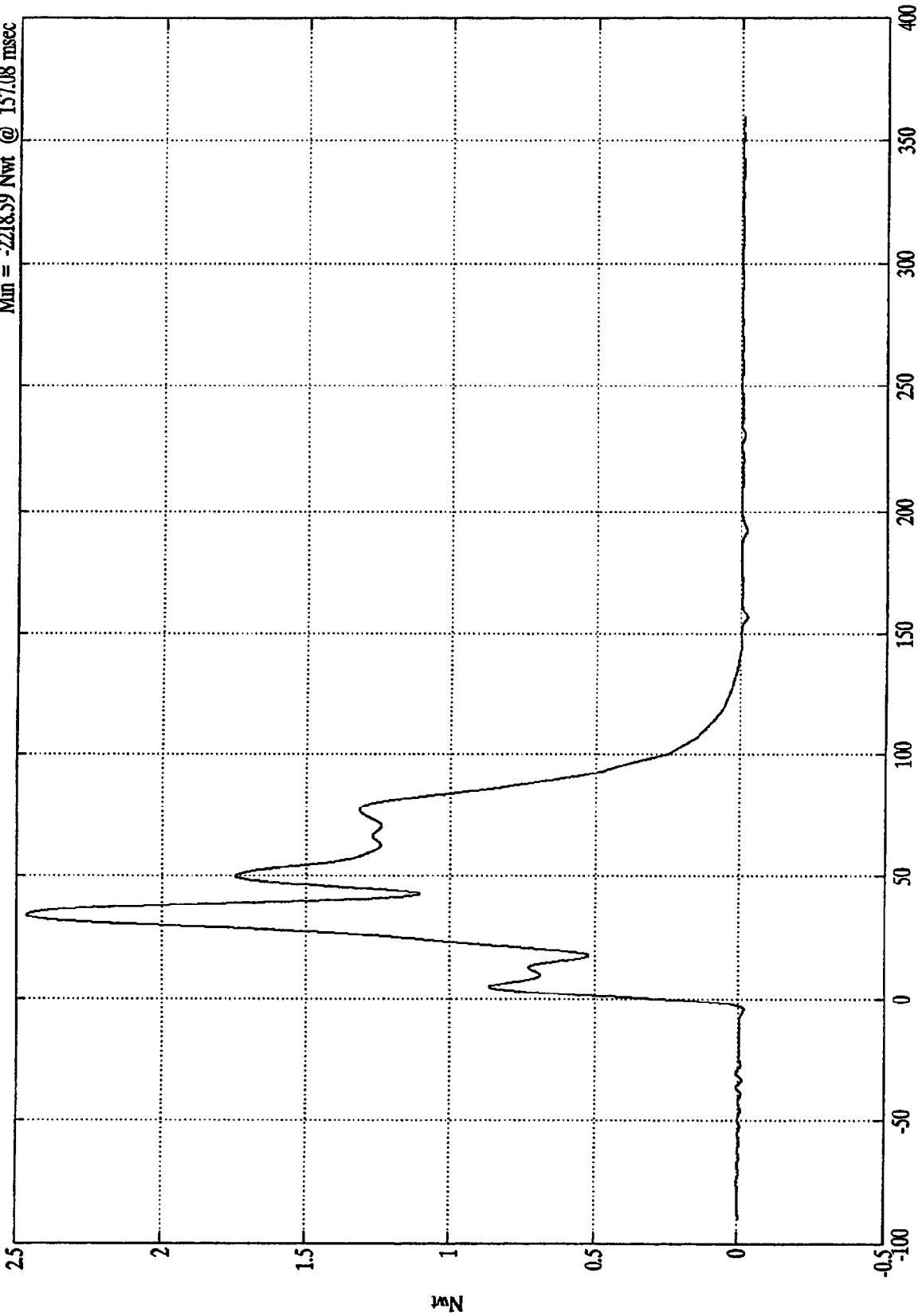


SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 246363.50 Nwt @ 33.96 msec
Min = -2218.59 Nwt @ 157.08 msec

Group 2 Load Cell Sum



Load Cells (A4,A5,A6,B4,B5,B6)

Time (msec)

