

V 2254

REPORT NUMBER: CAL-95-N11

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

**SUZUKI MOTOR CORPORATION
1995 SUZUKI SIDEKICK
4-DOOR MPV**

NHTSA NUMBER: MS0502

CALSPAN TEST NUMBER: 8227-11

February 8, 1995

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FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation
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16. <i>Abstract</i> A frontal load cell barrier test of a 1995 Suzuki Sidekick 4-Door MPV was performed at Calspan Advanced Technology Center crash test facility in Buffalo, New York, on February 8, 1995. The impact velocity was 56.3 kph and the temperature at the barrier face was 21°C. The maximum post-test vehicle crush was 514 mm. The test vehicle was equipped with a 3-point continuous belt system at each of the front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" the driver exceeded the maximum head injury criteria and the passenger exceeded the maximum 3 millisecond chest resultant criteria.					
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Section 1

PURPOSE AND TEST PROCEDURE

This 56.3 kph frontal barrier impact test is part of the Composite FY 92 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-90-D-02121. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 56.3 kph frontal barrier impact test was conducted in accordance with the Office of Market Incentives (OMI) Laboratory Indicant Test procedure.

Section 2

SUMMARY OF TEST MS0502

A load cell barrier consisting of 36 load cells was impacted by a 1995 Suzuki Sidekick 4-Door MPV at a velocity of 56.3 kph. The test was performed at the Calspan Corporation Advanced Technology Center on February 8, 1995. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by 1 real-time camera and 14 high-speed cameras. Camera locations and other pertinent camera information can be found in this report.

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

Both ATDs were fully instrumented with head and chest triaxial accelerometers and right/left femur load cells. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver ATD (Serial No. 061) and the right-front passenger ATD (Serial No. 245) were used in two previous tests (MS0103 and MS0102). Injury Criteria were not exceeded in either of these previous tests. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 101 channels of data were recorded on a P.C. based data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

The driver's HIC was 1214.4. The maximum chest deceleration over 3 milliseconds was 57.5 g's and maximum chest deflection was -26.1 mm. Femur loads were -5498.4 newtons on the left femur and -5506.5 newtons on the right femur.

The right front passenger's HIC was 886.2. Maximum chest deceleration over 3 milliseconds was 60.4 g's and maximum chest deflection was -33.6 mm. Femur loads were -2620.7 newtons on the left and -7908.8 newtons on the right.

Table 1

GENERAL TEST AND VEHICLE DATA

Vehicle Year/Make/Model/Body Style: 1995 Suzuki Sidekick 4-Door MPV

NHTSA Test No.: MS0502 VIN.: JS3TD03V8S4101003

Body Color: White Date of Manufacture: N/A

Date Received: 12/2/94

Odometer Reading: 00047

Engine: 4 Cylinders; - C.I.D.; 1.6 Liters; - CC
X Gas; - Diesel; - Turbocharged
X Longitudinal; - Transverse

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

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

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

Type of Occupant Restraint: 3 point continuous belt restraint

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 240 kPa, Rear 240 kPa

Recommended Tire Size: 205/75R15

Recommended Cold Tire Pressure: Front 160 kPa, Rear 160 kPa

Tires on Vehicle: 205/75R15 Manufacturer: Bridgestone

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

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

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

Vehicle Capacity Weight (VCW) = 348.5 kgs. (A)

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

Rated Cargo and Luggage Weight (RCLW) A-B = 76.5 kgs.

GVWR 1600 kgs. GAWR: Front 740 kgs. Rear 960 kgs.

Table 1

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

Right Front	=	<u>330</u>	kgs.	Right Rear	=	<u>299</u>	kgs.
Left Front	=	<u>310</u>	kgs.	Left Rear	=	<u>314</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>640</u>	kgs.	(51.1 % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>613</u>	kgs.	(48.9 % of Total Vehicle Weight)			
TOTAL DELIVERED WEIGHT	=	<u>1,253</u>	kgs.				

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight	<u>1251.5</u>	kgs.
VCW = Vehicle Capacity Weight	<u>348.5</u>	kgs.
DSC = Designated Seating Capacity	<u>272</u>	
RCLW = VCW - 68 (DSC) =	<u>76.5</u>	kgs.
Target Test Weight = UDW + RCLW + (2 dummies x 74.4 kgs./ dummy)		
Target Test Weight =	<u>1476</u>	

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 83 KGS CARGO:

Right Front	=	<u>361</u>	kgs.	Right Rear	=	<u>393</u>	kgs.
Left Front	=	<u>326</u>	kgs.	Left Rear	=	<u>391</u>	kgs.
TOTAL FRONT WEIGHT	=	<u>687</u>	kgs.	(46.7 % of Total Vehicle Weight)			
TOTAL REAR WEIGHT	=	<u>784</u>	kgs.	(53.3 % of Total Vehicle Weight)			
TOTAL TEST WEIGHT	=	<u>1,471</u>	kgs.				
Weight of ballast secured in vehicle trunk area =	<u>45.4</u>	kgs.					

VEHICLE ATTITUDE (all dimensions in mm):

Delivered Attitude:	RF	<u>785</u>	LF	<u>788</u>	RR	<u>785</u>	LR	<u>786</u>
Test Attitude:	RF	<u>777</u>	LF	<u>771</u>	RR	<u>755</u>	LR	<u>749</u>
Wheel Base:	<u>2477</u>	mm.;	C.G. =	<u>1313</u>	mm. rearward of front wheel C/L			

Remarks: 13.5 gallons of orange dyed stoddard solution was placed in fuel tank (93% of fuel tank capacity)

Table 1

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

Type of Test: Frontal Barrier Impact Angle: 0°
 Date of Test: February 8, 1995 Time of Test: 14:51
 Ambient Temperature: 21 ° C at impact area
 Temperature in Occupant Compartment: 21 ° C
 Windshield Molding Temperature: 21 ° C
 Required Impact Velocity Range: 55.5 to 57.1 kph
 Impact Velocity: primary = 56.3 kph, secondary = 56.3 kph
 Distance From Front Bumper to Barrier Face When
 Entering Speed Trap: 1321 mm
 Exiting Speed Trap: 305 mm

VEHICLE REBOUND AND CRUSH (mm):

Vehicle Length:	Pre-test = R	<u>3940</u>	C _L	<u>3990</u>	L	<u>3940</u>
	Post-test = R	<u>3470</u>	C _L	<u>3496</u>	L	<u>3495</u>
	Crush = R	<u>470</u>	C _L	<u>494</u>	L	<u>445</u>

Distance from front of test vehicle to point of impact:

R	<u>368</u>	C _L	<u>380</u>	L	<u>378</u>
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VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Steering wheel rim</u>	<u>Dash panel</u>
Chest	<u>No contact</u>	<u>No contact</u>
Abdomen	<u>Lower steering wheel rim</u>	<u>No contact</u>
Left Knee	<u>Lower dash panel</u>	<u>Glove box door</u>
Right Knee	<u>Lower dash panel</u>	<u>Glove box door</u>

Table 1

GENERAL TEST AND VEHICLE DATA (cont'd)

	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Door Opening	<u>Inoperable</u>	<u>Inoperable</u>	<u>Operable</u>	<u>Operable</u>
<u>Seat Movement</u>	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Seat Back Failure	<u>None</u>	<u>None</u>	<u>N/A</u>	<u>N/A</u>
Seat Shift (mm.)	<u>0.0</u>	<u>0.0</u>	<u>N/A</u>	<u>N/A</u>
<u>Glazing Damage</u>				
Backlight/Windshield:	<u>Windshield sustained stress fractures but remained intact.</u>			
Other Notable Impact Effects:	<u>None</u>			

Section 3

OCCUPANT AND VEHICLE INFORMATION

I.

DATA

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

Table 2

DUMMY INJURY CRITERIA VALUESNHTSA No.: MS0502 Vehicle: 1995 Suzuki Sidekick 4-Door MPV

	MAXIMUM HEAD ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-136.0	21.3	74.2	146.8
Position #2 - Passenger	67.6	-15.6	62.4	75.7

	MAXIMUM CHEST ACCELERATION (g's)			
	X	Y	Z	R*
Position #1 - Driver	-59.2	16.4	15.2	57.5
Position #2 - Passenger	-63.6	-12.7	-20.3	60.4

* 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	-5498.4	-5506.5
Position #2 - Passenger	-2620.7	-7908.8

	MAXIMUM FORCE - SEAT BELT LOADS (nwt)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
Position #1 - Driver	9174.0	-	8788.1
Position #2 - Passenger	11515.0	7068.1	-

	HEAD INJURY CRITERIA (HIC)			
	HIC**	t ₁ (mSec)	t ₂ (mSec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	1214.4	64.32	92.16	71.8
Position #2 - Passenger	886.2	65.64	101.52	57.2

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

Table 3

HYBRID III NECK AND CHEST DATA SHEET

Vehicle Year/Make/Model/Body Style: 1995 Suzuki Sidekick 4-Door MPV
 Vehicle NHTSA No.: MS0502 Test Date: February 8, 1995

MAXIMUM VALUES	DRIVER DUMMY ID #061:	PASSENGER DUMMY ID #245:
Neck Load X (nwt)	914.1	1856.2
Neck Load Y (nwt)	359.9	306.5
Neck Load Z (nwt)	2977.6	2649.0
Neck Moment X (nwt-m)	-25.2	22.4
Neck Moment Y (nwt-m)	42.3	126.0
Neck Moment Z (nwt-m)	13.6	10.0
Chest Deflection X (mm.)	-26.1	-33.6
Time of Max. Occurrence (msec)	78.6	76.4

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

Figure 1

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

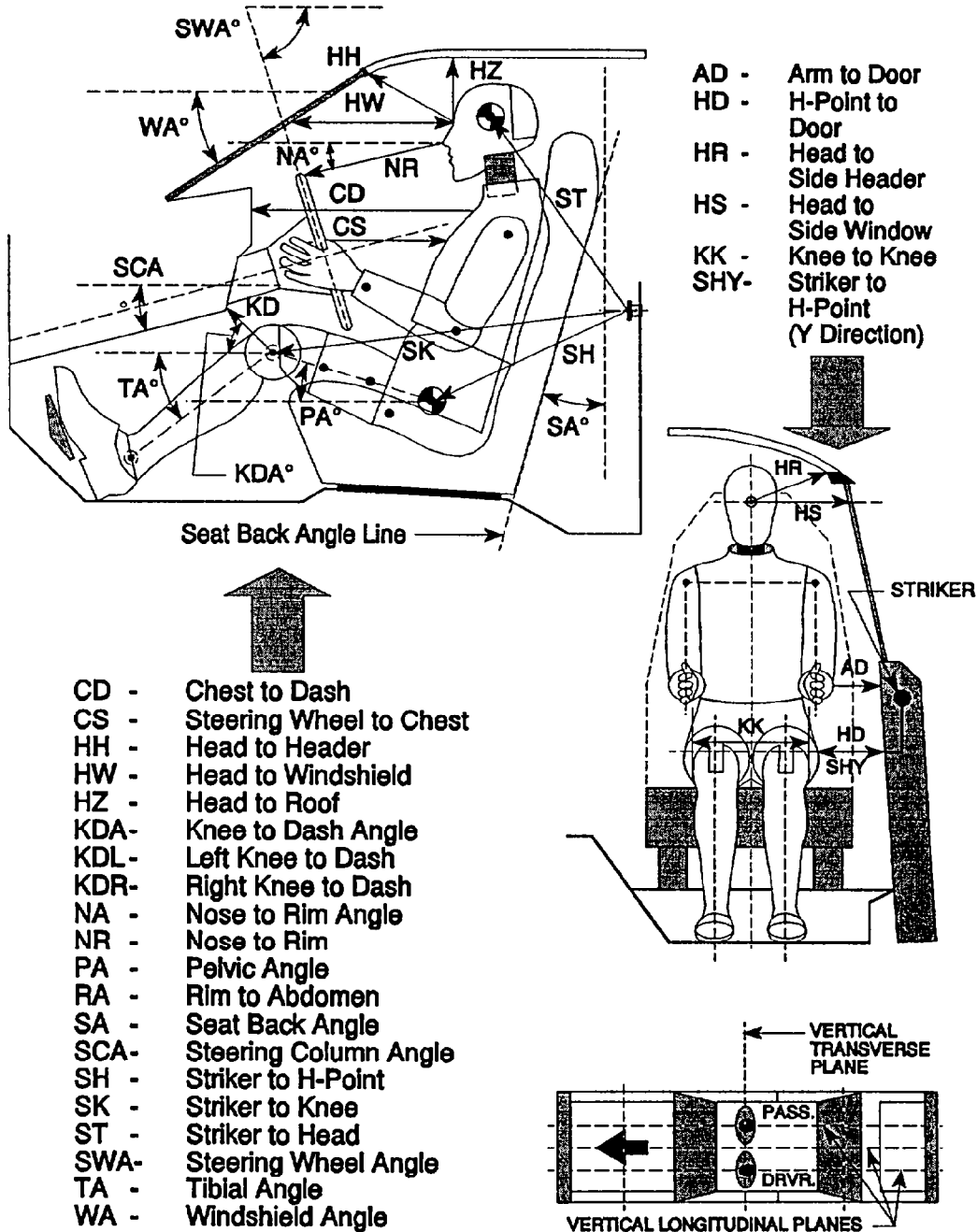


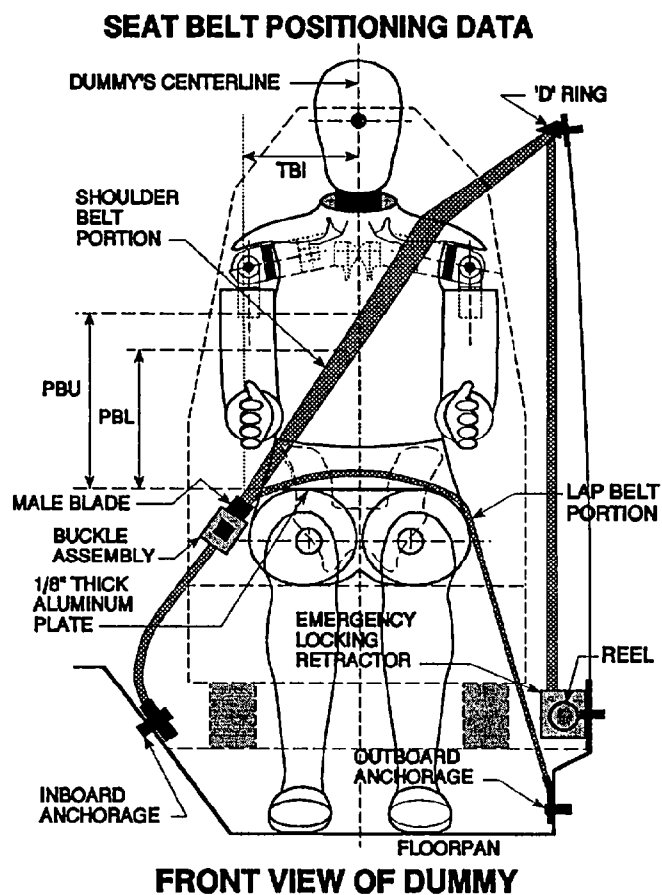
Table 4

FRONT SEAT OCCUPANT MEASUREMENTS

	DRIVER (Serial #061)			PASS. (Serial # 245)		
WA°	44 deg.			N/A		
SWA°	30 deg.			N/A		
SCA°	60 deg.			N/A		
SA°	18 deg.			18 deg.		
HZ	240			250		
HH	470			478		
HW	610			612		
HR	210			224		
NR	430	Angle	13 deg.	N/A		
CD	555			476		
CS	340			N/A		
RA	198			N/A		
KDL	206	Angle (KDA)	44 deg.	220		
KDR	188			224	Angle (KDA)	30 deg.
PA°	22 deg.			22 deg.		
TA°	40 deg.			45 deg.		
KK	285			270		
ST	622	Angle	5 deg.	605	Angle	8 deg.
SK	554	Angle	89 deg.	554	Angle	86 deg.
SH	147	Angle	108 deg.	147	Angle	106 deg.
SHY	195			190		
HS	190			188		
HD	140			122		
AD	65			55		

Figure 2

SEAT BELT POSITIONING DATA



	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	352	324
PBL-- Top surface of alum. plate to belt lower edge	278	240
<u>LAP BELT TENSION</u>	Retractor	Retractor
<u>SHOULDER BELT TENSION</u>	Retractor	Retractor

Table 5

SEAT BELT PERFORMANCE ASSESSMENT TEST DATABELT LENGTH DATA:

Belt length from trim panel exit
to bolt hole anchor point for
continuous webbing systems.

DriverPassenger

1980 mm

1950 mm

Shoulder belt length as measured
on Part 572 Dummy.

800 mm

800 mm

Lap belt length as measured
on Part 572 Dummy.

910 mm

880 mm

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis.

N/A

N/A

As determined mechanically.

88 mm

71 mm

As determined electronically.

83 mm

82 mm

BELT STRETCH DATA:

Measured electronically between shoulder
belt load cell and the "D" ring.

106.9 mm/M

79 mm/M

Measured mechanically.

0.0

0.0

Figure 3

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 6.

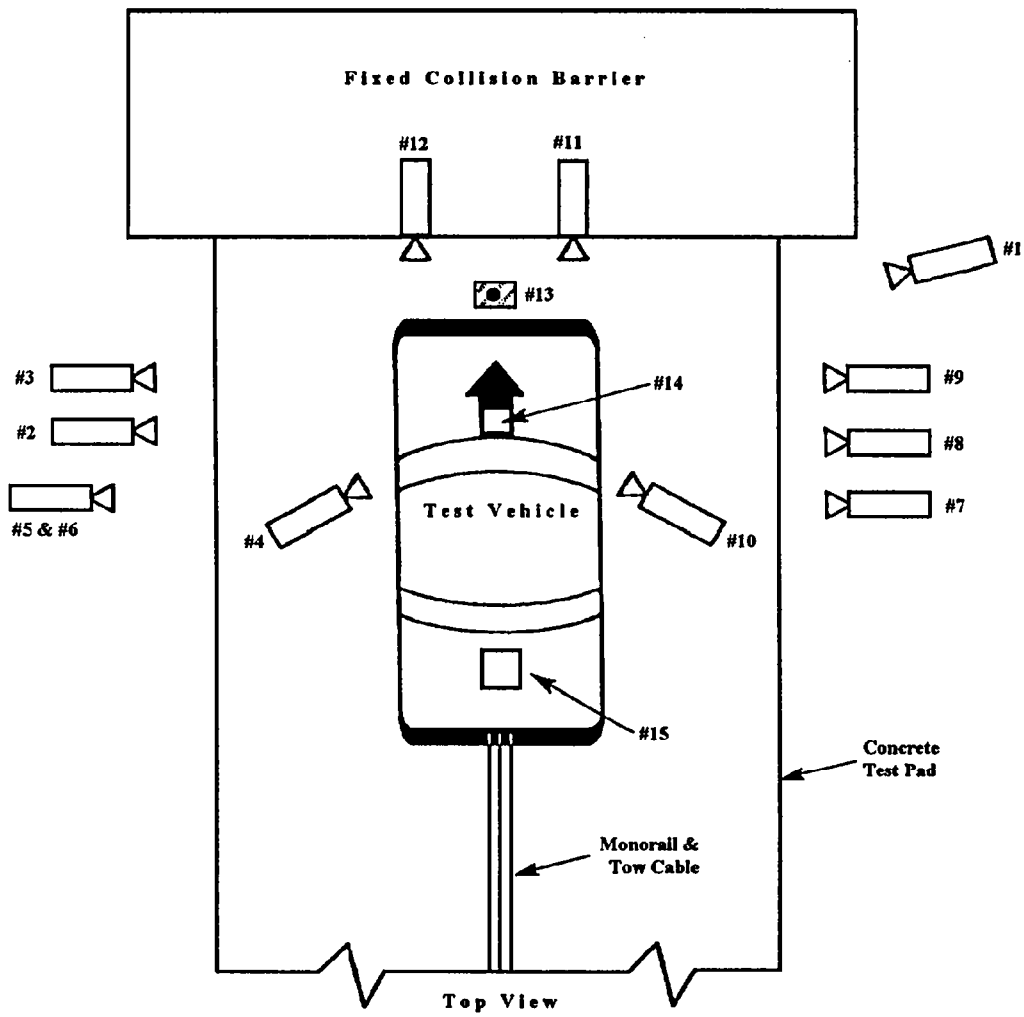


Table 6
HIGH-SPEED CAMERA LOCATIONS

Test No.		MS0502		Vehicle:		1995 Suzuki Sidekick 4-Door MPV			
CAMERA NO.	VIEW	CAMERA POSITIONS (MM.)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)	
		X	Y	Z					
1	Real-Time Camera	-	-	-	-	-	-	24	
2	Overall Left Side	5842	1524	1041	-2	5464	13	1020	
3	Left Side View	8001	965	1041	-1	7623	25	1000	
4	Driver and Interior View	2667	2489	1803	-15	-	13	990	
5	Steering Column (Bottom)	6957	1727	1168	-4	6579	25	1080	
6	Steering Column (Top)	6957	1727	1778	-8	6579	25	1130	
7	Overall Right Side	5791	1803	1092	-2	5413	13	1070	
8	Right Side View	7340	1346	1041	-2	6962	25	1000	
9	Right Passenger View	7340	1676	1397	-2	6962	25	1020	
10	Passenger and Interior View	2590	2438	1829	-17	-	13	1040	
11	Passenger Front View	560	127	1778	-35	-	13	1010	
12	Driver Front View	560	127	1778	-35	-	13	1020	
13	Windshield View	0	0	3048	-45	-	13	1060	
14	Pit View of Engine	0	505	-3048	90	-	13	900	
15	Pit View of Fuel Tank	0	3432	-3048	90	-	13	940	

*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

** = referenced to horizontal plane

N.T. indicates No Timing

Figure 4

VEHICLE TARGET LOCATIONS

(Dimensions in millimeters)

A	302
B	505
C	898
D	1932
E	813
F	1285
G	775
H	775
I	110
J	1170
K	885
L	1160
M	813
N	105
O	775
P	775
Q	1160
R	880
S	1175

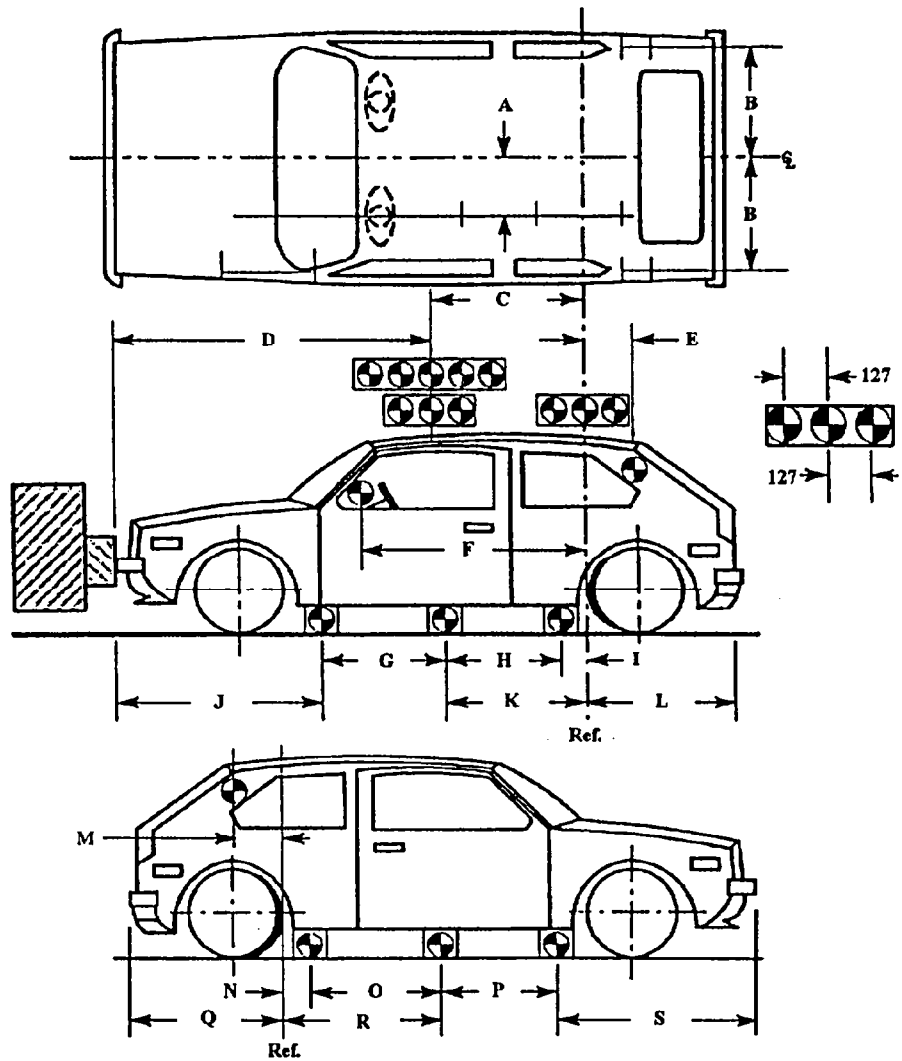
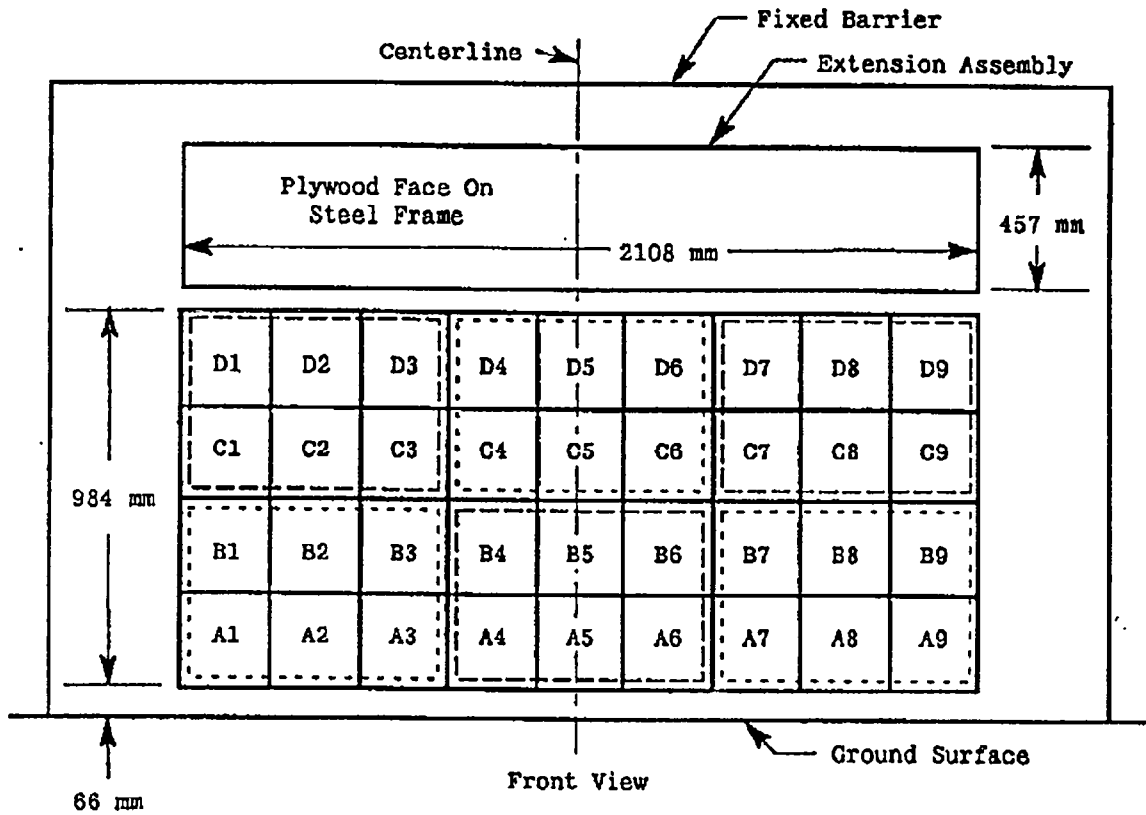


Figure 5

LOAD CELL LOCATIONS ON FIXED BARRIER

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



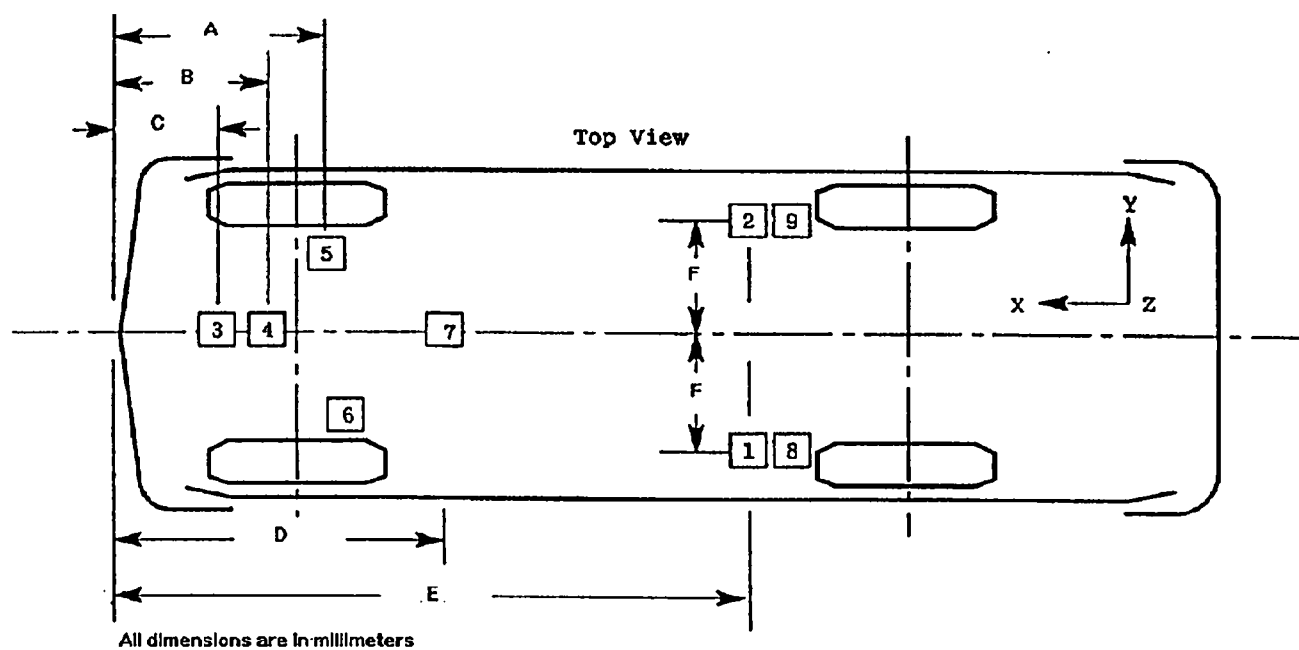
6 GROUPS OF 6 LOAD CELLS EACH

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

The following data is presented in Appendix B:

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

Figure 6

VEHICLE ACCELEROMETER LOCATIONS

ACCELEROMETER NUMBER*	ACCELEROMETER LOCATION	Distances From Vehicle Front	
		All dimensions in millimeters	
1	Left Rear Seat Crossmember [E/F]	X = 2776	Y = 390
2	Right Rear Seat Crossmember [E/F]	X = 2776	Y = 390
3	Top of engine [C]	657	
4	Bottom of engine [B]	952	
5	Right Disc Brake Caliper [A]	665	
6	Left Disc Brake Caliper [A]	665	
7	Instrument Panel [D]	1328	
8	Left Rear Seat Crossmember [E/F]	X = 2776	Y = 267
9	Right Rear Seat Crossmember [E/F]	X = 2776	Y = 267

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

Figure 7

TEST VEHICLE MEASUREMENTS

REAR DATUM REFERENCE

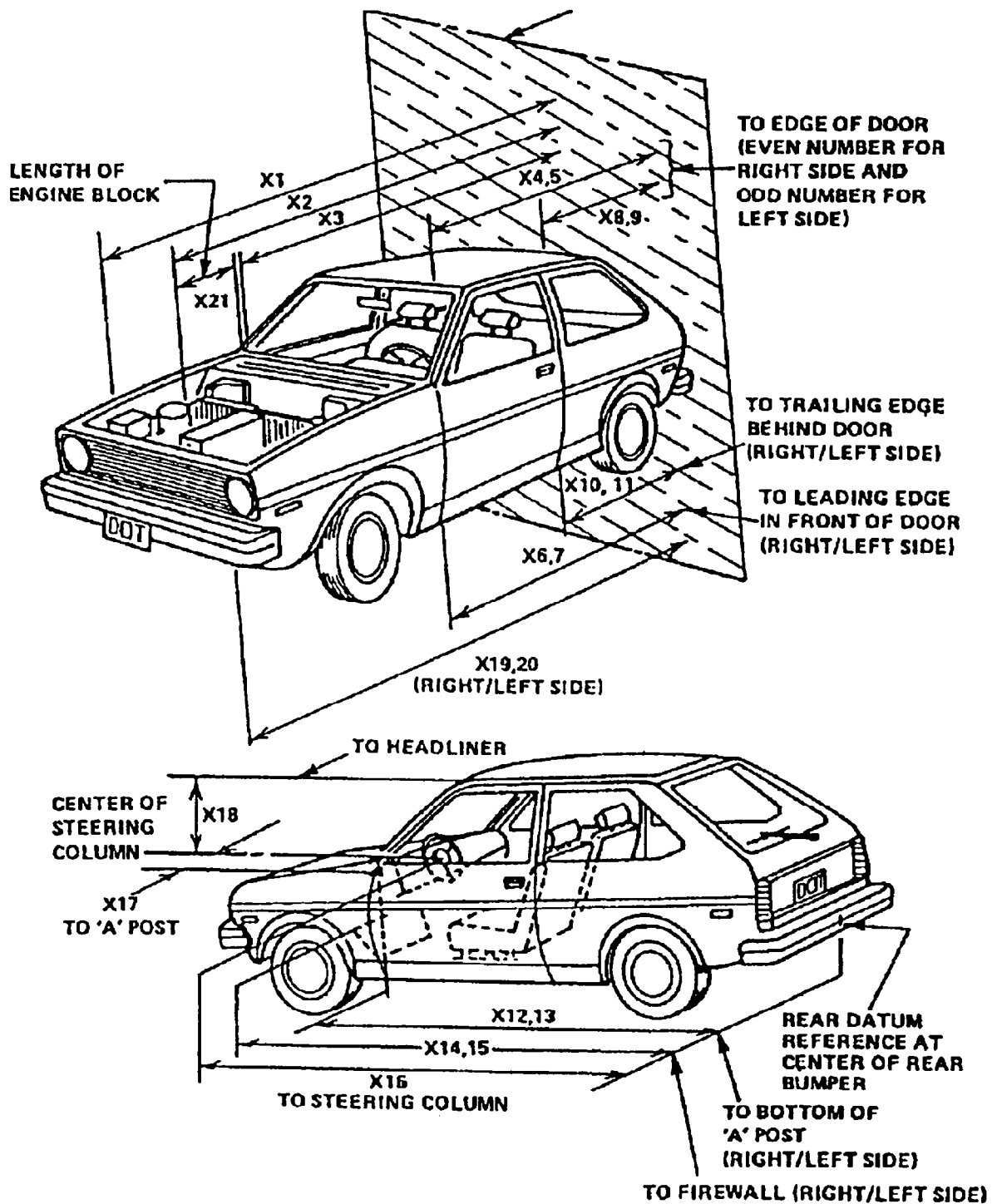


Table 7

VEHICLE MEASUREMENTS

No.		All Dimensions in mm		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	3990	3476	514
X2	Rear Surface of Vehicle to Front of Engine	3485	3255	230
X3	Rear Surface of Vehicle to Firewall	2935	2814	121
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	2749	2707	42
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	2750	2715	35
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	2725	2706	19
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	2723	2705	18
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	1727	1700	27
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	1716	1709	7
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	1732	1713	19
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	1722	1708	14
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	2725	2705	20
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	2723	2705	18
X14	Rear Surface of Vehicle to Firewall, Right Side	2990	2864	126
X15	Rear Surface of Vehicle to Firewall, Left Side	2980	2864	116
X16	Rear Surface of Vehicle to Steering Column	2290	2260	30
X17	Center of Steering Column to "A" Post	360	340	20
X18	Center of Steering Column to Headliner	480	565	-85
X19	Rear Surface of Vehicle to Right Side of Front Bumper	3940	3470	470
X20	Rear Surface of Vehicle to Left Side of Front Bumper	3940	3495	445
X21	Length of Engine Block	460	460	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2505	2458	47
CD	Rear Surface of Vehicle to Center of Dash Panel	2505	2445	60
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2515	2465	50

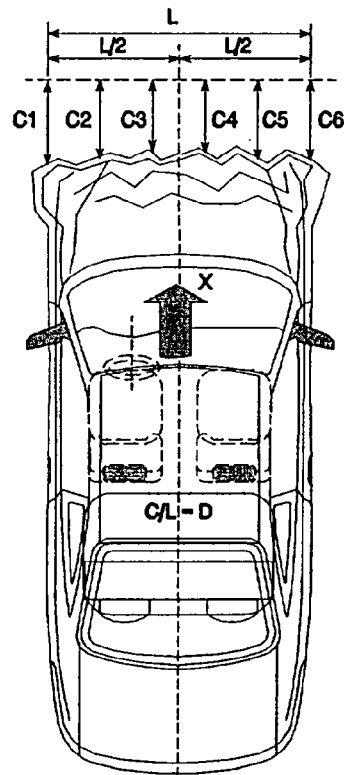
Table 8

ACCIDENT INVESTIGATION DIVISION DATA
FOR 56.3 KPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Suzuki Sidekick 4-Door MPV
 Vehicle NHTSA No.: MS0502 VIN: JS3TD03V8S4101003
 Model Year: 1995 Build Date: N/A Test Date: February 8, 1995
 Vehicle Size Category: MPV Test Weight: 1471 Kgs
 Vehicle Wheelbase: 2477 mm; Front Overhang: 1175 mm; Overall Width: 1575 mm
 Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions:

C1 = 430 mm
 C2 = 466 mm
 C3 = 508 mm
 C4 = 513 mm
 C5 = 481 mm
 C6 = 450 mm



Midpoint of Damage: $D = \frac{\text{Vehicle Centerline}}{(\text{Longitud.})}$

Longitude Length of Damaged Region: $L = \underline{1575}$ mm

Section 4

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

"Windshield Mounting" FMVSS No. 212 Data

"Windshield Zone Intrusion" FMVSS No. 219 Data

"Fuel System Integrity" FMVSS No. 301

Figure 8

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA

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

Windshield is bonded in place and covered with 17 mm molding.

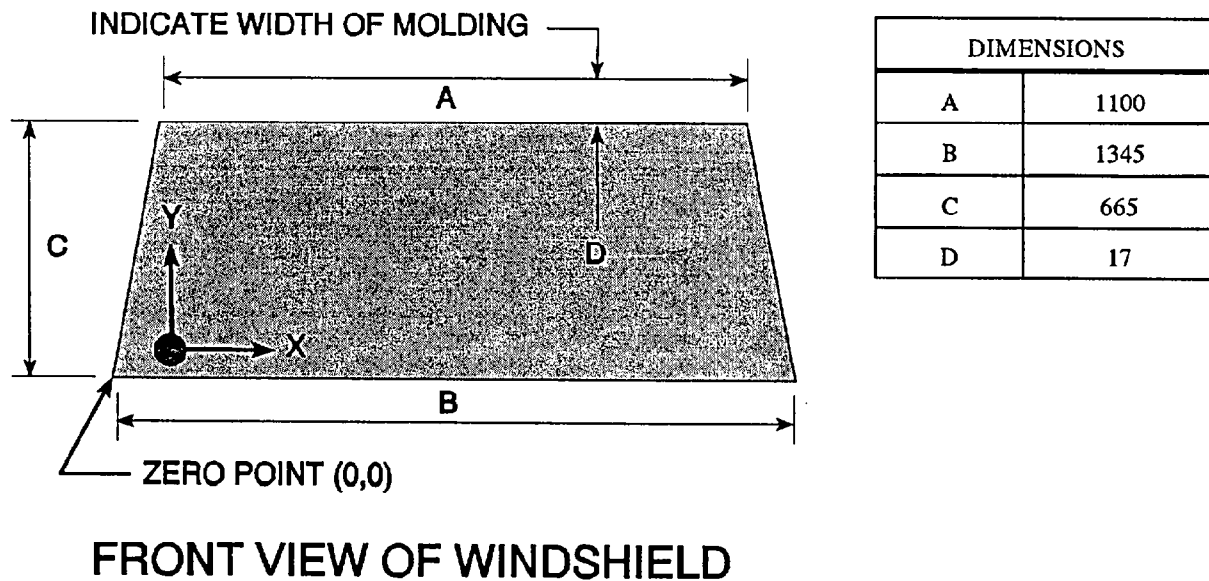
FMVSS 212 REQUIREMENTS:

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

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST(mm)	
RIGHT SIDE	1887.5	1887.5	100
LEFT SIDE	1887.5	1887.5	100
TOTAL	3,775	3,775	100

AREA OF RETENTION FAILURE:



FAILURE DETAILS: None

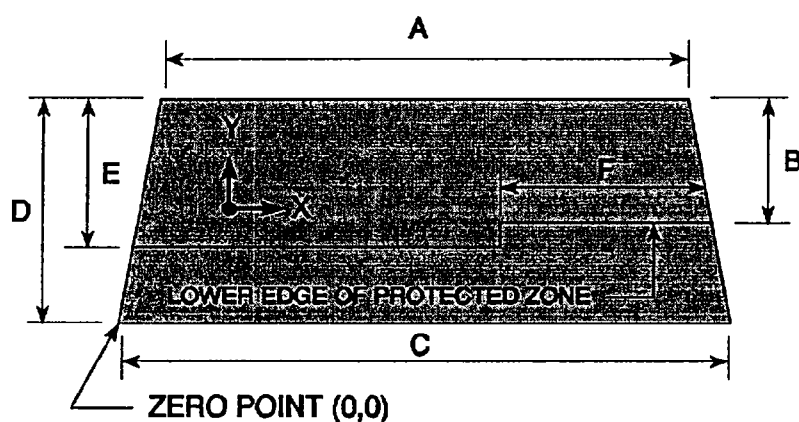
Figure 9

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

PROTECTED ZONE LOWER EDGE REQUIREMENT:

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

FMVSS 219 TEST DATA: (Dimensions in mm)



DIMENSIONS	
A	1100
B	455
C	1345
D	665
E	440
F	465

FRONT VIEW OF WINDSHIELD

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 1/4":

None

(Show location of penetration on the above sketch)

COORDINATES		
	X	Y
1.		
2.		
3.		
4.		

Table 9

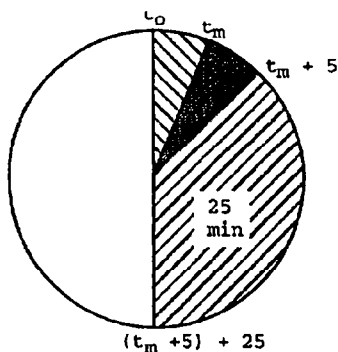
FMVSS NO. 301-75 "FUEL SYSTEM INTEGRITY" POST IMPACT TEST DATA

TEST VEHICLE NHTSA No.: MS0502 TEST DATE: February 8, 1995
VEHICLE MAKE/MODEL: 1995 Suzuki Sidekick

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

=====

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

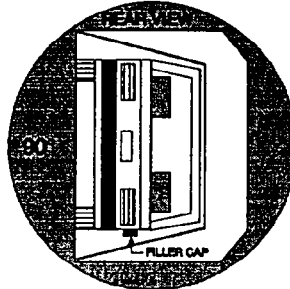
FUEL SPILLAGE MEASUREMENT:

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

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

SOLVENT SPILLAGE DETAILS: None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:Vehicle NHTSA ID No.
MS0502I.DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)2 minutes 20 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds**TOTAL**7 minutes 20 seconds

Next whole minute interval

8 minutes 00 secondsII.FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

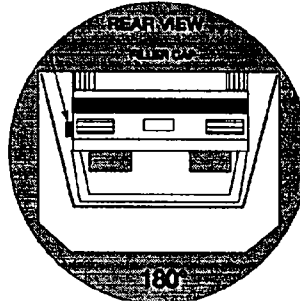
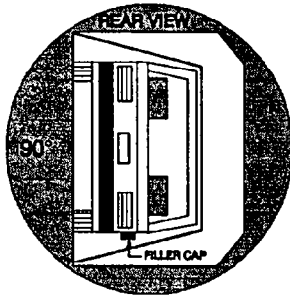
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S): None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:Vehicle NHTSA ID No.
MS0502I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)

2	minutes	30	seconds
---	---------	----	---------

FMVSS 301 Position Hold Time +

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

TOTAL

7	minutes	30	seconds
---	---------	----	---------

Next whole minute interval

8	minutes	00	seconds
---	---------	----	---------

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

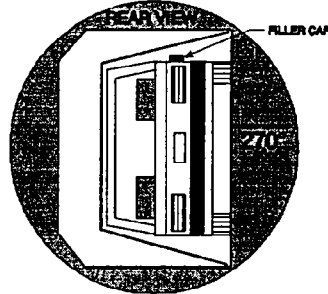
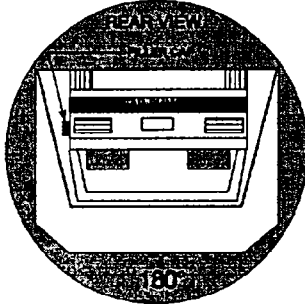
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S): None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:Vehicle NHTSA ID No.
MS0502I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)2

minutes

40

seconds

FMVSS 301 Position Hold Time +

5

minutes

00

seconds

TOTAL7

minutes

40

seconds

Next whole minute interval

8

minutes

00

seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

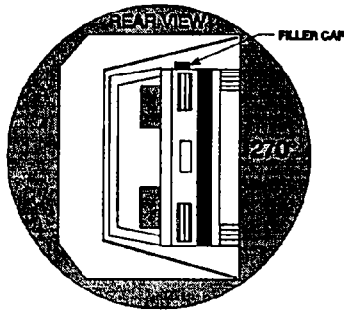
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S): None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET**TEST PHASE:**Vehicle NHTSA ID No.
MS0502**I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:**Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)

2	minutes	40	seconds
---	---------	----	---------

FMVSS 301 Position Hold Time +

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

TOTAL

7	minutes	40	seconds
---	---------	----	---------

Next whole minute interval

8	minutes	00	seconds
---	---------	----	---------

II. FMVSS 301 REQUIREMENTS:**(1) Time Period**

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S): None

Appendix A
PHOTOGRAPHS

PHOTOGRAPHS

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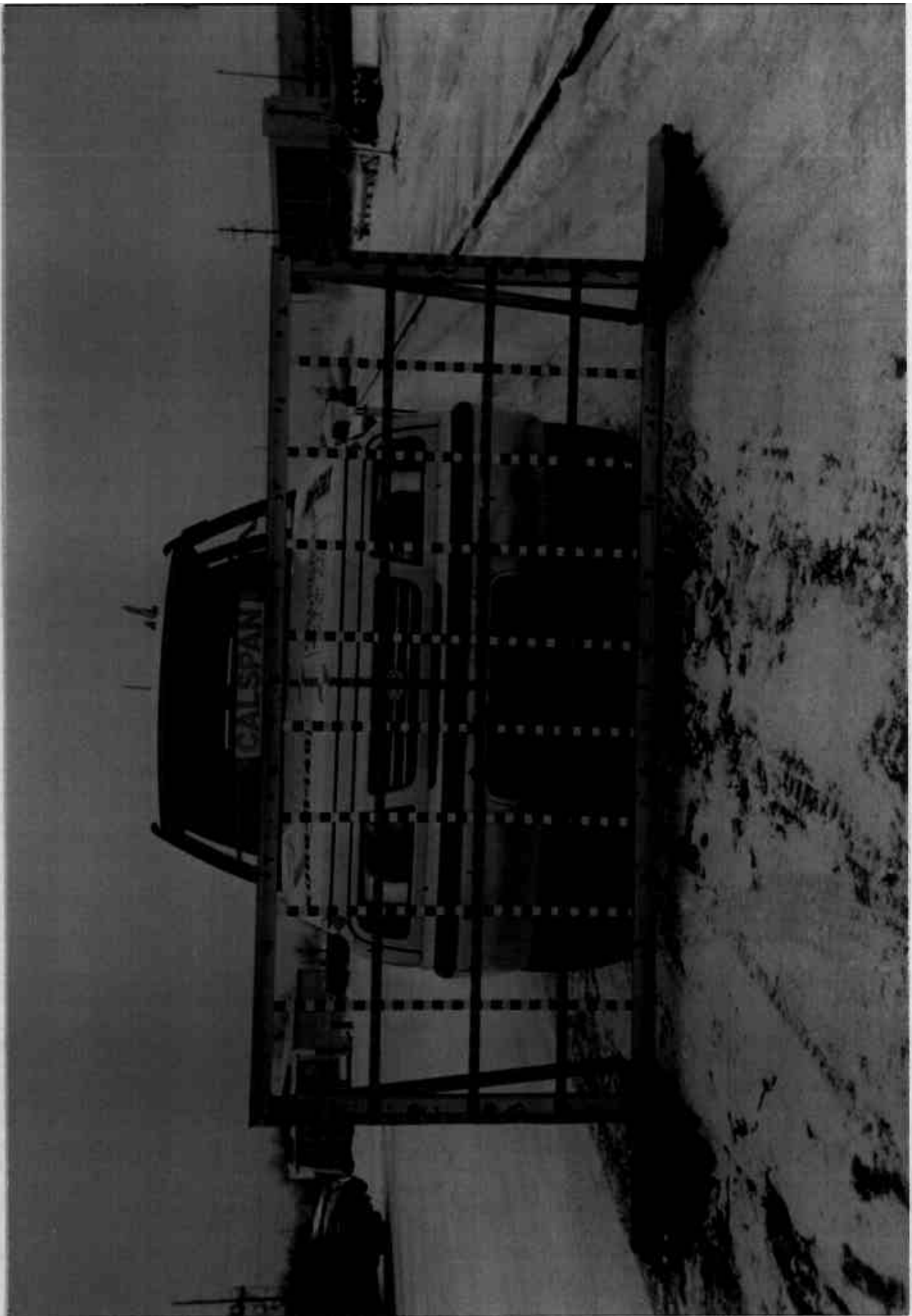


