

V2879

REPORT NUMBER: 301-CAL-98-05

**SAFETY COMPLIANCE TESTING FOR FMVSS 301
FUEL SYSTEM INTEGRITY**

FORD MOTOR COMPANY
1998 FORD EXPEDITION
MPV

NHTSA NUMBER: CW0208

CALSPAN TEST NUMBER: 8412-5

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



March 2, 1998

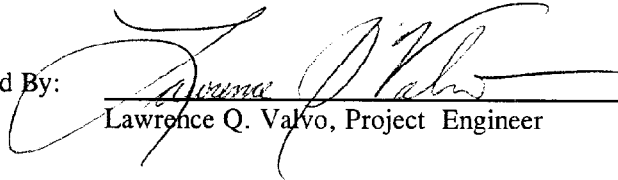
FINAL REPORT

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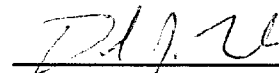
U. S. Department of Transportation
National Highway Traffic Safety Administration
ENFORCEMENT
Office of Vehicle Safety Compliance
400 Seventh Street, S. W.
Room No. 6115 (NEF-30)
Washington, DC 20590

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Prepared By:


Lawrence Q. Valvo, Project Engineer

Approved By:

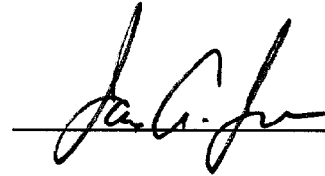

David J. Travale, Program Manager
Transportation Sciences Center

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16. Abstract Compliance tests were conducted on the subject 1998 Ford Expedition MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-301-01 for the determination of FMVSS 301 compliance. Test failures identified were as follows: The test vehicle appeared to comply with all requirements of FMVSS 301 "Fuel System Integrity."			
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Section 1

PURPOSE OF COMPLIANCE TEST

This 30 mph rear moving barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 301 Compliance Test Program conducted for the National Highway Traffic Safety Administration (NHTSA) by Calspan Corporation under Contract No. DTNH22-95-D-11000. The purpose of this test was to determine if the subject vehicle, a 1998 Ford Expedition MPV, meets the performance requirements of FMVSS No. 301, "Fuel System Integrity." This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-301-01, dated March 28, 1994.

Section 2

COMPLIANCE TEST RESULTS SUMMARY

A 5423 pound 1998 Ford Expedition MPV was impacted from the rear by a 3961 pound moving barrier at a velocity of 29.3 mph. The test was performed by the Calspan Corporation on March 2, 1998.

One instrumented Part 572 E and non-instrumented Part 572 B, 50th percentile male Anthropomorphic Test Device (ATD) were placed in the driver and right-front passenger seating positions respectively. Additional ballast (240 pounds) was secured in the vehicle cargo area.

Average longitudinal crush was 9.5 inches. Pre- and post-test photographs of the vehicle can be found in appendix A.

The gallon fuel tank was filled to 92.5 percent capacity with orange Stoddard fluid prior to the impact. After the impact, there was no fluid leakage for the first 30 minutes nor during any phase of the rollover test. The vehicle appeared to comply with all the requirements of FMVSS No. 301 "Fuel System Integrity." Section 3 presents the results of these tests.

The crash event was recorded by one real-time and eight high-speed cameras. Camera locations and other pertinent camera information are found on pages 3-9 and 3-10 of this report.

Table 1

CRASH TEST SUMMARY

Vehicle NHTSA No.: CW0208 Test Mode: 30 mph Rear Barrier
 Test Date: March 2, 1998 Time: 14:38 Temperature : 70 °F
 Vehicle Make/Model/Body Style: 1998 Ford Expedition MPV
 Vehicle Test Weight: 5423 lbs Impact Velocity: 29.3 mph
 Static Crush: Left Side = 8.7 inches
 Right Side = 8.2 inches
 Centerline = 11.5 inches
 Average Crush: 9.5 inches

TYPE OF FRONT OCCUPANT RESTRAINT SYSTEM INSTALLED IN TEST VEHICLE:

Driver's DSP: Airbag / 3-Point Active Seat Belt
 Right Passenger's DSP: Airbag / 3-Point Active Seat Belt

VISIBLE DUMMY CONTACT POINTS:

Driver: Back of head to center of driver seat head restraint

 Passenger: Back of head to center of front passenger seat head restraint

DOOR OPENING DATA:

Closed / Operable - Left Front
Closed / Operable - Right Front

Stoddard Solvent Spillage from Vehicle's Fuel System: None

Remarks: Driver and passenger seat backrests reclined rearward approximately 12 degrees as a result of the
impact. Both seat recline mechanisms remained operable following the test.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1998 Ford Expedition MPV

NHTSA No.: CW0208 ; VIN: 1FMRU1769WLA67226 ; Color: Blue

Engine Data: 8 cylinders; - CID; 4.6 Liters; - cc

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

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

Final Drive: X Rear Wheel Drive; - 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: 1/14/98 ; Odometer Reading 67 miles

Selling Dealer: Graham Ford Inc.

& Address: Columbus, OH 43216

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Ford Motor Company

Date of Manufacture: 11/97

GVWR: 6750 lbs.; GAWR: 3000 lbs. FRONT; 3900 lbs. REAR

DATA FROM TIRE PLACARD:

Location of Placard on Vehicle: Driver Door

Tire Pressure with Maximum Capacity Vehicle Load: 35 psi FRONT 35 psi REAR

Recommended Tire Size: P225/70R16SL

* Recommended Cold Tire Pressure: 30 psi FRONT; 35 psi REAR

Size of Tires on Test Vehicle: P225/70R16

Type of Spare Tire: P225/70R16

Vehicle Capacity Data:

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

Number of Occupants: 2 Front; 3 Rear; 5 Total

Vehicle Capacity Weight (VCW) = 1941 lbs.

No. of Occupants x 150 lbs. = 750 lbs.

Rated Cargo/Luggage Weight (RCLW) = 1,191 lbs. 300 lbs maximum

*Tire pressure used for test

Table 2

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

Right Front	=	<u>1239</u>	lbs.	Right Rear	=	<u>1134</u>	lbs.
Left Front	=	<u>1274</u>	lbs.	Left Rear	=	<u>1162</u>	lbs.
TOTAL FRONT	=	<u>2,513</u>	lbs.	TOTAL REAR	=	<u>2,296</u>	lbs.
TOTAL DELIVERED WEIGHT = <u>4,809</u> lbs.							
% of Total Front of Vehicle Weight = <u>52.3</u> %				% of Total Rear Weight = <u>47.7</u> %			

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight	=	<u>4,809</u>	lbs.	
Rated Cargo/Luggage Weight (RCLW)	=	<u>300</u>	lbs.	300 lbs maximum
Weight of 2 p.572 Dummies, 167 & 164 lbs	=	<u>331</u>	lbs.	
TARGET TEST WEIGHT	=	<u>5,440</u>	lbs.	

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 283 POUNDS OF CARGO WEIGHT:

Right Front	=	<u>1416</u>	lbs.	Right Rear	=	<u>1247</u>	lbs.
Left Front	=	<u>1477</u>	lbs.	Left Rear	=	<u>1283</u>	lbs.
TOTAL FRONT	=	<u>2,893</u>	lbs.	TOTAL REAR	=	<u>2,530</u>	lbs.
TOTAL TEST WEIGHT = <u>5,423</u> lbs.							
% of Total Front Weight = <u>53.3</u> %				% of Total Rear Weight = <u>46.7</u> %			

* Weight of Ballast Secured in Vehicle Trunk Area = 240 lbs.

Type of Ballast: Lead shot

Method of Securing Ballast: Rear seat anchorages

Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimension in inches):

AS DELIVERED:	RF	<u>35.3</u>	LF	<u>35.2</u>	RR	<u>35.4</u>	LR	<u>35.5</u>
AS TESTED:	RF	<u>34.1</u>	LF	<u>33.9</u>	RR	<u>34.7</u>	LR	<u>34.7</u>
Vehicle's Wheel Base:		<u>119.0</u>	in.					
Location of Vehicle's C.G.:		<u>55.5</u>	inches rearward of front wheel center.					

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual	=	<u>26</u>	gallons
Usable Capacity Figure Furnished by COTR	=	<u>26.0</u>	gallons
Test Volume Range (91 to 94% of Usable Capacity)	=	<u>23.7</u>	to <u>24.4</u> gallons
ACTUAL TEST VOLUME=	<u>24.1</u>	gallons (with entire fuel system filled)	

* Ballast weight includes the RCLW, the weight of drained vehicle fluids and the weight of any removed vehicle components less the weight of onboard instrumentation, cameras, and hardware.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

FUEL SYSTEM DATA (continued):

Test Fluid Type:	Stoddard Solution
Test Fluid Specific Gravity:	0.764
Test Fluid Kinematic Viscosity:	0.96 centistokes
Test Fluid Color:	Orange ("red" is preferred)
Type of Vehicle Fuel Pump:	Electric
Electric Fuel Pump Operation with Ignition Switch ON and Engine OFF - Fuel pump operated.	
Details of Fuel System:	Fuel Filler - Left side of vehicle aft of rear axle; Fuel Tank - Left side of vehicle forward of the rear axle; Fuel Lines - Left side of vehicle underbody, inboard of left frame rail.

Table 3

MOVING BARRIER PARAMETER DATA

WEIGHT OF MOVING BARRIER:

Right Front	=	<u>1113</u>	lbs.	Right Rear	=	<u>868</u>	lbs.
Left Front	=	<u>1102</u>	lbs.	Left Rear	=	<u>878</u>	lbs.
TOTAL FRONT	=	<u>2,215</u>	lbs.	TOTAL REAR	=	<u>1,746</u>	lbs.
TOTAL BARRIER WEIGHT	=	<u>3,961</u>	lbs.				

MOVING BARRIER DIMENSIONS:

Barrier Face Height:	<u>60.0</u>	in.
Barrier Face Width:	<u>78.0</u>	in.
Barrier Face		
Ground Clearance:	<u>5.0</u>	in.
Tread Width:	<u>59.5</u>	in.
Wheel Base:	<u>120.0</u>	in.
Location of C.G.:	X: <u>52.9</u> inches rearward of front wheel center.	
	Y: <u>0.0</u> inches from longitudinal-vertical plane of symmetry.	
	Z: <u>16.3</u> inches above ground.	

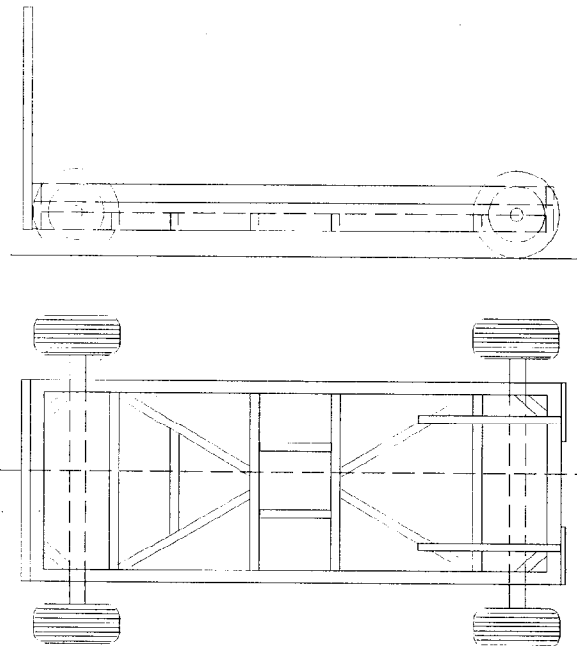


Table 4

POST IMPACT DATA

TYPE OF TEST:

Type of Test: Rear Barrier Impact Angle: 0°
 Test Date: March 2, 1998 Time: 14:38 Temperature: 70 °F
 Vehicle NHTSA No.: CW0208
 Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.3 mph; Trap No. 2 = 29.3 mph
 Average Impact Speed = 29.3 mph

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

Vehicle Length:

Pre-Test Right = 201.5 ; C/L = 204.8 ;Left = 201.5
 Post-Test Right = 193.3 ; C/L = 193.3 ;Left = 192.8
 Crush Right = 8.2 ; C/L = 11.5 ;Left = 8.7
 AVERAGE = 9.5 inches

Section 3

COMPLIANCE TEST DATA

Figure 1

PART 572 DUMMY IN-VEHICLE POSITION
(FOR REAR IMPACTS ONLY)

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

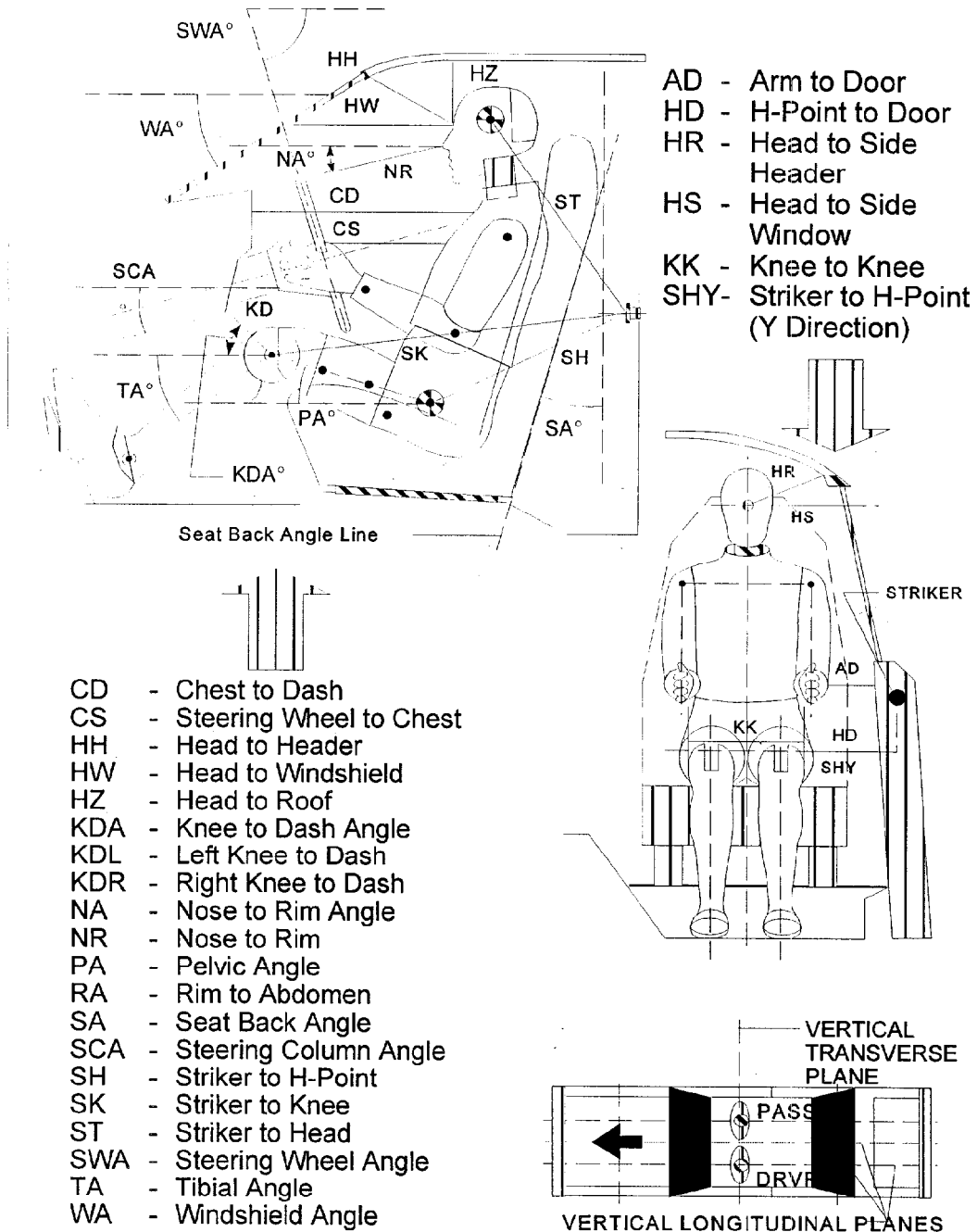


Table 5

**FRONT SEAT OCCUPANT MEASUREMENTS
(FOR REAR IMPACT ONLY)**

	DRIVER (Serial #152)		
WA°	34 deg.		
SWA°	68 deg.		
SCA°	22 deg.		
SA°	21.0 deg.		
HZ	9.5		
HH	15.7		
HW	23.3		
HR	10.6		
NR	14.5	Angle	12 deg.
CD	22.1		
CS	11.5		
RA	8.3		
KDL	6.4	Angle (KDA)	30 deg.
KDR	5.9		
PA°	24 deg.		
TA°	45 deg.		
KK	10.8		
ST	25.3	Angle	12 deg.
SK	24.2	Angle	88 deg.
SH	8.1	Angle	96 deg.
SHY	10.1		
HS	13.3		
HD	7.9		
AD	5.4		

Table 6
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

TEST VEHICLE NHTSA NO.: CW0208 TEST DATE: March 2, 1998

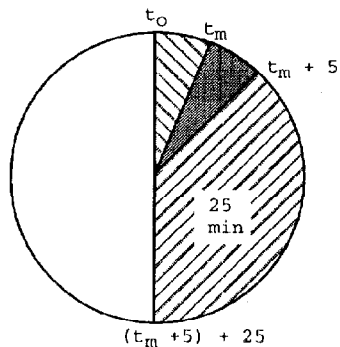
Vehicle Mfgr./Make/Model: 1998 Ford Expedition MPV

Test vehicle fuel tank filled to 91% to 94% of manufacturer's "usable" capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE:

- Frontal (30 mph)
- Oblique (30 mph) with - ° barrier face first
contacting _____
(driver/passenger) side
- X Rear Moving Barrier (30 mph)
- Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT:



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

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

SOLVENT SPILLAGE DETAILS:

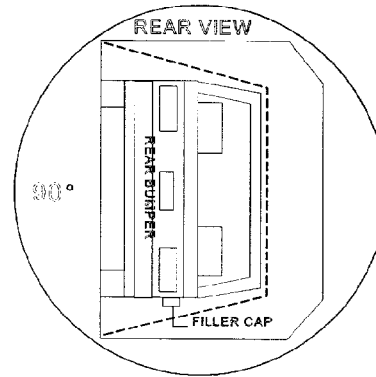
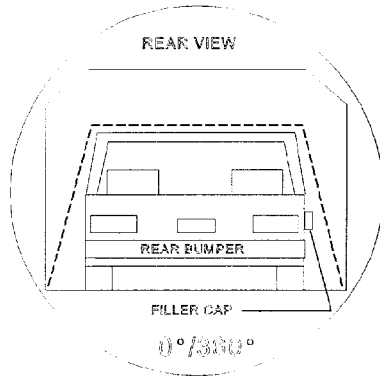
None

Table 7

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE :
0-90 Deg.

Vehicle NHTSA ID No.:
CW0208

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	<u>1</u> minutes <u>6</u> seconds
FMVSS 301 Position Hold Time +	<u>5</u> minutes <u>00</u> seconds
TOTAL	<u>6</u> minutes <u>6</u> seconds
Next whole minute interval	<u>7</u> minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0 ounces	0 ounces	0 ounces	N/A
----------	----------	----------	-----

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

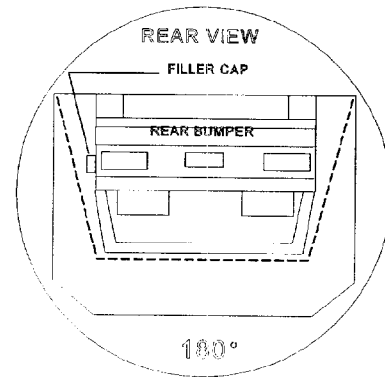
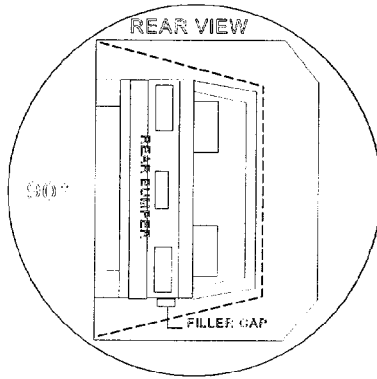
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 7
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE :
90-180 Deg.

Vehicle NHTSA ID No.:
CW0208



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	9	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	9	seconds
Next whole minute interval	7	minutes		

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0 ounces	0 ounces	0 ounces	N/A
----------	----------	----------	-----

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

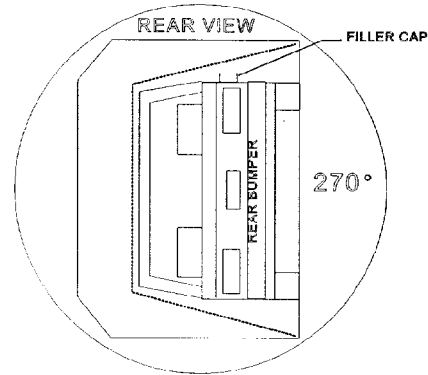
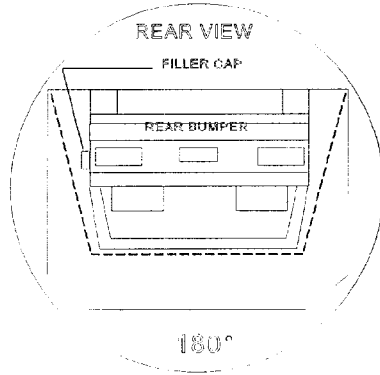
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 7
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE :
180-270 Deg.

Vehicle NHTSA ID No. :
CW0208



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 1 minutes 9 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL 6 minutes 9 seconds

Next whole minute interval 7 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0 ounces	0 ounces	0 ounces	N/A
----------	----------	----------	-----

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

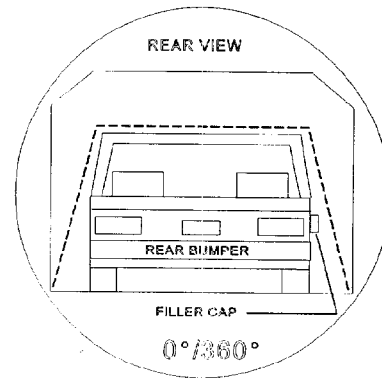
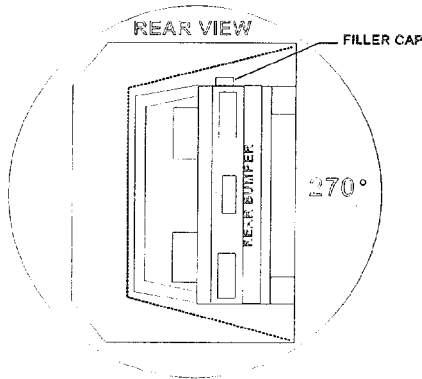
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 7
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE :
270-360 Deg.

