V2552

REPORT NUMBER: CAL-97-2

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

GENERAL MOTORS CORPORATION
1997 CHEVROLET VENTURE
3- DOOR VAN

NHTSA NUMBER: MV0100

CALSPAN TEST NUMBER: 8406-2

CALSPAN SRL CORPORATION
TRANSPORTATION SCIENCE CENTER
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February 14, 1997

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Performance Standards
Office of Crashworthiness Standards
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NHTSA, Office of Crashworthiness Standards

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15. *Supplementary Notes*		

16. *Abstract*

A frontal load cell barrier test of a 1997 Chevrolet Venture 3- Door Van was performed at Calspan SRL Corporation crash test facility in Buffalo, New York, on February 14, 1997.

The impact velocity was 56.8 kph and the temperature at the barrier face was 25°C. The maximum post-test vehicle crush was 556.7 mm. The test vehicle was equipped with a 3-point belt system and supplemental airbags at both front outboard seating positions.

With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appear to comply with head, chest and femur requirements.

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Section 1

PURPOSE AND TEST PROCEDURE

This 56.8 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. DTNH22-96-D-02010. 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 56.8 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 MV0100

A load cell barrier consisting of 36 load cells was impacted by a 1997 Chevrolet Venture 3- Door Van at a velocity of 56.8 kph. The test was performed at the Calspan SRL Corporation on February 14, 1997. 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 (position 1) ATD (Serial No. 150) and the right-front passenger (position 2) ATD (Serial No. 061) were used in a previous test (MV 5101). Injury criteria for ATD No. 150 and 061 were not exceeded in test MV5101. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 132 channels of data were recorded on a P.C. based data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces. Position 2 Right Toe Z and Barrier Load Cell D9 did not record accurately and are being omitted from this report.

The driver's HIC was 692.9. The maximum chest deceleration over 3 milliseconds was 48.8 g's and maximum chest deflection was 17.3 mm. Femur loads were -6006.1 newtons on the left and -7536.2 newtons on the right.

The right front passenger's HIC was 704.2. Maximum chest deceleration over 3 milliseconds was 49.3 g's and maximum chest deflection was 16.5 mm. Femur loads were -4234.9 newtons on the left and -4606.1 newtons on the right.

Table 1

CRASH TEST SUMMARY

Vehicle NHTSA No. : MV0100 Test Mode : 56 kph Frontal Barrier

Test Date : February 14, 1997 Time: 13:08 Temperature : -4 °C

Vehicle Make/Model/Body Style : 1997 Chevrolet Venture 3- Door Van

Vehicle Test Weight : 1946 kgs

Vehicle/Barrier Impact Angle : 0 °

Impact Velocity : 56.8 kph

Maximum Static Crush : 556.7 mm

Vehicle Rebound : 565.3 mm

DUMMIES:	DRIVER	PASSENGER
Type :	572E	572E
Restraint System :	Airbag with 3-point belt system	Airbag with 3-point belt system

Number of Data Channels : 132

Number of Cameras : 1 Real Time

16 High Speed

DOOR OPENING DATA : Closed/Operable - Left Front

Closed/Operable - Right Front

Front Seat(s) Data :	DRIVER	PASSENGER
Seat Track Failure :	None	None
	mm of shift	
Seat Back Failure :	12 mm	12 mm

VISIBLE DUMMY CONTACT POINTS :	DRIVER	PASSENGER
Head :	Center of airbag/Back of head to headrest	Center of airbag/Back of head to headrest
Abdomen :	none	none
Chest	Airbag	Airbag
Knees	Knee Bolster	Knee Bolster

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION :

Year/Make/Model/Body Style : 1997 Chevrolet Venture 3- Door Van

NHTSA No. : MV0100 ; VIN: 1GNDV06E7UD107451 ; Color : Green

Engine Data: 6 cylinders; - CID; 3.4 Liters; - cc

Placement : x Longitudinal or In-Line; - Transverse of Lateral

Transmission Data : 4 speeds; - Manual; x Automatic; x Overdrive

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

Major Options : x A/C; x Pwr.Strg.; x Pwr. Brakes

x Pwr. Windows; - Pwr. Door Locks; x Tilt Wheel

Date Received : 12/2/96 ; Odometer Reading 87 miles

Selling Dealer : Bob Johnson Chevrolet

& Address: 1110 Stone Rd. Rochester , N.Y. 14616

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by : General Motors Corp.

Date of Manufacture 9/96

GVWR : 2430 kgs.; GAWR: 1236 kgs. FRONT; 1215 kgs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load : 240 kpa FRONT

240 kpa REAR

Recommended Tire Size : P205/70R15

* Recommended Cold Tire Pressure : 240 kpa FRONT; 240 kpa REAR

Size of Tires on Test Vehicle: P205/70R15 ; Manufacturer: General

Vehicle Capacity Data :

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

Number of Occupants: 2 Front; 5 Rear; 7 Total

Vehicle Capacity Weight (VCW) = 760 kgs.

No. of Occupants x 68 kgs. = 476 kgs.

Rated Cargo/Luggage Weight (RCLW) = 284 kgs. (136 kg maximum)

*Tire pressure used for test

Table 2
GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids)= UDW:

Right Front =	502.0	kgs.	Right Rear =	340.5	kgs.
Left Front =	509.0	kgs.	Left Rear =	318.5	kgs.
TOTAL FRONT =	1,011	kgs.	TOTAL REAR =	659	kgs.

TOTAL DELIVERED WEIGHT = 1,670.0 kgs.

% of Total Front of Vehicle Weight = 60.5 % of Total Rear Weight = 39.5 %

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT :

Total Delivered Weight (UDW) =	1,670	kgs.
Rated Cargo/Luggage Weight (RCLW) =	136	kgs.
Weight of 2 p.572 Dummies @ 75 each =	150	kgs.
TARGET TEST WEIGHT =	1,956	kgs.

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 126 KG OF CARGO WEIGHT:

Right Front =	549	kgs.	Right Rear =	437	kgs.
Left Front =	558	kgs.	Left Rear =	402	kgs.
TOTAL FRONT =	1,107	kgs.	TOTAL REAR =	839	kgs.

TOTAL TEST WEIGHT = 1,946.0 kgs.

% of Total Front Weight = 56.9 % % of Total Rear Weight = 43.1 %

Weight of Ballast Secured in Vehicle Trunk Area = 95 kgs.

Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED :	RF	751	LF	753	RR	788	LR	782
FULLY LOADED :	RF	741	LF	738	RR	754	LR	750
AS TESTED :	RF	739	LF	738	RR	741	LR	744

Vehicle's Wheel Base : 2850 in.

Location of Vehicle's C.G. : 1,228.8 mm rearward of front wheel center.

FUEL SYSTEM DATA :

Fuel System Capacity From Owner's Manual = 75.7 liters

Usable Capacity Figure Furnished by COTR = 75.7 liters

Test Volume Range (92 to 94% of Usable Capacity) = 69.6 to 71.2 liters

ACTUAL TEST VOLUME= 70.0 liters (with entire fuel system filled)

Test Fluid Type: Stoddard ; Spec. Grav. = 0.764

Kinematic Viscosity = 0.96 centistokes; Color = Orange

Type of Fuel Pump: Electric- x ; Mechanical- -

Does Electric Pump operate with ignition switch "ON" & engine "OFF" Yes- x No- -

Details of Fuel System Fuel filler above rear axle, fuel tank forward of rear axle, fuel lines along left frame rail

Table 3

POST IMPACT DATA

TYPE OF TEST:

Type of Test : Frontal Barrier Impact Angle : 0°

Test Date : February 14, 1997 Time: 13:08 Temperature: -4 °C

Vehicle NHTSA No. : MV0100

Required Impact Velocity Range : 55.7 to 57.1 kph

BARRIER IMPACT VELOCITY : (Speed traps within 5 feet of impact plane.)

Trap No. 1 = 56.8 kph; Trap No. 2 = 56.8 kph

Distance from vehicle to barrier : (1) entering trap = 1320 mm

(2) exiting trap = 305 mm

VEHICLE STATIC CRUSH: (mm) (For frontal and rear impacts only.)

Vehicle Length:

Pre-Test	Right =	4670	; C/L =	4745	; Left =	4670
Post-Test	Right =	4125	; C/L =	4165	; Left =	4125
Crush	Right =	545.0	; C/L =	580.0	; Left =	545.0
AVERAGE	=	556.7	mm			

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point :

	Right =	561	; C/L =	550	; Left =	585
AVERAGE	=	565.3	mm			

Section 3

OCCUPANT AND VEHICLE INFORMATION

I. DATA

1. Test Vehicle Information
2. Dummy Positioning Data
3. Vehicle Accelerometer Data
4. Dummy Injury Criteria Data Summary
5. Seat Belt Performance Assessment Data
6. Test Vehicle Measurements
7. Vehicle Intrusion Measurements
8. Camera Locations
9. Vehicle Target Locations
10. Load Cell Barrier Data
11. Post Test Air Bag Data

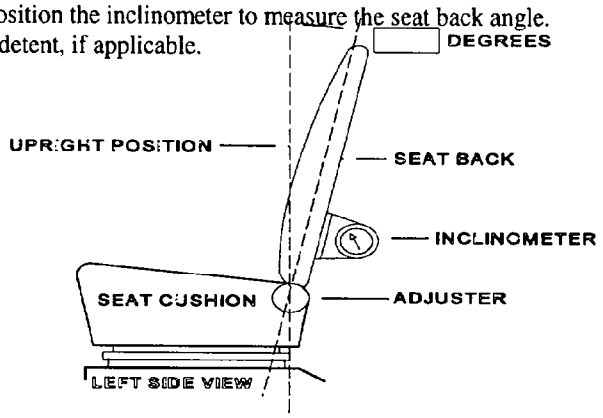
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 1997 Vehicle Model: Chevrolet Venture Body Style : 3- Door Van

1. Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



Seat back angle for driver's seat : 19 deg.

Measurement instructions : Matched notches located on recliner mechanism

Seat back angle for passenger's seat : 19 deg.

Measurement instructions : Matched notches located on recliner mechanism

2. Seat Fore and Aft Positioning

Positioning of the driver's seat : Located 17 notches on seat track ,put seat in 9th position

Positioning of the passenger's seat (if applicable) : Located 17 notches on seat track , put seat in 9th position

3. Fuel Tank Capacity Data

3.1

A. "Usable Capacity" of the standard equipment fuel tank is 75.7 liters

B. "Usable Capacity" of the optional equipment fuel tank is - liters

C. "Usable Capacity" of the vehicle(s) used for certification testing to requirements of FMVSS 301 = 70 liters

3.2 Amount of Stoddard solvent added to vehicl(s) used for certification test(s) = 70 liters

3.3 Is vehicle equipped with electric fuel pump? Yes- x ; No- ____

If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

Vehicle turned on

Figure 1

TEST VEHICLE INFORMATION (cont.)

4. STEERING COLUMN ADJUSTMENTS :

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

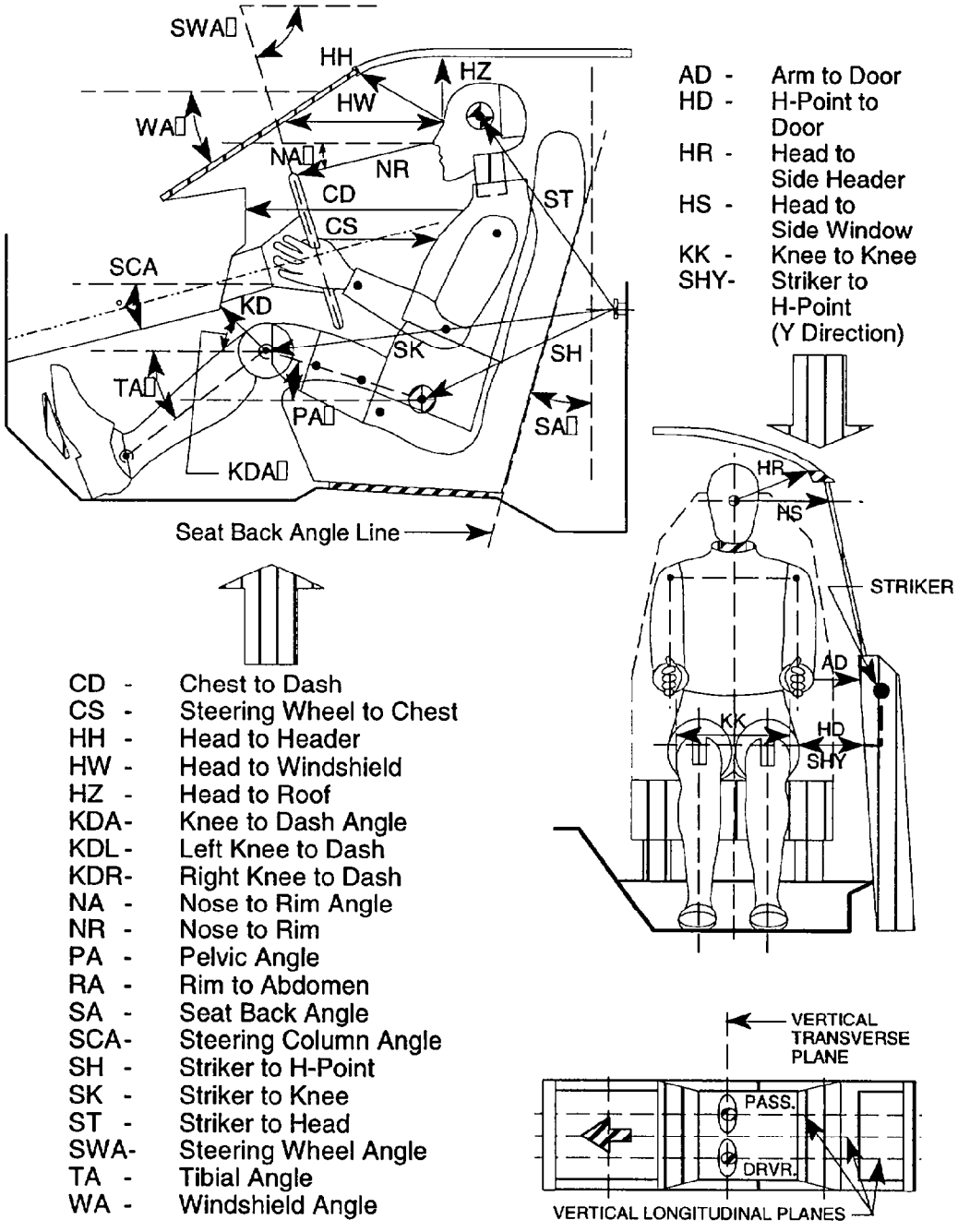
Operational Instructions: Mid-position is 2 notches below full up.

5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: One notch below full up.

Figure 2

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



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

Table 4

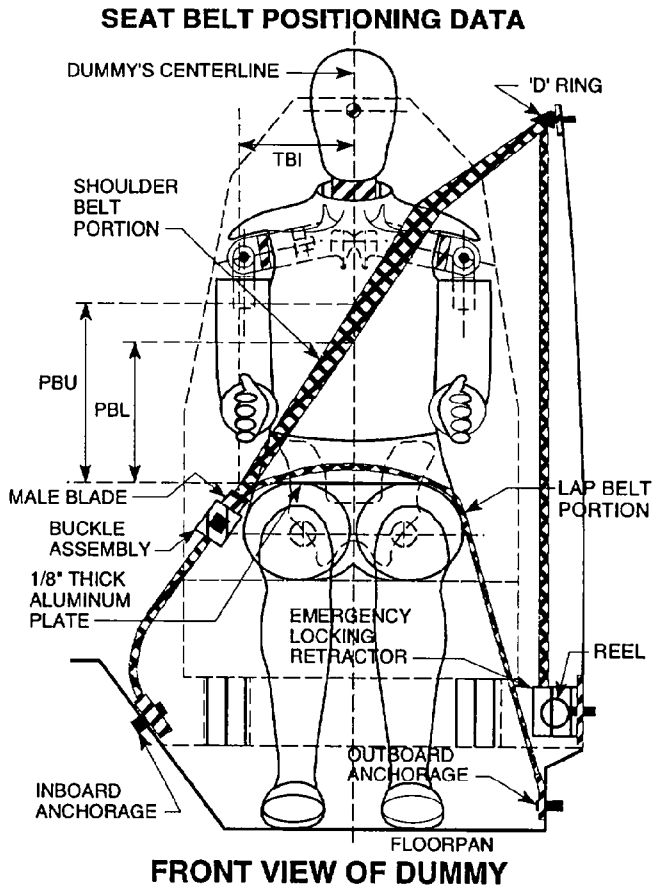
FRONT SEAT OCCUPANT MEASUREMENTS

	DRIVER (Serial #150)			PASS. (Serial # 061)		
WA°	32 deg.			N/A		
SWA°	65 deg.			N/A		
SCA°	25 deg.			N/A		
SA°	19 deg.			19 deg.		
HZ	245			230		
HH	435			430		
HW	635			634		
HR	285			280		
NR	370	Angle	25 deg.	N/A		
CD	525			489		
CS	280			N/A		
RA	165			N/A		
KDL	180	Angle (KDA)	25 deg.	159		
KDR	160			168	Angle (KDA)	25 deg.
PA°	21 deg.			23 deg.		
TA°	57 deg.			53 deg.		
KK	320			216		
ST	549	Angle	26 deg.	552	Angle	20 deg.
SK	665	Angle	108 deg.	665	Angle	102 deg.
SH	297	Angle	120 deg.	284	Angle	124 deg.
SHY	230			245		
HS	340			350		
HD	164			154		
AD	104			117		

Dimensions in millimeters

Figure 3

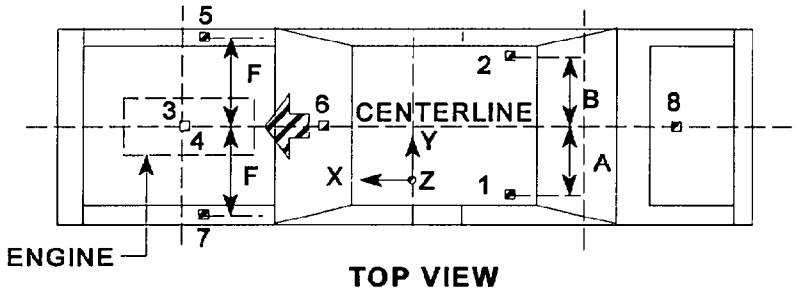
SEAT BELT POSITIONING DATA



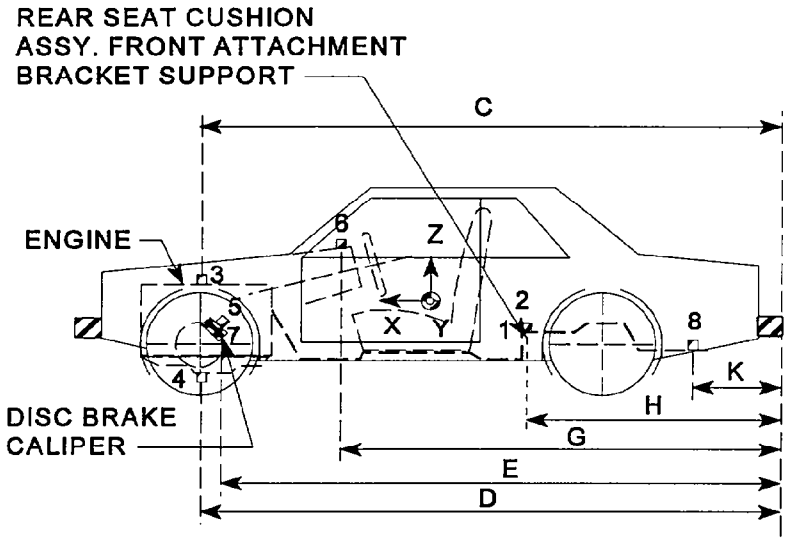
	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	360	361
PBL-- Top surface of alum. plate to belt lower edge	263	264
LAP BELT TENSION	10 nwts	10 nwts
SHOULDER BELT TENSION	retractor	retractor

Figure 4

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



TOP VIEW



LEFT SIDE VIEW

Table 5

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

DIMENSION	LENGTH (mm)	
	PRE-TEST VALUES	
A Left Rear Seat Crossmember Y	365	395 (redundant)
B Right Rear Seat Crossmember Y	357	397 (redundant)
C Top of Engine X	4129	
D Bottom of Engine X	3679	
E Disc Brake Calipers X	3752	
F Disc Brake Calipers Y	595	606
G Instrument Panel X	3046	
H Rear Seat Crossmembers X	2389	

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE			
		Pos.	msec.	Neg.	msec.
1	Rear Seat X-Member @ Left Side	5.7	165.9	-26.3	30.6
2	Rear Seat X-Member @ Right Side	2.6	154.1	-24.2	30.6
3	Top of Engine Block	112.8	38.8	-150.3	27.2
4	Bottom of Engine	24.3	40.4	-91.3	30.0
5	Disc Brake Caliper @ Right Side	36.0	64.2	-108.7	39.5
6	Instrument Panel	25.6	55.4	-49.1	63.4
7	Disc Brake Caliper @ Left Side	32.2	59.8	-91.7	44.3
8	Rear Seat X-Member @ Left-Redundant	2.6	153.0	-25.3	30.4
9	Rear Seat X-Member @ Right-Redundant	2.5	157.7	-25.1	31.1

Table 6

DUMMY INJURY CRITERIA VALUES

NHTSA Test No.: MV0100 Vehicle: 1997 Chevrolet Venture 3- Door Van

	MAXIMUM HEAD ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-66.3	-11.0	18.6	67.1
Position #2 - Passenger	70.0	-9.4	34.4	73.6

	MAXIMUM CHEST ACCELERATION (g's)			
	X	Y	Z	R*
Position #1 - Driver	-49.5	7.7	16.1	48.8
Position #2 - Passenger	-48.0	-4.7	15.9	49.3

* 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	-6006.1	-7536.2
Position #2 - Passenger	-4234.9	-4606.1

	MAXIMUM FORCE - SEAT BELT LOADS (nwt)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
Position #1 - Driver	6247.9	-	2860.9
Position #2 - Passenger	6592.6	3839.2	-

	HEAD INJURY CRITERIA (HIC)			
	HIC**	t_1 (mSec)	t_2 (mSec)	Average Acceleration t_1 to t_2
Position #1 - Driver	692.9	51.7	83.2	54.57
Position #2 - Passenger	704.2	53.9	85.0	55.21

** HIC is as defined in FMVSS 208. The maximum time interval from t_1 to t_2 is 36 milliseconds.

Table 7
HYBRID III NECK AND CHEST DATA SHEET

Vehicle Year/Make/Model/Body Style: 1997 Chevrolet Venture 3- Door Van

NHTSA Test No.: MV0100 Test Date: February 14, 1997

MAXIMUM VALUES	DRIVER DUMMY	PASSENGER DUMMY
Neck Load X (nwt)	339.1	851.4
Neck Load Y (nwt)	227.5	404.0
Neck Load Z (nwt)	3033.3	-2162.5
Neck Moment X (nwt-m)	-14.0	23.0
Neck Moment Y (nwt-m)	-52.4	-80.4
Neck Moment Z (nwt-m)	19.6	-14.5
Chest Deflection X (mm.)	-17.3	-16.5
Time of Max. Occurrence (msec)	63.3	70.2

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

PELVIC DATA

MAXIMUM VALUES	DRIVER DUMMY	PASSENGER DUMMY
Pelvis X Acceleration (G's)	-75.3	-46.6
Pelvis Y Acceleration	12.0	-7.9
Pelvis Z Acceleration	16.6	22.4

LOWER LEG INSTRUMENTATION (Abbreviated)

MAXIMUM VALUES	DRIVER DUMMY		PASSENGER DUMMY	
TIBIA FORCES FZ (nwt)	-1612.9	1529.8	-966.7	-1408.0
TIBIA MOMENTS MY (nwt)	-50.7	115.2	174.0	194.4

ANKLE ACCELERATIONS

MAXIMUM VALUES	DRIVER DUMMY		PASSENGER DUMMY	
X ACCEL.	-40.6	-89.4	-88.6	-75.2
Z ACCEL.	-66.2	-130.0	-107.1	-80.5

Table 8

REDUNDANT DUMMY INJURY CRITERIA VALUES

NHTSA Test No.: MV0100 : Vehicle: 1997 Chevrolet Venture 3- Door Van

	MAXIMUM HEAD ACCELERATION (g's) **REDUNDANT**			
	X	Y	Z	R
Position #1 - Driver	67.1	-10.1	16.0	67.7
Position #2 - Passenger	-68.8	9.8	34.0	70.4

	MAXIMUM CHEST ACCELERATION (g's) **REDUNDANT**			
	X	Y	Z	R*
Position #1 - Driver	-51.0	10.3	15.4	49.2
Position #2 - Passenger	-51.8	-7.8	-21.9	54.2

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

	HEAD INJURY CRITERIA (HIC) **REDUNDANT**			
	HIC**	t_1 (mSec)	t_2 (mSec)	Average Acceleration t_1 to t_2
Position #1 - Driver	707.6	52.0	84.6	54.28
Position #2 - Passenger	715.9	53.2	88.0	53.13

** HIC is as defined in FMVSS 208. The maximum time interval from t_1 to t_2 is 36 milliseconds.

Table 9

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:	Driver	Passenger
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	2417 mm	2502 mm
Shoulder belt length as measured on Part 572 Dummy.	896 mm	957 mm
Lap belt length as measured on Part 572 Dummy.	822 mm	846 mm
SHOULDER BELT SPOOL-OFF DATA:		
As determined by film analysis.	89 mm	102 mm
As determined mechanically.	81 mm	117 mm
As determined electronically.	47 mm	50 mm
BELT STRETCH DATA:		
Measured electronically between shoulder belt load cell and the "D" ring.	26 mm/M	172 mm/M
Measured mechanically.	0 mm	0 mm

Figure 5

TEST VEHICLE MEASUREMENTS

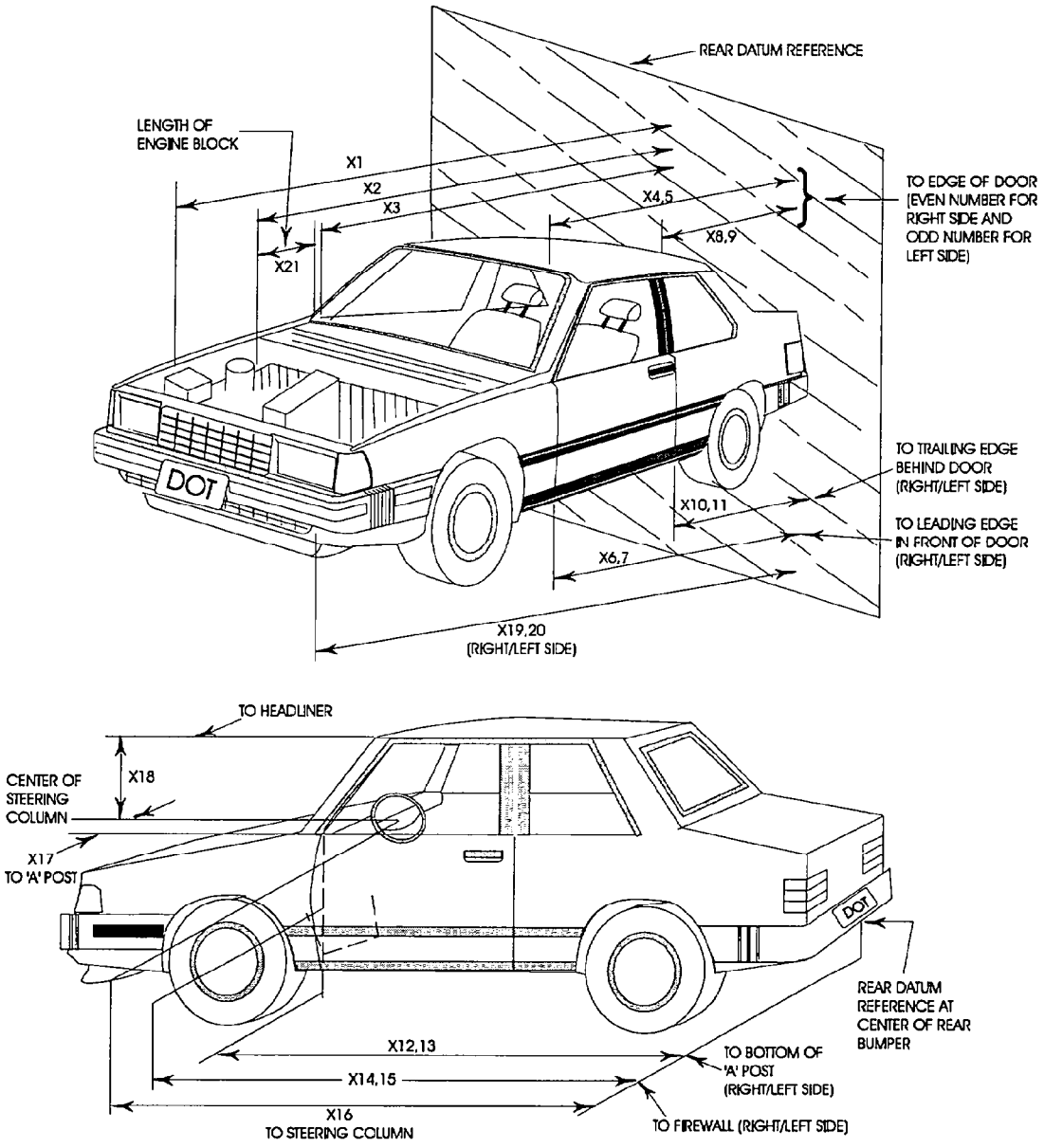


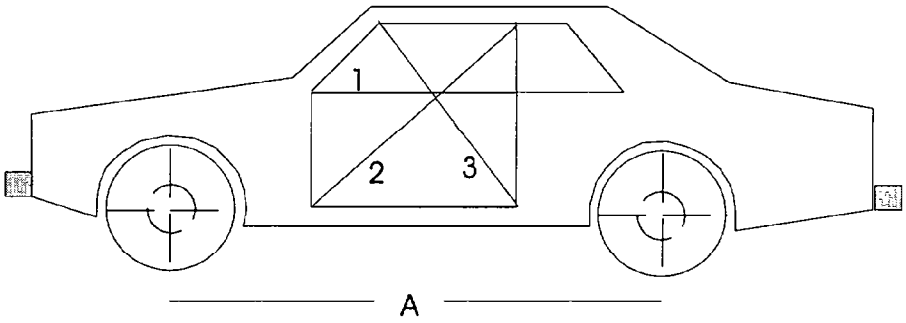
Table 10

VEHICLE MEASUREMENTS

No.		All Dimensions in mm		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	4745	4165	580
X2	Rear Surface of Vehicle to Front of Engine	4225	3900	325
X3	Rear Surface of Vehicle to Firewall	3640	3525	115
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3445	3412	33
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3439	3407	32
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3327	3306	21
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3322	3298	24
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2300	2273	27
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2290	2269	21
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2308	2292	16
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2305	2282	23
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3286	3271	15
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3276	3263	13
X14	Rear Surface of Vehicle to Firewall, Right Side	3685	3525	160
X15	Rear Surface of Vehicle to Firewall, Left Side	3635	3525	110
X16	Rear Surface of Vehicle to Steering Column	2900	2900	0
X17	Center of Steering Column to "A" Post	440	430	10
X18	Center of Steering Column to Headliner	475	340	135
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4670	4125	545
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4670	4125	545
X21	Length of Engine Block	600	600	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3110	3090	20
CD	Rear Surface of Vehicle to Center of Dash Panel	3115	3105	10
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3110	3105	5

Figure 6

VEHICLE INTRUSION MEASUREMENTS
DOOR OPENING WIDTH

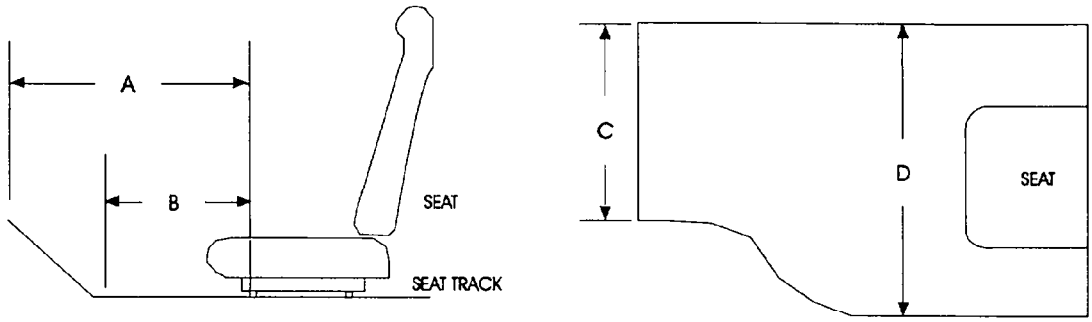


UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1160	1755	1390	1160	1760	1405
AFTER TEST	1115	1745	1435	1115	1740	1445
DIFFERENCE	45	10	-45	45	20	-40

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2850	2850
AFTER TEST	2715	2685
DIFFERENCE	135	165

Figure 7

VEHICLE INTRUSION MEASUREMENTS
STATIC FOOTWELL DEFORMATION



DRIVER

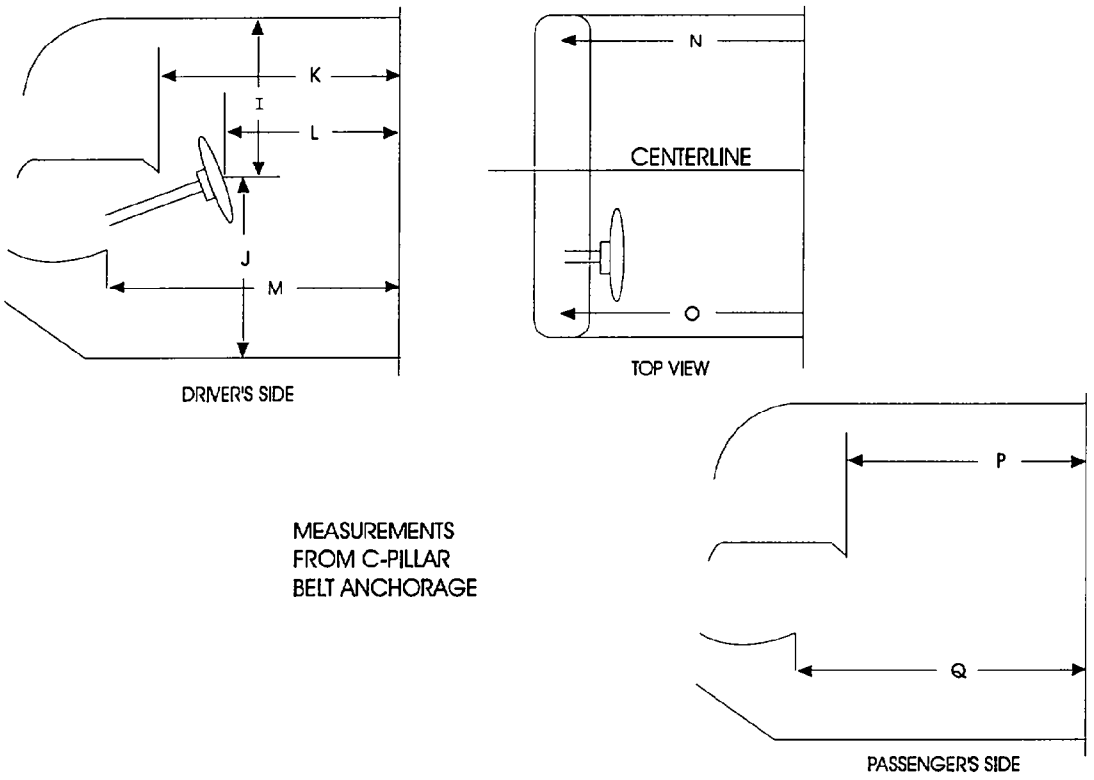
Measurement	Pre-Test	Post-Test	Difference
A	670	620	50
B	555	530	25
C	560	n/a	n/a
D	595	580	15

PASSENGER

Measurement	Pre-Test	Post-Test	Difference
A	750	630	120
B	665	615	50
C	515	n/a	n/a
D	585	580	5

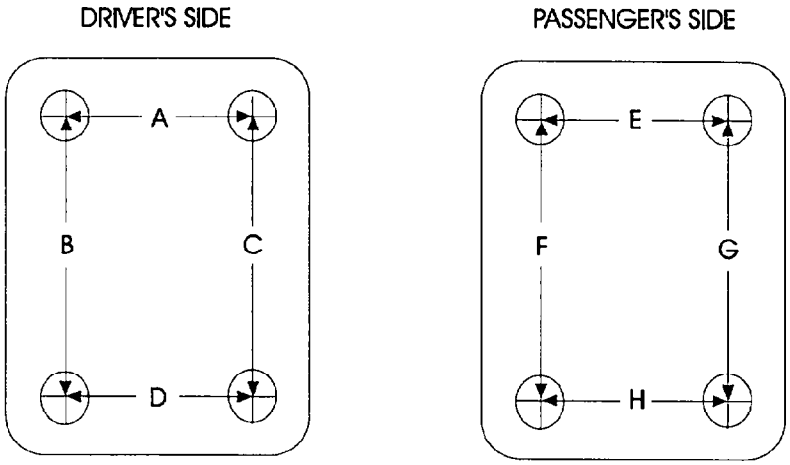
Figure 8

VEHICLE INTRUSION MEASUREMENTS
STATIC PASSENGER COMPARTMENT INTRUSION



Measurement	Pre-Test	Post-Test	Difference
I	480	340	140
J	670	930	-260
K	775	775	0
L	530	530	0
M	815	745	70
N	740	720	20
O	740	735	5
P = K (PASS.)	750	735	15
Q = M (PASS.)	715	680	35

Figure 9
FLOORBOARD DEFORMATION



Measurement	Pre-Test	Post-Test	Difference
A	310	300	10
B	405	400	5
C	415	330	85
D	285	290	-5
E	315	280	35
F	415	350	65
G	410	415	-5
H	280	290	-10

Units = mm

Figure 10

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera information shown in Table 11.

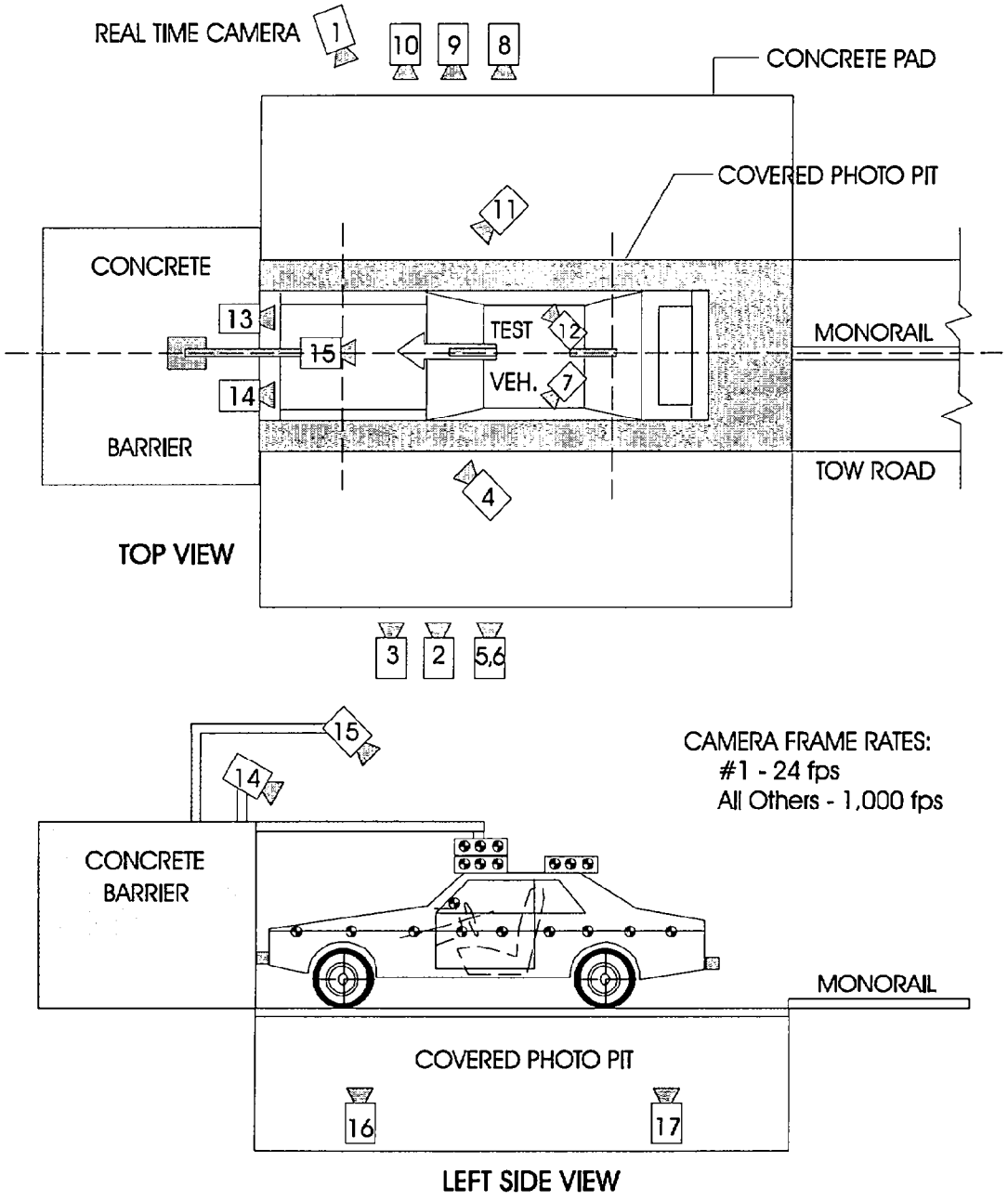


Table 11
HIGH-SPEED CAMERA LOCATIONS

NHTSA Test No.: MV0100 Vehicle: 1997 Chevrolet Venture 3- Door Van

CAMERA NO.	VIEW	CAMERA POSITIONS (MM.)* X	Y	Z	ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	7925	1065	1125	-4	7512	13	1015
3	Left Side View	6731	2405	1125	-4	6318	25	1015
4	Driver and Interior View	5385	3105	1920	-12	-	25	1000
5	Steering Column (Bottom)	8814	1840	1165	-2	8401	35	1015
6	Steering Column (Top)	8814	1840	1775	-6	8401	35	1045
7	Left Belt	-	-	-	-	-	8	620
8	Overall Right Side	6731	2600	1115	-3	6318	13	1100
9	Right Side View	8001	1840	1080	-2	7588	25	1105
10	Right Passenger View	8001	2480	1425	-3	7588	35	900
11	Passenger and Interior View	5232	3320	1930	-12	-	25	1120
12	Right Belt	-	-	-	-	-	8	700
13	Passenger Front View	580	0	2000	-32	-	13	1060
14	Driver Front View	580	0	2000	-32	-	13	1090
15	Windshield View	0	-530	3048	-51	-	13	700
16	Pit View of Engine	0	505	-3048	90	-	13	950
17	Pit View of Fuel Tank	0	3432	-3048	90	-	13	n.t.

*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 11

VEHICLE TARGET LOCATIONS

(Dimensions in millimeters)

A	337
B	1475
C	1219
D	2211
E	330
F	1783
G	965
H	965
I	126
J	1374
K	1091
L	1315
M	330
N	126
O	965
P	965
Q	1315
R	1091
S	1374

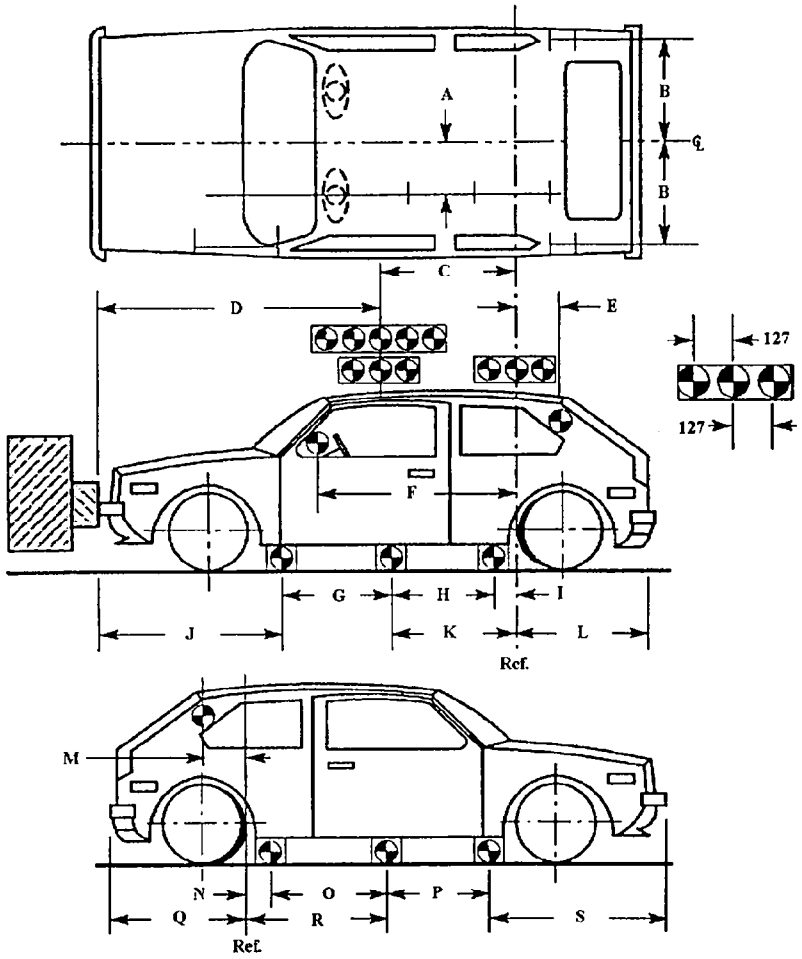
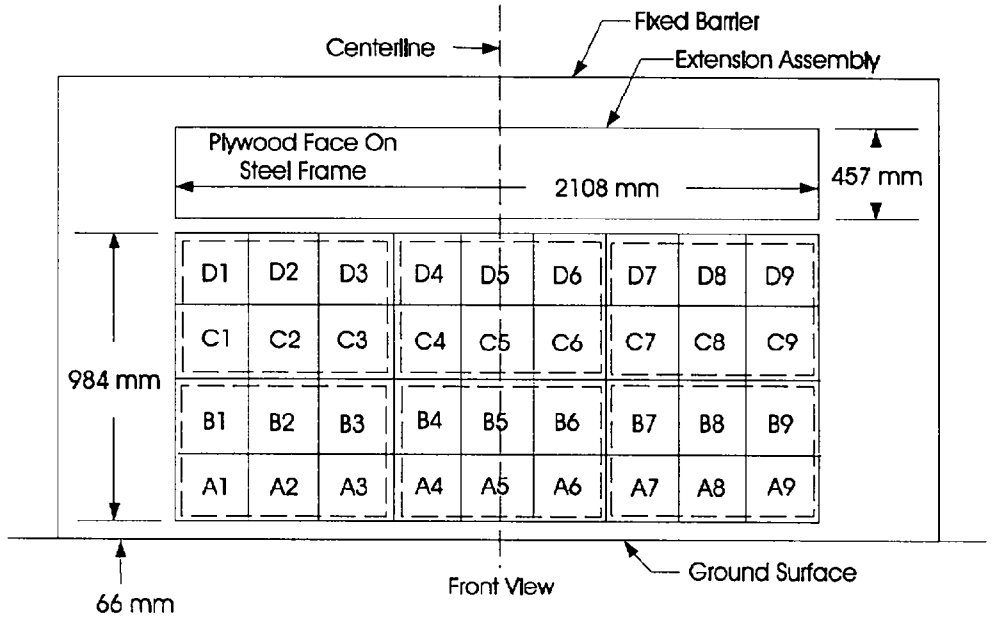


Figure 12

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)

Table 12

POST TEST AIR BAG DATA

NHTSA No. : MV0100; Test Date: February 14, 1997; Technician: J. Czarnecki

Vehicle Model Year/Make/Model: 1997 Chevrolet Venture

A. No. of vent holes: 2 -Driver 0 -Passenger

B. Size of vent holes: ($In.^2$) 1 -Driver 0 -Passenger

C. Total vent area: ($In.^2$) 2 -Driver 0 -Passenger

D. Deflated air bag length and width dimensions or, if round,diameter. (In mm)

Driver: ____ -Length; ____ -Width; 664 -Diameter

Passenger: 490 -Height; 535 -Width; 700 -Depth

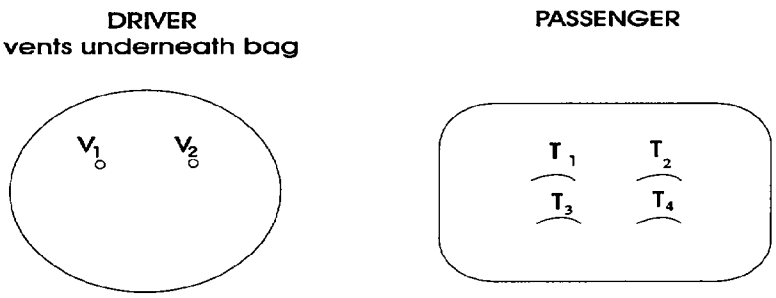
E. Is the air bag tethered?

Driver: ____ -Yes; x -No; If yes, record length of tether- ____

Passenger: x -Yes; ____ -No; If yes, record length of tether- 189 mm

Sketch the air bag showing the location of the vent holes, how the bag is tethered, and where the bag is tethered. Also describe how the tethers are attached to the bag and the steering wheel.

(Note: Not to scale; V_n = Vent hole$_n$, T_n = Tether$_n$).



F. Record part numbers and manufacturer name of the air bag and gas generator.

Driver: Air bag: 16770359 TCAP60057386

Generator: AB036615Q4FX96

Passenger: Air bag: 16757528 TJAG60005700

Generator: AL711115Q4CD9Z

Table 13

ACCIDENT INVESTIGATION DIVISION DATA

FOR 56.3 KPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Chevrolet Venture 3- Door Van

NHTSA Test No.: MV0100 VIN: 1GNDV06E7UD107451

Model Year: 1997 Build Date: 9/96 Test Date: February 14, 1997

Vehicle Size Category: Van Test Weight: 1946 Kgs

Vehicle Wheelbase: 2850 mm; Front Overhang: 1374 mm; Overall Width: 1830 mm

Collision Deformation Classification (CDC) Code: 12FDEW2

Crush Depth Dimensions;

C1 = 520 mm

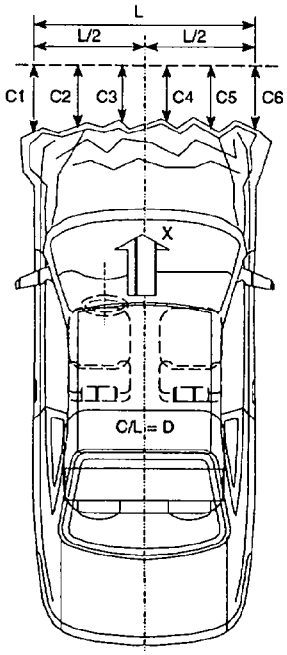
C2 = 550 mm

C3 = 675 mm

C4 = 675 mm

C5 = 555 mm

C6 = 470 mm



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

Longitude Length of Damaged Region: L= 1690 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 13

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.

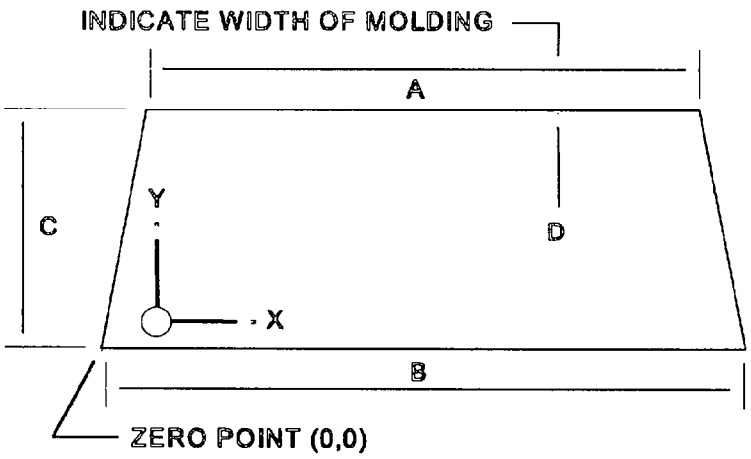
FMVSS 212 REQUIREMENTS:

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		
	PRE-TEST (mm)	POST-TEST(mm)	% OF RETENTION
RIGHT SIDE	2354	2354	100
LEFT SIDE	2354	2354	100
TOTAL	4,708	4,708	100

AREA OF RETENTION FAILURE:



FRONT VIEW OF WINDSHIELD

DIMENSIONS	
A	1309
B	1657
C	871
D	20

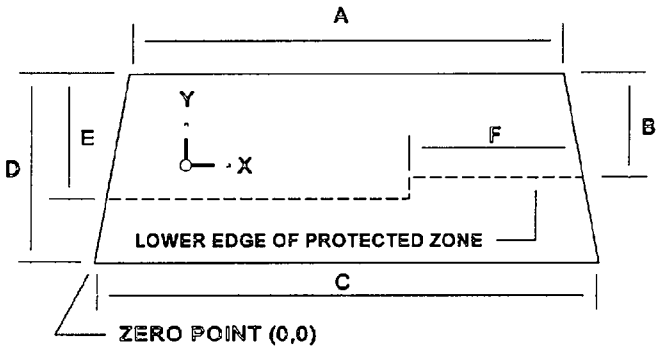
FAILURE DETAILS: none

Figure 14

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.



FRONT VIEW OF WINDSHIELD

FMVSS 219 TEST DATA: (Dimensions in mm)

DIMENSIONS	
A	1309
B	592
C	1657
D	871
E	579
F	406

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 14

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

NHTSA TEST No.: MV0100 TEST DATE: February 14, 1997

VEHICLE MAKE/MODEL: 1997 Chevrolet Venture

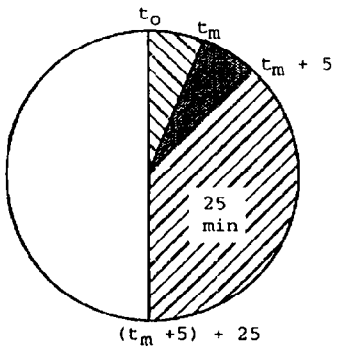
The test vehicle was filled from 92% to 94% of the manufacture's "usable" capacity. The electric fuel pump was operating if it will operate without engine operation. Two Part 572 anthropomorphic test devices were located at each of the front designated seating positions.

==========

TEST VEHICLE IMPACT TYPE:

X	Frontal (56 kph)
	Oblique (48 kph) with _____ deg. barrier face first contacting _____
-	(driver/passenger) side
-	Rear Moving Barrier (48 kph)
-	Lateral Moving Barrier (32 kph)

FUEL SPILLAGE MEASUREMENT:



	ACTUAL	MAX ALLOWED
1. From impact until vehicle motion ceases	0	1 oz.
2. For 5 minute period after vehicle motion ceases	0	5 oz.
3. For next 25 minutes	0	1 oz./min.

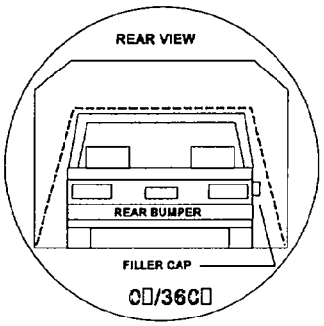
SOLVENT SPILLAGE DETAILS: NONE

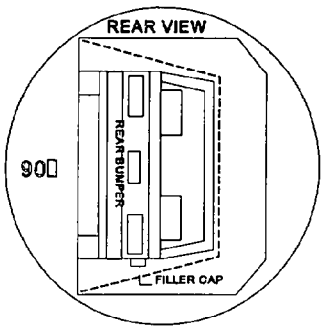
Table 15

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

NHTSA Test No.:
MV0100





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	52	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	52	seconds
Next whole minute interval	7	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	N/A

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

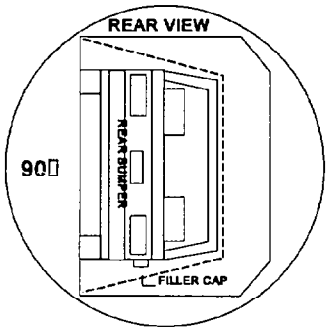
IV. SOLVENT SPILLAGE LOCATION(S): NONE

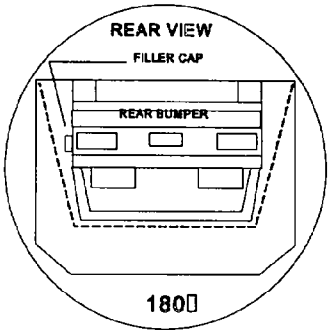
Table 15

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

NHTSA Test No.:
MV0100





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	53	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	53	seconds
Next whole minute interval	7	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	N/A

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

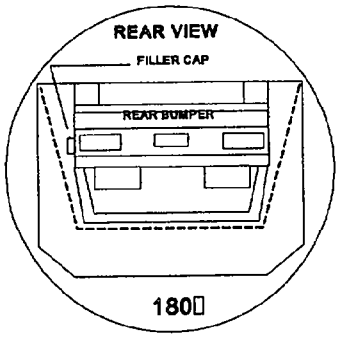
IV. SOLVENT SPILLAGE LOCATION(S): NONE

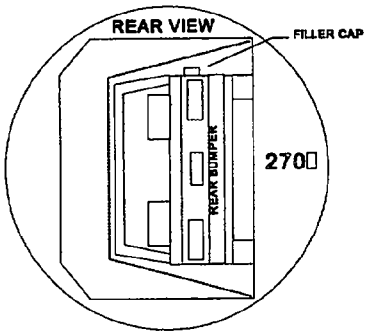
Table 15

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

NHTSA Test No.:MV0100





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	50	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	50	seconds
Next whole minute interval	7	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	N/A

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

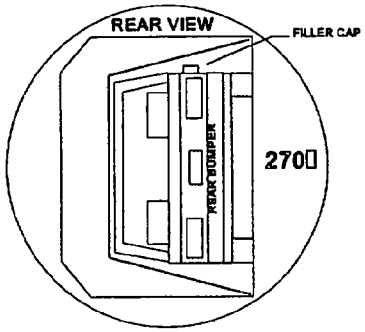
IV. SOLVENT SPILLAGE LOCATION(S): NONE

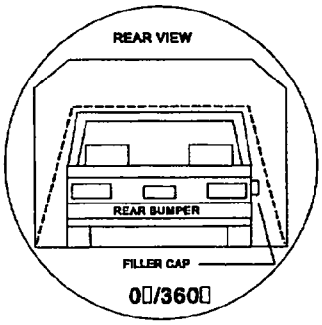
Table 15

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

NHTSA Test No.:
MV0100





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	53	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	53	seconds
Next whole minute interval	7	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	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S): NONE

Appendix A

PHOTOGRAPHS

PHOTOGRAPHS

PHOTOGRAPHS (continued)

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

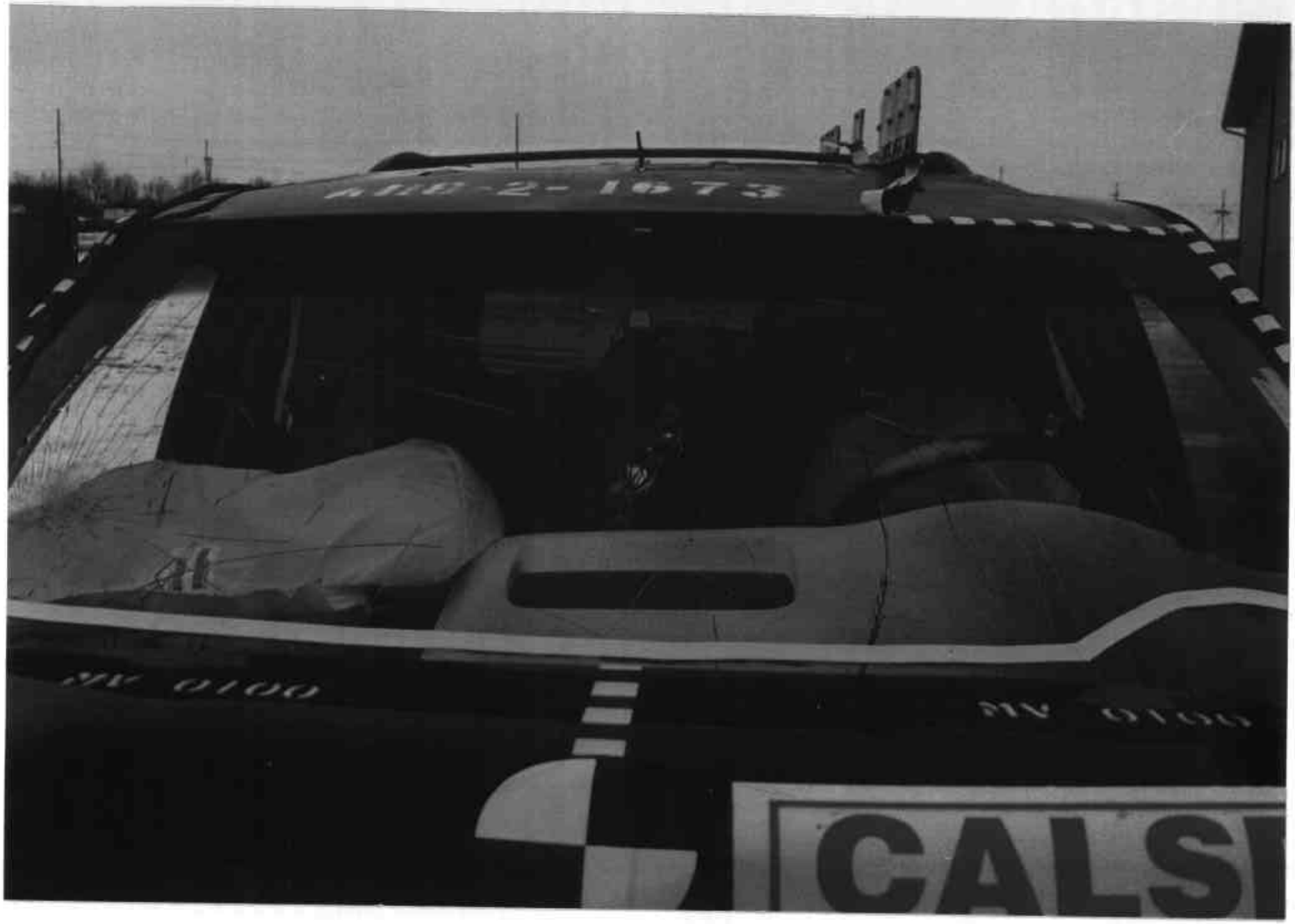


Figure A-13 POST-TEST WINDSHIELD VIEW

Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

Figure A-15 FUEL CAP VIEW

Figure A-16 PRE-TEST FRONT UNDERBODY VIEW

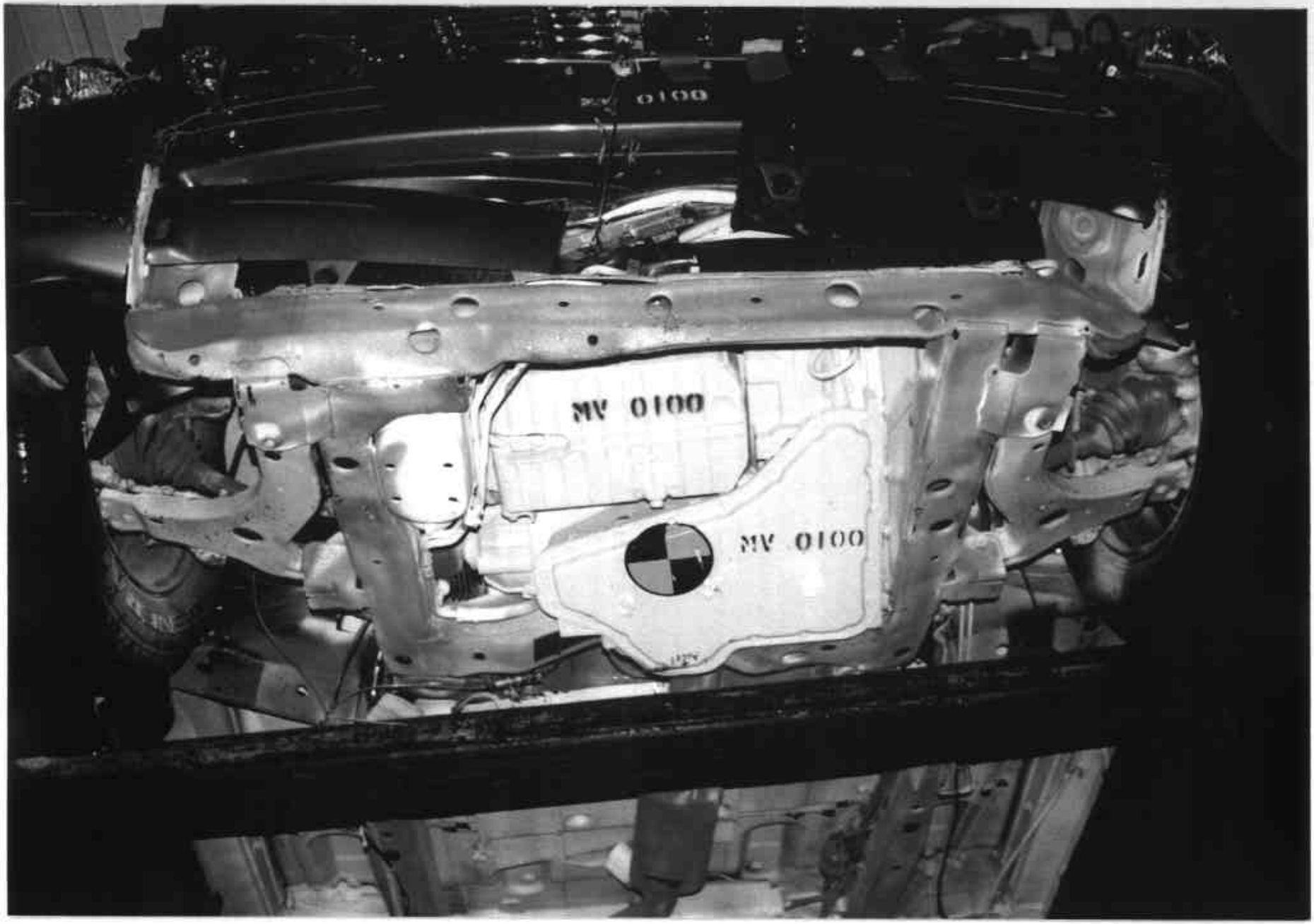


Figure A-17 POST-TEST FRONT UNDERBODY VIEW

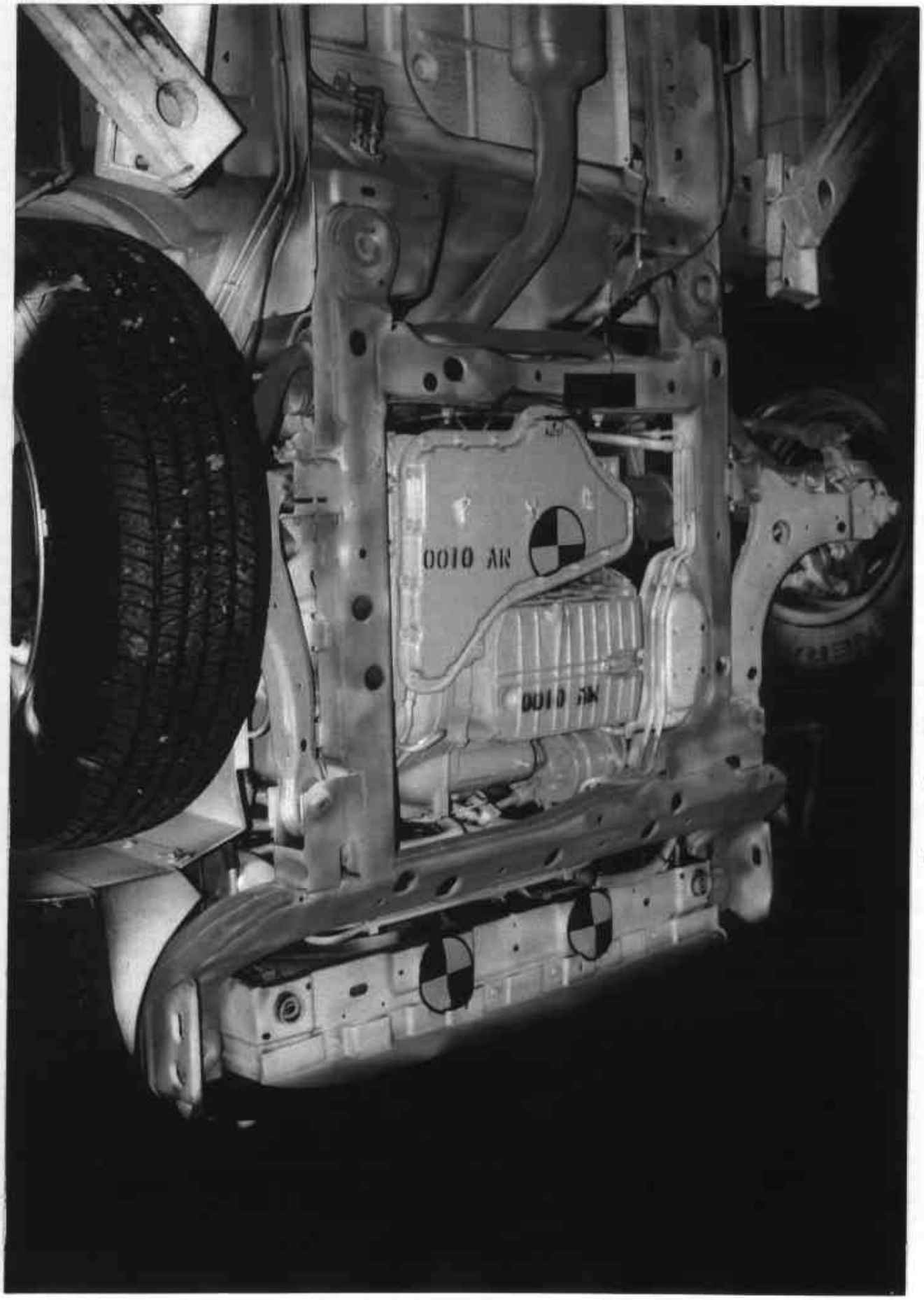


Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

Figure A-20 PRE-TEST REAR UNDERBODY VIEW

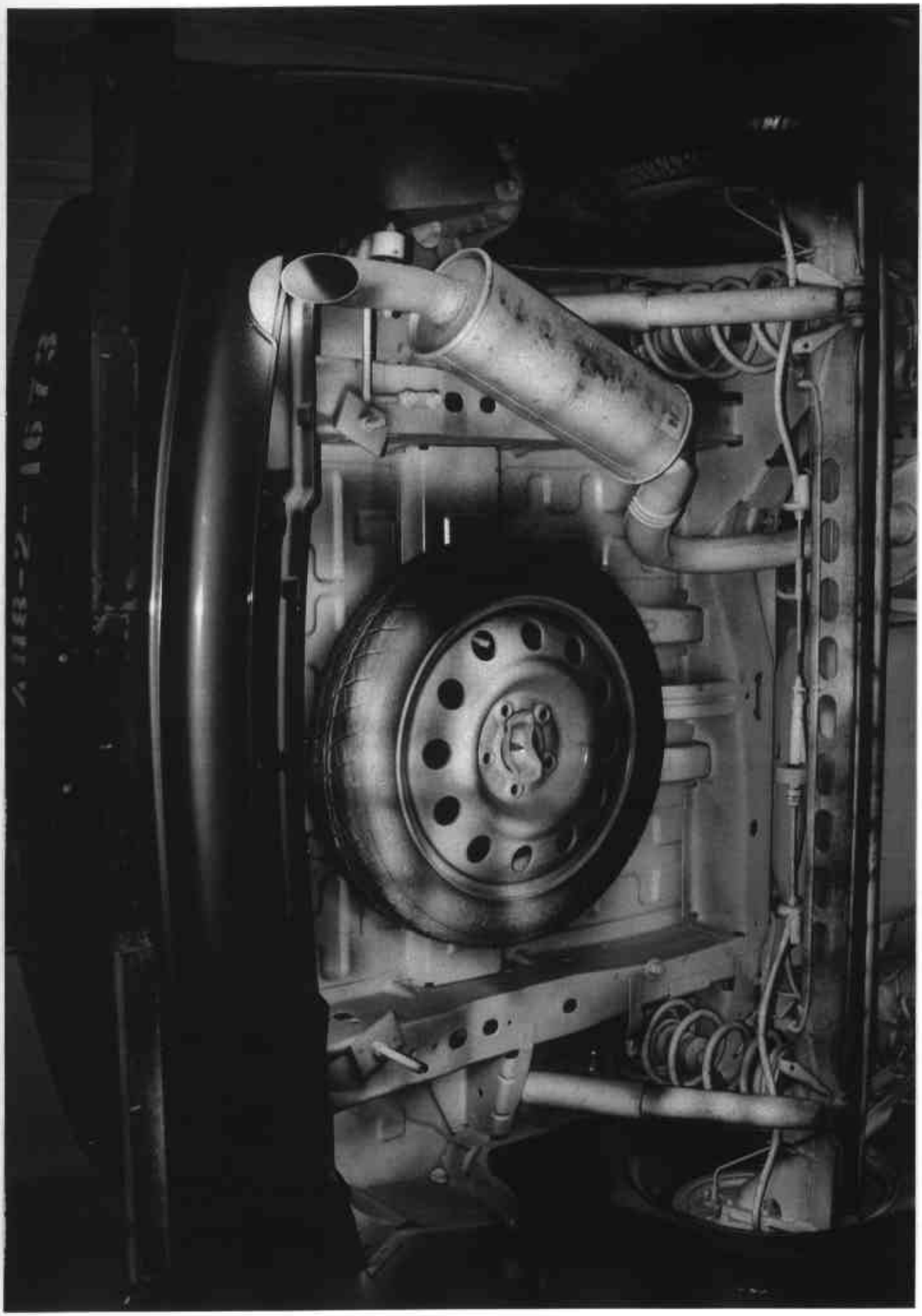


Figure A-21 POST-TEST REAR UNDERBODY VIEW

Figure A-22 PRE-TEST DRIVER POSITION VIEW

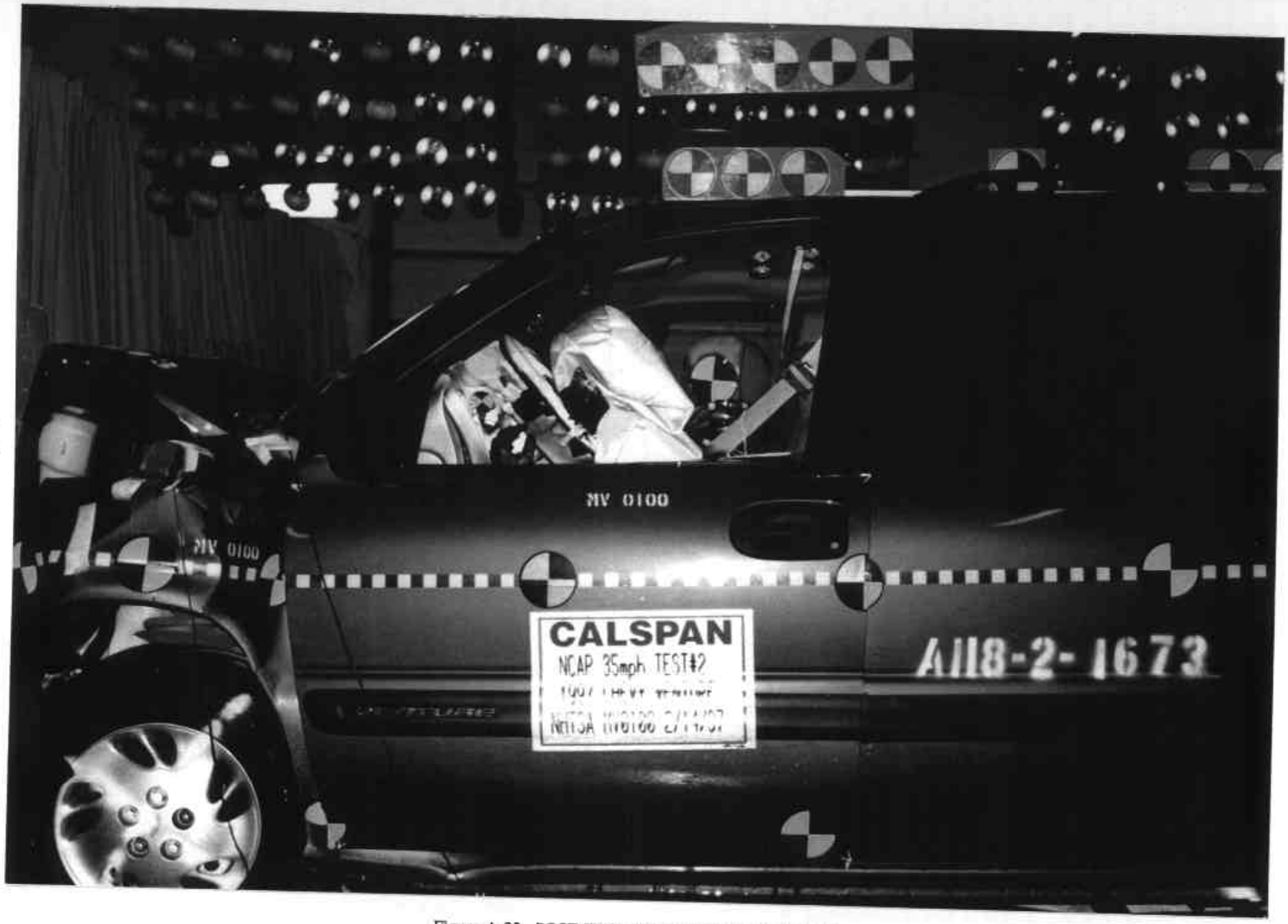


Figure A-23 POST-TEST DRIVER POSITION VIEW

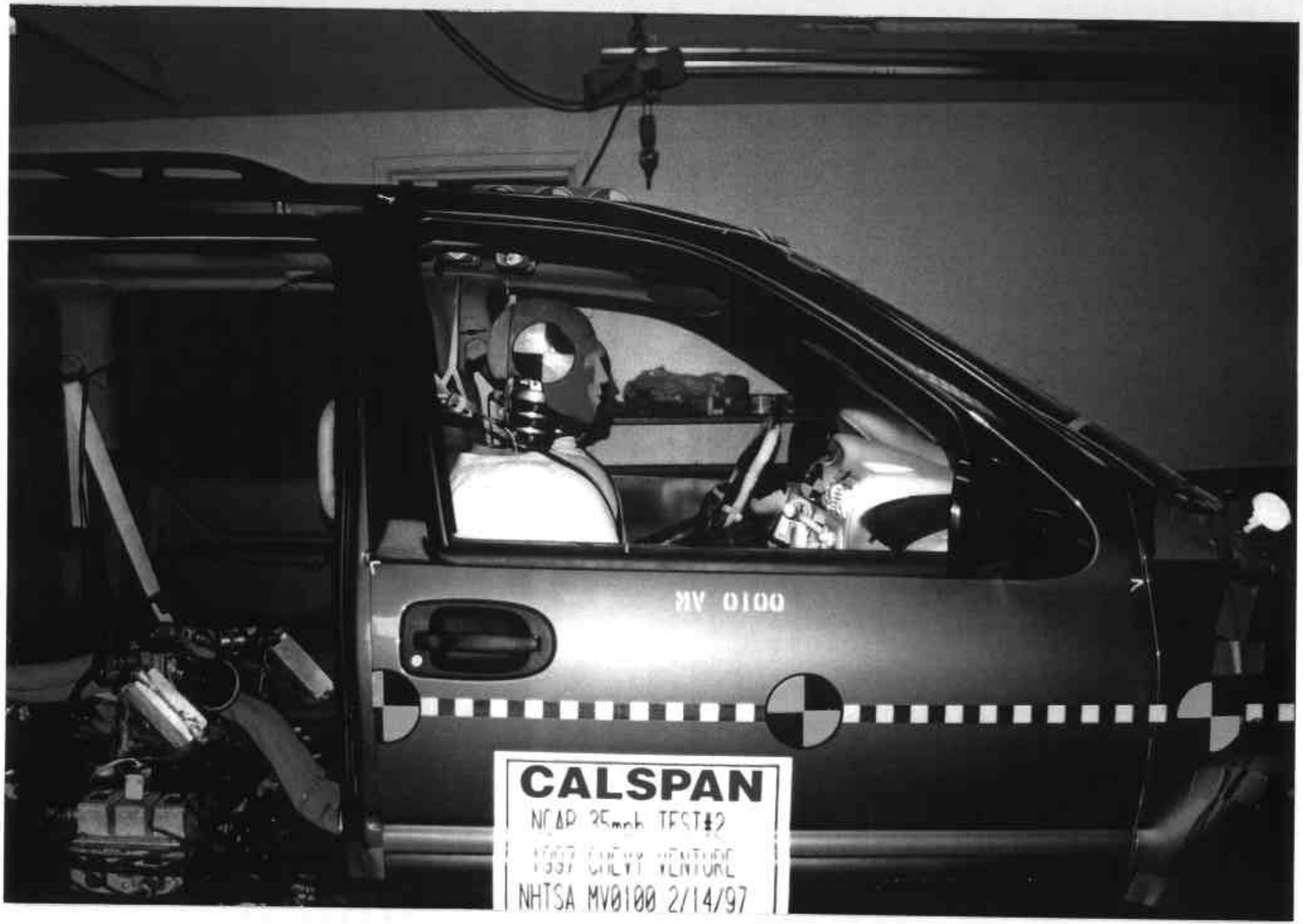


Figure A-24 PRE-TEST PASSENGER POSITION VIEW

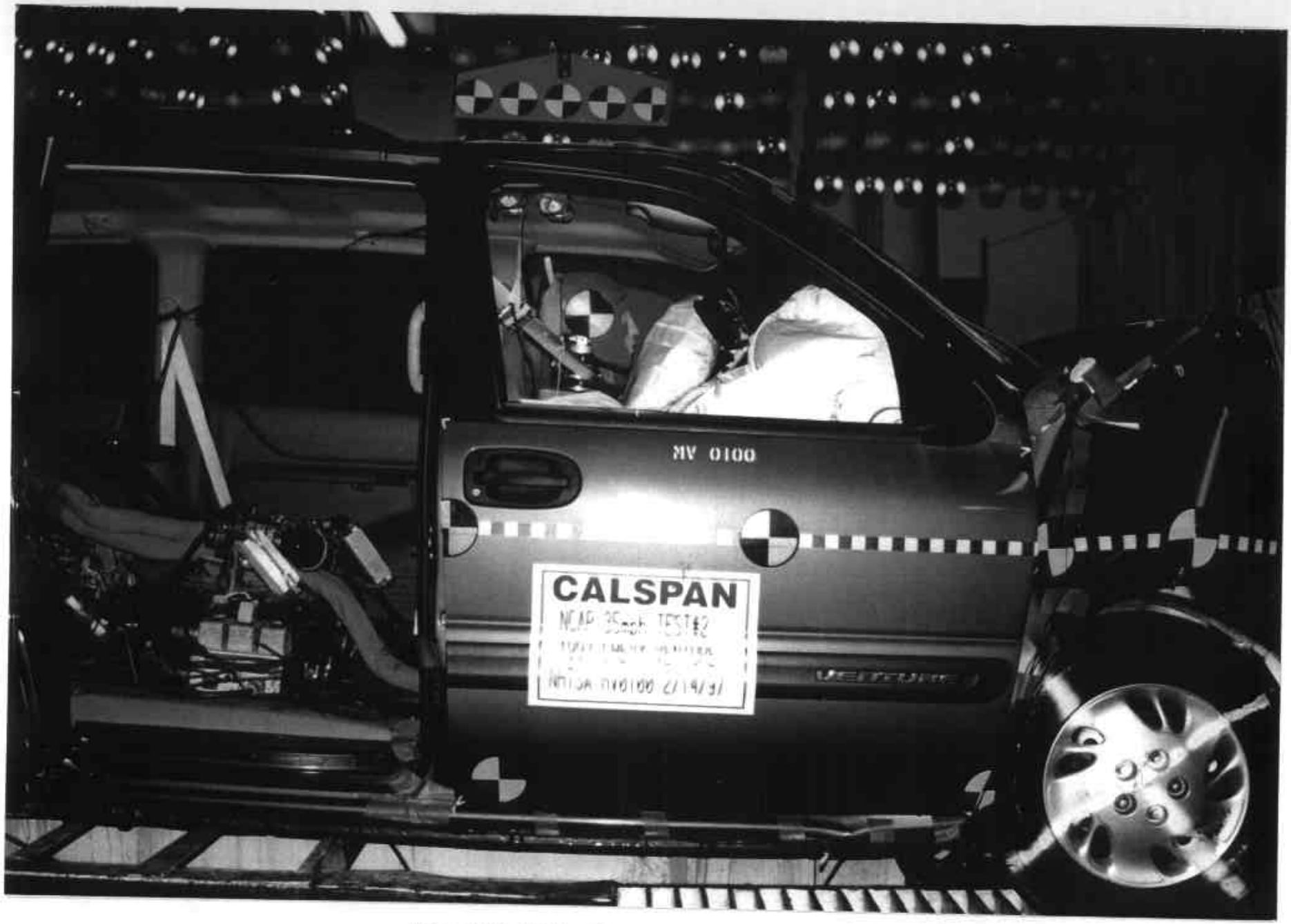


Figure A-25 POST-TEST PASSENGER POSITION VIEW

Figure A-26 PRE-TEST DRIVER AND INTERIOR VIEW

Figure A-27 POST-TEST DRIVER AND INTERIOR VIEW

Figure A-28 PRE-TEST PASSENGER AND INTERIOR VIEW

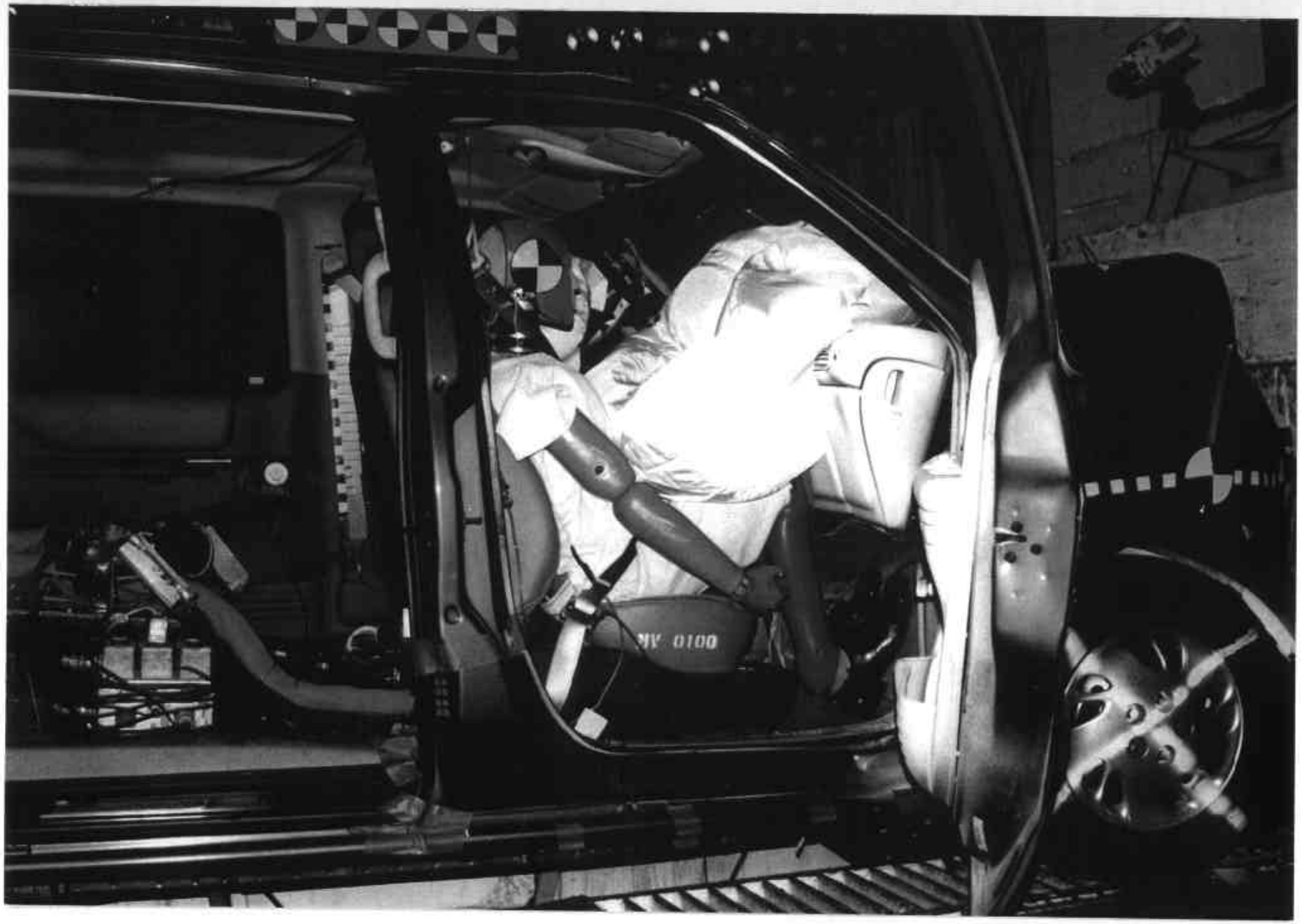


Figure A-29 POST-TEST PASSENGER AND INTERIOR VIEW

Figure A-30 PRE-TEST DRIVER HEAD LOCATION

Figure A-31 POST-TEST DRIVER HEAD LOCATION

A-35

8406-2

Figure A-32 PRE-TEST PASSENGER HEAD LOCATION

Figure A-33 POST-TEST PASSENGER HEAD LOCATION

Figure A-34 PRE-TEST DRIVER FLOOR PAN VIEW

Figure A-35 POST-TEST DRIVER FLOOR PAN VIEW

Figure A-36 PRE-TEST PASSENGER FLOOR PAN VIEW

Figure A-37 POST-TEST PASSENGER FLOOR PAN VIEW

Figure A-38 ROLLOVER VIEW

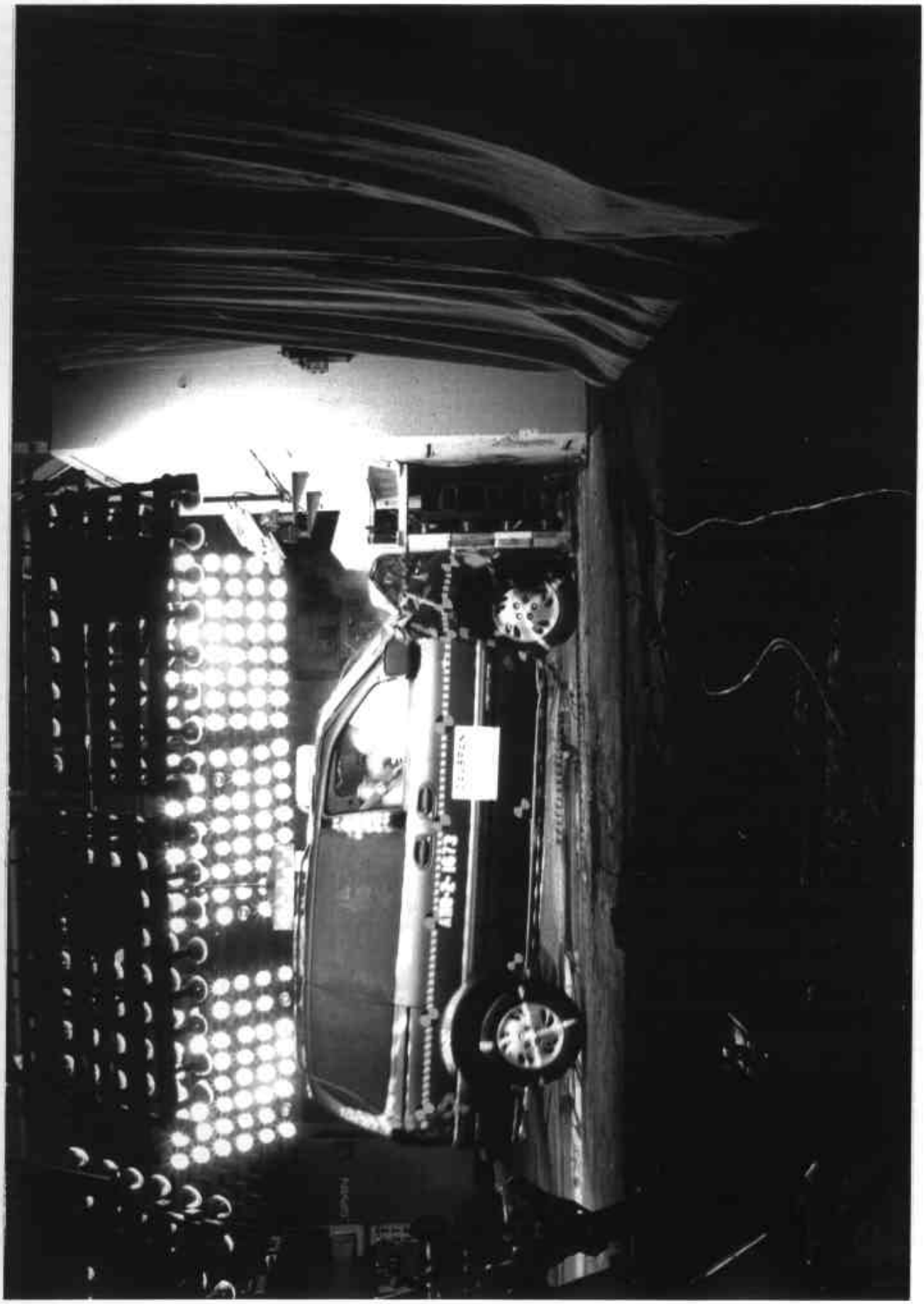


Figure A-39 IMPACT VIEW

Appendix B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

NHTSA TEST NO. MV0100

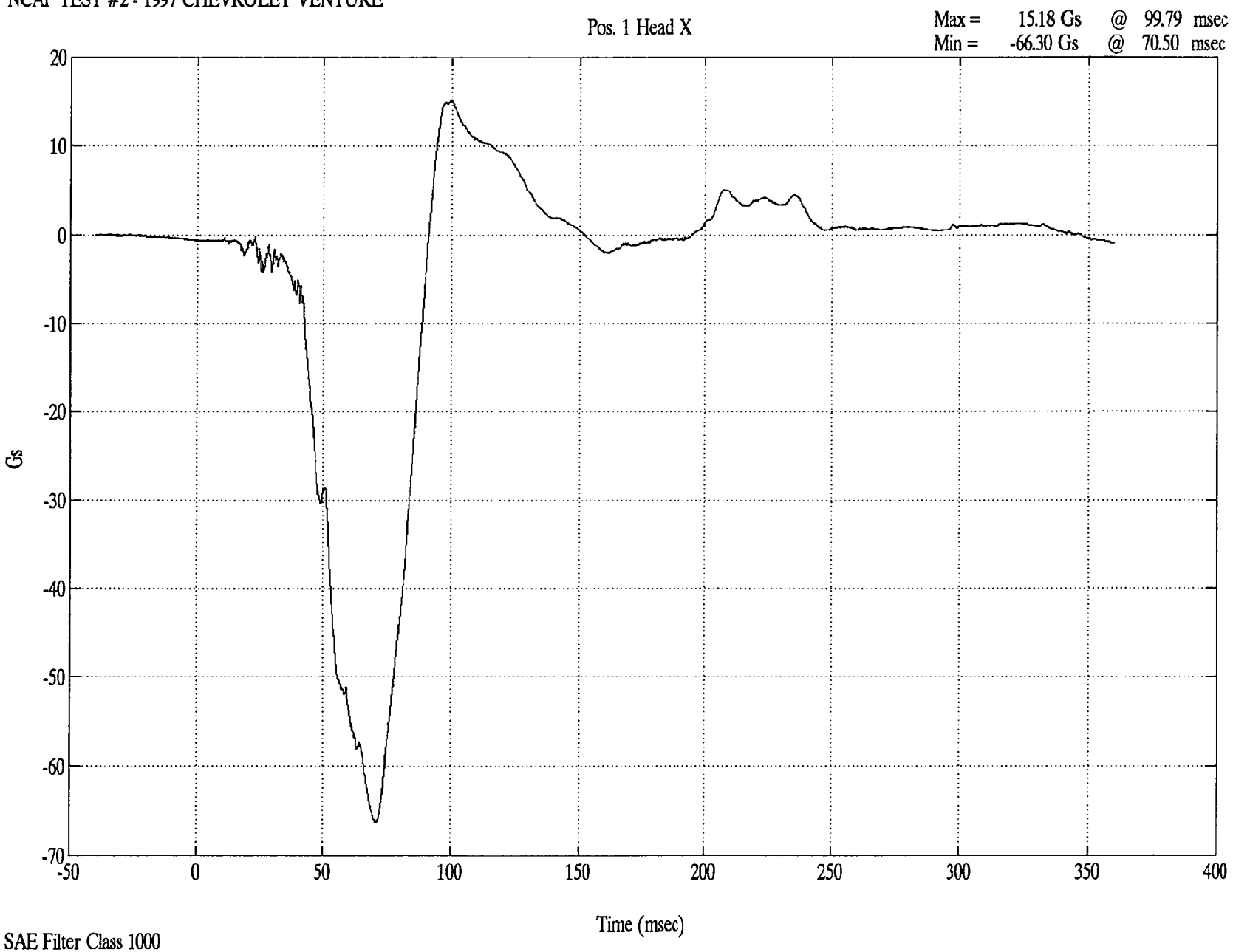
DUMMY DATA

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

Hybrid III Dummy Sign Conventions
Load Cells and Special Transducers

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

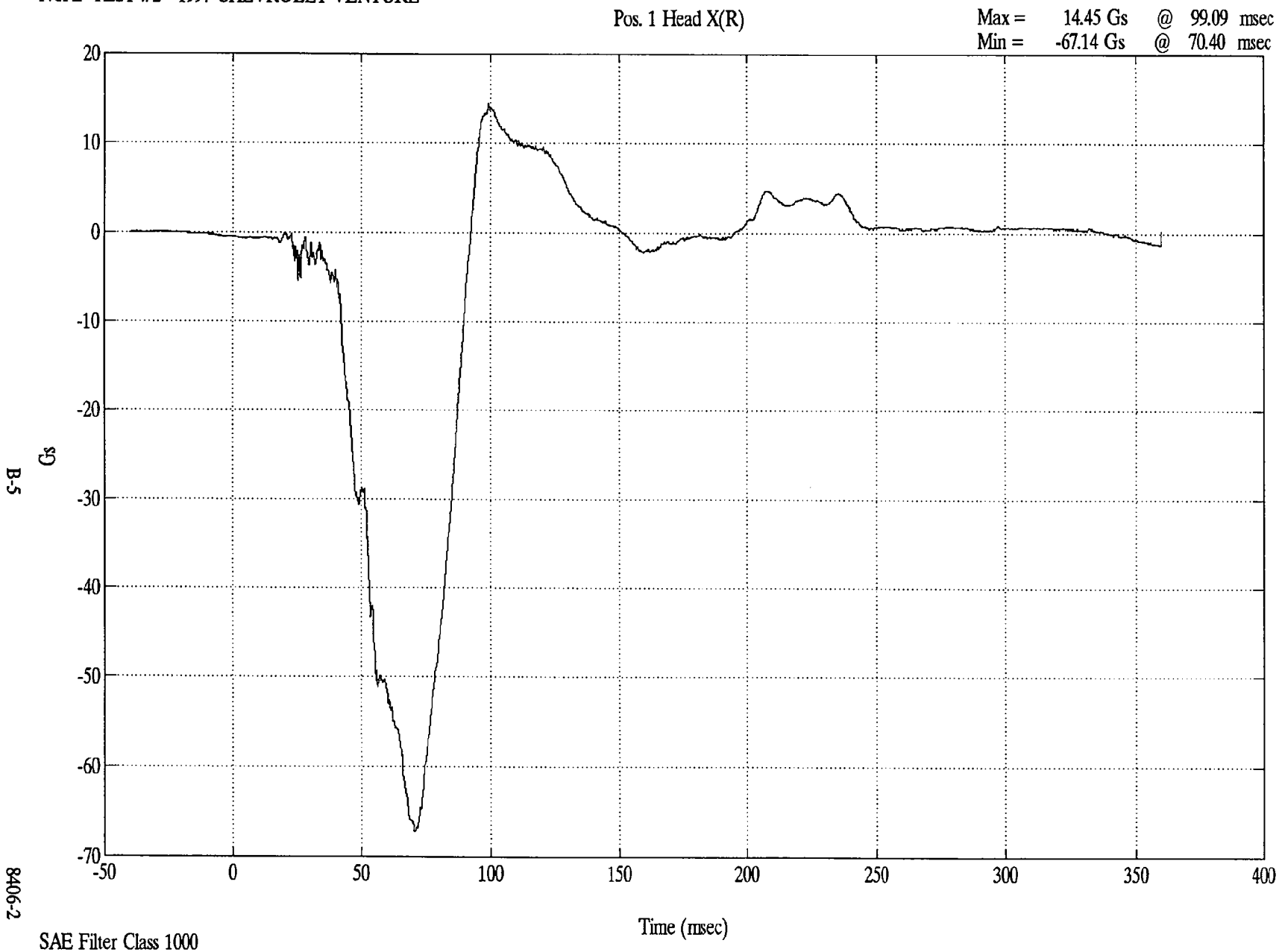
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 1000

