

V2750

REPORT NUMBER: CAL-98-13

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

**GENERAL MOTORS CORPORATION
1998 CHEVROLET VENTURE
EXTENDED 3-DOOR VAN**

NHTSA NUMBER: MW0109

CALSPAN TEST NUMBER: 8413-12

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12/8/97

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Performance Standards
Office of Crashworthiness Standards
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16. <i>Abstract</i> A frontal barrier test of a 1998 Chevrolet Venture Extended 3-Door Van was performed at Calspan SRL Corporation crash test facility in Buffalo, New York, on 12/8/97. The impact velocity was 56.5 kph and the temperature at the barrier face was 20.3°C. The maximum post-test vehicle crush was 566.7 mm. The test vehicle was equipped with a 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 drive rand passenger appear to comply with the head, chest and femur requirements.			
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Section 1

PURPOSE AND SUMMARY OF TEST MW0109

PURPOSE

This 56.5 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 56.5 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 Venture Extended 3-Door Van at a velocity of 56.5 kph. The test was performed at the Calspan SRL Corporation on 12/8/97. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

Two Part 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) was used in one previous test in which the FMVSS 208 requirements were not exceeded and the right-front passenger (position 2) ATD (Serial No. 150) was 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 and dummy response data traces. Load cell barrier data was not requested for this test. Accelerometer No. 3 experienced a cut wire at 35 msec. Accelerometer No. 4 data is questionable after 40 msec. Accelerometer No. 5 data is questionable after 50 msec. Accelerometer No. 6 data is questionable after 200 msec. Accelerometer No. 7 experienced a cut wire at 60 msec. Position No.2 Head X, Y and Z Redundant and Chest X, Y and Z Redundant channels did not record accurately and were deleted from report. Position No.2 Right Lower Tibia Fx data did not record accurately and is being omitted from this report. Position No. 2 Right Toe Z data is saturated at 40 msec.

The driver's HIC was 537.6. The maximum chest deceleration over 3 milliseconds was 43.3 g's and maximum chest deflection was 29.1 mm. Femur loads were -5825.3 Newtons on the left and -4114.5 Newtons on the right.

The right front passenger's HIC was 961.8. Maximum chest deceleration over 3 milliseconds was 48.1 g's and maximum chest deflection was 30.1 mm. Femur loads were -6614.8 Newtons on the left and -3577.0 Newtons on the right.

SECTION 2

GENERAL TEST AND VEHICLE PARAMETER DATA

DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No. :	MW0109	Test Mode :	56 kph Frontal Barrier
Test Date :	12/8/97	Time:	14:30
		Temperature :	20.4 °C
Vehicle Make/Model/Body Style :	1998 Chevrolet Venture Extended 3-Door Van		
Vehicle Test Weight :	2032	kg	
Vehicle/Barrier Impact Angle :	0	°	
Impact Velocity :	56.5	kph	
Maximum Static Crush :	640.0	mm	
Vehicle Rebound :	517.0	mm	
 <u>DUMMIES:</u>			
	<u>DRIVER</u>		<u>PASSENGER</u>
Type :	572E		572E
Restraint System :	3-Point belt system with airbags		3-Point belt system with airbags
Number of Data Channels :	97		
Number of Cameras :	1	Real Time	
	16	High Speed	
 <u>DOOR OPENING DATA :</u>			
	Closed/Inoperable	- Left Front	
	Closed/Inoperable	- Right Front	
 <u>Front Seat(s) Data :</u>			
	<u>DRIVER</u>		<u>PASSENGER</u>
Seat Track Failure :(mm of shift)	10		10
Seat Back Failure :	Yes		Yes
 <u>VISIBLE DUMMY CONTACT POINTS :</u>			
	<u>DRIVER</u>		<u>PASSENGER</u>
Head :	Center of airbag/ Back of head to headrest		Center of airbag/ Back of head to headrest
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 Venture Extended 3-Door Van
NHTSA No. : MW0109 ; VIN: 1GNDX06E2WD134517 ; Color : Silver
Engine Data: 6 cylinders; - CID; 3.4 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; x Front Wheel Drive; - 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 : 12/1/97 ; Odometer Reading 46 km
Selling Dealer : West-Herr Chevrolet Inc.
& 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 10/97
GVWR : 2430 kg; GAWR: 1250 kg FRONT; 1250 kg REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load : 240 kpa FRONT
240 kpa REAR
Recommended Tire Size : P215/70R15
* Recommended Cold Tire Pressure : 240 kpa FRONT; 240 kpa REAR
Size of Tires on Test Vehicle: P215/70R15 ; Manufacturer: Firestone
Vehicle Capacity Data :
Type of Front Seats: - Bench; x Bucket; - Split Bench
Number of Occupants: 2 Front; 5 Rear; 7 Total
Vehicle Capacity Weight (VCW) = 681 kg
No. of Occupants x 68 kg = 476 kg
Rated Cargo/Luggage Weight (RCLW) = 205** kg

*Tire pressure used for test

** 136 kg maximum 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>521.5</u>	kg	Right Rear	=	<u>365.5</u>	kg
Left Front	=	<u>503.5</u>	kg	Left Rear	=	<u>358.5</u>	kg
TOTAL FRONT	=	<u>1,025.0</u>	kg	TOTAL REAR	=	<u>724.0</u>	kg
TOTAL DELIVERED WEIGHT	=	<u>1,749.0</u>	kg				
% of Total Front of Vehicle Weight	=	<u>58.6</u>	%	% of Total Rear Weight	=	<u>41.4</u>	%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT :

Total Delivered Weight (UDW)	=	<u>1,749.0</u>	kg
Rated Cargo/Luggage Weight (RCLW)	=	<u>136.0</u>	kg
Weight of 2 p.572 Dummies @ 76 each	=	<u>152</u>	kg
TARGET TEST WEIGHT	=	<u>2,037.0</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 131 KG OF CARGO WEIGHT:

Right Front	=	<u>583</u>	kg	Right Rear	=	<u>438</u>	kg
Left Front	=	<u>547</u>	kg	Left Rear	=	<u>464</u>	kg
TOTAL FRONT	=	<u>1,130.0</u>	kg	TOTAL REAR	=	<u>902.0</u>	kg
TOTAL TEST WEIGHT	=	<u>2,032.0</u>	kg				
% of Total Front Weight	=	<u>55.6</u>	%	% of Total Rear Weight	=	<u>44.4</u>	%
Weight of Ballast Secured in Vehicle Trunk Area	=	<u>94</u>	kg				
Vehicle Components Removed for Weight Reduction:		<u>None</u>					

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED :	RF	<u>758</u>	LF	<u>770</u>	RR	<u>782</u>	LR	<u>782</u>
FULLY LOADED :	RF	<u>750</u>	LF	<u>761</u>	RR	<u>740</u>	LR	<u>740</u>
AS TESTED :	RF	<u>751</u>	LF	<u>761</u>	RR	<u>745</u>	LR	<u>741</u>
Vehicle's Wheel Base :		<u>3050</u>	mm					
Location of Vehicle's C.G. :		<u>1,353.9</u>	mm rearward of front wheel center.					

FUEL SYSTEM DATA :

Fuel System Capacity From Owner's Manual	=	<u>94.6</u>	liters
Usable Capacity Figure Furnished by COTR	=	<u>94.6</u>	liters
Test Volume Range (92 to 94% of Usable Capacity)	=	<u>87.0</u>	to <u>88.9</u> liters
ACTUAL TEST VOLUME	=	<u>87.0</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 on left side over axle and fuel tank is centered in front of axle</u>		

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test : Frontal Barrier Impact Angle : 0°
Test Date : 12/8/97 Time: 14:30 Temperature: 20.4 °C
Vehicle NHTSA No. : MW0109
Required Impact Velocity Range : 55.7 to 57.1 kph

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

Trap No. 1 = 56.5 kph; Trap No. 2 = 56.5 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 =	<u>5015</u>	; C/L =	<u>5100</u>	; Left =	<u>5025</u>
Post-Test	Right =	<u>4480</u>	; C/L =	<u>4460</u>	; Left =	<u>4500</u>
Crush	Right =	<u>535.0</u>	; C/L =	<u>640.0</u>	; Left =	<u>525.0</u>
AVERAGE	=	<u>566.7</u>	mm			

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point :

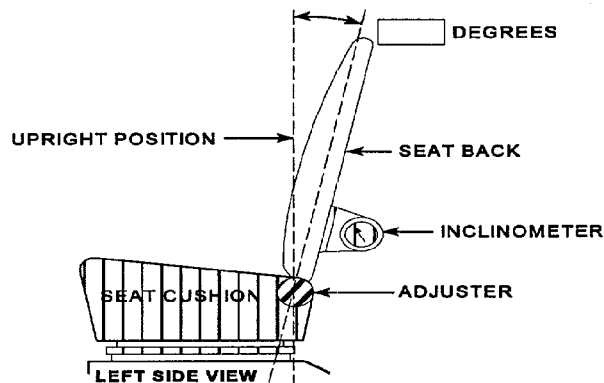
	Right =	<u>499</u>	; C/L =	<u>537</u>	; Left =	<u>515</u>
AVERAGE	=	<u>517.0</u>	mm			

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 1998 Vehicle Model: Chevrolet Venture Body Style : Extended 3-Door Van

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



FRONT SEAT ASSEMBLY

Seat back angle for driver's seat : 22

Measurement instructions : Adjust recliner 14 degrees from full forward position

Seat back angle for passenger's seat : 22

Measurement instructions : Adjust recliner 14 degrees from full forward position

2. Seat Fore and Aft Positioning

Positioning of the driver's seat : Placed in mid-position, located 17 detents placed in 9th

Positioning of the passenger's seat (if applicable) : Placed in mid-position, located 17 detents placed in 9th.

3. Fuel Tank Capacity Data

3.1

A. "Usable Capacity" of the standard equipment fuel tank is 94.6 liters

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

C. "Usable Capacity" of the vehicle(s) used for certification testing to requirements of FMVSS 301 = 94.6 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 87.0 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 vehicle ignition turned on.

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

4. STEERING COLUMN ADJUSTMENTS :

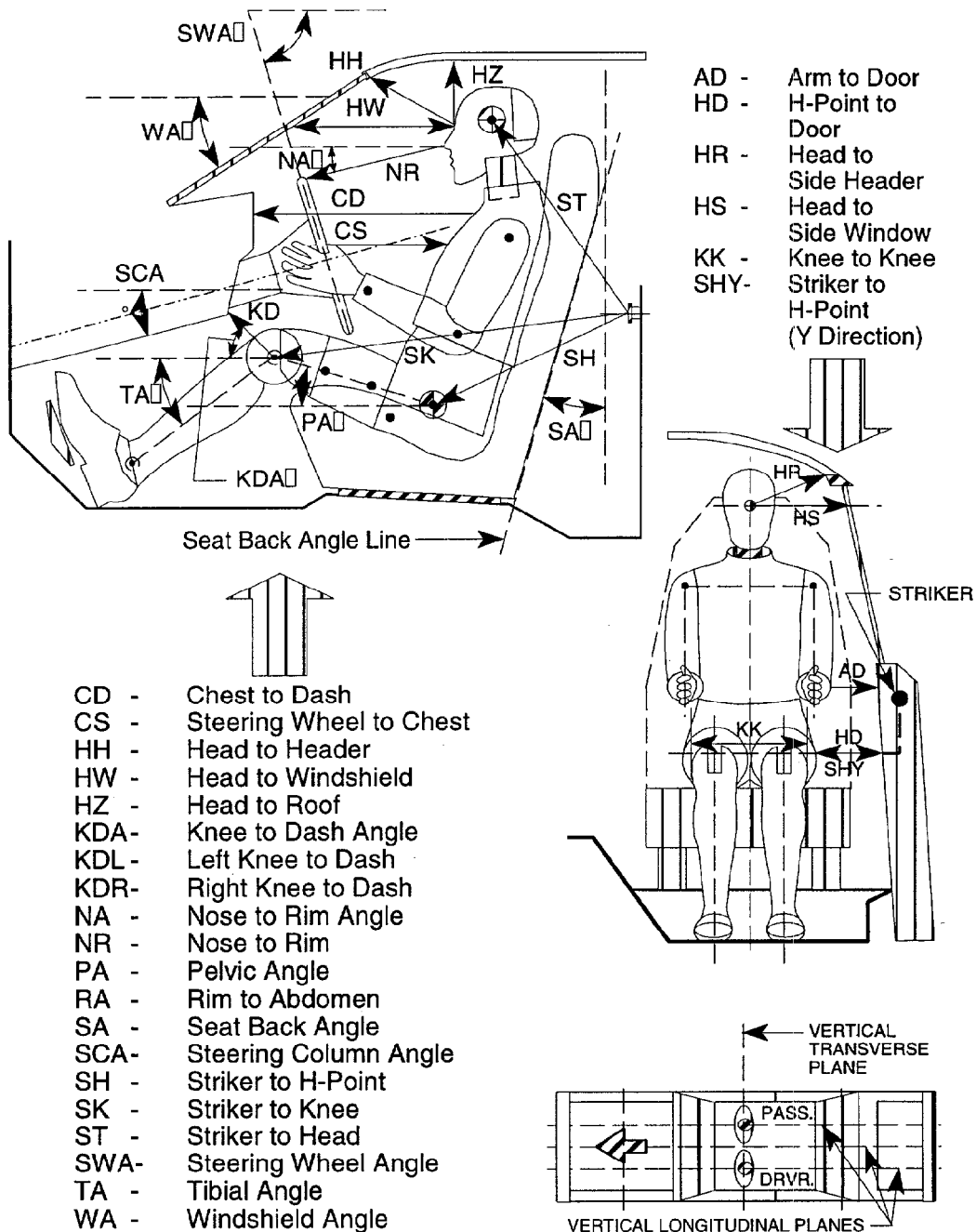
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine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

Operational Instructions: Placed in 3rd position from full-up - 28 degrees

5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: Placed in mid-position

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

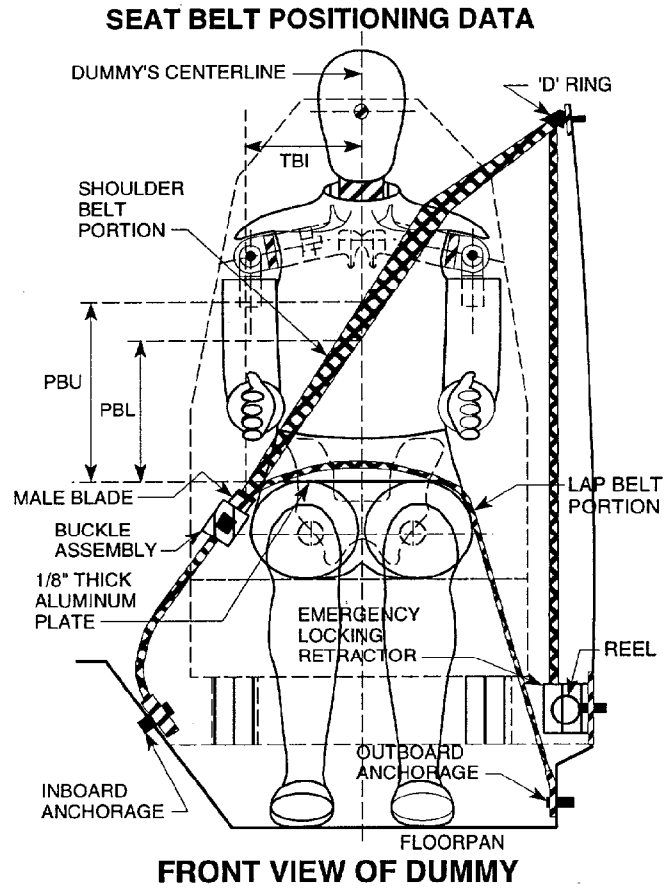


DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE

	DRIVER (Serial #061)			PASS. (Serial # 150)		
WA°	31 deg.			N/A		
SWA°	28 deg.			N/A		
SCA°	62 deg.			N/A		
SA°	22 deg.			22 deg.		
HZ	234			194		
HH	390			359		
HW	696			651		
HR	311			274		
NR	364	Angle	-8 deg.	N/A		
CD	527			464		
CS	268			N/A		
RA	160			N/A		
KDL	165	Angle (KDA)	31 deg.	144		
KDR	161			154	Angle (KDA)	31 deg.
PA°	21 deg.			20.5 deg.		
TA°	-61 deg.			-56 deg.		
KK	271			285		
ST	531	Angle	22 deg.	581	Angle	15 deg.
SK	652	Angle	100 deg.	668	Angle	98 deg.
SH	322	Angle	129 deg.	296	Angle	119 deg.
SHY	235			222		
HS	365			359		
HD	164			151		
AD	96			116		

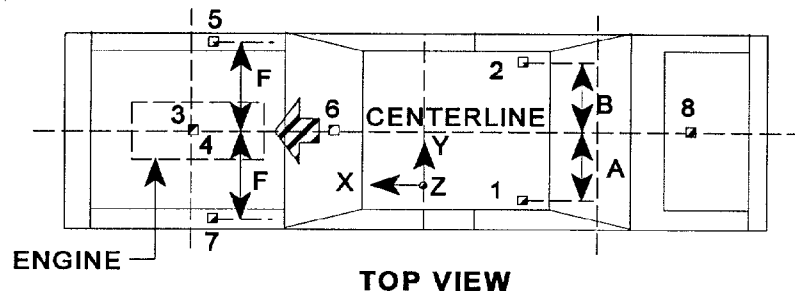
Dimensions in millimeters

DATA SHEET NO. 6 SEAT BELT POSITIONING DATA

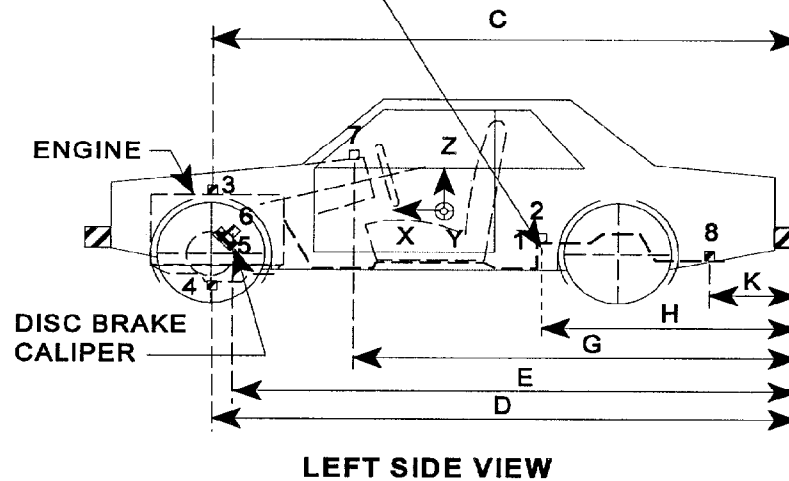


	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	234	241
PBL-- Top surface of alum. plate to belt lower edge	315	315
<u>LAP BELT TENSION</u>	10 N	10 N
<u>SHOULDER BELT TENSION</u>	Retractor	Retractor

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	552	586 (redundant)
B Right Rear Seat Crossmember Y	554	589 (redundant)
C Top of Engine X	4449	
D Bottom of Engine X	4395	
E Disc Brake Calipers X	4088	
F Disc Brake Calipers Y	592	
G Instrument Panel X	3384	
H Rear Seat Crossmembers X	2312	

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Rear Seat X-Member @ Left Side	1.2	163.4	-24.2	73.7
2	Rear Seat X-Member @ Right Side	1.4	208.6	-25.3	77.2
3	Top of Engine Block	0.4	0.0	*	*
4	Bottom of Engine	**	**	**	**
5	Disc Brake Caliper @ Left Side	71.5	25.1	-107.1	40.1
6	Disc Brake Caliper @ Right Side	***	***	***	***
7	Instrument Panel	****	****	****	****
8	Rear Seat X-Member @ Left-Redundant	1.0	210.3	-23.2	73.9
9	Rear Seat X-Member @ Right-Redundant	1.6	211.7	-27.2	79.2

*Data cable cut @35 msec.

**Data cable cut @60 msec.

*** Data questionable after 40 msec.

****Data questionable after 200 msec.

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

NHTSA Test No.: MW0109 Vehicle: 1998 Chevrolet Venture Extended 3-Door Van

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec.	Neg.	msec.
Pos. 1 Head X	g's	7.6	111.7	-77.5	64.3
Pos. 1 Head Y	g's	7.6	118.3	-13.1	76.5
Pos. 1 Head Z	g's	13.2	57.6	-11.3	84.5
Pos. 1 Head Resultant	g's	78.5	64.2	0.0	-30.3
Pos. 2 Head X	g's	34.3	114	-84.1	74.4
Pos. 2 Head Y	g's	6.1	46.9	-10.5	107.6
Pos. 2 Head Z	g's	30.1	46.4	-19.5	81.7
Pos. 2 Head Resultant	g's	84.7	74.4	0.0	-30.0
Pos. 1 Chest X	g's	2.1	219.6	-43.7	67.9
Pos. 1 Chest Y	g's	6.7	102.5	-4.9	58.2
Pos. 1 Chest Z	g's	9.8	64.0	-12.4	91.8
Pos. 1 Chest Resultant	g's	43.8	67.9	0.1	-32.1
Pos. 1 Chest Displacement	mm	0.0	3.7	-29.1	67.3
Pos. 2 Chest X	g's	2.2	221.6	-48.6	68.0
Pos. 2 Chest Y	g's	5.5	52.8	-9.2	74.3
Pos. 2 Chest Z	g's	14.2	63.3	-10.8	109.2
Pos. 2 Chest Resultant	g's	49.8	68.0	0.1	-31.1
Pos. 2 Chest Displacement	mm	0.1	-6.1	-30.1	76.6
Pos. 1 Left Femur	N	578.1	21.2	-5825.3	59.1
Pos. 1 Right Femur	N	947.4	49.3	-4114.5	53.5
Pos. 2 Left Femur	N	1219.6	80.3	-6614.8	47.6
Pos. 2 Right Femur	N	210.1	37.8	-3577.0	48.6
Pos. 1 Left Belt Load	N	2521.3	90.1	-15.9	1.6
Pos. 1 Torso Belt Load	N	7022.3	67.4	-10.3	-0.8
Pos. 2 Right Belt Load	N	2407.9	96.2	-5.5	-3.1
Pos. 2 Torso Belt Load	N	5935.8	65.4	-2.3	-40.0

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

NHTSA Test No.: MW0109 Vehicle: 1998 Chevrolet Venture Extended 3-Door Van

HEAD INJURY CRITERIA (HIC)				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	537.6	54.2	86.1	49.1
Position #2 - Passenger	961.8	59.8	87.7	65.3

** 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	43.3	66.8	69.8	371.1
Position #2 - Passenger	48.1	66.2	69.2	373.8

* 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 Venture Extended 3-Door Van
NHTSA Test No.: MW0109 Test Date: 12/8/97

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec	Neg.	msec
Pos. 1 Upper Neck Fx	N	352.6	82.9	-912.5	47.5
Pos. 1 Upper Neck Fy	N	543.7	46.6	-229.4	136.4
Pos. 1 Upper Neck Fz	N	2982	67.9	-600.5	147.9
Pos. 1 Neck Force Result	N	3003.9	67.9	5.2	-17.4
Pos. 1 Upper Neck Mx	N-m	12.1	53.8	-22.2	130.9
Pos. 1 Upper Neck My	N-m	10.2	78.3	-27.6	55.9
Pos. 1 Upper Neck Mz	N-m	17.8	70.8	-0.5	-0.9
Pos. 1 Neck Moment Result	N-m	31.3	53.8	0.1	-35.4
Pos. 2 Upper Neck Fx	N	314.2	128.4	-1338.9	59.9
Pos. 2 Upper Neck Fy	N	600.7	78.3	-340.3	49.6
Pos. 2 Upper Neck Fz	N	2651.9	67.0	-1212.2	169.9
Pos. 2 Neck Force Result	N	2828.1	67.0	3.3	-12.9
Pos. 2 Upper Neck Mx	N-m	7.1	56.7	-16.0	66.0
Pos. 2 Upper Neck My	N-m	0.8	19.8	-75.6	83.2
Pos. 2 Upper Neck Mz	N-m	11.5	142.2	-6.6	57.9
Pos. 2 Neck Moment Result	N-m	76.0	83.2	0.0	-32.0
Pos. 1 Pelvic (X)	g's	3.5	240.5	-50.3	58.9
Pos. 1 Pelvic (Y)	g's	9.1	100.2	-11.6	53.7
Pos. 1 Pelvic (Z)	g's	4.6	189.5	-24.3	77.5
Pos. 1 Pelvic (R)	g's	50.8	58.9	0.1	-30.2
Pos. 2 Pelvic (X)	g's	3.8	217.9	-50.4	48.0
Pos. 2 Pelvic (Y)	g's	10.4	46.7	-9.7	61.8
Pos. 2 Pelvic (Z)	g's	12.1	46.6	-22.9	96.2
Pos. 2 Pelvic (R)	g's	50.5	48.0	0.1	-31.5

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

Vehicle Year/Make/Model/Body Style: 1998 Chevrolet Venture Extended 3-Door Van

NHTSA Test No.: MW0109 Test Date: 12/8/97

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec	Neg.	msec
P1 Lt Upper Tibia Mx	N-m	79.2	81.3	-2.8	13.5
P1 Lt Upper Tibia My	N-m	10.8	46.1	-113	21.4
P1 Lt Lower Tibia Fx	N	157.5	165.6	-832.6	21.6
P1 Lt Lower Tibia Fz	N	627.3	82.8	-1702.8	21.3
P1 Lt Lower Tibia My	N-m	112.2	43.8	-49.3	20.4
P1 Rt Upper Tibia Mx	N-m	62.7	96.1	-25.1	51.0
P1 Rt Upper Tibia My	N-m	187.1	49.7	-7.4	188.8
P1 Rt Lower Tibia Fx	N	158.2	190.8	-1665.6	52.7
P1 Rt Lower Tibia Fz	N	158.5	199.5	-2445	49.5
P1 Rt Lower Tibia My	N-m	212	56.6	-17.8	47.6
Pos. 2 Lt Upper Tibia Mx	N-m	46.3	49.0	-80.2	85.4
Pos. 2 Lt Upper Tibia My	N-m	4.9	179.2	-286.7	91.5
Pos. 2 Lt Lower Tibia Fx	N	145.1	221.3	-2427.1	49.0
Pos. 2 Lt Lower Tibia Fz	N	523.5	127.5	-5330.4	45.7
Pos. 2 Lt Lower Tibia My	N-m	429.4	47.1	-45.7	102.9
Pos. 2 Rt Upper Tibia Mx	N-m	17.7	47.1	-72.9	72.3
Pos. 2 Rt Upper Tibia My	N-m	65.0	41.0	-231.0	96.2
Pos. 2 Rt Lower Tibia Fx	N	*	*	*	*
Pos. 2 Rt Lower Tibia Fz	N	745.7	59.7	-3160.1	40.1
Pos. 2 Rt Lower Tibia My	N-m	330.6	40.1	-77.4	93.8

* POS.2 Rt Lower Tibia Fx - Data is not accurate.

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

Vehicle Year/Make/Model/Body Style: 1998 Chevrolet Venture Extended 3-Door Van
 NHTSA Test No.: MW0109 Test Date: 12/8/97

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec	Neg.	msec
Pos. 1 Left Ankle X	g's	29.8	52.4	-63.7	21.3
Pos. 1 Left Ankle Z	g's	36.8	42.2	-79.1	19.2
Pos. 1 Left Toe Z	g's	111.0	42.8	-142.3	19.3
Pos. 1 Right Ankle X	g's	118.5	49.1	-12.8	59.7
Pos. 1 Right Ankle Z	g's	88.3	52.7	-85.5	52.3
Pos. 1 Right Toe Z	g's	101.0	53.7	-151.3	50.1
Pos. 2 Left Ankle X	g's	115.2	46.4	-115.0	44.3
Pos. 2 Left Ankle Z	g's	29.4	45.0	-128.0	43.5
Pos. 2 Left Toe Z	g's	230.1	44.8	-166.8	44.1
Pos. 2 Right Ankle X	g's	110.3	42.1	-161	38.7
Pos. 2 Right Ankle Z	g's	320.9	39.4	-137.6	33.6
Pos. 2 Right Toe Z	g's	302.8 *	39.3	-183.3	31.1

* Data channel saturated

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

NHTSA Test No.: MW0109 Vehicle: 1998 Chevrolet Venture Extended 3-Door Van

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec	Neg.	msec
Pos. 1 Head X(R)	g's	8.0	112.6	-79.1	63.9
Pos. 1 Head Y(R)	g's	5.3	113.2	-13	77.3
Pos. 1 Head Z(R)	g's	16.0	57.6	-14.5	84.7
Pos. 1 Head Resultant(RR)	g's	79.7	63.9	0.0	-23.5
Pos. 2 Head X(R)	g's	*	*	*	*
Pos. 2 Head Y(R)	g's	*	*	*	*
Pos. 2 Head Z(R)	g's	*	*	*	*
Pos. 2 Head Resultant(RR)	g's	*	*	*	*
Pos. 1 Chest X(R)	g's	2.1	153.4	-42.9	67.8
Pos. 1 Chest Y(R)	g's	6.5	97.1	-4.2	55.9
Pos. 1 Chest Z(R)	g's	9.2	63.9	-10.9	94.2
Pos. 1 Chest Resultant(RR)	g's	43.0	67.9	0.1	-10.3
Pos. 2 Chest X(R)	g's	*	*	*	*
Pos. 2 Chest Y(R)	g's	*	*	*	*
Pos. 2 Chest Z(R)	g's	*	*	*	*
Pos. 2 Chest Resultant(RR)	g's	*	*	*	*

* Position 2 Head and Chest Redundant Channels did not record accurately.

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

NHTSA Test No.: MW0109 Vehicle: 1998 Chevrolet Venture Extended 3-Door Van

HEAD INJURY CRITERIA (HIC) REDUNDANT				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	592.1	54.3	87.0	50.48
Position #2 - Passenger	-	-	-	-

** 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	42.7	66.7	69.7	341.8
Position #2 - Passenger	-	-	-	-

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

Note - Position 2 Head and Chest Redundant Channels did not record accurately.

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>2501</u>	<u>2514</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>939</u>	<u>941</u>
Lap belt length as measured on Part 572 Dummy.	<u>853</u>	<u>859</u>

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis.	<u>101.6</u>	<u>101.6</u>
As determined mechanically.	<u>90</u>	<u>96</u>
As determined electronically.	<u>111.7</u>	<u>101.5</u>

BELT STRETCH DATA:

Measured electronically between shoulder belt load cell and the "D" ring.	<u>56.6 mm/M</u>	<u>62.9 mm/M</u>
Measured mechanically.	<u>1</u>	<u>1</u>

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 20 mm molding.

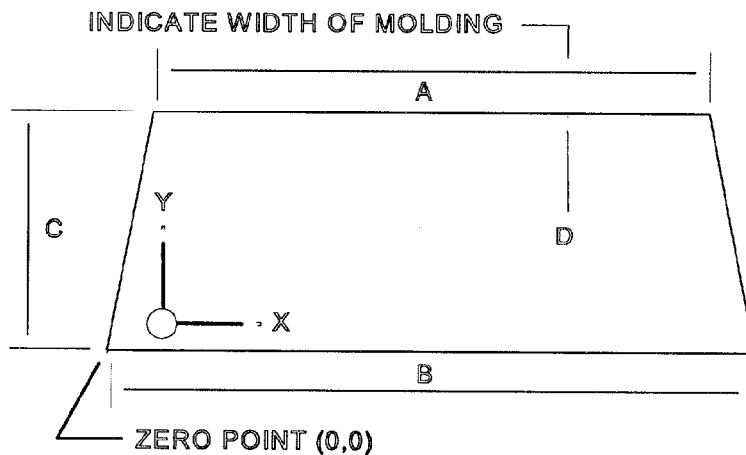
FMVSS 212 REQUIREMENTS:

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

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		
	PRE-TEST (mm)	POST-TEST(mm)	% OF RETENTION
RIGHT SIDE	2374.5	2374.5	100
LEFT SIDE	2374.5	2374.5	100
TOTAL	4,749	4,749	100

AREA OF RETENTION FAILURE:



DIMENSIONS (mm)	
A	1325
B	1680
C	872
D	20

FRONT VIEW OF WINDSHIELD

FAILURE DETAILS: None

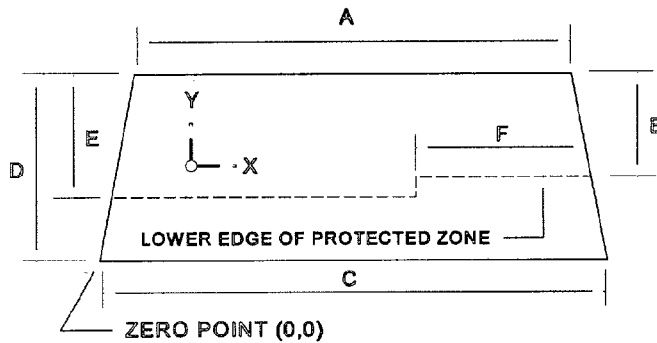
DATA SHEET NO. 11 FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA

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	1325
B	570
C	1680
D	872
E	565
F	458

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

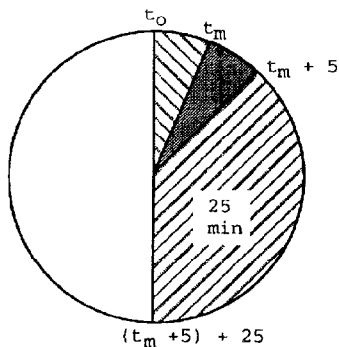
NHTSA TEST No.: MW0109 TEST DATE: 12/8/97
VEHICLE MAKE/MODEL: 1998 Chevrolet Venture

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

[illegible]

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

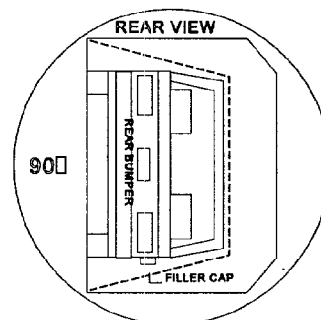
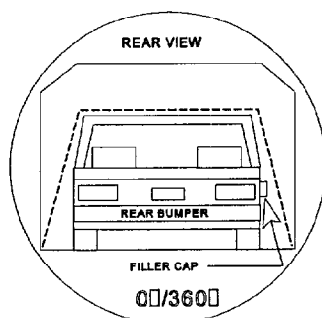
ACTUAL	MAX ALLOWED
0	28 g
0	141 g
0	28 g/min.

SOLVENT SPILLAGE DETAILS: None

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

TEST PHASE:
0-90 deg.

NHTSA Test No.:
MW0109



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.
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(2) Maximum Allowable Solvent Spillage

141 g	28 g	28 g	28 g
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III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	n/a
---	---	---	-----

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

IV. SOLVENT SPILLAGE LOCATION(S): None

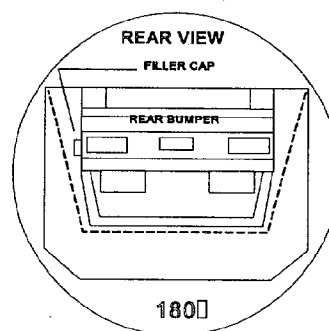
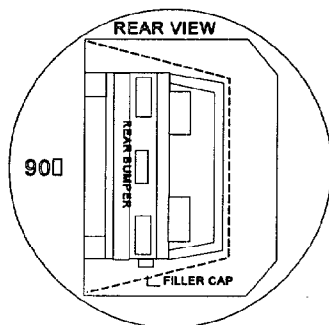
TEST SHEET NO. 13 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

90-180 deg.

NHTSA Test No.:

MW0109



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

1 minutes 10 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

6 minutes 10 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:

0	0	0	n/a
---	---	---	-----

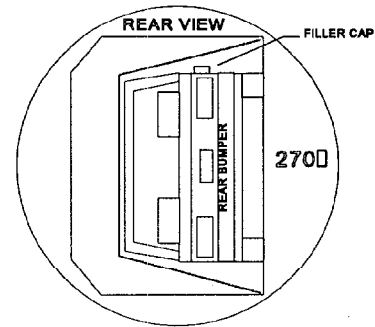
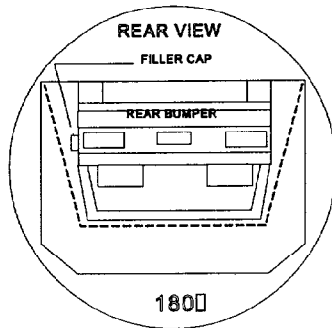
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S): None

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

TEST PHASE:
180-270 deg.

NHTSA Test No.:
MW0109



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

1 minutes 7 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

6 minutes 7 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.
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(2) Maximum Allowable Solvent Spillage

141 g	28 g	28 g	28 g
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III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	n/a
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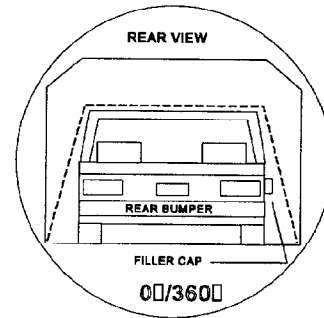
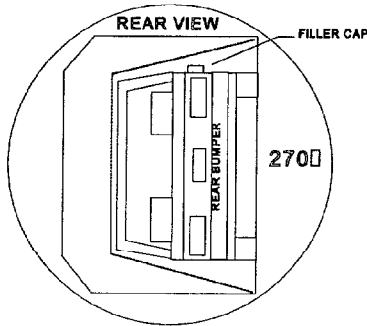
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S): None

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

TEST PHASE:
270-360 deg.

NHTSA Test No.:
MW0109



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

1 minutes 4 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

6 minutes 4 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
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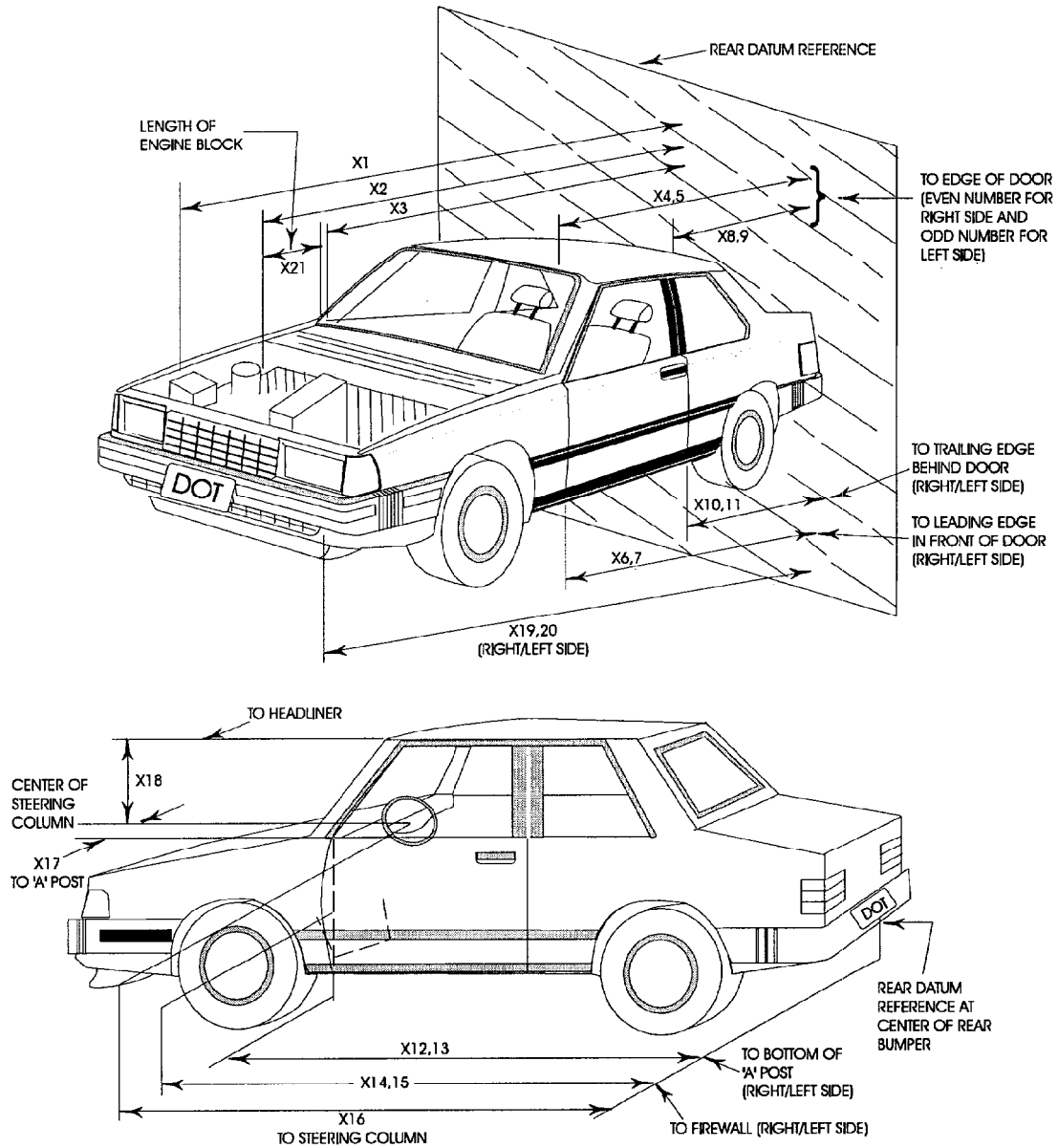
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	n/a
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Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S): None

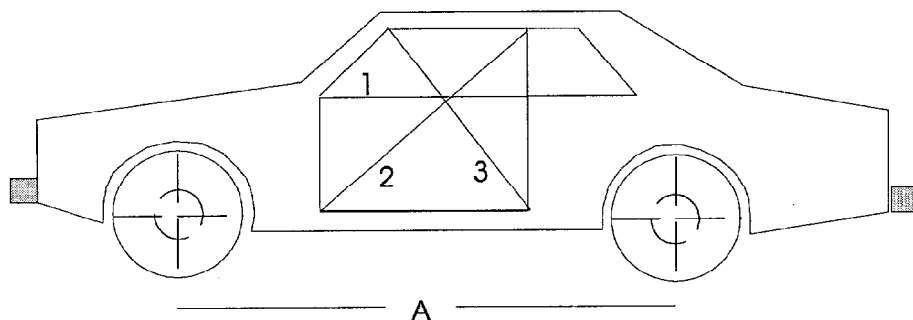
TEST VEHICLE MEASUREMENTS



DATA SHEET NO.14 VEHICLE MEASUREMENTS

No.		All Dimensions in mm		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	5100	4460	640
X2	Rear Surface of Vehicle to Front of Engine	4555	4140	415
X3	Rear Surface of Vehicle to Firewall	3985	3745	240
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3783	3767	16
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3788	3757	31
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3675	3672	3
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3679	3653	26
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2644	2642	2
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2650	2623	27
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2658	2694	-36
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2663	2638	25
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3688	3688	0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3695	3649	46
X14	Rear Surface of Vehicle to Firewall, Right Side	4030	3675	355
X15	Rear Surface of Vehicle to Firewall, Left Side	3980	3675	305
X16	Rear Surface of Vehicle to Steering Column	3230	3225	5
X17	Center of Steering Column to "A" Post	435	405	30
X18	Center of Steering Column to Headliner	490	395	95
X19	Rear Surface of Vehicle to Right Side of Front Bumper	5015	4480	535
X20	Rear Surface of Vehicle to Left Side of Front Bumper	5025	4500	525
X21	Length of Engine Block	550	550	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3475	3435	40
CD	Rear Surface of Vehicle to Center of Dash Panel	3435	3415	20
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3450	3435	15

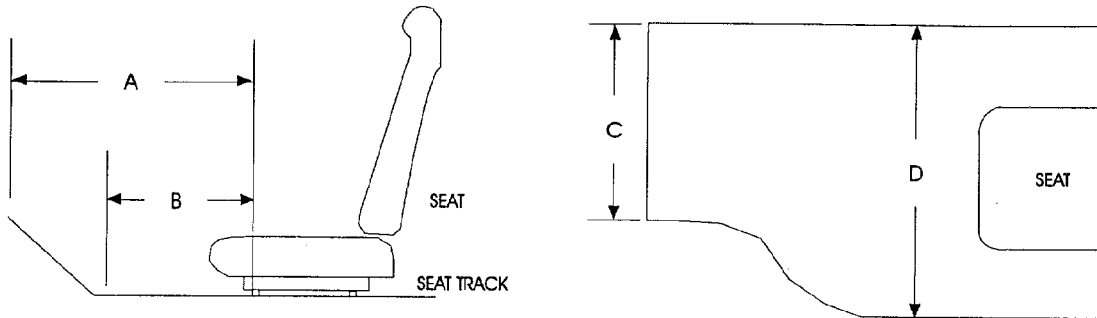
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
VEHICLE INTRUSION MEASUREMENTS
DOOR OPENING WIDTH



UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1085	1640	1270	1085	1640	1270
AFTER TEST	1060	1615	1295	1055	1615	1370
DIFFERENCE	25	25	-25	30	25	-100

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	3050	3050
AFTER TEST	2894	2894
DIFFERENCE	156	156

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



DRIVER

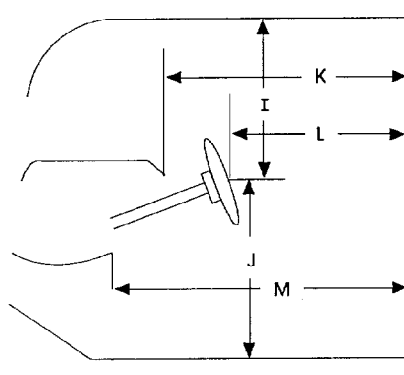
Measurement	Pre-Test	Post-Test	Difference
A	635	530	105
B	530	500	30
C	535	500	35
D	550	530	20

PASSENGER

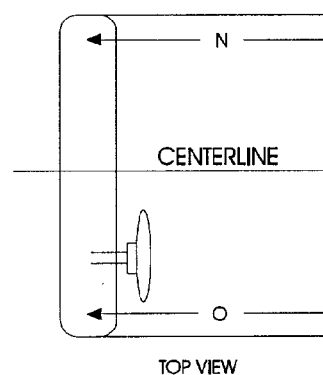
Measurement	Pre-Test	Post-Test	Difference
A	700	565	135
B	630	545	85
C	500	420	80
D	565	550	15

Units = mm

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

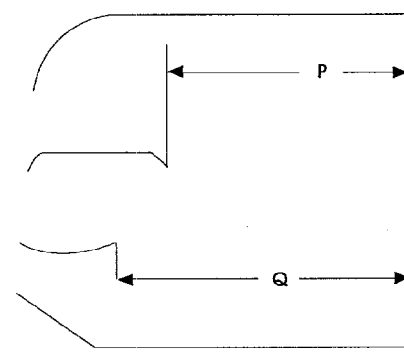


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE

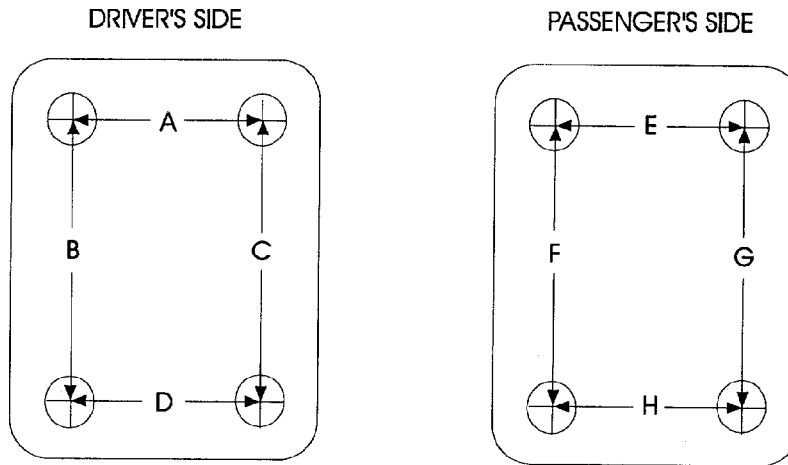


PASSENGER'S SIDE

Measurement	Pre-Test	Post-Test	Difference
I	465	370	95
J	690	785	-95
K	755	745	10
L	495	490	5
M	745	710	35
N	740	735	5
O	715	700	15
P = K (PASS.)	725	700	25
Q = M (PASS.)	695	665	30

Units = mm

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



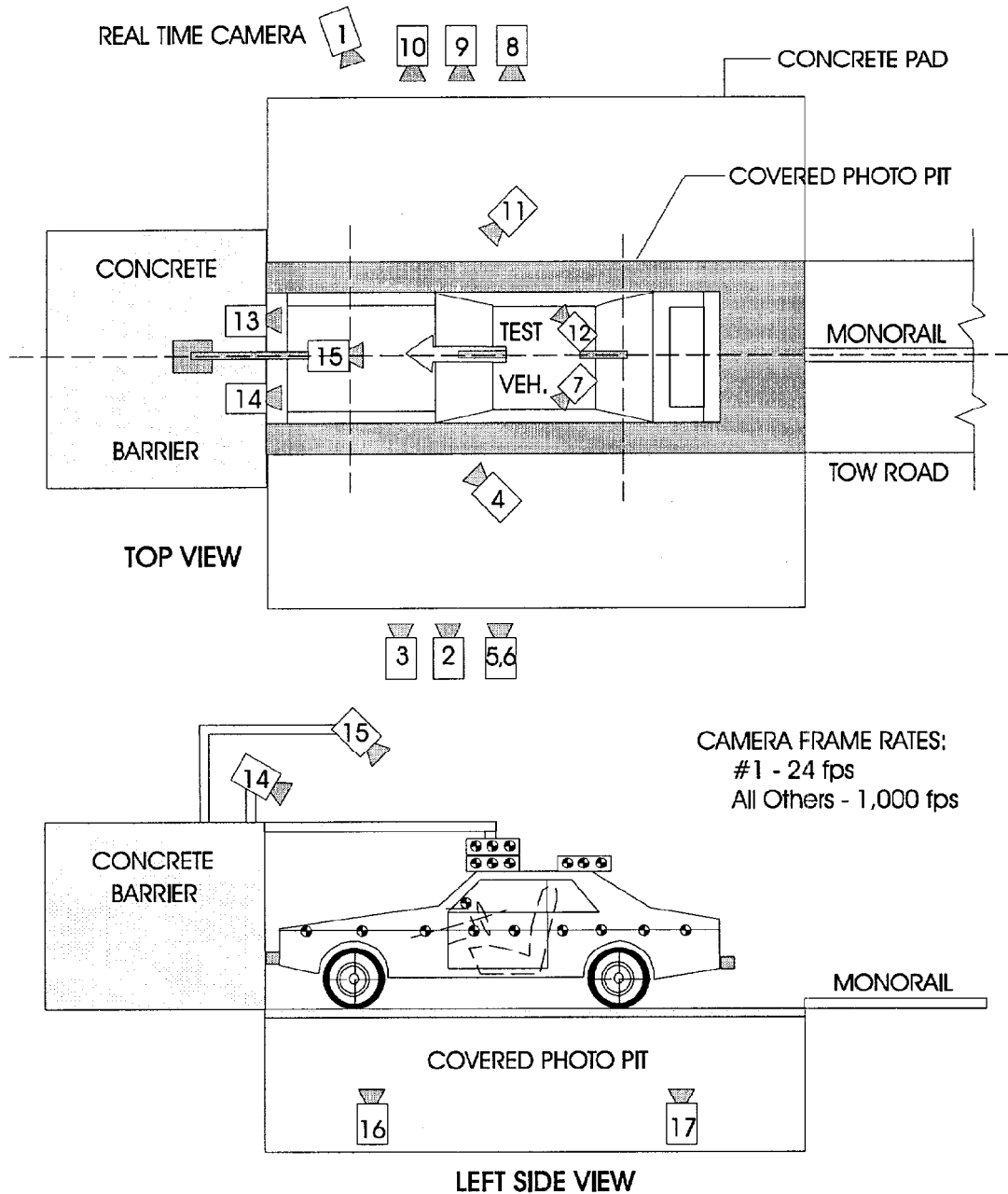
TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	445	445	0
B	450	440	10
C	465	435	30
D	480	515	-35
E	290	310	-20
F	515	510	5
G	560	545	15
H	295	325	-30

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.: MW0109 Vehicle: 1998 Chevrolet Venture Extended 3-Door Van

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	6789	1763	1104	-3.5	6468	13	1000
3	Left Side View	7789	813	1266	-4	7459	25	1000
4	Driver and Interior View	4973	2991	1952	-9	-	25	1000
5	Steering Column (Bottom)	7905	2100	1163	-2	7575	25	1010
6	Steering Column (Top)	7905	2100	1779	-3	7575	25	1010
7	Left Belt	-	-	-	-	-	8	830
8	Overall Right Side	6740	2037	1090	-5	6410	13	1000
9	Right Side View	7773	1465	1222	-5	7443	25	1000
10	Right Passenger View	7789	1768	1582	-3	7459	35	1010
11	Passenger and Interior View	4635	3251	2011	-11	-	25	1000
12	Right Belt	-	-	-	-	-	8	800
13	Passenger Front View	580	0	2000	-48	-	8	1000
14	Driver Front View	580	0	2000	-48	-	8	1010
15	Windshield View	0	530	3048	-55	-	8	1000
16	Pit View of Engine	0	950	-3048	90	-	13	1000
17	Pit View of Fuel Tank	0	2900	-3048	90	-	13	990

*X = film plane to monorail centerline

** = referenced to horizontal plane

Y = film plane to impact location

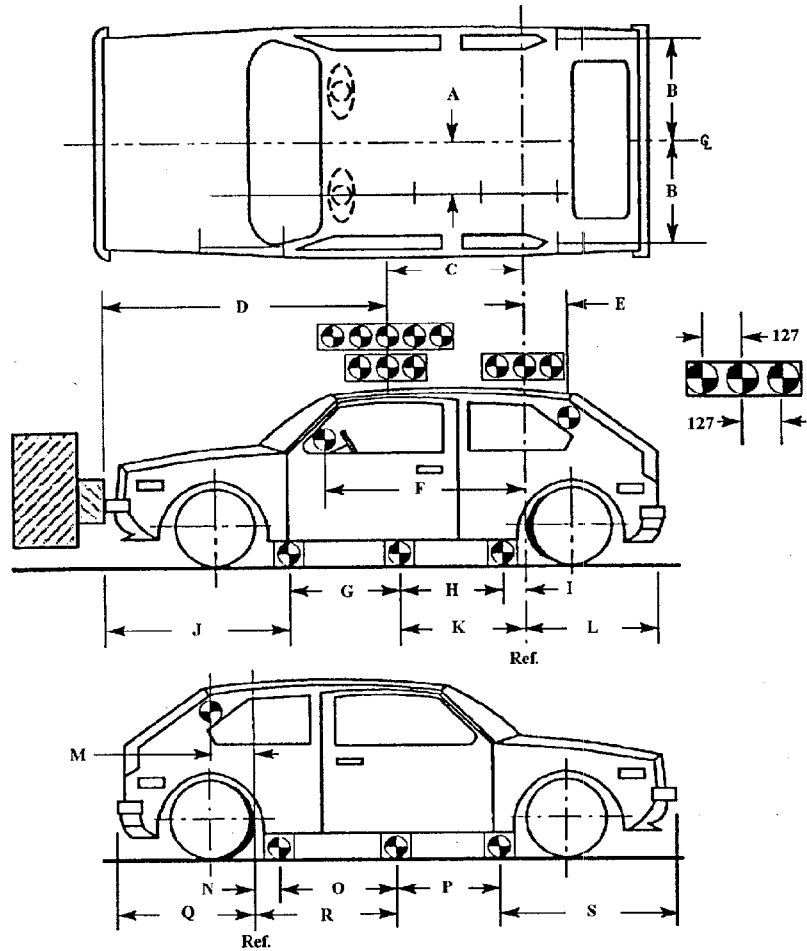
N.T. indicates No Timing

Z = film plane to ground

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

(Dimensions in millimeters)

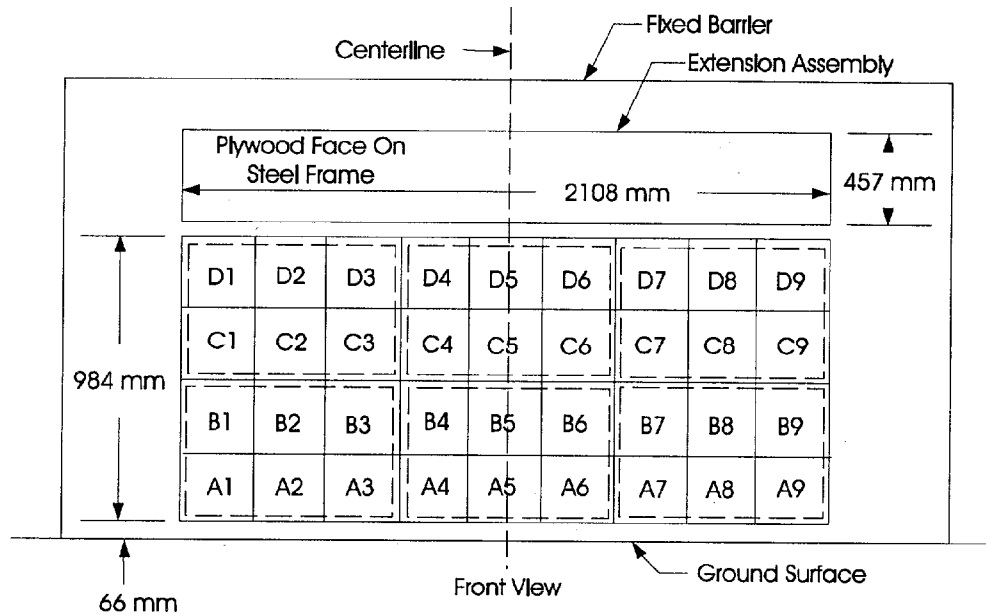
A	406
B	1294
C	1213
D	2449
E	345
F	1978
G	1070
H	1070
I	111
J	1381
K	1181
L	1585
M	345
N	111
O	1070
P	1070
Q	1585
R	1181
S	1381



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. : MW0109; Test Date: 12/8/97; Technician: J.Cz.

Vehicle Model Year/Make/Model: 1998 Chevrolet Venture

- A. No. of vent holes: 2 -Driver 2 -Passenger
- B. Size of vent holes: (mm²) 23 -Driver 30 -Passenger
- C. Total vent area: (mm²) 46 -Driver 60 -Passenger
- D. Deflated air bag length and width dimensions or, if round, diameter. (mm)
- Driver: - -Length; - -Width; 600 -Diameter
- Passenger: 750 -Height; 530 -Width; 500 -Depth

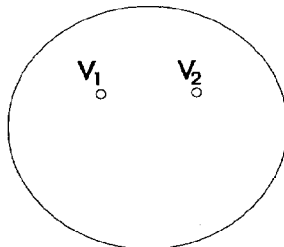
E. Is the air bag tethered?

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

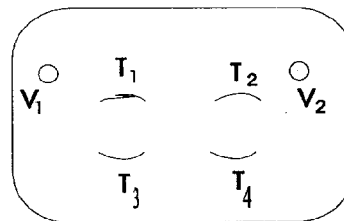
Passenger: x -Yes; - -No; If yes, record length of tether- 230

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: TCAP70487132

Generator: AB265315R94235

Passenger: Air bag: TJAG70278427

Generator: AL245615R6SZZT

FOR 56.3 KPH FRONTAL BARRIER IMPACT

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

NHTSA Test No.: MW0109 VIN: 1GNDX06E2WD134517

Model Year: 1998 Build Date: 10/97 Test Date: 12/8/97

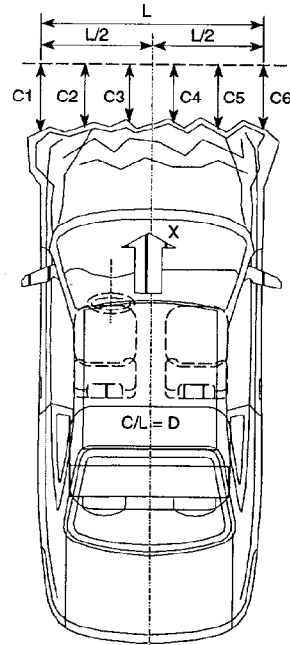
Vehicle Size Category: Van Test Weight: 2032 kg

Vehicle Wheelbase: 3050 mm; Front Overhang: 1381 mm; Overall Width: 1830 mm

Collision Deformation Classification (CDC) Code: 12FDEW2

Crush Depth Dimensions;

	PRE	POST	DIFF	
C1 =	4875	4440	-435	mm
C2 =	5035	4500	-535	mm
C3 =	5095	4495	-600	mm
C4 =	5095	4480	-615	mm
C5 =	5025	4480	-545	mm
C6 =	4865	4390	-475	mm



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

Length of Damaged Region:

L1= 1705 mm

L2= 852.5 mm

L3= 341 mm

Appendix A
PHOTOGRAPHS

PHOTOGRAPHS

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PHOTOGRAPH NOT AVAILABLE

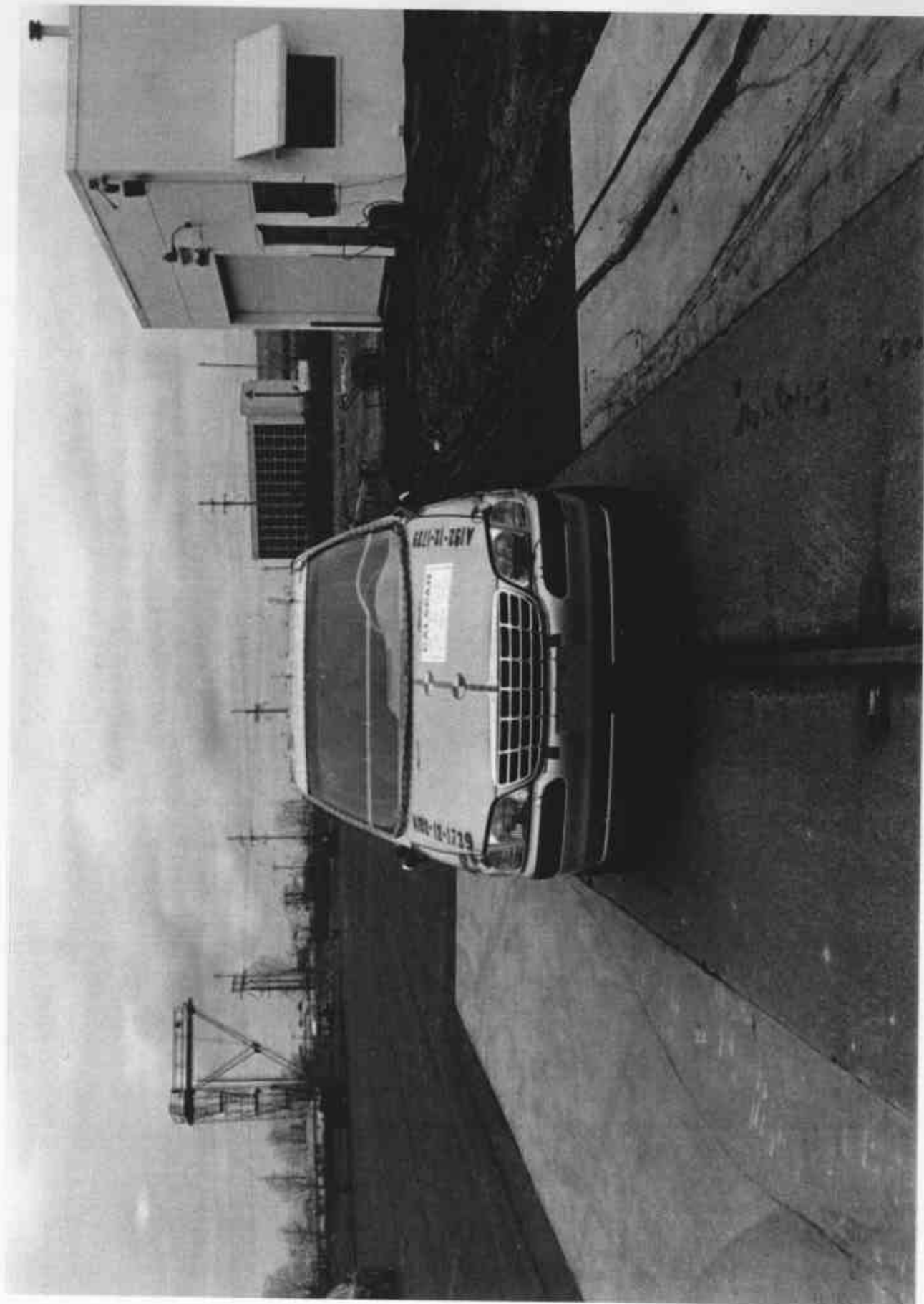


Figure A-2 PRE-TEST FRONT VIEW

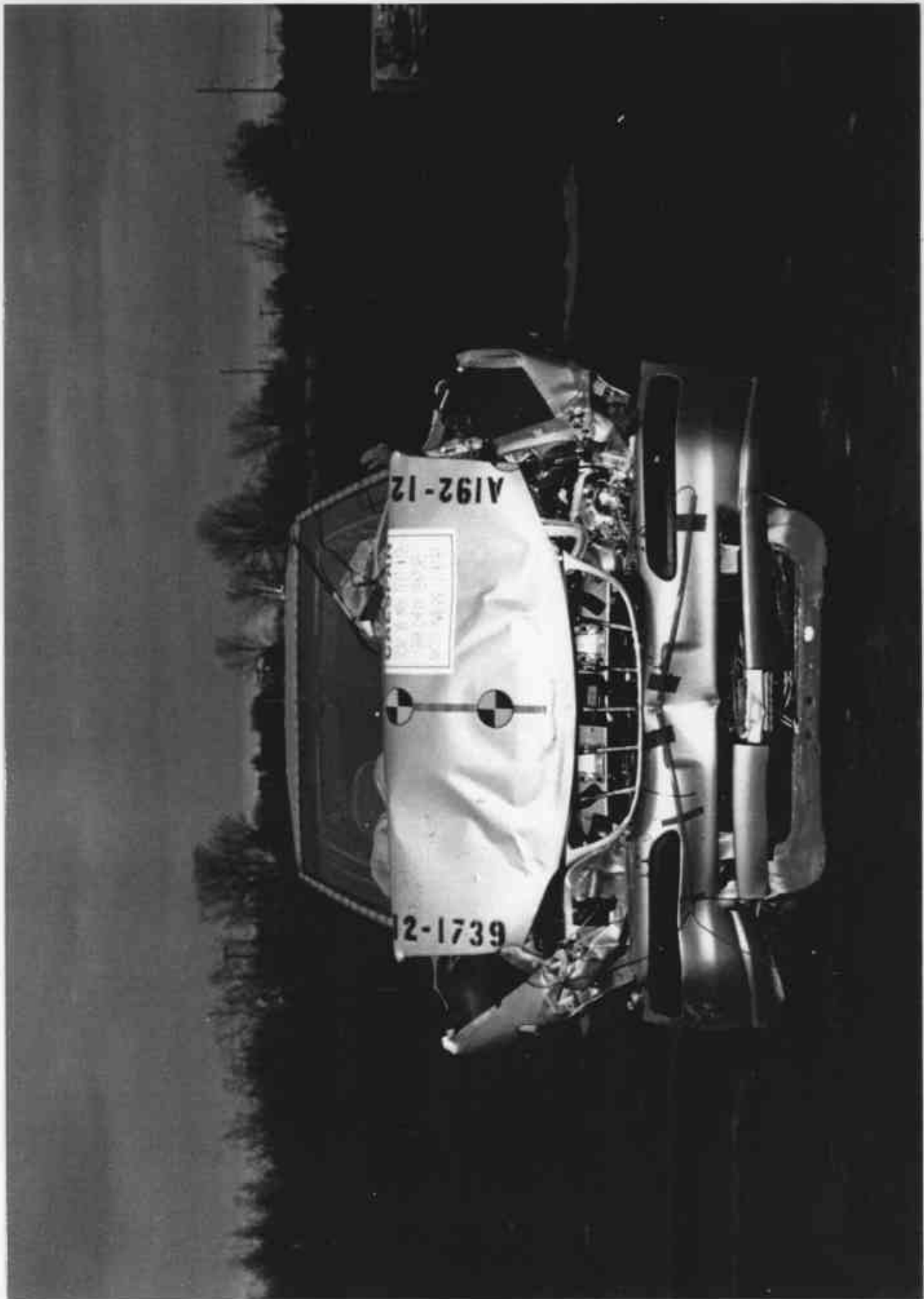


Figure A-3 POST-TEST FRONT VIEW



Figure A-4 PRE-TEST LEFT SIDE VIEW



Figure A-5 POST-TEST LEFT SIDE VIEW

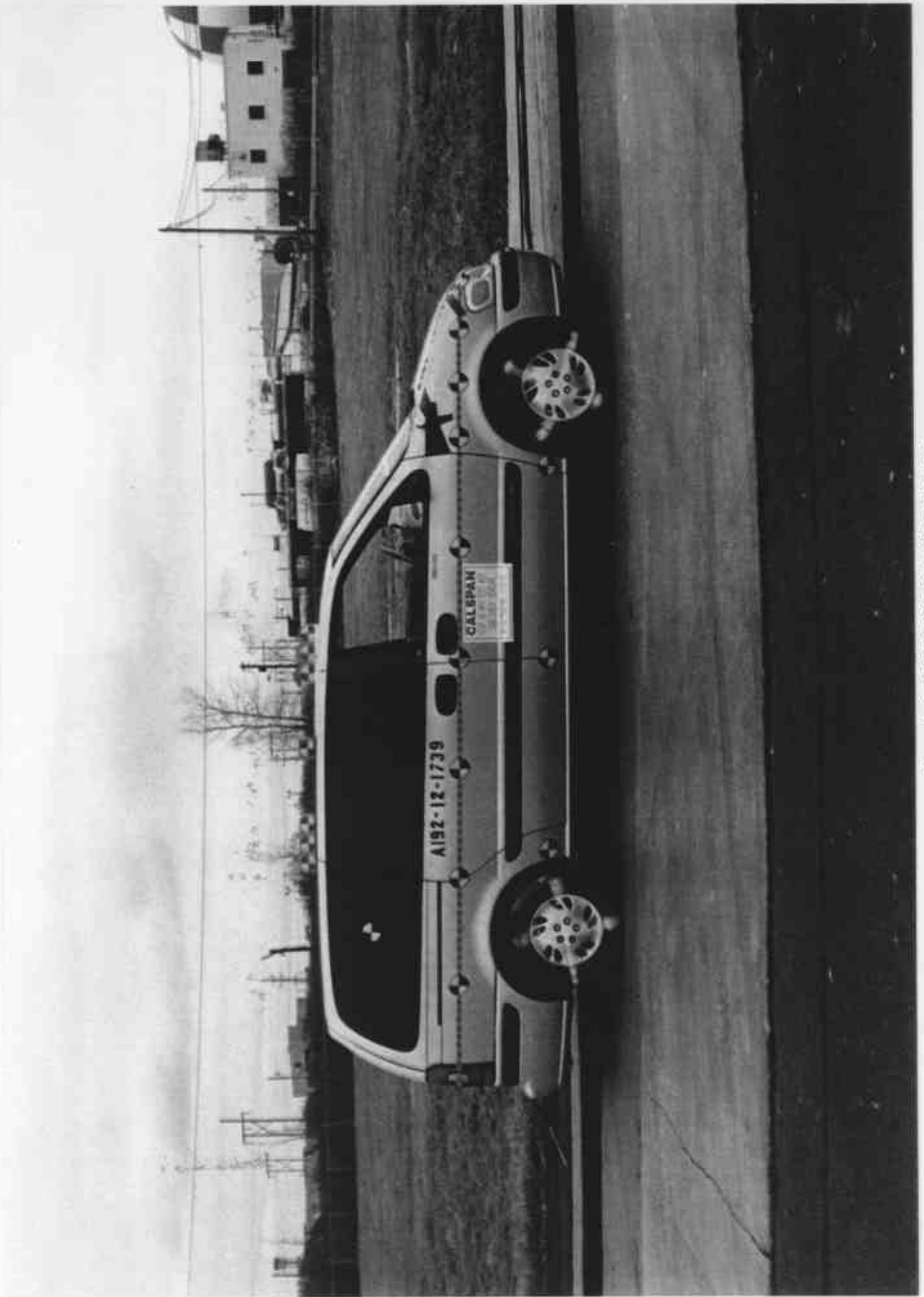


Figure A-6 PRE-TEST RIGHT SIDE VIEW



Figure A-7 POST-TEST RIGHT SIDE VIEW

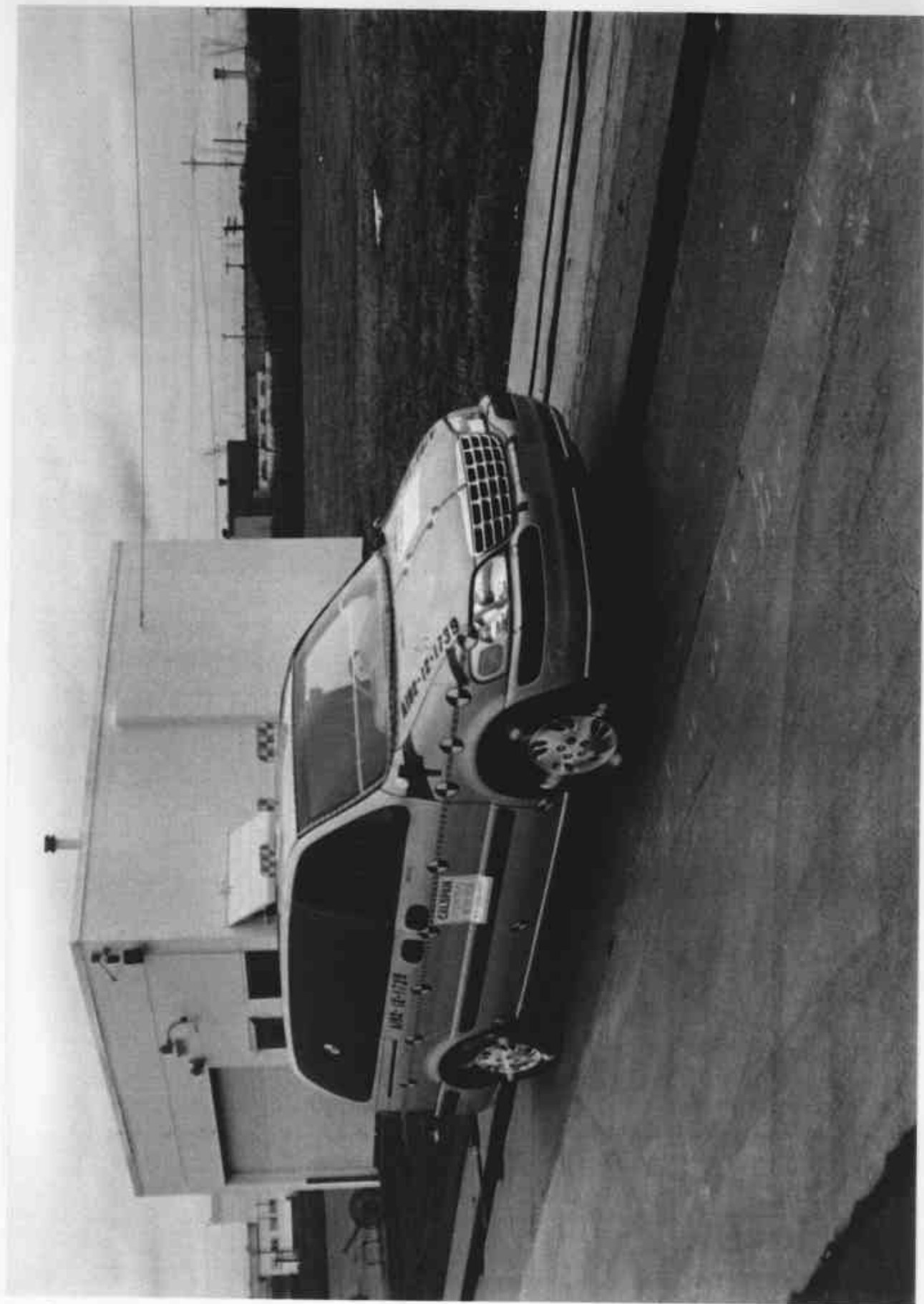


Figure A-8 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



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

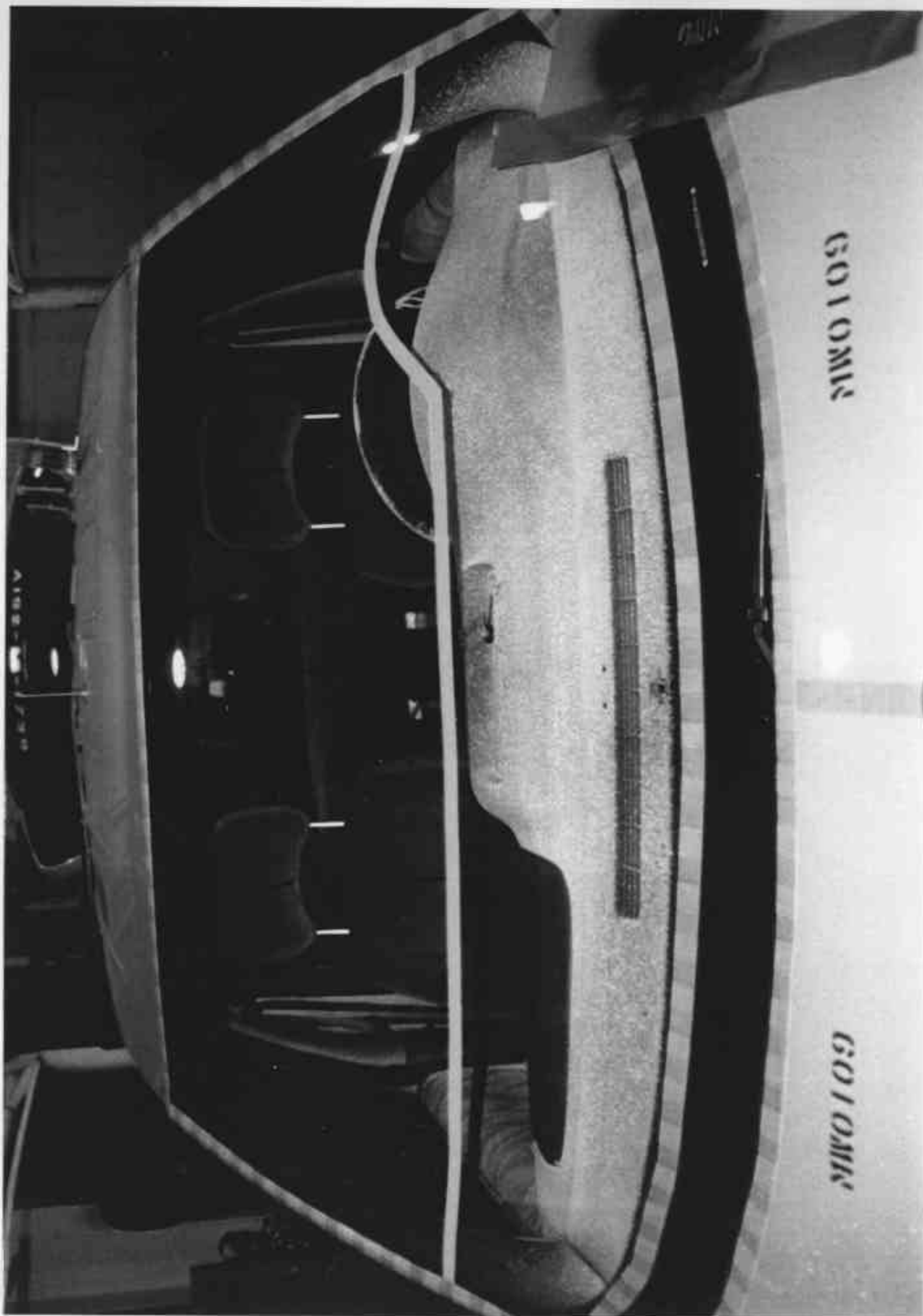


Figure A-12 PRE-TEST WINDSHIELD VIEW

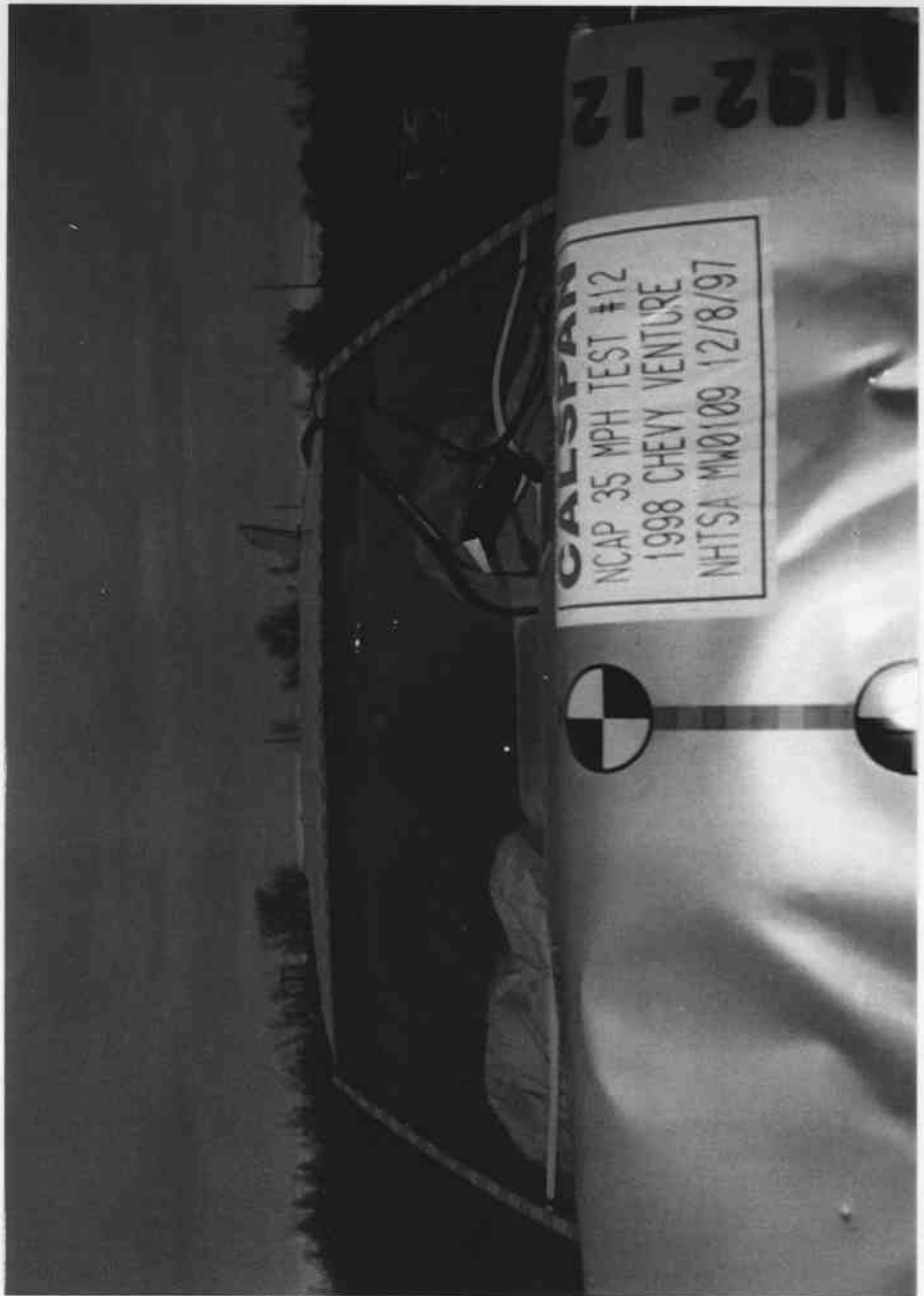


Figure A-13 POST-TEST WINDSHIELD VIEW

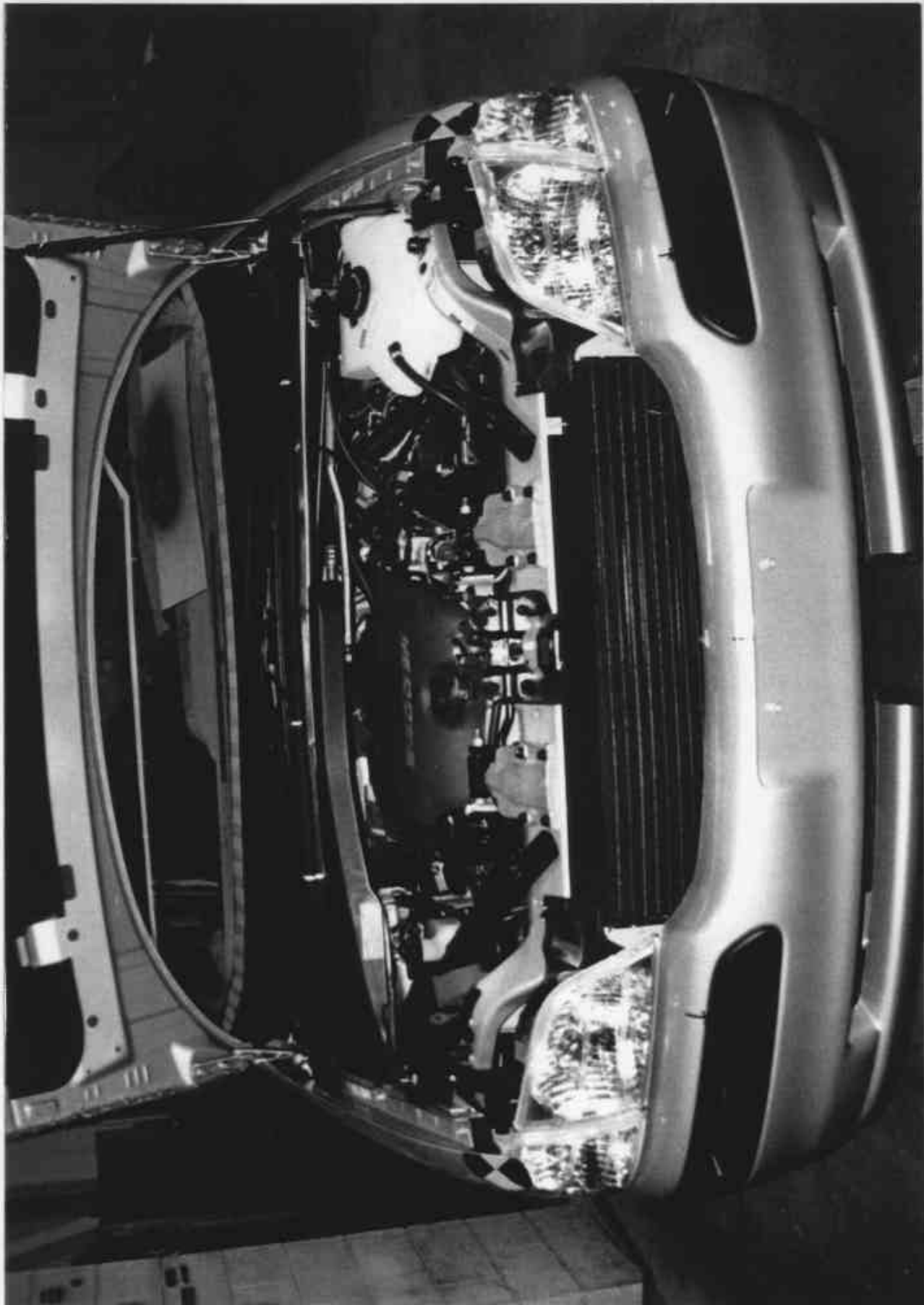


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-15 FUEL CAP VIEW



Figure A-16 PRE-TEST FRONT UNDERBODY VIEW

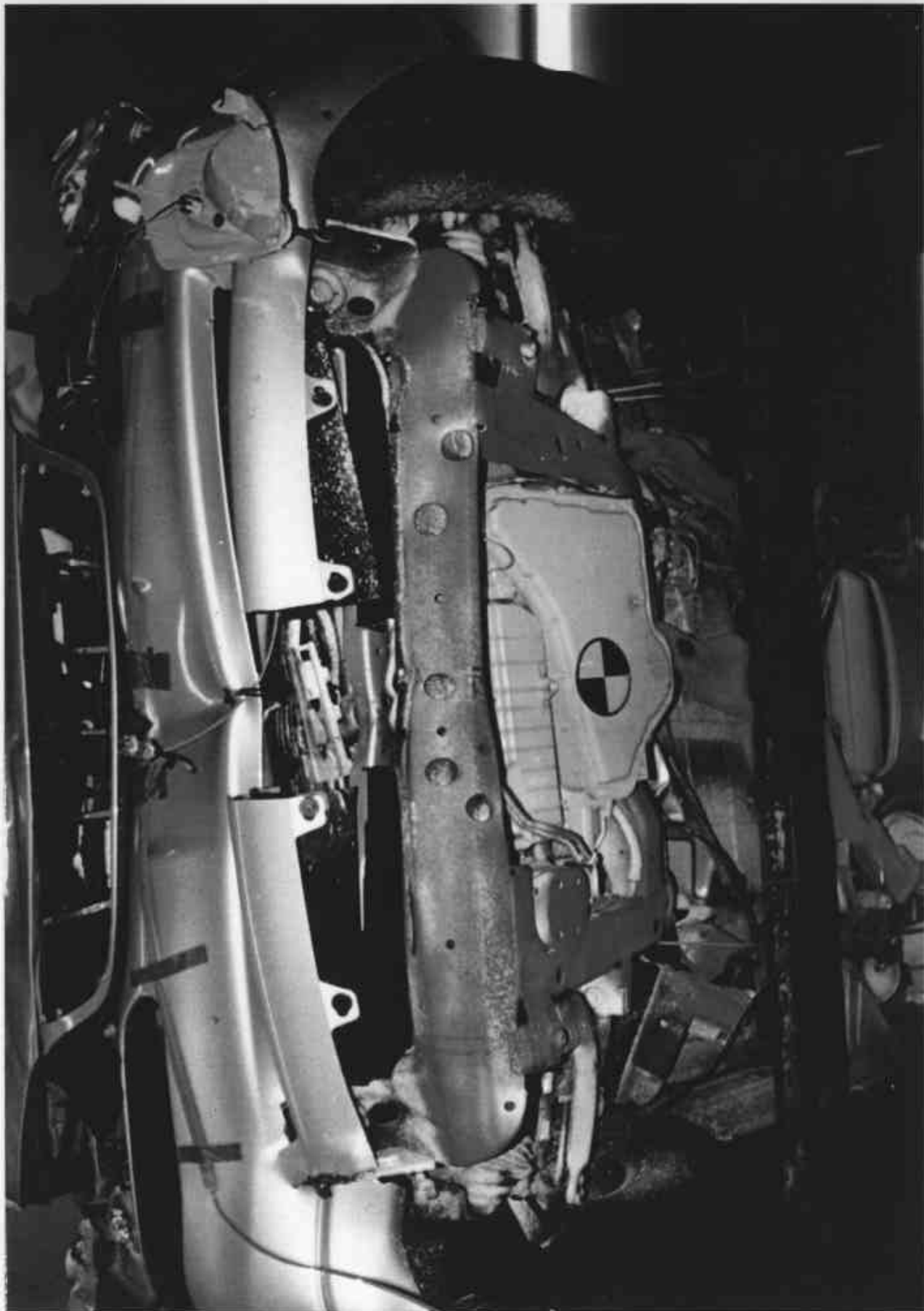


Figure A-17 POST-TEST FRONT UNDERBODY VIEW



Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

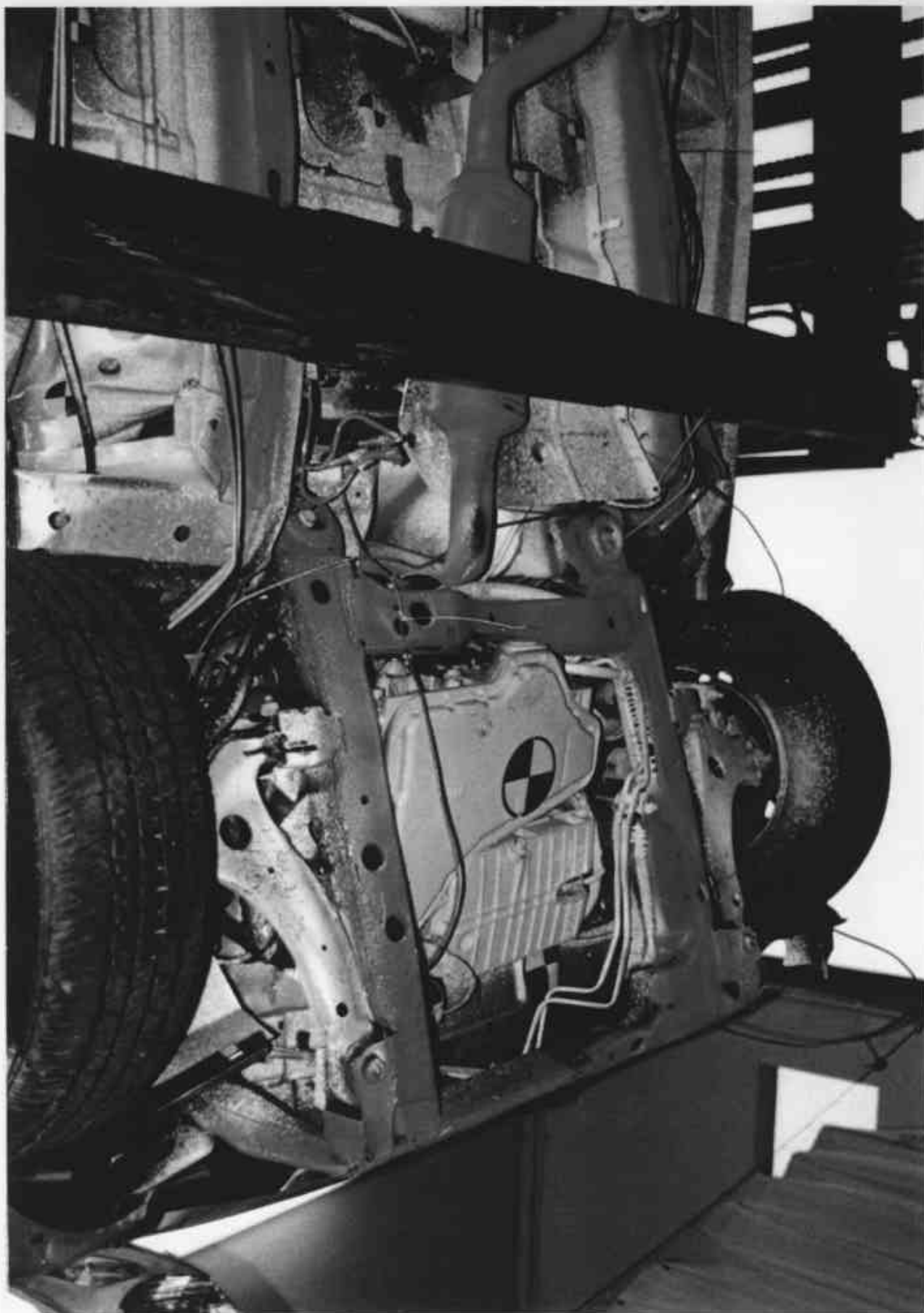


Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

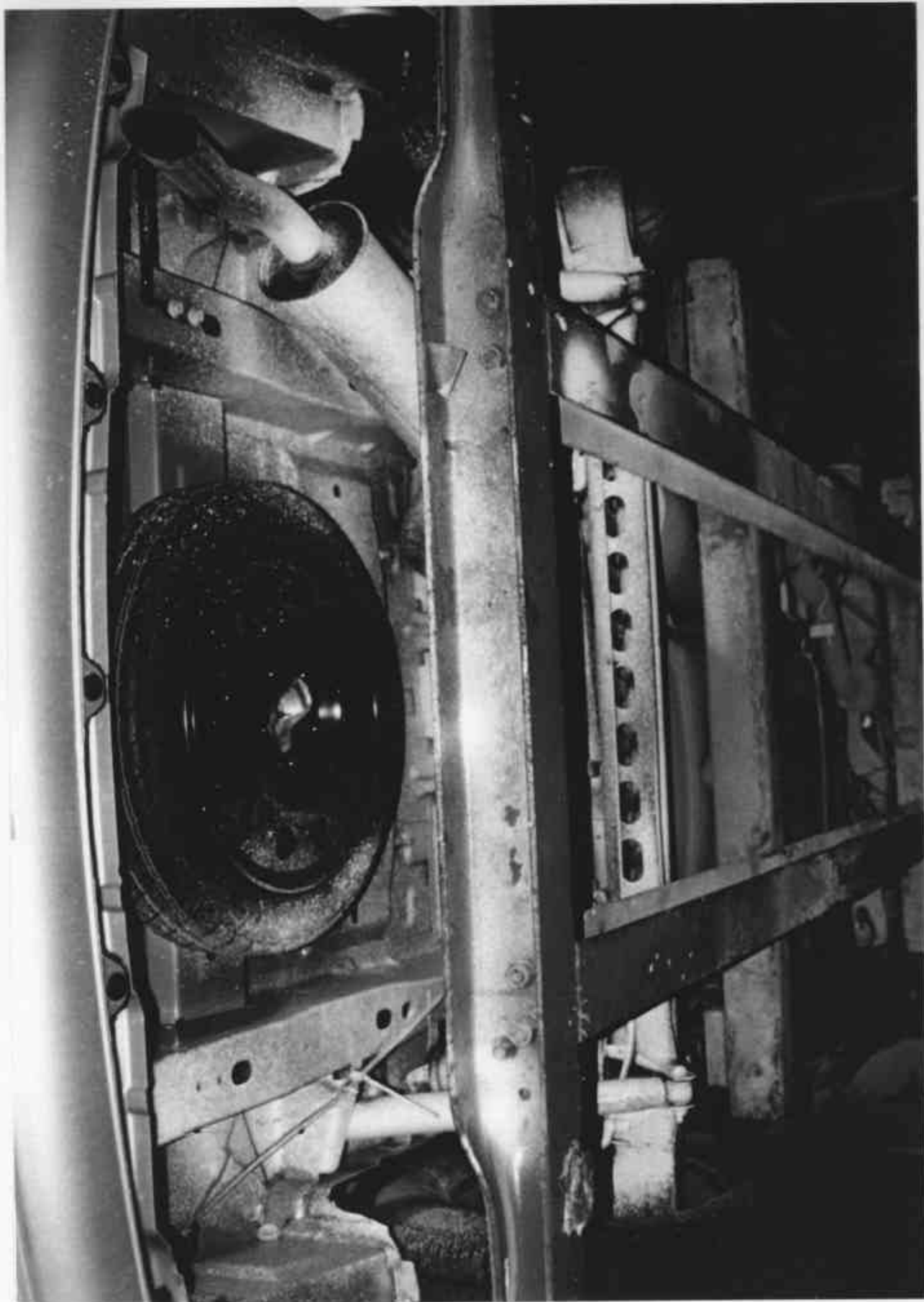


Figure A-20 PRE-TEST REAR UNDERBODY VIEW

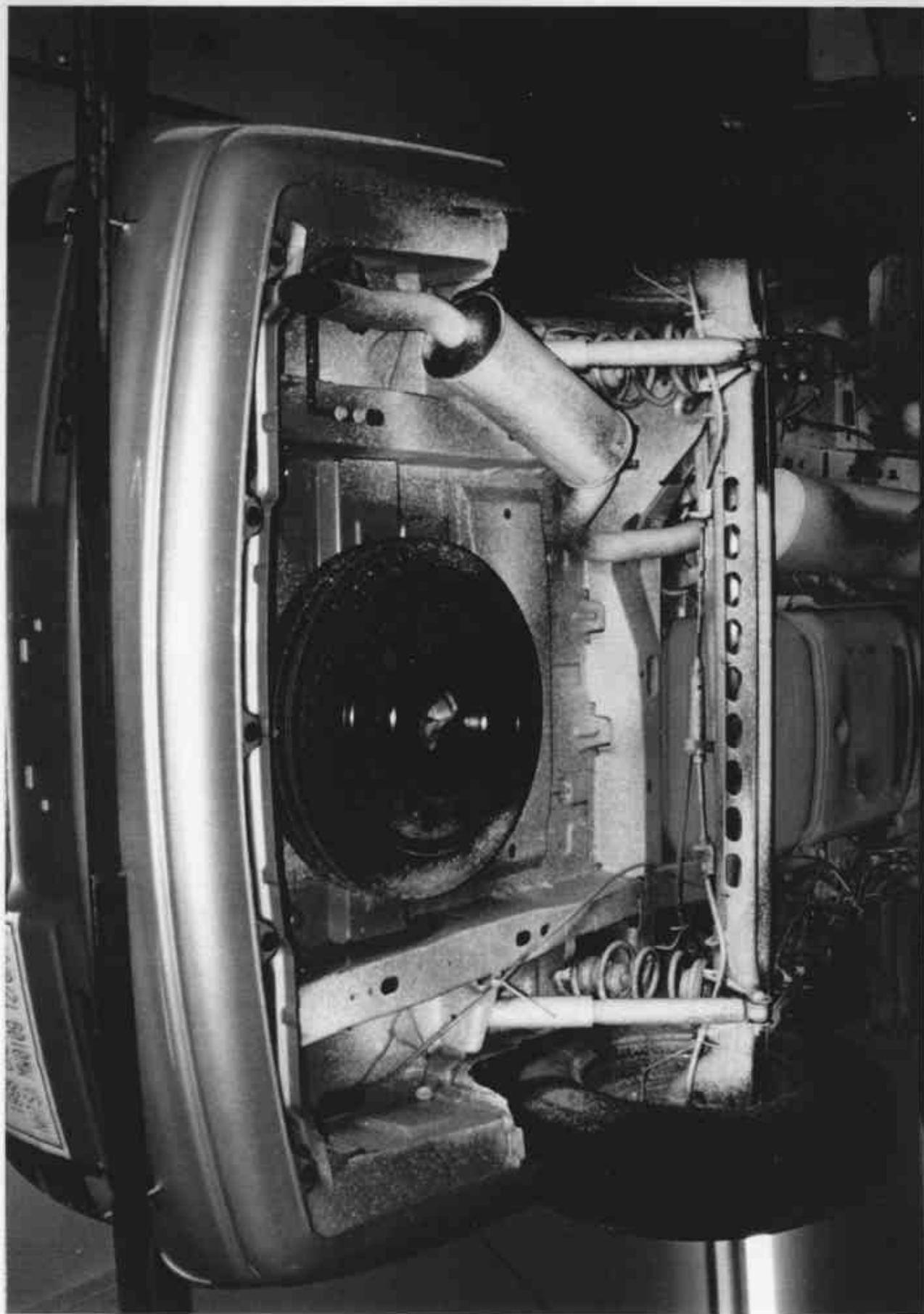


Figure A-21 POST-TEST REAR UNDERBODY VIEW



Figure A-22 PRE-TEST DRIVER POSITION VIEW

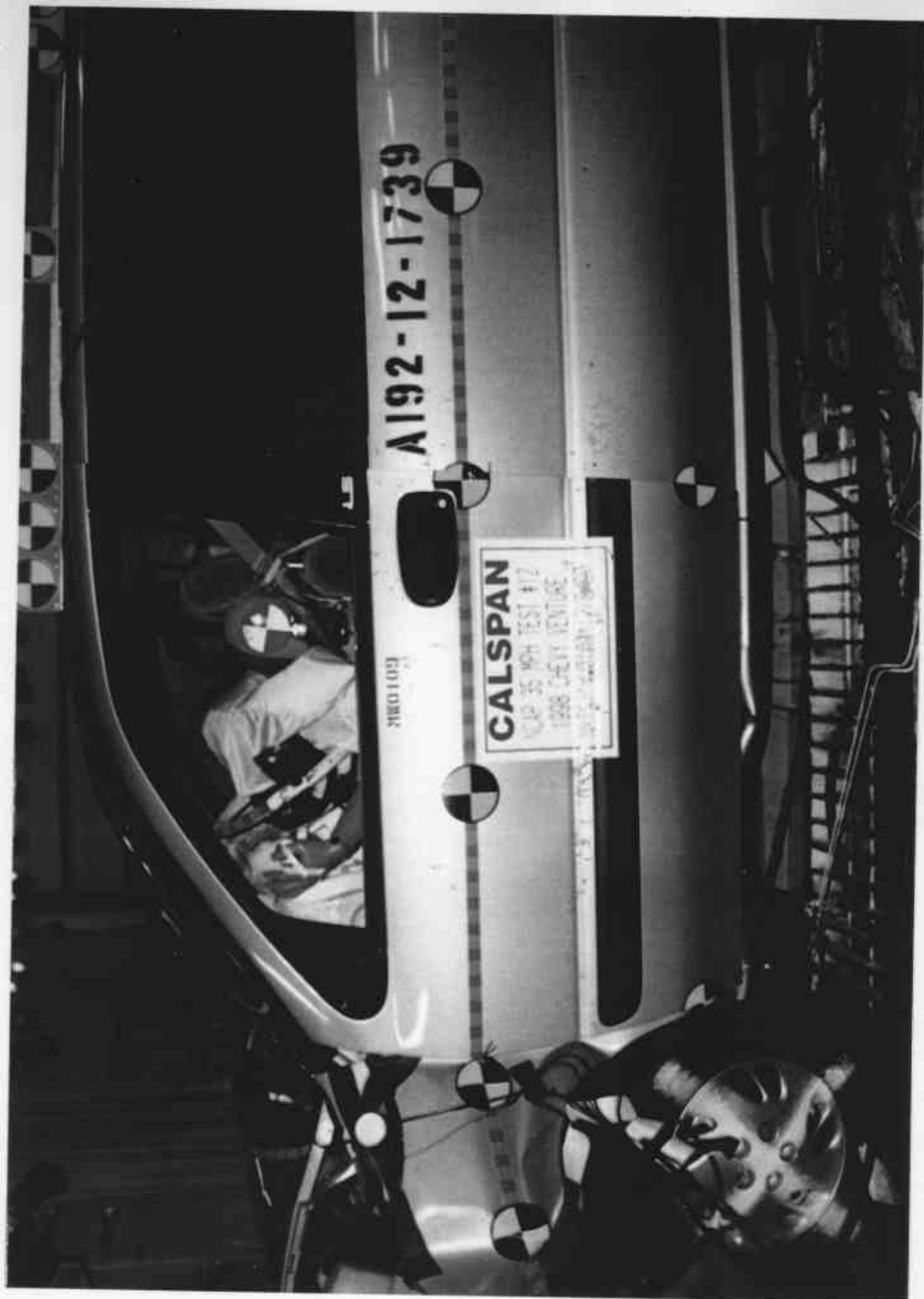


Figure A-23 POST-TEST DRIVER POSITION VIEW

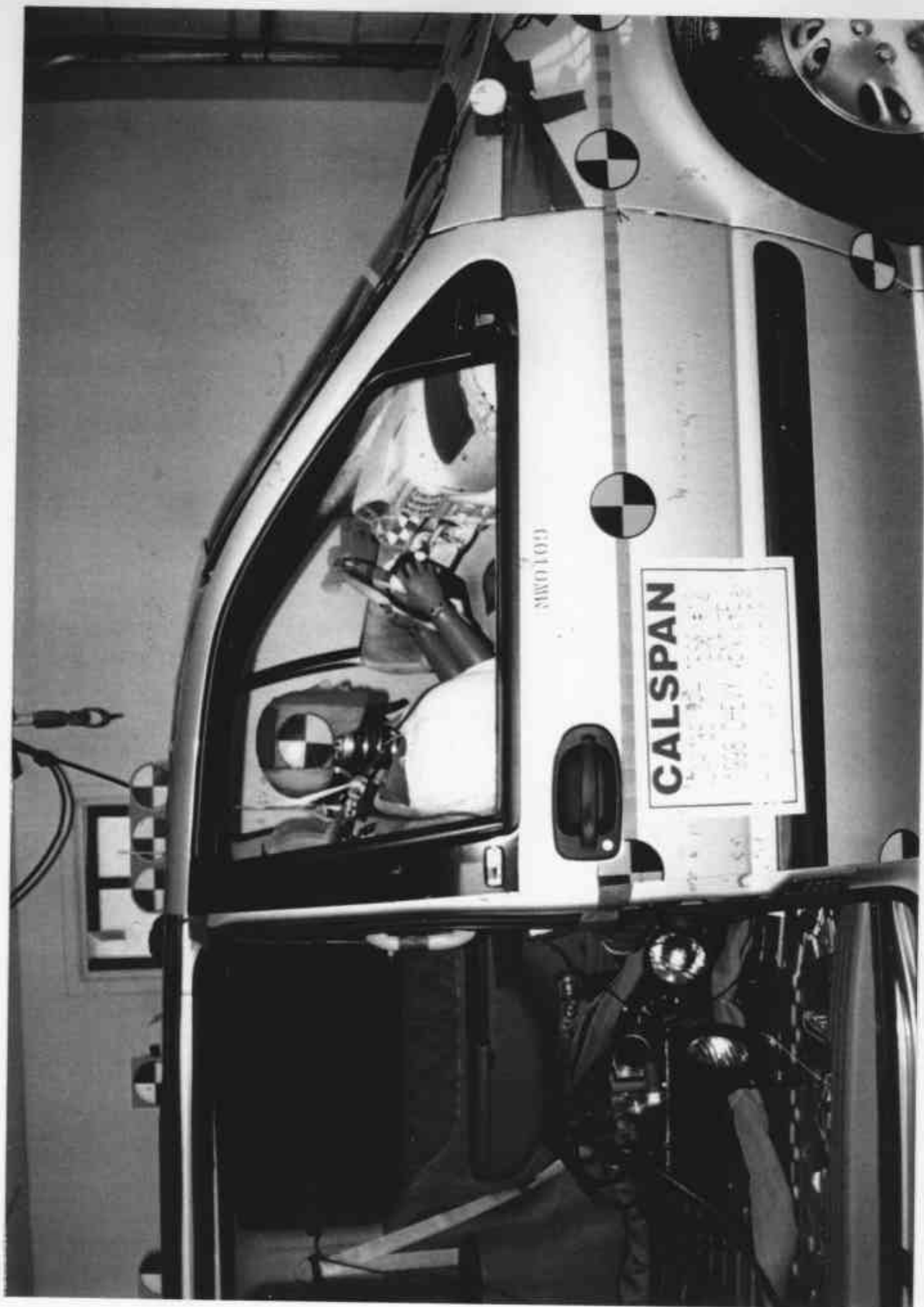


Figure A-24 PRE-TEST PASSENGER POSITION VIEW



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

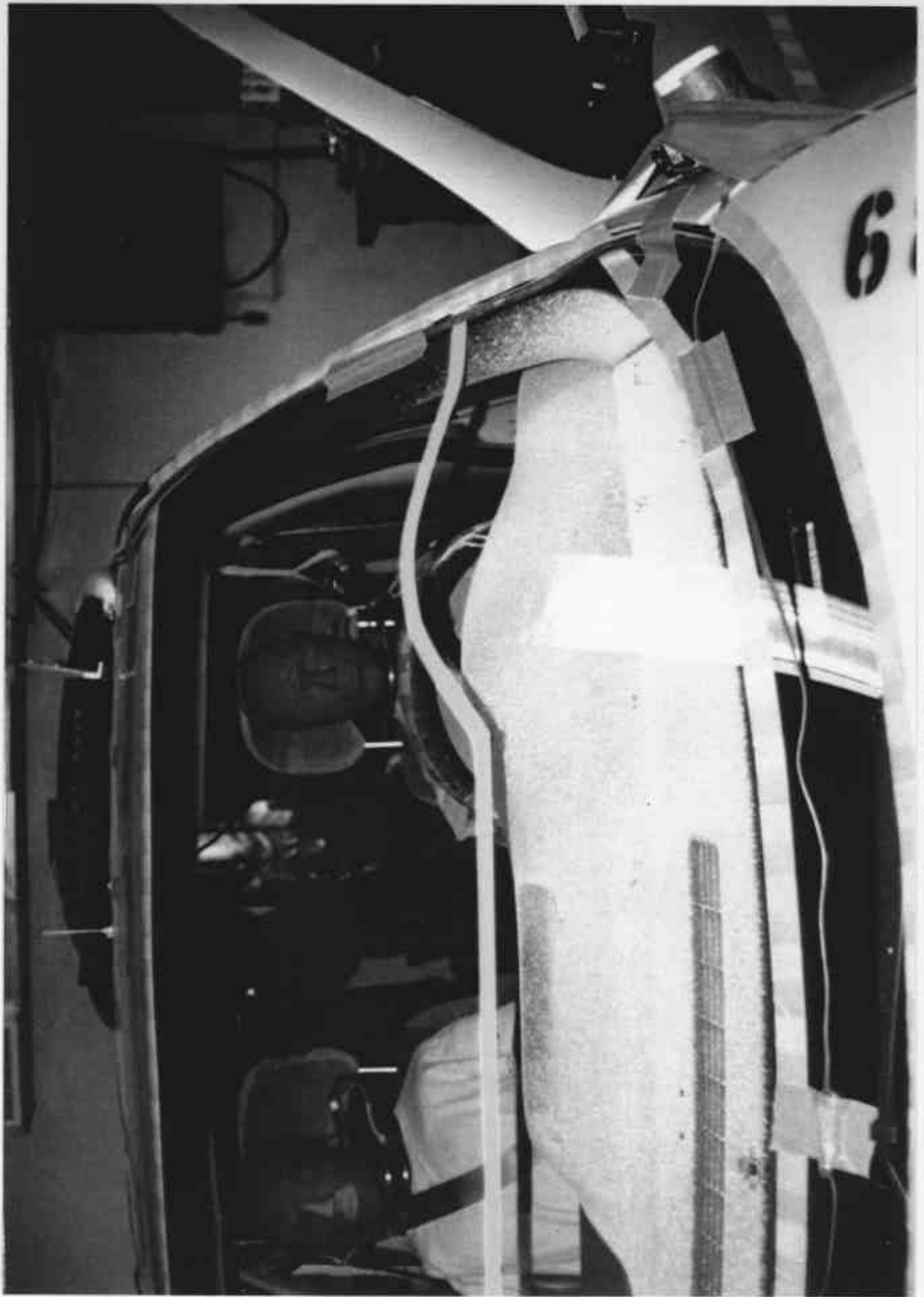


Figure A-30 PRE-TEST DRIVER HEAD LOCATION

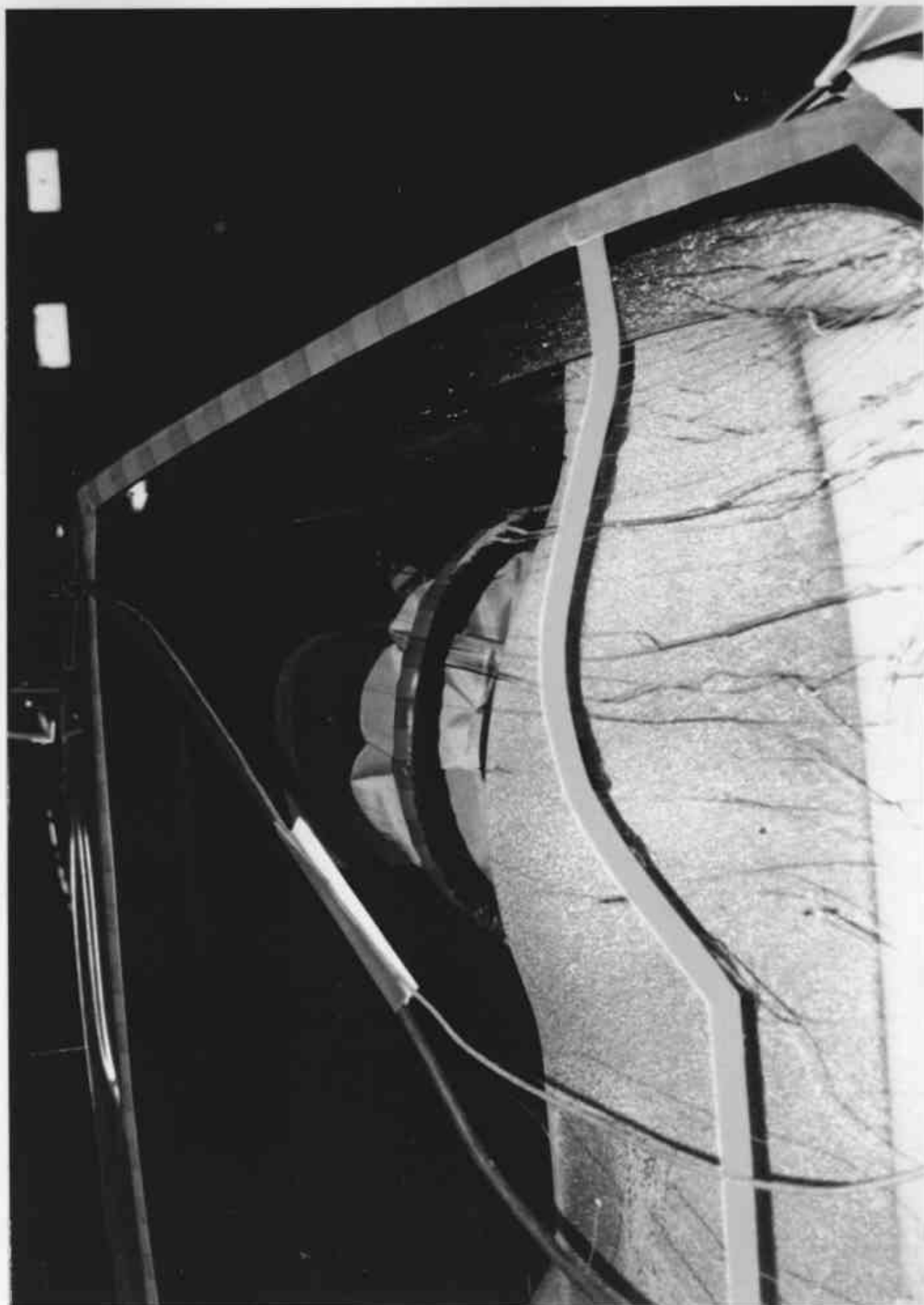


Figure A-31 POST-TEST DRIVER HEAD LOCATION

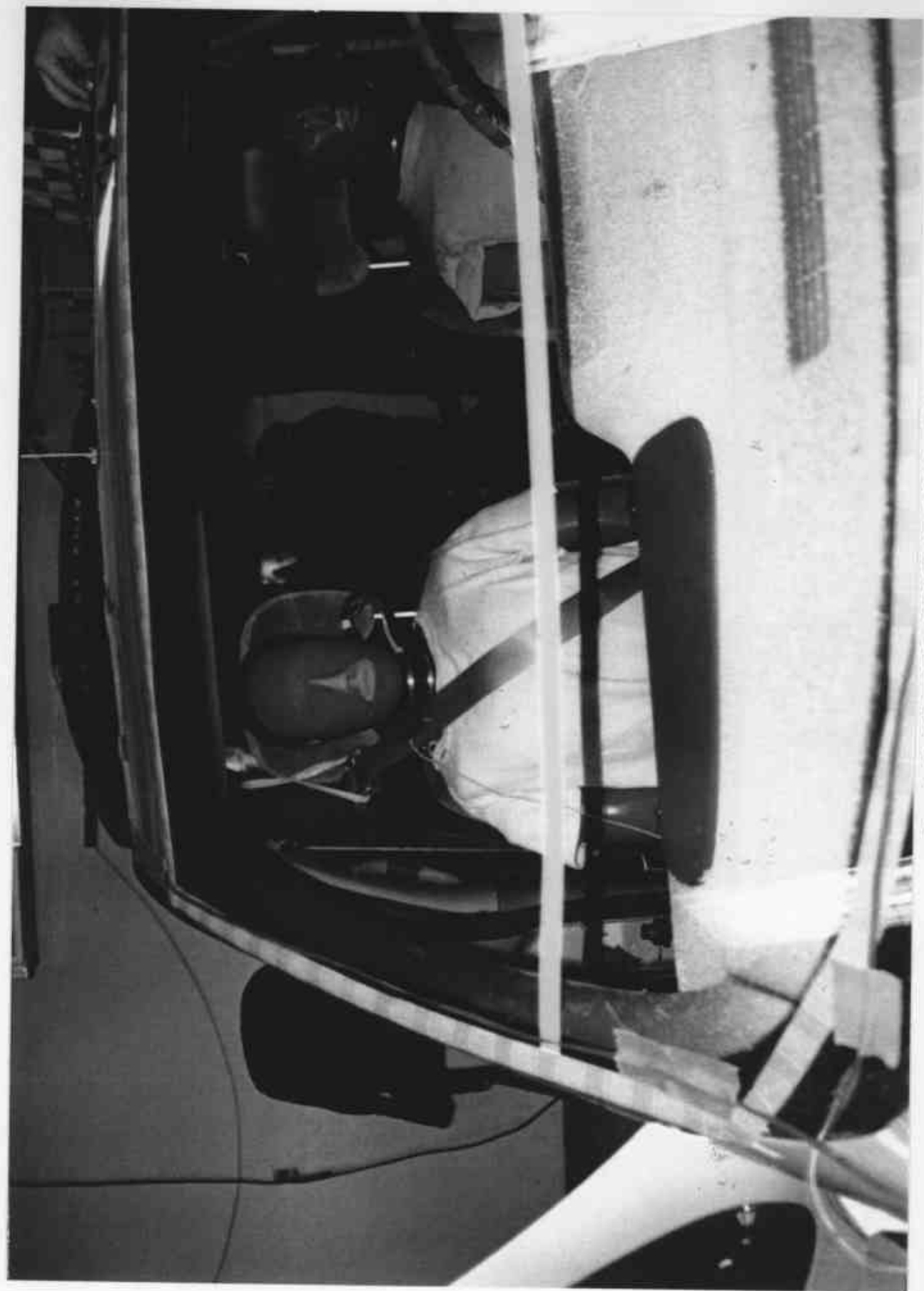


Figure A-32 PRE-TEST PASSENGER HEAD LOCATION



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

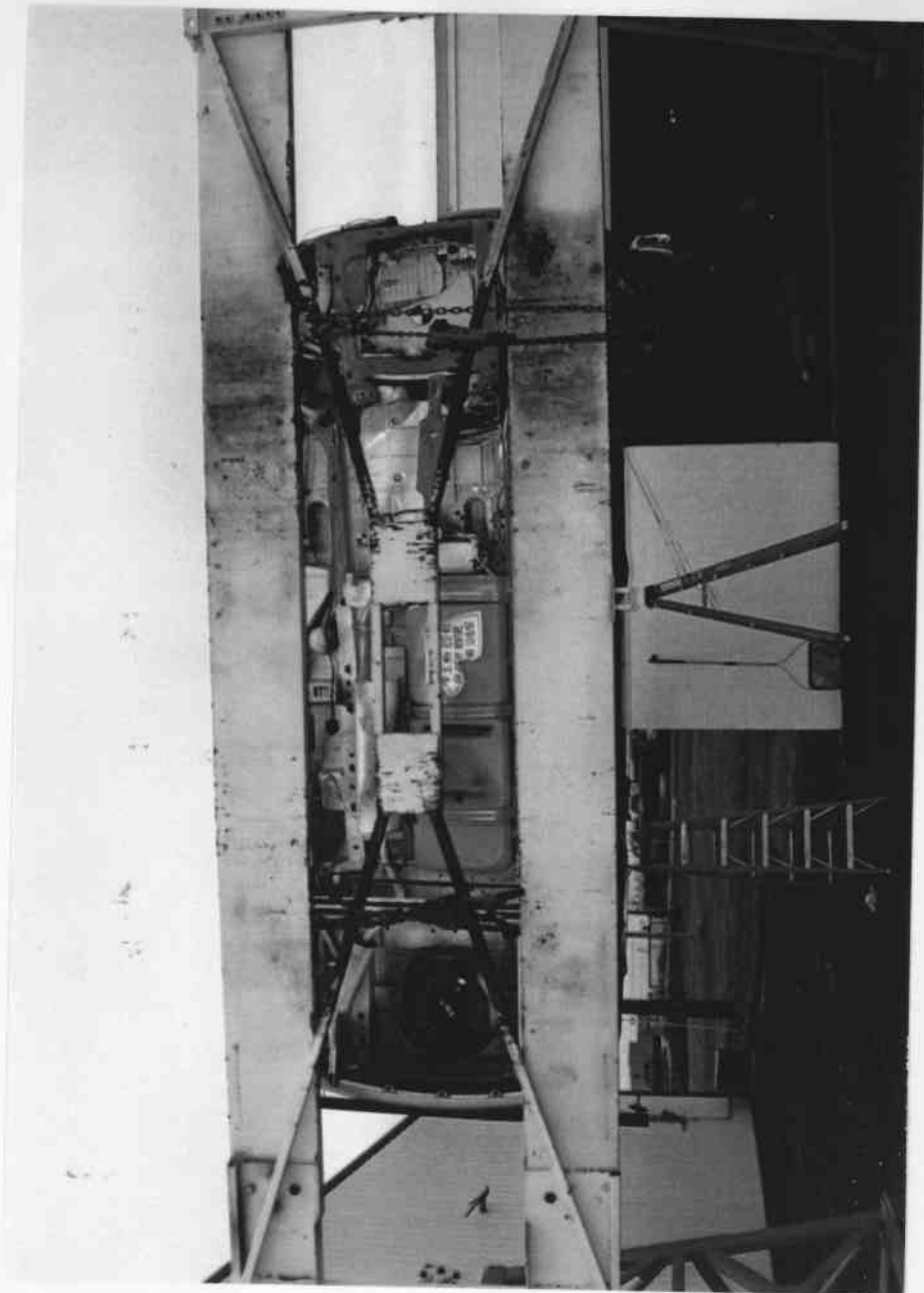


Figure A-38 ROLLOVER VIEW

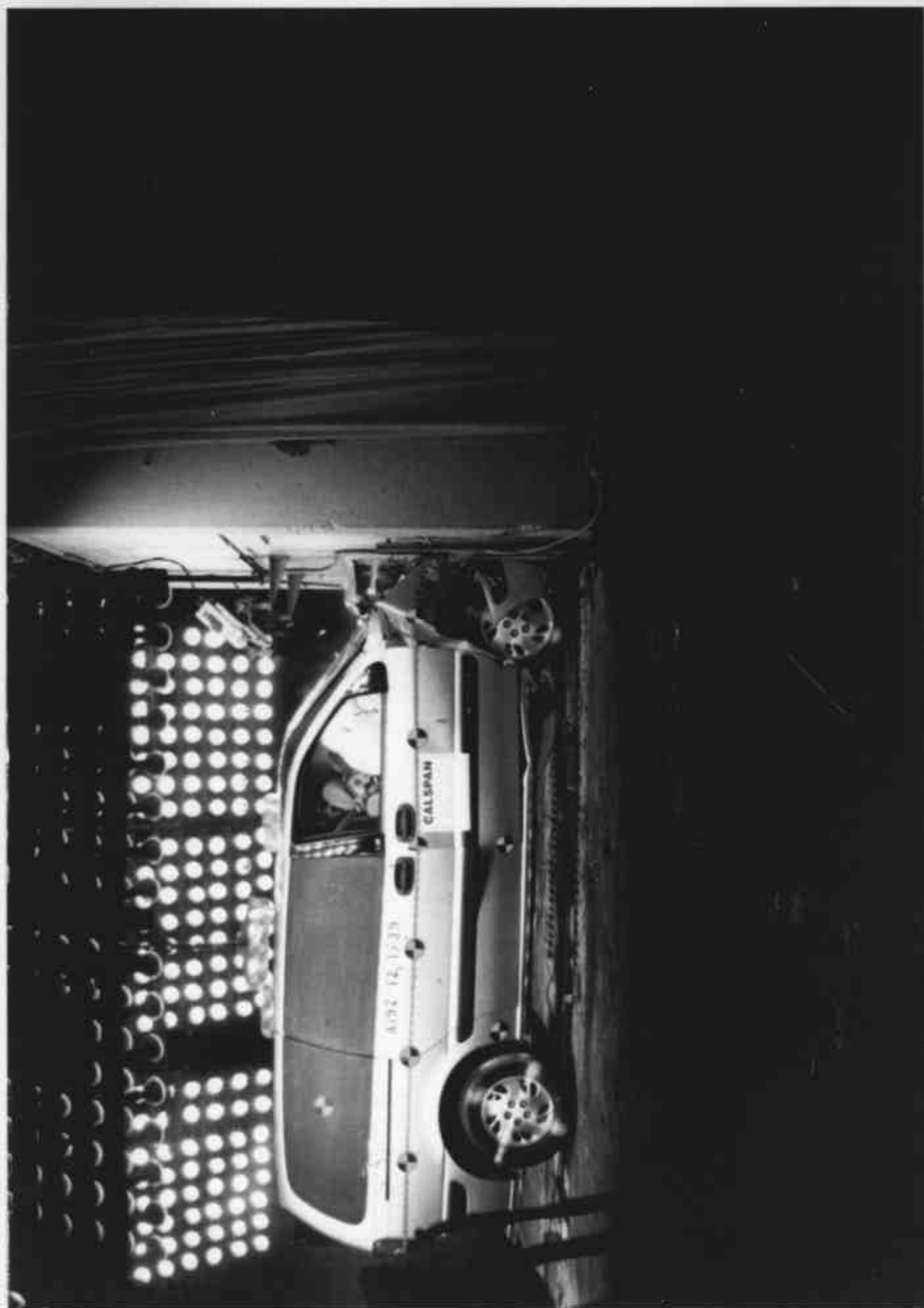


Figure A-39 IMPACT VIEW

Appendix B
DUMMY AND VEHICLE 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

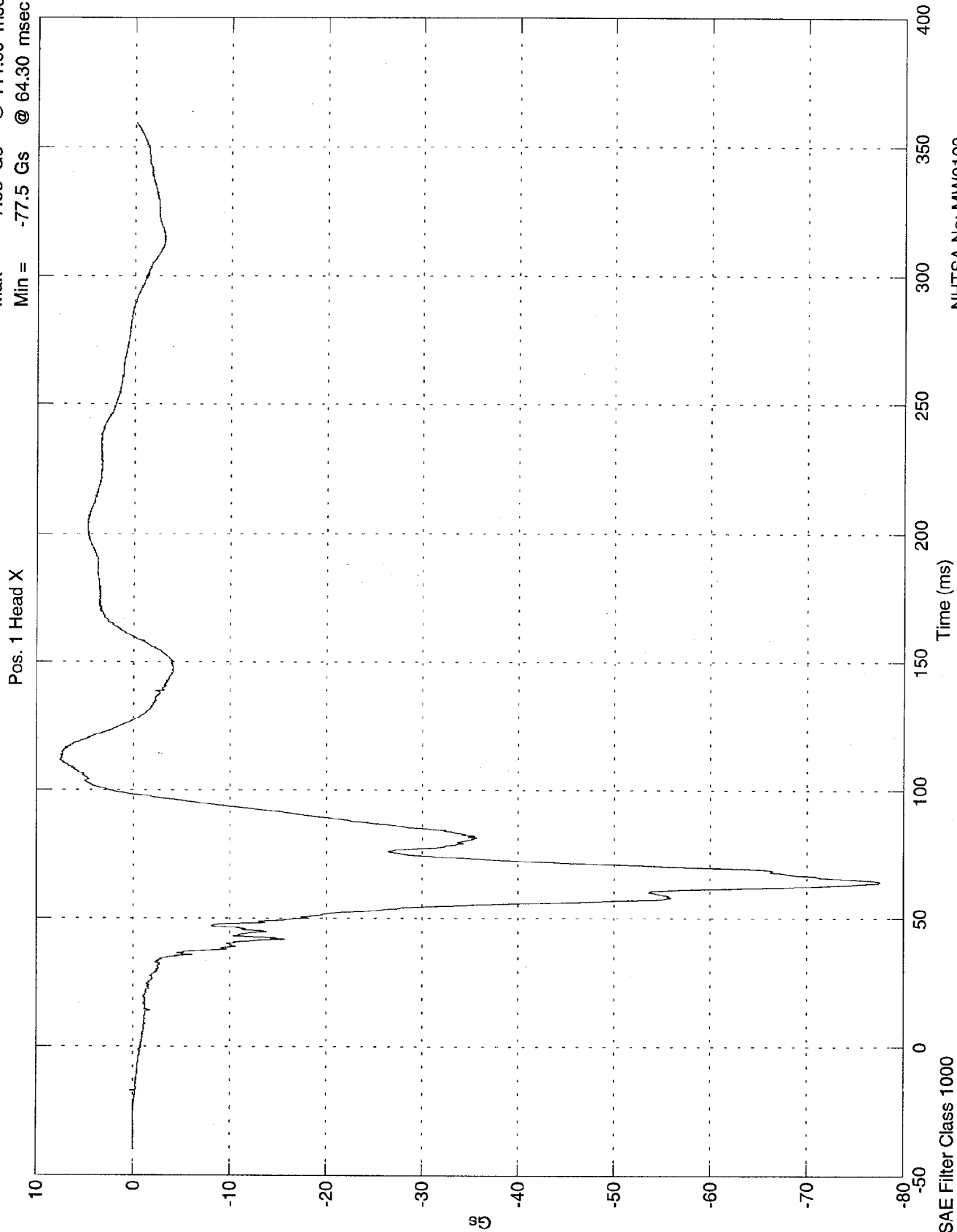
NHTSA TEST NO. MW0109

DUMMY DATA

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

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 7.63 Gs @ 111.80 msec
 Min = -77.5 Gs @ 64.30 msec

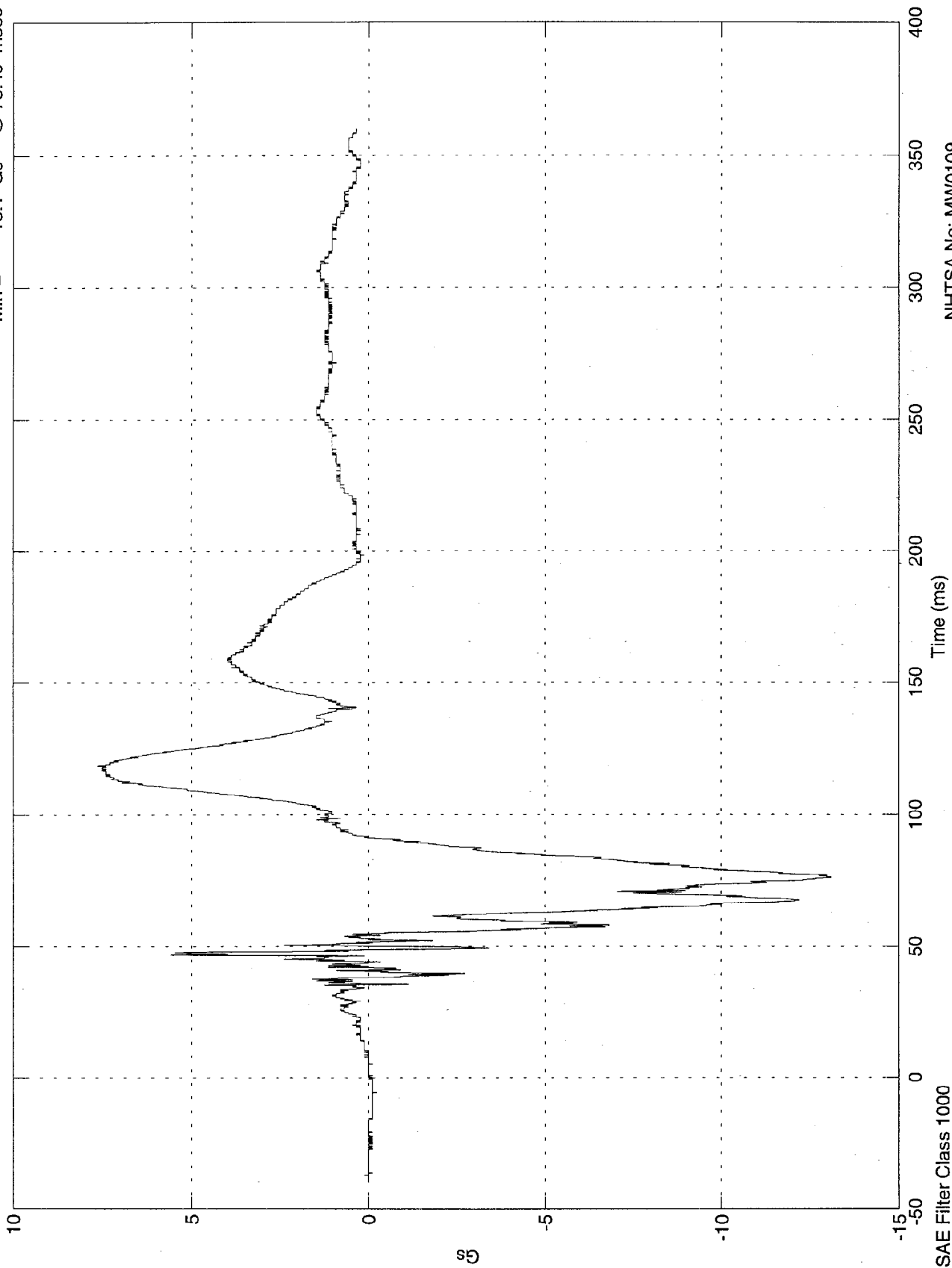


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 7.64 Gs @ 118.40 msec
 Min = -13.1 Gs @ 76.40 msec

Pos. 1 Head Y



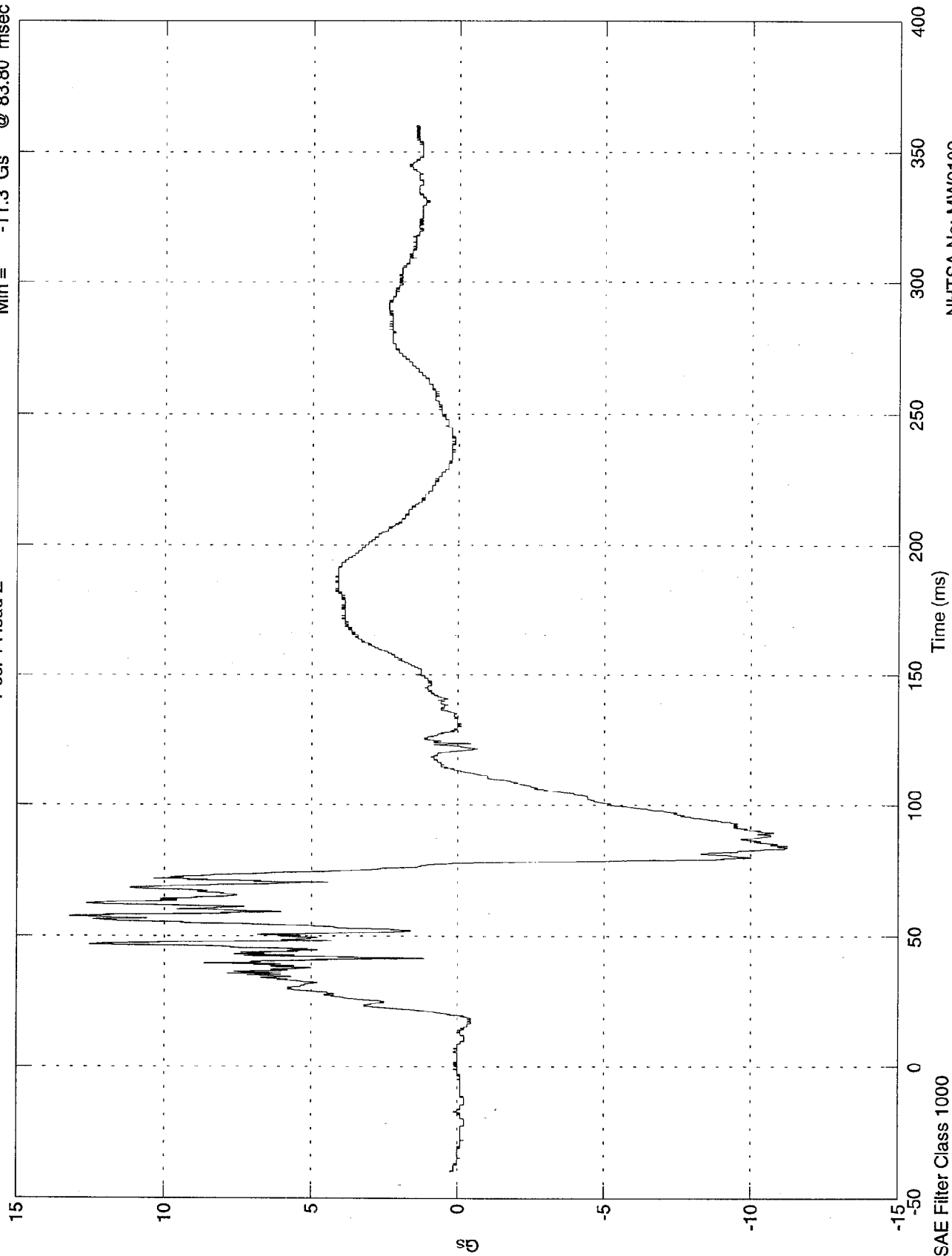
NHTSA No: MW0109
 Date: 08 Dec 1997

SAE Filter Class 1000

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 13.2 Gs @ 57.60 msec
 Min = -11.3 Gs @ 83.80 msec

Pos. 1 Head Z

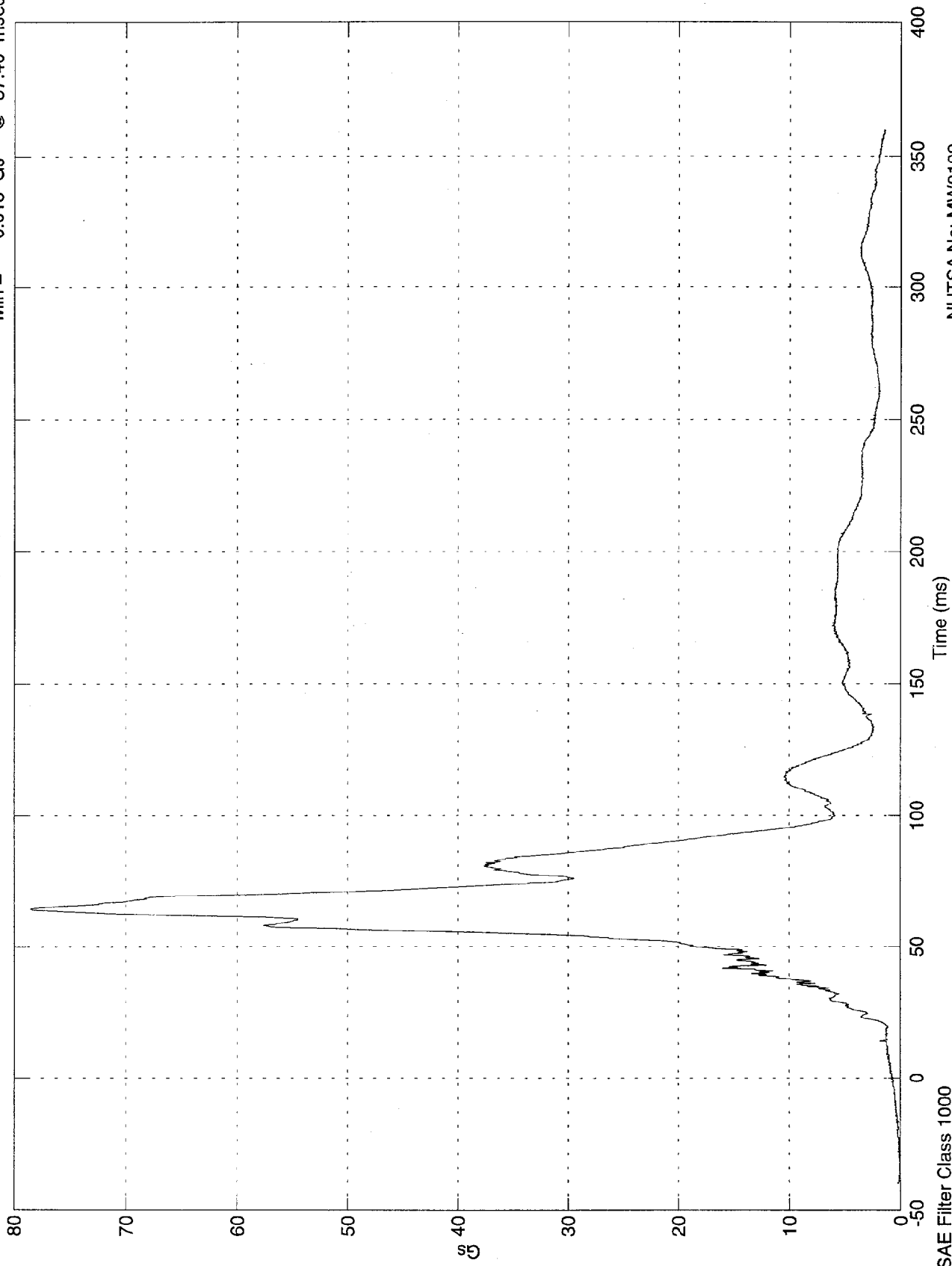


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Pos. 1 Head Resultant

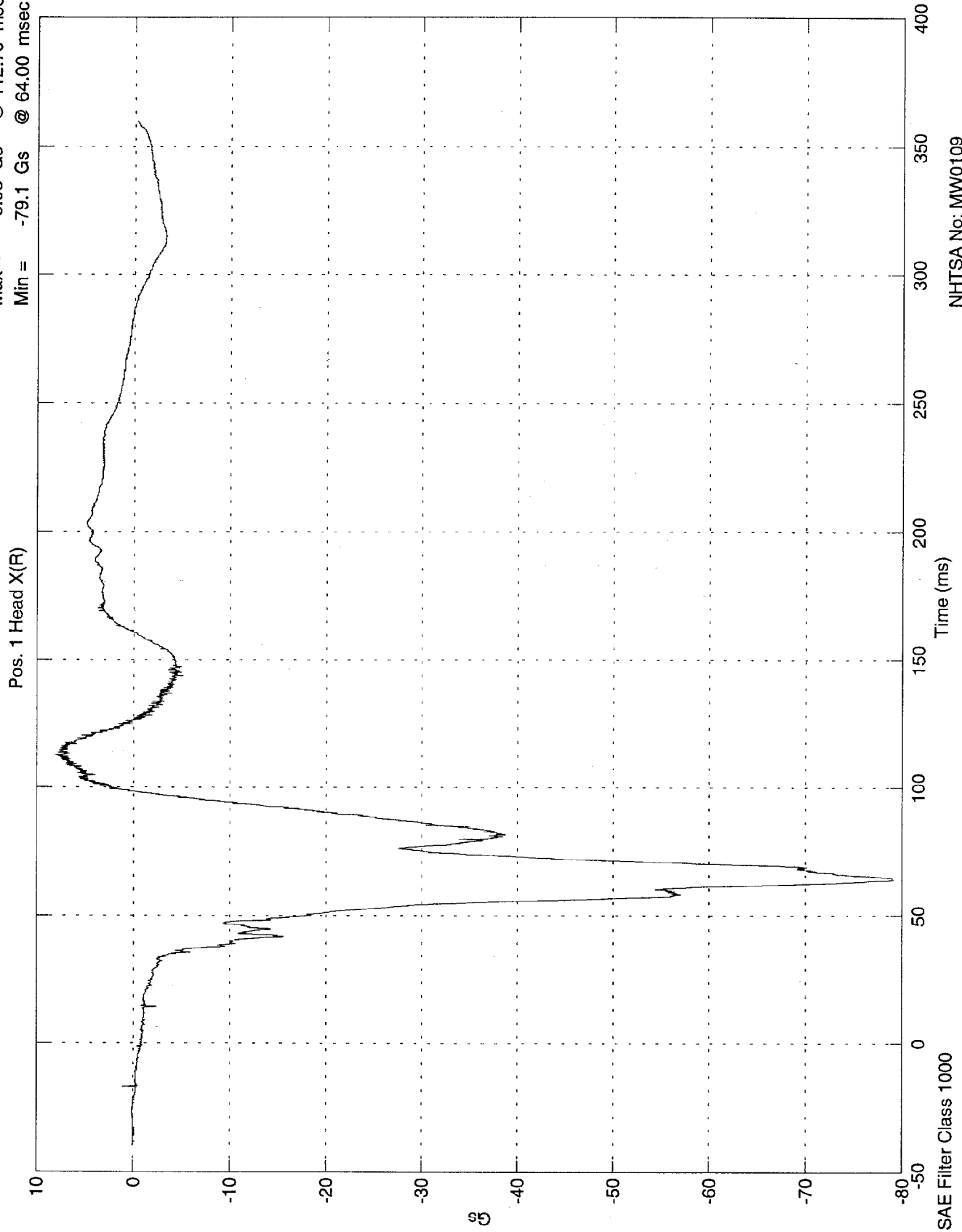
Max = 78.5 Gs @ 64.30 msec
Min = 0.015 Gs @ -37.40 msec



NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

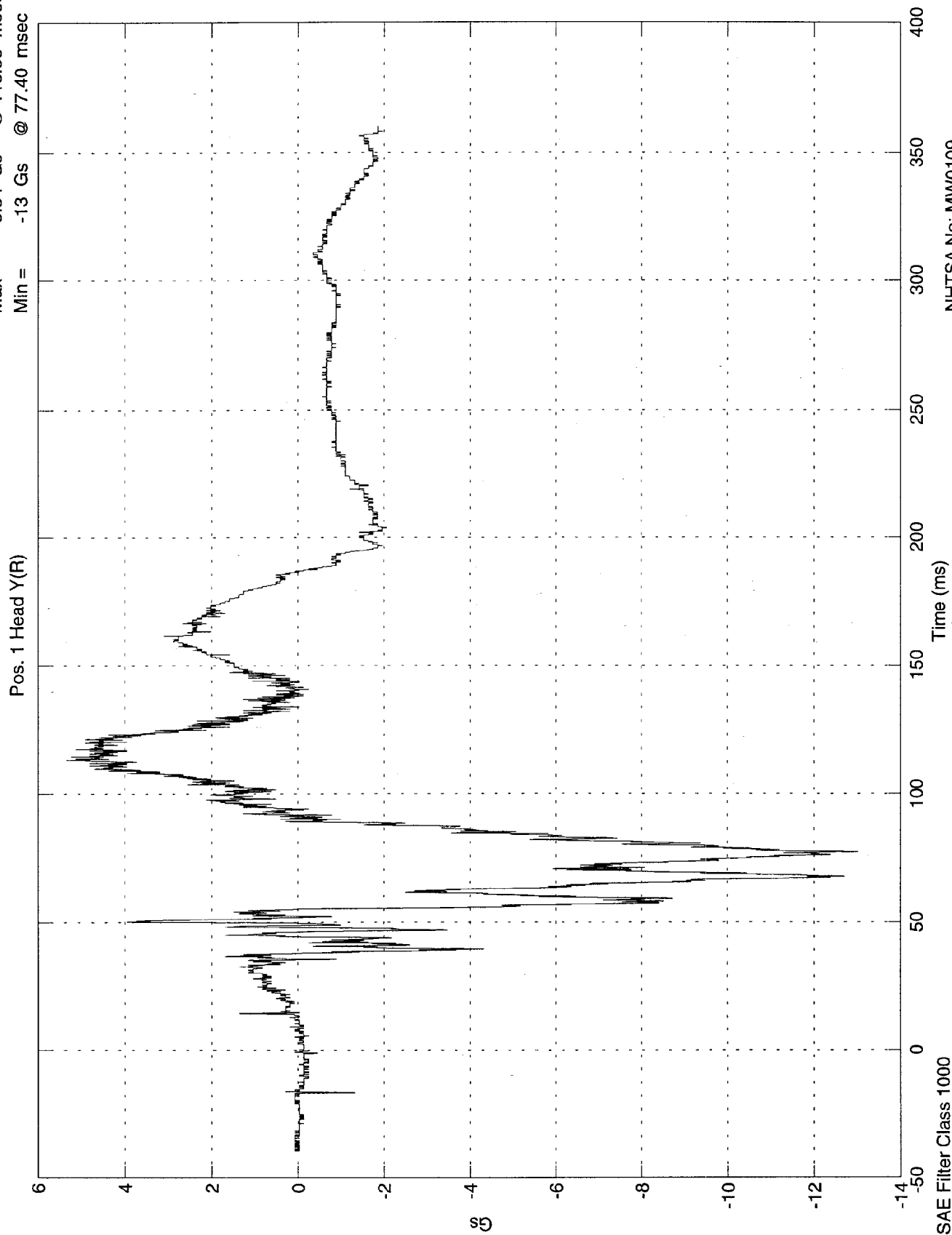
Max = 8.03 Gs @ 112.70 msec
Min = -79.1 Gs @ 64.00 msec



NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

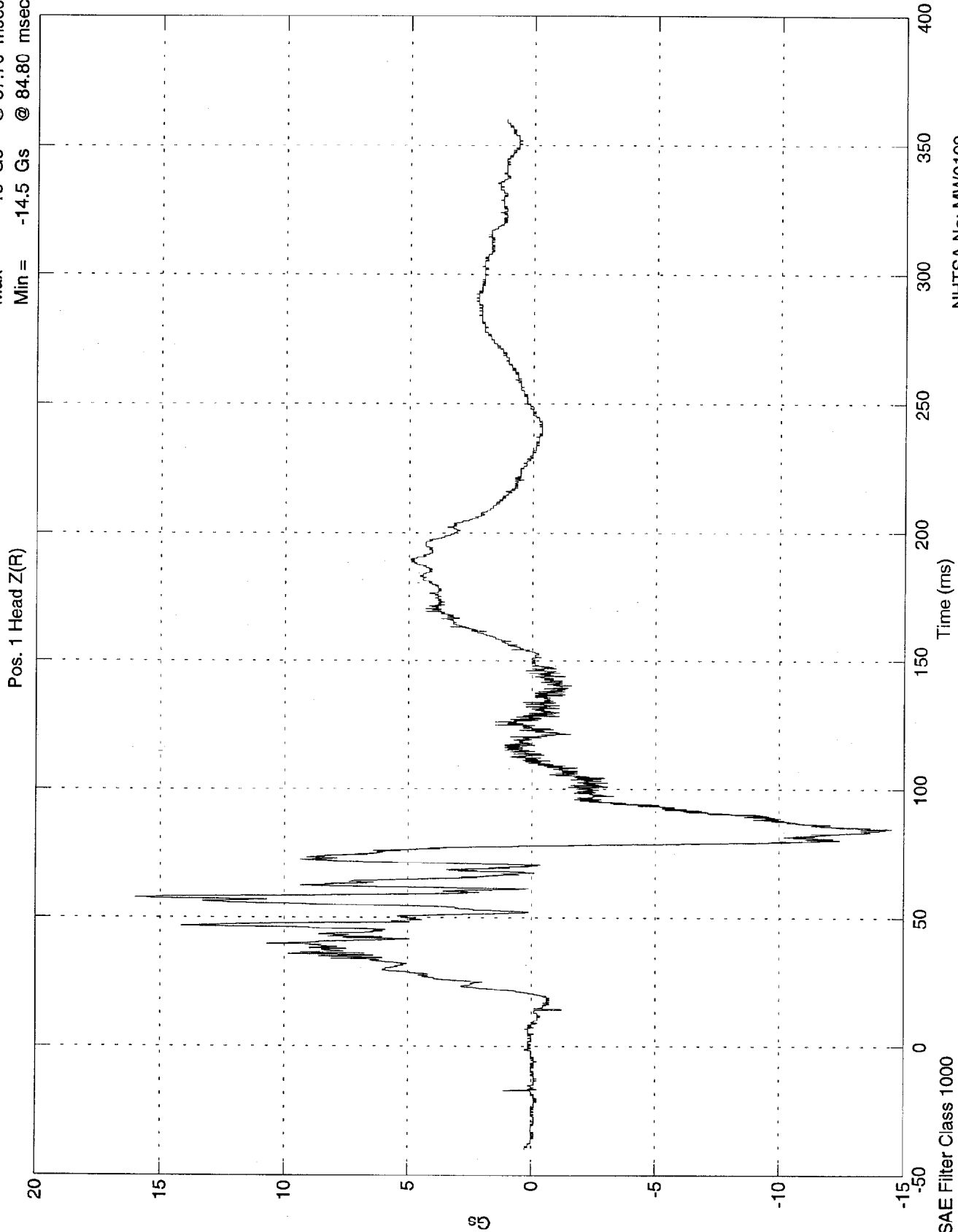
Max = 5.34 Gs @ 113.30 msec
 Min = -13 Gs @ 77.40 msec



NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 16 Gs @ 57.70 msec
 Min = -14.5 Gs @ 84.80 msec

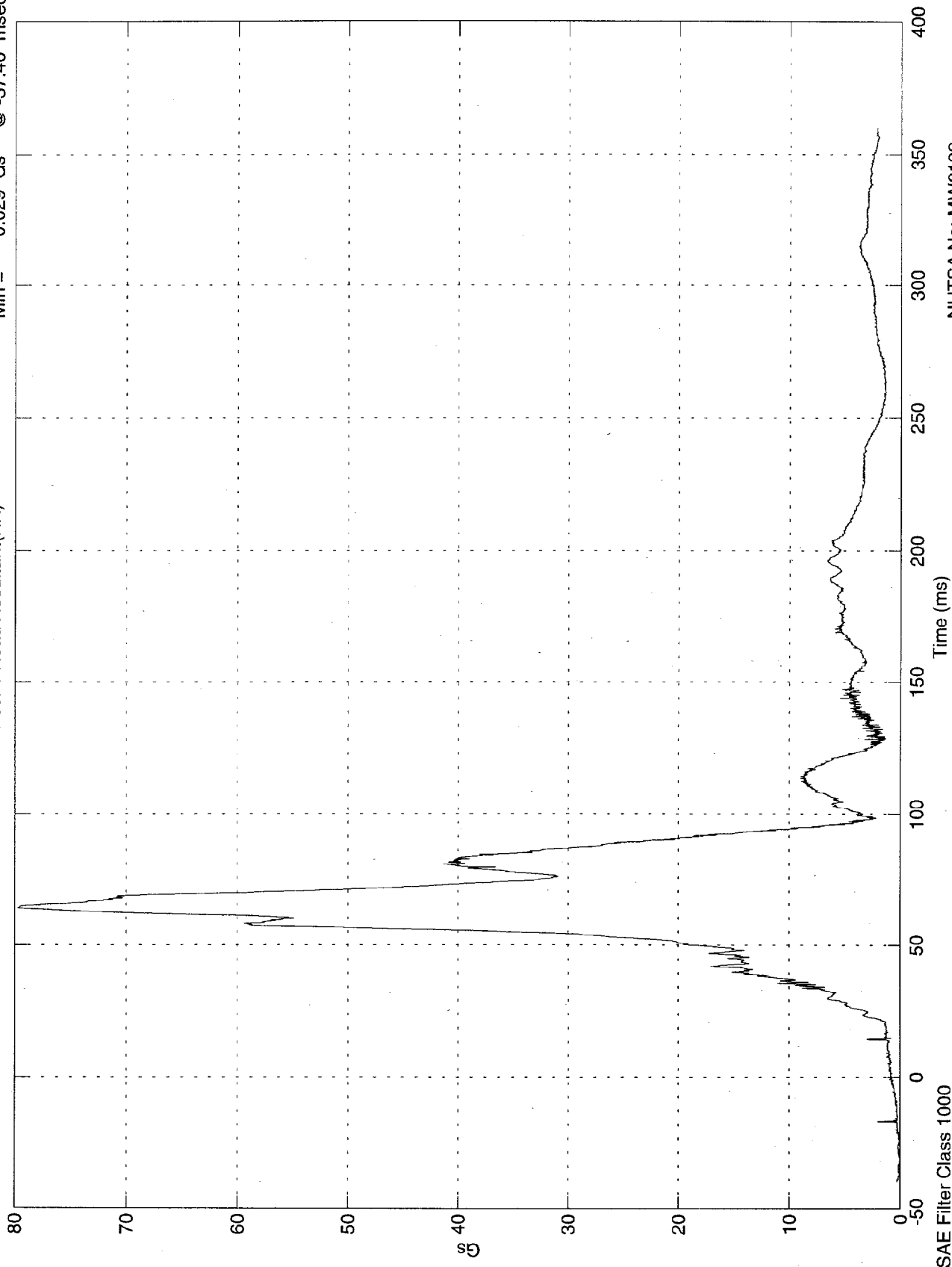


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 79.7 Gs @ 64.00 msec
 Min = 0.029 Gs @ -37.40 msec

Pos. 1 Head Resultant(RR)



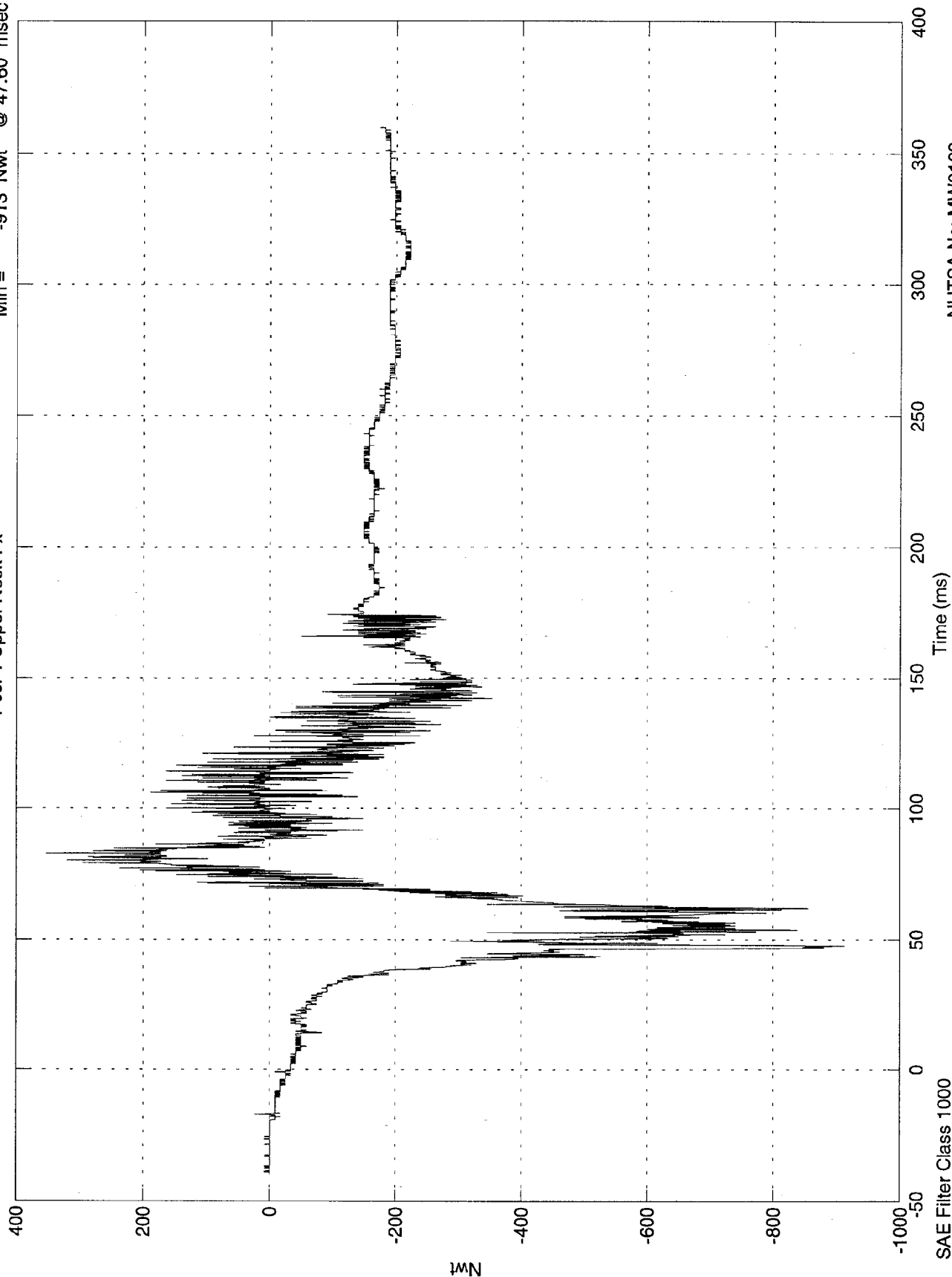
NHTSA No: MW0109
 Date: 08 Dec 1997

SAE Filter Class 1000

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 353 Nwt @ 83.00 msec
Min = -913 Nwt @ 47.60 msec

Pos. 1 Upper Neck Fx

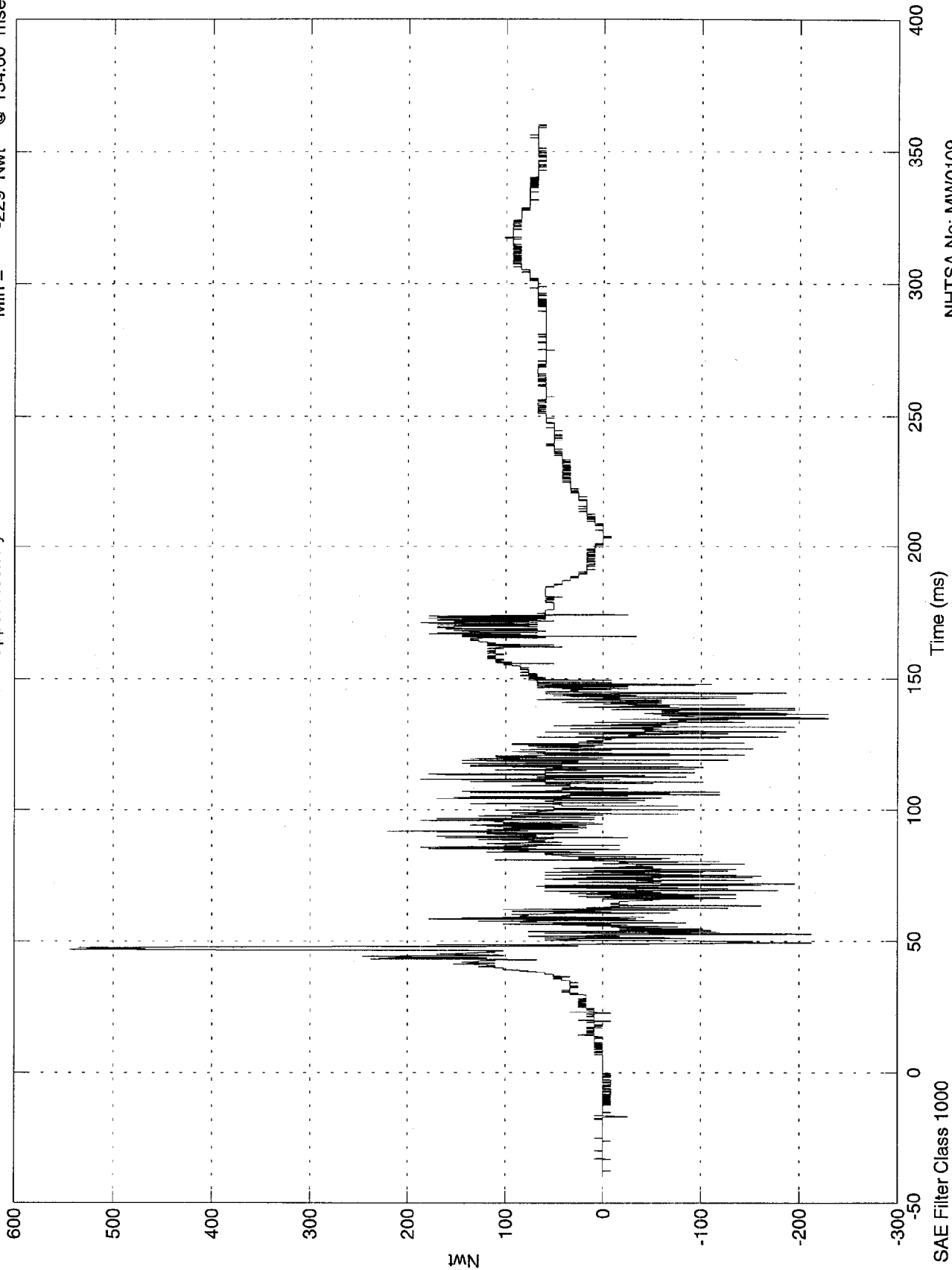


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Pos. 1 Upper Neck Fy

Max = 544 Nwt @ 46.70 msec
Min = -229 Nwt @ 134.60 msec

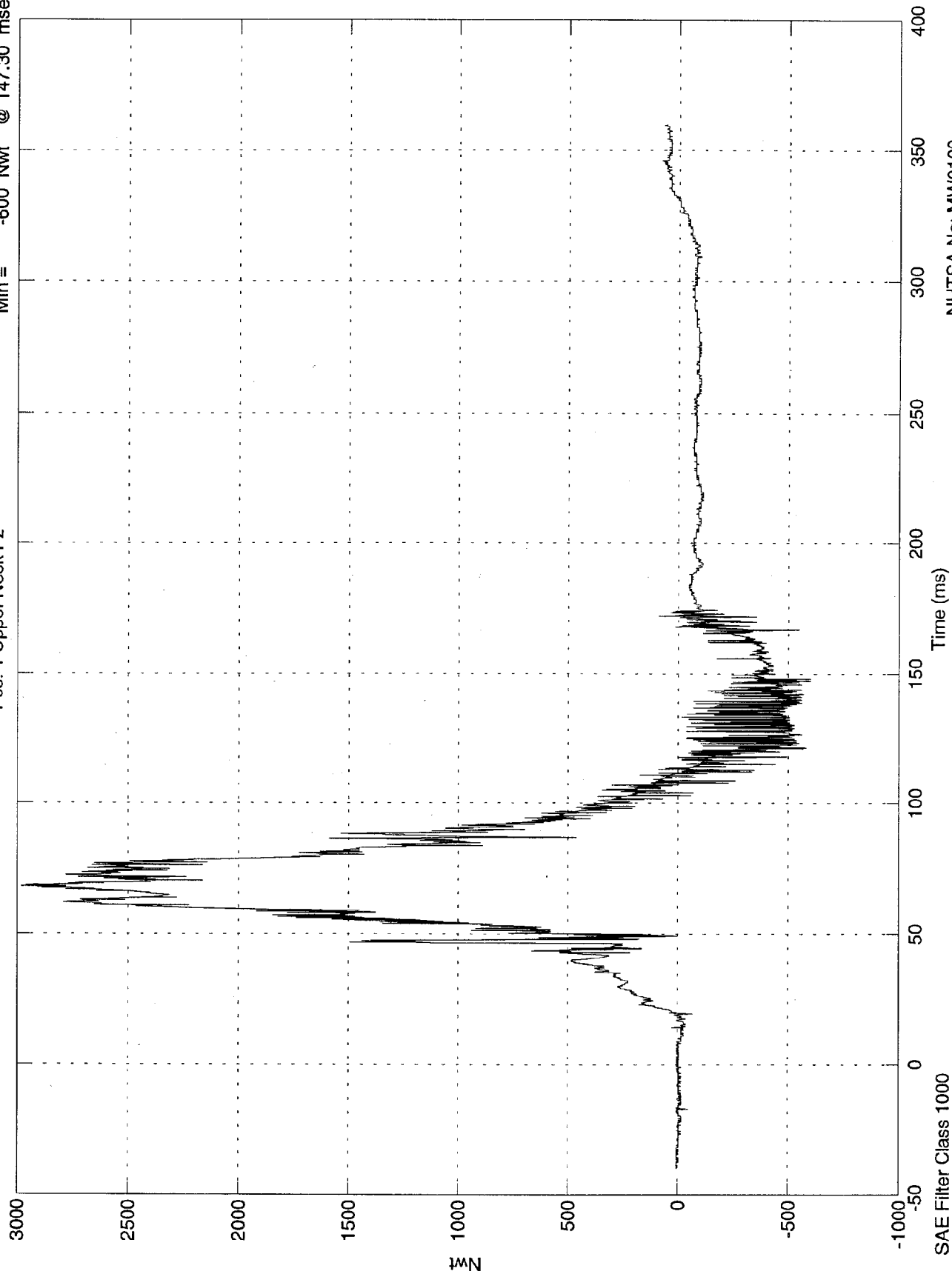


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 2.98e+003 Nwt @ 68.00 msec
 Min = -600 Nwt @ 147.30 msec

Pos. 1 Upper Neck Fz

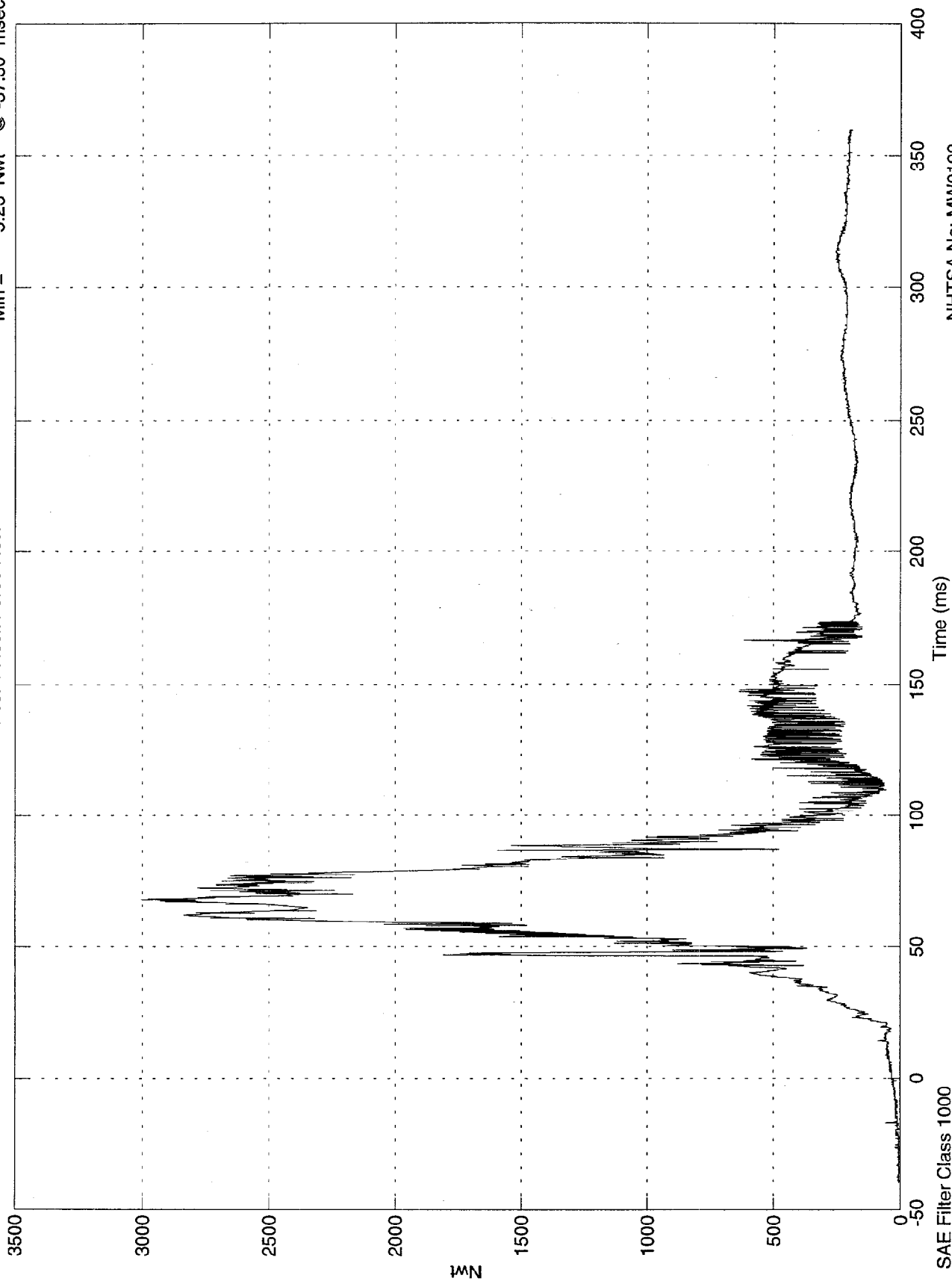


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 3e+003 Nwt @ 68.00 msec
Min = 5.23 Nwt @ -37.30 msec

Pos. 1 Neck Force Res.



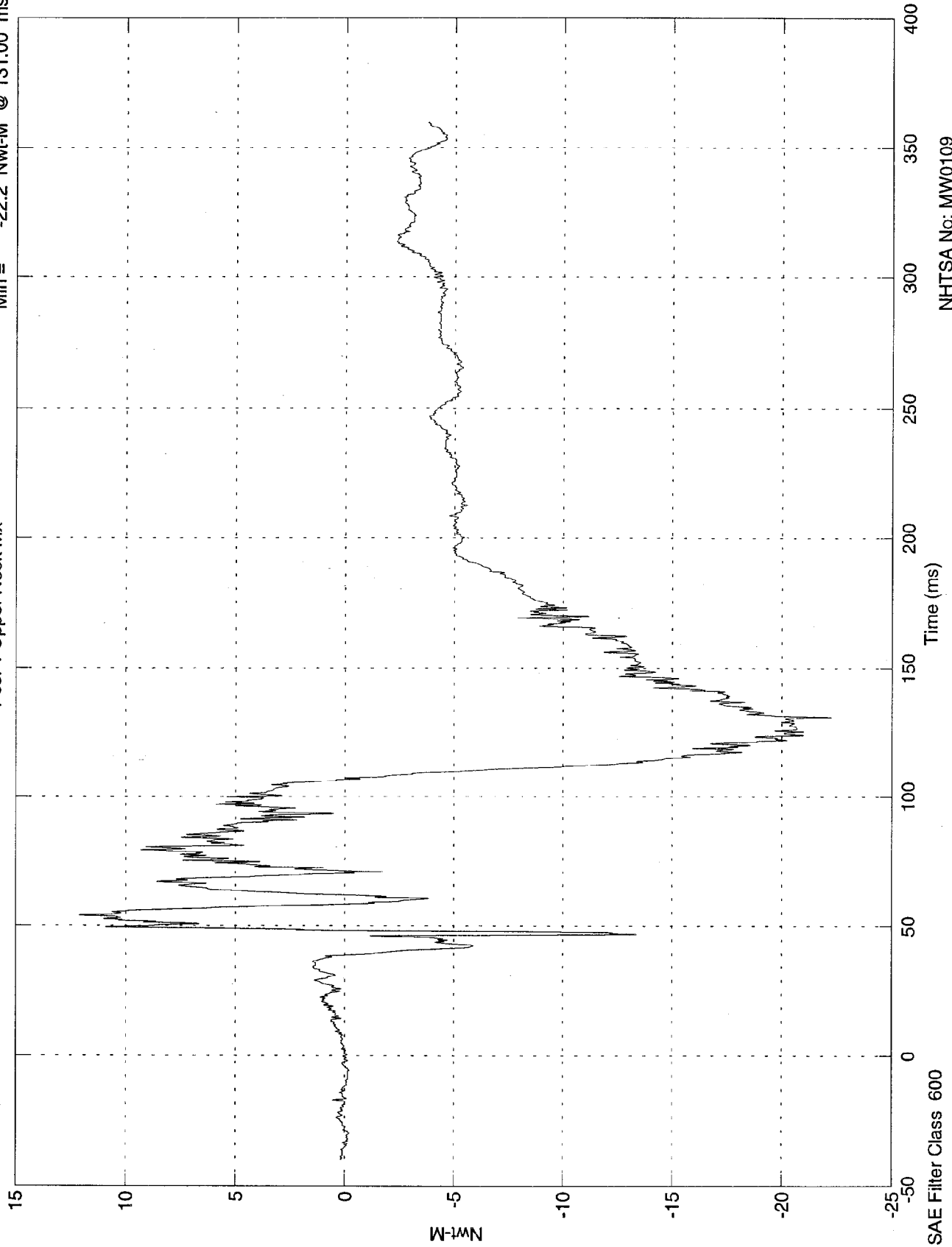
NHTSA No: MW0109
Date: 08 Dec 1997

SAE Filter Class 1000

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 12.1 Nwt-M @ 53.90 msec
Min = -22.2 Nwt-M @ 131.00 msec

Pos. 1 Upper Neck Mx

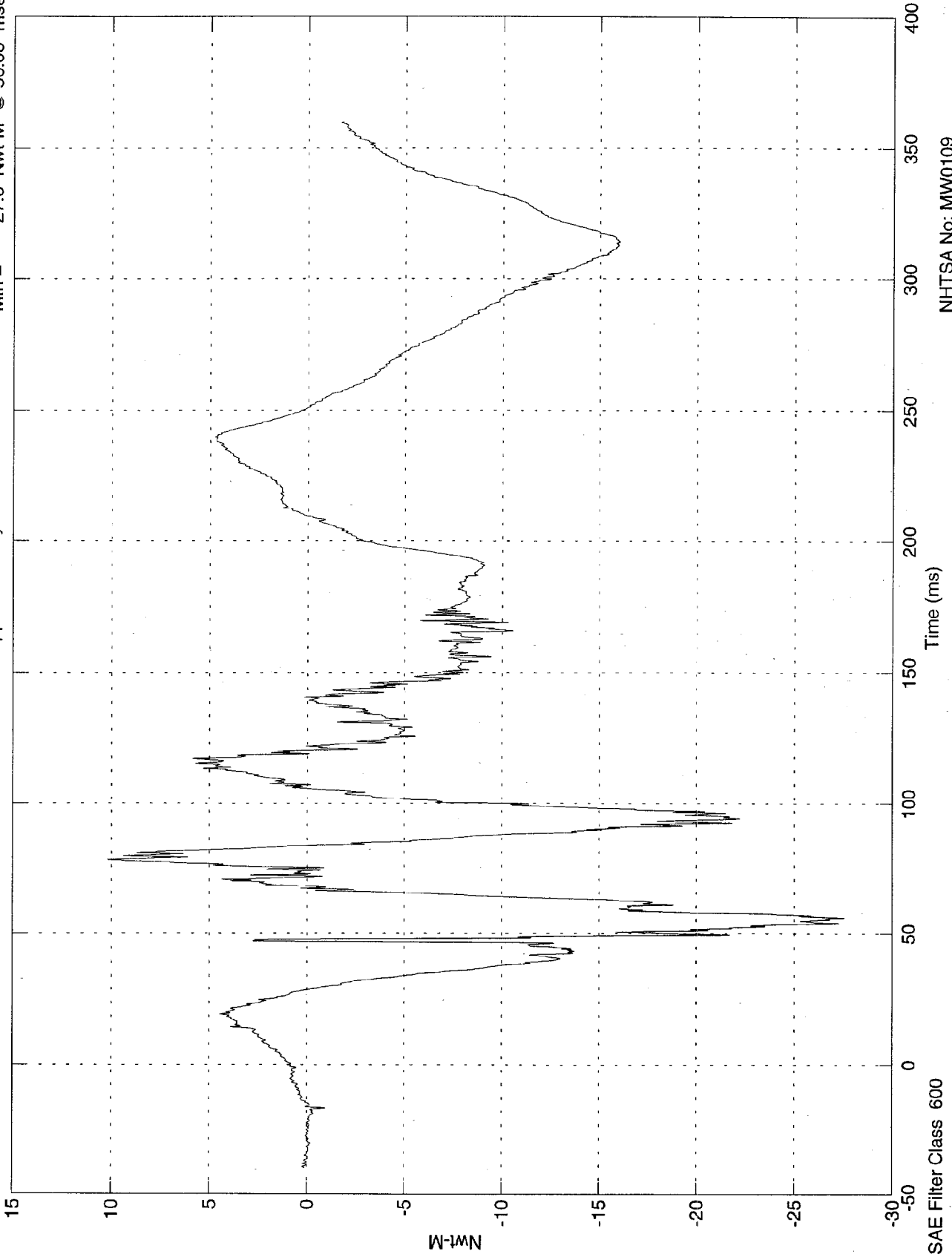


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Pos. 1 Upper Neck My

Max = 10.2 Nwt-M @ 78.40 msec
Min = -27.6 Nwt-M @ 56.00 msec

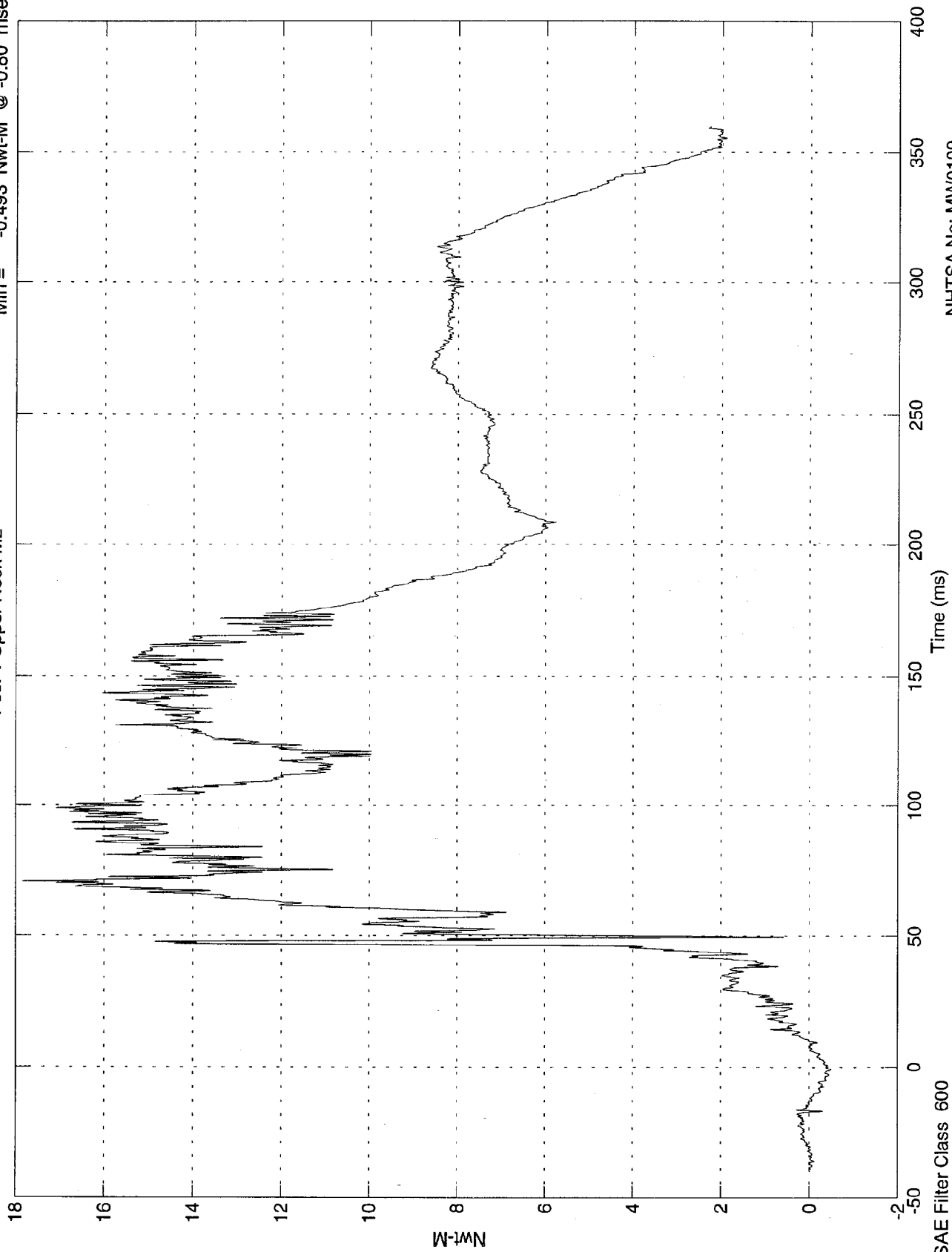


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 17.8 Nwt-M @ 70.90 msec
 Min = -0.493 Nwt-M @ -0.80 msec

Pos. 1 Upper Neck Mz



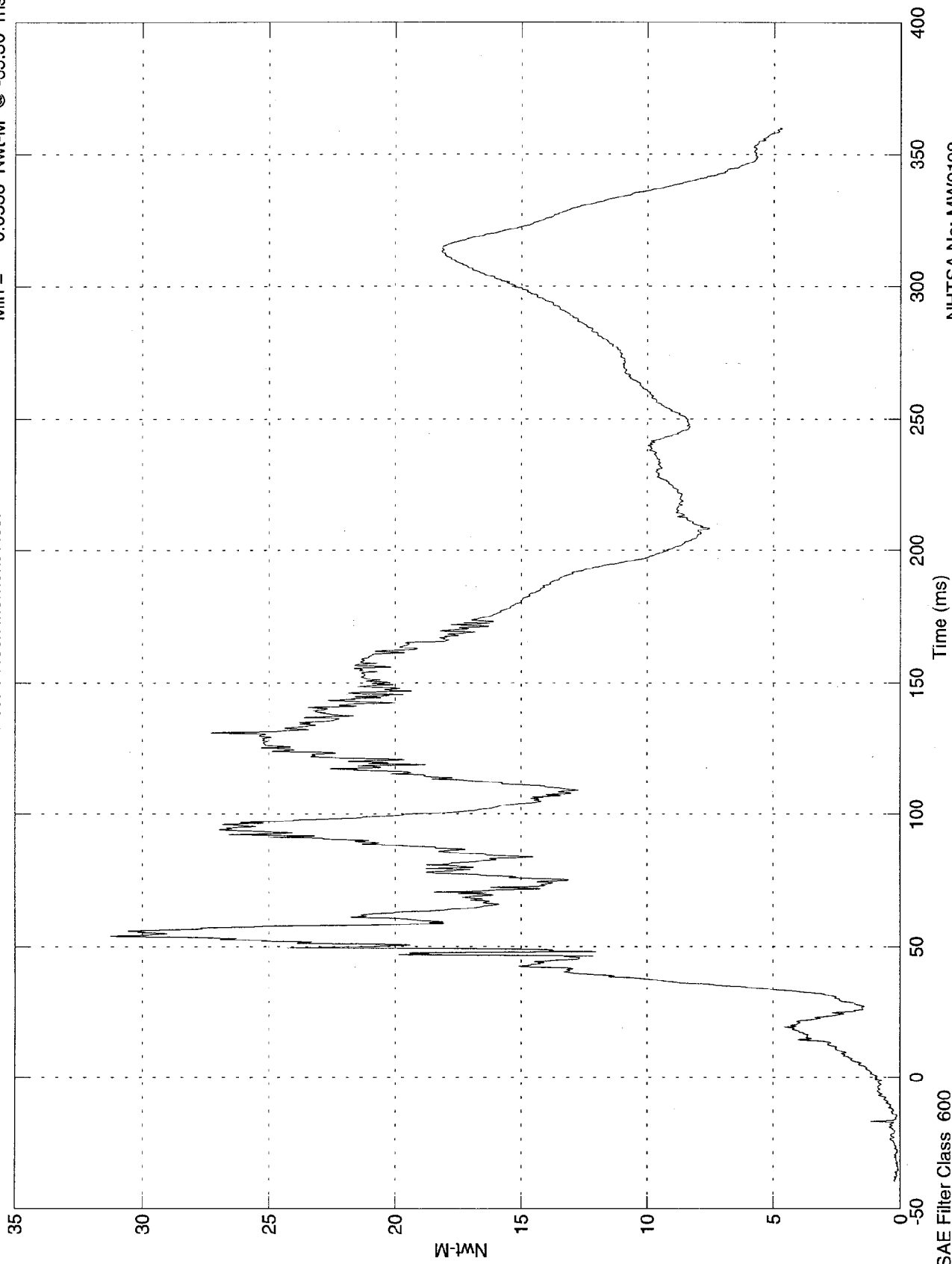
NHTSA No: MW0109
 Date: 08 Dec 1997

SAE Filter Class 600

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 31.3 Nwt-M @ 53.90 msec
 Min = 0.0538 Nwt-M @ -35.30 msec

Pos. 1 Neck Moment Res.



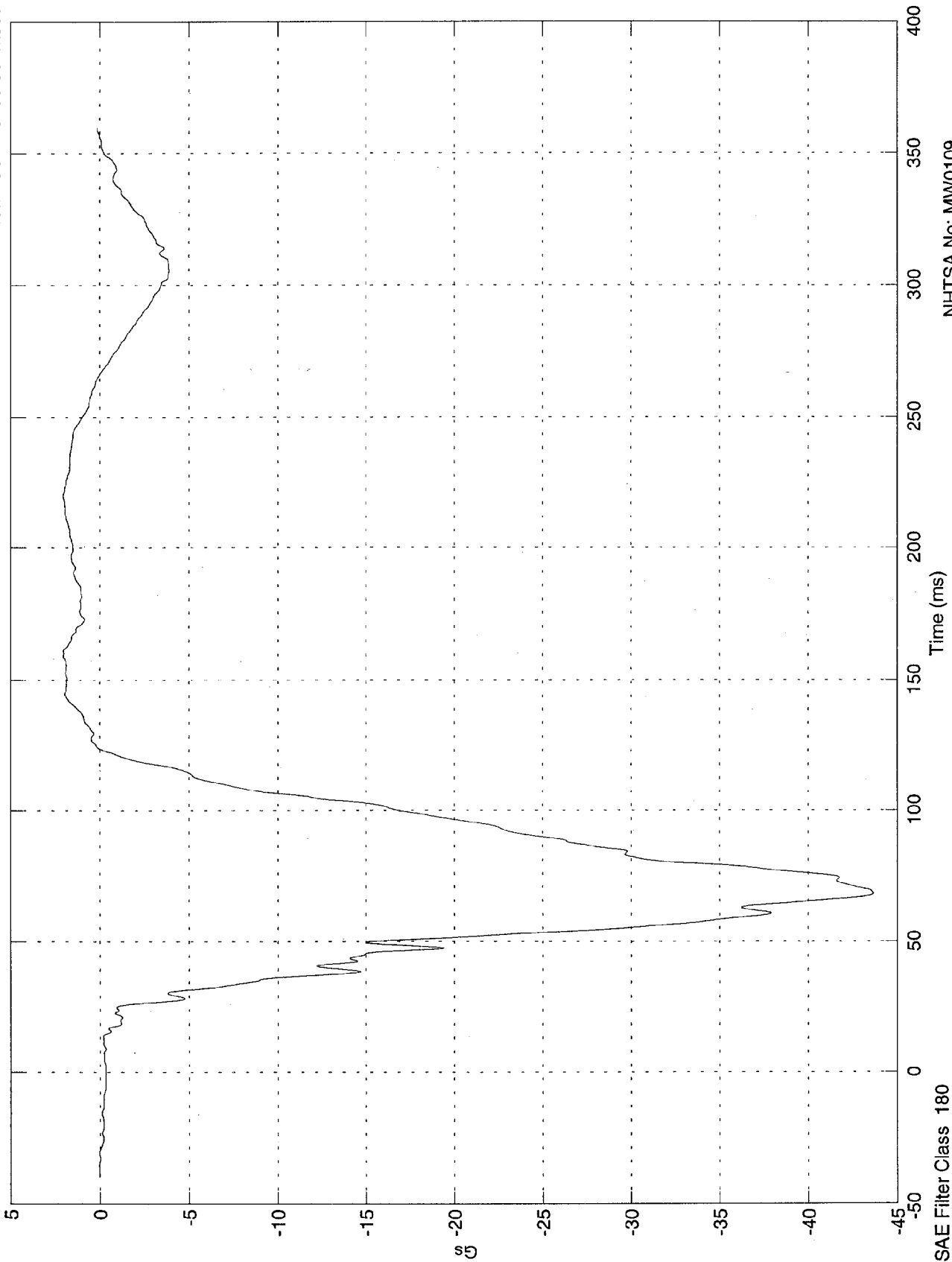
NHTSA No: MW0109
 Date: 08 Dec 1997

SAE Filter Class 600

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 2.09 Gs @ 219.70 msec
Min = -43.7 Gs @ 68.00 msec

Pos. 1 Chest X

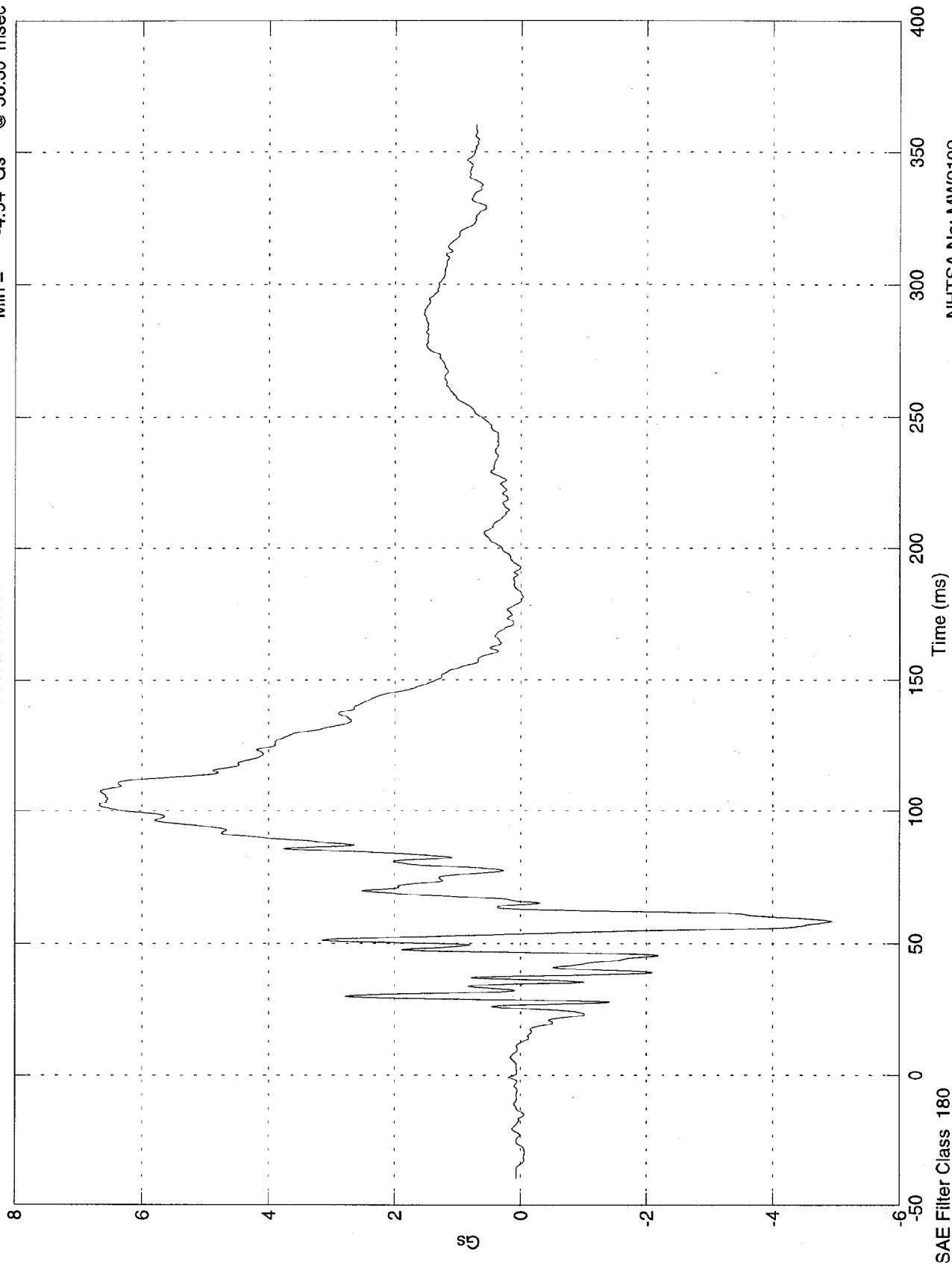


NHTSA No: MW0109
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NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 6.67 Gs @ 102.60 msec
Min = -4.94 Gs @ 58.30 msec

Pos. 1 Chest Y



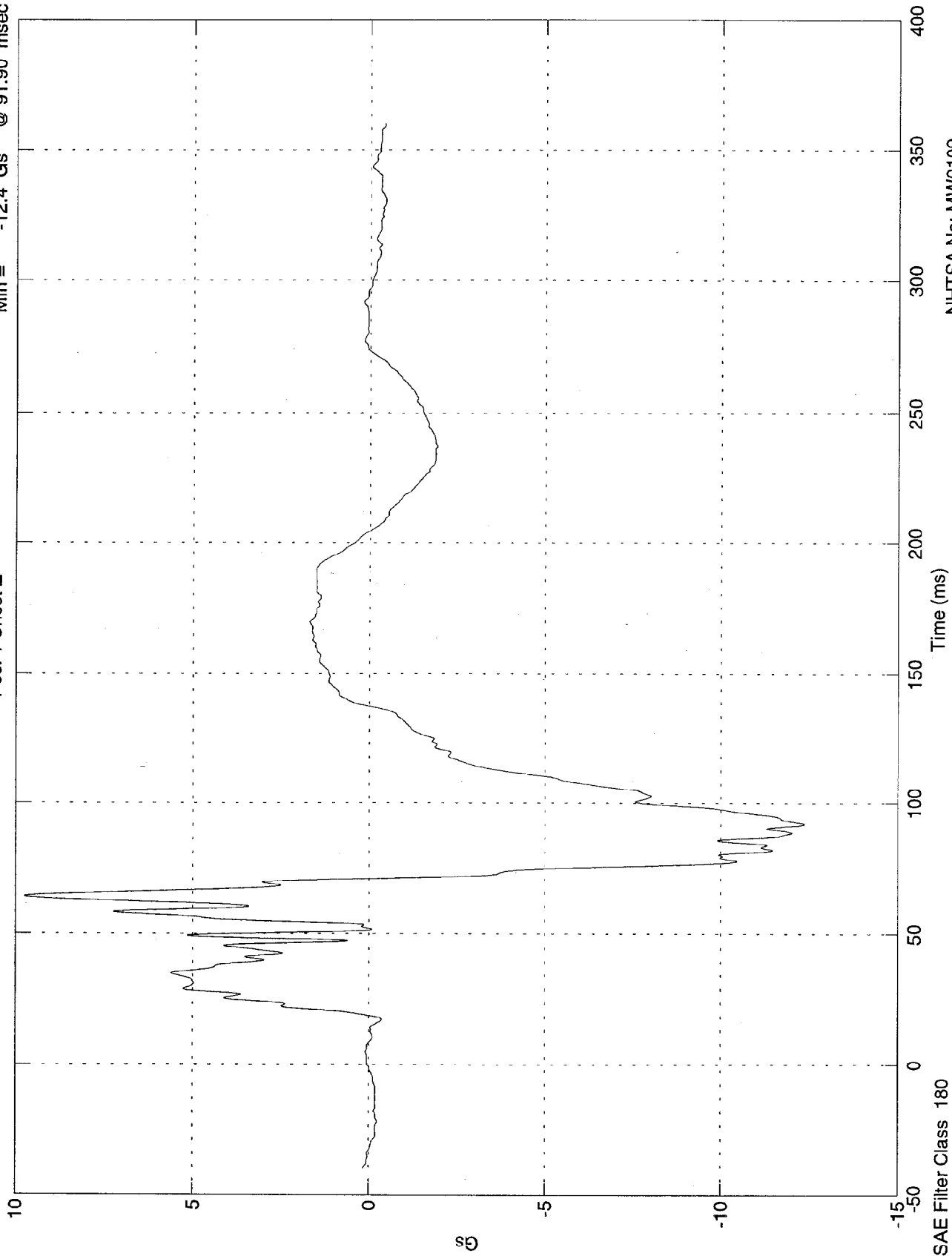
SAE Filter Class 180

NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 9.75 Gs @ 64.10 msec
Min = -12.4 Gs @ 91.90 msec

Pos. 1 Chest Z

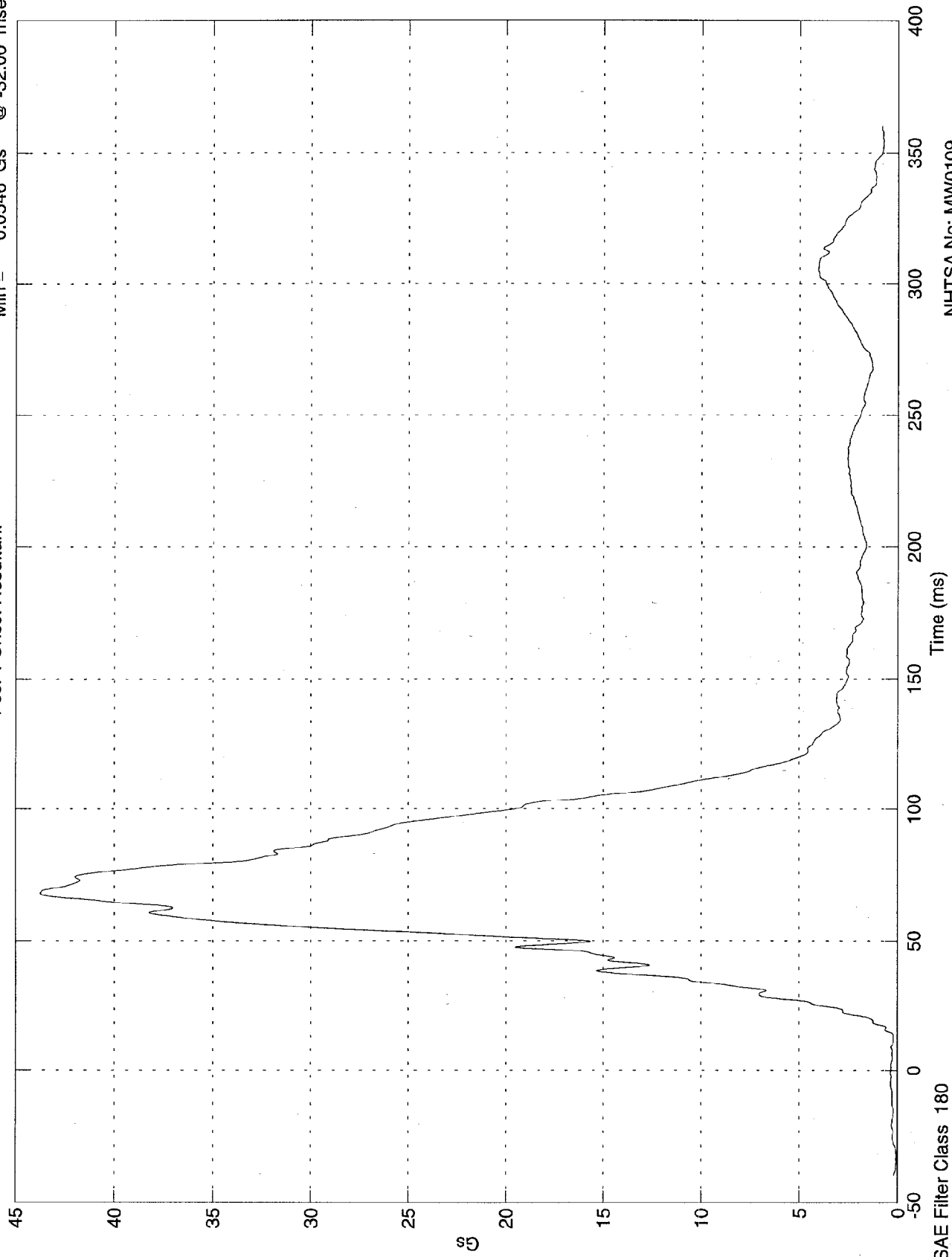


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 43.8 Gs @ 68.00 msec
Min = 0.0546 Gs @ -32.00 msec

Pos. 1 Chest Resultant

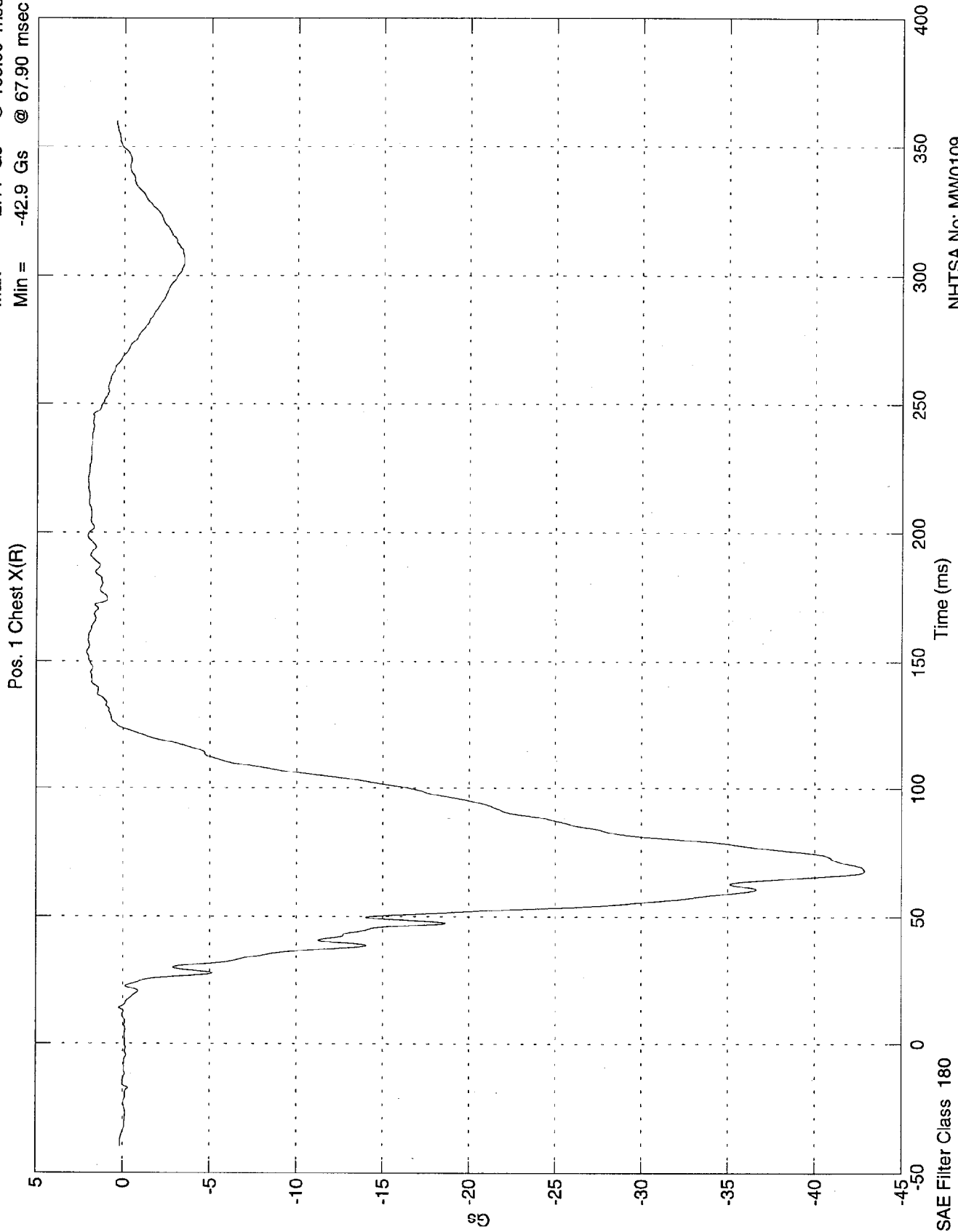


NHTSA No: MW0109
Date: 08 Dec 1997

SAE Filter Class 180

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 2.11 Gs @ 153.50 msec
Min = -42.9 Gs @ 67.90 msec

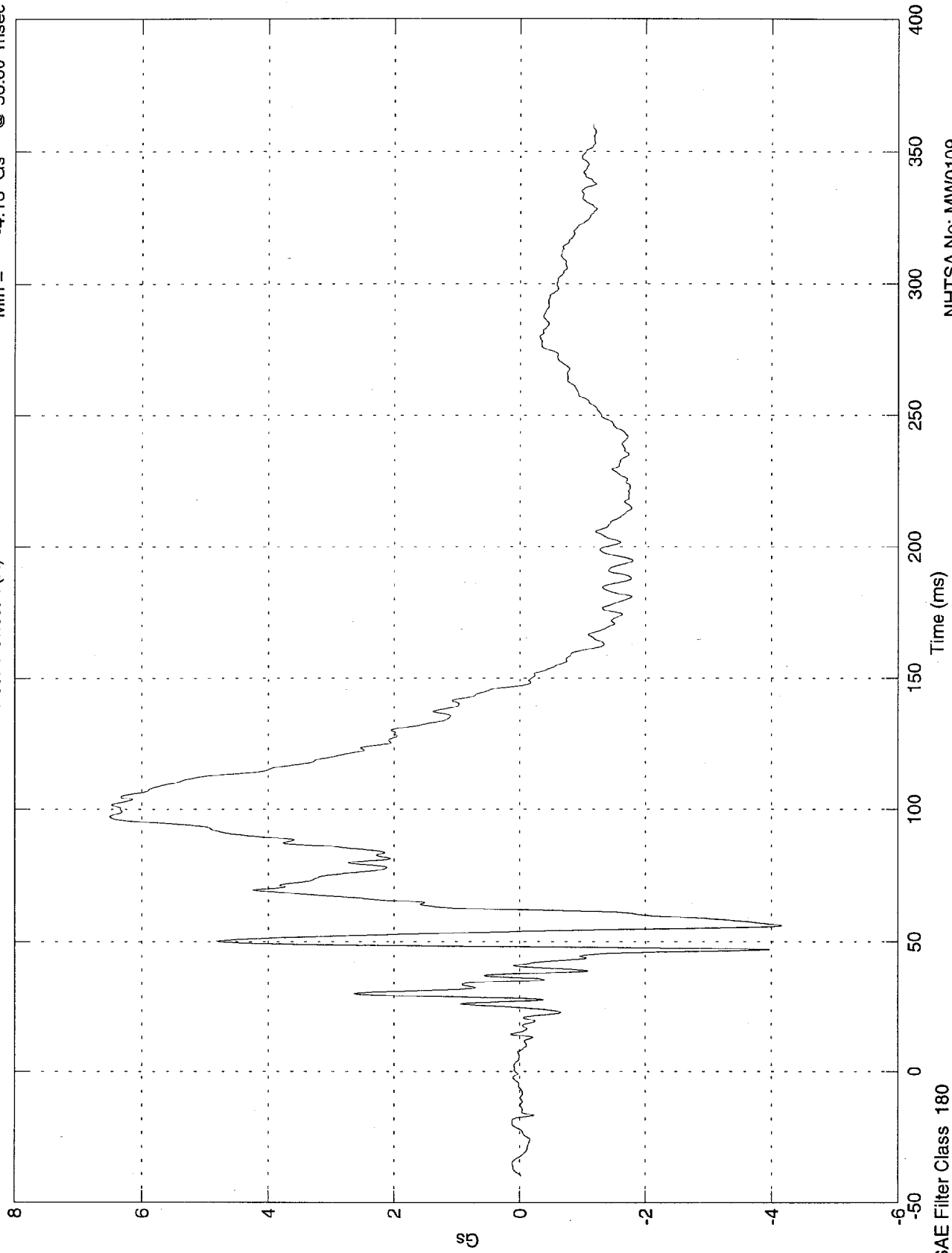


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 6.51 Gs @ 97.20 msec
 Min = -4.16 Gs @ 56.00 msec

Pos. 1 Chest Y(R)



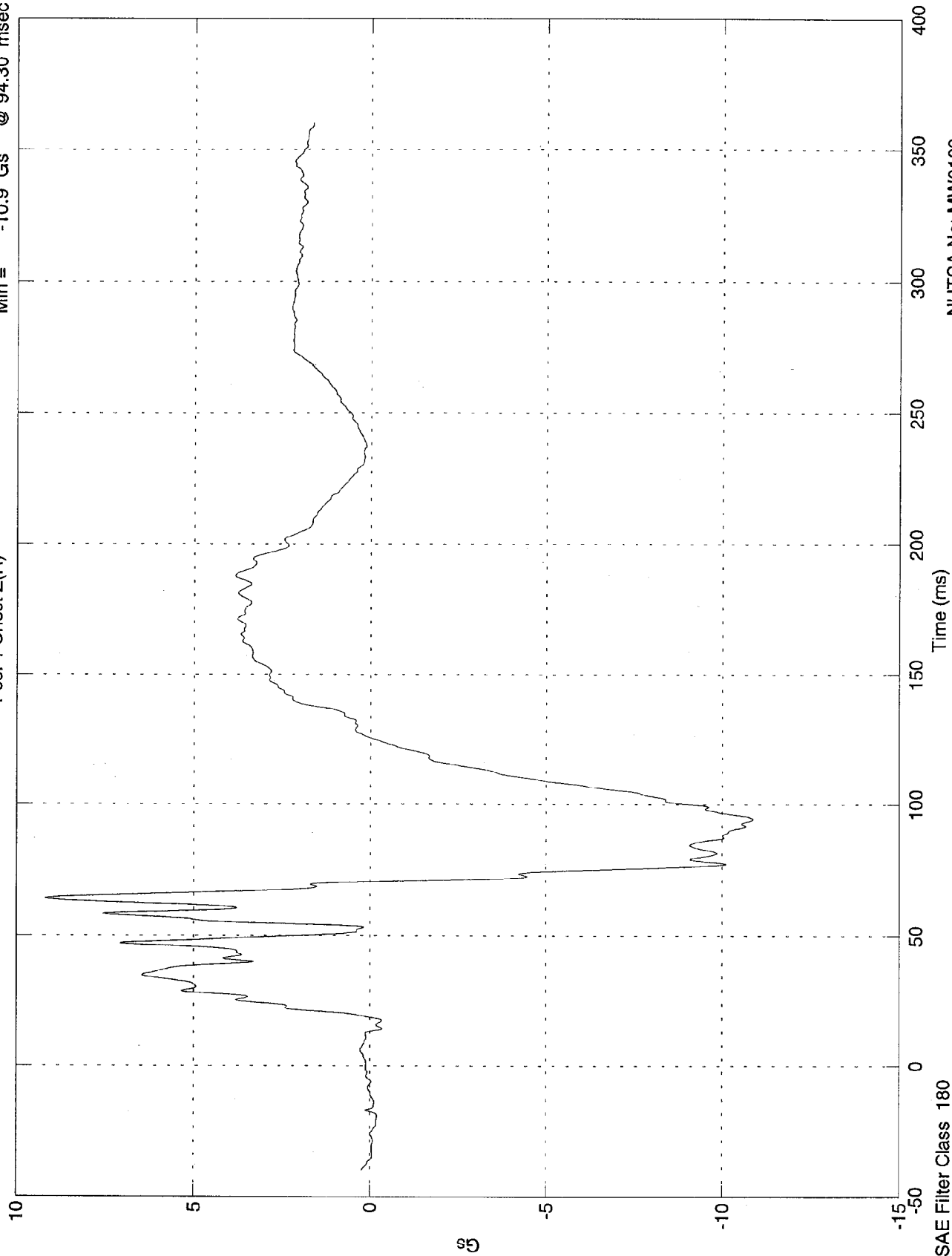
SAE Filter Class 180

NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

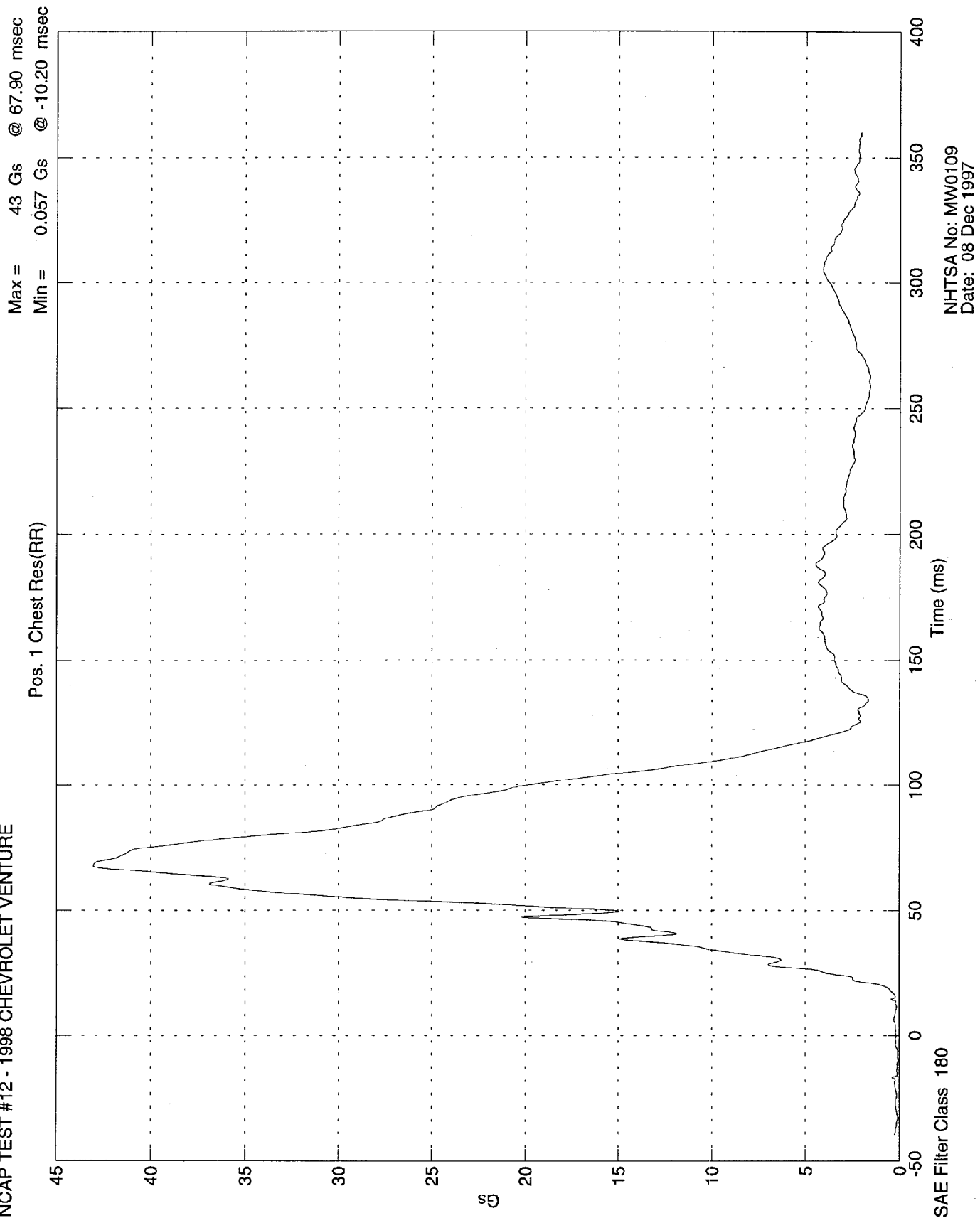
Max = 9.19 Gs @ 64.00 msec
 Min = -10.9 Gs @ 94.30 msec

Pos. 1 Chest Z(R)



NHTSA No: MW0109
 Date: 08 Dec 1997

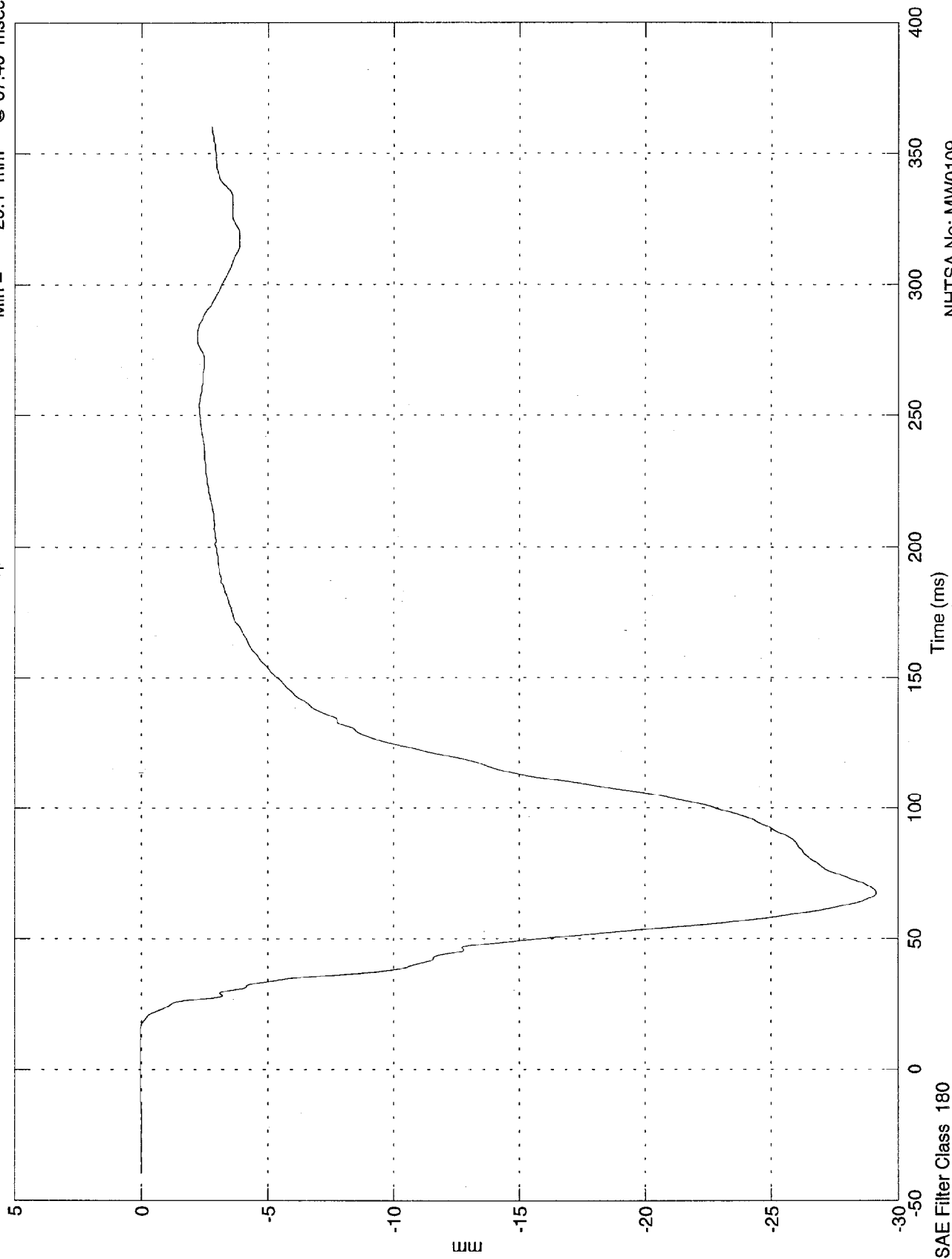
NCAP TEST #12 - 1998 CHEVROLET VENTURE



NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 0.0434 mm @ -4.90 msec
 Min = -29.1 mm @ 67.40 msec

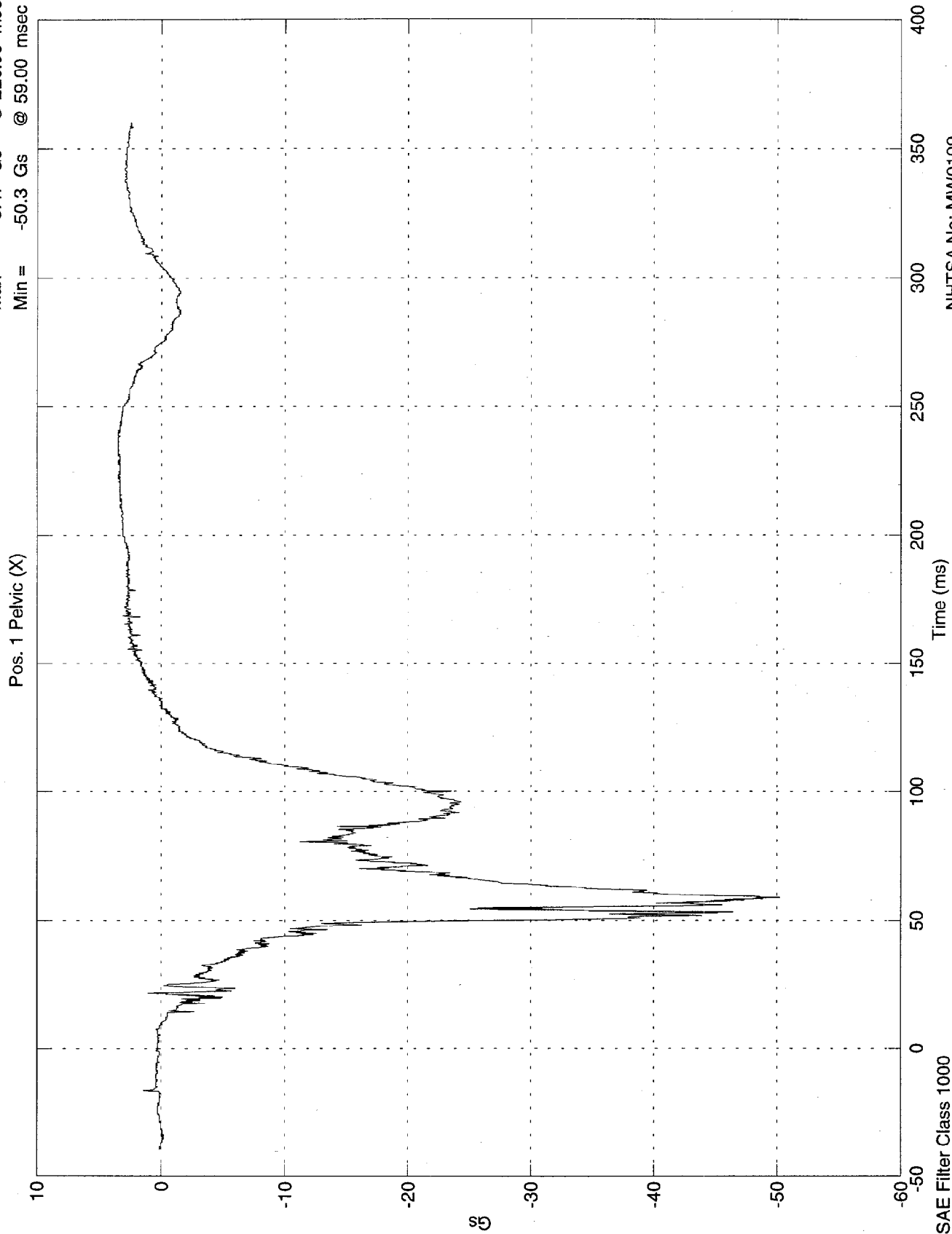
Pos. 1 Chest Disp.



NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 3.47 Gs @ 220.90 msec
 Min = -50.3 Gs @ 59.00 msec

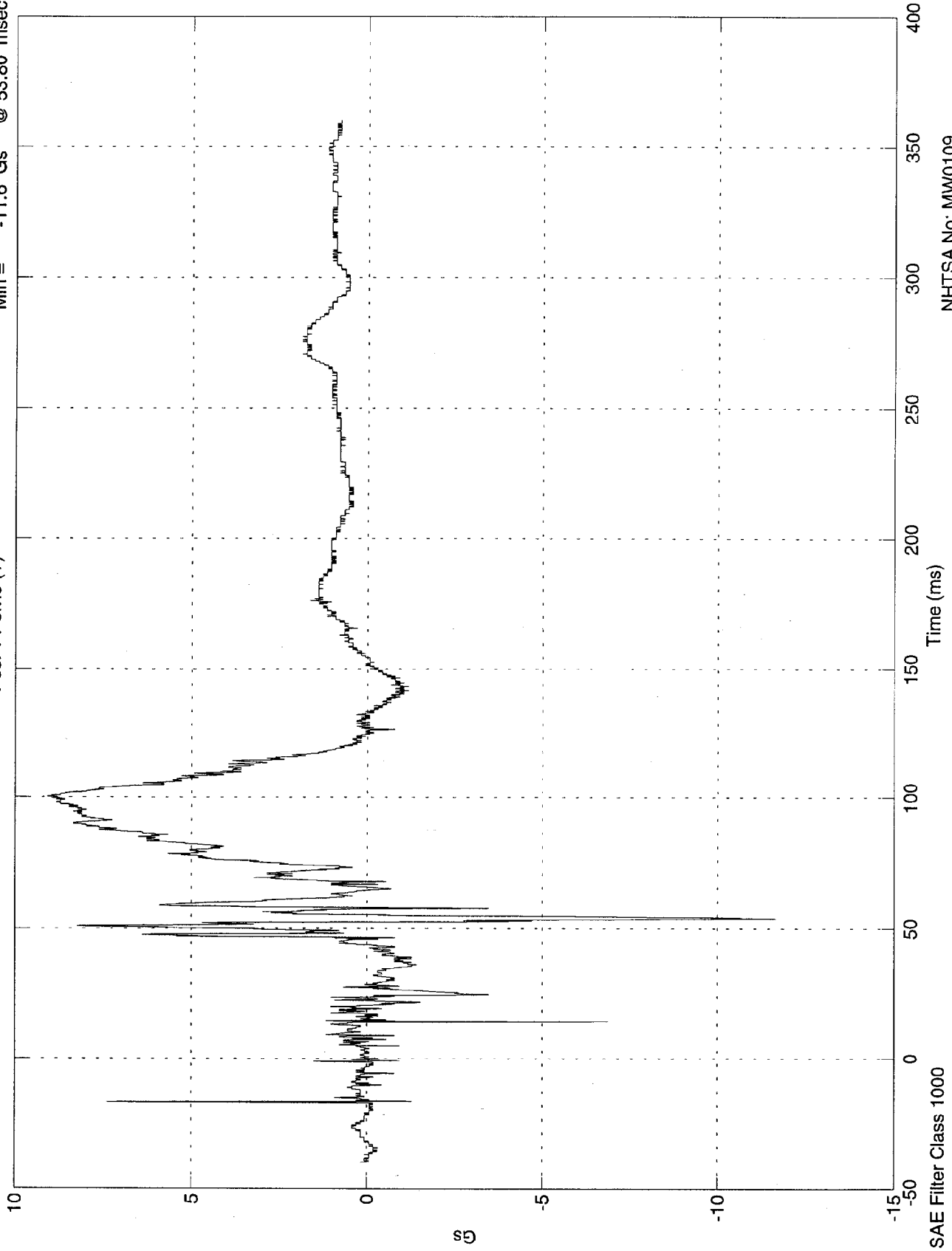


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 9.08 Gs @ 100.20 msec
 Min = -11.6 Gs @ 53.80 msec

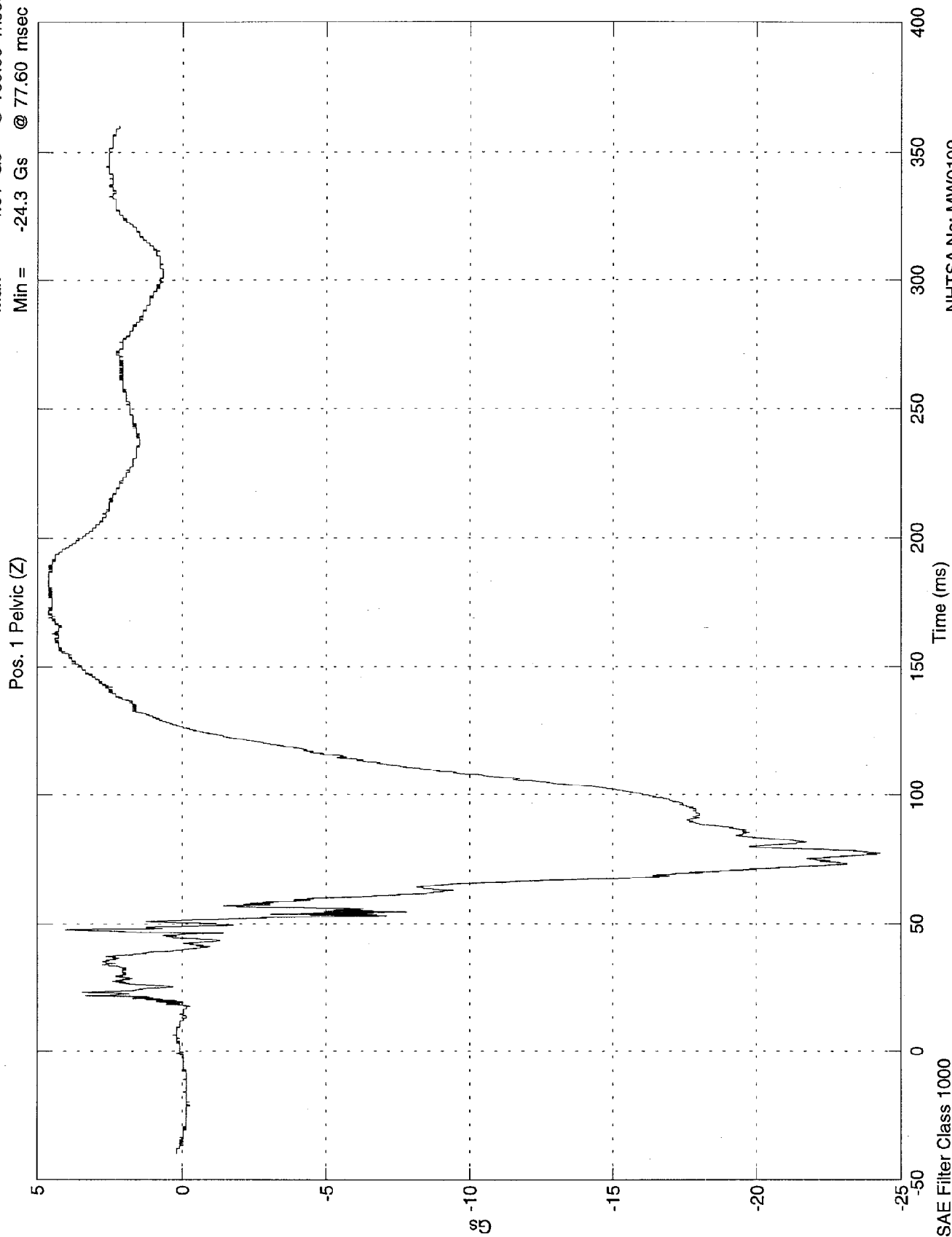
Pos. 1 Pelvic (Y)



NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 4.61 Gs @ 169.00 msec
 Min = -24.3 Gs @ 77.60 msec

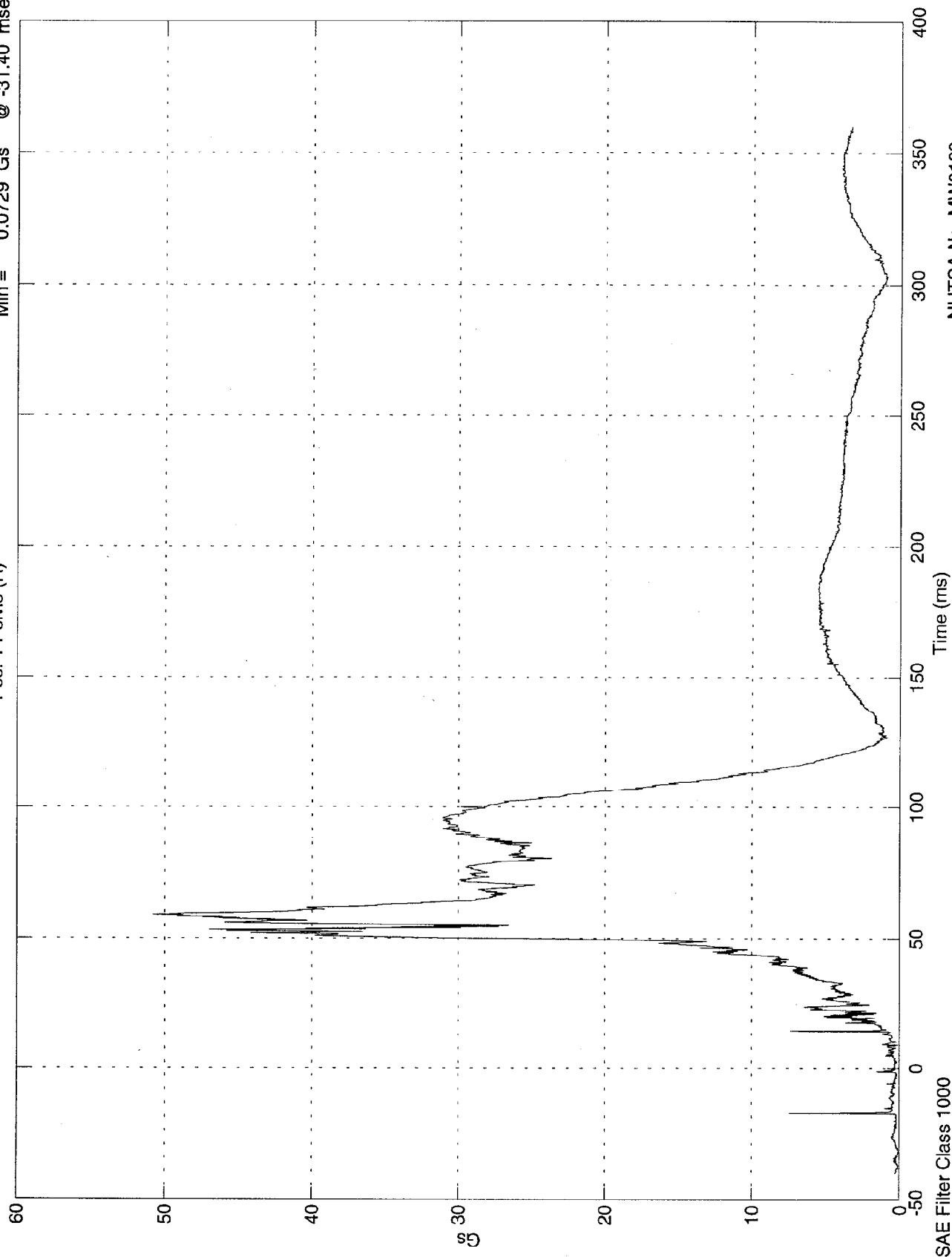


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 50.8 Gs @ 59.00 msec
 Min = 0.0729 Gs @ -31.40 msec

Pos. 1 Pelvic (R)



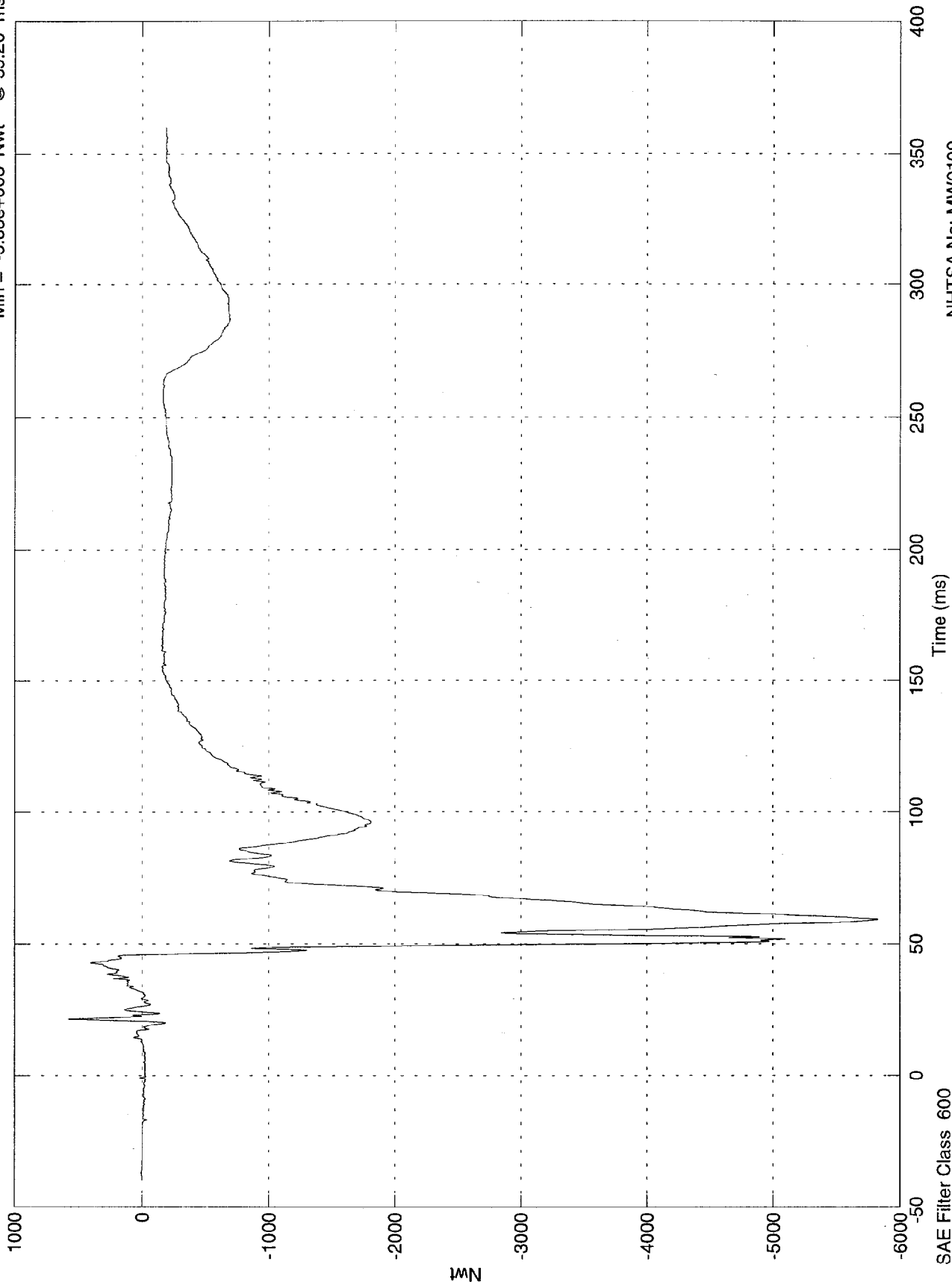
SAE Filter Class 1000

NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 578 Nwt @ 21.30 msec
Min = -5.83e+003 Nwt @ 59.20 msec

Pos. 1 Left Femur



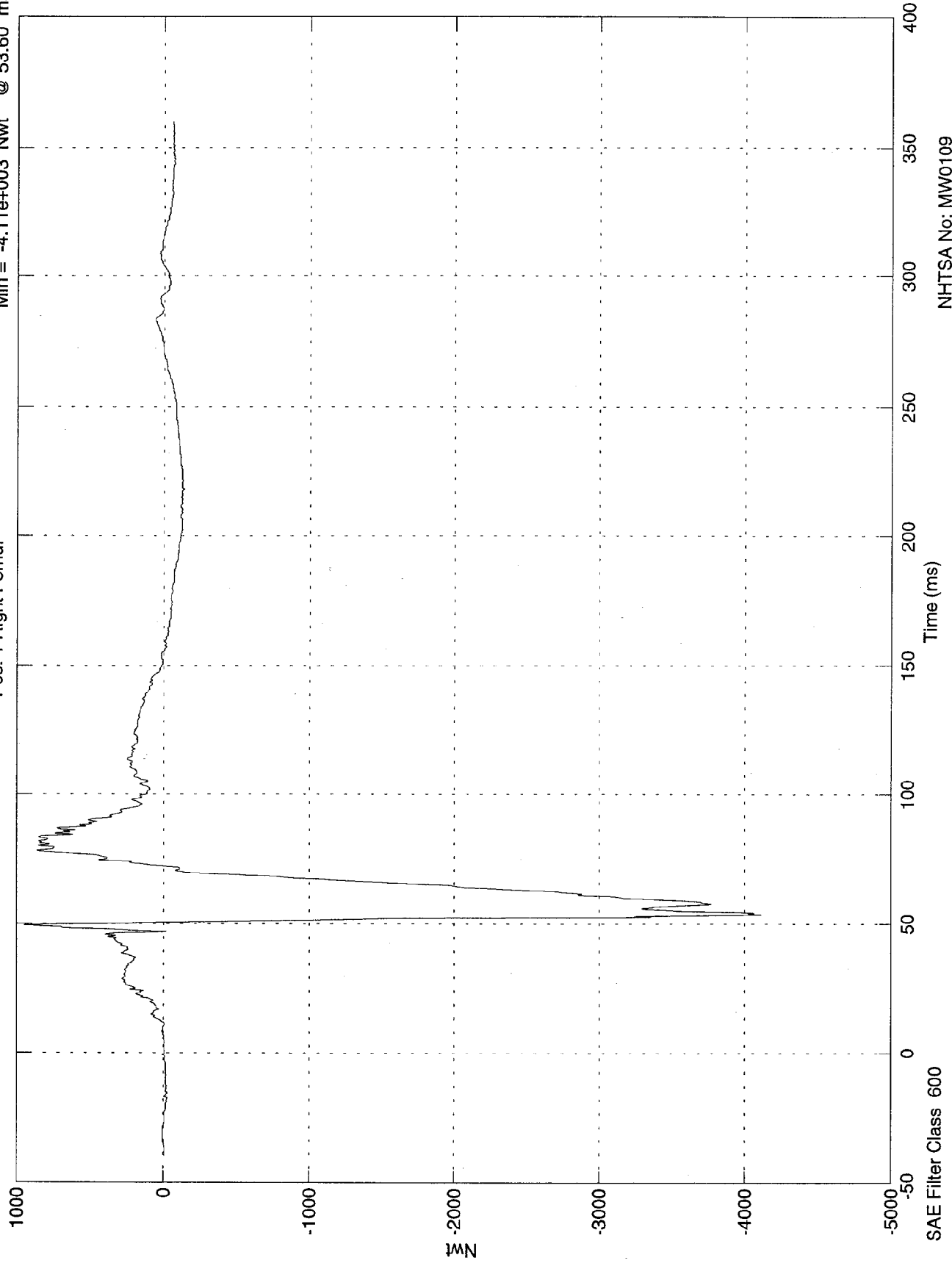
NHTSA No: MW0109
Date: 08 Dec 1997

SAE Filter Class 600

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 947 Nwt @ 49.40 msec
Min = -4.11e+003 Nwt @ 53.60 msec

Pos. 1 Right Femur

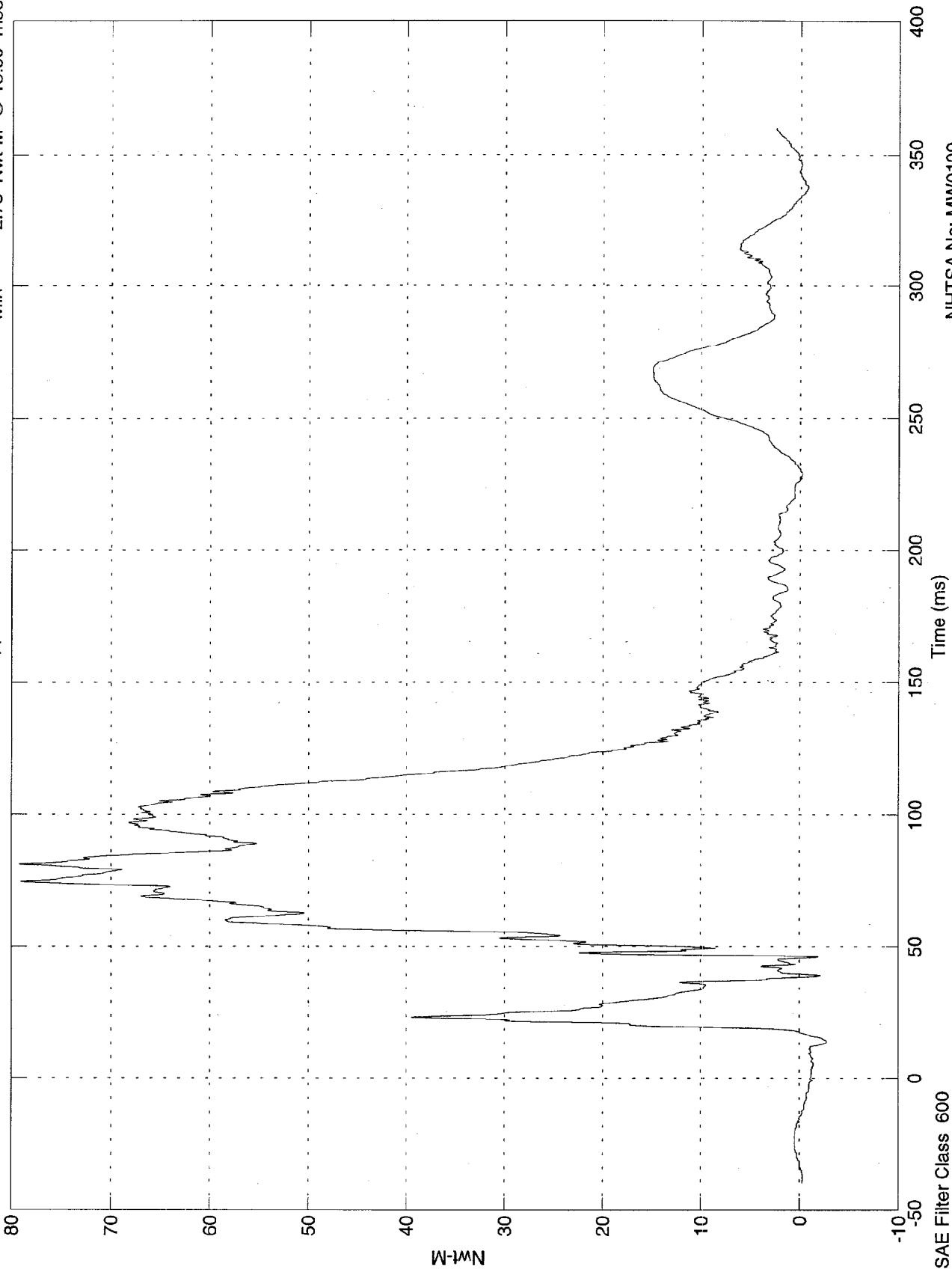


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 79.2 Nwt-M @ 81.40 msec
Min = -2.75 Nwt-M @ 13.60 msec

P1 Lt Upper Tibia Mx

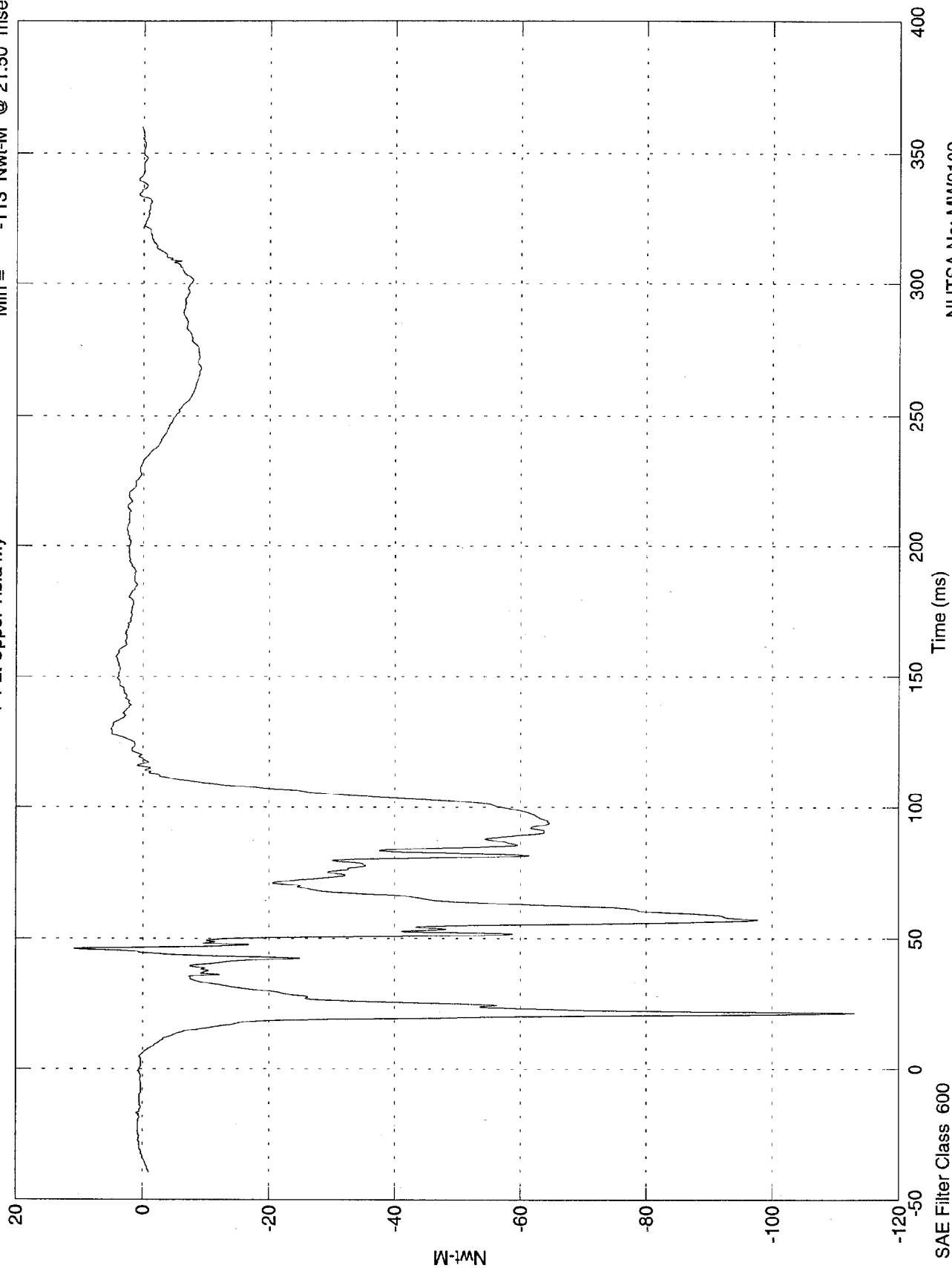


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 10.8 Nwt-M @ 46.20 msec
Min = -113 Nwt-M @ 21.50 msec

P1 Lt Upper Tibia My

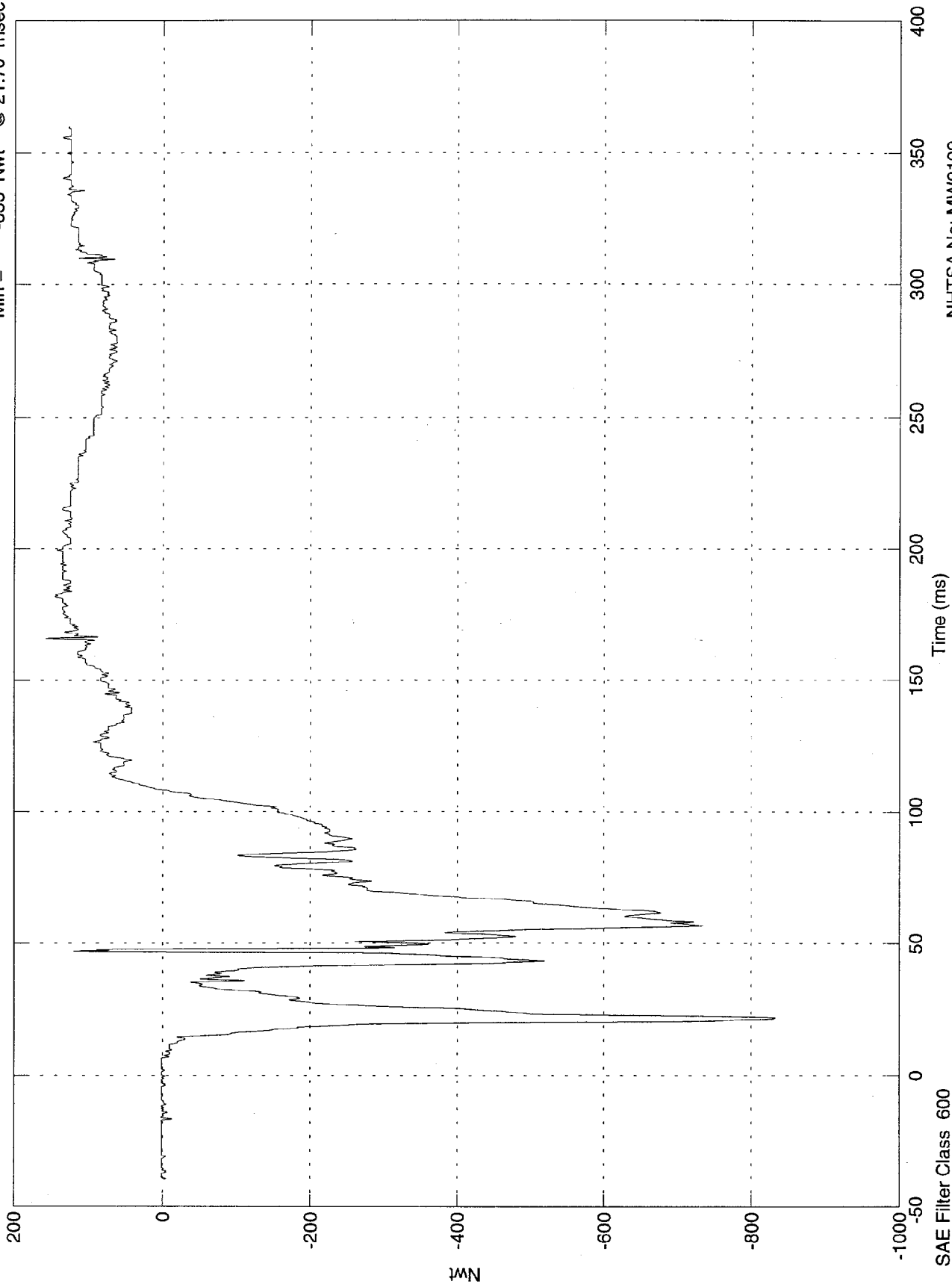


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 158 Nwt @ 165.70 msec
Min = -833 Nwt @ 21.70 msec

P1 Lt Lower Tibia Fx

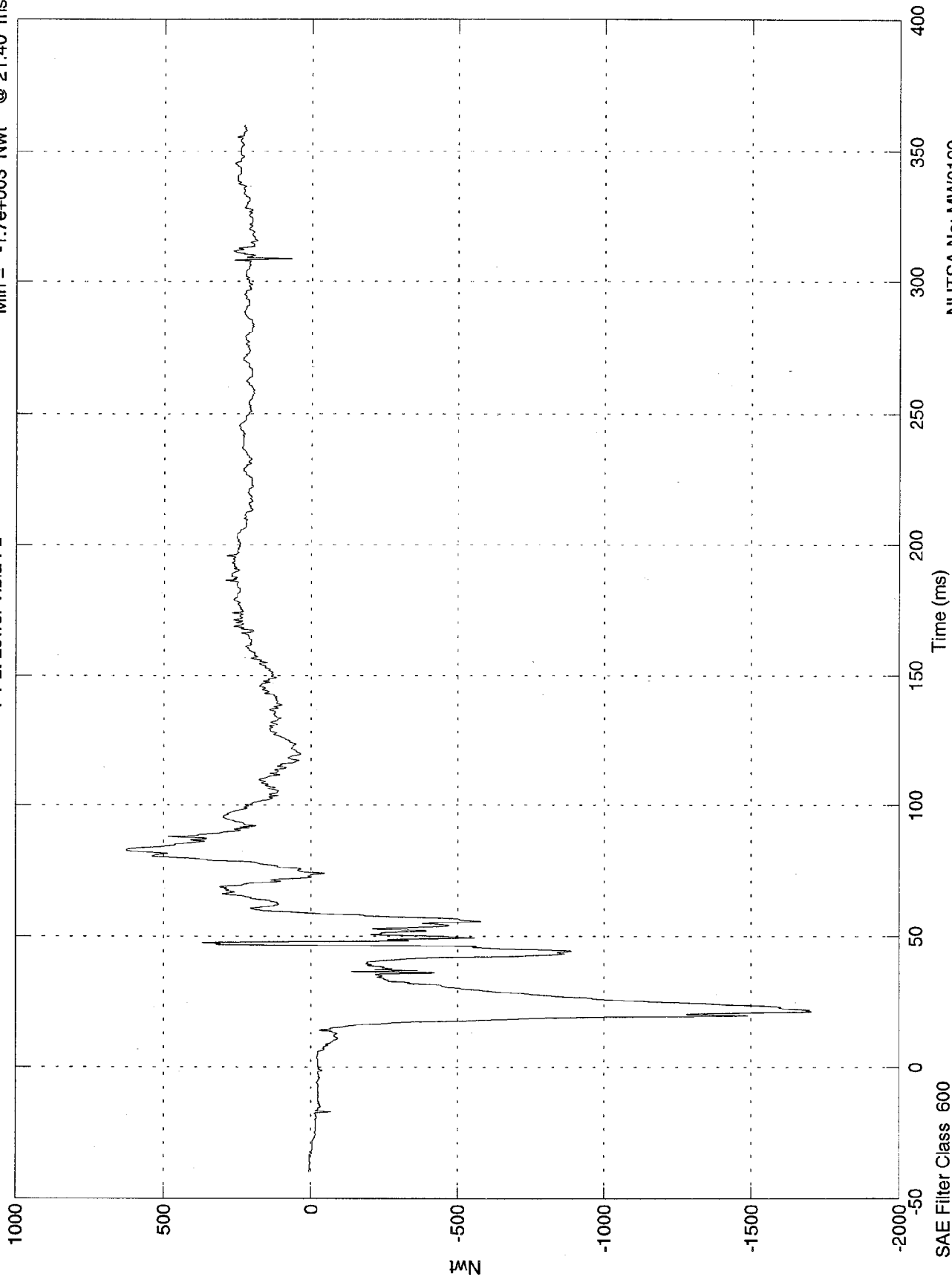


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 627 Nwt @ 82.90 msec
Min = -1.7e+003 Nwt @ 21.40 msec

P1 Lt Lower Tibia Fz

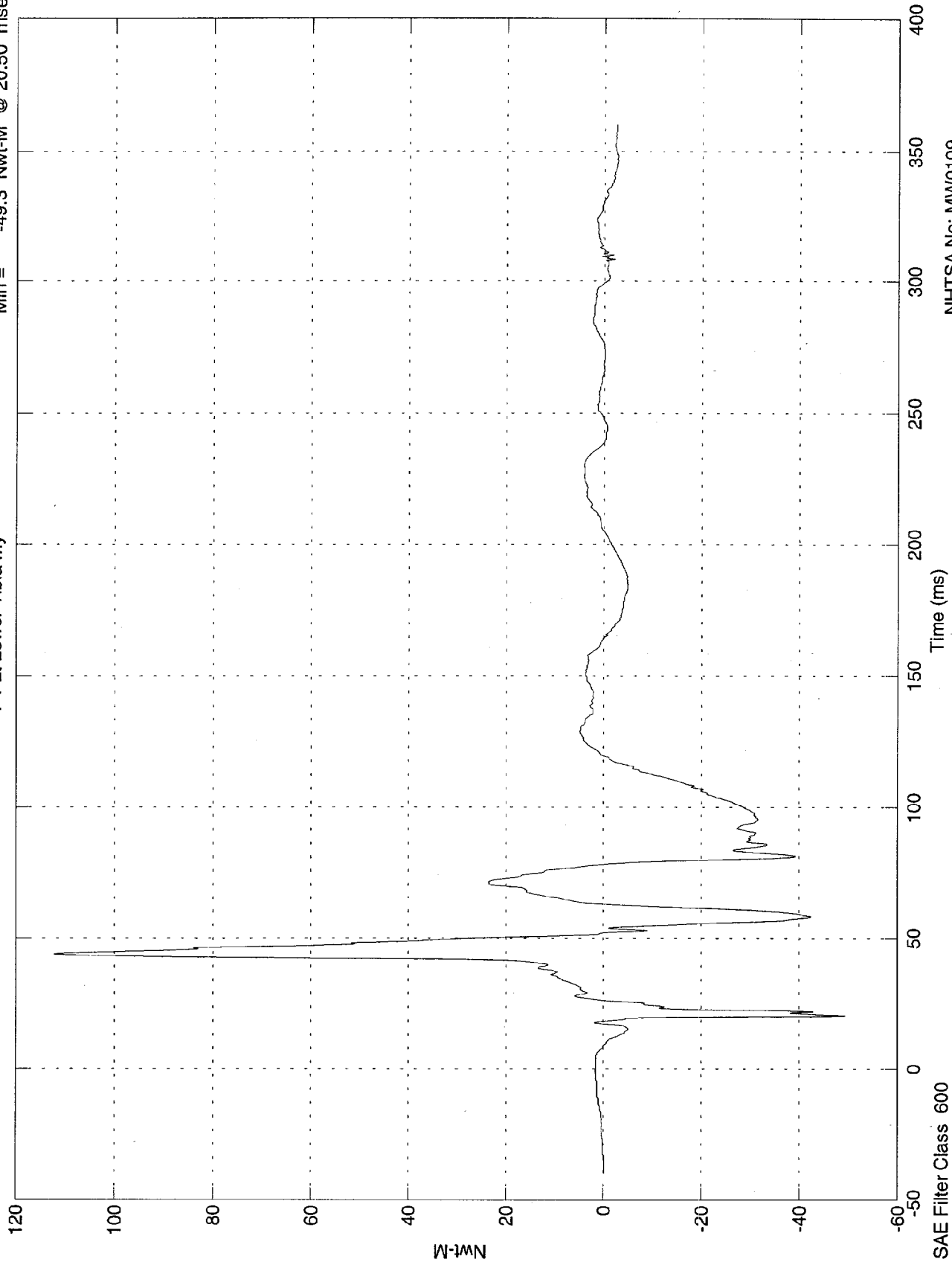


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 112 Nwt-M @ 43.90 msec
Min = -49.3 Nwt-M @ 20.50 msec

P1 Lt Lower Tibia My

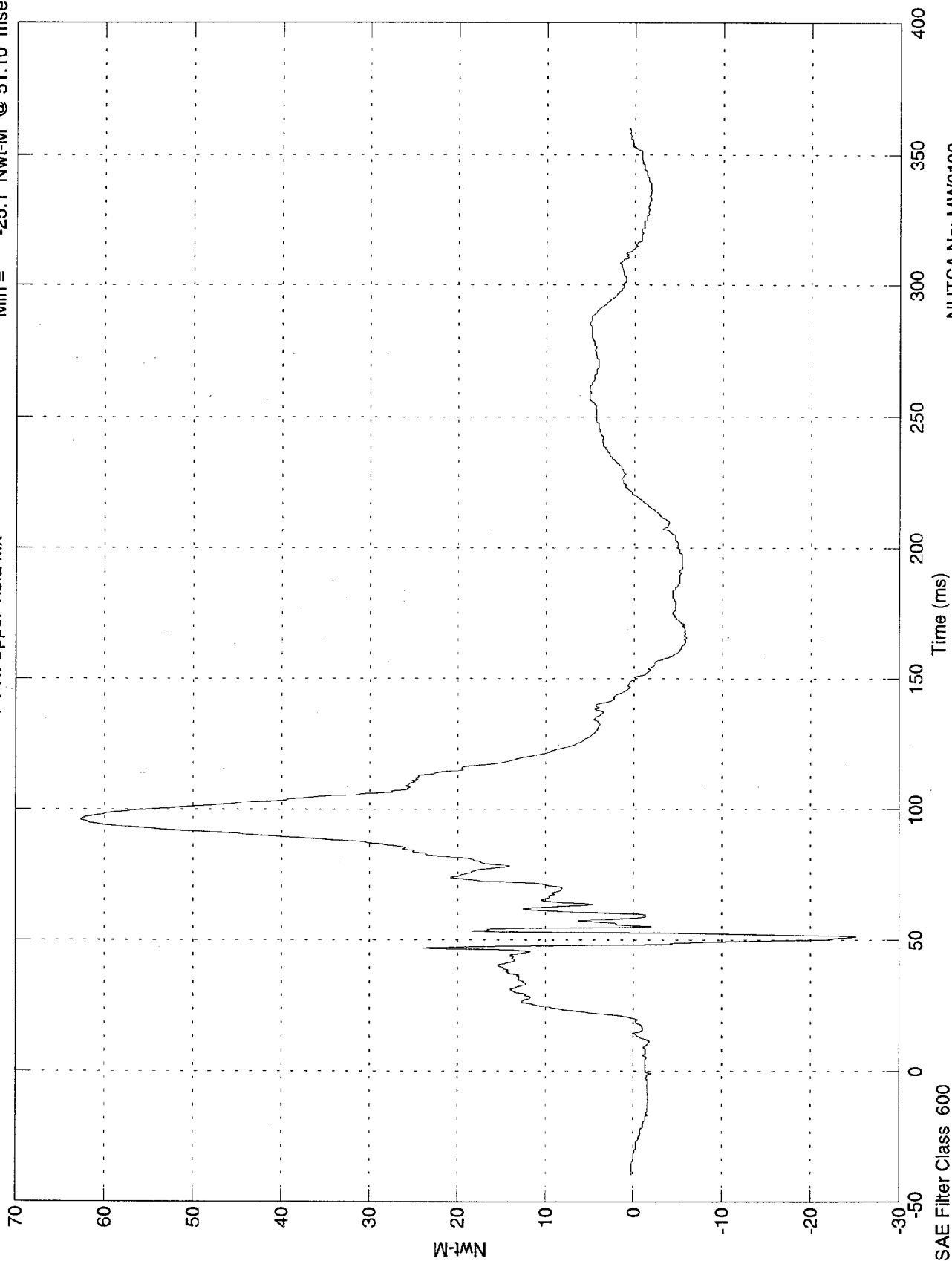


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 62.7 Nwt-M @ 96.20 msec
Min = -25.1 Nwt-M @ 51.10 msec

P1 Rt Upper Tibia Mx

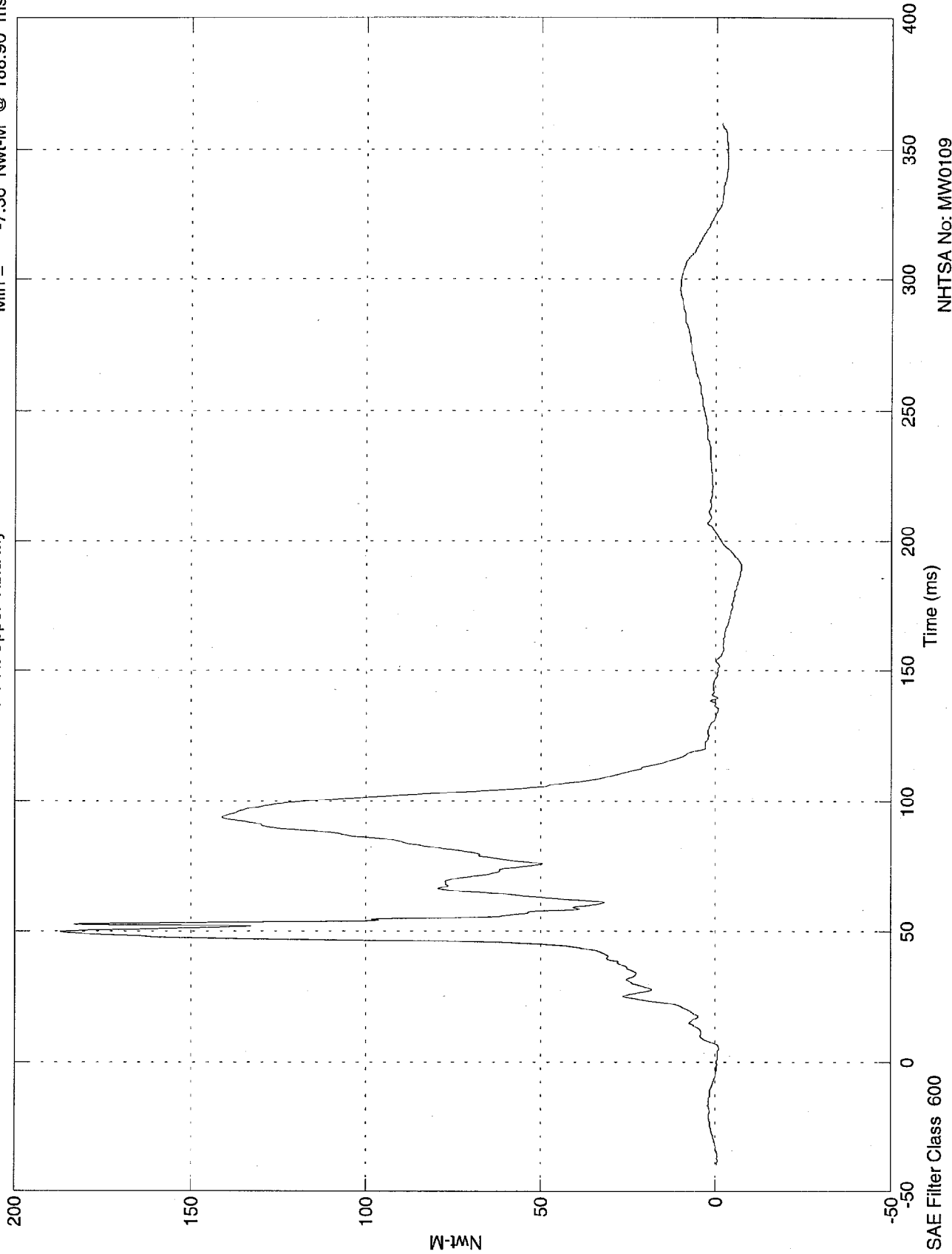


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 187 Nwt-M @ 49.80 msec
Min = -7.36 Nwt-M @ 188.90 msec

P1 Rt Upper Tibia My

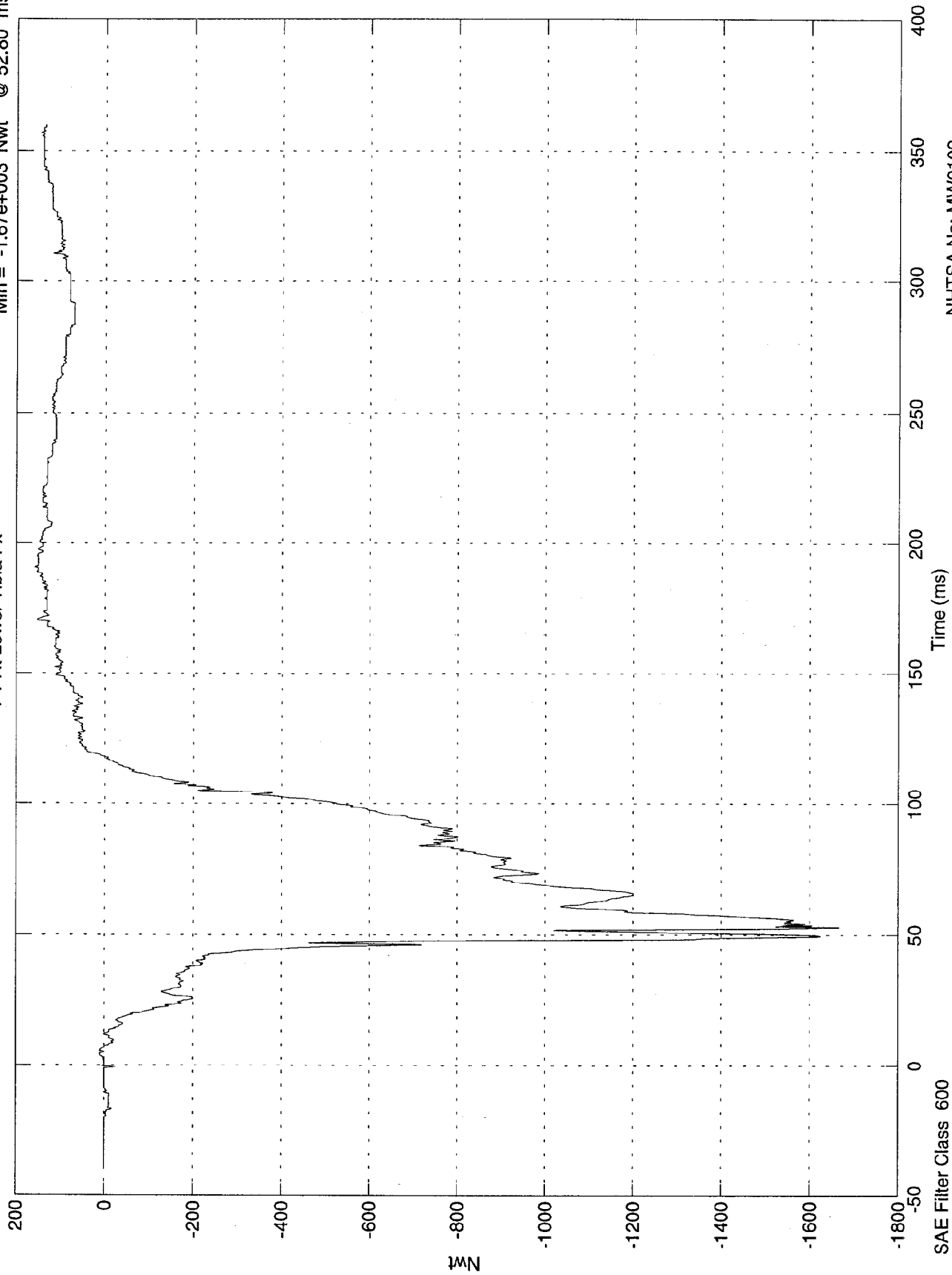


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 158 Nwt @ 190.90 msec
 Min = -1.67e+003 Nwt @ 52.80 msec

P1 Rt Lower Tibia Fx

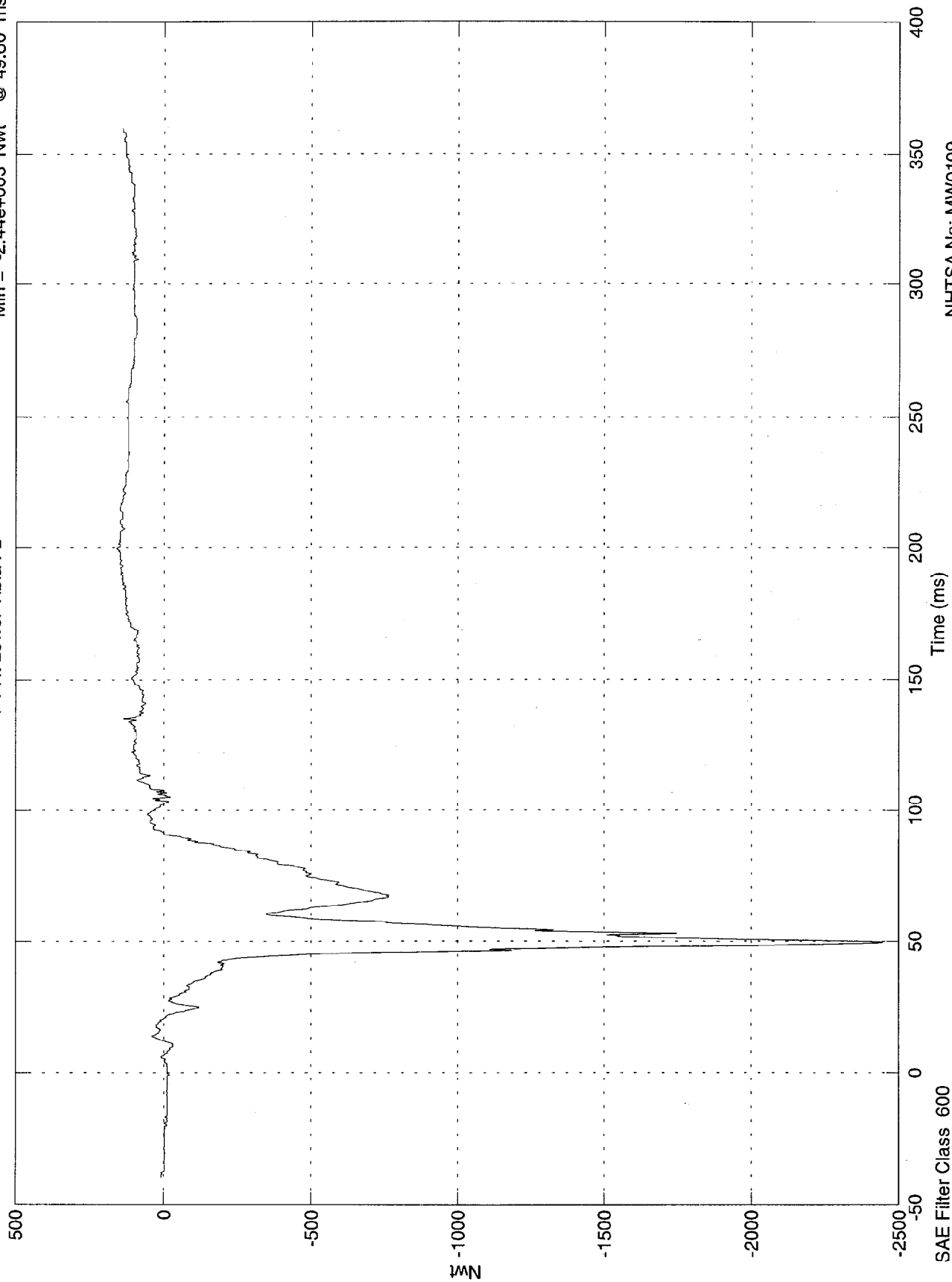


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 158 Nwt @ 199.60 msec
Min = -2.44e+003 Nwt @ 49.60 msec

P1 Rt Lower Tibia Fz

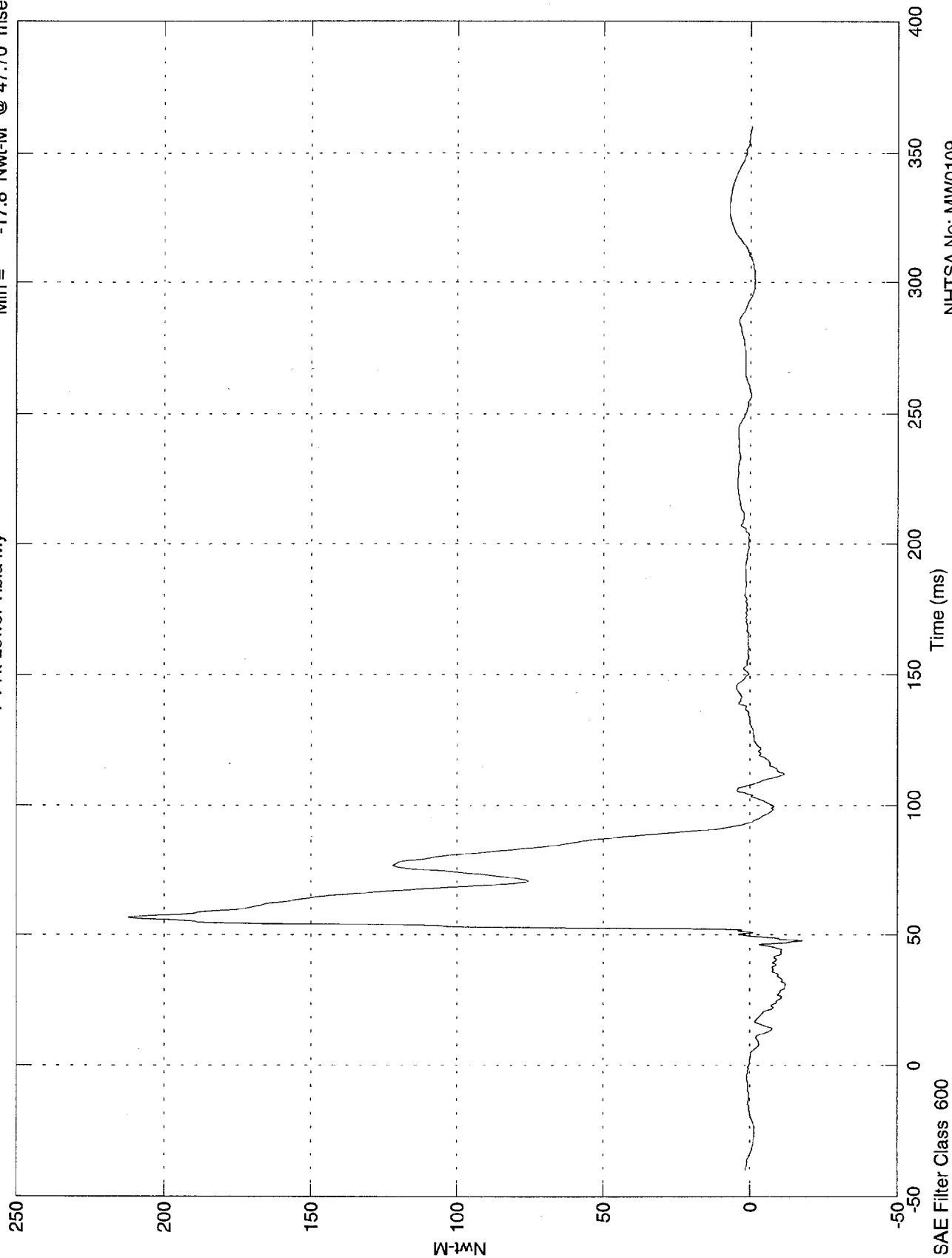


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

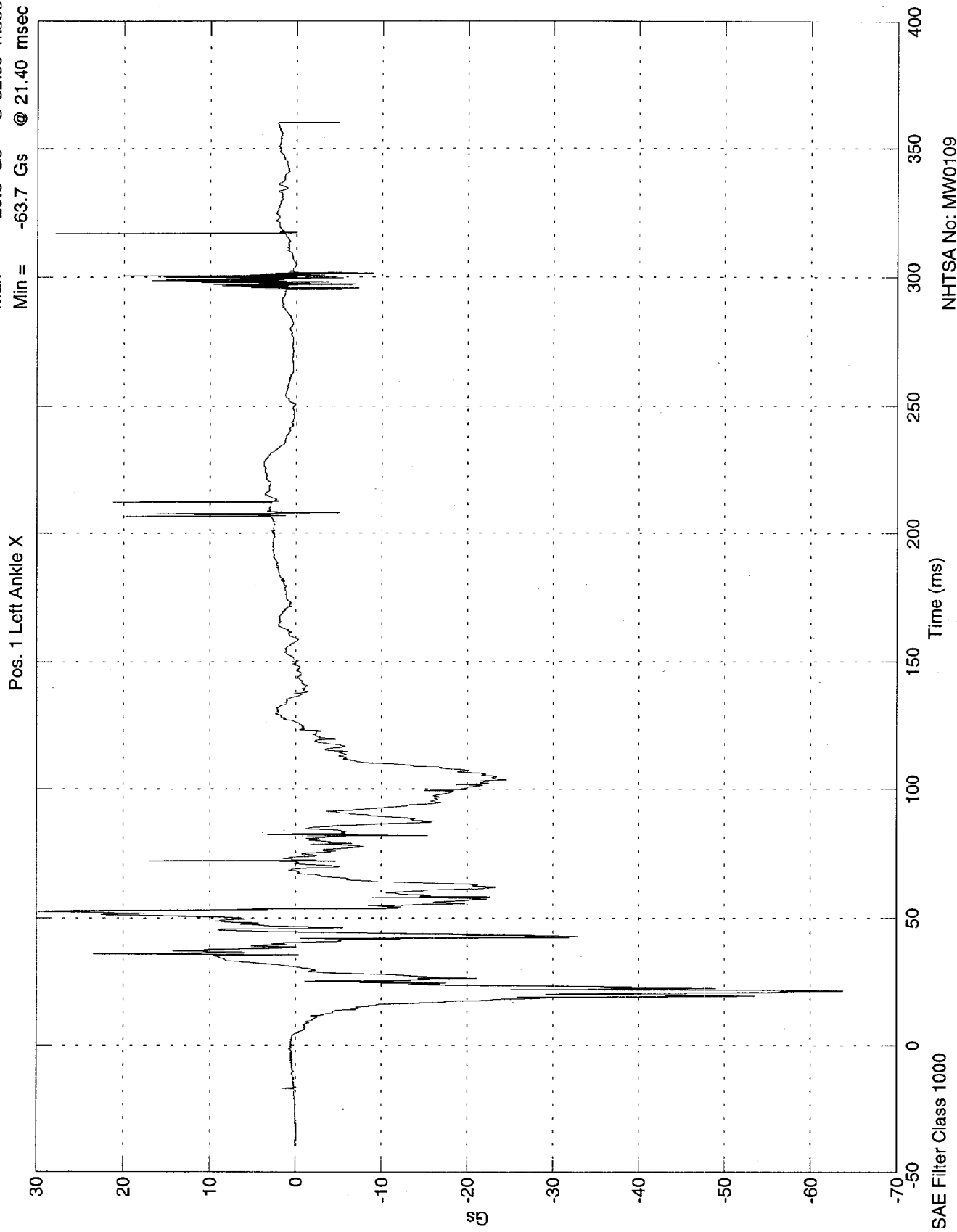
Max = 212 Nwt-M @ 56.70 msec
Min = -17.8 Nwt-M @ 47.70 msec

P1 Rt Lower Tibia My



NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

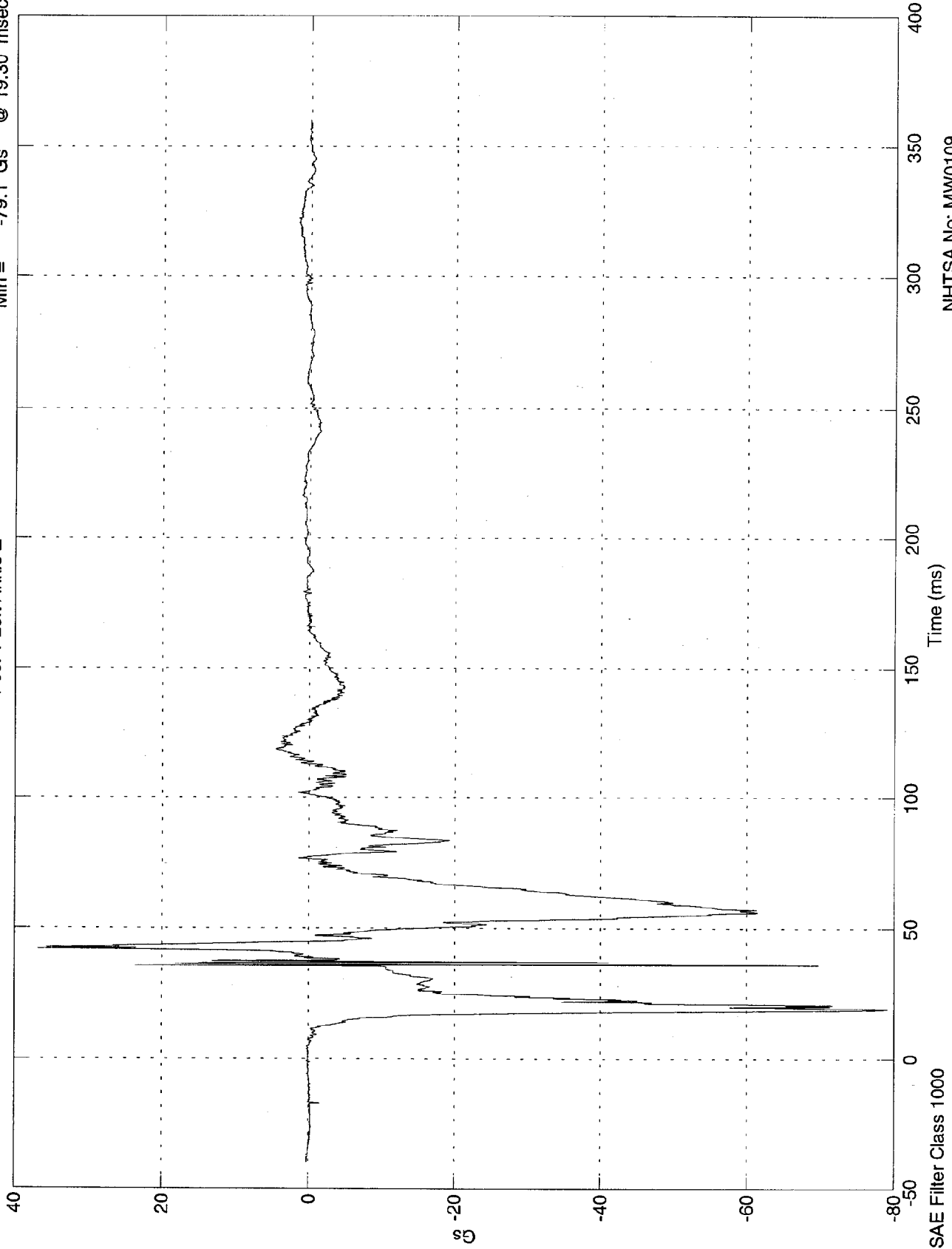


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 36.8 Gs @ 42.20 msec
 Min = -79.1 Gs @ 19.30 msec

Pos. 1 Left Ankle Z

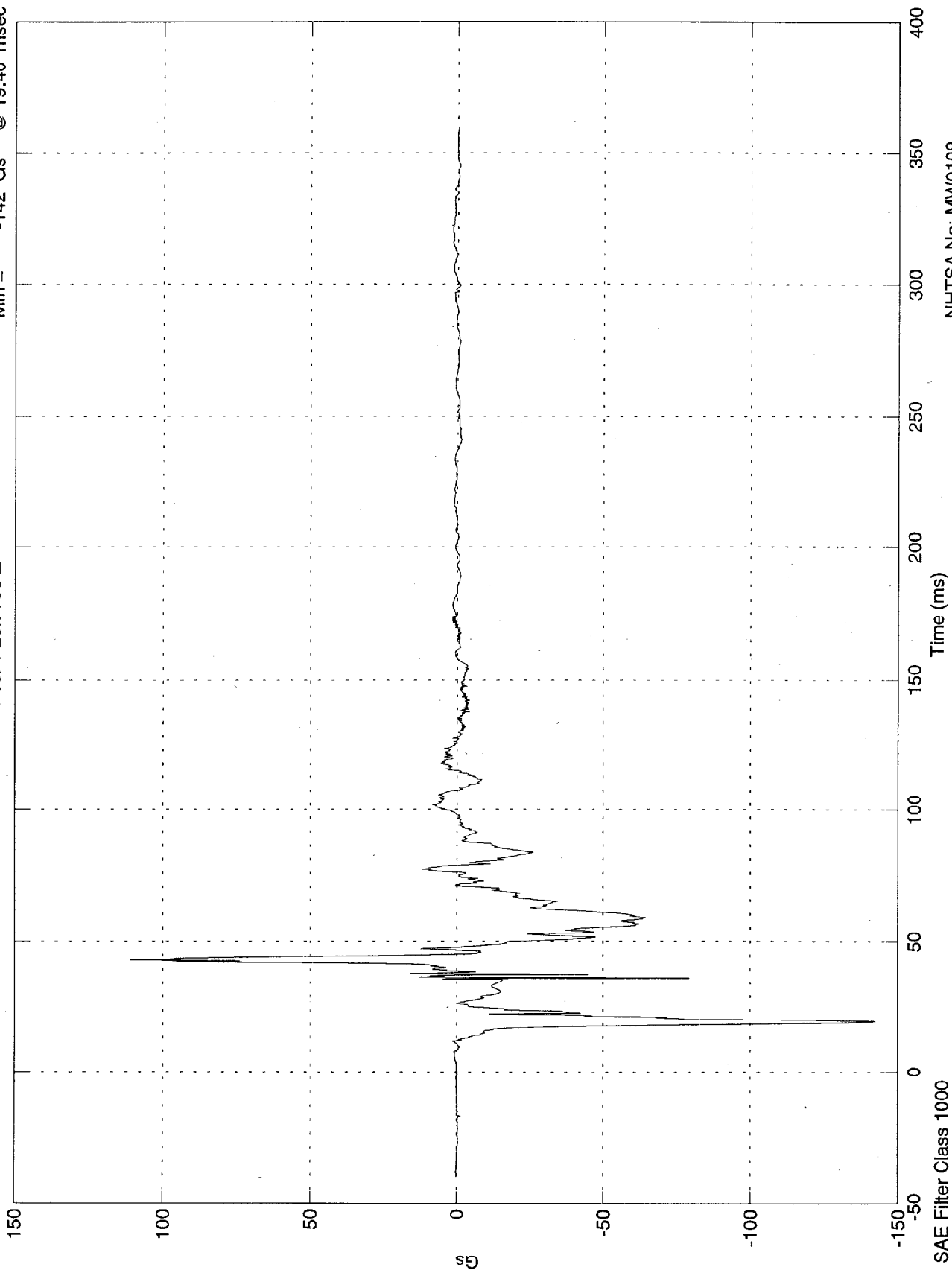


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 111 Gs @ 42.90 msec
Min = -142 Gs @ 19.40 msec

Pos. 1 Left Toe Z

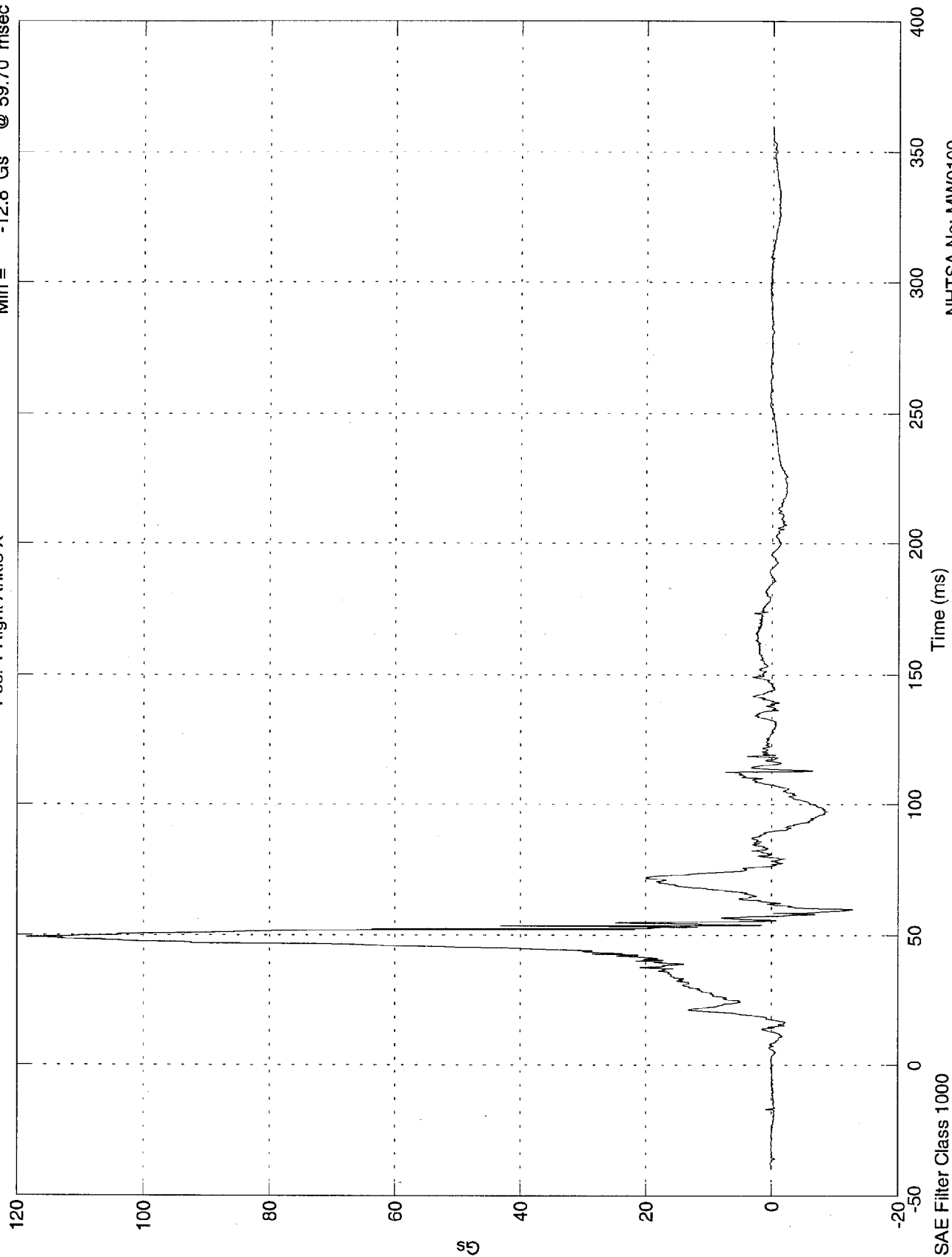


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 118 Gs @ 49.20 msec
 Min = -12.8 Gs @ 59.70 msec