Figure A-1 LOAD CELL LOCATIONS



Figure A-2 PRE-TEST FRONT VIEW

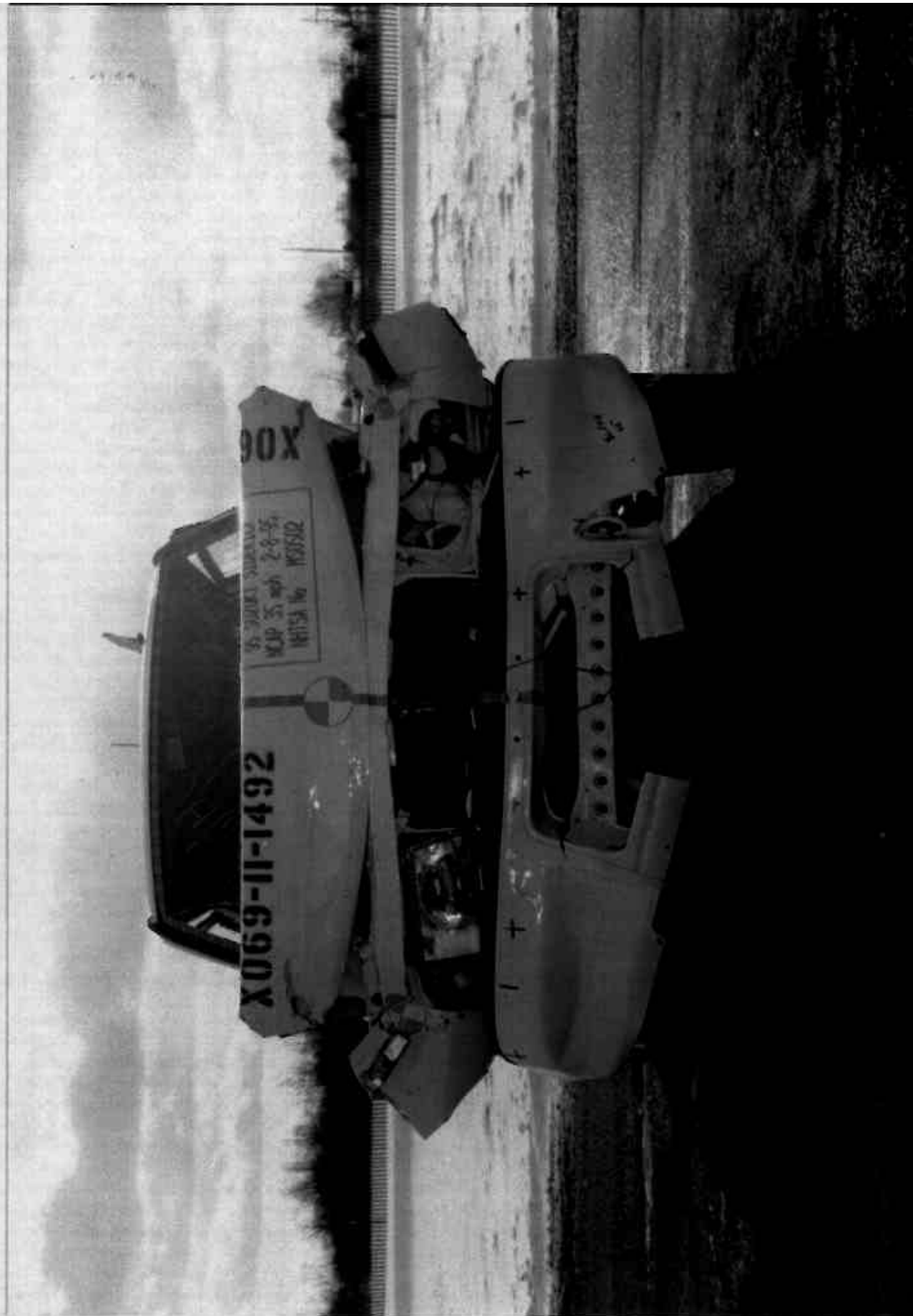


Figure A-3 POST-TEST FRONT VIEW

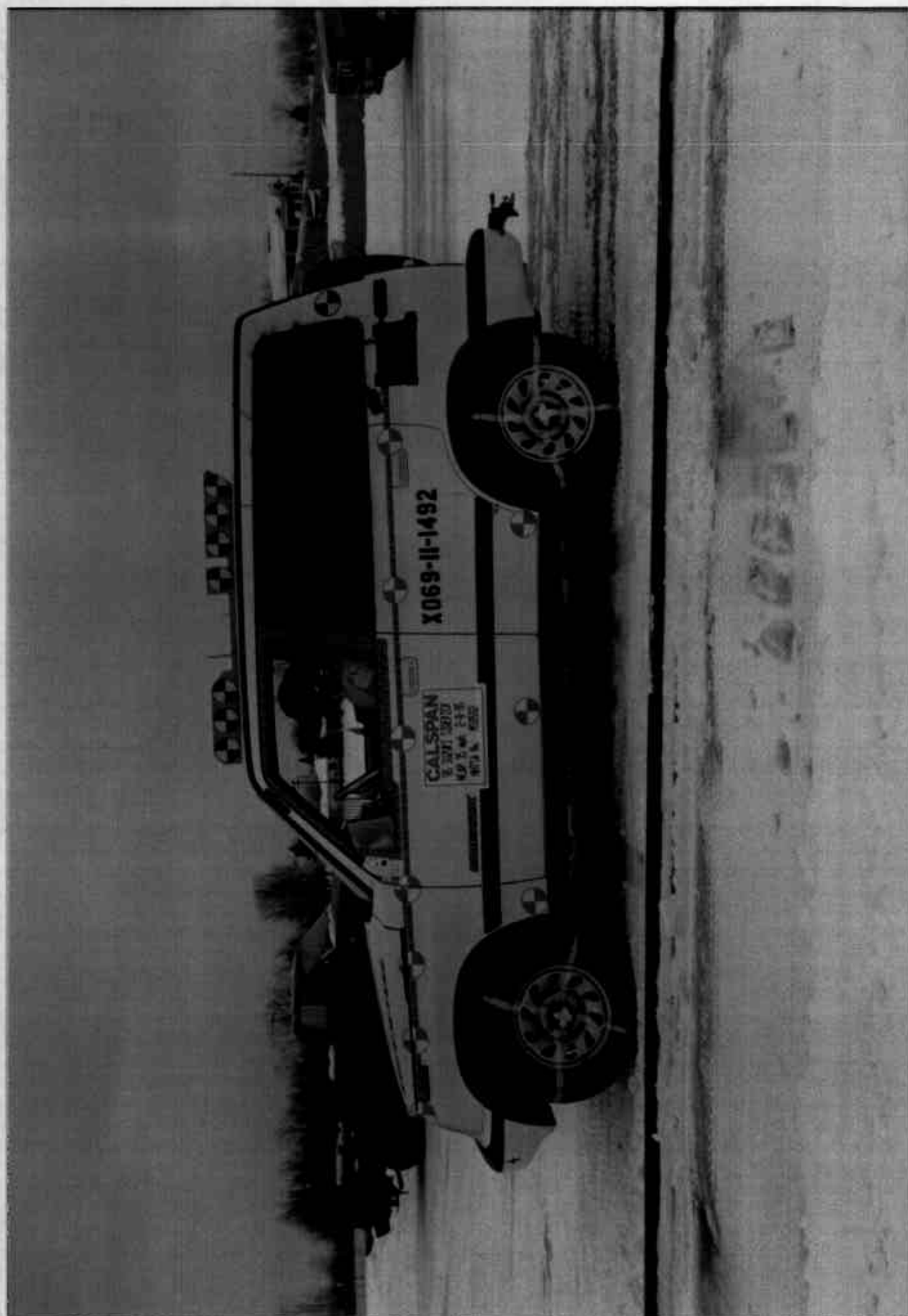


Figure A-4 PRE-TEST LEFT SIDE VIEW



A-7

8227-11

Figure A-5 POST-TEST LEFT SIDE VIEW

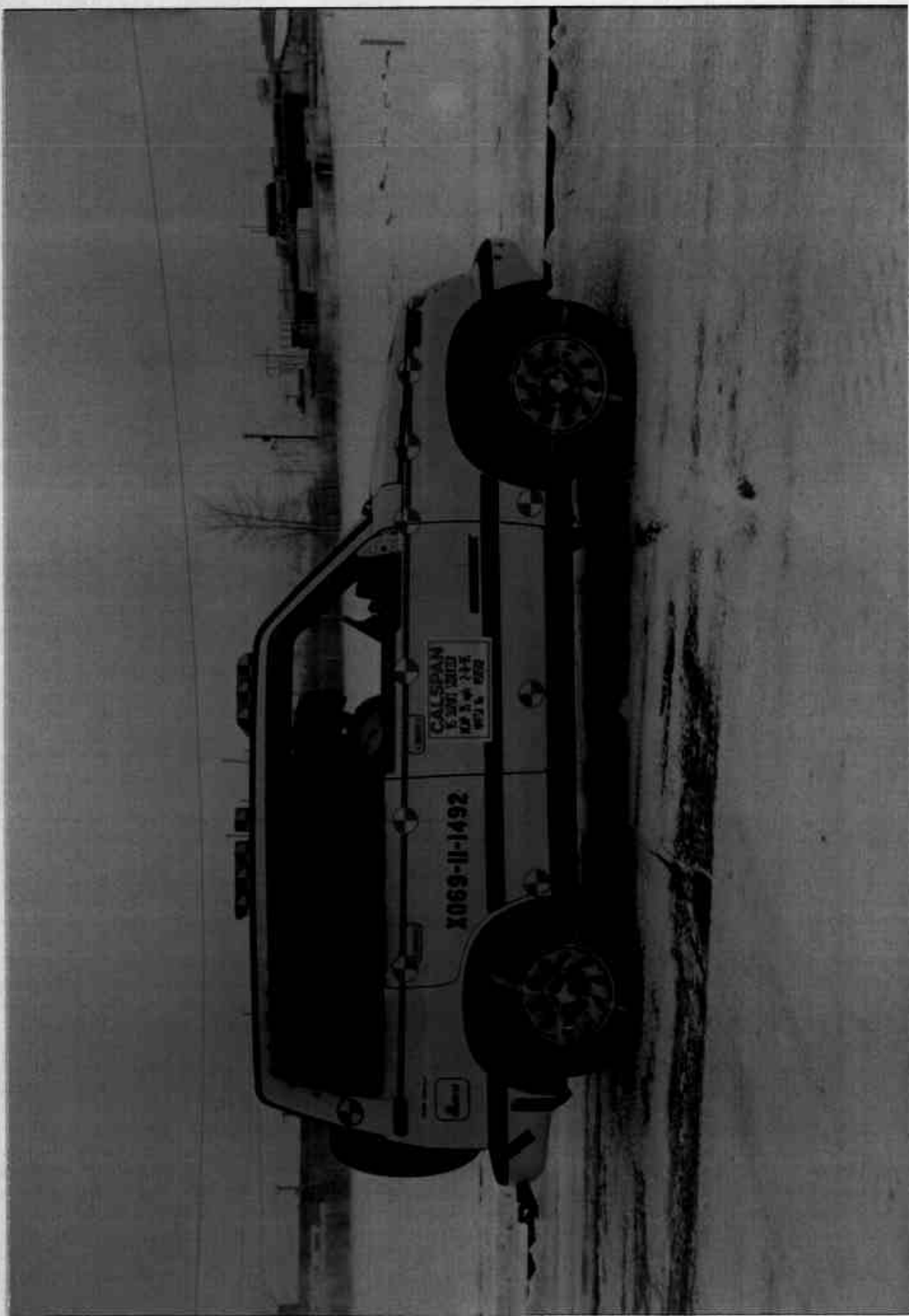


Figure A-6 PRE-TEST RIGHT SIDE VIEW



Figure A-7 POST-TEST RIGHT SIDE VIEW

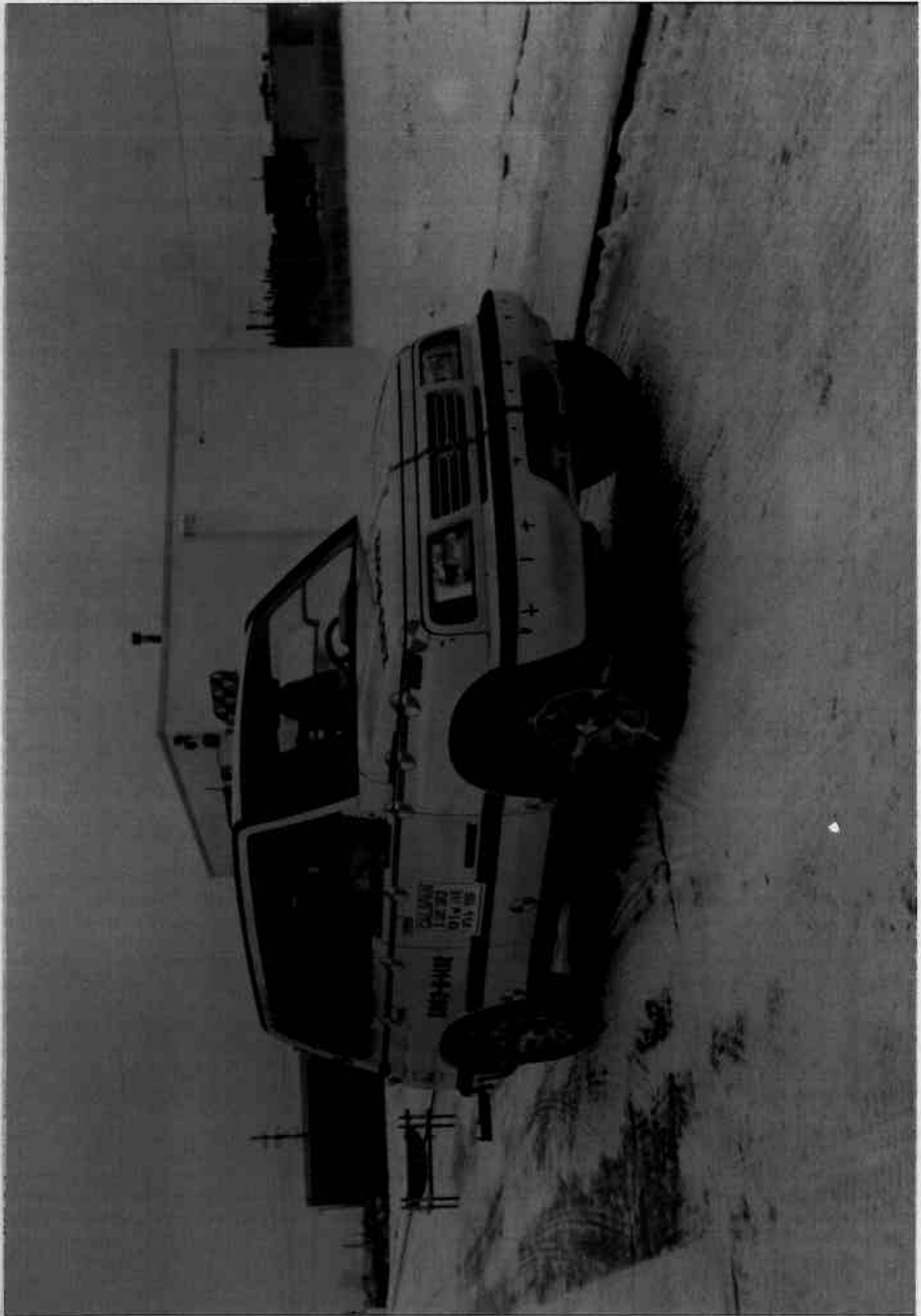


Figure A-8 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

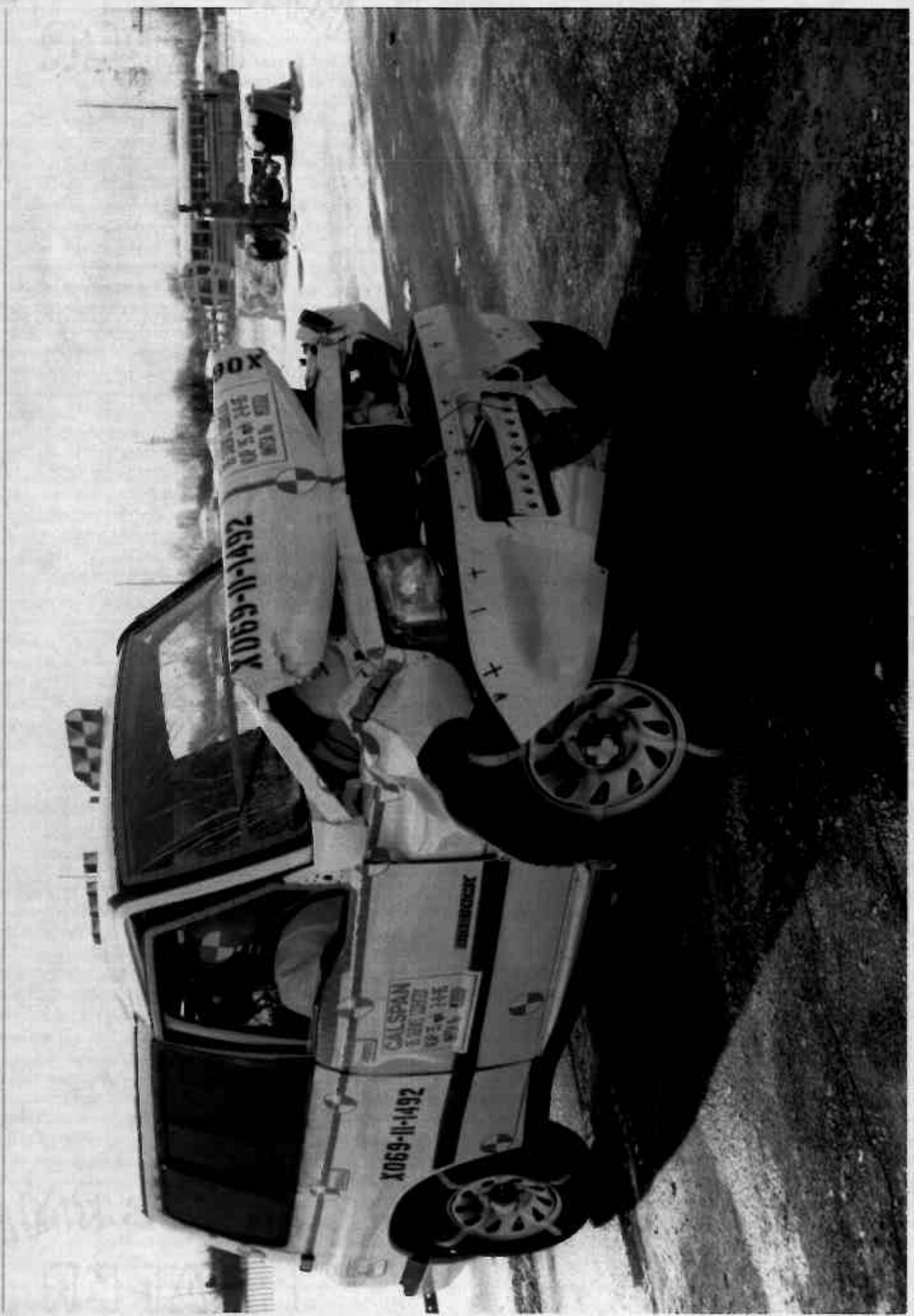


Figure A-9 POST-TEST RIGHT FRONT THREE-QUARTER VIEW



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



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

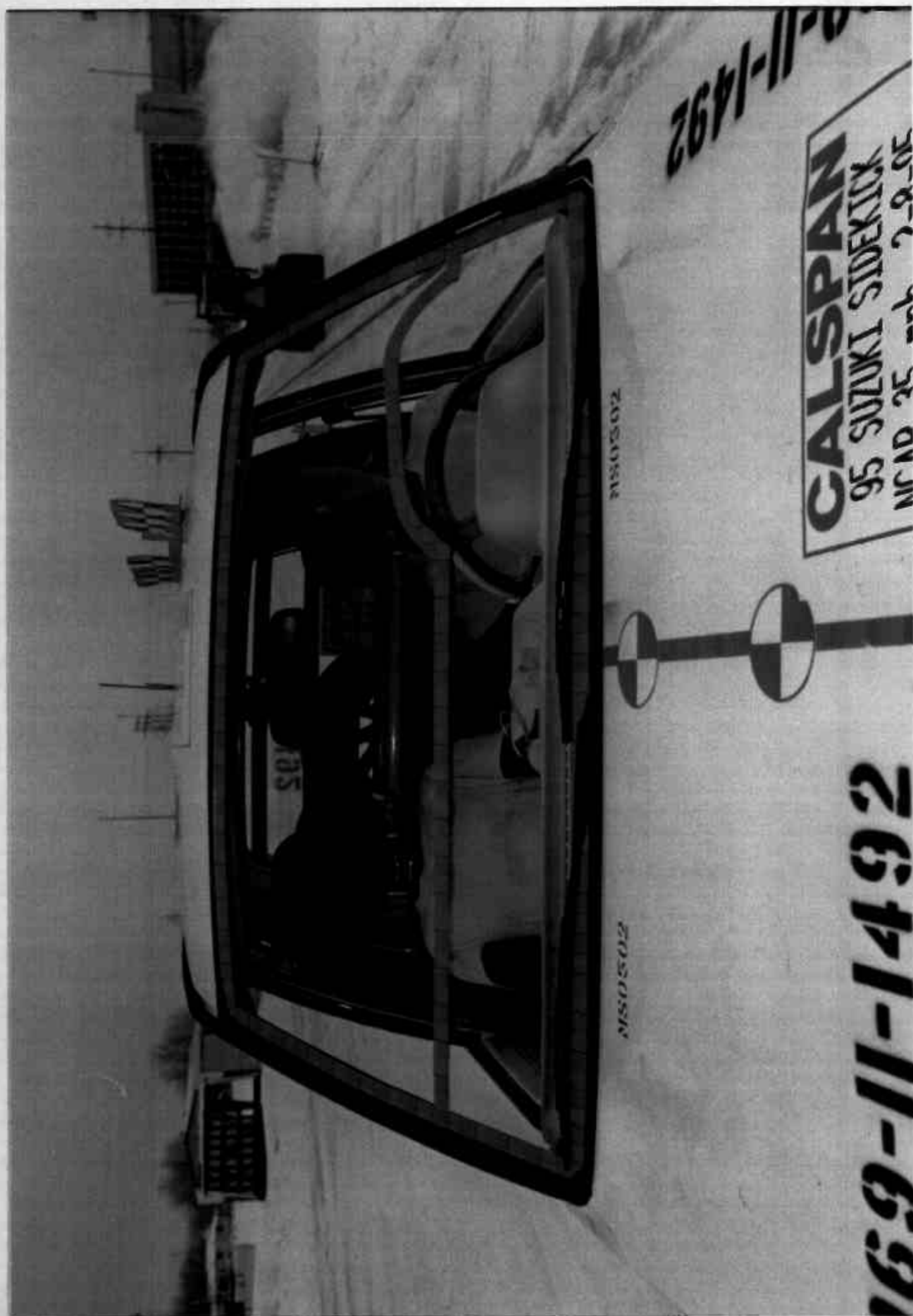


Figure A-12 PRE-TEST WINDSHIELD VIEW



Figure A-13 POST-TEST WINDSHIELD VIEW

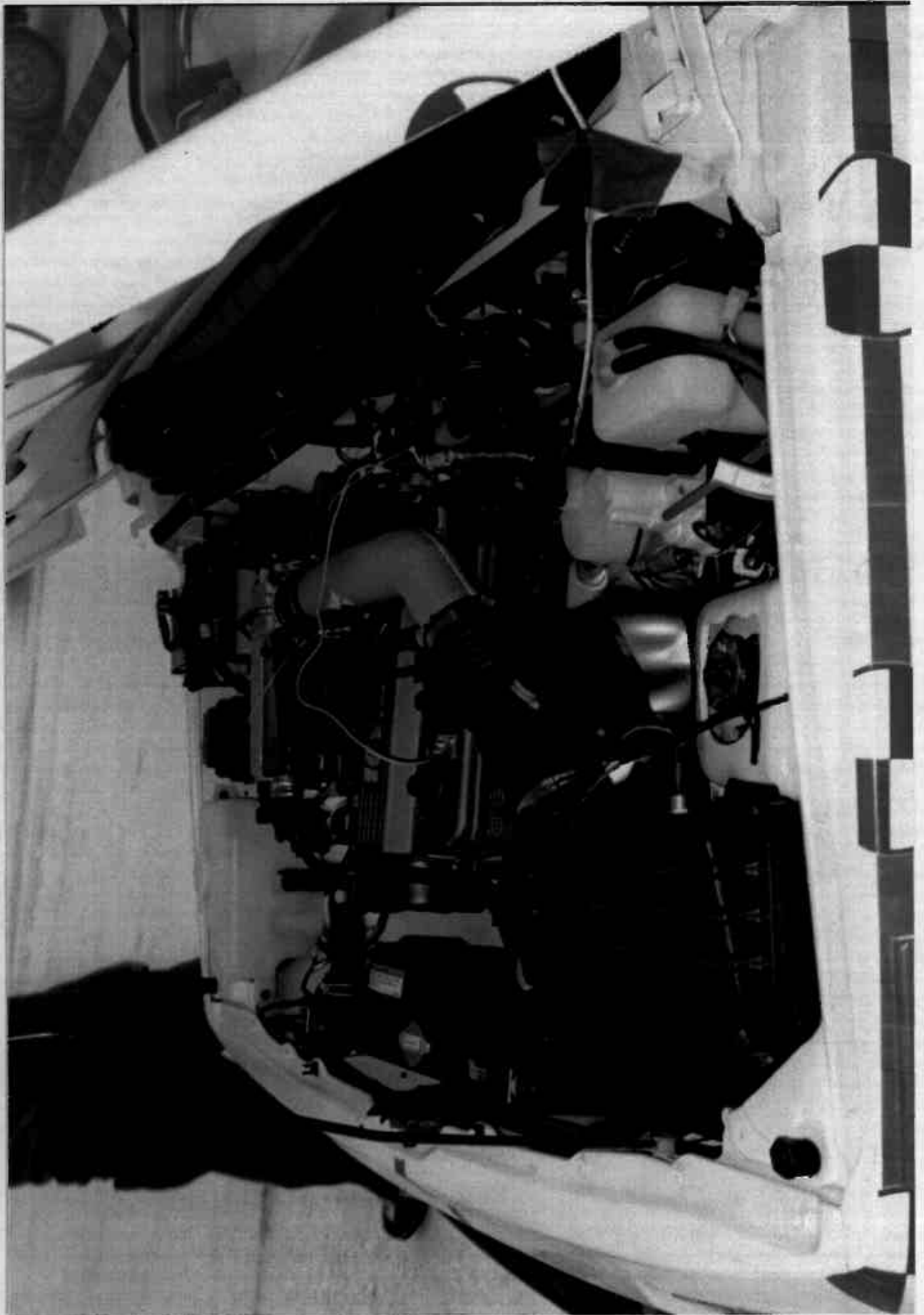


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

13.48 ORANGE



Figure A-15 FUEL FILLER CAP



Figure A-16 PRE-TEST FRONT UNDERBODY VIEW

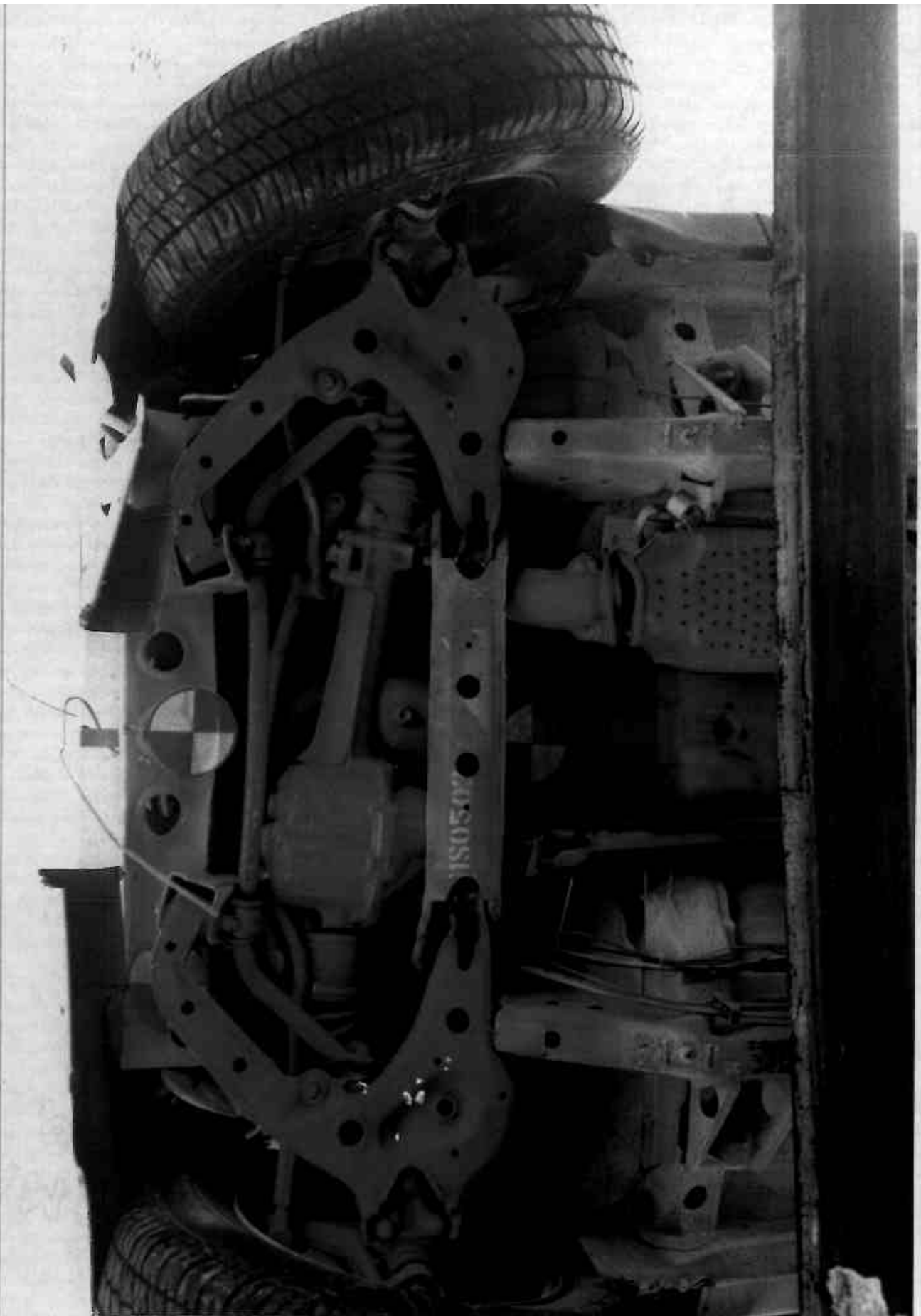


Figure A-17 POST-TEST FRONT UNDERBODY VIEW



Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

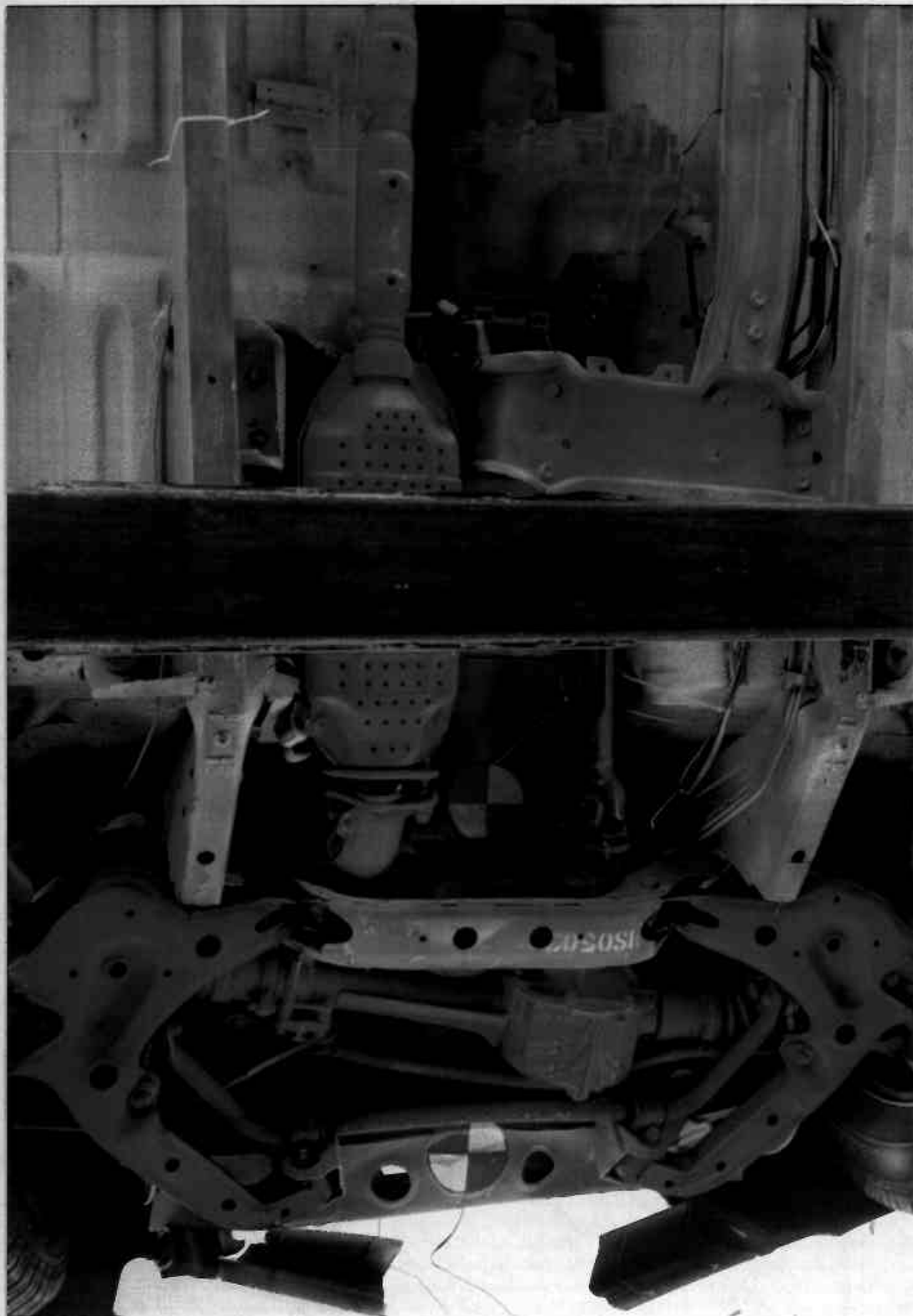


Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

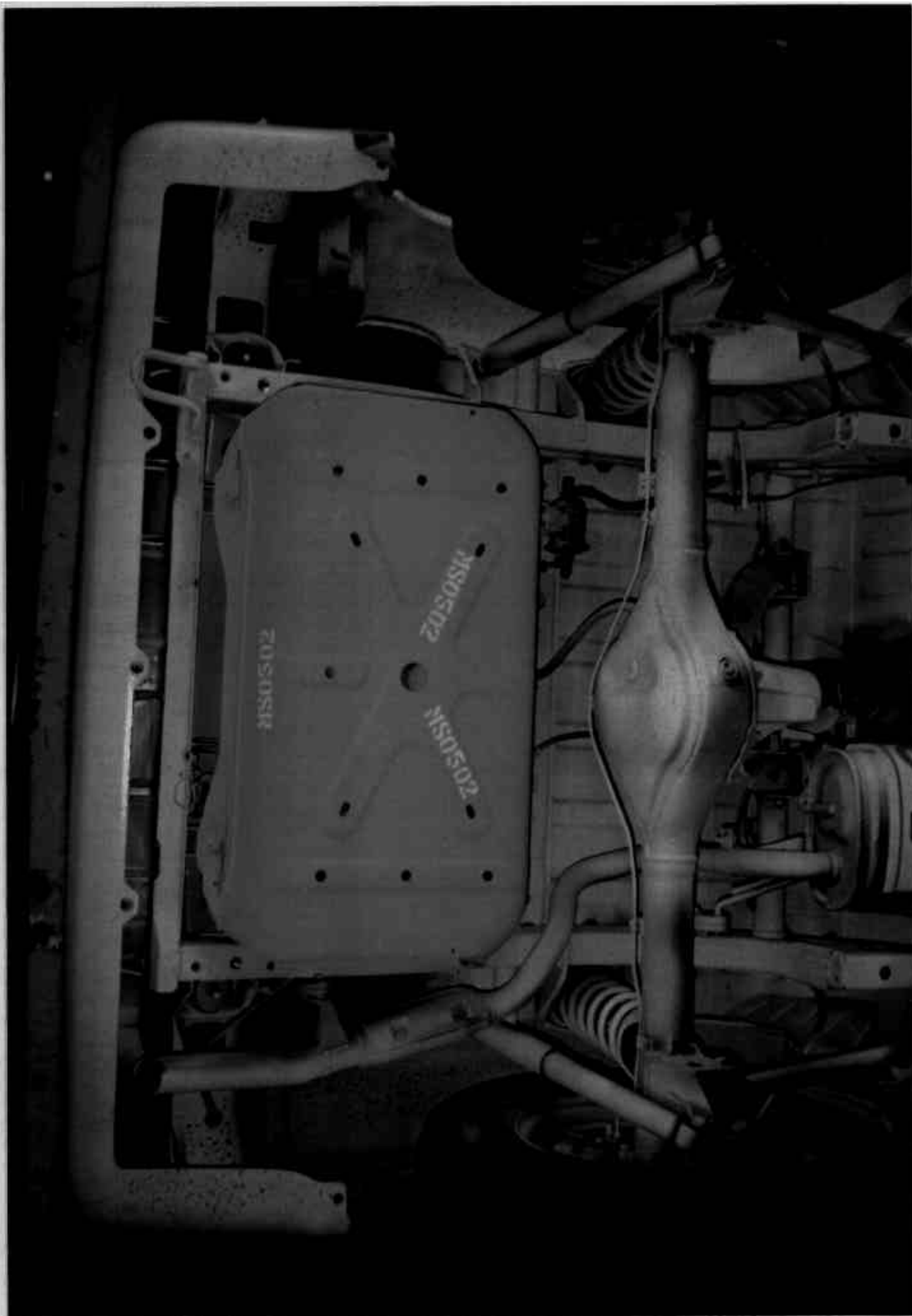


Figure A-20 PRE-TEST REAR UNDERBODY VIEW



Figure A-21 POST-TEST REAR UNDERBODY VIEW



Figure A-22 PRE-TEST DRIVER POSITION VIEW



Figure A-23 POST-TEST DRIVER POSITION VIEW



Figure A-24 PRE-TEST PASSENGER POSITION VIEW



Figure A-25 POST-TEST PASSENGER POSITION VIEW



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



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



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

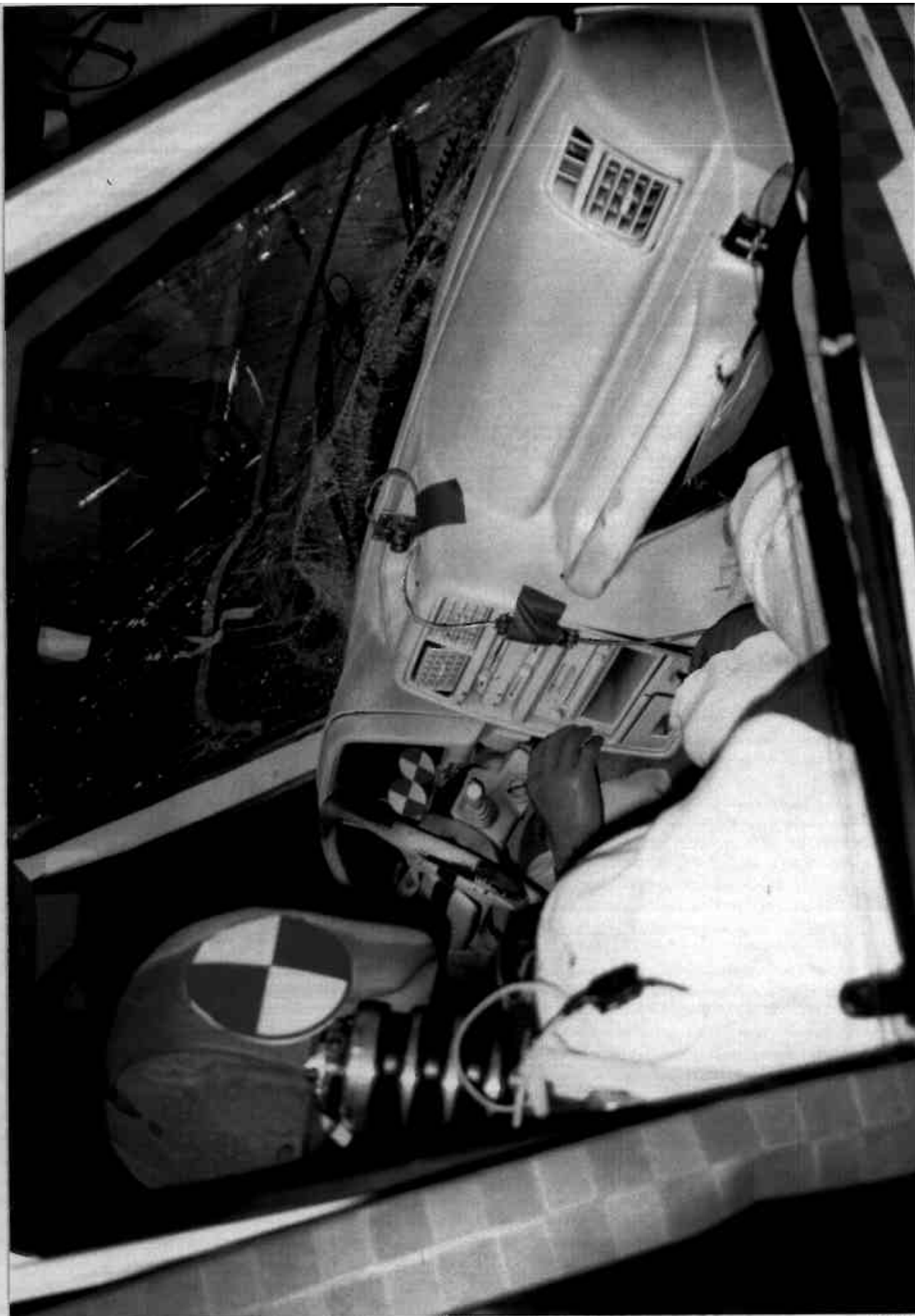


Figure A-29 POST-TEST PASSENGER DUMMY AND INTERIOR VIEW



Figure A-30 PRE-TEST DRIVER HEAD LOCATION



Figure A-31 PRE-TEST PASSENGER HEAD LOCATION



A-34

8227-11

Figure A-32 VEHICLE IMPACT

Appendix B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

TEST NO. MS0502

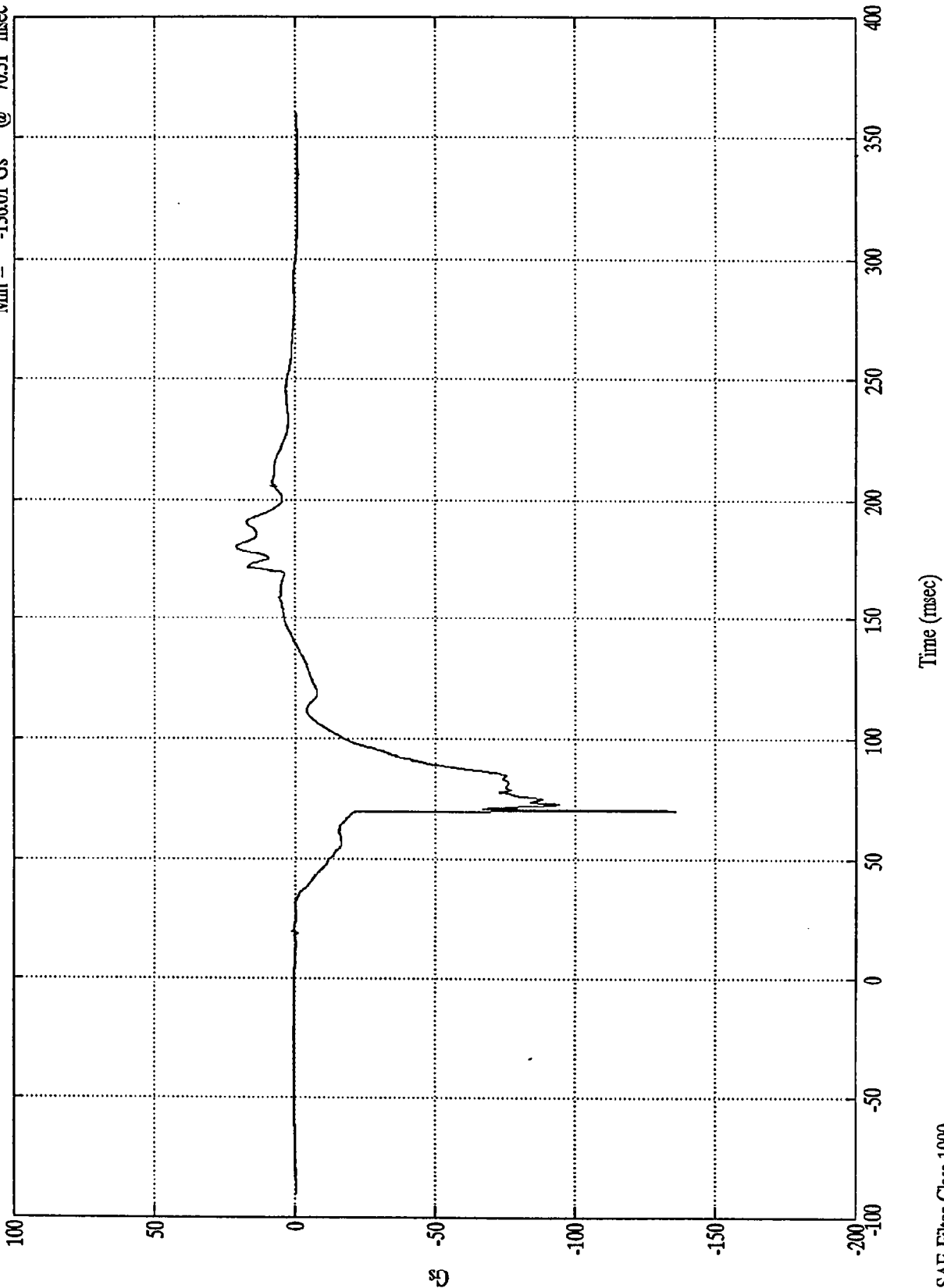
DUMMY DATA

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

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Head X

Max = 20.85 Gs @ 180.00 msec
Min = -136.01 Gs @ 70.31 msec

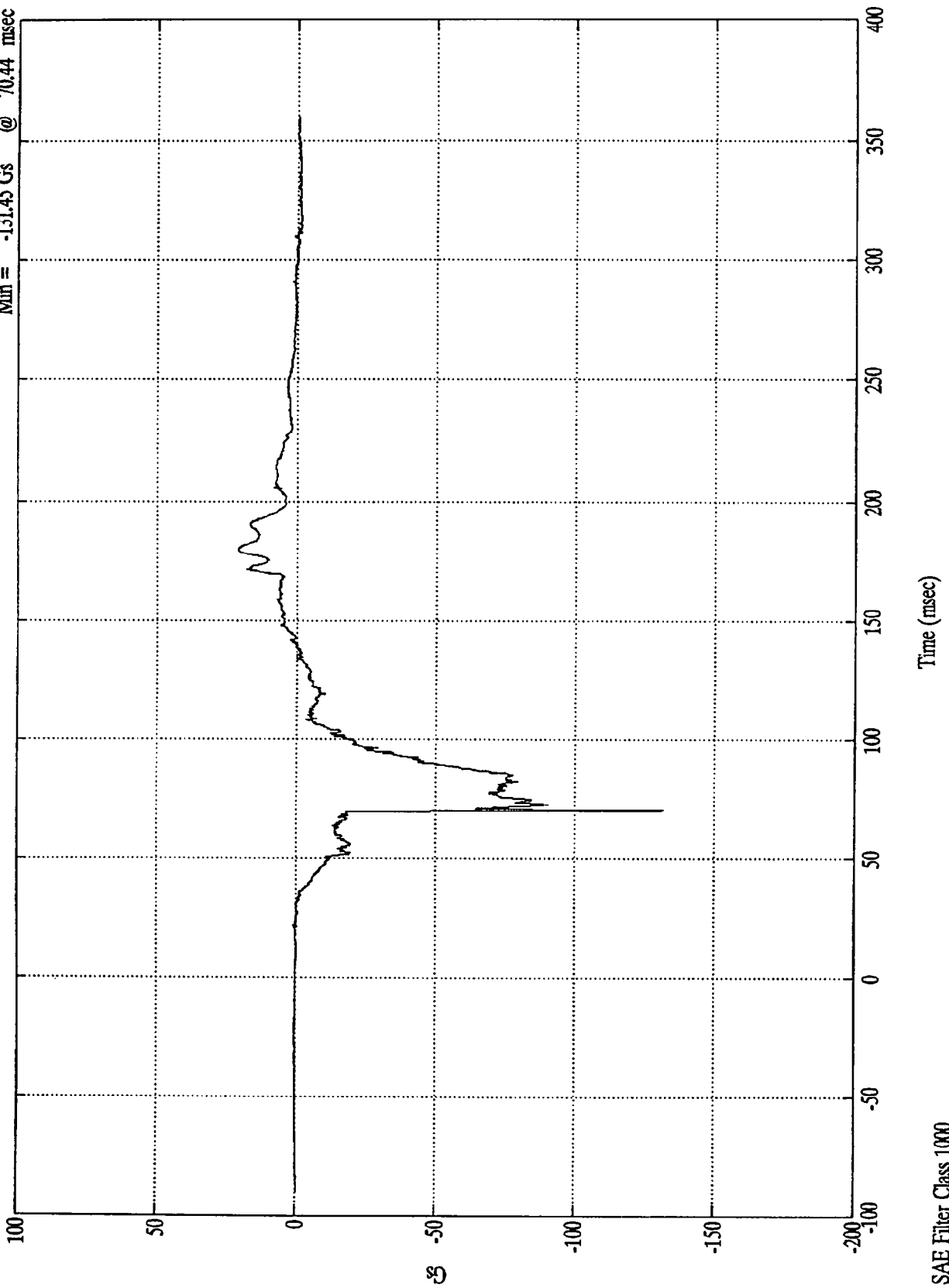


SAE Filter Class 1000

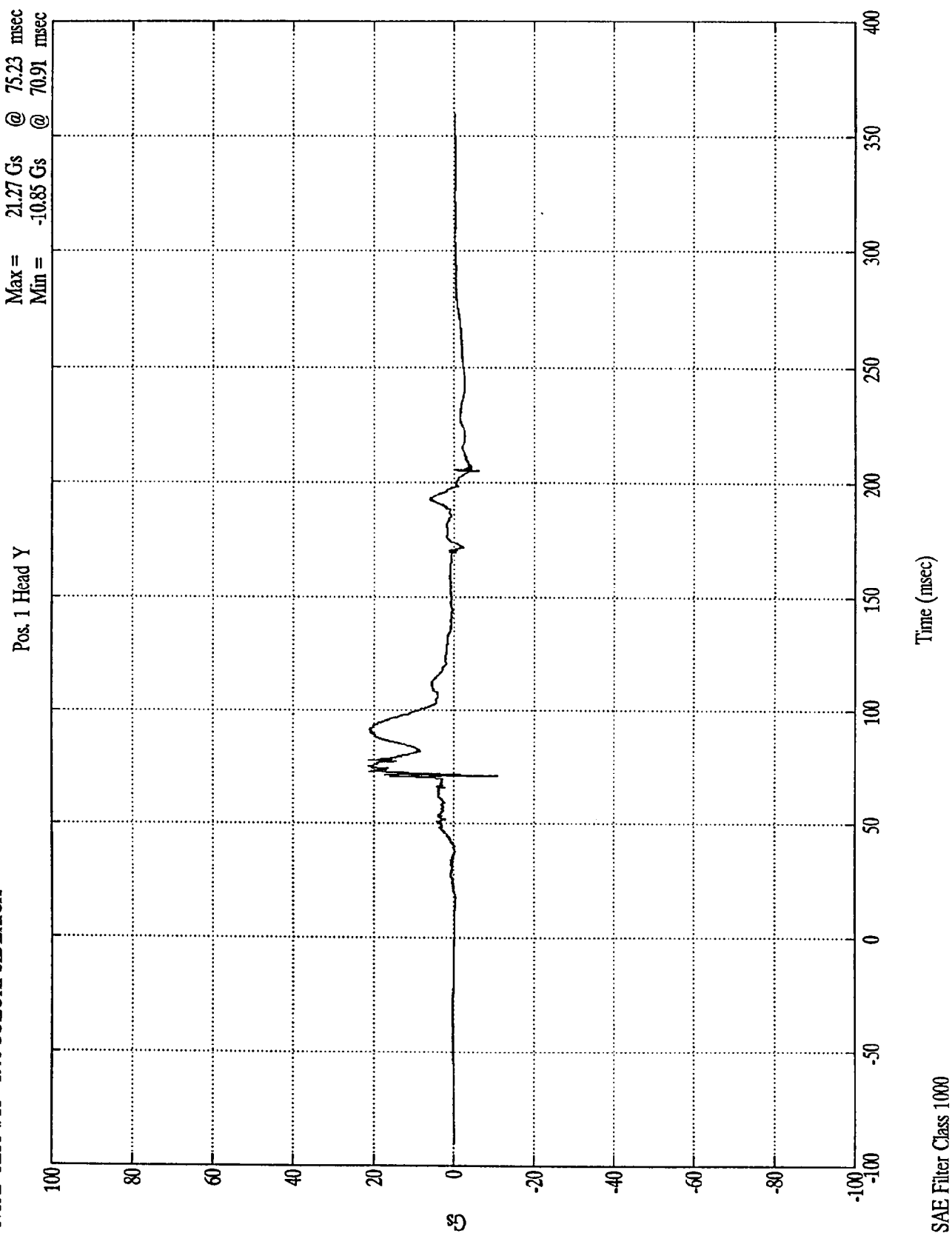
NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Head X(R)

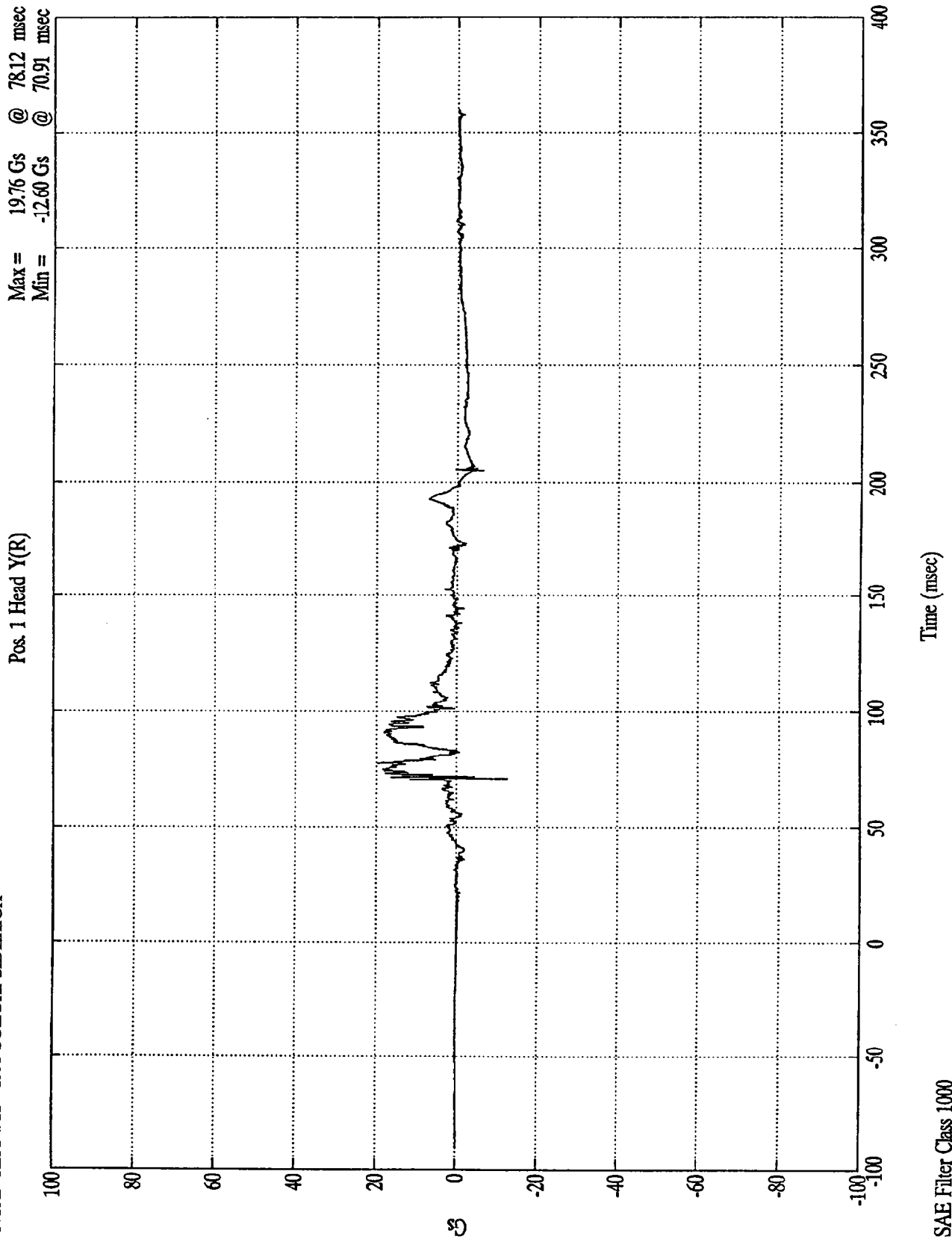
Max = 21.30 Gs @ 180.12 msec
Min = -131.45 Gs @ 70.44 msec



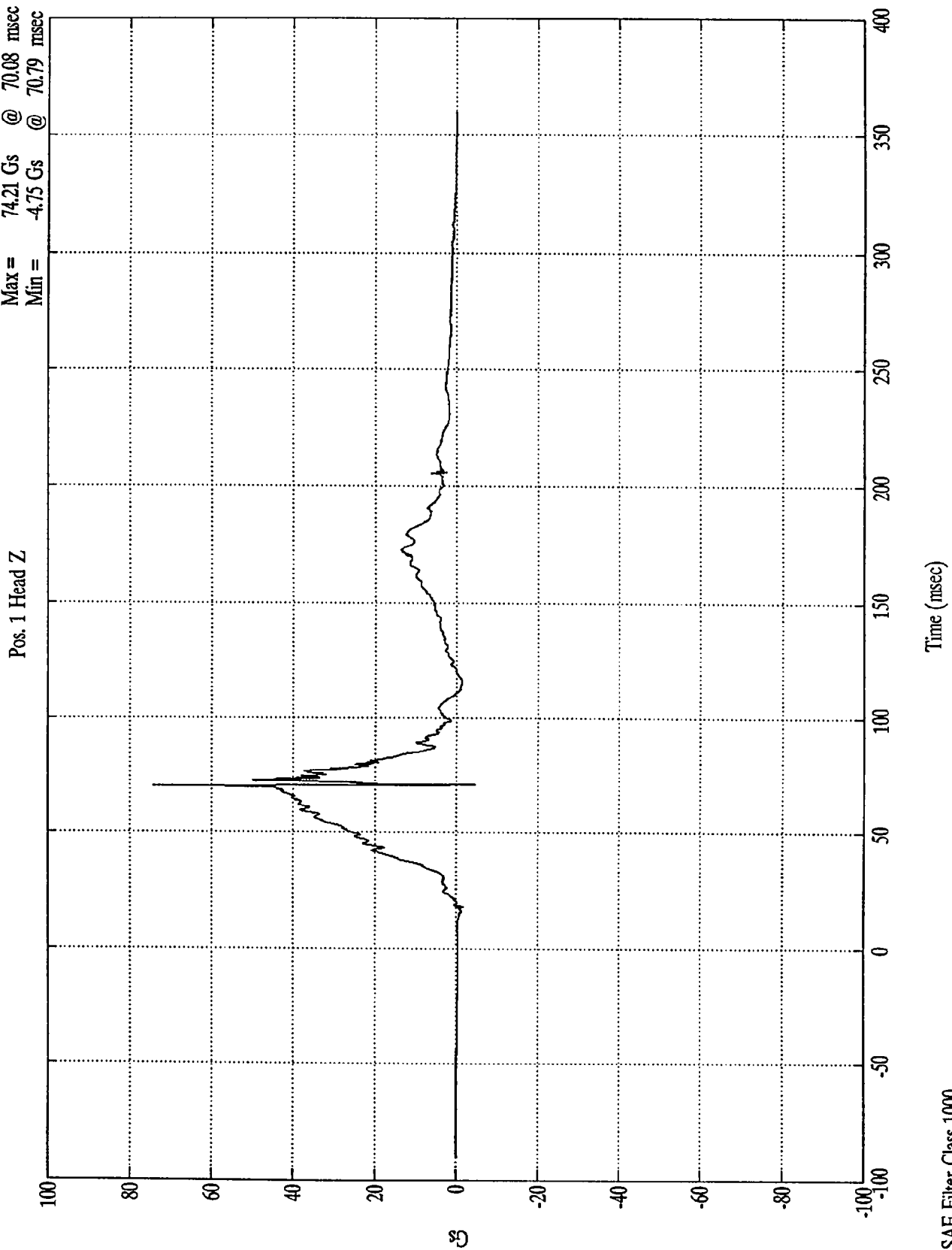
NCAP TEST #11 - 1995 SUZUKI SIDEKICK



NCAP TEST #11 - 1995 SUZUKI SIDEKICK



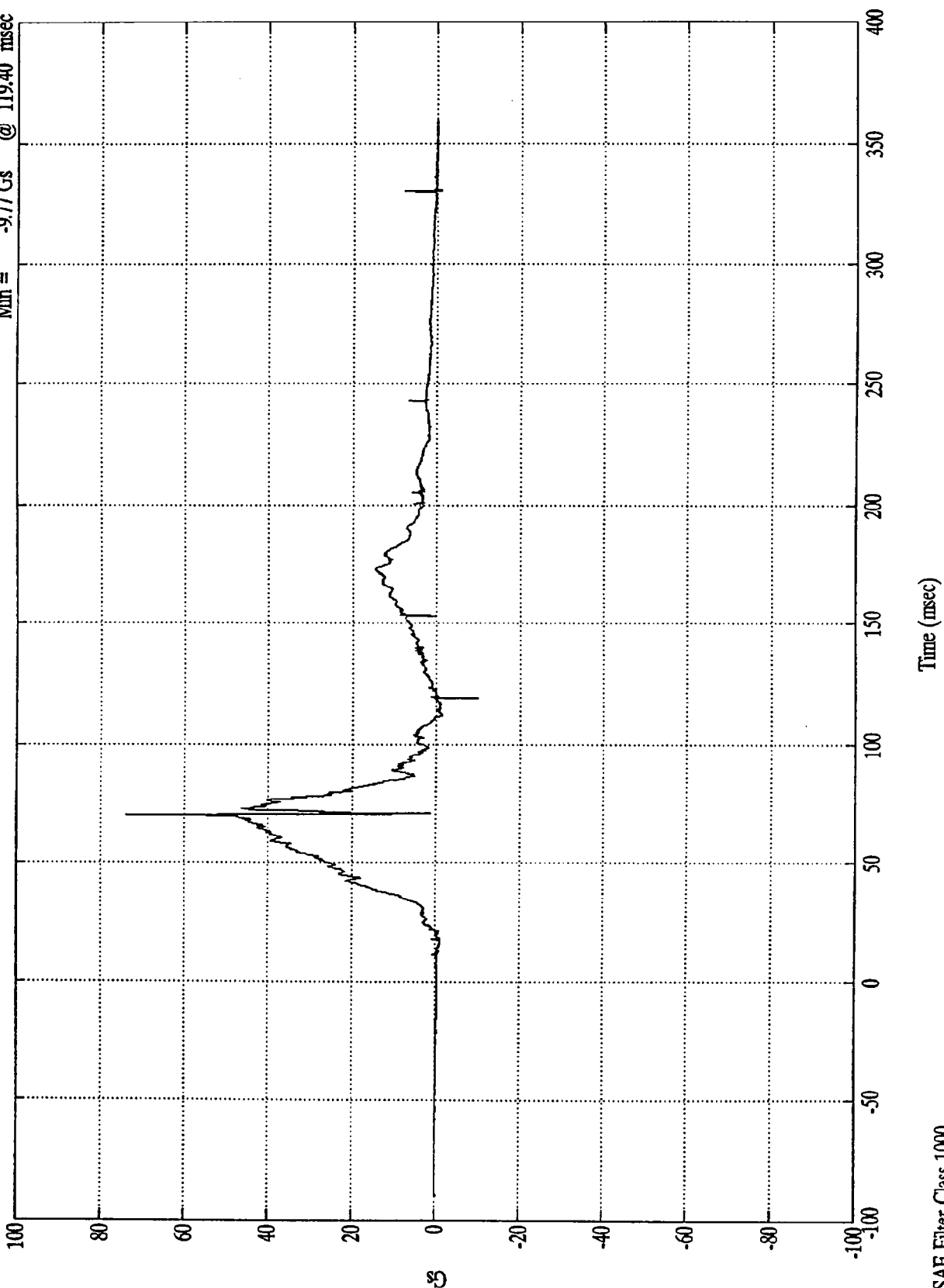
NCAP TEST #11 - 1995 SUZUKI SIDEKICK



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

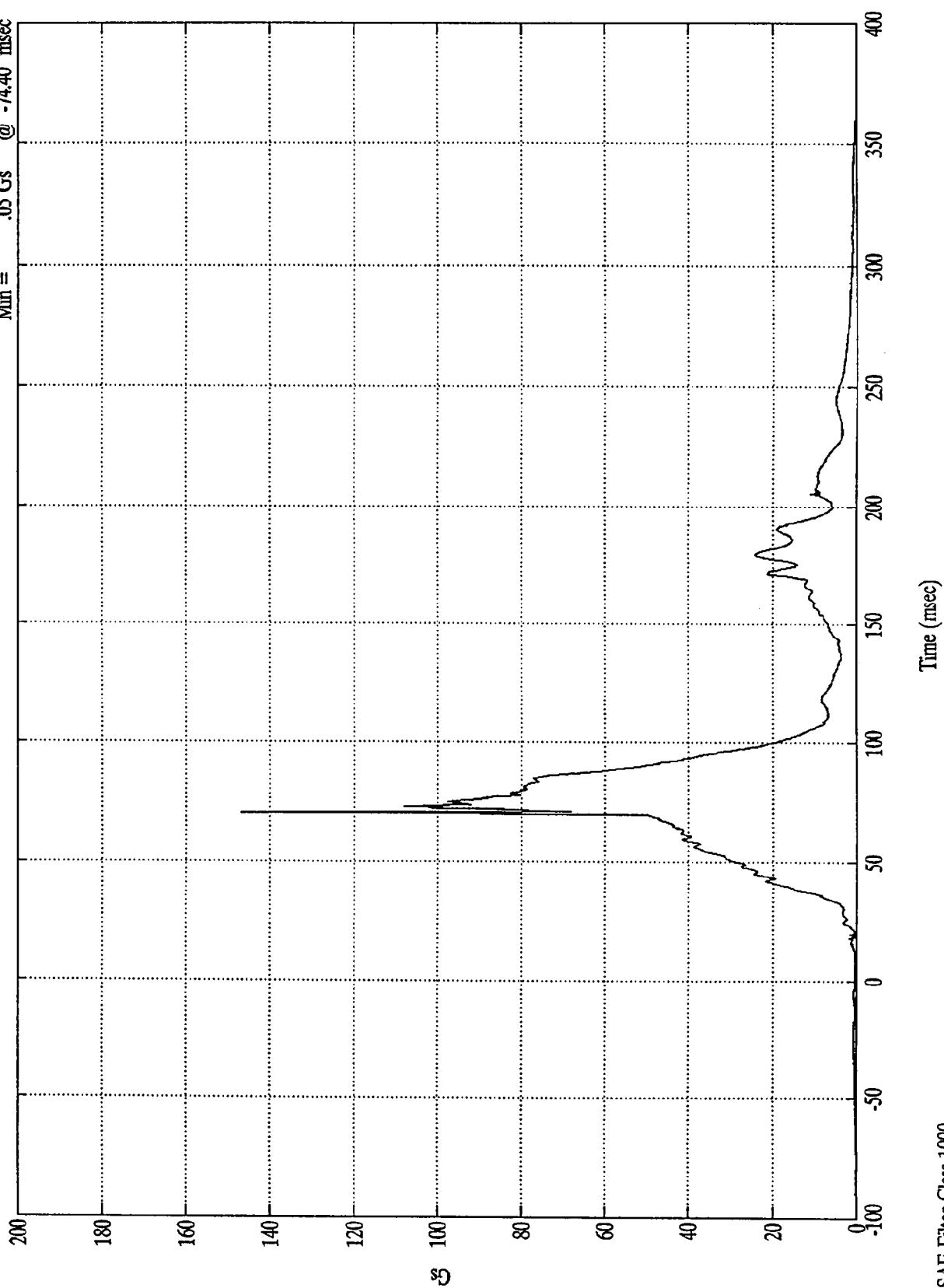
Pos. 1 Head Z(R)

Max = 73.96 Gs @ 70.20 msec
Min = -9.77 Gs @ 119.40 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

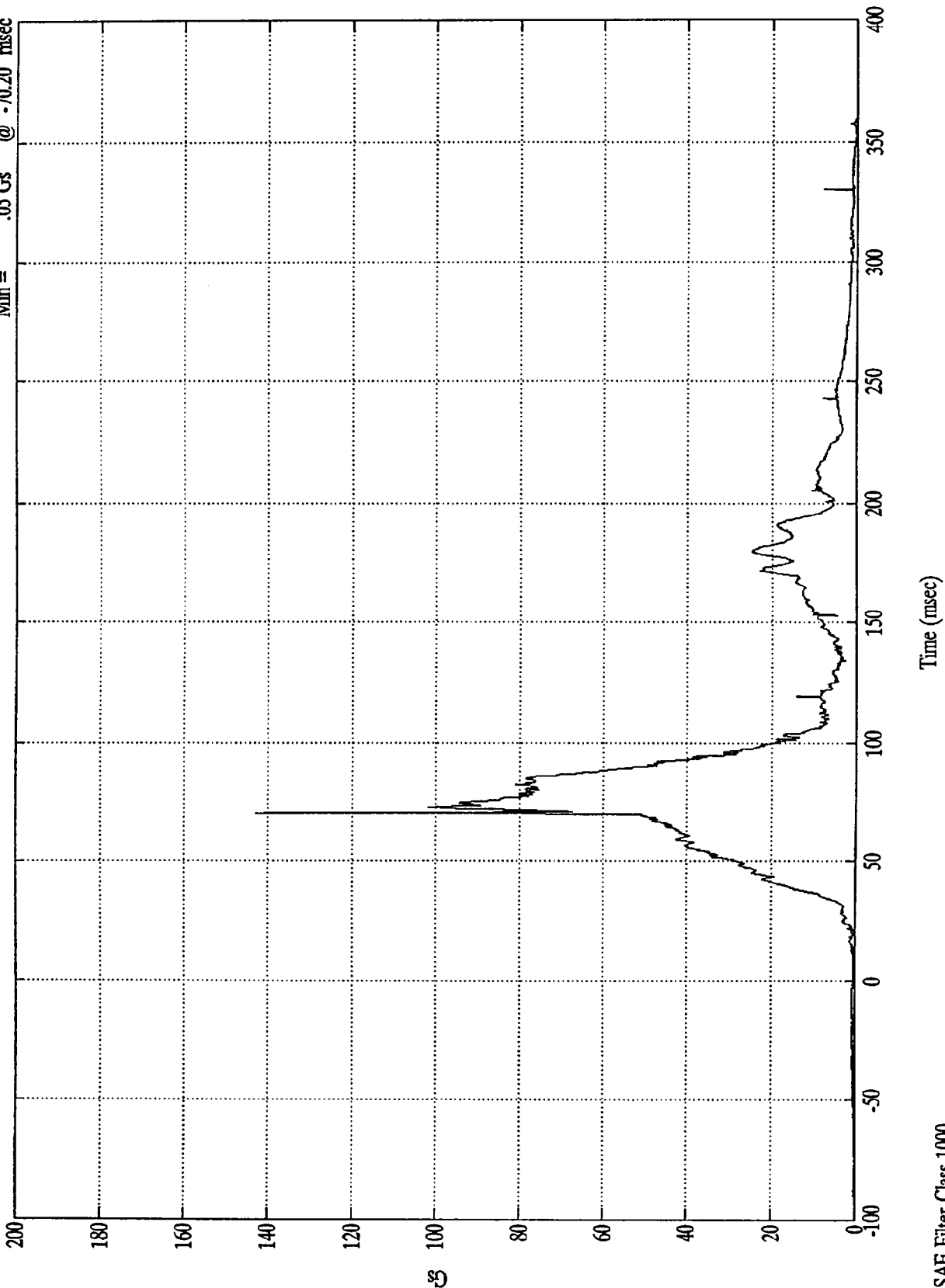
Pos. 1 Head Resultant
Max = 146.77 Gs @ 70.20 msec
Min = .05 Gs @ -74.40 msec



SAE Filter Class 1000

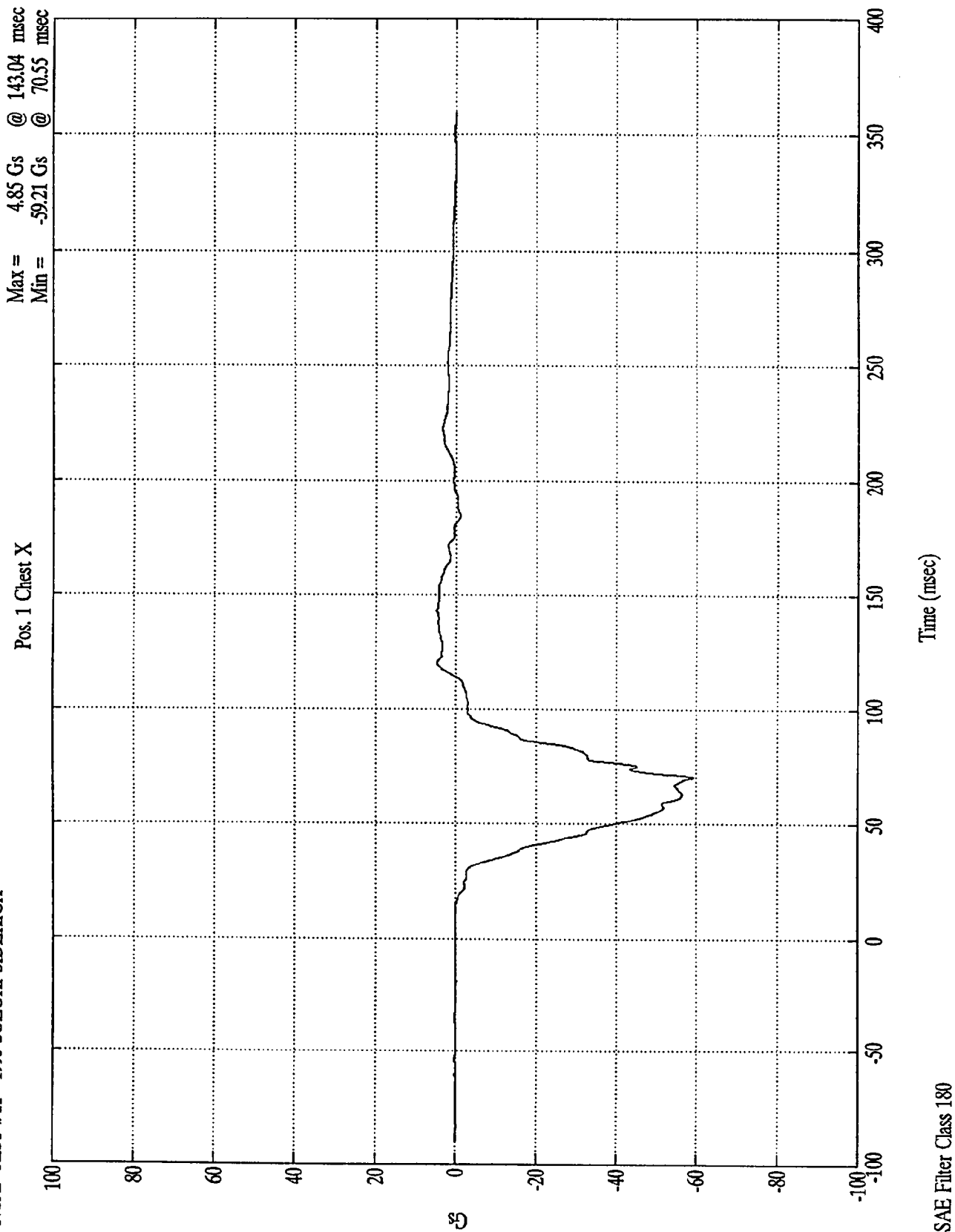
NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Head Resultant(R)
 Max = 143.07 Gs @ 70.31 msec
 Min = .05 Gs @ -70.20 msec



SAE Filter Class 1000

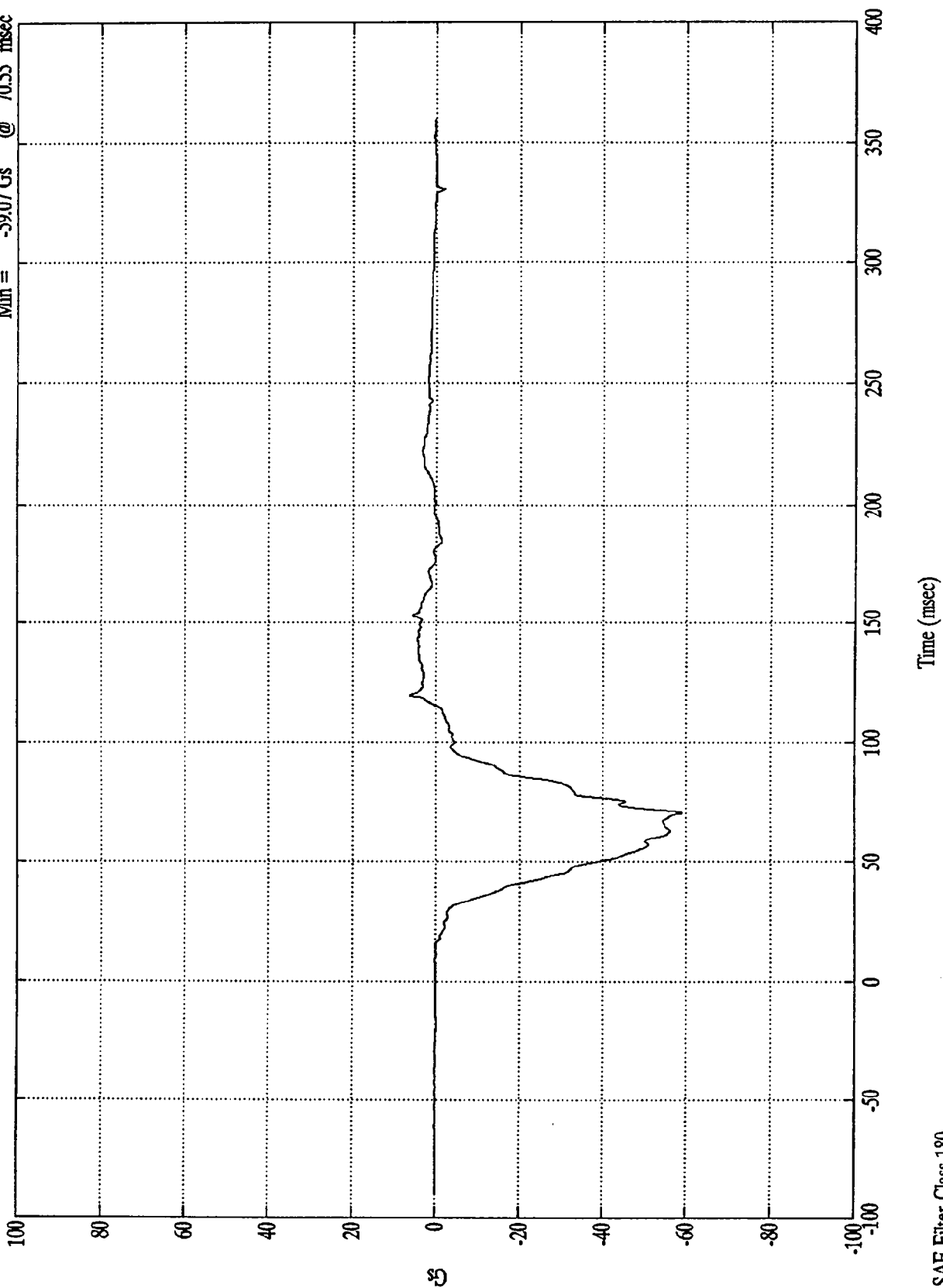
NCAP TEST #11 - 1995 SUZUKI SIDEKICK



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Chest X(R)

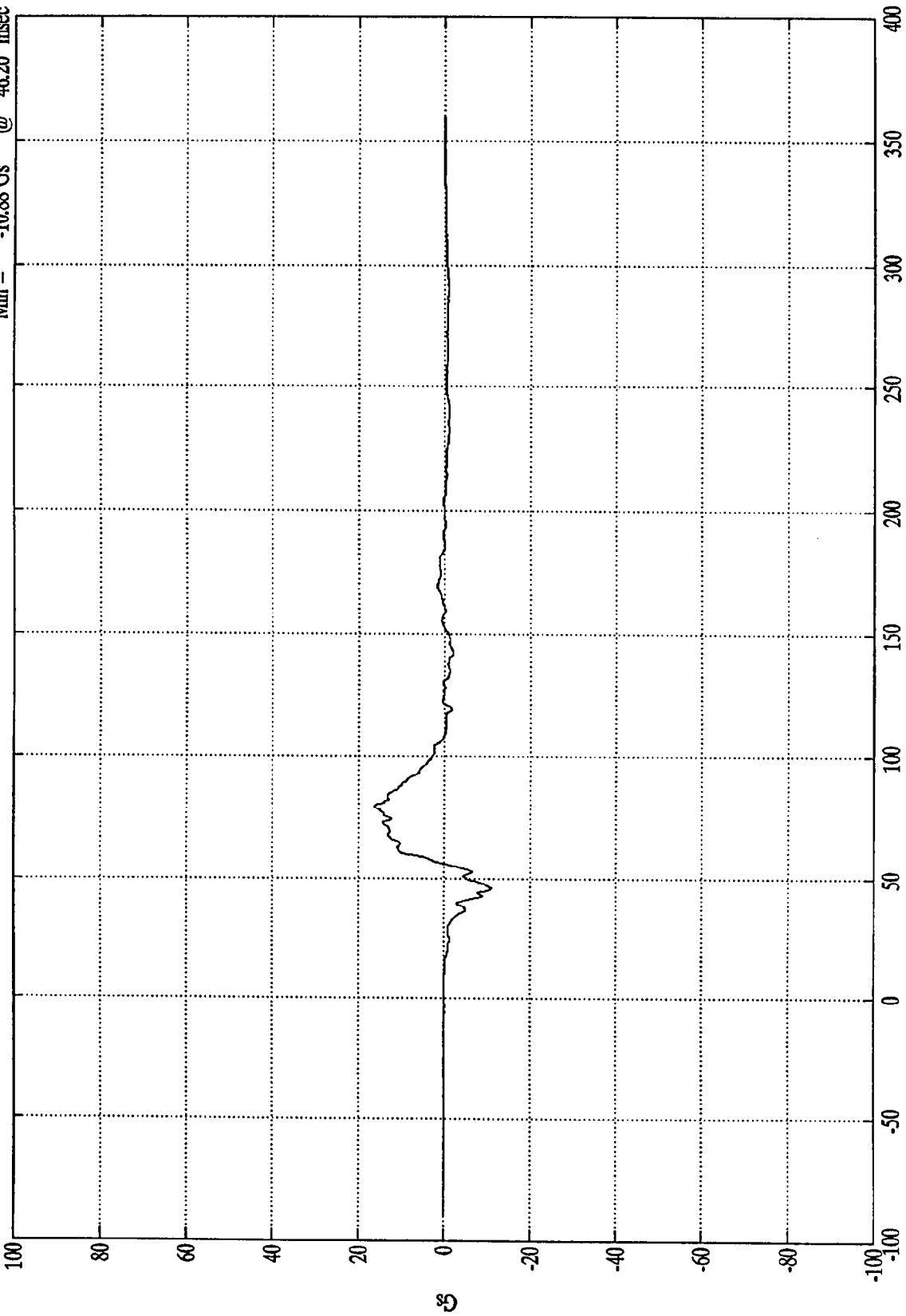
Max = 6.33 Gs @ 119.40 msec
Min = -59.07 Gs @ 70.55 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 16.43 Gs @ 79.08 msec
Min = -10.88 Gs @ 46.20 msec

Pos. 1 Chest Y



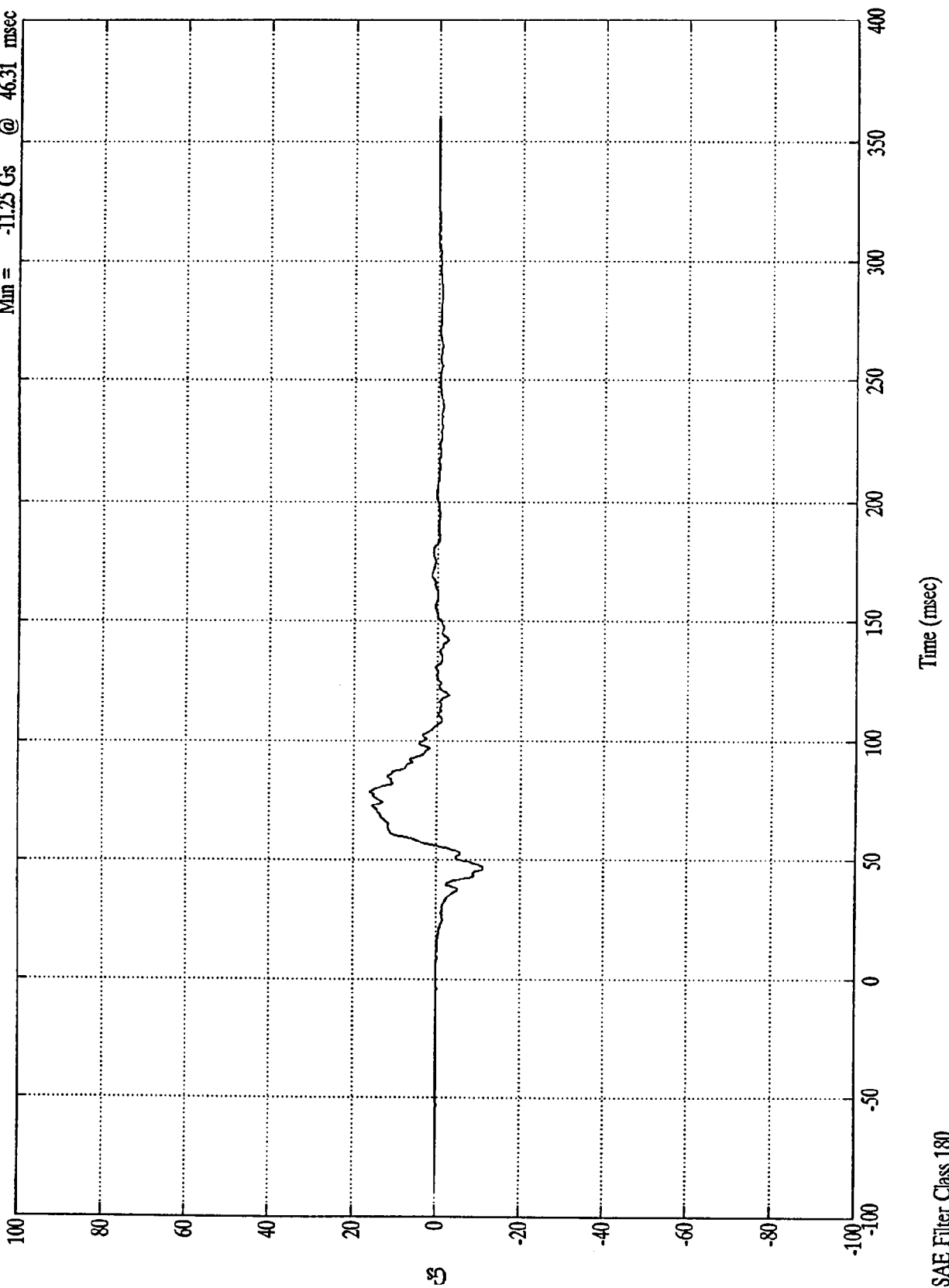
Time (msec)

SAE Filter Class 180

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Chest Y(R)

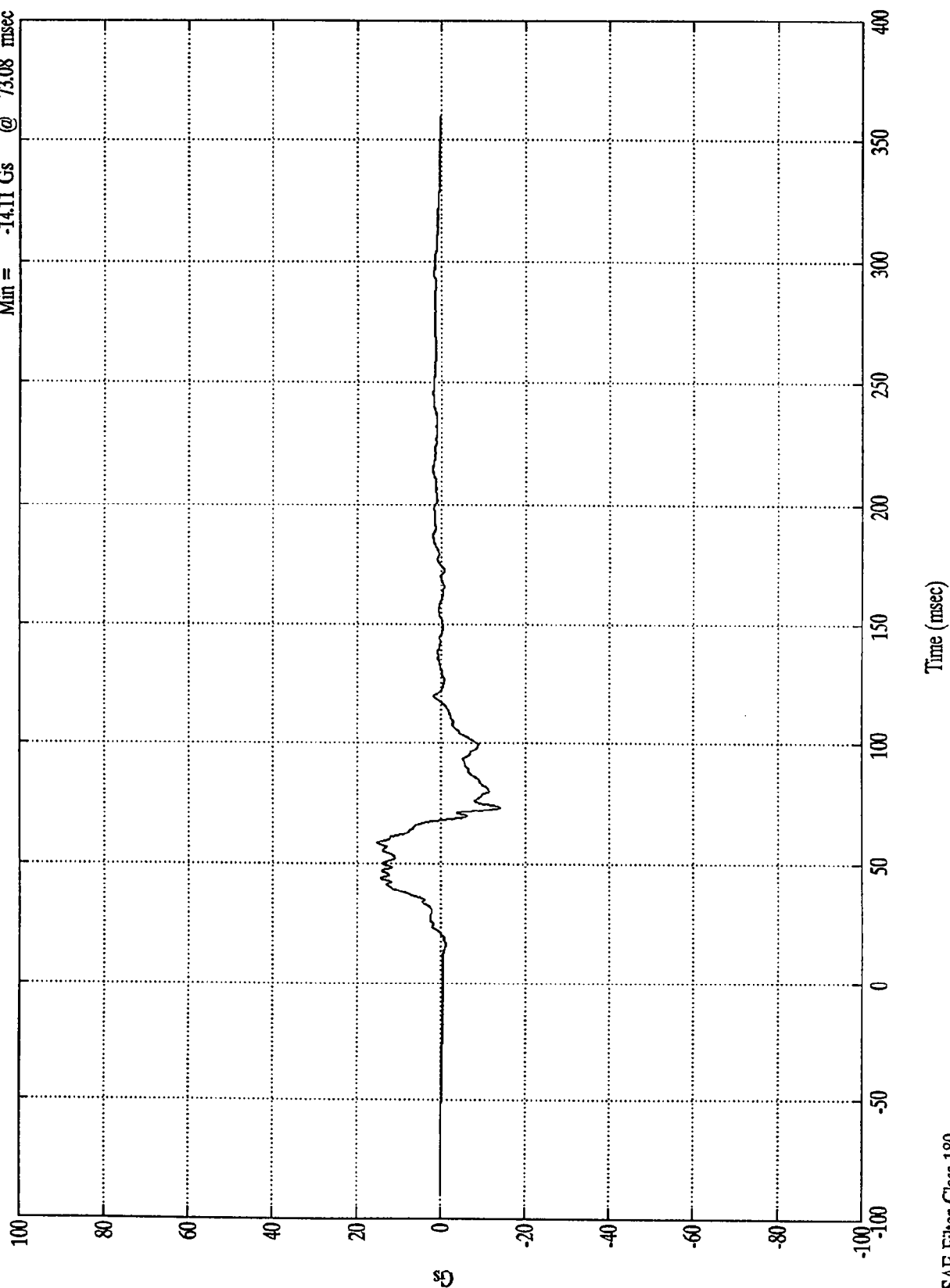
Max = 15.98 Gs @ 78.95 msec
Min = -11.25 Gs @ 46.31 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 15.24 Gs @ 58.43 msec
Min = -14.11 Gs @ 73.08 msec

Pos. 1 Chest Z

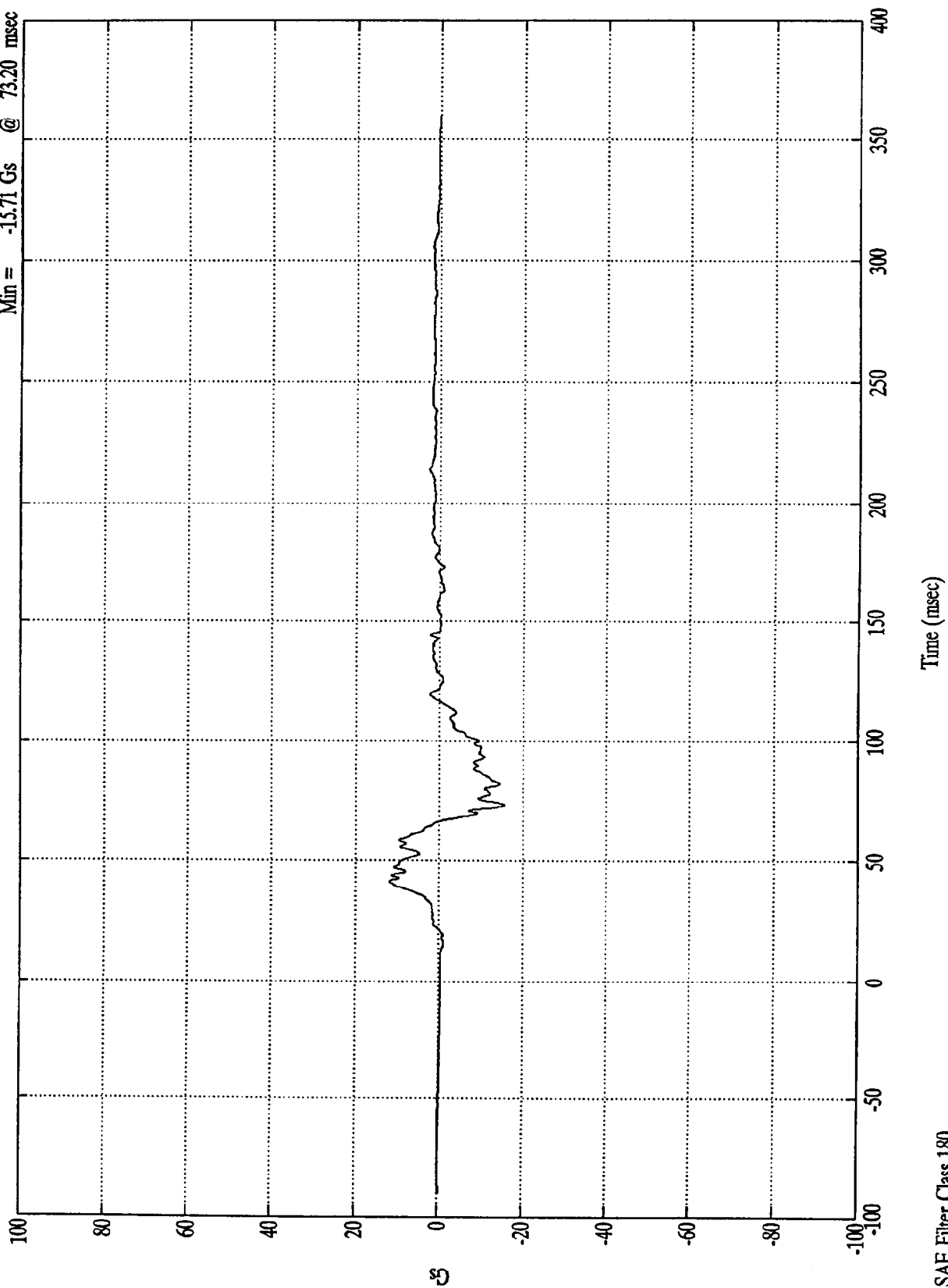


SAE Filter Class 180

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Chest Z(R)

Max = 11.94 Gs @ 41.40 msec
Min = -15.71 Gs @ 73.20 msec

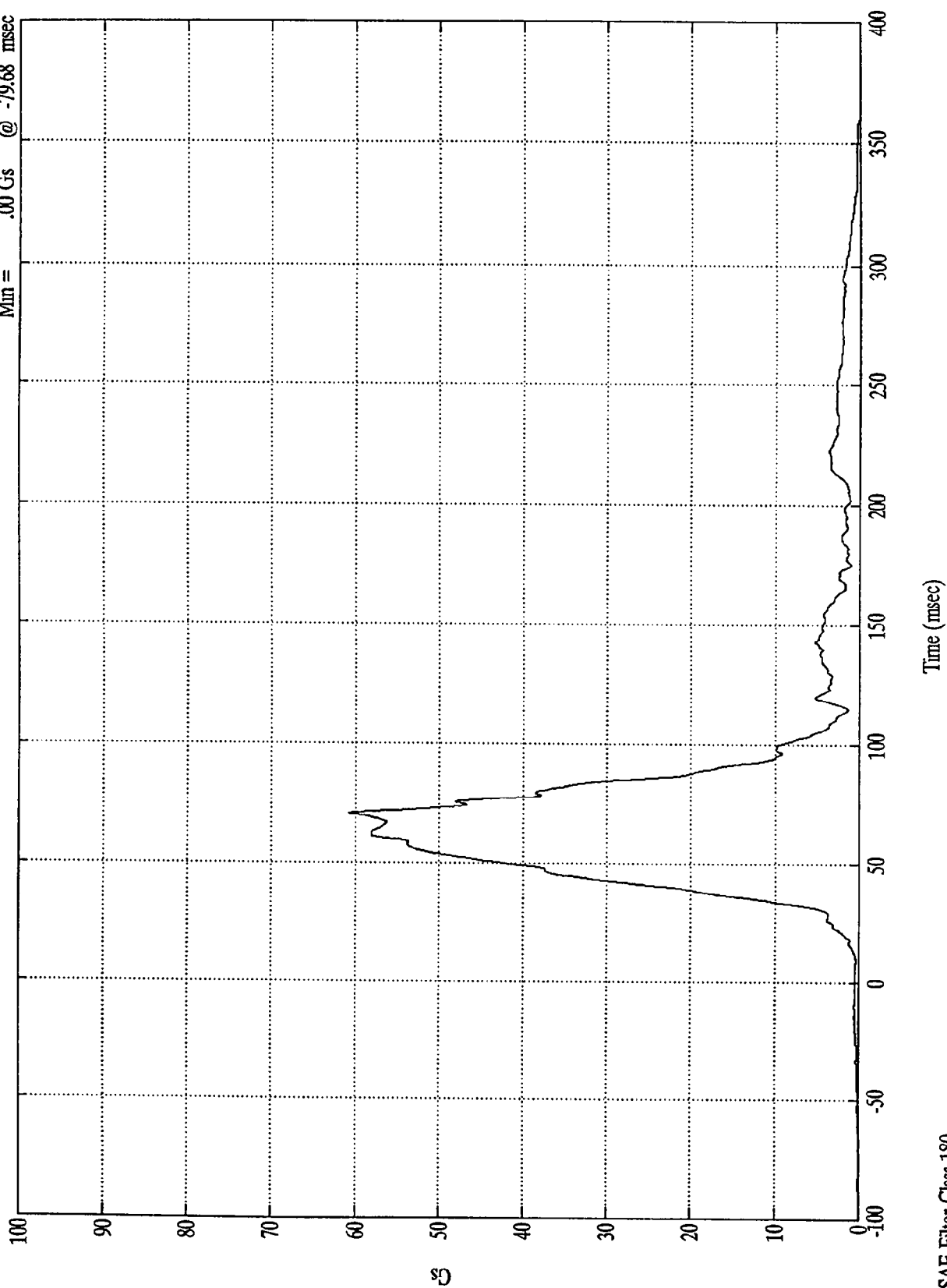


SAE Filter Class 180

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 60.75 Gs @ 70.55 msec
Min = .00 Gs @ -79.68 msec

Pos. 1 Chest Resultant

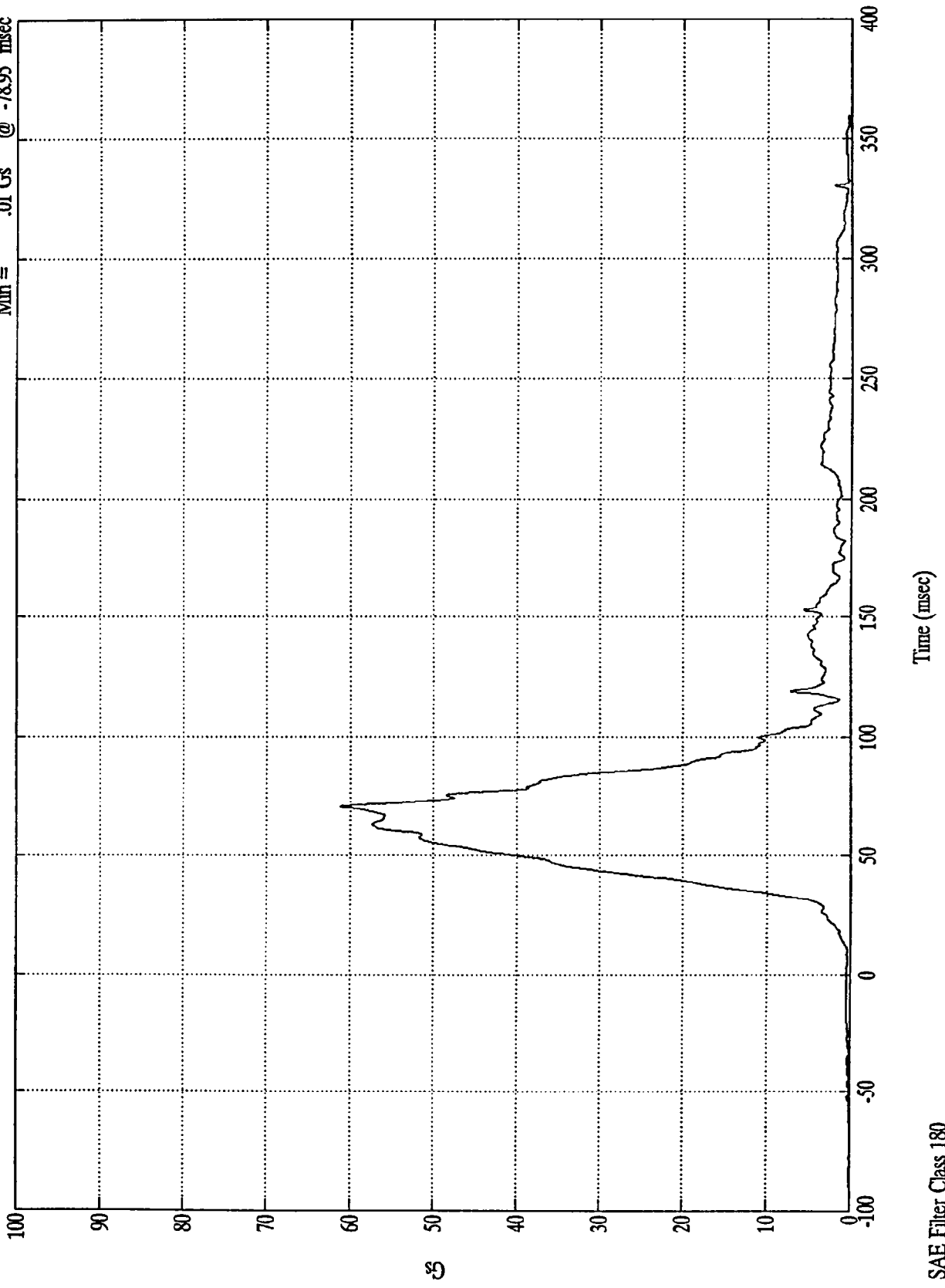


SAE Filter Class 180

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Chest Res(R)

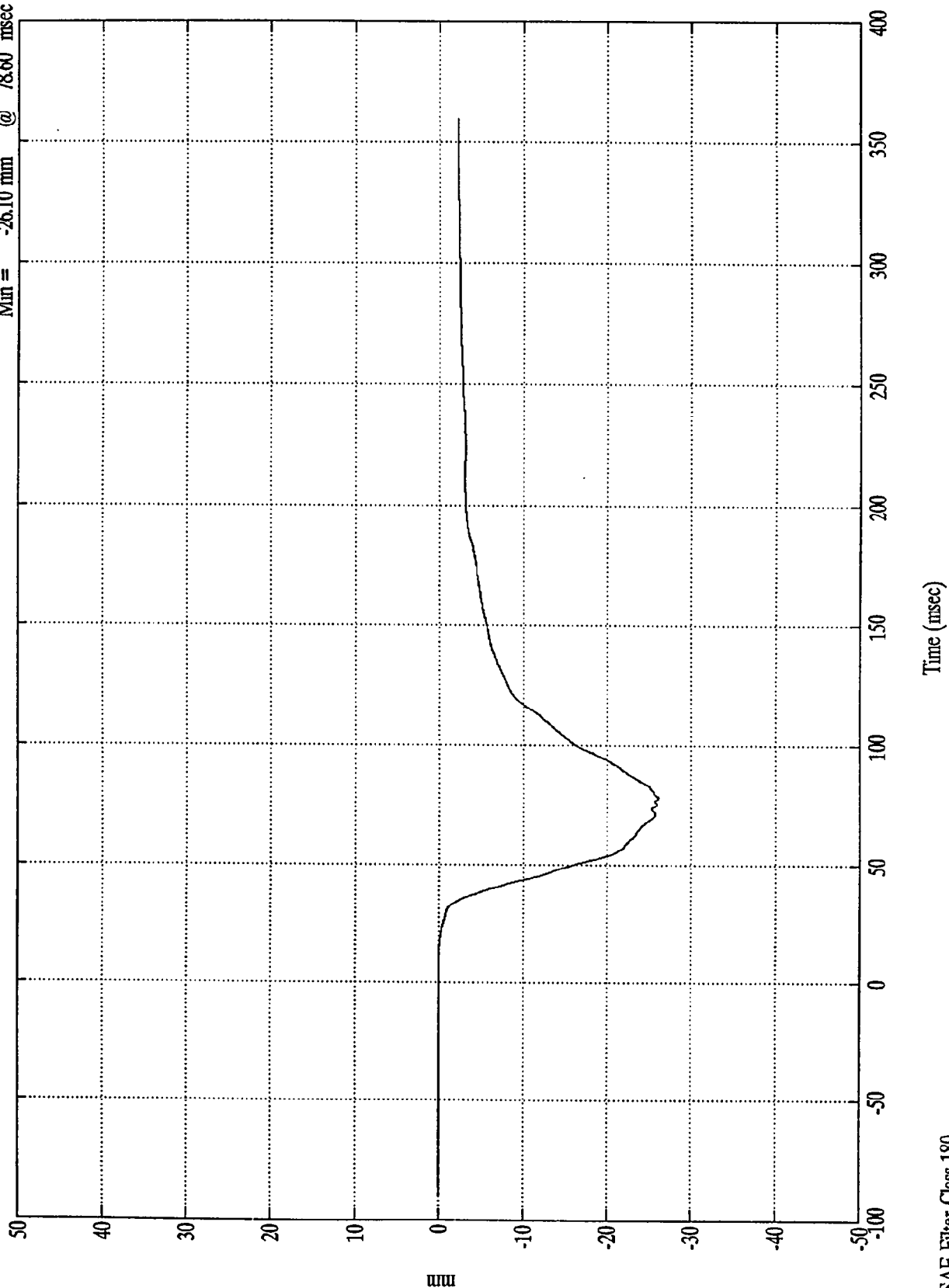
Max = 61.23 Gs @ 70.55 msec
Min = .01 Gs @ -78.95 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = .02 mm @ 4.79 msec
Min = -26.10 mm @ 78.60 msec

Pos. 1 Chest Disp.



mm

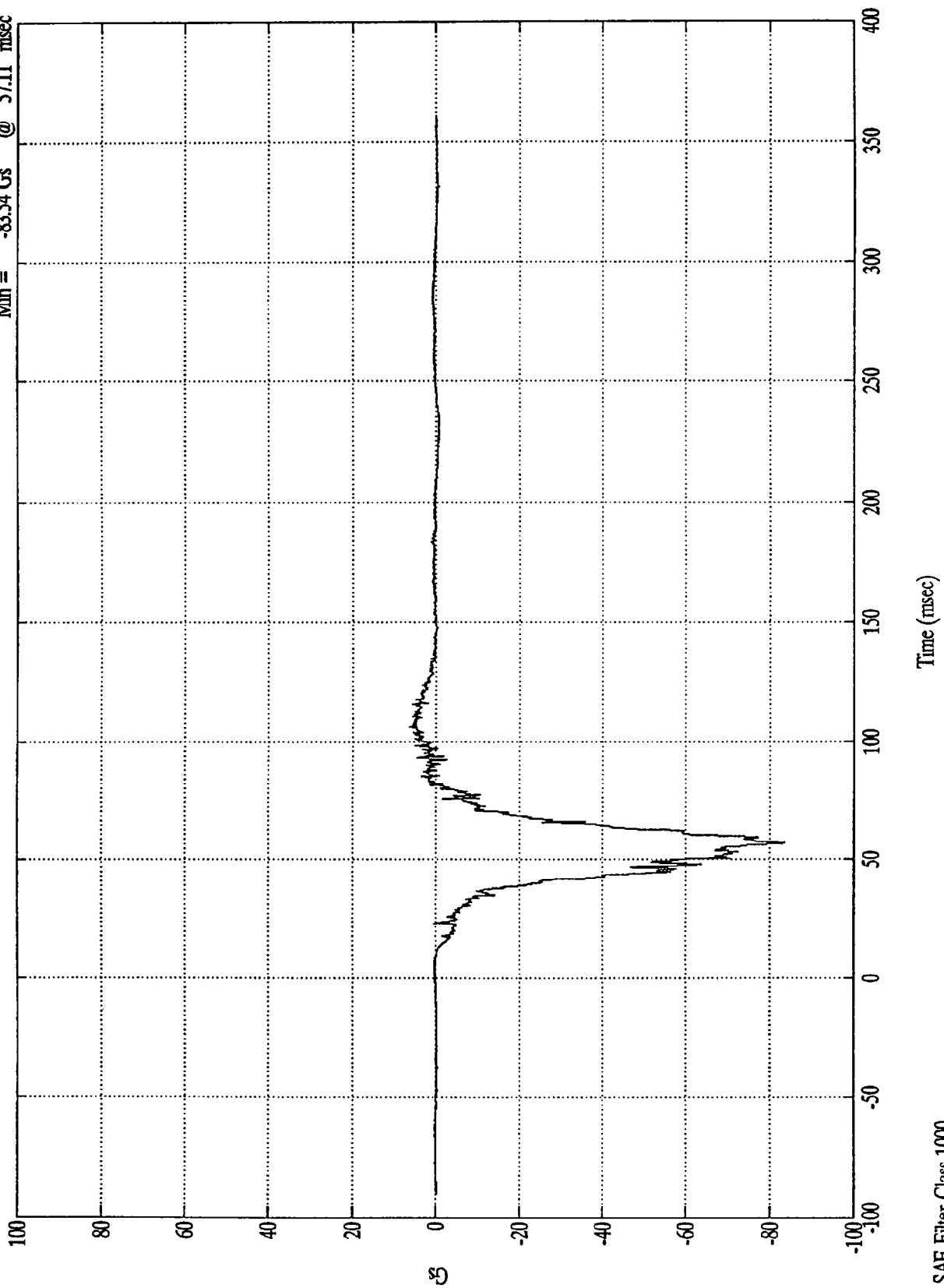
Time (msec)

SAE Filter Class 180

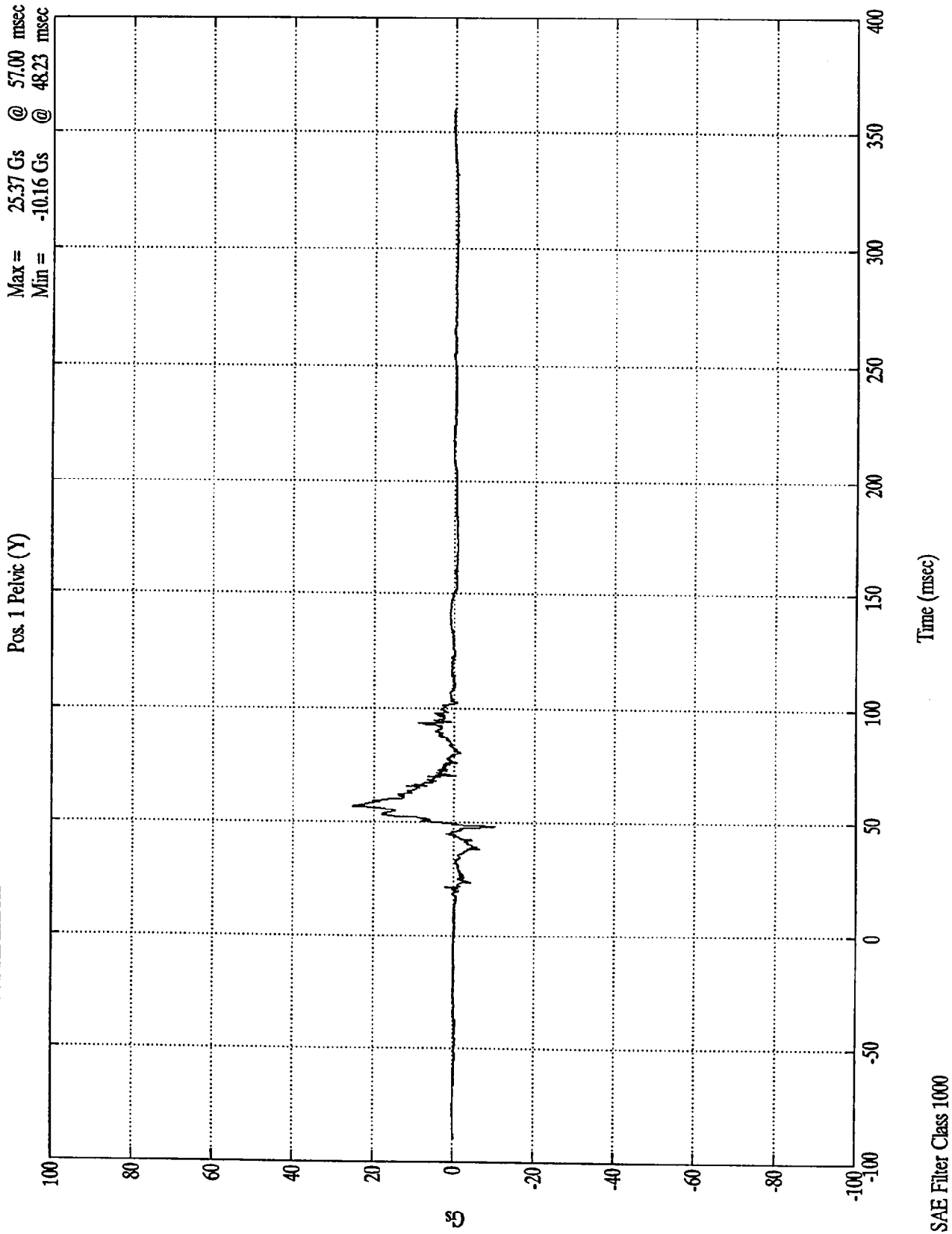
NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Pelvic (X)