Vehicle NHTSA ID No. :
CW0208



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 1 minutes 12 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL 6 minutes 12 seconds

Next whole minute interval

7 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0 ounces	0 ounces	0 ounces	N/A
----------	----------	----------	-----

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

IV. SOLVENT SPILLAGE LOCATION(S):

None

Figure 2

CAMERA POSITIONS FOR REAR IMPACTS

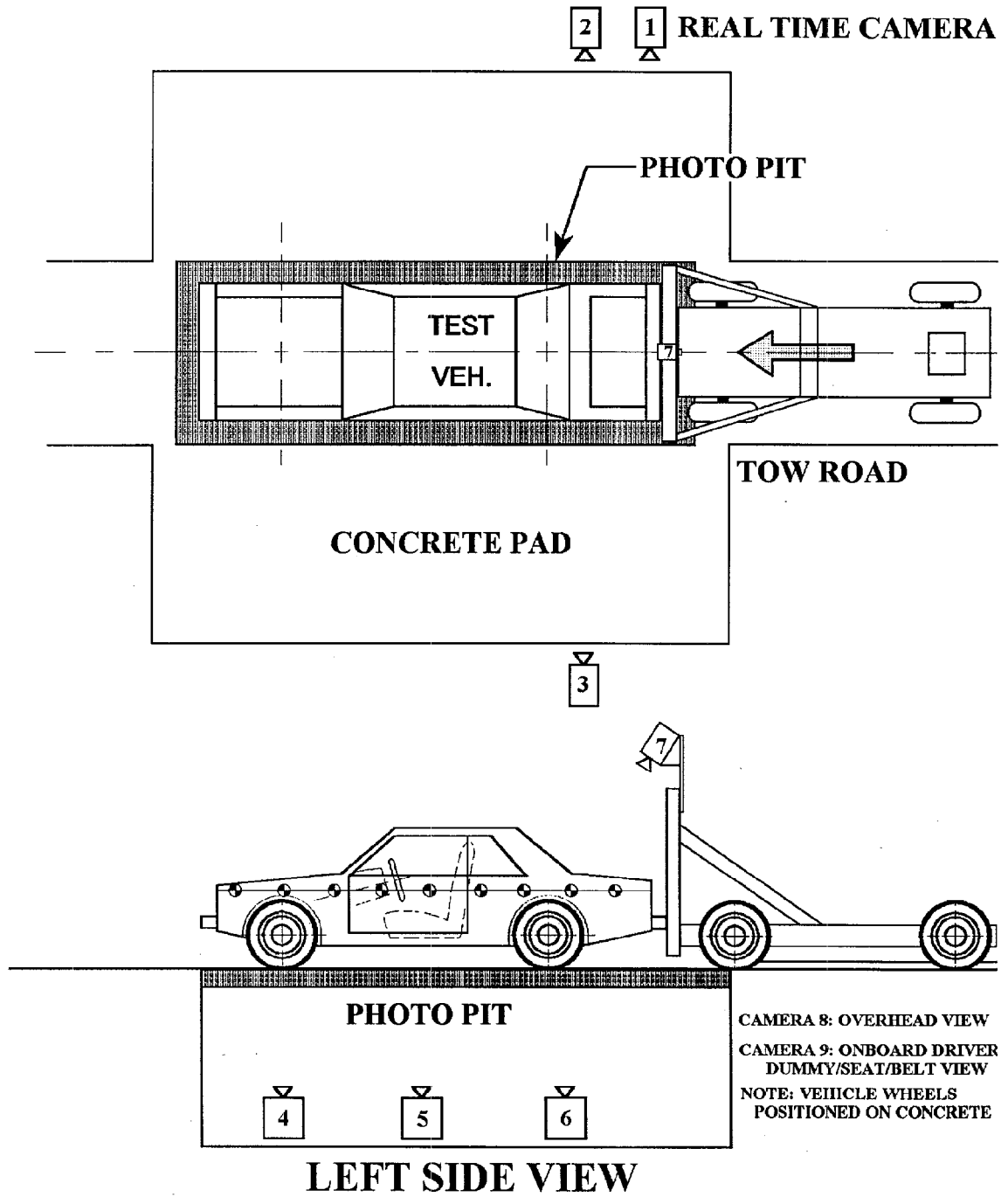


Table 8

HIGH-SPEED CAMERA LOCATIONSNHTSA No. : CW0208 Vehicle : 1998 Ford Expedition MPV

CAMERA NO.	VIEW	CAMERA POSITIONS (inches)*			ANGLE** (degrees)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	-	-	-	-	-	24
2	Right Side View	-462	-57	44	-1	25	510
3	Left Side View	508	86	57	-1	25	510
4	Vehicle Front Underbody View	0	142	-77	90	13	650
5	Vehicle Mid-Section Underbody View	0	78	-77	90	13	780
6	Vehicle Rear Underbody View	0	25	-77	90	13	600
7	Moving Barrier View	0	0	99	-105	7.5	510
8	Overhead Overall View	-20	0	386	-90	25	550
9	Onboard Driver Dummy/Seat/Belt View	-	-	-	-	12.5	350

* X = film plant to monorail centerline (+ to left of rail)

Y = film plane to impact location (+ ahead of impact location)

Z = film plane to ground (+ above ground)

** = referenced to horizontal plane

Appendix A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

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A-5	PRE-TEST RIGHT SIDE VIEW	A-7
A-6	POST-TEST RIGHT SIDE VIEW	A-8
A-7	PRE-TEST REAR VIEW	A-9
A-8	POST-TEST REAR VIEW	A-10
A-9	PRE-TEST LEFT FRONT THREE-QUARTER VIEW	A-11
A-10	POST-TEST LEFT FRONT THREE-QUARTER VIEW	A-12
A-11	PRE-TEST RIGHT REAR THREE-QUARTER VIEW	A-13
A-12	POST-TEST RIGHT REAR THREE-QUARTER VIEW	A-14
A-13	PRE-TEST FRONT UNDERBODY VIEW	A-15
A-14	POST-TEST FRONT UNDERBODY VIEW	A-16
A-15	PRE-TEST REAR UNDERBODY VIEW	A-17
A-16	POST-TEST REAR UNDERBODY VIEW	A-18
A-17	CERTIFICATION PLACARD	A-19
A-18	TIRE PLACARD	A-20
A-19	ROLLOVER 90°	A-21
A-20	ROLLOVER 180°	A-22
A-21	ROLLOVER 270°	A-23
A-22	ROLLOVER 360°	A-24



