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REPORT NUMBER: CAL-98-21

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

**GENERAL MOTORS CORPORATION
1998 CHEVROLET SUBURBAN
4-DOOR 4 X 4**

NHTSA NUMBER: MW0108

CALSPAN TEST NUMBER: 8413-20

**CALSPAN CORPORATION
TRANSPORTATION SCIENCE CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225**



February 3, 1998

FINAL REPORT

PREPARED FOR:

**U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Performance Standards
Office of Crashworthiness Standards
Mail Code: NPS-10
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Prepared by: James A. Czarnecki
James A. Czarnecki, Project Engineer

Approved by: Michael J. Kiballora for
David J. Travale, Program Manager
Transportation Science Center

Approval Date: _____

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NHTSA, Office of Crashworthiness Standards

Date of Report Acceptance

COTR, New Car Assessment Program (NCAP)
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16. <i>Abstract</i> A frontal barrier test of a 1998 Chevrolet Suburban 4-Door 4 x 4 was performed at Calspan Corporation crash test facility in Buffalo, New York, on February 3, 1998. The impact velocity was 56.0 kph and the temperature at the barrier face was 21°C. The maximum post-test vehicle crush was 675 mm. The test vehicle was equipped with 3-point belt system and supplemental second generation airbags at both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and the passenger appear to comply with the head, chest and femur requirements.			
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Section 1

PURPOSE AND SUMMARY OF TEST MW0108

PURPOSE

This 56.0 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-96-D-02010. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 56.0 kph frontal barrier impact test was conducted in accordance with the Office of Market Incentives (OMI) Laboratory Indicant Test procedure.

SUMMARY

A barrier was impacted by a 1998 Chevrolet Suburban 4-Door 4 x 4 at a velocity of 56.0 kph. The test was performed at the Calspan Corporation on February 3, 1998. 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. The onboard cameras were not used at the request of the COTR.

Two Part 572E, 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, chest, and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No. 150) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 97 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 Right Rear X Accelerometer data is not accurate. The Engine Top X Accelerometer data is not accurate after 26 msec. The Engine Bottom X Accelerometer is not accurate after 60 msec. The

Right Brake Caliper X Accelerometer data is not accurate after 10 msec. The Instrument Panel X Accelerometer data is not accurate after 70 msec.

The driver's HIC was 594.6. The maximum chest deceleration over 3 milliseconds was 44.2 g's and maximum chest deflection was 36.1 mm. Femur loads were -6867.1 Newtons on the left and -7101.8 Newtons on the right.

The right front passenger's HIC was 588.8. Maximum chest deceleration over 3 milliseconds was 46.6 g's and maximum chest deflection was 45.8 mm. Femur loads were -3405.5 Newtons on the left and -2695.0 Newtons on the right.

SECTION 2

GENERAL TEST AND VEHICLE PARAMETER DATA

DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No. :	MW0108	Test Mode :	56 kph Frontal Barrier
Test Date :	February 3, 1998	Time:	11:00
		Temperature :	21 °C
Vehicle Make/Model/Body Style :	1998 Chevrolet Suburban 4-Door 4 x 4		
Vehicle Test Weight :	2844	kg	
Vehicle/Barrier Impact Angle :	0	°	
Impact Velocity :	56.0	kph	
Maximum Static Crush :	675	mm	
Vehicle Rebound :	397.3	mm	

<u>DUMMIES:</u>	<u>DRIVER</u>	<u>PASSENGER</u>
Type :	572E	572E
Restraint System :	3-point belt system with supplemental airbag	3-point belt system with supplemental airbag

Number of Data Channels :	97	
Number of Cameras :	1	Real Time
	16	High Speed

<u>DOOR OPENING DATA :</u>	Closed/Inoperable	- Left Front
	Closed/Operable	- Right Front

Front Seat(s) Data :	<u>DRIVER</u>	<u>PASSENGER</u>
Seat Track Failure :(mm of shift)	0	0
Seat Back Failure :	None	None

<u>VISIBLE DUMMY CONTACT POINTS :</u>	<u>DRIVER</u>	<u>PASSENGER</u>
Head :	Face into airbag/ back of head to head rest	Face into airbag/ back of head to head rest
Abdomen :	-	-
Chest	Airbag	Airbag
Knees	Knee Bolster	Knee Bolster

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION :

Year/Make/Model/Body Style : 1998 Chevrolet Suburban 4-Door 4 x 4

NHTSA No. : MW0108 ; VIN: 1GNFK16R9WJ321318 ; Color : Dark Red

Engine Data: 8 cylinders; - CID; 5.7 Liters; - cc

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

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

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

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

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

Date Received : 1/26/98 ; Odometer Reading 125 km

Selling Dealer : West Herr Chevrolet

& Address: P.O. Box 158 Eden, N.Y. 14057

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by : General Motors Corporation

Date of Manufacture 9/97

GVWR : 3311 kg; GAWR: 1780 kg FRONT; 1814 kg REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load : 240 kpa FRONT

240 kpa REAR

Recommended Tire Size : P245/75R16

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

Size of Tires on Test Vehicle: P245/75R16 ; Manufacturer: B F Goodrich

Vehicle Capacity Data :

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

Number of Occupants: 3 Front; 6 Rear; 9 Total

Vehicle Capacity Weight (VCW) = 695.5 kg

No. of Occupants x 68 kg = 612 kg

Rated Cargo/Luggage Weight (RCLW) = 84 kg

*Tire pressure used for test

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

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

Right Front	=	<u>604.5</u>	kg	Right Rear	=	<u>696.5</u>	kg
Left Front	=	<u>645</u>	kg	Left Rear	=	<u>669.5</u>	kg
TOTAL FRONT	=	<u>1,249.5</u>	kg	TOTAL REAR	=	<u>1,366.0</u>	kg
TOTAL DELIVERED WEIGHT	=	<u>2,615.5</u>	kg *				
% of Total Front of Vehicle Weight	=	<u>47.8</u>	%	% of Total Rear Weight	=	<u>52.2</u>	%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT :

Total Delivered Weight (UDW)	=	<u>2,615.5</u>	kg
Rated Cargo/Luggage Weight (RCLW)	=	<u>84.0</u>	kg
Weight of 2 p.572 Dummies @ 76 each	=	<u>152</u>	kg
TARGET TEST WEIGHT	=	<u>2,851.5</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 77 KG OF CARGO WEIGHT:

Right Front	=	<u>673</u>	kg	Right Rear	=	<u>742</u>	kg
Left Front	=	<u>653</u>	kg	Left Rear	=	<u>776</u>	kg
TOTAL FRONT	=	<u>1,326.0</u>	kg	TOTAL REAR	=	<u>1,518.0</u>	kg
TOTAL TEST WEIGHT	=	<u>2,844.0</u>	kg				
% of Total Front Weight	=	<u>46.6</u>	%	% of Total Rear Weight	=	<u>53.4</u>	%
Weight of Ballast Secured in Vehicle Trunk Area	=	<u>77</u>	kg				
Vehicle Components Removed for Weight Reduction:		<u>None</u>					

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED :	RF	<u>912</u>	LF	<u>918</u>	RR	<u>892</u>	LR	<u>892</u>
FULLY LOADED :	RF	<u>911</u>	LF	<u>918</u>	RR	<u>874</u>	LR	<u>874</u>
AS TESTED :	RF	<u>911</u>	LF	<u>918</u>	RR	<u>874</u>	LR	<u>880</u>
Vehicle's Wheel Base :		<u>3350</u>	mm					
Location of Vehicle's C.G. :		<u>1,788.1</u>	mm rearward of front wheel center.					

FUEL SYSTEM DATA :

Fuel System Capacity From Owner's Manual	=	<u>160.9</u>	liters
Usable Capacity Figure Furnished by COTR	=	<u>160.9</u>	liters
Test Volume Range (92 to 94% of Usable Capacity)	=	<u>148.0</u>	to <u>151.2</u> liters
ACTUAL TEST VOLUME	=	<u>148.0</u>	liters (with entire fuel system filled)
Test Fluid Type:	<u>Stoddard Solution</u> ;	Spec. Grav. =	<u>0.764</u>
Kinematic Viscosity	=	<u>0.96</u>	centistokes; Color = <u>Orange</u>
Type of Fuel Pump:	Electric- <u>x</u> ;	Mechanical-	<u>-</u>
Does Electric Pump operate with ignition switch "ON" & engine "OFF"		Yes- <u>x</u>	No- <u>-</u>
Details of Fuel System	<u>Fuel filler was aft of rear axle on left side, fuel tank is centered aft of rear axle and fuel lines run along left frame rail.</u>		

* COTR notified curb weight exceeded 2494.8 kg as found in test procedure.

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test : Frontal Barrier Impact Angle : 0°
Test Date : February 3, 1998 Time: 11:00 Temperature: 21 °C
Vehicle NHTSA No. : MW0108
Required Impact Velocity Range : 55.7 to 57.1 kph

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

Trap No. 1 = 56.0 kph; Trap No. 2 = 56.0 kph
Distance from vehicle to barrier : (1) entering trap = 813 mm
(2) exiting trap = 305 mm

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

Vehicle Length:

Pre-Test Right = 5435 ; C/L = 5585 ; Left = 5430
Post-Test Right = 4885 ; C/L = 4910 ; Left = 4875
Crush Right = 550.0 ; C/L = 675.0 ; Left = 555.0
AVERAGE = 593.3 mm

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point :

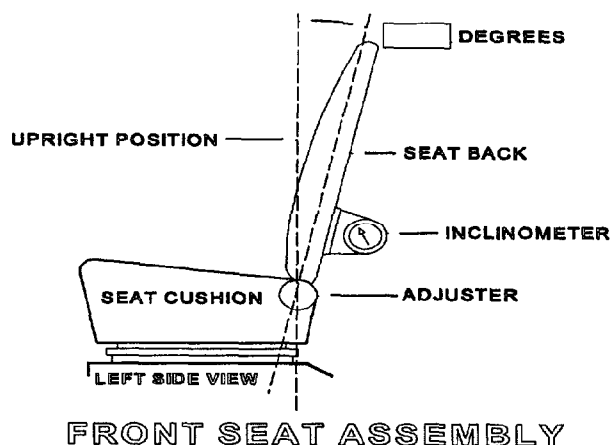
Right = 421 ; C/L = 387 ; Left = 384
AVERAGE = 397.3 mm

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 1998 Vehicle Model: Chevrolet Suburban Body Style : 4-Door 4 x 4

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



Seat back angle for driver's seat : 22

Measurement instructions : Placed in full upright position, moved back 4 notches (1st notch being 1)

Seat back angle for passenger's seat : 22

Measurement instructions : Placed in full upright position, moved back 4 notches (1st notch being 1)

2. Seat Fore and Aft Positioning

Positioning of the driver's seat : Electronic adjustment - found front and rear most position - bisected distance to find center location.

Positioning of the passenger's seat (if applicable) : Located 11 notches and placed in 6th notch which is center position.

3. Fuel Tank Capacity Data

3.1

- | | | |
|--|--------------|--------|
| A. "Usable Capacity" of the standard equipment fuel tank is | <u>160.9</u> | liters |
| B. "Usable Capacity" of the optional equipment fuel tank is | <u>-</u> | liters |
| C. "Usable Capacity" of the vehicle(s) used for certification testing to requirements of FMVSS 301 = | <u>160.9</u> | liters |

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 148.0 liters

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

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

With ignition in the on position

DATA SHEET NO. 4 TEST VEHICLE INFORMATION (cont.)

4. STEERING COLUMN ADJUSTMENTS :

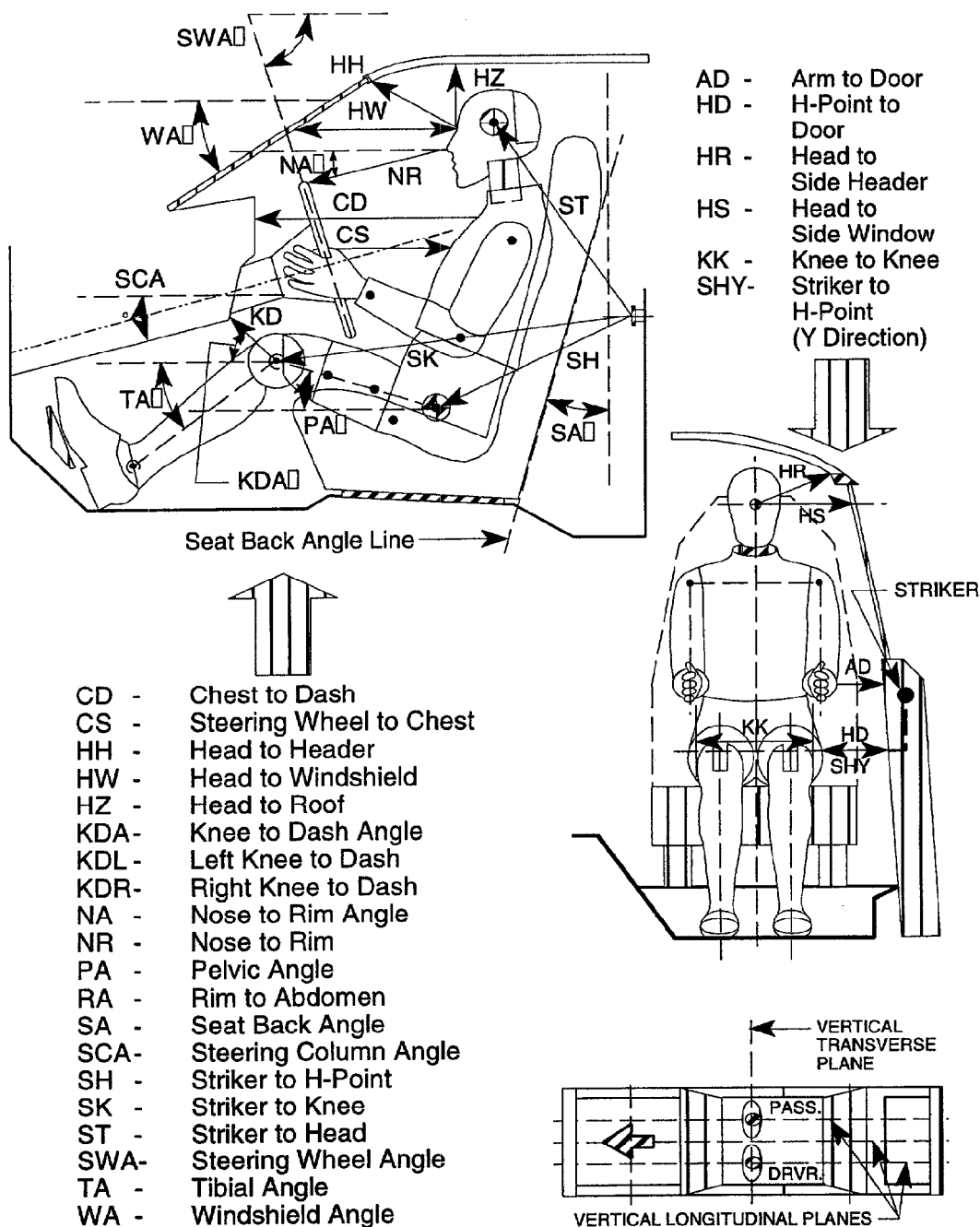
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine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

Operational Instructions: Located 5 positions placed in 3rd position.

5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: Located 5 positions placed in 3rd position.

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

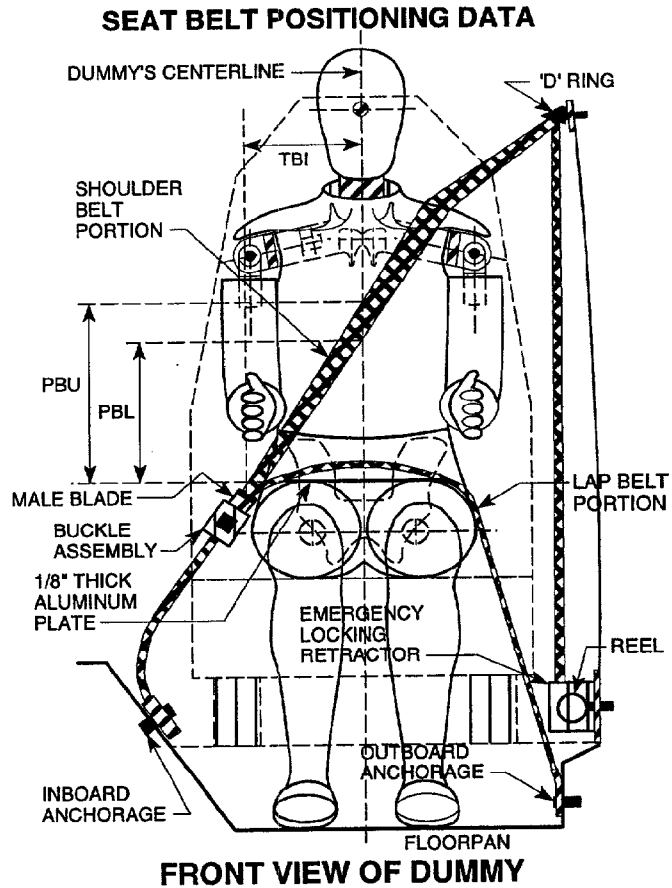


DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE

	DRIVER (Serial #061)			PASS. (Serial # 150)		
WA°	38 deg.			N/A		
SWA°	65 deg.			N/A		
SCA°	25 deg.			N/A		
SA°	22 deg.			22 deg.		
HZ	225			207		
HH	529			477		
HW	711			625		
HR	253			240		
NR	416	Angle	-12 deg.	N/A		
CD	607			558		
CS	326			N/A		
RA	203			N/A		
KDL	191	Angle (KDA)	27 deg.	216		
KDR	195			215	Angle (KDA)	34 deg.
PA°	21.5 deg.			23.5 deg.		
TA°	-58 deg.			-43 deg.		
KK	281			295		
ST	634	Angle	16.5 deg.	671	Angle	18.8 deg.
SK	690	Angle	83.4 deg.	722	Angle	87.5 deg.
SH	304	Angle	102.4 deg.	308	Angle	98.1 deg.
SHY	26.8			223		
HS	331			316		
HD	181			149		
AD	134			118		

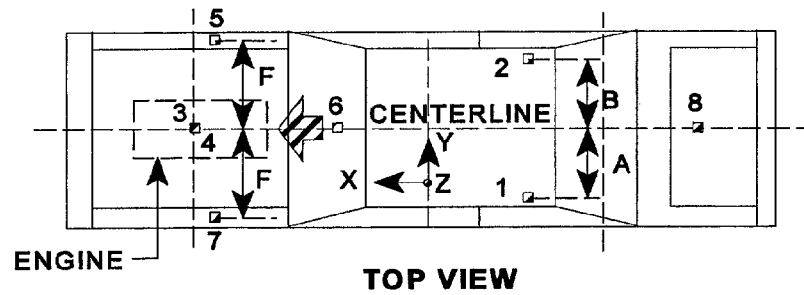
Dimensions in millimeters

DATA SHEET NO. 6 SEAT BELT POSITIONING DATA

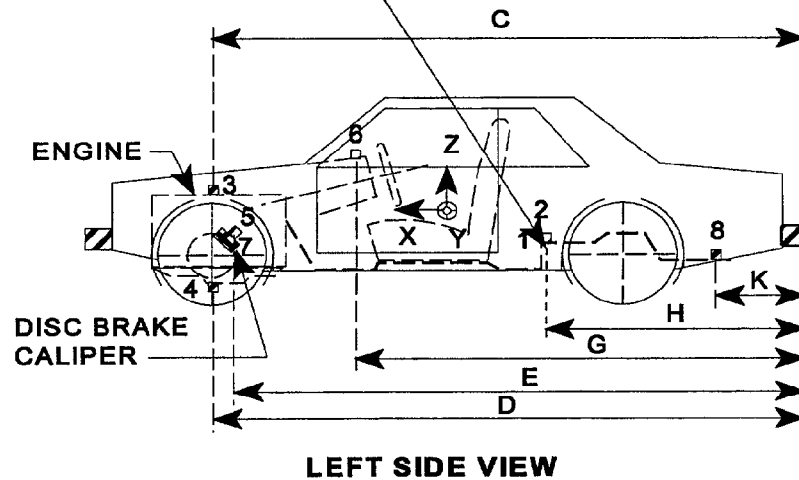


	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	335	340
PBL-- Top surface of alum. plate to belt lower edge	245	250
<u>LAP BELT TENSION</u>	Retractor	Retractor
<u>SHOULDER BELT TENSION</u>	Retractor	Retractor

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



REAR SEAT CUSHION
ASSY. FRONT ATTACHMENT
BRACKET SUPPORT



Note: Vehicle accelerometer location and data summary shown in DATA SHEET NO. 7

DATA SHEET NO. 7 VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

DIMENSION	LENGTH (mm)	
	PRE-TEST VALUES	
A Left Rear Seat Crossmember Y	450	481 redundant
B Right Rear Seat Crossmember Y	435	470 redundant
C Top of Engine X	4904	
D Bottom of Engine X	4314	
E Disc Brake Calipers X	4616	
F Disc Brake Calipers Y	650 left	670 right
G Instrument Panel X	3787	
H Rear Seat Crossmembers X	2731	

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Rear Seat X-Member @ Left Side	3.1	145.9	-28.3	48.9
2	Rear Seat X-Member @ Right Side	*	*	*	*
3	Top of Engine Block	*	*	*	*
4	Bottom of Engine	*	*	*	*
5	Disc Brake Caliper @ Right Side	*	*	*	*
6	Instrument Panel	*	*	*	*
7	Disc Brake Caliper @Left Side	35.6	56.8	-107.3	38.1
8	Rear Seat X-Member @ Left-Redundant	4.4	145.6	-29.9	61.3
9	Rear Seat X-Member @ Right-Redundant	3.1	197.5	-47.2	61.1

* Data not available , see test summary.

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

NHTSA Test No.: MW0108 Vehicle: 1998 Chevrolet Suburban 4-Door 4 x 4

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec.	Neg.	msec.
Pos. 1 Head X	g's	6.9	207.4	-62.7	79.6
Pos. 1 Head Y	g's	7.5	162.4	-11.1	84.9
Pos. 1 Head Z	g's	27.7	68.4	-12.6	130.1
Pos. 1 Head Resultant	g's	64.7	79.5	0.1	-27.3
Pos. 2 Head X	g's	19.8	209.0	-51.0	90.2
Pos. 2 Head Y	g's	15.2	94.8	-3.4	228.2
Pos. 2 Head Z	g's	35.1	68.4	-5.7	121.3
Pos. 2 Head Resultant	g's	58.0	85.3	0.0	-27.9
Pos. 1 Chest X	g's	3.8	152.8	-43.0	70.4
Pos. 1 Chest Y	g's	6.7	88.5	-4.4	62.8
Pos. 1 Chest Z	g's	16.4	61.0	-15.3	130.2
Pos. 1 Chest Resultant	g's	46.0	70.4	0.0	-33.2
Pos. 1 Chest Displacement	mm	0.0	17.5	-36.1	73.3
Pos. 2 Chest X	g's	5.6	179.0	-46.4	80.8
Pos. 2 Chest Y	g's	5.6	61.7	-5.1	106.5
Pos. 2 Chest Z	g's	20.1	68.0	-16.8	132.7
Pos. 2 Chest Resultant	g's	47.7	80.7	0.0	-32.1
Pos. 2 Chest Displacement	mm	0.0	13.9	-45.8	79.2
Pos. 1 Left Femur	N	237.3	46.6	-6867.1	54.2
Pos. 1 Right Femur	N	464.7	145.5	-7101.8	56.1
Pos. 2 Left Femur	N	362.1	89.0	-3405.5	61.9
Pos. 2 Right Femur	N	793.7	54.6	-2695.0	65.9
Pos. 1 Left Belt Load	N	2820.2	62.1	-20.3	24.3
Pos. 1 Torso Belt Load	N	8116.4	71.9	-3.1	-36.1
Pos. 2 Right Belt Load	N	6495.4	71.9	-8.6	2.0
Pos. 2 Torso Belt Load	N	8254.9	83.3	-18.2	150.0

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)

NHTSA Test No.: MW0108 Vehicle: 1998 Chevrolet Suburban 4-Door 4 x 4

HEAD INJURY CRITERIA (HIC)				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	594.6	60.5	96.3	48.77
Position #2 - Passenger	588.8	66.5	102.5	48.47

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

CLIP SUMMARY*				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	44.2	69.2	72.2	454.1
Position #2 - Passenger	46.6	73.3	76.8	534.6

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

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)
HYBRID III NECK AND PELVIC DATA SHEET

Vehicle Year/Make/Model/Body Style: 1998 Chevrolet Suburban 4-Door 4 x 4

NHTSA Test No.: MW0108 Test Date: February 3, 1998

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec	Neg.	msec
Pos. 1 Upper Neck Fx	N	221.0	98.1	-347.0	153.4
Pos. 1 Upper Neck Fy	N	348.3	162.9	-168.2	85.7
Pos. 1 Upper Neck Fz	N	2601.1	70.0	-499.5	134.1
Pos. 1 Neck Force Result	N	2601.9	69.9	3.5	-9.7
Pos. 1 Upper Neck Mx	N-m	16.4	110.6	-17.9	170.3
Pos. 1 Upper Neck My	N-m	35.3	165.5	-29.6	257.0
Pos. 1 Upper Neck Mz	N-m	16.5	98.6	-5.7	252.4
Pos. 1 Neck Moment Result	N-m	39.2	165.4	0.1	-29.9
Pos. 2 Upper Neck Fx	N	33.6	32.9	-983.8	147.6
Pos. 2 Upper Neck Fy	N	289.2	104.7	-247.7	74.1
Pos. 2 Upper Neck Fz	N	2620.3	81.7	-388.5	272.4
Pos. 2 Neck Force Result	N	2771.4	81.7	7.3	18.5
Pos. 2 Upper Neck Mx	N-m	29.0	99.1	-11.9	133.5
Pos. 2 Upper Neck My	N-m	73.6	153.1	-45.1	80.3
Pos. 2 Upper Neck Mz	N-m	7.7	309.7	-10.2	243.6
Pos. 2 Neck Moment Result	N-m	73.9	153.1	0.1	-35.4
Pos. 1 Pelvic (X)	g's	9.2	140.0	-69.5	54.5
Pos. 1 Pelvic (Y)	g's	11.5	57.7	-13.4	55.6
Pos. 1 Pelvic (Z)	g's	7.6	65.1	-16.6	121.7
Pos. 1 Pelvic (R)	g's	69.7	54.5	0.1	-32.8
Pos. 2 Pelvic (X)	g's	11.0	143.2	-61.8	65.8
Pos. 2 Pelvic (Y)	g's	5.8	50.2	-13.9	70.6
Pos. 2 Pelvic (Z)	g's	8.8	51.8	-18.9	110.9
Pos. 2 Pelvic (R)	g's	62.1	72.2	0.0	-21.6

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)
HYBRID III LOWER LEG DATA SHEET

Vehicle Year/Make/Model/Body Style: 1998 Chevrolet Suburban 4-Door 4 x 4
NHTSA Test No.: MW0108 Test Date: February 3, 1998

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec	Neg.	msec
P1 Lt Upper Tibia Mx	N-m	124.7	84.5	-30.9	57.1
P1 Lt Upper Tibia My	N-m	337.4	61.6	-9.3	101.7
P1 Lt Lower Tibia Fx	N	996.2	58.9	-699.2	67.1
P1 Lt Lower Tibia Fz	N	992.4	54.2	-3433.7	66.8
P1 Lt Lower Tibia My	N-m	90.4	58.7	-33.7	66.9
P1 Rt Upper Tibia Mx	N-m	89.8	52.6	-11.8	129.9
P1 Rt Upper Tibia My	N-m	219.2	49.2	-41.6	59.7
P1 Rt Lower Tibia Fx	N	102.0	204.9	-2162.0	51.9
P1 Rt Lower Tibia Fz	N	110.0	219.0	-2865.1	51.1
P1 Rt Lower Tibia My	N-m	177.7	60.4	-76.3	52.7
Pos. 2 Lt Upper Tibia Mx	N-m	58.5	59.3	-9.3	69.2
Pos. 2 Lt Upper Tibia My	N-m	80.9	65.0	-161.6	51.4
Pos. 2 Lt Lower Tibia Fx	N	1361.3	65.2	-1225.9	51.9
Pos. 2 Lt Lower Tibia Fz	N	590.8	59.5	-5101.6	50.5
Pos. 2 Lt Lower Tibia My	N-m	116.4	65.3	-30.8	42.5
Pos. 2 Rt Upper Tibia Mx	N-m	17.0	78.9	-31.7	68.5
Pos. 2 Rt Upper Tibia My	N-m	21.1	75.7	-104.5	54.5
Pos. 2 Rt Lower Tibia Fx	N	743.5	108.0	-952.9	54.7
Pos. 2 Rt Lower Tibia Fz	N	619.1	40.5	-1881.6	54.4
Pos. 2 Rt Lower Tibia My	N-m	13.3	72.0	-68.1	54.9

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)
HYBRID III ANKLE DATA SHEET

Vehicle Year/Make/Model/Body Style: 1998 Chevrolet Suburban 4-Door 4 x 4
NHTSA Test No.: MW0108 Test Date: February 3, 1998

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec	Neg.	msec
Pos. 1 Left Ankle X	g's	58.7	41.1	-171.1	66.0
Pos. 1 Left Ankle Z	g's	16.1	88.8	-70.3	63.7
Pos. 1 Left Toe Z	g's	54.7	57.3	-180.7	64.0
Pos. 1 Right Ankle X	g's	50.3	58.3	-243.0	62.5
Pos. 1 Right Ankle Z	g's	302.8	62.5	-194.1	53.1
Pos. 1 Right Toe Z	g's	159.8	61.3	-308.9	50.5
Pos. 2 Left Ankle X	g's	36.8	67.5	-139.5	50.8
Pos. 2 Left Ankle Z	g's	95.9	62.7	-87.2	52.3
Pos. 2 Left Toe Z	g's	93.3	60.6	-145.5	46.4
Pos. 2 Right Ankle X	g's	16.9	74.0	-136.7	55.2
Pos. 2 Right Ankle Z	g's	22.3	48.5	-42.5	56.8
Pos. 2 Right Toe Z	g's	34.3	61.4	-78.3	53.6

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)
REDUNDANT DUMMY DATA

NHTSA Test No.: MW0108 Vehicle: 1998 Chevrolet Suburban 4-Door 4 x 4

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec	Neg.	msec
Pos. 1 Head X(R)	g's	6.0	250.6	-64.7	80.0
Pos. 1 Head Y(R)	g's	6.9	162.7	-14.6	84.5
Pos. 1 Head Z(R)	g's	28.9	62.0	-13.5	128.7
Pos. 1 Head Resultant(RR)	g's	66.5	79.9	0.0	-28.1
Pos. 2 Head X(R)	g's	17.8	217.0	-51.2	90.5
Pos. 2 Head Y(R)	g's	17.0	94.0	-24.6	147.5
Pos. 2 Head Z(R)	g's	42.0	68.8	-10.5	152.2
Pos. 2 Head Resultant(RR)	g's	58.7	89.8	0.1	-23.9
Pos. 1 Chest X(R)	g's	3.8	152.3	-41.2	69.7
Pos. 1 Chest Y(R)	g's	8.0	88.9	-2.7	56.9
Pos. 1 Chest Z(R)	g's	17.2	68.0	-14.6	130.1
Pos. 1 Chest Resultant(RR)	g's	44.3	70.7	0.0	-32.3
Pos. 2 Chest X(R)	g's	6.1	179.5	-46.7	88.4
Pos. 2 Chest Y(R)	g's	5.7	61.6	-4.2	106.4
Pos. 2 Chest Z(R)	g's	20.8	70.2	-17.4	120.2
Pos. 2 Chest Resultant(RR)	g's	48.9	76.2	0.0	-38.7

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)
REDUNDANT DUMMY DATA

NHTSA Test No.: MW0108 Vehicle: 1998 Chevrolet Suburban 4-Door 4 x 4

HEAD INJURY CRITERIA (HIC) REDUNDANT				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	651.0	60.1	96.1	50.5
Position #2 - Passenger	582.1	66.7	102.7	48.3

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

CLIP SUMMARY* REDUNDANT				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	43.9	68.6	71.6	445.8
Position #2 - Passenger	47.8	73.3	77.6	562.2

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

DATA SHEET NO. 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

	<u>Driver</u>	<u>Passenger</u>
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	<u>2325</u>	<u>2435</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>804</u>	<u>863</u>
Lap belt length as measured on Part 572 Dummy.	<u>717</u>	<u>767</u>

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis.	<u>*</u>	<u>*</u>
As determined mechanically.	<u>89</u>	<u>74</u>
As determined electronically.	<u>**</u>	<u>**</u>

BELT STRETCH DATA:

Measured electronically between shoulder belt load cell and the "D" ring.	<u>38.2 mm/M</u>	<u>5.5 mm/M</u>
Measured mechanically.	<u>1 mm</u>	<u>1 mm</u>

* Onboard cameras not used by request of COTR

** Insufficient room to attach belt spoolout potentiometer

Dimensions in millimeters

DATA SHEET NO.10 SUMMARY OF FMVSS 212 DATA

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 10 mm molding.

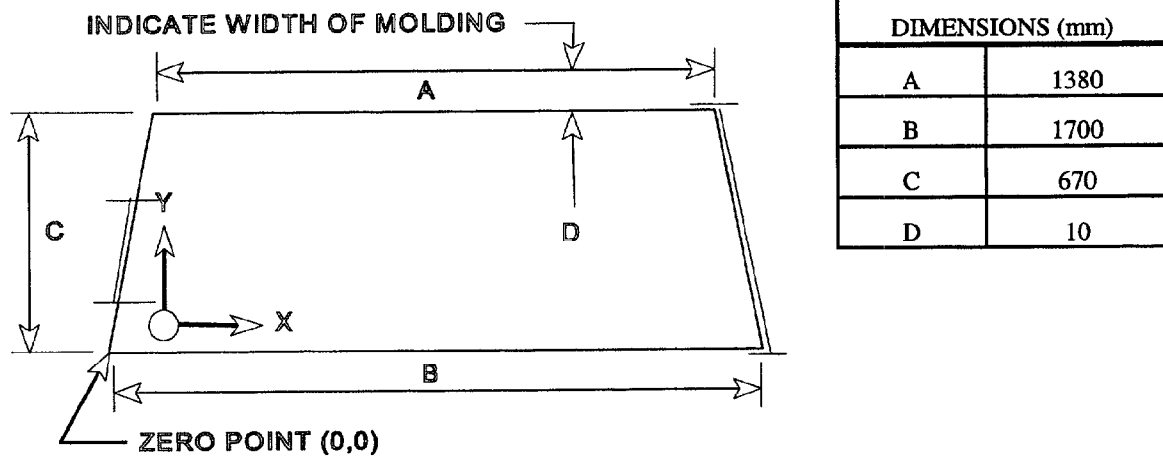
FMVSS 212 REQUIREMENTS:

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

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST(mm)	
RIGHT SIDE	2210	2065	93
LEFT SIDE	2210	1680	76
TOTAL	4,420	3,745	85

AREA OF RETENTION FAILURE:



FRONT VIEW OF WINDSHIELD

FAILURE DETAILS: Middle of windshield right side edge 145 mm separation occurred
Total left side edge of windshield separated - 670 mm

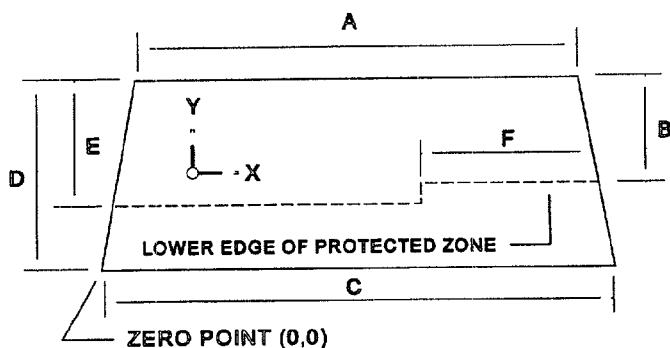
DATA SHEET NO. 11 FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 165 mm diameter rigid sphere weighing 6.8 kg 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 13 mm 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	1380
B	315
C	1700
D	670
E	305
F	1070

FRONT VIEW OF WINDSHIELD

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 6 mm: None

(Show location of penetration on the above sketch)

	COORDINATES	
	X	Y
1.		
2.		
3.		
4.		

DATA SHEET NO. 12 FMVSS NO. 301-75 "FUEL SYSTEM INTEGRITY" POST IMPACT TEST DATA

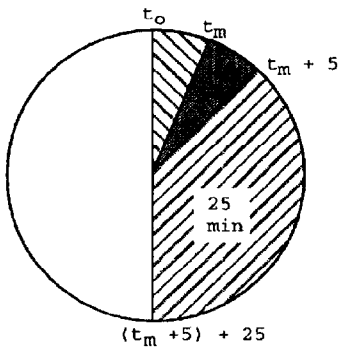
NHTSA TEST No.: MW0108 TEST DATE: February 3, 1998
VEHICLE MAKE/MODEL: 1998 Chevrolet Suburban

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

=====

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

FUEL SPILLAGE MEASUREMENT:



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

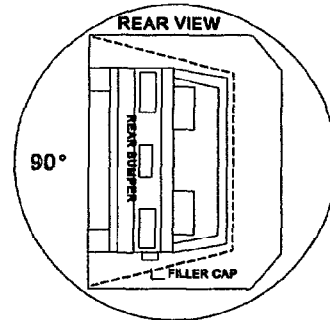
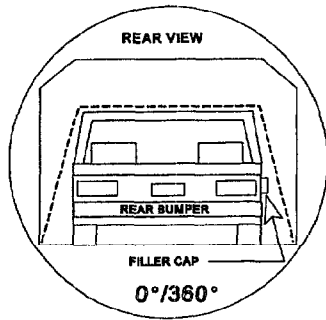
ACTUAL	MAX ALLOWED
0	28 g
0	141 g
0	28 g/min.

SOLVENT SPILLAGE DETAILS: None

DATA SHEET NO. 13 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:
0-90 deg.

NHTSA Test No.:
MW0108



INDETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)

1 minutes 5 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

6 minutes 5 seconds

Next whole minute interval

7 minutes 00 seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

141 g	28 g	28 g	28 g
-------	------	------	------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

129 g	trace	trace	n/a
-------	-------	-------	-----

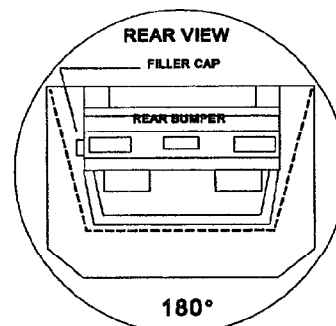
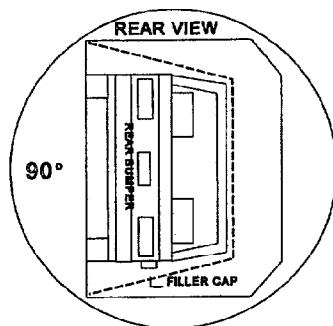
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S): Stoddard leaked out from an O-ring which sealed the fuel tank and a fitting found on top of the fuel tank

TEST SHEET NO. 13 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:
90-180 deg.

NHTSA Test No.:
MW0108



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)

1 minutes 1 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

6 minutes 1 seconds

Next whole minute interval

7 minutes 00 seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

141 g	28 g	28 g	28 g
-------	------	------	------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

101 g	trace	trace	n/a
-------	-------	-------	-----

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

IV. SOLVENT SPILLAGE LOCATION(S): Stoddard leaked out from an O-ring which sealed the fuel tank and a fitting found on top of the fuel tank

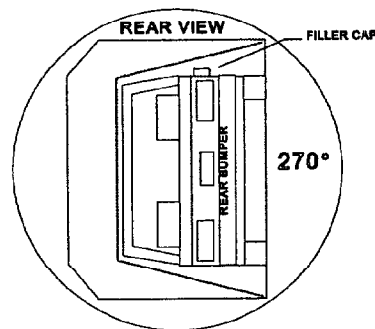
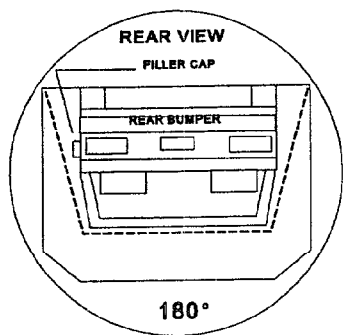
TEST SHEET NO. 13 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

180-270 deg.

NHTSA Test No.:

MW0108



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)

1 minutes

1 seconds

FMVSS 301 Position Hold Time +

5 minutes

00 seconds

TOTAL

6 minutes

1 seconds

Next whole minute interval

7 minutes

00 seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

141 g	28 g	28 g	28 g
-------	------	------	------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

39 g	trace	trace	n/a
------	-------	-------	-----

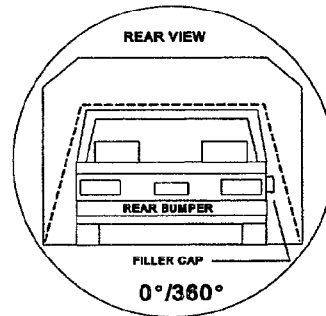
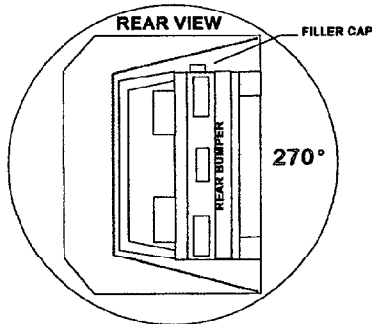
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S): Stoddard leaked out from an O-ring which sealed the fuel tank and a fitting found on top of the fuel tank

TEST SHEET NO. 13 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:
270-360 deg.

NHTSA Test No.:
MW0108



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time
(Spec. Range = 1 to 3 minutes)

1 minutes 3 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

6 minutes 3 seconds

Next whole minute interval

7 minutes 00 seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

141 g	28 g	28 g	28 g
-------	------	------	------

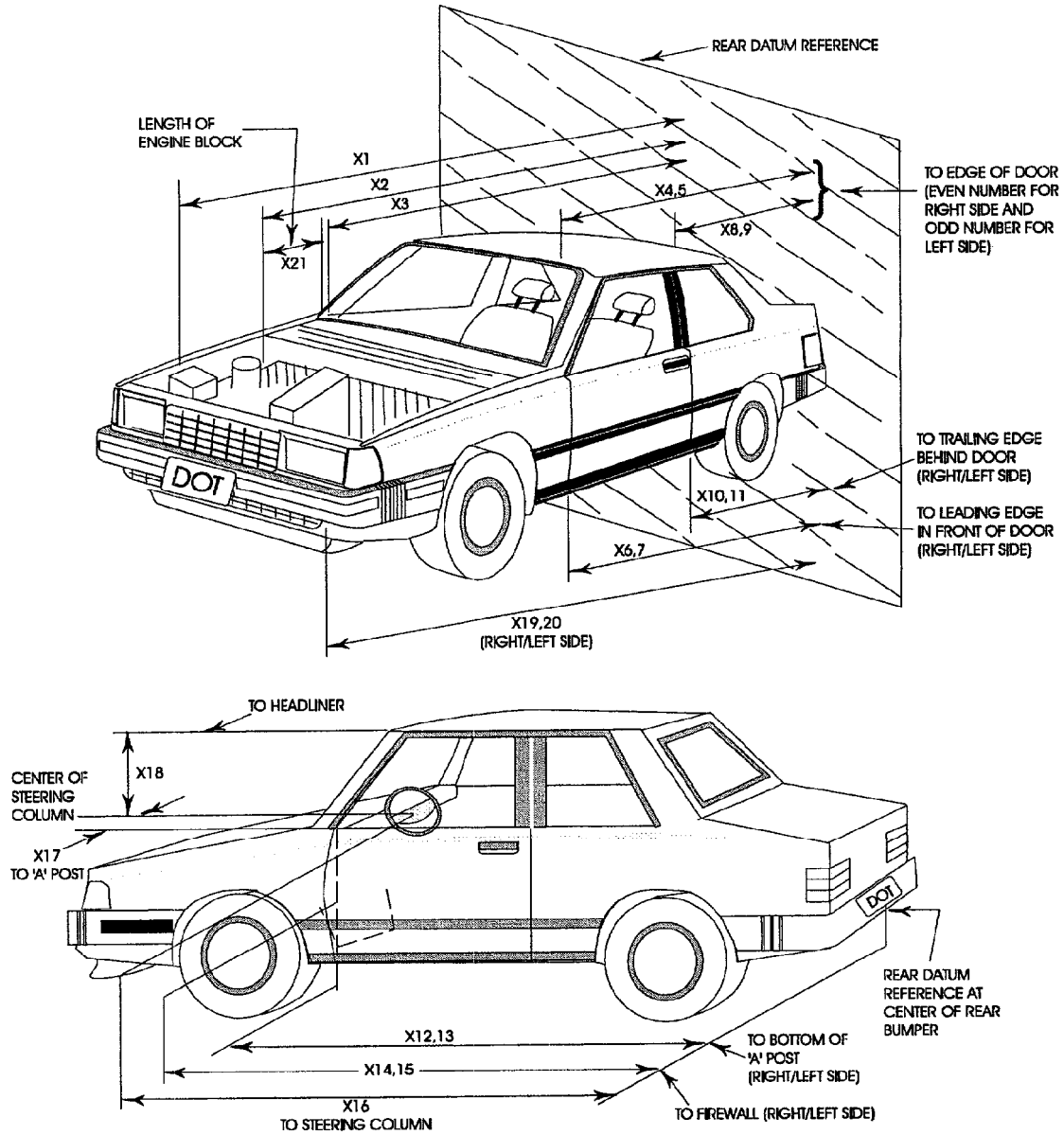
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

96 g	trace	0	n/a
------	-------	---	-----

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

IV. SOLVENT SPILLAGE LOCATION(S): Stoddard leaked out from an O-ring which sealed the fuel tank and a fitting found on top of the fuel tank

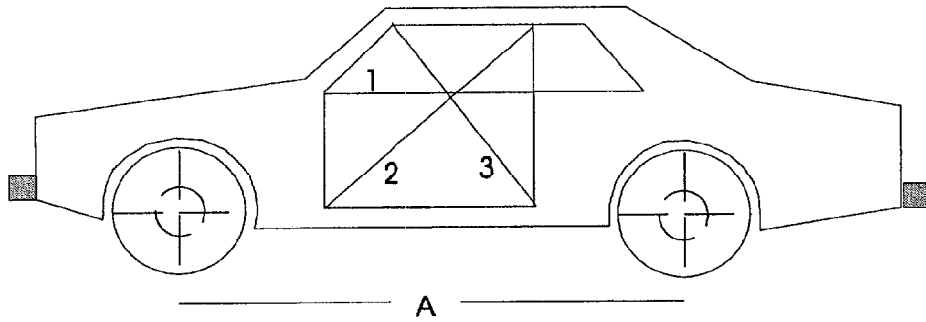
TEST VEHICLE MEASUREMENTS



DATA SHEET NO.14 VEHICLE MEASUREMENTS

No.		All Dimensions in mm		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	5585	4910	675
X2	Rear Surface of Vehicle to Front of Engine	4975	4760	215
X3	Rear Surface of Vehicle to Firewall	4345	4275	70
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	4126	4128	-2
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	4130	4090	40
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	4059	4057	2
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	4061	4115	-54
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2900	2895	5
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2901	2870	31
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2897	2900	-3
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2900	2859	41
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	4115	4096	19
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	4110	4060	50
X14	Rear Surface of Vehicle to Firewall, Right Side	4345	4300	45
X15	Rear Surface of Vehicle to Firewall, Left Side	4340	4295	45
X16	Rear Surface of Vehicle to Steering Column	3555	3525	30
X17	Center of Steering Column to "A" Post	465	420	45
X18	Center of Steering Column to Headliner	470	460	10
X19	Rear Surface of Vehicle to Right Side of Front Bumper	5435	4885	550
X20	Rear Surface of Vehicle to Left Side of Front Bumper	5430	4875	555
X21	Length of Engine Block	600	600	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3830	3790	40
CD	Rear Surface of Vehicle to Center of Dash Panel	3790	3740	50
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3760	3695	65

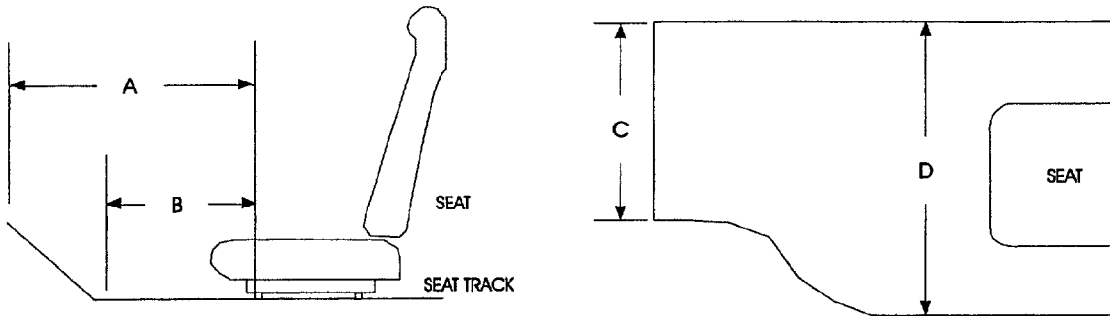
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
VEHICLE INTRUSION MEASUREMENTS
DOOR OPENING WIDTH



UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1170	1665	1315	1170	1665	1315
AFTER TEST	1150	1595	1420	1155	1600	1410
DIFFERENCE	20	70	-105	15	65	-95

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	3345	3345
AFTER TEST	3205	3225
DIFFERENCE	140	120

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
VEHICLE INTRUSION MEASUREMENTS
STATIC FOOTWELL DEFORMATION



DRIVER

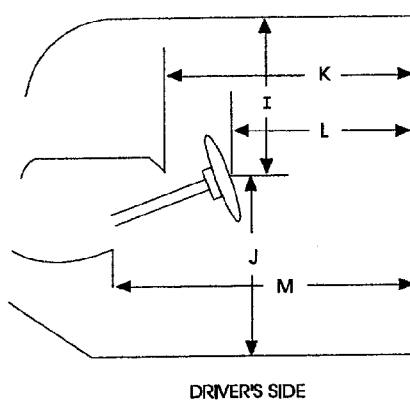
Measurement	Pre-Test	Post-Test	Difference
A	690	660	30
B	580	575	5
C	515	480	35
D	530	520	10

PASSENGER

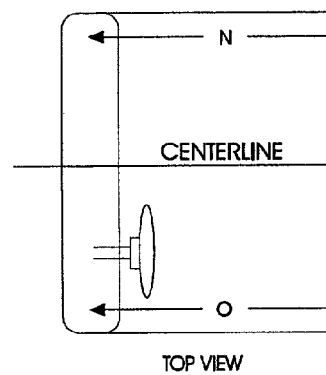
Measurement	Pre-Test	Post-Test	Difference
A	655	650	5
B	510	510	0
C	420	395	25
D	445	435	10

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
VEHICLE INTRUSION MEASUREMENTS
STATIC PASSENGER COMPARTMENT INTRUSION

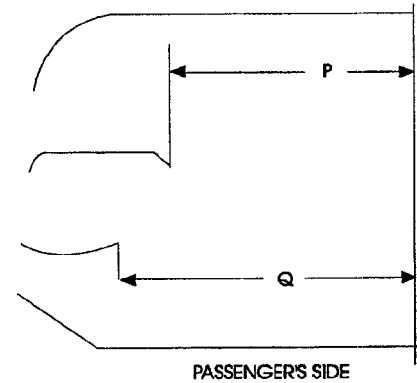


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE

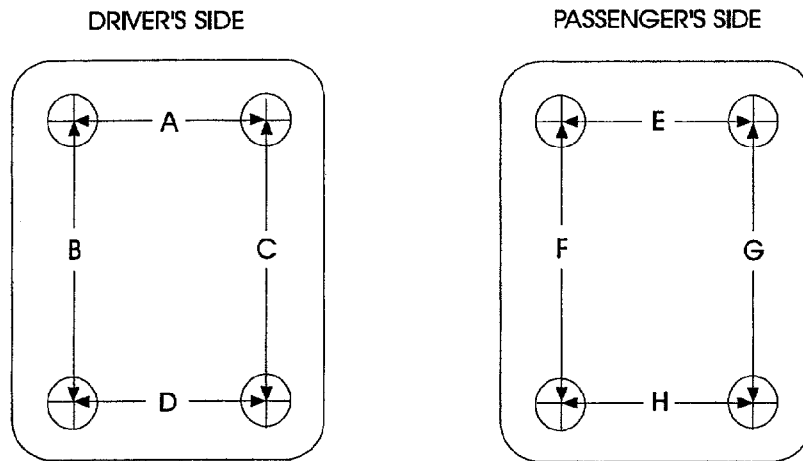


PASSENGER'S SIDE

Measurement	Pre-Test	Post-Test	Difference
I	455	440	15
J	700	715	-15
K	865	800	65
L	610	580	30
M	820	790	30
N	885	845	40
O	785	750	35
P = K (PASS.)	860	810	50
Q = M (PASS.)	910	870	40

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
FLOORBOARD DEFORMATION



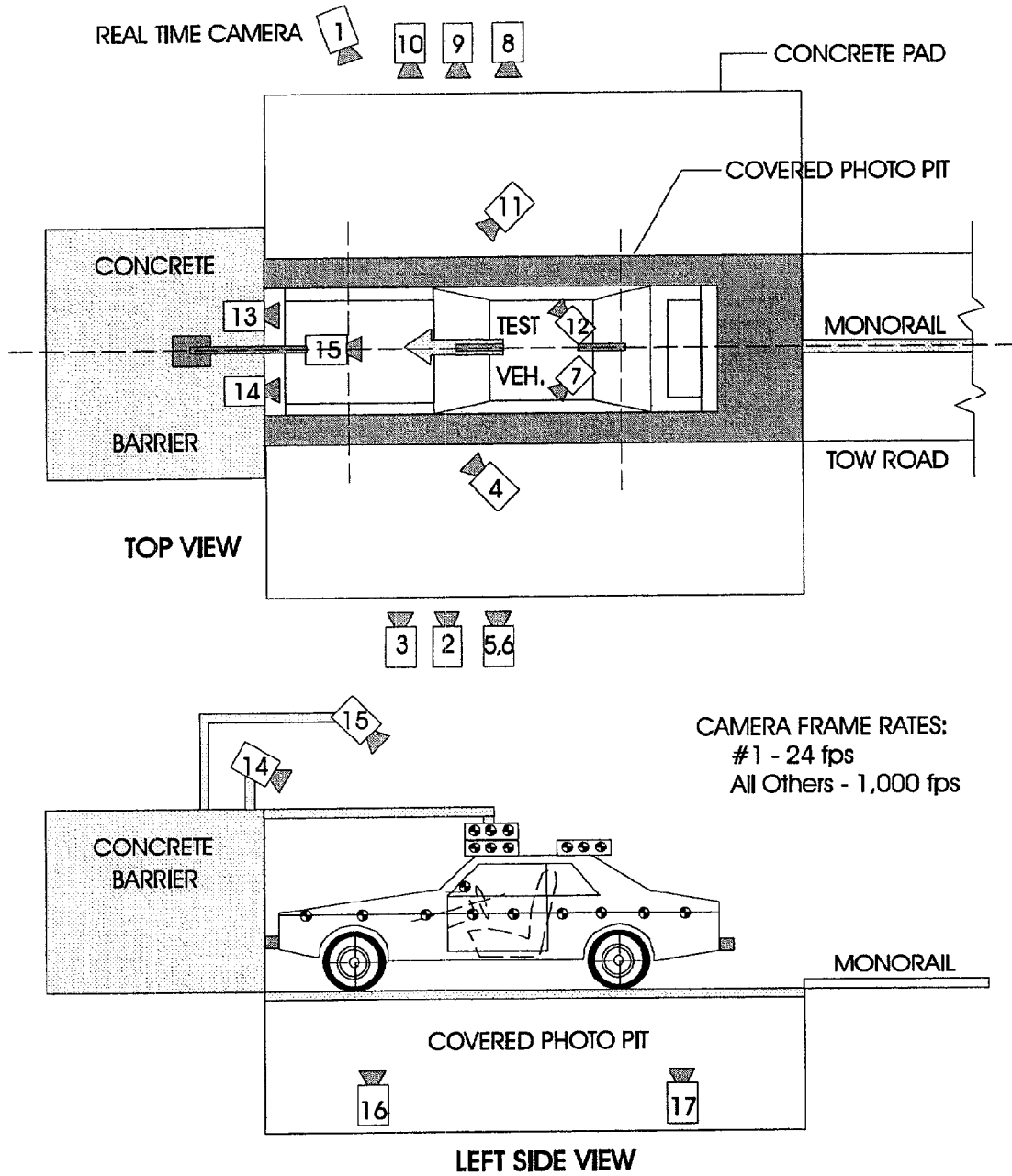
TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	365	370	-5
B	580	570	10
C	570	555	15
D	345	345	0
E	335	340	-5
F	485	480	5
G	540	555	-15
H	230	225	5

Units = mm

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera information shown in DATA SHEET NO. 15.



DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS

NHTSA Test No.: MW0108 Vehicle: 1998 Chevrolet Suburban 4-Door 4 x 4

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	7519	1743	1216	-3	7149	13	1020
3	Left Side View	8343	1064	1147	-2	7973	25	1020
4	Driver and Interior View	4896	3129	1966	-9	-	25	1010
5	Steering Column (Bottom)	8549	2004	1174	-3	8179	25	1020
6	Steering Column (Top)	8549	2004	1779	-6	8179	25	1020
7	Left Belt	-	-	-	-	-	8	N/A
8	Overall Right Side	7300	2389	1262	-2	6930	13	1025
9	Right Side View	8391	1804	1213	-3	8021	25	1010
10	Right Passenger View	8415	2144	1580	-2	8045	35	1000
11	Passenger and Interior View	5252	3366	1969	-10	-	25	1020
12	Right Belt	-	-	-	-	-	8	N/A
13	Passenger Front View	580	0	2000	-45	-	8	1015
14	Driver Front View	580	0	2000	-45	-	8	1015
15	Windshield View	0	930	3048	-55	-	8	1005
16	Pit View of Engine	0	970	-3048	90	-	13	950
17	Pit View of Fuel Tank	0	3470	-3048	90	-	13	1010

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

Y = film plane to impact location

N.T. indicates No Timing

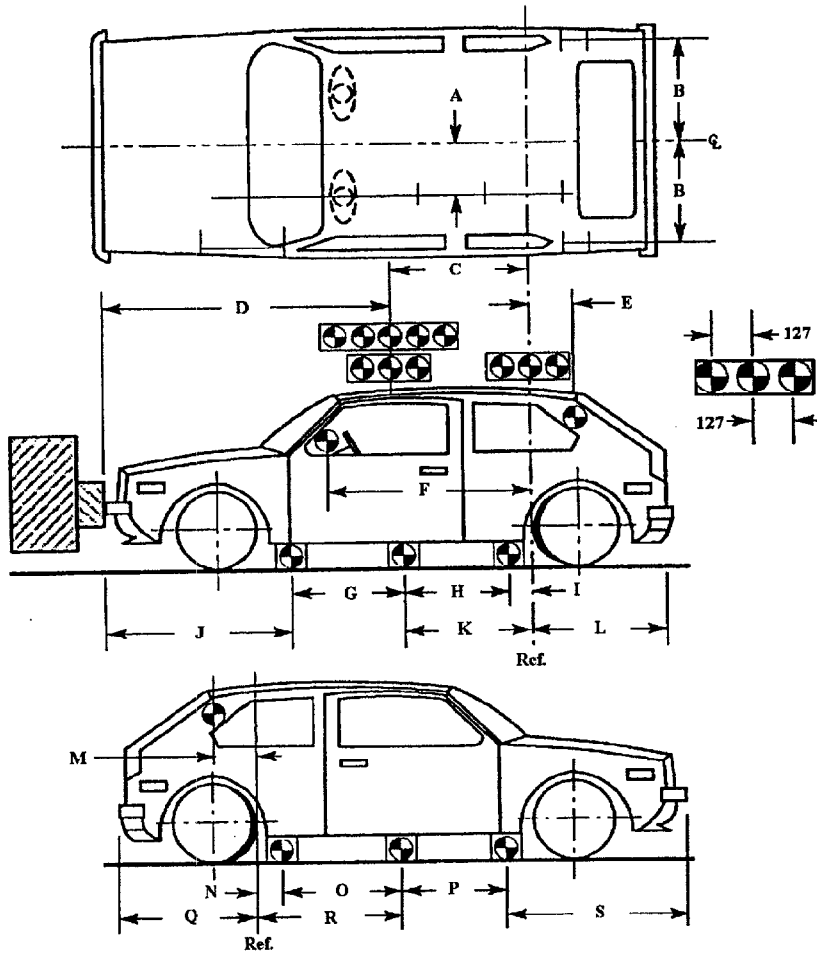
Z = film plane to ground

DATA SHEET NO. 16

VEHICLE REFERENCE PHOTO TARGET LOCATIONS

(Dimensions in millimeters)

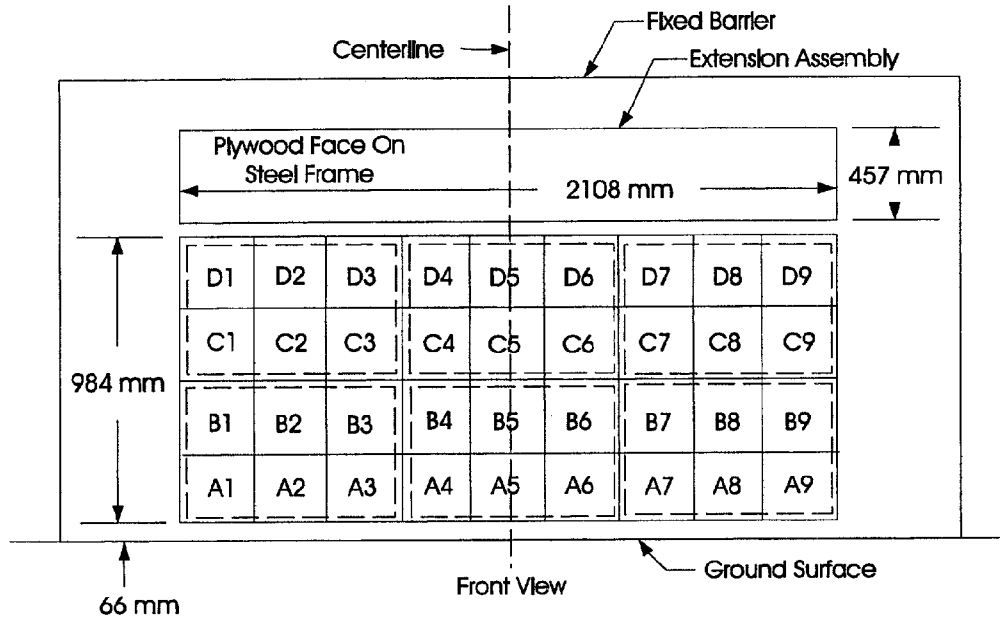
A	446
B	1580
C	1214
D	2588
E	395
F	1986
G	1140
H	1165
I	122
J	1519
K	1287
L	1739
M	395
N	122
O	1165
P	1140
Q	1739
R	1287
S	1519



DATA SHEET NO. 17 LOAD CELL LOCATIONS ON FIXED BARRIER

LOAD CELL BARRIER NOT REQUESTED FOR THIS TEST

- 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)

DATA SHEET NO. 18 POST TEST AIR BAG DATA

NHTSA No. : MW0108; Test Date: February 3, 1998; Technician: J. Cz.

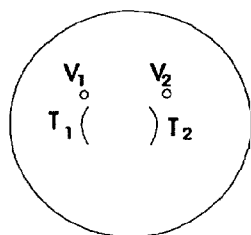
Vehicle Model Year/Make/Model: 1998 Chevrolet Suburban

- A. No. of vent holes: 2 -Driver 2 -Passenger
- B. Size of vent holes: (mm²) 40 -Driver 60 -Passenger
- C. Total vent area: (mm²) 80 -Driver 120 -Passenger
- D. Deflated air bag length and width dimensions or, if round, diameter. (mm)
- Driver: - -Length; - -Width; 650 -Diameter
- Passenger: 500 -Height; 510 -Width; 300 -Depth
- E. Is the air bag tethered?
- Driver: x -Yes; - -No; If yes, record length of tether- 270
- Passenger: - -Yes; x -No; If yes, record length of tether- -

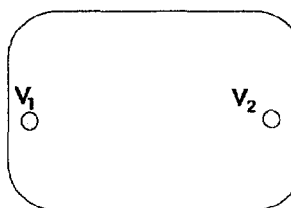
Sketch the air bag showing the location of the vent holes, how the bag is tethered, and where the bag is tethered. Also describe how the tethers are attached to the bag and the steering wheel.

(Note: Not to scale; V_n = Vent hole_n, T_n = Tether_n).

DRIVER
vents underneath bag



PASSENGER
vents underneath bag



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

Driver: Air bag: -

Generator: AB108916R7B6QG

Passenger: Air bag: -

Generator: AL7944Q5R6JLX5

DATA SHEET NO.19 ACCIDENT INVESTIGATION DIVISION DATA

FOR 56.3 KPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Chevrolet Suburban 4-Door 4 x 4

NHTSA Test No.: MW0108 VIN: 1GNFK16R9WJ321318

Model Year: 1998 Build Date: 9/97 Test Date: February 3, 1998

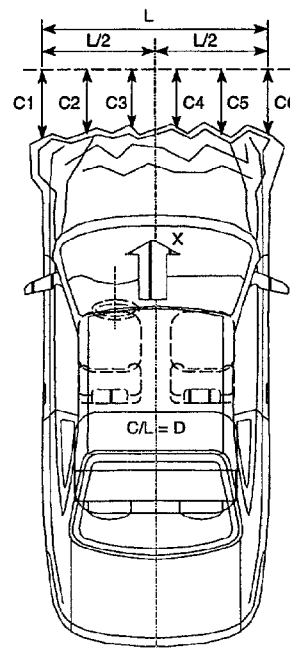
Vehicle Size Category: SUV Test Weight: 2844 kg

Vehicle Wheelbase: 3350 mm; Front Overhang: 1519 mm; Overall Width: 1948 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions:

	PRE	POST	DIFF	
C1 =	5360	4825	-535	mm
C2 =	5500	4905	-595	mm
C3 =	5570	4920	-650	mm
C4 =	5570	4920	-650	mm
C5 =	5510	4910	-600	mm
C6 =	5370	4835	-535	mm



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

Length of Damaged Region:

L1= 1875 mm

L2= 937.5 mm

L3= 375 mm

Appendix A
PHOTOGRAPHS

PHOTOGRAPHS

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PHOTOGRAPH NOT AVAILABLE

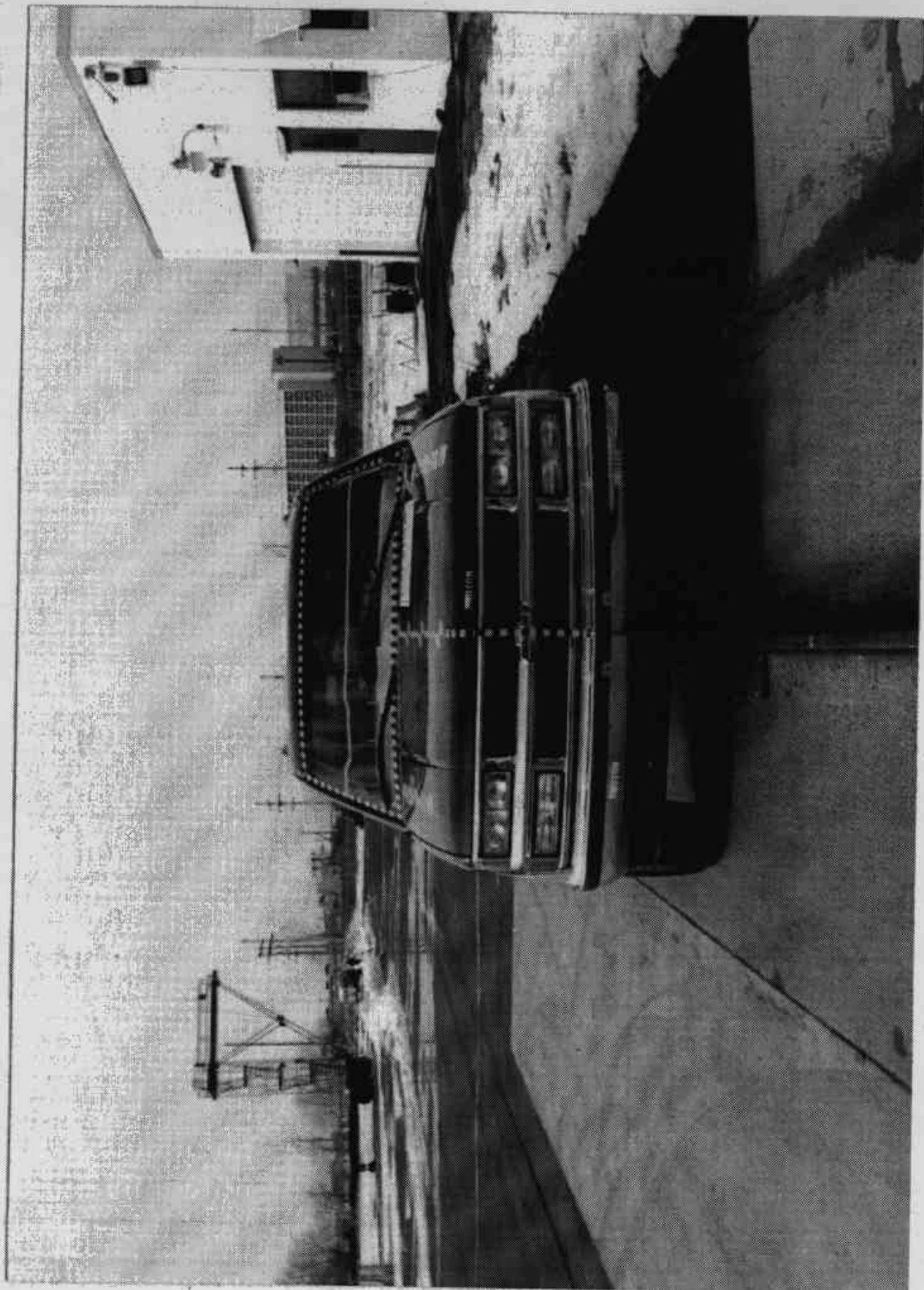


Figure A-2 PRE-TEST FRONT VIEW



Figure A-3 POST-TEST FRONT VIEW

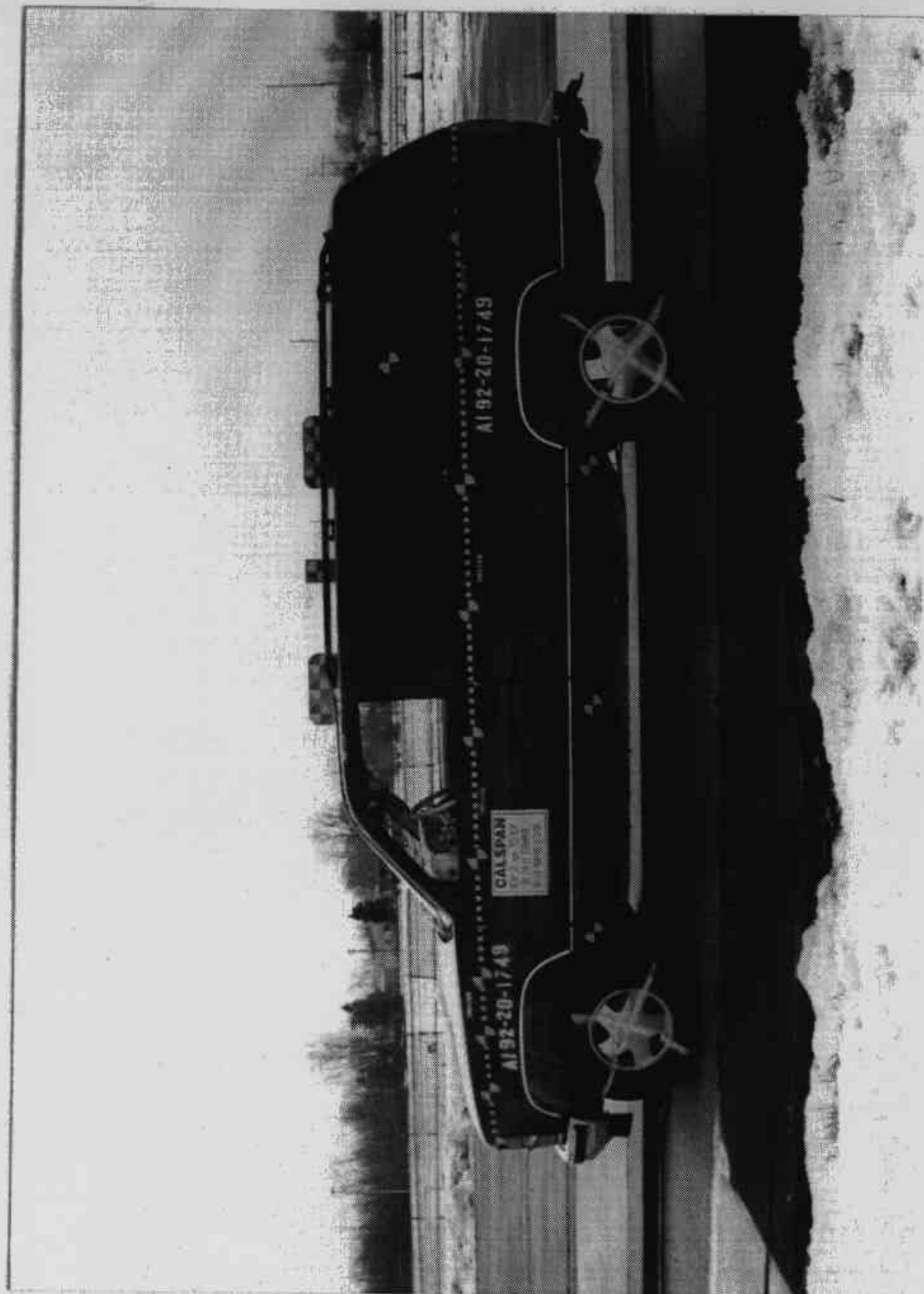


Figure A-4 PRE-TEST LEFT SIDE VIEW



Figure A-5 POST-TEST LEFT SIDE VIEW

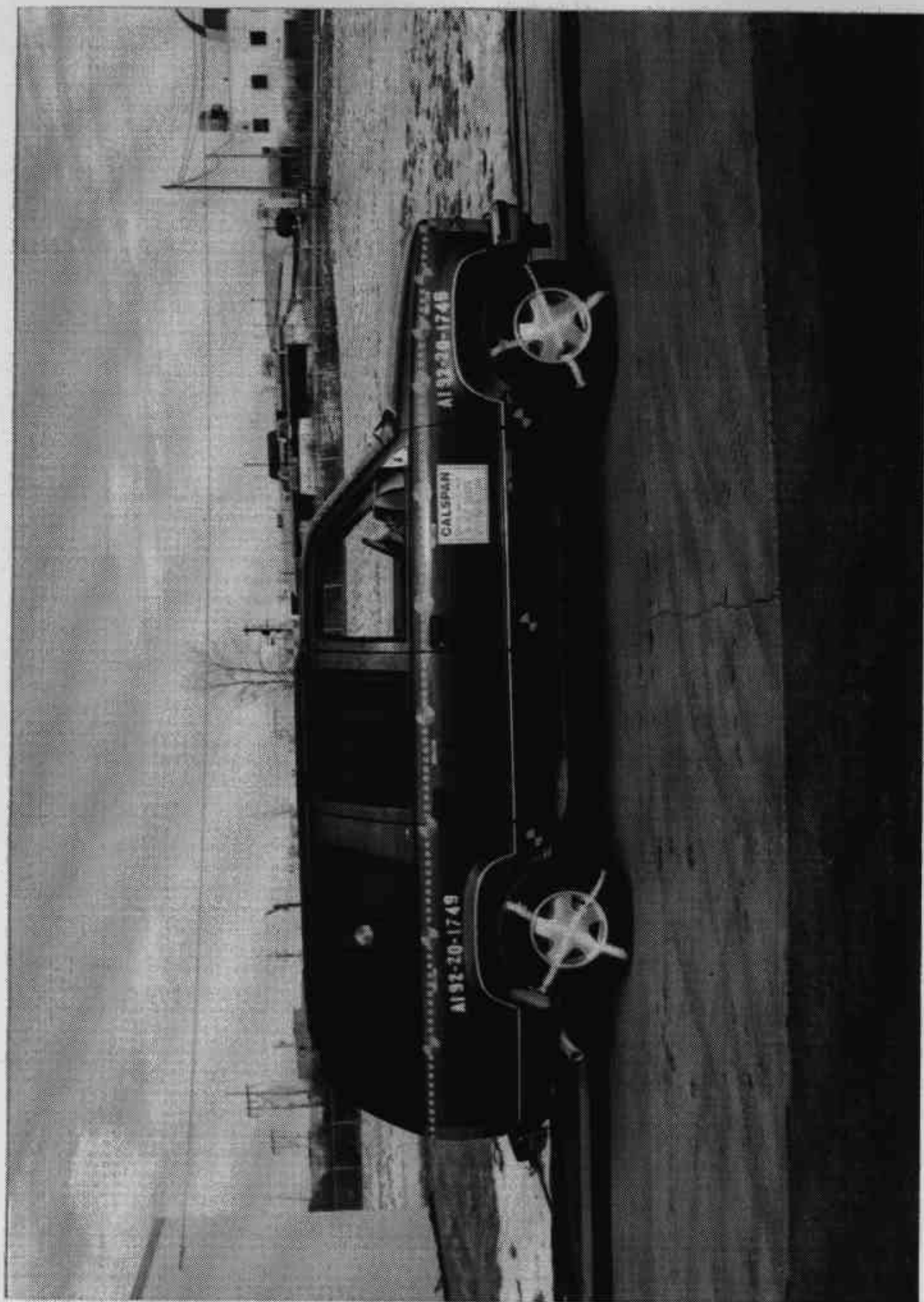


Figure A-6 PRE-TEST RIGHT SIDE VIEW

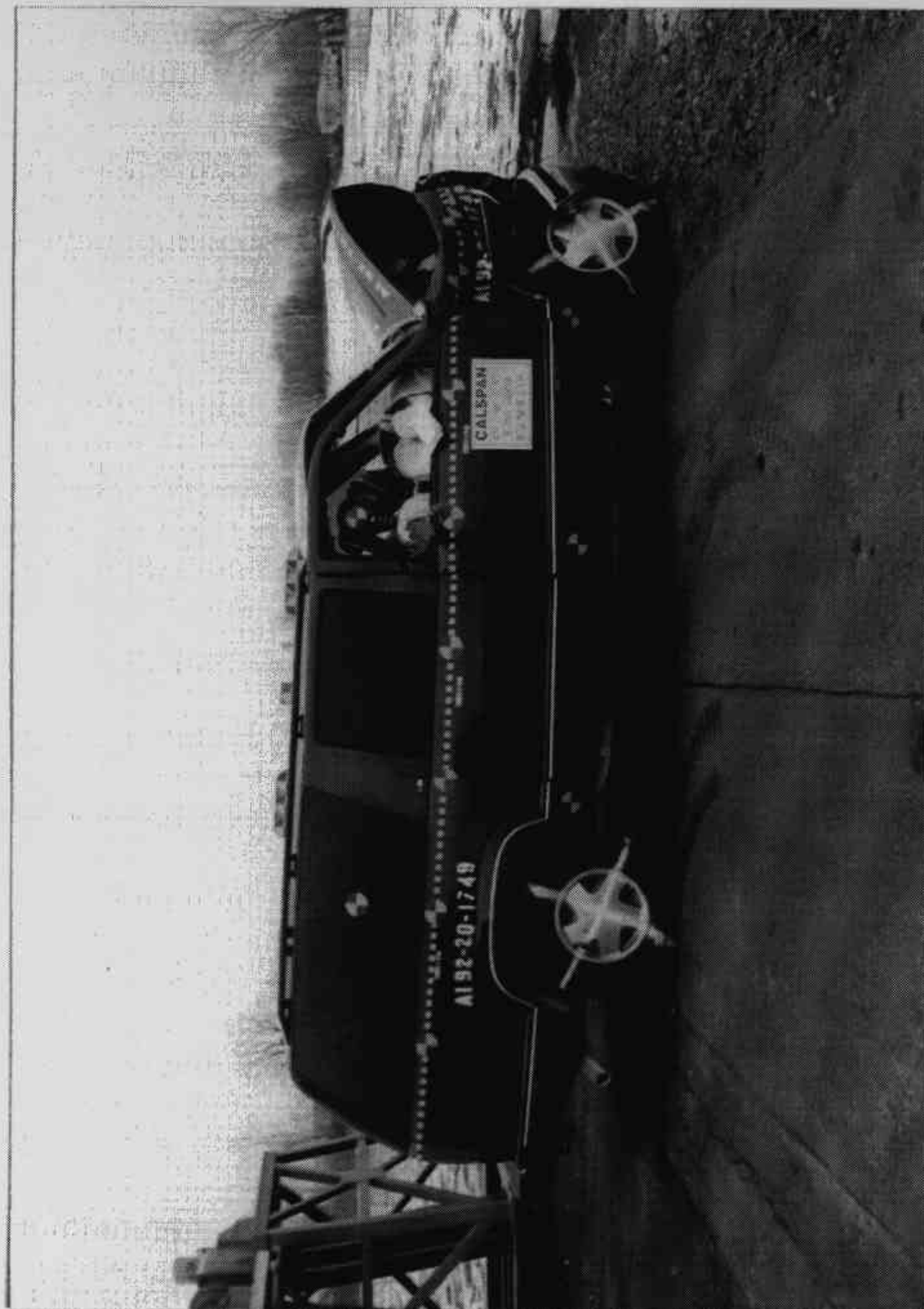


Figure A-7 POST-TEST RIGHT SIDE VIEW



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

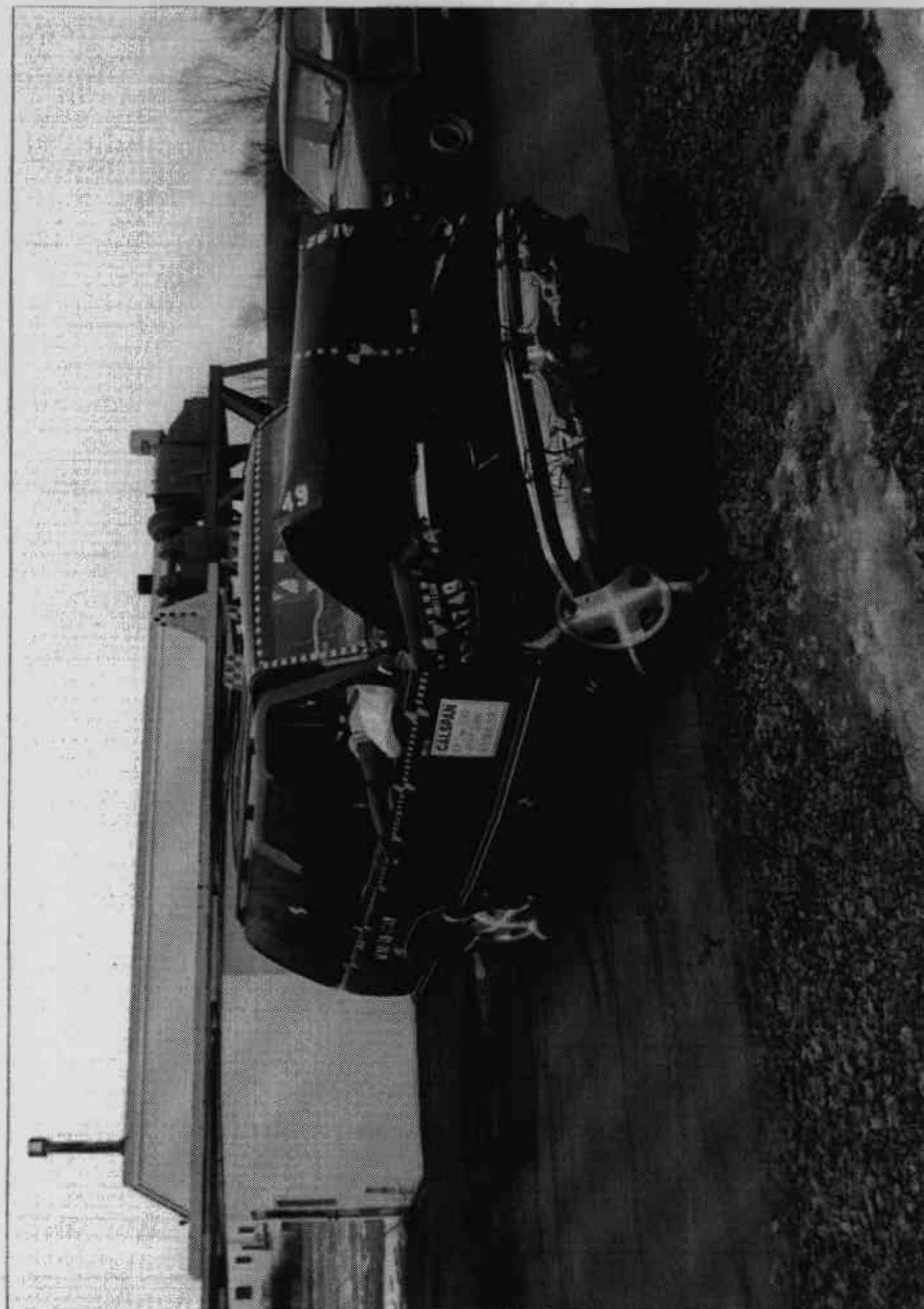


Figure A-9 POST-TEST RIGHT FRONT THREE-QUARTER VIEW



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



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

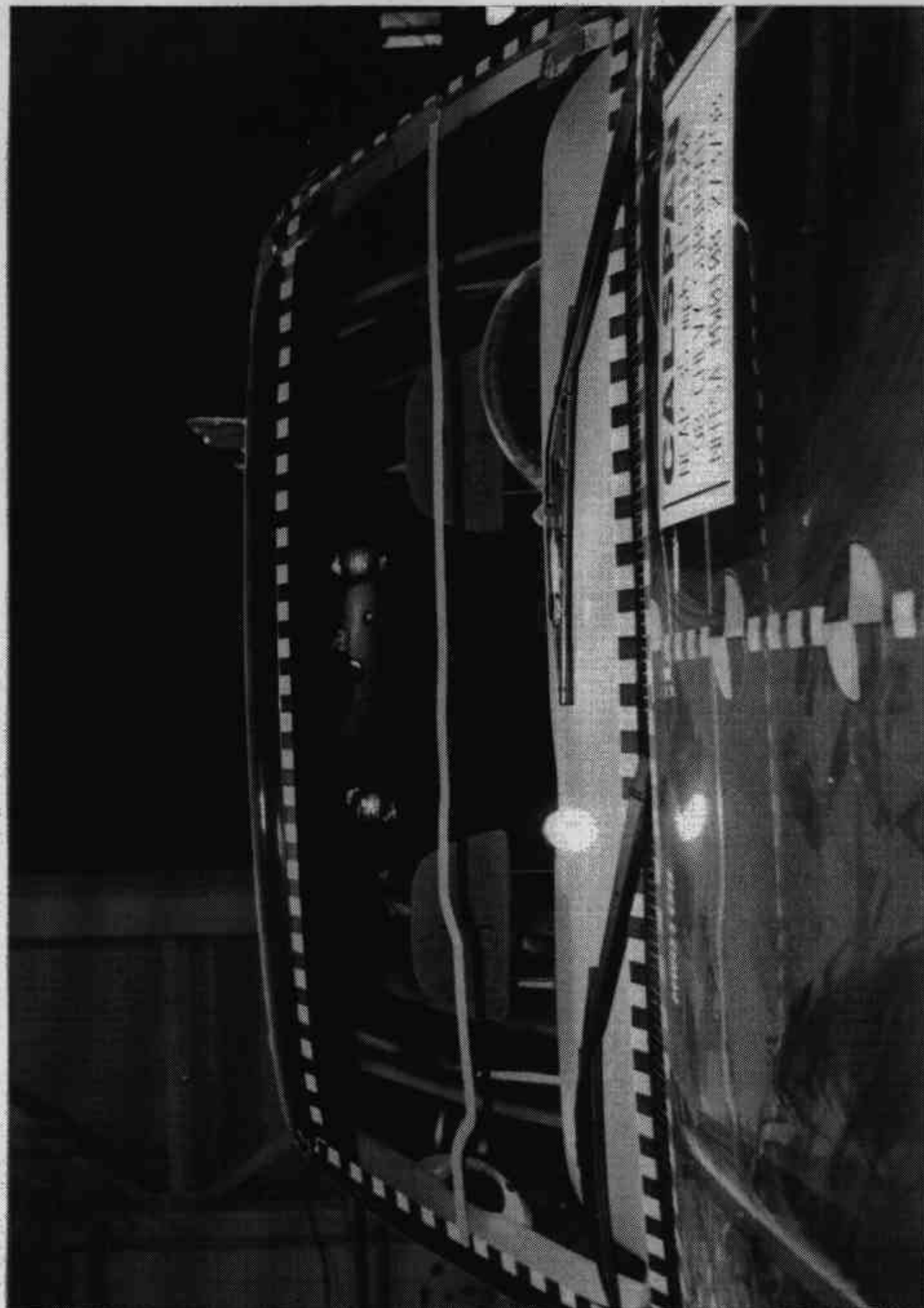


Figure A-12 PRE-TEST WINDSHIELD VIEW



Figure A-13 POST-TEST WINDSHIELD VIEW

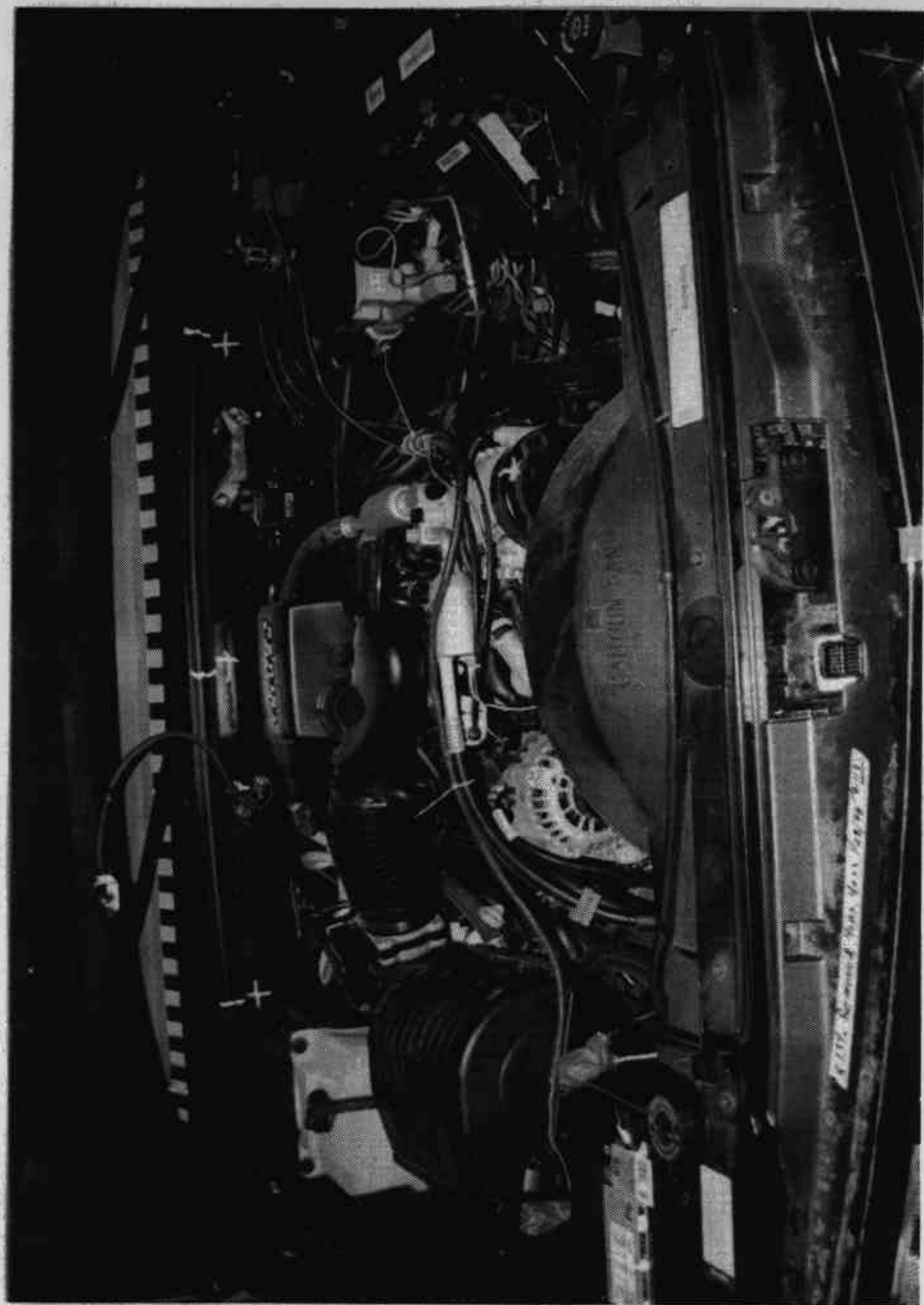


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

Figure A-15 FUEL CAP VIEW





Figure A-16 PRE-TEST FRONT UNDERBODY VIEW

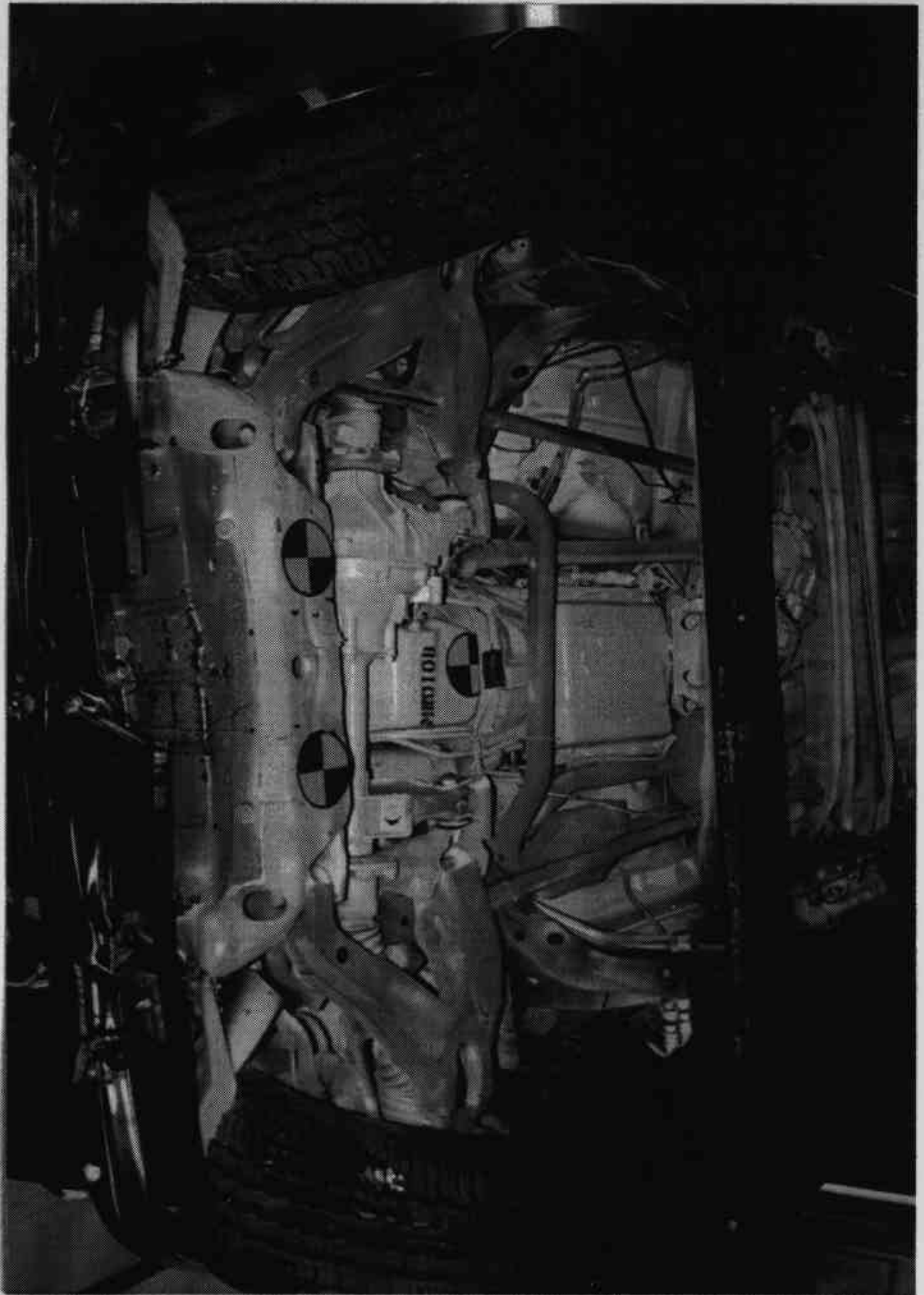


Figure A-17 POST-TEST FRONT UNDERBODY VIEW



Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW



Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

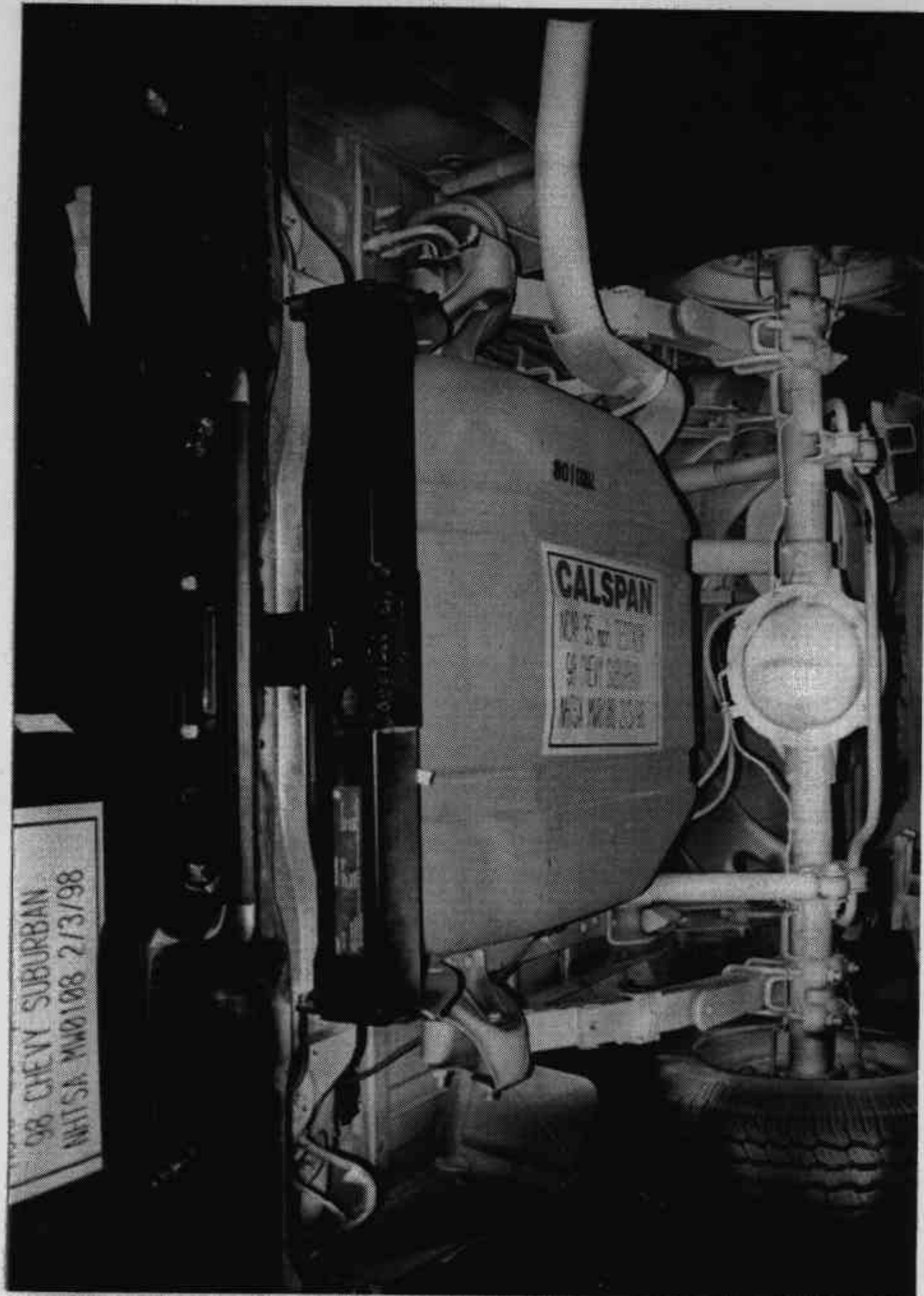
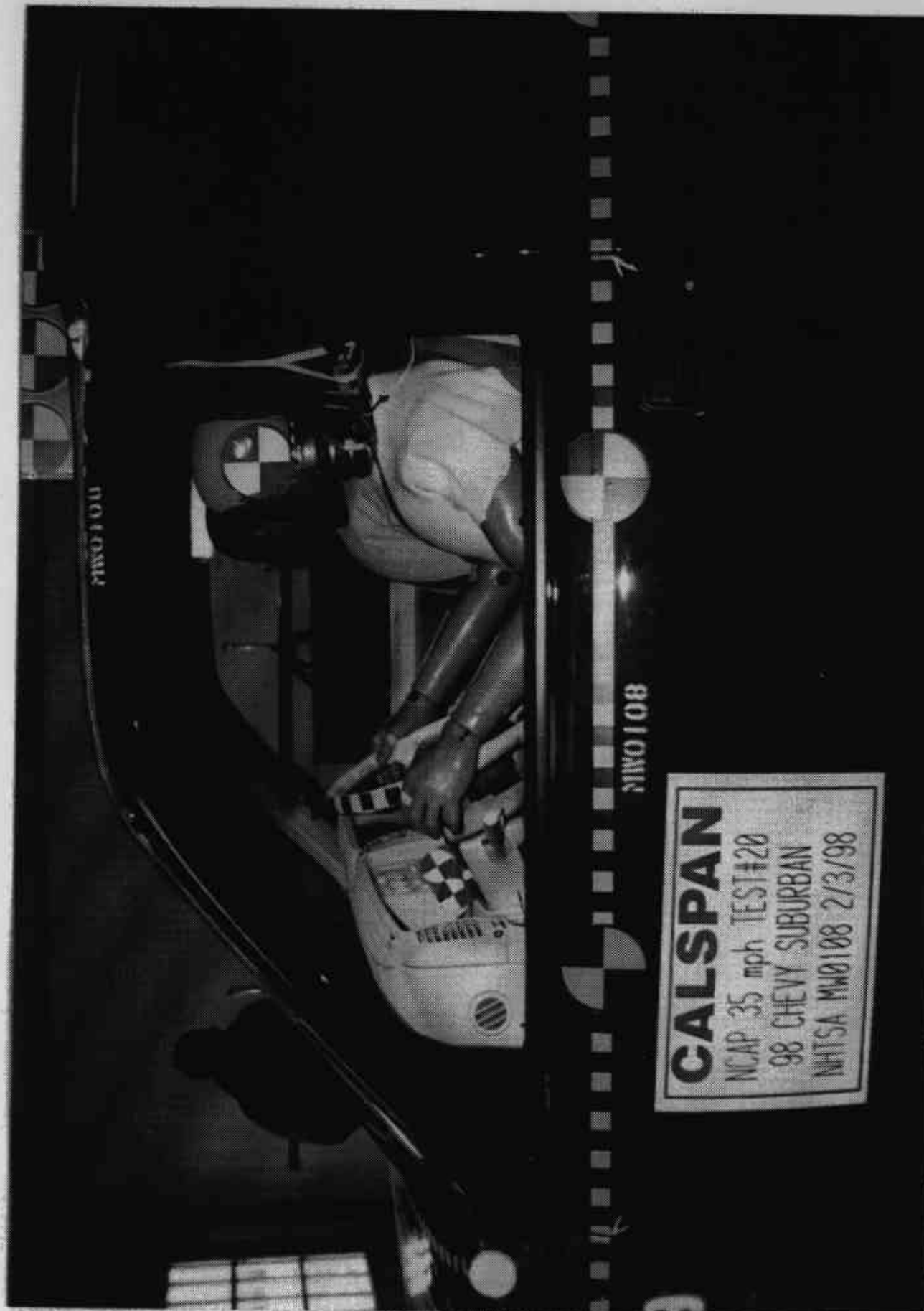


Figure A-20 PRE-TEST REAR UNDERBODY VIEW



Figure A-21 POST-TEST REAR UNDERBODY VIEW



CALSPAN
NCAP 35 mph TEST#20
98 CHEVY SUBURBAN
NHTSA MW0108 2/3/98

Figure A-22 PRE-TEST DRIVER POSITION VIEW

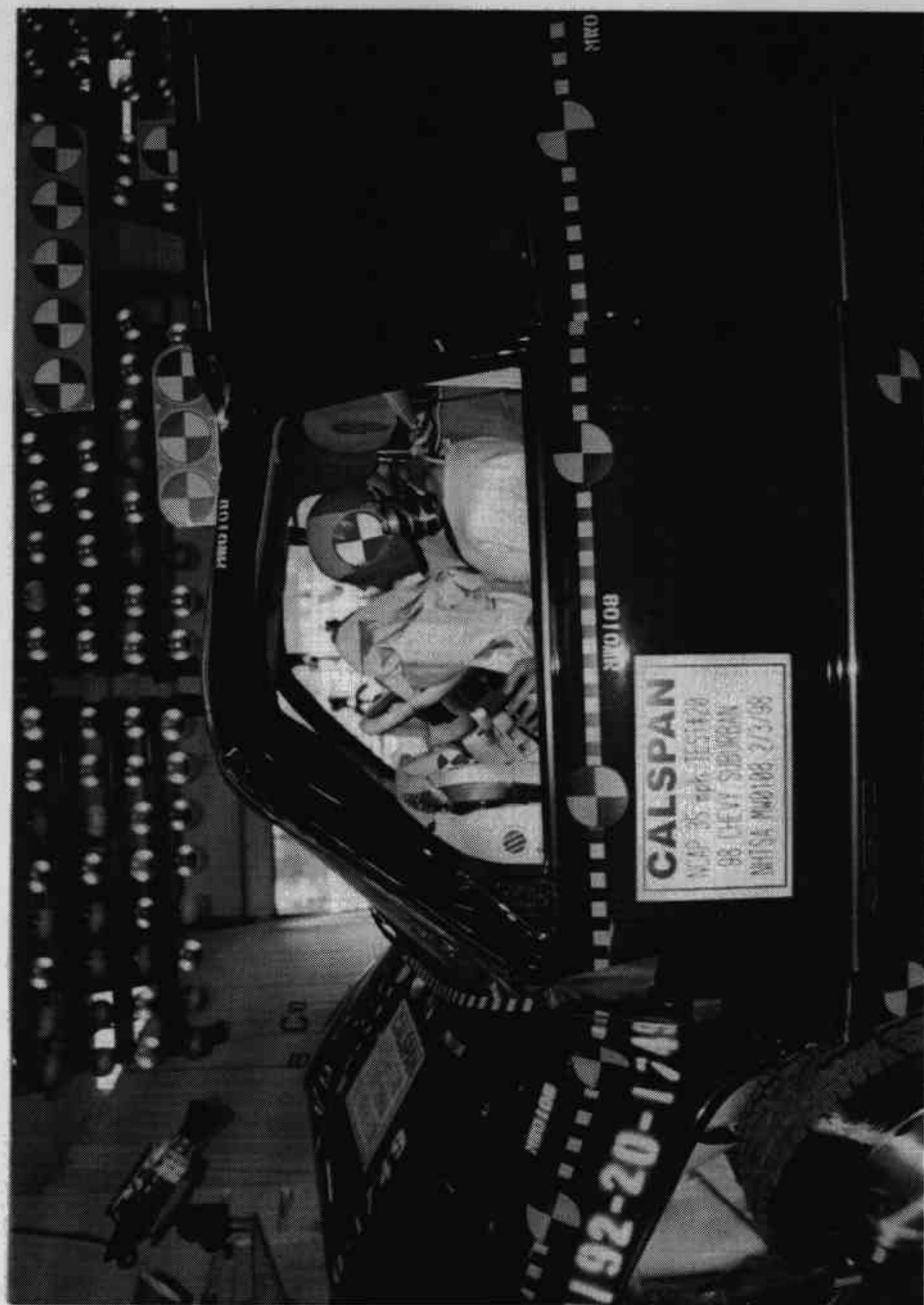


Figure A-23 POST-TEST DRIVER POSITION VIEW

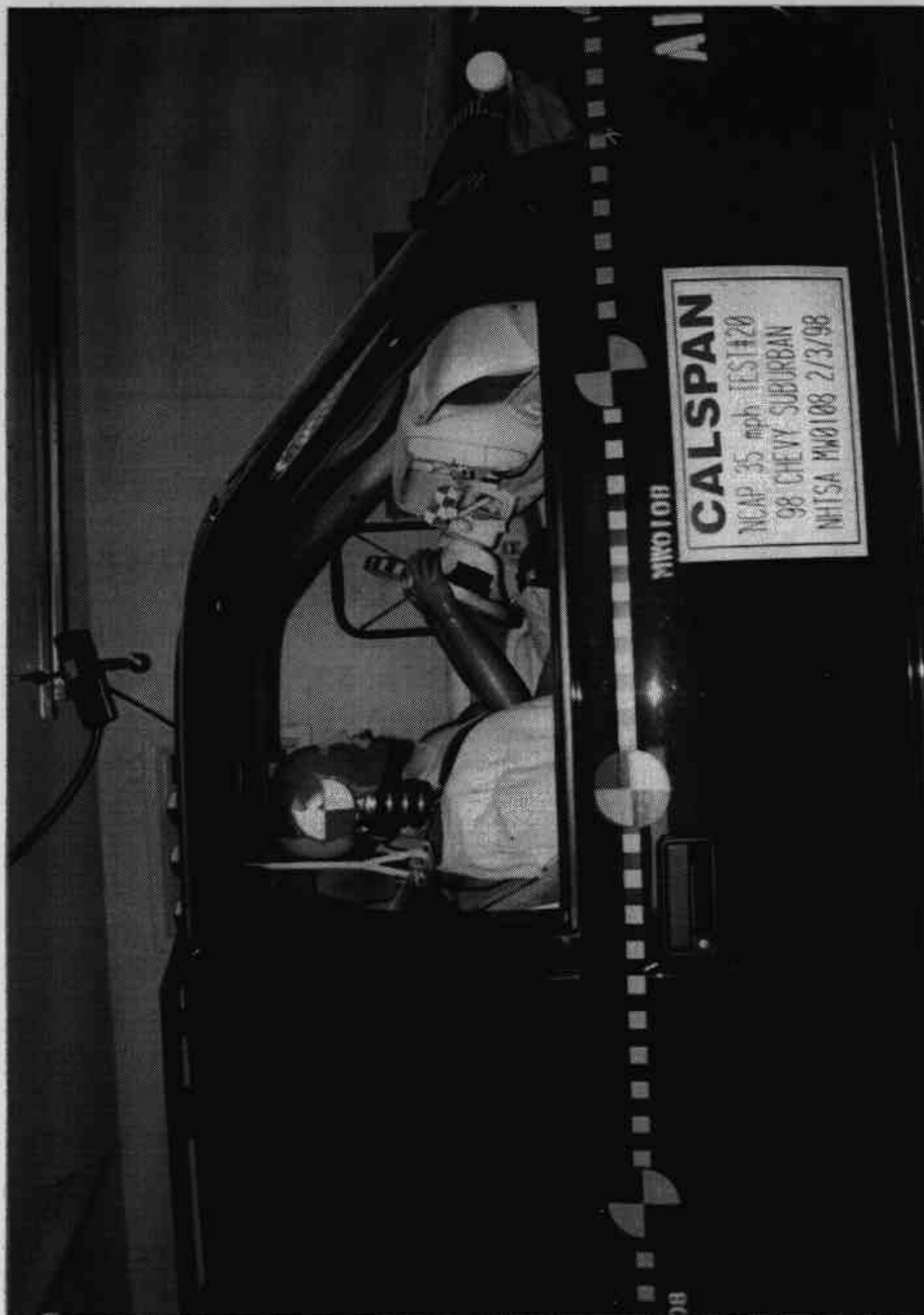


Figure A-24 PRE-TEST PASSENGER POSITION VIEW

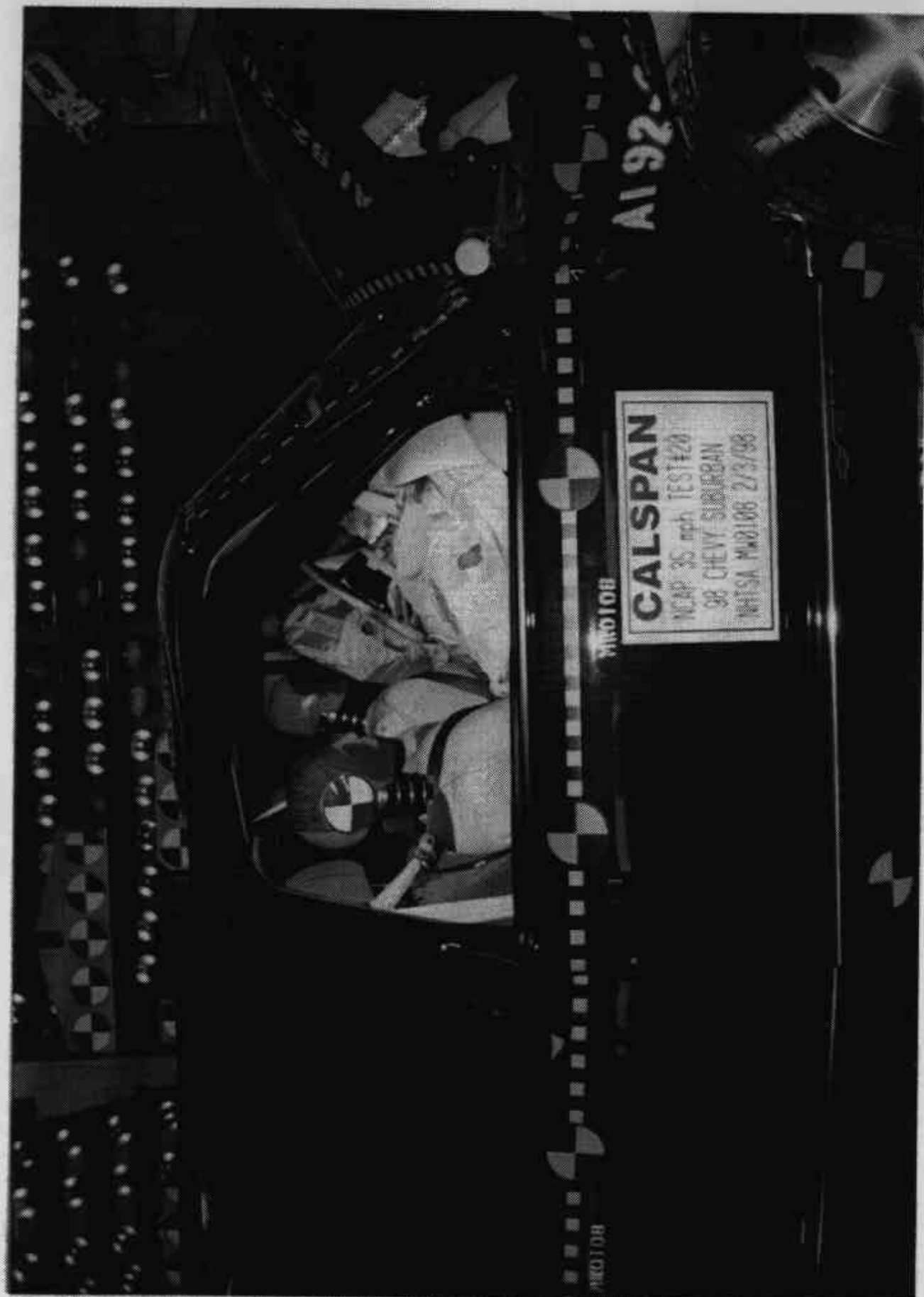


Figure A-25 POST-TEST PASSENGER POSITION VIEW

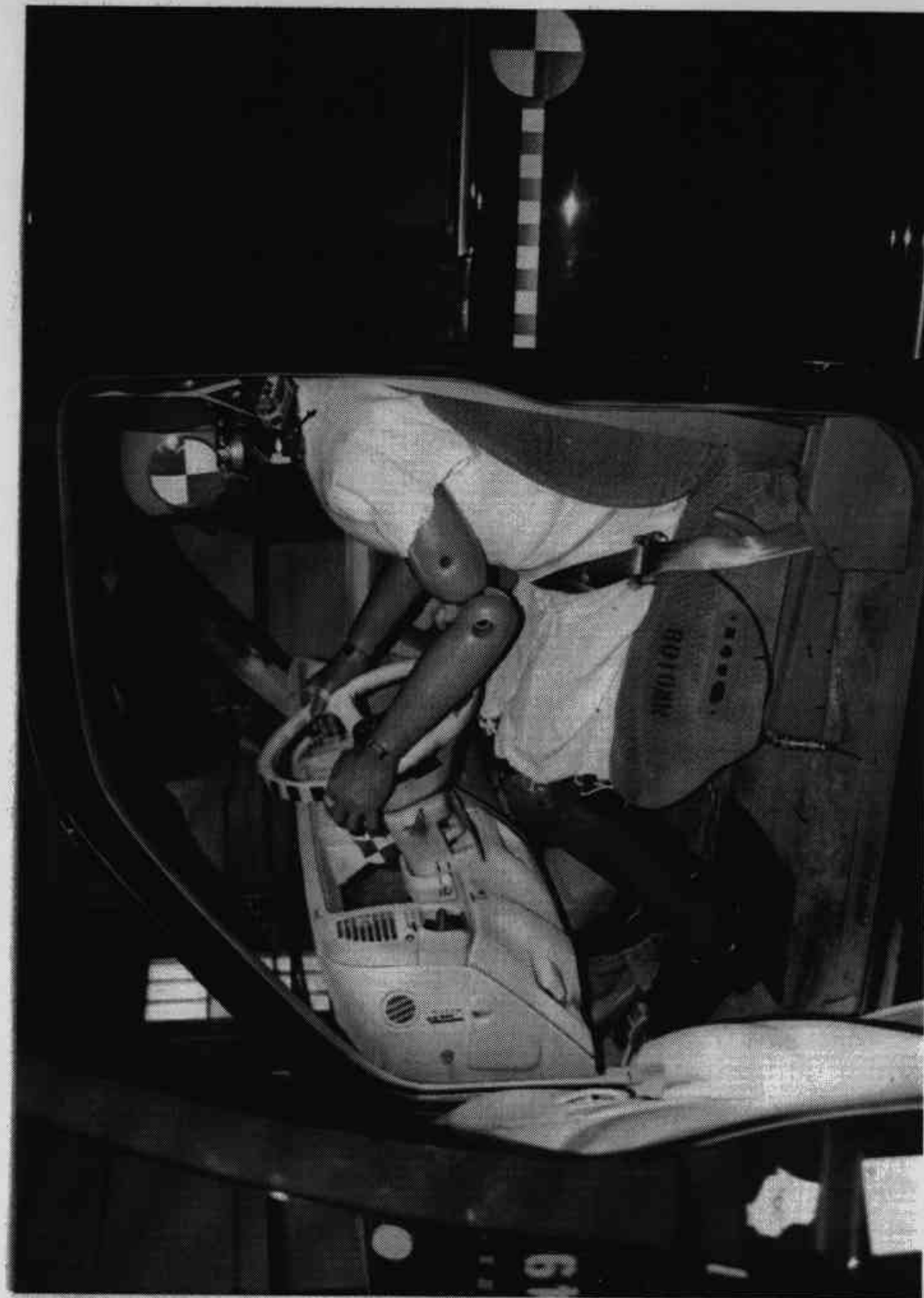


Figure A-26 PRE-TEST DRIVER AND INTERIOR VIEW



Figure A-27 POST-TEST DRIVER AND INTERIOR VIEW

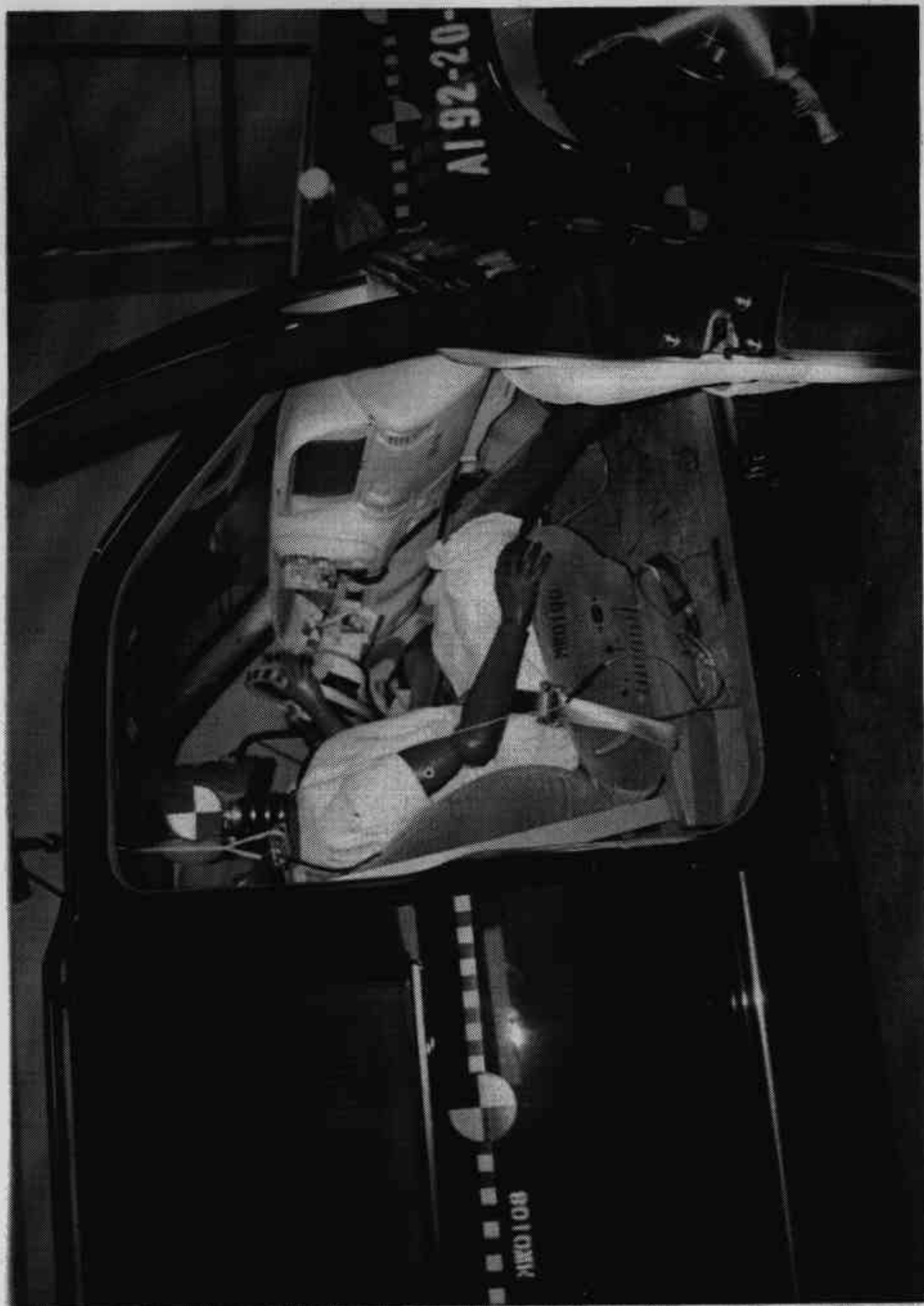


Figure A-28 PRE-TEST PASSENGER AND INTERIOR VIEW



Figure A-29 POST-TEST PASSENGER AND INTERIOR VIEW

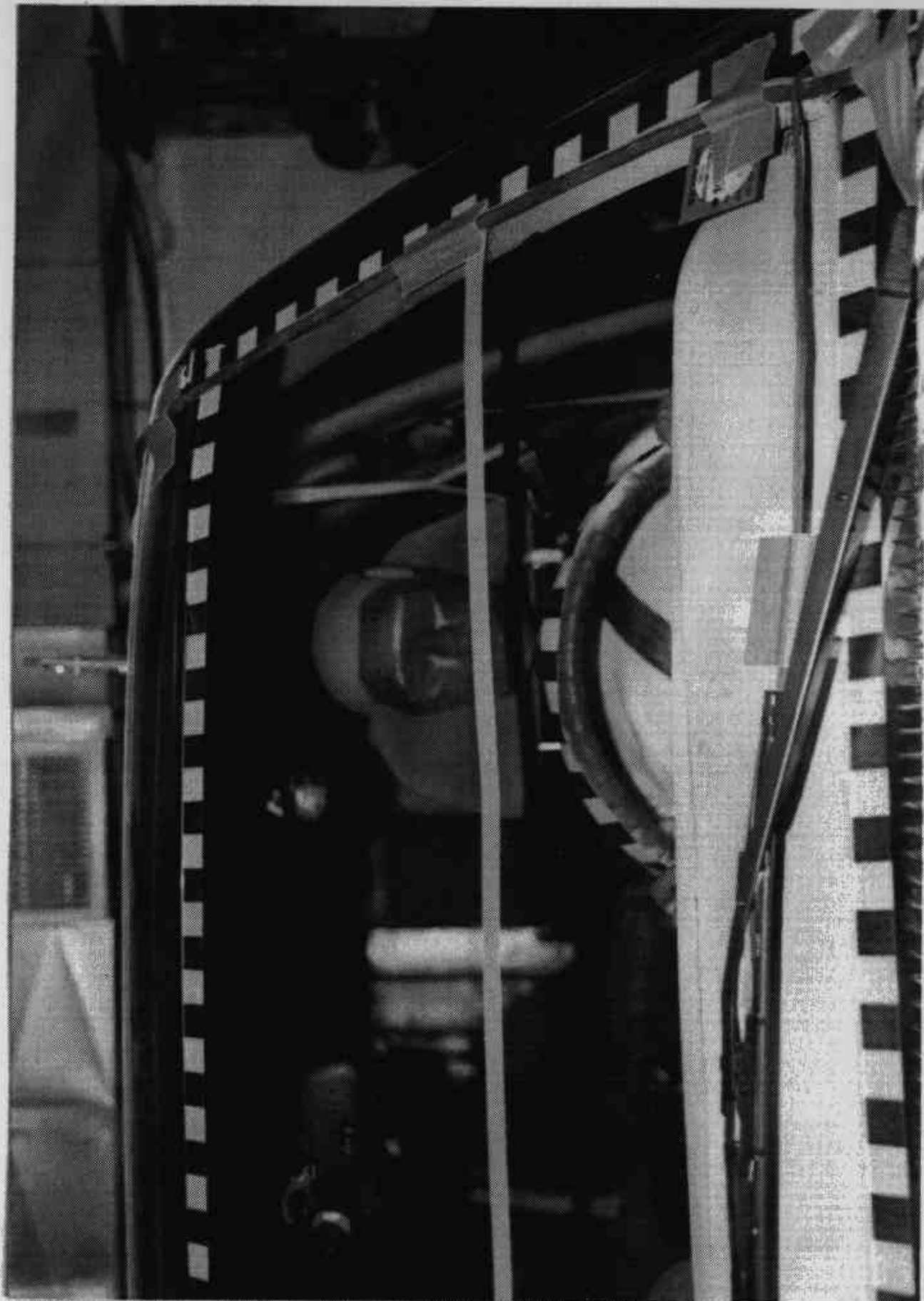


Figure A-30 PRE-TEST DRIVER HEAD LOCATION

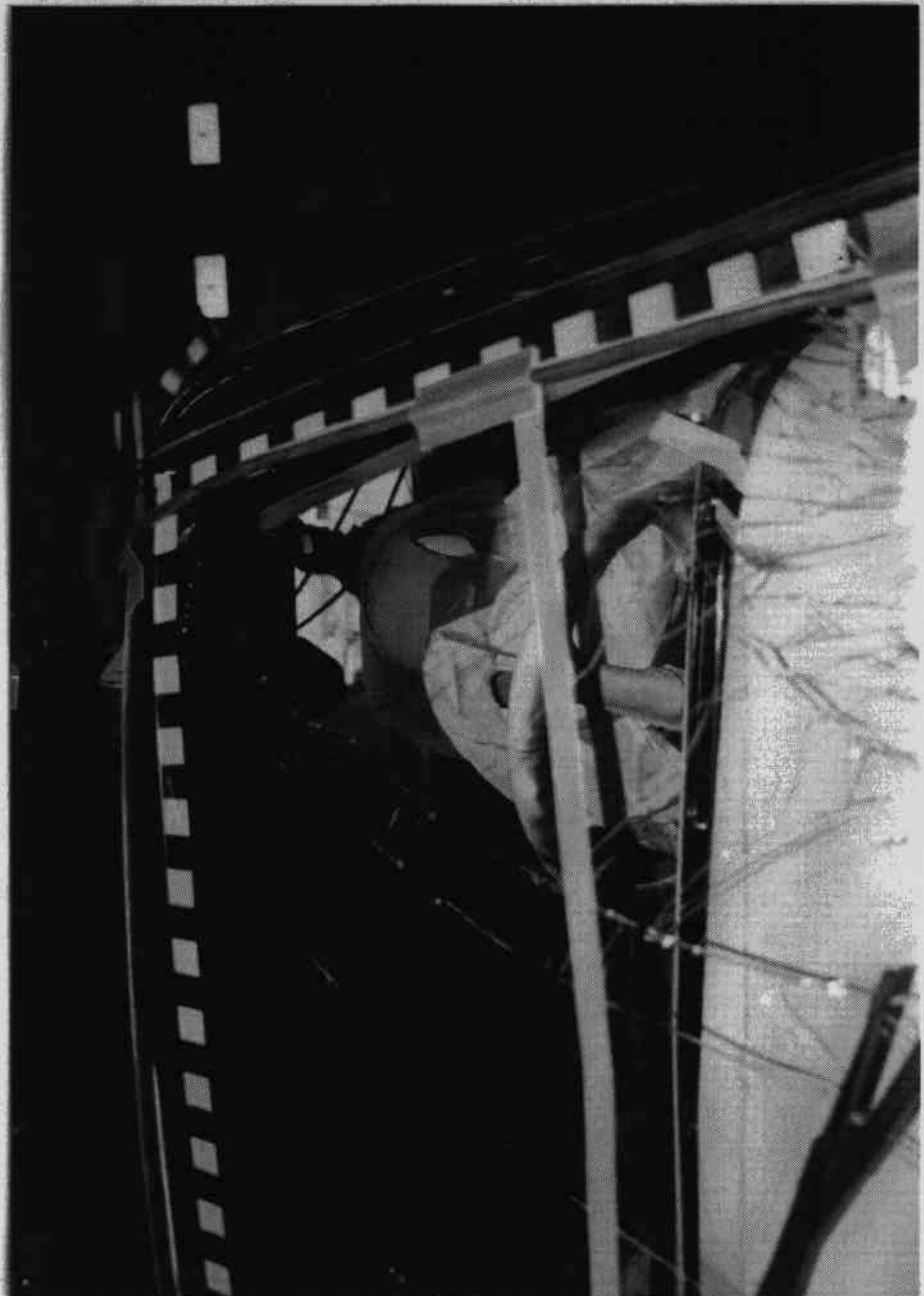


Figure A-31 POST-TEST DRIVER HEAD LOCATION



Figure A-32 PRE-TEST PASSENGER HEAD LOCATION

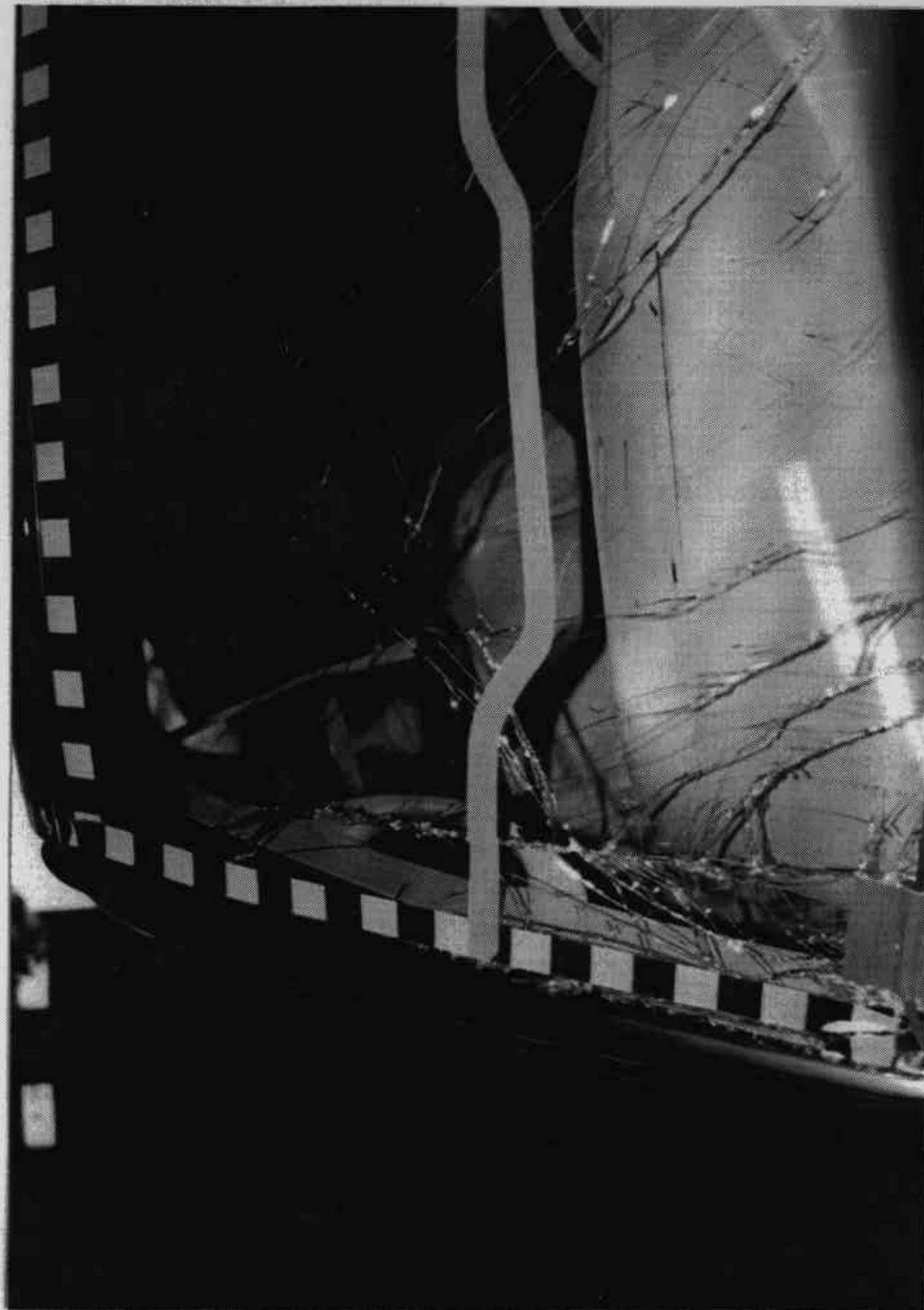


Figure A-33 POST-TEST PASSENGER HEAD LOCATION



Figure A-34 PRE-TEST DRIVER FLOOR PAN VIEW



Figure A-35 POST-TEST DRIVER FLOOR PAN VIEW

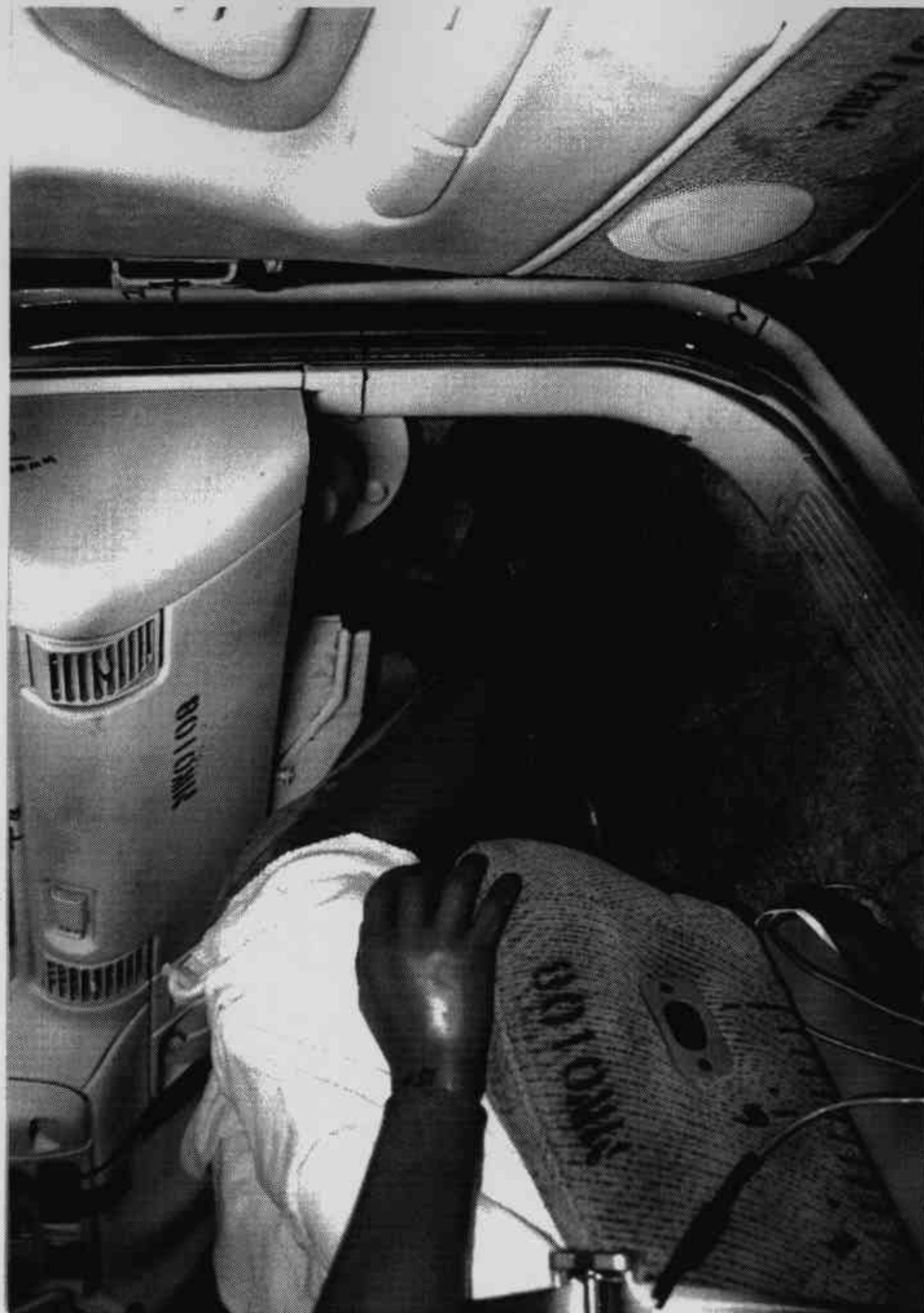


Figure A-36 PRE-TEST PASSENGER FLOOR PAN VIEW



Figure A-37 POST-TEST PASSENGER FLOOR PAN VIEW

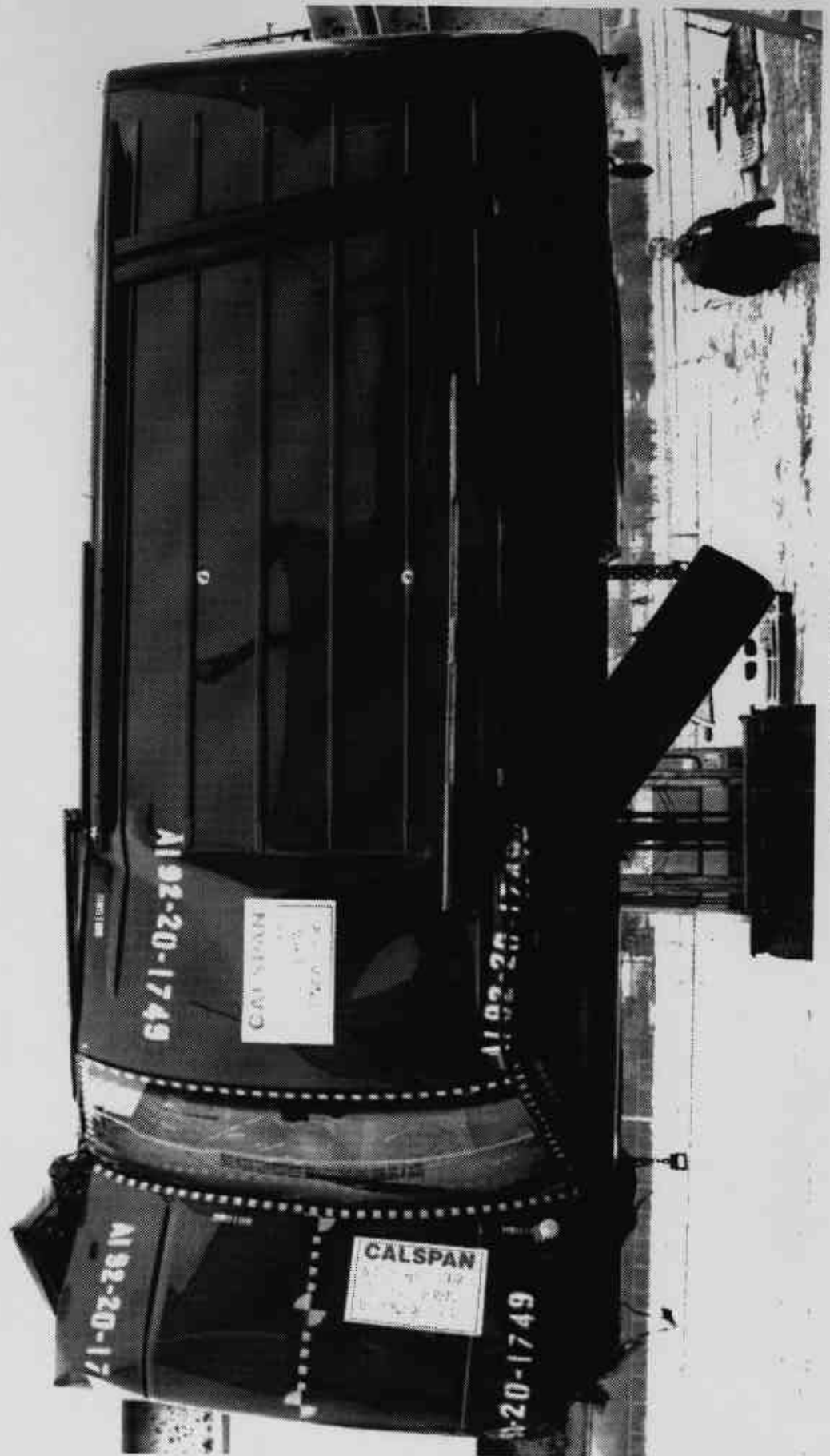


Figure A-38 ROLLOVER VIEW



Figure A-39 IMPACT VIEW

Appendix B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

**Hybrid III Dummy Sign Conventions
Load Cells and Special Transducers**

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

NHTSA TEST NO. MW0108

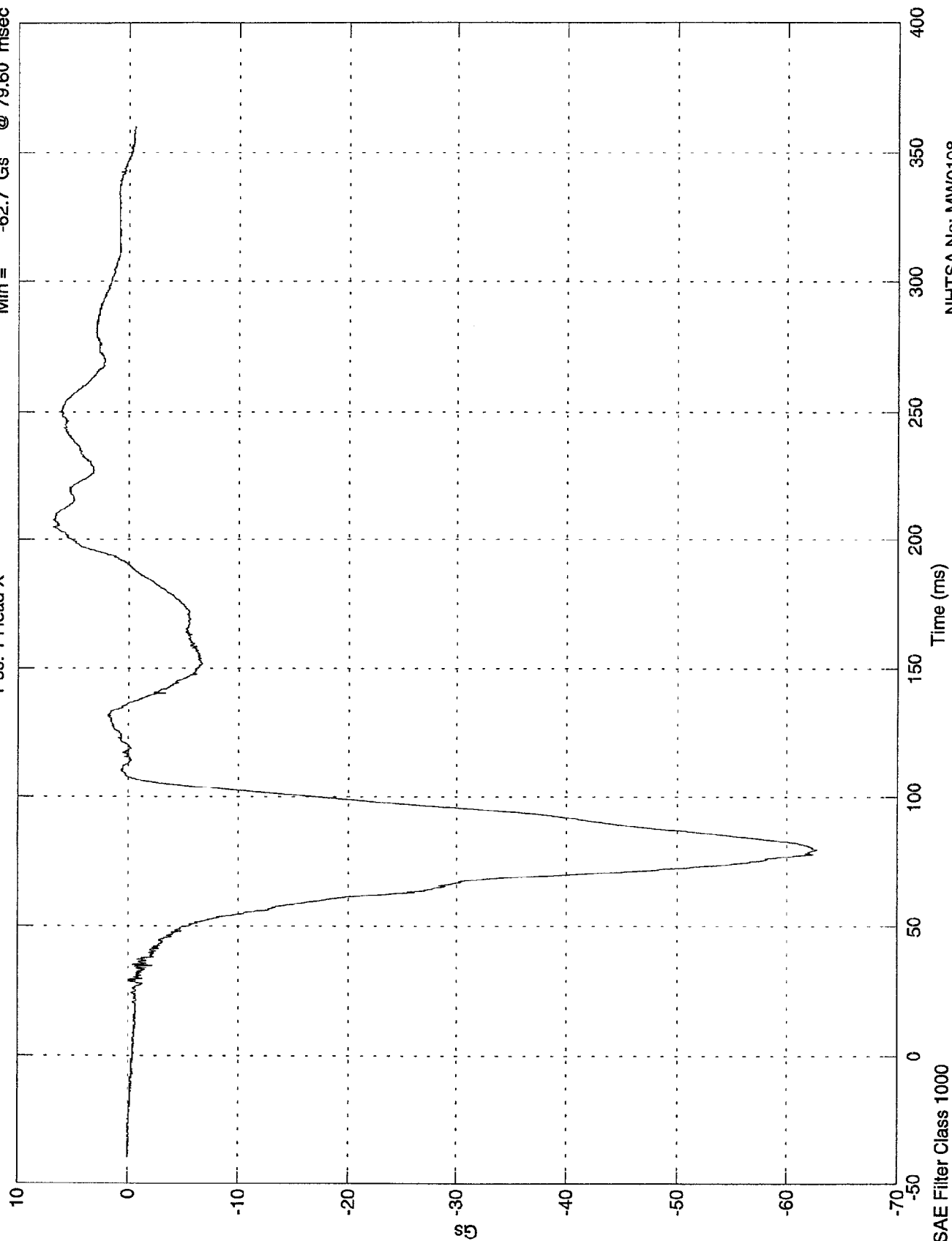
DUMMY DATA

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 #20 - 1998 CHEVROLET SUBURBAN

Max = 6.88 Gs @ 204.70 msec
 Min = -62.7 Gs @ 79.60 msec

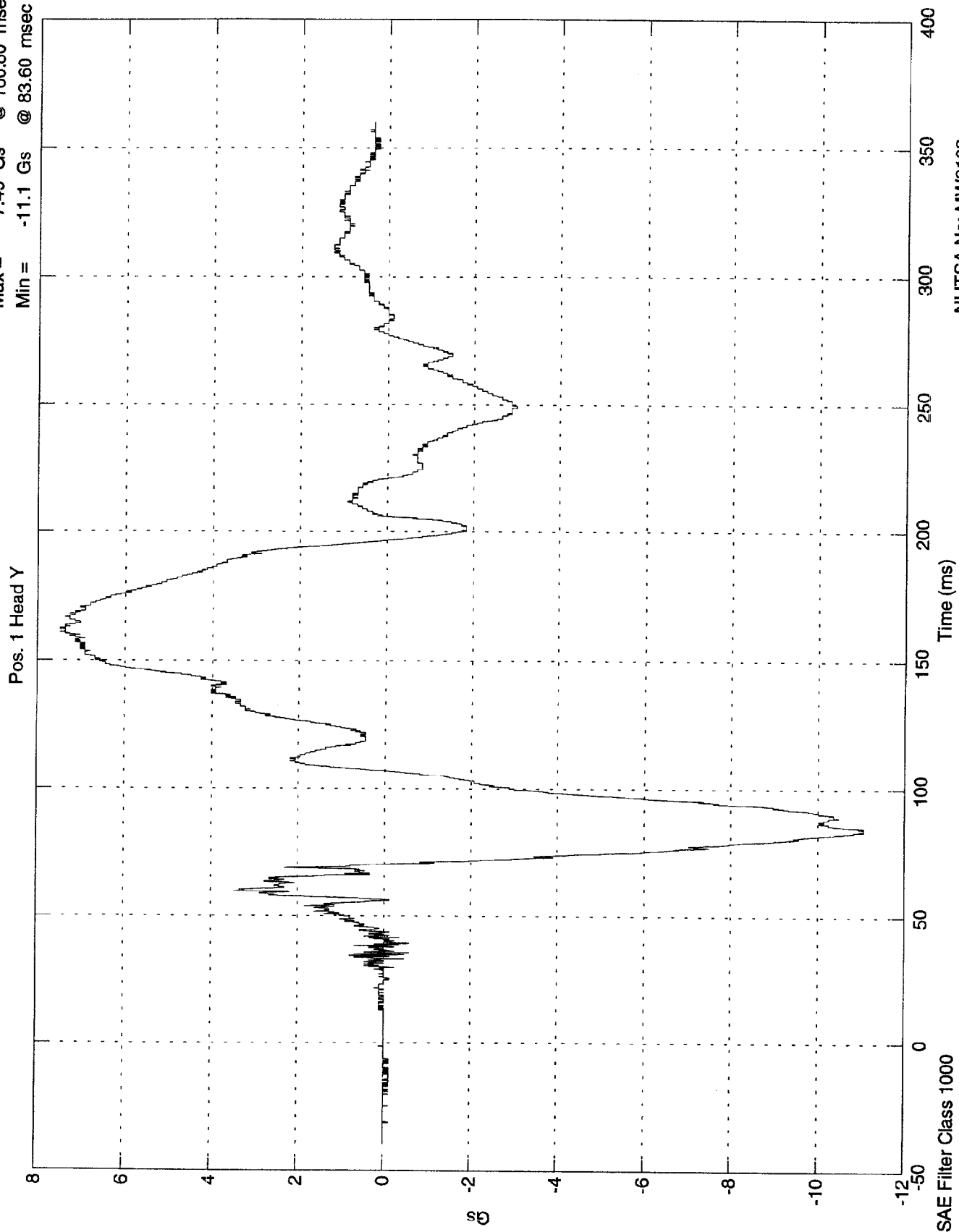
Pos. 1 Head X



NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 7.49 Gs @ 160.80 msec
 Min = -11.1 Gs @ 83.60 msec

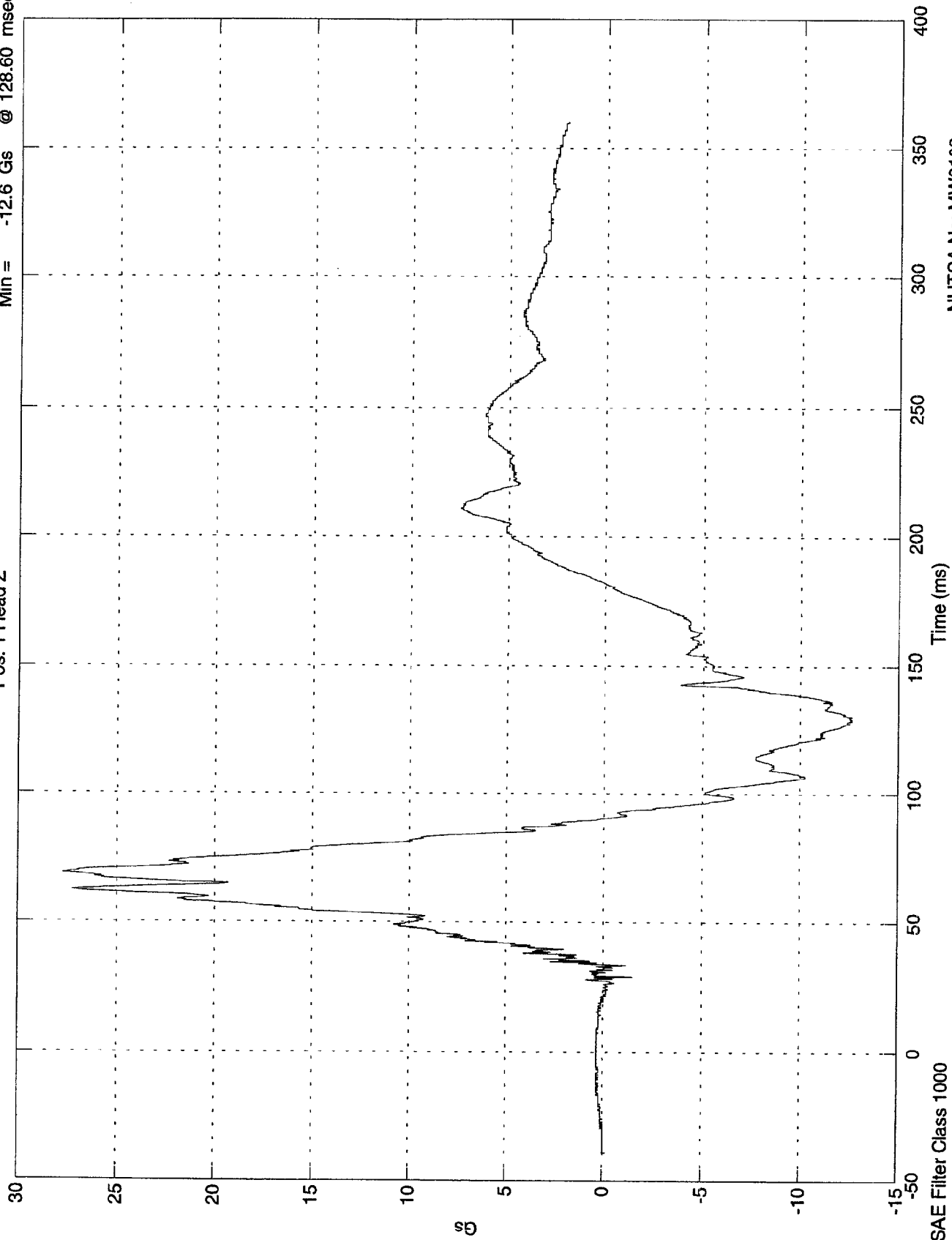


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 27.7 Gs @ 68.50 msec
Min = -12.6 Gs @ 128.60 msec

Pos. 1 Head Z

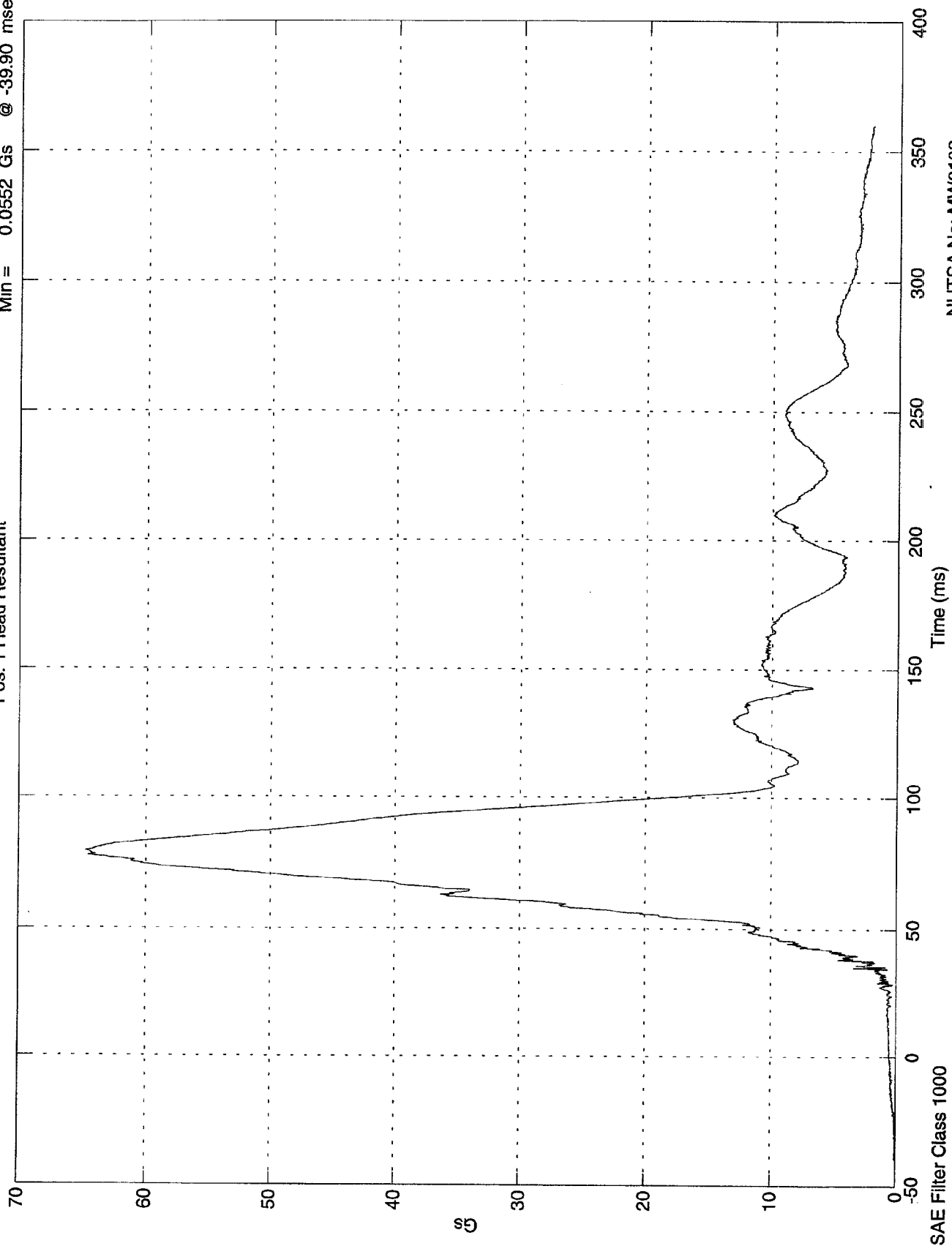


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 64.7 Gs @ 79.60 msec
 Min = 0.0552 Gs @ -39.90 msec

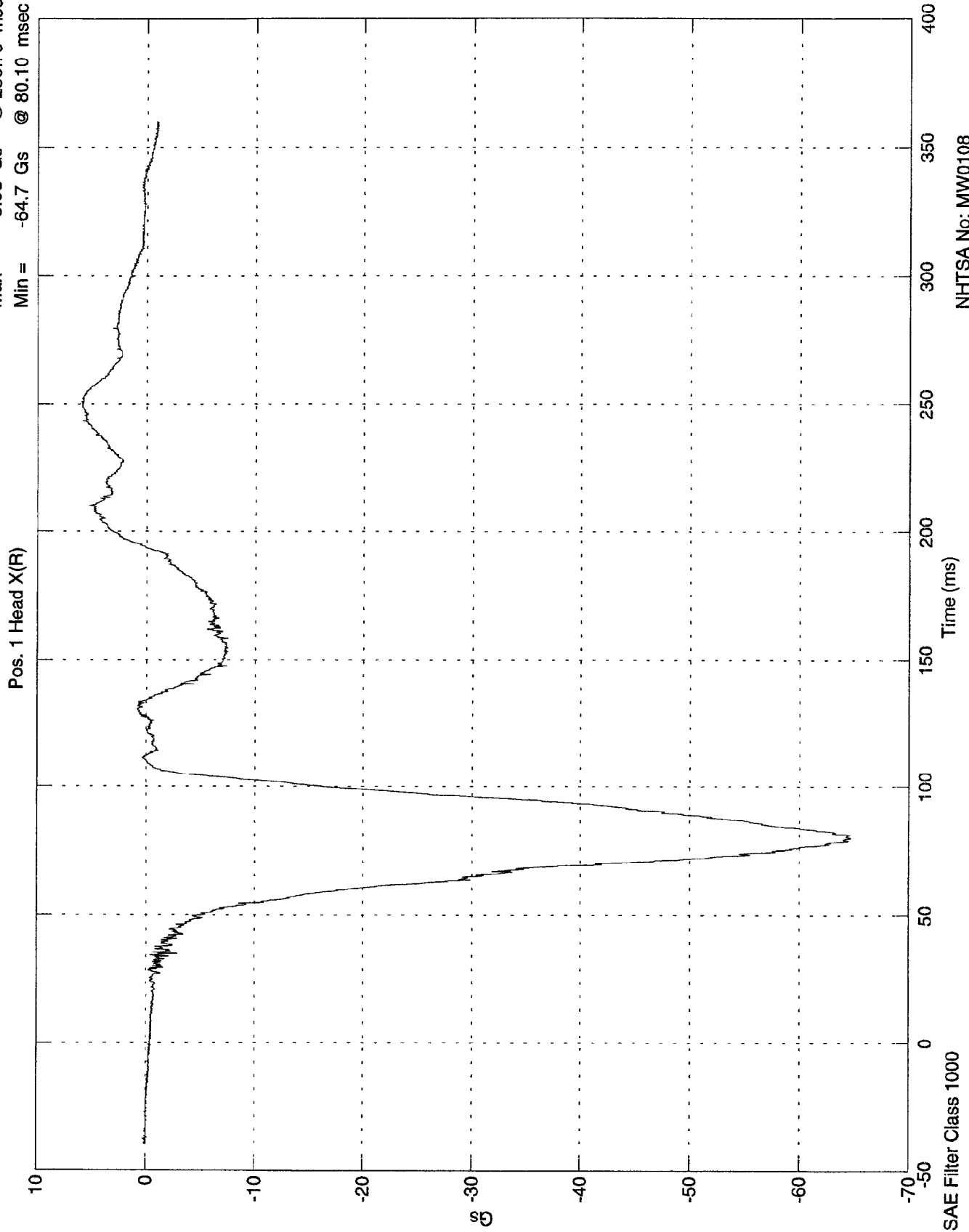
Pos. 1 Head Resultant



NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

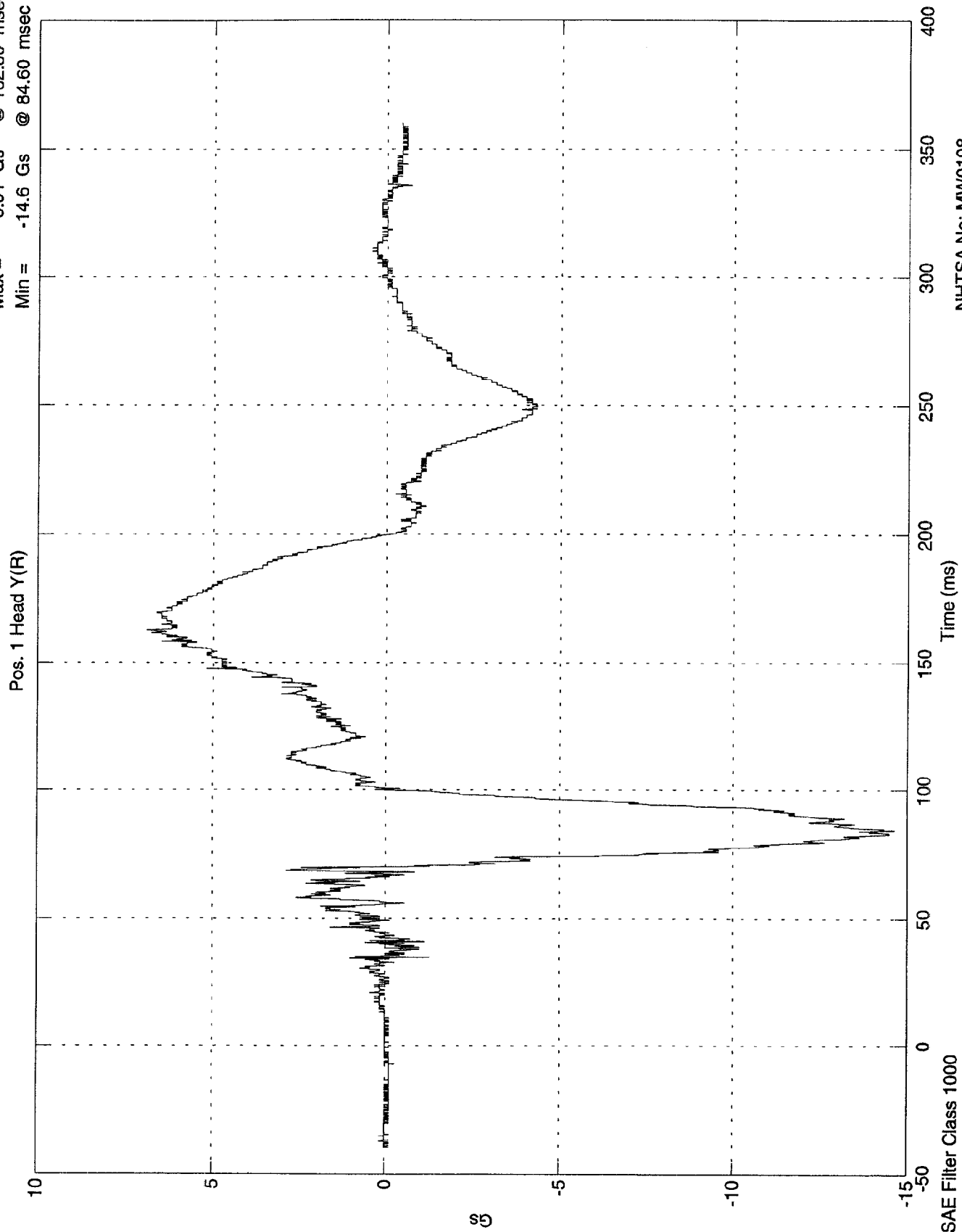
Max = 5.98 Gs @ 250.70 msec
Min = -64.7 Gs @ 80.10 msec



NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

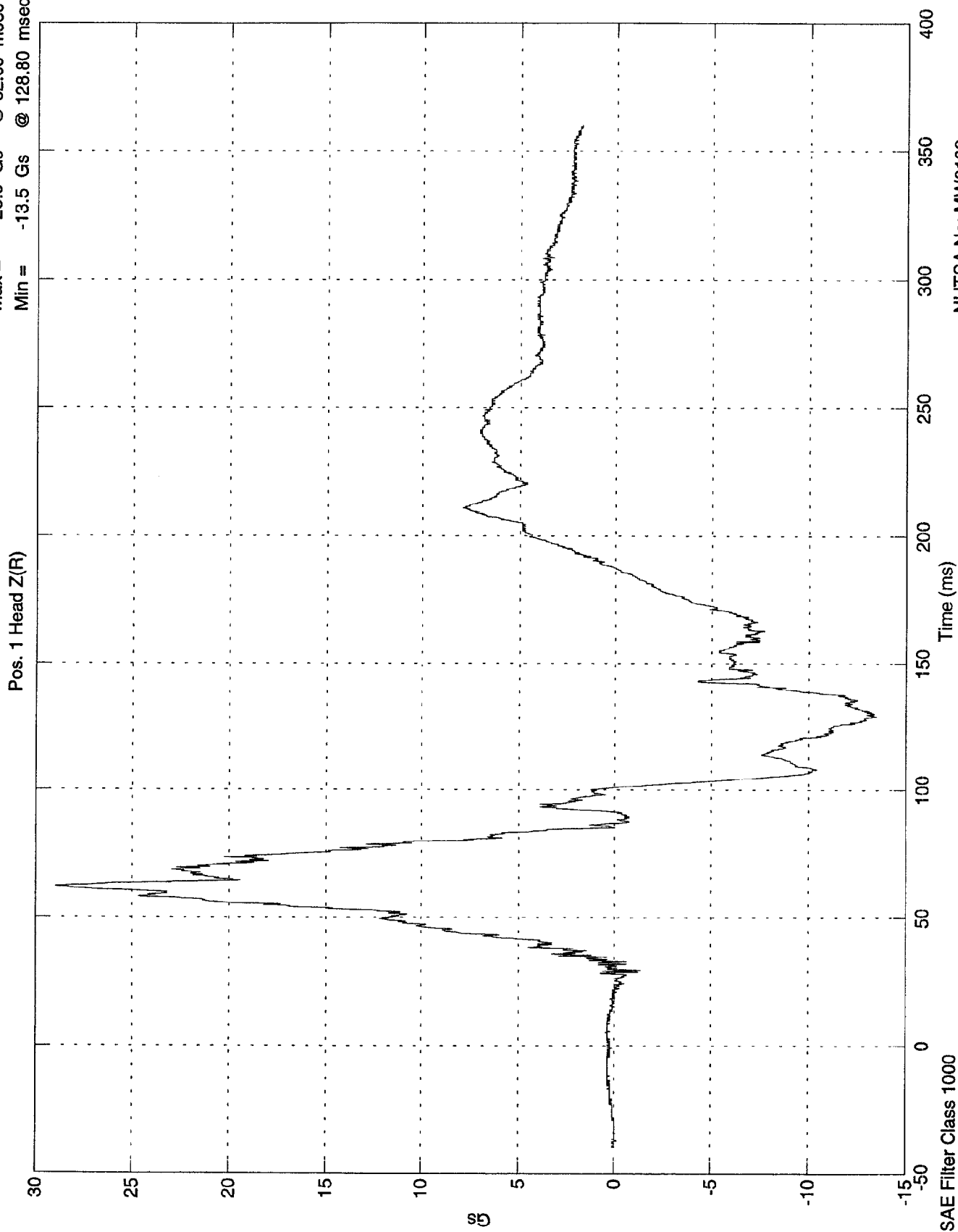
Max = 6.91 Gs @ 162.80 msec
 Min = -14.6 Gs @ 84.60 msec



NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 28.9 Gs @ 62.00 msec
 Min = -13.5 Gs @ 128.80 msec

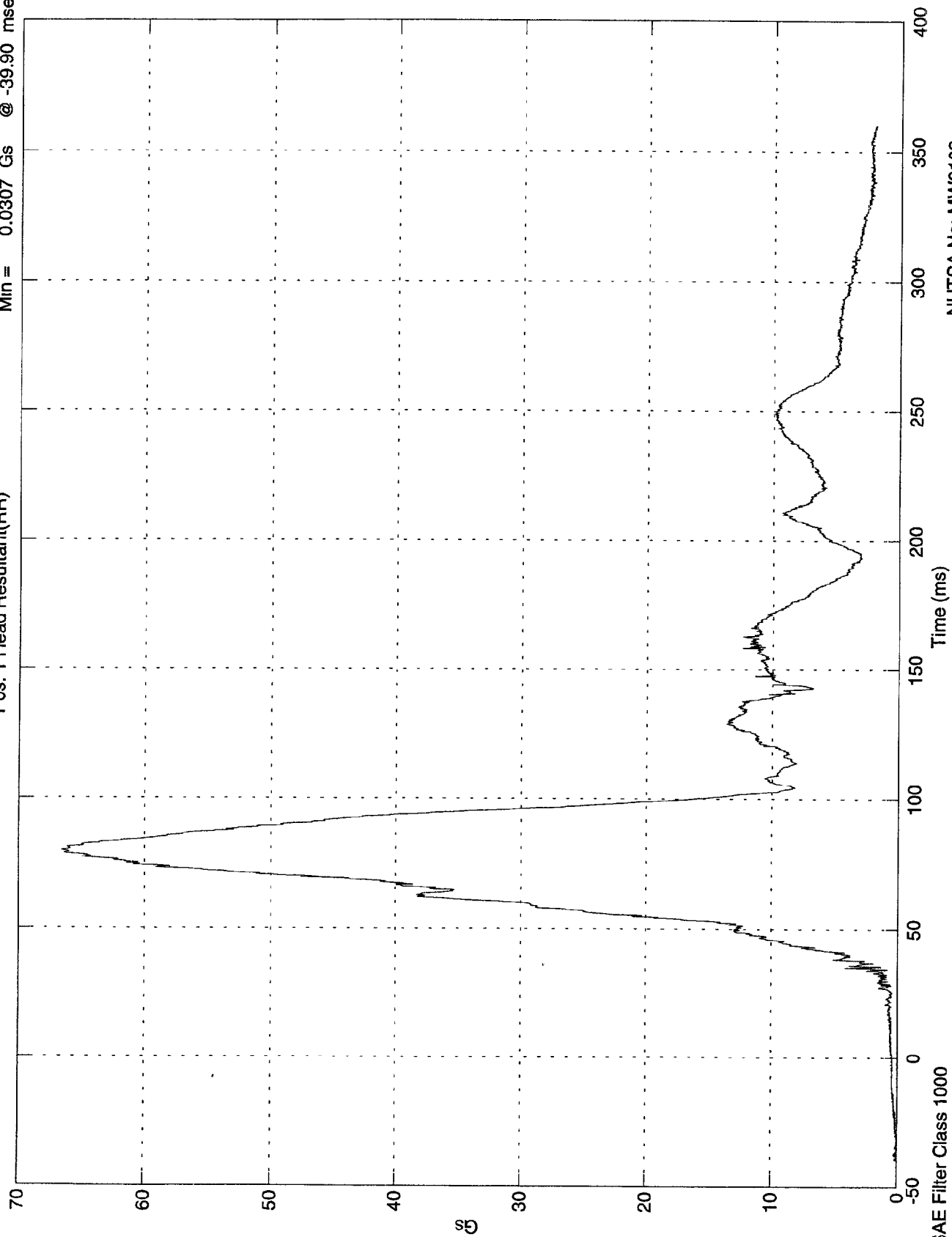


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 66.5 Gs @ 80.00 msec
 Min = 0.0307 Gs @ -39.90 msec

Pos. 1 Head Resultant(RR)

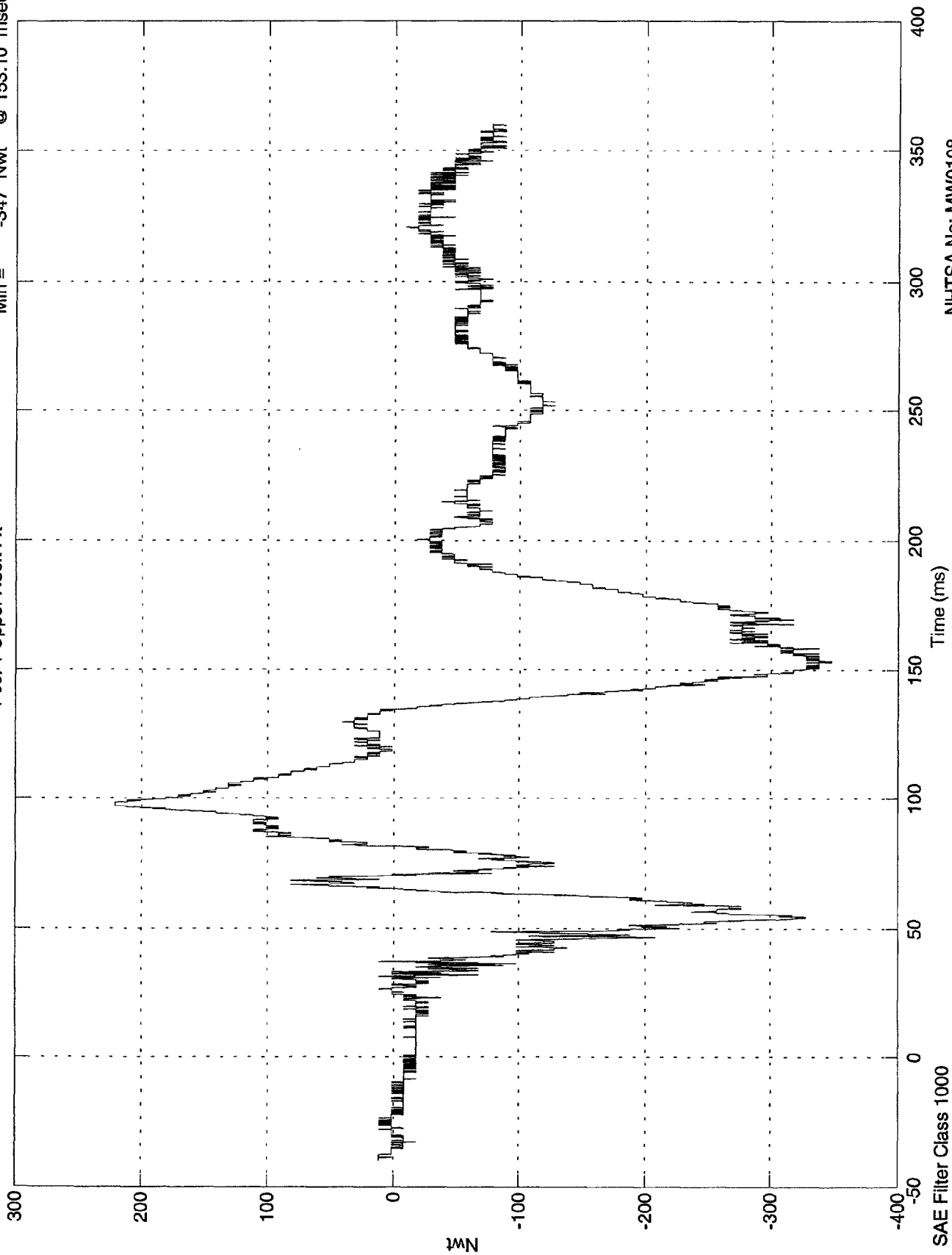


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 221 Nwt @ 96.90 msec
 Min = -347 Nwt @ 153.10 msec

Pos. 1 Upper Neck Fx

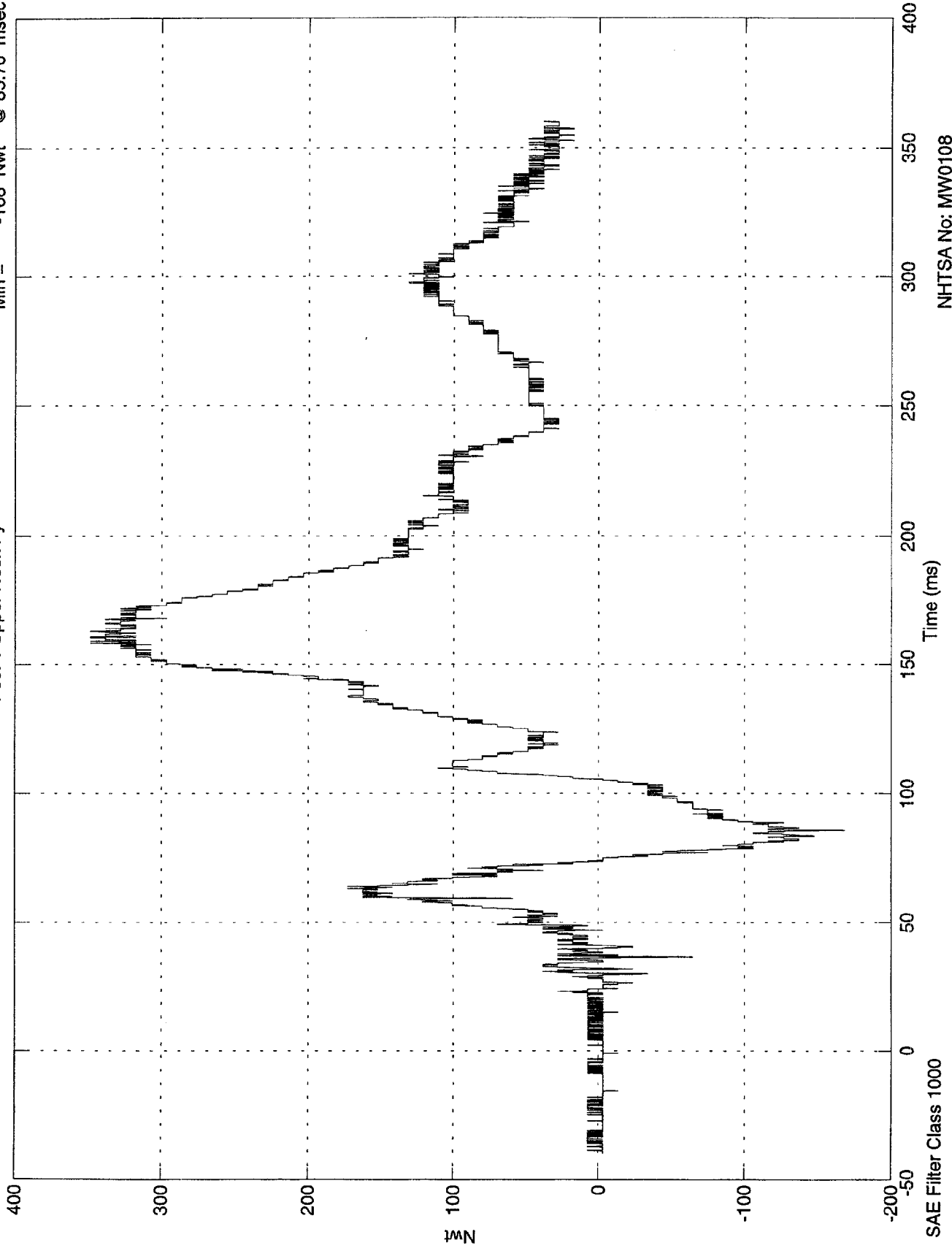


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Pos. 1 Upper Neck Fy

Max = 348 Nwt @ 158.40 msec
Min = -168 Nwt @ 85.70 msec

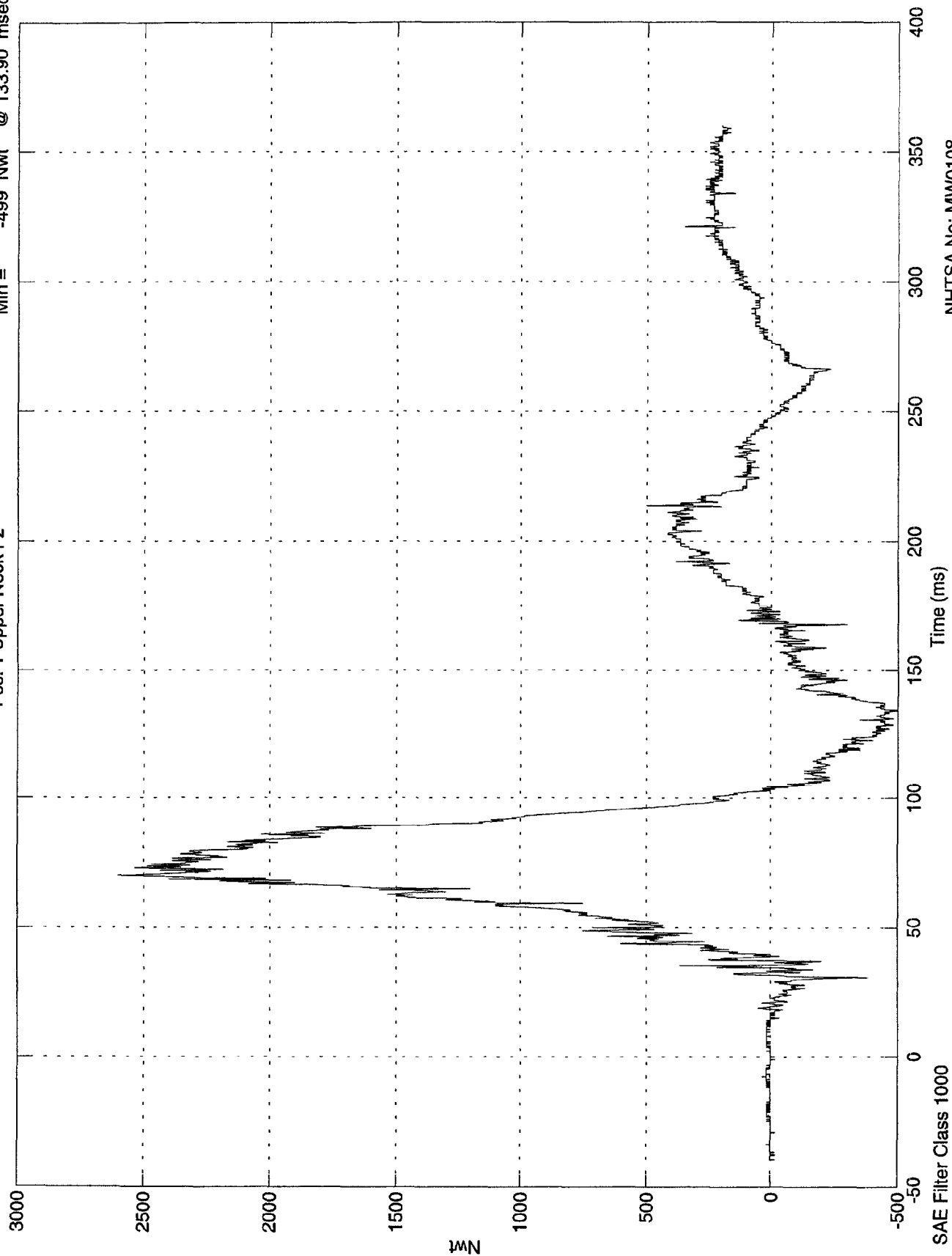


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 2.6e+003 Nwt @ 70.00 msec
 Min = -499 Nwt @ 133.90 msec

Pos. 1 Upper Neck Fz

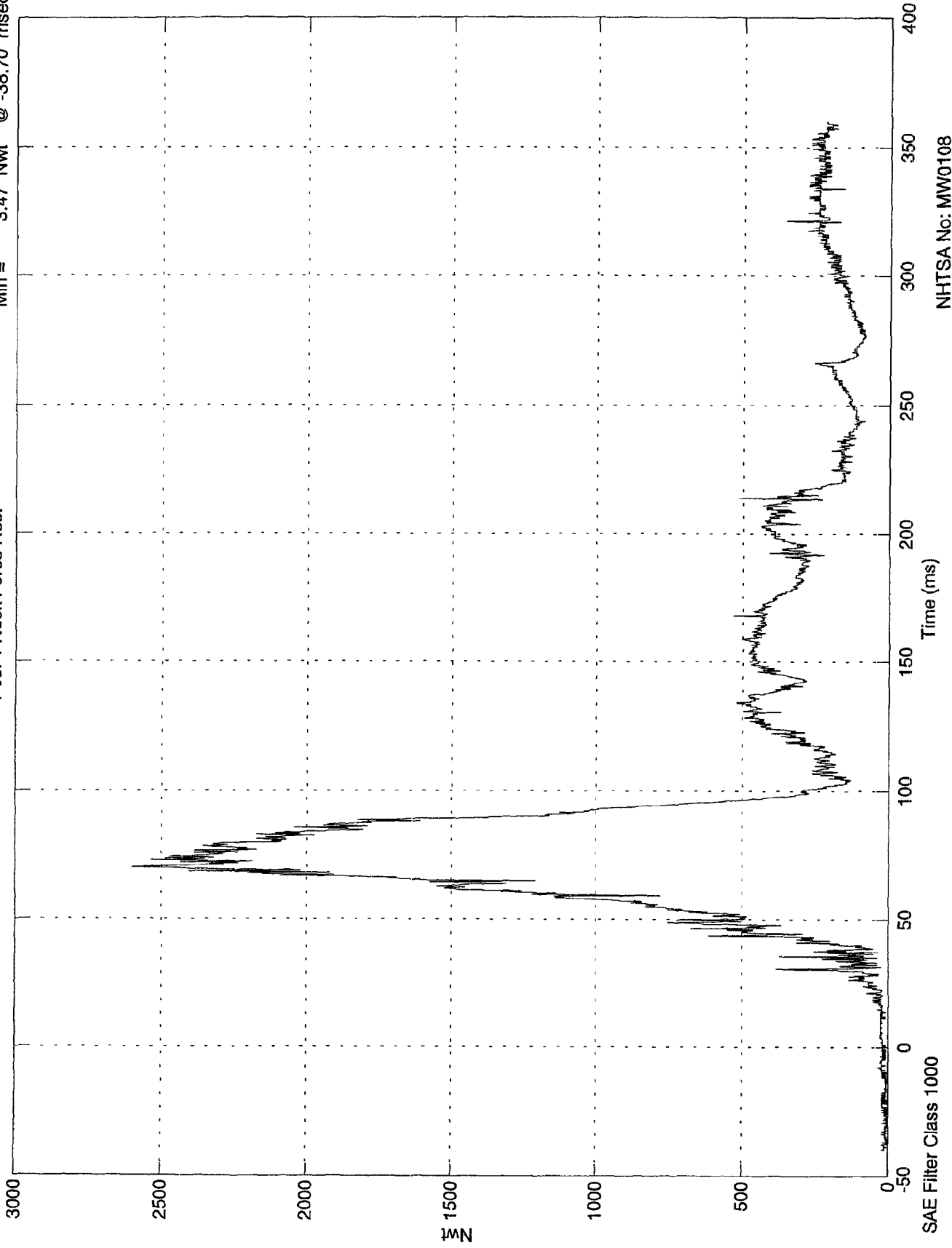


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 2.6e+003 Nwt @ 70.00 msec
Min = 3.47 Nwt @ -38.70 msec

Pos. 1 Neck Force Res.



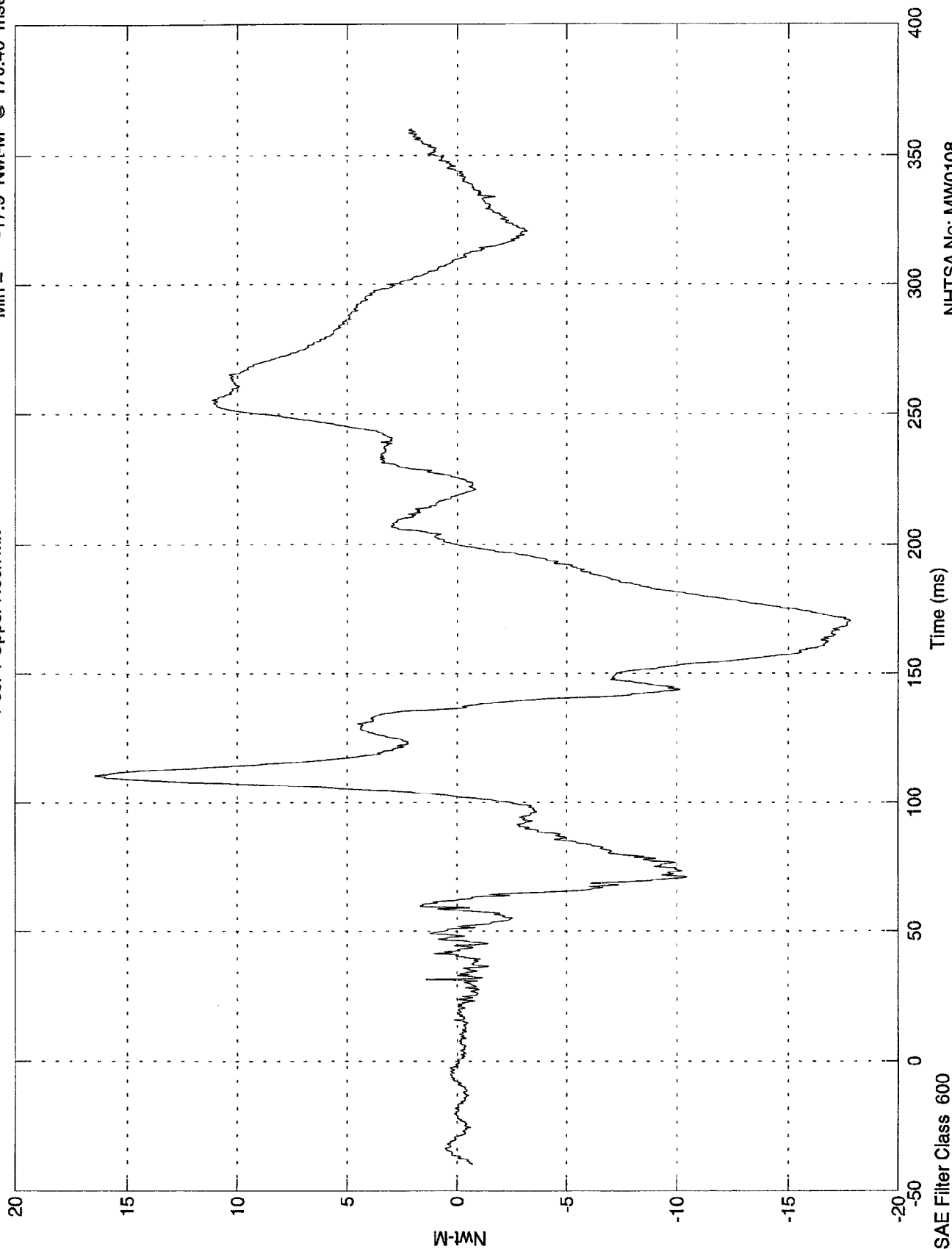
NHTSA No: MW0108
Date: 03 Feb 1998

SAE Filter Class 1000

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 16.4 Nwt-M @ 110.70 msec
 Min = -17.9 Nwt-M @ 170.40 msec

Pos. 1 Upper Neck Mx



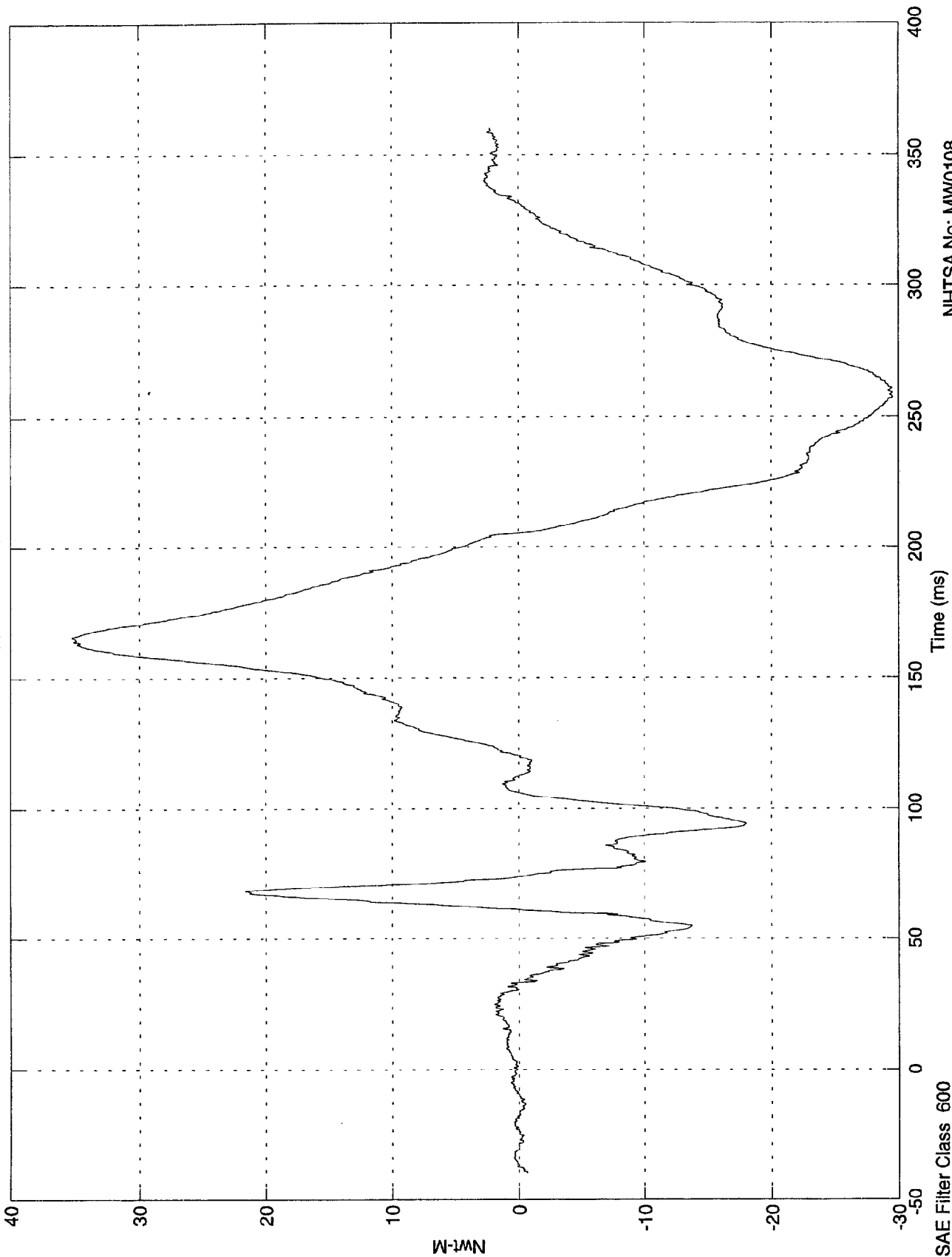
NHTSA No: MW0108
 Date: 03 Feb 1998

SAE Filter Class 600

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 35.3 Nwt-M @ 165.60 msec
 Min = -29.6 Nwt-M @ 257.10 msec

Pos. 1 Upper Neck My

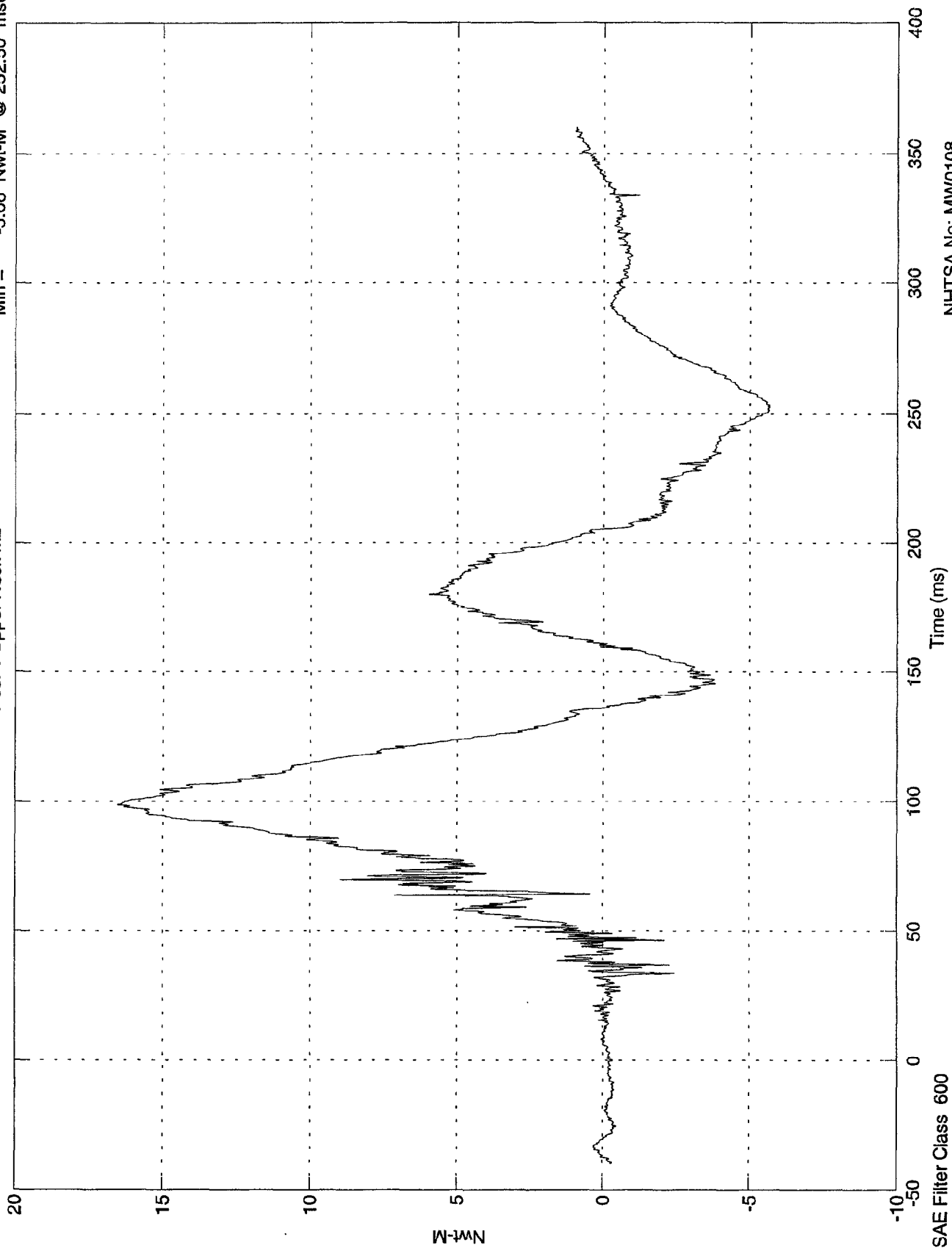


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 16.5 Nwt-M @ 98.70 msec
 Min = -5.66 Nwt-M @ 252.50 msec

Pos. 1 Upper Neck Mz



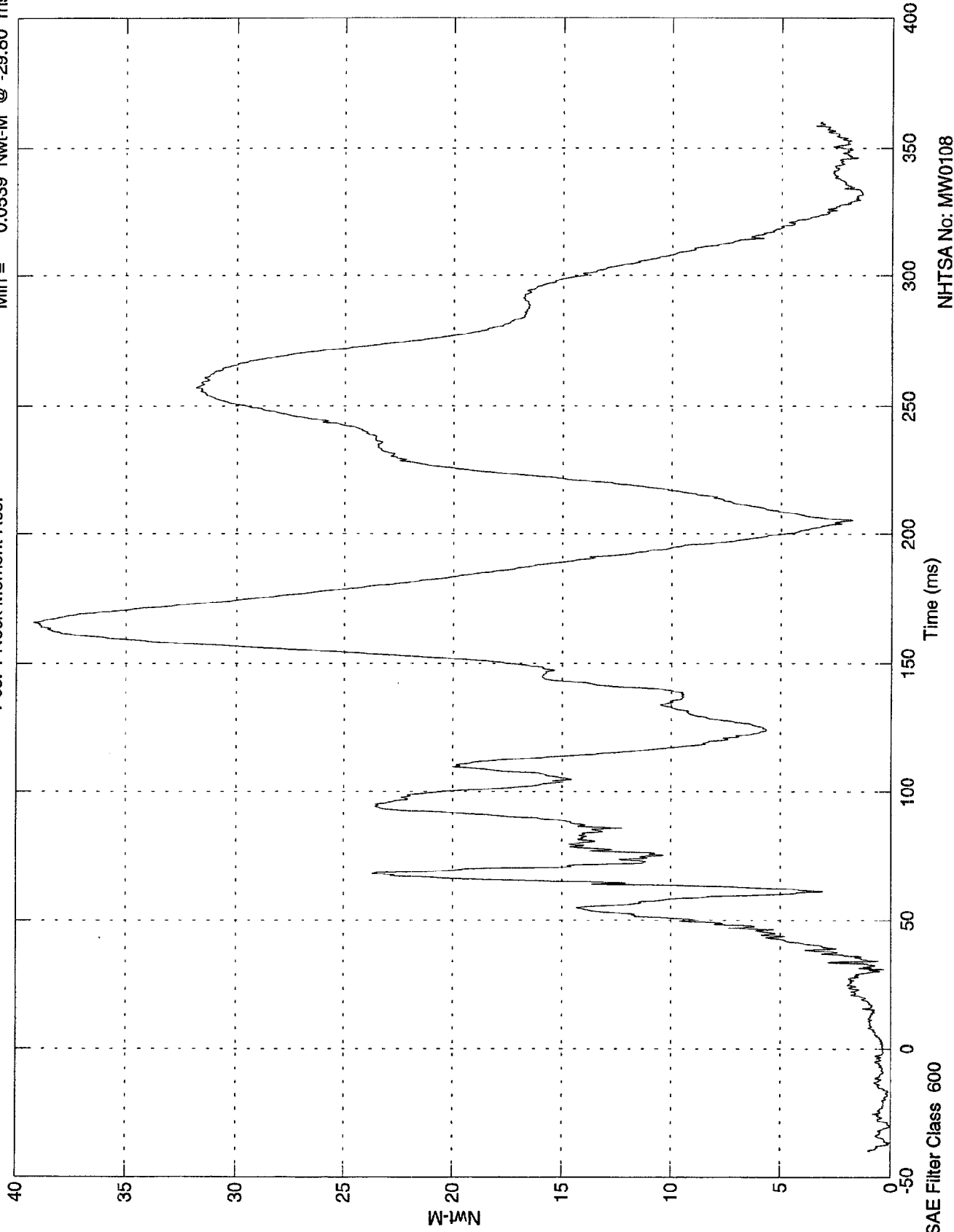
SAE Filter Class 600

NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 39.2 Nwt-M @ 165.50 msec
 Min = 0.0539 Nwt-M @ -29.80 msec

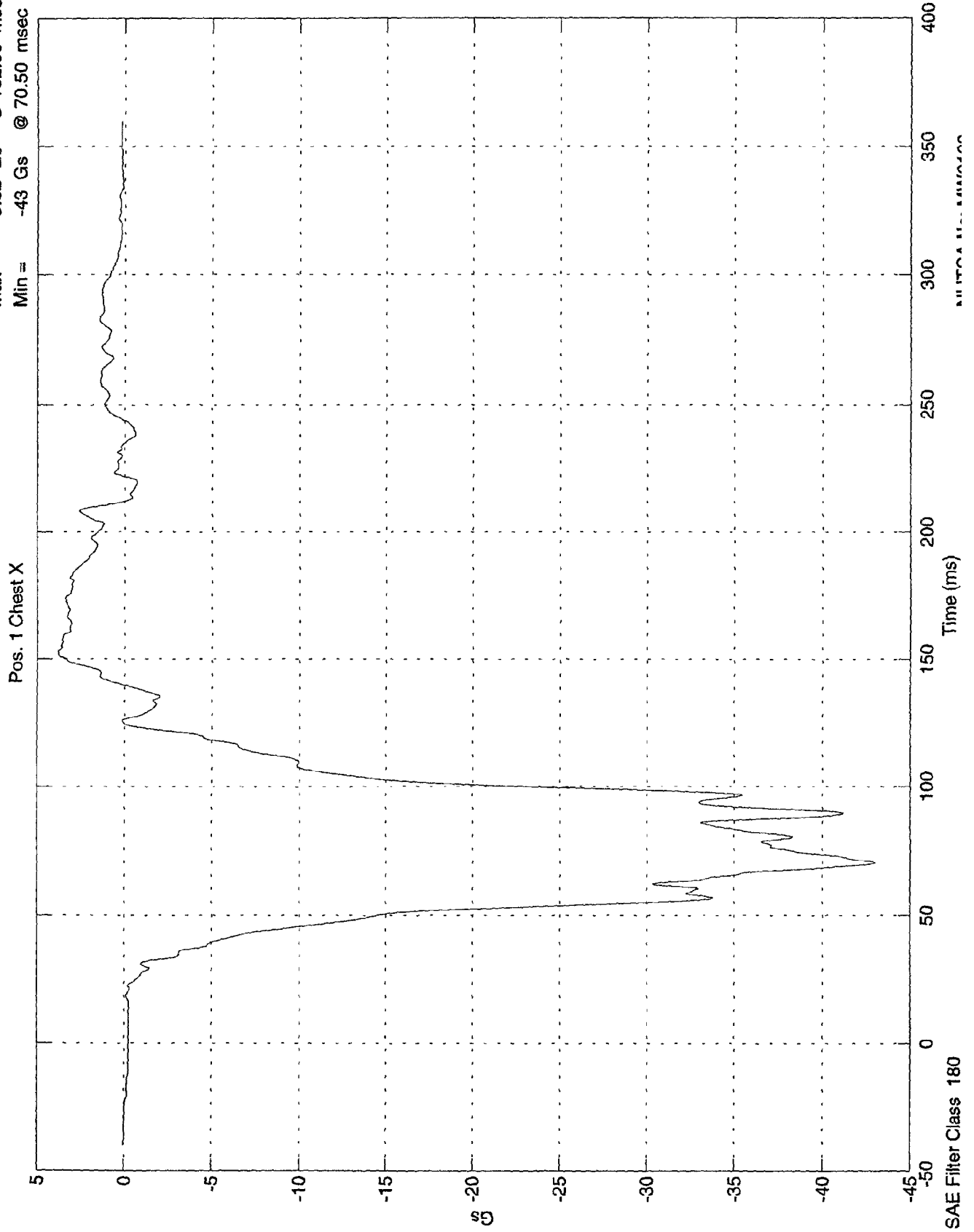
Pos. 1 Neck Moment Res.



NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

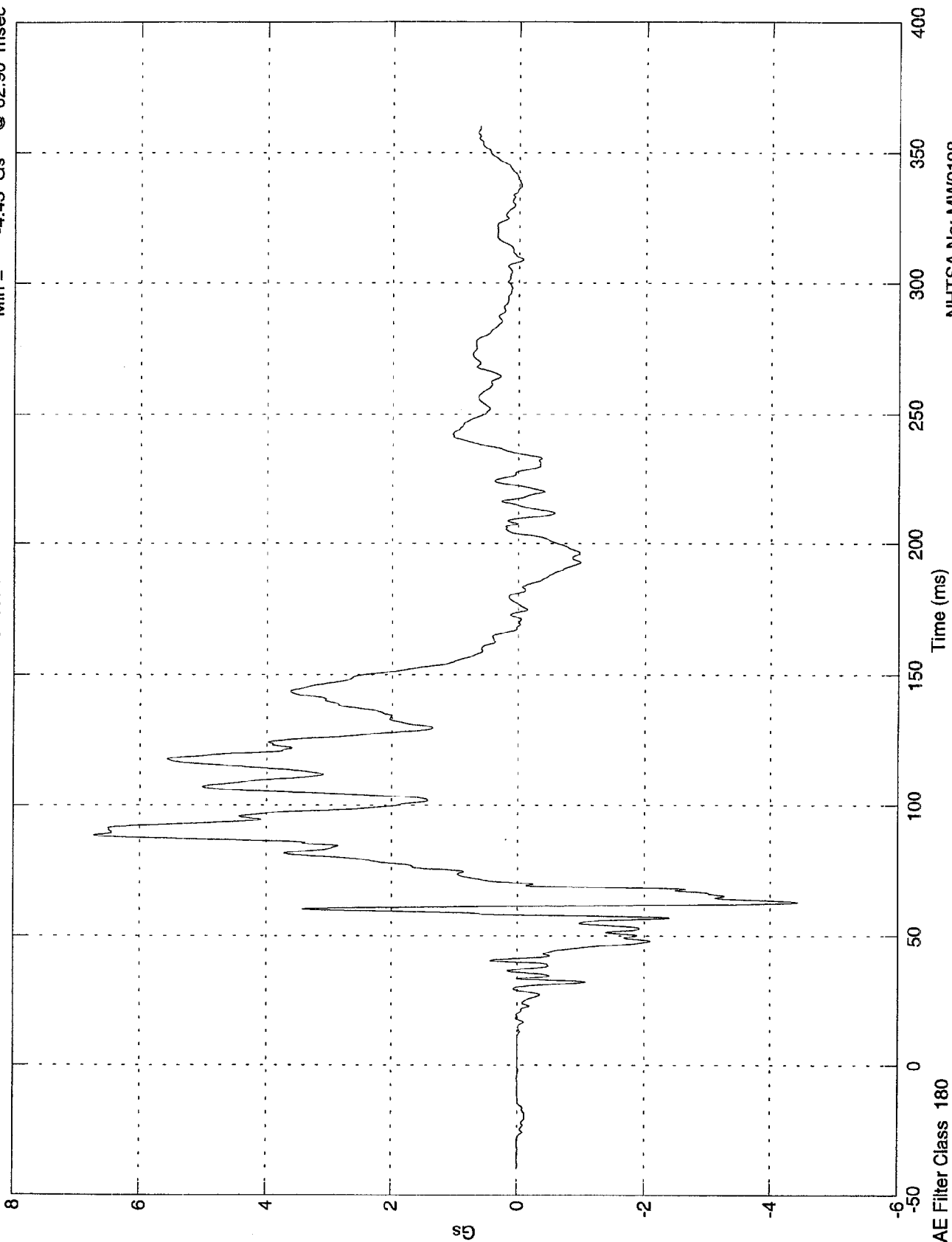
Max = 3.82 Gs @ 152.90 msec
Min = -43 Gs @ 70.50 msec



NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 6.73 Gs @ 88.60 msec
Min = -4.43 Gs @ 62.90 msec

Pos. 1 Chest Y



SAE Filter Class 180

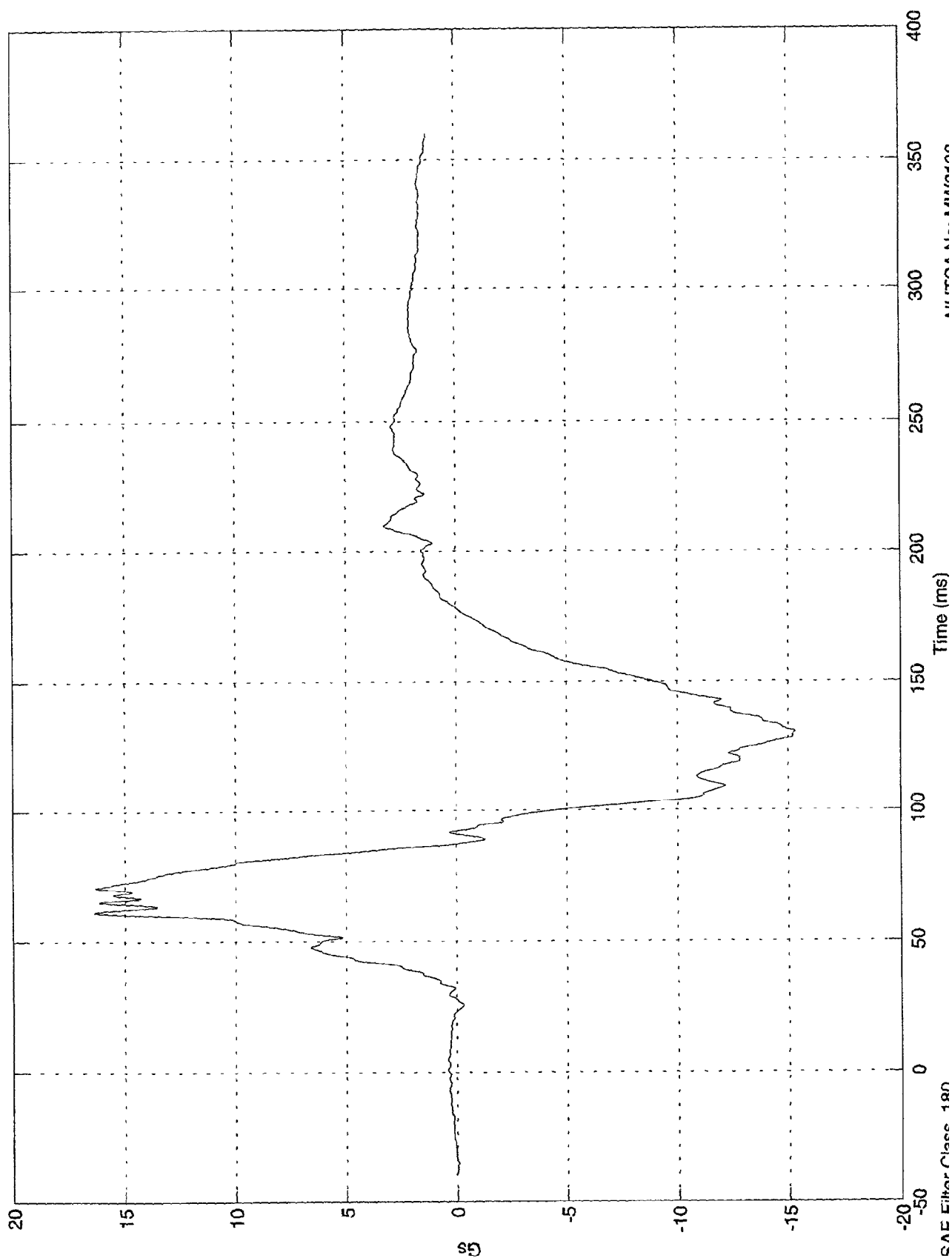
Time (ms)

NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 16.4 Gs @ 61.10 msec
 Min = -15.3 Gs @ 130.30 msec

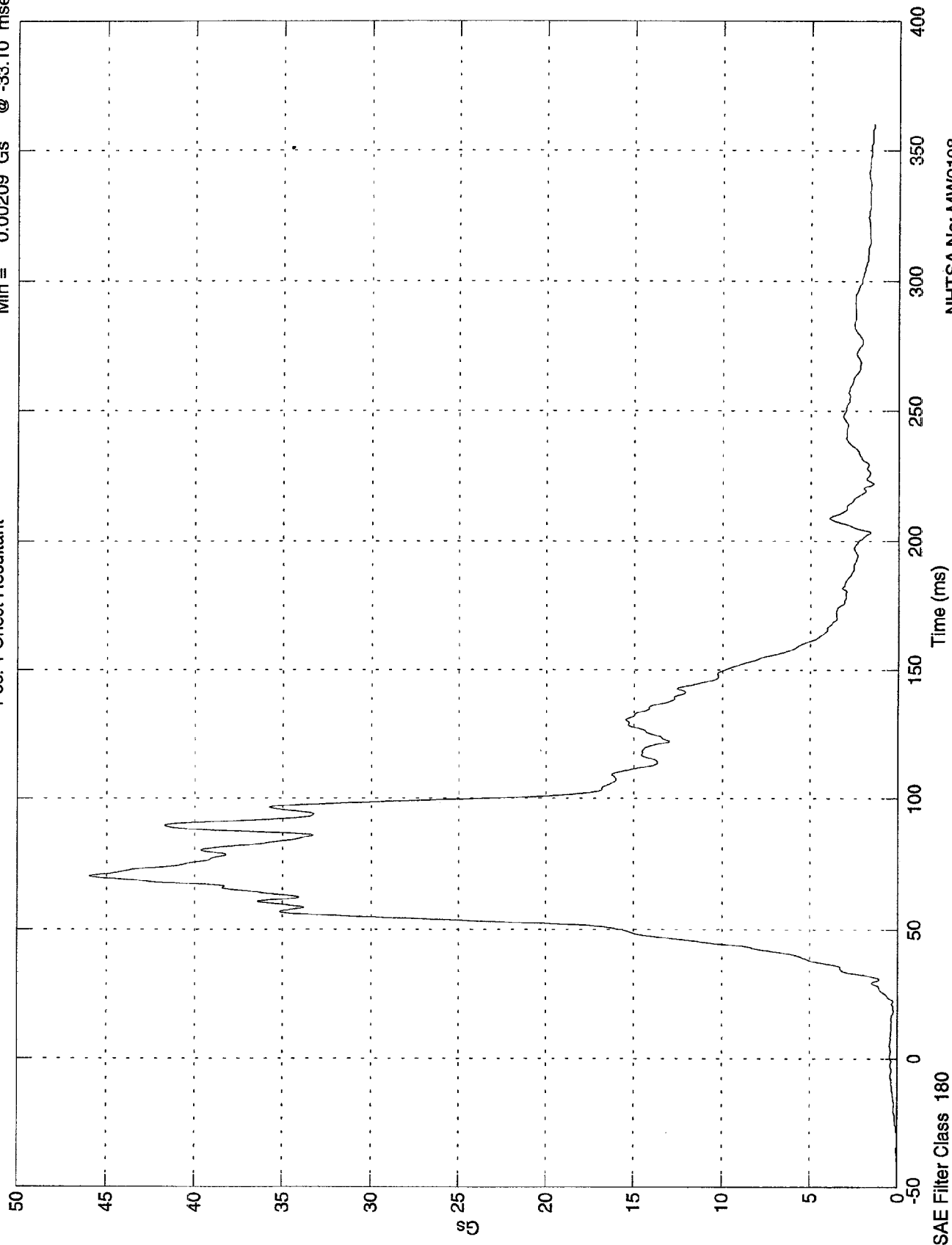
Pos. 1 Chest Z



NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 46 Gs @ 70.50 msec
 Min = 0.00209 Gs @ -33.10 msec

Pos. 1 Chest Resultant

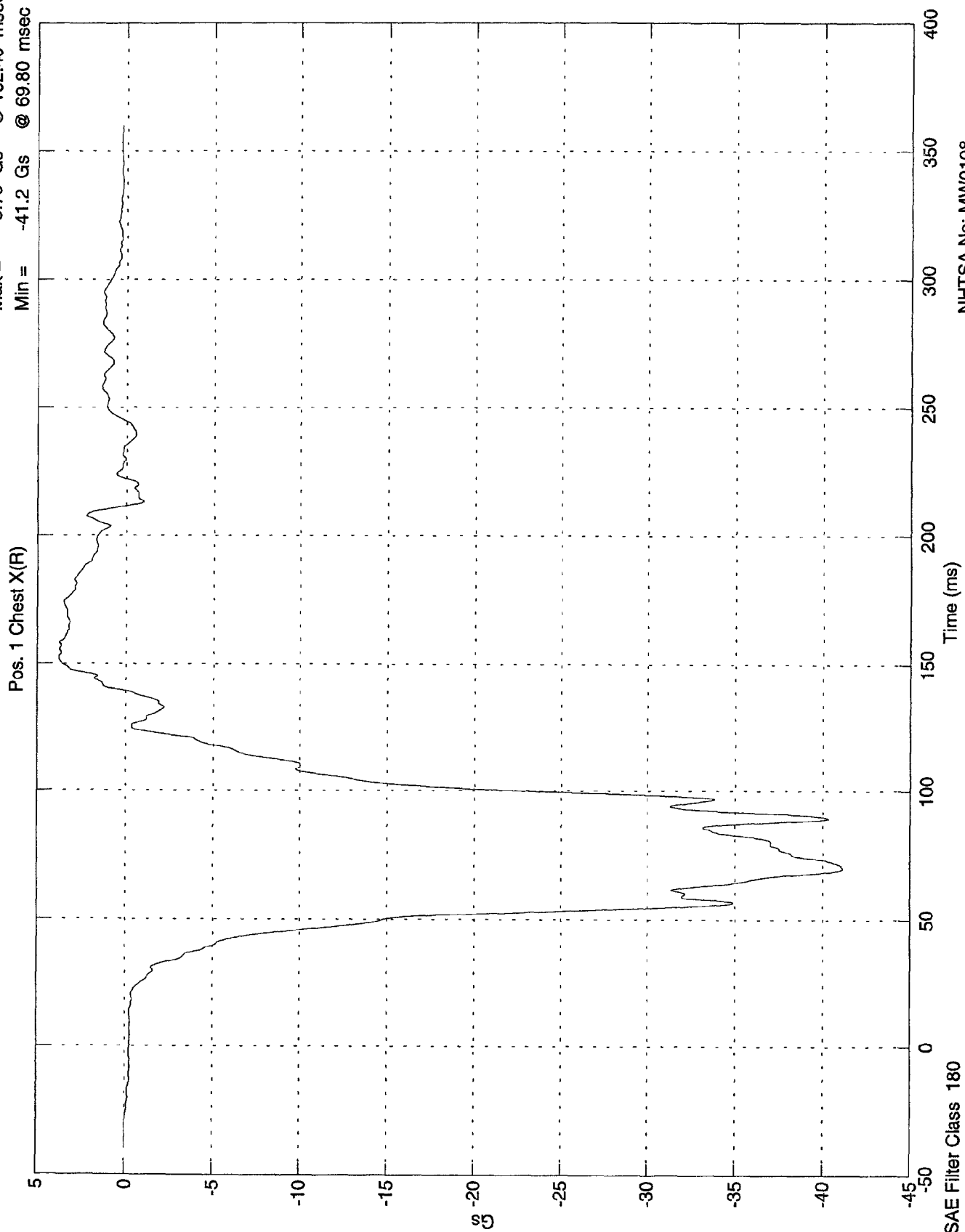


SAE Filter Class 180

NHTSA No: MW0108
 Date: 03 Feb 1998

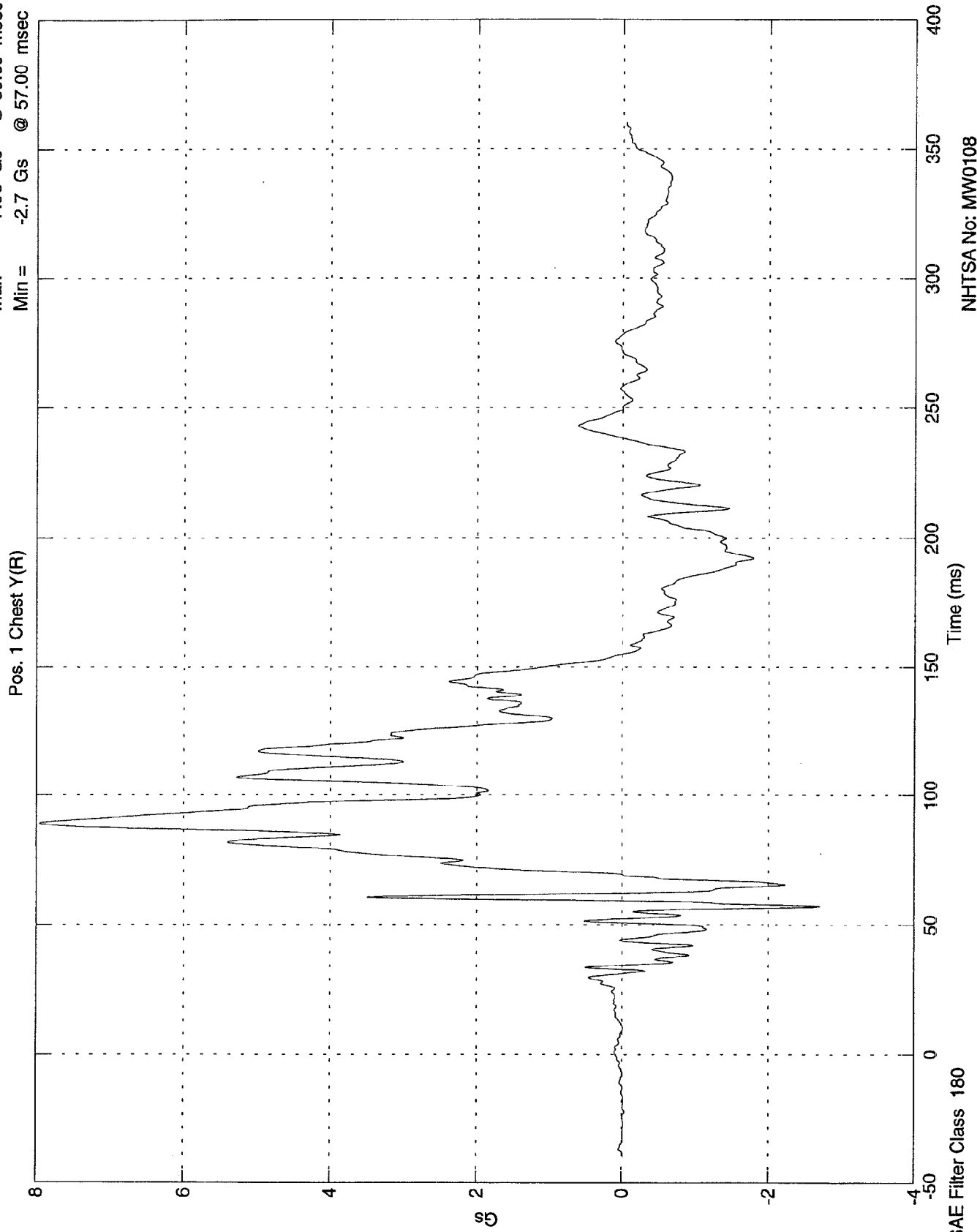
NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 3.79 Gs @ 152.40 msec
Min = -41.2 Gs @ 69.80 msec



NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

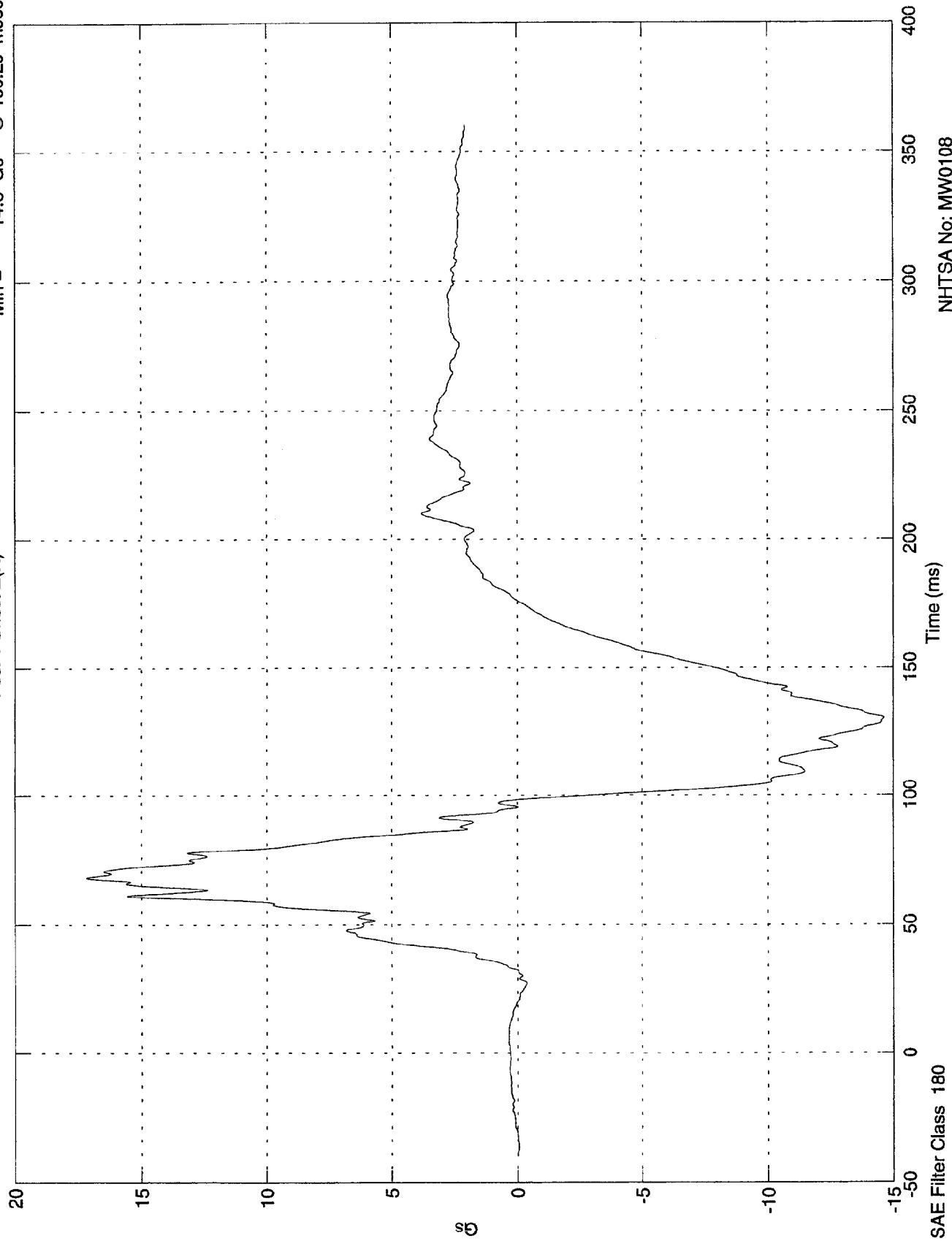


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 17.2 Gs @ 68.10 msec
Min = -14.6 Gs @ 130.20 msec

Pos. 1 Chest Z(R)

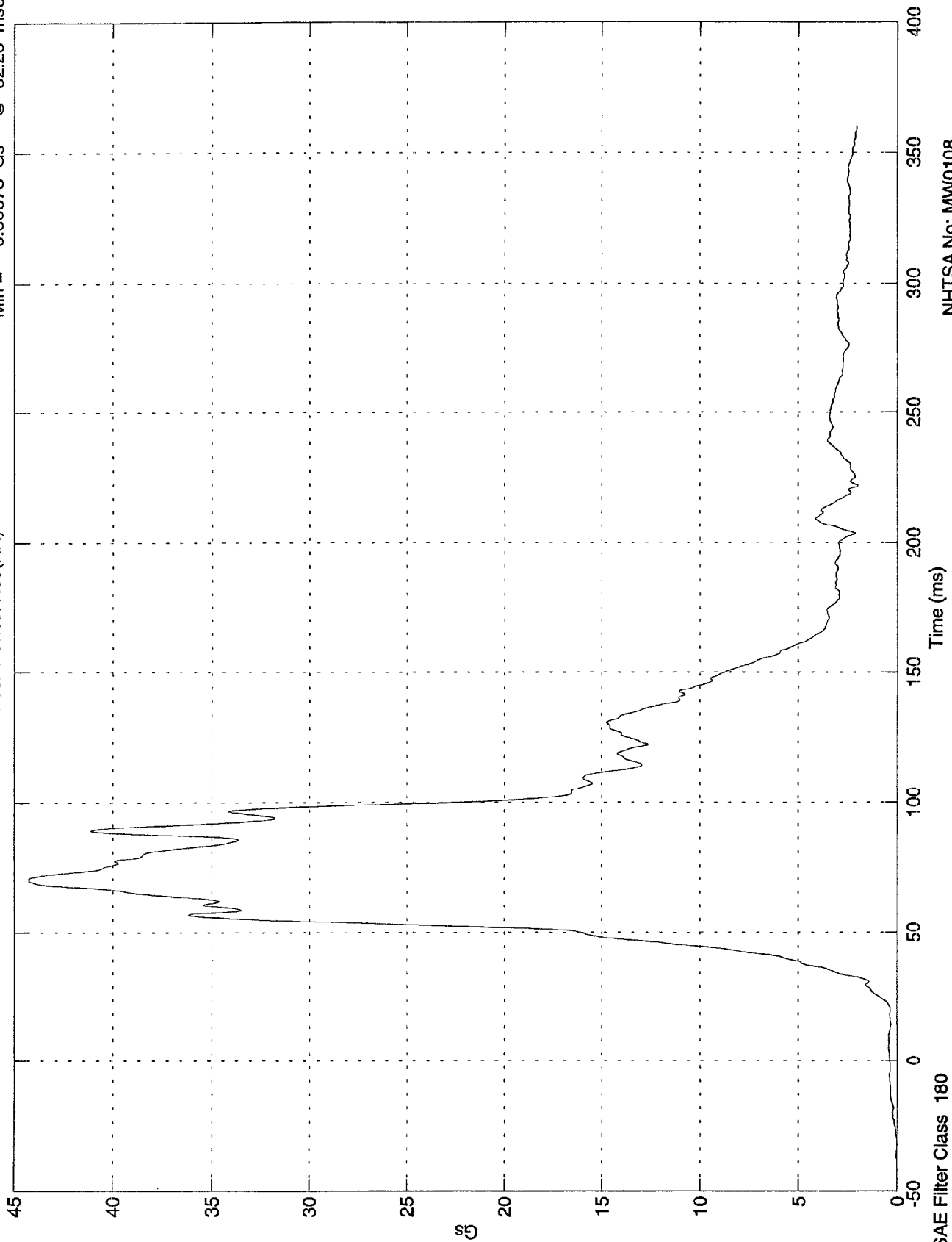


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 44.3 Gs @ 70.80 msec
 Min = 0.00878 Gs @ -32.20 msec

Pos. 1 Chest Res(RR)



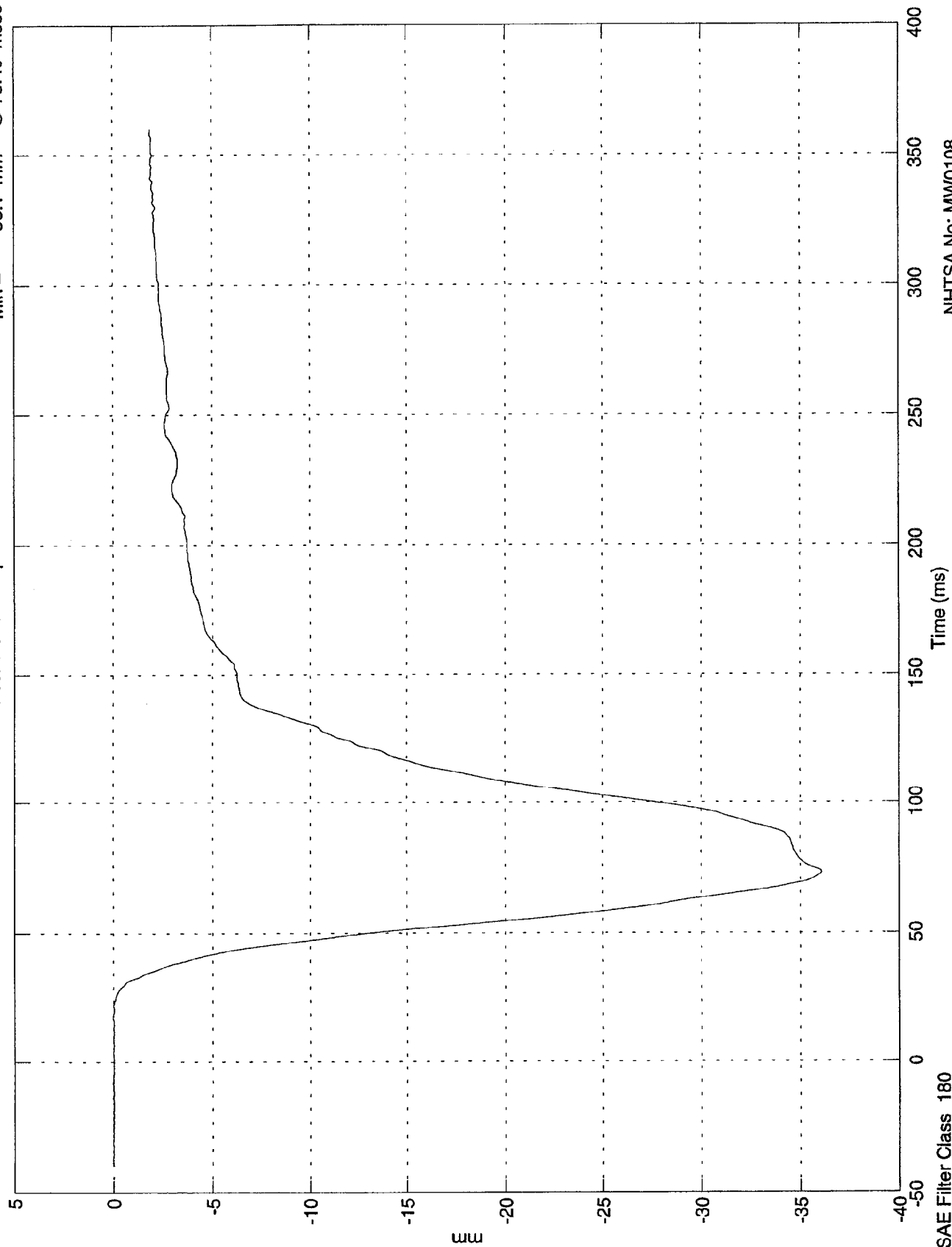
SAE Filter Class 180

NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 0.015 mm @ 17.60 msec
 Min = -36.1 mm @ 73.40 msec

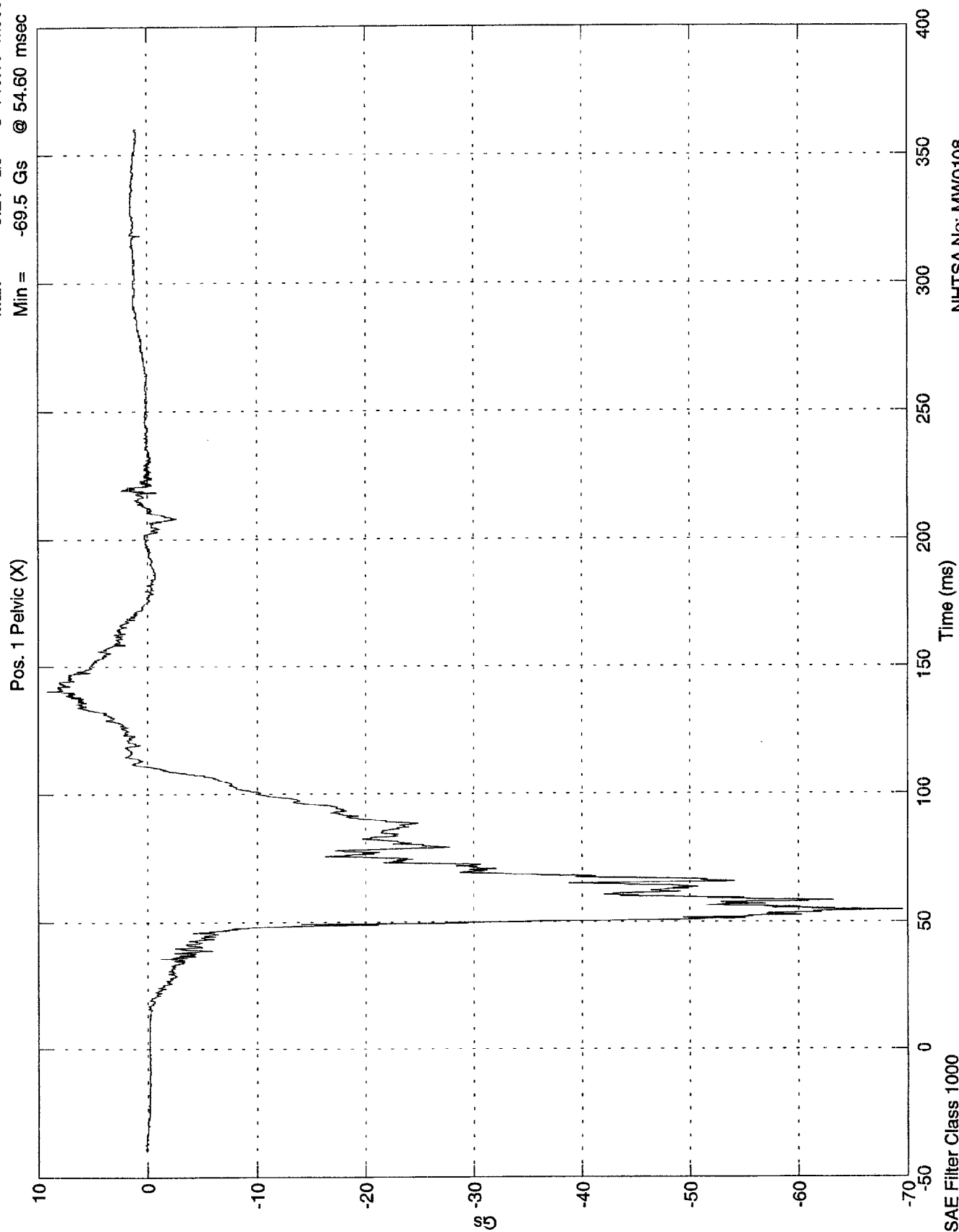
Pos. 1 Chest Disp.



NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 9.21 Gs @ 140.10 msec
 Min = -69.5 Gs @ 54.60 msec

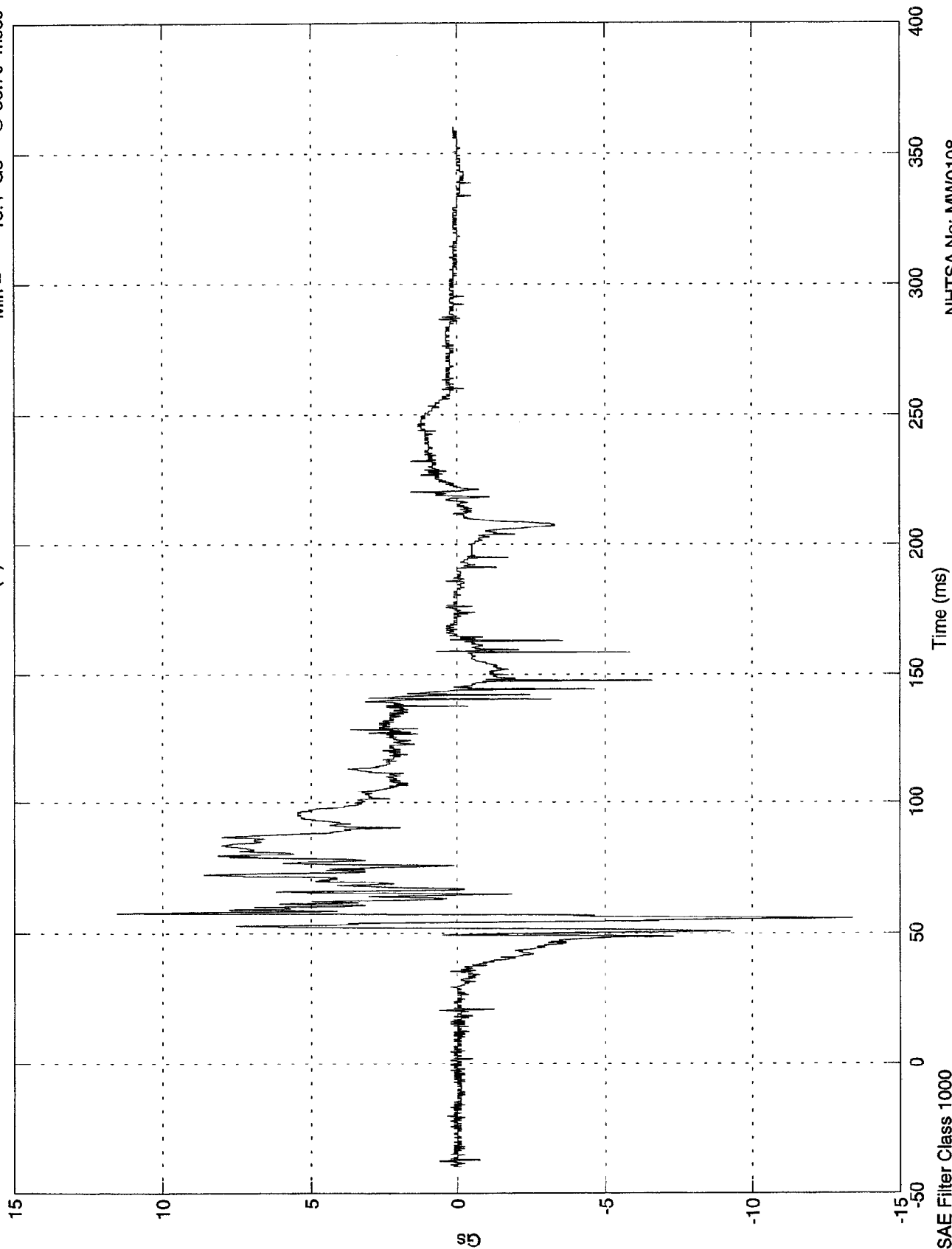


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 11.5 Gs @ 57.80 msec
 Min = -13.4 Gs @ 55.70 msec

Pos. 1 Pelvic (Y)

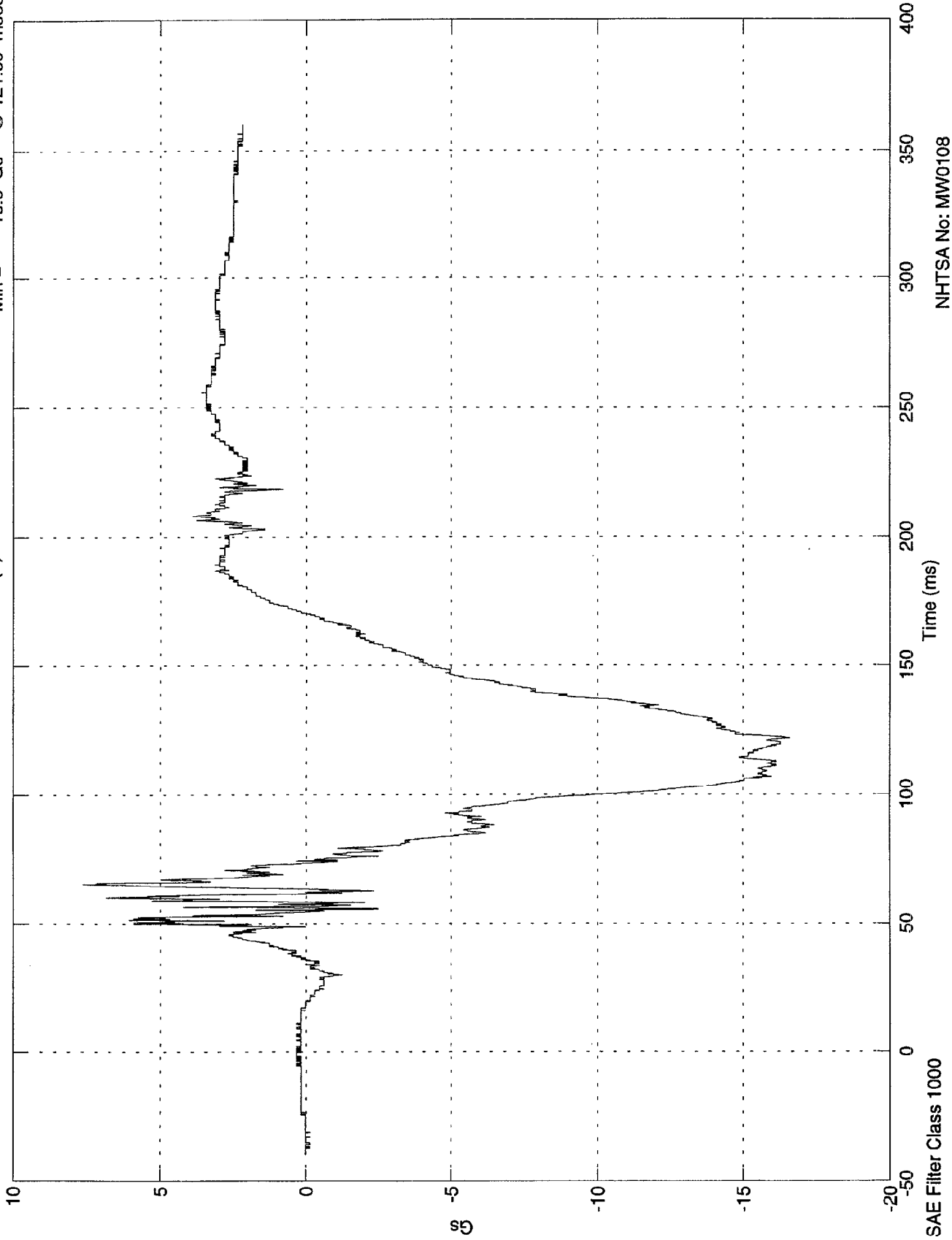


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 7.62 Gs @ 65.20 msec
Min = -16.6 Gs @ 121.80 msec

Pos. 1 Pelvic (Z)

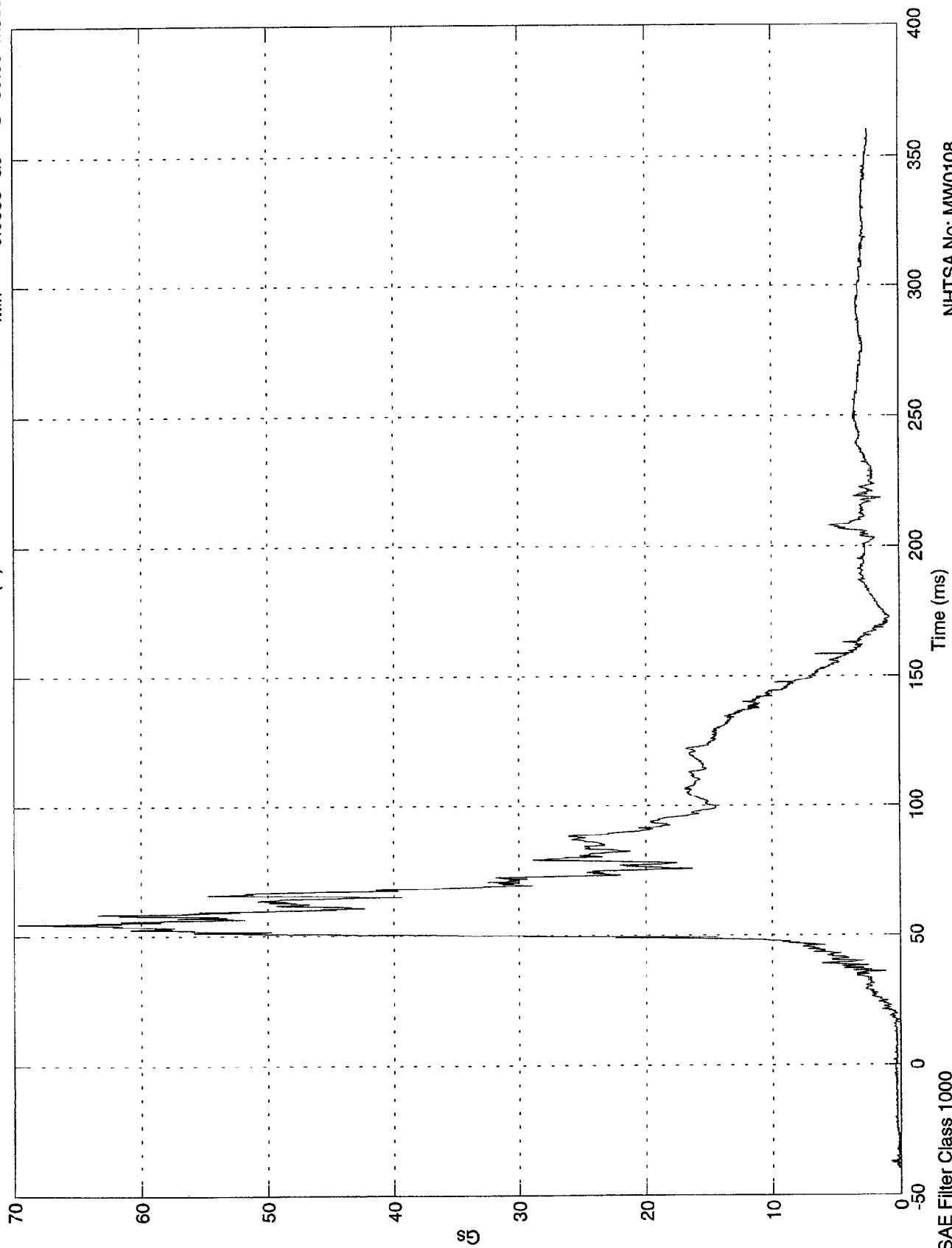


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 69.7 Gs @ 54.60 msec
 Min = 0.0638 Gs @ -39.80 msec

Pos. 1 Pelvic (R)

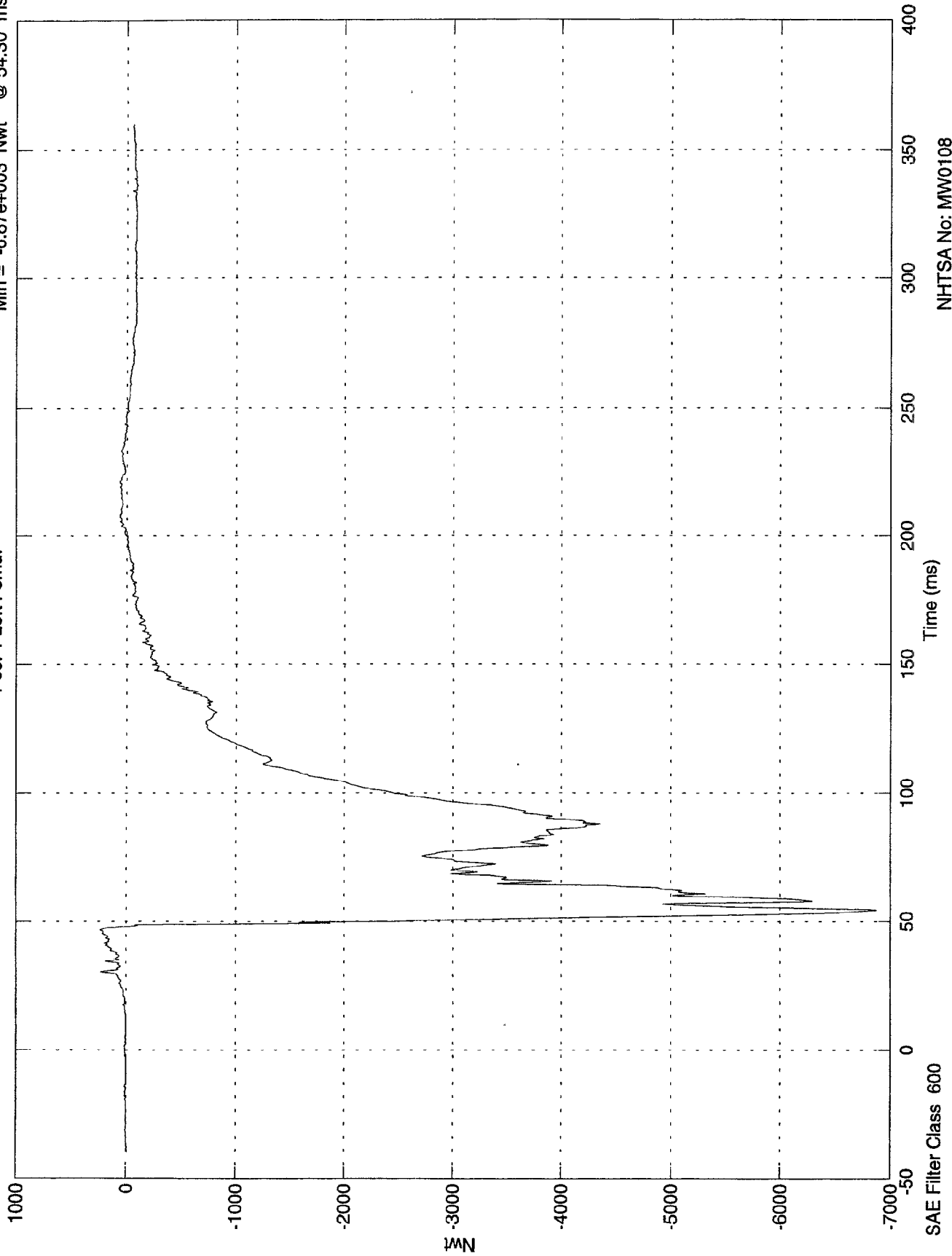


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 237 Nwt @ 46.70 msec
 Min = -6.87e+003 Nwt @ 54.30 msec

Pos. 1 Left Femur

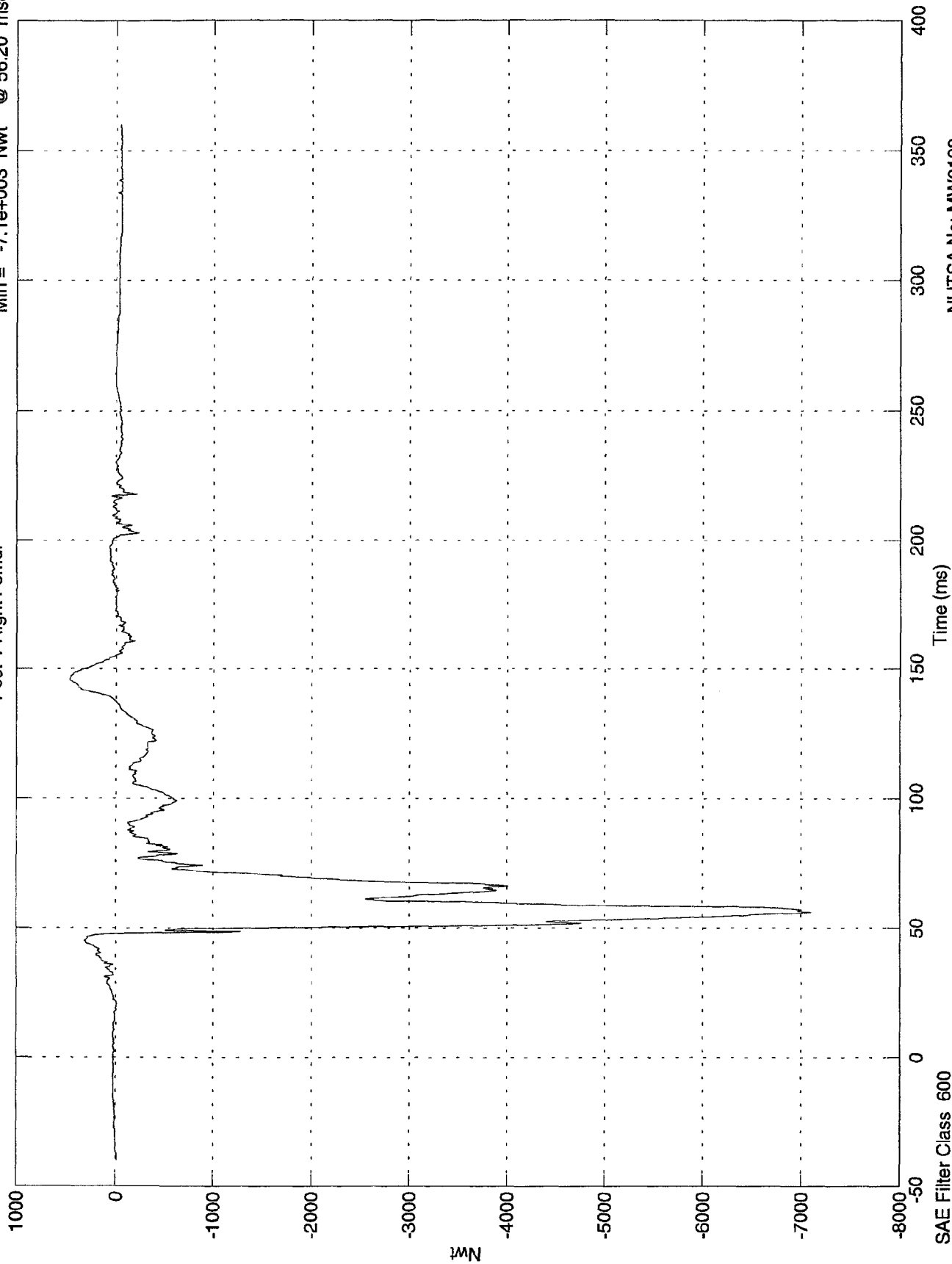


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 465 Nwt @ 145.60 msec
 Min = -7.1e+003 Nwt @ 56.20 msec

Pos. 1 Right Femur



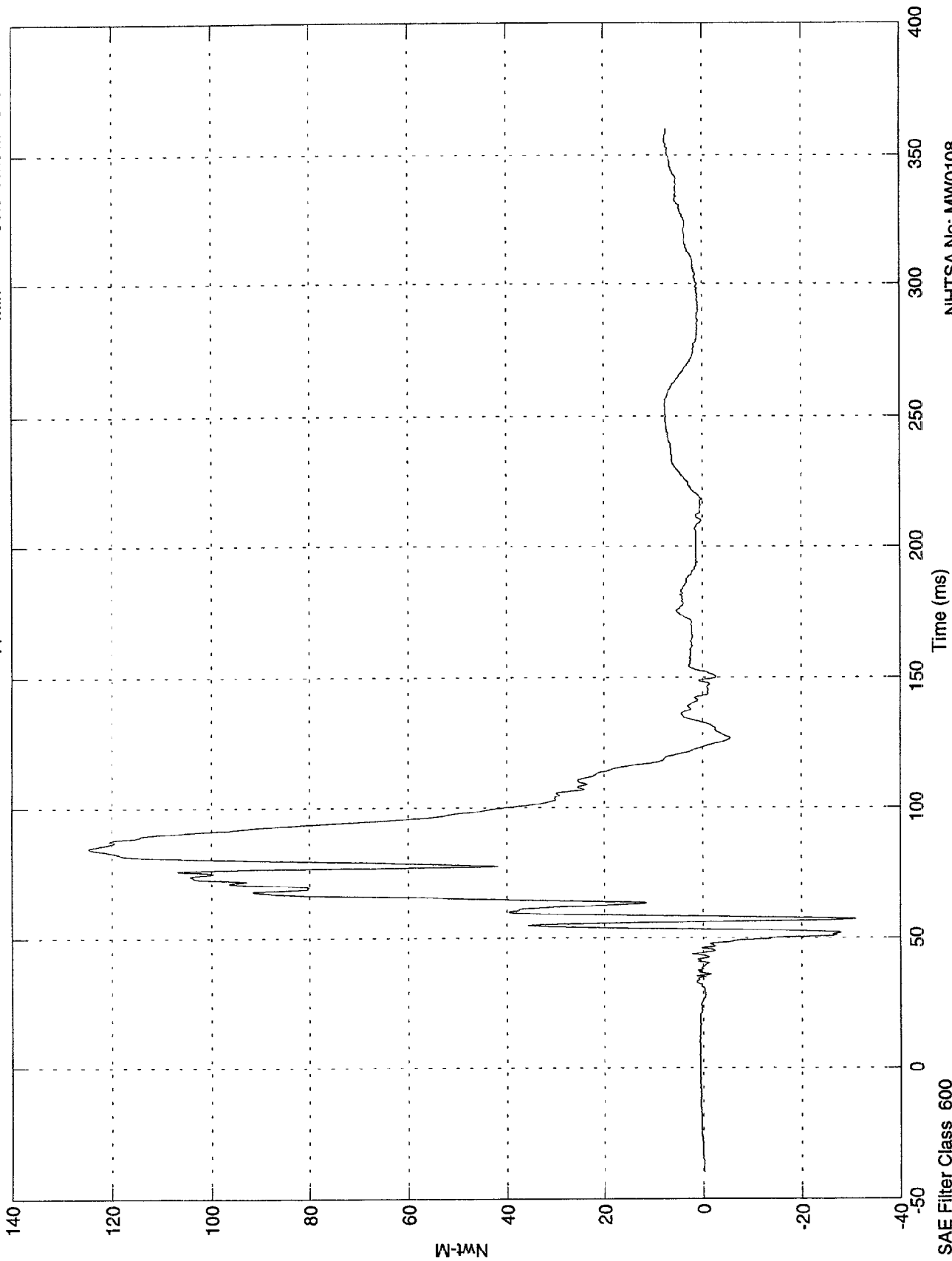
SAE Filter Class 600

NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 125 Nwt-M @ 84.60 msec
Min = -30.9 Nwt-M @ 57.20 msec

P1 Lt Upper Tibia Mx

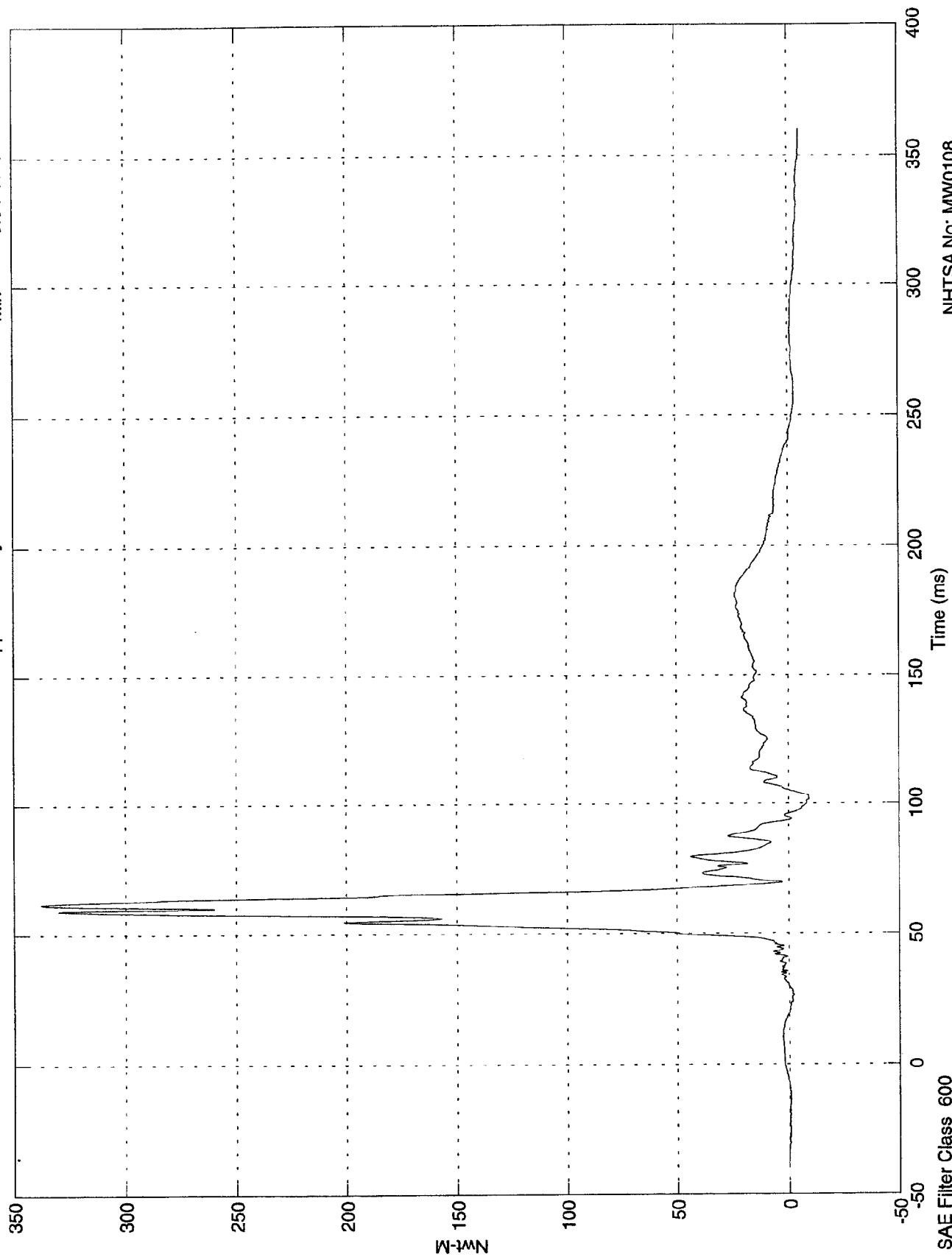


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 337 Nwt-M @ 61.70 msec
 Min = -9.34 Nwt-M @ 101.80 msec

P1 Lt Upper Tibia My

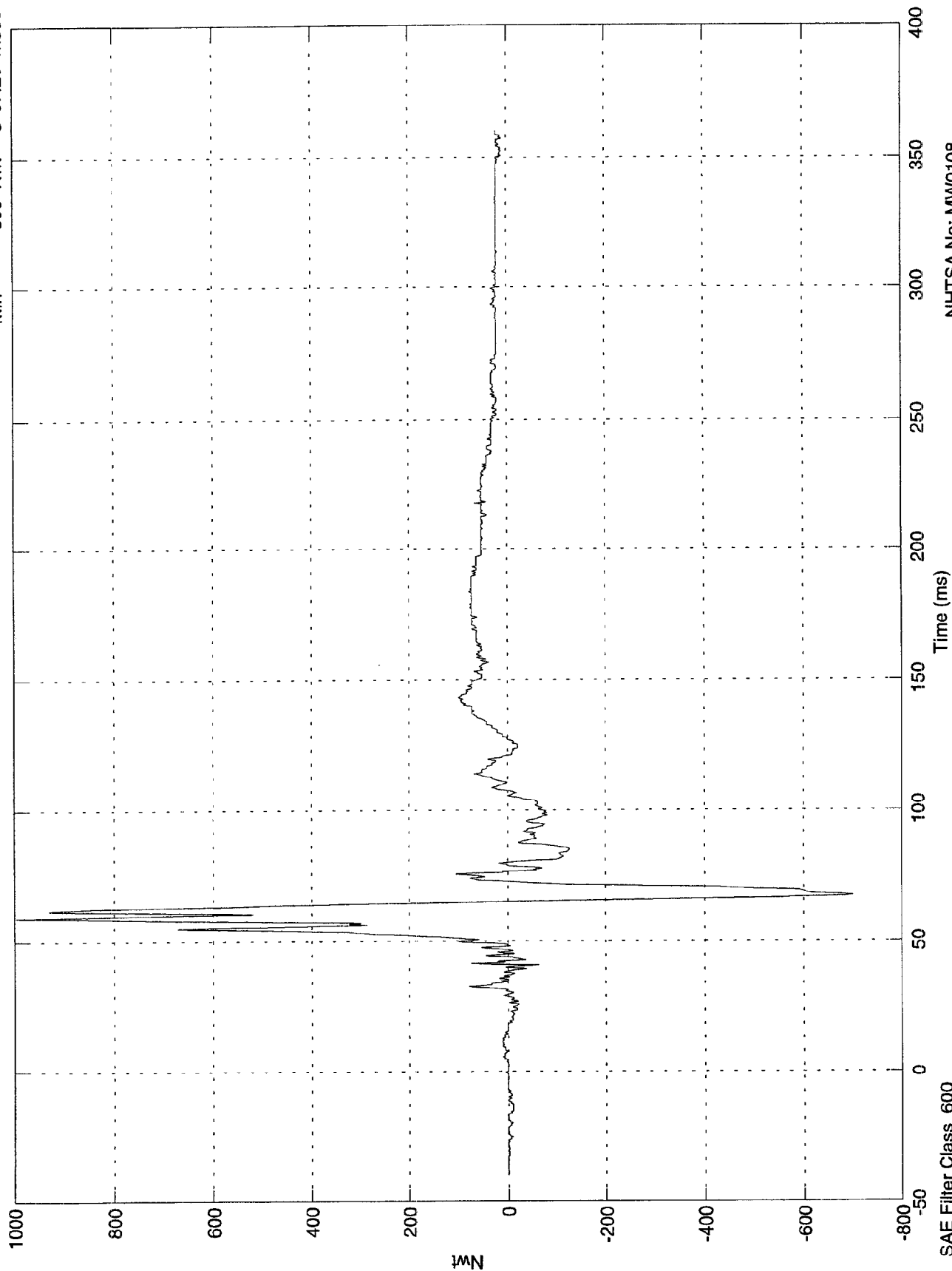


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 996 Nwt @ 59.00 msec
Min = -699 Nwt @ 67.20 msec

P1 Lt Lower Tibia Fx

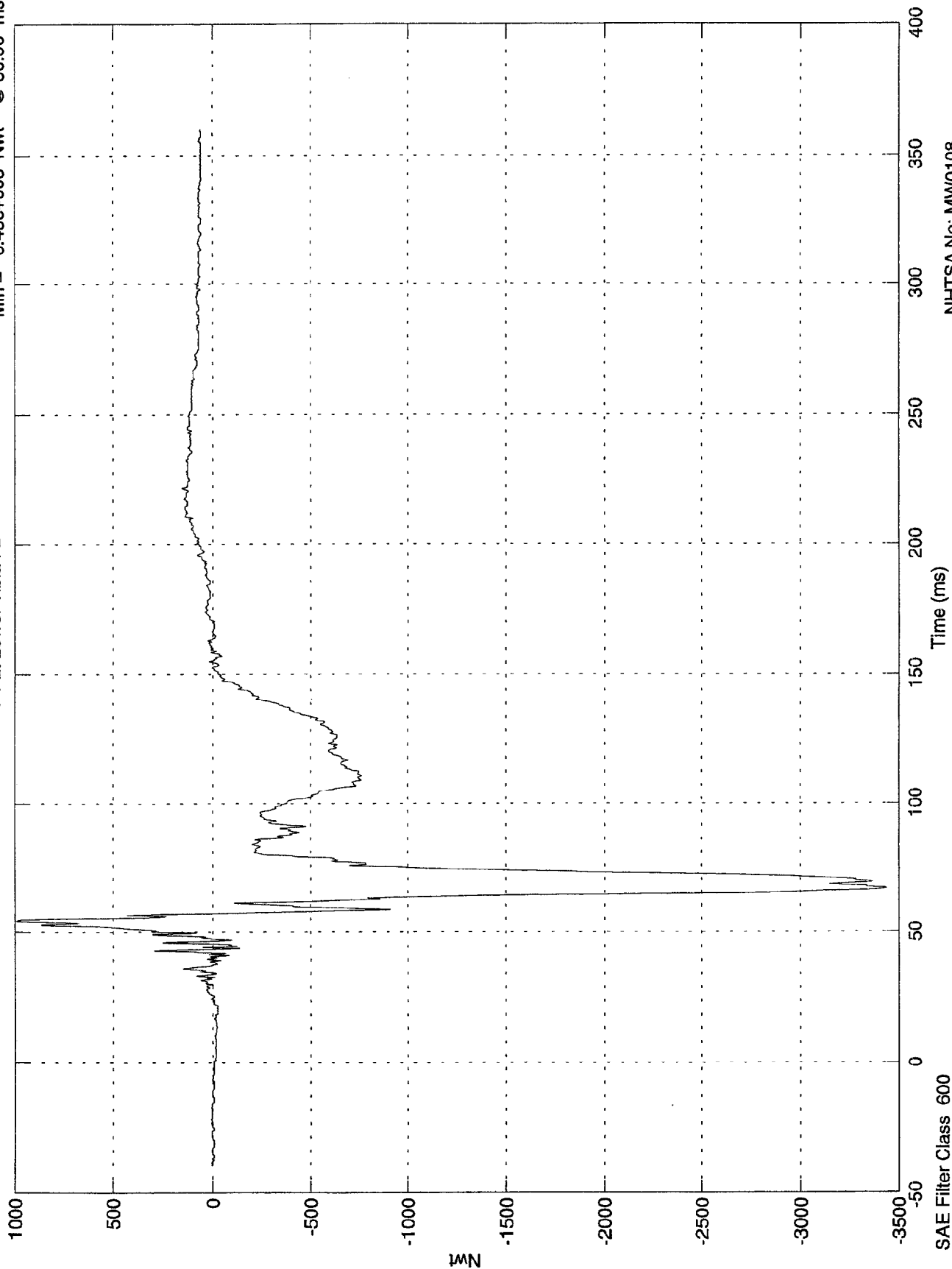


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 992 Nwt @ 54.30 msec
 Min = -3.43e+003 Nwt @ 66.90 msec

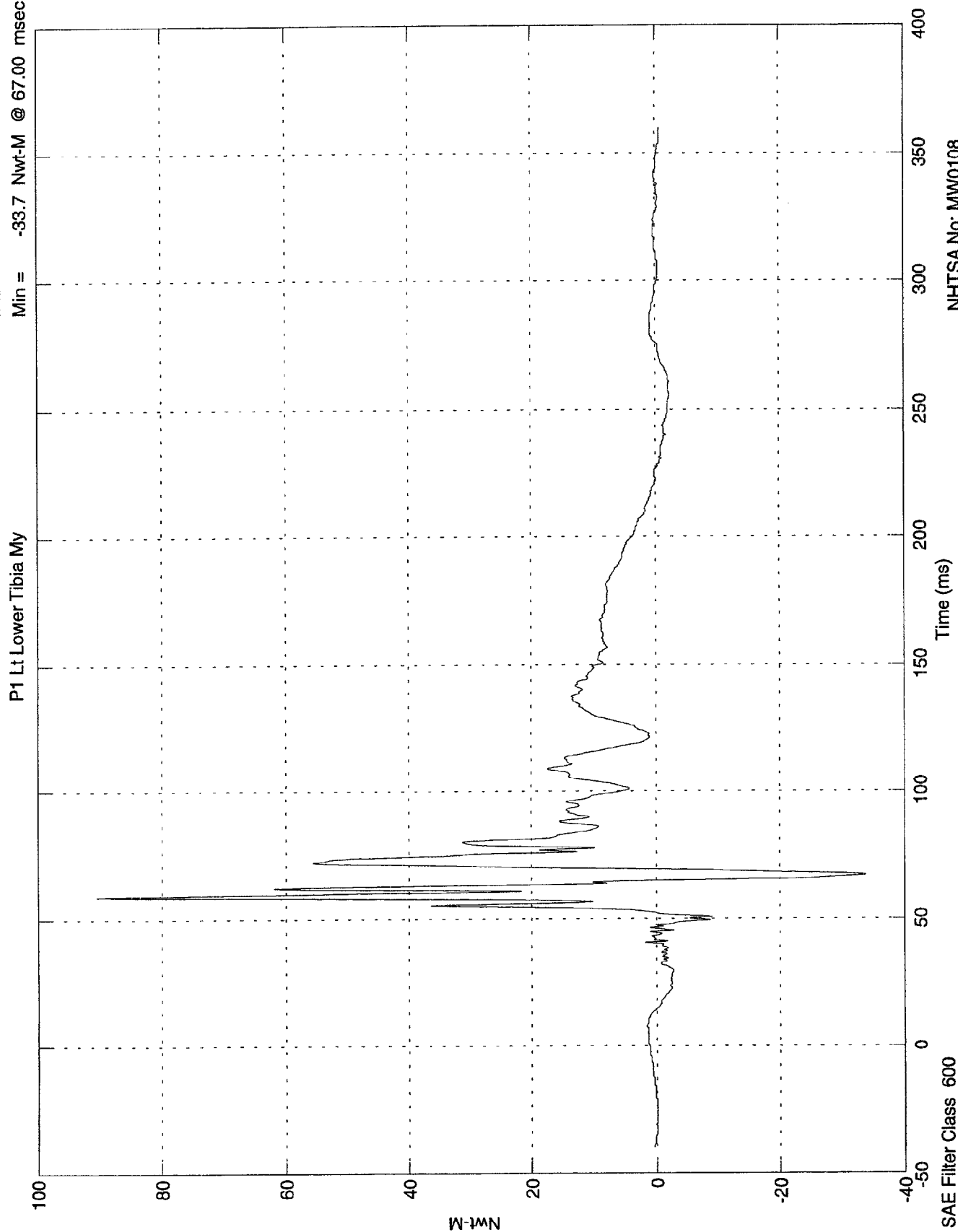
P1 Lt Lower Tibia Fz



NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 90.4 Nwt-M @ 58.80 msec
 Min = -33.7 Nwt-M @ 67.00 msec

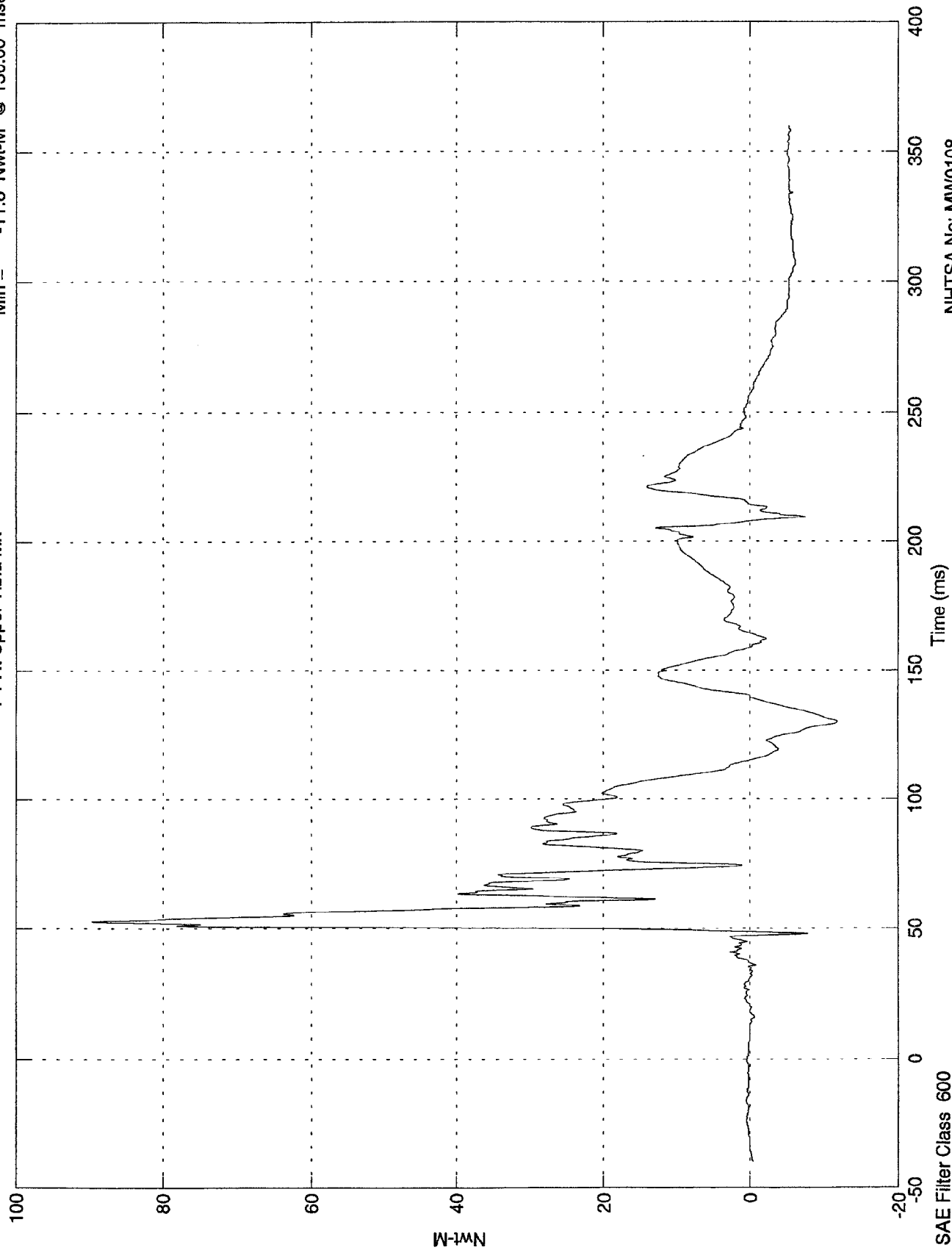


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 89.8 Nwt-M @ 52.70 msec
 Min = -11.8 Nwt-M @ 130.00 msec

P1 Rt Upper Tibia Mx

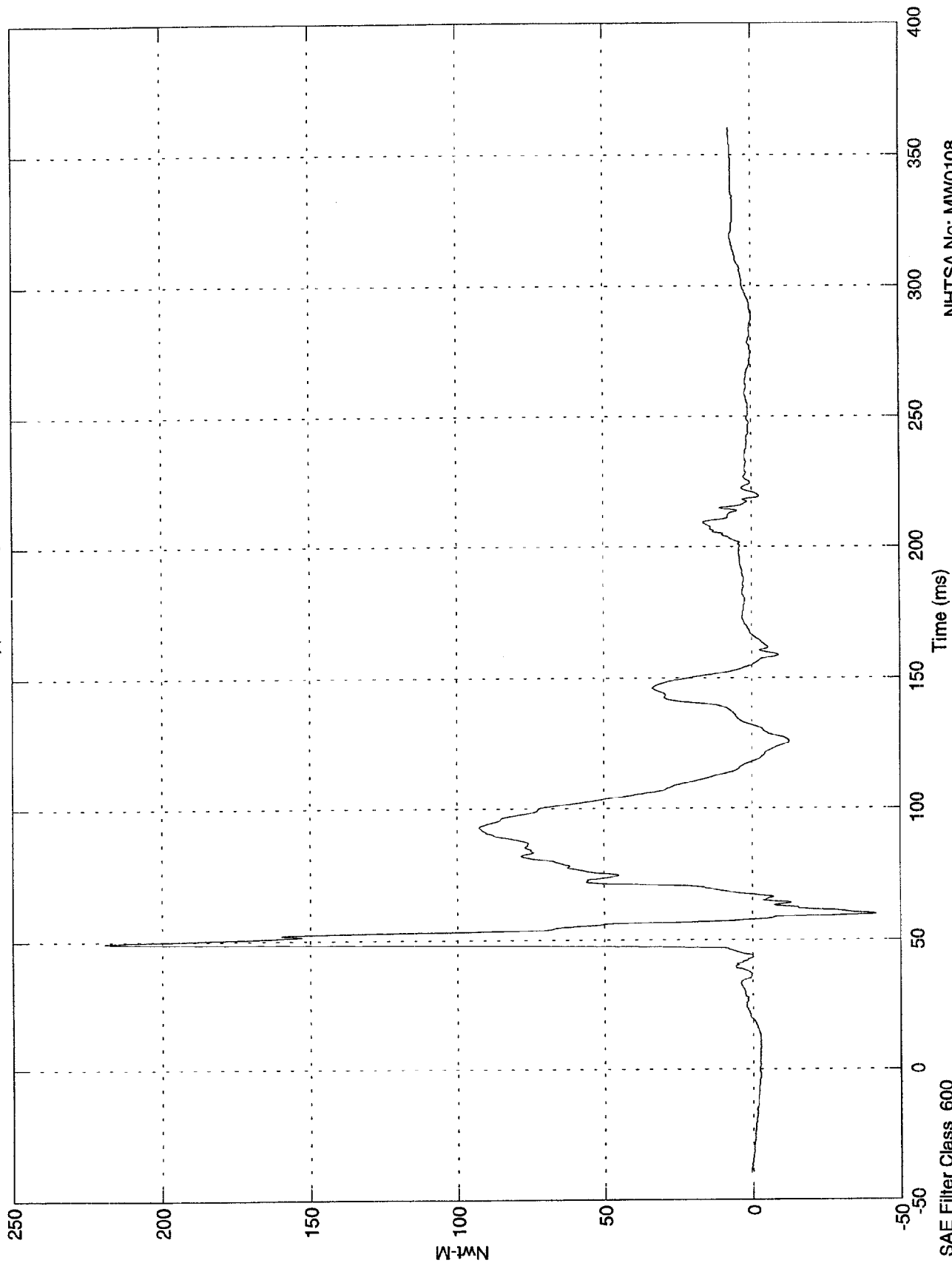


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 219 Nwt-M @ 49.30 msec
 Min = -41.6 Nwt-M @ 59.80 msec

P1 Rt Upper Tibia My

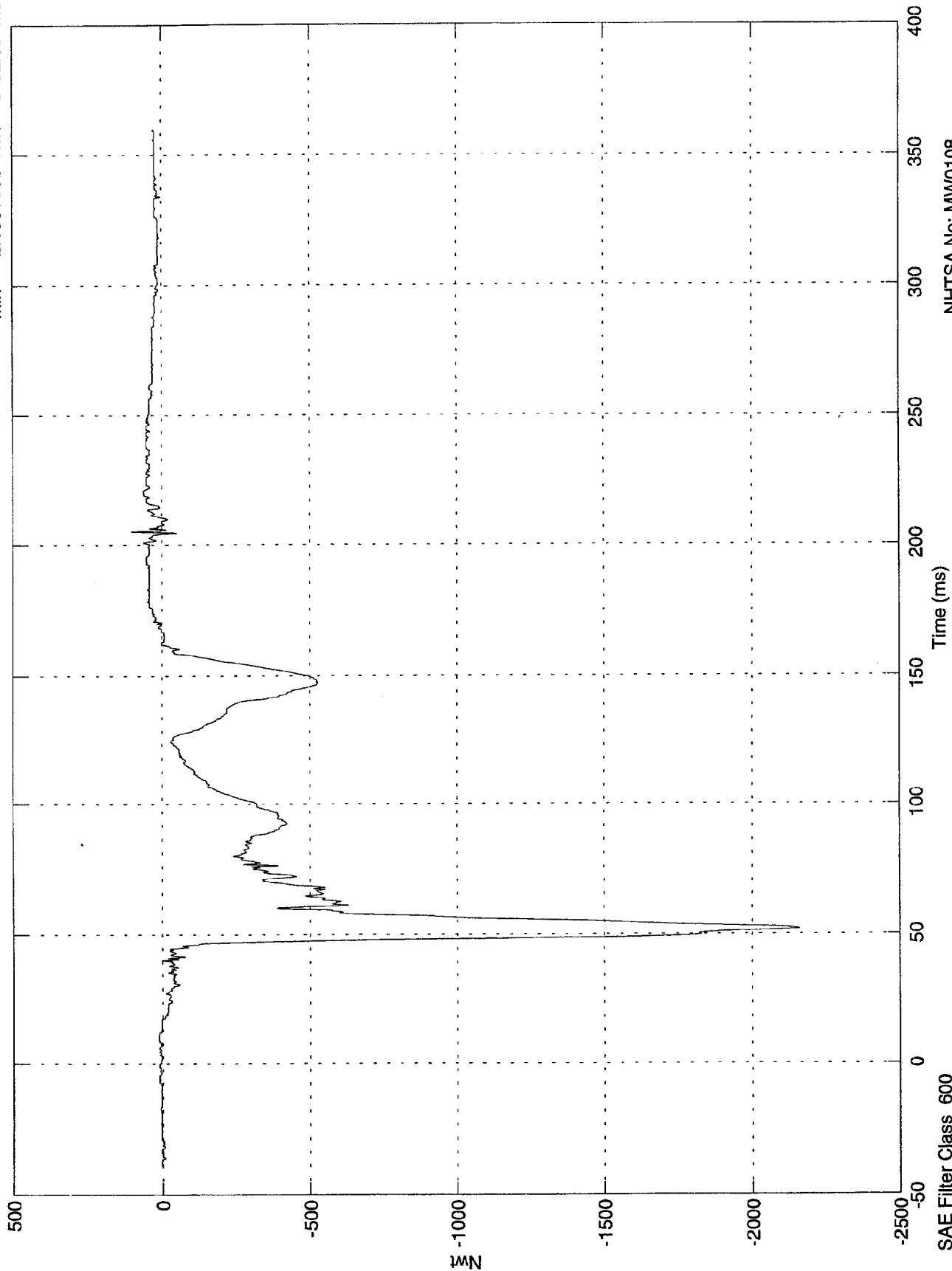


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 102 Nwt @ 205.00 msec
 Min = -2.16e+003 Nwt @ 52.00 msec

P1 Rt Lower Tibia Fx



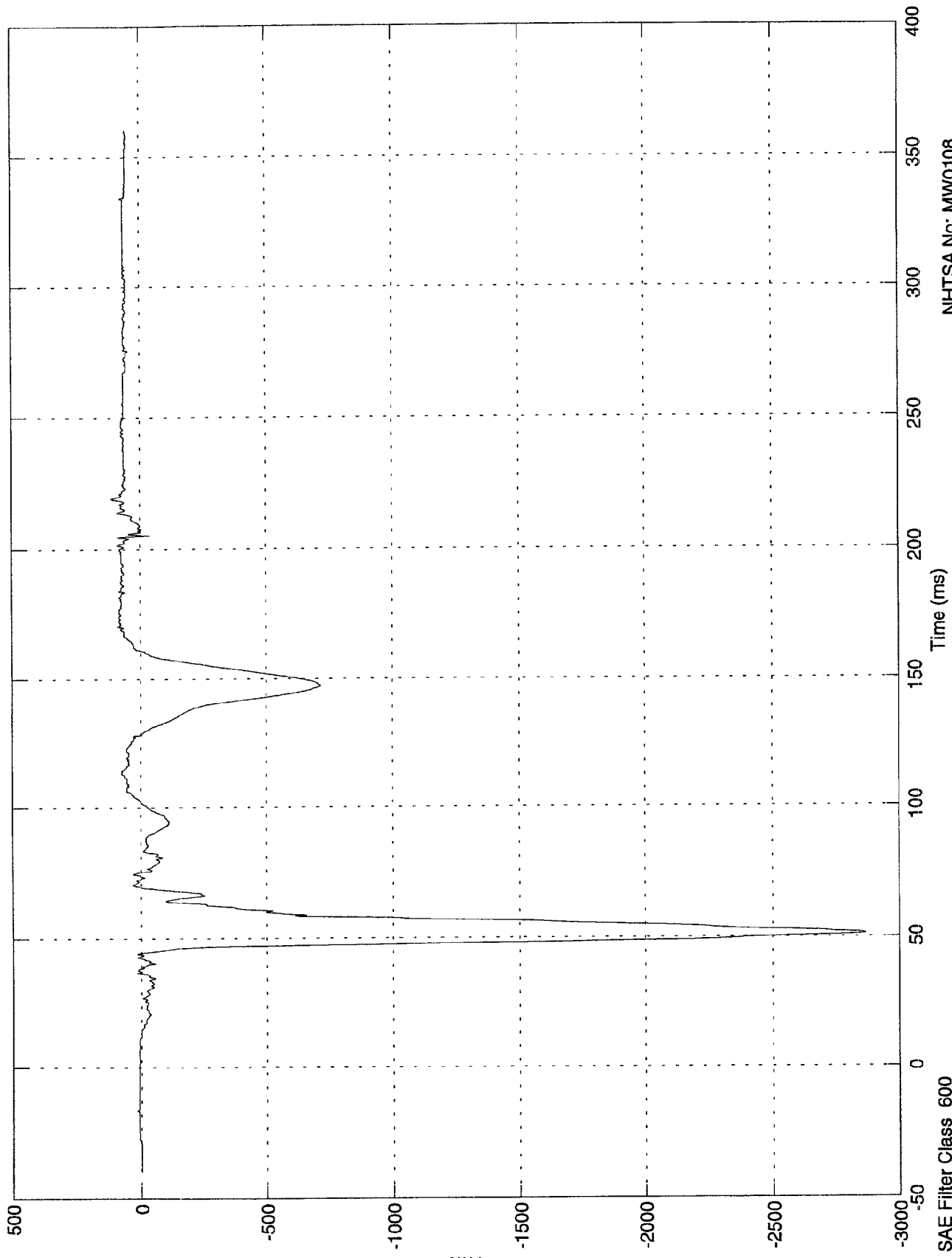
SAE Filter Class 600

NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 110 Nwt @ 219.10 msec
 Min = -2.87e+003 Nwt @ 51.20 msec

P1 Rt Lower Tibia Fz

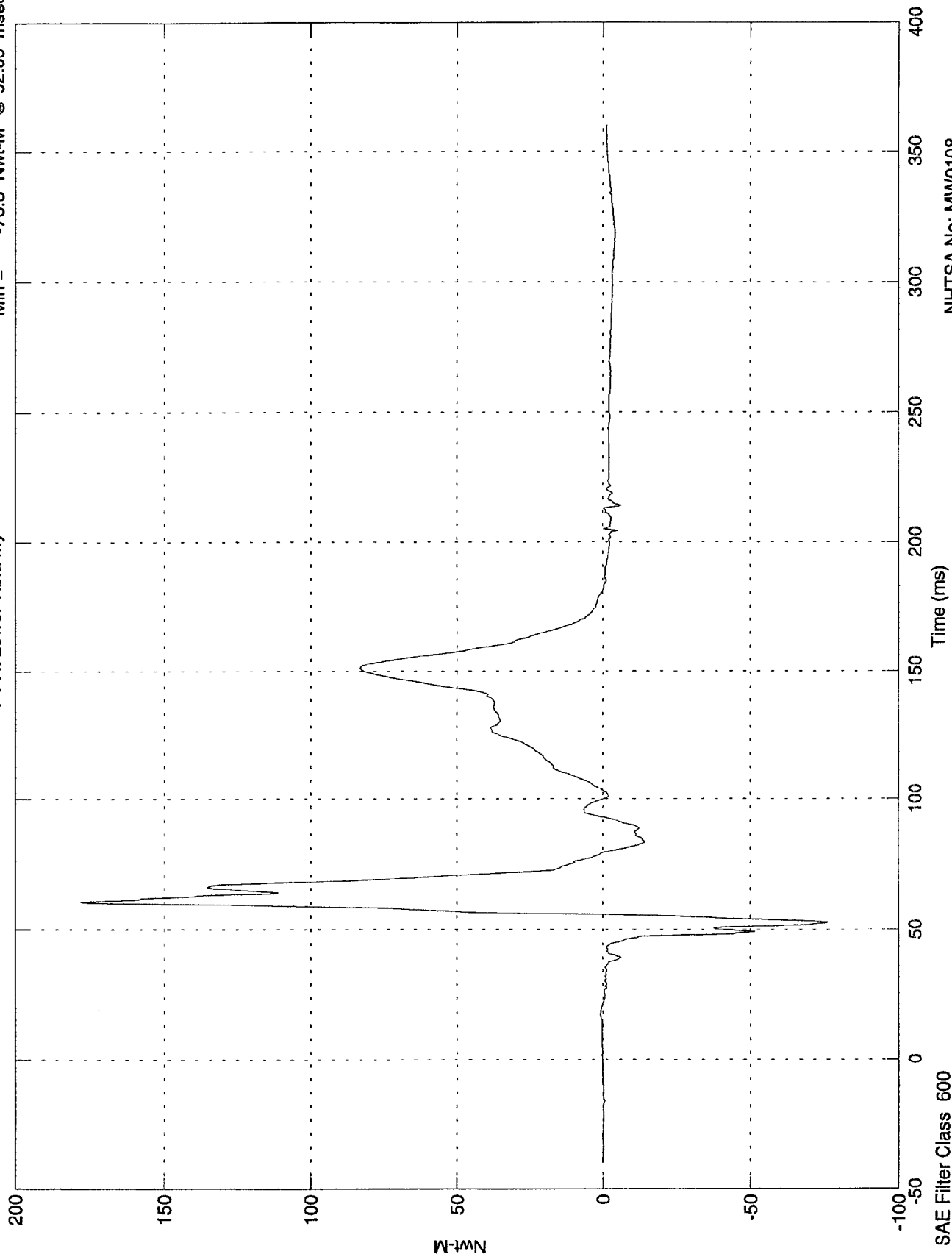


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 178 Nwt-M @ 60.50 msec
Min = -76.3 Nwt-M @ 52.80 msec

P1 Rt Lower Tibia My

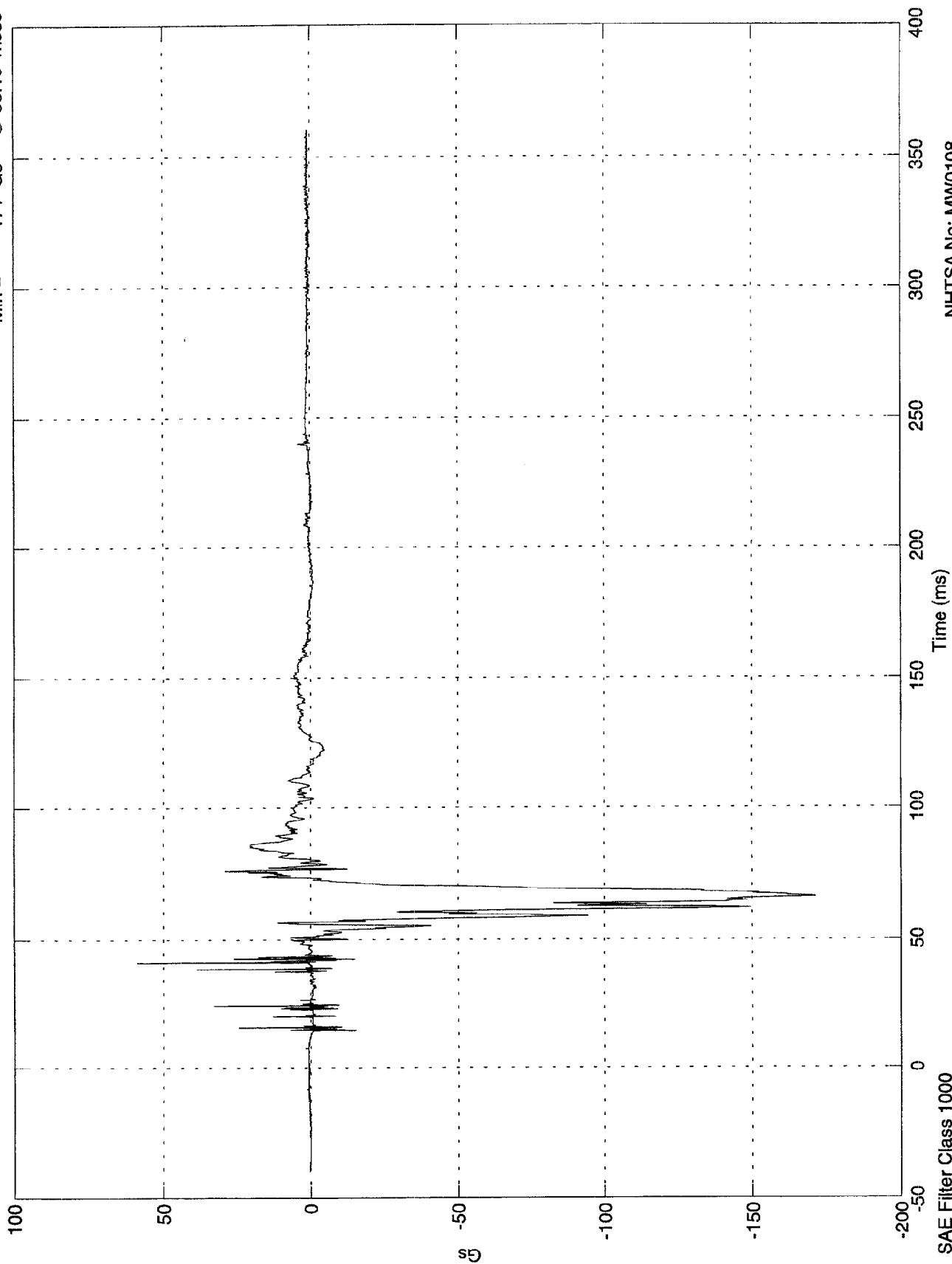


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Pos. 1 Left Ankle X

Max = 58.7 Gs @ 41.20 msec
Min = -171 Gs @ 66.10 msec

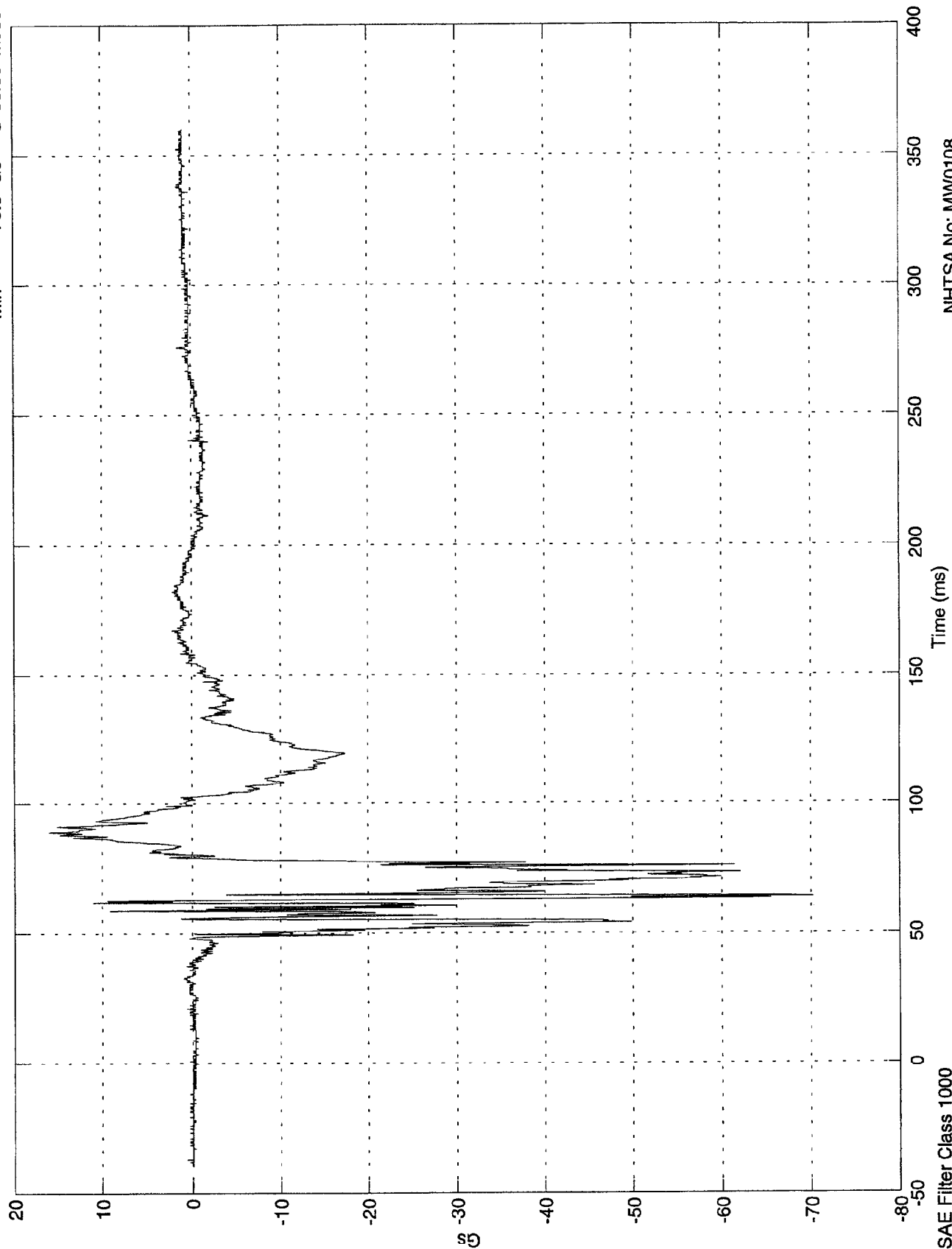


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 16.1 Gs @ 88.90 msec
 Min = -70.3 Gs @ 63.80 msec

Pos. 1 Left Ankle Z

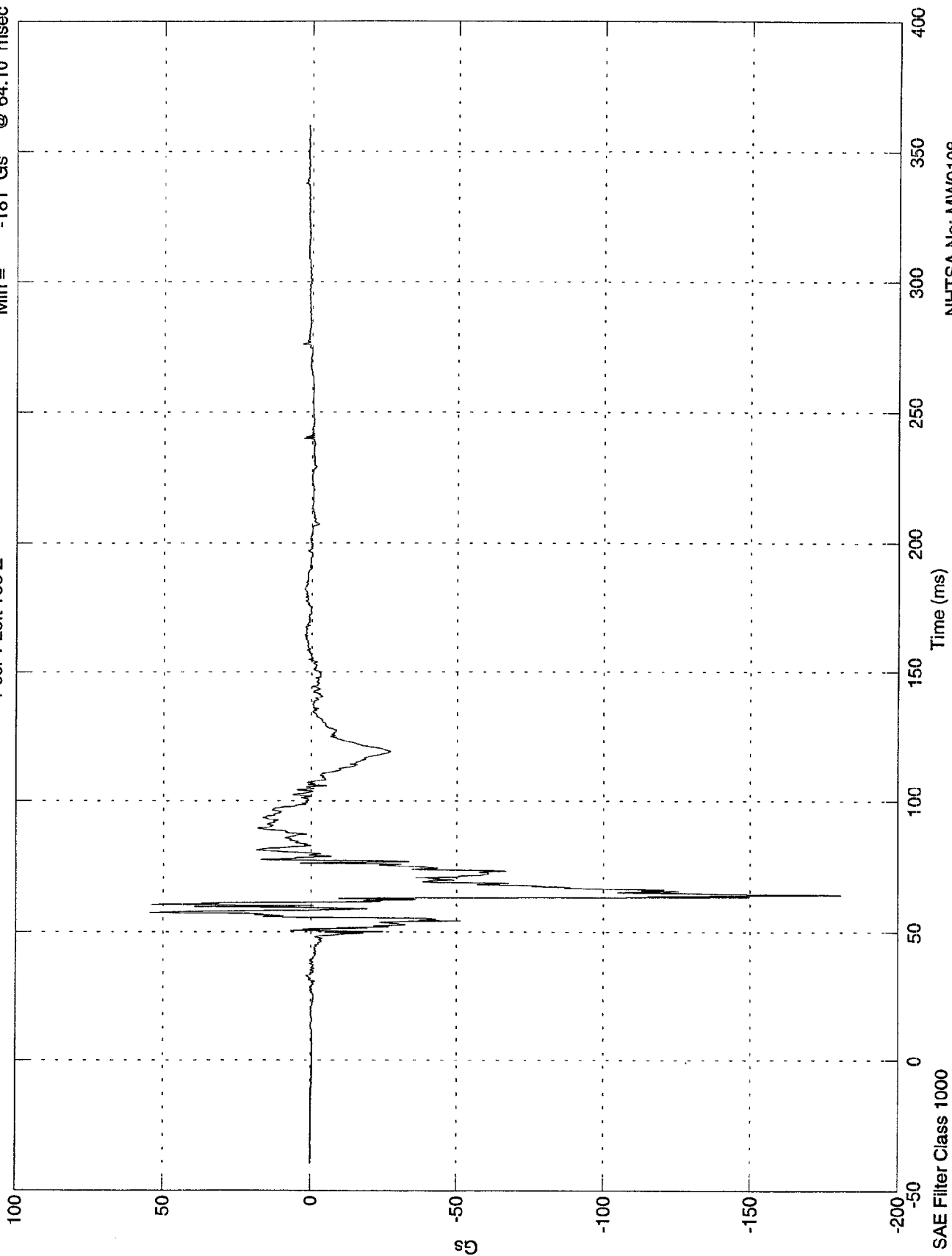


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 54.7 Gs @ 57.40 msec
 Min = -181 Gs @ 64.10 msec

Pos. 1 Left Toe Z

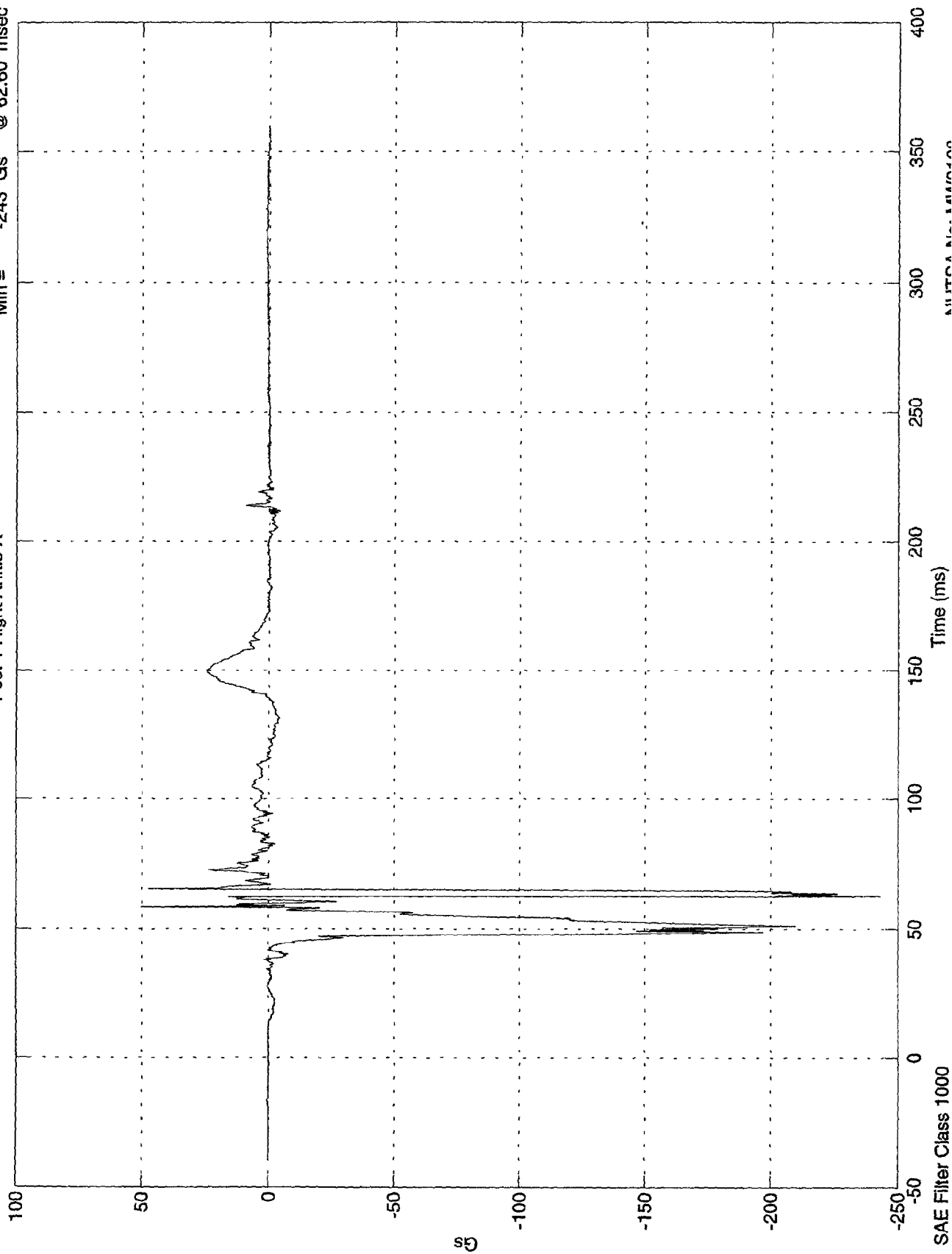


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 50.3 Gs @ 58.40 msec
 Min = -243 Gs @ 62.60 msec

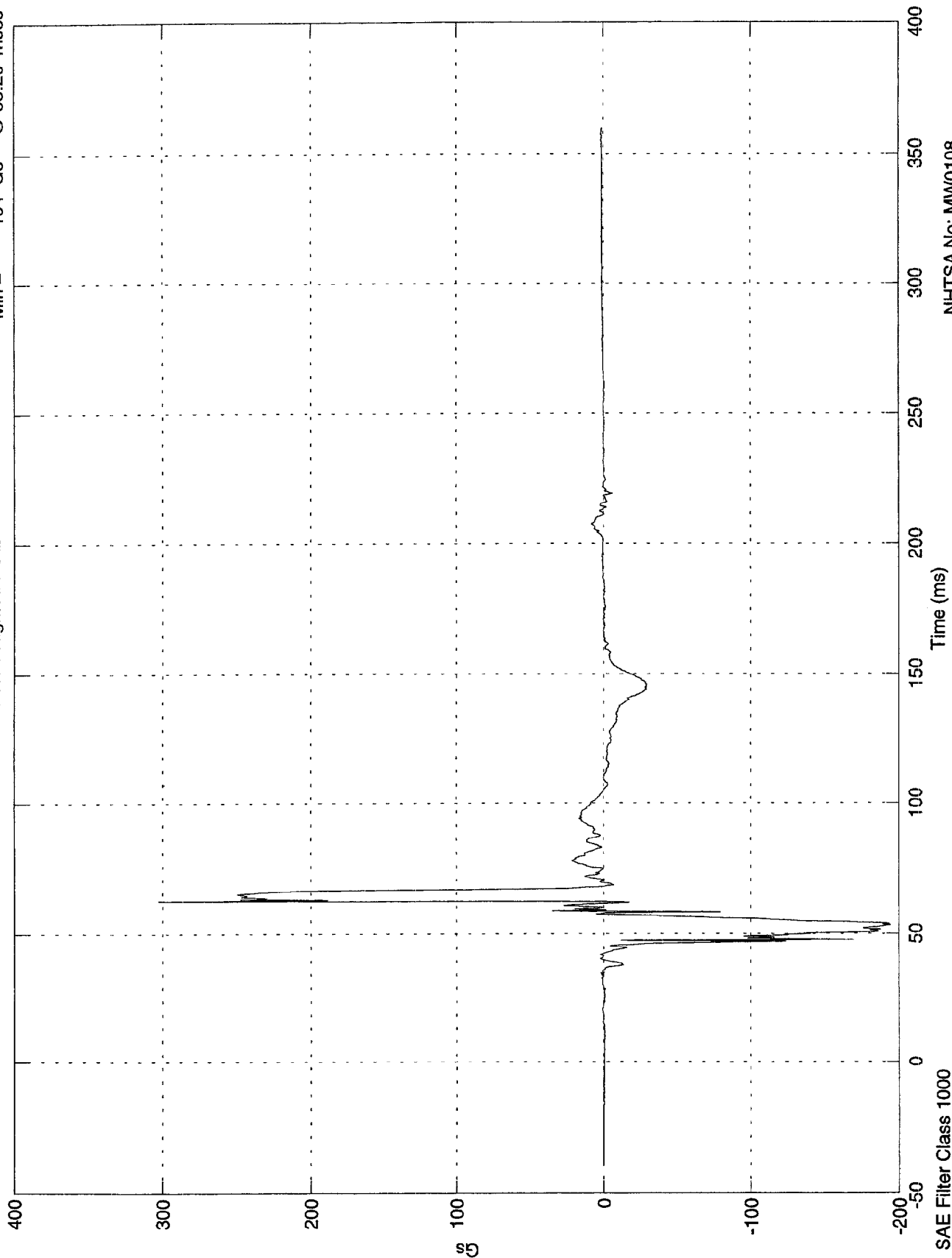
Pos. 1 Right Ankle X



NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 303 Gs @ 62.60 msec
Min = -194 Gs @ 53.20 msec

Pos. 1 Right Ankle Z

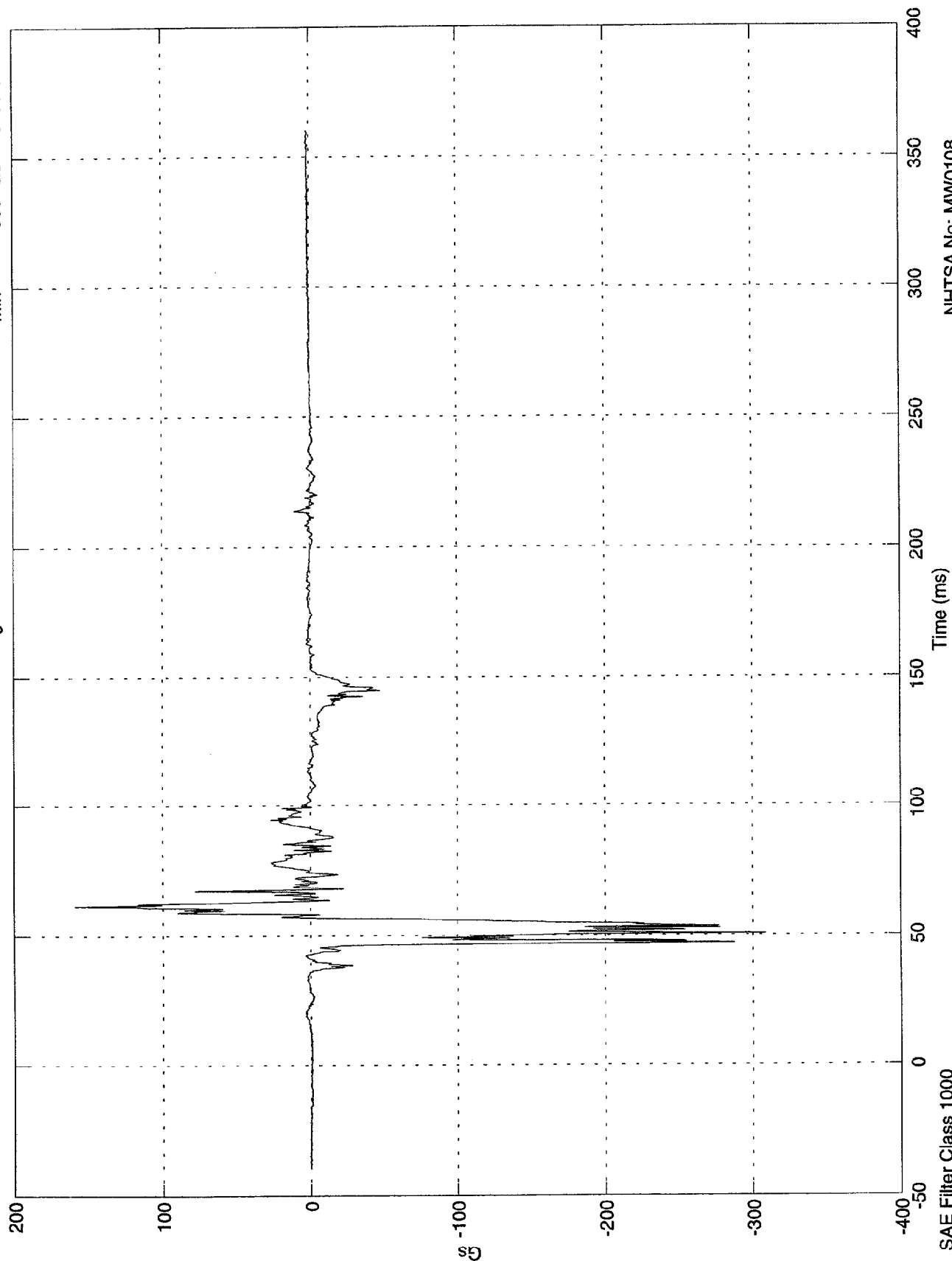


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 160 Gs @ 61.40 msec
 Min = -309 Gs @ 50.60 msec

Pos. 1 Right Toe Z

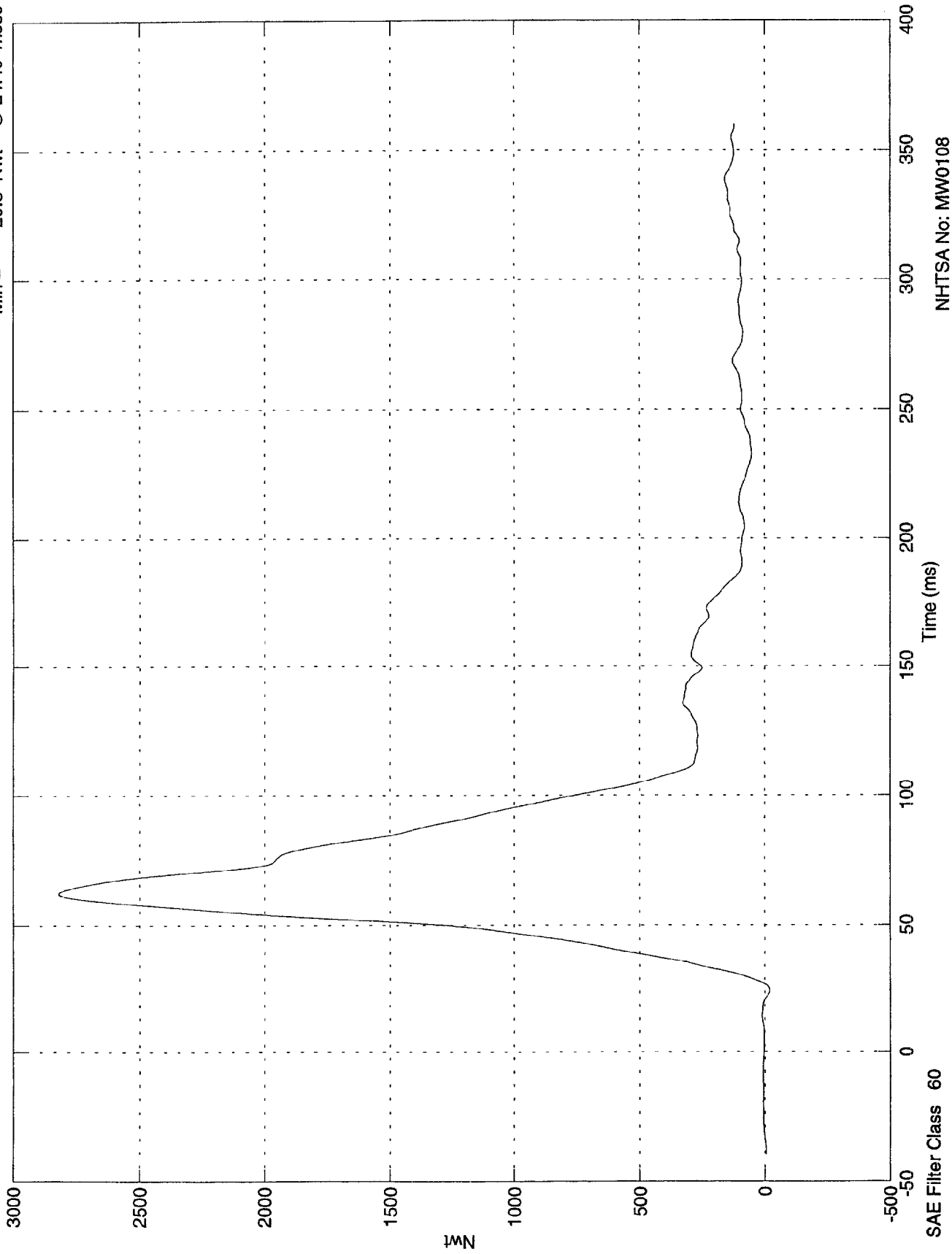


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 2.82e+003 Nwt @ 62.10 msec
Min = -20.3 Nwt @ 24.40 msec