Max = 6.38 Gs @ 106.08 msec
Min = -83.54 Gs @ 57.11 msec



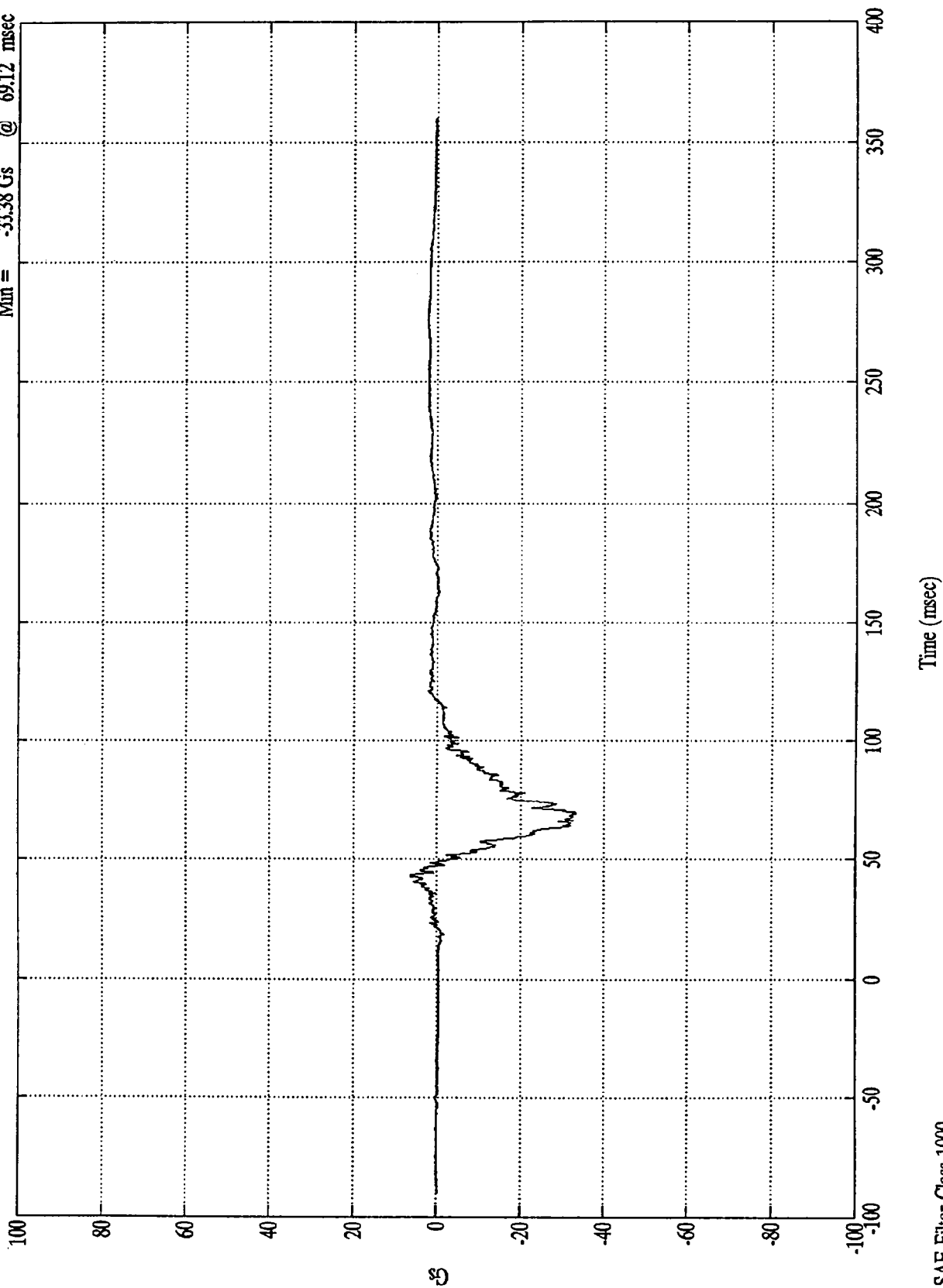
NCAP TEST #11 - 1995 SUZUKI SIDEKICK



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Pelvic (Z)

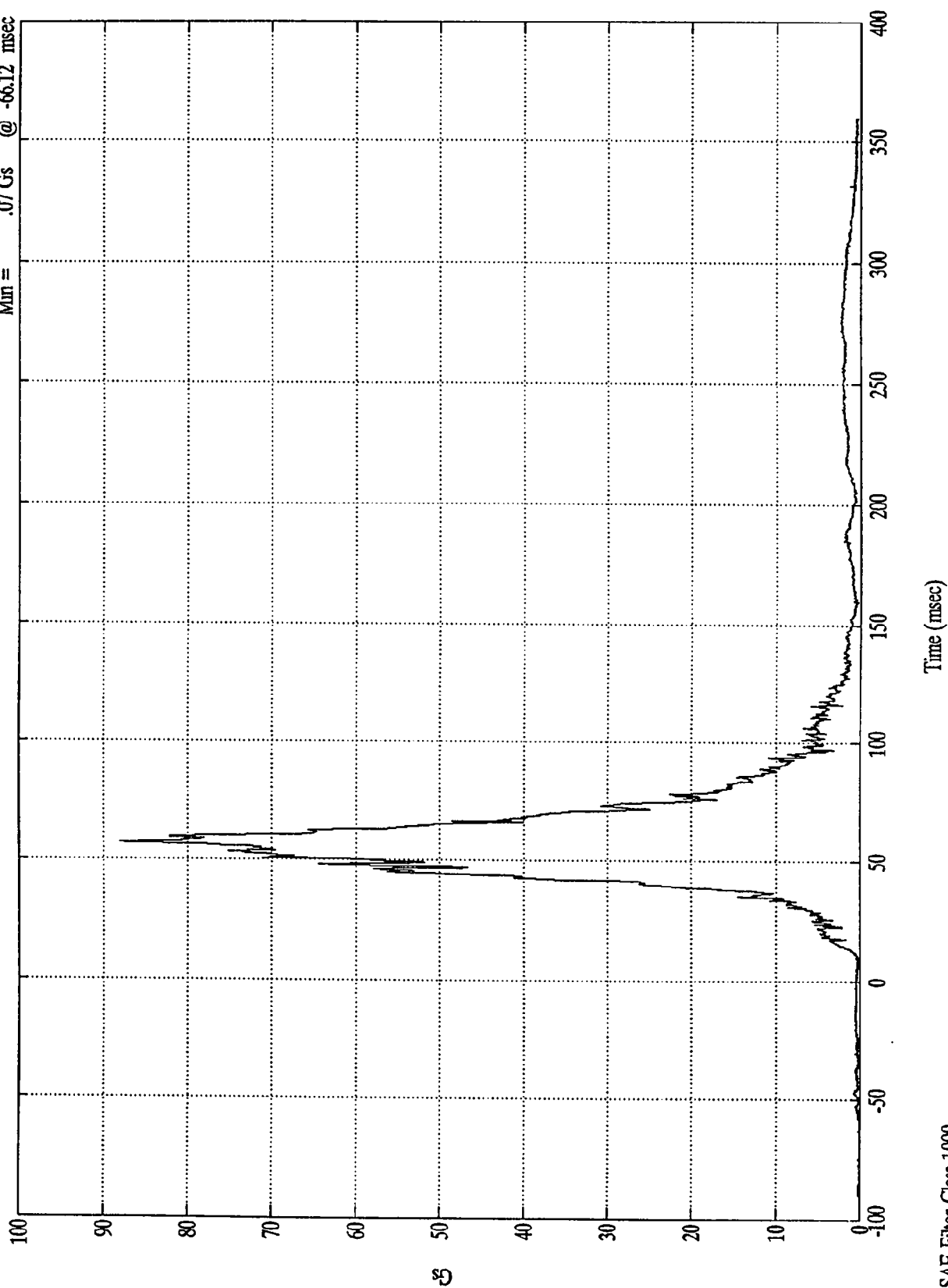
Max = 6.39 Gs @ 42.95 msec
Min = -33.38 Gs @ 69.12 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Pelvic (R)

Max = 88.02 Gs @ 57.11 msec
Min = .07 Gs @ -66.12 msec



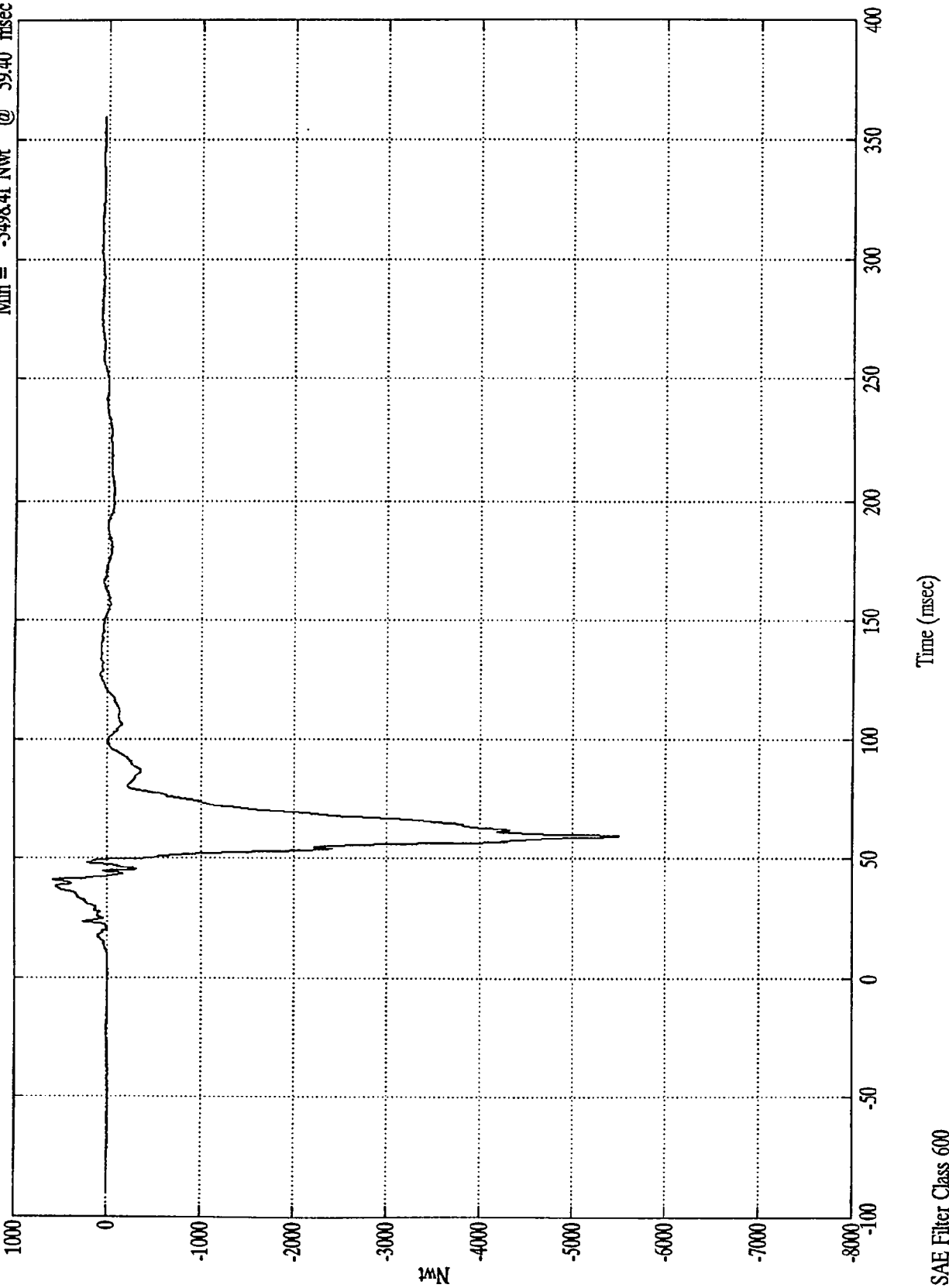
SAE Filter Class 1000

5

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 585.05 Nwt @ 41.15 msec
Min = -5498.41 Nwt @ 59.40 msec

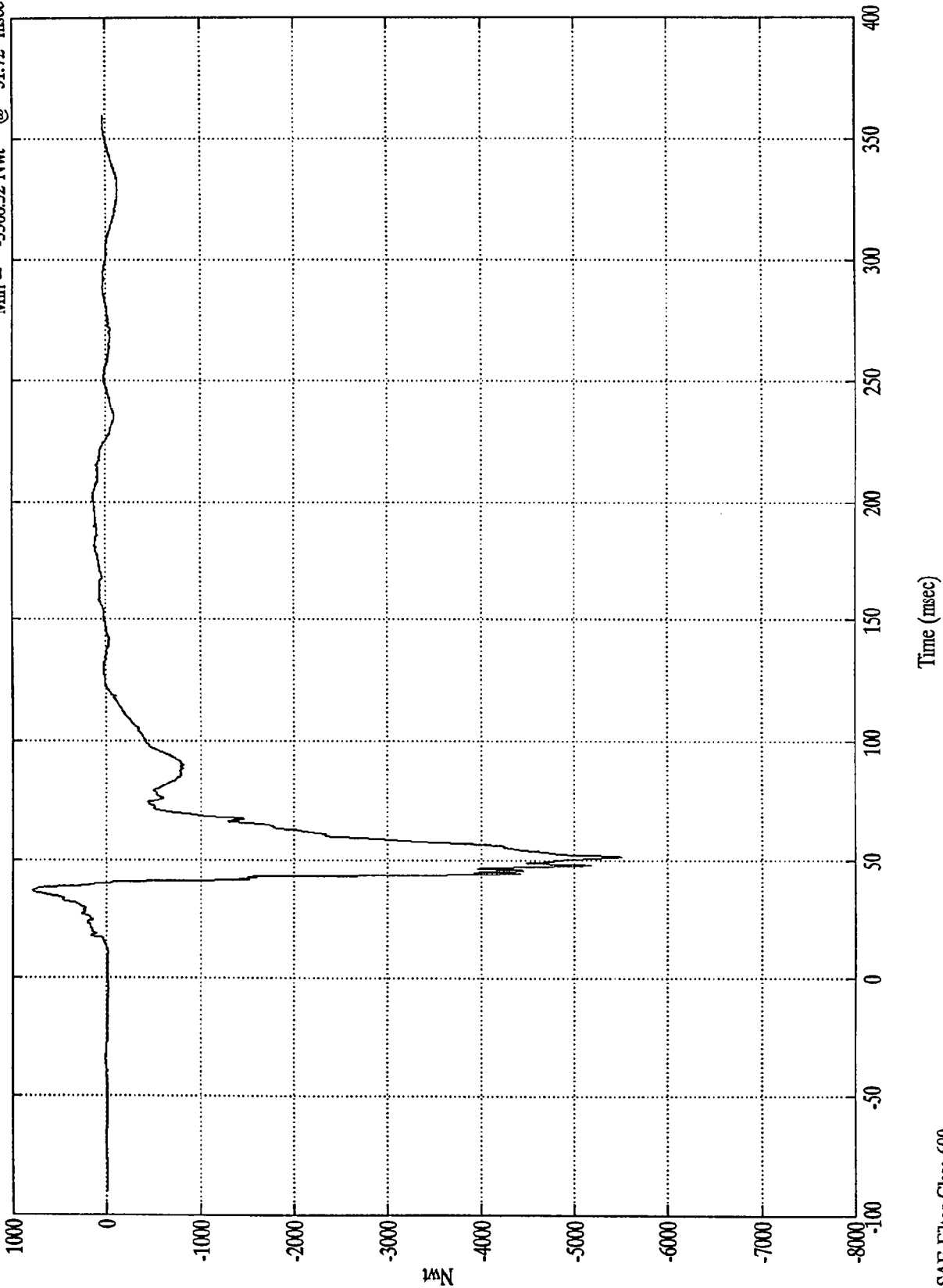
Pos. 1 Left Femur



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Right Femur

Max = 792.53 Nwt @ 36.95 msec
Min = -5506.52 Nwt @ 51.72 msec

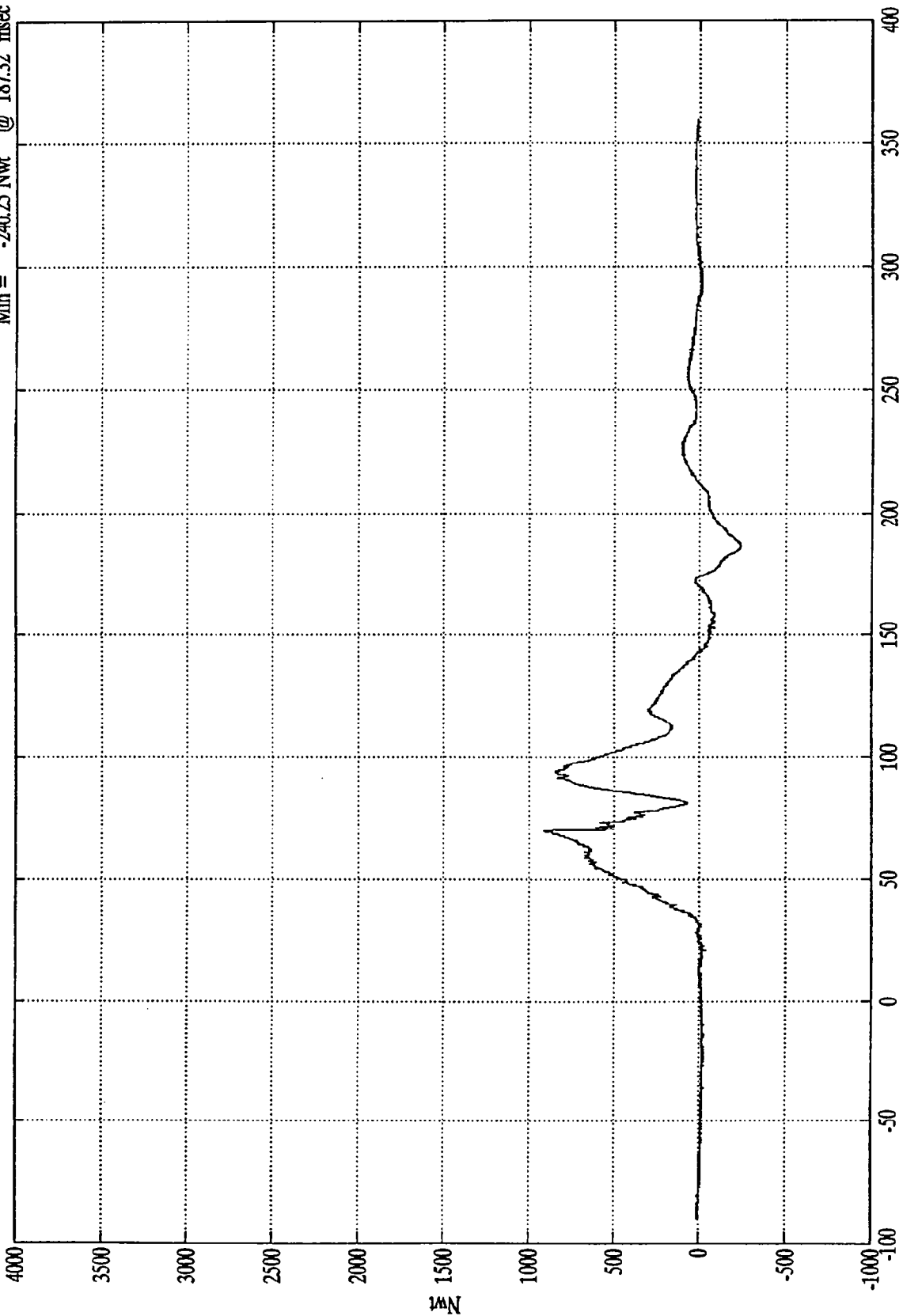


SAE Filter Class 600

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Upper Neck Fx

Max = 914.13 Nwt @ 69.72 msec
Min = -240.25 Nwt @ 187.32 msec



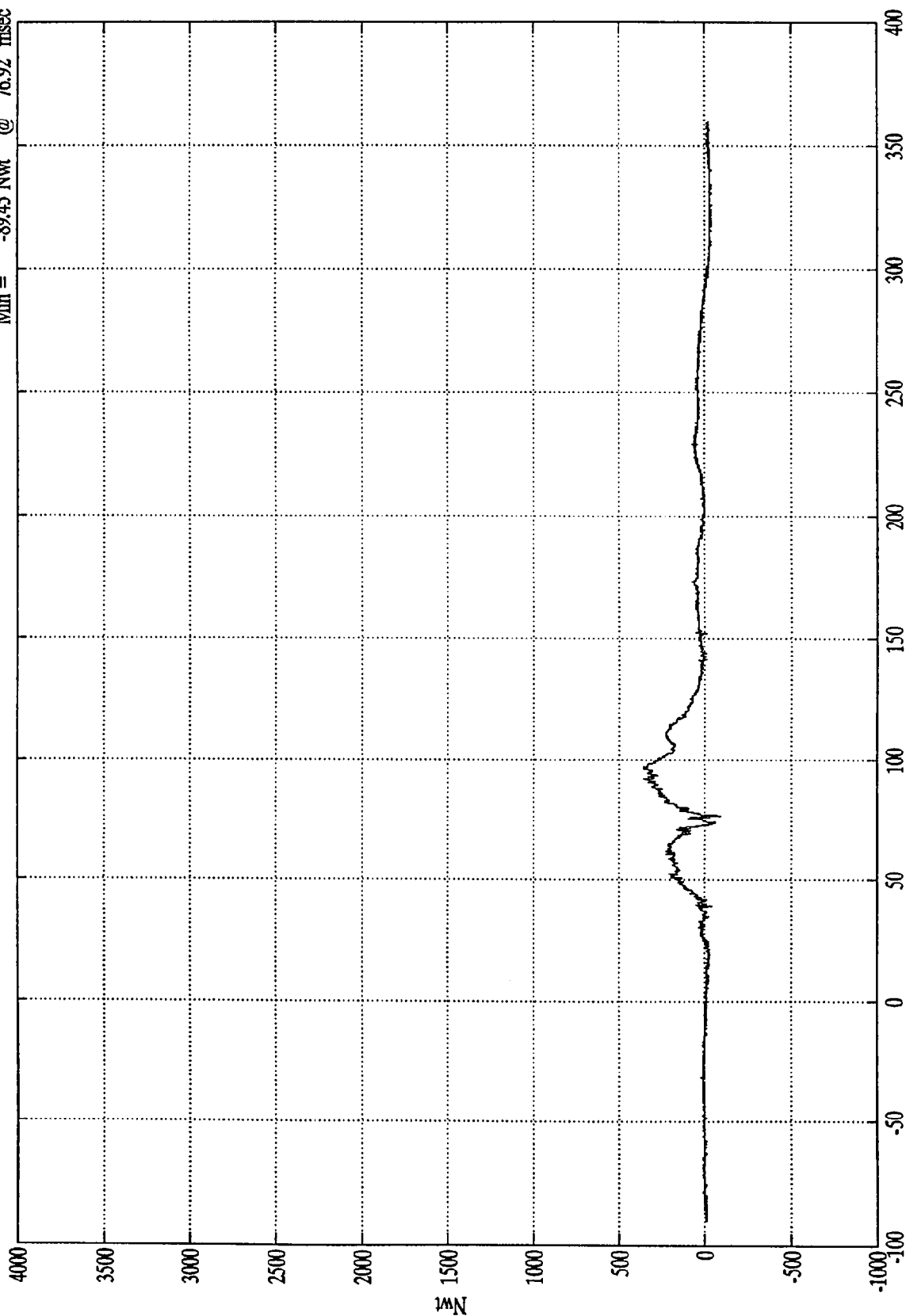
Time (msec)

SAE Filter Class 1000

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Upper Neck Fy

Max = 359.89 Nwt @ 97.08 msec
Min = -89.45 Nwt @ 76.92 msec



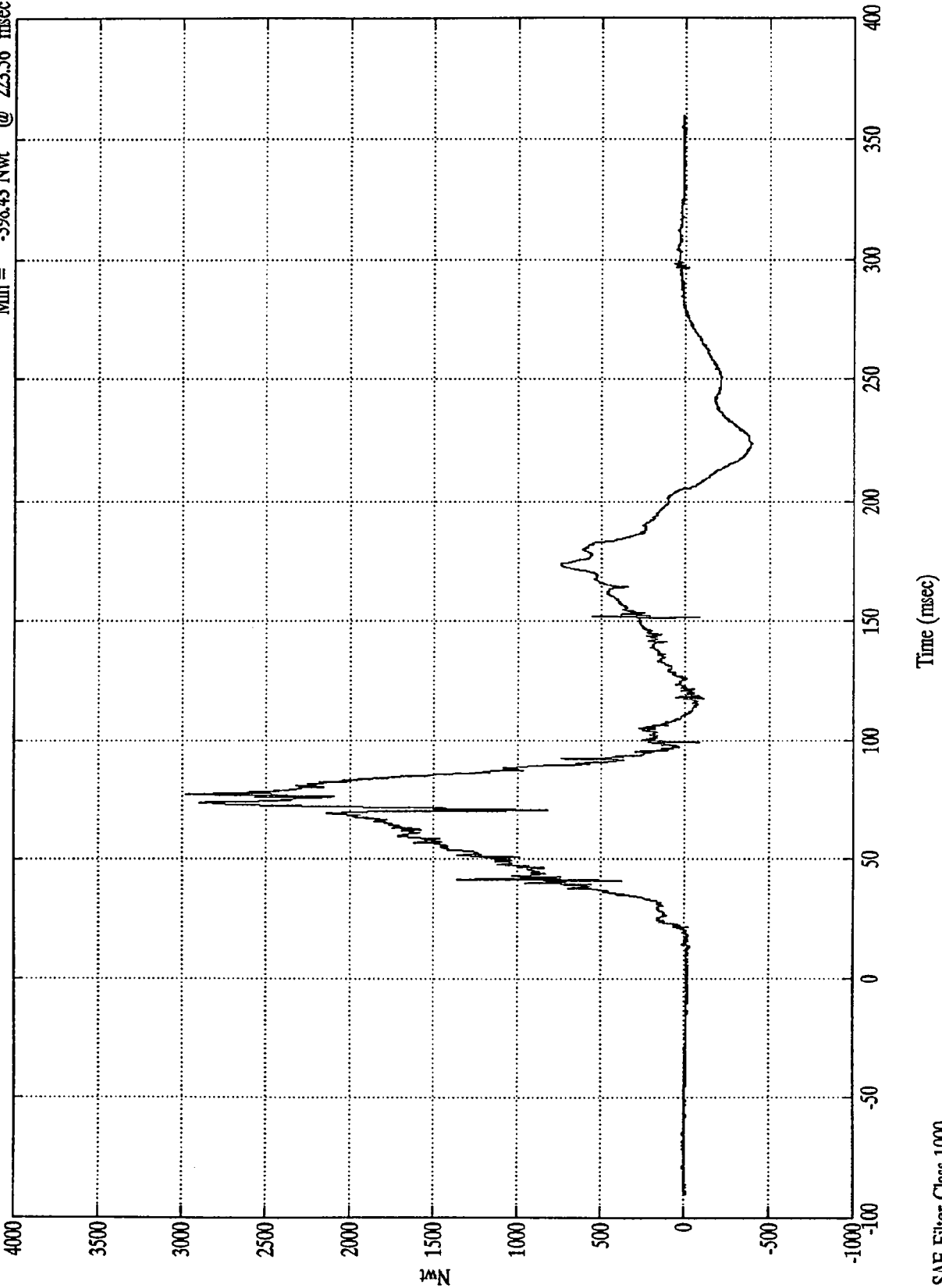
Time (msec)

SAE Filter Class 1000

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Upper Neck Fz

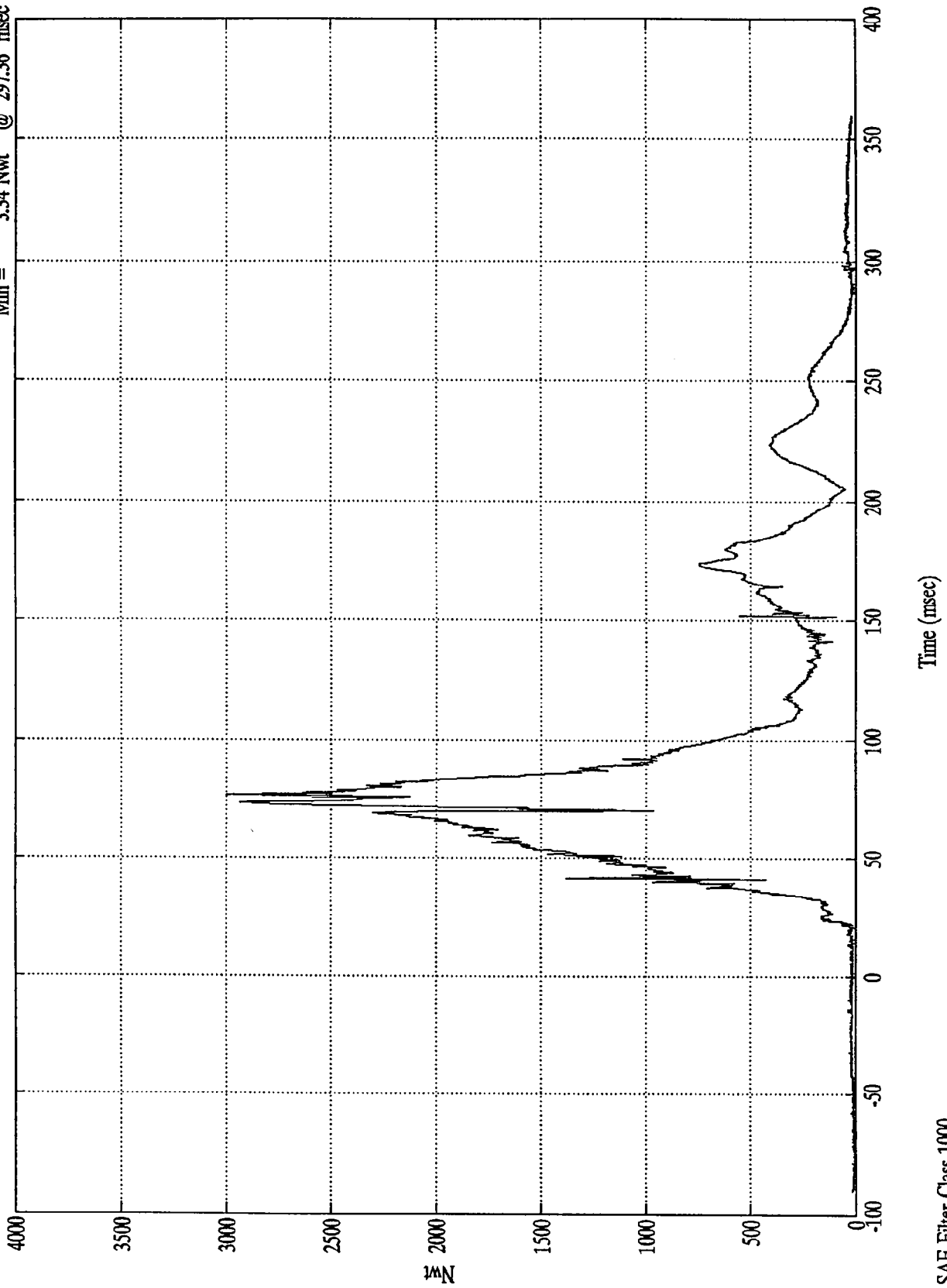
Max = 2977.57 Nwt @ 77.16 msec
Min = -398.43 Nwt @ 223.56 msec



SAE Filter Class 1000

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

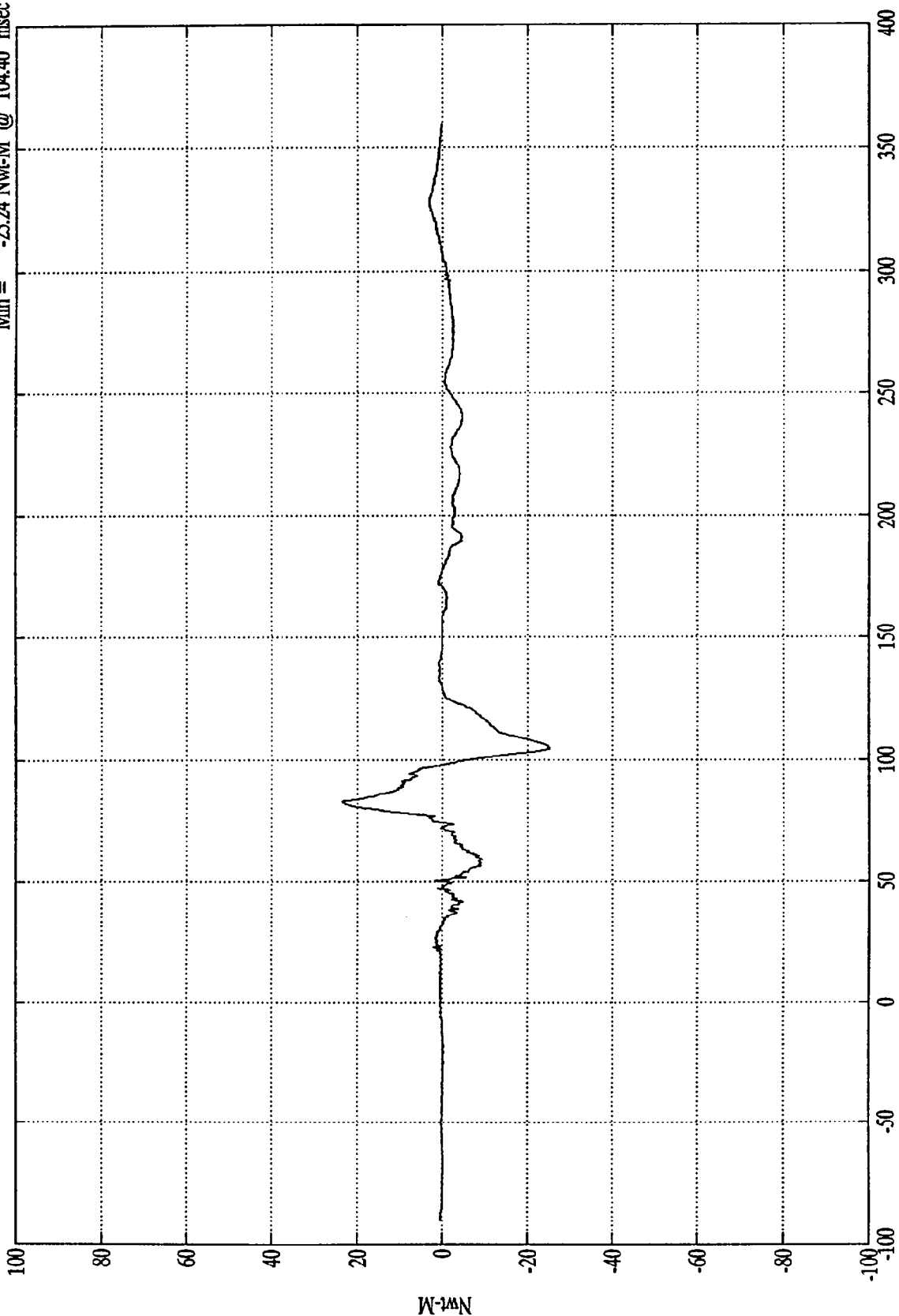
Pos. 1 Neck Force Res.
Max = 2998.30 Nwt @ 77.16 msec
Min = 3.34 Nwt @ 297.36 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Upper Neck Mx

Max = 23.55 Nwt-M @ 83.04 msec
Min = -25.24 Nwt-M @ 104.40 msec



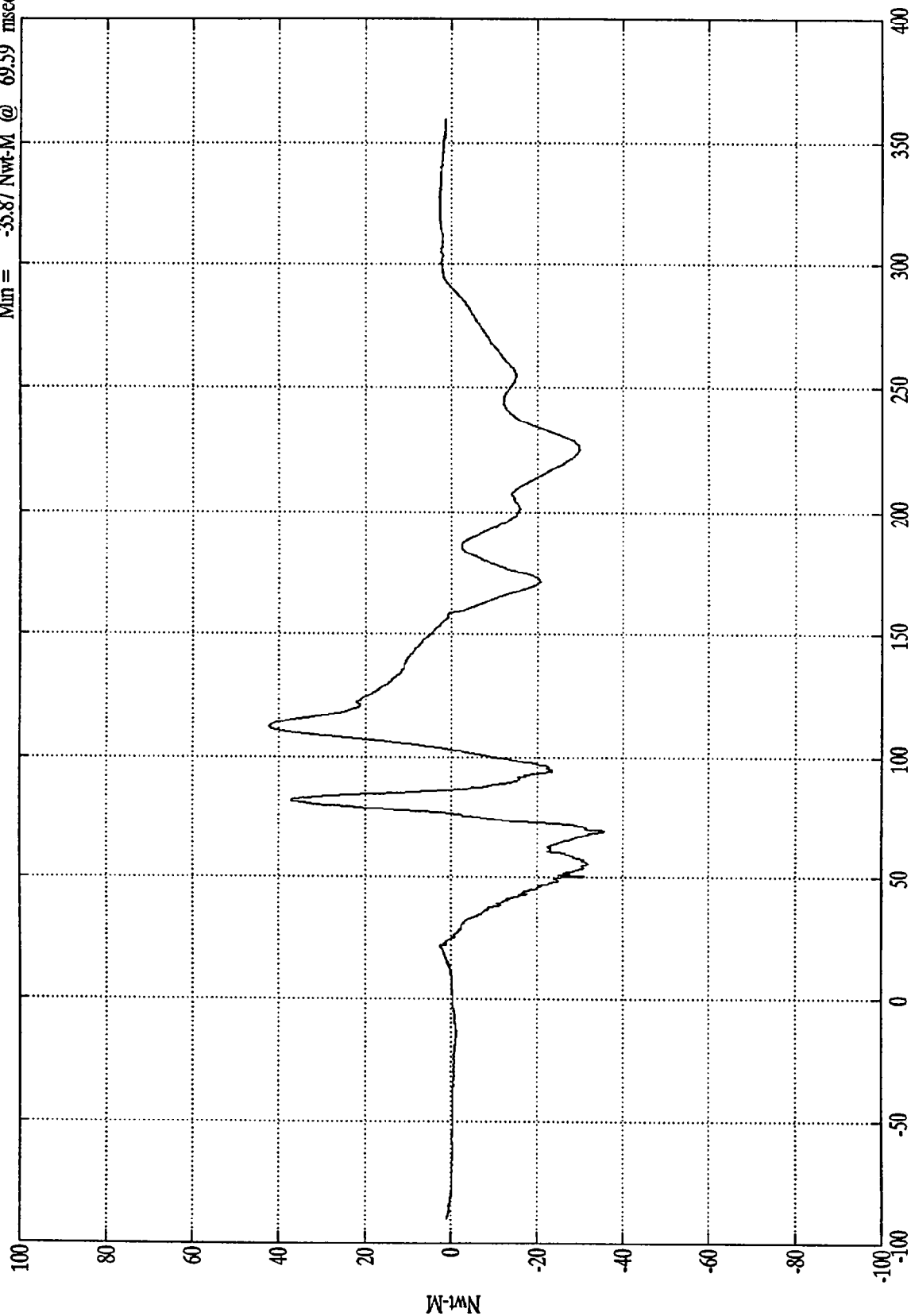
Time (msec)

SAE Filter Class 600

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Upper Neck My

Max = 42.34 Nwt-M @ 112.19 msec
Min = -35.87 Nwt-M @ 69.59 msec

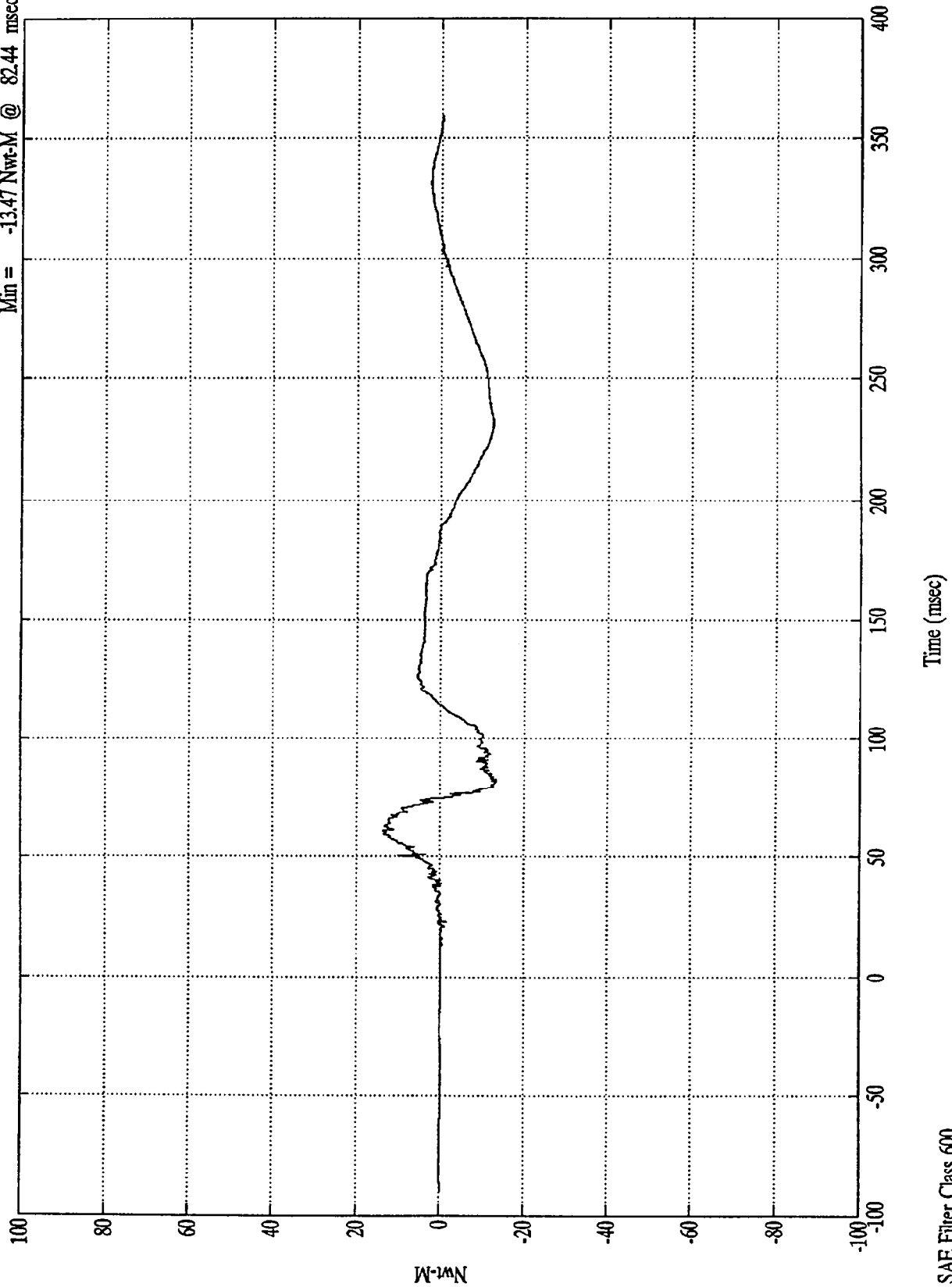


Time (msec)

SAE Filter Class 600

Pos. 1 Upper Neck Mz

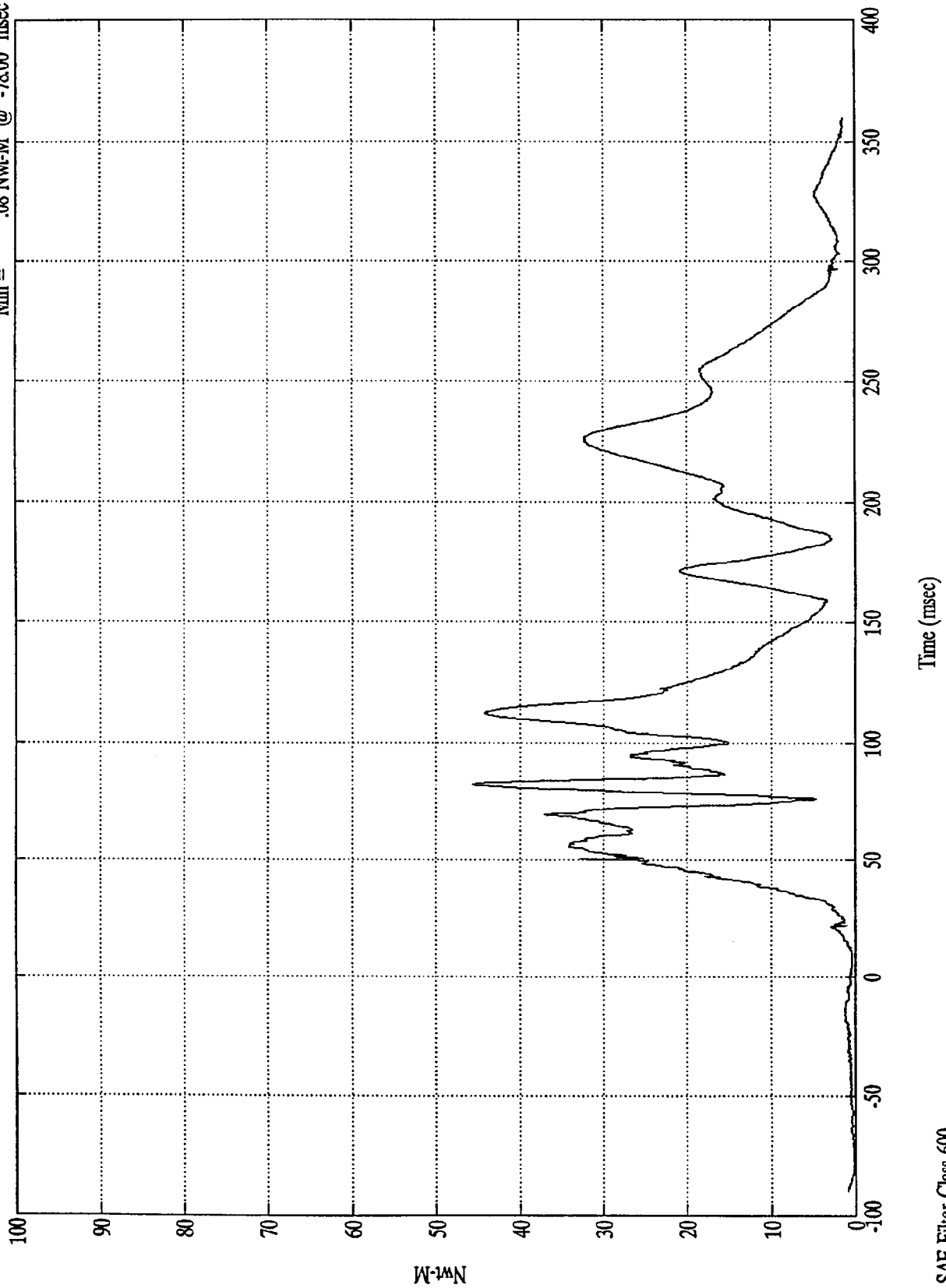
Max = 13.63 Nwt-M @ 60.84 msec
Min = -13.47 Nwt-M @ 82.44 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 45.68 Nwt-M @ 82.56 msec
 Min = .08 Nwt-M @ -78.00 msec

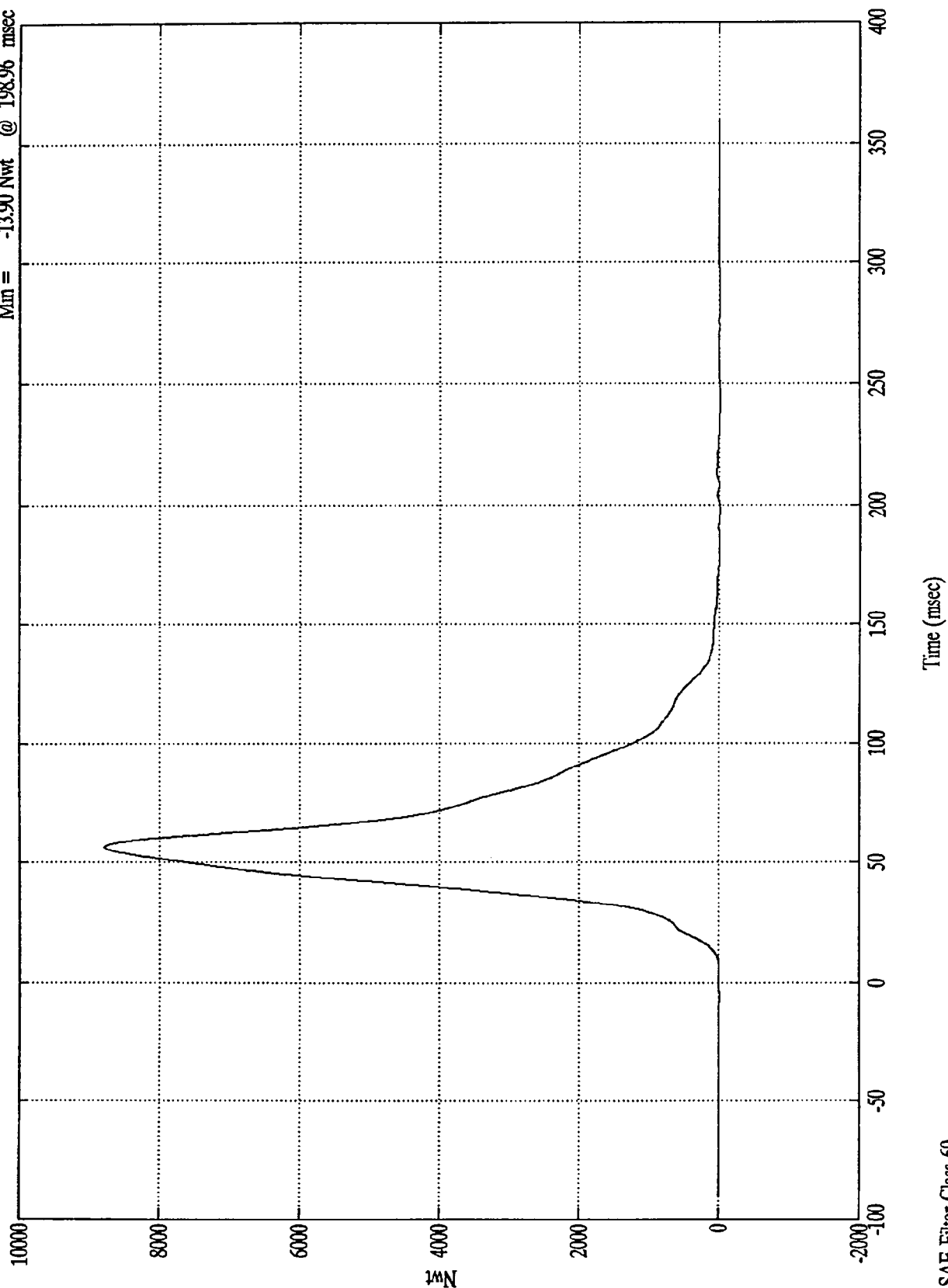
Pos. 1 Neck Moment Res.



SAE Filter Class 600

Pos. 1 Left Belt Load

Max = 8788.12 Nwt @ 56.40 msec
Min = -13.90 Nwt @ 198.96 msec

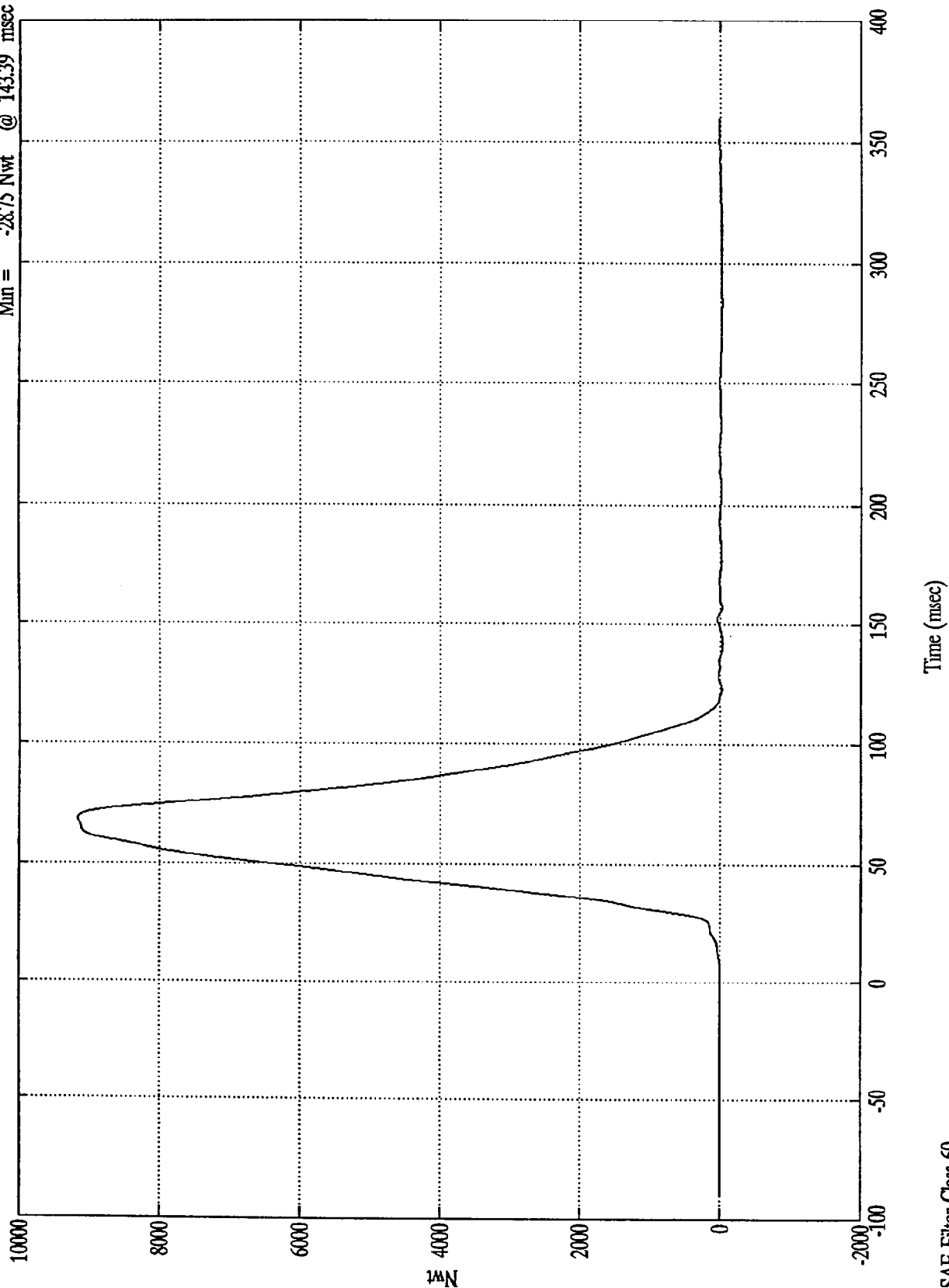


SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 9173.99 Nwt @ 68.63 msec
 Min = -28.75 Nwt @ 143.39 msec

Pos. 1 Torso Belt Load

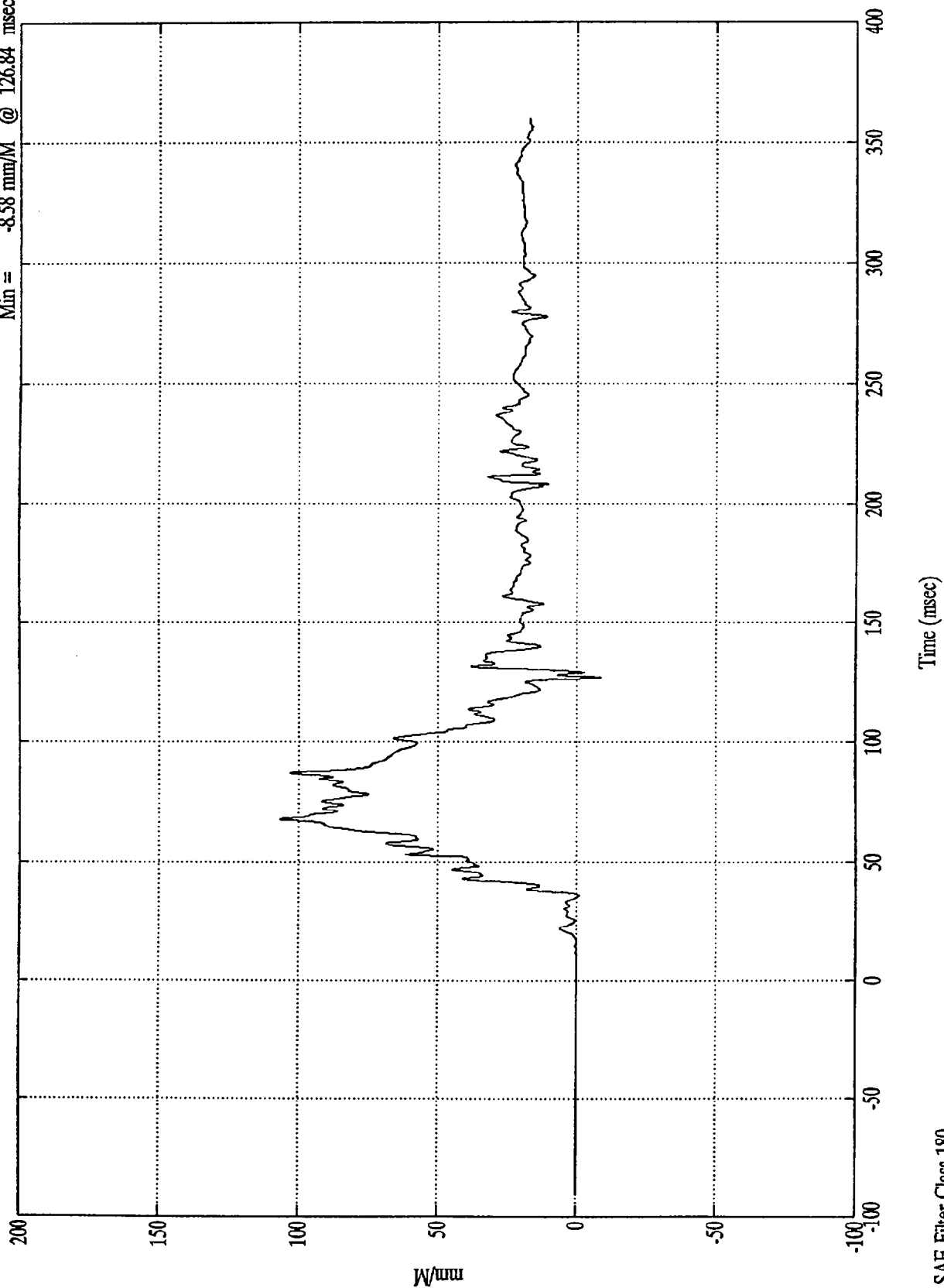


SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Belt Elongation

Max = 106.89 mm/M @ 67.80 msec
Min = -8.58 mm/M @ 126.84 msec

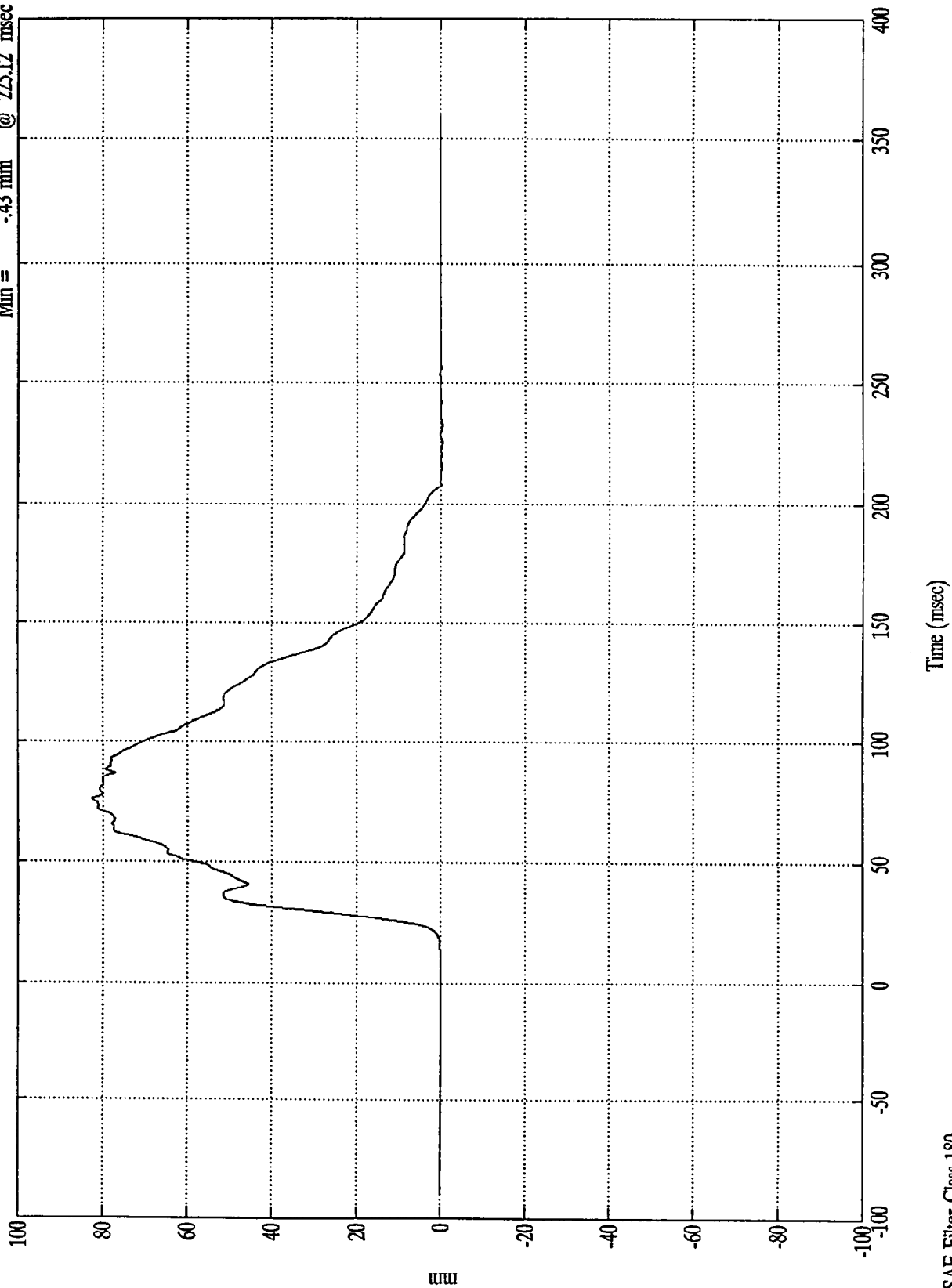


SAE Filter Class 180

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 1 Belt Spool Out

Max = 82.61 mm @ 75.59 msec
Min = -43 mm @ 225.12 msec

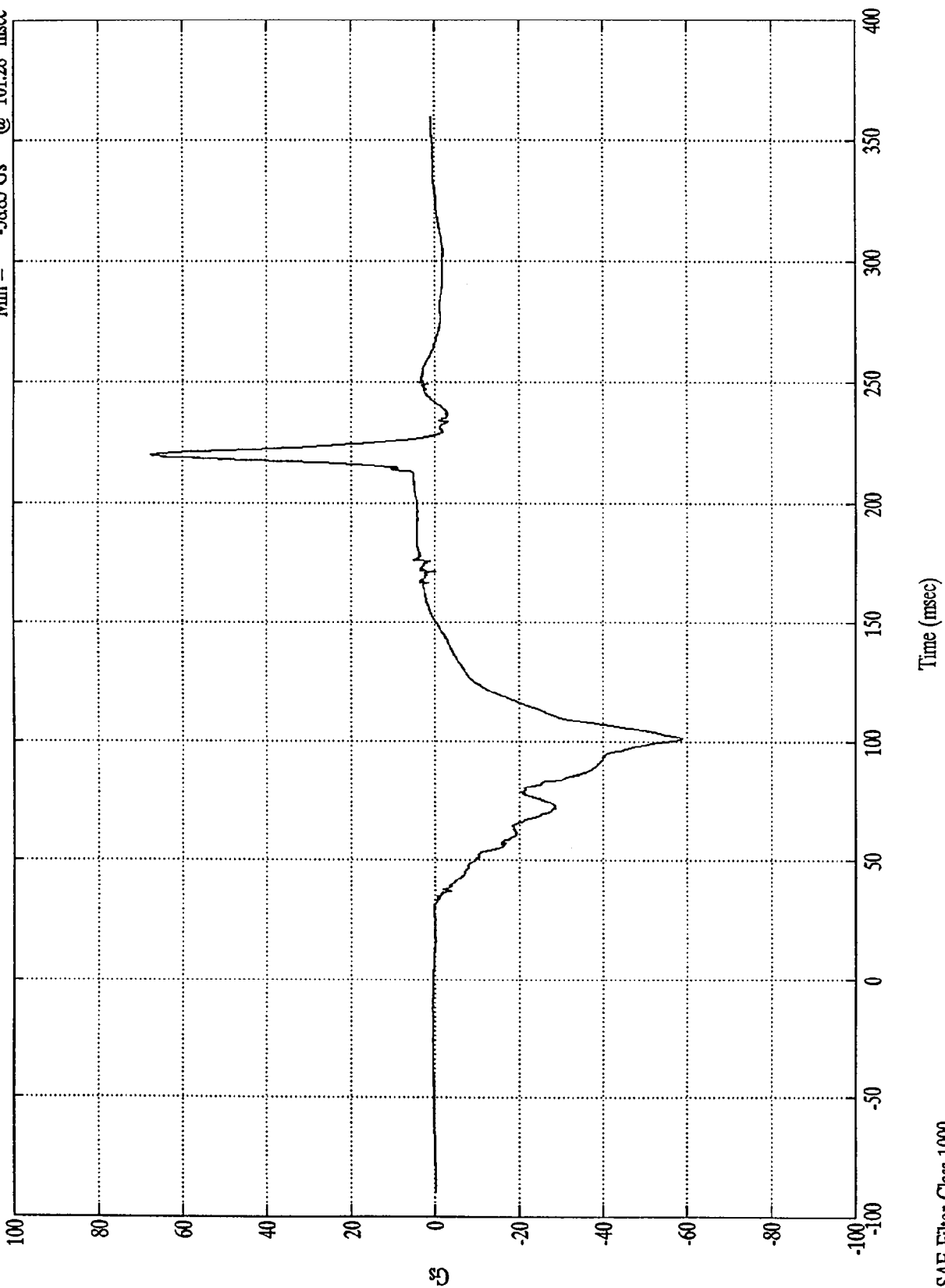


SAE Filter Class 180

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 67.64 Gs @ 220.19 msec
Min = -58.85 Gs @ 101.28 msec

Pos. 2 Head X

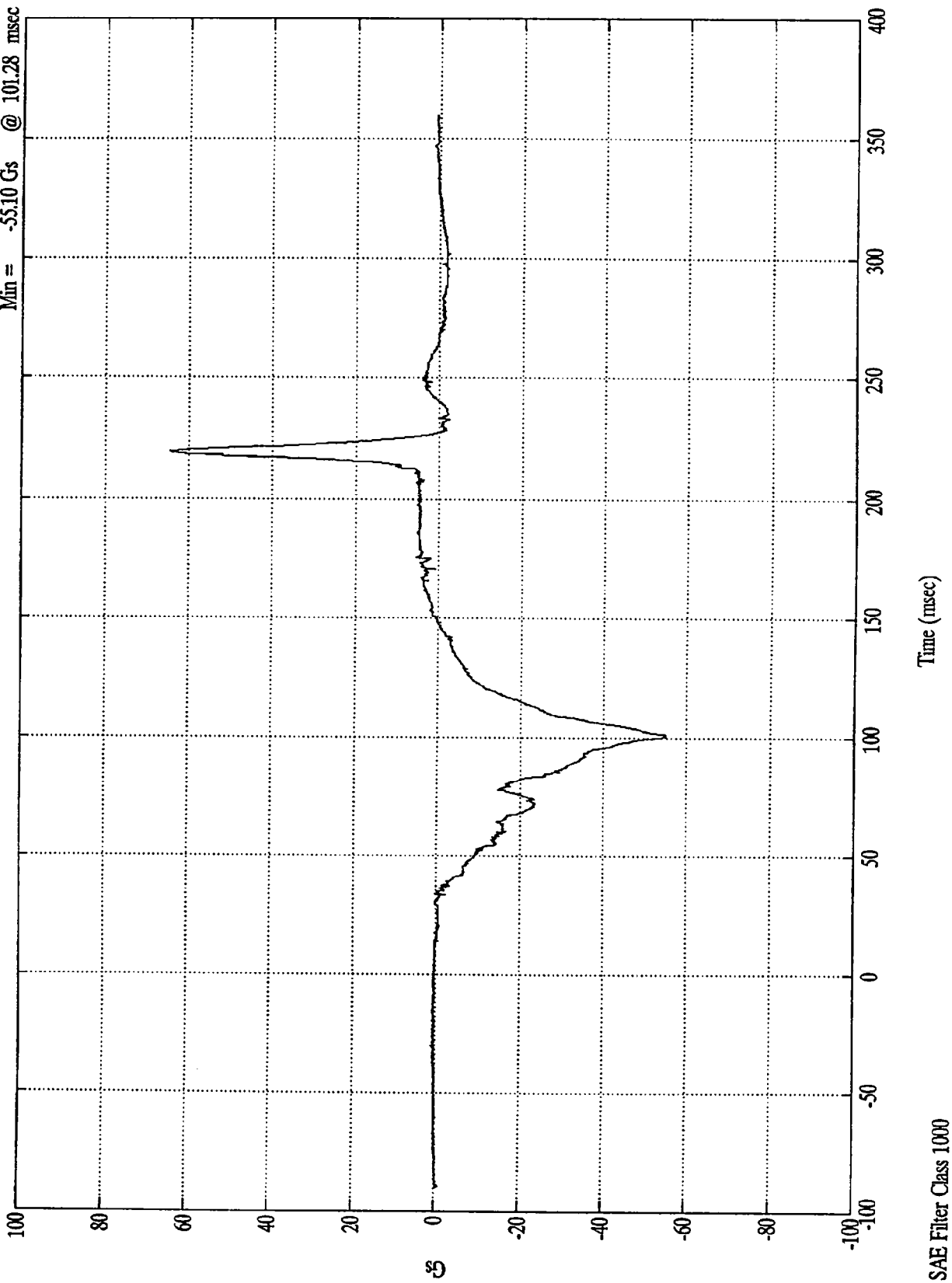


SAE Filter Class 1000

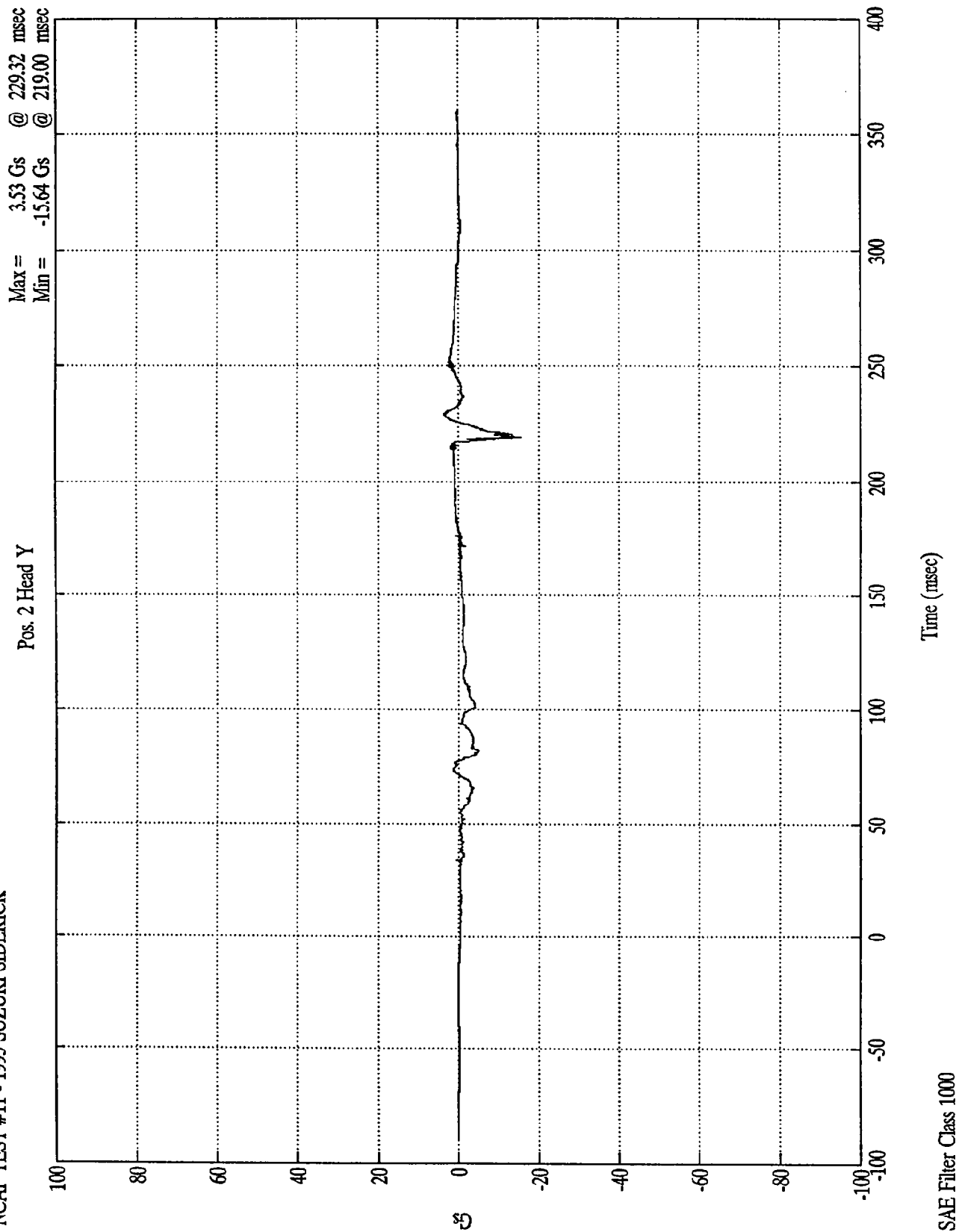
NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Head X(R)

Max = 64.54 Gs @ 219.36 msec
Min = -55.10 Gs @ 101.28 msec



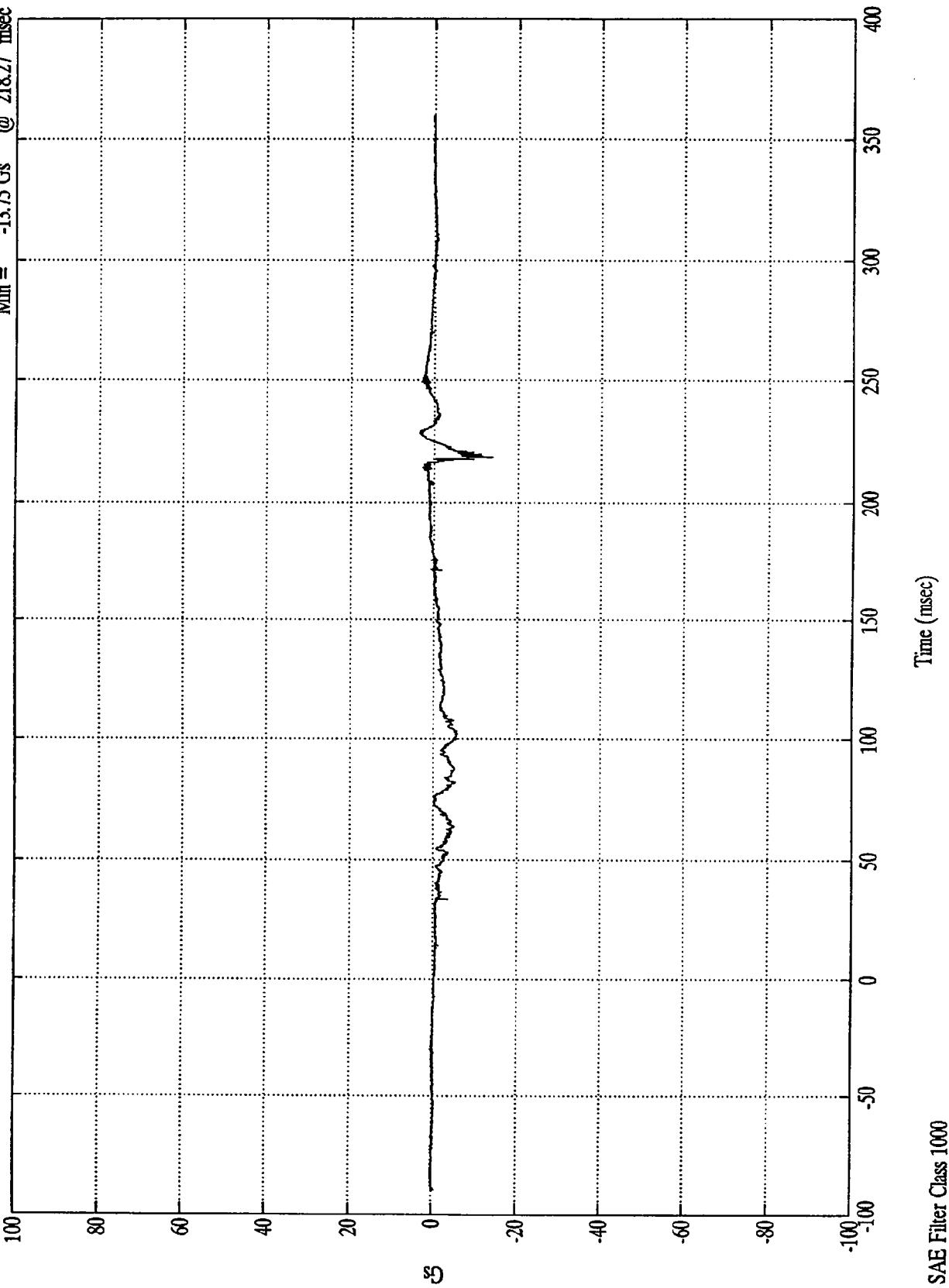
NCAP TEST #11 - 1995 SUZUKI SIDEKICK



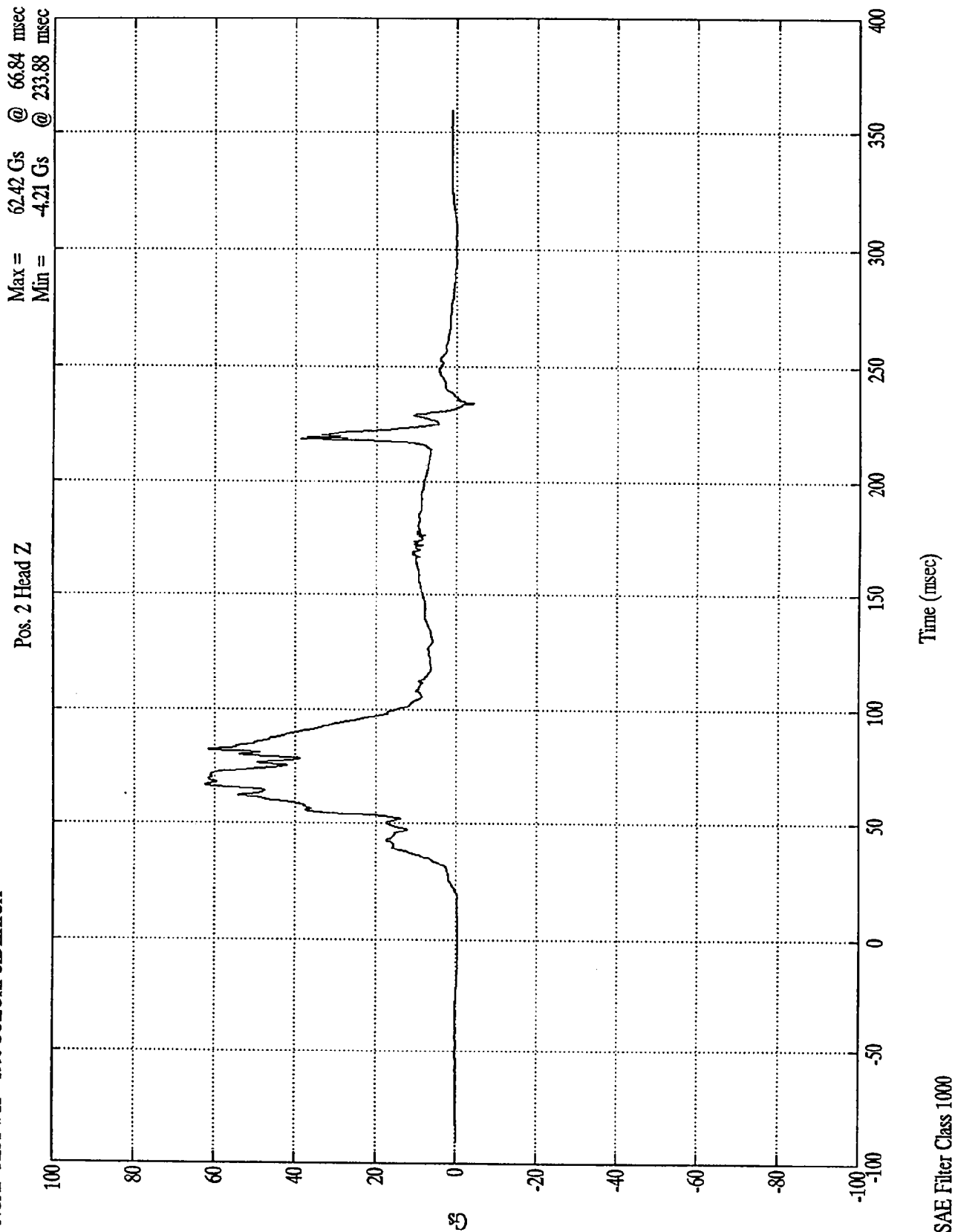
NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Head Y(R)

