

V2771

REPORT NUMBER: CAL-98-22

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

**NISSAN MOTOR COMPANY, LTD.
1998 NISSAN SENTRA
4-DOOR SEDAN**

NHTSA NUMBER: MW5205

CALSPAN TEST NUMBER: 8413-21

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



February 4, 1998

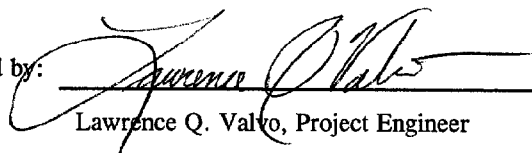
FINAL REPORT

PREPARED FOR:

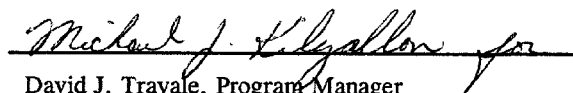
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National Highway Traffic Safety Administration
Safety Performance Standards
Office of Crashworthiness Standards
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NHTSA, Office of Crashworthiness Standards

Date of Report Acceptance

COTR, New Car Assessment Program (NCAP)
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16. <i>Abstract</i> A frontal barrier test of a 1998 Nissan Sentra 4-Door Sedan was performed at Calspan Corporation crash test facility in Buffalo, New York, on February 4, 1998. The impact velocity was 56.6 kph and the temperature at the barrier face was 21.7°C. The maximum post-test vehicle crush was 560 mm. The test vehicle was equipped with driver and passenger frontal airbags. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appear to comply with head, chest, and femur requirements.			
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Section 1

PURPOSE AND SUMMARY OF TEST MW5205

PURPOSE

This 56.6 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 56.6 kph frontal barrier impact test was conducted in accordance with the Office of Market Incentives (OMI) Laboratory Indicant Test procedure.

SUMMARY

A frontal barrier was impacted by a 1998 Nissan Sentra 4-Door Sedan at a velocity of 56.6 kph. The test was performed at the Calspan Corporation on February 4, 1998. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by 1 real-time camera and 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) and the right-front passenger (position 2) ATD (Serial No. 150) were used in one previous test (MW0108) where the FMVSS 208 requirements were not exceeded. 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.

The driver's HIC was 897.87. The maximum chest deceleration over 3 milliseconds was 48.79 g's and maximum chest deflection was -40.5 mm. Femur loads were -2309.9 Newtons on the left and -2413.8 Newtons on the right.

The right front passenger's HIC was 797.09. Maximum chest deceleration over 3 milliseconds was 49.47 g's and maximum chest deflection was -44.2 mm. Femur loads were -2690.6 Newtons on the left and -2687.0 Newtons on the right.

The Position #1 Belt Elongation transducer and the Position #2 Head Y Redundant accelerometer were damaged during the impact, data is not available for these channels. The Position #2 Right Upper Tibia Mx and My transducers and Position #2 Left Ankle Z accelerometer sustained a data cable cut after 70 milliseconds, causing some noise in adjacent channels. The Engine Top X (#3) accelerometer data cable was severed at approximately 100 milliseconds, data beyond this time is not accurate.

SECTION 2

GENERAL TEST AND VEHICLE PARAMETER DATA

DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No. : MW5205 Test Mode : 56 kph Frontal Barrier

Test Date : February 4, 1998 Time: 13:28 Temperature : 21.7 °C

Vehicle Make/Model/Body Style : 1998 Nissan Sentra 4-Door Sedan

Vehicle Test Weight : 1288.0 kg

Vehicle/Barrier Impact Angle : 0 °

Impact Velocity : 56.6 kph

Maximum Static Crush : 560 mm

Vehicle Rebound : 558 mm

DUMMIES:

DRIVER

PASSENGER

Type : 572E 572E

Restraint System : Airbag, Seatbelt, Knee Bolster Airbag, Seatbelt, Knee Bolster

Number of Data Channels : 97

Number of Cameras : 1 Real Time

 16 High Speed

DOOR OPENING DATA : Closed/Operable - Left Front

 Closed/Operable - Right Front

Front Seat(s) Data :

DRIVER

PASSENGER

Seat Track Failure :(mm of shift) 0 0

Seat Back Failure : None None

VISIBLE DUMMY CONTACT POINTS :

DRIVER

PASSENGER

Head : Face to upper center of airbag,
back of head to outboard side
of headrest Face to upper center of airbag,
back of head to outboard side
of headrest

Abdomen : None None

Chest Airbag Airbag

Knees Knee Bolster Glove compartment door

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION :

Year/Make/Model/Body Style : 1998 Nissan Sentra 4-Door Sedan

NHTSA No. : MW5205 ; VIN: 1N4AB41D6WC721377 ; Color : Green

Engine Data: 4 cylinders; - CID; 1.6 Liters; - cc

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

Transmission Data : 5 speeds; X Manual; - Automatic; - 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 : 01/30/98 ; Odometer Reading 40 km

Selling Dealer : Auto Place Nissan

& Address: 8129 Main St. Williamsville NY 14231

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by : Nissan Motor Company, Ltd.

Date of Manufacture 10/97

GVWR : 1510.0 kg; GAWR: 849.1 kg FRONT; 710.8 kg REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load : 240 kpa FRONT
240 kpa REAR

Recommended Tire Size : P175/65R14

* Recommended Cold Tire Pressure : 230 kpa FRONT; 200 kpa REAR

Size of Tires on Test Vehicle: P175/65R14 ; Manufacturer: Dunlop

Vehicle Capacity Data :

Type of Front Seats:	<u>-</u> Bench;	<u>X</u> Bucket;	<u>-</u> Split Bench
Number of Occupants:	<u>2</u> Front;	<u>3</u> Rear;	<u>5</u> Total
Vehicle Capacity Weight (VCW) =	<u>369.2</u> kg		
No. of Occupants x 68 kg =	<u>340.2</u> kg		
Rated Cargo/Luggage Weight (RCLW) =	<u>29.0</u> kg		

*Tire pressure used for test

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

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

Right Front	=	<u>343.5</u>	kg	Right Rear	=	<u>215.0</u>	kg
Left Front	=	<u>340.0</u>	kg	Left Rear	=	<u>213.0</u>	kg
TOTAL FRONT	=	<u>683.5</u>	kg	TOTAL REAR	=	<u>428.0</u>	kg
TOTAL DELIVERED WEIGHT		=	<u>1,111.5</u>	kg			
% of Total Front of Vehicle Weight		=	<u>61.5</u>	% of Total Rear Weight		=	<u>38.5</u> %

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT :

Total Delivered Weight (UDW)	=	<u>1111.5</u>	kg
Rated Cargo/Luggage Weight (RCLW)	=	<u>29.0</u>	kg
Weight of 2 p.572 Dummies @ 76 each	=	<u>152.0</u>	kg
TARGET TEST WEIGHT	=	<u>1292.5</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 25 KG OF CARGO WEIGHT:

Right Front	=	<u>373.5</u>	kg	Right Rear	=	<u>268.5</u>	kg
Left Front	=	<u>371.5</u>	kg	Left Rear	=	<u>274.5</u>	kg
TOTAL FRONT	=	<u>745.0</u>	kg	TOTAL REAR	=	<u>543.0</u>	kg
TOTAL TEST WEIGHT		=	<u>1,288.0</u>	kg			
% of Total Front Weight		=	<u>57.8</u>	% of Total Rear Weight		=	<u>42.2</u> %
Weight of Ballast Secured in Vehicle Trunk Area		=	<u>0</u>	kg			
Vehicle Components Removed for Weight Reduction:		<u>Rear bumper, muffler, trunk lid, rear seat & trim</u>					

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED :	RF	<u>675</u>	LF	<u>680</u>	RR	<u>655</u>	LR	<u>657</u>
FULLY LOADED :	RF	<u>660</u>	LF	<u>662</u>	RR	<u>620</u>	LR	<u>623</u>
AS TESTED :	RF	<u>667</u>	LF	<u>665</u>	RR	<u>620</u>	LR	<u>623</u>
Vehicle's Wheel Base :		<u>2532</u> mm						
Location of Vehicle's C.G. :		<u>1,067</u> mm rearward of front wheel center.						

FUEL SYSTEM DATA :

Fuel System Capacity From Owner's Manual	=	<u>50.2</u>	liters
Usable Capacity Figure Furnished by COTR	=	<u>50.0</u>	liters
Test Volume Range (92 to 94% of Usable Capacity)	=	<u>46.0</u>	to <u>47.0</u> liters
ACTUAL TEST VOLUME	=	<u>46.2</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 Filler - Left side aft of rear axle; Tank - Forward of rear axle; Lines - Inboard of left frame rail.			

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test : Frontal Barrier Impact Angle : 0°
Test Date : February 4, 1998 Time: 13:28 Temperature: 21.7 °C
Vehicle NHTSA No. : MW5205
Required Impact Velocity Range : 55.7 to 57.1 kph

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

Trap No. 1 = 56.6 kph; Trap No. 2 = 56.6 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 = 4265 ; C/L = 4320 ; Left = 4255
Post-Test Right = 3745 ; C/L = 3760 ; Left = 3770
Crush Right = 520 ; C/L = 560 ; Left = 485
AVERAGE = 522 mm

VEHICLE REBOUND: (From rigid barrier only.)

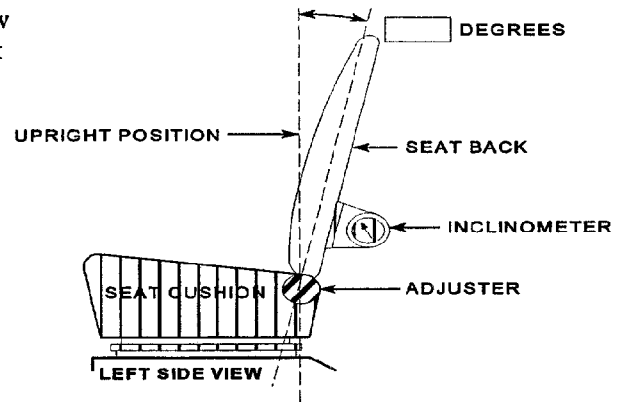
Distance from front of test vehicle to impact point :
Right = 549 ; C/L = 578 ; Left = 548
AVERAGE = 558 mm

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 1998 Vehicle Model: Nissan Sentra Body Style : 4-Door Sedan

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 : 15°

Measurement instructions : Adjust seat back until it is in its full upright position (first detent = 0). Release the lock by actuating the recline lever and push the seat back to the 7th rearward notch.

Seat back angle for passenger's seat : 15°

Measurement instructions : Same as driver's seat.

2. Seat Fore and Aft Positioning

Positioning of the driver's seat : With the forward most position designated as 0, release the lock mechanism and adjust the seat to the 10th notch rearward (neutral position).

Positioning of the passenger's seat (if applicable) : Same as driver's seat.

3. Fuel Tank Capacity Data

3.1

- | | |
|--|--------------------|
| A. "Usable Capacity" of the standard equipment fuel tank is | <u>50.0</u> liters |
| B. "Usable Capacity" of the optional equipment fuel tank is | <u>-</u> liters |
| C. "Usable Capacity" of the vehicle(s) used for certification testing to requirements of FMVSS 301 = | <u>50.0</u> liters |

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 46.2 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.

While engine is running or ignition switch is activated.

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

4. STEERING COLUMN ADJUSTMENTS :

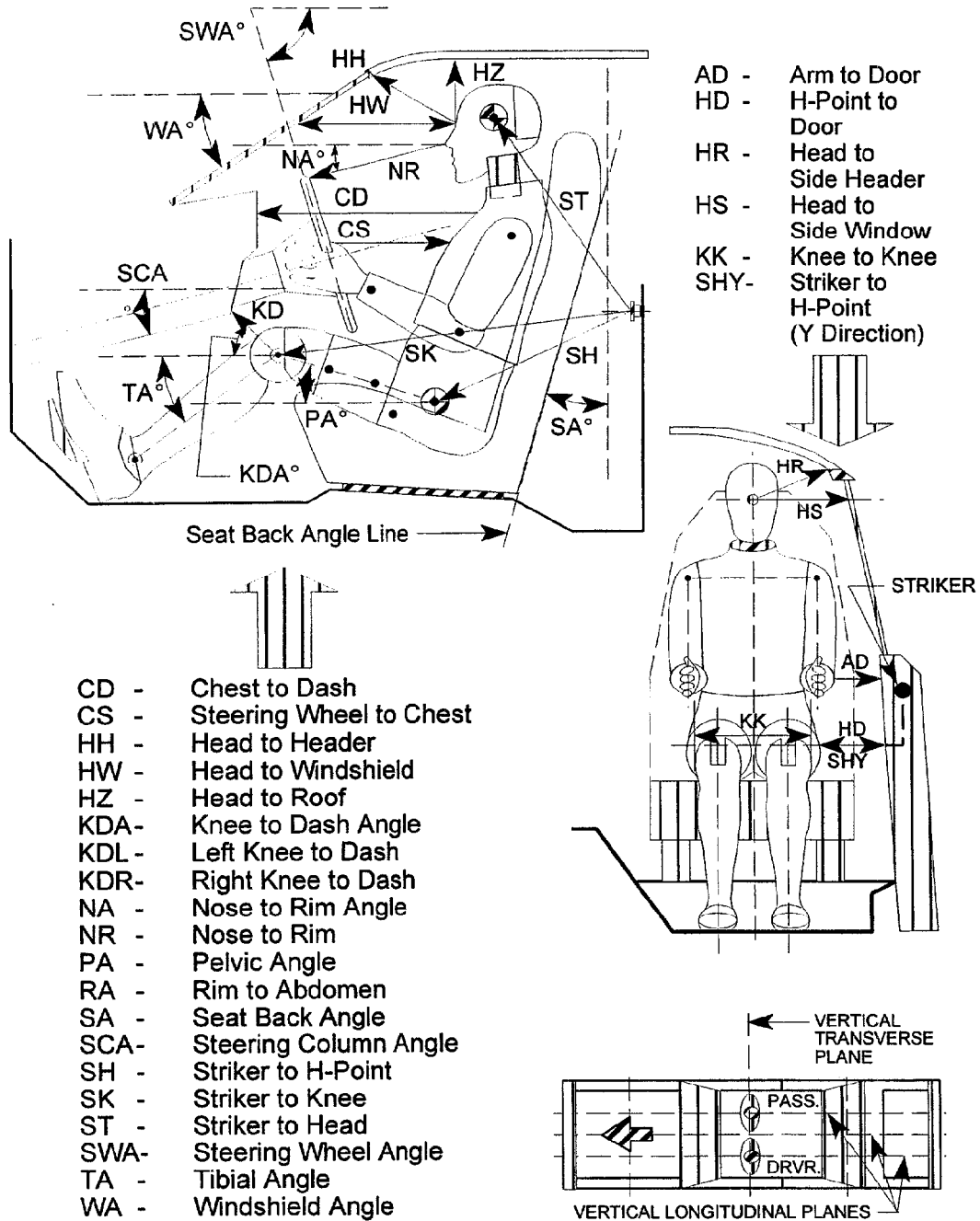
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine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

Operational Instructions: Adjust the steering column to its mid-travel position when measured from the header down to the steering wheel rim. The steering column angle should read 24°.

5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: Place adjustable D-ring in the upper most position.

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

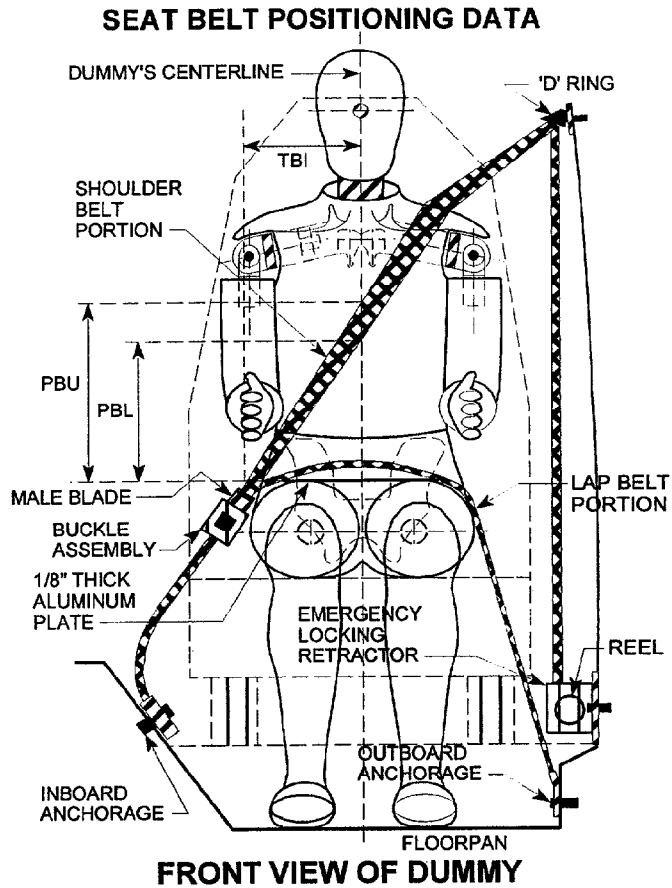


DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE

	DRIVER (Serial #061)			PASS. (Serial # 150)		
WA ^o	29 deg.			N/A		
SWA ^o	66 deg.			N/A		
SCA ^o	24 deg.			N/A		
SA ^o	15 deg.			15 deg.		
HZ	161			153		
HH	360			348		
HW	569			550		
HR	221			229		
NR	405	Angle	13 deg.	N/A		
CD	538			538		
CS	300			N/A		
RA	190			N/A		
KDL	165	Angle (KDA)	29 deg.	166		
KDR	157			158	Angle (KDA)	37 deg.
PA ^o	24.5 deg.			24.0 deg.		
TA ^o	40 deg.			40 deg.		
KK	305			265		
ST	536	Angle	0 deg.	548	Angle	3 deg.
SK	594	Angle	91 deg.	611	Angle	91 deg.
SH	242	Angle	125 deg.	242	Angle	121 deg.
SHY	236			216		
HS	321			326		
HD	193			175		
AD	105			101		

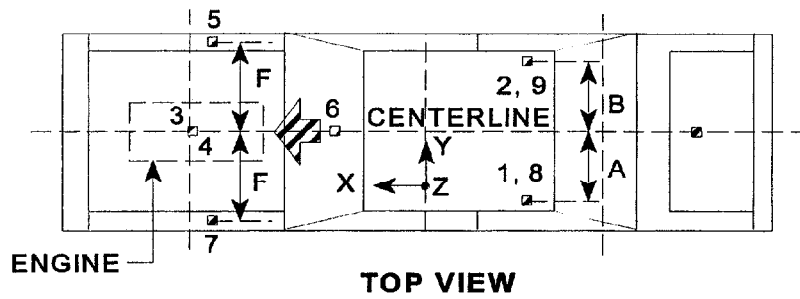
Dimensions in millimeters

DATA SHEET NO. 6 SEAT BELT POSITIONING DATA

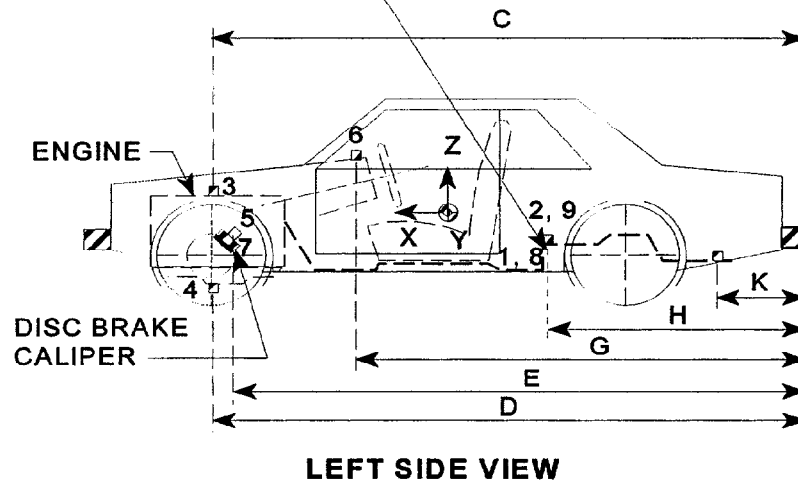


	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	331	329
PBL-- Top surface of alum. plate to belt lower edge	250	248
<u>LAP BELT TENSION</u>	10 Newtons	10 Newtons
<u>SHOULDER BELT TENSION</u>	Retractor	Retractor

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	410
B Right Rear Seat Crossmember Y	-330
C Top of Engine X	3518
D Bottom of Engine X	3641
E Disc Brake Calipers X	3502
F Disc Brake Calipers Y	±578
G Instrument Panel X	2715
H Rear Seat Crossmembers X	1777

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Rear Seat X-Member @ Left Side	2.3	121.2	-39.1	33.7
2	Rear Seat X-Member @ Right Side	2.8	122.0	-37.2	34.2
3	Top of Engine Block	†	†	†	†
4	Bottom of Engine	74.6	34.1	-155.0	26.5
5	Disc Brake Caliper @ Right Side	51.8	59.2	-160.5	40.9
6	Instrument Panel	43.2	55.5	-57.1	60.3
7	Disc Brake Caliper @Left Side	37.2	60.8	-165.7	39.7
8	Rear Seat X-Member @ Left-Redundant	2.6	121.5	-37.6	33.7
9	Rear Seat X-Member @ Right-Redundant	2.8	122.3	-36.8	34.3

† Data is not accurate after 100 ms.

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

NHTSA Test No.: MW5205 Vehicle: 1998 Nissan Sentra 4-Door Sedan

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec.	Neg.	msec.
Pos. 1 Head X	g's	21.2	198	-73	77
Pos. 1 Head Y	g's	7.8	82.5	-0.9	97.5
Pos. 1 Head Z	g's	29.2	72	-1	23.6
Pos. 1 Head Resultant	g's	77.3	77	0.1	-31.4
Pos. 2 Head X	g's	18.4	222	-63.6	76.5
Pos. 2 Head Y	g's	8.9	67.3	-3.9	92.8
Pos. 2 Head Z	g's	39	68.2	-2.5	116.1
Pos. 2 Head Resultant	g's	71.5	73.8	0	-25.9
Pos. 1 Chest X	g's	5.5	220.5	-49.4	63.2
Pos. 1 Chest Y	g's	4.2	84.4	-9.3	53
Pos. 1 Chest Z	g's	6	42.6	-4.3	103.7
Pos. 1 Chest Resultant	g's	49.5	63.2	0	-31.3
Pos. 1 Chest Displacement	mm	0.3	-0.7	-40.5	72.7
Pos. 2 Chest X	g's	3.2	239.1	-51.5	60.3
Pos. 2 Chest Y	g's	9.1	66	-2.3	71.6
Pos. 2 Chest Z	g's	10	42.7	-9	100.8
Pos. 2 Chest Resultant	g's	51.9	60.3	0	-38.7
Pos. 2 Chest Displacement	mm	0	-17.9	-44.2	73.4
Pos. 1 Left Femur	N	542.6	40.1	-2309.9	51.1
Pos. 1 Right Femur	N	793.1	41.5	-2413.8	50.8
Pos. 2 Left Femur	N	920.6	42.4	-2690.6	44.7
Pos. 2 Right Femur	N	920.5	42.6	-2687	45.2
Pos. 1 Left Belt Load	N	8554.6	56.2	-5.7	-40
Pos. 1 Torso Belt Load	N	8317.7	65.2	-4.7	-34.3
Pos. 2 Right Belt Load	N	7071.5	58.8	-0.9	-0.2
Pos. 2 Torso Belt Load	N	8246.9	62.8	-3.6	-35.3

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

NHTSA Test No.: MW5205 Vehicle: 1998 Nissan Sentra 4-Door Sedan

HEAD INJURY CRITERIA (HIC)				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	897.87	60.90	89.10	63.27
Position #2 - Passenger	797.09	56.90	91.60	55.52

** 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	48.79	61.36	64.36	491.64
Position #2 - Passenger	49.47	58.35	61.35	511.58

* 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 Nissan Sentra 4-Door Sedan
 NHTSA Test No.: MW5205 Test Date: February 4, 1998

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec	Neg.	msec
Pos. 1 Upper Neck Fx	N	305.8	74.2	-651.1	349.6
Pos. 1 Upper Neck Fy	N	493.3	338.7	-363.7	82.5
Pos. 1 Upper Neck Fz	N	2399.3	70.7	-344.6	21.6
Pos. 1 Neck Force Result	N	2414.7	70.3	6.1	25.0
Pos. 1 Upper Neck Mx	N-m	12.9	218.5	-18.9	69.8
Pos. 1 Upper Neck My	N-m	40.0	88.7	-26.1	50.1
Pos. 1 Upper Neck Mz	N-m	11.7	218.5	-26.6	81.3
Pos. 1 Neck Moment Result	N-m	47.5	88.8	0.0	-35.7
Pos. 2 Upper Neck Fx	N	338.0	218.5	-817.1	86.0
Pos. 2 Upper Neck Fy	N	715.1	285.6	-490.1	95.7
Pos. 2 Upper Neck Fz	N	2097.8	71.7	-315.8	112.8
Pos. 2 Neck Force Result	N	2178.5	71.7	5.2	-7.1
Pos. 2 Upper Neck Mx	N-m	20.3	74.9	-11.7	123.7
Pos. 2 Upper Neck My	N-m	24.3	123.7	-21.6	247.7
Pos. 2 Upper Neck Mz	N-m	10.5	305.1	-2.3	352.1
Pos. 2 Neck Moment Result	N-m	27.8	123.7	0.1	-32.1
Pos. 1 Pelvic (X)	g's	4.2	134.3	-57.5	51.5
Pos. 1 Pelvic (Y)	g's	11.8	83.6	-13.9	43.1
Pos. 1 Pelvic (Z)	g's	6.4	216.1	-25.4	61.9
Pos. 1 Pelvic (R)	g's	60.9	51.4	0.1	-25.3
Pos. 2 Pelvic (X)	g's	5.8	128.3	-61.6	45.4
Pos. 2 Pelvic (Y)	g's	6.3	52.2	-8.4	61.5
Pos. 2 Pelvic (Z)	g's	4.3	234.1	-17.0	63.9
Pos. 2 Pelvic (R)	g's	61.6	45.4	0.0	-11.3

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

Vehicle Year/Make/Model/Body Style: 1998 Nissan Sentra 4-Door Sedan
 NHTSA Test No.: MW5205 Test Date: February 4, 1998

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec	Neg.	msec
P1 Lt Upper Tibia Mx	N-m	32.6	69.2	-53.5	44.3
P1 Lt Upper Tibia My	N-m	82.7	51.5	-46.5	37.9
P1 Lt Lower Tibia Fx	N	250.0	147.8	-622.5	47.1
P1 Lt Lower Tibia Fz	N	500.0	155.1	-2368.8	47.7
P1 Lt Lower Tibia My	N-m	60.4	52.1	-8.2	236.6
P1 Rt Upper Tibia Mx	N-m	75.2	51.1	-43.1	41.2
P1 Rt Upper Tibia My	N-m	205.9	41.3	-25.6	51.2
P1 Rt Lower Tibia Fx	N	248.5	168.4	-1995.6	41.6
P1 Rt Lower Tibia Fz	N	244.5	143.0	-1723.8	44.7
P1 Rt Lower Tibia My	N-m	252.6	59.9	-113.0	41.5
Pos. 2 Lt Upper Tibia Mx	N-m	34.4	40.7	-34.1	47.4
Pos. 2 Lt Upper Tibia My	N-m	71.8	54.7	-135.6	36.2
Pos. 2 Lt Lower Tibia Fx	N	1677.1	300.9	-1119.5	35.5
Pos. 2 Lt Lower Tibia Fz	N	2636.1	292.6	-5103.2	36.1
Pos. 2 Lt Lower Tibia My	N-m	112.9	70.2	-26.5	39.4
Pos. 2 Rt Upper Tibia Mx	N-m	†	†	†	†
Pos. 2 Rt Upper Tibia My	N-m	†	†	†	†
Pos. 2 Rt Lower Tibia Fx	N	1725.3	336.4	-2230.7	169.8
Pos. 2 Rt Lower Tibia Fz	N	1012.2	284.8	-4464.5	36.7
Pos. 2 Rt Lower Tibia My	N-m	68.0	63.0	-44.0	48.4

† Data is not accurate after 70 ms.

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

Vehicle Year/Make/Model/Body Style: 1998 Nissan Sentra 4-Door Sedan

NHTSA Test No.: MW5205 Test Date: February 4, 1998

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec	Neg.	msec
Pos. 1 Left Ankle X	g's	43.7	59.4	-92.6	48.3
Pos. 1 Left Ankle Z	g's	14.4	235.0	-44.2	48.0
Pos. 1 Left Toe Z	g's	32.4	40.8	-88.6	48.0
Pos. 1 Right Ankle X	g's	68.2	60.5	-163.9	41.3
Pos. 1 Right Ankle Z	g's	44.0	59.8	-204.3	39.5
Pos. 1 Right Toe Z	g's	142.4	60.1	-446.1	39.5
Pos. 2 Left Ankle X	g's	158.1	224.3	-117.7	35.8
Pos. 2 Left Ankle Z	g's	†	†	†	†
Pos. 2 Left Toe Z	g's	228.4	168.3	-186.5	357.7
Pos. 2 Right Ankle X	g's	22.0	72.9	-86.6	37.0
Pos. 2 Right Ankle Z	g's	62.2	58.2	-86.6	36.8
Pos. 2 Right Toe Z	g's	123.0	59.0	-104.8	37.4

† Data is not accurate after 80 ms.

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

NHTSA Test No.: MW5205 Vehicle: 1998 Nissan Sentra 4-Door Sedan

DESCRIPTION	UNIT	MAXIMUM VALUE			
		Pos.	msec	Neg.	msec
Pos. 1 Head X(R)	g's	20.8	198.3	-79.4	77.1
Pos. 1 Head Y(R)	g's	8.0	82.6	-6.1	99.7
Pos. 1 Head Z(R)	g's	30.8	61.7	-4.0	114.8
Pos. 1 Head Resultant(RR)	g's	81.6	77.1	0.0	-30.2
Pos. 2 Head X(R)	g's	21.7	222.4	-67.0	75.2
Pos. 2 Head Y(R)	g's	†	†	†	†
Pos. 2 Head Z(R)	g's	38.9	62.9	-8.0	120.4
Pos. 2 Head Resultant(RR)	g's	†	†	†	†
Pos. 1 Chest X(R)	g's	6.2	219.5	-48.6	56.6
Pos. 1 Chest Y(R)	g's	5.8	90.5	-7.9	53.2
Pos. 1 Chest Z(R)	g's	5.9	42.7	-3.6	97.5
Pos. 1 Chest Resultant(RR)	g's	49.1	56.5	0.0	-27.3
Pos. 2 Chest X(R)	g's	5.0	250.3	-49.6	60.0
Pos. 2 Chest Y(R)	g's	8.5	66.0	-2.1	109.8
Pos. 2 Chest Z(R)	g's	21.5	54.4	-14.1	99.8
Pos. 2 Chest Resultant(RR)	g's	51.6	60.2	0.0	-33.1

† Data channel did not record.

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

NHTSA Test No.: MW5205 Vehicle: 1998 Nissan Sentra 4-Door Sedan

HEAD INJURY CRITERIA (HIC) REDUNDANT				
	HIC**	t_1 (msec)	t_2 (msec)	Average Acceleration t_1 to t_2
Position #1 - Driver	1000.79	59.60	89.00	64.98
Position #2 - Passenger	†	†	†	†

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

† Head Y(R) data channel did not record, therefore HIC was not calculated.

CLIP SUMMARY* REDUNDANT				
	CLIP (g's)	t_1 (msec)	t_2 (msec)	CSI
Position #1 - Driver	48.09	55.65	58.65	482.04
Position #2 - Passenger	50.47	57.38	60.96	575.89

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

DATA SHEET NO. 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

	<u>Driver</u>	<u>Passenger</u>
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	<u>1940</u>	<u>1938</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>850</u>	<u>848</u>
Lap belt length as measured on Part 572 Dummy.	<u>910</u>	<u>910</u>

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis.	<u>43</u>	<u>44</u>
As determined mechanically.	<u>46</u>	<u>52</u>
As determined electronically.	<u>47</u>	<u>46</u>

BELT STRETCH DATA:

Measured electronically between shoulder belt load cell and the "D" ring.	<u>†</u>	<u>40 mm/M</u>
Measured mechanically.	<u>25 mm/M</u>	<u>30 mm/M</u>

Dimensions in millimeters

† Data channel did not record.

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 18 mm molding.

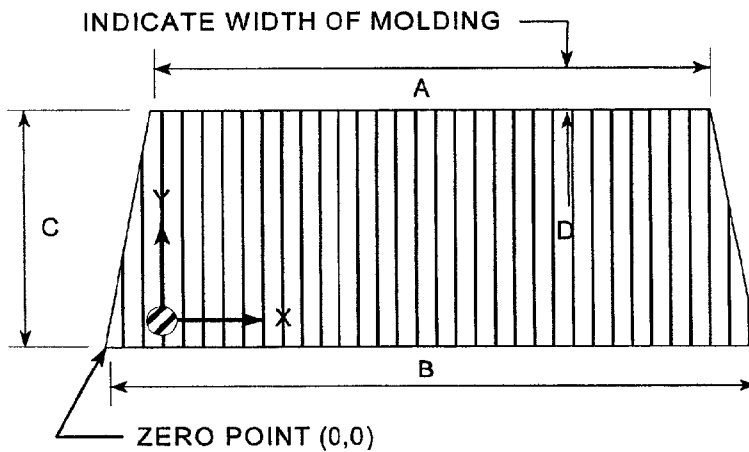
FMVSS 212 REQUIREMENTS:

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

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST(mm)	
RIGHT SIDE	2675	2675	100
LEFT SIDE	2675	2675	100
TOTAL	5,350	5,350	100

AREA OF RETENTION FAILURE:



DIMENSIONS (mm)	
A	1078
B	1405
C	748
D	18

FRONT VIEW OF WINDSHIELD

FAILURE DETAILS: None

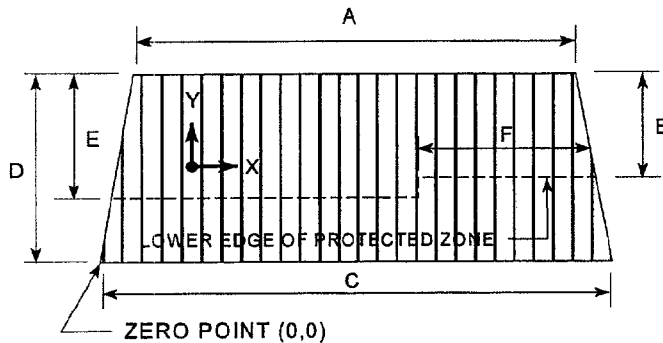
DATA SHEET NO. 11 FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA

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)



FRONT VIEW OF WINDSHIELD

DIMENSIONS	
A	1078
B	470
C	1405
D	748
E	480
F	600

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.	-	-

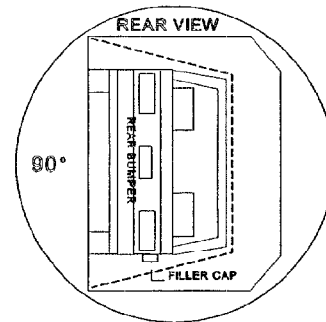
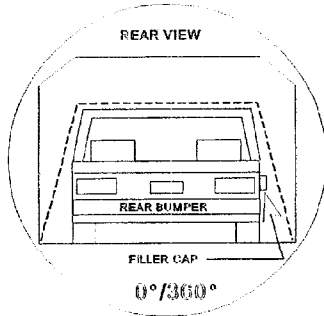
DATA SHEET NO. 13 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

0-90 deg.

NHTSA Test No.:

MW5205



INDETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

1 minutes 15 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

6 minutes 15 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 g	0 g	0 g	N/A
-----	-----	-----	-----

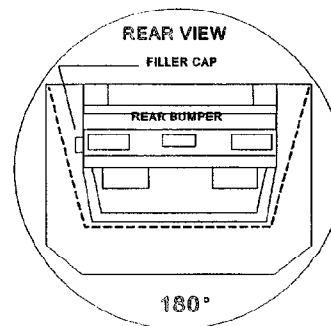
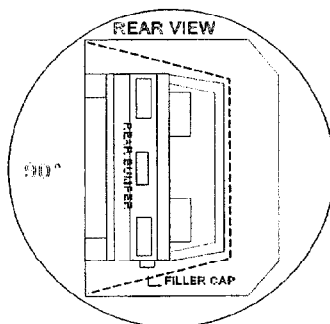
Note: Record spillage for whole minute intervals only as determined above.

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.:
MW5205



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

1 minutes 06 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

6 minutes 6 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 g	0 g	0 g	N/A
-----	-----	-----	-----

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

IV. SOLVENT SPILLAGE LOCATION(S): None

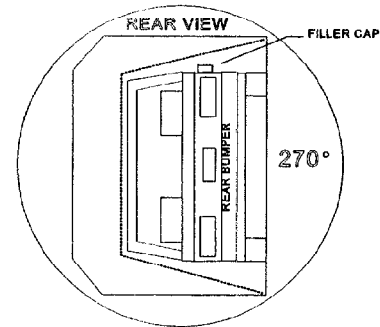
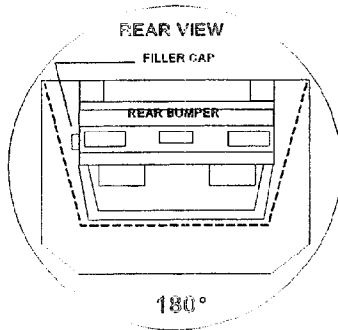
TEST SHEET NO. 13 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

180-270 deg.

NHTSA Test No.:

MW5205



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

1 minutes 06 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

6 minutes 6 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 g	0 g	0 g	N/A
-----	-----	-----	-----

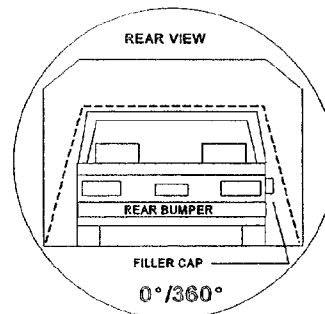
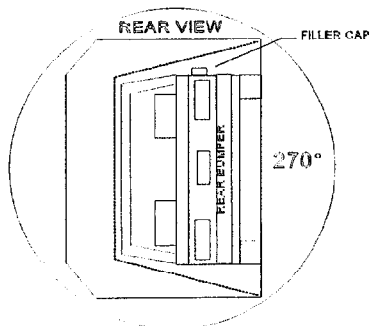
Note: Record spillage for whole minute intervals only as determined above.

IV. **SOLVENT SPILLAGE LOCATION(S):** None

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

TEST PHASE:
270-360 deg.

NHTSA Test No.:
MW5205



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
-------	------	------	------

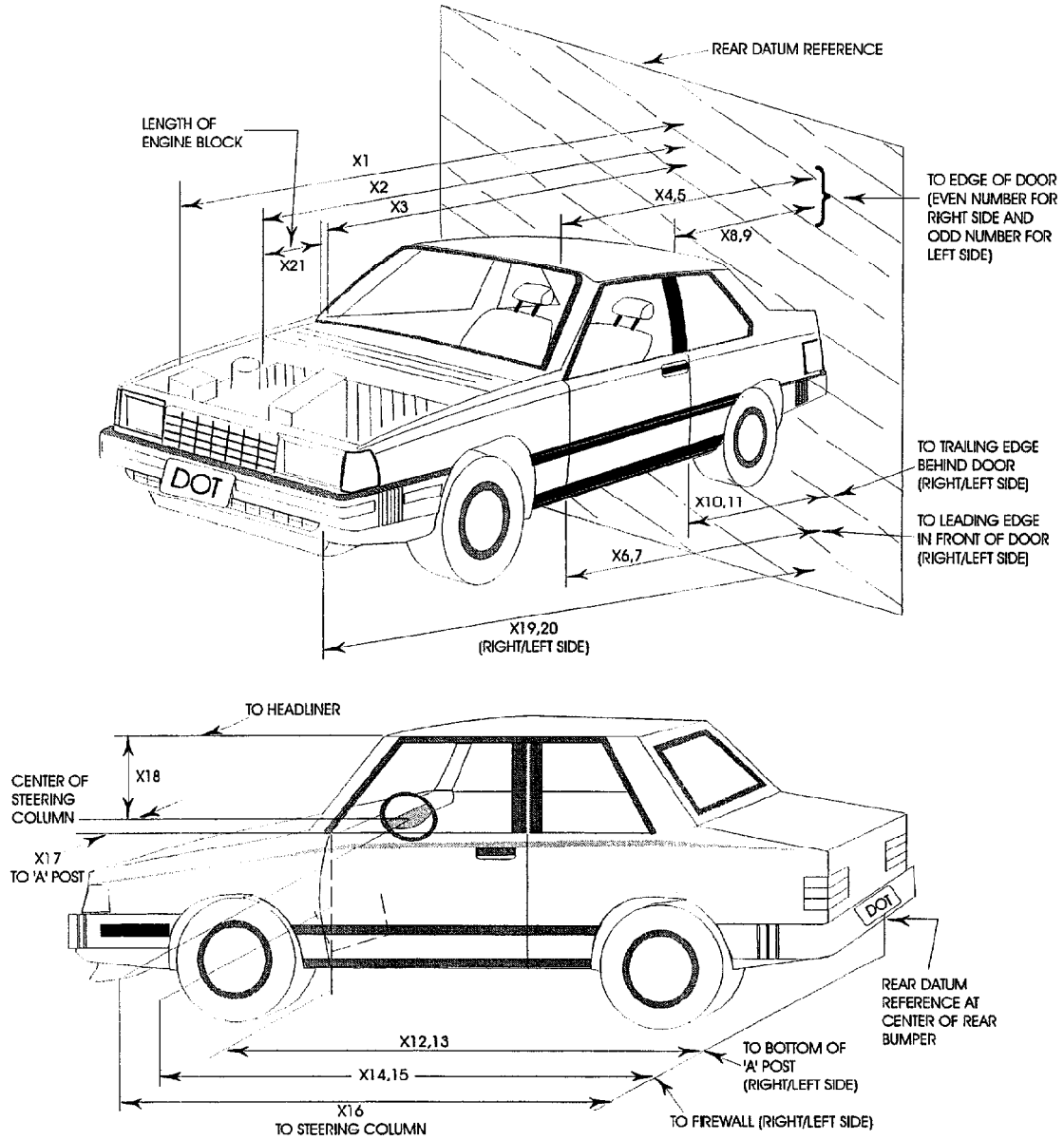
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

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

IV. SOLVENT SPILLAGE LOCATION(S): None

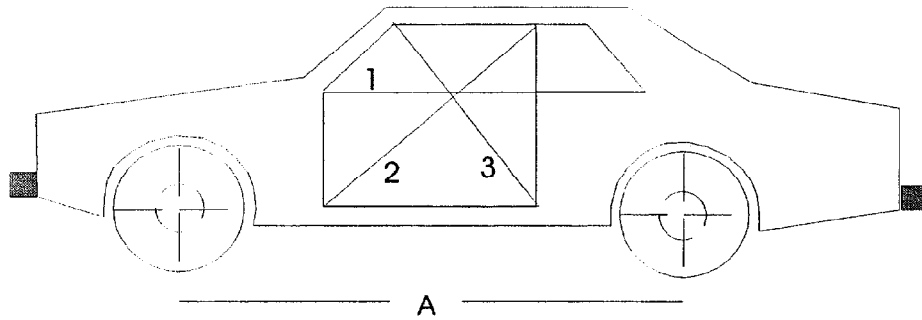
TEST VEHICLE MEASUREMENTS



DATA SHEET NO.14 VEHICLE MEASUREMENTS

No.		All Dimensions in mm			Differences
		Pre-Test	Post-Test		
X1	Total Length of Vehicle at Centerline	4320	3760		560
X2	Rear Surface of Vehicle to Front of Engine	3542	3289		253
X3	Rear Surface of Vehicle to Firewall	3283	3130		153
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3030	3023		7
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3020	3007		13
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3004	2996		8
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	2989	2970		19
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	1943	1937		6
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	1932	1919		13
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	1923	1922		1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	1911	1898		13
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3018	3018		0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3004	2990		14
X14	Rear Surface of Vehicle to Firewall, Right Side	3287	3125		162
X15	Rear Surface of Vehicle to Firewall, Left Side	3254	3140		114
X16	Rear Surface of Vehicle to Steering Column	2525	2520		5
X17	Center of Steering Column to "A" Post	415	480		-65
X18	Center of Steering Column to Headliner	430	410		20
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4265	3745		520
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4255	3770		485
X21	Length of Engine Block	500	500		0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2755	2755		0
CD	Rear Surface of Vehicle to Center of Dash Panel	2800	2770		30
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2760	2760		0

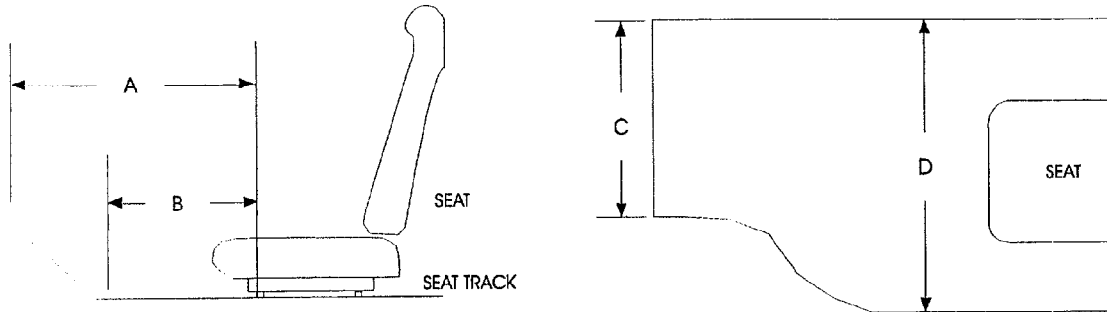
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
VEHICLE INTRUSION MEASUREMENTS
DOOR OPENING WIDTH



UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1000	1345	995	1000	1350	1000
AFTER TEST	990	1370	1010	995	1370	1010
DIFFERENCE	10	-25	-15	5	-20	-10

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2535	2533
AFTER TEST	2445	2445
DIFFERENCE	90	88

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



DRIVER

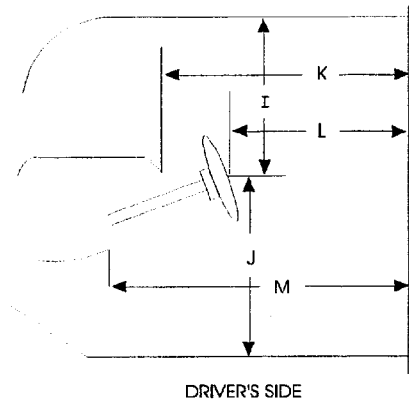
Measurement	Pre-Test	Post-Test	Difference
A	680	585	95
B	535	510	25
C	400	415	-15
D	505	480	25

PASSENGER

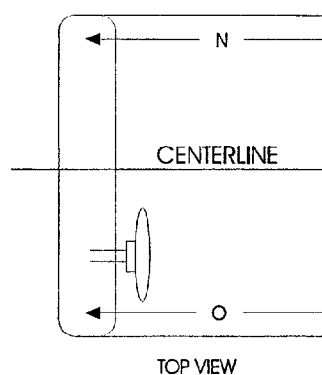
Measurement	Pre-Test	Post-Test	Difference
A	630	590	40
B	550	540	10
C	375	360	15
D	490	480	10

Units = mm

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

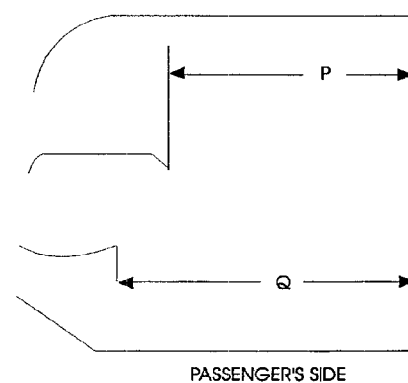


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE

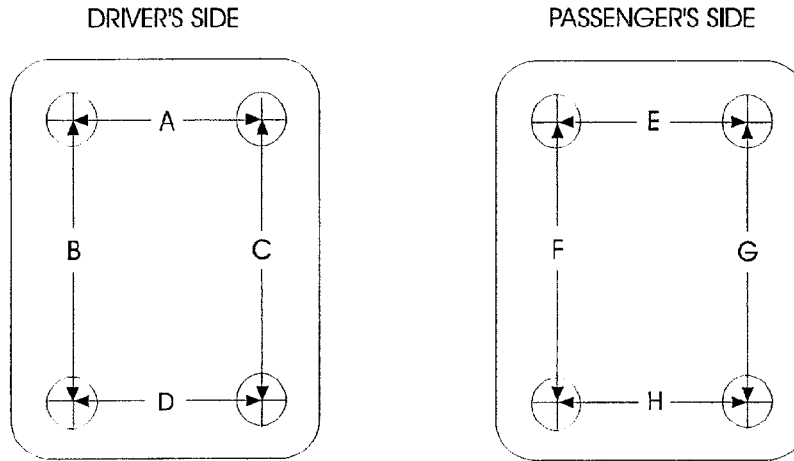


PASSENGER'S SIDE

Measurement	Pre-Test	Post-Test	Difference
I	425	395	30
J	640	670	-30
K	750	715	35
L	550	545	5
M	740	730	10
N	780	750	30
O	785	755	30
P = K (PASS.)	840	815	25
Q = M (PASS.)	745	720	25

Units = mm

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



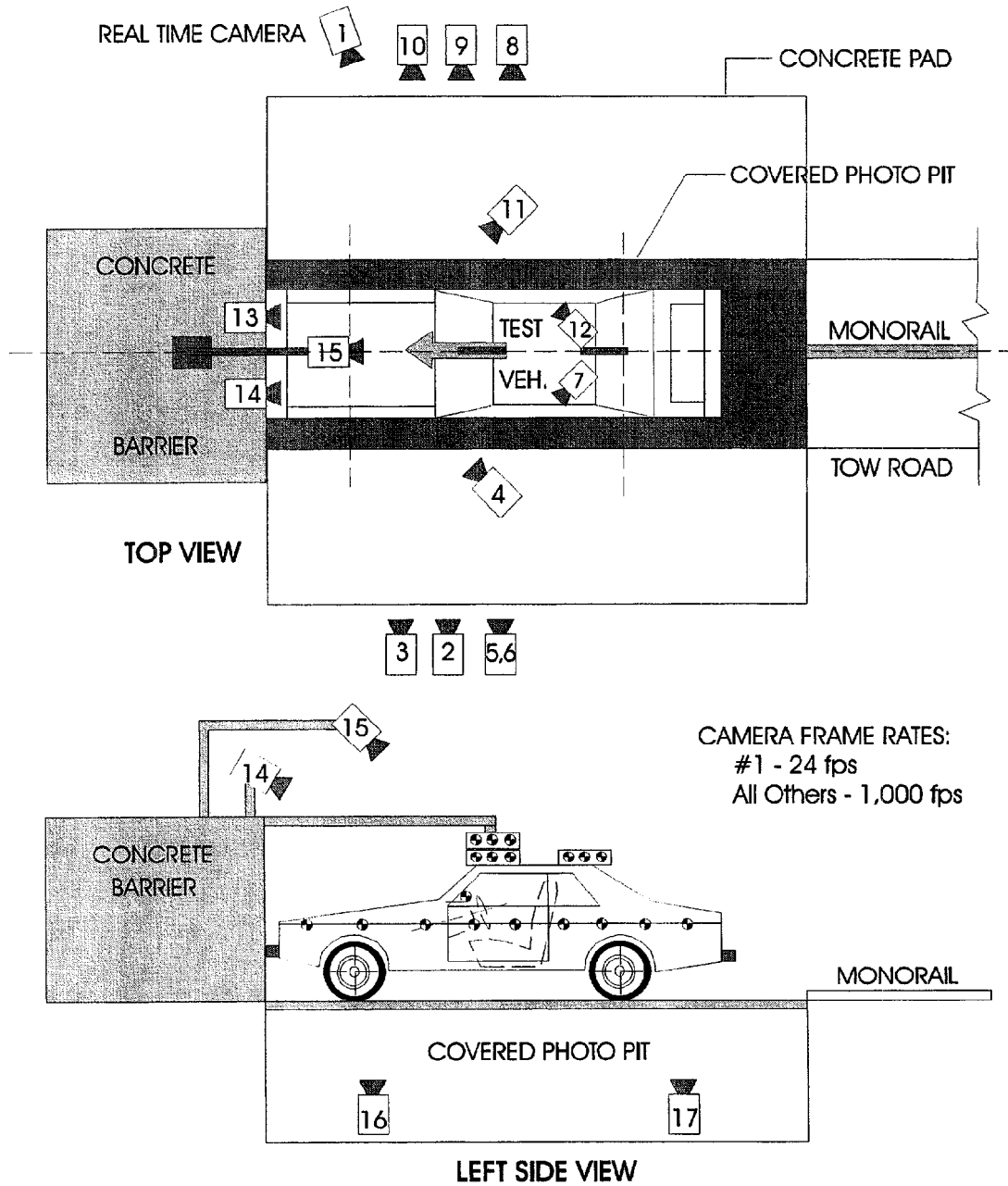
TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	300	280	20
B	400	404	-4
C	400	404	-4
D	300	300	0
E	300	295	5
F	400	402	-2
G	400	400	0
H	300	305	-5

Units = mm

CAMERA POSITIONS FOR FRONTAL IMPACTS

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



DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS

Vehicle: 1998 Nissan Sentra 4-Door Sedan

MW5205

NHTSA Test No.:

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	6293	1478	1128	-4	5884	12.5	1020
3	Left Side View	7401	958	1100	-3	6992	25	1020
4	Driver and Interior View	4834	2185	1976	-12	-	25	1020
5	Steering Column (Bottom)	6970	1708	1165	-5	6561	25	1020
6	Steering Column (Top)	6970	1708	1785	-19	6561	25	1020
7	Left Belt	-	-	-	-	-	13	990
8	Overall Right Side	6237	1942	1095	-2	5828	13	1030
9	Right Side View	7595	1402	1135	-4	7186	25	1010
10	Right Passenger View	7458	1829	1520	-5	7049	35	†
11	Passenger and Interior View	4777	2986	1976	-12	-	25	1025
12	Right Belt	-	-	-	-	-	13	1000
13	Passenger Front View	580	490	1975	-52	-	8	1025
14	Driver Front View	580	490	1975	-53	-	8	1010
15	Windshield View	0	-130	3558	-64	-	13	1010
16	Pit View of Engine	0	576	-3048	90	-	13	910
17	Pit View of Fuel Tank	0	2430	-3048	90	-	13	1010

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

Y = film plane to impact location

N.T. indicates No Timing

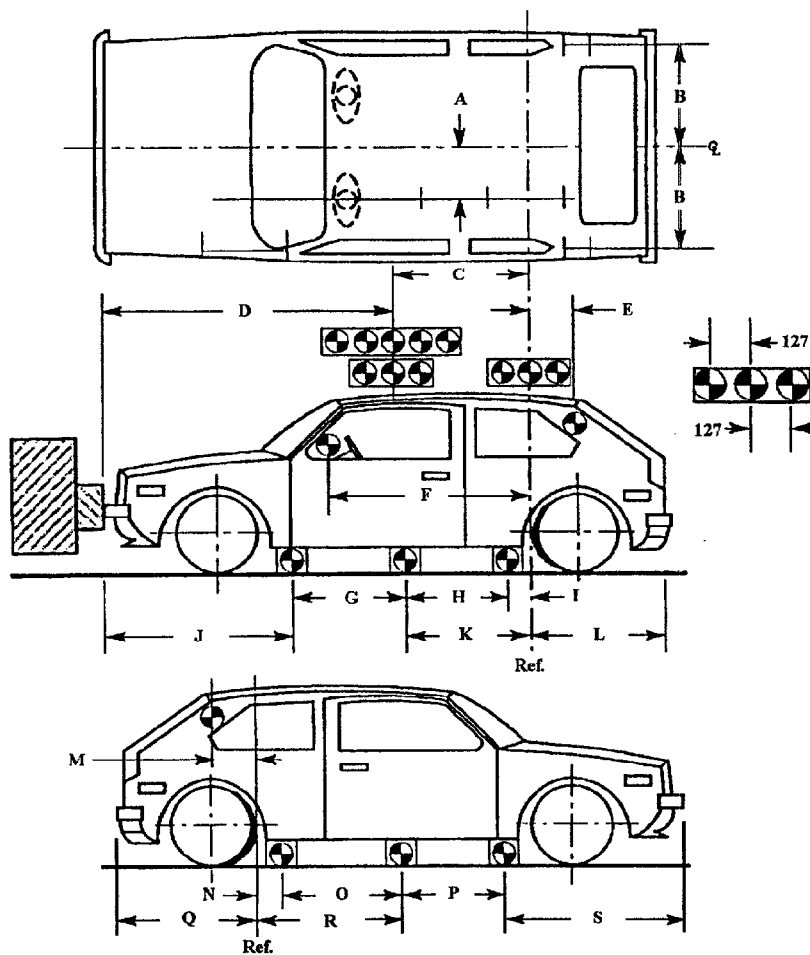
Z = film plane to ground

† Camera did not operate.

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

(Dimensions in millimeters)

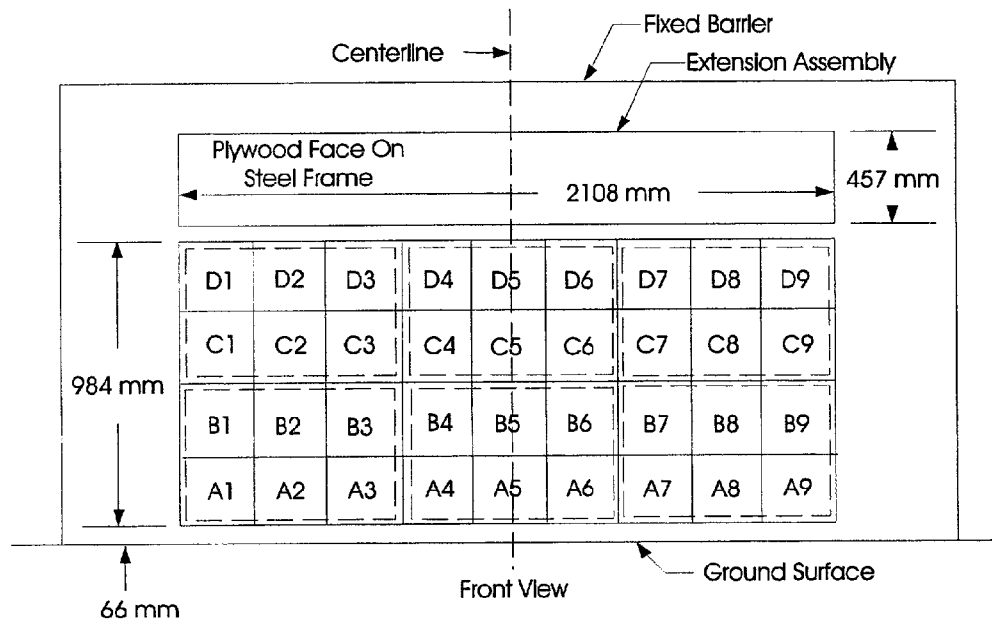
A	333
B	650
C	1219
D	1905
E	293
F	1492
G	850
H	868
I	109
J	1264
K	977
L	1229
M	293
N	109
O	853
P	863
Q	1231
R	962
S	1264



DATA SHEET NO. 17 LOAD CELL LOCATIONS ON FIXED BARRIER

Load Cell Barrier data was 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. : MW5205; Test Date: February 4, 1998; Technician: Lawrence Valvo

Vehicle Model Year/Make/Model: 1998 Nissan Sentra

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

B. Size of vent holes: (mm²) 962 -Driver 1964 -Passenger

C. Total vent area: (mm²) 1924 -Driver 3927 -Passenger

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

Driver: - -Length; - -Width; 595 -Diameter

Passenger: 490 -Height; 405 -Width; 538 -Depth

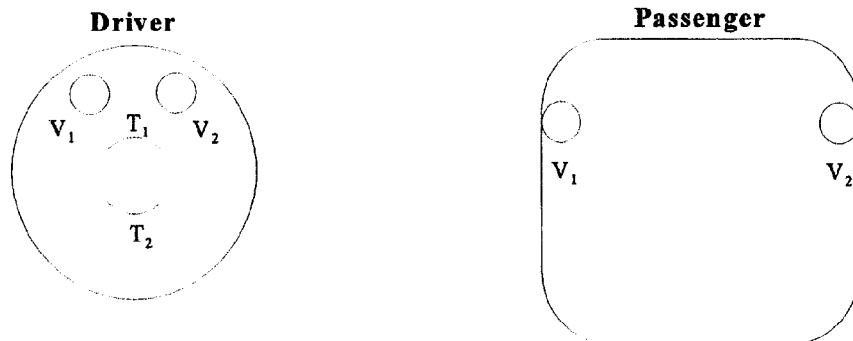
E. Is the air bag tethered?

Driver: X -Yes; - -No; If yes, record length of tether- 245

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

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

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



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

Driver: Air bag: NISSAN HF 98570-8B700; 0005885; 031097

Generator: PERG24801; G022; KP8B797X205835

Passenger: Air bag: NISSAN HF 98575-8B700; 5909 201097

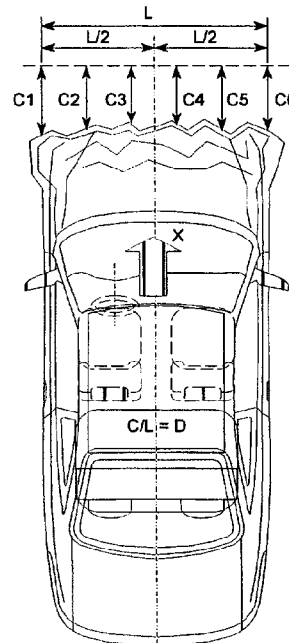
Generator: KM8B797X205033; P/N114156; 8AM-PT1-0388; NPAH9X3WDUG

DATA SHEET NO.19 ACCIDENT INVESTIGATION DIVISION DATA
FOR 56.3 KPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Nissan Sentra 4-Door Sedan
 NHTSA Test No.: MW5205 VIN: 1N4AB41D6WC721377
 Model Year: 1998 Build Date: 10/97 Test Date: February 4, 1998
 Vehicle Size Category: Compact Test Weight: 1287.5 kg
 Vehicle Wheelbase: 2532 mm; Front Overhang: 1264 mm; Overall Width: 1692 mm
 Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions:

	PRE	POST	DIFF	
C1 =	4170	3725	-445	mm
C2 =	4285	3785	-500	mm
C3 =	4315	3770	-545	mm
C4 =	4316	3765	-551	mm
C5 =	4290	3750	-540	mm
C6 =	4180	3695	-485	mm



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

Length of Damaged Region:

L1 = 1510 mm
 L2 = 755 mm
 L3 = 302 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