Pos. 1 Left Belt Load



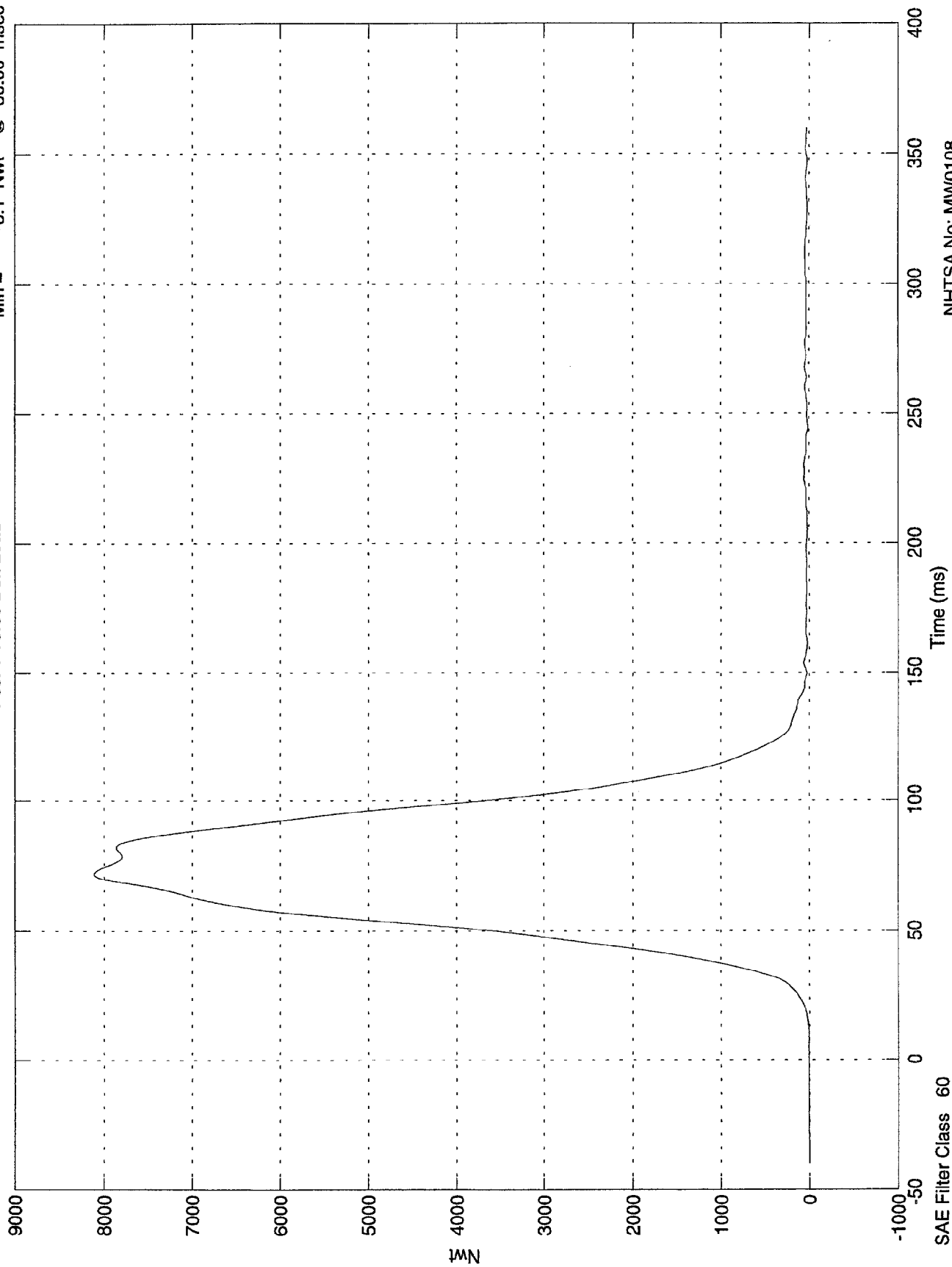
NHTSA No: MW0108
Date: 03 Feb 1998

SAE Filter Class 60

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 8.12e+003 Nwt @ 72.00 msec
Min = -3.1 Nwt @ -36.00 msec

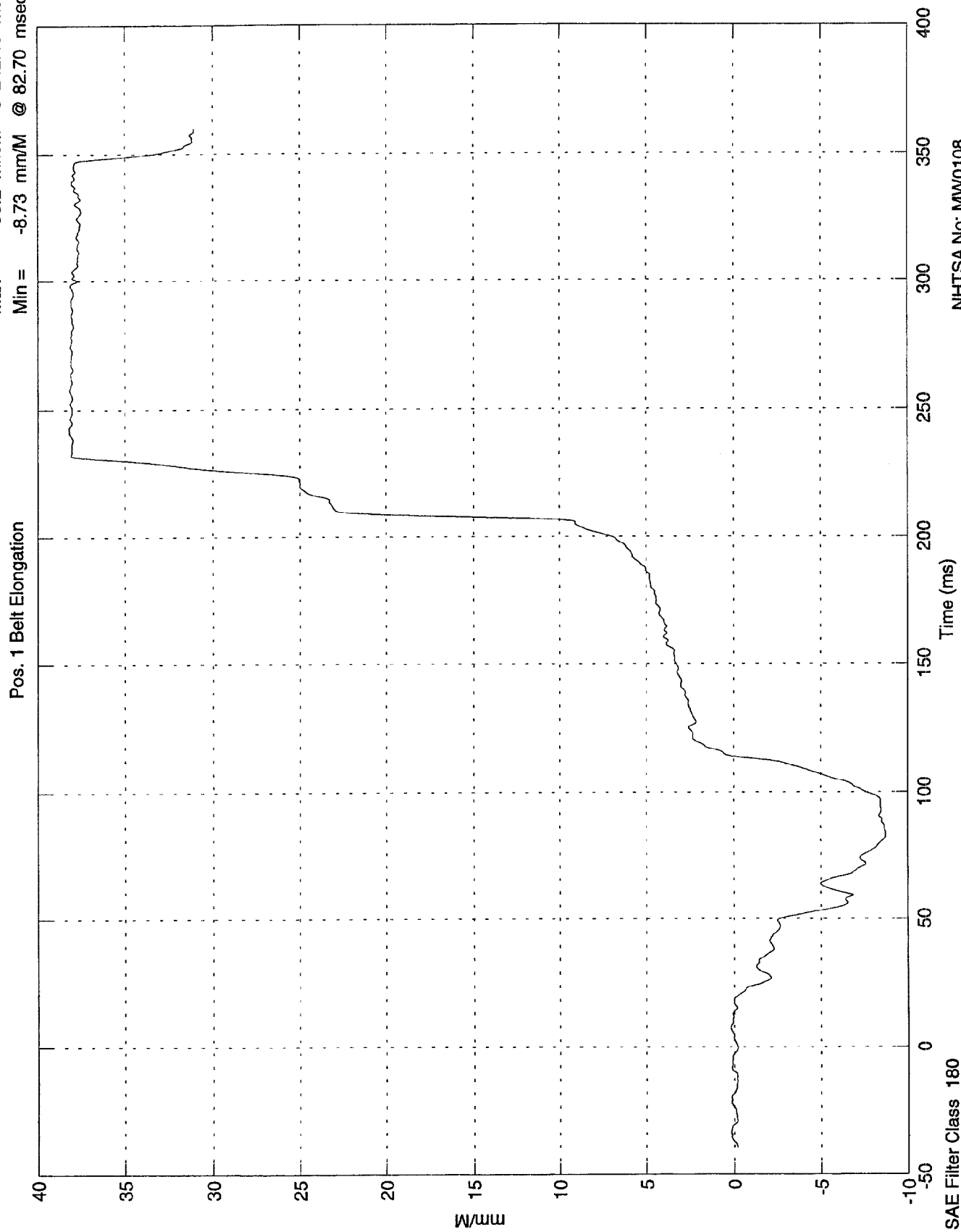
Pos. 1 Torso Belt Load



NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 38.2 mm/M @ 242.40 msec
Min = -8.73 mm/M @ 82.70 msec

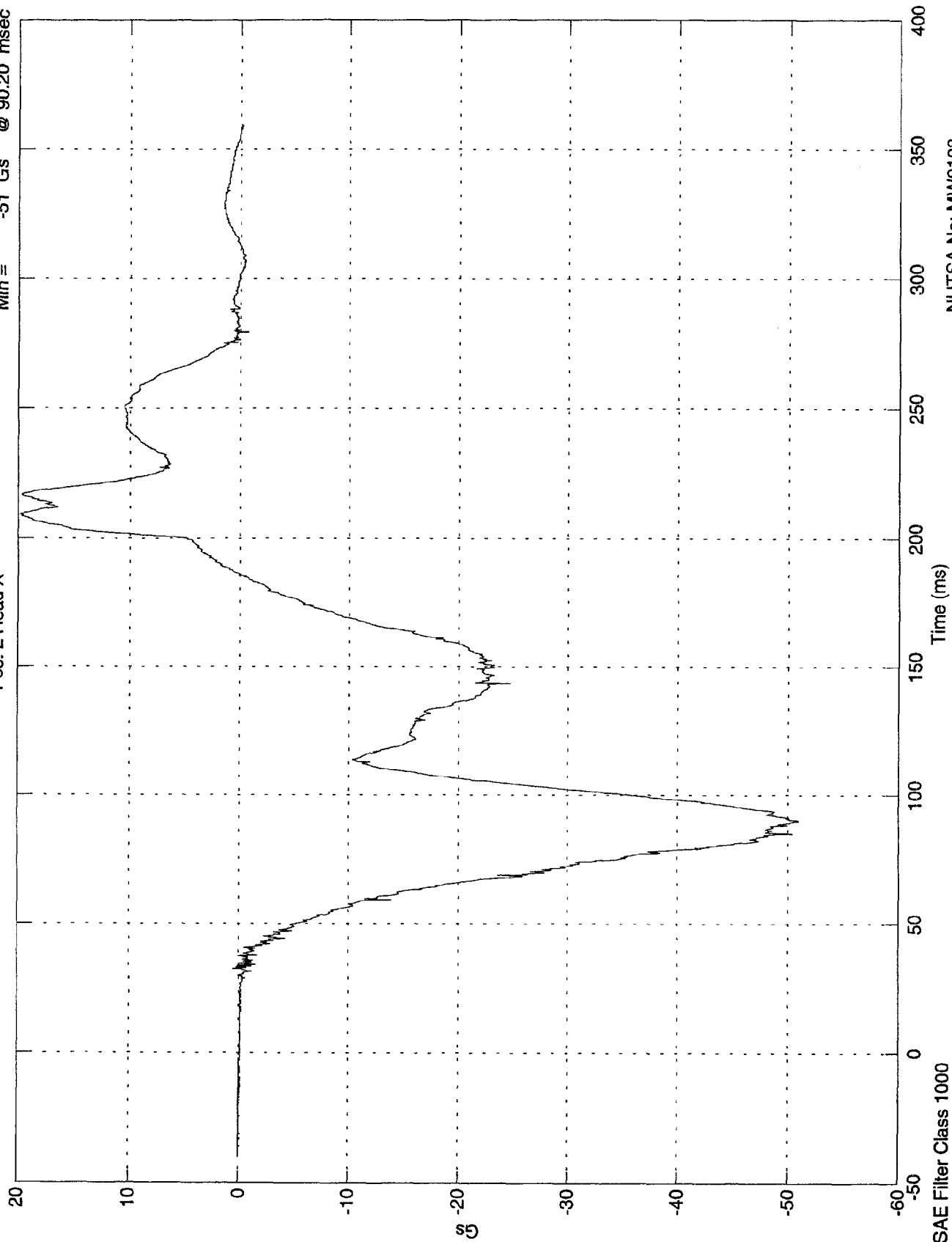


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 19.8 Gs @ 209.00 msec
 Min = -51 Gs @ 90.20 msec

Pos. 2 Head X

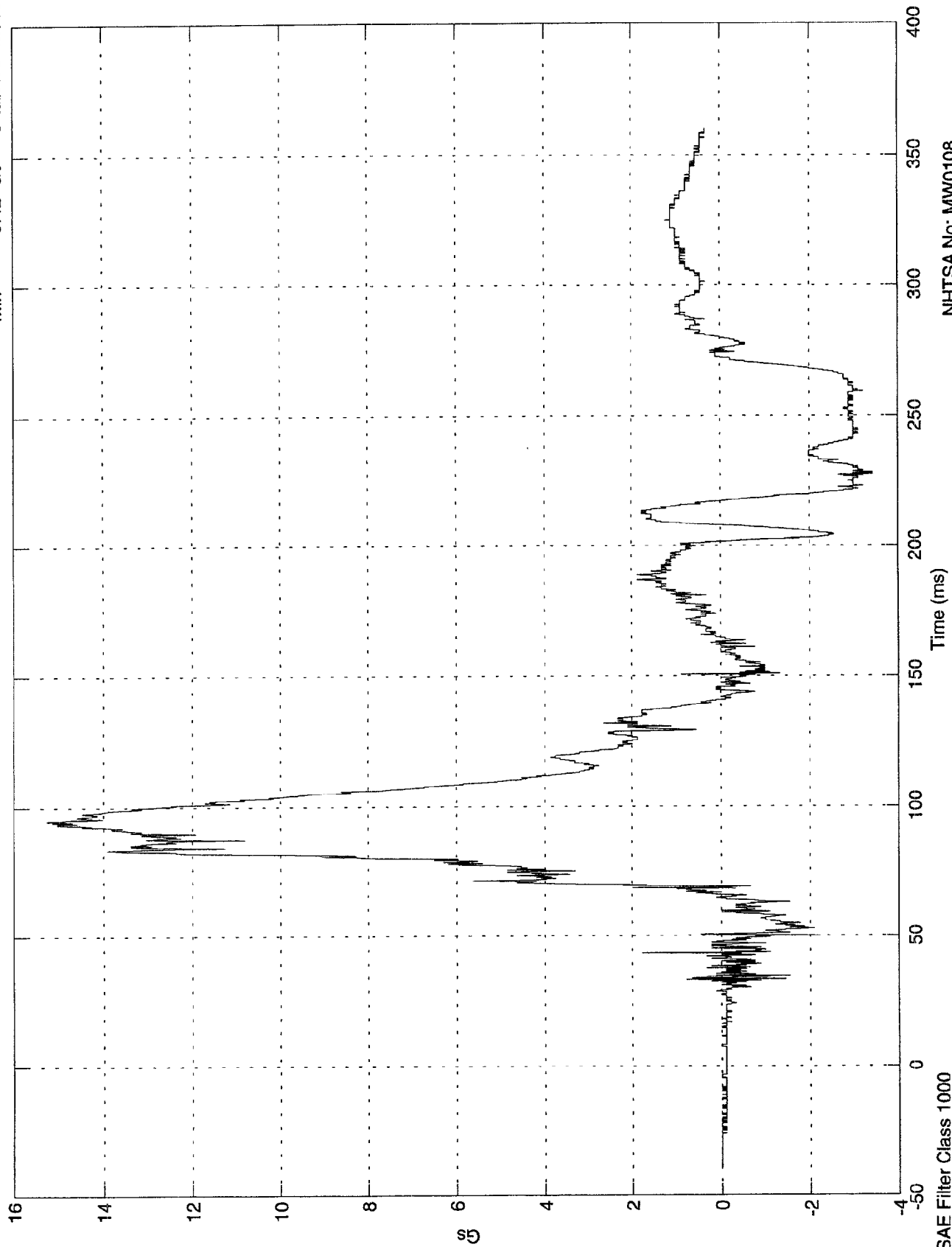


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 15.2 Gs @ 94.70 msec
 Min = -3.42 Gs @ 227.70 msec

Pos. 2 Head Y



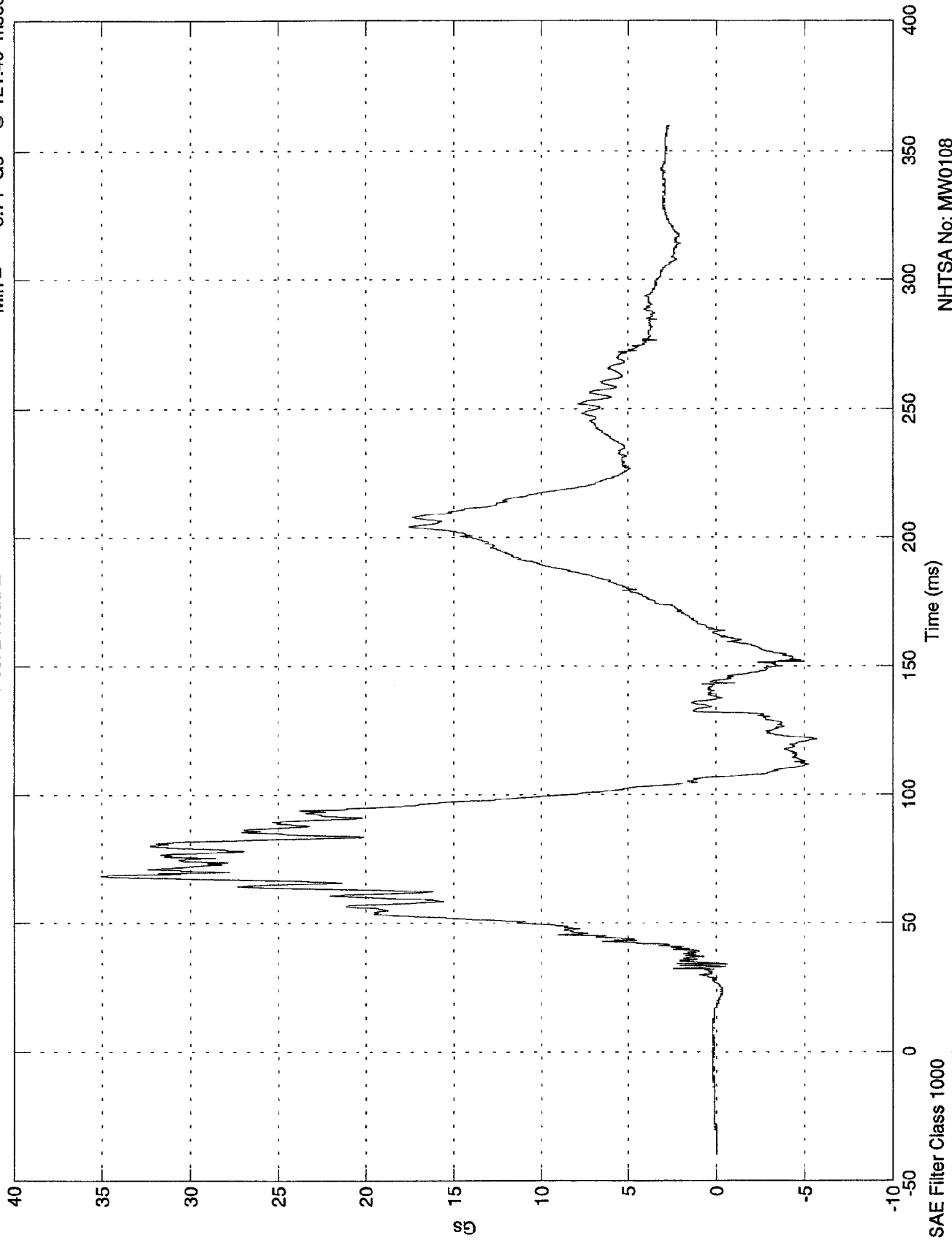
NHTSA No: MW0108
 Date: 03 Feb 1998

SAE Filter Class 1000

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

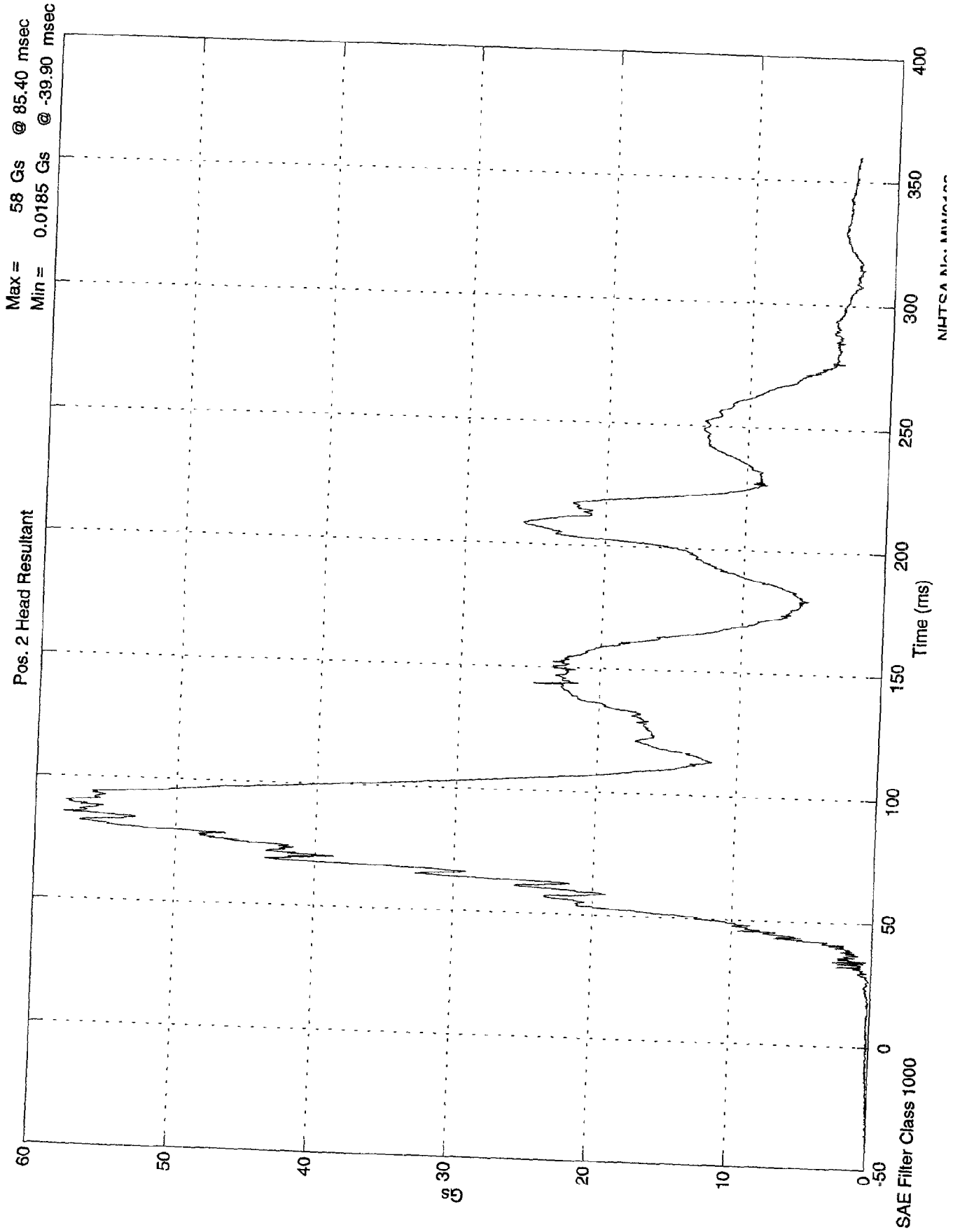
Max = 35.1 Gs @ 68.30 msec
 Min = -5.71 Gs @ 121.40 msec

Pos. 2 Head Z



NHTSA No: MW0108
 Date: 03 Feb 1998

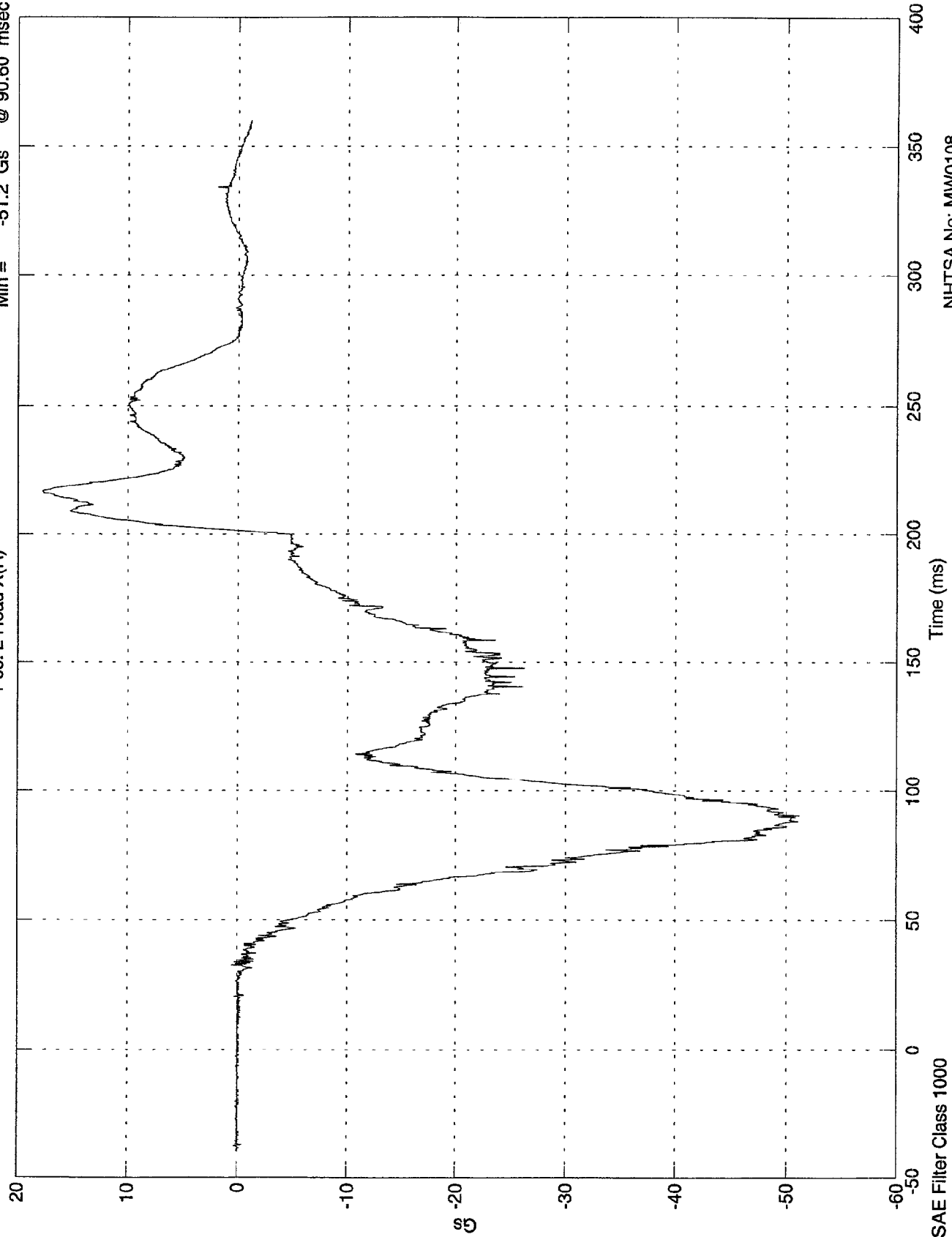
NCAP TEST #20 - 1998 CHEVROLET SUBURBAN



NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 17.8 Gs @ 217.00 msec
 Min = -51.2 Gs @ 90.60 msec

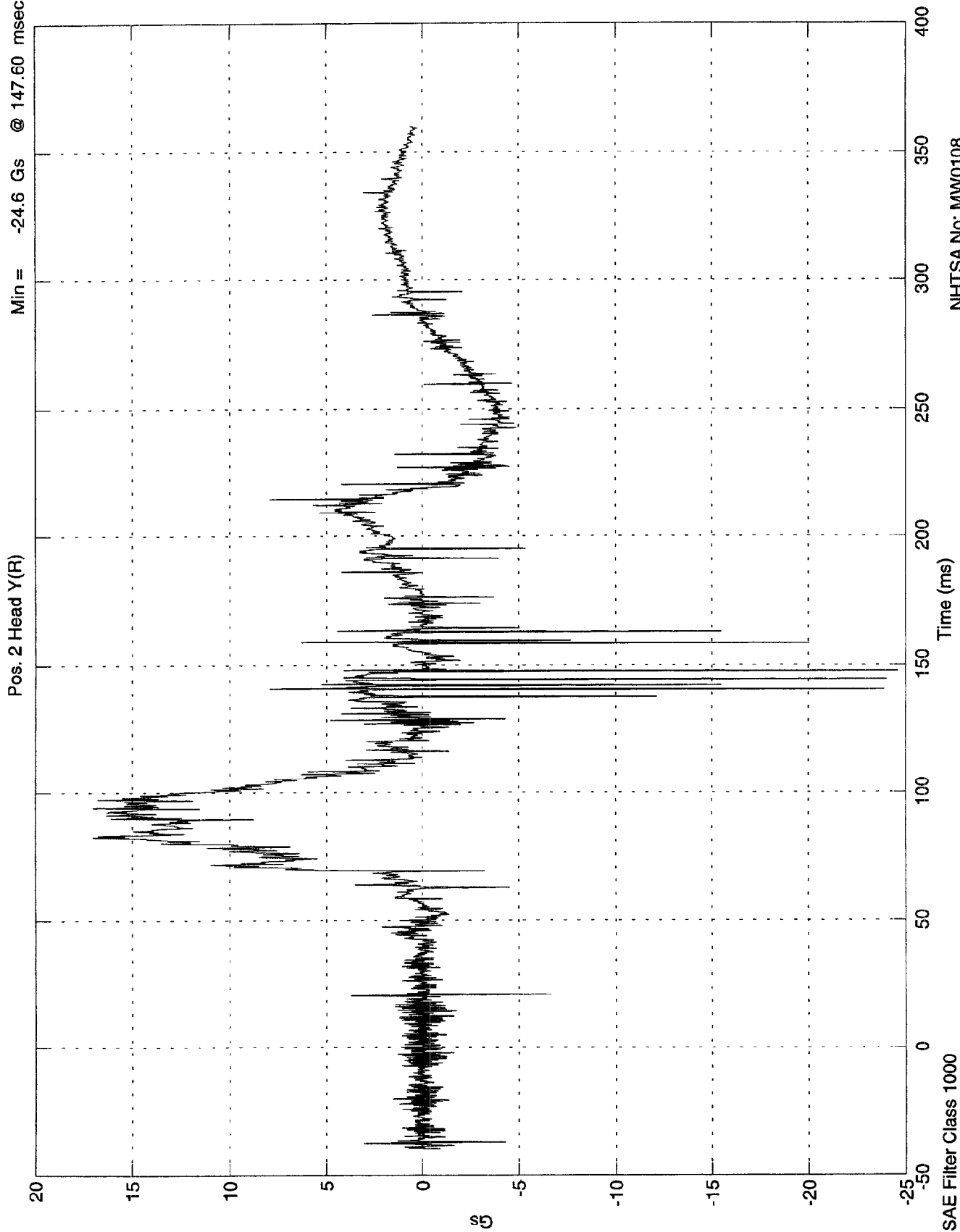
Pos. 2 Head X(R)



NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

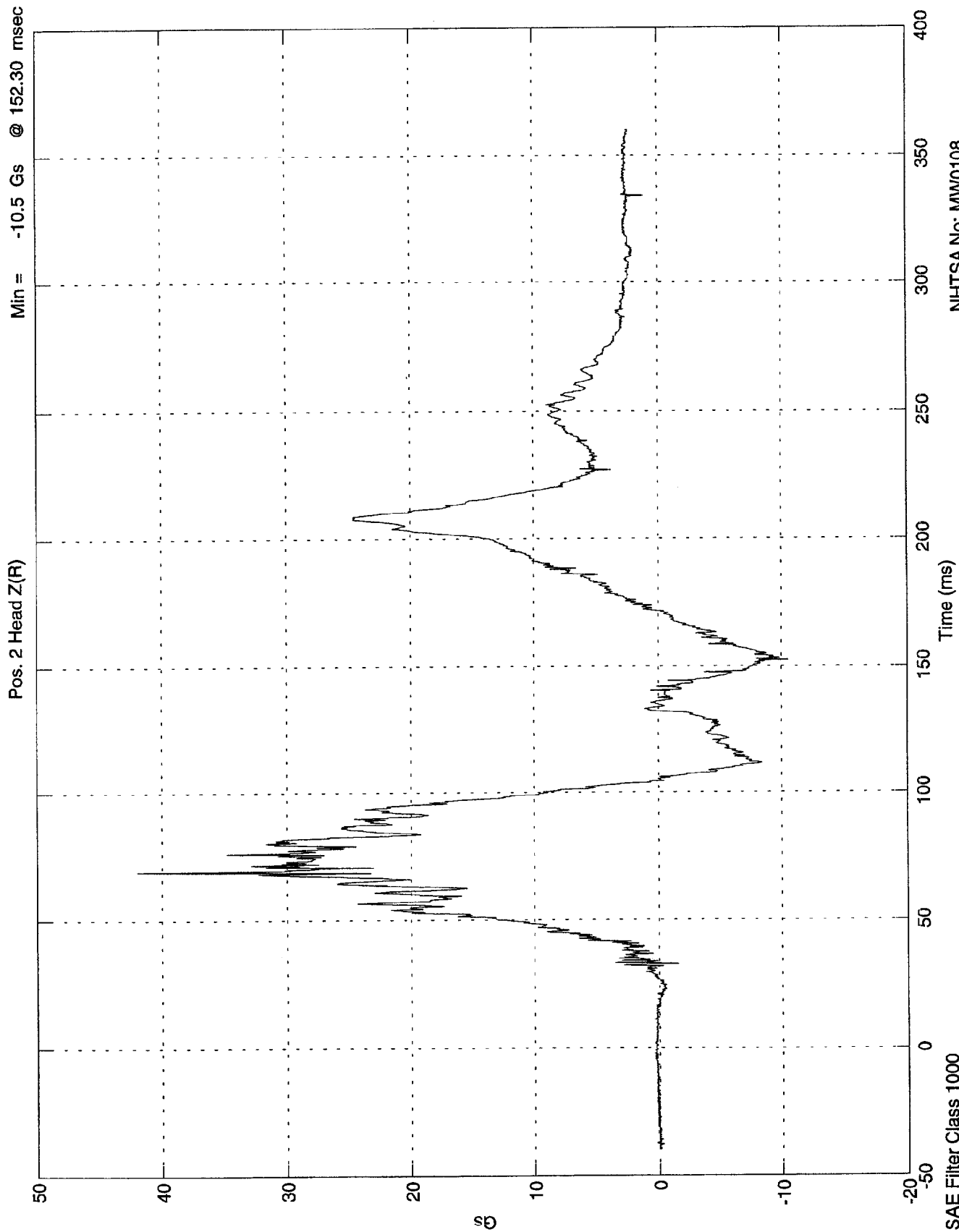
Max = 17 Gs @ 82.60 msec
 Min = -24.6 Gs @ 147.60 msec



NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 42 Gs @ 68.90 msec
 Min = -10.5 Gs @ 152.30 msec

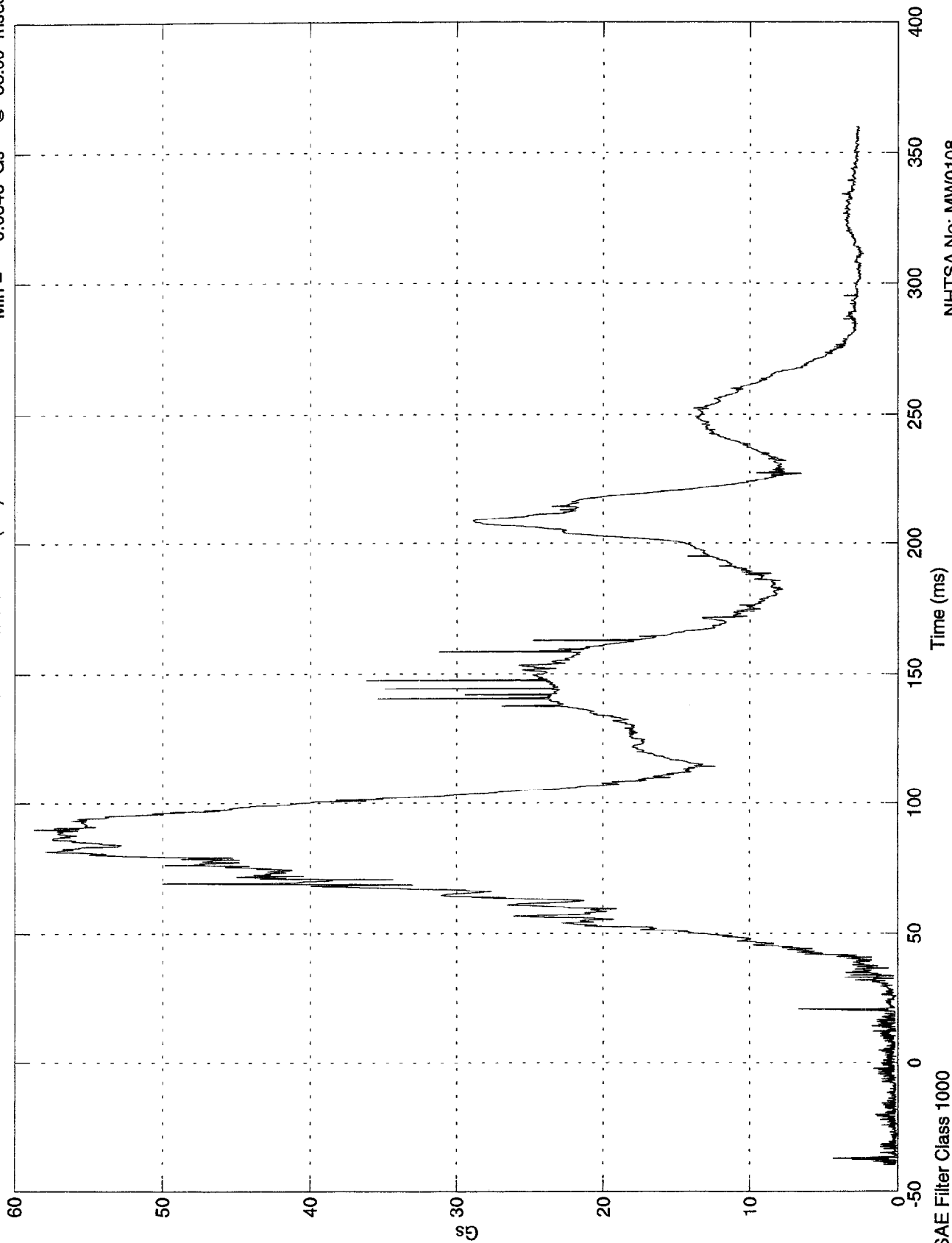


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 58.7 Gs @ 89.90 msec
 Min = 0.0546 Gs @ -38.30 msec

Pos. 2 Head Resultant(RR)

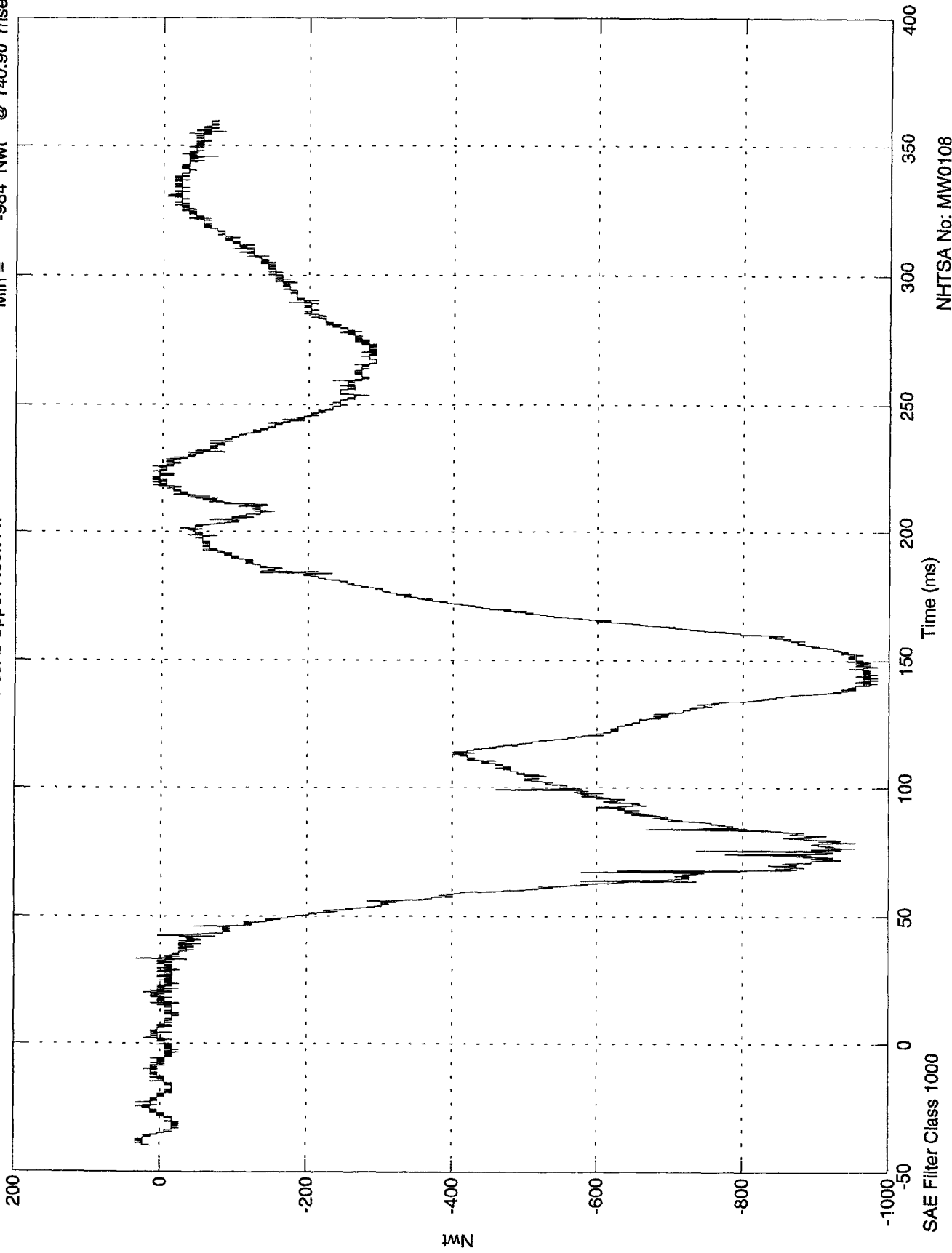


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 33.6 Nwt @ -39.10 msec
Min = -984 Nwt @ 140.90 msec

Pos. 2 Upper Neck Fx

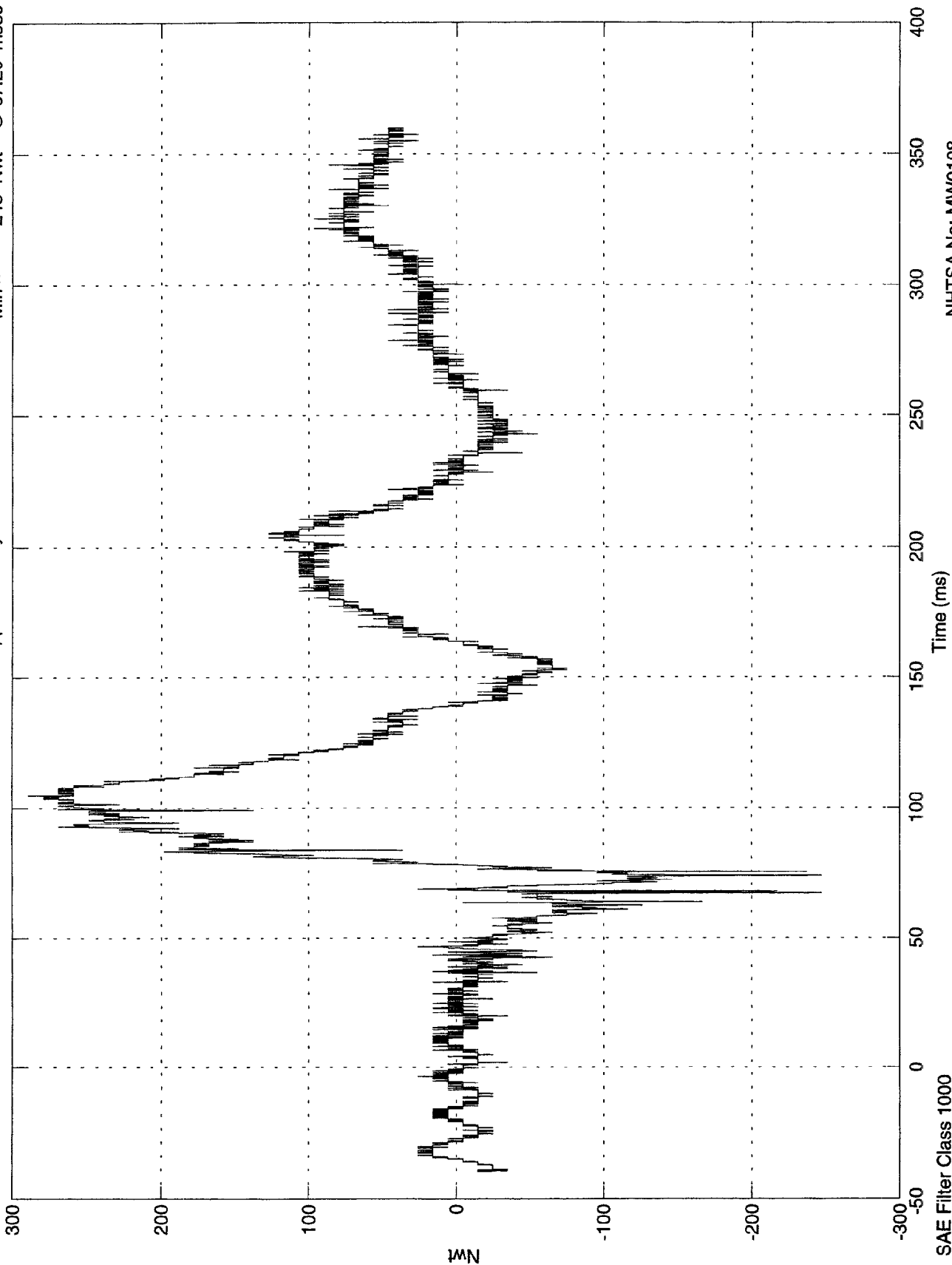


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 289 Nwt @ 104.80 msec
 Min = -248 Nwt @ 67.20 msec

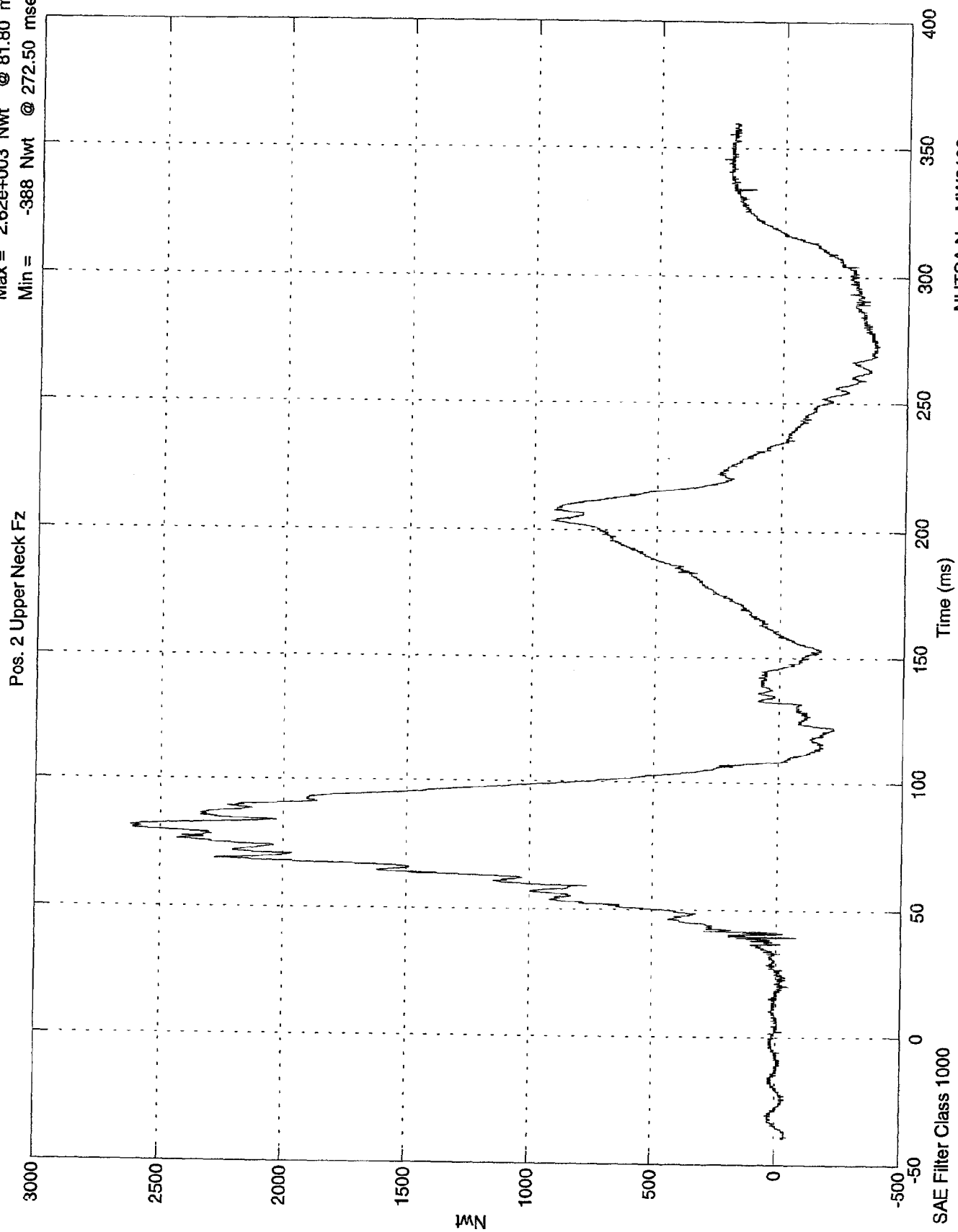
Pos. 2 Upper Neck Fy



NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 2.62e+003 Nwt @ 81.80 msec
 Min = -388 Nwt @ 272.50 msec

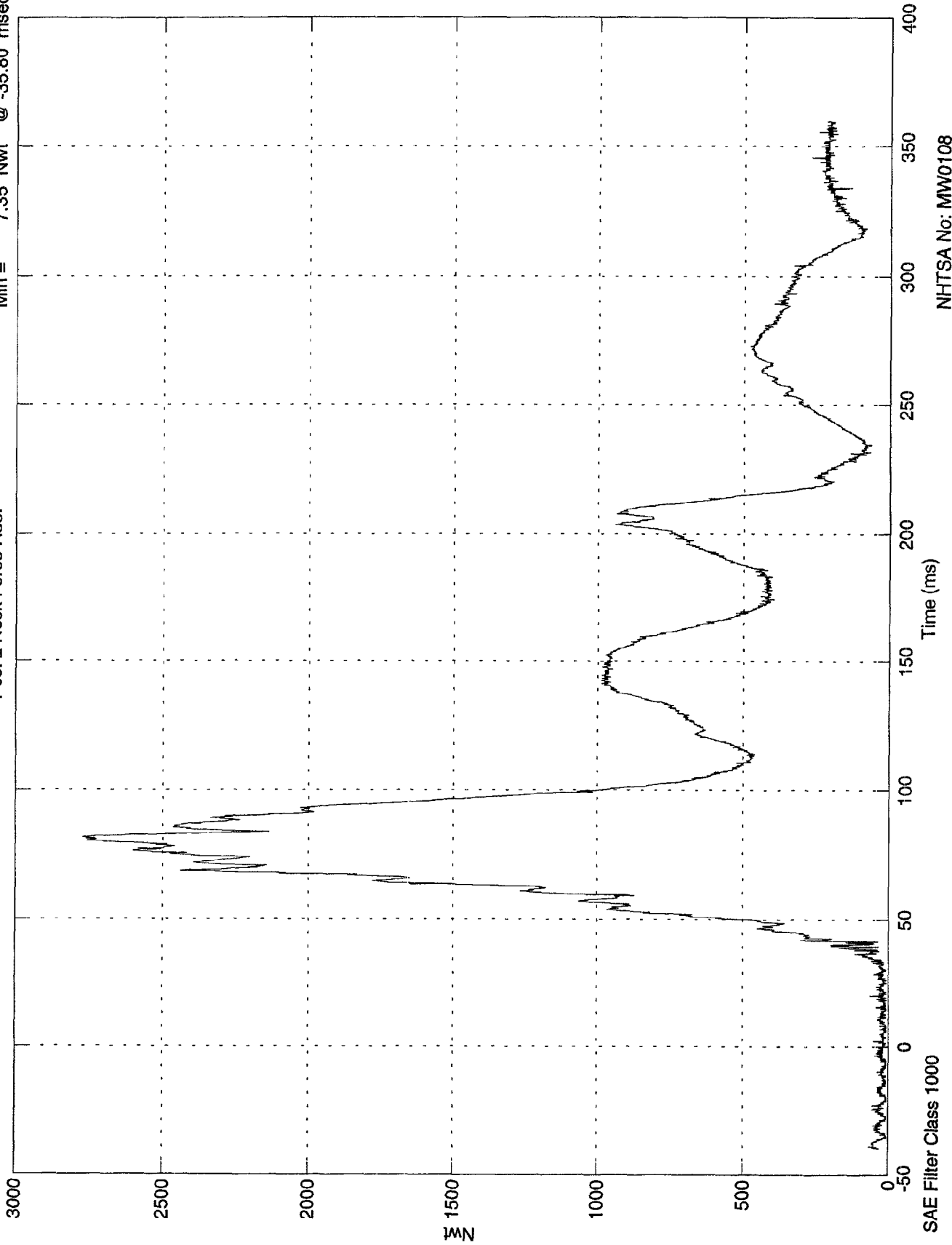


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 2.77e+003 Nwt @ 81.80 msec
 Min = 7.35 Nwt @ -35.80 msec

Pos. 2 Neck Force Res.

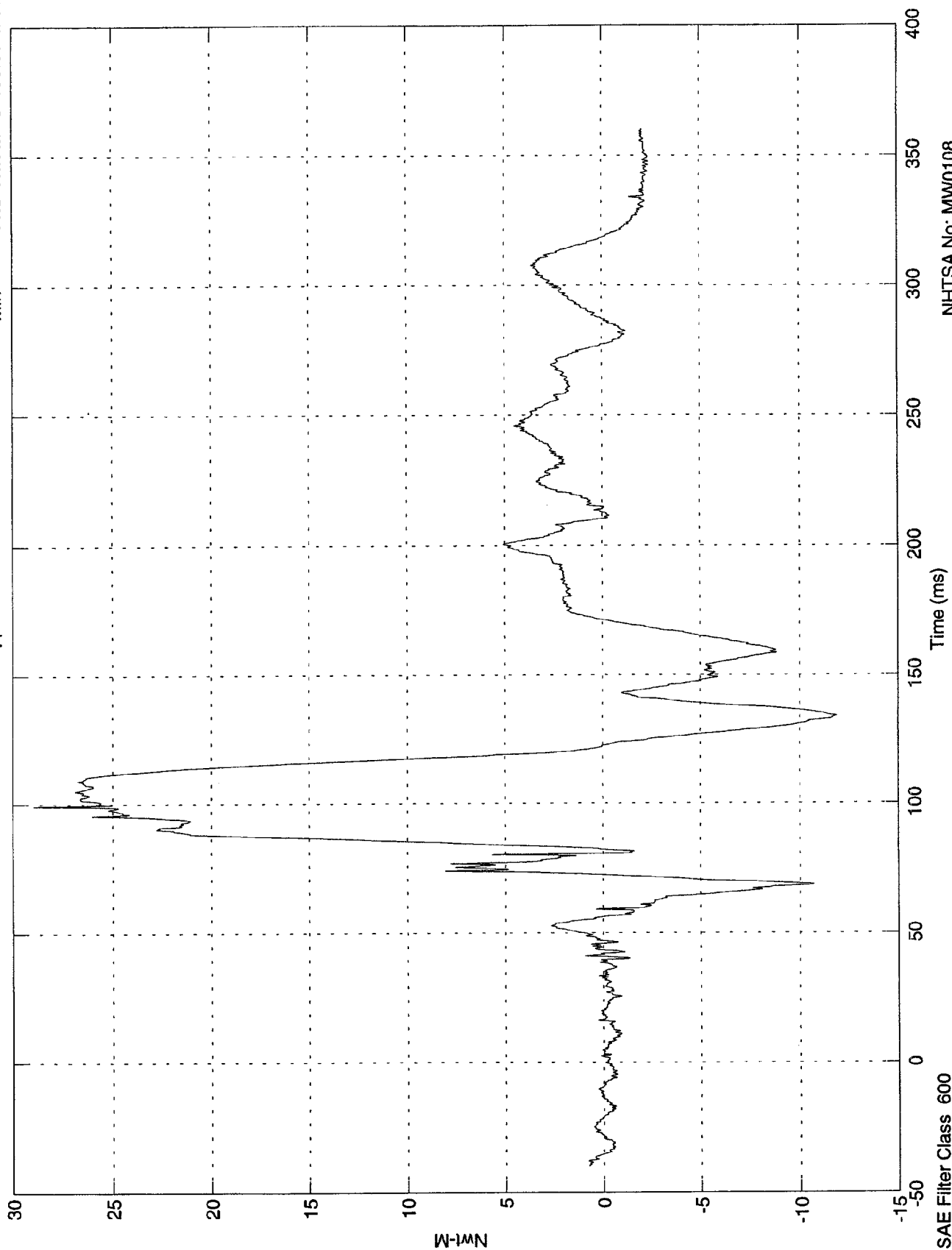


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 29 Nwt-M @ 99.20 msec
Min = -11.9 Nwt-M @ 133.60 msec

Pos. 2 Upper Neck Mx



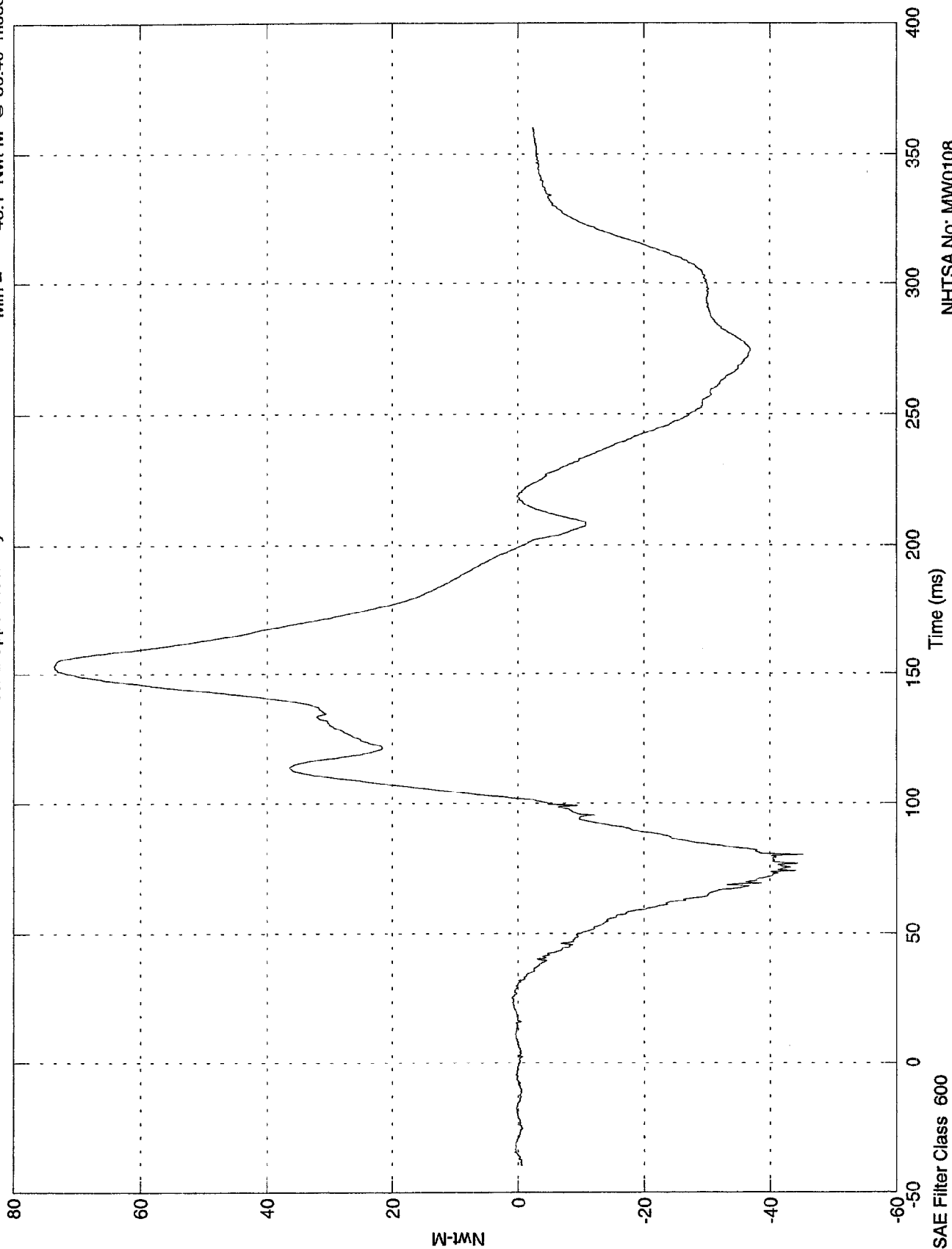
SAE Filter Class 600

NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Pos. 2 Upper Neck My

Max = 73.6 Nwt-M @ 153.20 msec
Min = -45.1 Nwt-M @ 80.40 msec

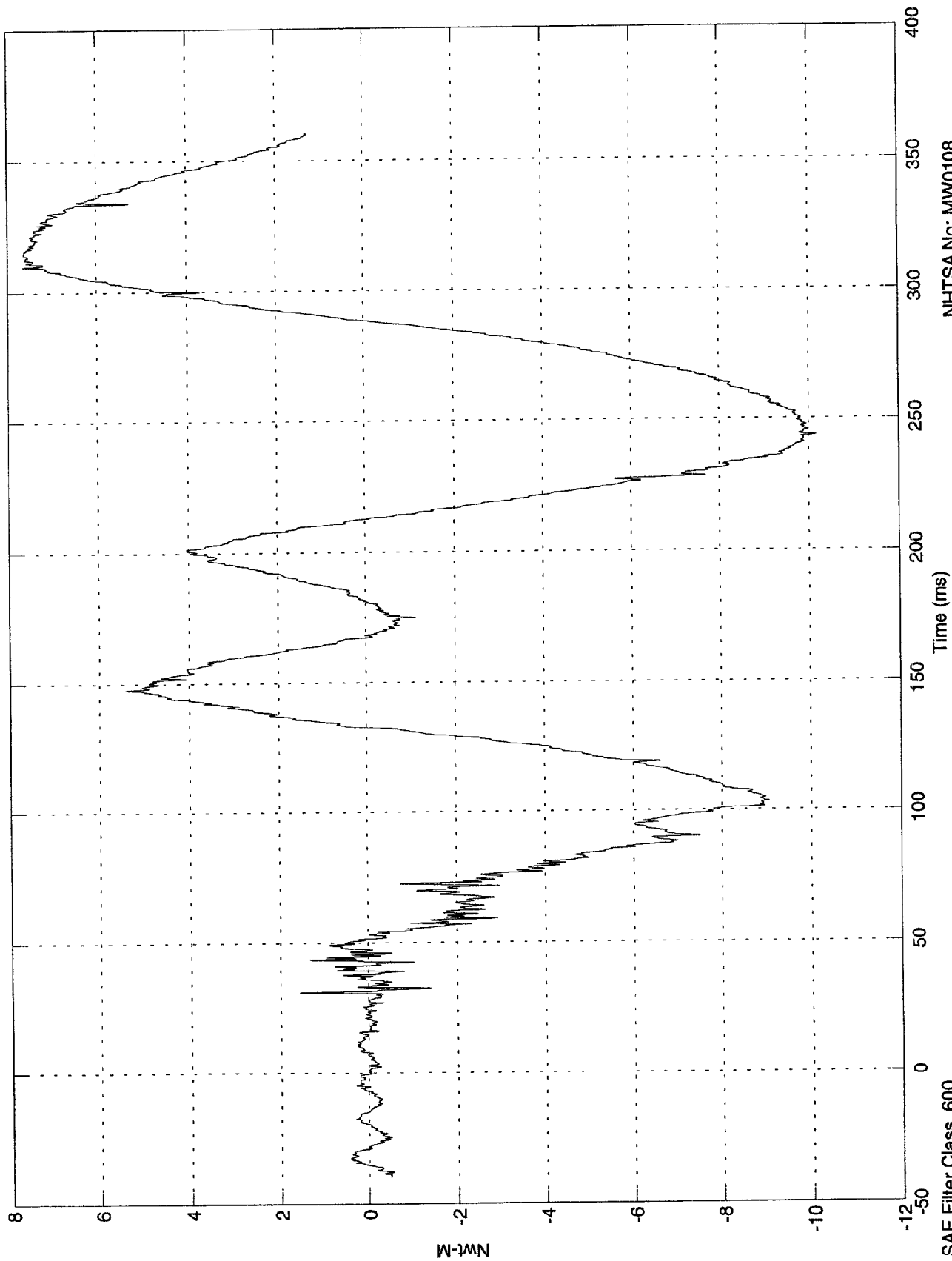


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 7.65 Nwt-M @ 309.80 msec
 Min = -10.2 Nwt-M @ 243.70 msec

Pos. 2 Upper Neck Mz



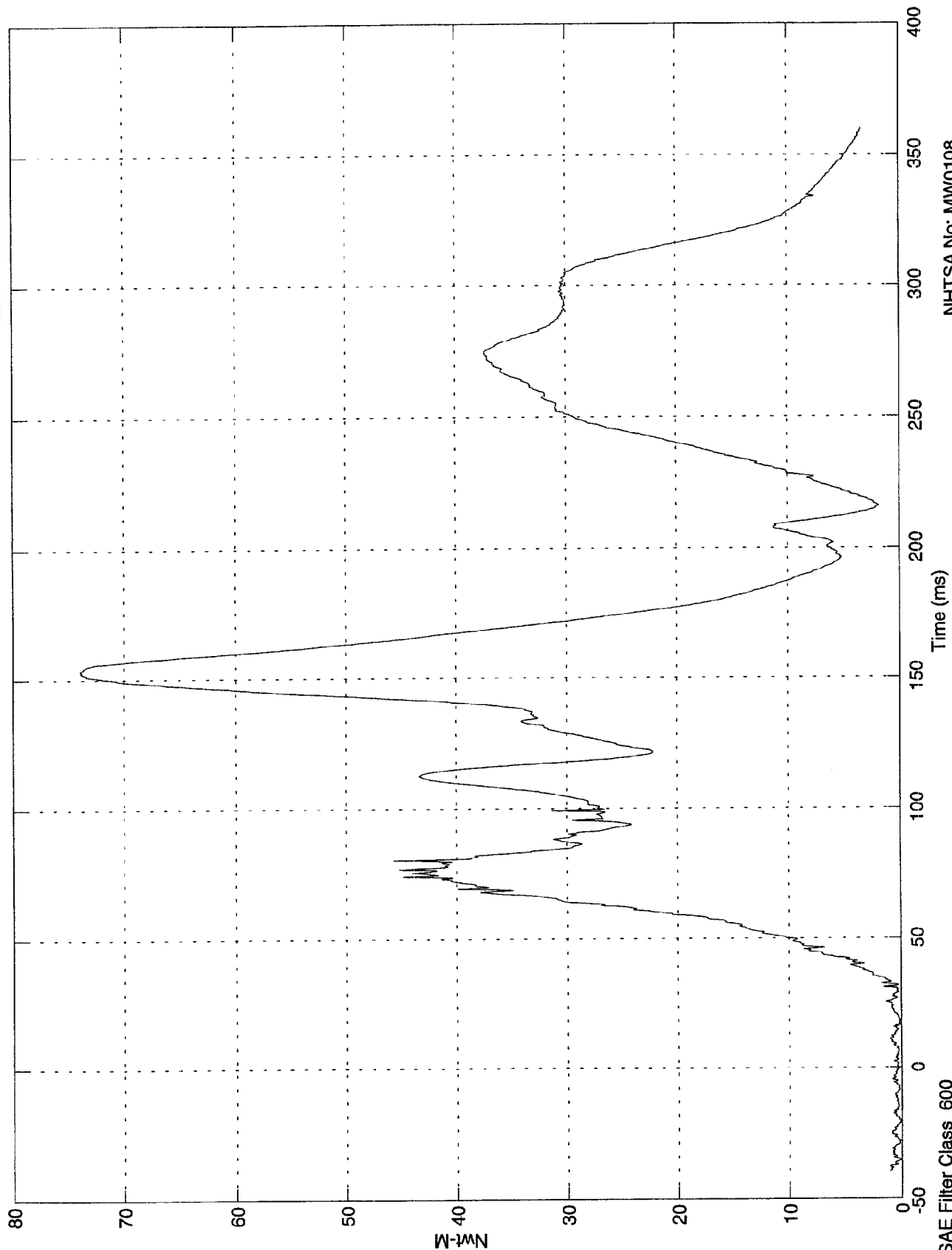
NHTSA No: MW0108
 Date: 03 Feb 1998

SAE Filter Class 600

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 73.9 Nwt-M @ 153.20 msec
 Min = 0.0667 Nwt-M @ -35.30 msec

Pos. 2 Neck Moment Res.