Max = 3.45 Gs @ 228.24 msec
Min = -13.75 Gs @ 218.27 msec



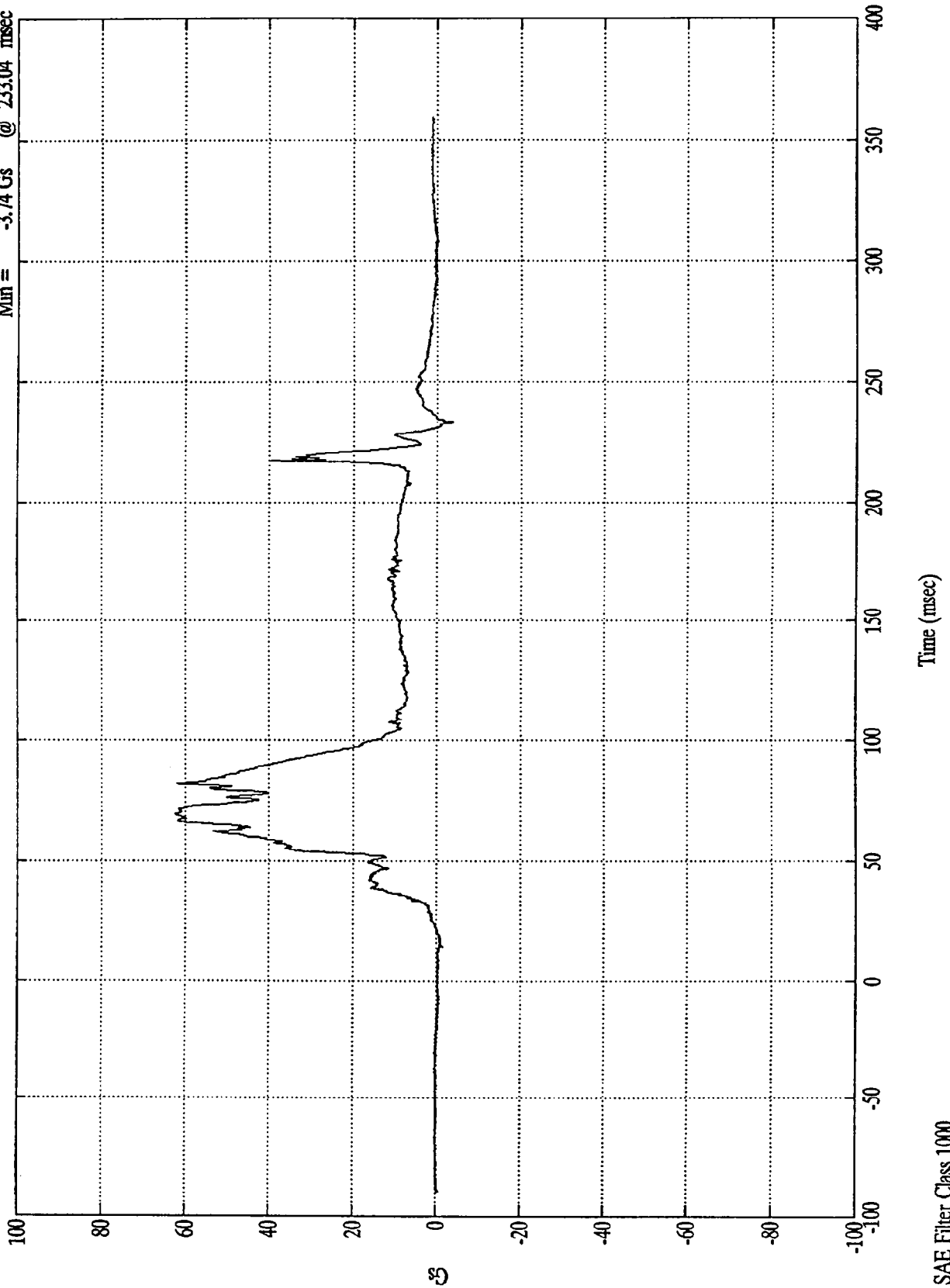
NCAP TEST #11 - 1995 SUZUKI SIDEKICK



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Head Z(R)

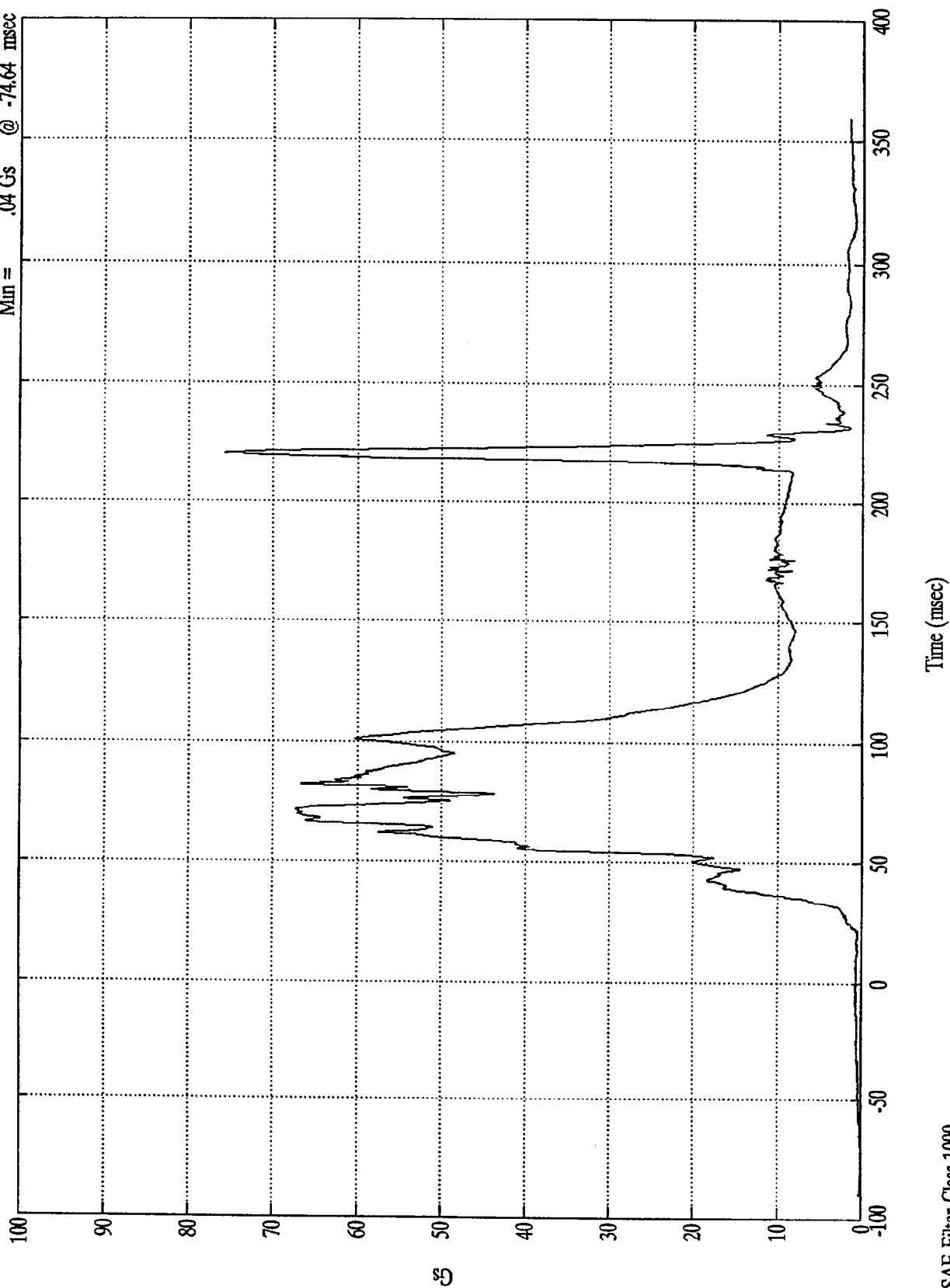
Max = 62.49 Gs @ 69.24 msec
Min = -3.74 Gs @ 233.04 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Head Resultant

Max = 75.69 Gs @ 219.84 msec
Min = .04 Gs @ -74.64 msec

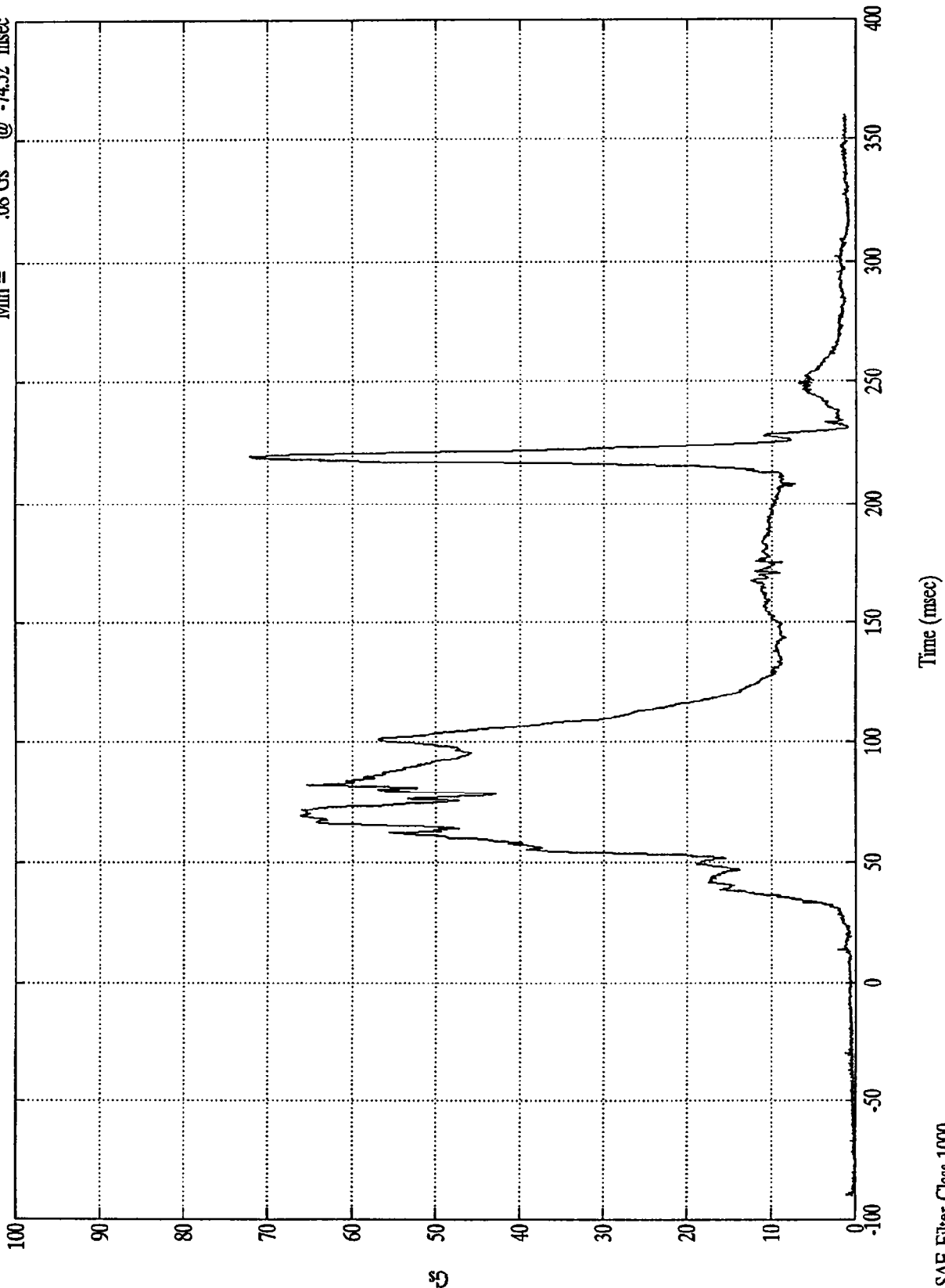


SAE Filter Class 1000

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Head Resultant(R)

Max = 72.21 Gs @ 219.36 msec
Min = .08 Gs @ -74.52 msec

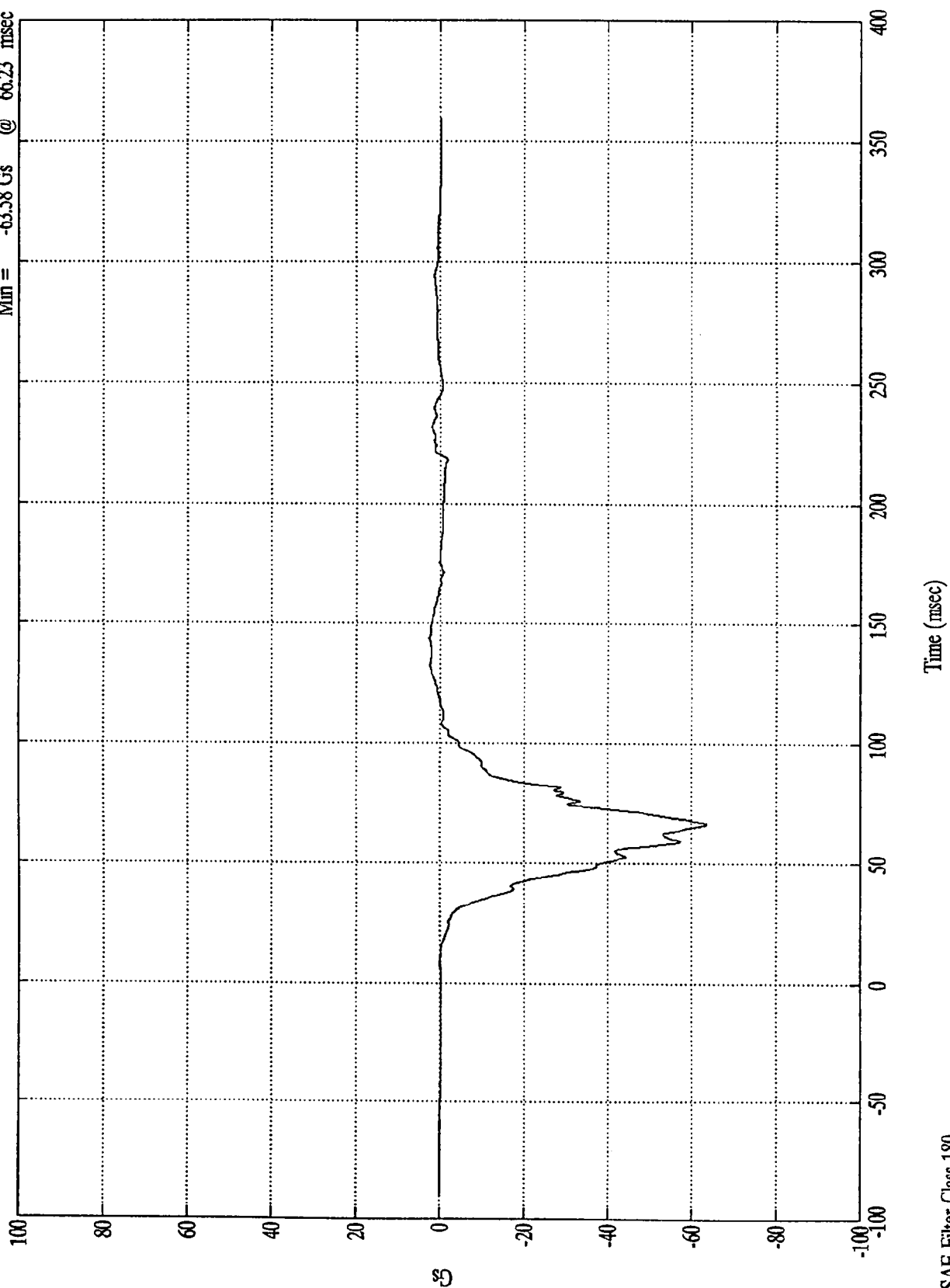


SAE Filter Class 1000

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Chest X

Max = 261 Gs @ 143.76 msec
Min = -63.58 Gs @ 66.23 msec

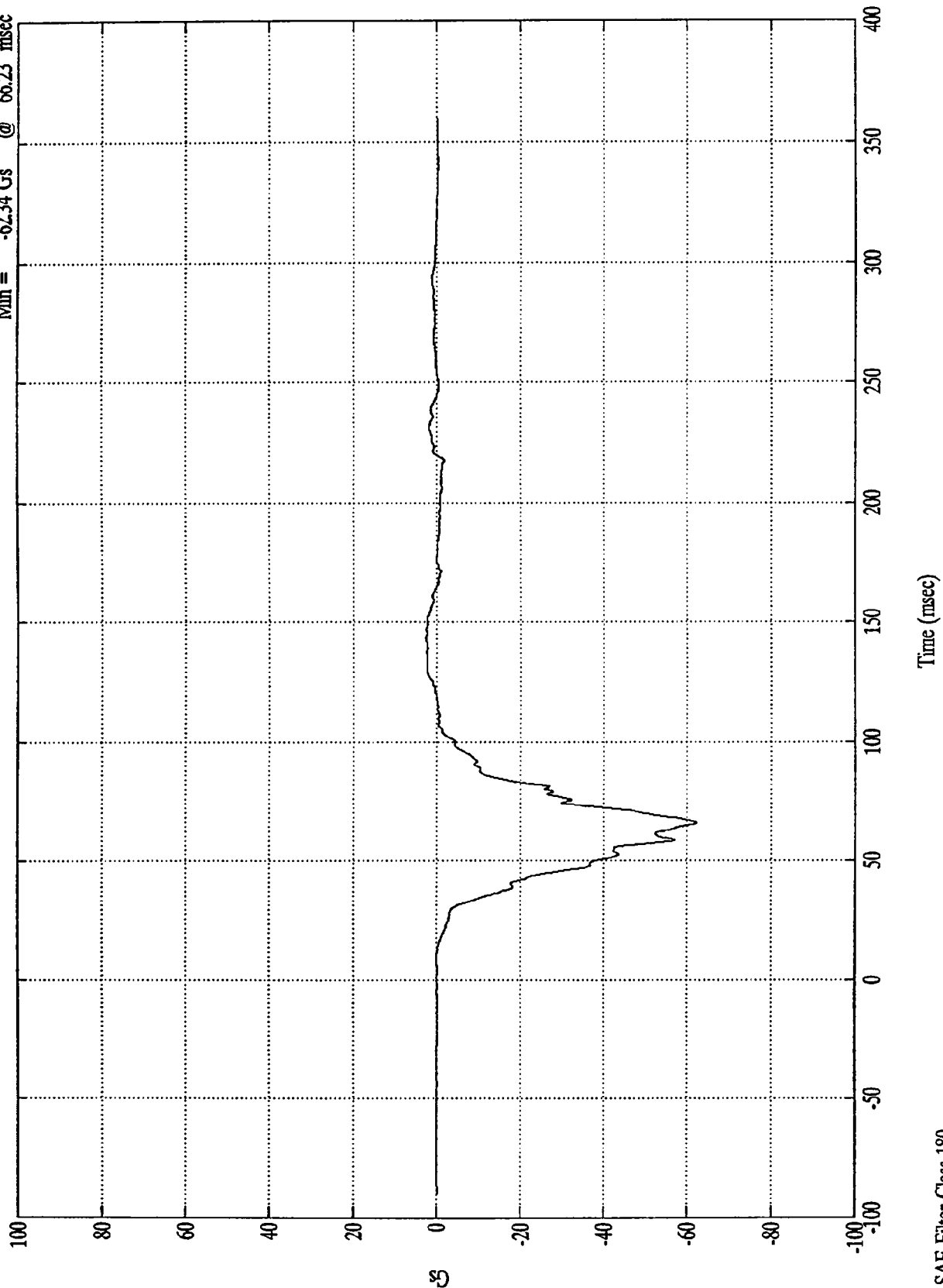


SAE Filter Class 180

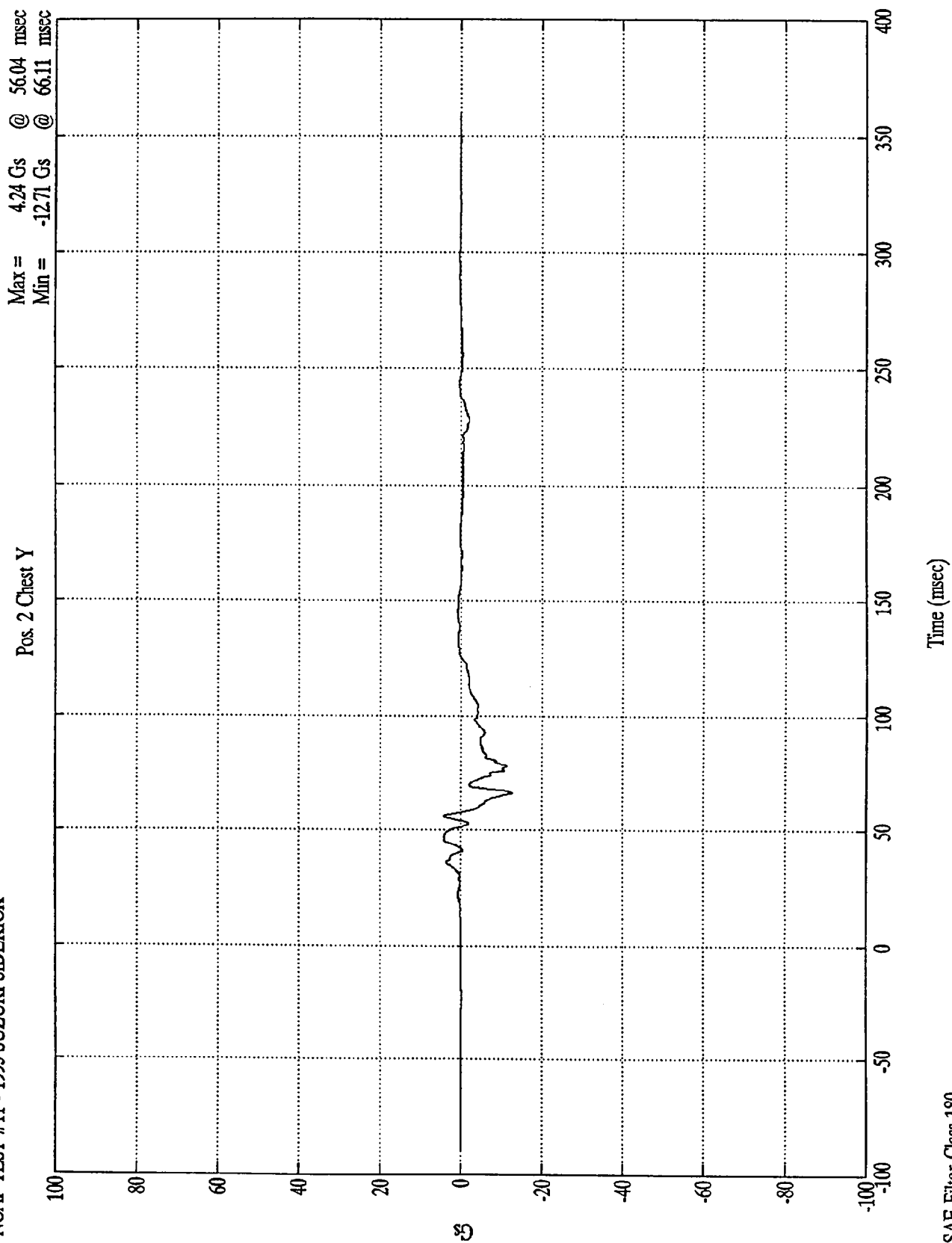
NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Chest X(R)

Max = 2.61 Gs @ 143.16 msec
Min = -62.34 Gs @ 66.23 msec



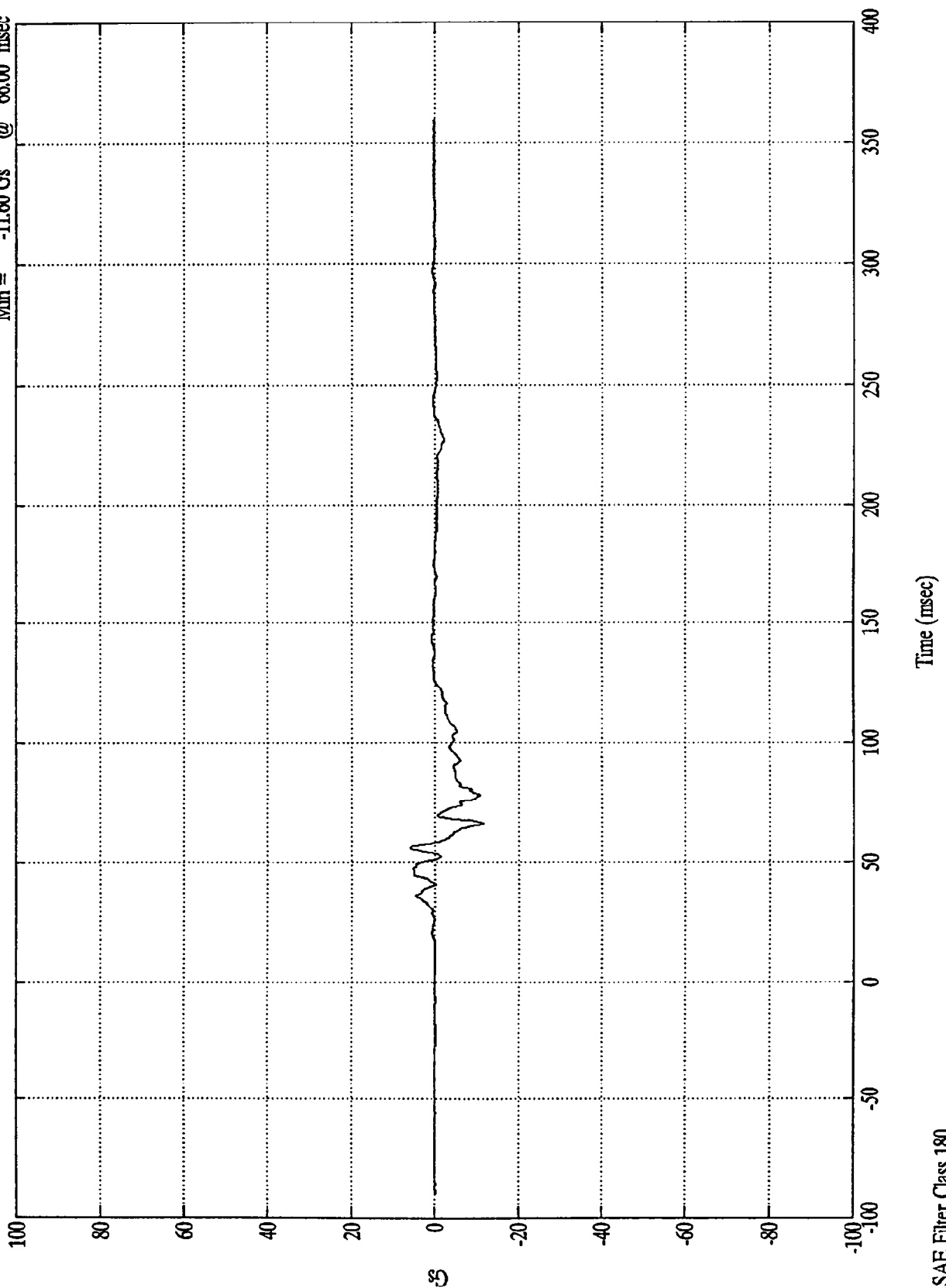
NCAP TEST #11 - 1995 SUZUKI SIDEKICK



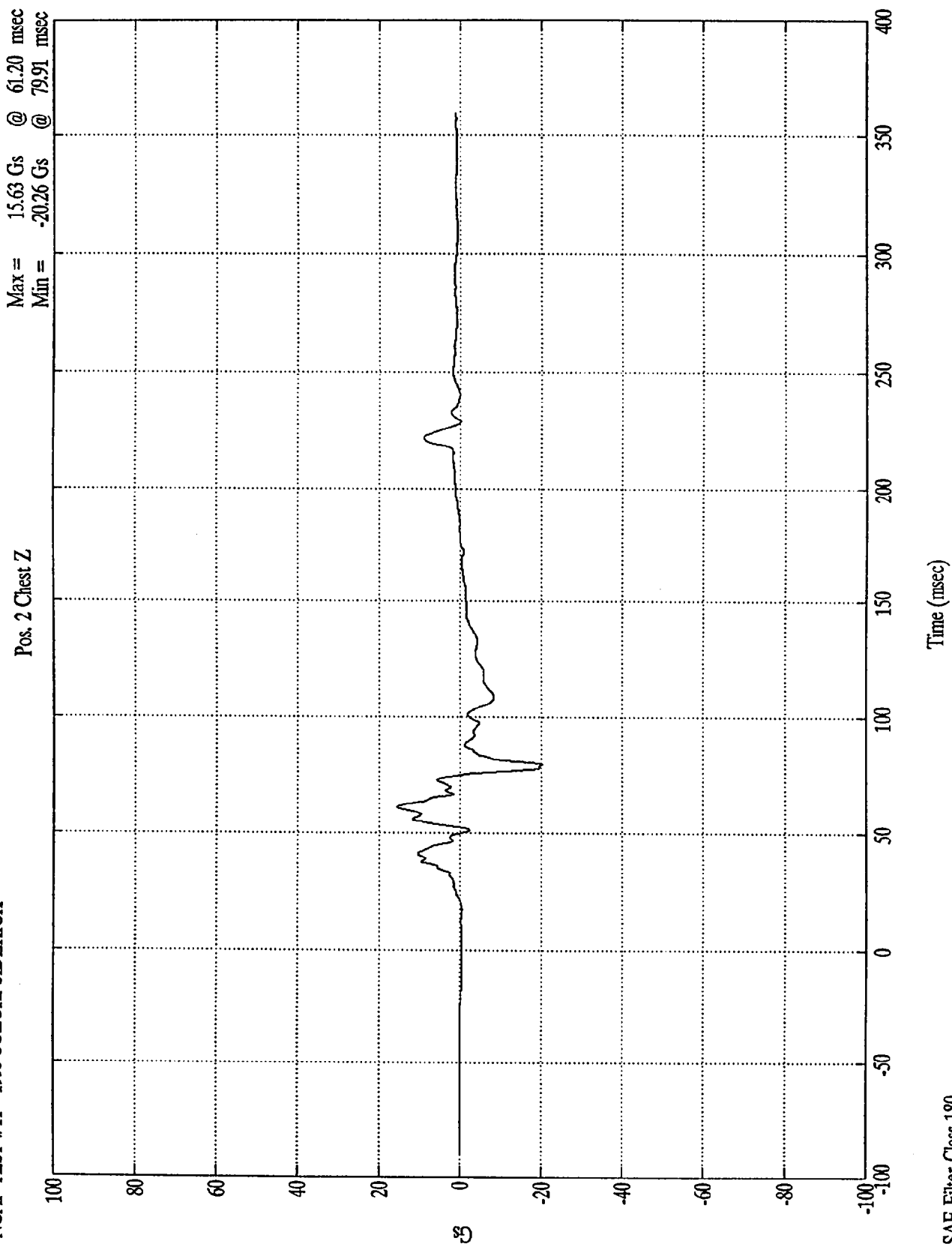
NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Chest Y(R)

Max = 5.94 Gs @ 56.04 msec
Min = -11.60 Gs @ 66.00 msec



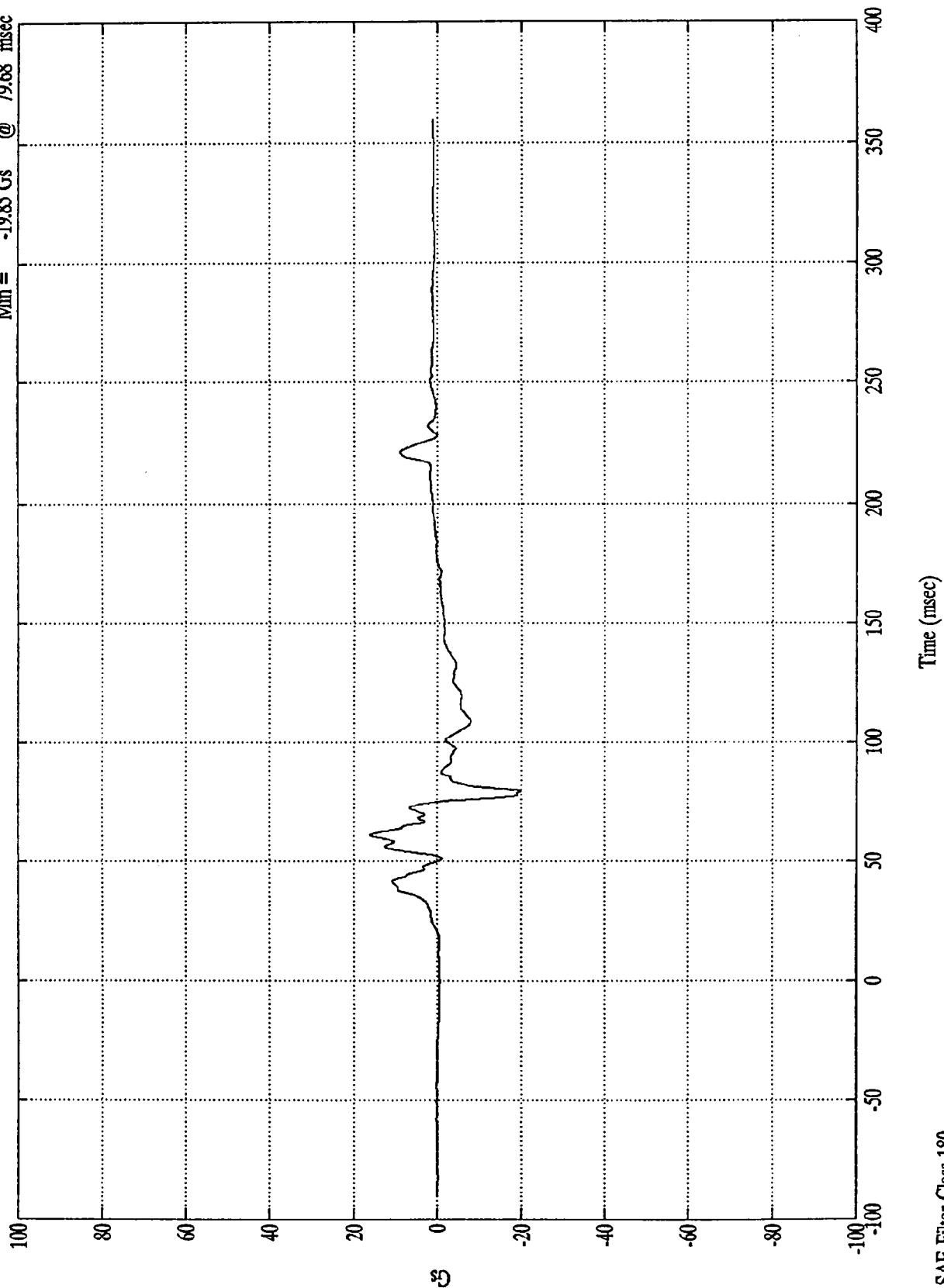
NCAP TEST #11 - 1995 SUZUKI SIDEKICK



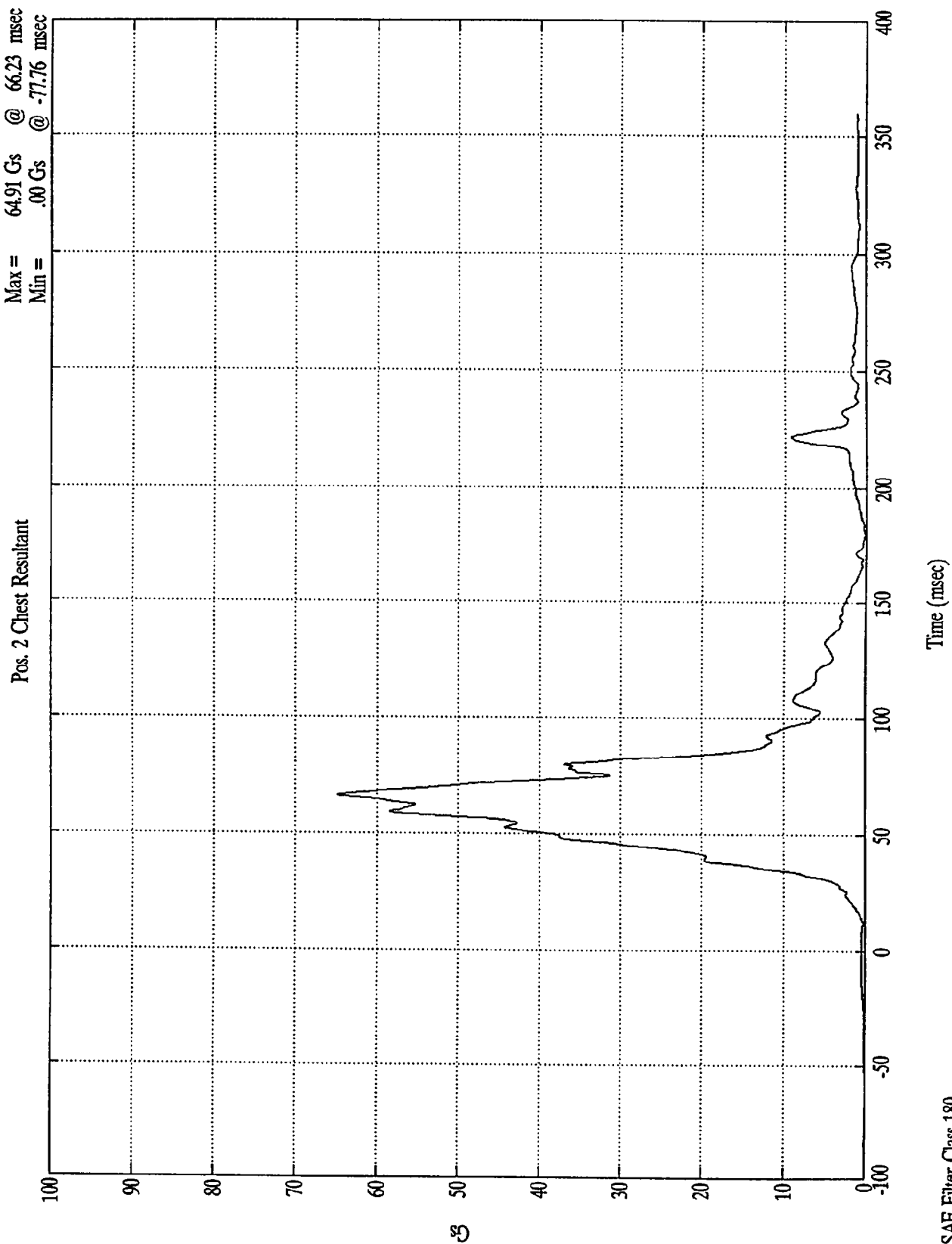
NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Chest Z(R)

Max = 16.12 Gs @ 61.20 msec
Min = -19.85 Gs @ 79.68 msec

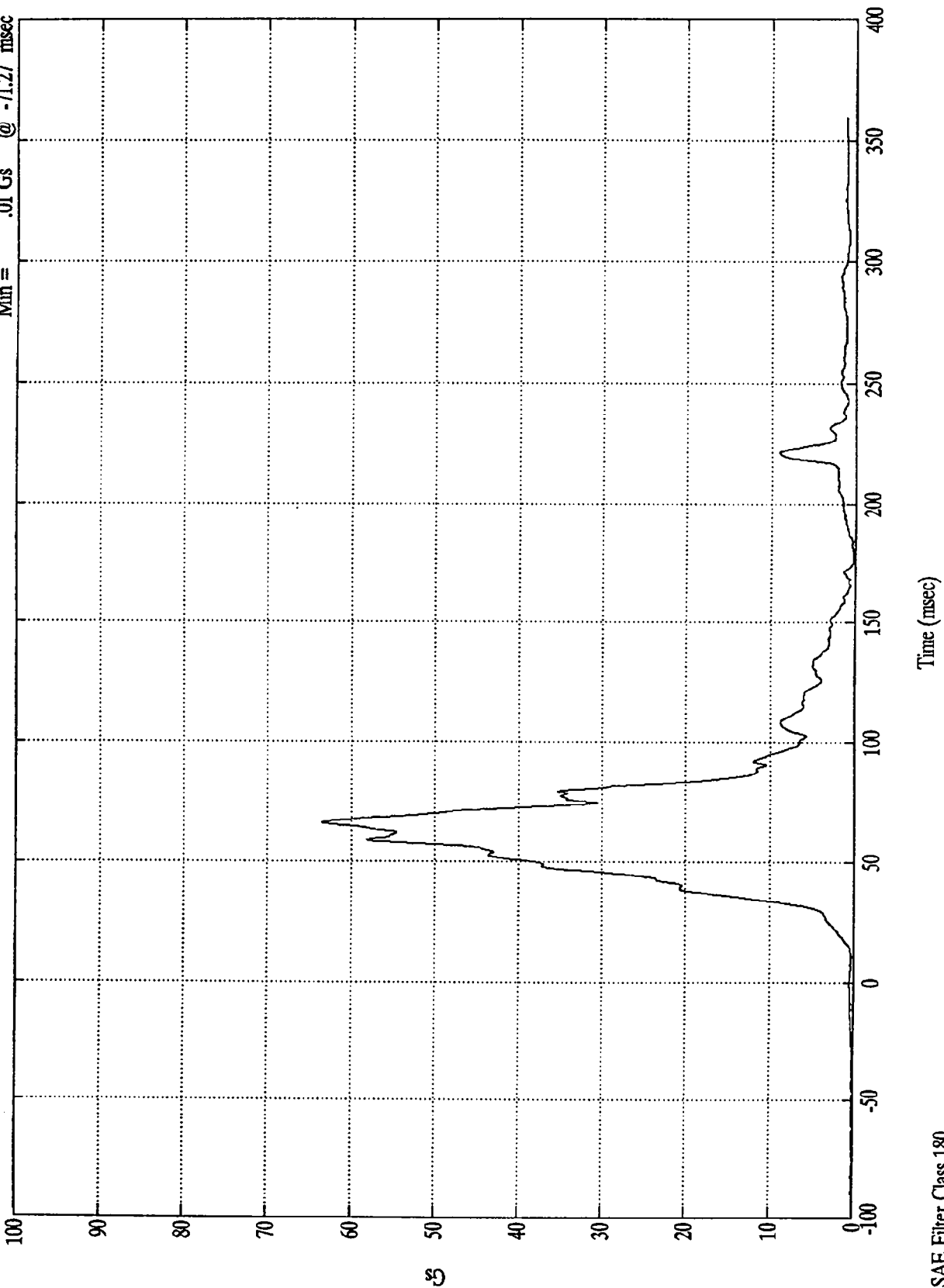


NCAP TEST #11 - 1995 SUZUKI SIDEKICK



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

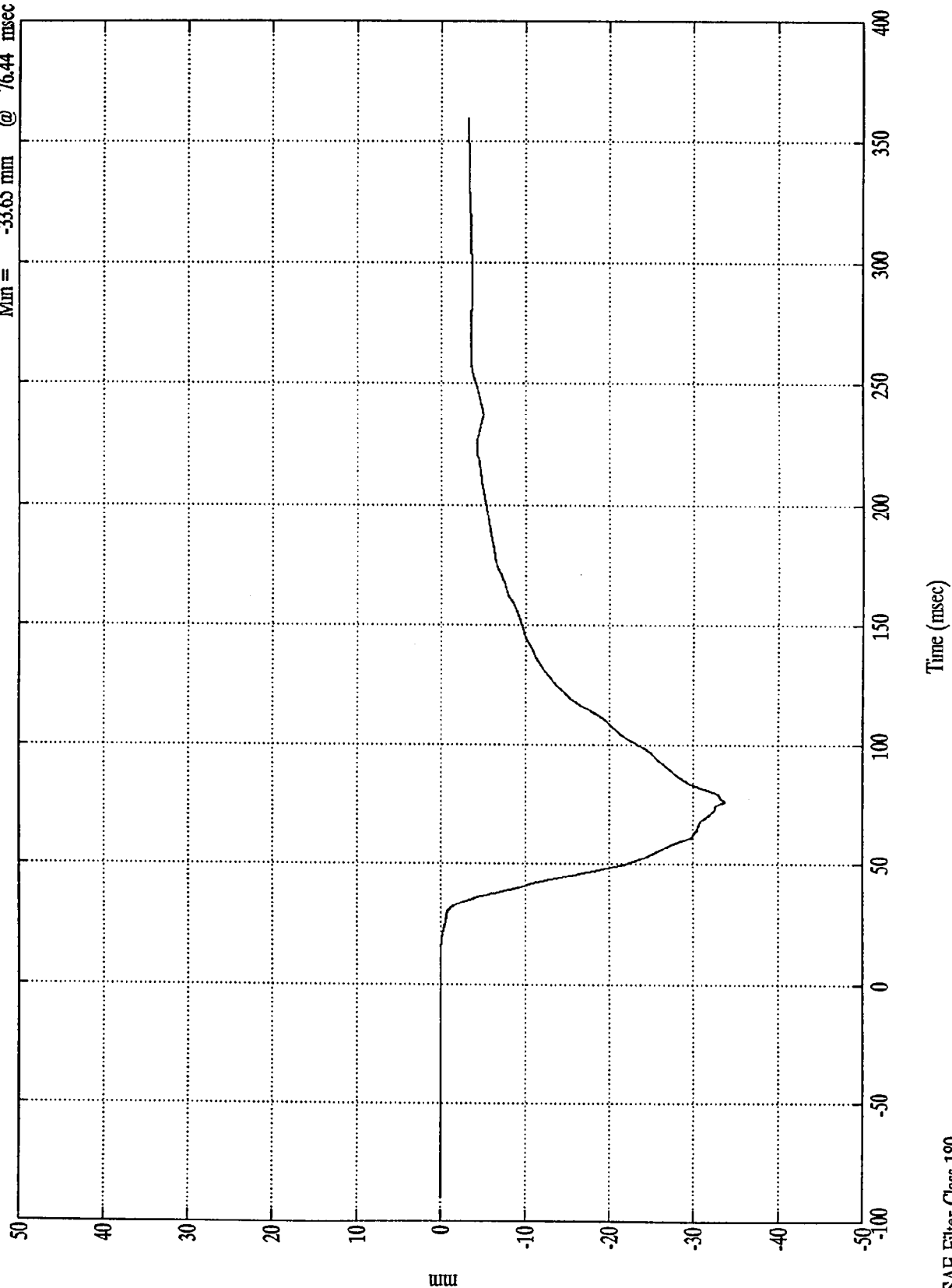
Pos. 2 Chest Res(R)
Max = 63.51 Gs @ 66.11 msec
Min = .01 Gs @ -71.27 msec



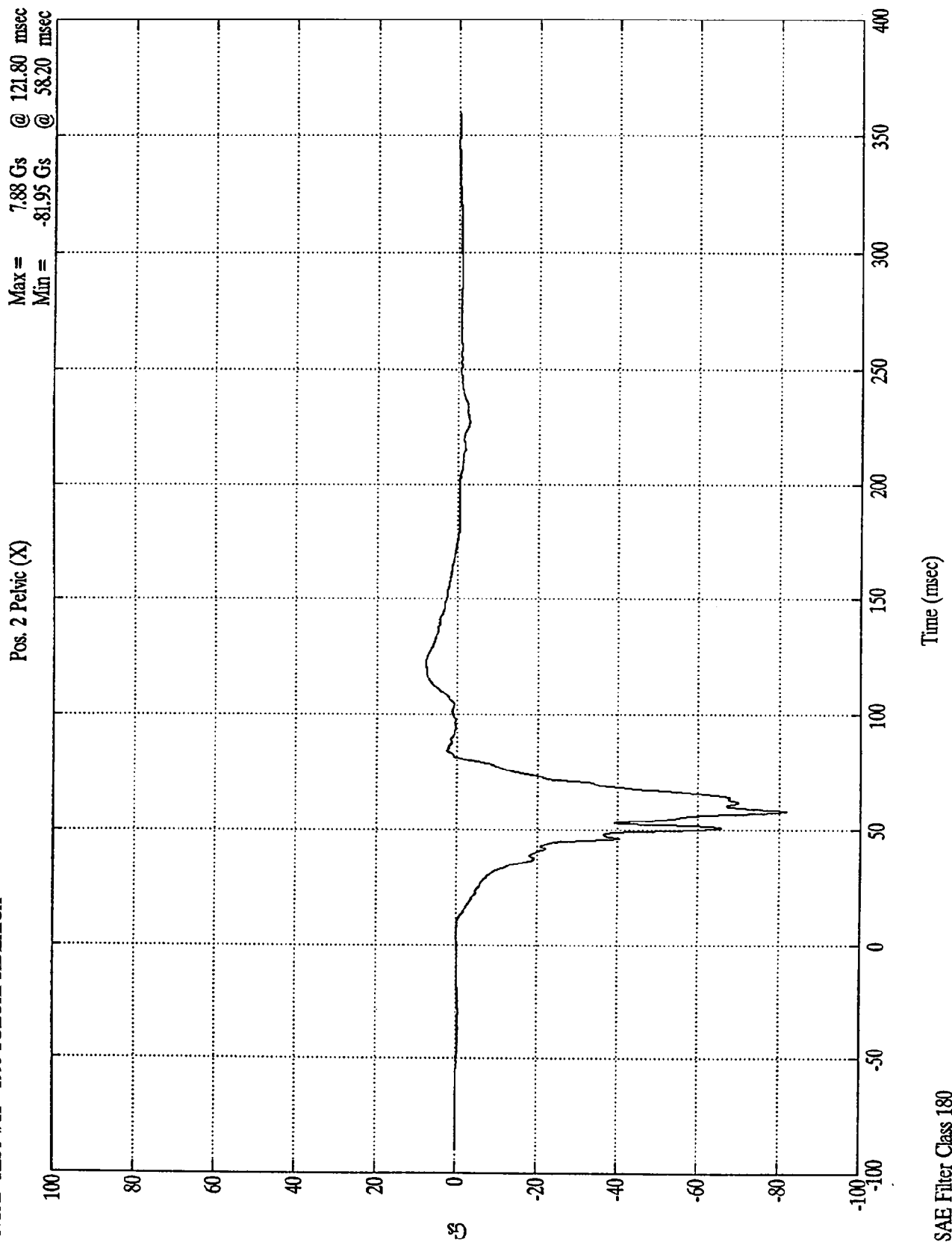
NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Chest Disp.

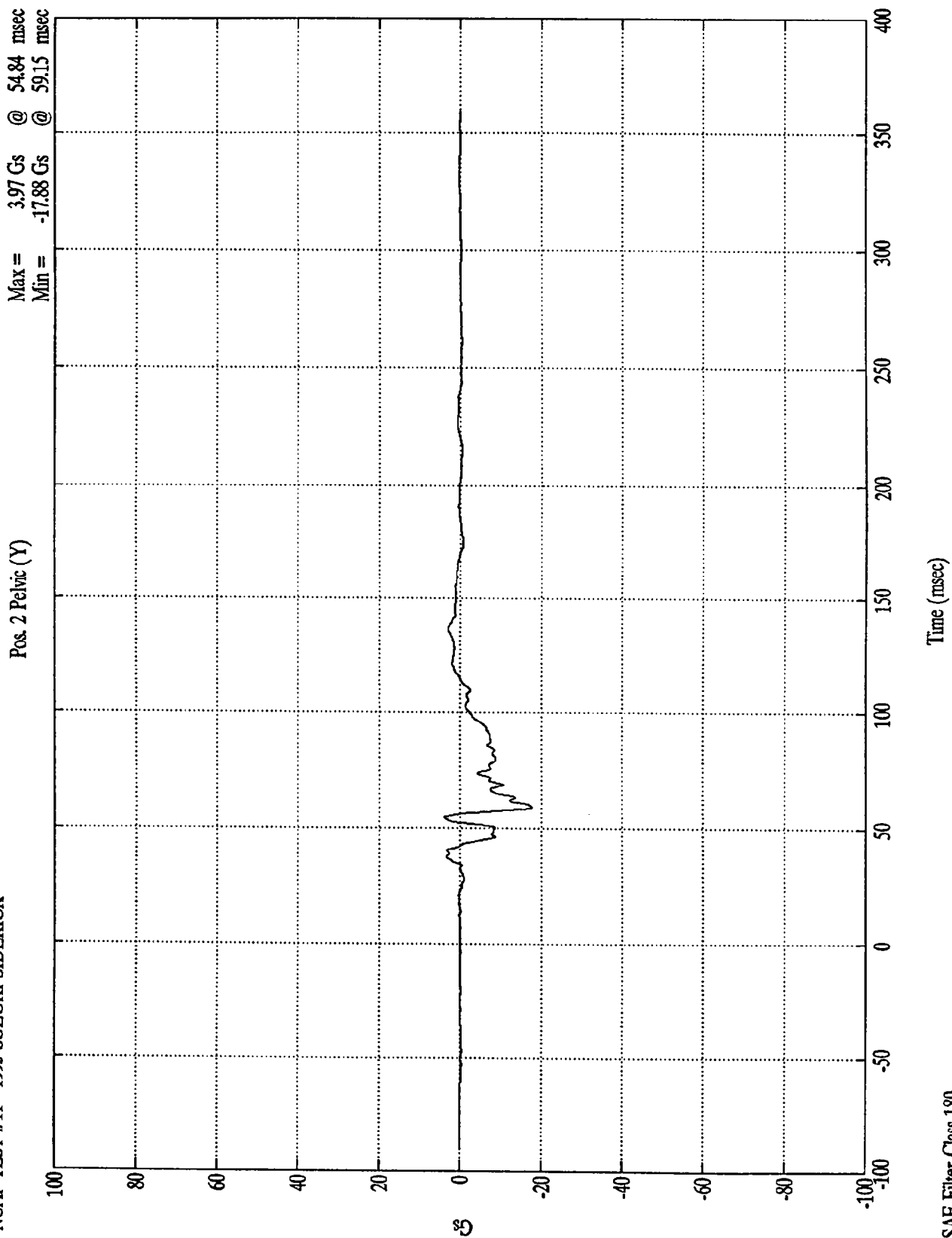
Max = .00 mm @ -32.16 msec
Min = -33.65 mm @ 76.44 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK



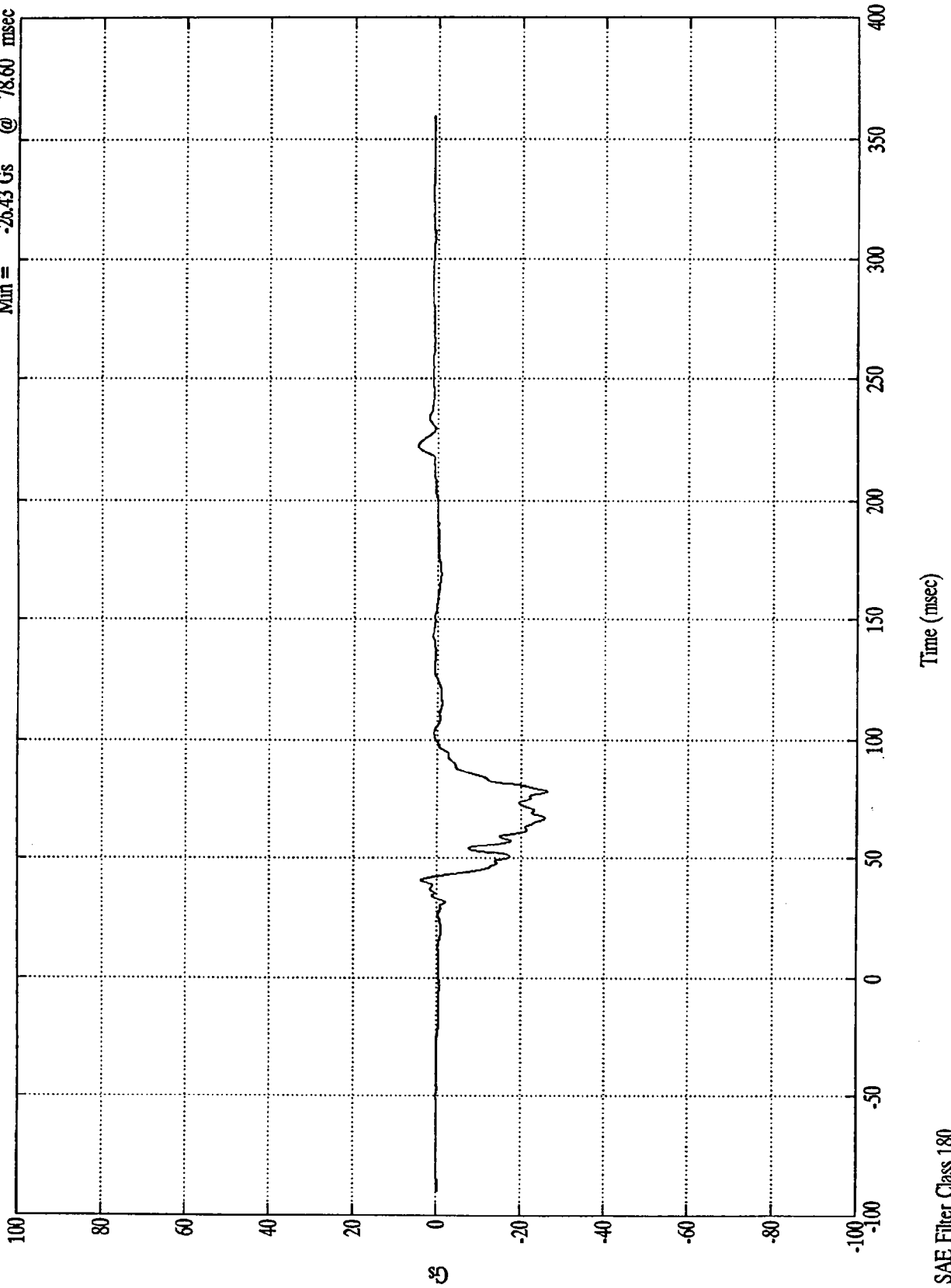
NCAP TEST #11 - 1995 SUZUKI SIDEKICK



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Pelvic (Z)

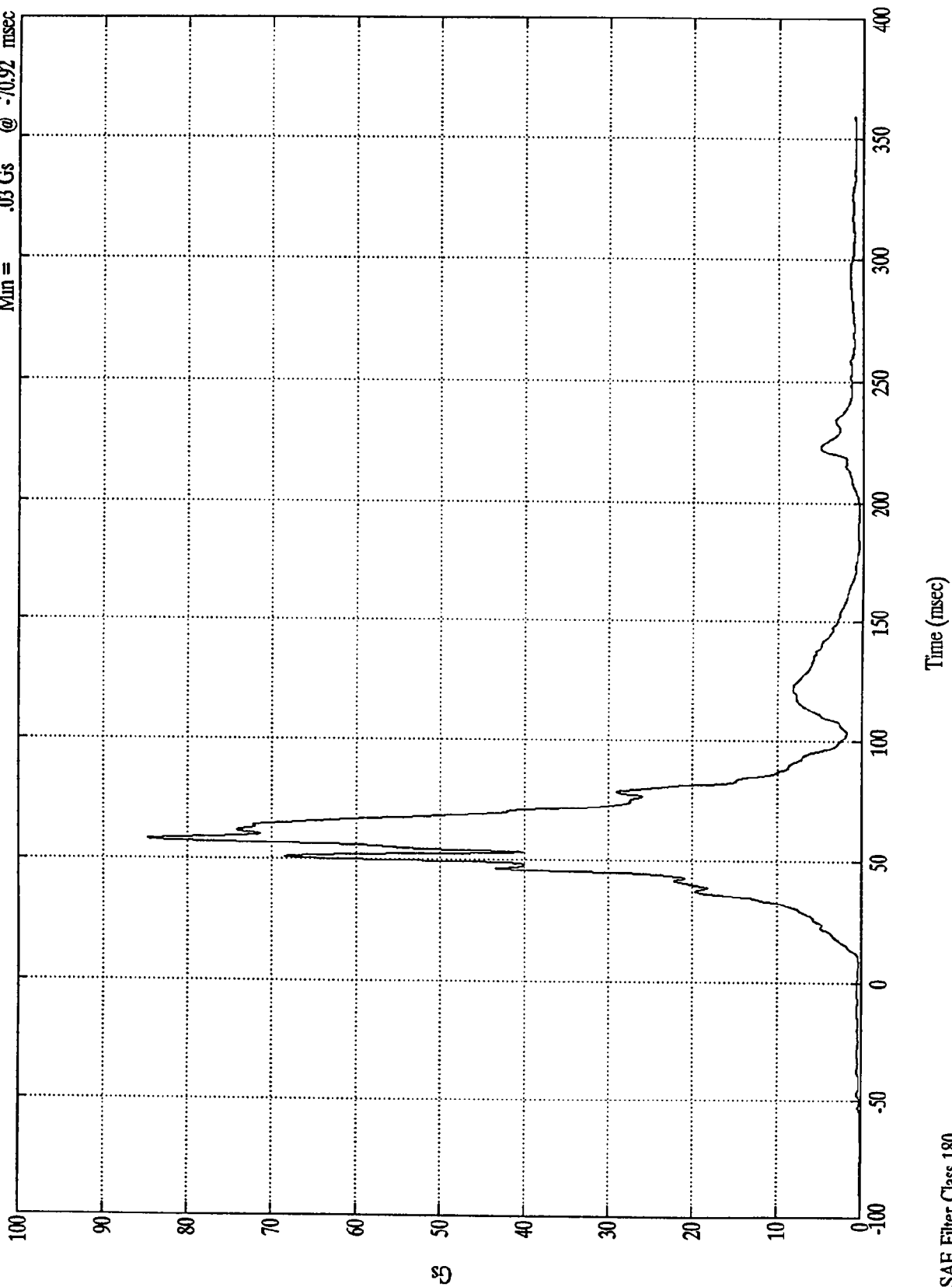
Max = 4.63 Gs @ 222.36 msec
Min = -26.43 Gs @ 78.60 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Pelvic (R)

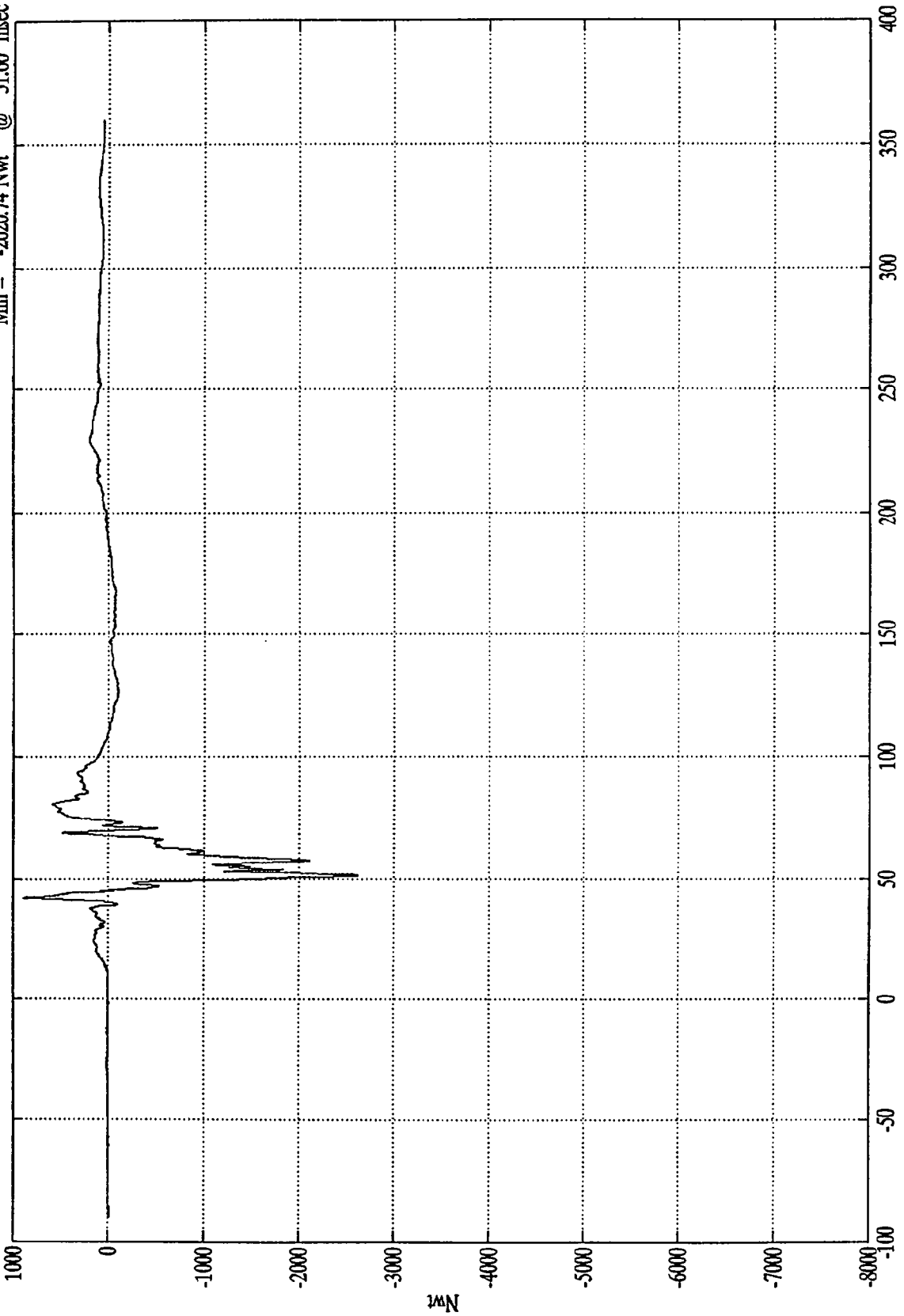
Max = 84.64 Gs @ 58.20 msec
Min = .03 Gs @ -70.92 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 895.56 Nwt @ 42.47 msec
Min = -2620.74 Nwt @ 51.60 msec

Pos. 2 Left Femur



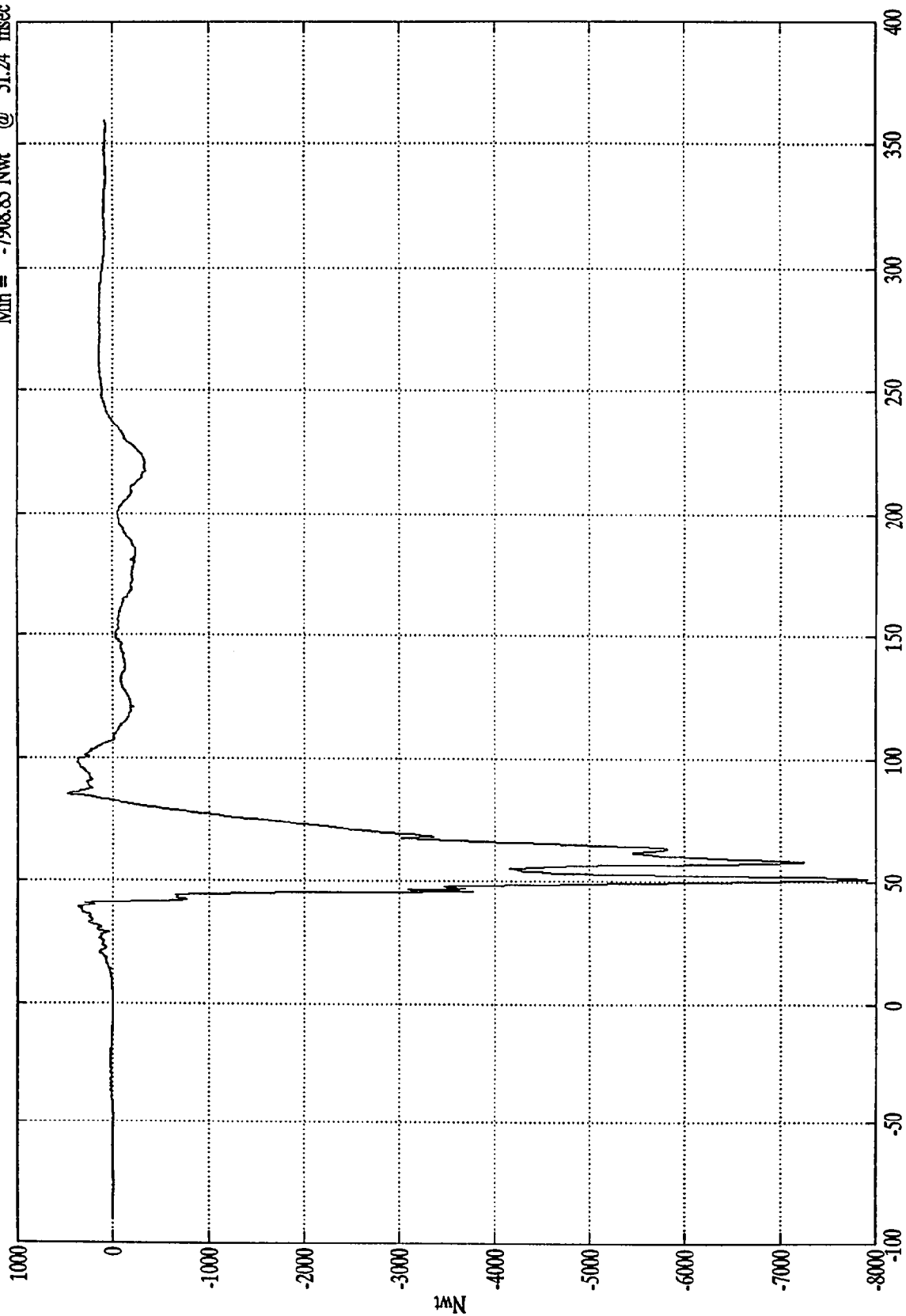
Time (msec)

SAE Filter Class 600

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Right Femur

Max = 473.46 Nwt @ 85.44 msec
Min = -7908.85 Nwt @ 51.24 msec



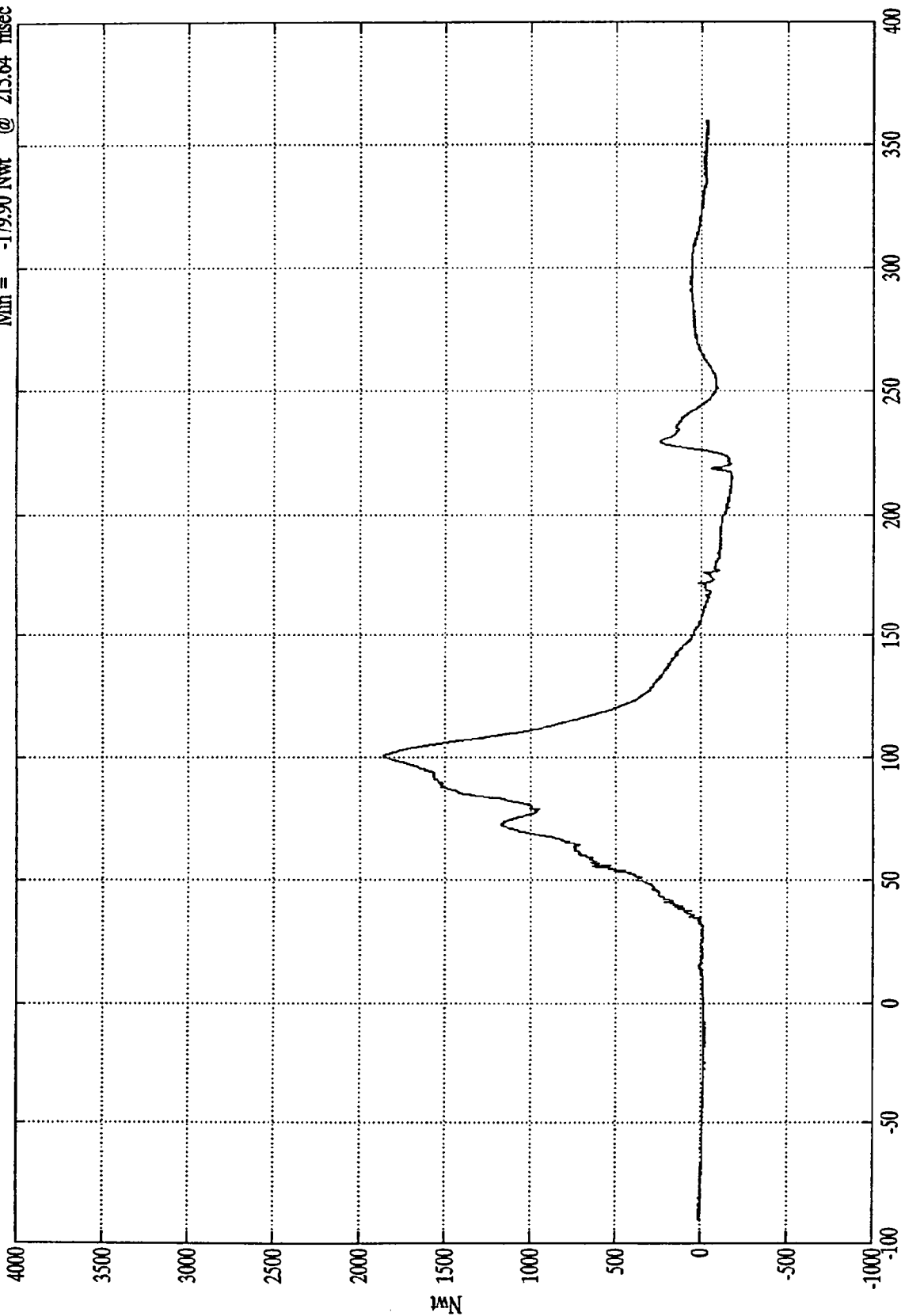
Time (msec)

SAE Filter Class 600

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Upper Neck Fx

Max = 1856.25 Nwt @ 100.68 msec
Min = -179.90 Nwt @ 215.64 msec



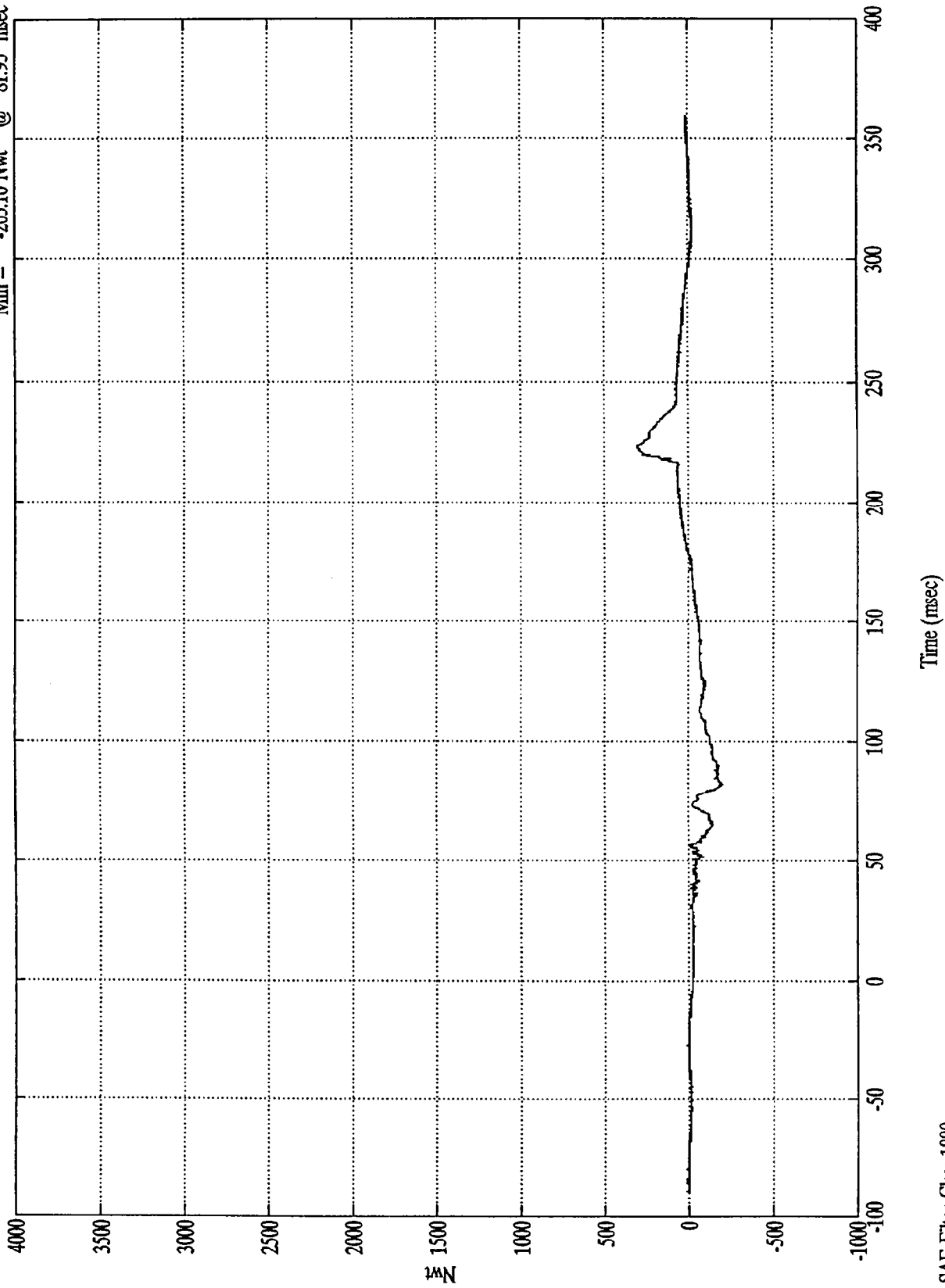
Time (msec)

SAE Filter Class 1000

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Upper Neck Fy

Max = 306.48 Nwt @ 224.04 msec
Min = -205.10 Nwt @ 81.95 msec

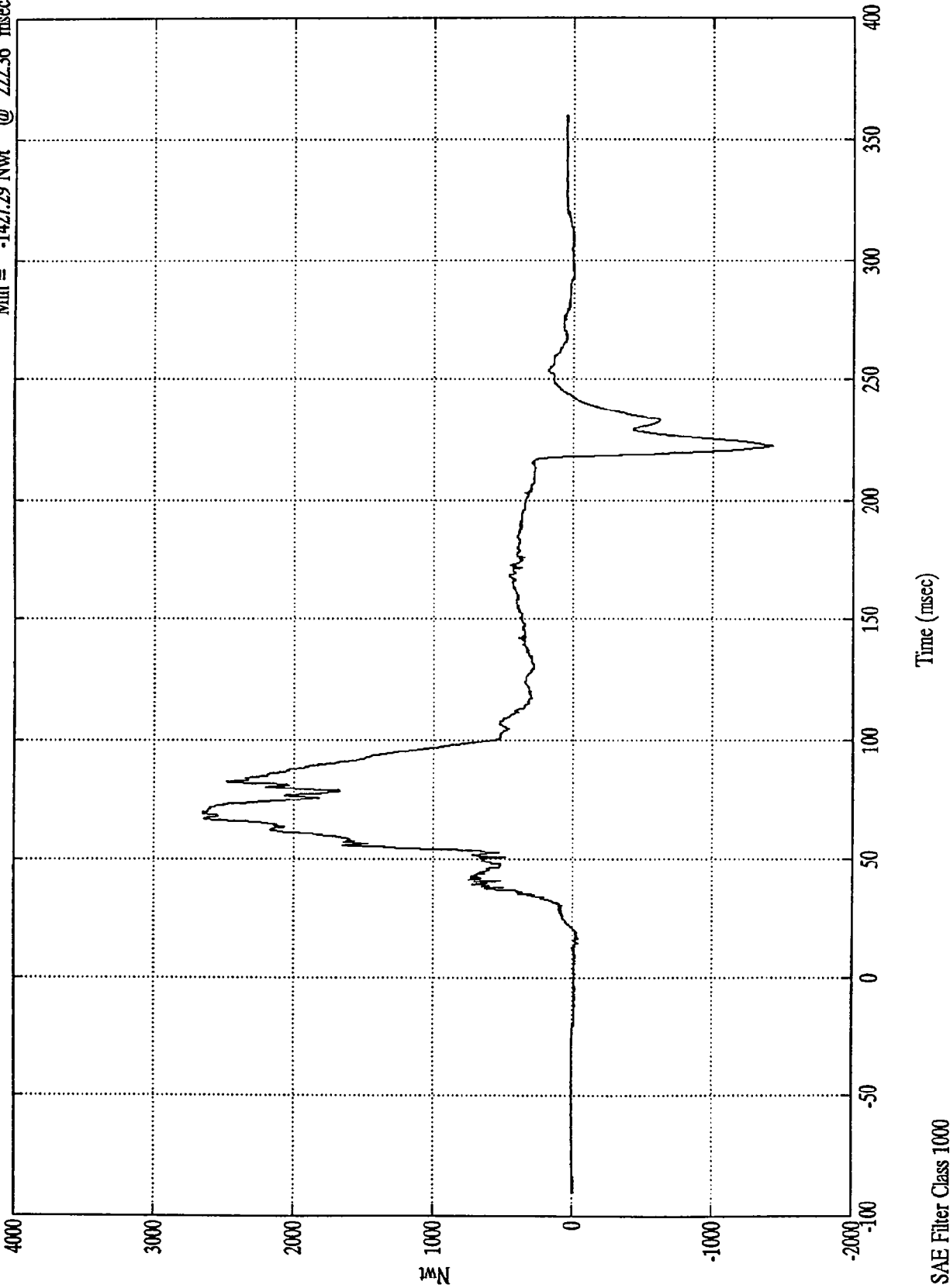


SAE Filter Class 1000

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Upper Neck Fz

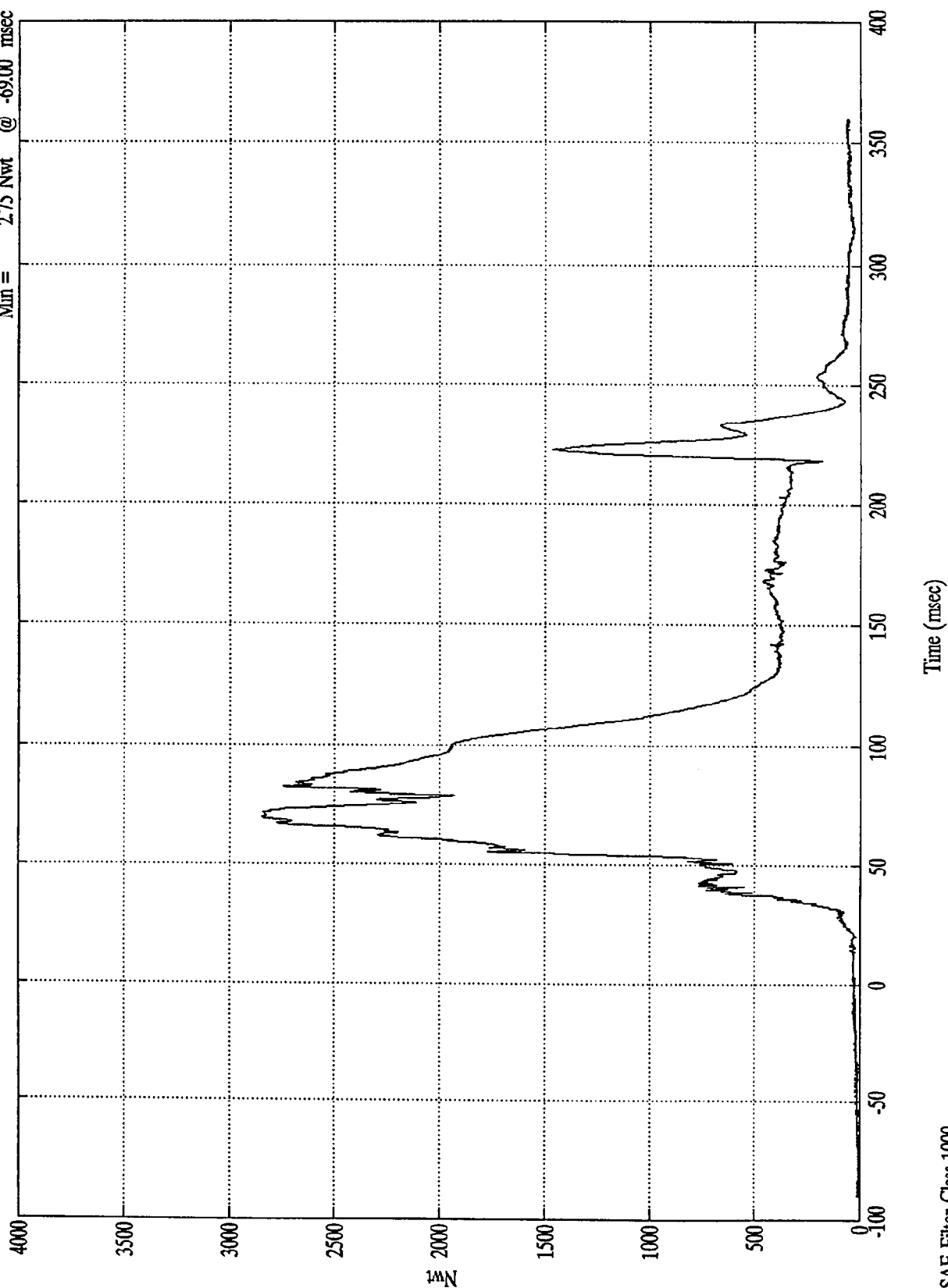
Max = 2649.04 Nwt @ 69.59 msec
Min = -1427.29 Nwt @ 222.36 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 2846.12 Nwt @ 69.59 msec
Min = 2.75 Nwt @ -69.00 msec

Pos. 2 Neck Force Res.