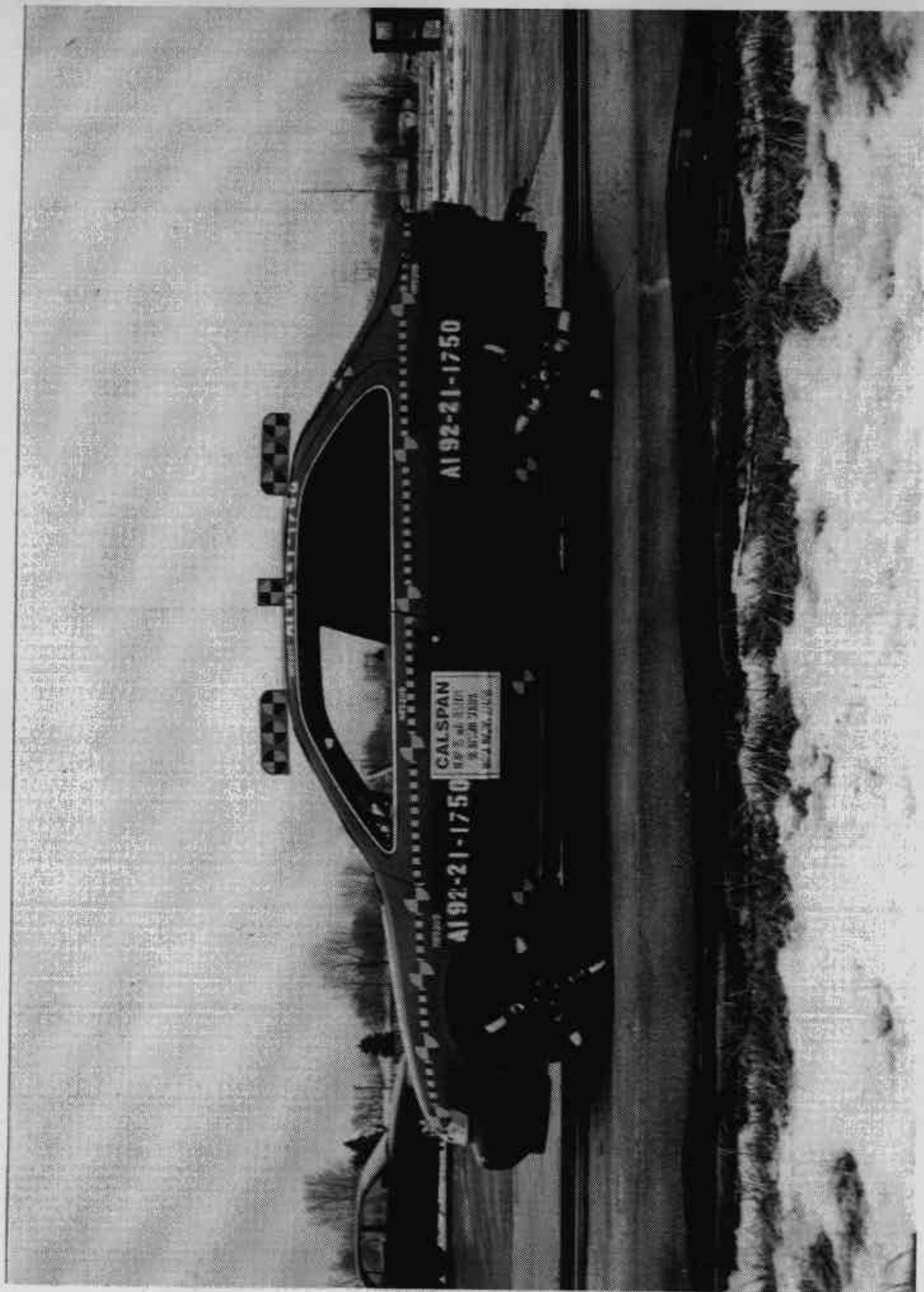


Figure A-4 PRE-TEST LEFT SIDE VIEW

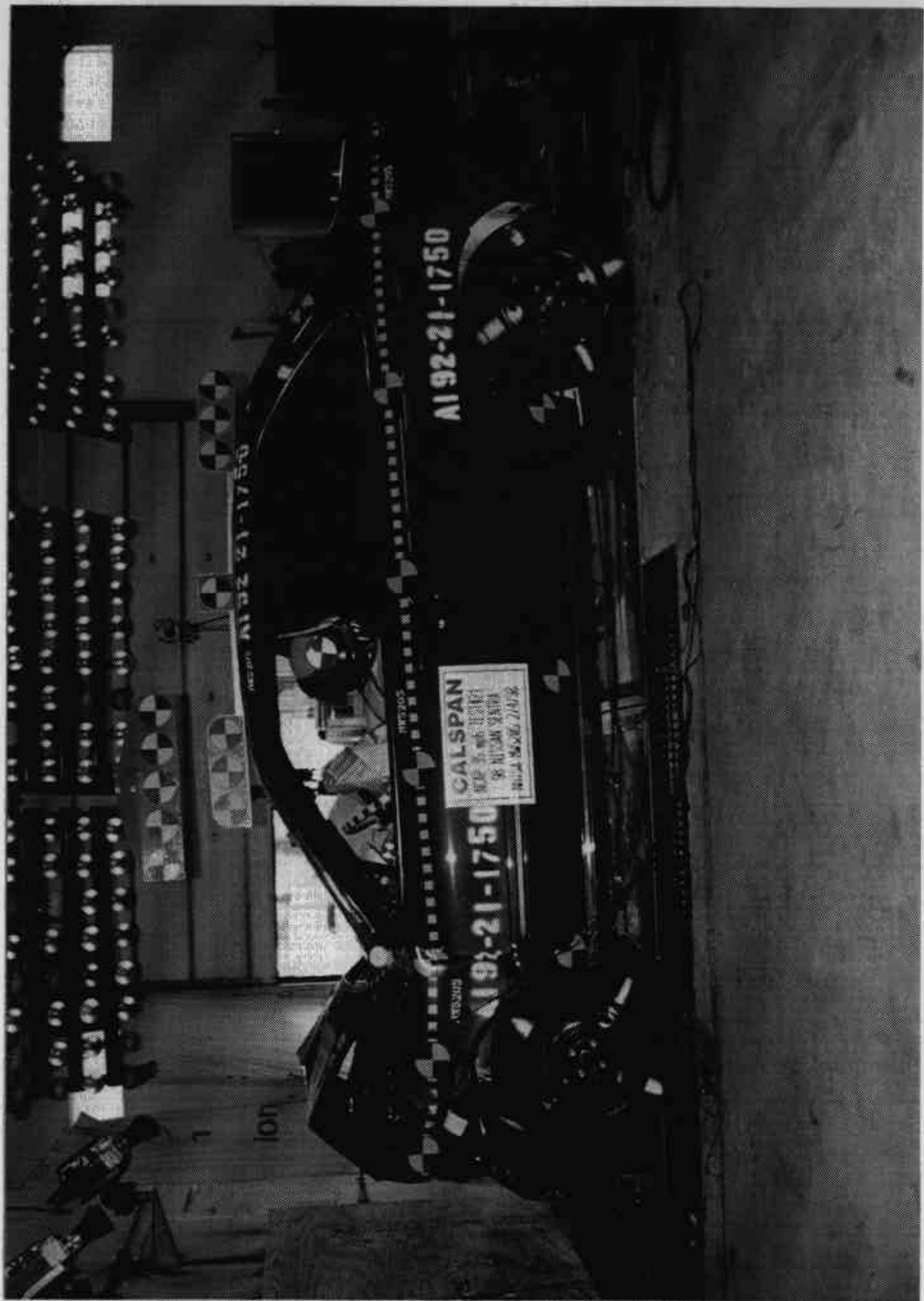


Figure A-5 POST-TEST LEFT SIDE VIEW

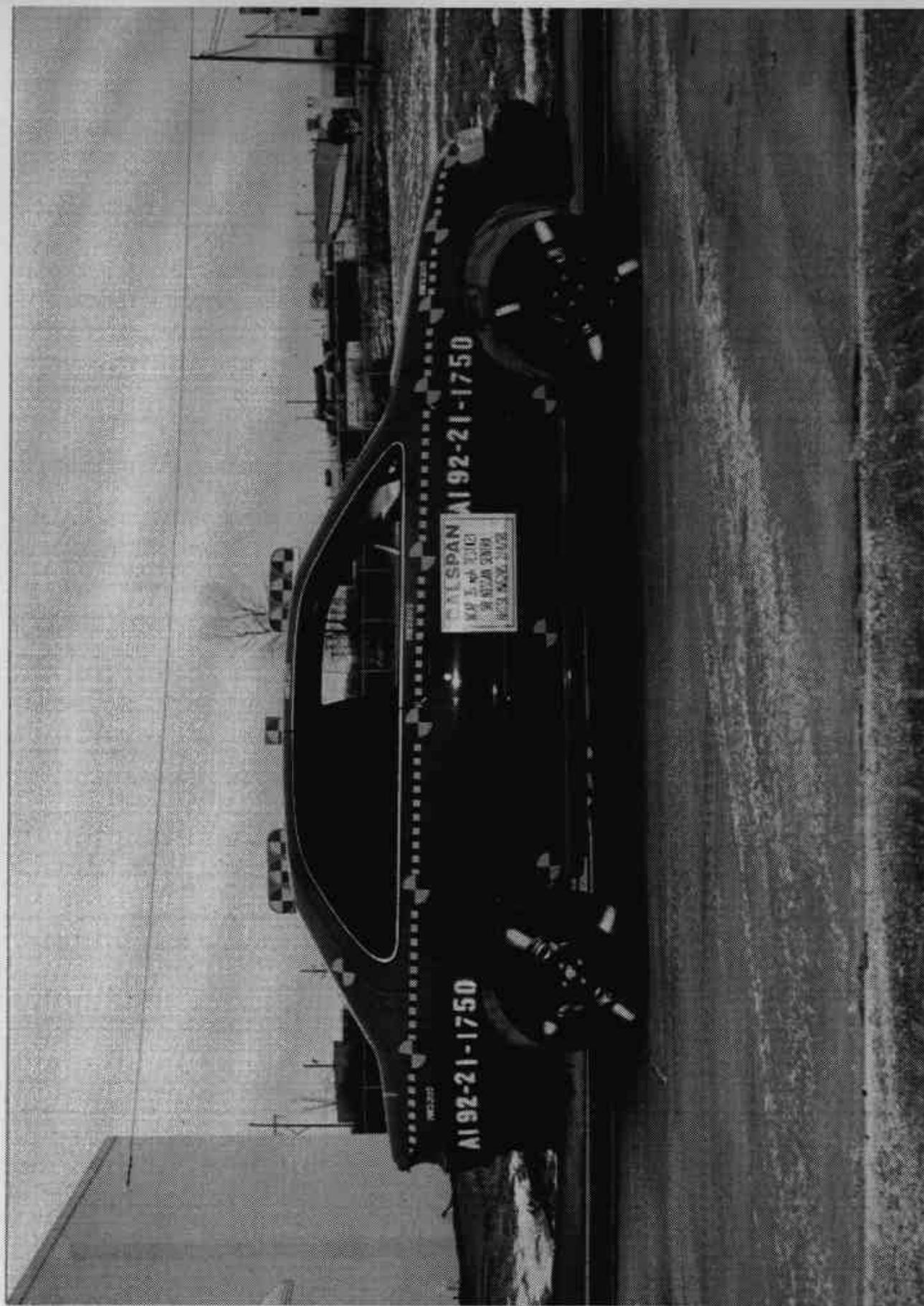


Figure A-6 PRE-TEST RIGHT SIDE VIEW

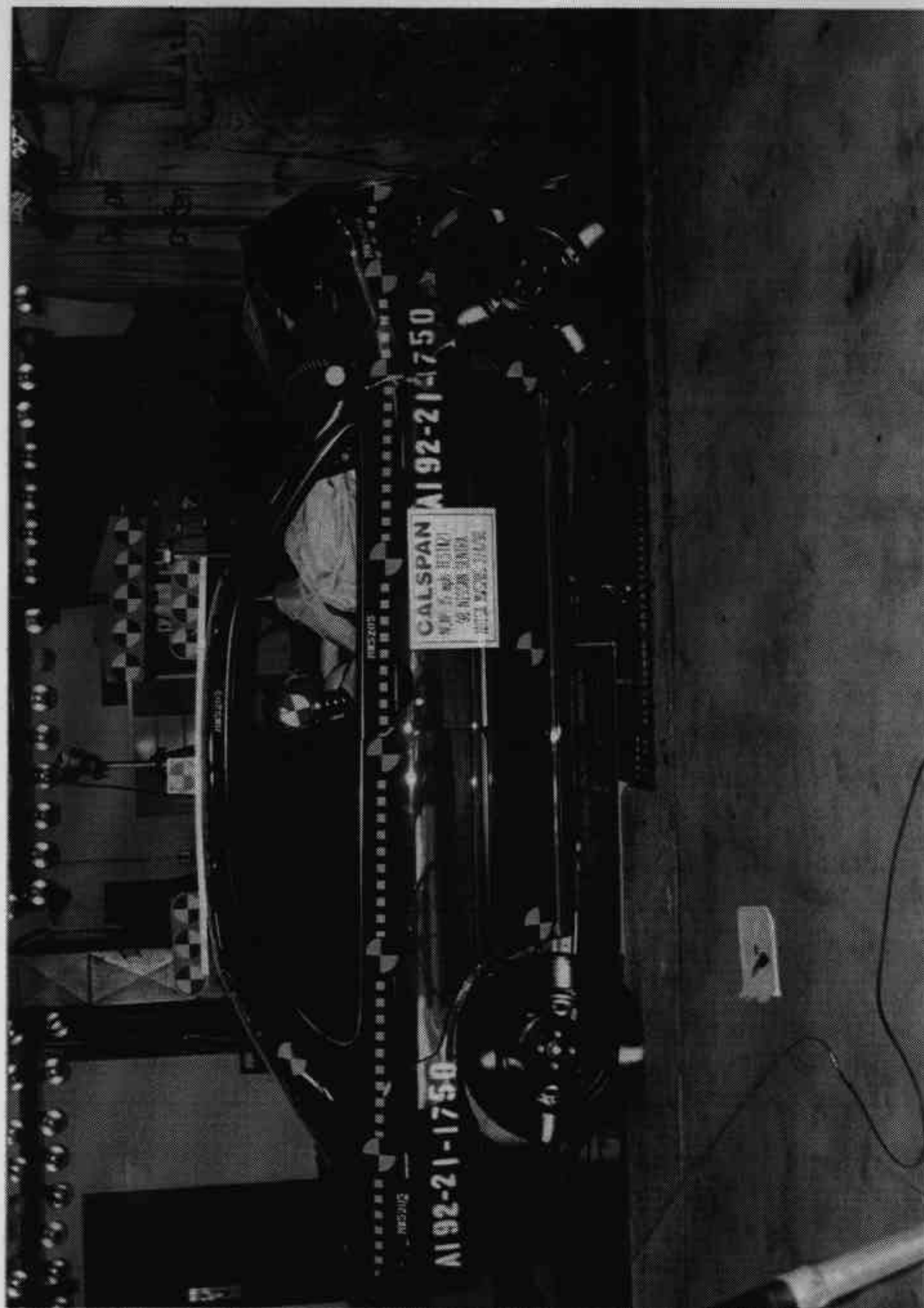


Figure A-7 POST-TEST RIGHT SIDE VIEW

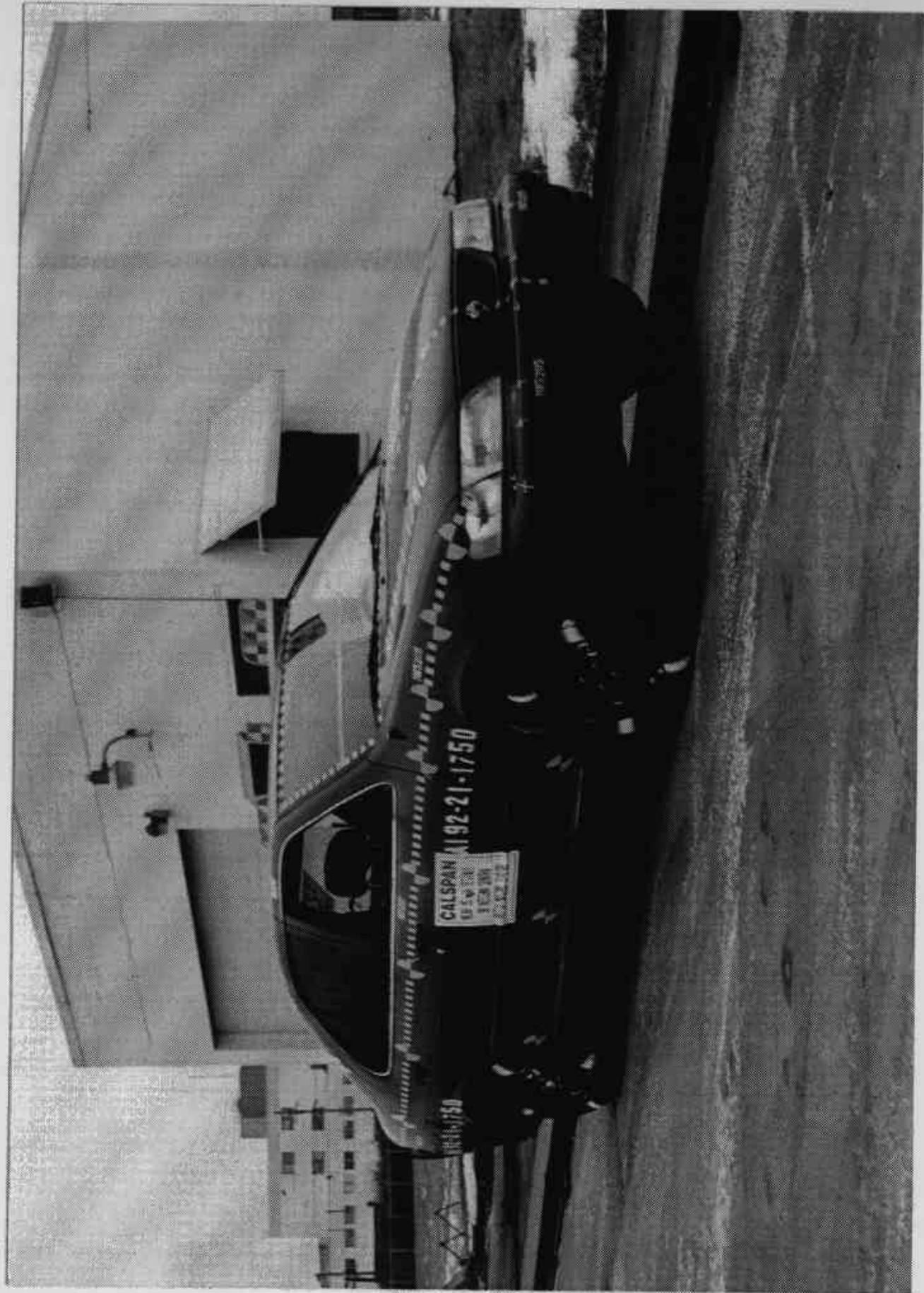


Figure A-8 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

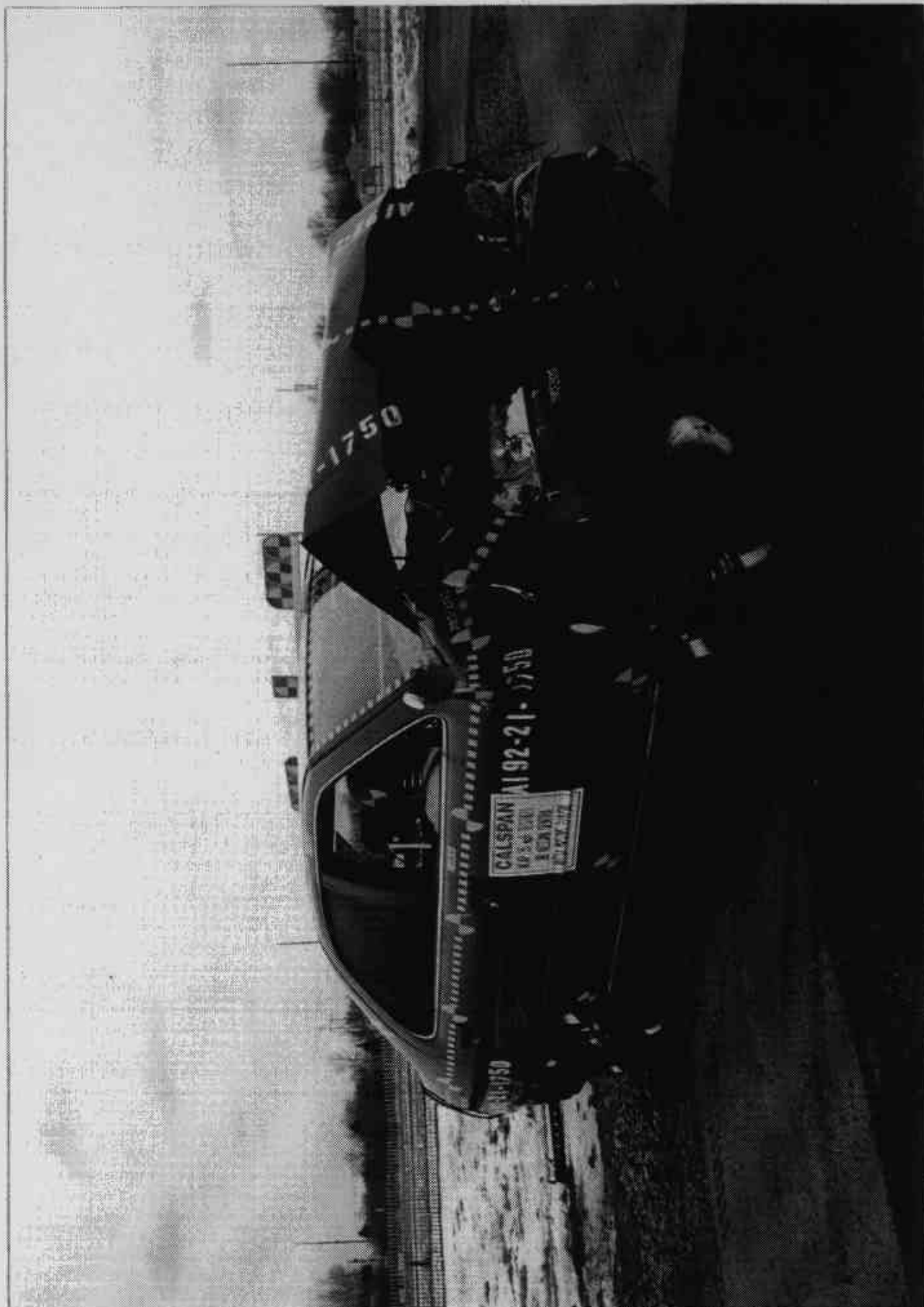


Figure A-9 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

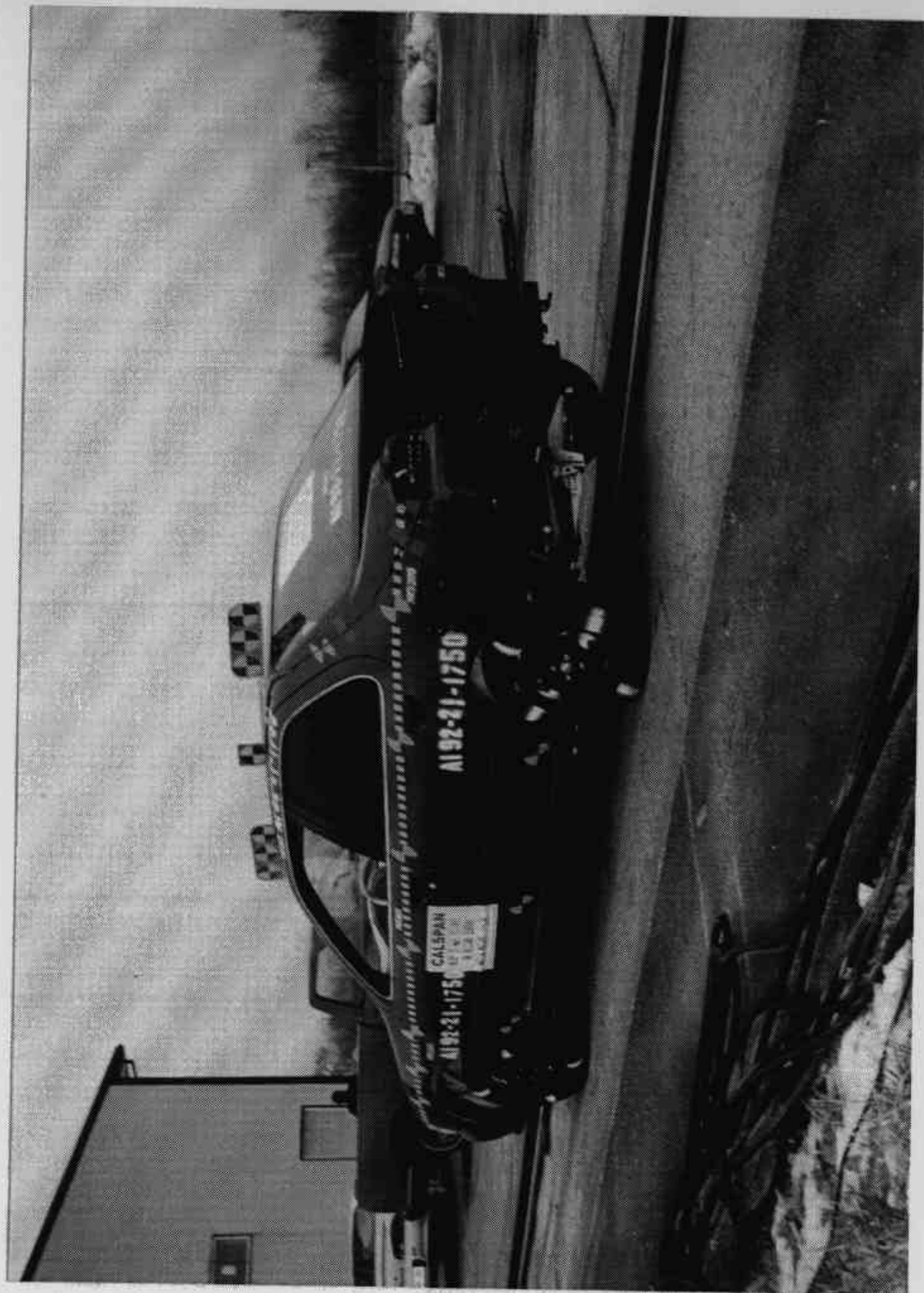


Figure A-10 PRE-TEST LEFT REAR THREE-QUARTER VIEW

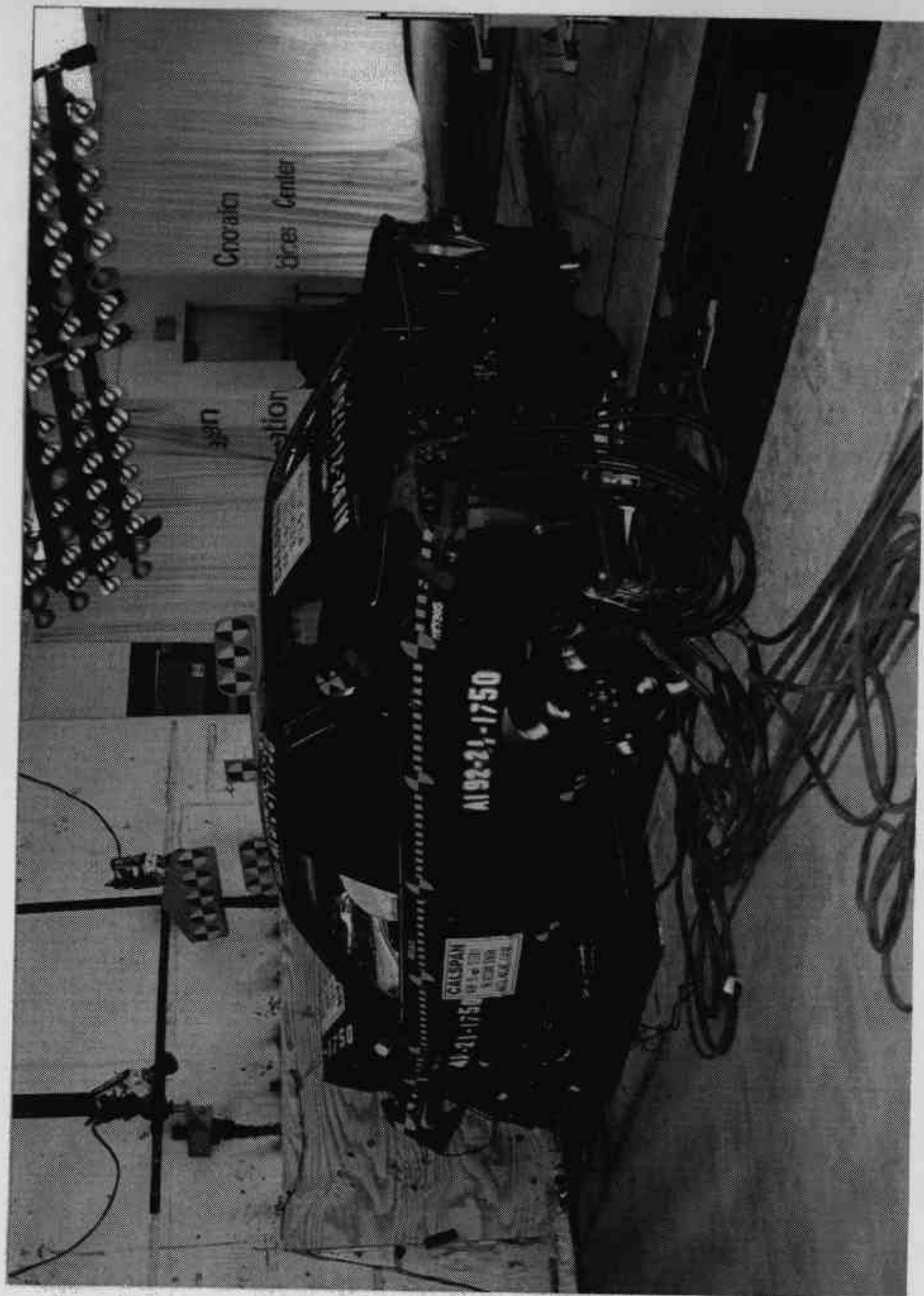


Figure A-11 POST-TEST LEFT REAR THREE-QUARTER VIEW

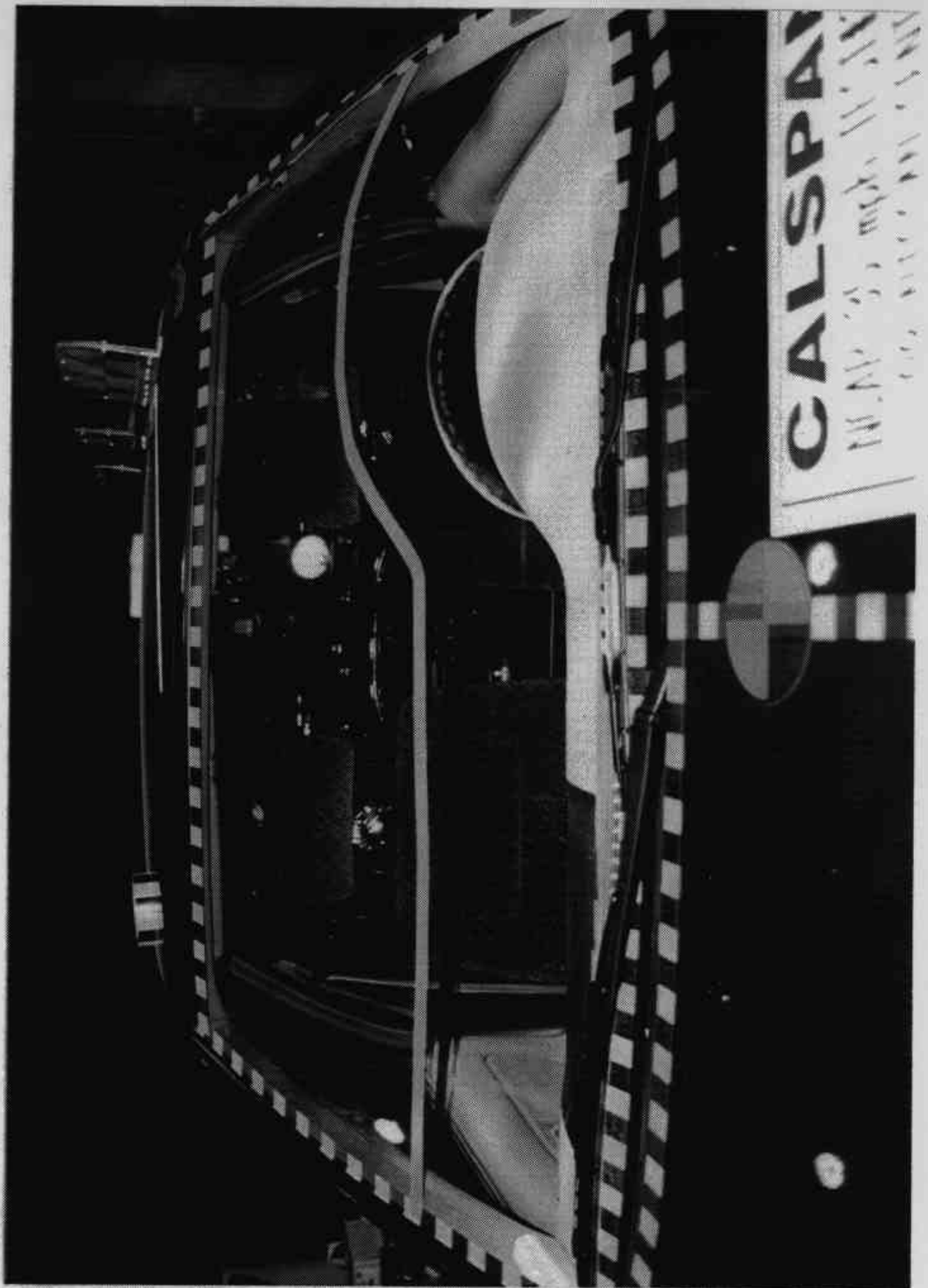


Figure A-12 PRE-TEST WINDSHIELD VIEW



Figure A-13 POST-TEST WINDSHIELD VIEW

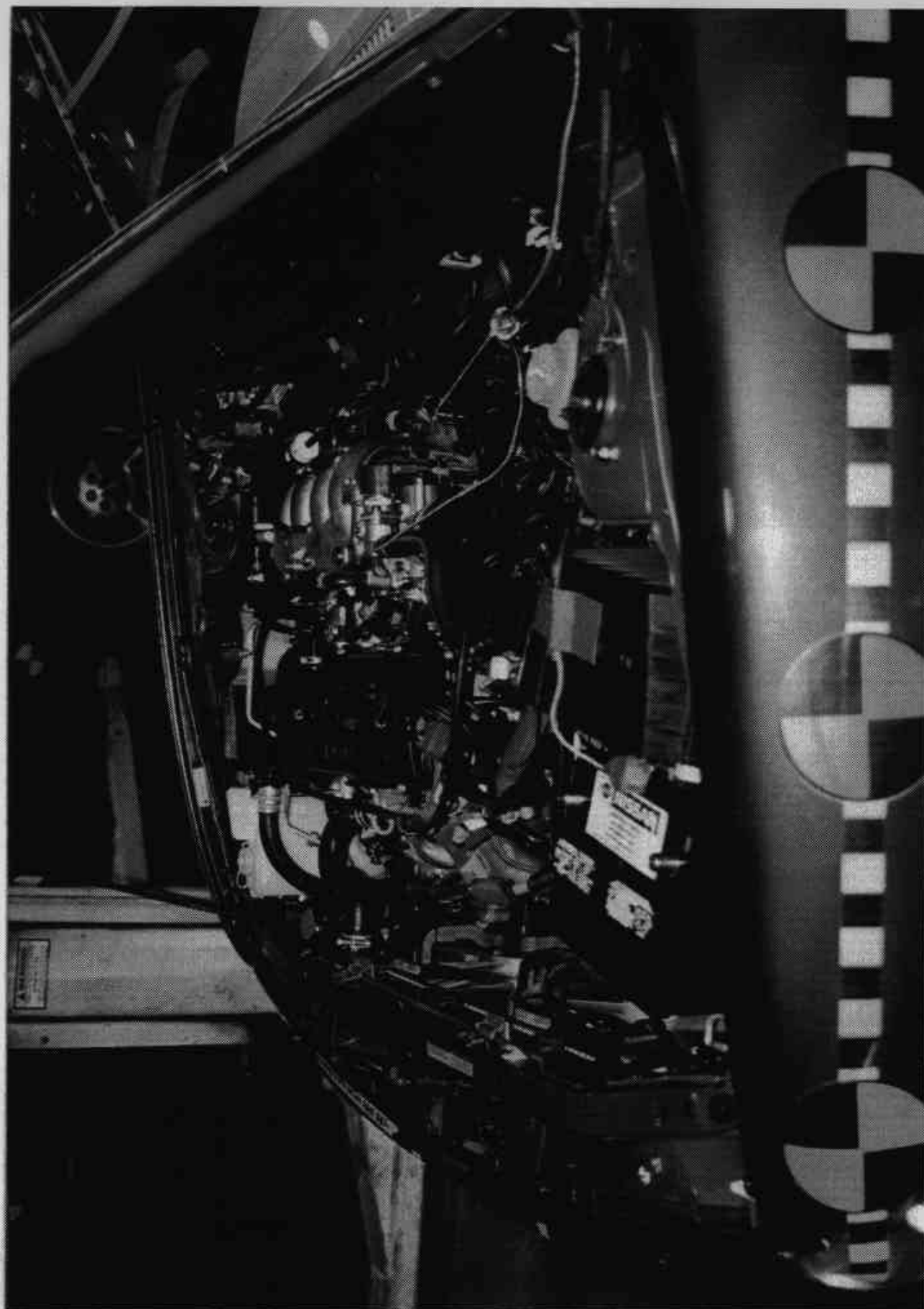


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-15 FUEL CAP VIEW

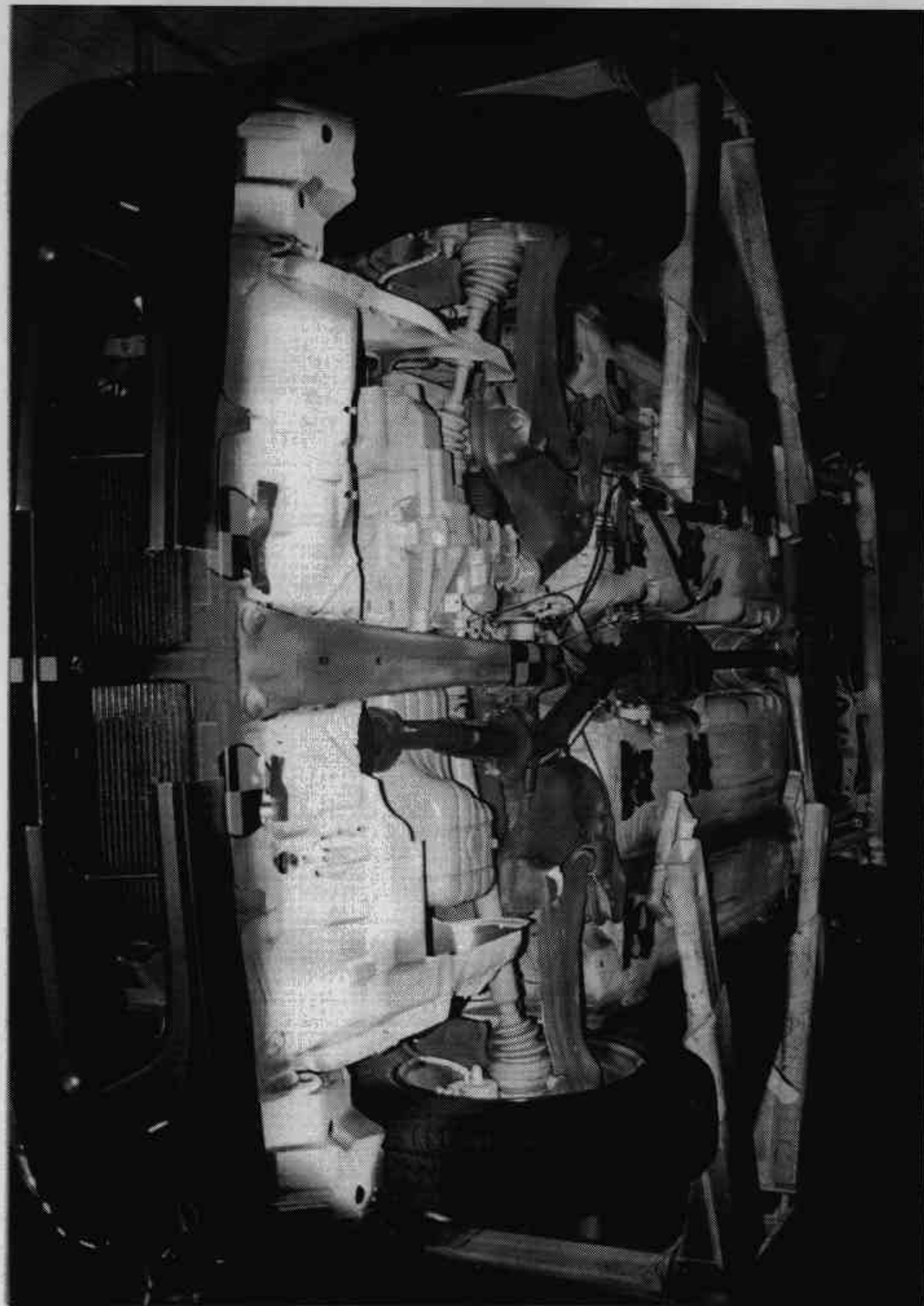


Figure A-16 PRE-TEST FRONT UNDERBODY VIEW



Figure A-17 POST-TEST FRONT UNDERBODY VIEW

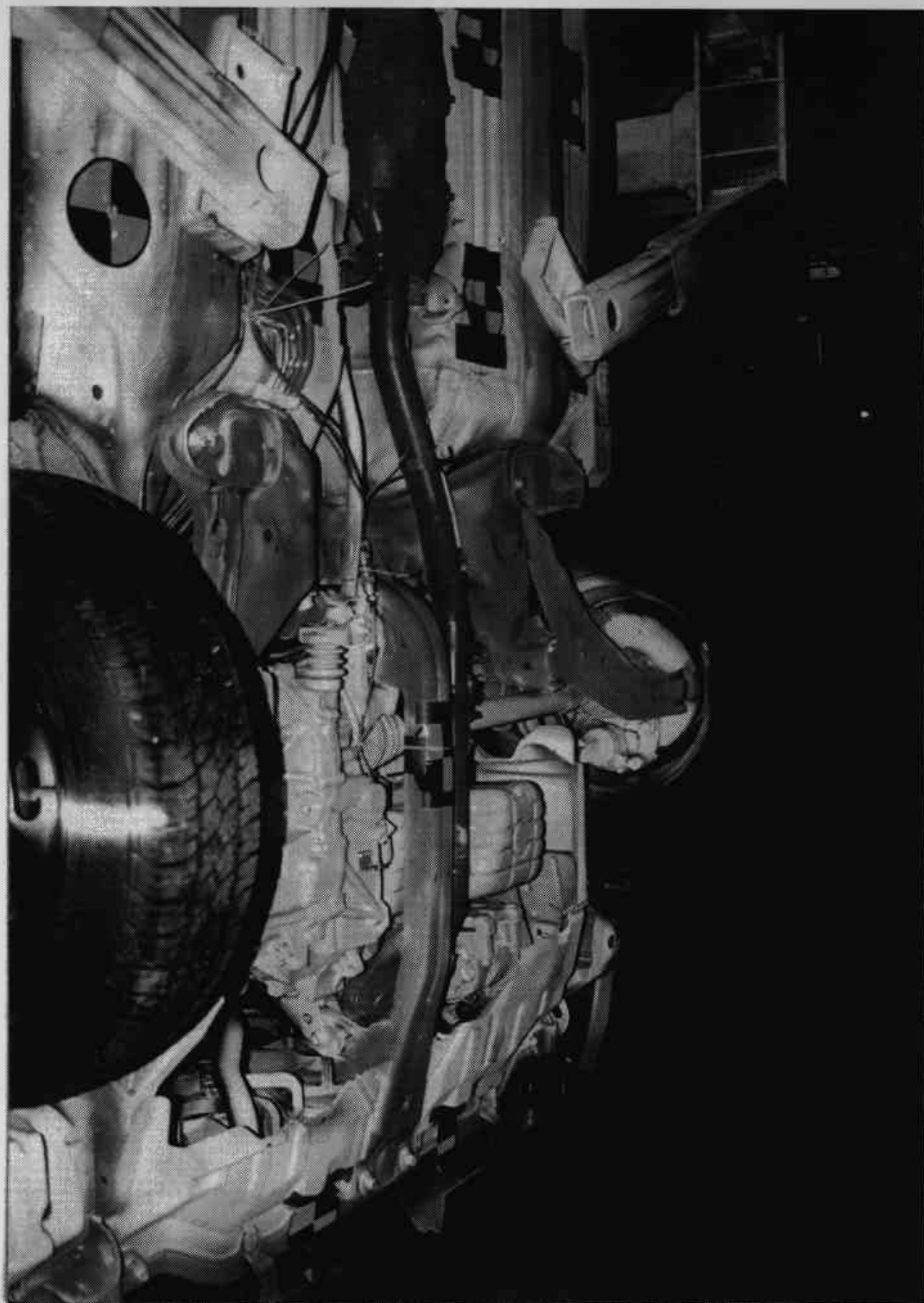


Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

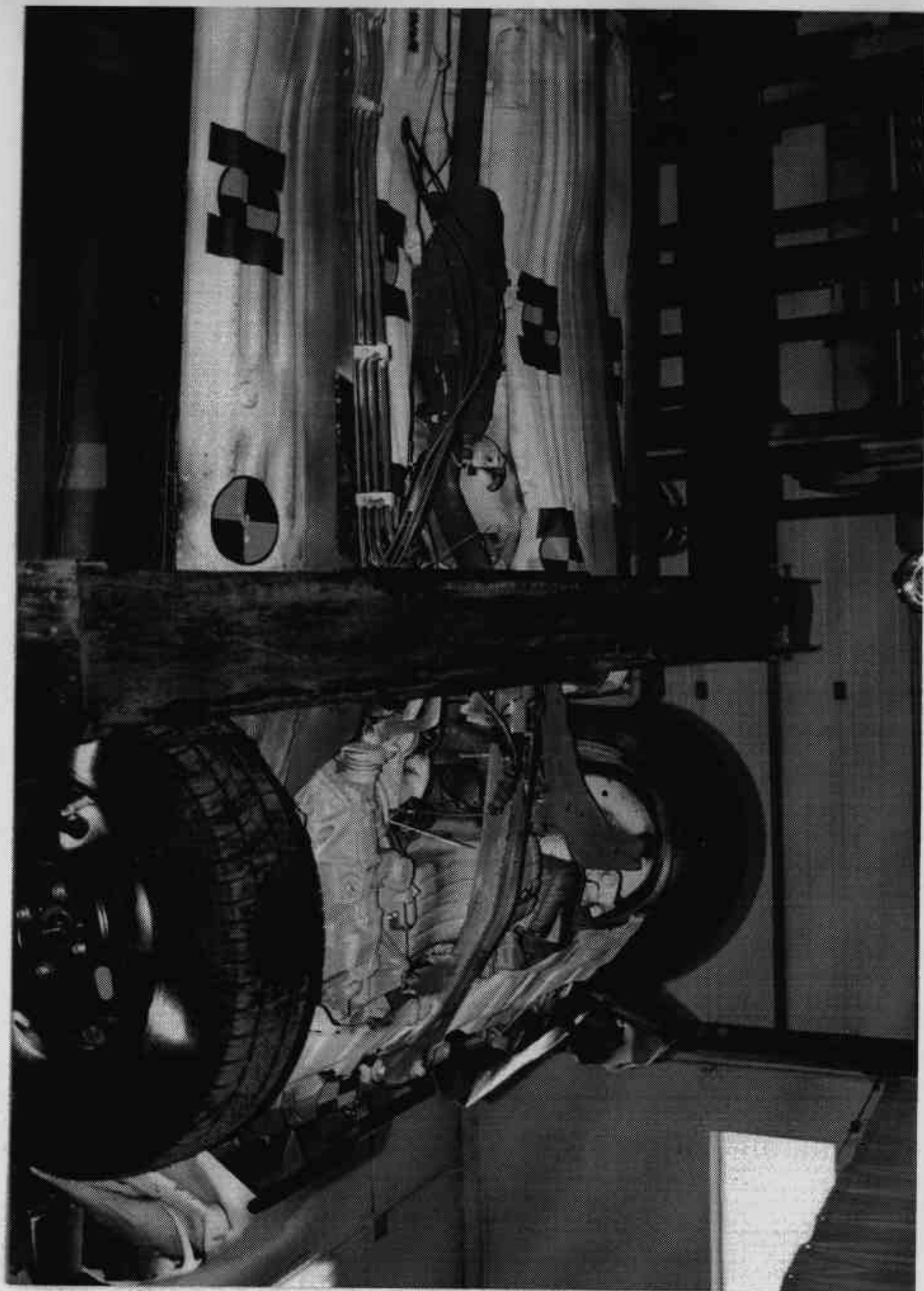


Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

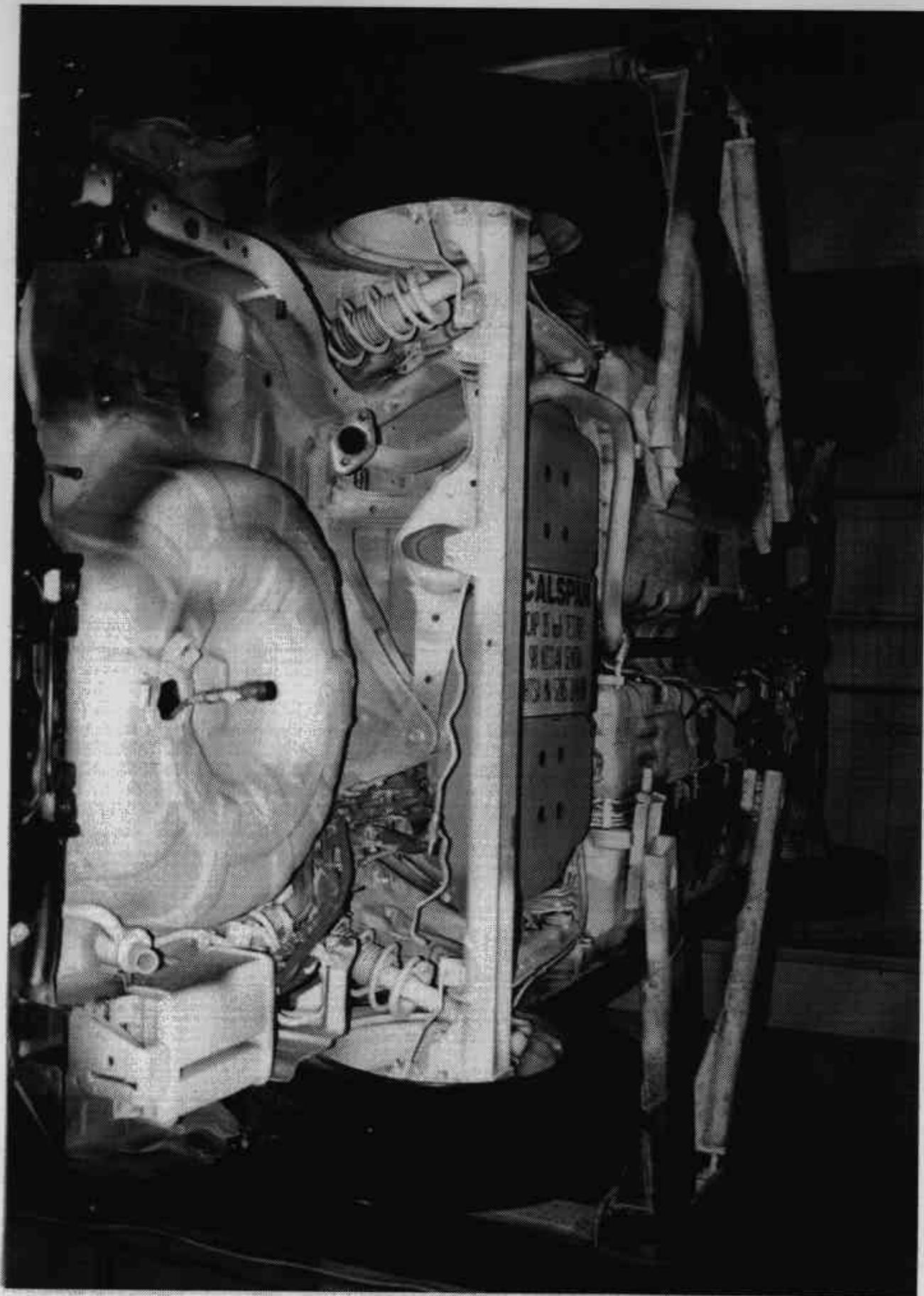


Figure A-20 PRE-TEST REAR UNDERBODY VIEW

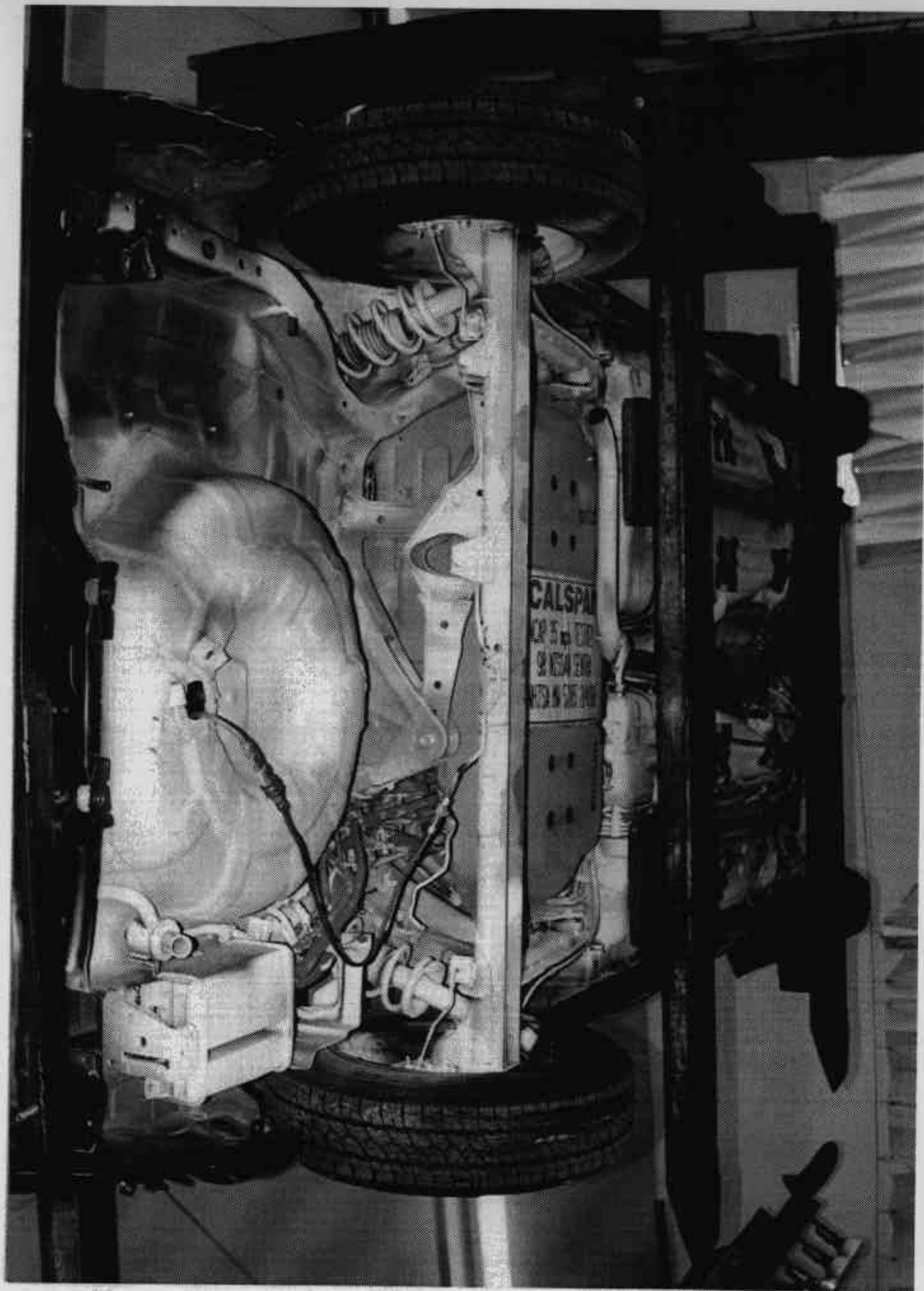


Figure A-21 POST-TEST REAR UNDERBODY VIEW

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

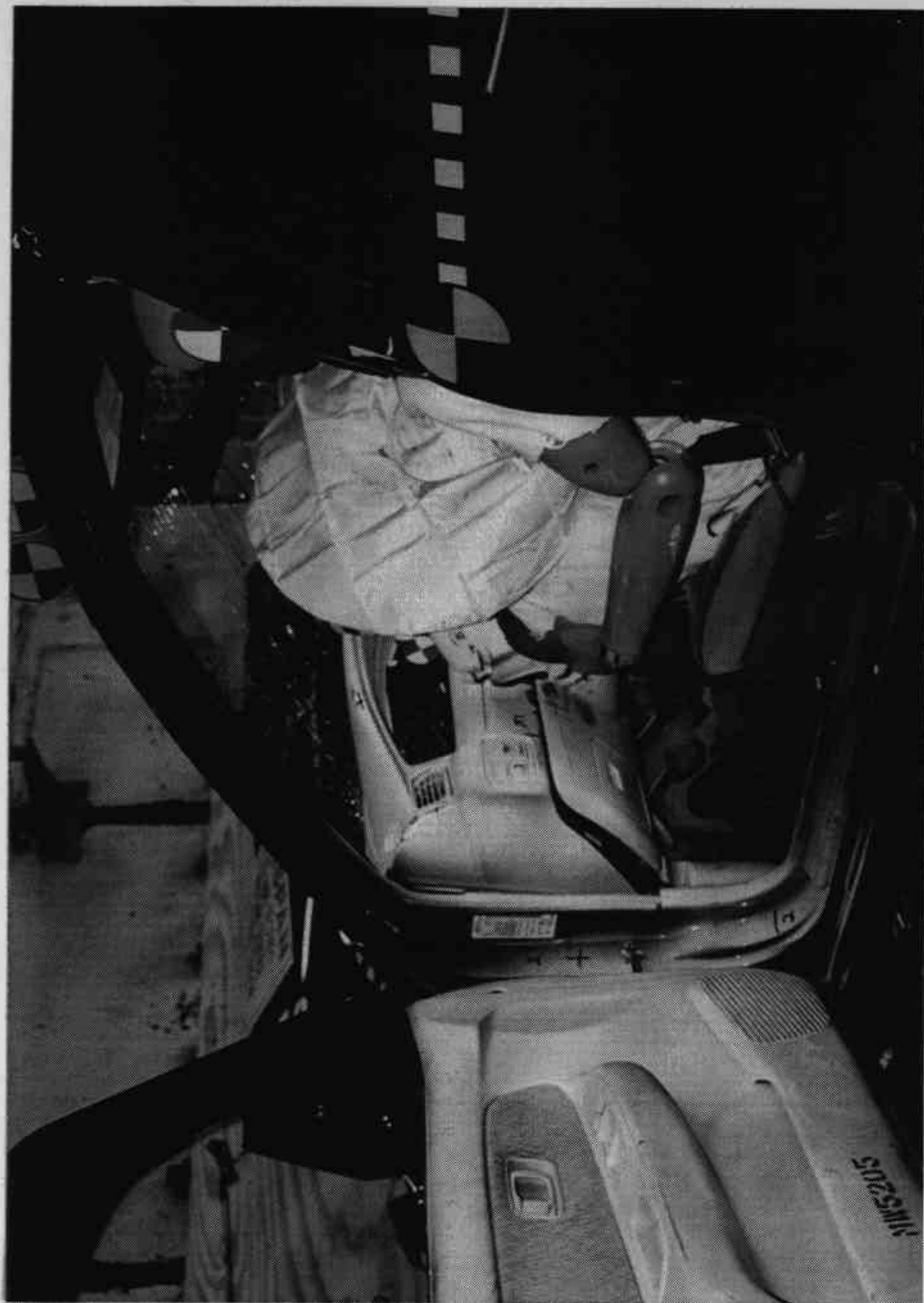




Figure A-28 PRE-TEST PASSENGER AND INTERIOR VIEW



Figure A-29 POST-TEST PASSENGER AND INTERIOR VIEW

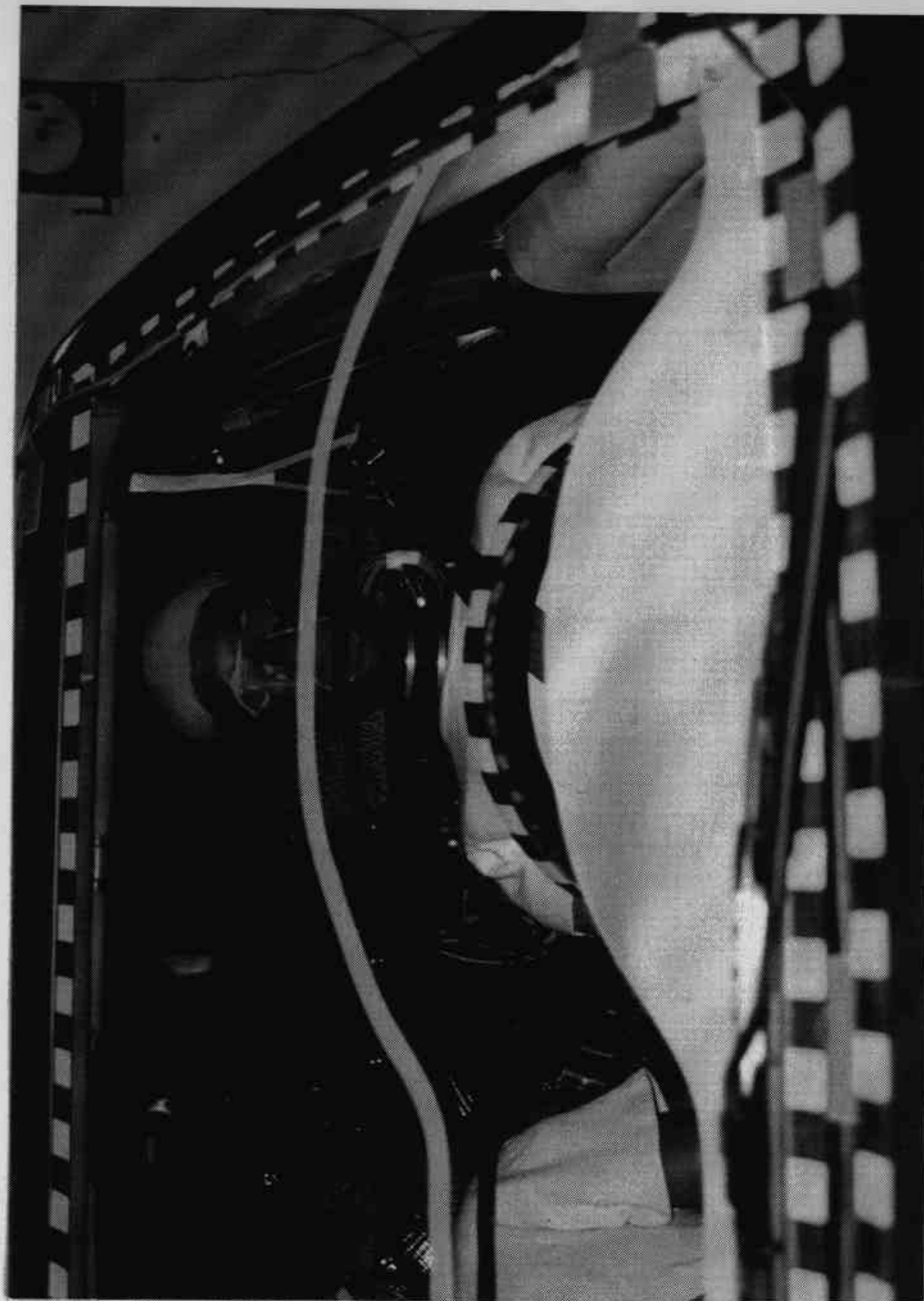


Figure A-30 PRE-TEST DRIVER HEAD LOCATION



Figure A-31 POST-TEST DRIVER HEAD LOCATION

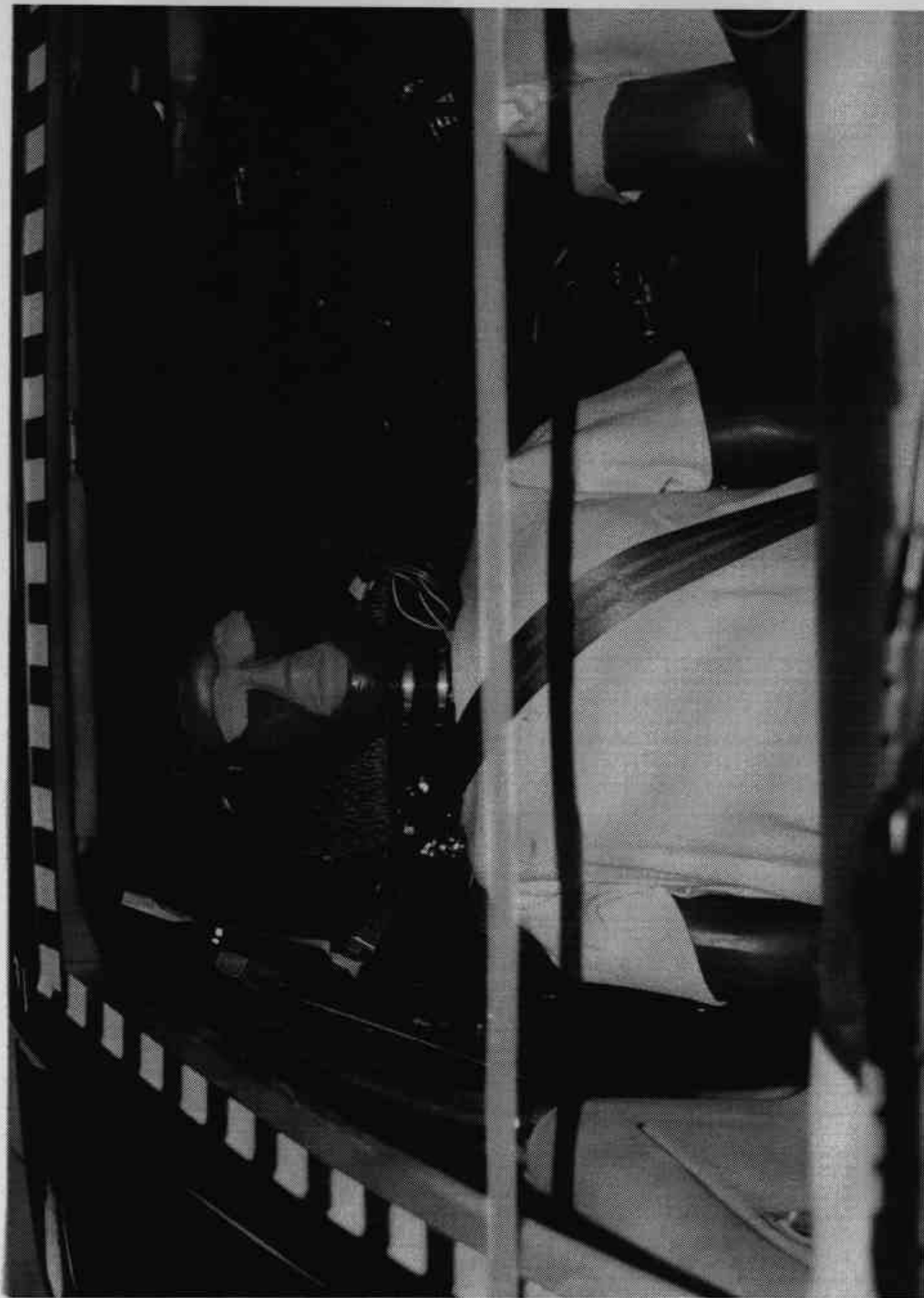


Figure A-32 PRE-TEST PASSENGER HEAD LOCATION

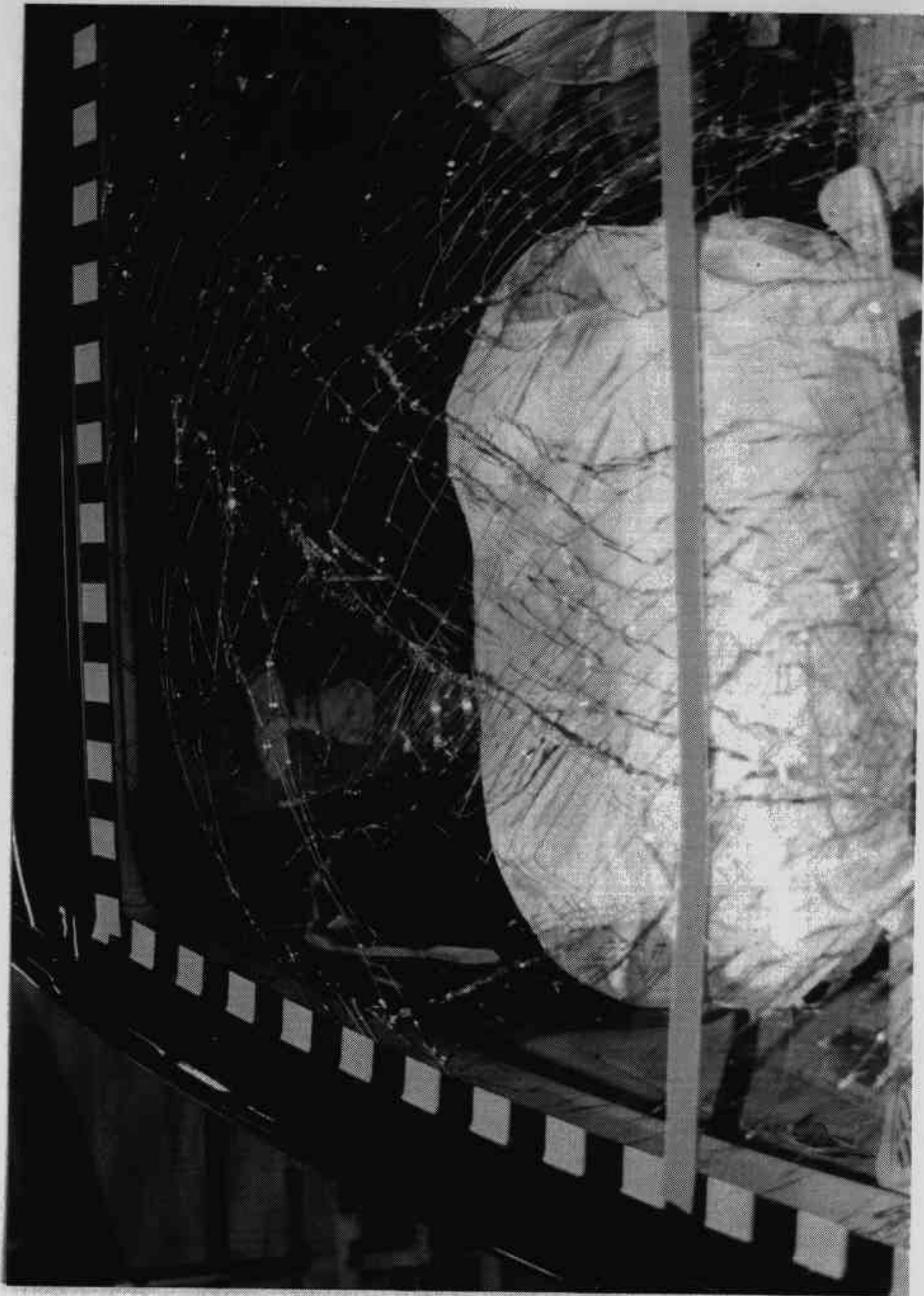


Figure A-33 POST-TEST PASSENGER HEAD LOCATION



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, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

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

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

NHTSA TEST NO. MW5205

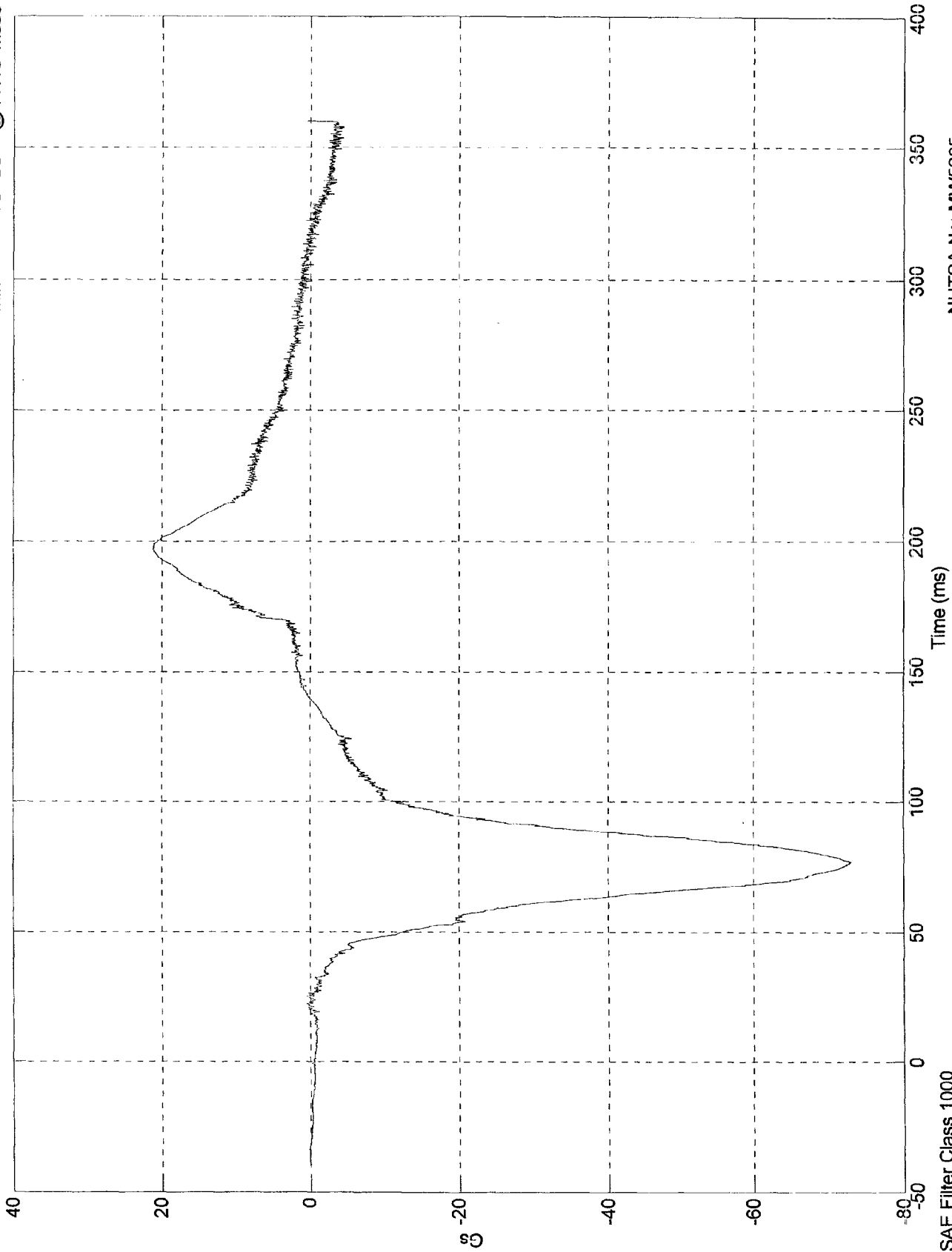
DUMMY DATA

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 #21 - 1998 NISSAN SENTRA

Max = 21.2 Gs @ 196.60 msec
Min = -73 Gs @ 77.10 msec

Pos. 1 Head X



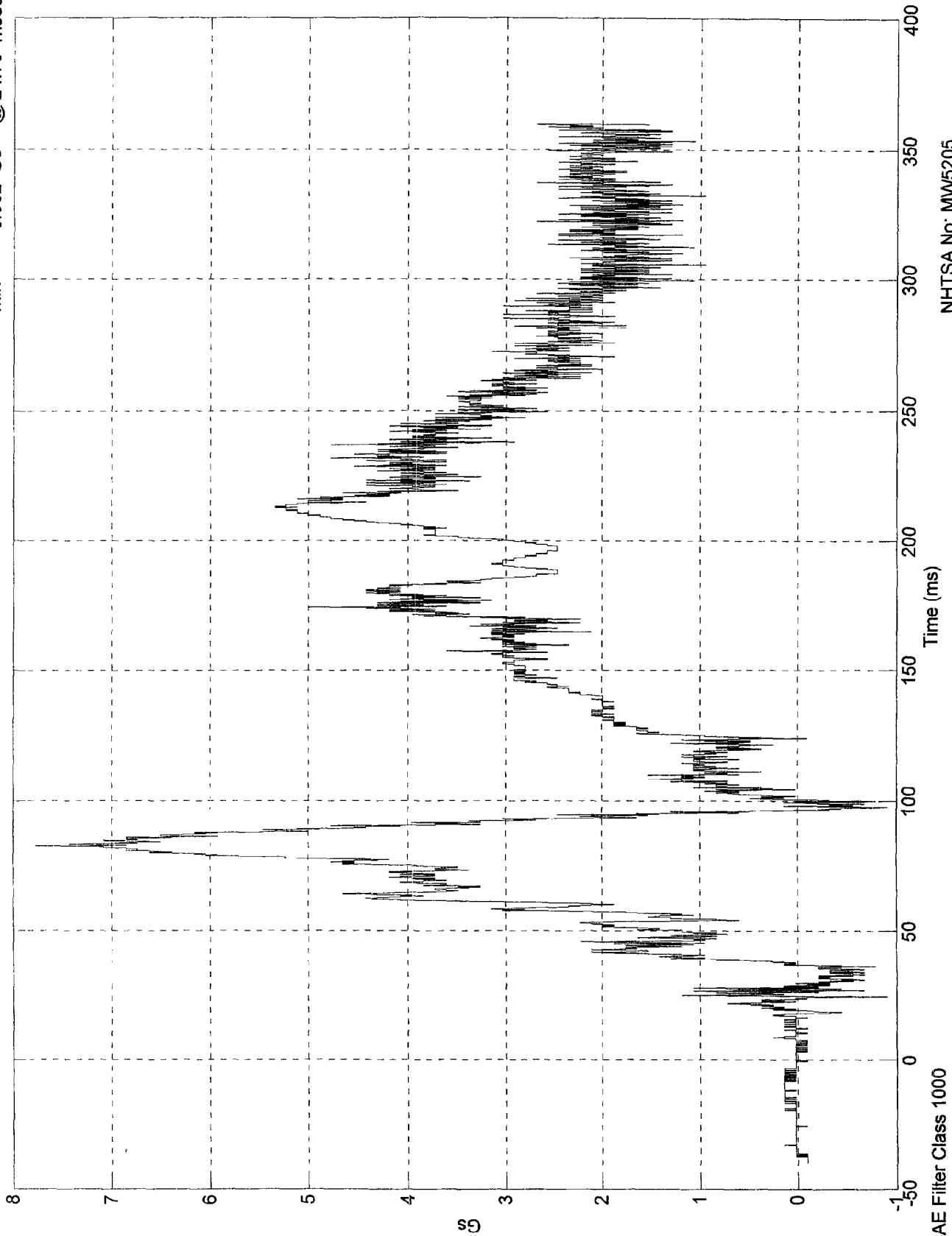
SAE Filter Class 1000

NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 7.78 Gs @ 82.60 msec
Min = -0.902 Gs @ 24.70 msec

Pos. 1 Head Y

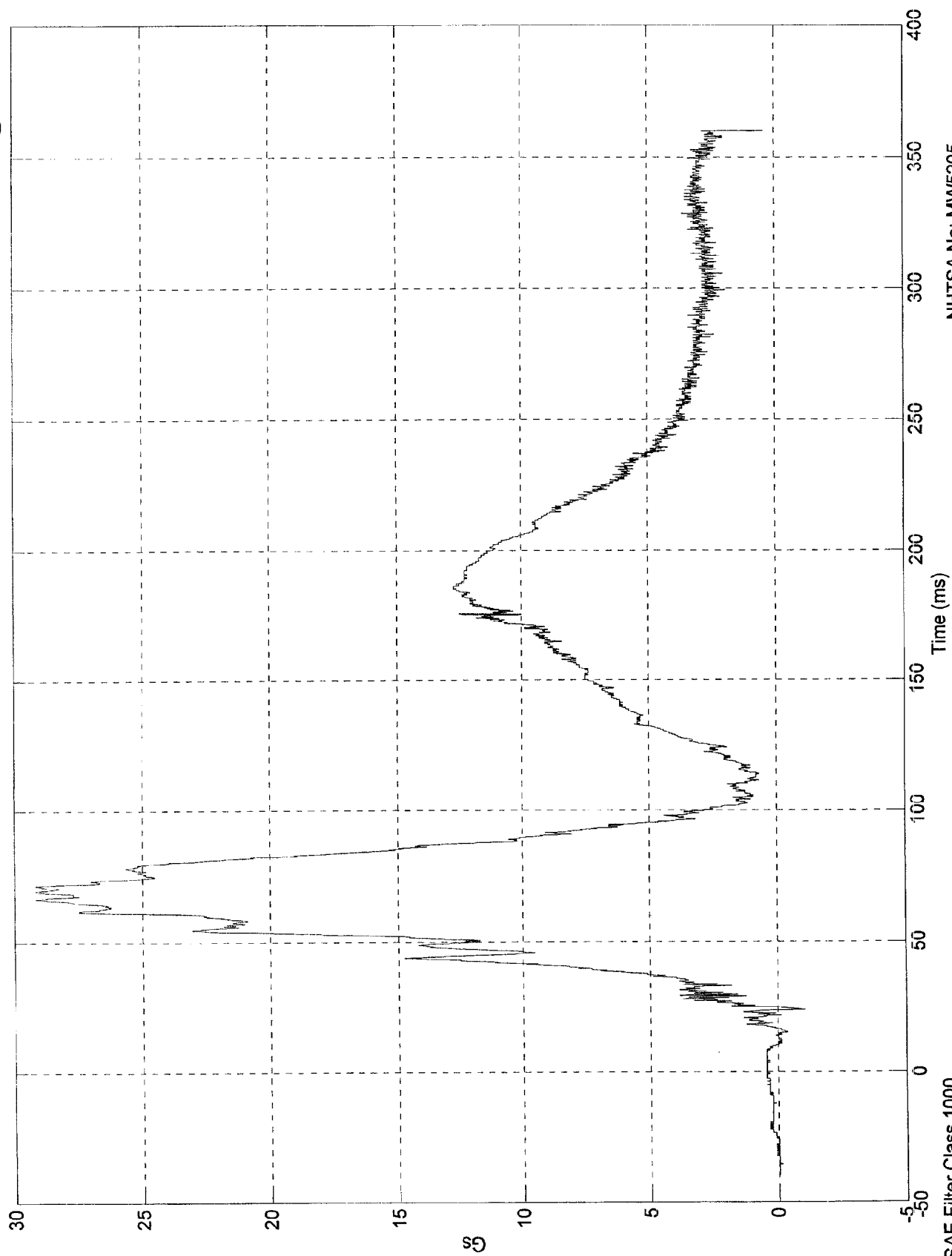


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 29.2 Gs @ 66.70 msec
 Min = -1.03 Gs @ 23.70 msec

Pos. 1 Head Z



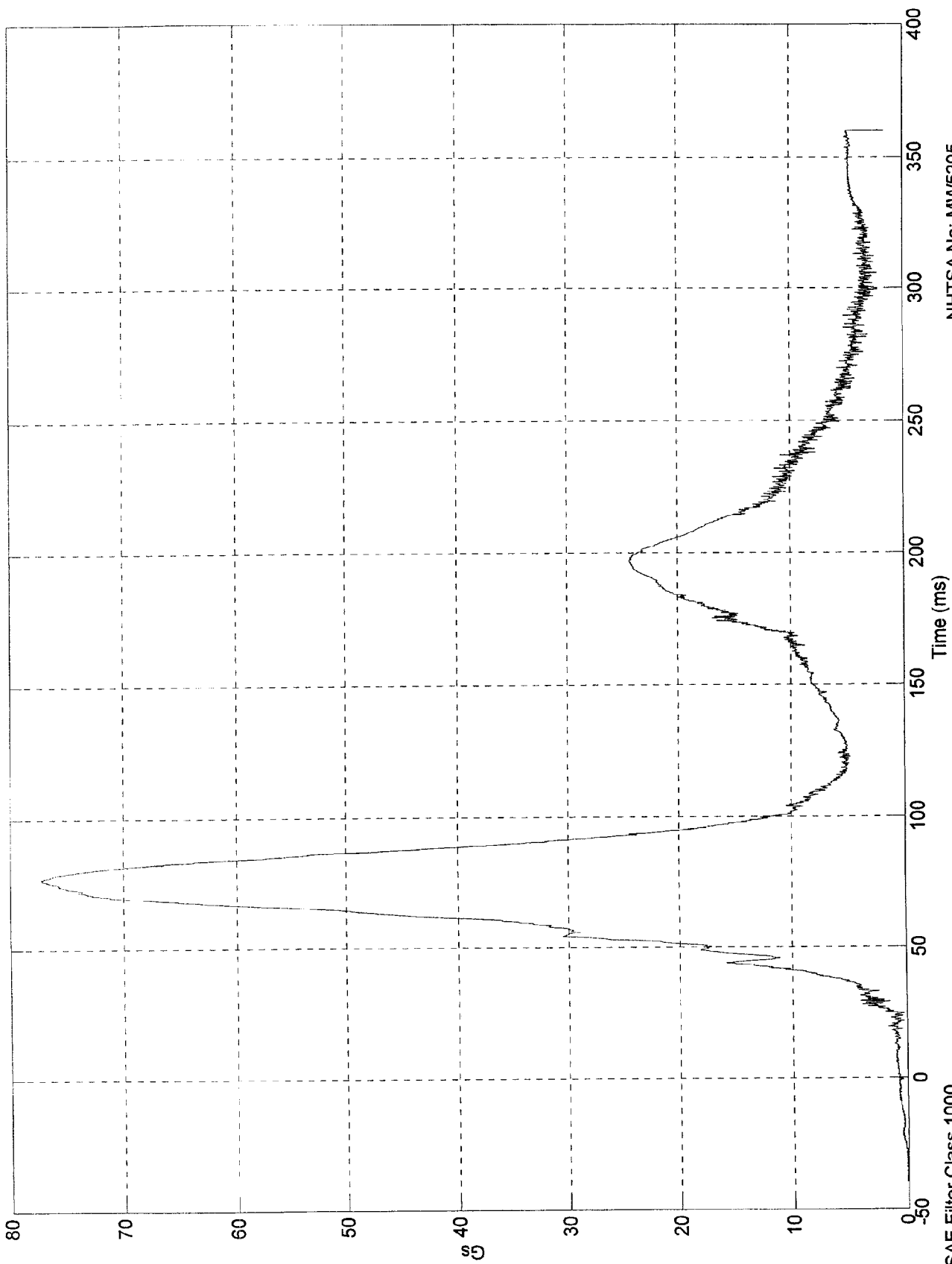
NHTSA No. MW5205
 Date: 04 Feb 1998

SAE Filter Class 1000

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 77.3 Gs @ 77.10 msec
Min = 0.0546 Gs @ -37.50 msec

Pos. 1 Head Resultant

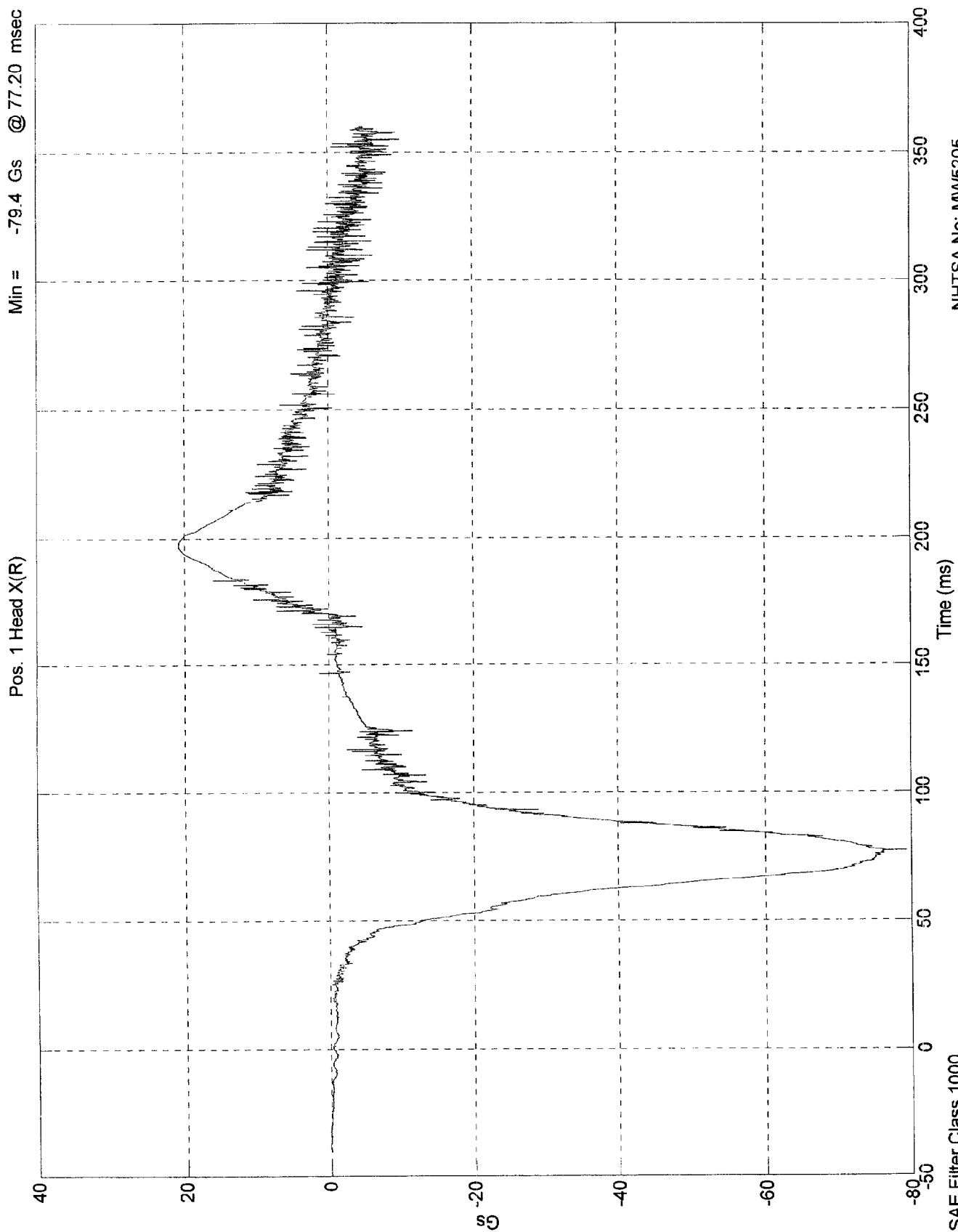


NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 1000

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 20.8 Gs @ 196.30 msec
Min = -79.4 Gs @ 77.20 msec

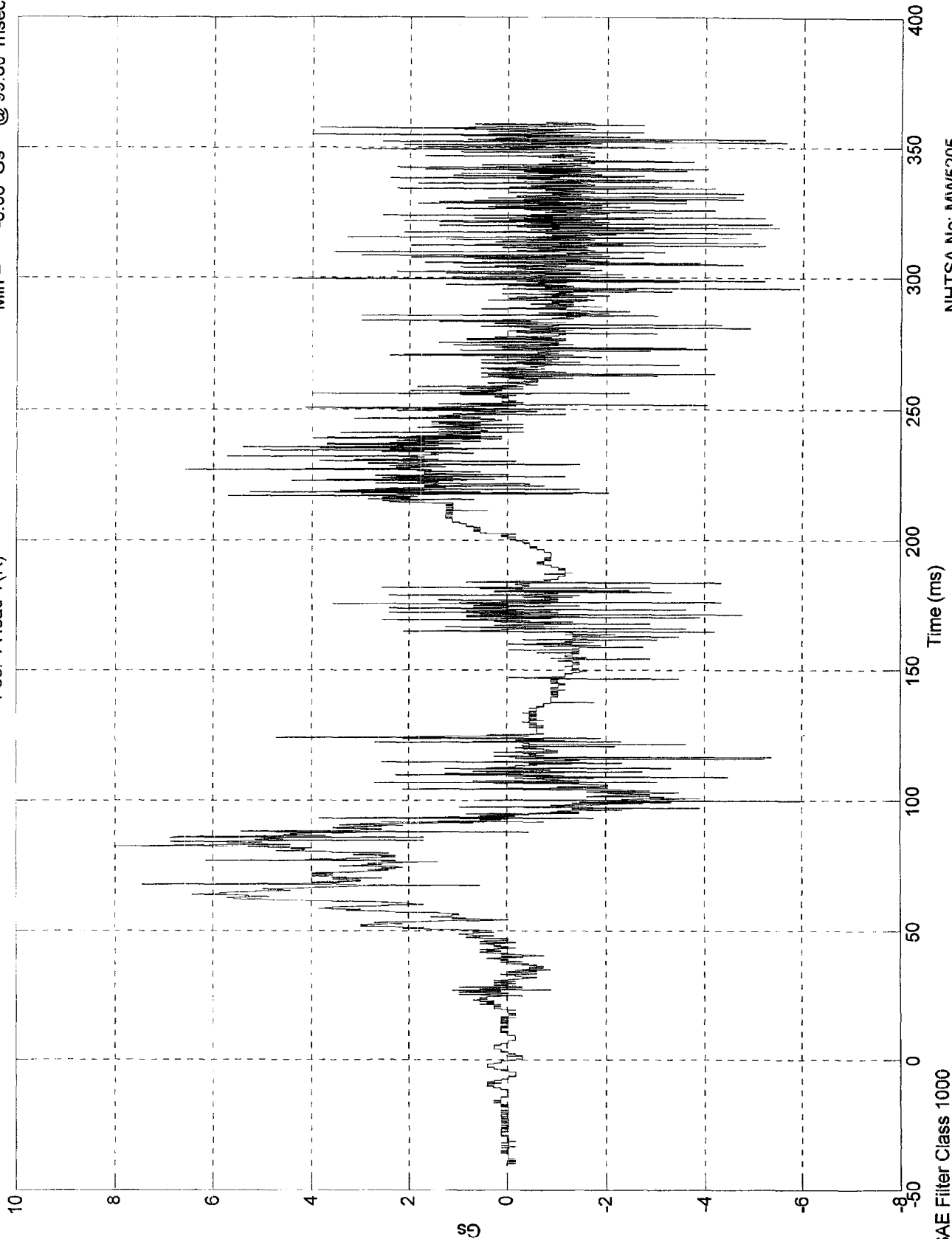


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 8.01 Gs @ 82.70 msec
Min = -6.06 Gs @ 99.80 msec

Pos. 1 Head Y(R)