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

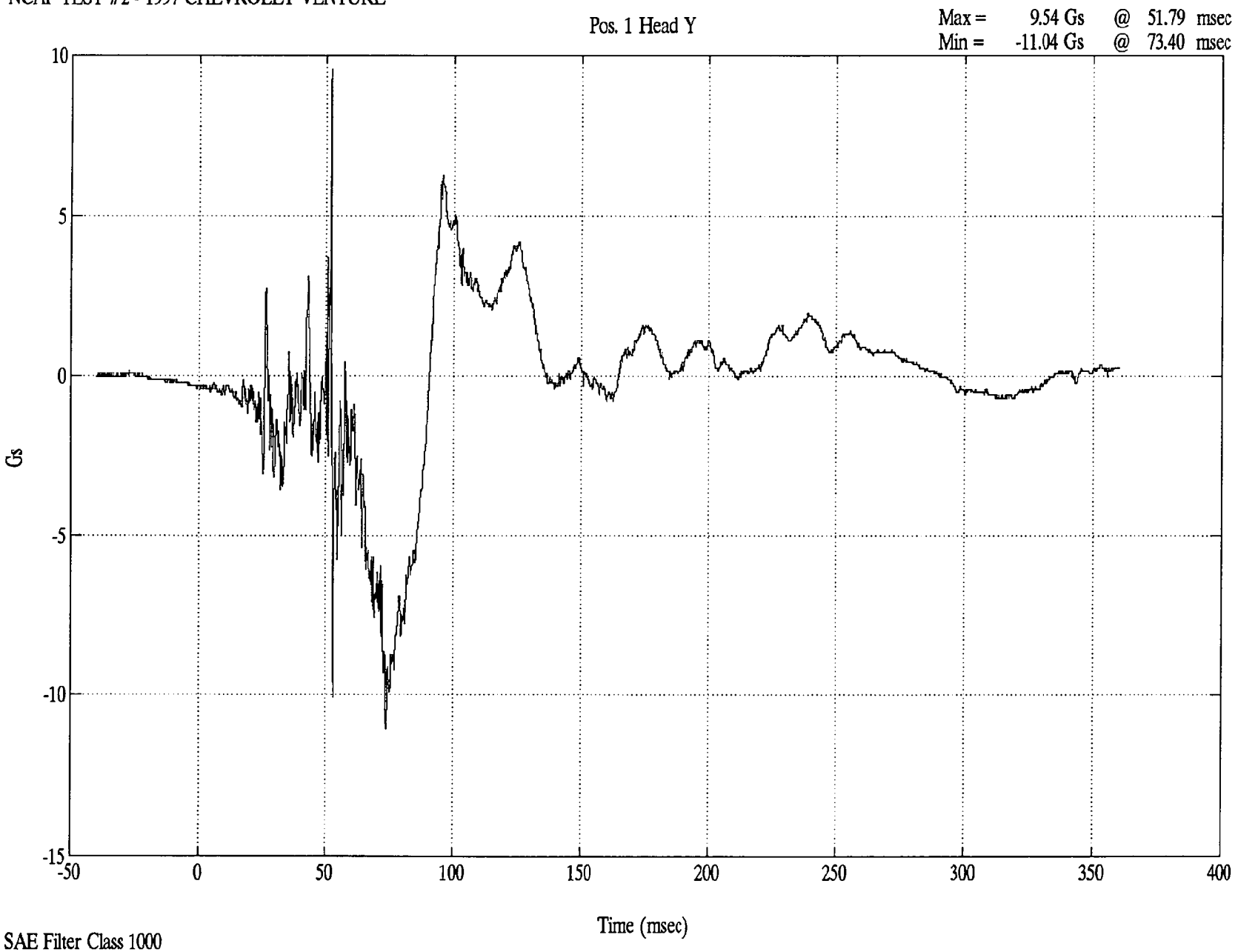


B-5

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

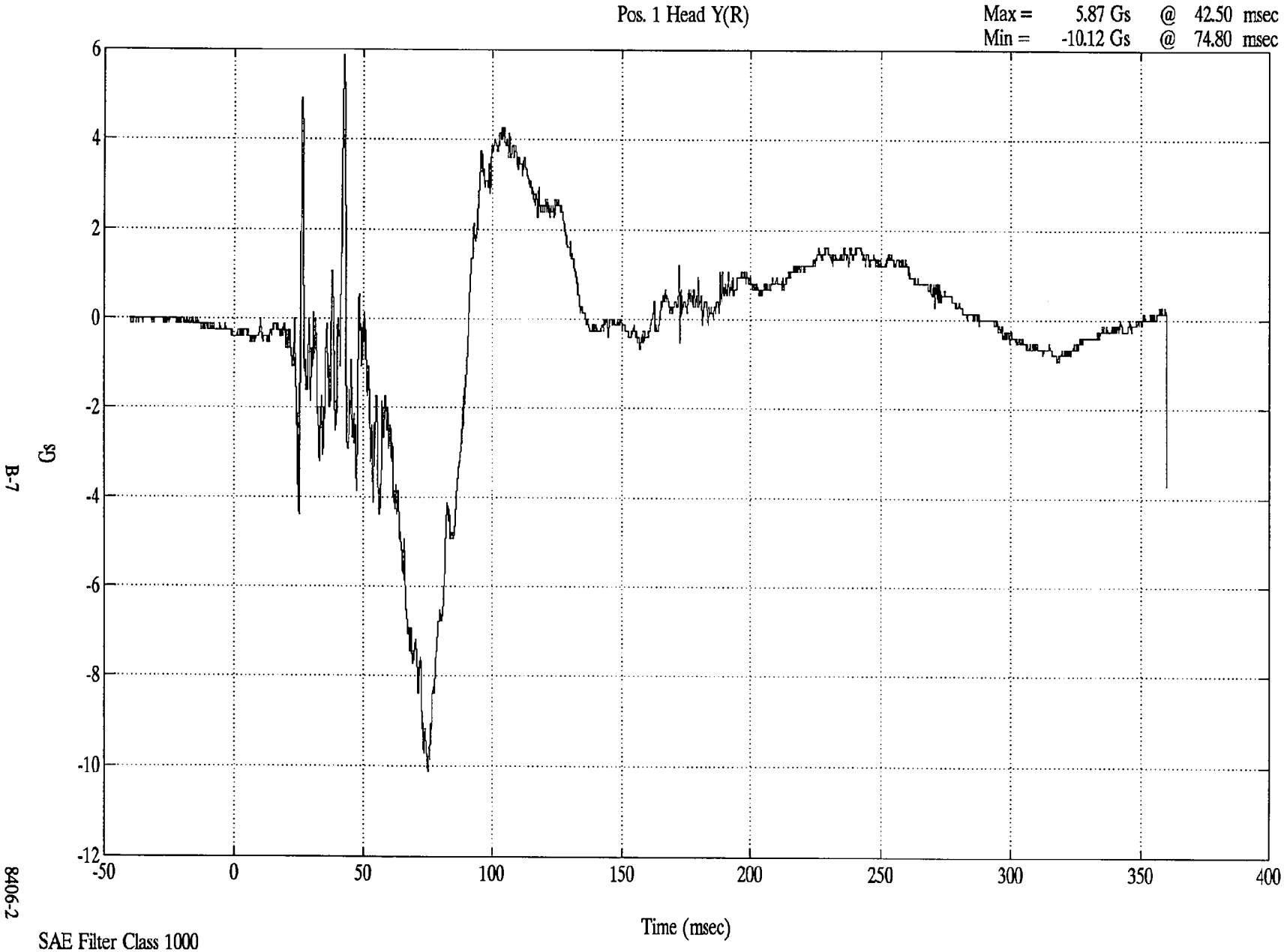


B-6

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

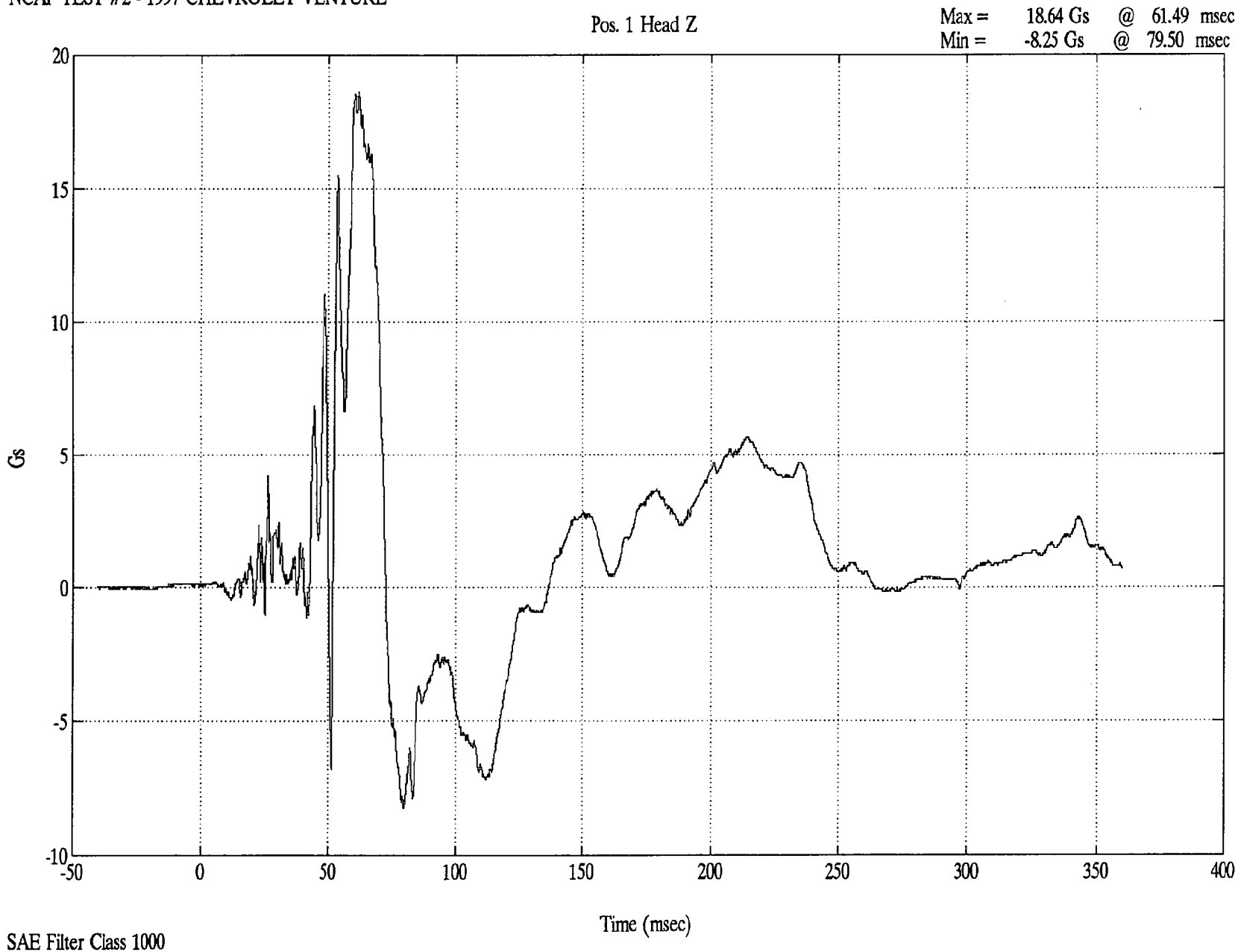


B-7

8406-2

SAE Filter Class 1000

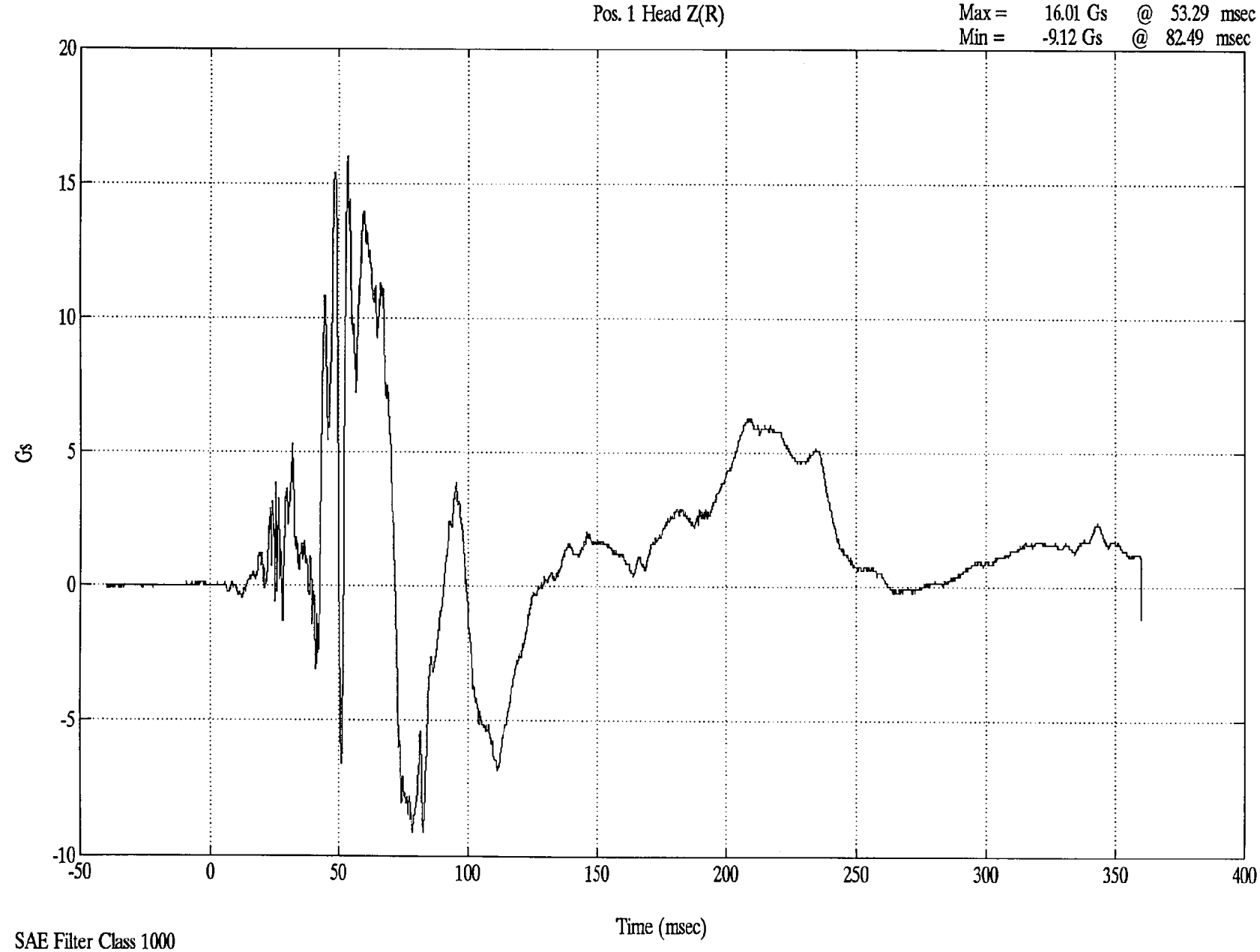
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 1000

8406-2

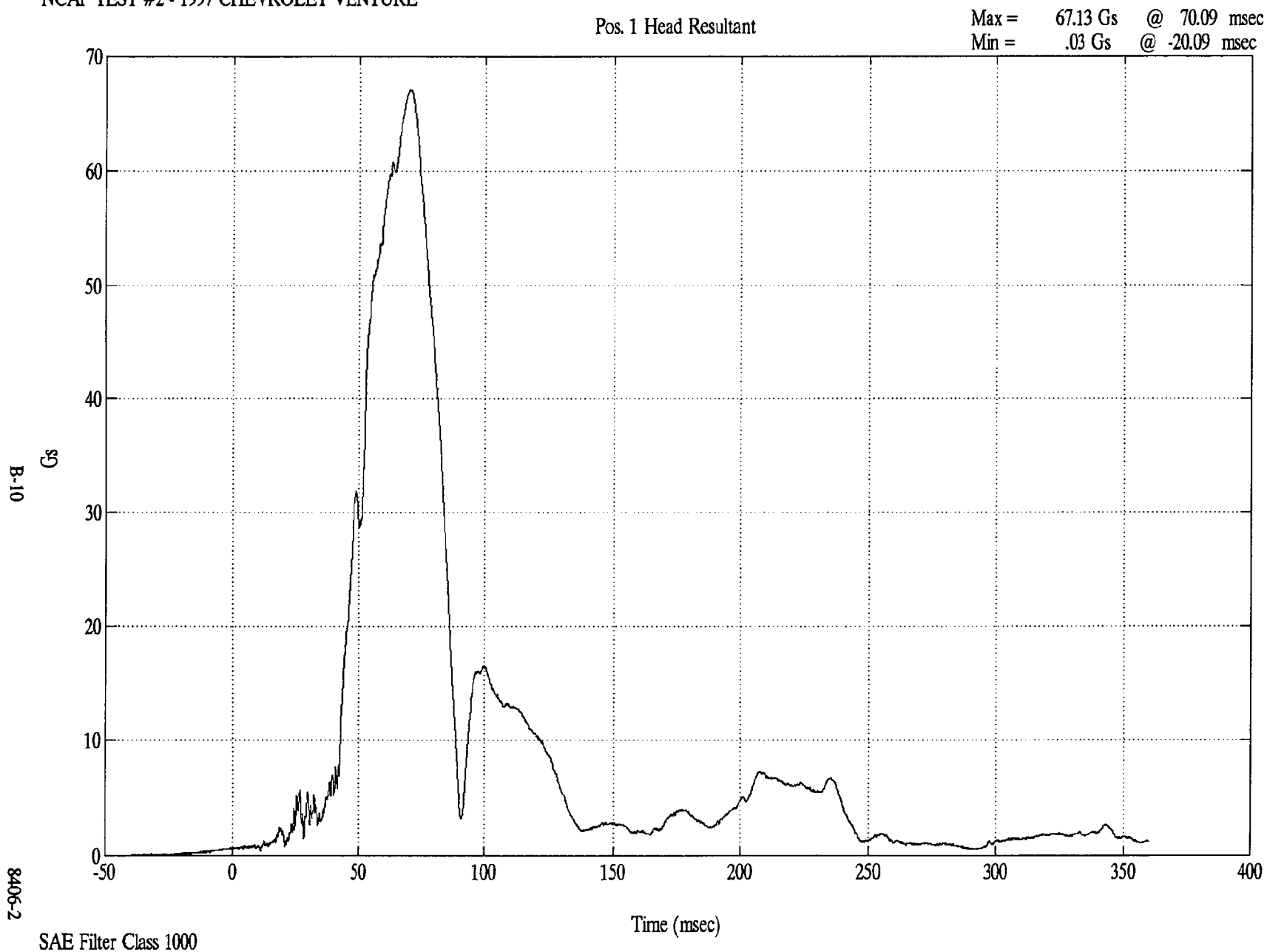
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 1000

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

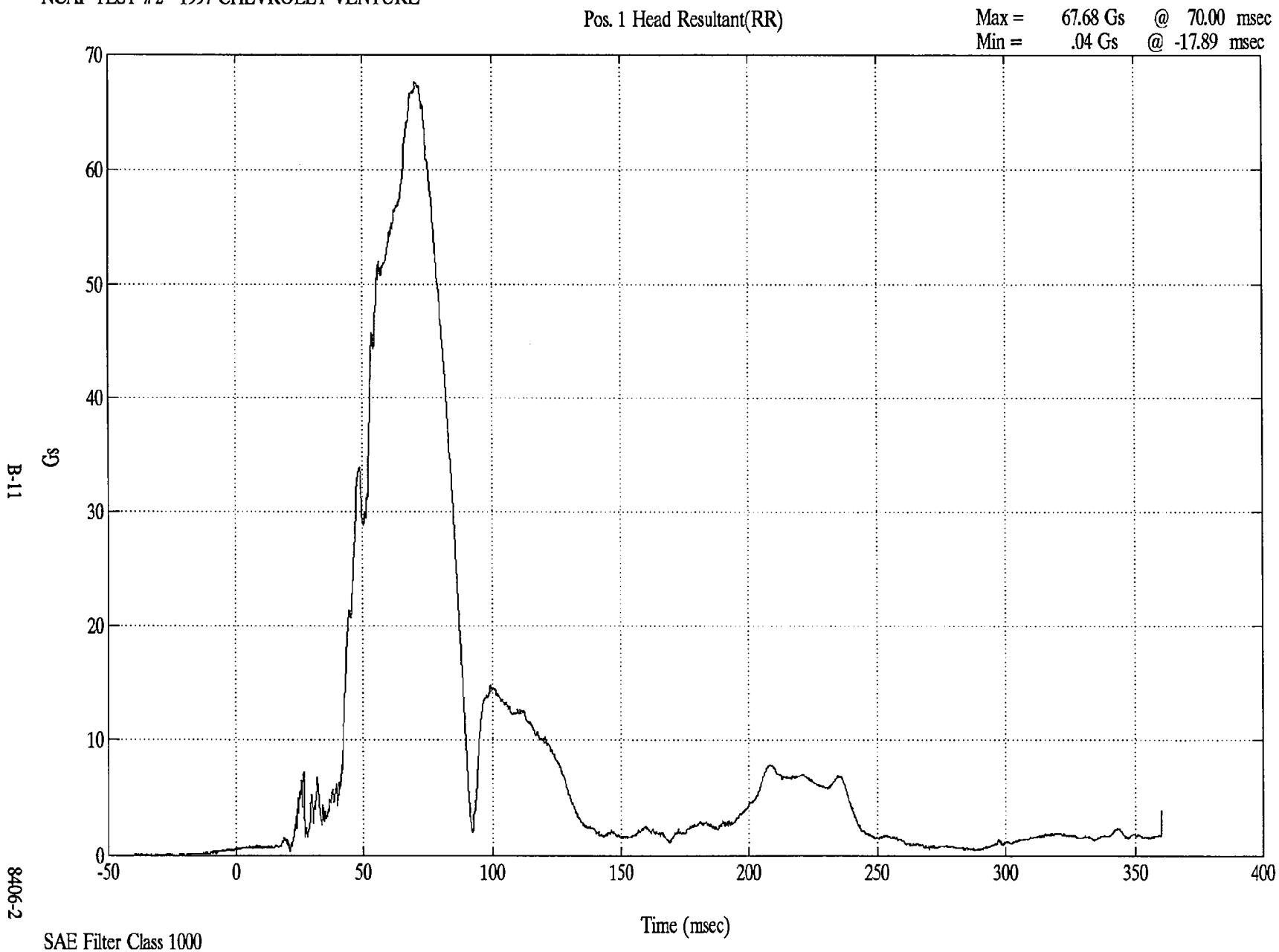


B-10

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

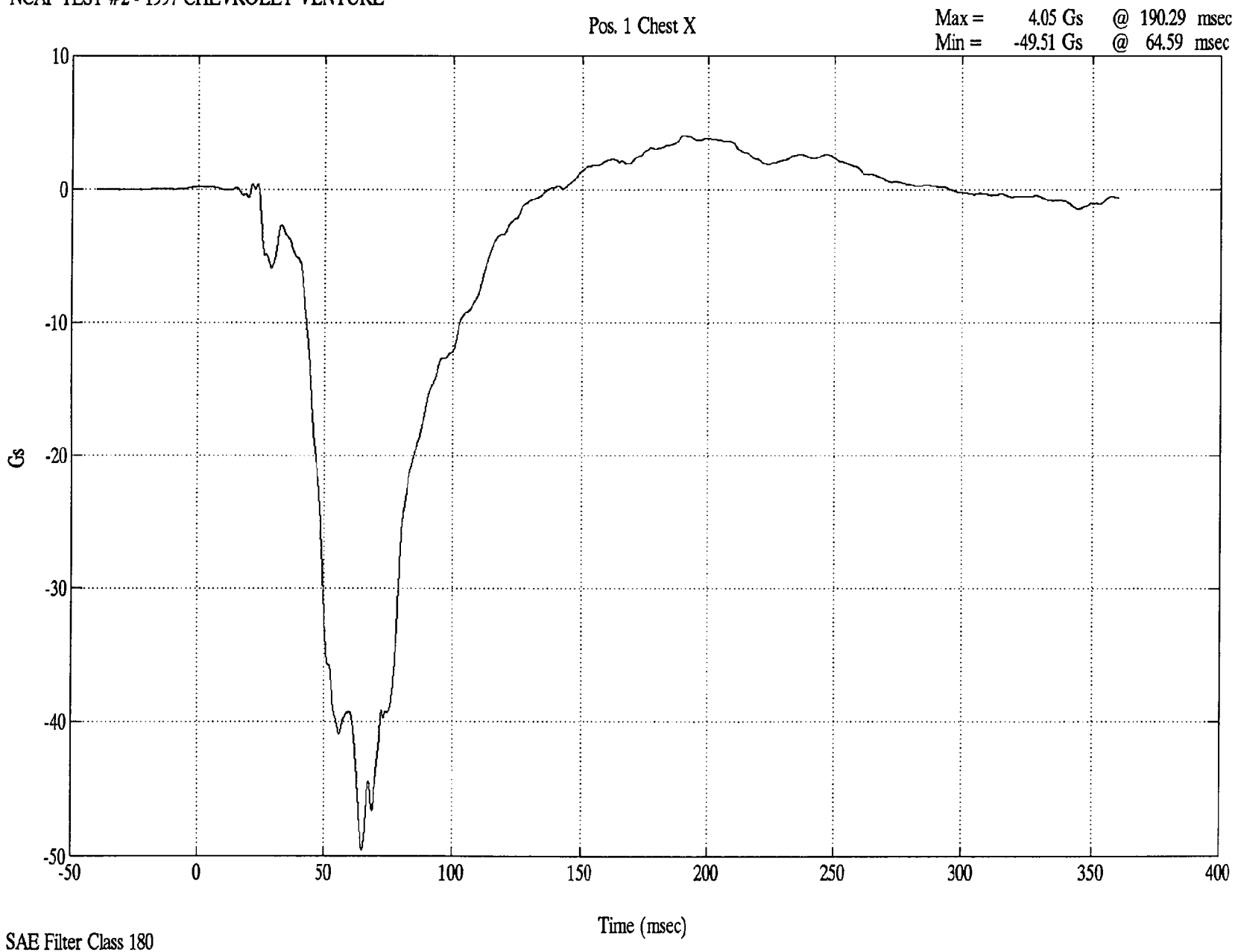


B-11

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

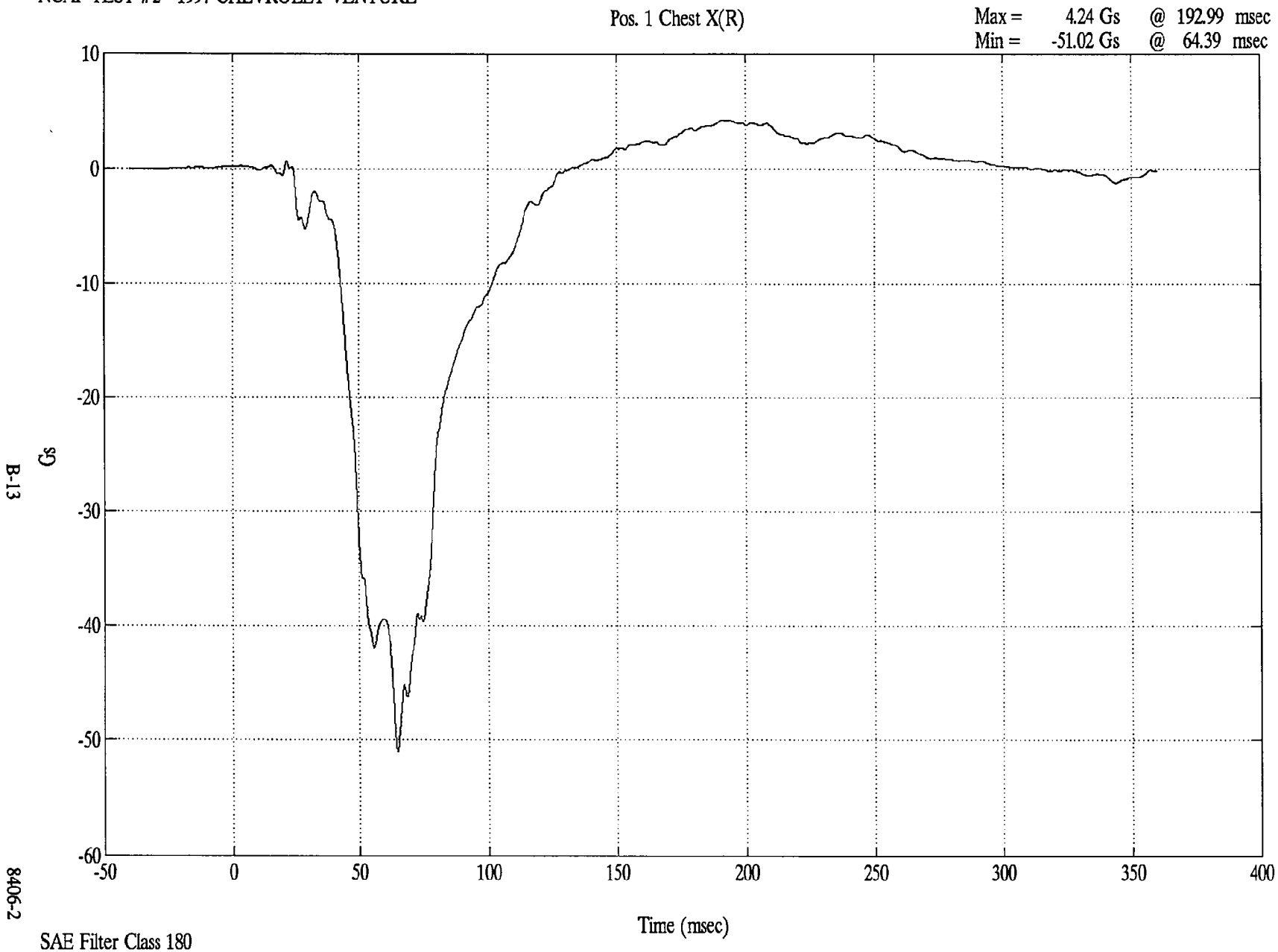


B-12

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

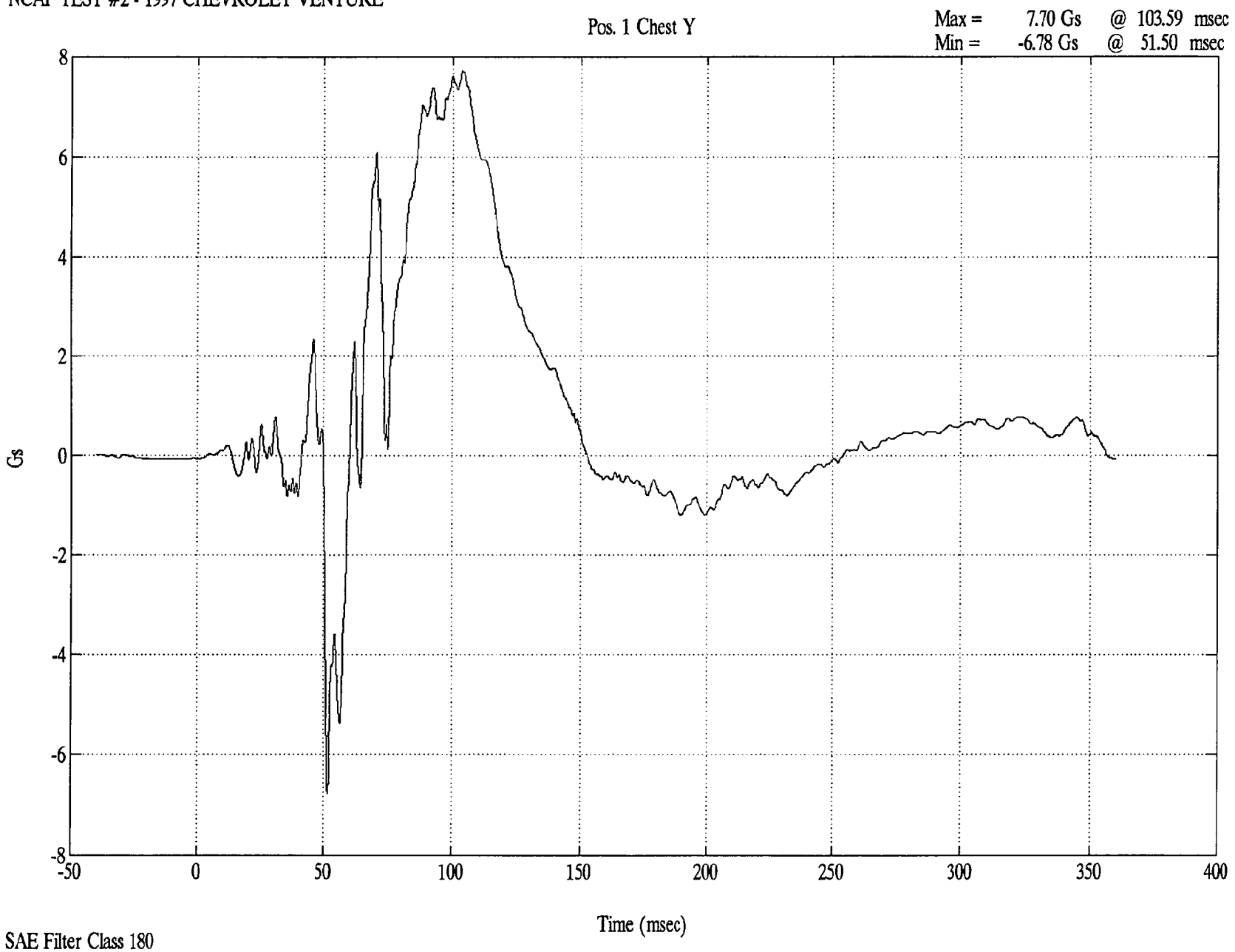


B-13

8406-2

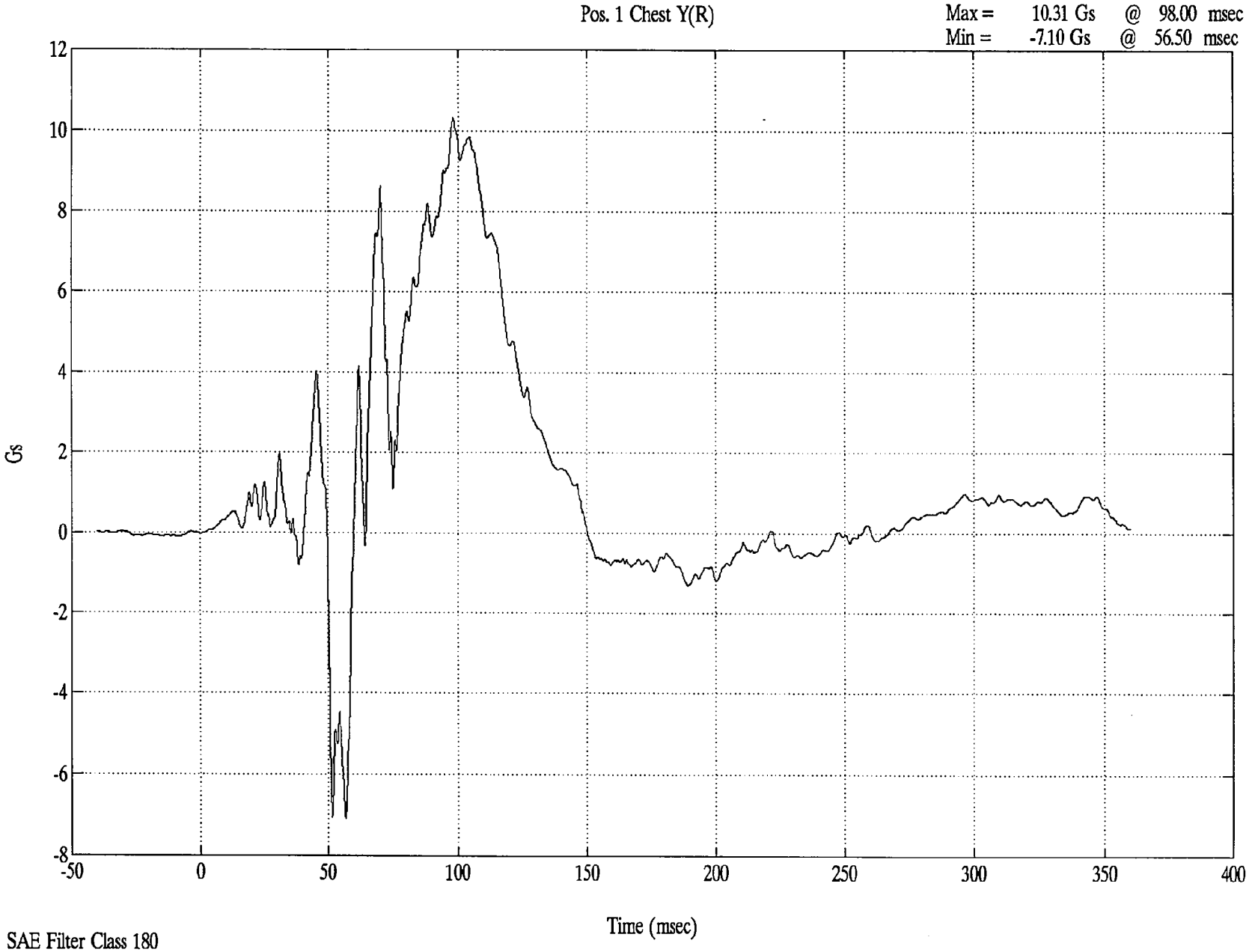
SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

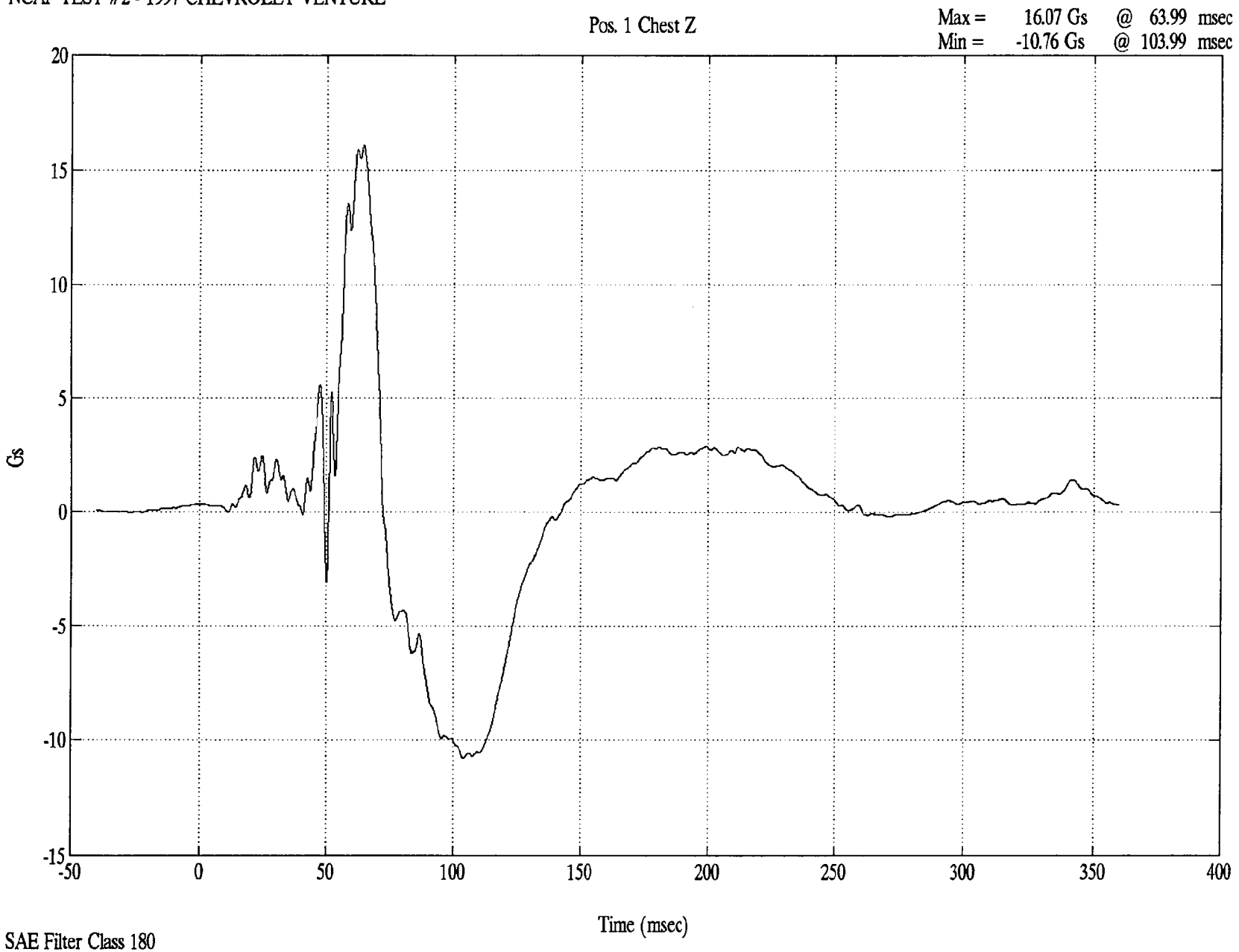


B-15

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

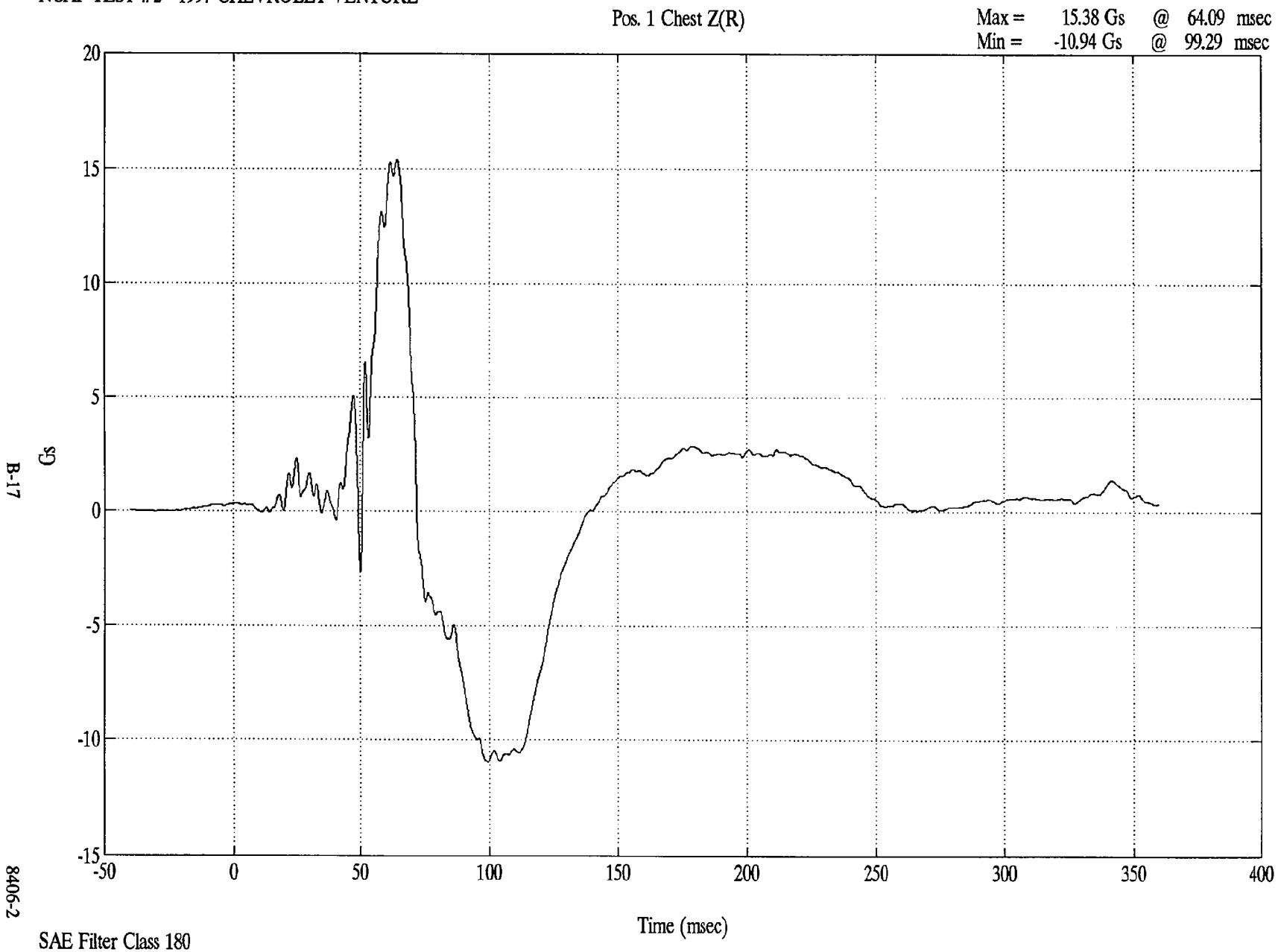


B-16

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

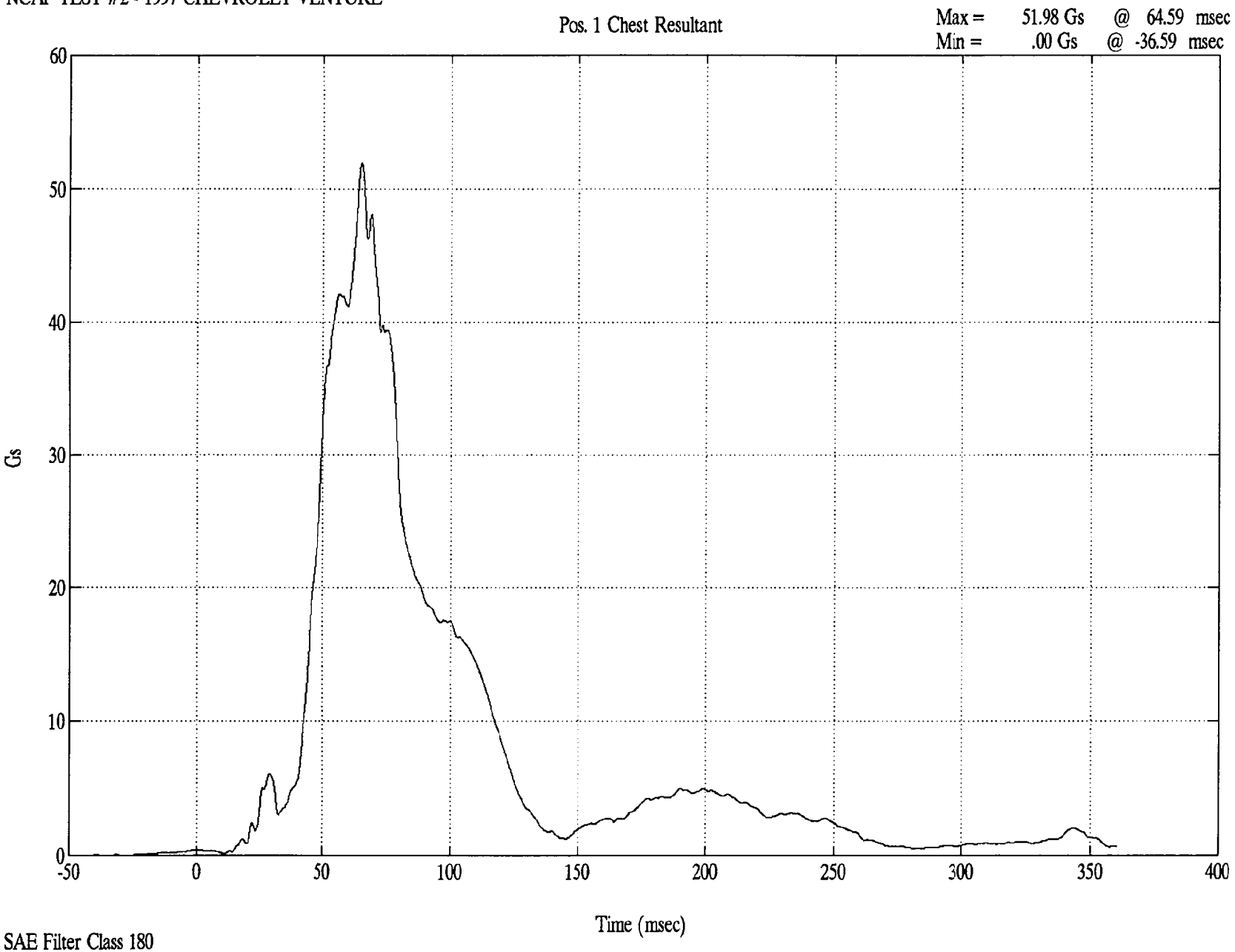


B-17

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

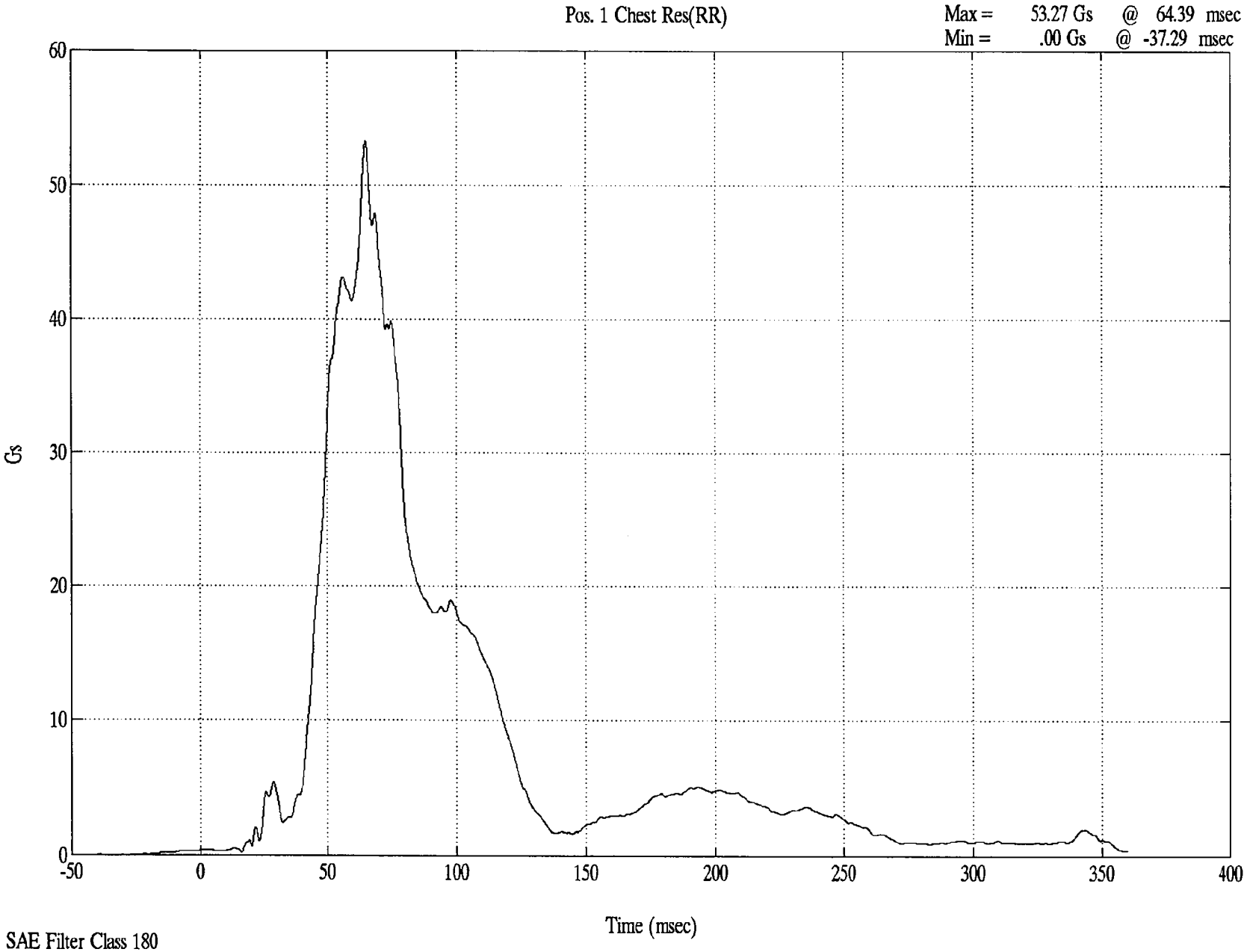


B-18

8406-2

SAE Filter Class 180

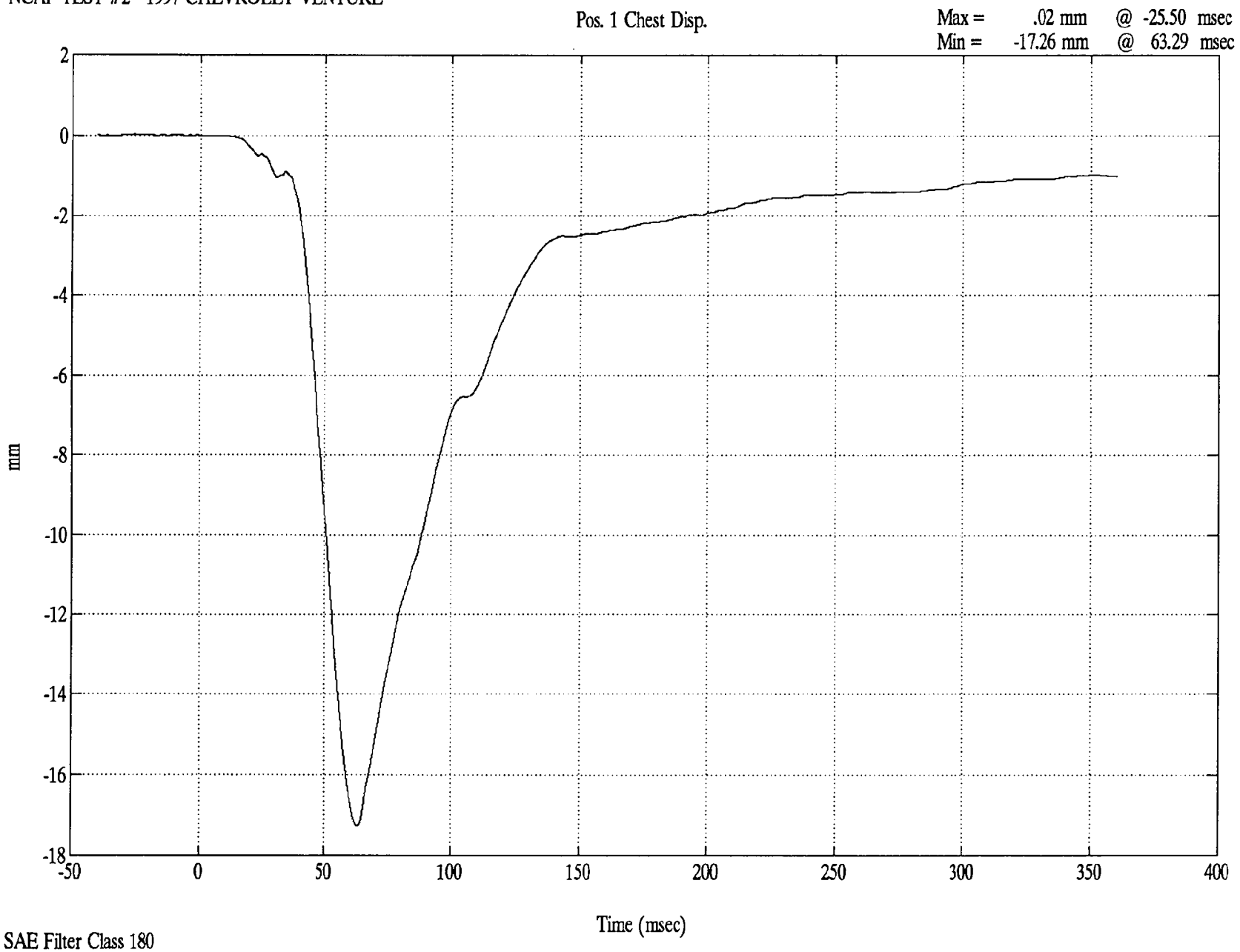
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 180

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

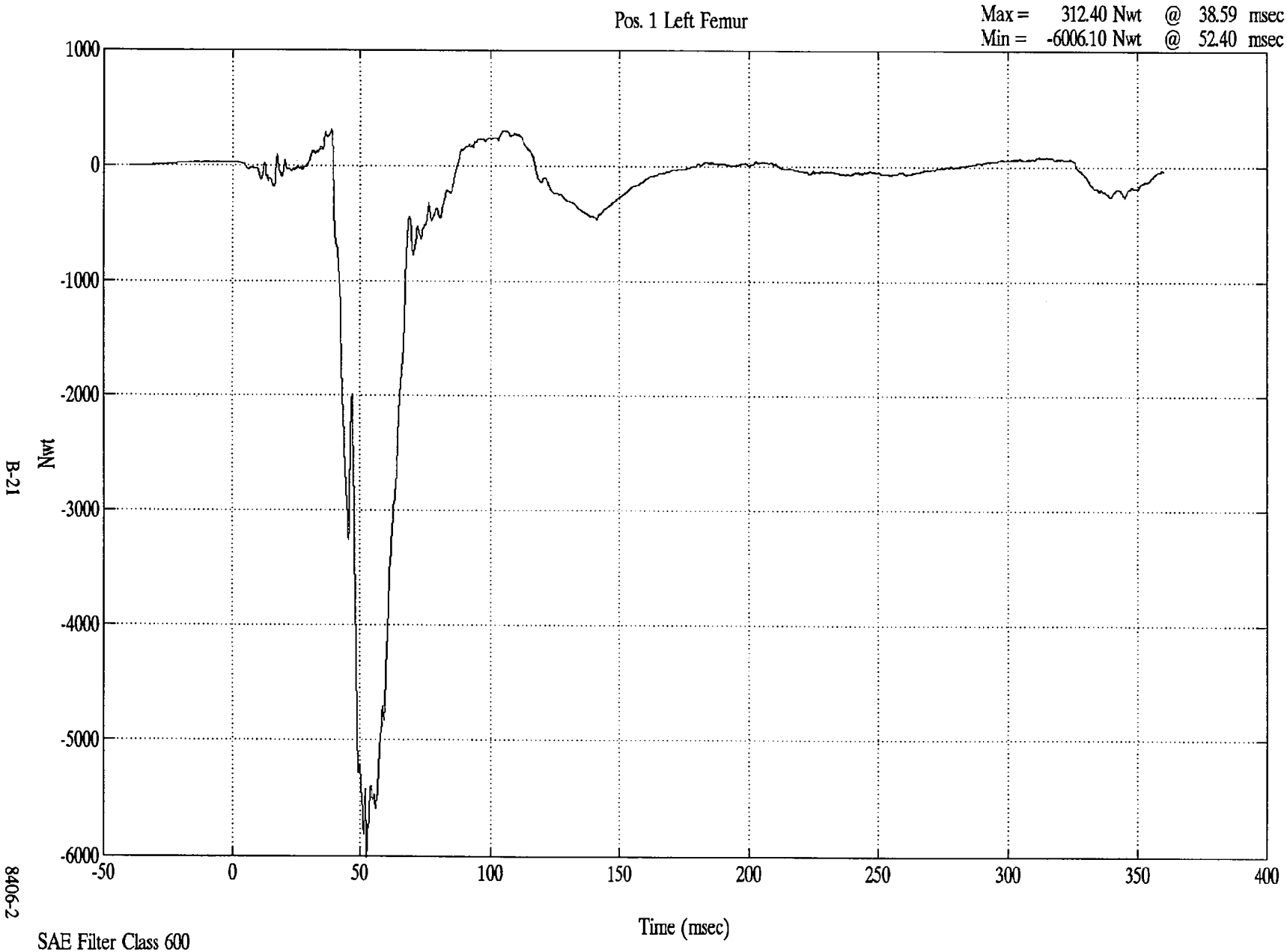


B-20

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

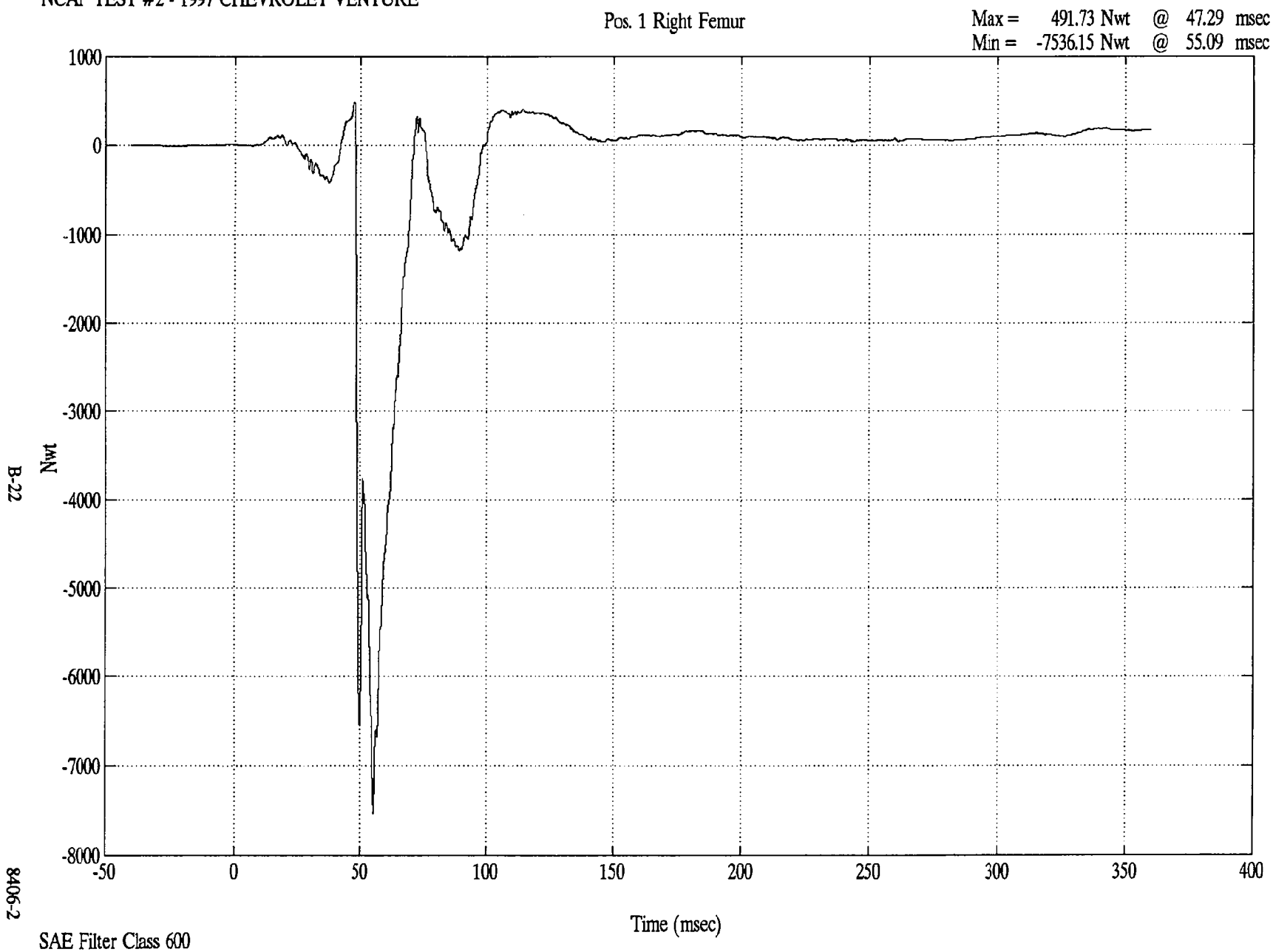


B-21

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

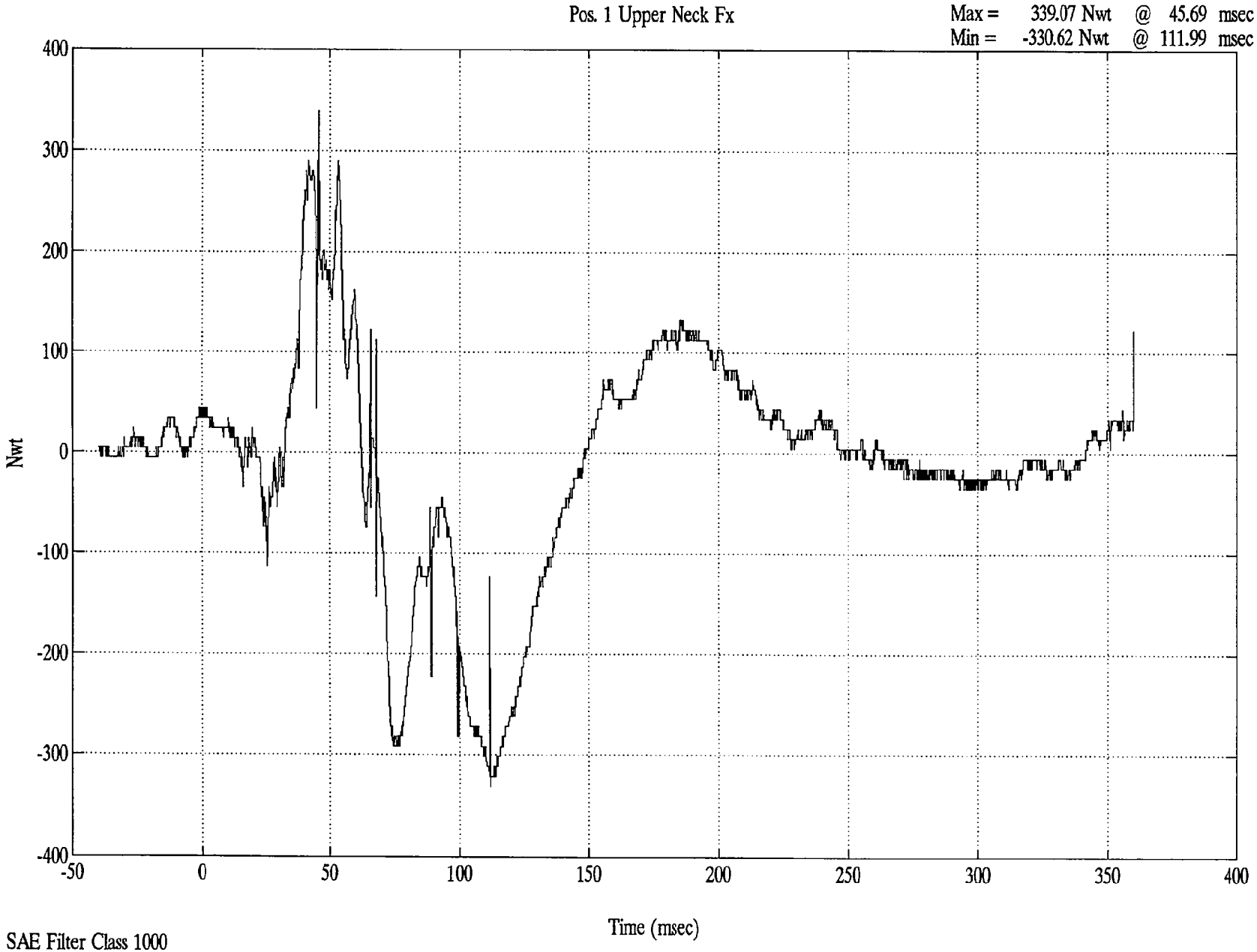


B-22

8406-2

SAE Filter Class 600

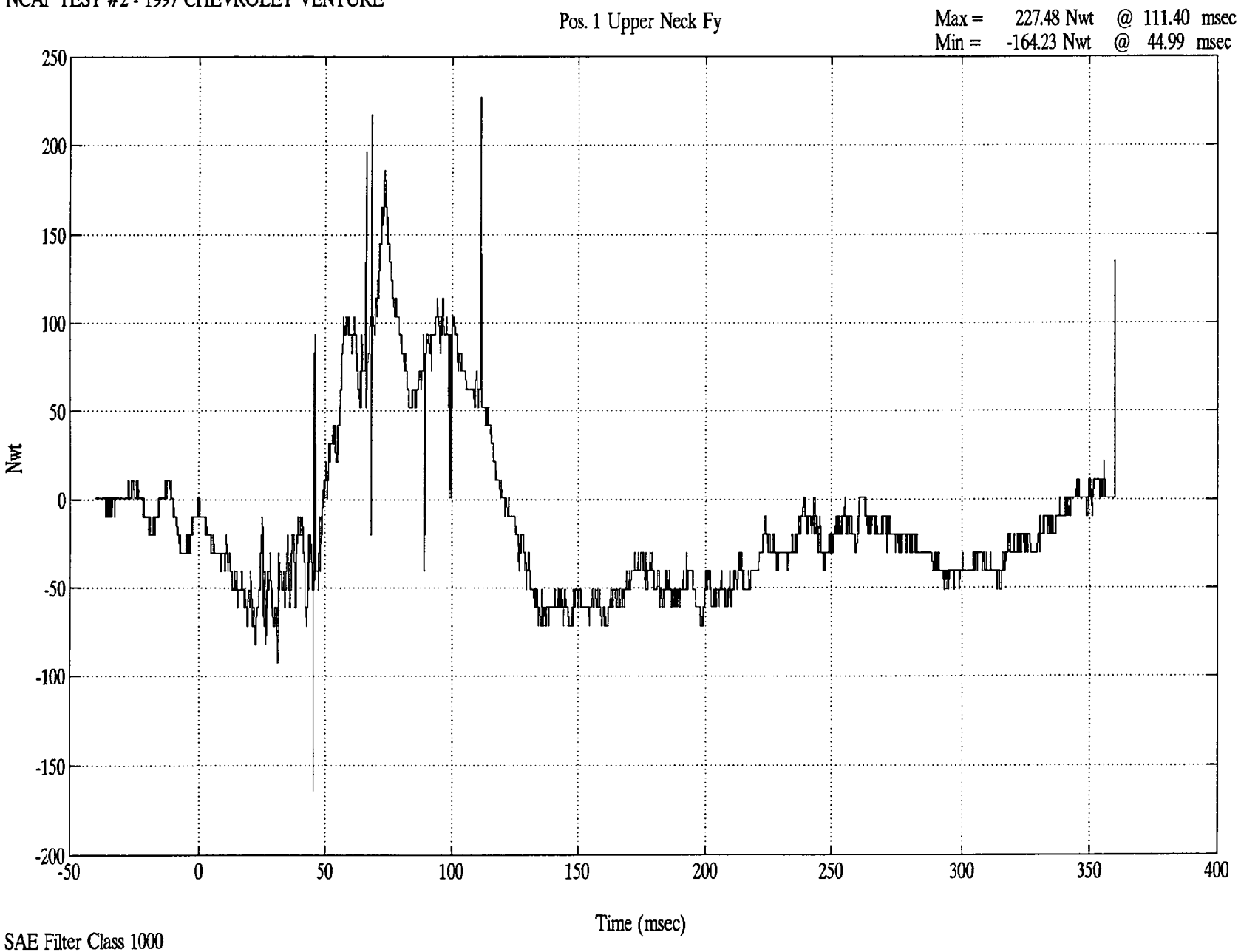
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 1000

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

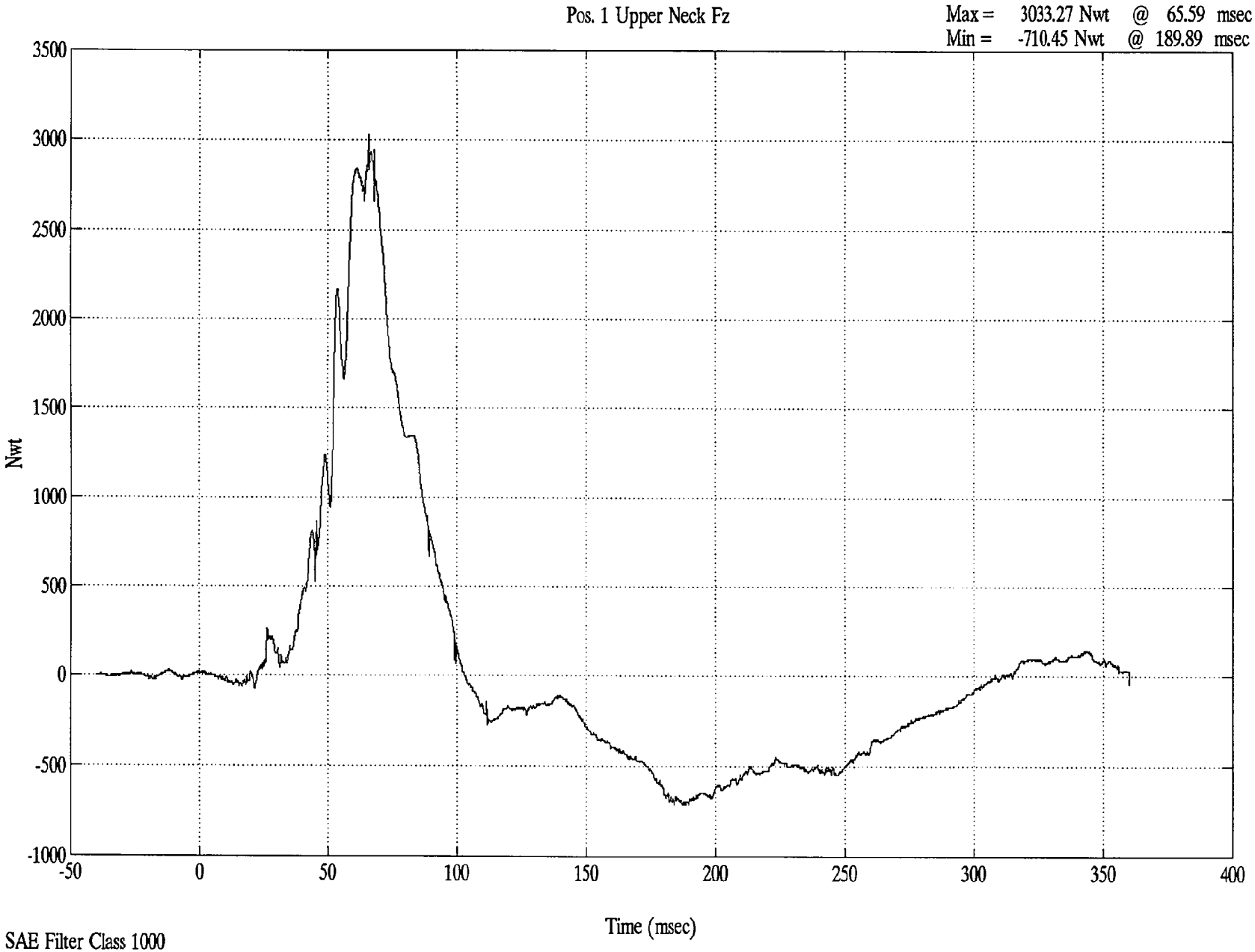


B-24

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

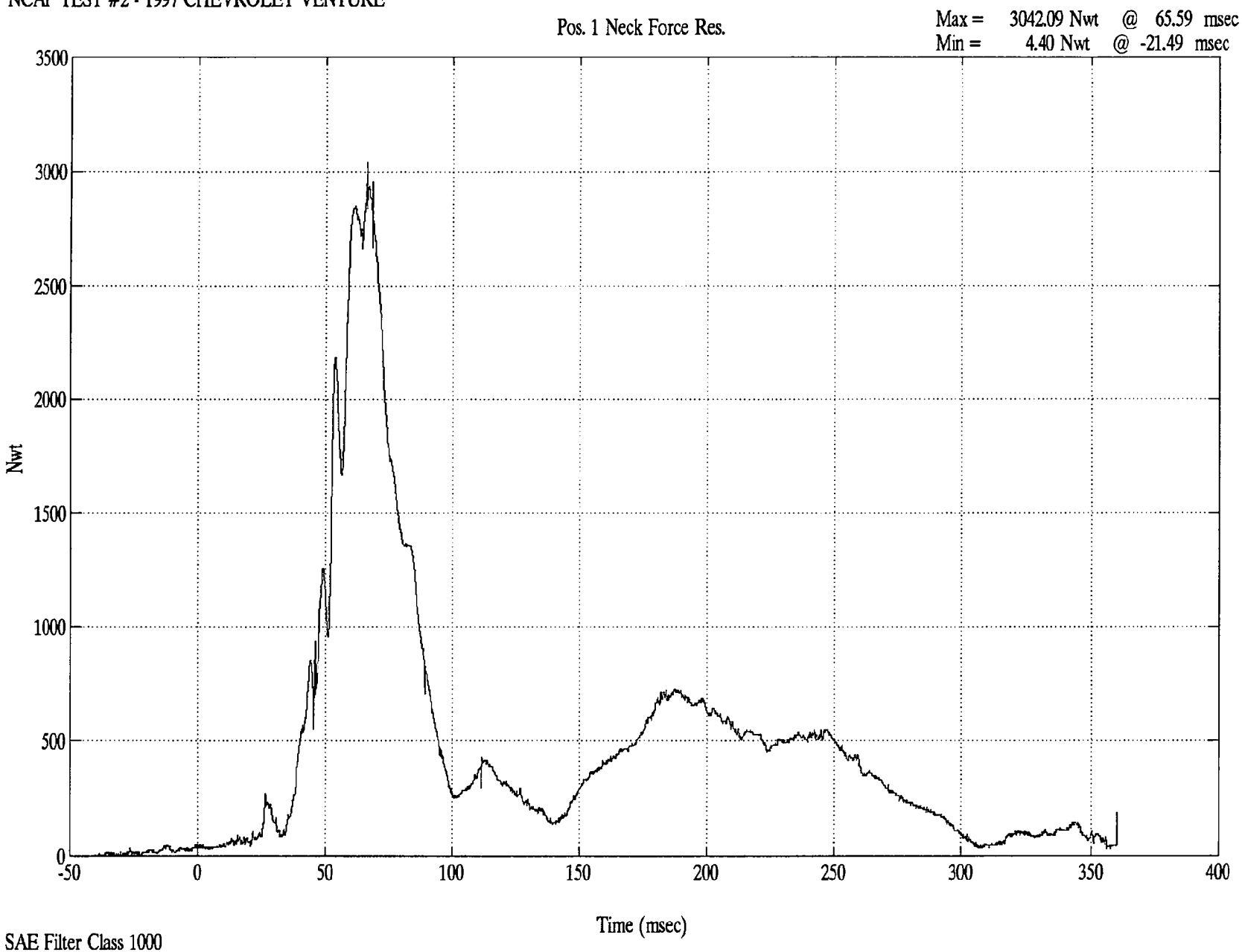


B-25

8406-2

SAE Filter Class 1000

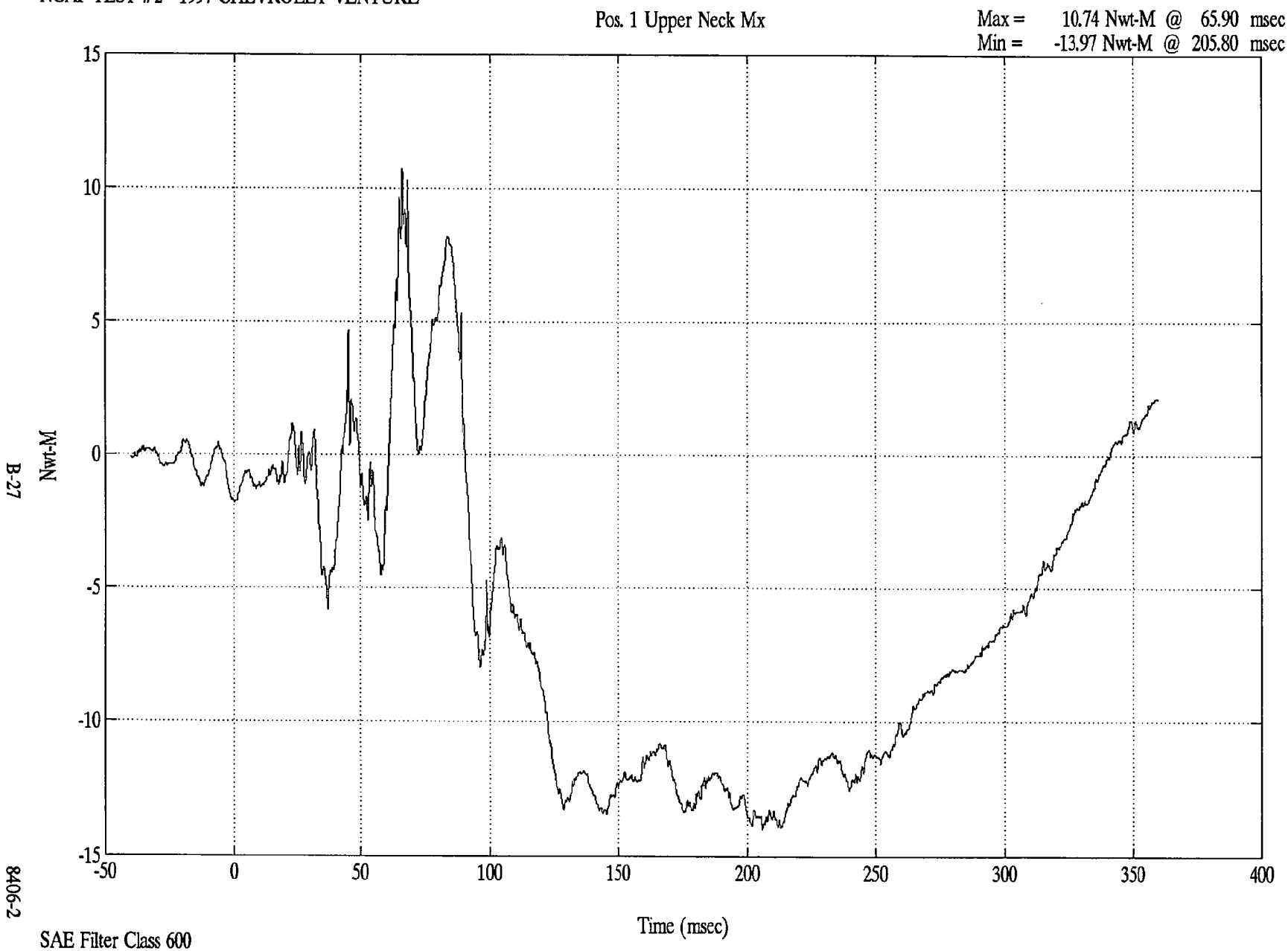
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 1000