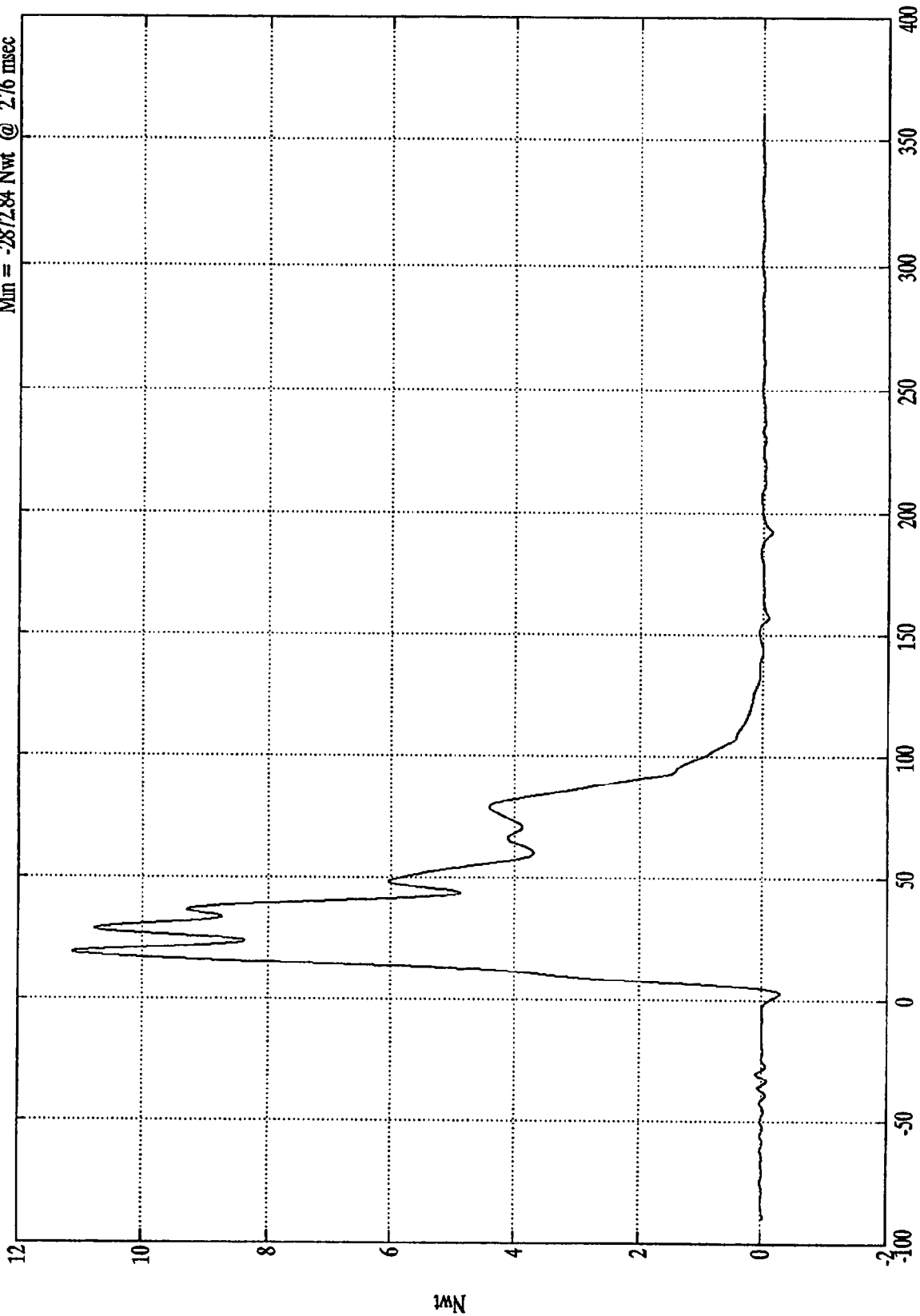
SAE Filter Class 60

Nwt

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 111264.99 Nwt @ 19.44 msec
Min = -2872.84 Nwt @ 2.76 msec

Group 3 Load Cell Sum



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

Time (msec)

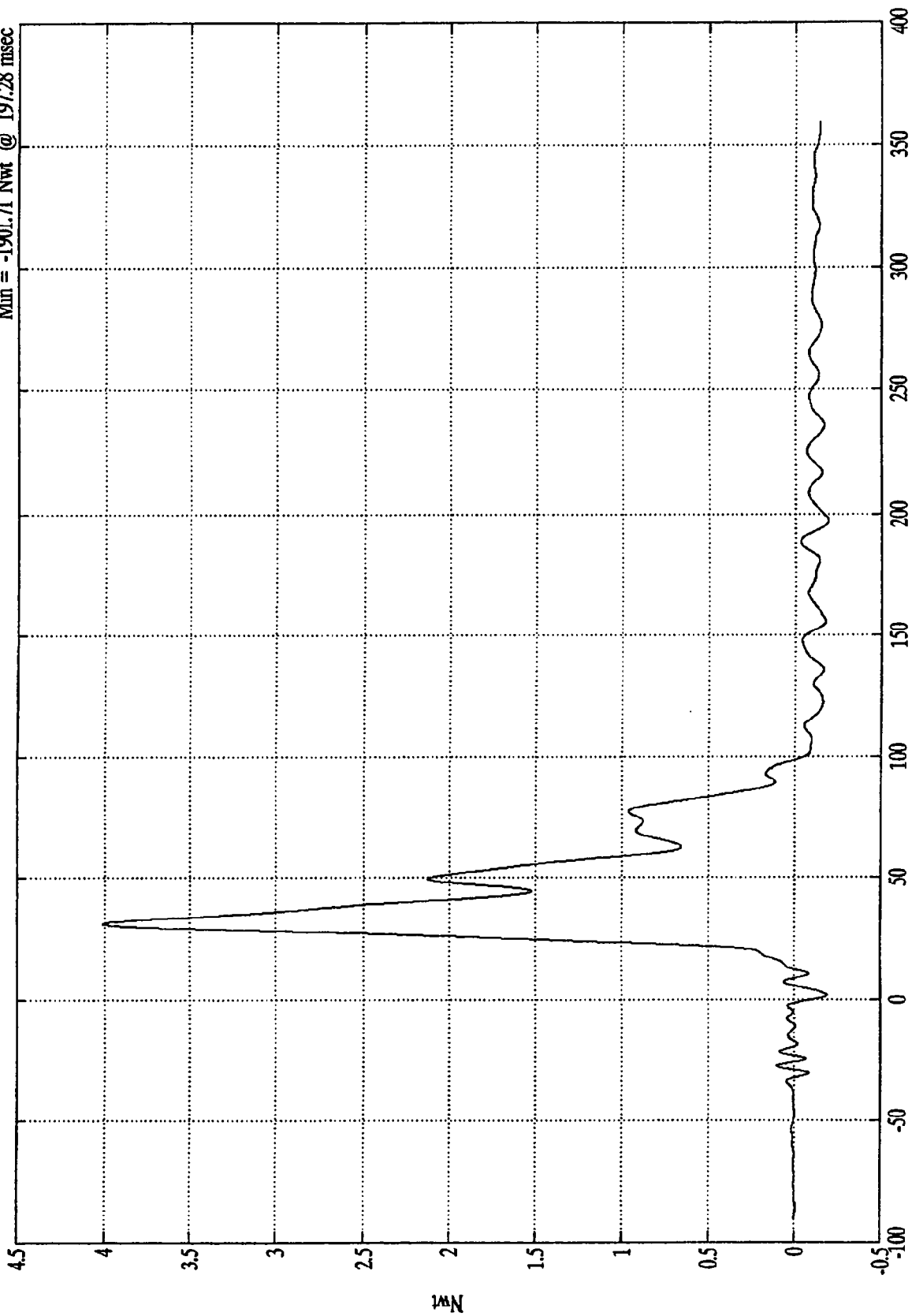
SAE Filter Class 60

Nwt

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Group 4 Load Cell Sum

Max = 40092.74 Nwt @ 30.84 msec
Min = -1901.71 Nwt @ 197.28 msec



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

Time (msec)