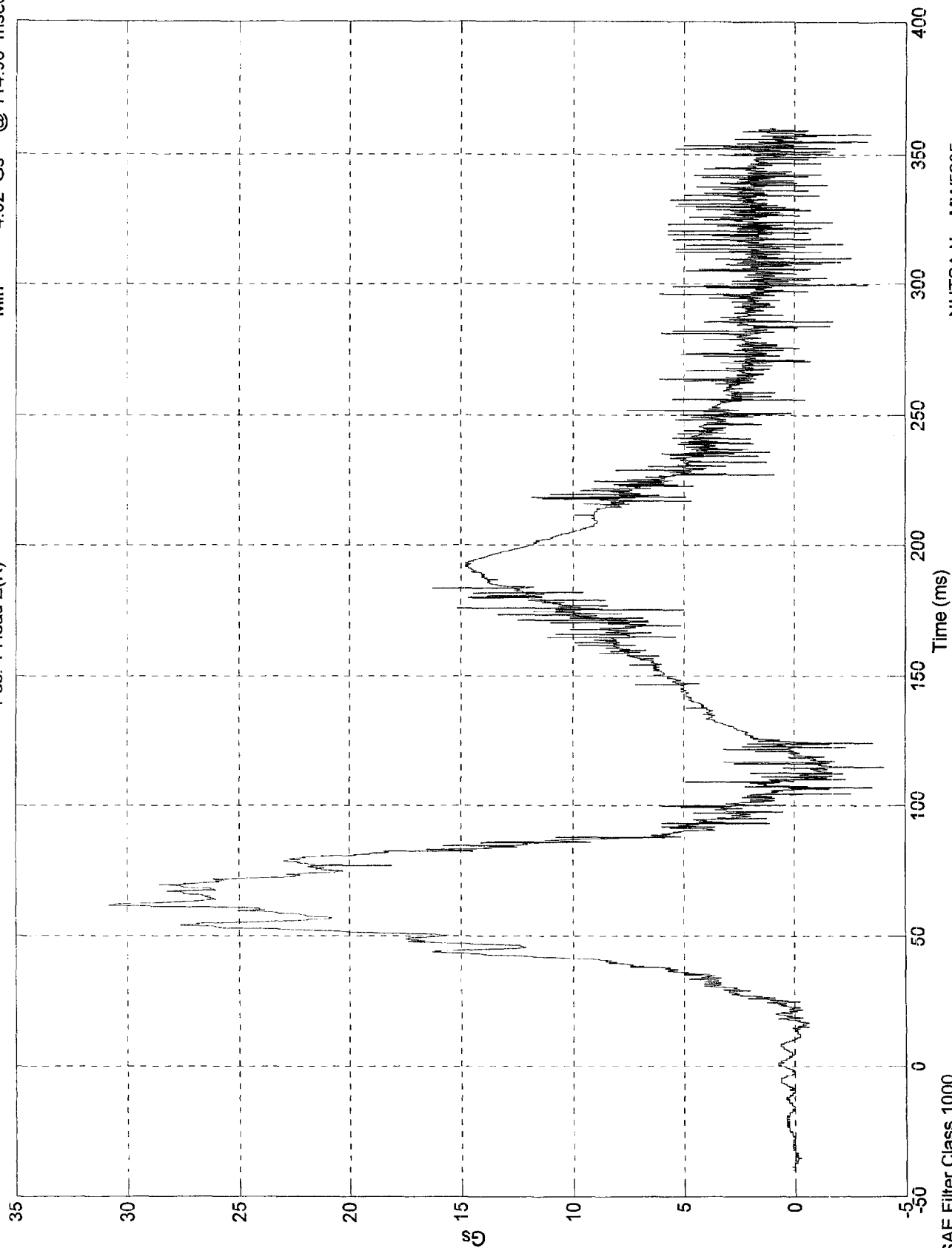


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 30.8 Gs @ 61.80 msec
Min = -4.02 Gs @ 114.90 msec

Pos. 1 Head Z(R)

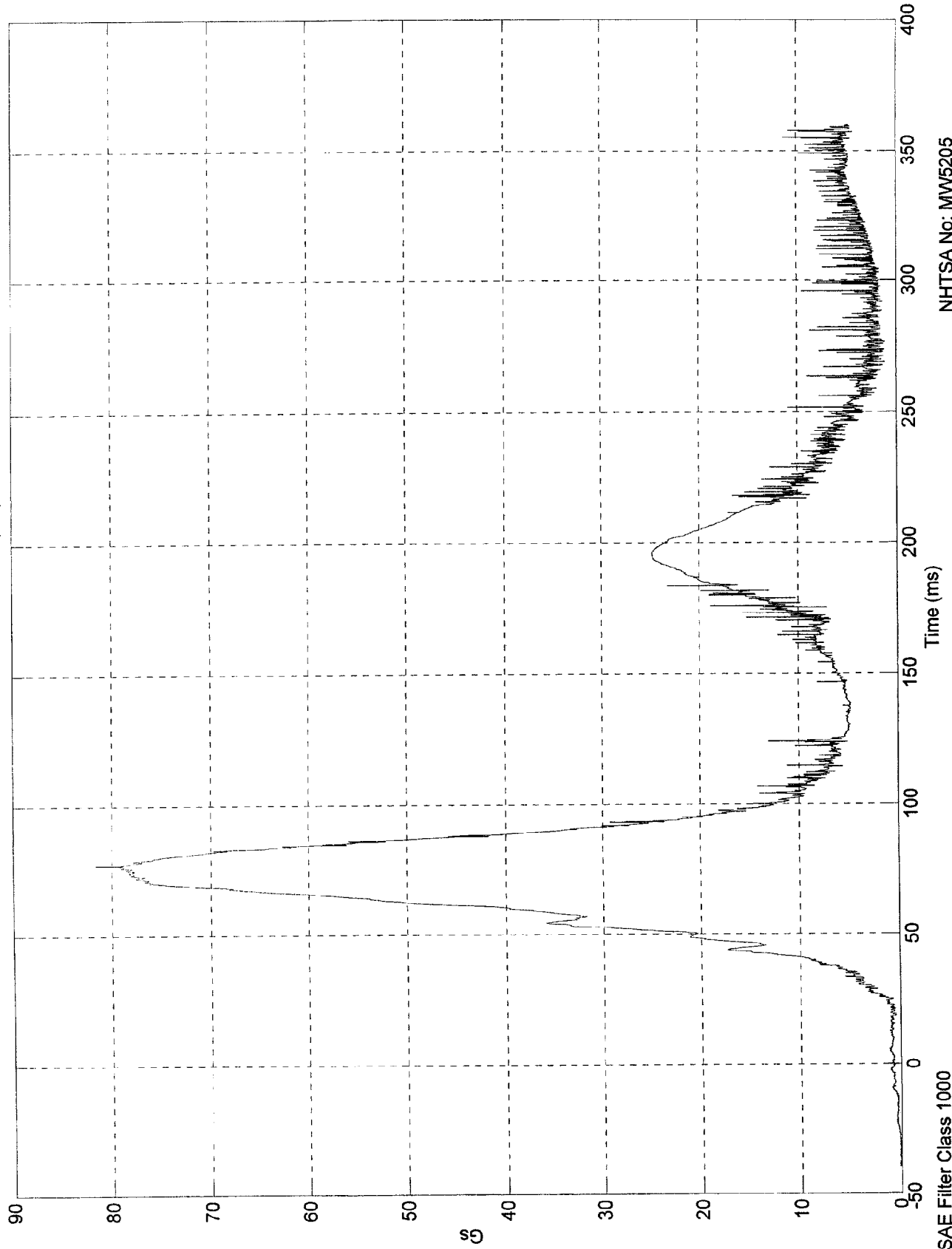


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 81.6 Gs @ 77.20 msec
Min = 0.0393 Gs @ -39.90 msec

Pos. 1 Head Resultant(RR)



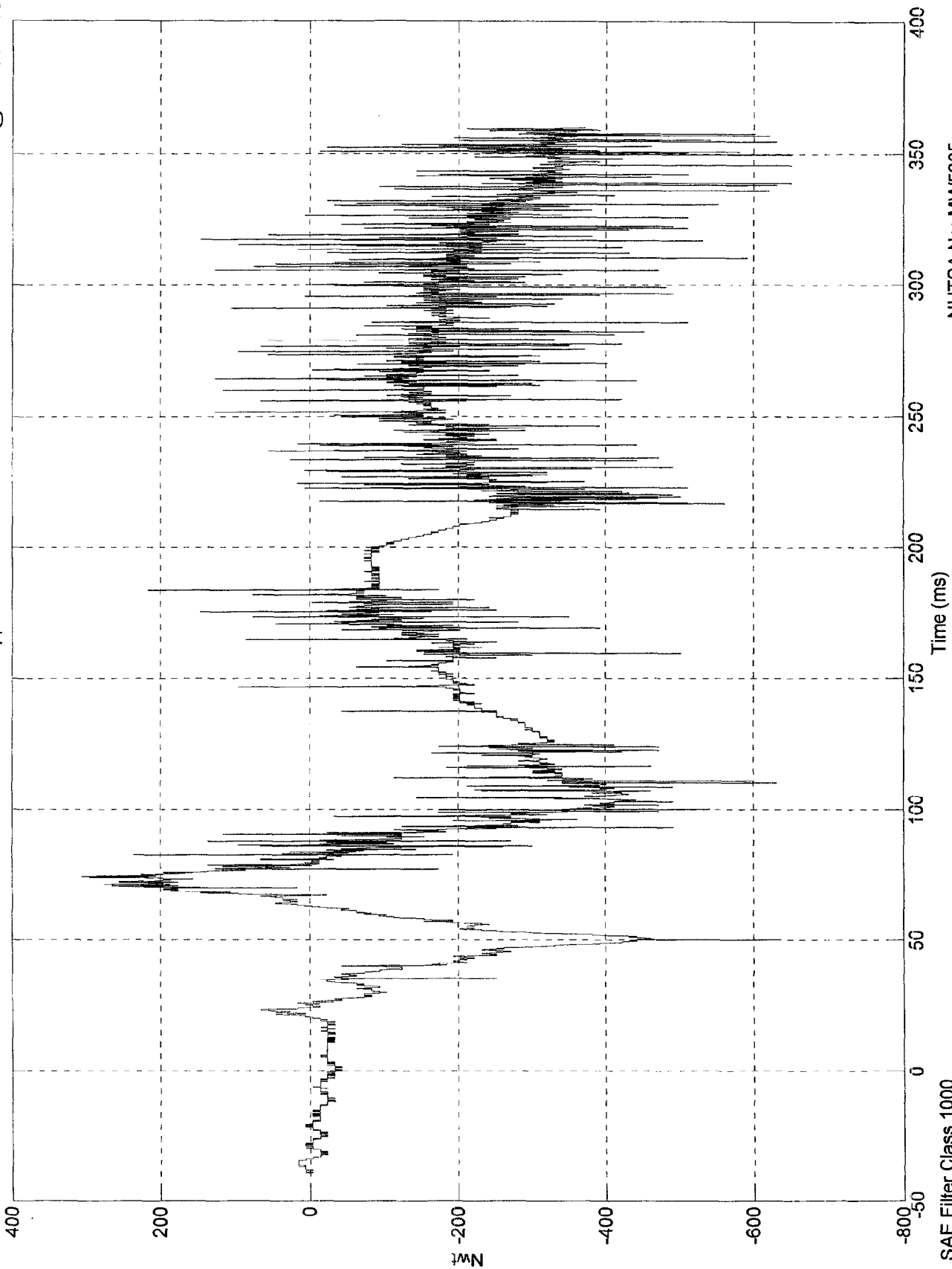
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 1000

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 306 Nwt @ 74.30 msec
Min = -651 Nwt @ 338.80 msec

Pos. 1 Upper Neck Fx



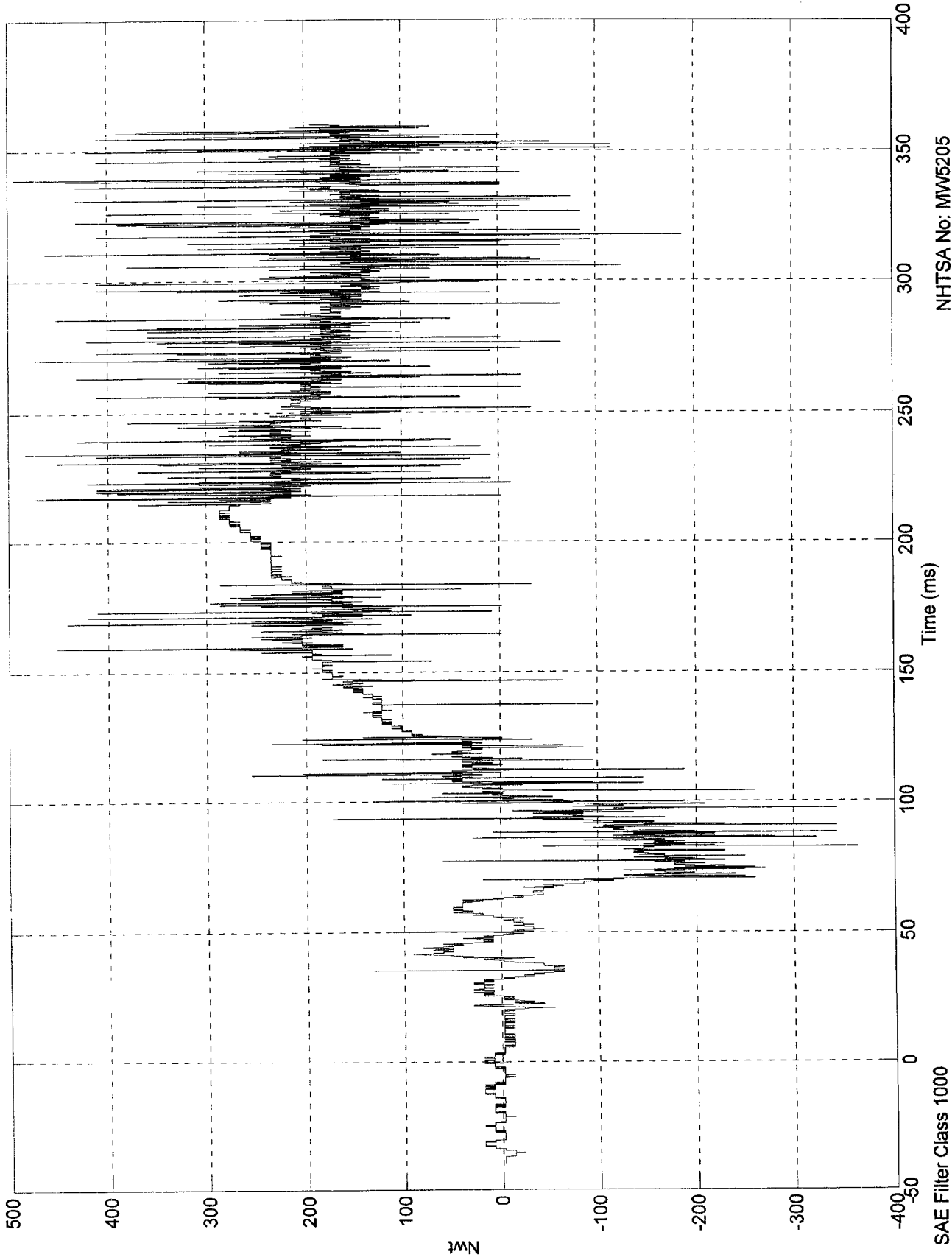
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 1000

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 493 Nwt @ 338.80 msec
Min = -364 Nwt @ 82.60 msec

Pos. 1 Upper Neck Fy



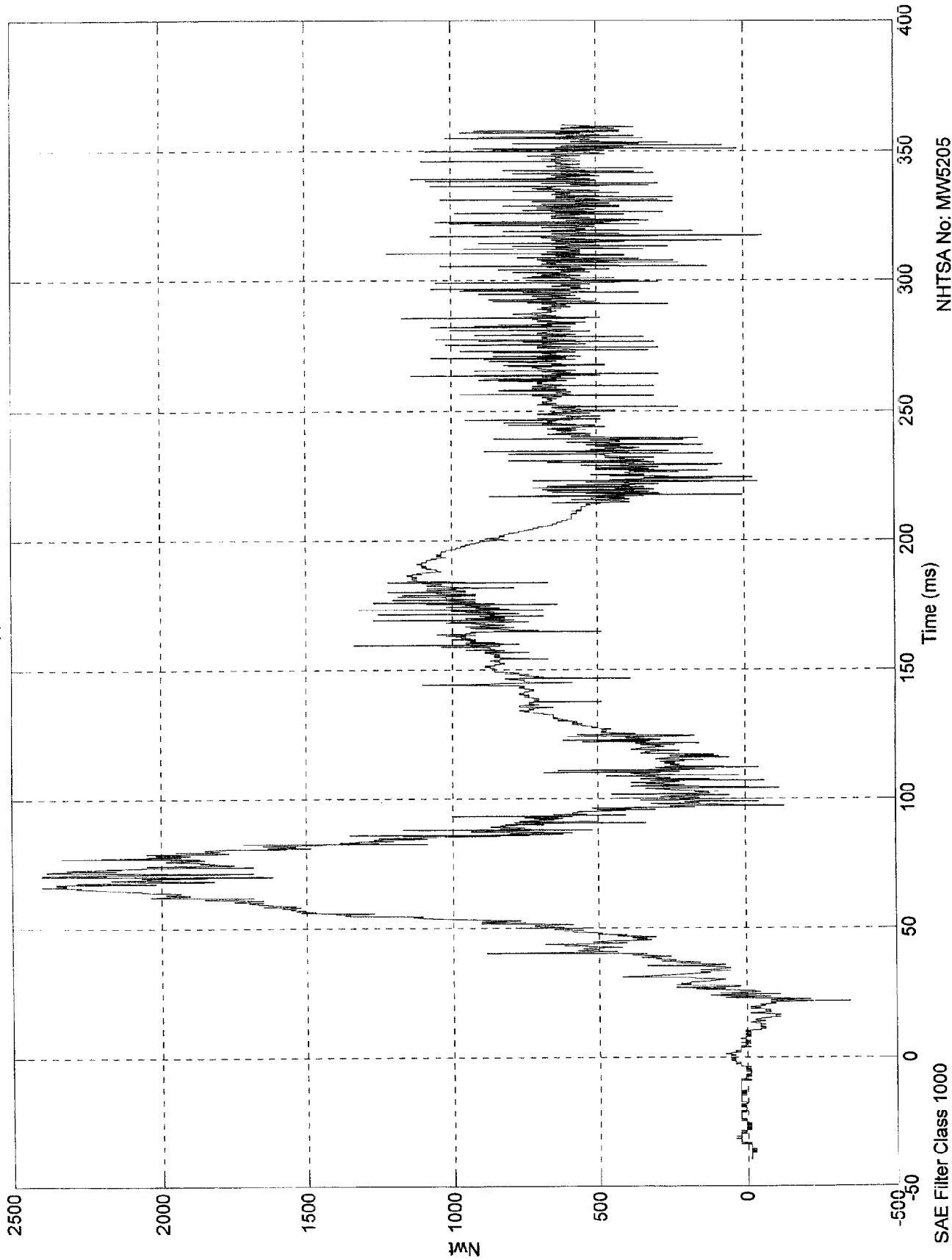
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 1000

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 2.4e+003 Nwt @ 66.00 msec
Min = -345 Nwt @ 21.70 msec

Pos. 1 Upper Neck Fz



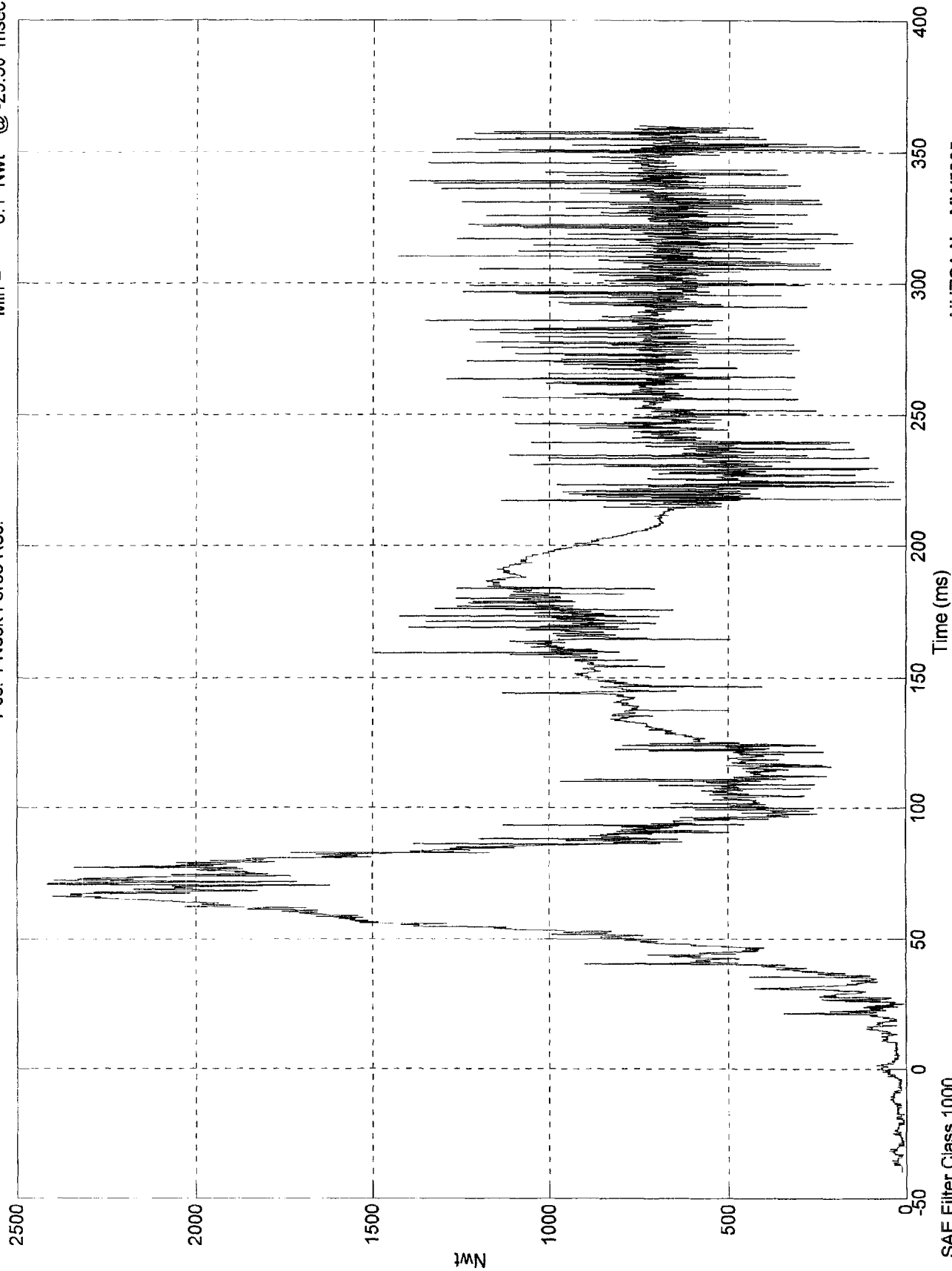
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 1000

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 2.41e+003 Nwt @ 70.40 msec
Min = 6.1 Nwt @ -29.50 msec

Pos. 1 Neck Force Res.

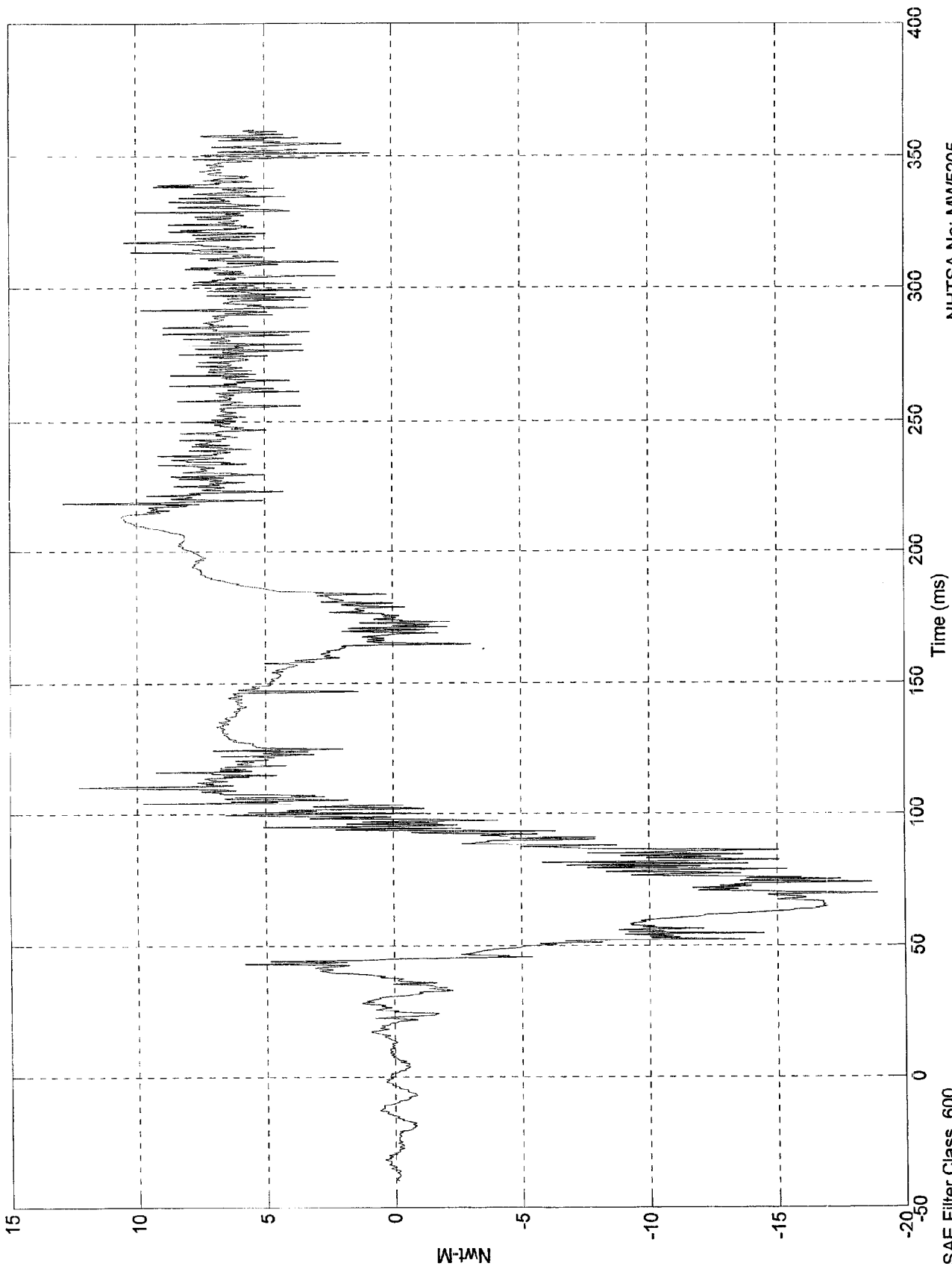


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 12.9 Nwt-M @ 218.60 msec
Min = -18.9 Nwt-M @ 69.90 msec

Pos. 1 Upper Neck Mx



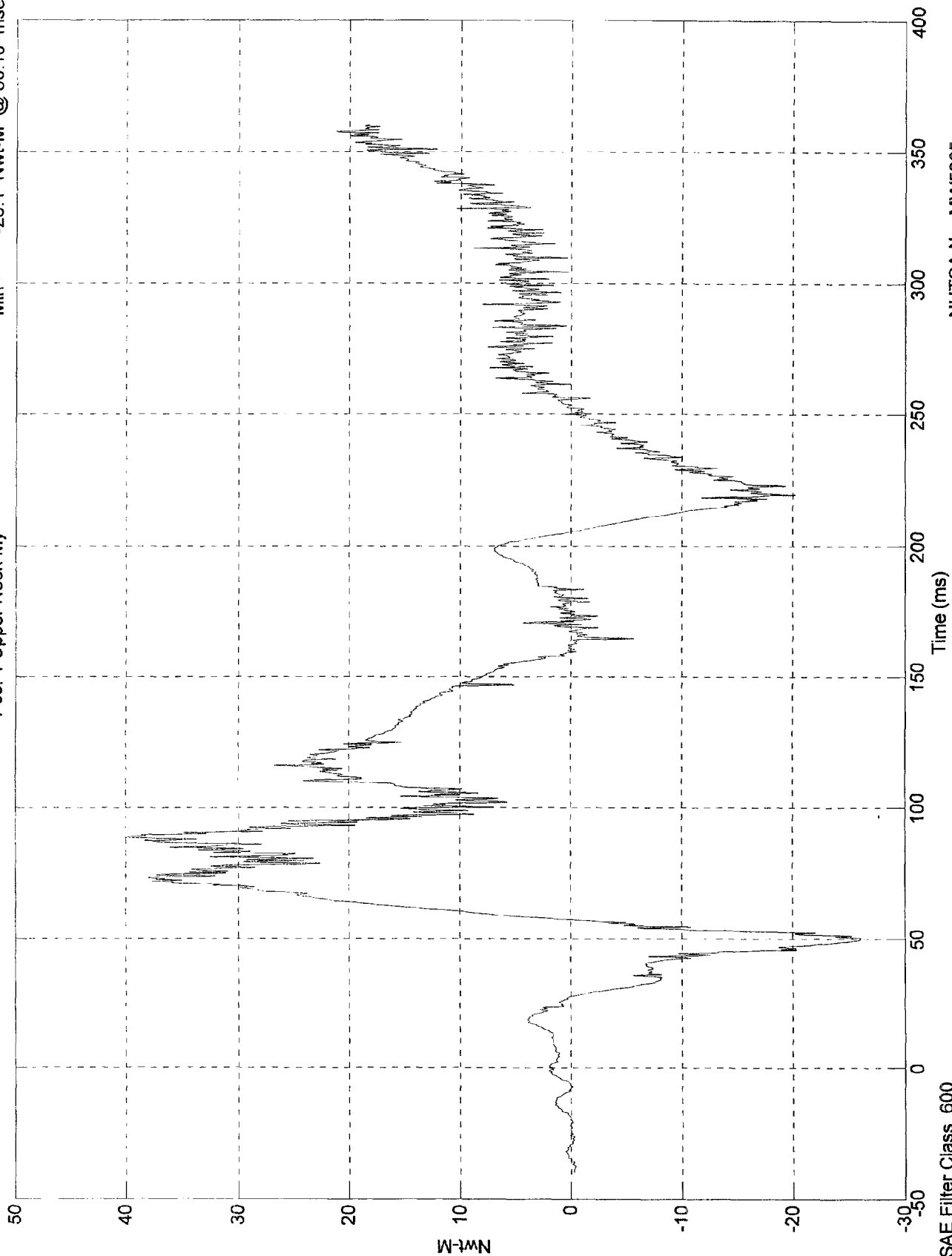
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 40 Nwt-M @ 88.80 msec
 Min = -26.1 Nwt-M @ 50.10 msec

Pos. 1 Upper Neck My



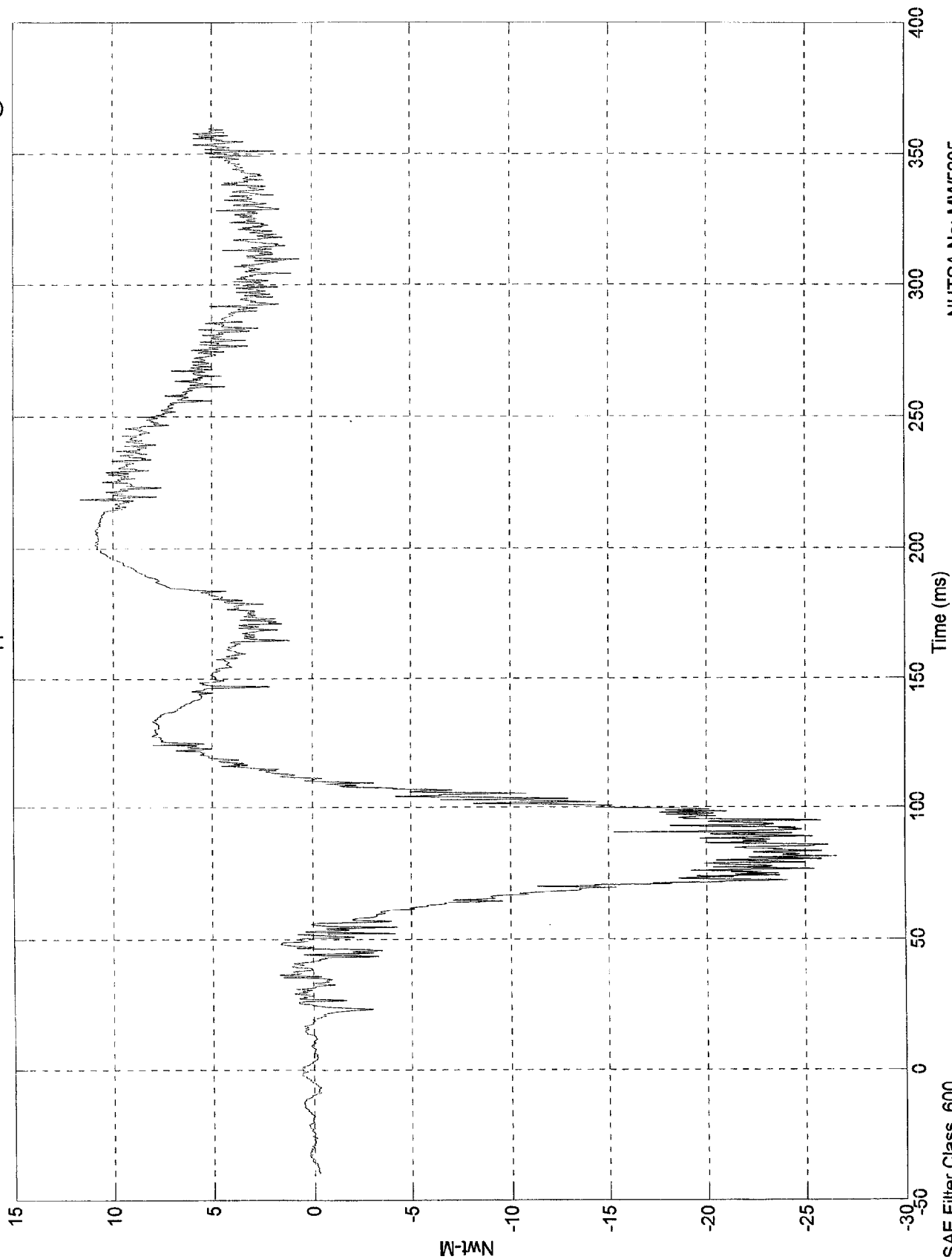
NHTSA No: MW5205
 Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 11.7 Nwt-M @ 218.60 msec
Min = -26.6 Nwt-M @ 81.40 msec

Pos. 1 Upper Neck Mz



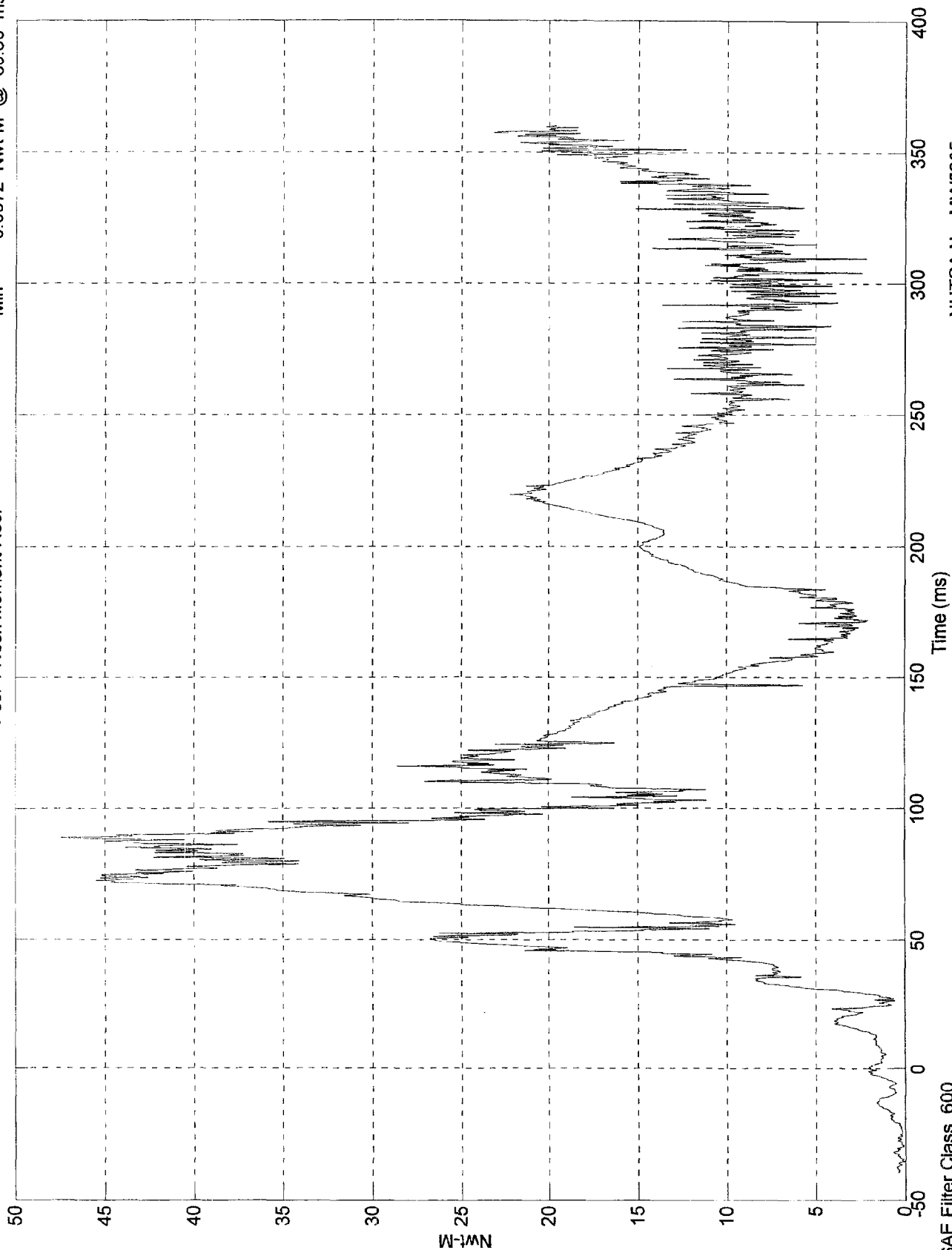
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 47.5 Nwt-M @ 88.90 msec
 Min = 0.0372 Nwt-M @ -35.60 msec

Pos. 1 Neck Moment Res.



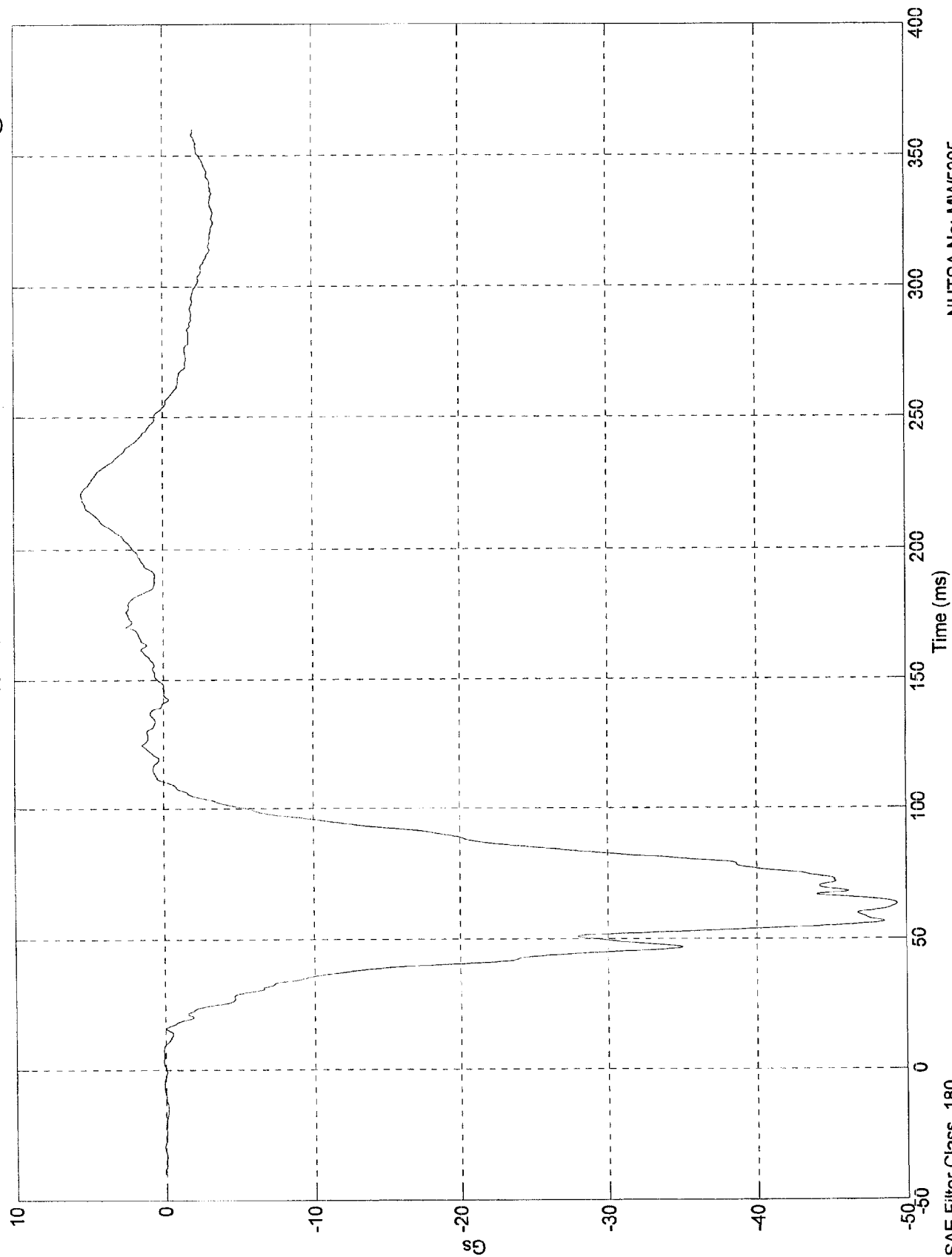
SAE Filter Class 600

NHTSA No: MW5205
 Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 5.55 Gs @ 220.60 msec
Min = -49.4 Gs @ 63.30 msec

Pos. 1 Chest X



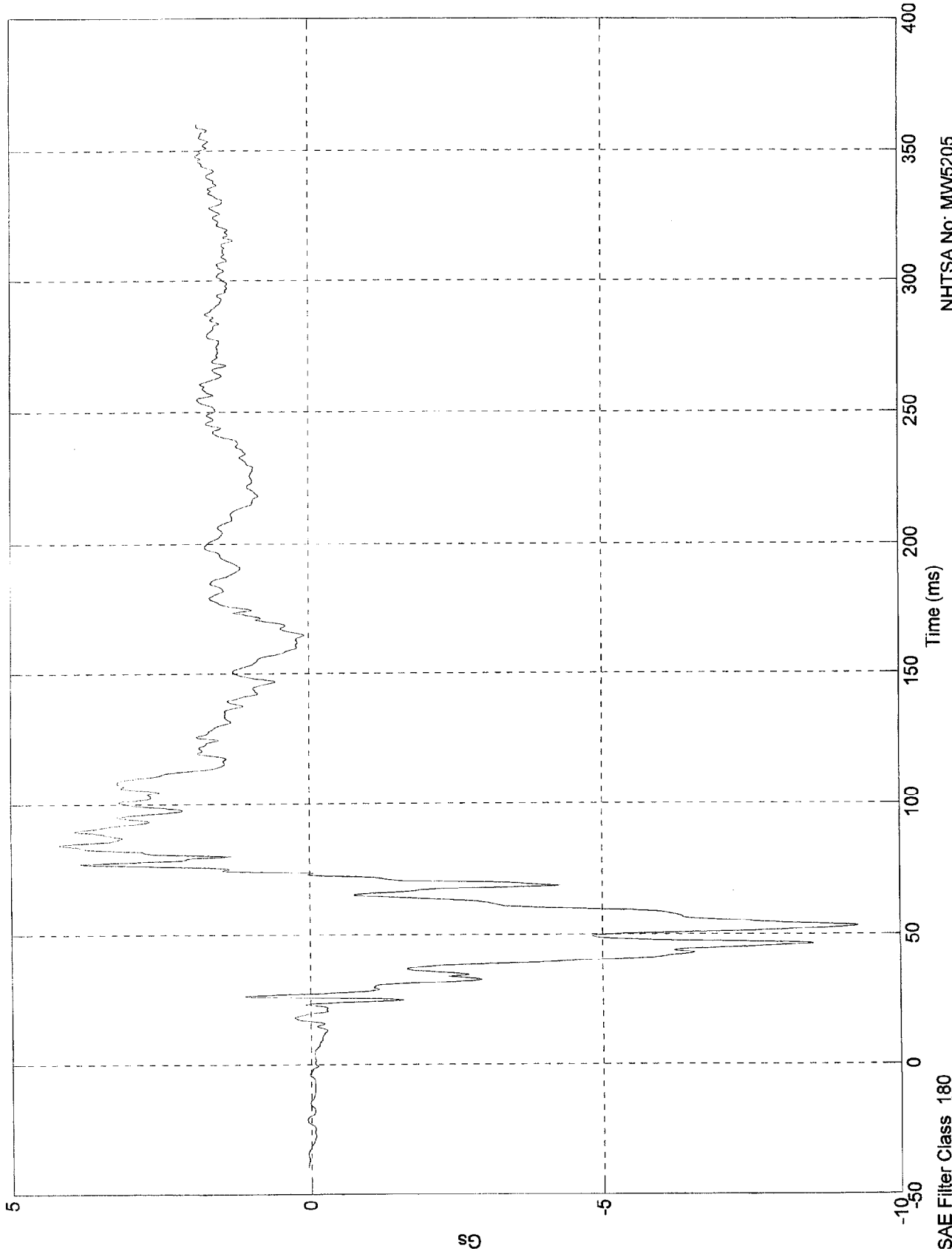
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 4.18 Gs @ 84.50 msec
Min = -9.3 Gs @ 53.10 msec

Pos. 1 Chest Y



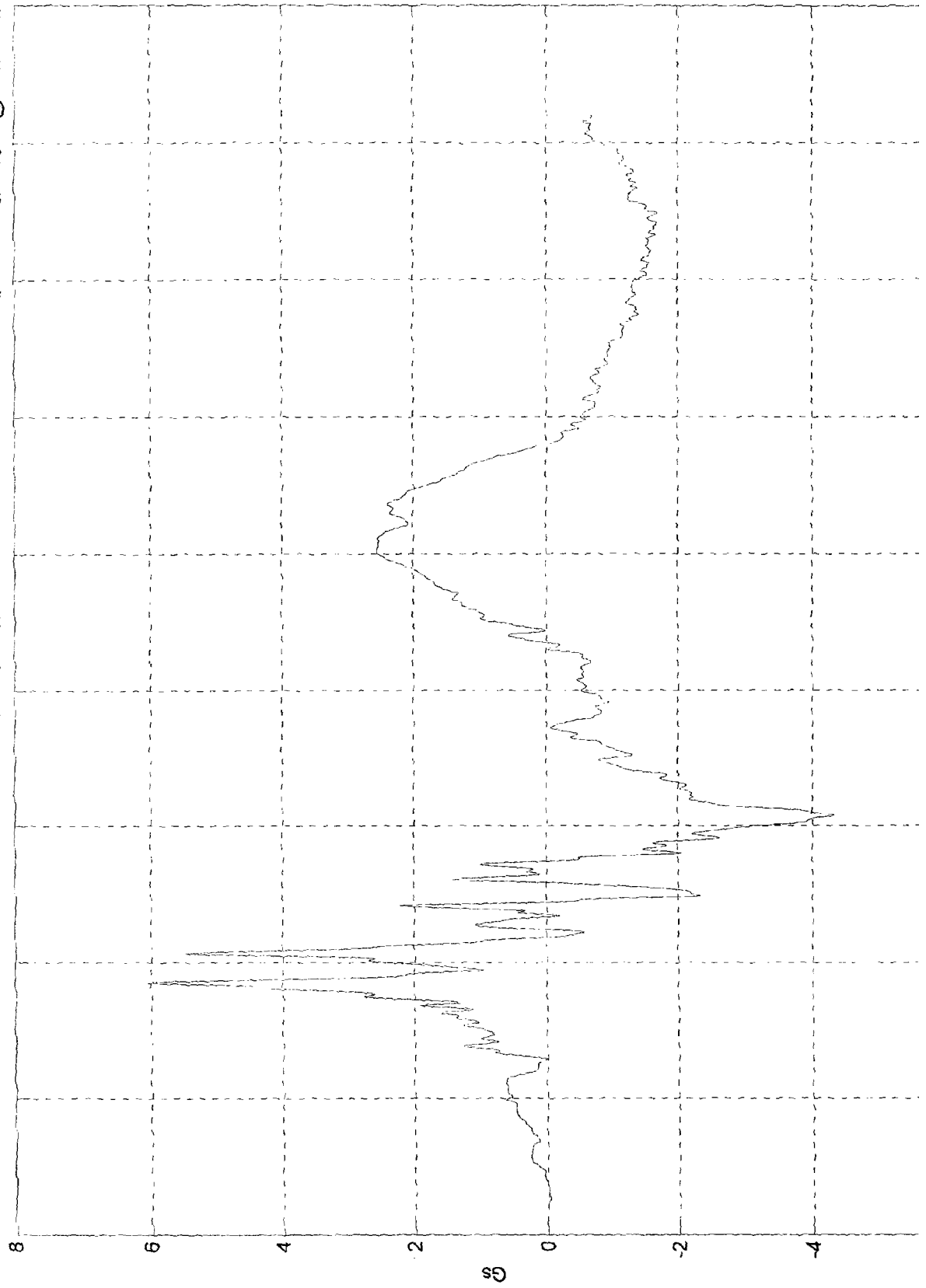
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 6.04 Gs @ 42.70 msec
 Min = -4.32 Gs @ 103.80 msec

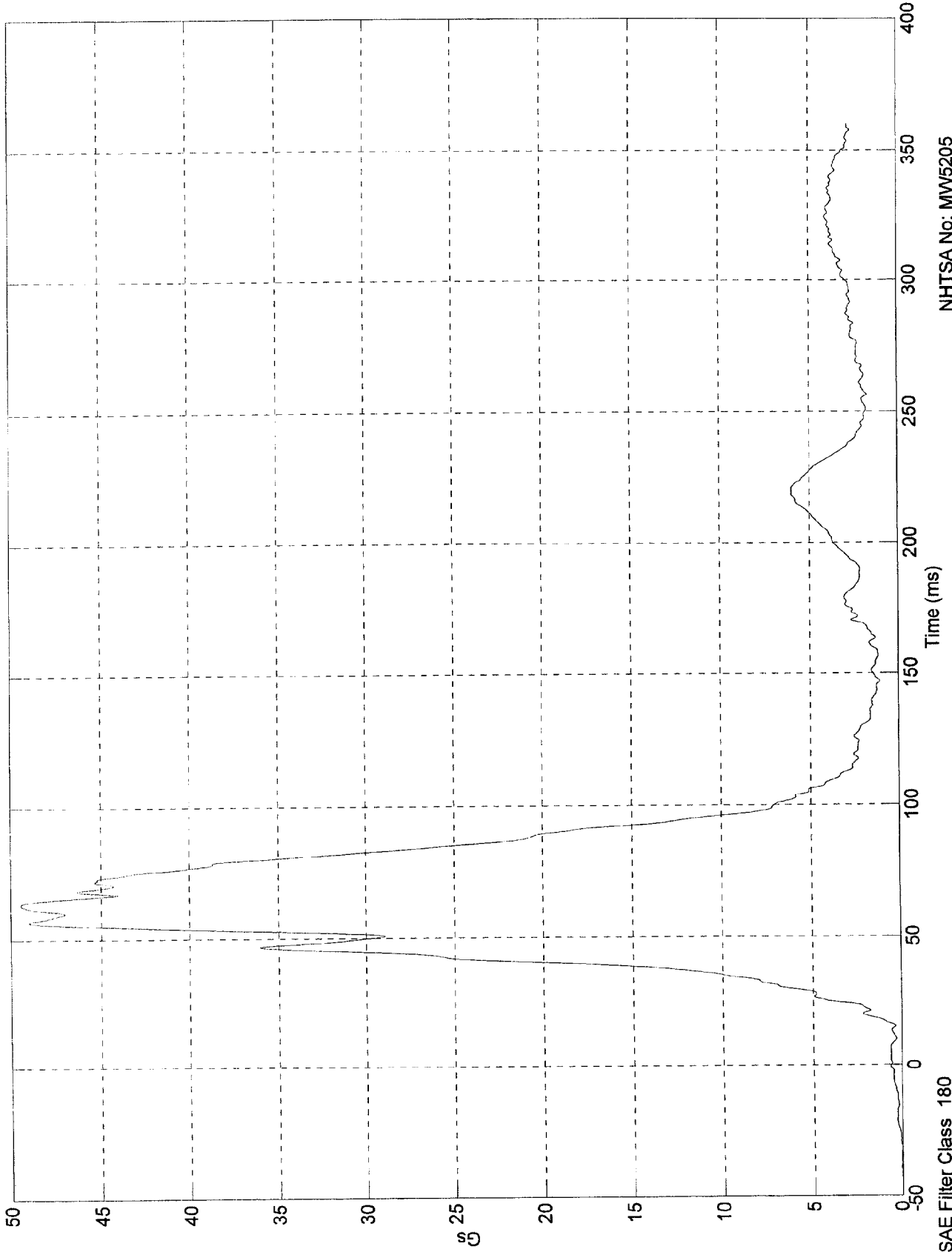
Pos. 1 Chest Z



NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 49.5 Gs @ 63.20 msec
Min = 0.0157 Gs @ -31.20 msec

Pos. 1 Chest Resultant

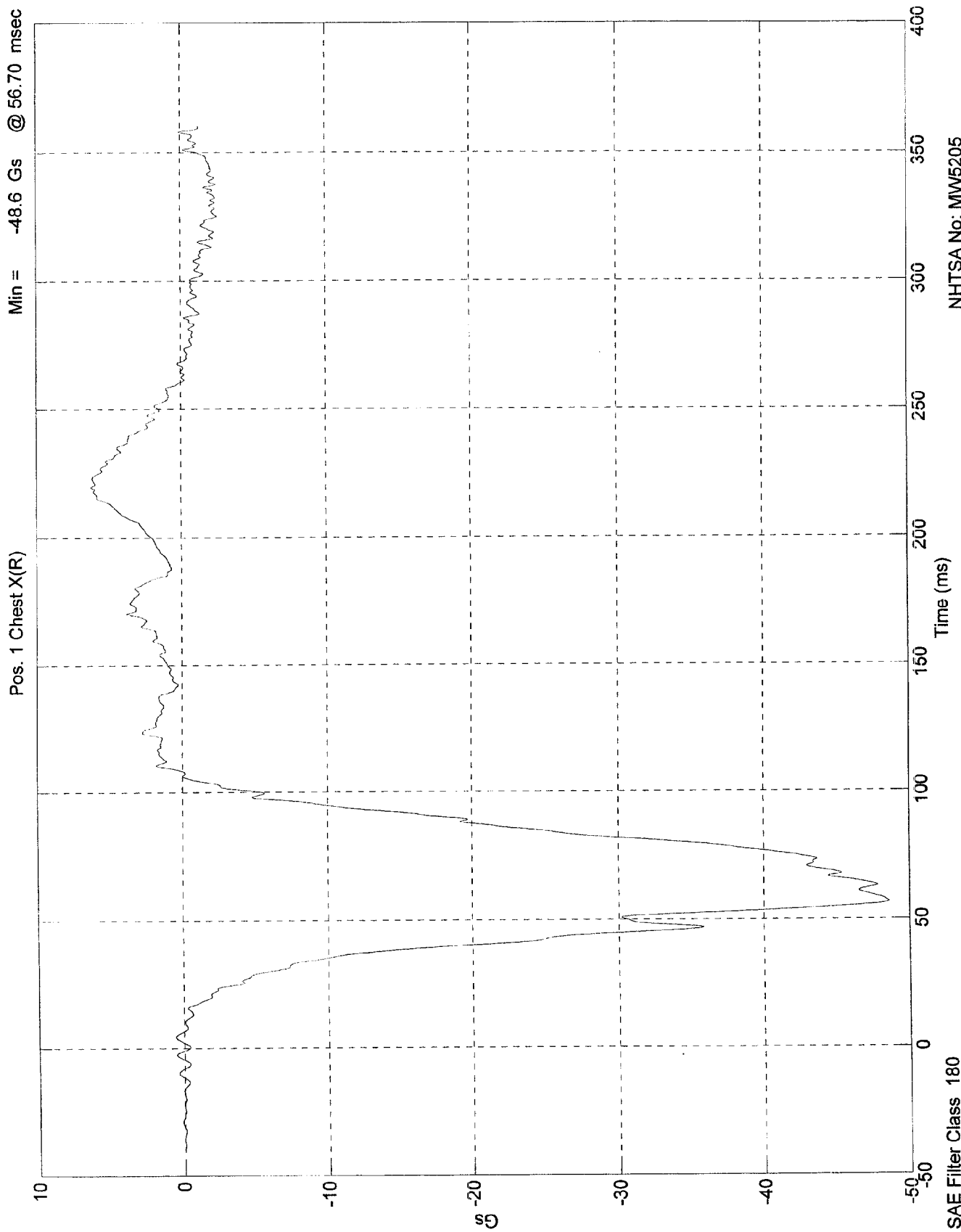


NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 6.25 Gs @ 219.60 msec
Min = -48.6 Gs @ 56.70 msec

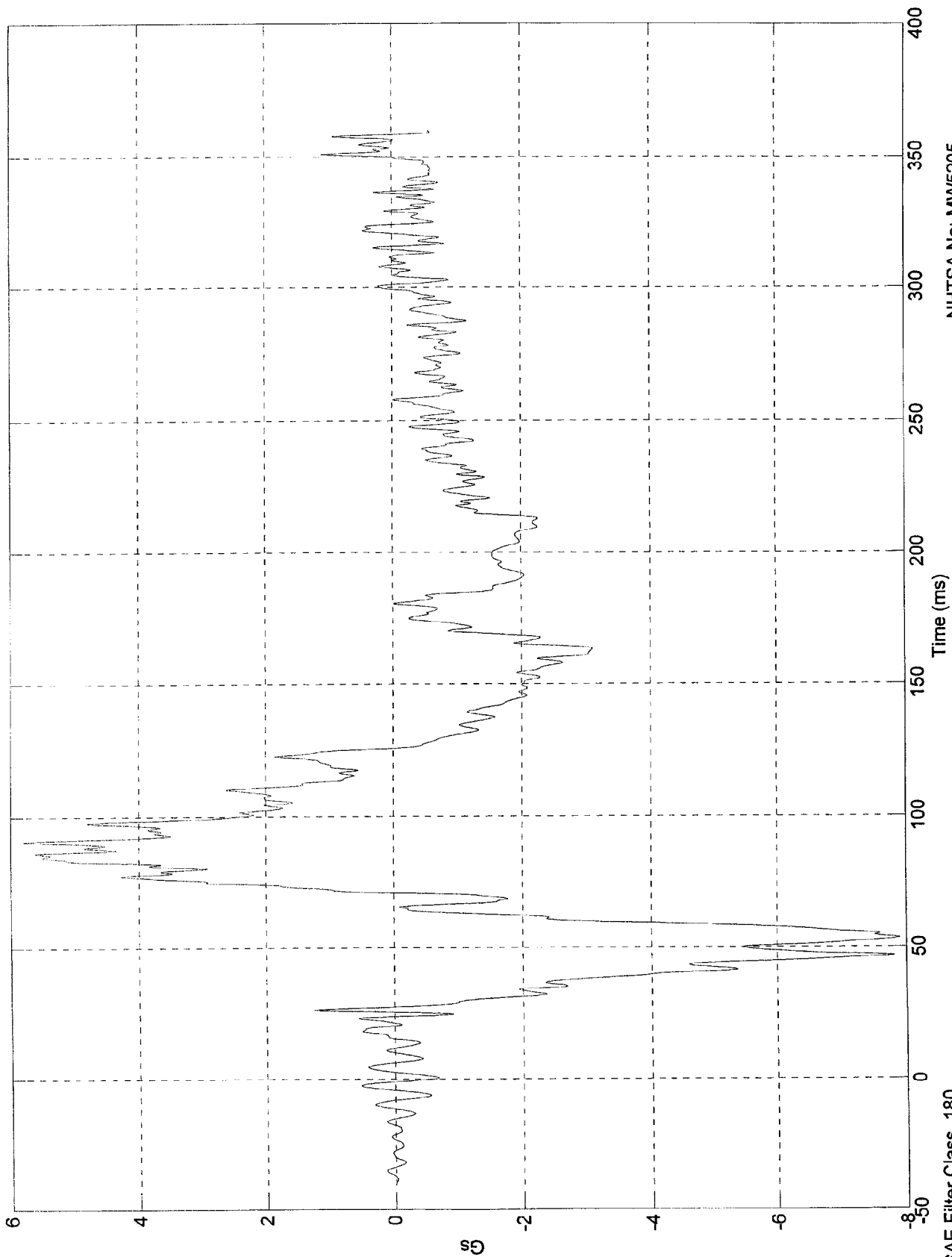


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 5.8 Gs @ 90.60 msec
Min = -7.9 Gs @ 53.30 msec

Pos. 1 Chest Y(R)



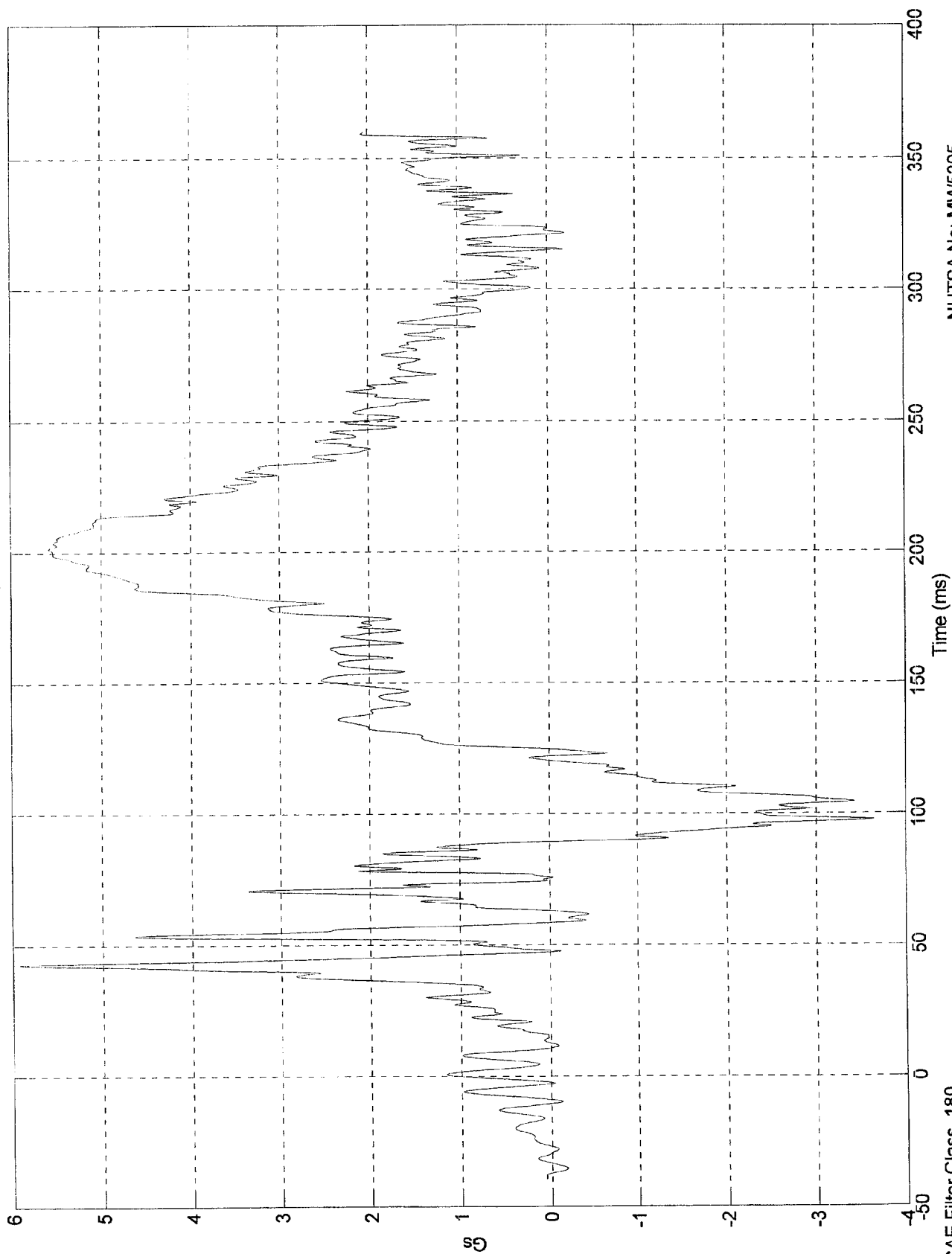
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 5.92 Gs @ 42.80 msec
Min = -3.64 Gs @ 97.60 msec

Pos. 1 Chest Z(R)



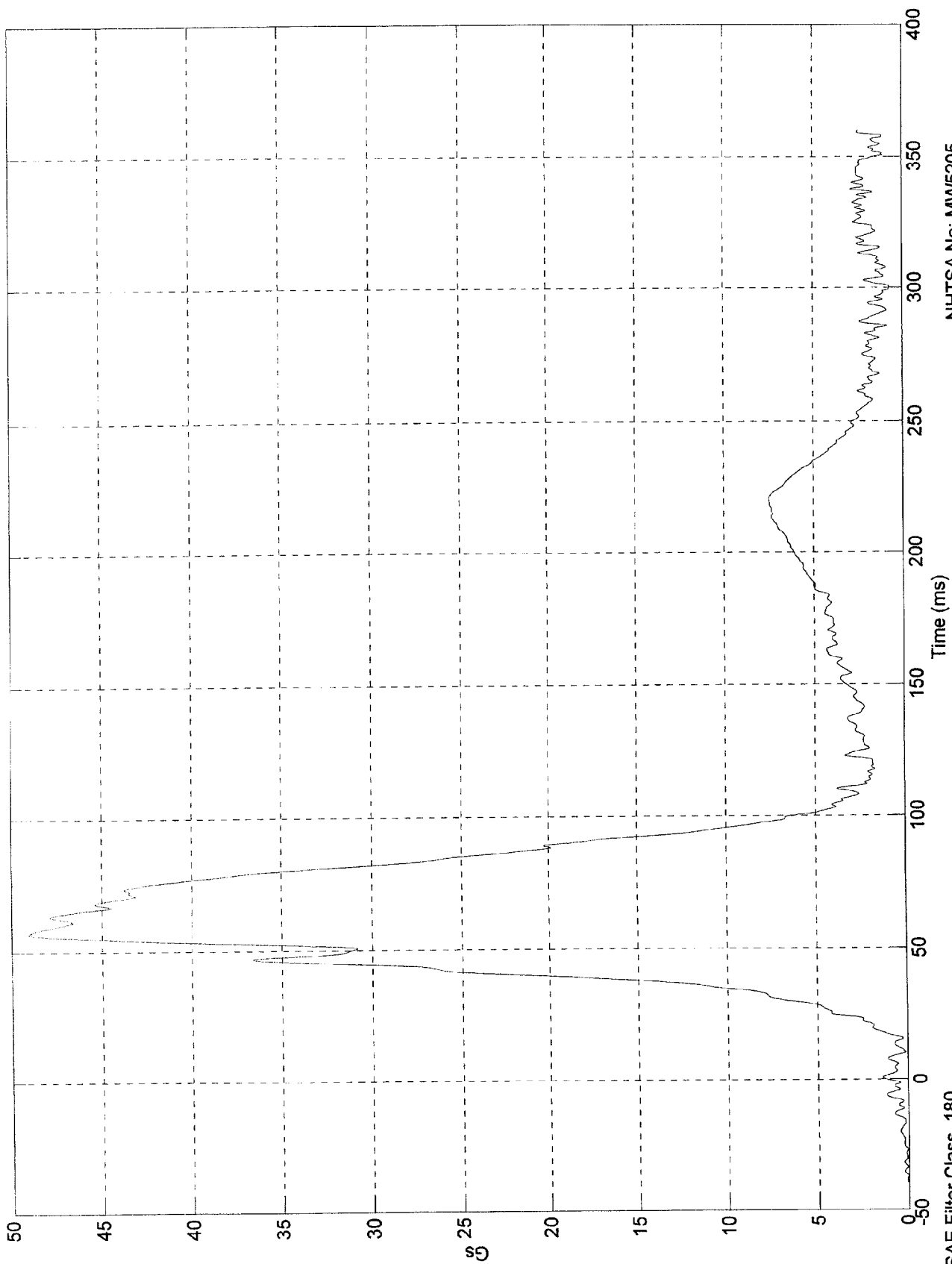
SAE Filter Class 180

NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 49.1 Gs @ 56.60 msec
Min = 0.0243 Gs @ -27.20 msec

Pos. 1 Chest Res(RR)

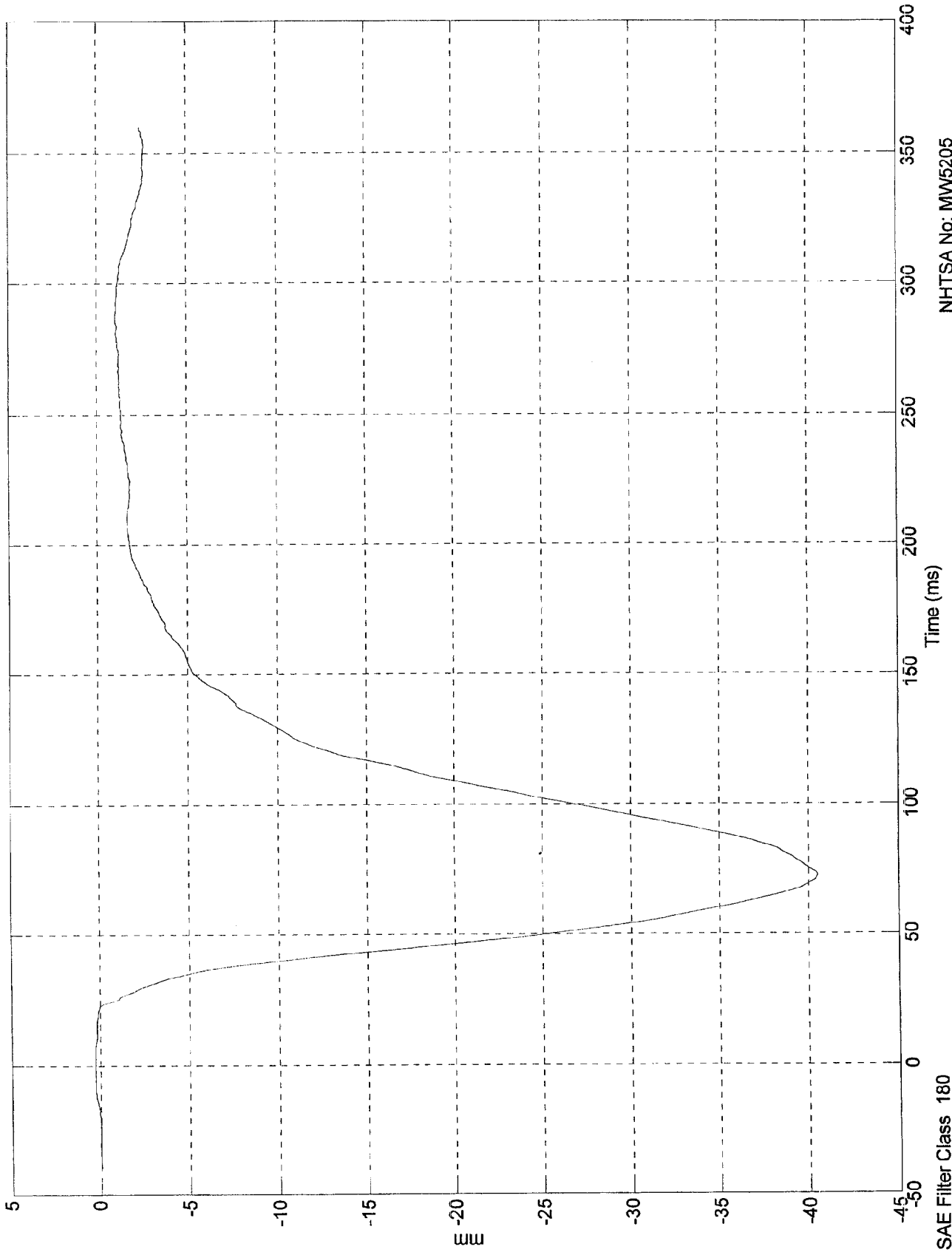


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 0.287 mm @ -0.60 msec
Min = -40.5 mm @ 72.80 msec

Pos. 1 Chest Disp.