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

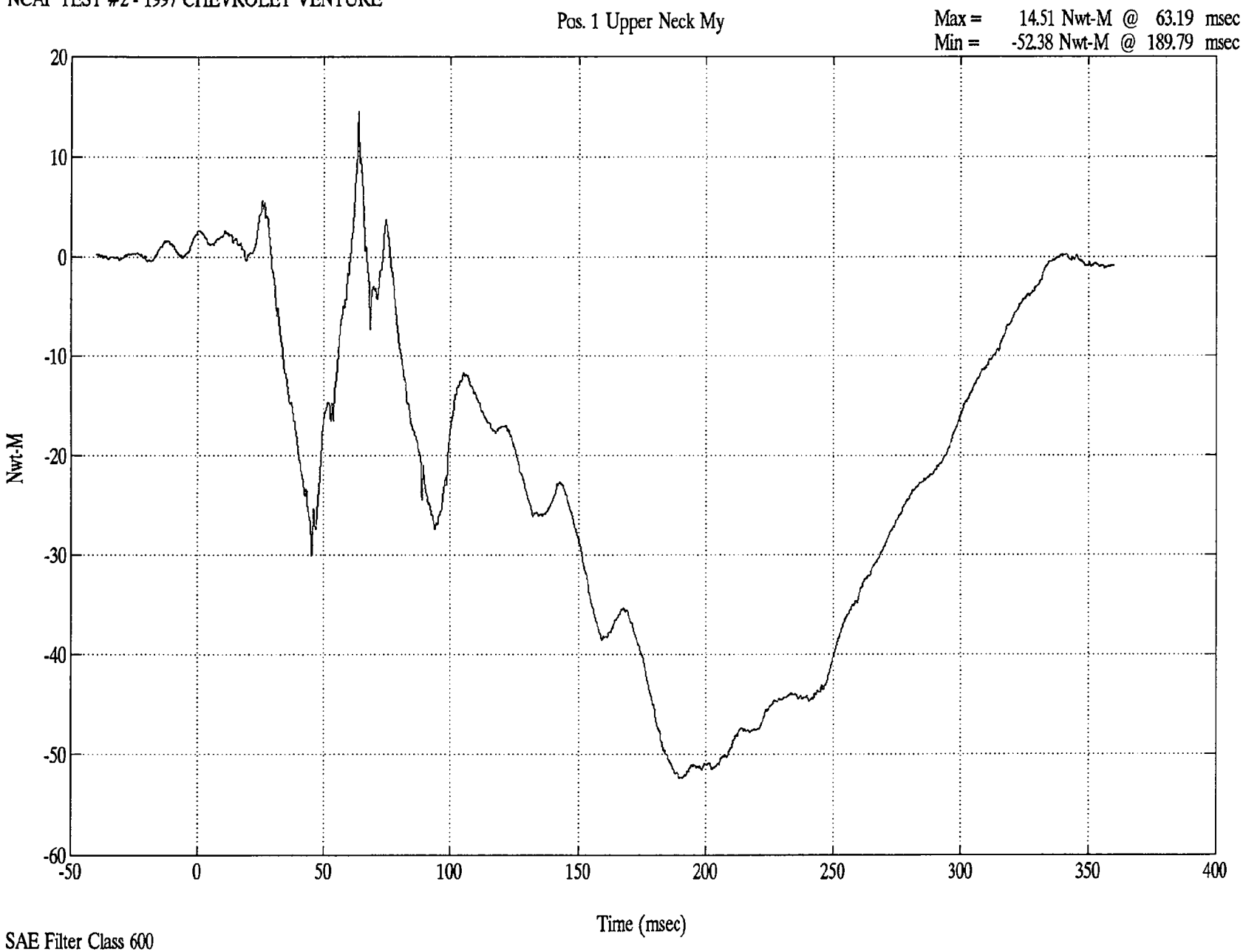


B-27

8406-2

SAE Filter Class 600

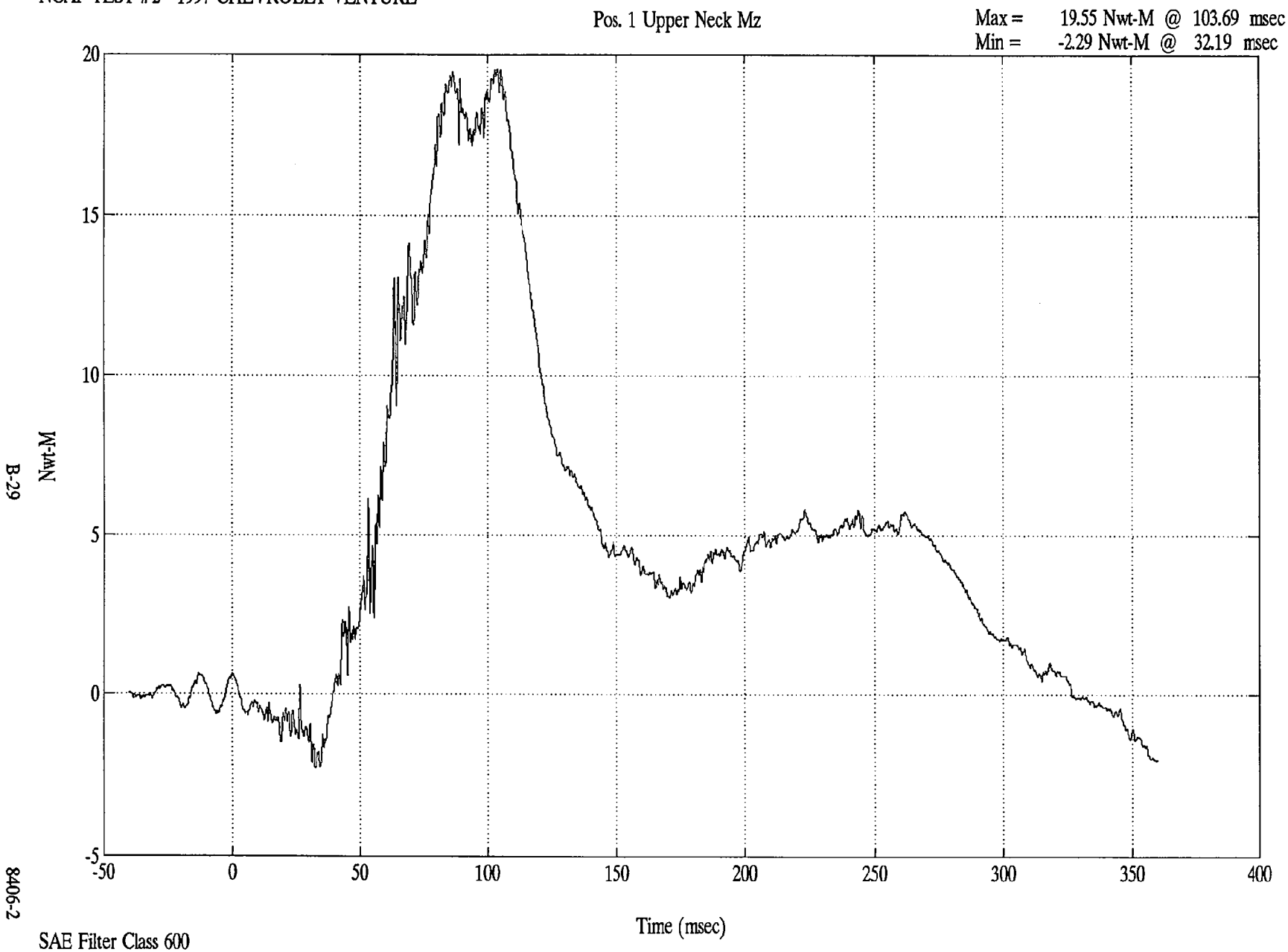
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 600

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

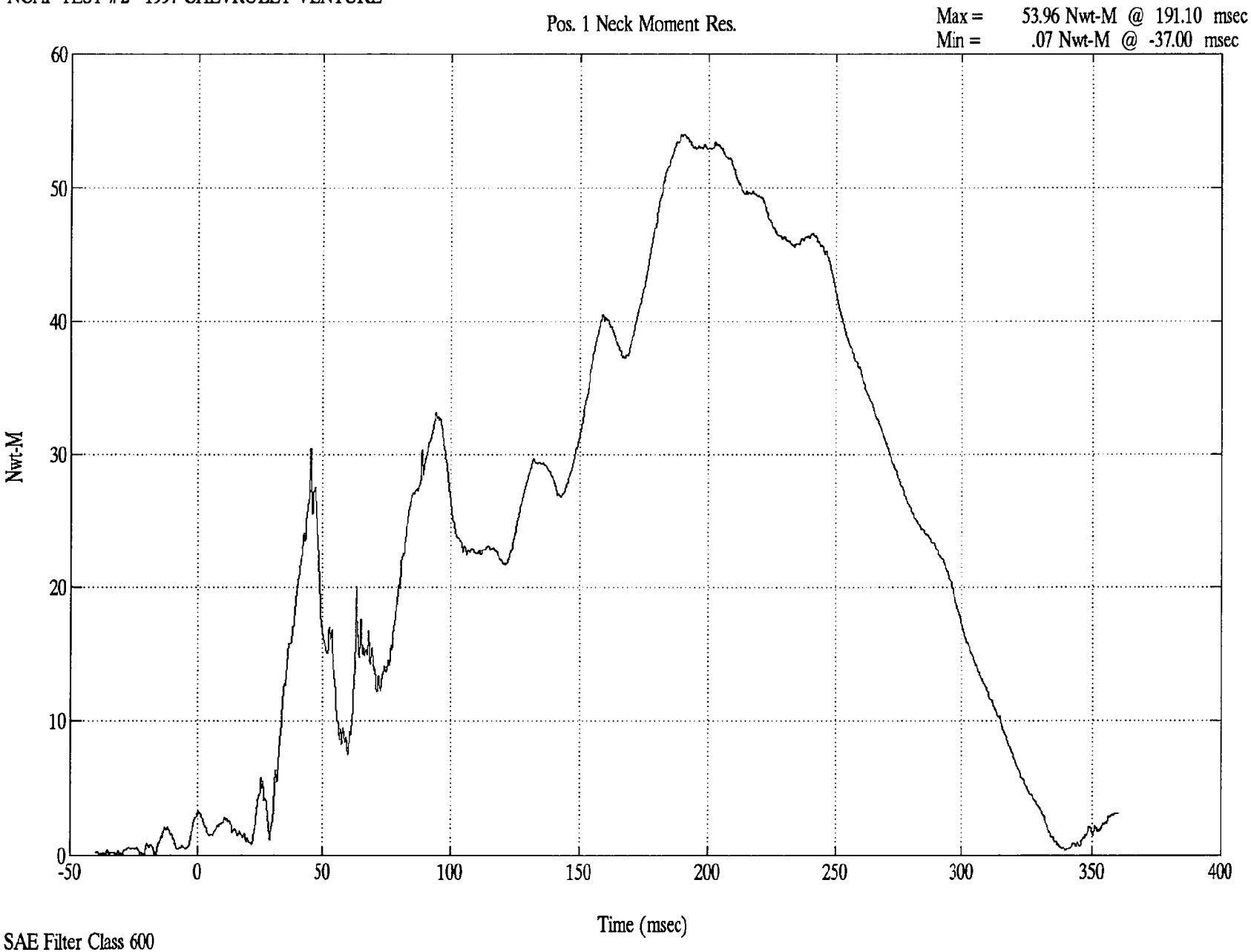


B-29

8406-2

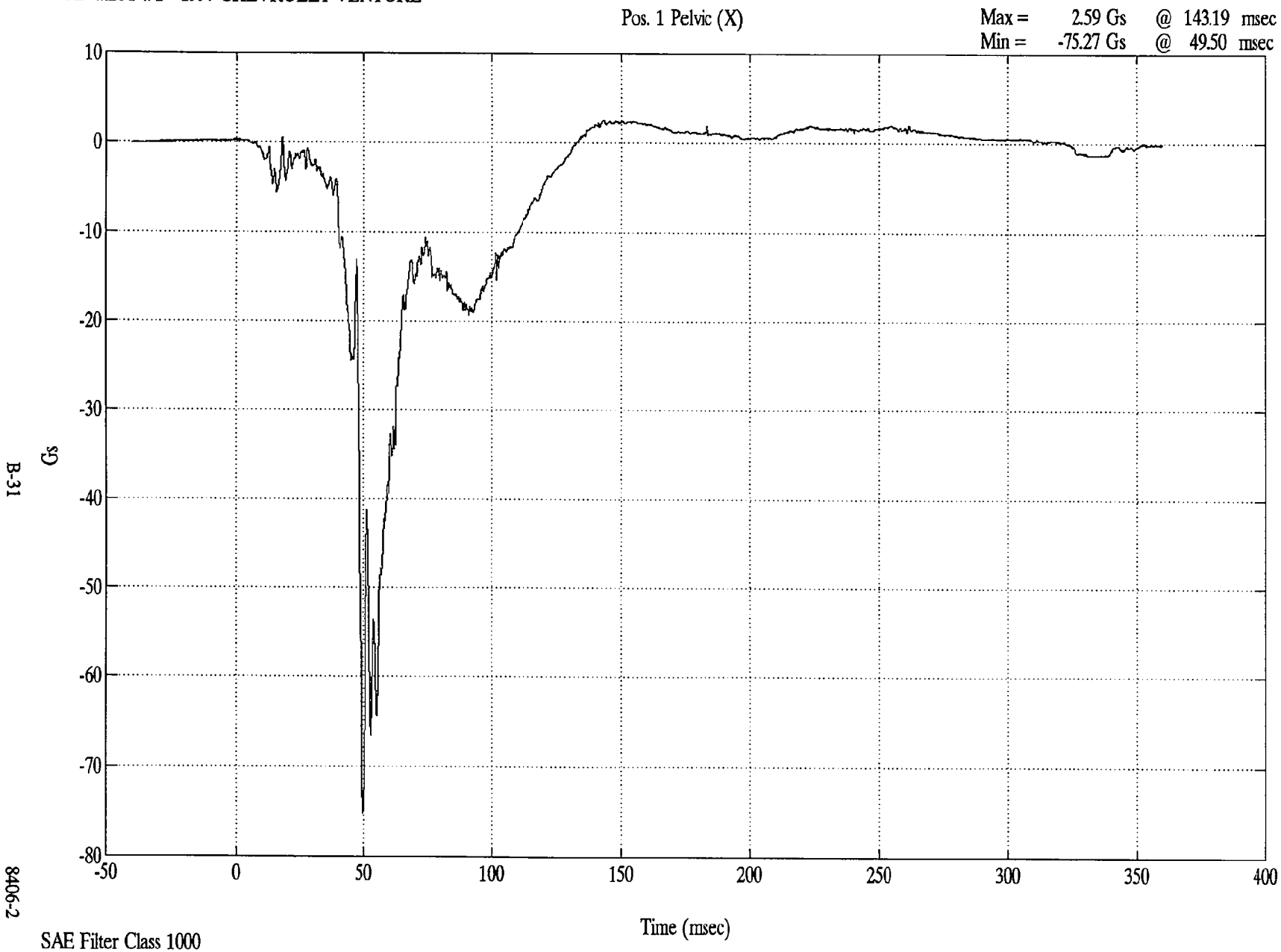
SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

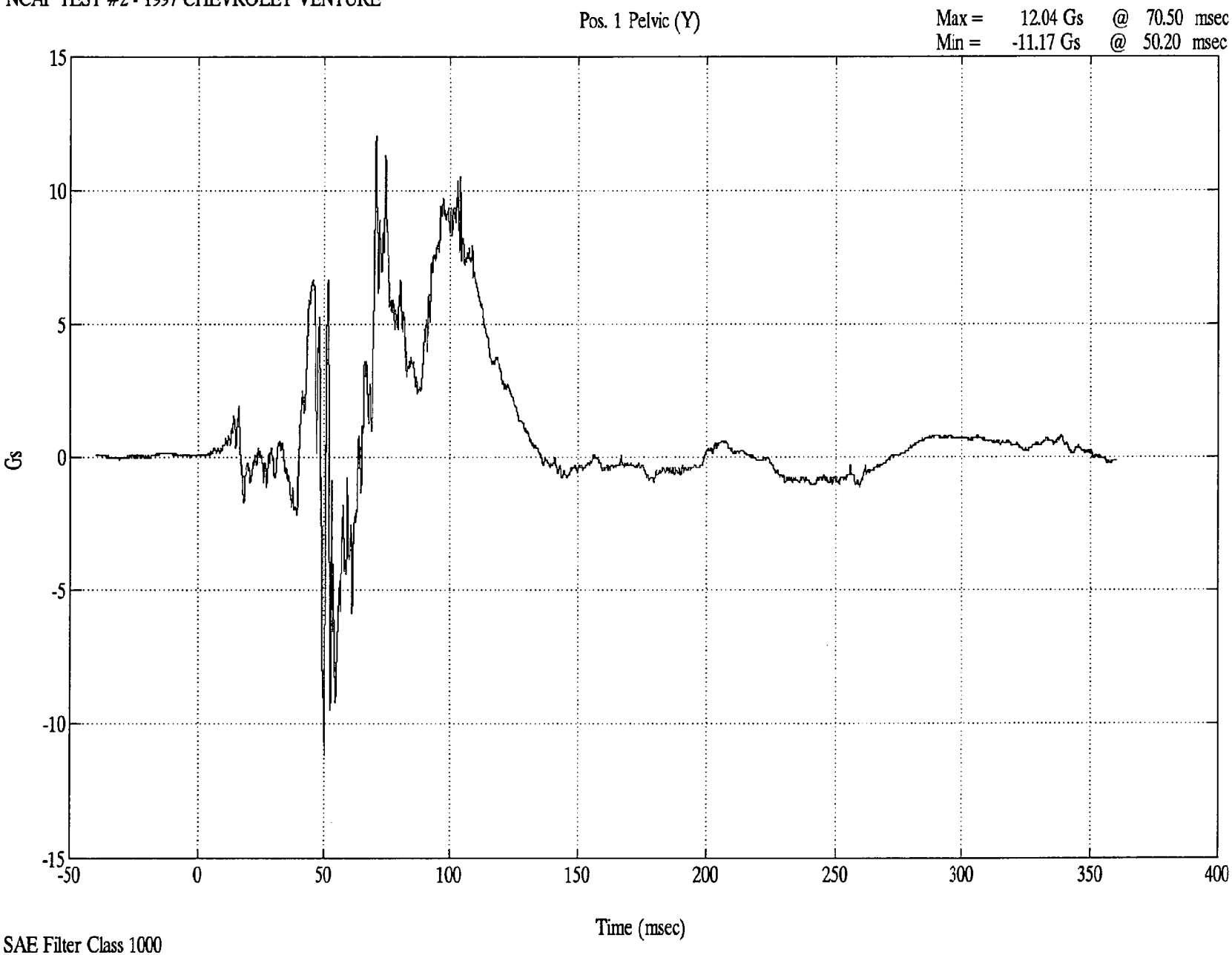


B-31

8406-2

SAE Filter Class 1000

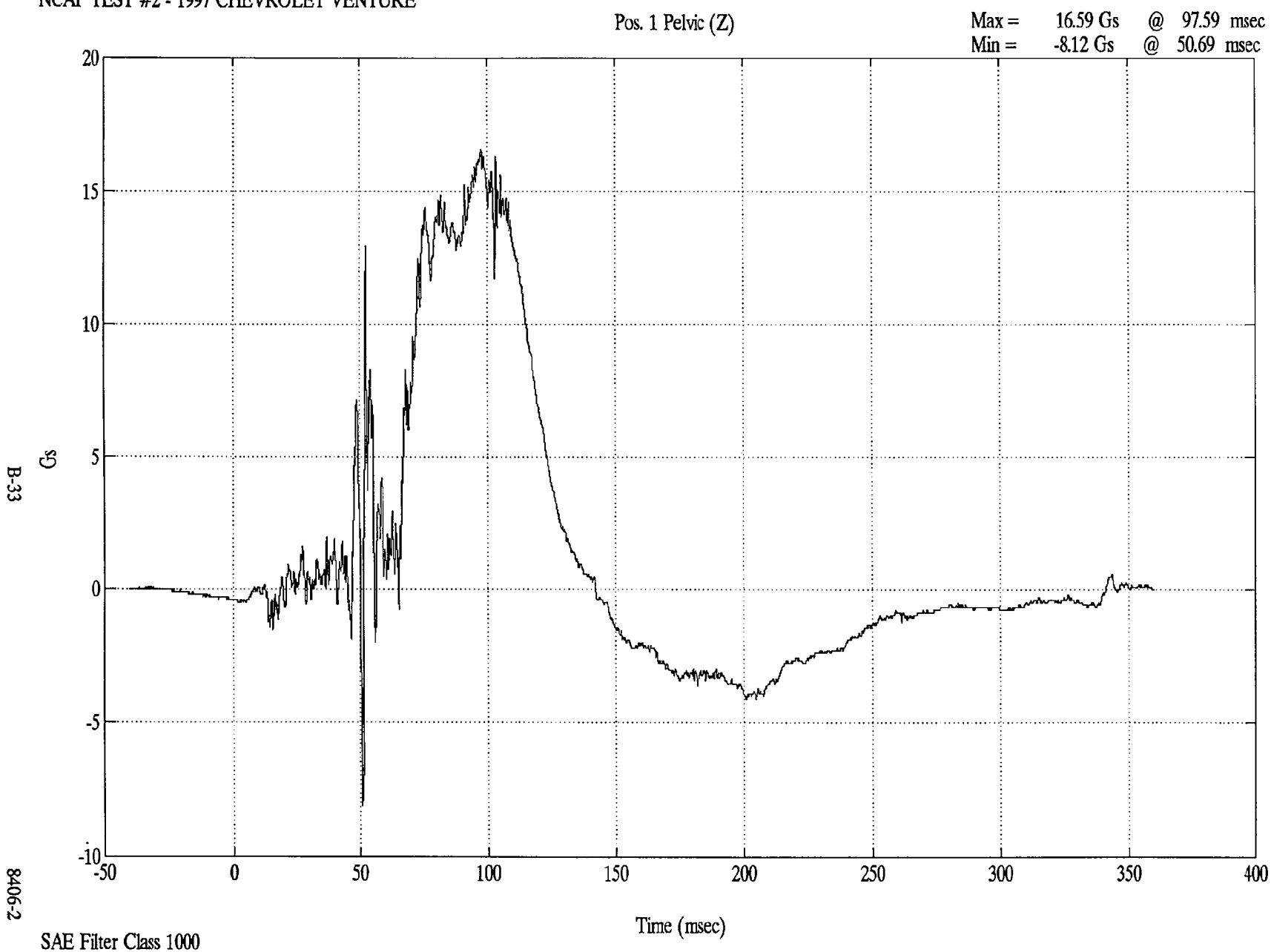
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 1000

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

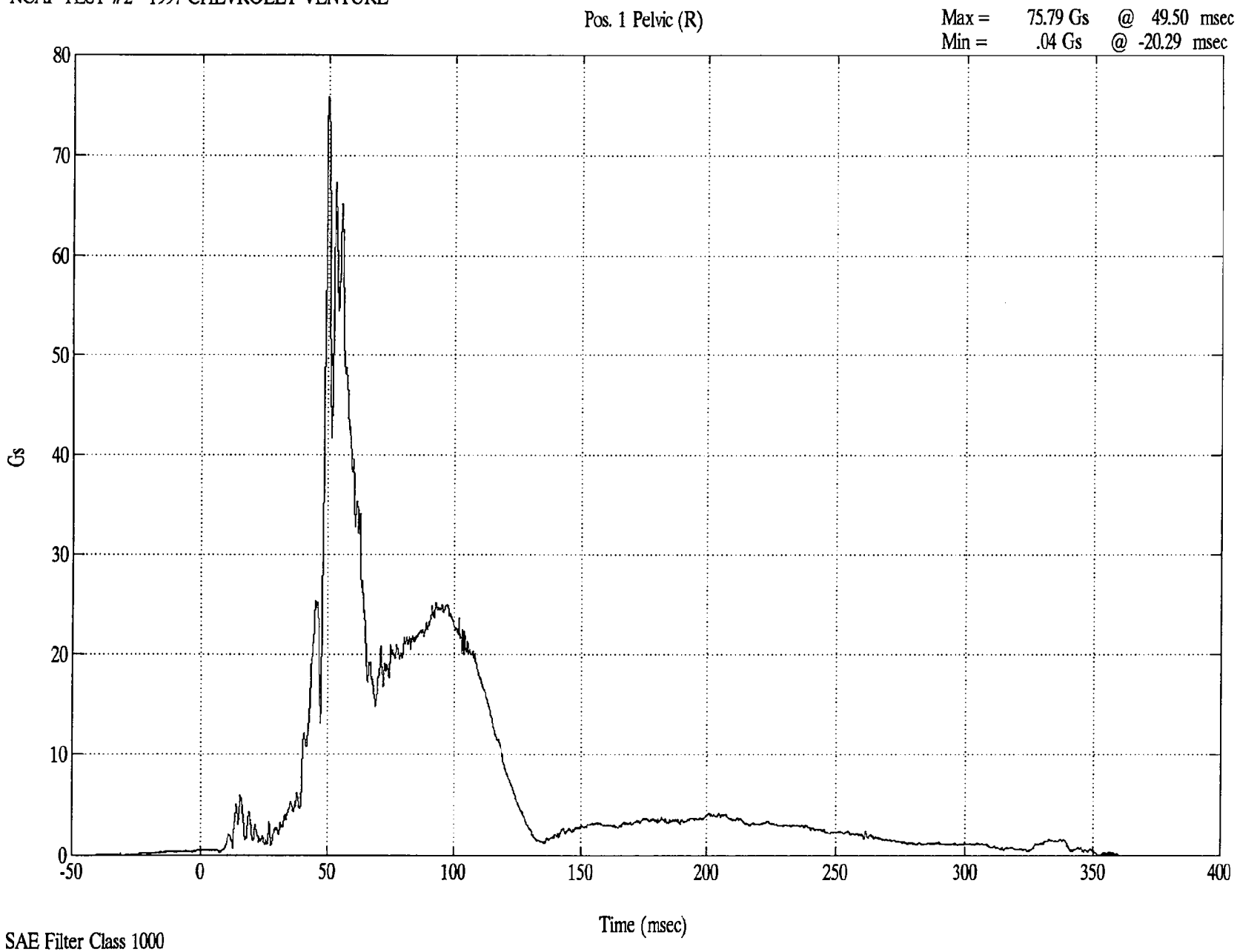


B-33

8406-2

SAE Filter Class 1000

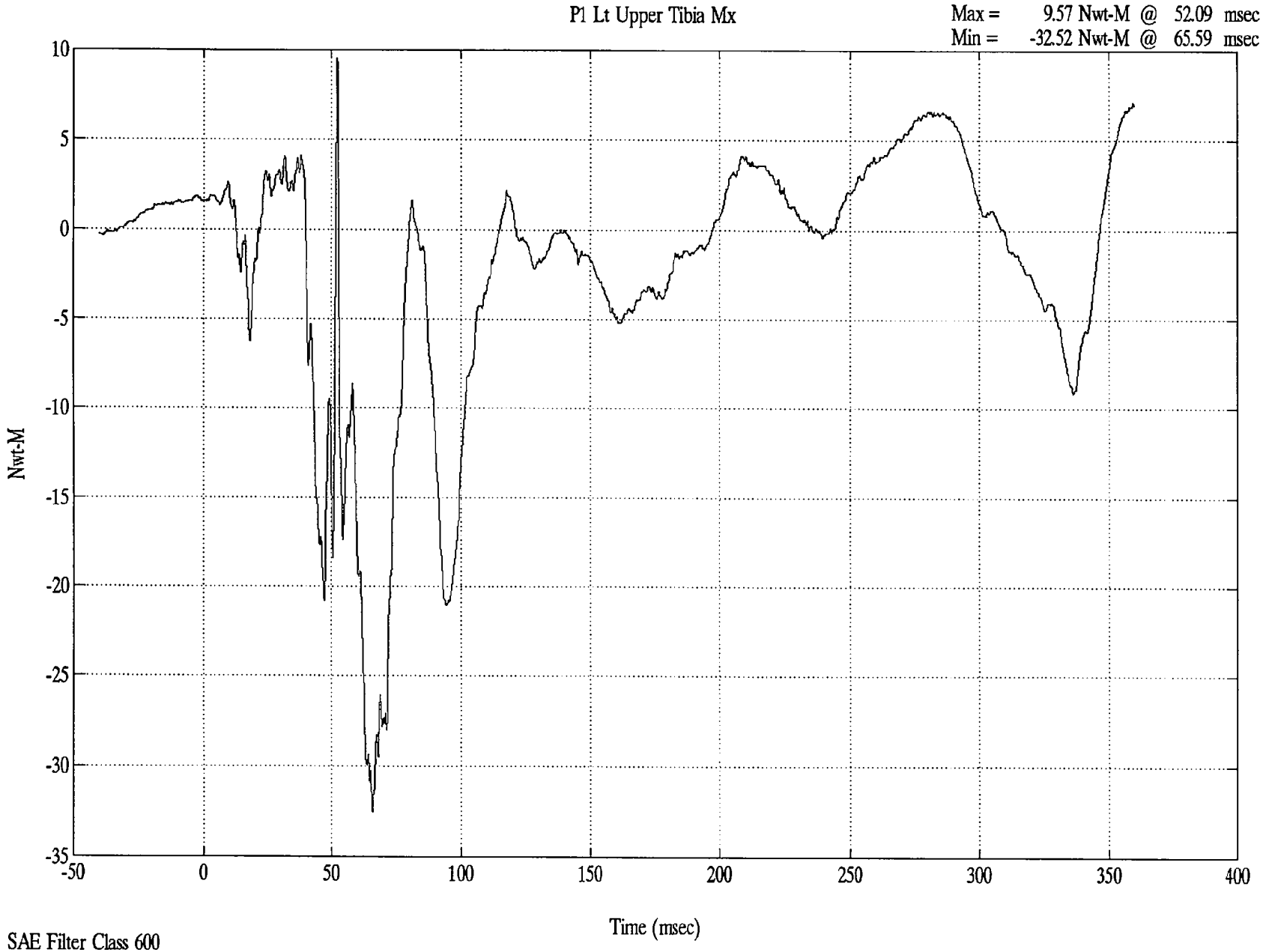
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 1000

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

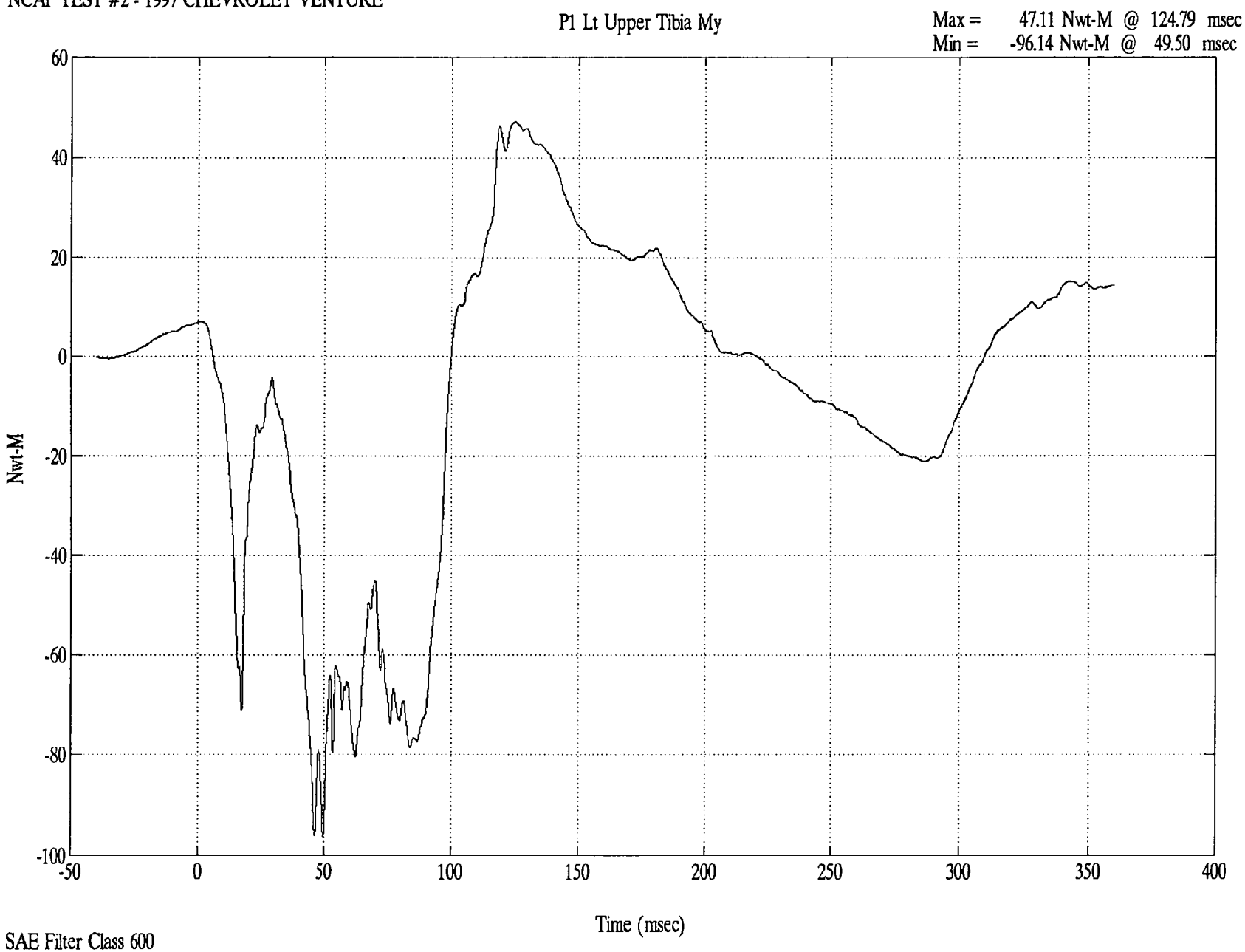


B-35

8406-2

SAE Filter Class 600

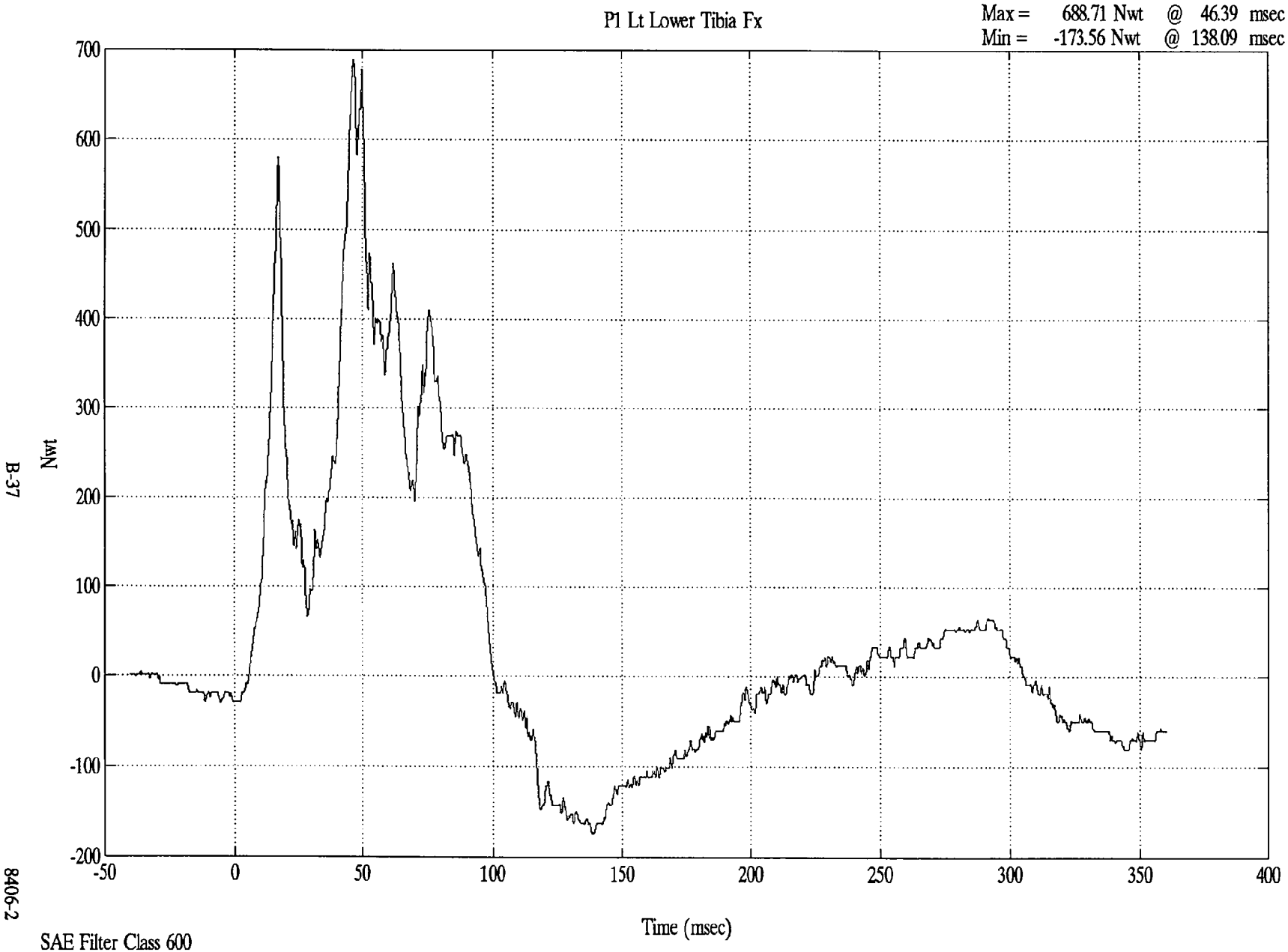
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 600

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

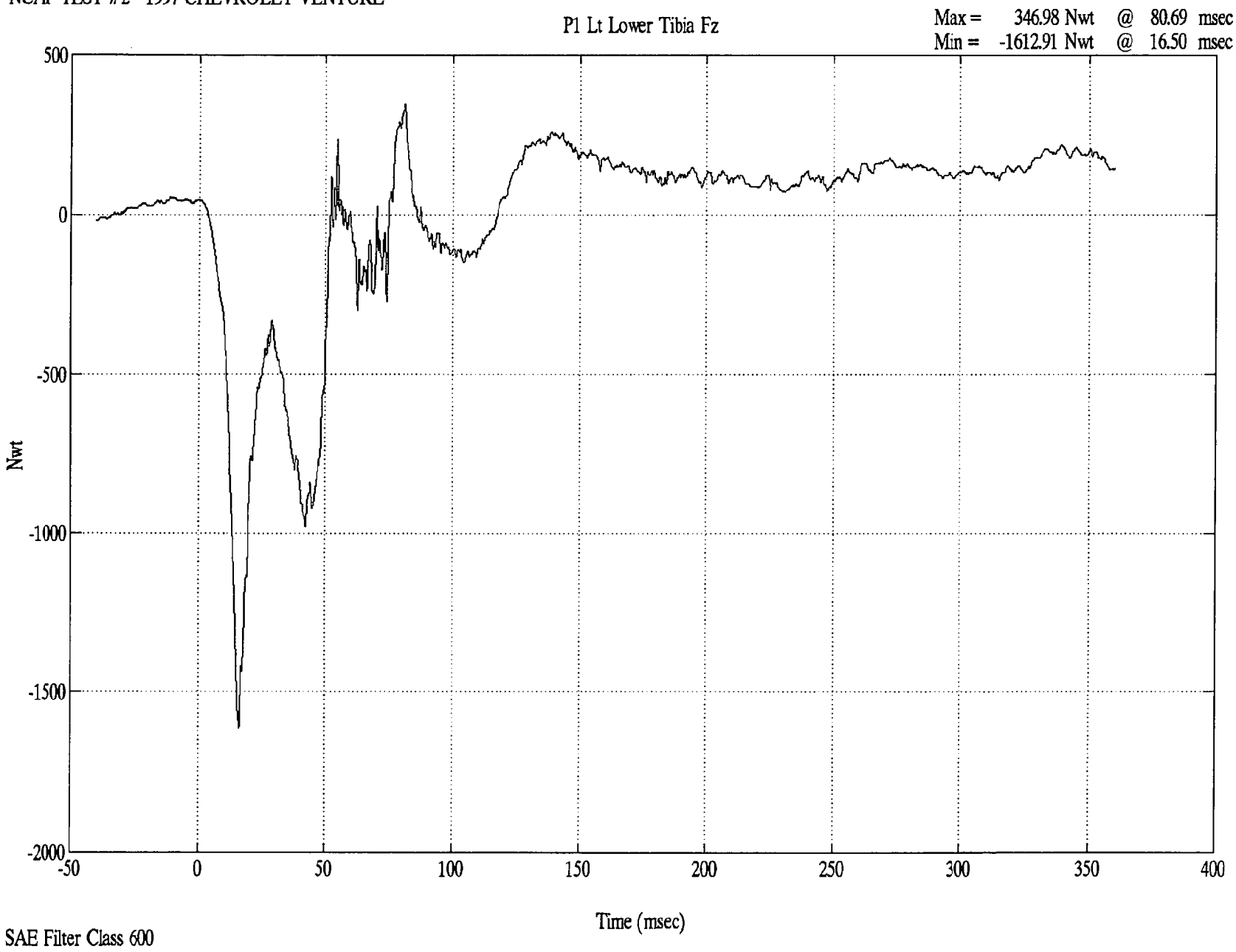


B-37

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

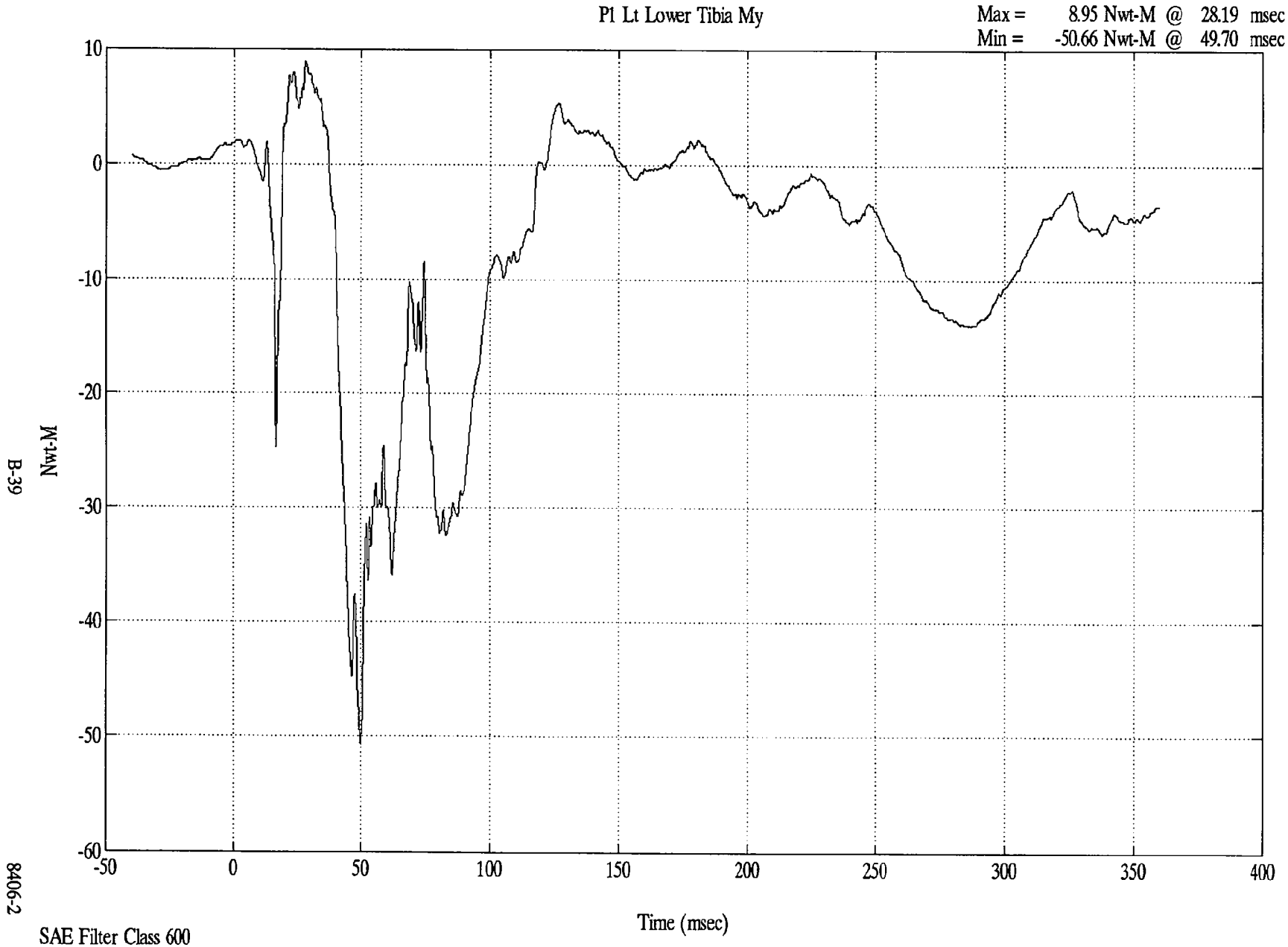


B-38

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE



B-39

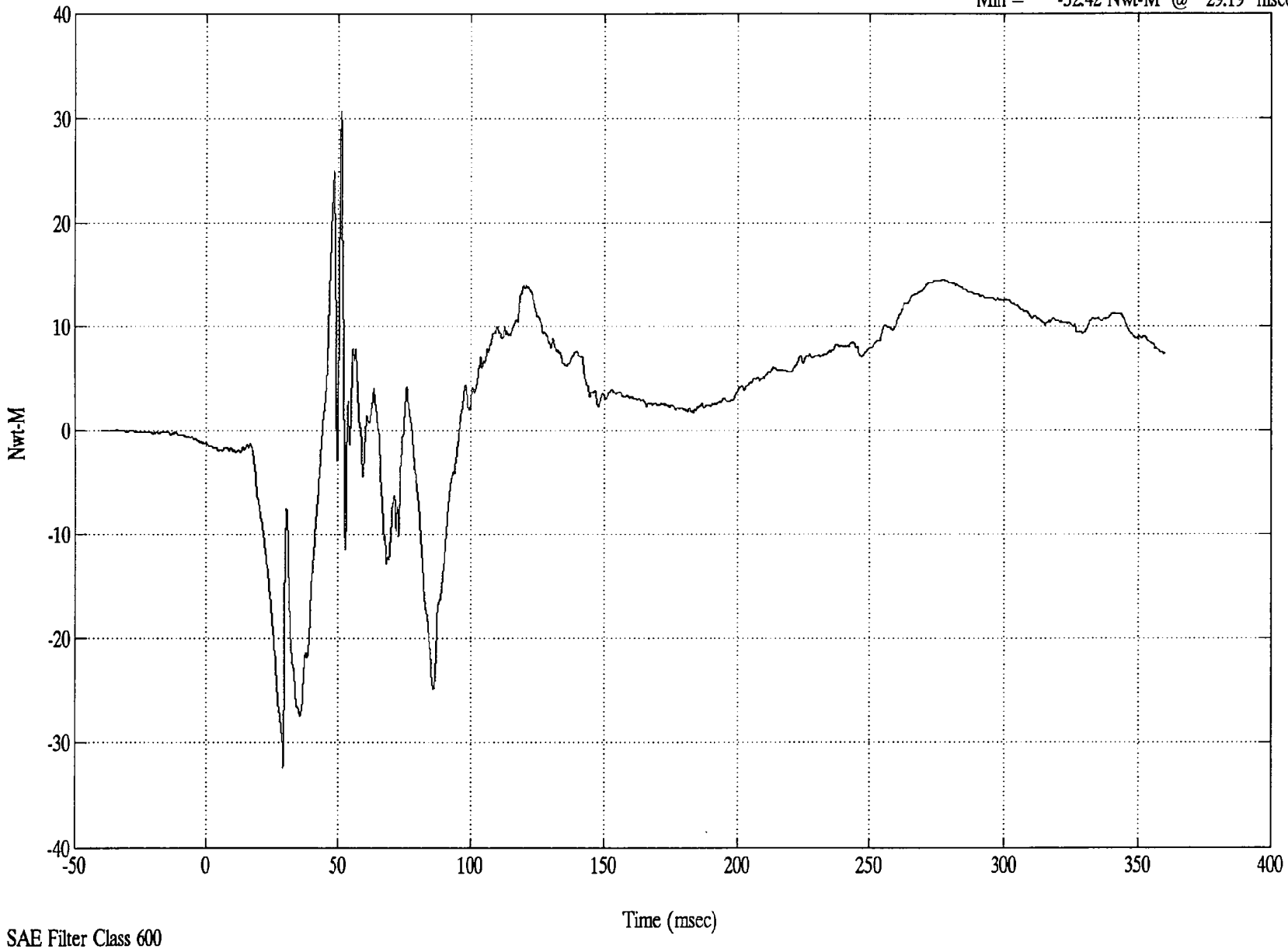
8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

P1 Rt Upper Tibia Mx

Max = 30.70 Nwt-M @ 50.89 msec
Min = -32.42 Nwt-M @ 29.19 msec

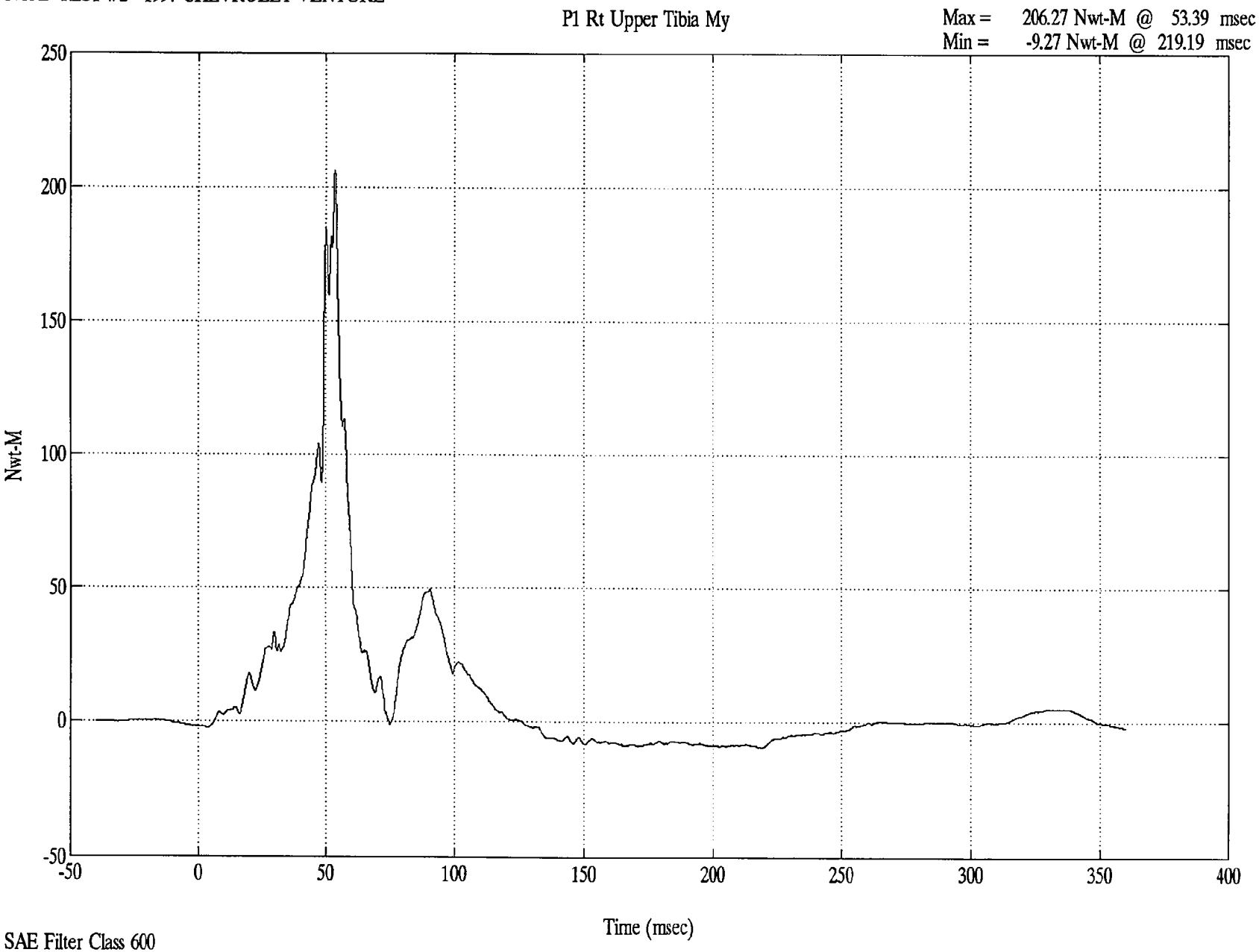


B-40

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

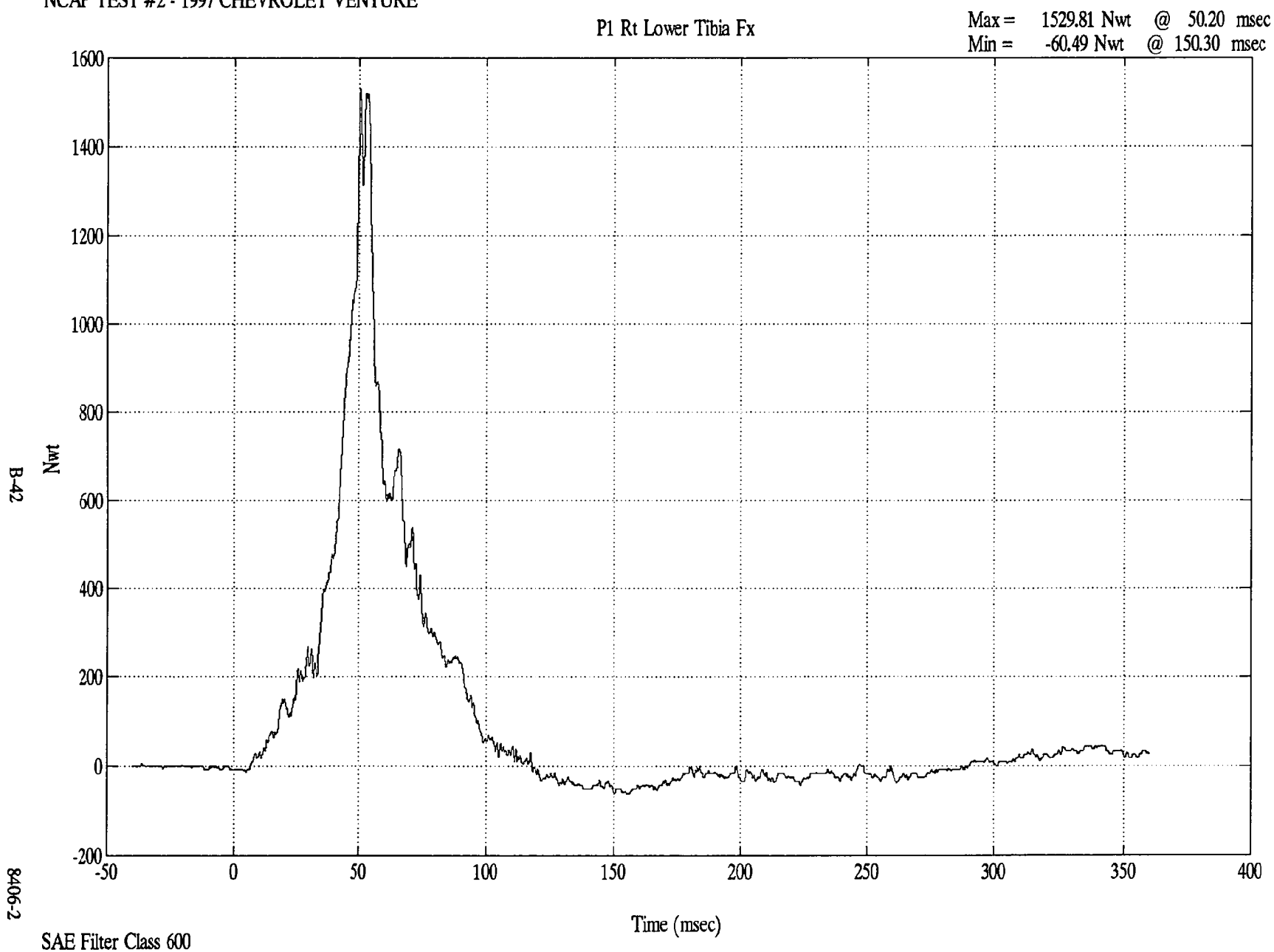


B-41

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

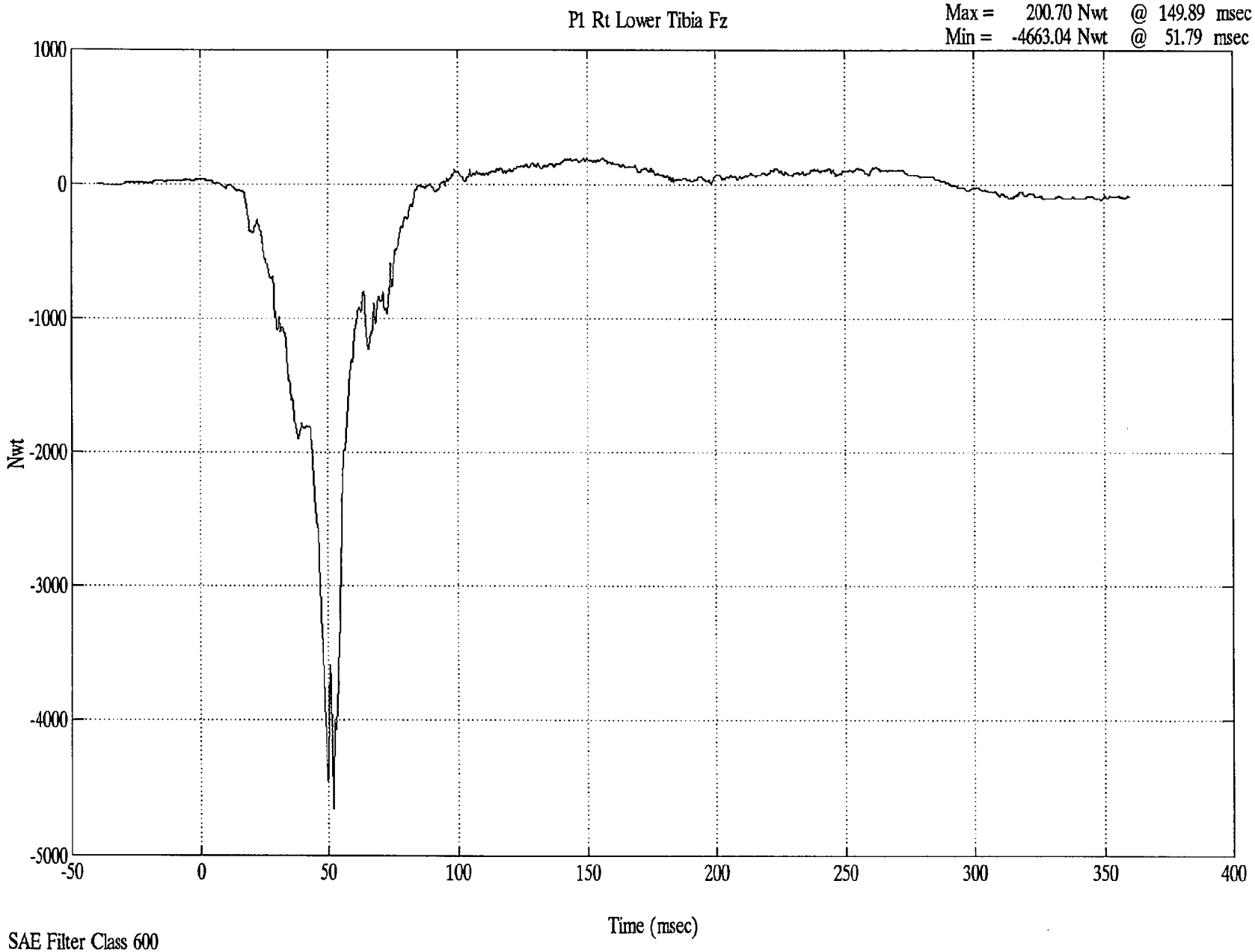


B-42

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

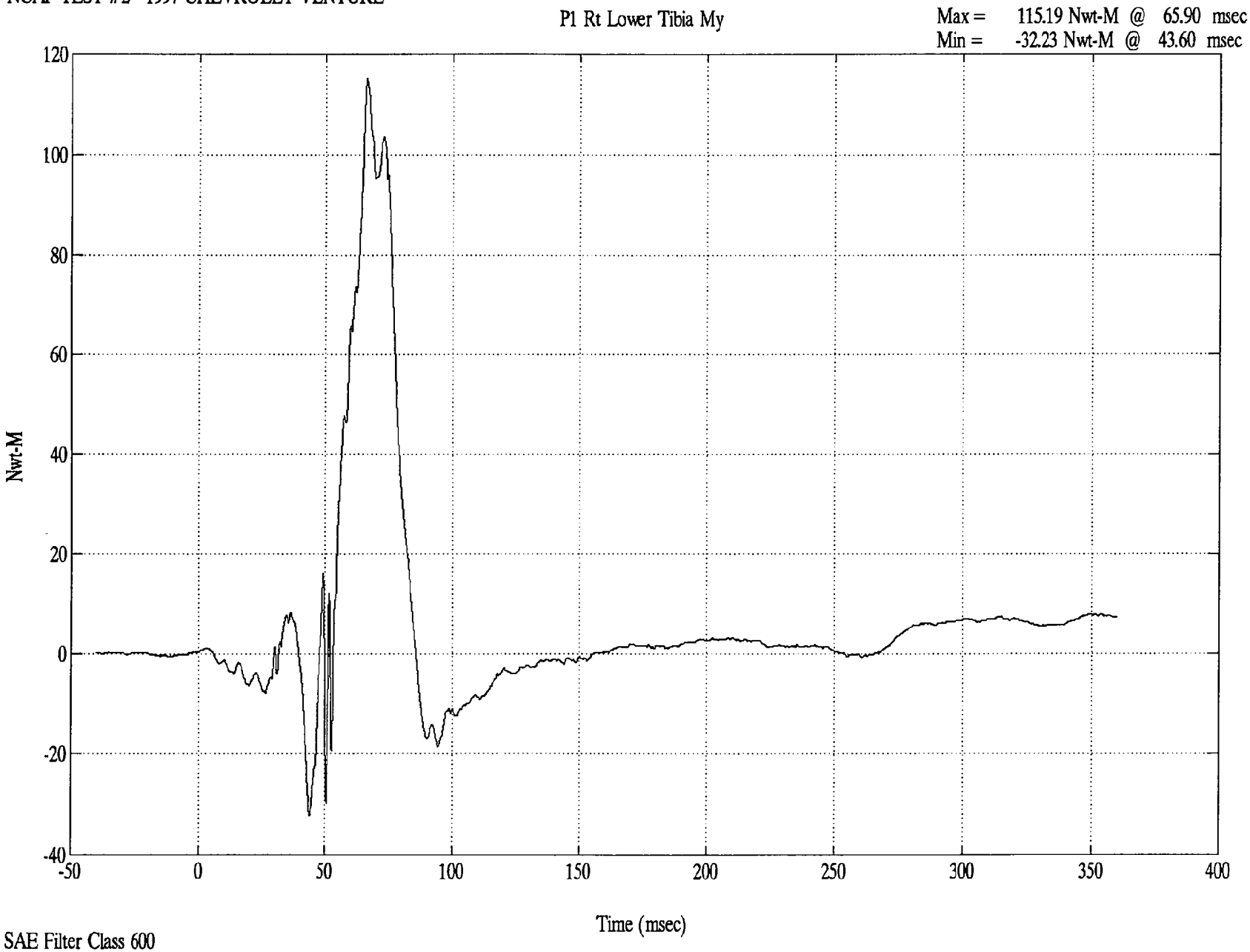


B-43

8406-2

SAE Filter Class 600

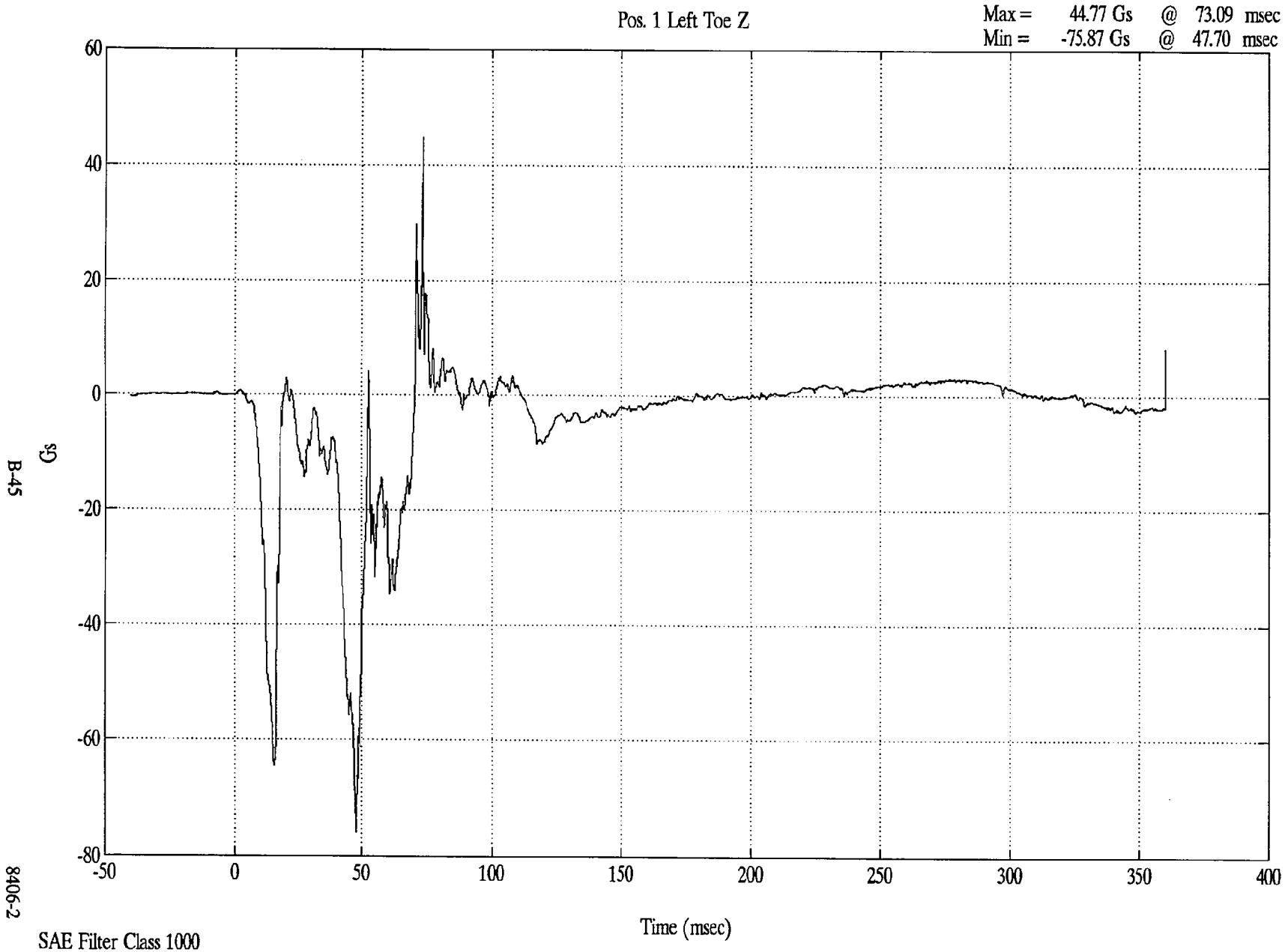
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 600

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

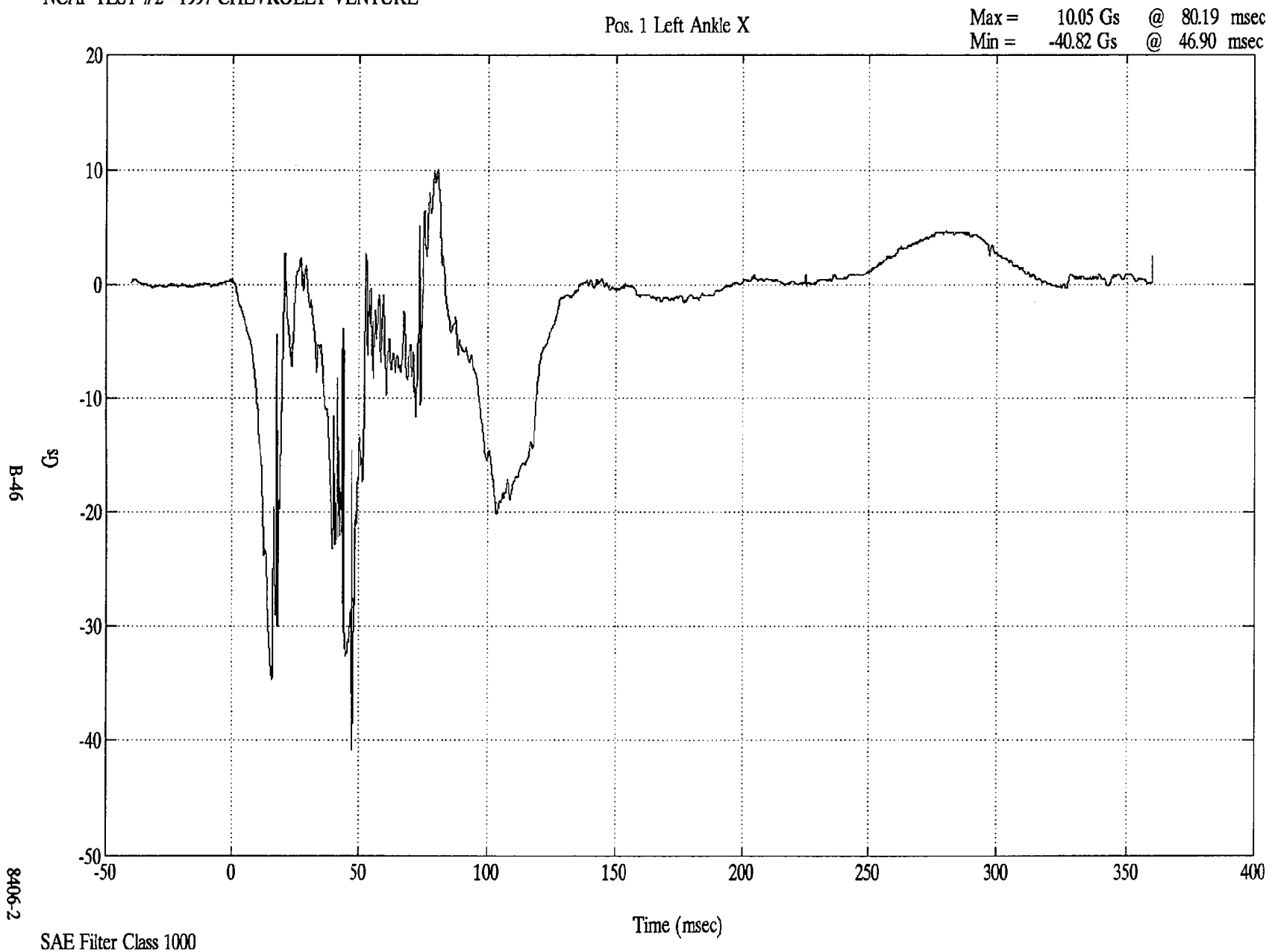


B-45

8406-2

SAE Filter Class 1000

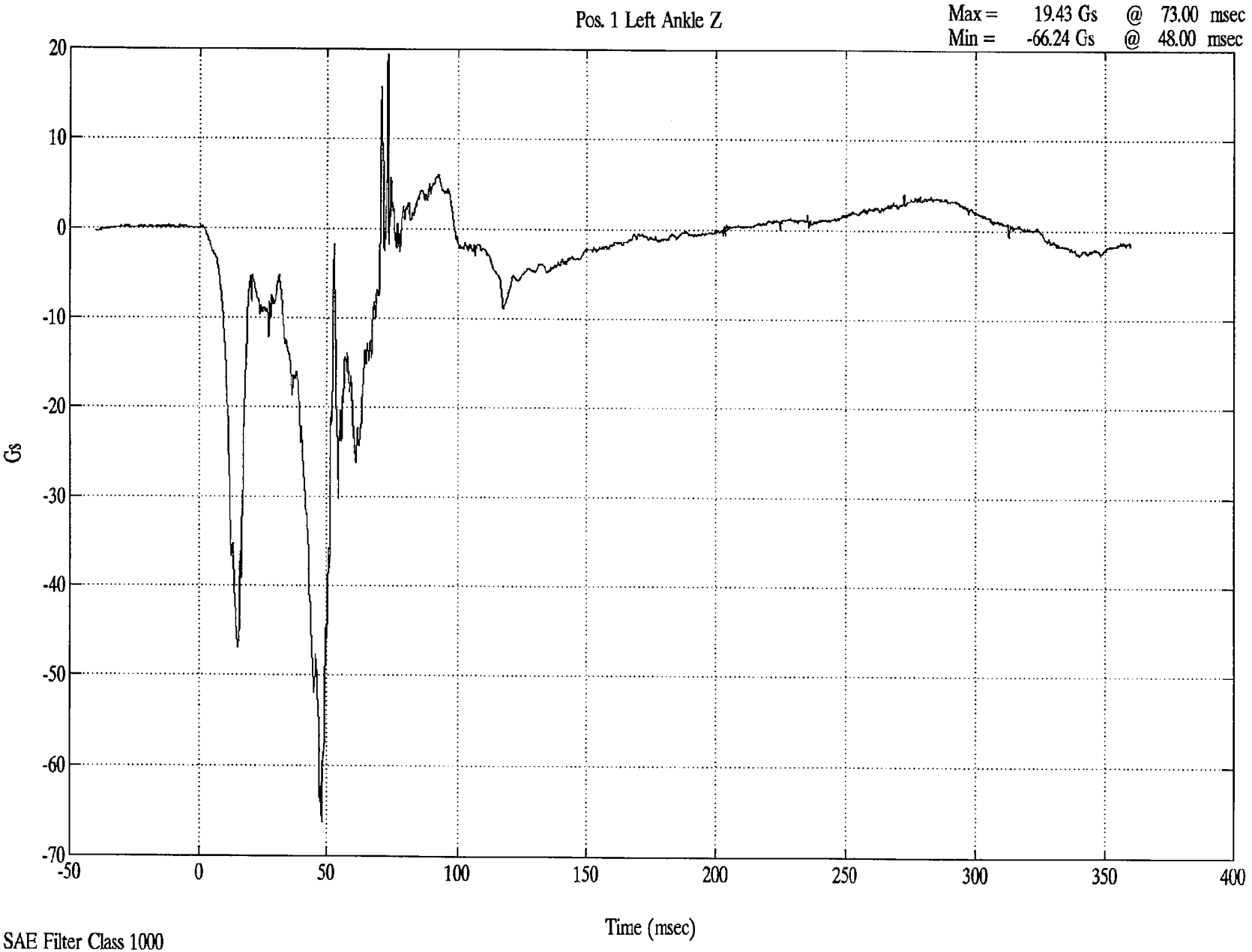
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 1000

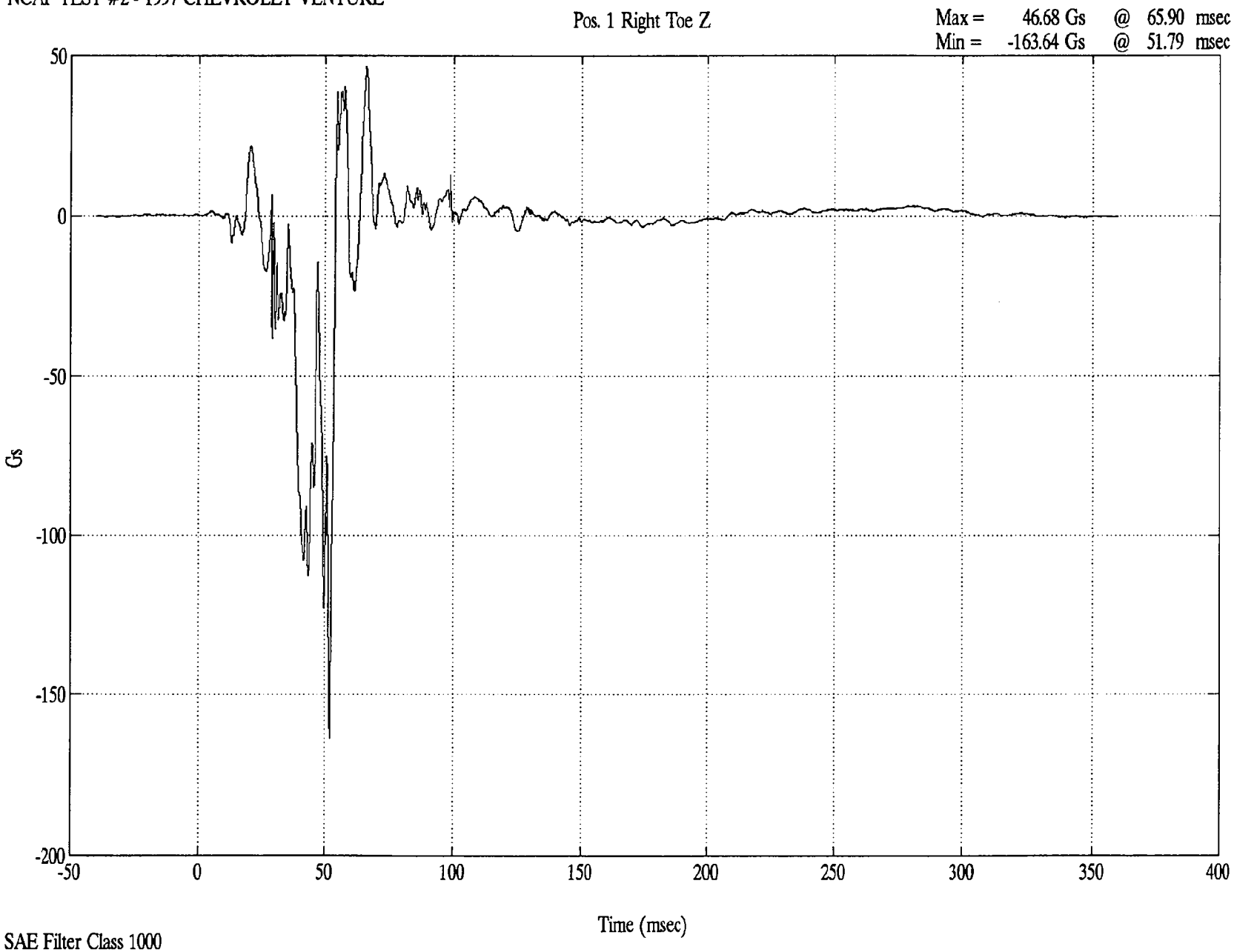
8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 1000

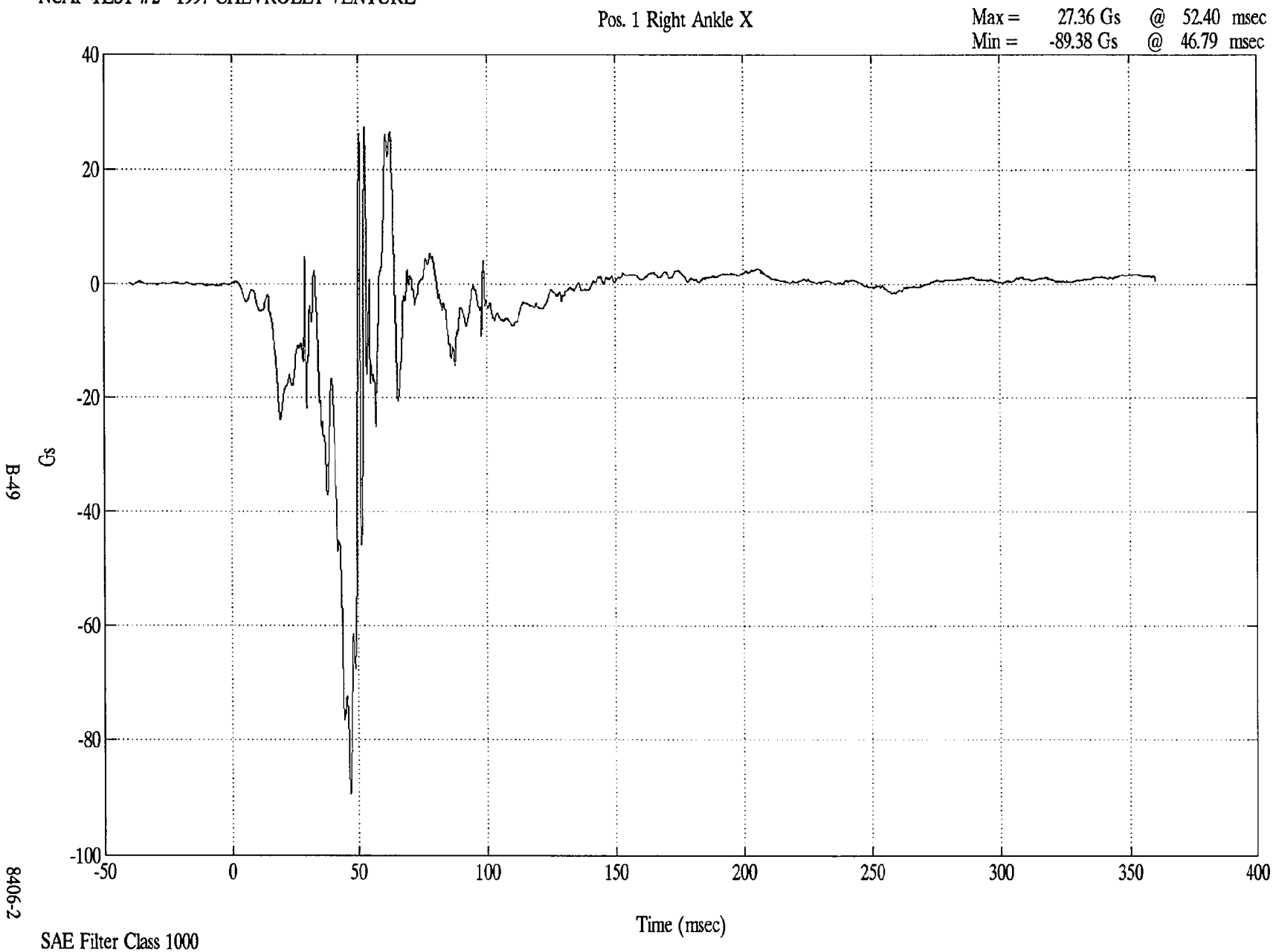
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 1000

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

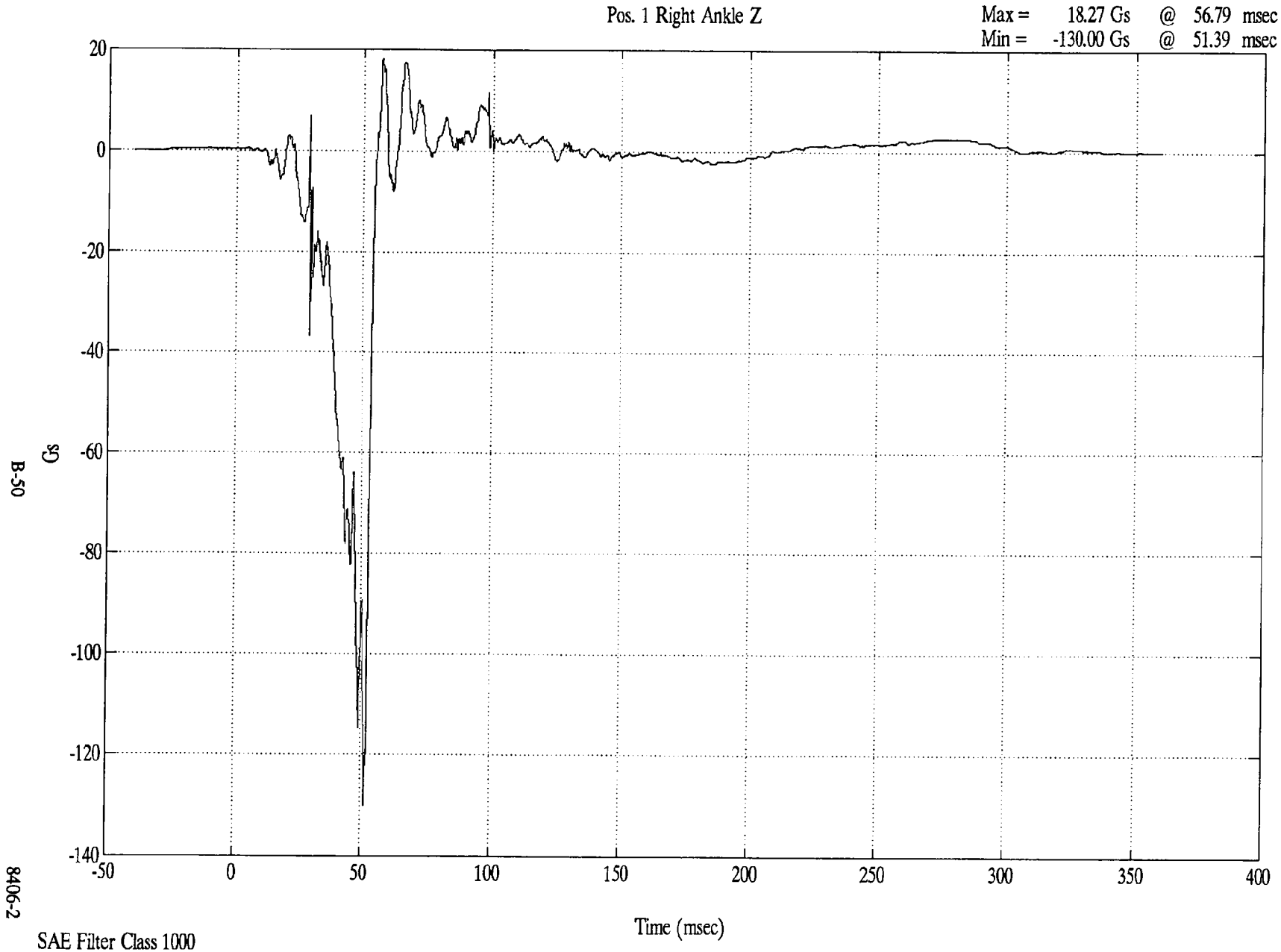


B-49

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

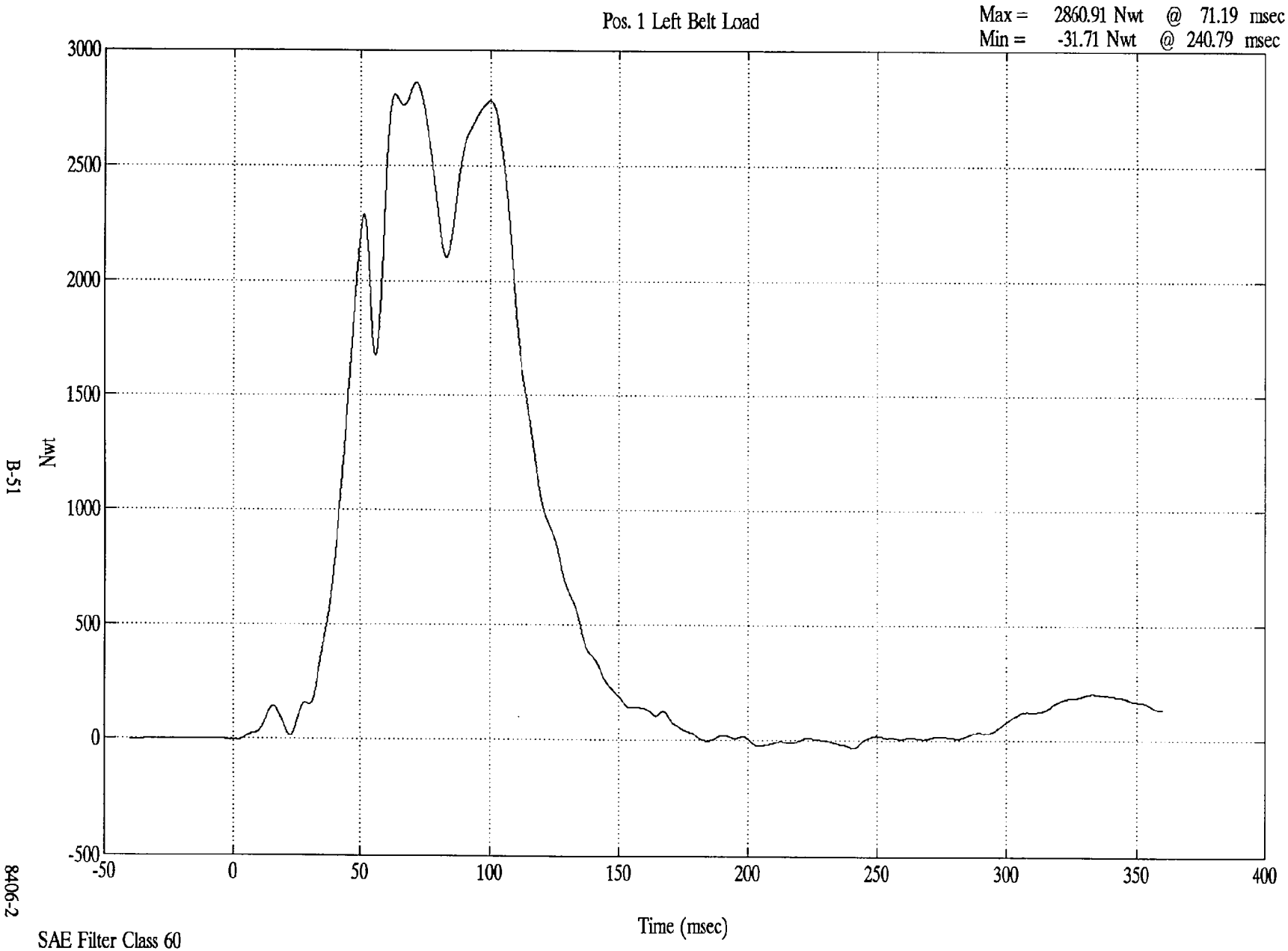


B-50

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

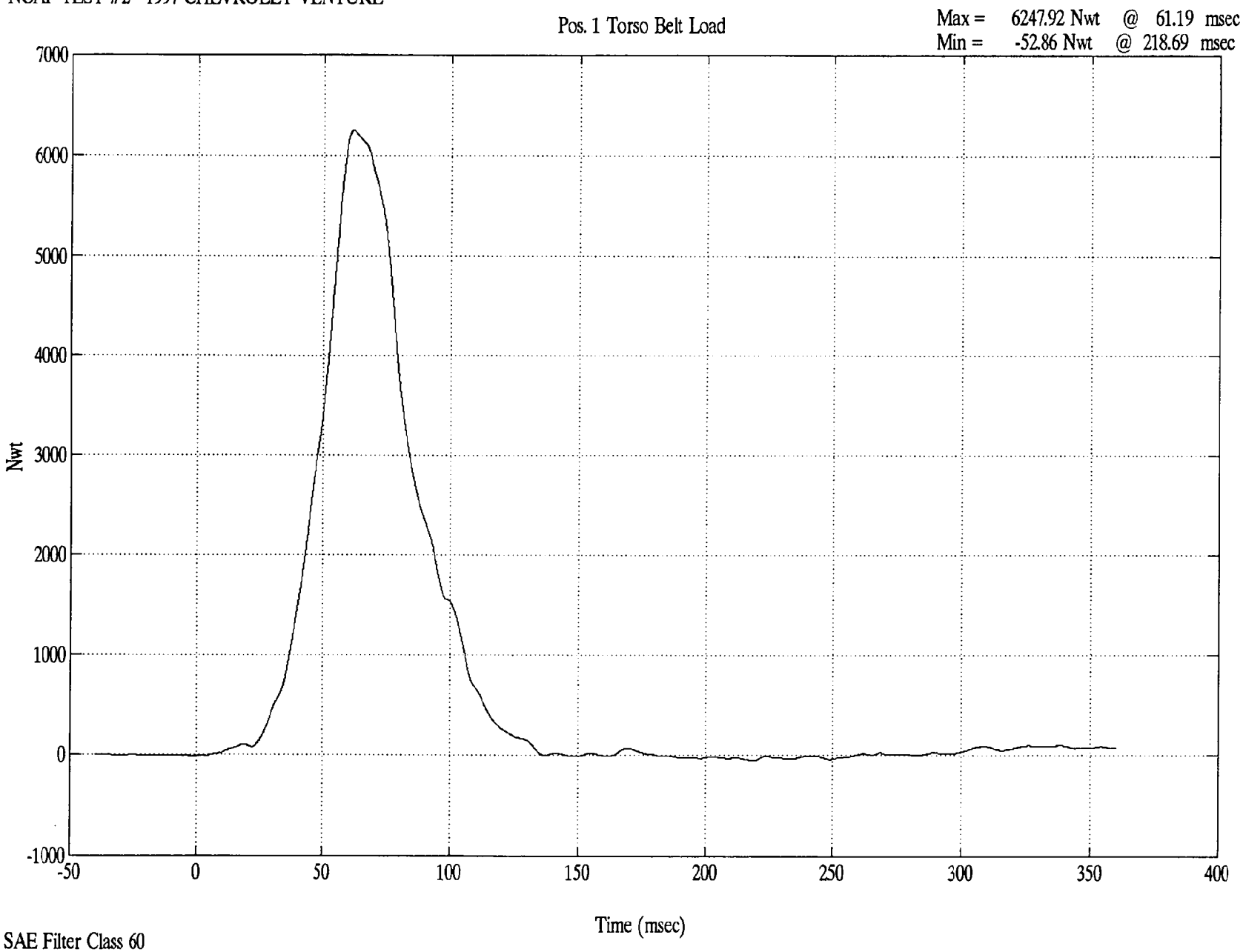


B-51

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

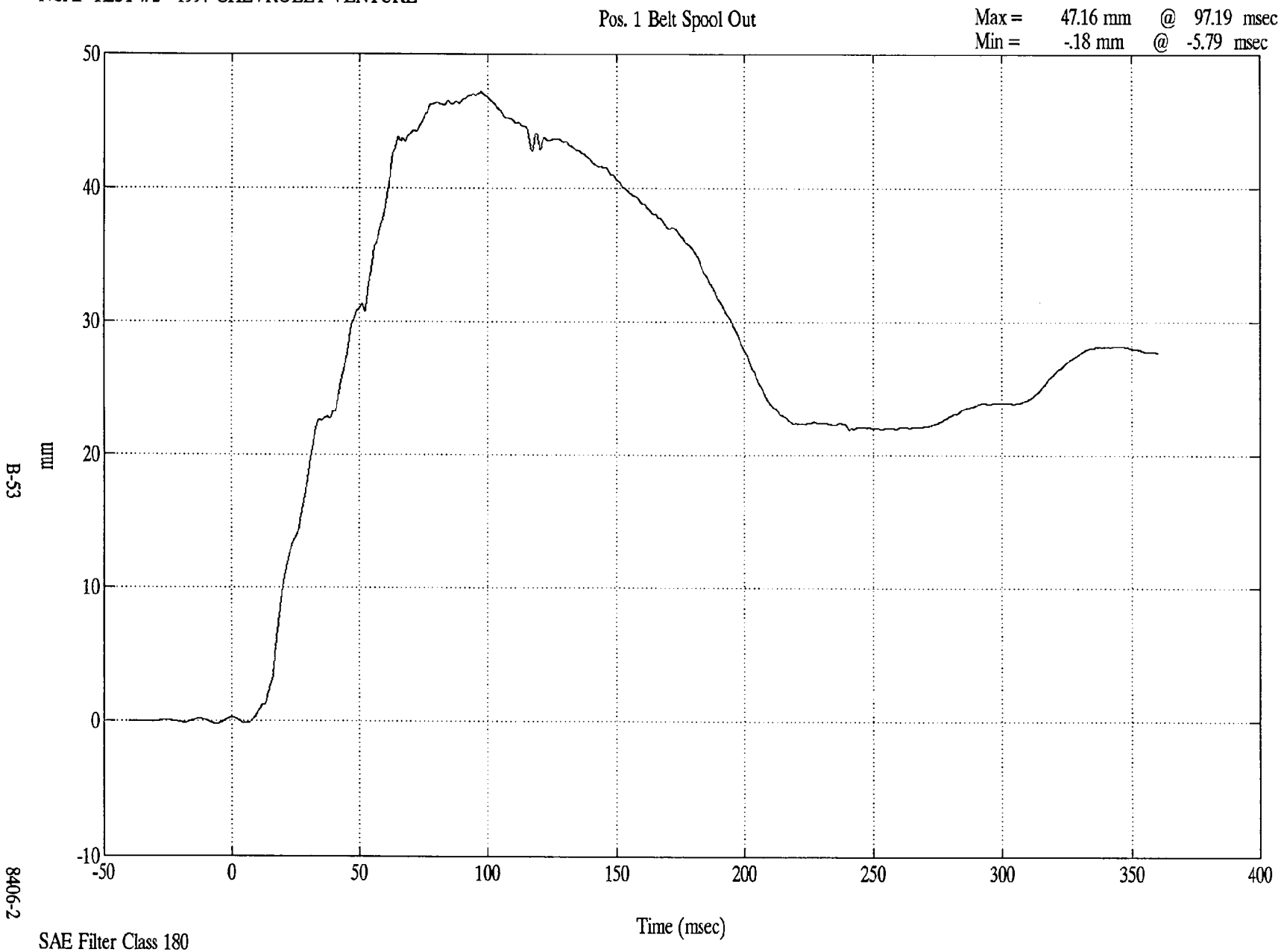


B-52

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

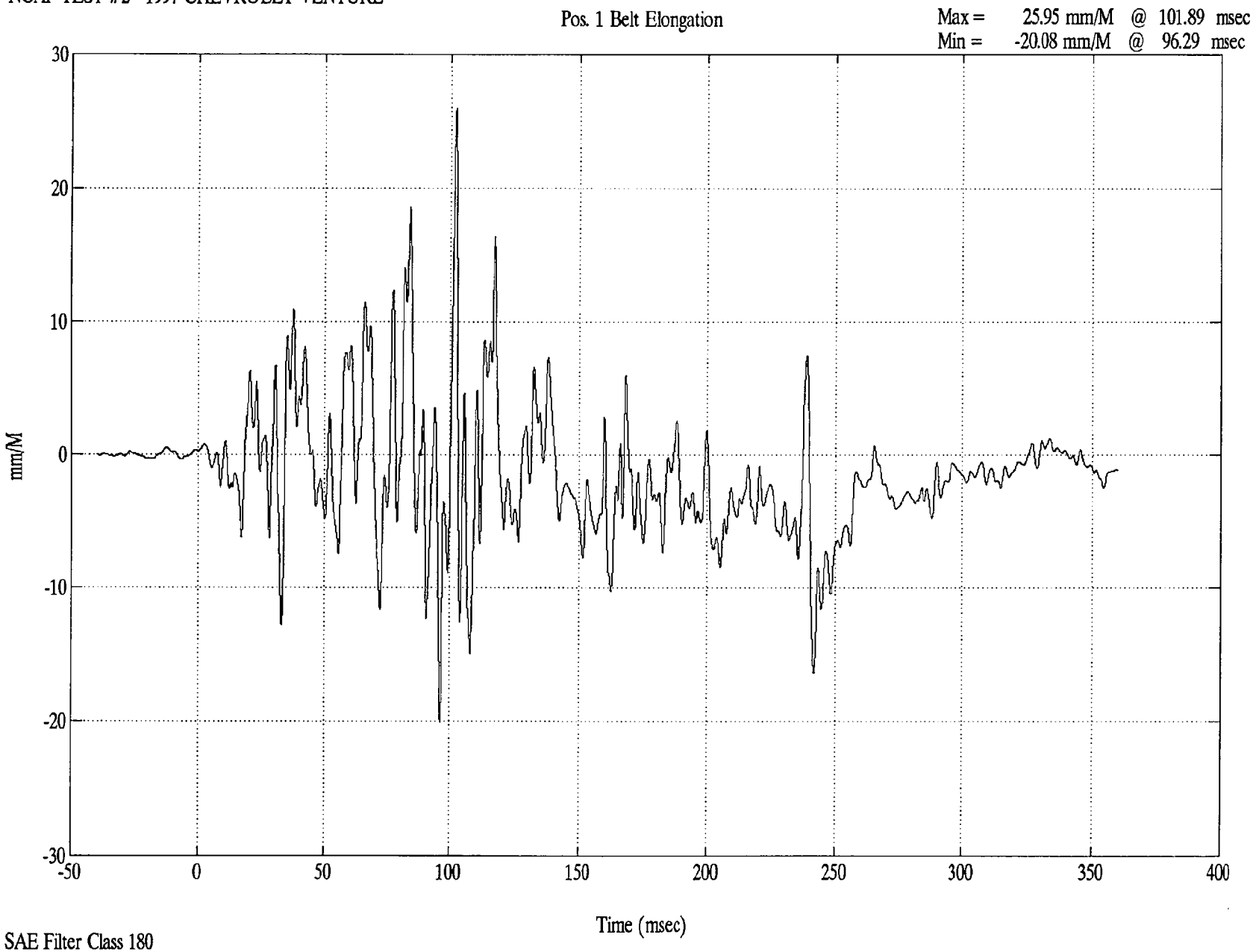


B-53

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 180

B-54

8406-2

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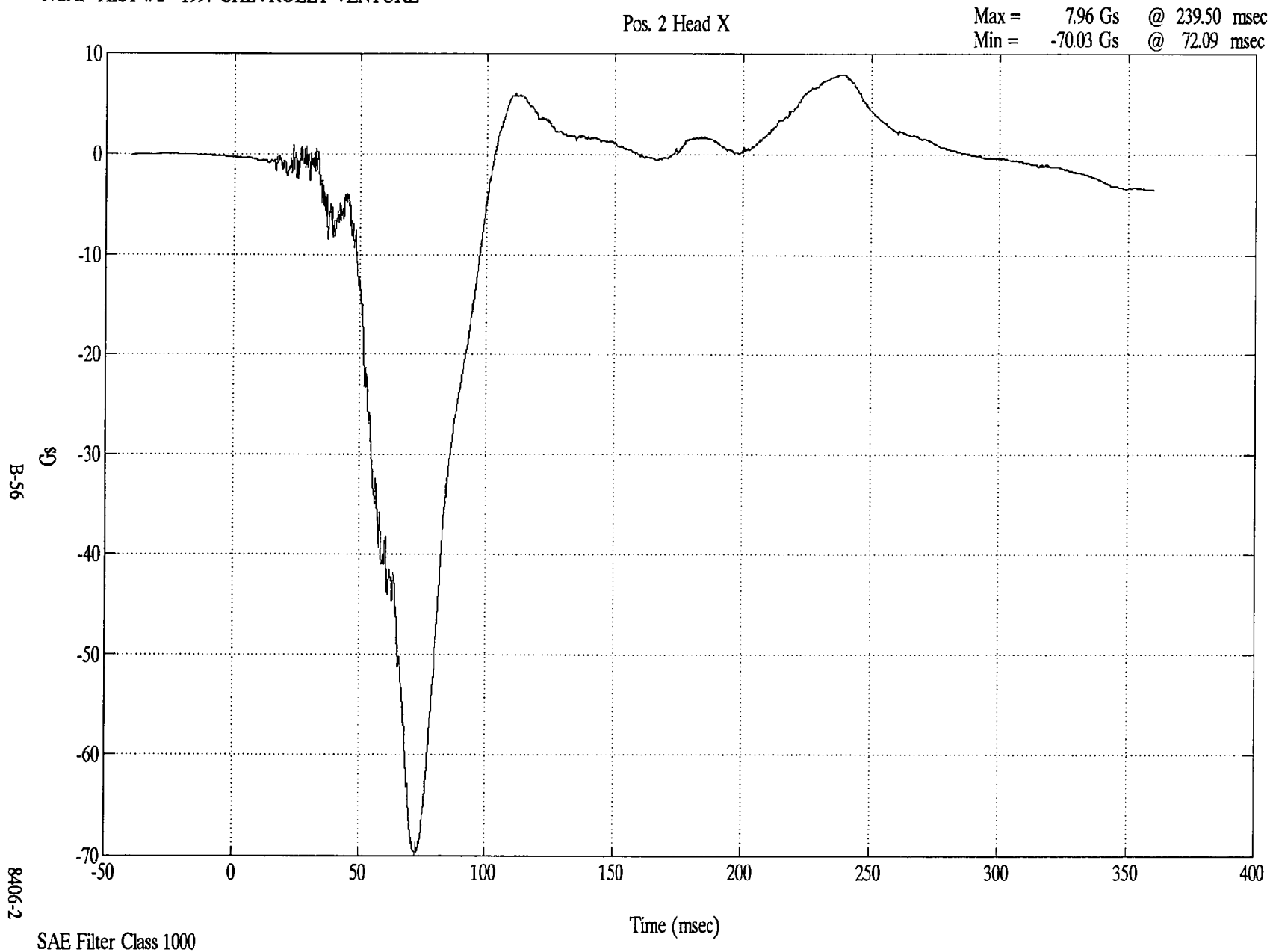
NCAP TEST #2 - 1997 CHEVROLET VENTURE