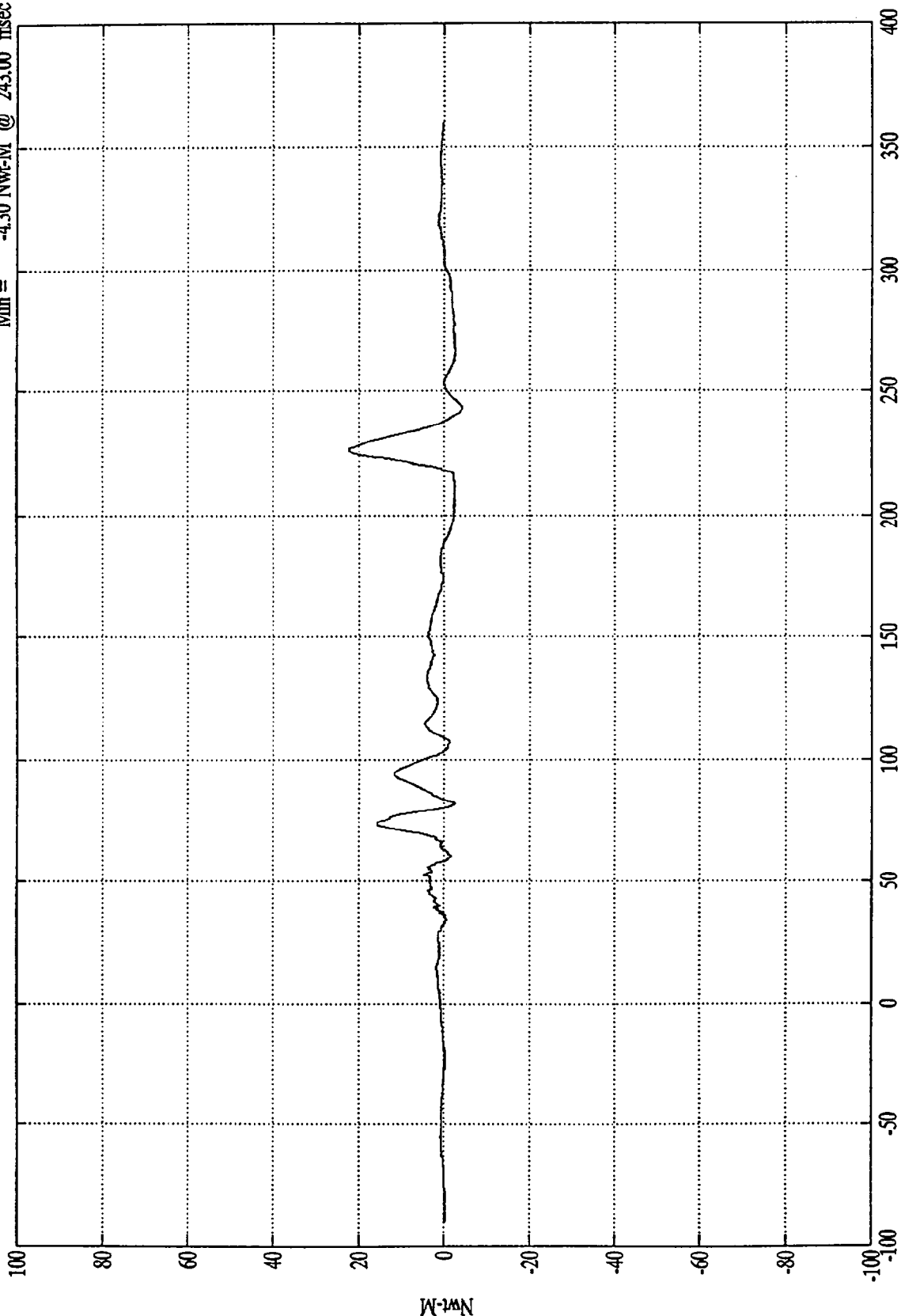


SAE Filter Class 1000

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Upper Neck Mix

Max = 22.38 Nwt-M @ 226.32 msec
Min = -4.30 Nwt-M @ 243.00 msec



Time (msec)

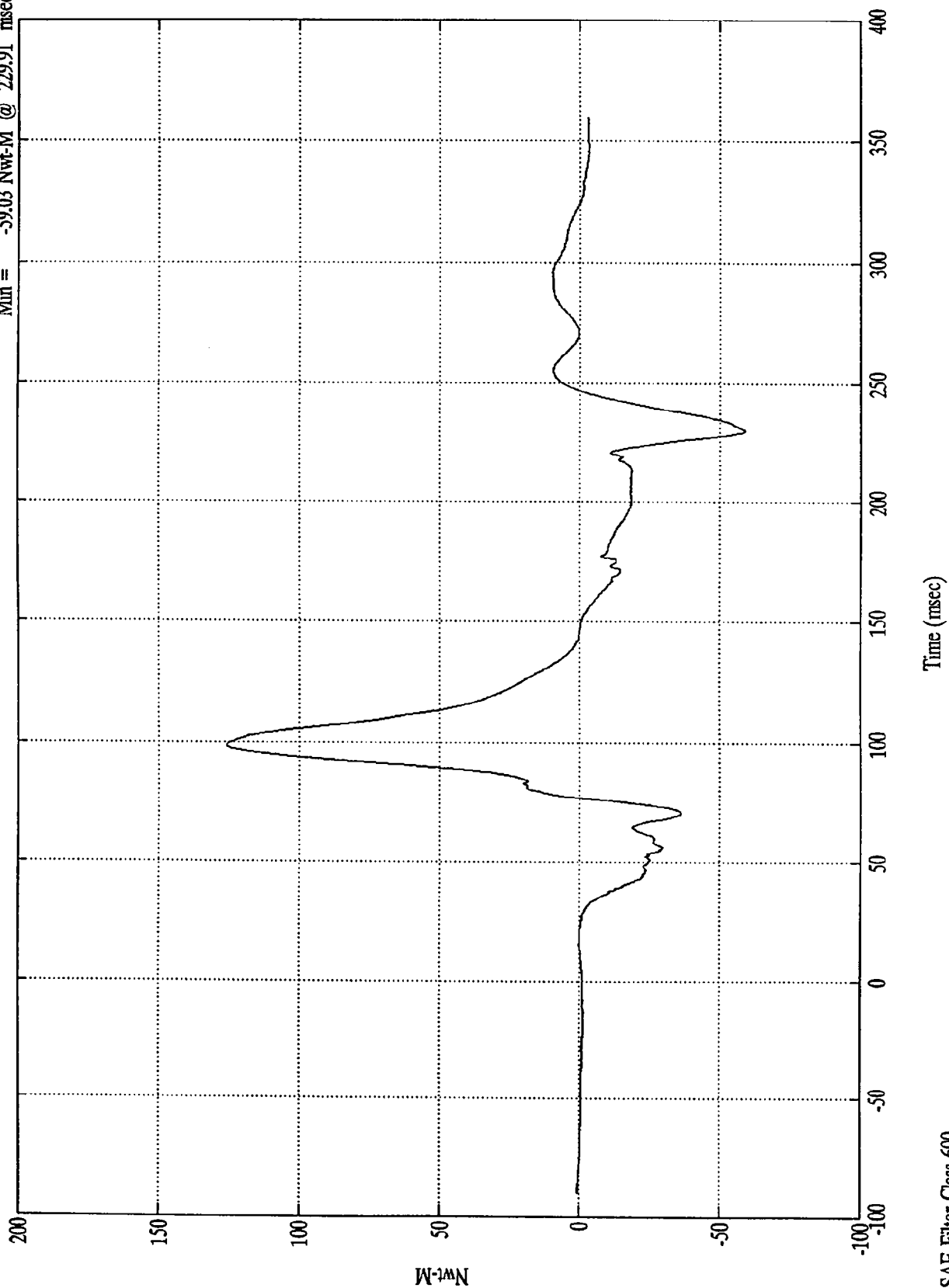
SAE Filter Class 600

Nwt-M

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Upper Neck My

Max = 126.02 Nwt-M @ 98.52 msec
Min = -59.03 Nwt-M @ 229.91 msec

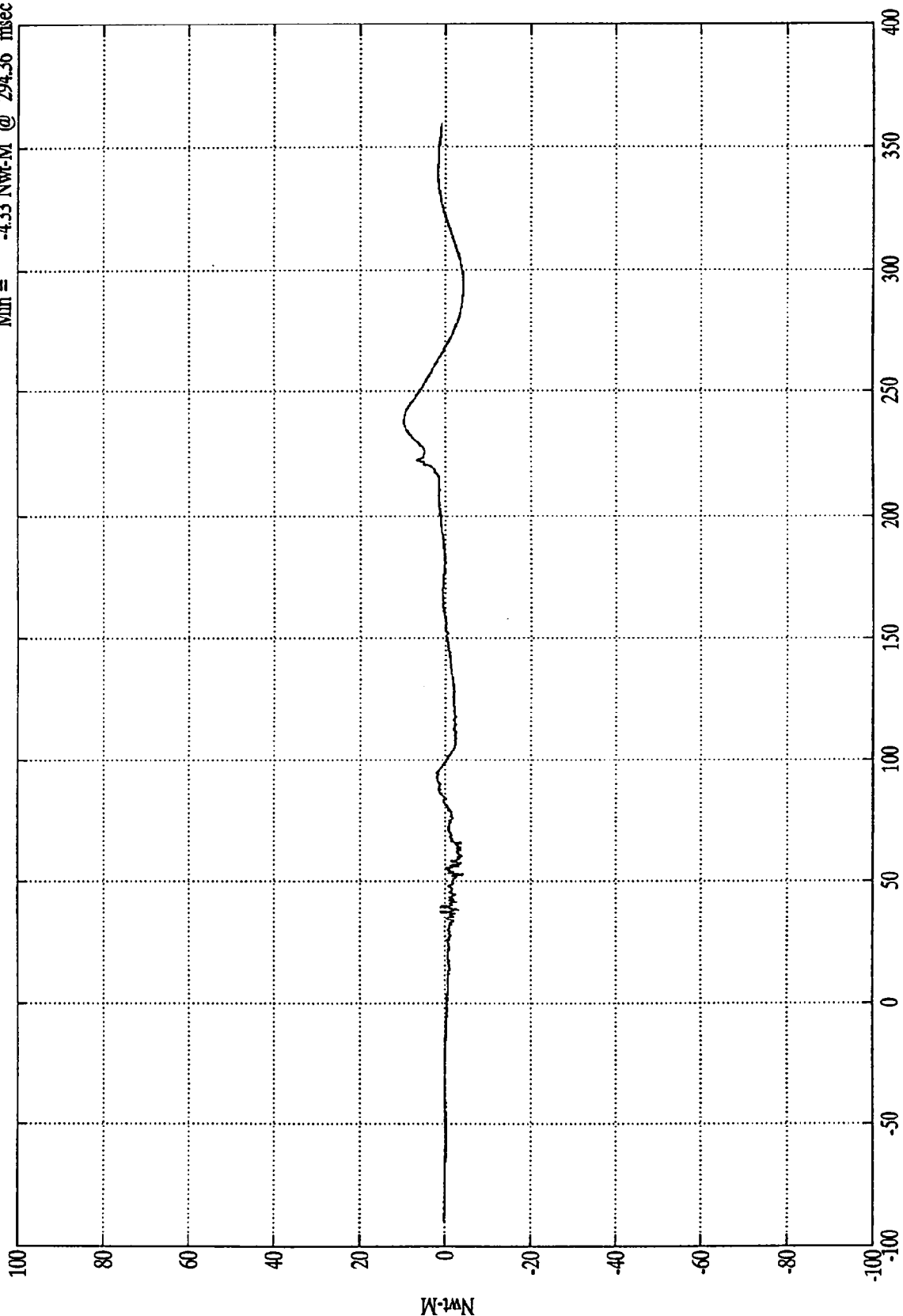


SAE Filter Class 600

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Upper Neck Mz

Max = 9.95 Nwt-M @ 237.47 msec
Min = -4.33 Nwt-M @ 294.36 msec



Time (msec)

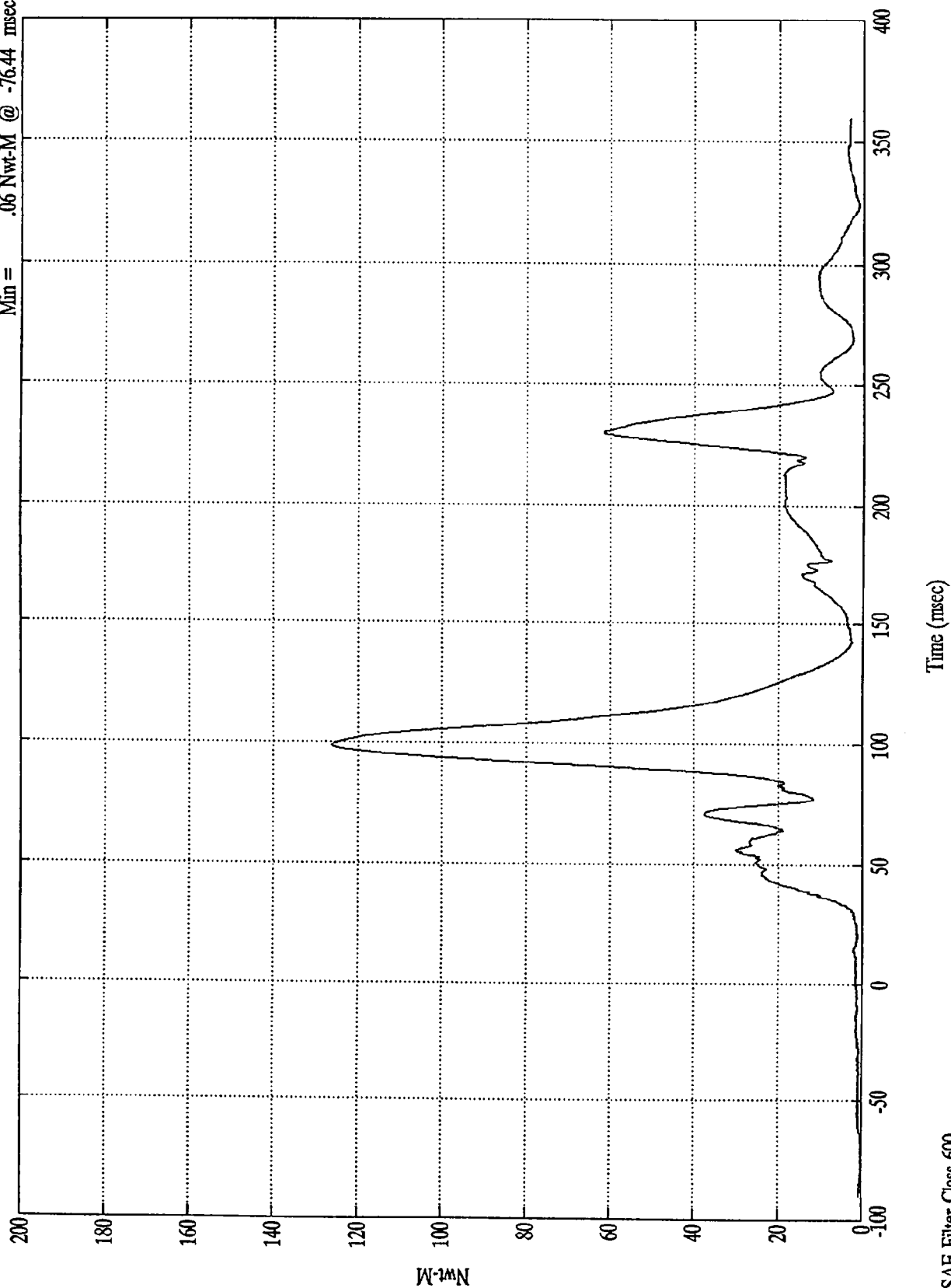
SAE Filter Class 600

Nwt-M

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Neck Moment Res.

Max = 126.22 Nwt-M @ 98.52 msec
Min = .06 Nwt-M @ -76.44 msec

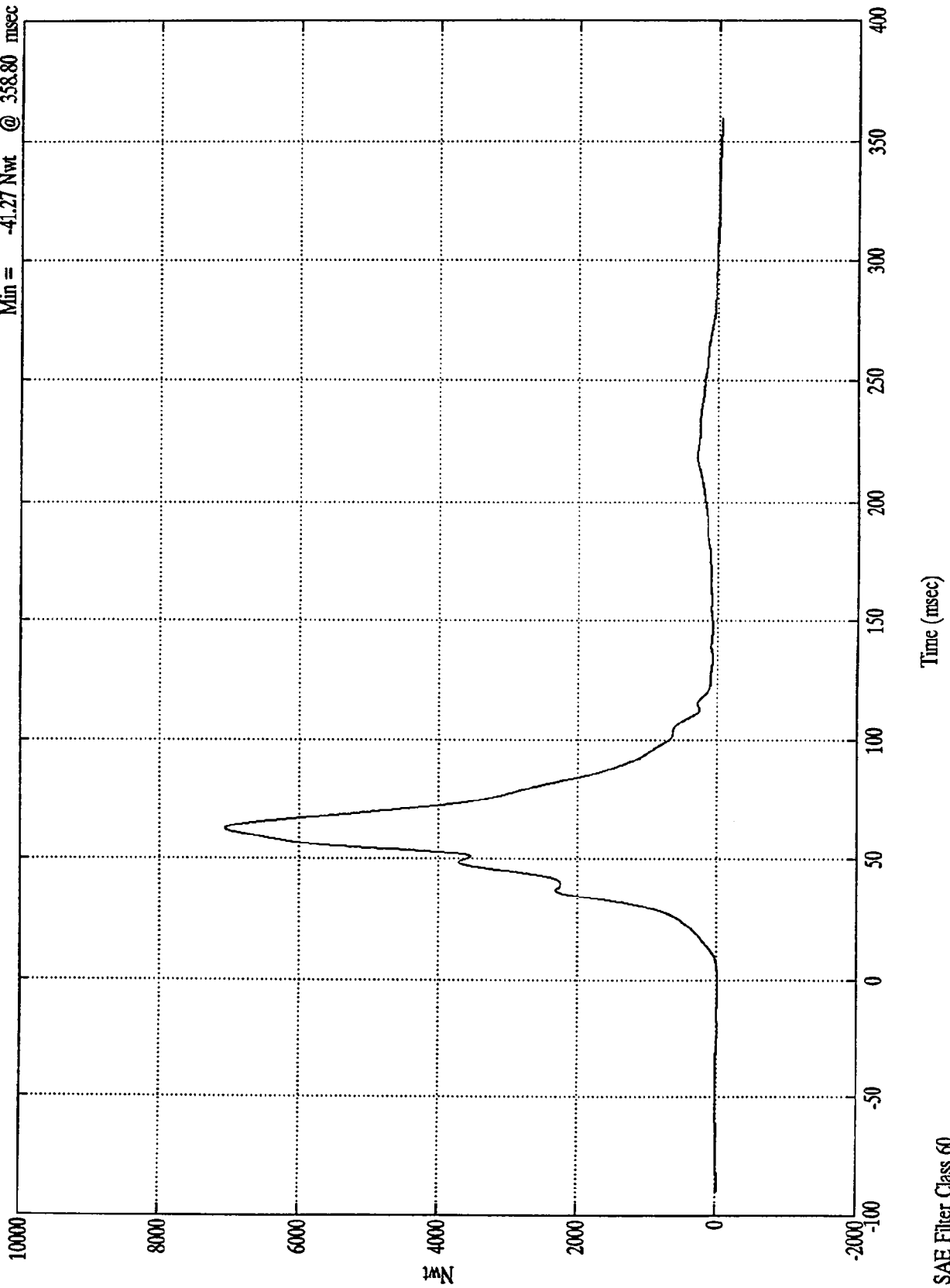


SAE Filter Class 600

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

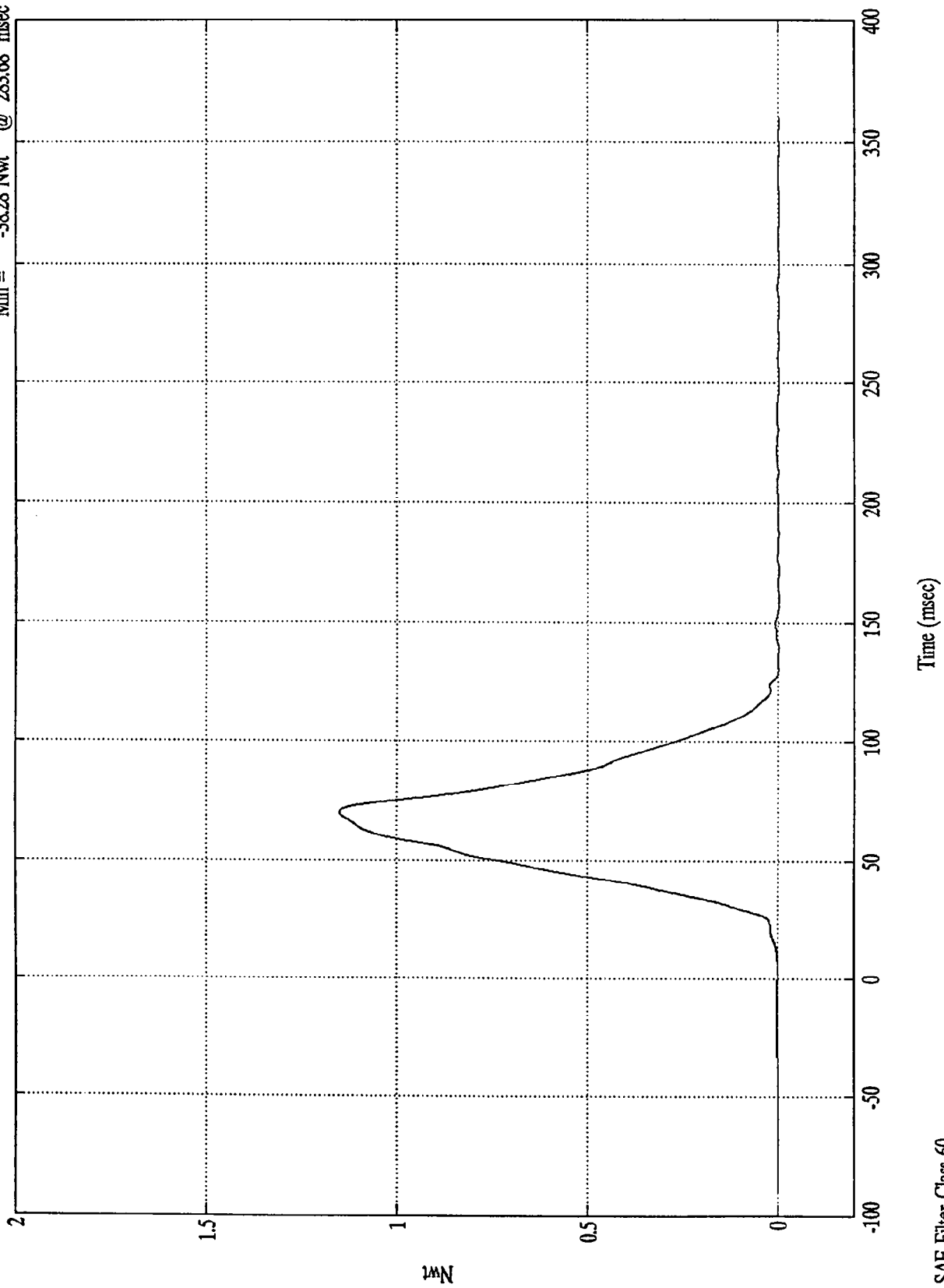
Pos. 2 Right Belt Load

Max = 7068.14 Nwt @ 62.64 msec
Min = -41.27 Nwt @ 358.80 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK
x10⁴

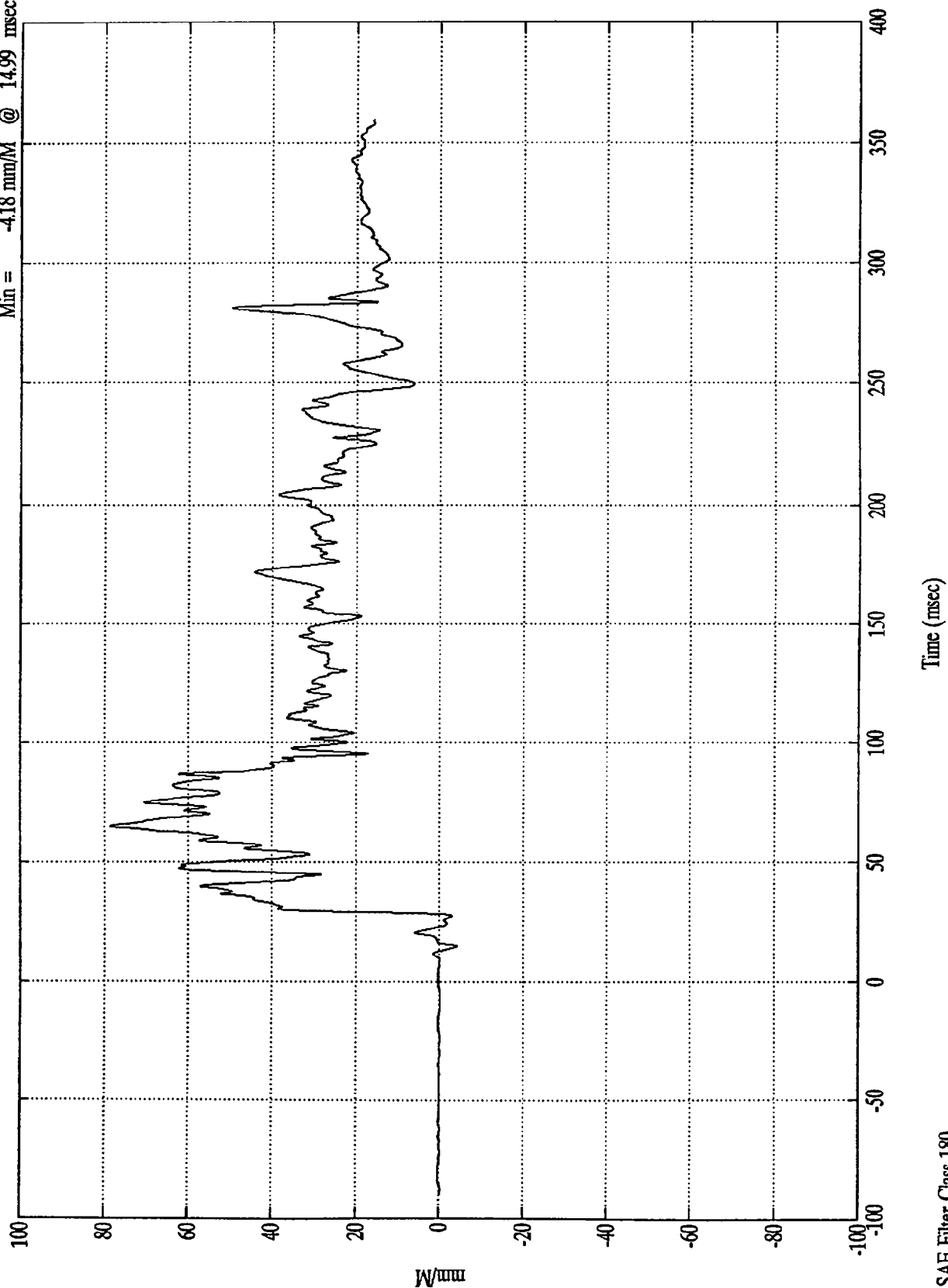
Pos. 2 Torso Belt Load
Max = 11515.03 Nwt @ 70.08 msec
Min = -38.28 Nwt @ 283.68 msec



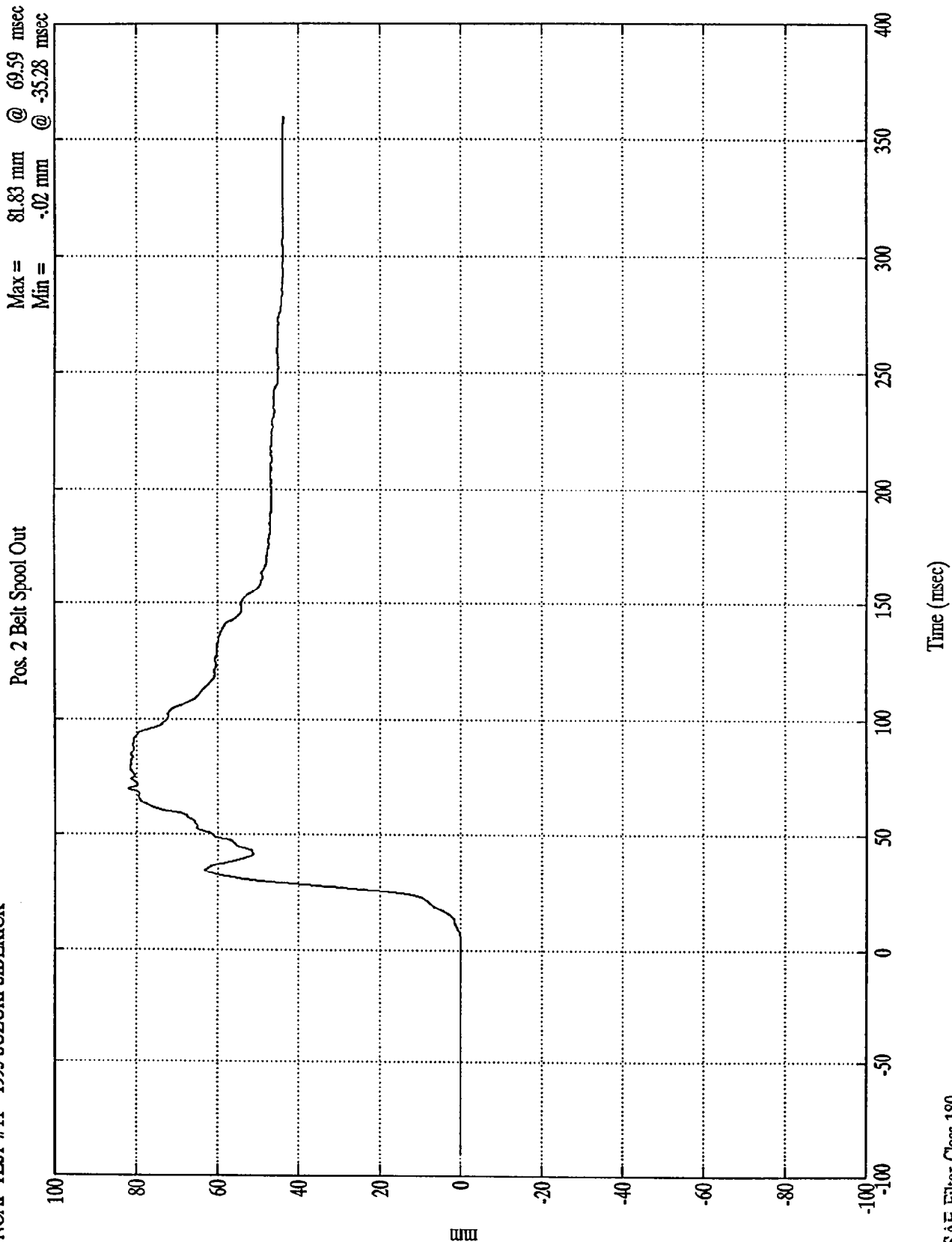
NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Pos. 2 Belt Elongation

Max = 78.59 mm/M @ 64.91 msec
Min = -4.18 mm/M @ 14.99 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK



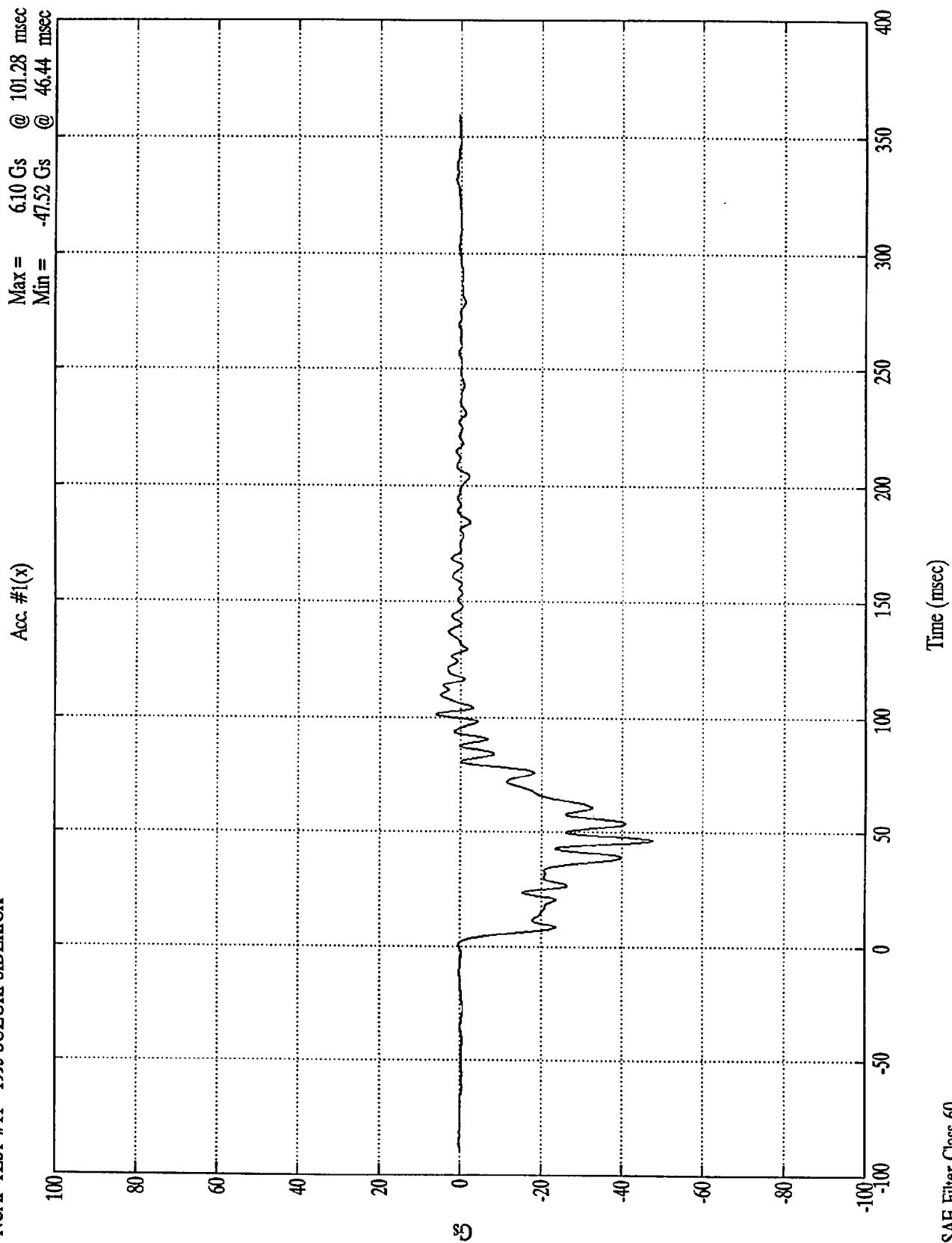
TEST NO. MS0502

VEHICLE DATA

FILTER CHANNEL CLASS

60

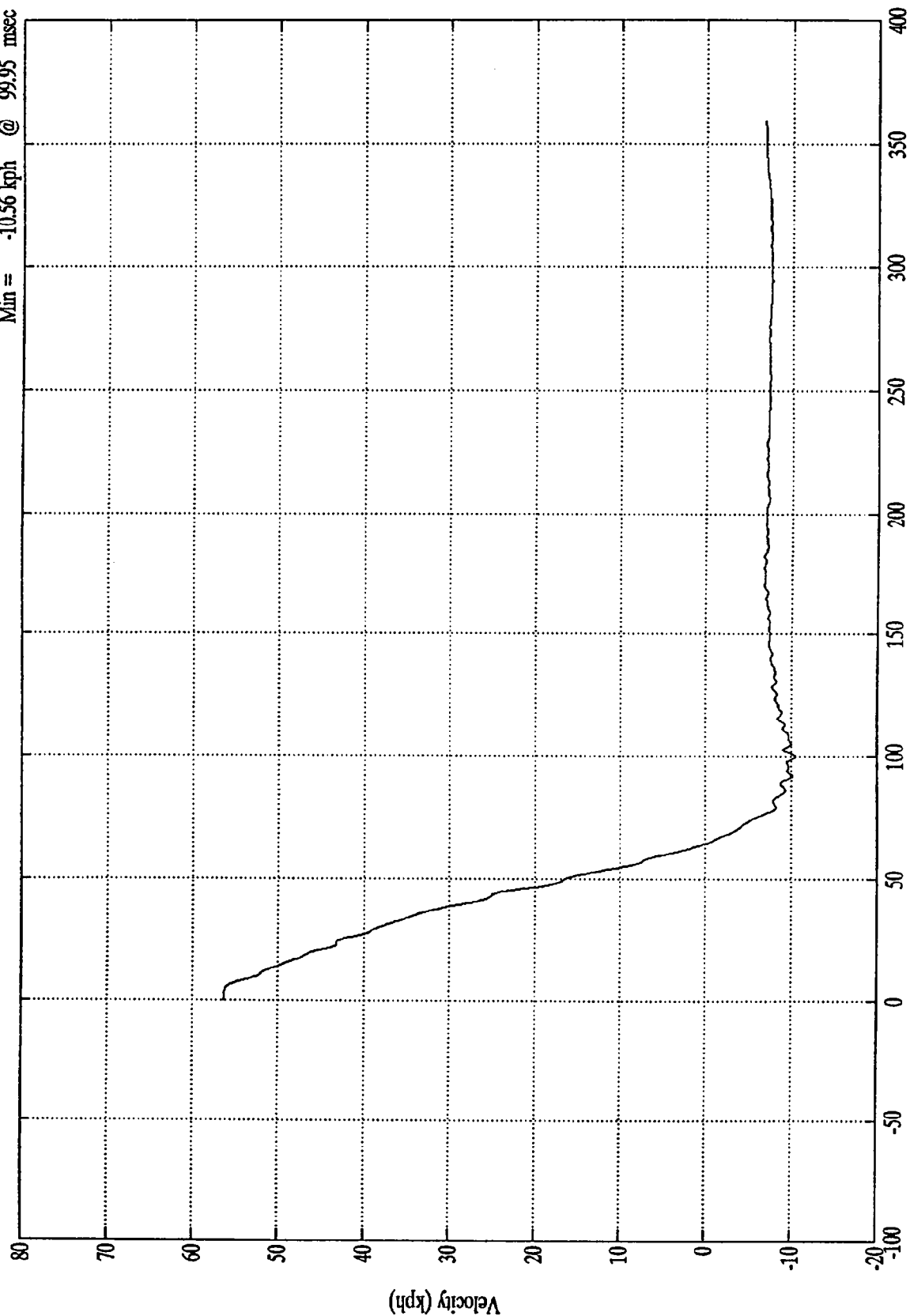
NCAP TEST #11 - 1995 SUZUKI SIDEKICK



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 56.33 kph @ 0.95 msec
Min = -10.56 kph @ 99.95 msec

Acc. #1(x)



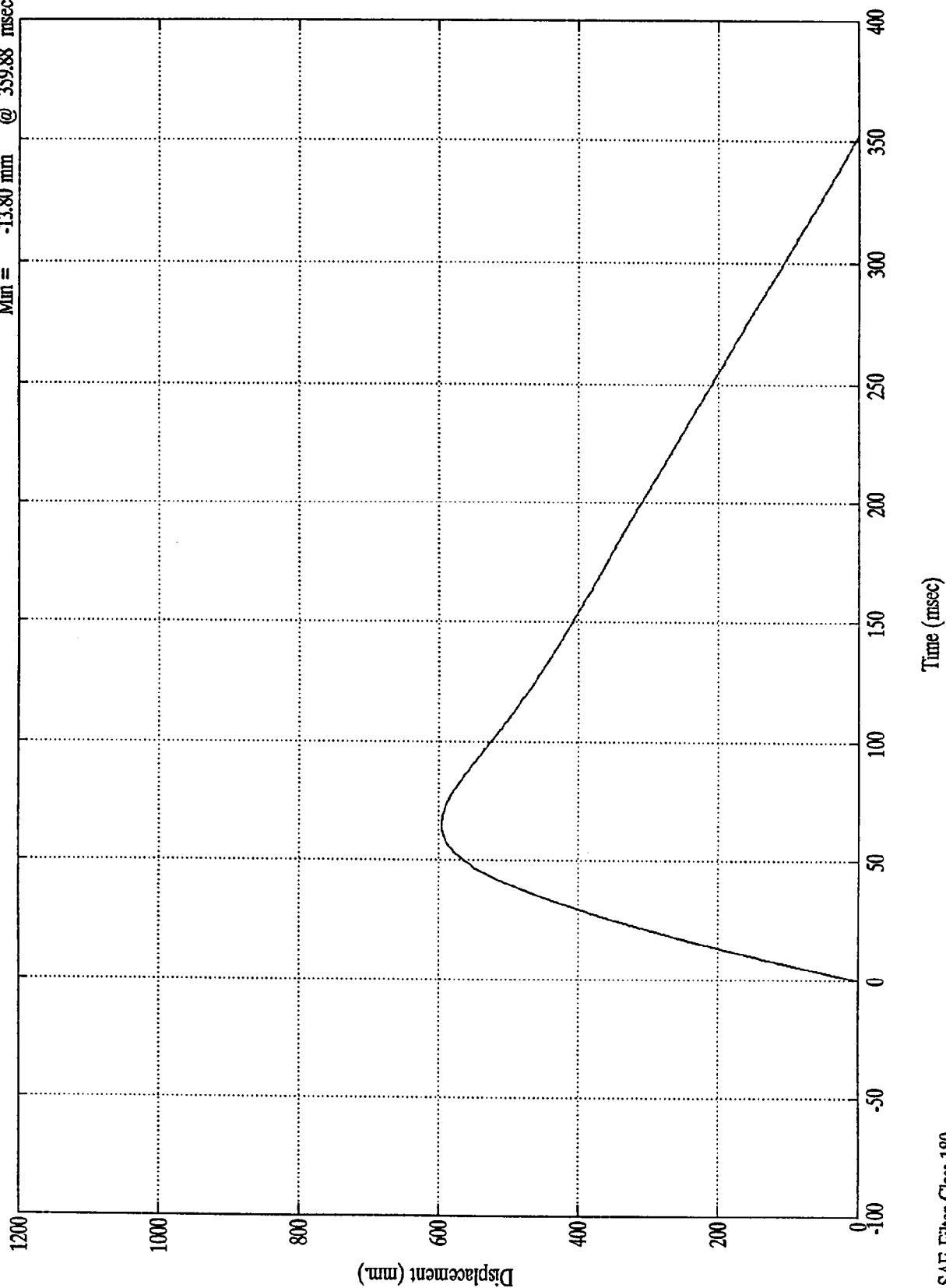
Time (msec)

SAE Filter Class 180

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 596.01 mm @ 64.56 msec
 Min = -13.80 mm @ 359.88 msec

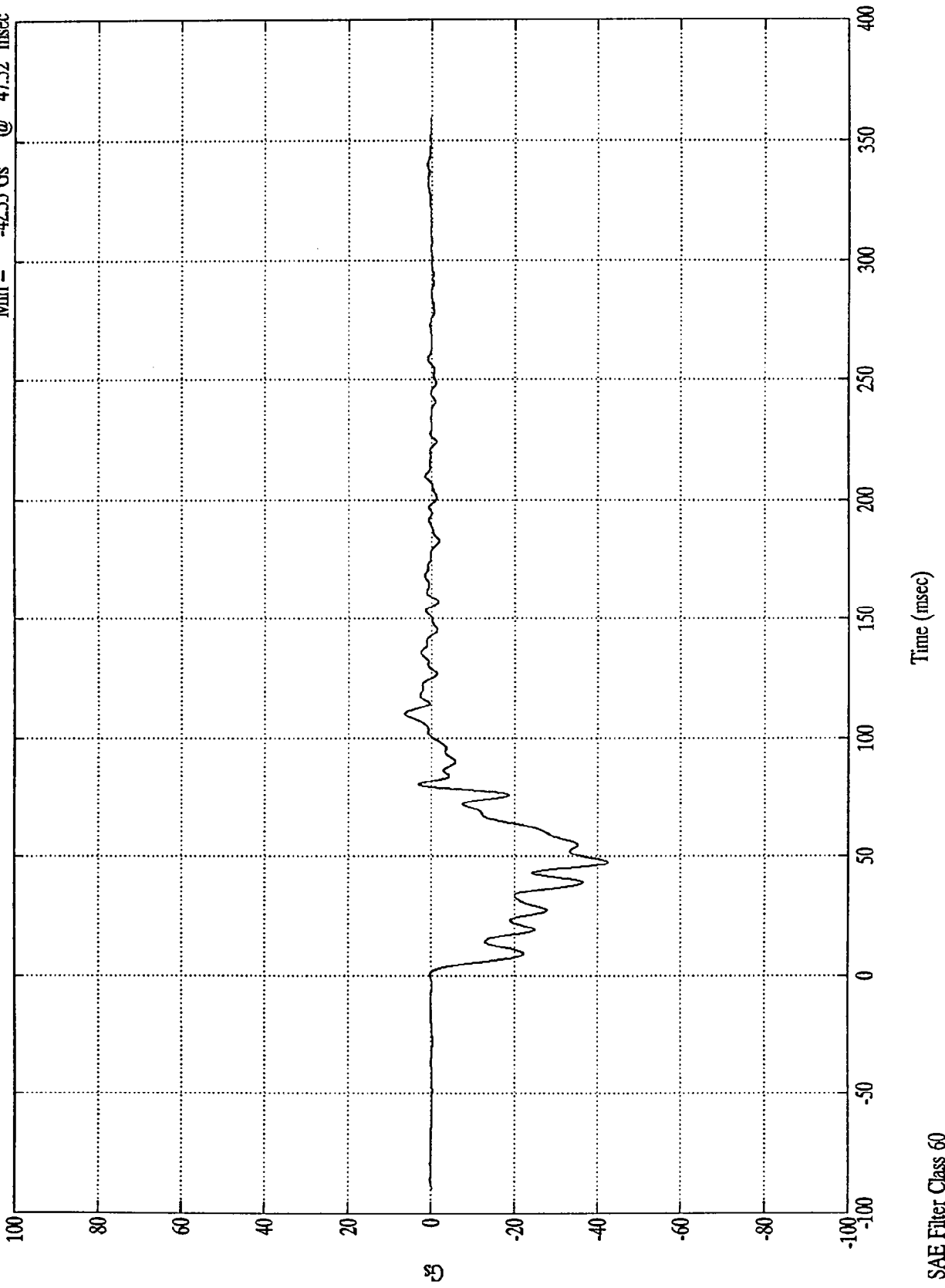
Acc. #1(x)



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Acc. #2(x)

Max = 6.40 Gs @ 110.04 msec
Min = -42.55 Gs @ 47.52 msec



B-79

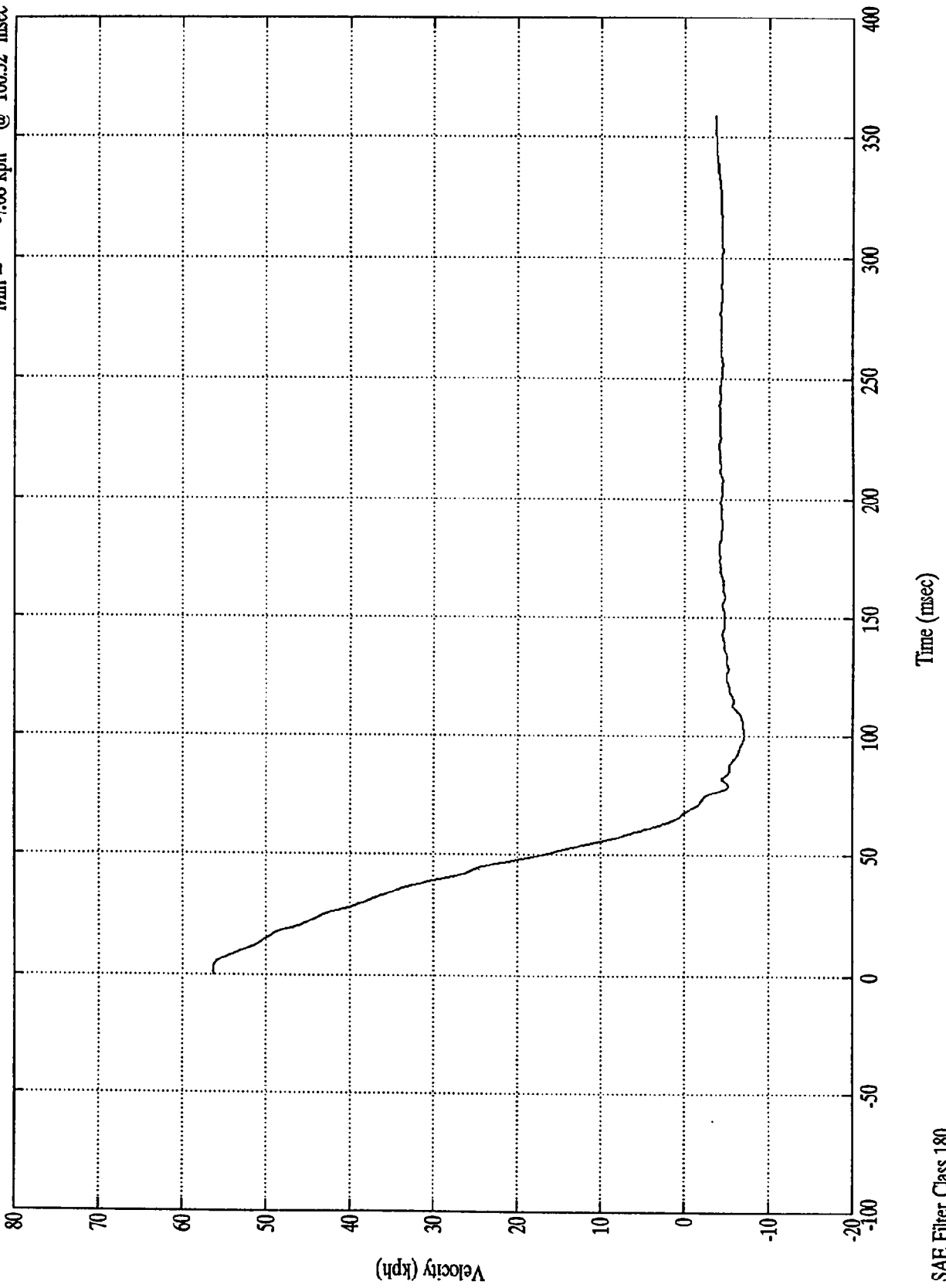
8227-11

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Acc. #2(x)

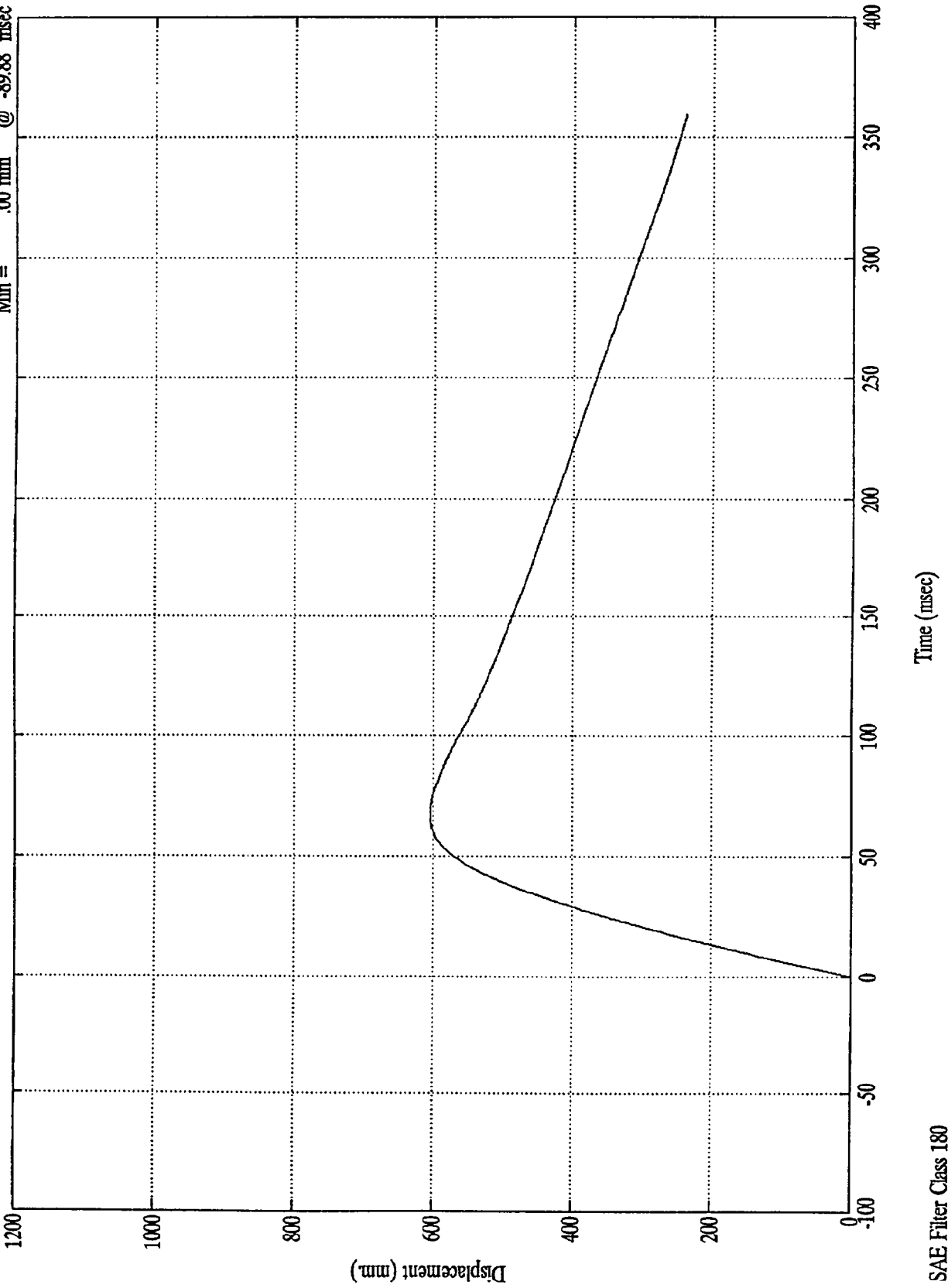
Max = 56.33 kph @ -0.00 msec
Min = -7.08 kph @ 100.32 msec



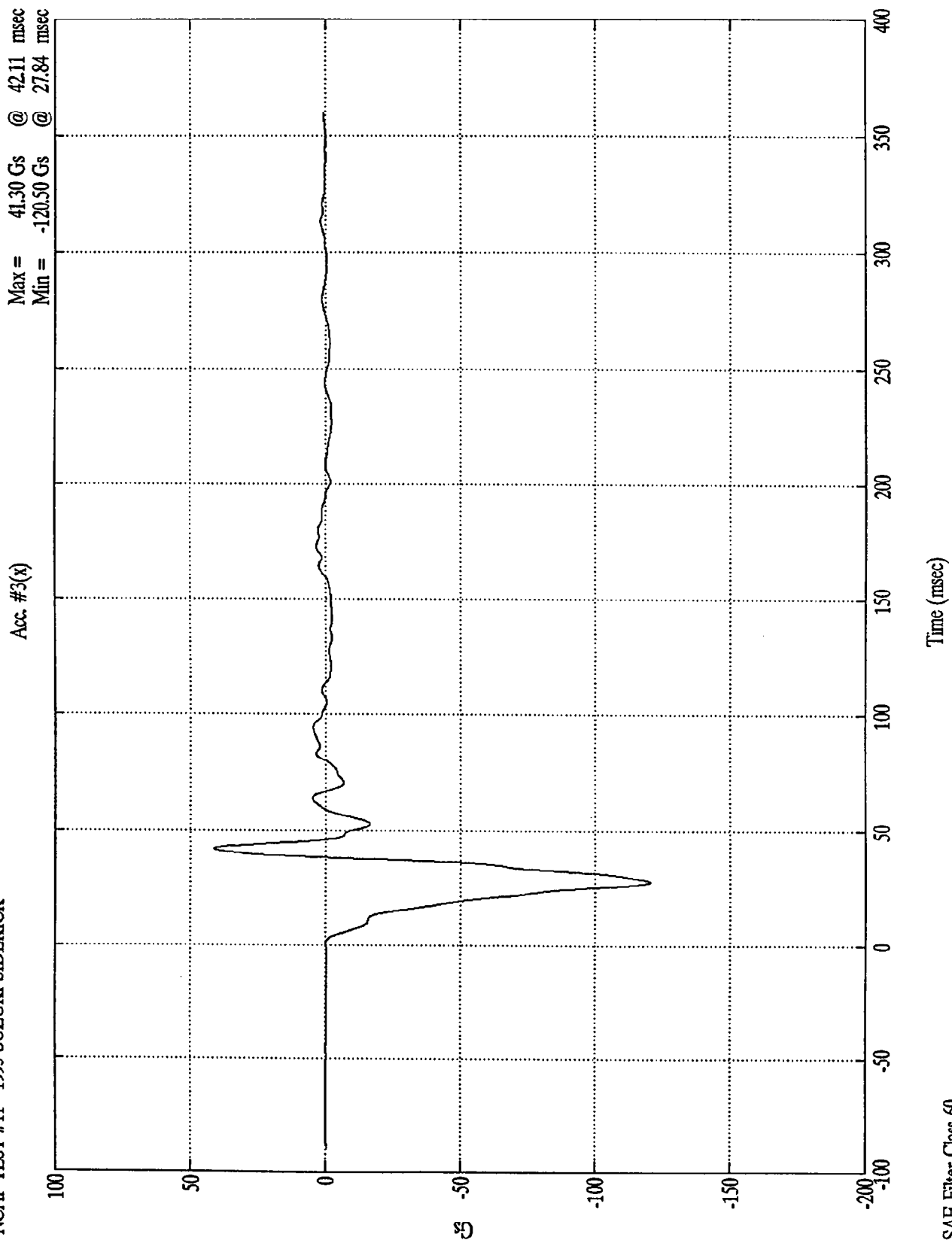
NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 604.55 mm @ 67.44 msec
Min = .00 mm @ -89.88 msec

Acc. #2(x)



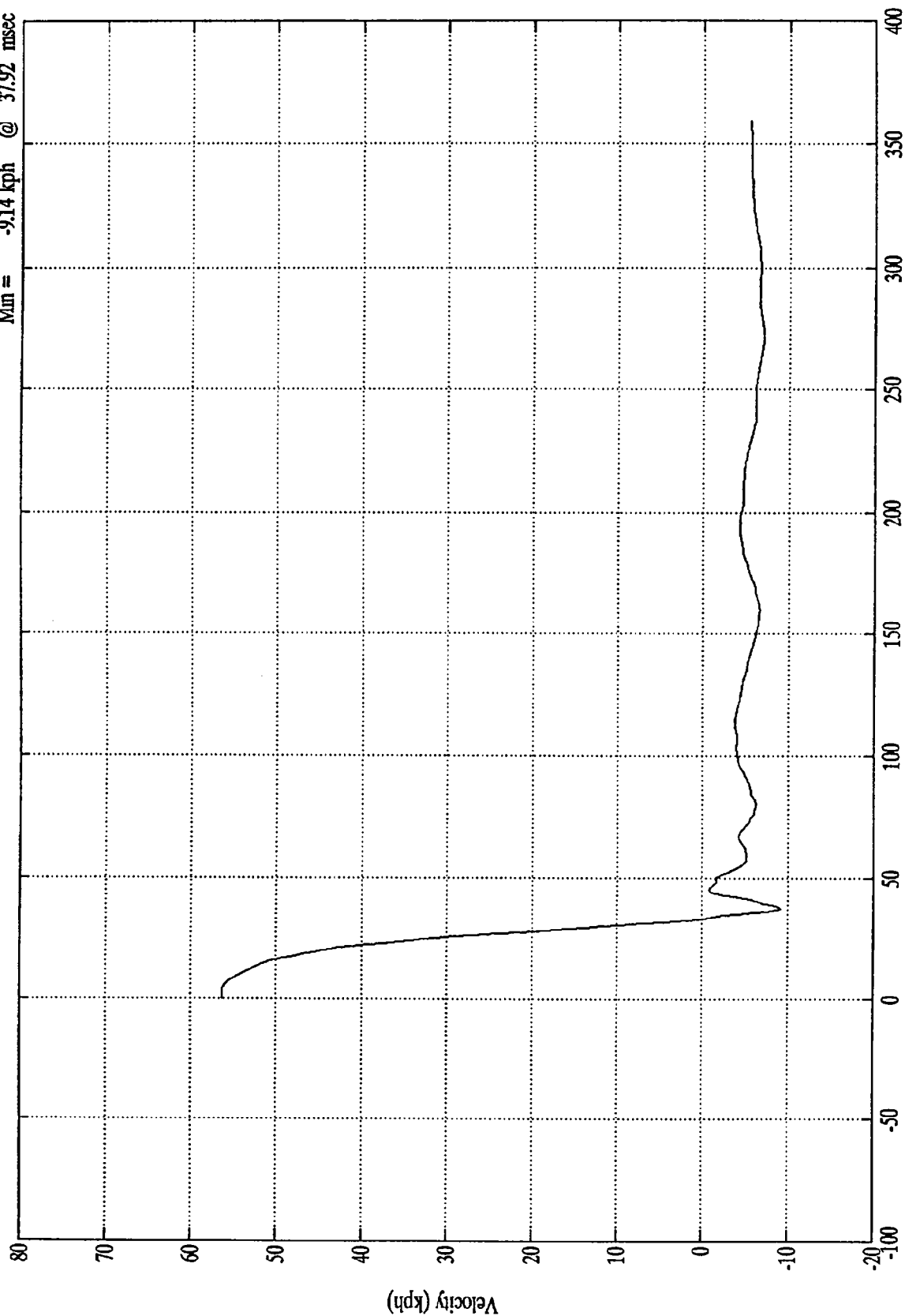
NCAP TEST #11 - 1995 SUZUKI SIDEKICK



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 56.33 kph @ -0.00 msec
Min = -9.14 kph @ 37.92 msec

Acc. #3(x)



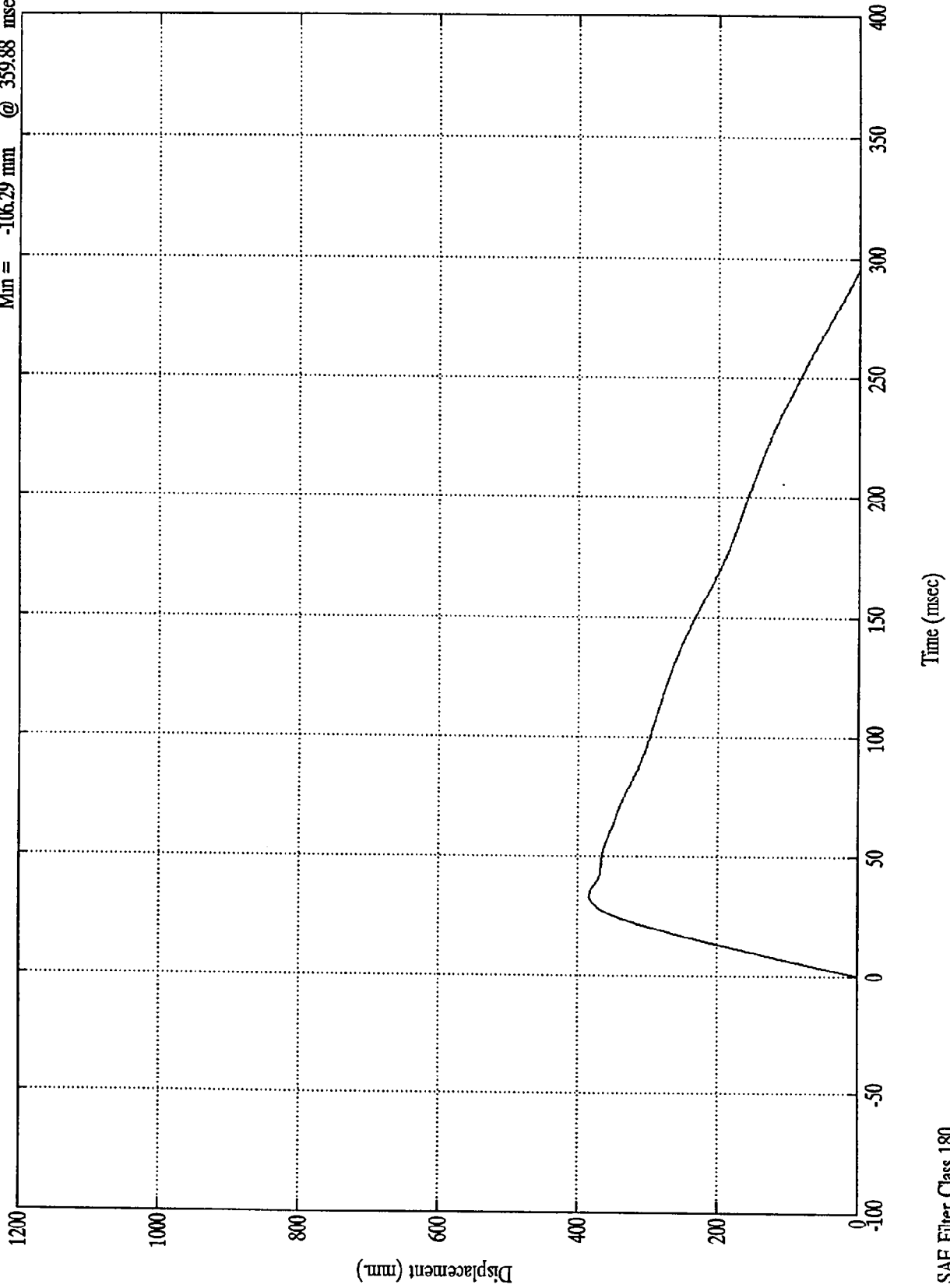
Time (msec)

SAE Filter Class 180

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 383.58 mm @ 33.11 msec
Min = -106.29 mm @ 359.88 msec

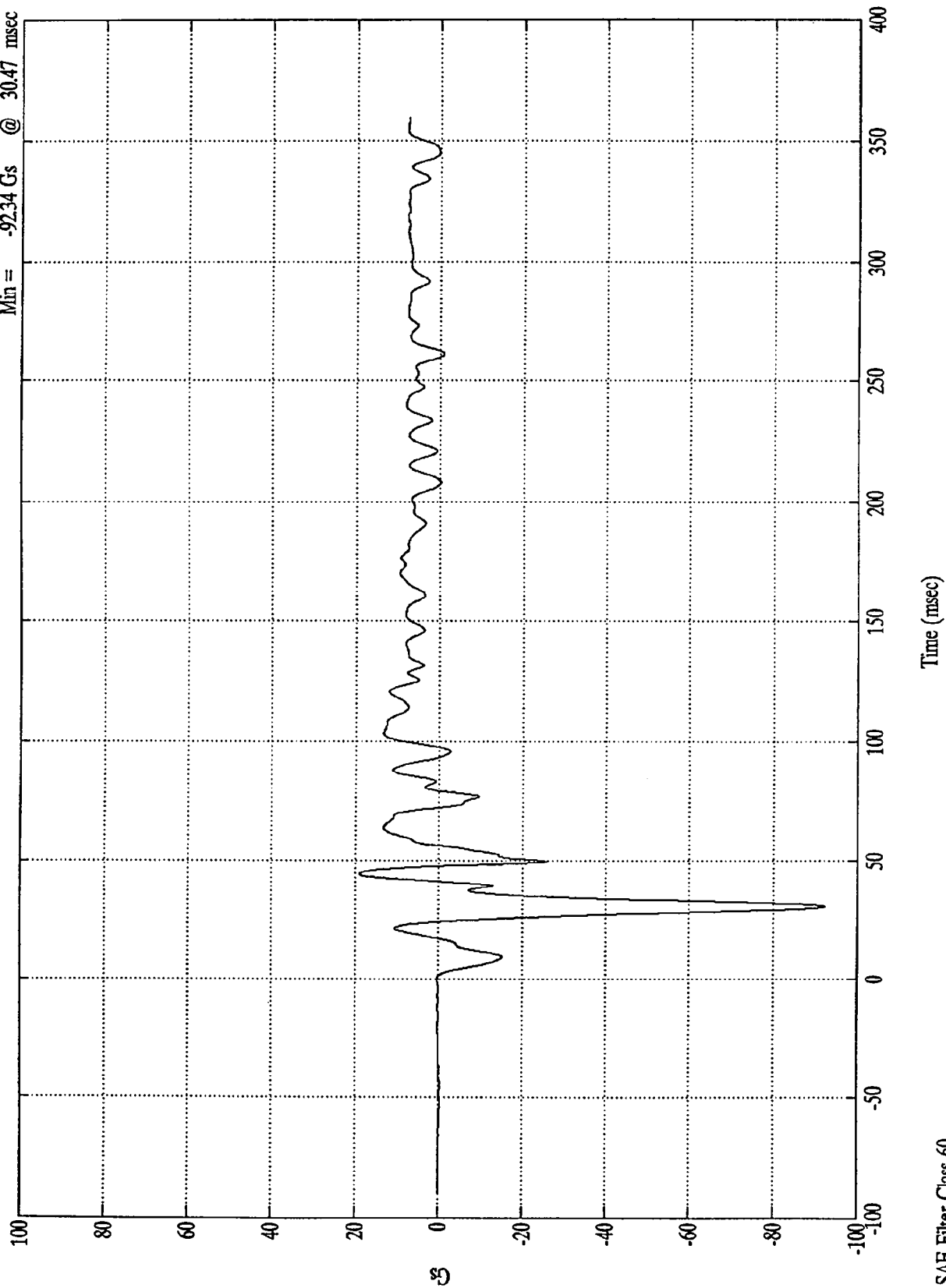
Acc. #3(x)



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 19.04 Gs @ 44.63 msec
Min = -92.34 Gs @ 30.47 msec

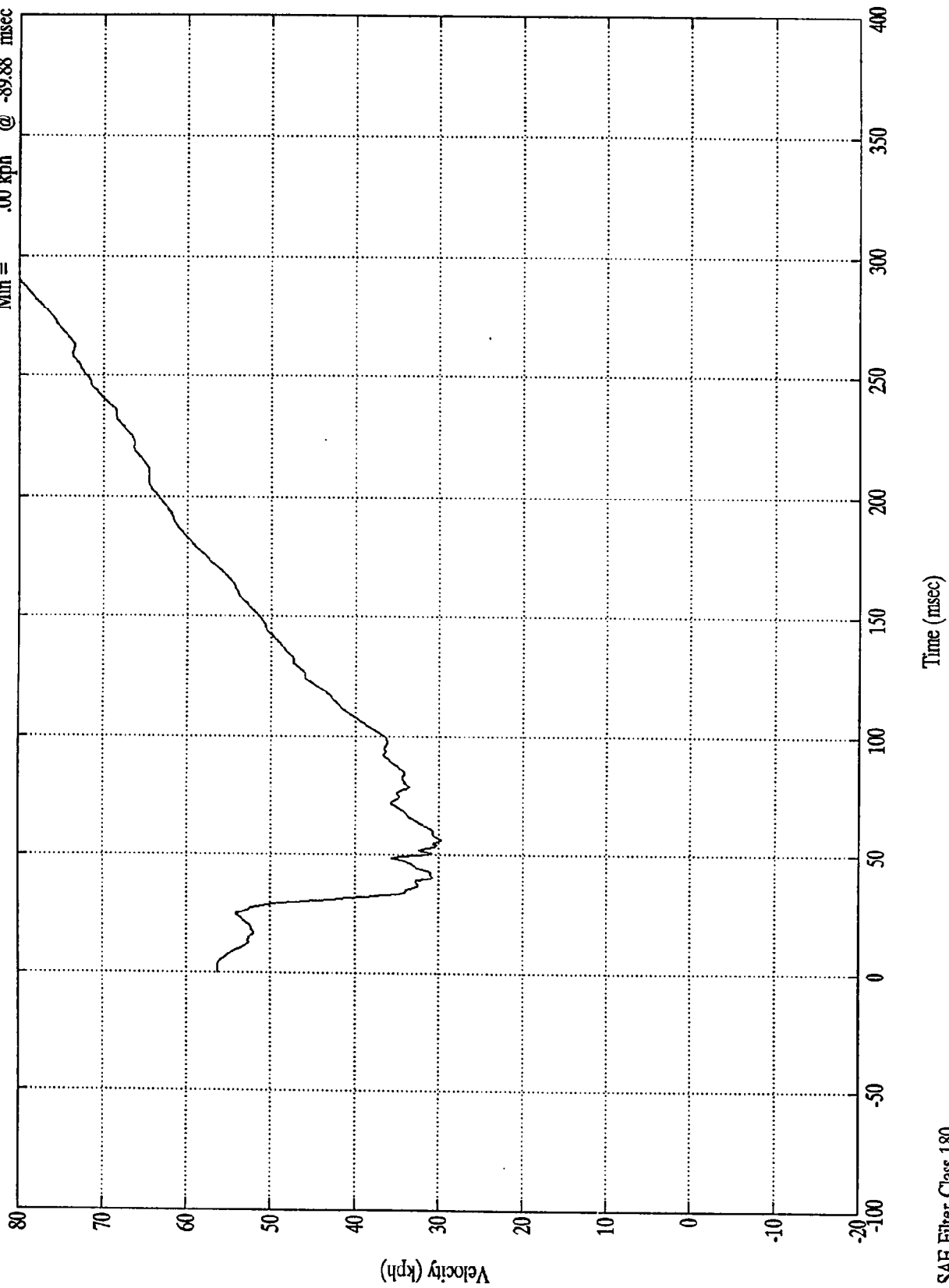
Acc. #4(x)



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 94.59 kph @ 359.88 msec
Min = .00 kph @ -89.88 msec

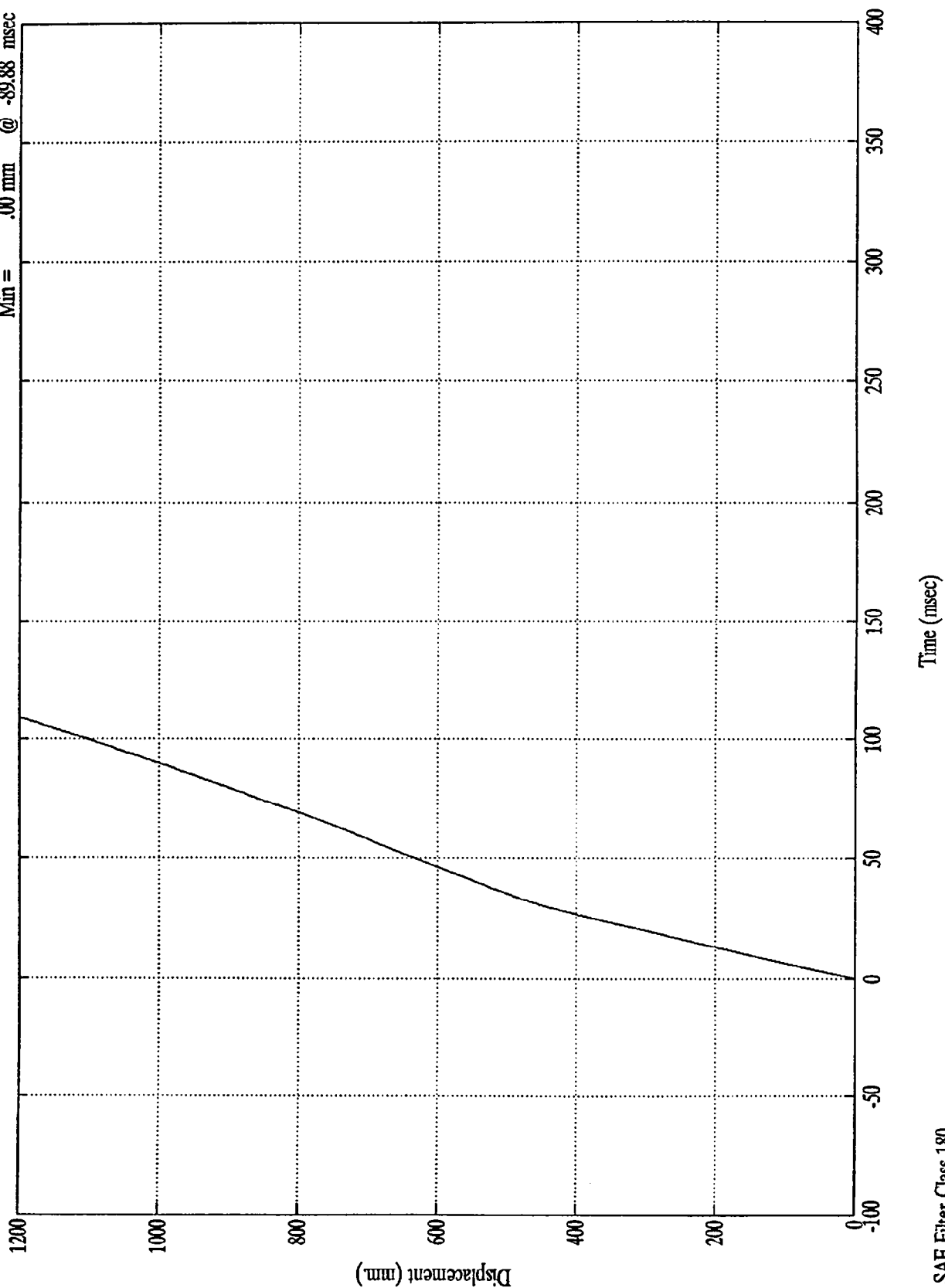
Acc. #4(x)



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Acc. #4(x)

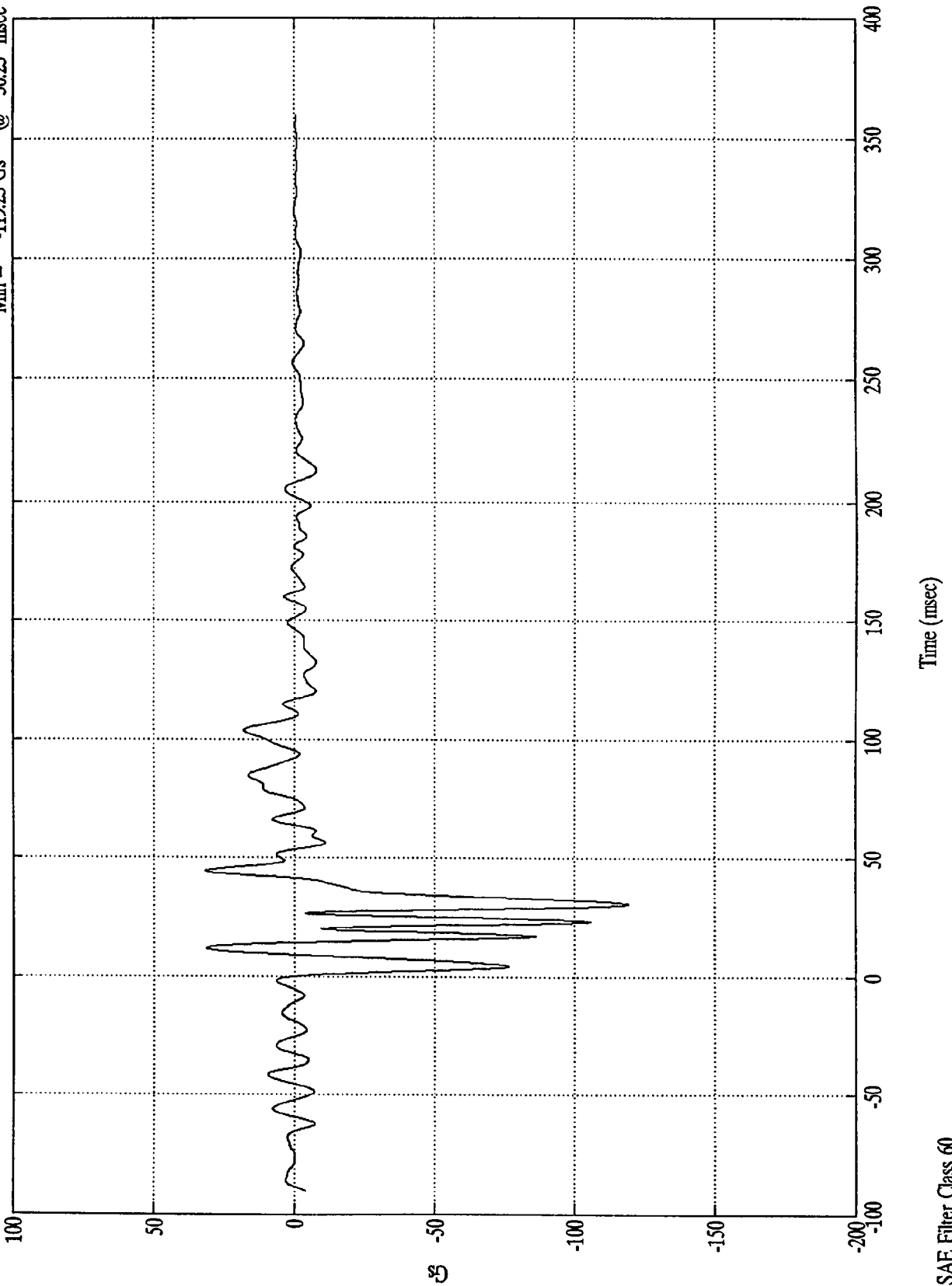
Max = 6004.20 mm @ 359.88 msec
Min = .00 mm @ -89.88 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 31.62 Gs @ 44.39 msec
Min = -119.23 Gs @ 30.23 msec