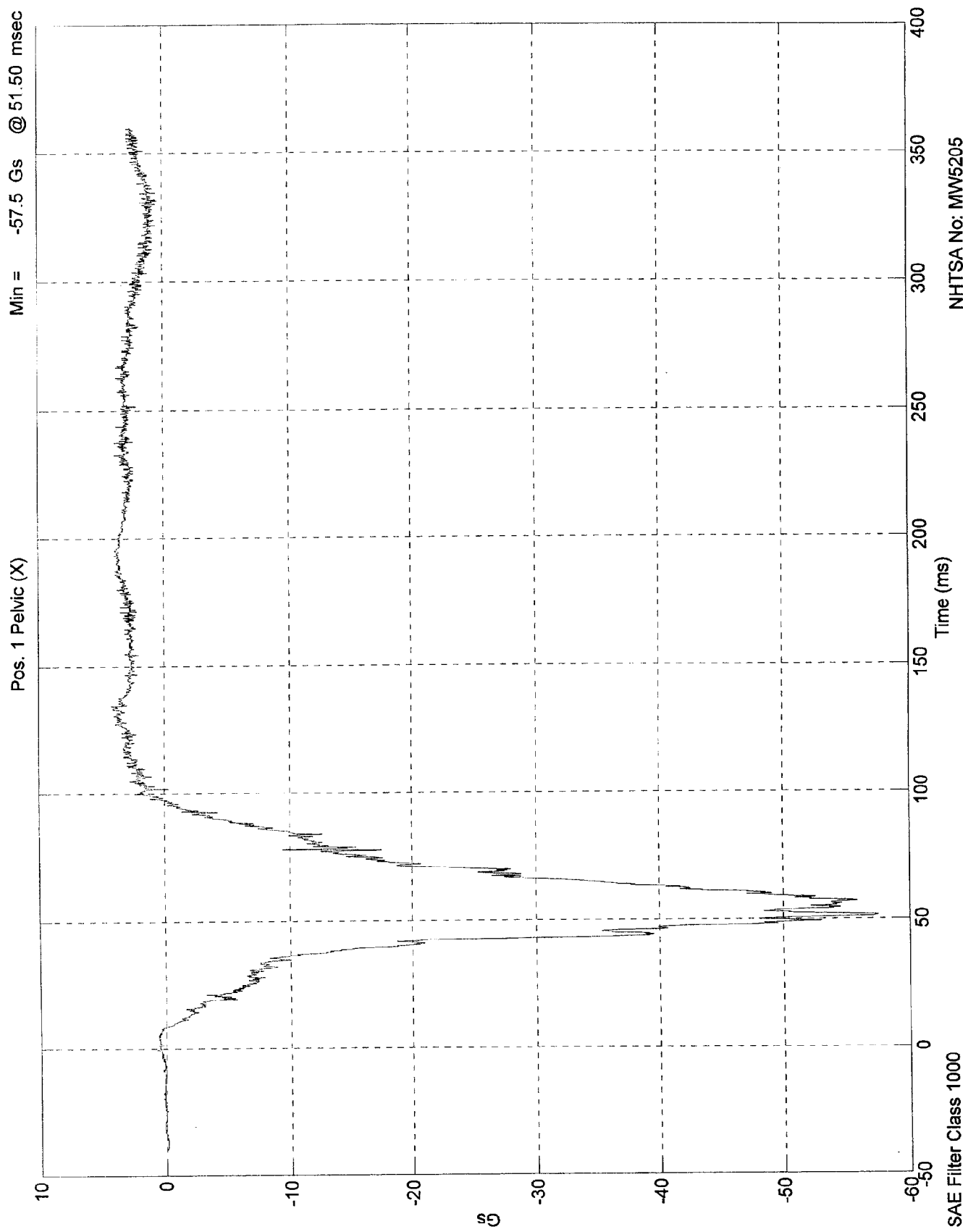


NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 4.2 Gs @ 134.40 msec
Min = -57.5 Gs @ 51.50 msec

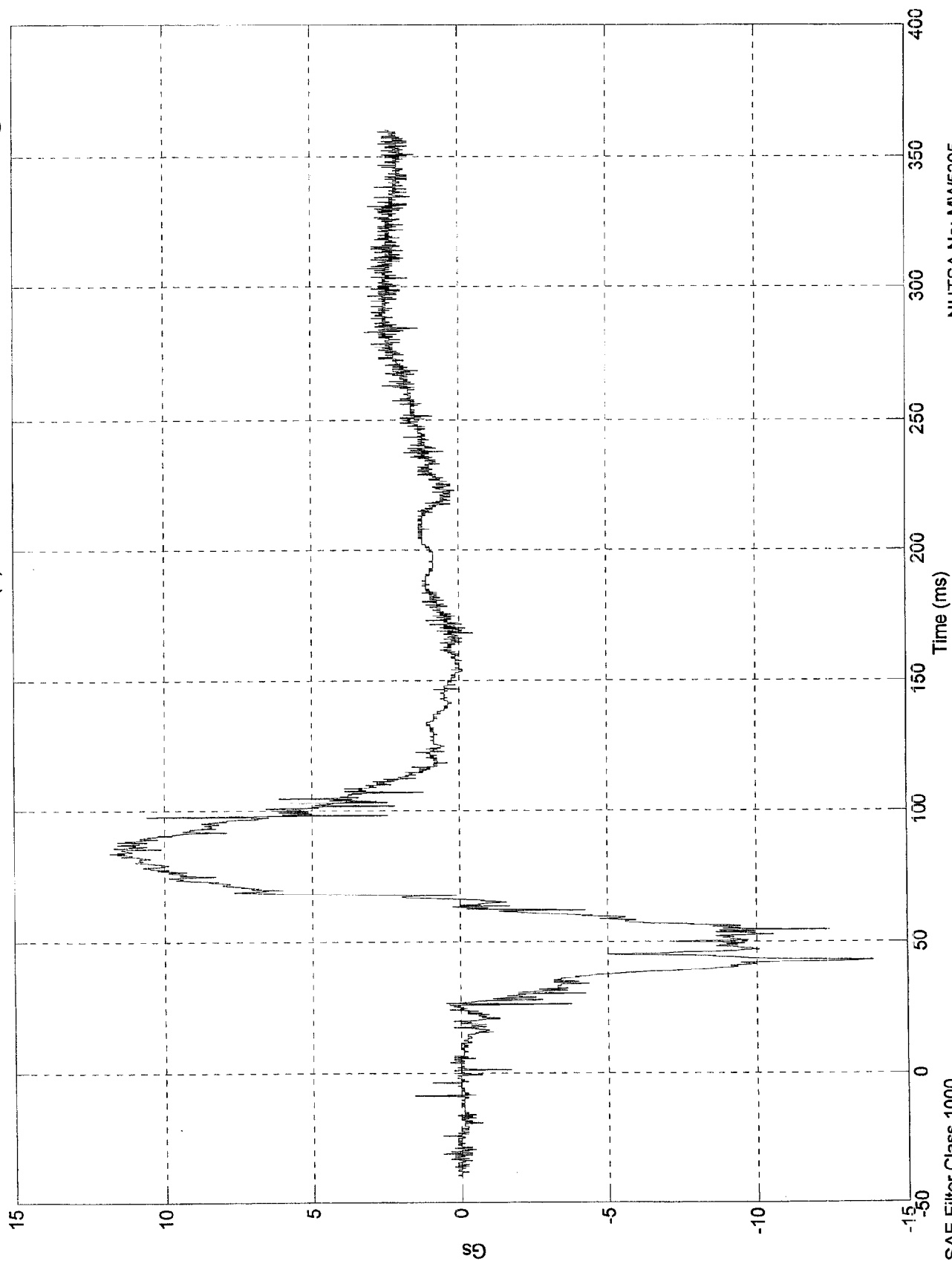


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 11.8 Gs @ 83.70 msec
Min = -13.9 Gs @ 43.10 msec

Pos. 1 Pelvic (Y)

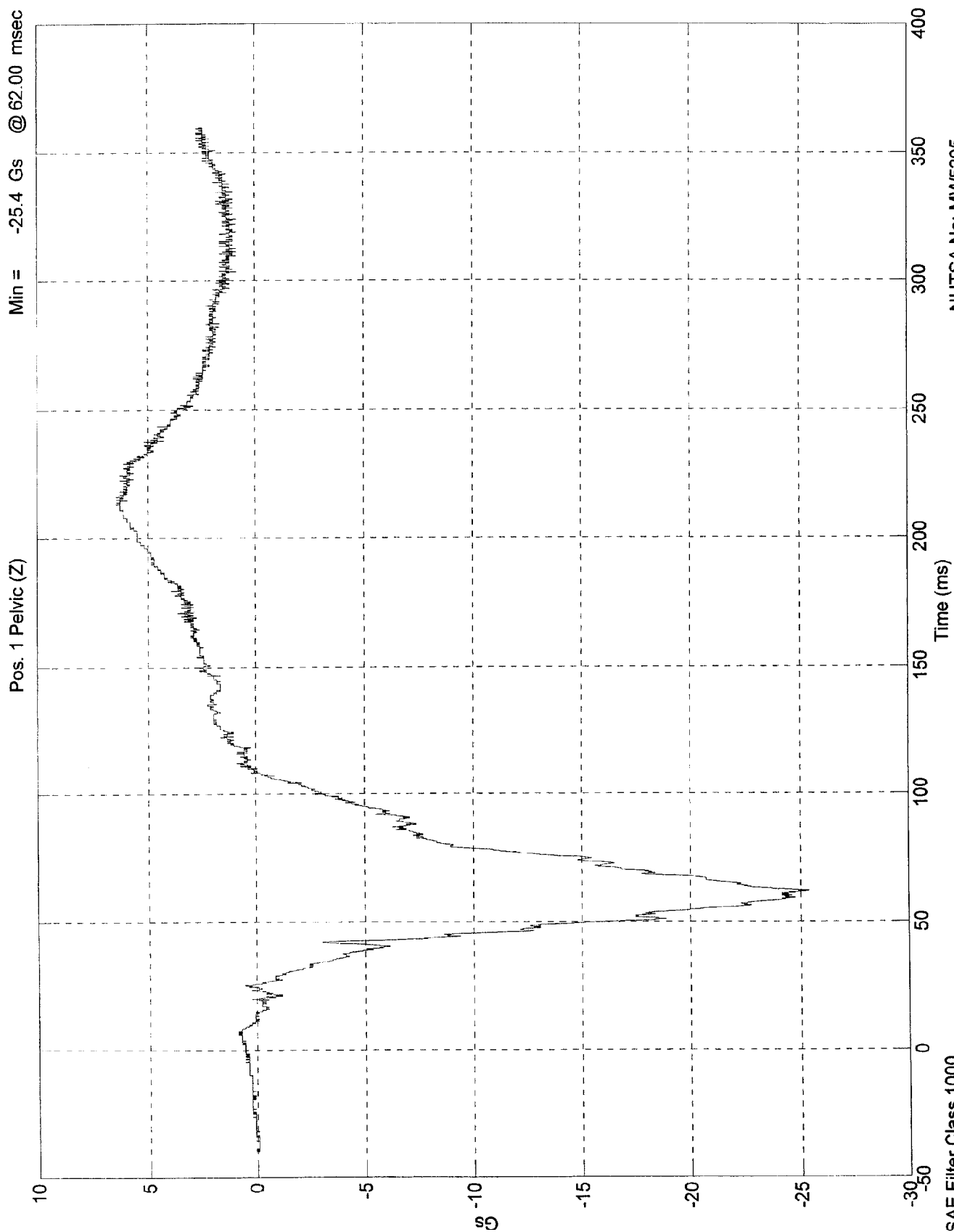


NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 1000

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 6.43 Gs @ 213.20 msec
 Min = -25.4 Gs @ 62.00 msec



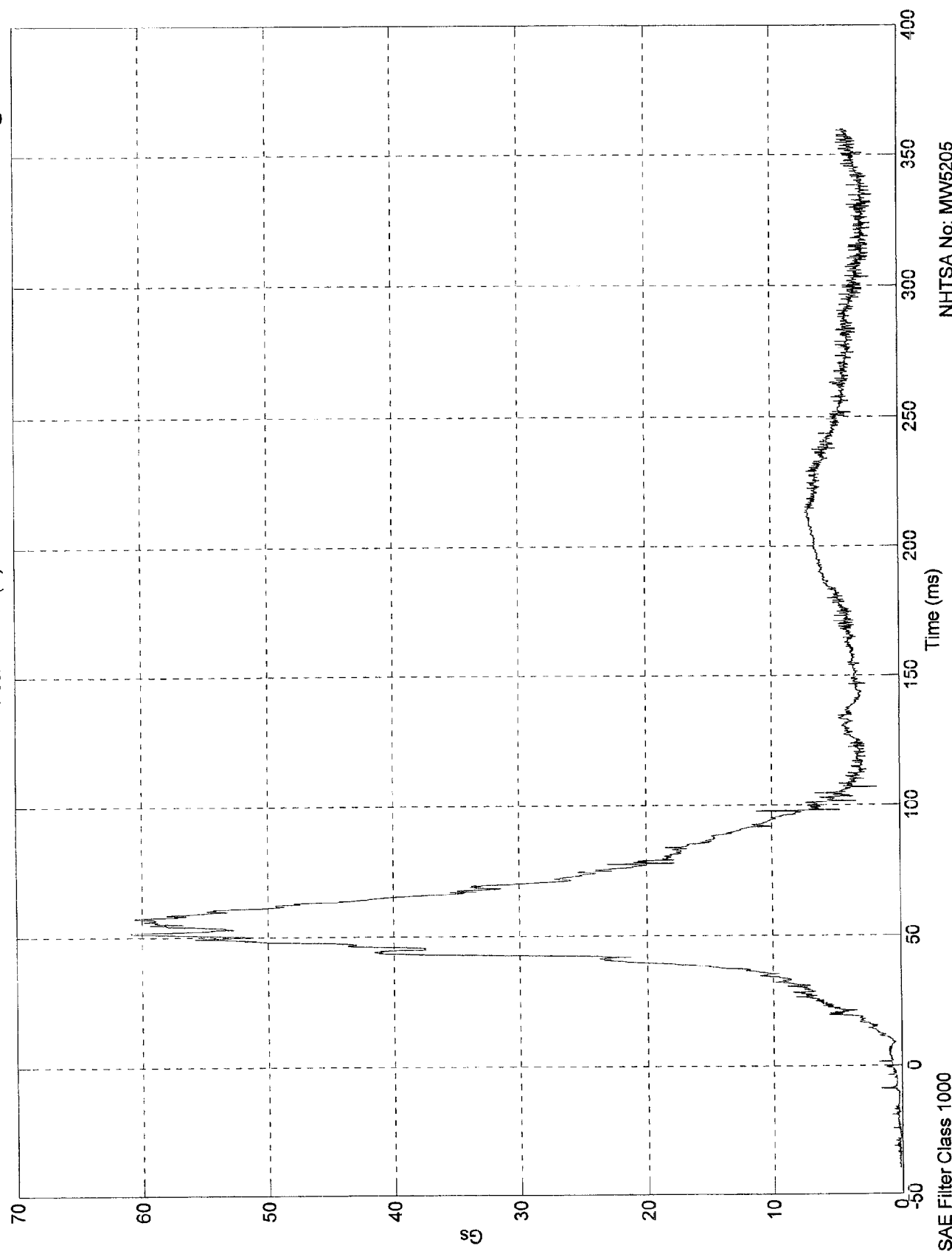
NHTSA No: MW5205
 Date: 04 Feb 1998

SAE Filter Class 1000

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 60.9 Gs @ 51.50 msec
Min = 0.0681 Gs @ -33.60 msec

Pos. 1 Pelvic (R)



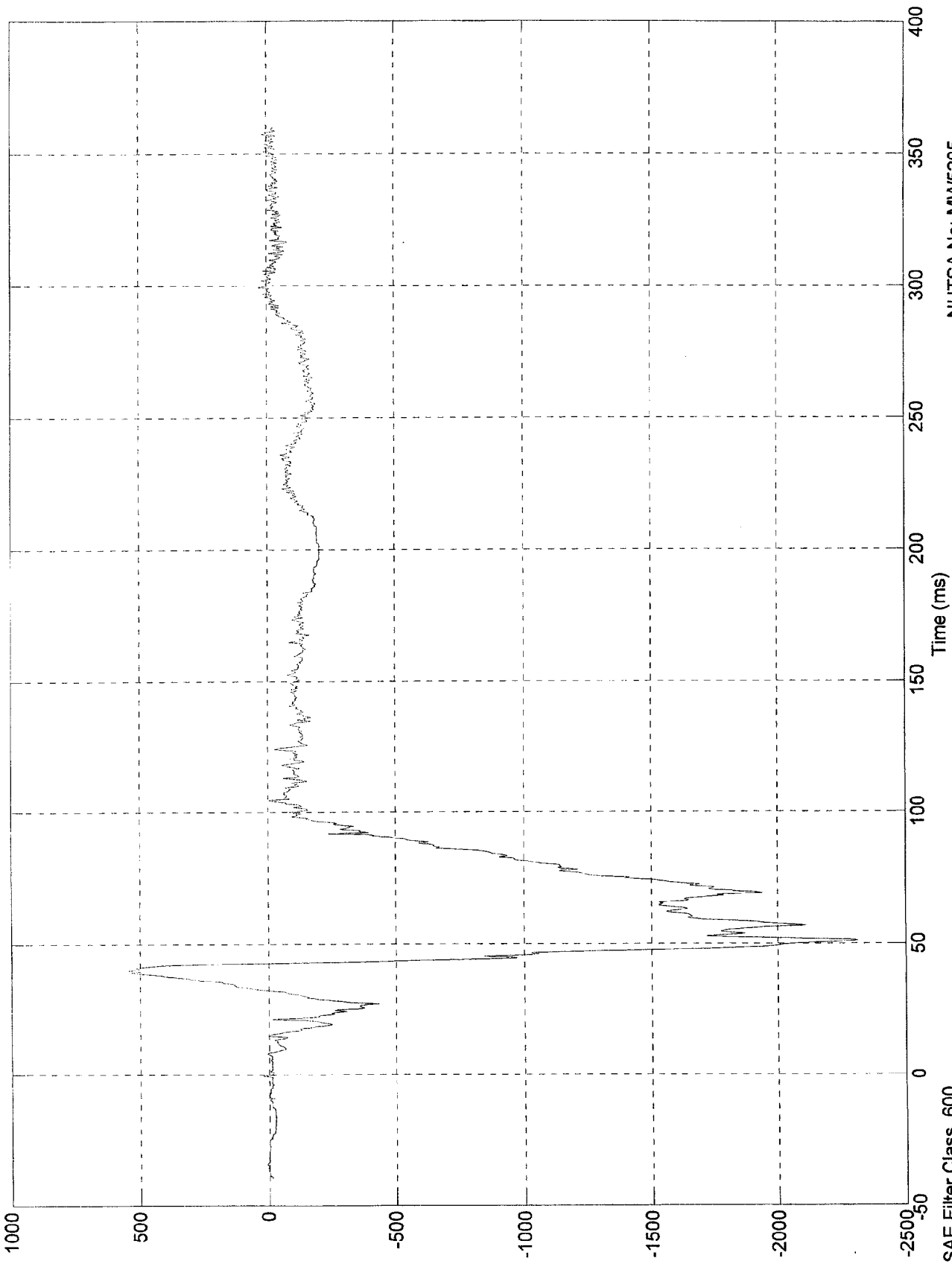
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 1000

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 543 Nwt @ 40.20 msec
Min = -2.31e+003 Nwt @ 51.20 msec

Pos. 1 Left Femur

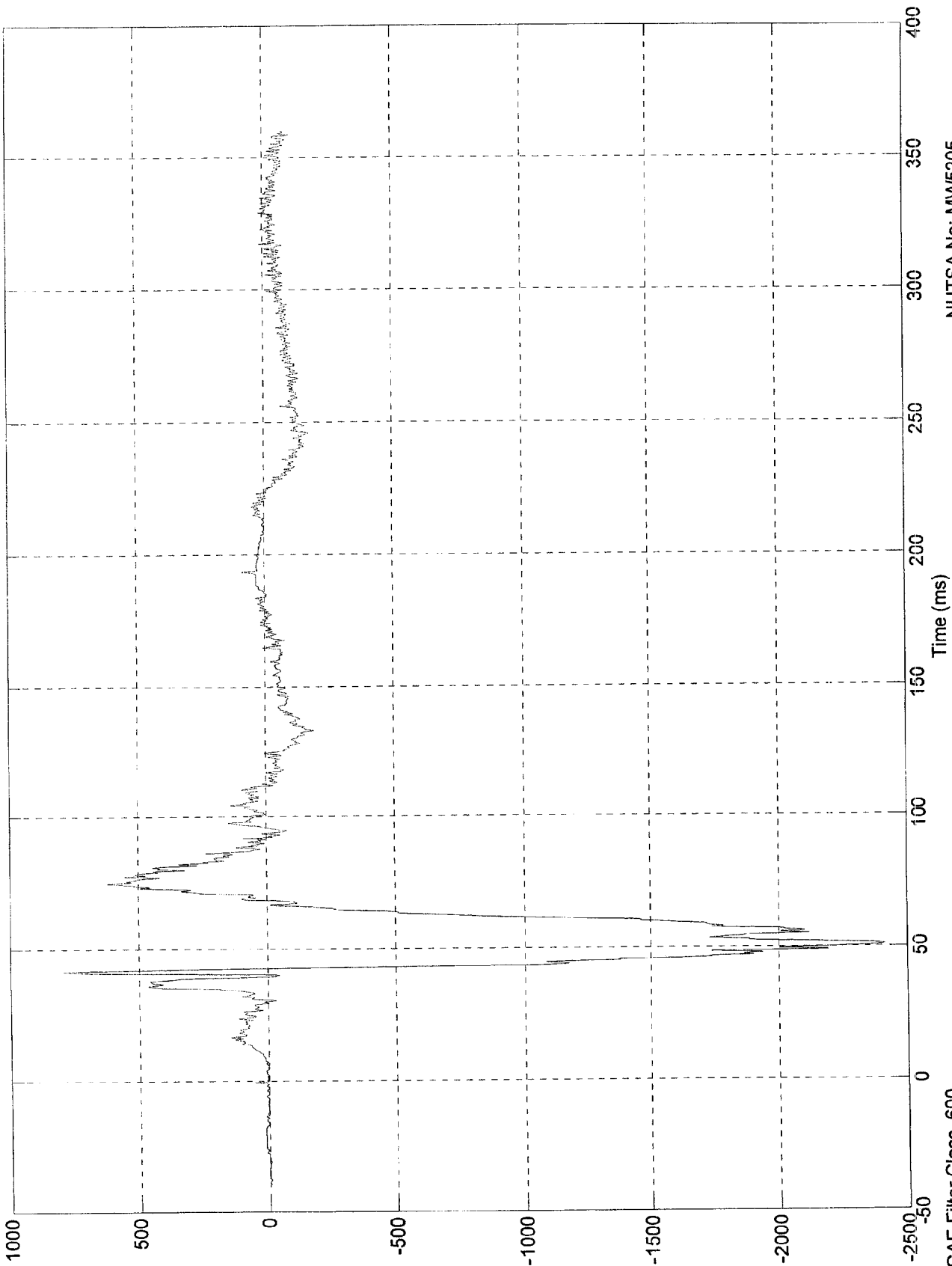


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 793 Nwt @ 41.60 msec
Min = -2.41e+003 Nwt @ 50.90 msec

Pos. 1 Right Femur



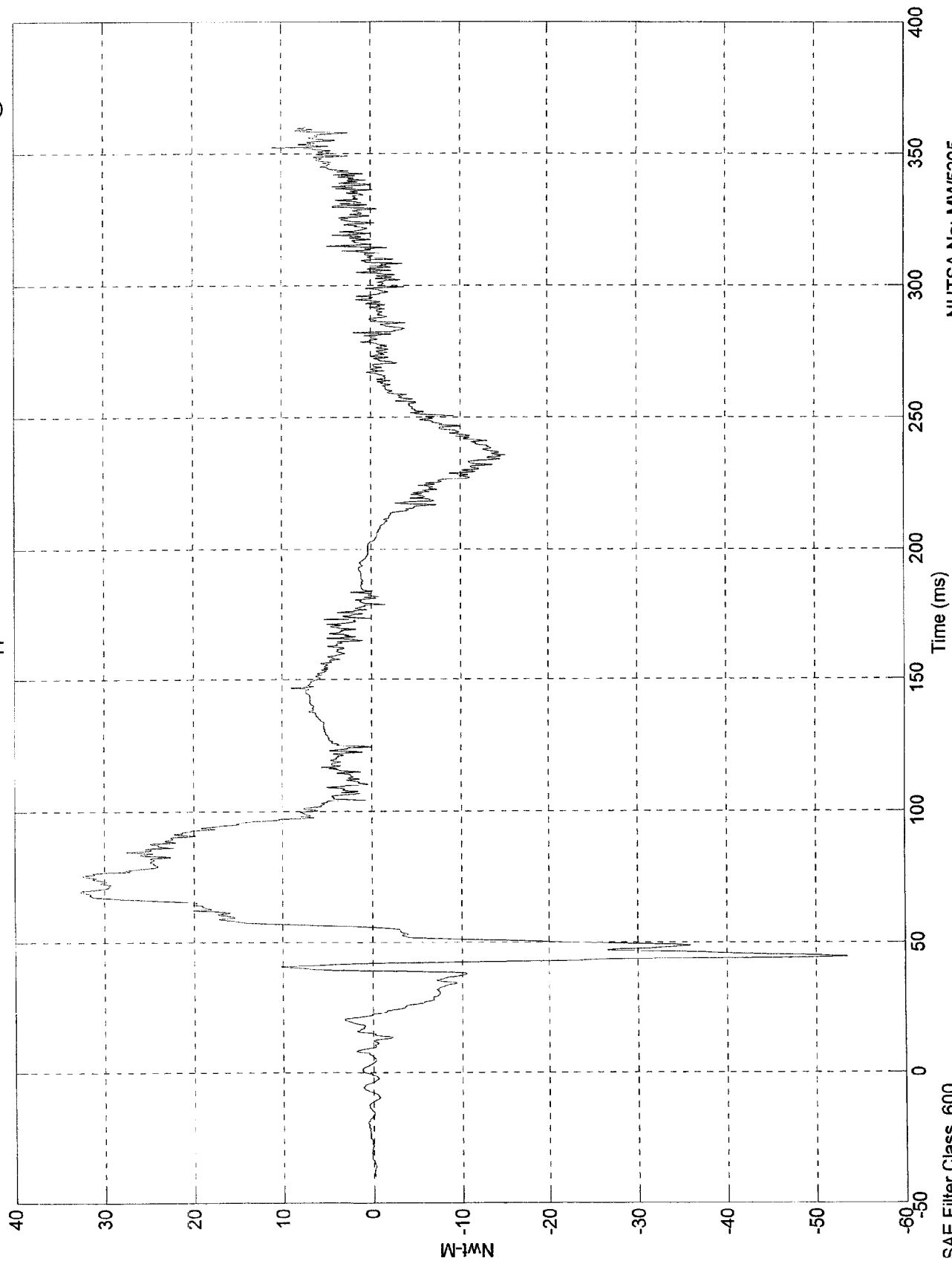
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 32.6 Nwt-M @ 69.30 msec
Min = -53.5 Nwt-M @ 44.40 msec

P1 Lt Upper Tibia Mx



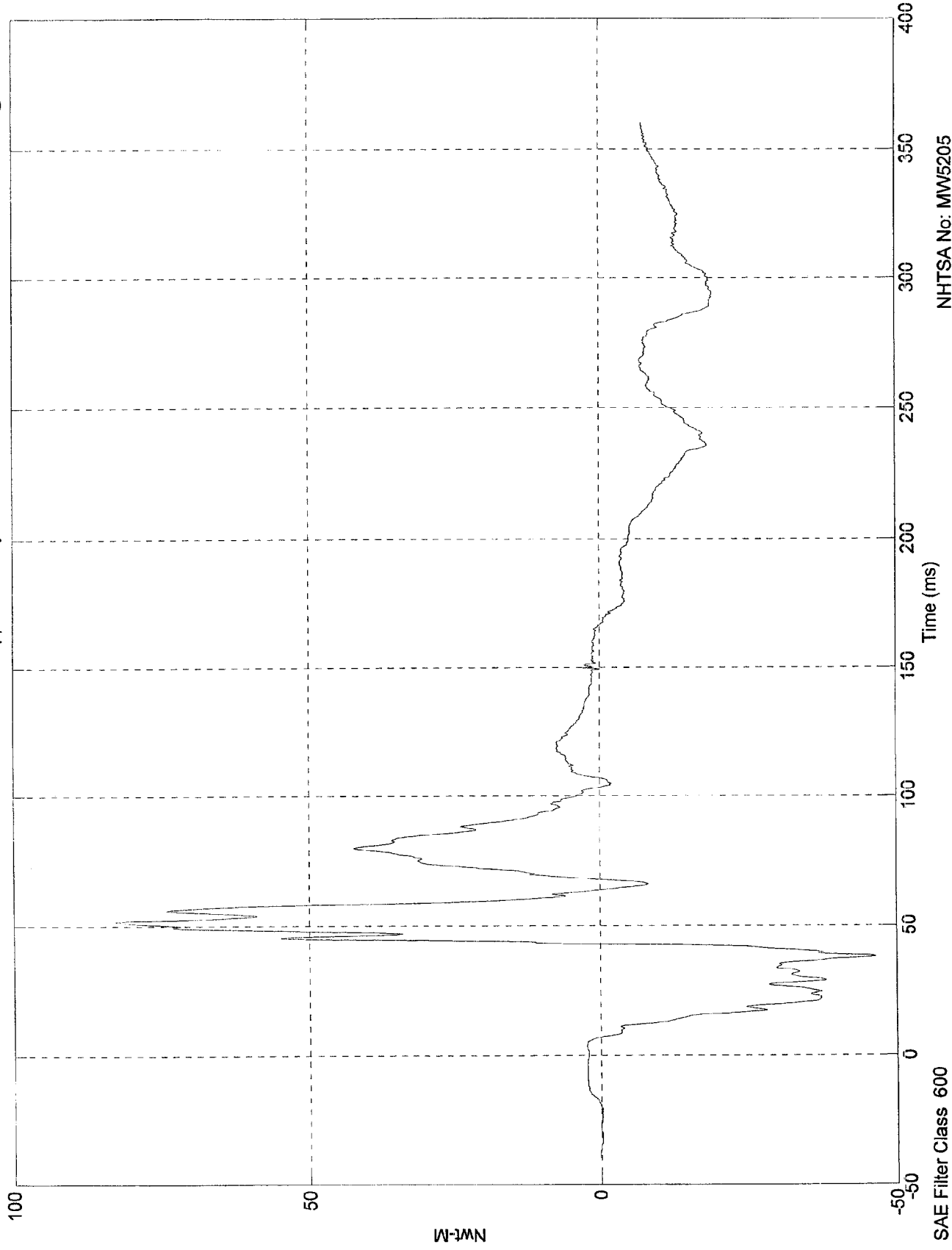
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 82.7 Nwt-M @ 51.60 msec
Min = -46.5 Nwt-M @ 38.00 msec

P1 Lt Upper Tibia My



NHTSA No: MW5205
Date: 04 Feb 1998

W-MN

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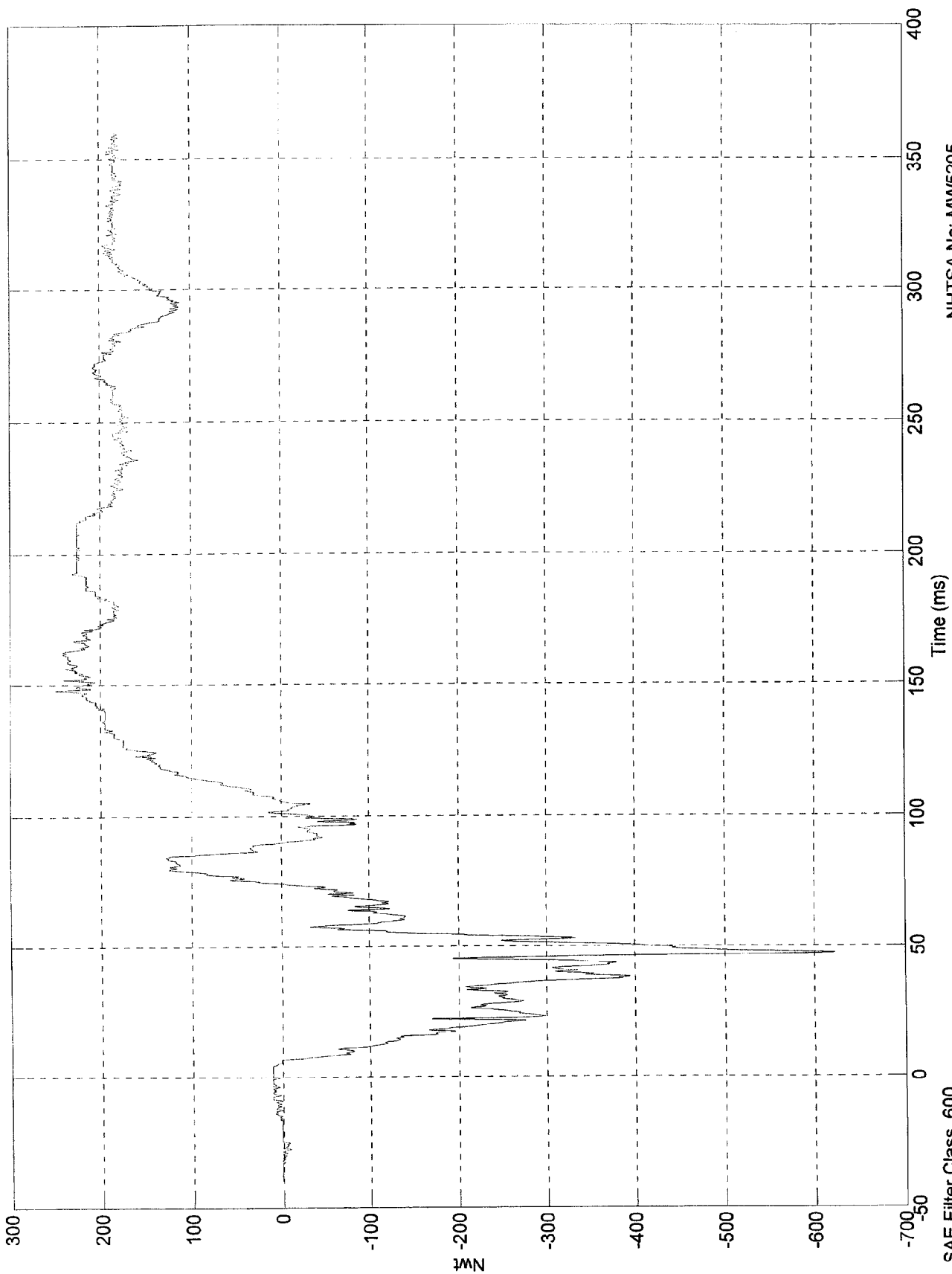
8413-21

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 250 Nwt @ 147.90 msec
Min = -622 Nwt @ 47.20 msec

P1 Lt Lower Tibia Fx



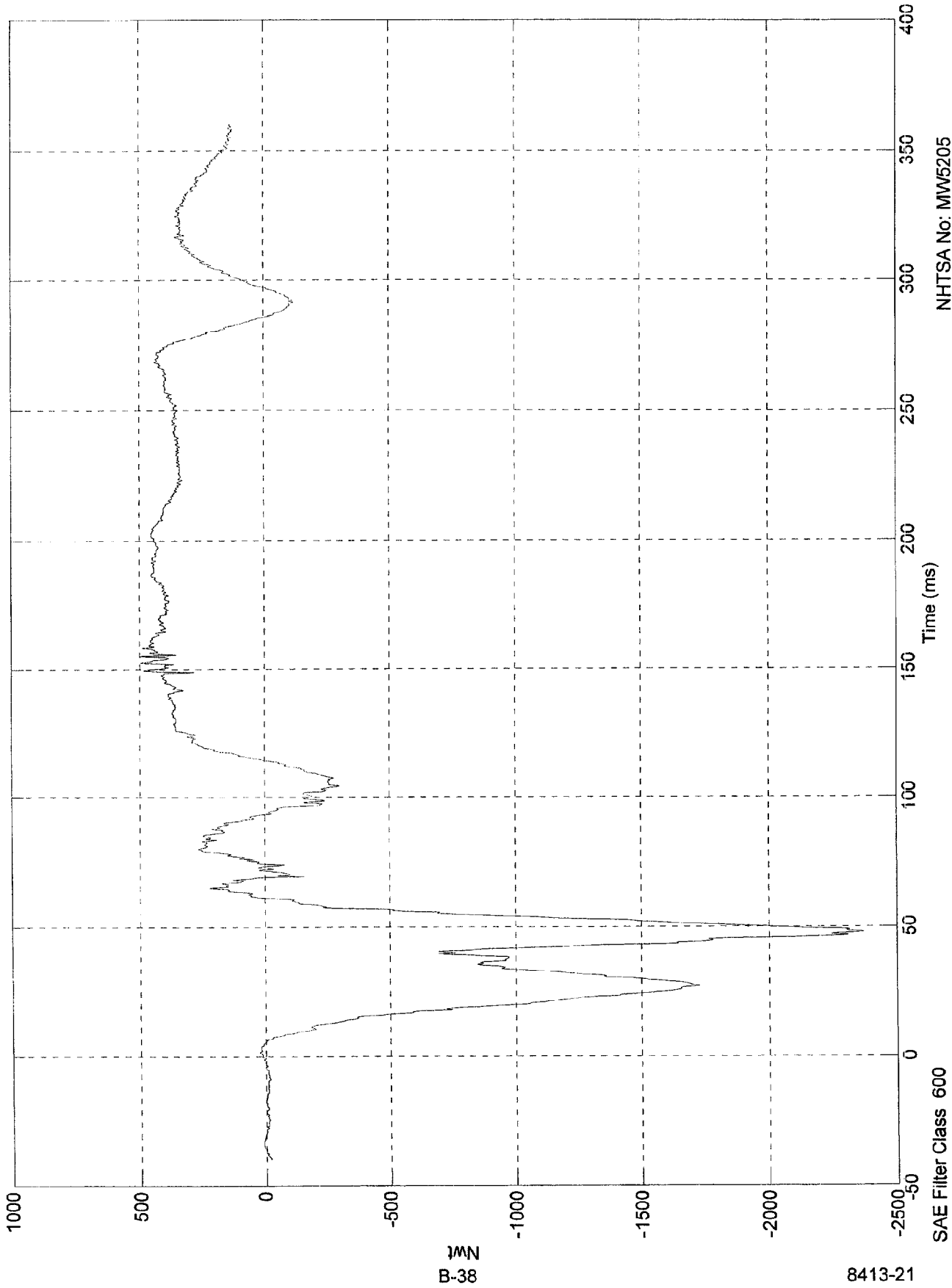
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 500 Nwt @ 155.20 msec
Min = -2.37e+003 Nwt @ 47.80 msec

P1 Lt Lower Tibia Fz

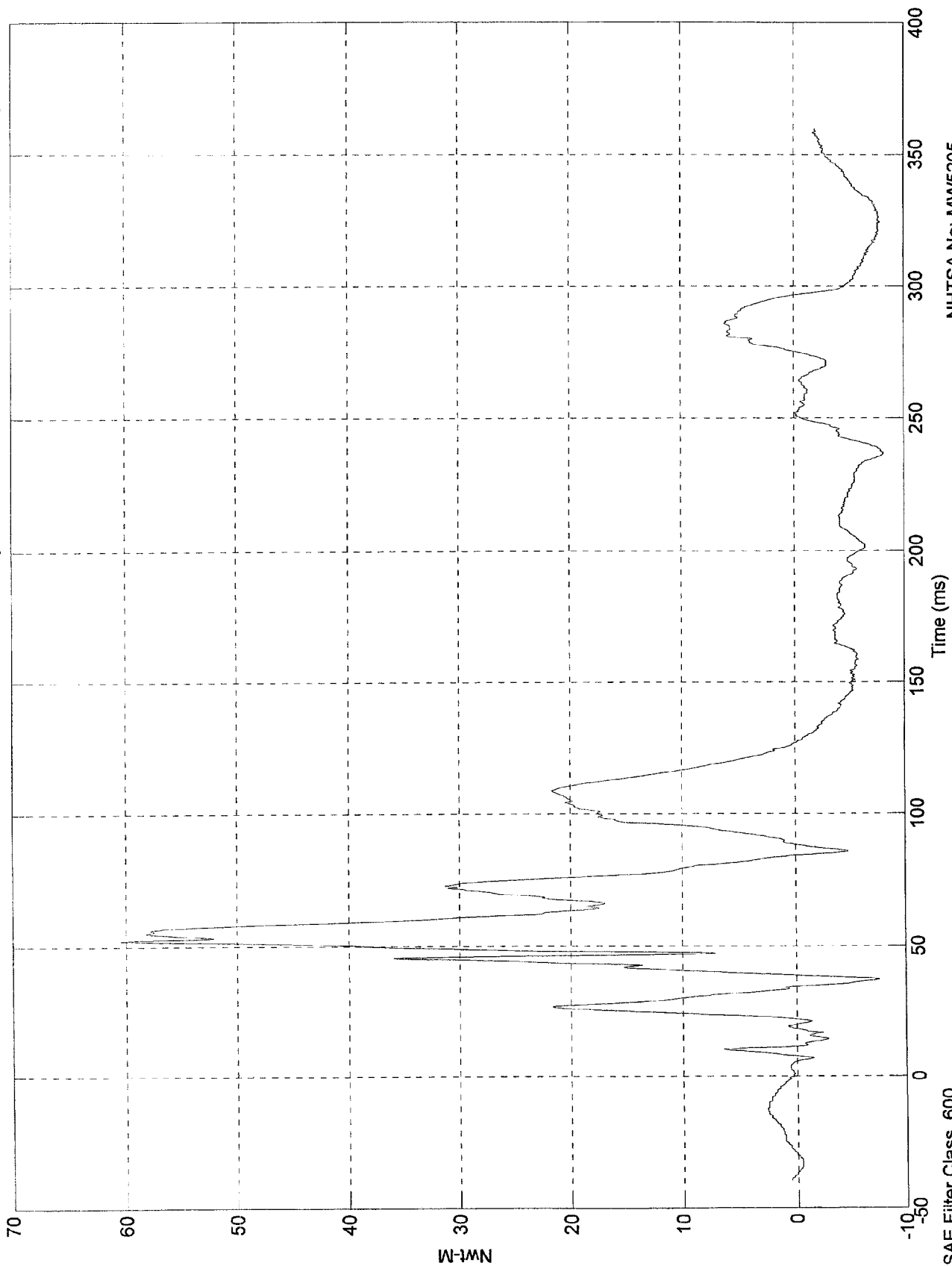


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 60.4 Nwt-M @ 52.20 msec
Min = -8.18 Nwt-M @ 236.70 msec

P1 Lt Lower Tibia My



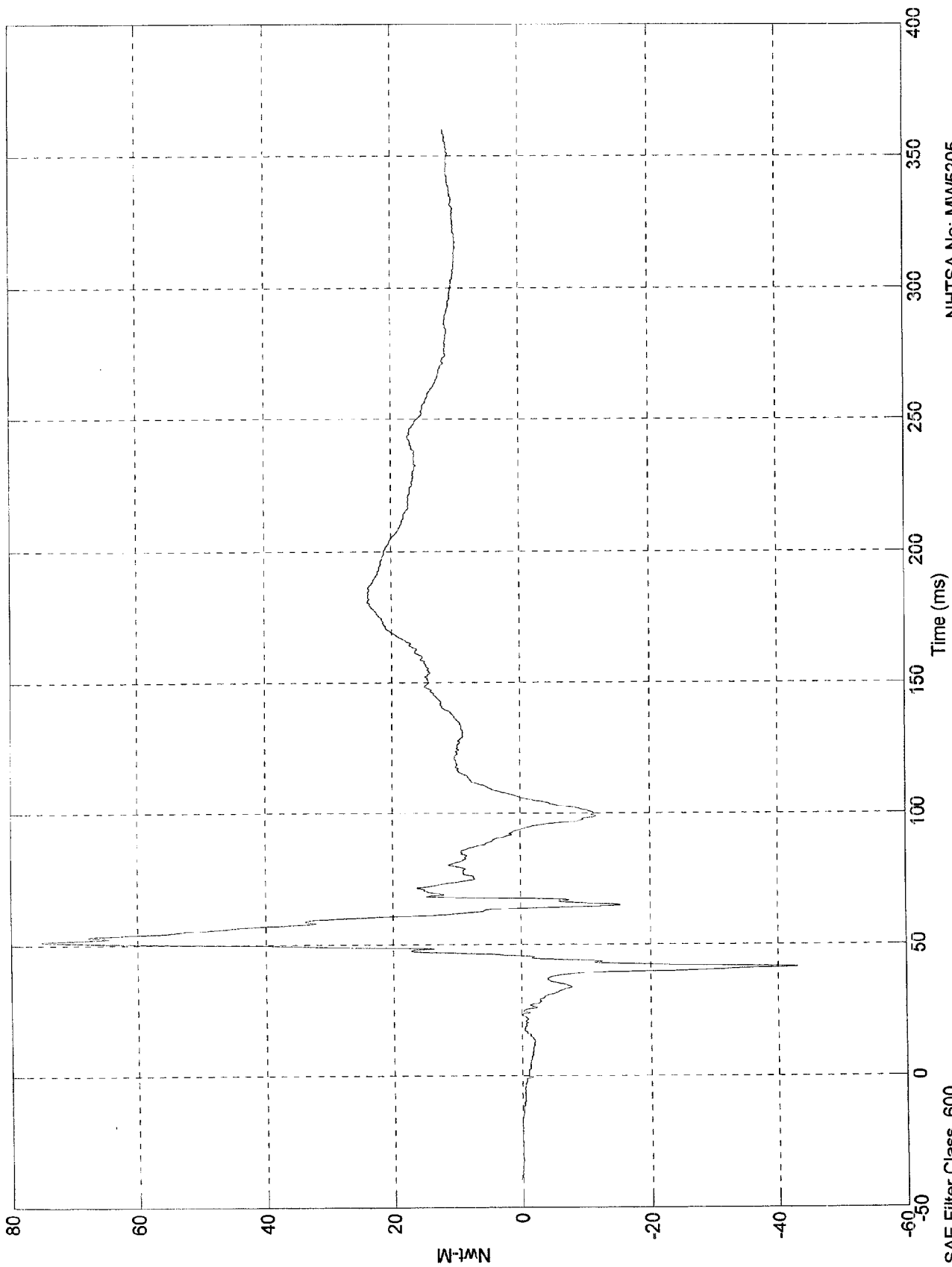
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 75.2 Nwt-M @ 51.20 msec
Min = -43.1 Nwt-M @ 41.30 msec

P1 Rt Upper Tibia Mx



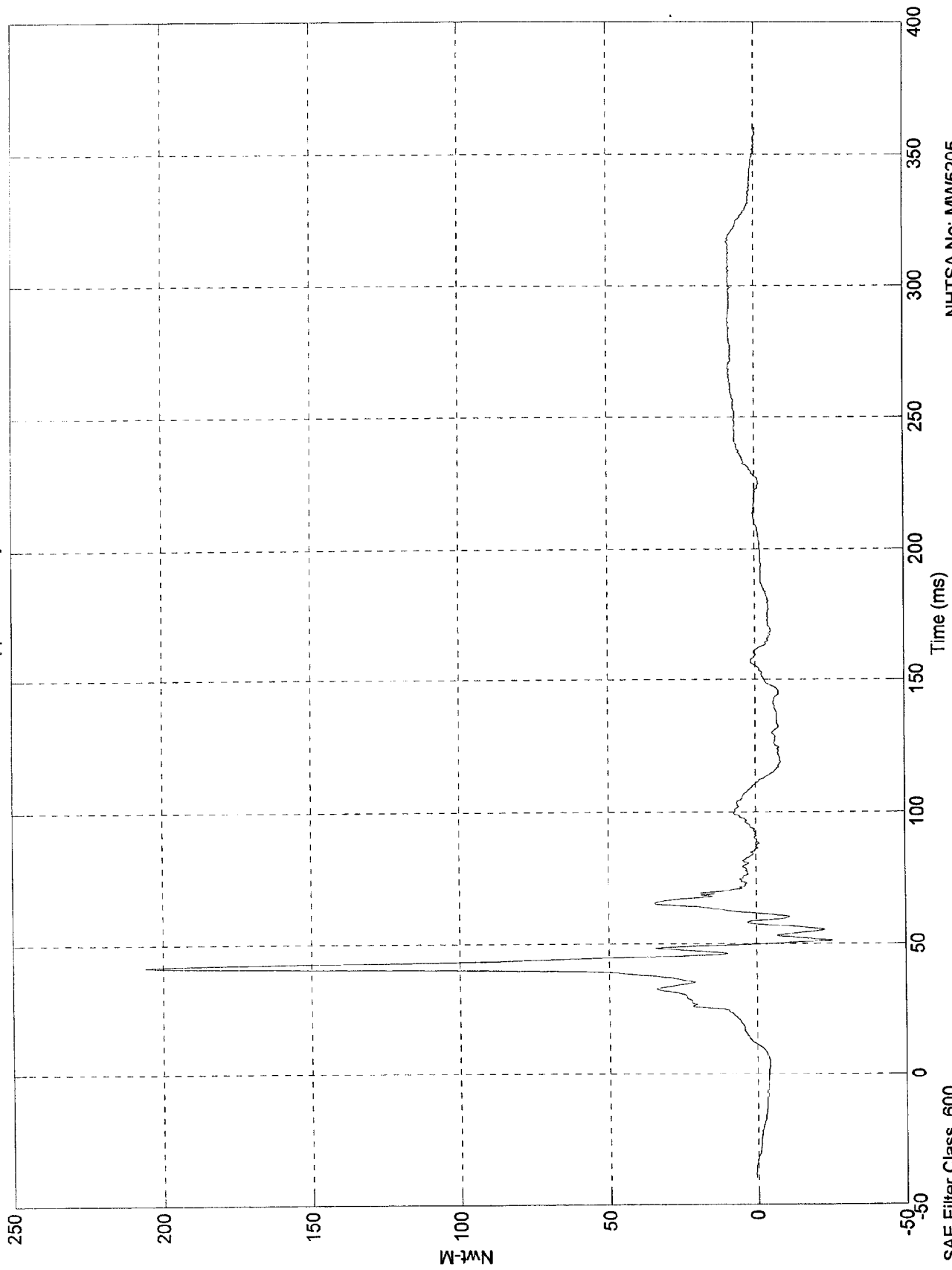
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 206 Nwt-M @ 41.40 msec
Min = -25.6 Nwt-M @ 51.30 msec

P1 Rt Upper Tibia My



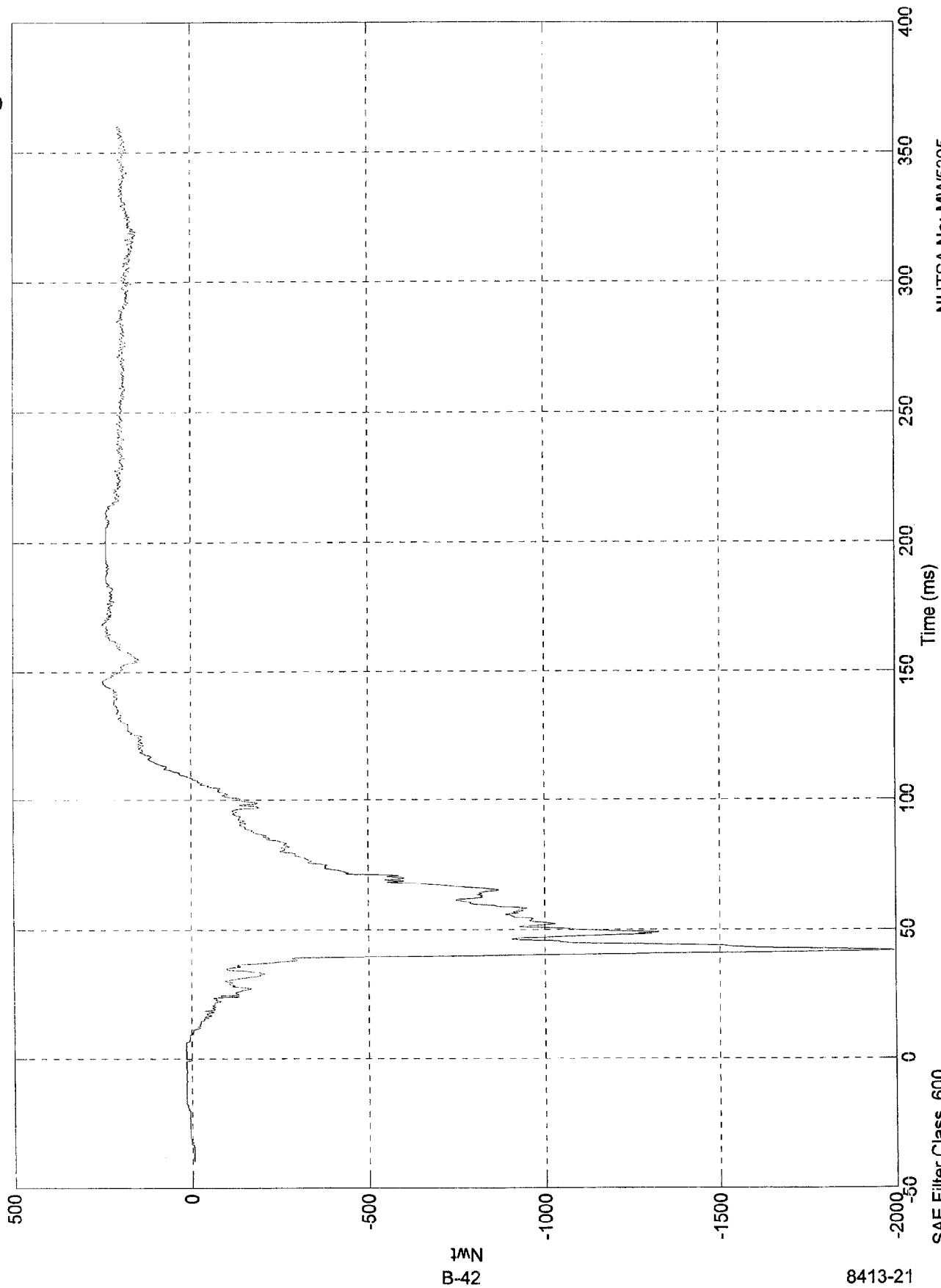
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 248 Nwt @ 168.50 msec
Min = -2e+003 Nwt @ 41.70 msec

P1 Rt Lower Tibia Fx



NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

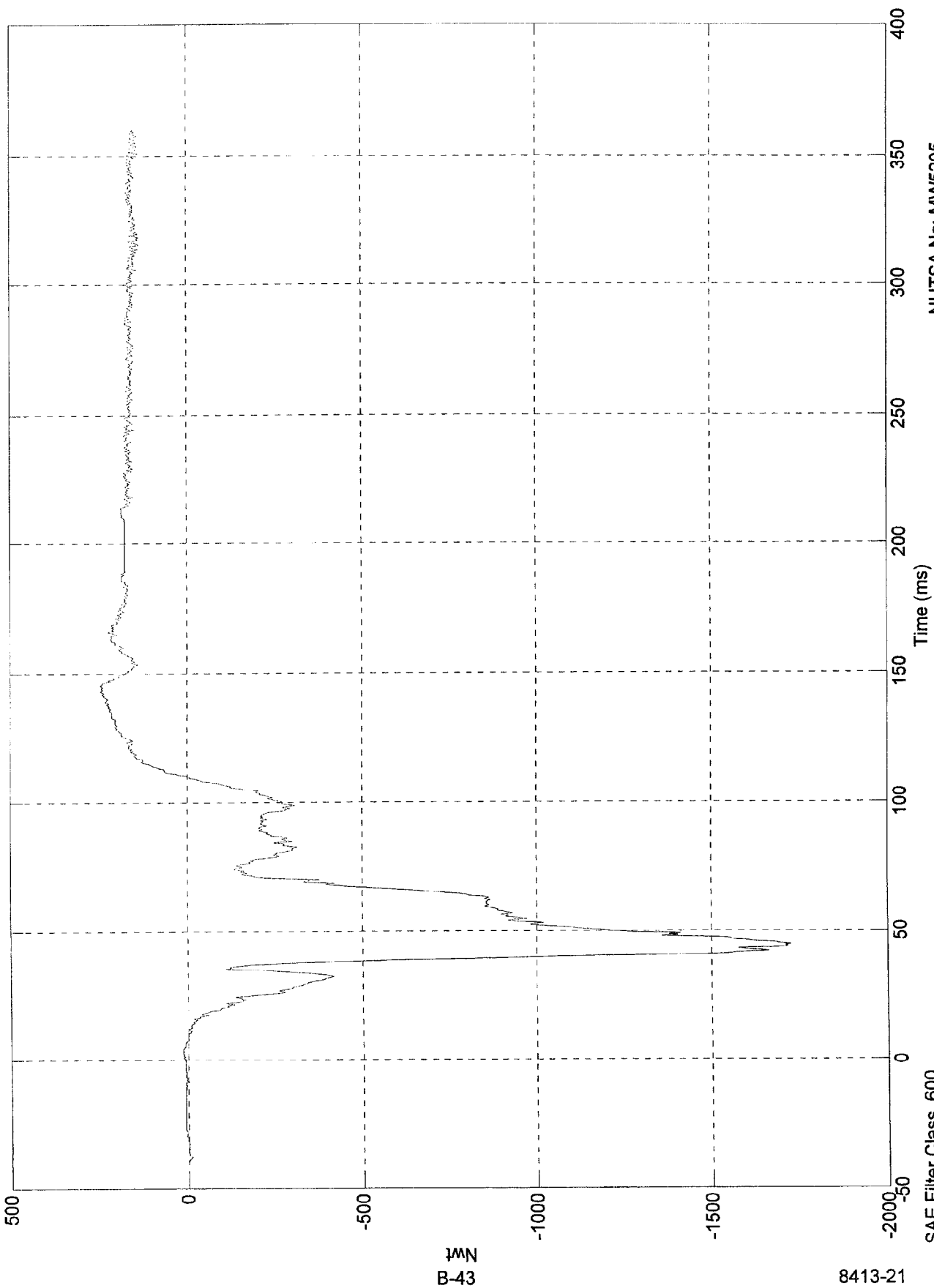
B-42

8413-21

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 245 Nwt @ 143.10 msec
Min = -1.72e+003 Nwt @ 44.80 msec

P1 Rt Lower Tibia Fz



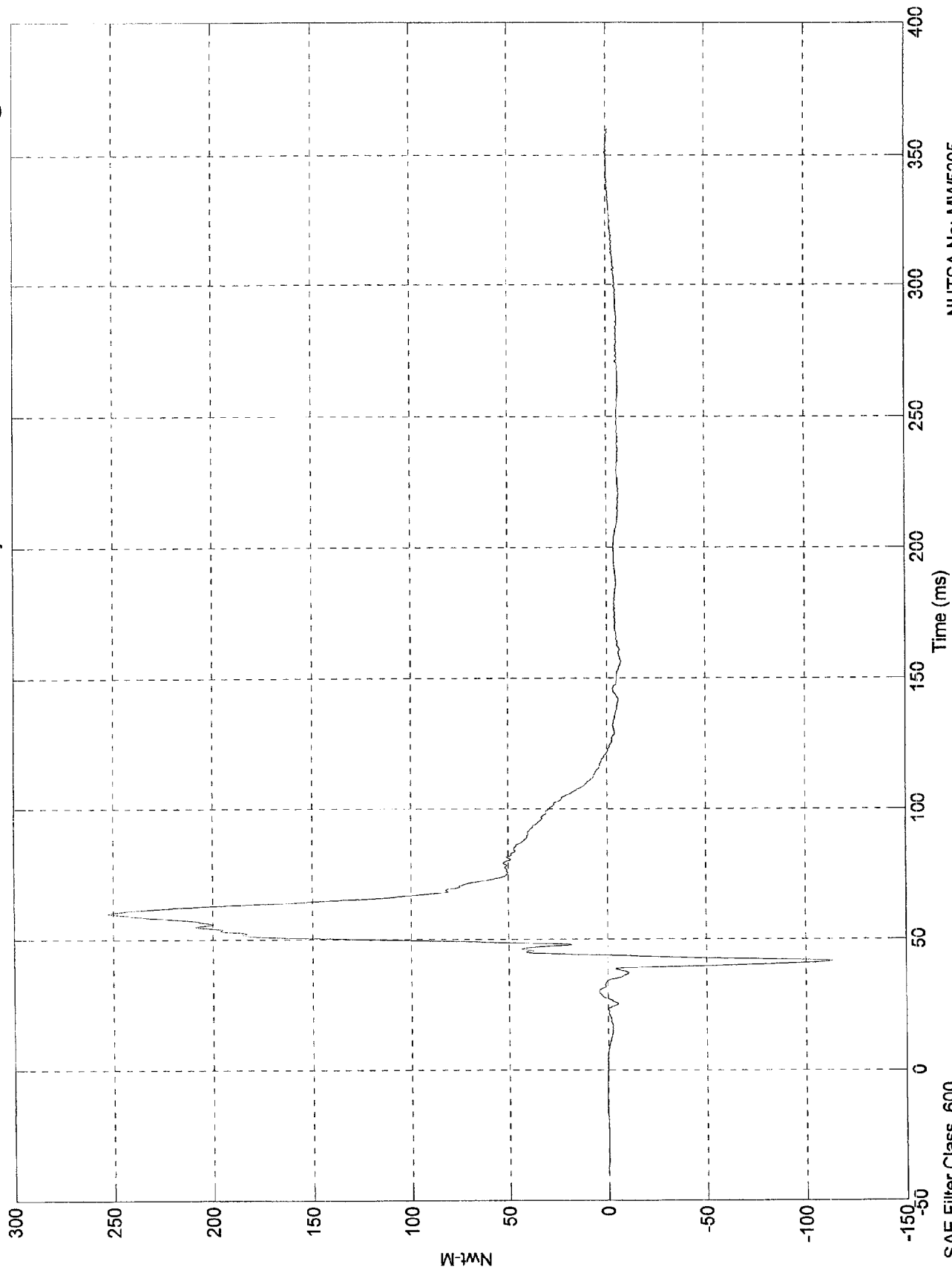
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 253 Nwt-M @ 60.00 msec
Min = -113 Nwt-M @ 41.60 msec

P1 Rt Lower Tibia My



NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

Nwt-M

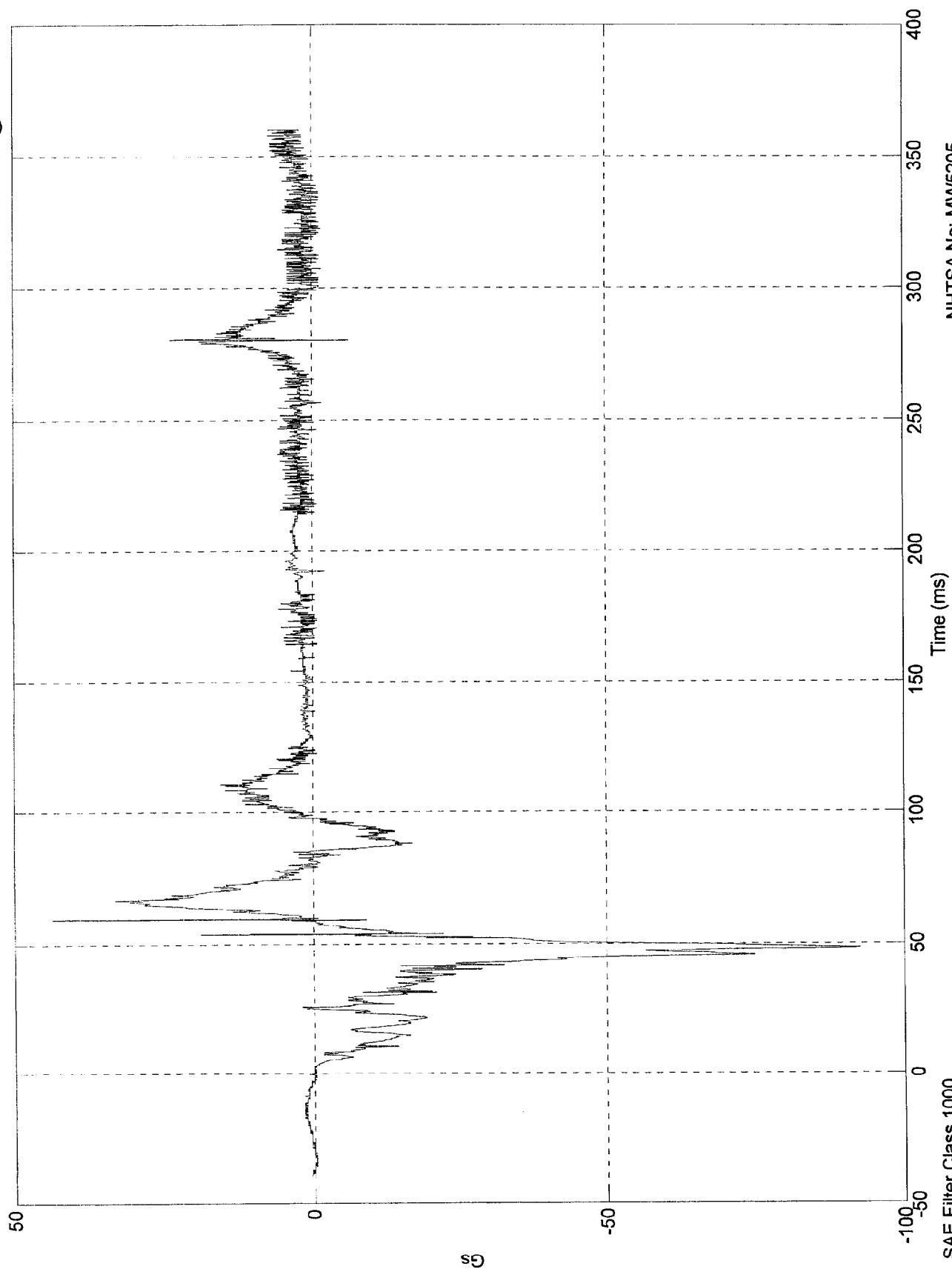
B-44

8413-21

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 43.7 Gs @ 59.50 msec
Min = -92.6 Gs @ 48.40 msec

Pos. 1 Left Ankle X

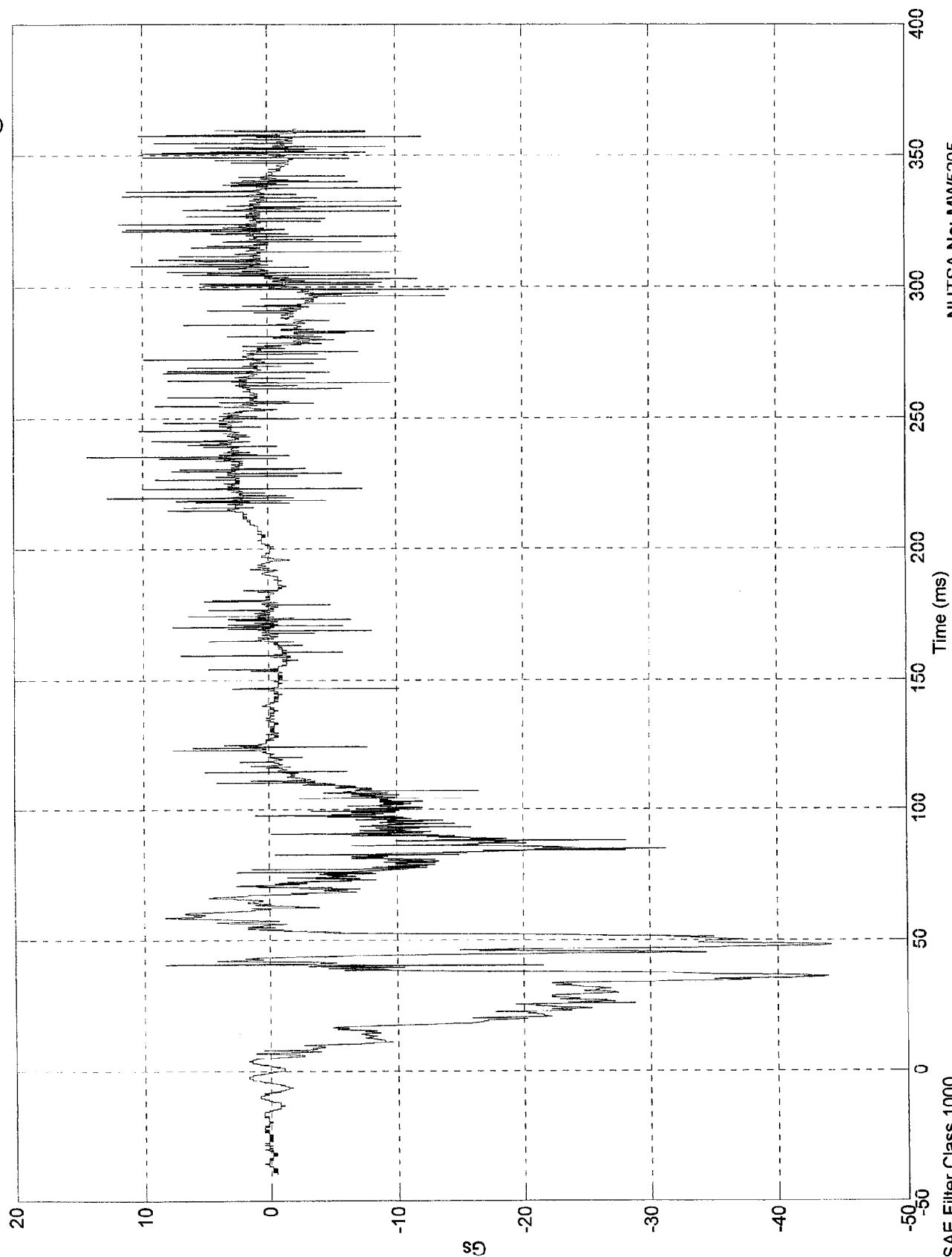


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 14.4 Gs @ 235.10 msec
Min = -44.2 Gs @ 48.00 msec

Pos. 1 Left Ankle Z

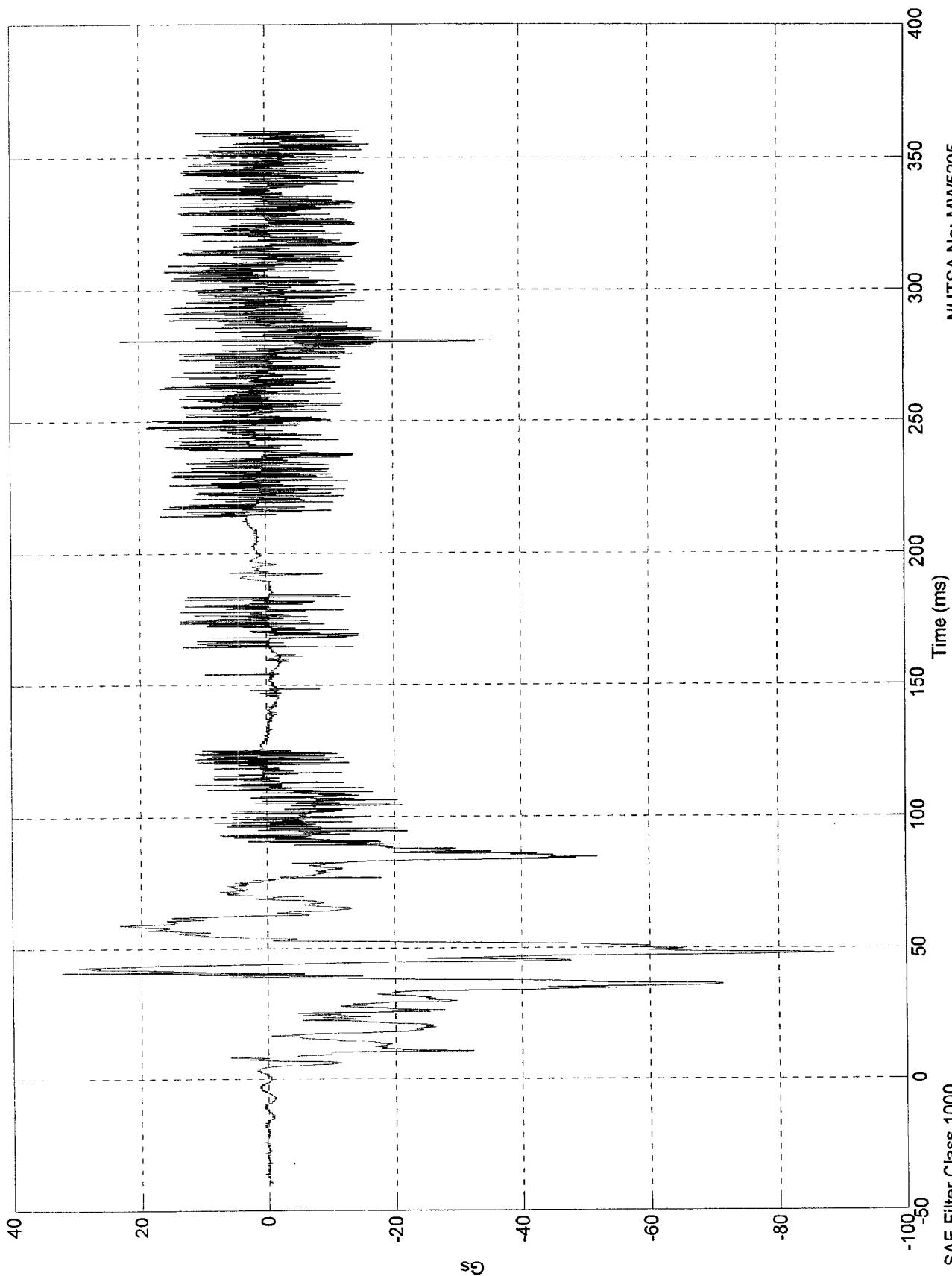


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 32.4 Gs @ 40.90 msec
Min = -88.6 Gs @ 48.10 msec

Pos. 1 Left Toe Z

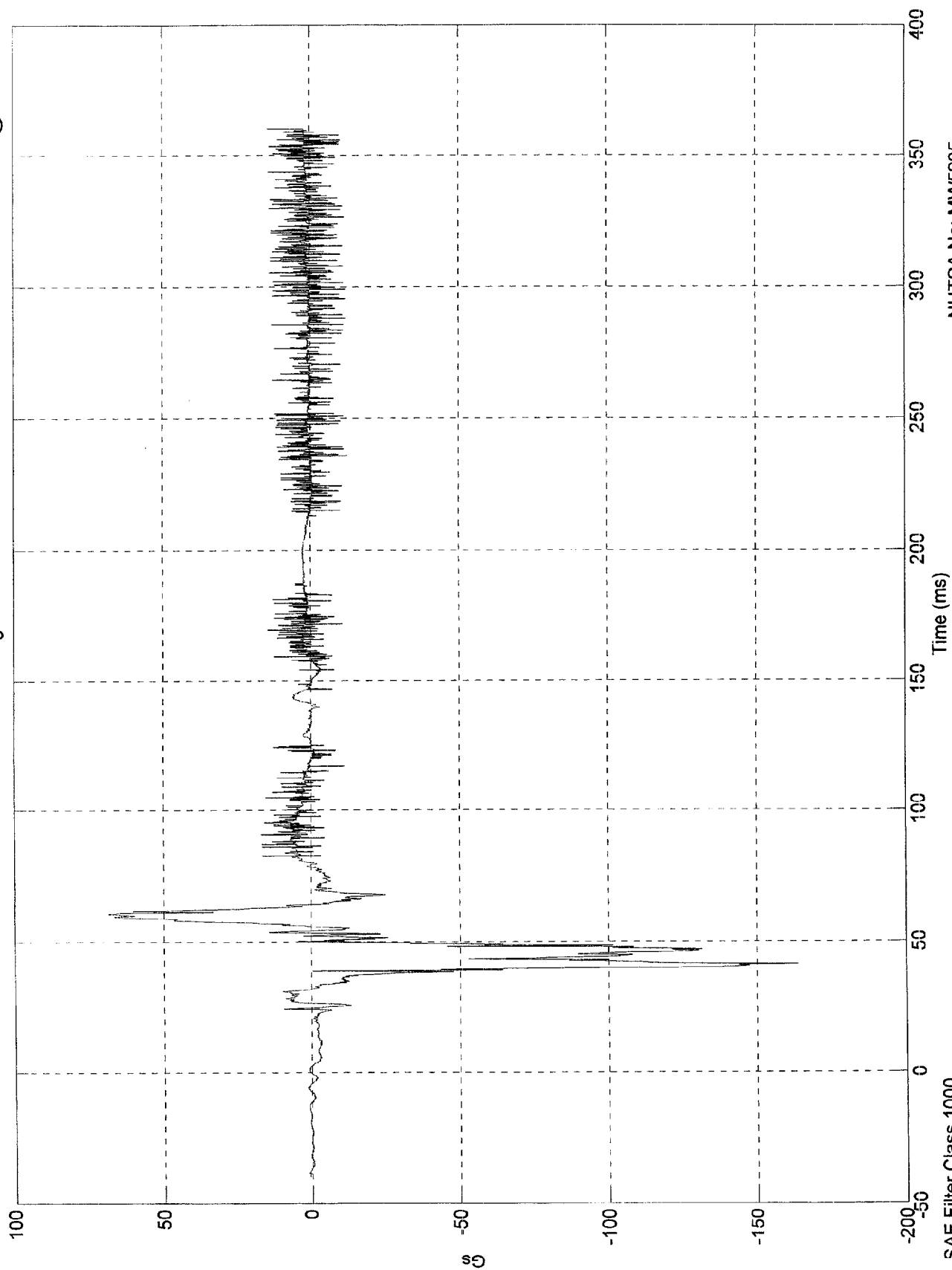


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 68.2 Gs @ 60.60 msec
Min = -164 Gs @ 41.40 msec

Pos. 1 Right Ankle X

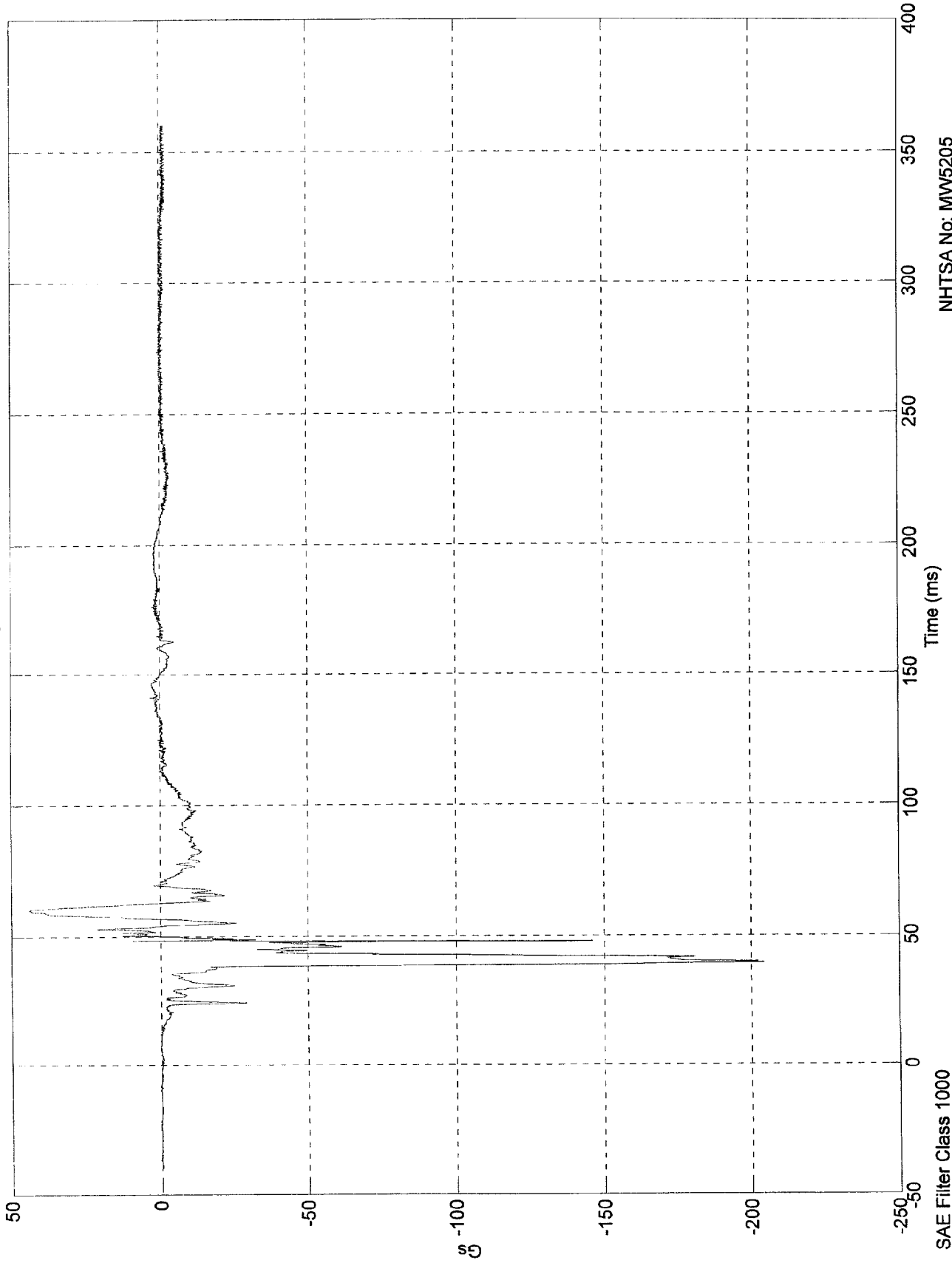


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 44 Gs @ 59.80 msec
Min = -204 Gs @ 39.60 msec

Pos. 1 Right Ankle Z



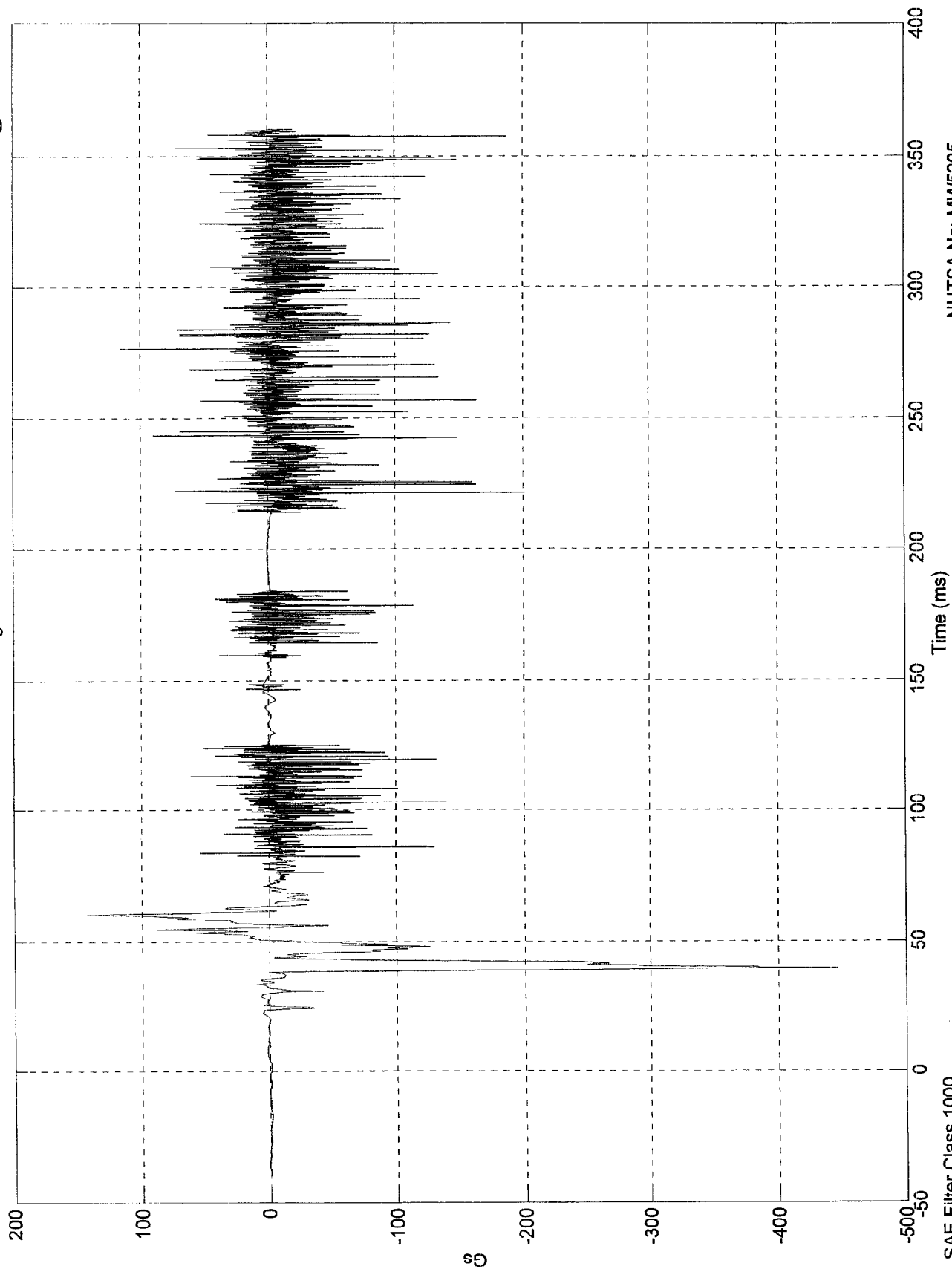
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 1000

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 142 Gs @ 60.10 msec
Min = -446 Gs @ 39.60 msec