Figure A-1 PRE-TEST FRONT VIEW

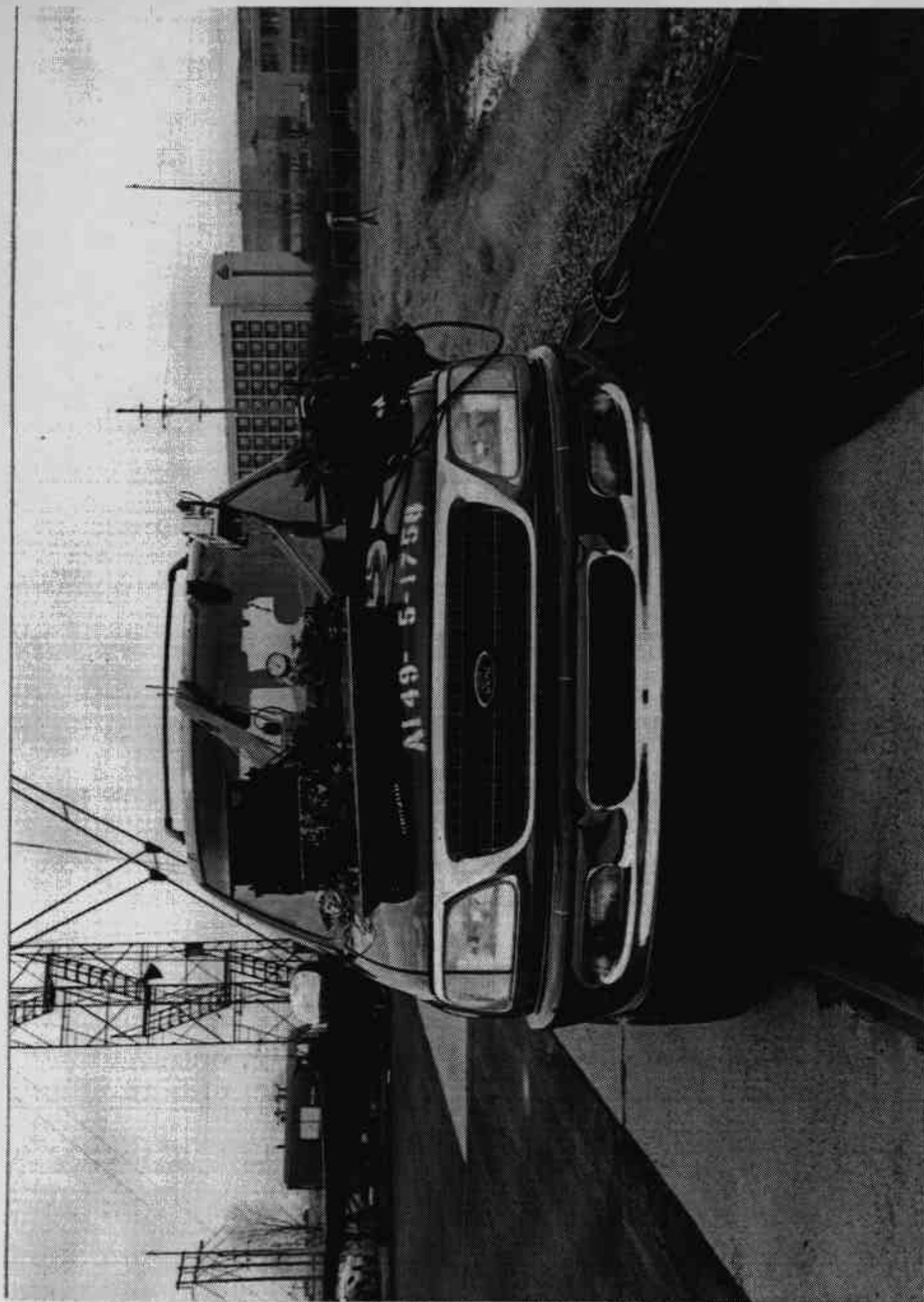


Figure A-2 POST-TEST FRONT VIEW

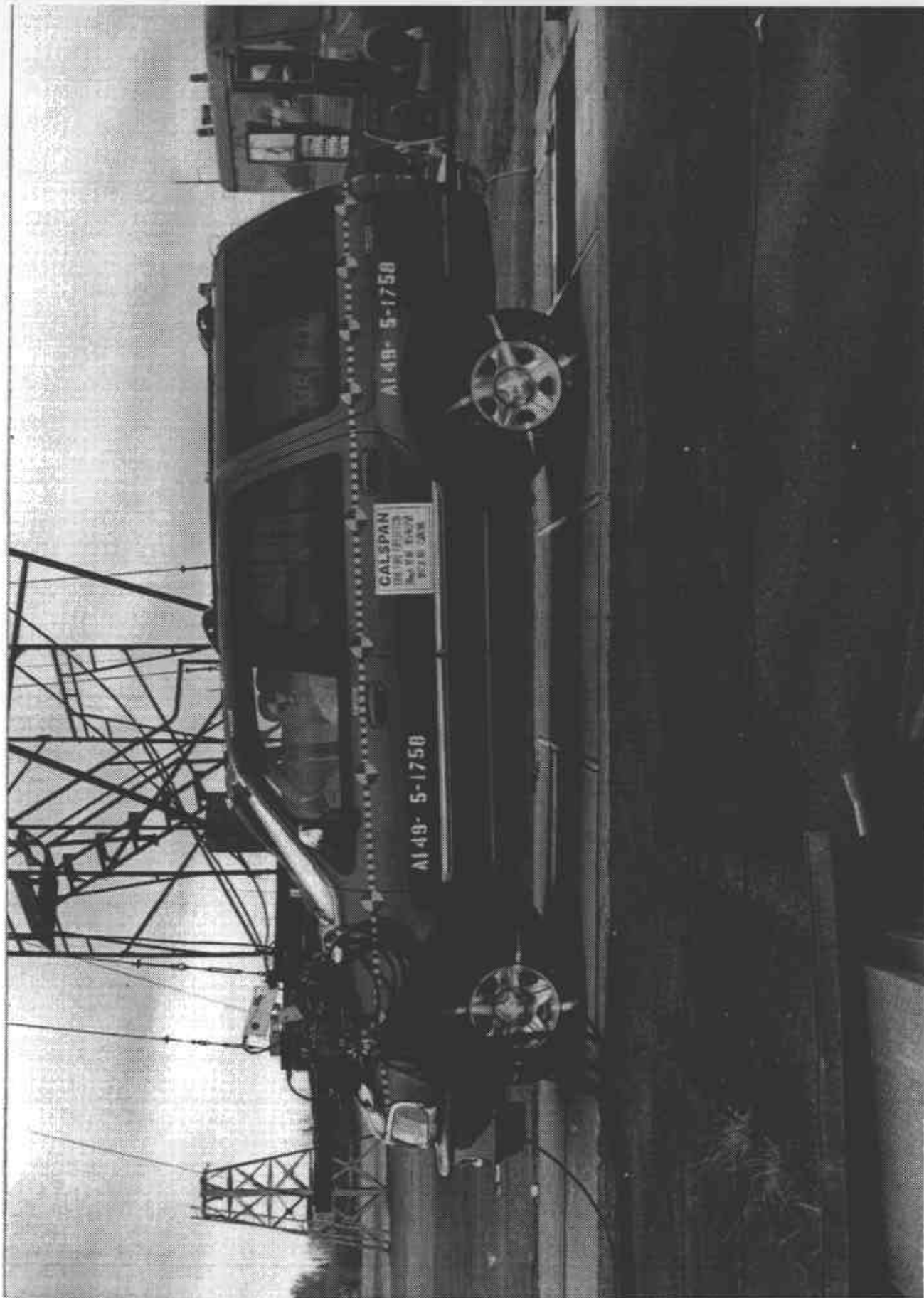


Figure A-3 PRE-TEST LEFT SIDE VIEW

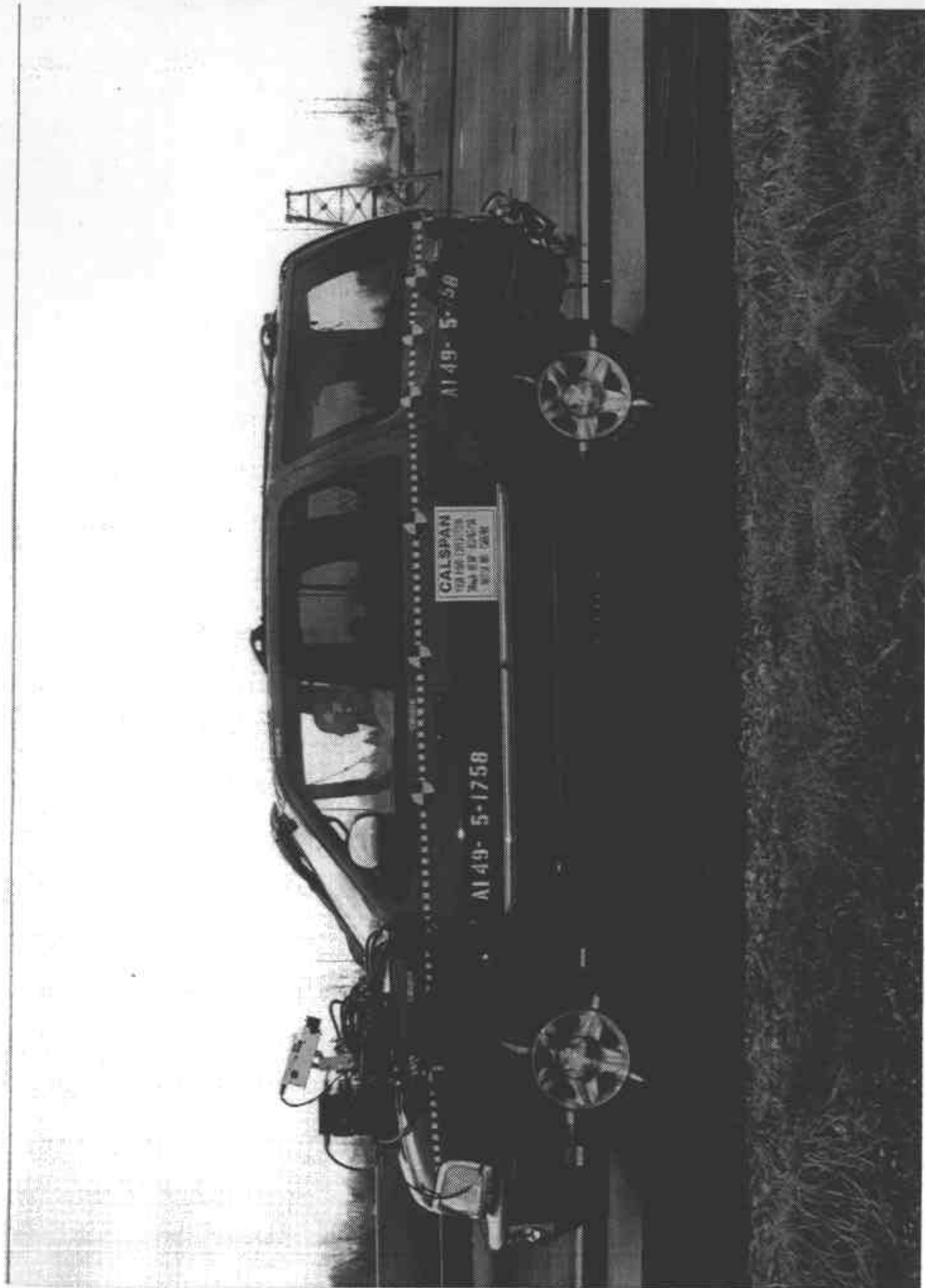


Figure A-4 POST-TEST LEFT SIDE VIEW



Figure A-5 PRE-TEST RIGHT SIDE VIEW

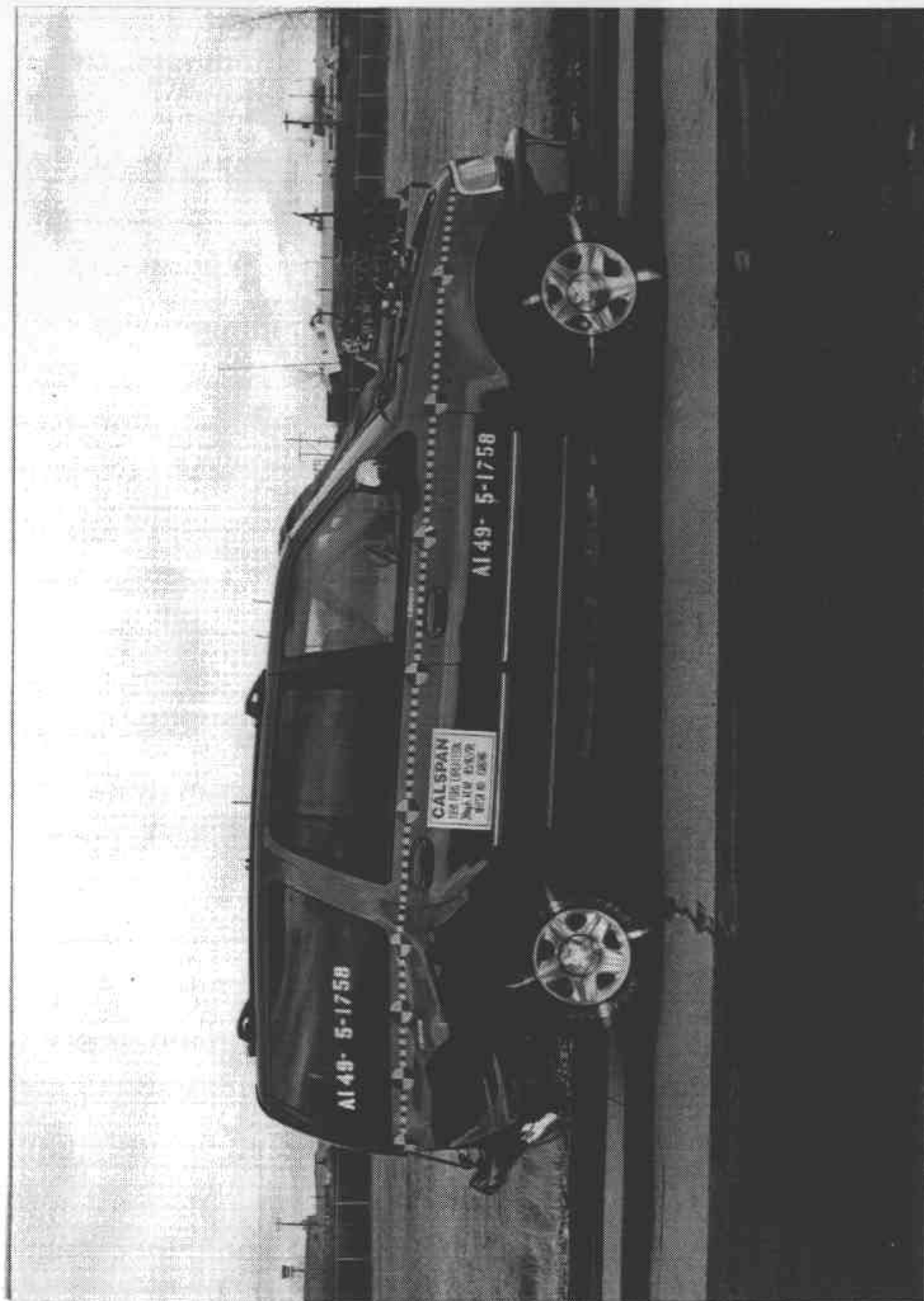


Figure A-6 POST-TEST RIGHT SIDE VIEW



Figure A-7 PRE-TEST REAR VIEW

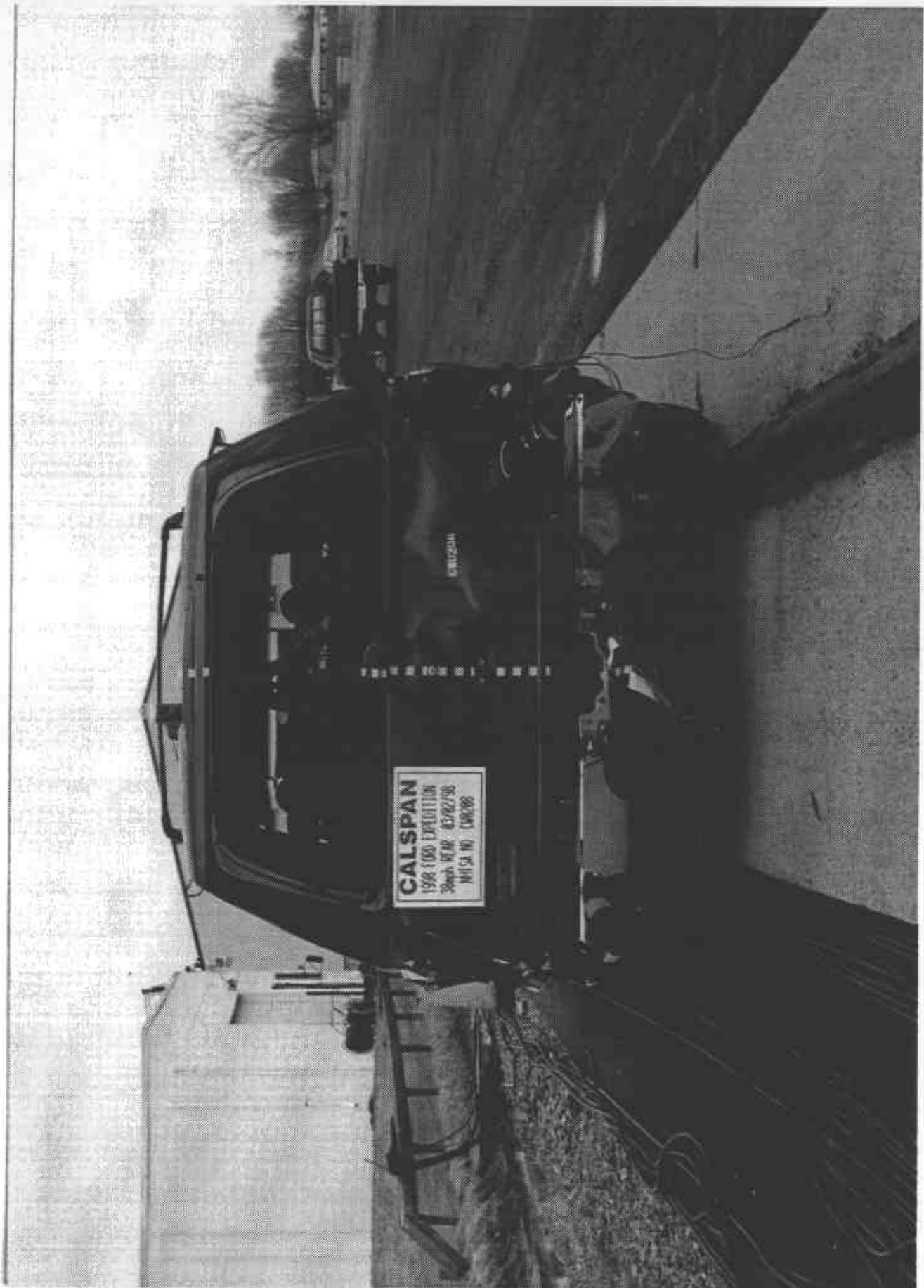


Figure A-8 POST-TEST REAR VIEW



Figure A-9 PRE-TEST LEFT FRONT THREE-QUARTER VIEW

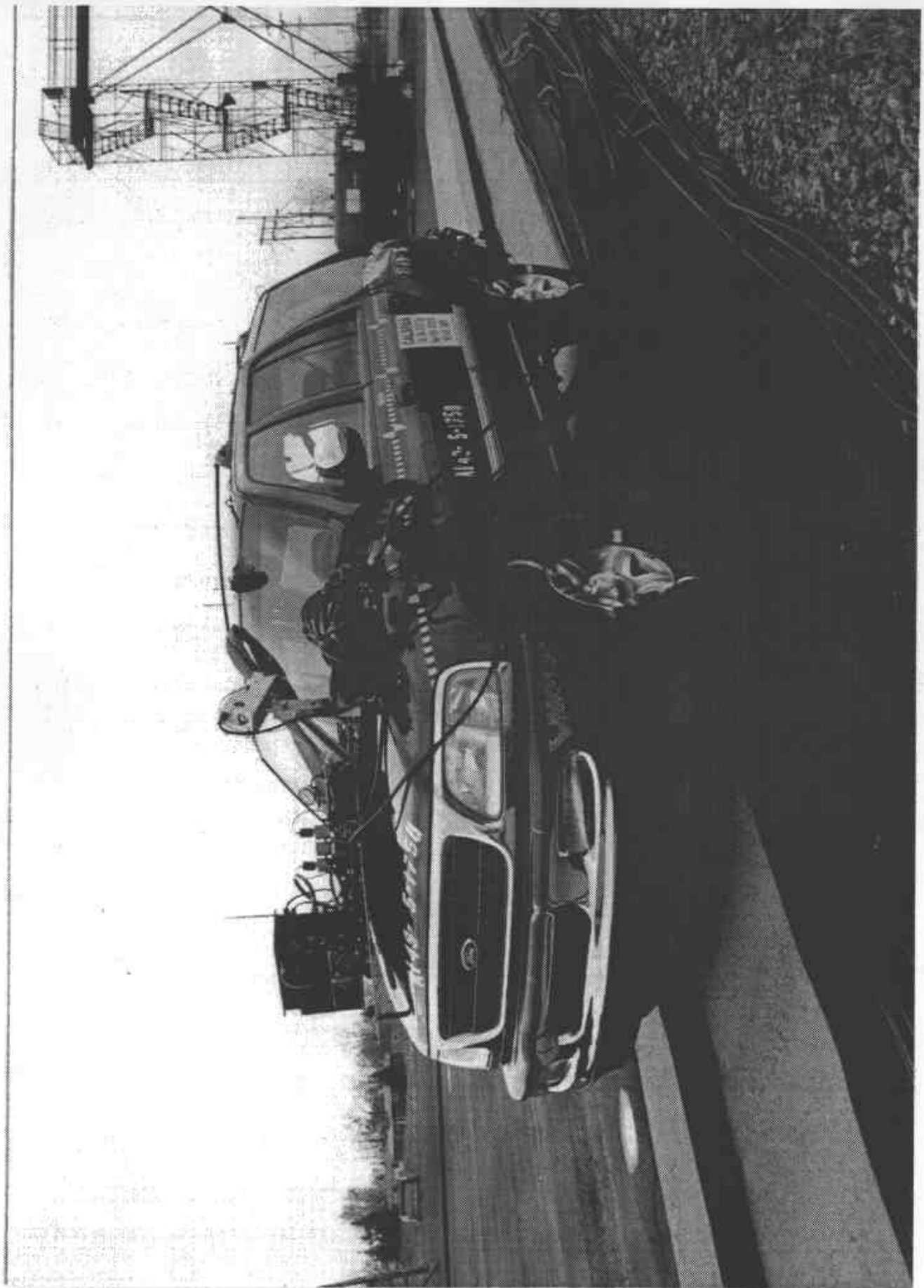


Figure A-10 POST-TEST LEFT FRONT THREE-QUARTER VIEW

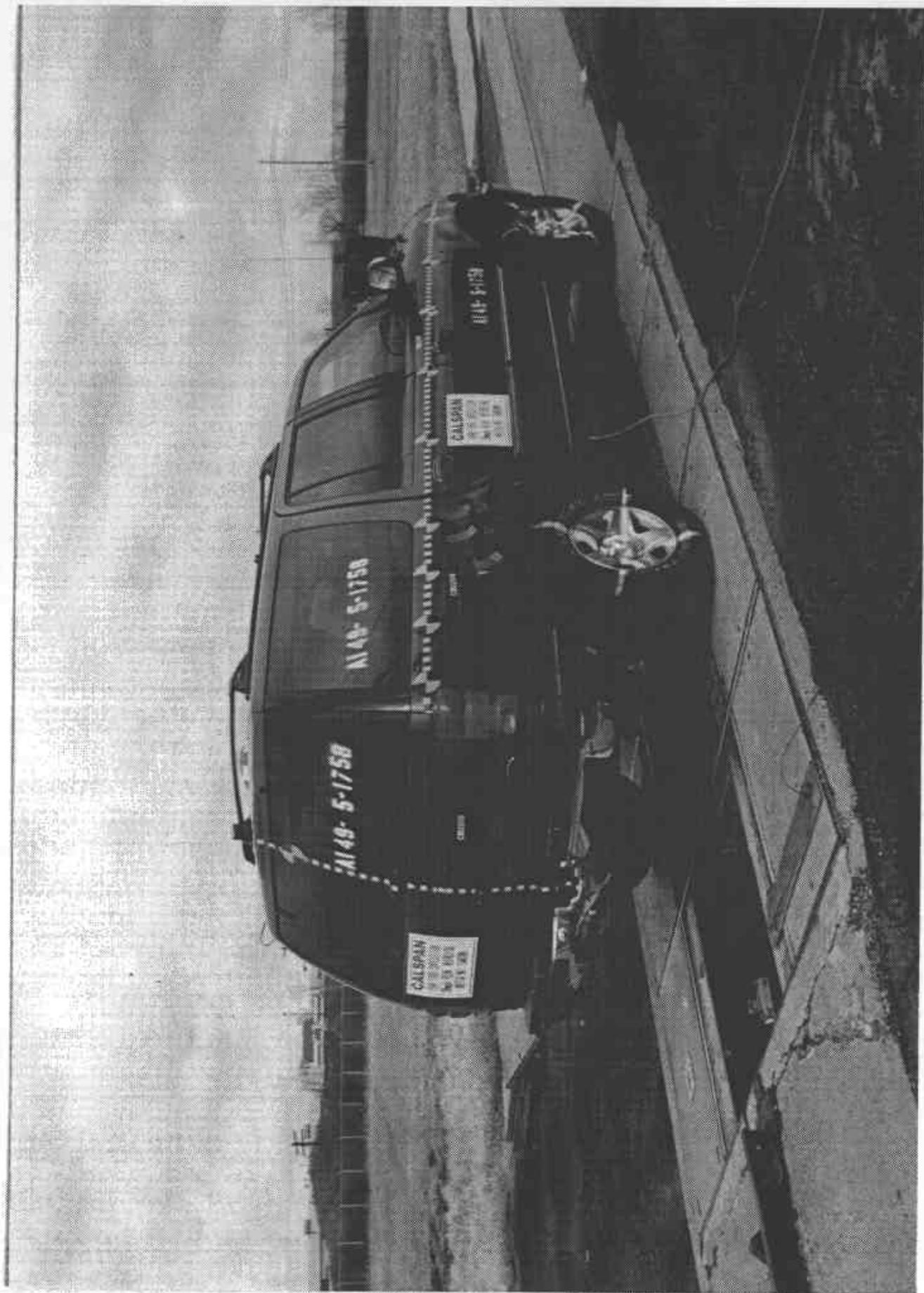


Figure A-11 PRE-TEST RIGHT REAR THREE-QUARTER VIEW

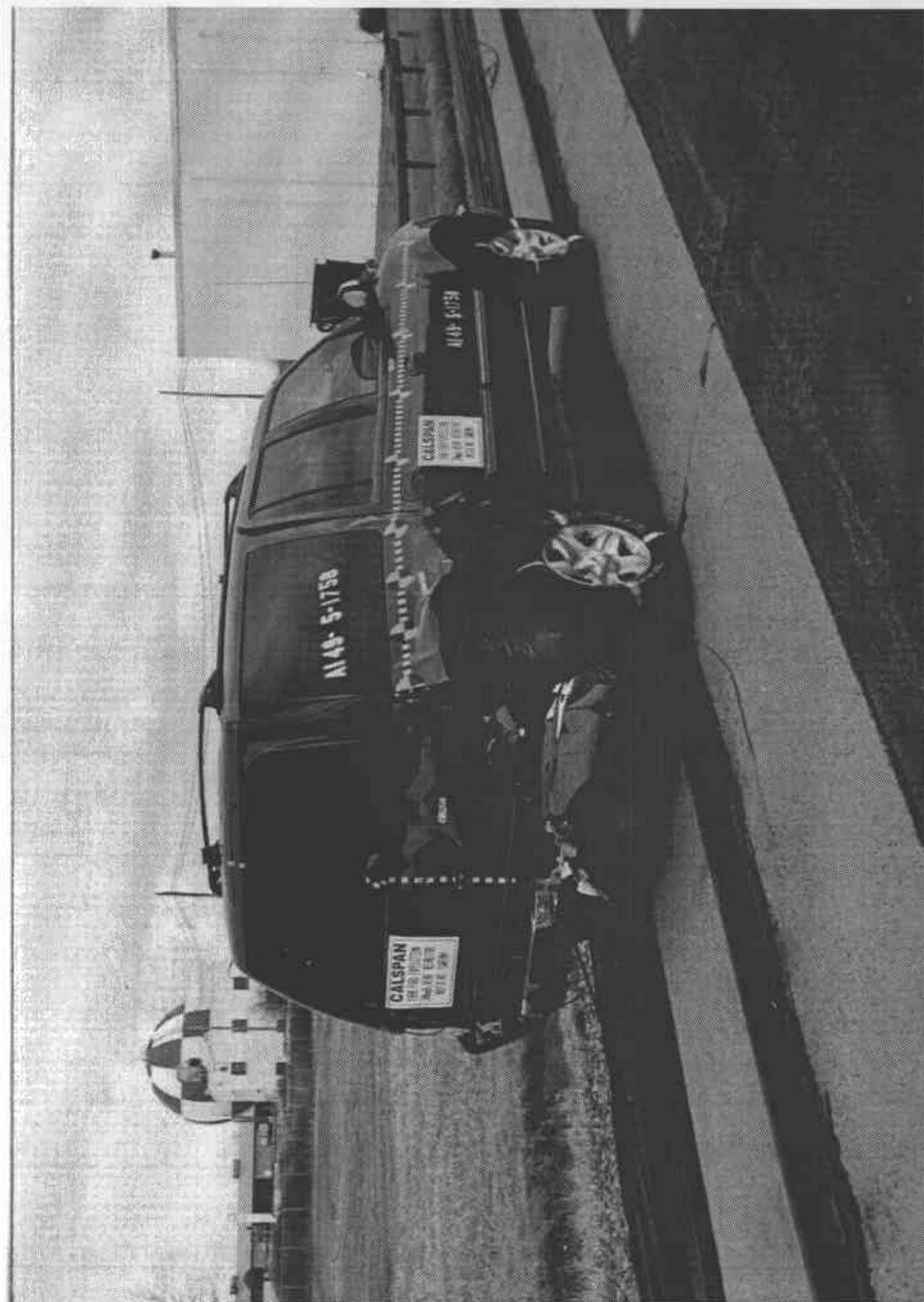


Figure A-12 POST-TEST RIGHT REAR THREE-QUARTER VIEW

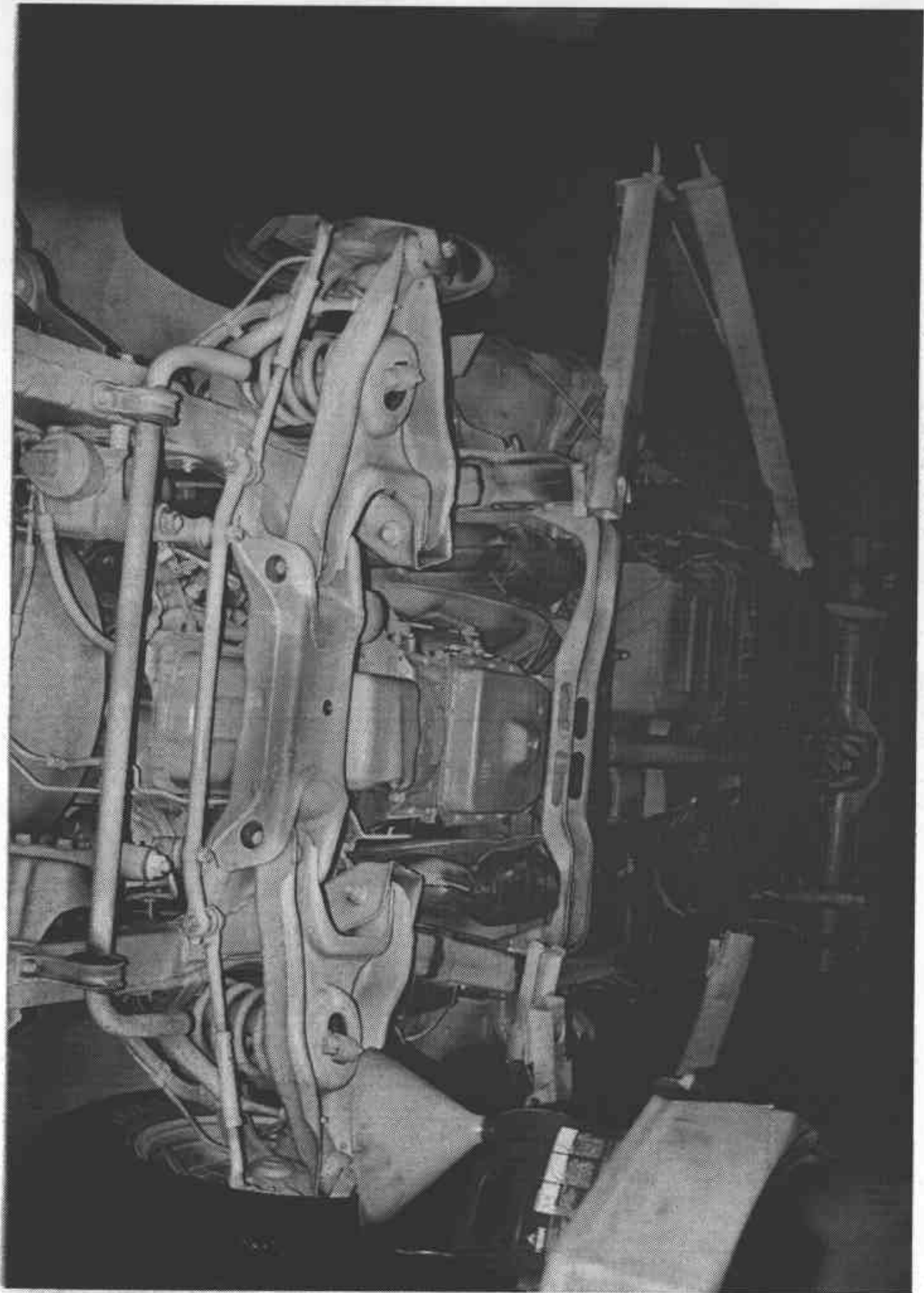


Figure A-13 PRE-TEST FRONT UNDERBODY VIEW

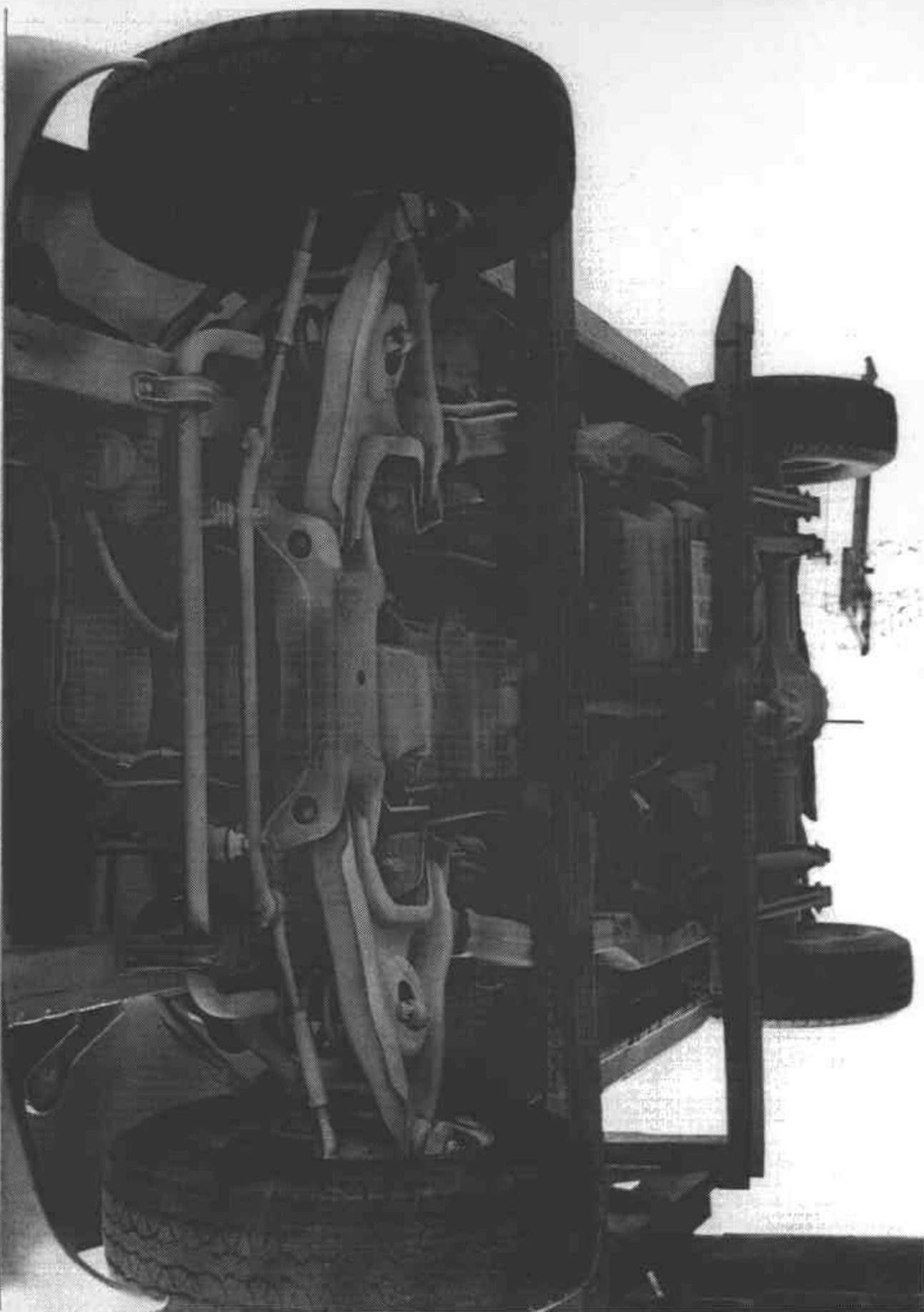


Figure A-14 POST-TEST FRONT UNDERBODY VIEW

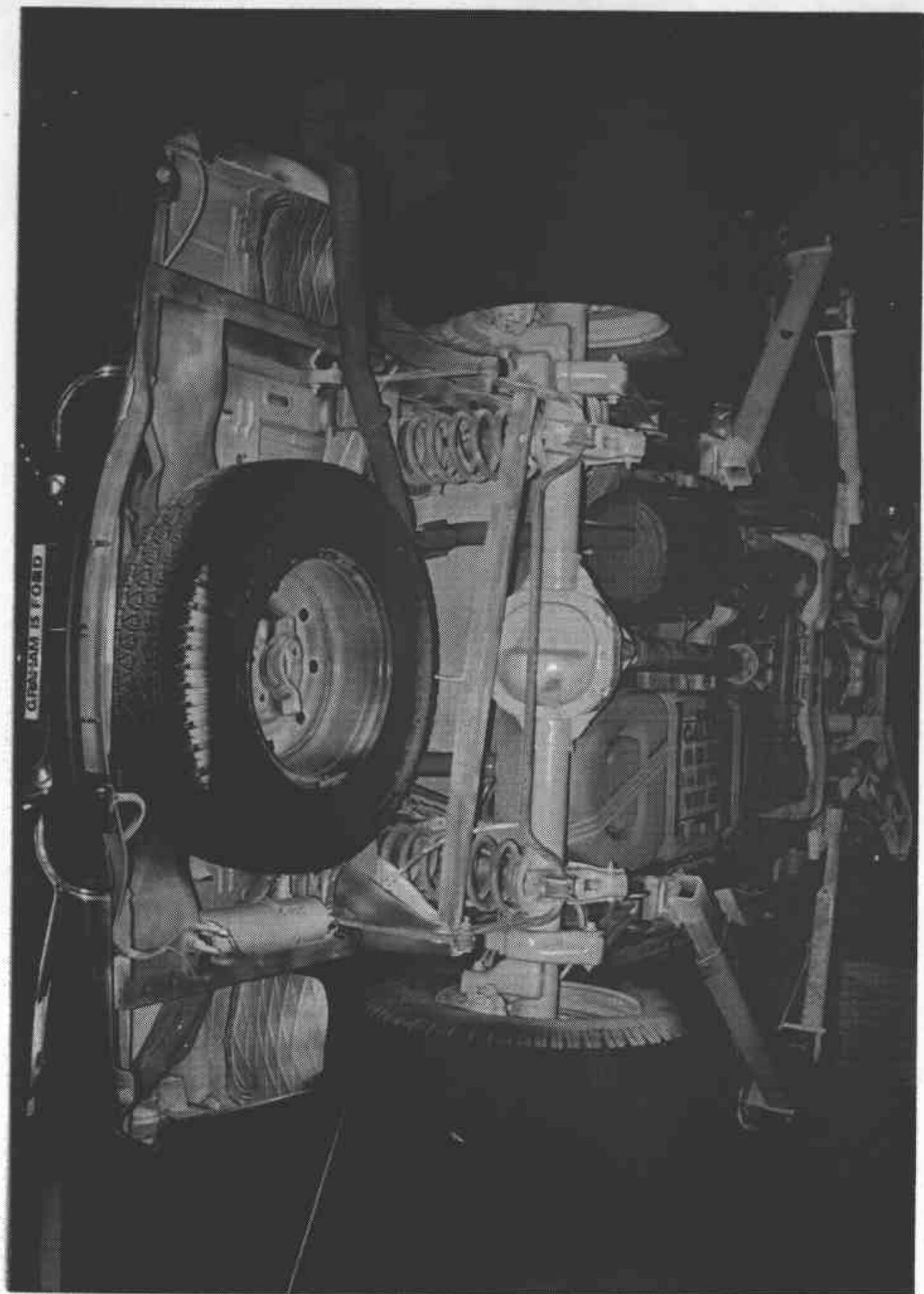
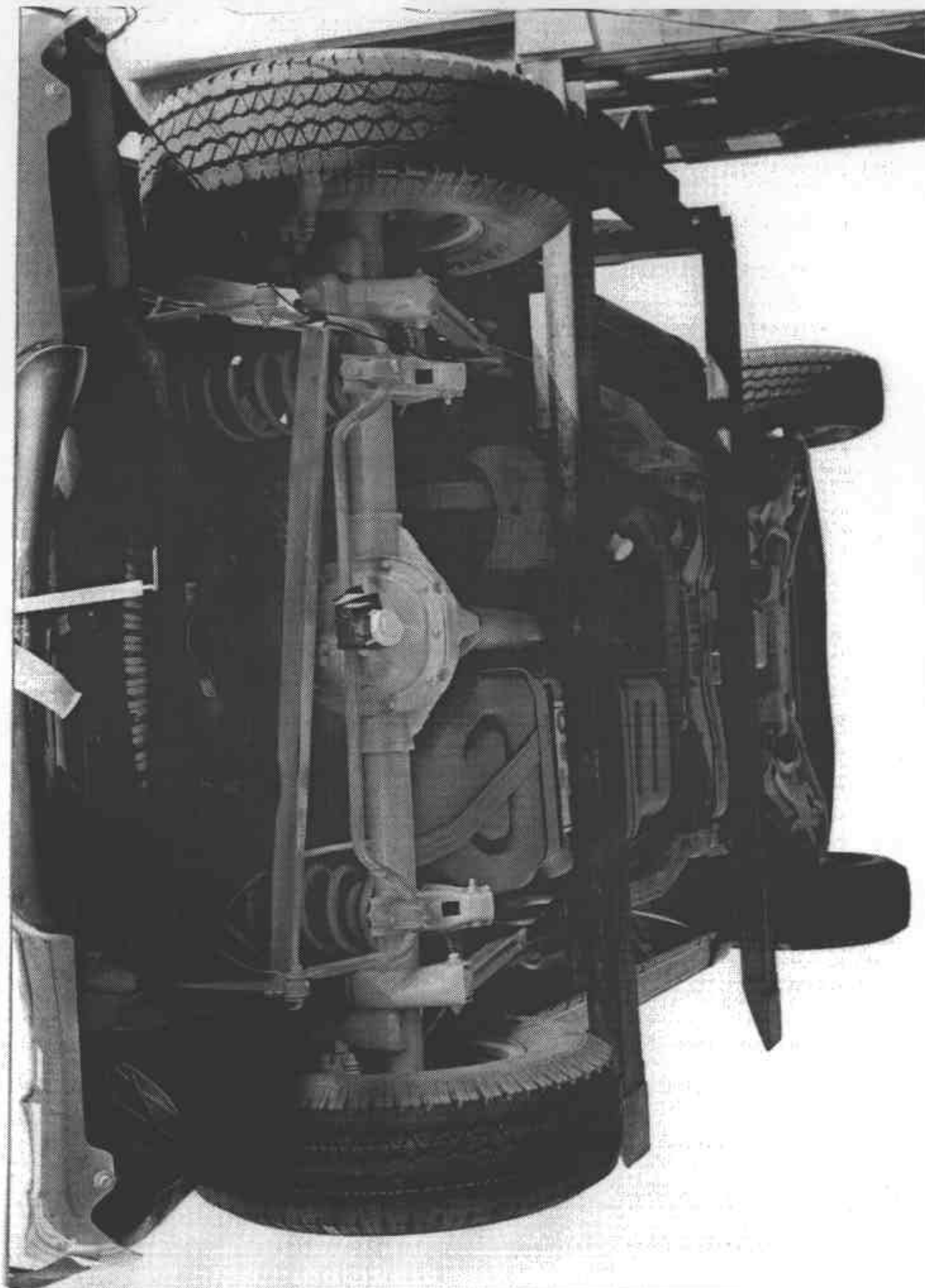


Figure A-15 PRE-TEST REAR UNDERBODY VIEW

Figure A-16 POST-TEST REAR UNDERBODY VIEW



NOT APPLICABLE

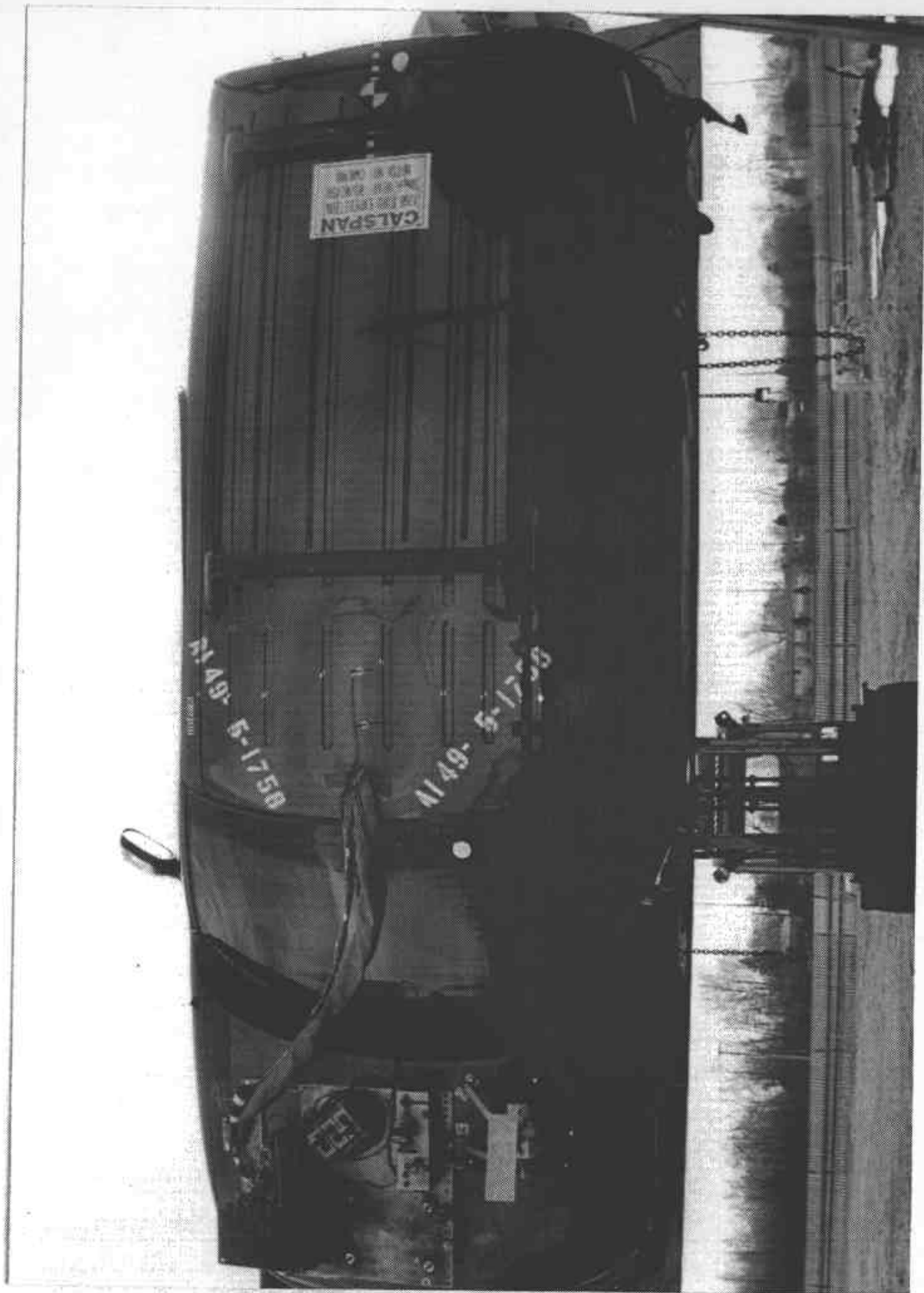


Figure A-19 ROLLOVER 90°

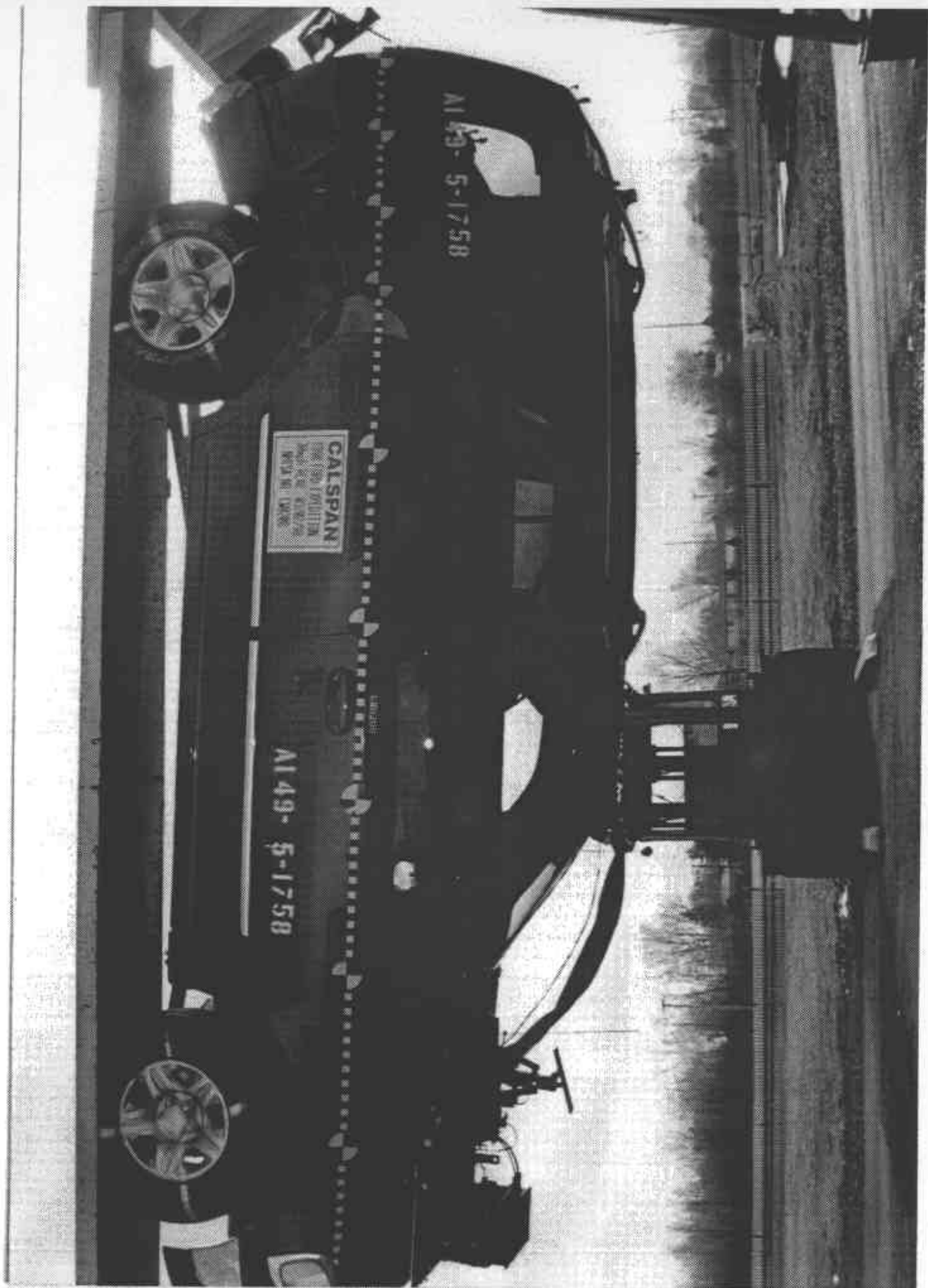


Figure A-20 ROLLOVER 180°

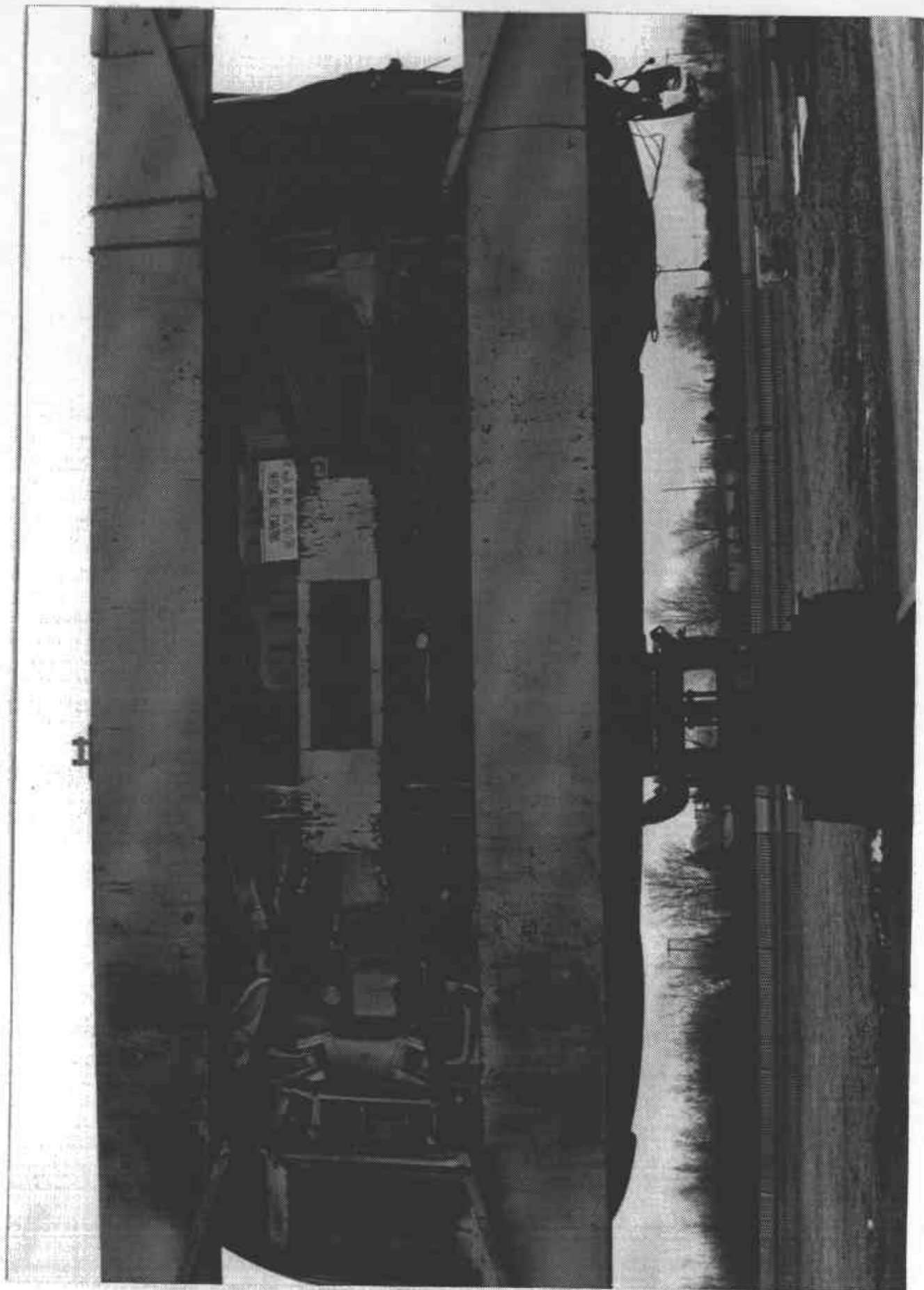


Figure A-21 ROLLOVER 270°