Pos. 1 Right Ankle X

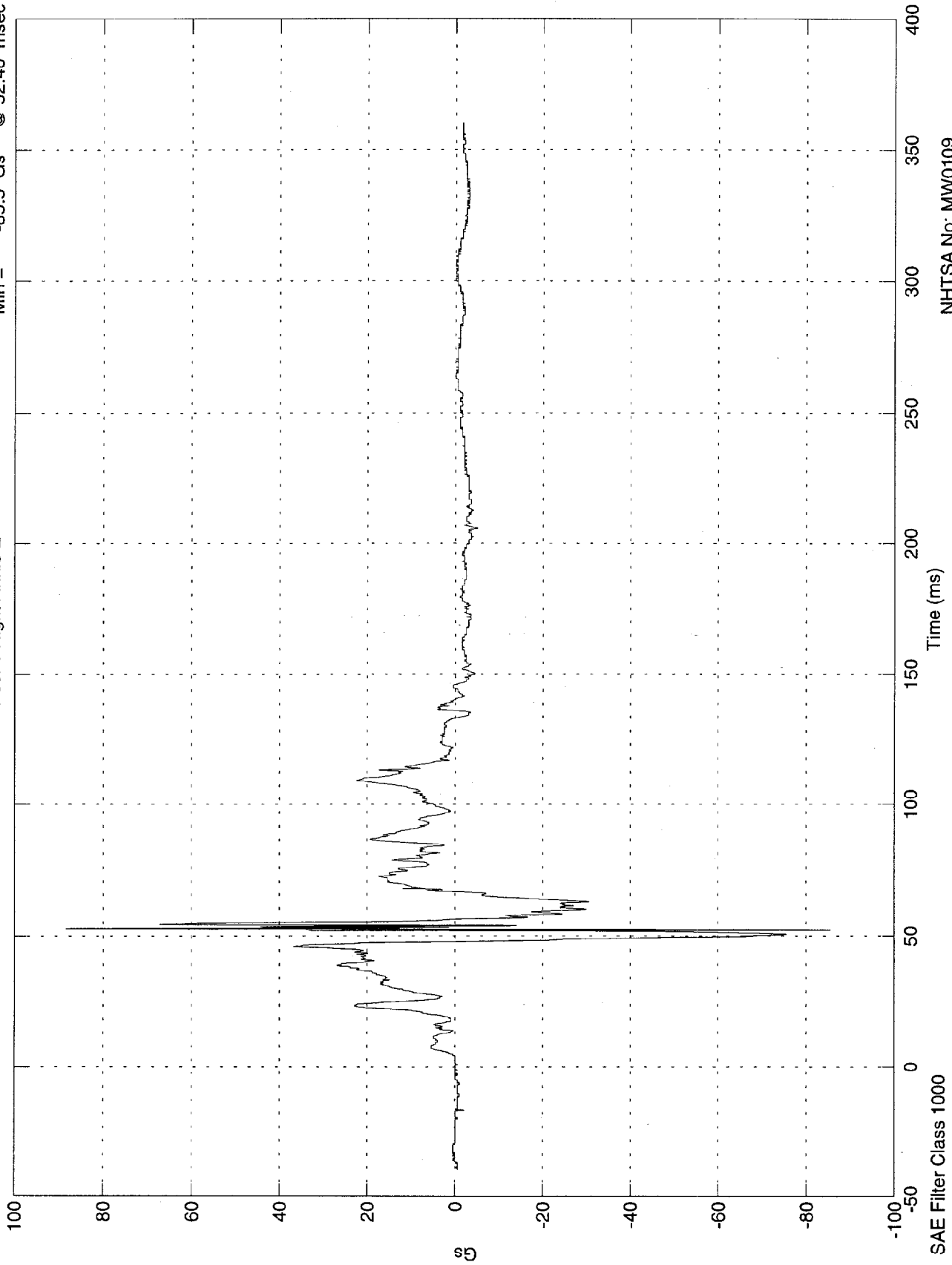


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 88.3 Gs @ 52.80 msec
Min = -85.5 Gs @ 52.40 msec

Pos. 1 Right Ankle Z

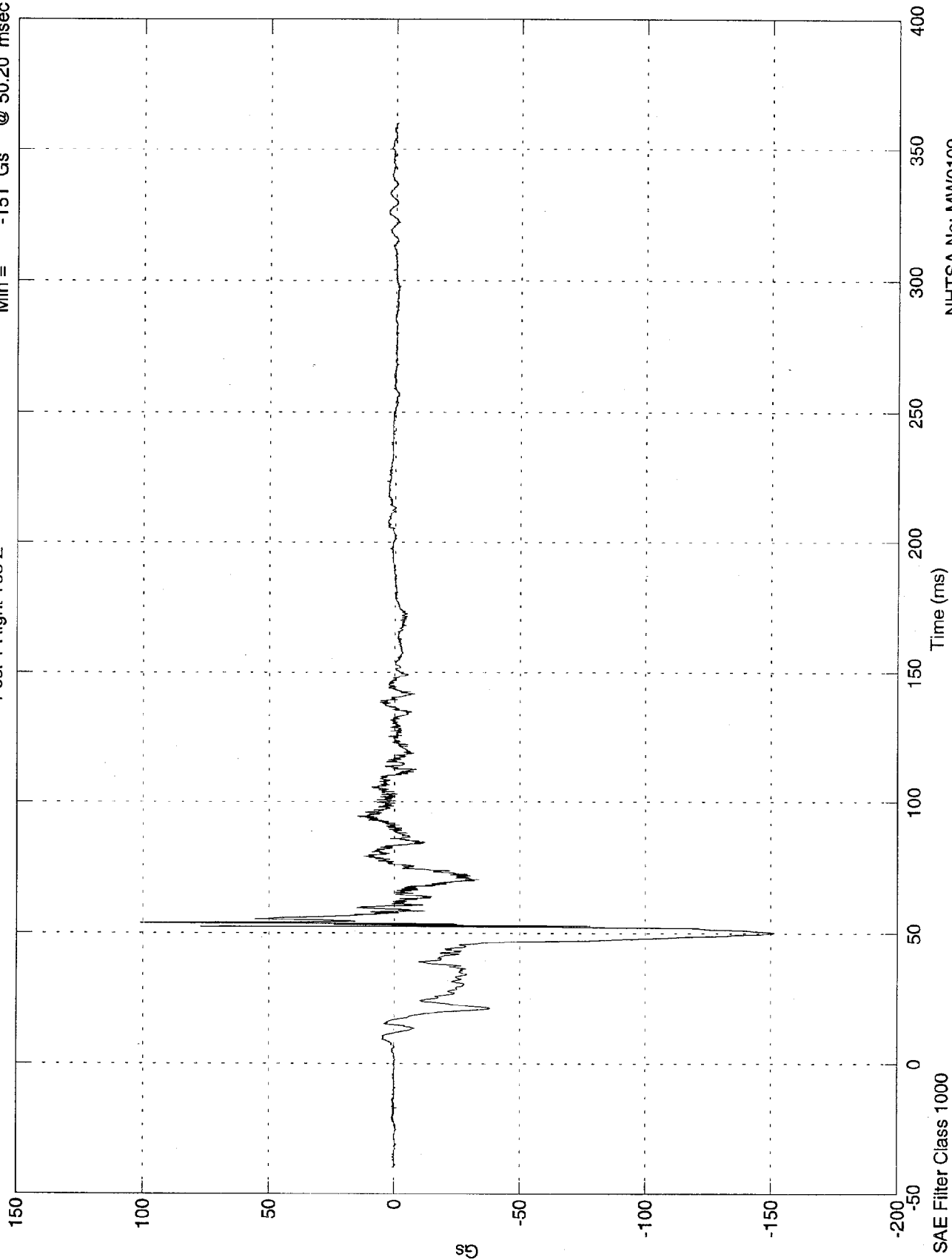


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 101 Gs @ 53.80 msec
Min = -151 Gs @ 50.20 msec

Pos. 1 Right Toe Z

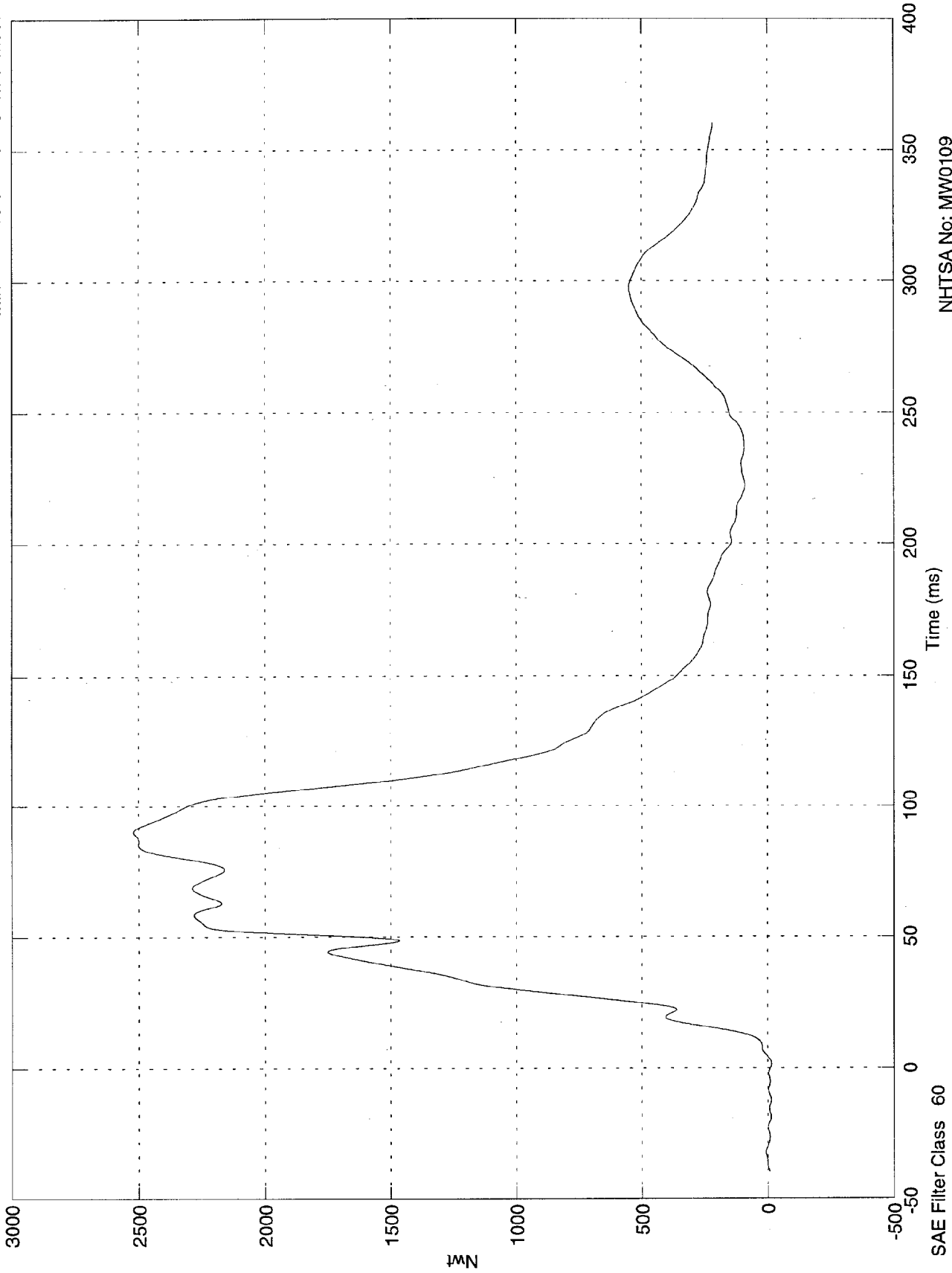


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 2.52e+003 Nwt @ 90.10 msec
Min = -15.9 Nwt @ 1.70 msec

Pos. 1 Left Belt Load

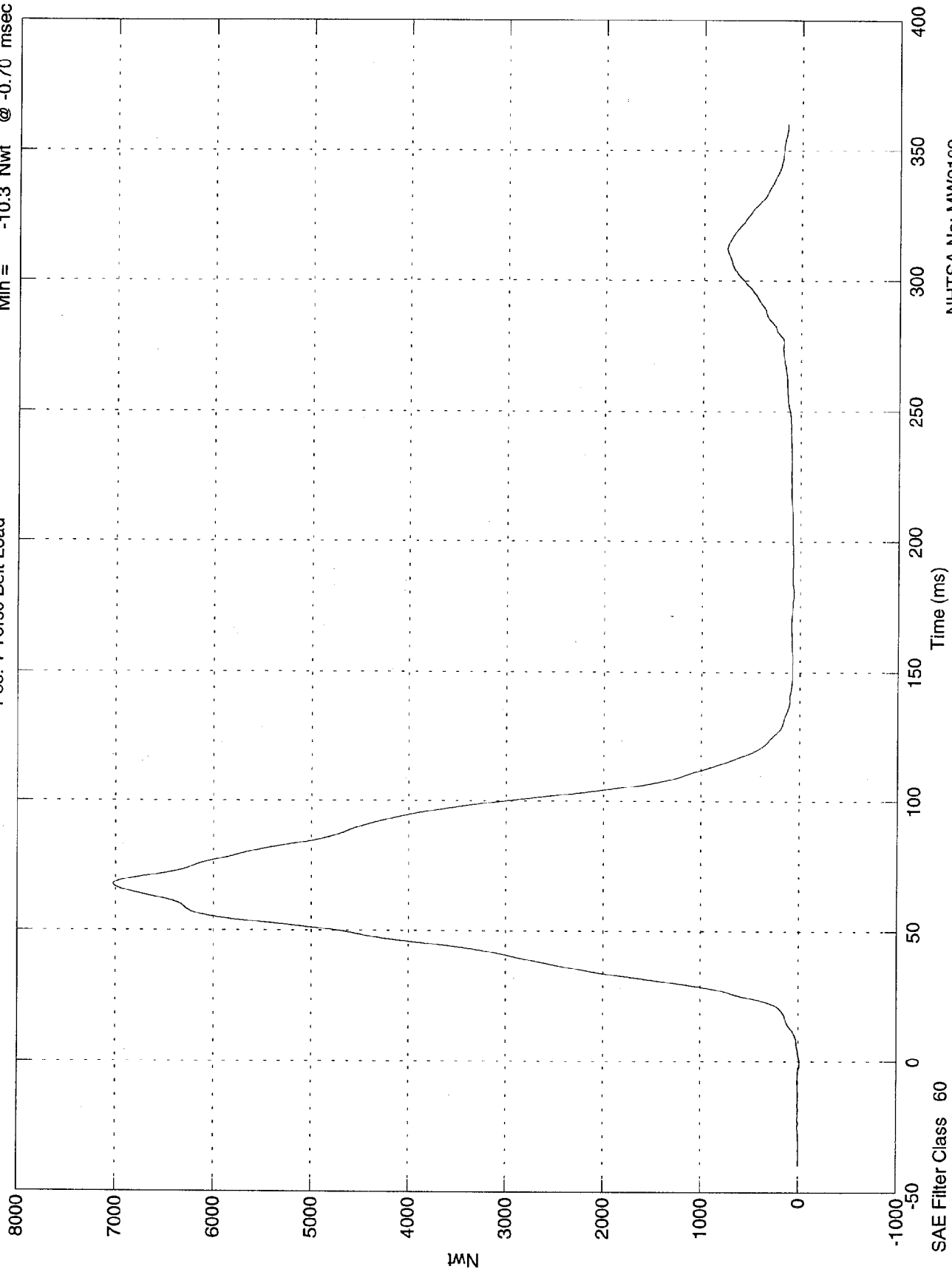


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 7.02e+003 Nwt @ 67.50 msec
 Min = -10.3 Nwt @ -0.70 msec

Pos. 1 Torso Belt Load

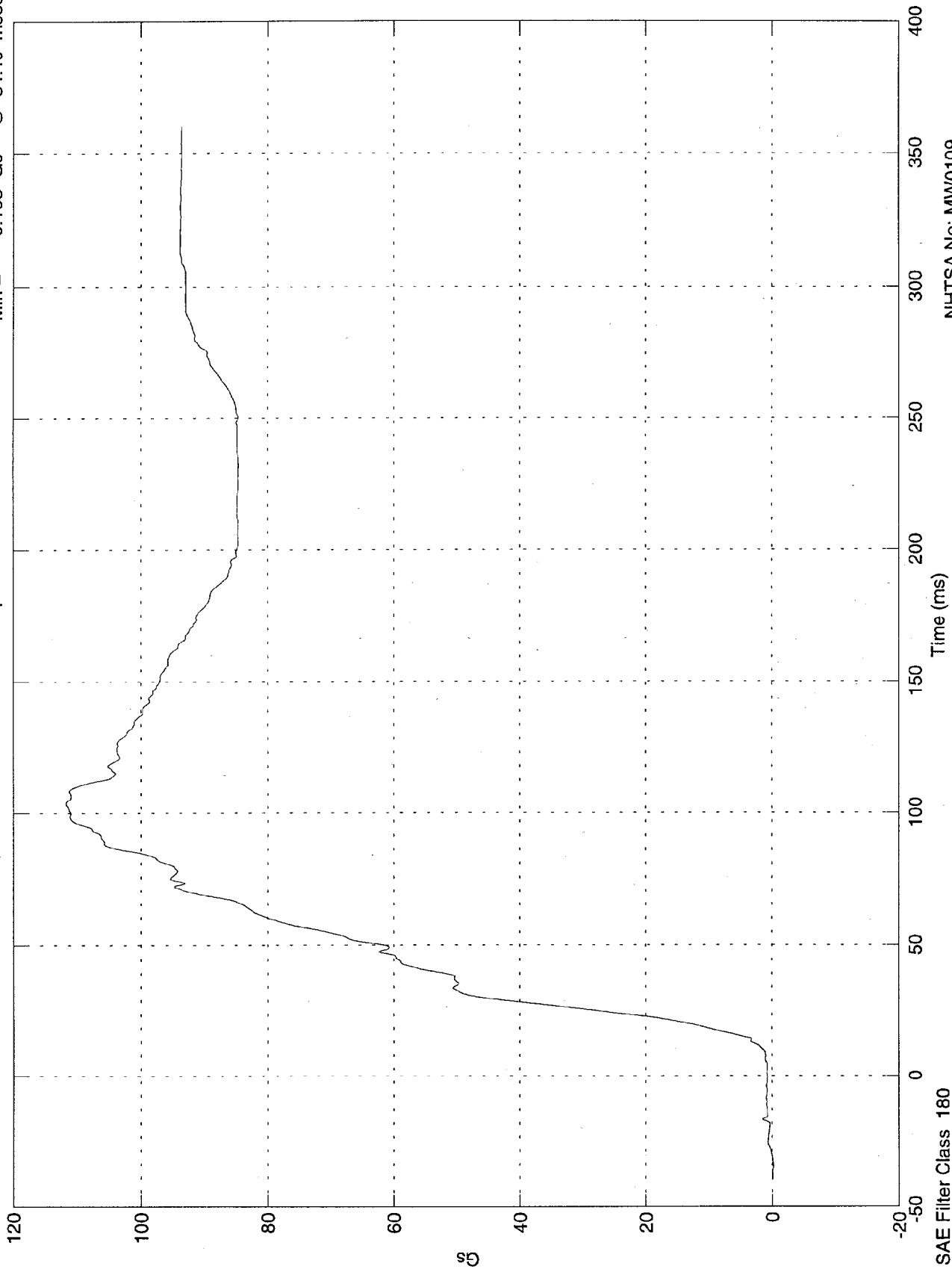


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 112 Gs @ 103.40 msec
 Min = -0.195 Gs @ -34.40 msec

Pos. 1 Belt Spoolout



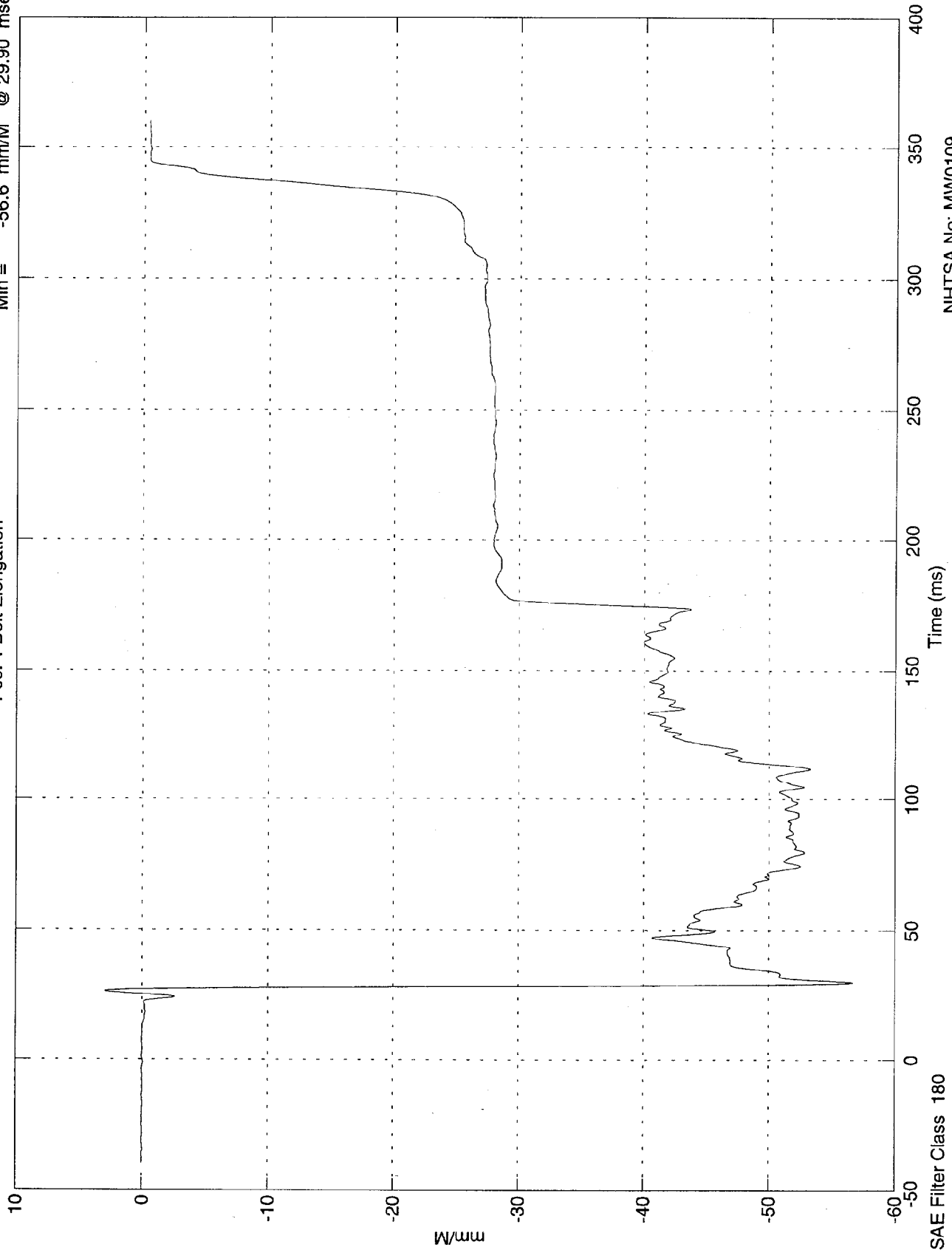
NHTSA No: MW0109
 Date: 08 Dec 1997

SAE Filter Class 180

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 2.9 mm/M @ 26.30 msec
 Min = -56.6 mm/M @ 29.90 msec

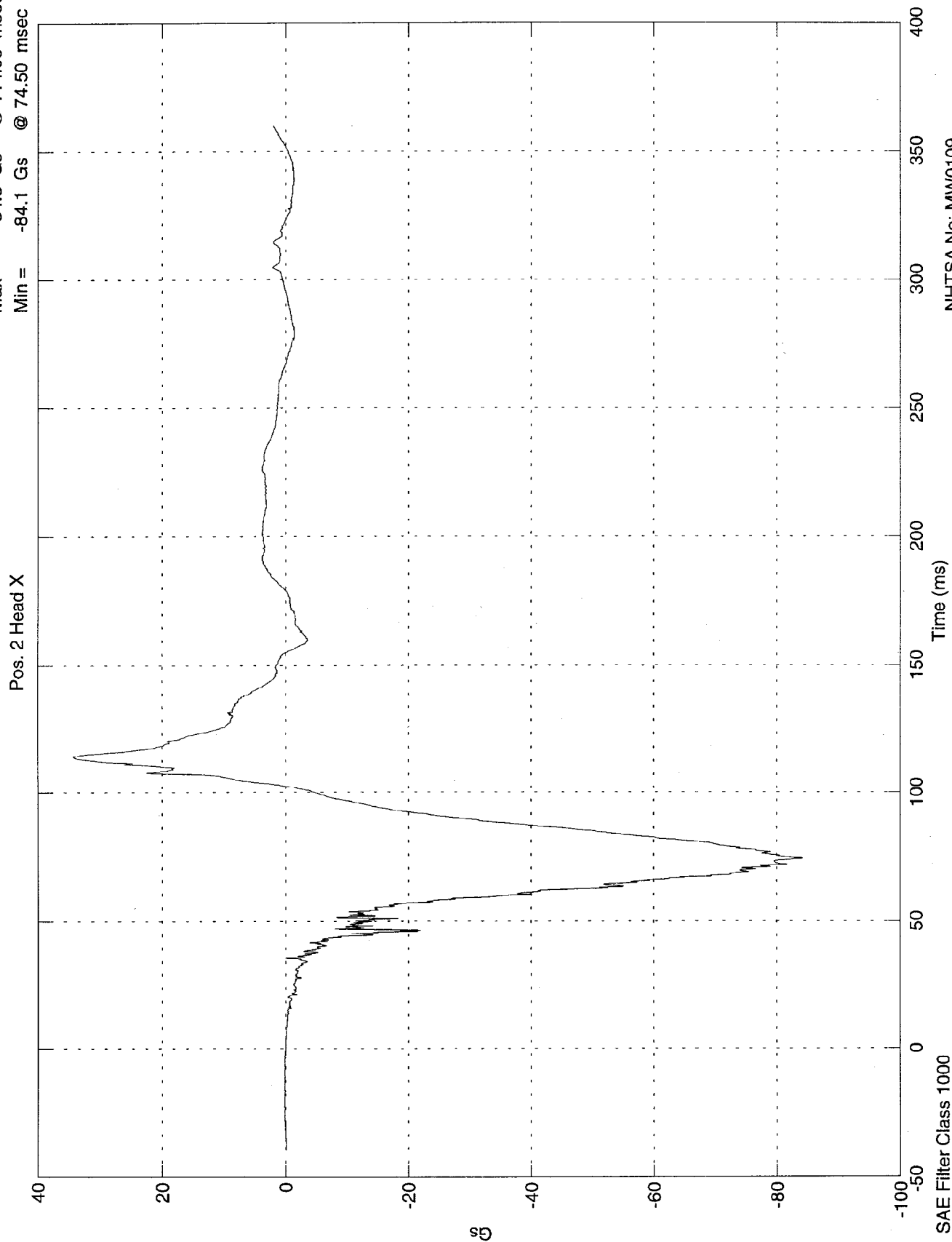
Pos. 1 Belt Elongation



NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 34.3 Gs @ 114.00 msec
Min = -84.1 Gs @ 74.50 msec

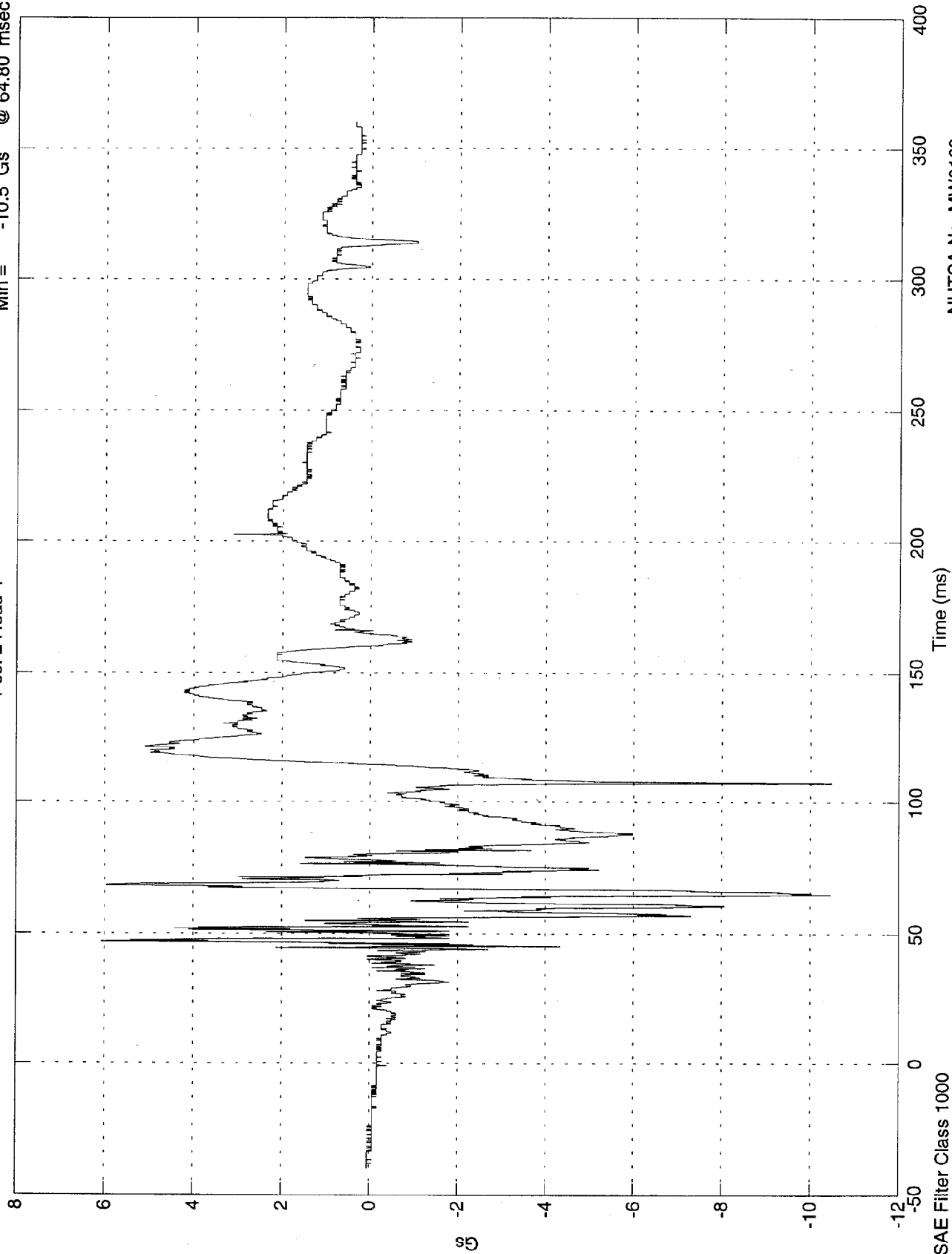


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 6.08 Gs @ 47.00 msec
 Min = -10.5 Gs @ 64.80 msec

Pos. 2 Head Y

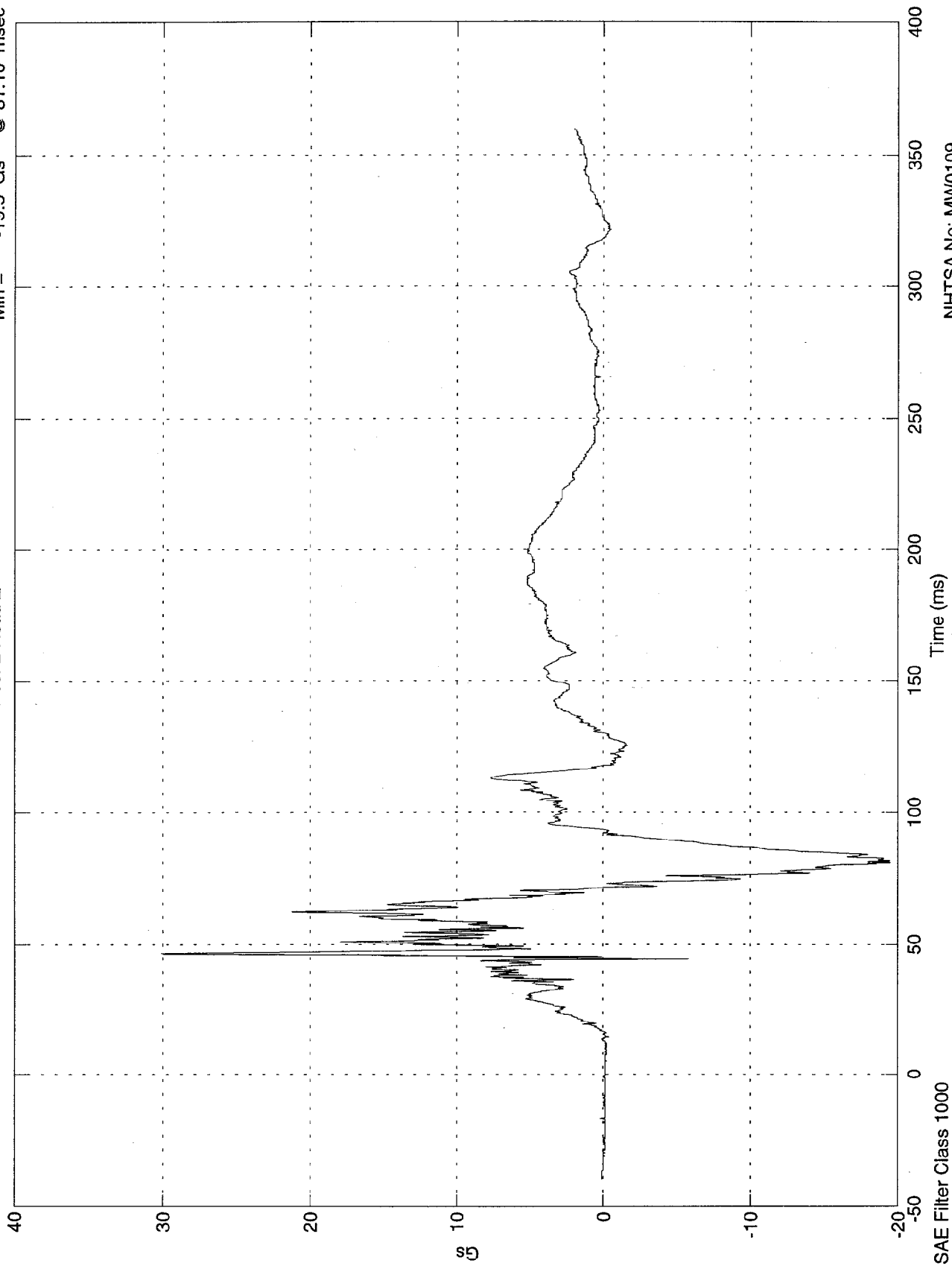


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 30.1 Gs @ 46.50 msec
Min = -19.5 Gs @ 81.10 msec

Pos. 2 Head Z

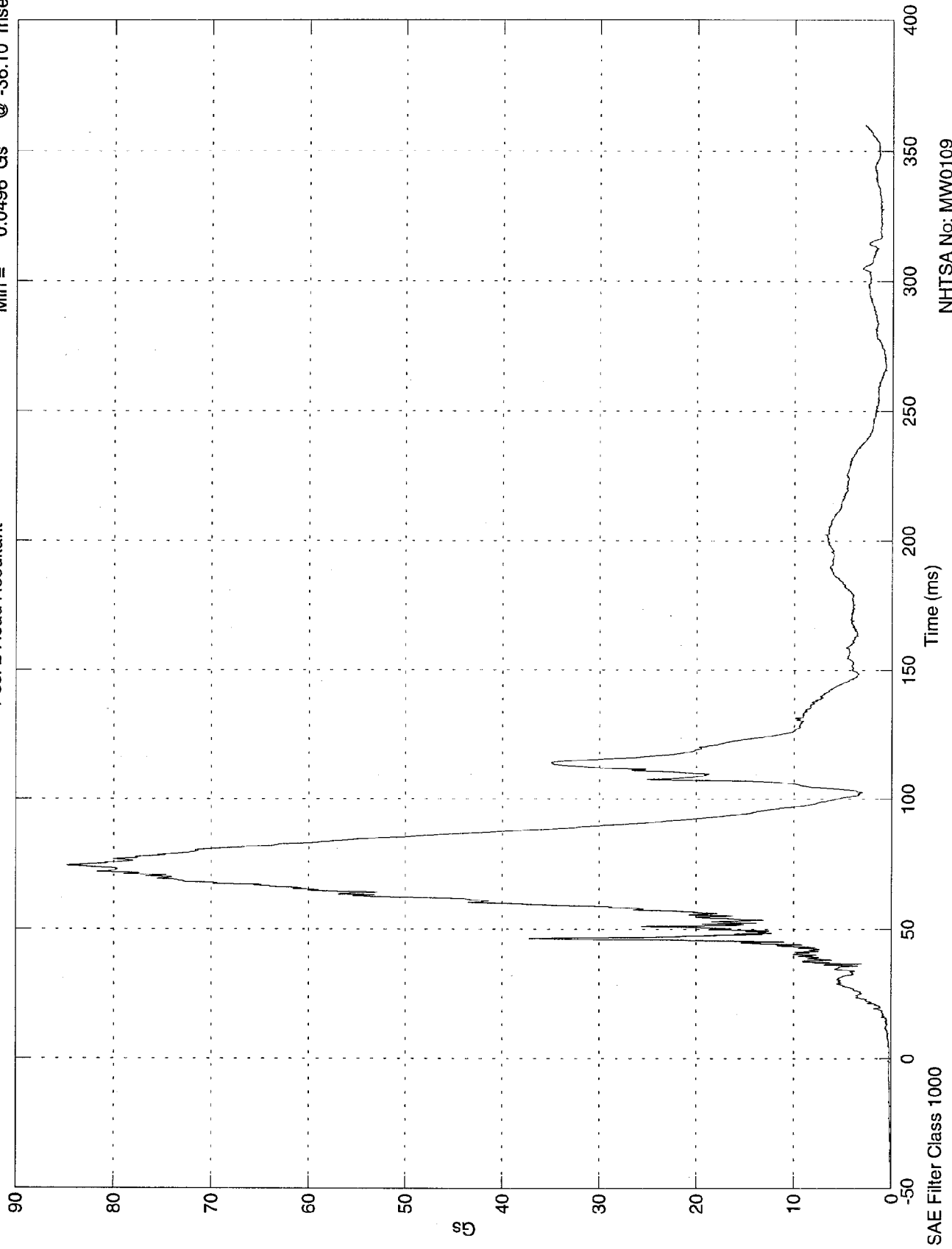


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 84.7 Gs @ 74.50 msec
 Min = 0.0496 Gs @ -36.10 msec

Pos. 2 Head Resultant

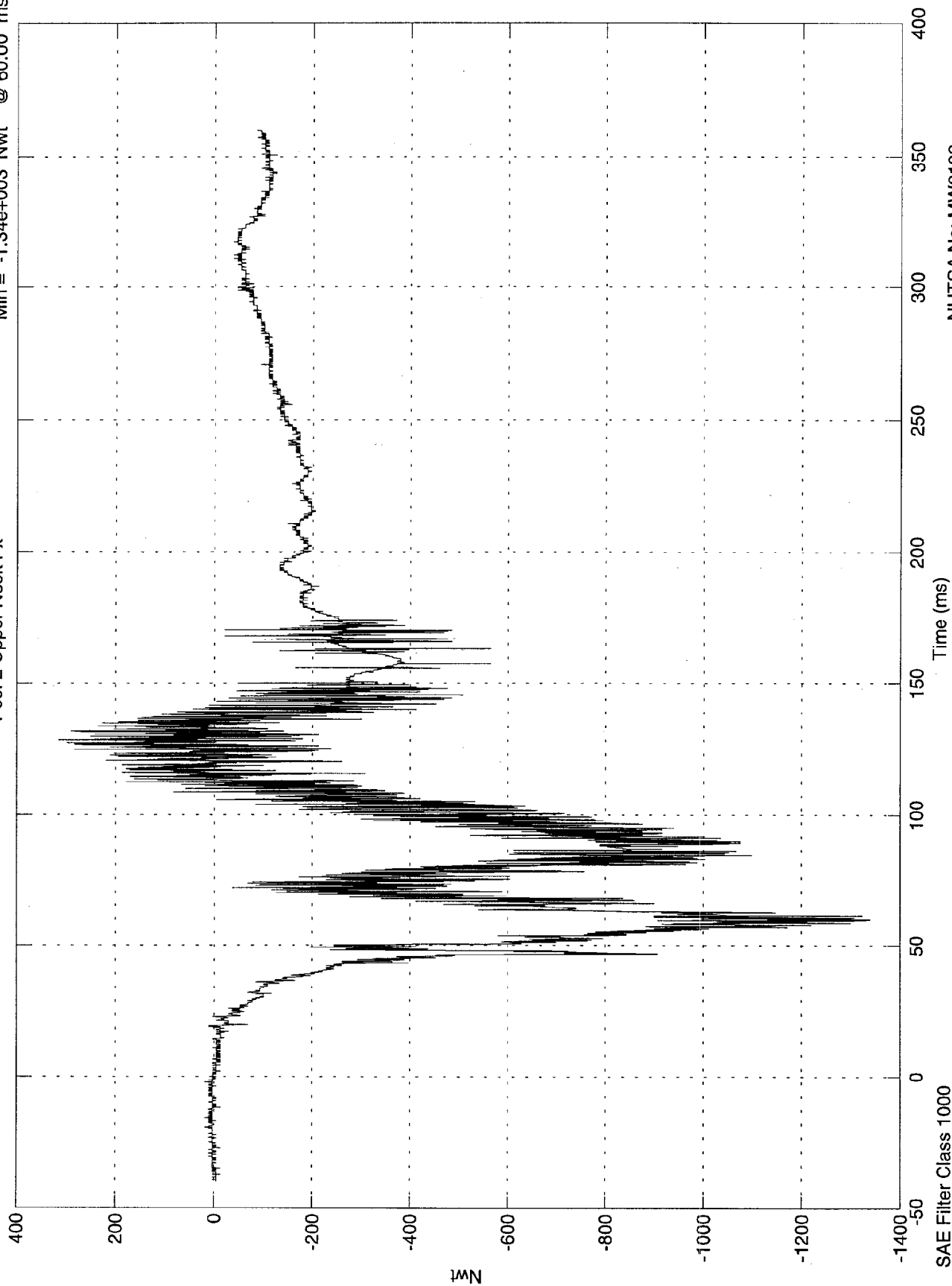


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 314 Nwt @ 128.50 msec
 Min = -1.34e+003 Nwt @ 60.00 msec

Pos. 2 Upper Neck Fx

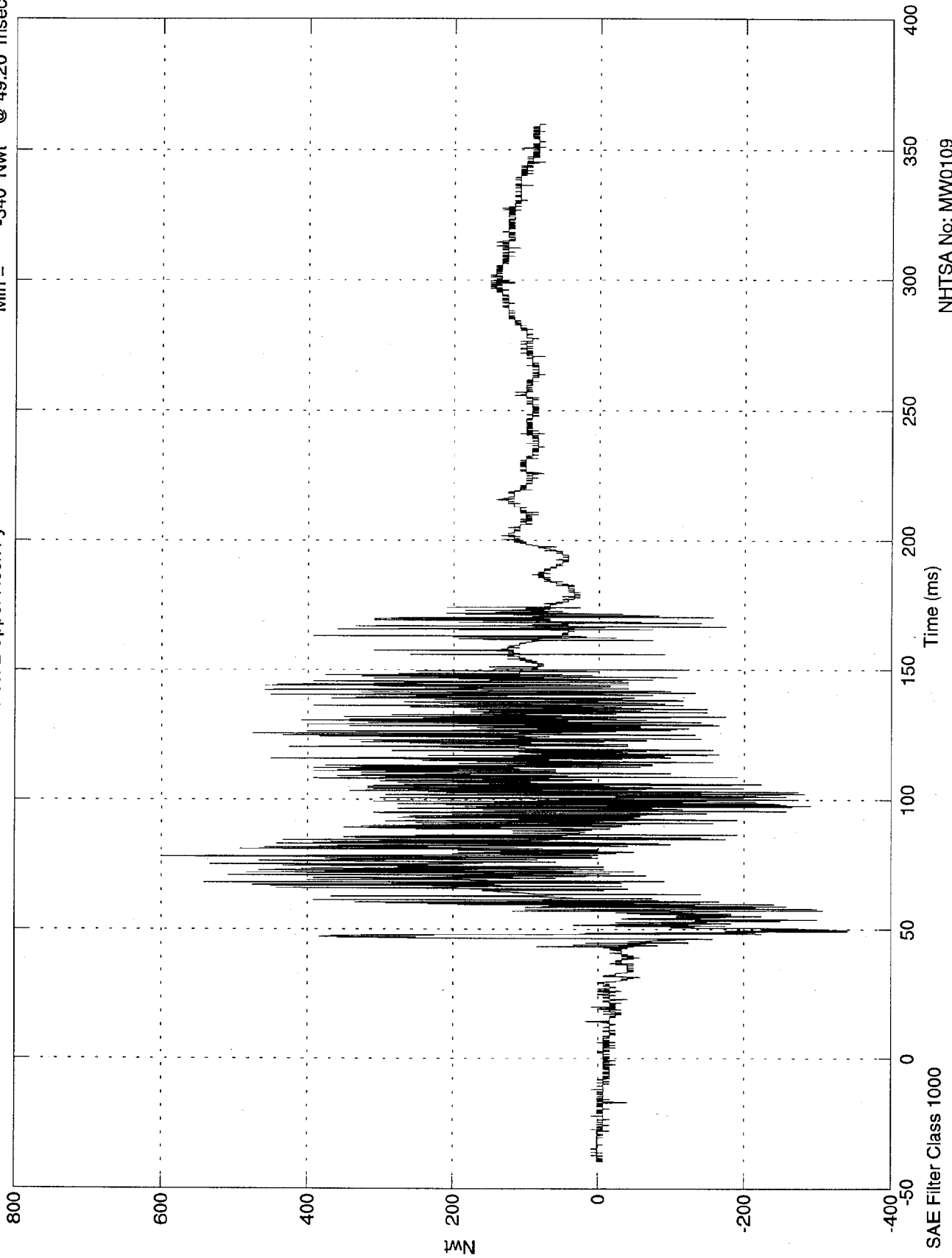


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 601 Nwt @ 78.40 msec
Min = -340 Nwt @ 49.20 msec

Pos. 2 Upper Neck Fy

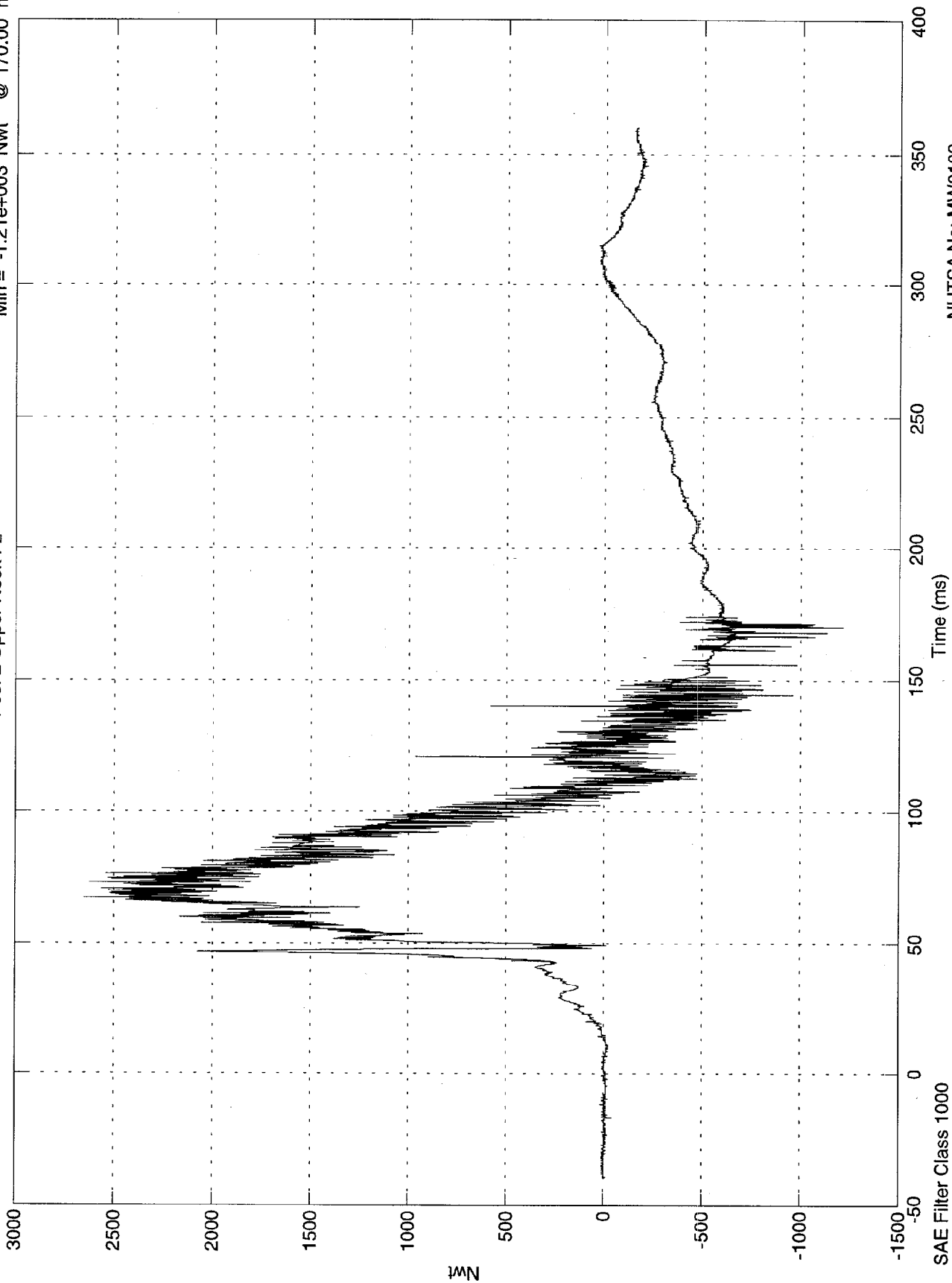


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 2.65e+003 Nwt @ 67.10 msec
Min = -1.21e+003 Nwt @ 170.00 msec

Pos. 2 Upper Neck Fz

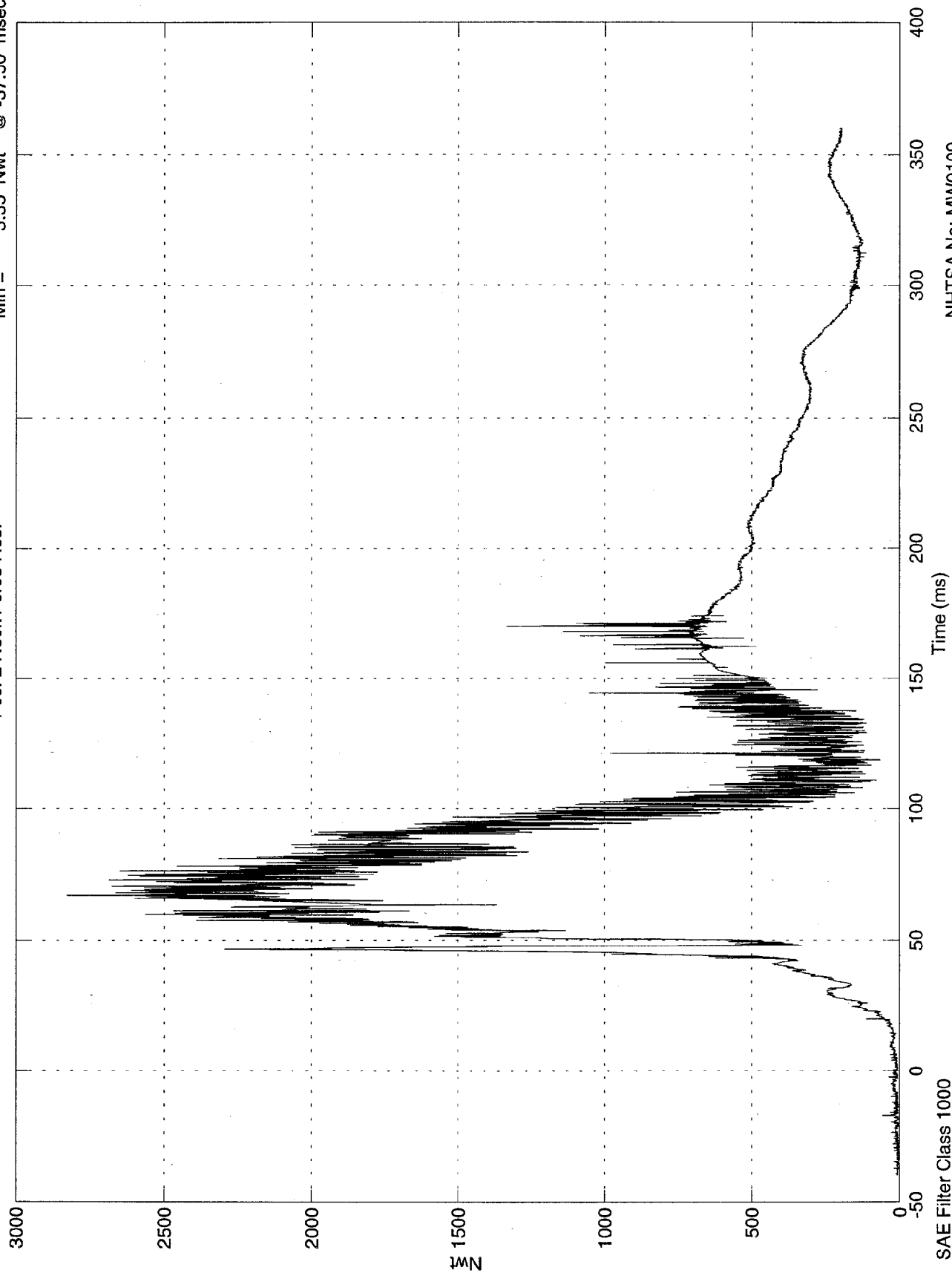


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 2.83e+003 Nwt @ 67.10 msec
 Min = 3.35 Nwt @ -37.50 msec

Pos. 2 Neck Force Res.

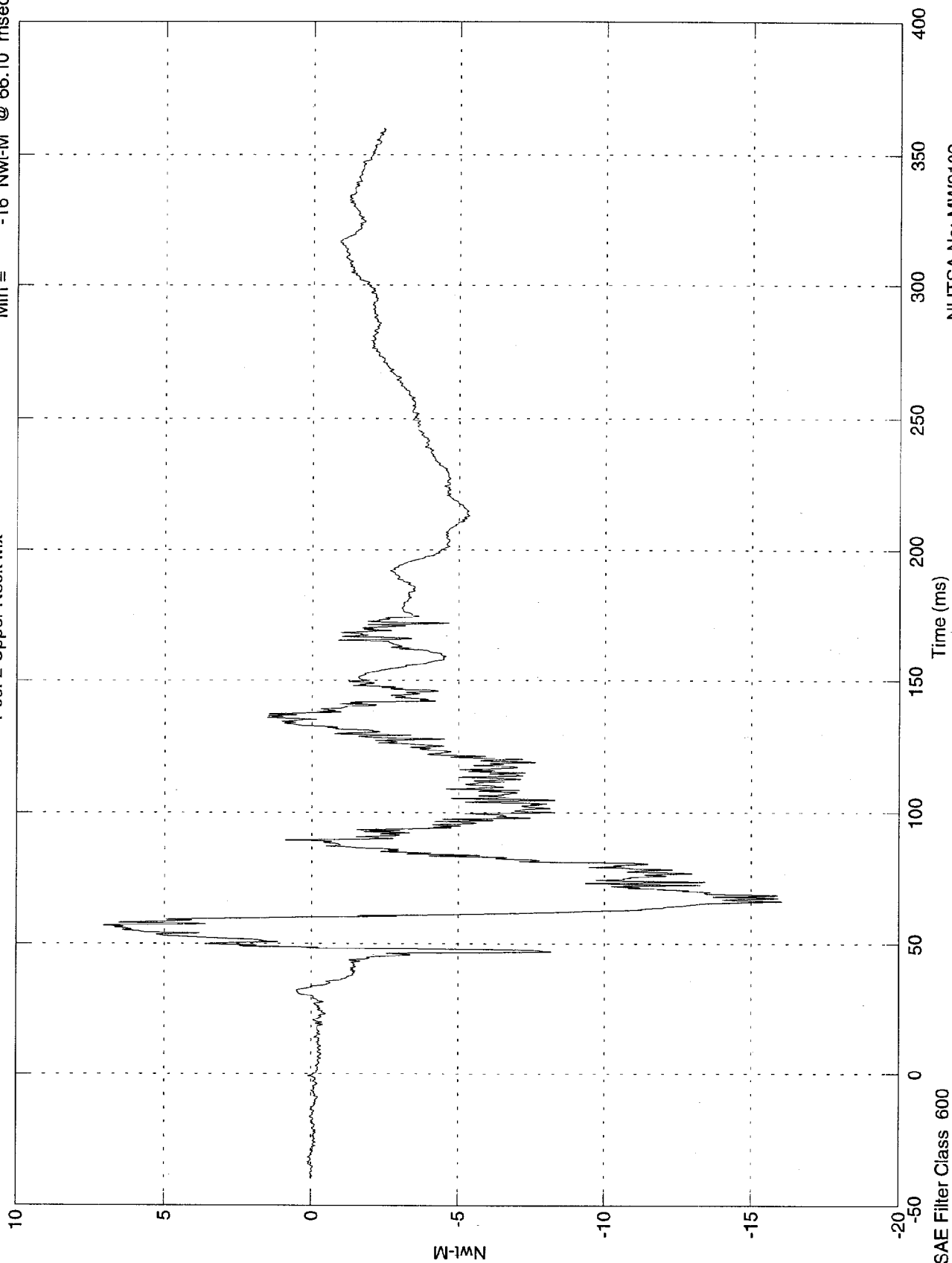


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 7.06 Nwt-M @ 56.80 msec
 Min = -16 Nwt-M @ 66.10 msec

Pos. 2 Upper Neck Mx



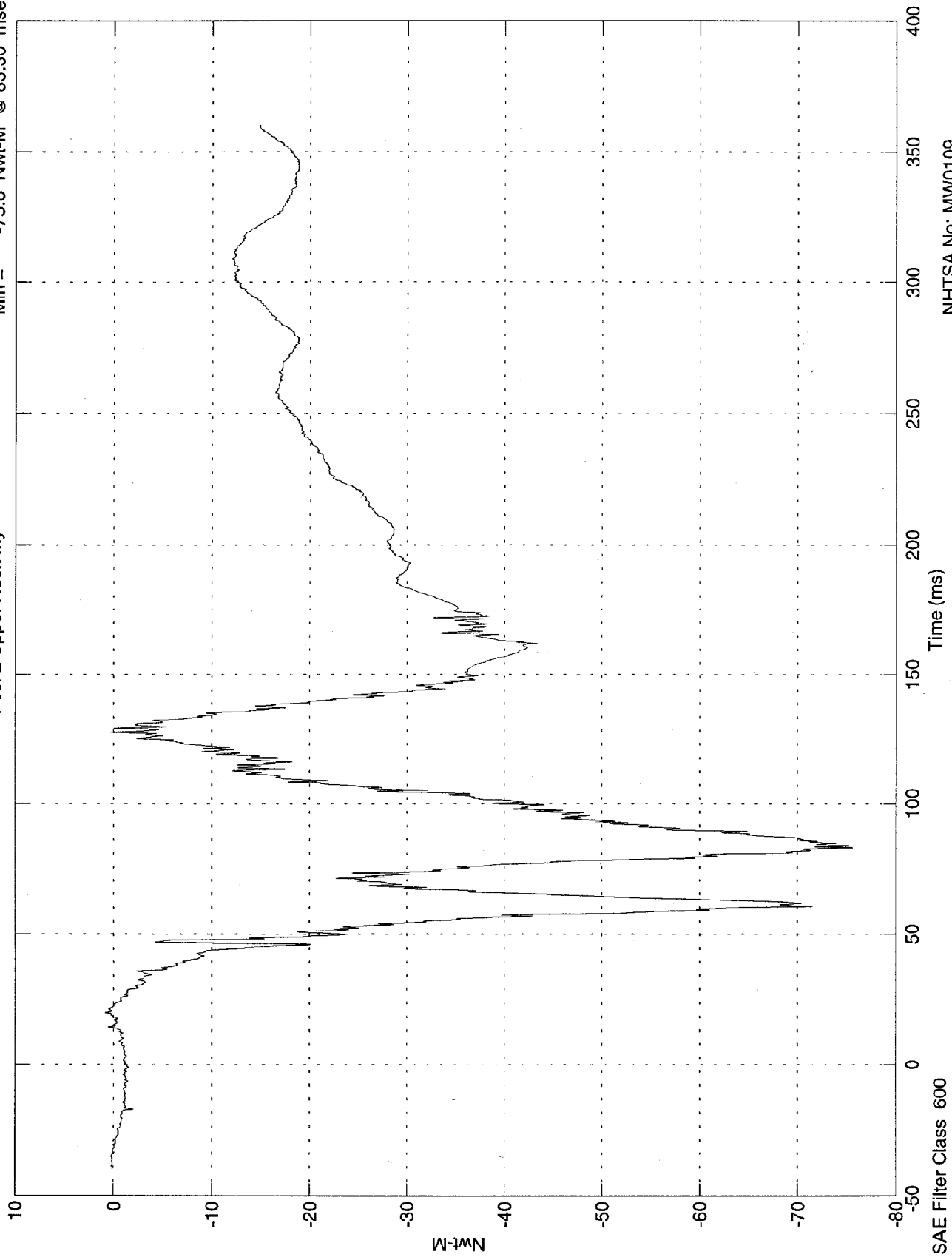
NHTSA No: MW0109
 Date: 08 Dec 1997

SAE Filter Class 600

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 0.848 Nwt-M @ 19.90 msec
Min = -75.6 Nwt-M @ 83.30 msec

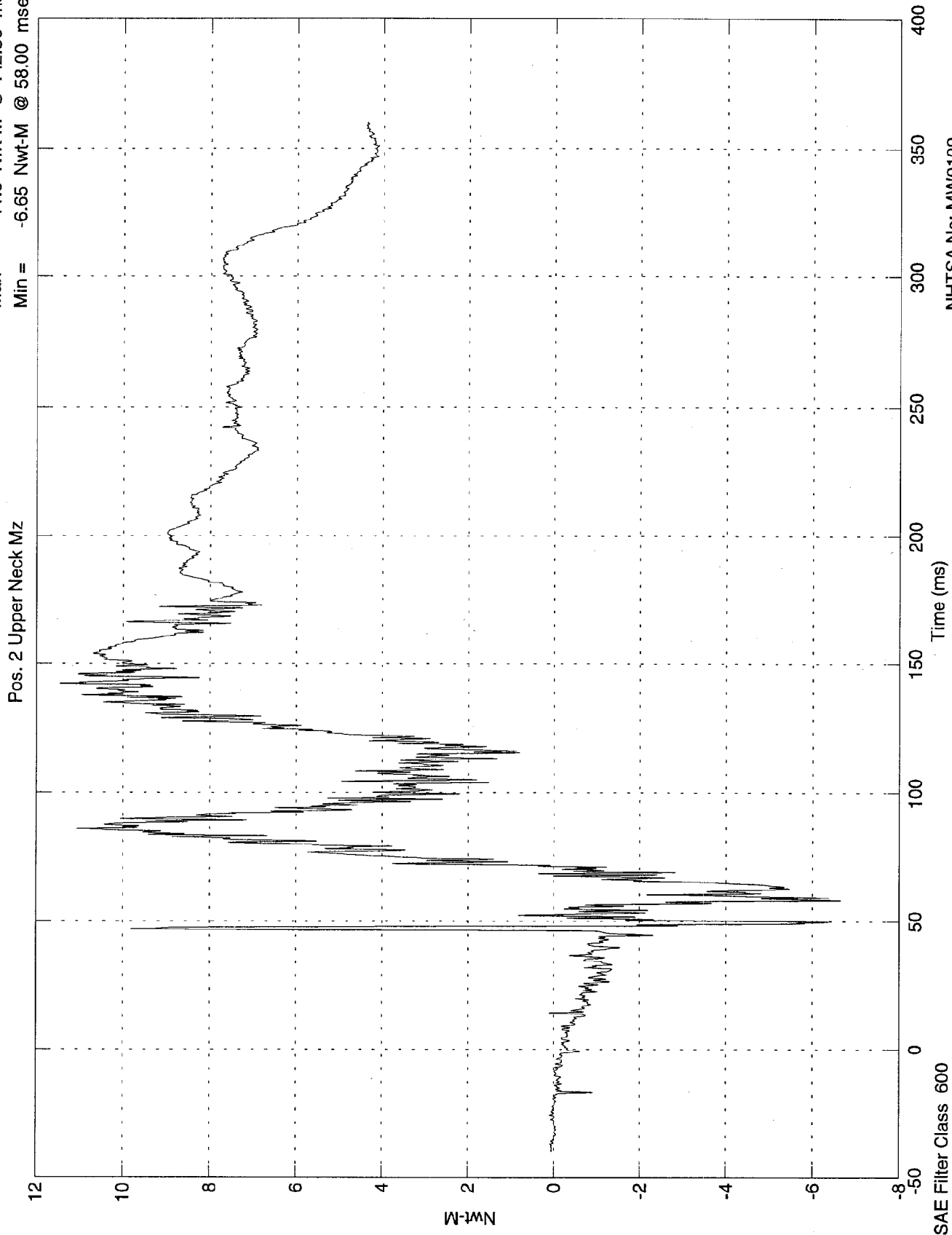
Pos. 2 Upper Neck My



NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 11.5 Nwt-M @ 142.30 msec
Min = -6.65 Nwt-M @ 58.00 msec

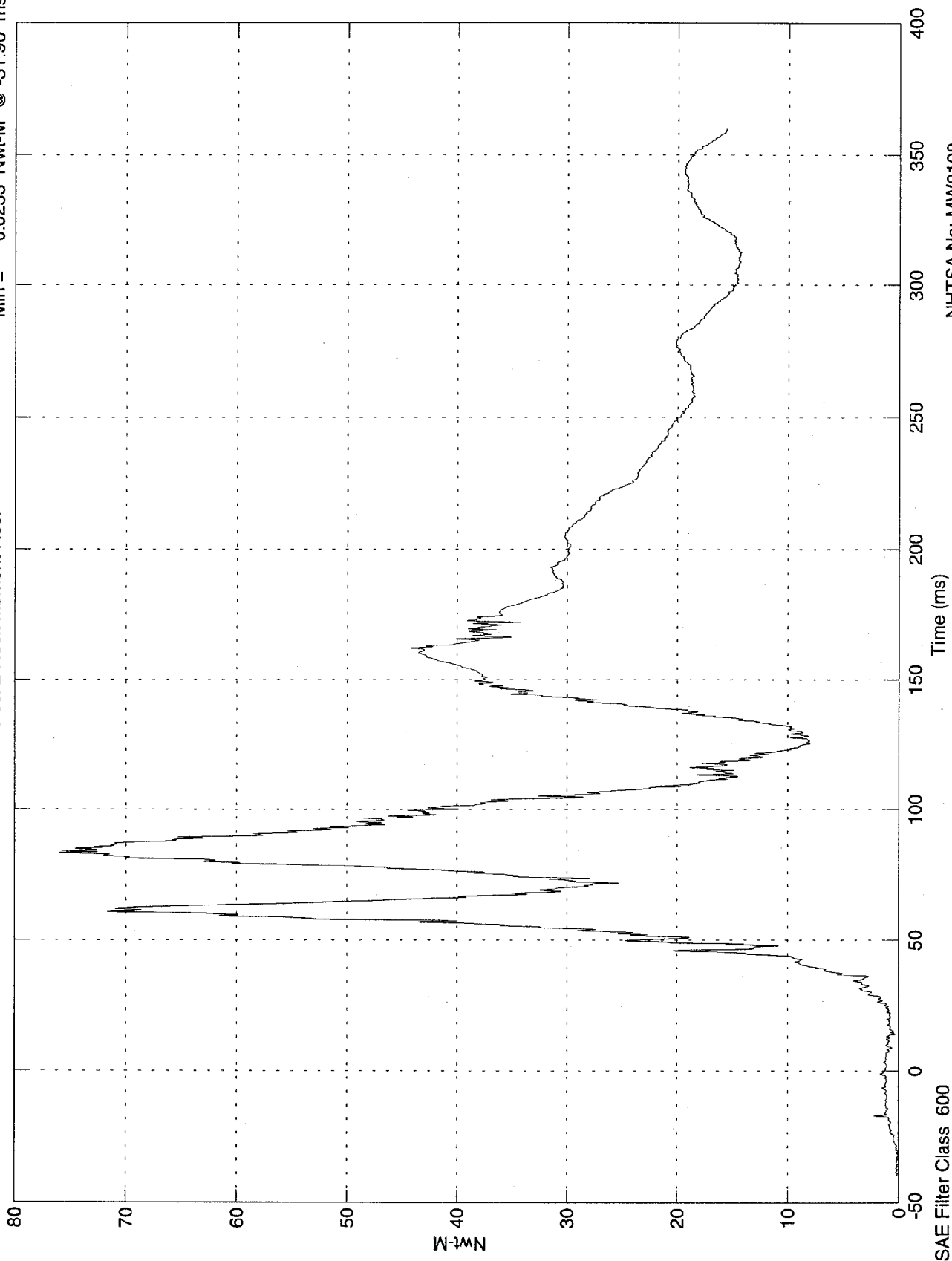


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 76 Nwt-M @ 83.30 msec
 Min = 0.0233 Nwt-M @ -31.90 msec

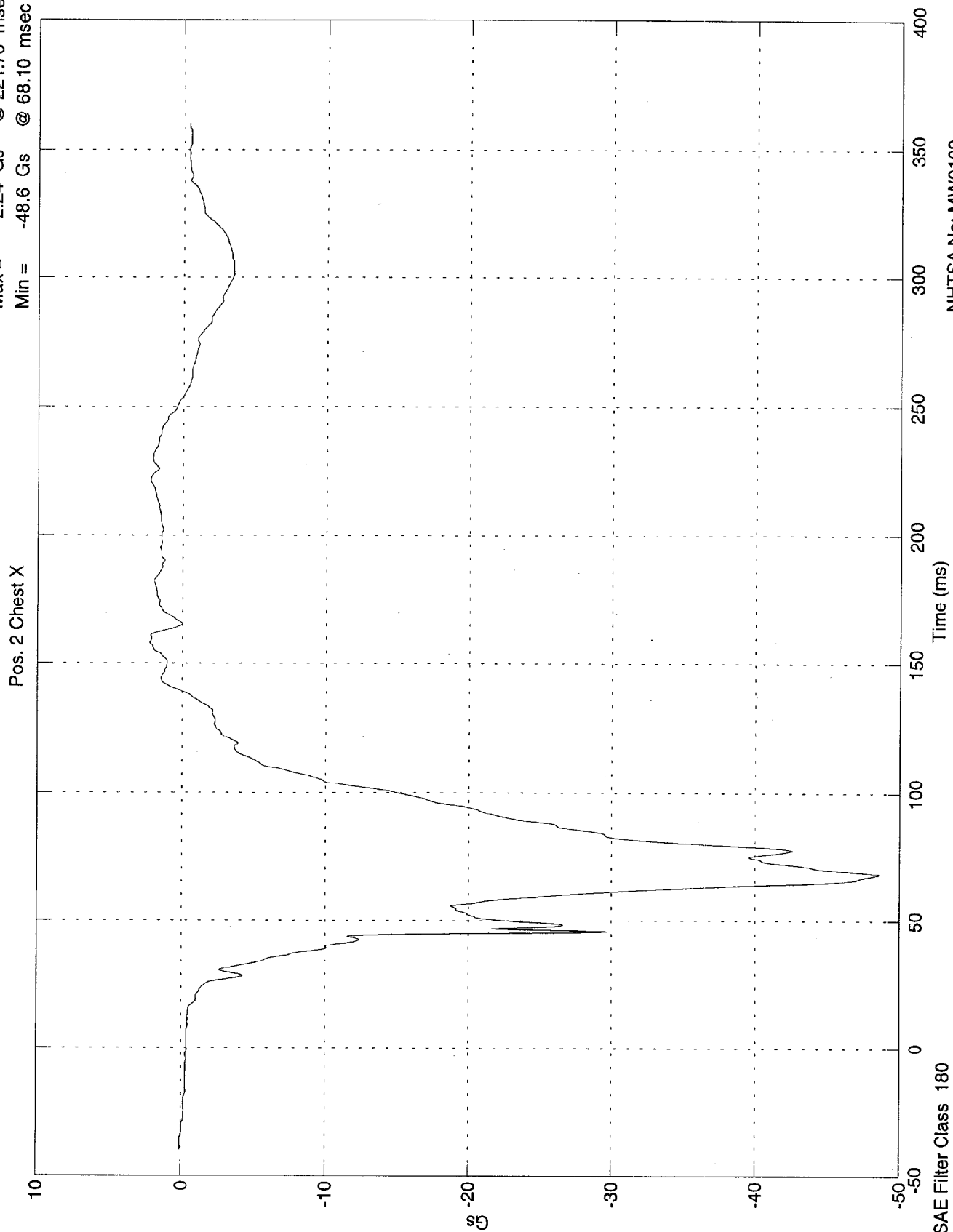
Pos. 2 Neck Moment Res.



NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 2.24 Gs @ 221.70 msec
Min = -48.6 Gs @ 68.10 msec

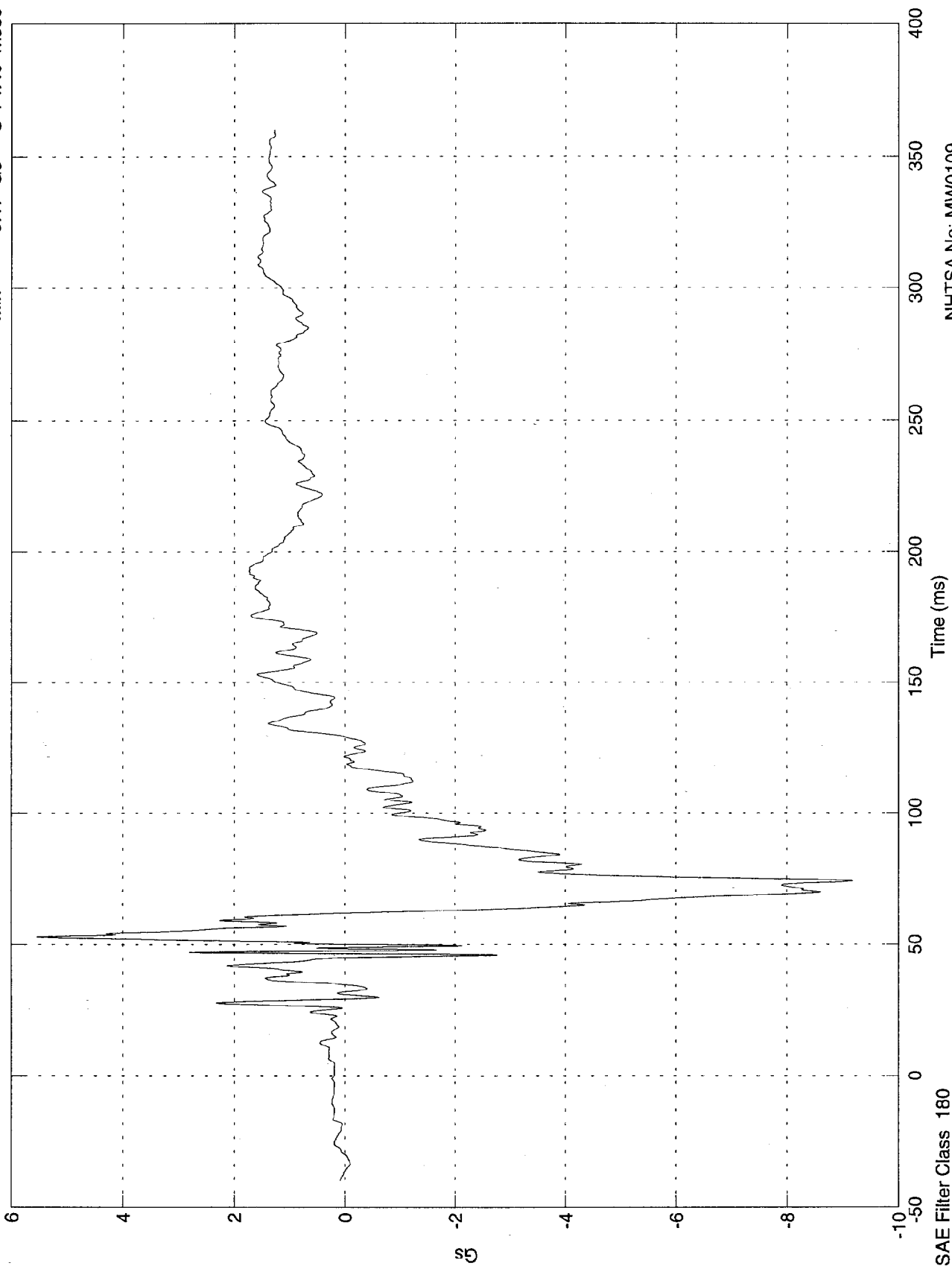


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 5.54 Gs @ 52.90 msec
 Min = -9.17 Gs @ 74.40 msec

Pos. 2 Chest Y



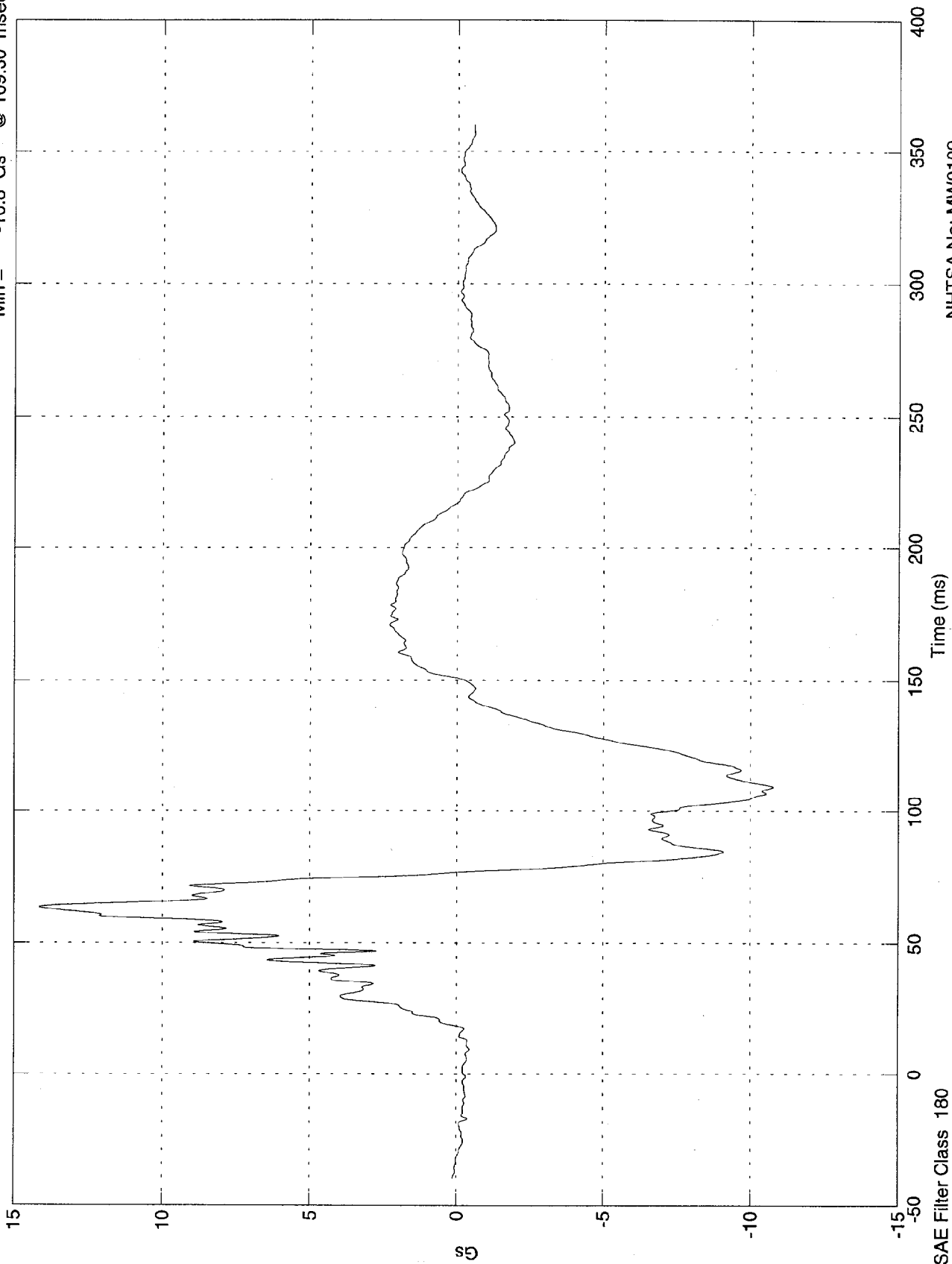
NHTSA No: MW0109
 Date: 08 Dec 1997

SAE Filter Class 180

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 14.2 Gs @ 63.40 msec
Min = -10.8 Gs @ 109.30 msec

Pos. 2 Chest Z

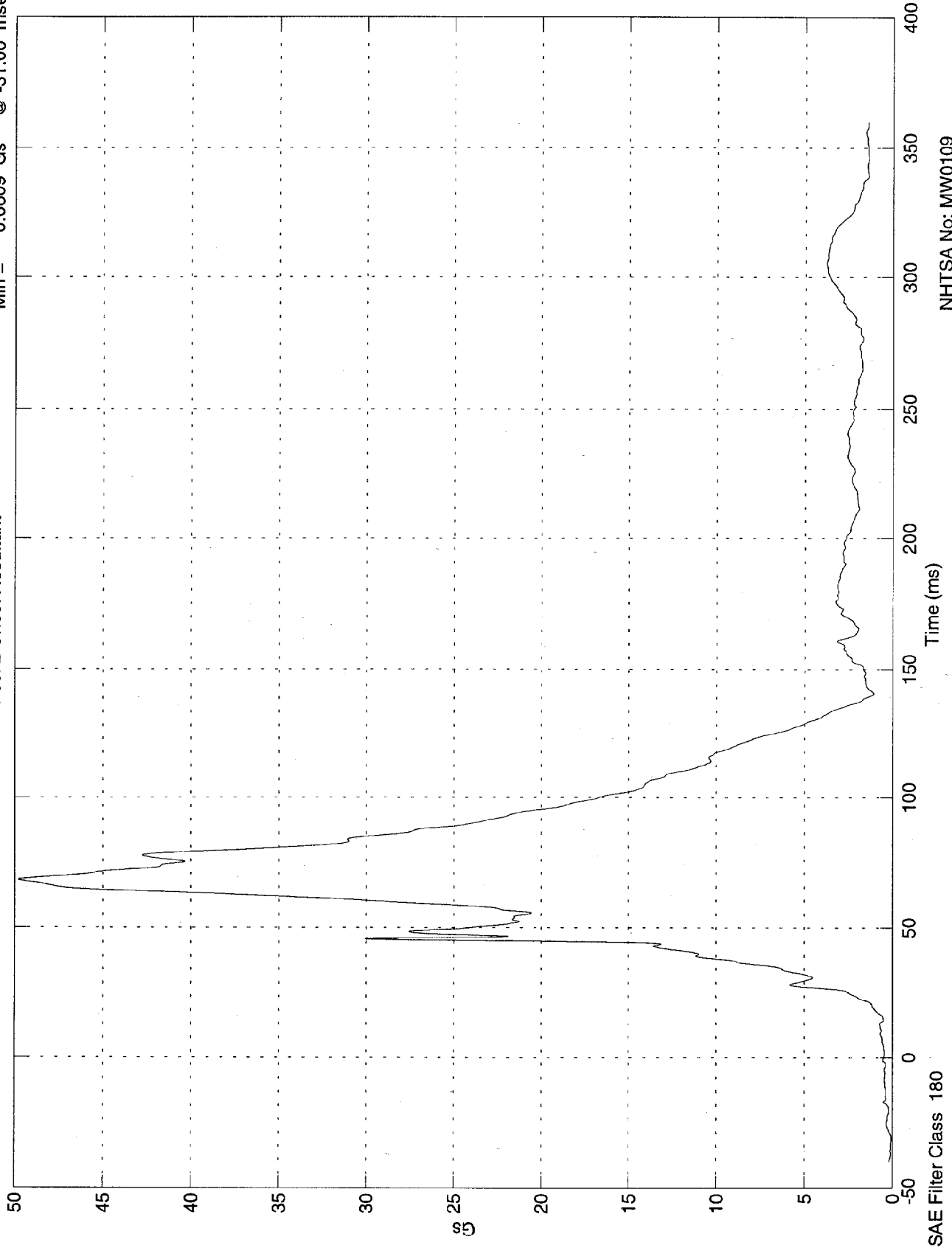


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 49.8 Gs @ 68.10 msec
Min = 0.0609 Gs @ -31.00 msec

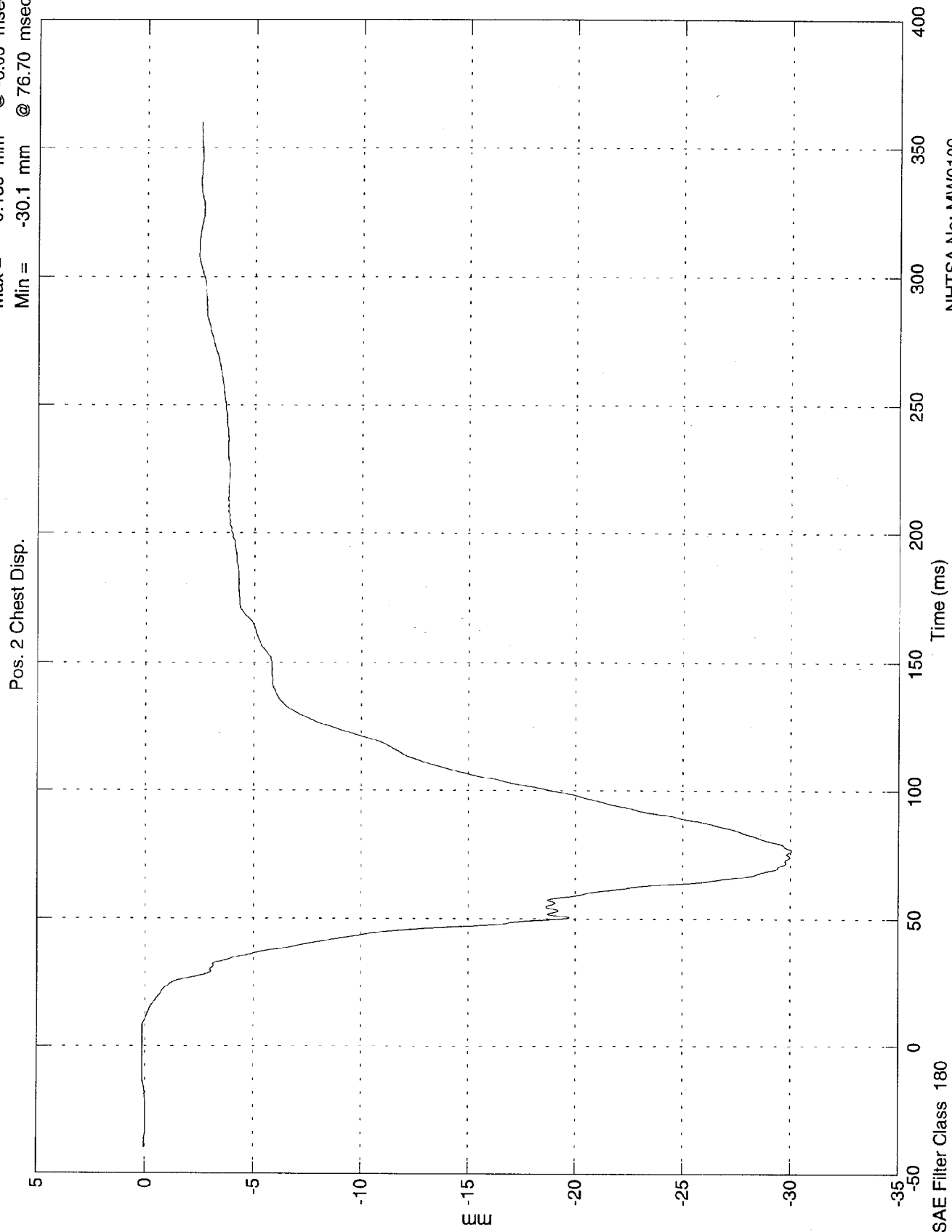
Pos. 2 Chest Resultant



NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

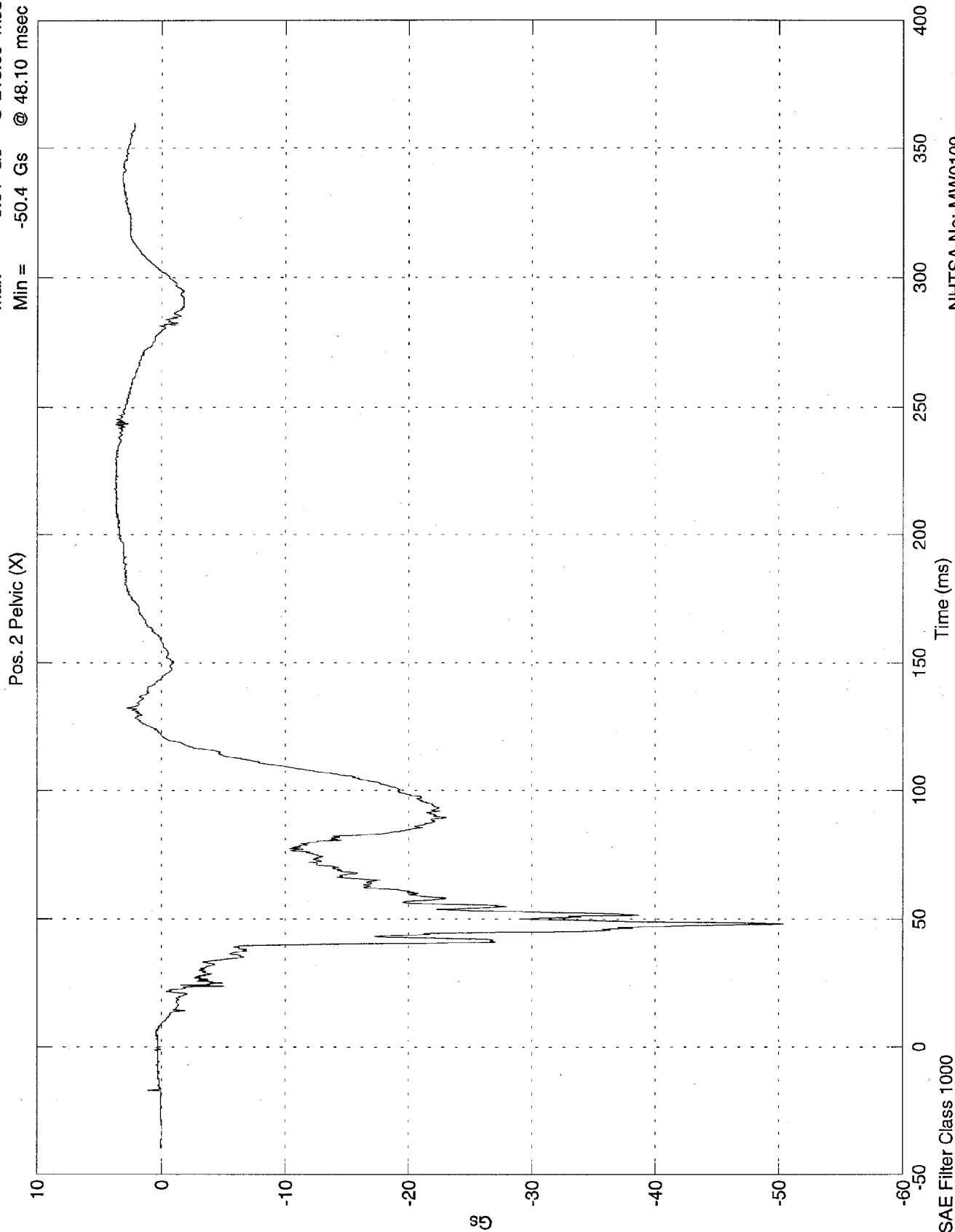
Max = 0.139 mm @ -6.00 msec
Min = -30.1 mm @ 76.70 msec



NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 3.81 Gs @ 218.00 msec
 Min = -50.4 Gs @ 48.10 msec

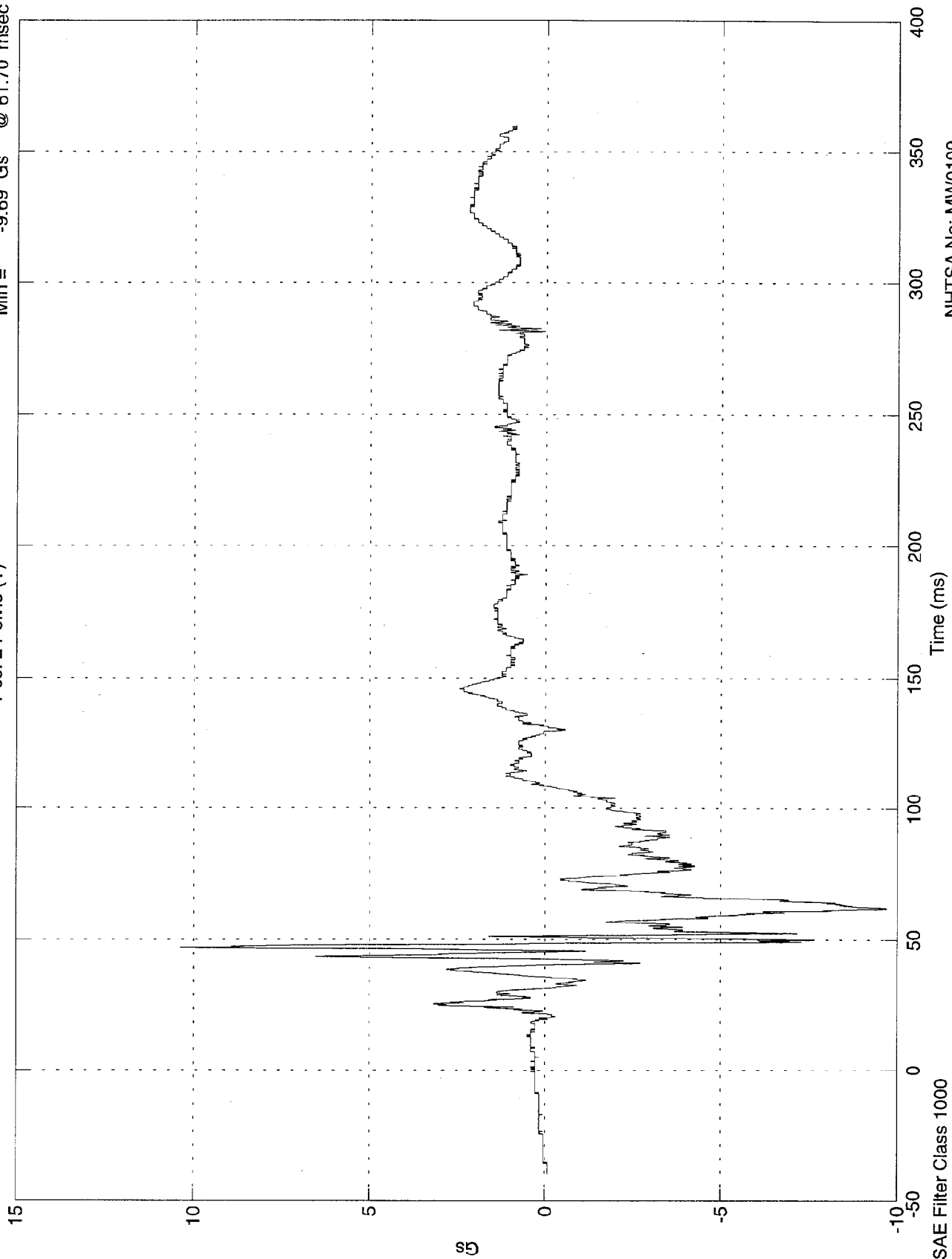


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 10.4 Gs @ 46.80 msec
Min = -9.69 Gs @ 61.70 msec

Pos. 2 Pelvic (Y)

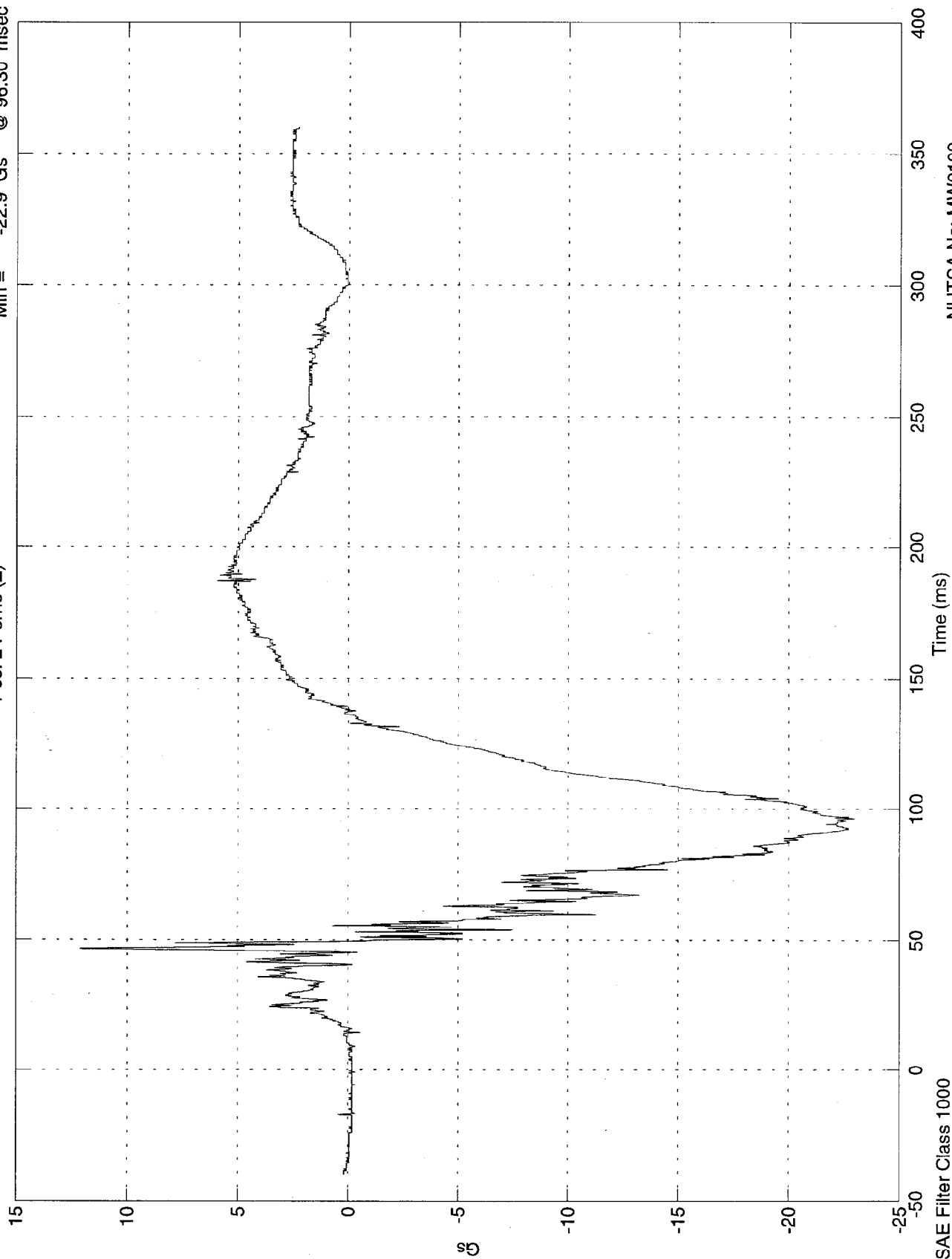


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 12.1 Gs @ 46.70 msec
Min = -22.9 Gs @ 96.30 msec

Pos. 2 Pelvic (Z)

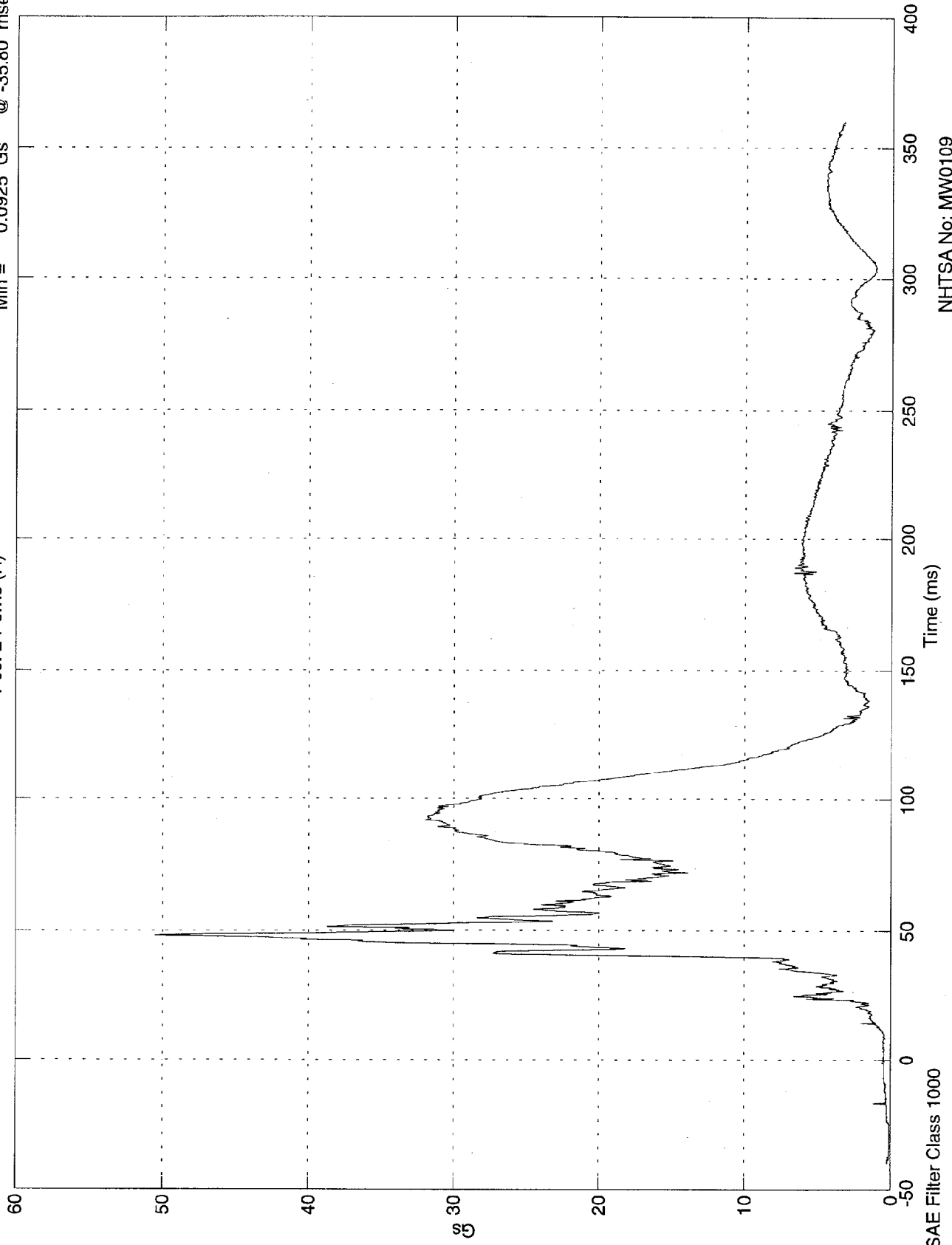


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 50.5 Gs @ 48.10 msec
 Min = 0.0925 Gs @ -35.80 msec

Pos. 2 Pelvic (R)



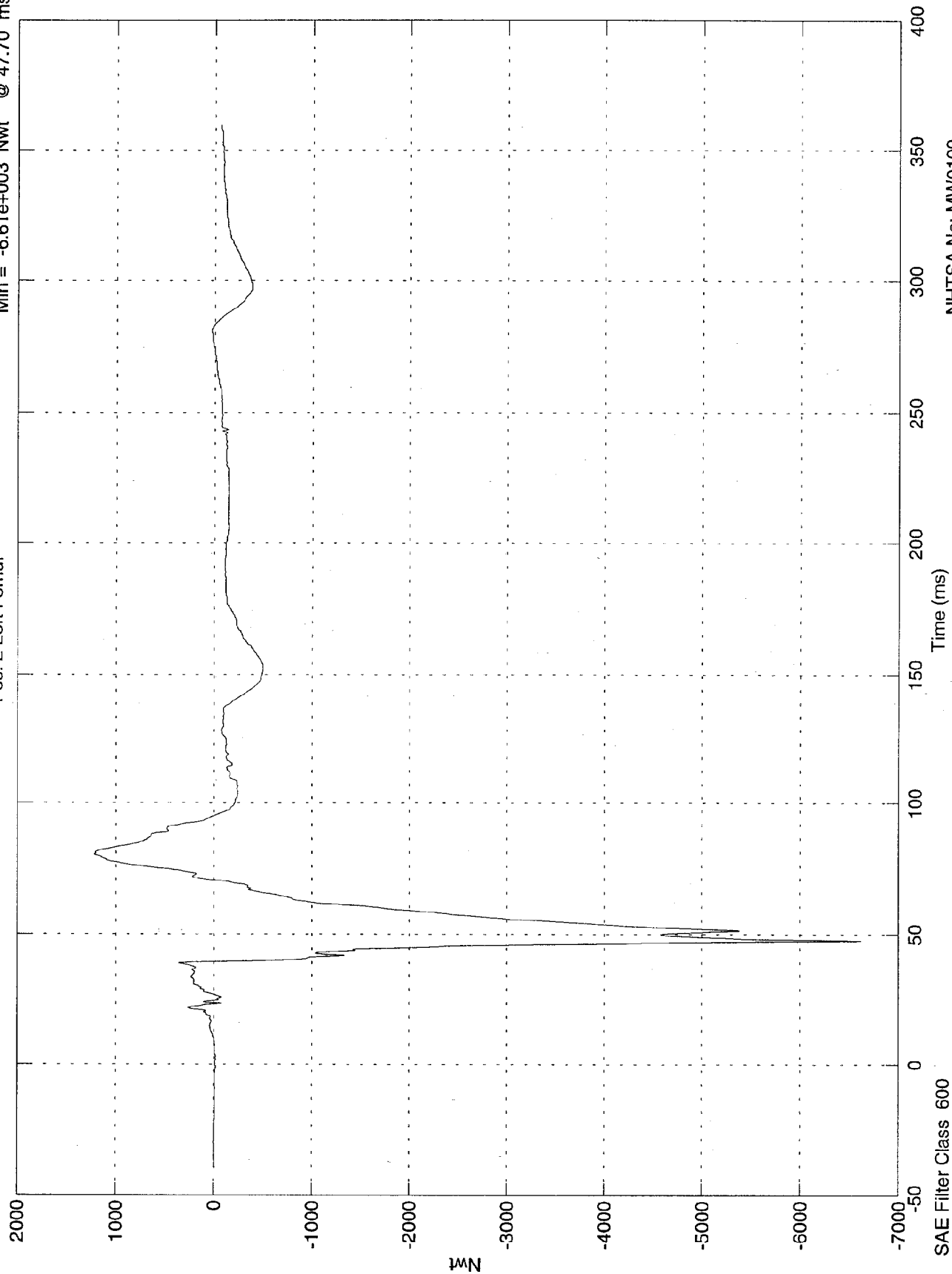
NHTSA No: MW0109
 Date: 08 Dec 1997

SAE Filter Class 1000

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 1.22e+003 Nwt @ 80.40 msec
Min = -6.61e+003 Nwt @ 47.70 msec

Pos. 2 Left Femur

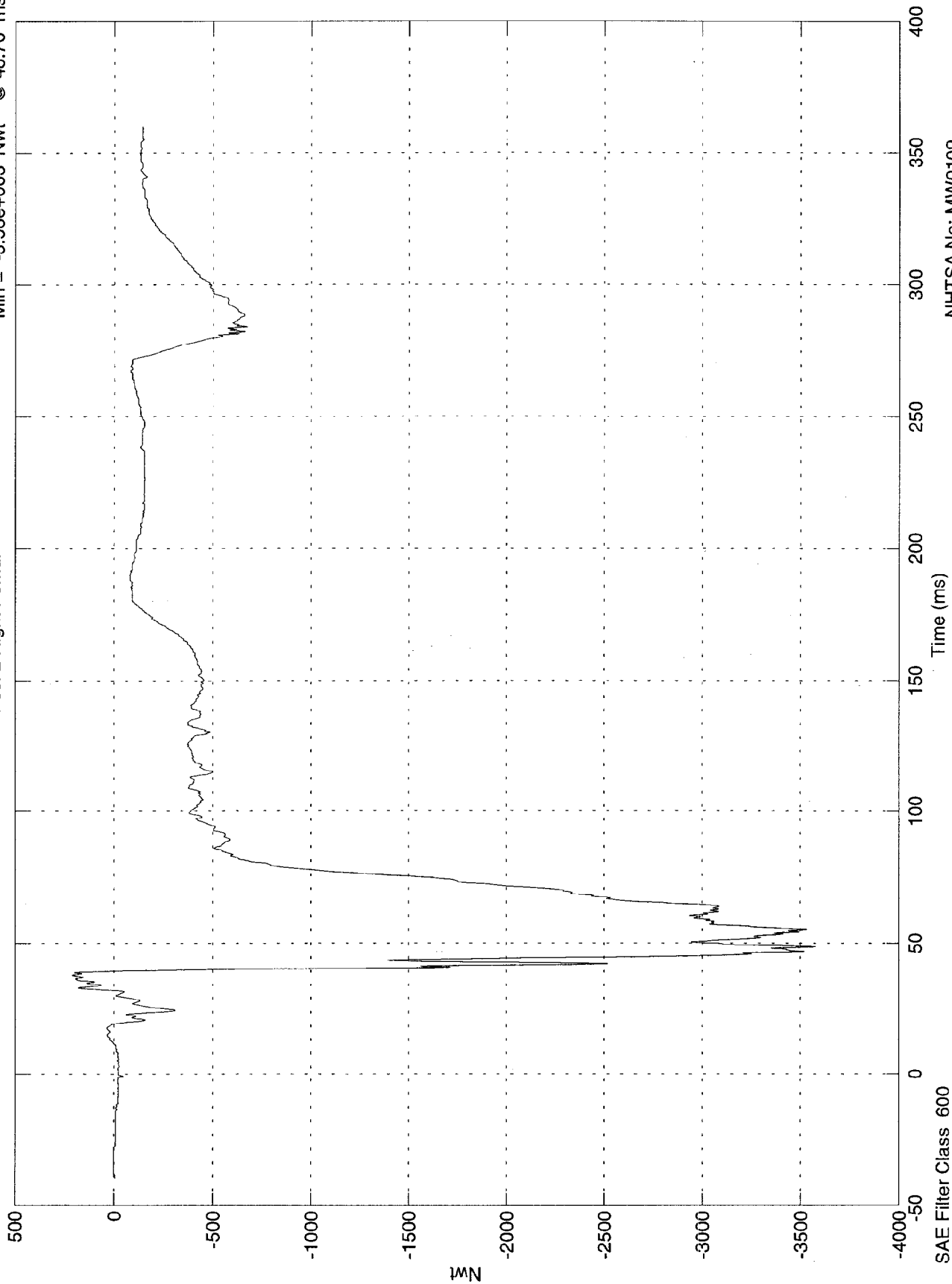


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 210 Nwt @ 37.90 msec
Min = -3.58e+003 Nwt @ 48.70 msec

Pos. 2 Right Femur

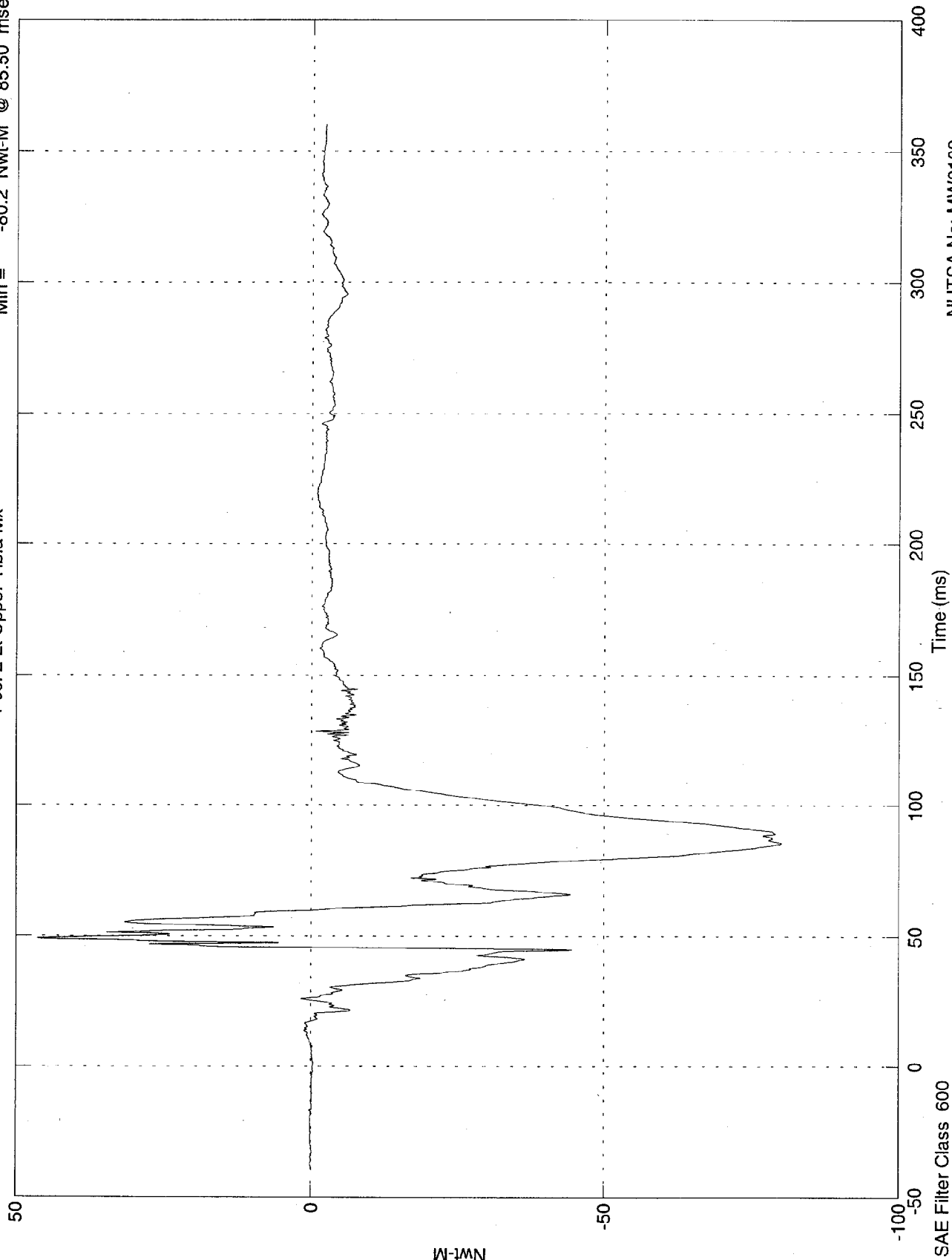


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 46.3 Nwt-M @ 49.10 msec
Min = -80.2 Nwt-M @ 85.50 msec

Pos. 2 Lt Upper Tibia Mx



NHTSA No: MW0109
Date: 08 Dec 1997

M-1WN

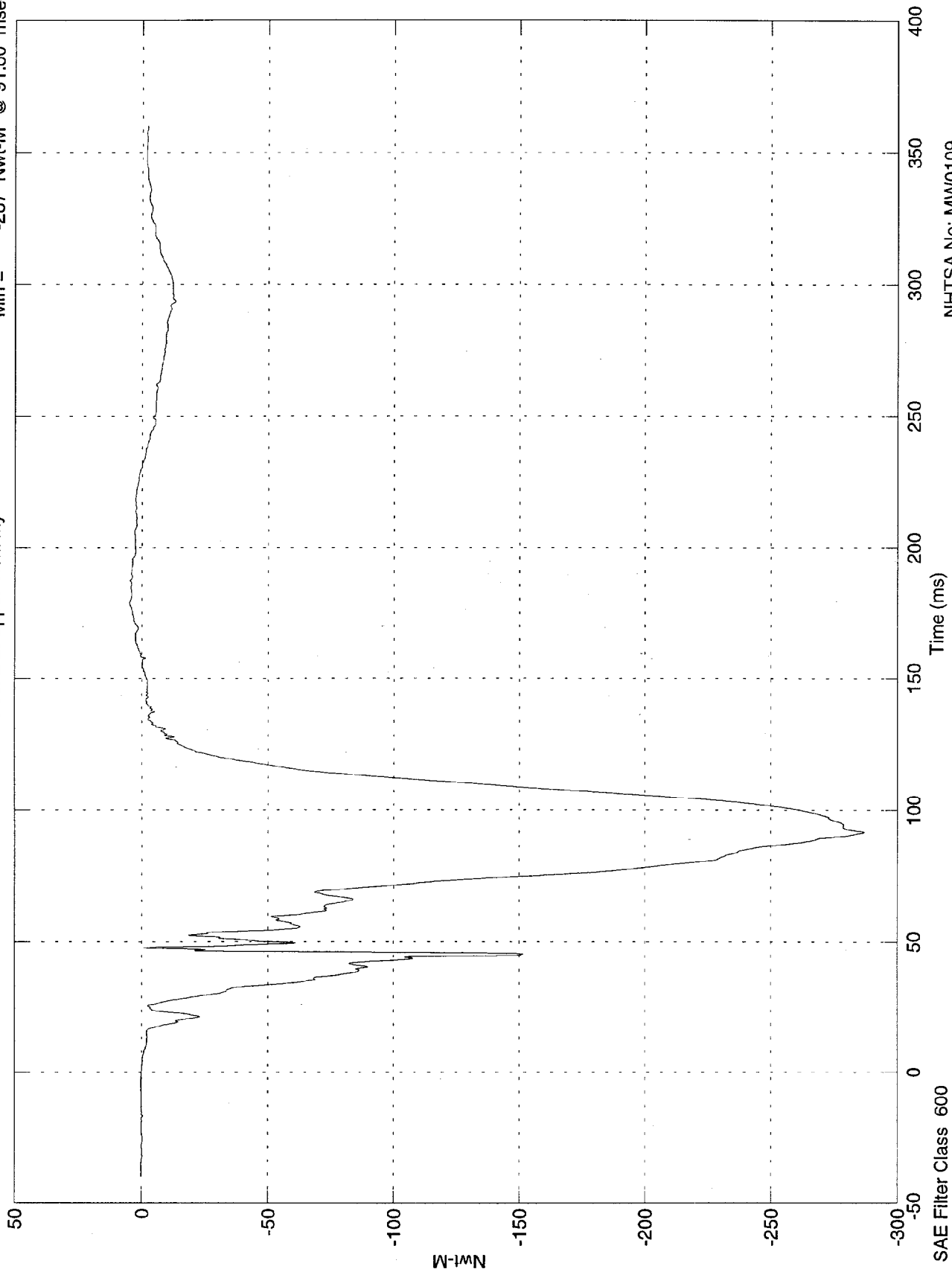
B-78

8413-12

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 4.94 Nwt-M @ 179.30 msec
Min = -287 Nwt-M @ 91.60 msec

Pos. 2 Lt Upper Tibia My



NHTSA No: MW0109
Date: 08 Dec 1997

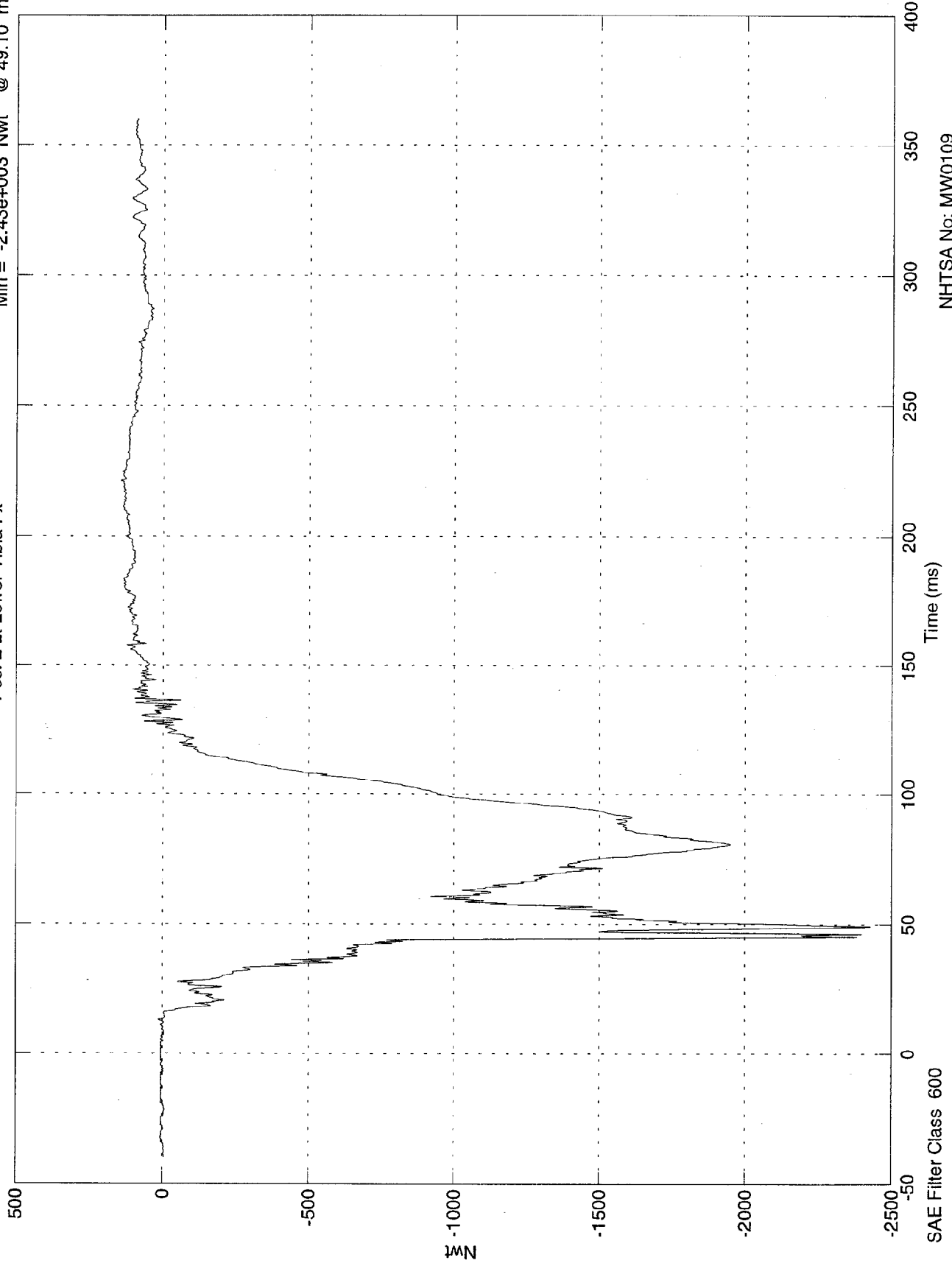
SAE Filter Class 600

M-I-M-N

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 145 Nwt @ 221.40 msec
Min = -2.43e+003 Nwt @ 49.10 msec

Pos. 2 Lt Lower Tibia Fx

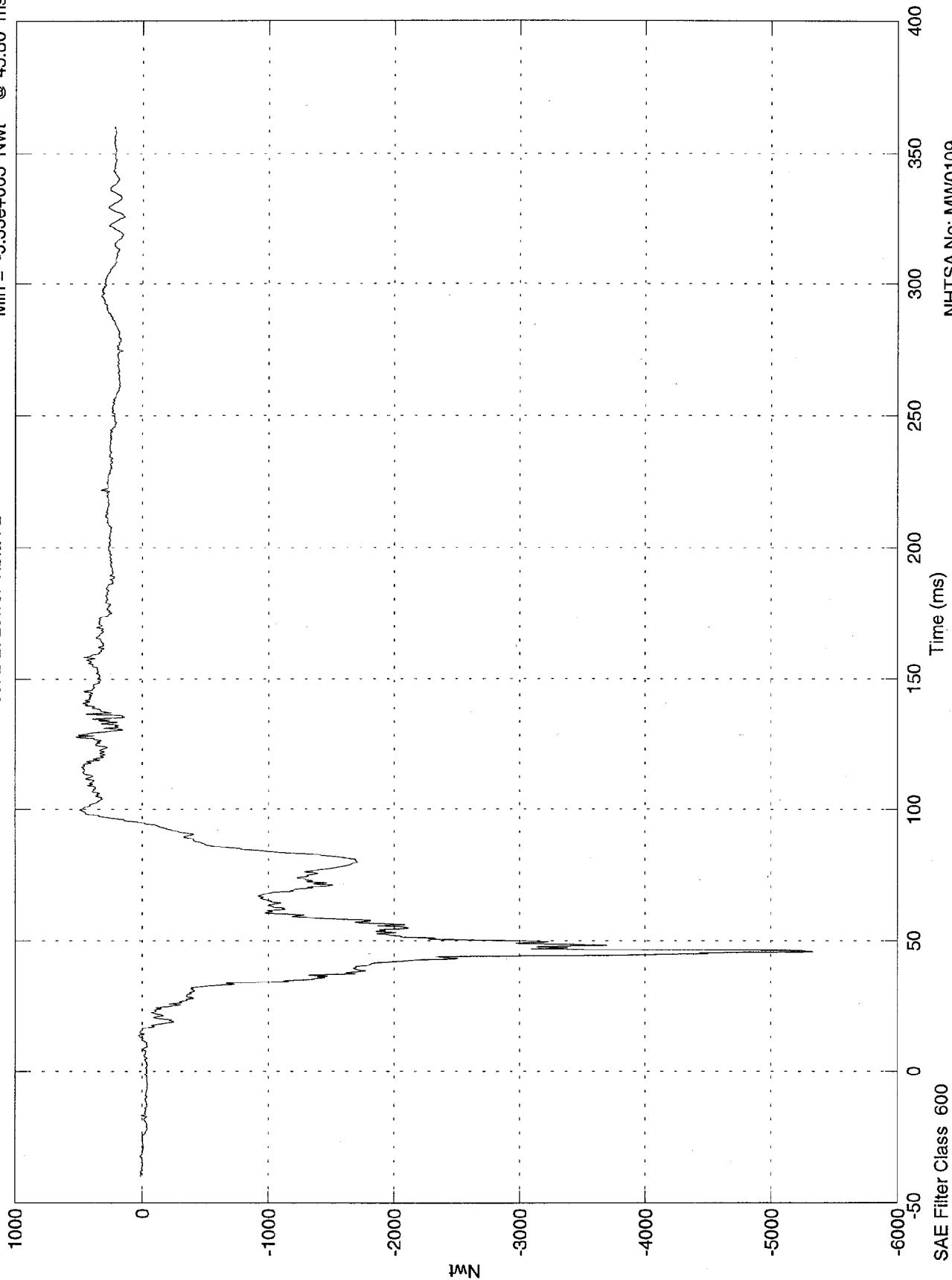


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 524 Nwt @ 127.60 msec
Min = -5.33e+003 Nwt @ 45.80 msec

Pos. 2 Lt Lower Tibia Fz

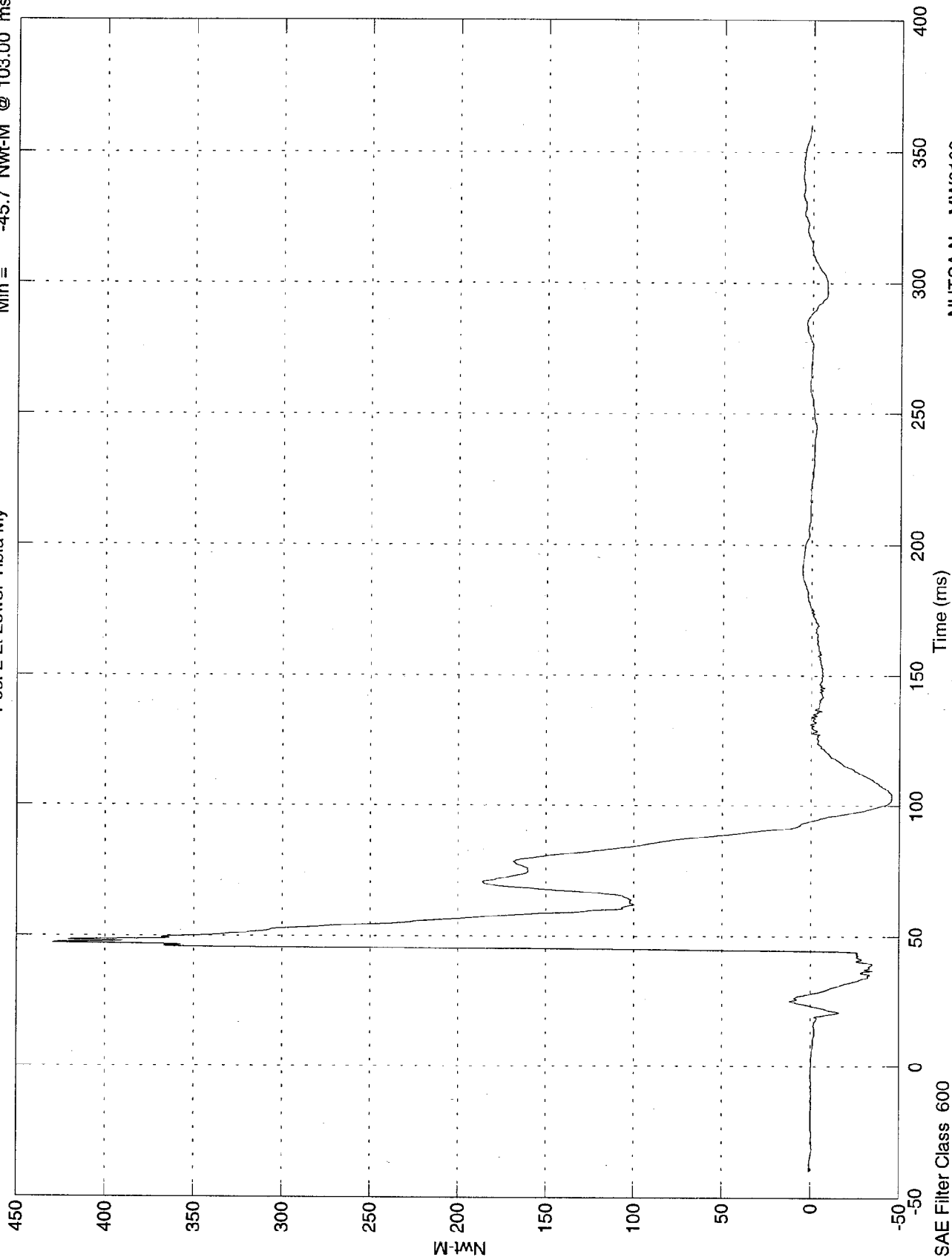


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 429 Nwt-M @ 47.20 msec
 Min = -45.7 Nwt-M @ 103.00 msec

Pos. 2 Lt Lower Tibia My

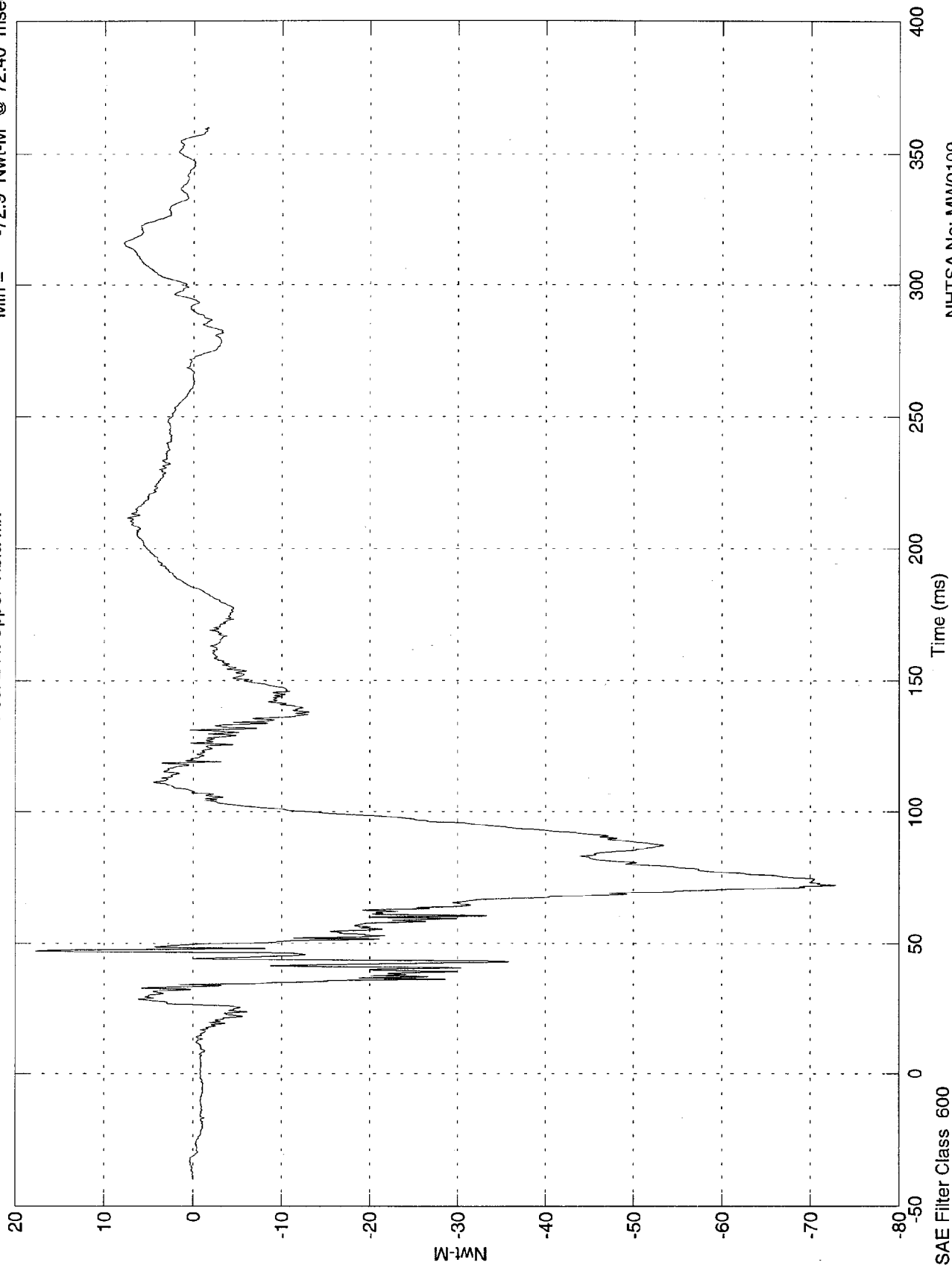


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 17.7 Nwt-M @ 47.20 msec
Min = -72.9 Nwt-M @ 72.40 msec

Pos. 2 Rt Upper Tibia Mx



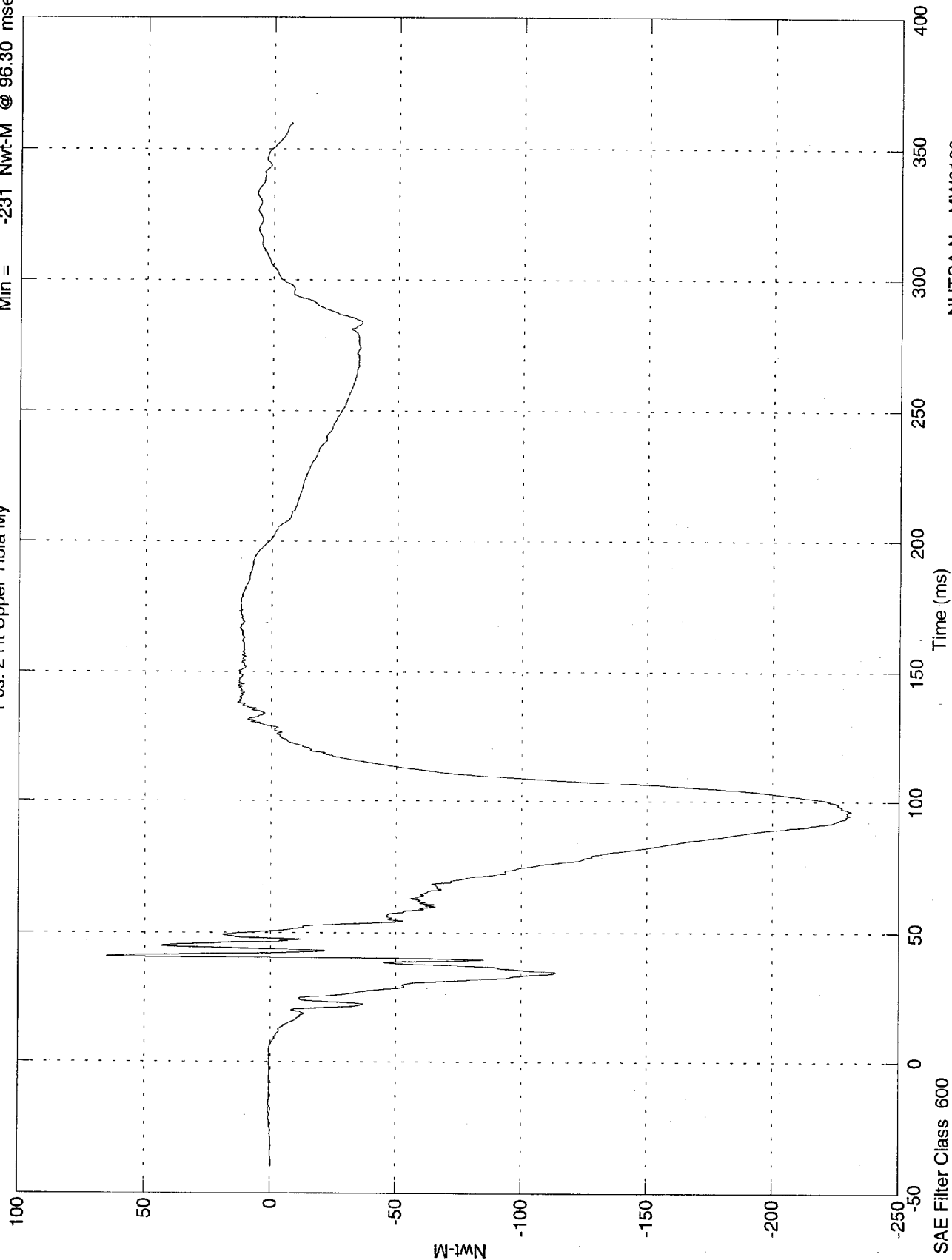
NHTSA No: MW0109
Date: 08 Dec 1997

SAE Filter Class 600

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 65 Nwt-M @ 41.10 msec
 Min = -231 Nwt-M @ 96.30 msec

Pos. 2 Rt Upper Tibia My

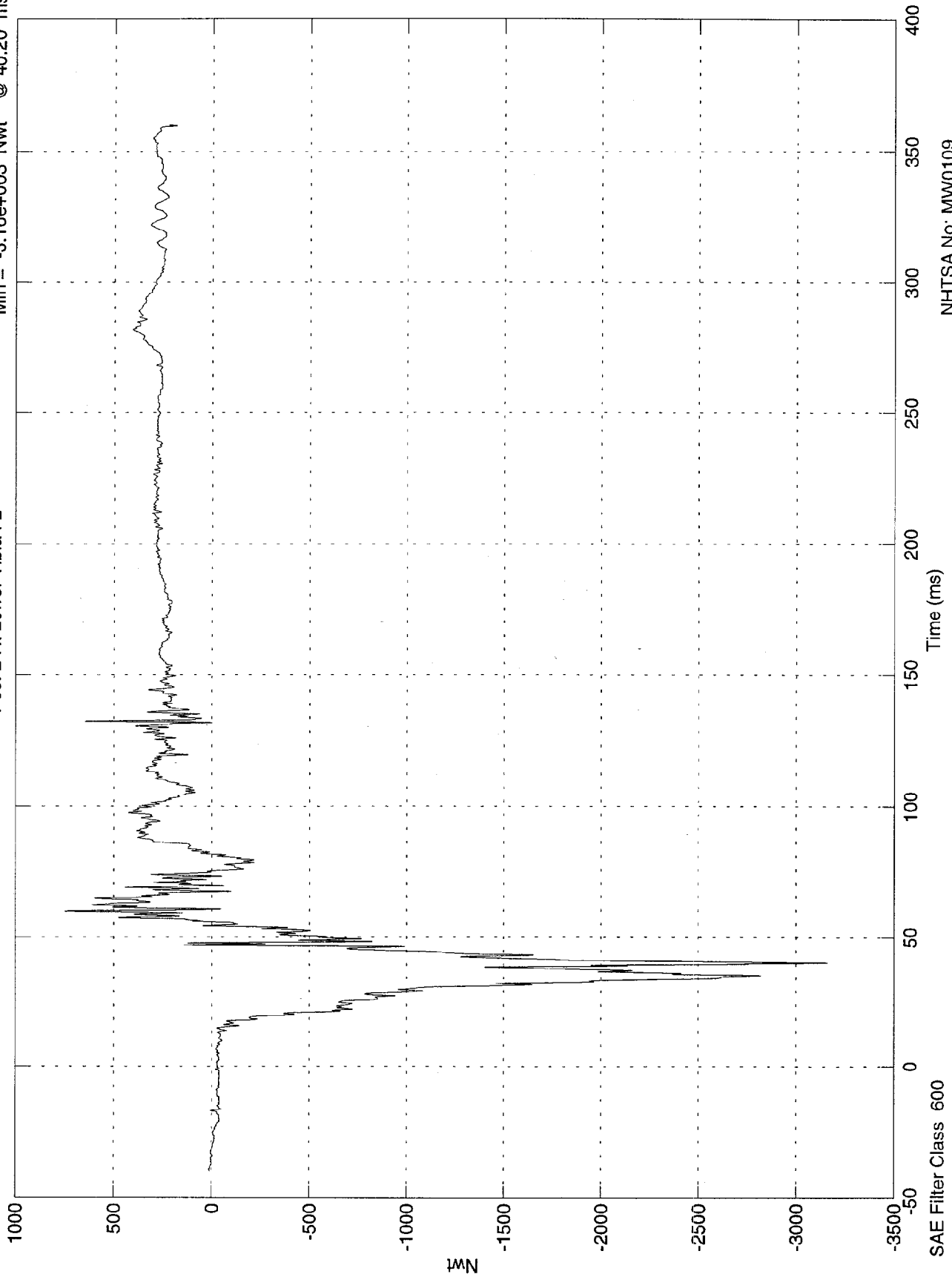


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 746 Nwt @ 59.80 msec
Min = -3.16e+003 Nwt @ 40.20 msec

Pos. 2 Rt Lower Tibia Fz

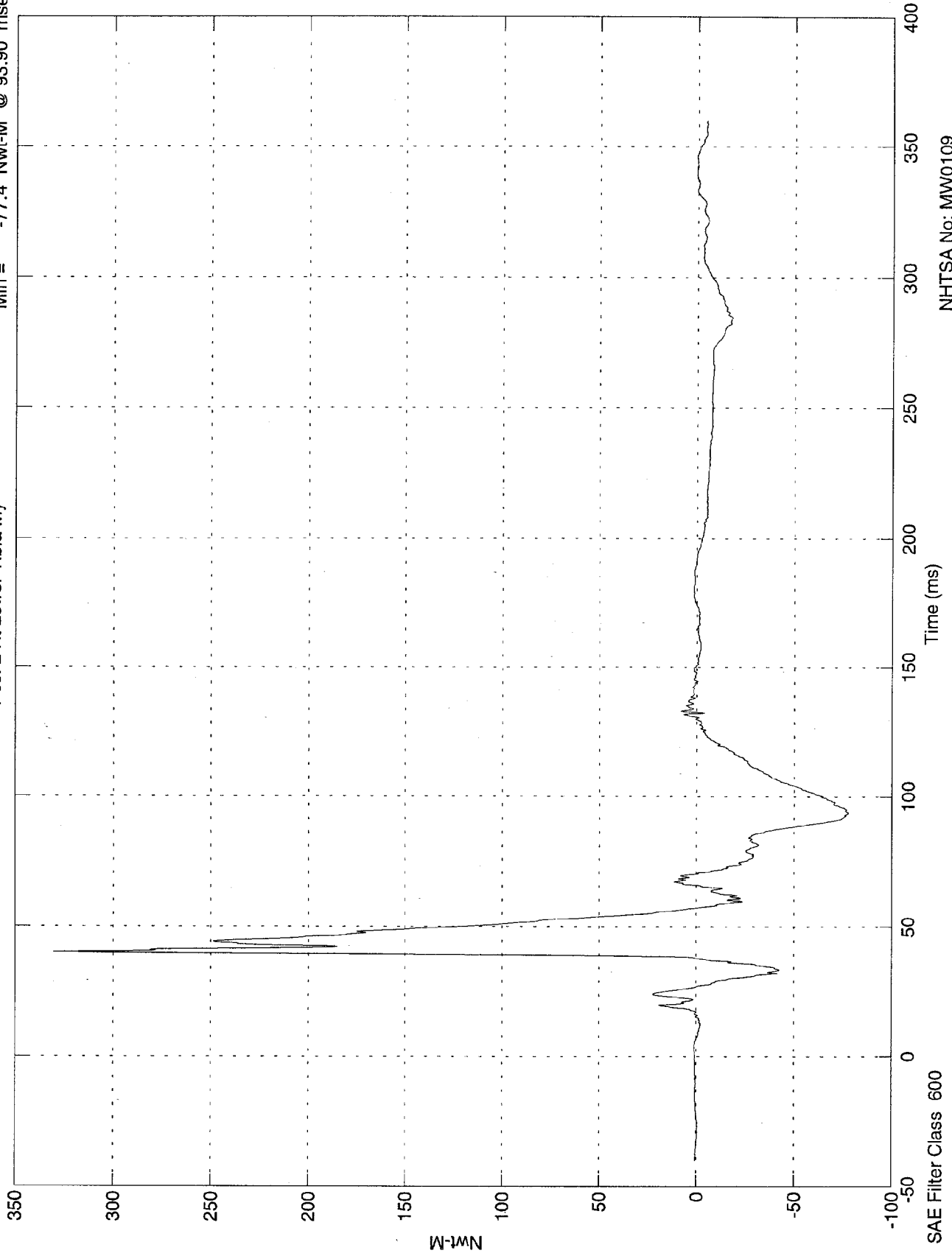


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 331 Nwt-M @ 40.20 msec
Min = -77.4 Nwt-M @ 93.90 msec

Pos. 2 Rt Lower Tibia My

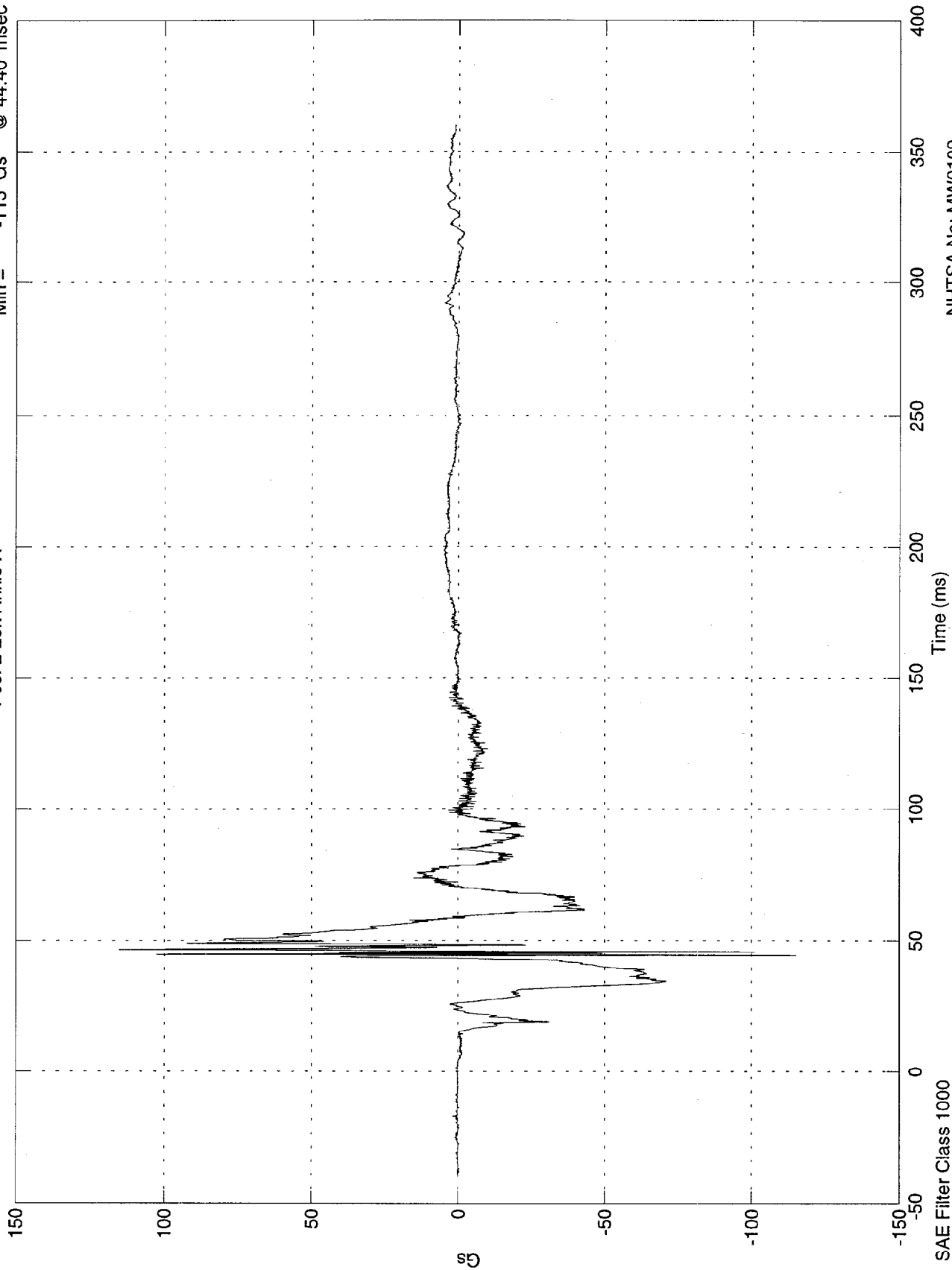


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 115 Gs @ 46.50 msec
Min = -115 Gs @ 44.40 msec

Pos. 2 Left Ankle X

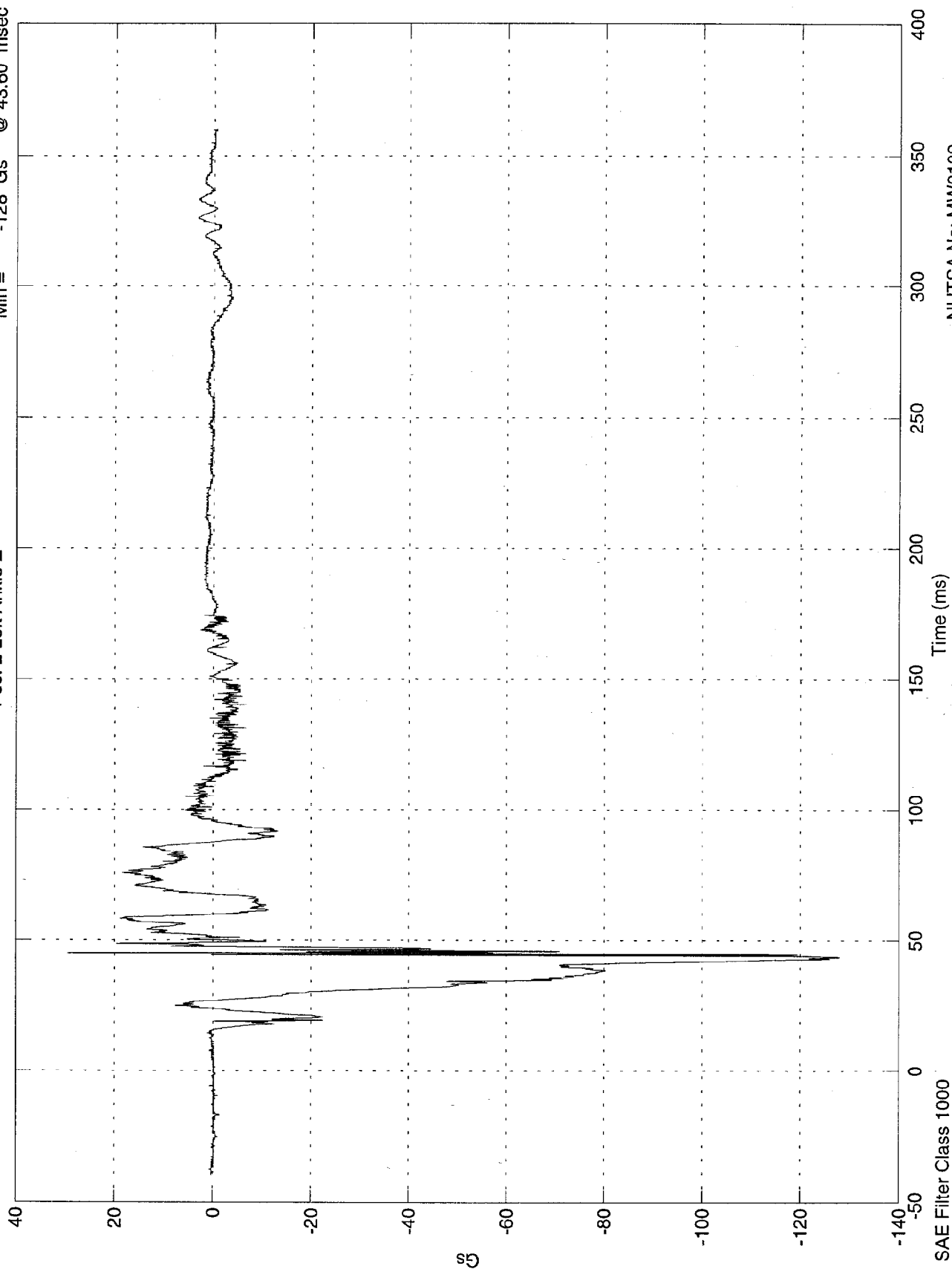


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 29.4 Gs @ 45.10 msec
 Min = -128 Gs @ 43.60 msec