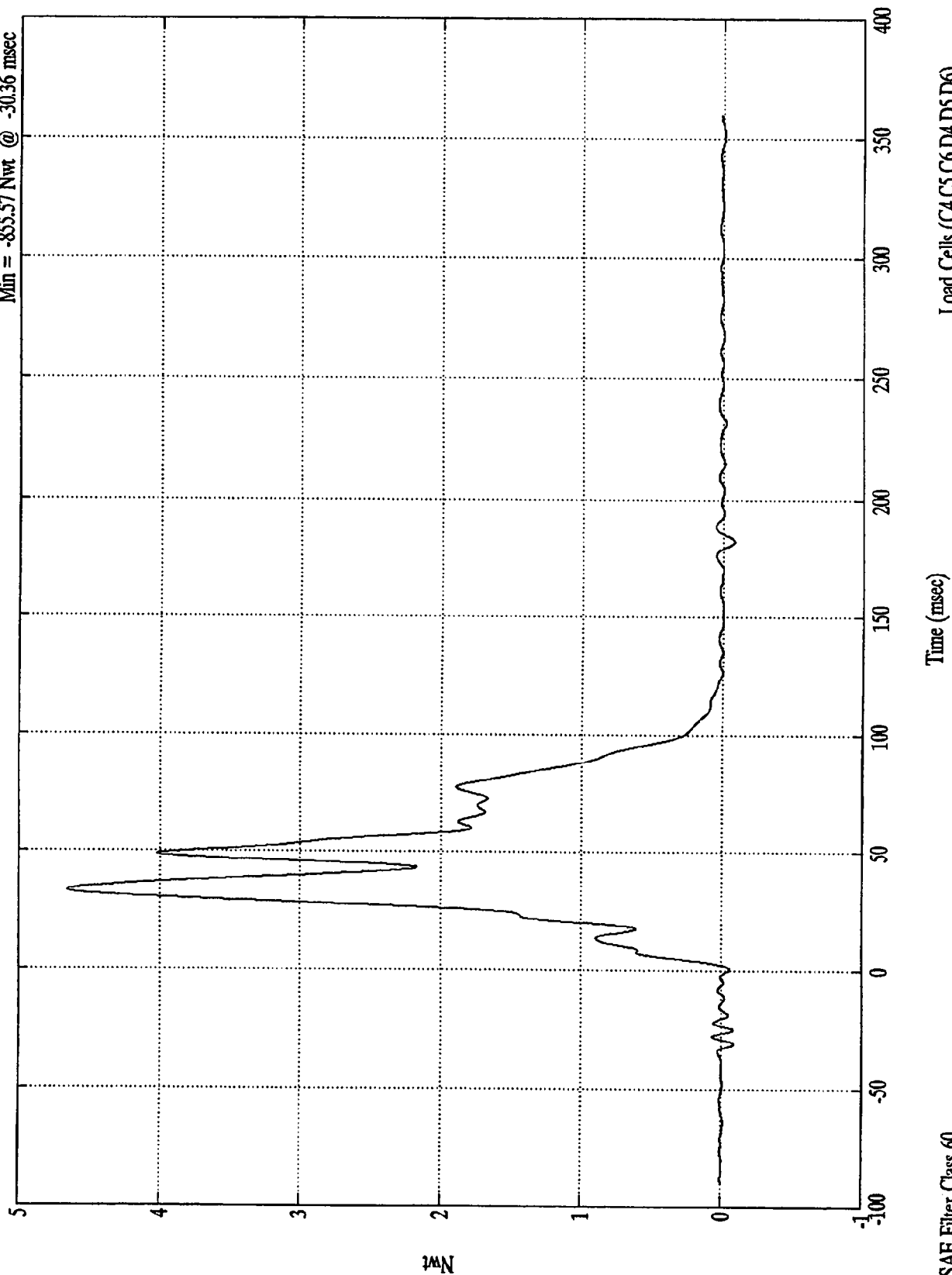
SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 46614.95 Nwt @ 33.12 msec
Min = -855.57 Nwt @ -30.36 msec

Group 5 Load Cell Sum

$\times 10^4$



SAE Filter Class 60

Time (msec)

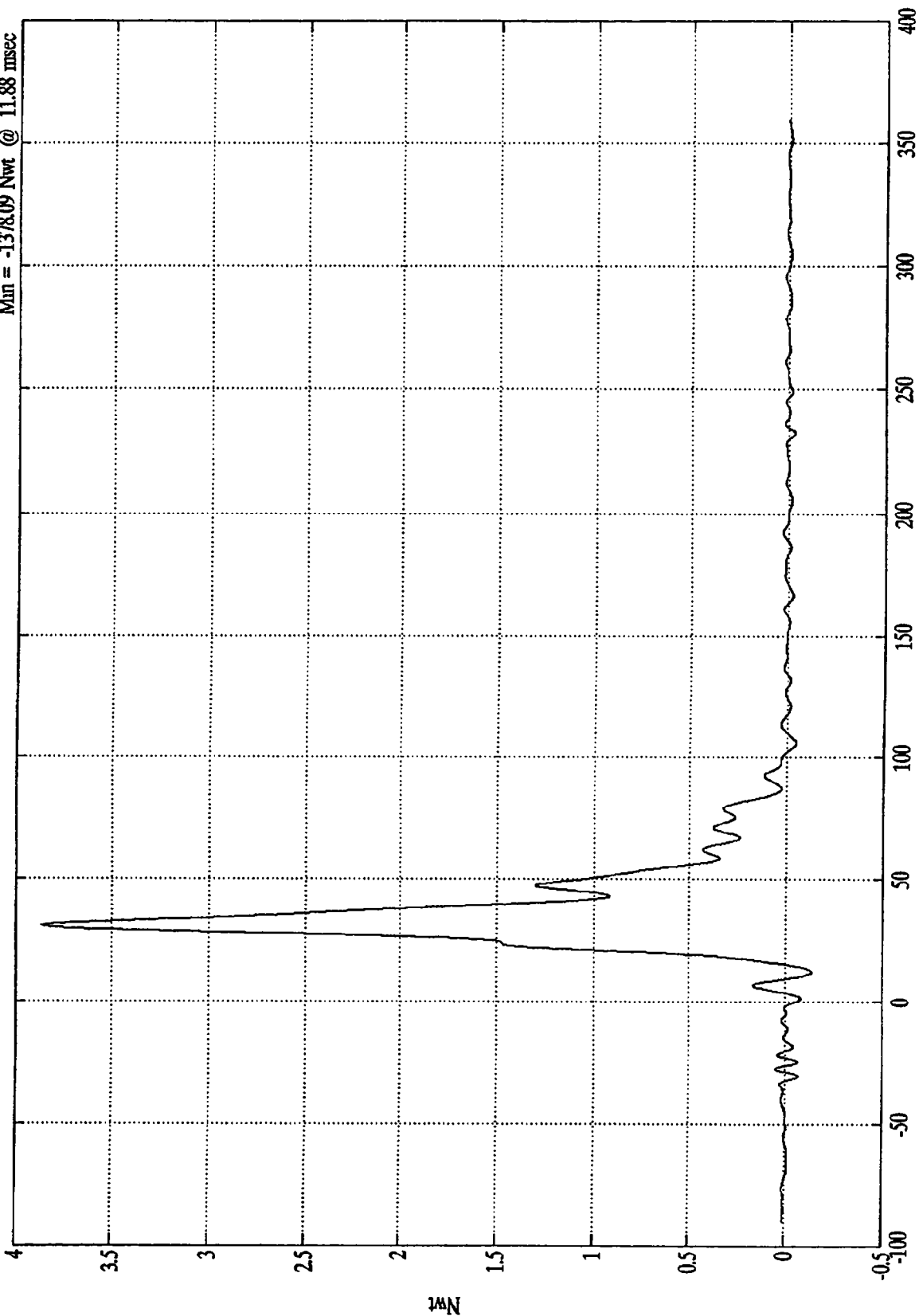
Load Cells (C4,C5,C6,D4,D5,D6)