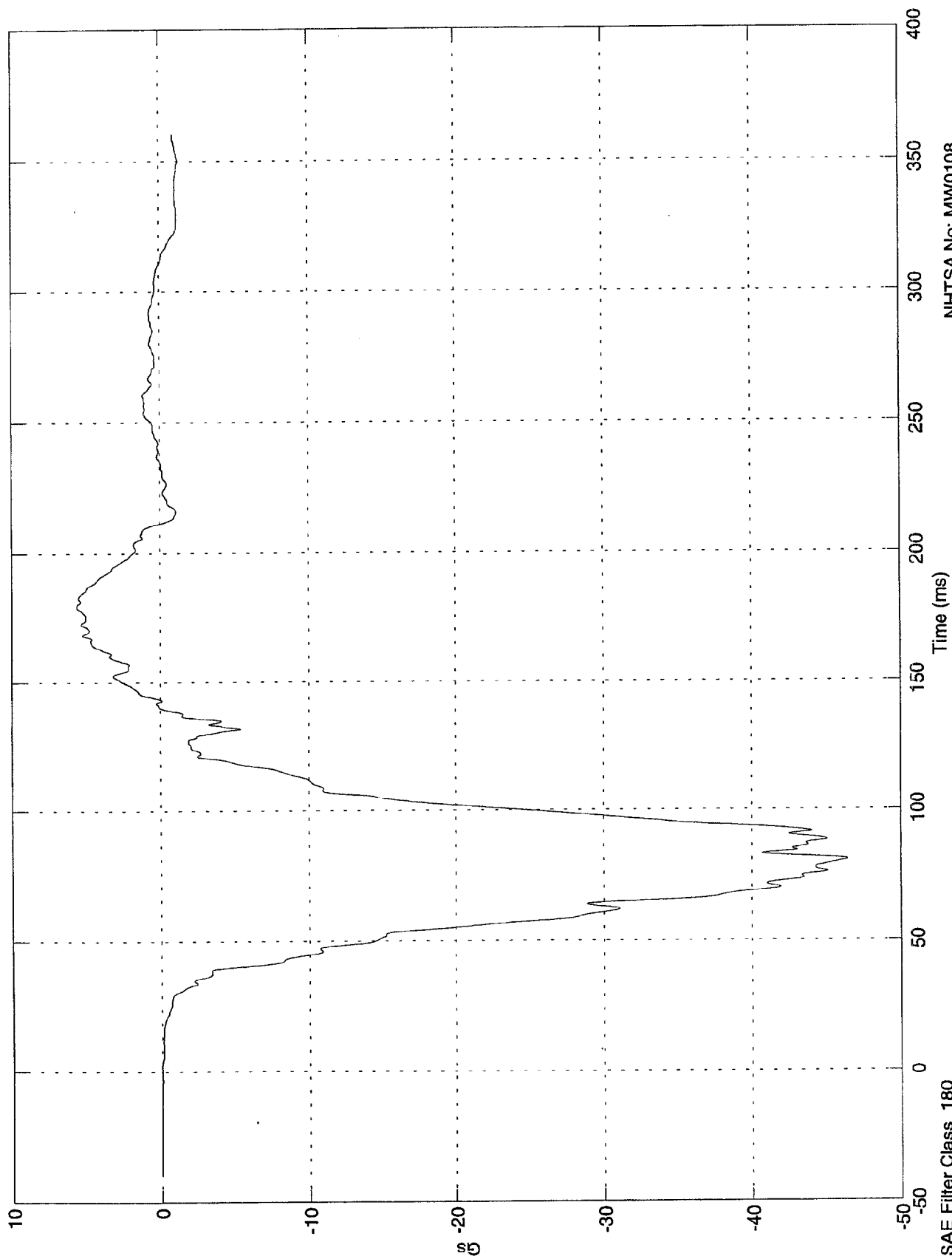


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 5.64 Gs @ 179.10 msec
 Min = -46.4 Gs @ 80.90 msec

Pos. 2 Chest X



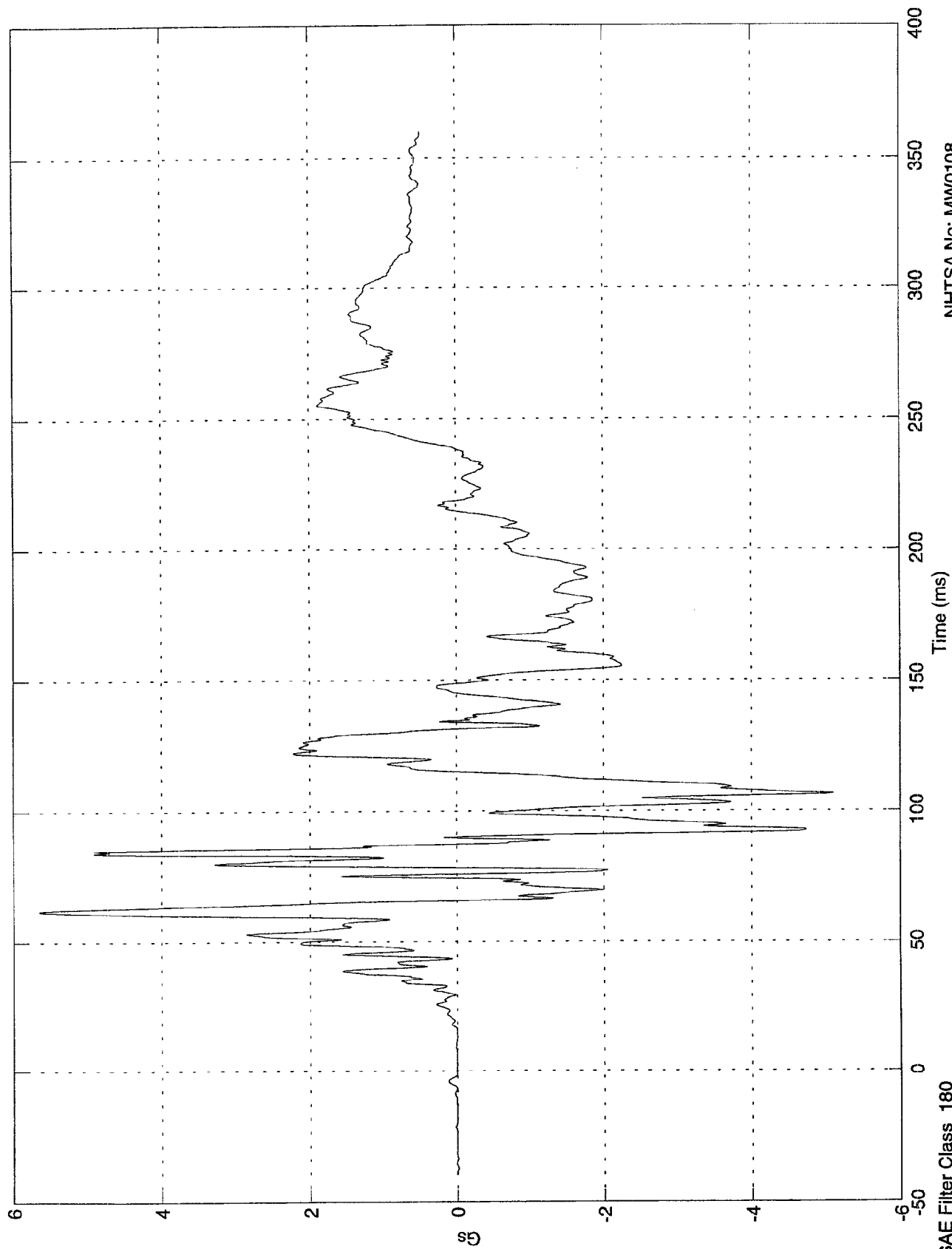
NHTSA No: MW0108
 Date: 03 Feb 1998

SAE Filter Class 180

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 5.65 Gs @ 61.80 msec
 Min = -5.11 Gs @ 106.60 msec

Pos. 2 Chest Y

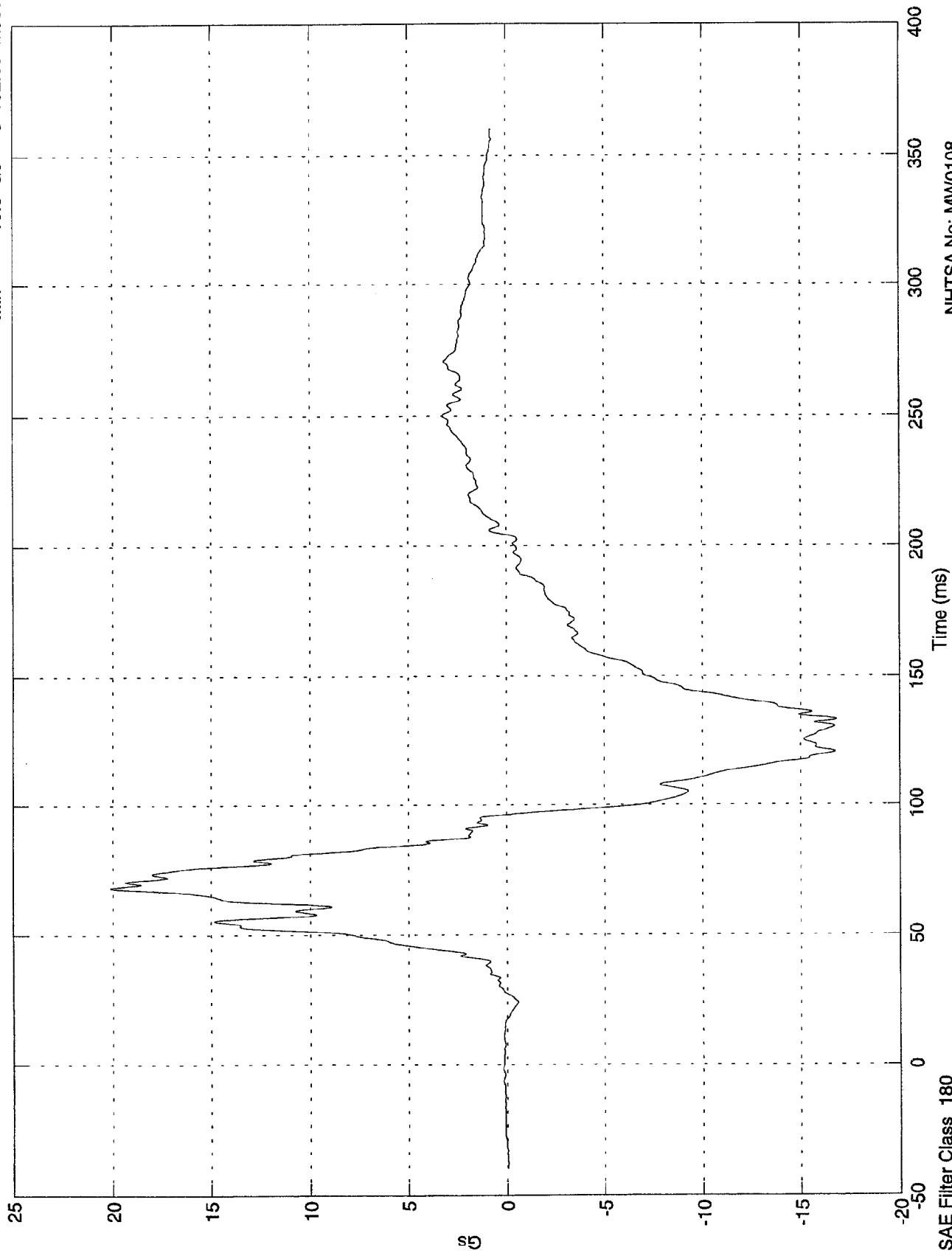


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 20.1 Gs @ 68.10 msec
 Min = -16.8 Gs @ 132.80 msec

Pos. 2 Chest Z

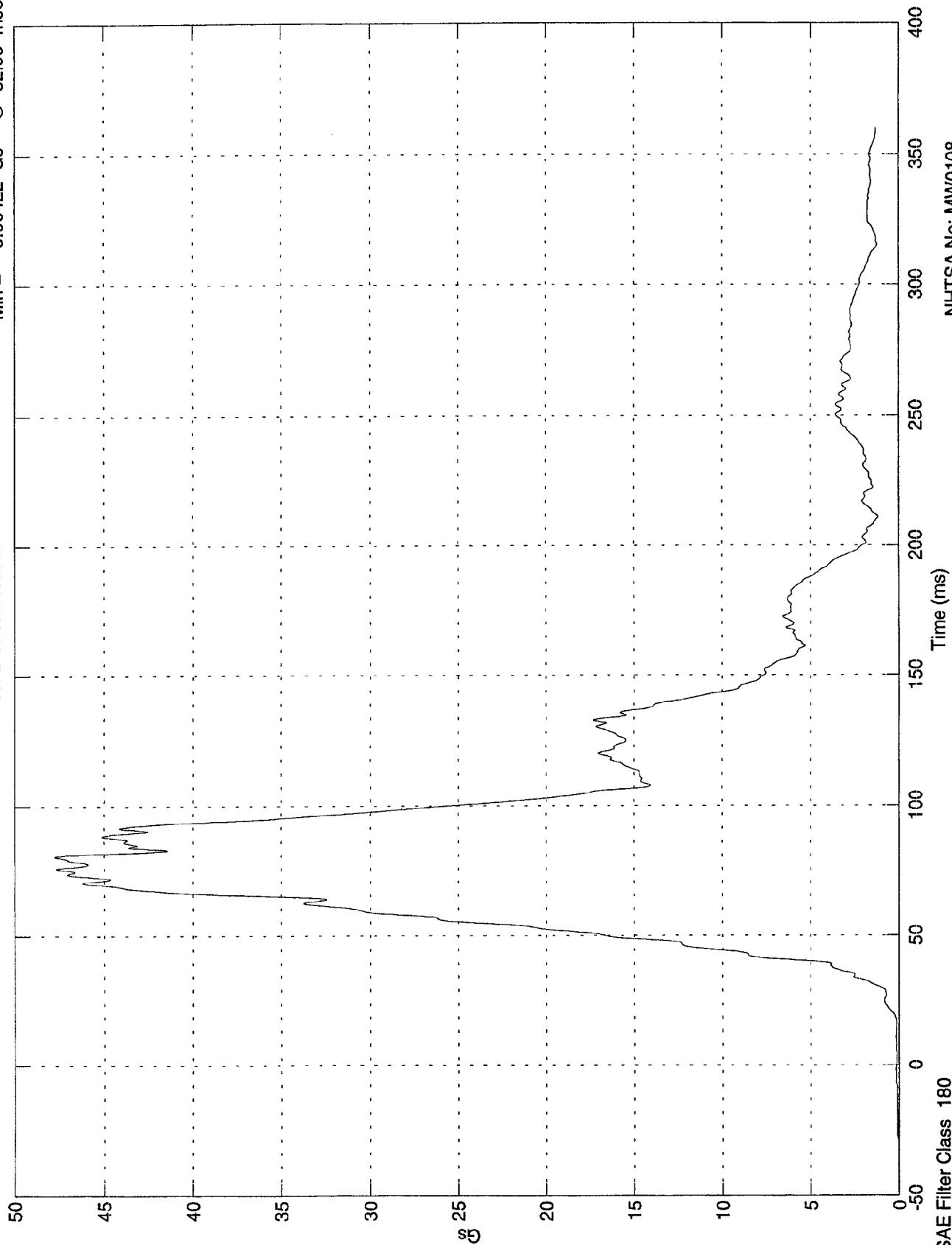


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 47.7 Gs @ 80.80 msec
Min = 0.00422 Gs @ -32.00 msec

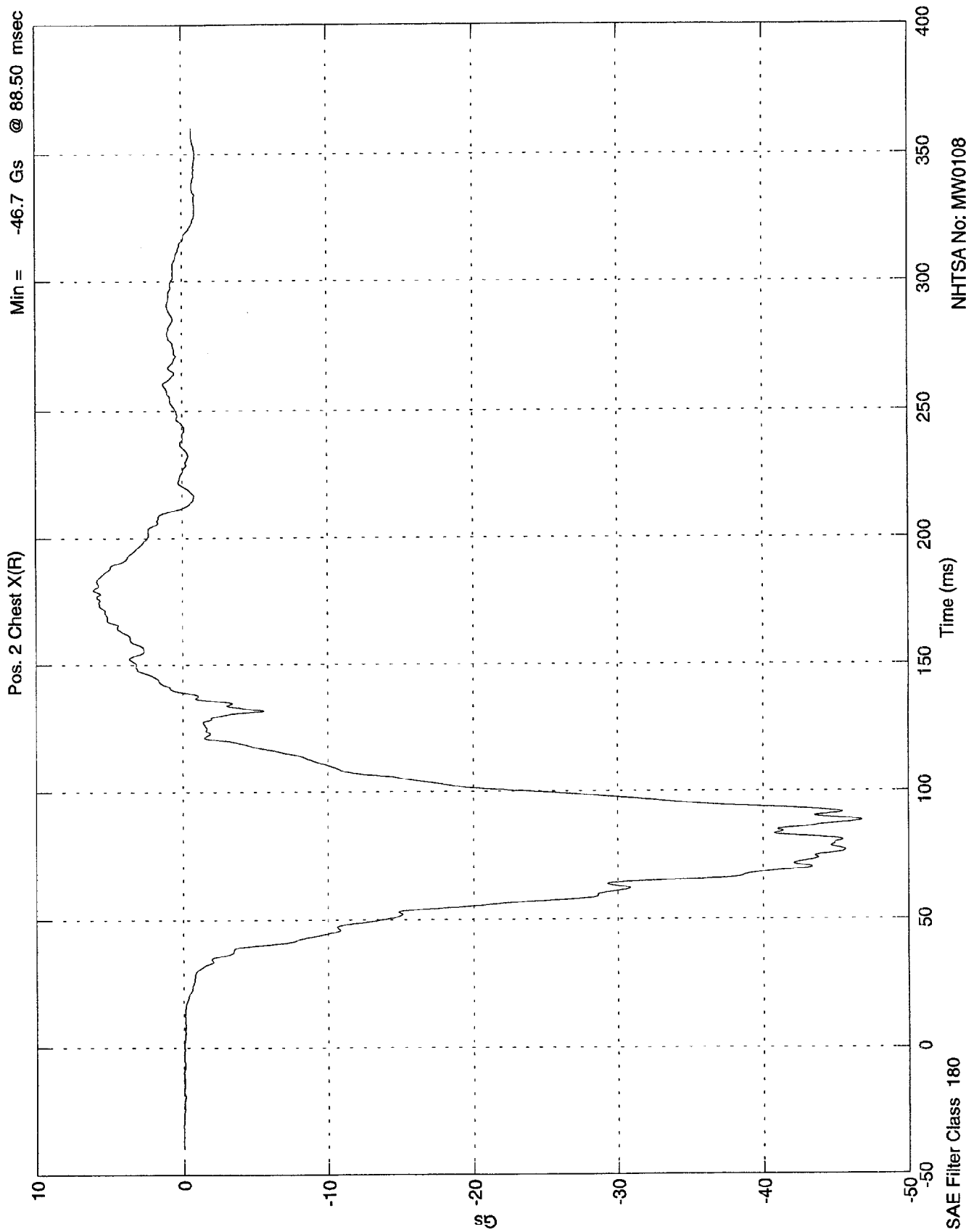
Pos. 2 Chest Resultant



NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 6.06 Gs @ 179.60 msec
 Min = -46.7 Gs @ 88.50 msec

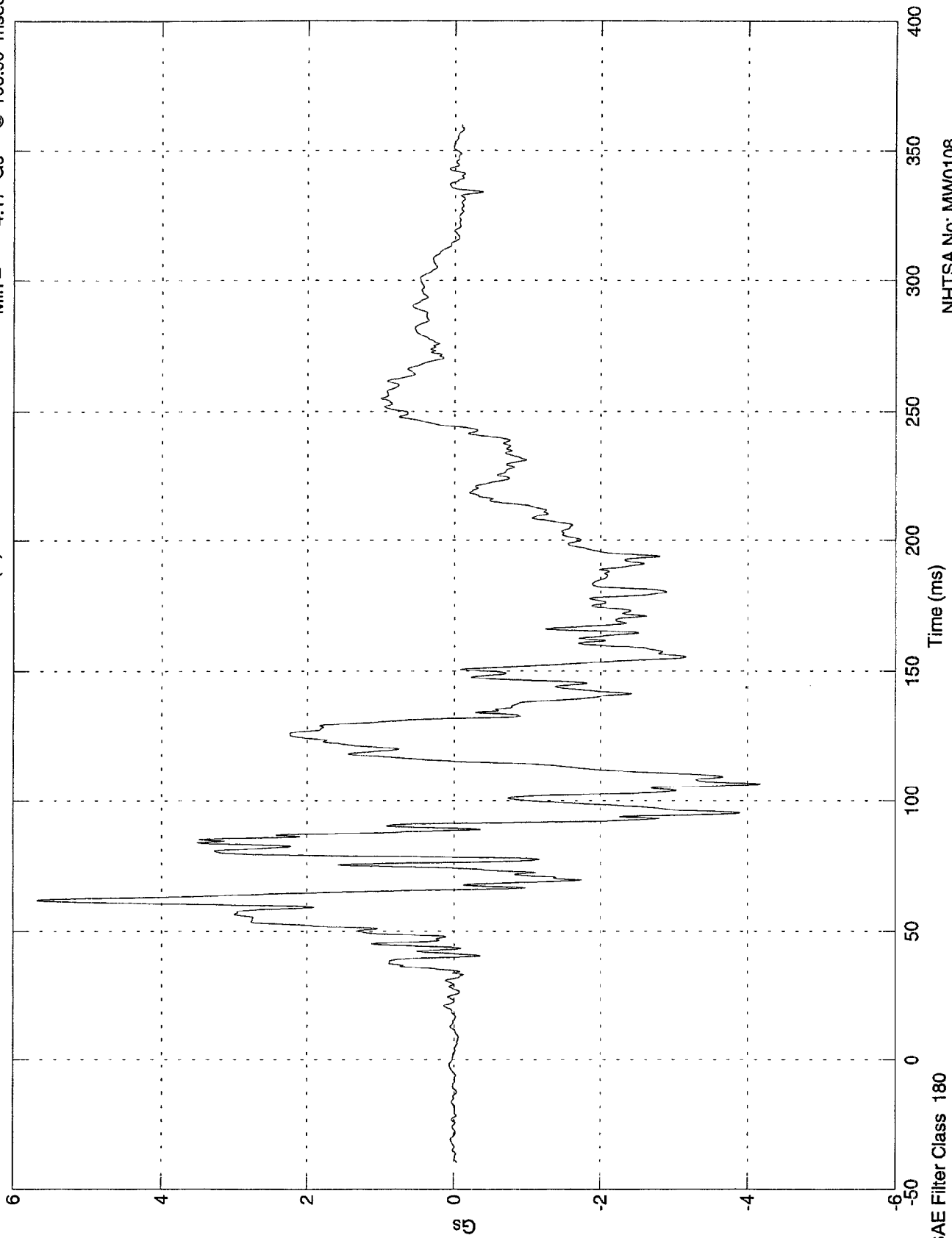


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 5.68 Gs @ 61.70 msec
Min = -4.17 Gs @ 106.50 msec

Pos. 2 Chest Y(R)

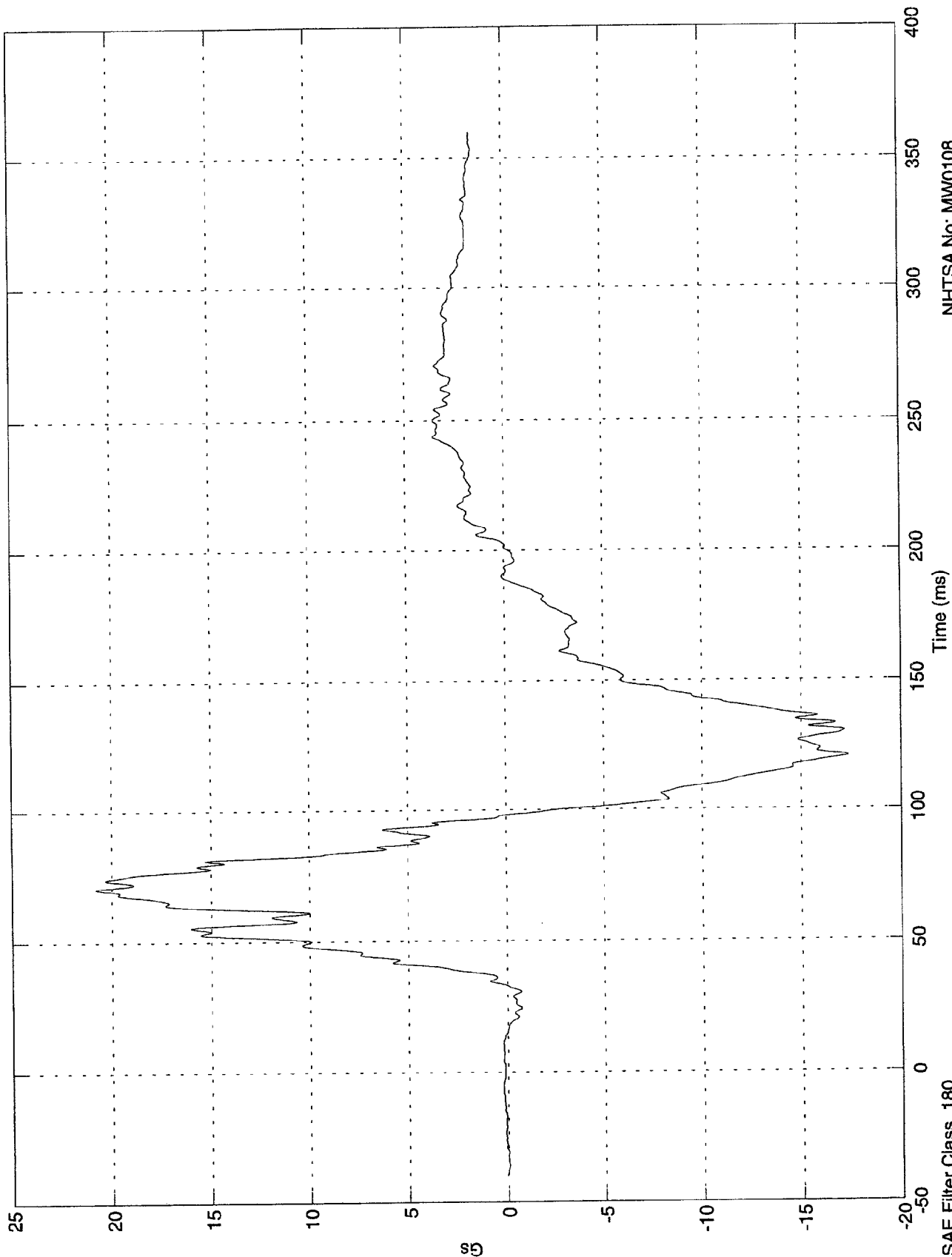


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 20.8 Gs @ 70.30 msec
 Min = -17.4 Gs @ 120.30 msec

Pos. 2 Chest Z(R)



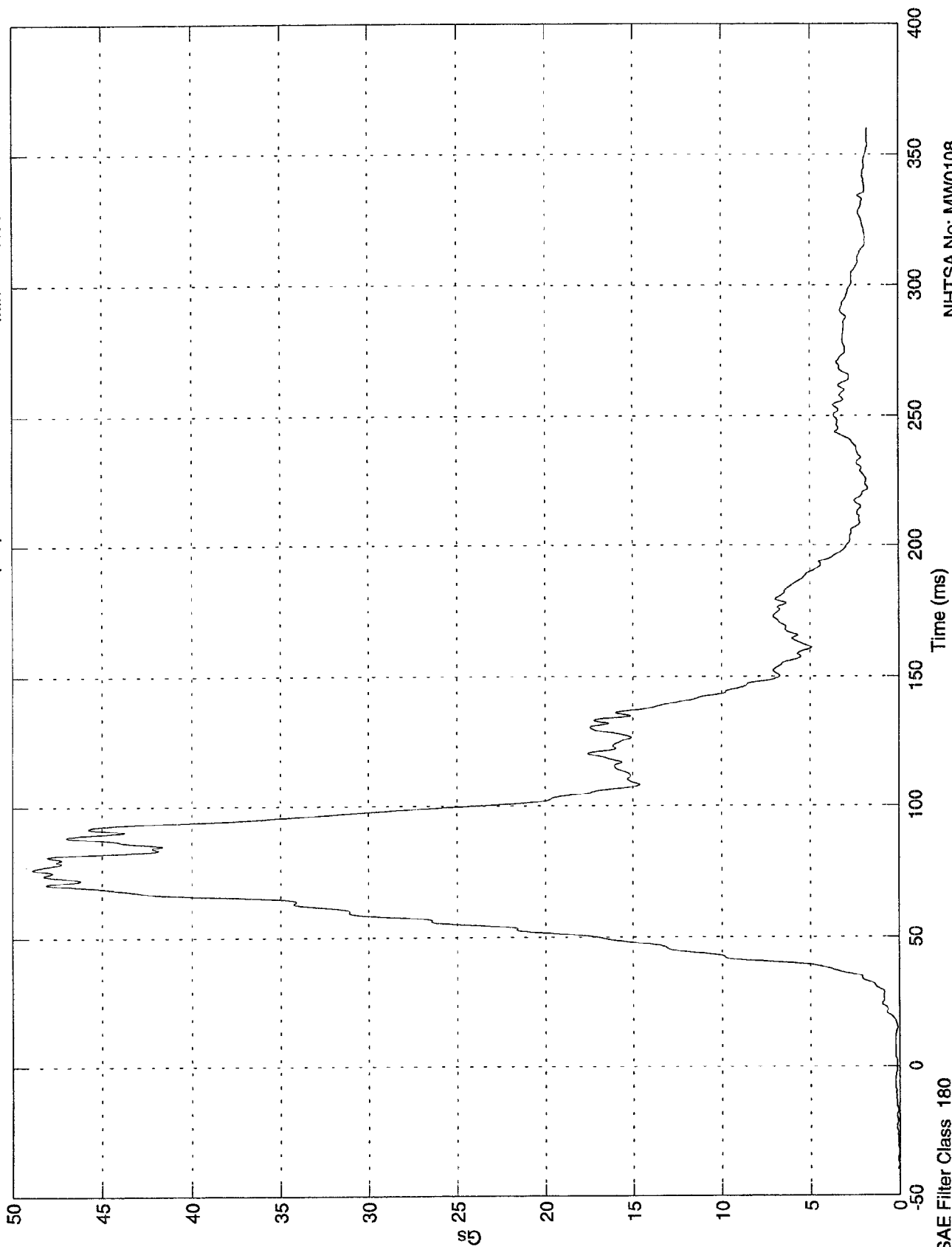
NHTSA No: MW0108
 Date: 03 Feb 1998

SAE Filter Class 180

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 48.9 Gs @ 76.30 msec
 Min = 0.00722 Gs @ -38.60 msec

Pos. 2 Chest Res(RR)

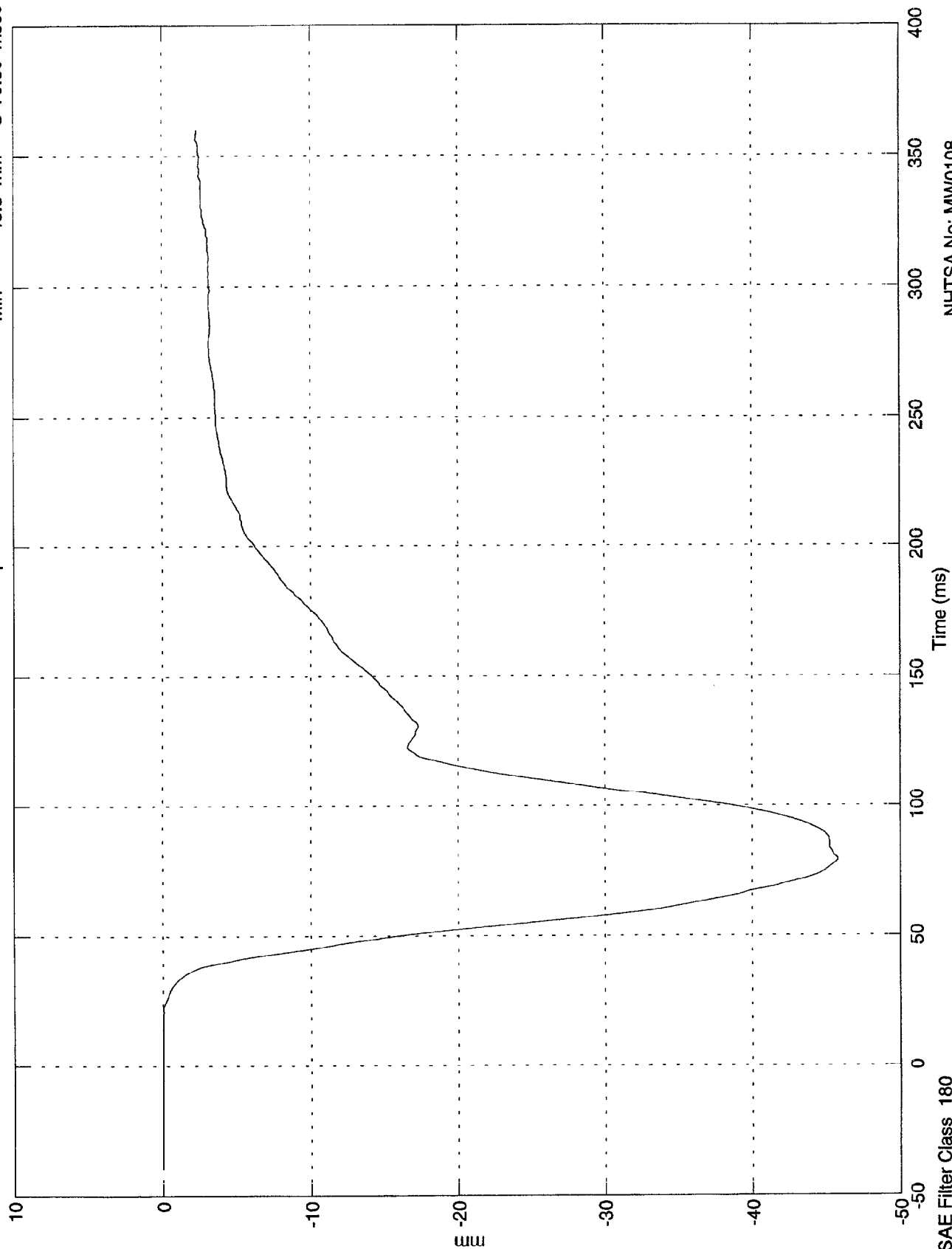


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 0.00164 mm @ 14.00 msec
 Min = -45.8 mm @ 79.30 msec

Pos. 2 Chest Disp.

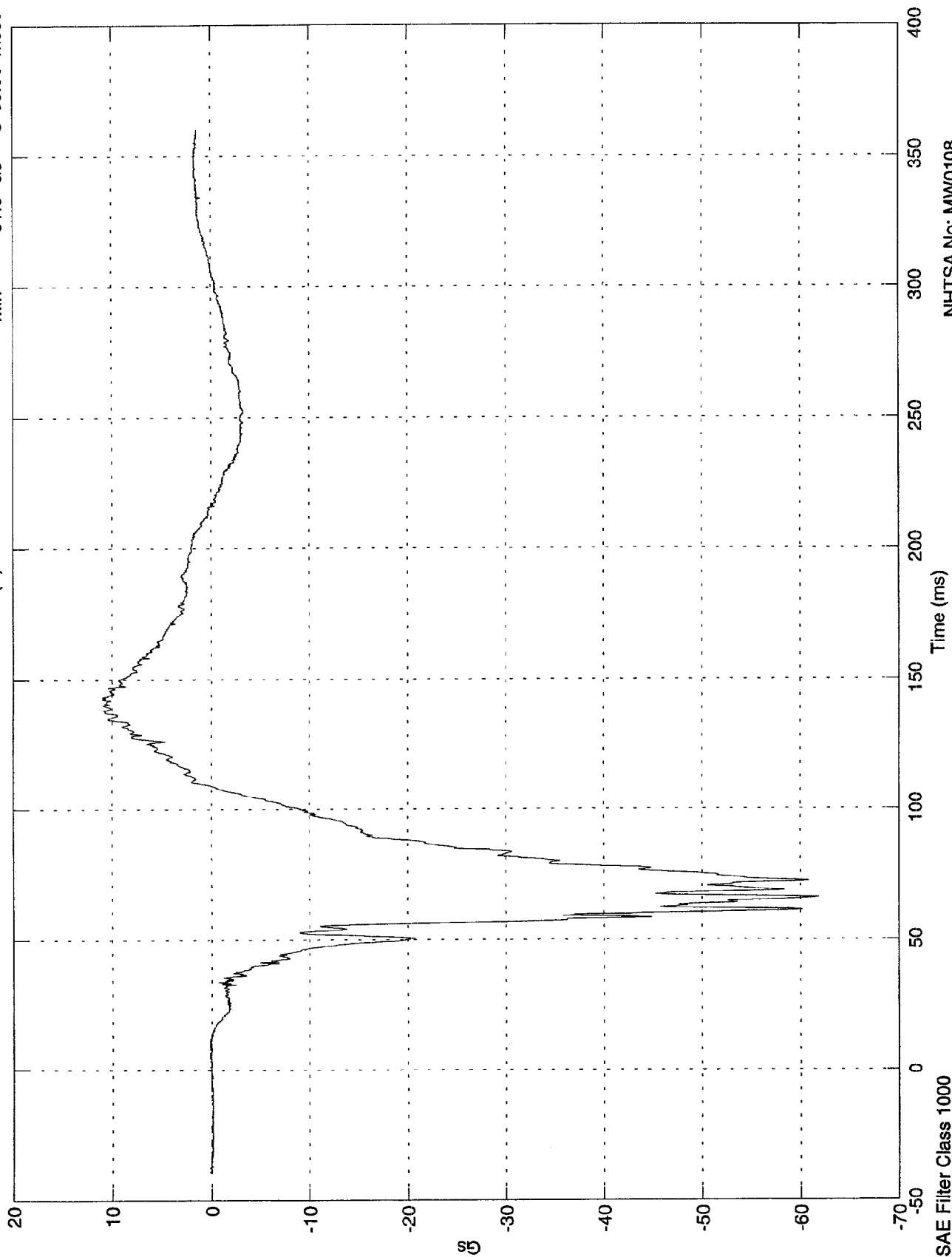


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 11 Gs @ 140.10 msec
 Min = -61.8 Gs @ 65.90 msec

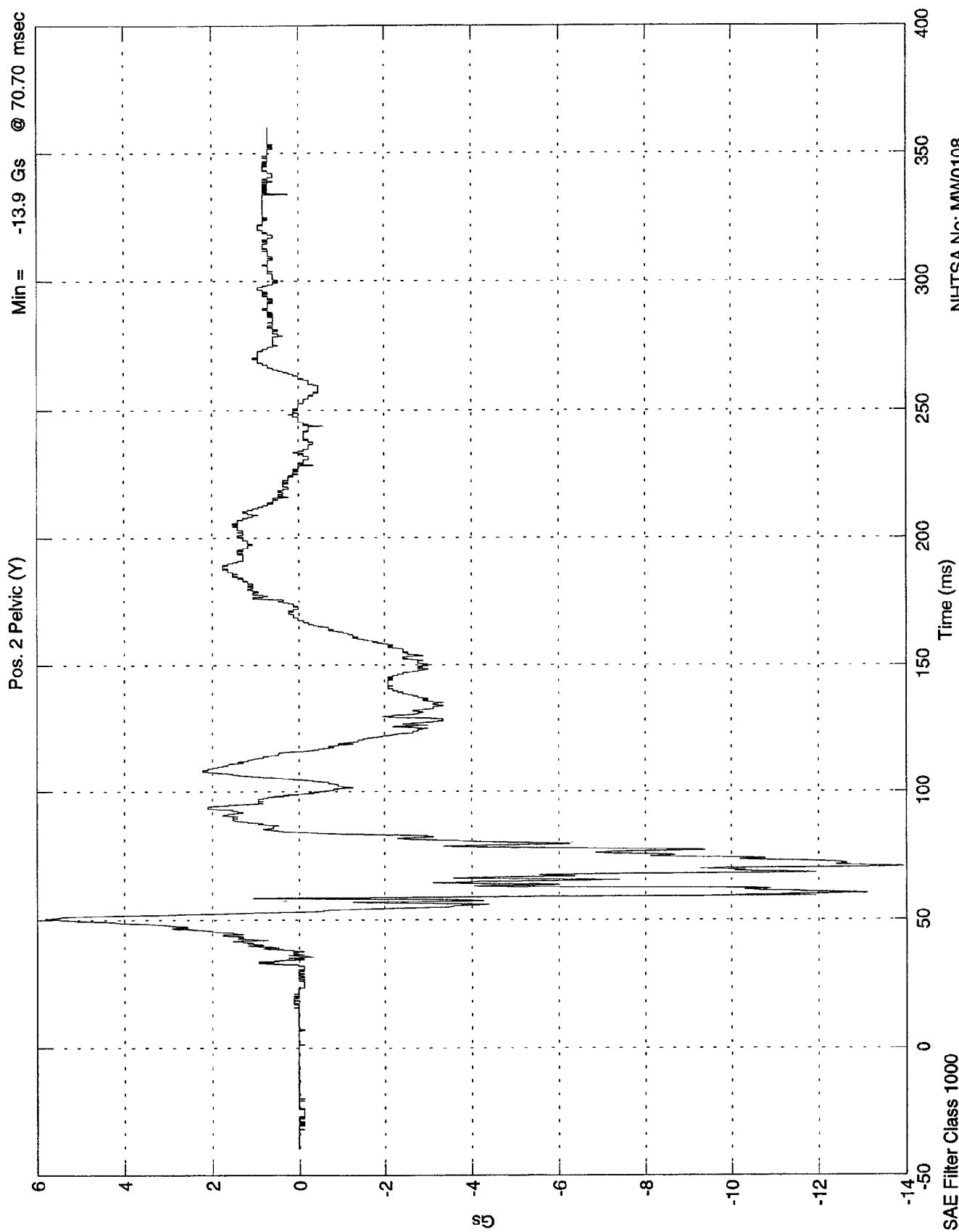
Pos. 2 Pelvic (X)



NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

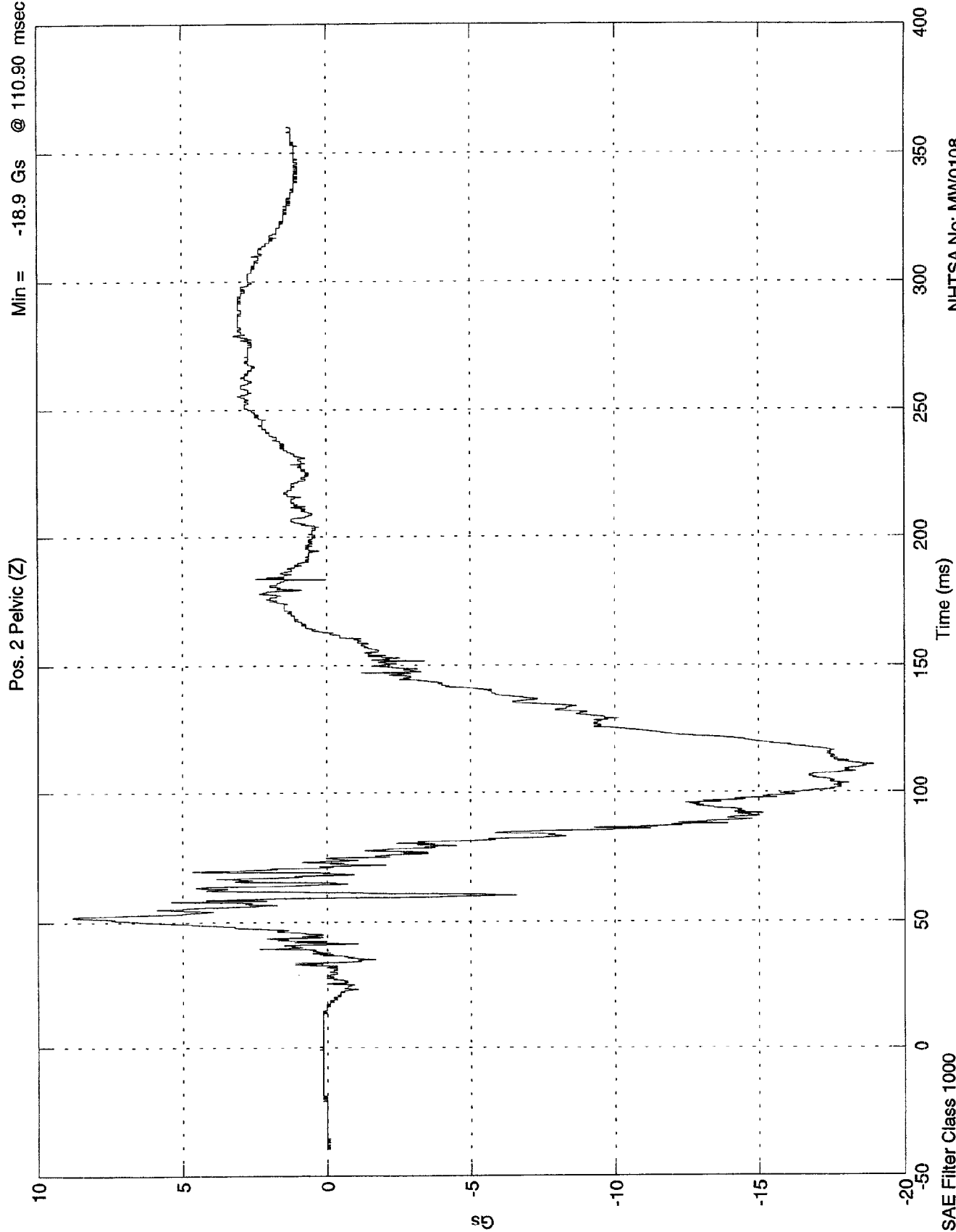
Max = 5.82 Gs @ 50.30 msec
 Min = -13.9 Gs @ 70.70 msec



NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 8.81 Gs @ 51.70 msec
 Min = -18.9 Gs @ 110.90 msec

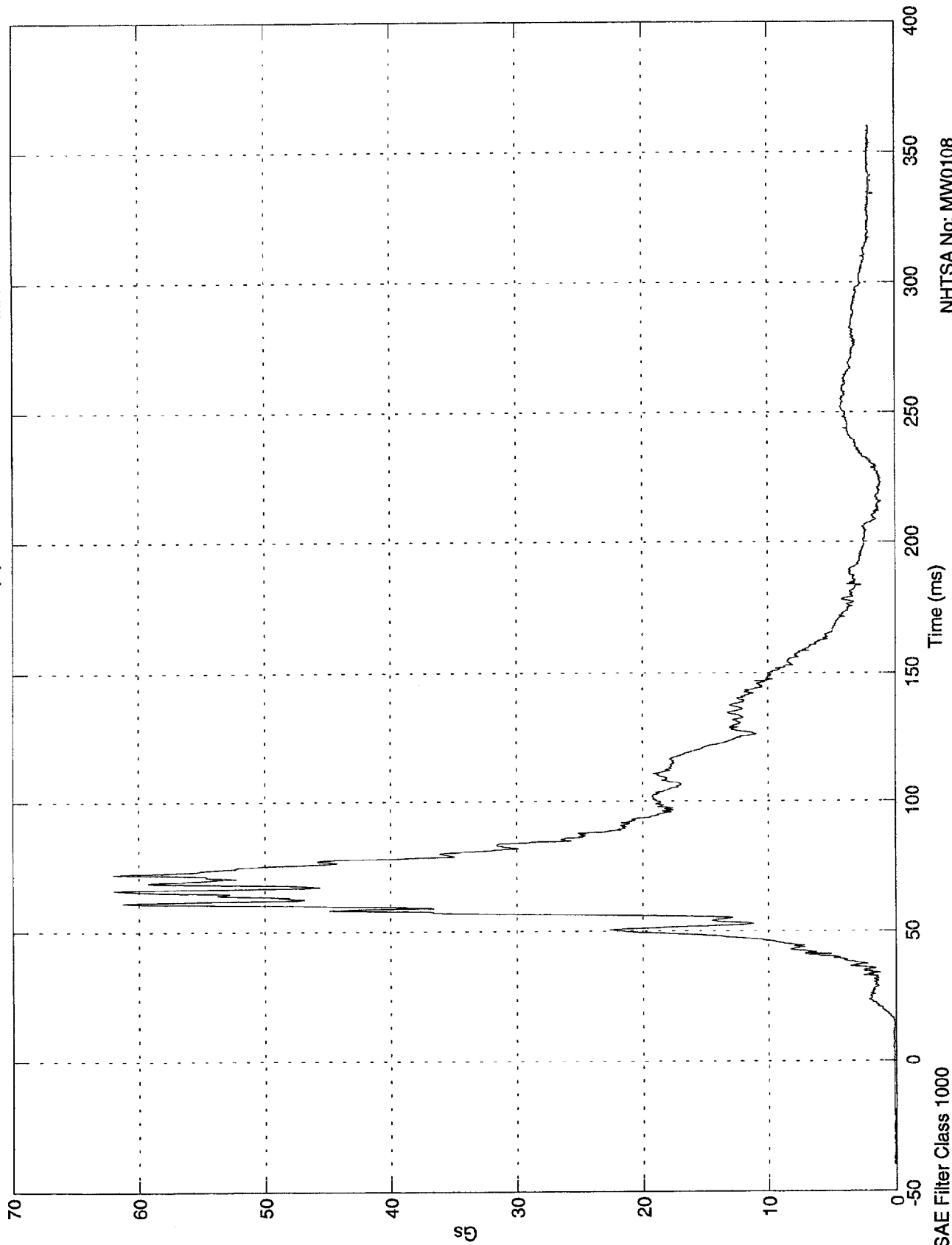


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 62.1 Gs @ 72.30 msec
 Min = 0.0454 Gs @ -39.90 msec

Pos. 2 Pelvic (R)

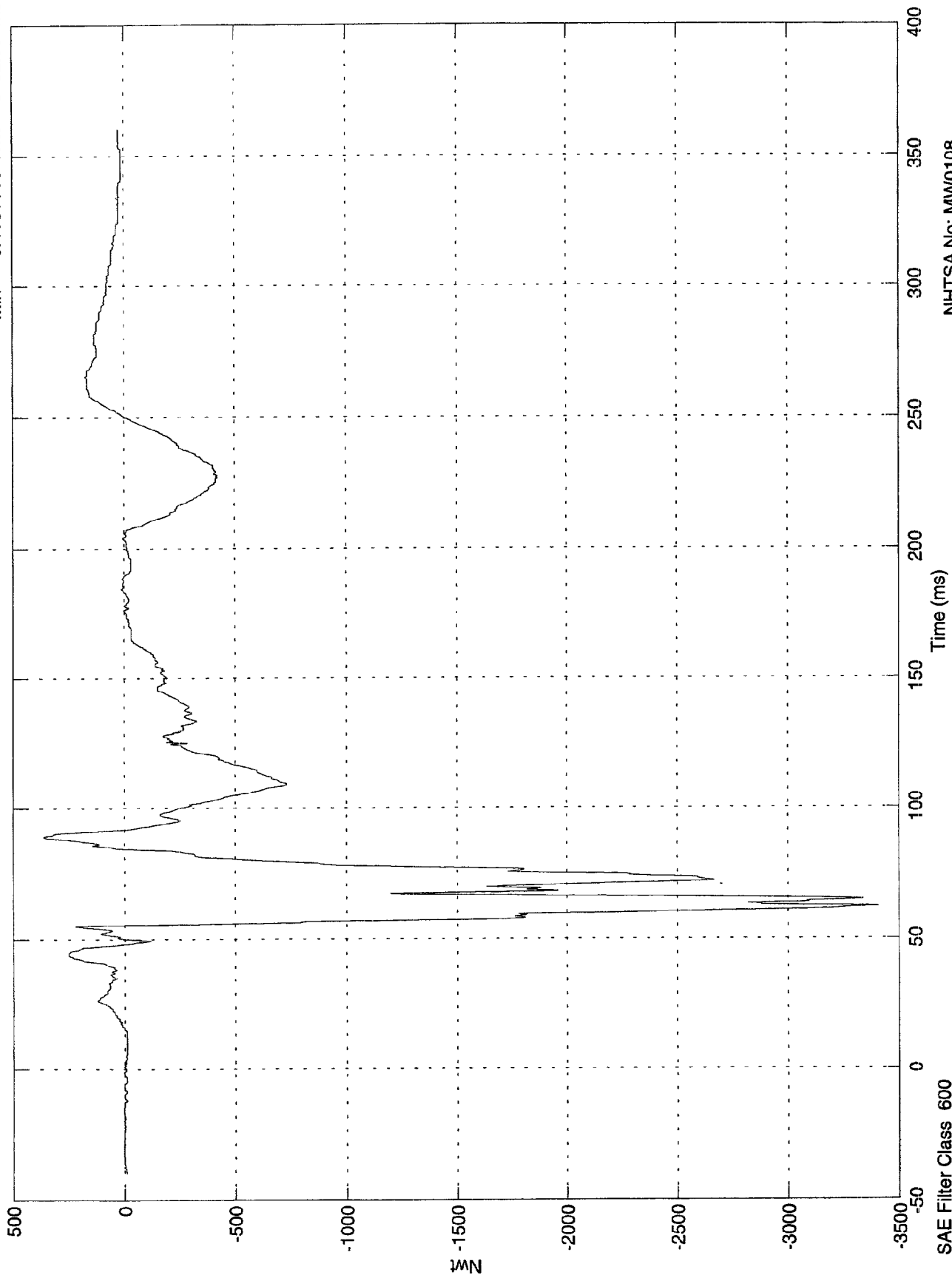


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 362 Nwt @ 89.10 msec
 Min = -3.41e+003 Nwt @ 62.00 msec

Pos. 2 Left Femur

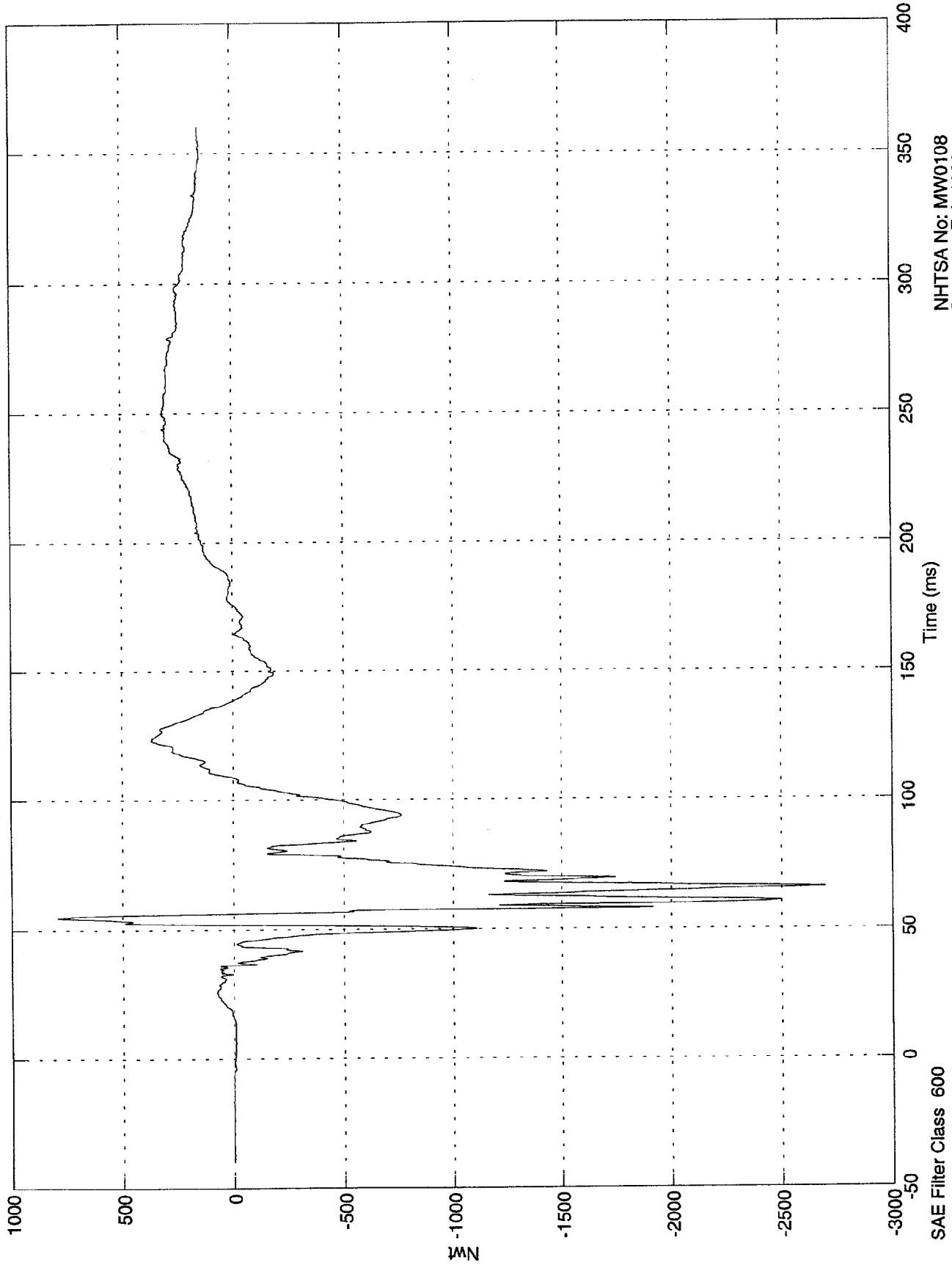


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 794 Nwt @ 54.70 msec
Min = -2.7e+003 Nwt @ 66.00 msec

Pos. 2 Right Femur

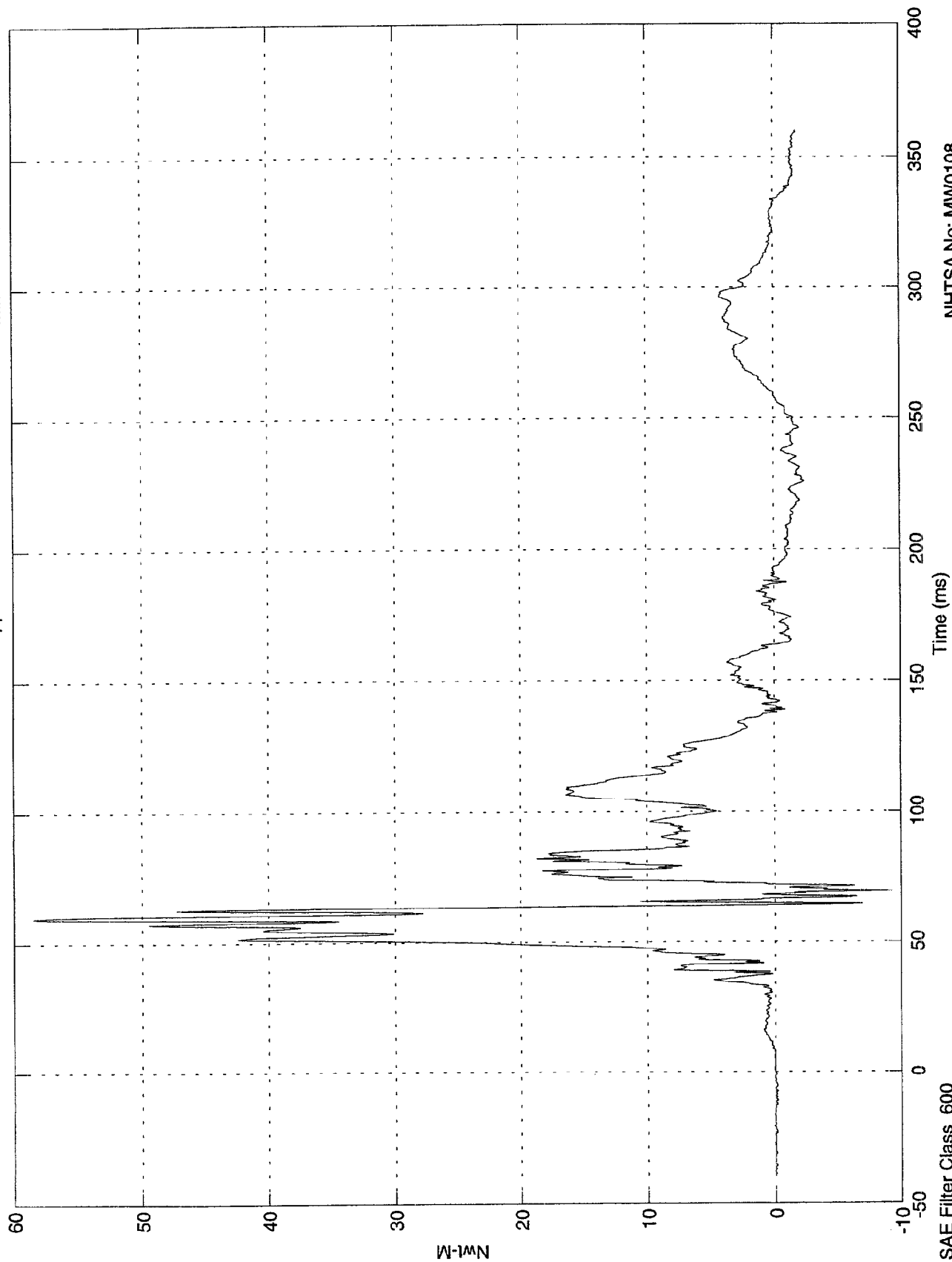


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 58.5 Nwt-M @ 59.40 msec
 Min = -9.3 Nwt-M @ 69.30 msec

Pos. 2 Lt Upper Tibia Mx



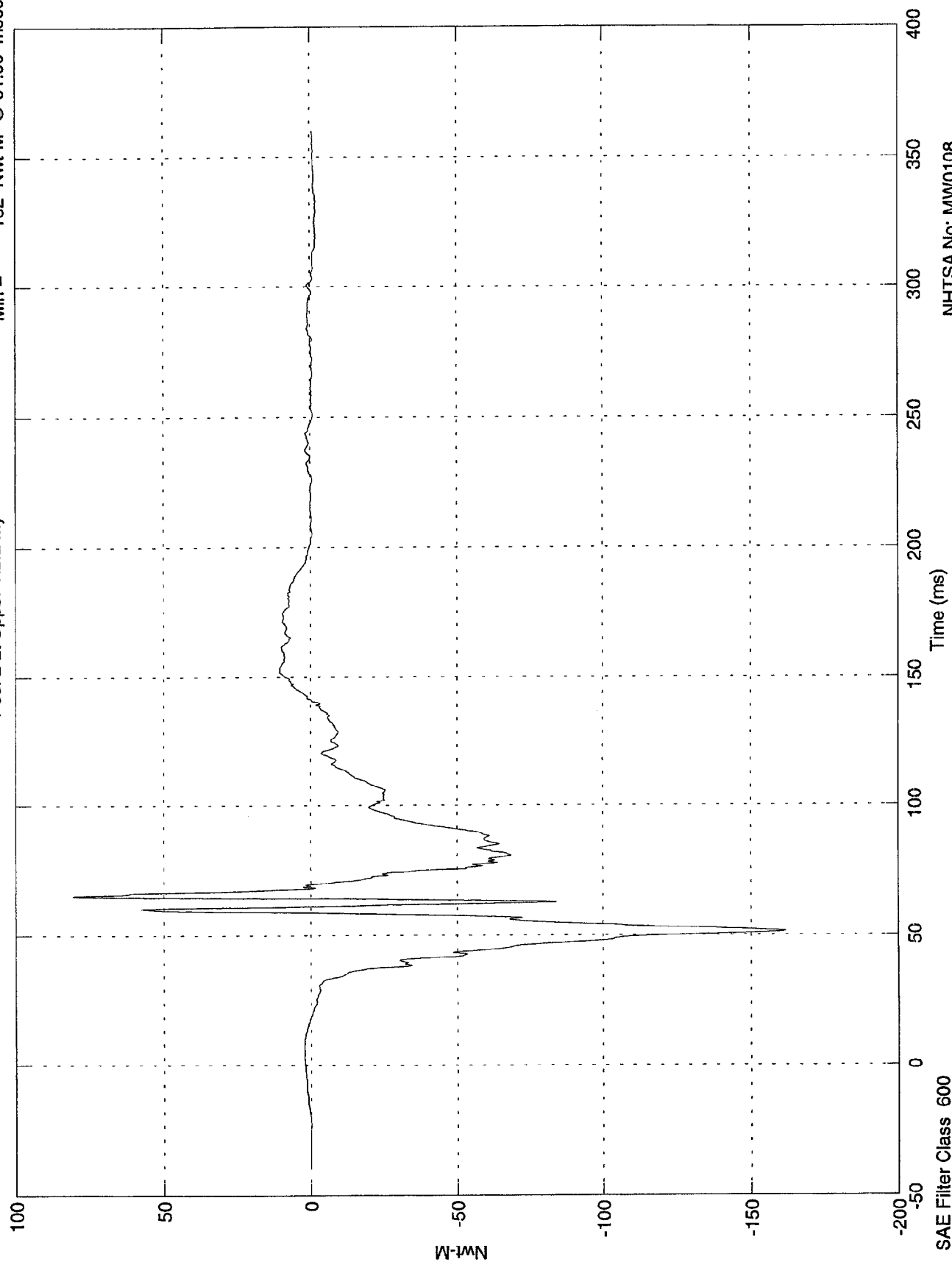
NHTSA No: MW0108
 Date: 03 Feb 1998

SAE Filter Class 600

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 80.9 Nwt-M @ 65.10 msec
Min = -162 Nwt-M @ 51.50 msec

Pos. 2 Lt Upper Tibia My

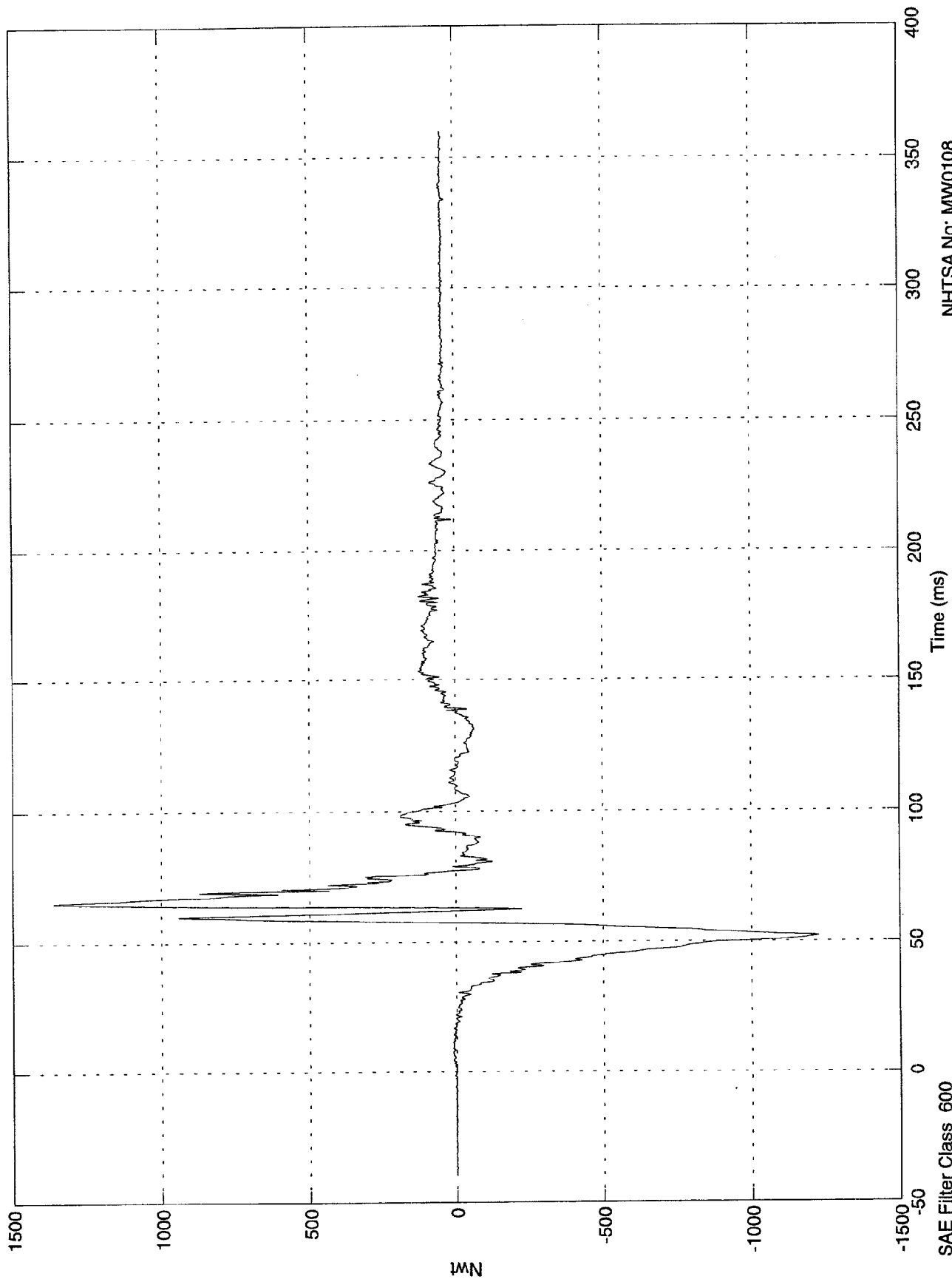


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 1.36e+003 Nwt @ 65.30 msec
Min = -1.23e+003 Nwt @ 52.00 msec

Pos. 2 Lt Lower Tibia Fx

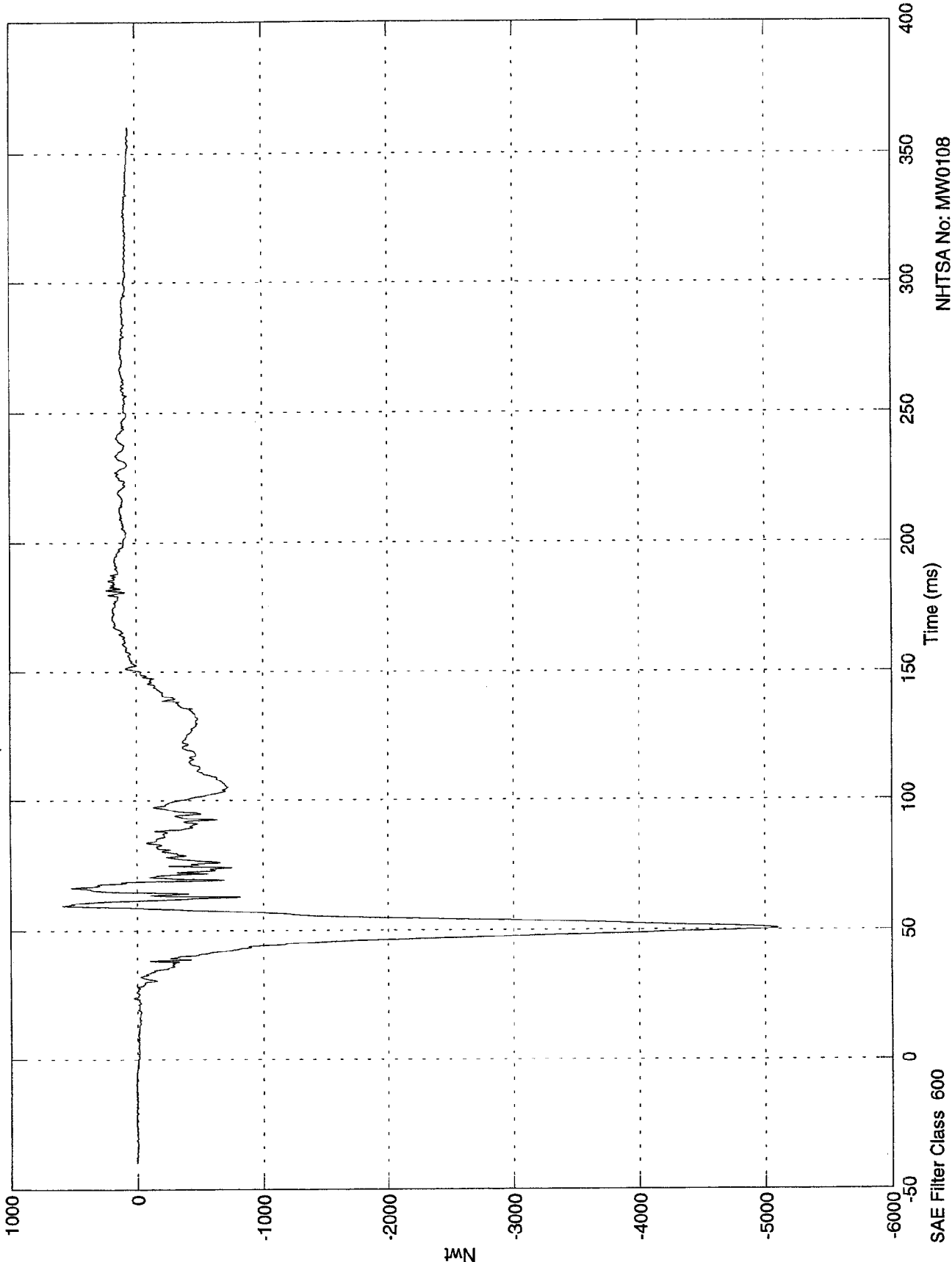


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 591 Nwt @ 59.60 msec
Min = -5.1e+003 Nwt @ 50.60 msec

Pos. 2 Lt Lower Tibia Fz

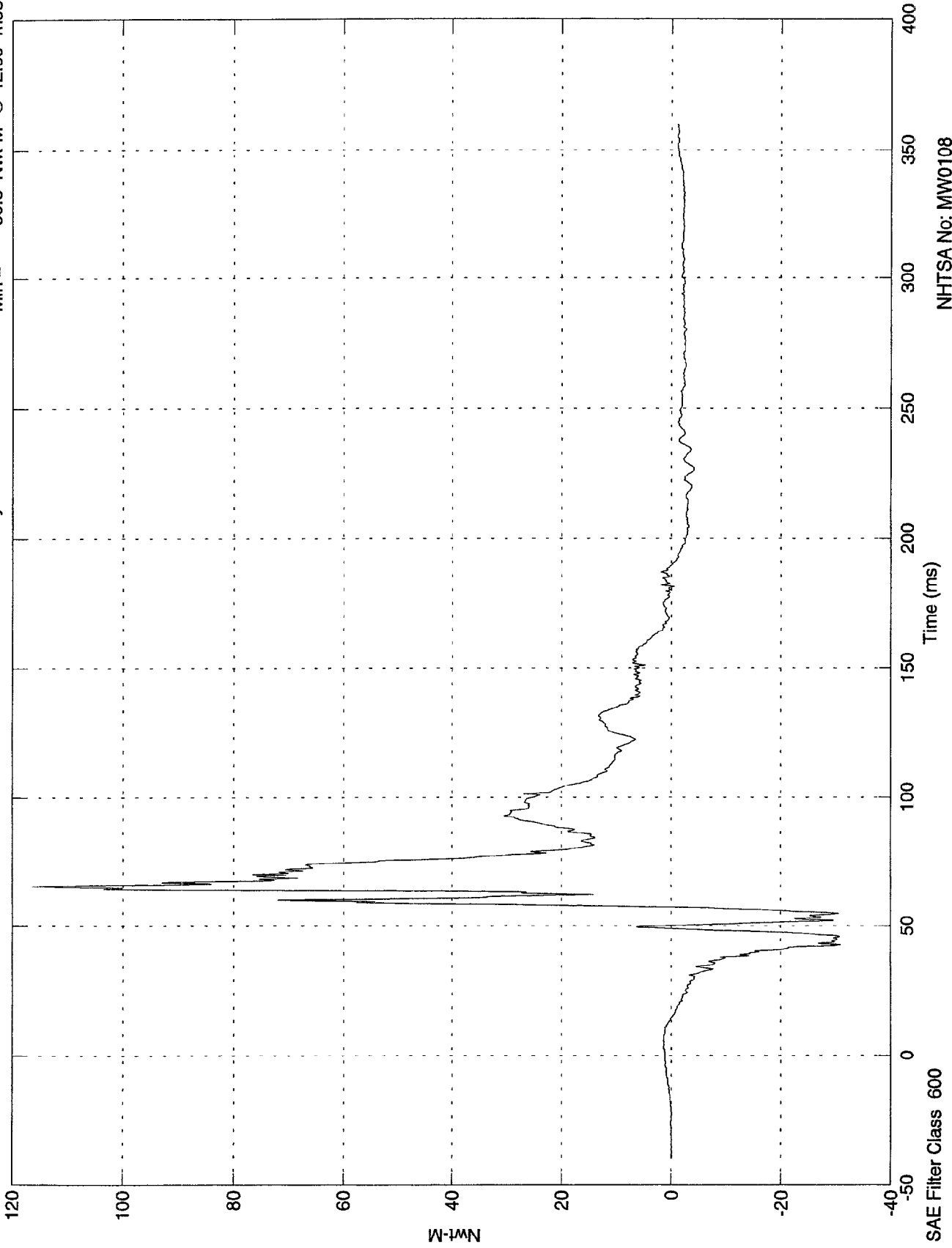


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Pos. 2 Lt Lower Tibia My

Max = 116 Nwt-M @ 65.40 msec
Min = -30.8 Nwt-M @ 42.60 msec

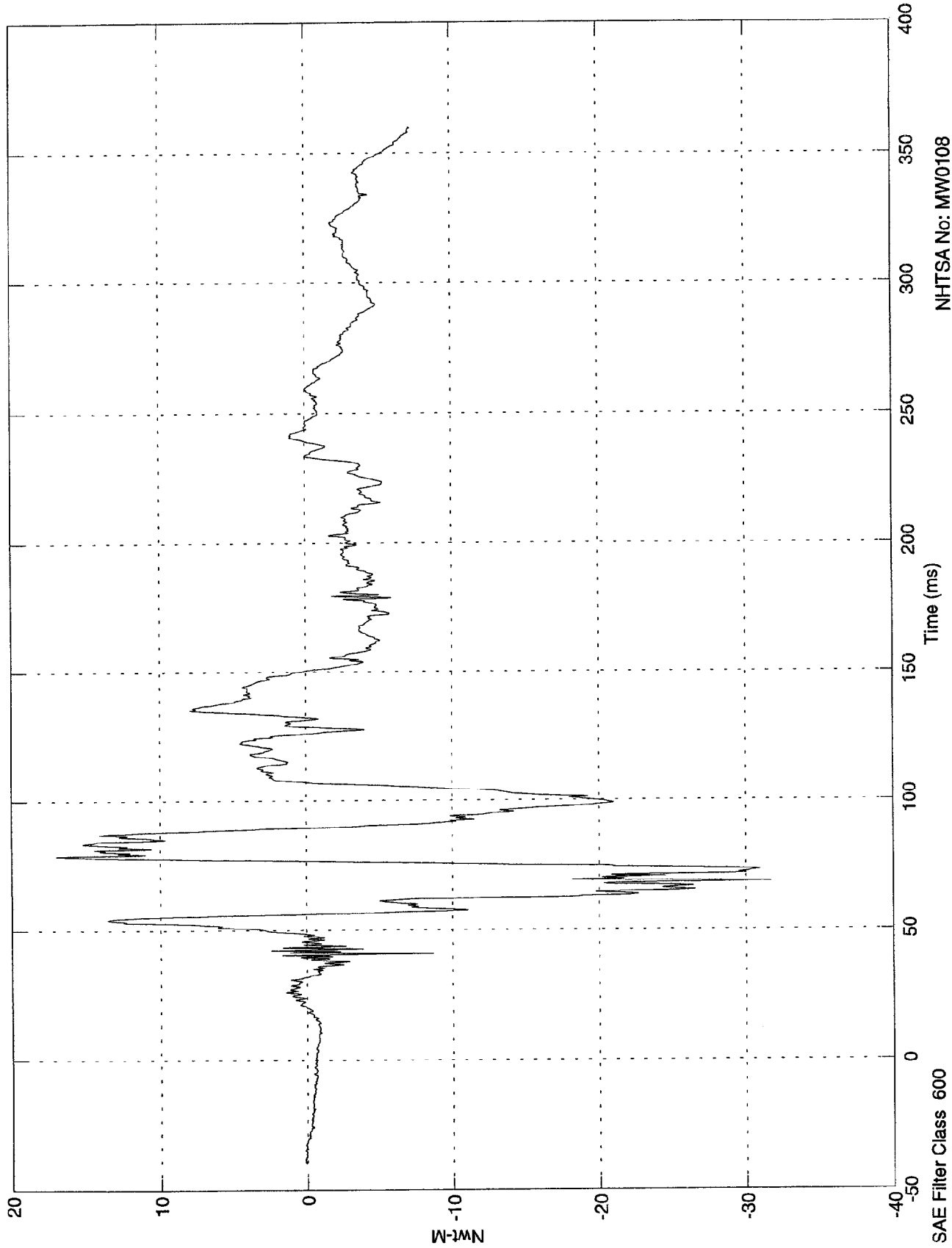


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 17 Nwt-M @ 79.00 msec
 Min = -31.7 Nwt-M @ 68.60 msec

Pos. 2 Rt Upper Tibia Mx



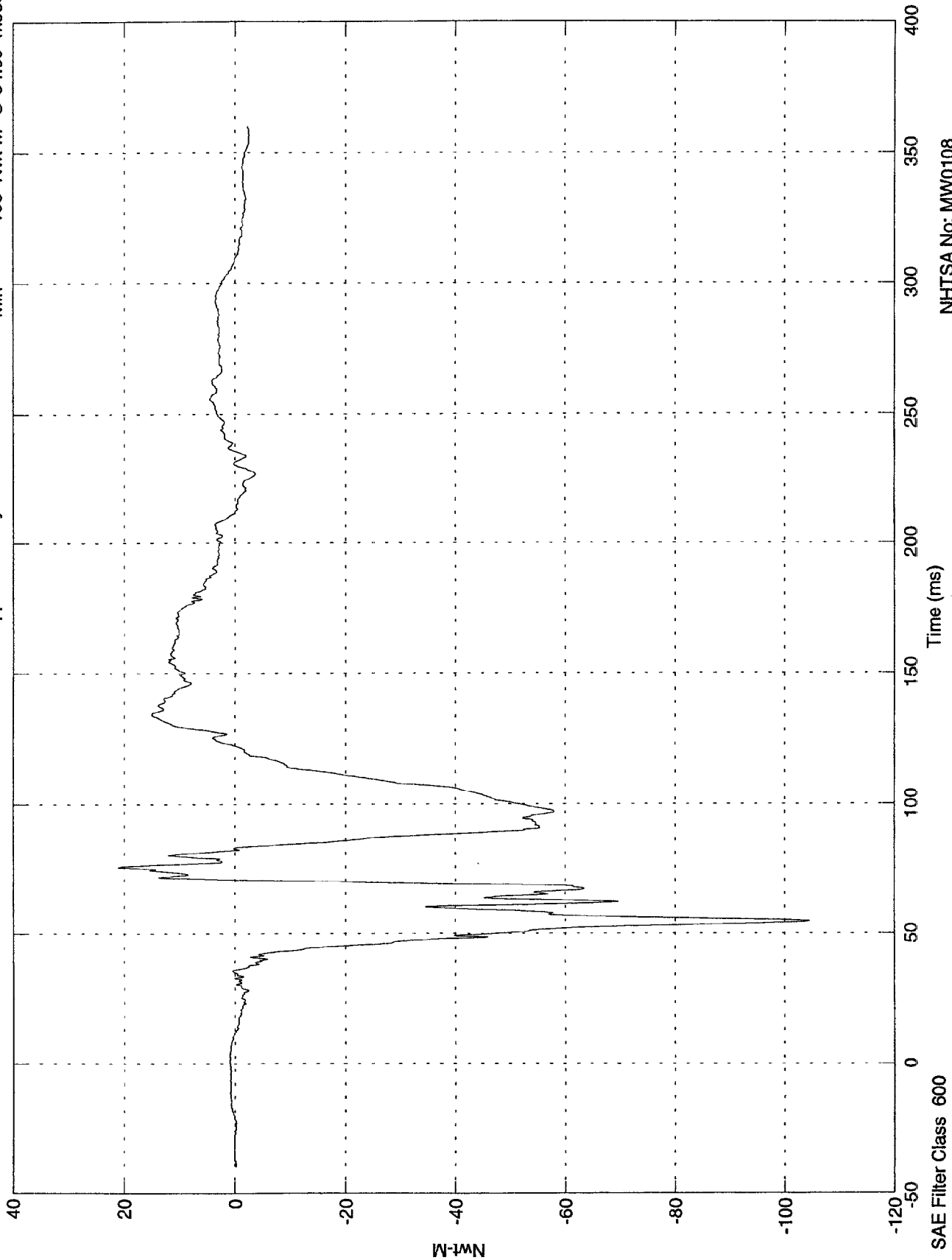
NHTSA No: MW0108
 Date: 03 Feb 1998

SAE Filter Class 600

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 21.1 Nwt-M @ 75.80 msec
 Min = -105 Nwt-M @ 54.60 msec

Pos. 2 Rt Upper Tibia My

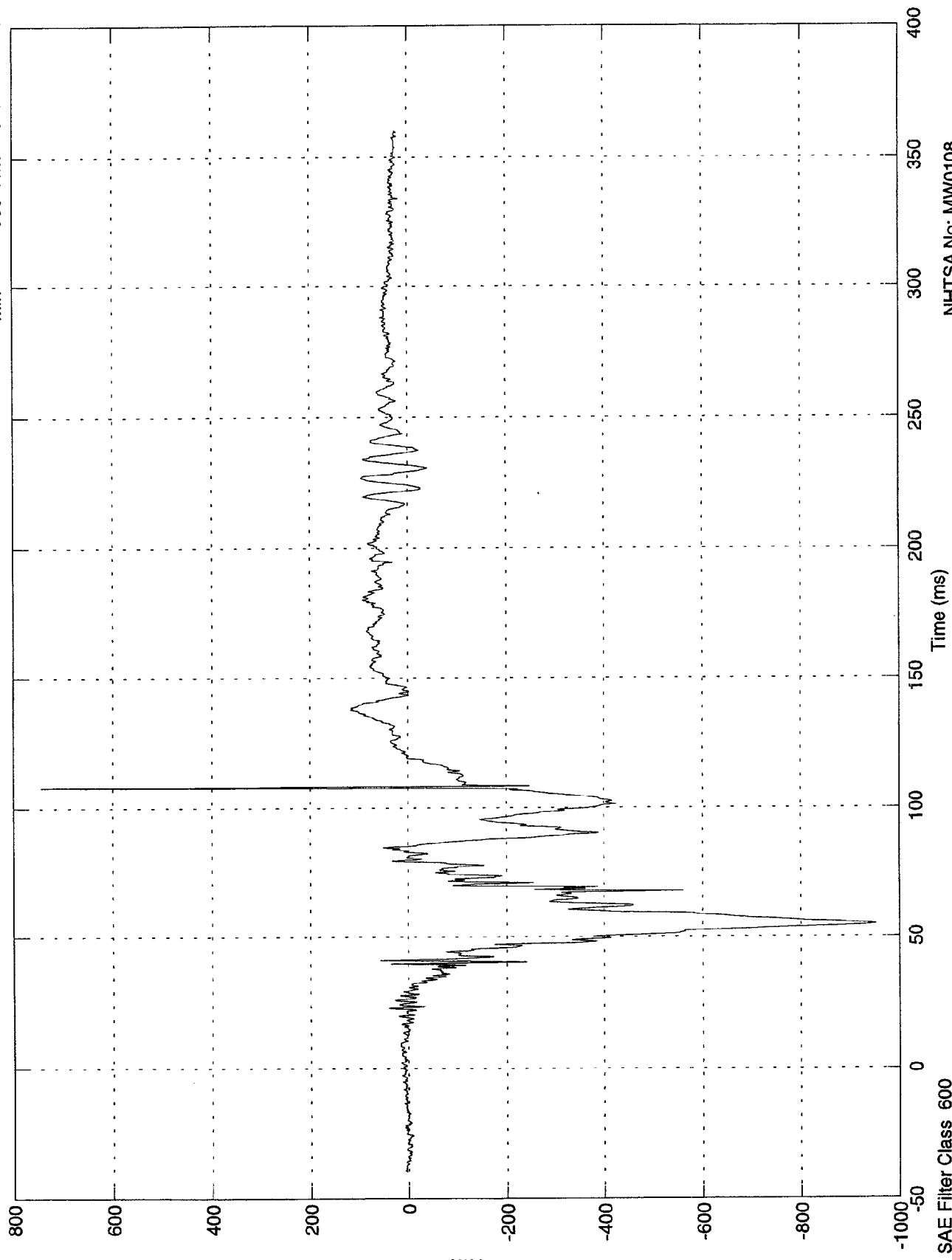


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 744 Nwt @ 108.10 msec
 Min = -953 Nwt @ 54.80 msec

Pos. 2 Rt Lower Tibia Fx

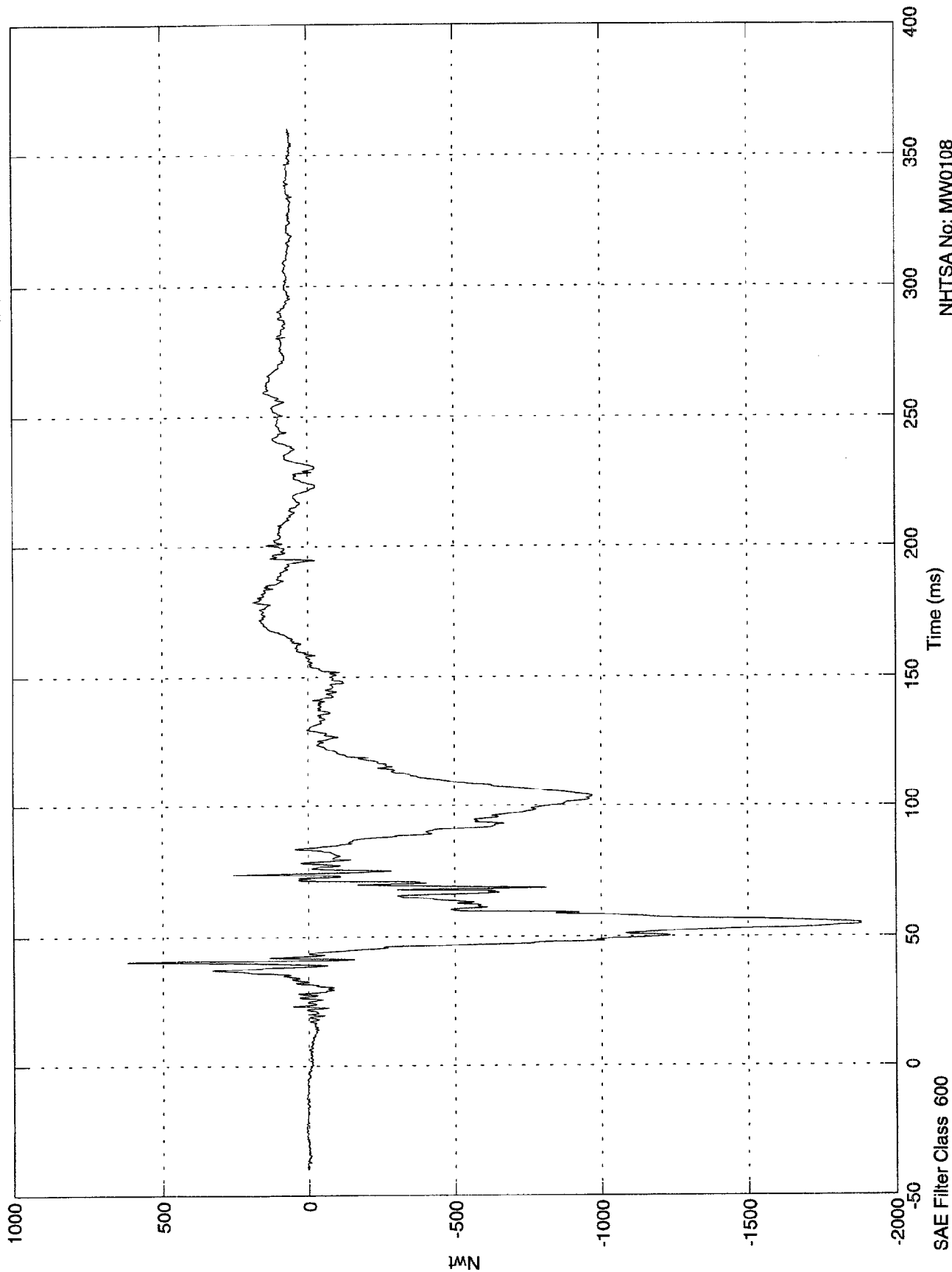


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 619 Nwt @ 40.60 msec
Min = -1.88e+003 Nwt @ 54.50 msec