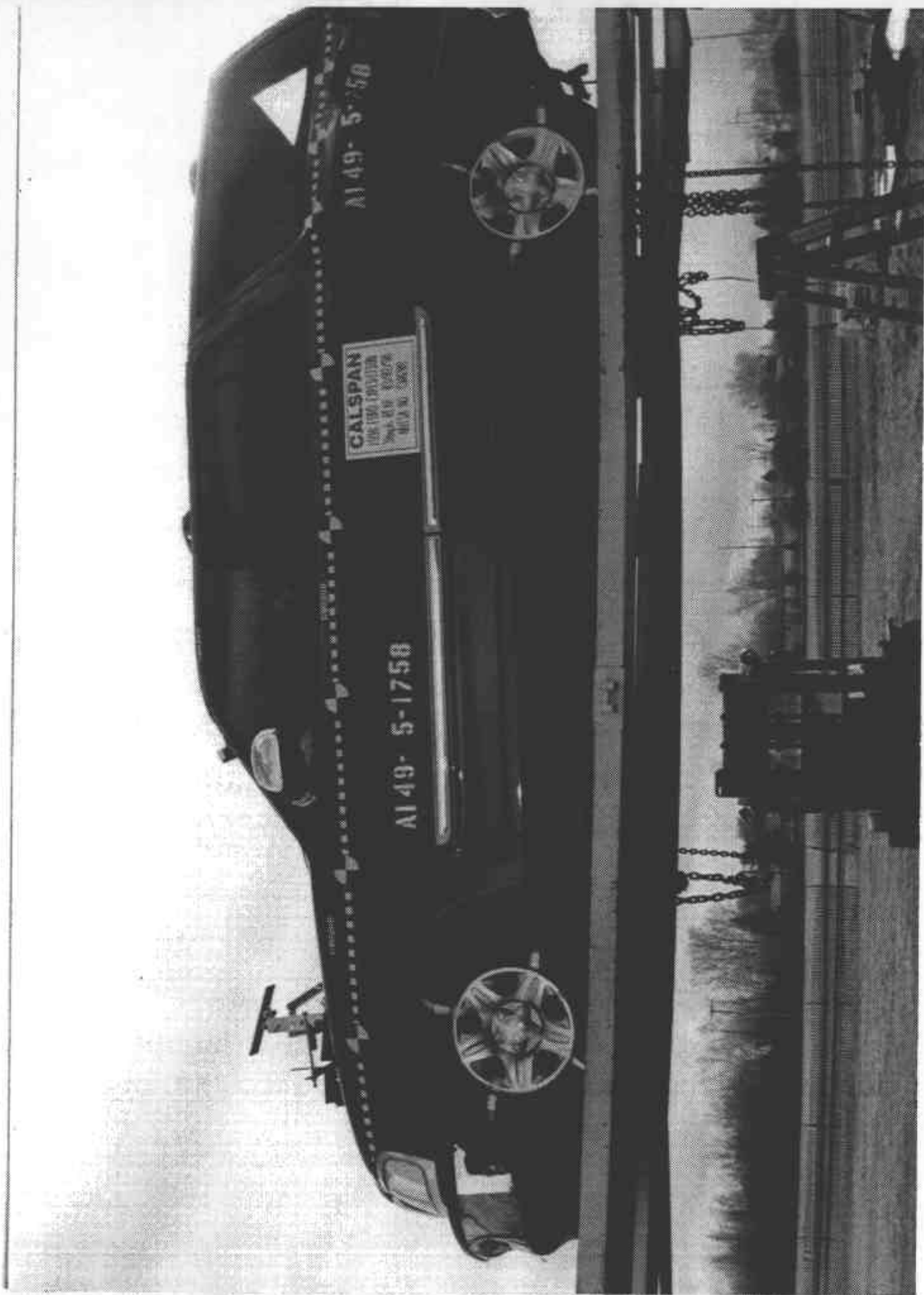


Figure A-22 ROLLOVER 360°

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

(REAR IMPACT ONLY)

FACILITY: track TEST DATE: 02 Mar 1998
 RUN #: 1758 TEST TIME: 14:37:52
 SERIES #: 1 BOARD: a

TITLE: 301 Rear 30 MPH-1998 Ford Expedition

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER
			AMP	msec	AMP	msec	CLASS
1	Pos. 1 Head X	Gs	41.3	121.9	-4.0	359.8	1000.0
2	Pos. 1 Head Y	Gs	1.2	260.8	-4.1	72.7	1000.0
3	Pos. 1 Head Z	Gs	27.0	118.4	-2.2	72.7	1000.0
4	Pos. 1 Chest Disp	ins	.0	100.6	.0	129.0	60.0
5	Pos. 1 Chest X	Gs	12.3	86.5	-4.1	321.7	180.0
6	Pos. 1 Chest Y	Gs	1.3	146.5	-2.8	78.8	180.0
7	Pos. 1 Chest Z	Gs	5.4	72.7	-3.9	117.9	180.0
8	Pos. 1 Lap Belt Load	lbs	28.0	42.2	-16.4	55.7	60.0
9	Pos. 1 Pelvic X	Gs	18.0	60.4	-5.7	145.9	1000.0
10	Pos. 1 Pelvic Y	Gs	2.3	50.4	-5.2	72.6	1000.0
11	Pos. 1 Pelvic Z	Gs	7.2	55.7	-3.7	300.0	1000.0
12	Pos. 1 Belt Spoolout	ins	.0	-16.7	-3.6	241.2	60.0
13	Pos. 1 Upper Neck Fx	lbs	72.3	103.3	-51.4	260.7	1000.0
14	Pos. 1 Upper Neck Fy	lbs	24.2	72.6	-22.8	147.4	1000.0
15	Pos. 1 Upper Neck Fz	lbs	405.2	118.1	-48.1	51.9	1000.0
16	Left Rear Xmember X	Gs	21.1	28.6	-4.5	76.2	60.0
17	Pos. 1 Head Resultant	Gs	43.4	121.9	.1	8.2	1000.0
18	Pos. 1 Chest Resultant	Gs	12.4	86.3	.0	-12.9	180.0
19	Pos. 1 Pelvic Res.	Gs	19.0	60.4	.0	6.1	1000.0
20	Pos. 1 Upper Neck F(Res)	lbs	405.5	118.1	1.2	8.6	1000.0