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 38673.76 Nwt @ 30.48 msec
Min = -1378.09 Nwt @ 11.88 msec

Group 6 Load Cell Sum

$\times 10^4$



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

Time (msec)

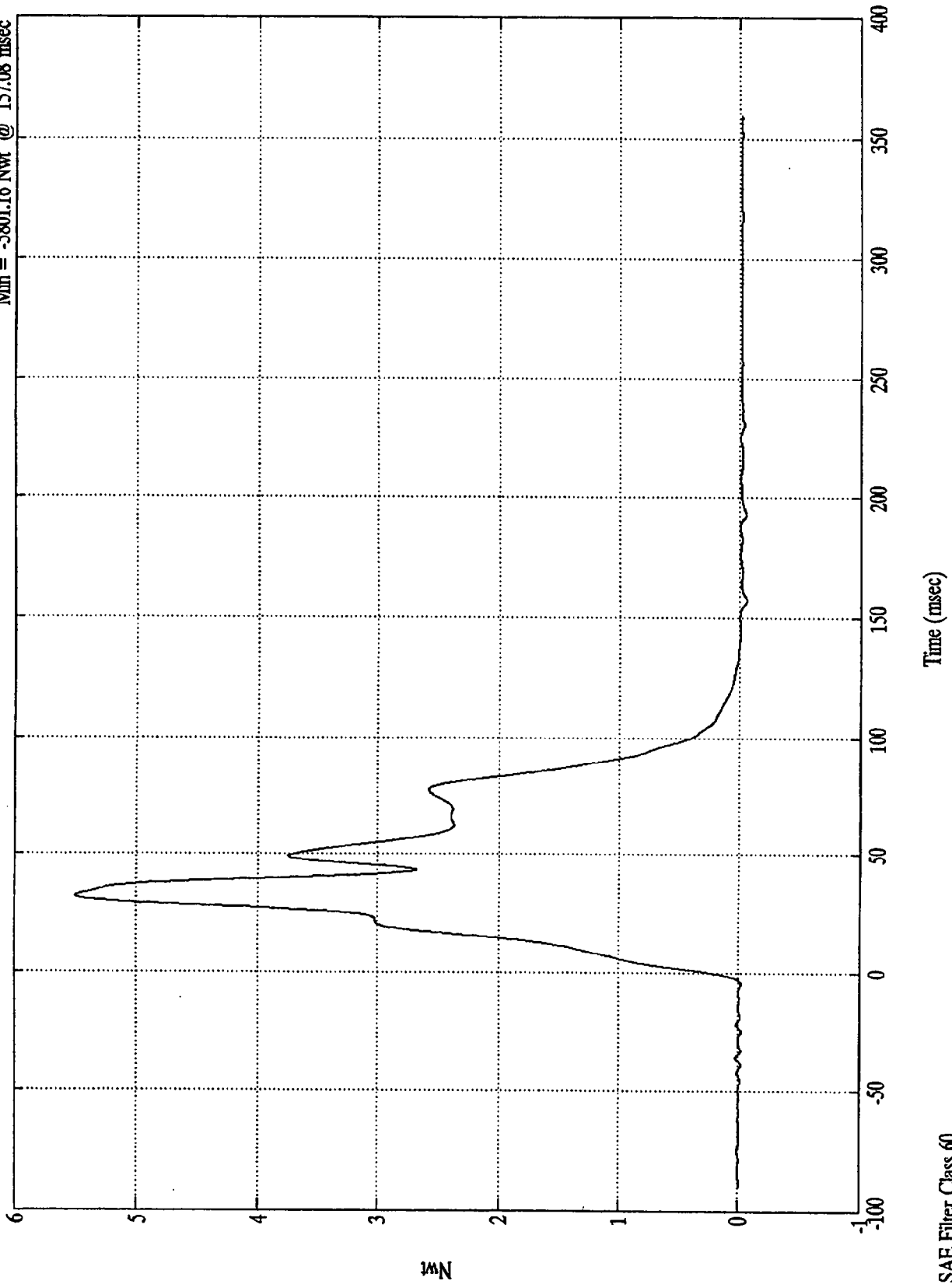
SAE Filter Class 60

NCAP TEST #12 - 1995 CHEVROLET CAVALIER

Max = 550344.24 Nwt @ 31.92 msec
Min = -5801.16 Nwt @ 157.08 msec

Total Load Cell Sum

x10⁵



Nwt

SAE Filter Class 60

Appendix C

PART 572B/E DUMMY CONFIGURATION
AND PERFORMANCE VERIFICATION DATA SHEETS

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

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

Dummy serial numbers and certification dates are:

<u>Serial No.</u>	<u>Completion Date</u>
45	1/26/95
150	1/25/95

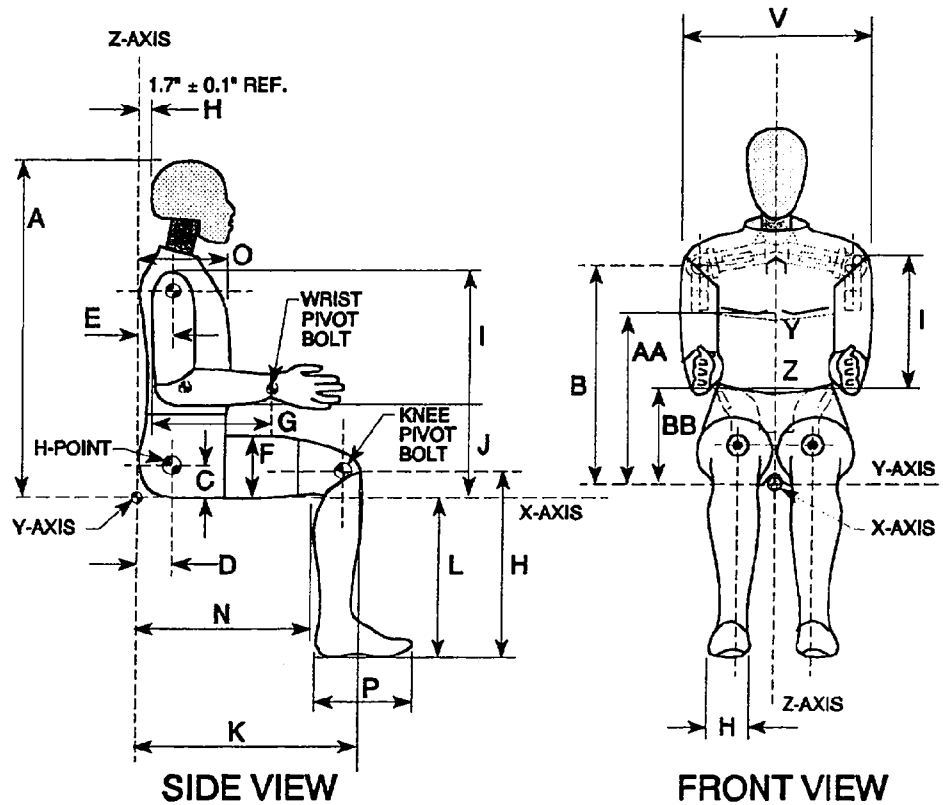
Electronic Test Equipment

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

Figure 7

DUMMY CONFIGURATION DIMENSIONS

EXTERNAL DIMENSIONS SPECIFICATIONS



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

HYBRID III EXTERNAL DIMENSIONS

S/N 45 HUMANOID

DUMMY SERIAL NO. 45

DATE: 1/26/95

TEMPERATURE		21 DEG. C
RELATIVE HUMIDITY		30 %
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 MINKIEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