Pos. 2 Rt Lower Tibia Fz

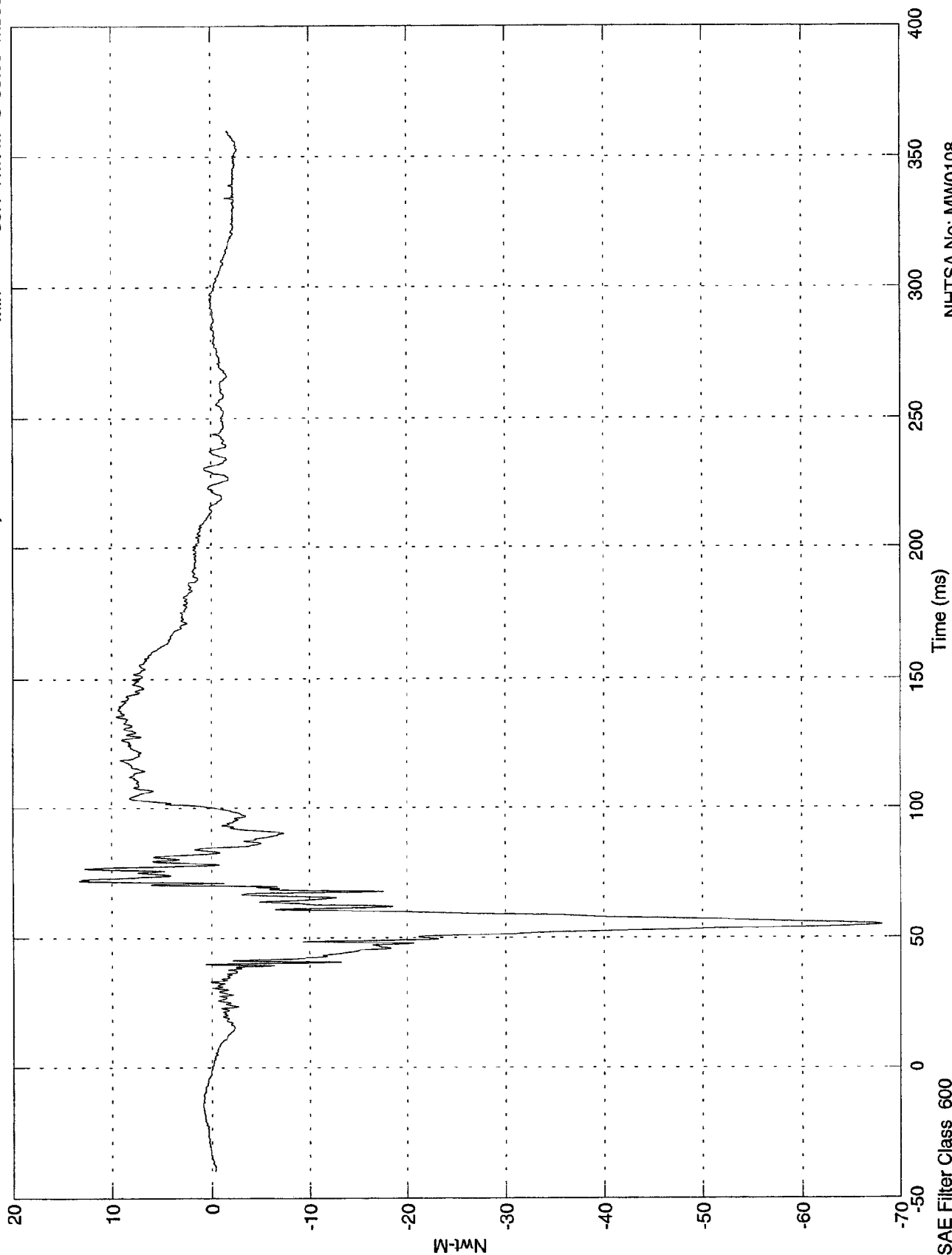


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

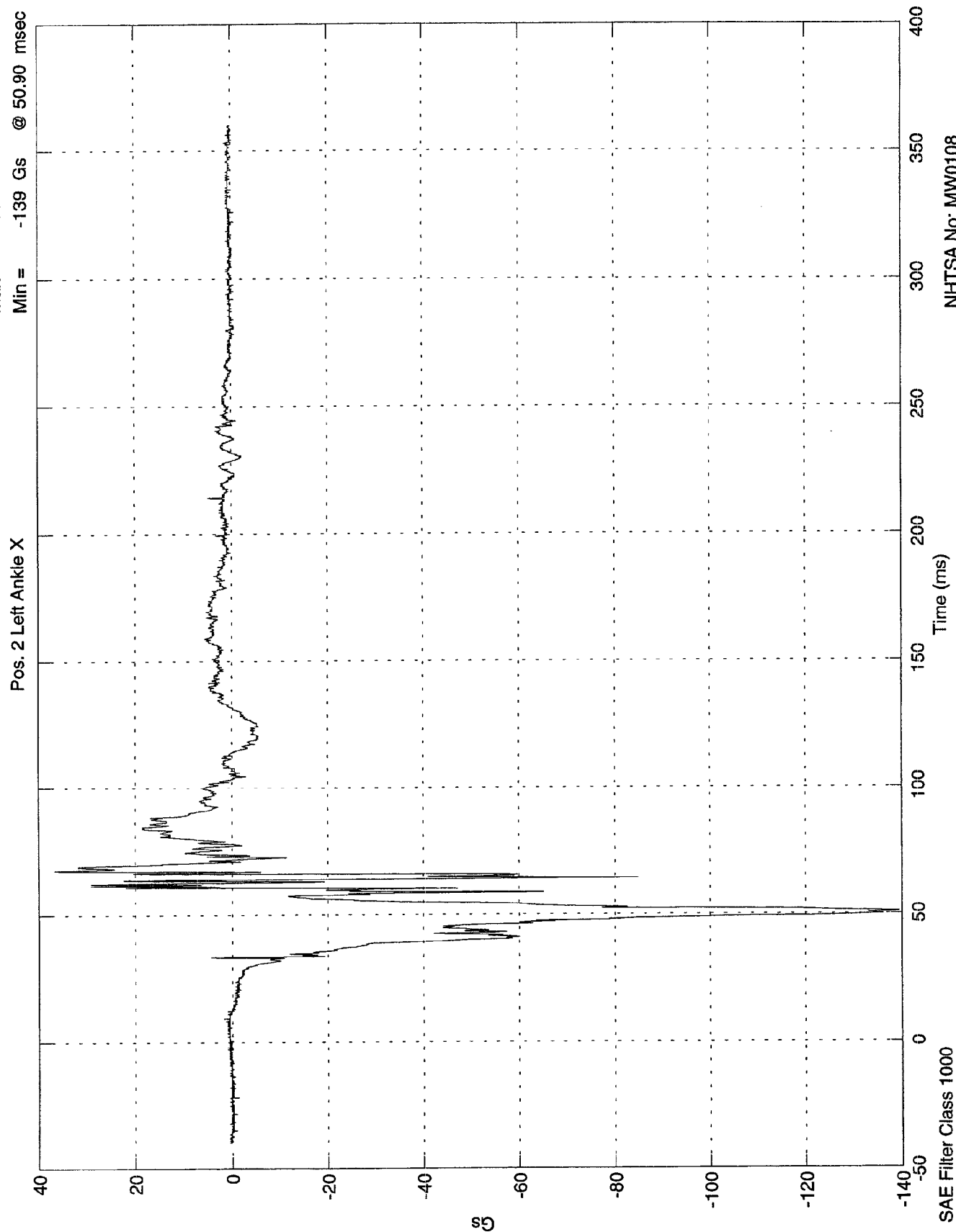
Max = 13.3 Nwt-M @ 72.10 msec
 Min = -68.1 Nwt-M @ 55.00 msec

Pos. 2 Rt Lower Tibia My



NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

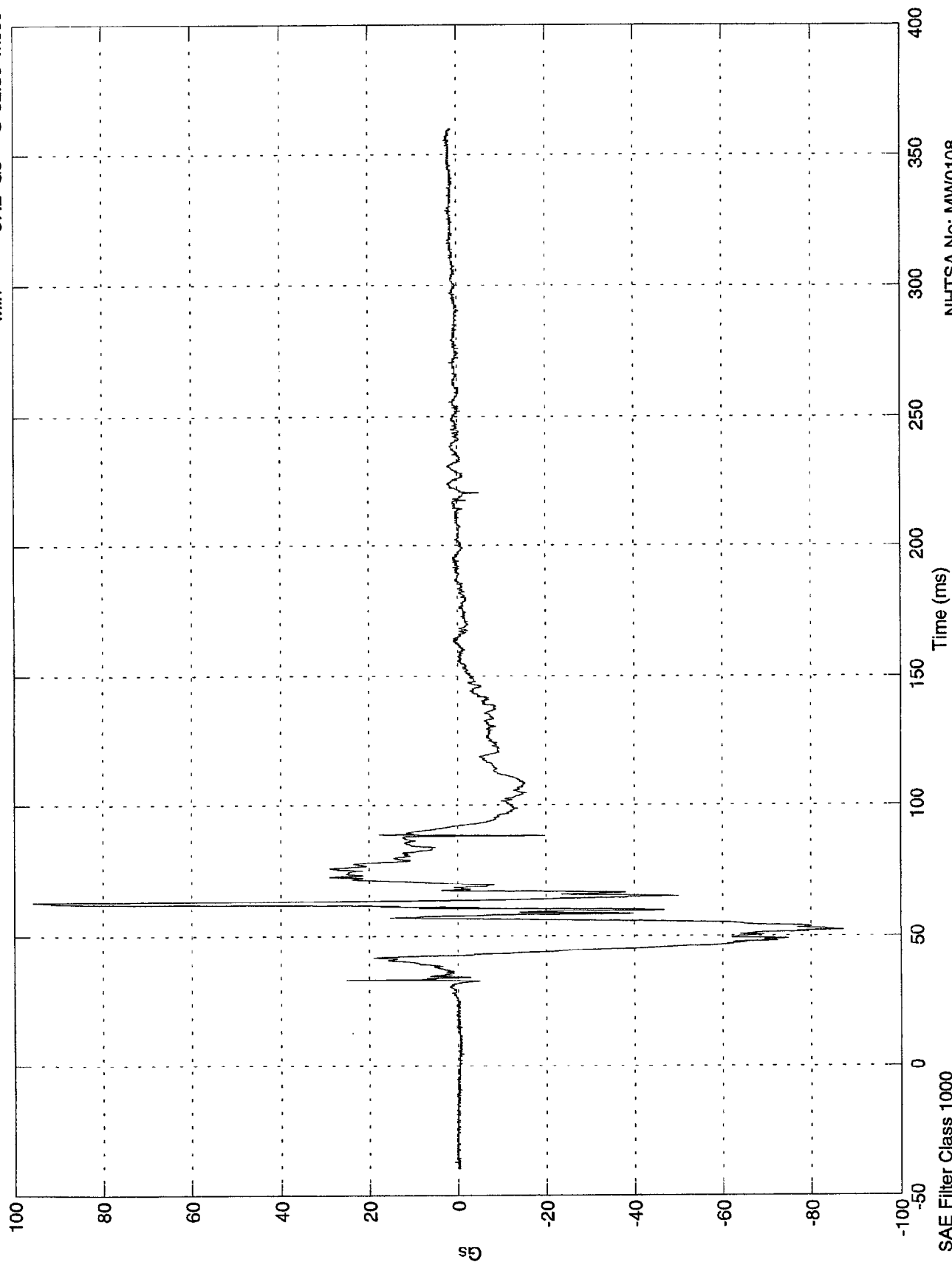


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 95.9 Gs @ 62.80 msec
 Min = -87.2 Gs @ 52.30 msec

Pos. 2 Left Ankle Z

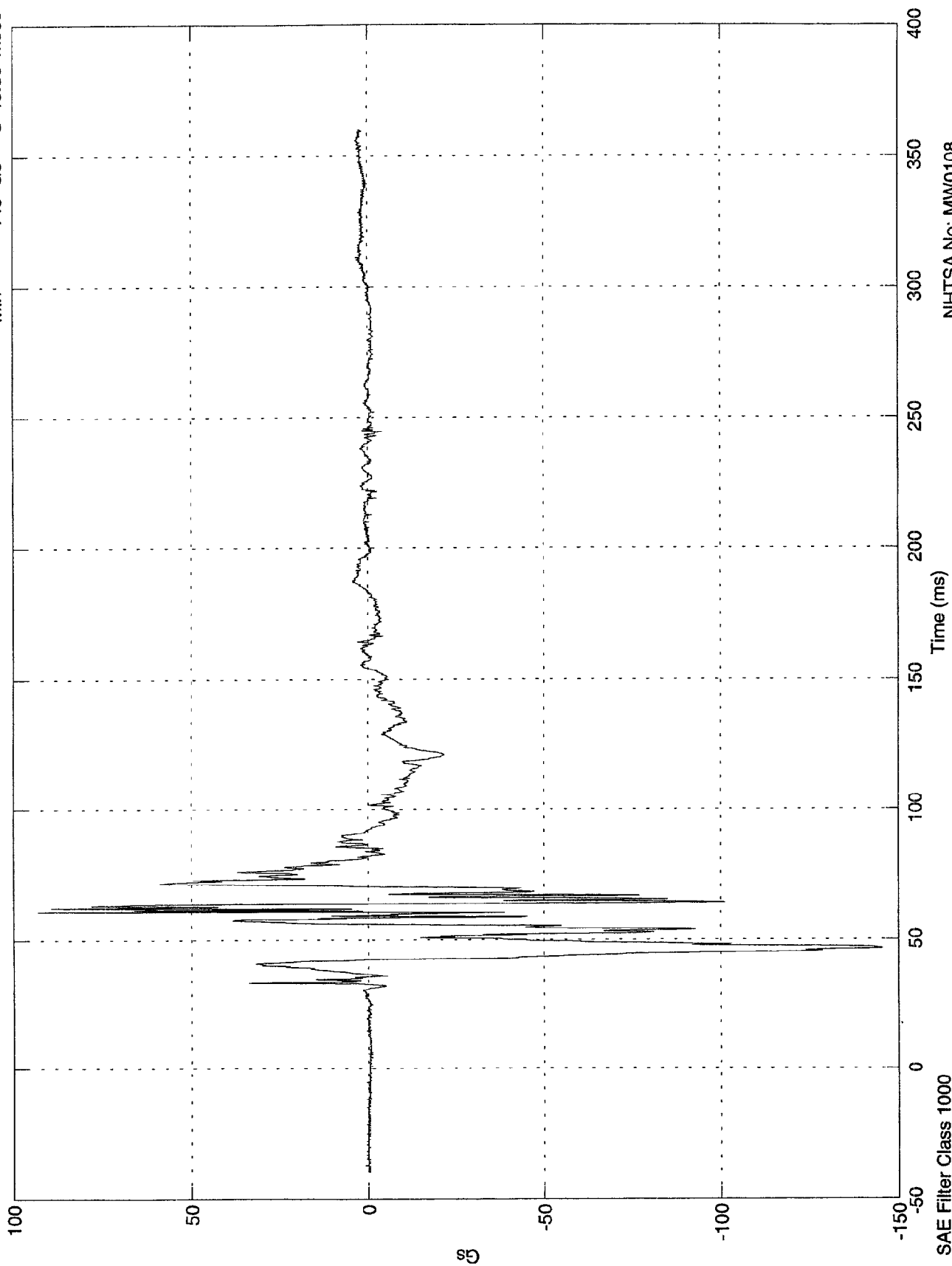


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 93.3 Gs @ 60.70 msec
 Min = -145 Gs @ 46.50 msec

Pos. 2 Left Toe Z

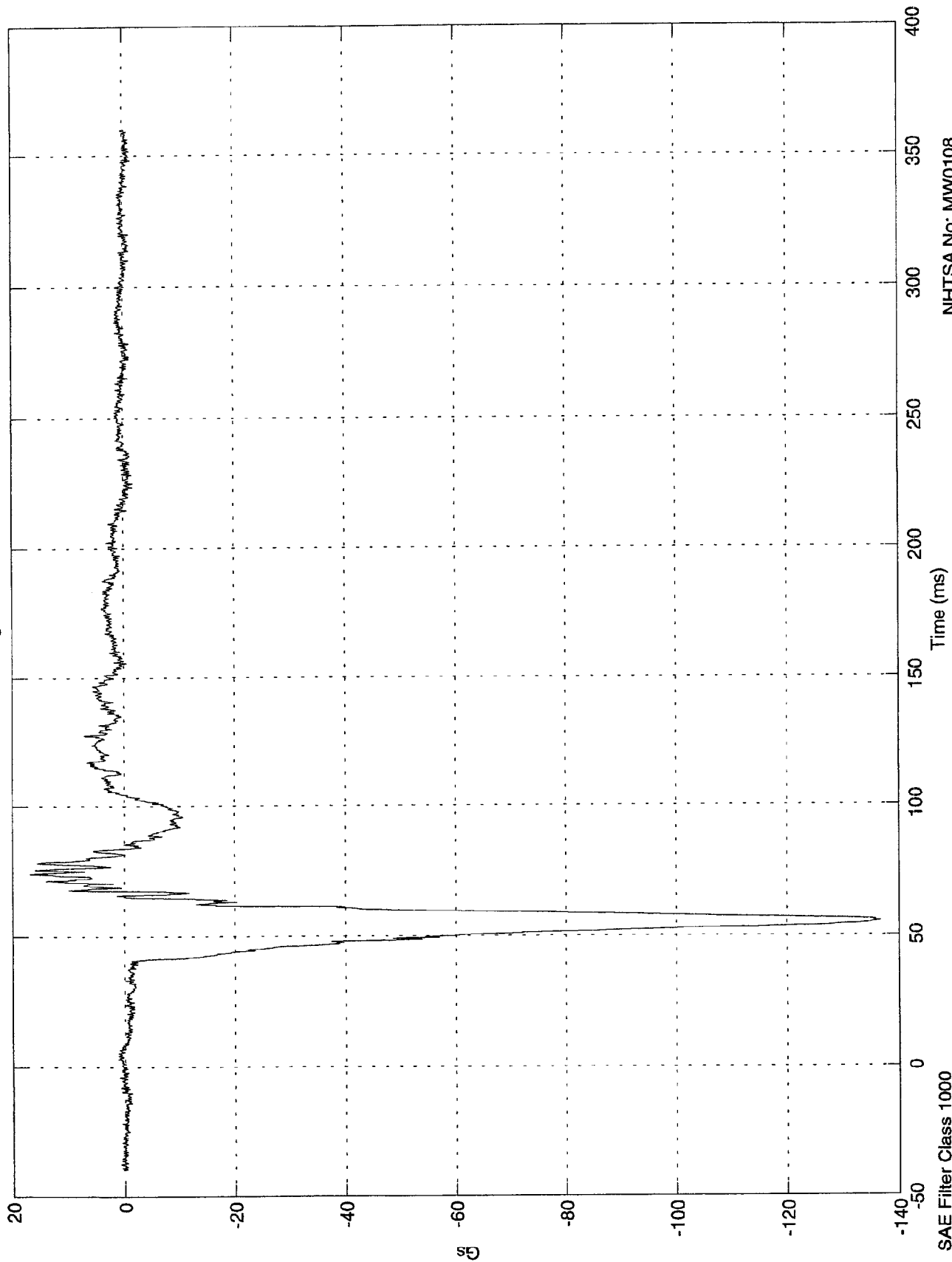


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 16.9 Gs @ 74.10 msec
Min = -137 Gs @ 55.30 msec

Pos. 2 Right Ankle X

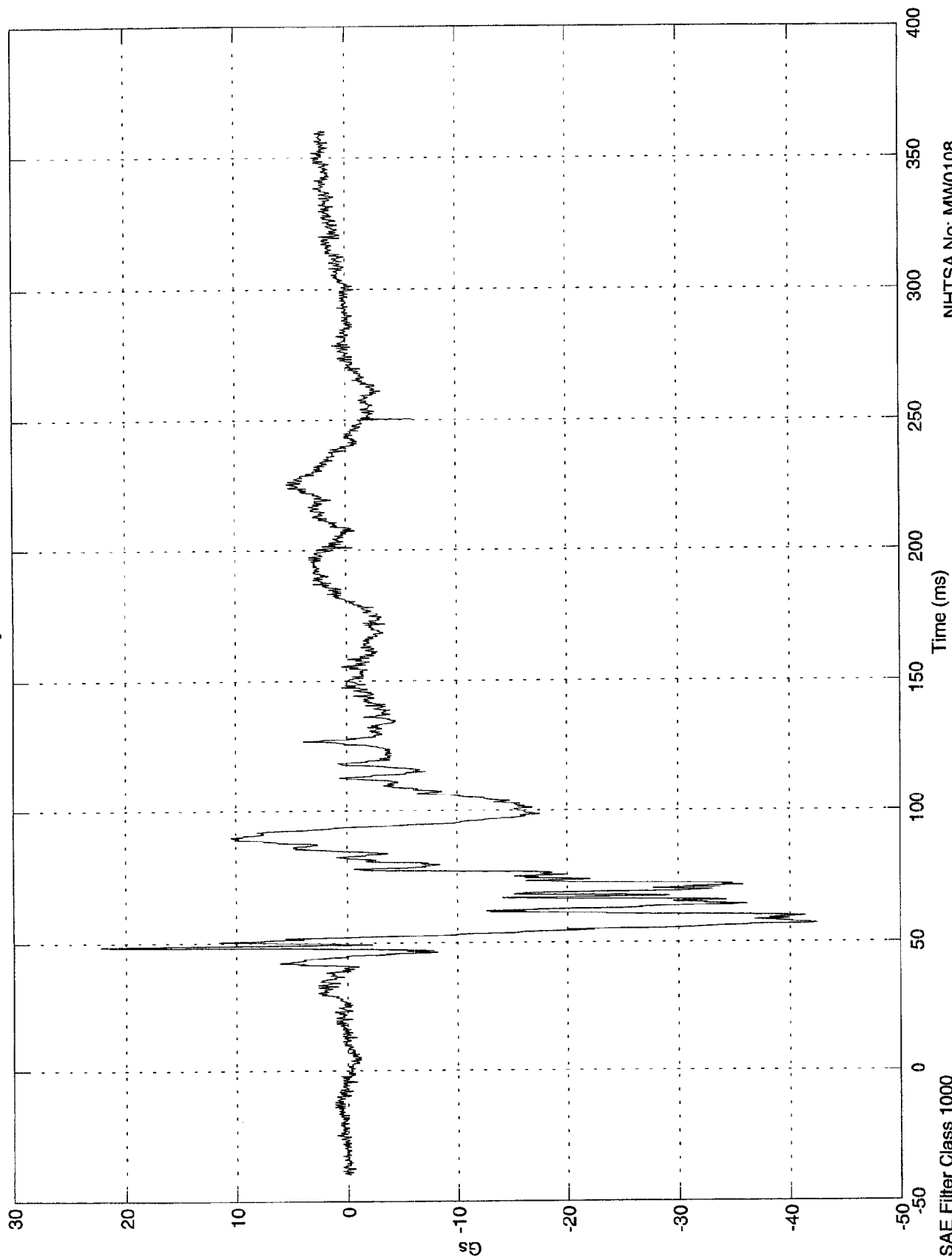


NHTSA No: MW0108
Date: 04 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 22.3 Gs @ 48.50 msec
 Min = -42.5 Gs @ 56.90 msec

Pos. 2 Right Ankle Z

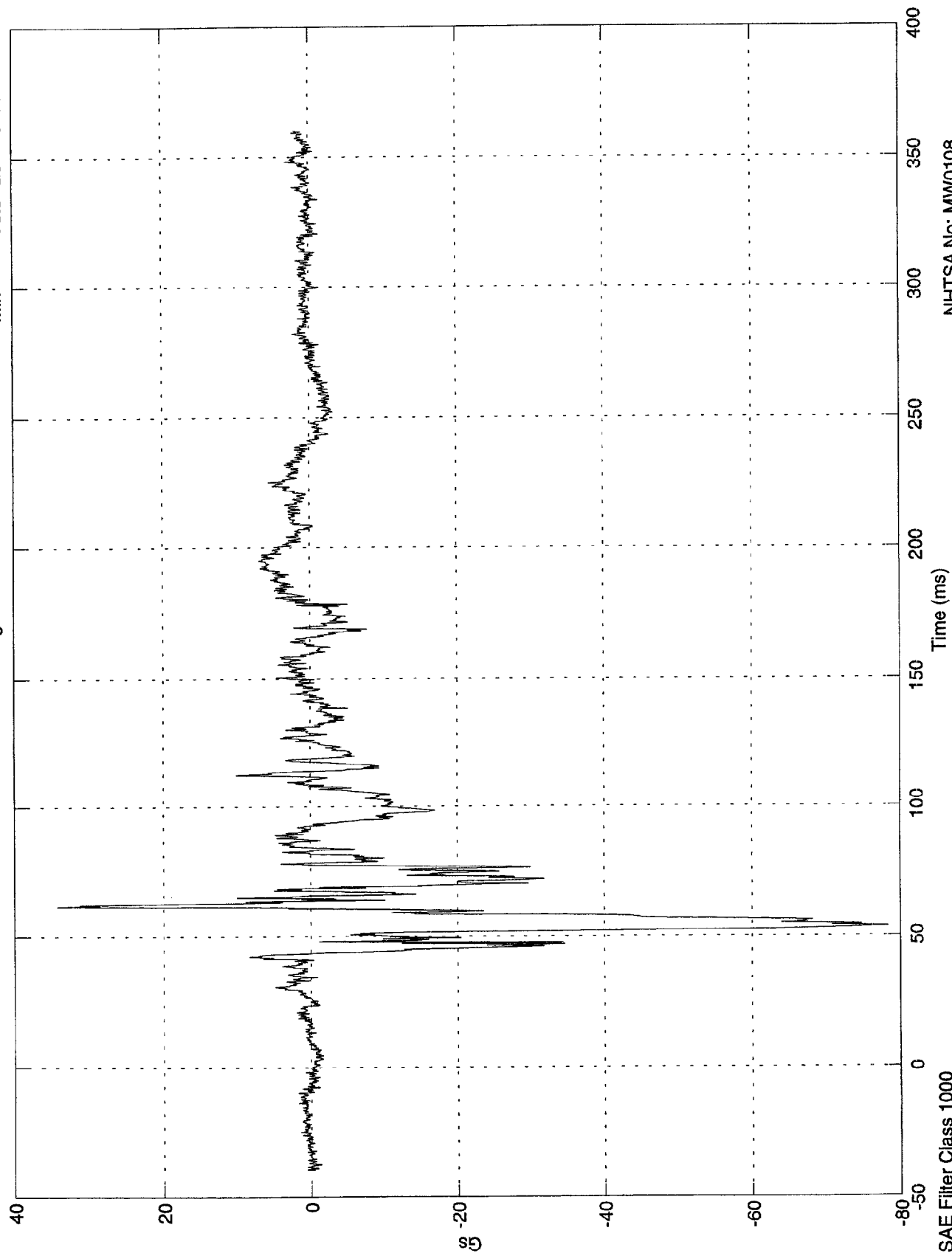


NHTSA No: MW0108
 Date: 04 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 34.3 Gs @ 61.50 msec
 Min = -78.3 Gs @ 53.70 msec

Pos. 2 Right Toe Z

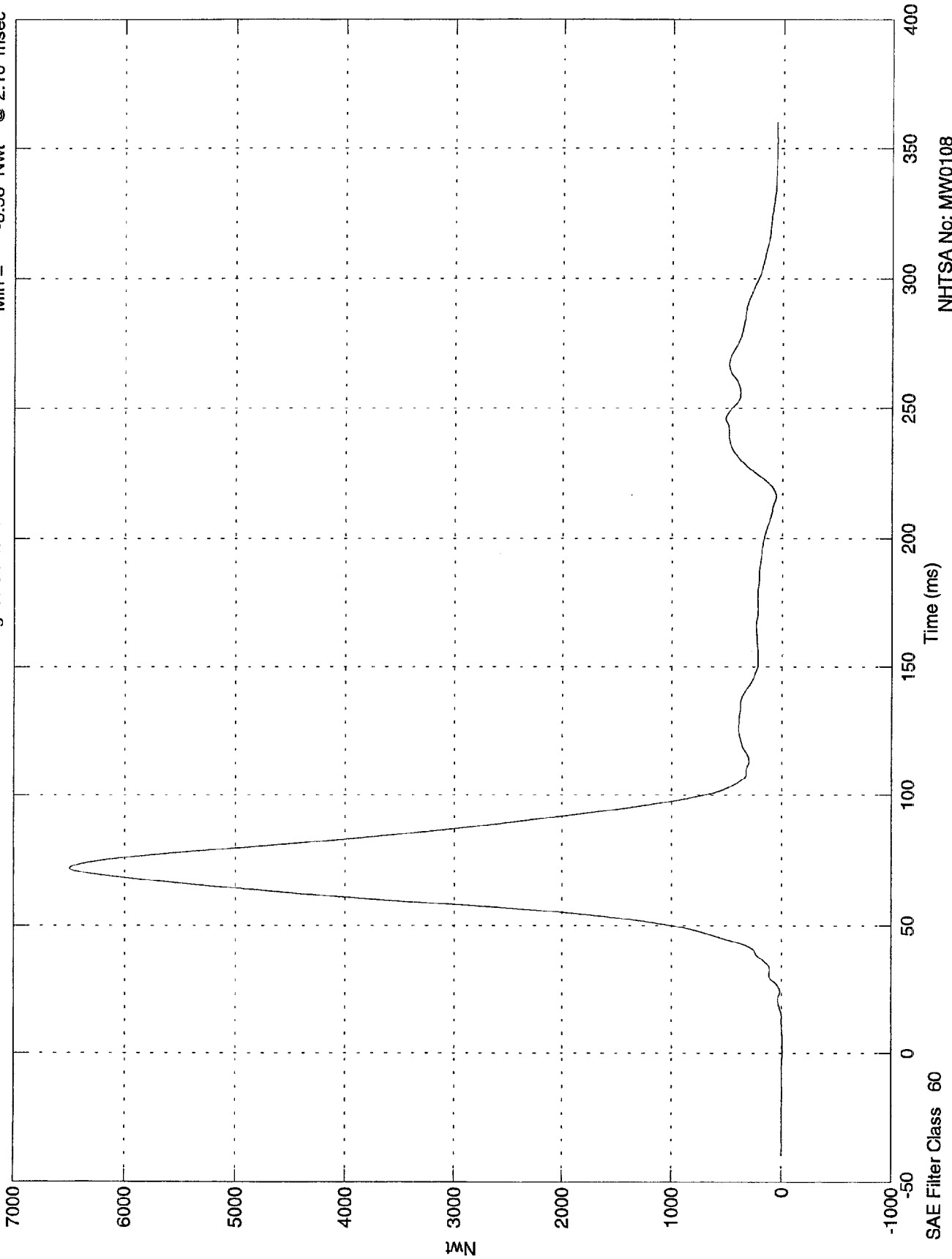


NHTSA No: MW0108
 Date: 04 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Pos. 2 Right Belt Load

Max = 6.5e+003 Nwt @ 72.00 msec
Min = -8.58 Nwt @ 2.10 msec

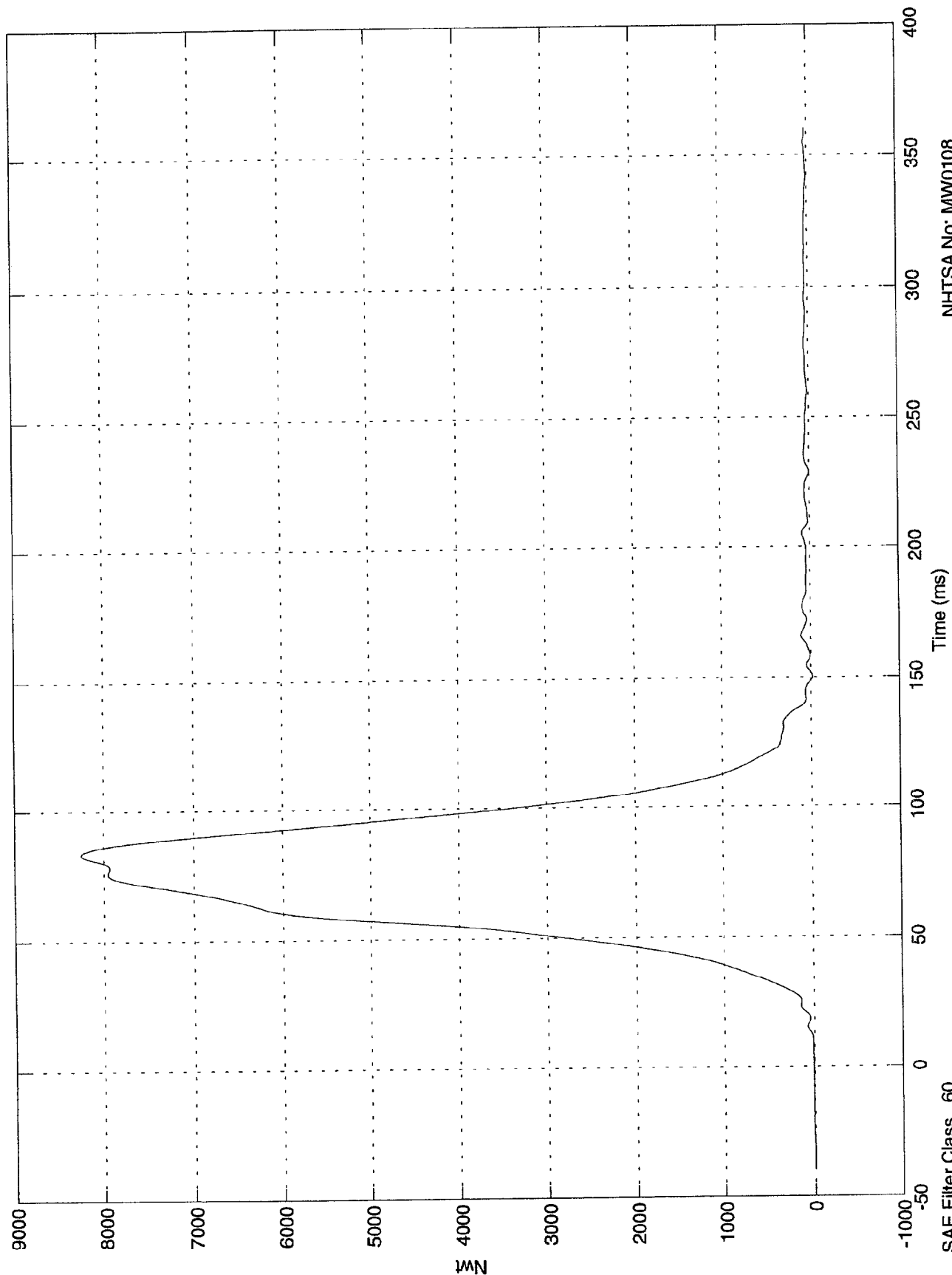


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 8.25e+003 Nwt @ 83.40 msec
Min = -18.2 Nwt @ 150.10 msec

Pos. 2 Torso Belt Load

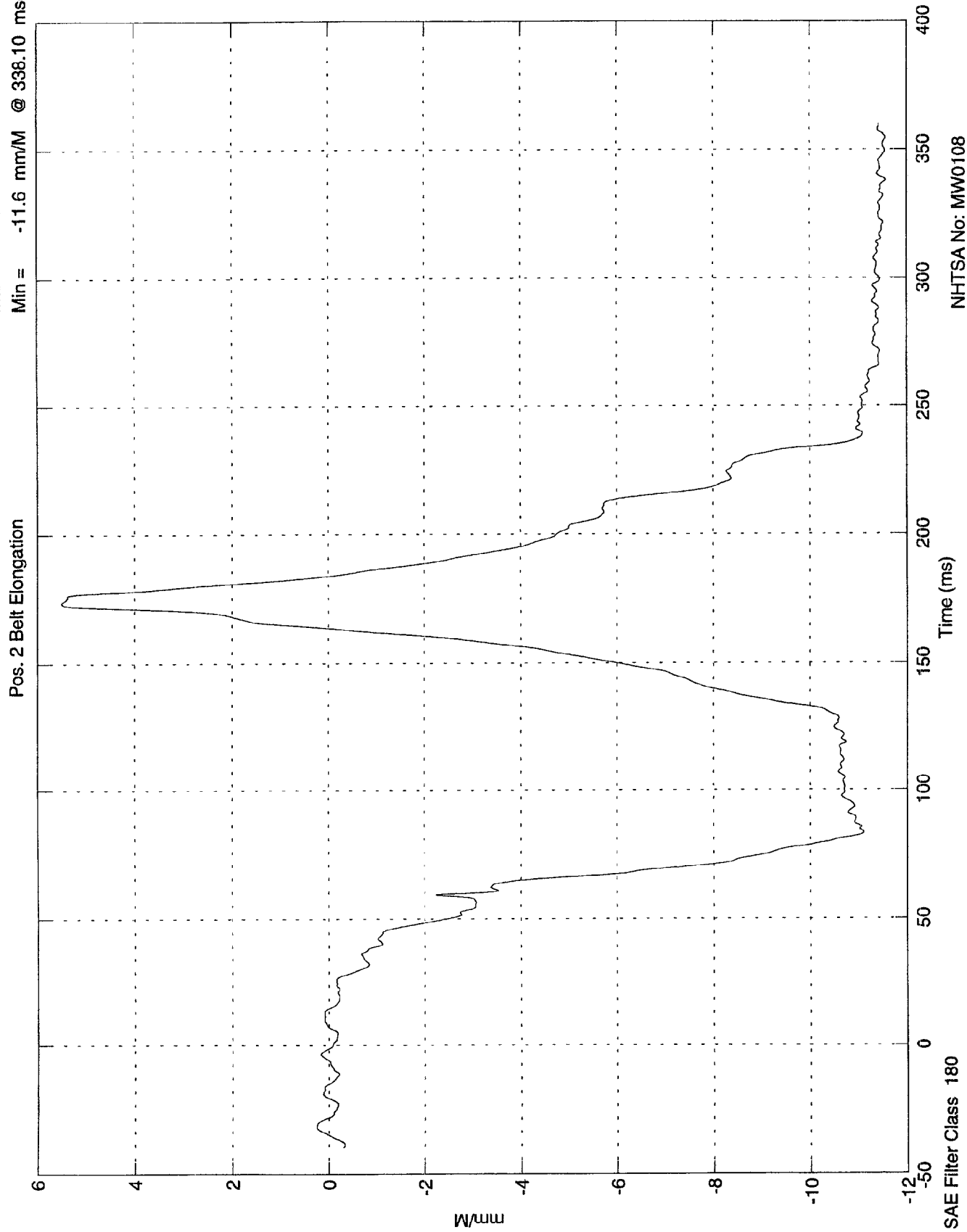


NHTSA No: MW0108
Date: 03 Feb 1998

SAE Filter Class 60

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 5.5 mm/M @ 173.50 msec
Min = -11.6 mm/M @ 338.10 msec



NHTSA No: MW0108
Date: 03 Feb 1998

NHTSA TEST NO. MW0108

VEHICLE DATA

Acceleration

Velocity

Displacement

FILTER CHANNEL CLASS

60

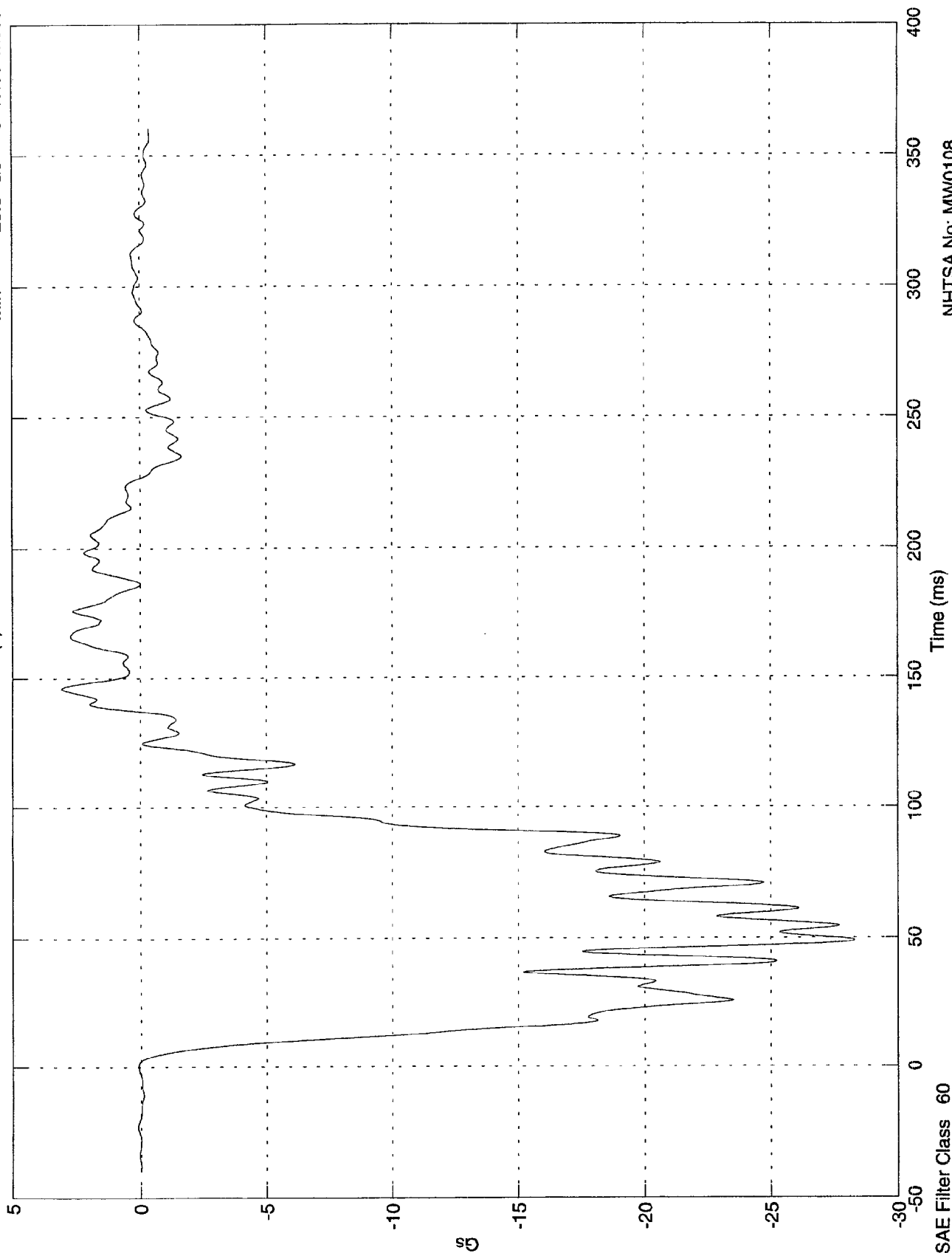
180

180

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 3.08 Gs @ 146.00 msec
 Min = -28.3 Gs @ 49.00 msec

Acc. #1(x) Left Rear X

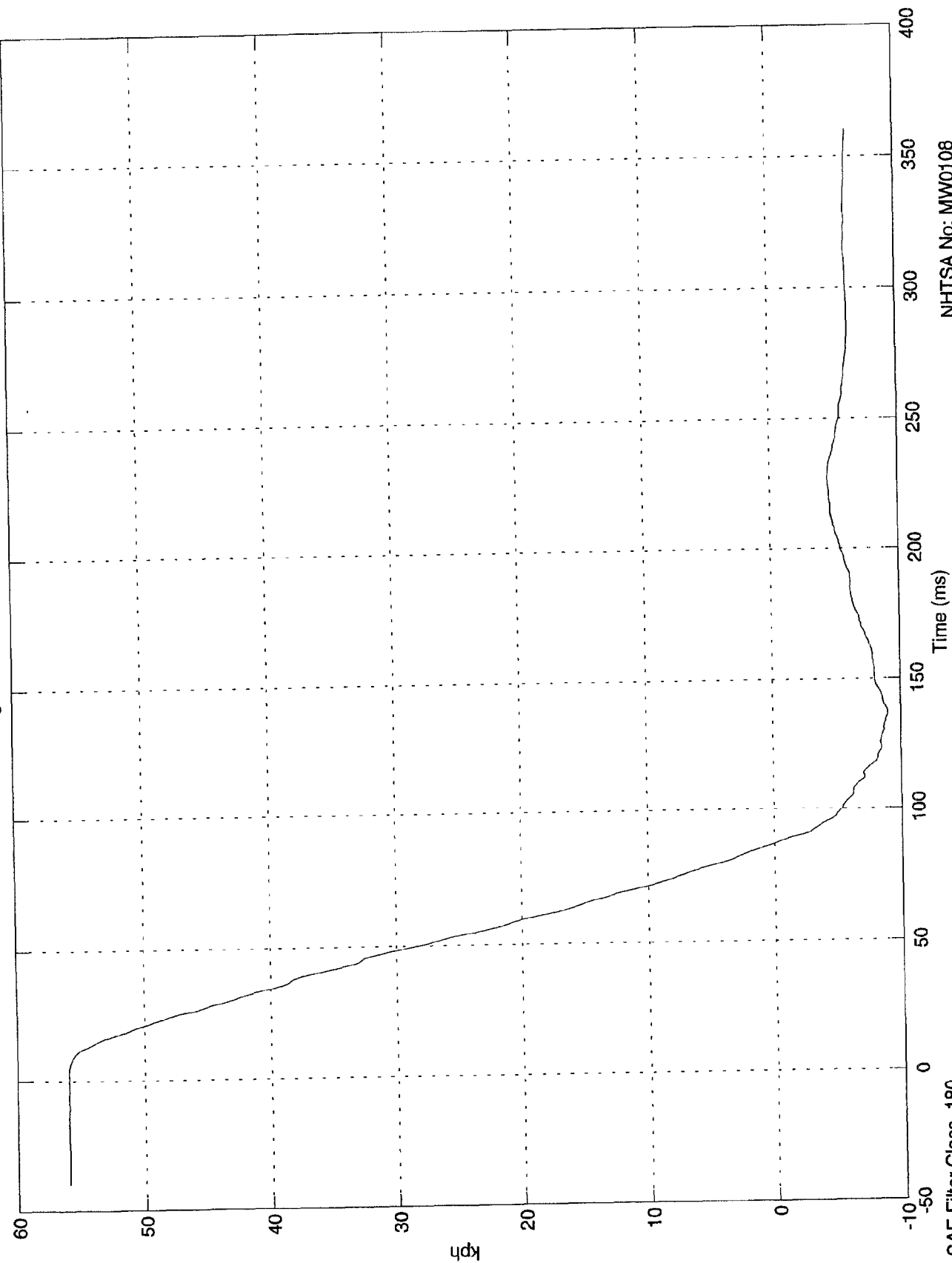


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 56 kph @ -18.70 msec
Min = -8.97 kph @ 137.30 msec

1st Integral Acc. #1(x) Left Rear X



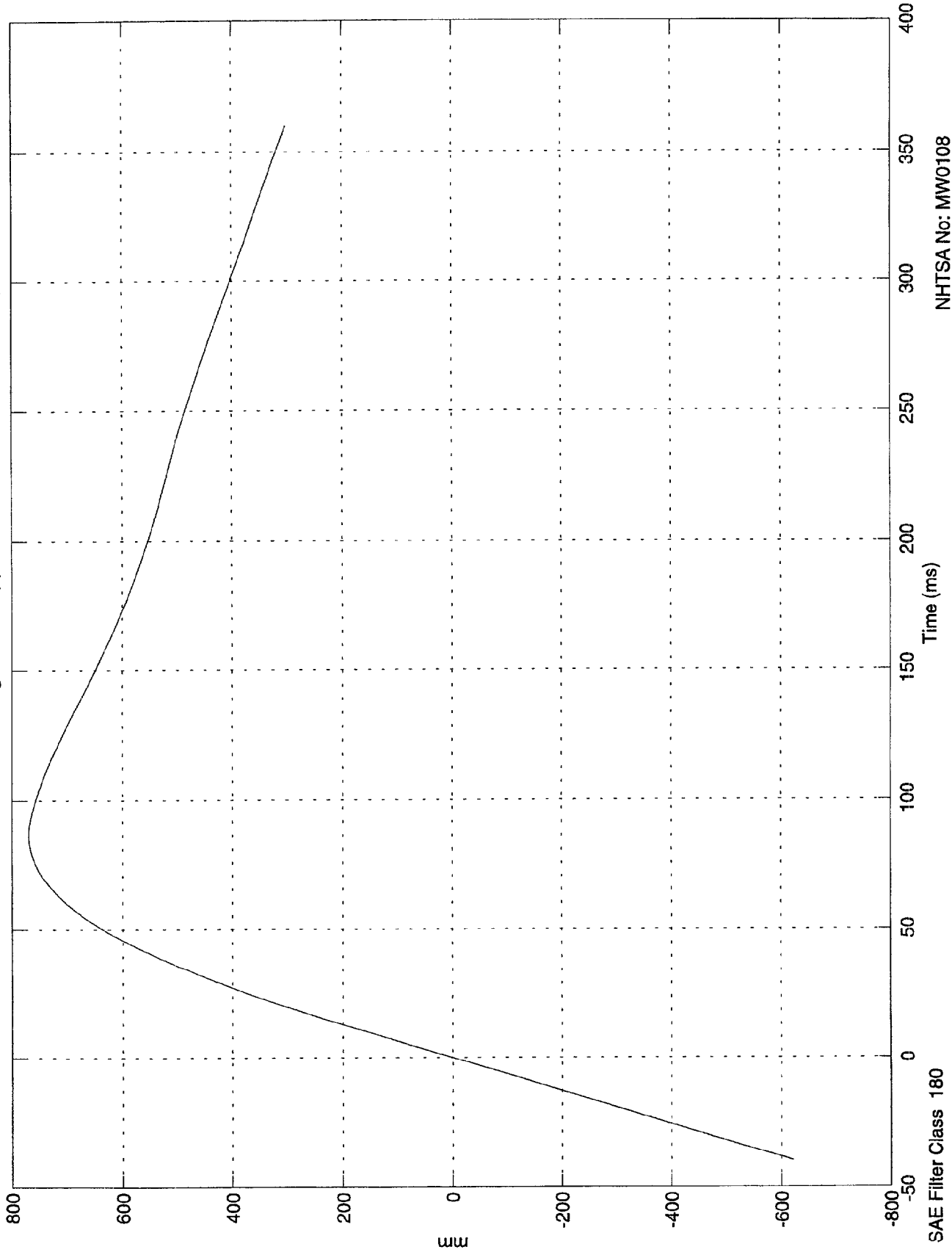
NHTSA No: MW0108
Date: 03 Feb 1998

SAE Filter Class 180

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 770 mm @ 86.90 msec
Min = -621 mm @ -39.90 msec

2nd Integral Acc. #1(x) Left Rear X

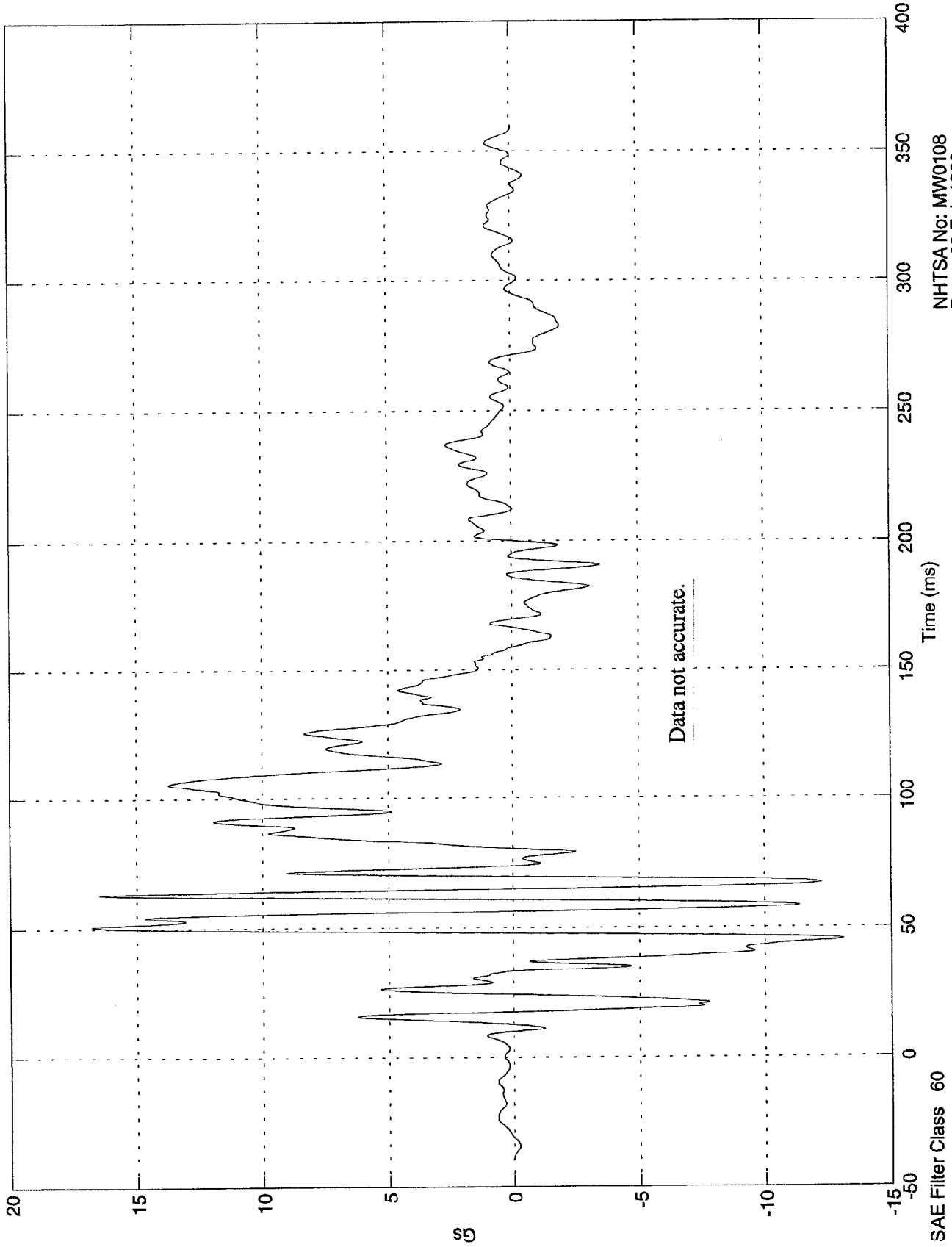


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 16.8 Gs @ 50.70 msec
Min = -13.1 Gs @ 45.20 msec

Acc. #2(x) Right Rear X

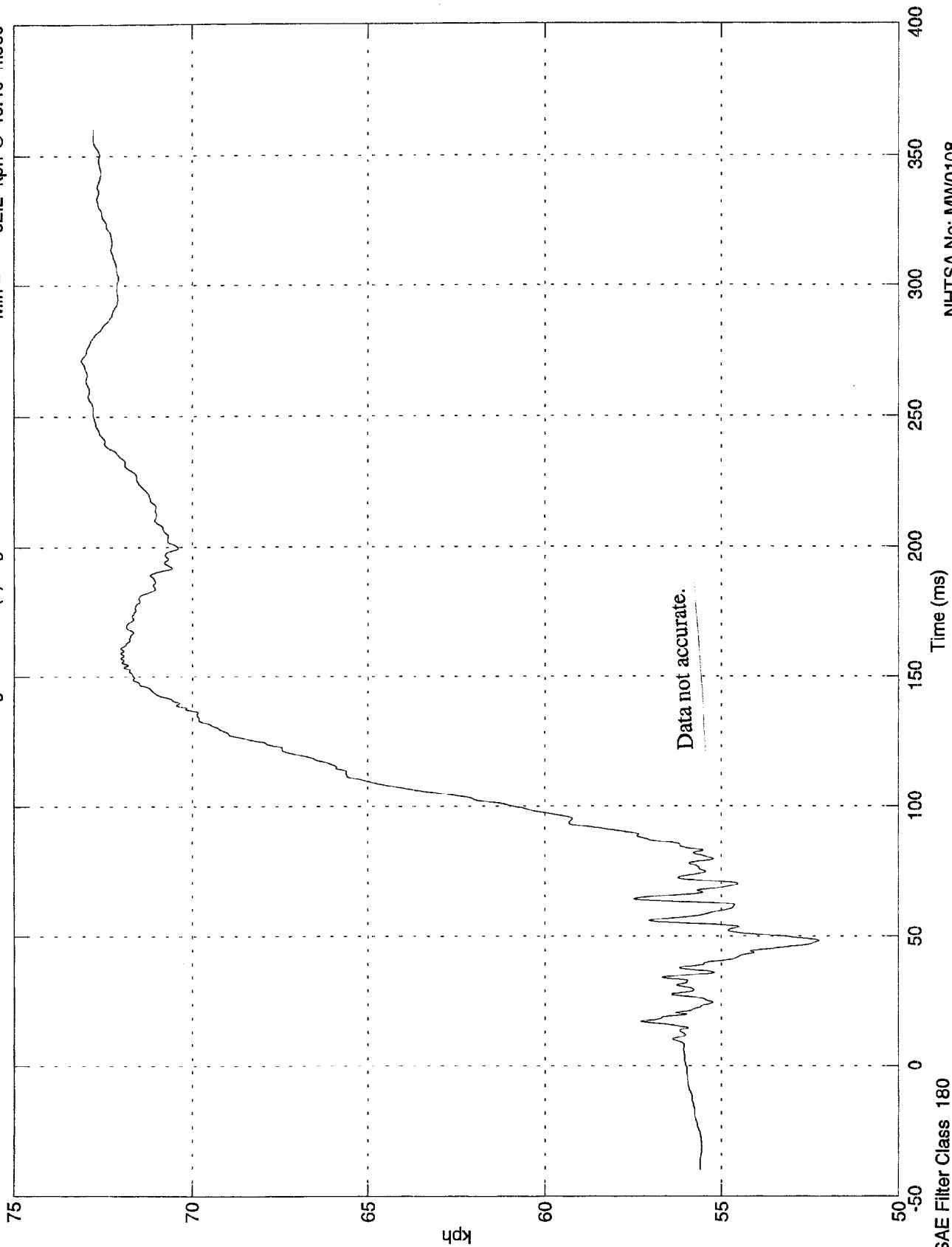


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 73.1 kph @ 271.20 msec
Min = 52.2 kph @ 48.40 msec

1st Integral Acc. #2(x) Right Rear X

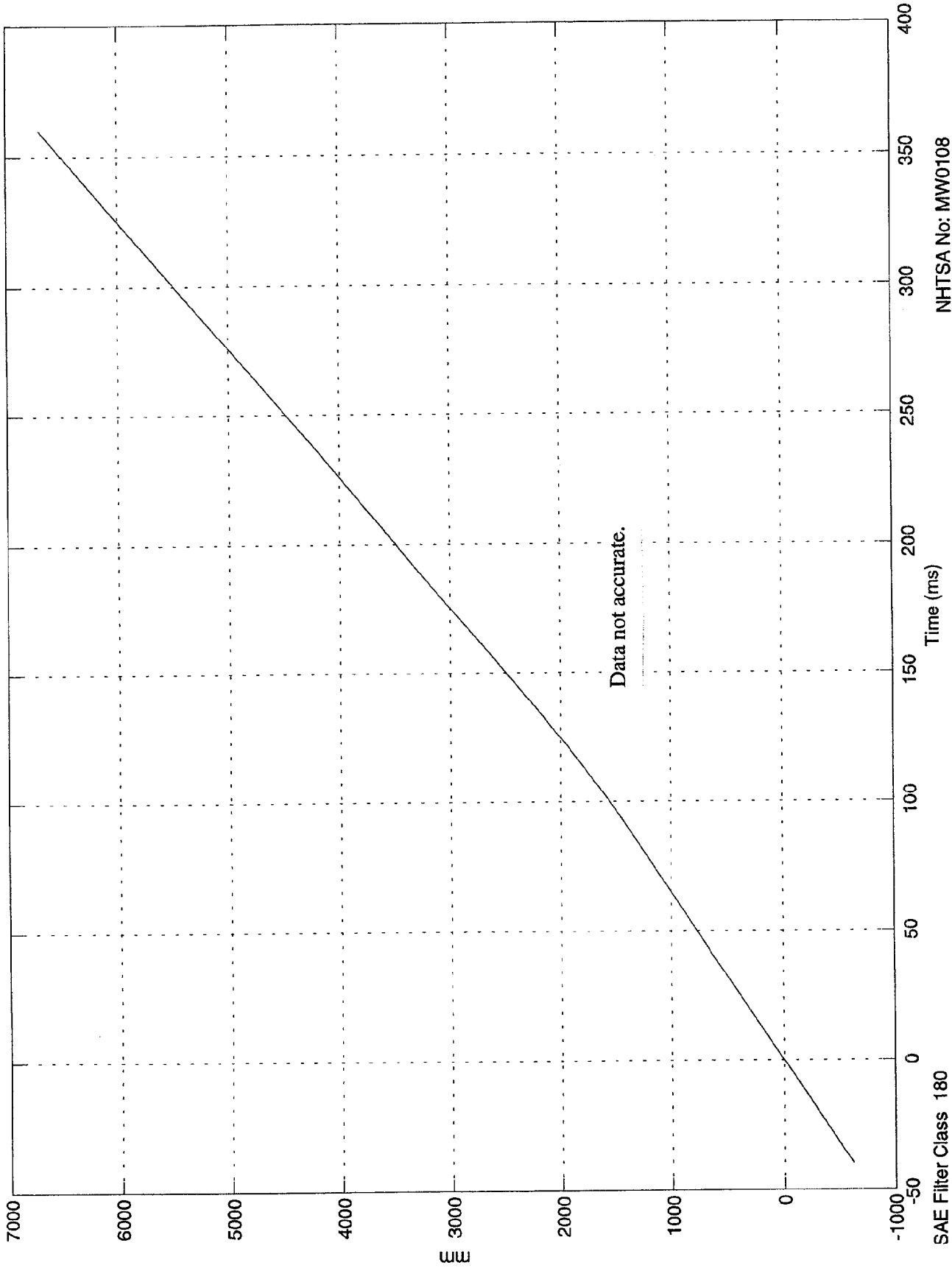


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 6.7e+003 mm @ 360.00 msec
Min = -618 mm @ -39.90 msec

2nd Integral Acc. #2(x) Right Rear X



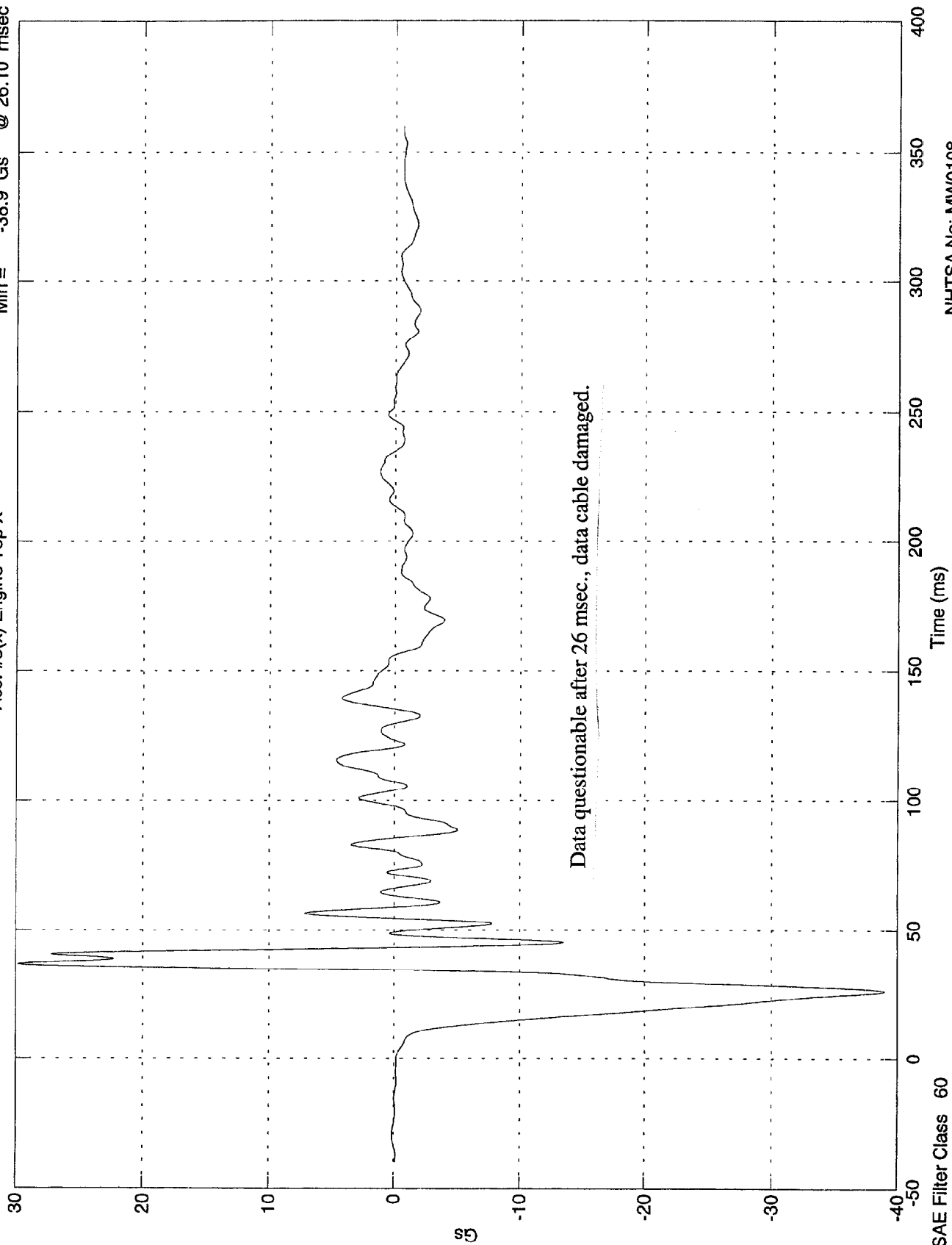
NHTSA No: MW0108
Date: 03 Feb 1998

SAE Filter Class 180

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 29.8 Gs @ 36.70 msec
 Min = -38.9 Gs @ 26.10 msec

Acc. #3(x) Engine Top X

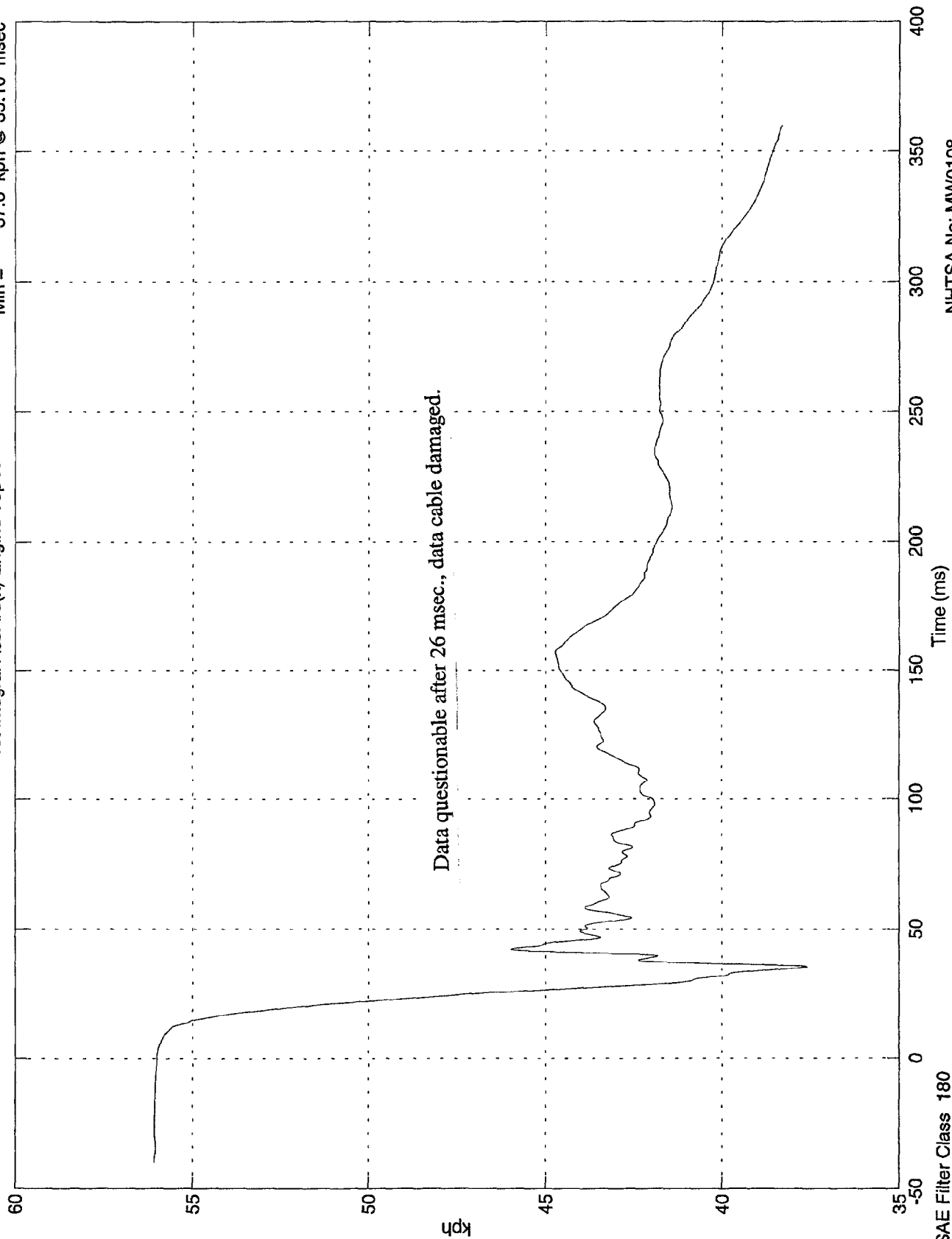


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 56.1 kph @ -25.30 msec
Min = 37.6 kph @ 35.10 msec

1st Integral Acc. #3(x) Engine Top X

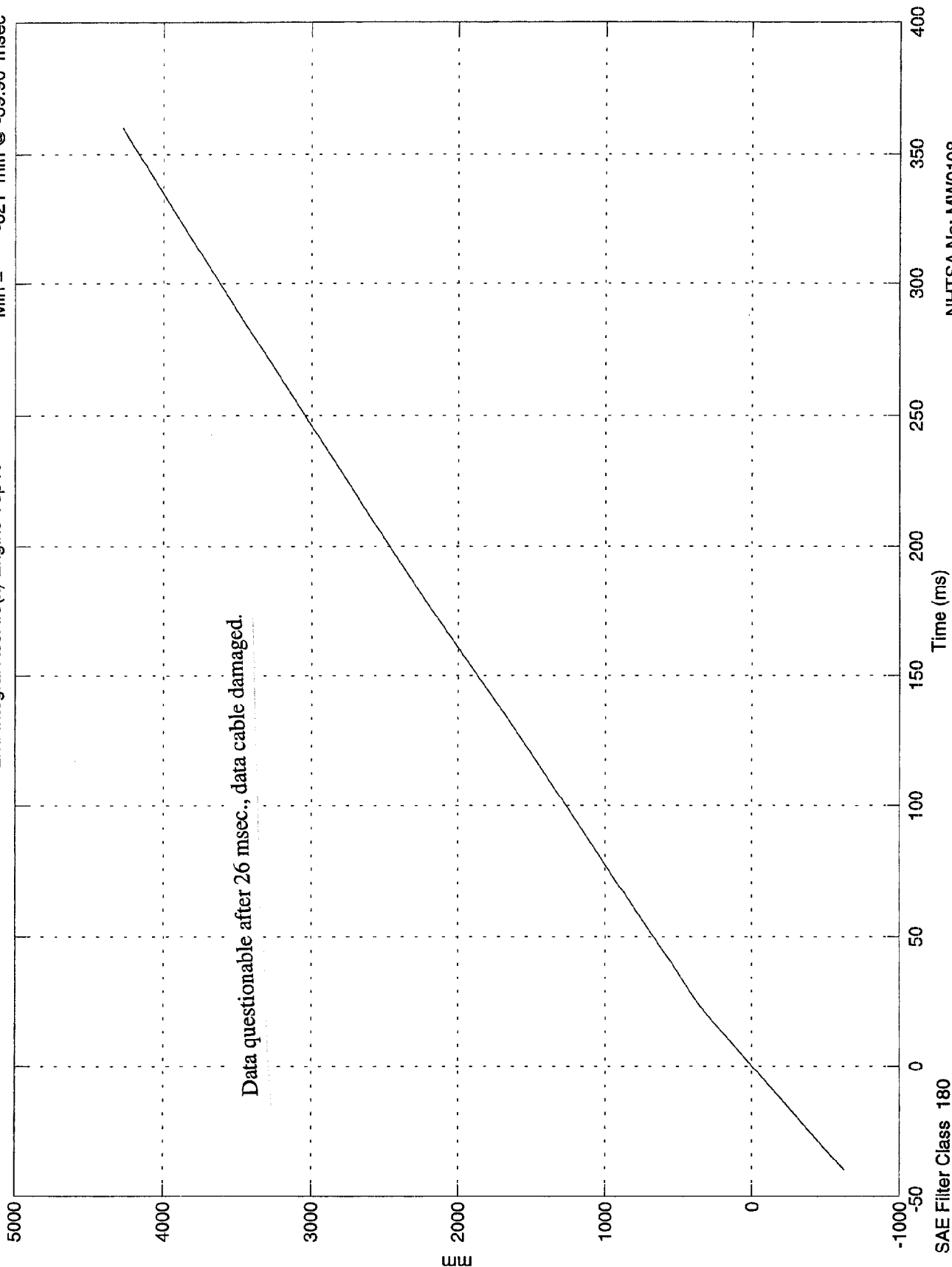


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 4.27e+003 mm @ 360.00 msec
Min = -621 mm @ -39.90 msec

2nd Integral Acc. #3(x) Engine Top X

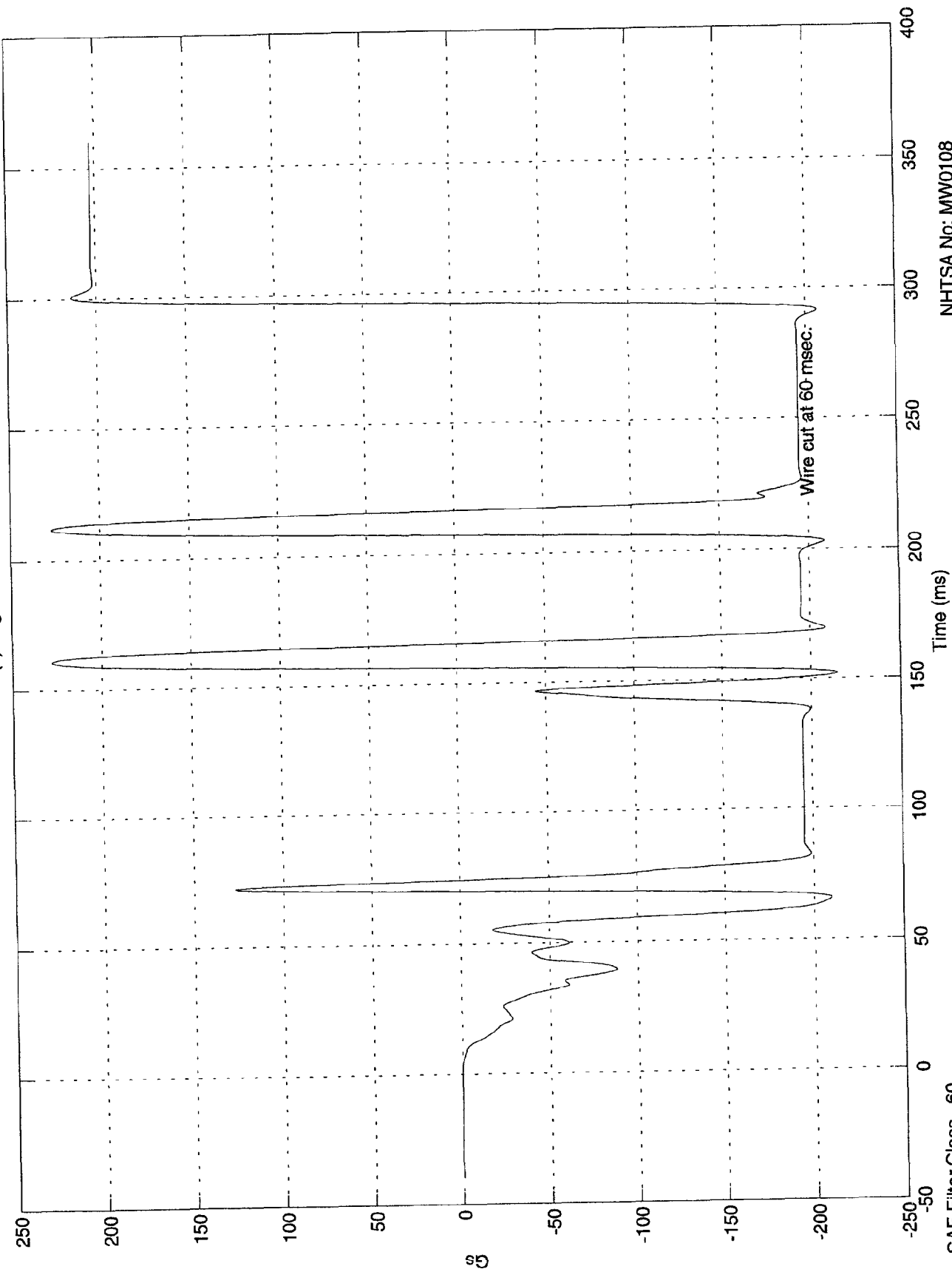


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 228 Gs @ 160.70 msec
Min = -214 Gs @ 152.10 msec

Acc. #4(x) Eng. Bottom X



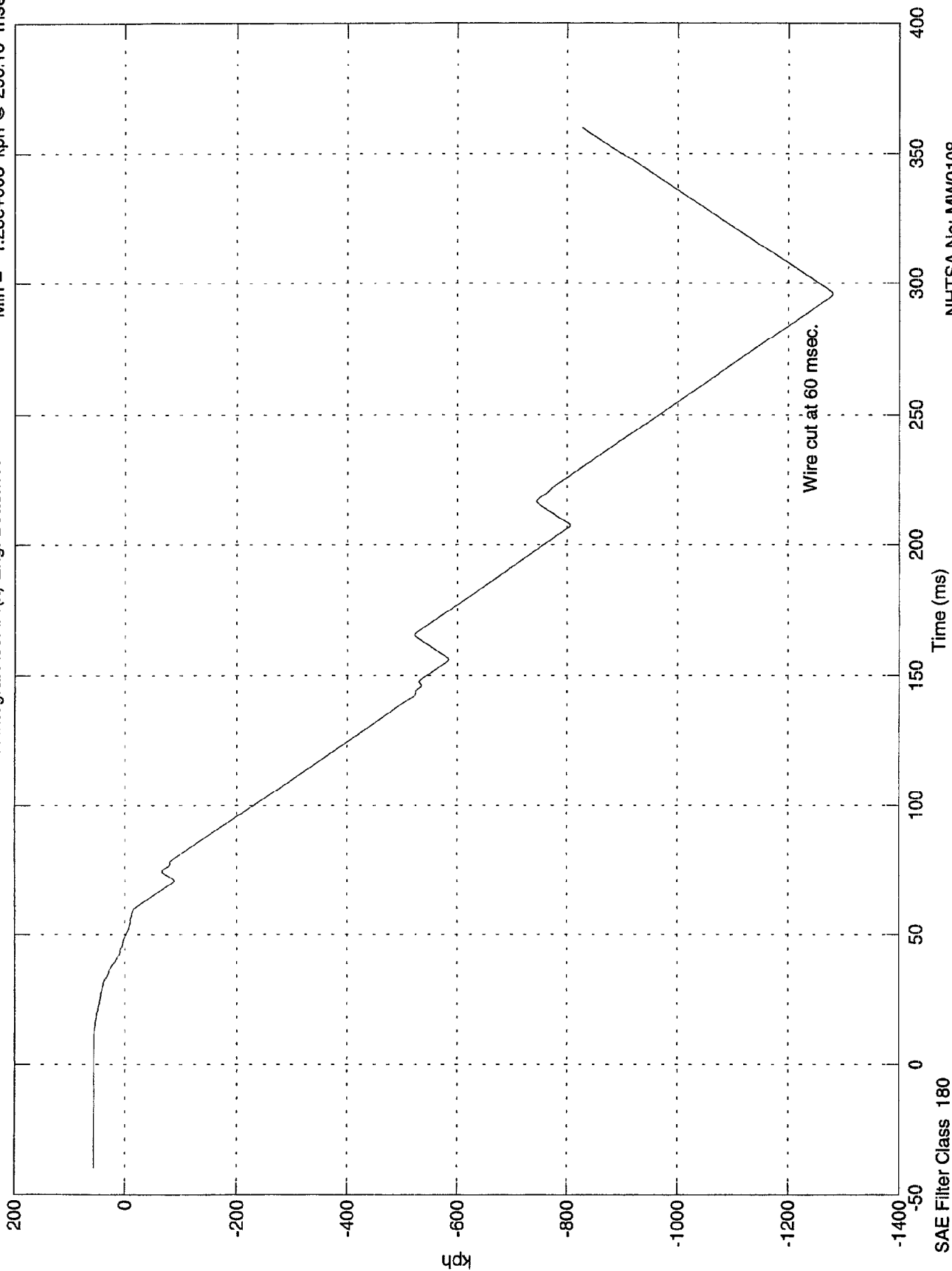
NHTSA No: MW0108
Date: 03 Feb 1998

SAE Filter Class 60

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

1st Integral Acc. #4(x) Eng. Bottom X

Max = 56 kph @ -19.50 msec
Min = -1.28e+003 kph @ 296.10 msec

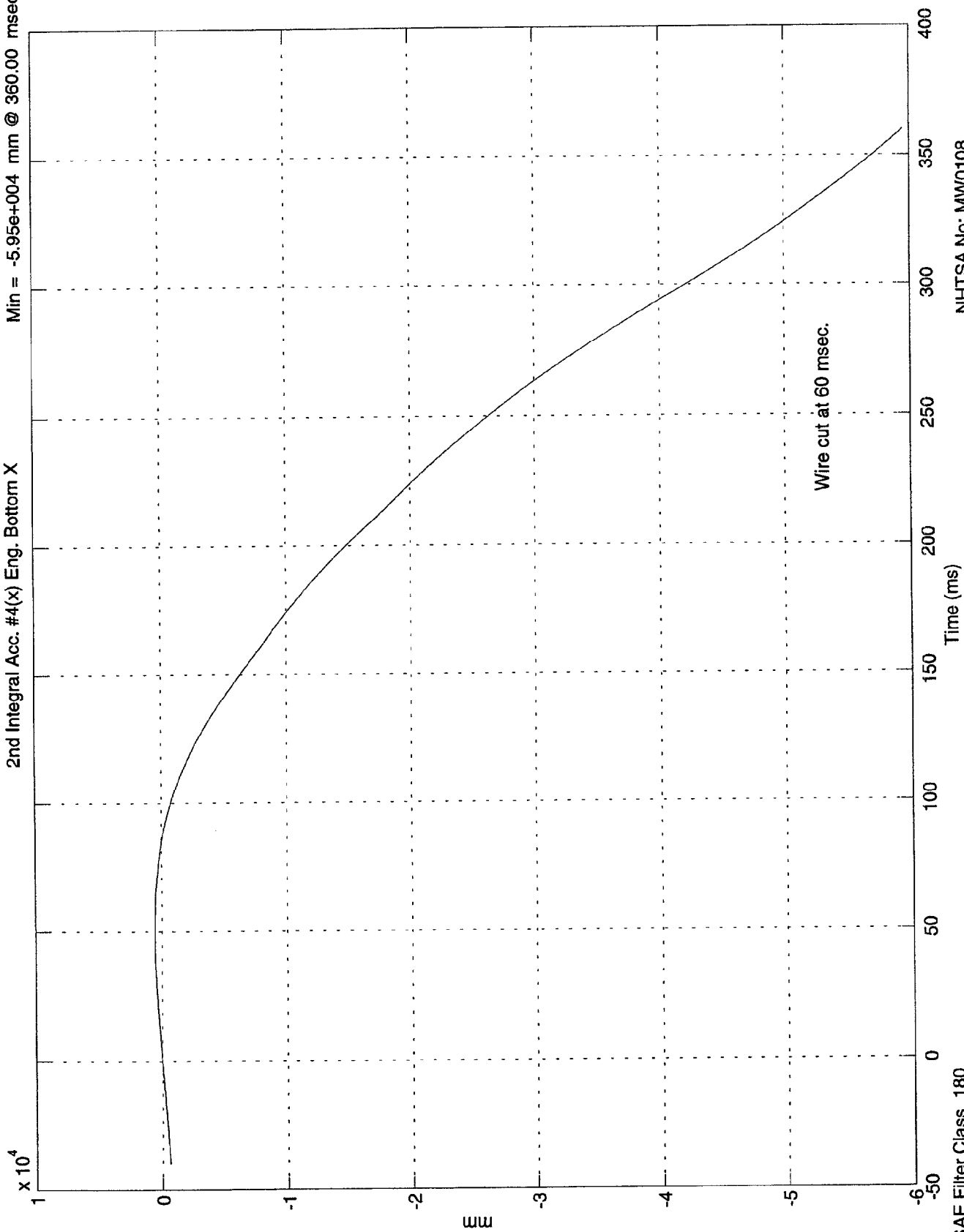


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 536 mm @ 49.30 msec
 Min = -5.95e+004 mm @ 360.00 msec