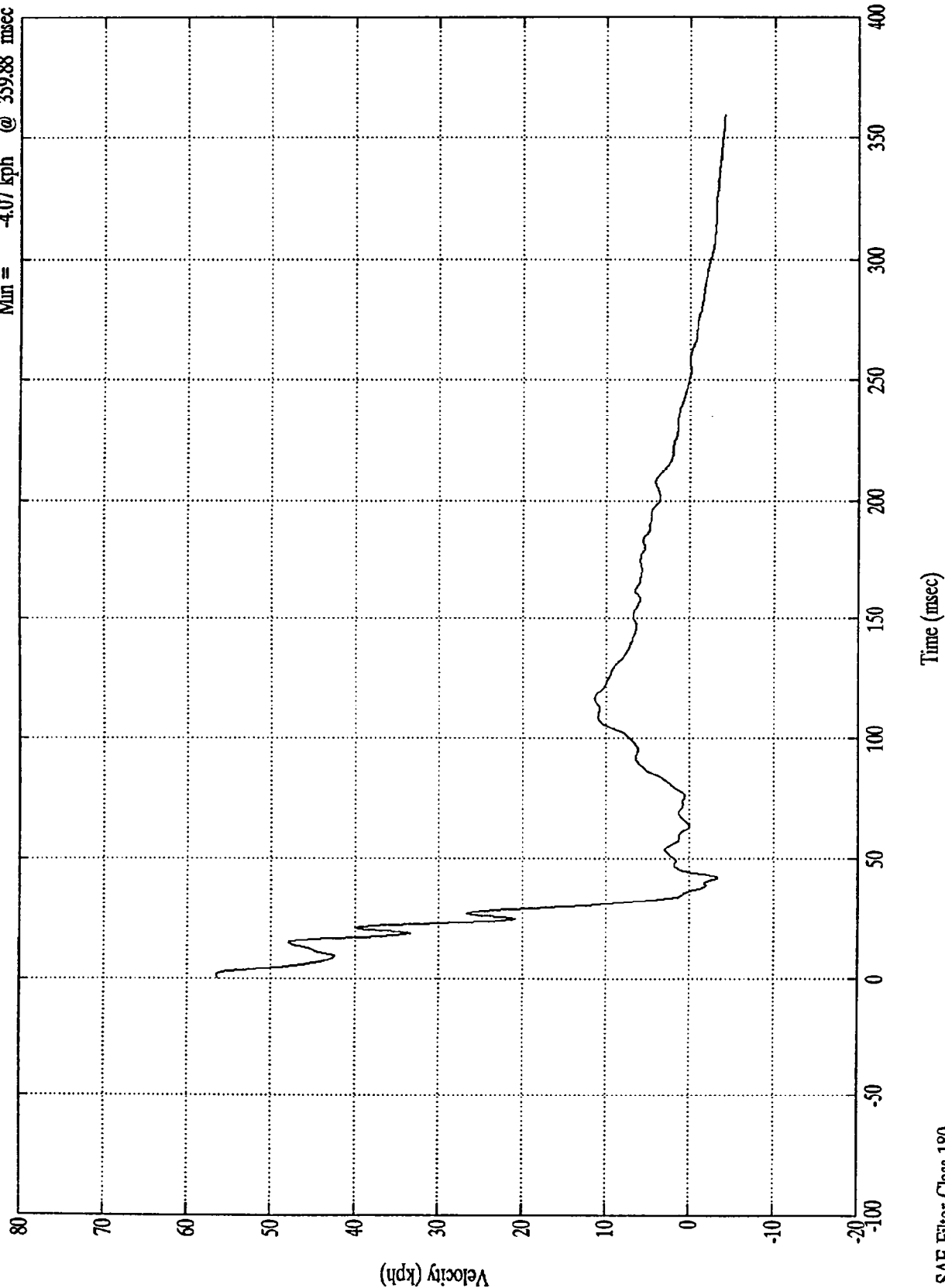
Acc. #5(x)



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

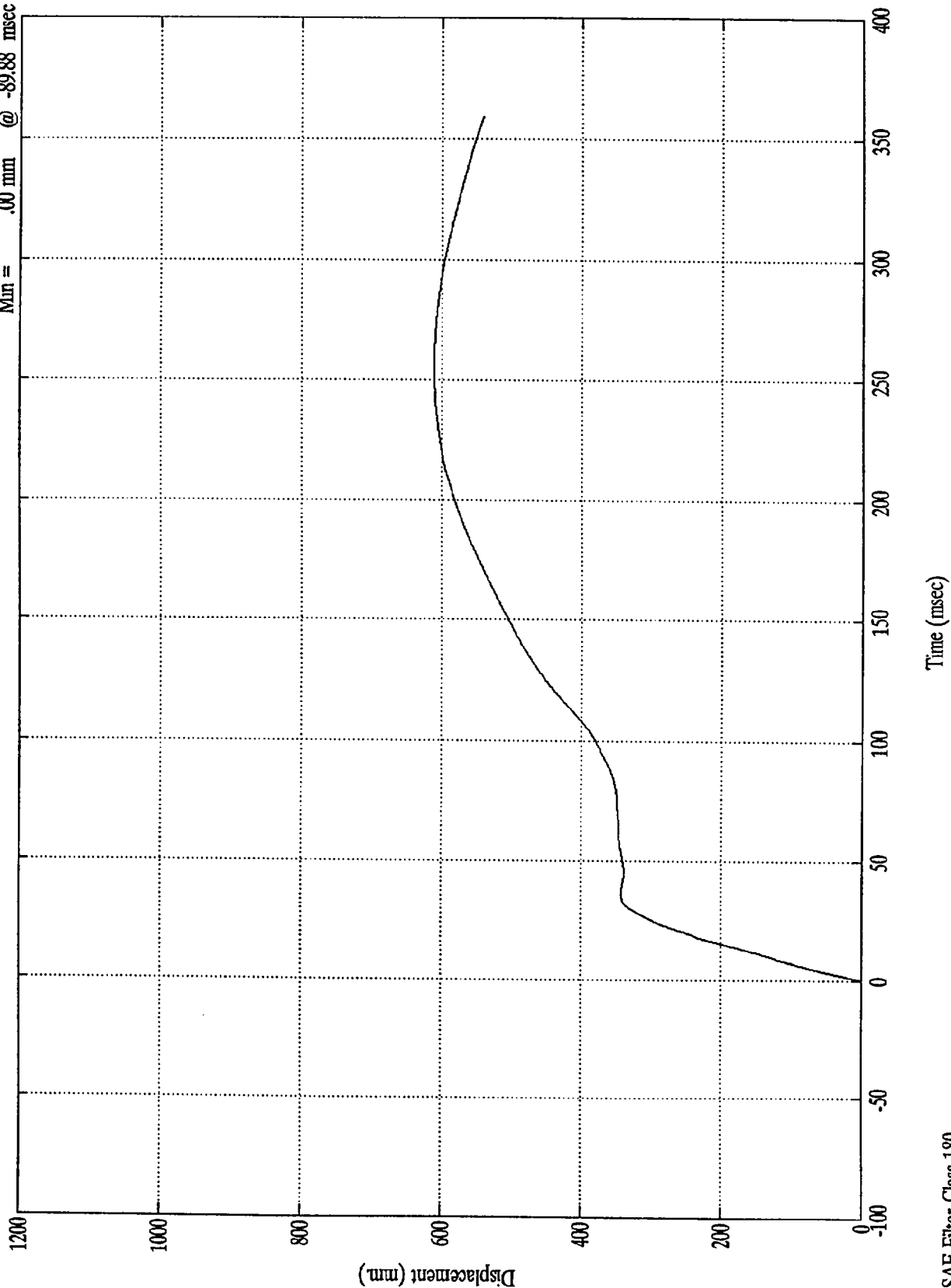
Max = 56.57 kph @ 1.79 msec
Min = -4.07 kph @ 359.88 msec

Acc. #5(x)



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Acc. #5(x)
Max = 610.64 mm @ 252.24 msec
Min = .00 mm @ -89.88 msec



06-B

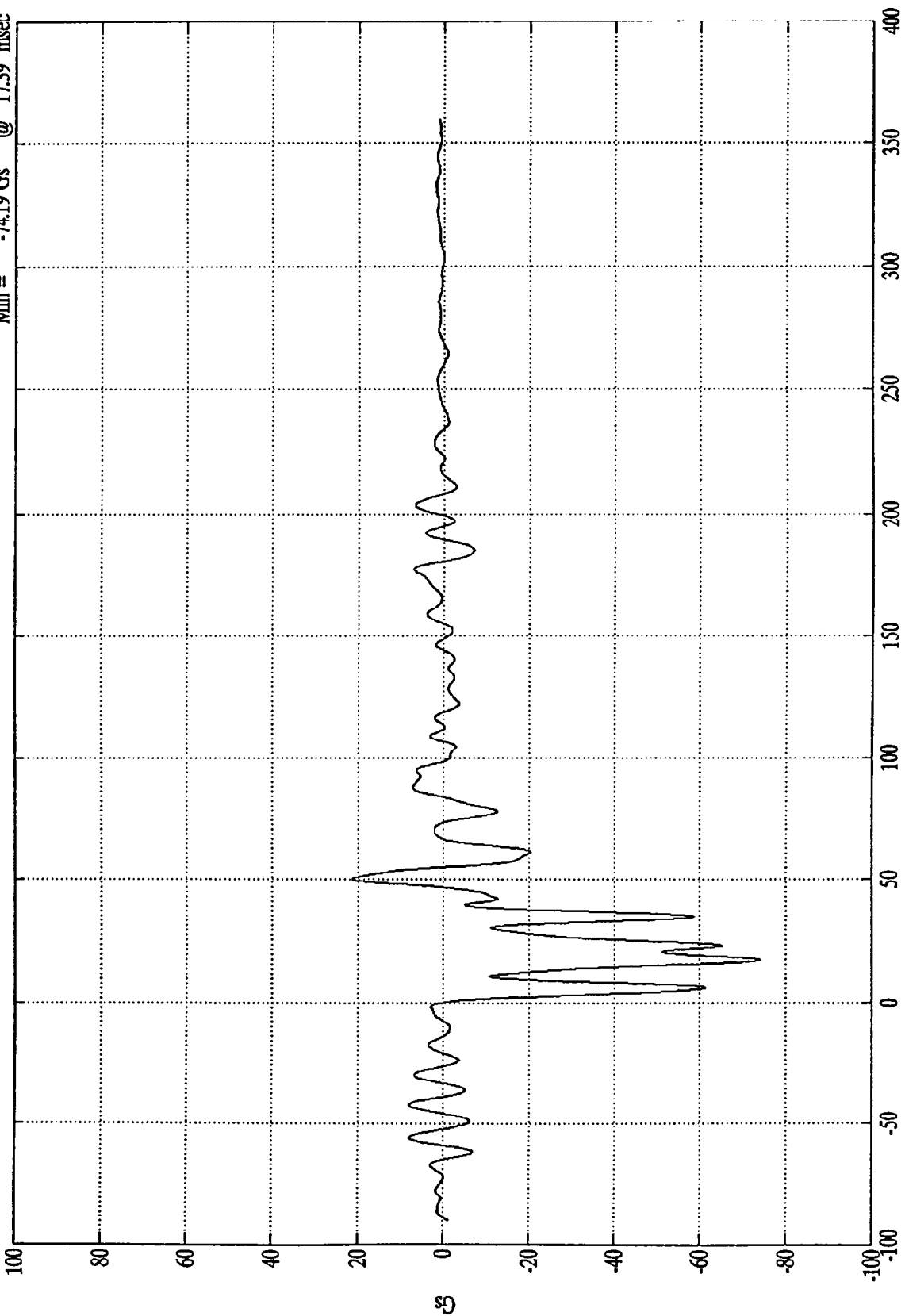
8227-11

SAE Filter Class 180

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 21.36 Gs @ 50.16 msec
Min = -74.19 Gs @ 17.39 msec

Acc. #6(x)



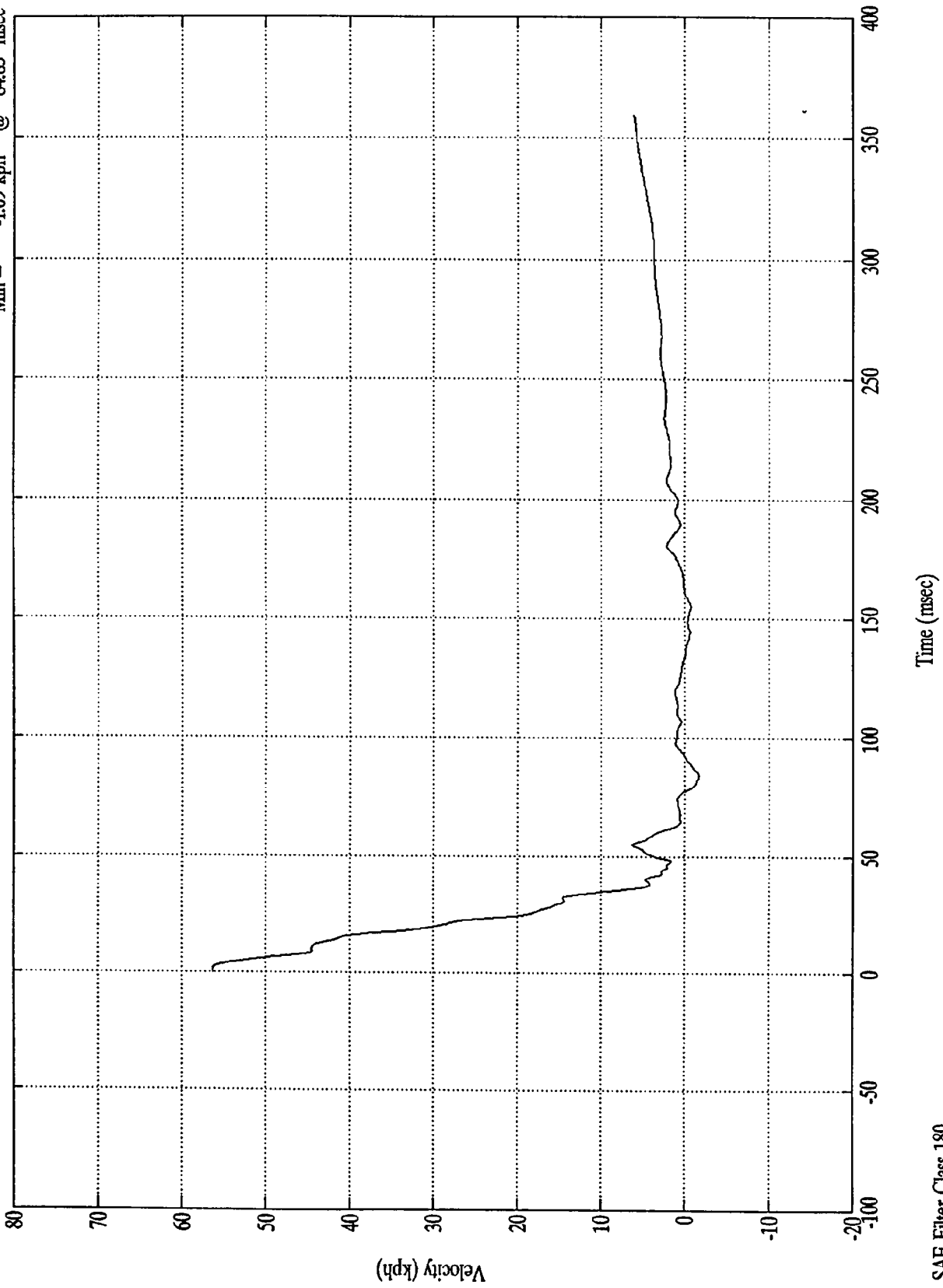
Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 56.33 kph @ 0.11 msec
Min = -1.69 kph @ 84.83 msec

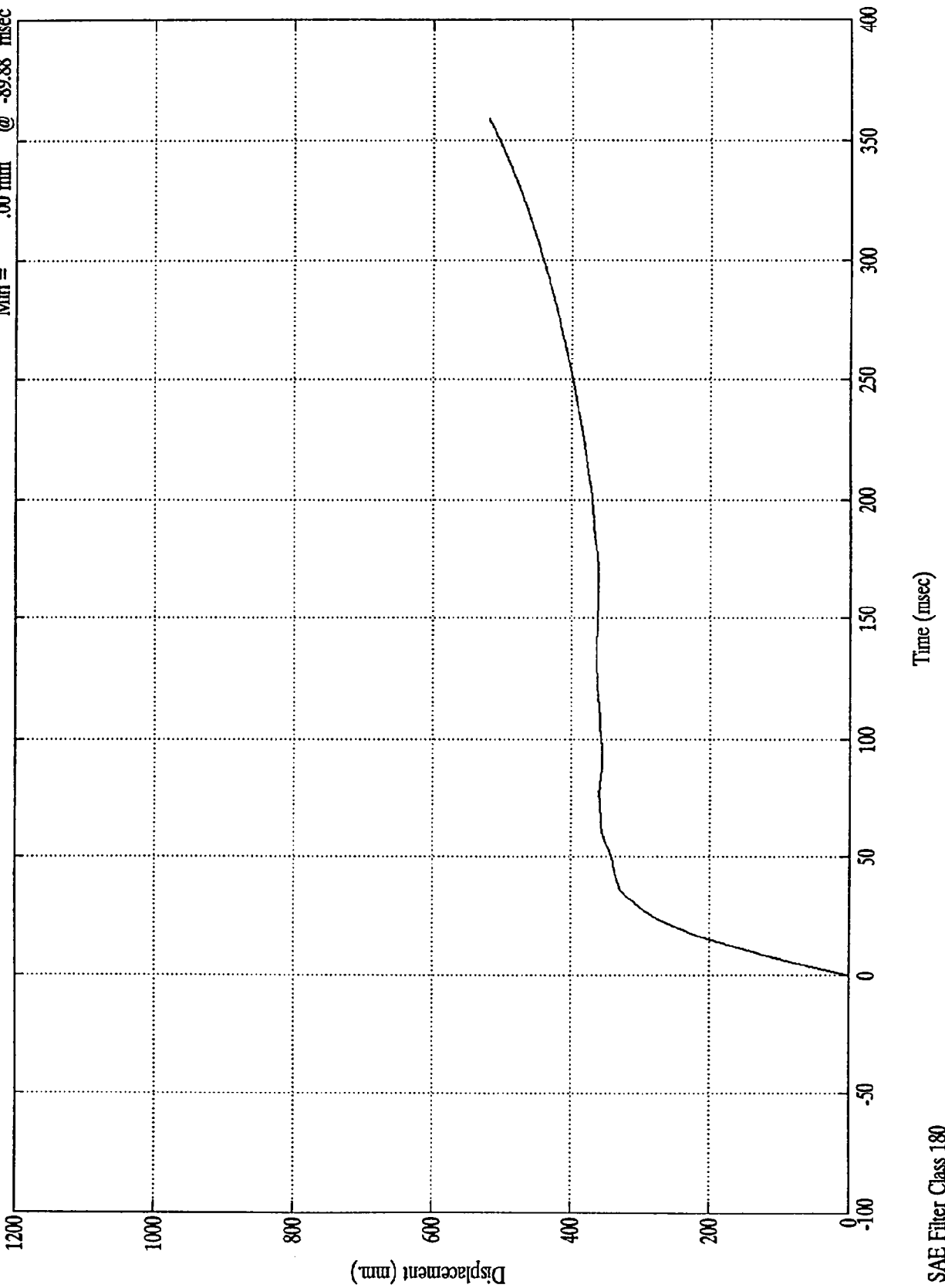
Acc. #6(x)



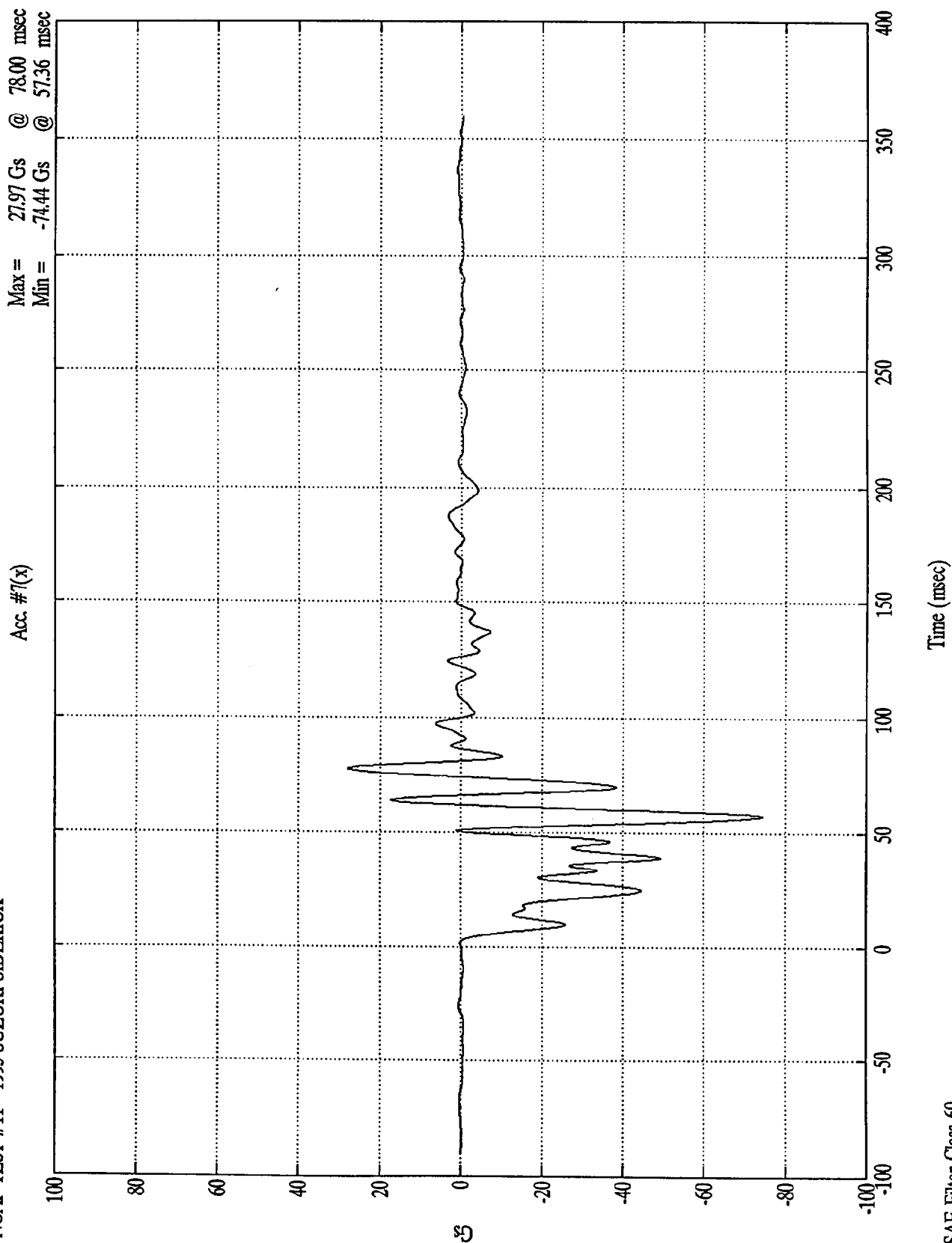
NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Acc. #6(x)

Max = 520.87 mm @ 359.88 msec
Min = .00 mm @ -89.88 msec



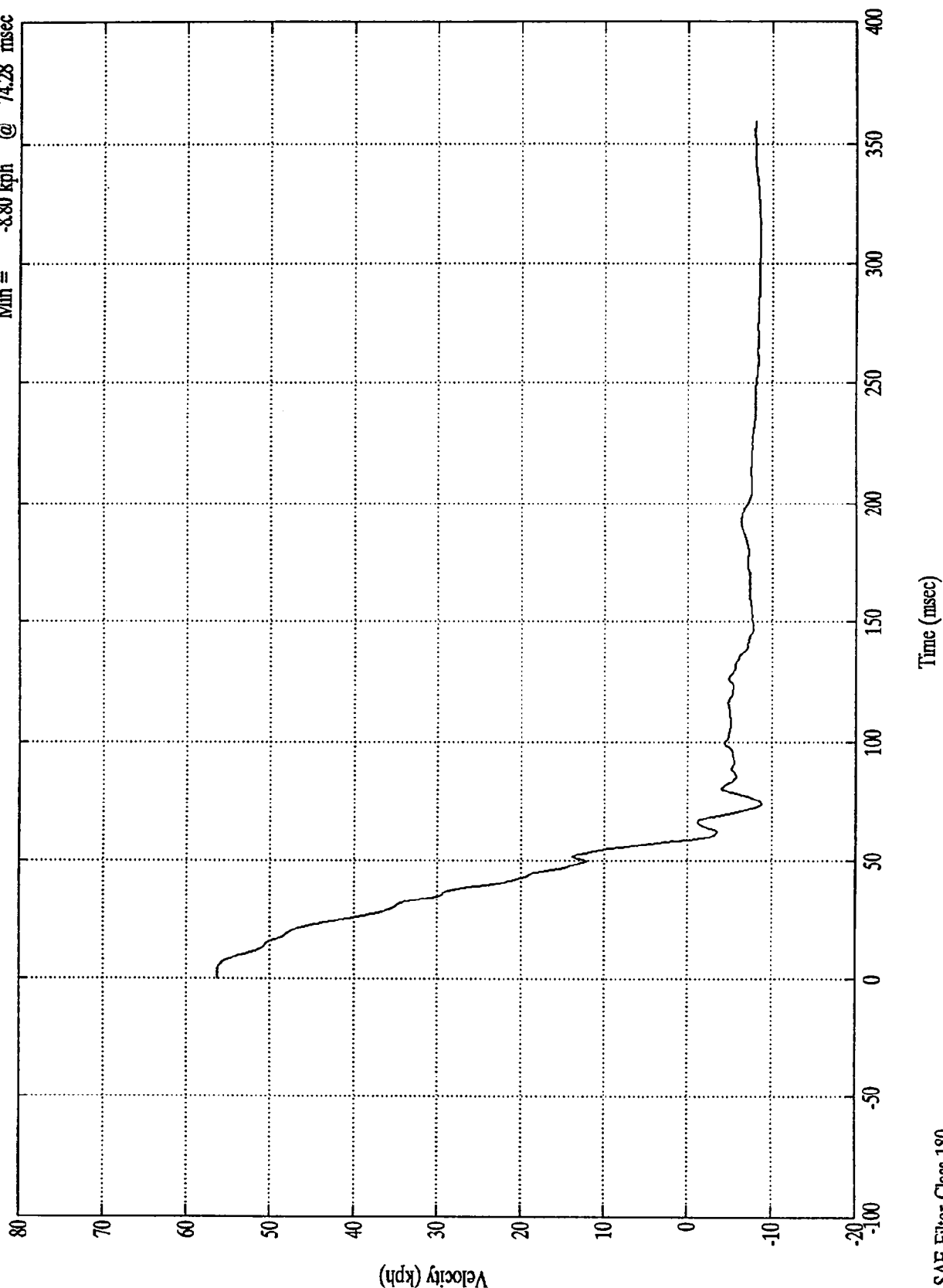
NCAP TEST #11 - 1995 SUZUKI SIDEKICK



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 56.33 kph @ -0.00 msec
Min = -8.80 kph @ 74.28 msec

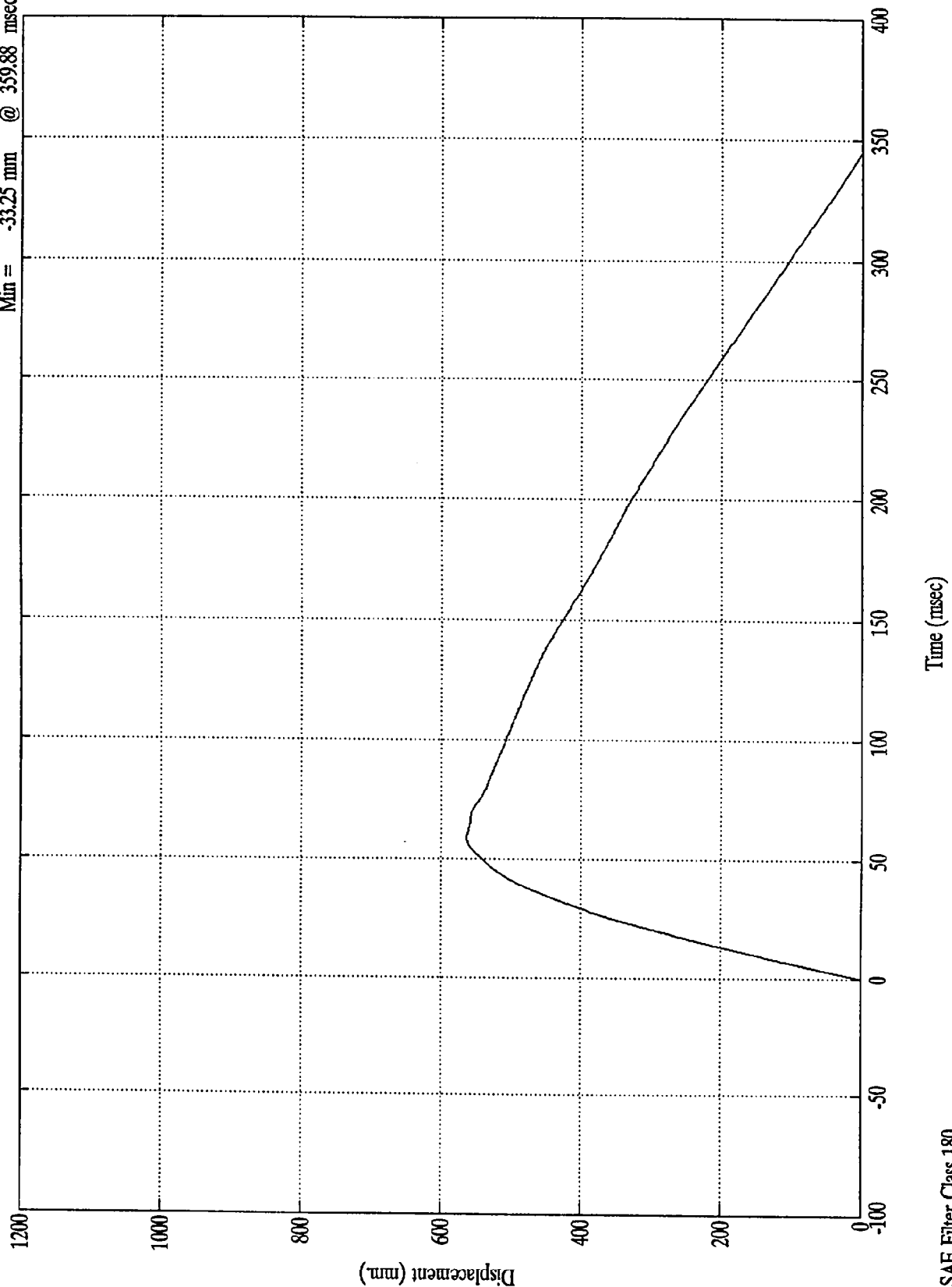
Acc. #7(x)



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 563.78 mm @ 58.68 msec
Min = -33.25 mm @ 359.88 msec

Acc. #7(x)

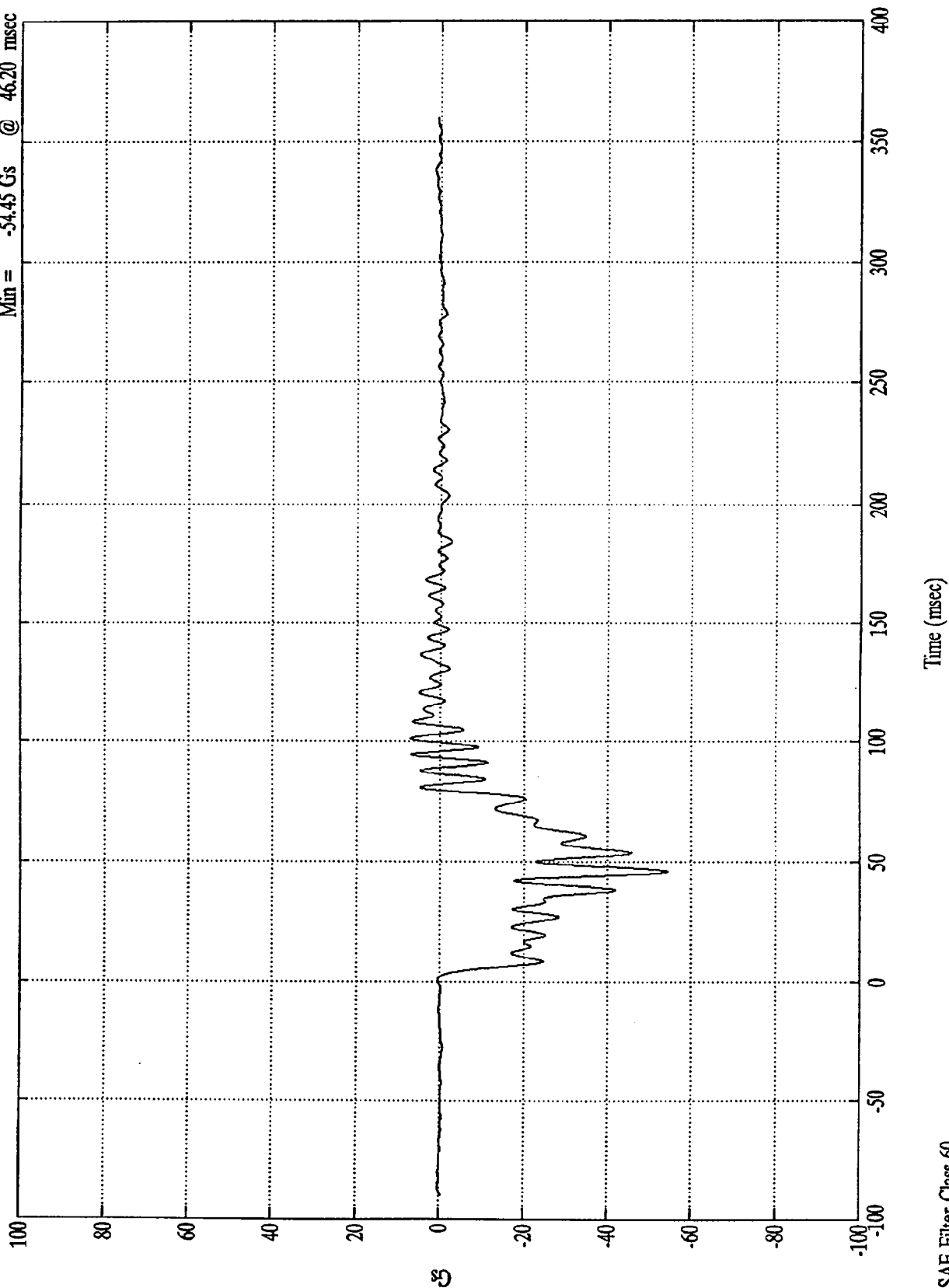


SAE Filter Class 180

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Acc. #8(x)

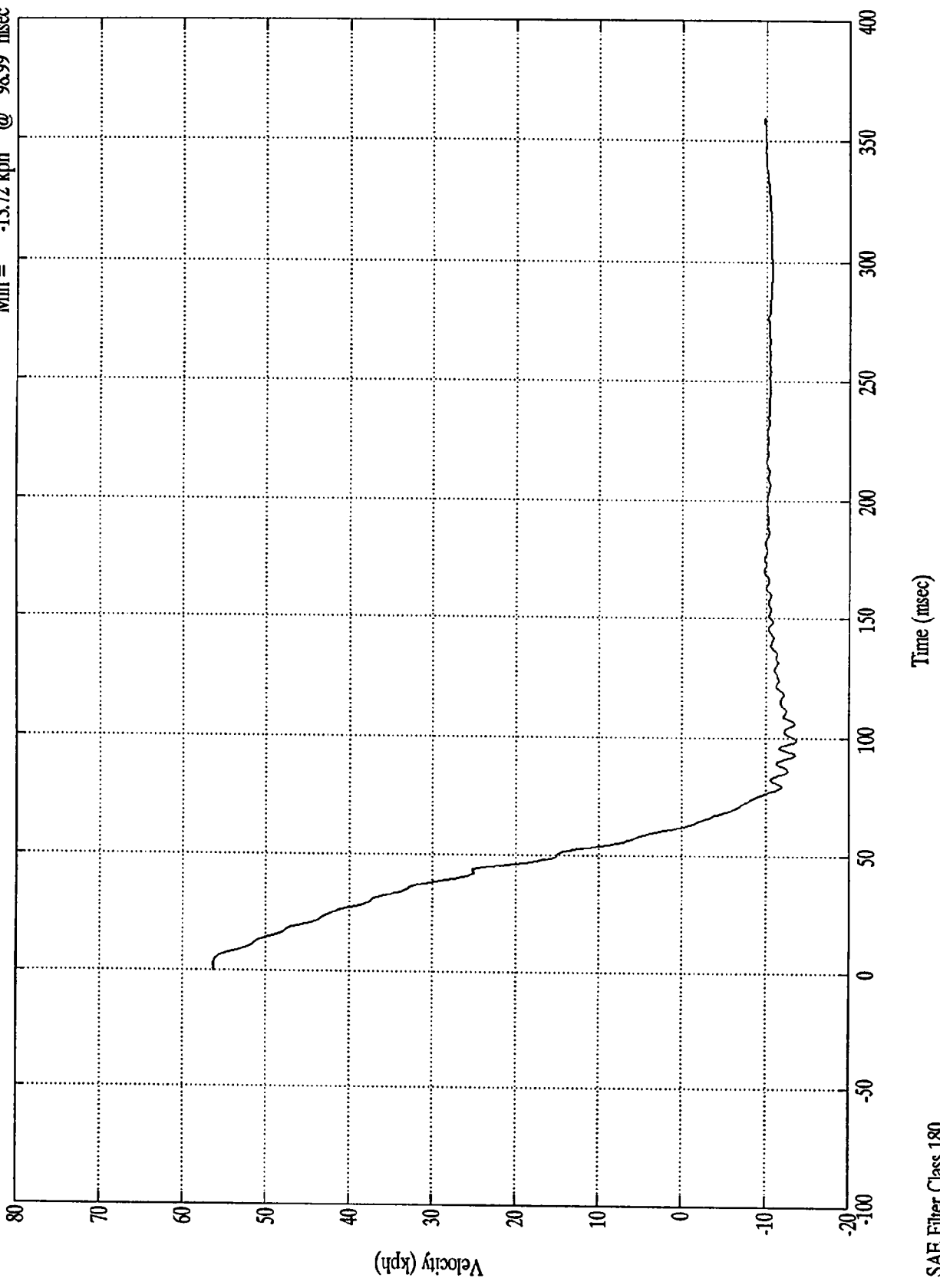
Max = 7.13 Gs @ 101.04 msec
Min = -54.45 Gs @ 46.20 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 56.35 kph @ 1.43 msec
Min = -13.72 kph @ 98.99 msec

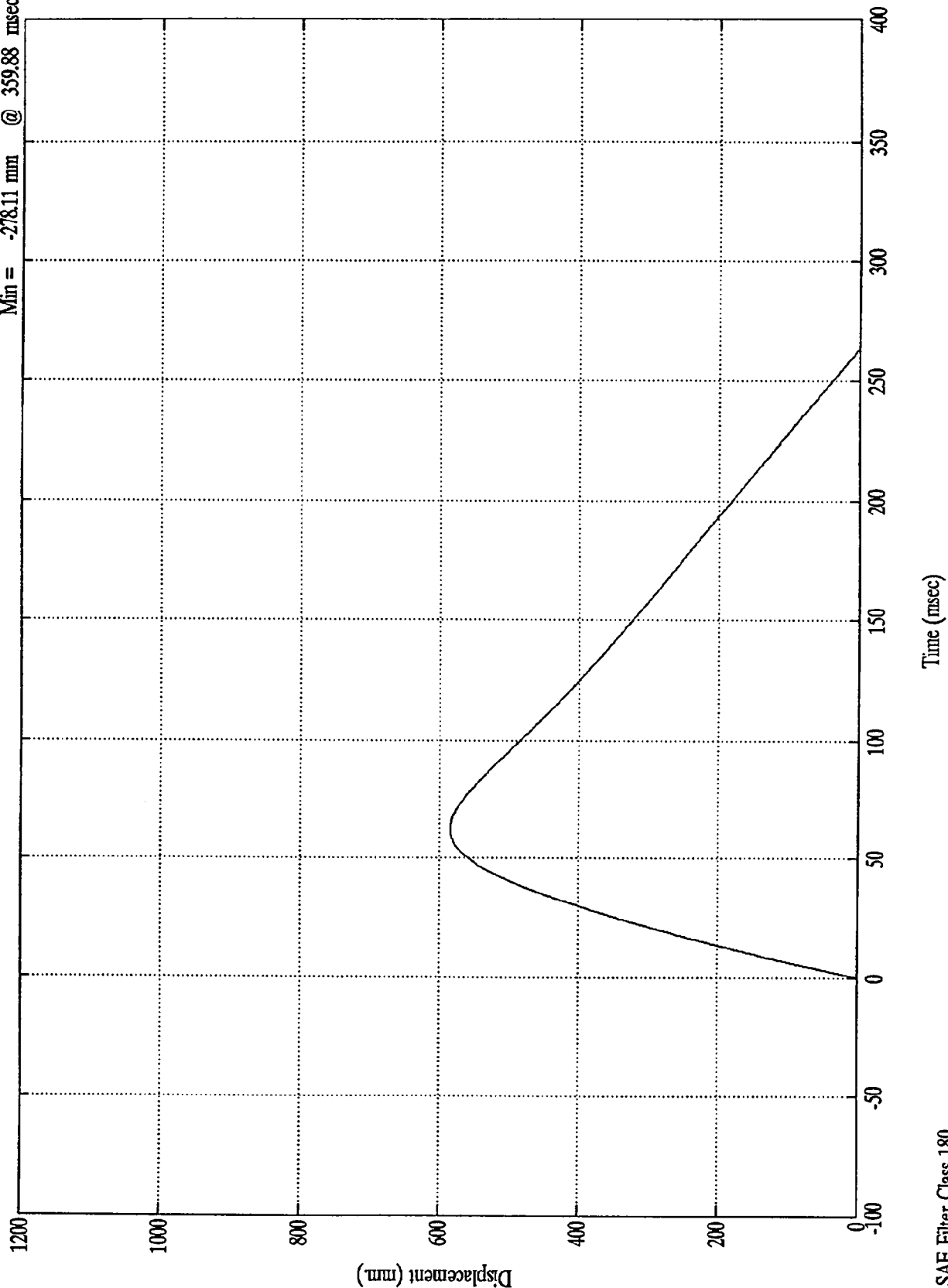
Acc. #8(x)



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Acc. #8(x)

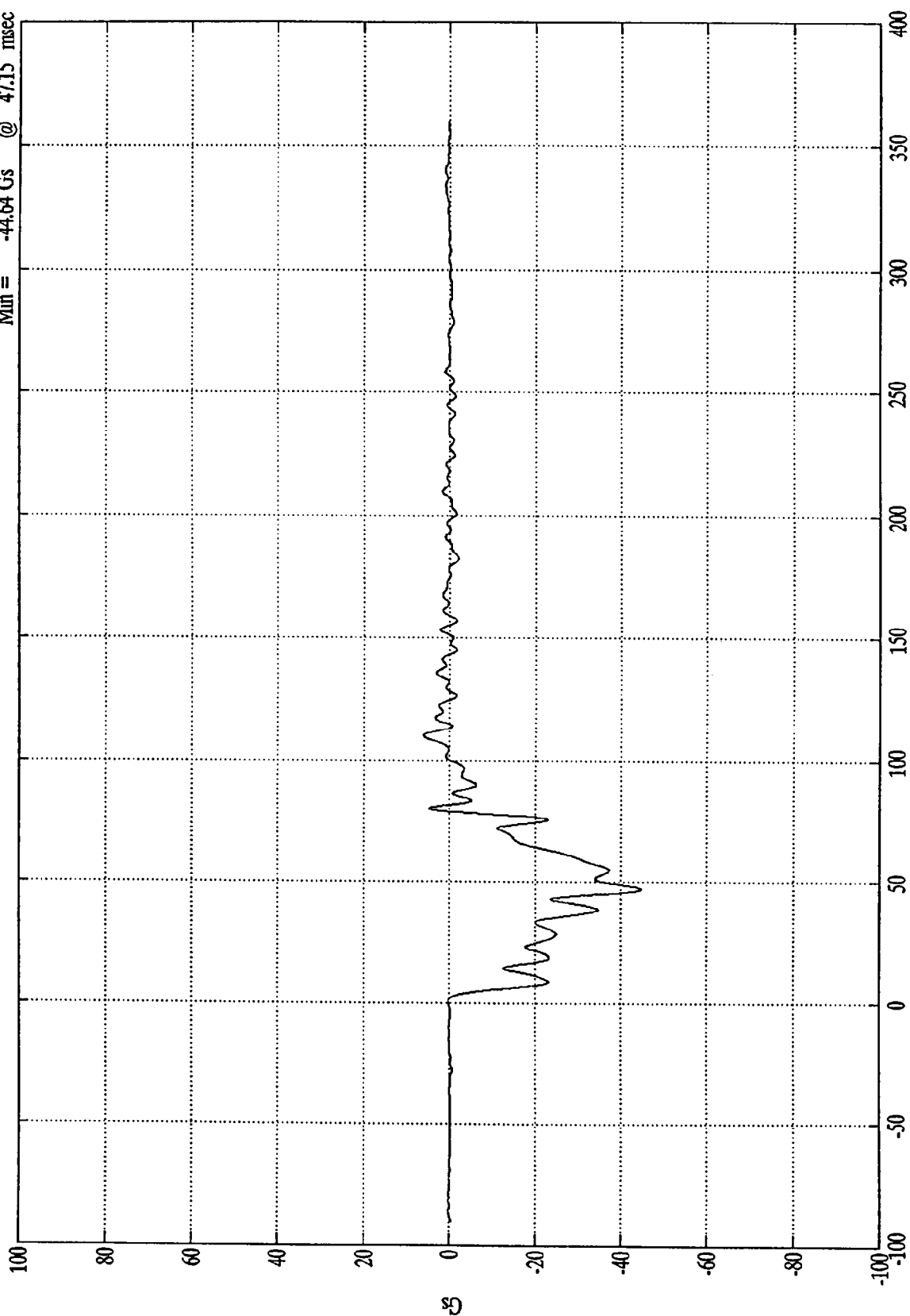
Max = 584.32 mm @ 62.16 msec
Min = -278.11 mm @ 359.88 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 6.09 Gs @ 110.04 msec
Min = -44.64 Gs @ 47.15 msec

Acc. #9(x)



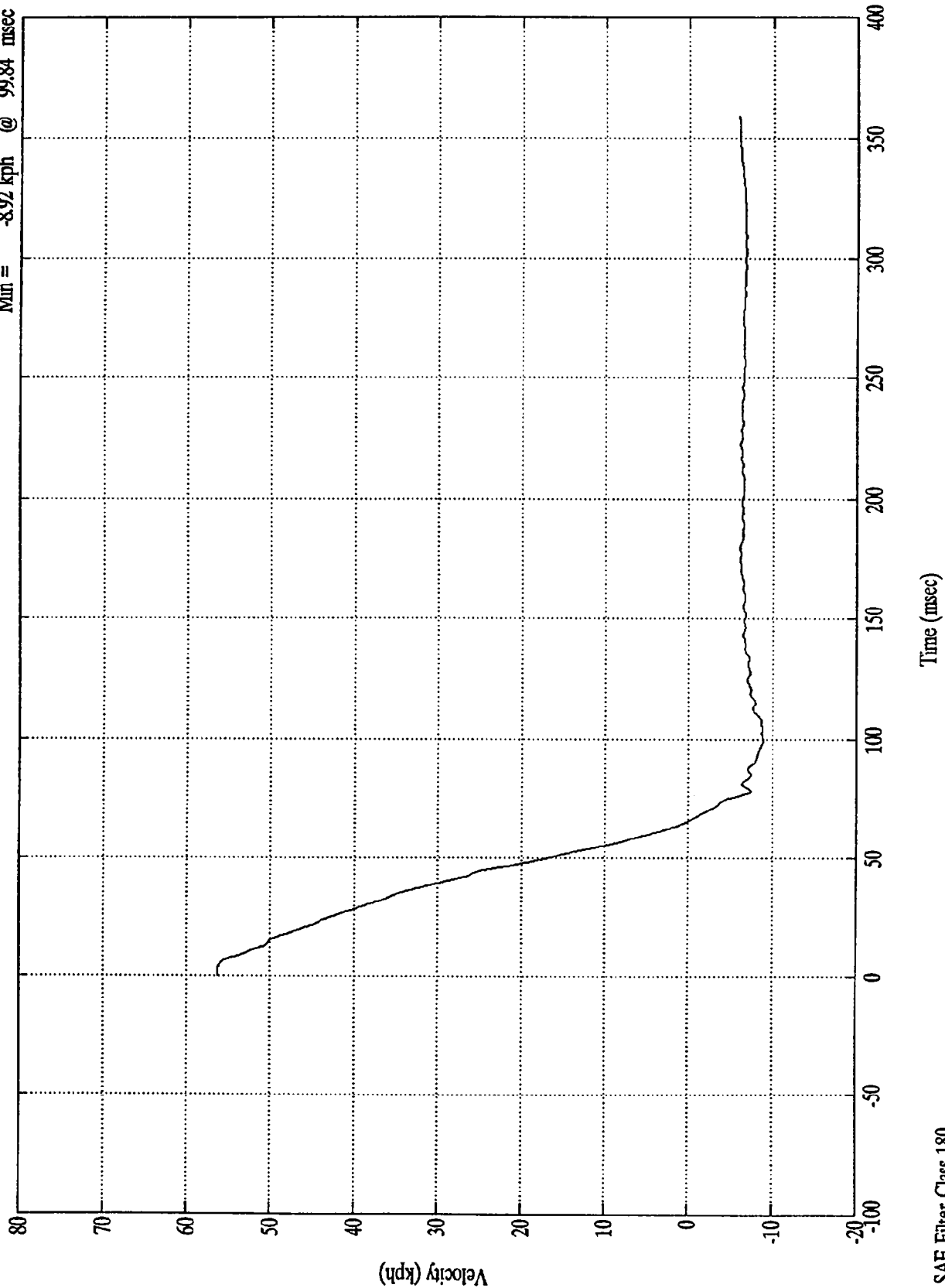
Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Acc. #9(x)

Max = 56.33 kph @ 0.35 msec
Min = -8.92 kph @ 99.84 msec



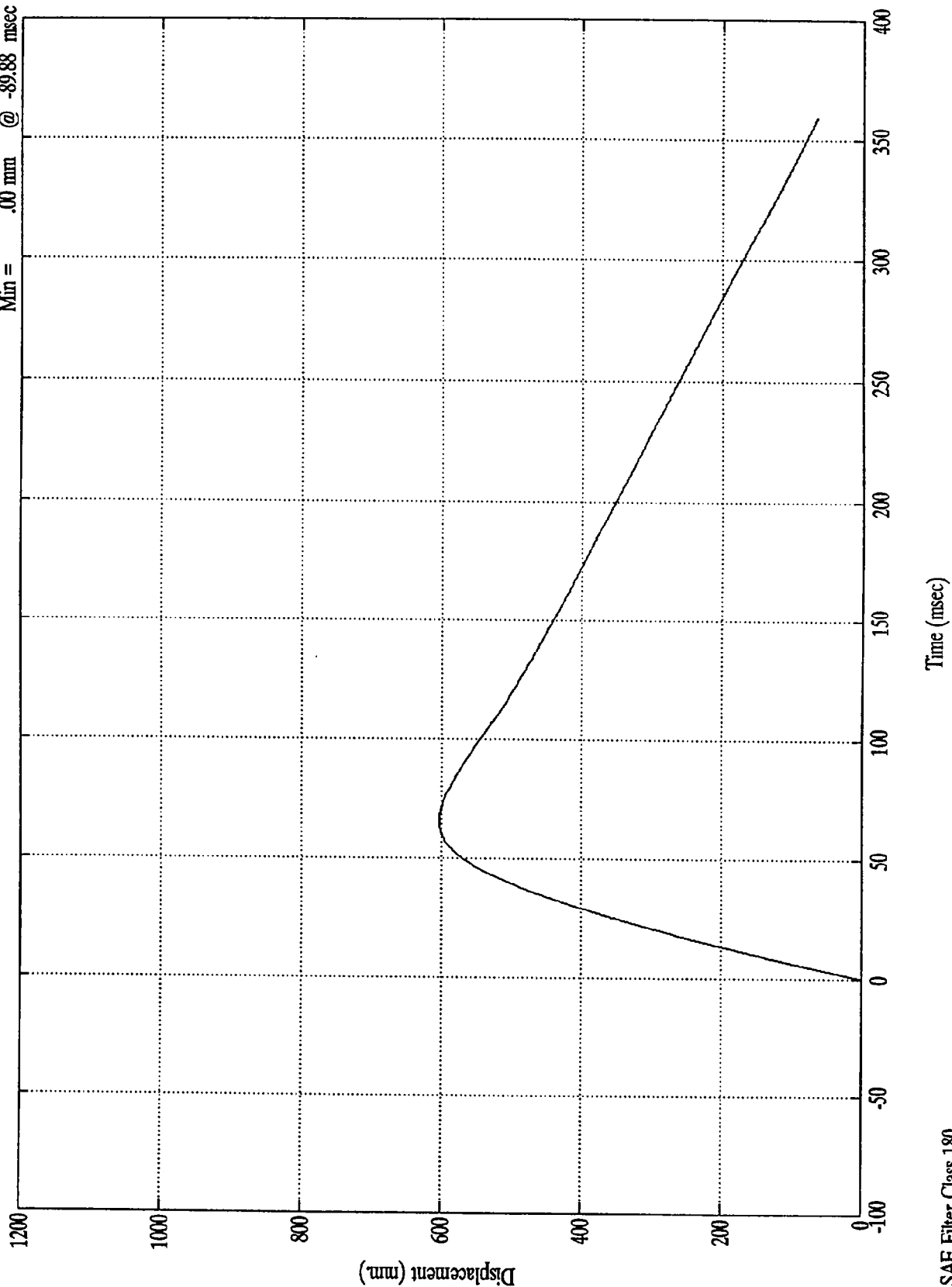
B-101

8227-11

SAE Filter Class 180

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Acc. #9(x)
Max = 603.01 mm @ 65.64 msec
Min = .00 mm @ -89.88 msec



TEST NO. MS0502

LOAD CELL BARRIER DATA

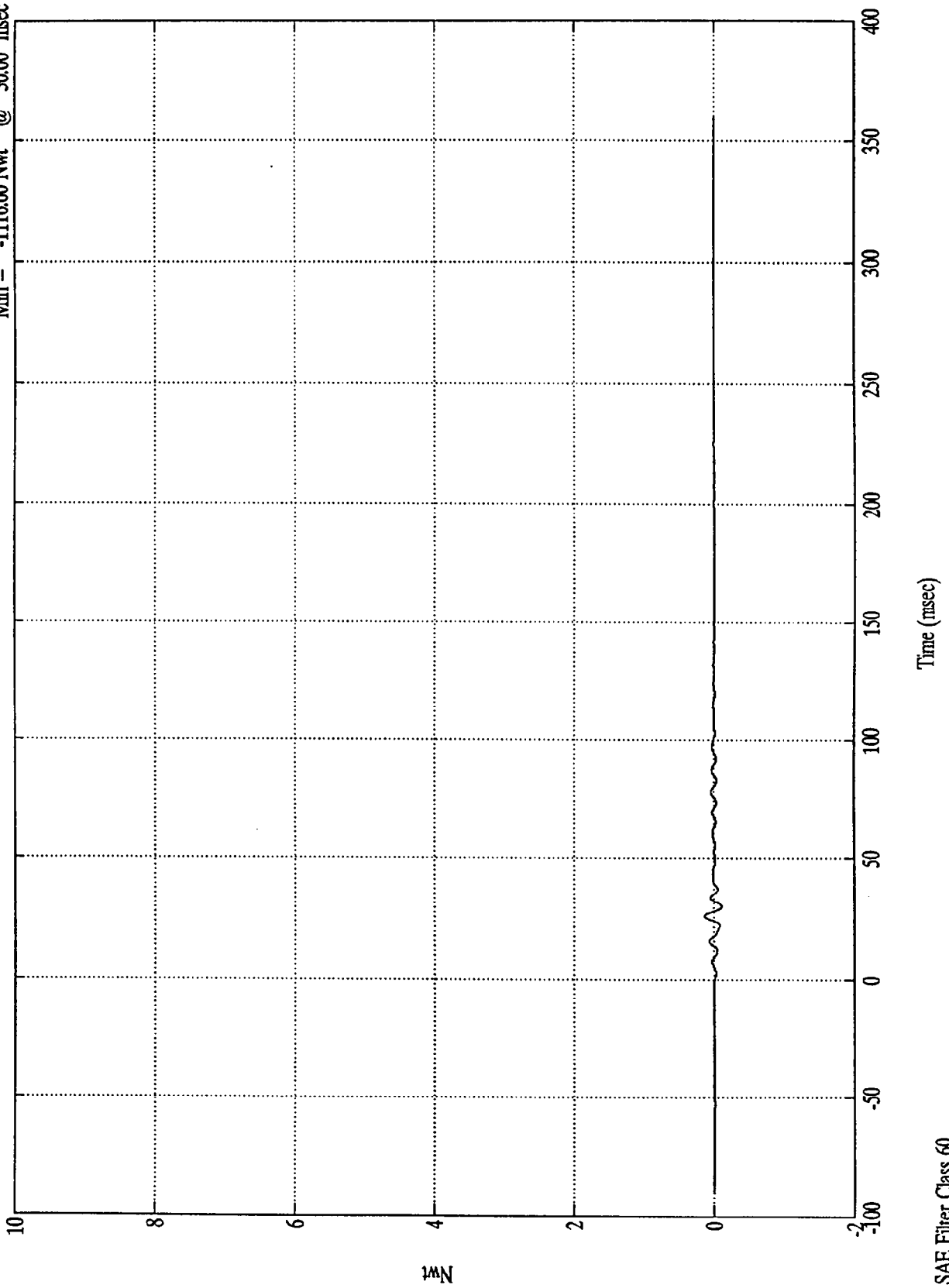
FILTER CHANNEL CLASS

60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

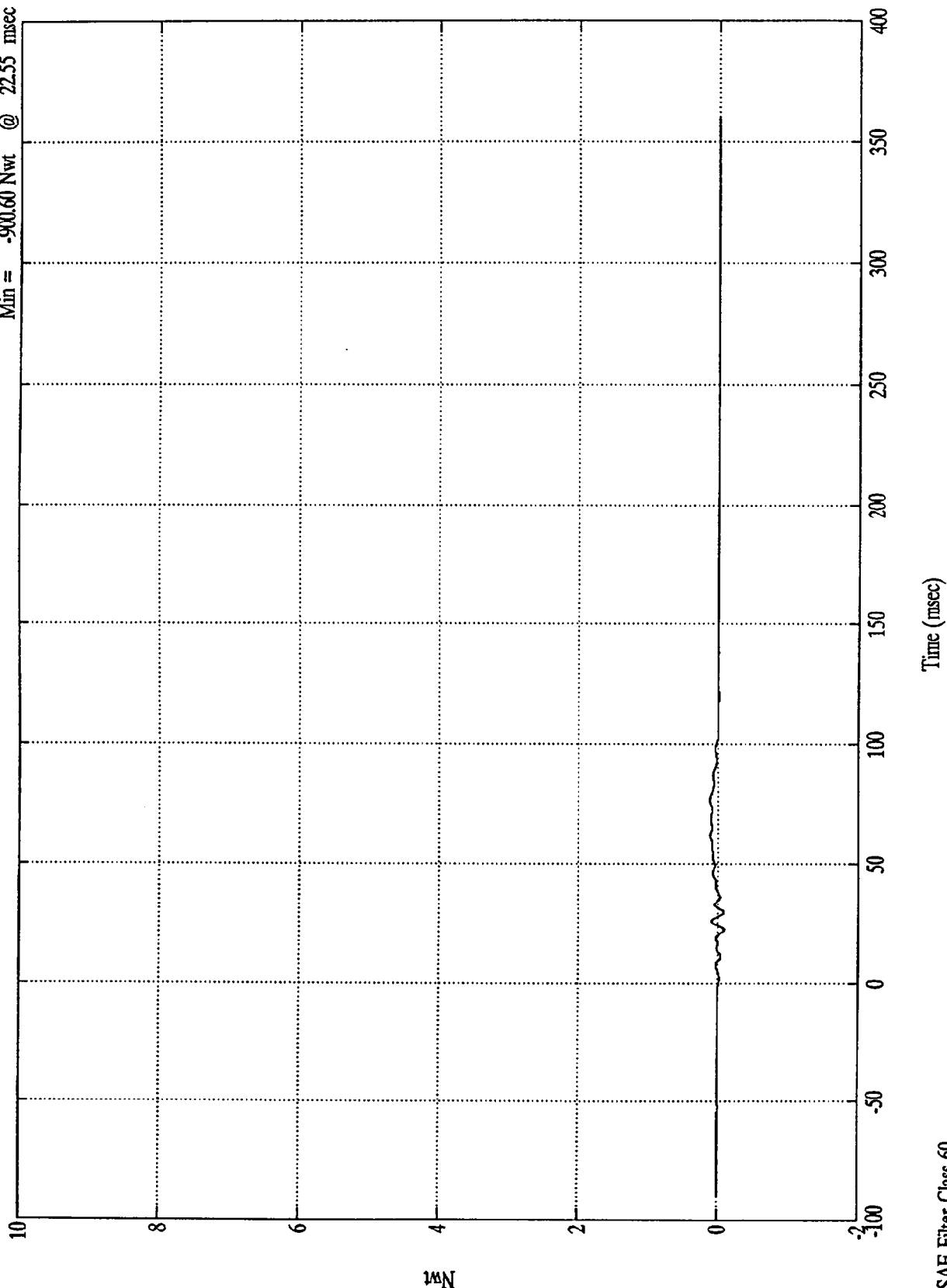
Max = 1367.68 Nwt @ 26.03 msec
Min = -1116.60 Nwt @ 30.00 msec

Barrier Load Cell A1



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell A2
Max = 1156.58 Nwt @ 76.80 msec
Min = -900.60 Nwt @ 22.55 msec



Nwt

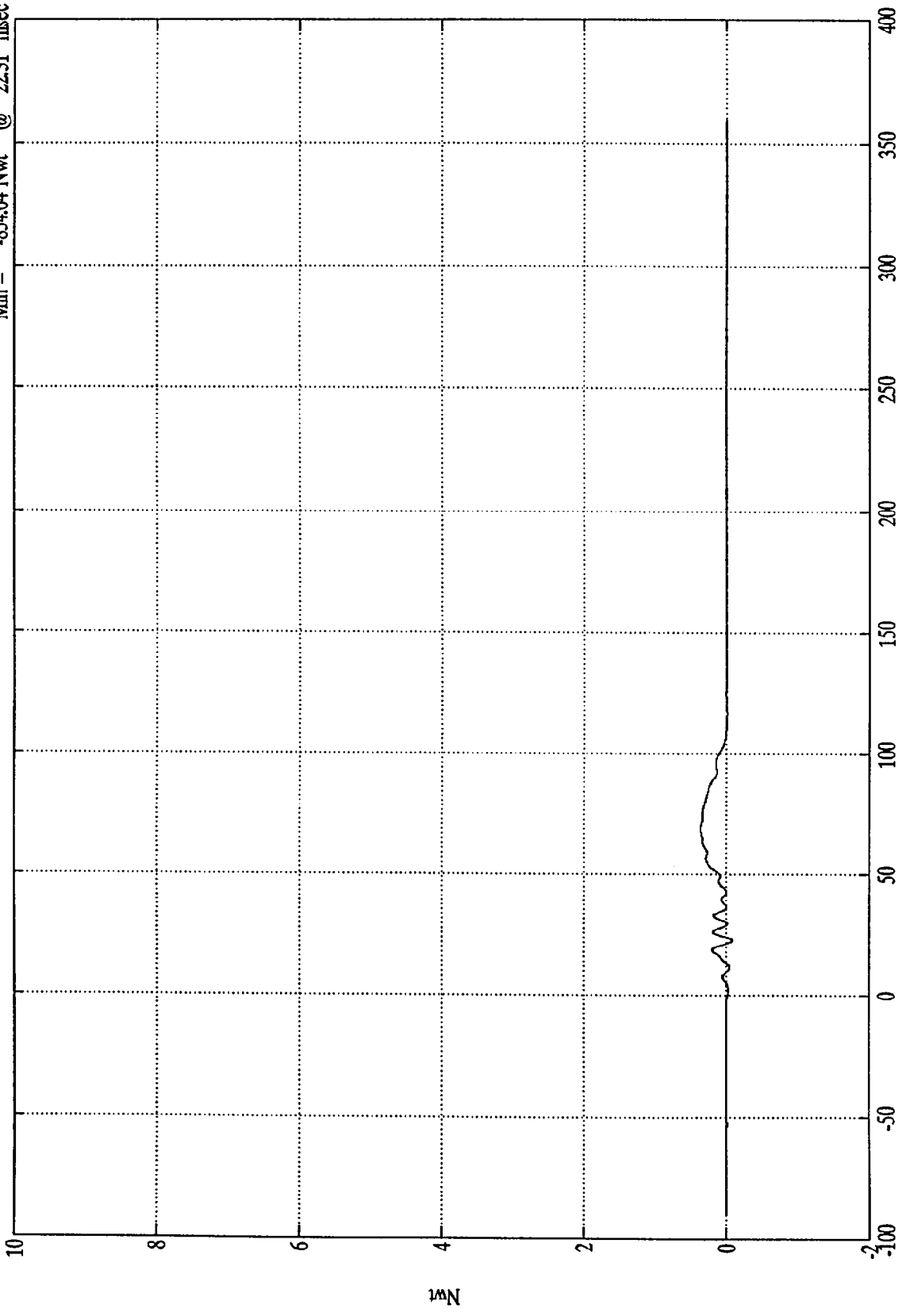
SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 3658.32 Nwt @ 68.63 msec
Min = -834.04 Nwt @ 22.31 msec

Barrier Load Cell A3

x10⁴



Time (msec)

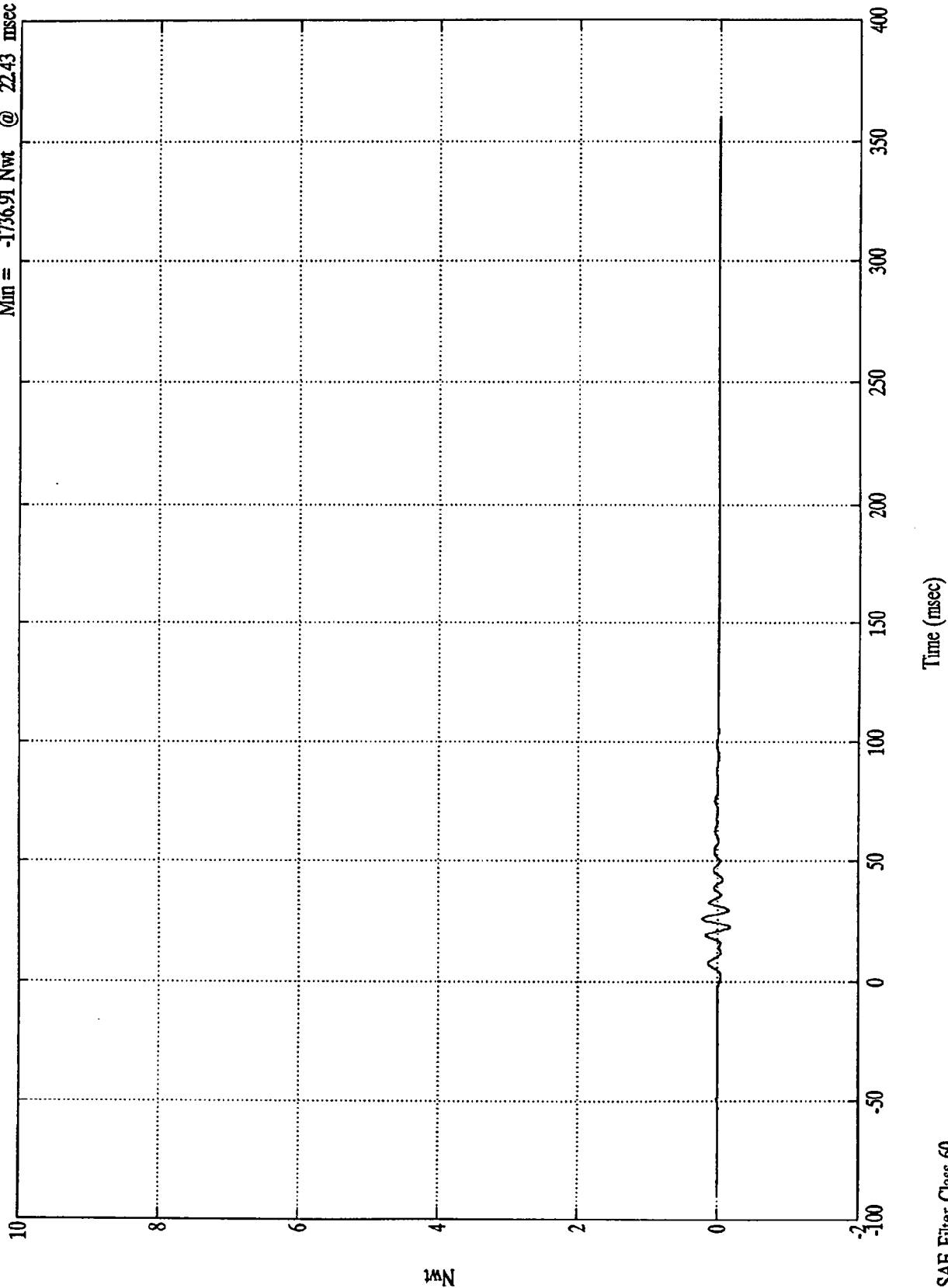
SAE Filter Class 60

Nwt

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell A4
Max = 2242.04 Nwt @ 25.79 msec
Min = -1736.91 Nwt @ 22.43 msec

x10⁴

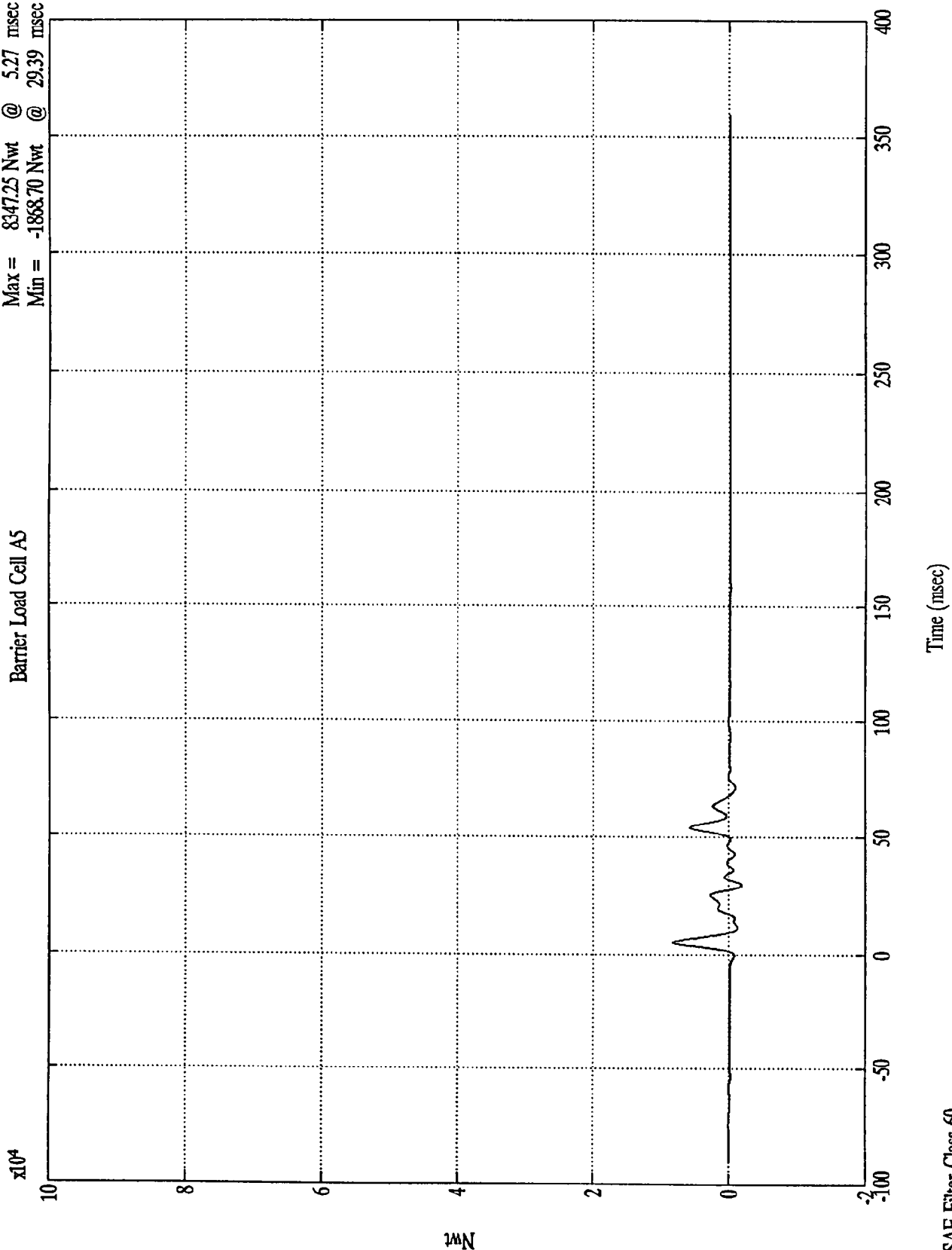


Nwt

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell A5
Max = 8347.25 Nwt @ 5.27 msec
Min = -1888.70 Nwt @ 29.39 msec



Nwt

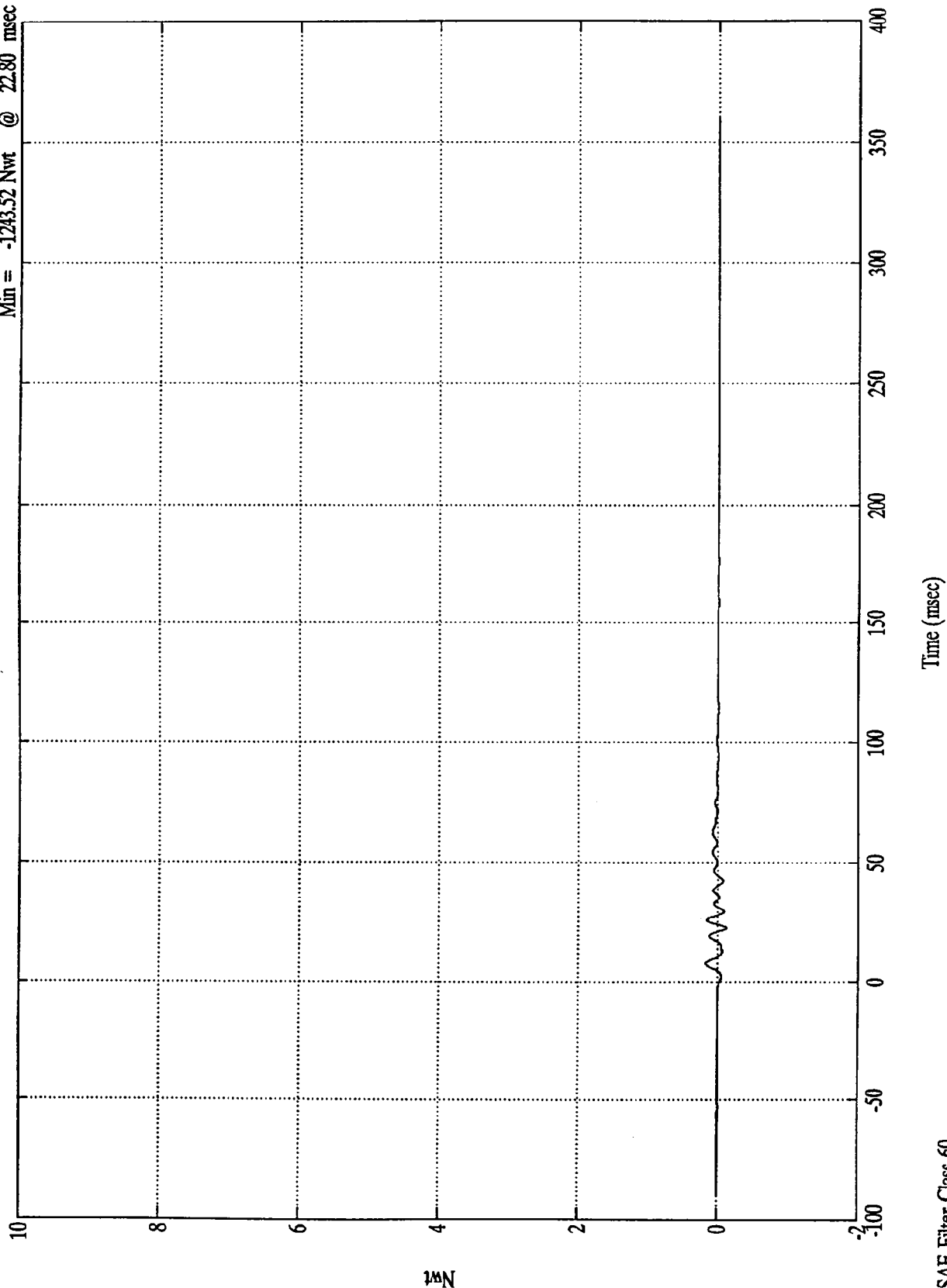
Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell A6
Max = 1731.50 Nwt @ 7.67 msec
Min = -1243.52 Nwt @ 22.80 msec