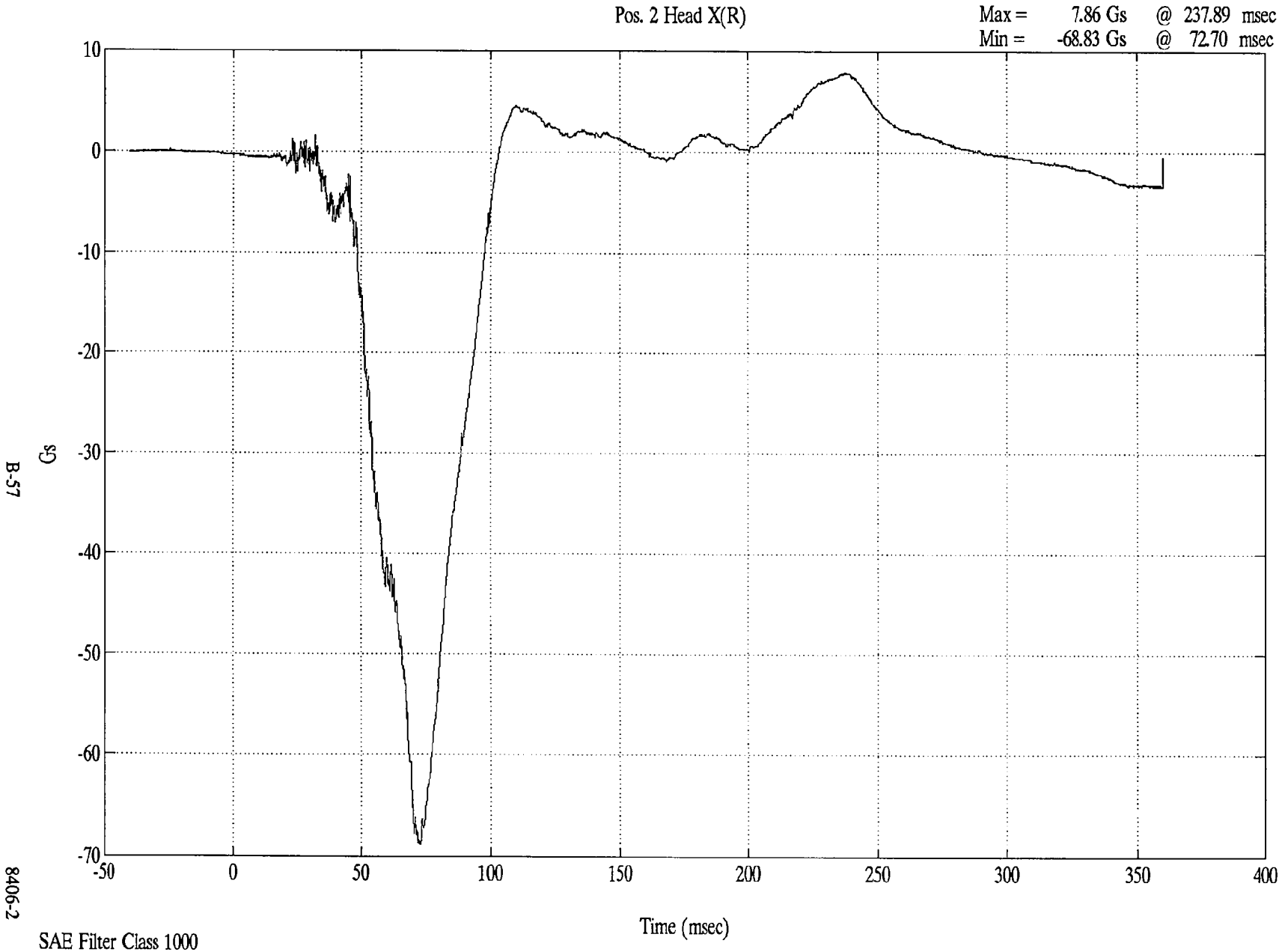


B-56

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

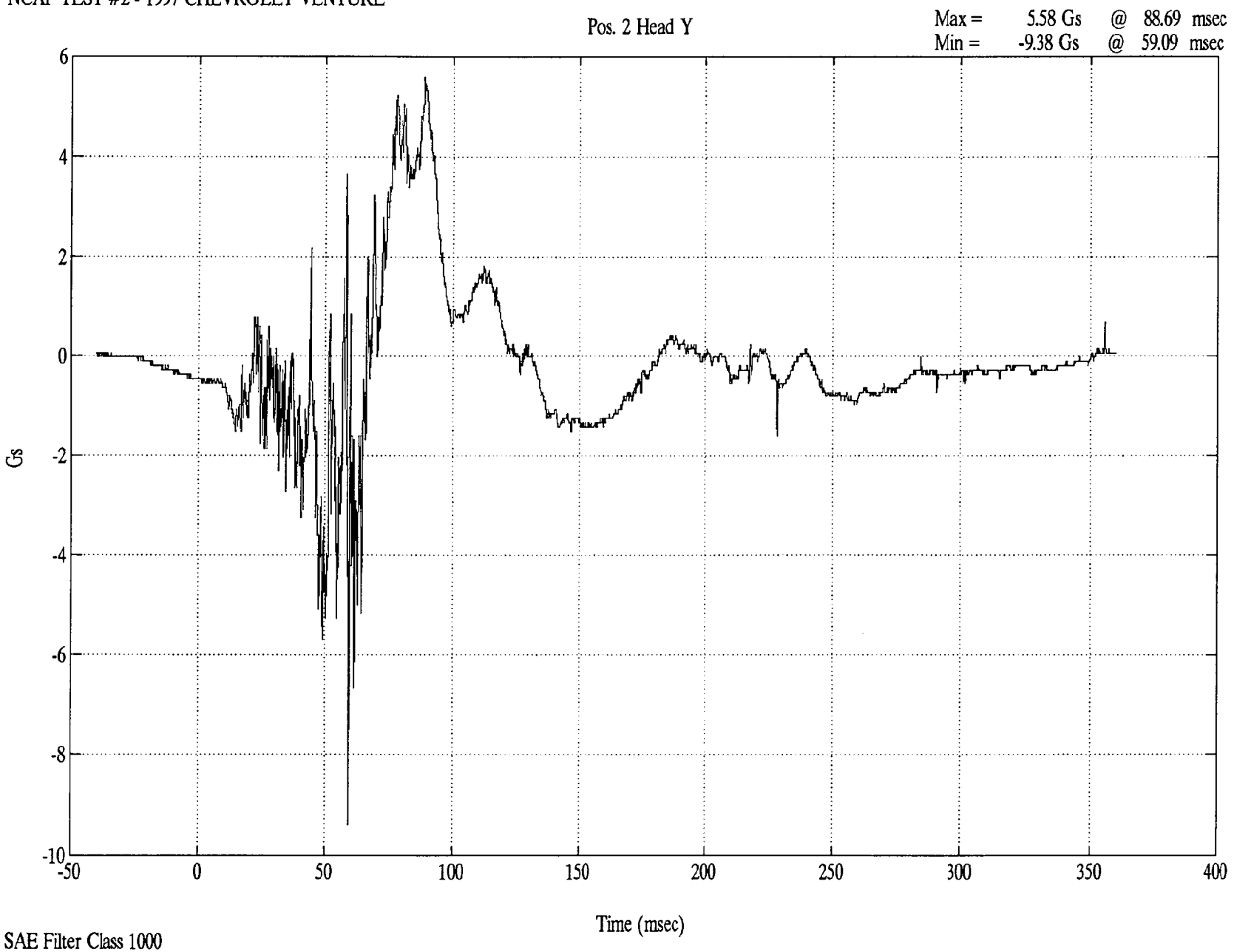


B-57

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

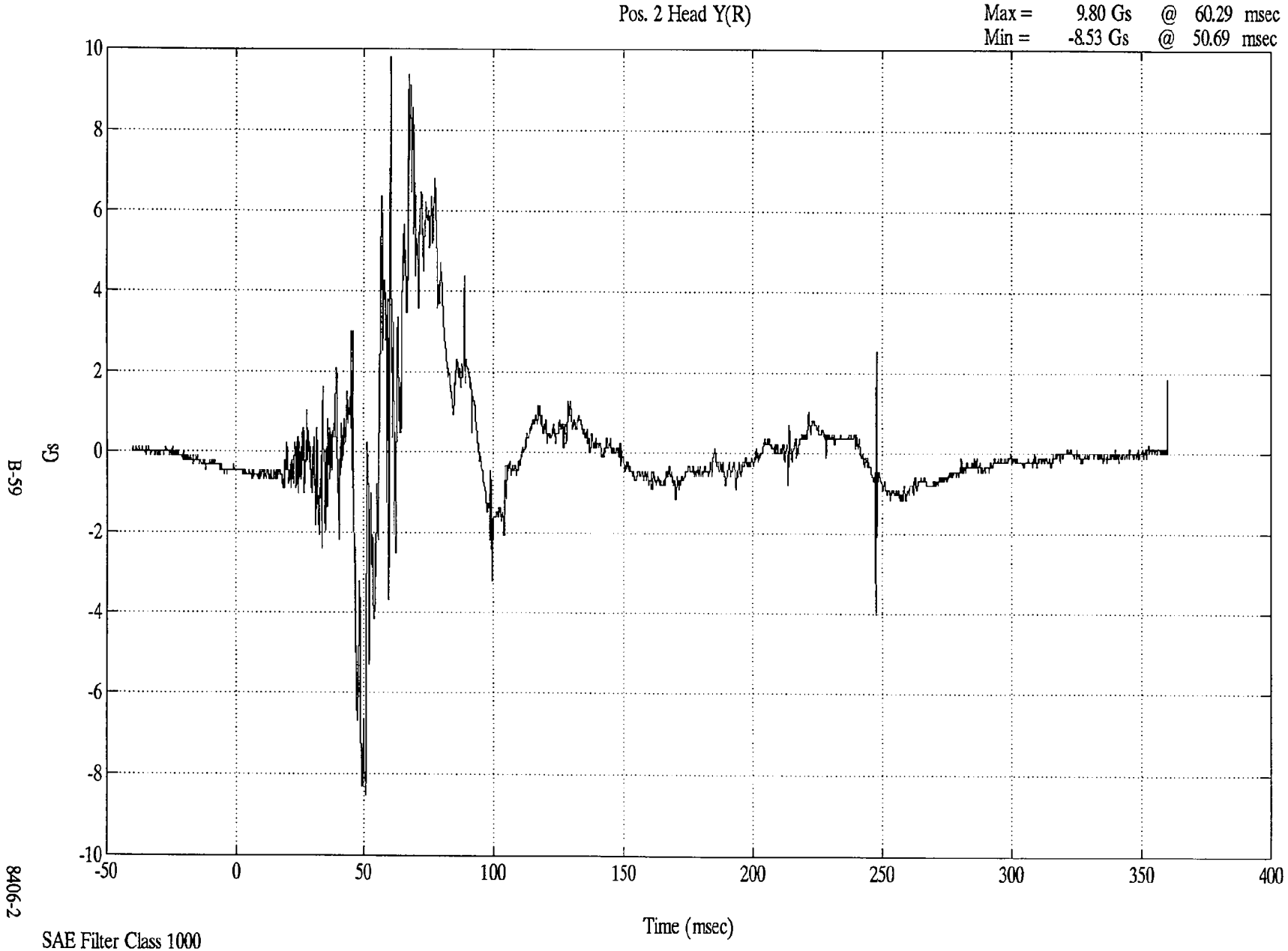


B-58

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

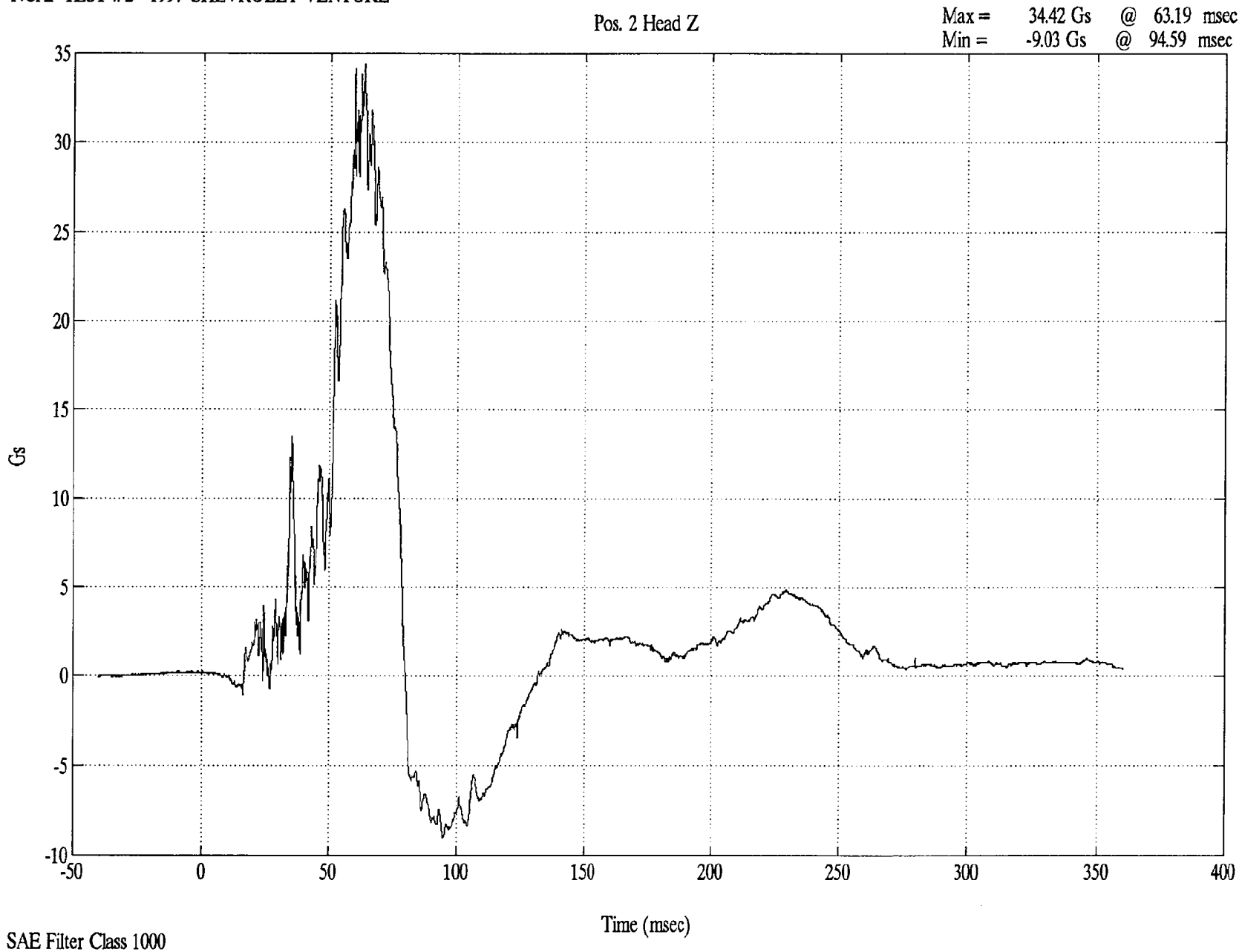


B-59

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

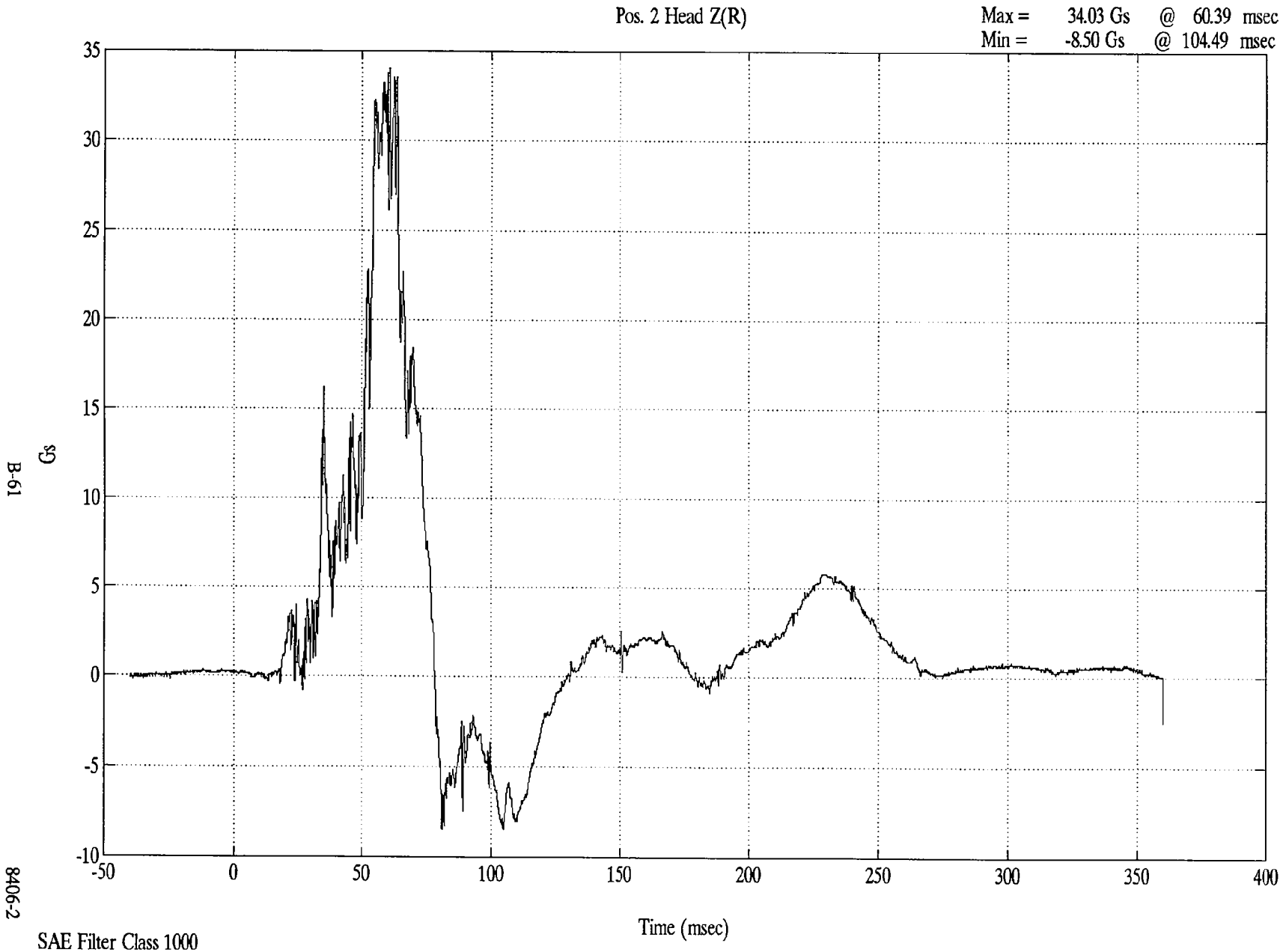


B-60

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

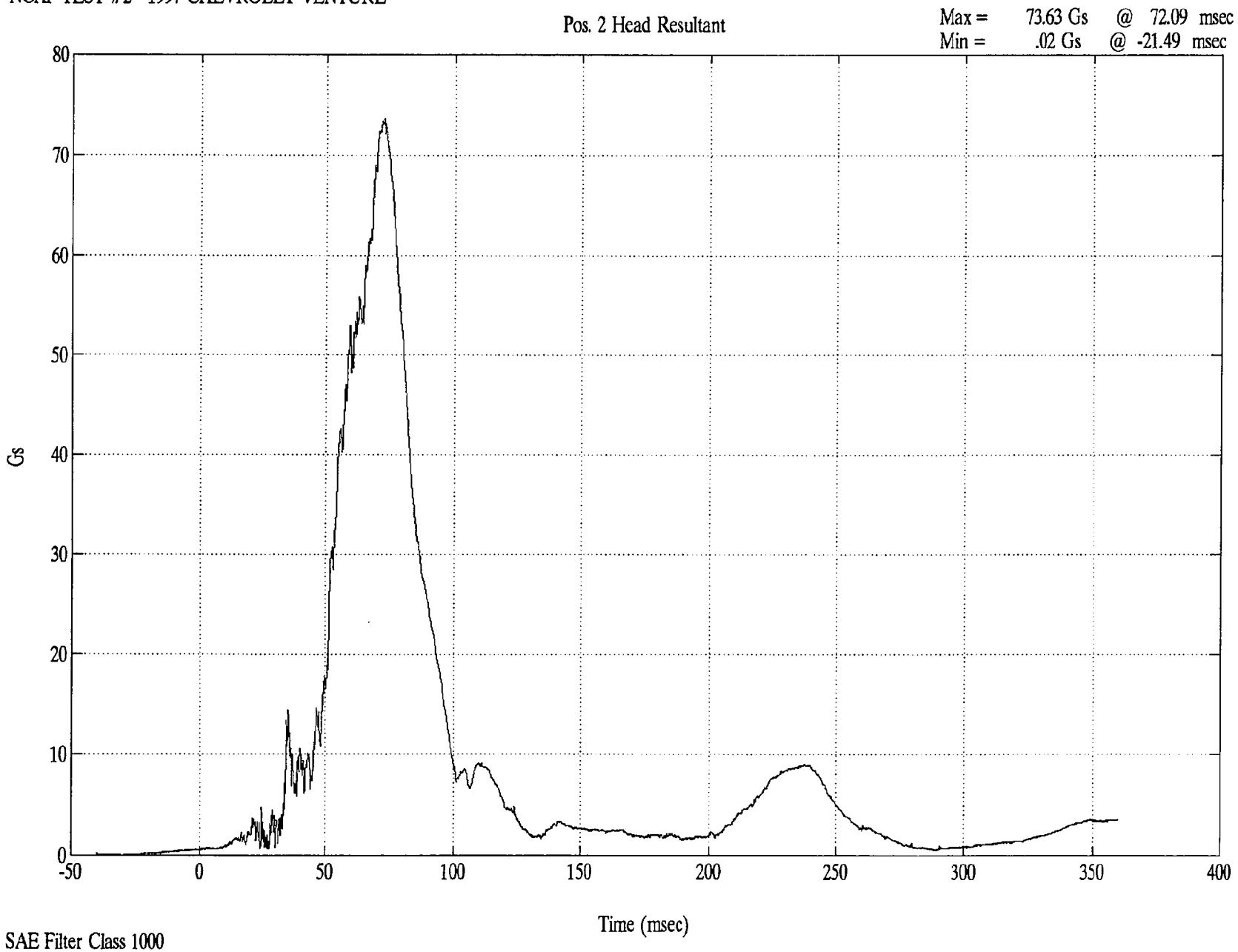


B-61

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

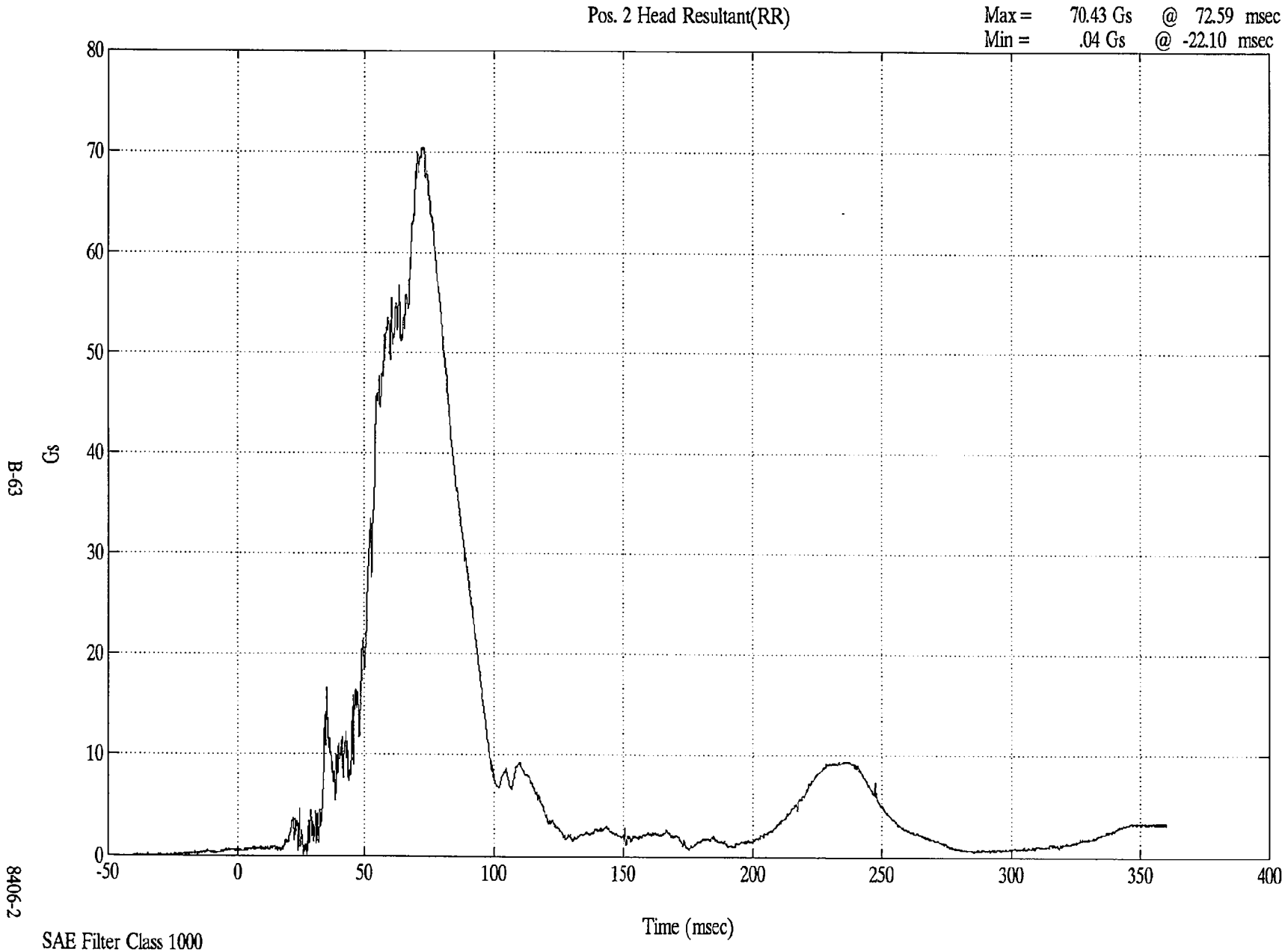


B-62

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

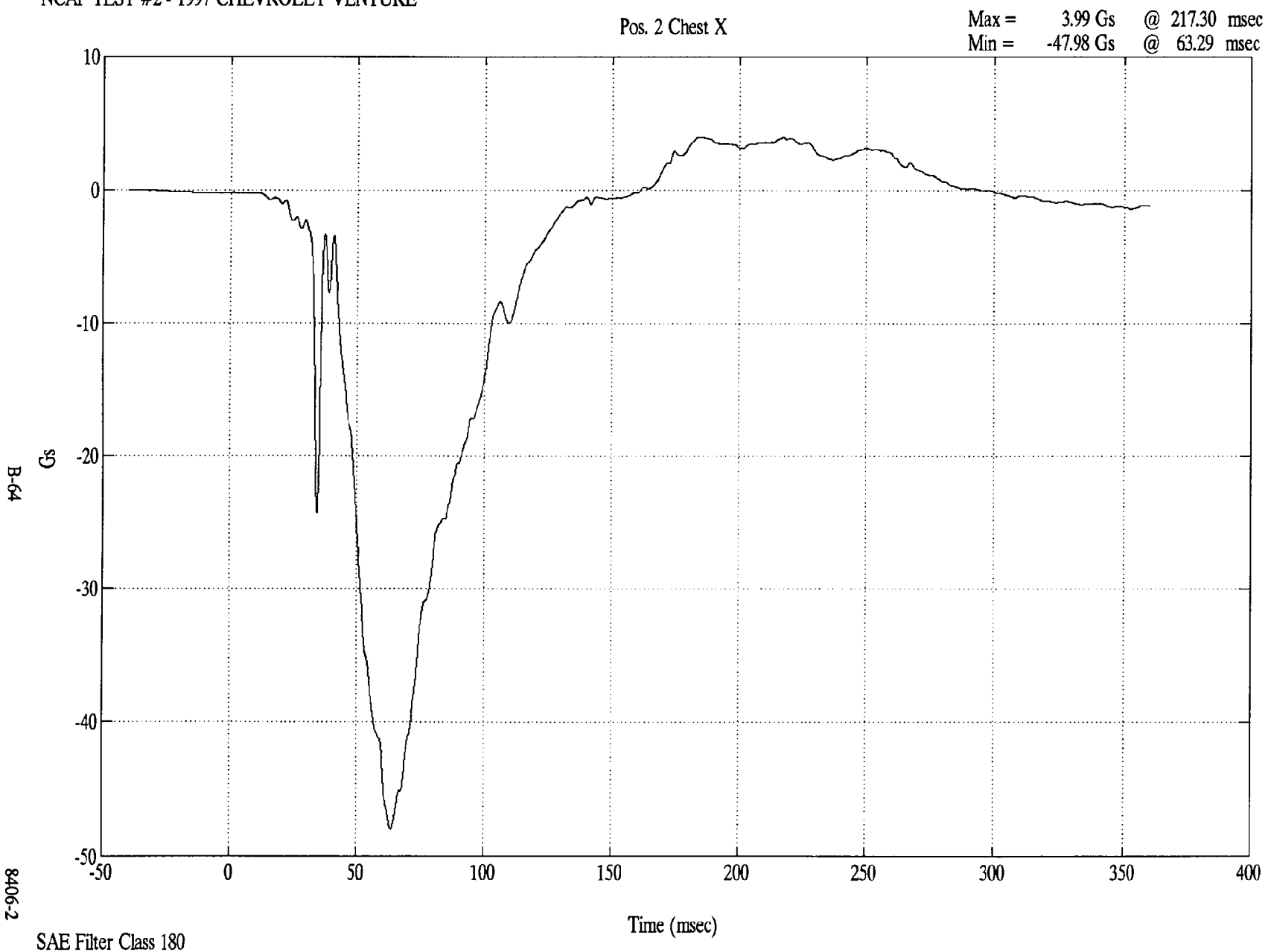


B-63

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

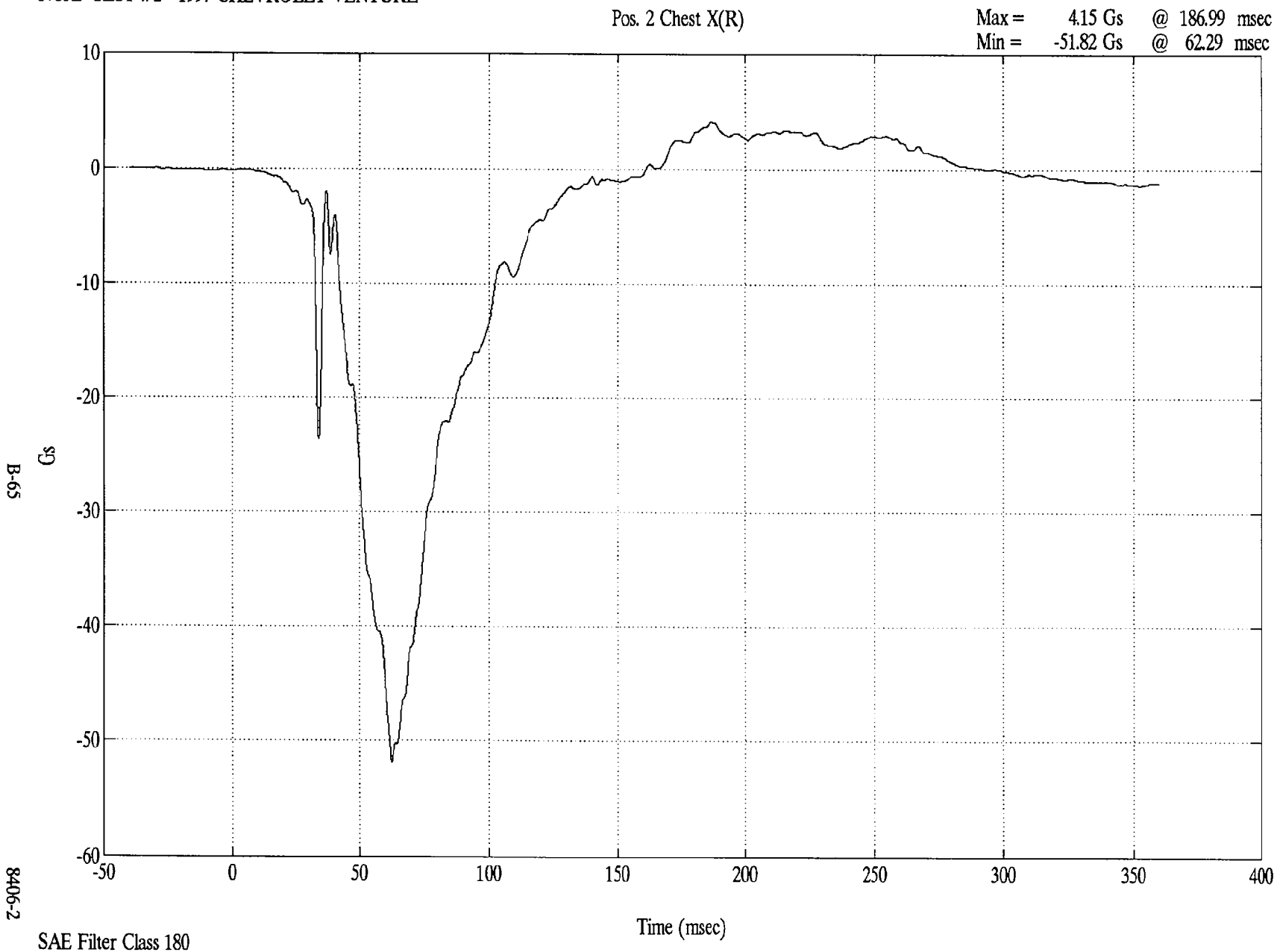


B-64

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

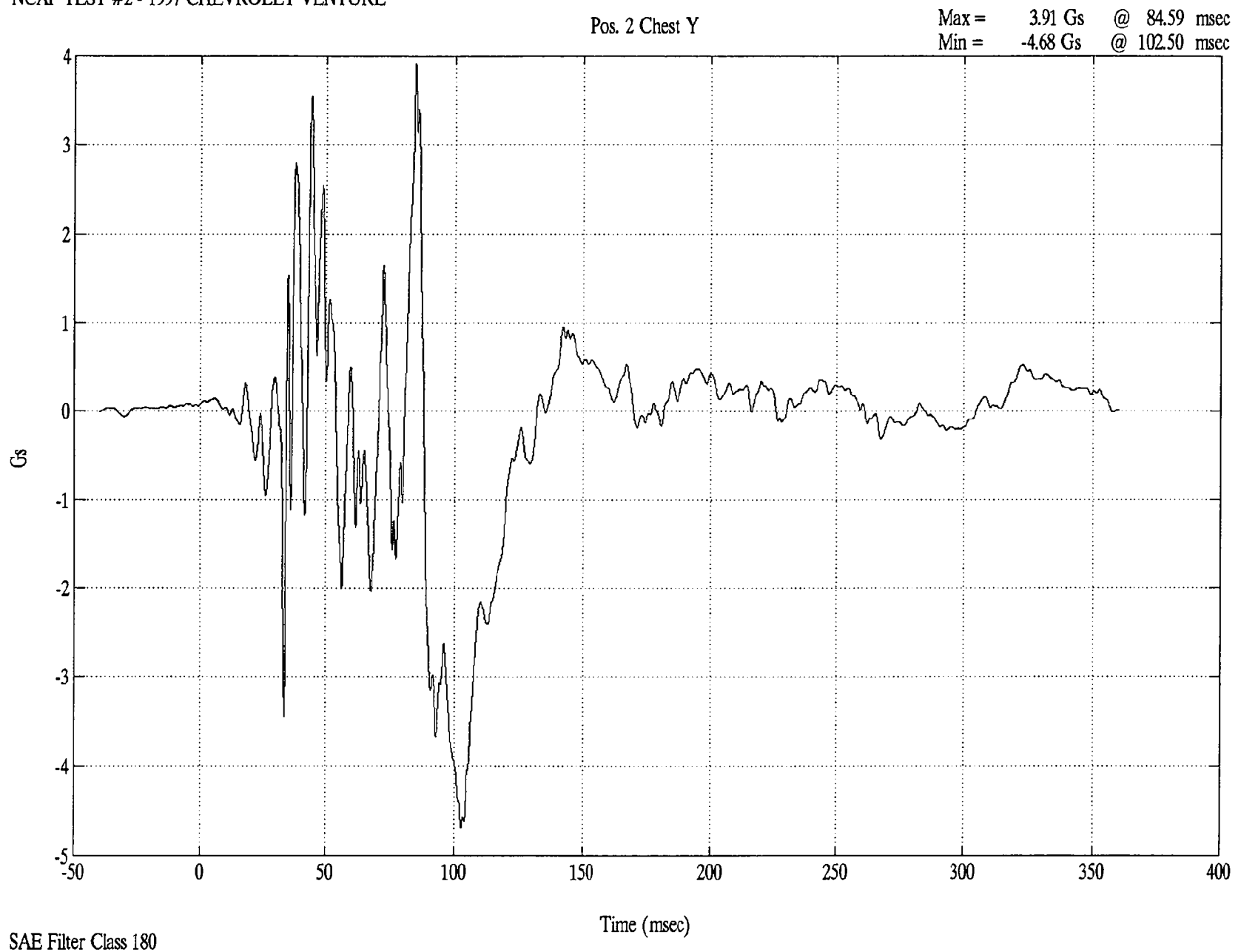


B-65

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

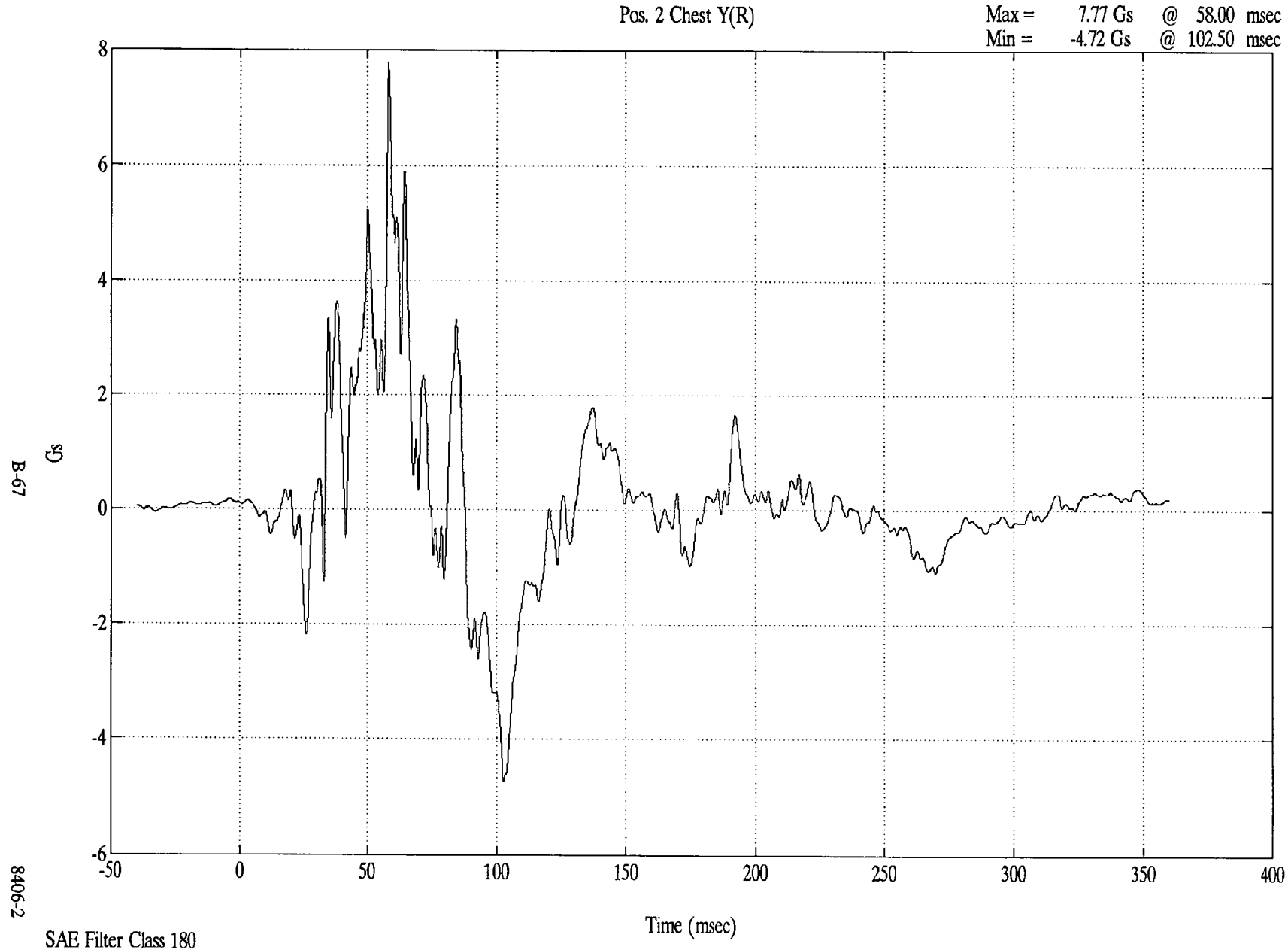


B-66

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

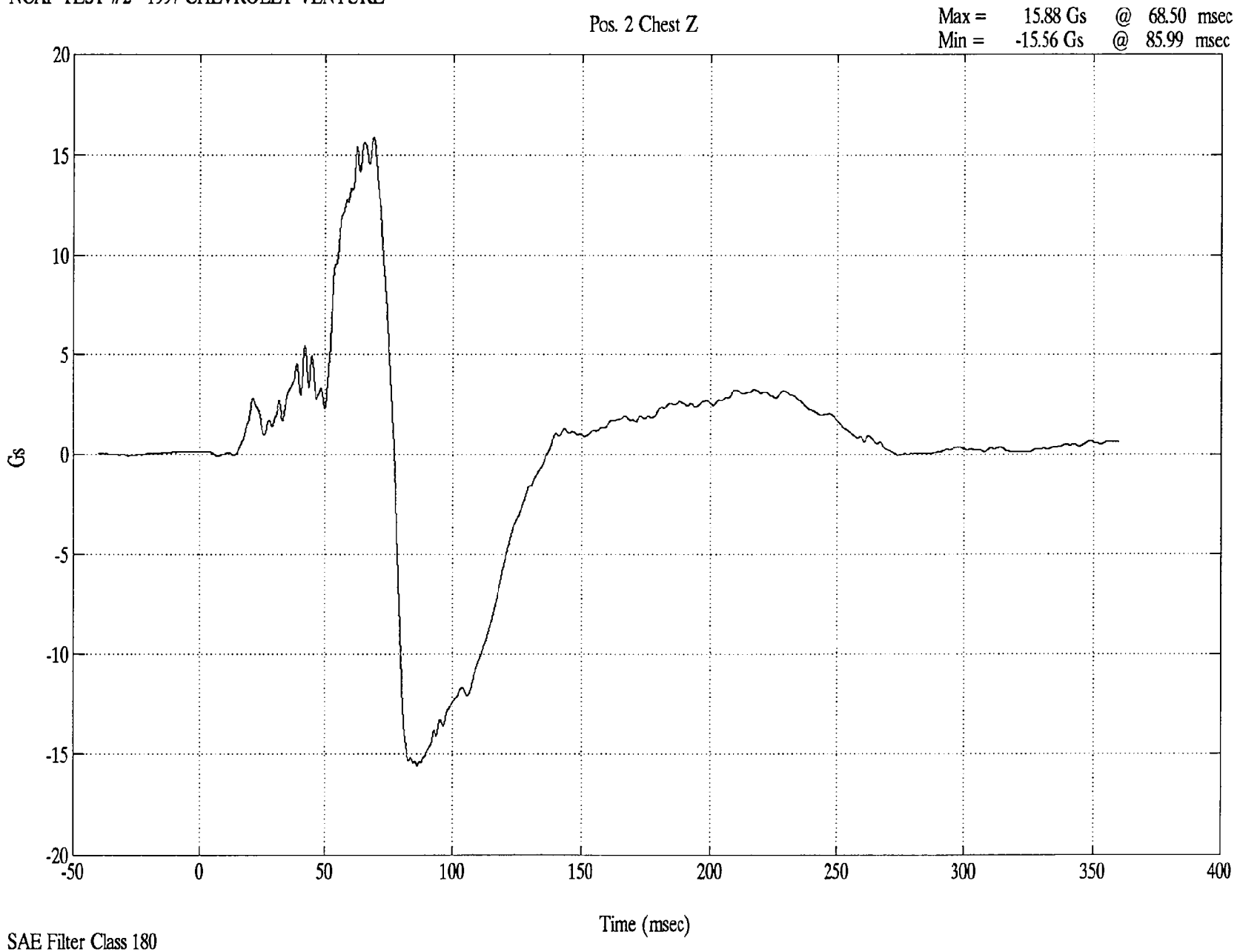


B-67

8406-2

SAE Filter Class 180

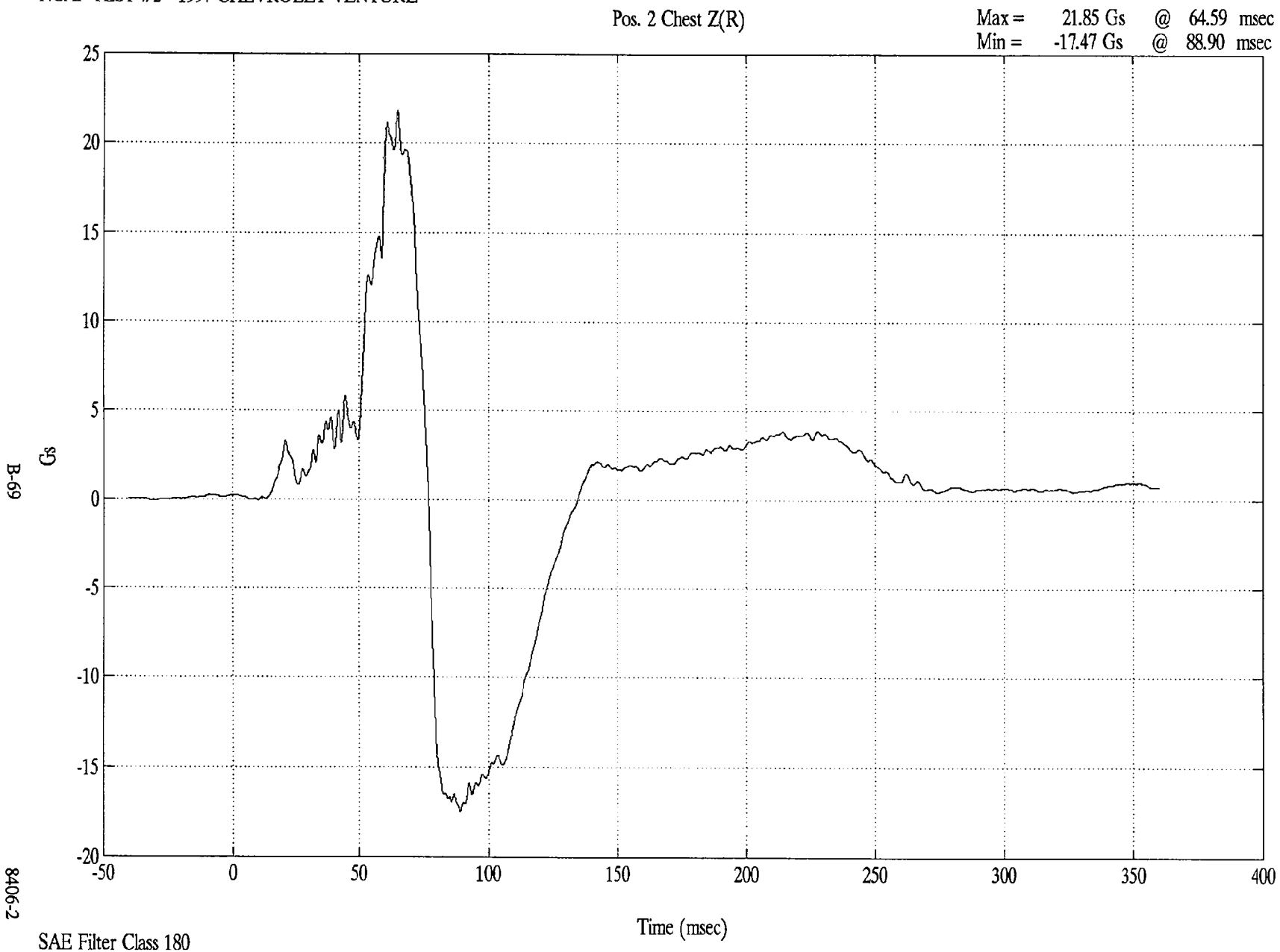
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 180