HEAD DROP TEST

HYBRID III

DATE : 1/19/95

CALSPAN SEQUENTIAL NUMBER 6

HY3 SN: 045 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	36 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	243.9 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	5.5 G'S
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

NECK FLEXION TEST

HYBRID III

DATE : 1/25/94

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 6

HY3 SN: 045 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5-22.2 DEG. C	21.6 DEG. C
RELATIVE HUMIDITY		10% - 70%	31 %
IMPACT VELOCITY		24.8 - 25.7 KPH	25.6 KPH
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	23.85 G'S
	20 MS	17.60 - 22.60 G'S	21.41 G'S
	30 MS	12.50 - 18.50 G'S	16.23 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	16.23 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	40.38 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	70.09 DEG.
	TIME	57 - 64 MS	63.75 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88 - 108 N-M	93.3 N-M
	TIME	47 - 58 MS	53 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	123 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	103 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST
HYBRID III

DATE : 1/26/95

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 6

HY3 SN: 045 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5 - 22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY		10% - 70%	29 %
IMPACT VELOCITY		21.4 - 22.3 KPH	22 KPH
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	18.79 G'S
	20 MS	14.00 - 19.00 G'S	16.36 G'S
	30 MS	11.00 - 16.00 G'S	15.59 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	15.59 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	40.75 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	89.71 DEG.
	TIME	72 - 82 MS	74.63 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-80.0/-52.9 N-M	-55.99 N-M
	TIME	65 - 79 MS	71.38 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	156.25 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	133.13 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 1/18/95

CALSPAN SEQUENTIAL NUMBER 6

HY3 SN 045 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.5 - 22.2 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	34 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	23.7 KPH
MAXIMUM DEFLECTION	64 - 73 mm	65.5 mm
MAXIMUM RESISTIVE FORCE	5160 - 5894 NEWTONS	5871 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	69.1 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 1/18/95

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 6

HY3 SN: 045 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21.6 DEG. C
RELATIVE HUMIDITY	10% - 70%	36 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4968 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 1/18/95

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 6

HY3 SN: 045 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21.6 DEG. C
RELATIVE HUMIDITY	10% - 70%	36 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4830 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

HYBRID III EXTERNAL DIMENSIONS

S/N 150 HUMANOID

DUMMY SERIAL NO. 150

DATE: 1/25/95

TEMPERATURE		21.6 DEG. C
RELATIVE HUMIDITY		30 %
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 MINKIEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
HEAD DROP TEST
HYBRID III

DATE : 1/19/95

CALSPAN SEQUENTIAL NUMBER 4

HY3 SN: 150 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	36 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	249.4 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	2.8 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 : 1/25/95

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 4

HY3 SN: 150 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5-22.2 DEG. C	21.6 DEG. C
RELATIVE HUMIDITY		10% - 70%	31 %
IMPACT VELOCITY		24.8 - 25.7 KPH	25.6 KPH
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	25.61 G'S
	20 MS	17.60 - 22.60 G'S	21.43 G'S
	30 MS	12.50 - 18.50 G'S	18.28 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	18.28 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	37.25 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	73.27 DEG.
	TIME	57 - 64 MS	60.38 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88 - 108 N-M	99.4 N-M
	TIME	47 - 58 MS	51.13 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	120.5 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	98.13 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST

HYBRID III

DATE : 1/25/95

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 4

HY3 SN: 150 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5 - 22.2 DEG. C	21.6 DEG. C
RELATIVE HUMIDITY		10% - 70%	31 %
IMPACT VELOCITY		21.4 - 22.3 KPH	22.16 KPH
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	19.61 G'S
	20 MS	14.00 - 19.00 G'S	17.25 G'S
	30 MS	11.00 - 16.00 G'S	15.71 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	15.71 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	39.75 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	94.96 DEG.
	TIME	72 - 82 MS	75 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-80.0/-52.9 N-M	-86.8 N-M
	TIME	65 - 79 MS	70.38 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	131.63 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 1/18/95

CALSPAN SEQUENTIAL NUMBER 4

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%	36 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	23.7 KPH
MAXIMUM DEFLECTION	64 - 73 mm	64.3 mm
MAXIMUM RESISTIVE FORCE	5160 - 5894 NEWTONS	5773 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	72.5 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 1/18/95

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 4

HY3 SN: 150 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21.6 DEG. C
RELATIVE HUMIDITY	10% - 70%	36 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4746 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 1/18/95

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 4

HY3 SN: 150 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	21 DEG. C
RELATIVE HUMIDITY	10% - 70%	36 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4928 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

Appendix D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head	X	ENDEVCO	8/94	2/95
	Y			
	Z			
Chest	X	ENDEVCO	8/94	2/95
	Y			
	Z			
Right Femur Load Cell	F232	GSE	12/94	6/95
	F231			
Neck Load Cell	X	DENTON	8/94	2/95
	Y			
	Z			
Neck Moment	X	DENTON	8/94	2/95
	Y			
	Z			
Chest Deflection Gauge	CP45	HUMANOID	8/94	2/95
Lap Belt Load Cells	706	LEBOW	1/95	7/95
	707			
Shoulder Belt Load Cells	7	MAGNETEK	10/94	4/95
	E7			
Spool-Out Potentiometer				
Belt Stretch Transducer				

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head				
X (R)	AEW70	ENDEVCO	11/94	5/95
Y (R)	AET34	ENDEVCO	11/94	5/95
Z (R)	AKD93	ENDEVCO	11/94	5/95
Chest				
X (R)	AKD92	ENDEVCO	11/94	5/95
Y (R)	AFPI7	ENDEVCO	11/94	5/95
Z (R)	AJP62	ENDEVCO	11/94	5/95
Pelvic				
X	AGHM9	ENDEVCO	11/94	5/95
Y	AE8R7	ENDEVCO	11/94	5/95
Z	AH5L8	ENDEVCO	12/94	6/95