Pos. 1 Right Toe Z

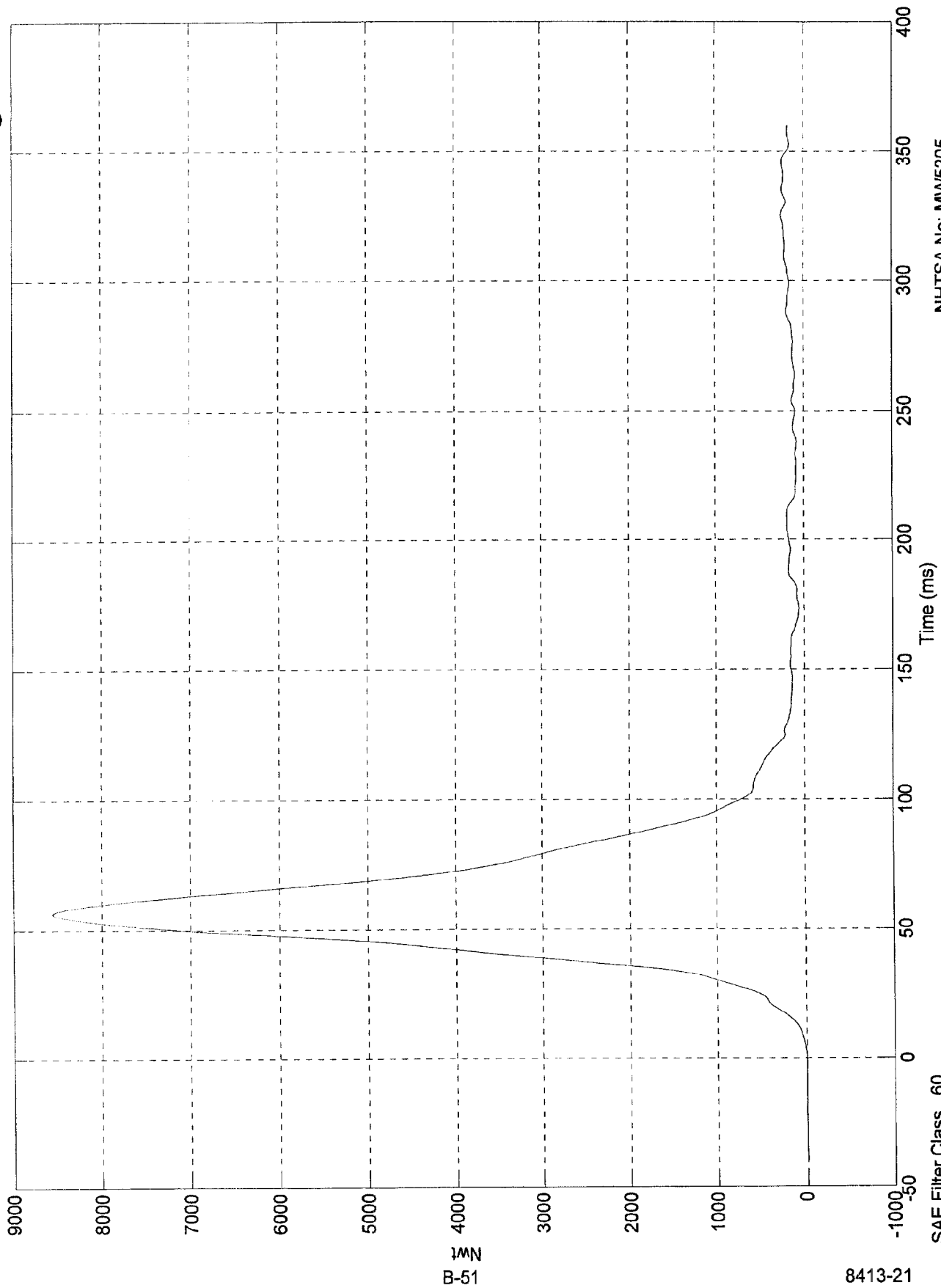


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 8.55e+003 Nwt @ 56.30 msec
Min = -5.74 Nwt @ -39.90 msec

Pos. 1 Left Belt Load



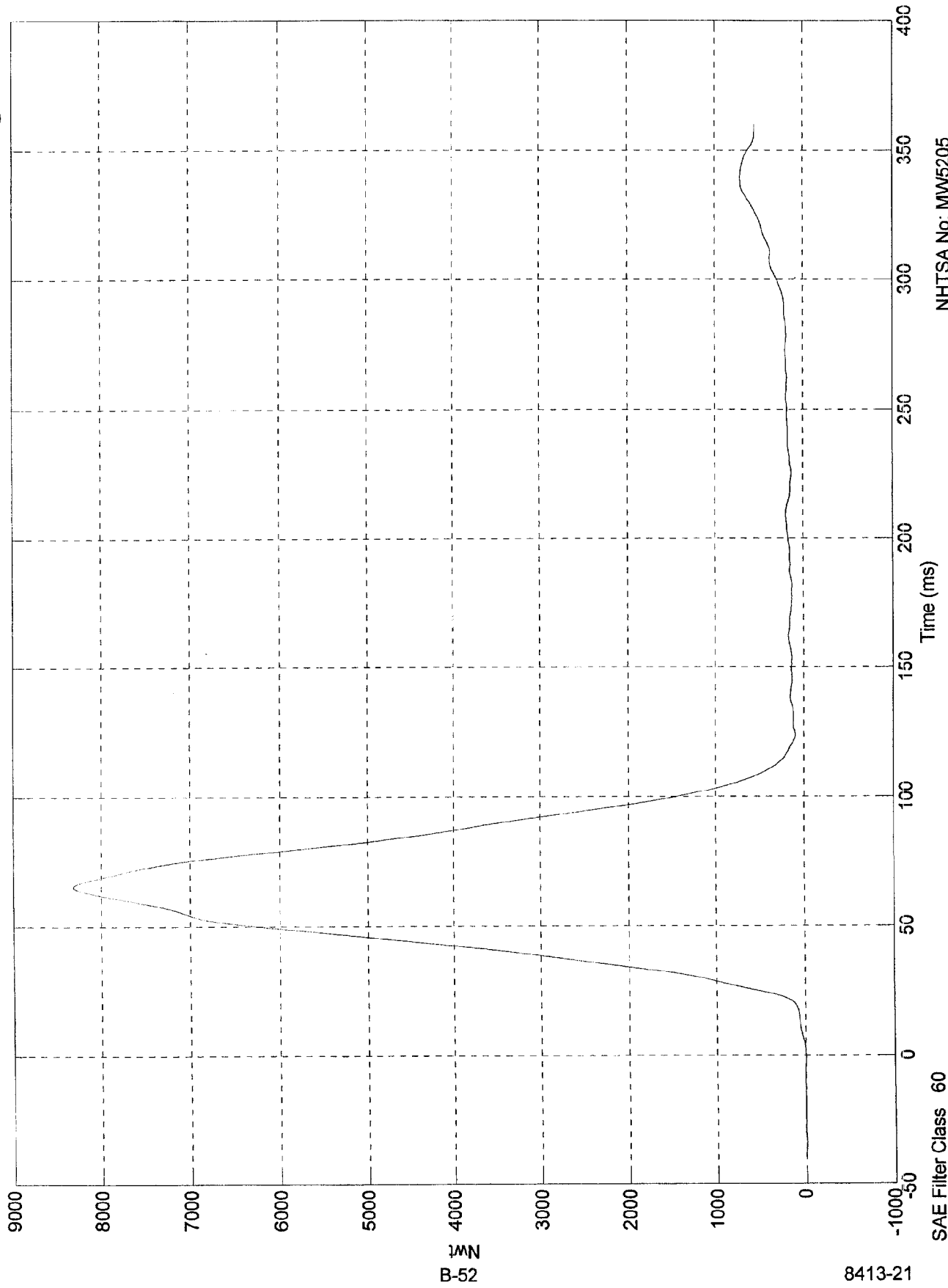
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 60

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 8.32e+003 Nwt @ 65.30 msec
Min = -4.71 Nwt @ -34.20 msec

Pos. 1 Torso Belt Load



NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 60

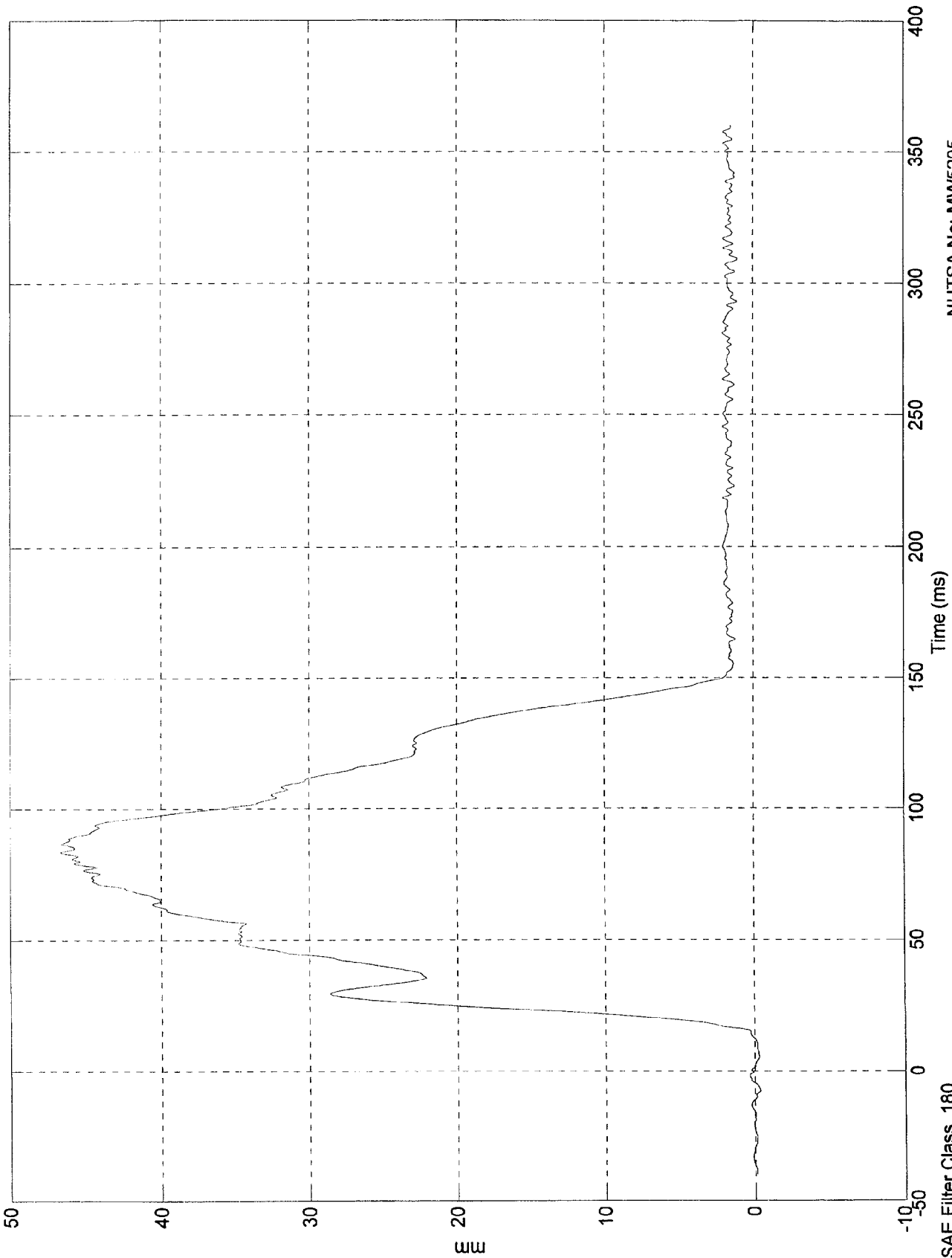
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8413-21

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 46.6 mm @ 83.50 msec
Min = -0.377 mm @ -7.70 msec

Pos. 1 Belt Spoolout



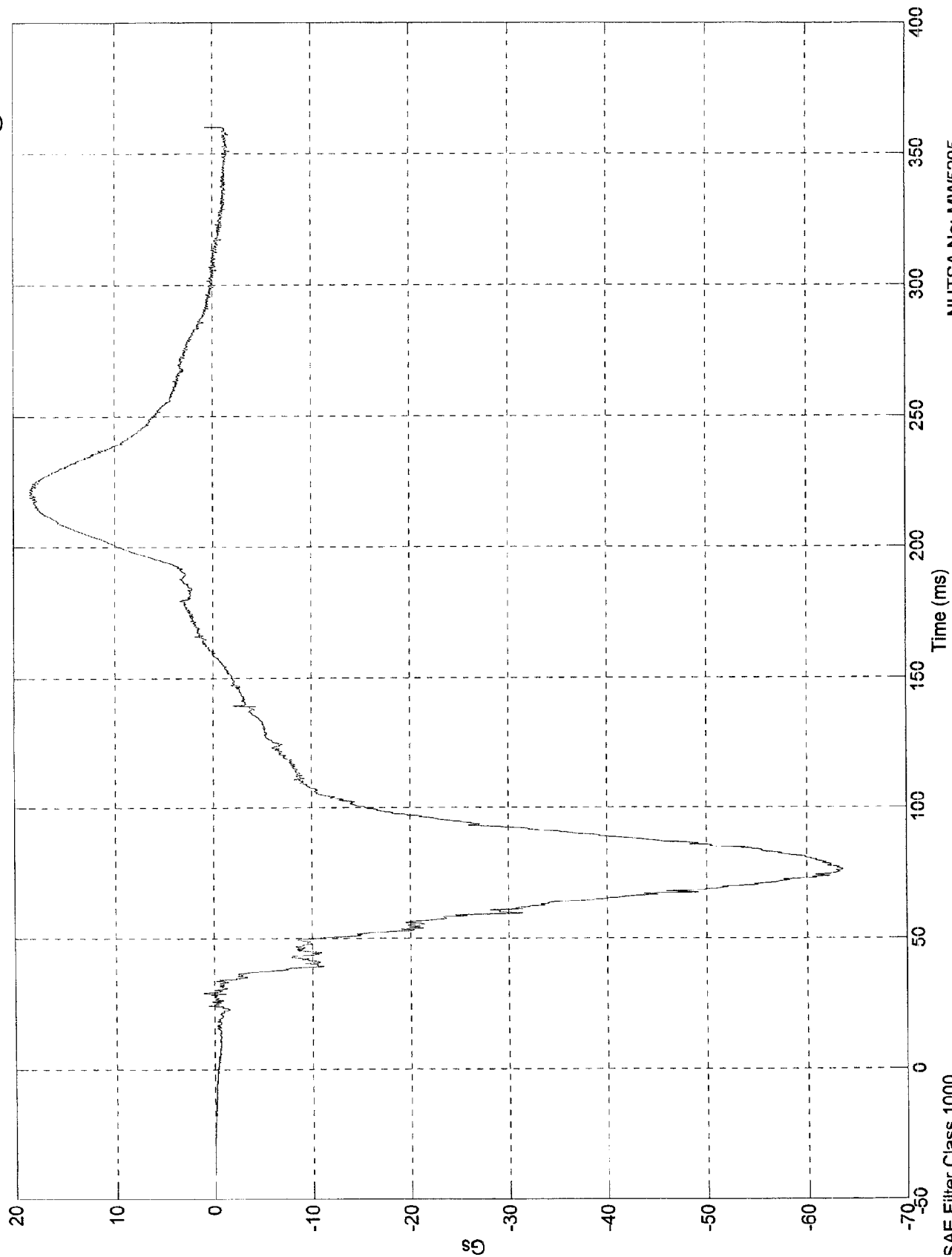
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 18.4 Gs @ 219.10 msec
Min = -63.6 Gs @ 76.30 msec

Pos. 2 Head X

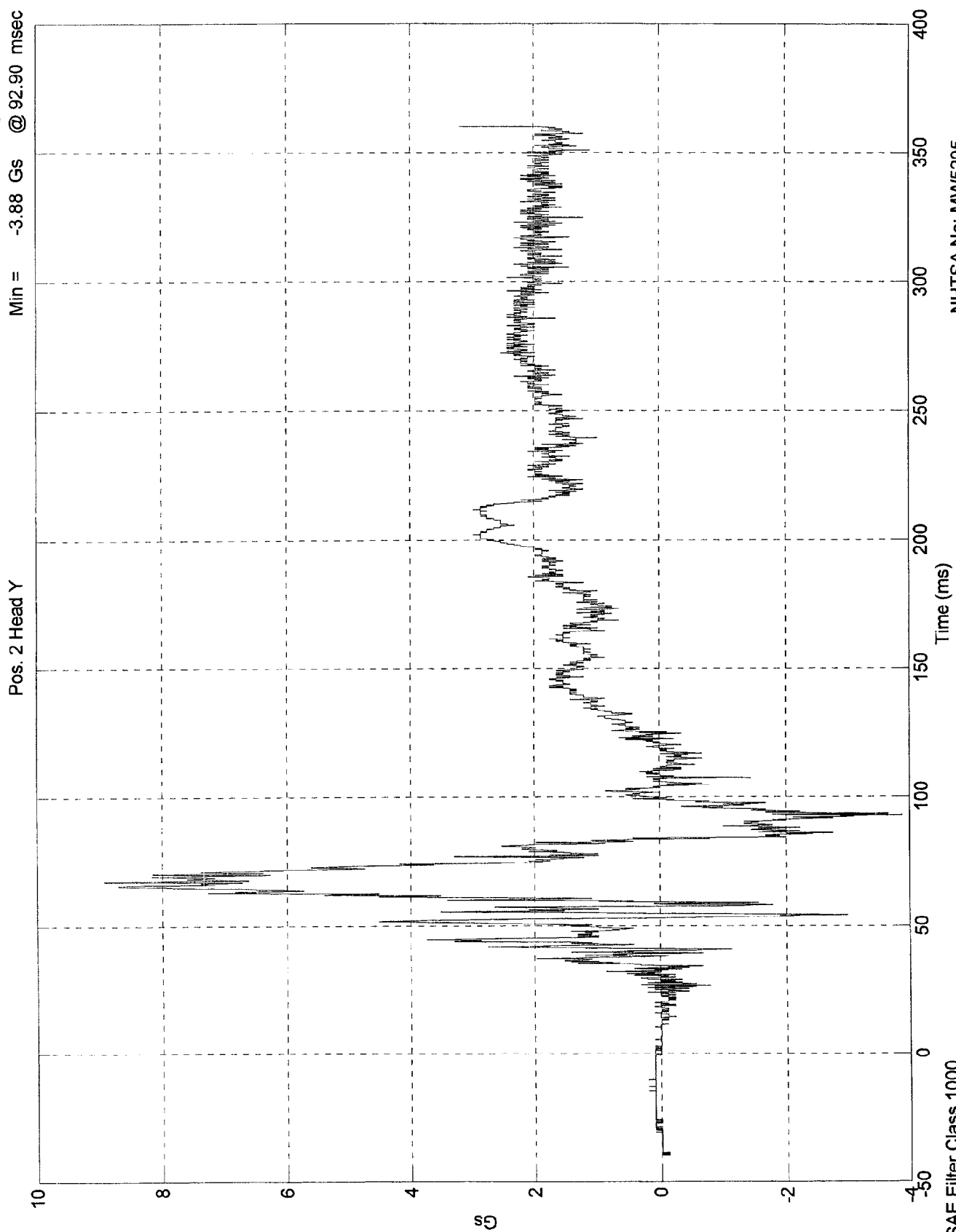


NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 1000

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 8.93 Gs @ 67.30 msec
Min = -3.88 Gs @ 92.90 msec

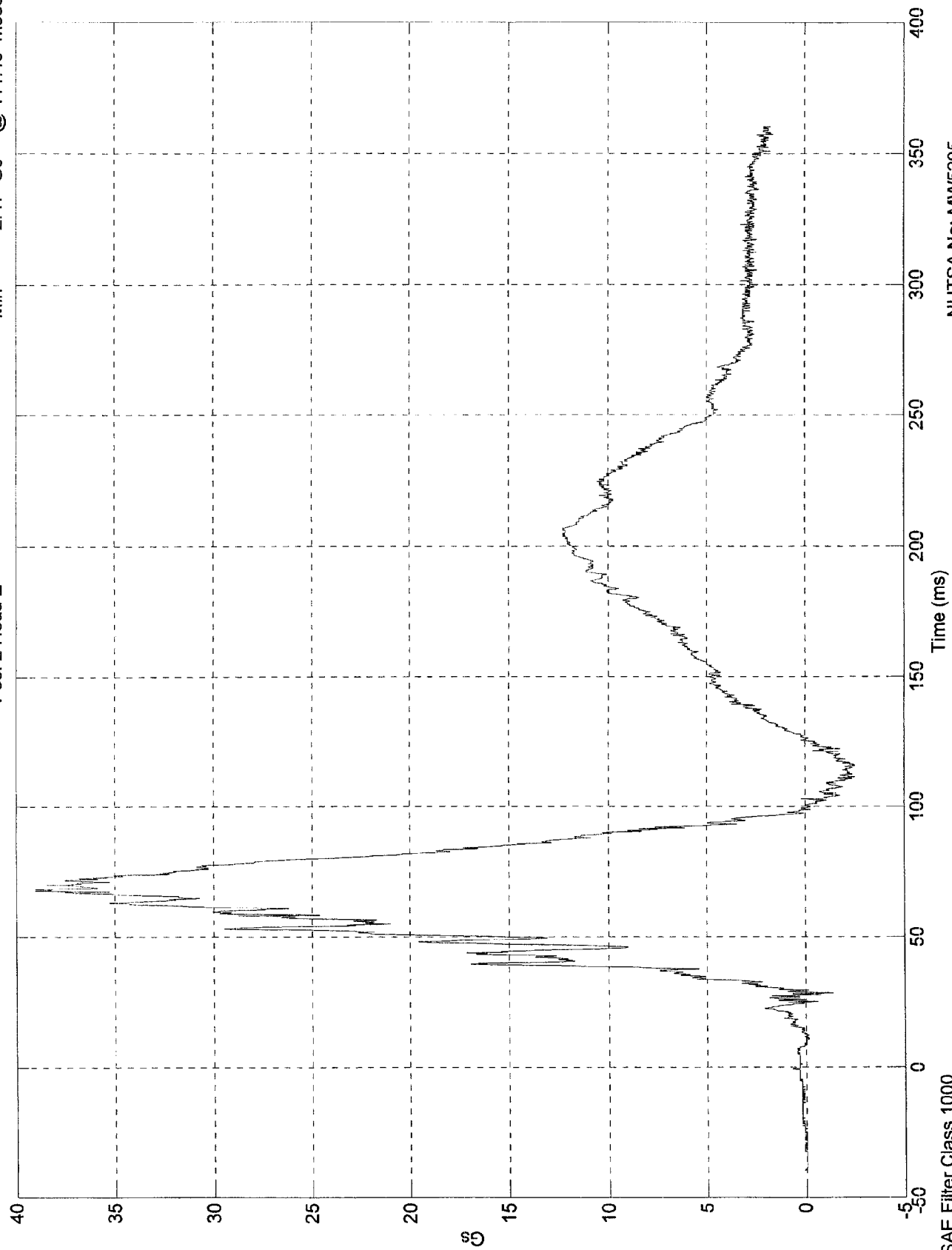


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 39 Gs @ 67.70 msec
 Min = -2.47 Gs @ 111.40 msec

Pos. 2 Head Z

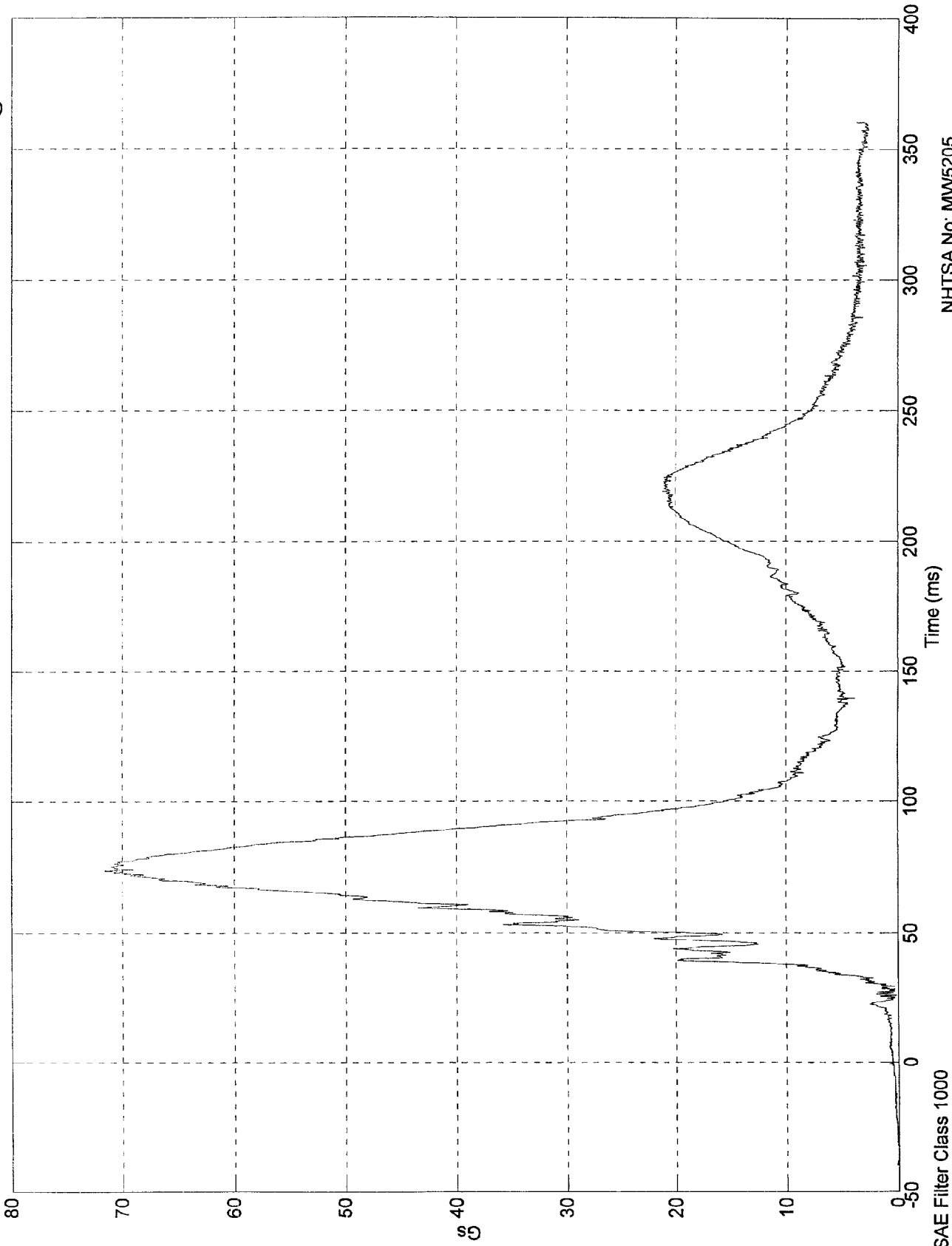


NHTSA No: MW5205
 Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 71.5 Gs @ 73.90 msec
Min = 0.0375 Gs @ -39.30 msec

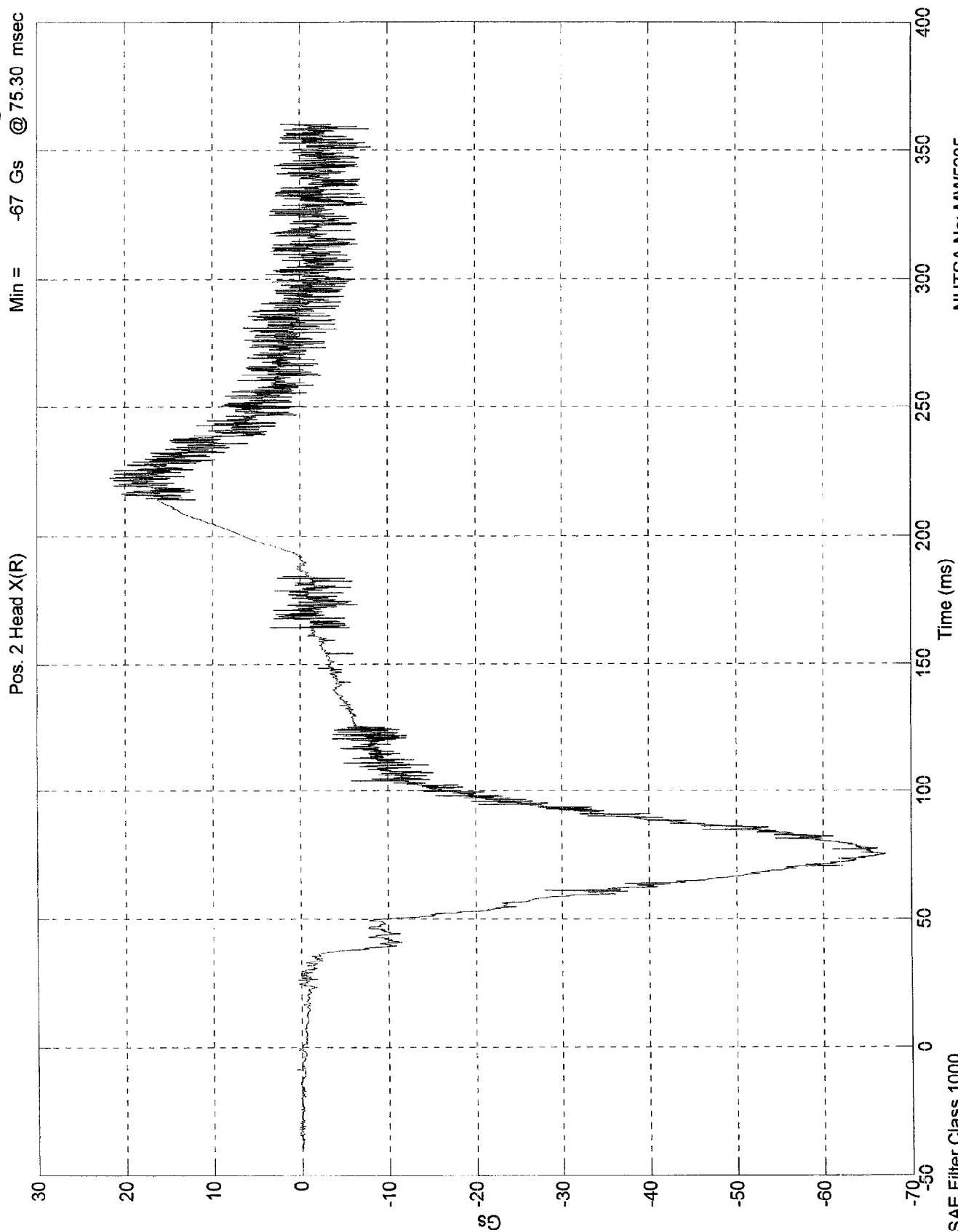
Pos. 2 Head Resultant



NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

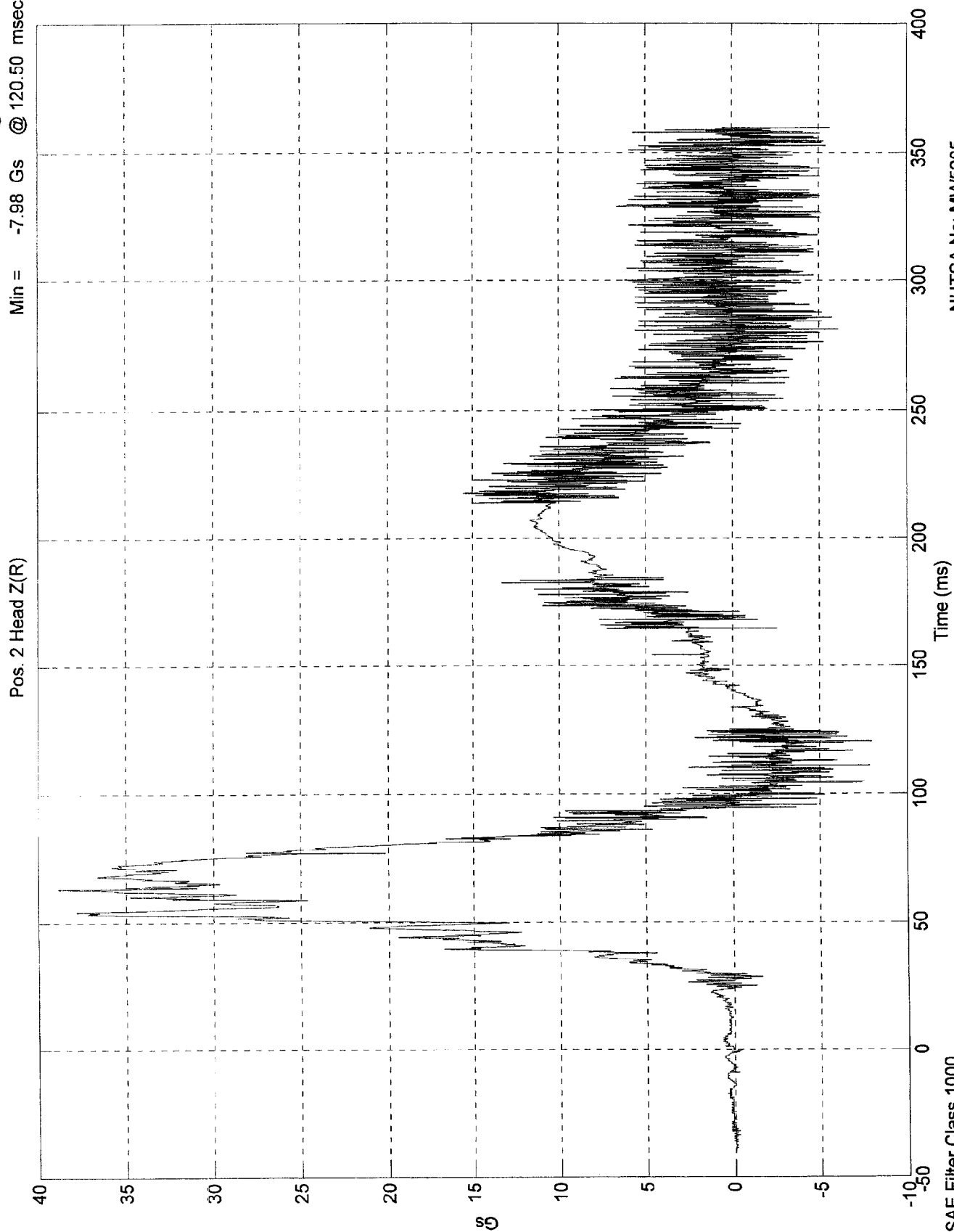
Max = 21.7 Gs @ 222.50 msec
Min = -67 Gs @ 75.30 msec



NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 38.9 Gs @ 63.00 msec
Min = -7.98 Gs @ 120.50 msec

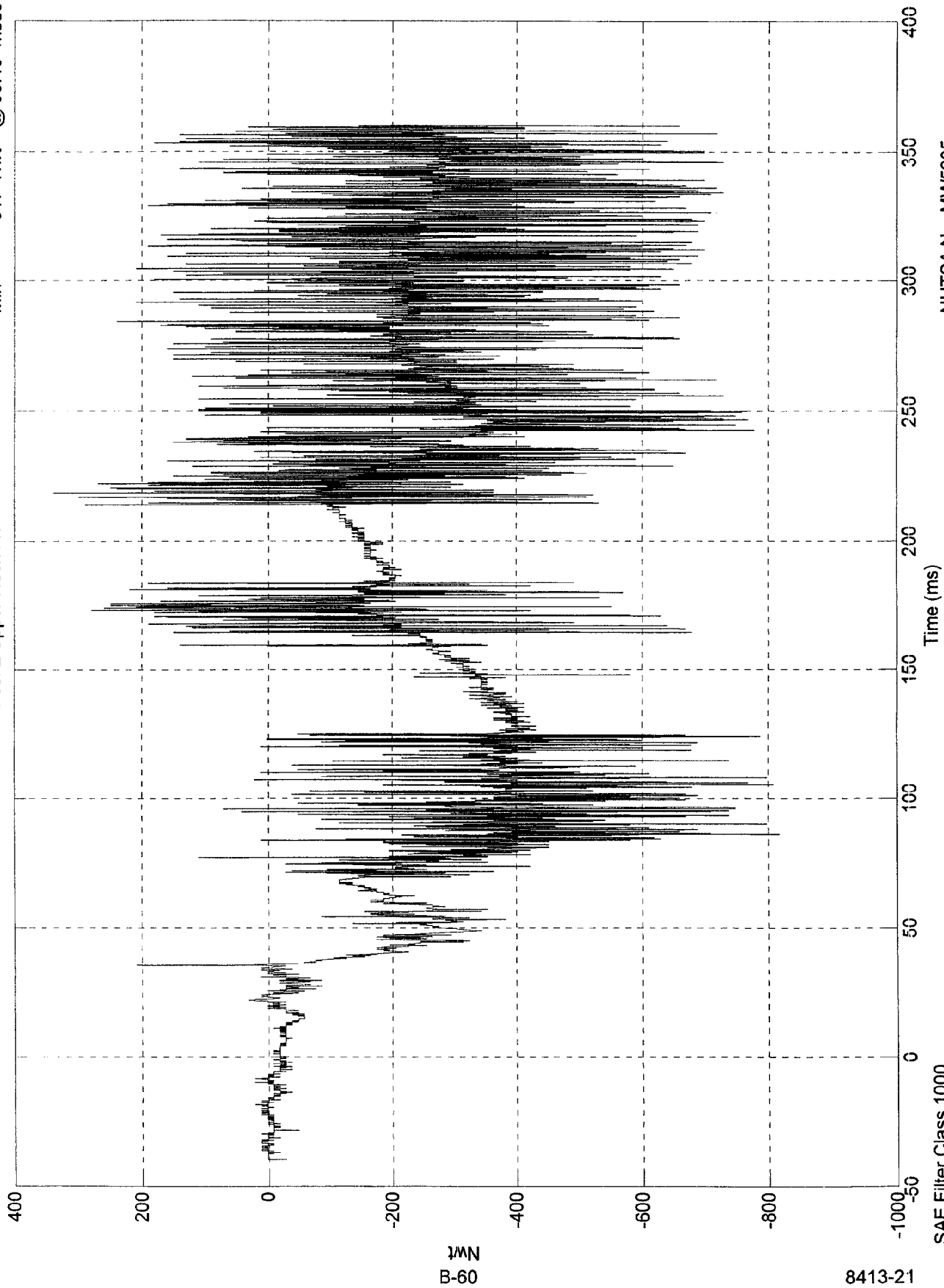


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 338 Nwt @ 218.60 msec
Min = -817 Nwt @ 86.10 msec

Pos. 2 Upper Neck Fx

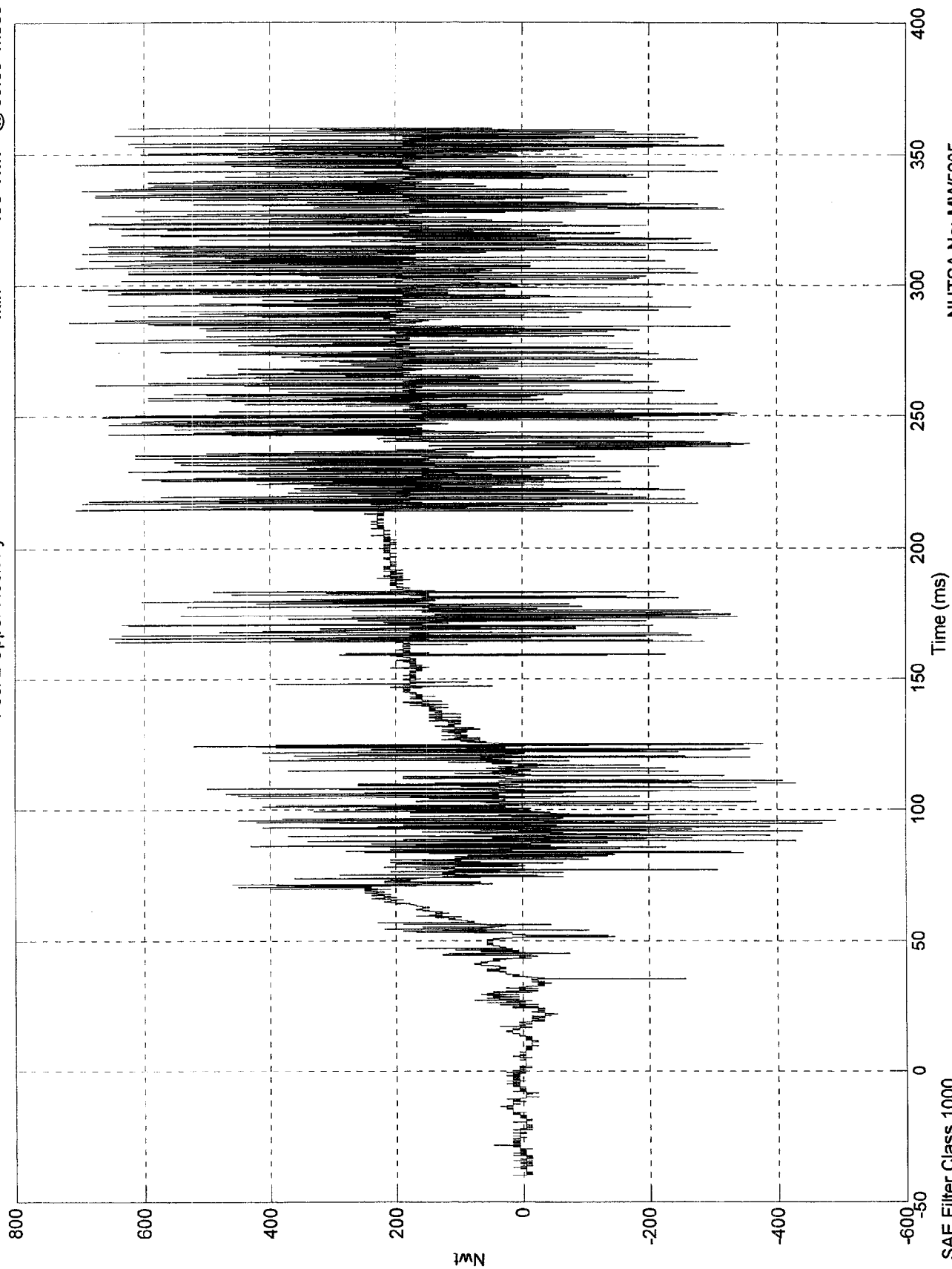


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 715 Nwt @ 285.70 msec
Min = -490 Nwt @ 95.80 msec

Pos. 2 Upper Neck Fy

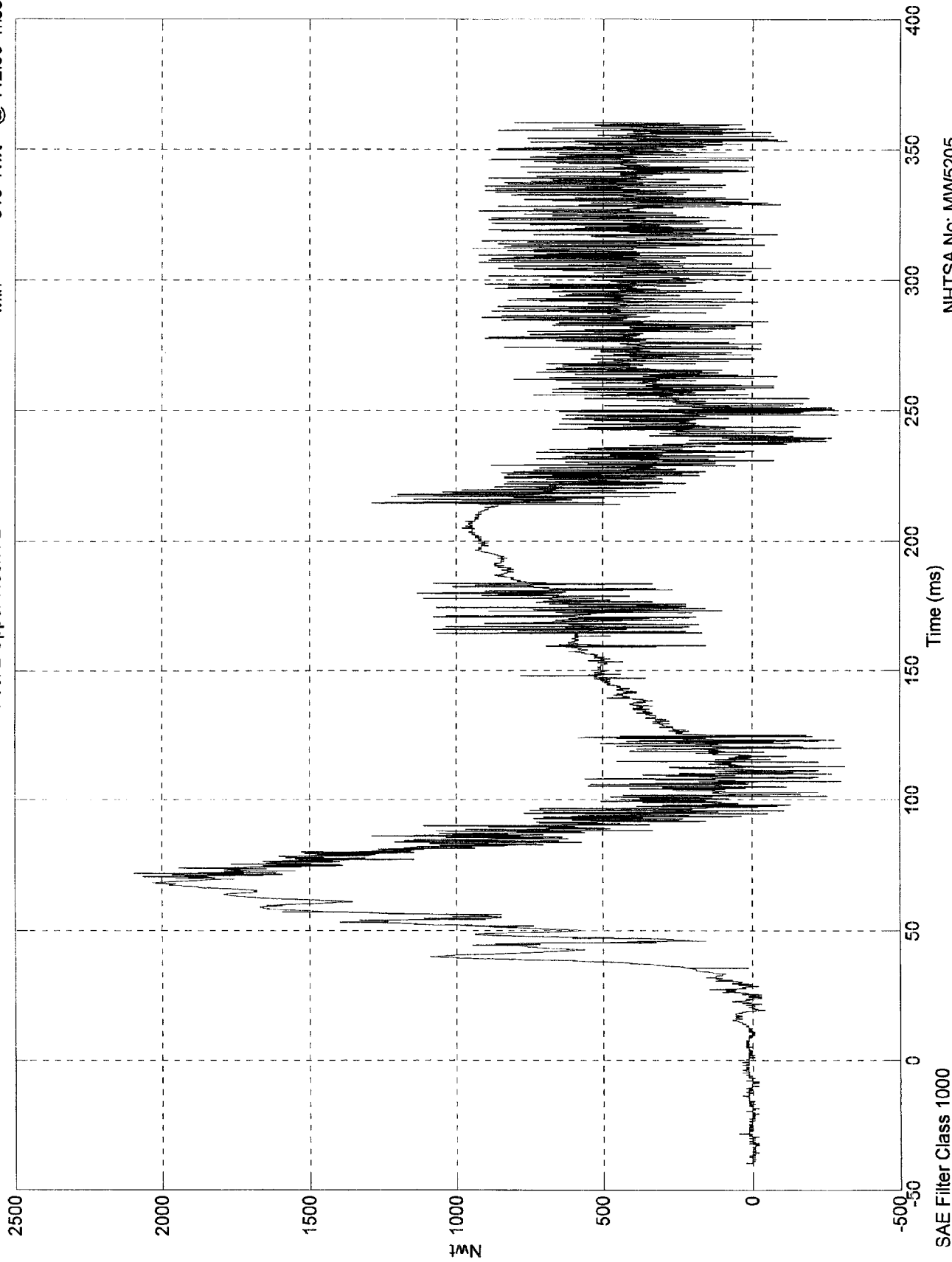


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 2.1e+003 Nwt @ 71.80 msec
Min = -316 Nwt @ 112.90 msec

Pos. 2 Upper Neck Fz

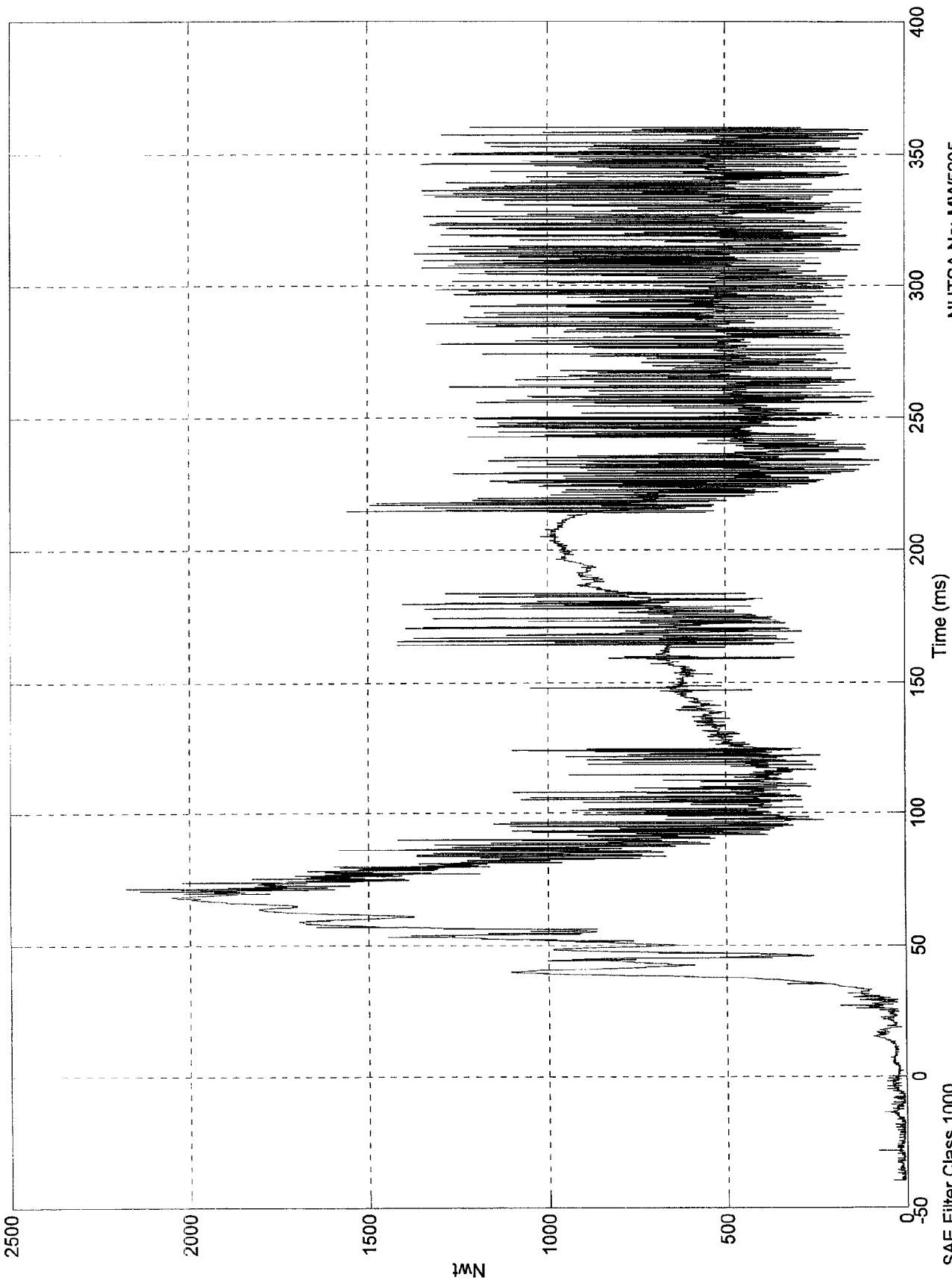


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 2.18e+003 Nwt @ 71.80 msec
 Min = 5.16 Nwt @ -39.80 msec

Pos. 2 Neck Force Res.



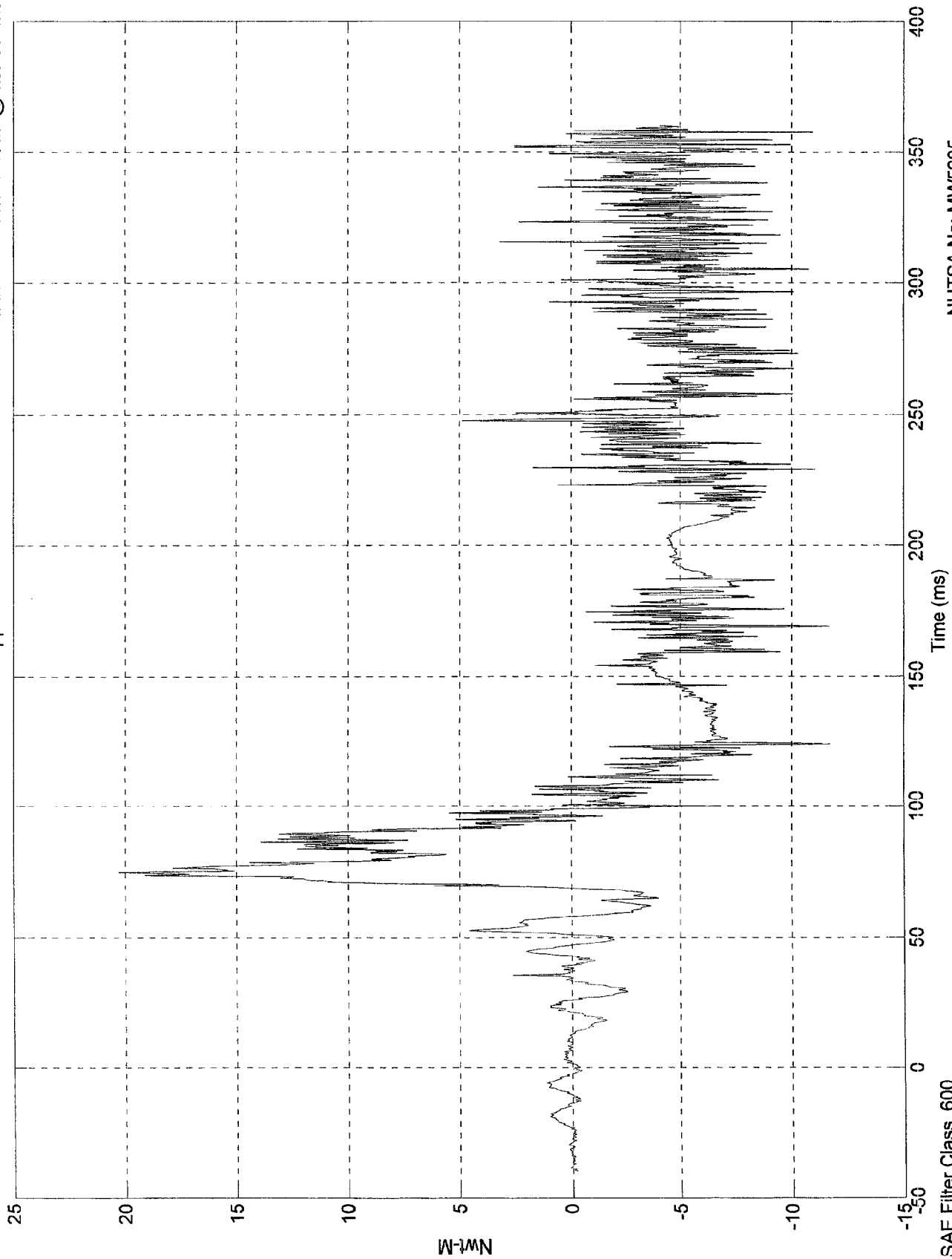
NHTSA No: MW5205
 Date: 04 Feb 1998

SAE Filter Class 1000

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 20.3 Nwt-M @ 75.00 msec
Min = -11.7 Nwt-M @ 123.80 msec

Pos. 2 Upper Neck Mx



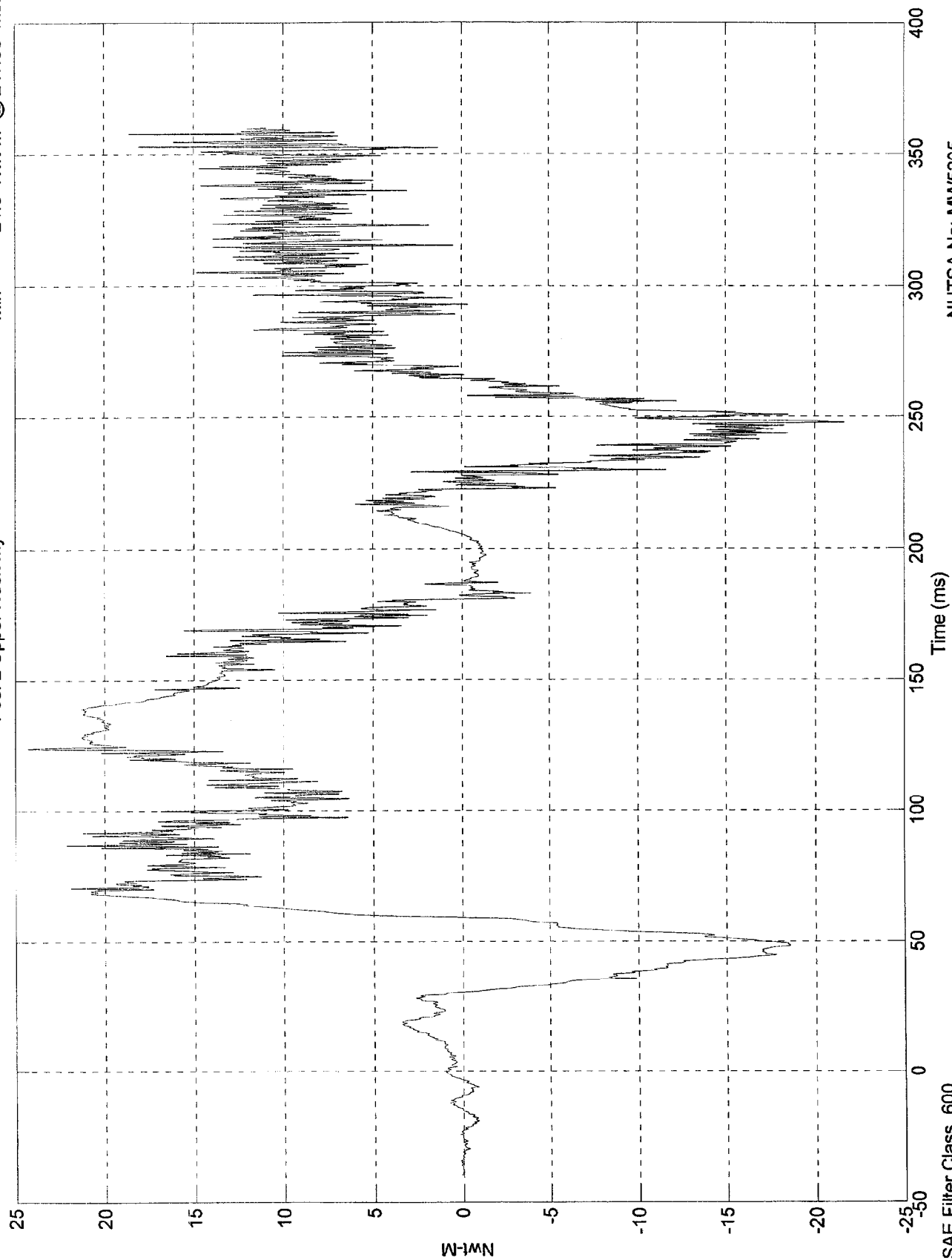
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 24.3 Nwt-M @ 123.80 msec
Min = -21.6 Nwt-M @ 247.80 msec

Pos. 2 Upper Neck My



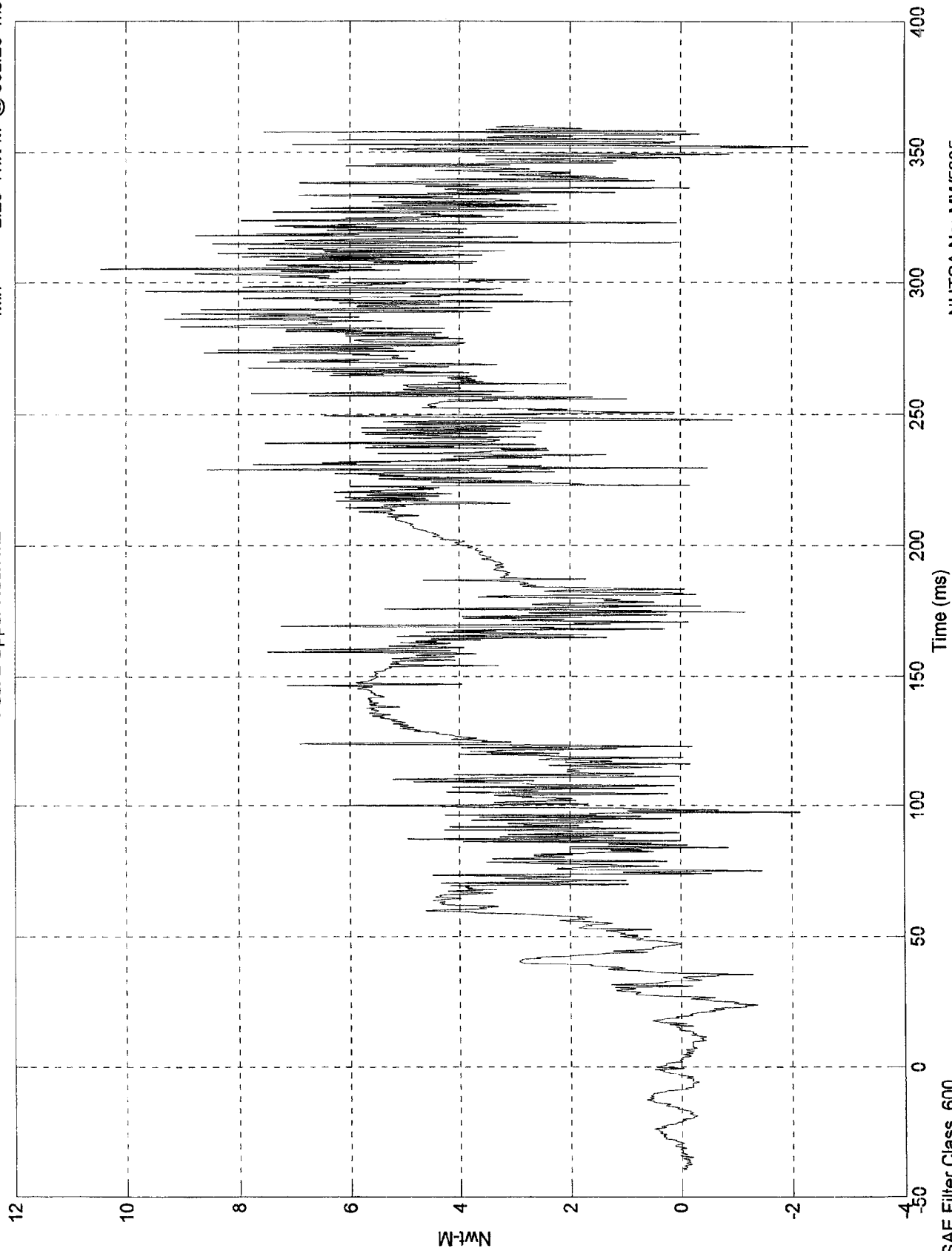
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 10.5 Nwt-M @ 305.20 msec
Min = -2.29 Nwt-M @ 352.20 msec

Pos. 2 Upper Neck Mz



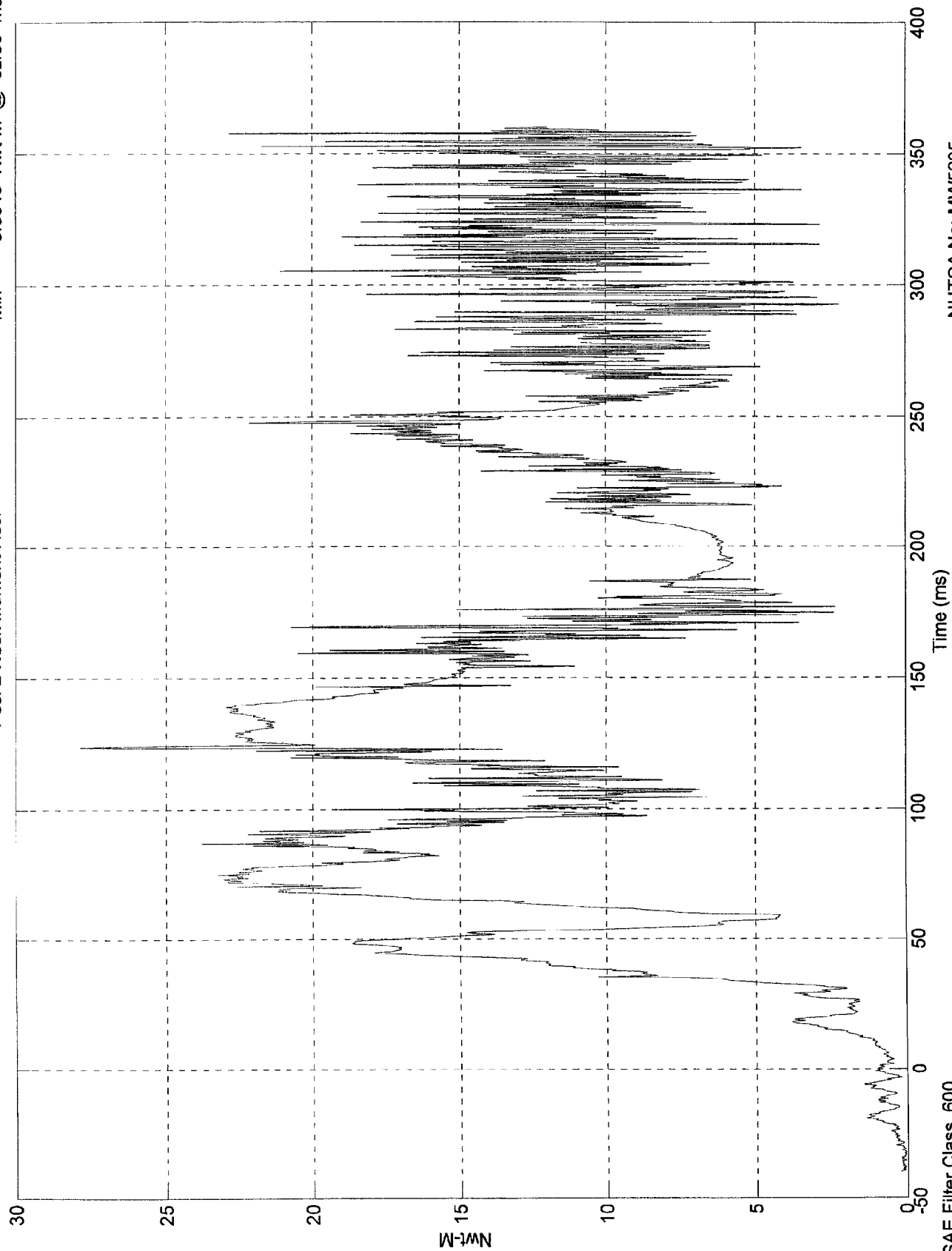
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 27.8 Nwt-M @ 123.80 msec
 Min = 0.0549 Nwt-M @ -32.00 msec

Pos. 2 Neck Moment Res.

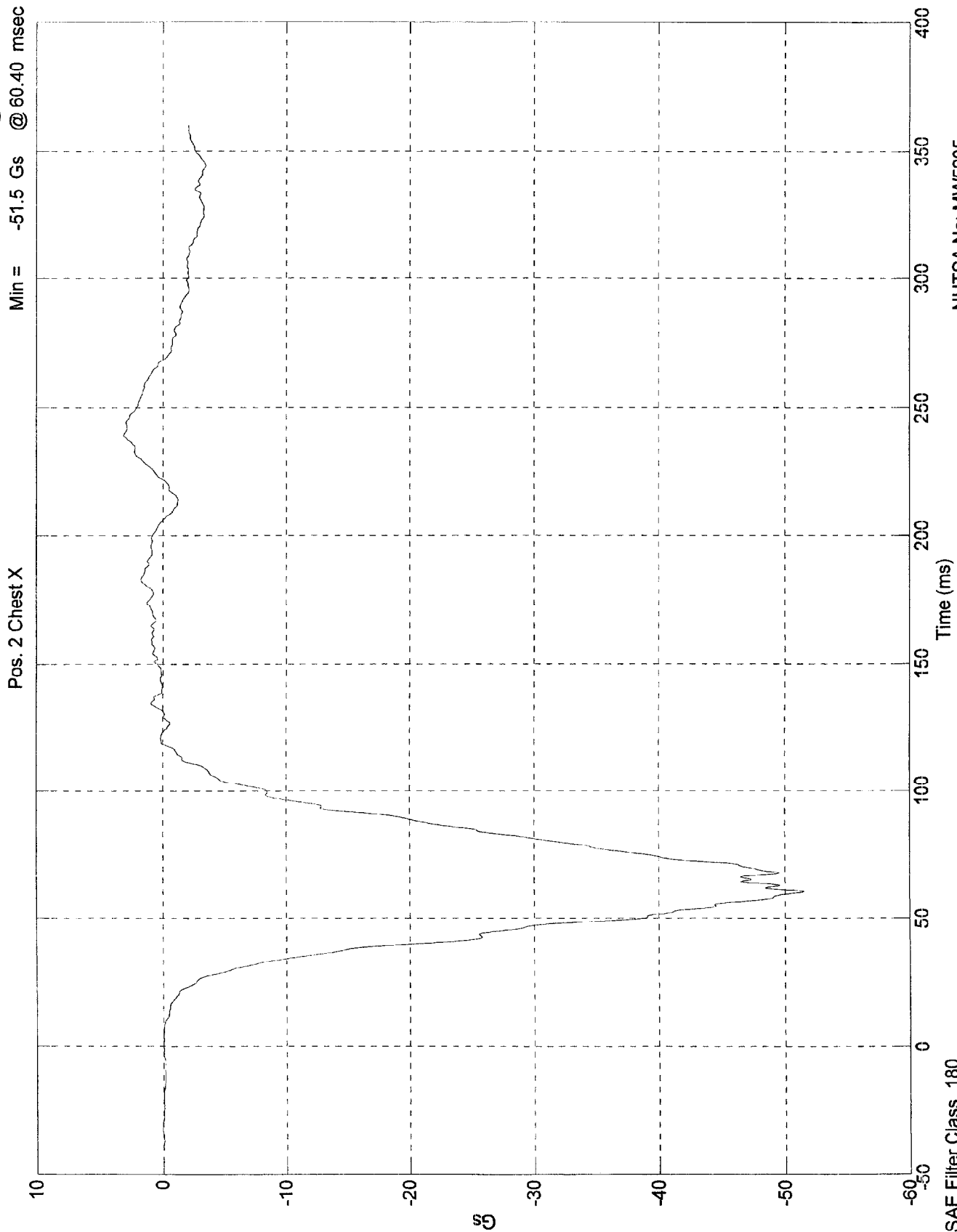


SAE Filter Class 600

NHTSA No: MW5205
 Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 3.16 Gs @ 239.20 msec
Min = -51.5 Gs @ 60.40 msec

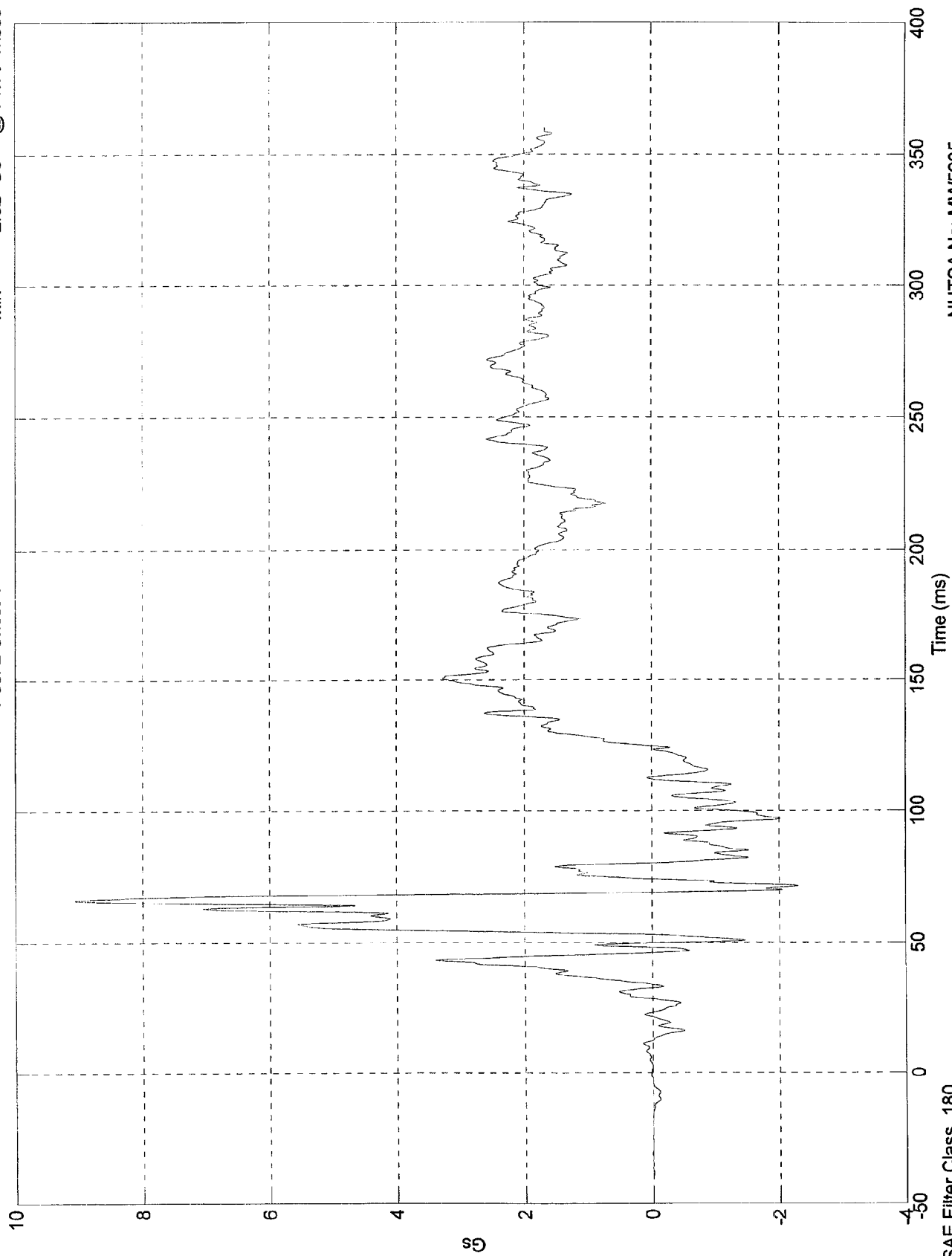


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 9.07 Gs @ 66.10 msec
Min = -2.32 Gs @ 71.70 msec

Pos. 2 Chest Y



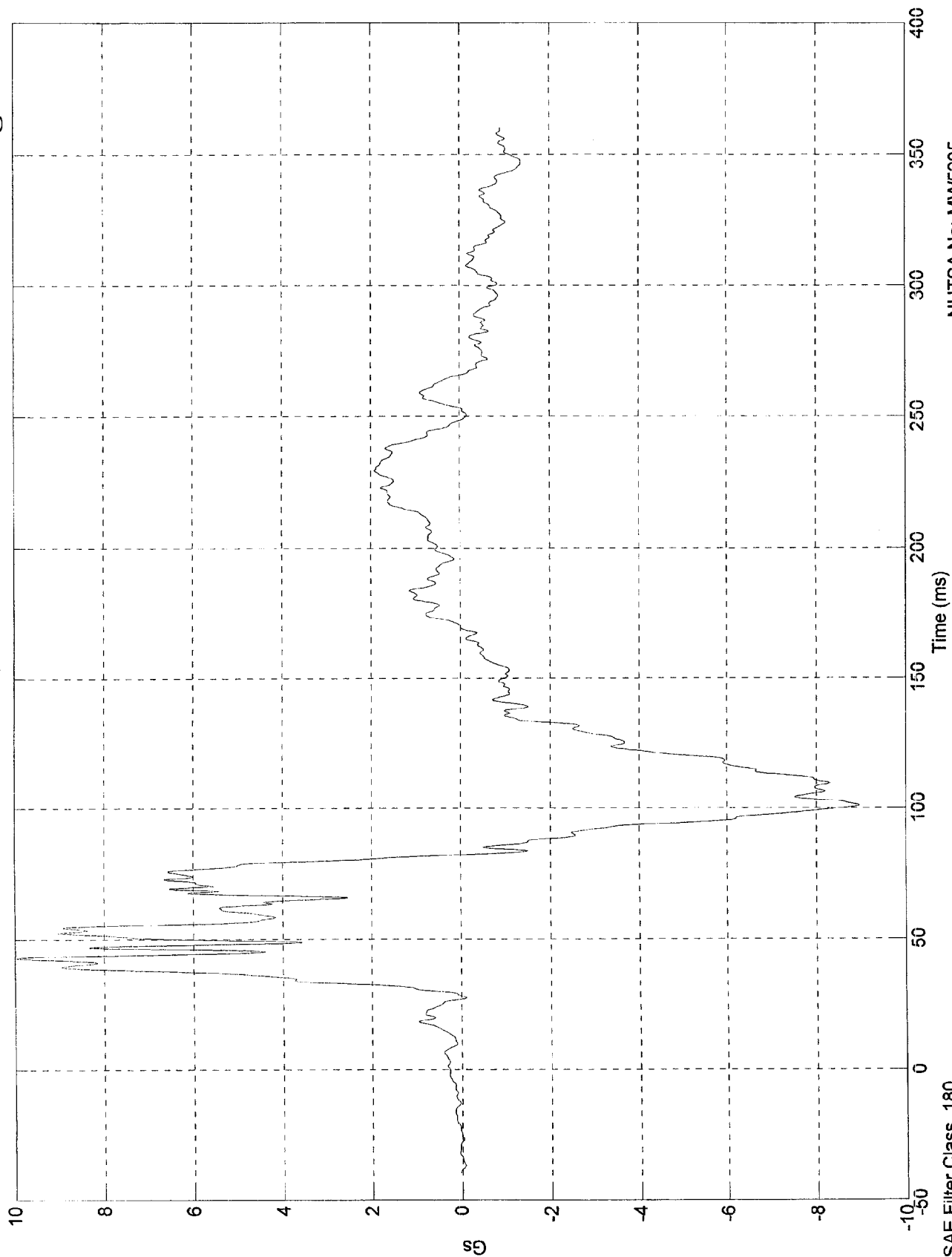
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 9.96 Gs @ 42.80 msec
Min = -8.97 Gs @ 100.90 msec

Pos. 2 Chest Z



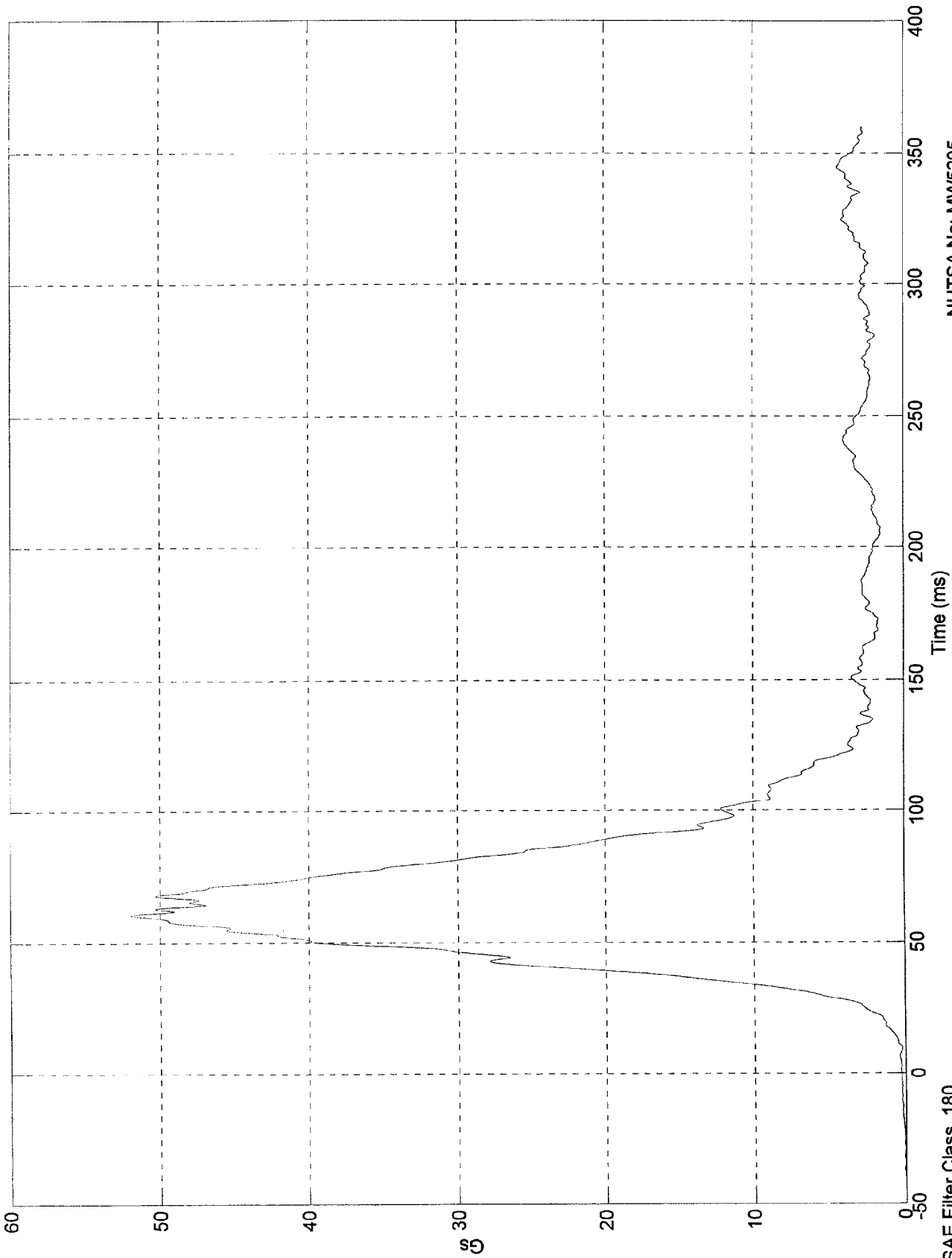
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 51.9 Gs @ 60.40 msec
Min = 0.0162 Gs @ -38.60 msec