V2 36 ms Fixed Duration HIC SUMMARY: Pos. 1 Head Resultant

hic: 175.48
 t1 = 110.300 msec
 t2 = 136.700 msec
 Average G's Over Hic Duration = 33.81

CLIP V2.1 SUMMARY: Pos. 1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 12.204 G's
 Tstart = 84.8523 ms
 Tend = 87.8523 ms
 CSI = 25.706

FACILITY: track TEST DATE: 02 Mar 1998
 RUN #: 1758 TEST TIME: 14:37:52
 SERIES #: 1 BOARD: b

TITLE: 301 Rear 30 MPH-1998 Ford Expedition

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Pos. 1 Upper Neck Mx	Ft-Lbs	3.1	72.7	-4.3	118.2	600.0
2	Pos. 1 Upper Neck My	Ft-Lbs	12.5	89.1	-26.6	142.5	600.0
3	Pos. 1 Upper Neck Mz	Ft-Lbs	2.1	244.9	-4.4	159.8	600.0
4	Right Rear Xmember X	Gs	20.3	3.5	-4.5	73.8	60.0
5	Upper Seatback X	Gs	35.9	76.4	-10.7	54.6	60.0
6	Lower Seatback X	Gs	14.5	18.9	-6.4	55.0	60.0
17	Pos. 1 Neck Moment Res.	Ft-Lbs	26.8	142.5	.0	-4.6	600.0

TEST NO. CW0208

VEHICLE

SAE FILTER CHANNEL CLASS

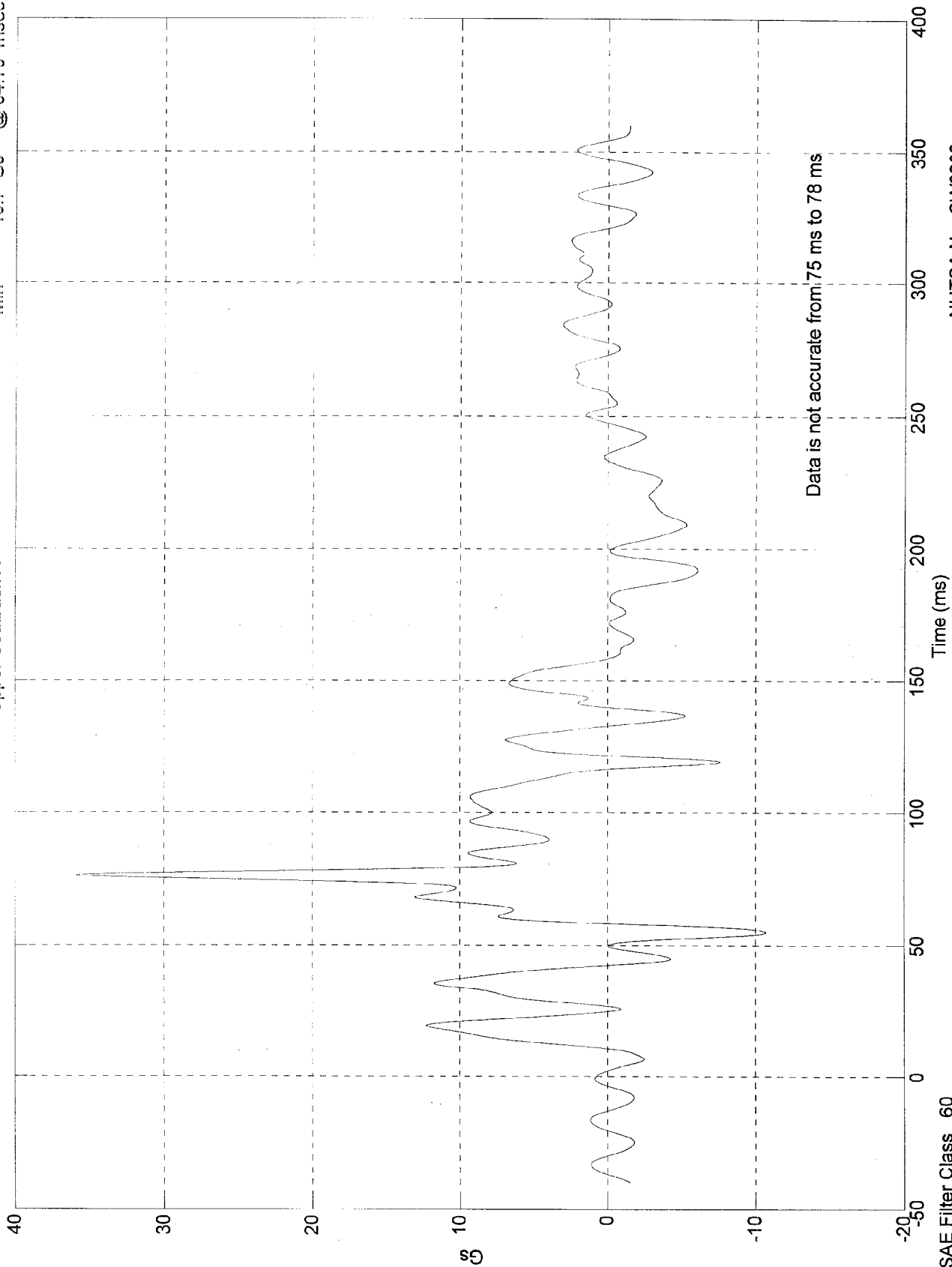
60

Note: Angular seatback position is measured in degrees of rotation from the initial (design) position.

301 Rear 30 MPH-1998 Ford Expedition

Max = 35.9 Gs @ 76.50 msec
Min = -10.7 Gs @ 54.70 msec

Upper Seatback X



Data is not accurate from 75 ms to 78 ms

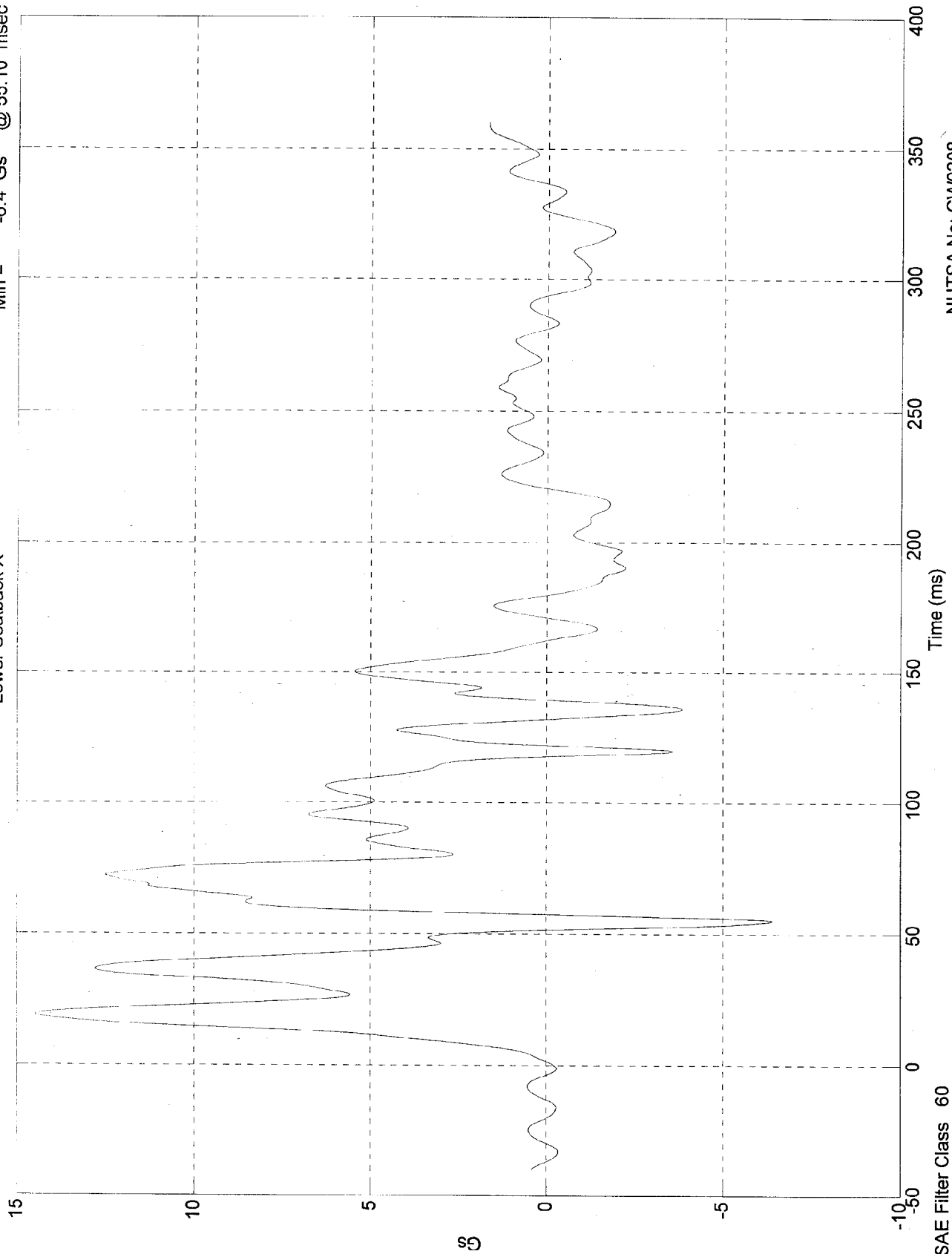
NHTSA No: CW0208
Date: 02 Mar 1998

SAE Filter Class 60

301 Rear 30 MPH-1998 Ford Expedition

Max = 14.5 Gs @ 19.00 msec
Min = -6.4 Gs @ 55.10 msec

Lower Seatback X

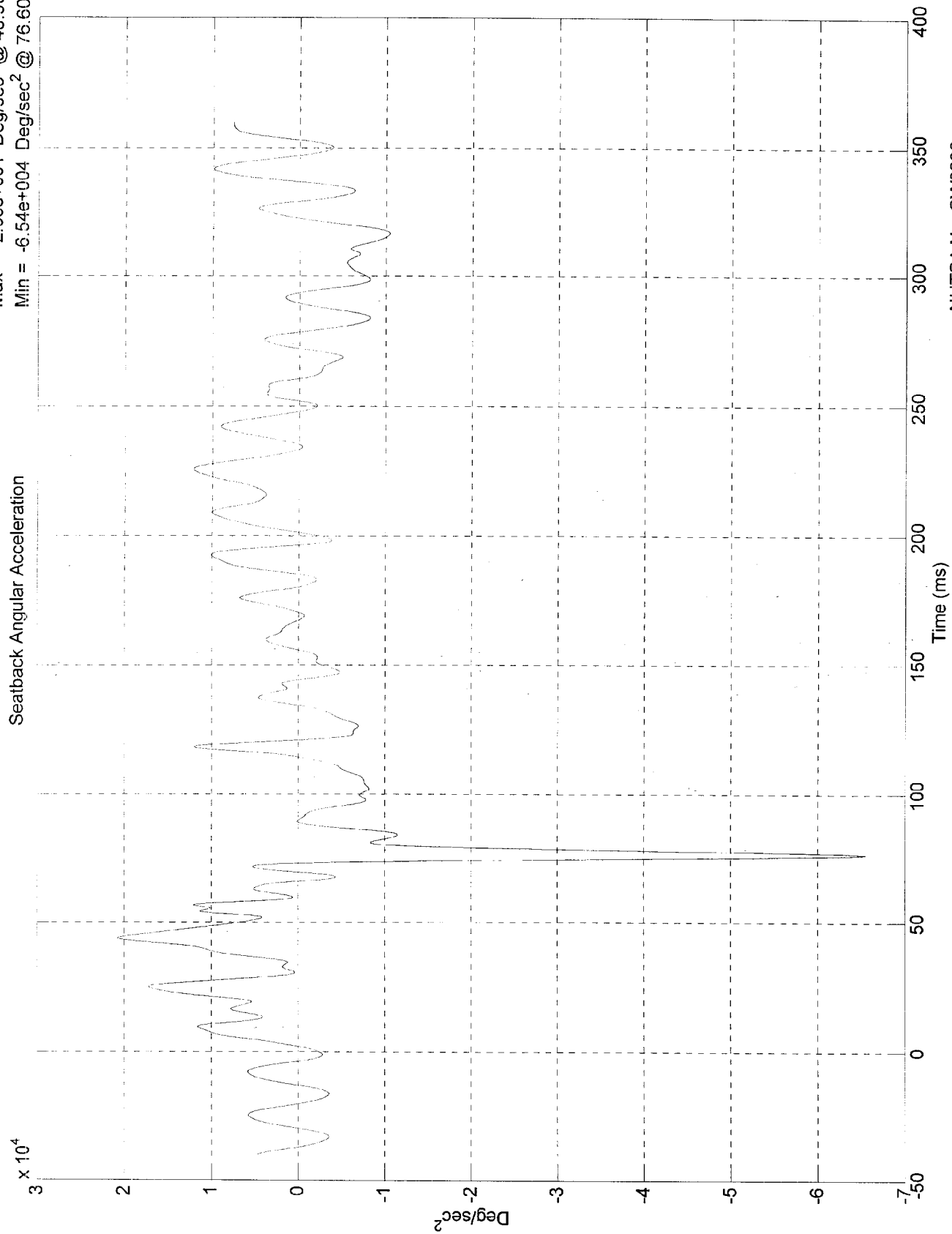


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 2.08e+004 Deg/sec² @ 43.90 msec
Min = -6.54e+004 Deg/sec² @ 76.60 msec

Seatback Angular Acceleration

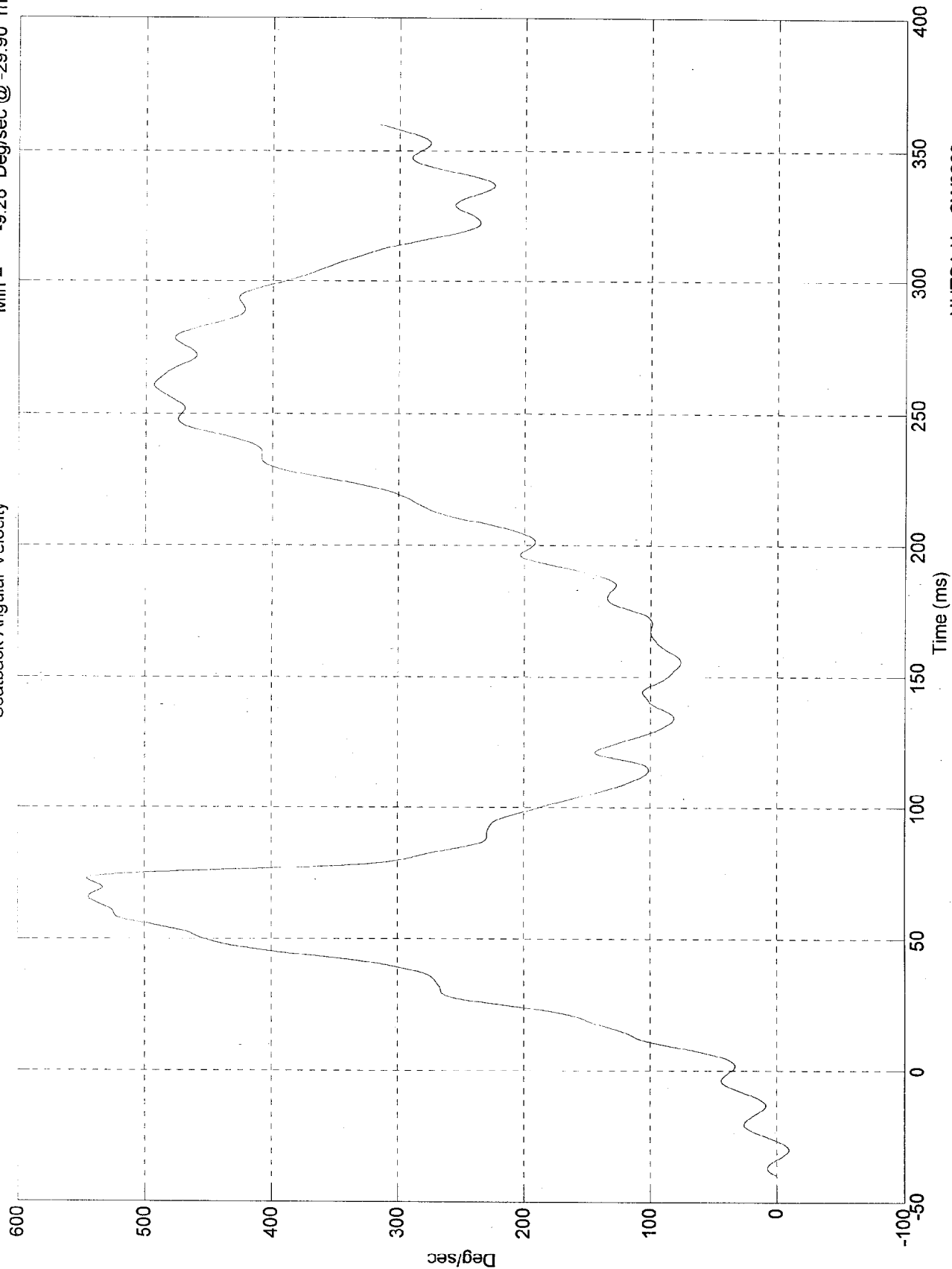


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 546 Deg/sec @ 73.00 msec
Min = -9.28 Deg/sec @ -29.90 msec

Seatback Angular Velocity

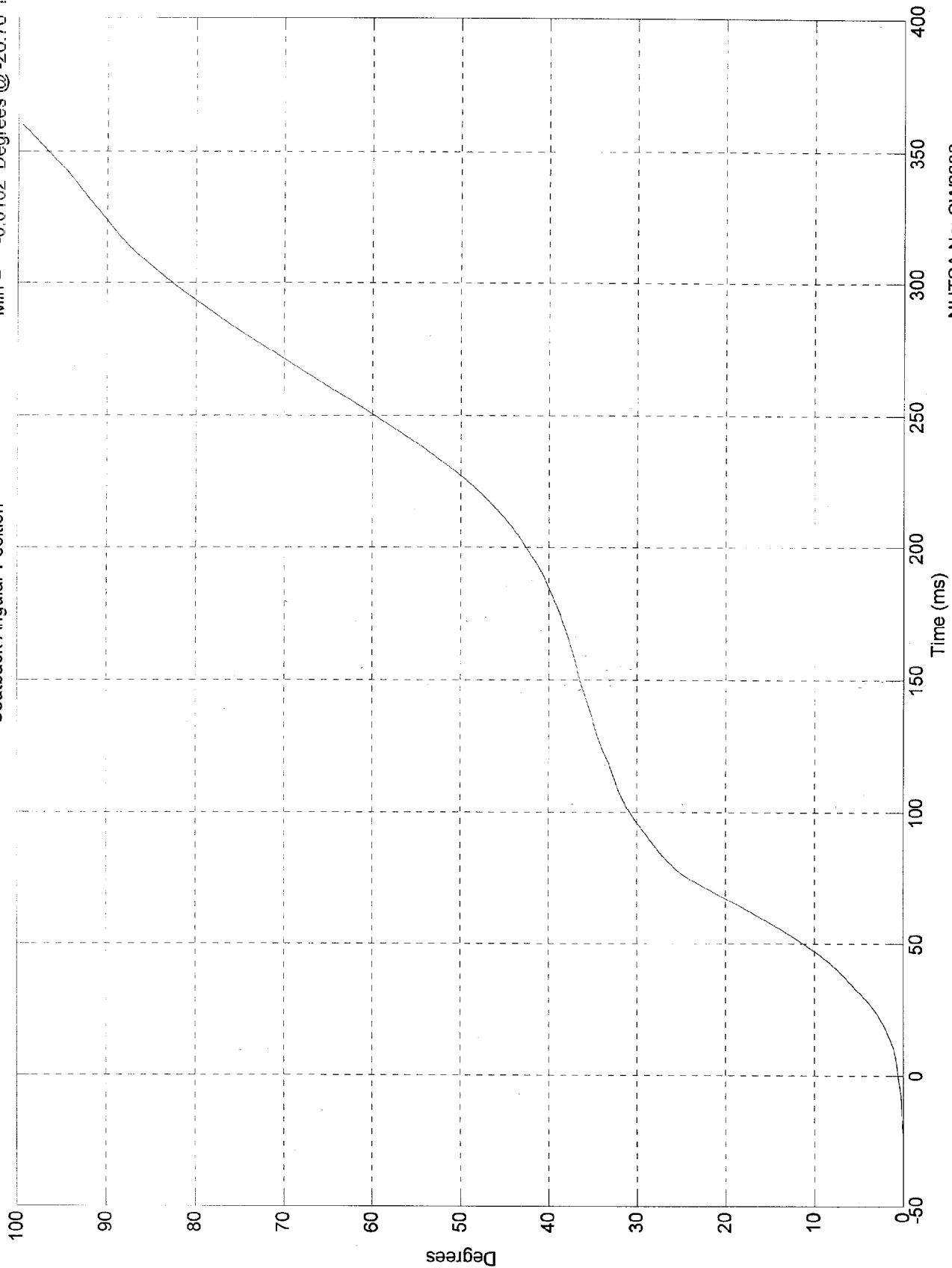


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 99.5 Degrees @ 360.00 msec
Min = -0.0102 Degrees @ -26.70 msec