Pos. 2 Left Ankle Z

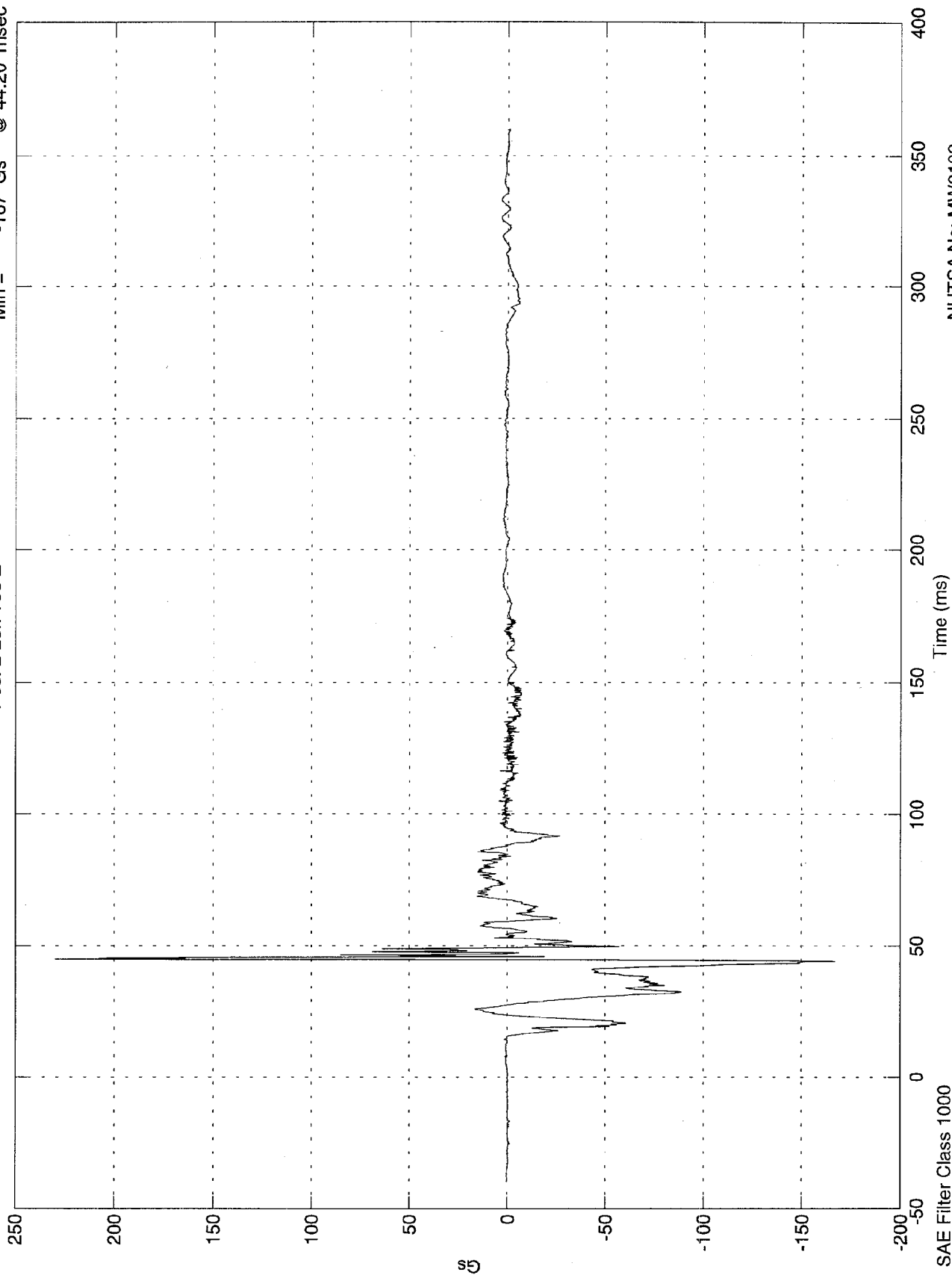


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 230 Gs @ 44.90 msec
Min = -167 Gs @ 44.20 msec

Pos. 2 Left Toe Z

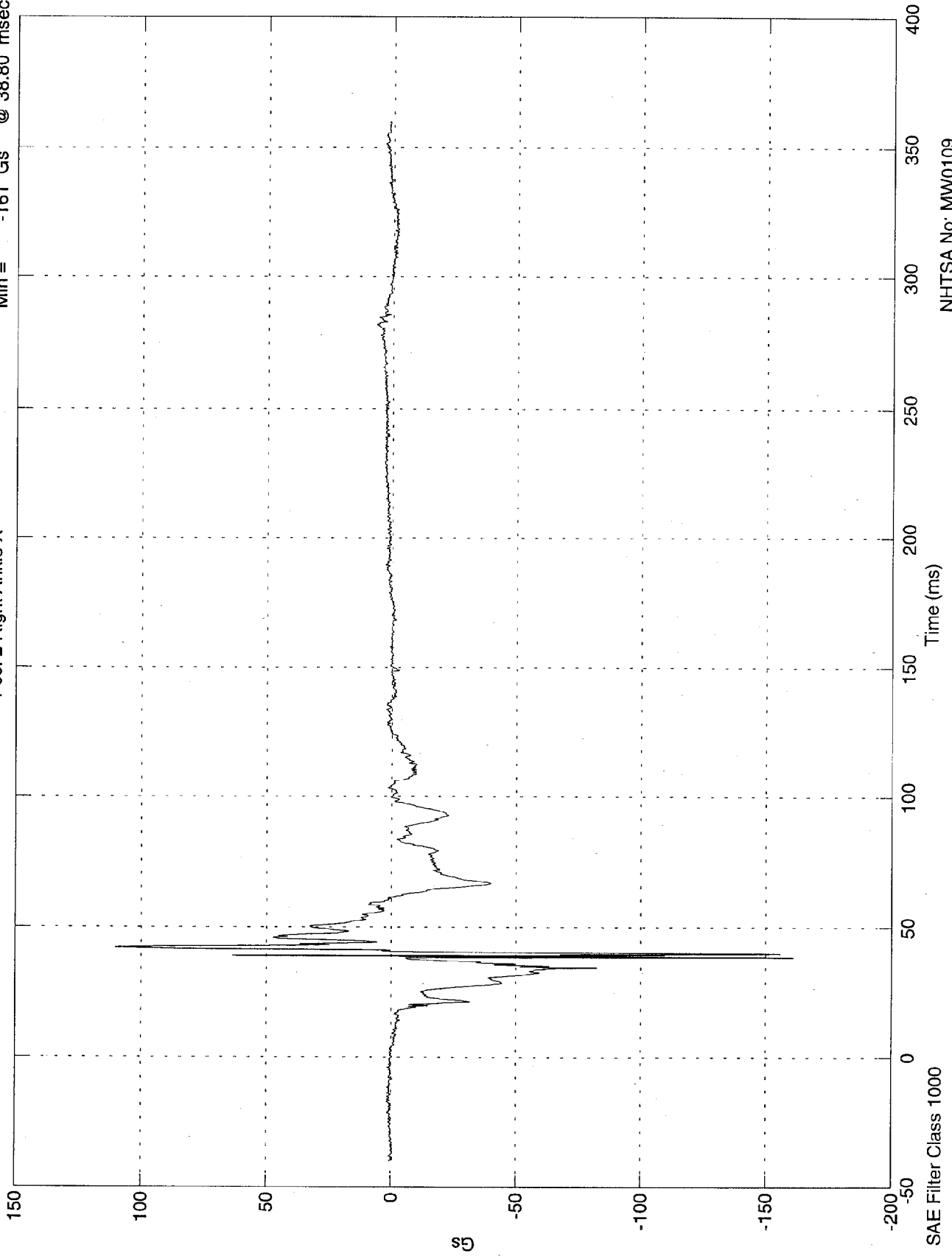


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 110 Gs @ 42.20 msec
Min = -161 Gs @ 38.80 msec

Pos. 2 Right Ankle X

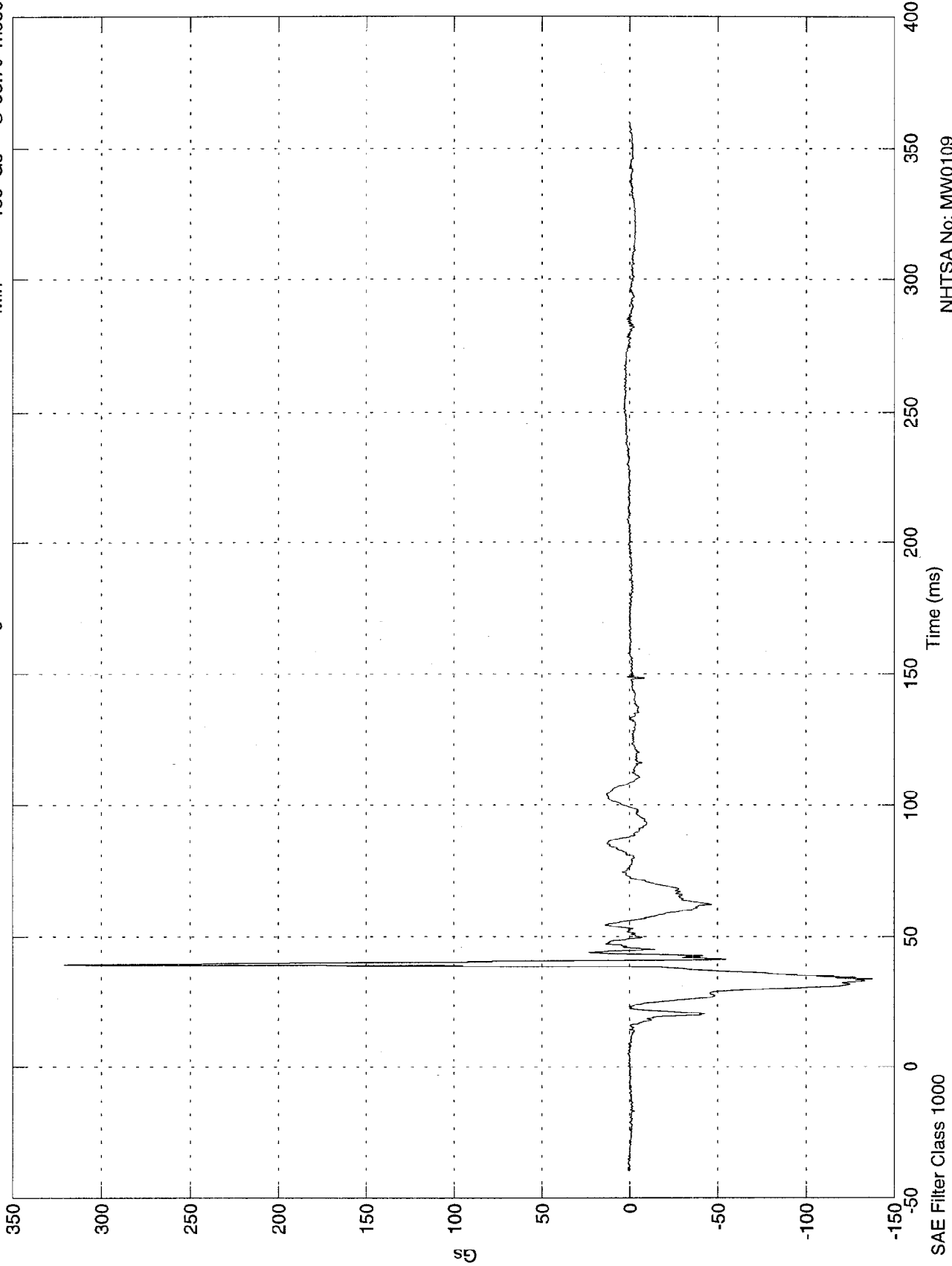


NHTSA No: MW0109
Date: 09 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 321 Gs @ 39.50 msec
Min = -138 Gs @ 33.70 msec

Pos. 2 Right Ankle Z

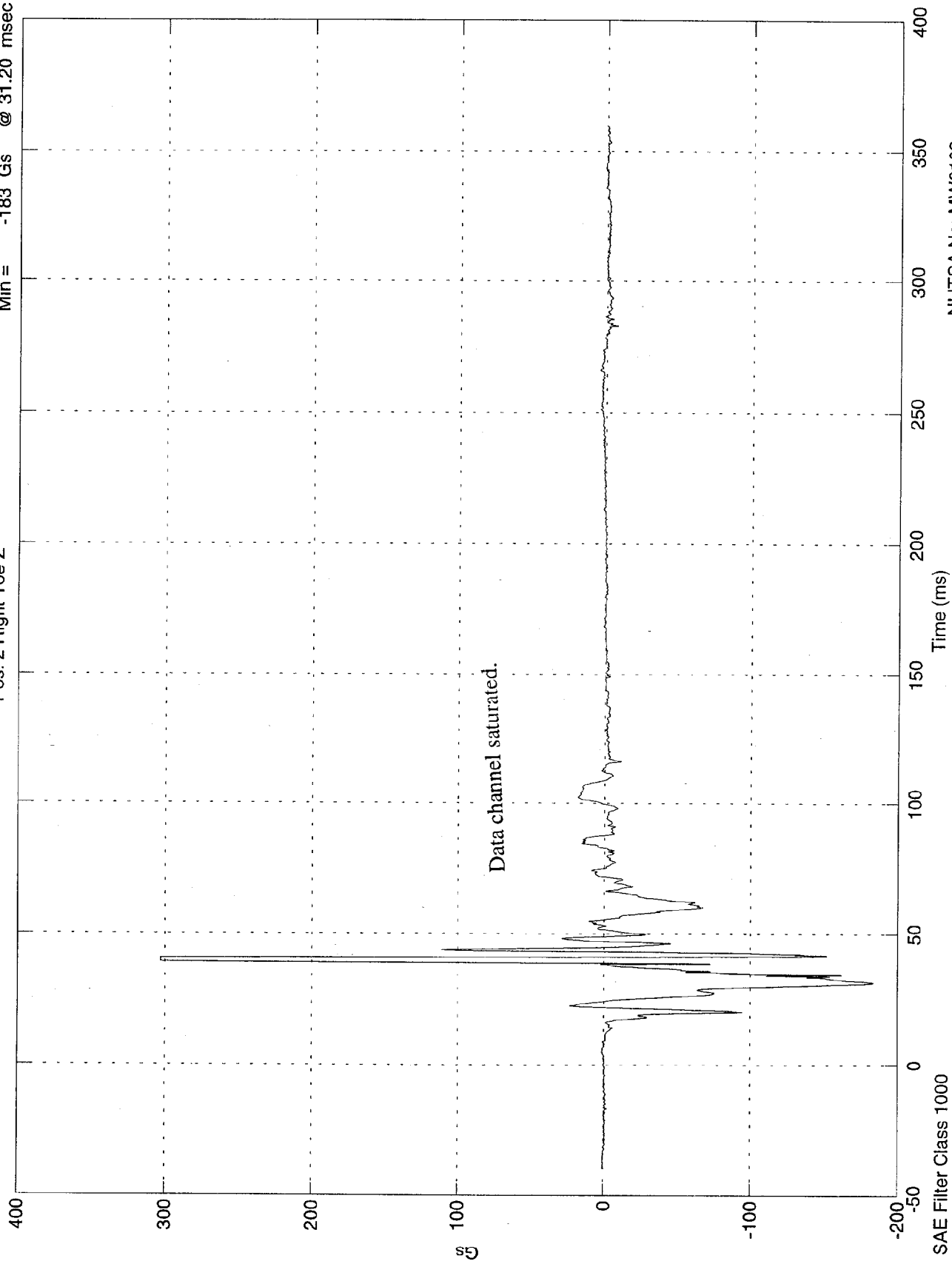


NHTSA No: MW0109
Date: 09 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 303 Gs @ 39.30 msec
Min = -183 Gs @ 31.20 msec

Pos. 2 Right Toe Z

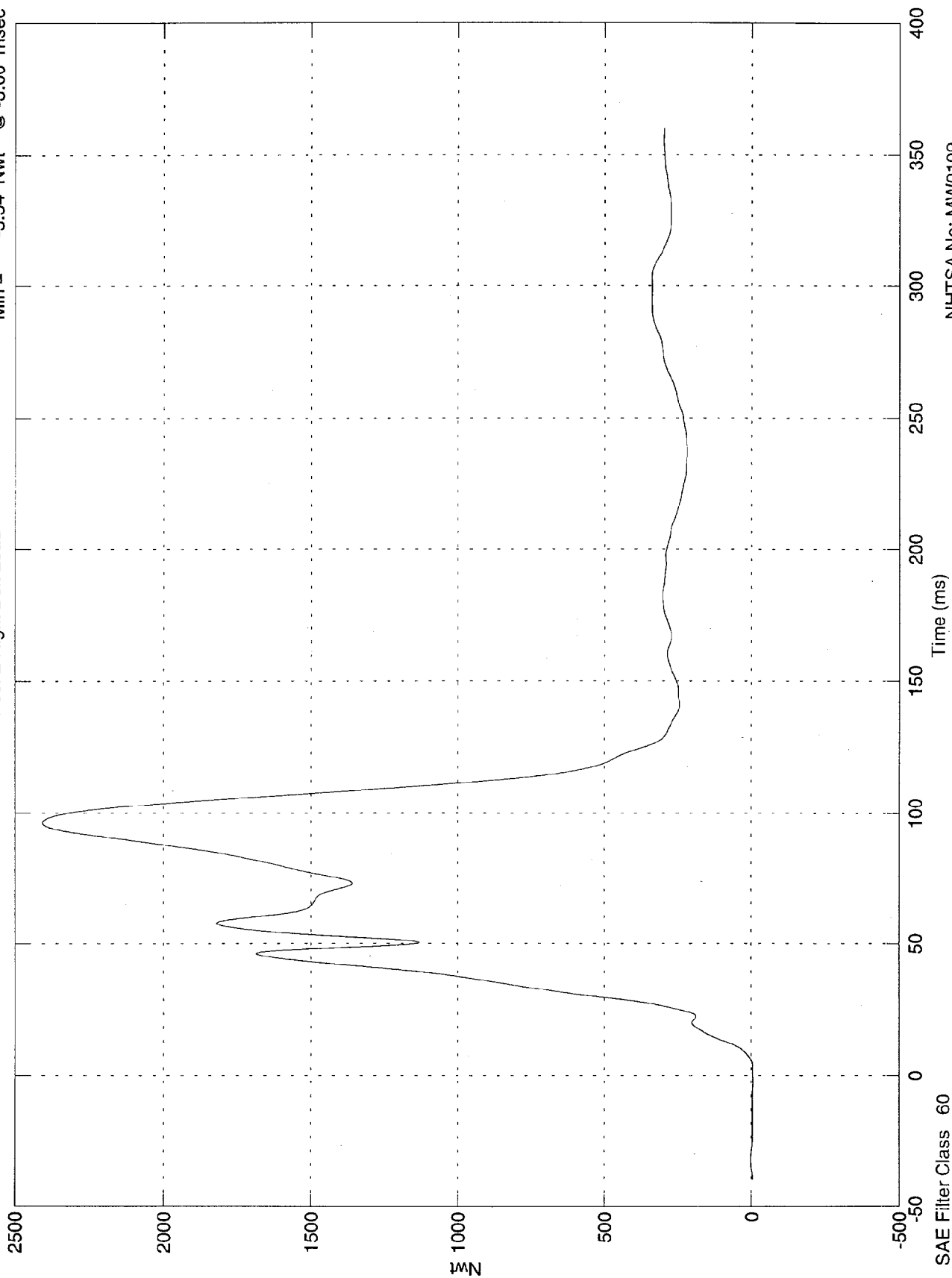


NHTSA No: MW0109
Date: 09 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 2.41e+003 Nwt @ 96.20 msec
Min = -5.54 Nwt @ -3.00 msec

Pos. 2 Right Belt Load

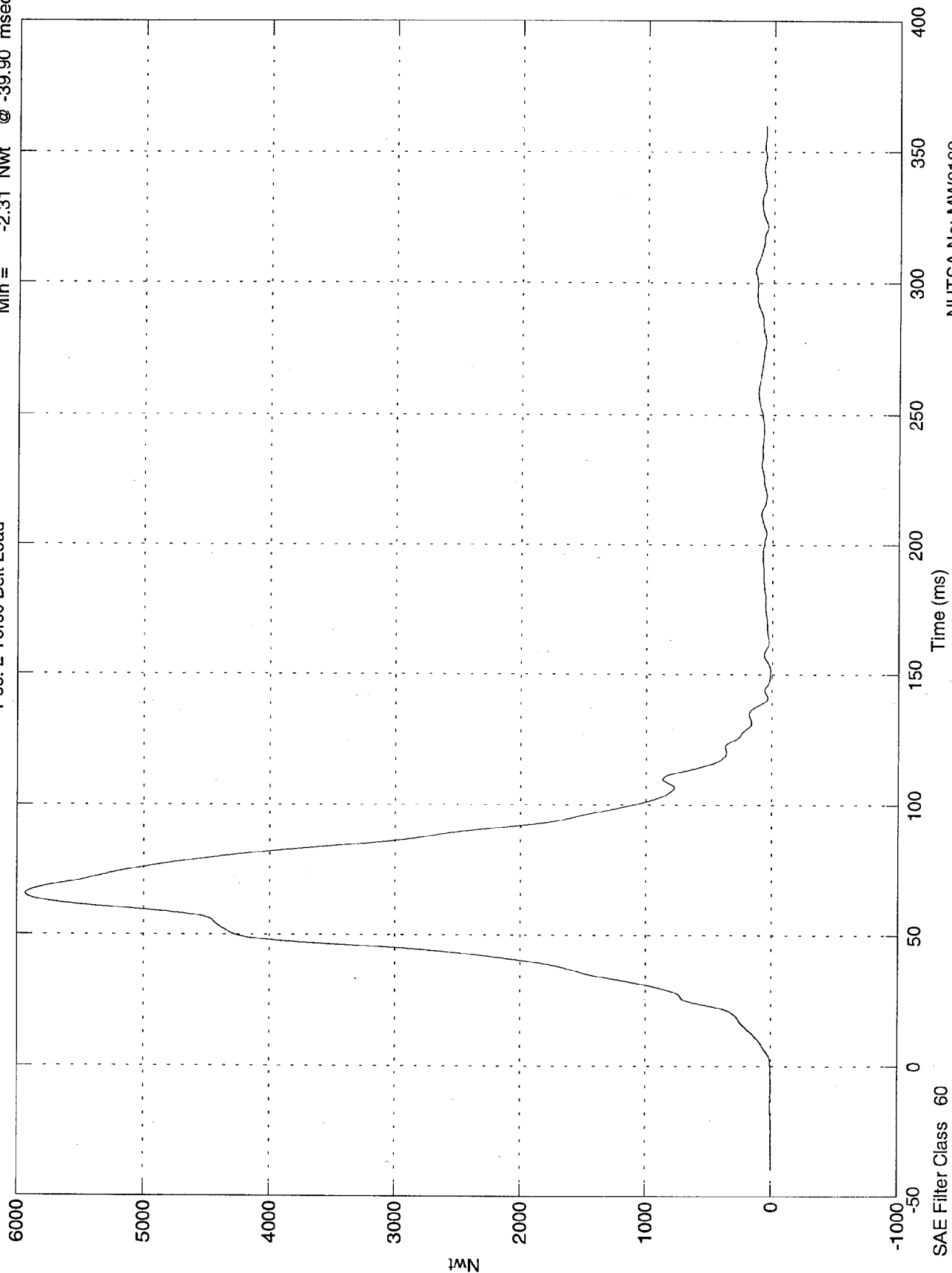


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 5.94e+003 Nwt @ 65.50 msec
Min = -2.31 Nwt @ -39.90 msec

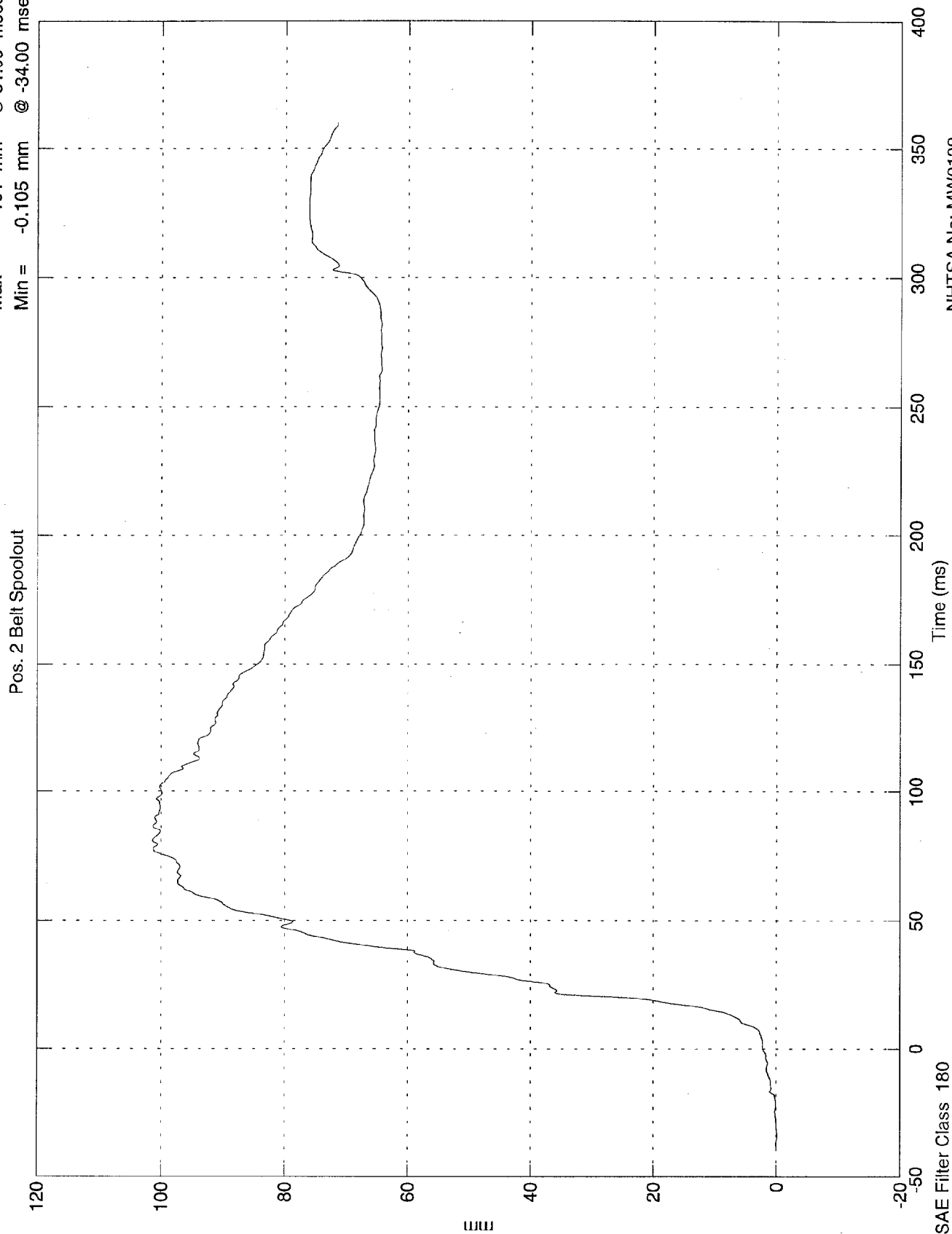
Pos. 2 Torso Belt Load



NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 101 mm @ 81.00 msec
Min = -0.105 mm @ -34.00 msec

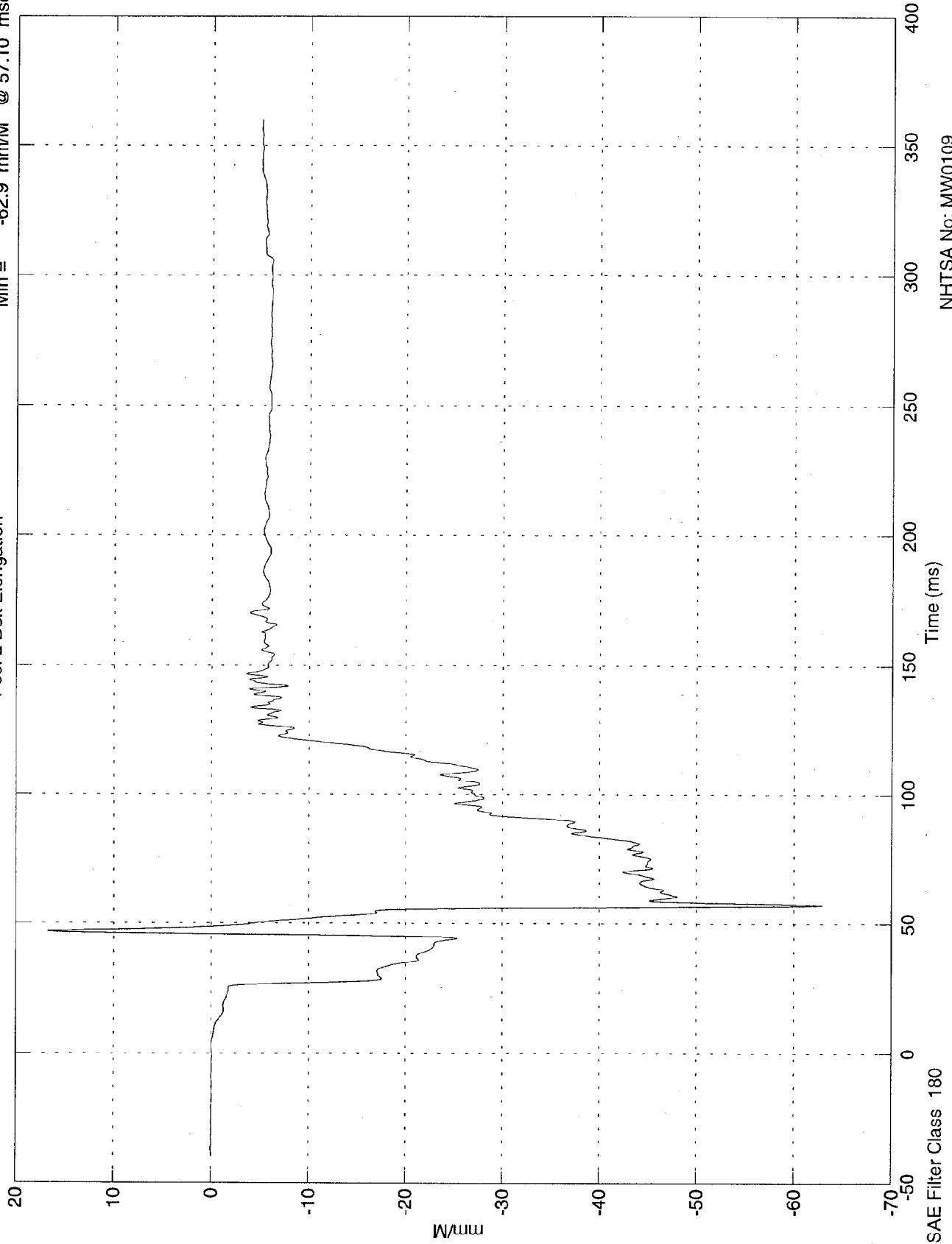


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 16.7 mm/M @ 46.80 msec
 Min = -62.9 mm/M @ 57.10 msec

Pos. 2 Belt Elongation



NHTSA No: MW0109
 Date: 08 Dec 1997

NHTSA TEST NO. MW0109

VEHICLE DATA

FILTER CHANNEL CLASS

Acceleration

60

Velocity

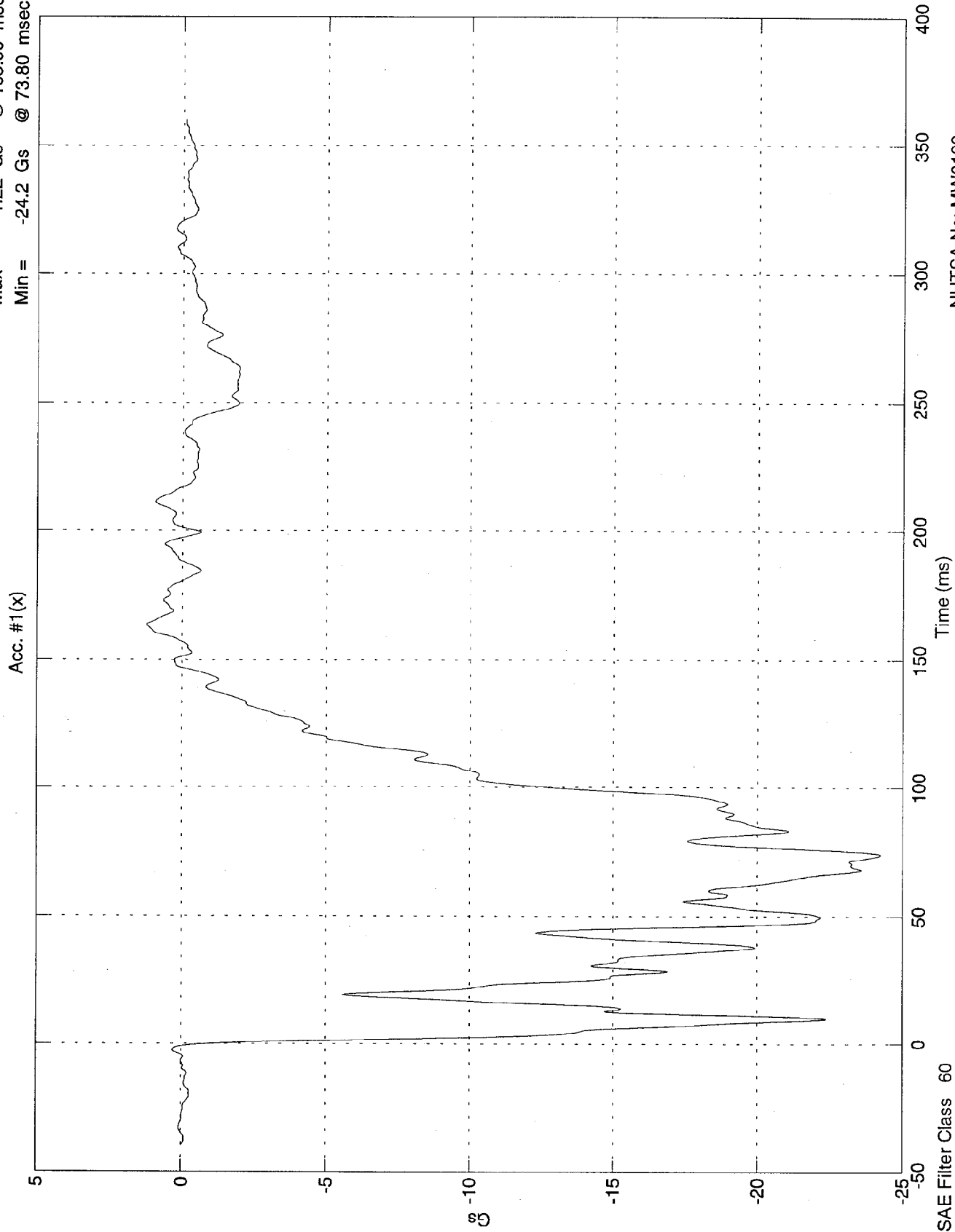
180

Displacement

180

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 1.22 Gs @ 163.50 msec
Min = -24.2 Gs @ 73.80 msec

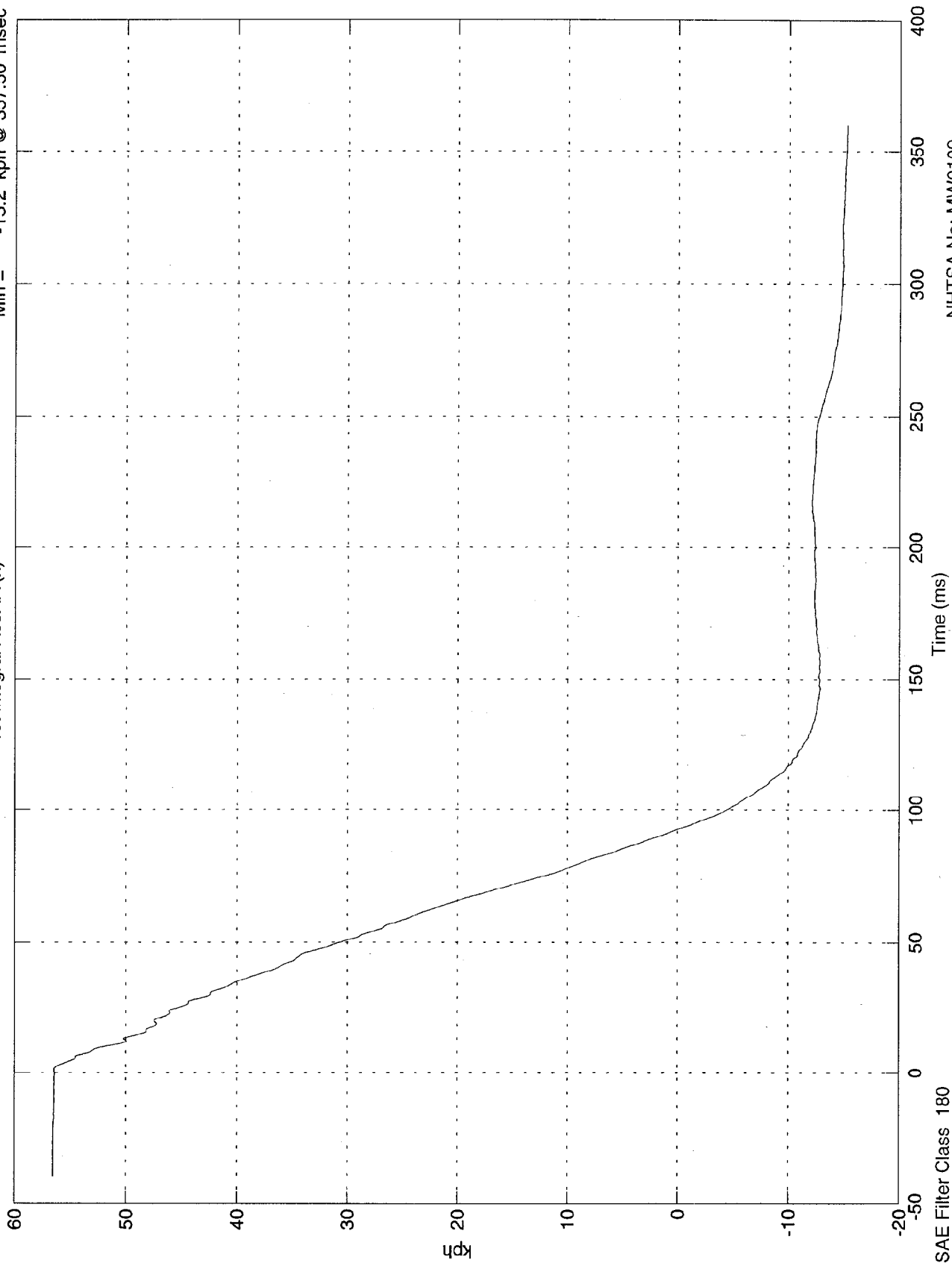


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 56.5 kph @ -39.50 msec
Min = -15.2 kph @ 357.50 msec

1st Integral Acc. #1(x)

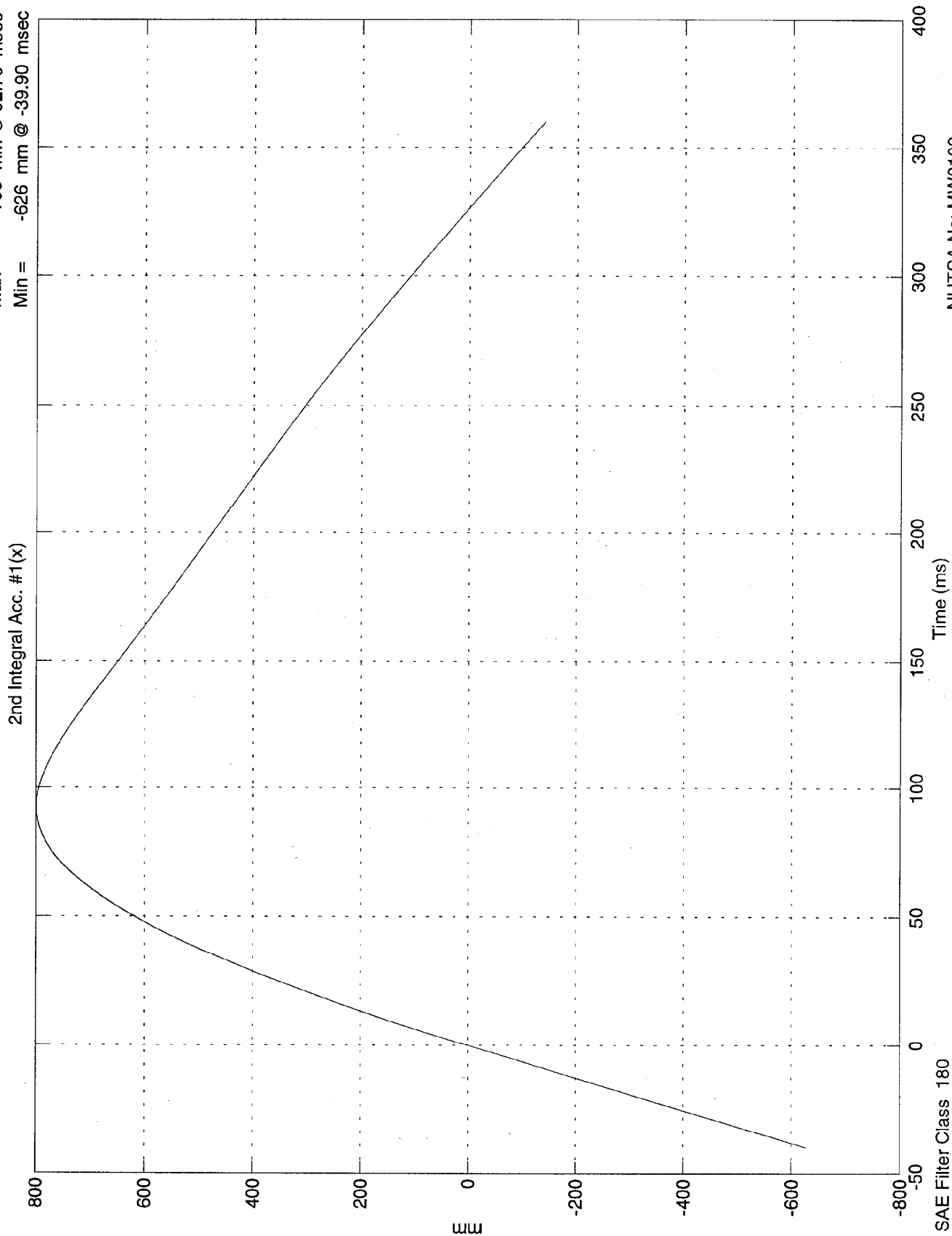


SAE Filter Class 180

NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

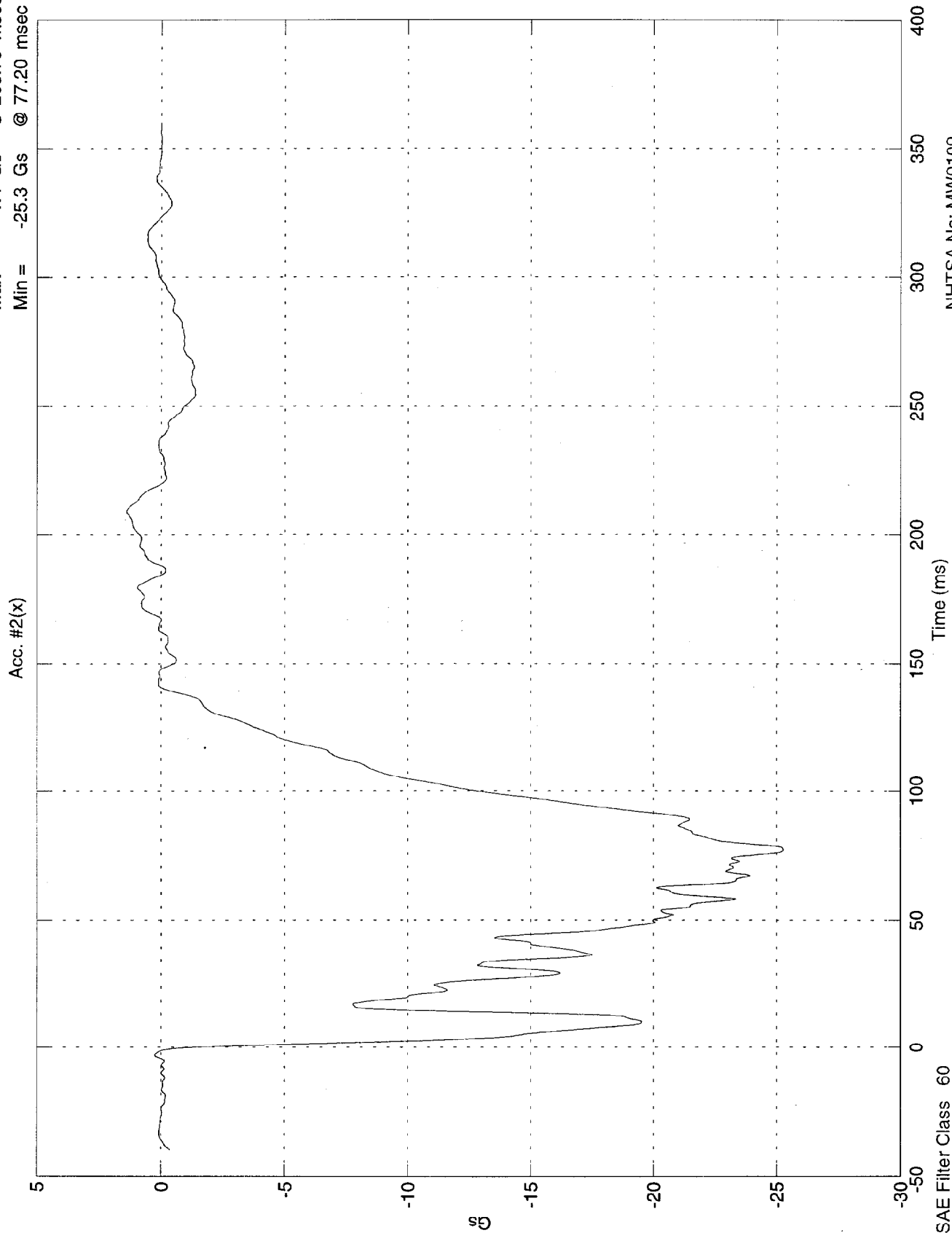
Max = 799 mm @ 92.70 msec
Min = -626 mm @ -39.90 msec



NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 1.4 Gs @ 208.70 msec
 Min = -25.3 Gs @ 77.20 msec

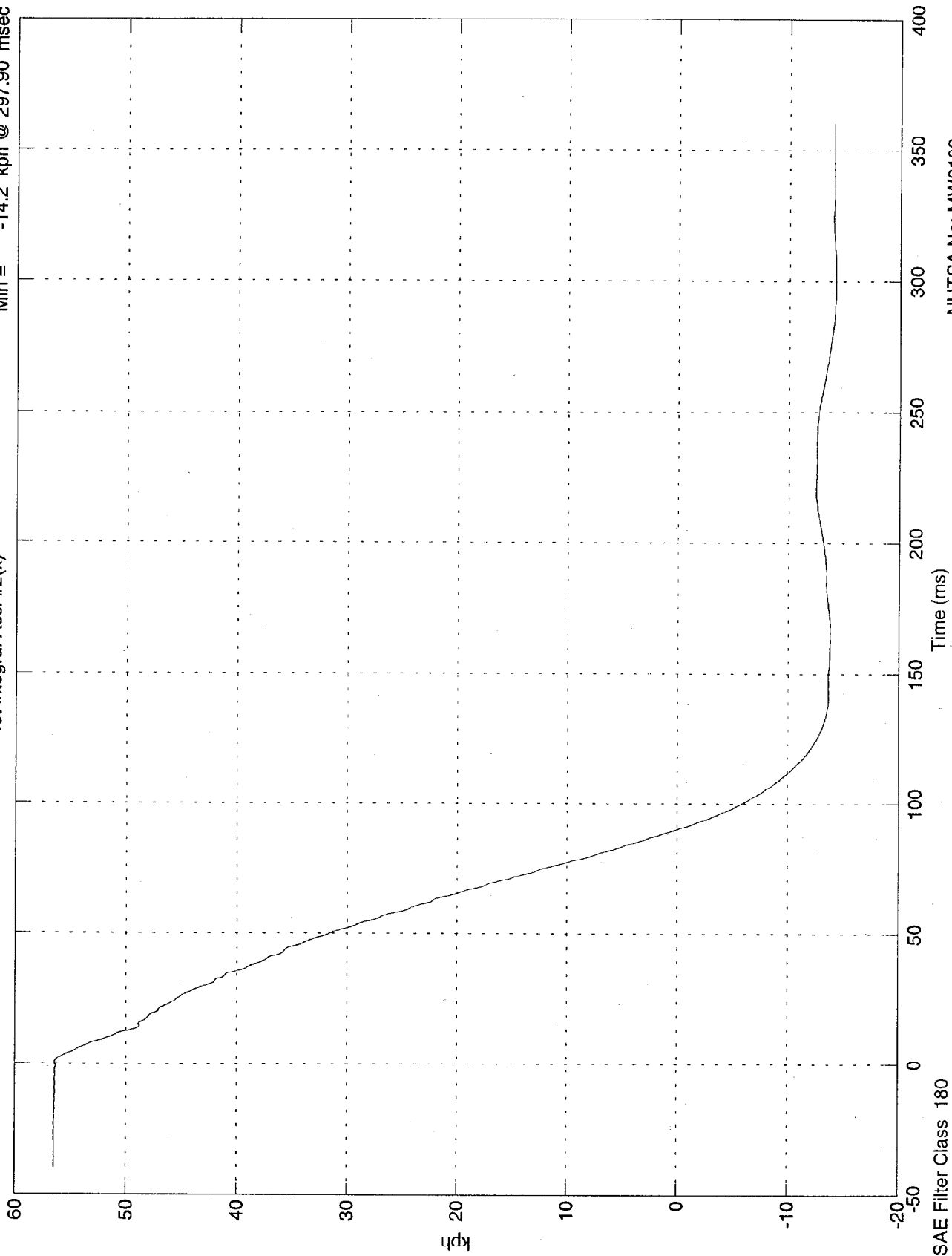


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 56.5 kph @ -22.70 msec
Min = -14.2 kph @ 297.90 msec

1st Integral Acc. #2(x)

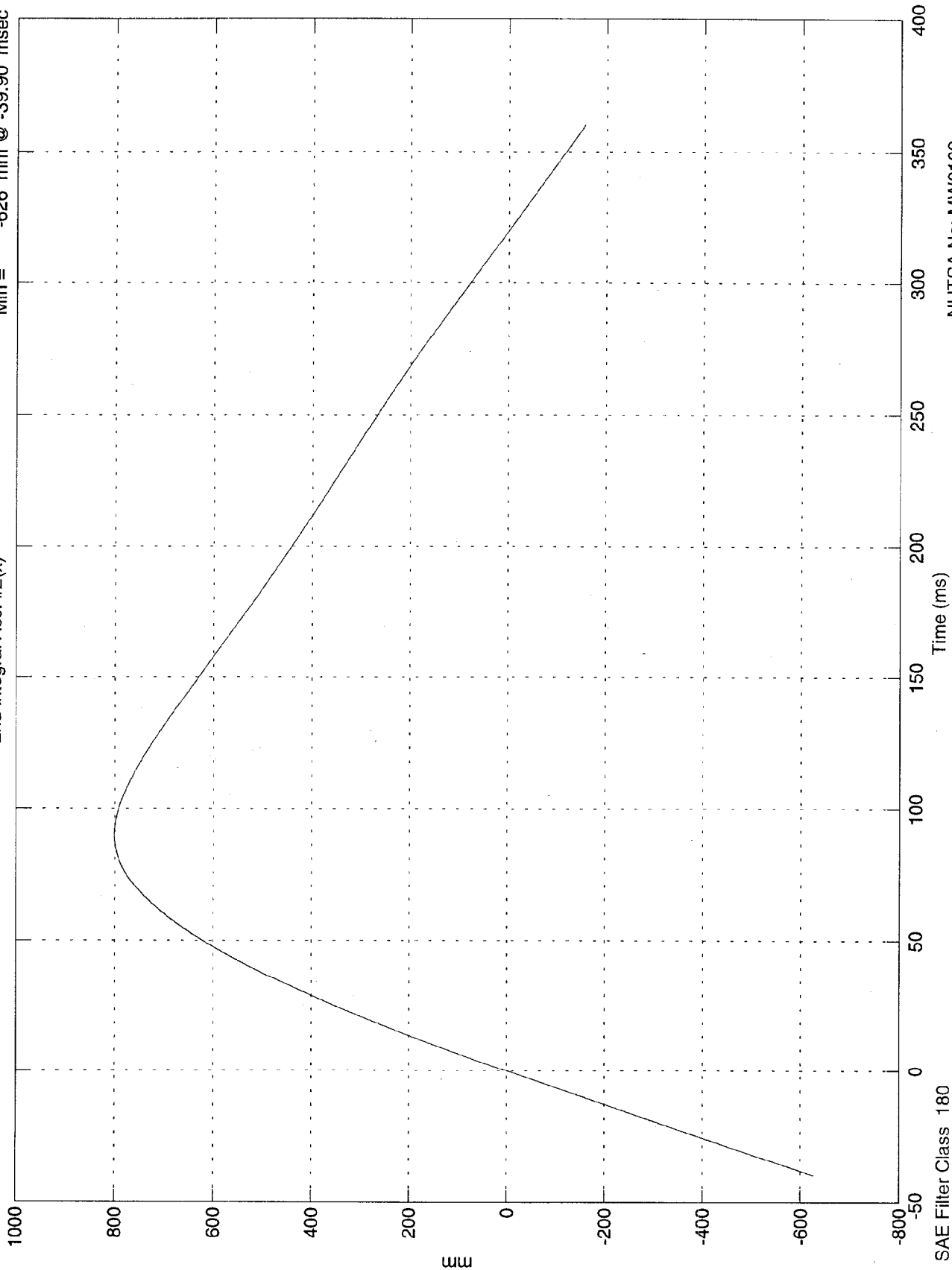


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 801 mm @ 90.10 msec
Min = -626 mm @ -39.90 msec

2nd Integral Acc. #2(x)



NHTSA No: MW0109
Date: 08 Dec 1997

SAE Filter Class 180

mm

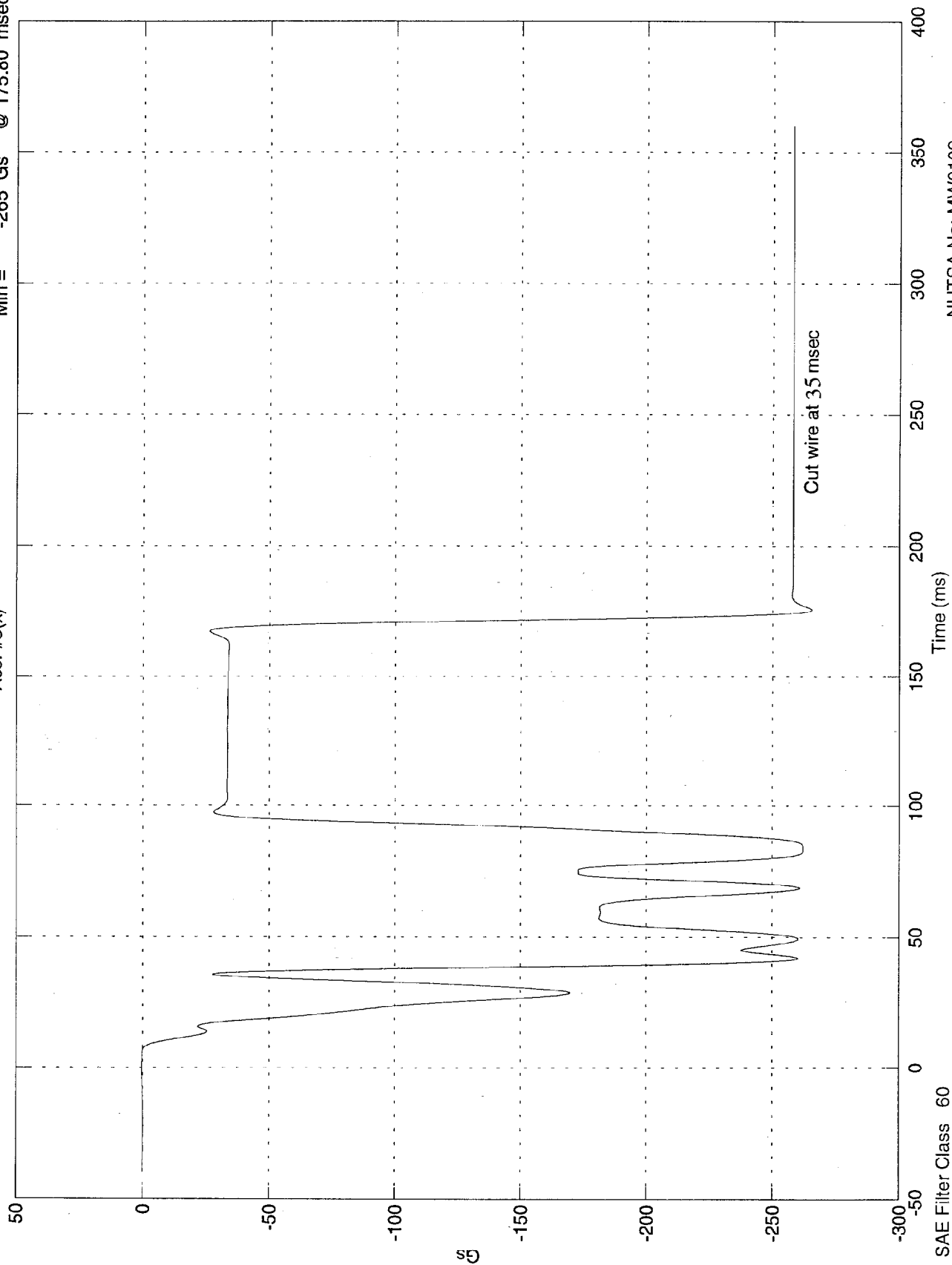
B-103

8413-12

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 0.44 Gs @ 0.00 msec
 Min = -265 Gs @ 175.80 msec

Acc. #3(x)

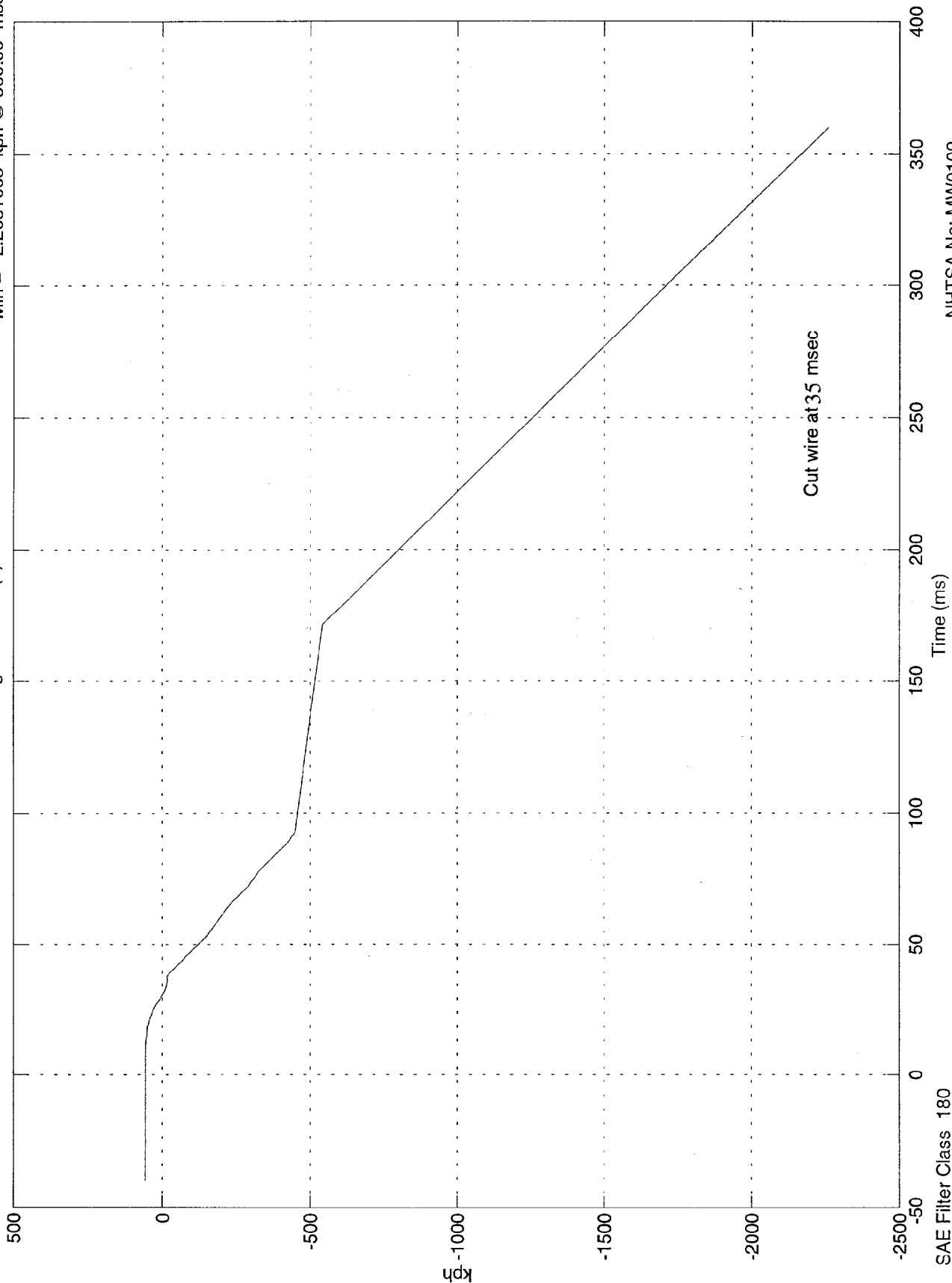


NHTSA No: MW0109
 Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 56.5 kph @ 4.40 msec
Min = -2.26e+003 kph @ 360.00 msec

1st Integral Acc. #3(x)



NHTSA No: MW0109
Date: 08 Dec 1997

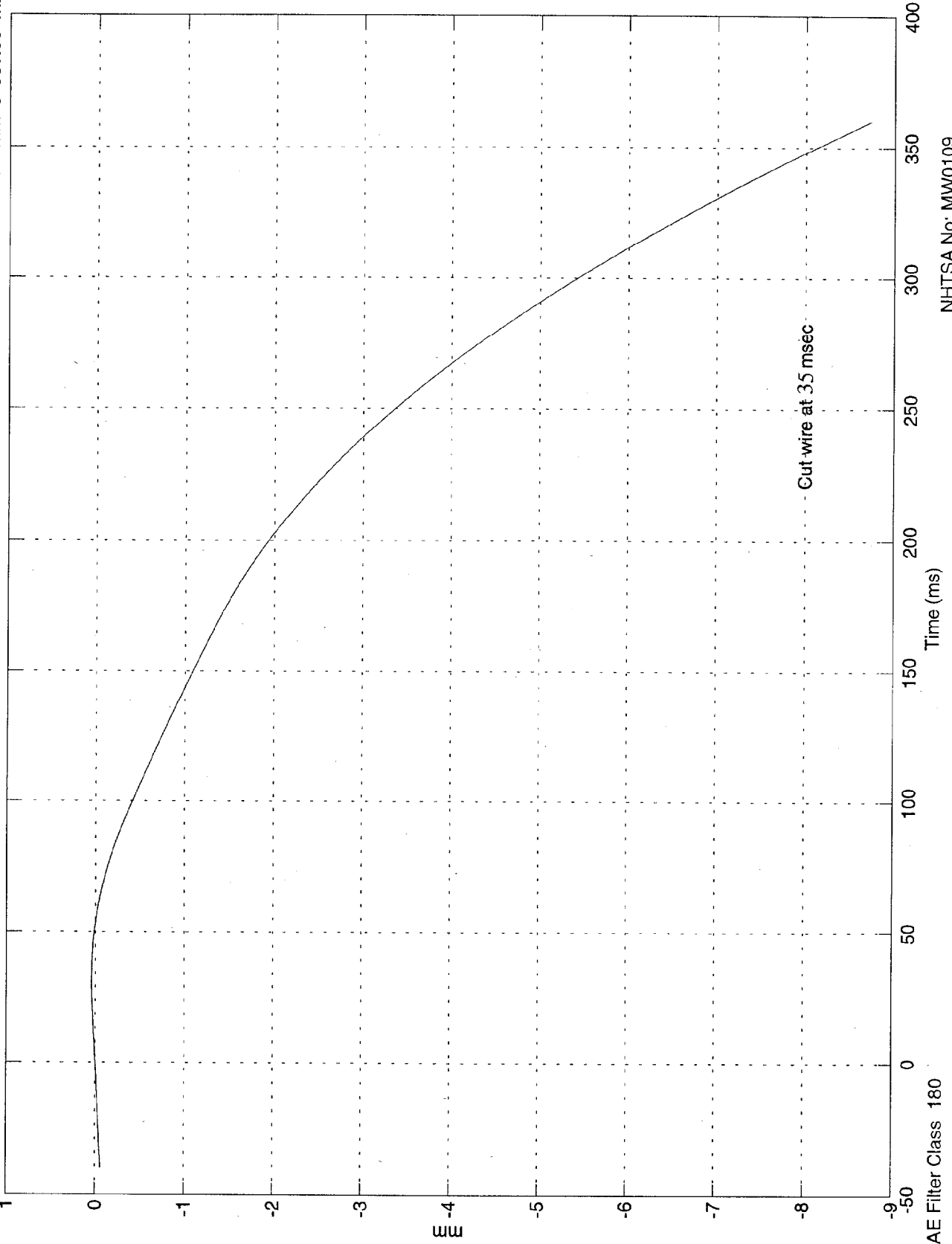
SAE Filter Class 180

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 379 mm @ 30.40 msec
Min = -8.73e+004 mm @ 360.00 msec

2nd Integral Acc. #3(x)

$\times 10^4$

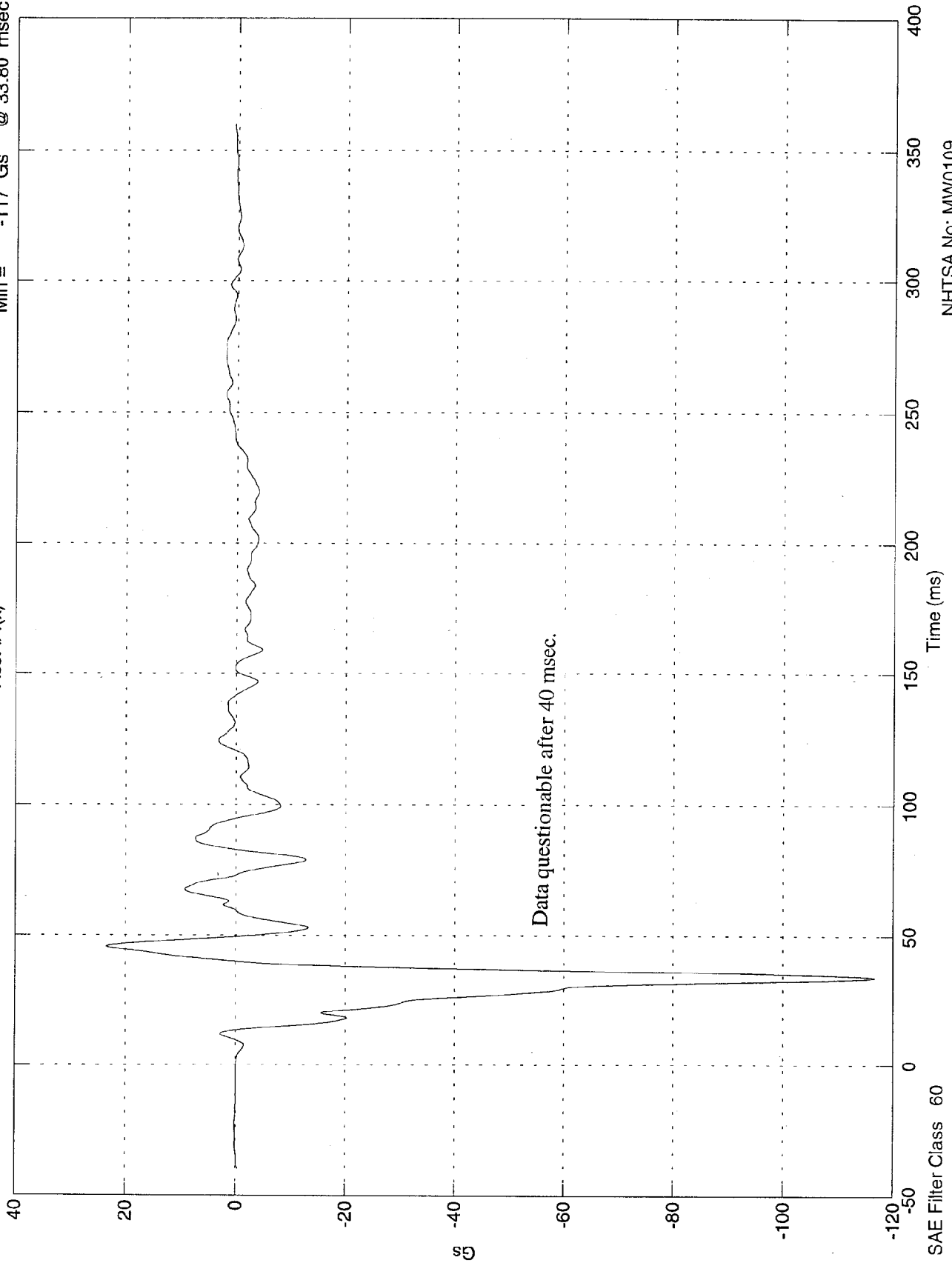


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 23.5 Gs @ 45.80 msec
Min = -117 Gs @ 33.80 msec

Acc. #4(x)



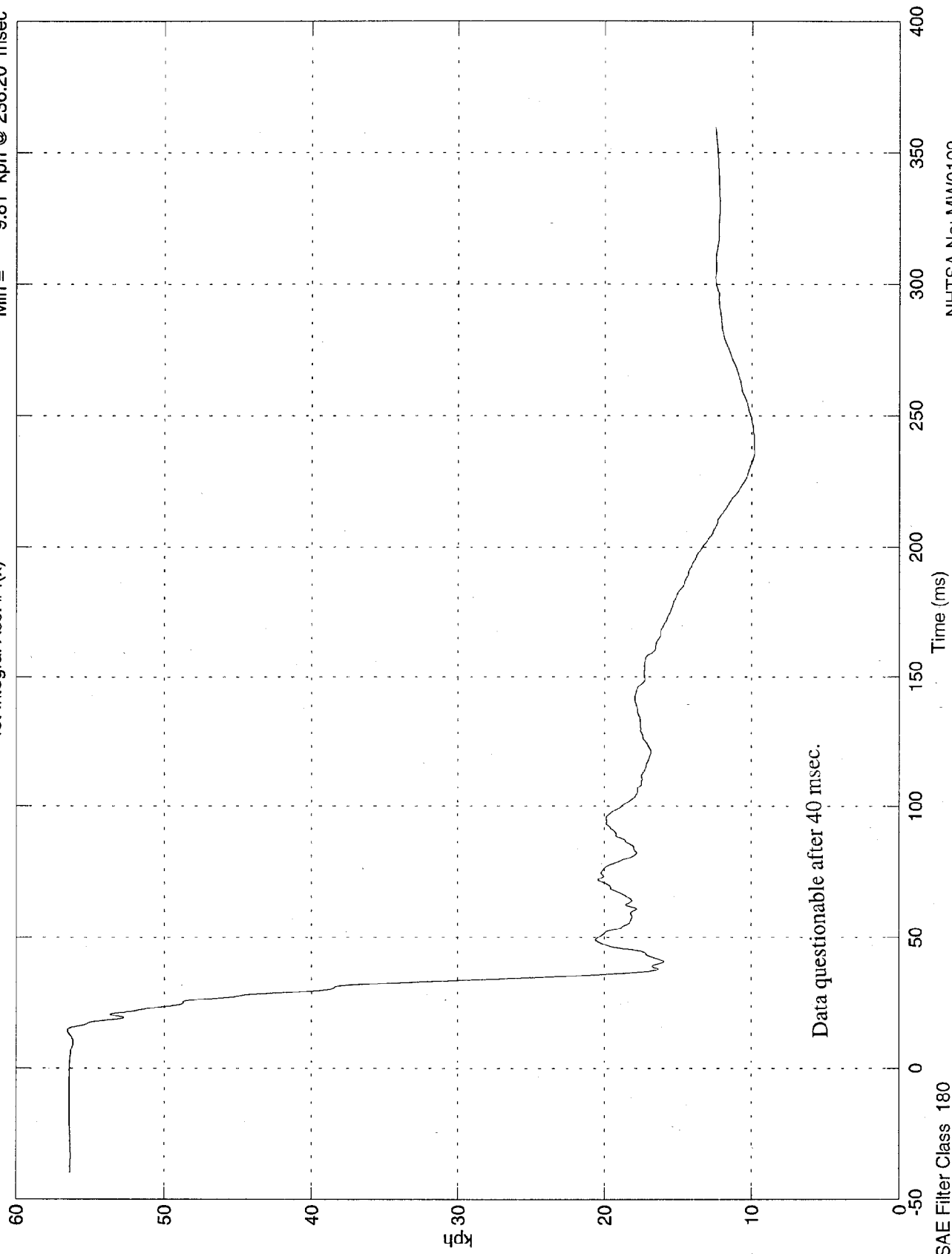
Data questionable after 40 msec.