Pos. 2 Chest Resultant

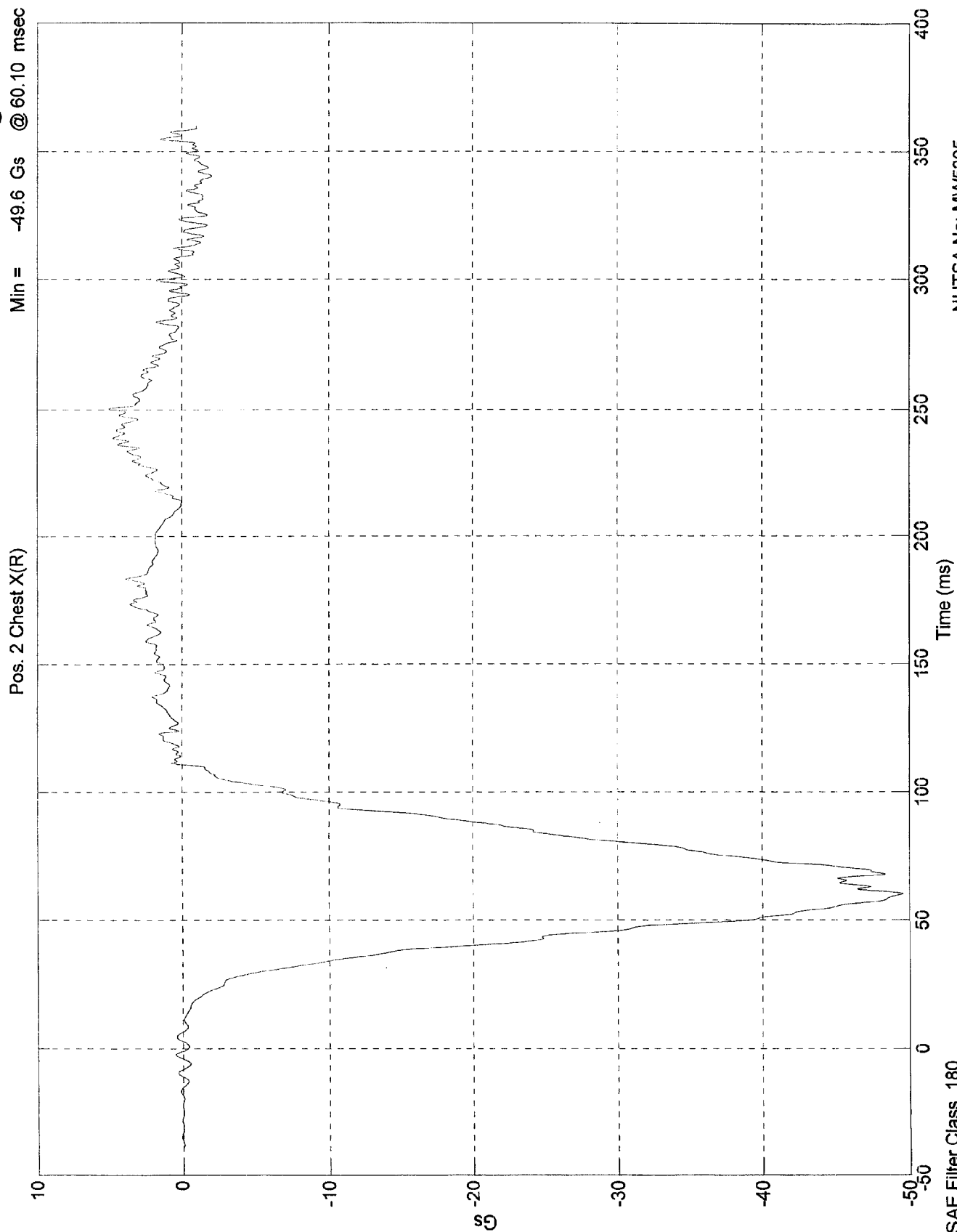


NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 5.02 Gs @ 250.40 msec
 Min = -49.6 Gs @ 60.10 msec



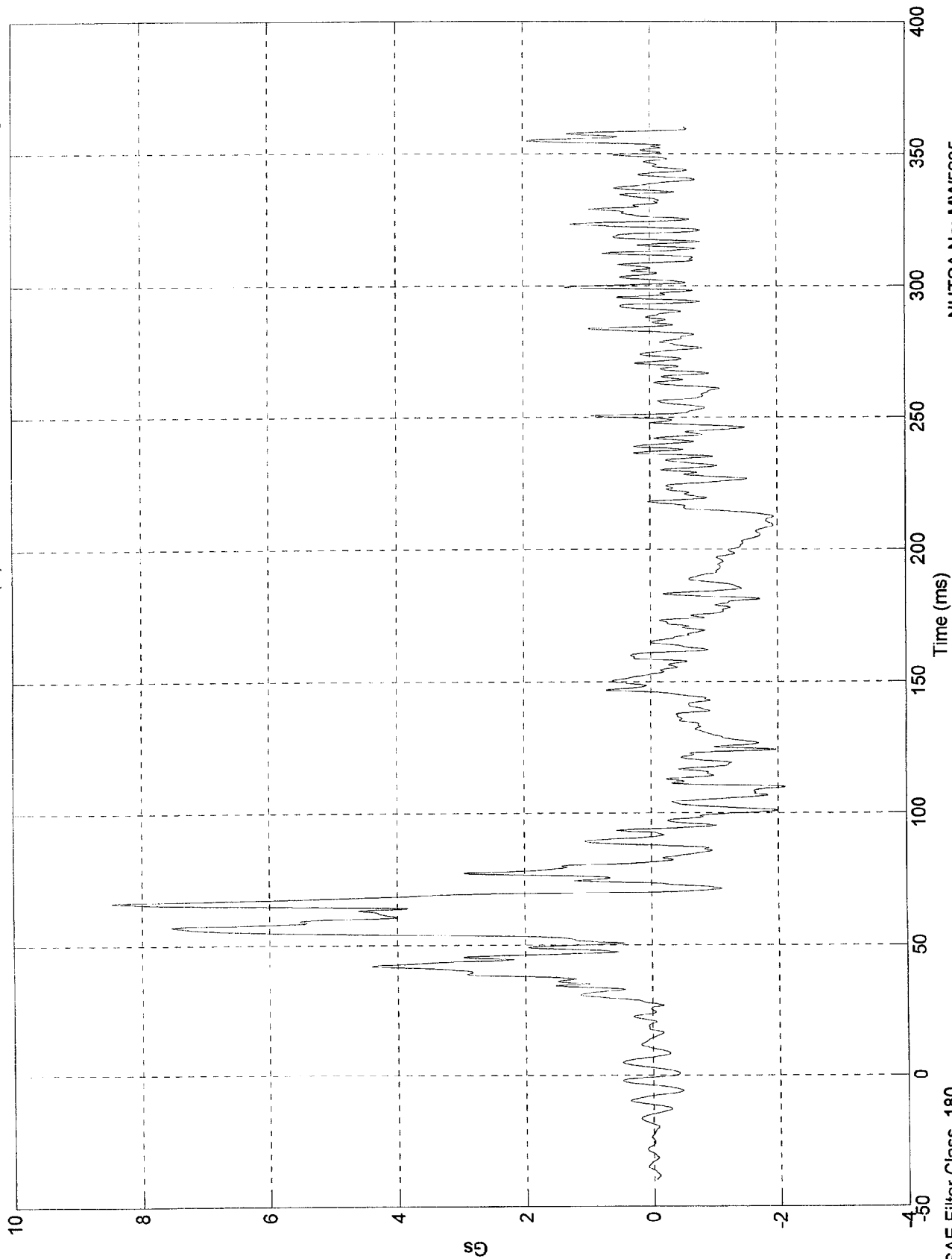
NHTSA No: MW5205
 Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 8.46 Gs @ 66.10 msec
Min = -2.11 Gs @ 109.90 msec

Pos. 2 Chest Y(R)



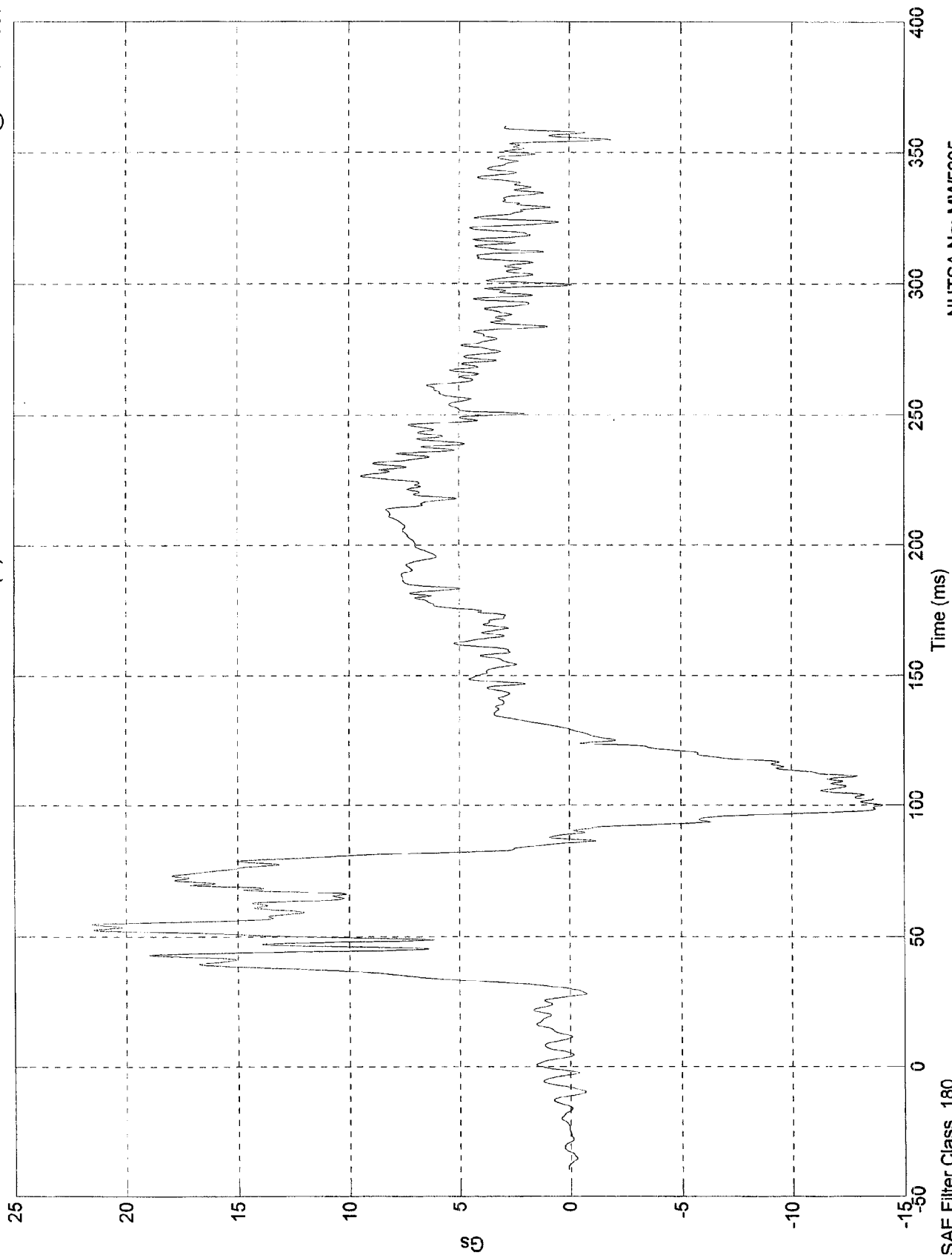
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 21.5 Gs @ 54.50 msec
Min = -14.1 Gs @ 99.90 msec

Pos. 2 Chest Z(R)



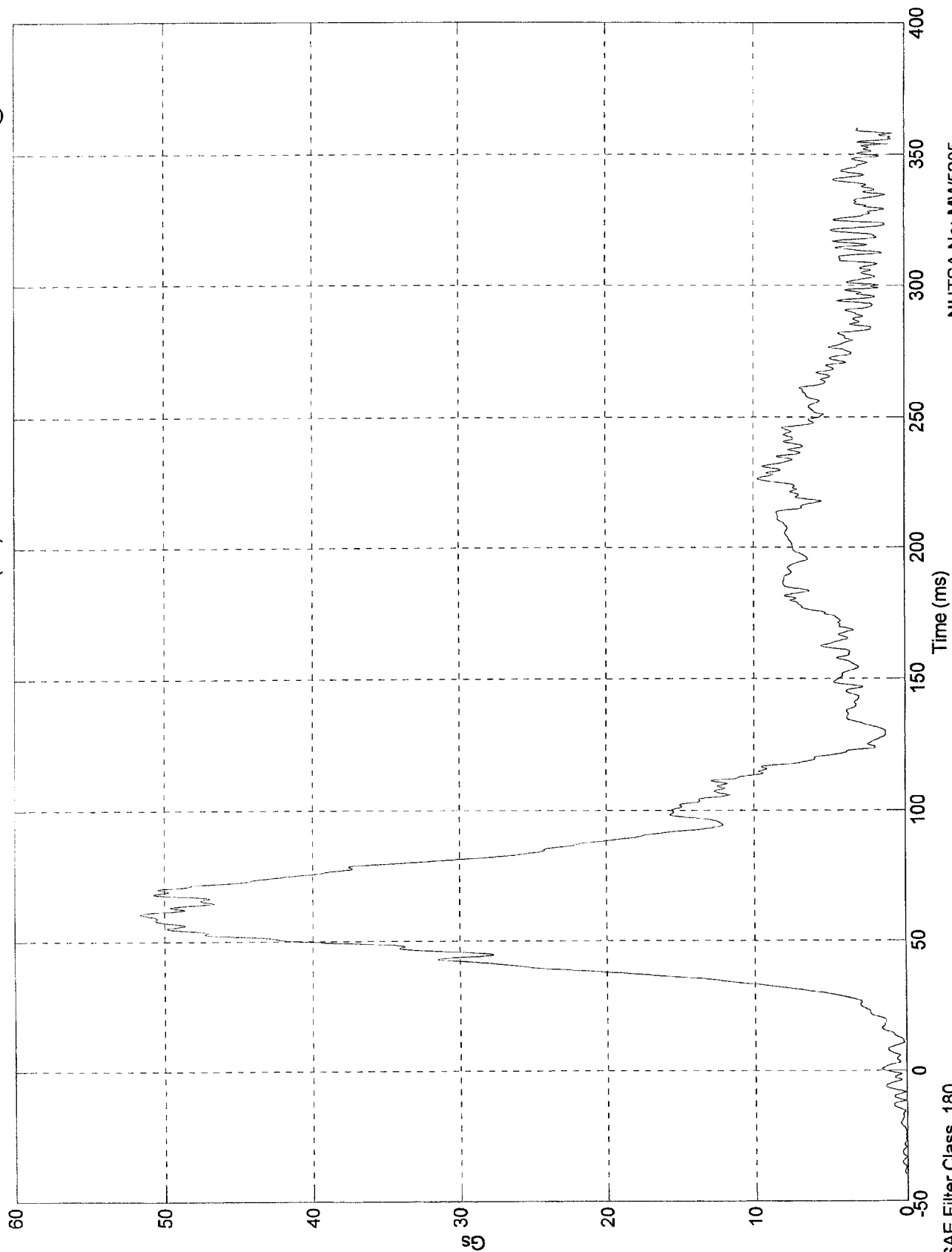
SAE Filter Class 180

NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 51.6 Gs @ 60.30 msec
Min = 0.0198 Gs @ -33.00 msec

Pos. 2 Chest Res(RR)

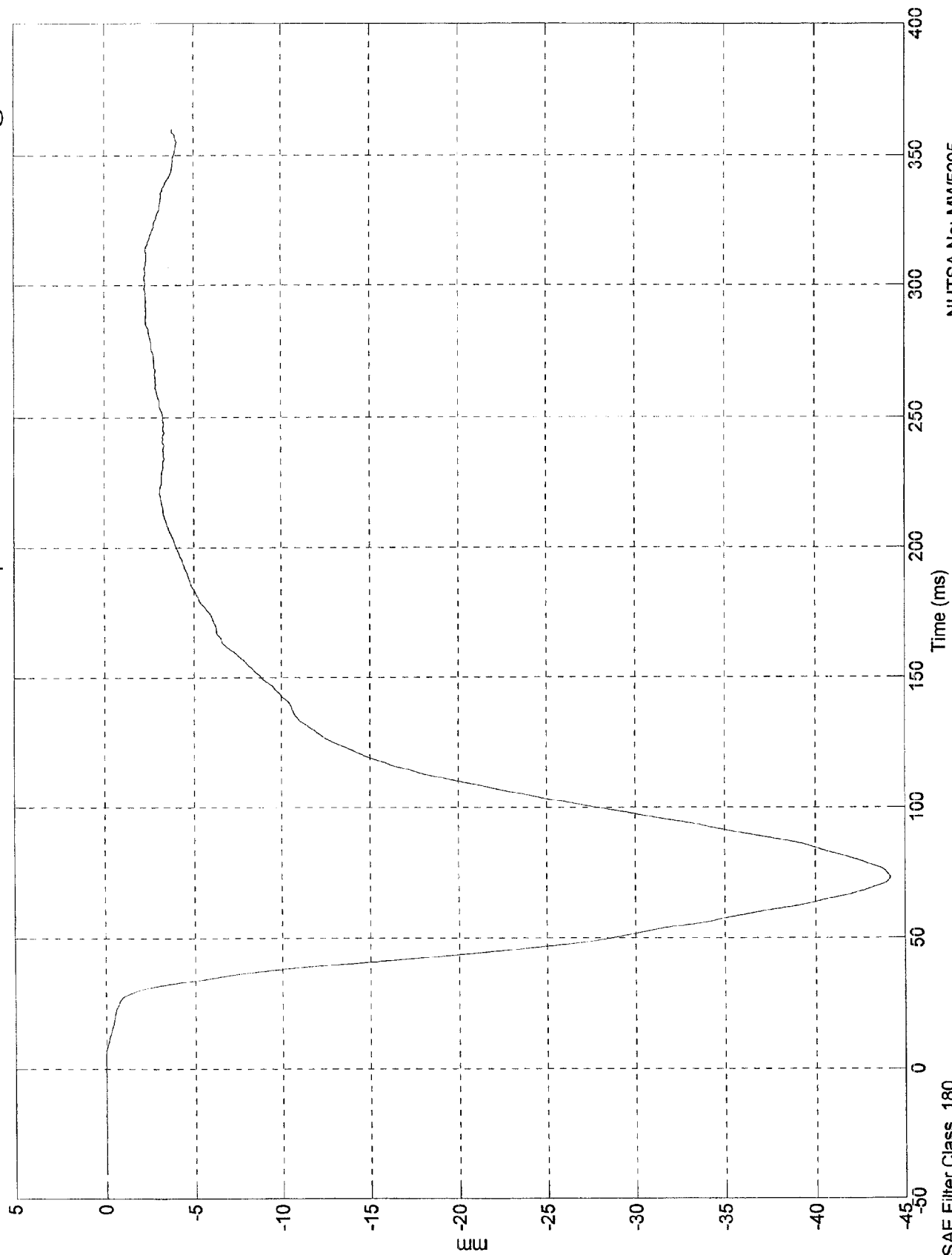


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 0.0129 mm @ -17.80 msec
Min = -44.2 mm @ 73.50 msec

Pos. 2 Chest Disp.

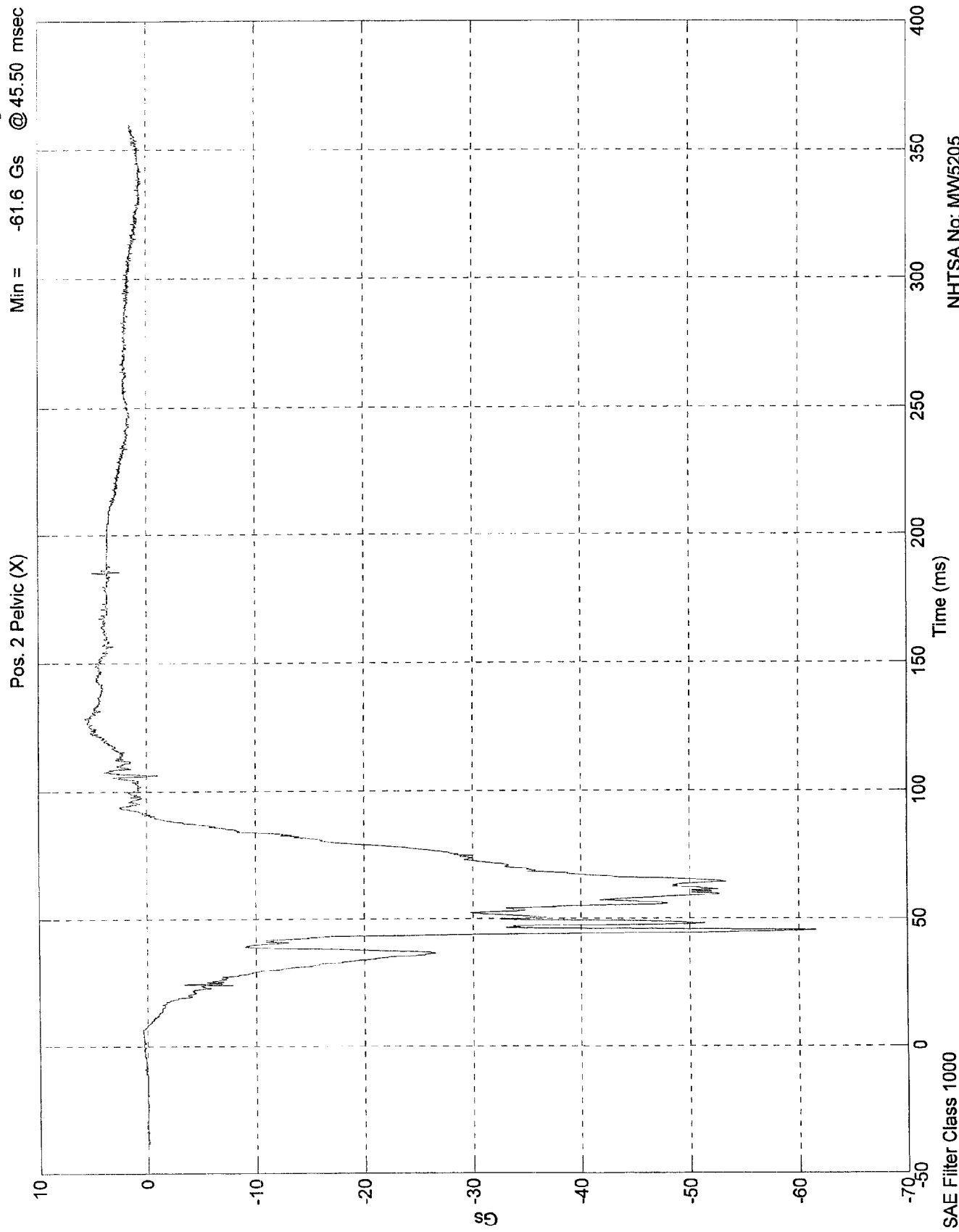


NHTSA No. MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

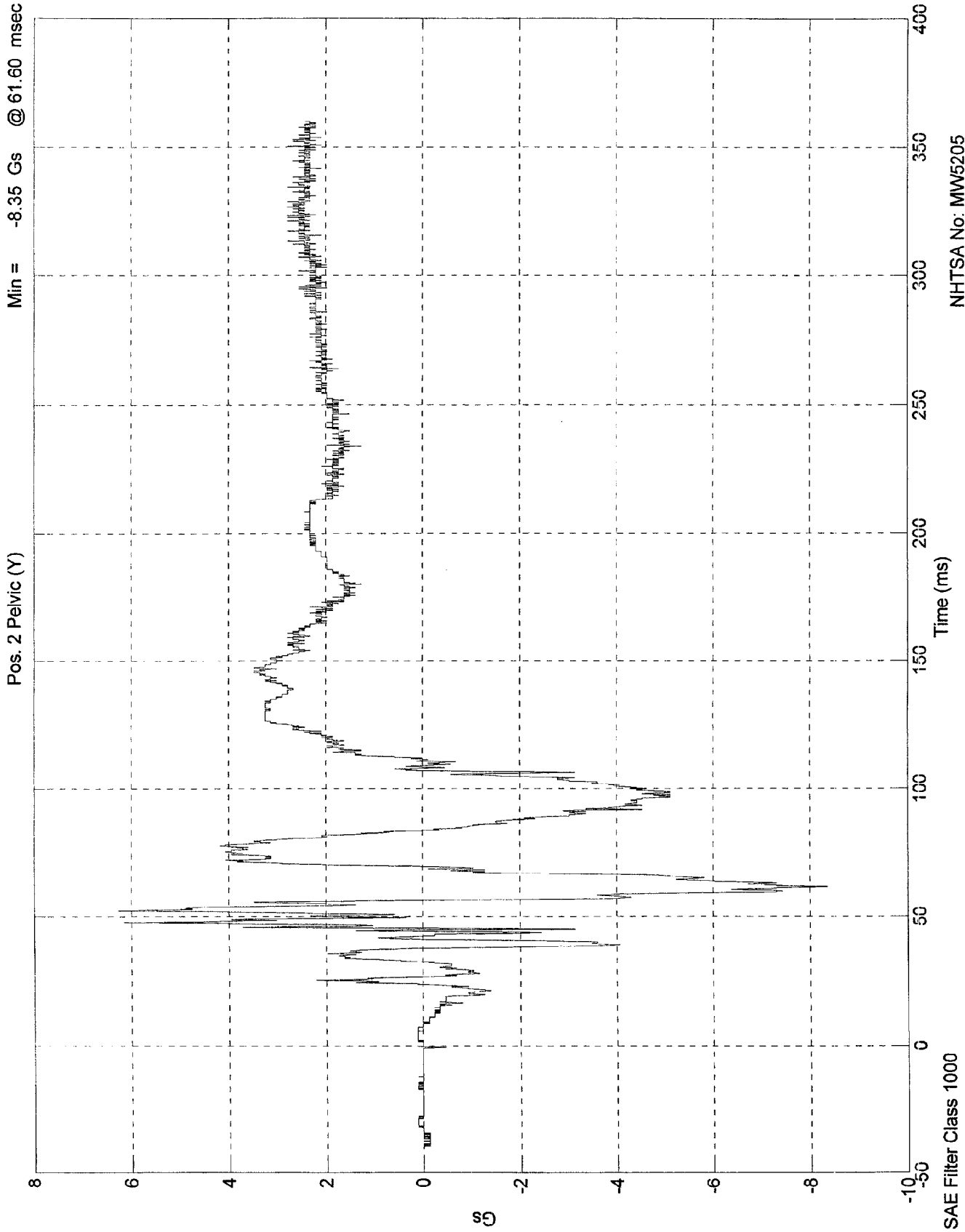
Max = 5.75 Gs @ 128.30 msec
Min = -61.6 Gs @ 45.50 msec



NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

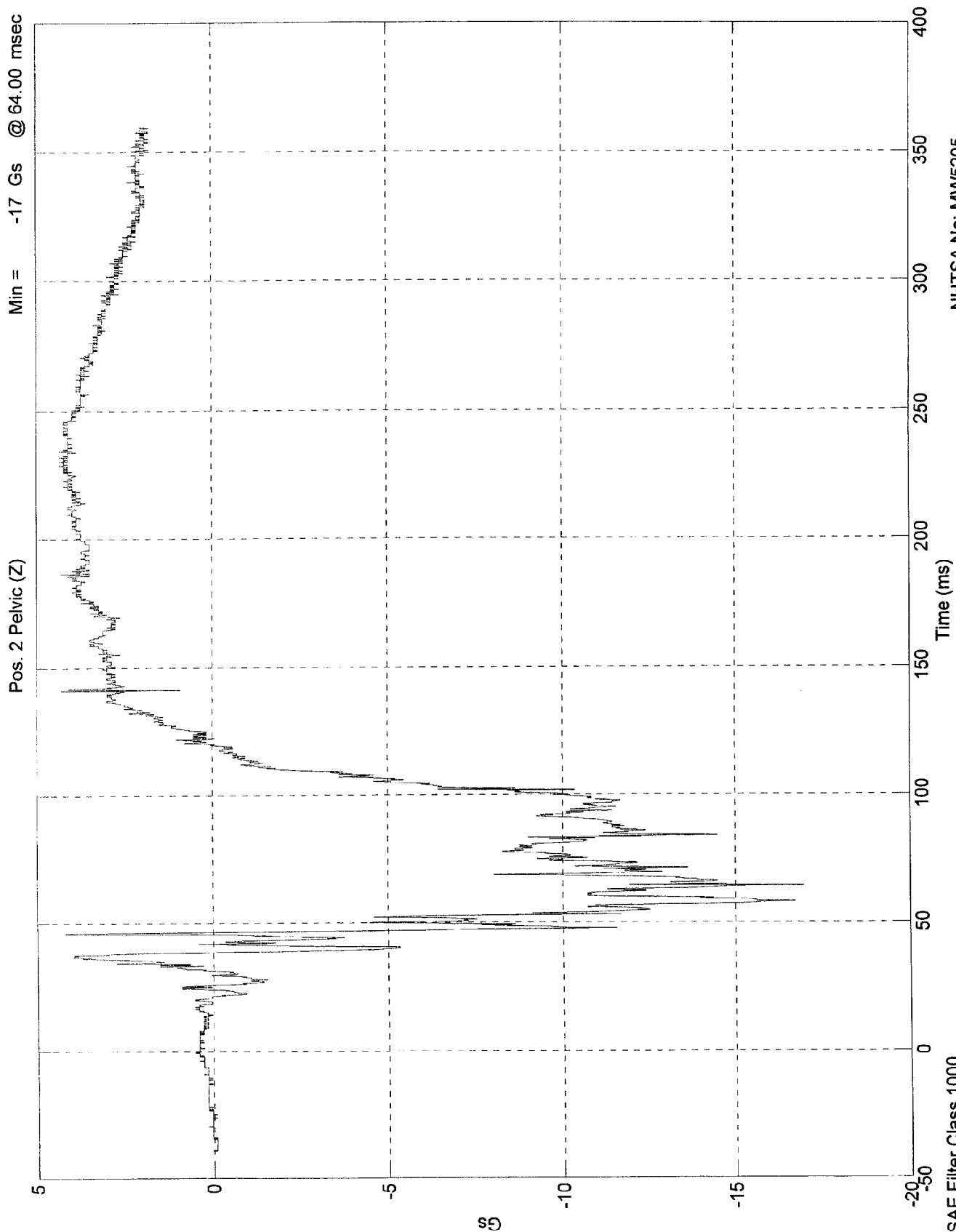
Max = 6.27 Gs @ 52.30 msec
Min = -8.35 Gs @ 61.60 msec



NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 4.32 Gs @ 141.20 msec
Min = -17 Gs @ 64.00 msec

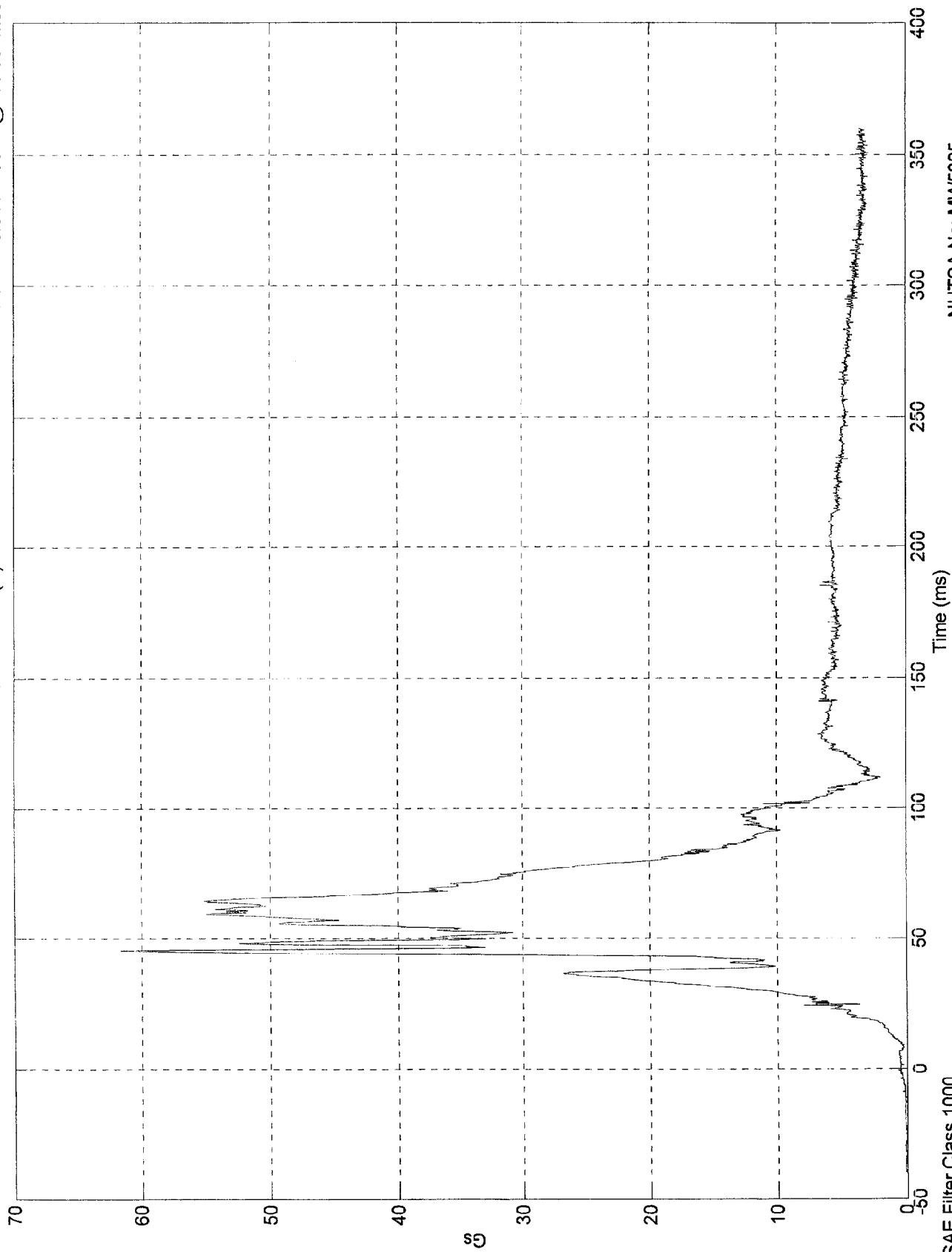


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 61.6 Gs @ 45.50 msec
Min = 0.0441 Gs @ -39.90 msec

Pos. 2 Pelvic (R)



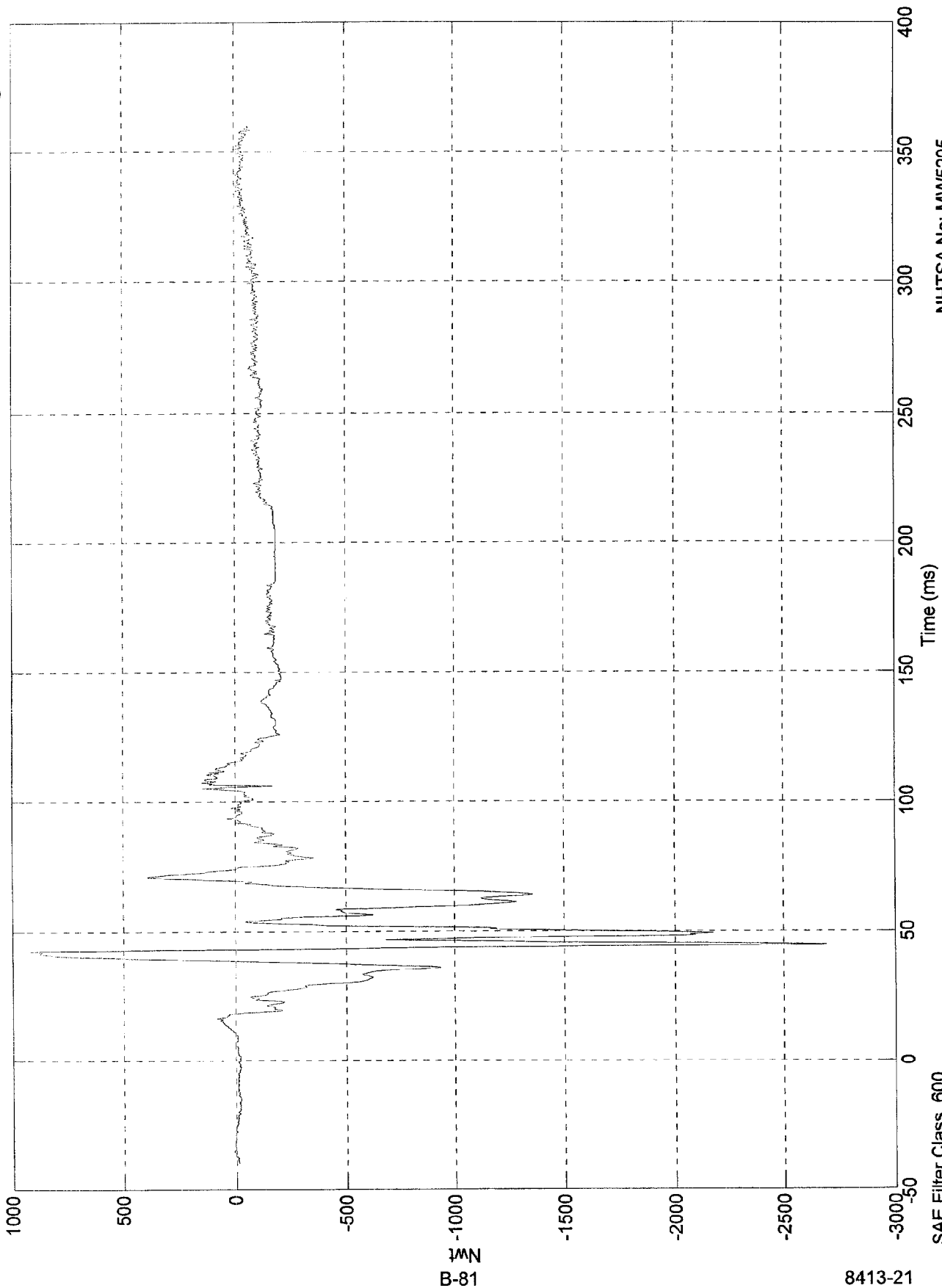
SAE Filter Class 1000

NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 921 Nwt @ 42.50 msec
Min = -2.69e+003 Nwt @ 44.80 msec

Pos. 2 Left Femur



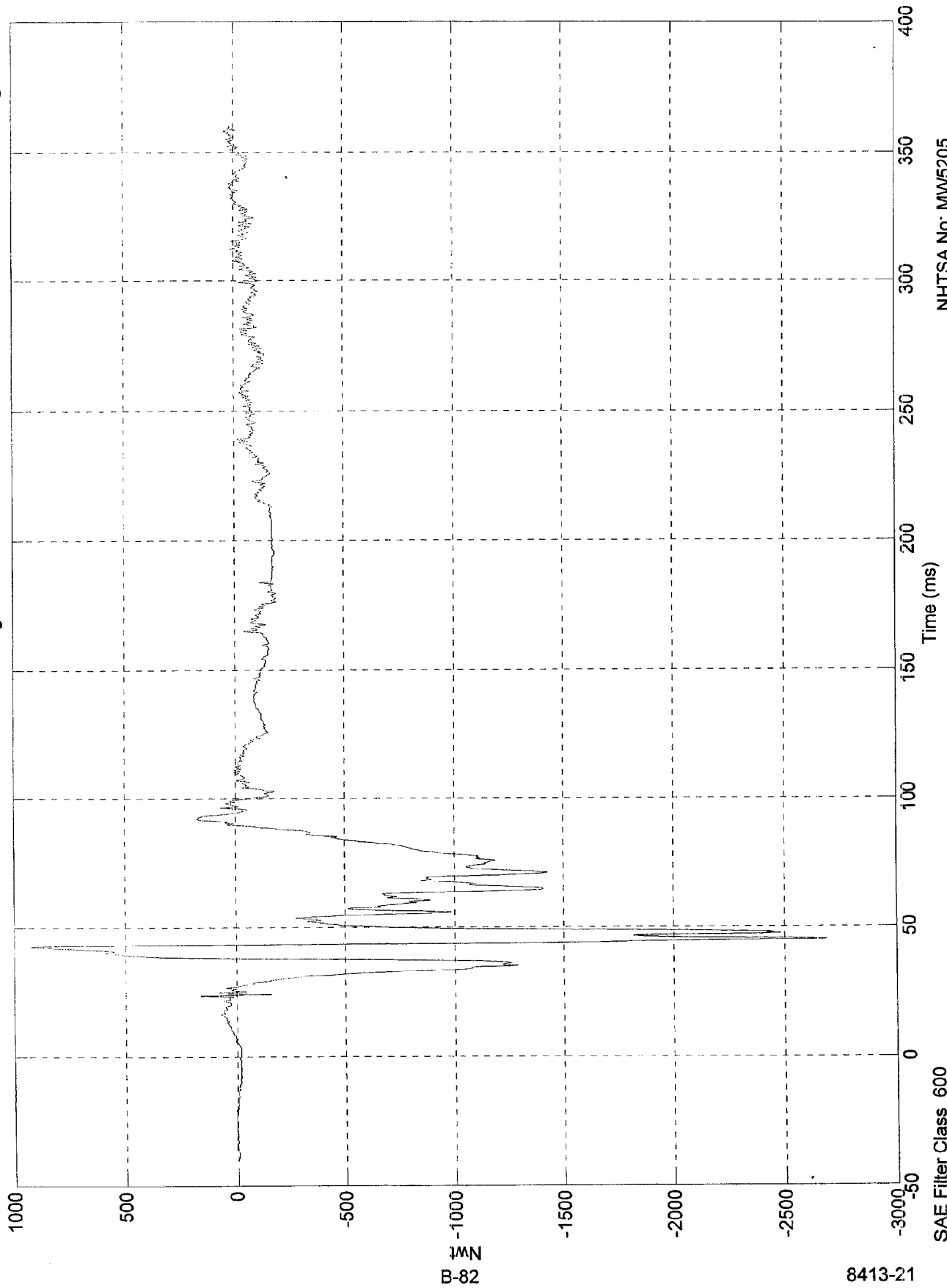
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 921 Nwt @ 42.70 msec
Min = -2.69e+003 Nwt @ 45.30 msec

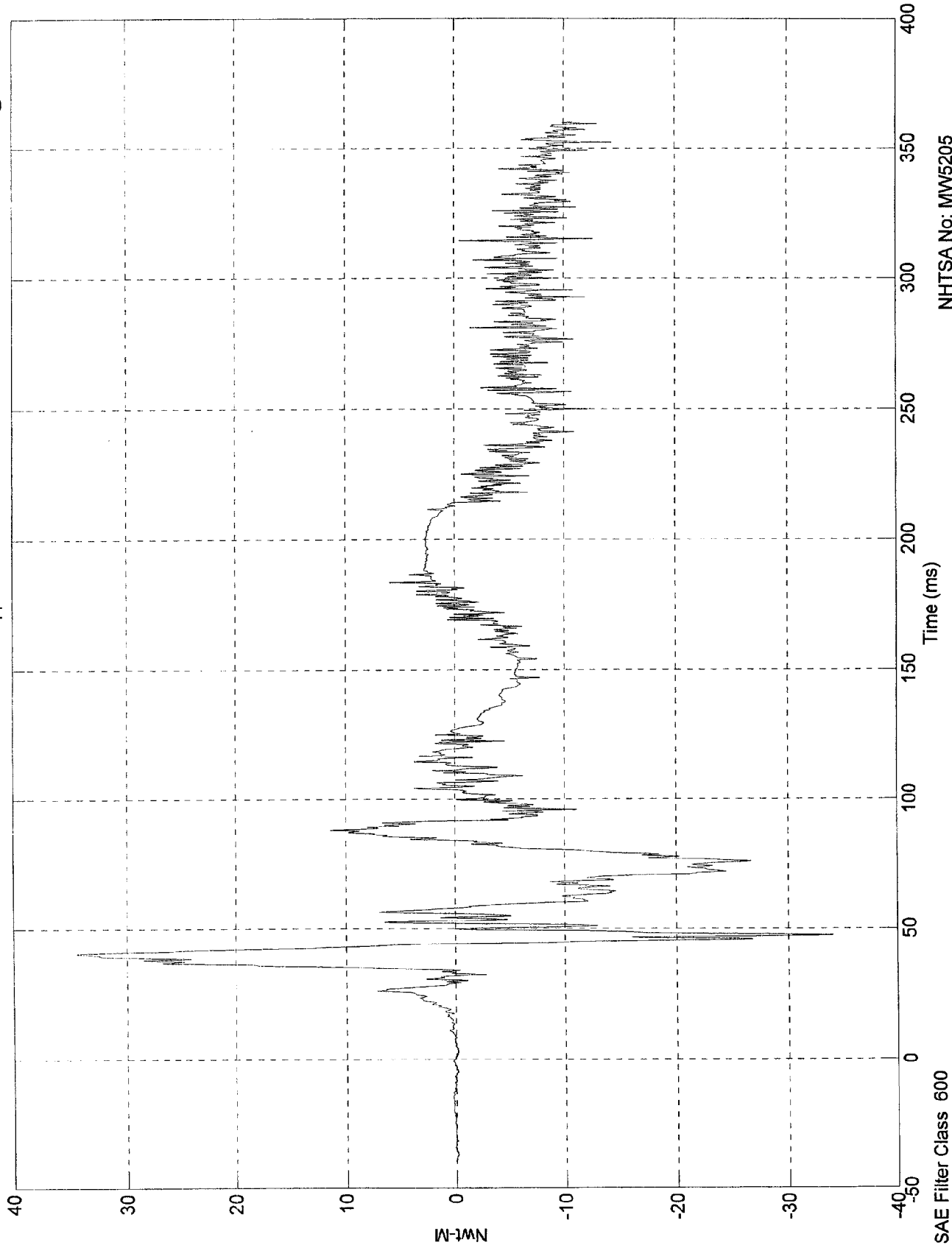
Pos. 2 Right Femur



NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 34.4 Nwt-M @ 40.80 msec
Min = -34.1 Nwt-M @ 47.50 msec

Pos. 2 Lt Upper Tibia Mx



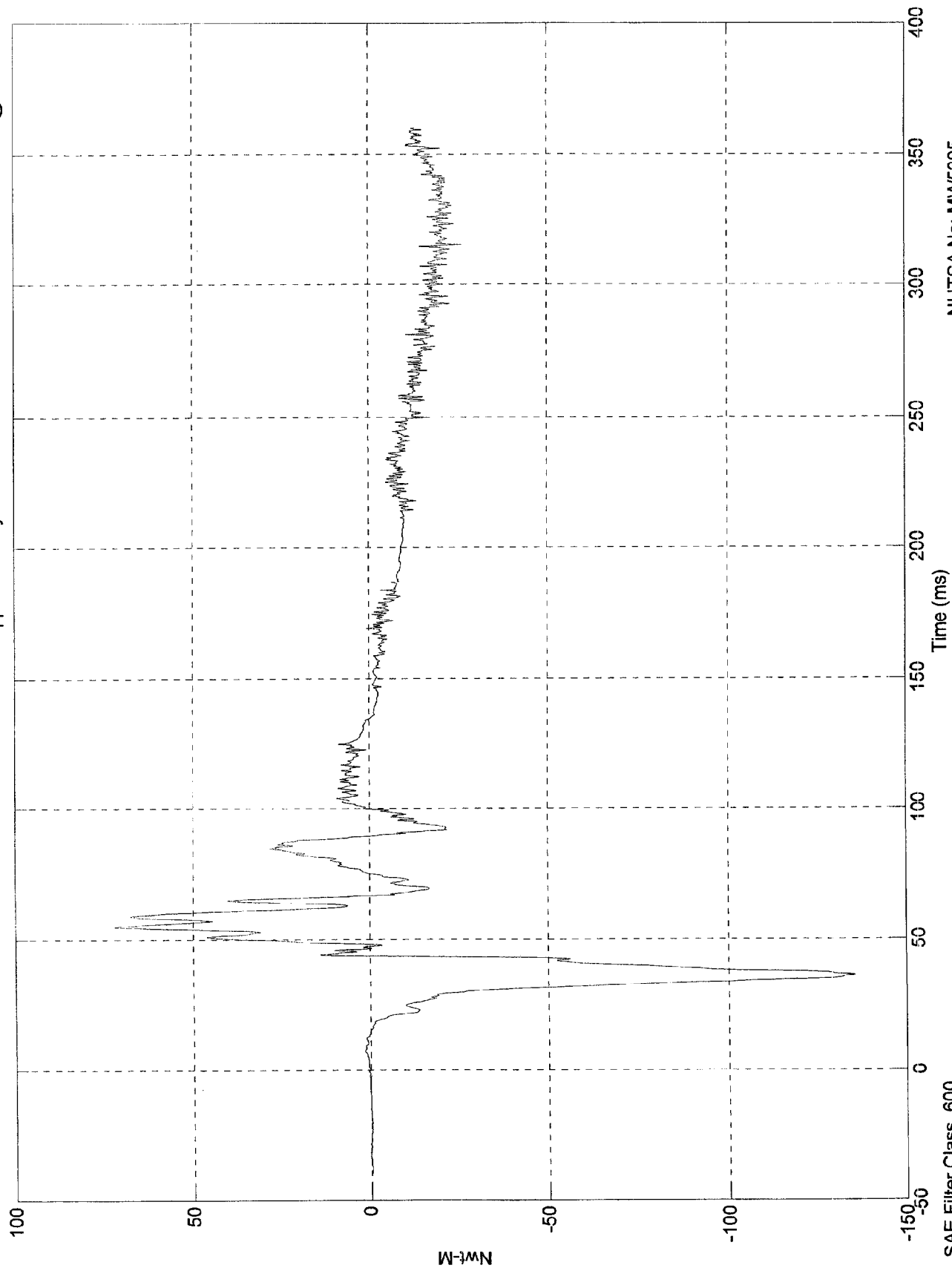
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 71.8 Nwt-M @ 54.80 msec
Min = -136 Nwt-M @ 36.30 msec

Pos. 2 Lt Upper Tibia My



NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

Nwt-M

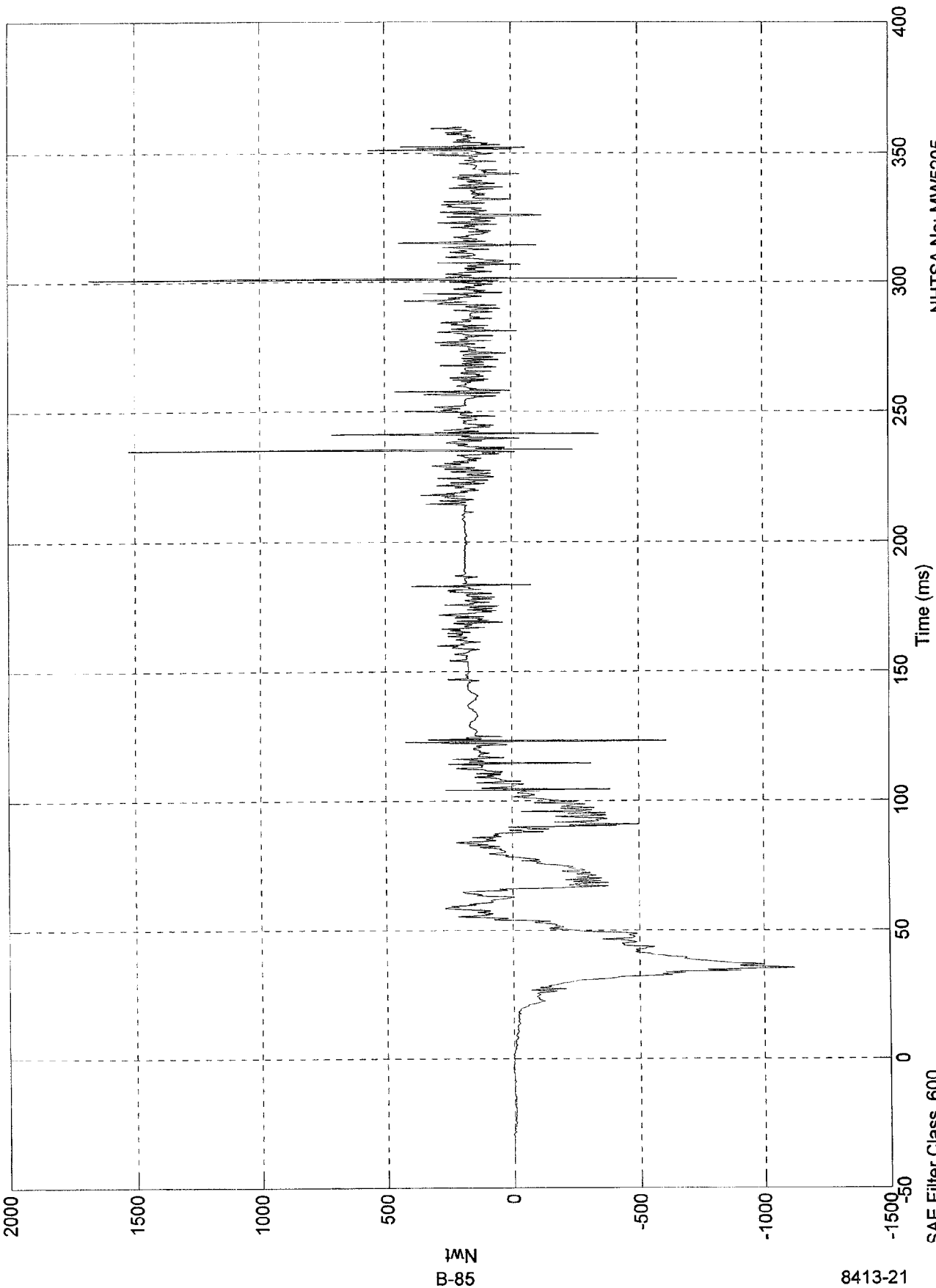
B-84

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NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 1.68e+003 Nwt @ 301.00 msec
Min = -1.12e+003 Nwt @ 35.60 msec

Pos. 2 Lt Lower Tibia Fx



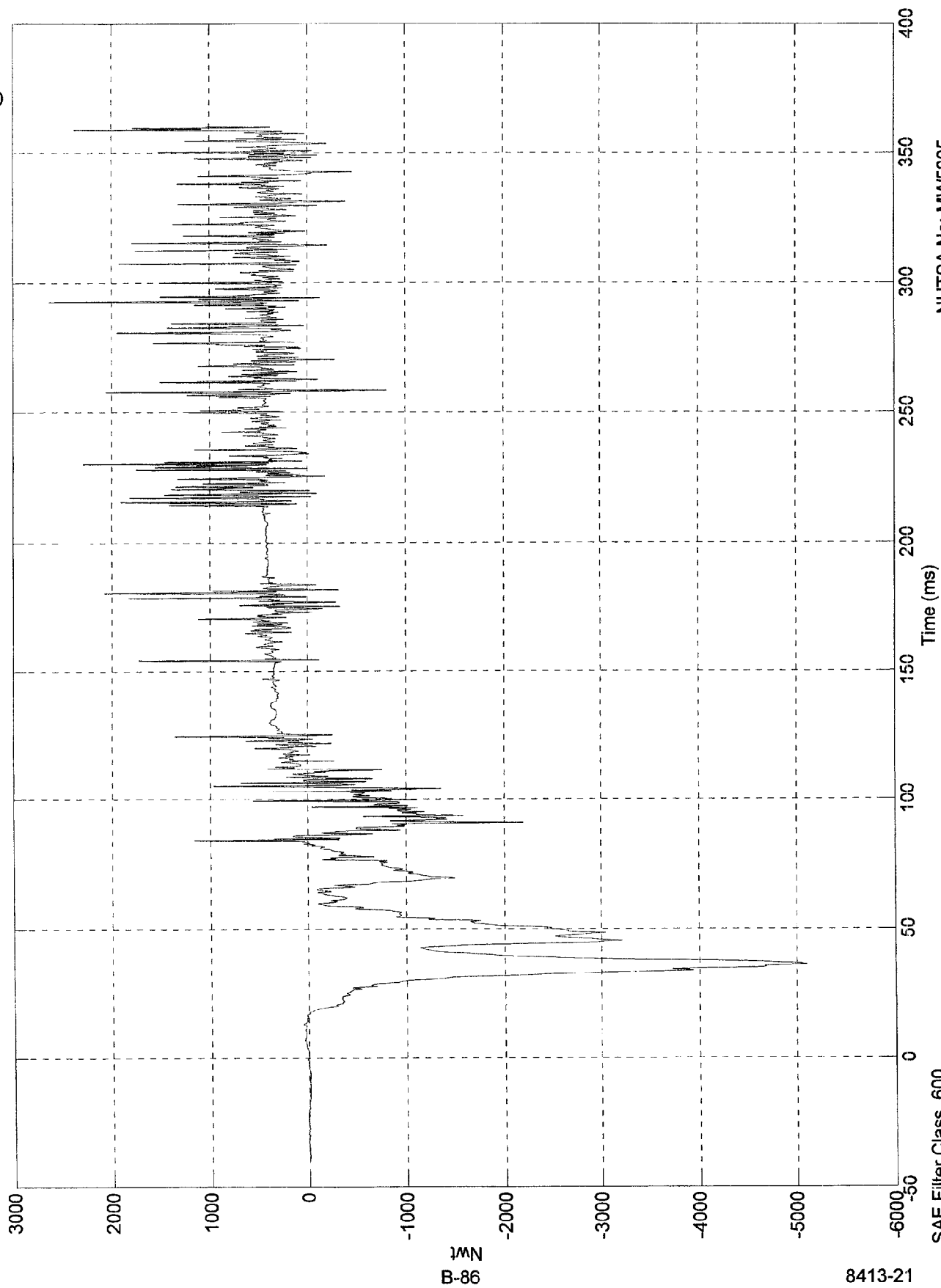
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 2.64e+003 Nwt @ 292.70 msec
Min = -5.1e+003 Nwt @ 36.20 msec

Pos. 2 Lt Lower Tibia Fz

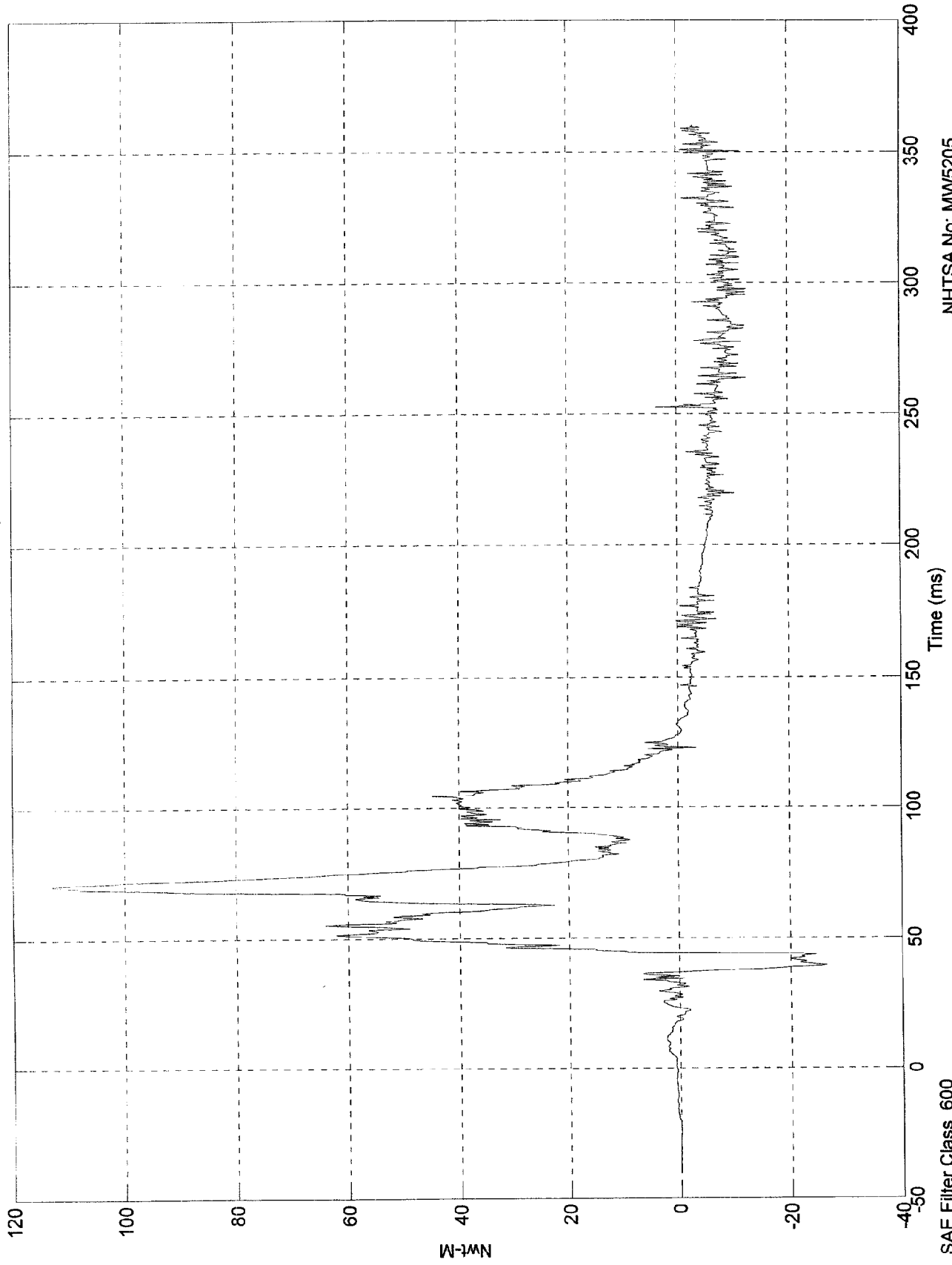


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 113 Nwt-M @ 70.30 msec
Min = -26.5 Nwt-M @ 39.50 msec

Pos. 2 Lt Lower Tibia My



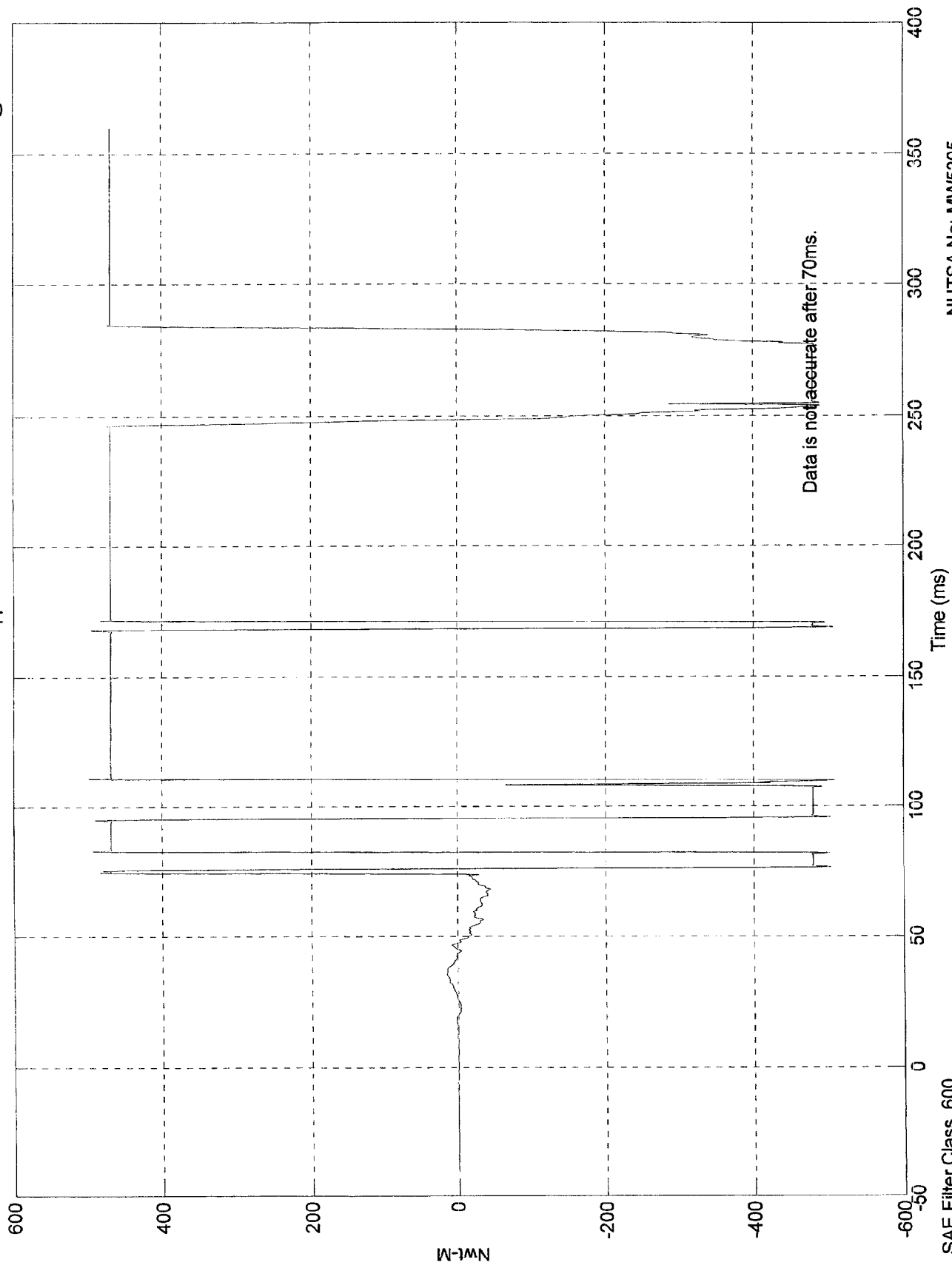
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 498 Nwt-M @ 110.90 msec
Min = -509 Nwt-M @ 110.00 msec

Pos. 2 Rt Upper Tibia Mx

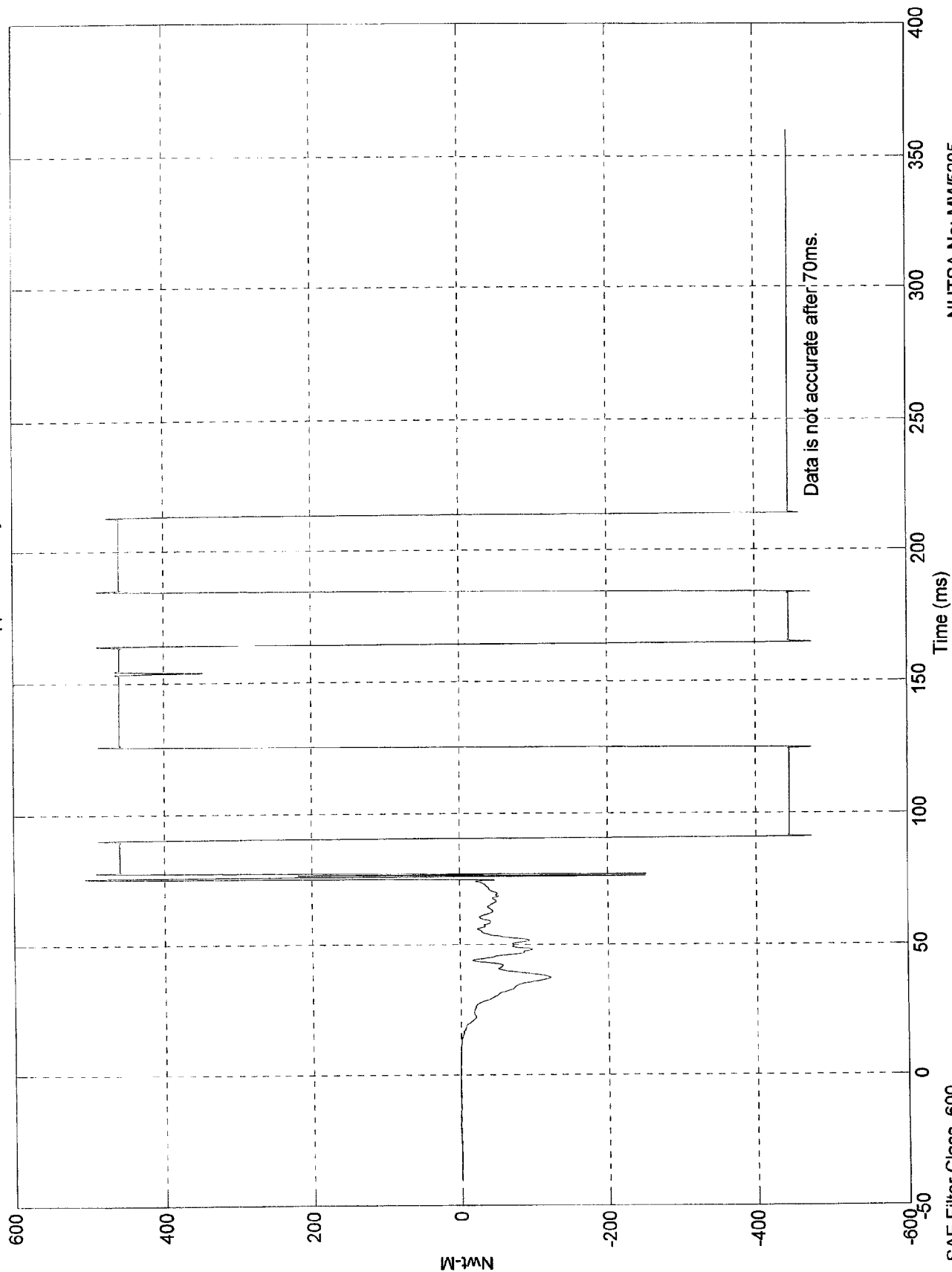


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 505 Nwt-M @ 75.80 msec
Min = -475 Nwt-M @ 164.60 msec

Pos. 2 Rt Upper Tibia My



Data is not accurate after 70ms.