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #	Manufacturer	Calibration		
			Last	Next	
Head	X	AF5B3	ENDEVCO	10/94	4/95
	Y	AF5F7	ENDEVCO	10/94	4/95
	Z	AF5E1	ENDEVCO	10/94	4/95
Chest	X	AF5C1	ENDEVCO	10/94	4/95
	Y	AF480	ENDEVCO	10/94	4/95
	Z	AF5H9	ENDEVCO	10/94	4/95
Right Femur Load Cell		F255	GSE	12/94	6/95
Left Femur Load Cell		F77	GSE	12/94	6/95
Neck Load Cell	X	076	DENTON	8/94	2/95
	Y	076	DENTON	8/94	2/95
	Z	076	DENTON	8/94	2/95
Neck Moment	X	076	DENTON	8/94	2/95
	Y	076	DENTON	8/94	2/95
	Z	076	DENTON	8/94	2/95
Chest Deflection Gauge		CP150	HUMANOID	8/94	2/95
Hybrid III Use Only					
Lap Belt Load Cells		710	LEBOW	1/95	7/95
Shoulder Belt Load Cells		711	LEBOW	1/95	7/95
Spool-Out Potentiometer		8	MAGNETEK	10/94	4/95
Belt Stretch Transducer		E8	CALSPAN	8/94	2/95

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head	X (R)	ENDEVCO	11/94	5/95
	Y (R)	ENDEVCO	11/94	5/95
	Z (R)	ENDEVCO	11/94	5/95
Chest	X (R)	ENDEVCO	11/94	5/95
	Y (R)	ENDEVCO	11/94	5/95
	Z (R)	ENDEVCO	11/94	5/95
Pelvic	X	ENDEVCO	12/94	6/95
	Y	ENDEVCO	12/94	6/95
	Z	ENDEVCO	12/94	6/95

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(6 Month Calibration Minimum)

	Serial #	Manufacturer	Calibration	
			Last	Next
Left Seat Rear Crossmember	A175	CEC	1/95	7/95
Right Rear Seat Crossmember	A89	CEC	1/95	7/95
Top of Engine	A150	CEC	9/94	3/95
Bottom of Engine	BC21	CEC	8/94	2/95
Left Disc Brake Caliper	A147	CEC	1/95	7/95
Right Disc Brake Caliper	A29	CEC	1/95	7/95
Instrument Panel	A143	CEC	11/94	5/95
Left Seat Rear Crossmember (R)	A68	CEC	8/94	2/95
Right Seat Rear Crossmember (R)	A44	CEC	8/94	2/95

Appendix E

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

How to Wear Safety Belts Properly

Adults

This part 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 Chevrolet, see the part of this manual 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.

Driver Position

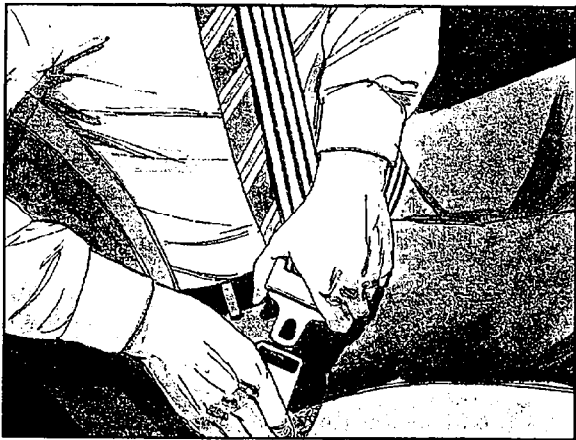
This part describes the driver's restraint system.

Lap-Shoulder Belt

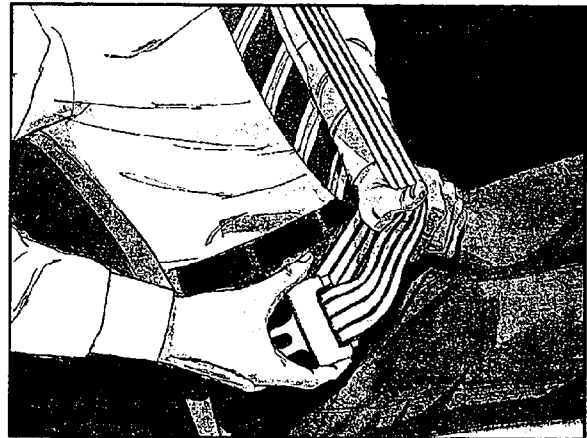
The driver has a lap-shoulder belt. Here's how to wear it properly.

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

1-10



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.

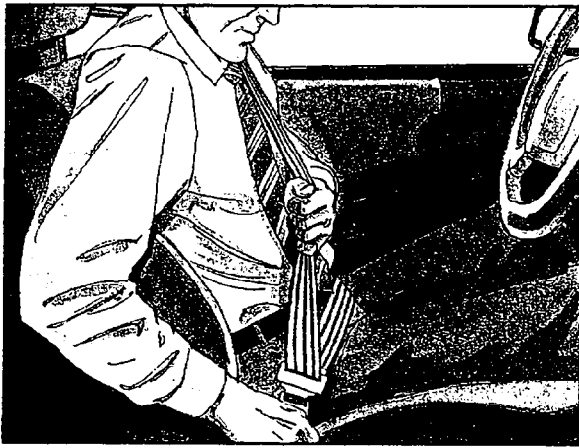


If the belt stops before it reaches the buckle, tilt the latch plate and keep pulling until you can buckle the belt.

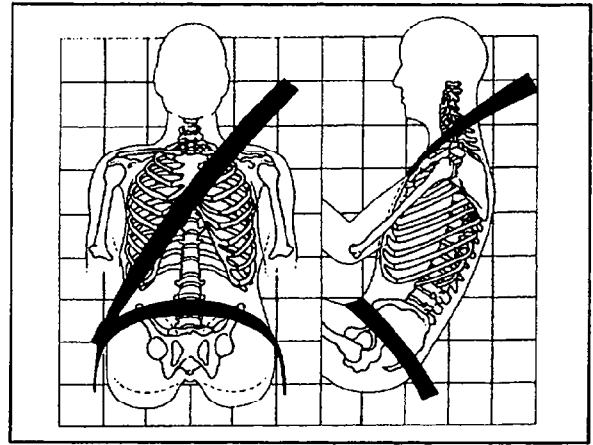
Pull up on the latch plate to make sure it is secure. If the belt isn't long enough, see "Safety Belt Extender" at the end of this section.

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.

1-11



5. To make the lap part tight, pull down on the buckle end of the belt as you pull up on the shoulder belt.



The lap part of the belt should be worn low and snug on the hips, just touching the thighs. In a crash, this applies force to the strong pelvic bones. And you'd be less likely to slide under the lap belt. If you slid under it, the belt would apply force at your abdomen. This could cause serious or even fatal injuries. The shoulder belt should go over the shoulder and across the chest. These parts of the body are best able to take belt restraining forces.