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

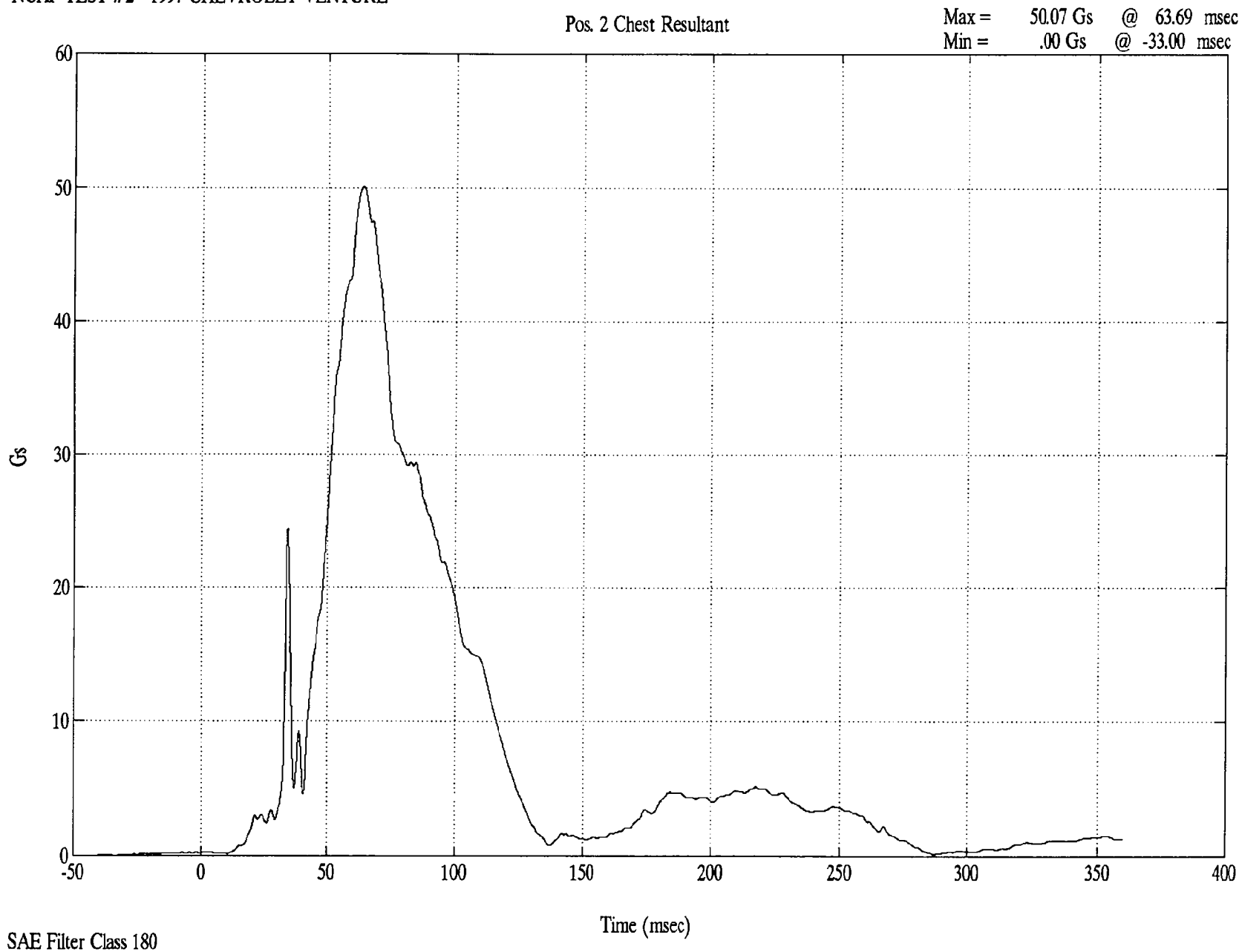


B-69

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

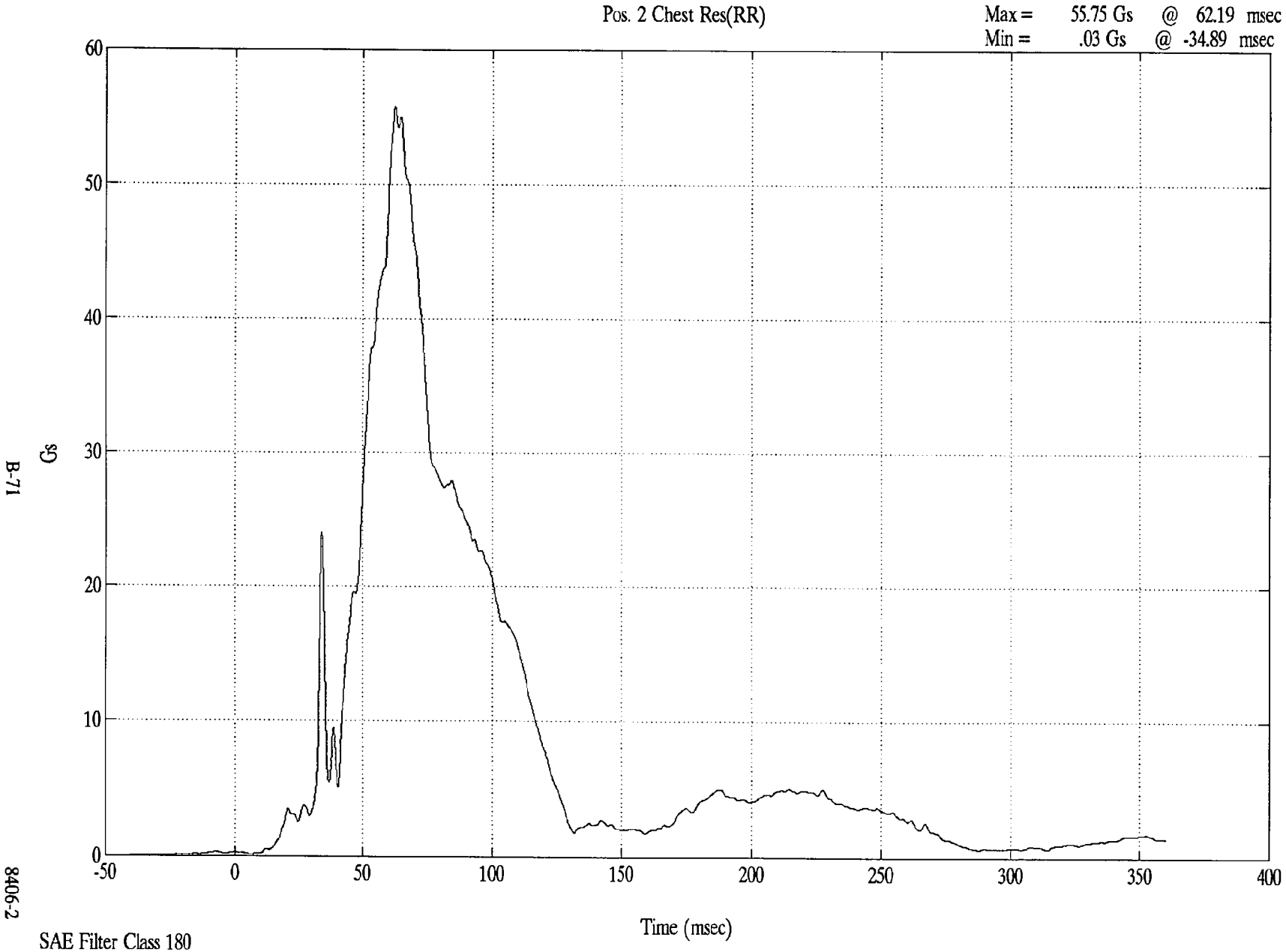


B-70

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

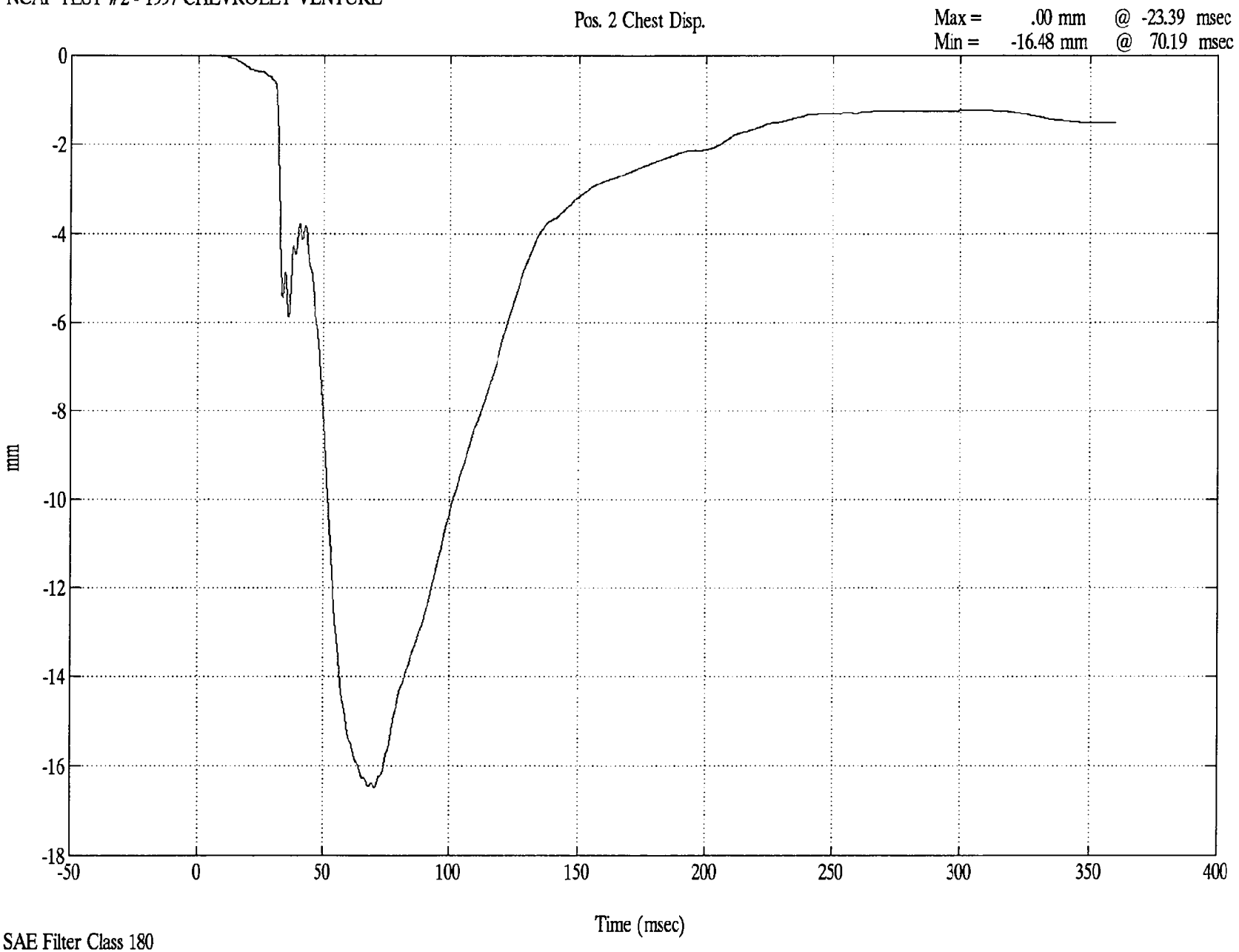


SAE Filter Class 180

B-71

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

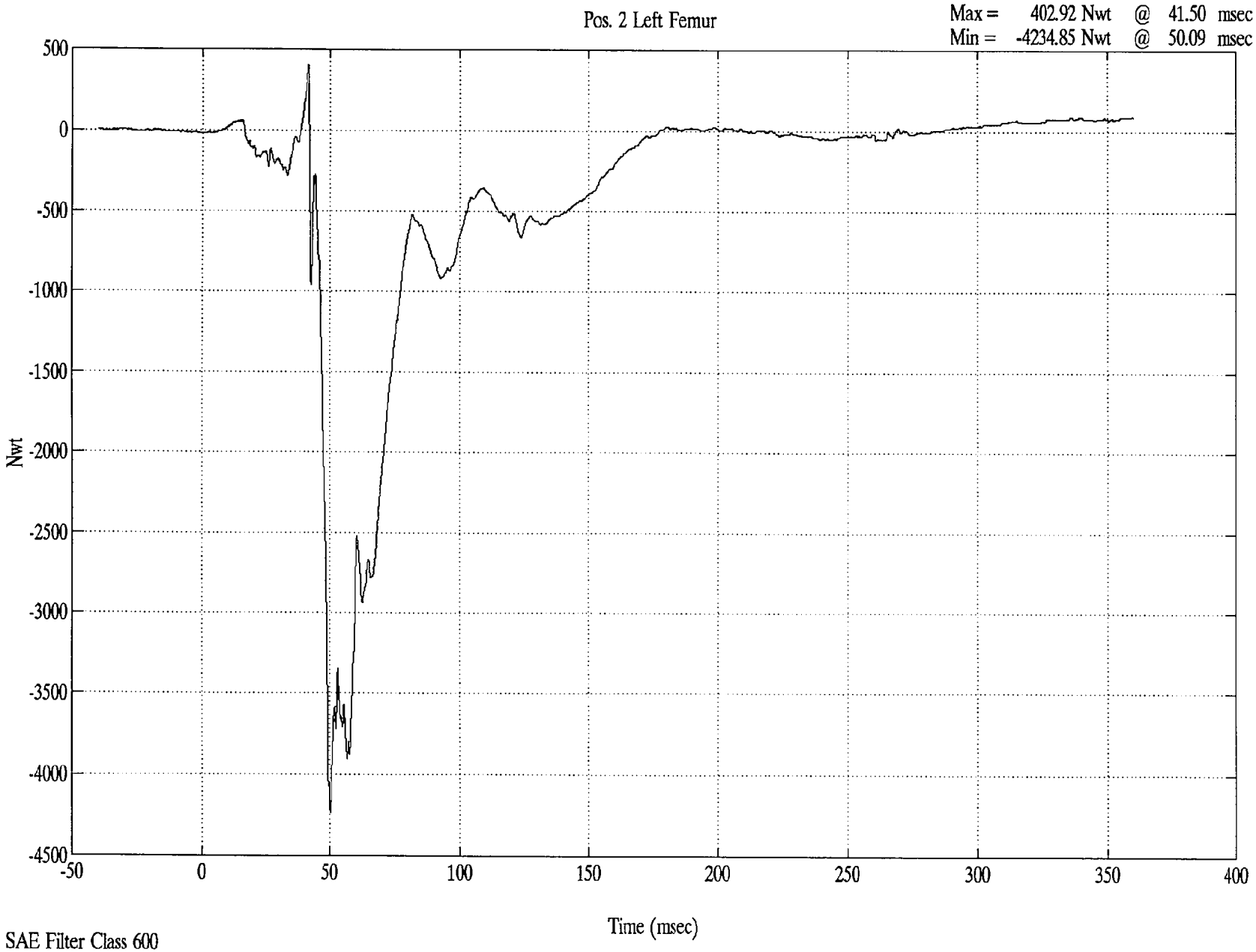


B-72

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

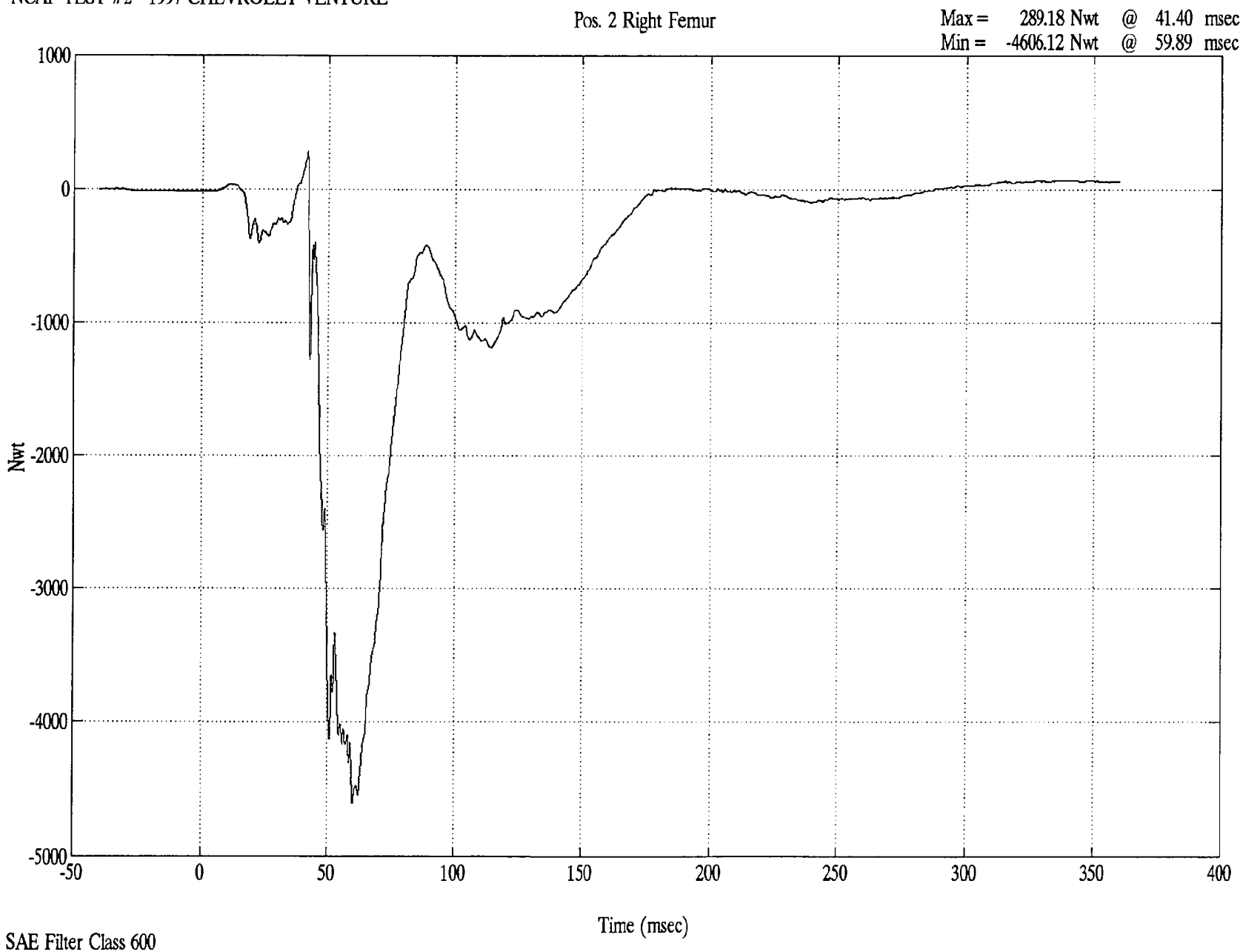


B-73

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

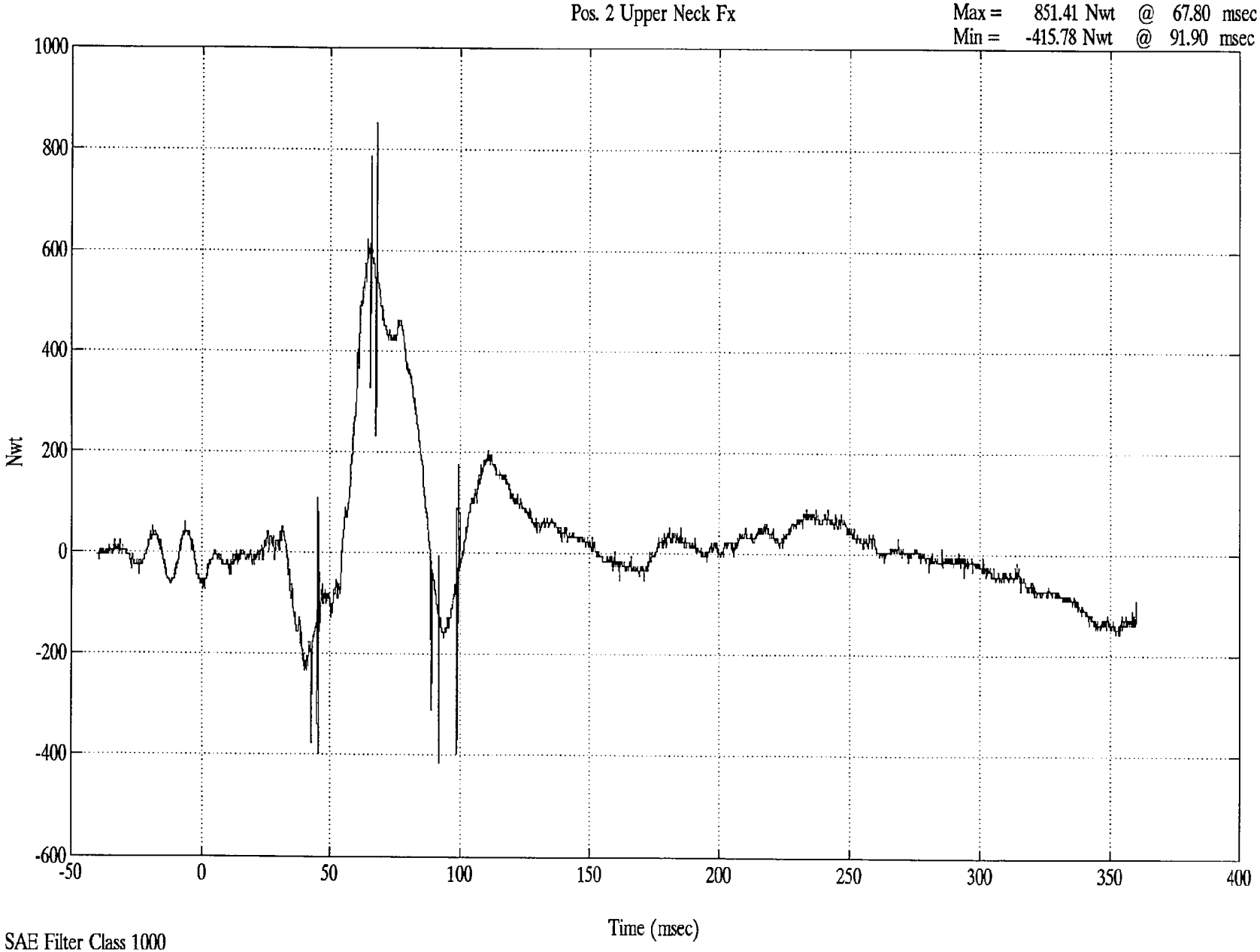


B-74

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

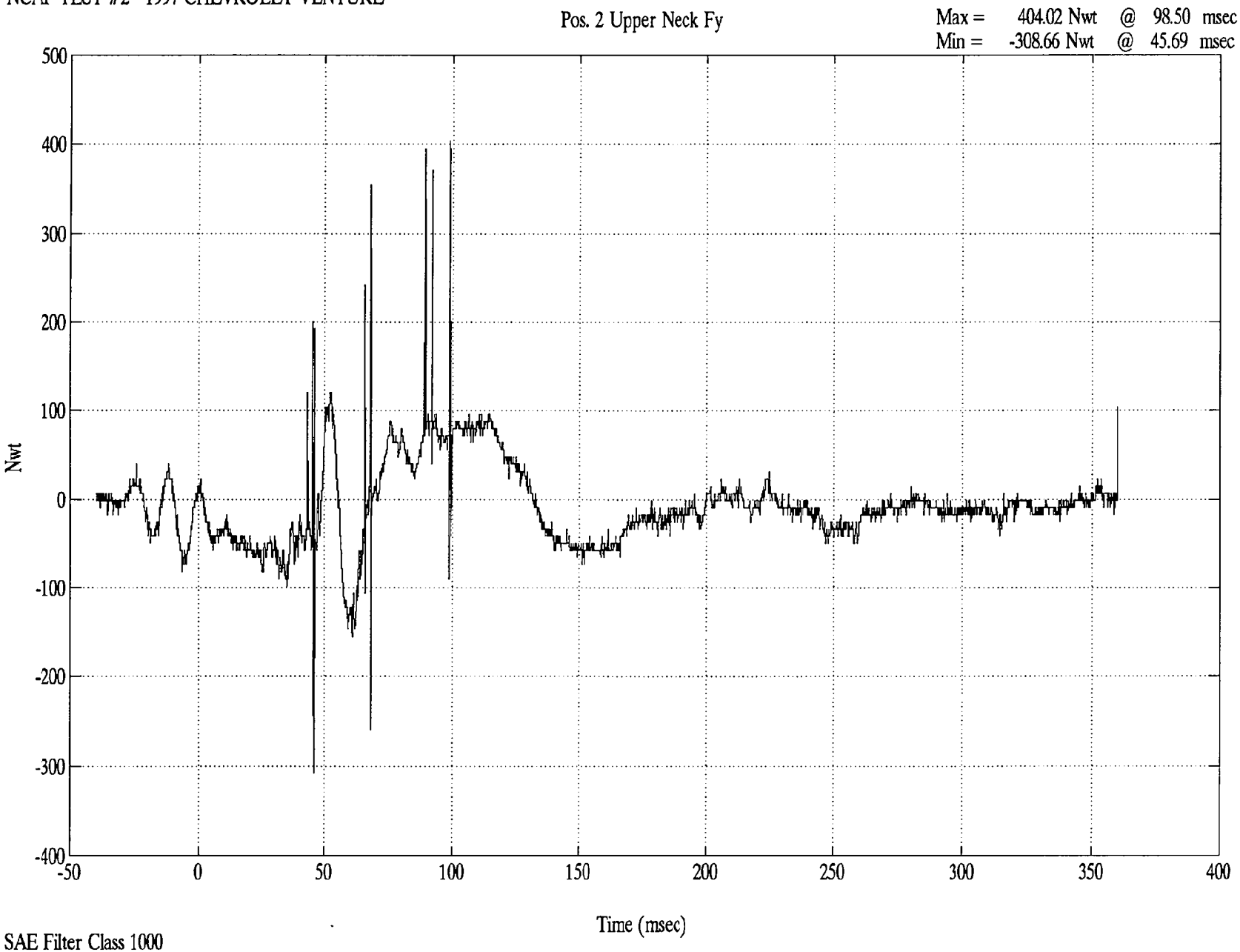


B-75

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

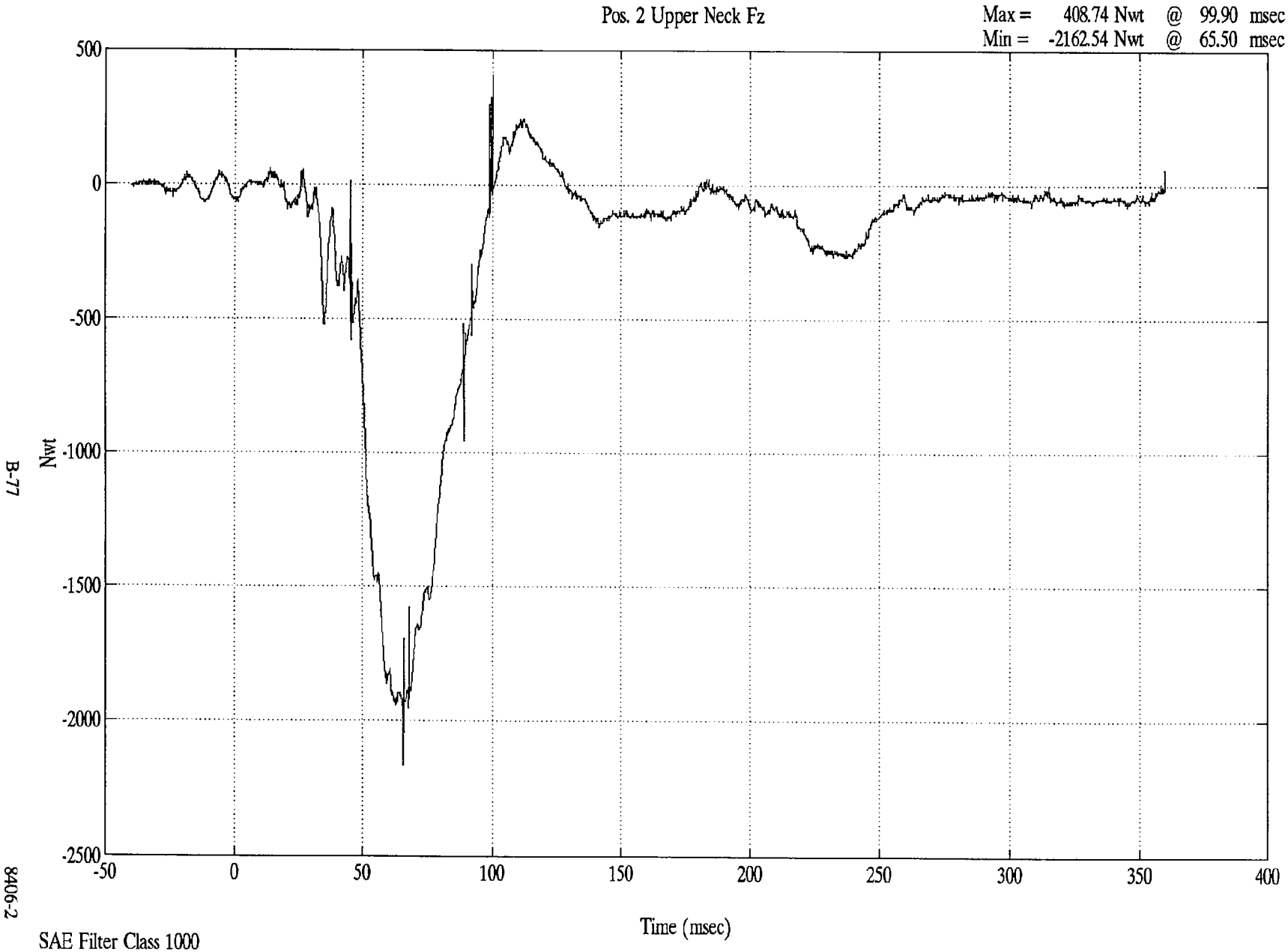


B-76

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

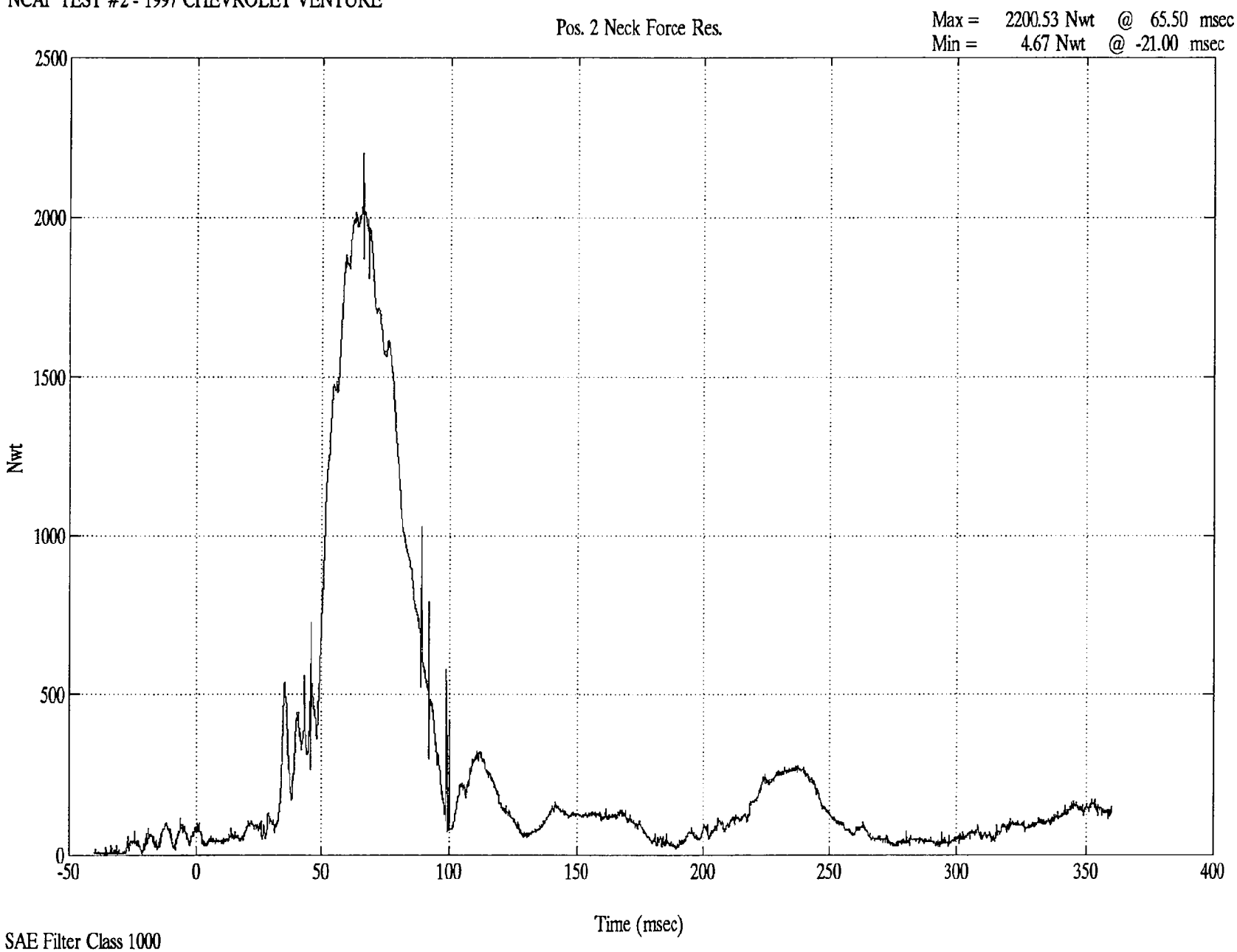


B-77

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

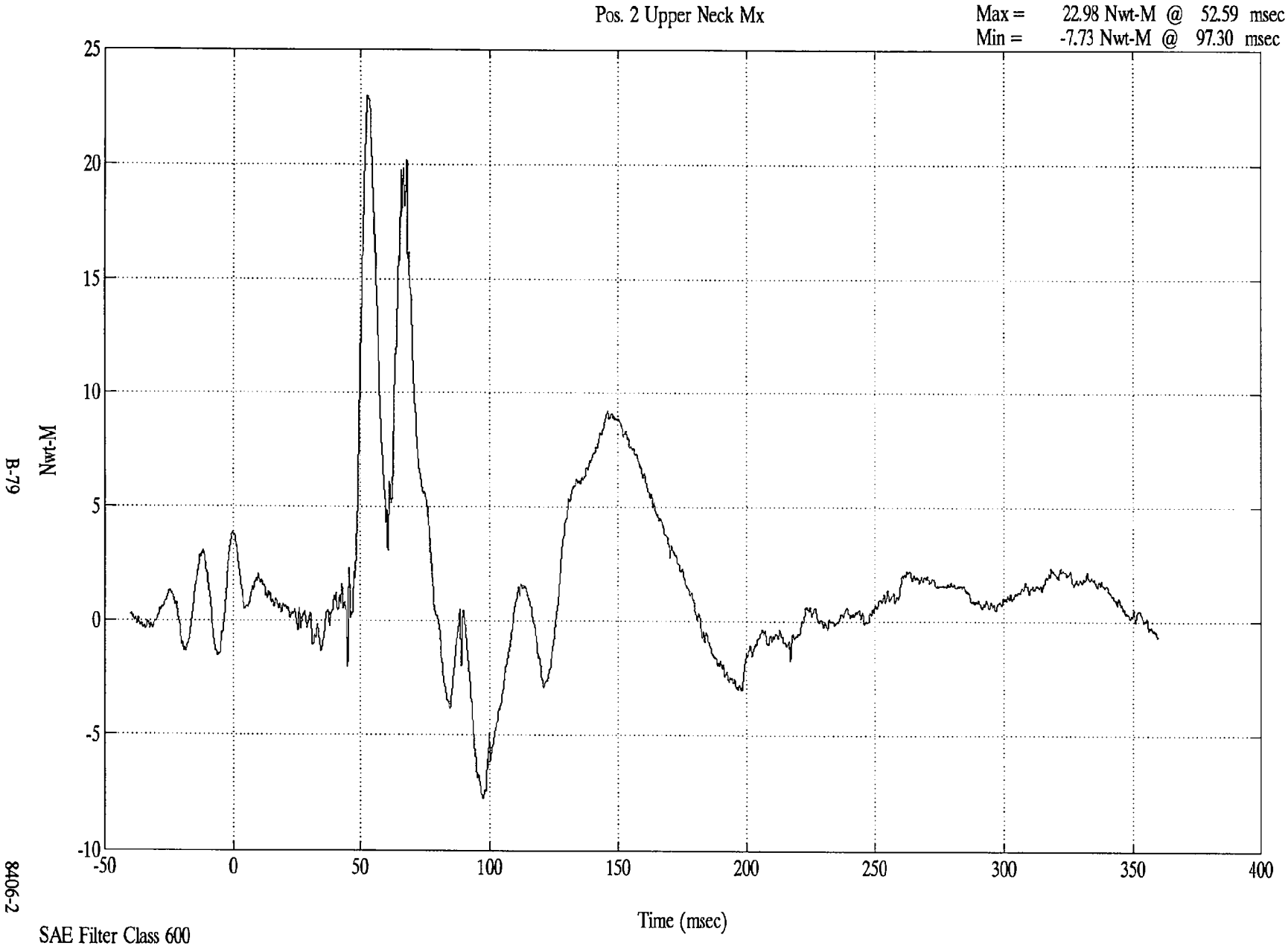


B-78

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

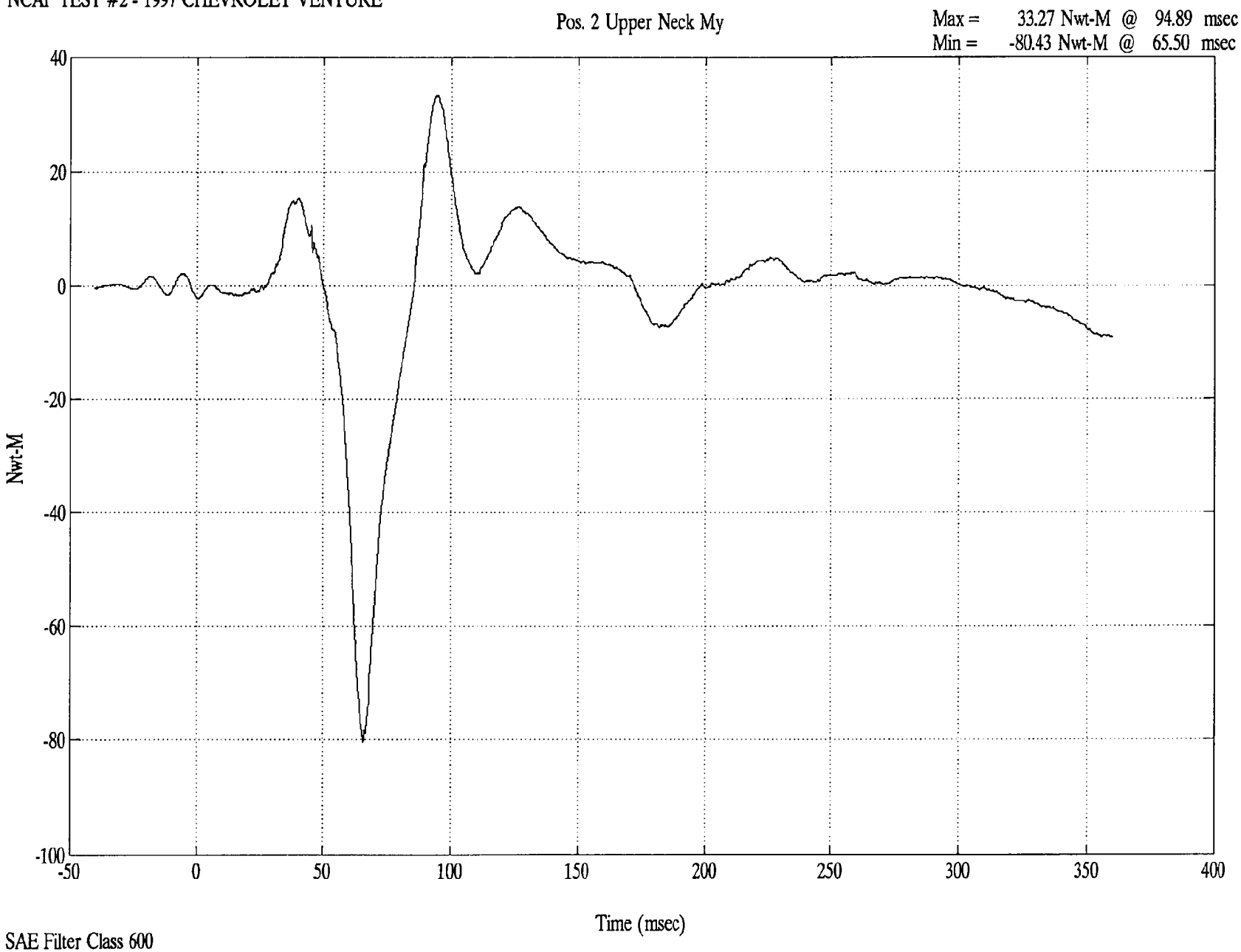


B-79

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

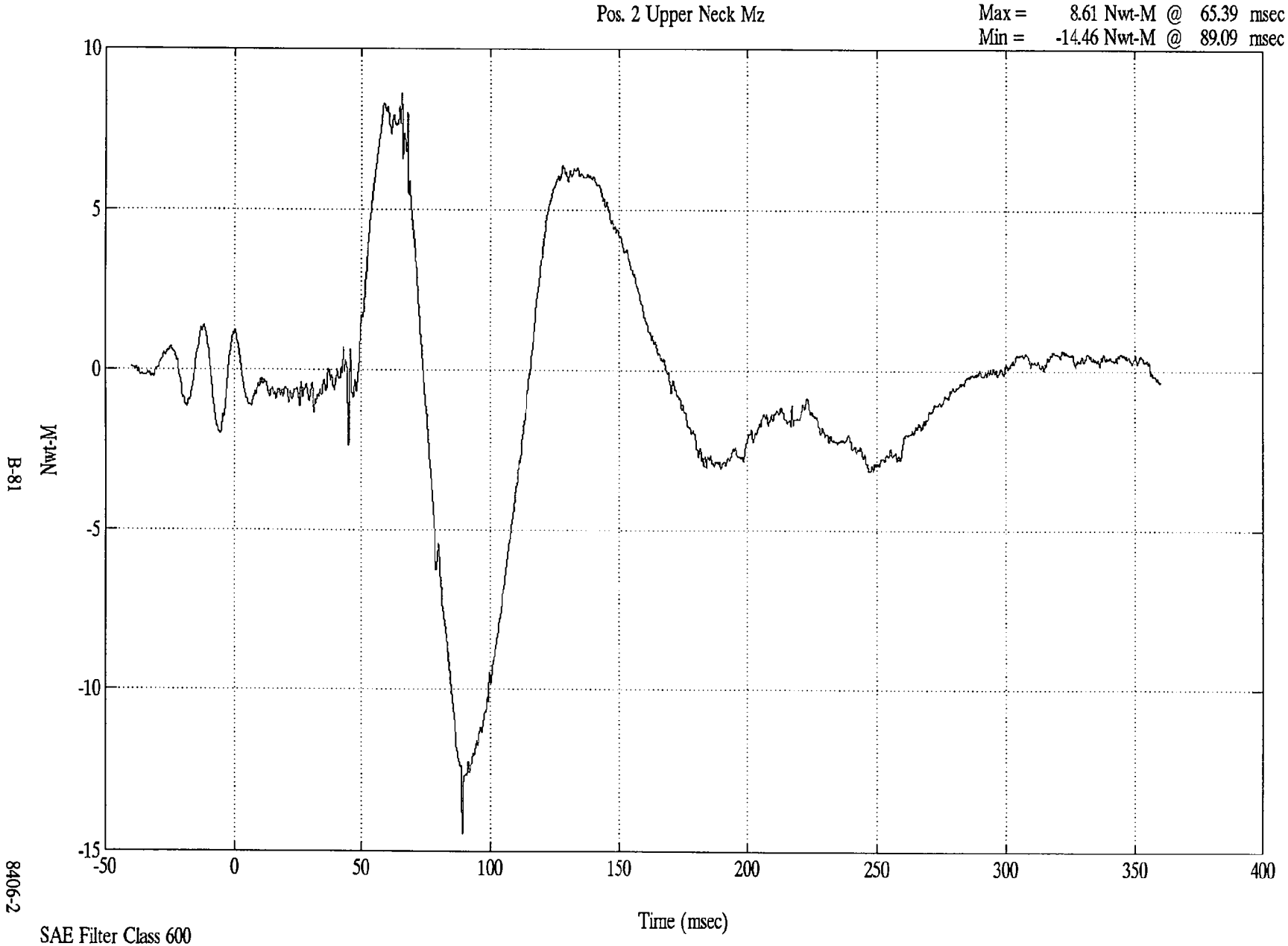


B-80

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

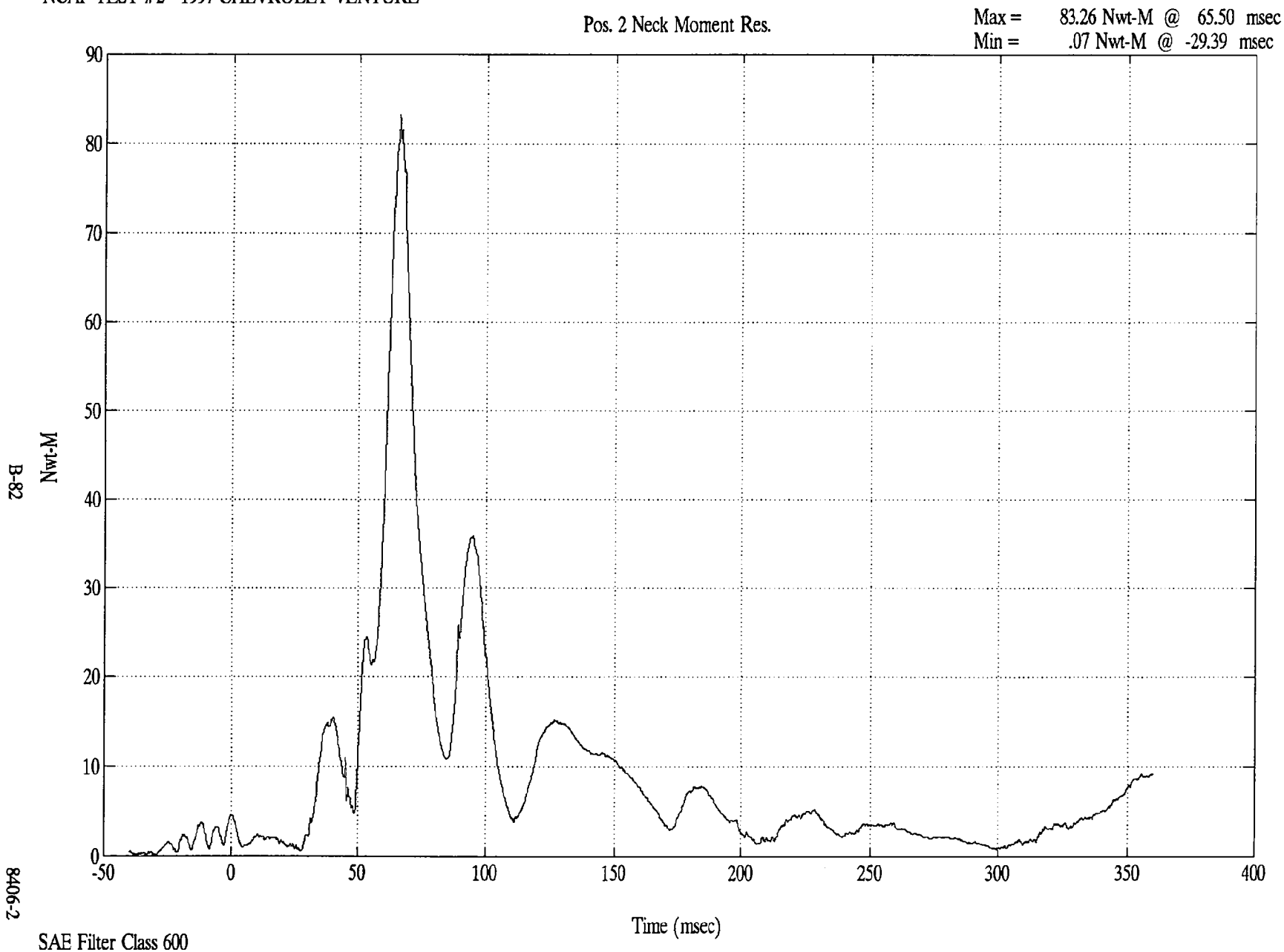


B-81

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

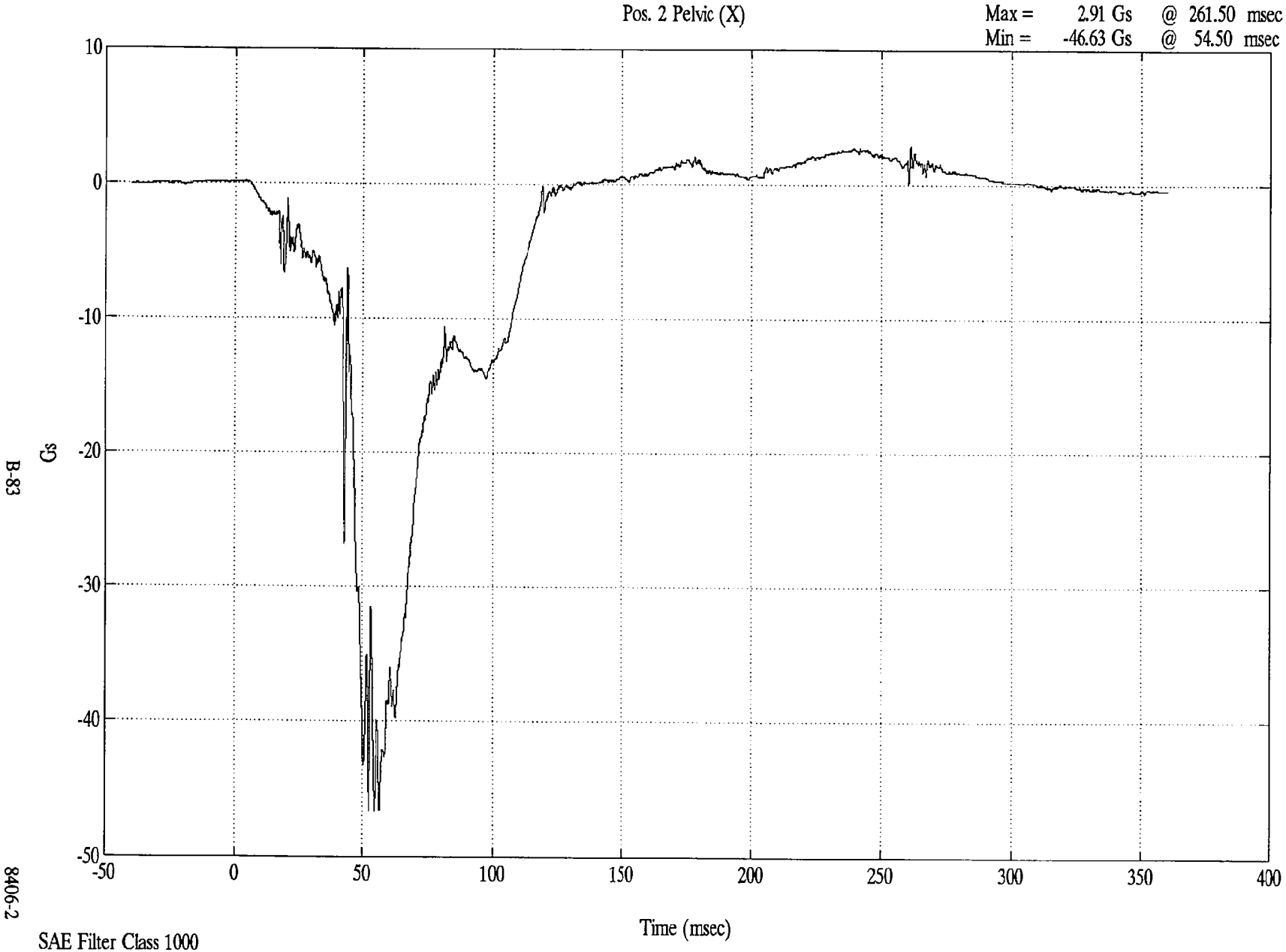


B-82

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

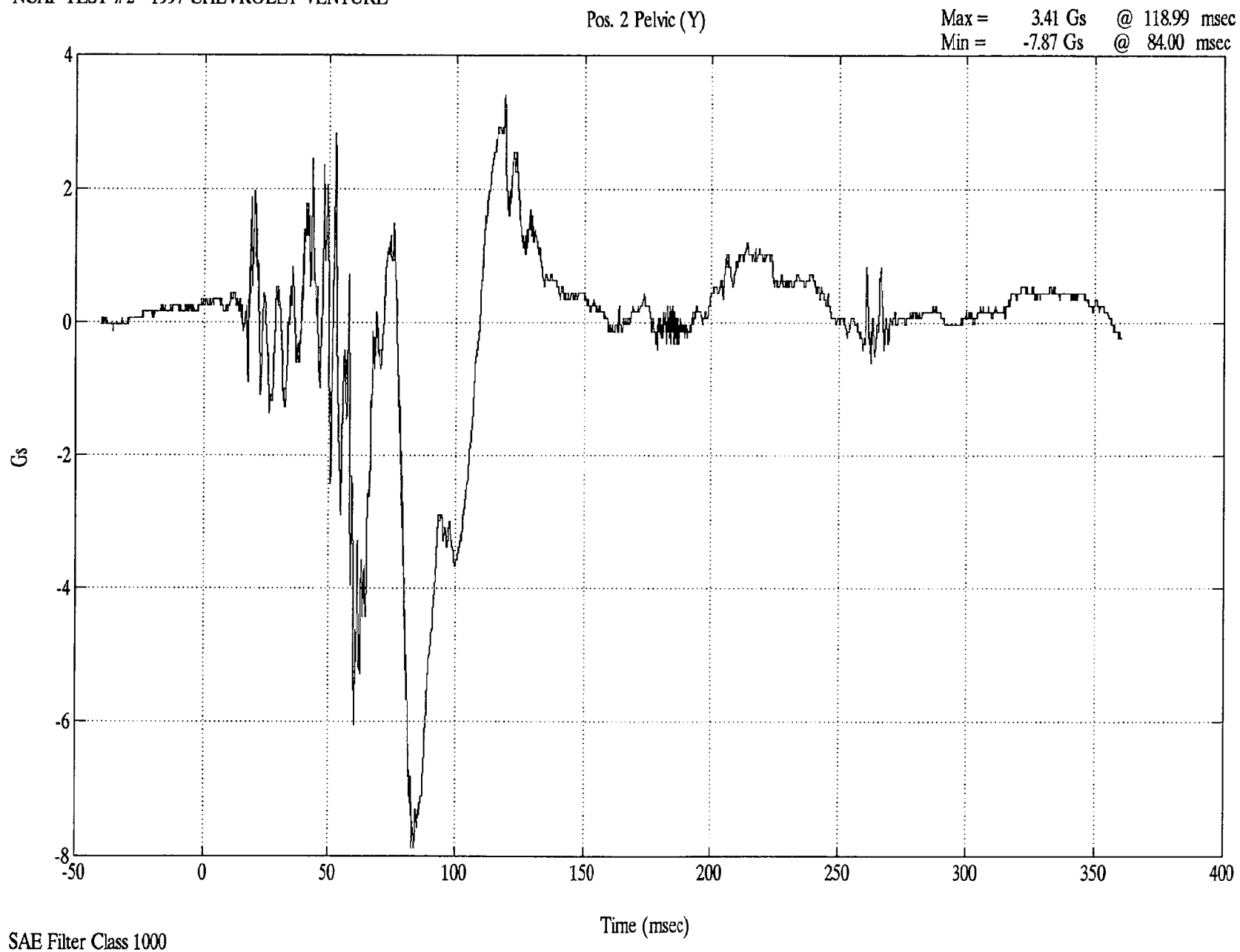


B-83

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

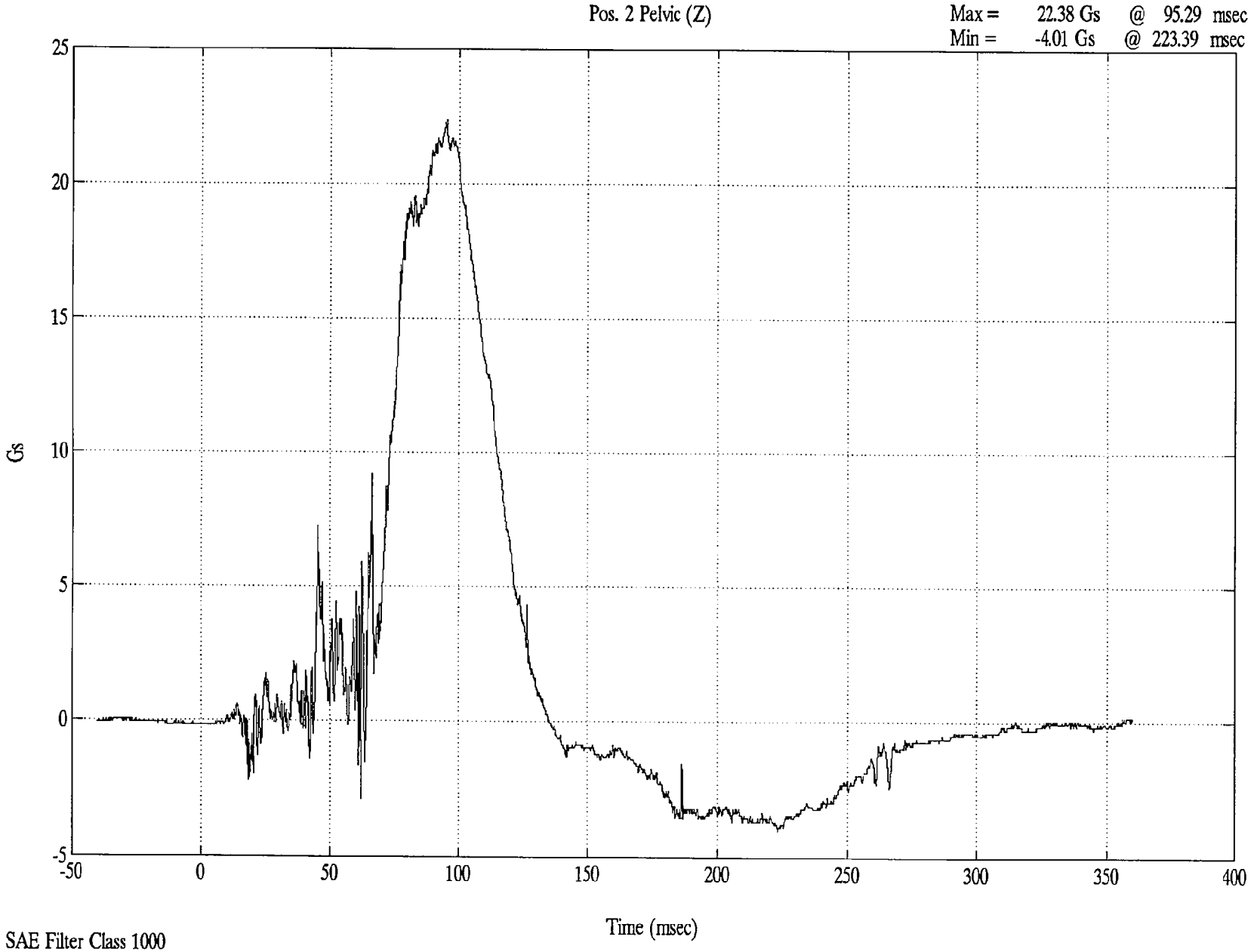


B-84

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

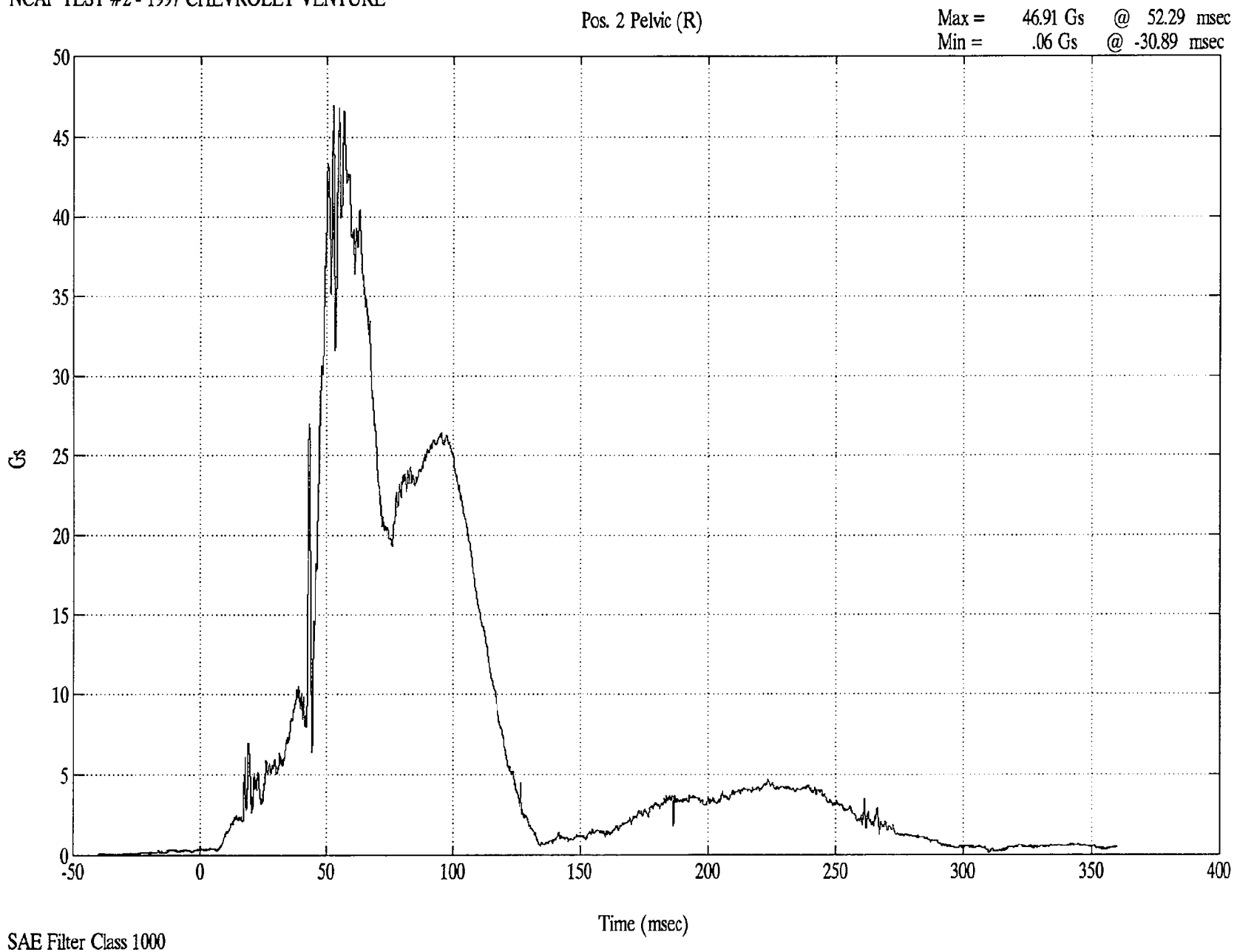


B-85

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

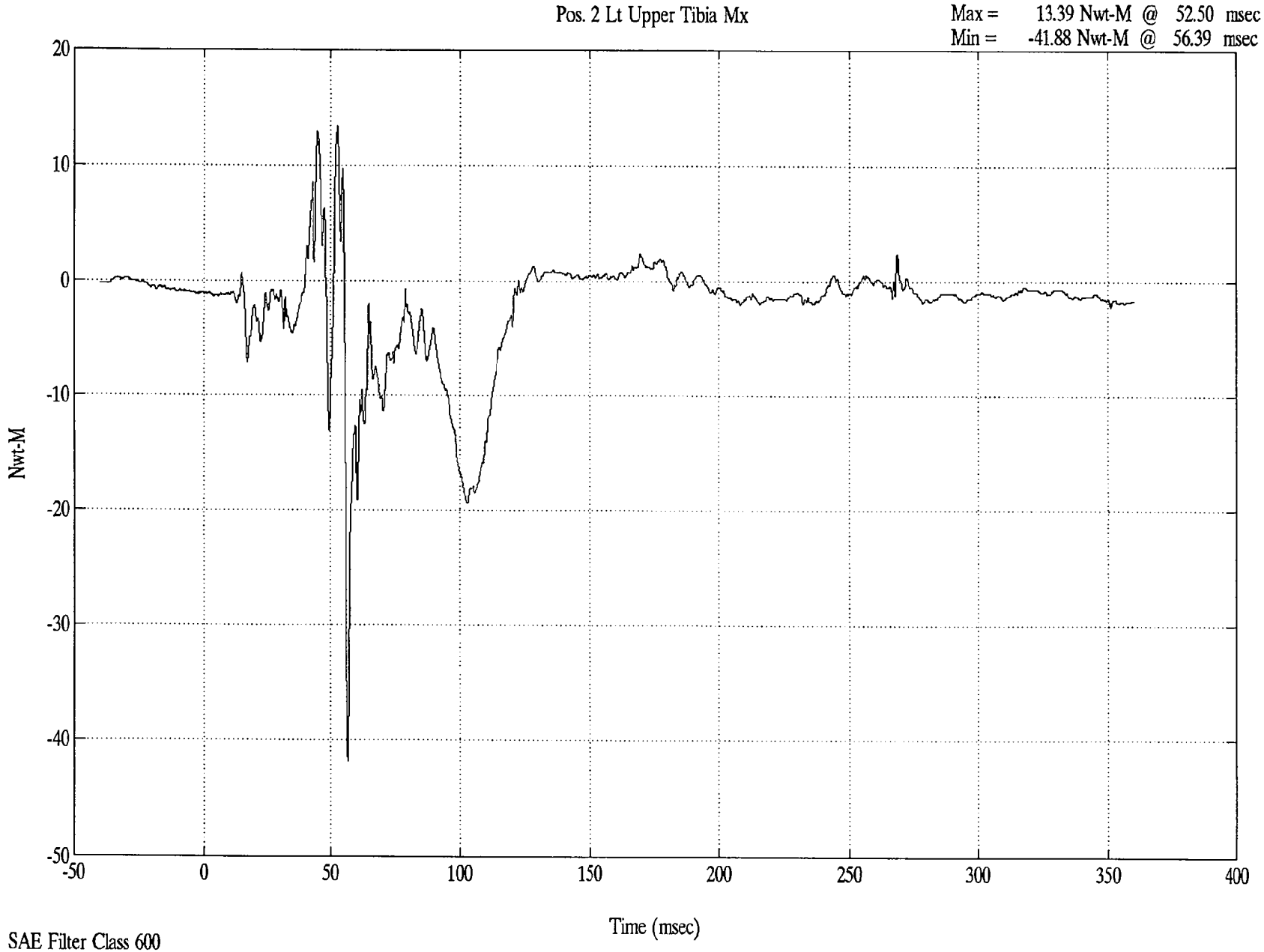


B-86

8406-2

SAE Filter Class 1000

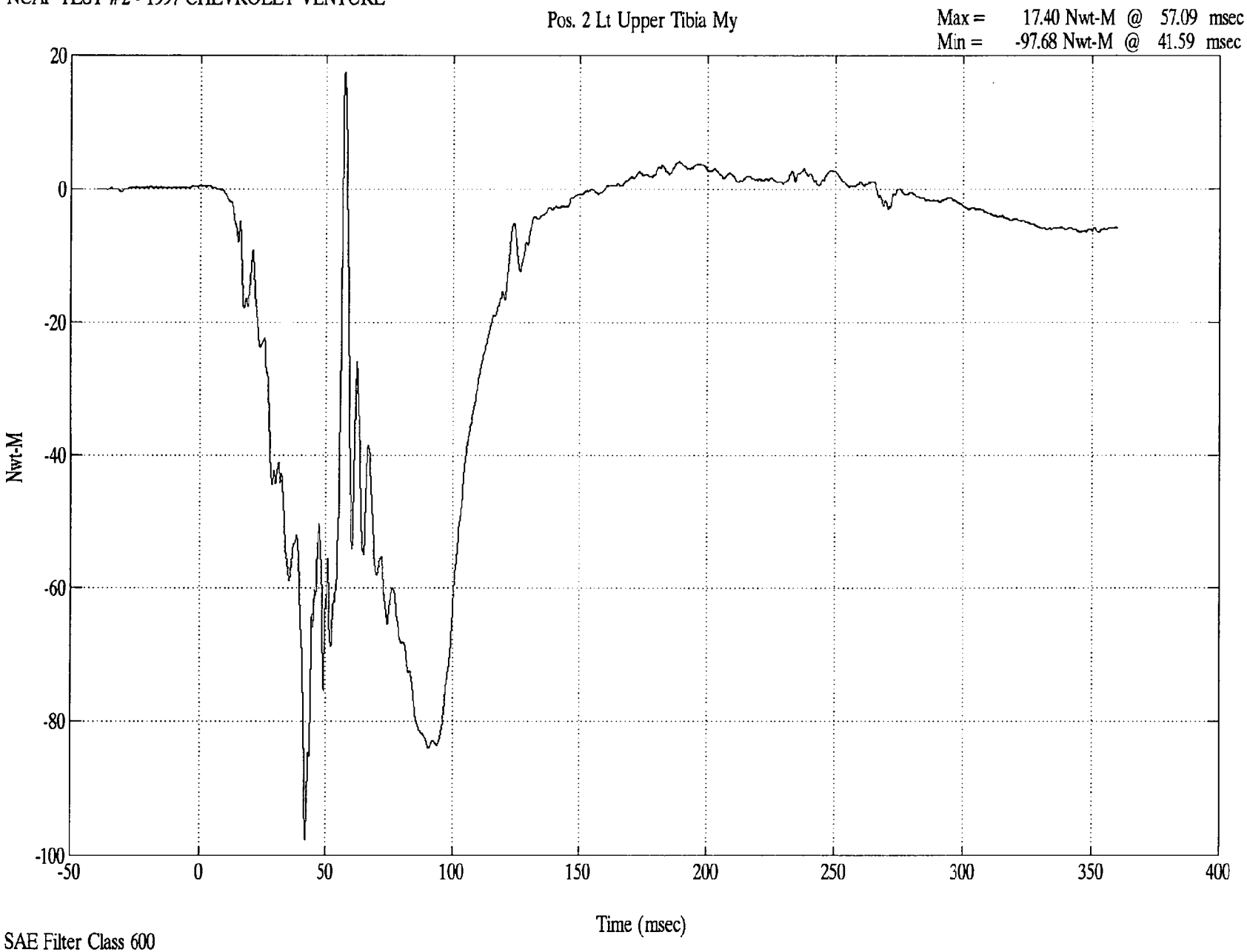
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 600

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

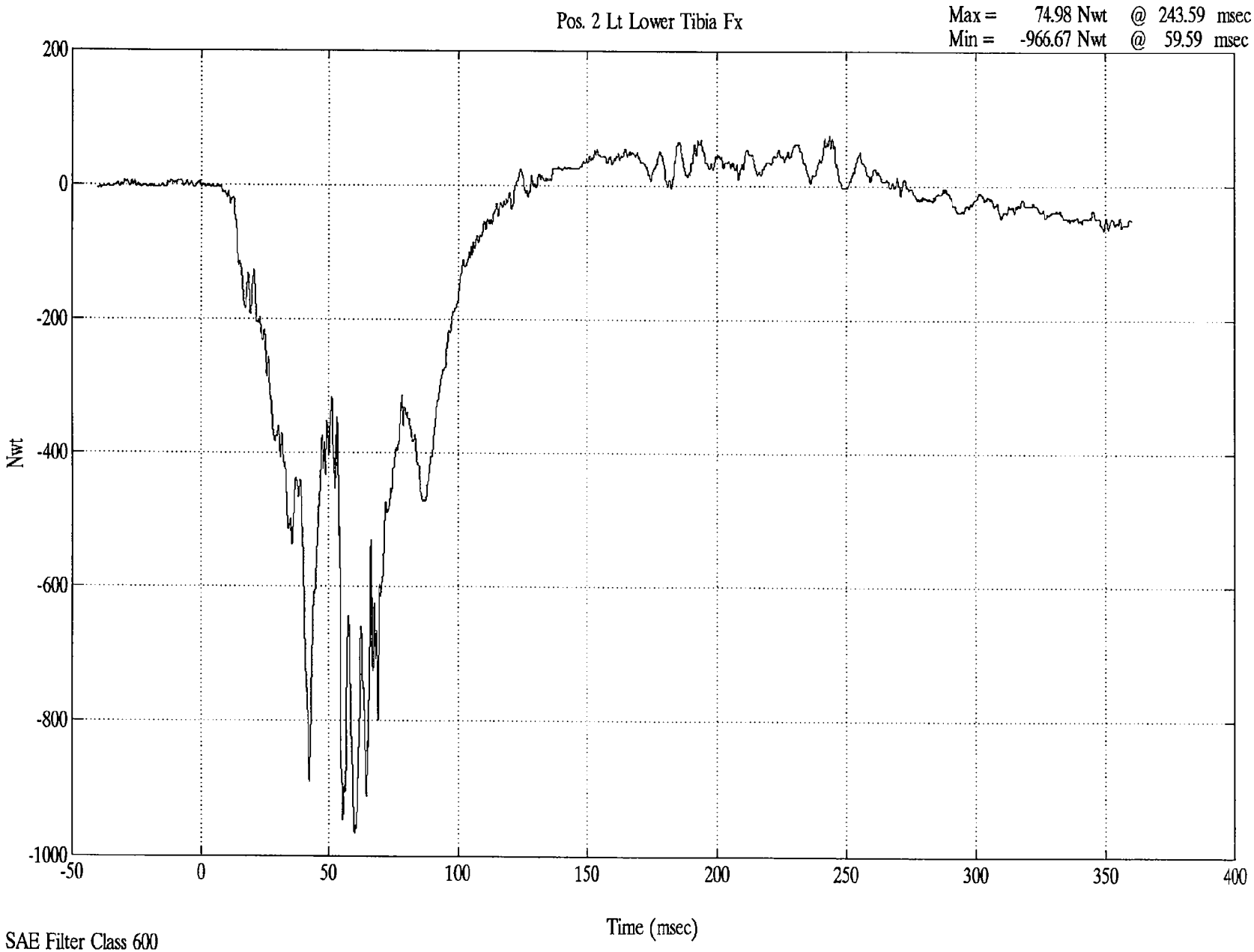


B-88

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

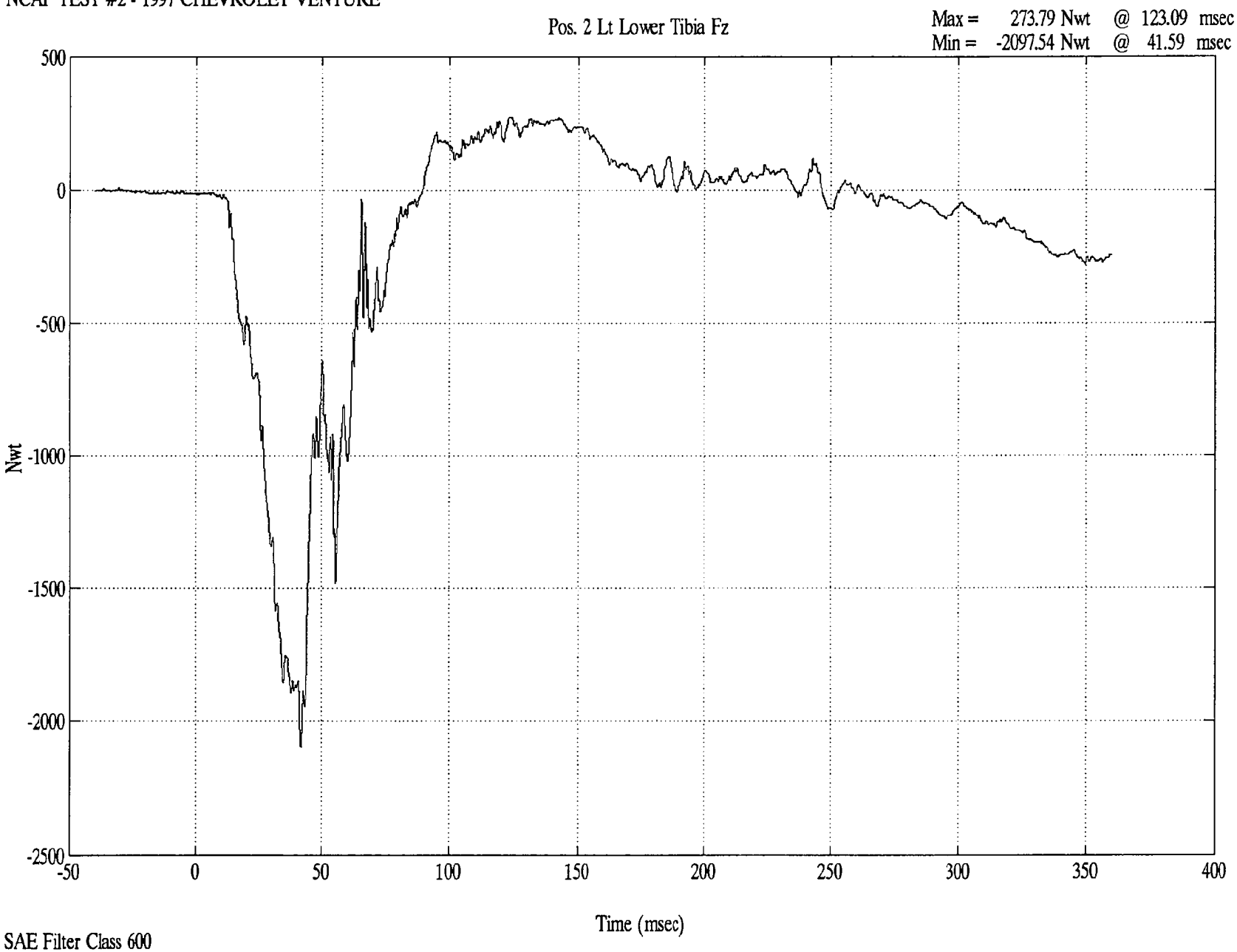


B-89

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

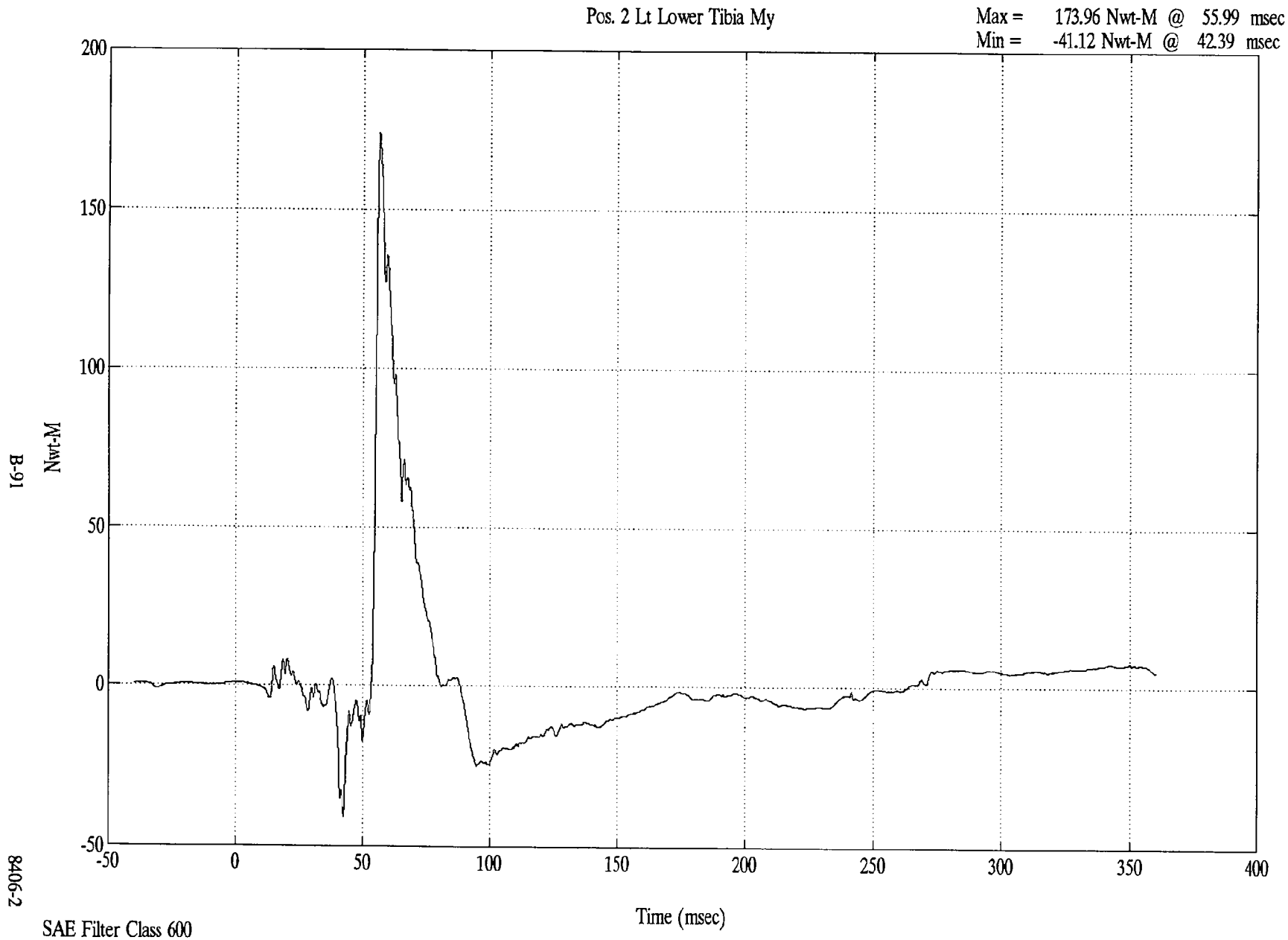


B-90

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

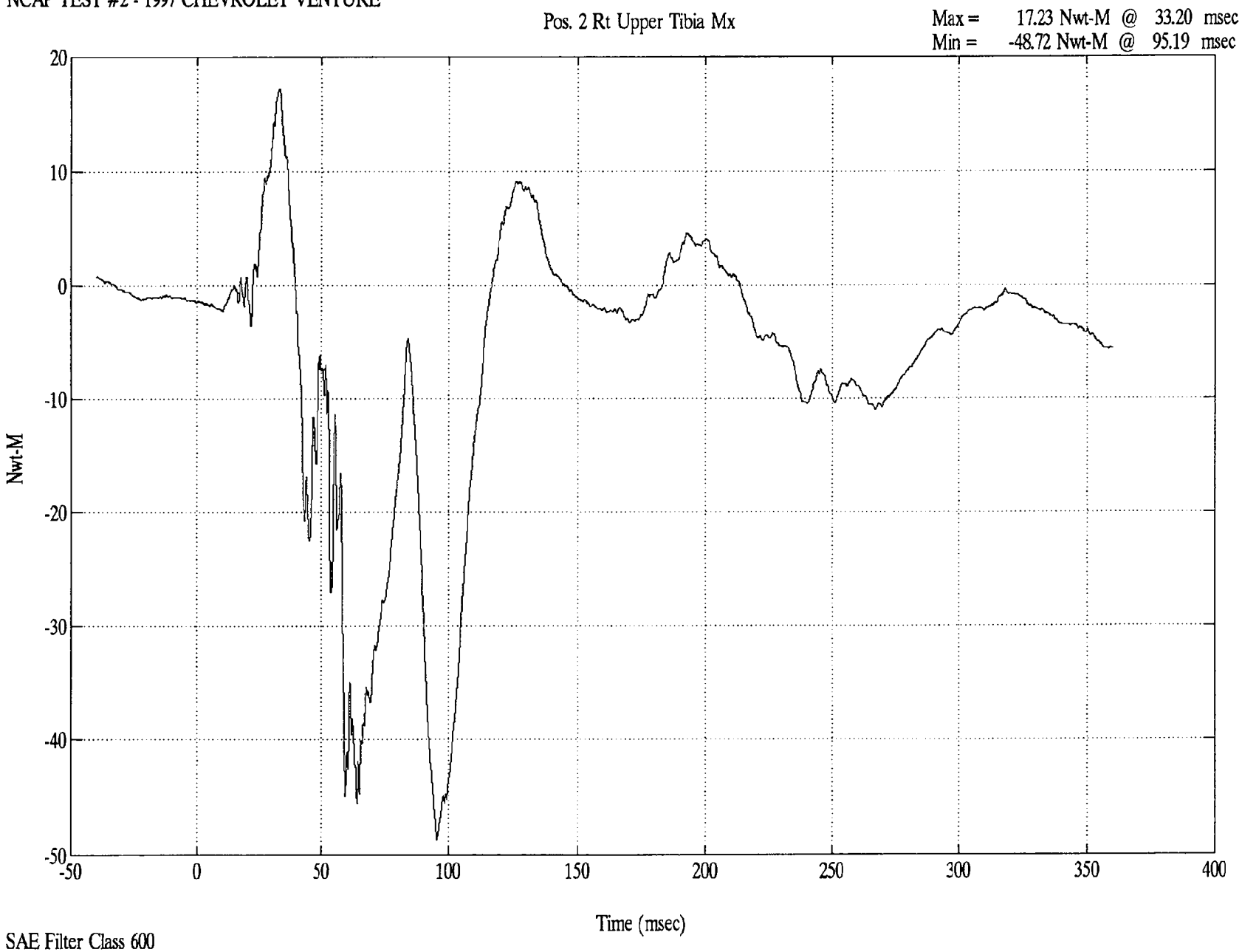


B-91

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

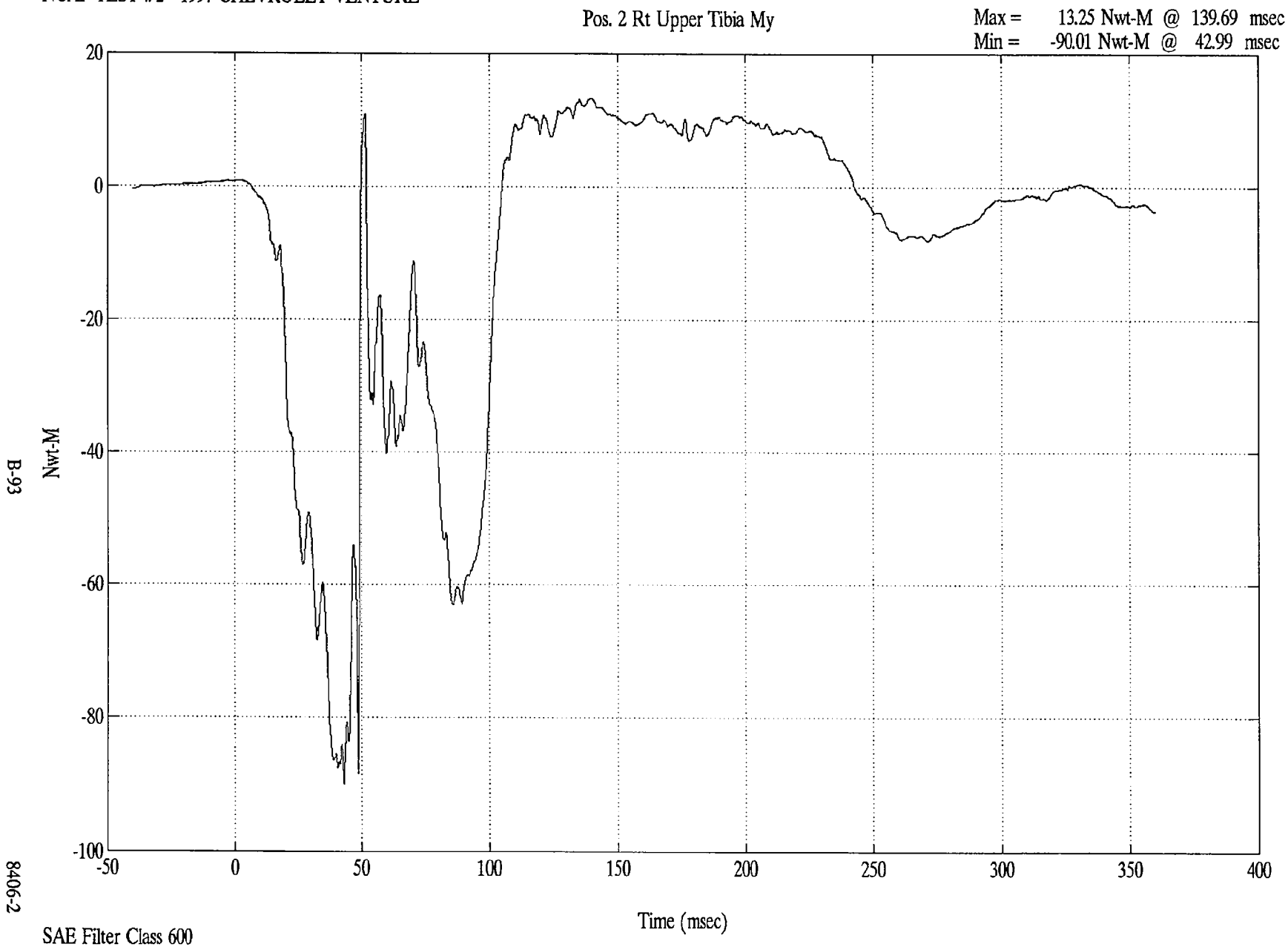


B-92

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

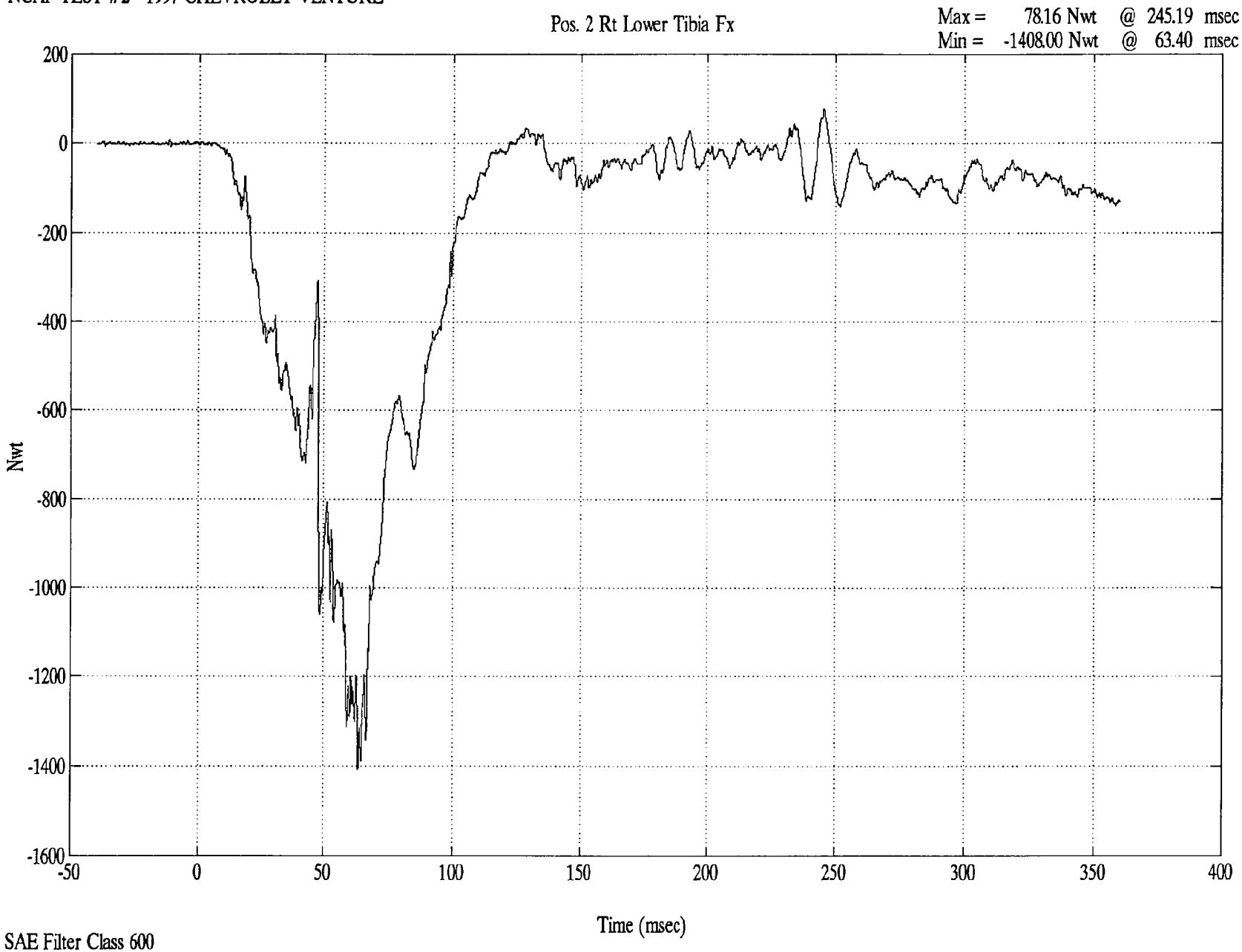


B-93

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

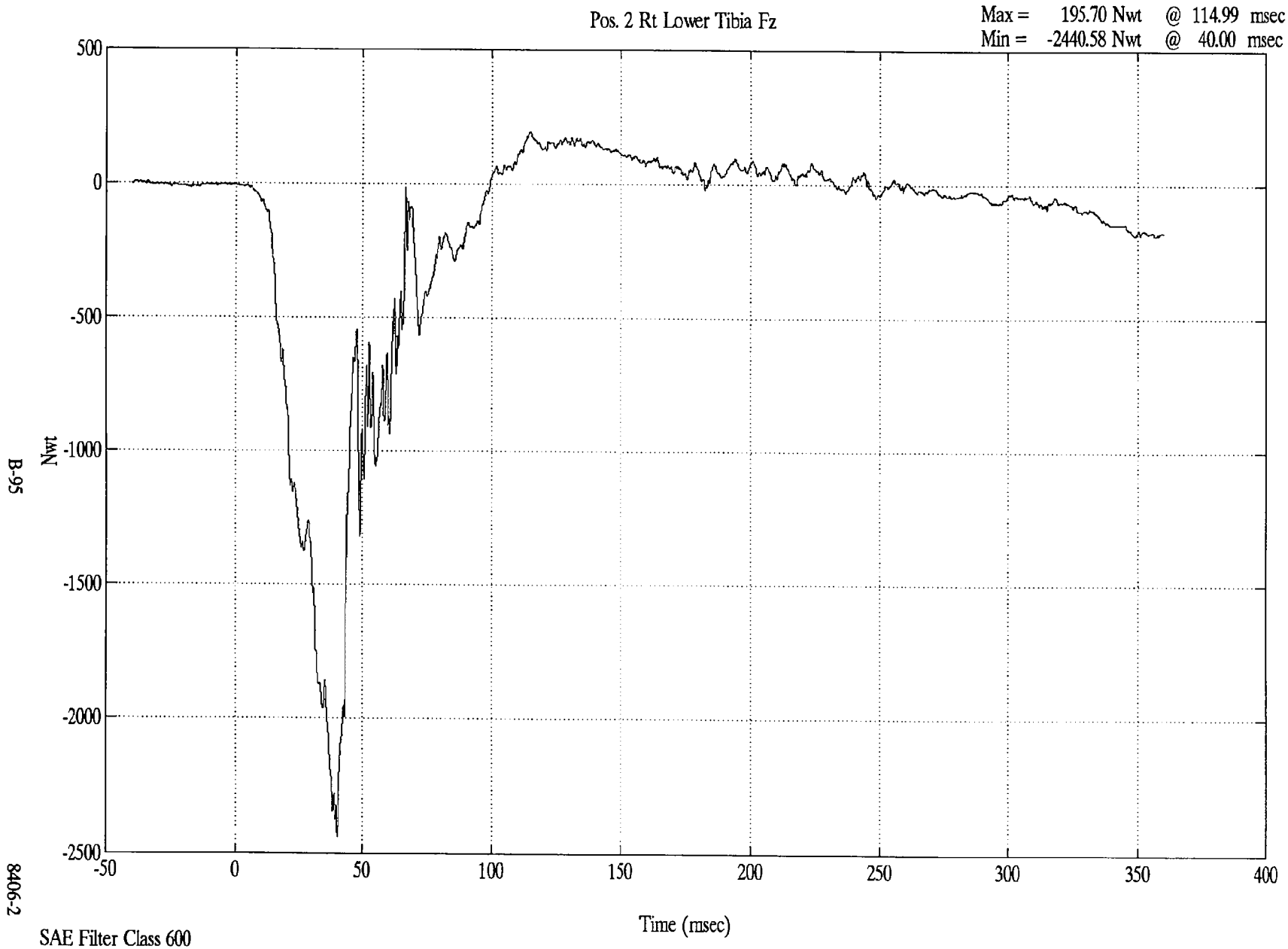


B-94

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

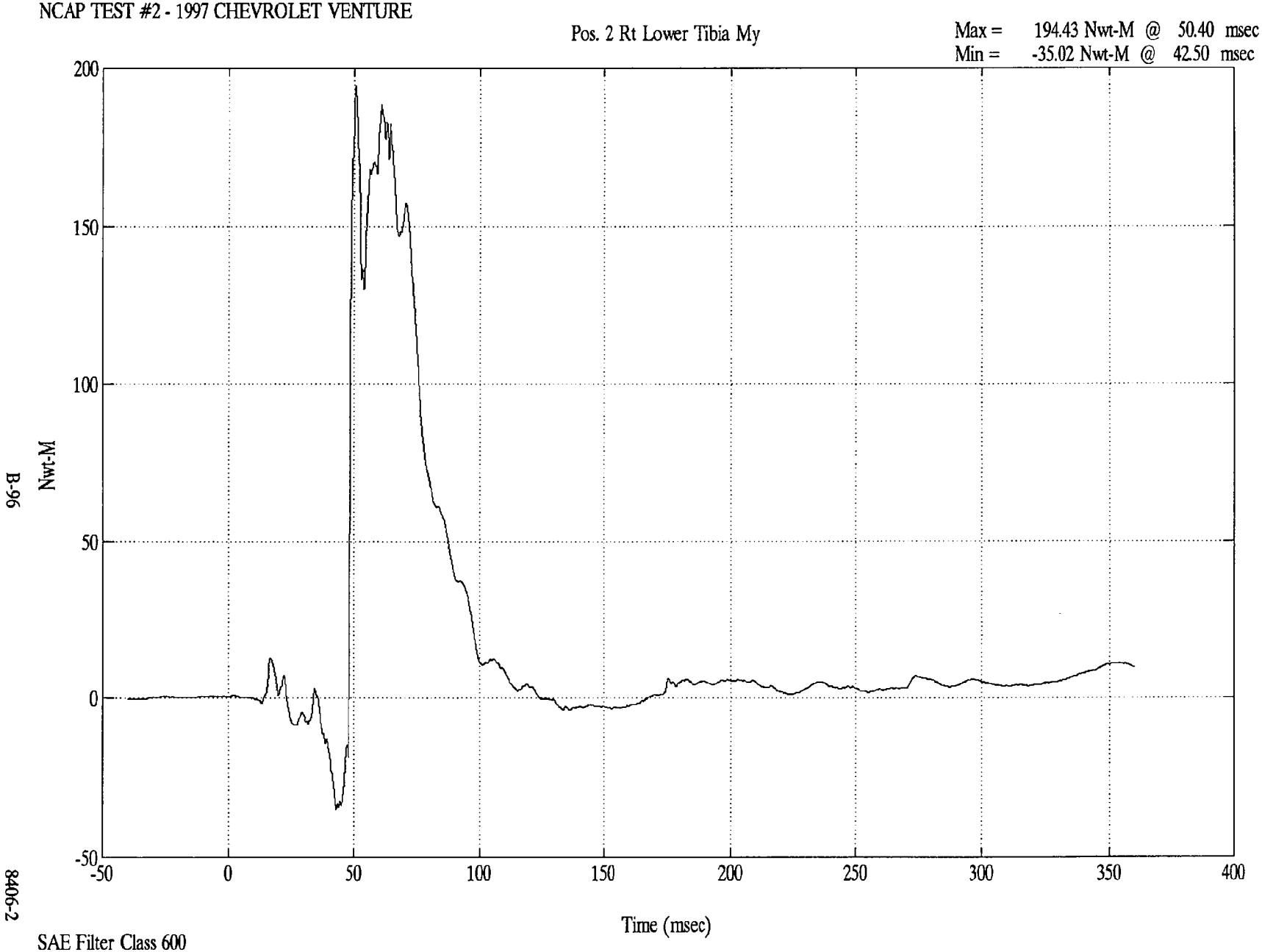


B-95

8406-2

SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE

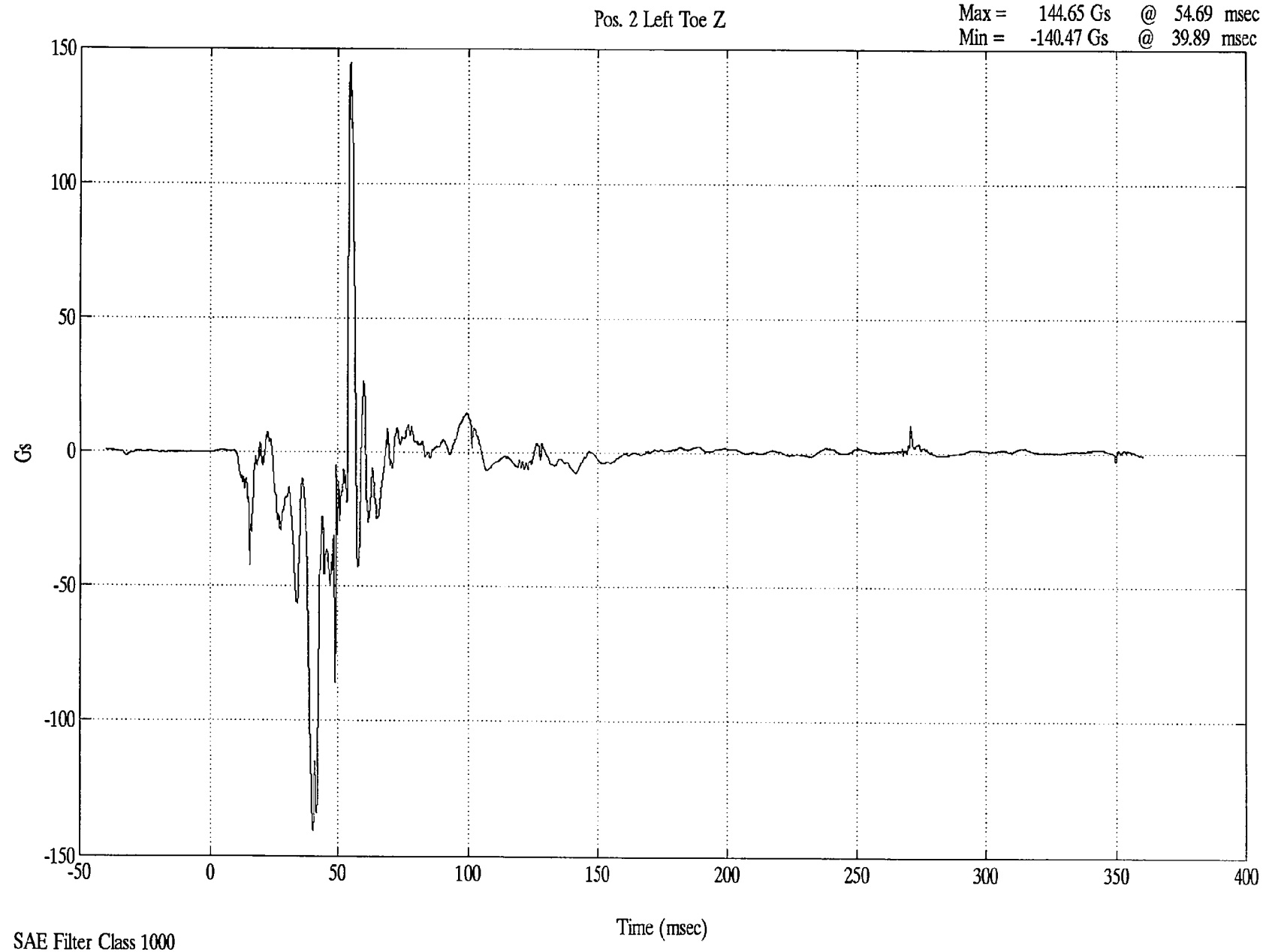


B-96

8406-2

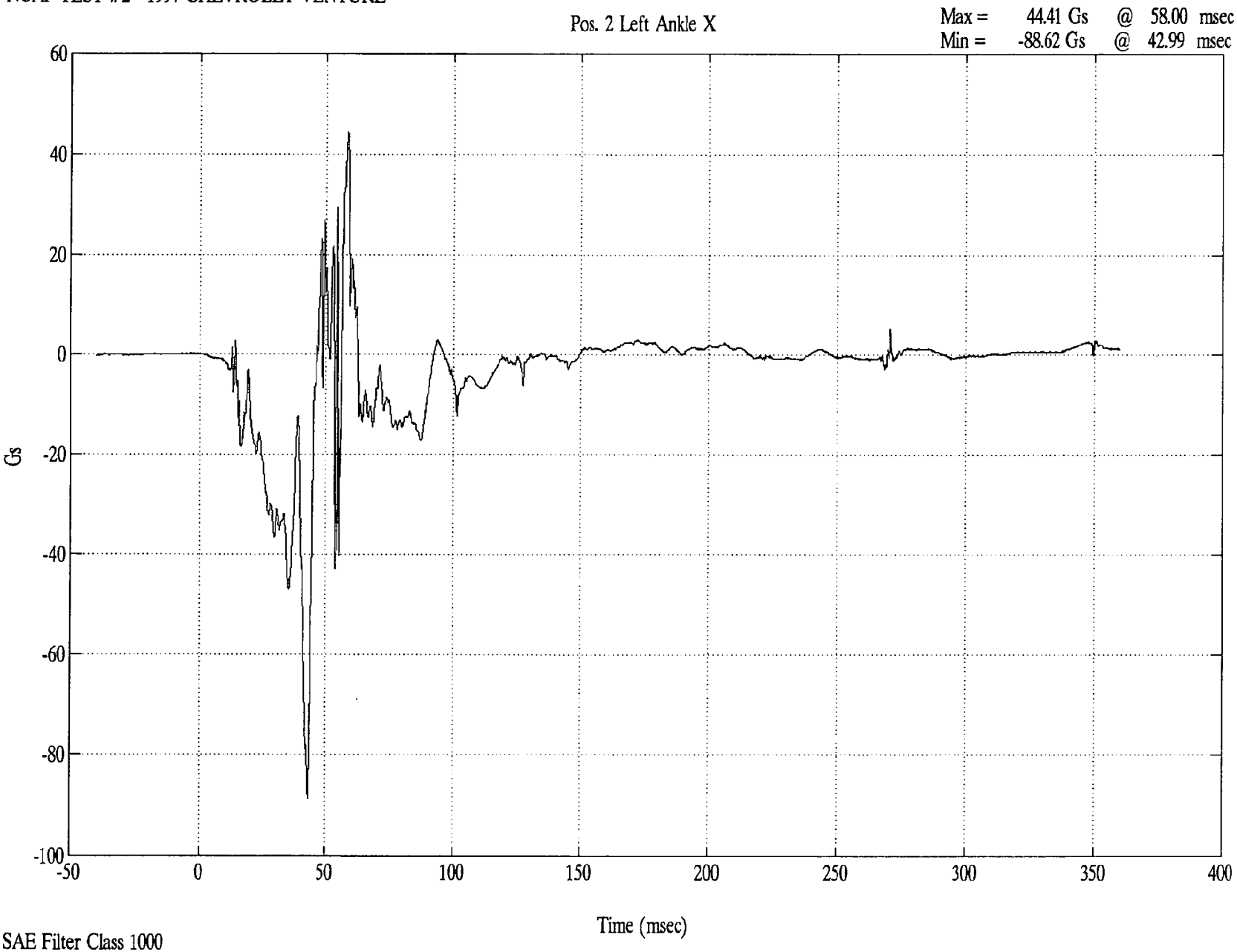
SAE Filter Class 600

NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

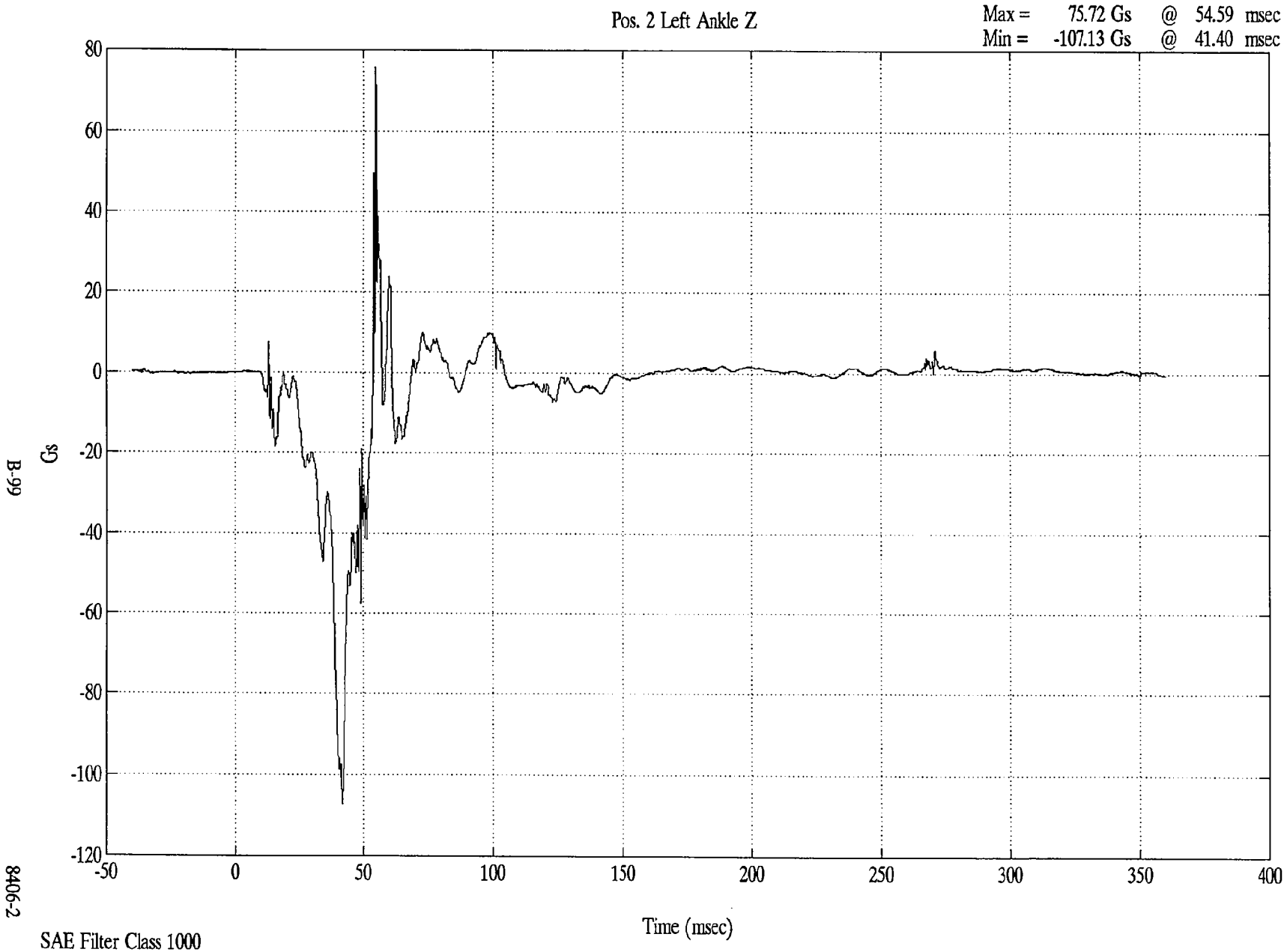


B-98

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

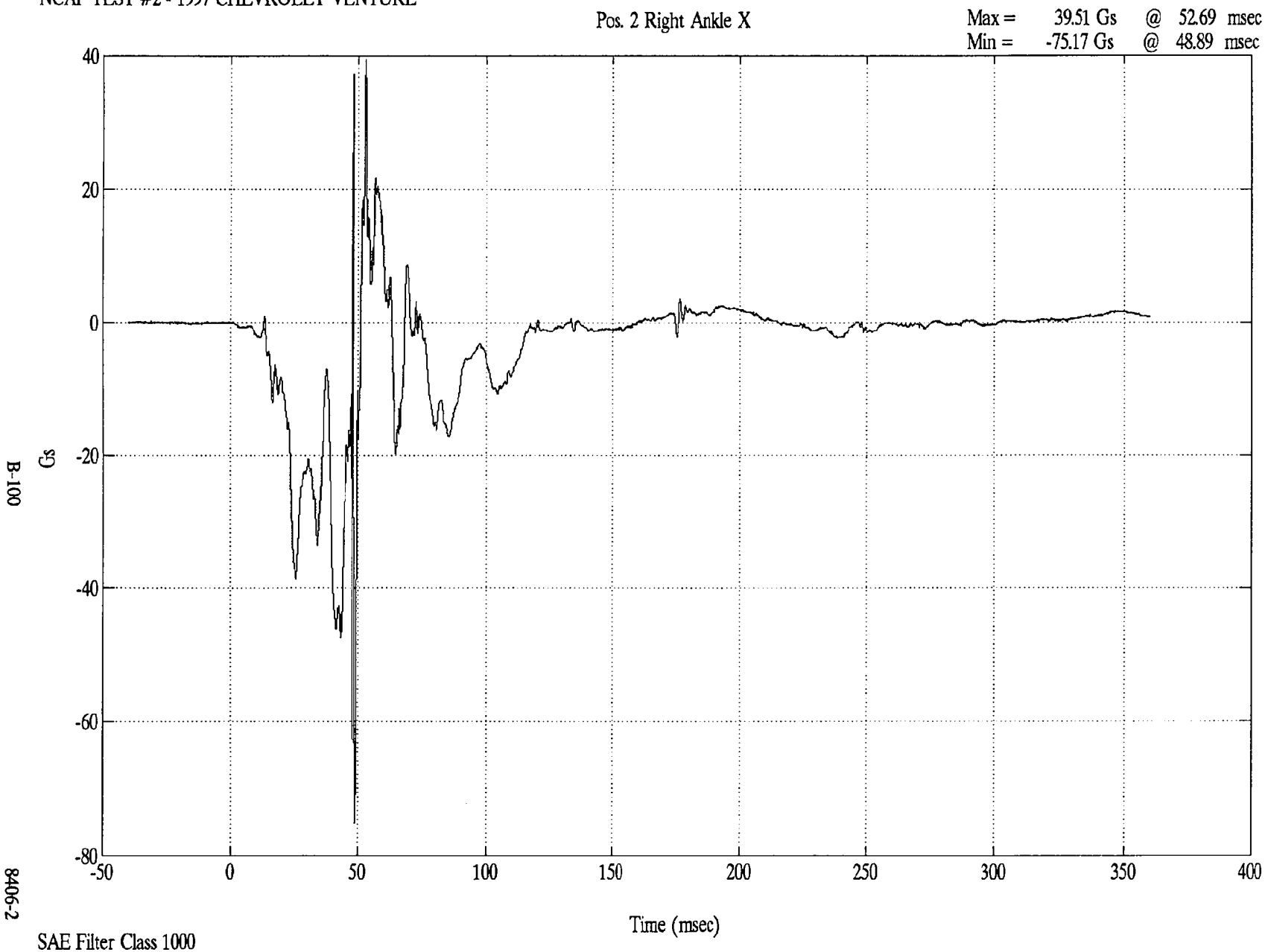


B-99

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

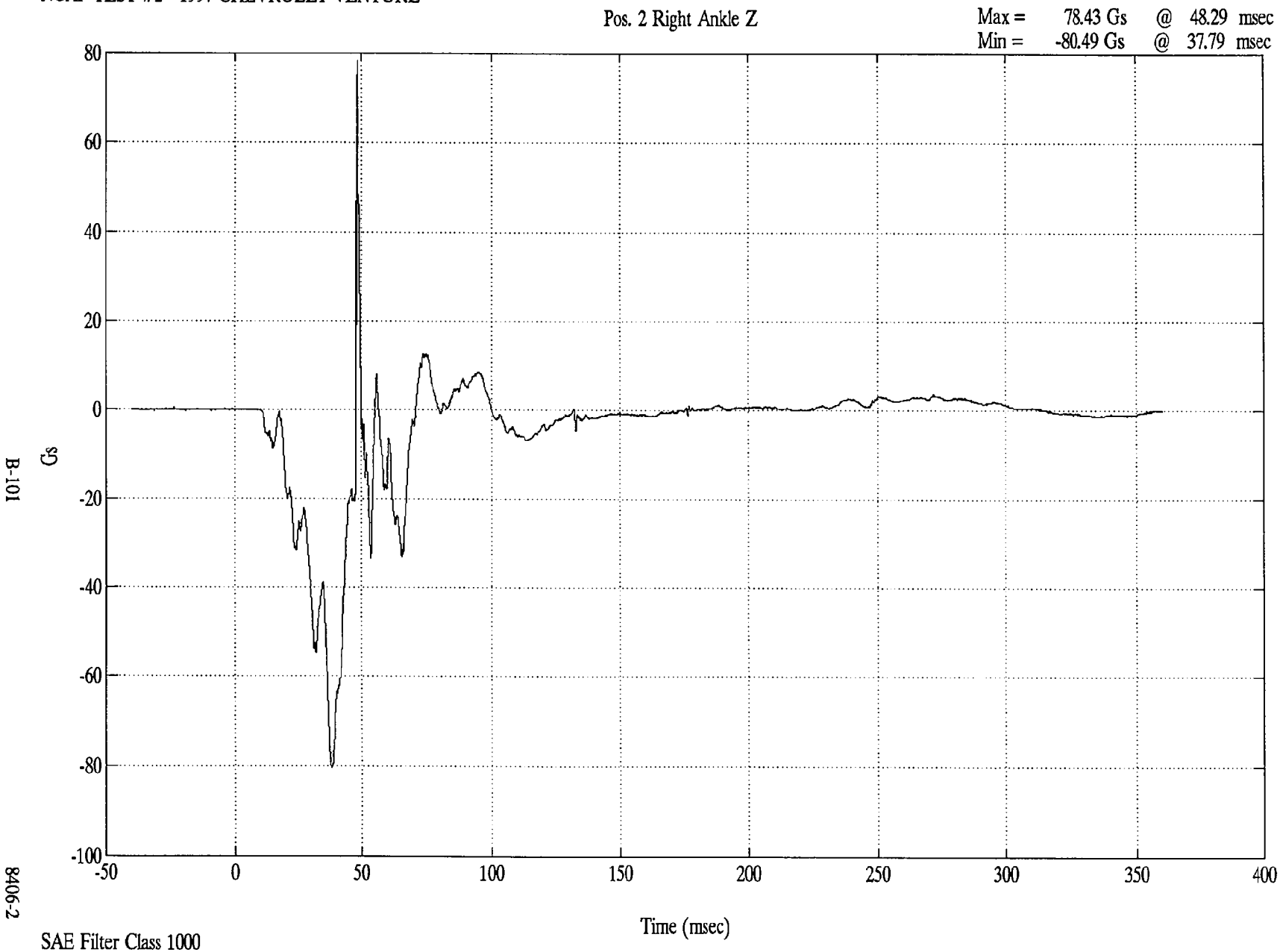


B-100

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

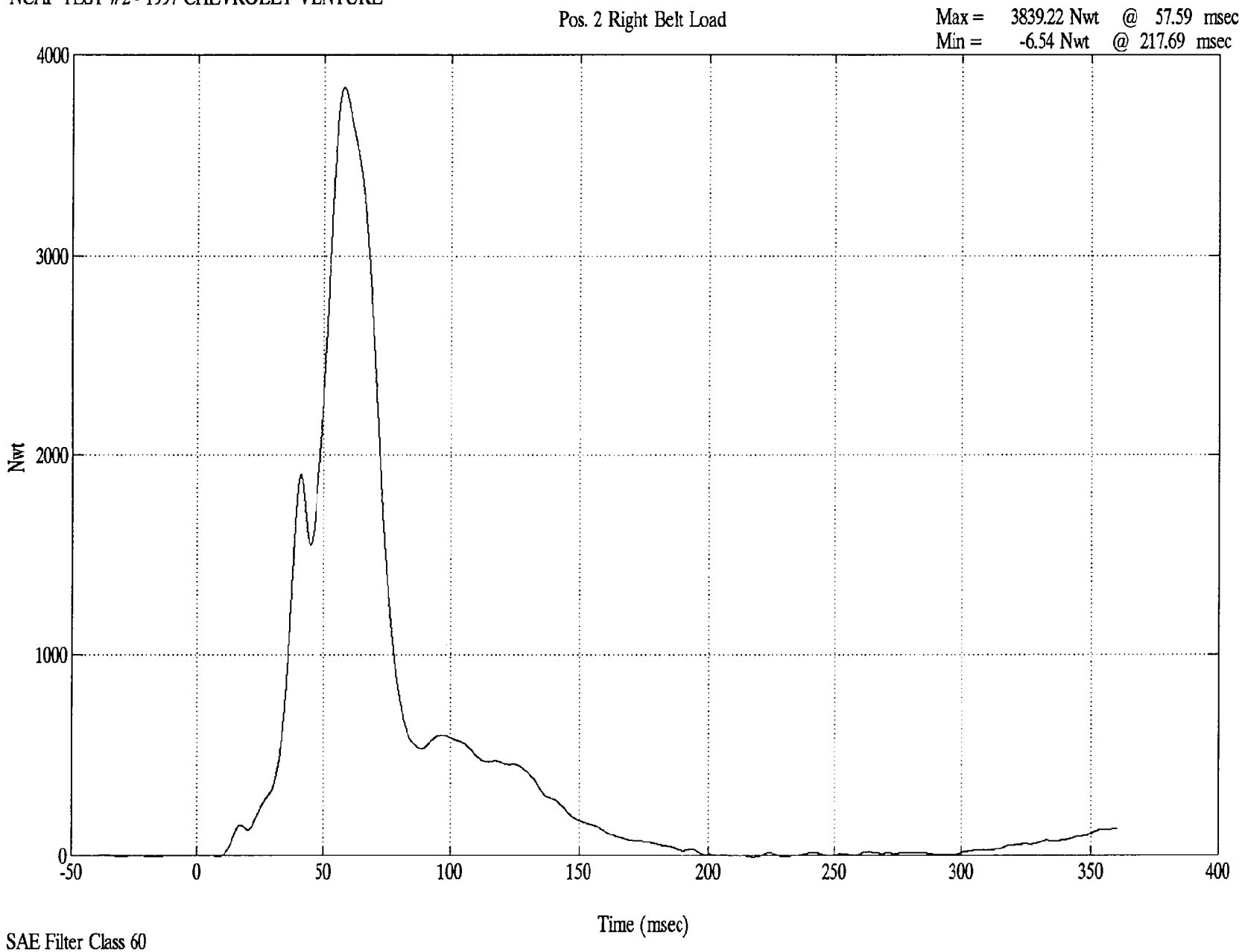


B-101

8406-2

SAE Filter Class 1000

NCAP TEST #2 - 1997 CHEVROLET VENTURE

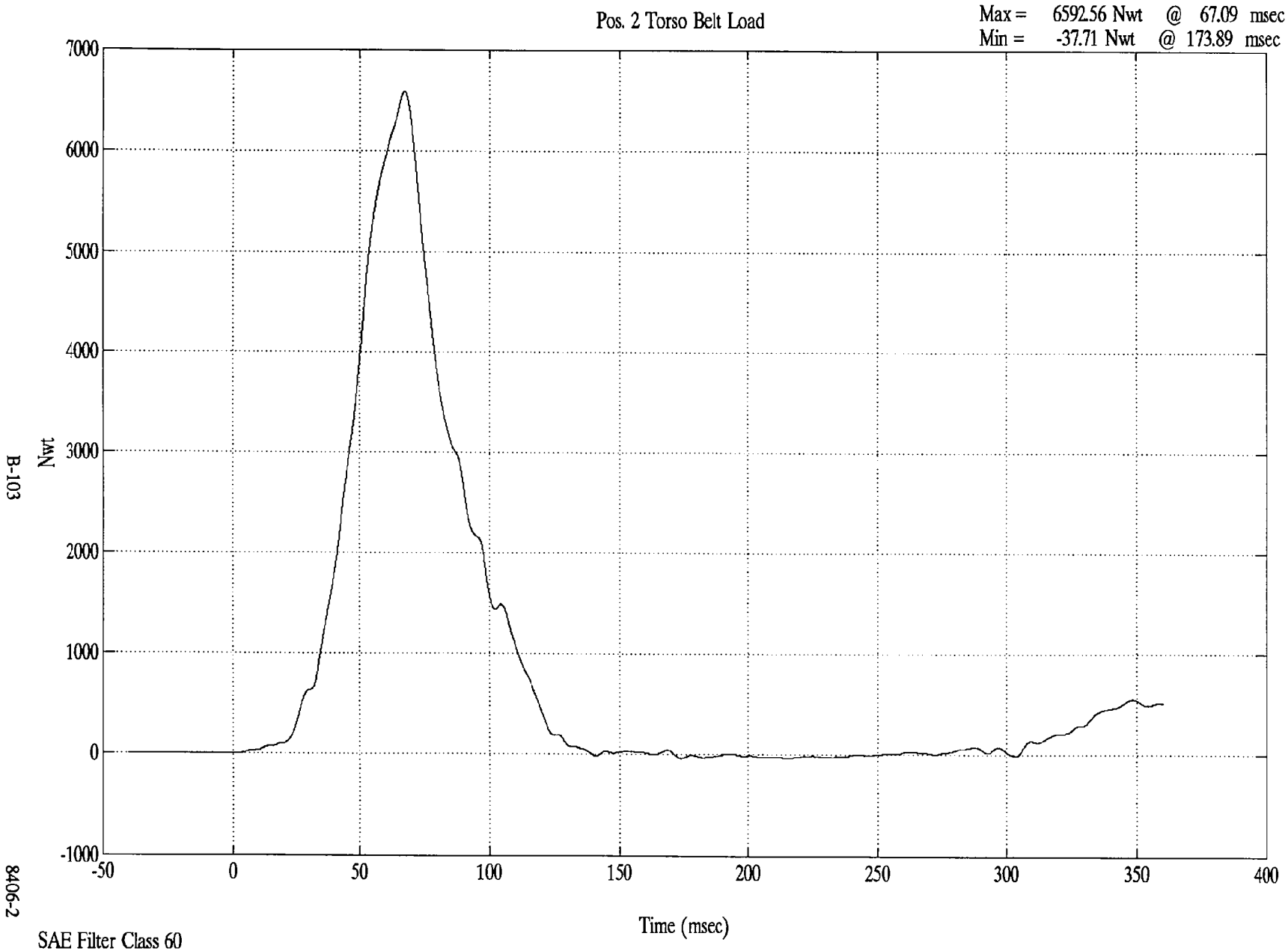


B-102

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

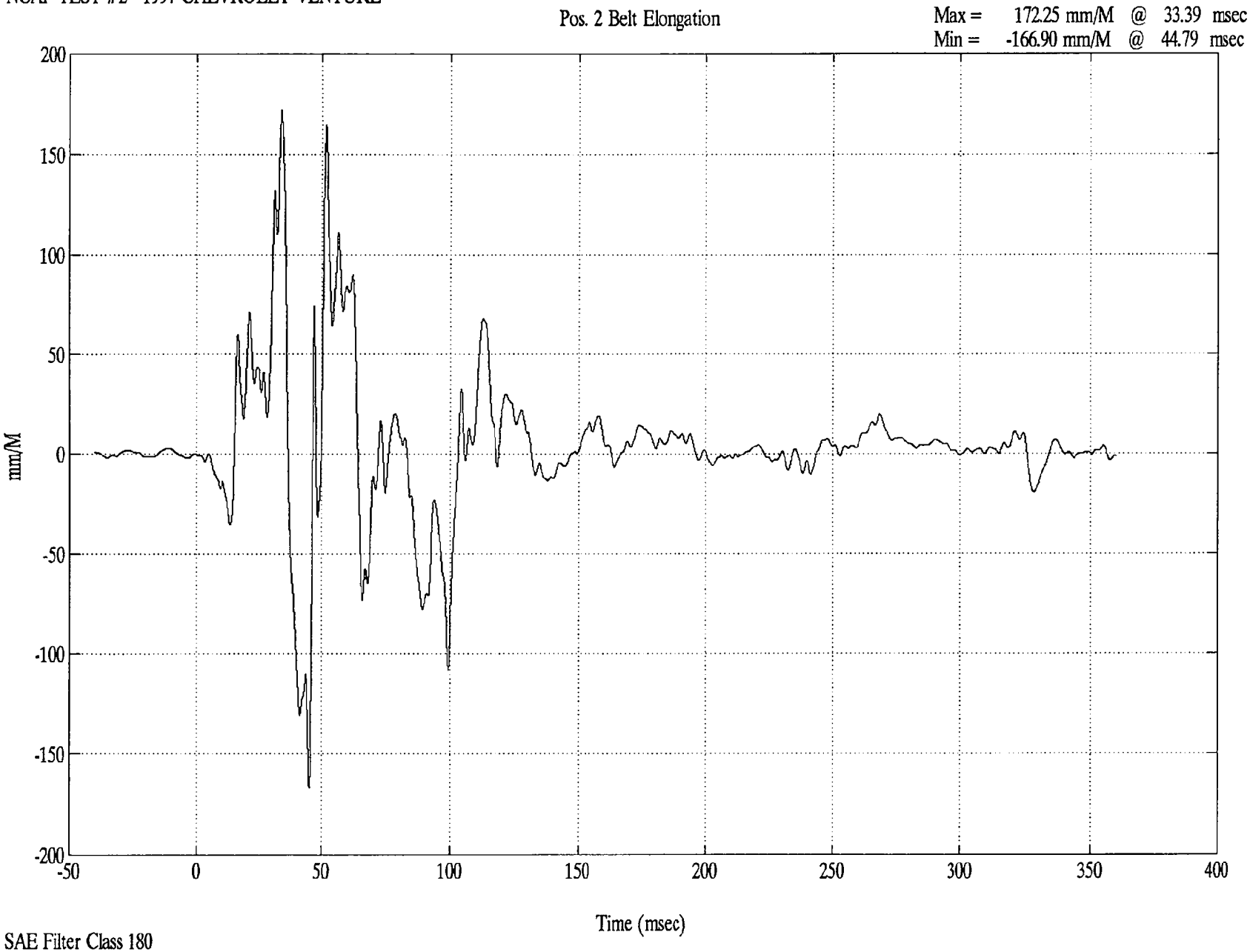


B-103

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

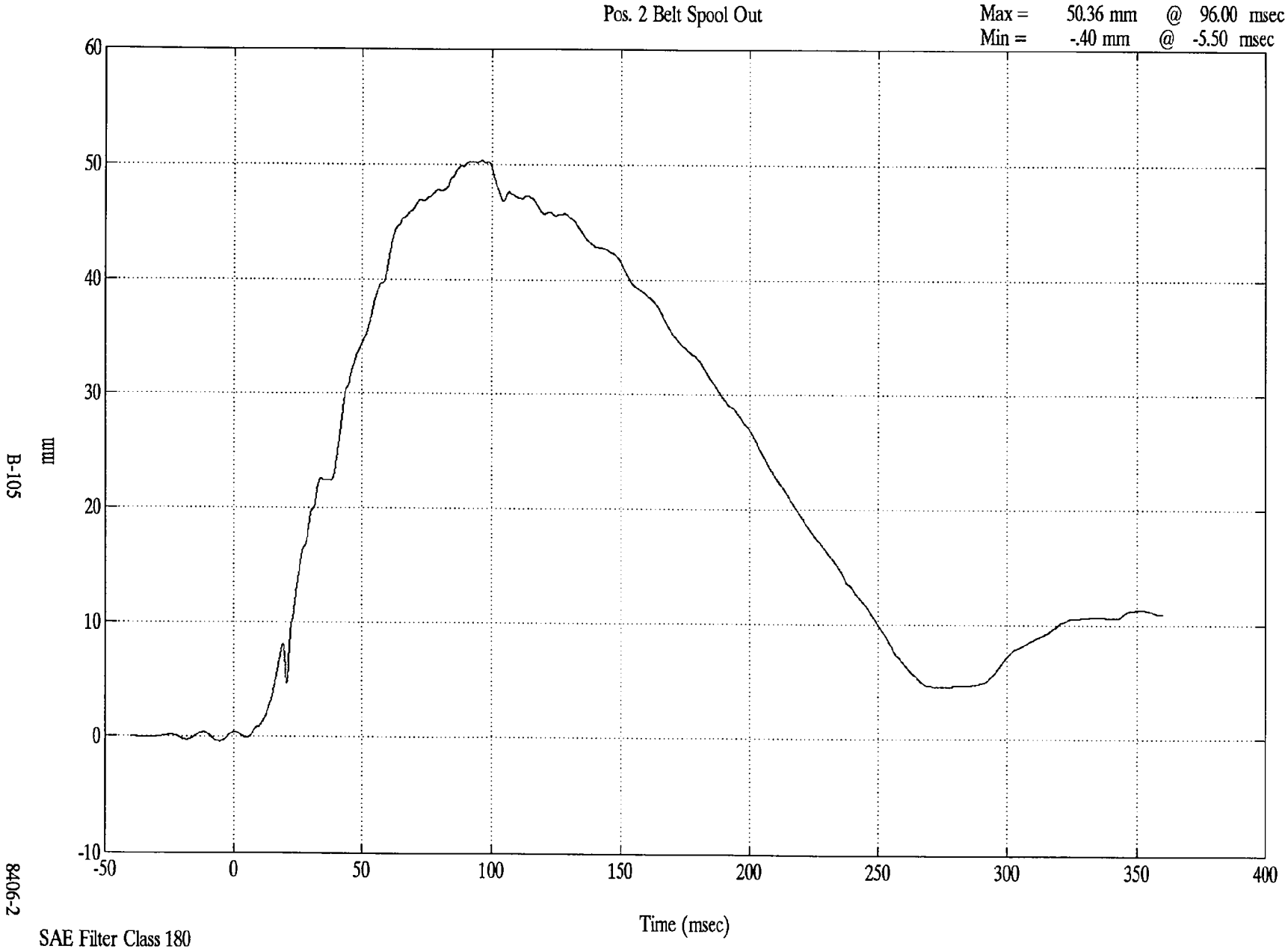


B-104

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE



B-105

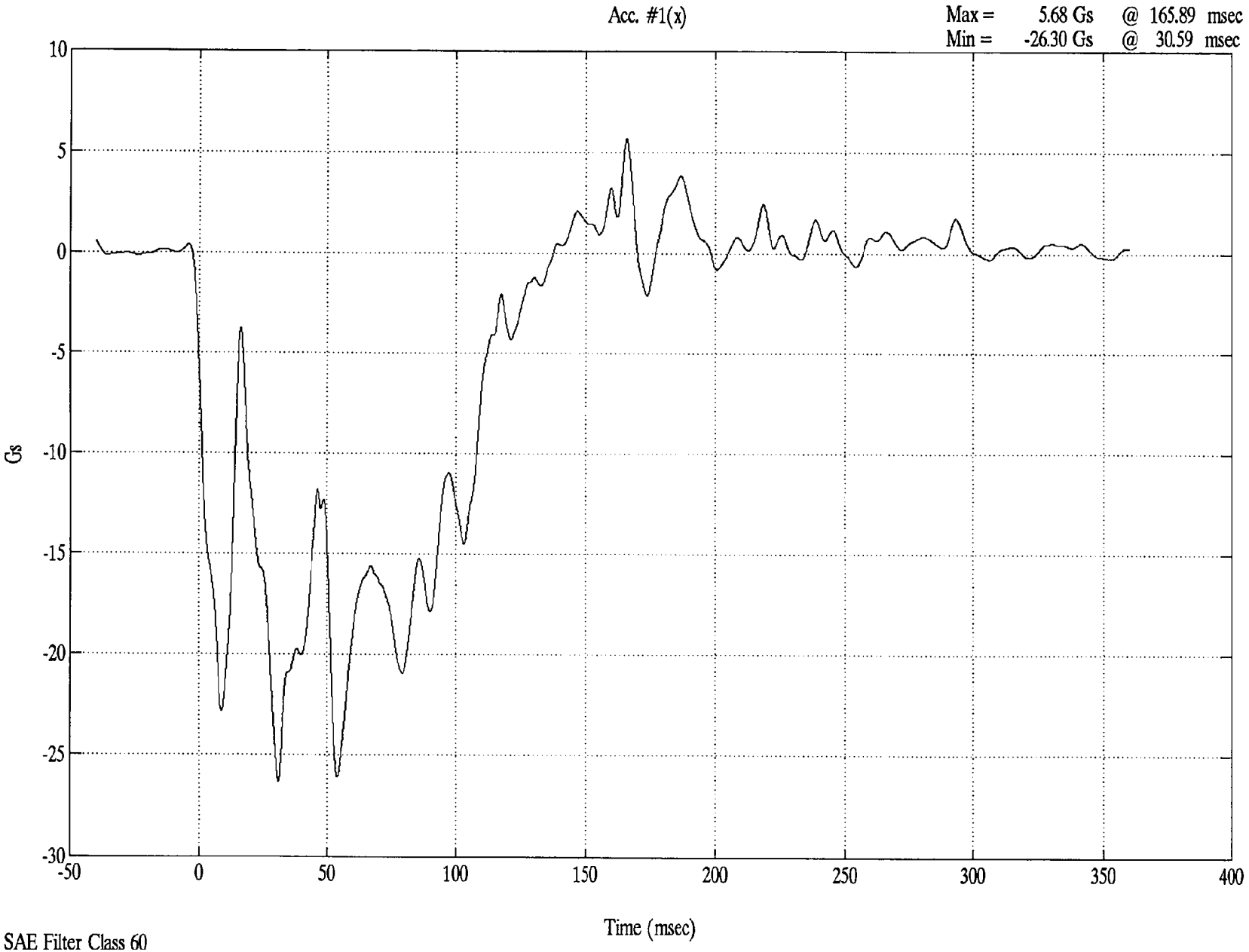
8406-2

SAE Filter Class 180

NHTSA TEST NO. MV0100

VEHICLE DATA	FILTER CHANNEL CLASS
Acceleration	60
Velocity	180
Displacement	180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