Seatback Angular Position

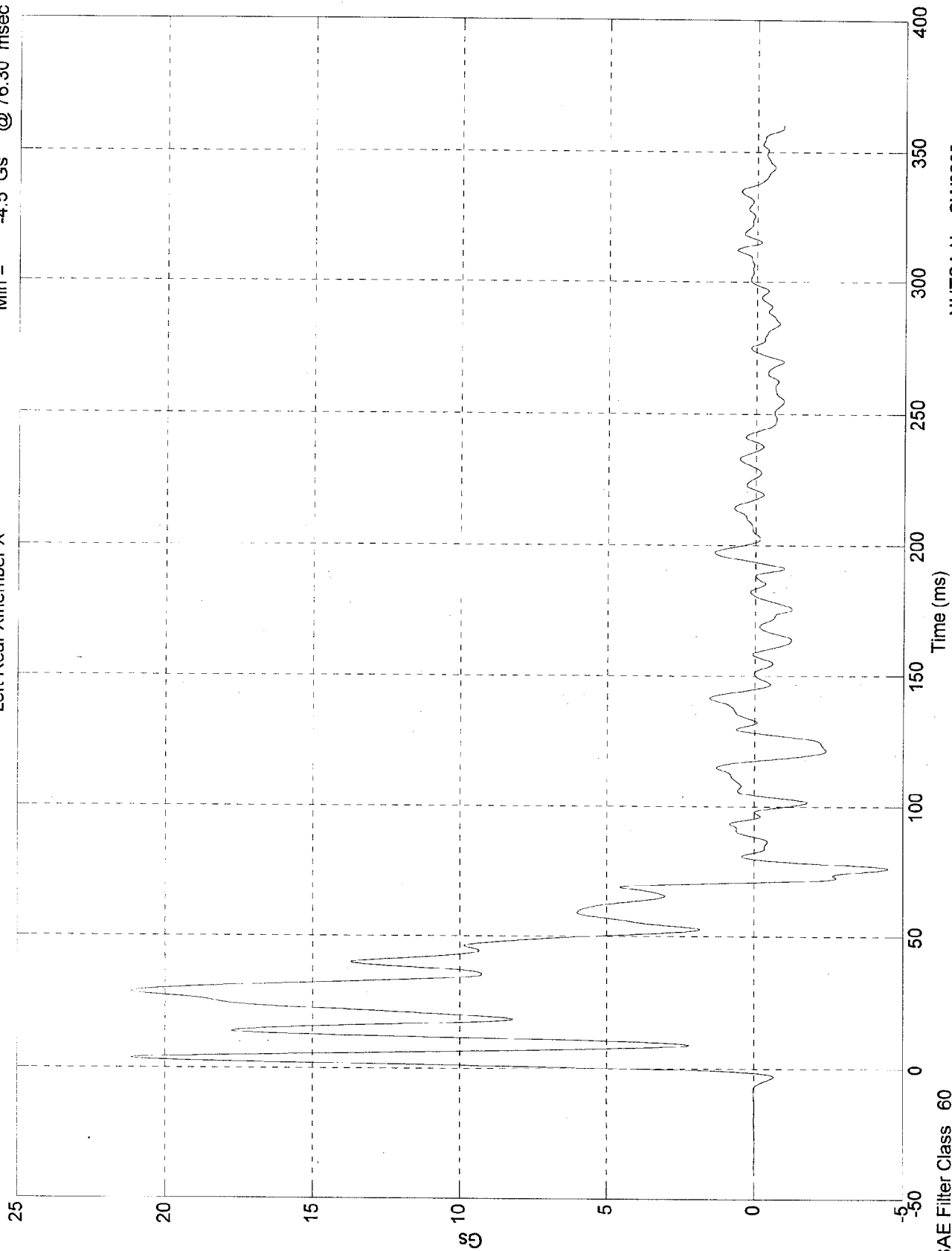


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Left Rear Xmember X

Max = 21.1 Gs @ 28.70 msec
Min = -4.5 Gs @ 76.30 msec

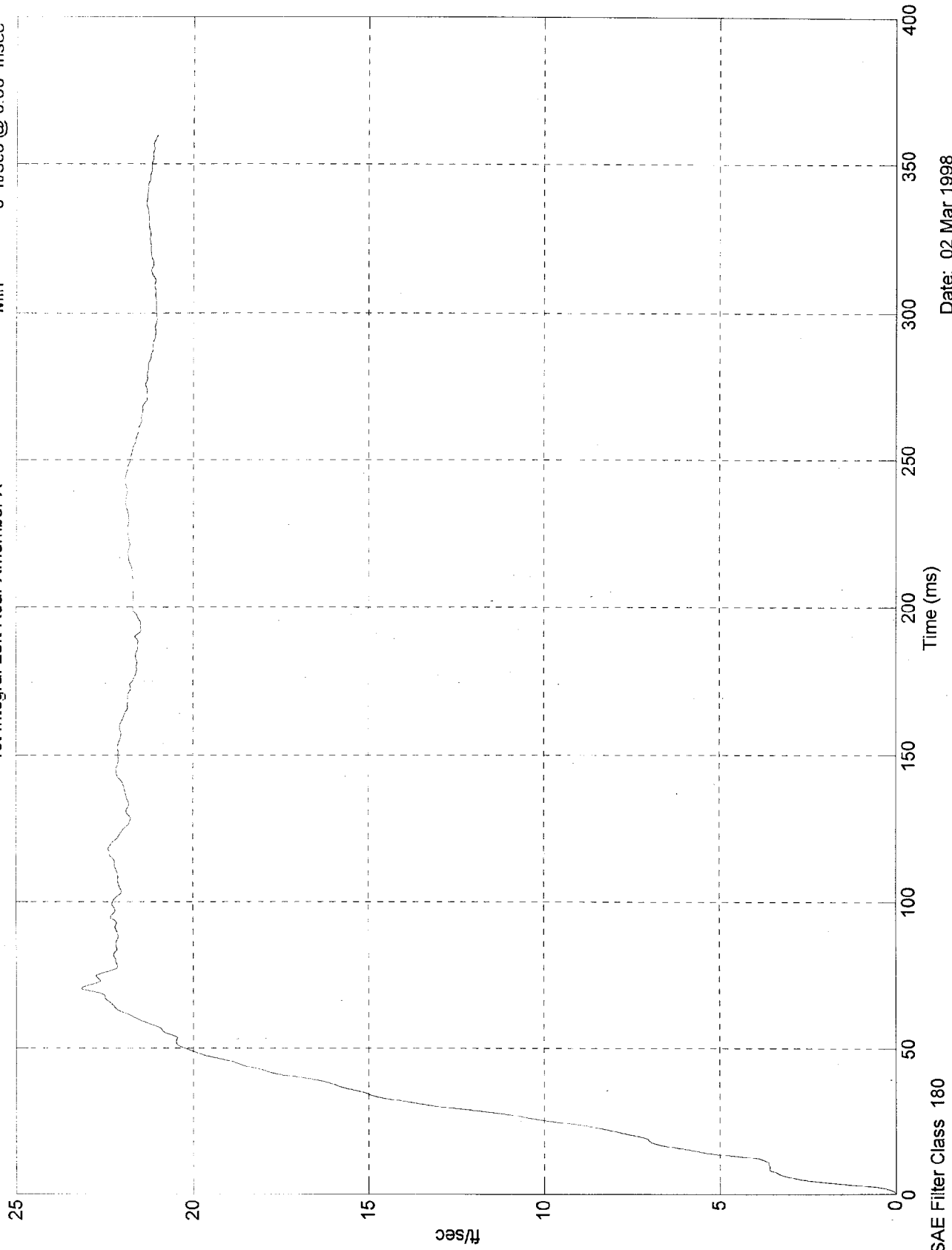


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 23.2 ft/sec @ 70.70 msec
Min = 0 ft/sec @ 0.00 msec

1st Integral Left Rear Xmember X

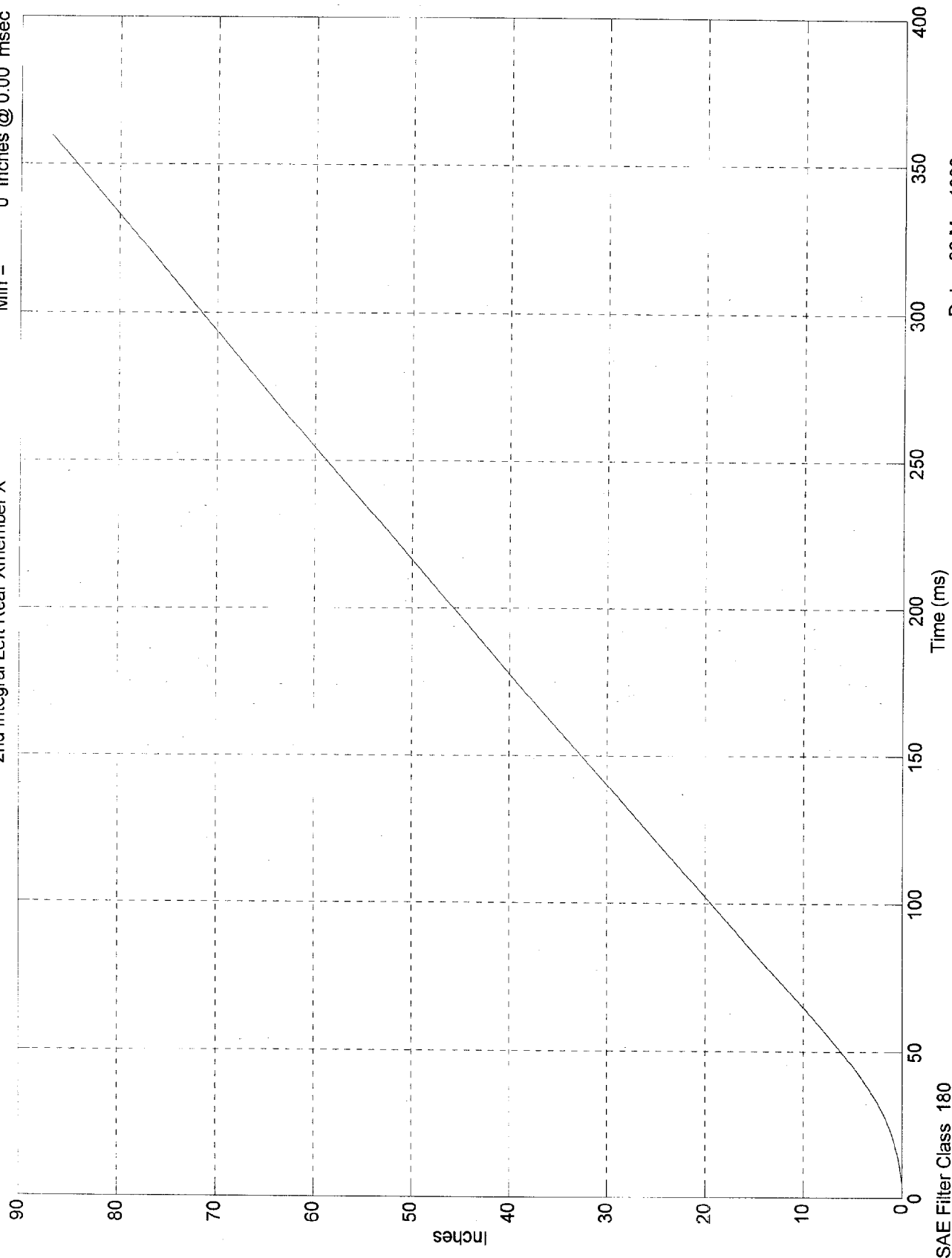


SAE Filter Class 180

Date: 02 Mar 1998

2nd Integral Left Rear Xmember X

Max = 86.9 Inches @ 360.00 msec
Min = 0 Inches @ 0.00 msec



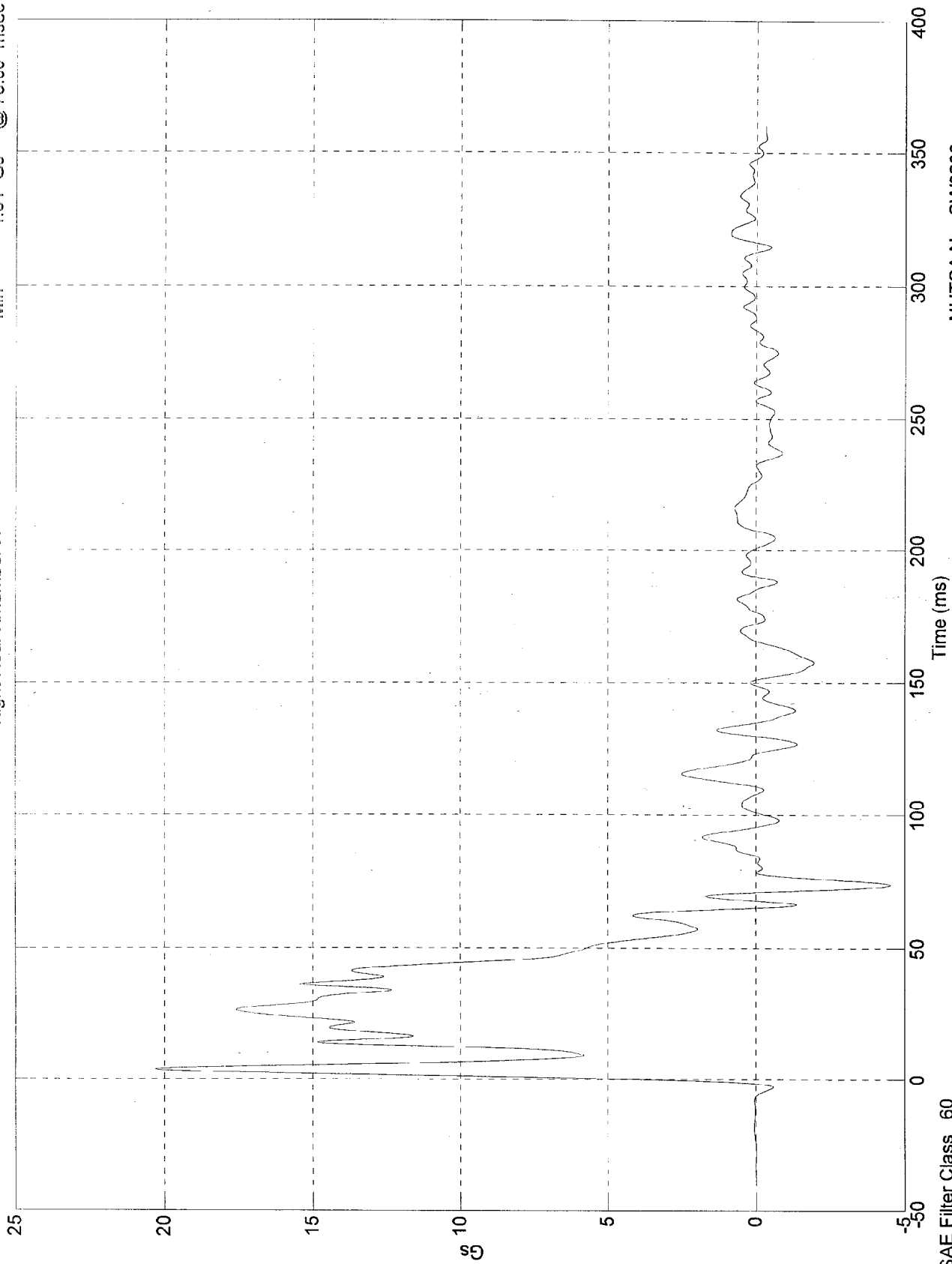
SAE Filter Class 180

Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 20.3 Gs @ 3.60 msec
Min = -4.51 Gs @ 73.90 msec

Right Rear Xmember X



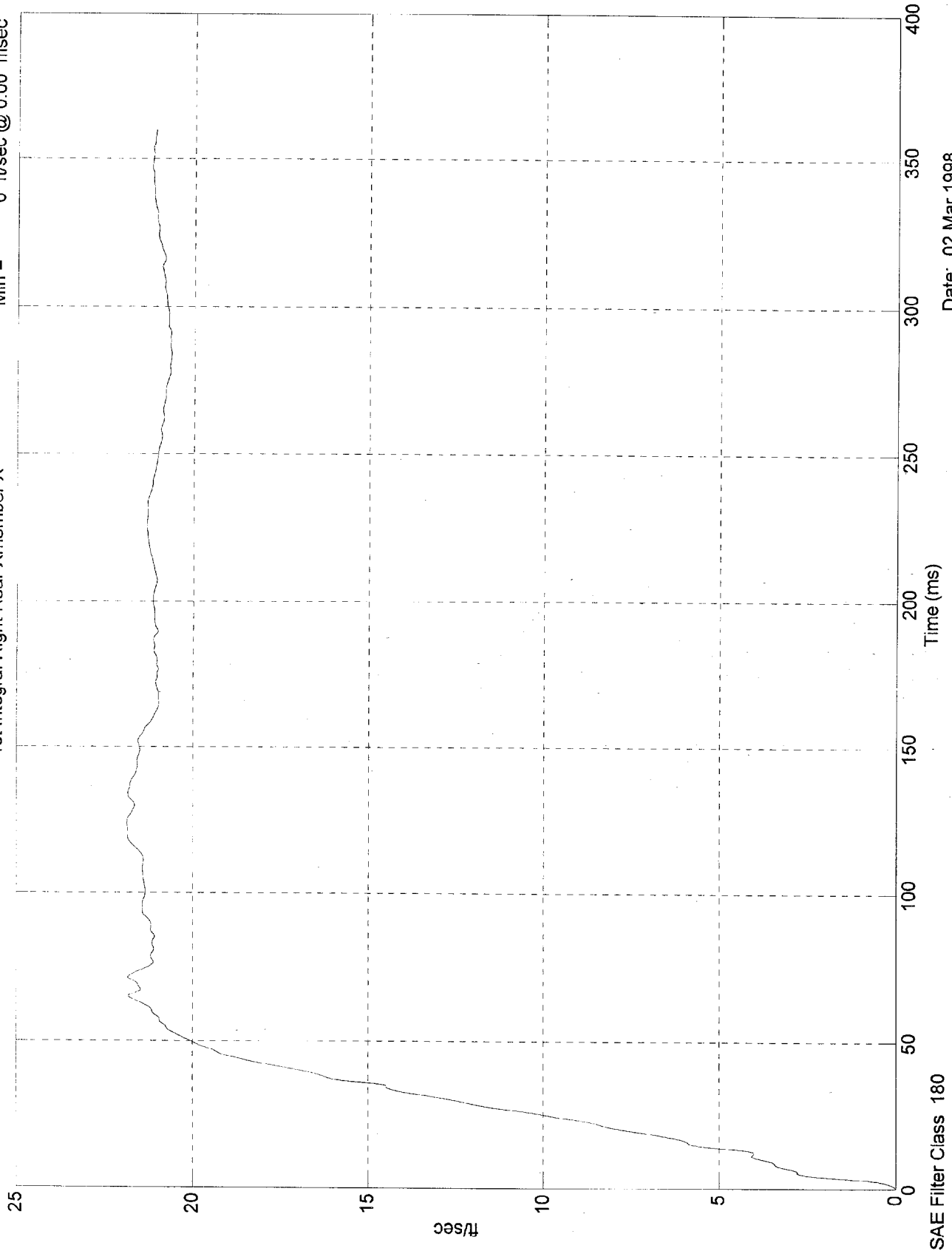
NHTSA No: CW0208
Date: 02 Mar 1998

SAE Filter Class 60

301 Rear 30 MPH-1998 Ford Expedition

Max = 21.9 ft/sec @ 123.70 msec
Min = 0 ft/sec @ 0.00 msec

1st Integral Right Rear Xmember X



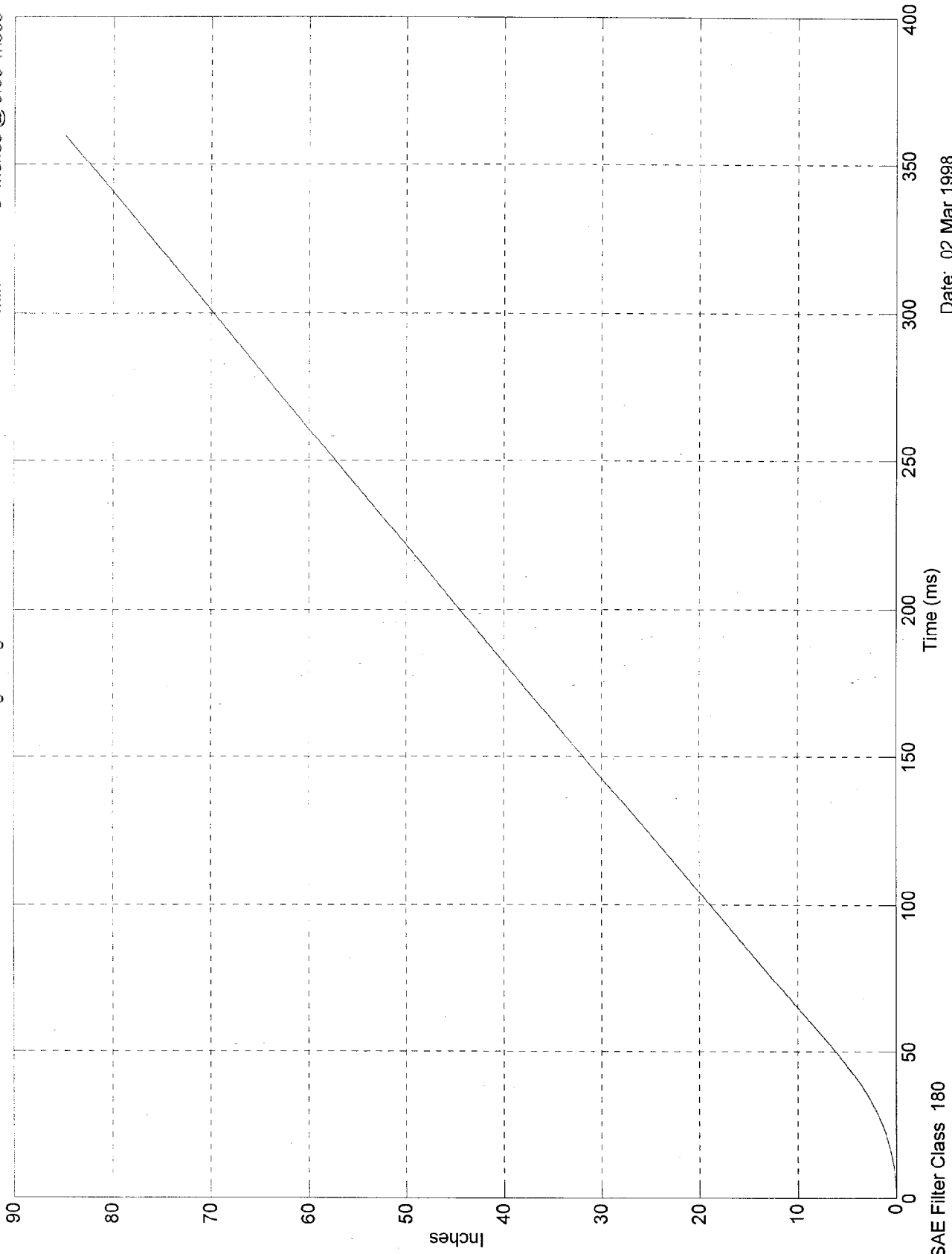
SAE Filter Class 180

Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 84.9 Inches @ 360.00 msec
Min = 0 Inches @ 0.00 msec