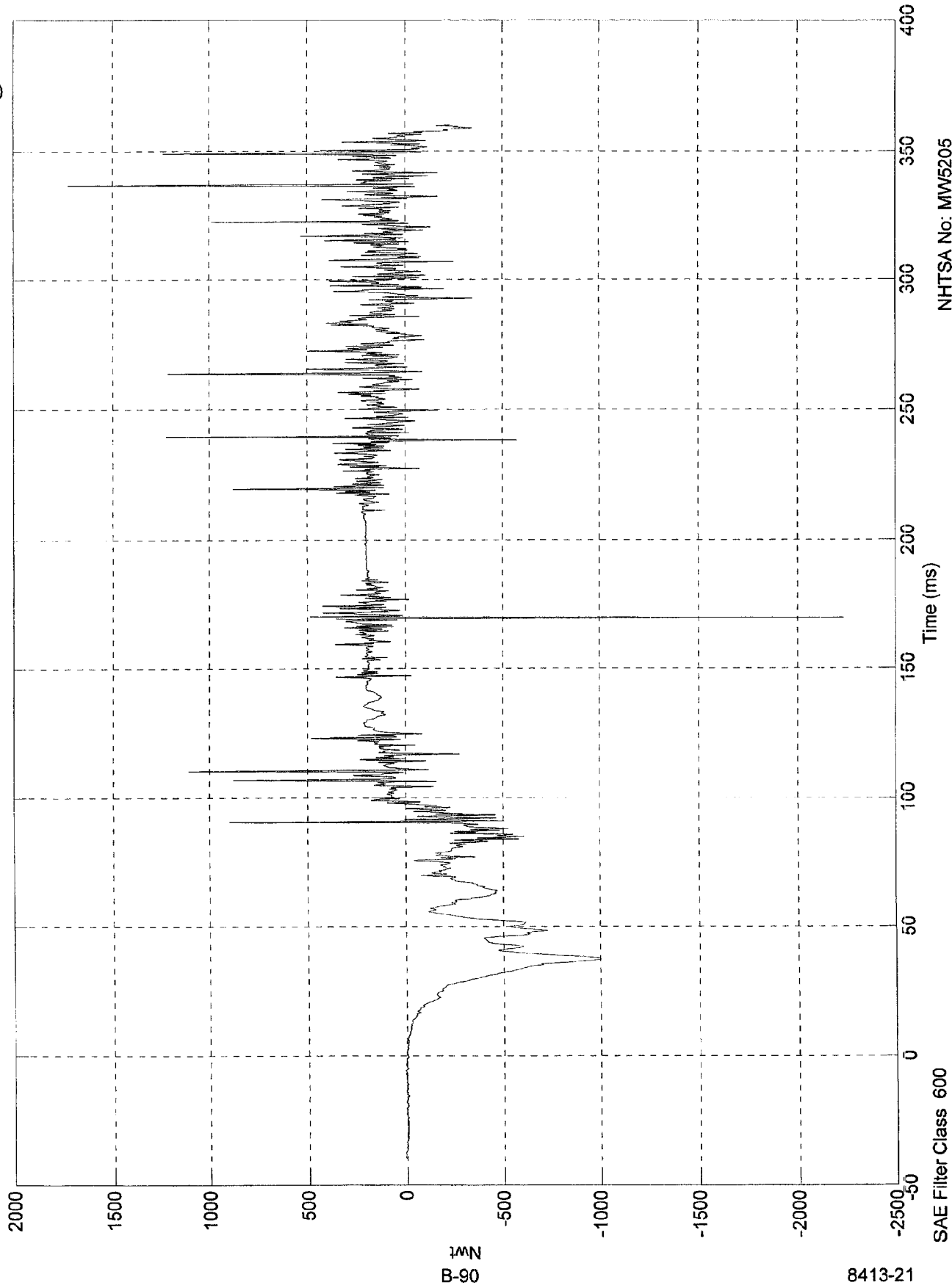
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 1.73e+003 Nwt @ 336.50 msec
Min = -2.23e+003 Nwt @ 169.90 msec

Pos. 2 Rt Lower Tibia Fx



NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

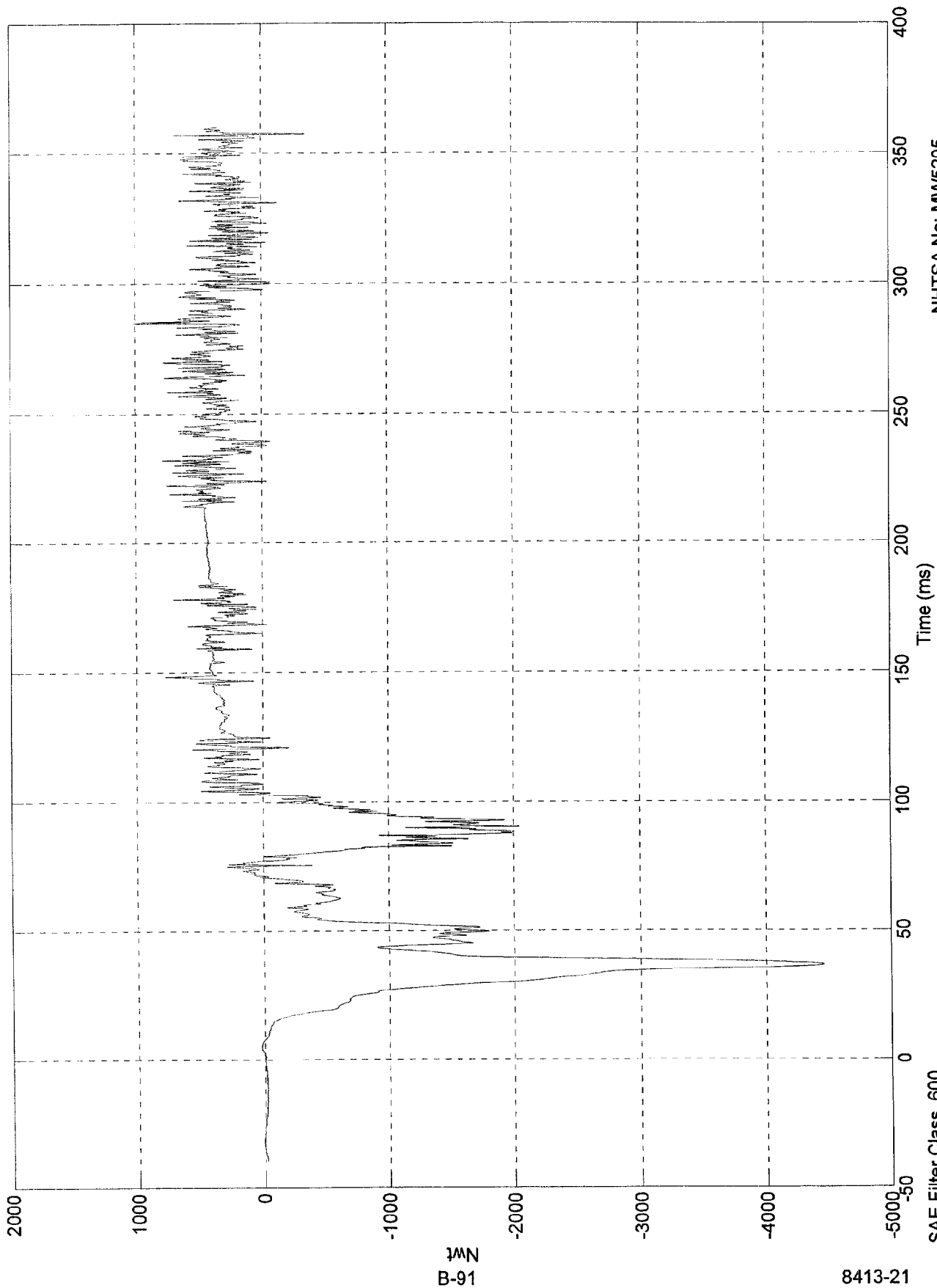
B-90

8413-21

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 1.01e+003 Nwt @ 284.90 msec
Min = -4.46e+003 Nwt @ 36.80 msec

Pos. 2 Rt Lower Tibia Fz



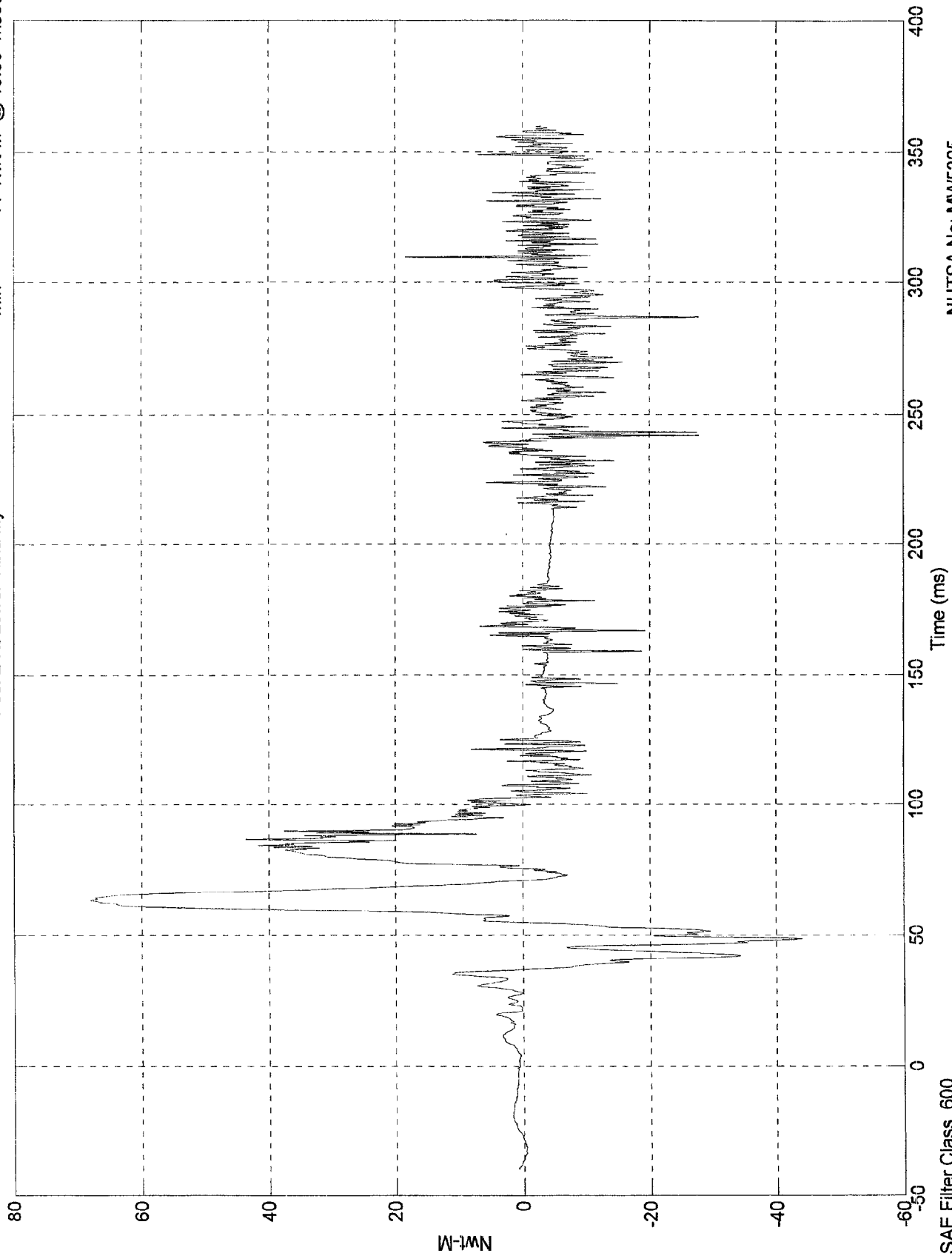
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 600

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 68 Nwt-M @ 63.10 msec
Min = -44 Nwt-M @ 48.50 msec

Pos. 2 Rt Lower Tibia My

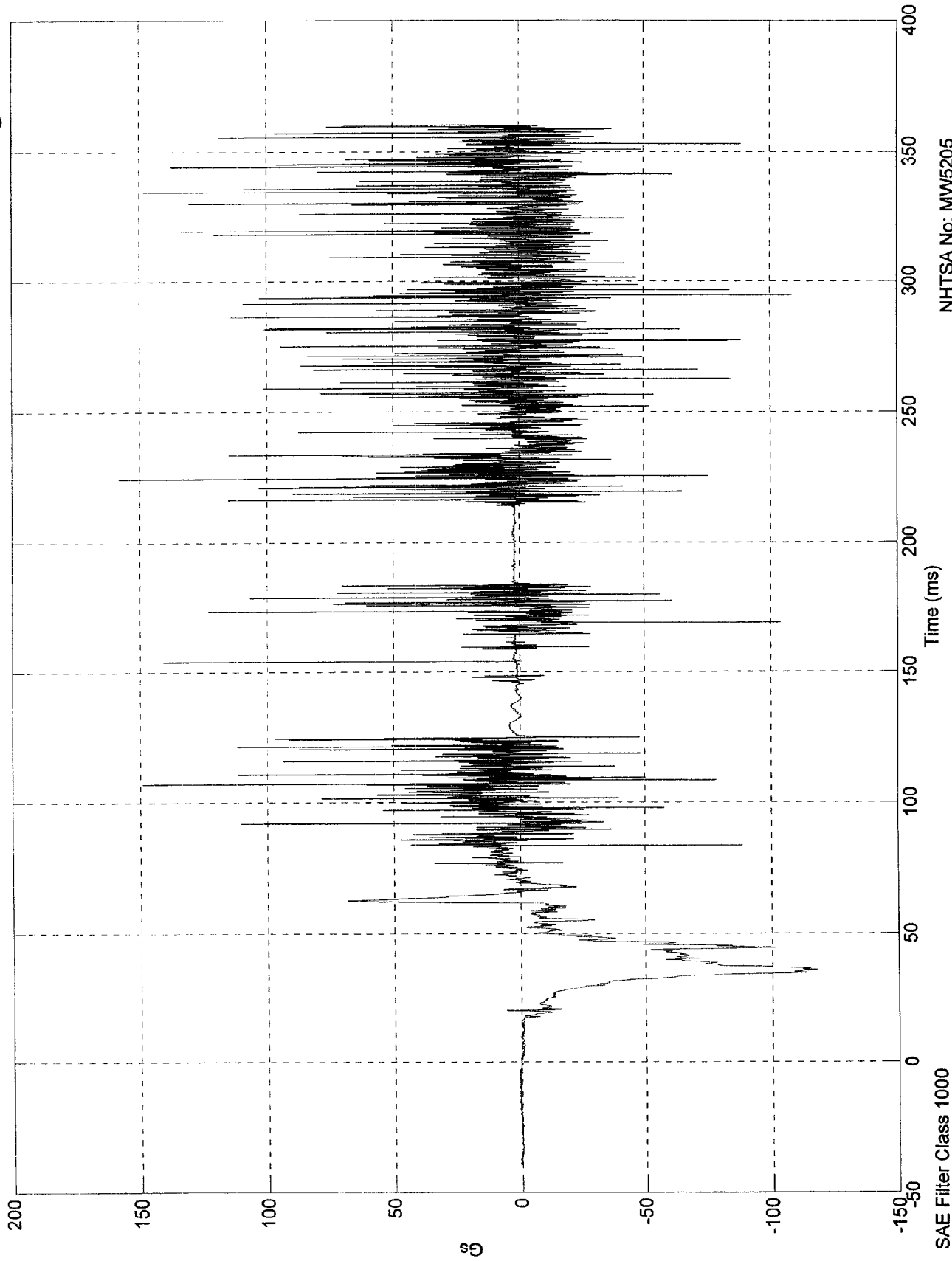


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 158 Gs @ 224.40 msec
Min = -118 Gs @ 35.90 msec

Pos. 2 Left Ankle X

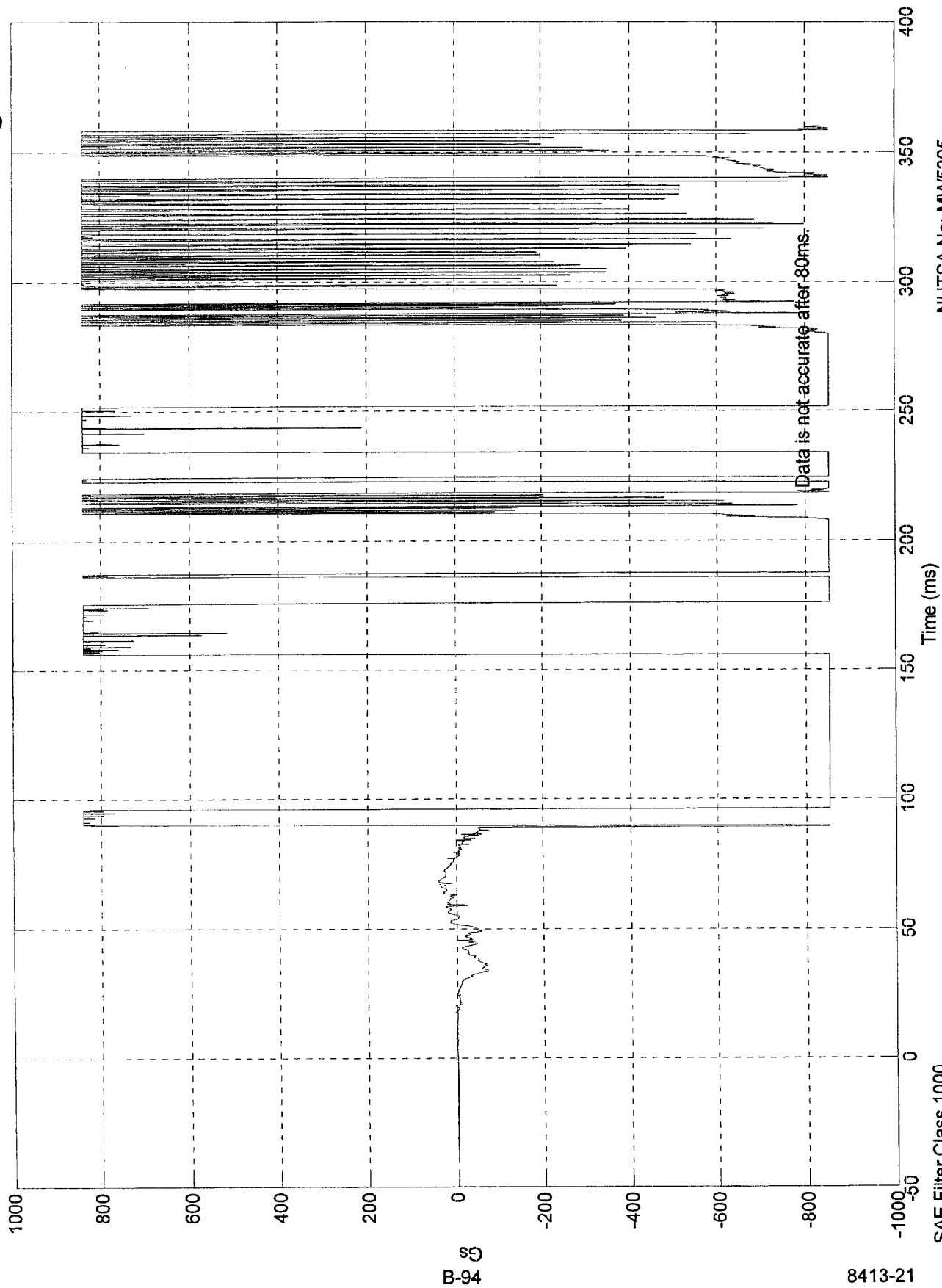


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 839 Gs @ 90.10 msec
Min = -852 Gs @ 89.40 msec

Pos. 2 Left Ankle Z



NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 1000

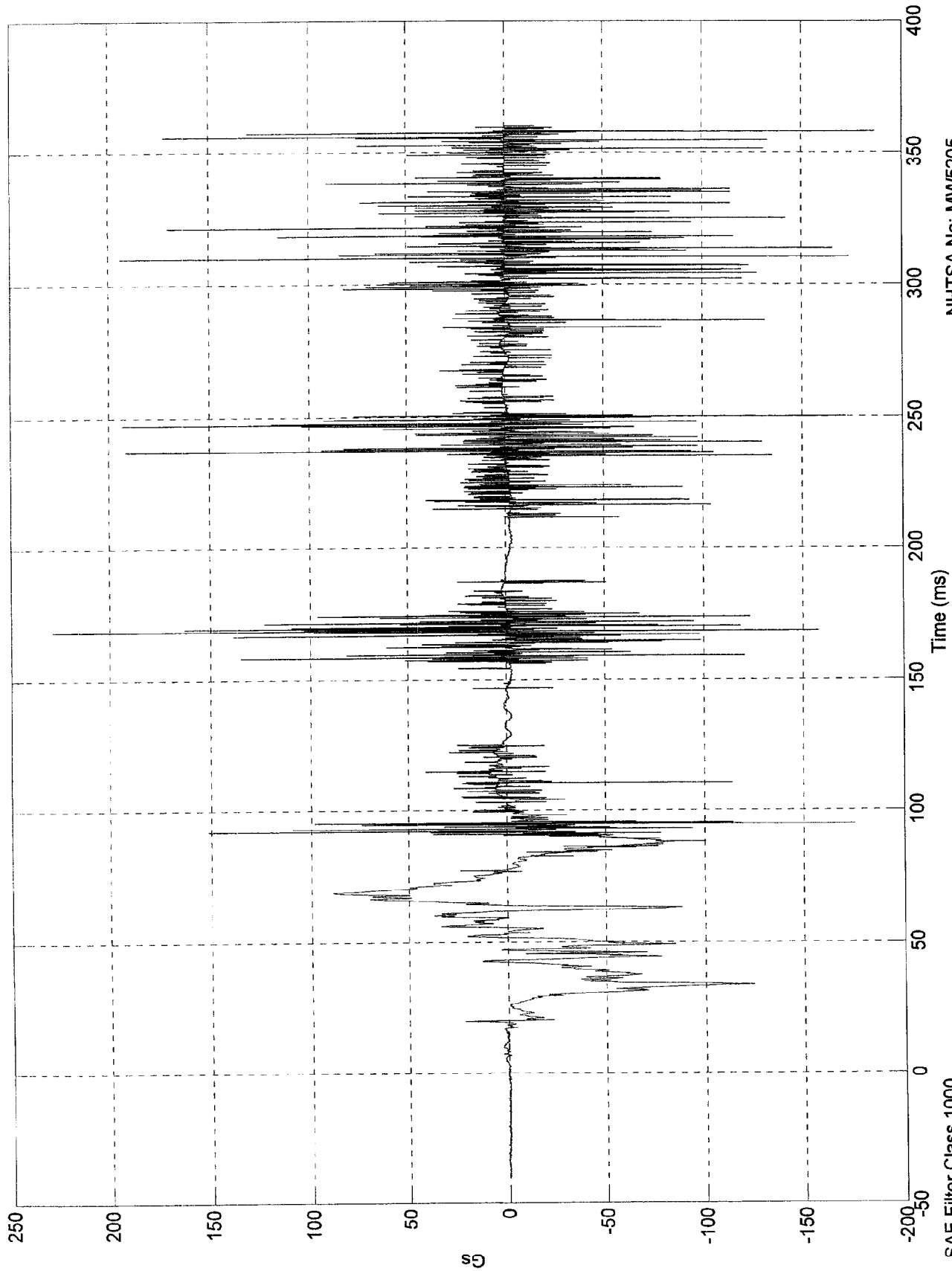
B-94

8413-21

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 228 Gs @ 168.40 msec
Min = -187 Gs @ 357.80 msec

Pos. 2 Left Toe Z

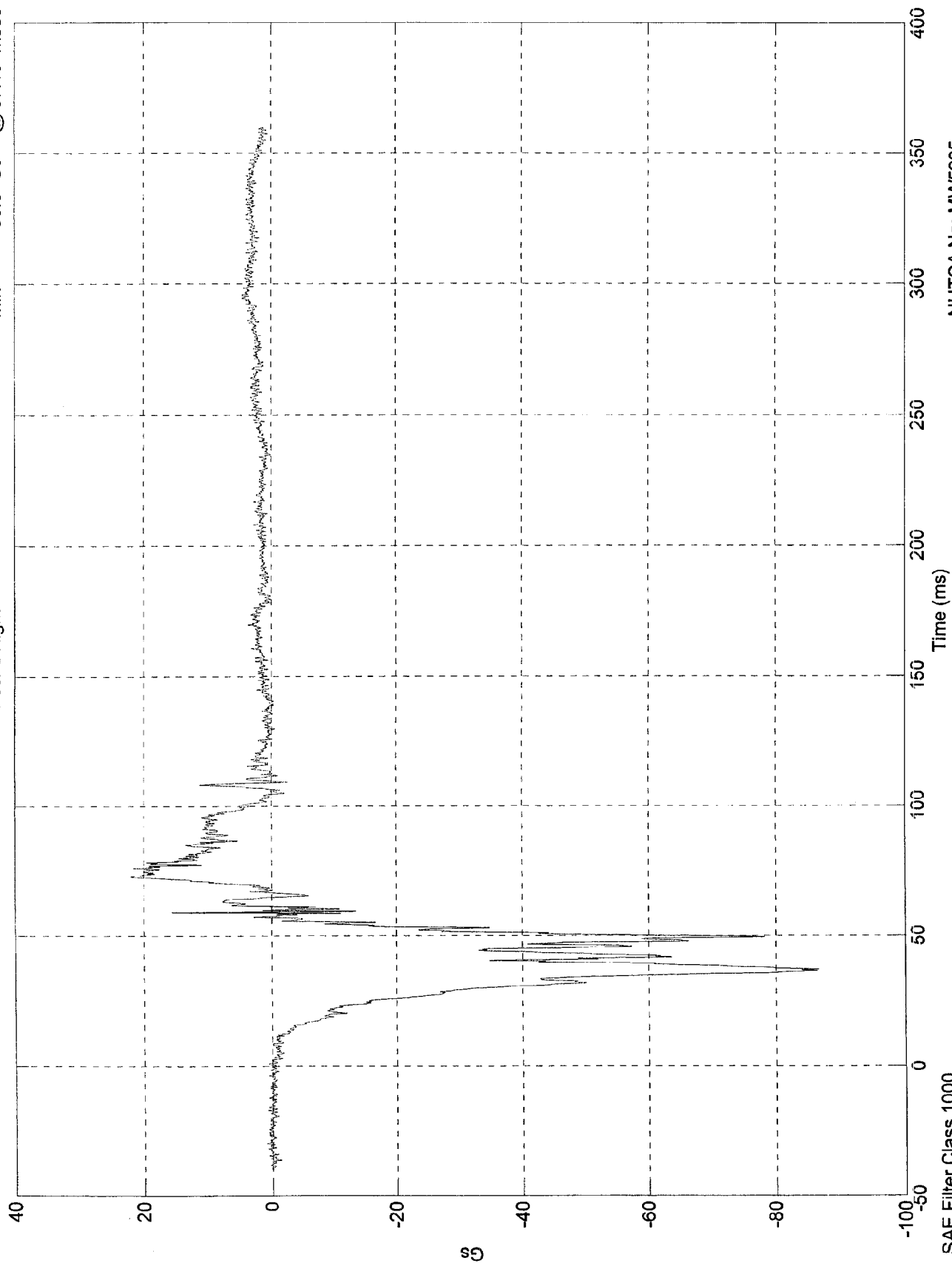


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 22 Gs @ 73.00 msec
Min = -86.6 Gs @ 37.10 msec

Pos. 2 Right Ankle X

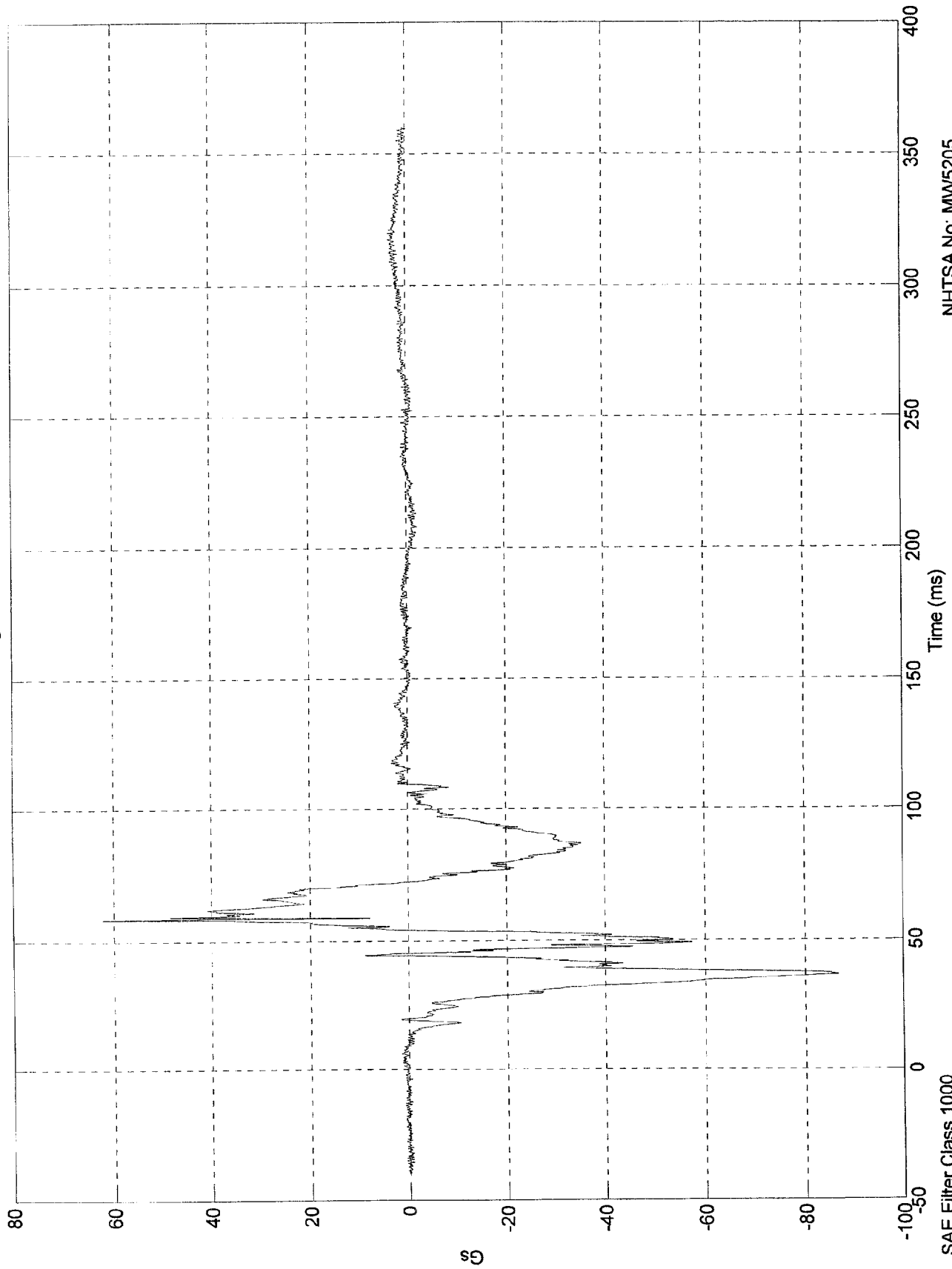


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 62.2 Gs @ 58.30 msec
Min = -86.5 Gs @ 36.90 msec

Pos. 2 Right Ankle Z

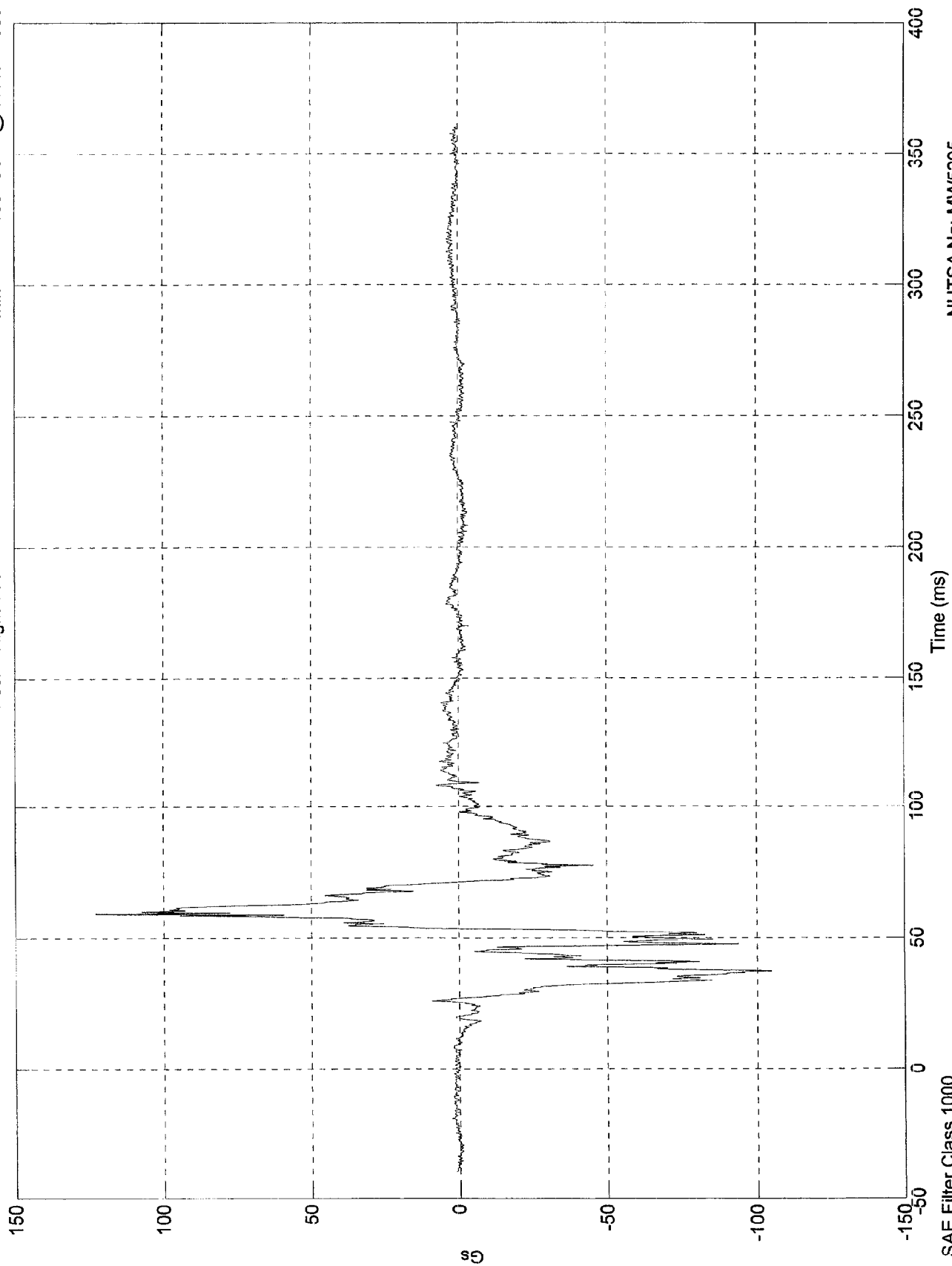


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 123 Gs @ 59.10 msec
Min = -105 Gs @ 37.40 msec

Pos. 2 Right Toe Z

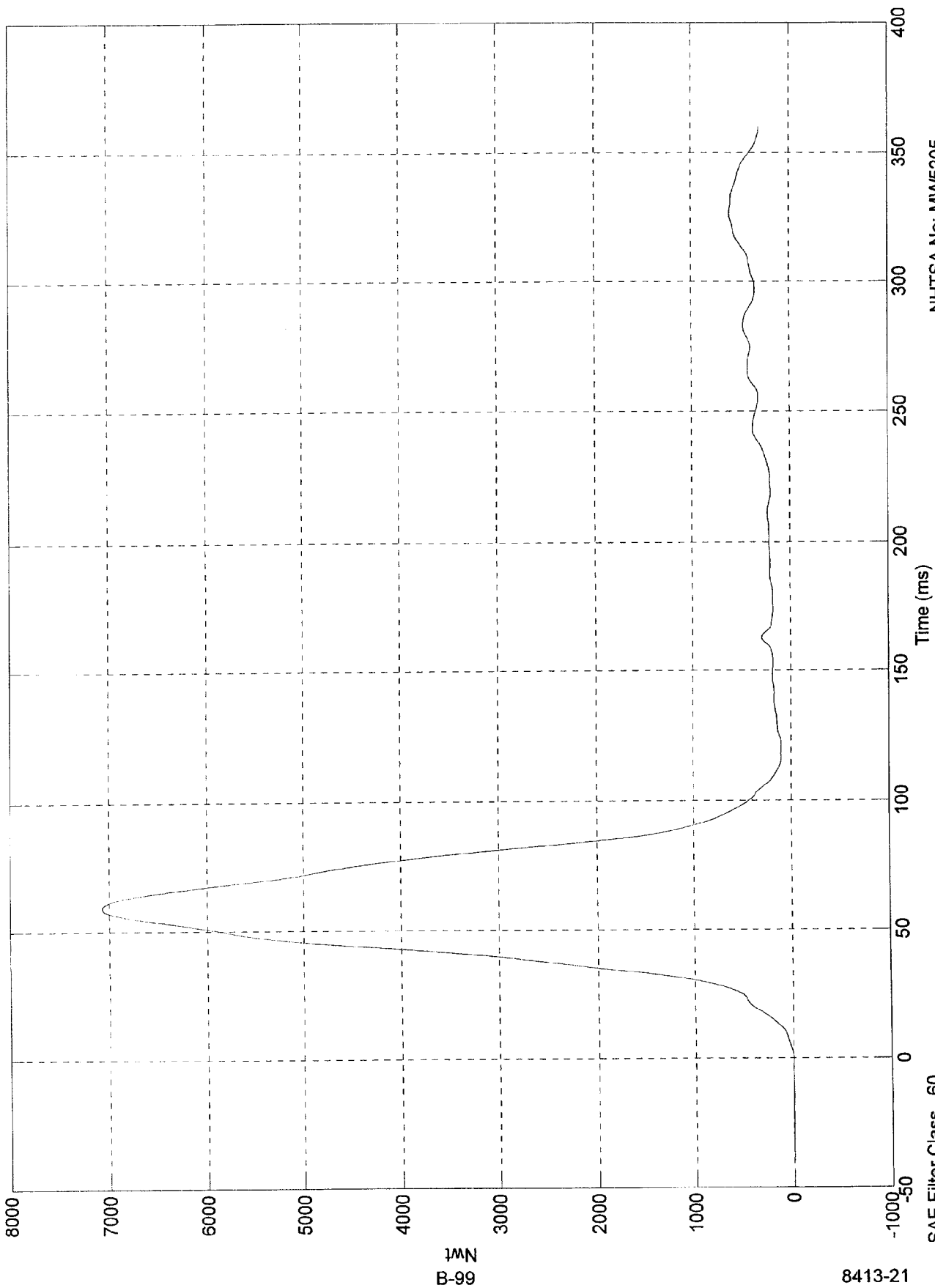


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 7.07e+003 Nwt @ 58.90 msec
Min = -0.893 Nwt @ -0.10 msec

Pos. 2 Right Belt Load



NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 60

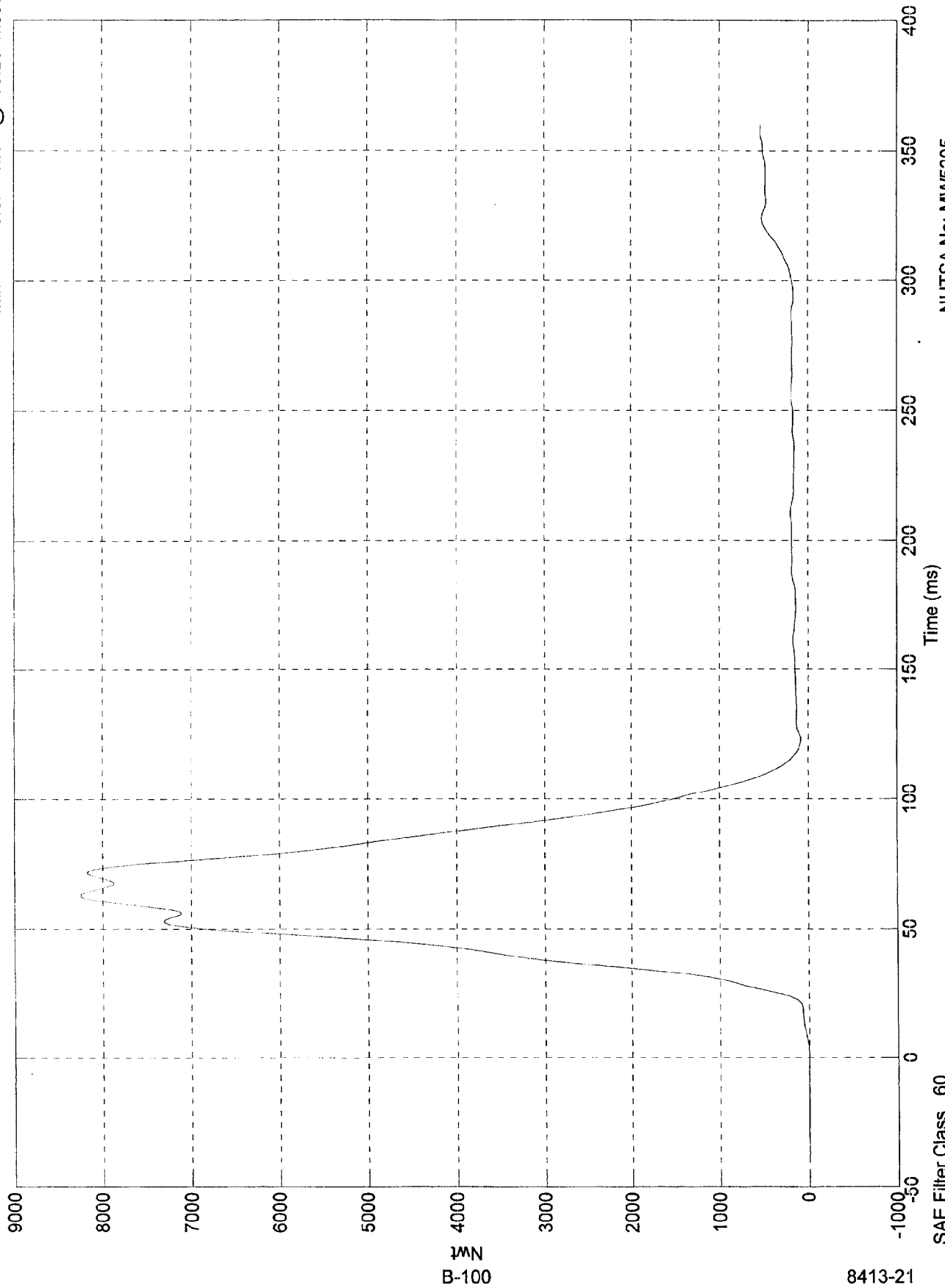
B-99

8413-21

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 8.25e+003 Nwt @ 62.90 msec
Min = -3.62 Nwt @ -35.20 msec

Pos. 2 Torso Belt Load



NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 60

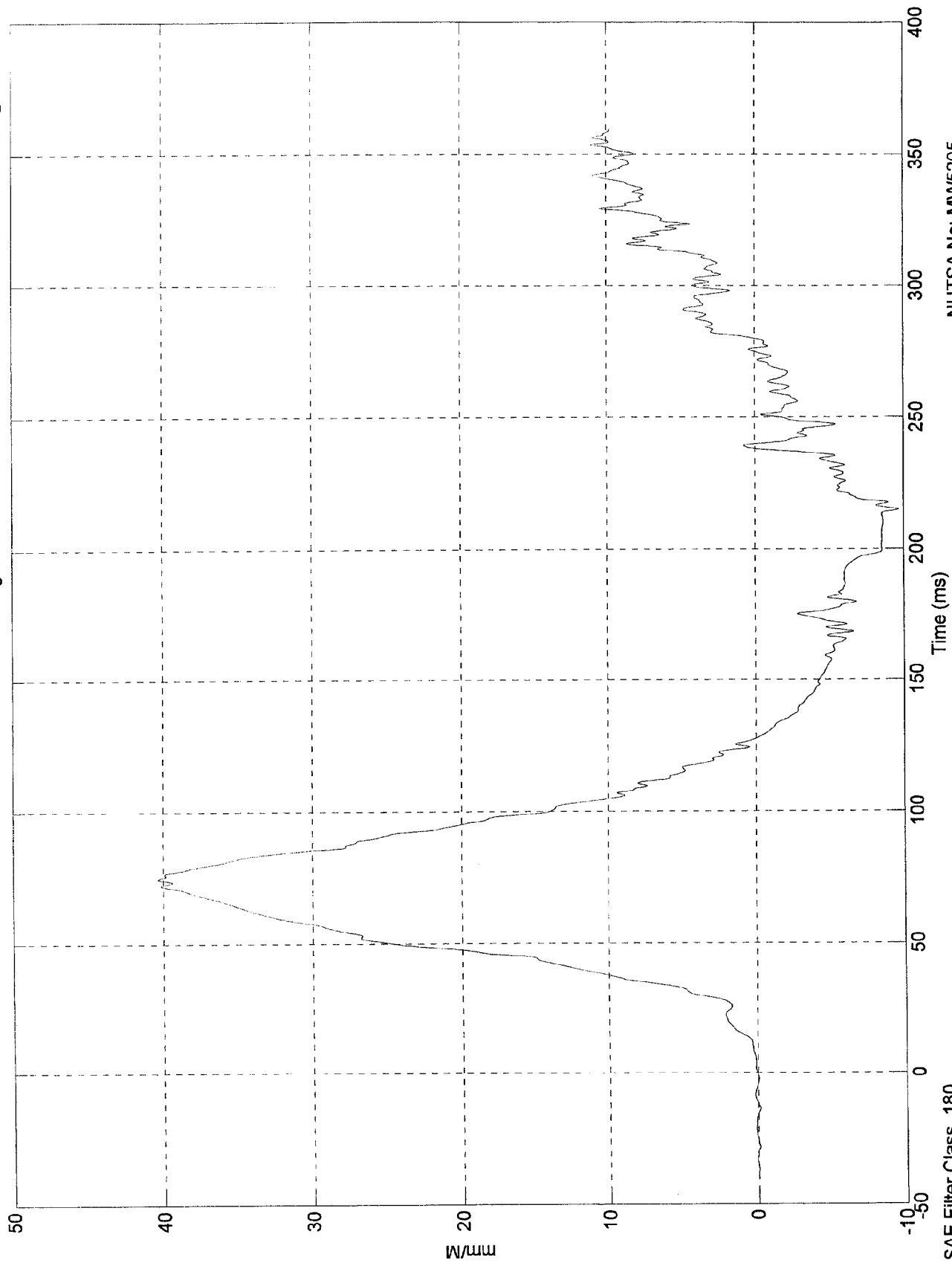
B-100

8413-21

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 40.4 mm/M @ 74.90 msec
Min = -9.67 mm/M @ 214.90 msec

Pos. 2 Belt Elongation



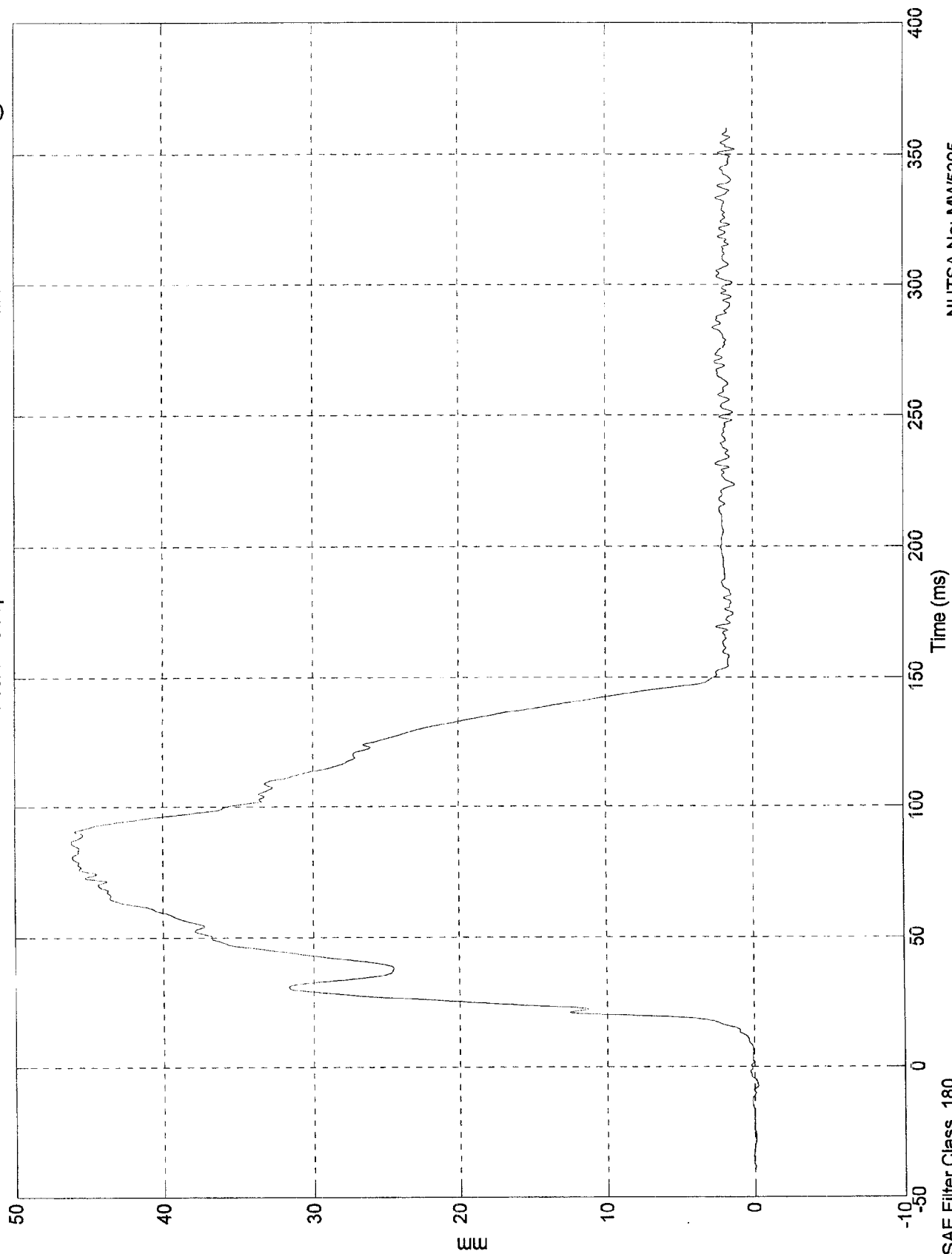
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 46.2 mm @ 86.10 msec
Min = -0.235 mm @ -7.60 msec

Pos. 2 Belt Spoolout



NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NHTSA TEST NO. MW5205

VEHICLE DATA

FILTER CHANNEL CLASS

Acceleration

60

Velocity

180

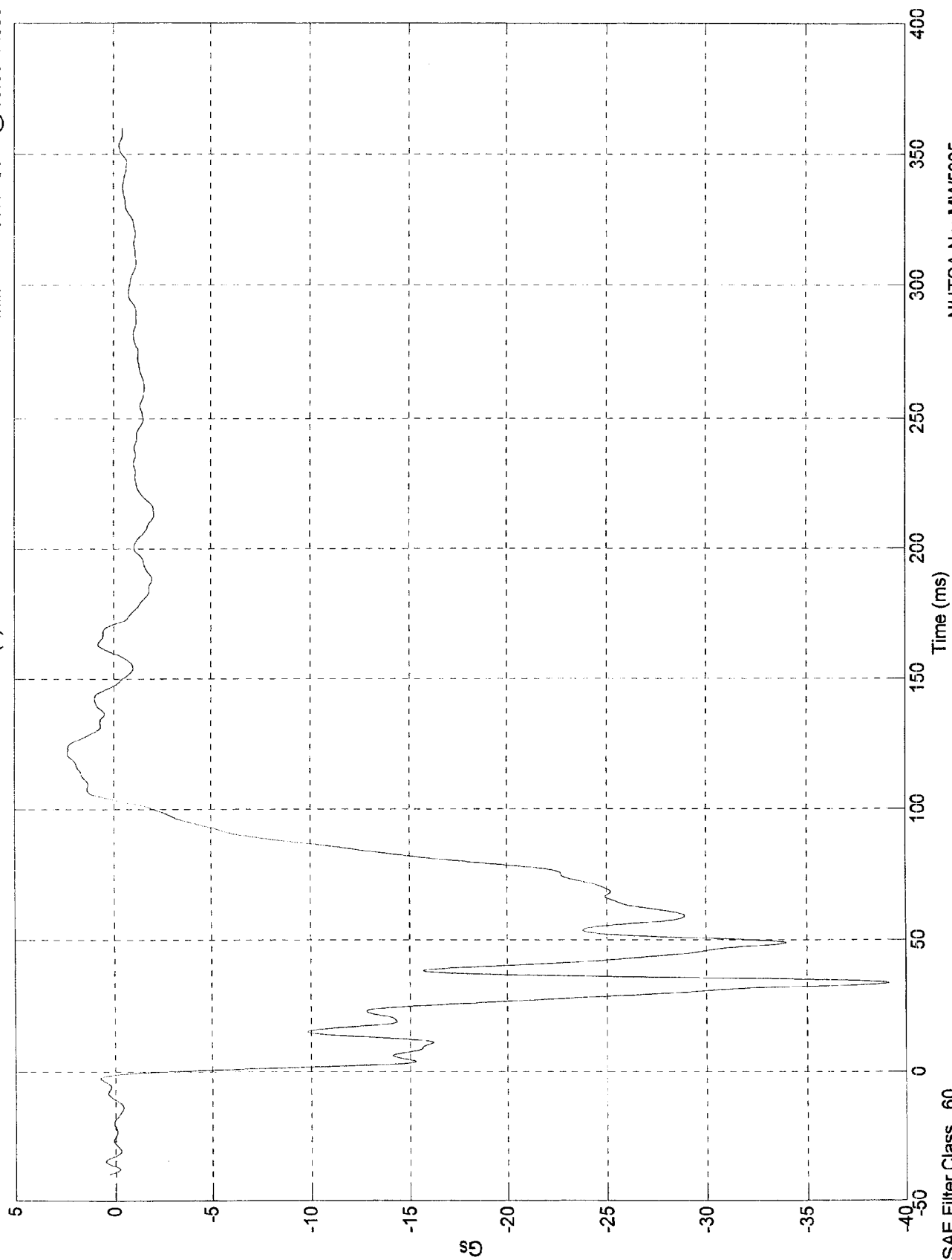
Displacement

180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 2.34 Gs @ 121.30 msec
Min = -39.1 Gs @ 33.80 msec

Acc. #1(x) Left Rear X

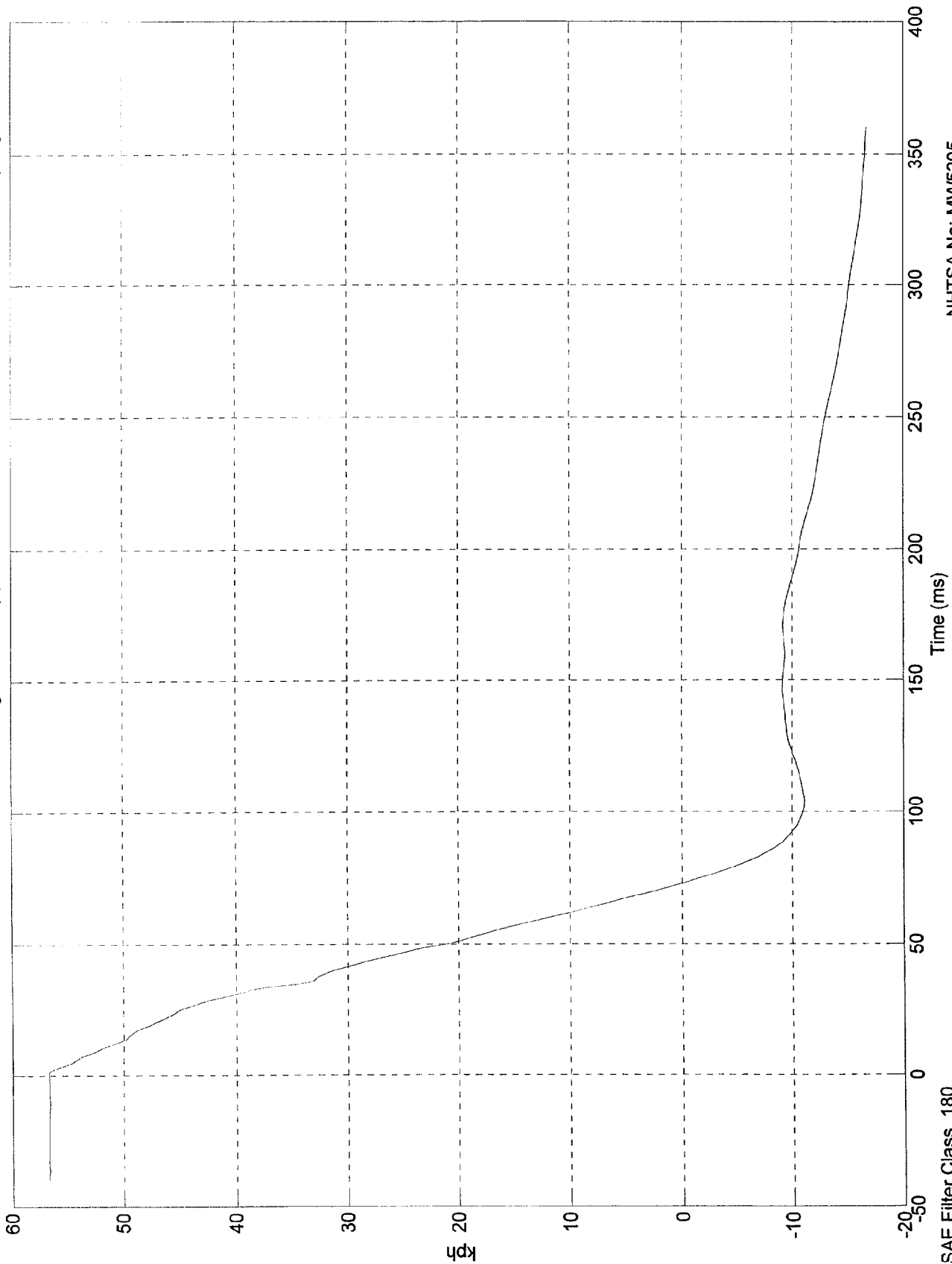


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 56.6 kph @ -33.00 msec
Min = -16.6 kph @ 360.00 msec

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



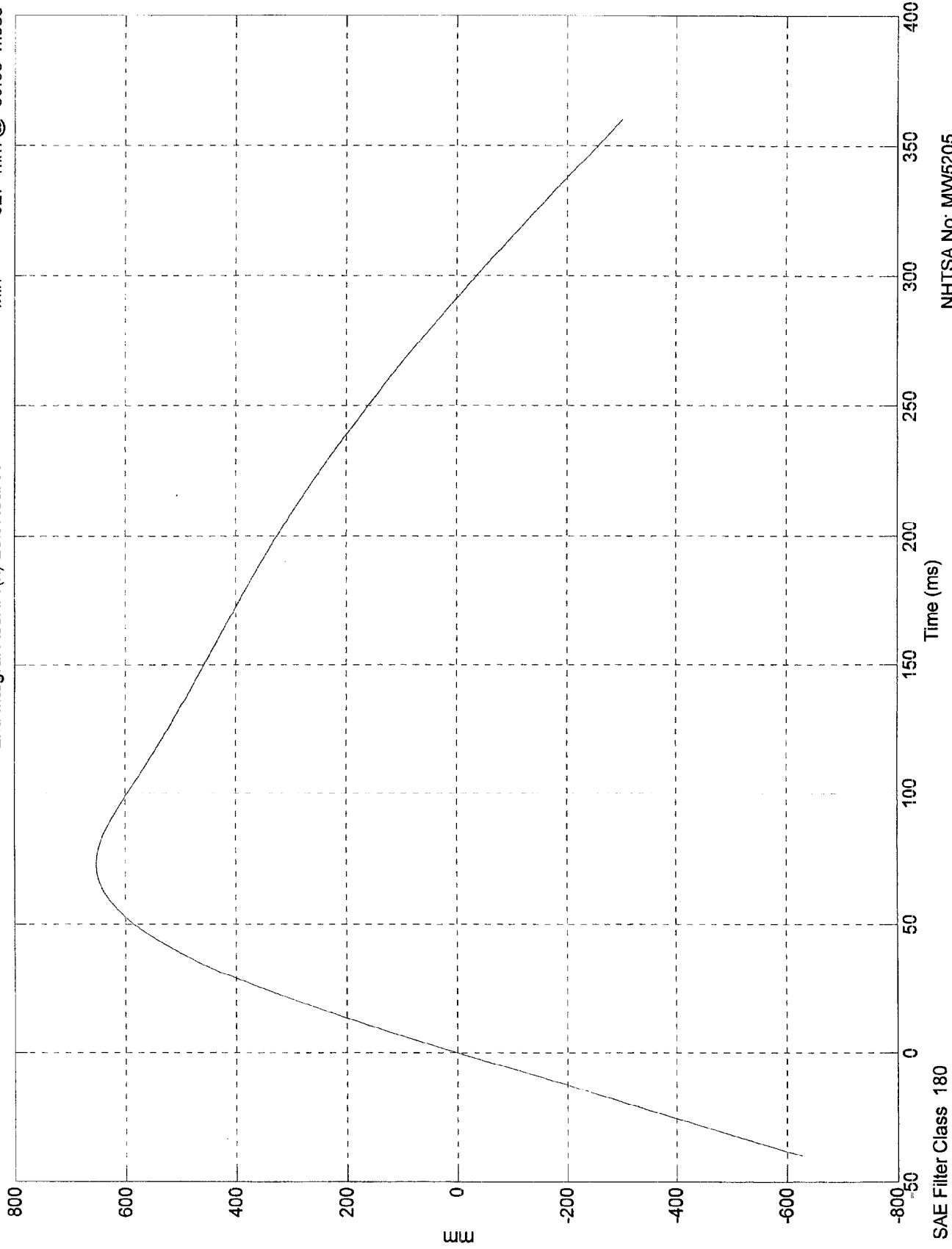
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 652 mm @ 73.00 msec
Min = -627 mm @ -39.90 msec

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

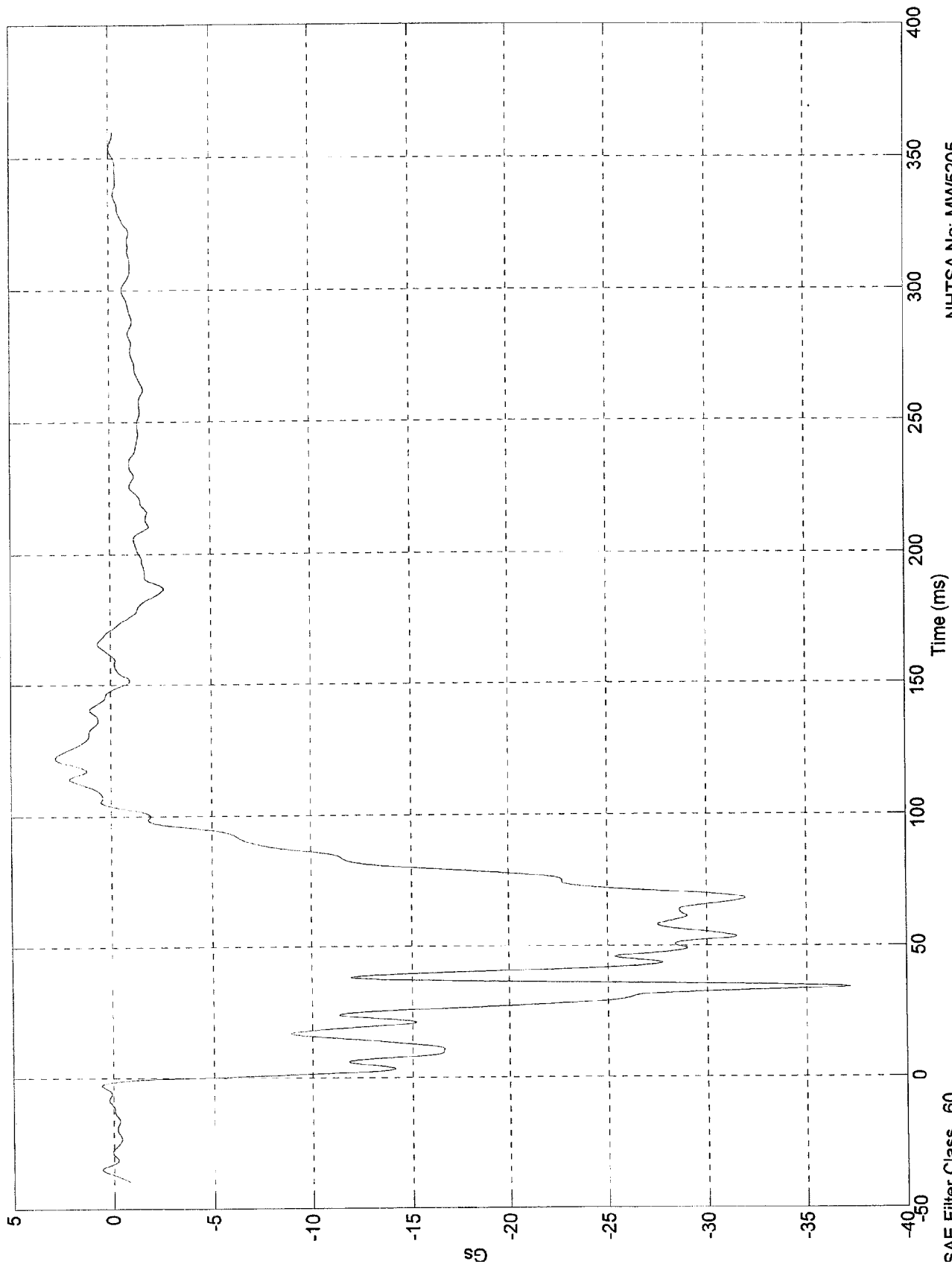


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 2.78 Gs @ 122.10 msec
Min = -37.2 Gs @ 34.30 msec

Acc. #2(x) Right Rear X



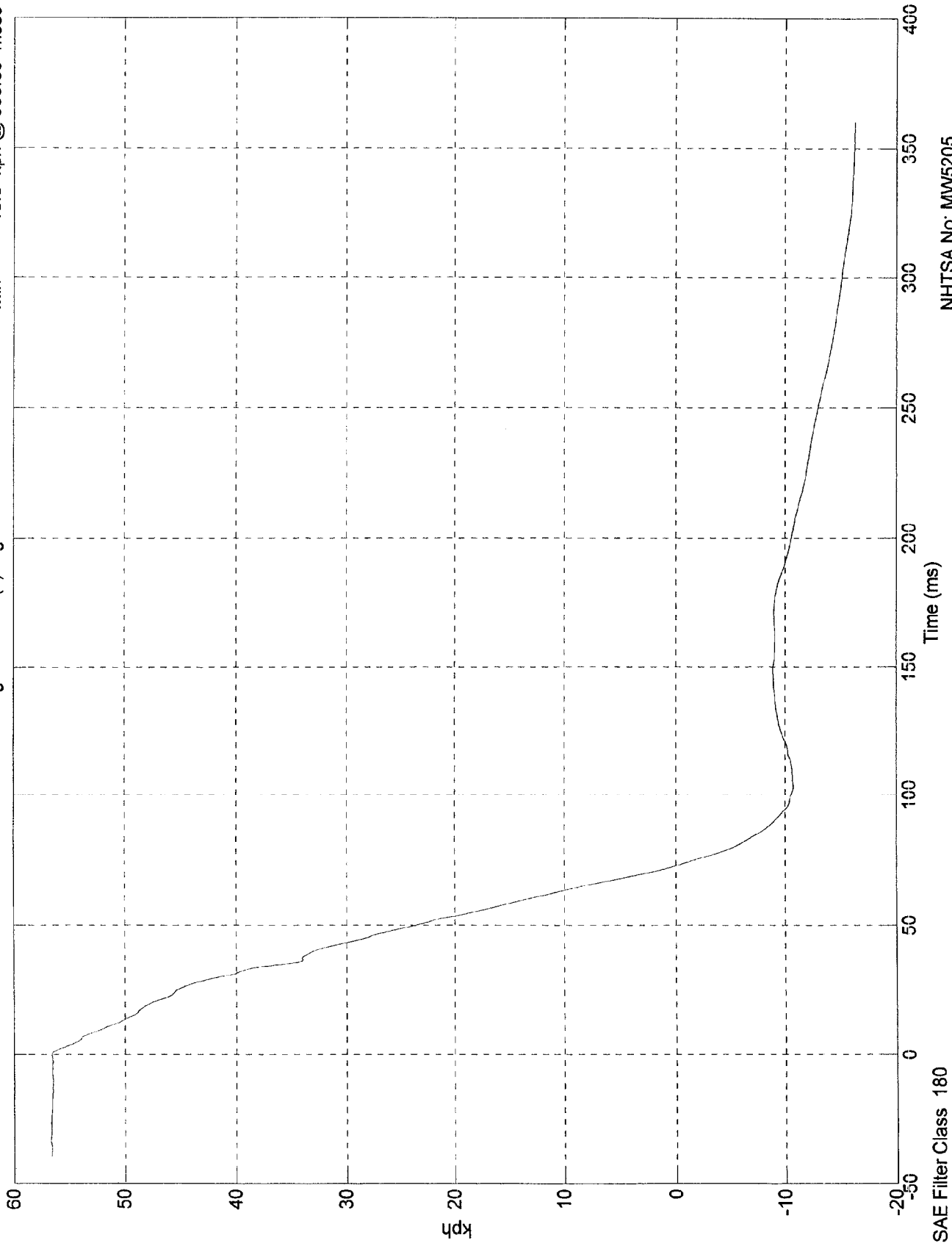
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 60

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 56.7 kph @ -33.40 msec
Min = -16.3 kph @ 360.00 msec

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



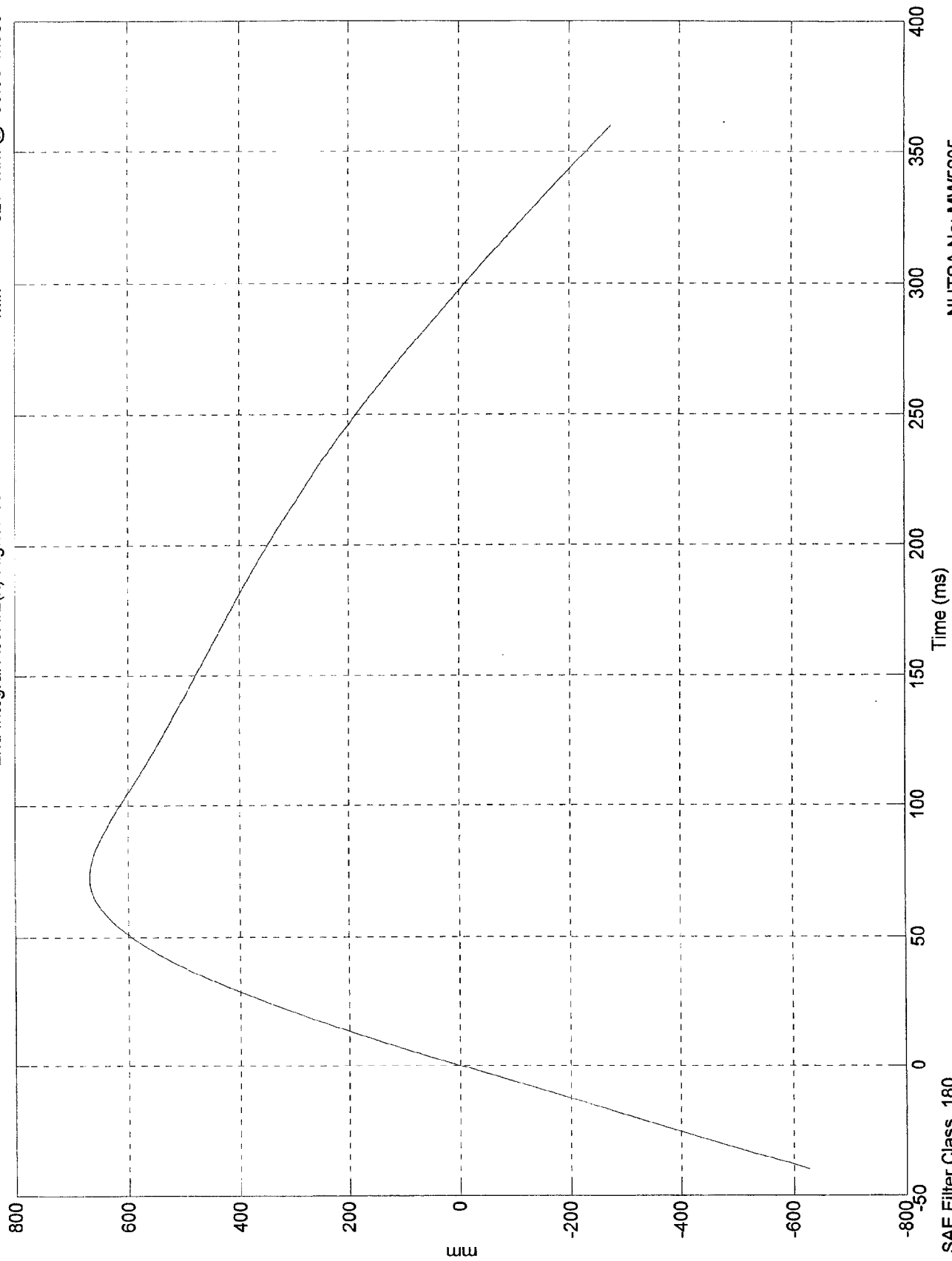
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 668 mm @ 72.80 msec
Min = -627 mm @ -39.90 msec

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



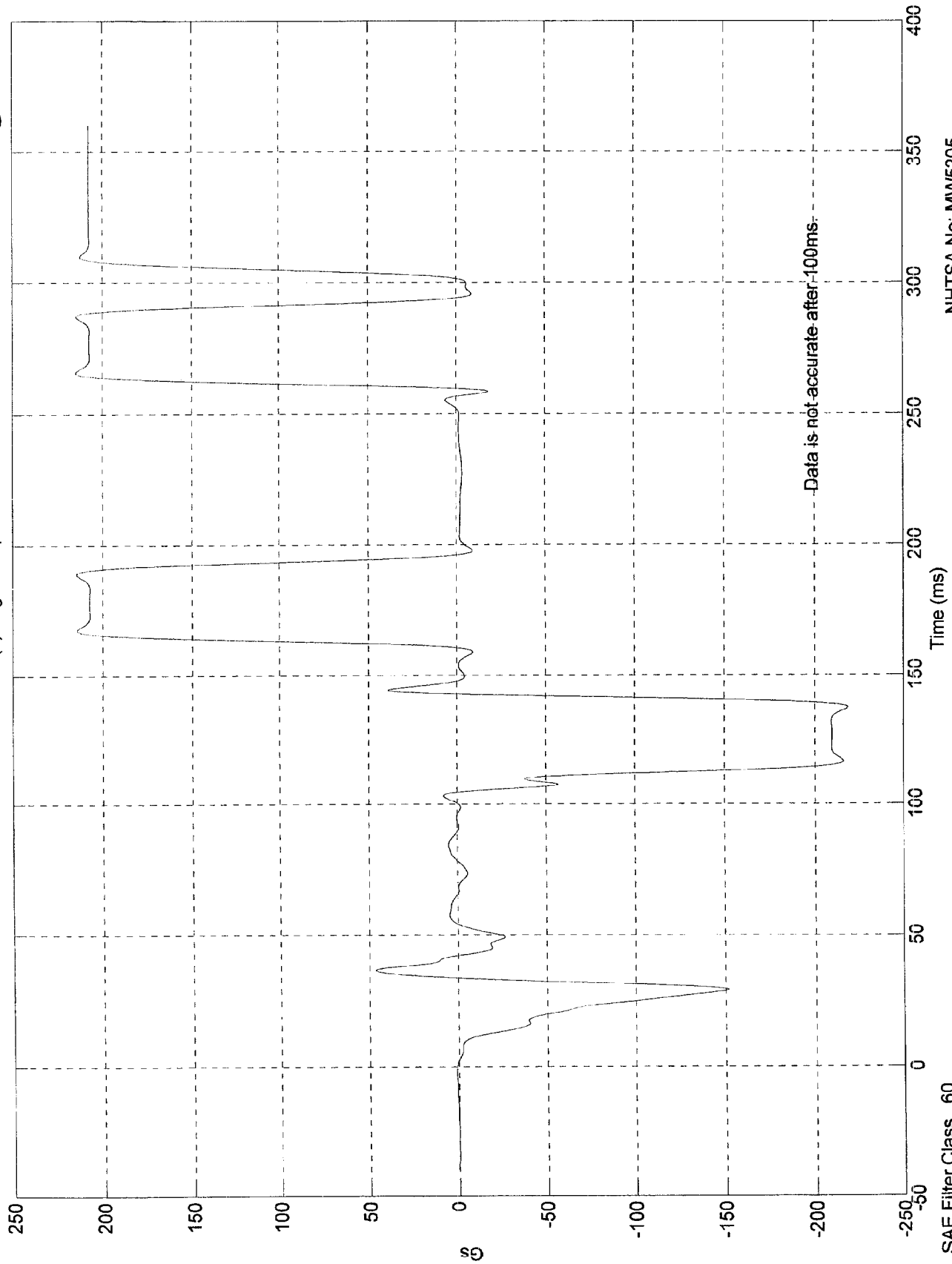
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 215 Gs @ 265.50 msec
Min = -218 Gs @ 137.50 msec

Acc. #3(x) Engine Top X



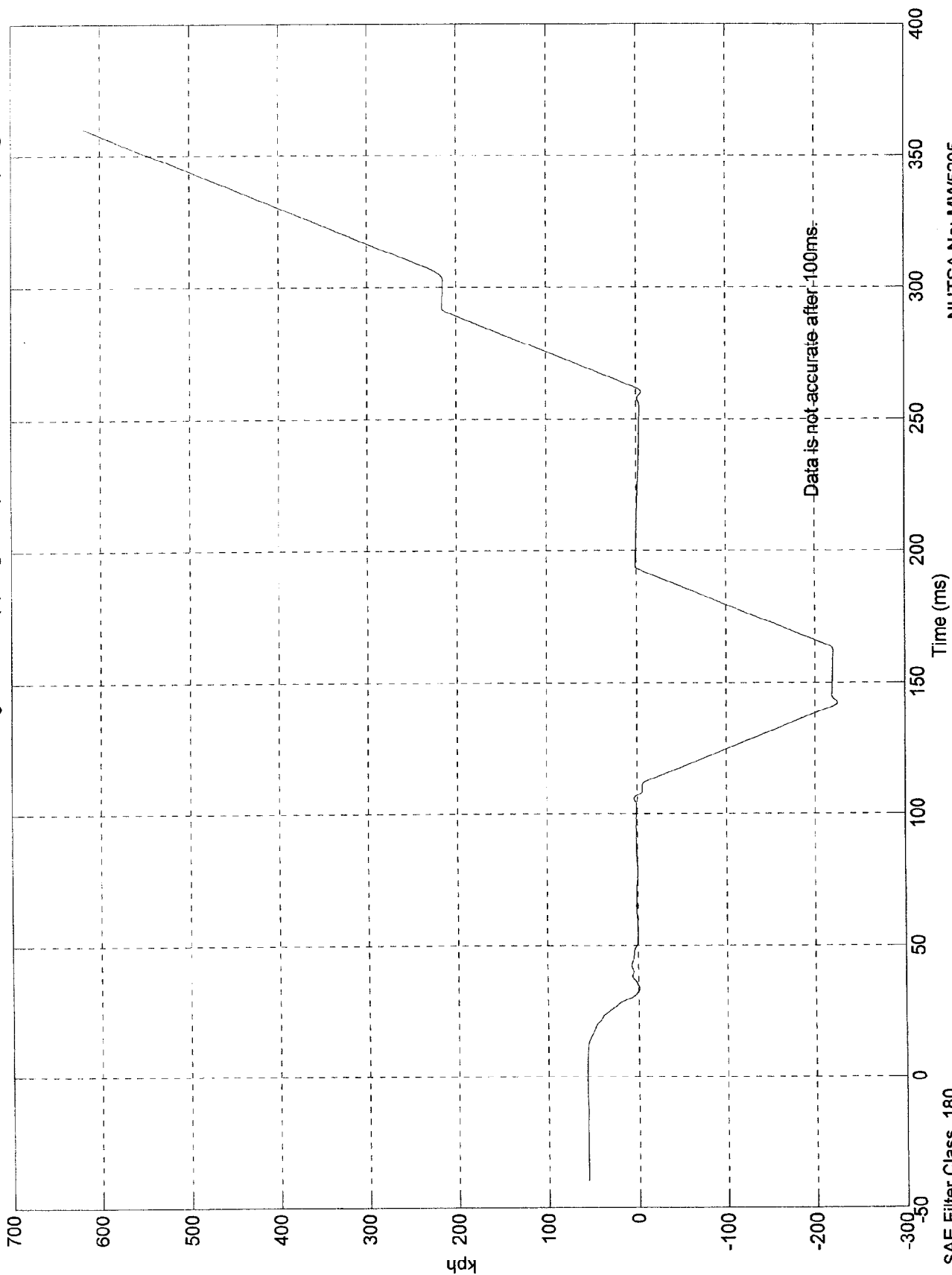
SAE Filter Class 60

NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 619 kph @ 360.00 msec
Min = -225 kph @ 142.30 msec

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



Data is not accurate after 100ms.