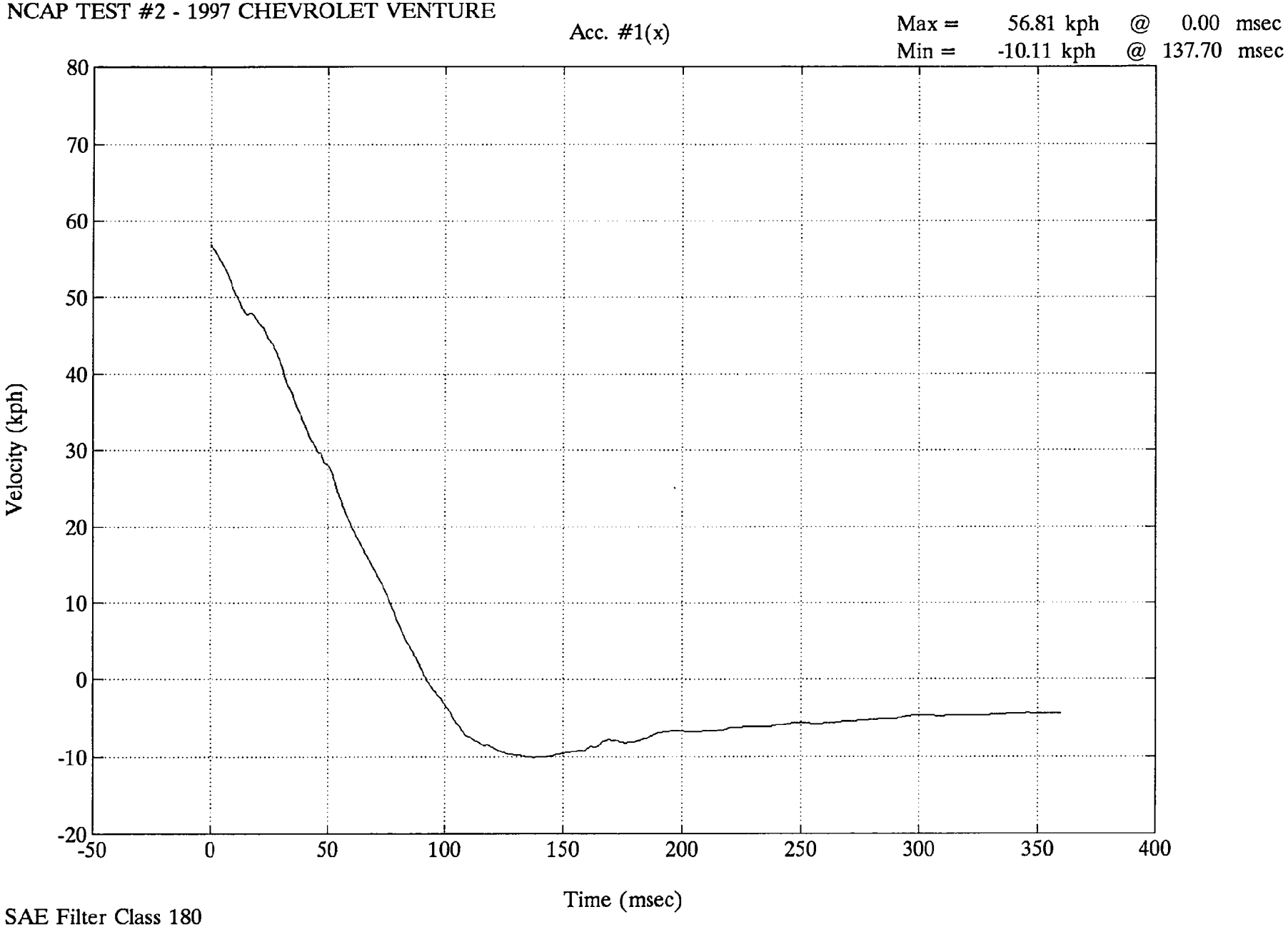


B-106

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

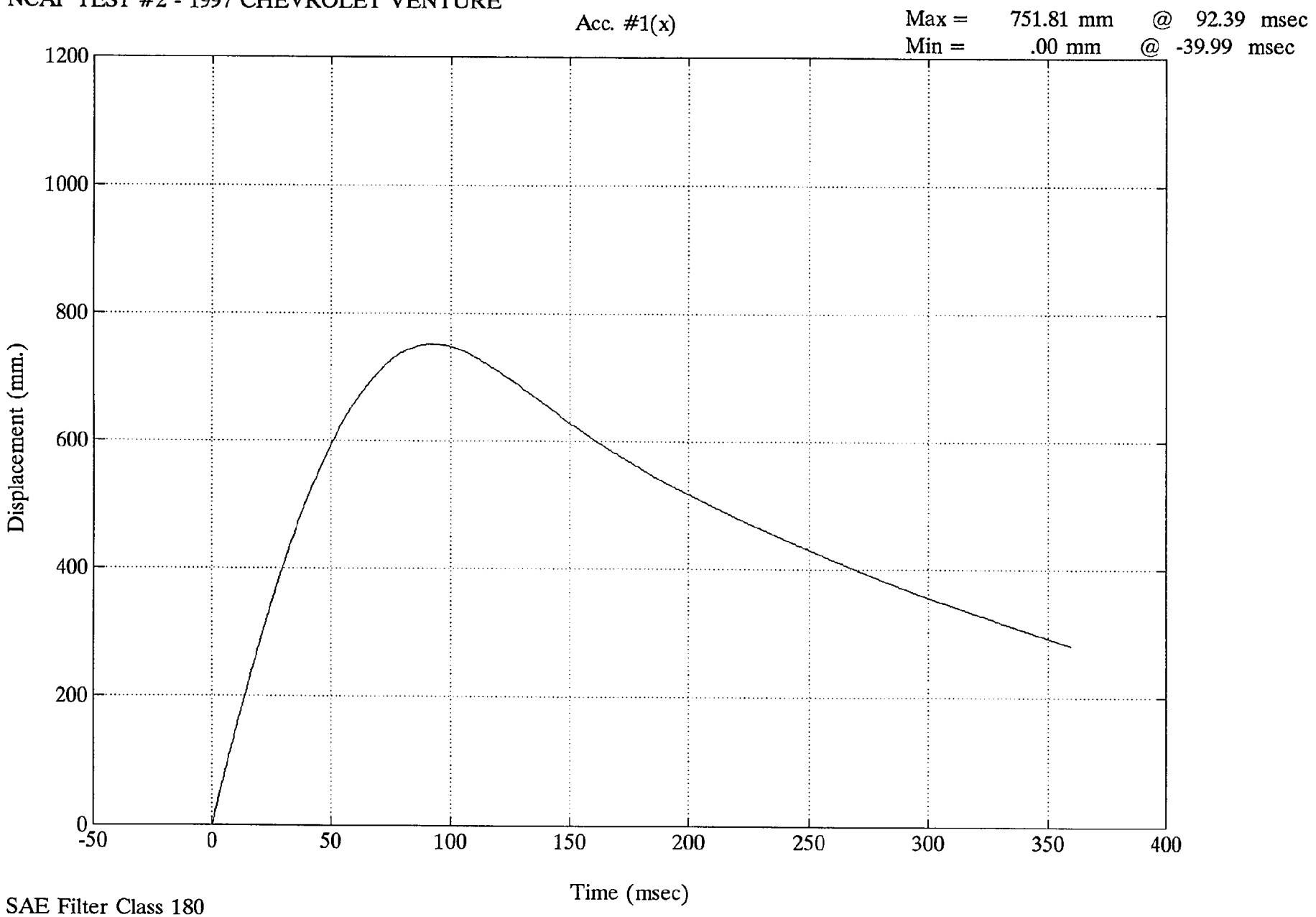


B-107

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

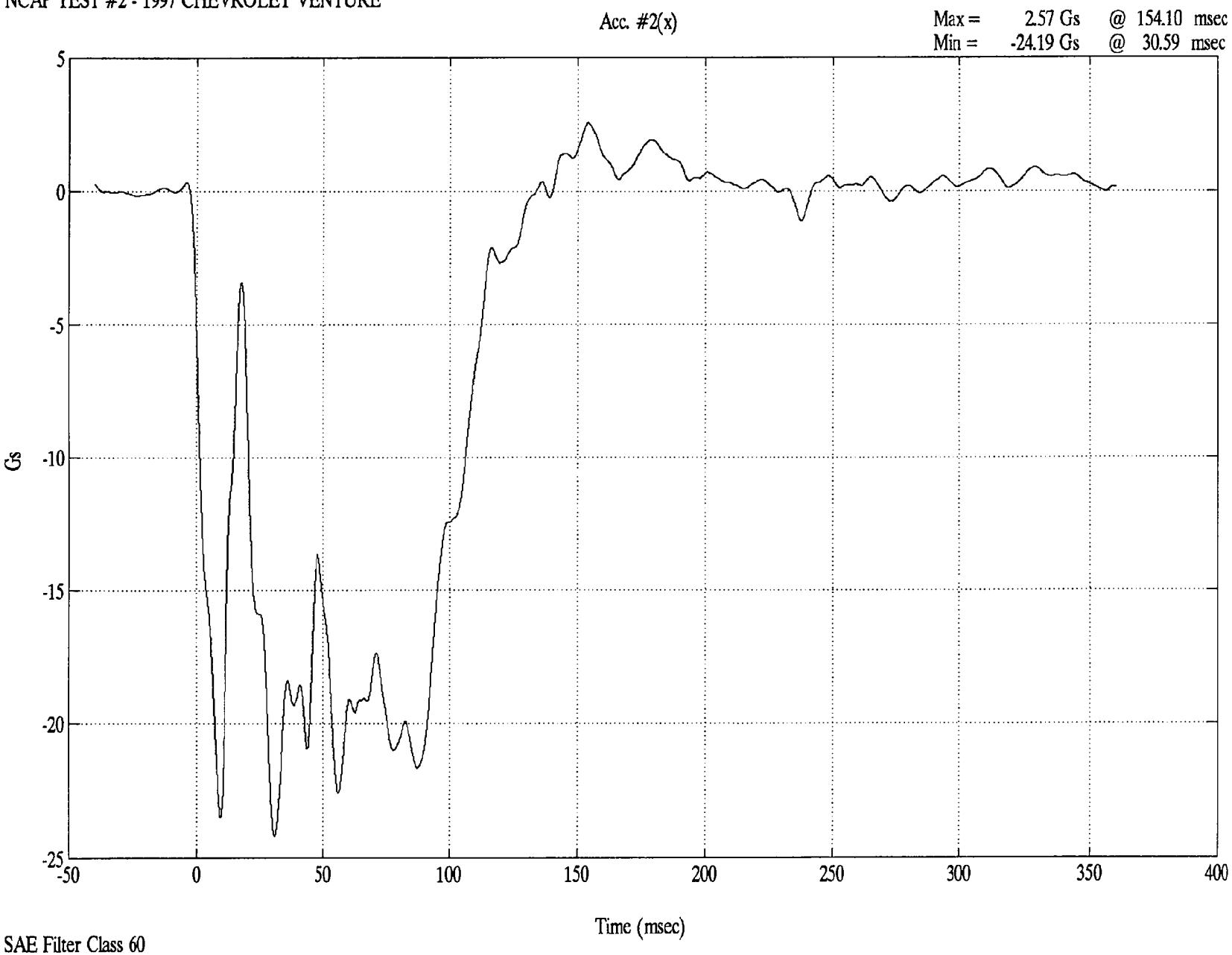


B-108

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

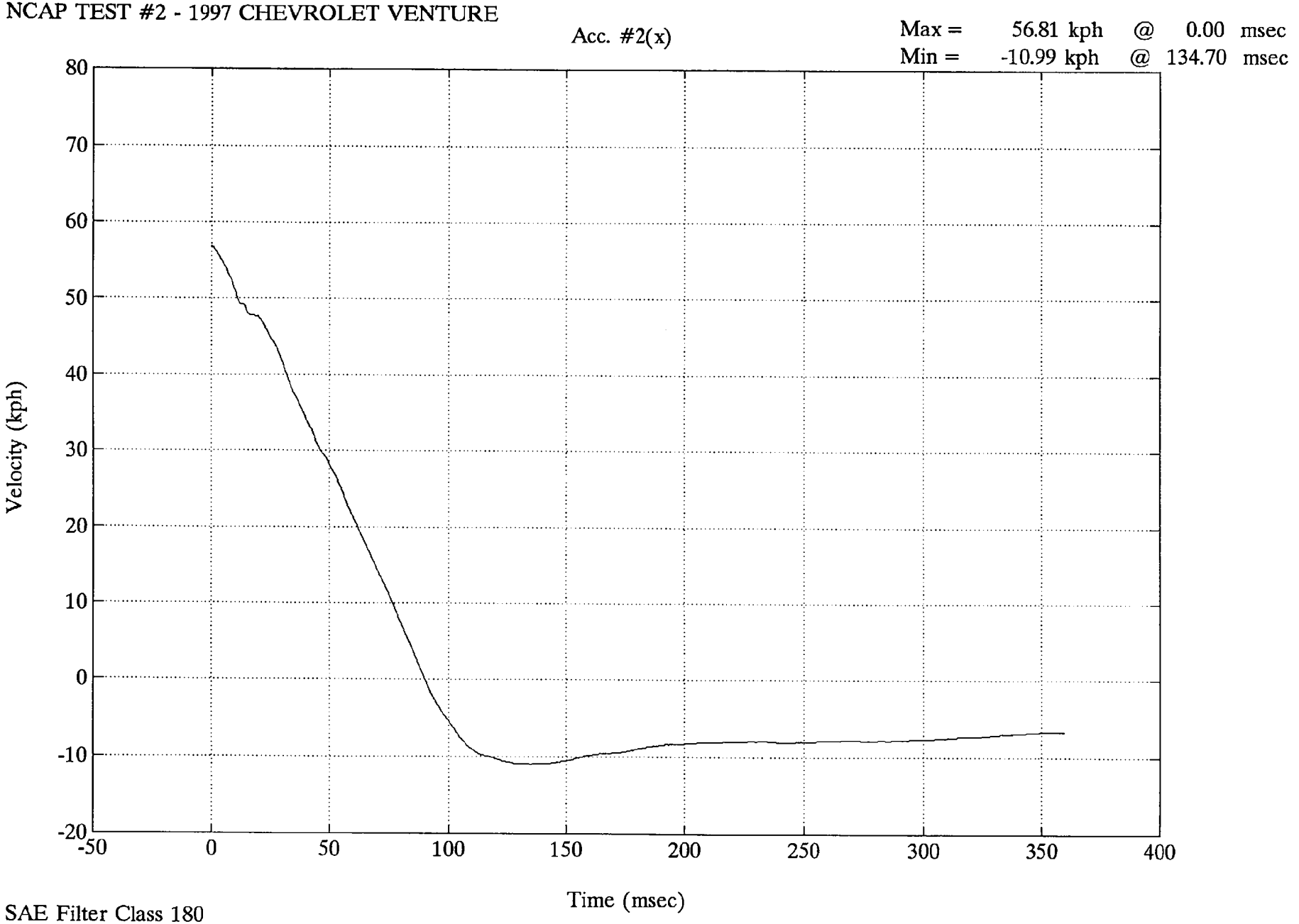


B-109

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

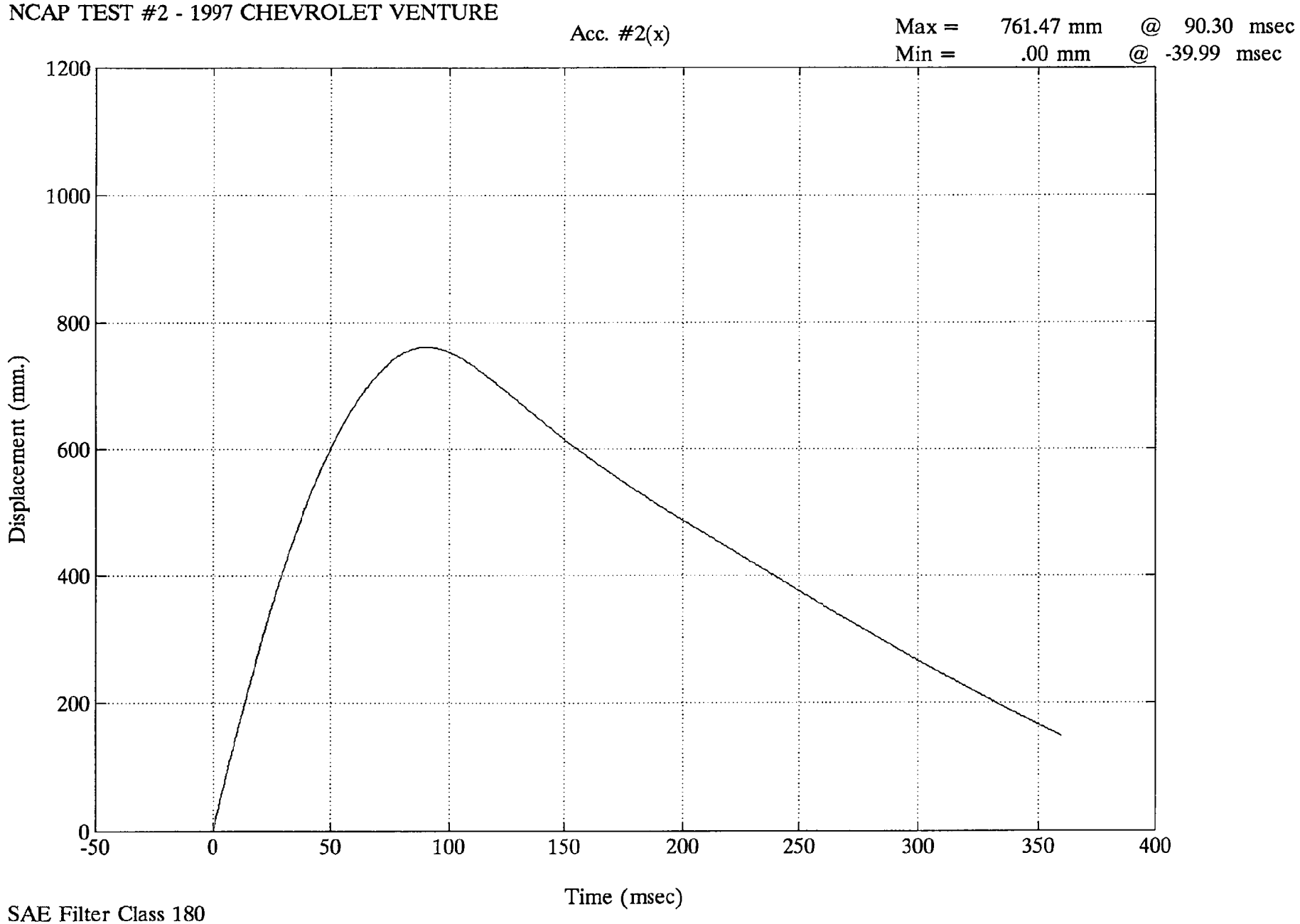


B-110

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

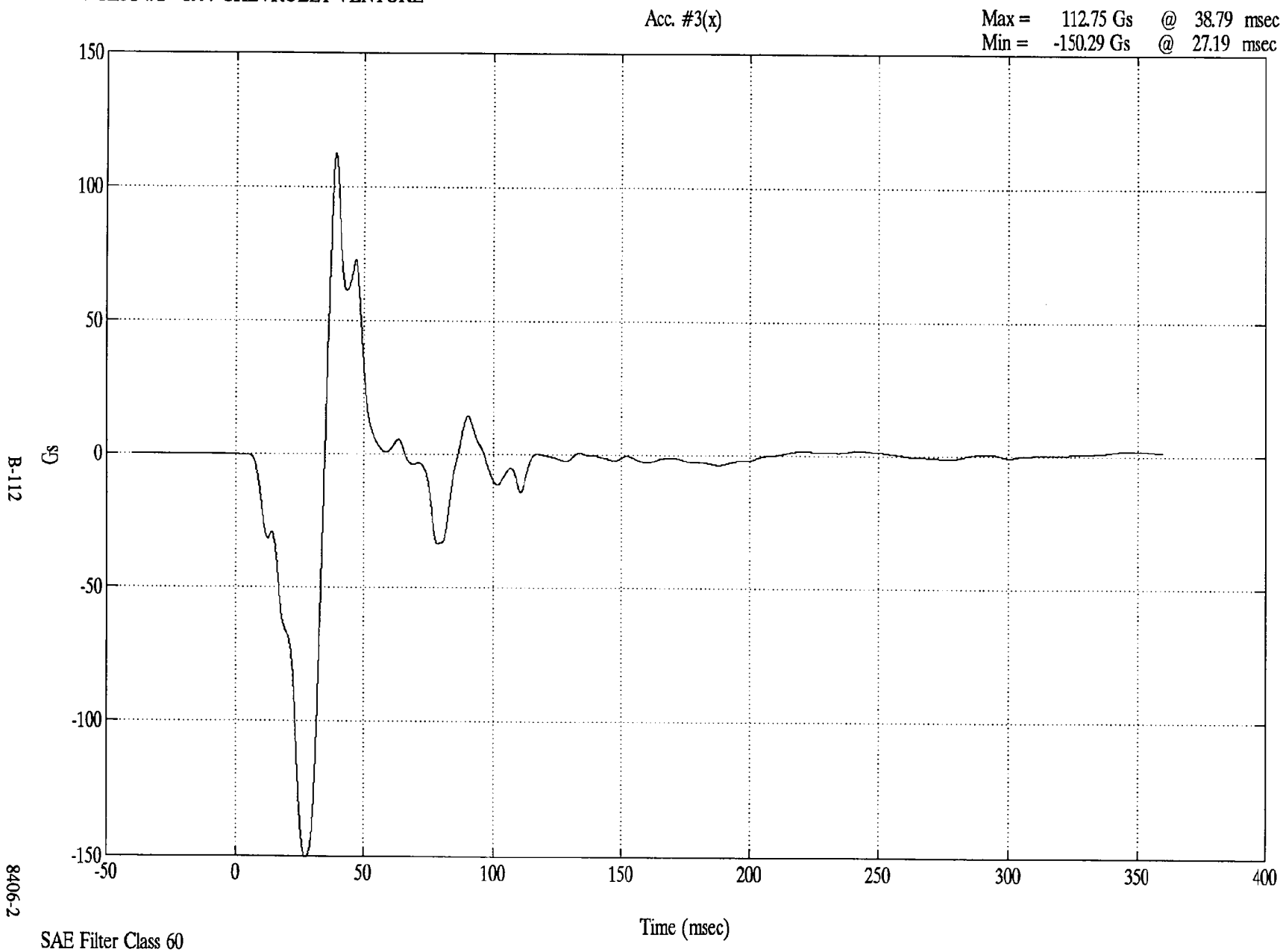


B-111

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

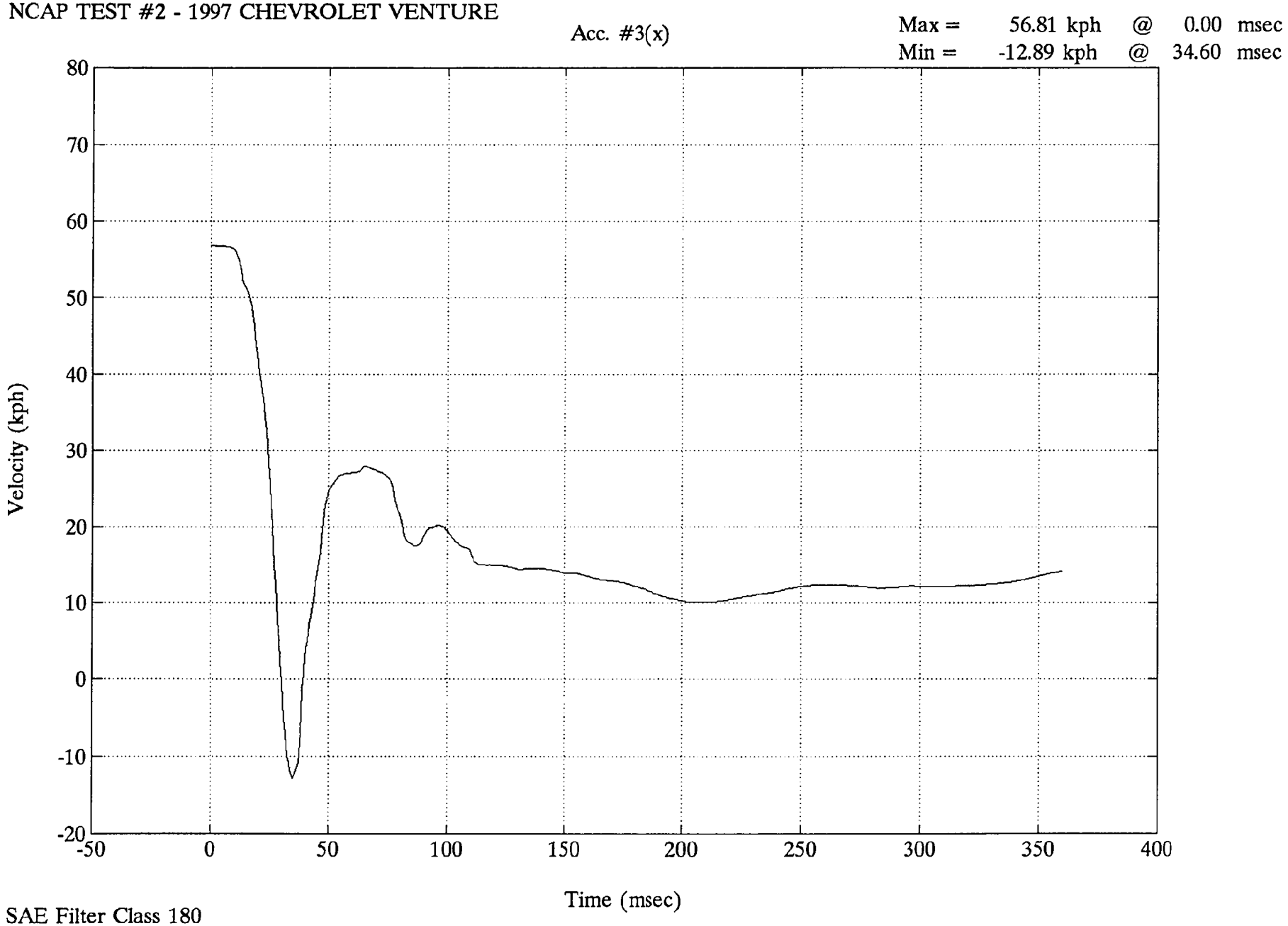


B-112

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

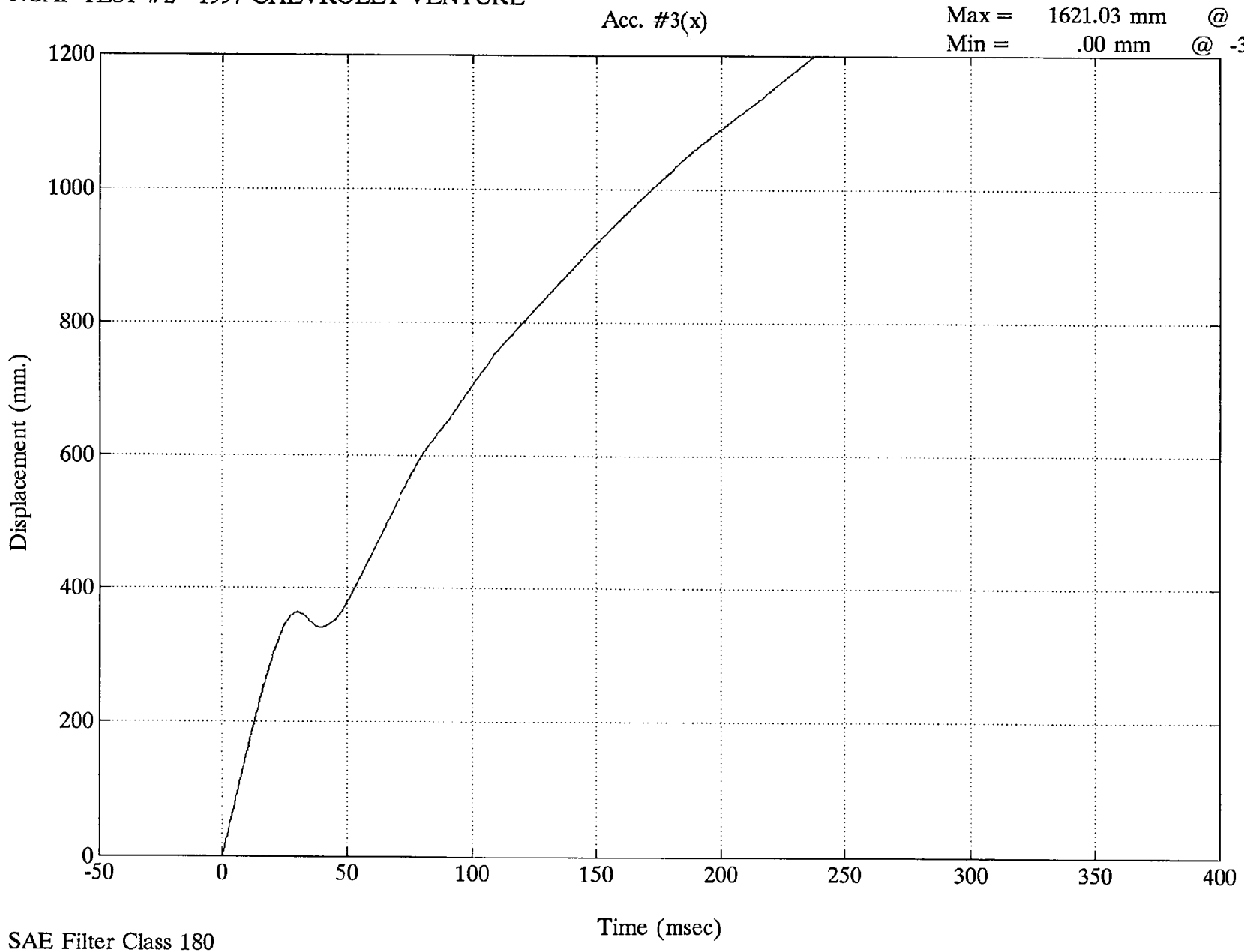


B-113

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

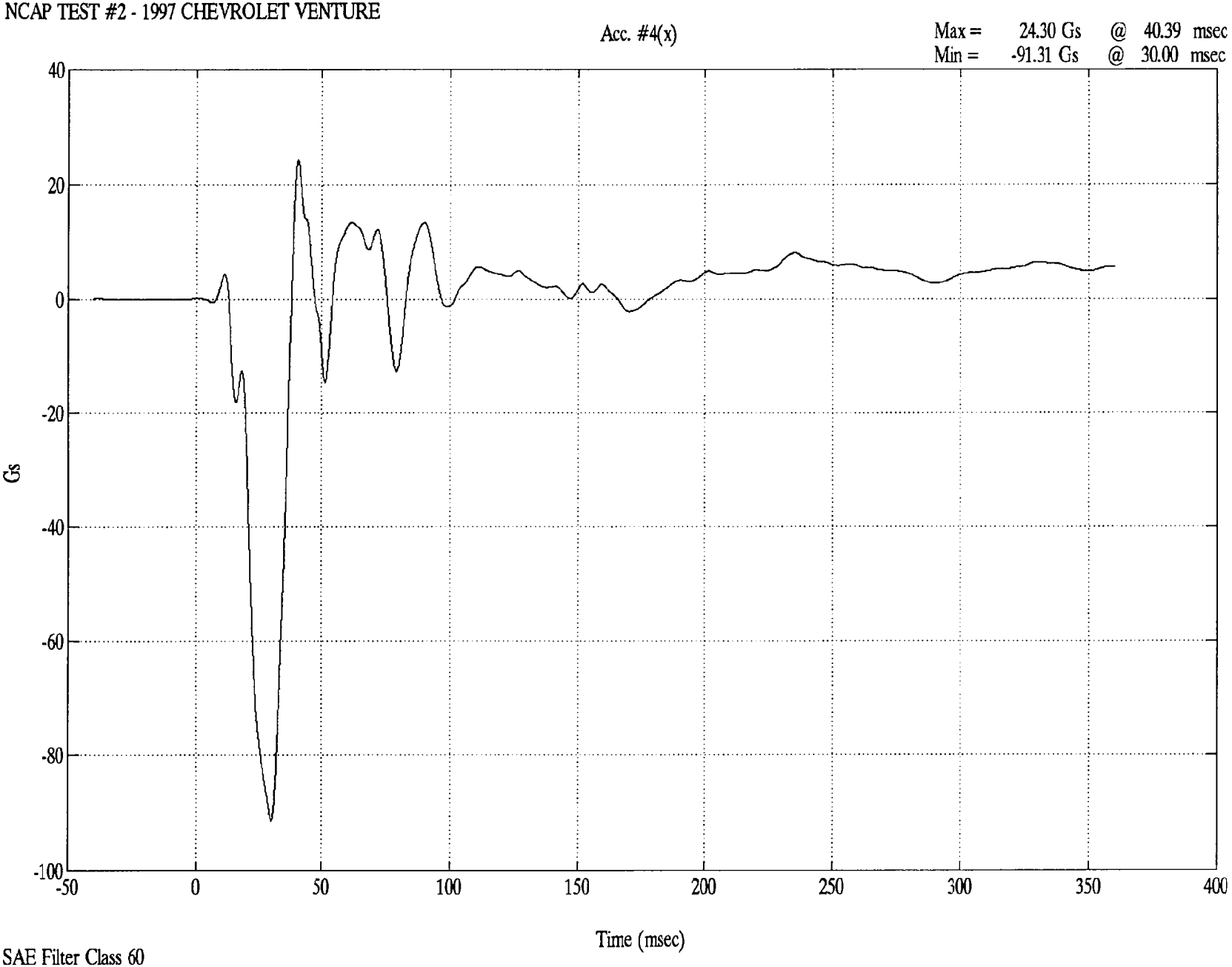


B-114

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

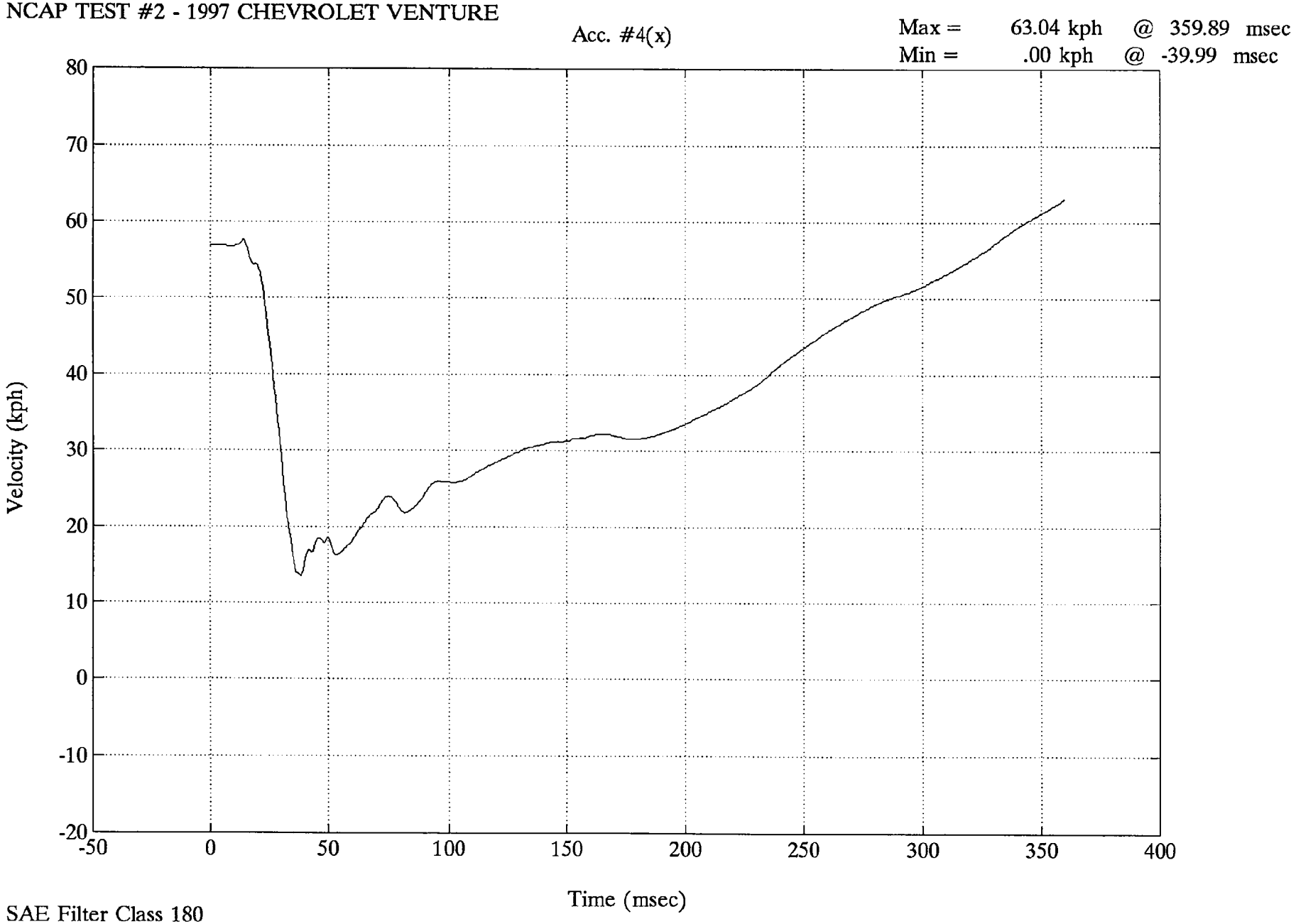


B-115

8406-2

SAE Filter Class 60

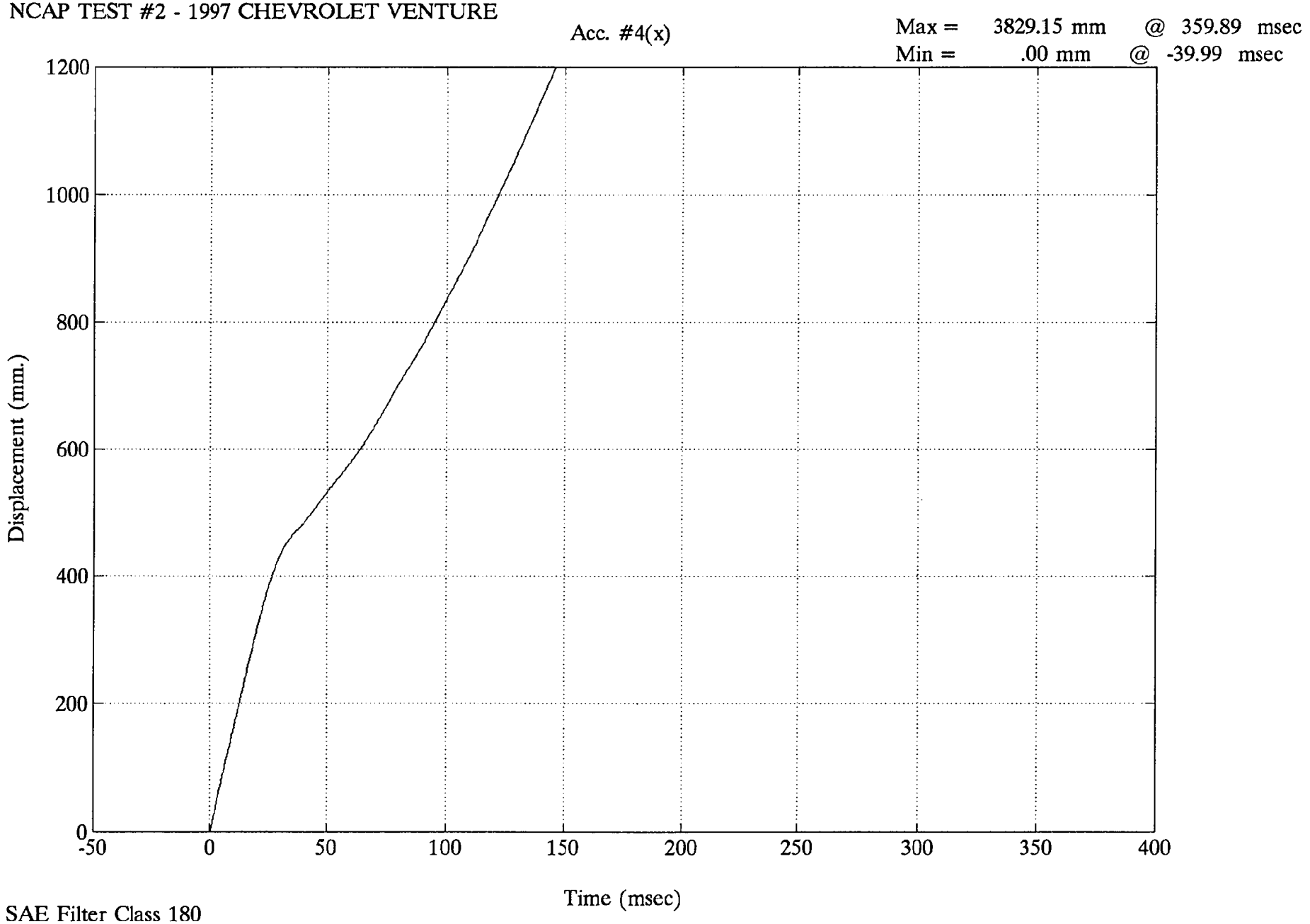
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 180

8406-2

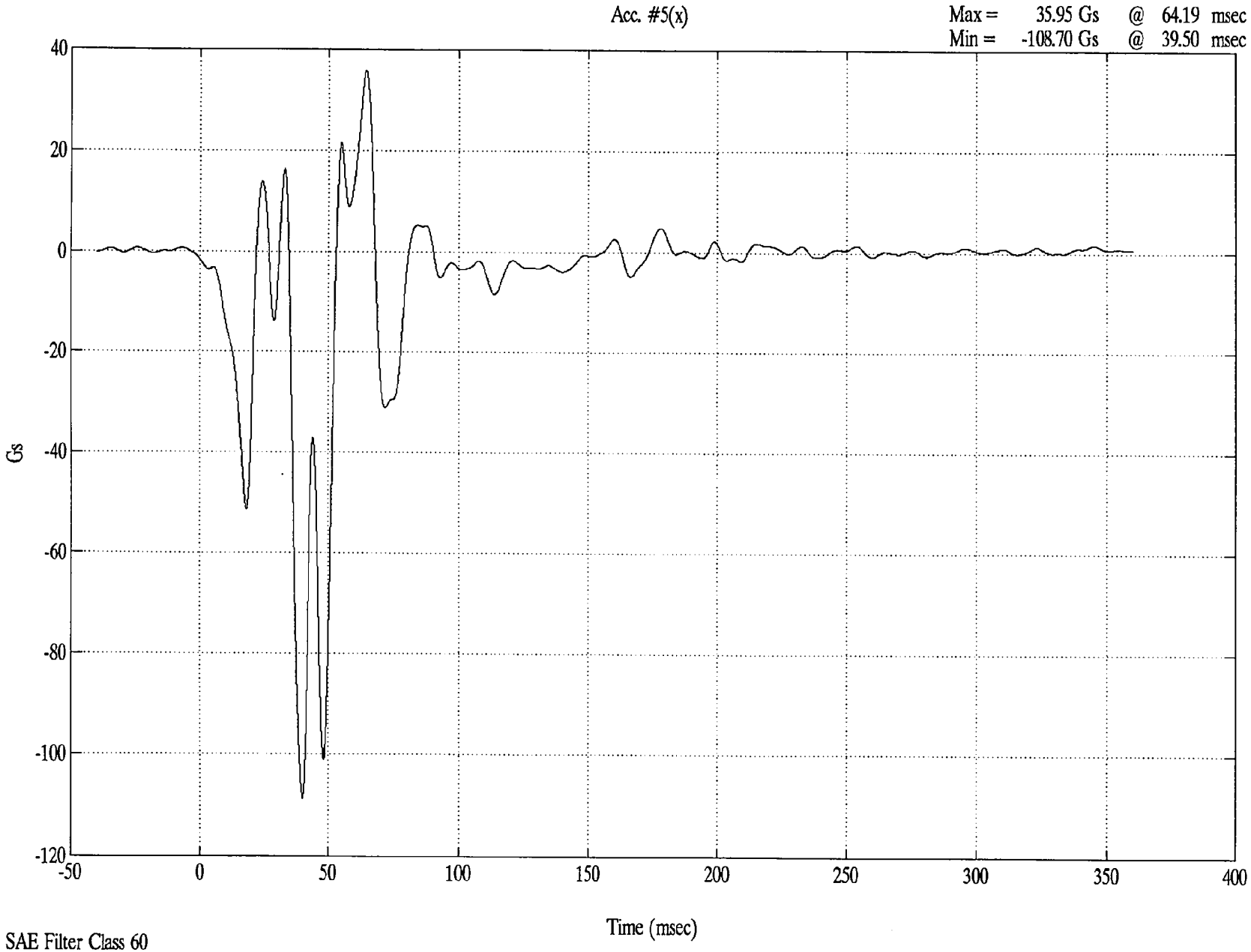
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 180