2nd Integral Right Rear Xmember X



Date: 02 Mar 1998

SAE Filter Class 180

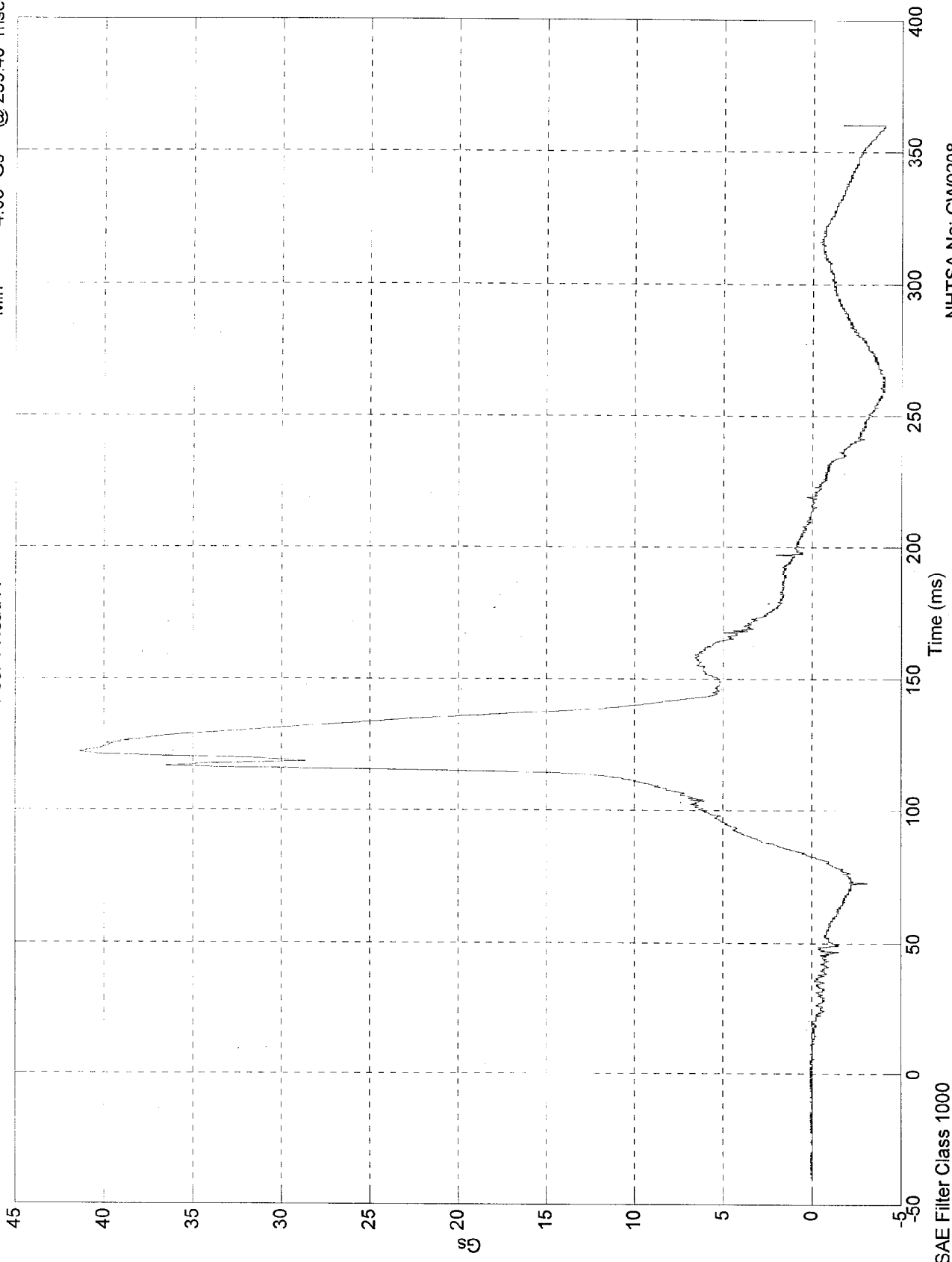
TEST NO. CW0208

DRIVER DUMMY (Pos. 1)	SAE FILTER CHANNEL CLASS
Head Accelerations	1000
Chest Accelerations	180
Pelvic Accelerations	1000
Upper Neck Forces	1000
Upper Neck Moments	600
Belt Forces	60
Belt Spoolout	60

301 Rear 30 MPH-1998 Ford Expedition

Pos. 1 Head X

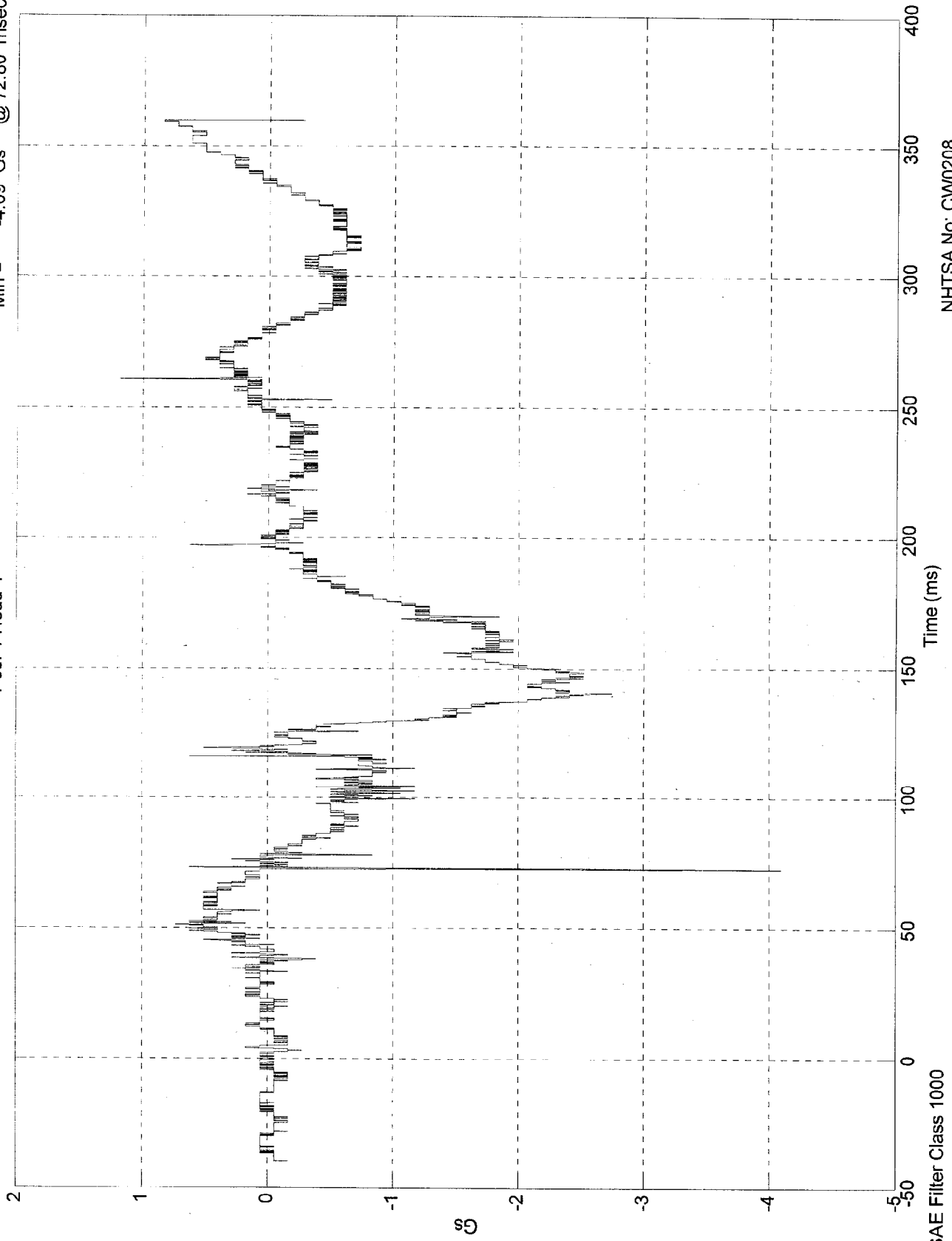
Max = 41.3 Gs @ 122.00 msec
Min = -4.03 Gs @ 259.40 msec



NHTSA No: CW0208
Date: 02 Mar 1998

Max = 1.18 Gs @ 260.90 msec
Min = -4.09 Gs @ 72.80 msec

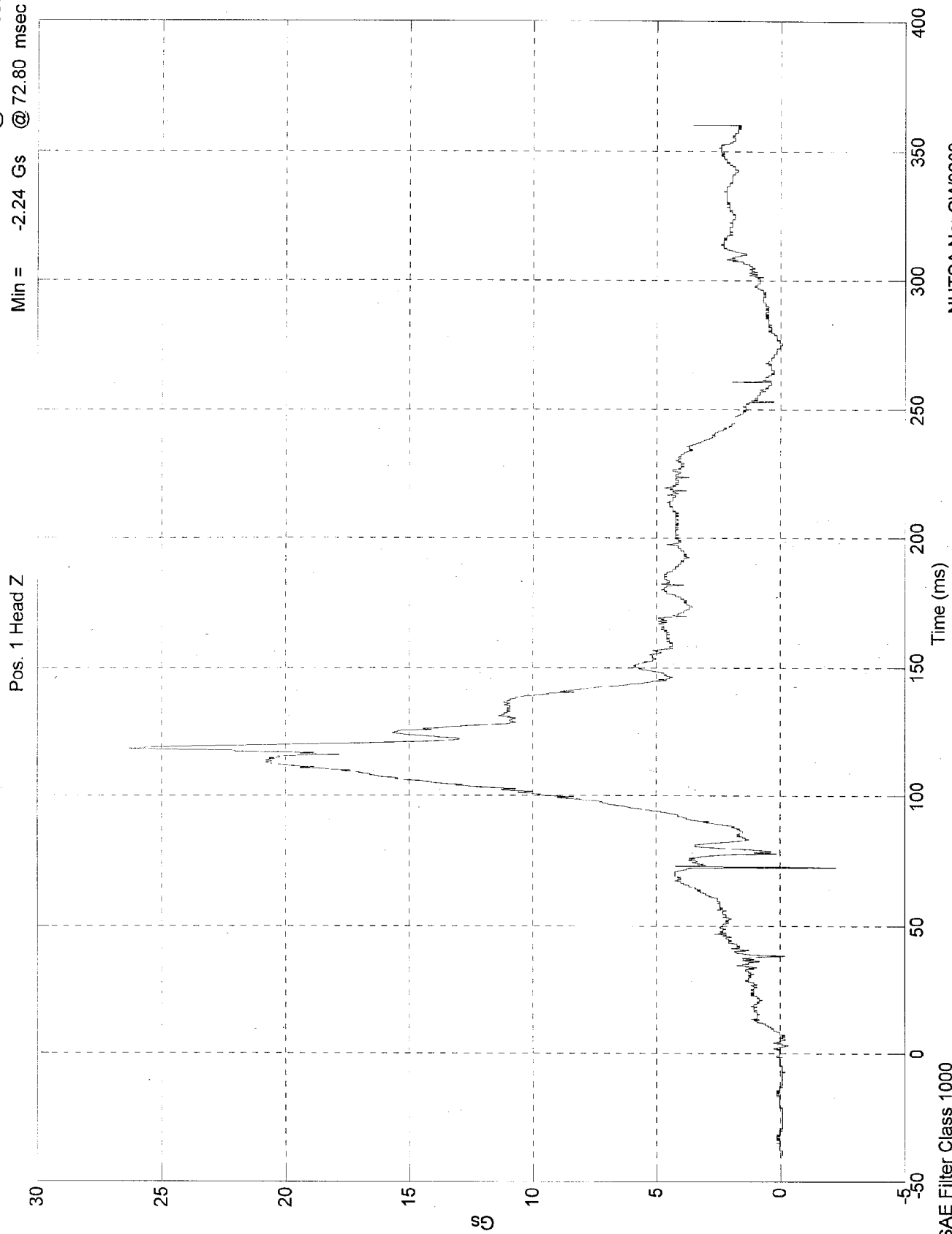
Pos. 1 Head Y



NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 27 Gs @ 118.50 msec
Min = -2.24 Gs @ 72.80 msec

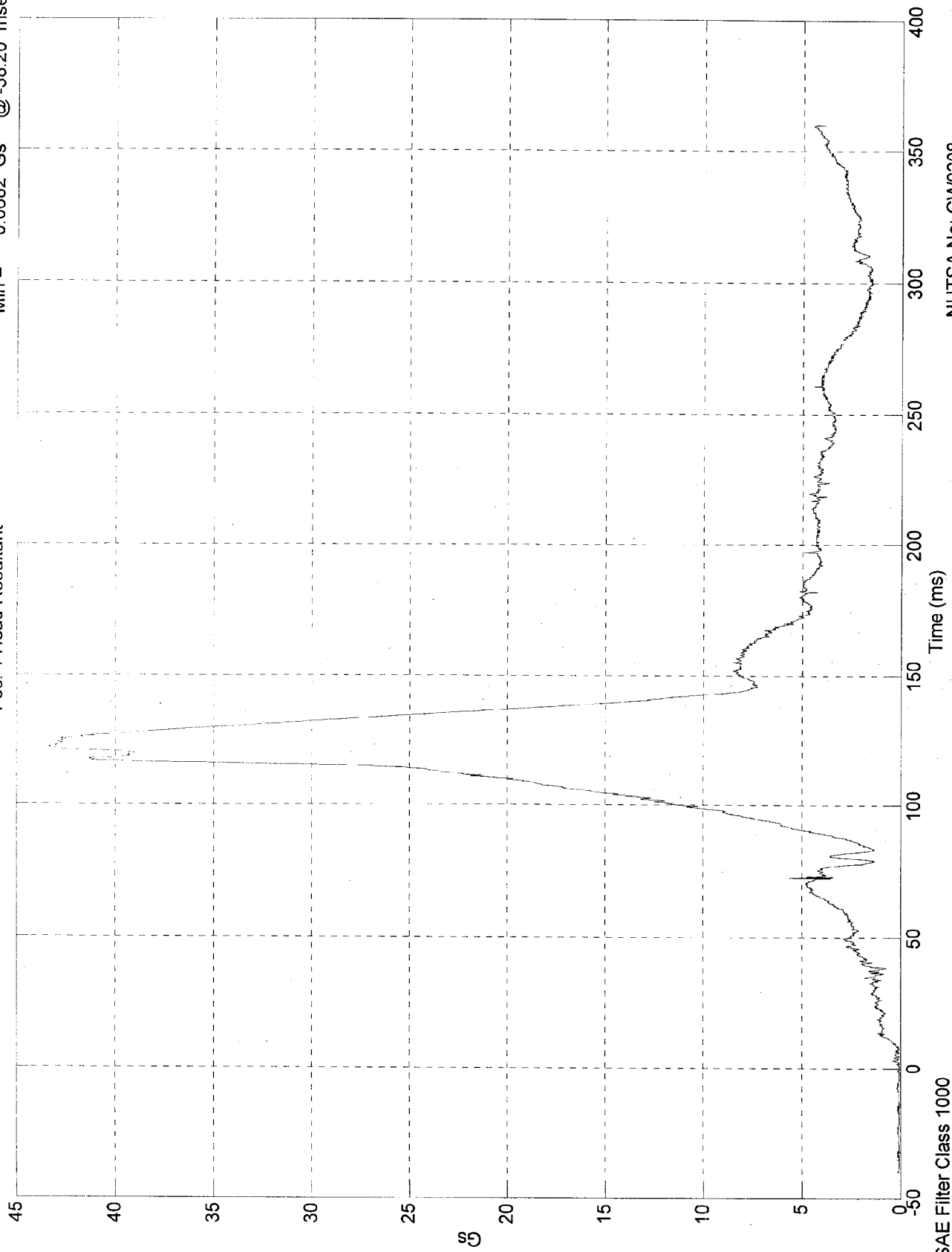


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 43.4 Gs @ 122.00 msec
Min = 0.0682 Gs @ -38.20 msec

Pos. 1 Head Resultant

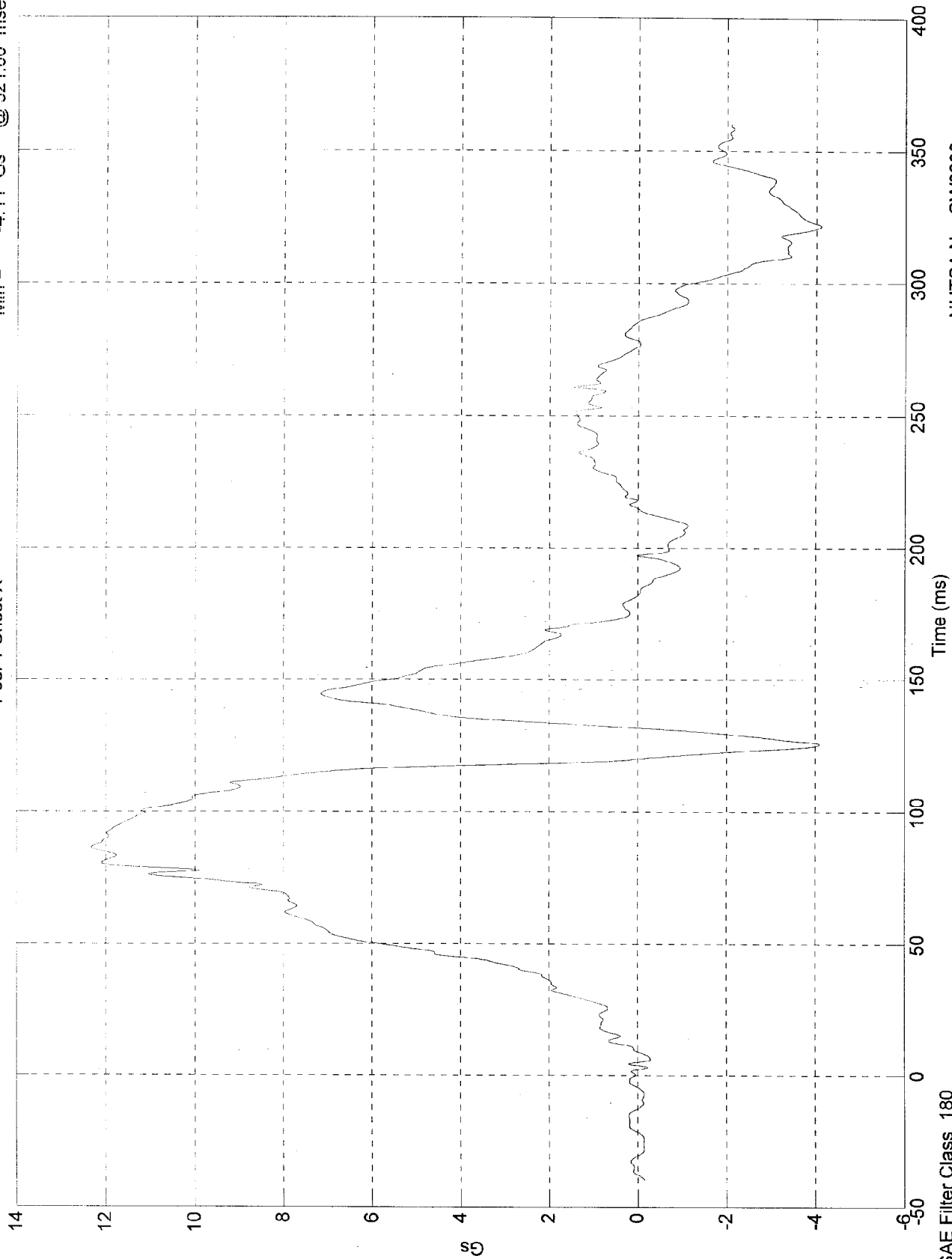


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 12.3 Gs @ 86.50 msec
Min = -4.11 Gs @ 321.80 msec

Pos. 1 Chest X



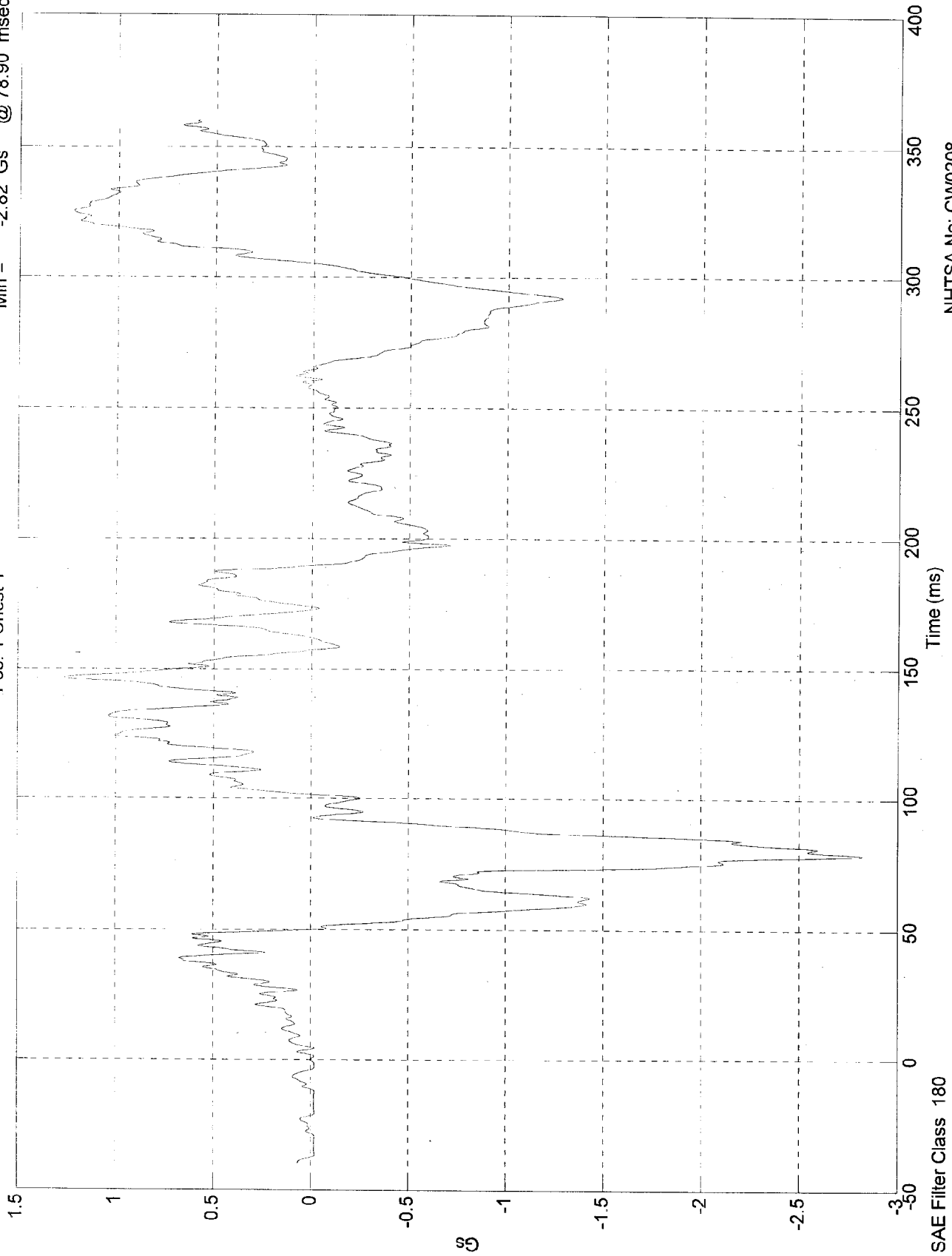
SAE Filter Class 180

NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 1.26 Gs @ 146.60 msec
Min = -2.82 Gs @ 78.90 msec