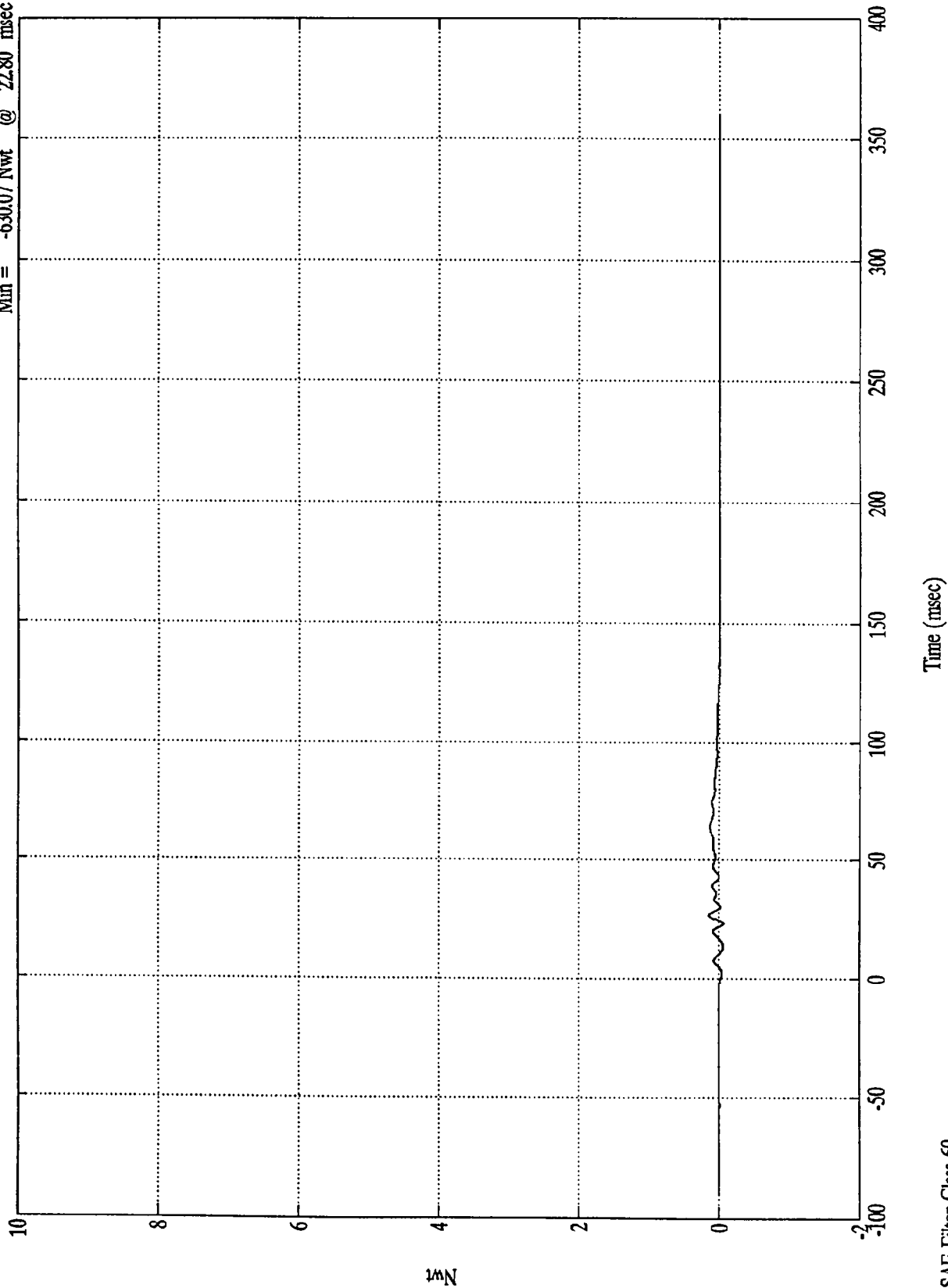
$\times 10^4$



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell A7
 Max = 1508.84 Nwt @ 26.15 msec
 Min = -630.07 Nwt @ 22.80 msec

x10⁴

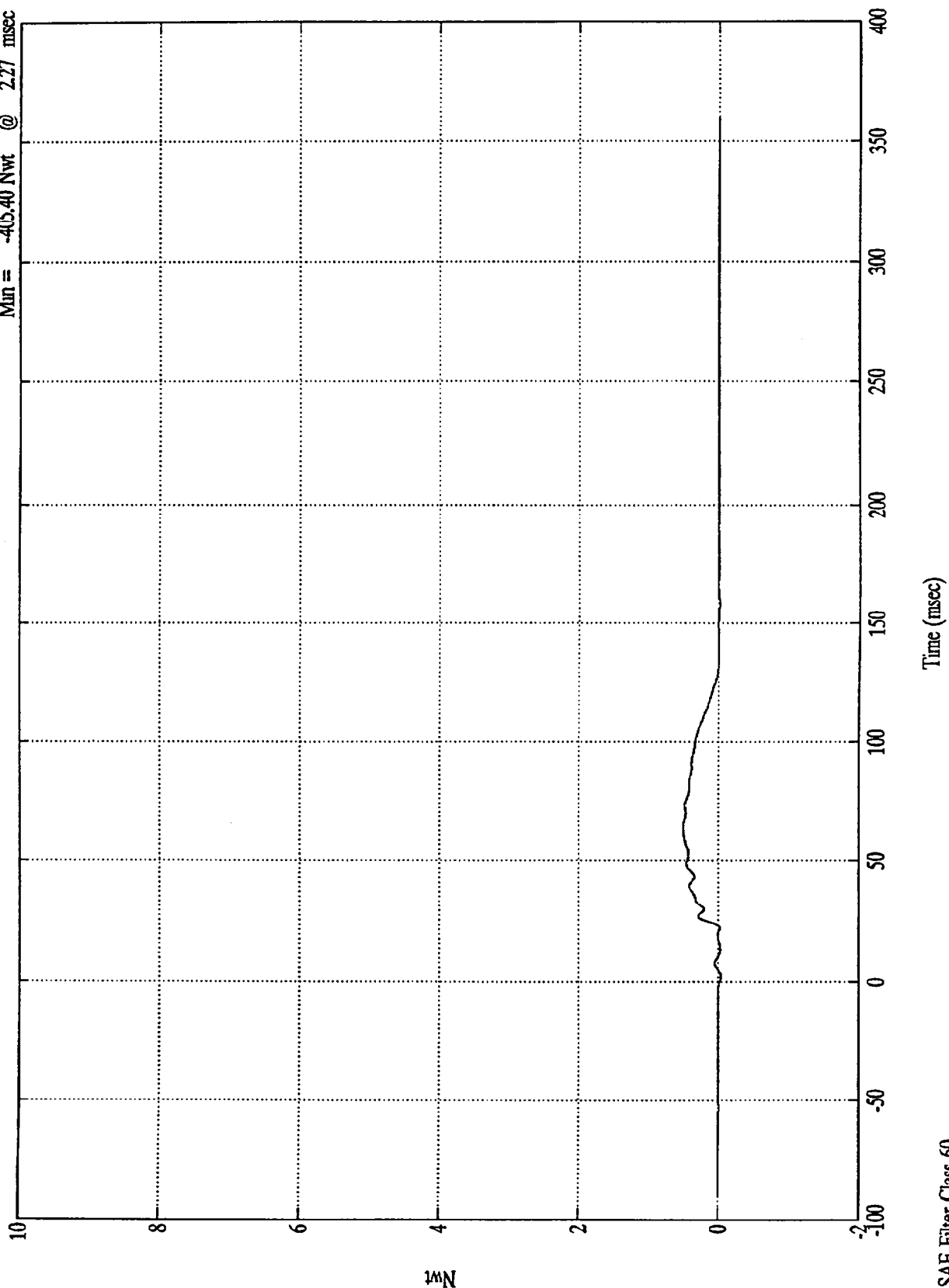


SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell A8

Max = 4997.06 Nwt @ 64.56 msec
Min = -405.40 Nwt @ 2.27 msec



Nwt

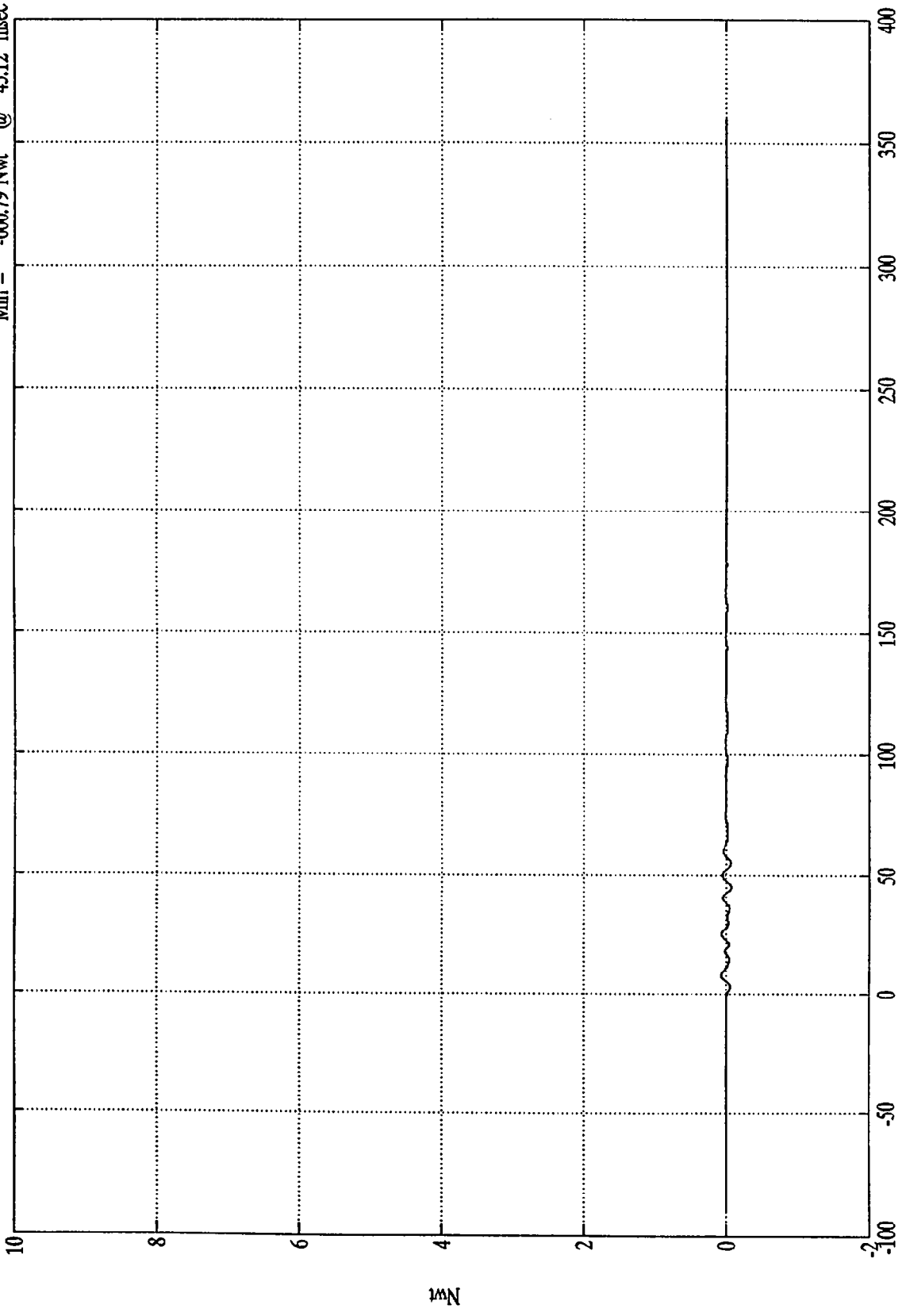
Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell A9
Max = 711.16 Nwt @ 8.15 msec
Min = -660.79 Nwt @ 45.12 msec

x10⁴



Time (msec)

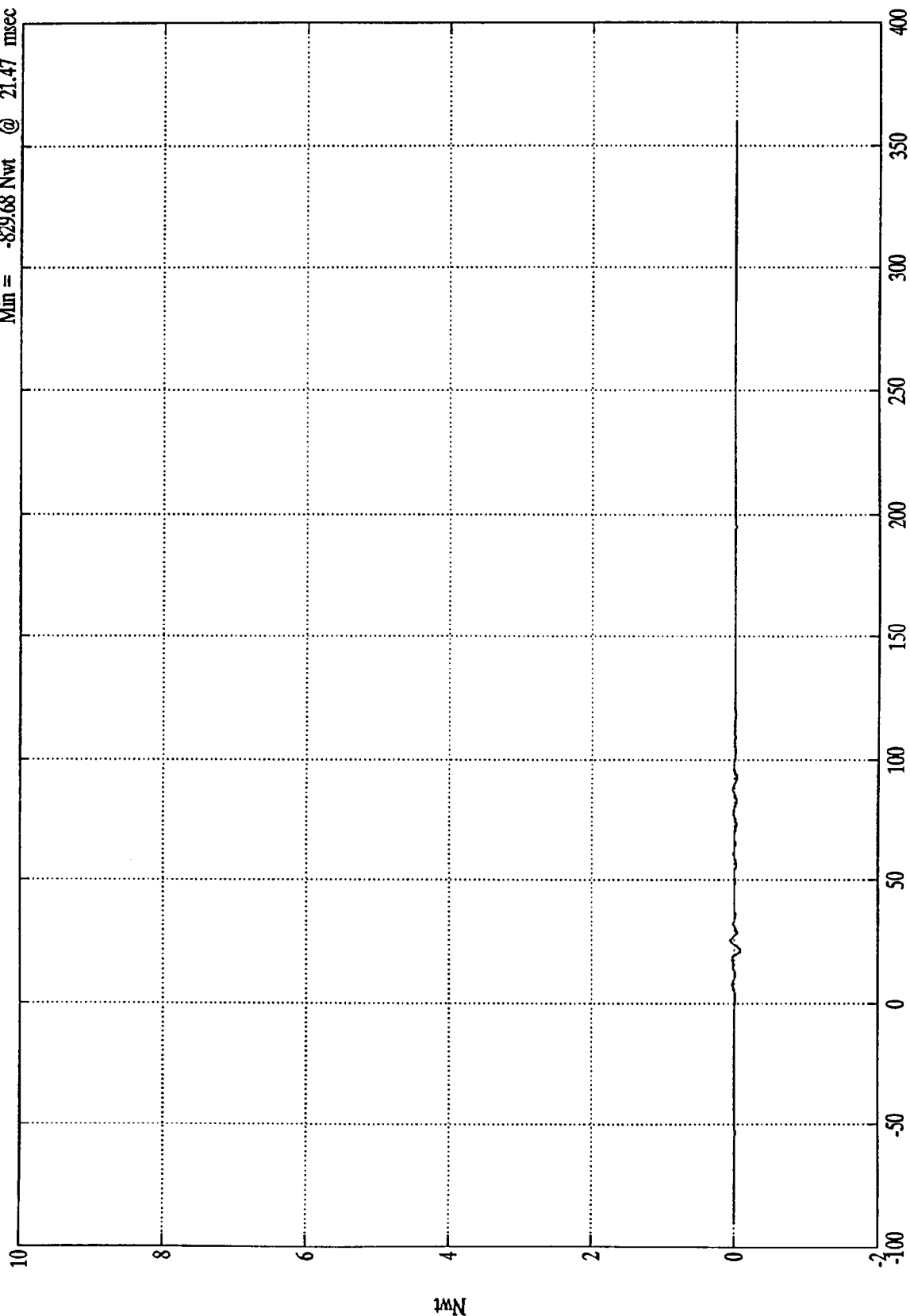
SAE Filter Class 60

Nwt

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 508.16 Nwt @ 25.31 msec
Min = -829.68 Nwt @ 21.47 msec

Barrier Load Cell B1



Time (msec)

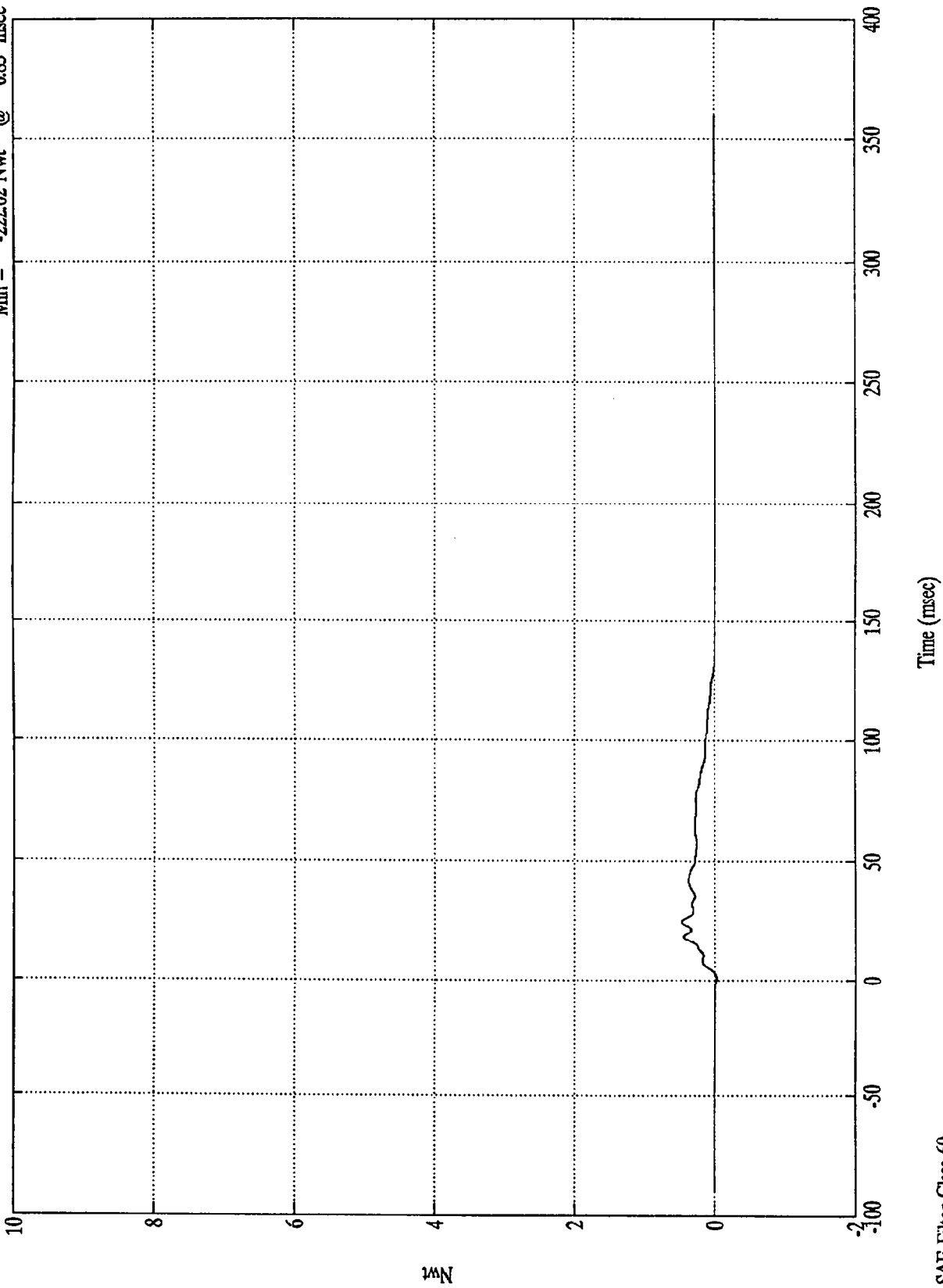
SAE Filter Class 60

Nwt

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 4748.30 Nwt @ 24.71 msec
Min = -222.02 Nwt @ 0.83 msec

Barrier Load Cell B2



SAE Filter Class 60

Nwt

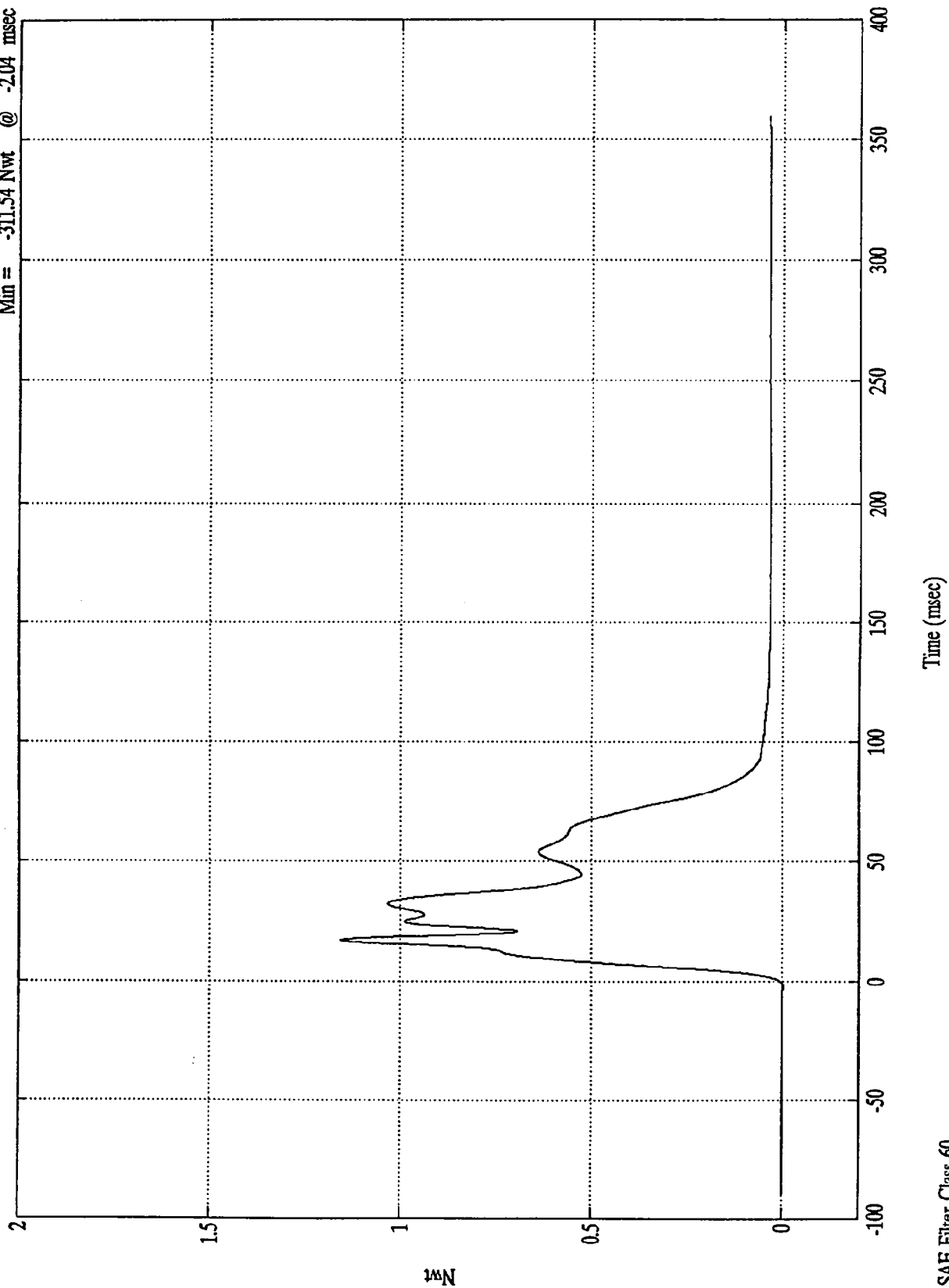
Time (msec)

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

$\times 10^5$

Barrier Load Cell B3

Max = 115854.13 Nwt @ 17.15 msec
Min = -311.54 Nwt @ -2.04 msec



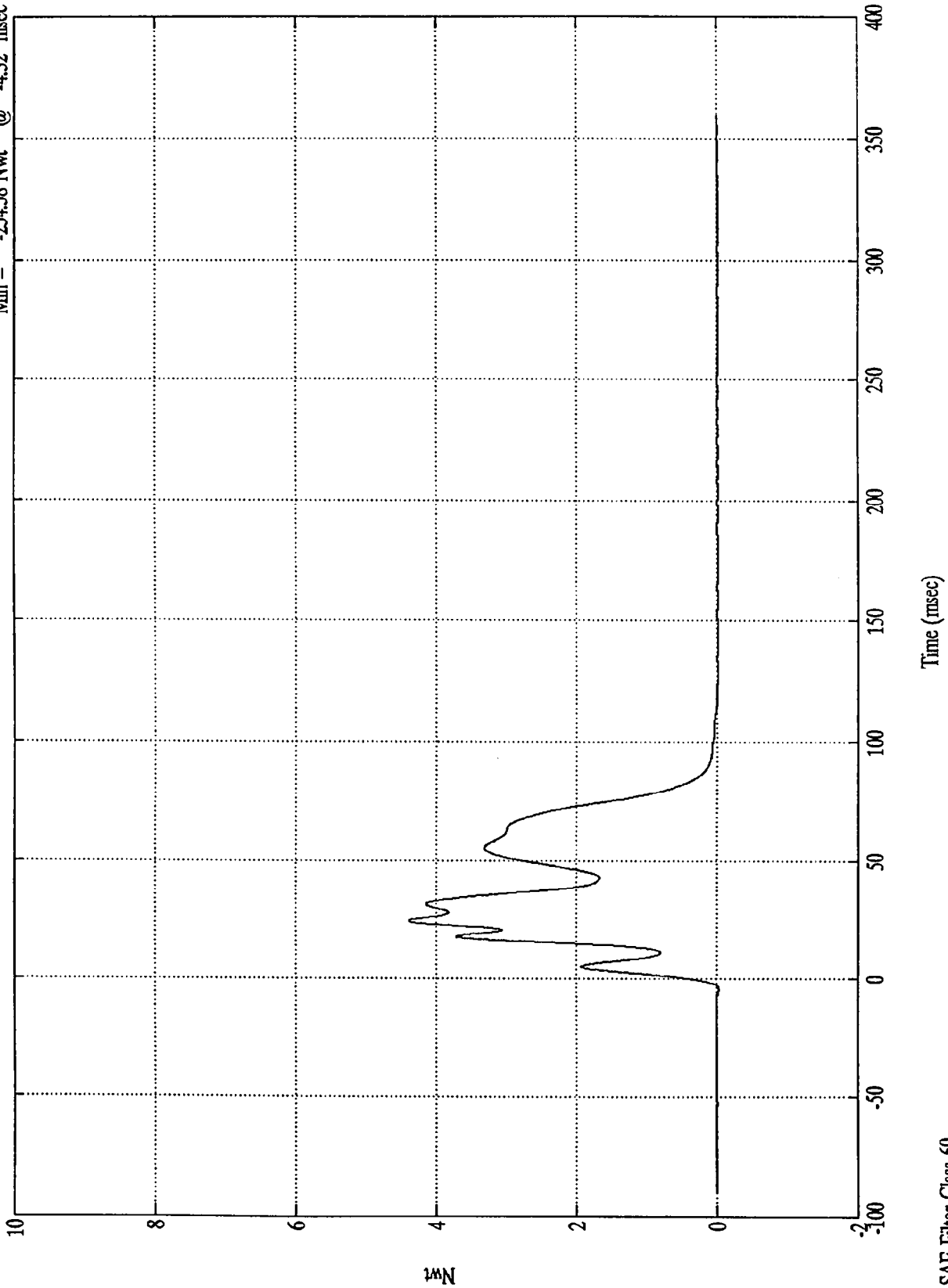
Nwt

Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK
x10⁴

Barrier Load Cell B4
Max = 43966.78 Nwt @ 24.00 msec
Min = -254.58 Nwt @ -4.32 msec

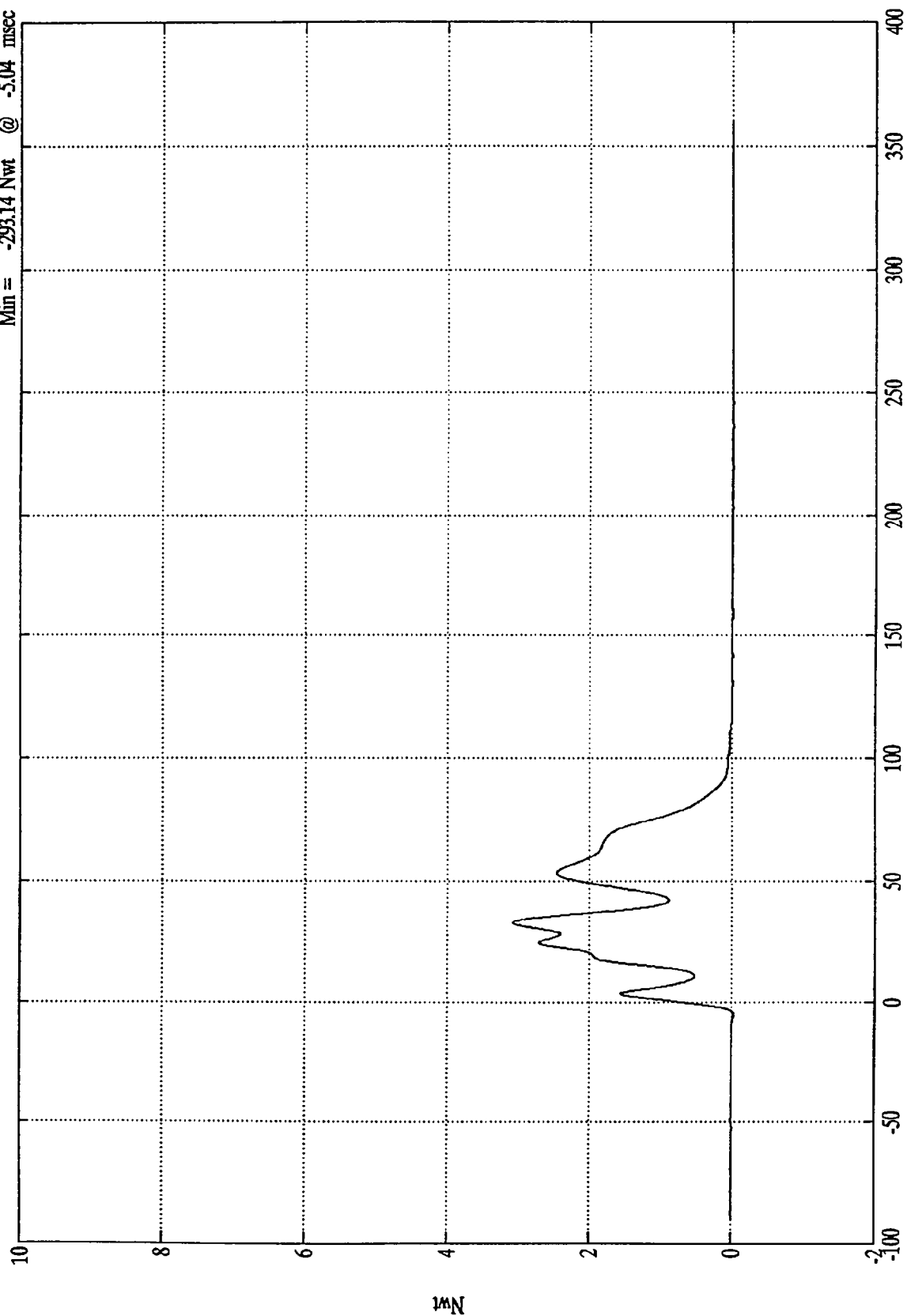


SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 30783.46 Nwt @ 32.75 msec
Min = -293.14 Nwt @ -5.04 msec

Barrier Load Cell B5



Time (msec)

SAE Filter Class 60

Nwt

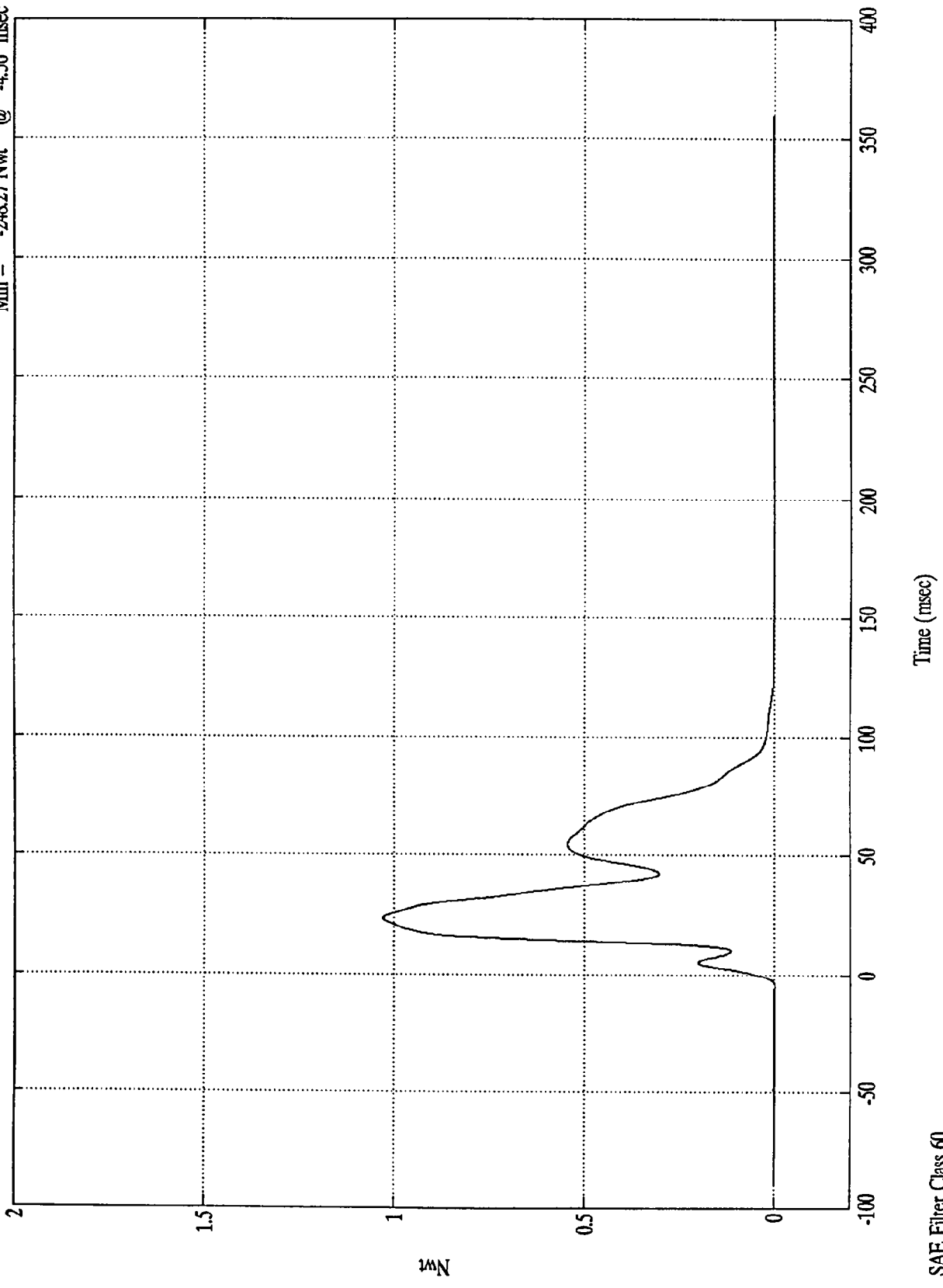
B-117

8227-11

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell B6

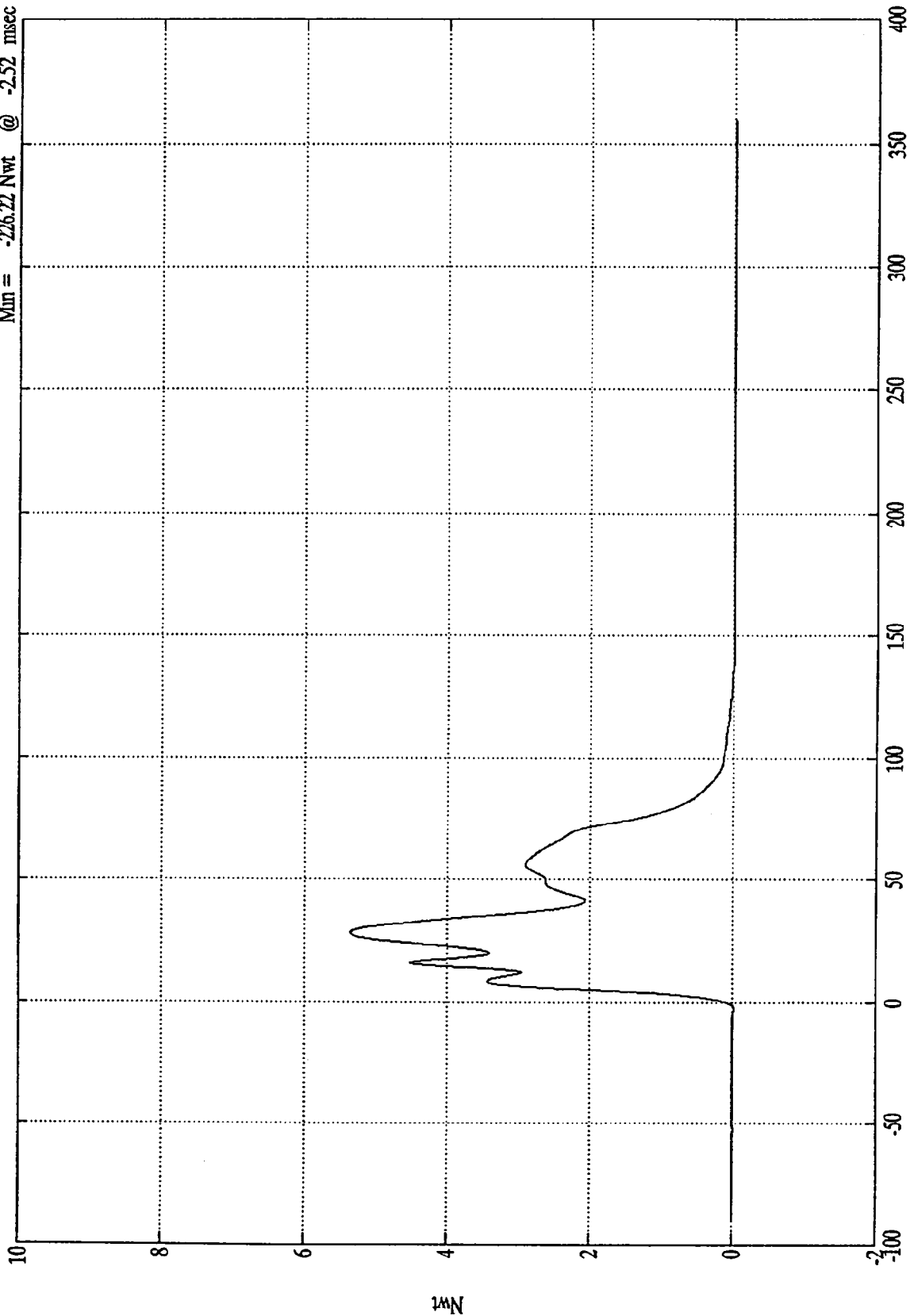
Max = 102971.09 Nwt @ 23.28 msec
Min = -248.27 Nwt @ -4.56 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 53526.45 Nwt @ 27.96 msec
Min = -226.22 Nwt @ -2.52 msec

Barrier Load Cell B7



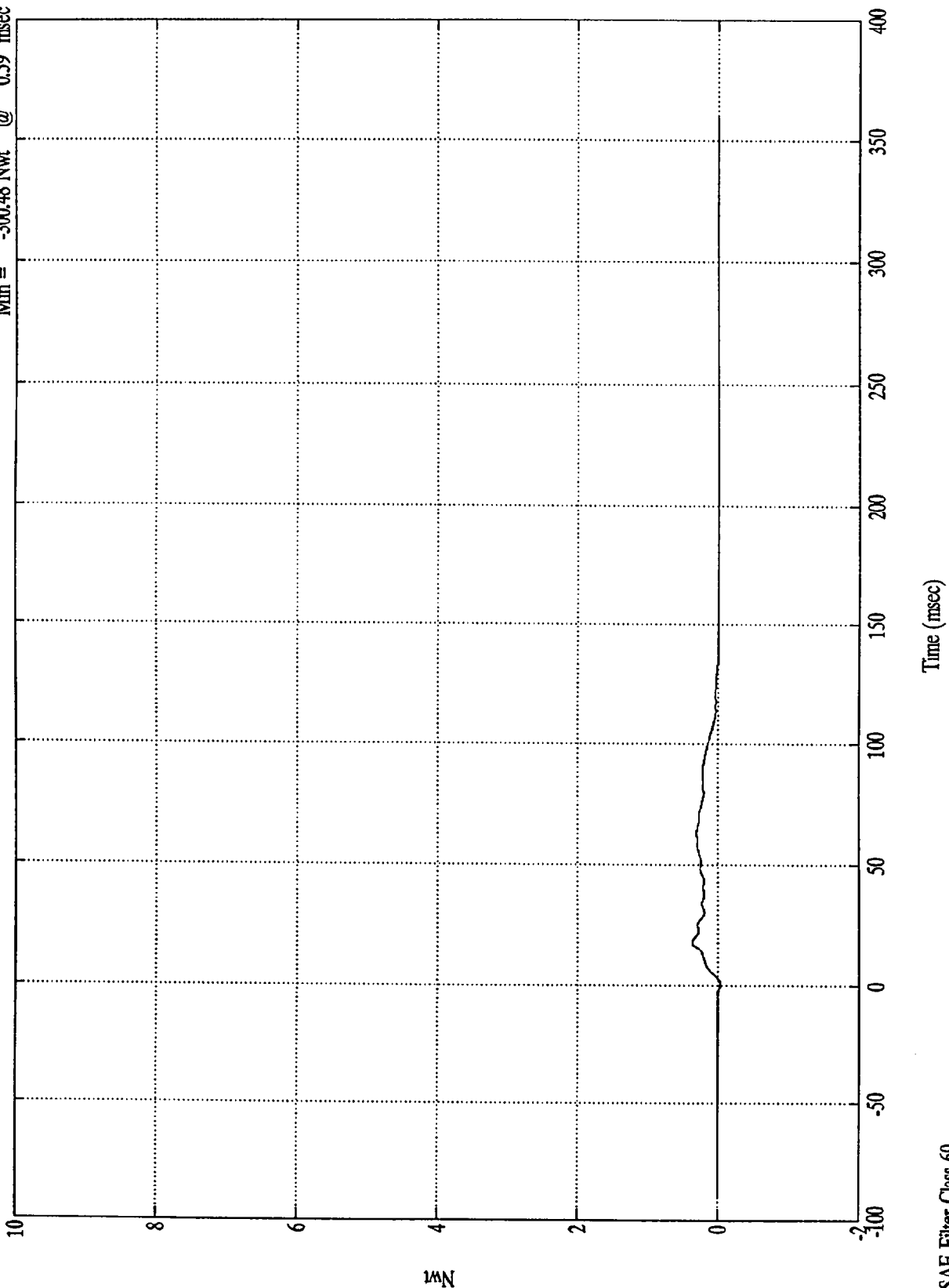
Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell B8
 Max = 3680.02 Nwt @ 17.63 msec
 Min = -300.48 Nwt @ 0.59 msec

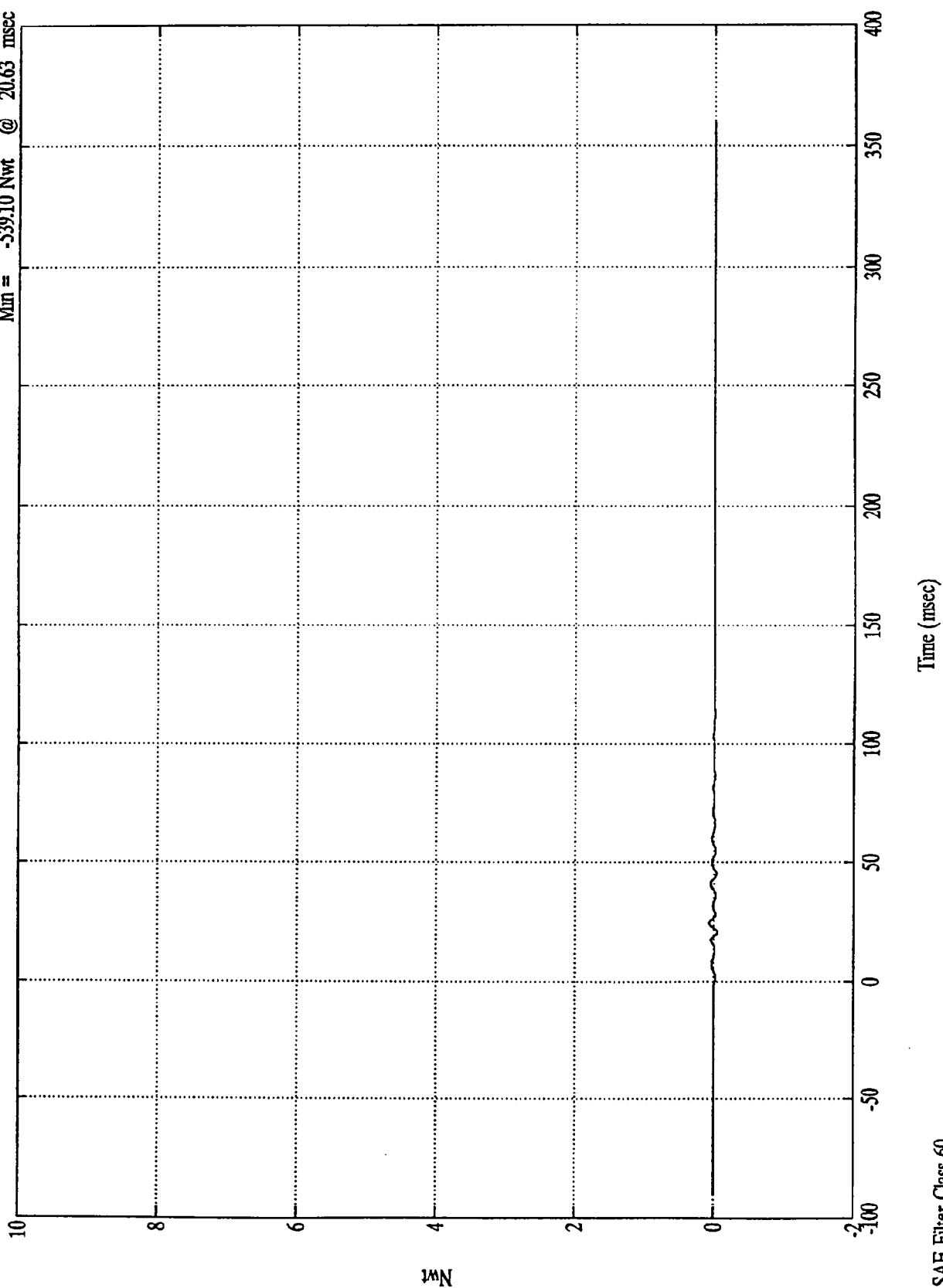
$\times 10^4$



SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell B9
Max = 621.39 Nwt @ 24.35 msec
Min = -539.10 Nwt @ 20.63 msec



Nwt

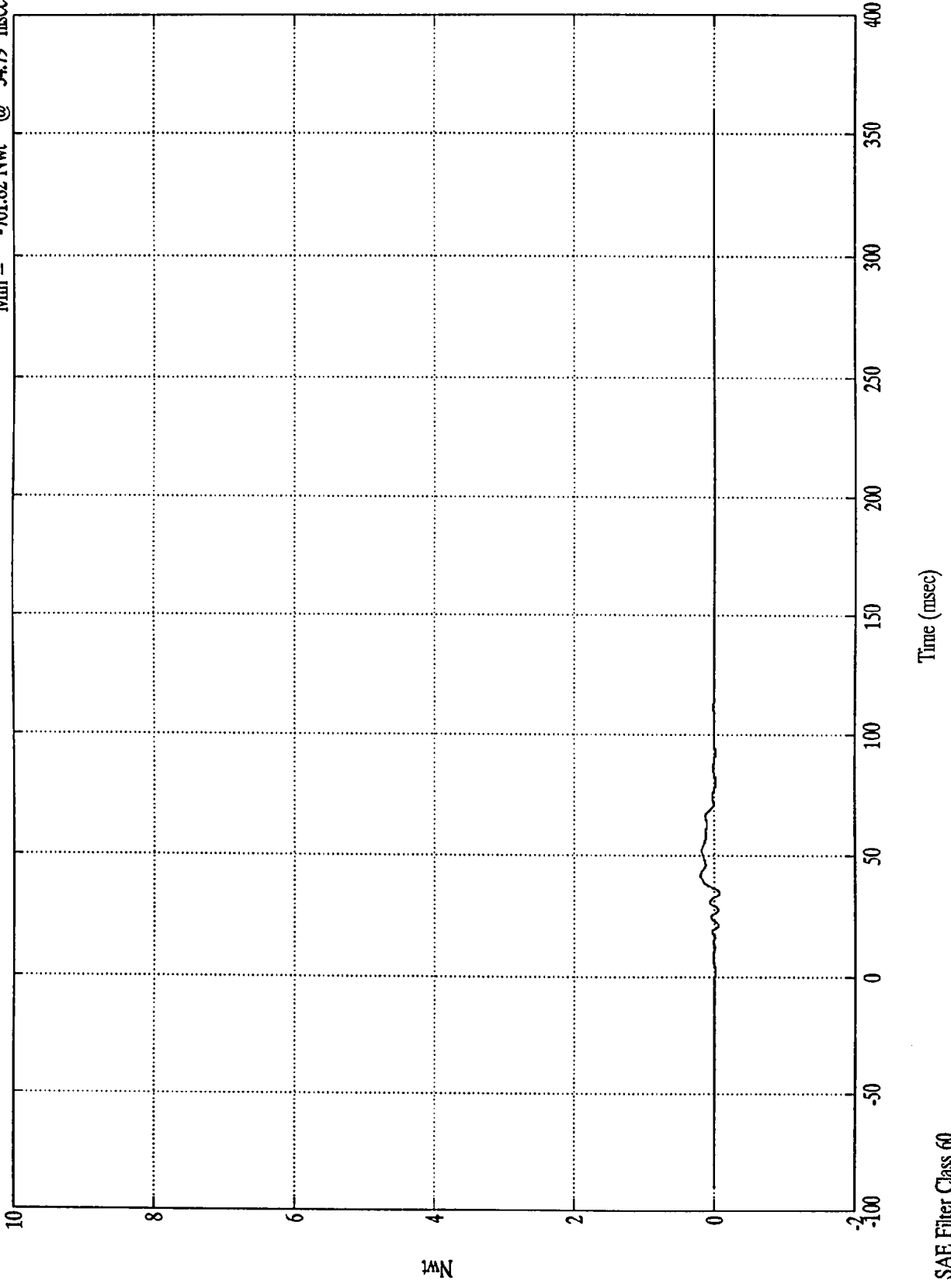
SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 2024.17 Nwt @ 41.88 msec
Min = -701.82 Nwt @ 34.79 msec

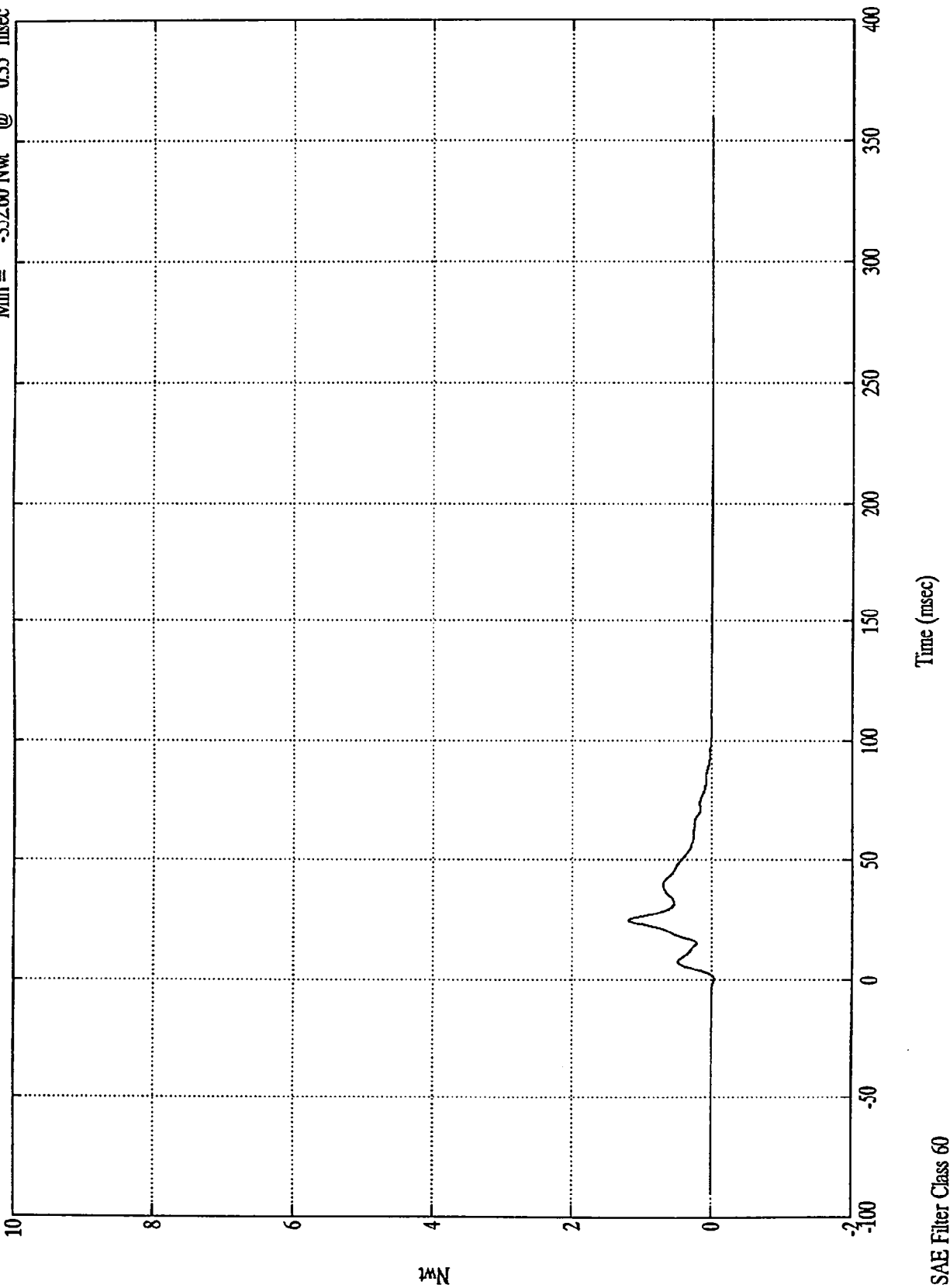
Barrier Load Cell C1

$\times 10^4$



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

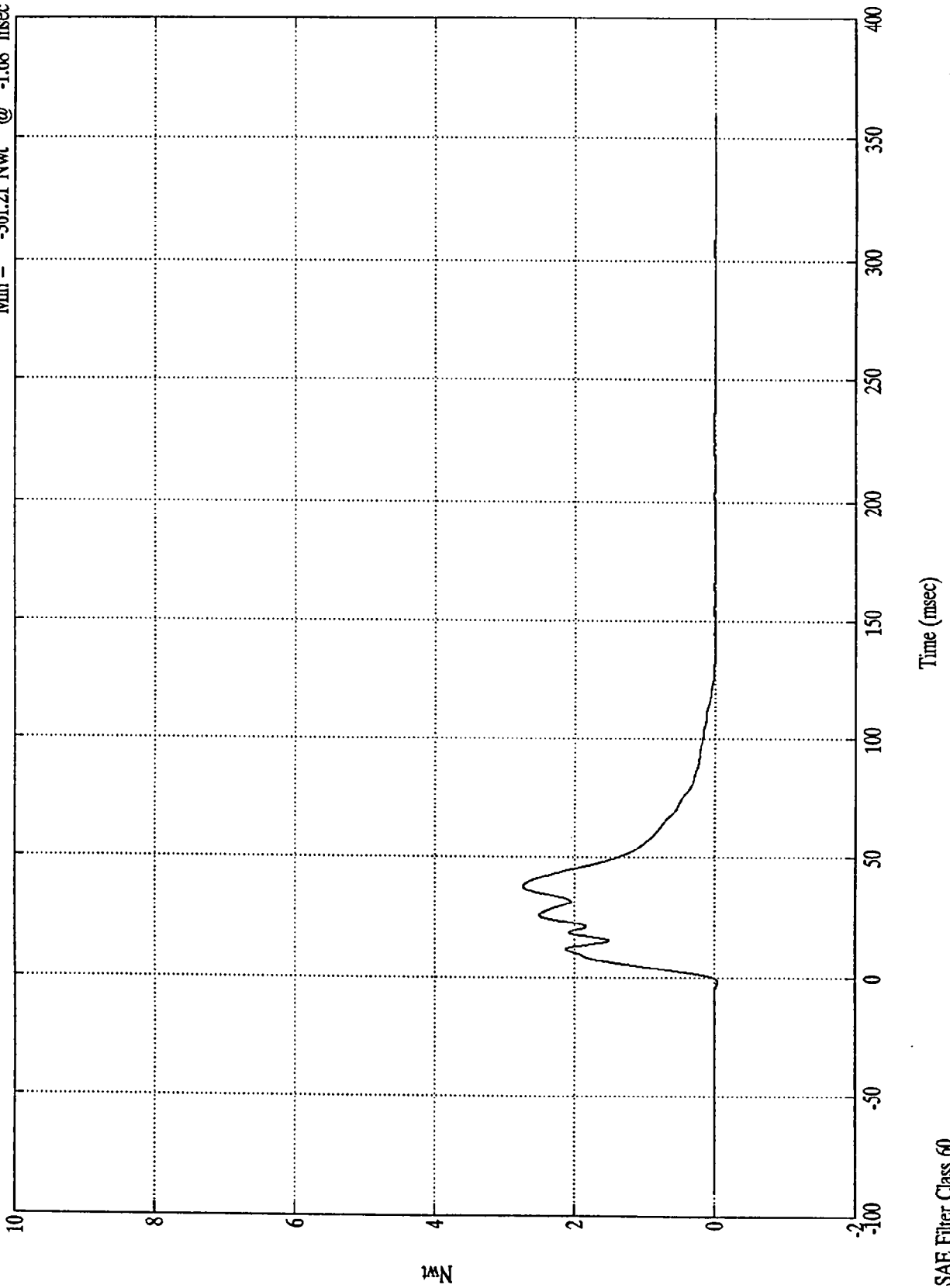
Barrier Load Cell C2
Max = 11954.93 Nwt @ 24.59 msec
Min = -352.60 Nwt @ 0.35 msec



NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 27426.93 Nwt @ 37.79 msec
Min = -361.21 Nwt @ -1.68 msec

Barrier Load Cell C3



Nwt

B-124

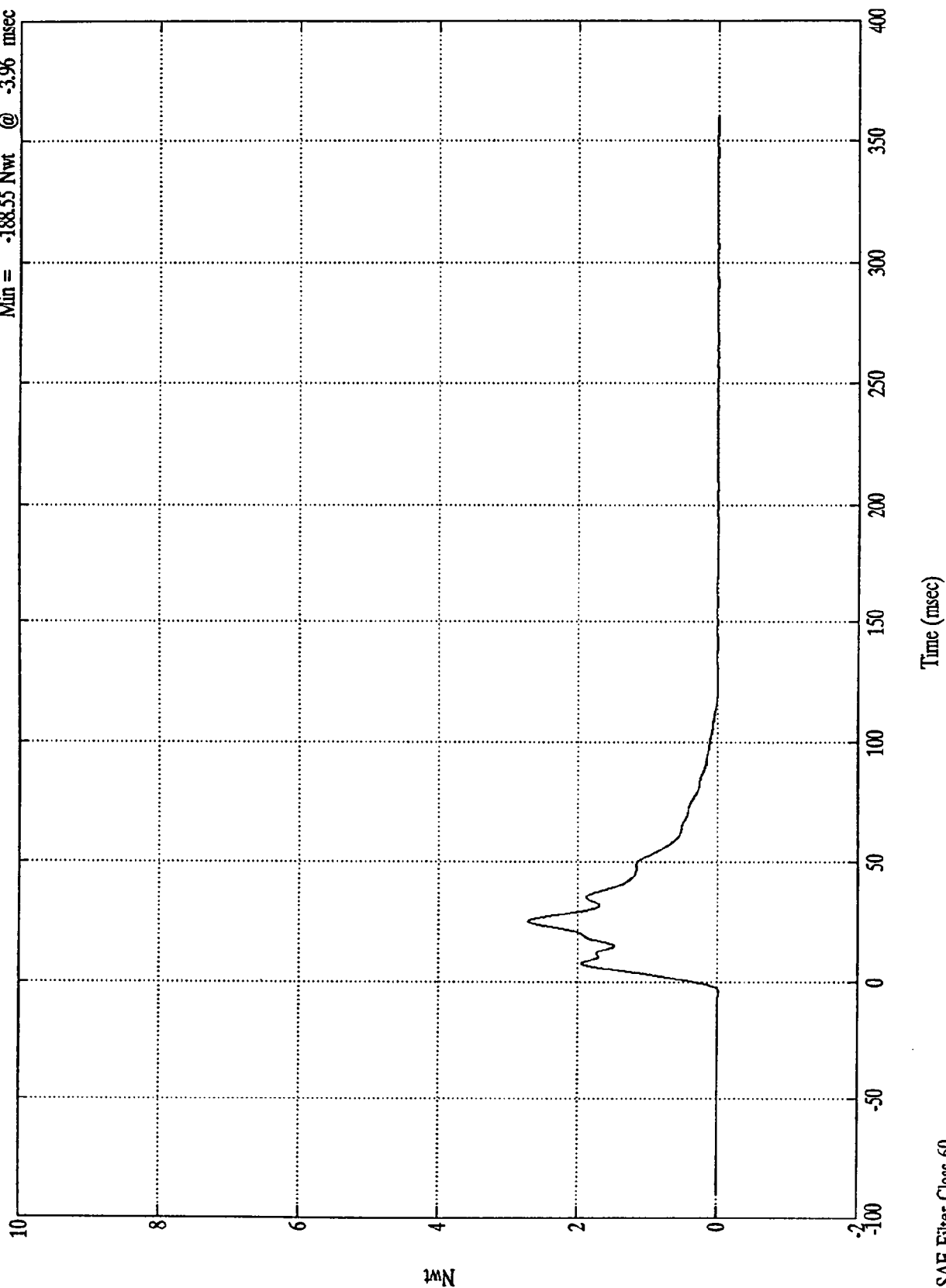
8227-11

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 27105.90 Nwt @ 24.96 msec
Min = -188.55 Nwt @ -3.96 msec

Barrier Load Cell C4



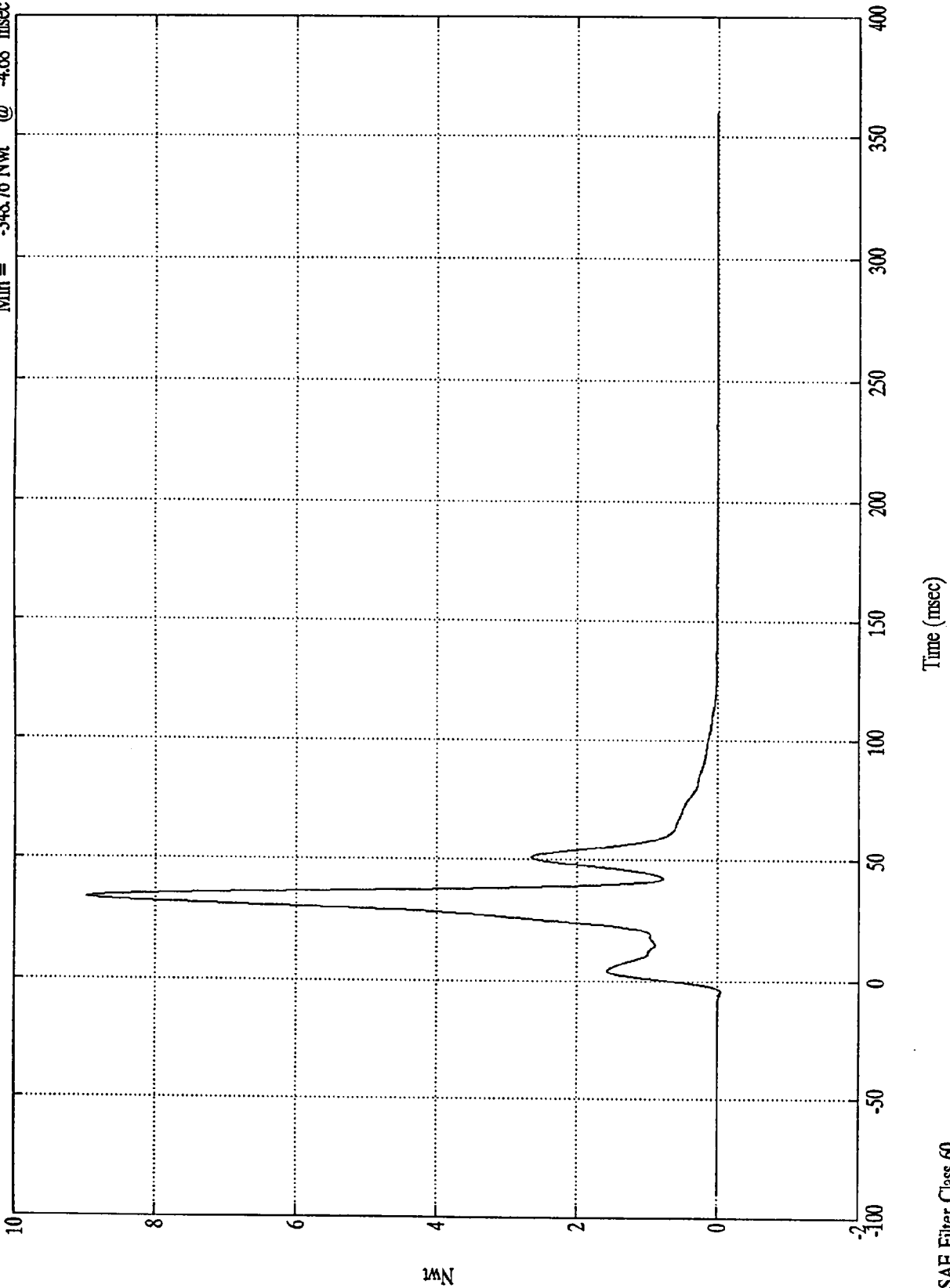
Nwt

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 89764.92 Nwt @ 33.72 msec
Min = -348.76 Nwt @ -4.68 msec

Barrier Load Cell C5

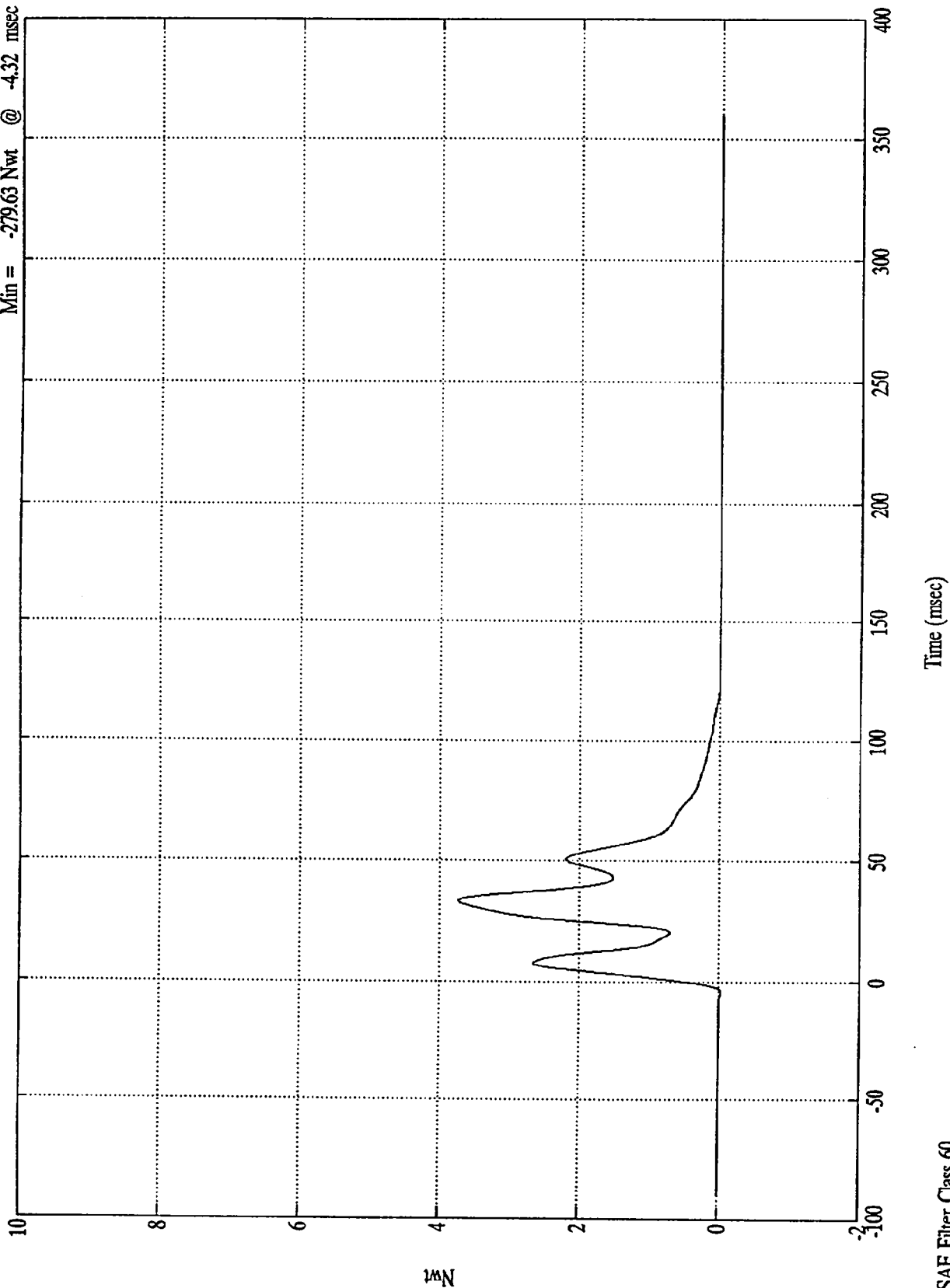


SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 37375.58 Nwt @ 33.11 msec
Min = -279.63 Nwt @ -4.32 msec

Barrier Load Cell C6



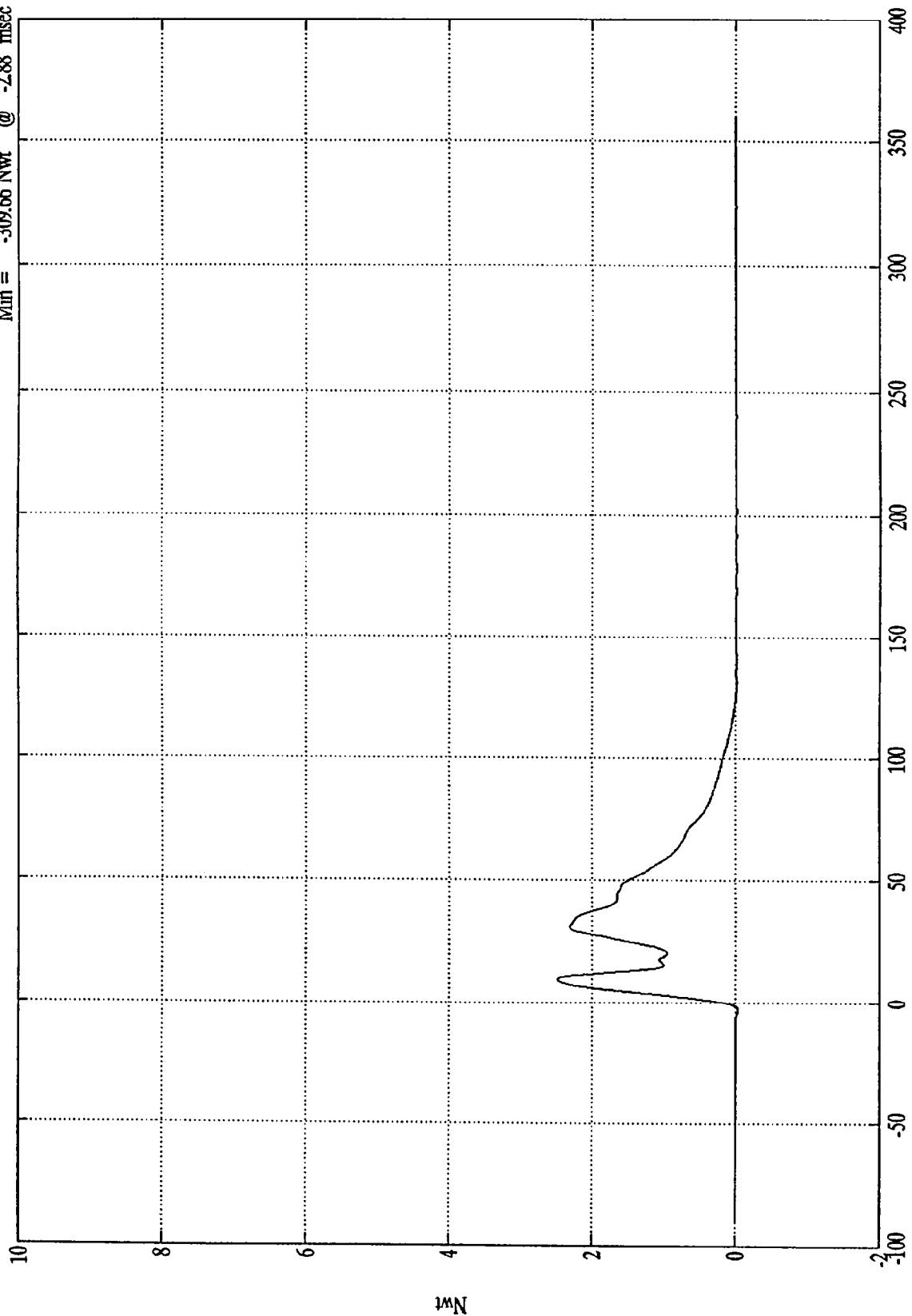
SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell C7
Max = 24887.80 Nwt @ 9.71 msec
Min = -309.66 Nwt @ -2.88 msec

Barrier Load Cell C7

$\times 10^4$

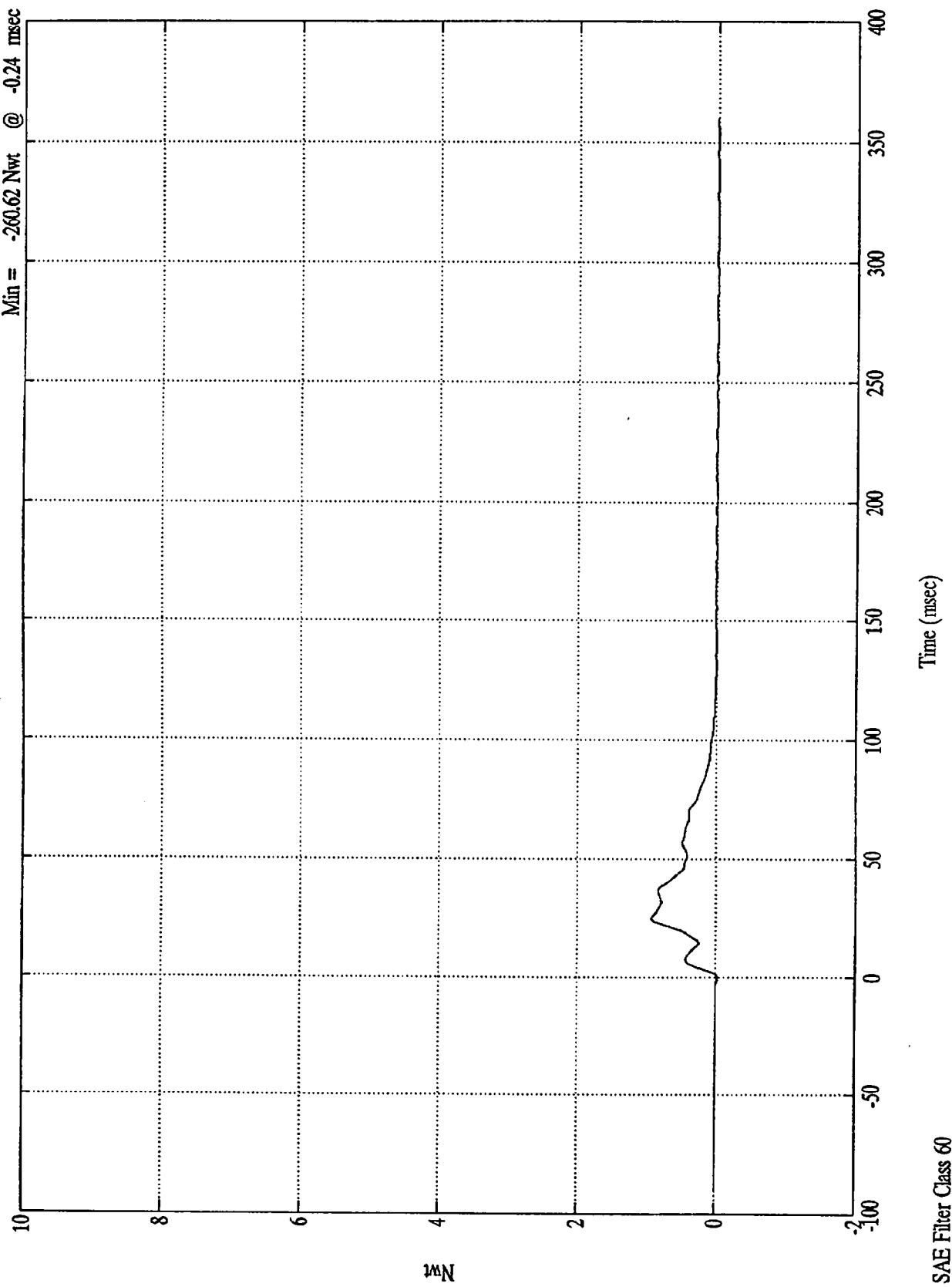


Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell C8
Max = 9275.04 Nwt @ 24.71 msec
Min = -260.62 Nwt @ -0.24 msec



Nwt

Time (msec)

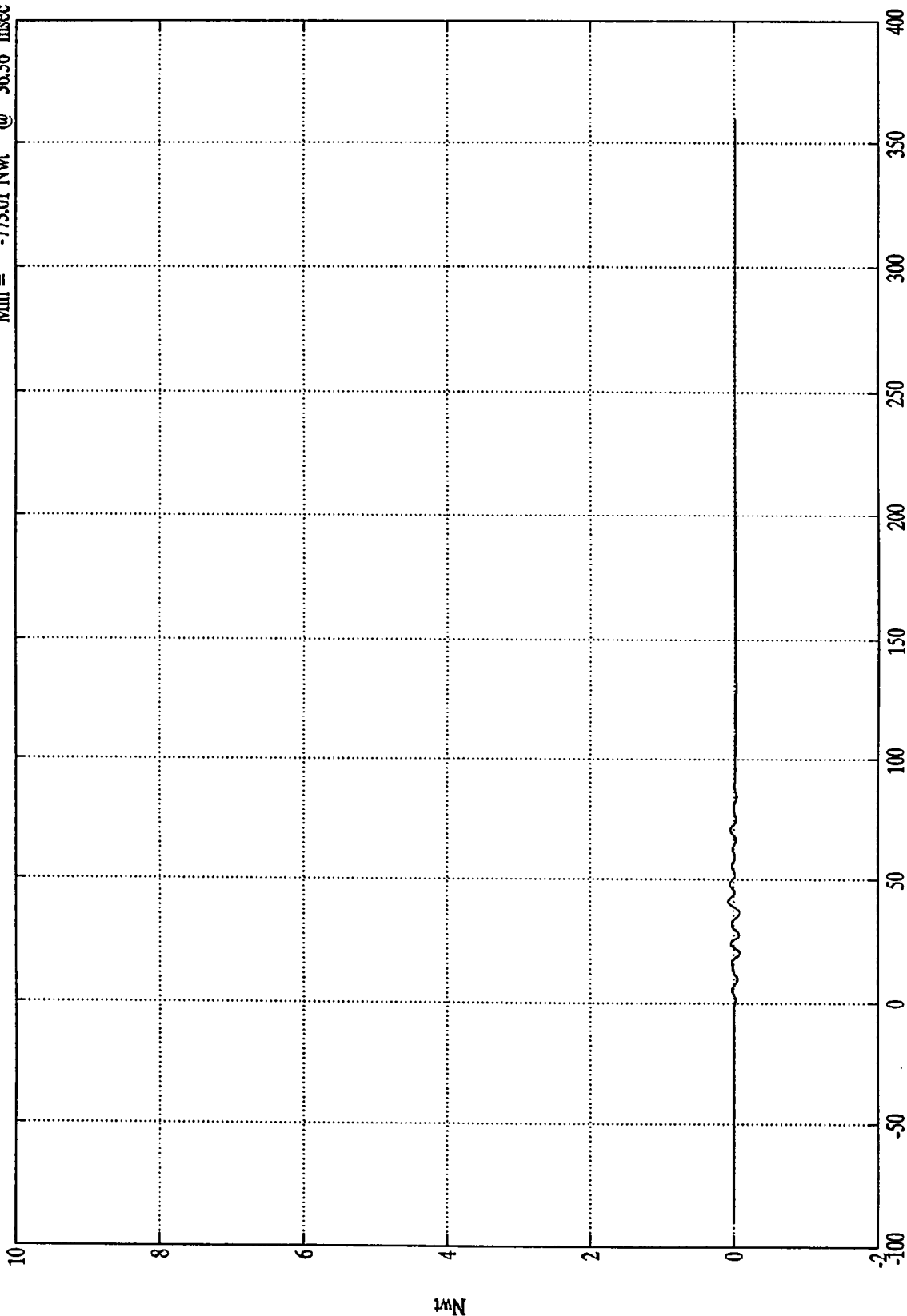
SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell C9
 Max = 784.42 Nwt @ 41.15 msec
 Min = -773.01 Nwt @ 36.36 msec

Barrier Load Cell C9

x10⁴



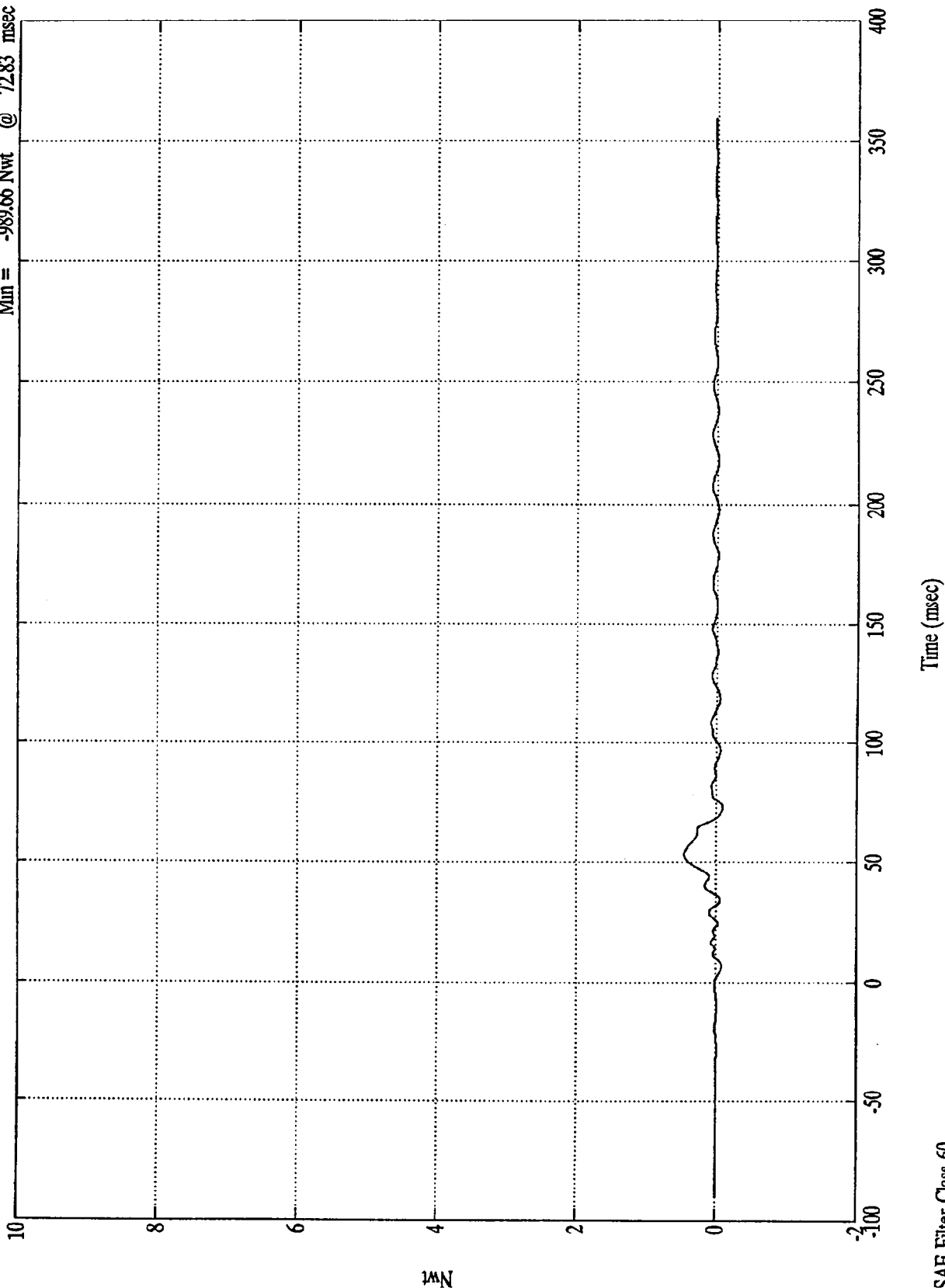
Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell D1
 Max = 4560.18 Nwt @ 53.15 msec
 Min = -989.66 Nwt @ 72.83 msec