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

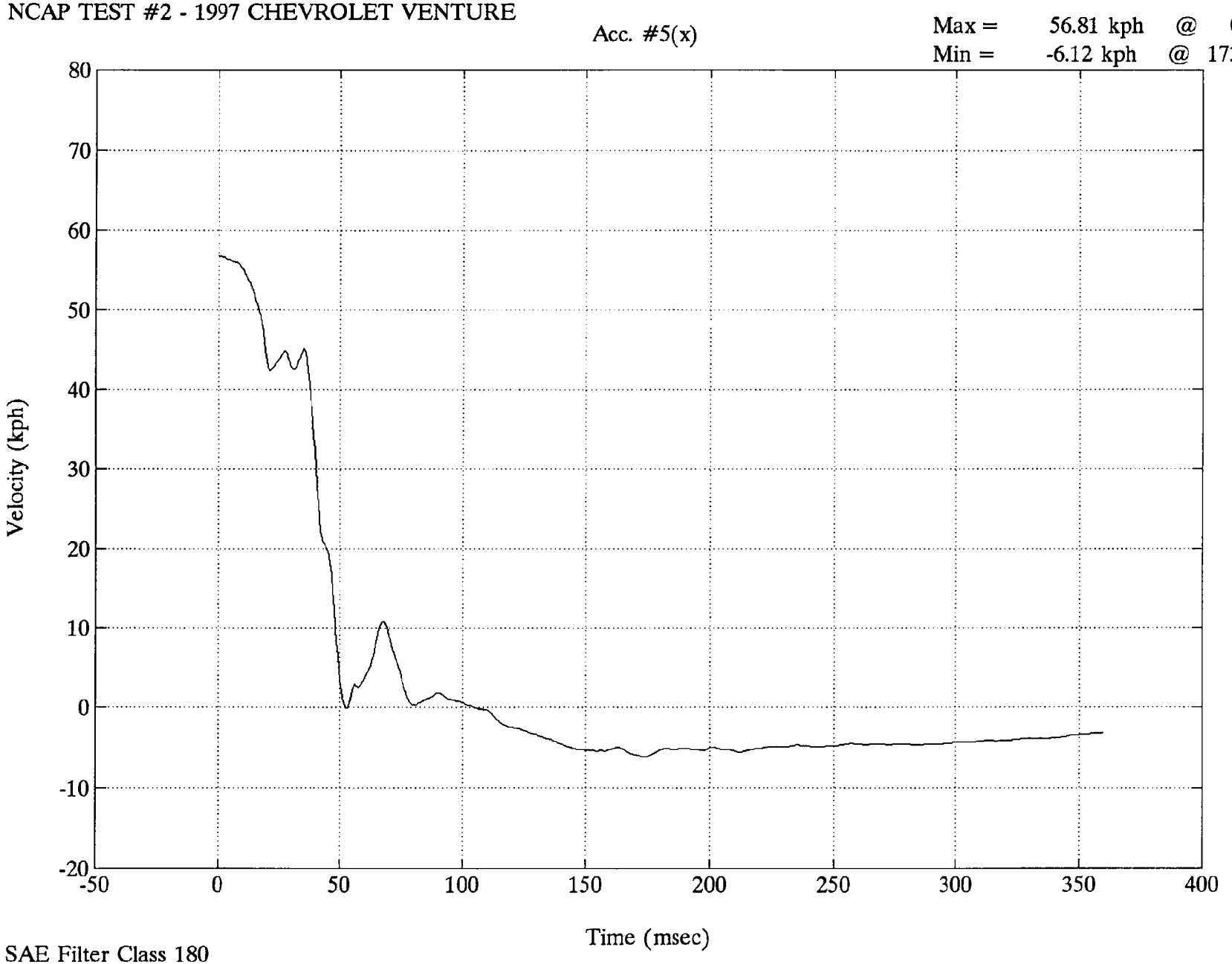


B-118

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

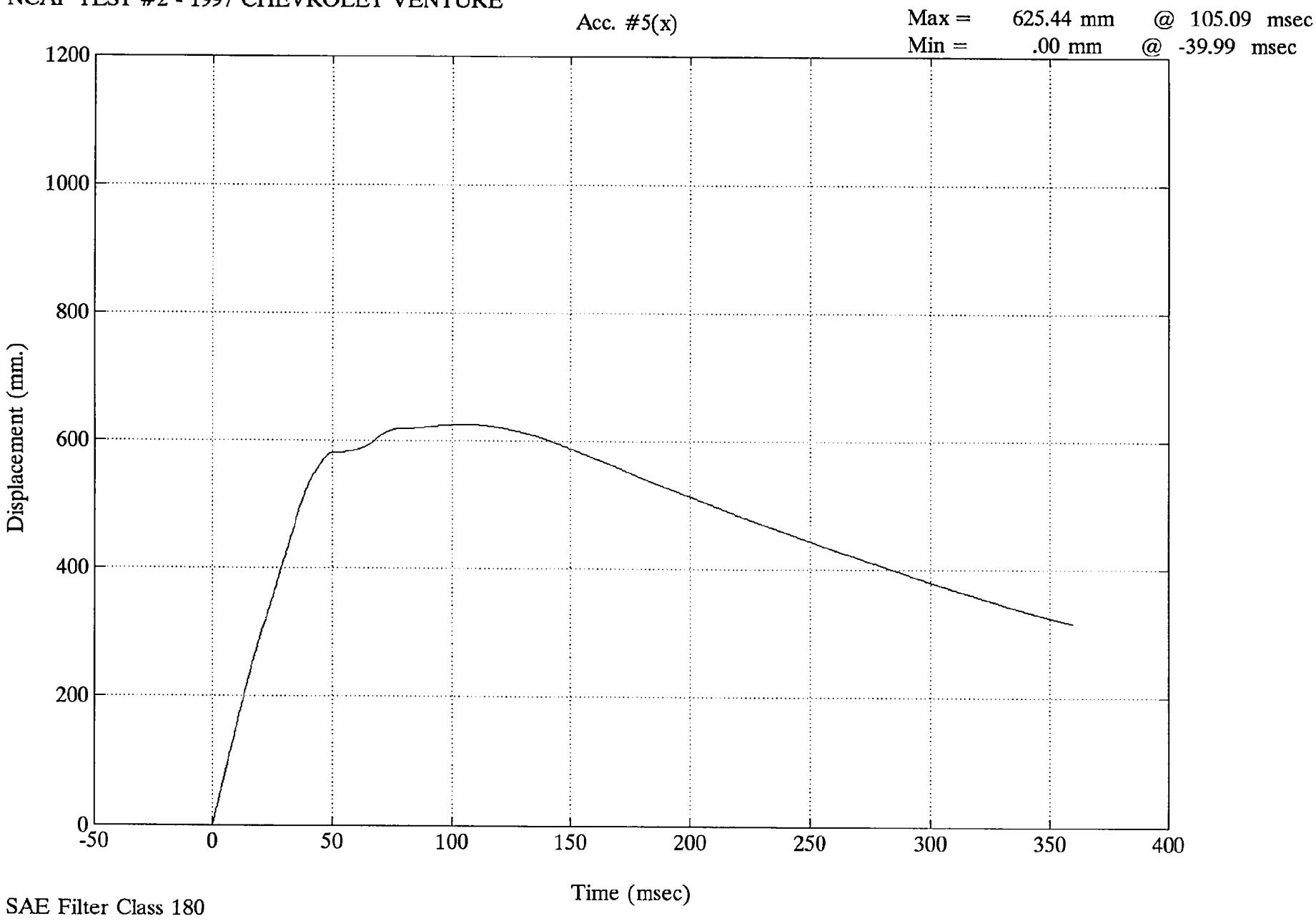


B-119

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

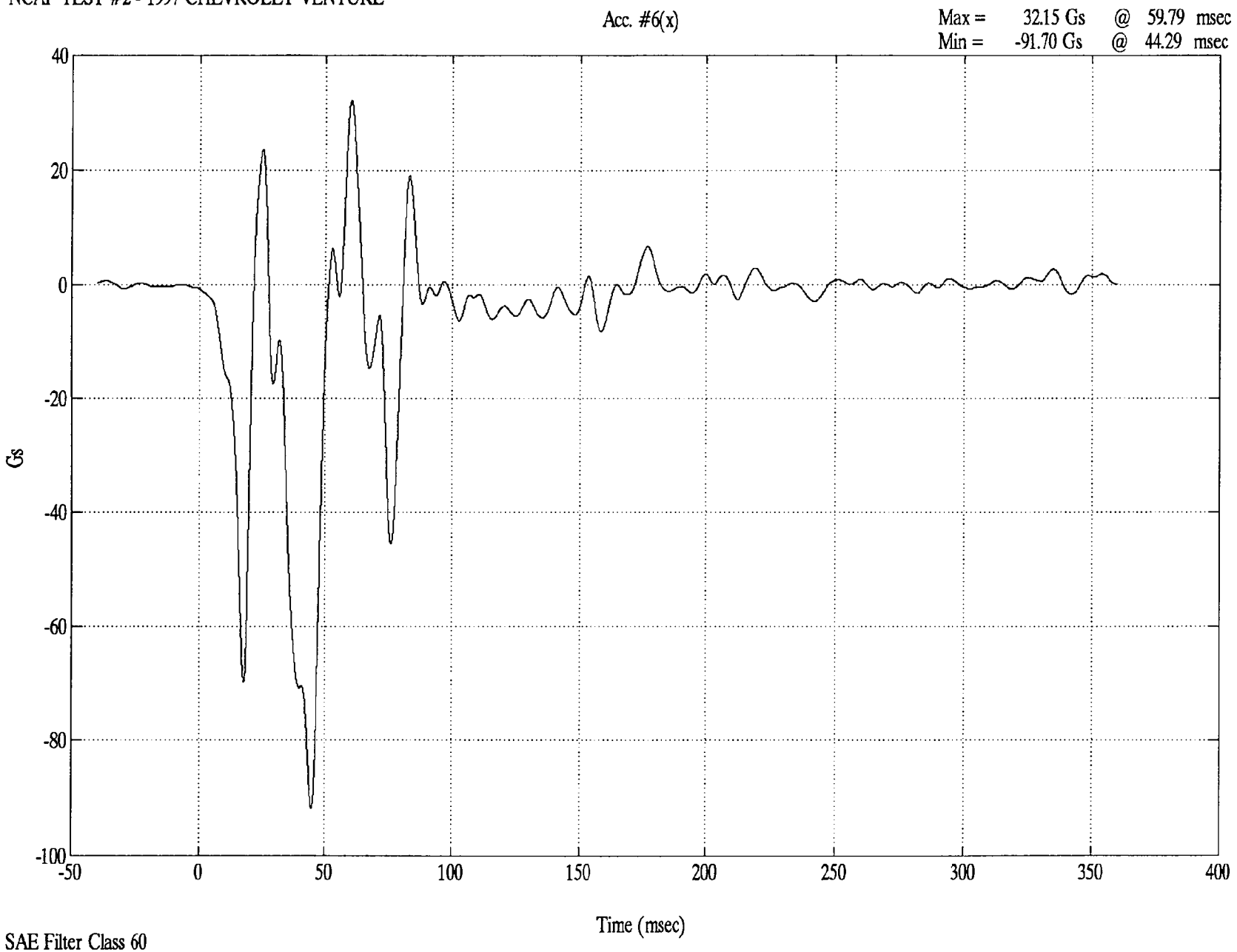


B-120

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

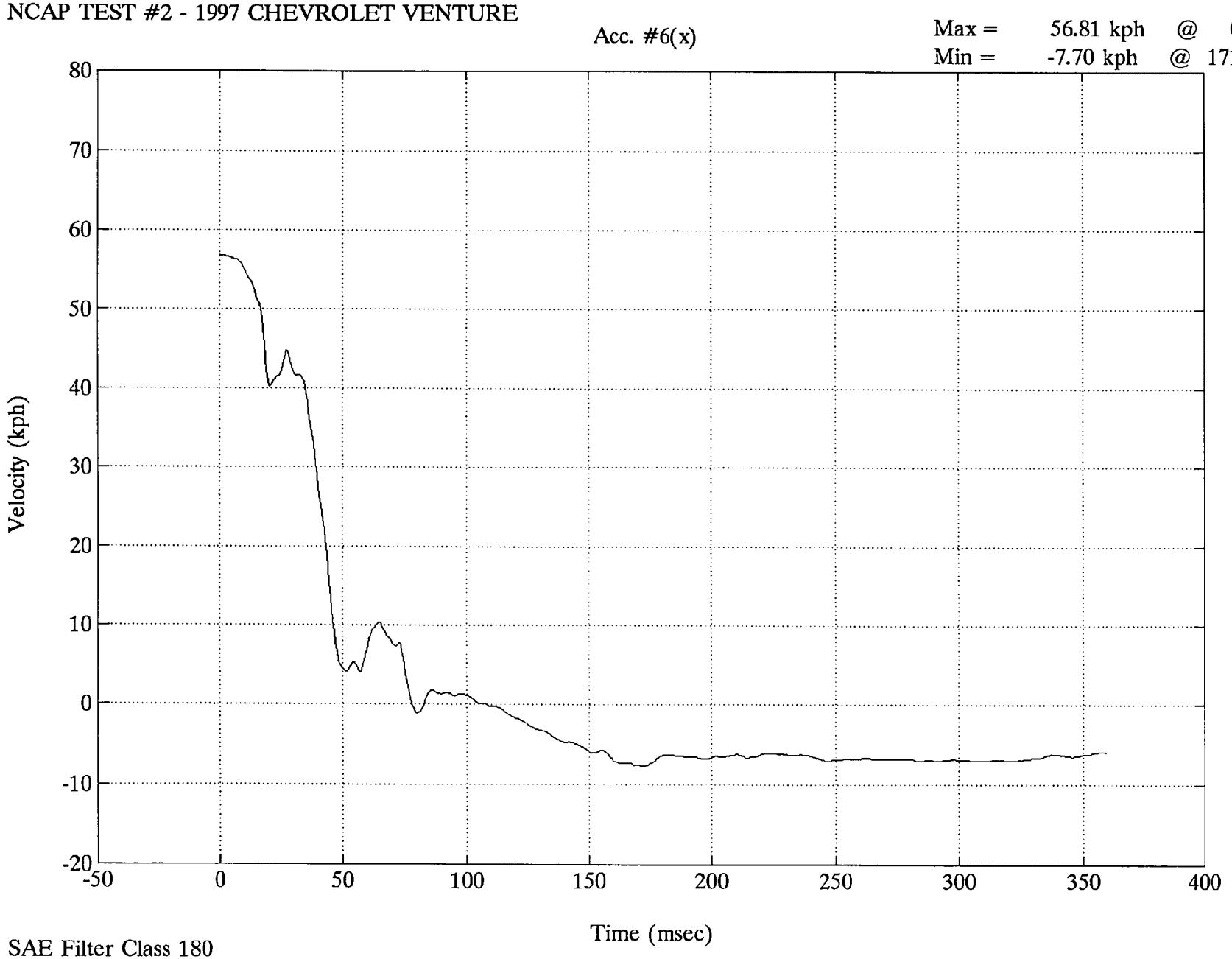


B-121

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

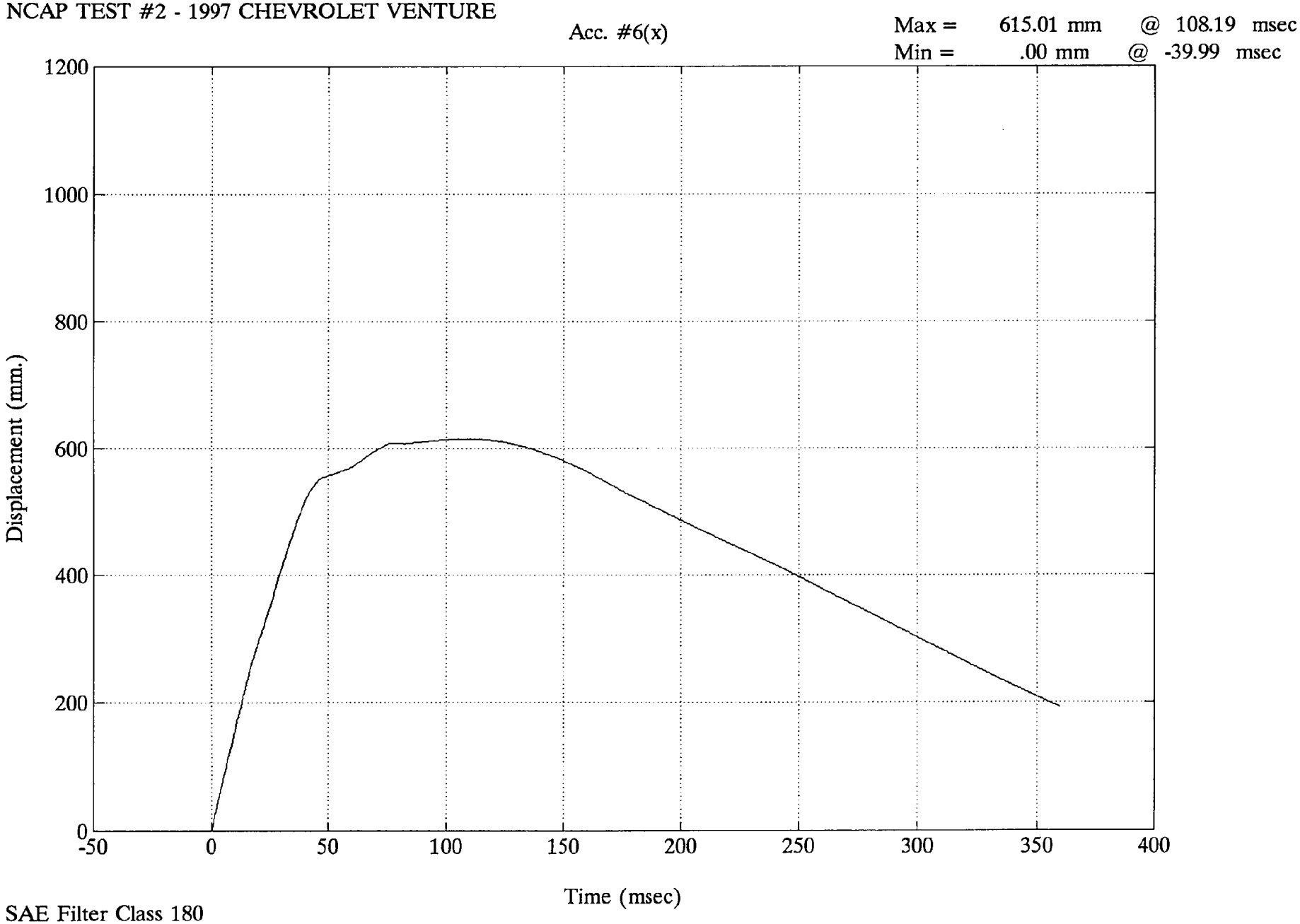


B-122

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

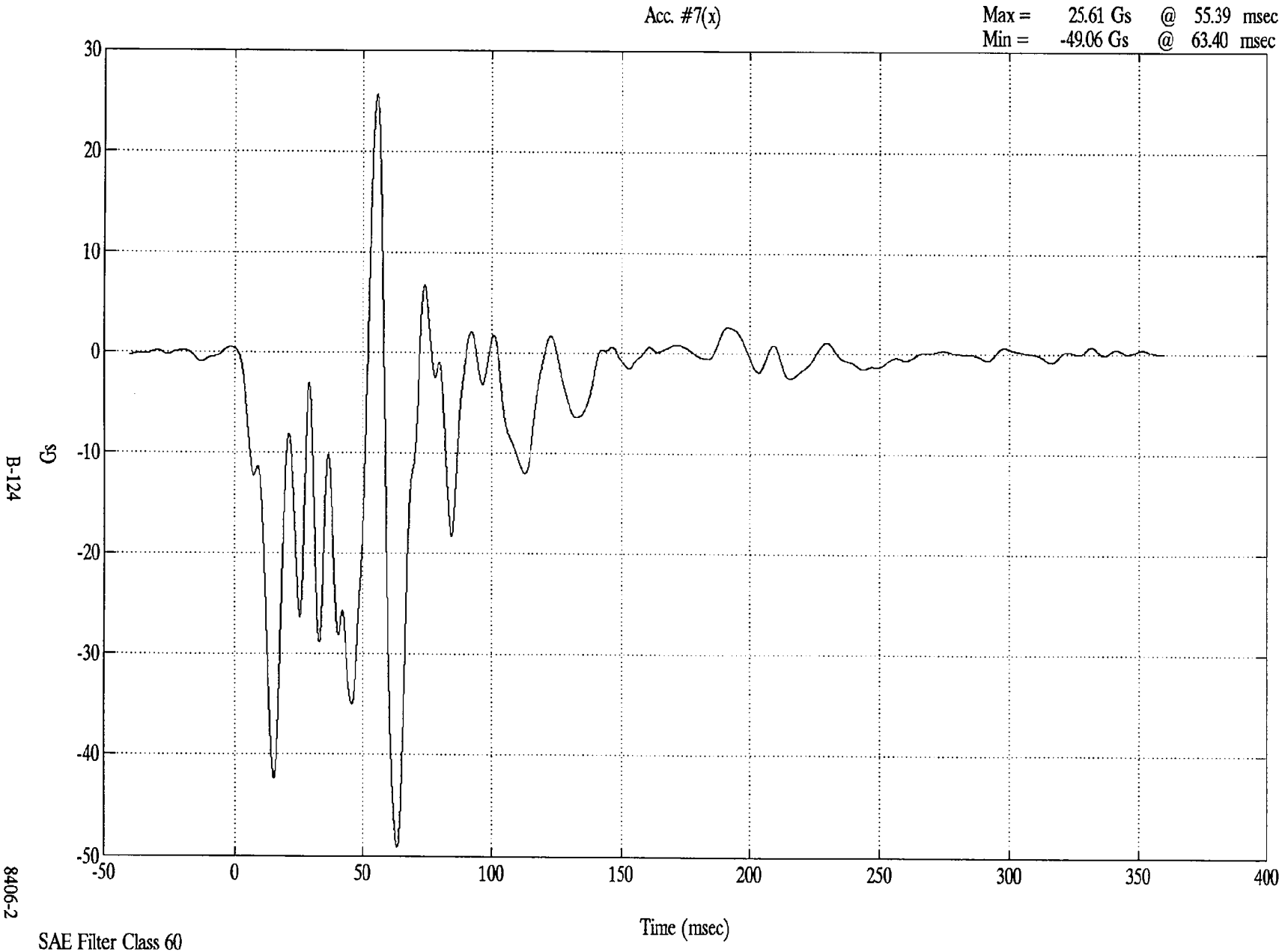


B-123

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

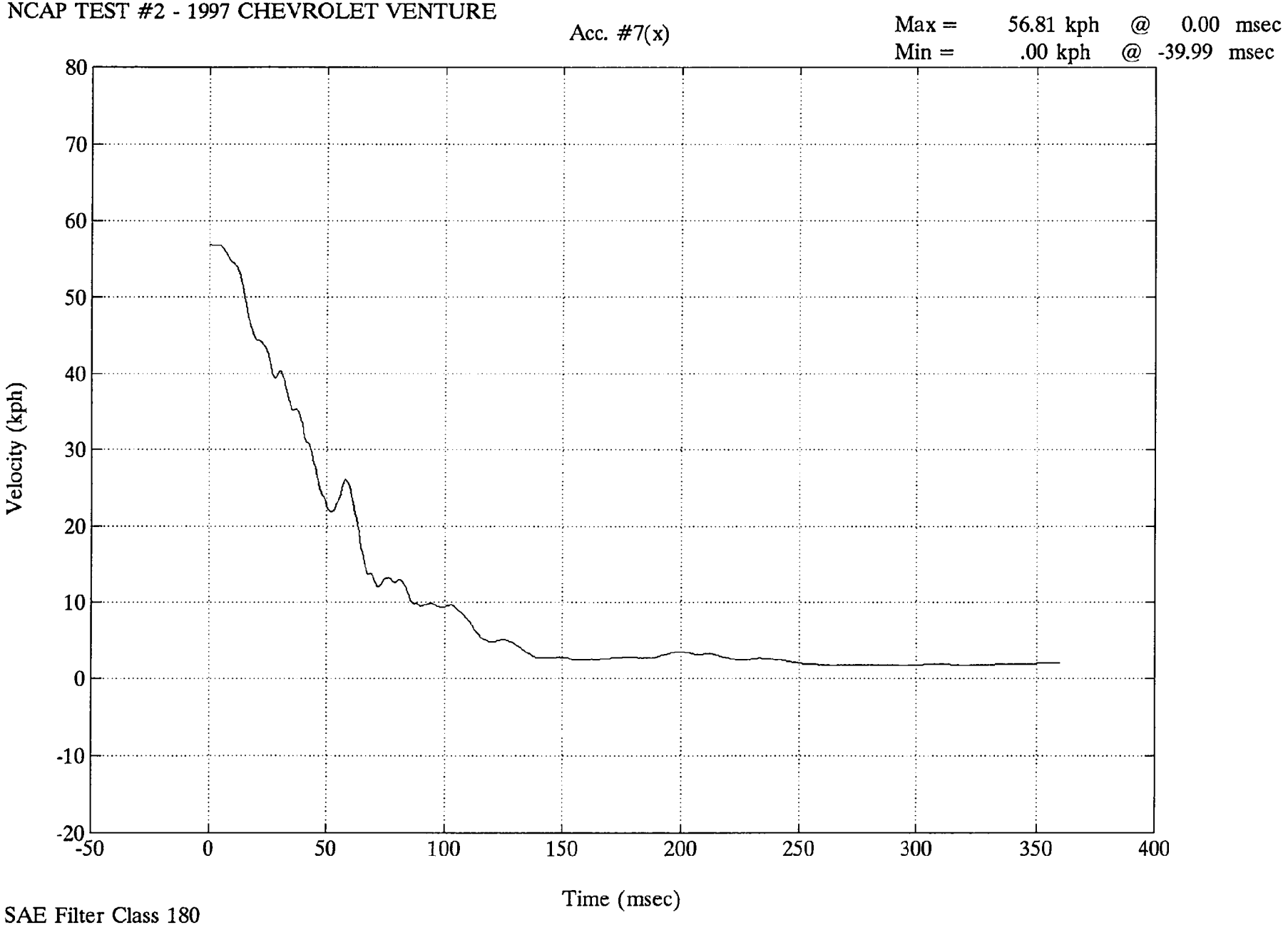


B-124

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

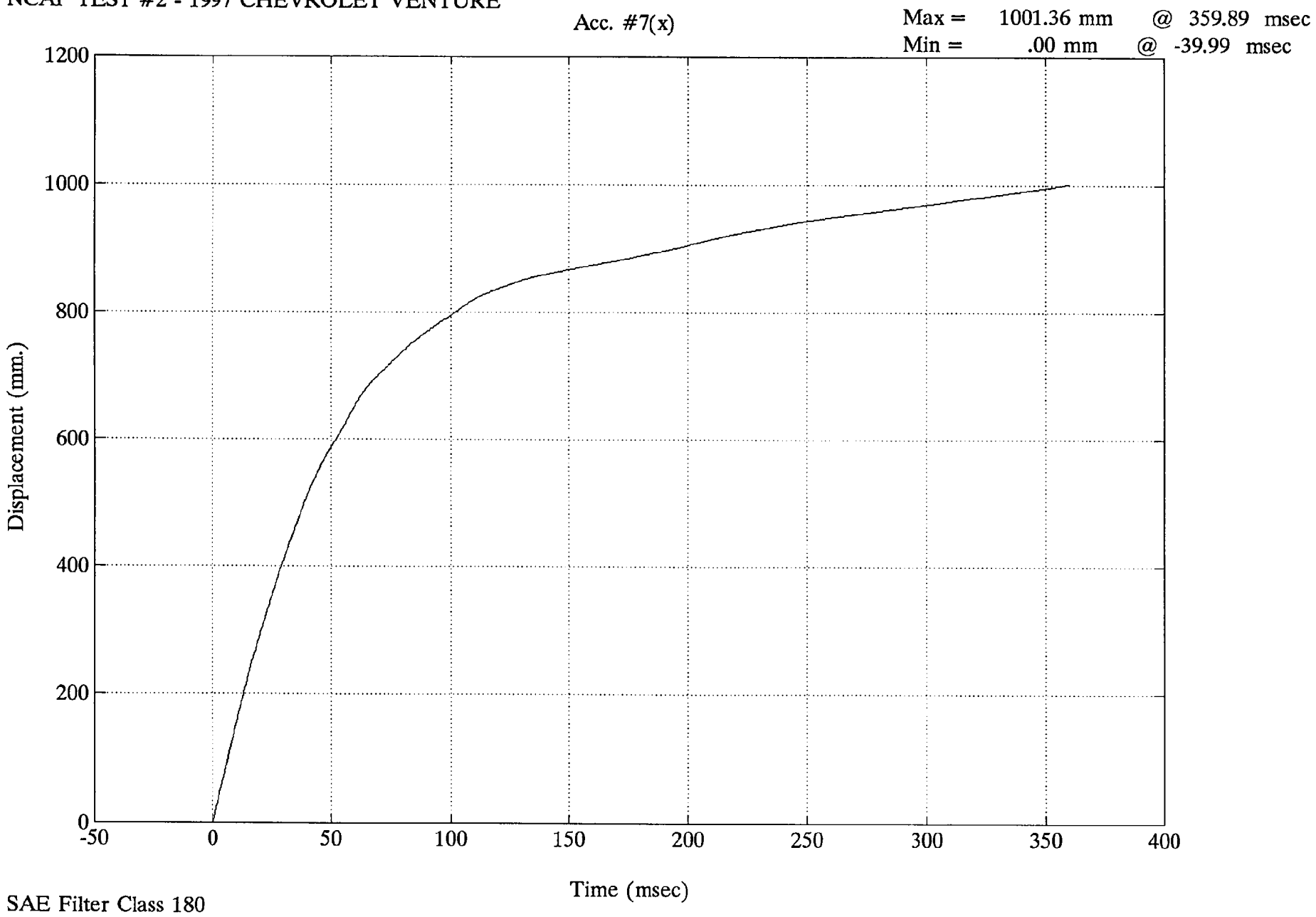


B-125

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

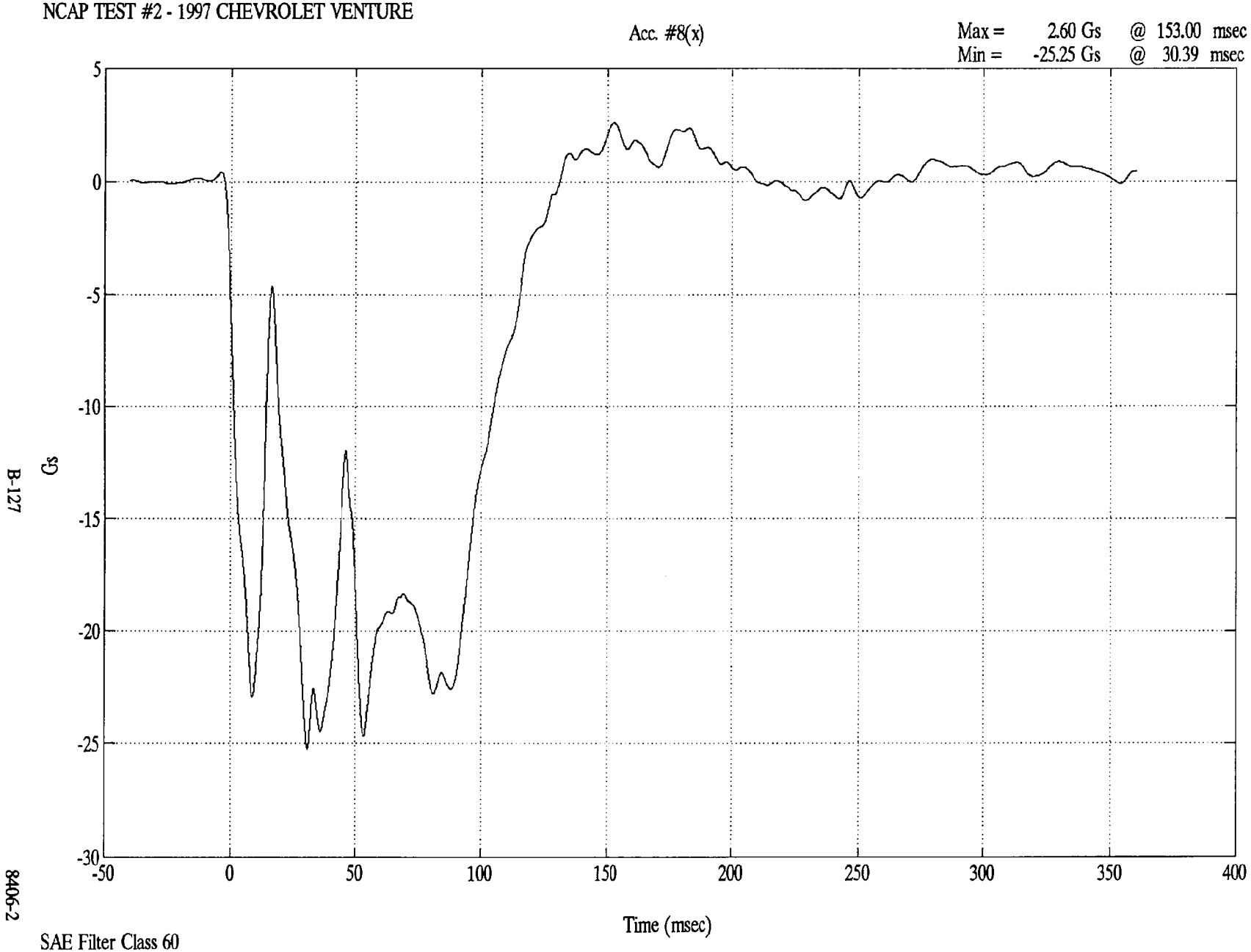


SAE Filter Class 180

B-126

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

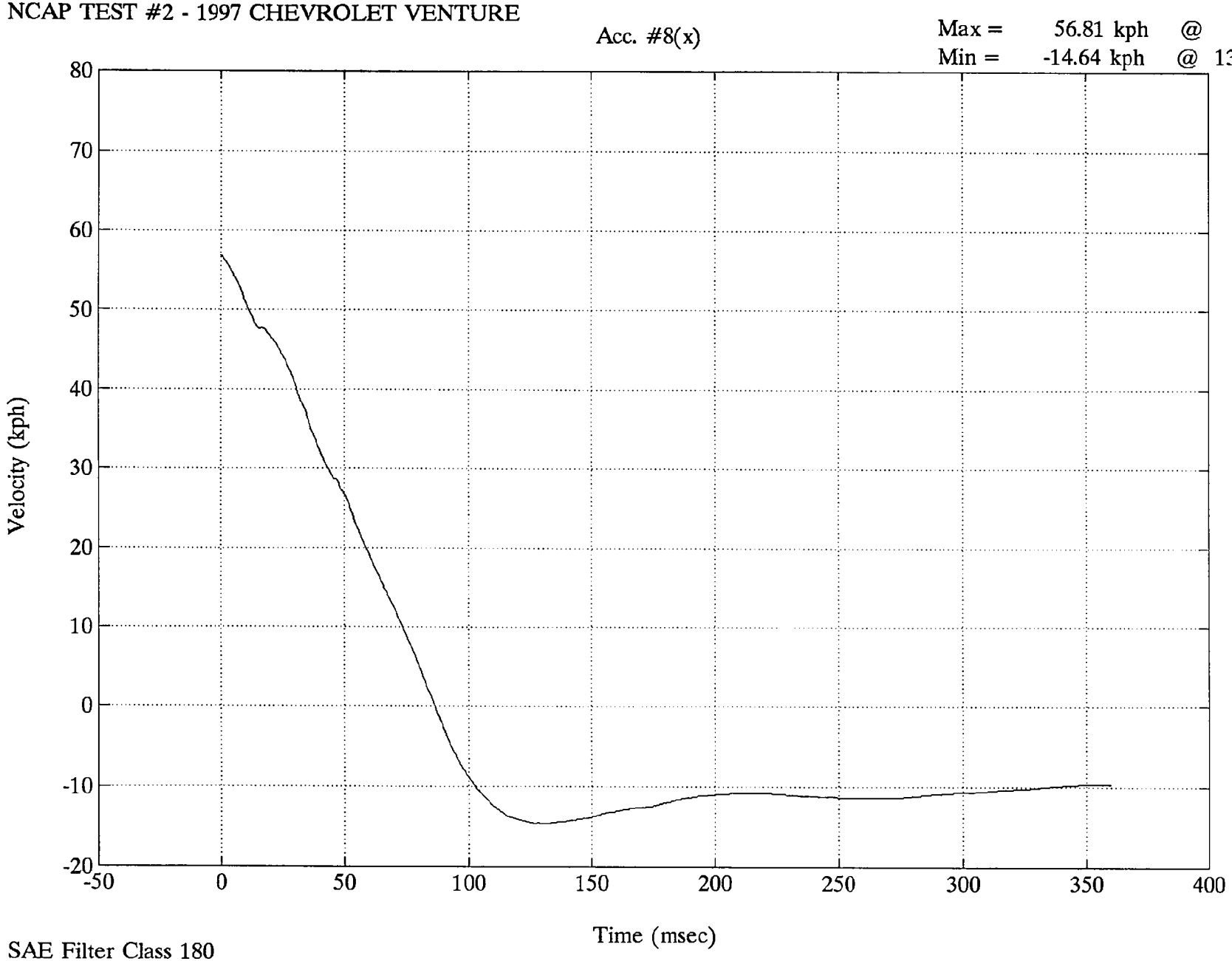


B-127

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

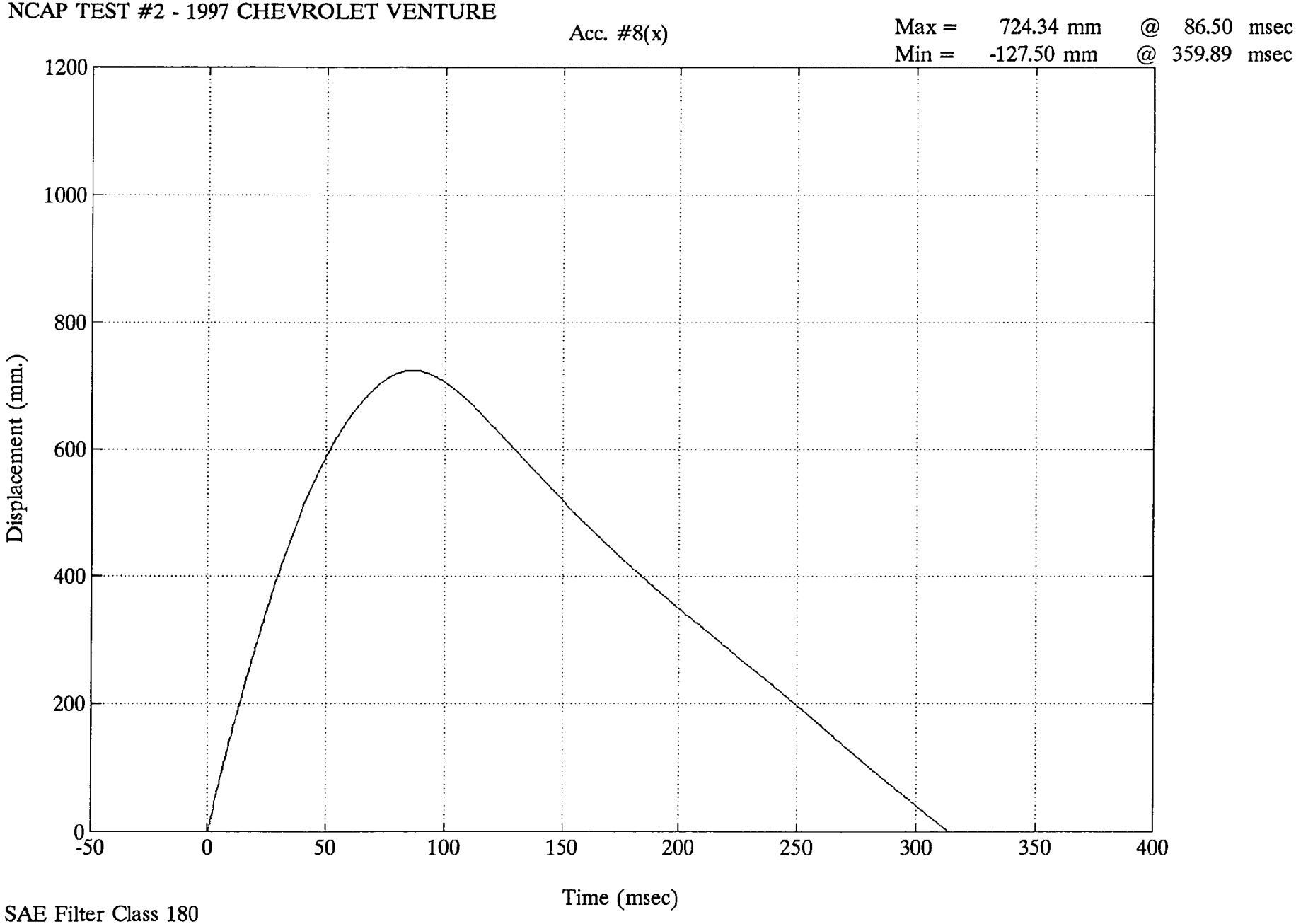


B-128

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

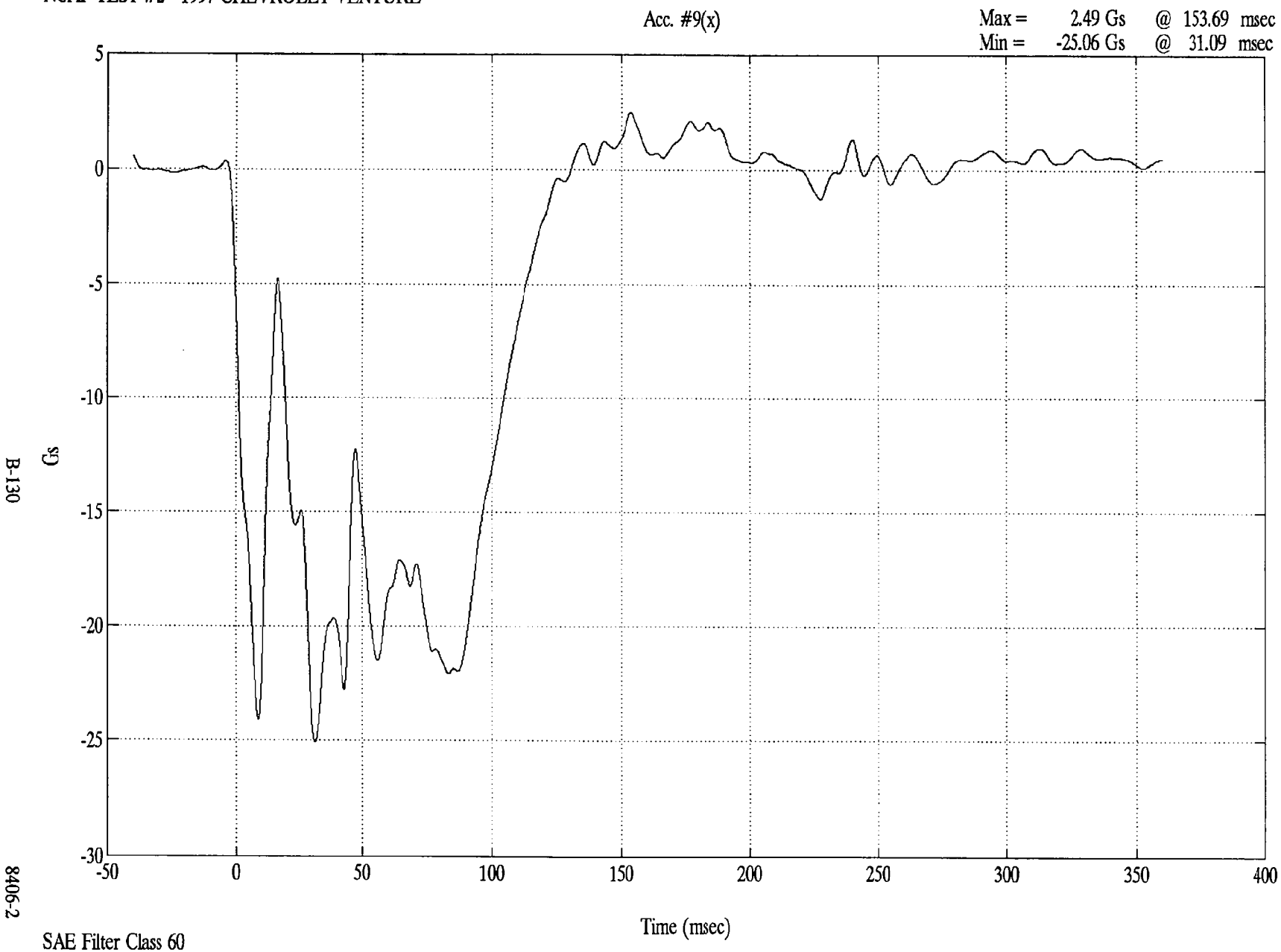


B-129

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE

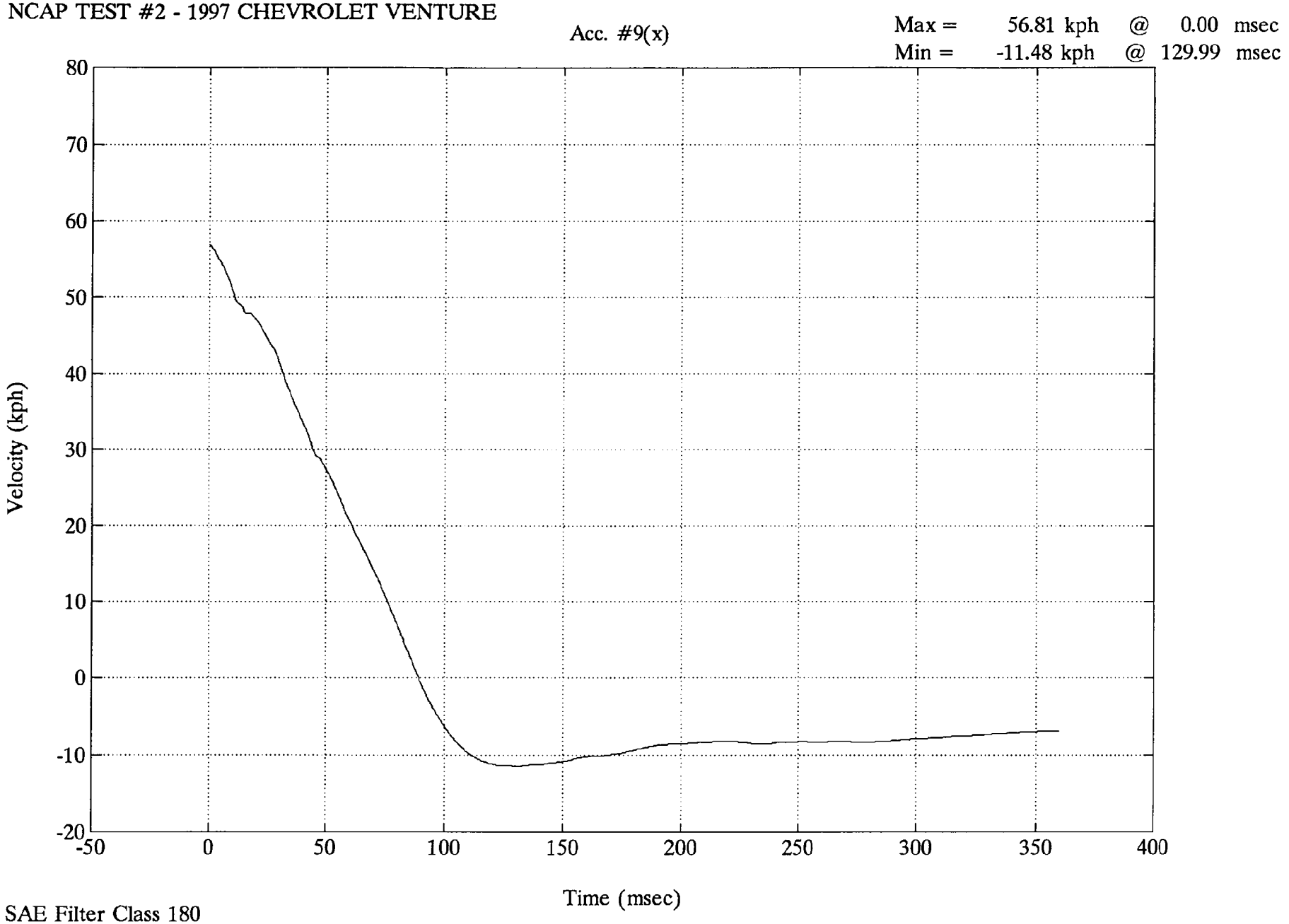


B-130

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

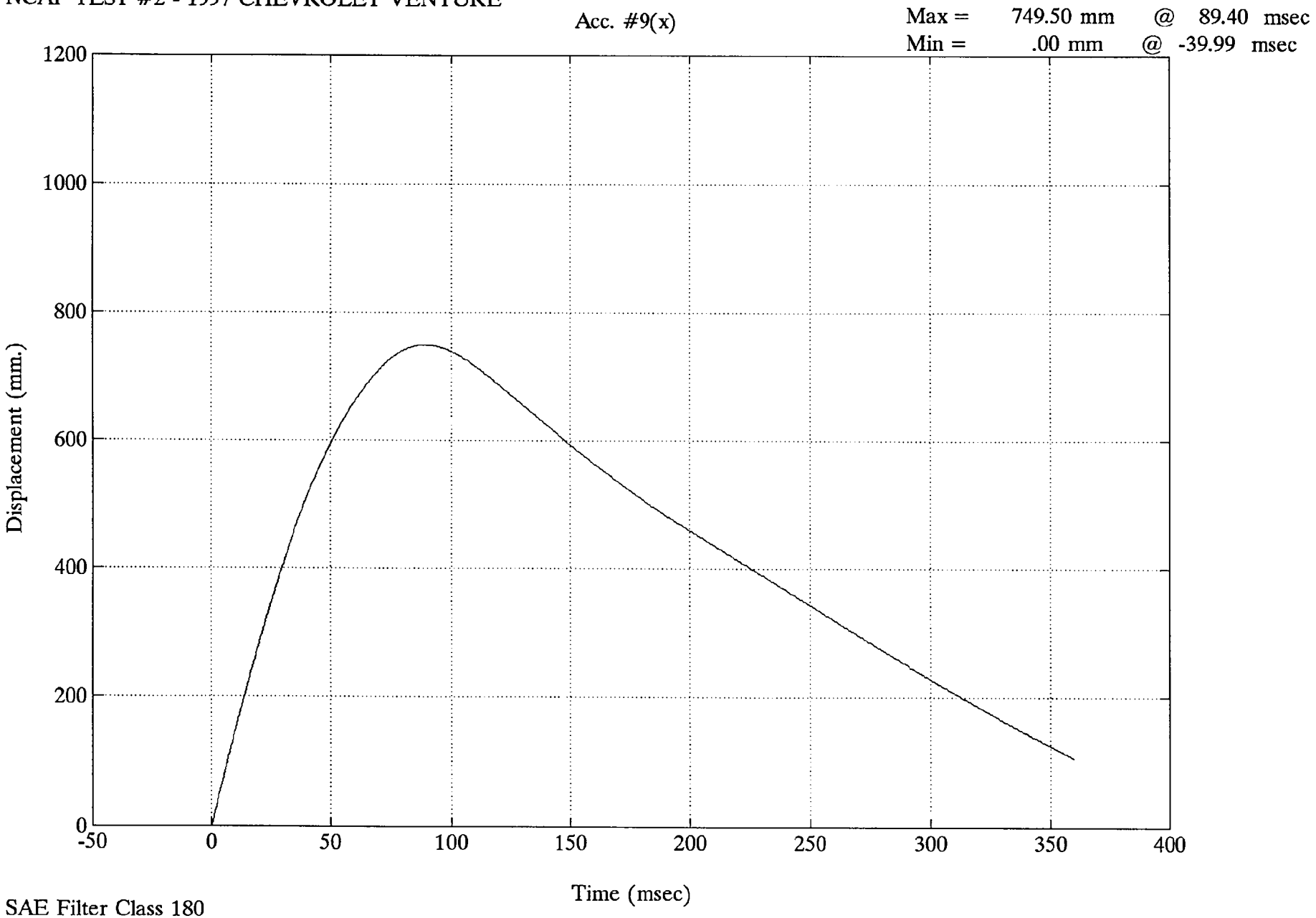


B-131

8406-2

SAE Filter Class 180

NCAP TEST #2 - 1997 CHEVROLET VENTURE



B-132

8406-2

SAE Filter Class 180

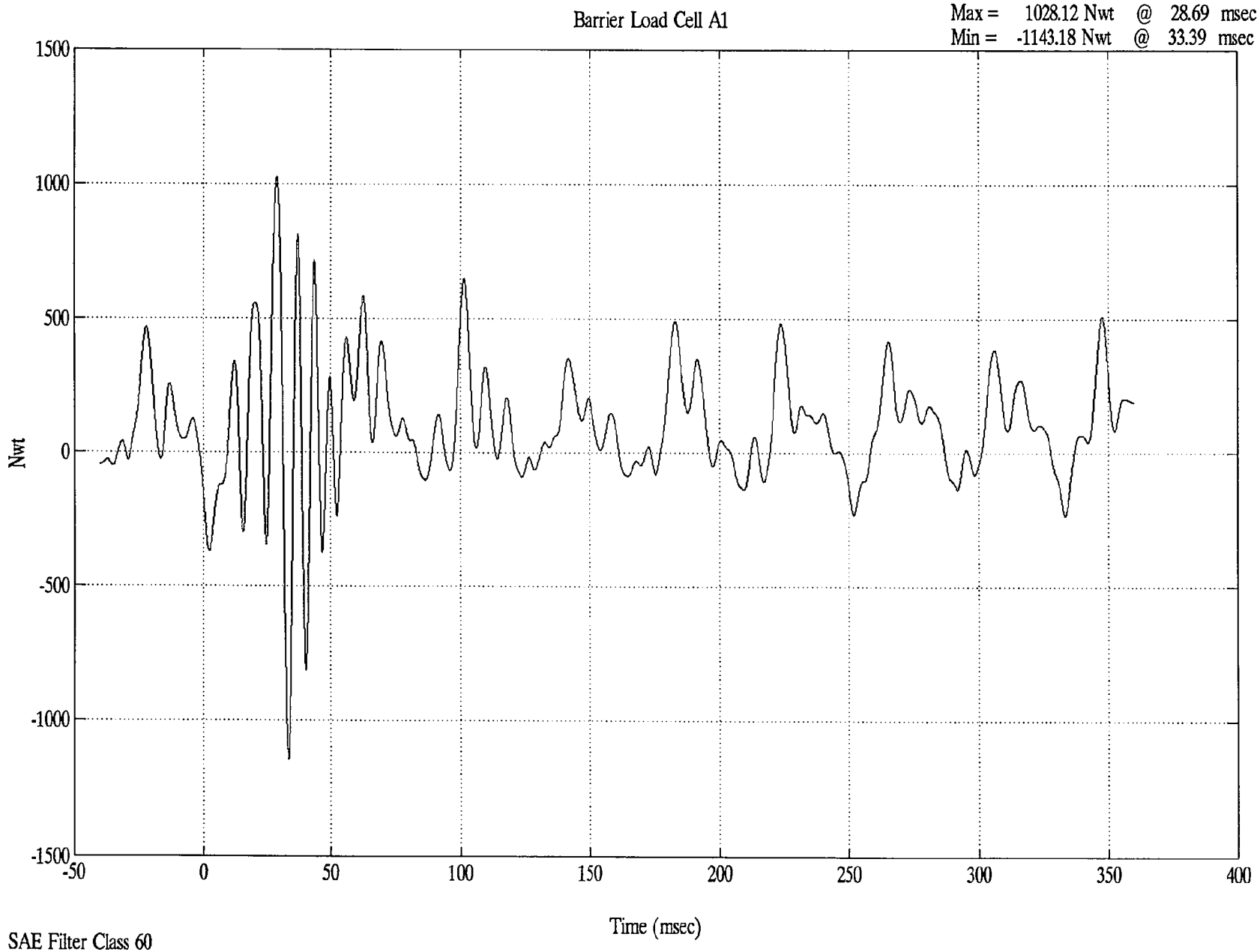
NHTSA TEST NO. MV0100

LOAD CELL BARRIER DATA

FILTER CHANNEL CLASS

60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

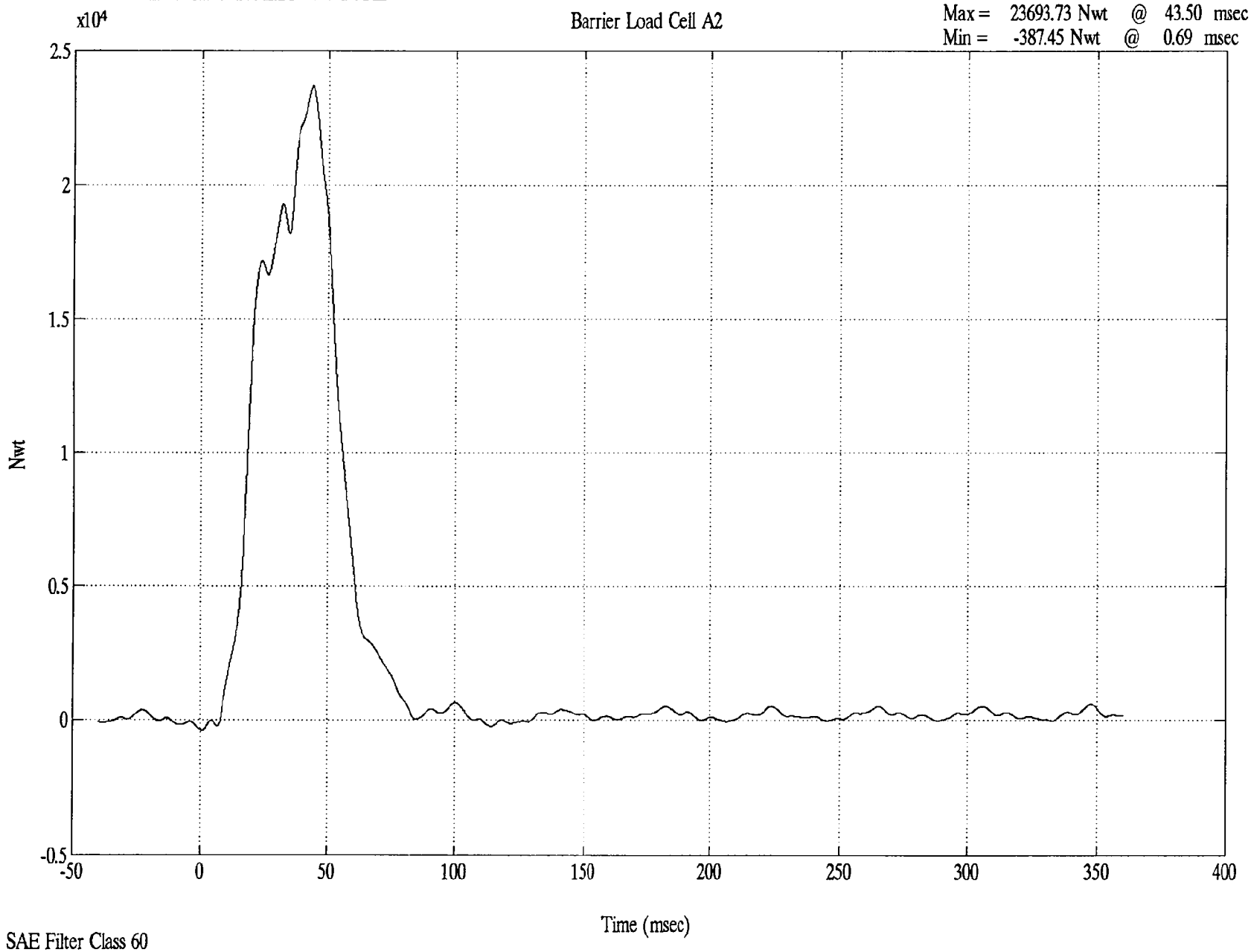


B-134

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

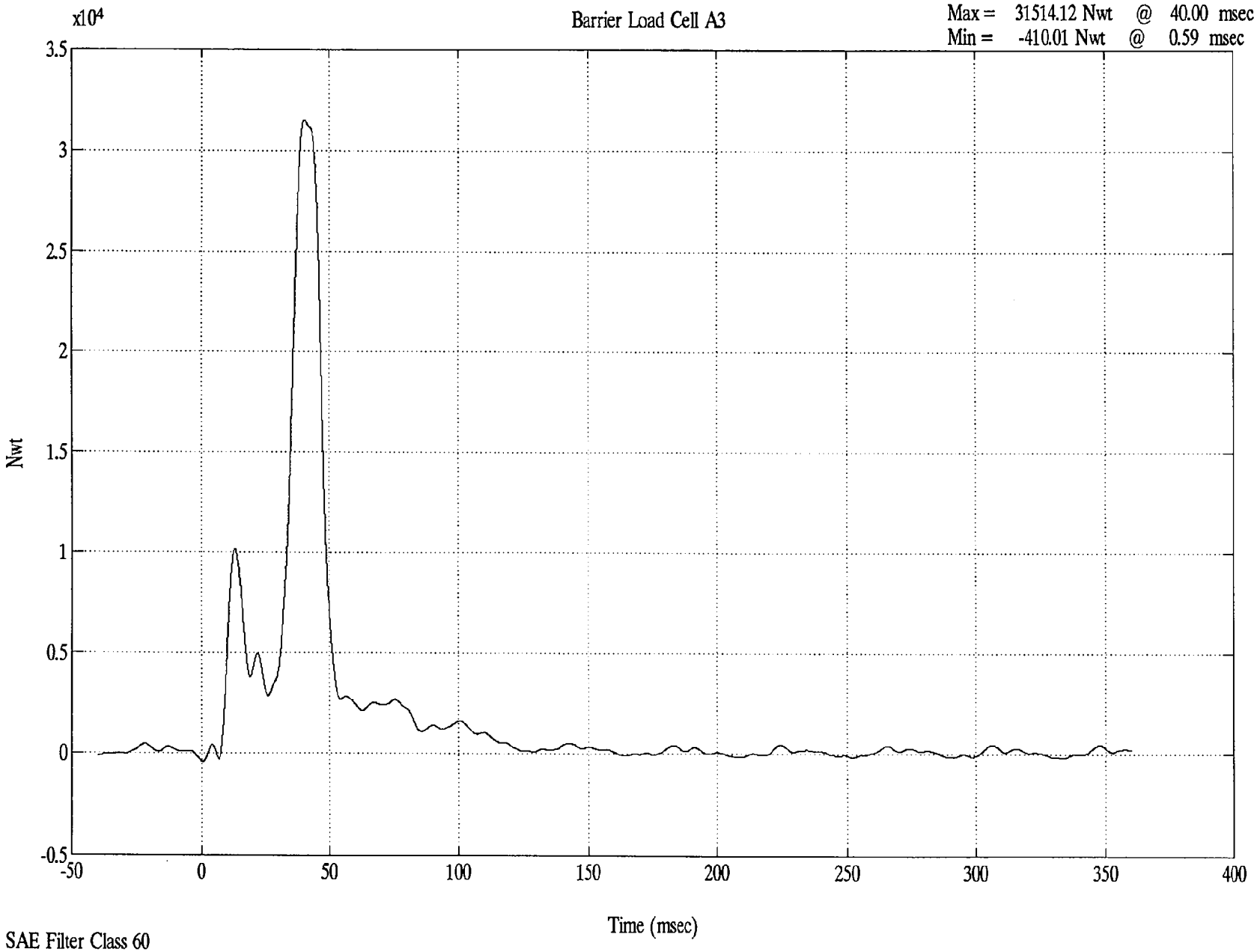


B-135

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

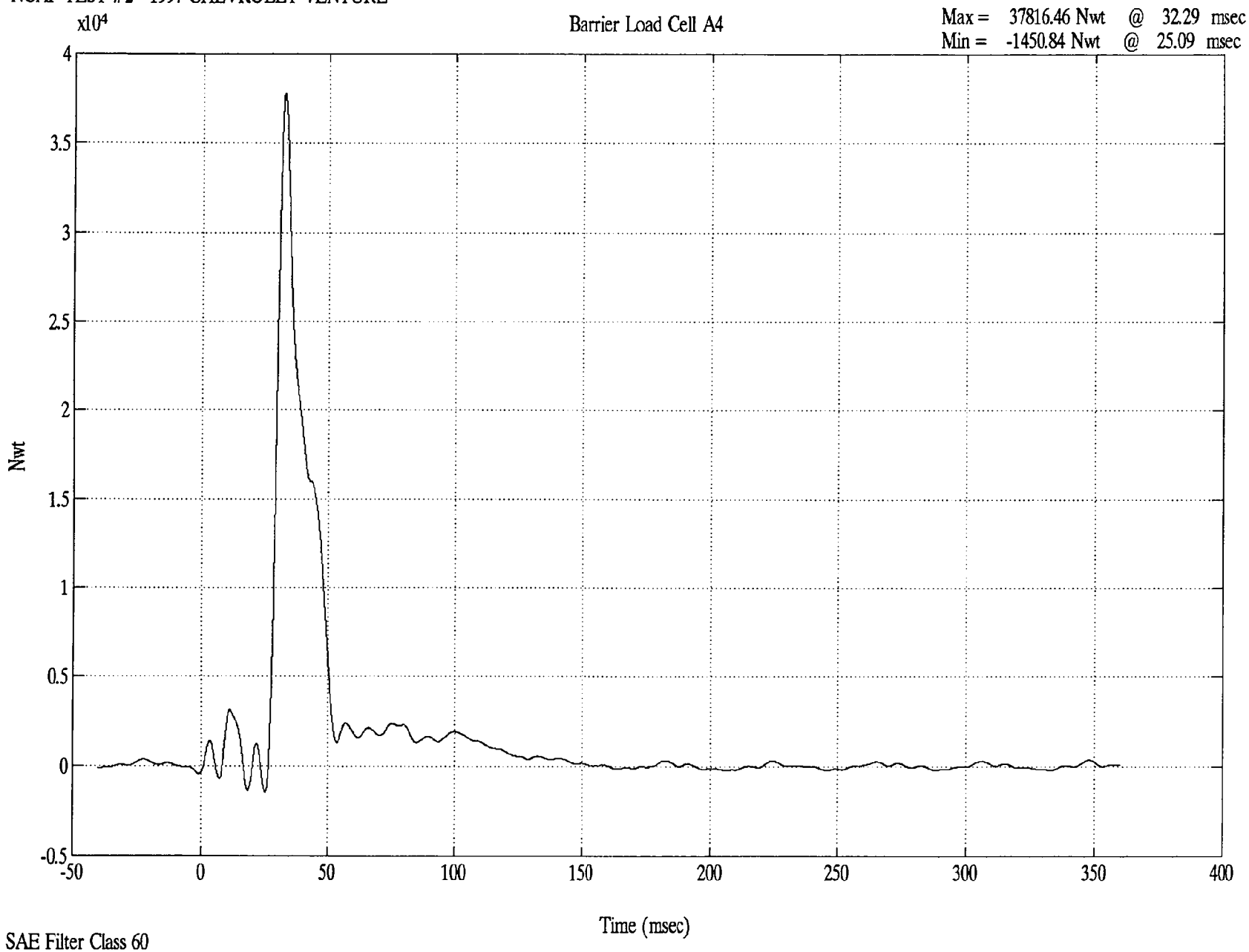


B-136

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

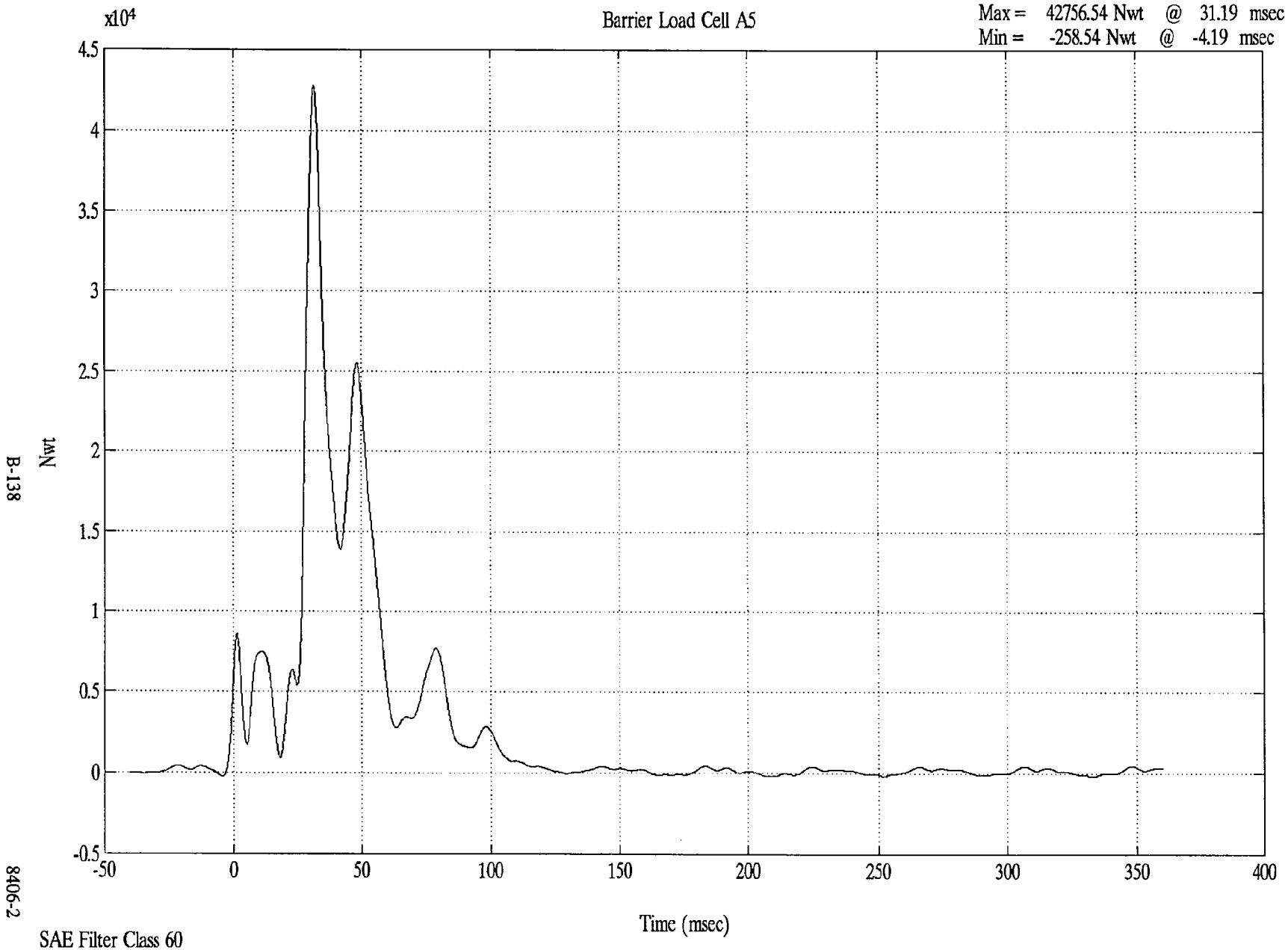


B-137

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

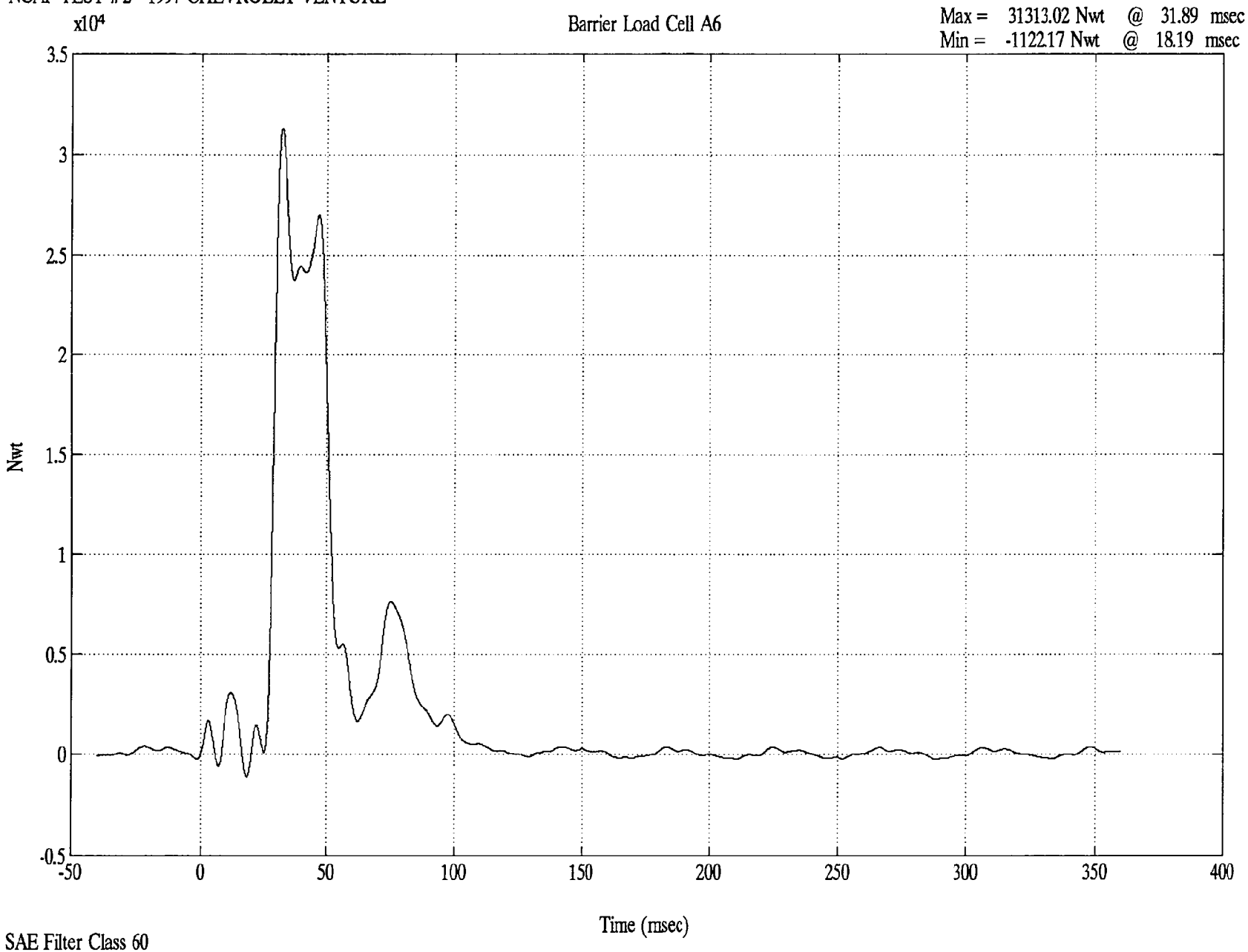


B-138

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

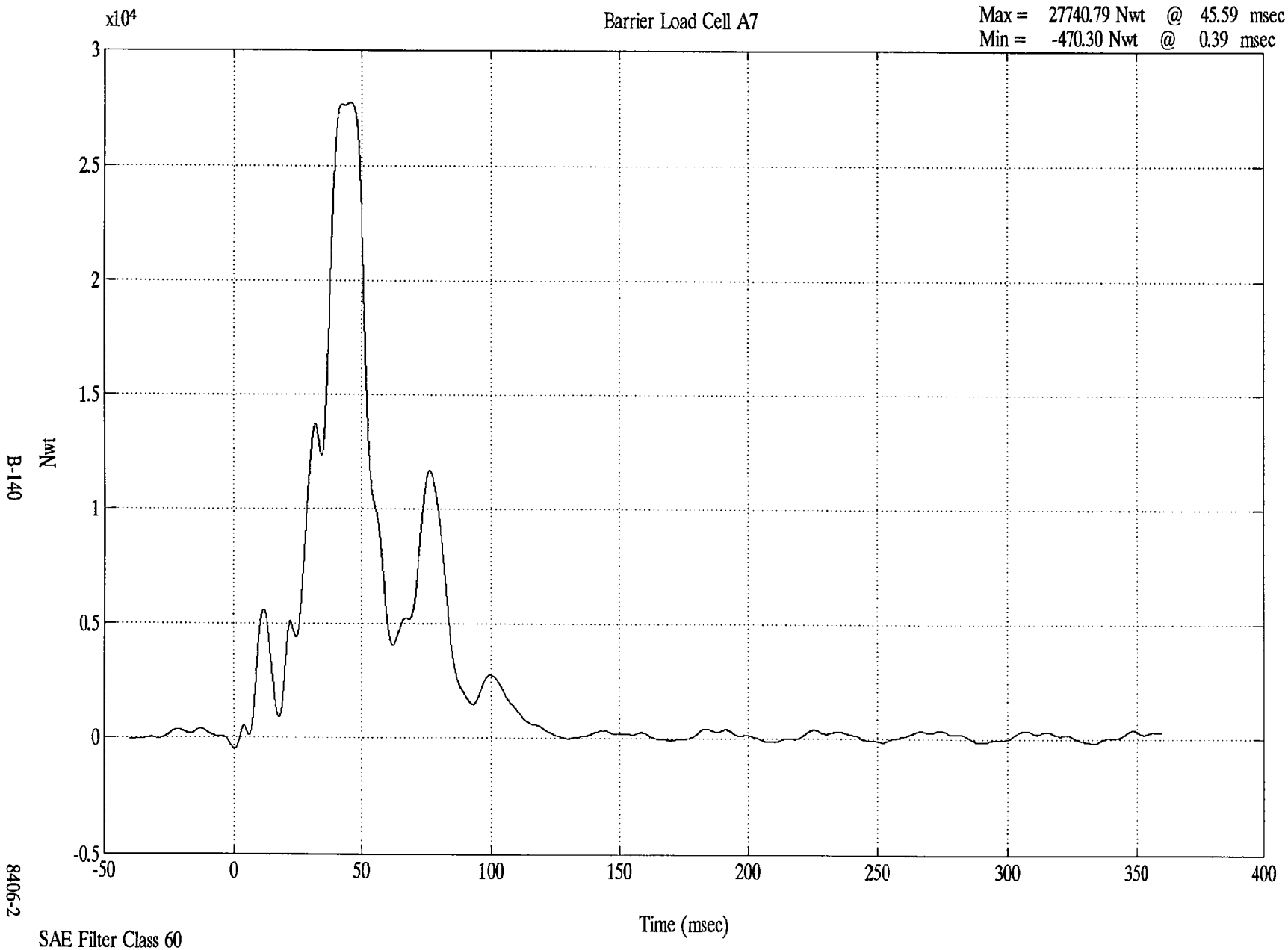


B-139

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

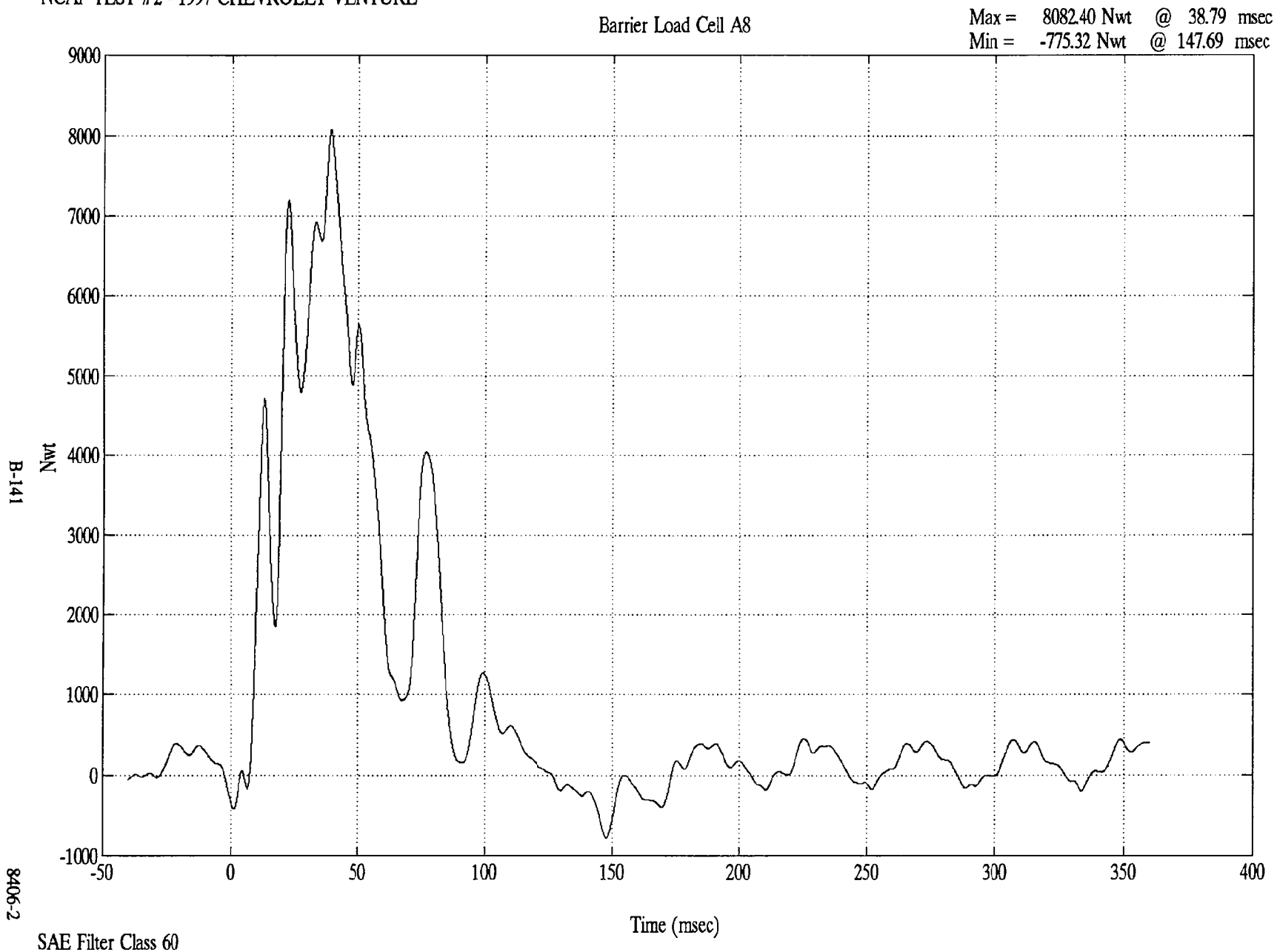


B-140

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

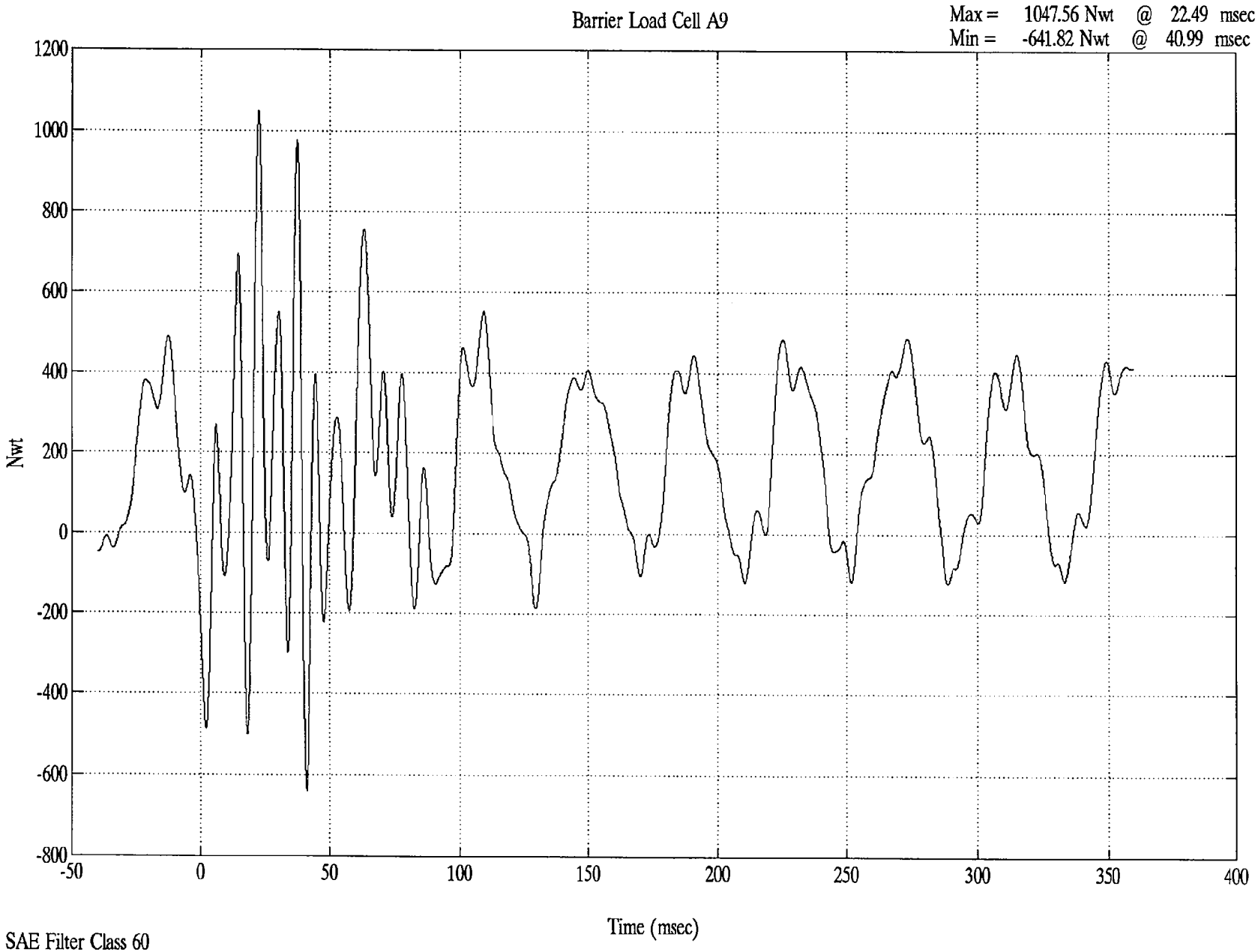


B-141

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

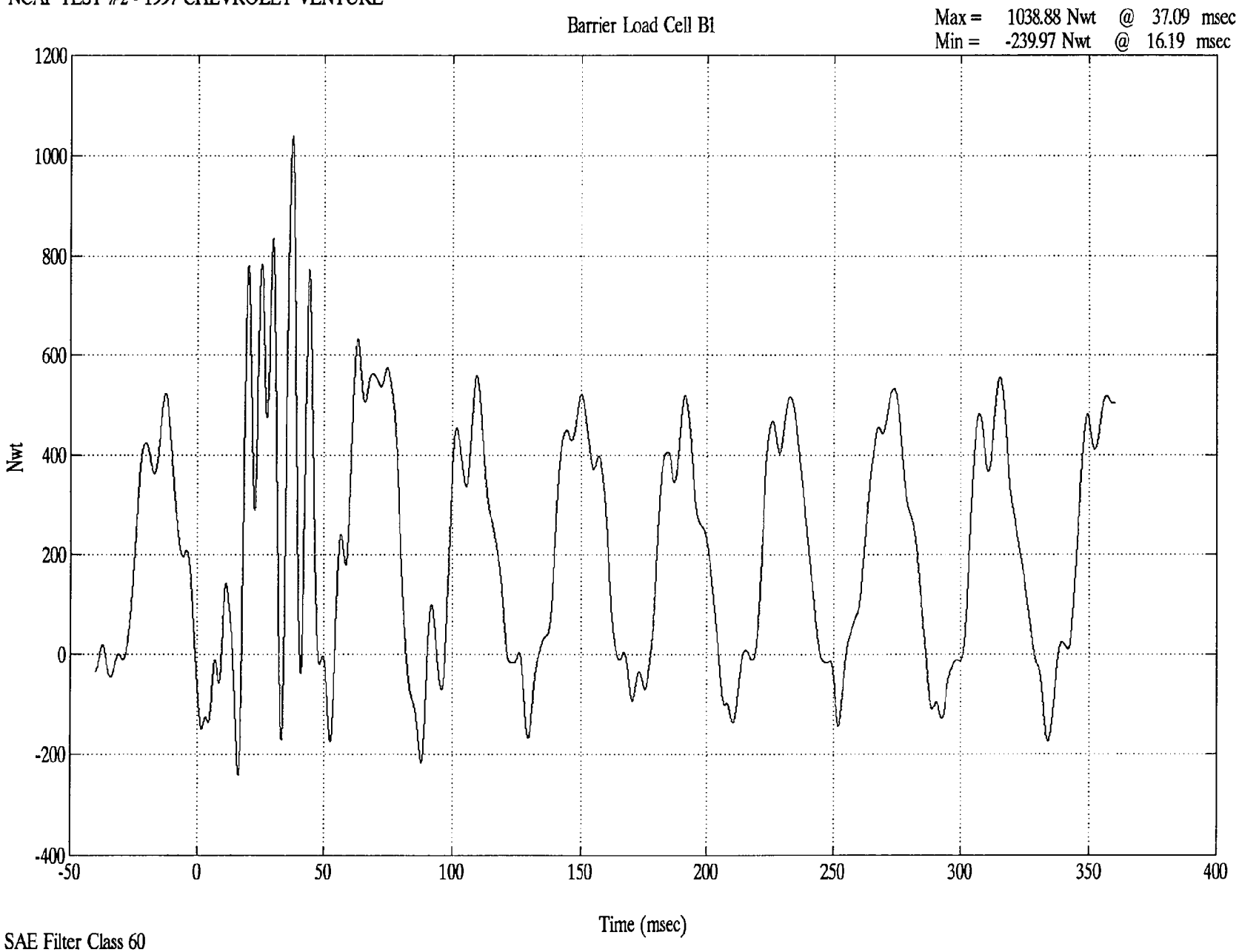


B-142

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

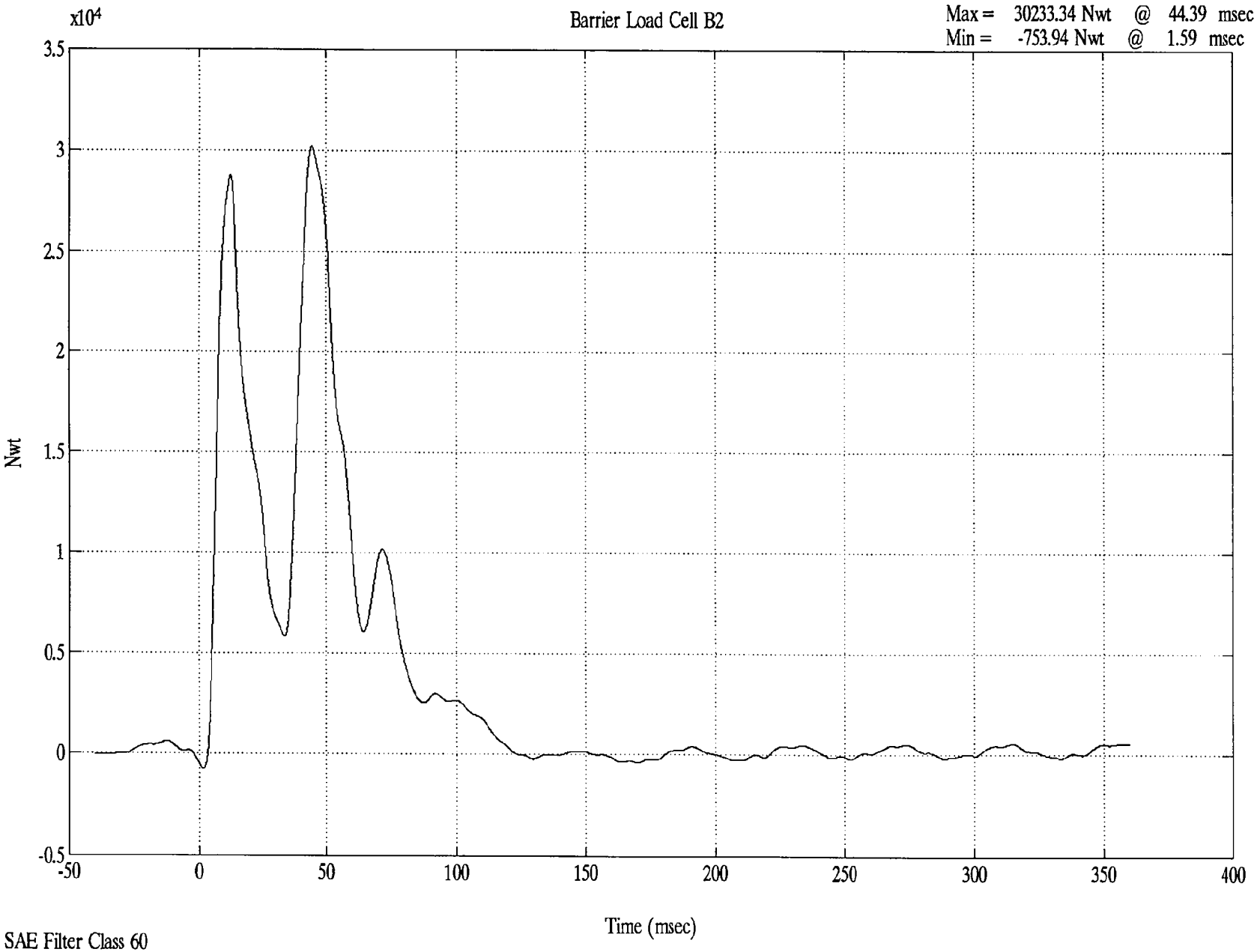


B-143

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

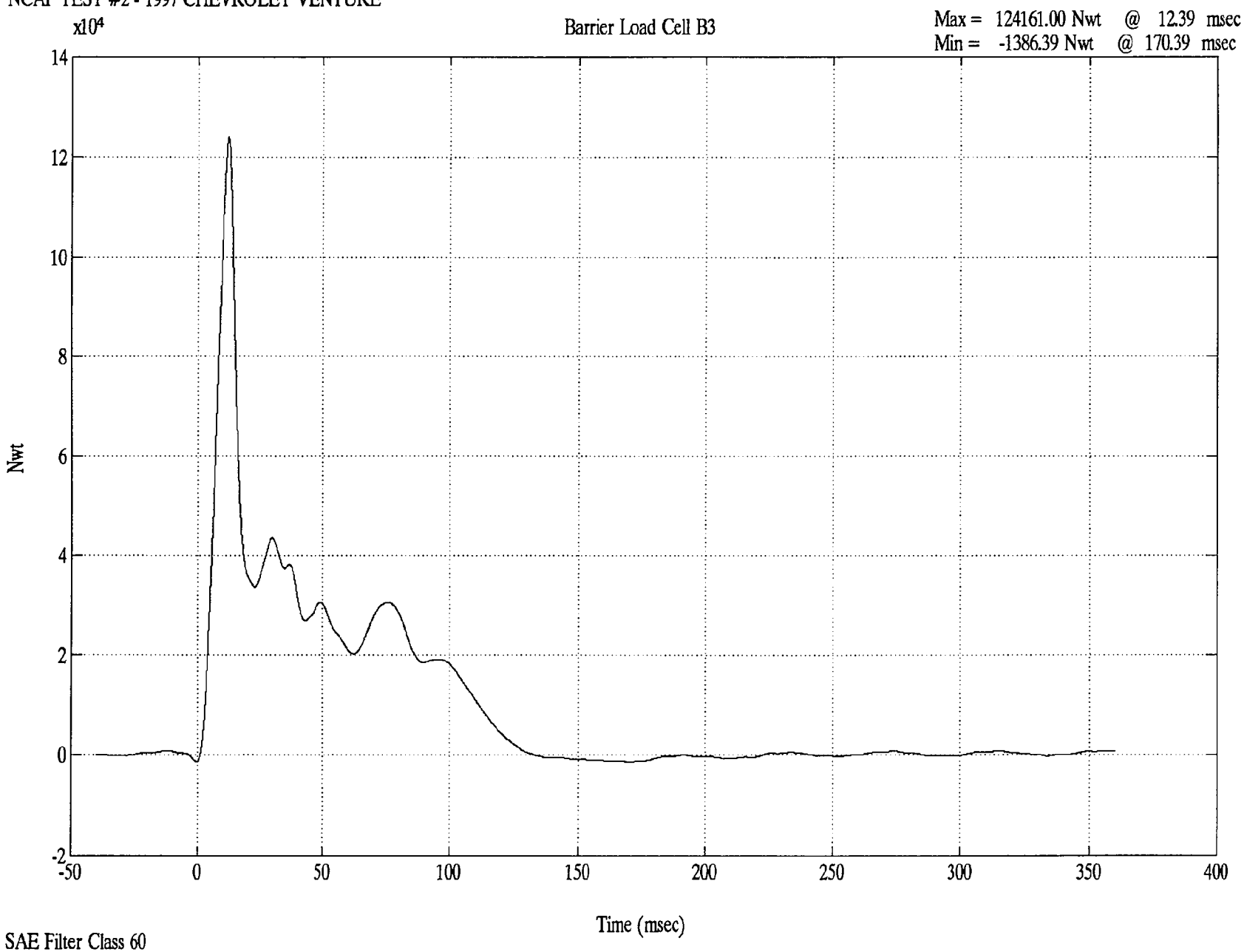


B-144

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

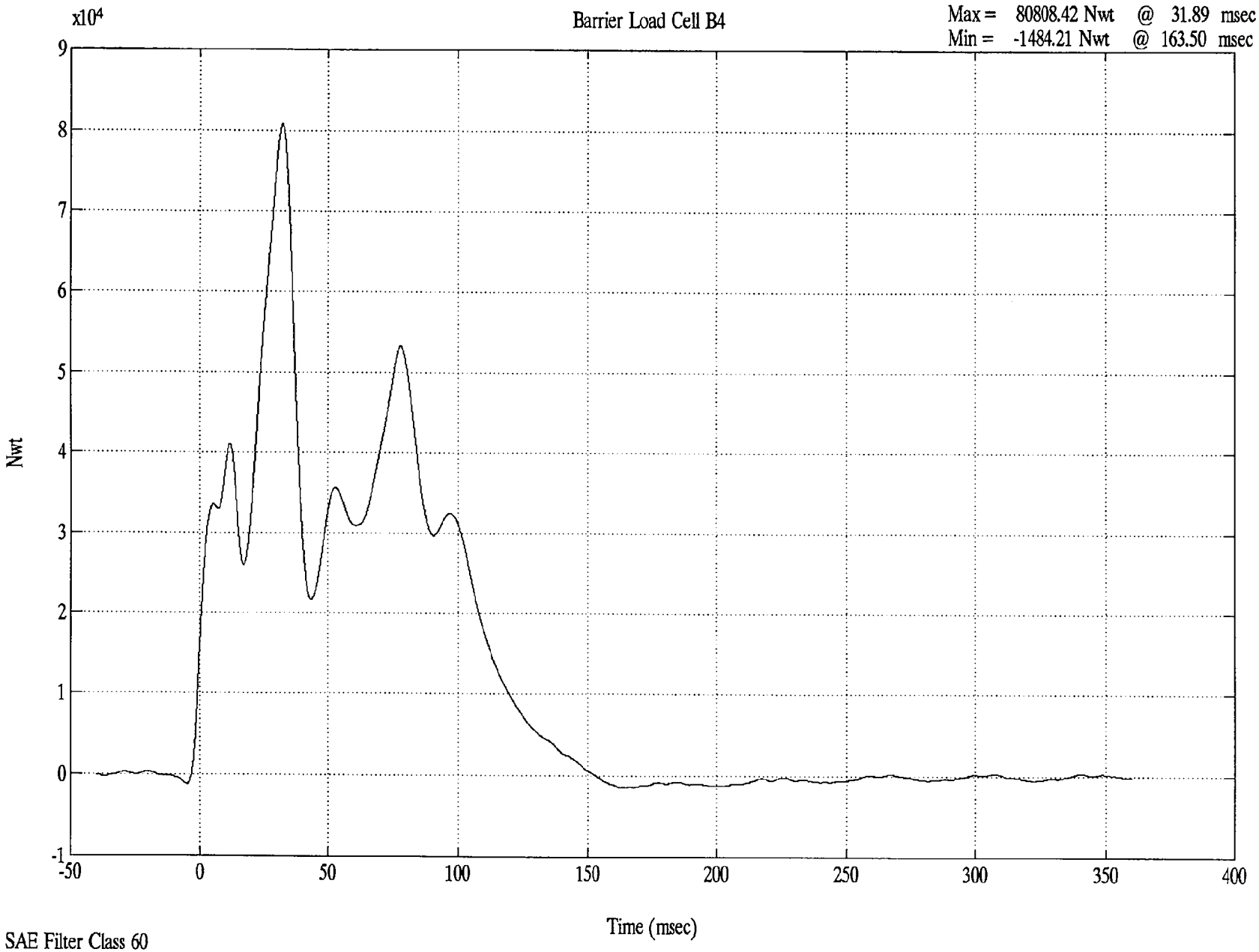


B-145

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

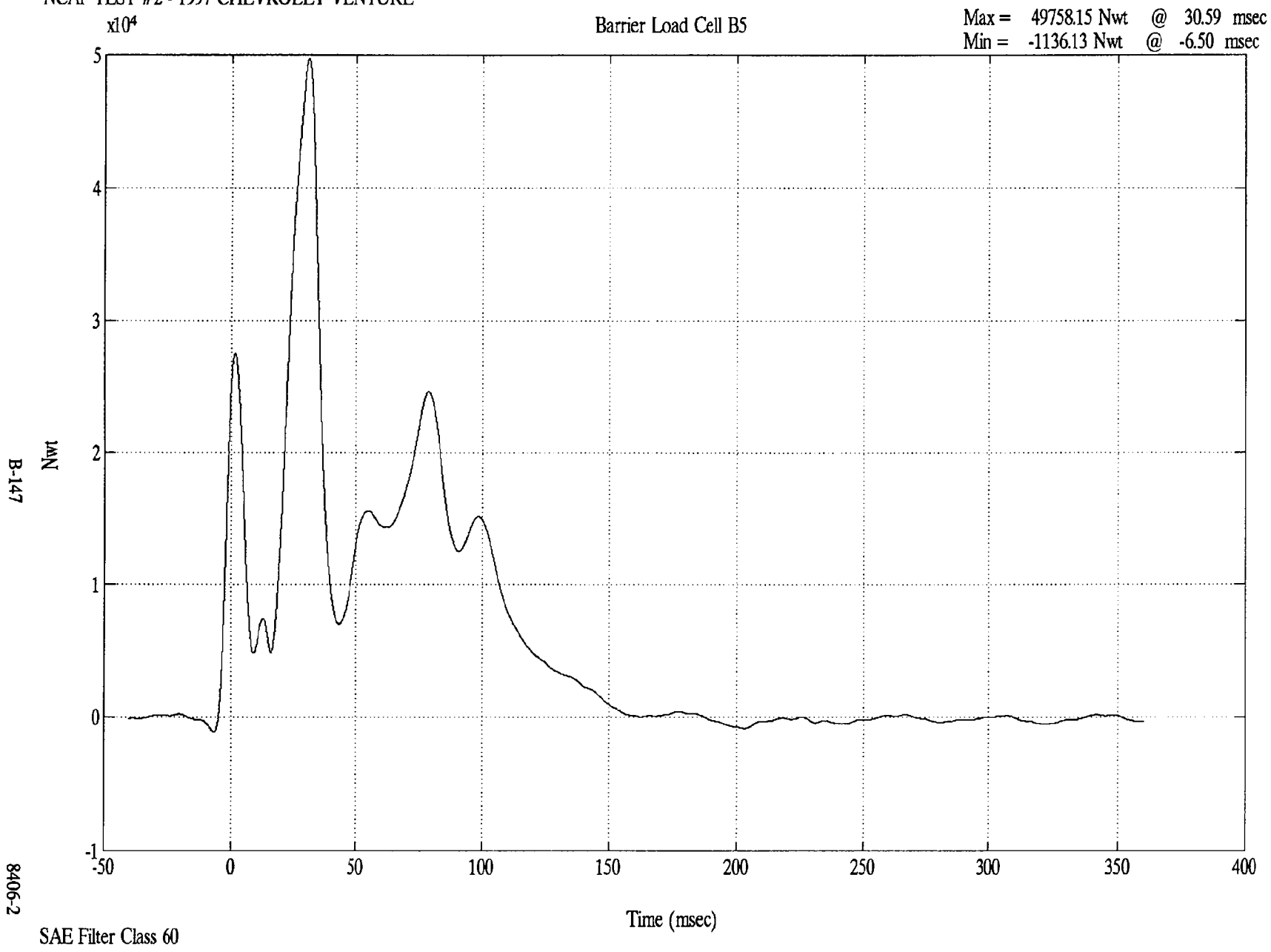


B-146

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

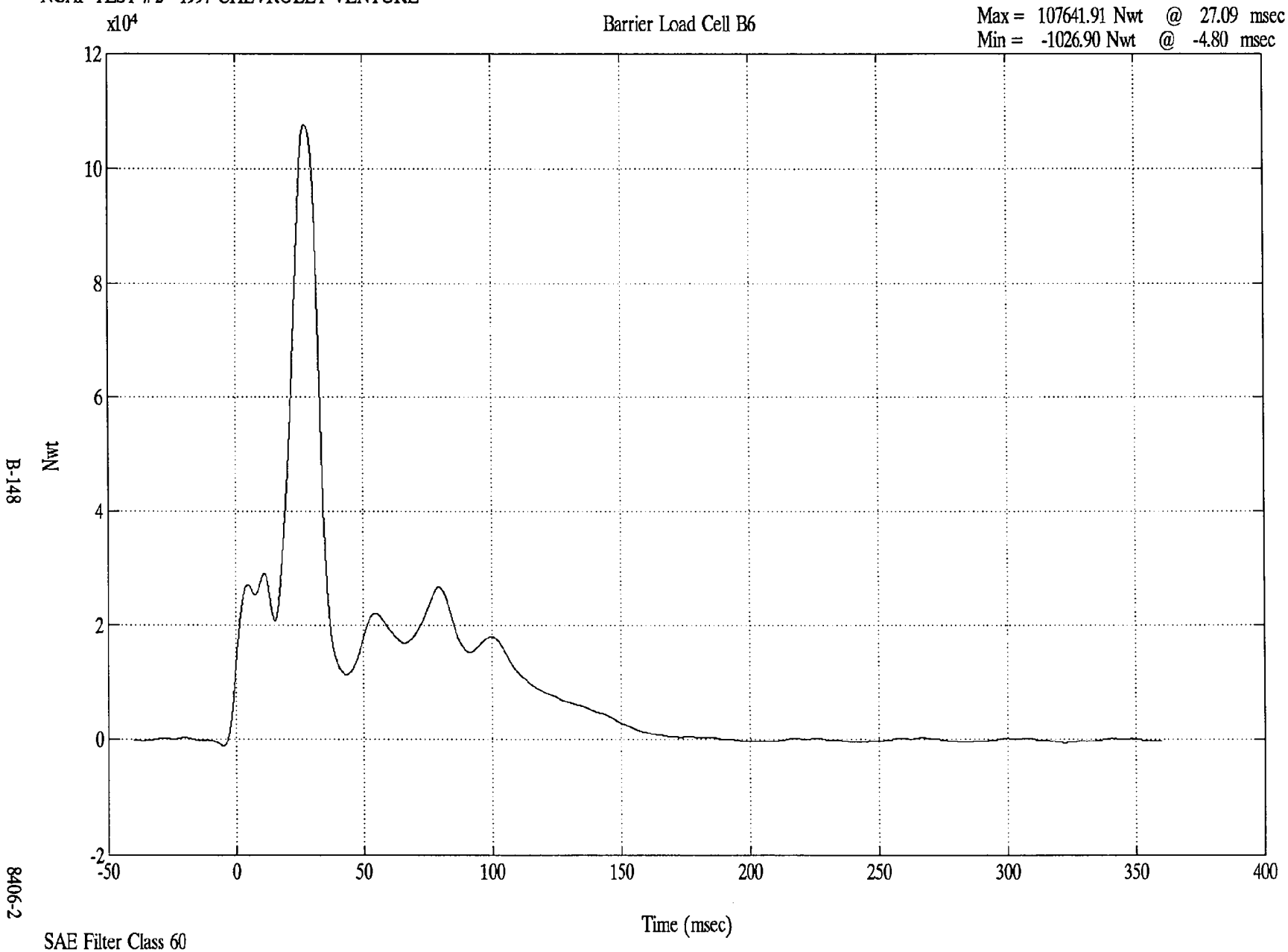


B-147

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

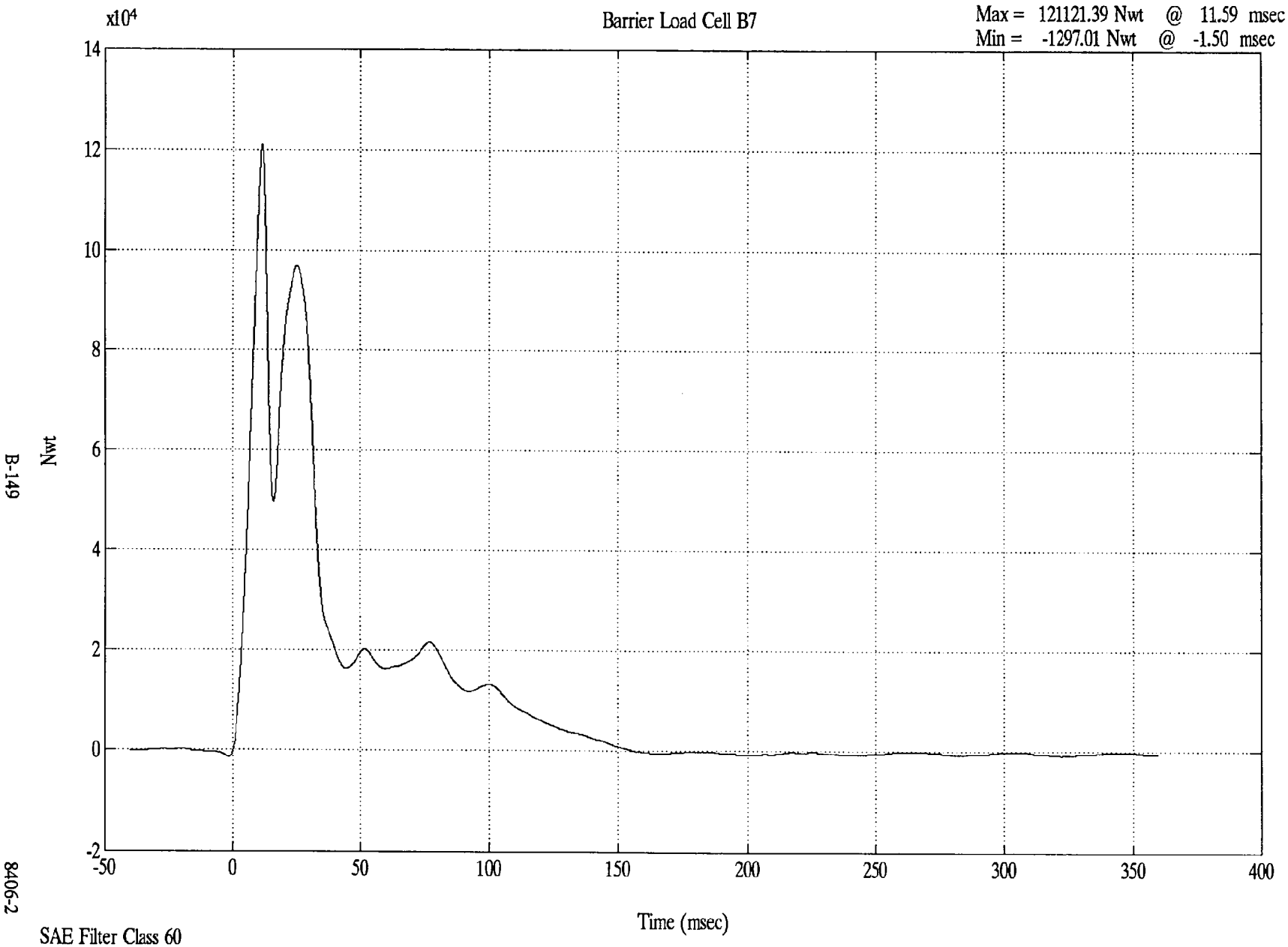


B-148

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

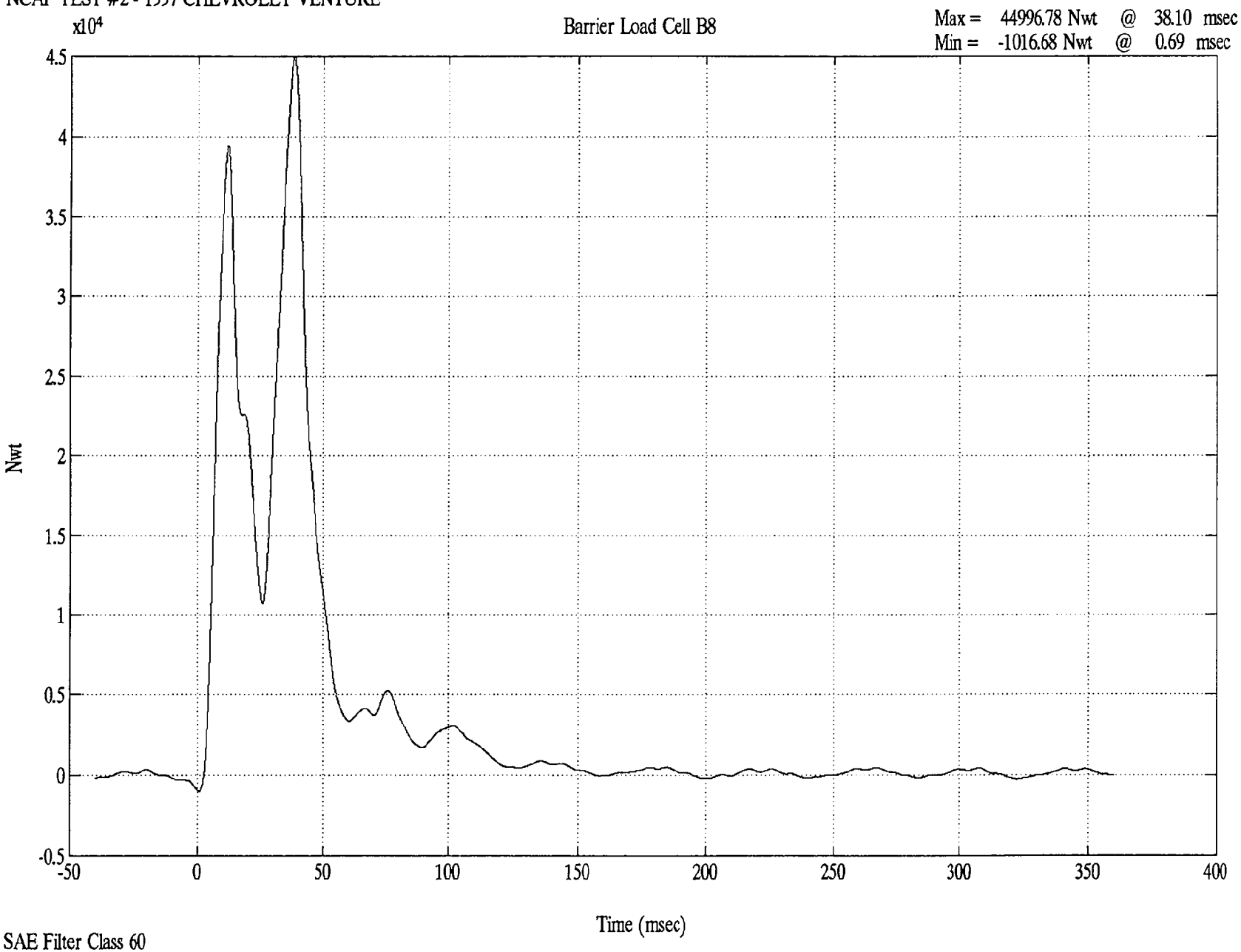


B-149

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

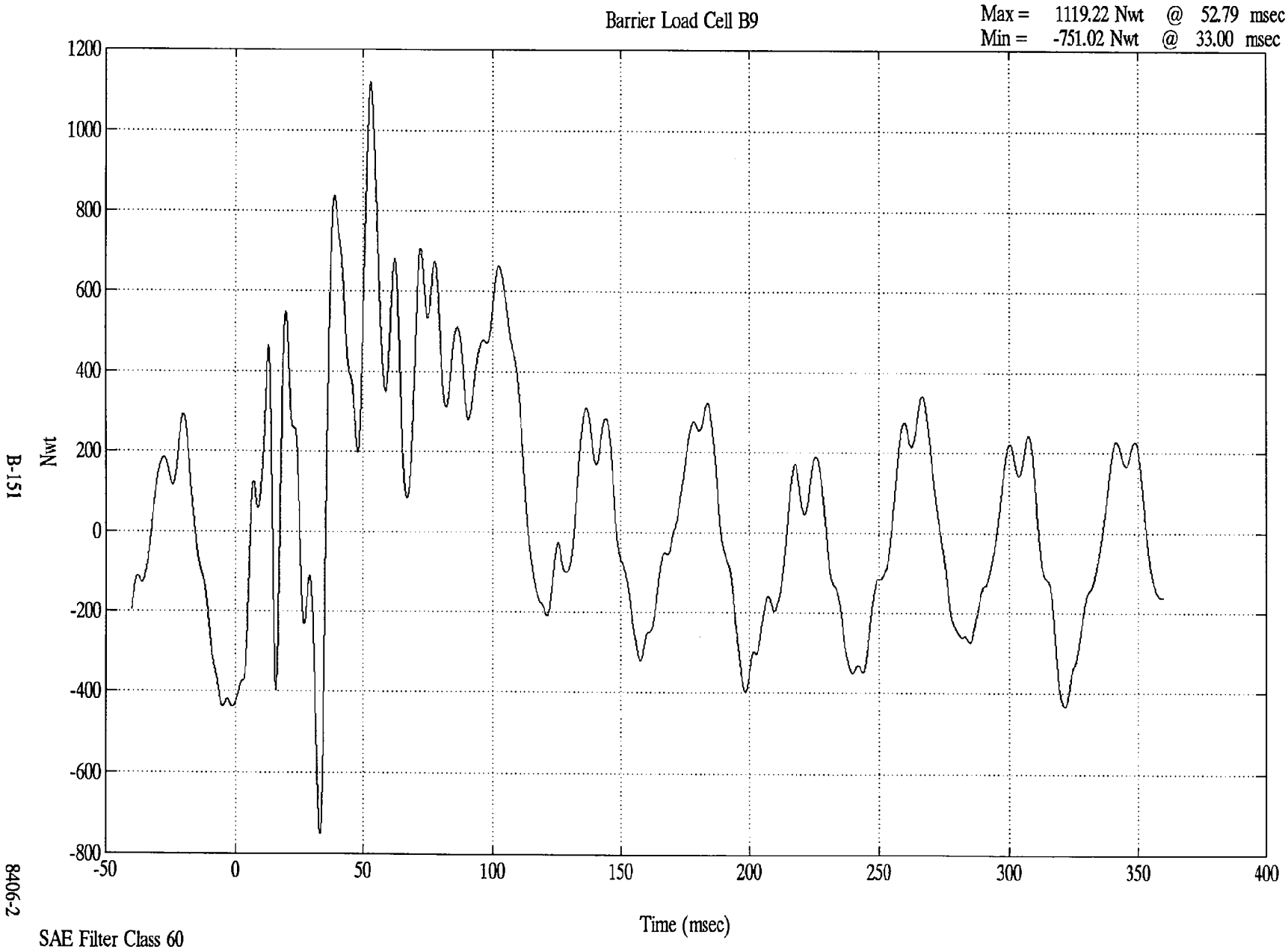


B-150

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

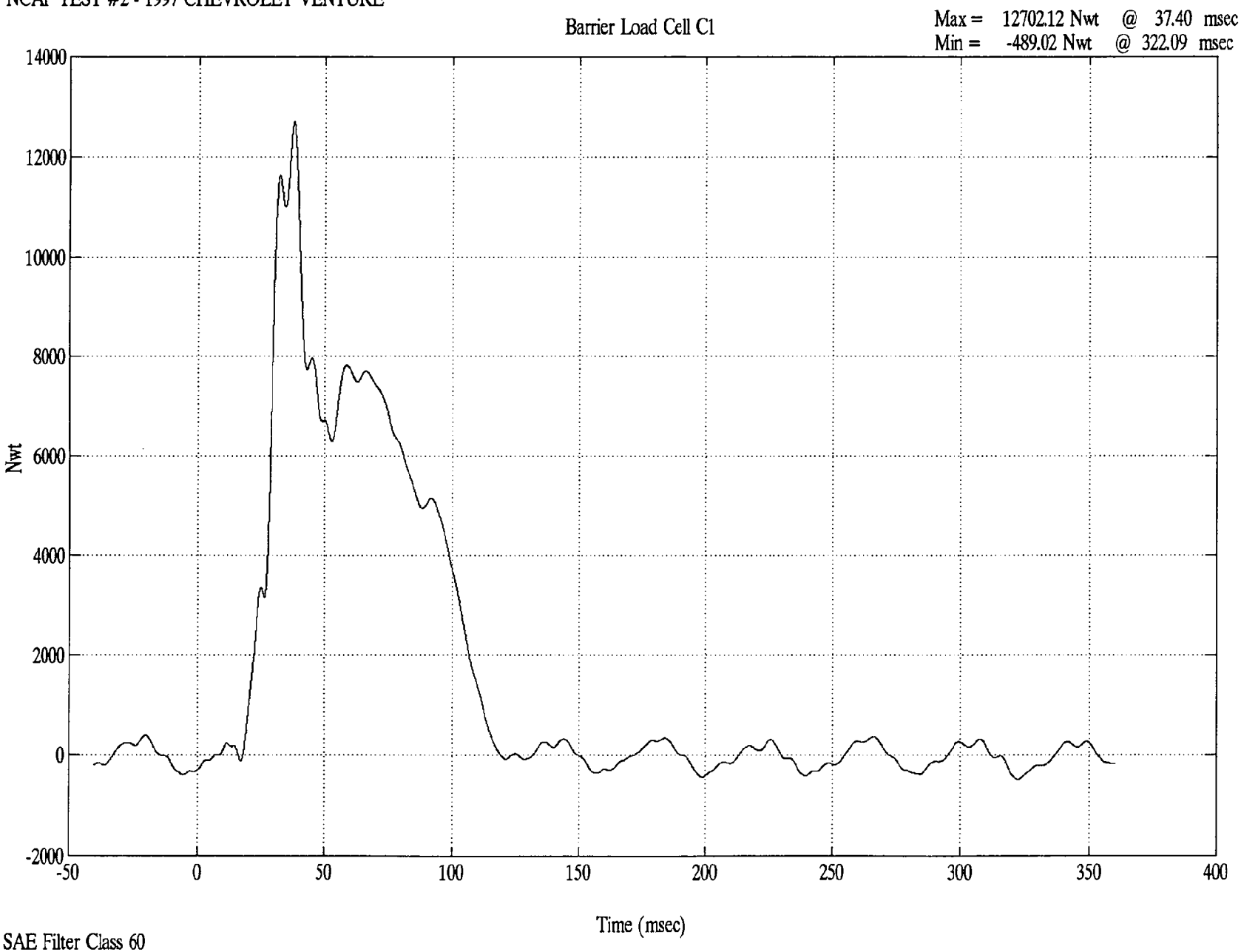


B-151

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

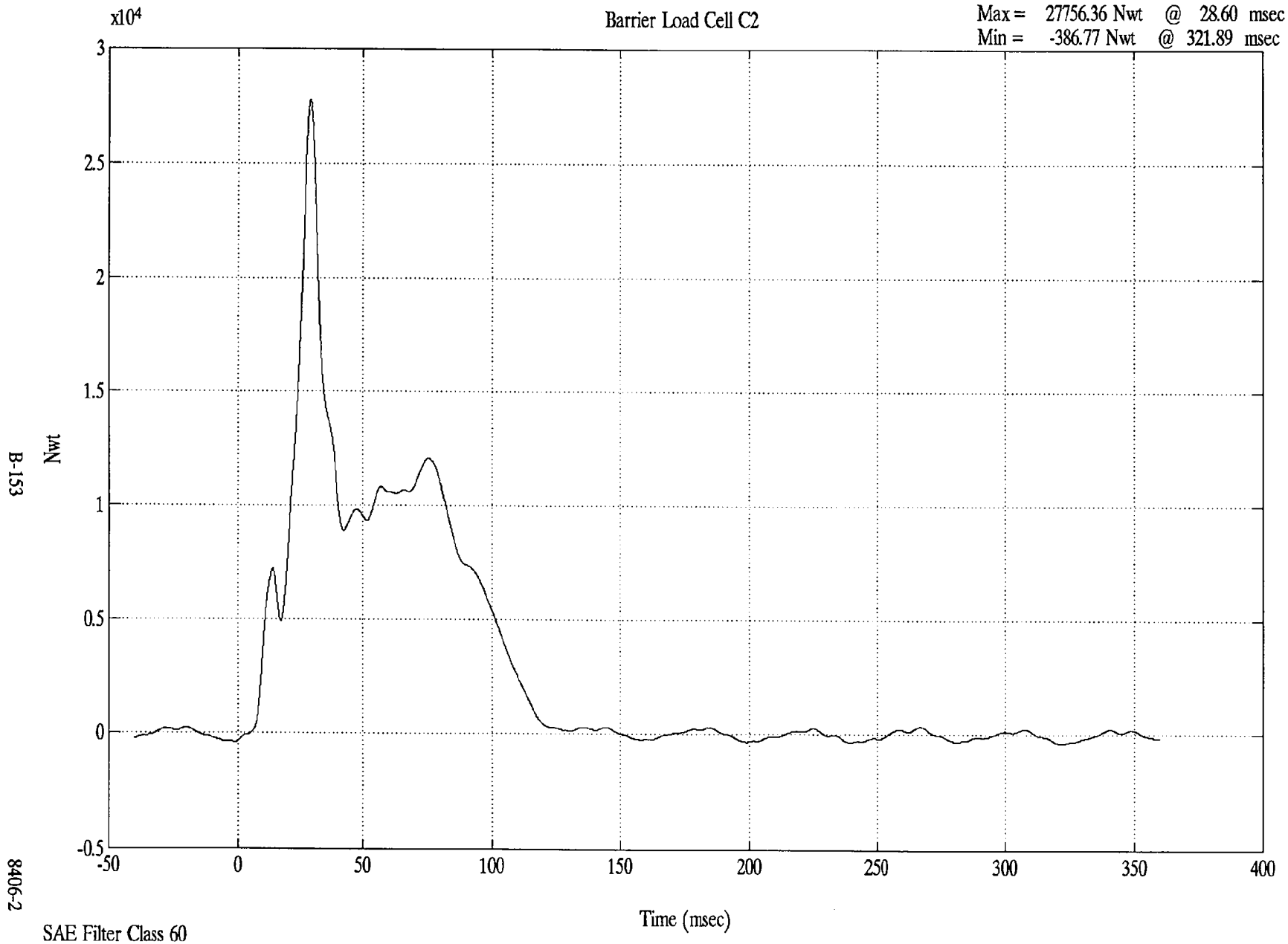


B-152

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

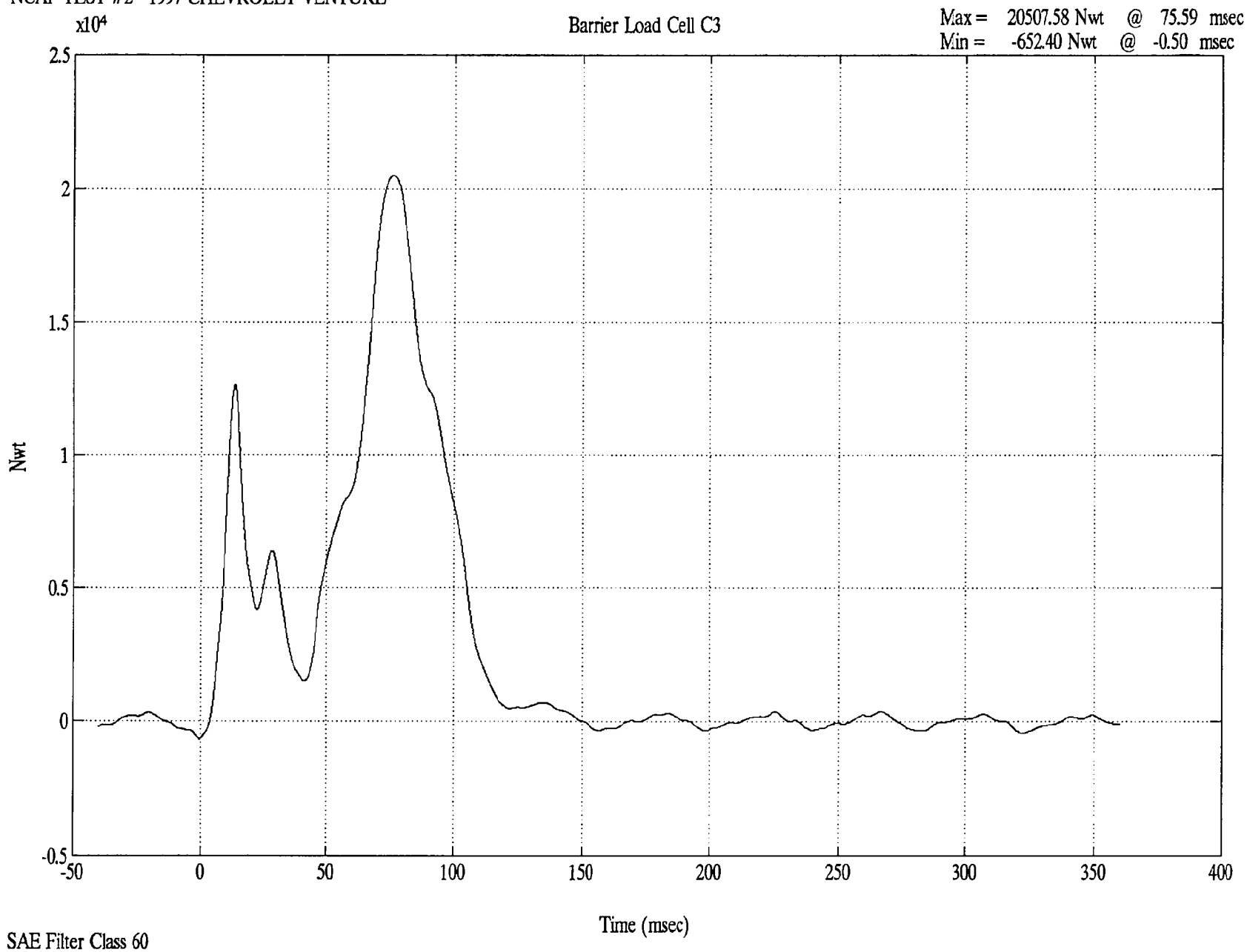


B-153

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

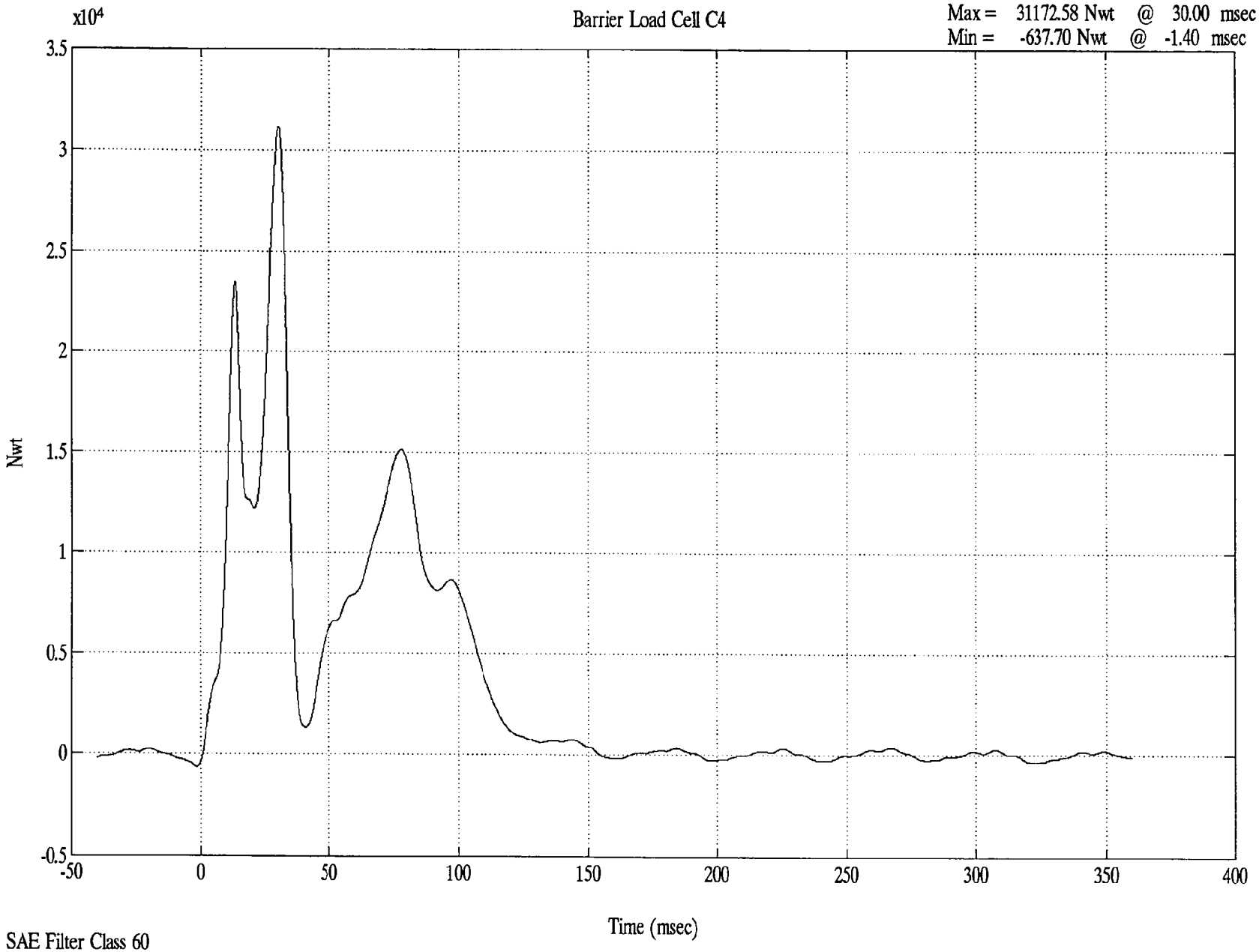


B-154

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

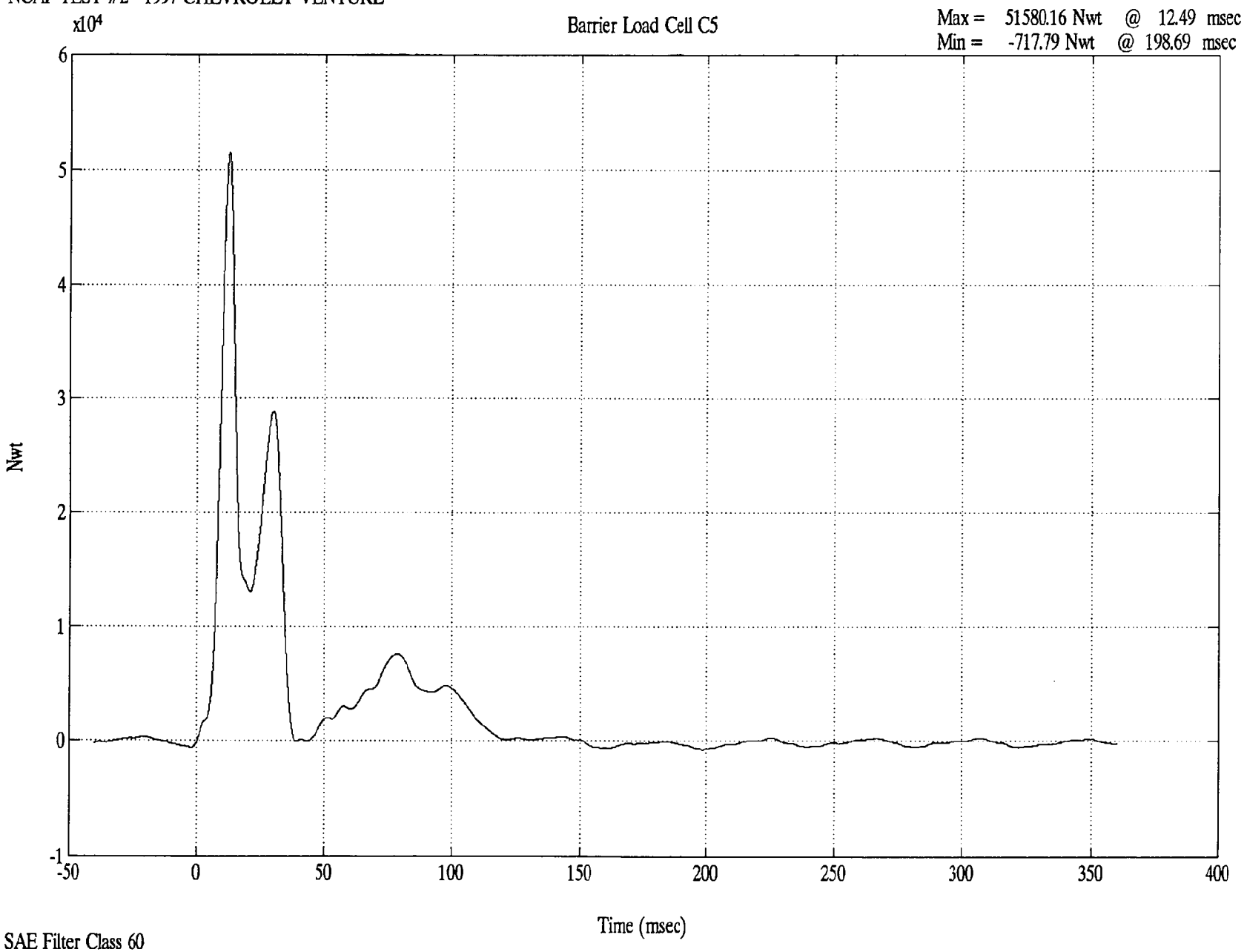


B-155

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

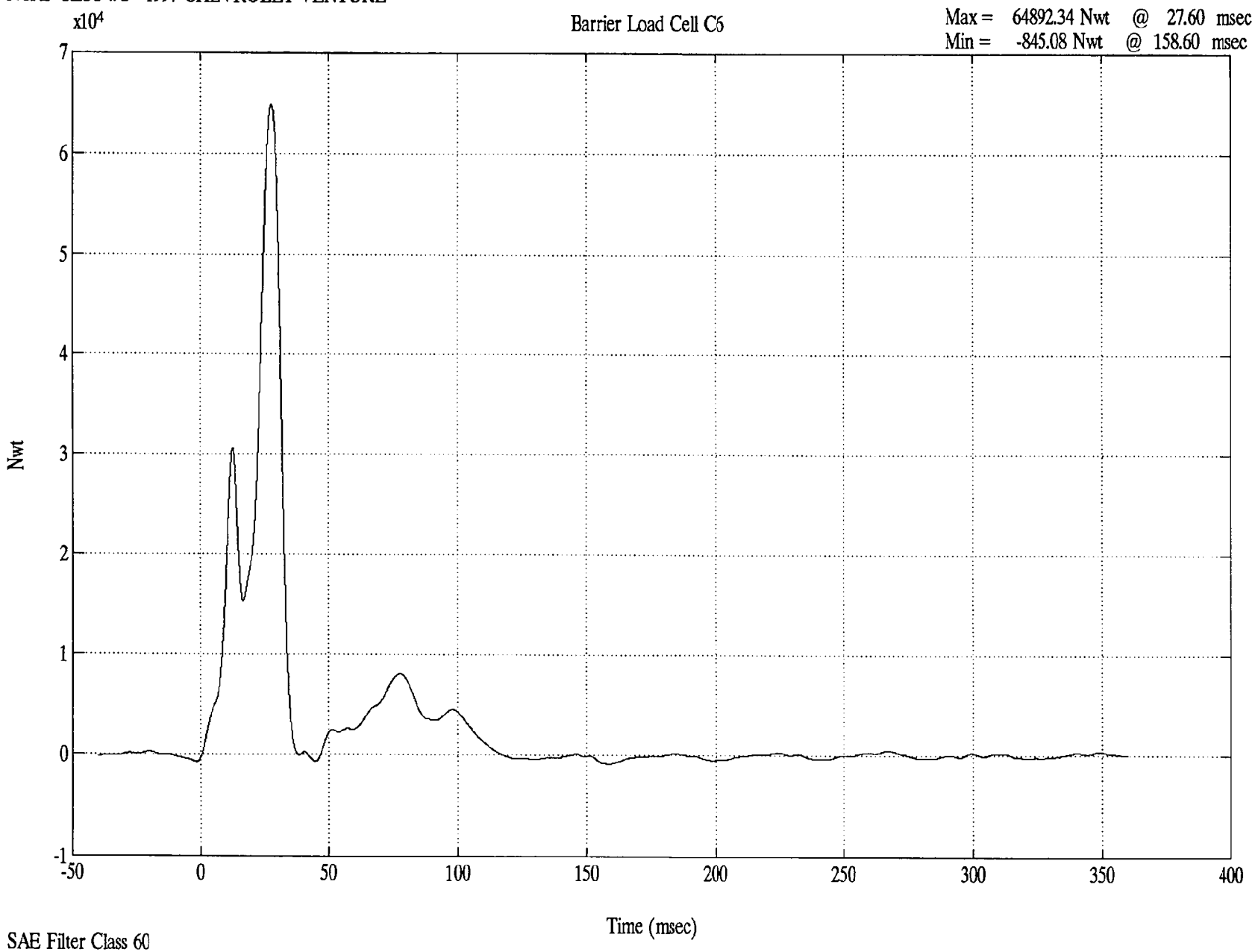


B-156

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

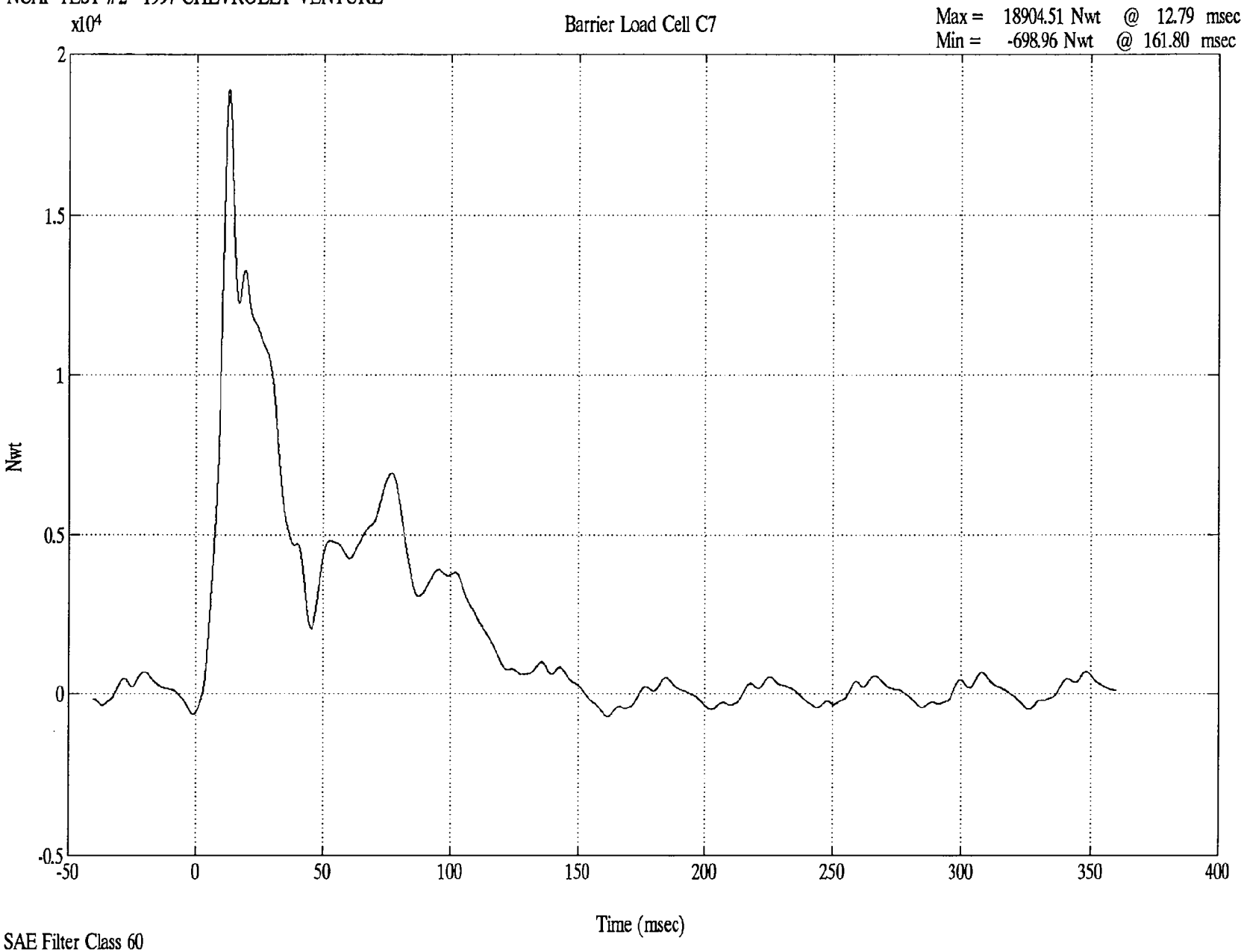


B-157

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

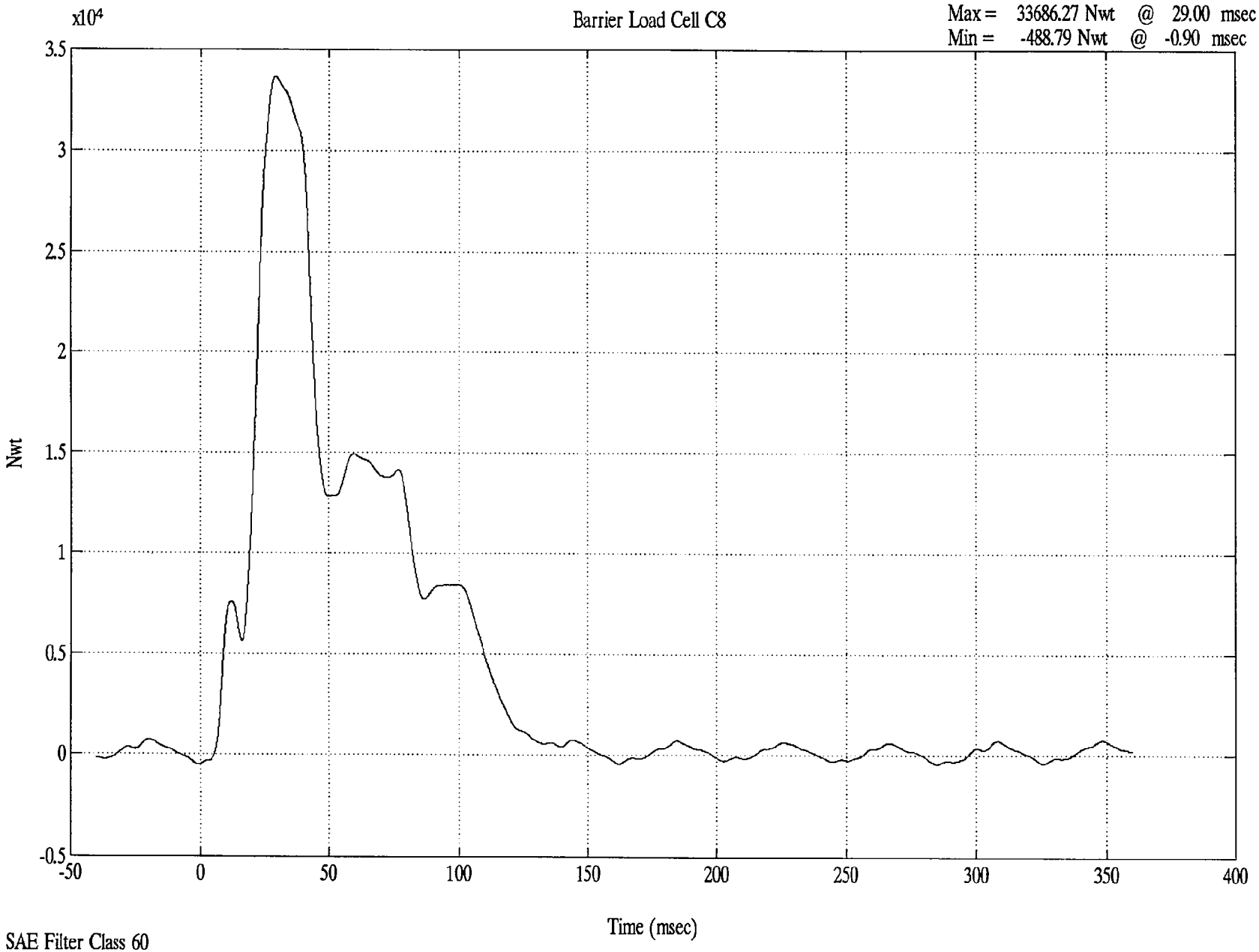


B-158

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

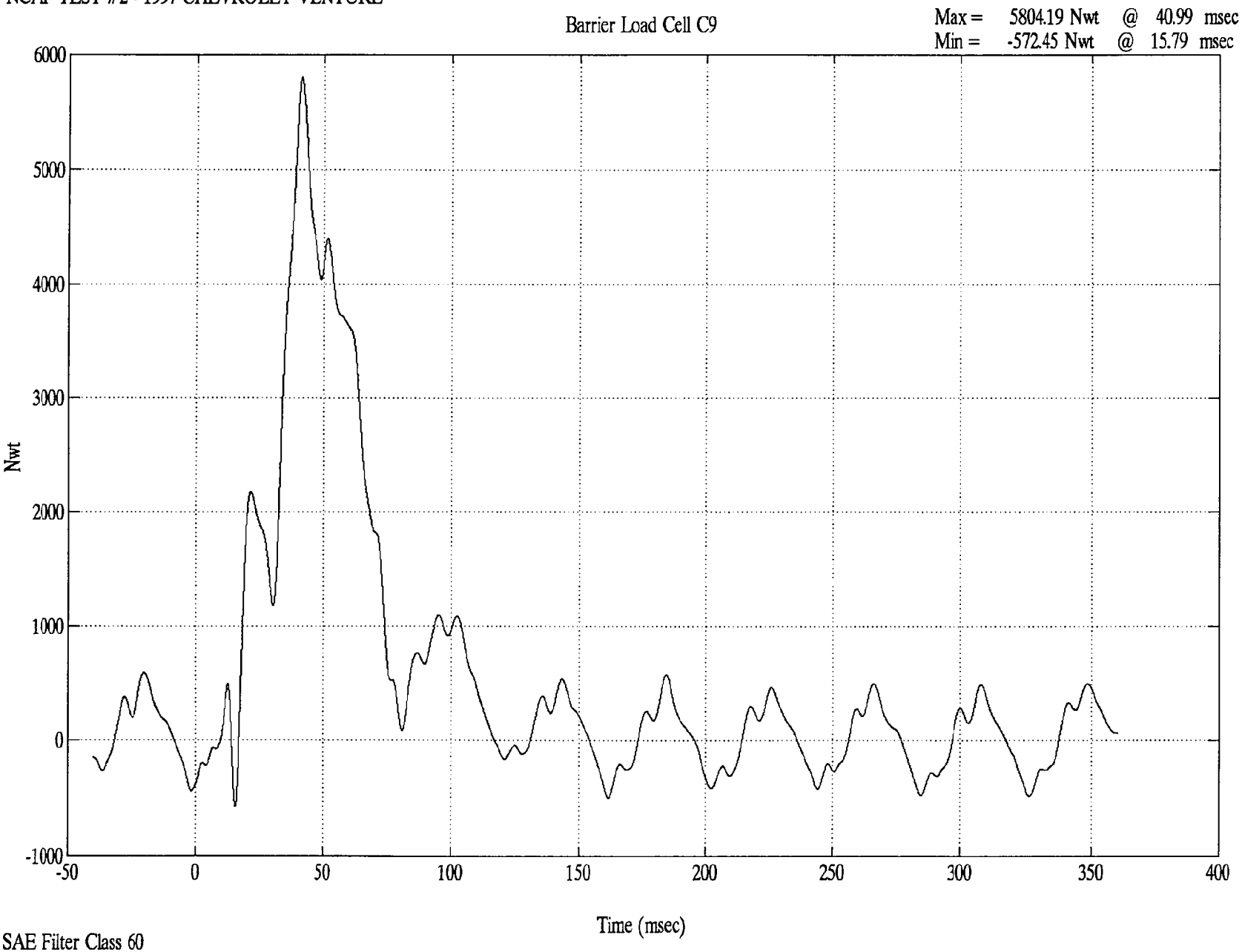


B-159

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

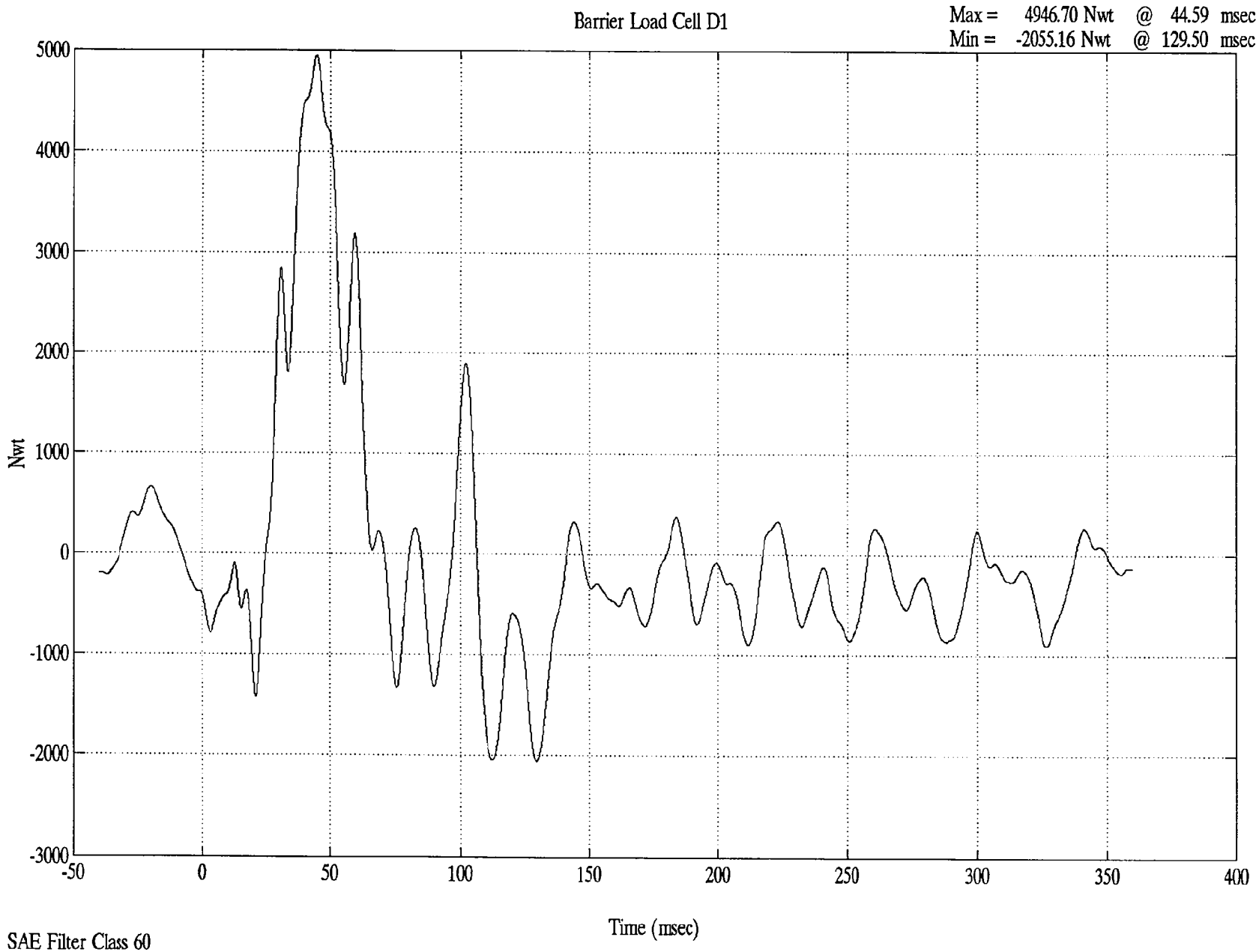


B-160

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

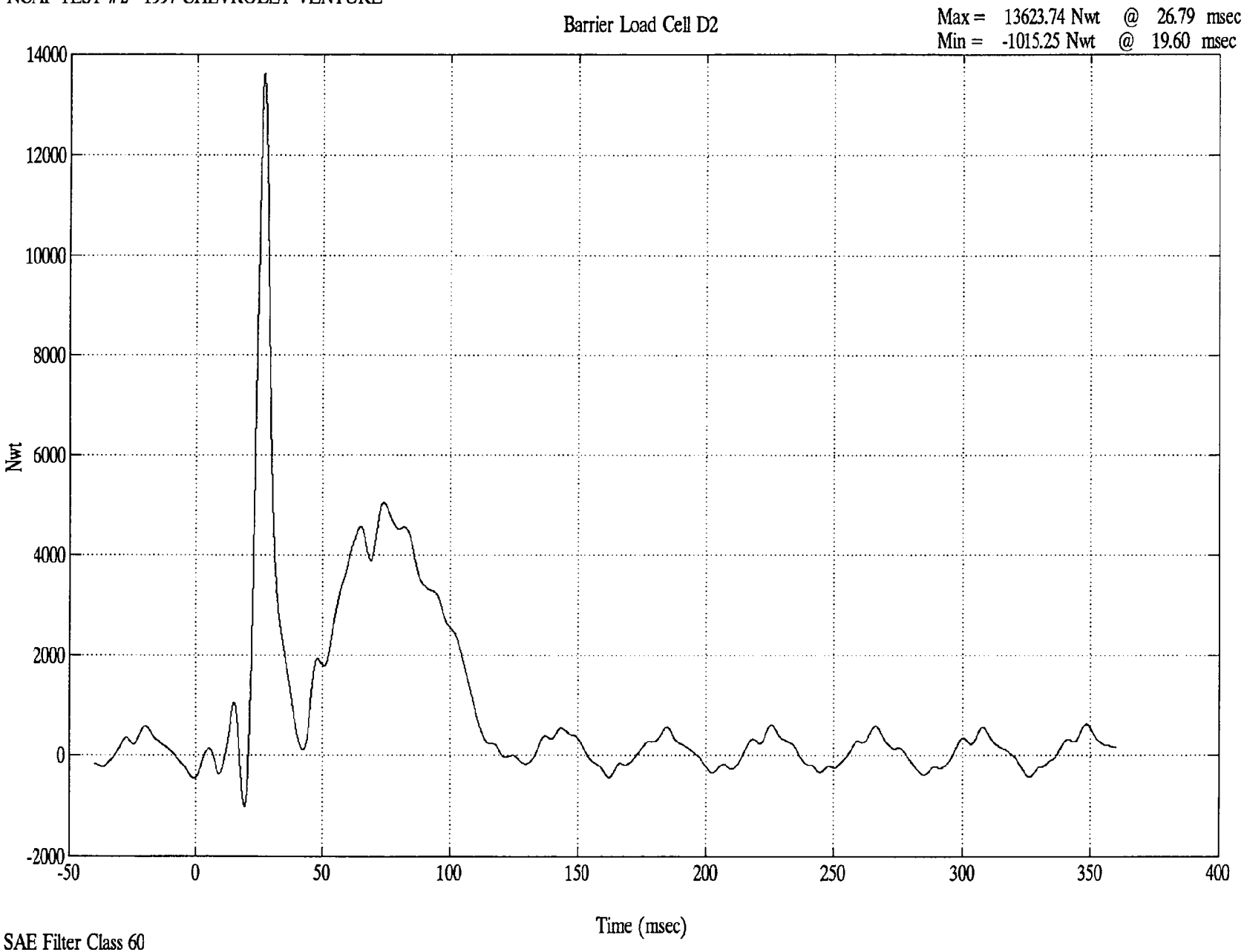


B-161

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

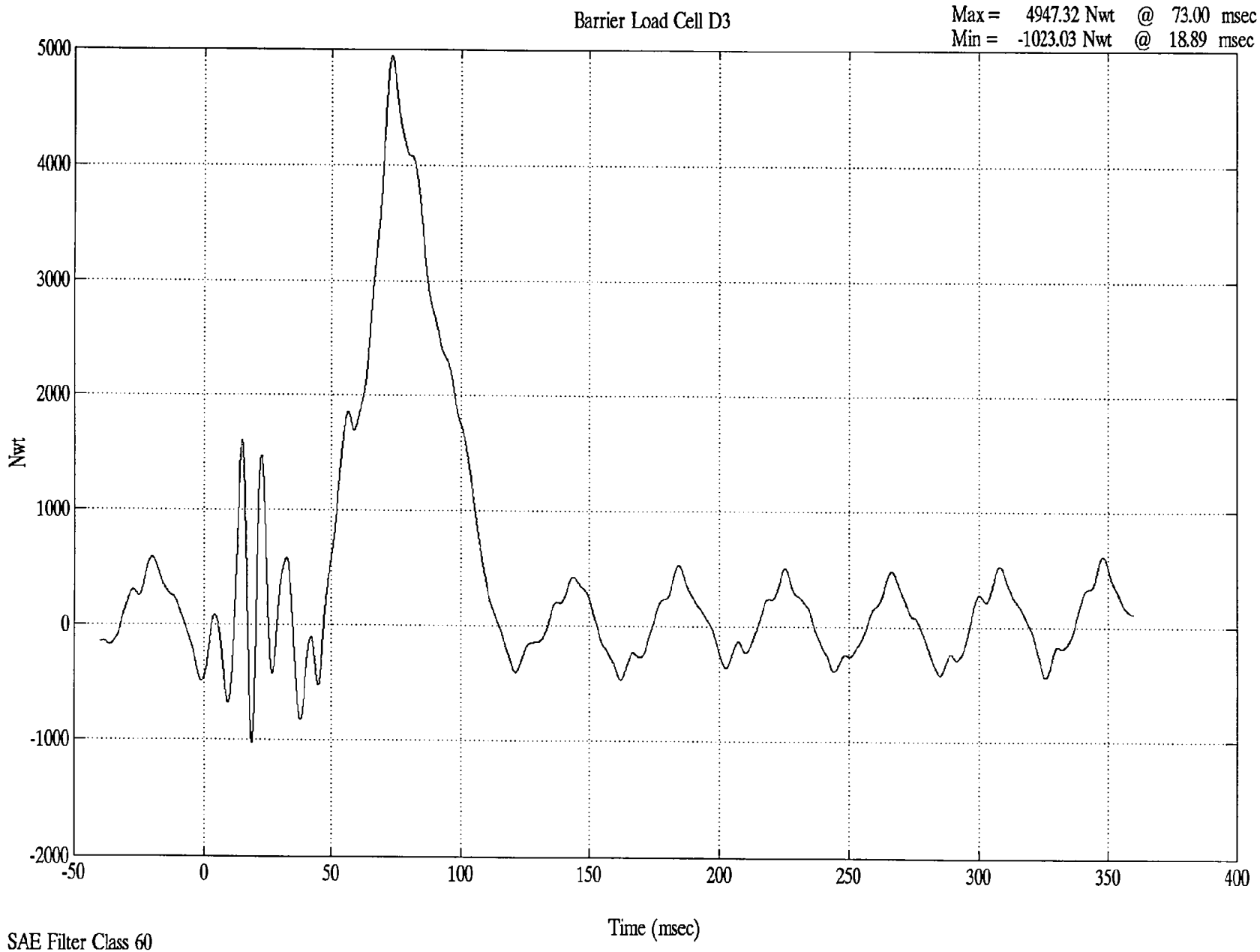


B-162

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

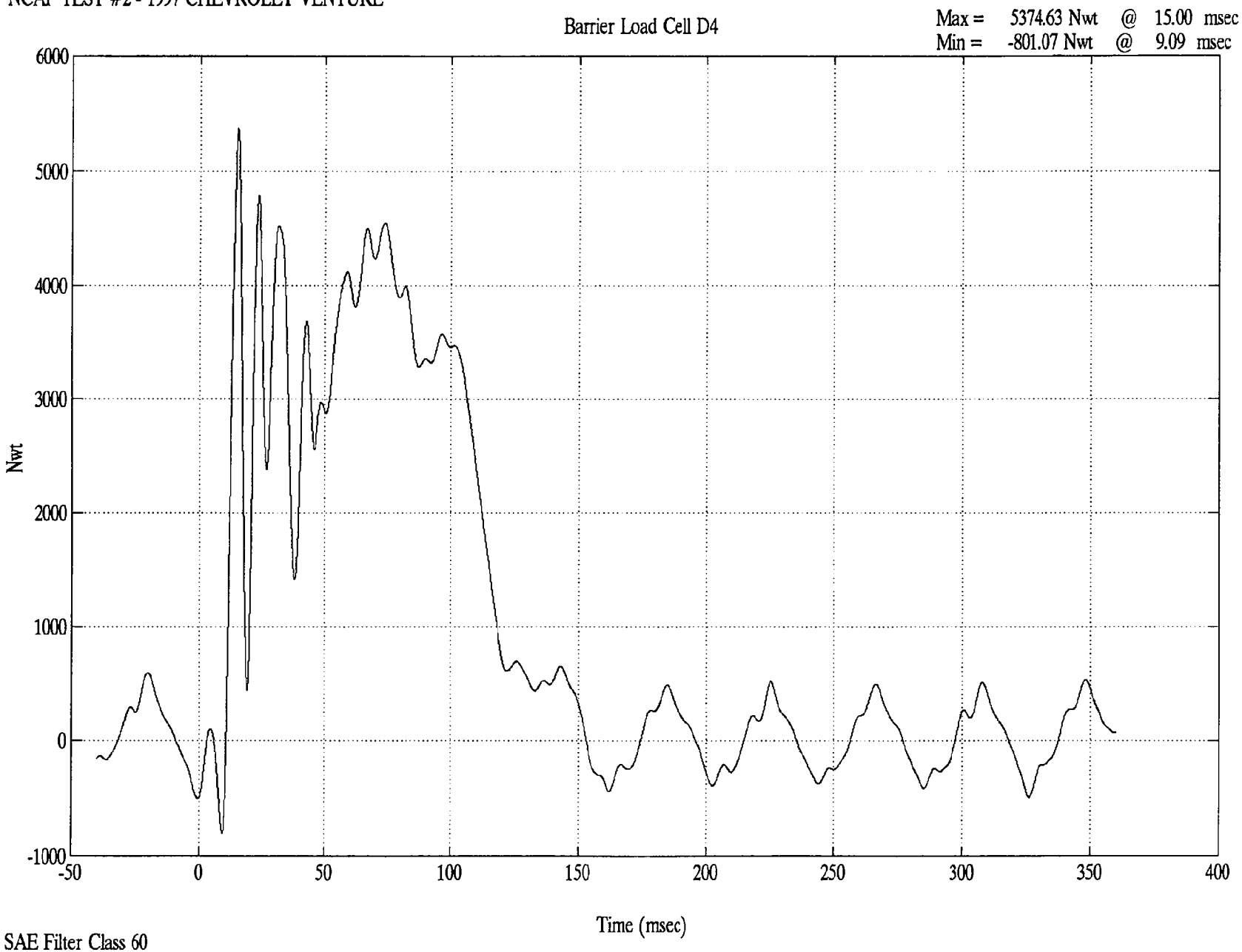


B-163

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

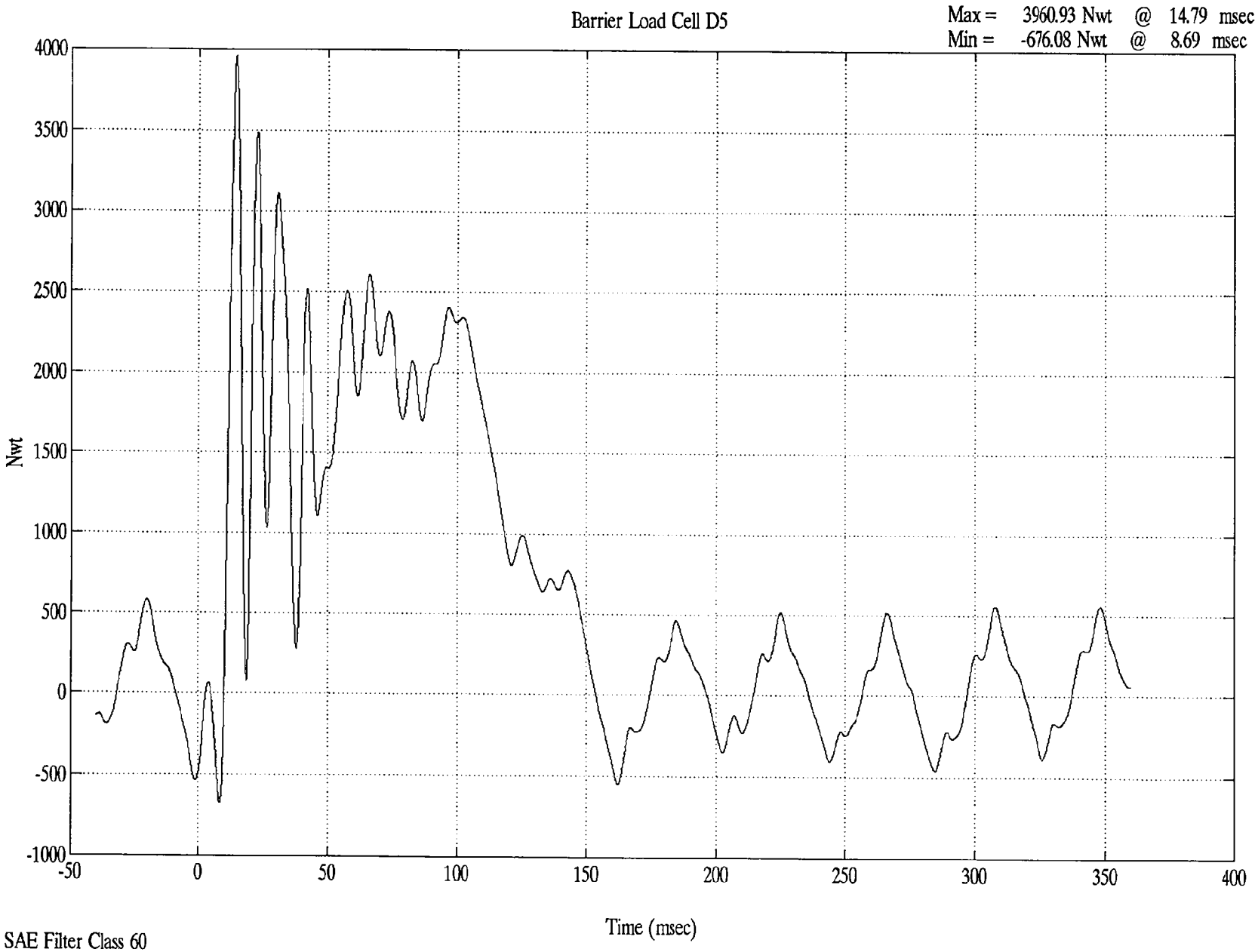


B-164

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

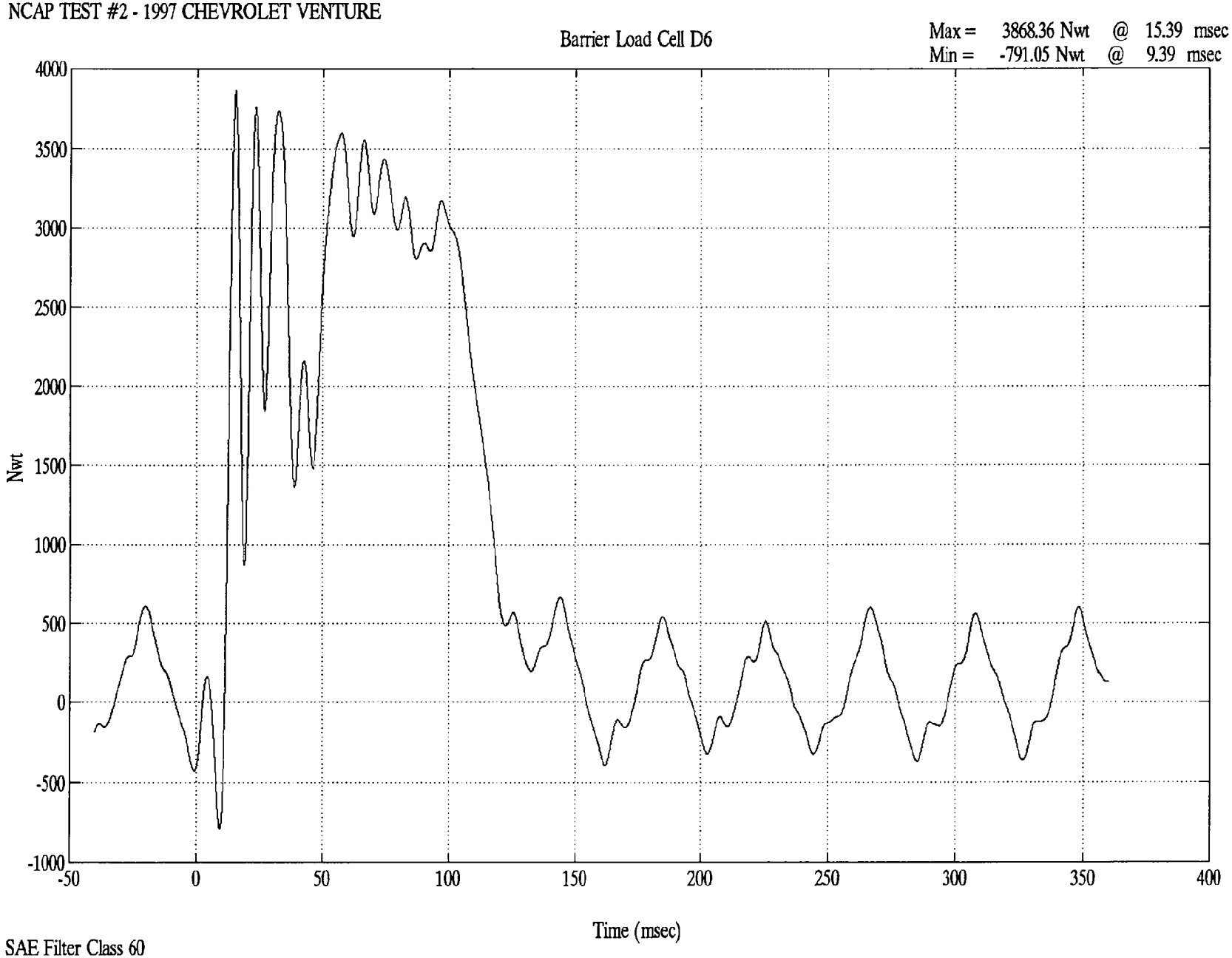


B-165

8406-2

SAE Filter Class 60

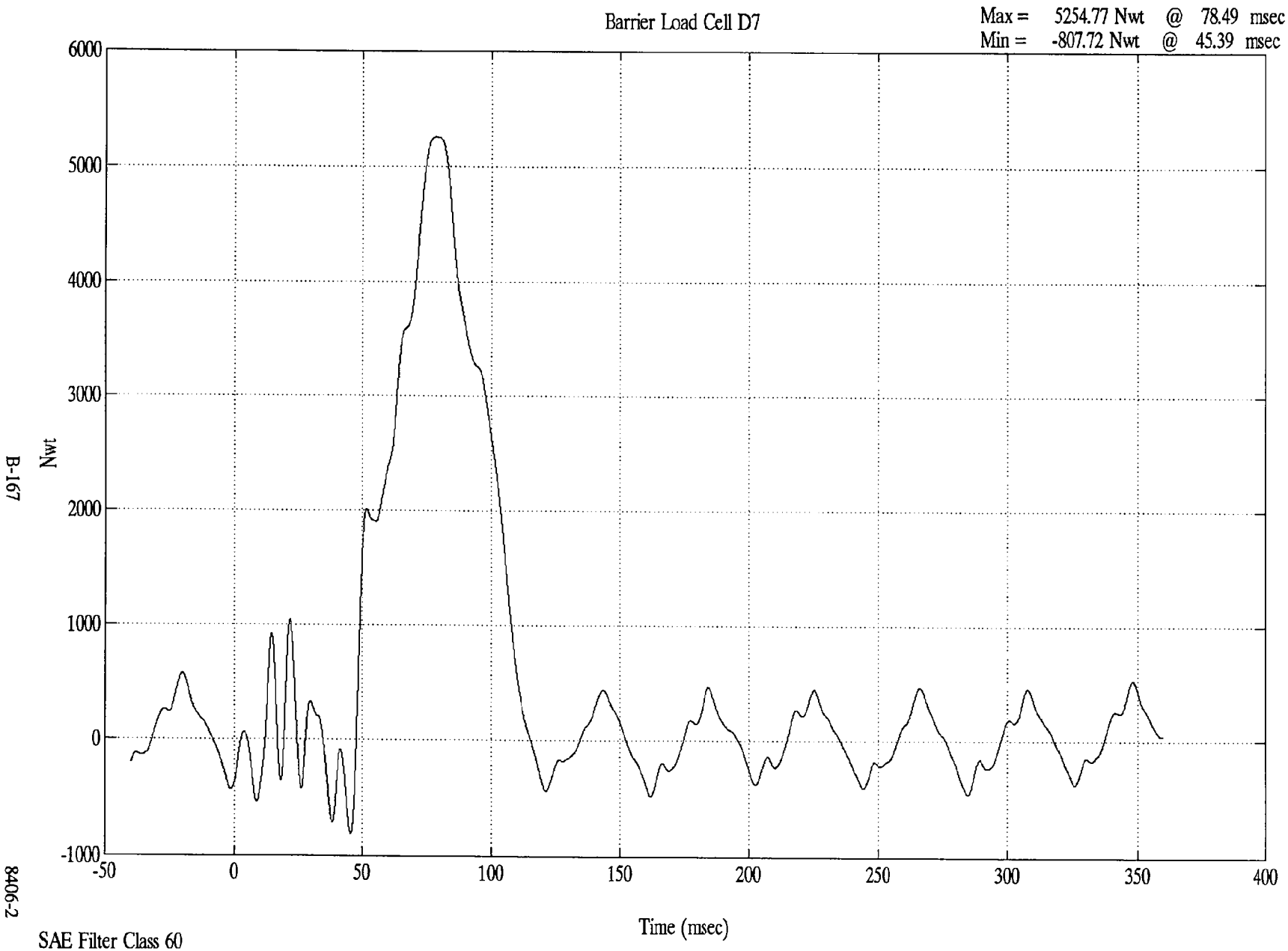
NCAP TEST #2 - 1997 CHEVROLET VENTURE



SAE Filter Class 60

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE

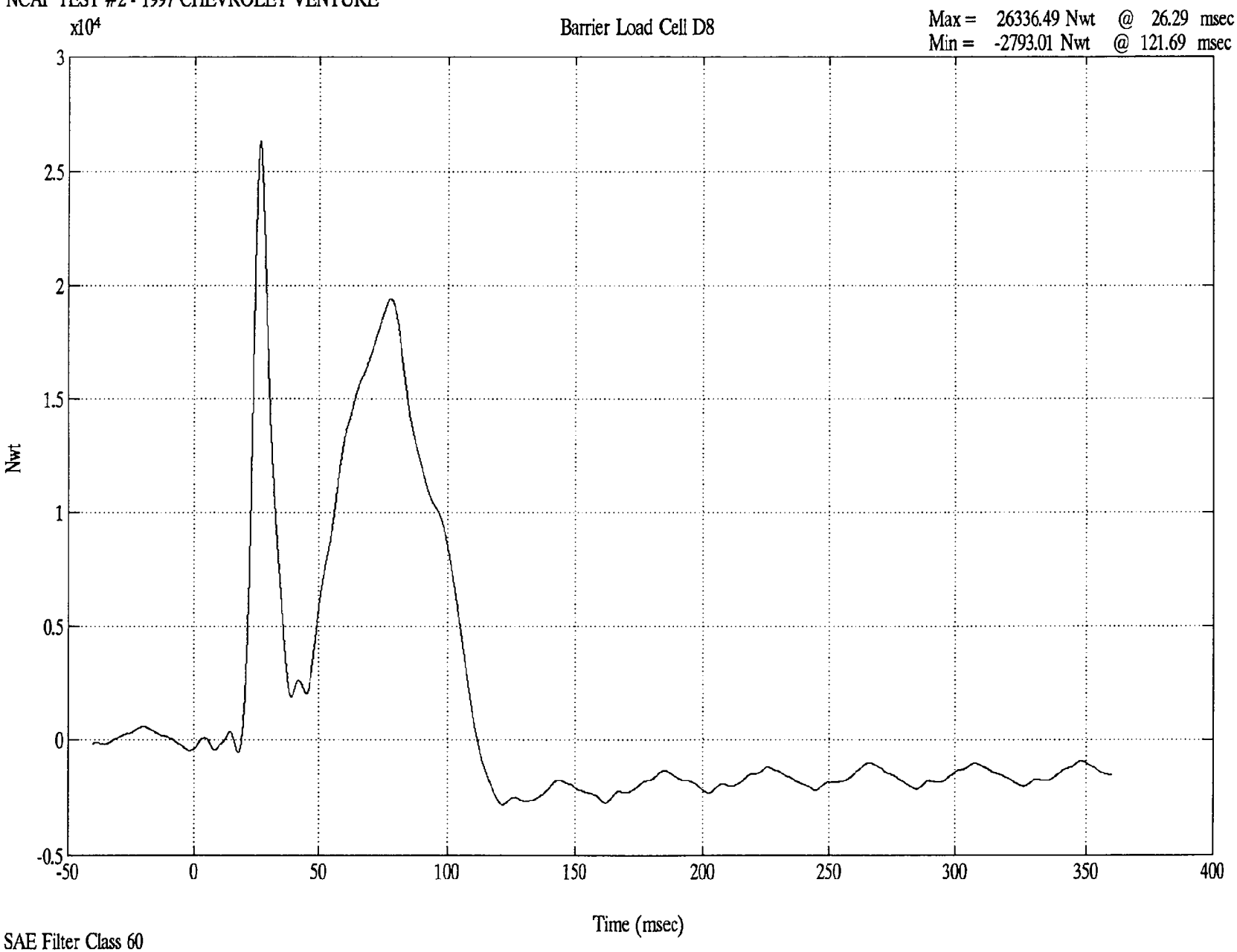


B-167

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE

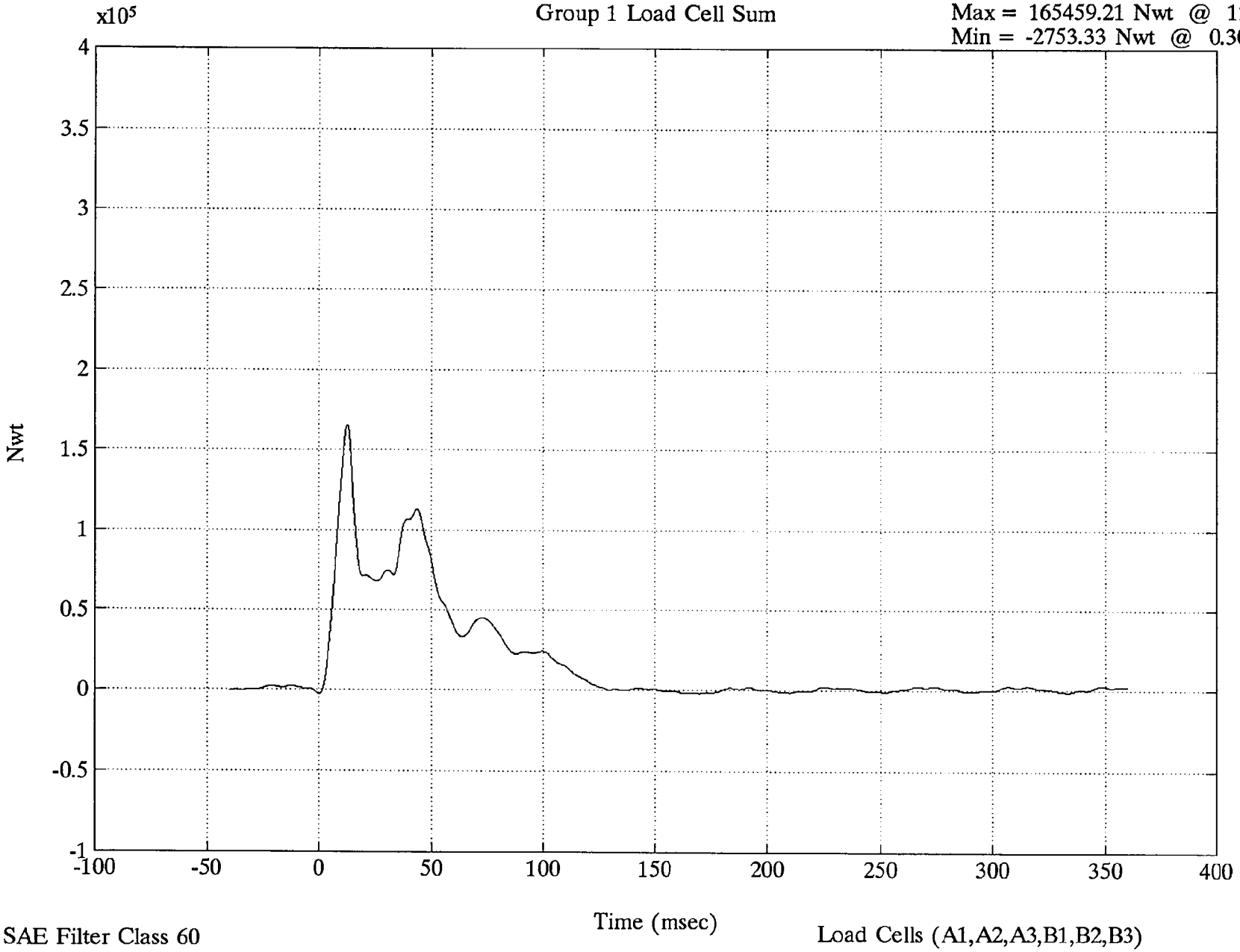


B-168

8406-2

SAE Filter Class 60

NCAP TEST #2 - 1997 CHEVROLET VENTURE



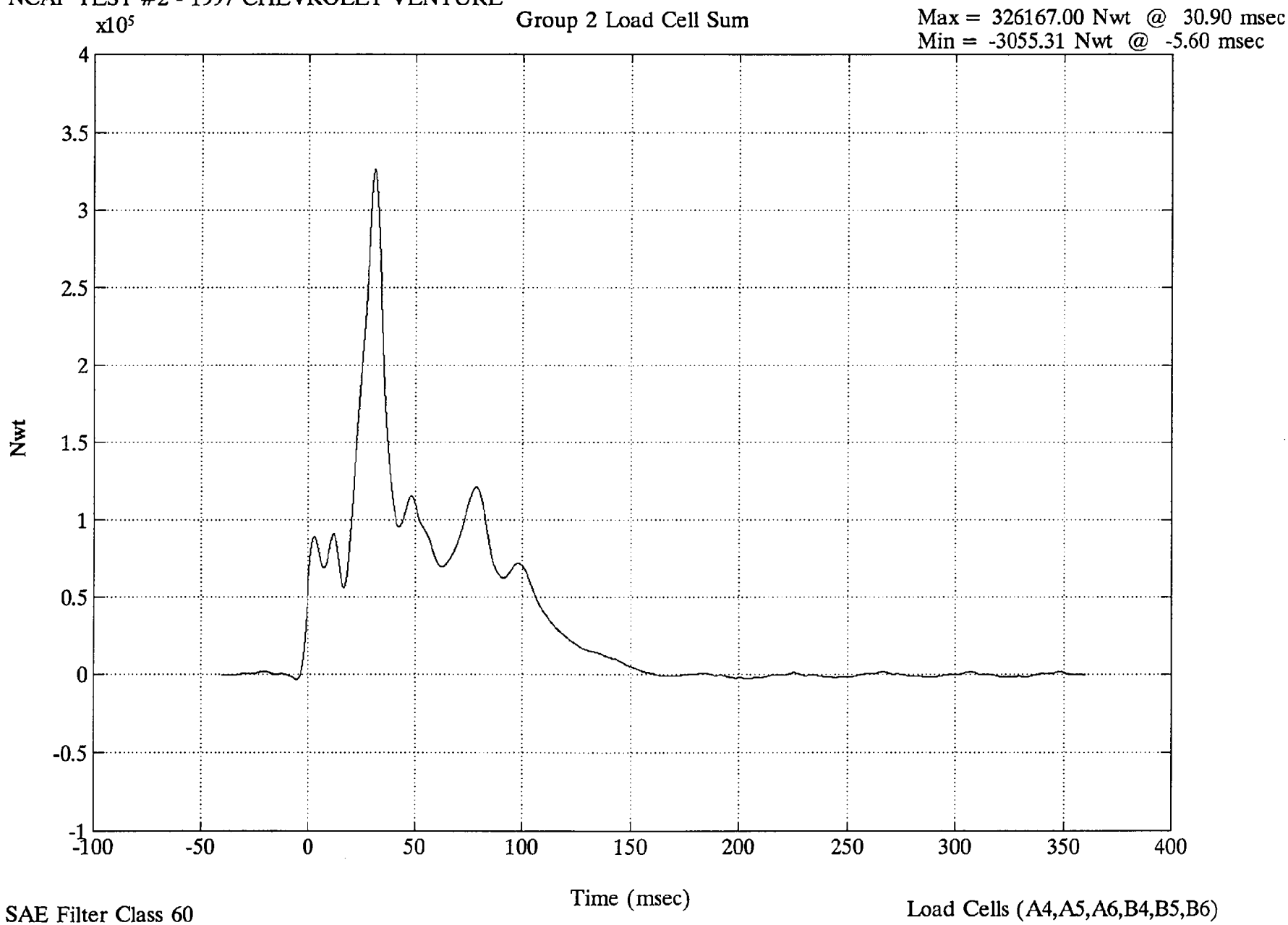
B-169

8406-2

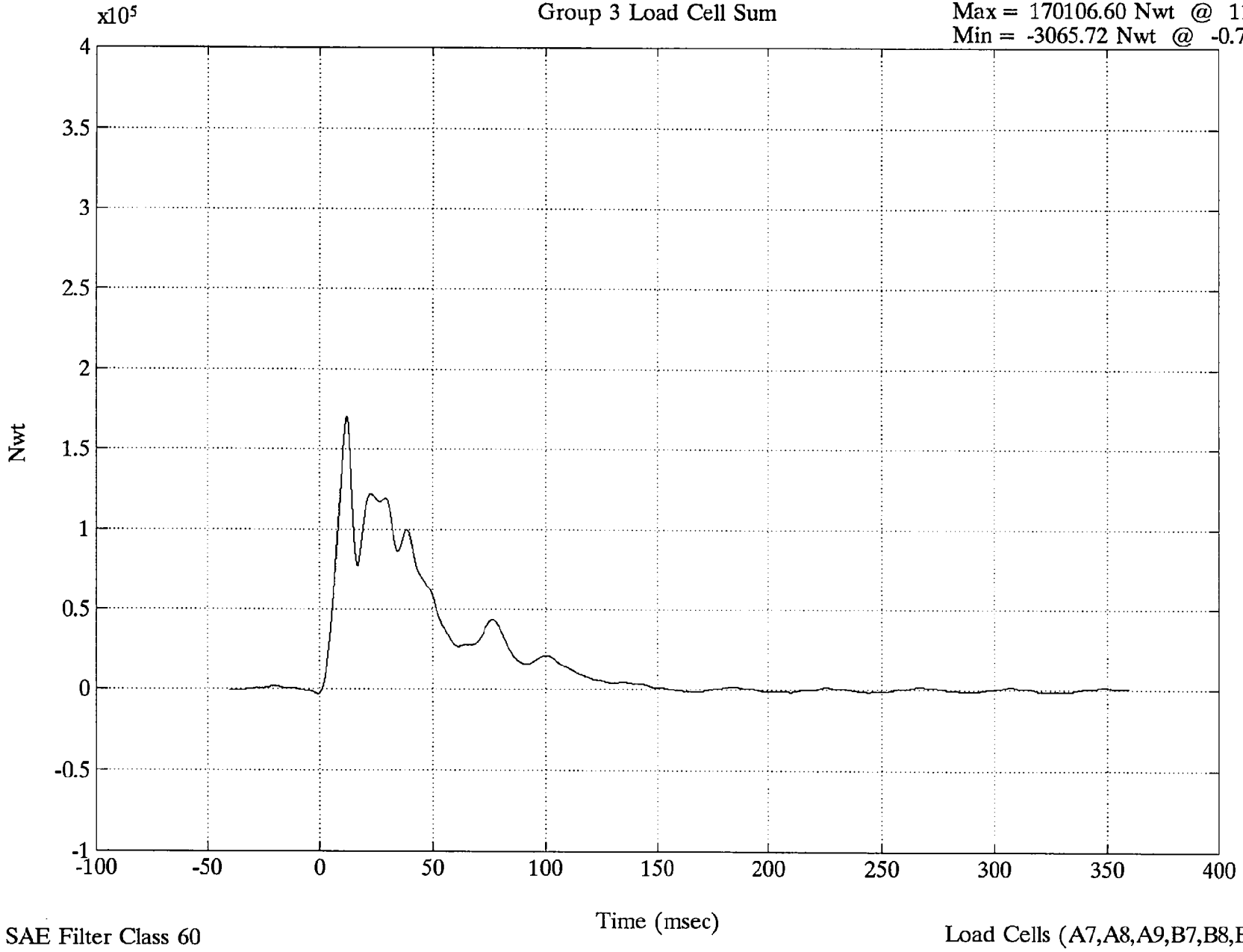
SAE Filter Class 60

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

NCAP TEST #2 - 1997 CHEVROLET VENTURE



NCAP TEST #2 - 1997 CHEVROLET VENTURE



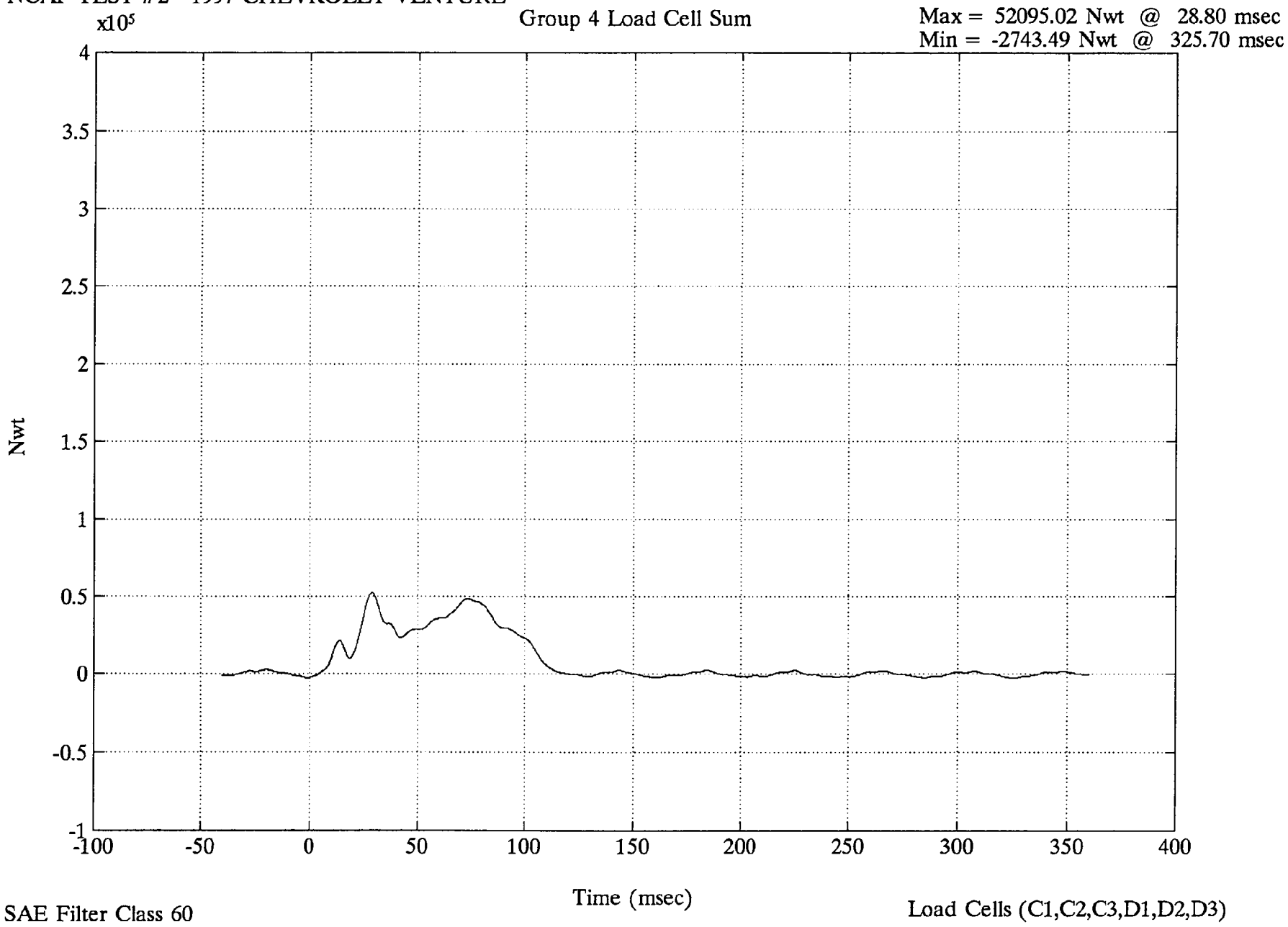
B-171

8406-2

SAE Filter Class 60

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

NCAP TEST #2 - 1997 CHEVROLET VENTURE



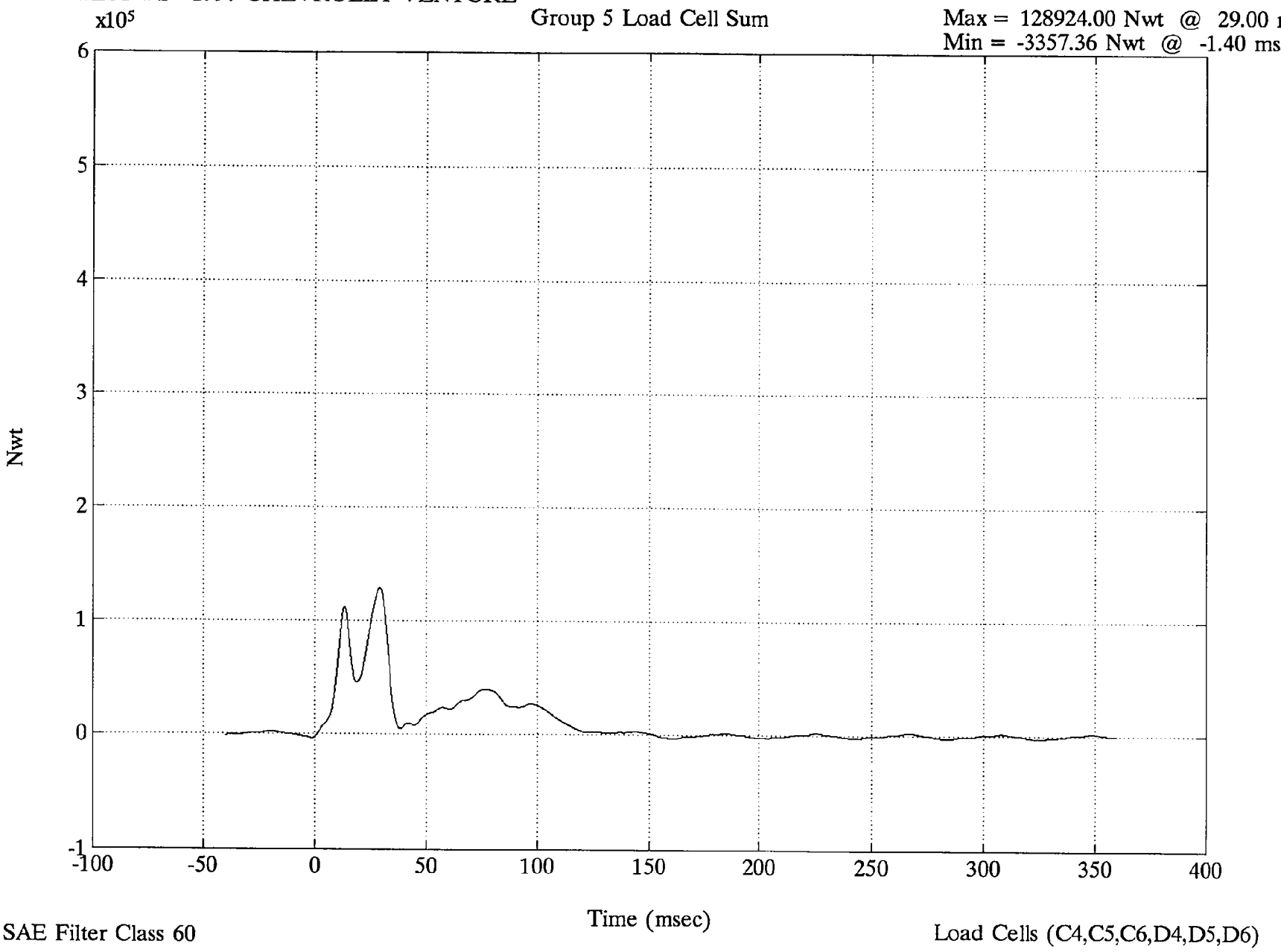
B-172

8406-2

SAE Filter Class 60

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

NCAP TEST #2 - 1997 CHEVROLET VENTURE



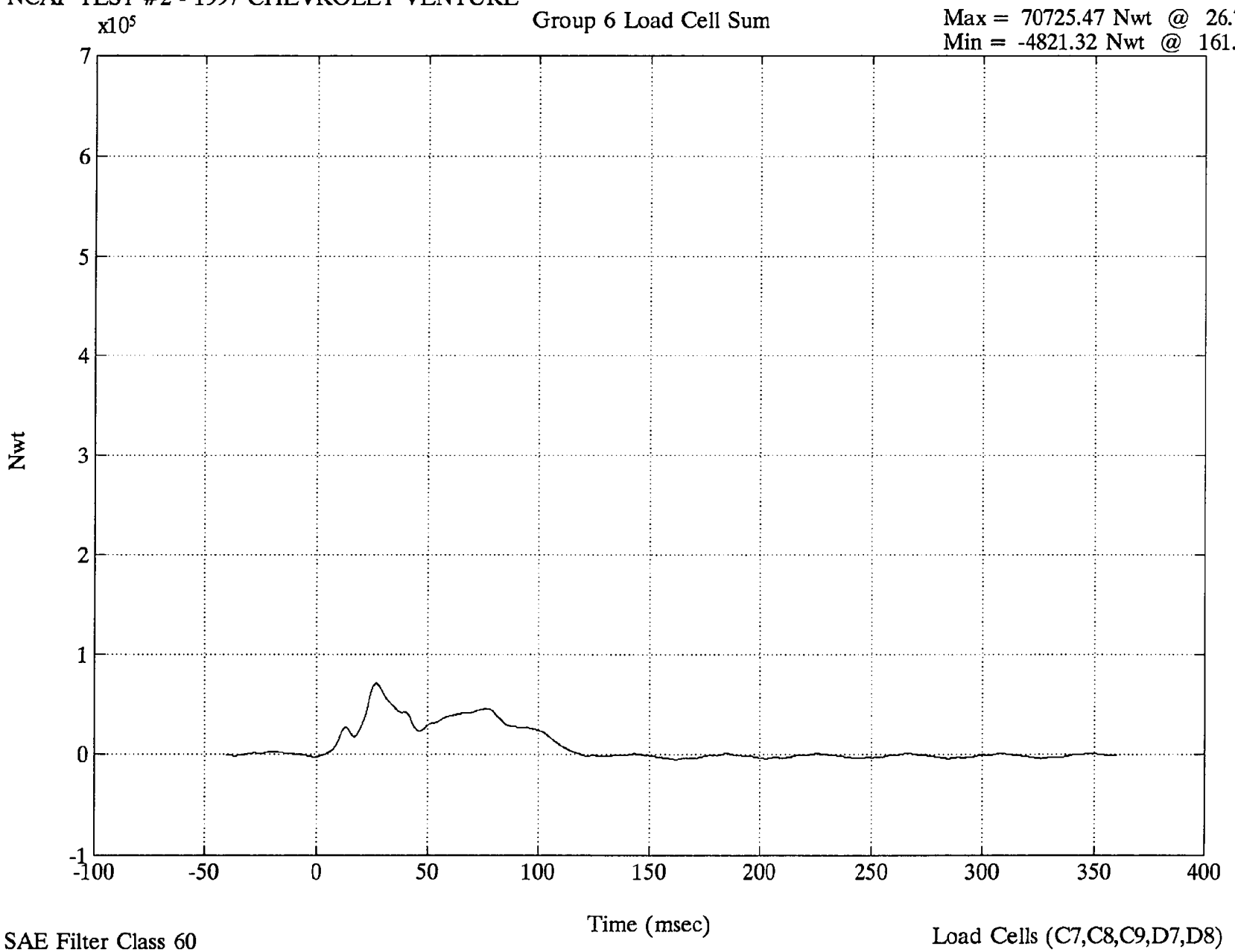
B-173

8406-2

SAE Filter Class 60

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

NCAP TEST #2 - 1997 CHEVROLET VENTURE



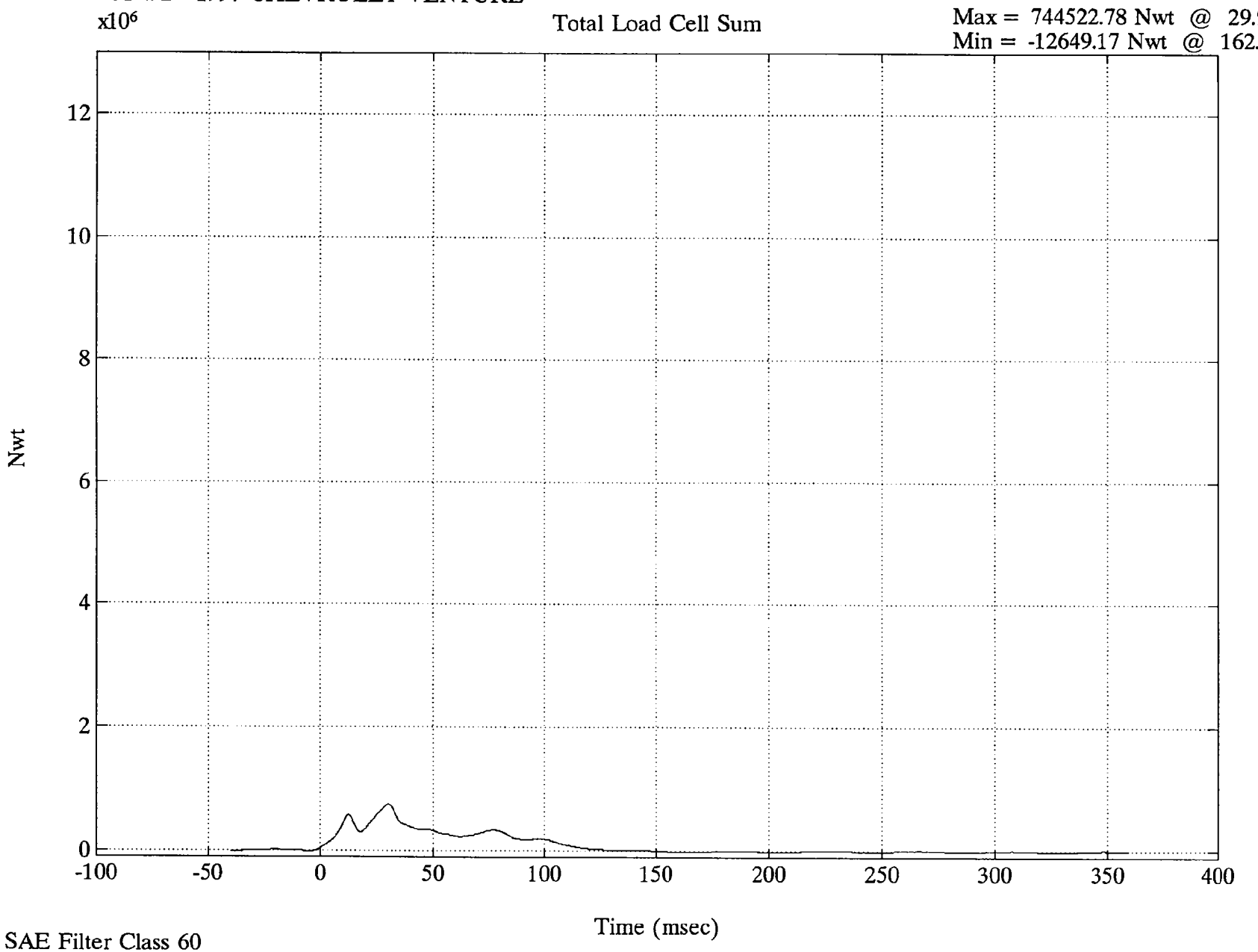
SAE Filter Class 60

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

B-174

8406-2

NCAP TEST #2 - 1997 CHEVROLET VENTURE



B-175

8406-2

SAE Filter Class 60

Appendix C

PART 572B/E DUMMY CONFIGURATION

AND PERFORMANCE VERIFICATION DATA SHEETS

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

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

Dummy serial numbers and certification dates are:

Position No./Location	Serial No.	Completion Date
#1/Driver	150	
#2/Right Front Passenger	061	

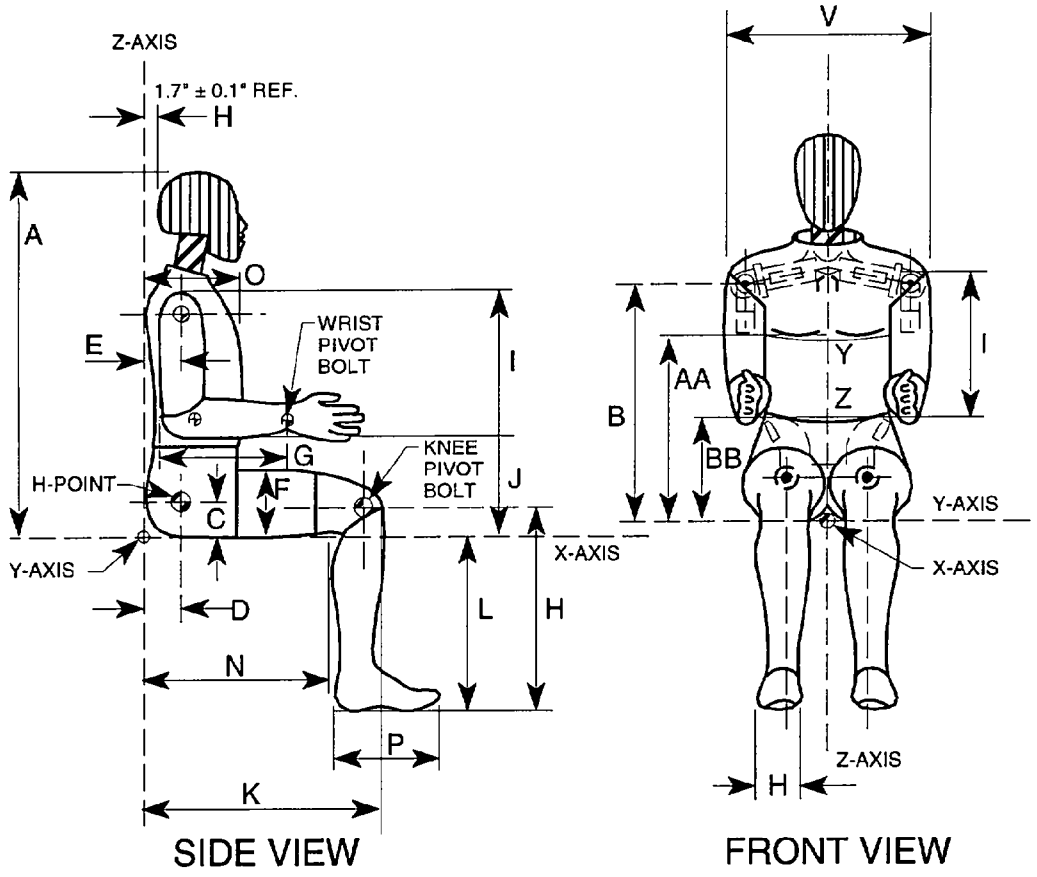
Electronic Test Equipment

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

Figure 15

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))

CALSPAN CORPORATION

Transportation Sciences Center

PART 572E
HEAD DROP TEST

Dummy Serial Number	150
Calspan Sequential Test Number	1
Date	9/17/96
Workfile	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	55
Peak Resultant Acceleration	225-275 G's	255.5
Peak Lateral Acceleration	15 G's Max	14.8
Is Acceleration Curve Unimodal?	YES	Yes

Remarks:

Laboratory Technician: B. Swiecicki

CALSPAN CORPORATION
Transportation Sciences Center

PART 572E
NECK FLEXION TEST

Dummy Serial Number	150	
Calspan Sequential Test Number	1	
Date	9/16/96	6 Axis Neck Transducer
Workfile		

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	45
Impact Velocity		22.60 - 23.40 Ft/s	23.2
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.66
	20 ms	17.60 - 22.60 G's	19.89
	30 ms	12.50 - 18.50 G's	16.24
Max Pendulum G's Above 30 ms		29 G's Max	16.24
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	35.88
D Plane Rotation	Max	64 - 78 Deg	68.08
	Time	57 - 64 ms	62.25
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	66.09
	Time	47 - 58 ms	49.88
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	121.13
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	99.00

Remarks:

Laboratory Technician: B. Swiecicki

CALSPAN CORPORATION

Transportation Sciences Center

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	150	
Calspan Sequential Test Number	1	
Date	9/16/96	6 Axis Neck Transducer
Workfile		

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	45
Impact Velocity		19.50 - 20.30 Ft/s	19.70
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	17.63
	20 ms	14.00 - 19.00 G's	15.68
	30 ms	11.00 - 16.00 G's	13.81
Max Pendulum G's Above 30 ms		22 G's Max	13.81
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	38.63
D Plane Rotation	Max	81 - 106 Deg	92.29
	Time	72 - 82 ms	78.13
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	43.80
	Time	65 - 79 ms	71.75
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	155.50
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	140.13

Remarks:

Laboratory Technician: B. Swiecicki

CALSPAN CORPORATION
Transportation Sciences Center

PART 572E
THORAX IMPACT TEST

Dummy Serial Number	150
Calspan Sequential Test Number	1
Date	9/17/96
Workfile	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70
Relative Humidity	10% - 70%	53
Pendulum Velocity	21.6 - 22.4 Ft/s	22.00
Maximun Deflection	2.50 - 2.86 in	2.69
Maximum Resistive Force	1160 - 1325 Lbs	1260.42
Internal Hysteresis	69 - 85 %	70.99

Remarks:

Laboratory Technician: B. Swiecicki

CALSPAN CORPORATION

Transportation Sciences Center

PART 572E