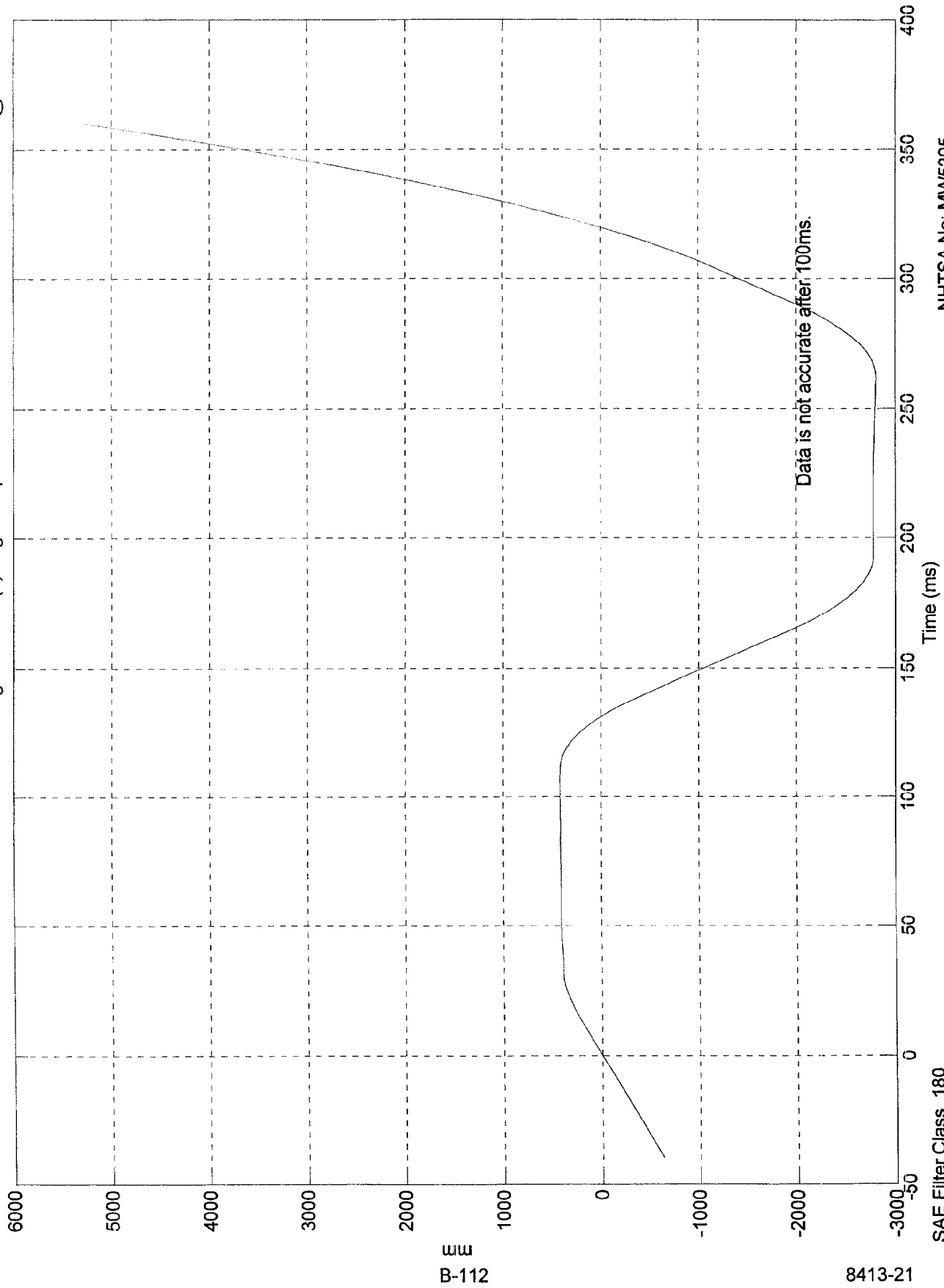
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 5.27e+003 mm @ 360.00 msec
Min = -2.81e+003 mm @ 261.90 msec

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



NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

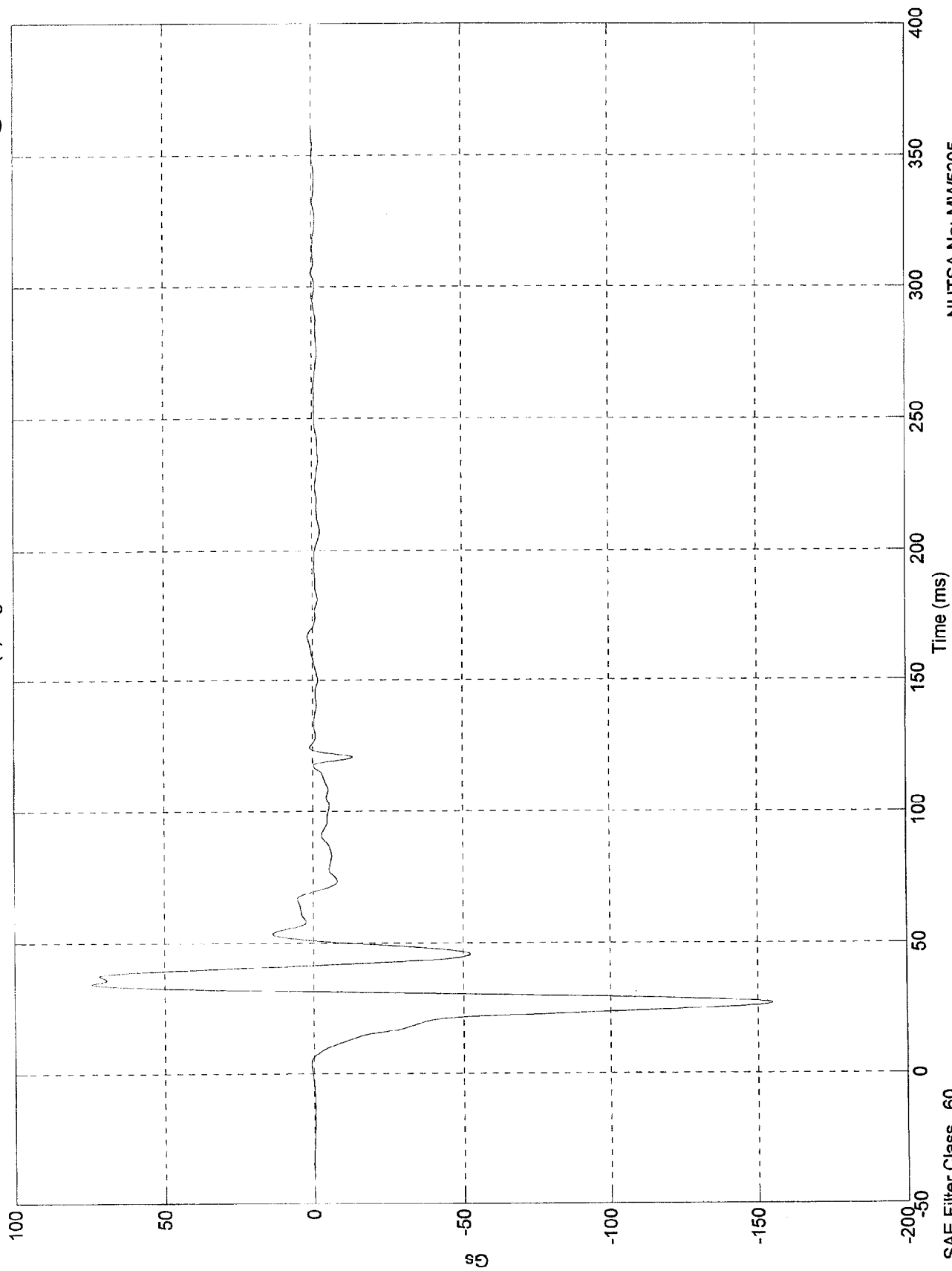
B-112

8413-21

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 74.6 Gs @ 34.20 msec
Min = -155 Gs @ 26.60 msec

Acc. #4(x) Eng. Bottom X



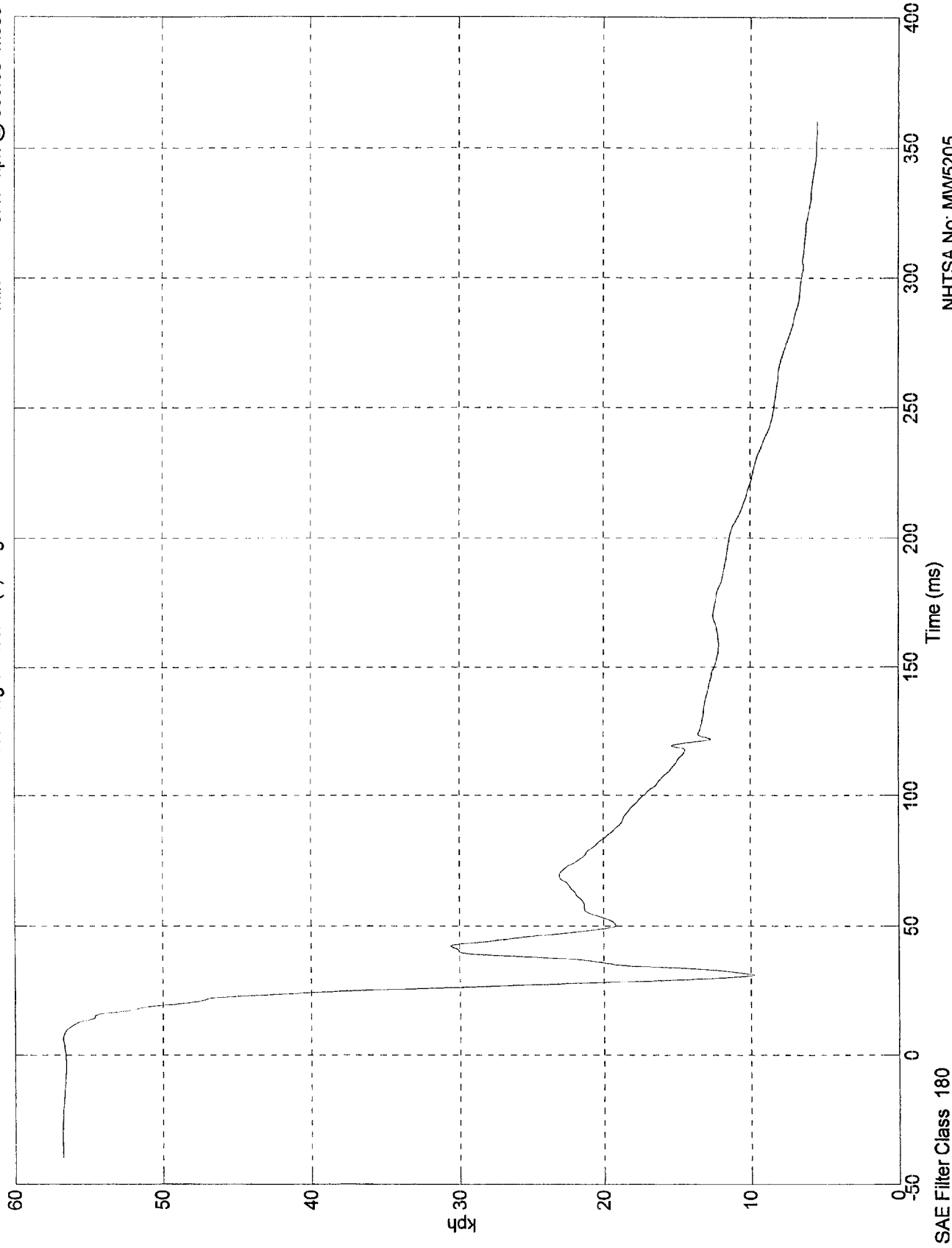
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 60

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 56.8 kph @ -29.40 msec
Min = 5.47 kph @ 360.00 msec

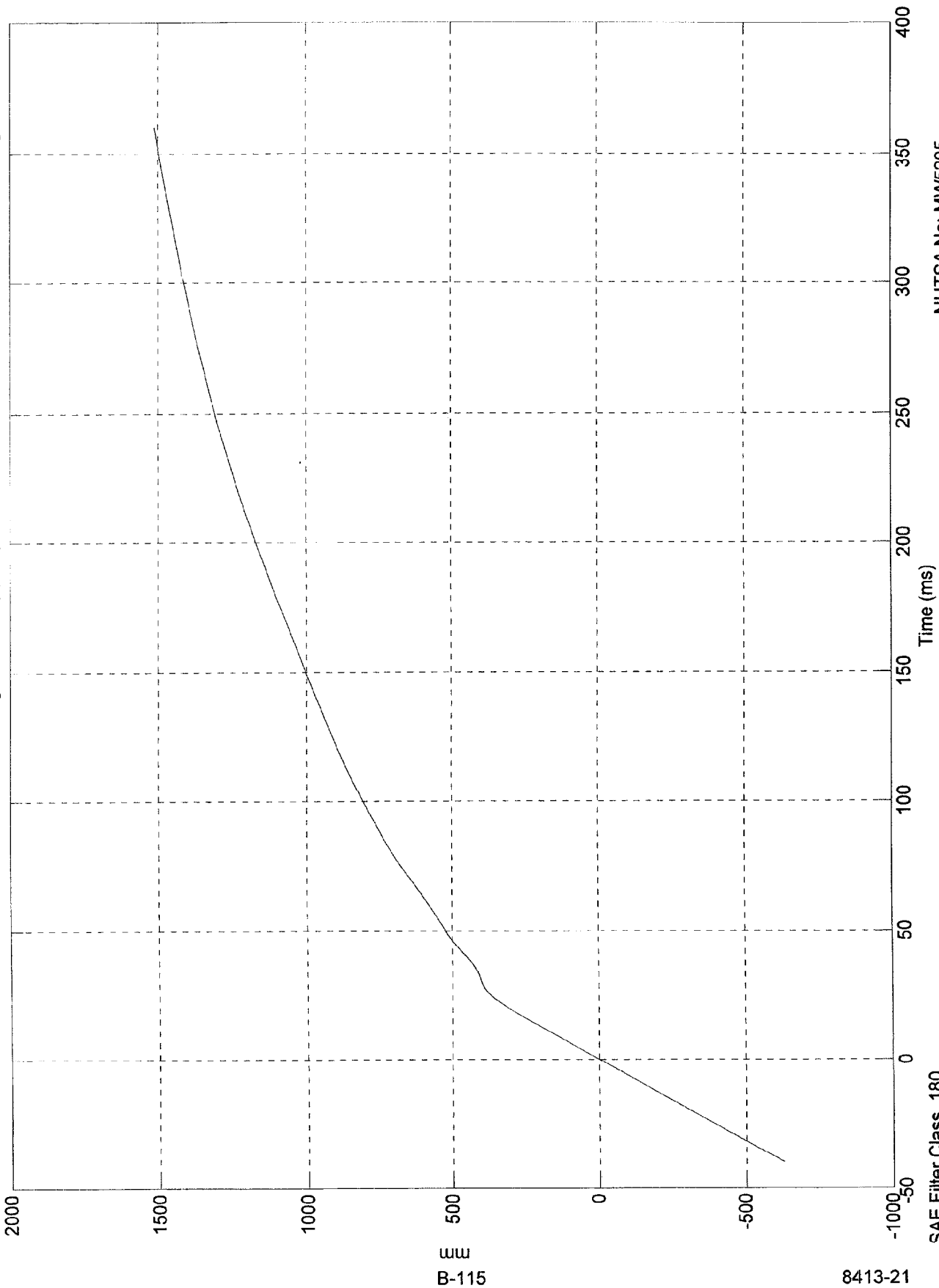
1st Integral Acc. #4(x) Eng. Bottom X



NHTSA No: MW5205
Date: 04 Feb 1998

Max = 1.51e+003 mm @ 360.00 msec
Min = -629 mm @ -39.90 msec

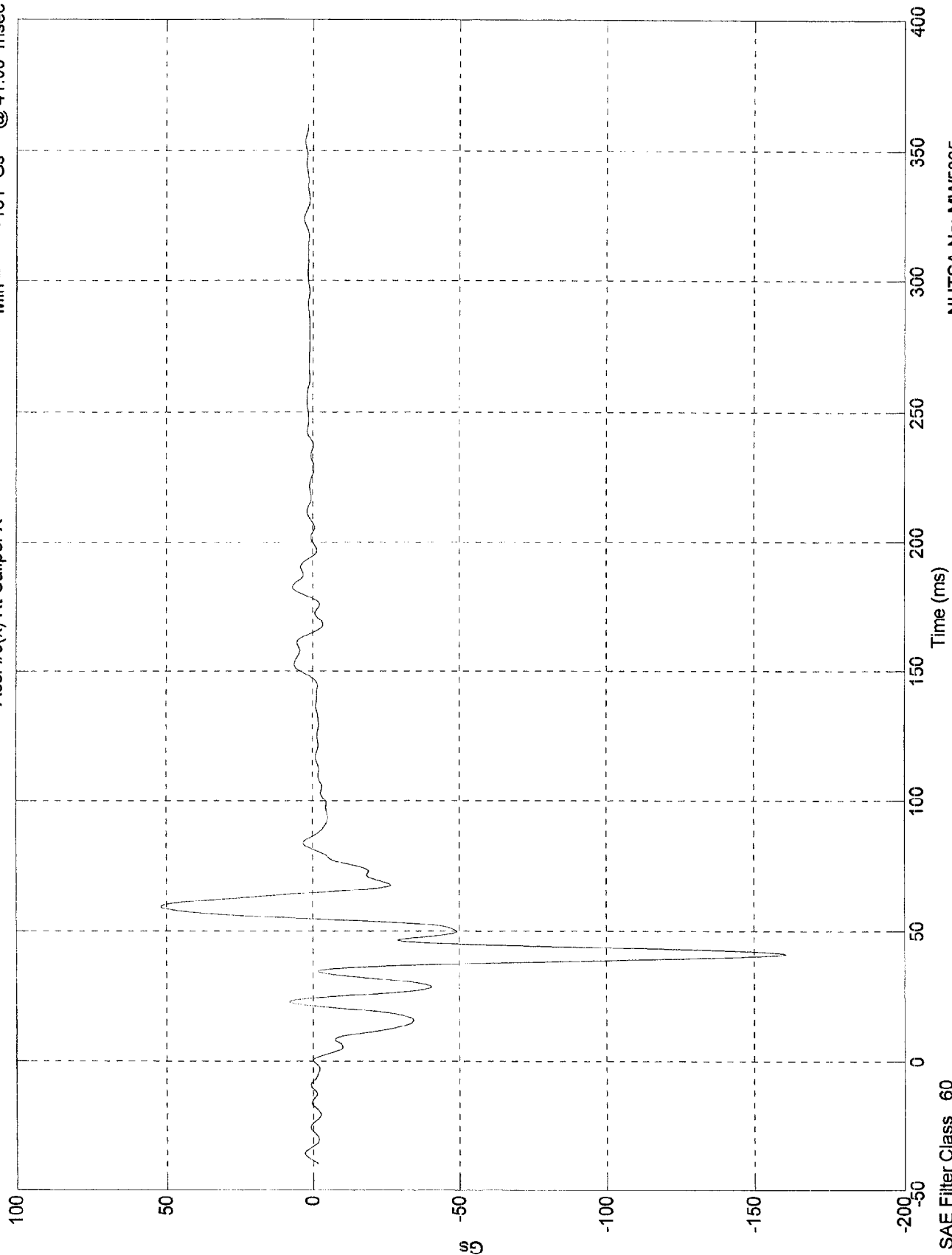
2nd Integral Acc. #4(x) Eng. Bottom X



NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 51.8 Gs @ 59.30 msec
Min = -161 Gs @ 41.00 msec

Acc. #5(x) Rt Caliper X



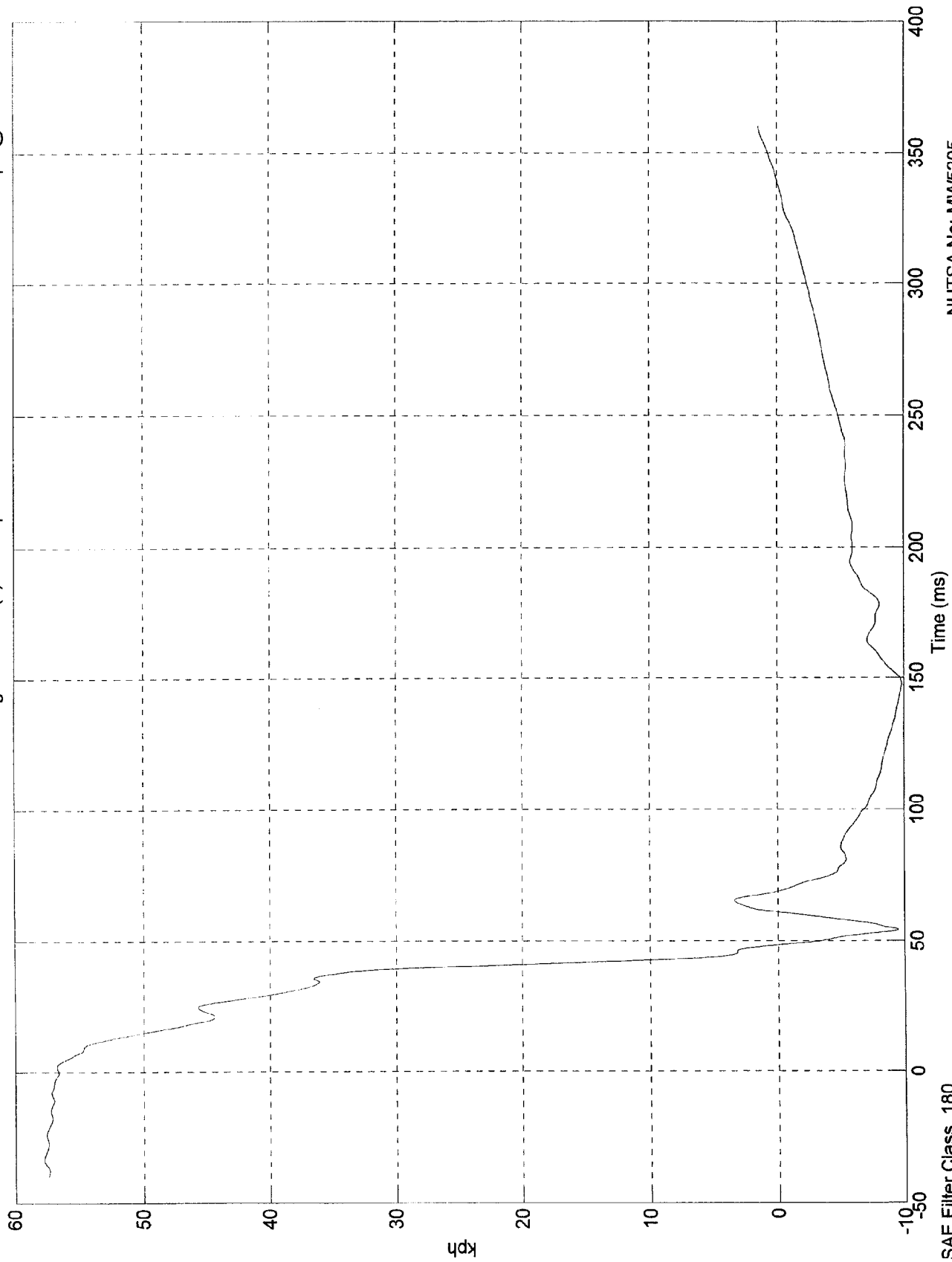
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 60

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 57.8 kph @ -33.20 msec
Min = -9.82 kph @ 147.80 msec

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



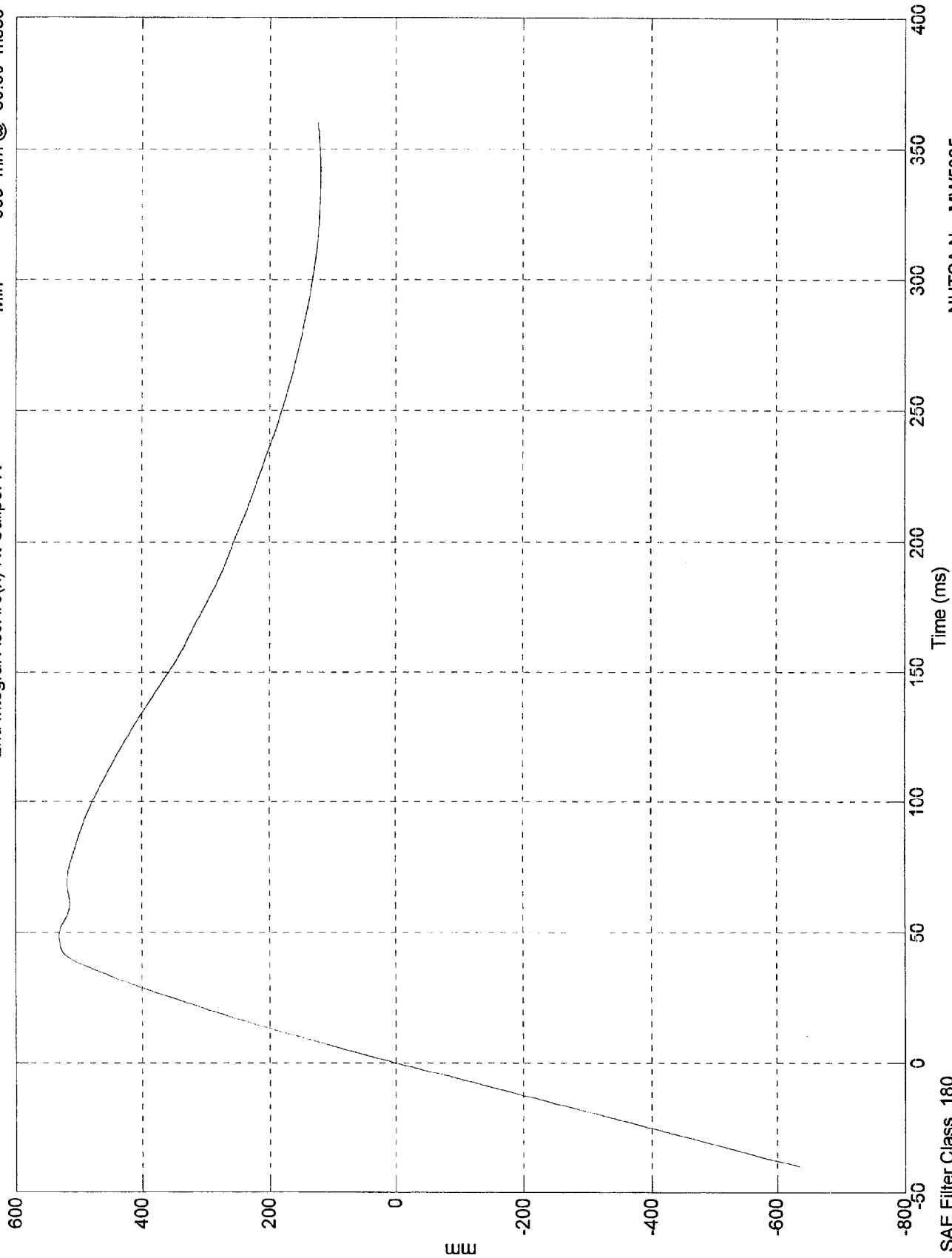
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 532 mm @ 48.40 msec
Min = -635 mm @ -39.90 msec

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



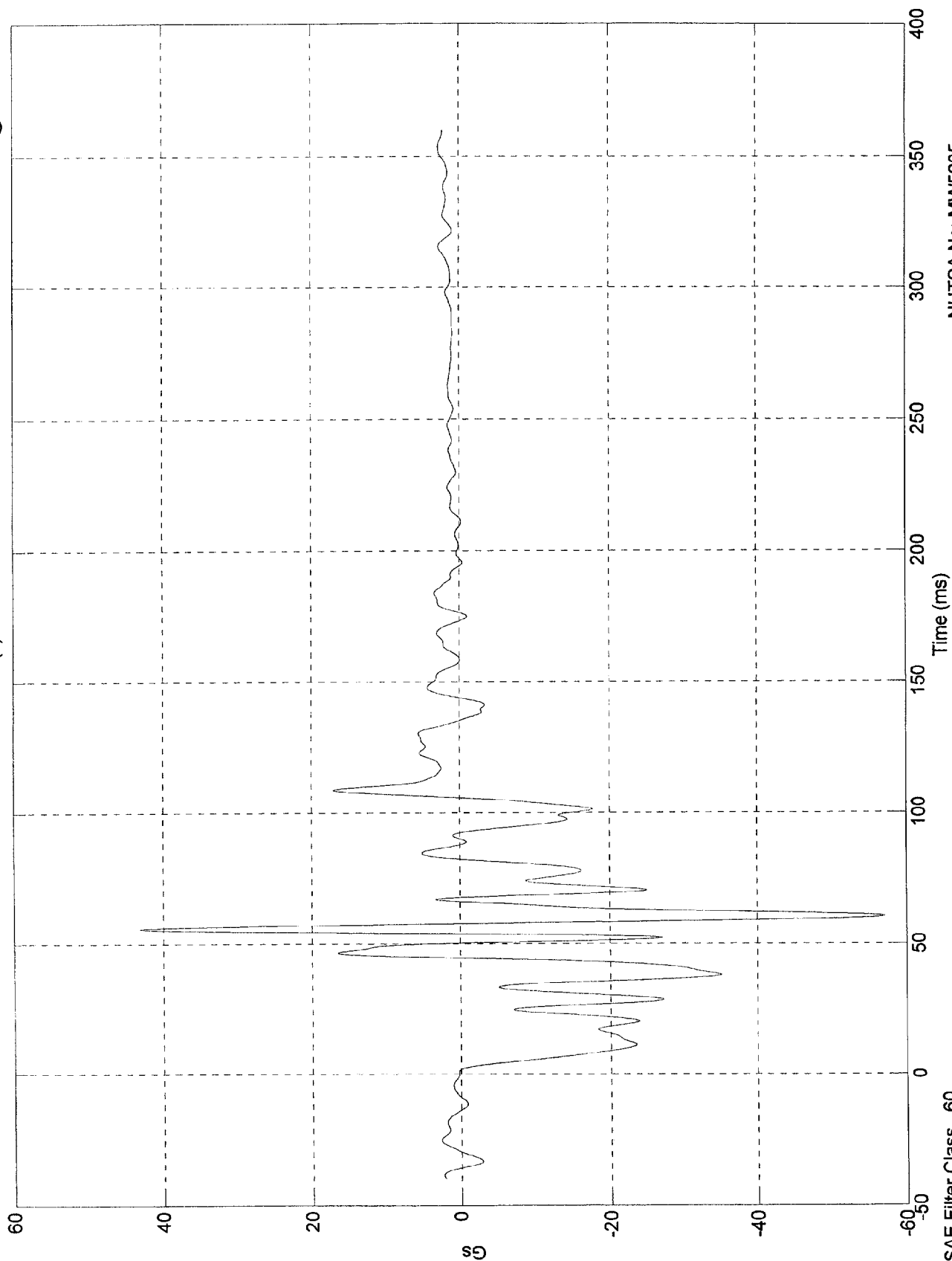
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 43.2 Gs @ 55.60 msec
Min = -57.1 Gs @ 60.40 msec

Acc. #6(x) Instrument X



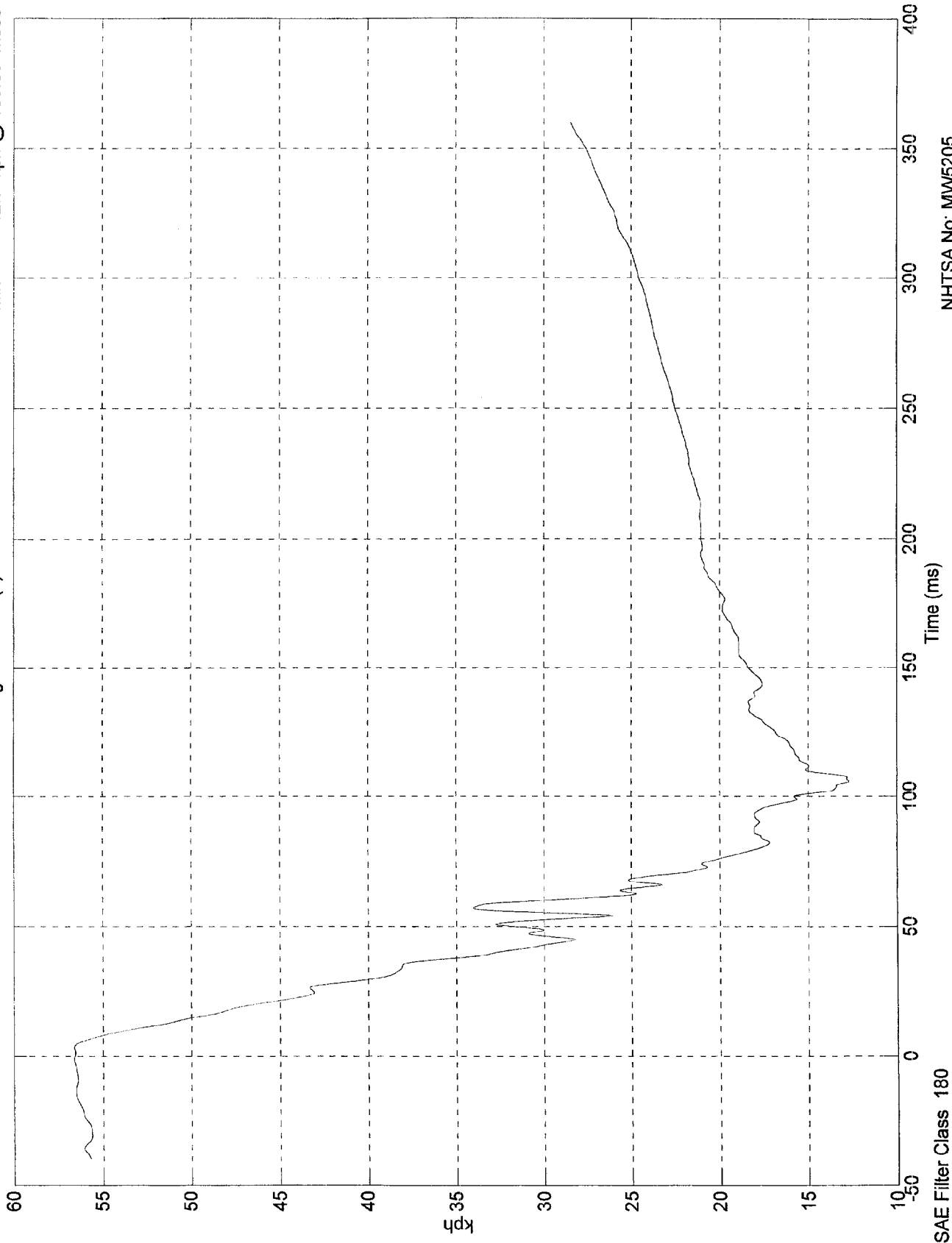
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 60

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 56.6 kph @ -1.30 msec
Min = 12.7 kph @ 105.80 msec

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

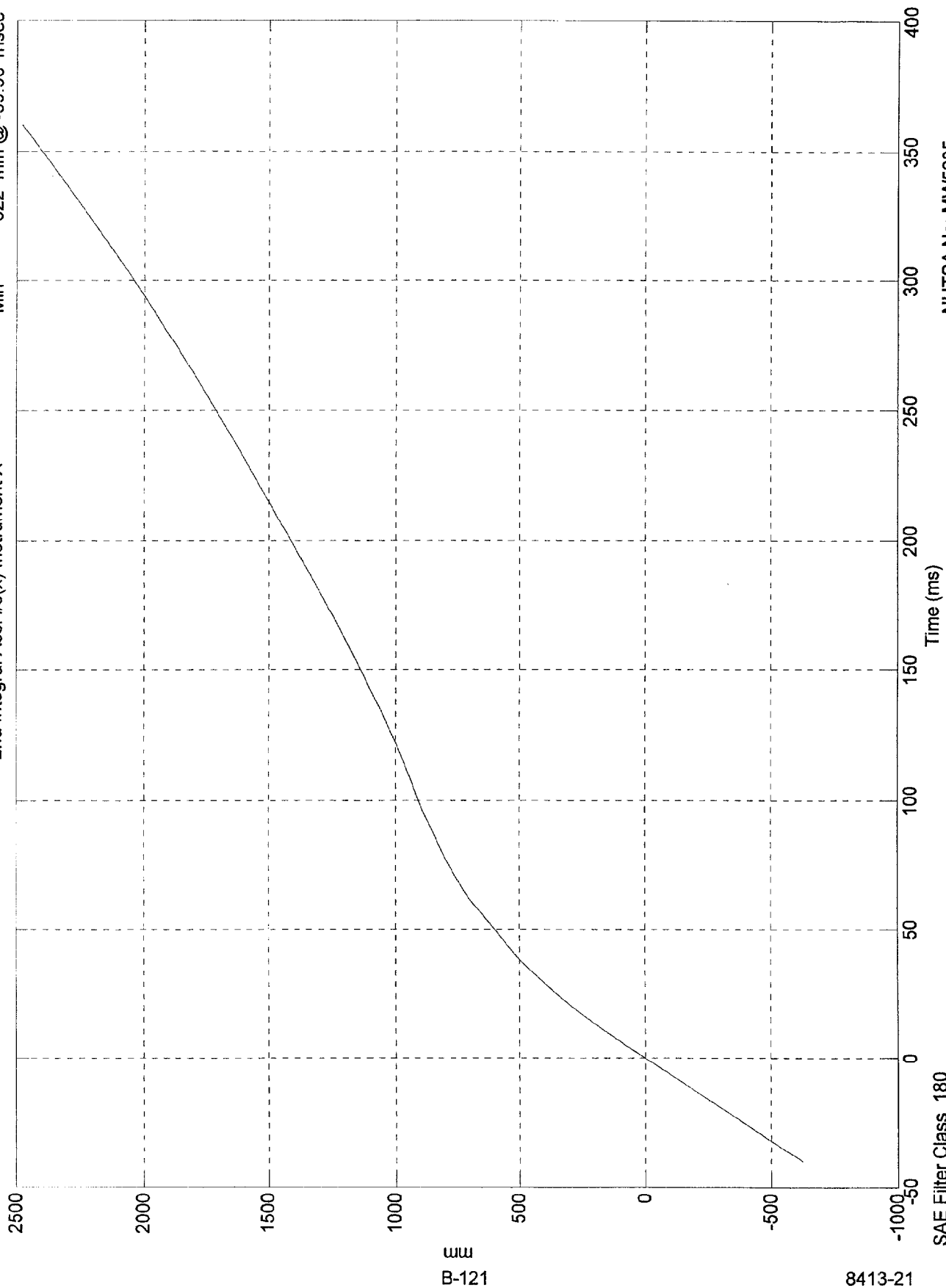


NHTSA No: MW5205
Date: 04 Feb 1998

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 2.48e+003 mm @ 360.00 msec
Min = -622 mm @ -39.90 msec

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



NHTSA No: MW5205
Date: 04 Feb 1998

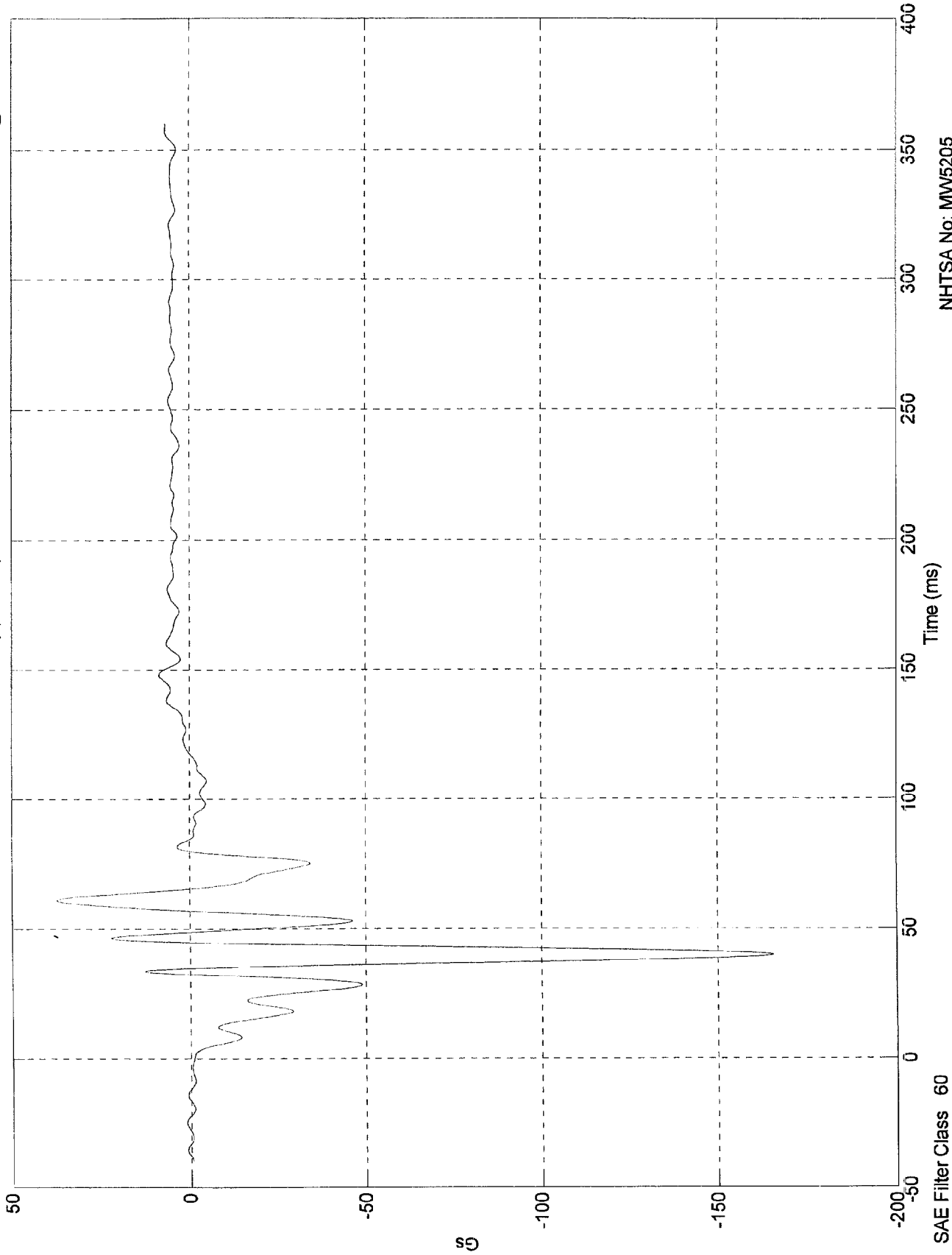
ww
B-121

8413-21

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 37.2 Gs @ 60.90 msec
Min = -166 Gs @ 39.80 msec

Acc. #7(x) Lt Caliper X



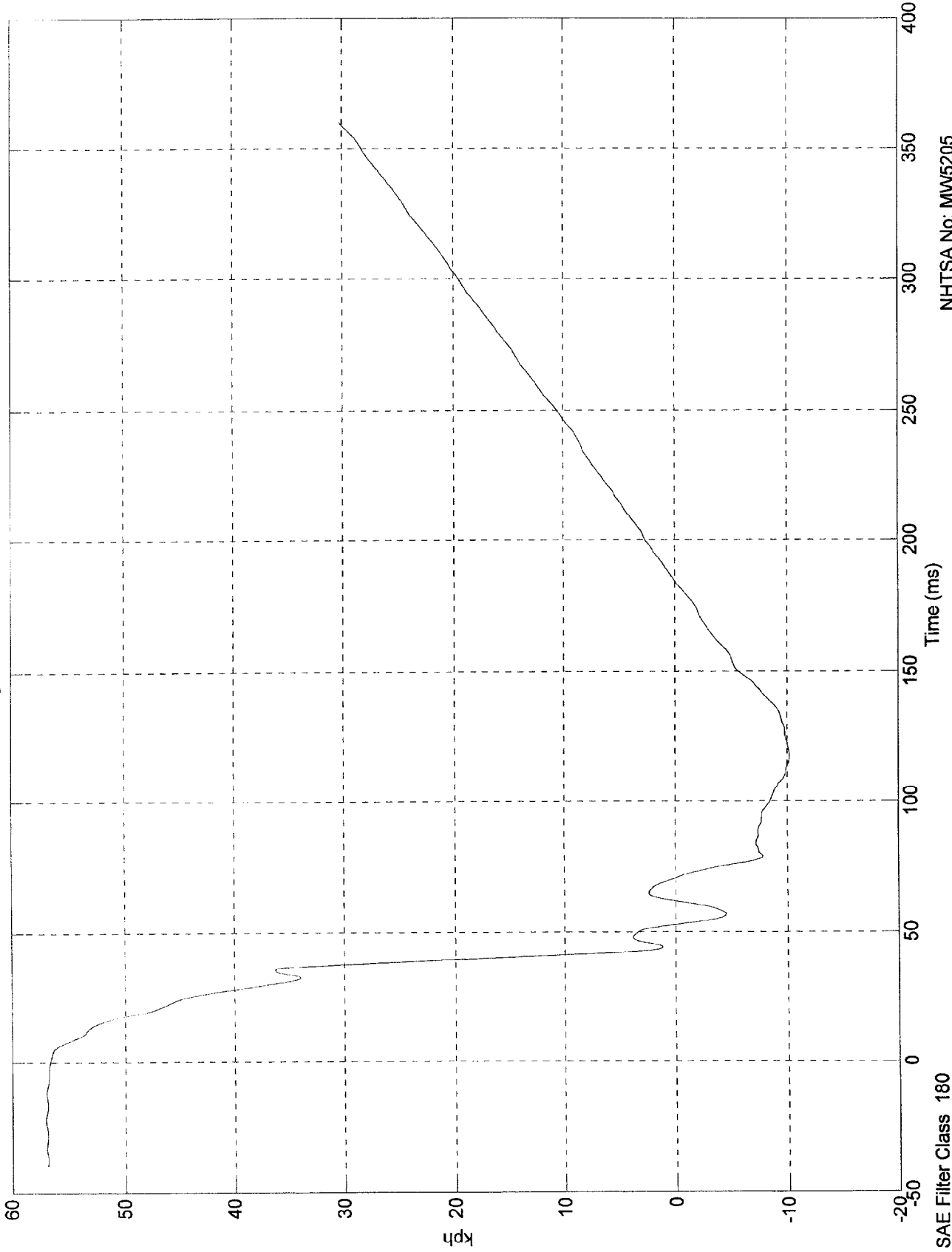
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 60

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 57 kph @ -22.10 msec
Min = -10.2 kph @ 118.30 msec

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



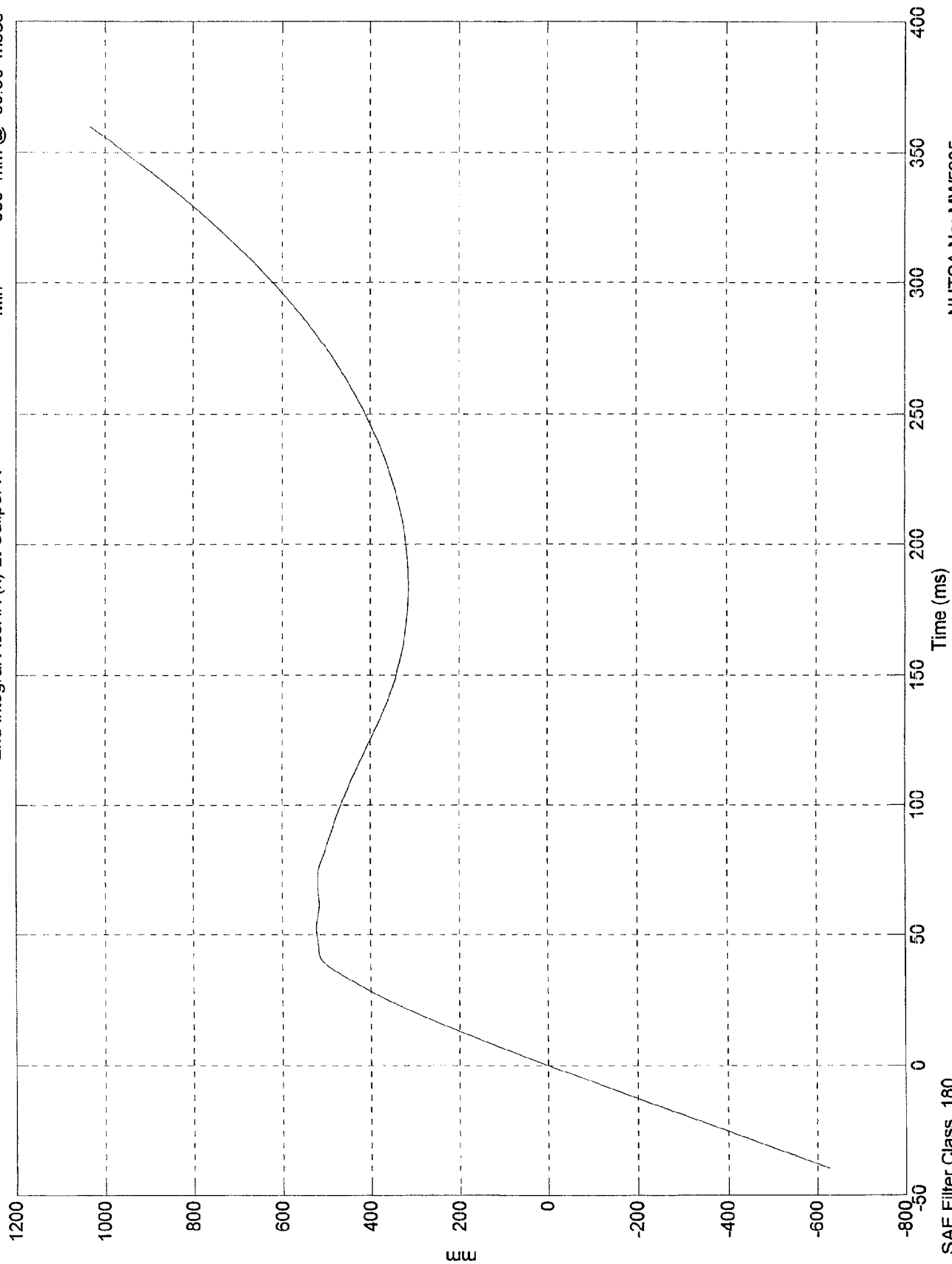
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 1.03e+003 mm @ 360.00 msec
Min = -630 mm @ -39.90 msec

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

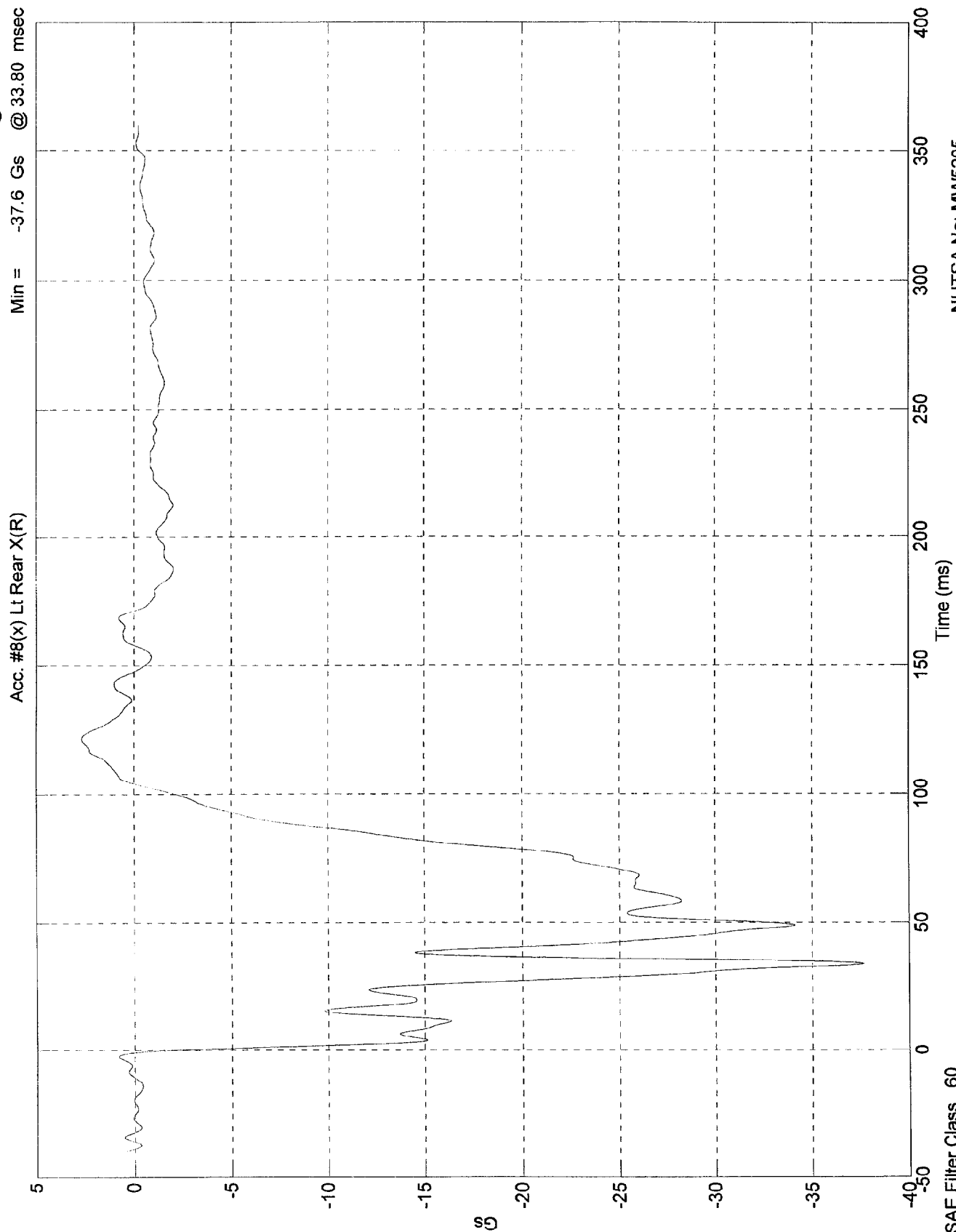


NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 2.64 Gs @ 121.60 msec
Min = -37.6 Gs @ 33.80 msec



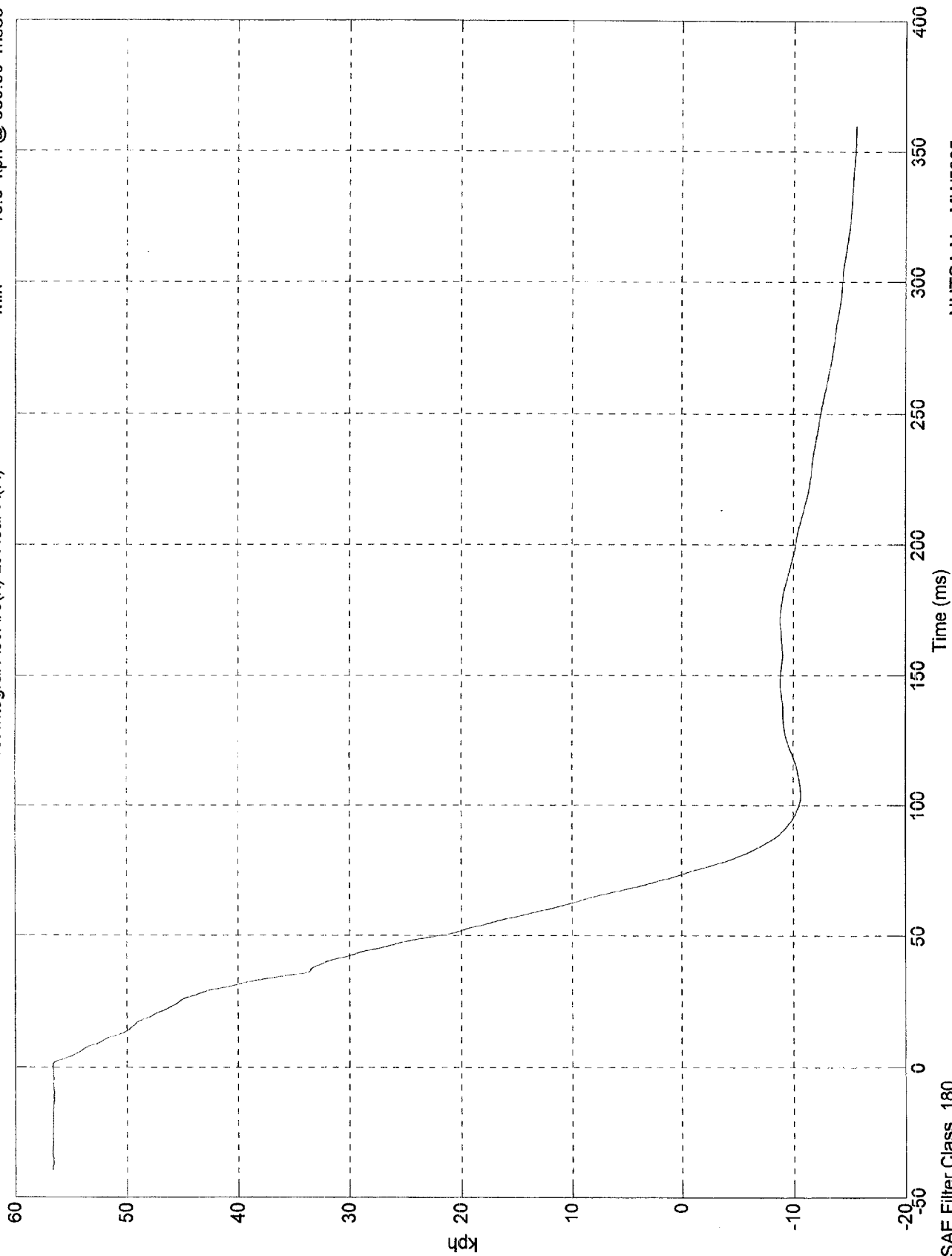
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 60

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 56.6 kph @ -32.80 msec
Min = -15.6 kph @ 360.00 msec

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

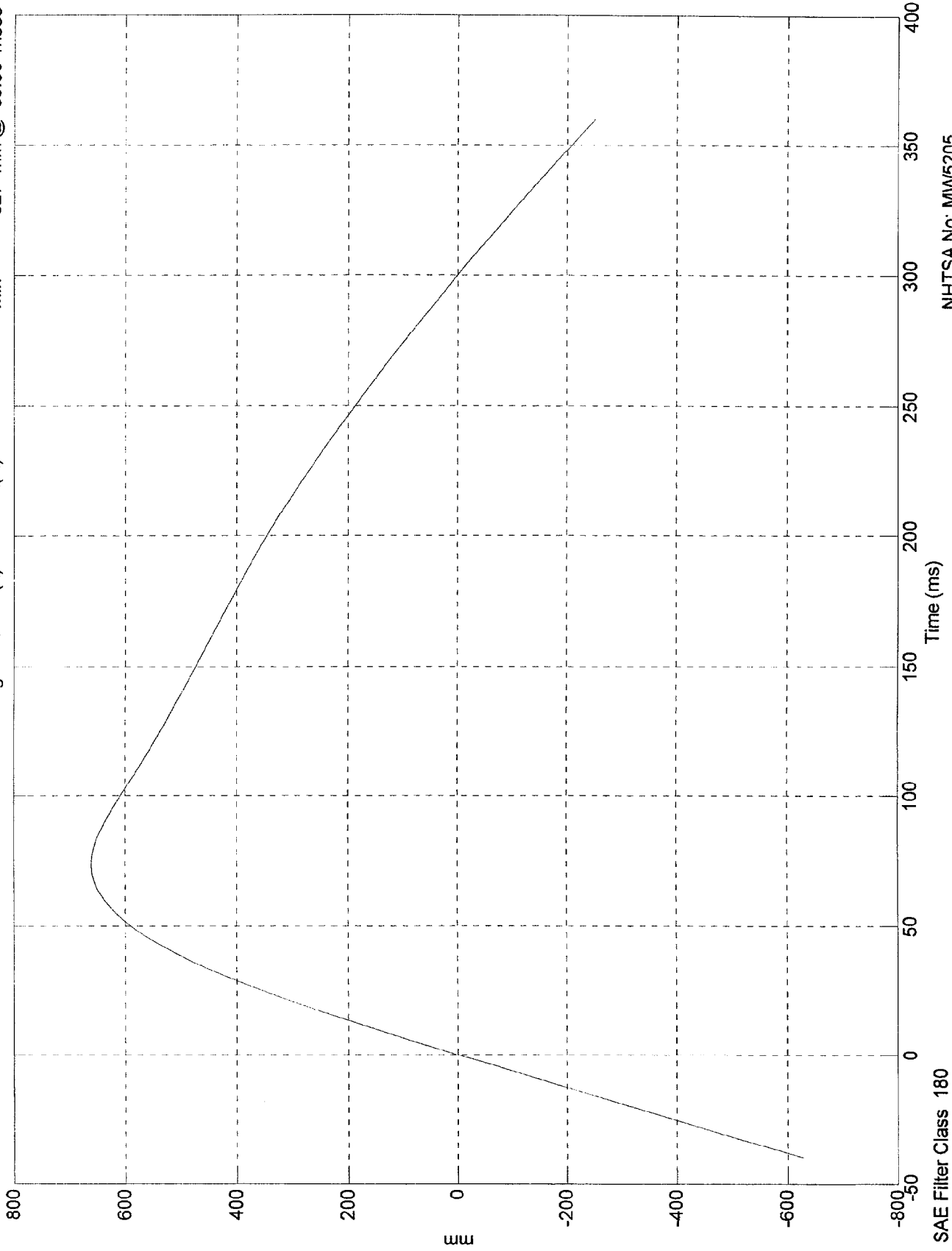


NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

Max = 660 mm @ 73.60 msec
Min = -627 mm @ -39.90 msec

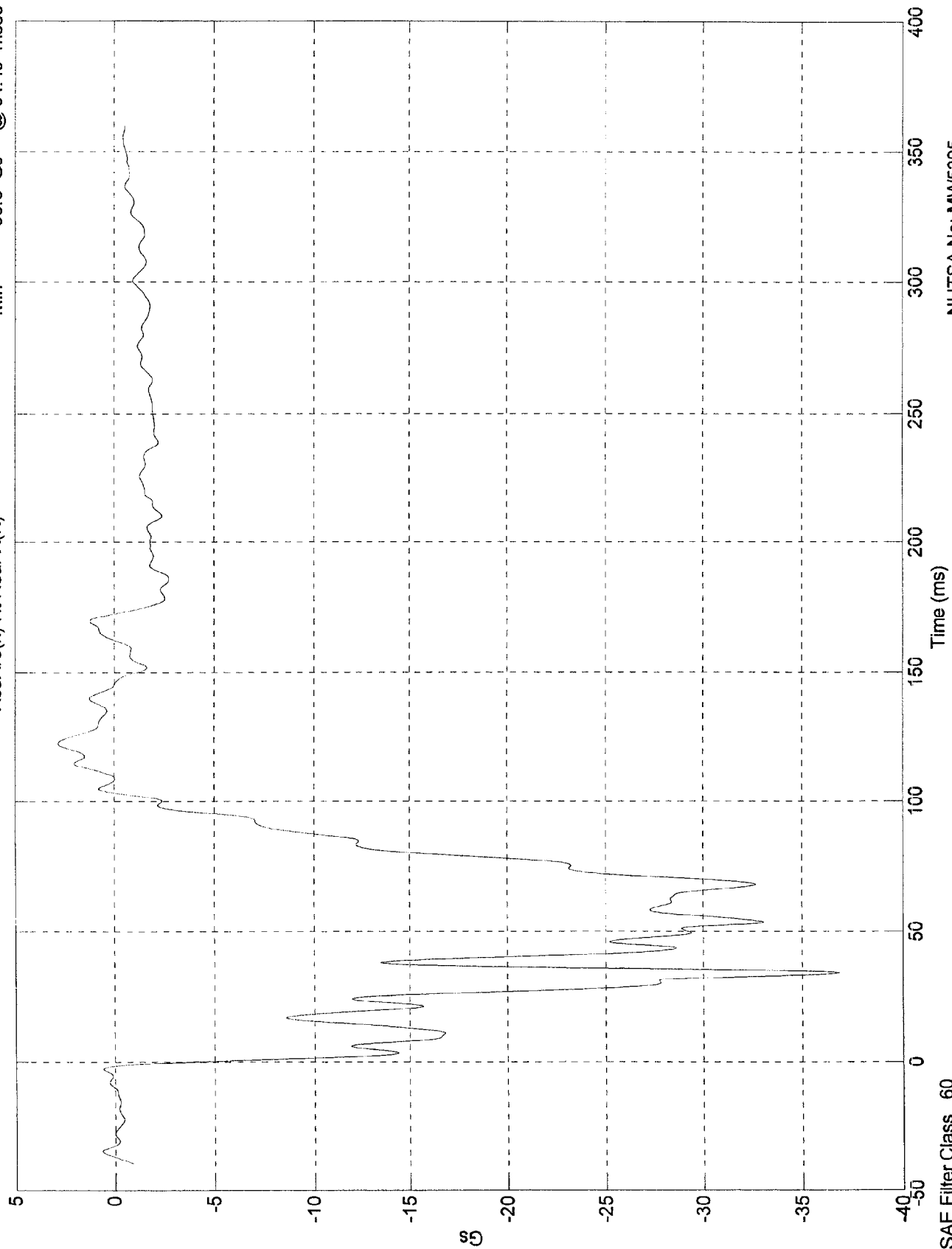
2nd Integral Acc. #8(x) Lt Rear X(R)



NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 2.83 Gs @ 122.40 msec
Min = -36.8 Gs @ 34.40 msec

Acc. #9(x) Rt Rear X(R)



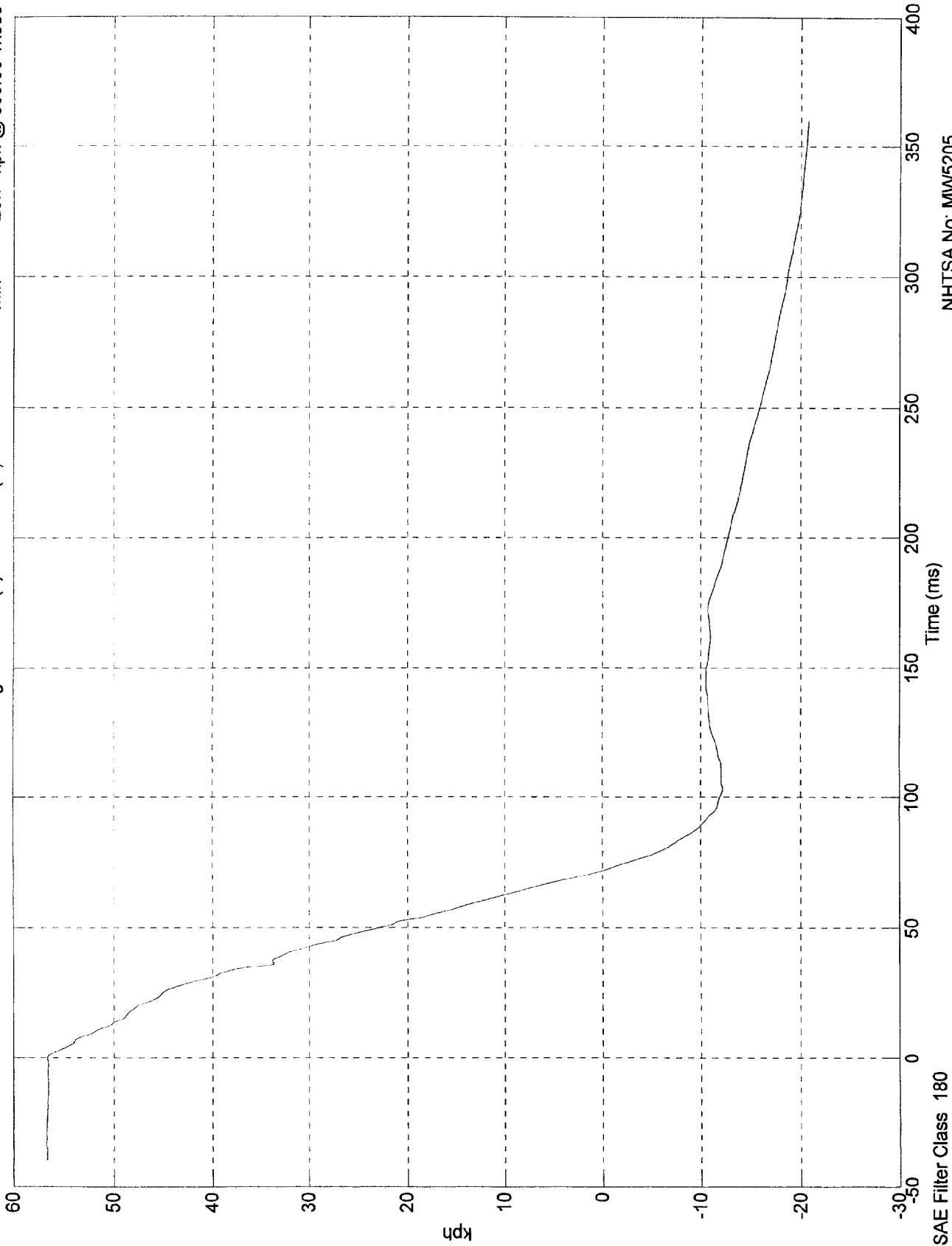
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 60

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 56.7 kph @ -33.40 msec
Min = -20.7 kph @ 360.00 msec

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



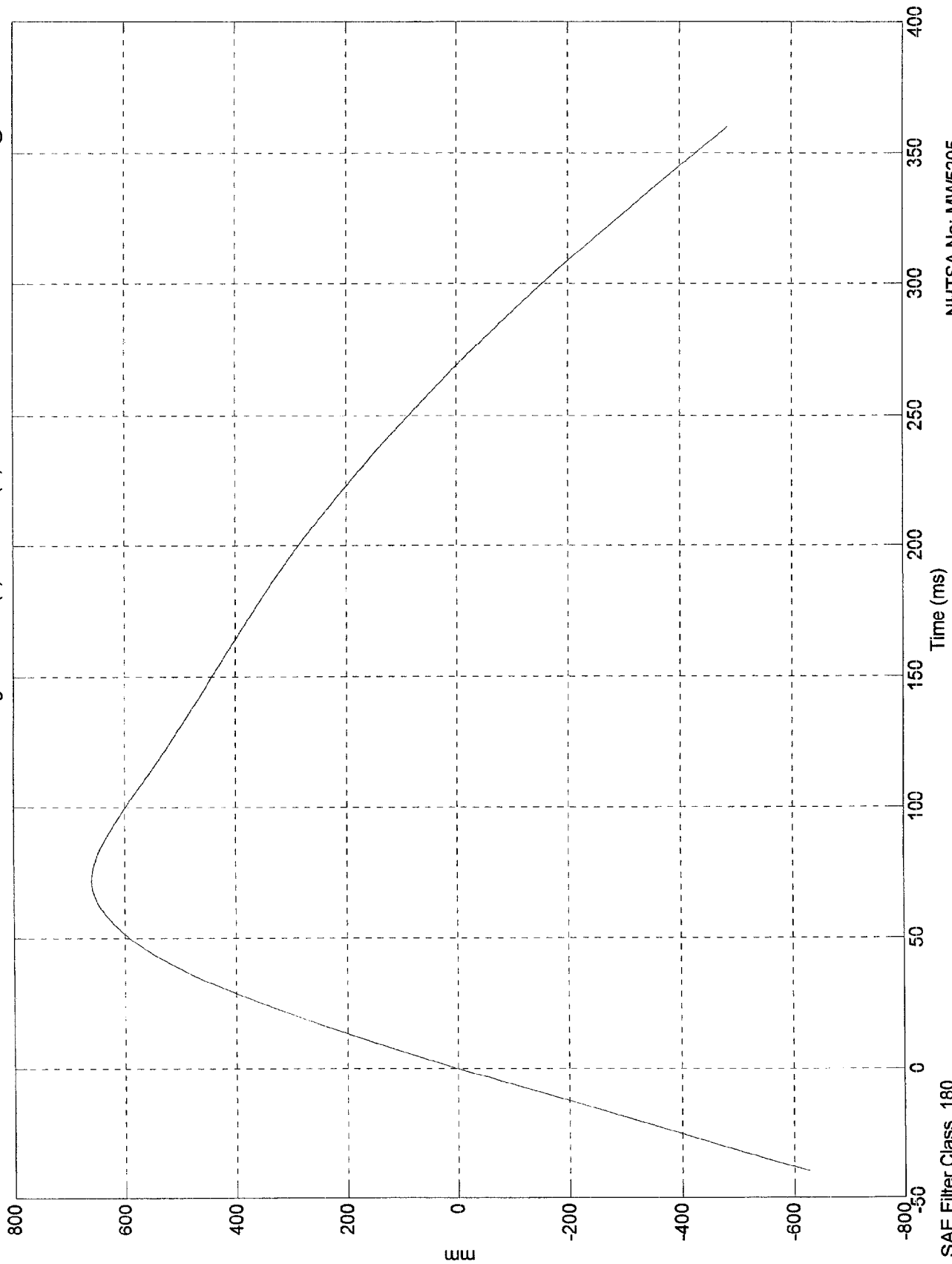
NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 661 mm @ 71.90 msec
Min = -627 mm @ -39.90 msec

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

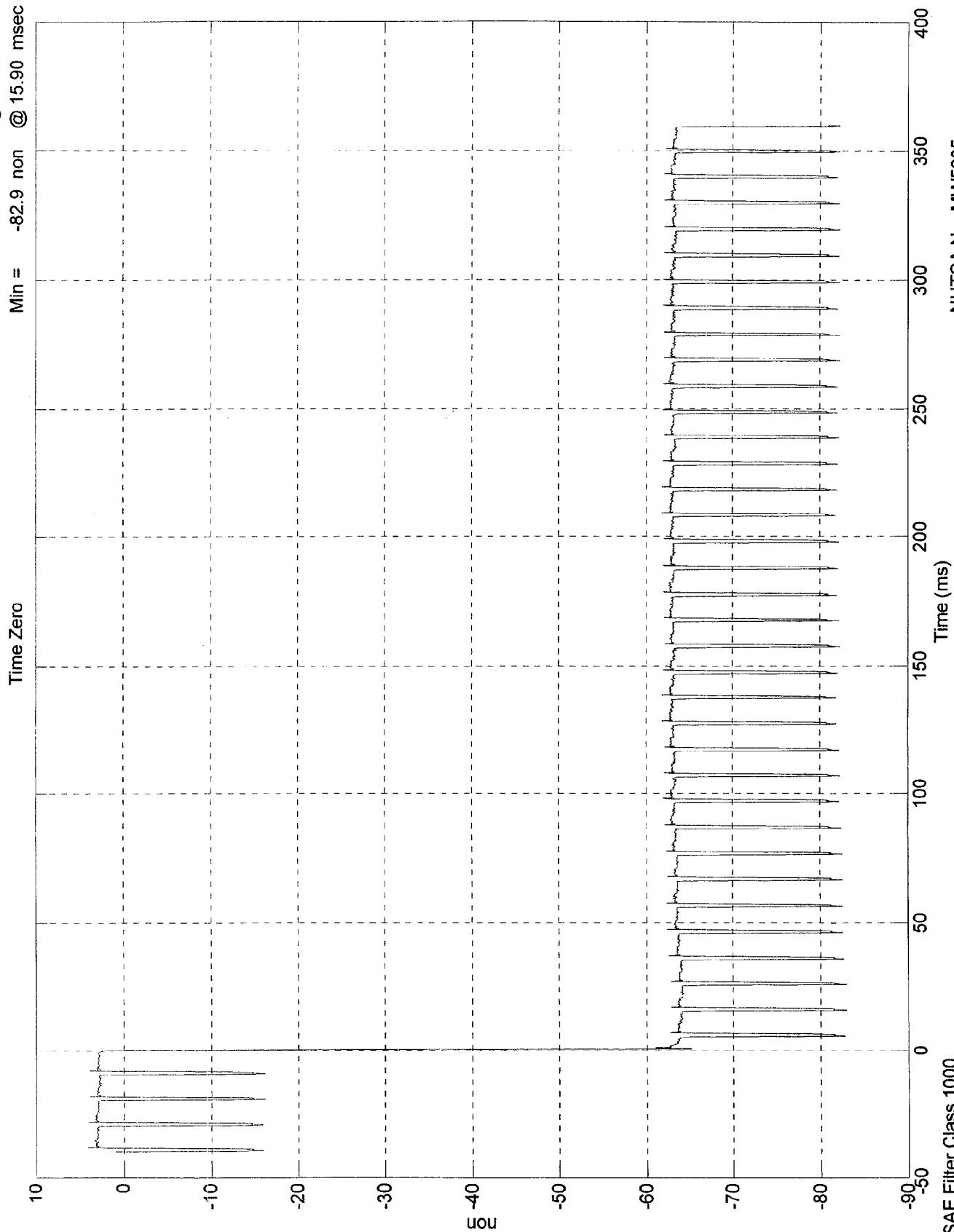


NHTSA No: MW5205
Date: 04 Feb 1998

SAE Filter Class 180

NCAP TEST #21 - 1998 NISSAN SENTRA

Max = 4.12 non @ -38.30 msec
Min = -82.9 non @ 15.90 msec



NHTSA No: MW5205
Date: 04 Feb 1998

Appendix C

PART 572B/E DUMMY CONFIGURATION

AND PERFORMANCE VERIFICATION DATA SHEETS

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

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

Dummy serial numbers and certification dates are:

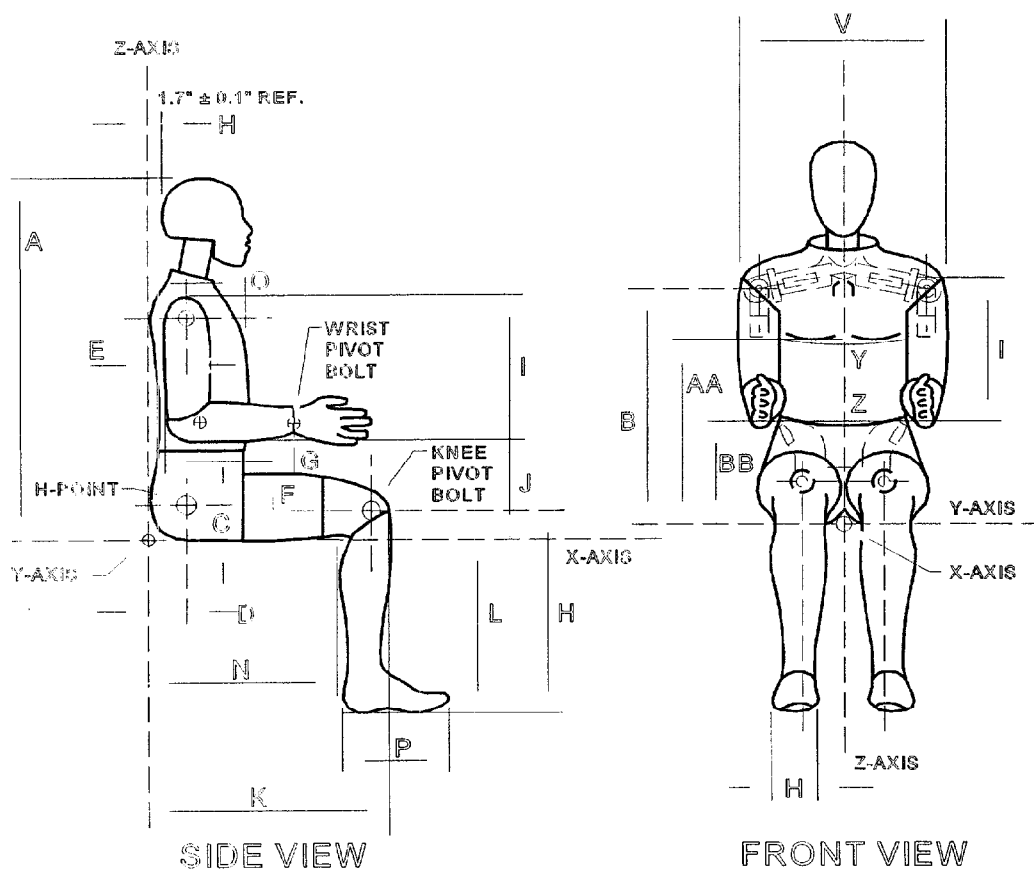
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	01/30/98
#2/Right Front Passenger	150	01/29/98

Electronic Test Equipment

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

DUMMY CONFIGURATION DIMENSIONS

EXTERNAL DIMENSIONS SPECIFICATIONS



NOTE: Figure is referenced to the erect seated position. The curved lumbar does not allow the Hybrid III to be positioned in a perfect erect attitude.
(REF: 6572.31(A)(6))

PART 572E
HEAD DROP TEST

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

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

6 Axis Neck Transducer

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

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

6 Axis Neck Transducer

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
HEAD DROP TEST

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

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

6 Axis Neck Transducer

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

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

6 Axis Neck Transducer

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

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

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

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

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

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

Remarks:

Laboratory Technician: B. Swiecicki

Appendix D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY (S/N 061)	Serial #	Manufacturer	Calibration	
			Last	Next
Head				
X	C14883	ENDEVCO	8/97	2/98
Y	C14972	ENDEVCO	8/97	2/98
Z	C15018	ENDEVCO	8/97	2/98
Chest				
X	AL6C4	ENDEVCO	8/97	2/98
Y	AE8W7	ENDEVCO	8/97	2/98
Z	A57G	ENDEVCO	8/97	2/98
Right Femur Load Cell	951	GSE	1/98	7/98
Left Femur Load Cell	952	GSE	1/98	7/98
Neck Load Cell	446	DENTON	10/97	4/98
Y	446	DENTON	10/97	4/98
Z	446	DENTON	10/97	4/98
Neck Moment	446	DENTON	10/97	4/98
Y	446	DENTON	10/97	4/98
Z	446	DENTON	10/97	4/98
Chest Deflection Gauge	061	HUMANOID	11/97	5/98
Hybrid III Use Only				
Lap Belt Load Cells	706	LEBOW	1/98	7/98
Shoulder Belt Load Cells	707	LEBOW	1/98	7/98
Spool-Out Potentiometer	M11	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	DENTON	10/97	4/98
Left Upper Tibia	My	DENTON	10/97	4/98
Left Lower Tibia	Fy	DENTON	10/97	4/98
Left Lower Tibia	Fz	DENTON	10/97	4/98
Left Lower Tibia	Mx	DENTON	10/97	4/98
Right Upper Tibia	Mx	DENTON	10/97	4/98
Right Upper Tibia	My	DENTON	10/97	4/98
Right Lower Tibia	Fy	DENTON	10/97	4/98
Right Lower Tibia	Fz	DENTON	10/97	4/98
Right Lower Tibia	Mx	DENTON	10/97	4/98

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #	Manufacture	Calibration	
			Last	Next
Left Foot Front Z	A14058	ENDEVCO	9/97	3/98
Left Foot Rear X	APA58	ENDEVCO	10/97	4/98
Left Foot Rear Z	A14150	ENDEVCO	9/97	3/98
Right Foot Front Z	A14124	ENDEVCO	9/97	3/98
Right Foot Rear X	A14181	ENDEVCO	9/97	3/98
Right Foot Rear Z	A14126	ENDEVCO	9/97	3/98

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY (S/N 150)	Serial #	Manufacturer	Calibration	
			Last	Next
Head				
X	AH5M9	ENDEVCO	1/98	7/98
Y	AGHF5	ENDEVCO	1/98	7/98
Z	AL6K2	ENDEVCO	1/98	7/98
Chest				
X	A33A	ENDEVCO	1/98	7/98
Y	FB32L	ENDEVCO	1/98	7/98
Z	AD395	ENDEVCO	1/98	7/98
Right Femur Load Cell	231	GSE	1/98	7/98
Left Femur Load Cell	232	GSE	1/98	7/98
Neck Load Cell	576	DENTON	1/98	7/98
X	576	DENTON	1/98	7/98
Y	576	DENTON	1/98	7/98
Z	576	DENTON	1/98	7/98
Neck Moment	576	DENTON	1/98	7/98
X	576	DENTON	1/98	7/98
Y	576	DENTON	1/98	7/98
Z	576	DENTON	1/98	7/98
Chest Deflection Gauge	150	HUMANOID	10/97	4/98
Hybrid III Use Only				
Lap Belt Load Cells	635	LEBOW	1/98	7/98
Shoulder Belt Load Cells	711	LEBOW	1/98	7/98
Spool-Out Potentiometer	M10	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	1/98	7/98
Y (R)	APBD7	ENDEVCO	1/98	7/98
Z (R)	AN967	ENDEVCO	1/98	7/98
Chest				
X (R)	J18406	ENDEVCO	1/98	7/98
Y (R)	AP1B5	ENDEVCO	1/98	7/98
Z (R)	AY60	ENDEVCO	1/98	7/98
Pelvic				
X	AF480	ENDEVCO	1/98	7/98
Y	AC2M6	ENDEVCO	1/98	7/98
Z	AF5C1	ENDEVCO	1/98	7/98
Left Upper Tibia				
Mx	015	DENTON	10/97	4/98
Left Upper Tibia				
My	015	DENTON	10/97	4/98
Left Lower Tibia				
Fy	011	DENTON	10/97	4/98
Left Lower Tibia				
Fz	011	DENTON	10/97	4/98
Left Lower Tibia				
Mx	011	DENTON	10/97	4/98
Right Upper Tibia				
Mx	016	DENTON	10/97	4/98
Right Upper Tibia				
My	016	DENTON	10/97	4/98
Right Lower Tibia				
Fy	012	DENTON	10/97	4/98
Right Lower Tibia				
Fz	012	DENTON	10/97	4/98
Right Lower Tibia				
Mx	012	DENTON	10/97	4/98

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #	Manufacture	Calibration	
			Last	Next
Left Foot Front Z	A13011	ENDEVCO	9/97	3/98
Left Foot Rear X	A13506	ENDEVCO	9/97	3/98
Left Foot Rear Z	A12268	ENDEVCO	9/97	3/98
Right Foot Front Z	AC814	ENDEVCO	10/97	4/98
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	D31	ICS	10/97	4/98
Right Rear Seat Crossmember	D86	ICS	9/97	3/98
Top of Engine	D29	ICS	9/97	3/98
Bottom of Engine	Y17	ICS	9/97	3/98
Left Disc Brake Caliper	A189	CEC	8/97	2/98
Right Disc Brake Caliper	A178	CEC	10/97	4/98
Instrument Panel	A14151	ENDEVCO	9/97	3/98
Left Seat Rear Crossmember (R)	X86	ICS	2/98	8/98
Right Seat Rear Crossmember (R)	Y93	ICS	8/97	2/98