$\times 10^4$



Nwt

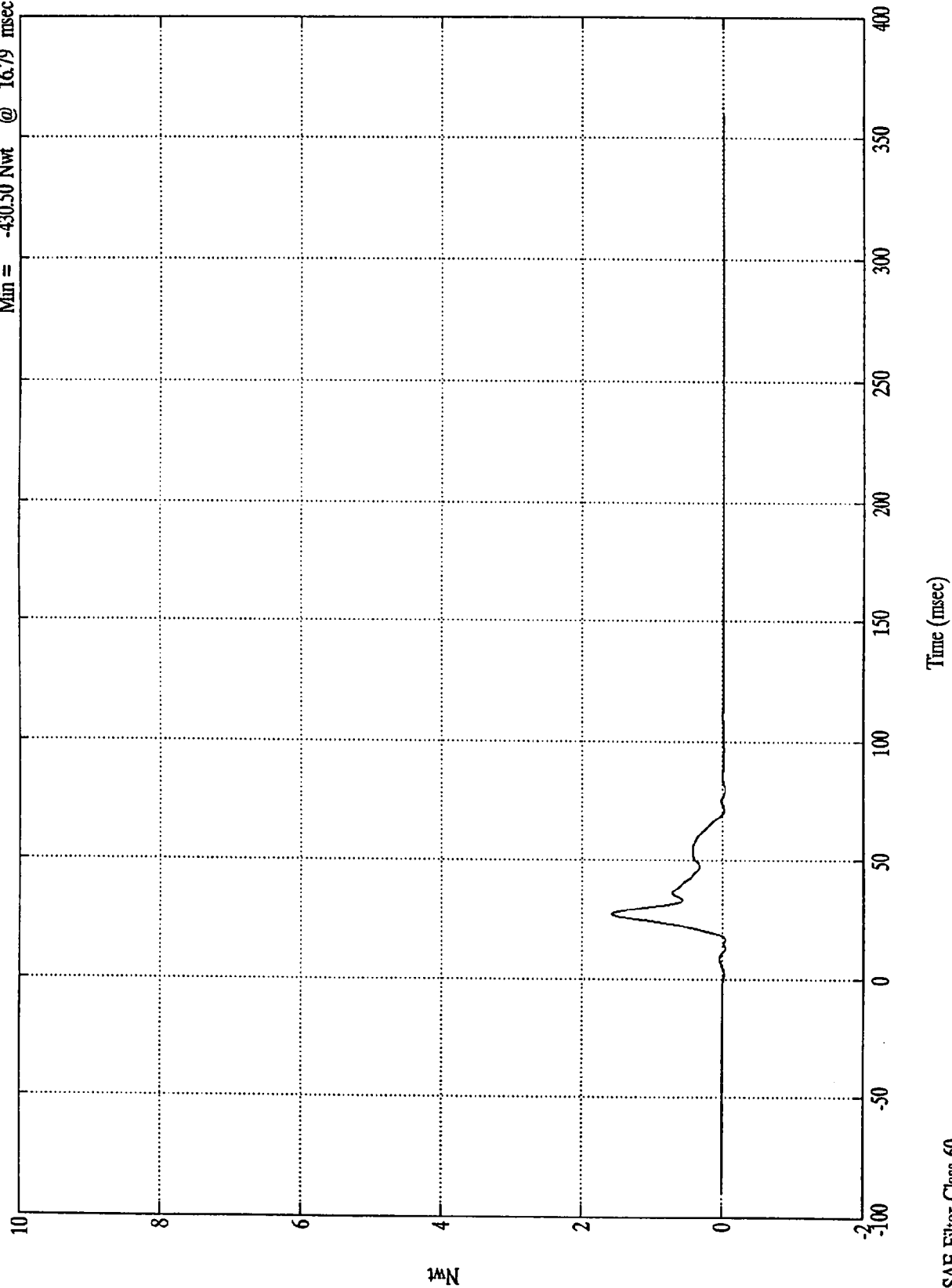
Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell D2
 Max = 15724.54 Nwt @ 27.11 msec
 Min = -430.50 Nwt @ 16.79 msec

$\times 10^4$



Nwt

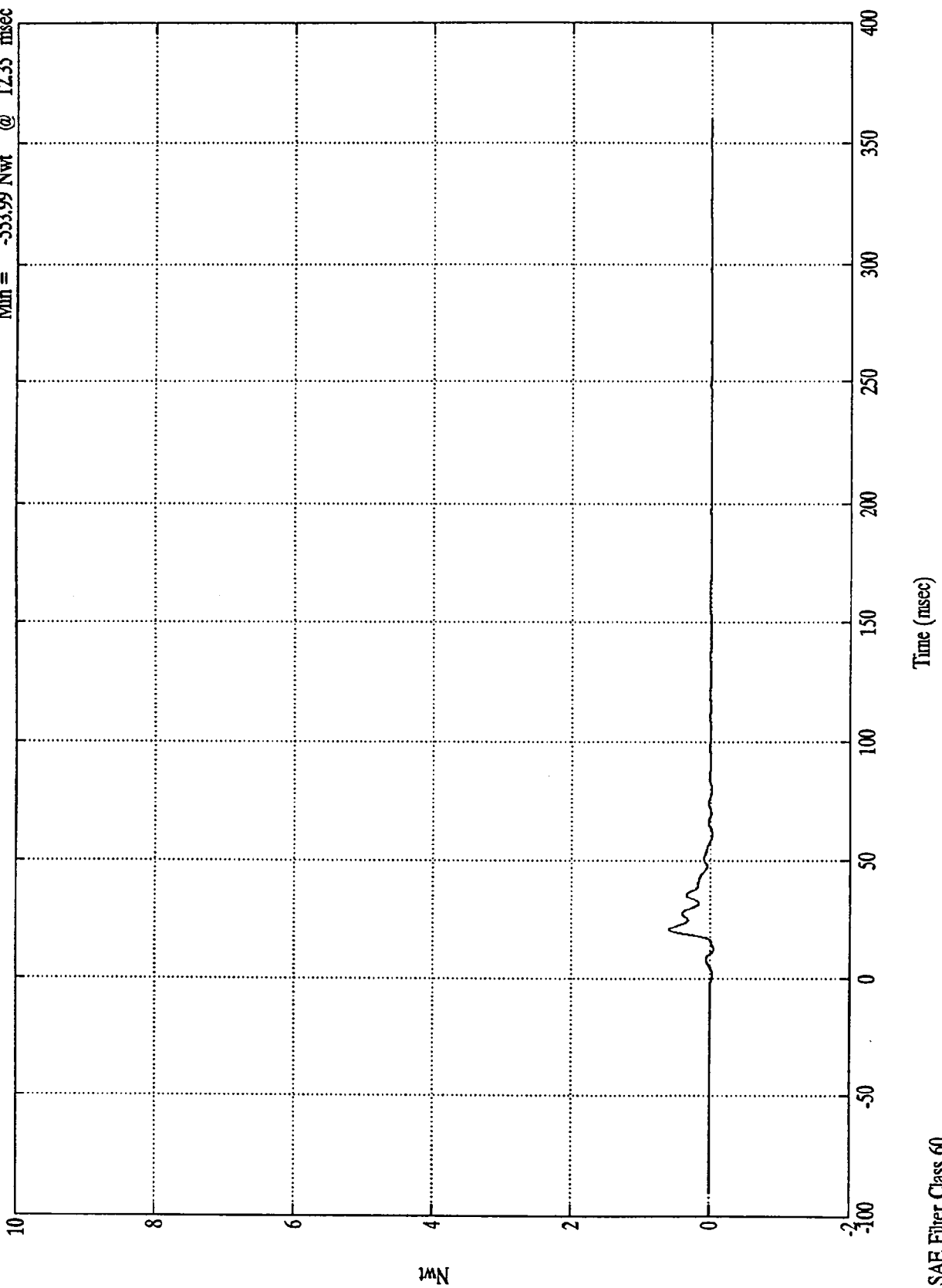
Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell D3
Max = 5910.19 Nwt @ 20.76 msec
Min = -553.99 Nwt @ 12.35 msec

$\times 10^4$



Nwt

Time (msec)

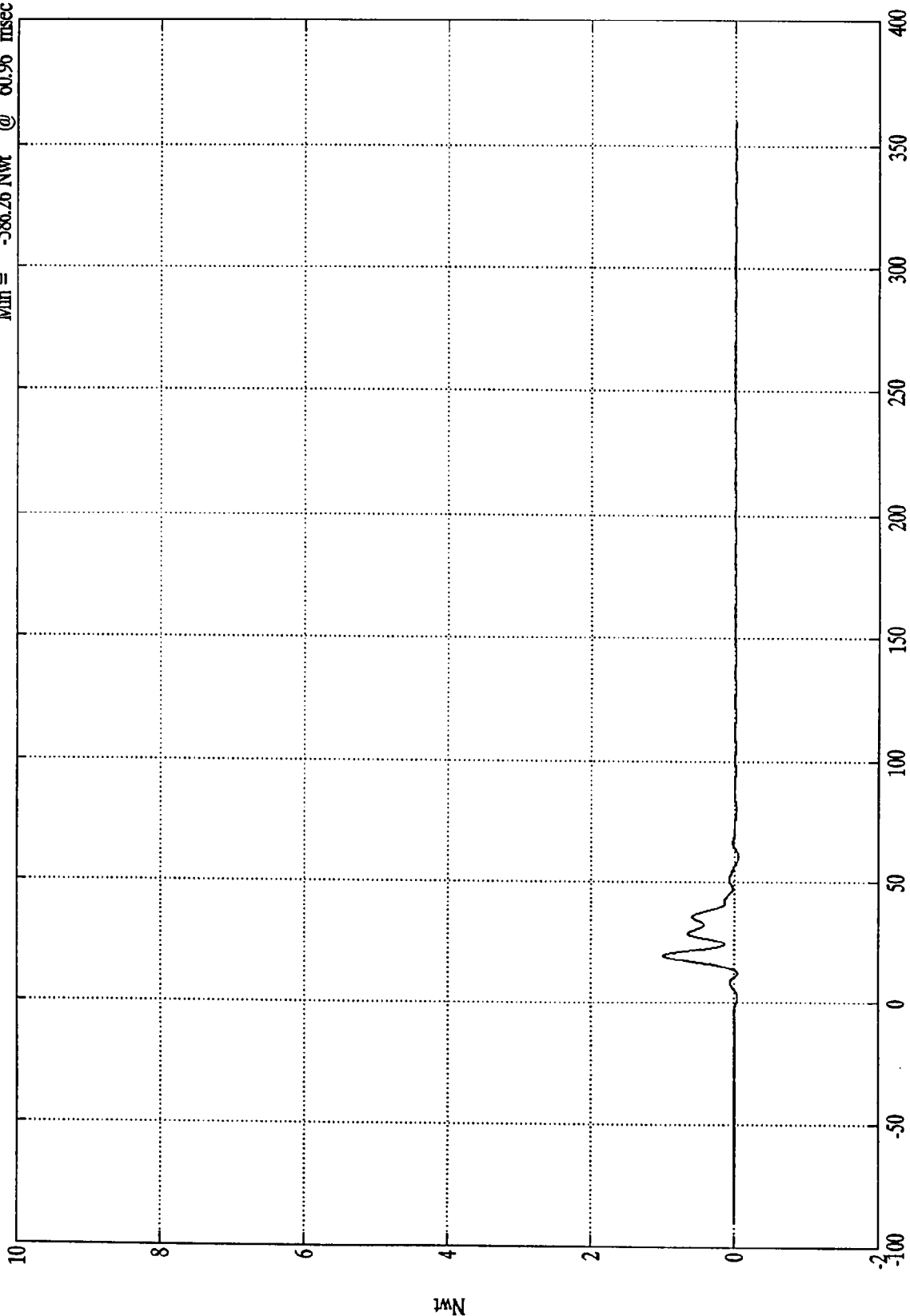
SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 9882.52 Nwt @ 18.84 msec
 Min = -586.26 Nwt @ 60.96 msec

Barrier Load Cell D4

x10⁴



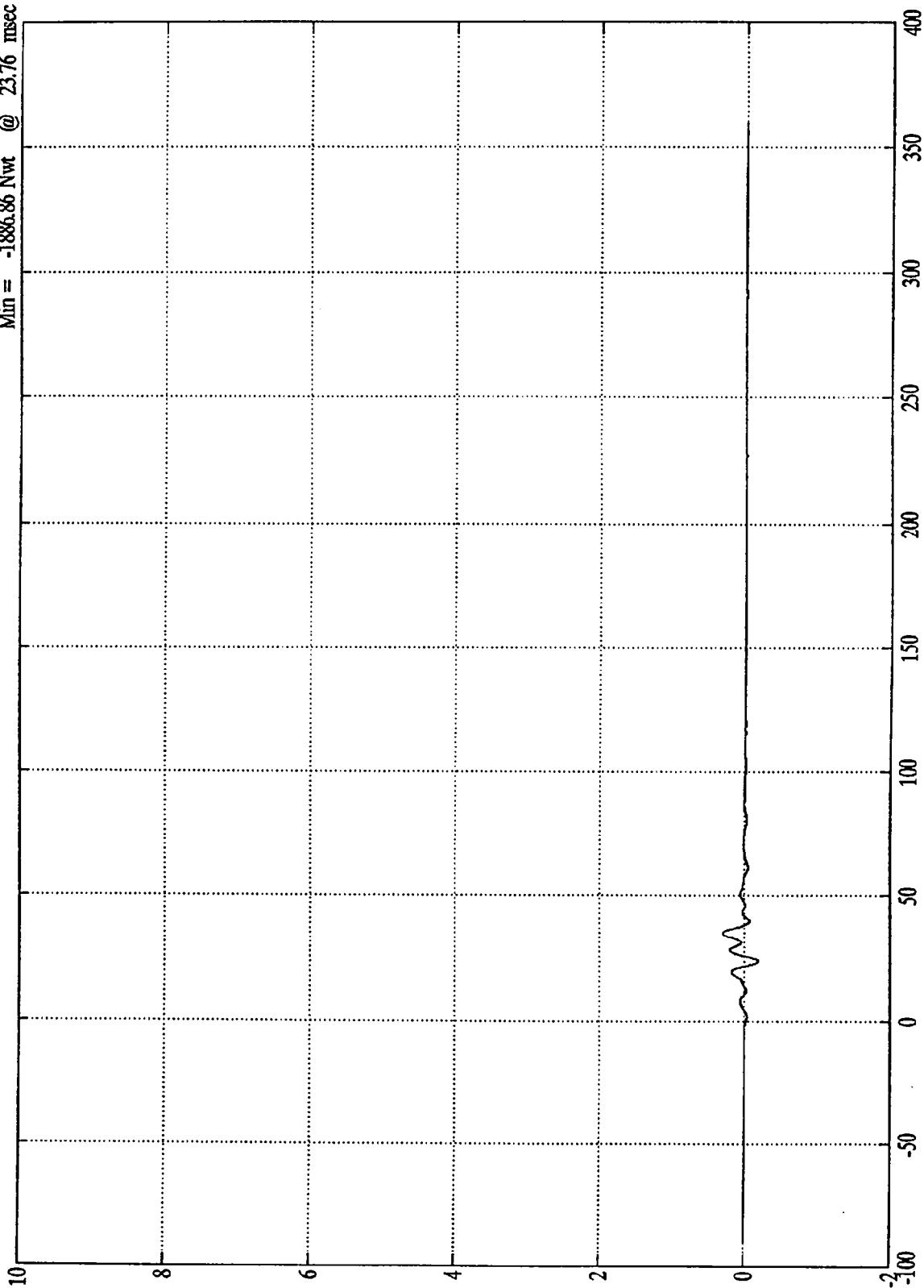
Time (msec)

SAE Filter Class 60

Nwt

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell D5
Max = 2999.05 Nwt @ 35.15 msec
Min = -1886.86 Nwt @ 23.76 msec



Time (msec)

SAE Filter Class 60

Nwt

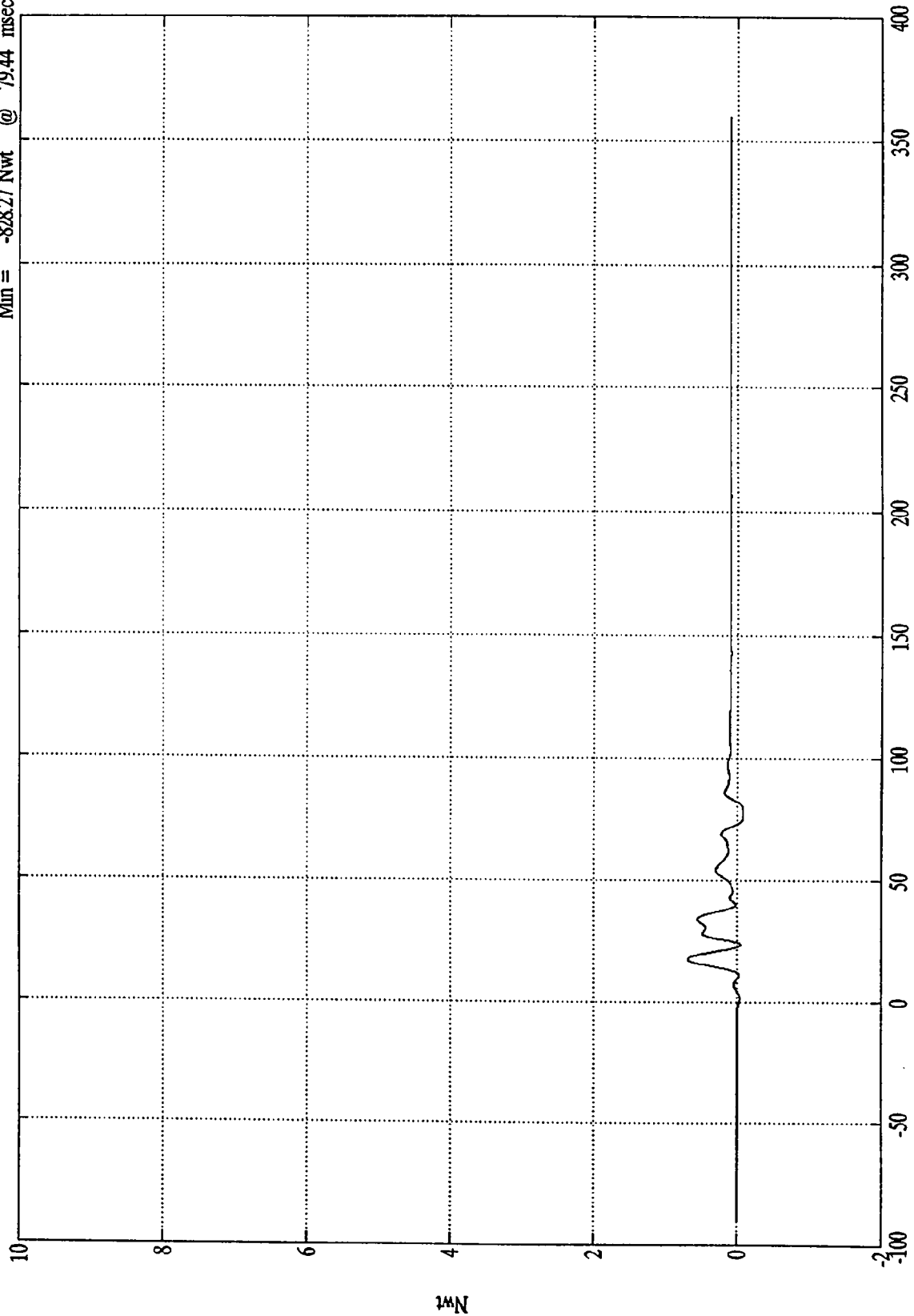
B-135

8227-11

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell D6
 Max = 6913.35 Nwt @ 17.63 msec
 Min = -828.27 Nwt @ 79.44 msec

$\times 10^4$



Time (msec)

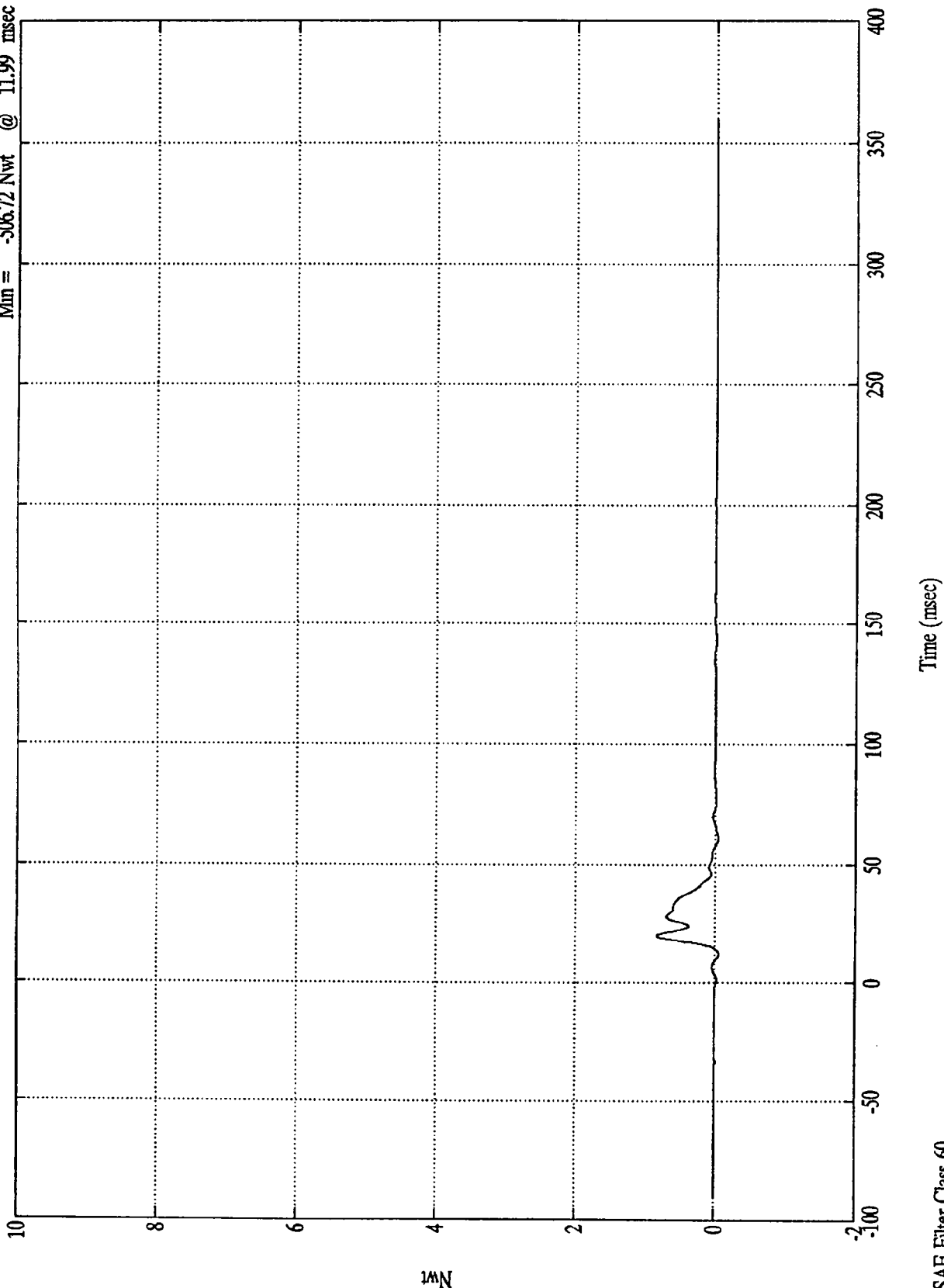
SAE Filter Class 60

Nwt

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell D7
Max = 8371.03 Nwt @ 19.79 msec
Min = -506.72 Nwt @ 11.99 msec

$\times 10^4$



Nwt

Time (msec)

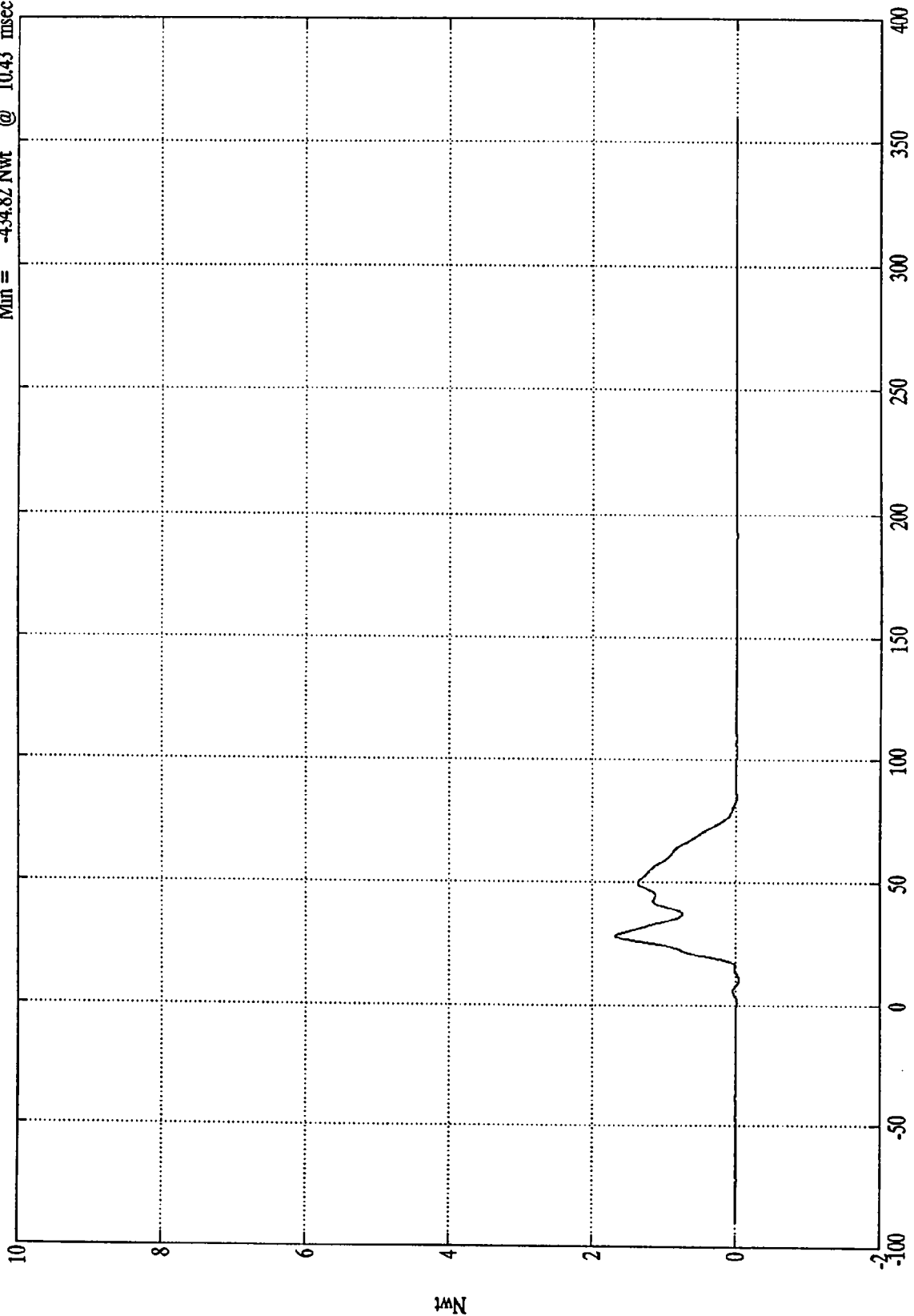
SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 16779.34 Nwt @ 28.07 msec
Min = -434.82 Nwt @ 10.43 msec

Barrier Load Cell D8

$\times 10^4$

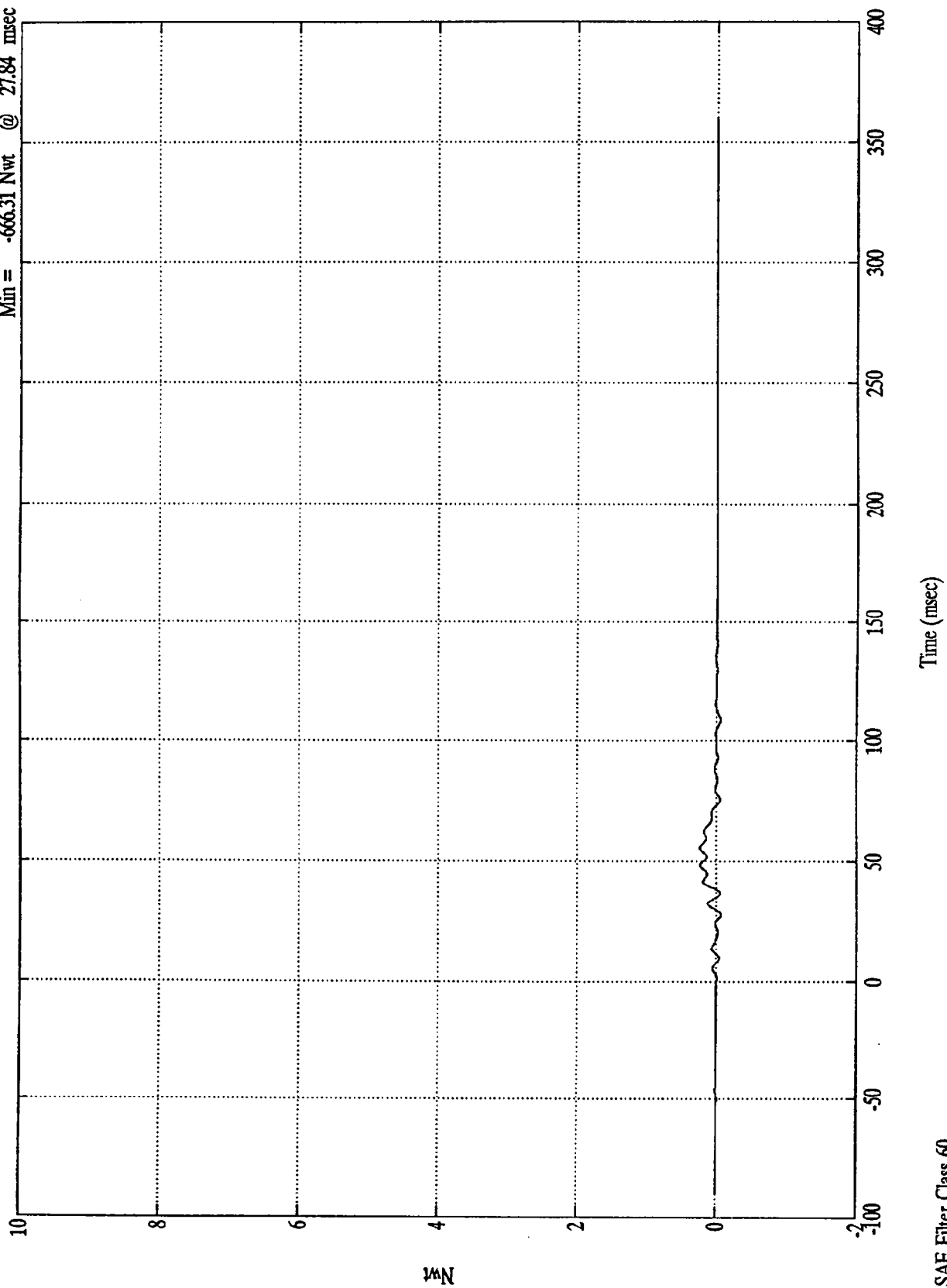


Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Barrier Load Cell D9
Max = 2373.41 Nwt @ 55.68 msec
Min = -666.31 Nwt @ 27.84 msec



Nwt

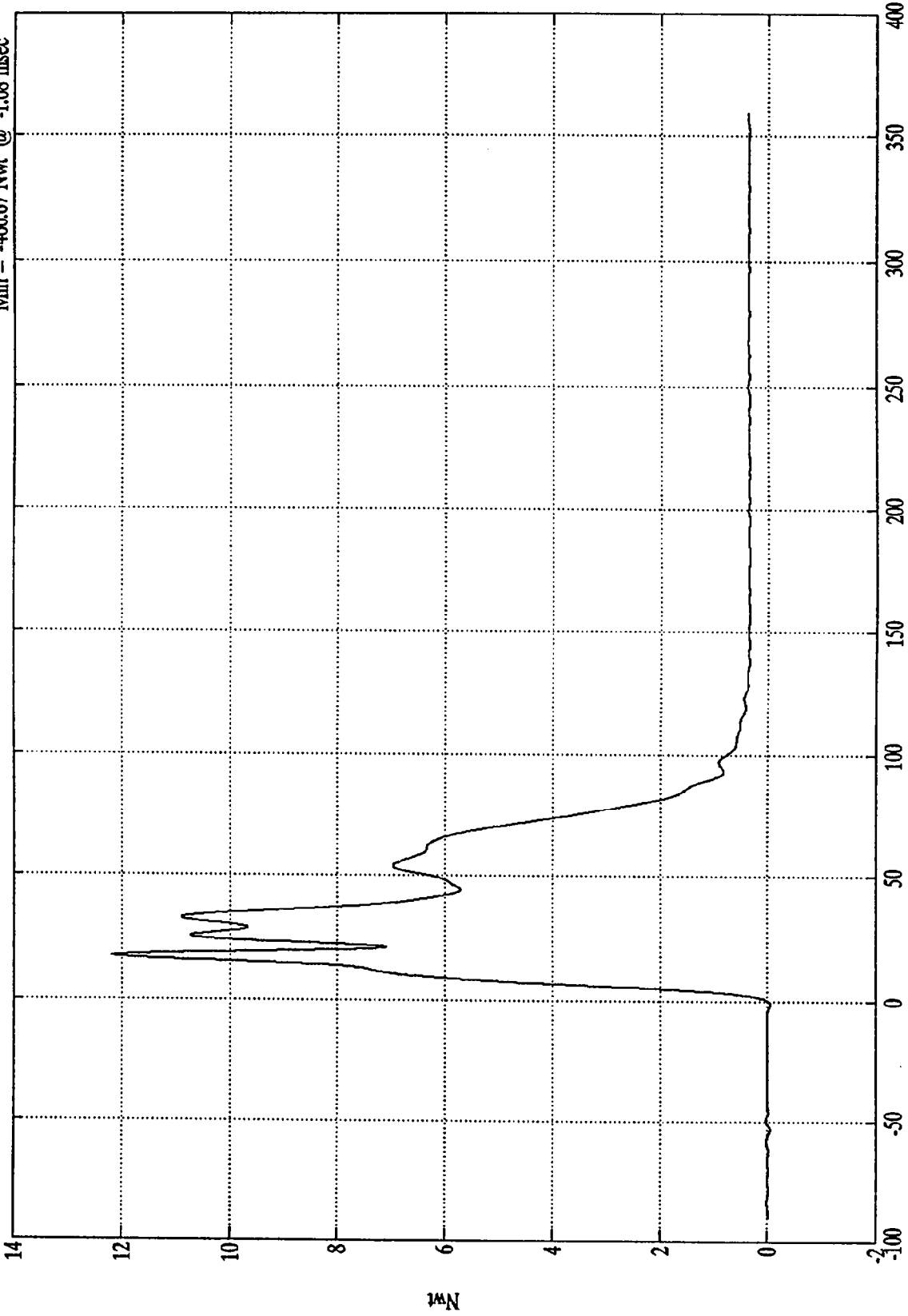
Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Group 1 Load Cell Sum

Max = 121869.46 Nwt @ 17.28 msec
Min = -460.67 Nwt @ -1.08 msec



Time (msec)

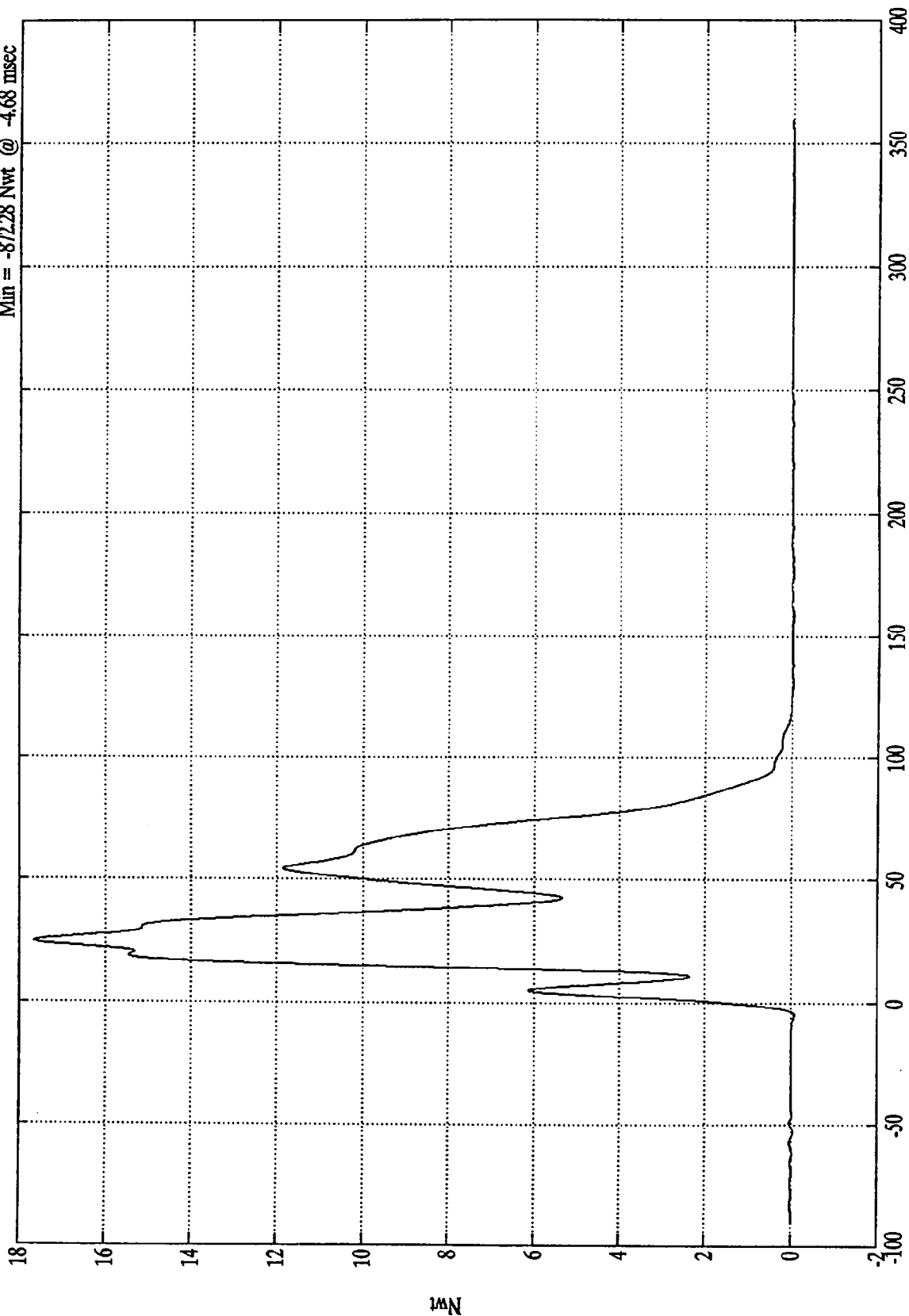
SAE Filter Class 60

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

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Group 2 Load Cell Sum

Max = 176657.58 Nwt @ 24.60 msec
Min = -872.28 Nwt @ -4.68 msec



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

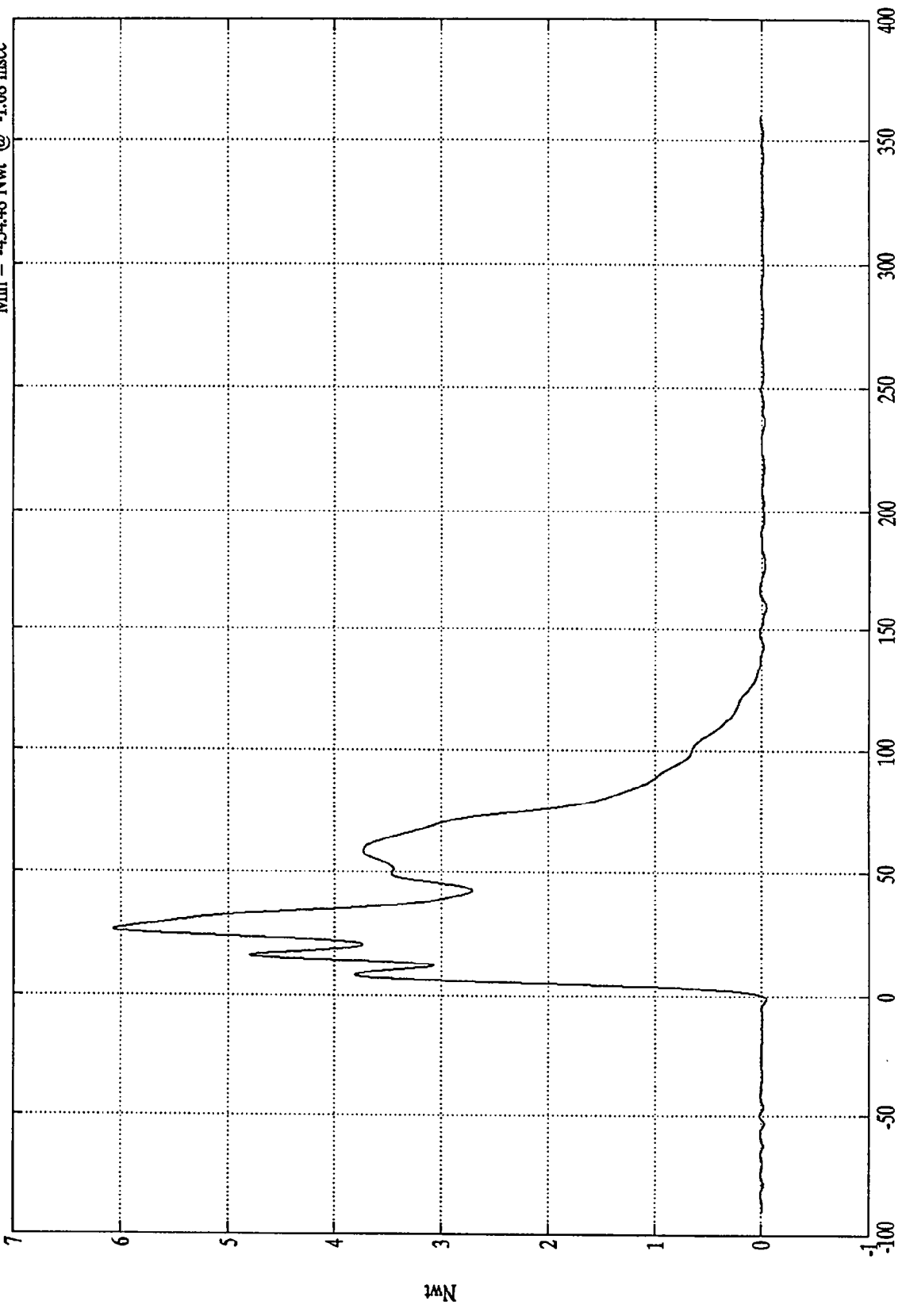
Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Group 3 Load Cell Sum

Max = 60668.51 Nwt @ 26.52 msec
Min = -434.48 Nwt @ -1.08 msec



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

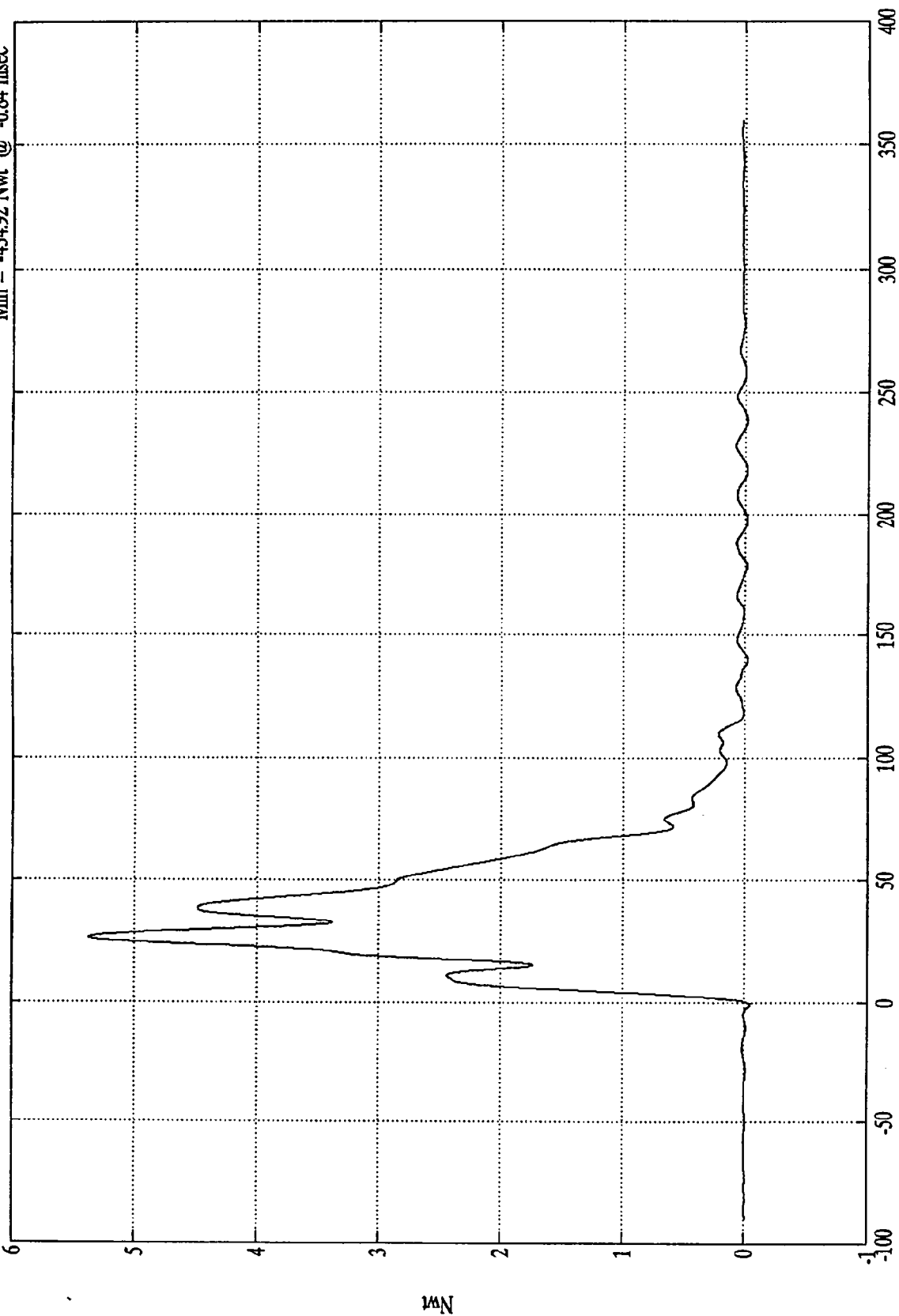
Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Group 4 Load Cell Sum

Max = 53746.25 Nwt @ 26.04 msec
Min = -434.92 Nwt @ -0.84 msec



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

Time (msec)

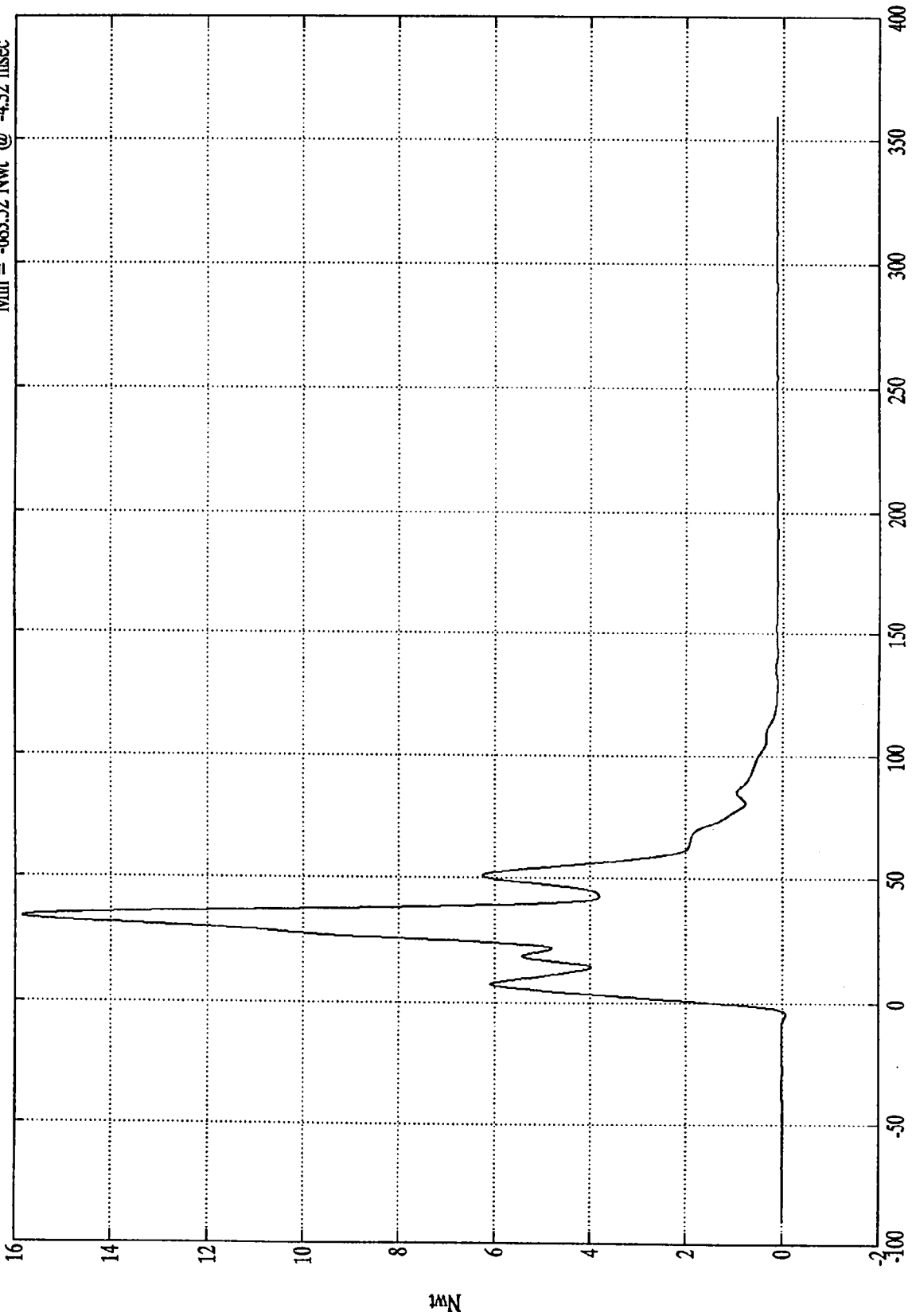
SAE Filter Class 60

Nwt

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 158419.20 Nwt @ 33.96 msec
Min = -683.52 Nwt @ -4.32 msec

Group 5 Load Cell Sum



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

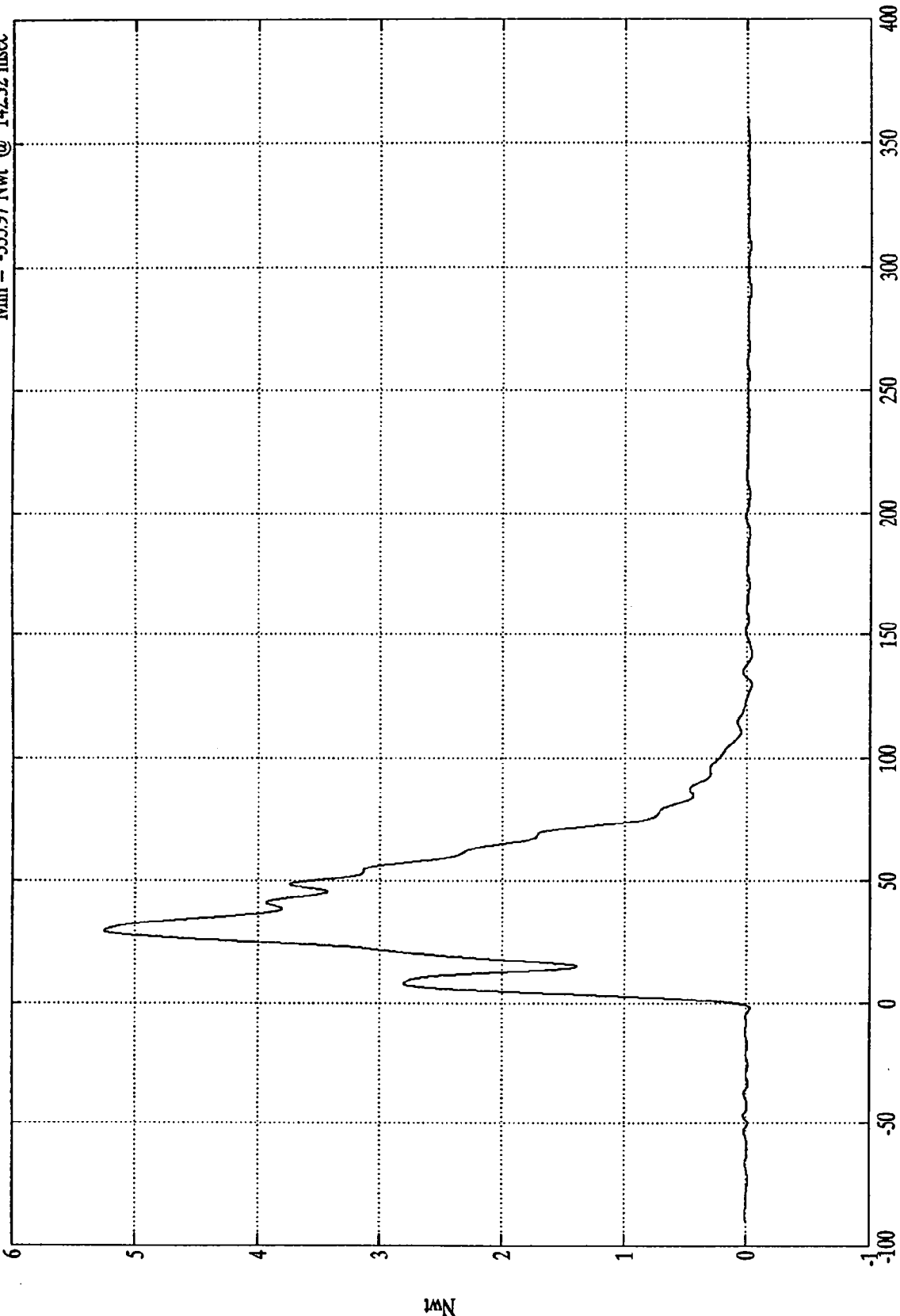
Time (msec)

SAE Filter Class 60

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Group 6 Load Cell Sum

Max = 52471.23 Nwt @ 29.40 msec
Min = -355.97 Nwt @ 142.32 msec



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

Time (msec)

SAE Filter Class 60

Nwt

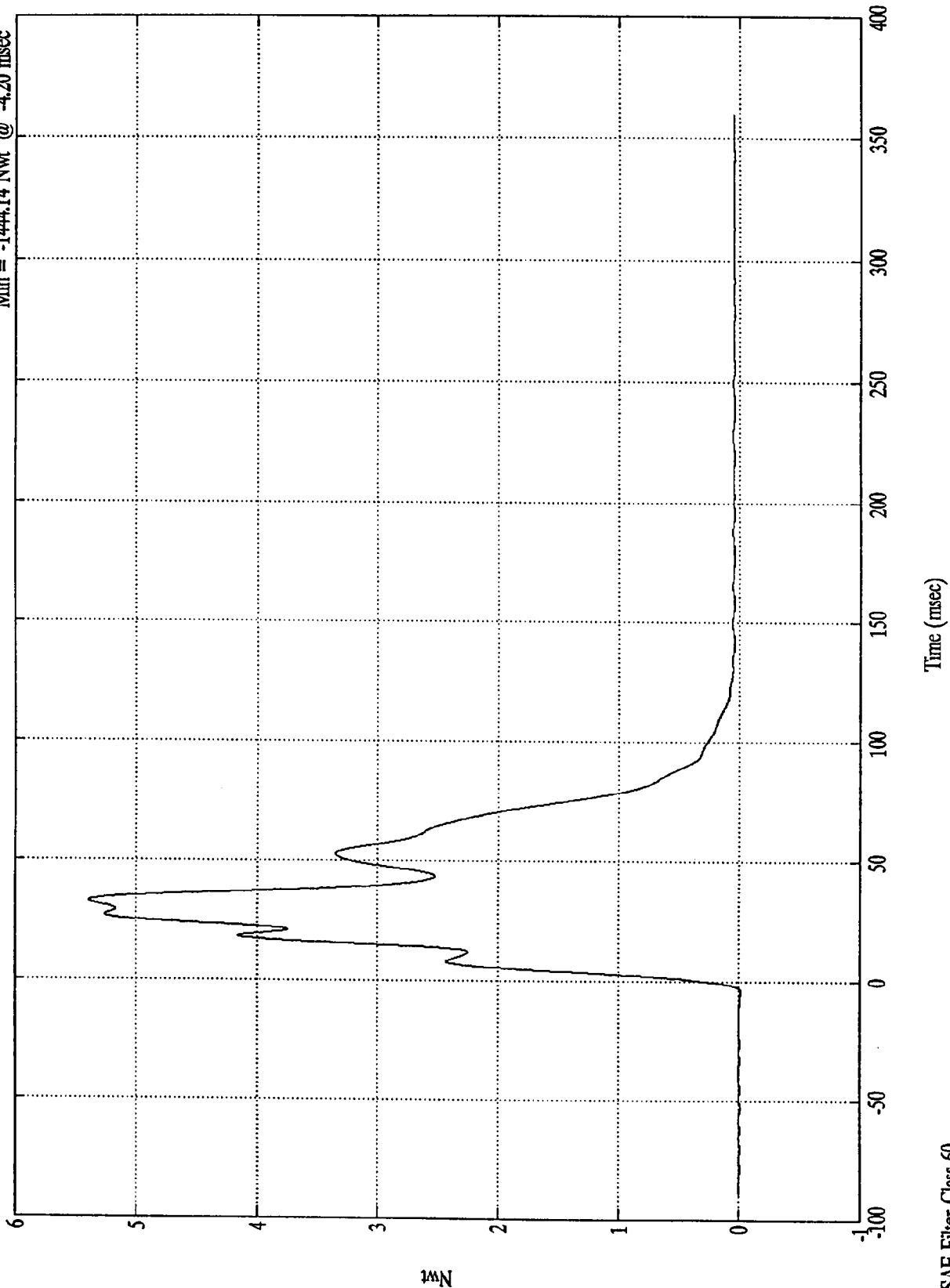
B-145

8227-11

NCAP TEST #11 - 1995 SUZUKI SIDEKICK

Max = 538746.24 Nwt @ 32.52 msec
Min = -1444.14 Nwt @ -4.20 msec

Total Load Cell Sum



SAE Filter Class 60

Appendix C

PART 572B/E DUMMY CONFIGURATION

AND PERFORMANCE VERIFICATION DATA SHEETS

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

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

Dummy serial numbers and certification dates are:

<u>Serial No.</u>	<u>Completion Date</u>
061	12/6/94
245	12/12/94

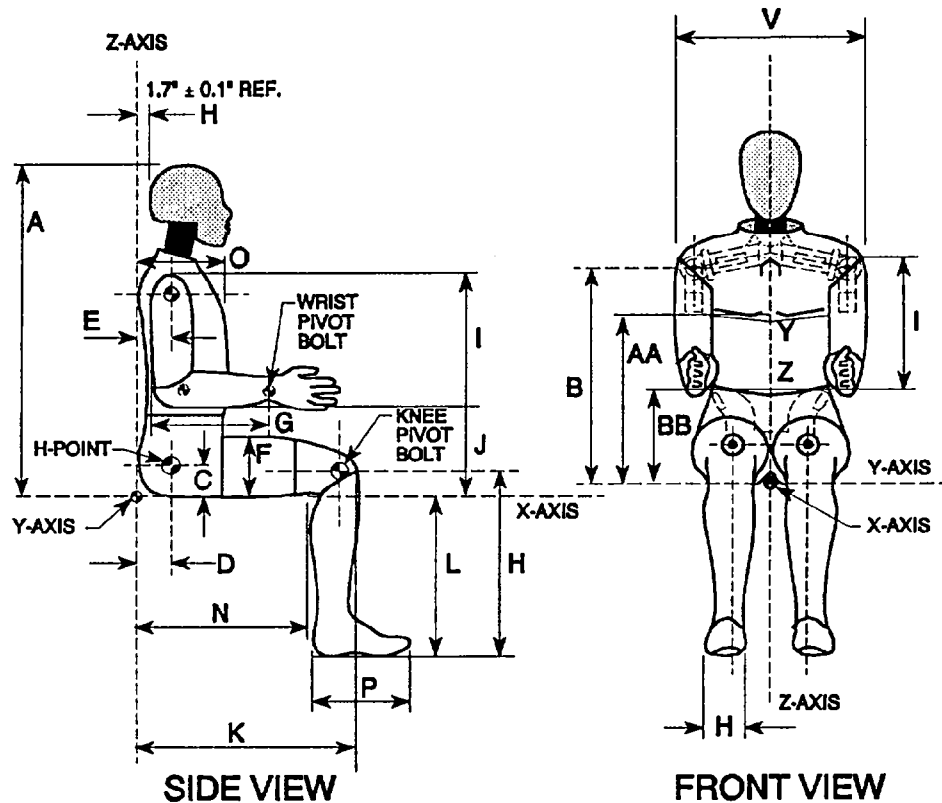
Electronic Test Equipment

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

Figure 7

DUMMY CONFIGURATION DIMENSIONS

EXTERNAL DIMENSIONS SPECIFICATIONS



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

HYBRID III EXTERNAL DIMENSIONS

S/N 061 HUMANOID

DUMMY SERIAL NO. 061

DATE: 12/6/94

TEMPERATURE		20.5 DEG. C
RELATIVE HUMIDITY		42 %
LOCATION FOR CHEST CIRCUMFERENCE (AA)	429-434 mm	431 mm
LOCATION FOR WAIST CIRCUMFERENCE (BB)	226-231 mm	228 mm
CHEST CIRCUMFERENCE (Y)	970-1001 mm	1000 mm
WAIST CIRCUMFERENCE (Z)	836-866 mm	851 mm
CHEST DEPTH (O)	213-229 mm	216 mm
H-POINT HEIGHT (C)	84-89 mm	86 mm
H-POINT FROM SEAT BACK (D)	135-140 mm	137 mm
SKULL CAP TO BACKLINE (H)	41-46 mm	43 mm
TOTAL SITTING HEIGHT (A)	879-889 mm	884 mm
THIGH CLEARANCE (F)	140-155 mm	155 mm
BUTTOCK KNEE LENGTH (K)	580-605 mm	592 mm
BUTTOCK POPLITAL LENGTH (N)	452-477 mm	465 mm
POPLITEAL LENGTH (L)	430-455 mm	450 mm
KNEE PIVOT HEIGHT (M)	485-501 mm	493 mm
FOOT LENGTH (P)	252-267 mm	257 mm
FOOT BREADTH (W)	91-107 mm	97 mm
SHOULDER PIVOT FROM BACKLINE (E)	84-94 mm	89 mm
SHOULDER BREADTH (V)	422-437 mm	427 mm
SHOULDER PIVOT HEIGHT (B)	505-521 mm	511 mm
ELBOW REST HEIGHT (J)	190-211 mm	196 mm
SHOULDER-ELBOW LENGTH (I)	330-345 mm	340 mm
BACK OF ELBOW TO WRIST PIVOT (G)	290-305 mm	295 mm

DUMMY MEETS SPECIFICATIONS

TECHNICIAN: IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
HEAD DROP TEST
HYBRID III

DATE : 10/21/94

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 061 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	50 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	265 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	3.8 G'S
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK FLEXION TEST
HYBRID III

DATE : 12/6/94

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN:061 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5-22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY		10% - 70%	42 %
IMPACT VELOCITY		24.8 - 25.7 KPH	25.1 KPH
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	24.85 G'S
	20 MS	17.60 - 22.60 G'S	21.86 G'S
	30 MS	12.50 - 18.50 G'S	17.9 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	17.9 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	39.38 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	70.91 DEG.
	TIME	57 - 64 MS	57.5 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88 - 108 N-M	97.3 N-M
	TIME	47 - 58 MS	51.88 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	118.25 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	99.88 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST
HYBRID III

DATE : 12/6/94

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN:061 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5 - 22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY		10% - 70%	42 %
IMPACT VELOCITY		21.4 - 22.3 KPH	22.0 KPH
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	20.46 G'S
	20 MS	14.00 - 19.00 G'S	18.18 G'S
	30 MS	11.00 - 16.00 G'S	14.71 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	14.71 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	43.25 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	97.5 DEG.
	TIME	72 - 82 MS	75.13 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-80.0/-52.9 N-M	-73.7 N-M
	TIME	65 - 79 MS	69.75 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	155.5 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	130.5 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 11/30/94

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN 061 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.5 - 22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	33 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	23.7 KPH
MAXIMUM DEFLECTION	64 - 73 mm	65.3 mm
MAXIMUM RESISTIVE FORCE	5160 - 5894 NEWTONS	5653 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	72.2 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 10/21/94

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 061 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	52 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4986 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 10/21/94

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 1

HY3 SN: 061 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	52 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4946 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

HYBRID III EXTERNAL DIMENSIONS

S/N 245 HUMANOID

DUMMY SERIAL NO. 245

DATE: 12/12/94

TEMPERATURE		20.5 DEG. C
RELATIVE HUMIDITY		28 %
LOCATION FOR CHEST CIRCUMFERENCE (AA)	429-434 mm	431 mm
LOCATION FOR WAIST CIRCUMFERENCE (BB)	226-231 mm	228 mm
CHEST CIRCUMFERENCE (Y)	970-1001 mm	998 mm
WAIST CIRCUMFERENCE (Z)	815-866 mm	863 mm
CHEST DEPTH (O)	213-229 mm	213 mm
H-POINT HEIGHT (C)	84-89 mm	89 mm
H-POINT FROM SEAT BACK (D)	135-140 mm	137 mm
SKULL CAP TO BACKLINE (H)	41-46 mm	43 mm
TOTAL SITTING HEIGHT (A)	879-889 mm	889 mm
THIGH CLEARANCE (F)	140-155 mm	152 mm
BUTTOCK KNEE LENGTH (K)	580-605 mm	596 mm
BUTTOCK POPLITAL LENGTH (N)	452-477 mm	464 mm
POPLITEAL LENGTH (L)	430-455 mm	447 mm
KNEE PIVOT HEIGHT (M)	485-501 mm	487 mm
FOOT LENGTH (P)	252-267 mm	256 mm
FOOT BREADTH (W)	91-107 mm	96 mm
SHOULDER PIVOT FROM BACKLINE (E)	84-94 mm	89 mm
SHOULDER BREADTH (V)	422-437 mm	426 mm
SHOULDER PIVOT HEIGHT (B)	505-521 mm	518 mm
ELBOW REST HEIGHT (J)	190-211 mm	205 mm
SHOULDER-ELBOW LENGTH (I)	330-345 mm	335 mm
BACK OF ELBOW TO WRIST PIVOT (G)	290-305 mm	294 mm

DUMMY MEETS SPECIFICATIONS

TECHNICIAN: IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
HEAD DROP TEST
HYBRID III

DATE : 12/9/94

CALSPAN SEQUENTIAL NUMBER 4

HY3 SN: 245 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	33 %
PEAK RESULTANT ACCELERATION	225 - 275 G'S	242.7 G'S
PEAK LATERAL ACCELERATION	15 G'S MAX	5.3 G'S
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK FLEXION TEST
HYBRID III

DATE : 12/8/94

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 4

HY3 SN: 245 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5-22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY		10% - 70%	31 %
IMPACT VELOCITY		24.8 - 25.7 KPH	24.9 KPH
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G'S	25.01 G'S
	20 MS	17.60 - 22.60 G'S	22.55 G'S
	30 MS	12.50 - 18.50 G'S	17.3 G'S
MAX PENDULUM G'S ABOVE 30 MS		29 G'S MAX	17.3 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		34 - 42 MS	38.38 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	77.75 DEG.
	TIME	57 - 64 MS	59.88 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88 - 108 N-M	105.15 N-M
	TIME	47 - 58 MS	54 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	120.63 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	97.38 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
NECK EXTENSION TEST
HYBRID III

DATE : 12/8/94

6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 4

HY3 SN: 245 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.5 - 22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY		10% - 70%	31 %
IMPACT VELOCITY		21.4 - 22.3 KPH	22.16 KPH
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G'S	18.66 G'S
	20 MS	14.00 - 19.00 G'S	17.99 G'S
	30 MS	11.00 - 16.00 G'S	14.68 G'S
MAX PENDULUM G'S ABOVE 30 MS		22 G'S MAX	14.68 G'S
DECELERATION -TIME CURVE DECAY TIME TO 5 G'S		38 - 46 MS	45.25 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	94.47 DEG.
	TIME	72 - 82 MS	74.5 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-80.0/-52.9 N-M	-74.9 N-M
	TIME	65 - 79 MS	69 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	150.88 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	130.63 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
THORAX IMPACT TEST
HYBRID III

DATE : 12/8/94

CALSPAN SEQUENTIAL NUMBER 4

HY3 SN 245 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.5 - 22.2 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	32 %
PENDULUM VELOCITY	23.7 - 24.6 KPH	23.7 KPH
MAXIMUM DEFLECTION	64 - 73 mm	64.8 mm
MAXIMUM RESISTIVE FORCE	5160 - 5894 NEWTONS	5747 NEWTONS
INTERNAL HYSTERESIS	69% - 85%	73.6 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 12/12/94

KNEE: LEFT

CALSPAN SEQUENTIAL NUMBER 4

HY3 SN: 245 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	28 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	5124 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

CALSPAN CORPORATION
TRANSPORTATION RESEARCH DEPARTMENT
KNEE IMPACT TEST
HYBRID III

DATE : 12/12/94

KNEE: RIGHT

CALSPAN SEQUENTIAL NUMBER 4

HY3 SN: 245 KNEE 4.9 KGS CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19 - 25 DEG. C	20.5 DEG. C
RELATIVE HUMIDITY	10% - 70%	28 %
PROBE VELOCITY	7.5 - 7.7 KPH	7.68 KPH
PEAK KNEE IMPACT FORCE	4715 - 5782 N	4723 N
PROBE WEIGHT	4.9 KGS	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN IVAN MINKEWICZ

Appendix D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #	Manufacturer	Calibration		
			Last	Next	
Head	X	AC2M6	ENDEVCO	8/94	2/95
	Y	AF5C9	ENDEVCO	8/94	2/95
	Z	ACT12	ENDEVCO	10/94	4/95
Chest	X	AF5P8	ENDEVCO	8/94	2/95
	Y	AF5C4	ENDEVCO	10/94	4/95
	Z	AE8K1	ENDEVCO	8/94	2/95
Right Femur Load Cell		F232	GSE	12/94	6/95
Left Femur Load Cell		F231	GSE	12/94	6/95
Neck Load Cell	X	269	DENTON	8/94	2/95
	Y	269	DENTON	8/94	2/95
	Z	269	DENTON	8/94	2/95
Neck Moment	X	269	DENTON	8/94	2/95
	Y	269	DENTON	8/94	2/95
	Z	269	DENTON	8/94	2/95
Chest Deflection Gauge		CP061	HUMANOID	8/94	2/95
Hybrid III Use Only					
Lap Belt Load Cells		706	LEBOW	1/95	7/95
Shoulder Belt Load Cells		707	LEBOW	1/95	7/95
Spool-Out Potentiometer		7	MAGNETEK	10/94	4/95
Belt Stretch Transducer		E6	CALSPAN	8/94	2/95

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head				
X (R)	AEW70	ENDEVCO	11/94	5/95
Y (R)	AET34	ENDEVCO	11/94	5/95
Z (R)	AKD93	ENDEVCO	11/94	5/95
Chest				
X (R)	AKD92	ENDEVCO	11/94	5/95
Y (R)	AFPJ7	ENDEVCO	11/94	5/95
Z (R)	AJP62	ENDEVCO	11/94	5/95
Pelvic				
X	AGHM9	ENDEVCO	11/94	5/95
Y	AE8R7	ENDEVCO	11/94	5/95
Z	AH5L8	ENDEVCO	12/94	6/95

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head				
X	AF5B3	ENDEVCO	10/94	4/95
Y	AF5F7	ENDEVCO	10/94	4/95
Z	AF5E1	ENDEVCO	10/94	4/95
Chest				
X	AF5C1	ENDEVCO	10/94	4/95
Y	AF480	ENDEVCO	10/94	4/95
Z	AF5H9	ENDEVCO	10/94	4/95
Right Femur Load Cell	F77	GSE	12/94	6/95
Left Femur Load Cell	F255	GSE	12/94	6/95
Neck Load Cell	076	DENTON	8/94	2/95
X	076	DENTON	8/94	2/95
Y	076	DENTON	8/94	2/95
Z	076	DENTON	8/94	2/95
Neck Moment	076	DENTON	8/94	2/95
X	076	DENTON	8/94	2/95
Y	076	DENTON	8/94	2/95
Z	076	DENTON	8/94	2/95
Chest Deflection Gauge	CP245	HUMANOID	8/94	2/95
Hybrid III Use Only				
Lap Belt Load Cells	710	LEBOW	1/95	7/95
Shoulder Belt Load Cells	711	LEBOW	1/95	7/95
Spool-Out Potentiometer	8	MAGNETEK	10/94	4/95
Belt Stretch Transducer	E7	CALSPAN	8/94	2/95

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

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

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS

(6 Month Calibration Minimum)

	Serial #	Manufacturer	Calibration	
			Last	Next
Left Seat Rear Crossmember	A175	CEC	1/95	7/95
Right Rear Seat Crossmember	A89	CEC	1/95	7/95
Top of Engine	X32	CEC	1/95	7/95
Bottom of Engine	BA67	CEC	1/95	7/95
Left Disc Brake Caliper	A69	CEC	11/94	5/95
Right Disc Brake Caliper	A115	CEC	11/94	5/95
Instrument Panel	A56	CEC	11/94	5/95
Left Seat Rear Crossmember (R)	A147	CEC	1/95	7/95
Right Seat Rear Crossmember (R)	A44	CEC	8/94	2/95

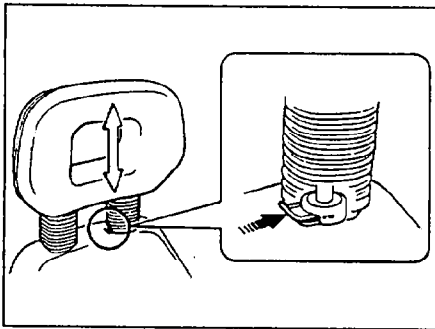
Appendix E

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

BEFORE DRIVING

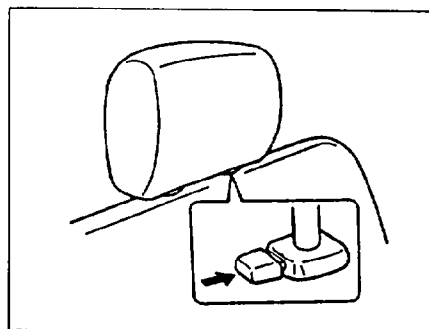
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SEAT BELTS AND CHILD RESTRAINT SYSTEMS

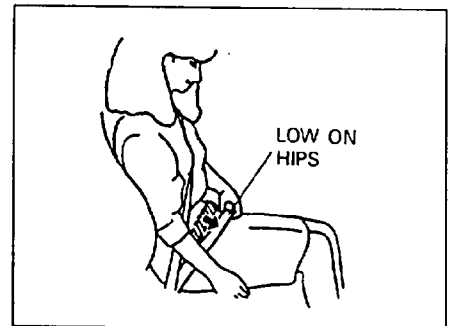
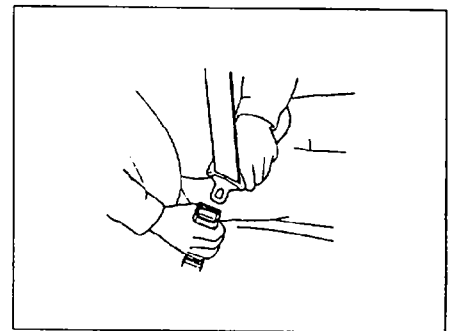


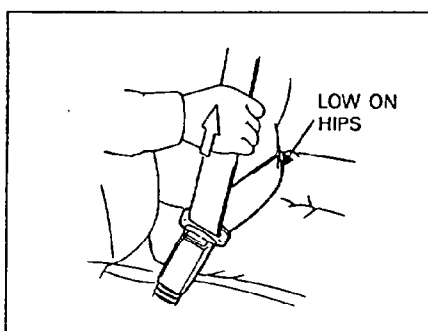
(For front seat in the 2-door model)
Pull upward on the restraint to raise it to the first position. To raise it higher (or to lower), pull upward on the restraint (or push it down) while pushing in the release.

(For front seat in the 4-door model)
To raise the head restraint, pull upward on the restraint until it clicks. To lower the restraint, push down on the restraint while holding in the lock lever. If a head restraint must be removed (for cleaning, replacement, etc.), push in the lock lever and pull the head restraint all the way out.



(For split rear seat in the 4-door model)
The head restraints do not have different height positions; they should remain fully inserted. If a head restraint must be removed (for cleaning, replacement, etc.), push in the release and pull the head restraint all the way out. To reinstall, fully insert the head restraint while pushing in the release.

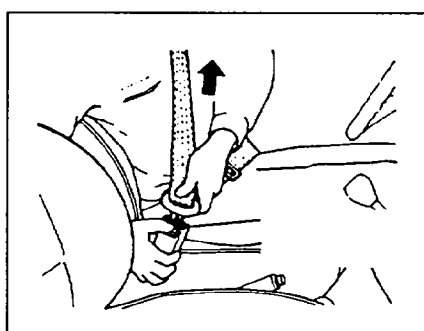




Front and Rear Lap-Shoulder Belts

Pull the buckle tongue attached to the seat belt across your body and press it into the buckle catch until you hear a "click". The buckle catch is located at the inboard side of the seat. To reduce the risk of sliding under the belt during a collision, position the lap portion of the belt across your lap as low on your hips as possible and adjust it to a snug fit by pulling the shoulder portion of the belt upward through the latch plate.

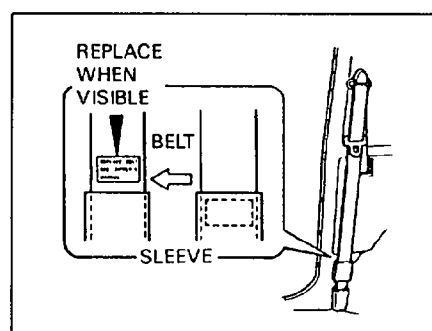
The length of the diagonal shoulder strap adjusts itself to allow freedom of movement. The seat belt has an emergency



locking retractor (ELR), which is designed to lock the seat belt only during a sudden stop or impact. To unfasten the belt, press the release button on the buckle catch.

NOTE:

The front passenger's seat belt and the rear seat belts have emergency locking retractors (ELRs) that can be temporarily converted to function as automatic locking retractors (ALRs). The ALR mode should be used if you need to secure a child restraint system in the seat. Refer to the CHILD RESTRAINT section for details.



Seat Belt Inspection

Periodically inspect the seat belts to make sure they work properly and are not damaged. Check the webbing, buckles, latch plates, retractors, anchorages, and guide loops. Replace any seat belts which do not work properly or are damaged.

The front passenger's seat lap-shoulder belt has a small loop of webbing lightly stitched into the belt under the plastic sleeve, as shown in the illustration. Periodically inspect the belt to see if the loop has been pulled out (making the "REPLACE BELT" label visible). If the "REPLACE BELT" label is visible, you must replace the belt to help restore optimum restraint system effectiveness.

BEFORE DRIVING

⚠ WARNING

Be sure to inspect all seat belt assemblies after any collision. Any seat belt assembly which was in use during a collision (other than a very minor one) should be replaced, even if damage to the assembly is not obvious. Any seat belt assembly which was not in use during a collision should be replaced if it does not function properly or is damaged in any way.

Child Restraint Systems

Suzuki highly recommends that you use a child restraint system to restrain infants and small children. Many different types of child restraint systems are available; make sure that the restraint system you select meets Federal Motor Vehicle Safety Standards.

All child restraint systems are designed to be secured in vehicle seats by lap belts or the lap portion of lap-shoulder belts. Whenever possible, Suzuki recommends that child restraint systems be installed on the rear seat. According to accident statistics, children are safer when properly restrained in rear seating positions than in front seating positions.

When using a child restraint in the front passenger's seat, adjust the passenger's seat as far back as possible.

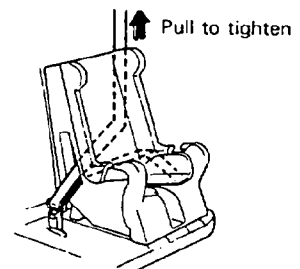
⚠ WARNING

Children could be endangered in a crash if their child restraints are not properly secured in the vehicle. When installing a child restraint system, be sure to follow the instructions below.

Installation-Child Restraint with no Top Strap

Install your child restraint system according to the instructions provided by the child restraint system manufacturer. If you install the child restraint system in the front seat, be sure to slide the seat to the rearmost position. After making sure that the seat belt is securely latched:

- 1) Pull all of the remaining webbing out of the retractor. You will hear a click, which means that the emergency locking retractor (ELR) has converted to function as an automatic locking retractor (ALR).
- 2) Allow the extra webbing to retract, and pull the webbing toward the retractor to take up any slack. Make sure that the lap portion of the belt is tight around the child restraint system and



the shoulder portion of the belt is positioned so that it can not interfere with the child's head or neck.

- 3) Make sure that the retractor has converted to the ALR mode by trying to pull webbing out of the retractor. If the retractor is in the ALR mode, the belt will be locked.

⚠ WARNING

If the retractor is not in the ALR mode, the child restraint system can move or tip over when your vehicle turns or stops abruptly.

- 4) Try moving the child restraint system in all directions, to make sure it is securely installed. If you need to