KNEE IMPACT TEST

Dummy Serial Number	150
Calspan Sequential Test Number	1
Date	9/16/96
Workfile	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	55
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 -1300 Lbs	1147
RIGHT KNEE		
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	55
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 -1300 Lbs	1144

Remarks:

Laboratory Technician: B. Swiecicki

CALSPAN CORPORATION
Transportation Sciences Center

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number	150
Calspan Sequential Test Number	1
Date	9/17/96

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			52
Location for Chest Circumference	AA	16.9 -17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	34.0
Chest Depth	O	8.4 - 9.0 in	8.4
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	5.7
Buttock Knee Length	K	22.8 - 23.8 in	23.4
Buttock Popliteal Length	N	17.8 - 18.8 in	18.5
Popliteal Height	L	16.9 - 17.9 in	17.8
Knee Pivot Height	M	19.1 - 19.7 in	19.6
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.7
Shoulder Breadth	V	16.6 - 17.2 in	16.9
Shoulder Pivot Height	B	19.9 20.5 in	20.2
Elbow Rest Height	J	7.5 - 8.3 in	8.1
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.2
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.5

Remarks:

Laboratory Technician: B. Swiecicki

CALSPAN CORPORATION
Transportation Sciences Center

PART 572E
HEAD DROP TEST

Dummy Serial Number	064
Calspan Sequential Test Number	1
Date	9/19/96
Workfile	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	45
Peak Resultant Acceleration	225-275 G's	271.2
Peak Lateral Acceleration	15 G's Max	2.0
Is Acceleration Curve Unimodal?	YES	Yes

Remarks:

Laboratory Technician: B. Swiecicki

CALSPAN CORPORATION
Transportation Sciences Center

PART 572E
NECK FLEXION TEST

Dummy Serial Number 061
Calspan Sequential Test Number 1
Date 9/20/96 6 Axis Neck Transducer
Workfile

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	45
Impact Velocity		22.60 - 23.40 Ft/s	23.20
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.62
	20 ms	17.60 - 22.60 G's	19.31
	30 ms	12.50 - 18.50 G's	15.03
Max Pendulum G's Above 30 ms		29 G's Max	15.03
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	41.38
D Plane Rotation	Max	64 - 78 Deg	64.29
	Time	57 - 64 ms	60.88
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	70.32
	Time	47 - 58 ms	53.63
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	114.88
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	102.00

Remarks:

Laboratory Technician: B. Swiecicki

CALSPAN CORPORATION

Transportation Sciences Center

PART 572E
NECK EXTENSION TEST

Dummy Serial Number 061
Calspan Sequential Test Number 1
Date 9/20/96
Workfile

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	45
Impact Velocity		19.50 - 20.30 Ft/s	19.70
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	17.44
	20 ms	14.00 - 19.00 G's	16.07
	30 ms	11.00 - 16.00 G's	12.88
Max Pendulum G's Above 30 ms		22 G's Max	12.88
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	41.00
D Plane Rotation	Max	81 - 106 Deg	89.88
	Time	72 - 82 ms	77.50
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-39.94
	Time	65 - 79 ms	71.75
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	154.38
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	146.00

Remarks:

Laboratory Technician: B. Swiecicki

CALSPAN CORPORATION
Transportation Sciences Center

PART 572E
THORAX IMPACT TEST

Dummy Serial Number	061
Calspan Sequential Test Number	1
Date	9/20/96
Workfile	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70
Relative Humidity	10% - 70%	45
Pendulum Velocity	21.6 - 22.4 Ft/s	22.00
Maximun Deflection	2.50 - 2.86 in	2.51
Maximum Resistive Force	1160 - 1325 Lbs	1280.37
Internal Hysteresis	69 - 85 %	72.5

Remarks:

Laboratory Technician: B. Swiecicki

CALSPAN CORPORATION

Transportation Sciences Center

PART 572E
KNEE IMPACT TEST

Dummy Serial Number	061
Calspan Sequential Test Number	1
Date	9/19/96
Workfile	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	45
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 -1300 Lbs	1169
RIGHT KNEE		
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	45
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 -1300 Lbs	1154

Remarks:

Laboratory Technician: B. Swiecicki

CALSPAN CORPORATION

Transportation Sciences Center

PART 572E

EXTERNAL DIMENSIONS

Dummy Serial Number	061
Calspan Sequential Test Number	1
Date	9/19/96

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			45
Location for Chest Circumference	AA	16.9 -17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	38.8
Waist Circumference	Z	32.9 - 34.1 in	33.3
Chest Depth	O	8.4 - 9.0 in	8.6
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	6.0
Buttock Knee Length	K	22.8 - 23.8 in	23.6
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Popliteal Height	L	16.9 - 17.9 in	17.3
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.6
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 20.5 in	20.4
Elbow Rest Height	J	7.5 - 8.3 in	8.0
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.3
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician: B. Swiecicki

Appendix D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY (S/N 150)		Serial #	Manufacturer	Calibration	
				Last	Next
Head	X	ADL98	ENDEVCO	1/97	7/97
	Y	AE8K0	ENDEVCO	1/97	7/97
	Z	ADMB6	ENDEVCO	1/97	7/97
Chest	X	A26A	ENDEVCO	1/97	7/97
	Y	A27A	ENDEVCO	1/97	7/97
	Z	A51A	ENDEVCO	1/97	7/97
Right Femur Load Cell		952	GSE	1/97	7/97
Left Femur Load Cell		951	GSE	1/97	7/97
Neck Load Cell	X	440	DENTON	1/97	7/97
	Y	440	DENTON	1/97	7/97
	Z	440	DENTON	1/97	7/97
Neck Moment	X	440	DENTON	1/97	7/97
	Y	440	DENTON	1/97	7/97
	Z	440	DENTON	1/97	7/97
Chest Deflection Gauge		150	HUMANOID	1/97	7/97
Hybrid III Use Only					
Lap Belt Load Cells		706	LEBOW	12/96	6/97
Shoulder Belt Load Cells		707	LEBOW	12/96	6/97
Spool-Out Potentiometer		M10	MAGNETEK	1/97	7/97
Belt Stretch Transducer		E1	CALSPAN	1/97	7/97

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY		Serial #	Manufacturer	Calibration	
				Last	Next
Head	X (R)	AP1A0	ENDEVCO	1/97	7/97
	Y (R)	AC8F6	ENDEVCO	1/97	7/97
	Z (R)	ACW0	ENDEVCO	1/97	7/97
Chest	X (R)	AHRC9	ENDEVCO	1/97	7/97
	Y (R)	AC7W8	ENDEVCO	1/97	7/97
	Z (R)	ACC06	ENDEVCO	1/97	7/97
Pelvic	X	AL6N5	ENDEVCO	1/97	7/97
	Y	AL6R7	ENDEVCO	1/97	7/97
	Z	A12C	ENDEVCO	1/97	7/97
Left Upper Tibia	Mx	038	DENTON	9/96	3/97
Left Upper Tibia	My	038	DENTON	9/96	3/97
Left Lower Tibia	Fy	032	DENTON	9/96	3/97
Left Lower Tibia	Fz	032	DENTON	9/96	3/97
Left Lower Tibia	Mx	032	DENTON	9/96	3/97
Right Upper Tibia	Mx	045	DENTON	9/96	3/97
Right Upper Tibia	My	045	DENTON	9/96	3/97
Right Lower Tibia	Fy	041	DENTON	9/96	3/97
Right Lower Tibia	Fz	041	DENTON	9/96	3/97
Right Lower Tibia	Mx	041	DENTON	9/96	3/97

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY		Serial #	Manufacture	Calibration	
				Last	Next
Left Foot Front	Z	J18439	ENDEVCO	12/96	6/97
Left Foot Rear	X	J18624	ENDEVCO	1/97	7/97
Left Foot Rear	Z	J18408	ENDEVCO	1/97	7/97
Right Foot Front	Z	J18418	ENDEVCO	12/96	6/97
Right Foot Rear	X	AEWK1	ENDEVCO	1/97	7/97
Right Foot Rear	Z	AKD92	ENDEVCO	1/97	7/97

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY (S/N 061)		Serial #	Manufacturer	Calibration	
				Last	Next
Head	X	AH5M9	ENDEVCO	1/97	7/97
	Y	AGHF5	ENDEVCO	1/97	7/97
	Z	AL6K2	ENDEVCO	1/97	7/97
Chest	X	A33A	ENDEVCO	1/97	7/97
	Y	FB32L	ENDEVCO	1/97	7/97
	Z	AD395	ENDEVCO	1/97	7/97
Right Femur Load Cell		232	GSE	1/97	7/97
Left Femur Load Cell		231	GSE	1/97	7/97
Neck Load Cell	X	076	DENTON	9/96	3/97
	Y	076	DENTON	9/96	3/97
	Z	076	DENTON	9/96	3/97
Neck Moment	X	076	DENTON	9/96	3/97
	Y	076	DENTON	9/96	3/97
	Z	076	DENTON	9/96	3/97
Chest Deflection Gauge		061	HUMANOID	10/96	4/97
Hybrid III Use Only					
Lap Belt Load Cells		635	LEBOW	1/97	7/97
Shoulder Belt Load Cells		711	LEBOW	1/97	7/97
Spool-Out Potentiometer		M11	MAGNETEK	1/97	7/97
Belt Stretch Transducer		E2	CALSPAN	1/97	7/97

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY		Serial #	Manufacturer	Calibration	
				Last	Next
Head	X (R)	APBF4	ENDEVCO	1/97	7/97
	Y (R)	APBD7	ENDEVCO	1/97	7/97
	Z (R)	AN967	ENDEVCO	1/97	7/97
Chest	X (R)	APA30	ENDEVCO	1/97	7/97
	Y (R)	AP1B5	ENDEVCO	1/97	7/97
	Z (R)	AP057	ENDEVCO	1/97	7/97
Pelvic	X	AF480	ENDEVCO	1/97	7/97
	Y	AL508	ENDEVCO	1/97	7/97
	Z	AF5C1	ENDEVCO	1/97	7/97
Left Upper Tibia	Mx	015	DENTON	9/96	3/97
Left Upper Tibia	My	015	DENTON	9/96	3/97
Left Lower Tibia	Fy	011	DENTON	9/96	3/97
Left Lower Tibia	Fz	011	DENTON	9/96	3/97
Left Lower Tibia	Mx	011	DENTON	9/96	3/97
Right Upper Tibia	Mx	016	DENTON	9/96	3/97
Right Upper Tibia	My	016	DENTON	9/96	3/97
Right Lower Tibia	Fy	012	DENTON	9/96	3/97
Right Lower Tibia	Fz	012	DENTON	9/96	3/97
Right Lower Tibia	Mx	012	DENTON	9/96	3/97

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY		Serial #	Manufacture	Calibration	
				Last	Next
Left Foot Front	Z	J18400	ENDEVCO	12/96	6/97
Left Foot Rear	X	J18649	ENDEVCO	1/97	7/97
Left Foot Rear	Z	J17965	ENDEVCO	1/97	7/97
Right Foot Front	Z	J18406	ENDEVCO	12/96	6/97
Right Foot Rear	X	J18465	ENDEVCO	12/96	6/97
Right Foot Rear	Z	J18623	ENDEVCO	12/96	6/97

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS

(6 Month Calibration Minimum)

	Serial #	Manufacturer	Calibration	
			Last	Next
Left Seat Rear Crossmember	X80	ICS	1/97	7/97
Right Rear Seat Crossmember	Y93	ICS	10/96	4/97
Top of Engine	Y13	ICS	1/97	7/97
Bottom of Engine	AN11	ICS	10/96	4/97
Left Disc Brake Caliper	A70	CEC	9/96	3/97
Right Disc Brake Caliper	A157	CEC	10/96	4/97
Instrument Panel	A129	CEC	11/96	5/97
Left Seat Rear Crossmember (R)	Y18	ICS	1/97	7/97
Right Seat Rear Crossmember (R)	Y151	ICS	2/97	8/97