The safety belt locks if there's a sudden stop or crash.

1-12

Shoulder Belt Height Adjuster (4-Door Models)

Before you begin to drive, move the shoulder belt adjuster to the height that is right for you.

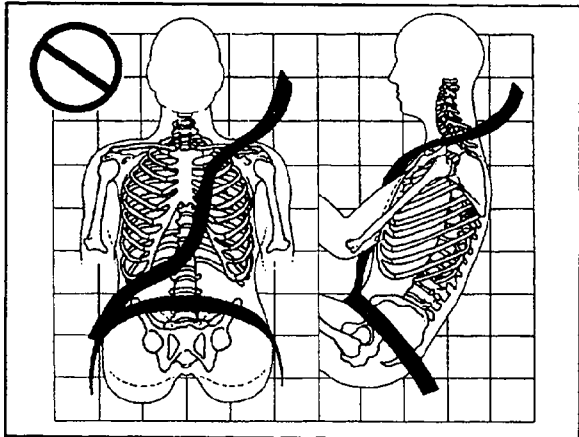


To move it down, squeeze the release button and move the adjuster to the desired position. You can move the adjuster up just by pushing up on the shoulder belt guide. After you move the adjuster to where you want it, try to move it down without squeezing the release button to make sure it has locked into position.

Adjust the height so that the shoulder portion of the belt is centered on your shoulder. The belt should be away from your face and neck, but not falling off your shoulder.

1-13

Q: What's wrong with this?



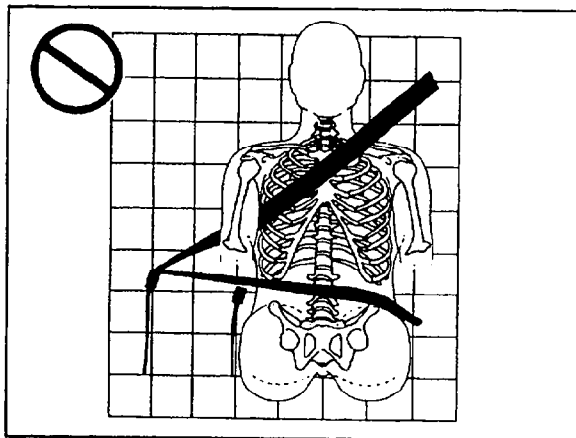
⚠ CAUTION:

You can be seriously hurt if your shoulder belt is too loose. In a crash you would move forward too much, which could increase injury. The shoulder belt should fit against your body.

A: The shoulder belt is too loose. It won't give nearly as much protection this way.

1-14

Q: What's wrong with this?



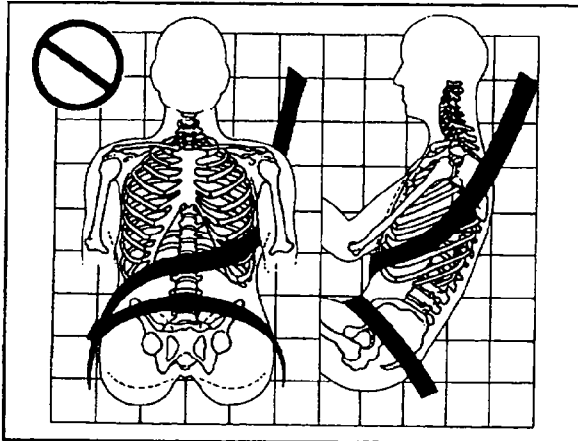
⚠ CAUTION:

You can be seriously injured if your belt is buckled in the wrong place like this. In a crash, the belt would go up over your abdomen. The belt forces would be there, not at the pelvic bones. This could cause serious internal injuries. Always buckle your belt into the buckle nearest you.

A: The belt is buckled in the wrong place.

1-15

Q: What's wrong with this?



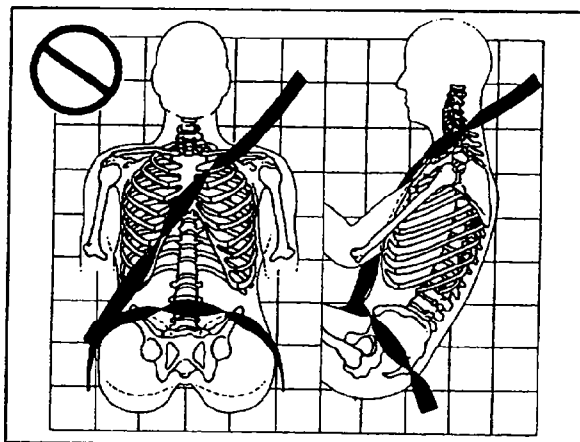
⚠ CAUTION:

You can be seriously injured if you wear the shoulder belt under your arm. In a crash, your body would move too far forward, which would increase the chance of head and neck injury. Also, the belt would apply too much force to the ribs, which aren't as strong as shoulder bones. You could also severely injure internal organs like your liver or spleen.

A: The shoulder belt is worn under the arm. It should be worn over the shoulder at all times.

1-16

Q: What's wrong with this?



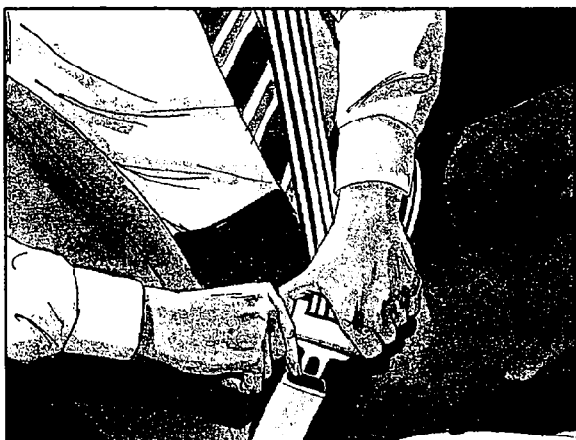
⚠ CAUTION:

You can be seriously injured by a twisted belt. In a crash, you wouldn't have the full width of the belt to spread impact forces. If a belt is twisted, make it straight so it can work properly, or ask your dealer to fix it.

A: The belt is twisted across the body.

1-17

To unlatch the belt, just push the button on the buckle. The belt should go back out of the way.



Before you close the door, be sure the belt is out of the way. If you slam the door on it, you can damage both the belt and your vehicle.

Supplemental Restraint System (SRS)

This part explains the Supplemental Restraint System (SRS), or air bag system.

Your Chevrolet has two air bags -- one air bag for the driver and another air bag for the right front passenger.