NHTSA No: MWO109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 56.5 kph @ 14.50 msec
Min = 9.81 kph @ 236.20 msec

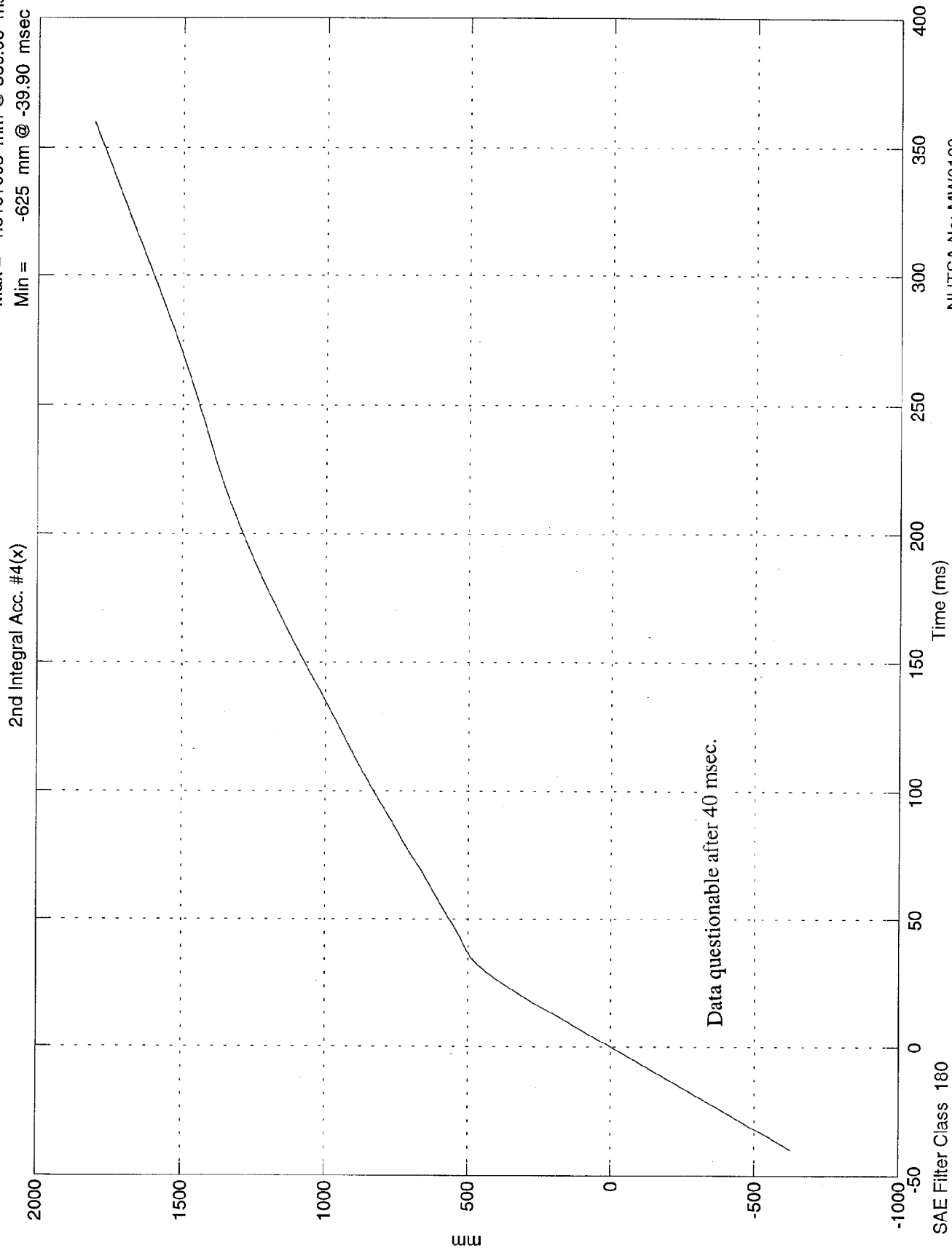
1st Integral Acc. #4(x)



NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 1.81e+003 mm @ 360.00 msec
Min = -625 mm @ -39.90 msec

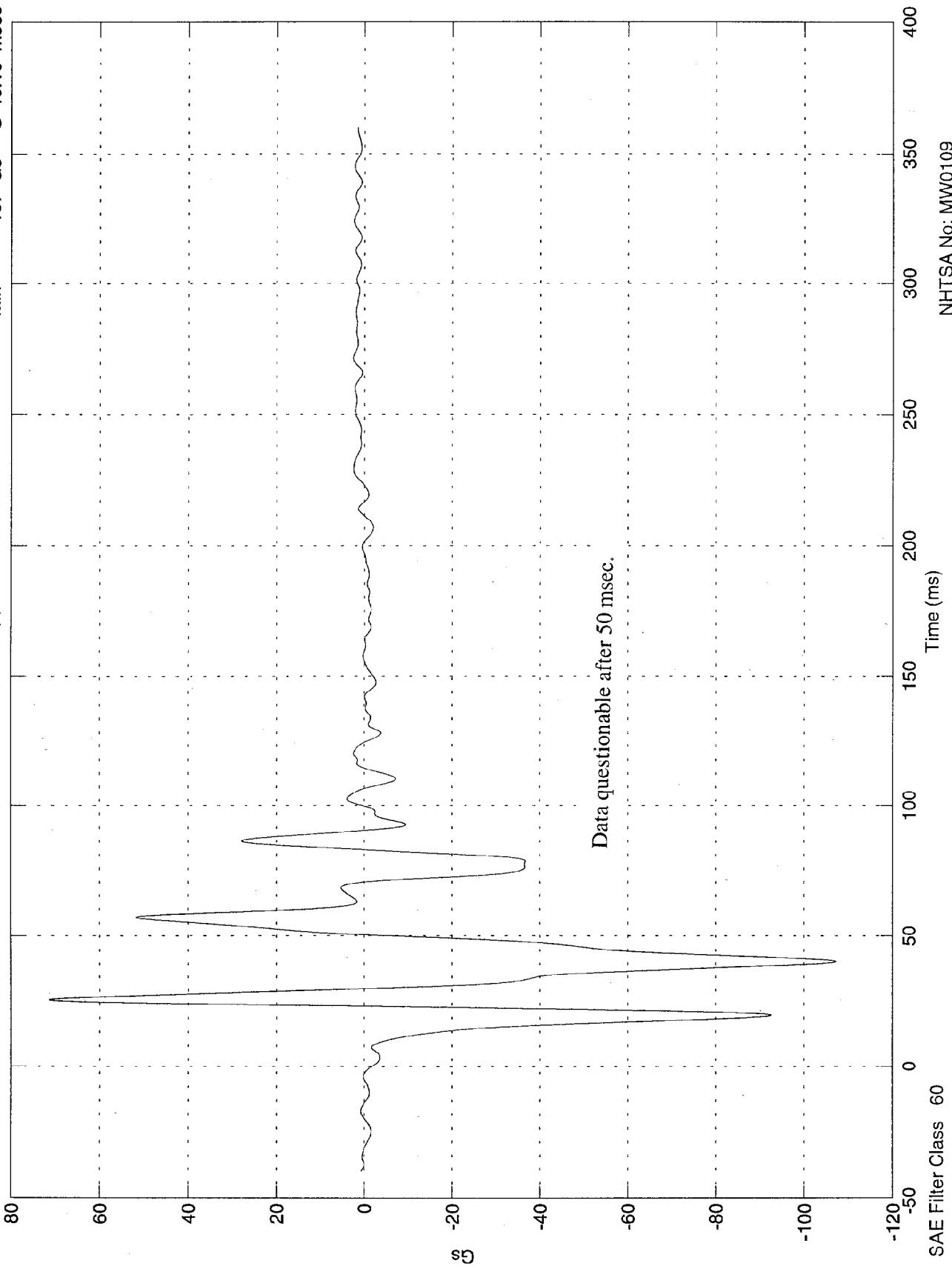


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 71.5 Gs @ 25.20 msec
Min = -107 Gs @ 40.10 msec

Acc. #5(x)



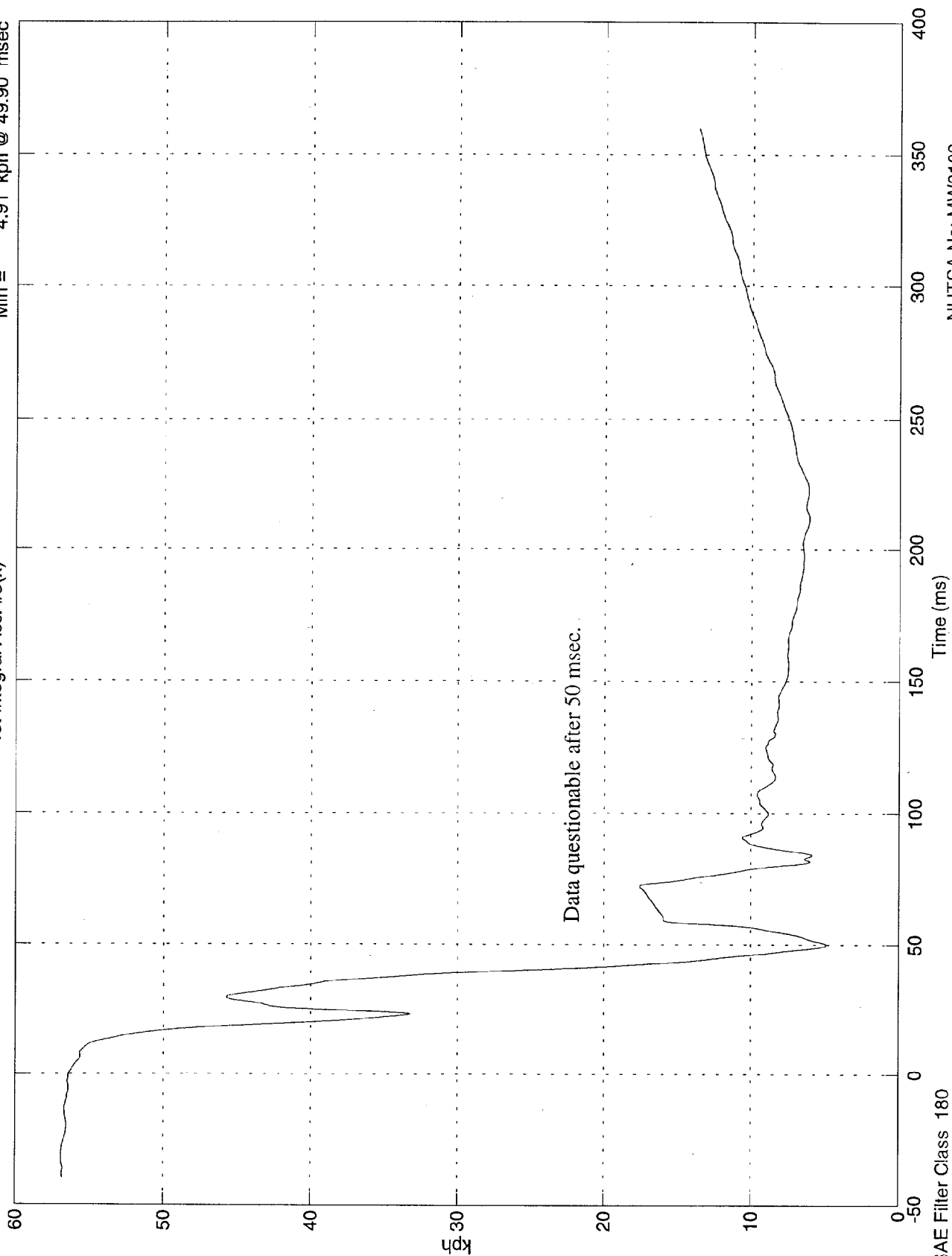
Data questionable after 50 msec.

NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 56.9 kph @ -30.50 msec
Min = 4.91 kph @ 49.90 msec

1st Integral Acc. #5(x)



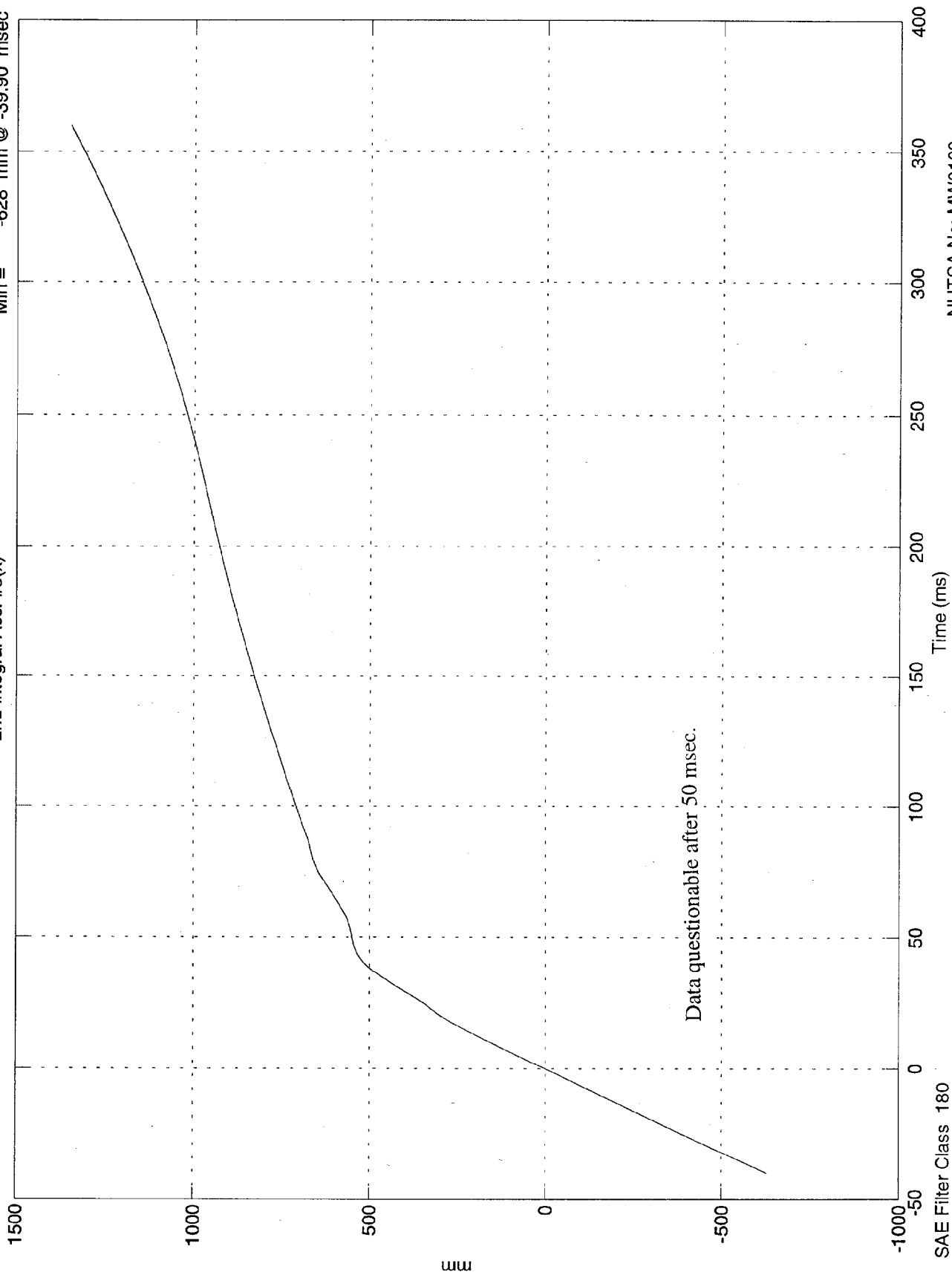
NHTSA No: MW0109
Date: 08 Dec 1997

SAE Filter Class 180

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 1.35e+003 mm @ 360.00 msec
Min = -628 mm @ -39.90 msec

2nd Integral Acc. #5(x)

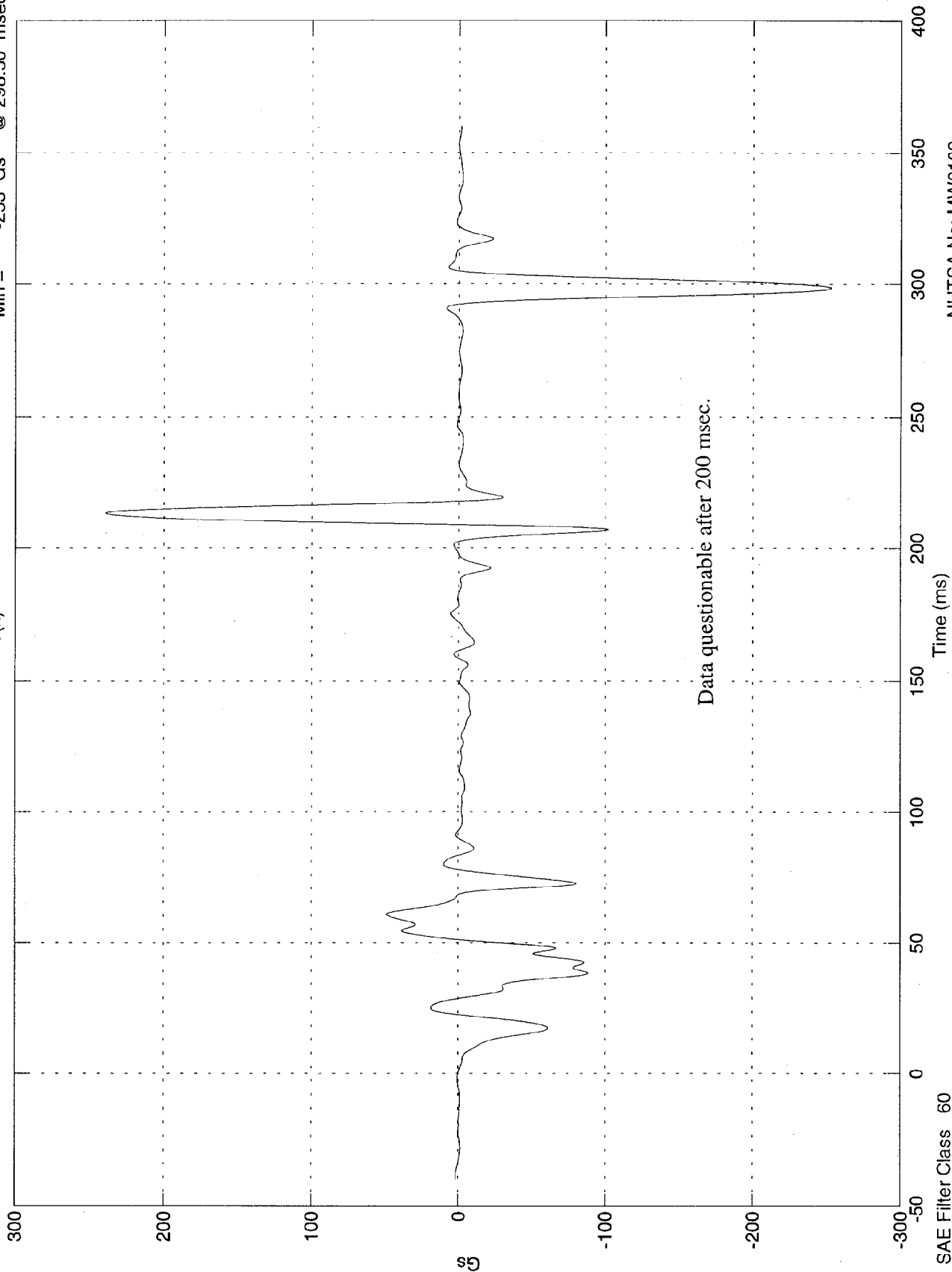


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 239 Gs @ 213.50 msec
Min = -253 Gs @ 298.50 msec

Acc. #6(x)



Data questionable after 200 msec.

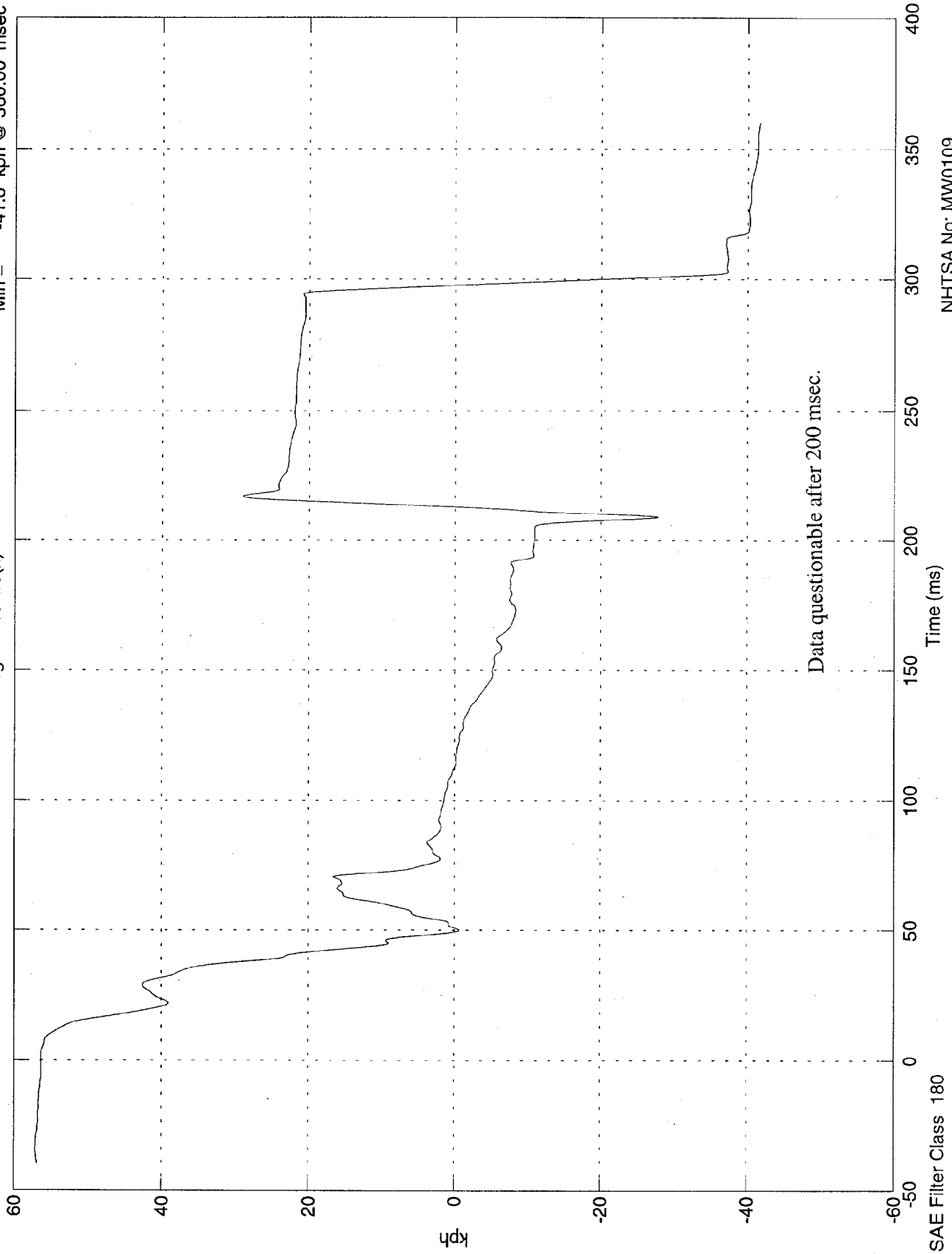
SAE Filter Class 60

NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 57.1 kph @ -34.20 msec
Min = -41.6 kph @ 360.00 msec

1st Integral Acc. #6(x)

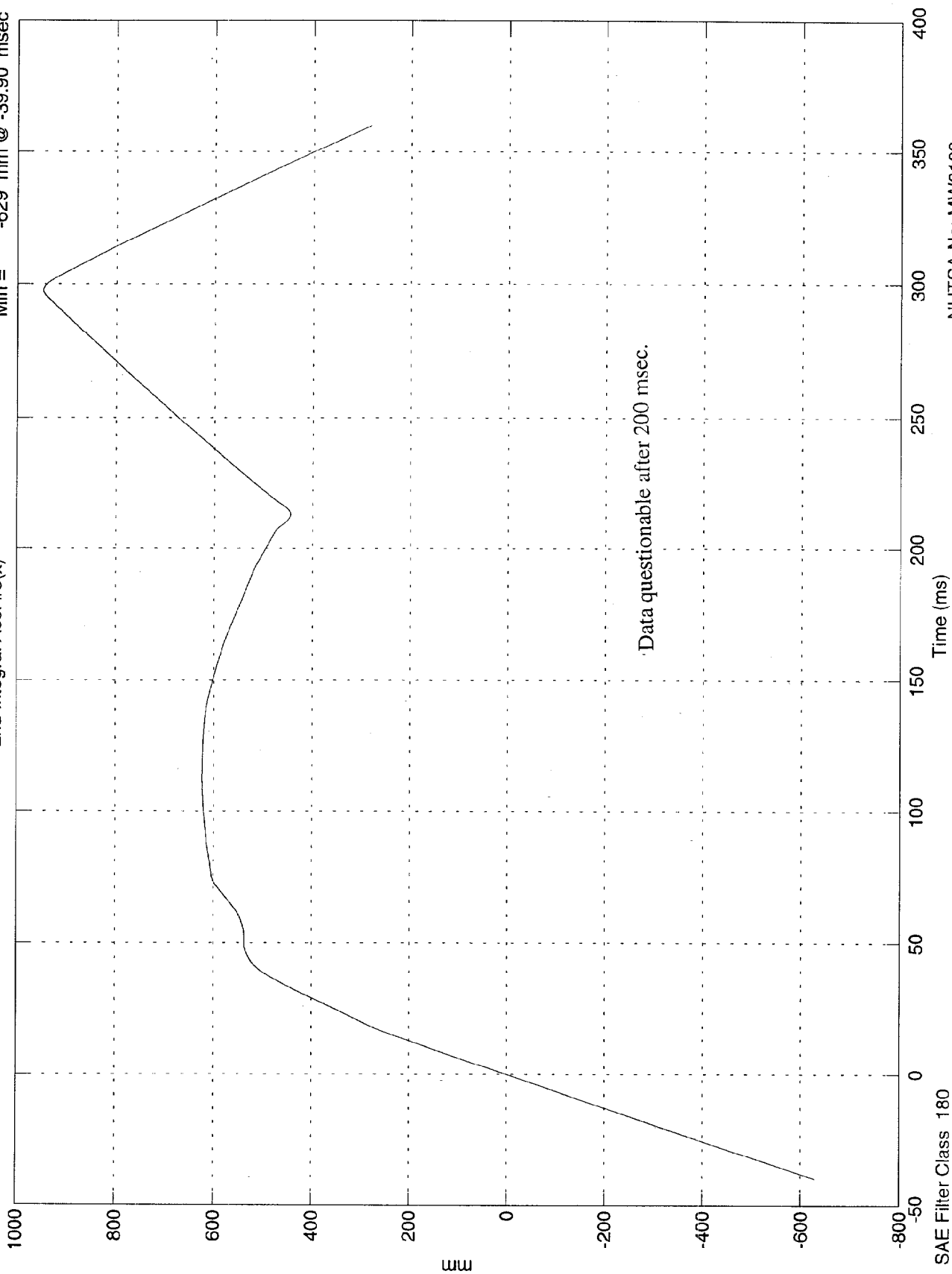


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 948 mm @ 297.60 msec
Min = -629 mm @ -39.90 msec

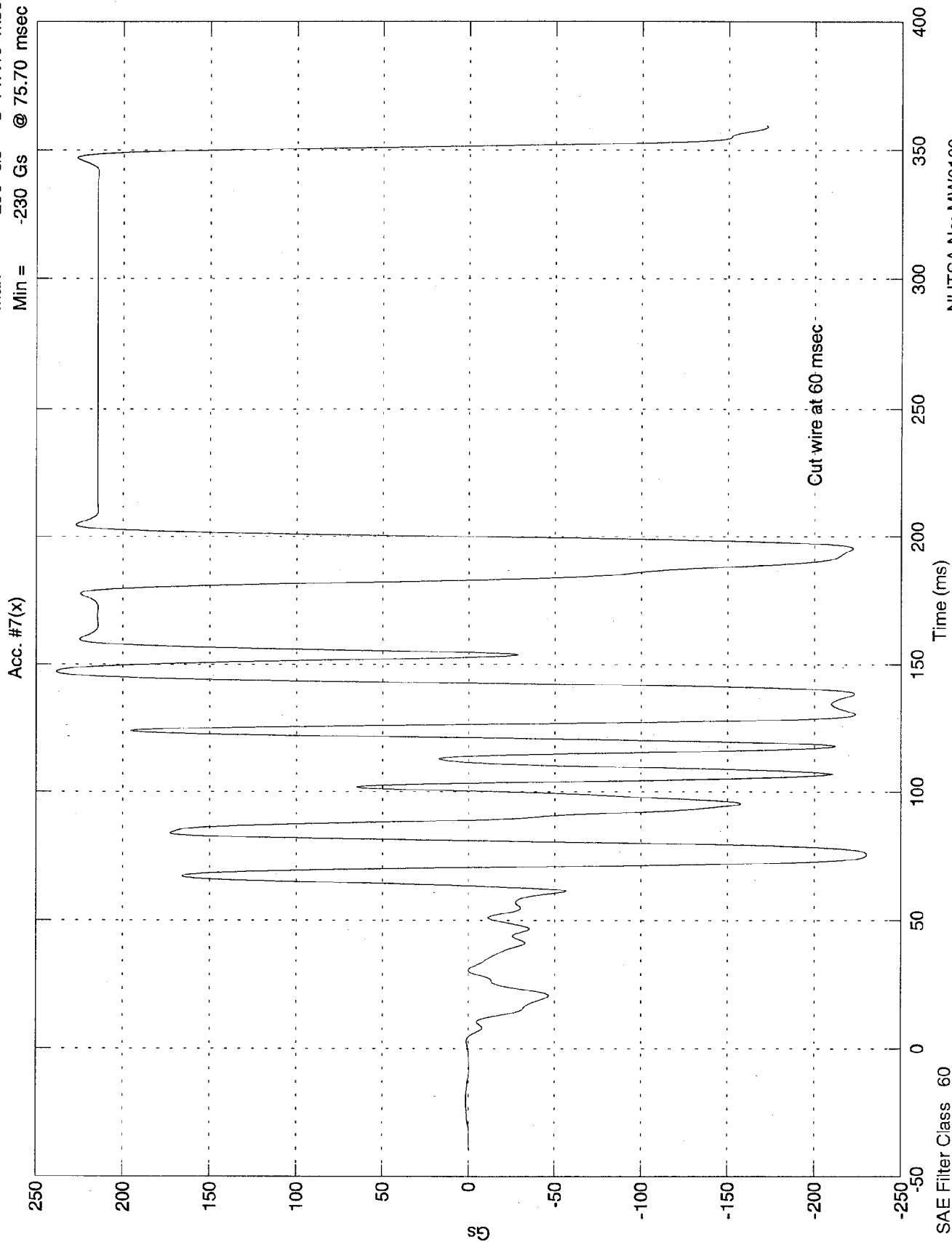
2nd Integral Acc. #6(x)



NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 238 Gs @ 147.10 msec
Min = -230 Gs @ 75.70 msec

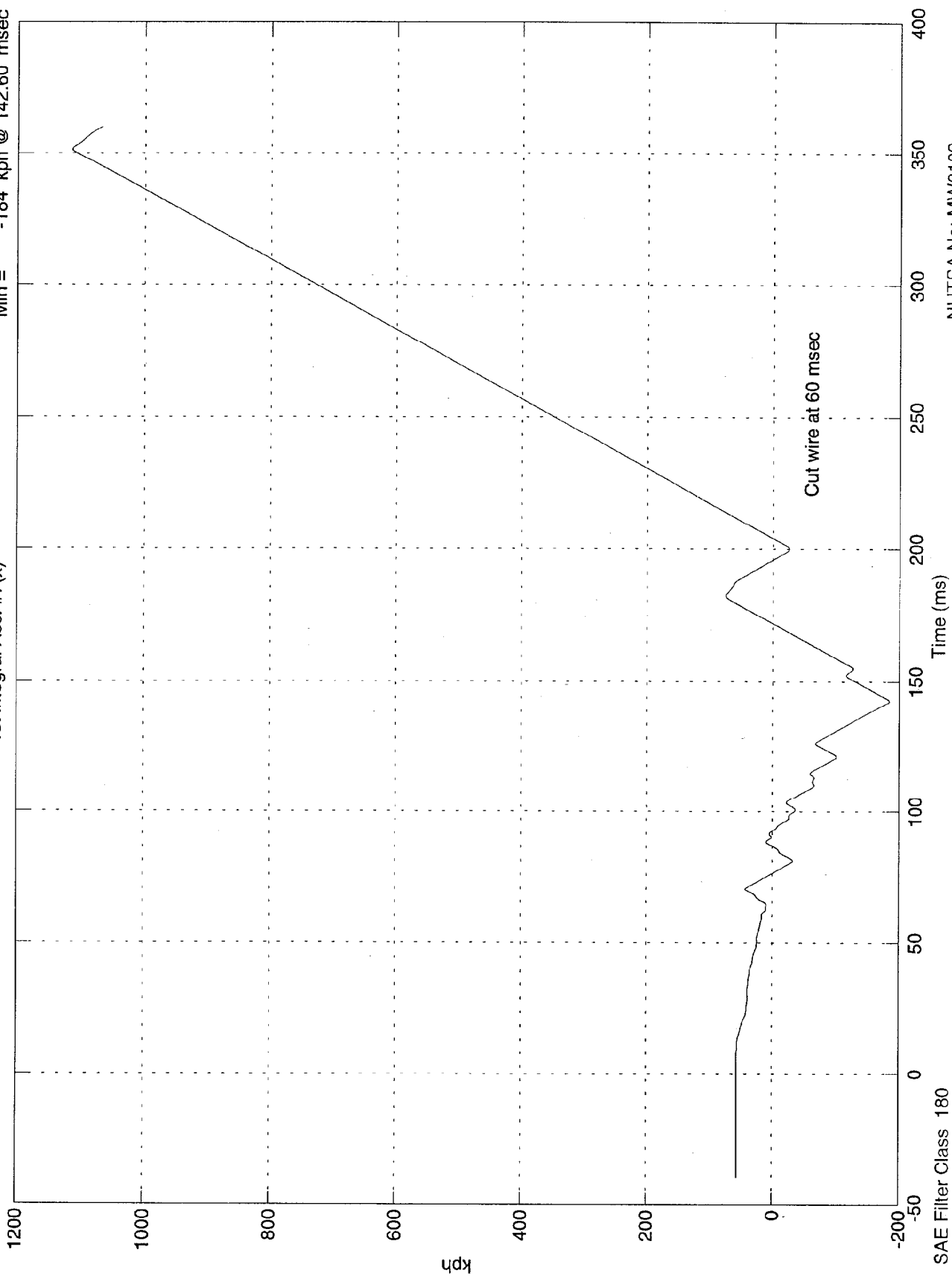


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 1.11e+003 kph @ 351.40 msec
Min = -184 kph @ 142.60 msec

1st Integral Acc. #7(x)

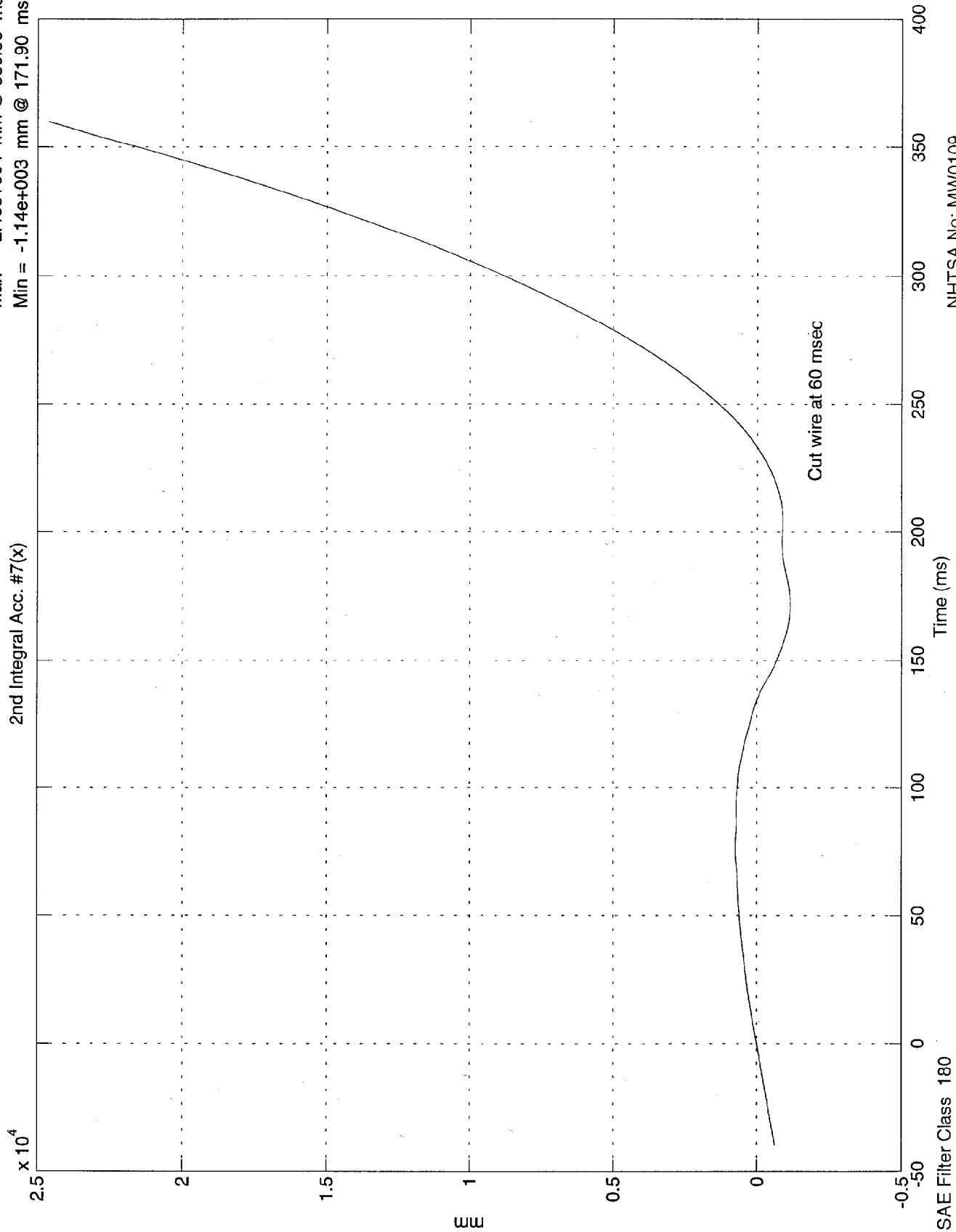


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 2.46e+004 mm @ 360.00 msec
 Min = -1.14e+003 mm @ 171.90 msec

2nd Integral Acc. #7(x)

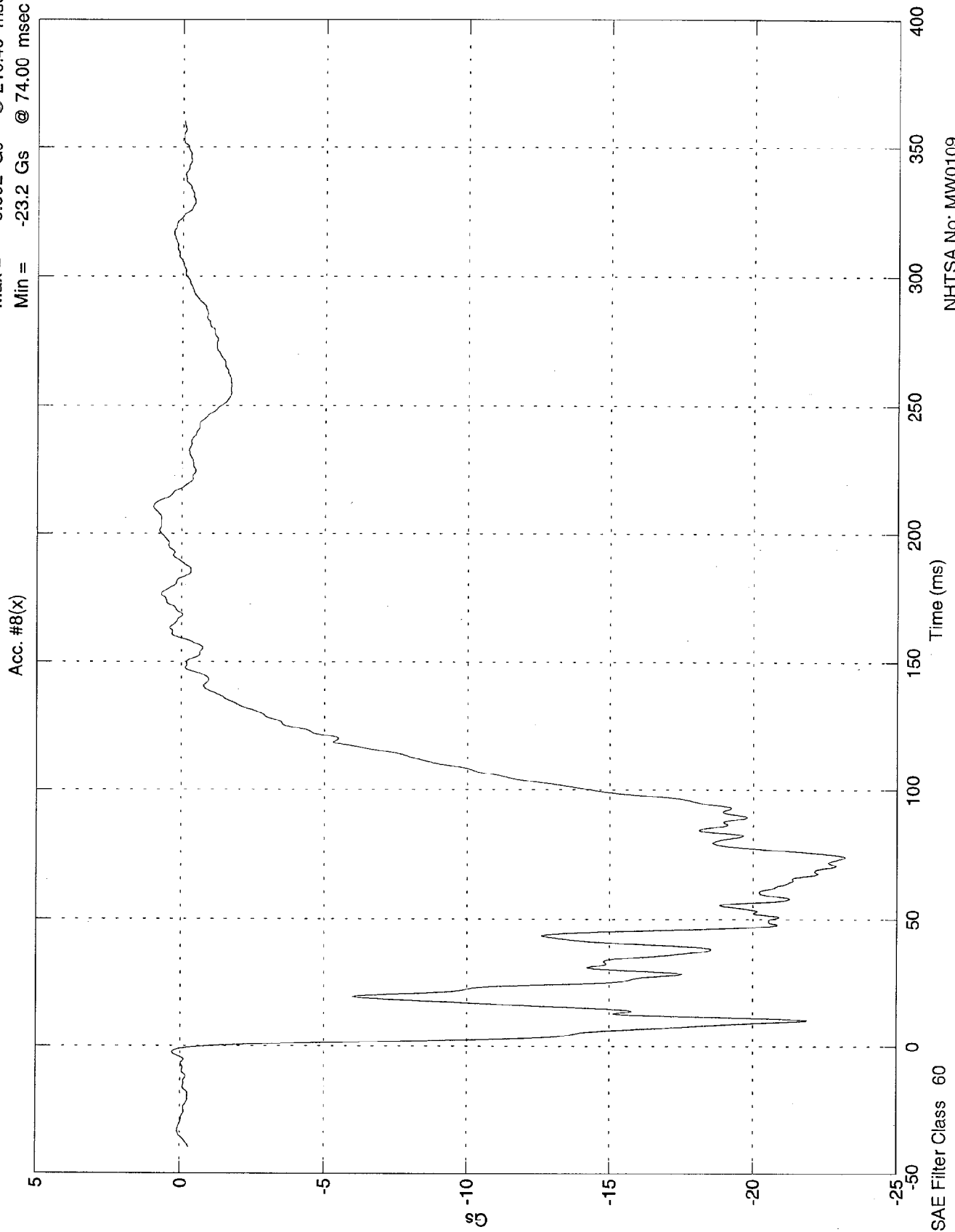


NHTSA No: MW0109
 Date: 08 Dec 1997

SAE Filter Class 180

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 0.992 Gs @ 210.40 msec
Min = -23.2 Gs @ 74.00 msec

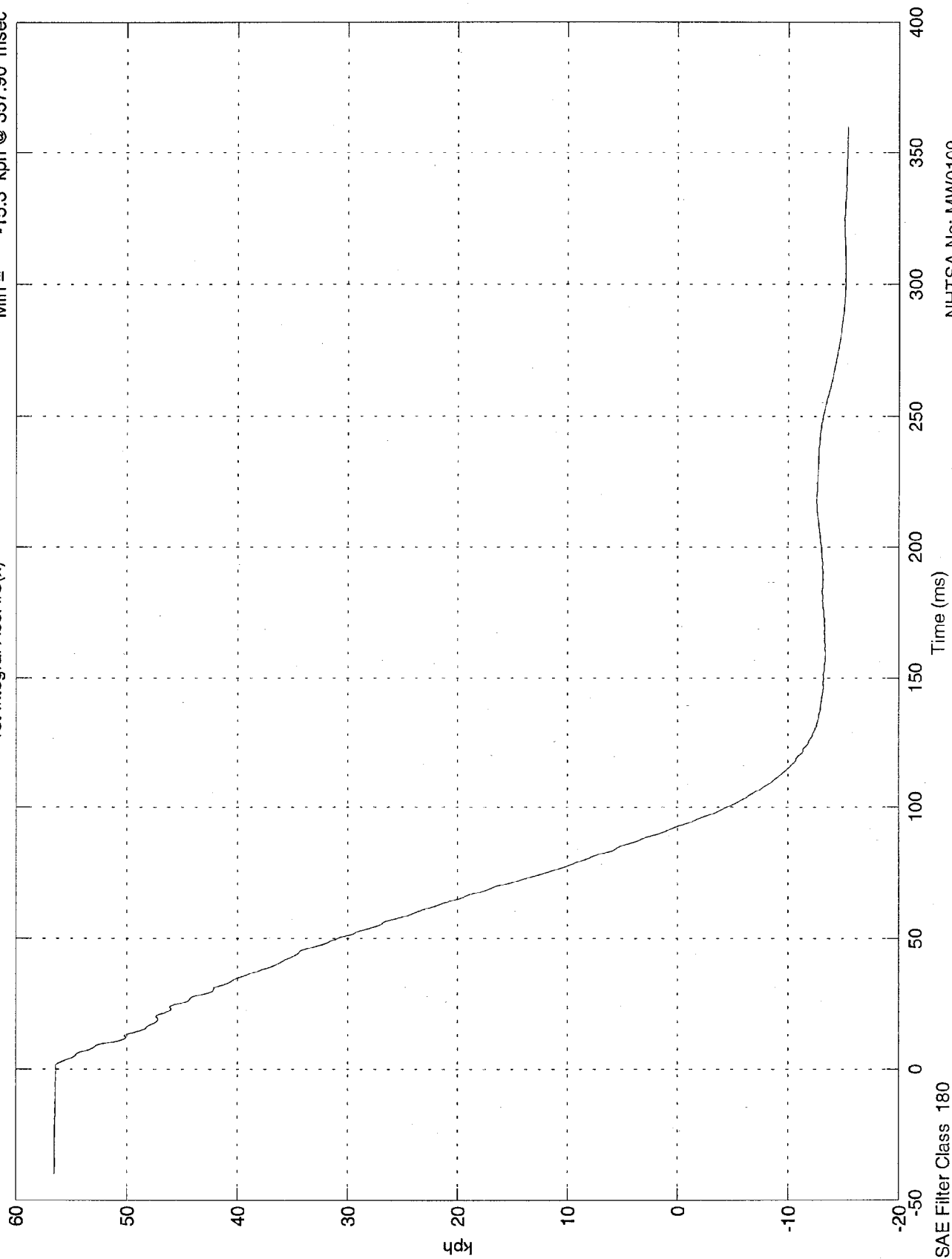


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 56.6 kph @ -39.90 msec
Min = -15.3 kph @ 357.90 msec

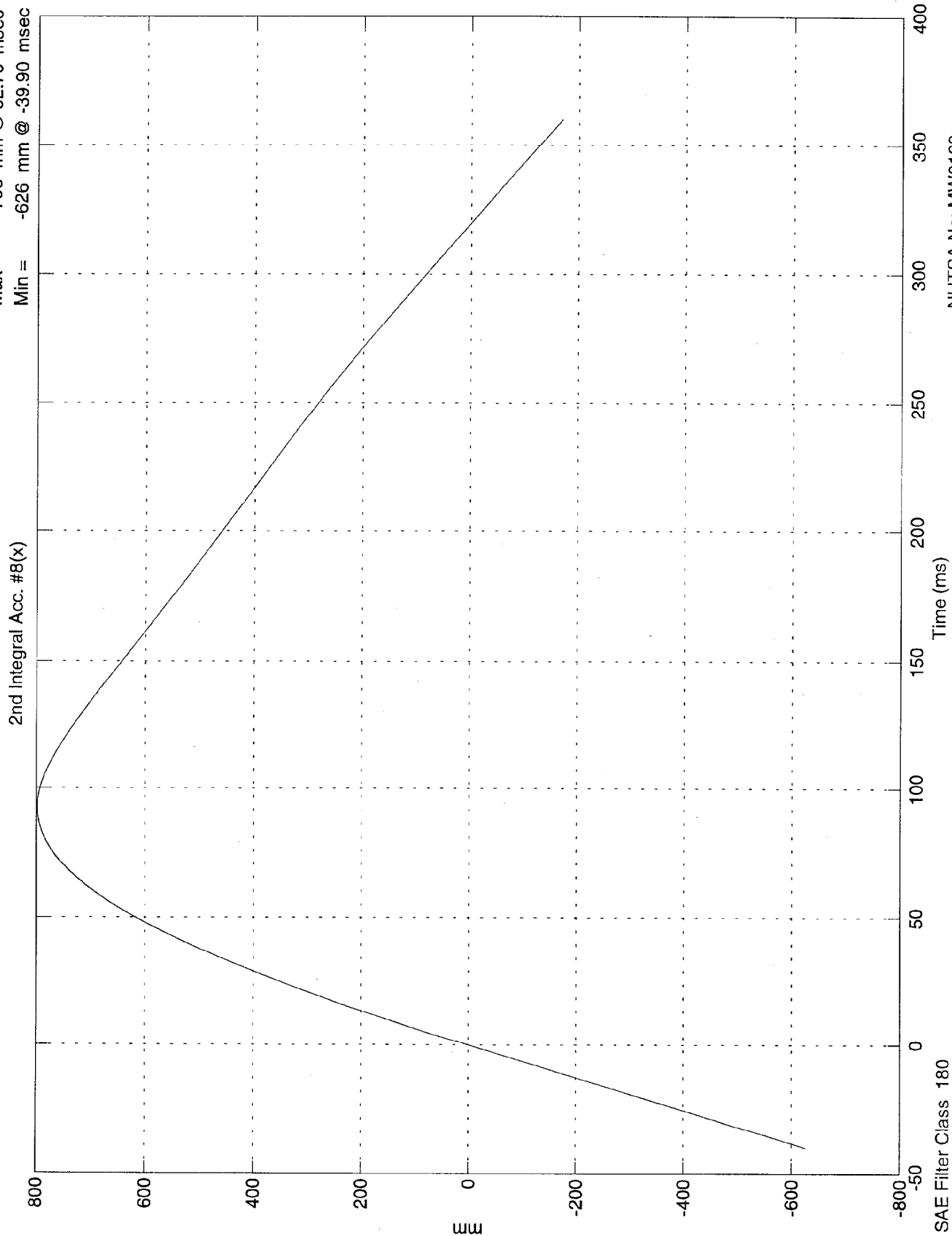
1st Integral Acc. #8(x)



NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 798 mm @ 92.70 msec
Min = -626 mm @ -39.90 msec

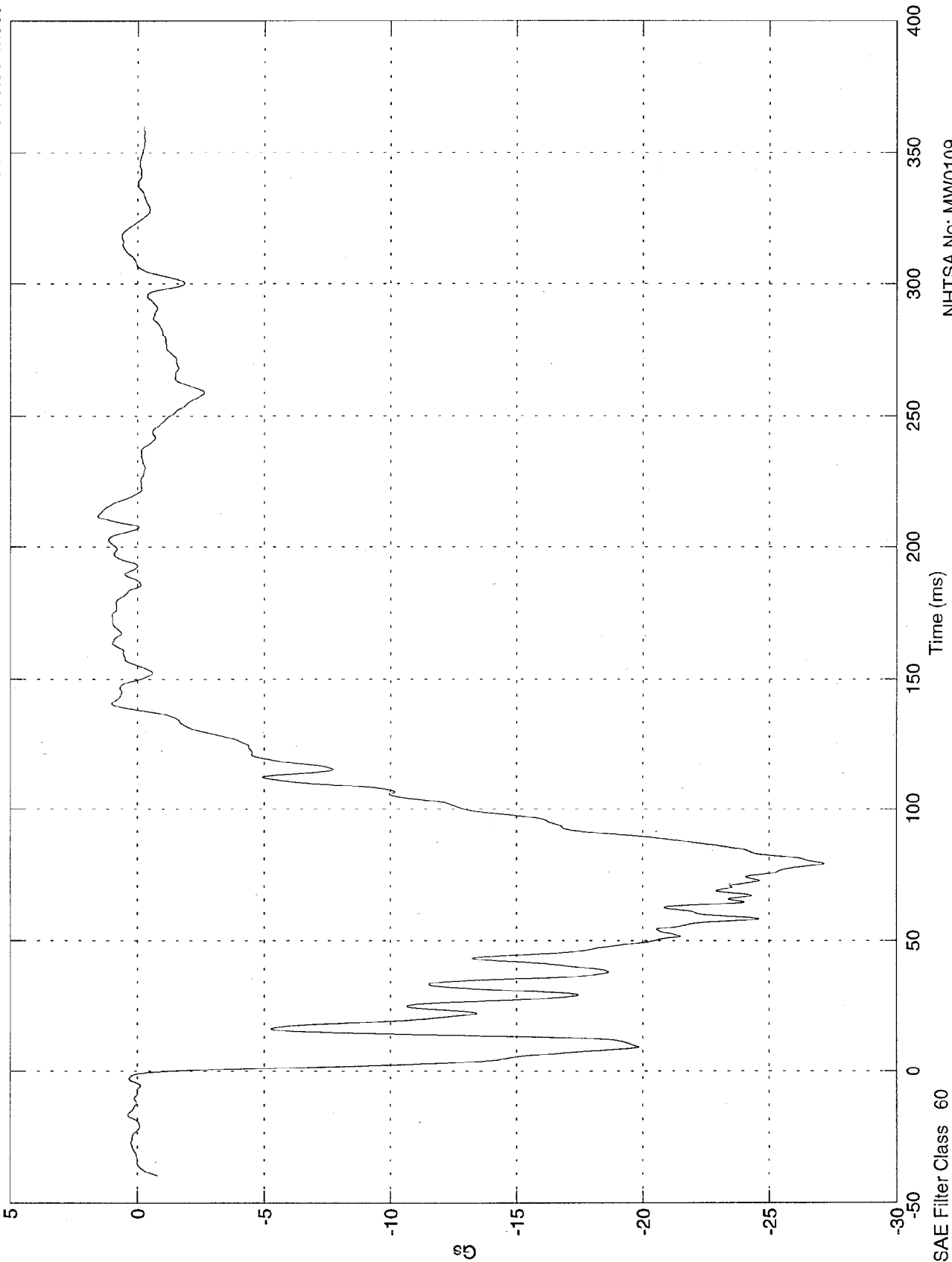


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 1.56 Gs @ 211.80 msec
Min = -27.2 Gs @ 79.30 msec

Acc. #9(x)

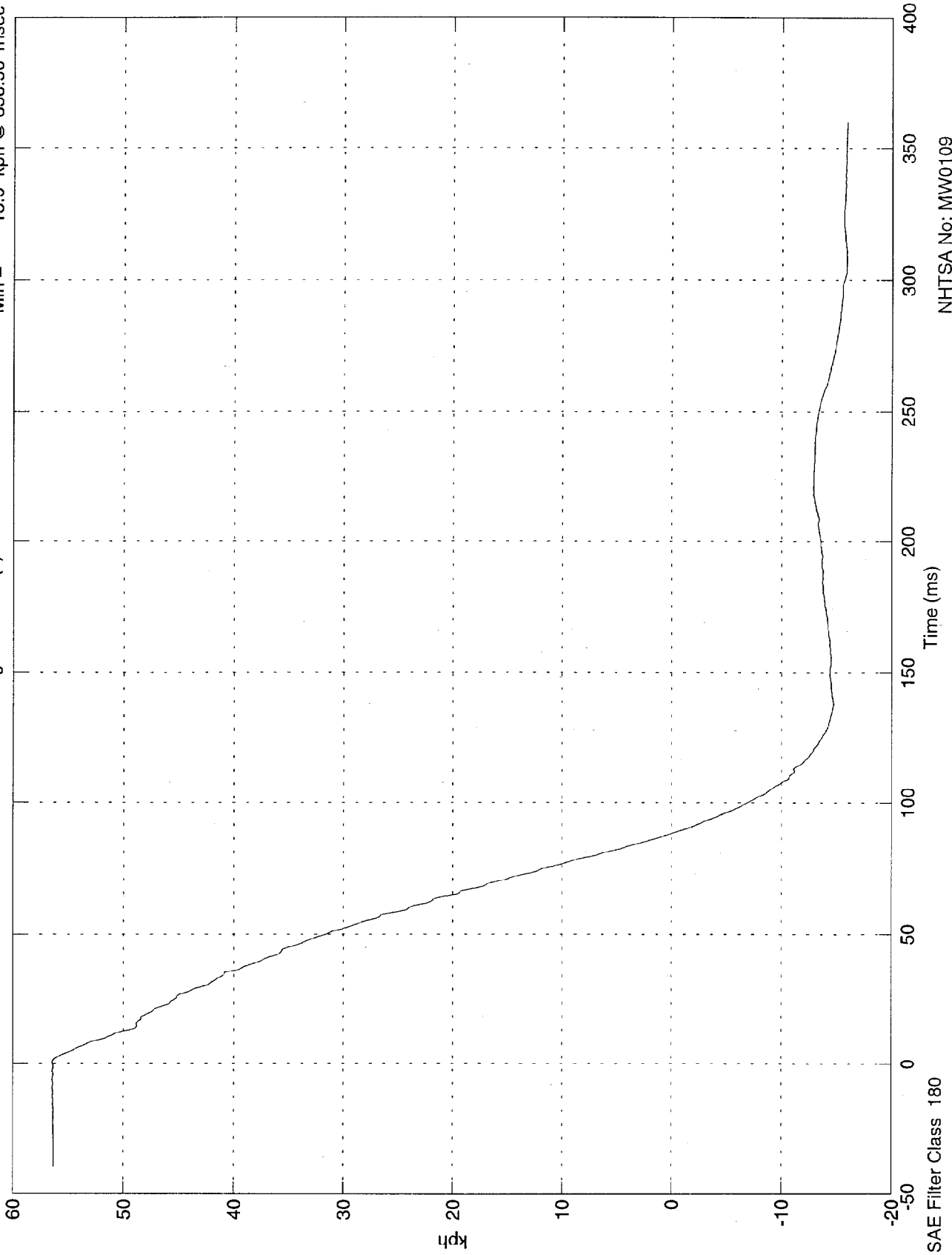


NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 56.4 kph @ 0.70 msec
Min = -15.9 kph @ 358.50 msec

1st Integral Acc. #9(x)

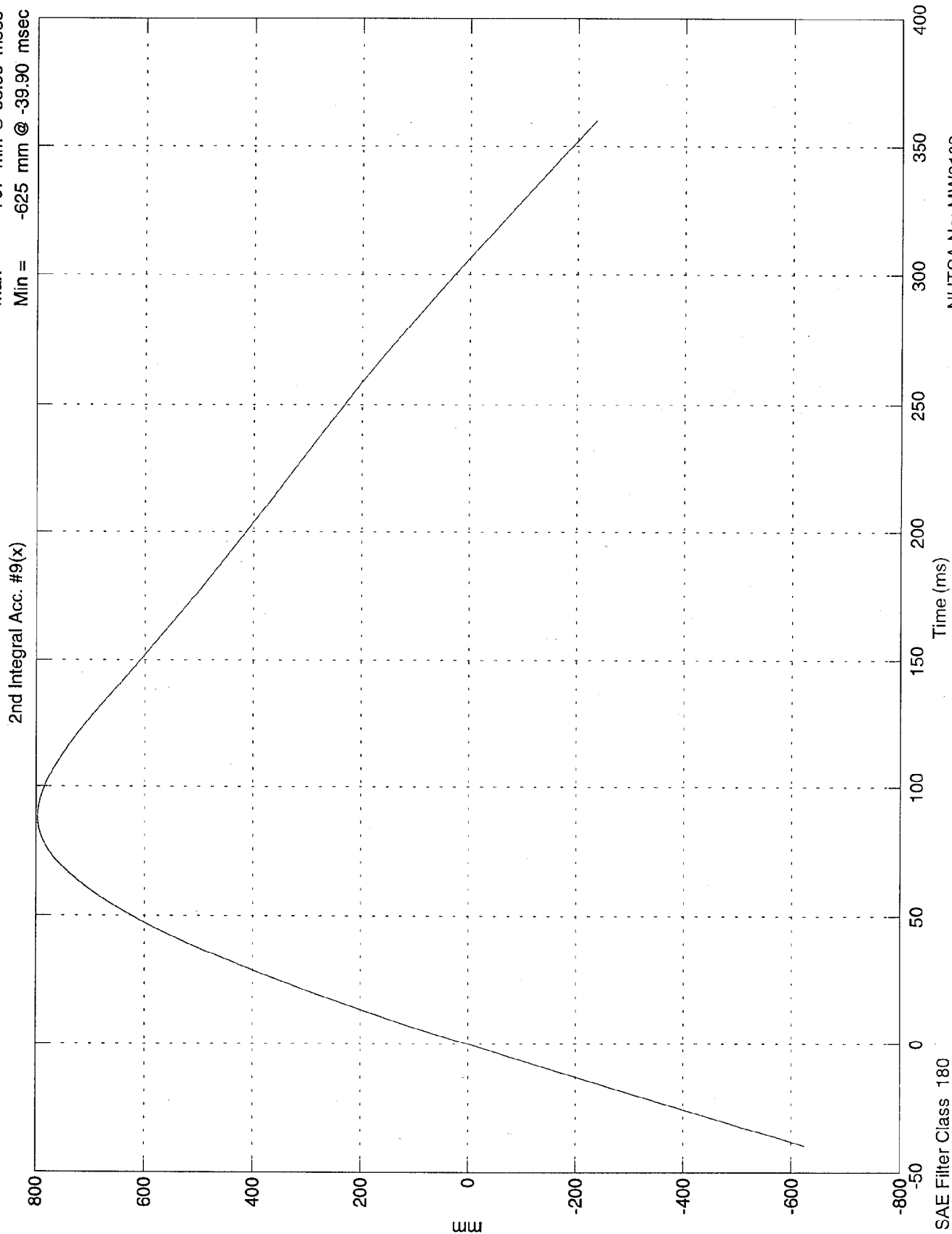


NHTSA No: MW0109
Date: 08 Dec 1997

SAE Filter Class 180

NCAP TEST #12 - 1998 CHEVROLET VENTURE

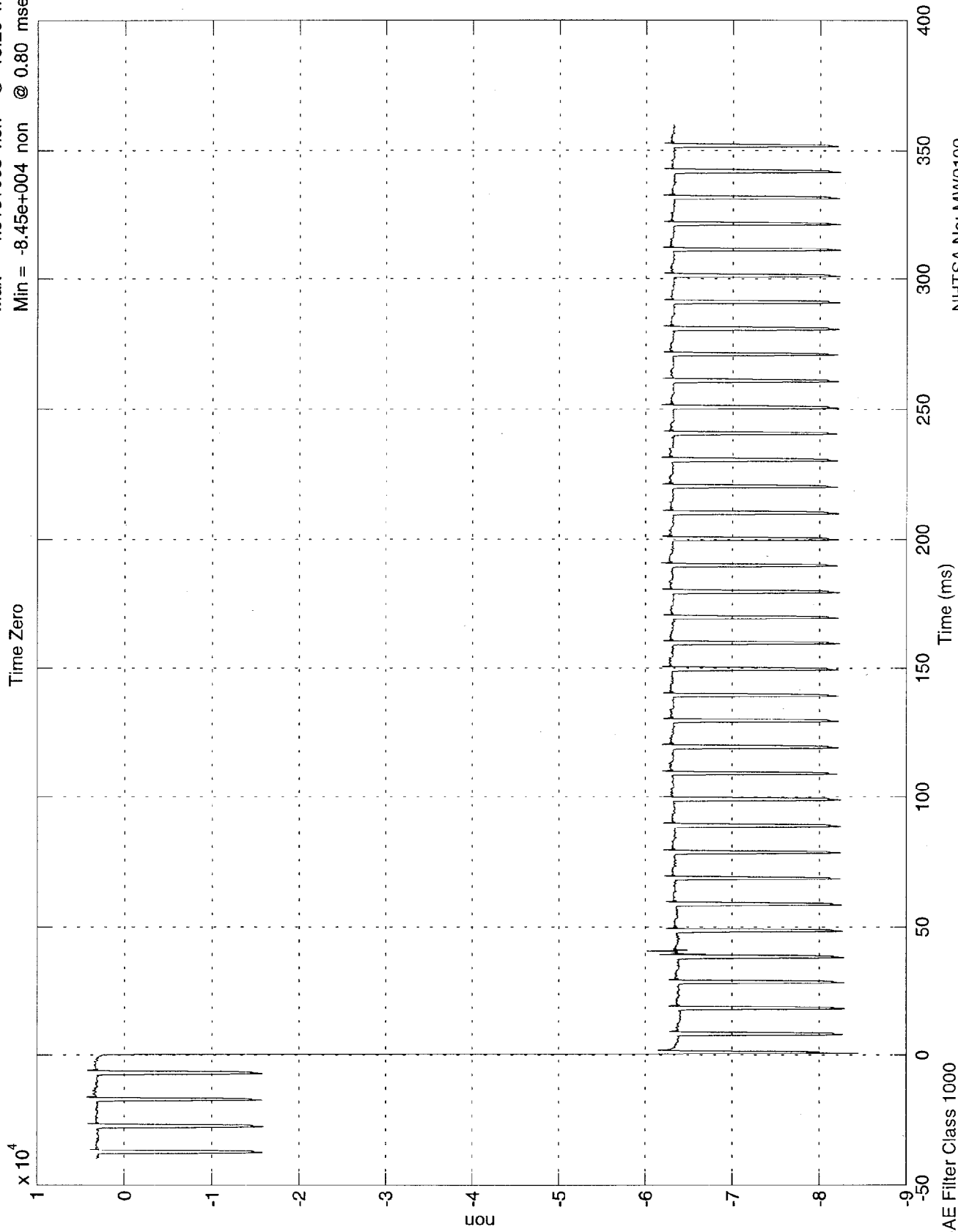
Max = 797 mm @ 88.30 msec
Min = -625 mm @ -39.90 msec



NHTSA No: MW0109
Date: 08 Dec 1997

NCAP TEST #12 - 1998 CHEVROLET VENTURE

Max = 4.31e+003 non @ -16.20 msec
Min = -8.45e+004 non @ 0.80 msec



NHTSA No: MW0109
Date: 09 Dec 1997

Appendix C

PART 572B/E DUMMY CONFIGURATION

AND PERFORMANCE VERIFICATION DATA SHEETS

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

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

Dummy serial numbers and certification dates are:

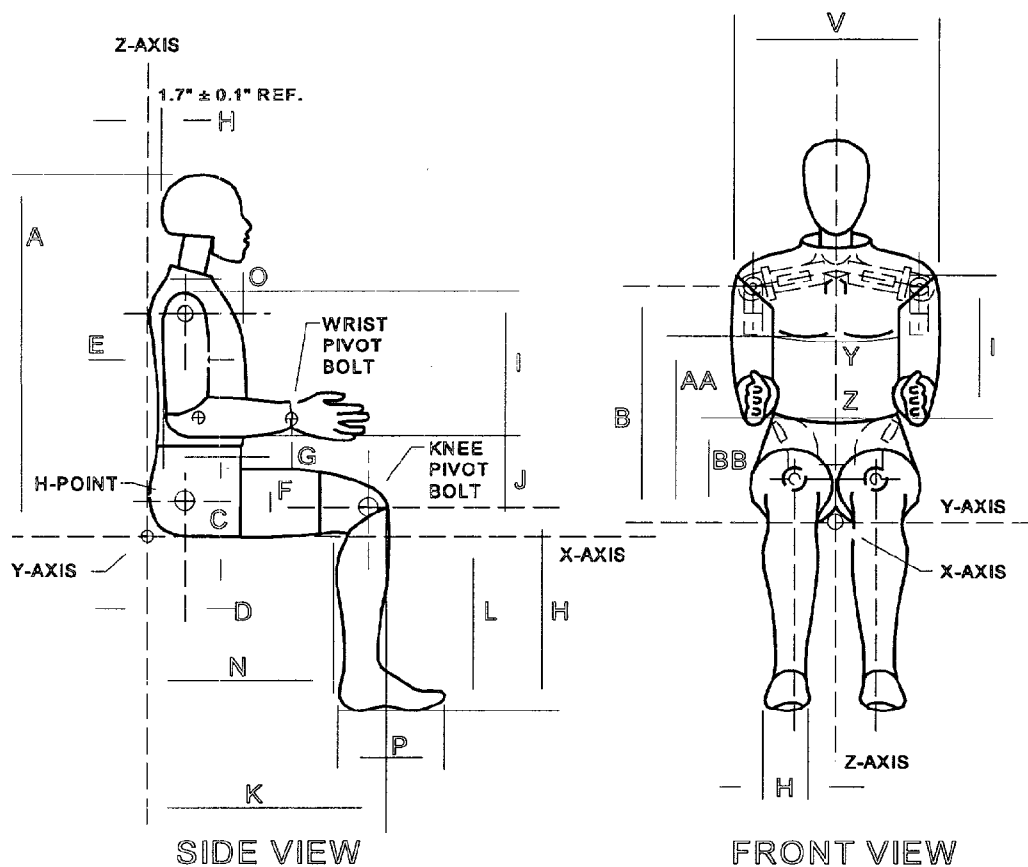
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	11/18/97
#2/Right Front Passenger	150	12/01/97

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 3
Date 11/13/97
Workfile 061397.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	30
Peak Resultant Acceleration	225-275 G's	241.8
Peak Lateral Acceleration	15 G's Max	3.1
Is Acceleration Curve Unimodal?	YES	Yes

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number 061
Calspan Sequential Test Number 3
Date 11/13/97
Workfile 061397.nfl

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	50
Impact Velocity		22.60 - 23.40 Ft/s	23.00
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.70
	20 ms	17.60 - 22.60 G's	19.32
	30 ms	12.50 - 18.50 G's	17.17
Max Pendulum G's Above 30 ms		29 G's Max	17.17
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	40.25
D Plane Rotation	Max	64 - 78 Deg	65.21
	Time	57 - 64 ms	57.50
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	71.80
	Time	47 - 58 ms	52.13
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	117.38
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	97.38

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number 061
 Calspan Sequential Test Number 3
 Date 11/14/97
 Workfile 061397.nex

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	50
Impact Velocity		19.50 - 20.30 Ft/s	19.70
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	19.32
	20 ms	14.00 - 19.00 G's	17.18
	30 ms	11.00 - 16.00 G's	13.79
Max Pendulum G's Above 30 ms		22 G's Max	13.79
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	41.13
D Plane Rotation	Max	81 - 106 Deg	90.51
	Time	72 - 82 ms	75.38
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-41.78
	Time	65 - 79 ms	71.13
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	162.50
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	141.13

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 061
Calspan Sequential Test Number 3
Date 11/17/97
Workfile 061397.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	71
Relative Humidity	10% - 70%	35
Pendulum Velocity	21.6 - 22.4 Ft/s	22.00
Maximum Deflection	2.50 - 2.86 in	2.50
Maximum Resistive Force	1160 - 1325 Lbs	1307.12
Internal Hysteresis	69 - 85 %	73.3

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
Calspan Sequential Test Number 3
Date 11/18/97
Workfile 061397.

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	71
Relative Humidity	10% - 70%	35
Probe Velocity	6.8 - 7.0 Ft/s	6.90
Peak Knee Impact Force	1060 - 1300 Lbs	1114.0
RIGHT KNEE		
Temperature	66 - 78 Deg F	71
Relative Humidity	10% - 70%	35
Probe Velocity	6.8 - 7.0 Ft/s	6.90
Peak Knee Impact Force	1060 - 1300 Lbs	1167.0

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Calspan Sequential Test Number 3
Date 11/17/97

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			71
Relative Humidity			35
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 7
Date 11/25/97
Workfile 150797.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70
Relative Humidity	10% - 70%	50
Peak Resultant Acceleration	225-275 G's	225.4
Peak Lateral Acceleration	15 G's Max	3.1
Is Acceleration Curve Unimodal?	YES	Yes

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number 150
Calspan Sequential Test Number 7
Date 11/26/97
Workfile 150797.nfl

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	50
Impact Velocity		22.60 - 23.40 Ft/s	22.68
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.52
	20 ms	17.60 - 22.60 G's	19.52
	30 ms	12.50 - 18.50 G's	16.29
Max Pendulum G's Above 30 ms		29 G's Max	16.29
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	40.13
D Plane Rotation	Max	64 - 78 Deg	68.63
	Time	57 - 64 ms	59.75
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	72.99
	Time	47 - 58 ms	53.50
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	118.38
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	103.38

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number 150
 Calspan Sequential Test Number 7
 Date 11/26/97
 Workfile 150797.nex

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70
Relative Humidity		10% - 70%	50
Impact Velocity		19.50 - 20.30 Ft/s	19.61
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.57
	20 ms	14.00 - 19.00 G's	16.77
	30 ms	11.00 - 16.00 G's	13.44
Max Pendulum G's Above 30 ms		22 G's Max	13.44
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	44.00
D Plane Rotation	Max	81 - 106 Deg	90.90
	Time	72 - 82 ms	74.38
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-50.73
	Time	65 - 79 ms	68.88
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	152.00
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	138.00

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 150
Calspan Sequential Test Number 7
Date 12/01/97
Workfile 150797.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70
Relative Humidity	10% - 70%	50
Pendulum Velocity	21.6 - 22.4 Ft/s	21.70
Maximum Deflection	2.50 - 2.86 in	2.74
Maximum Resistive Force	1160 - 1325 Lbs	1304.14
Internal Hysteresis	69 - 85 %	73.24

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 150
Calspan Sequential Test Number 7
Date 11/24/97
Workfile 150797.

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	50
Probe Velocity	6.8 - 7.0 Ft/s	6.90
Peak Knee Impact Force	1060 - 1300 Lbs	1289.0
RIGHT KNEE		
Temperature	66 - 78 Deg F	70
Relative Humidity	10% - 70%	50
Probe Velocity	6.8 - 7.0 Ft/s	6.90
Peak Knee Impact Force	1060 - 1300 Lbs	1241.0

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 150
Calspan Sequential Test Number 7
Date 12/01/97

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			50
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	18.4
Popliteal Height	L	16.9 - 17.9 in	17.5
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.2
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.6
Shoulder Breadth	V	16.6 - 17.2 in	16.9
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	952	GSE	9/97	3/98
Left Femur Load Cell	951	GSE	9/97	3/98
Neck Load Cell	269	DENTON	10/97	4/98
X	269	DENTON	10/97	4/98
Y	269	DENTON	10/97	4/98
Z	269	DENTON	10/97	4/98
Neck Moment	269	DENTON	10/97	4/98
X	269	DENTON	10/97	4/98
Y	269	DENTON	10/97	4/98
Z	269	DENTON	10/97	4/98
Chest Deflection Gauge	061	HUMANOID	11/97	5/98
Hybrid III Use Only				
Lap Belt Load Cells	706	LEBOW	6/97	12/97
Shoulder Belt Load Cells	707	LEBOW	6/97	12/97
Spool-Out Potentiometer	M10	MAGNETEK	9/97	3/98
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
My	038	DENTON	10/97	4/98
Left Lower Tibia				
Fy	032	DENTON	10/97	4/98
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
My	045	DENTON	10/97	4/98
Right Lower Tibia				
Fy	041	DENTON	10/97	4/98
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	A13929	ENDEVCO	9/97	3/98
Left Foot Rear Z	A14058	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	8/97	2/98
Y	AGHF5	ENDEVCO	8/97	2/98
Z	AL6K2	ENDEVCO	8/97	2/98
Chest				
X	A33A	ENDEVCO	8/97	2/98
Y	FB32L	ENDEVCO	8/97	2/98
Z	AD395	ENDEVCO	8/97	2/98
Right Femur Load Cell	232	GSE	9/97	3/98
Left Femur Load Cell	231	GSE	9/97	3/98
Neck Load Cell	205	DENTON	8/97	2/98
X	205	DENTON	8/97	2/98
Y	205	DENTON	8/97	2/98
Z	205	DENTON	8/97	2/98
Neck Moment	205	DENTON	8/97	2/98
X	205	DENTON	8/97	2/98
Y	205	DENTON	8/97	2/98
Z	205	DENTON	8/97	2/98
Chest Deflection Gauge	150	HUMANOID	10/97	4/98
Hybrid III Use Only				
Lap Belt Load Cells	635	LEBOW	6/97	12/97
Shoulder Belt Load Cells	711	LEBOW	6/97	12/97
Spool-Out Potentiometer	M5	MAGNETEK	9/97	3/98
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	8/97	2/98
Y (R)	APBD7	ENDEVCO	8/97	2/98
Z (R)	AN967	ENDEVCO	8/97	2/98
Chest				
X (R)	J18406	ENDEVCO	8/97	2/98
Y (R)	APIB5	ENDEVCO	8/97	2/98
Z (R)	AY60	ENDEVCO	8/97	2/98
Pelvic				
X	AF480	ENDEVCO	8/97	2/98
Y	AL508	ENDEVCO	8/97	2/98
Z	AF5C1	ENDEVCO	8/97	2/98
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	J18418	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	D75	ICS	10/97	4/98
Right Rear Seat Crossmember	Y13	ICS	10/97	4/98
Top of Engine	Y30	ICS	10/97	4/98
Bottom of Engine	D79	ICS	9/97	3/98
Left Disc Brake Caliper	A44	CEC	10/97	4/98
Right Disc Brake Caliper	A56	CEC	10/97	4/98
Instrument Panel	A129	CEC	10/97	4/98
Left Seat Rear Crossmember (R)	Y171	ICS	9/97	3/98
Right Seat Rear Crossmember (R)	Y151	ICS	9/97	3/98