2nd Integral Acc. #4(x) Eng. Bottom X



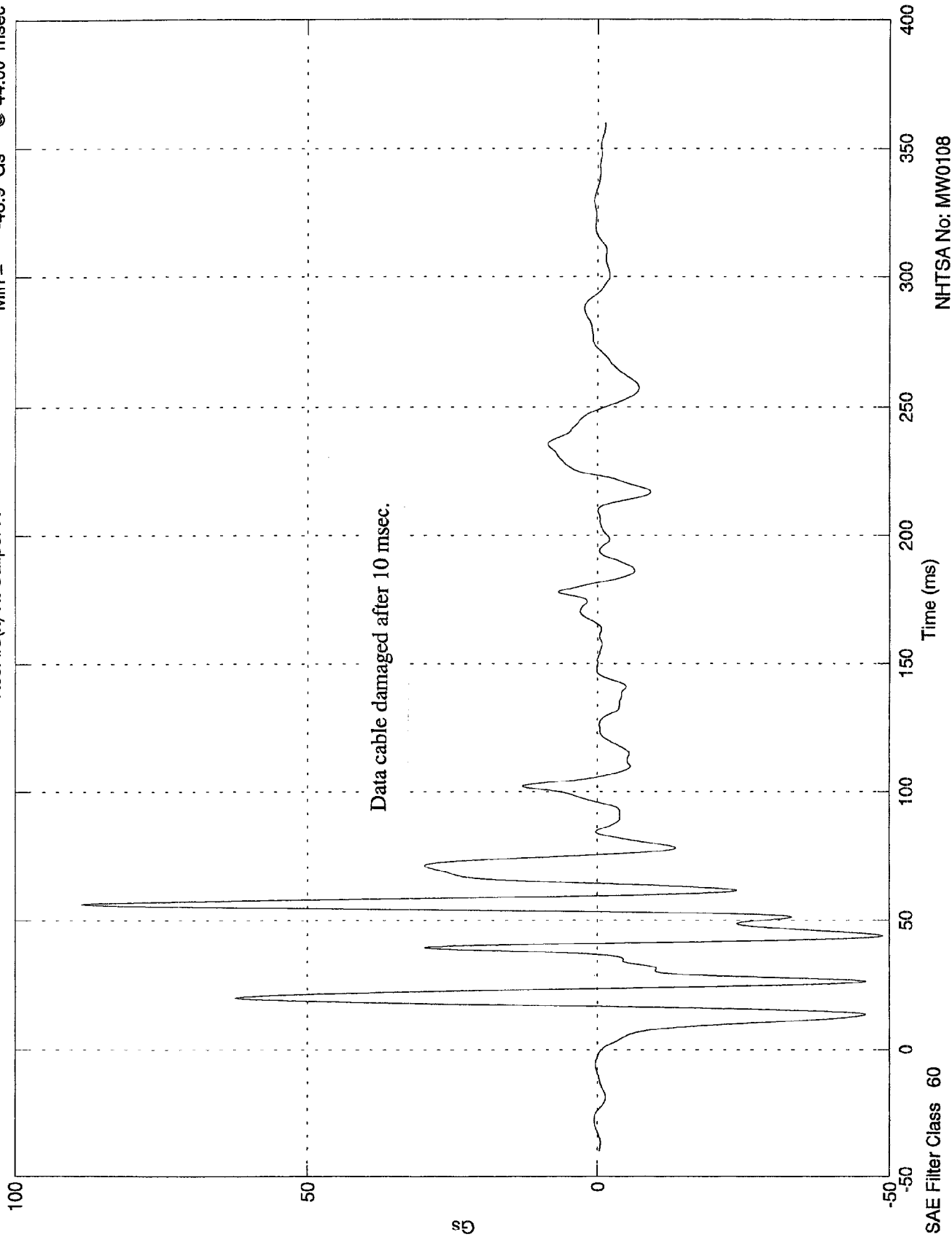
NHTSA No: MW0108
 Date: 03 Feb 1998

SAE Filter Class 180

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 88.9 Gs @ 56.10 msec
Min = -48.9 Gs @ 44.00 msec

Acc. #5(x) Rt Caliper X

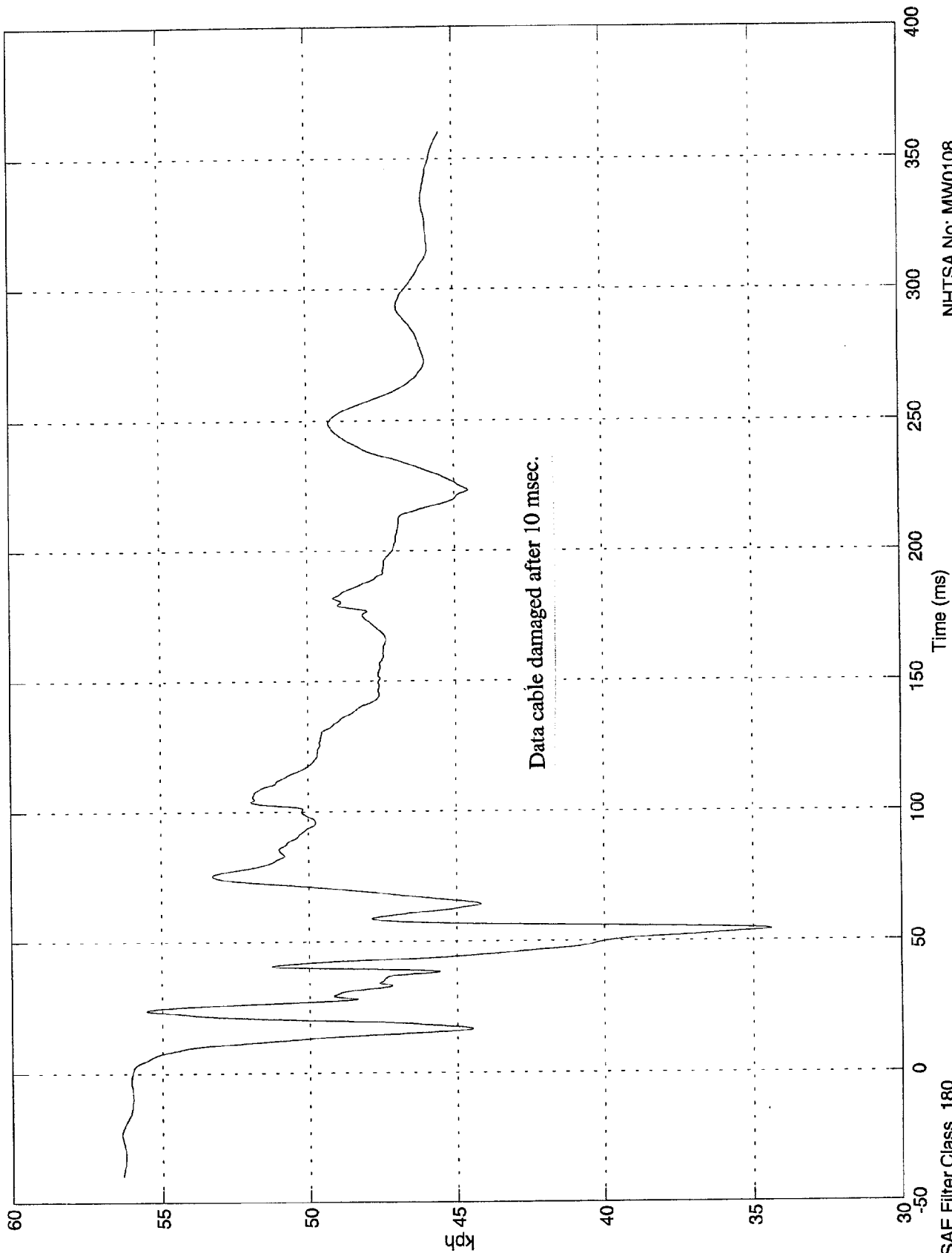


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 56.3 kph @ -23.70 msec
Min = 34.4 kph @ 54.20 msec

1st Integral Acc. #5(x) Rt Caliper X



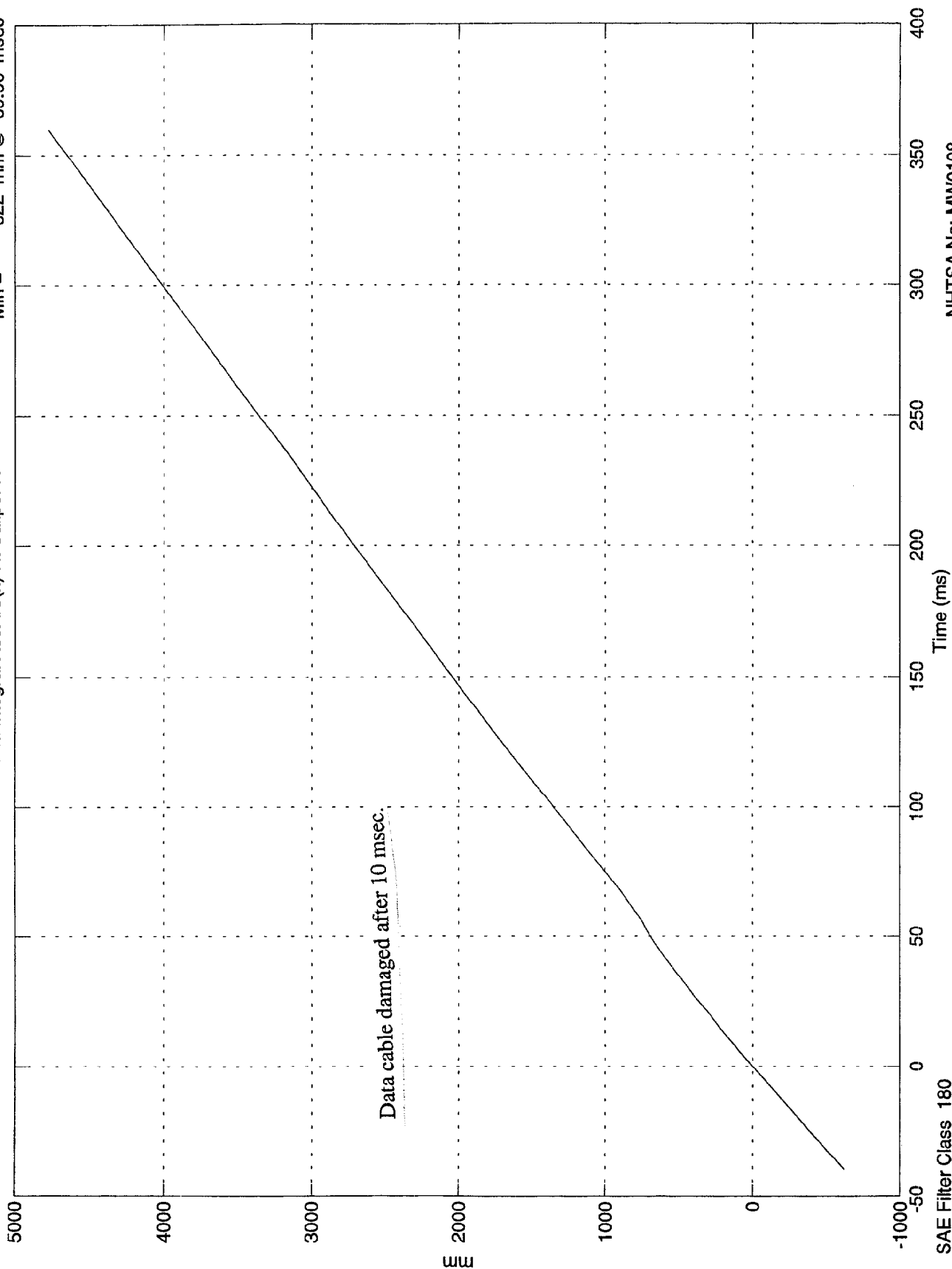
NHTSA No: MW0108
Date: 03 Feb 1998

SAE Filter Class 180

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 4.77e+003 mm @ 360.00 msec
Min = -622 mm @ -39.90 msec

2nd Integral Acc. #5(x) Rt Caliper X

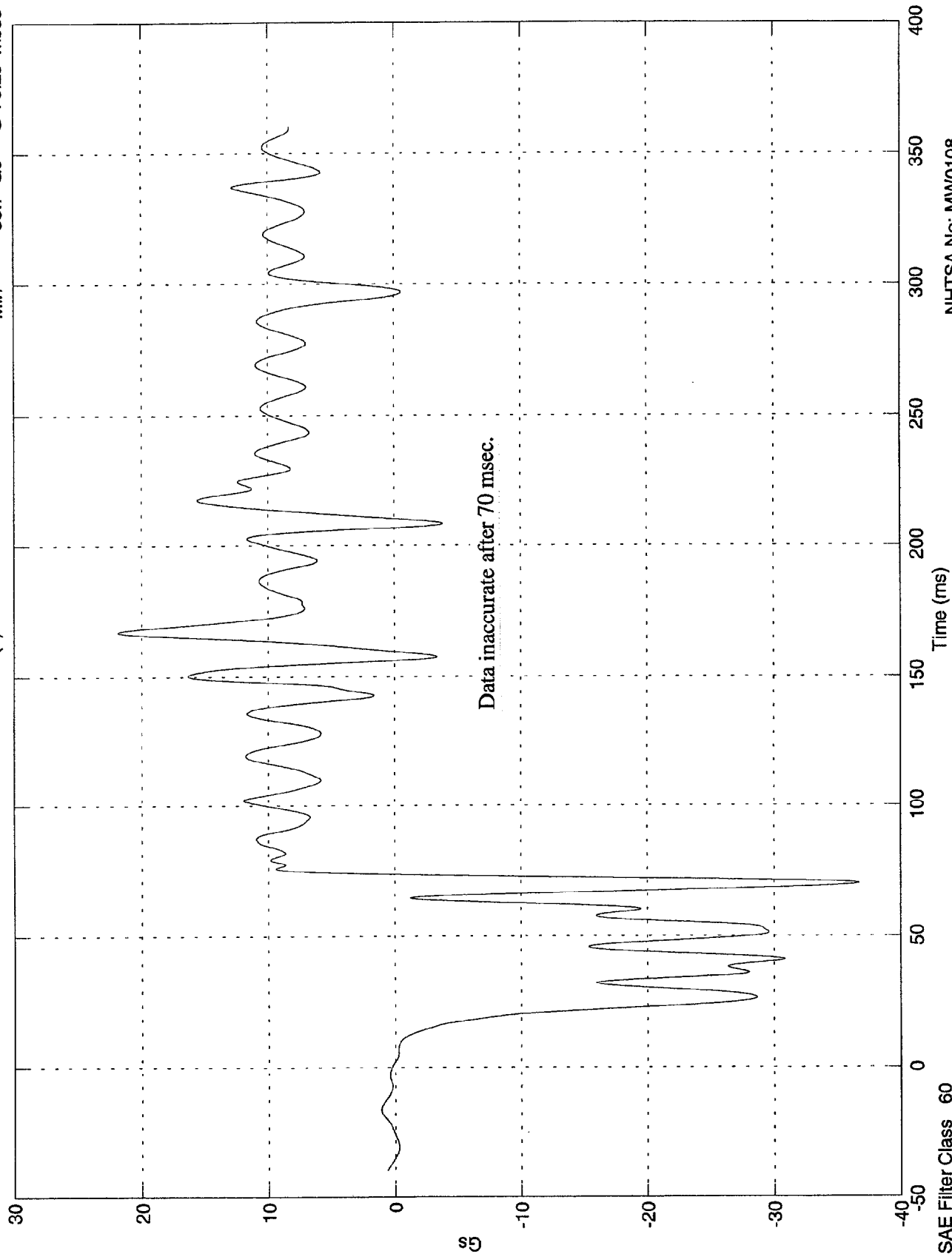


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 21.8 Gs @ 167.00 msec
Min = -36.7 Gs @ 70.20 msec

Acc. #6(x) Instrument X



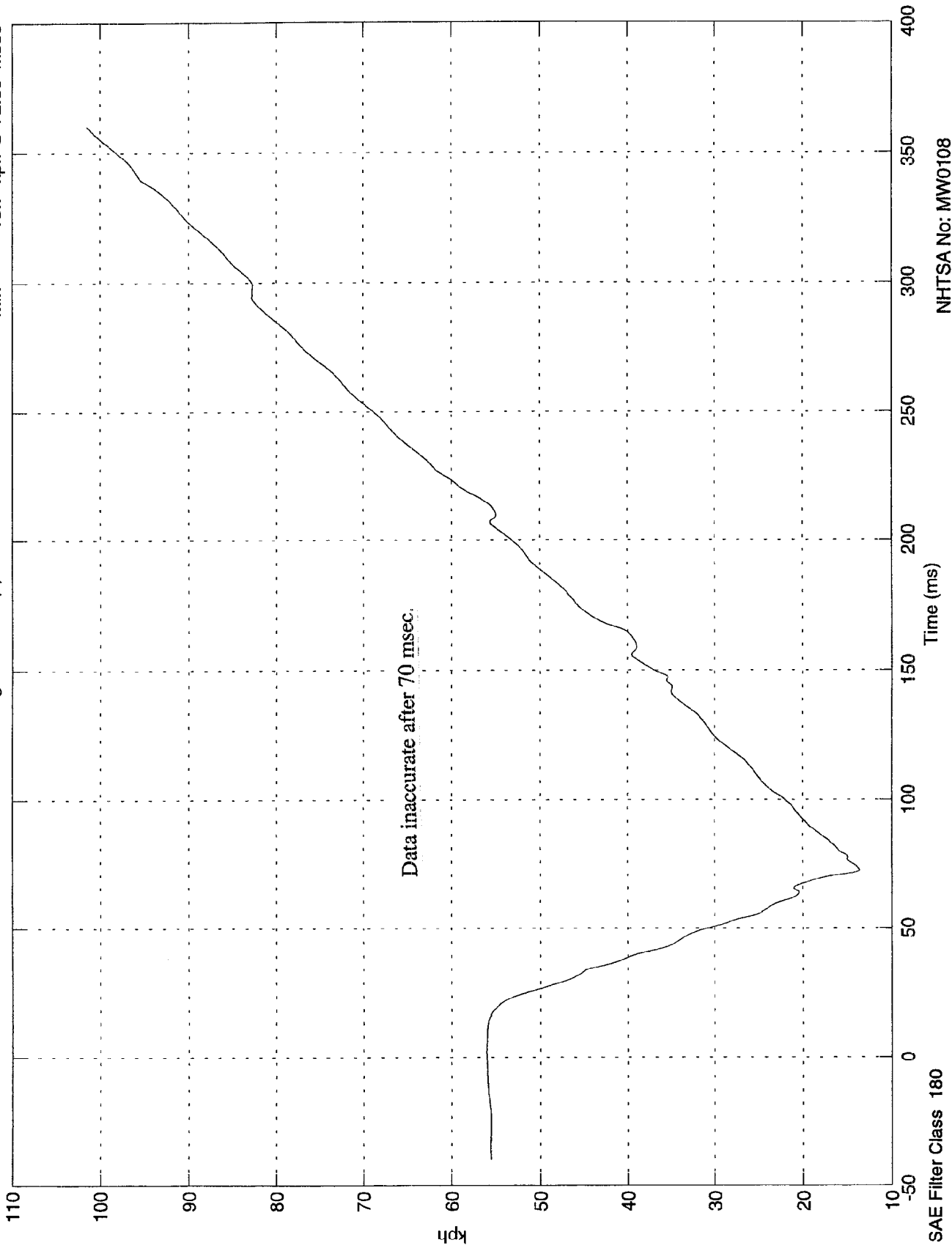
SAE Filter Class 60

NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 101 kph @ 360.00 msec
Min = 13.7 kph @ 72.60 msec

1st Integral Acc. #6(x) Instrument X

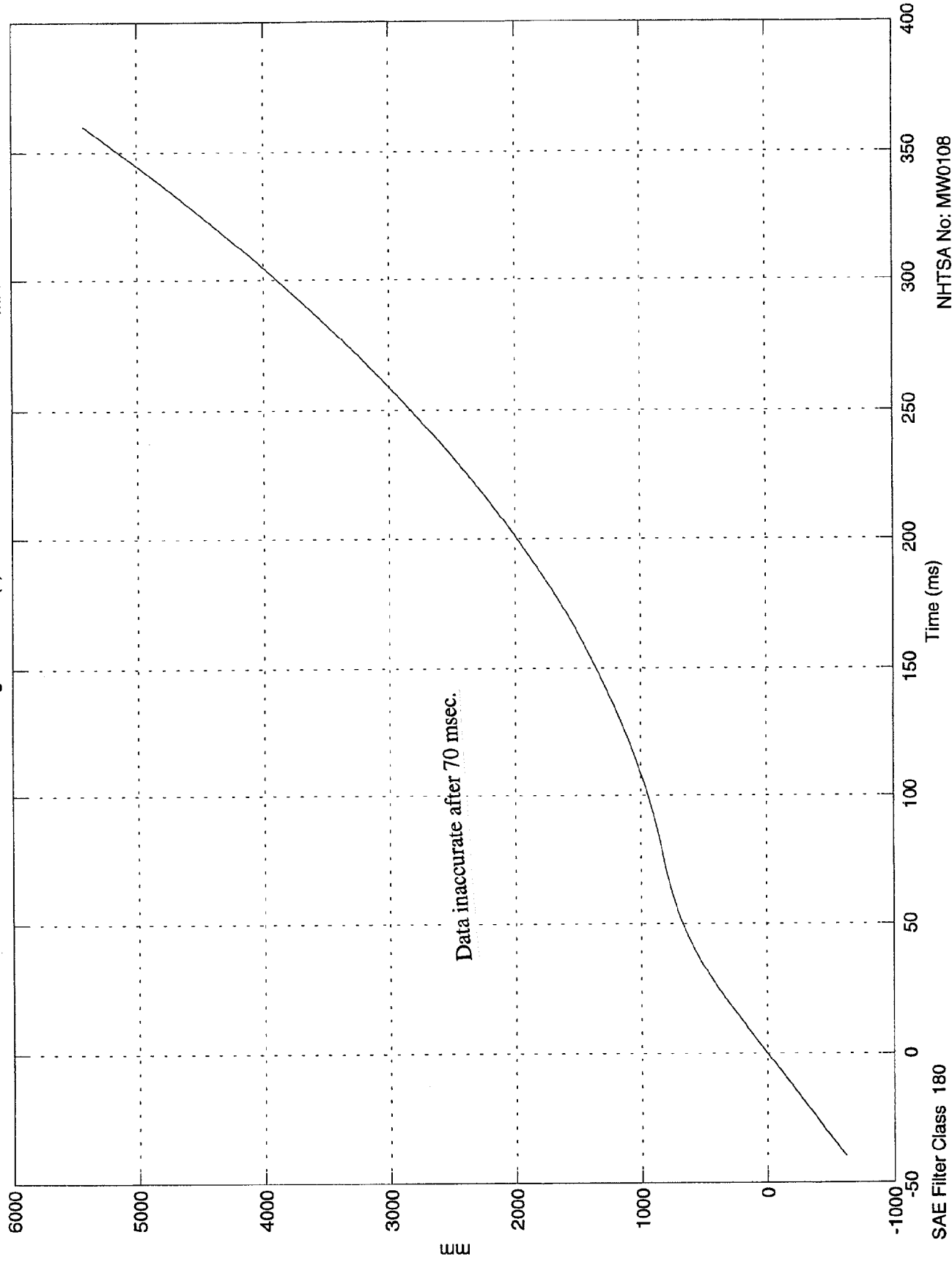


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 5.43e+003 mm @ 360.00 msec
Min = -617 mm @ -39.90 msec

2nd Integral Acc. #6(x) Instrument X

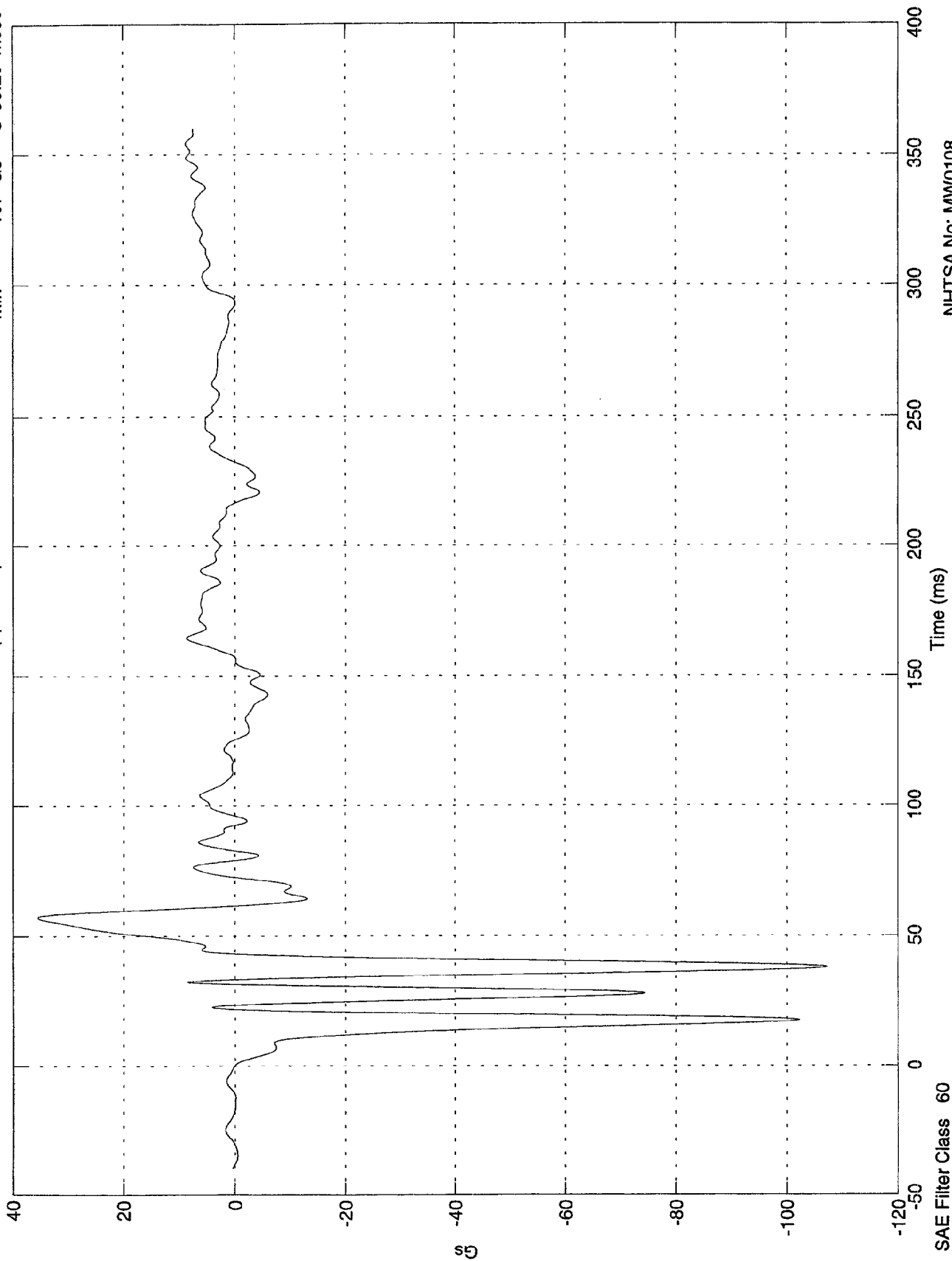


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 35.6 Gs @ 56.90 msec
Min = -107 Gs @ 38.20 msec

Acc. #7(x) Lt Caliper X



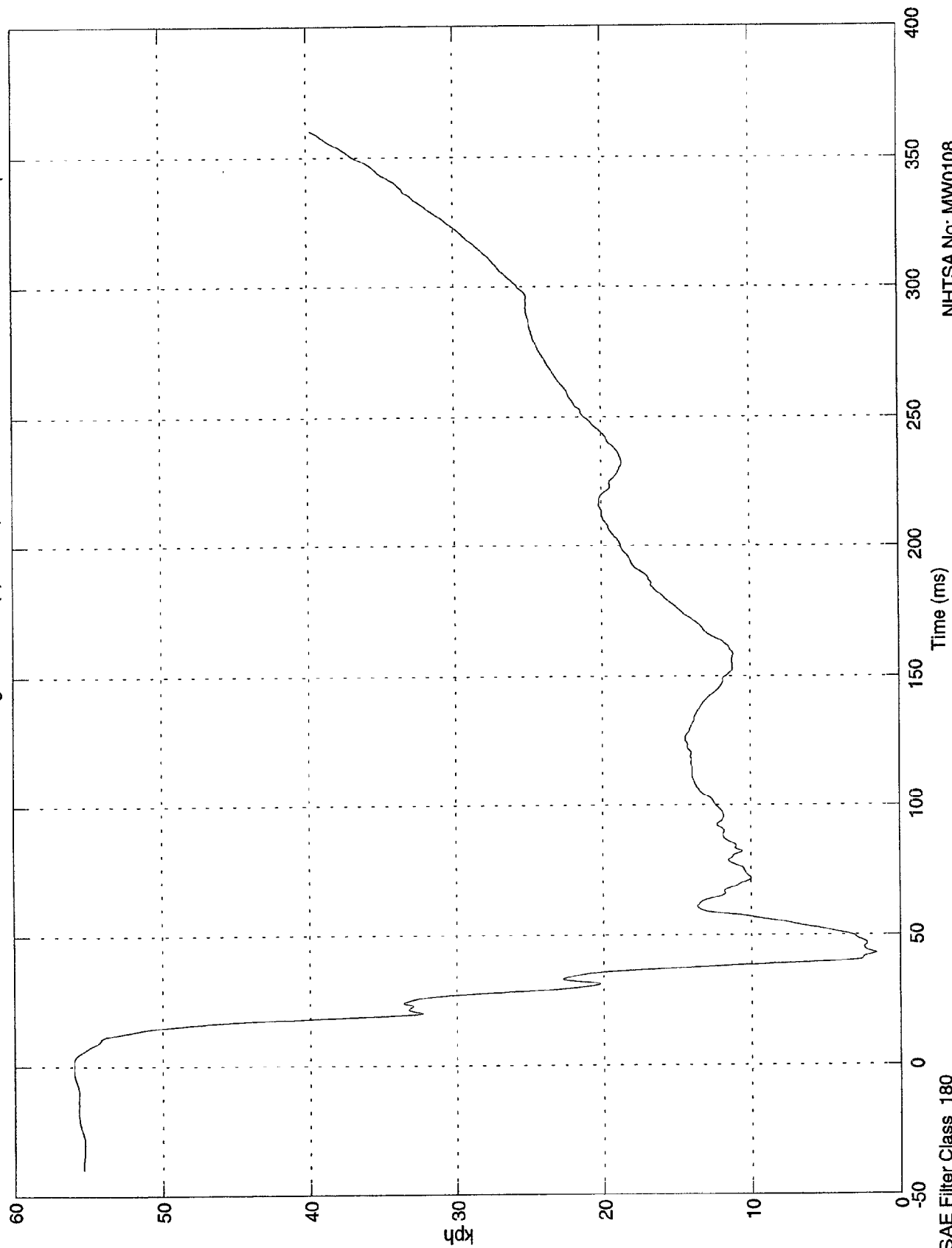
SAE Filter Class 60

NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 56 kph @ -1.30 msec
Min = 1.63 kph @ 43.00 msec

1st Integral Acc. #7(x) Lt Caliper X



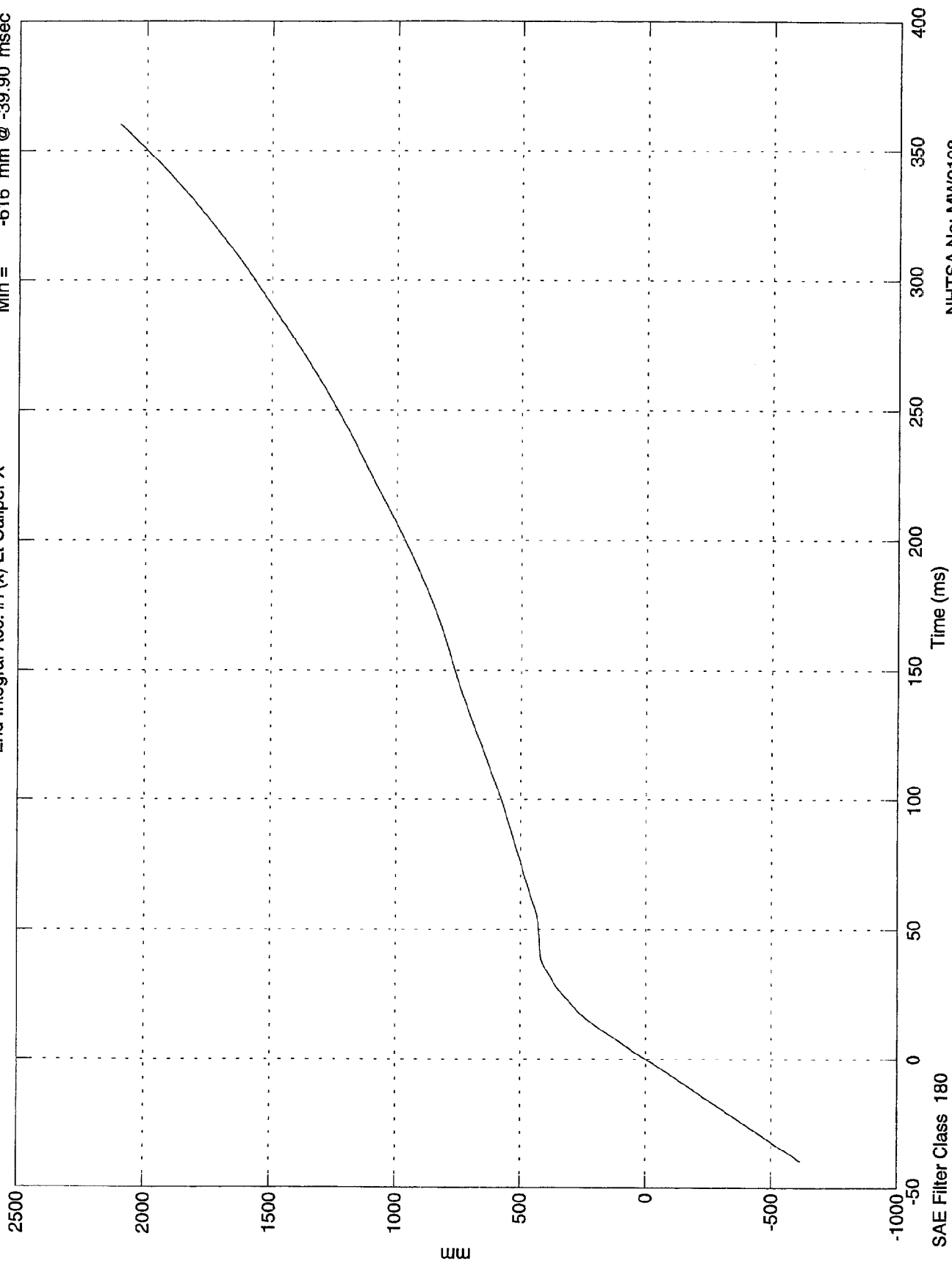
NHTSA No: MW0108
Date: 03 Feb 1998

SAE Filter Class 180

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 2.1e+003 mm @ 360.00 msec
Min = -616 mm @ -39.90 msec

2nd Integral Acc. #7(x) Lt Caliper X

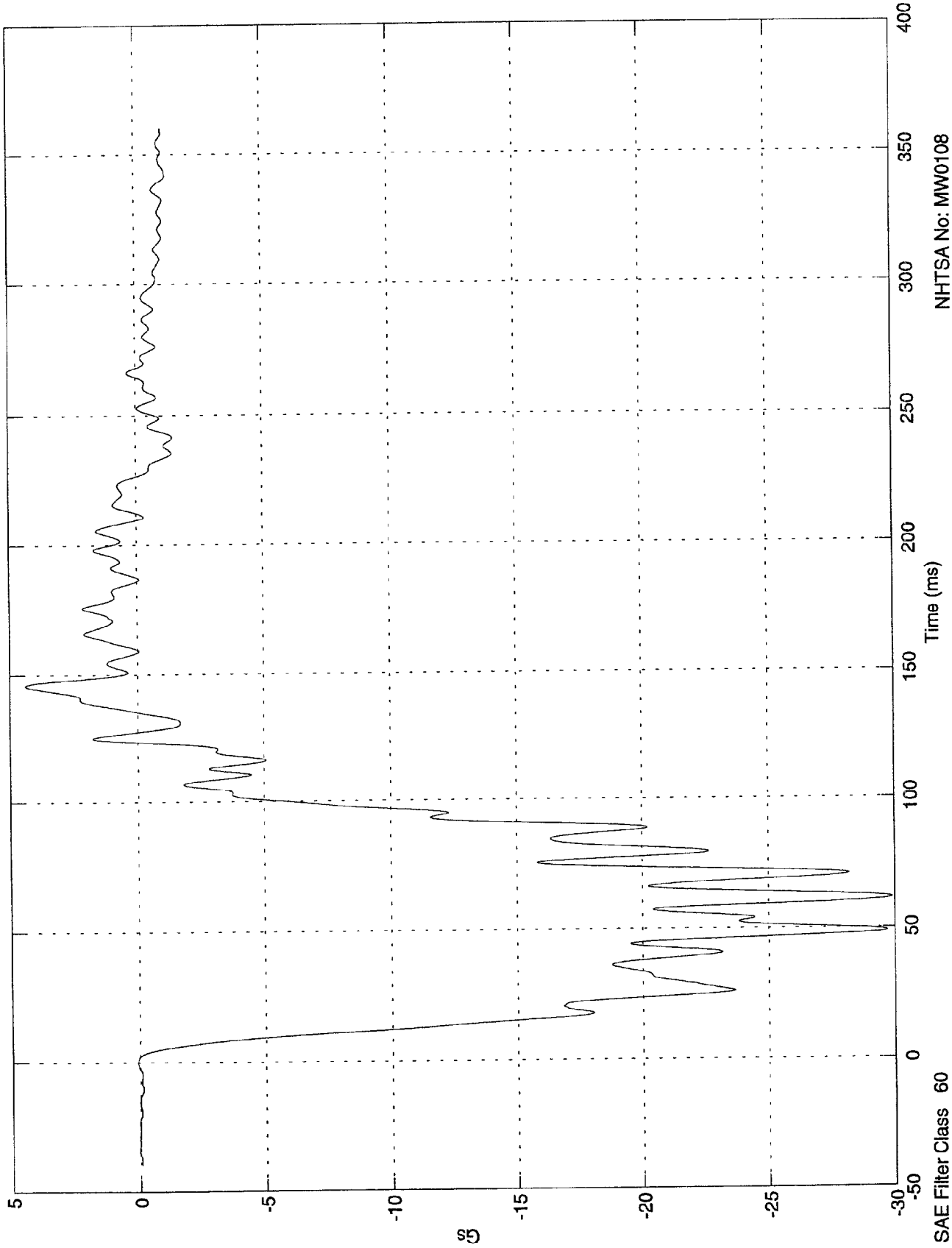


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 4.38 Gs @ 145.70 msec
Min = -29.9 Gs @ 61.40 msec

Acc. #8(x) Lt Rear X(R)



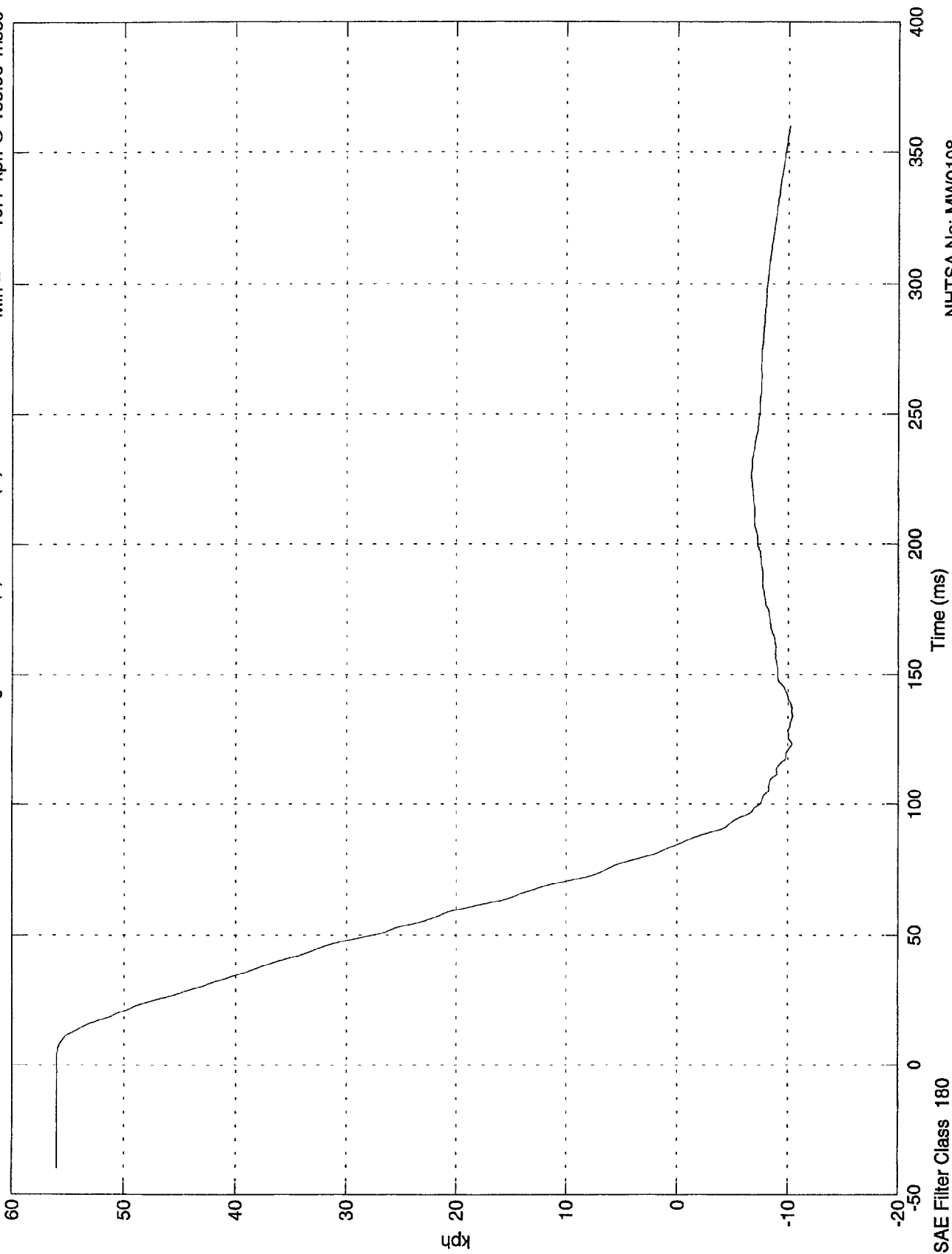
NHTSA No: MW0108
Date: 03 Feb 1998

SAE Filter Class 60

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 56 kph @ -21.20 msec
Min = -10.4 kph @ 133.90 msec

1st Integral Acc. #8(x) Lt Rear X(R)

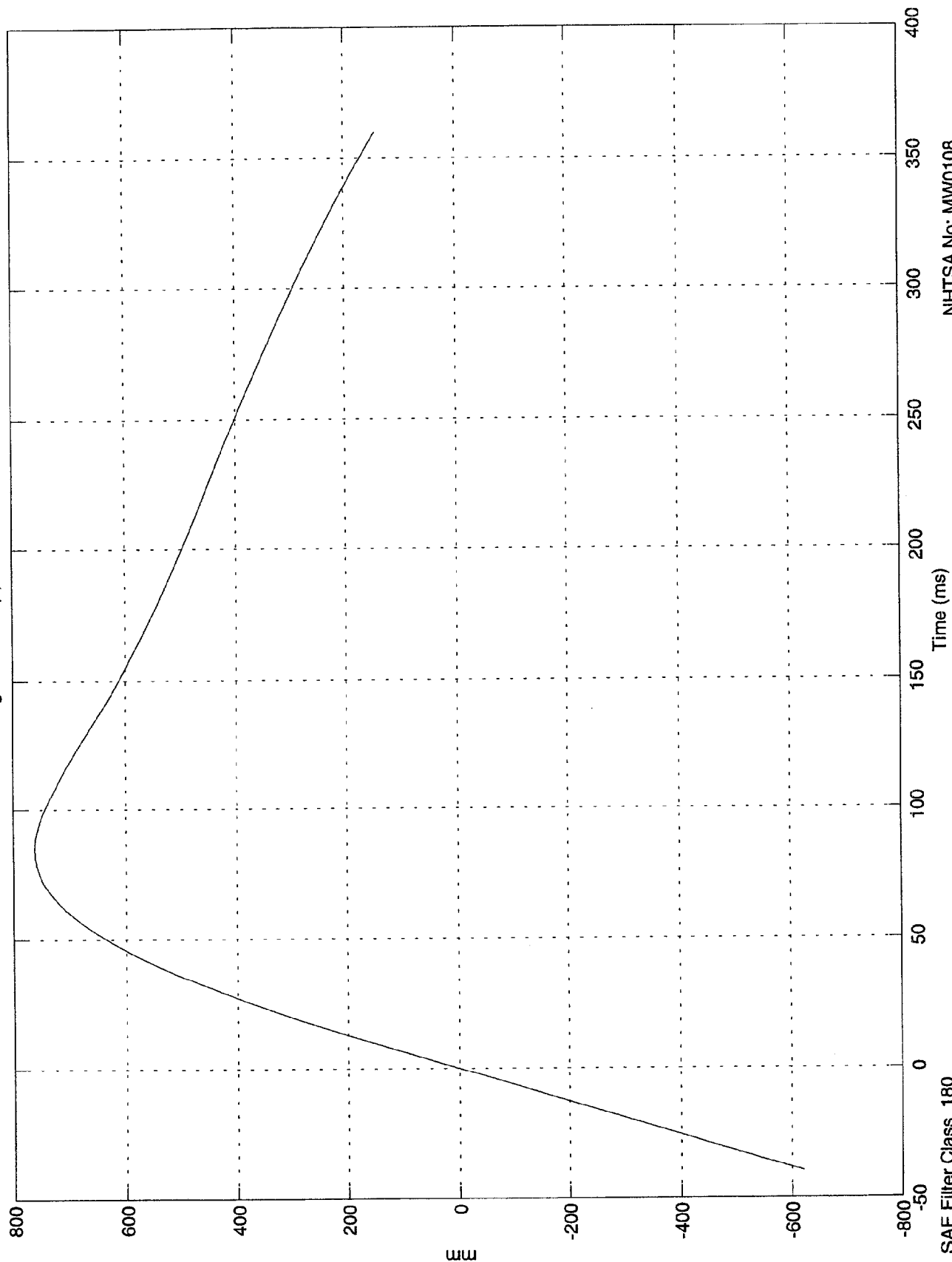


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 761 mm @ 84.60 msec
Min = -621 mm @ -39.90 msec

2nd Integral Acc. #8(x) Lt Rear X(R)

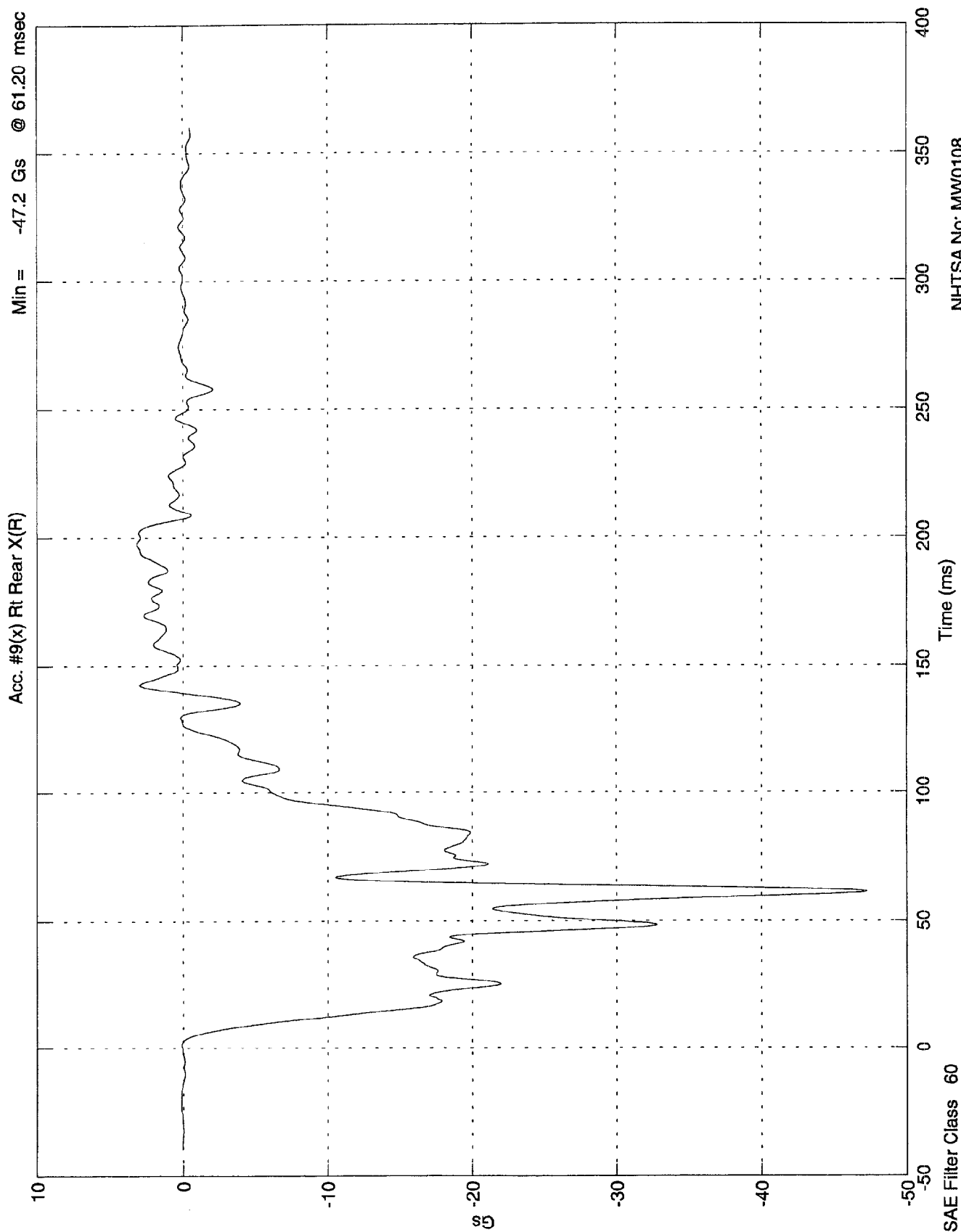


NHTSA No: MW0108
Date: 03 Feb 1998

SAE Filter Class 180

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 3.14 Gs @ 197.60 msec
 Min = -47.2 Gs @ 61.20 msec

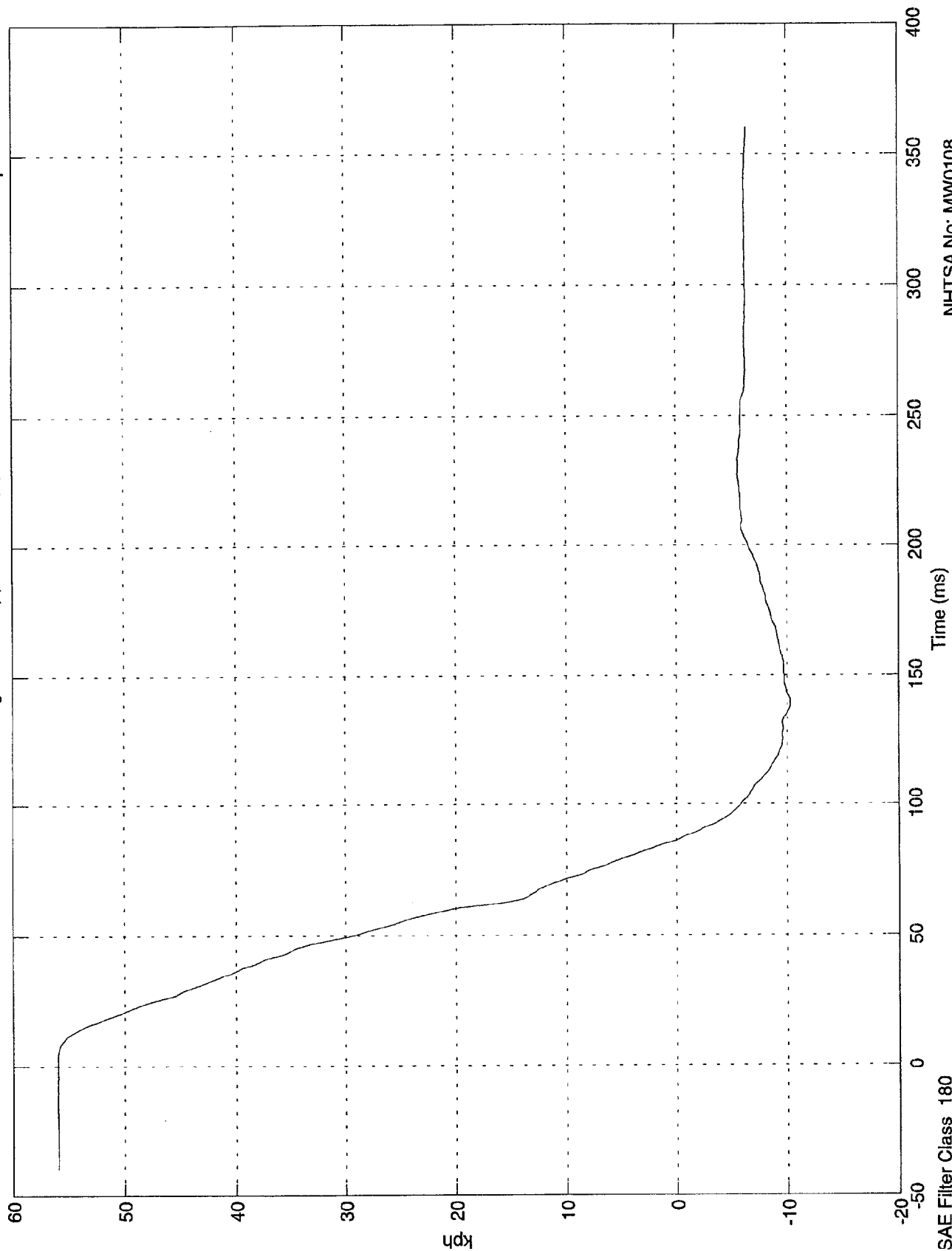


NHTSA No: MW0108
 Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 56 kph @ -12.50 msec
Min = -10.3 kph @ 138.40 msec

1st Integral Acc. #9(x) Rt Rear X(R)

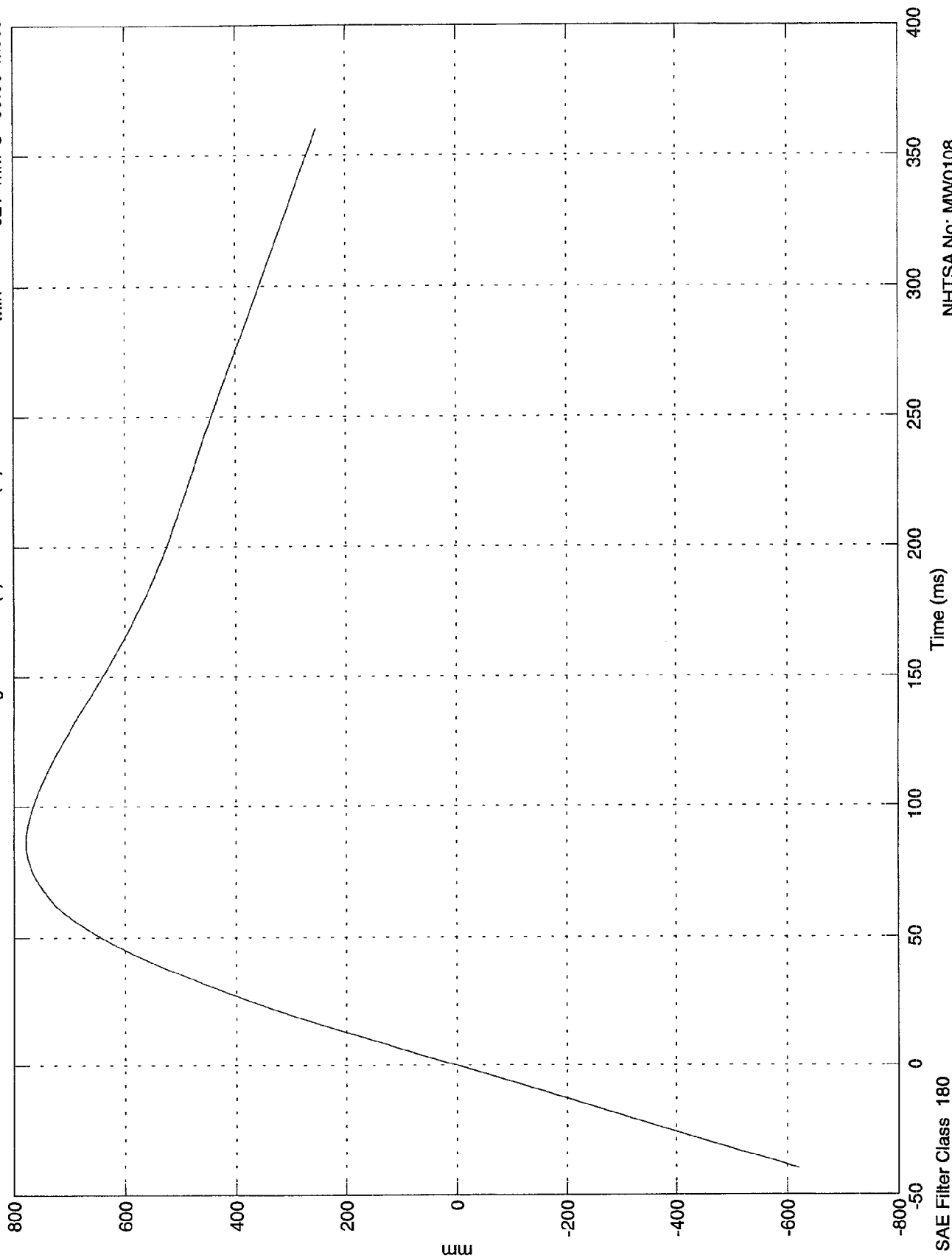


NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 778 mm @ 86.20 msec
Min = -621 mm @ -39.90 msec

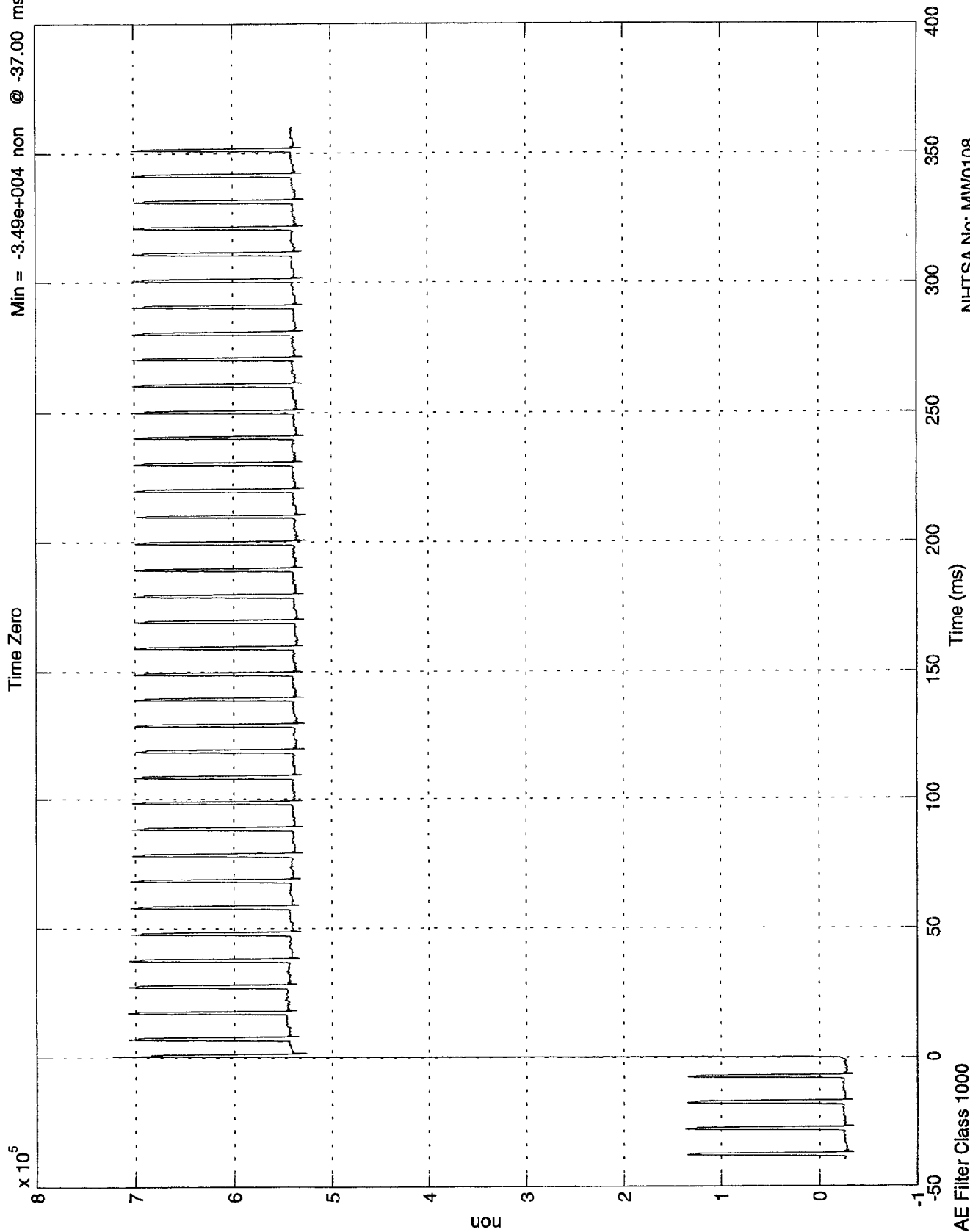
2nd Integral Acc. #9(x) Rt Rear X(R)



NHTSA No: MW0108
Date: 03 Feb 1998

NCAP TEST #20 - 1998 CHEVROLET SUBURBAN

Max = 7.23e+005 non @ 0.80 msec
 Min = -3.49e+004 non @ -37.00 msec



NHTSA No: MW0108
 Date: 04 Feb 1998

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

Dummy serial numbers and certification dates are:

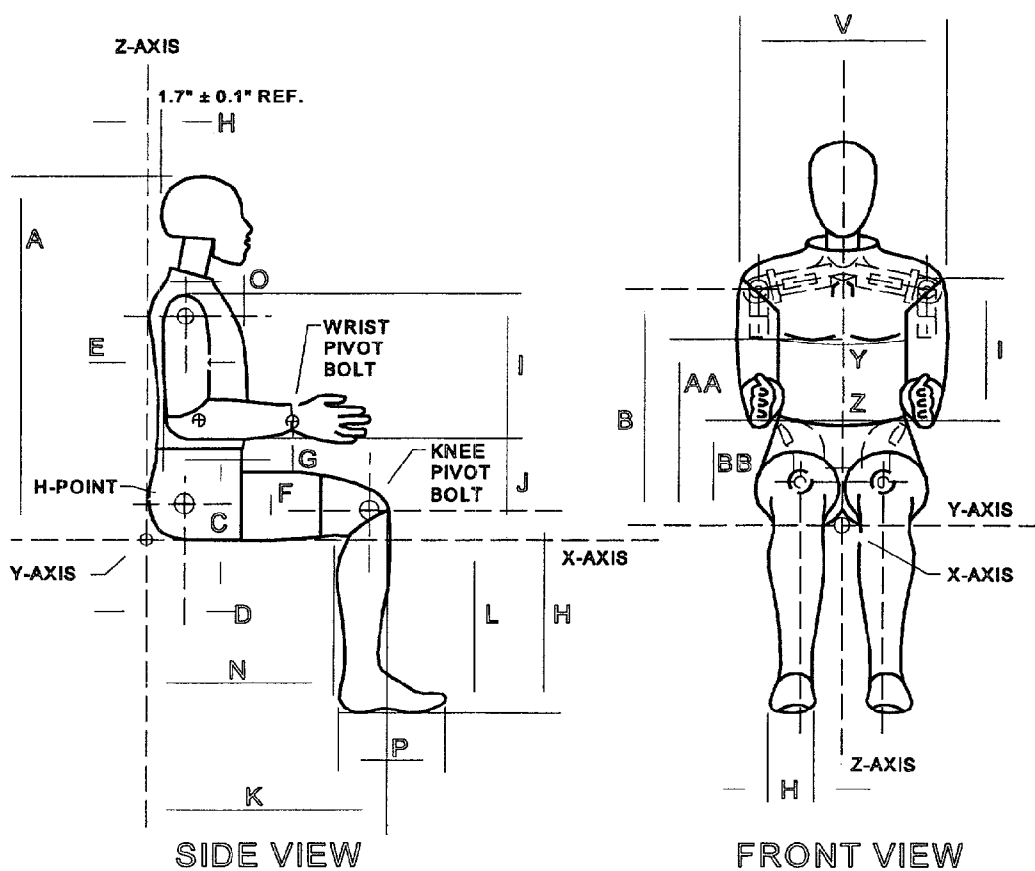
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	1/30/98
#2/Right Front Passenger	150	1/29/98

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.

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))

PART 572E
HEAD DROP TEST

Dummy Serial Number 061
Calspan Sequential Test Number 2
Date 01/28/98
Workfile 061298.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	32
Peak Resultant Acceleration	225-275 G's	259.2
Peak Lateral Acceleration	15 G's Max	10.5
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number 061
Calspan Sequential Test Number 2
Date 01/30/98
Workfile 061298.nfl

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	39
Impact Velocity		22.60 - 23.40 Ft/s	22.93
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.18
	20 ms	17.60 - 22.60 G's	20.22
	30 ms	12.50 - 18.50 G's	17.16
Max Pendulum G's Above 30 ms		29 G's Max	17.16
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	39.38
D Plane Rotation	Max	64 - 78 Deg	68.04
	Time	57 - 64 ms	59.00
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	72.81
	Time	47 - 58 ms	52.50
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	118.63
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	99.25

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number 061
 Calspan Sequential Test Number 2
 Date 01/30/98
 Workfile 061298.nex

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	39
Impact Velocity		19.50 - 20.30 Ft/s	20.09
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.46
	20 ms	14.00 - 19.00 G's	06.58
	30 ms	11.00 - 16.00 G's	13.90
Max Pendulum G's Above 30 ms		22 G's Max	13.90
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	43.13
D Plane Rotation	Max	81 - 106 Deg	94.16
	Time	72 - 82 ms	76.63
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-51.97
	Time	65 - 79 ms	71.25
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	158.25
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	138.38

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 061
Calspan Sequential Test Number 2
Date 01/29/98
Workfile 061298.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70
Relative Humidity	10% - 70%	37
Pendulum Velocity	21.6 - 22.4 Ft/s	21.68
Maximum Deflection	2.50 - 2.86 in	2.52
Maximum Resistive Force	1160 - 1325 Lbs	1316.91
Internal Hysteresis	69 - 85 %	73.2

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
Calspan Sequential Test Number 2
Date 01/29/98
Workfile 061298

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	39
Probe Velocity	6.8 - 7.0 Ft/s	6.90
Peak Knee Impact Force	1060 - 1300 Lbs	1181.0
RIGHT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	39
Probe Velocity	6.8 - 7.0 Ft/s	6.89
Peak Knee Impact Force	1060 - 1300 Lbs	1187.0

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Calspan Sequential Test Number 2
Date 01/29/98

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			39
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.4
Waist Circumference	Z	32.9 - 34.1 in	33.5
Chest Depth	O	8.4 - 9.0 in	8.5
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	6.1
Buttock Knee Length	K	22.8 - 23.8 in	23.3
Buttock Popliteal Length	N	17.8 - 18.8 in	18.3
Popliteal Height	L	16.9 - 17.9 in	17.7
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.5
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.1
Elbow Rest Height	J	7.5 - 8.3 in	7.7
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.4
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number 150
Calspan Sequential Test Number 1
Date 01/28/98
Workfile 150198.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	32
Peak Resultant Acceleration	225-275 G's	258.5
Peak Lateral Acceleration	15 G's Max	6.9
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician: B. Swiecicki

**PART 572E
NECK FLEXION TEST**

Dummy Serial Number 150
 Calspan Sequential Test Number 1
 Date 01/28/98
 Workfile 150198.nfl

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	39
Impact Velocity		22.60 - 23.40 Ft/s	23.25
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.13
	20 ms	17.60 - 22.60 G's	19.63
	30 ms	12.50 - 18.50 G's	17.12
Max Pendulum G's Above 30 ms		29 G's Max	17.12
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	41.50
D Plane Rotation	Max	64 - 78 Deg	70.23
	Time	57 - 64 ms	60.00
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	78.23
	Time	47 - 58 ms	54.50
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	118.00
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	103.00

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number 150
 Calspan Sequential Test Number 1
 Date 01/28/98
 Workfile 150198.nex

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	39
Impact Velocity		19.50 - 20.30 Ft/s	20.14
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	17.54
	20 ms	14.00 - 19.00 G's	16.46
	30 ms	11.00 - 16.00 G's	14.38
Max Pendulum G's Above 30 ms		22 G's Max	14.38
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	44.75
D Plane Rotation	Max	81 - 106 Deg	92.74
	Time	72 - 82 ms	75.13
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-58.90
	Time	65 - 79 ms	69.63
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	148.88
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	137.13

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 150
Calspan Sequential Test Number 1
Date 01/29/98
Workfile 150198.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70
Relative Humidity	10% - 70%	39
Pendulum Velocity	21.6 - 22.4 Ft/s	21.61
Maximum Deflection	2.50 - 2.86 in	2.7.
Maximum Resistive Force	1160 - 1325 Lbs	1223.12
Internal Hysteresis	69 - 85 %	72.5

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 150
Calspan Sequential Test Number 1
Date 01/29/98
Workfile 150198

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	39
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1167.0
RIGHT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	39
Probe Velocity	6.8 - 7.0 Ft/s	6.98
Peak Knee Impact Force	1060 - 1300 Lbs	1180.0

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 150
Calspan Sequential Test Number 1
Date 01/29/98

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			39
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	34.0
Chest Depth	O	8.4 - 9.0 in	8.4
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	5.7
Buttock Knee Length	K	22.8 - 23.8 in	23.4
Buttock Popliteal Length	N	17.8 - 18.8 in	18.35
Popliteal Height	L	16.9 - 17.9 in	17.8
Knee Pivot Height	M	19.1 - 19.7 in	19.6
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.7
Shoulder Breadth	V	16.6 - 17.2 in	16.9
Shoulder Pivot Height	B	19.9 - 20.5 in	20.2
Elbow Rest Height	J	7.5 - 8.3 in	8.1
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.2
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.5

Remarks:

Laboratory Technician: B. Swiecicki

Appendix D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY (S/N 061)	Serial #	Manufacturer	Calibration	
			Last	Next
Head				
X	C14883	ENDEVCO	8/97	2/98
Y	C14972	ENDEVCO	8/97	2/98
Z	C15018	ENDEVCO	8/97	2/98
Chest				
X	AL6C4	ENDEVCO	8/97	2/98
Y	AE8W7	ENDEVCO	8/97	2/98
Z	A57G	ENDEVCO	8/97	2/98
Right Femur Load Cell	951	GSE	10/97	4/98
Left Femur Load Cell	952	GSE	10/97	4/98
Neck Load Cell	446	DENTON	10/97	4/98
X	446	DENTON	10/97	4/98
Y	446	DENTON	10/97	4/98
Z	446	DENTON	10/97	4/98
Neck Moment	446	DENTON	10/97	4/98
X	446	DENTON	10/97	4/98
Y	446	DENTON	10/97	4/98
Z	446	DENTON	10/97	4/98
Chest Deflection Gauge	061	HUMANOID	10/97	4/98
Hybrid III Use Only				
Lap Belt Load Cells	706	LEBOW	1/98	7/98
Shoulder Belt Load Cells	707	LEBOW	1/98	7/98
Spool-Out Potentiometer	N/A	MAGNETEK	N/A	N/A
Belt Stretch Transducer	E1	CALSPAN	9/97	3/98

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head				
X (R)	A13937	ENDEVCO	10/97	4/98
Y (R)	A13517	ENDEVCO	10/97	4/98
Z (R)	A13941	ENDEVCO	10/97	4/98
Chest				
X (R)	A1381	ENDEVCO	10/97	4/98
Y (R)	A13828	ENDEVCO	10/97	4/98
Z (R)	A13883	ENDEVCO	10/97	4/98
Pelvic				
X	AC2P5	ENDEVCO	8/97	2/98
Y	ADL50	ENDEVCO	8/97	2/98
Z	A59J	ENDEVCO	8/97	2/98
Left Upper Tibia	Mx			
	038	DENTON	10/97	4/98
Left Upper Tibia	My			
	038	DENTON	10/97	4/98
Left Lower Tibia	Fy			
	032	DENTON	10/97	4/98
Left Lower Tibia	Fz			
	032	DENTON	10/97	4/98
Left Lower Tibia	Mx			
	032	DENTON	10/97	4/98
Right Upper Tibia	Mx			
	045	DENTON	10/97	4/98
Right Upper Tibia	My			
	045	DENTON	10/97	4/98
Right Lower Tibia	Fy			
	041	DENTON	10/97	4/98
Right Lower Tibia	Fz			
	041	DENTON	10/97	4/98
Right Lower Tibia	Mx			
	041	DENTON	10/97	4/98

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #	Manufacture	Calibration	
			Last	Next
Left Foot Front Z	A14058	ENDEVCO	9/97	3/98
Left Foot Rear X	APA58	ENDEVCO	9/97	3/98
Left Foot Rear Z	A14150	ENDEVCO	9/97	3/98
Right Foot Front Z	A14124	ENDEVCO	9/97	3/98
Right Foot Rear X	A14181	ENDEVCO	9/97	3/98
Right Foot Rear Z	A14126	ENDEVCO	9/97	3/98

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY (S/N 150)	Serial #	Manufacturer	Calibration	
			Last	Next
Head				
X	AH5M9	ENDEVCO	1/98	7/98
Y	AGHF5	ENDEVCO	1/98	7/98
Z	AL6K2	ENDEVCO	1/98	7/98
Chest				
X	A33A	ENDEVCO	1/98	7/98
Y	FB32L	ENDEVCO	1/98	7/98
Z	AD395	ENDEVCO	1/98	7/98
Right Femur Load Cell	232	GSE	1/98	7/98
Left Femur Load Cell	231	GSE	1/98	7/98
Neck Load Cell	576	DENTON	1/98	7/98
X	576	DENTON	1/98	7/98
Y	576	DENTON	1/98	7/98
Z	576	DENTON	1/98	7/98
Neck Moment	576	DENTON	1/98	7/98
X	576	DENTON	1/98	7/98
Y	576	DENTON	1/98	7/98
Z	576	DENTON	1/98	7/98
Chest Deflection Gauge	150	HUMANOID	1/98	7/98
Hybrid III Use Only				
Lap Belt Load Cells	635	LEBOW	1/98	7/98
Shoulder Belt Load Cells	711	LEBOW	1/98	7/98
Spool-Out Potentiometer	N/A	MAGNETEK	N/A	N/A
Belt Stretch Transducer	E4	CALSPAN	9/97	3/98

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head				
X (R)	APBF4	ENDEVCO	1/98	7/98
Y (R)	APBD7	ENDEVCO	1/98	7/98
Z (R)	AN967	ENDEVCO	1/98	7/98
Chest				
X (R)	J18406	ENDEVCO	1/98	7/98
Y (R)	APIB5	ENDEVCO	1/98	7/98
Z (R)	AY60	ENDEVCO	1/98	7/98
Pelvic				
X	AF480	ENDEVCO	1/98	7/98
Y	AL508	ENDEVCO	1/98	7/98
Z	AF5C1	ENDEVCO	1/98	7/98
Left Upper Tibia				
Mx	015	DENTON	10/97	4/98
Left Upper Tibia				
My	015	DENTON	10/97	4/98
Left Lower Tibia				
Fy	011	DENTON	10/97	4/98
Left Lower Tibia				
Fz	011	DENTON	10/97	4/98
Left Lower Tibia				
Mx	011	DENTON	10/97	4/98
Right Upper Tibia				
Mx	016	DENTON	10/97	4/98
Right Upper Tibia				
My	016	DENTON	10/97	4/98
Right Lower Tibia				
Fy	012	DENTON	10/97	4/98
Right Lower Tibia				
Fz	012	DENTON	10/97	4/98
Right Lower Tibia				
Mx	012	DENTON	10/97	4/98

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #	Manufacture	Calibration	
			Last	Next
Left Foot Front Z	A13011	ENDEVCO	9/97	3/98
Left Foot Rear X	A13506	ENDEVCO	9/97	3/98
Left Foot Rear Z	A12268	ENDEVCO	9/97	3/98
Right Foot Front Z	AC814	ENDEVCO	8/97	2/98
Right Foot Rear X	AEWK1	ENDEVCO	8/97	2/98
Right Foot Rear Z	AKD92	ENDEVCO	8/97	2/98

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS

(6 Month Calibration Minimum)

	Serial #	Manufacturer	Calibration	
			Last	Next
Left Seat Rear Crossmember	D25	ICS	10/97	4/98
Right Rear Seat Crossmember	Y18	ICS	10/97	4/98
Top of Engine	Y13	ICS	10/97	4/98
Bottom of Engine	MB19	ICS	10/97	4/98
Left Disc Brake Caliper	BA98	CEC	8/97	2/98
Right Disc Brake Caliper	A86	CEC	10/97	4/98
Instrument Panel	AN25	CEC	10/97	4/98
Left Seat Rear Crossmember (R)	D33	ICS	9/97	3/98
Right Seat Rear Crossmember (R)	D72	ICS	10/97	4/98