Here are the most important things to know about the air bag system:

1-18

CAUTION:

You can be severely injured or killed in a crash if you aren't wearing your safety belt -- even if you have an air bag. Wearing your safety belt during a crash helps reduce your chance of hitting things inside the vehicle or being ejected from it. The air bag is only a "supplemental restraint." That is, it works with safety belts but doesn't replace them. Air bags are designed to work only in moderate to severe crashes where the front of your vehicle hits something. They aren't designed to inflate at all in rollover, rear, side, or low-speed frontal crashes. Everyone in your vehicle, including the driver, should wear a safety belt properly -- whether or not there's an air bag for that person.

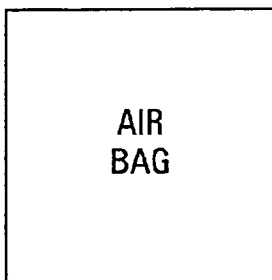
CAUTION:

Air bags inflate with great force, faster than the blink of an eye. If you're too close to an inflating air bag, it could seriously injure you. Safety belts help keep you in position for an air bag inflation in a crash. Always wear your safety belt, even with an air bag. The driver should sit as far back as possible while still maintaining control of the vehicle.

CAUTION:

An inflating air bag can seriously injure small children. Always secure children properly in your vehicle. To read how, see the part of this manual called "Children" and the caution label on the right front passenger's safety belt.

1-19



There is an air bag readiness light on the instrument panel, which shows AIR BAG.

The system checks the air bag's electrical system for malfunctions. The light tells you if there is an electrical problem. See "Air Bag Readiness Light" in the Index for more information.

How the Air Bag System Works



1-20



Where is the air bag?

The driver's air bag is in the middle of the steering wheel. The right front passenger's air bag is in the instrument panel on the passenger's side.

CAUTION:

Don't put anything on, or attach anything to, the steering wheel or instrument panel. Also, don't put anything (such as pets, or objects) between any occupant and the steering wheel or instrument panel. If something is between an occupant and an air bag, it could affect the performance of the air bag -- or worse, it could cause injury.

When should an air bag inflate?

The air bag is designed to inflate in moderate to severe frontal or near-frontal crashes. The air bag will inflate only if the impact speed is above the system's designed "threshold level." If your vehicle goes straight into a wall that doesn't move or deform, the threshold level is about 9 to 15 mph (14 to 24 km/h). The threshold level can vary, however, with specific vehicle design, so that it can be somewhat above or below this range. If your vehicle strikes something that will move or deform, such as a parked car, the threshold level will be higher. The air bag is not designed to inflate in rollovers, side impacts, or rear impacts, because inflation would not help the occupant.

1-21

It is possible that in a crash only one of the two air bags in your Cavalier will deploy. This is rare, but can happen in a crash just severe enough to make an air bag inflate.

In any particular crash, no one can say whether an air bag should have inflated simply because of the damage to a vehicle or because of what the repair costs were. Inflation is determined by the angle of the impact and the vehicle's deceleration. Vehicle damage is only one indication of this.

What makes an air bag inflate?

In a frontal or near-frontal impact of sufficient severity, the air bag sensing system detects that the vehicle is suddenly stopping as a result of a crash. The sensing system triggers a chemical reaction of the sodium azide sealed in the inflator. The reaction produces nitrogen gas, which inflates the air bag. The inflator, air bag, and related hardware are all part of the air bag modules packed inside the steering wheel and in the instrument panel in front of the right front passenger.

How does an air bag restrain?

In moderate to severe frontal or near-frontal collisions, even belted occupants can contact the steering wheel or the instrument panel. The air bag supplements the protection provided by safety belts. Air bags distribute the force of the impact more evenly over the occupant's upper body, stopping the occupant more gradually. But air bags would not help you in many types of collisions, including rollovers and rear and side impacts, primarily because an occupant's motion is not toward the air bag. Air bags should never be regarded as anything more than a supplement to safety belts, and then only in moderate to severe frontal or near-frontal collisions.

What will you see after an air bag inflates?

After the air bag inflates, it quickly deflates. This occurs so quickly that some people may not even realize the air bag inflated. Some components of the air bag module in the steering wheel hub for the driver's air bag, or the instrument panel for the right front passenger's bag, will be hot for a short time, but the part of the bag that comes into contact with you will not be hot to the touch. There will be some smoke and dust coming from vents in the deflated air bags. Air bag inflation will not prevent the driver from seeing or from being able to steer the vehicle, nor will it stop people from leaving the vehicle.

1-22

CAUTION:

When an air bag inflates, there is dust in the air. This dust could cause breathing problems for people with a history of asthma or other breathing trouble. To avoid this, everyone in the vehicle should get out as soon as it is safe to do so. If you have breathing problems but can't get out of the vehicle after an air bag inflates, then get fresh air by opening a window or door.

In many crashes severe enough to inflate an air bag, windshields are broken by vehicle deformation. Additional windshield breakage may also occur from the right front passenger air bag.

- The air bags are designed to inflate only once. After they inflate, you'll need some new parts for your air bag system. If you don't get them, the air bag system won't be there to help protect you in another crash. A new system will include air bag modules and possibly other parts. The service manual for your vehicle covers the need to replace other parts.

- Your vehicle is equipped with a diagnostic module, which records information about the air bag system. The module records information about the readiness of the system, when the sensors are activated and driver's safety belt usage at deployment.
- Let only qualified technicians work on your air bag system. Improper service can mean that your air bag system won't work properly. See your dealer for service.

NOTICE:

If you damage the cover for the driver's or the right front passenger's air bag, they may not work properly. You may have to replace the air bag module in the steering wheel or both the air bag module and the instrument panel for the right front passenger's air bag. Do not open or break the air bag covers.

1-23

Servicing Your Air Bag-Equipped Chevrolet

Air bags affect how your Chevrolet should be serviced. There are parts of the air bag system in several places around your vehicle. You don't want the system to inflate while someone is working on your vehicle. Your Chevrolet dealer and the 1995 Cavalier Service Manual have information about servicing your vehicle and the air bag system. To purchase a service manual, see "Service Publications" in the Index.

The air bag system does not need regular maintenance.

⚠ CAUTION:

For up to 2 minutes after the ignition key is turned off and the battery is disconnected, an air bag can still inflate during improper service. You can be injured if you are close to an air bag when it inflates. Avoid wires wrapped with yellow tape, or yellow connectors. They are probably part of the air bag system. Be sure to follow proper service procedures, and make sure the person performing work for you is qualified to do so.

Safety Belt Use During Pregnancy

Safety belts work for everyone, including pregnant women. Like all occupants, they are more likely to be seriously injured if they don't wear safety belts.

A pregnant woman should wear a lap-shoulder belt, and the lap portion should be worn as low as possible throughout the pregnancy.