Pos. 1 Chest Y

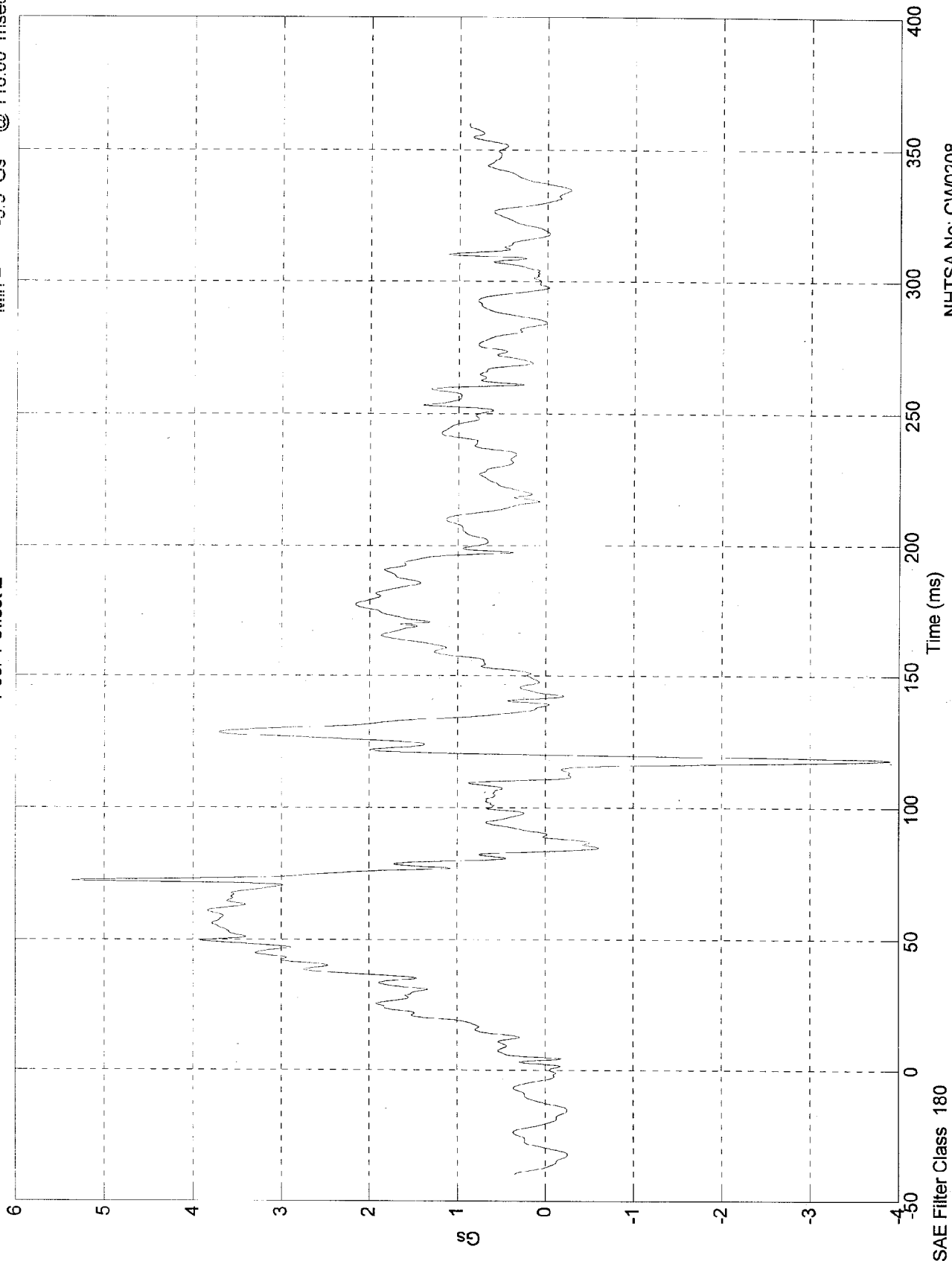


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 5.36 Gs @ 72.80 msec
Min = -3.9 Gs @ 118.00 msec

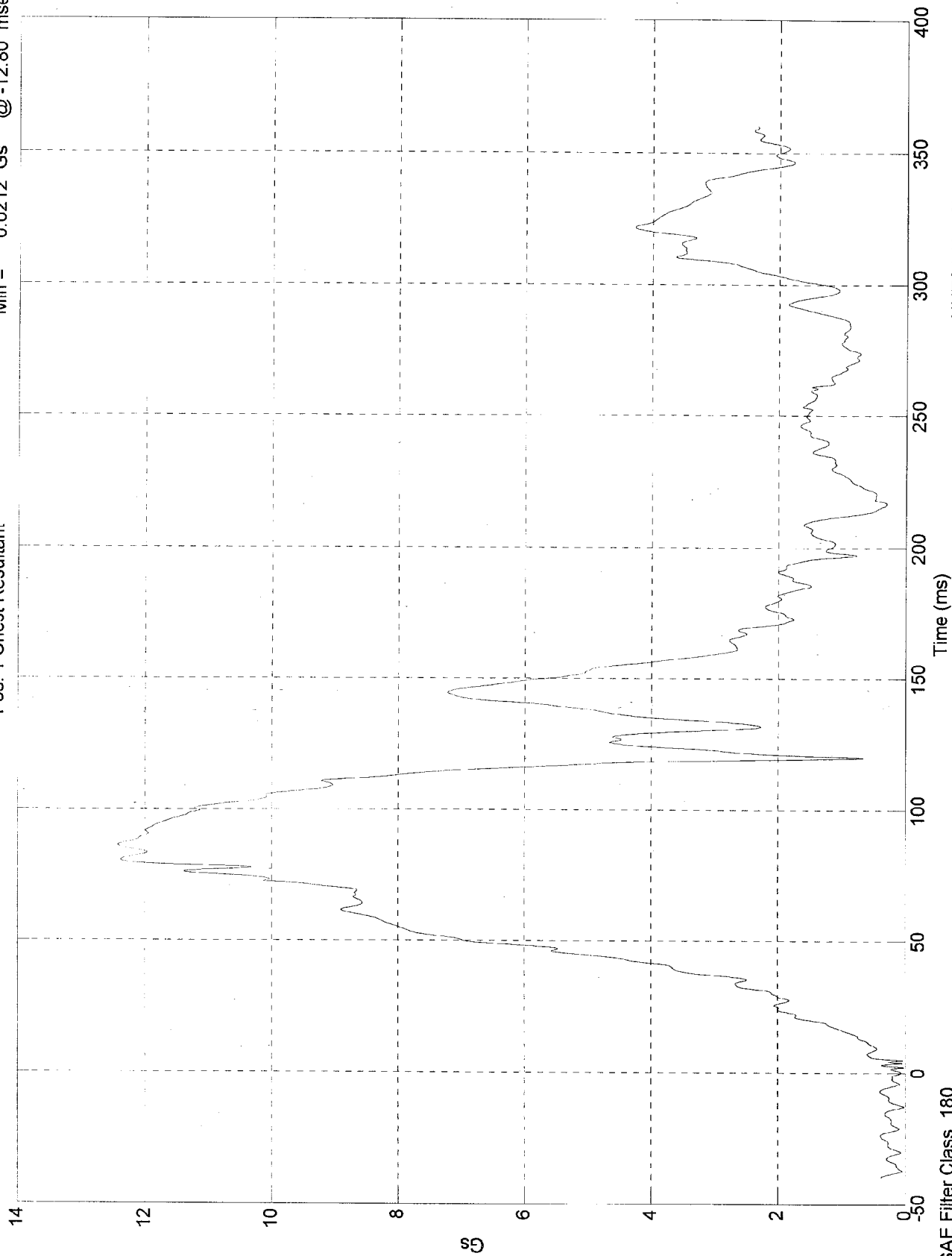
Pos. 1 Chest Z



NHTSA No: CW0208
Date: 02 Mar 1998

Max = 12.4 Gs @ 86.30 msec
 Min = 0.0212 Gs @ -12.80 msec

Pos. 1 Chest Resultant



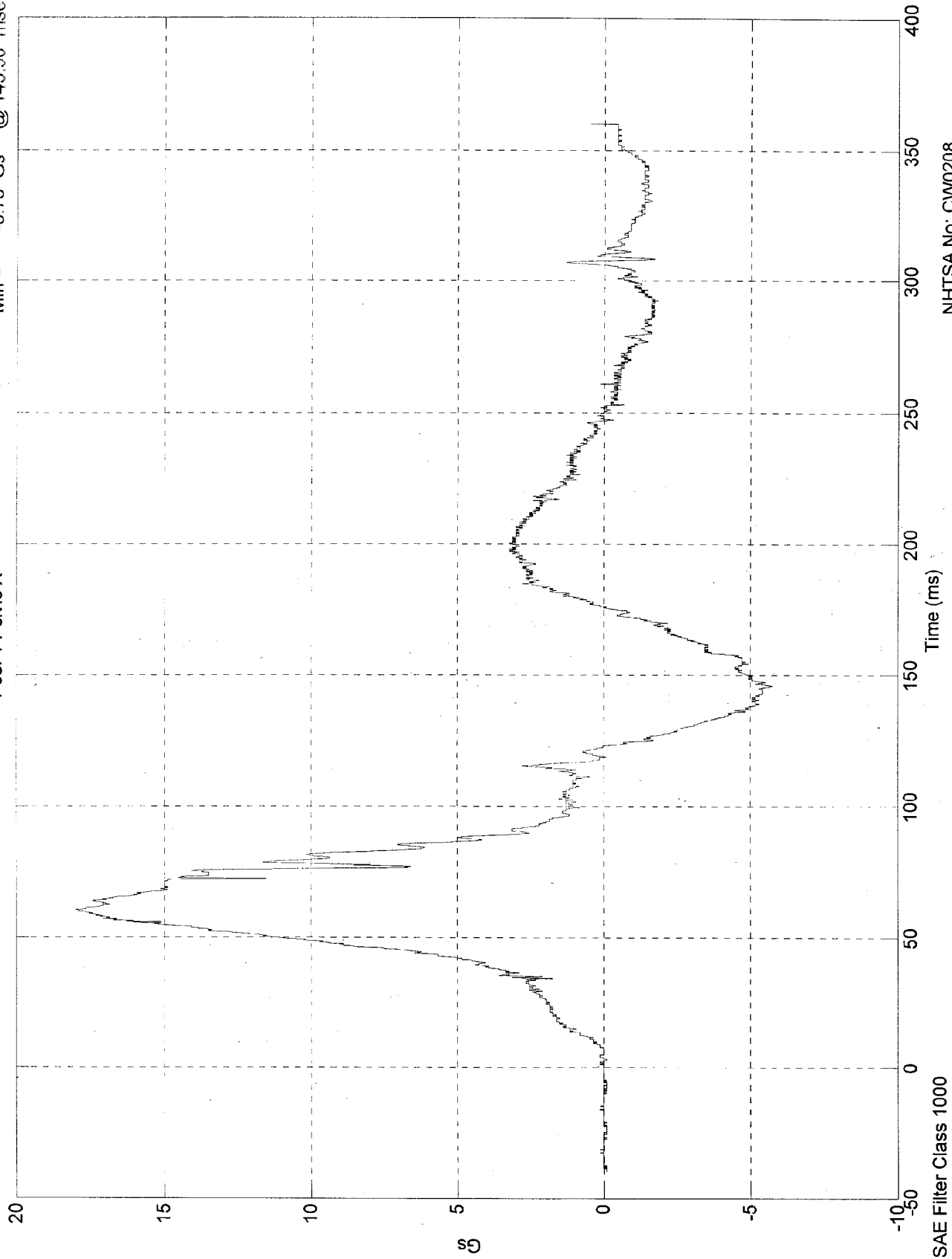
SAE Filter Class 180

NHTSA No: CW0208
 Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 18 Gs @ 60.30 msec
Min = -5.75 Gs @ 145.90 msec

Pos. 1 Pelvic X



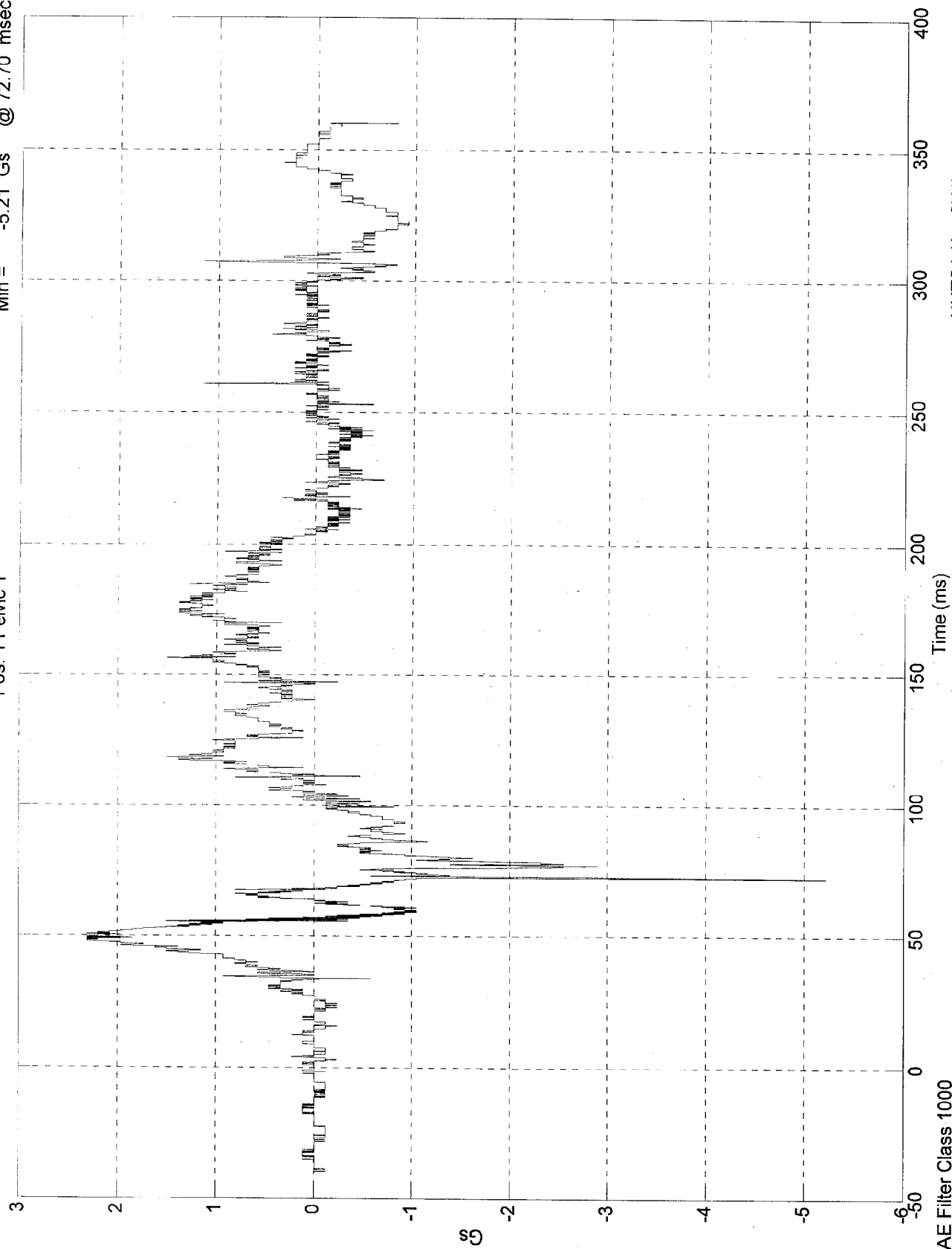
NHTSA No: CW0208
Date: 02 Mar 1998

SAE Filter Class 1000

301 Rear 30 MPH-1998 Ford Expedition

Max = 2.31 Gs @ 47.80 msec
Min = -5.21 Gs @ 72.70 msec

Pos. 1 Pelvic Y

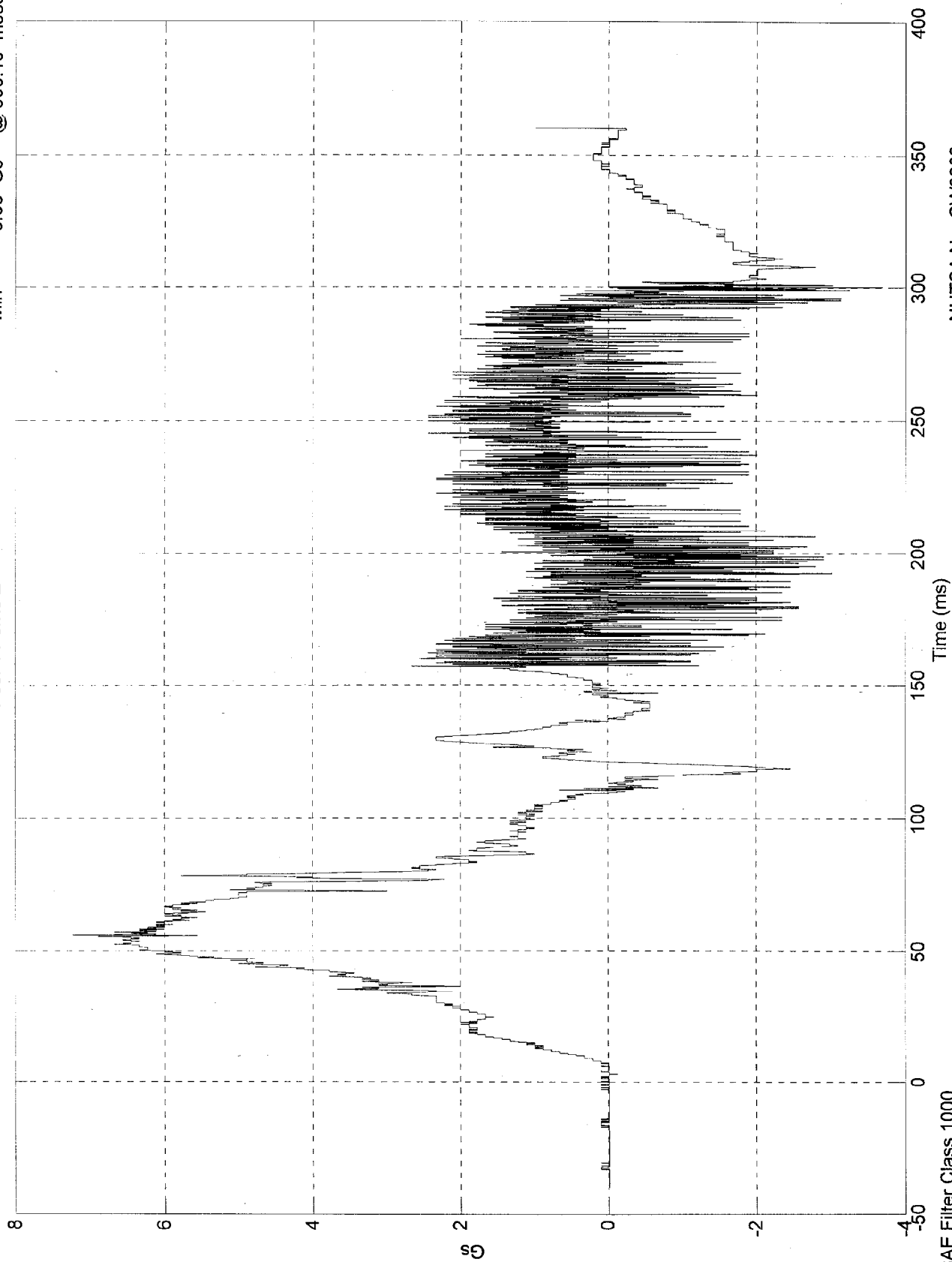


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Pos. 1 Pelvic Z

Max = 7.23 Gs @ 55.80 msec
Min = -3.68 Gs @ 300.10 msec

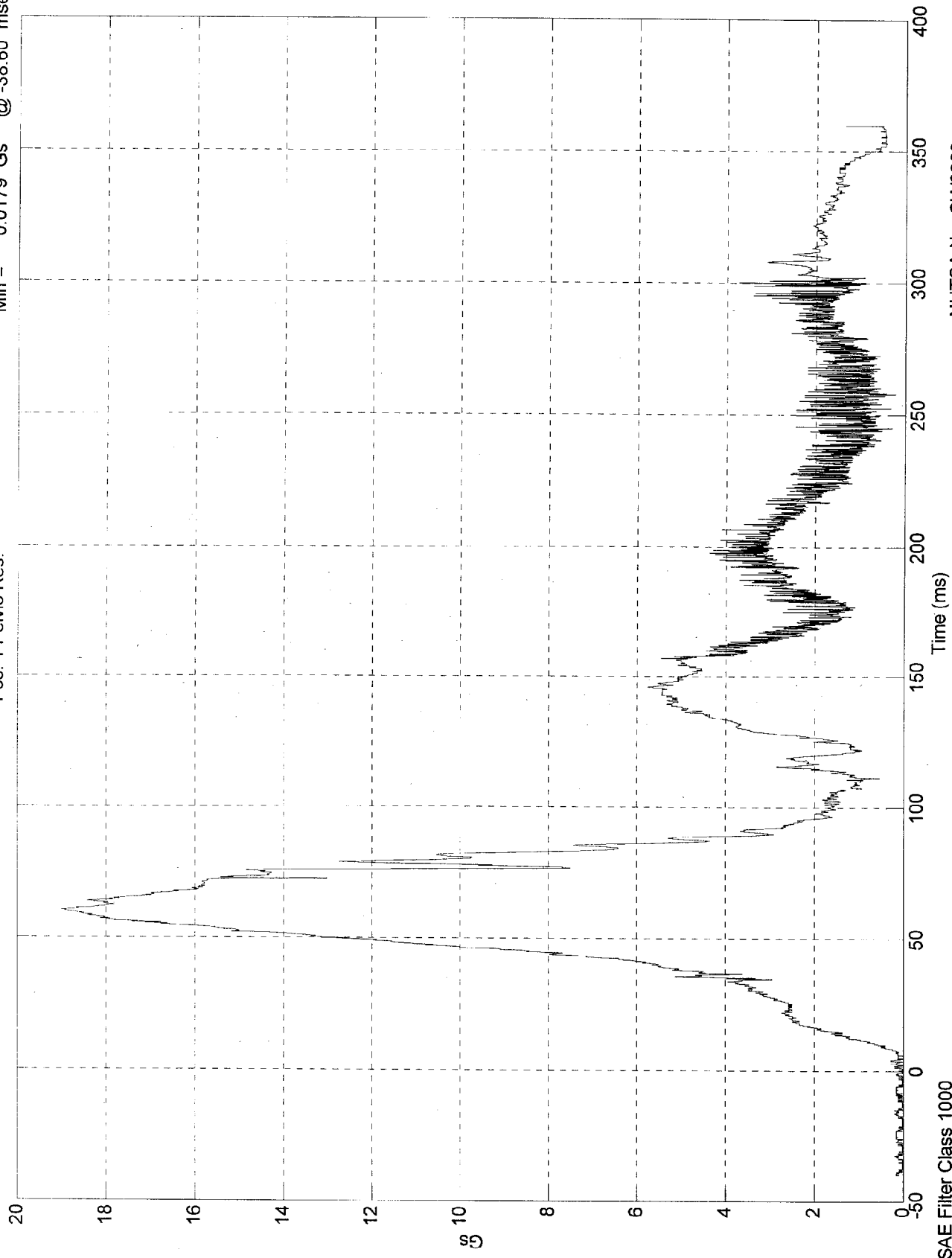


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 19 Gs @ 60.50 msec
Min = 0.0179 Gs @ -38.60 msec

Pos. 1 Pelvic Res.

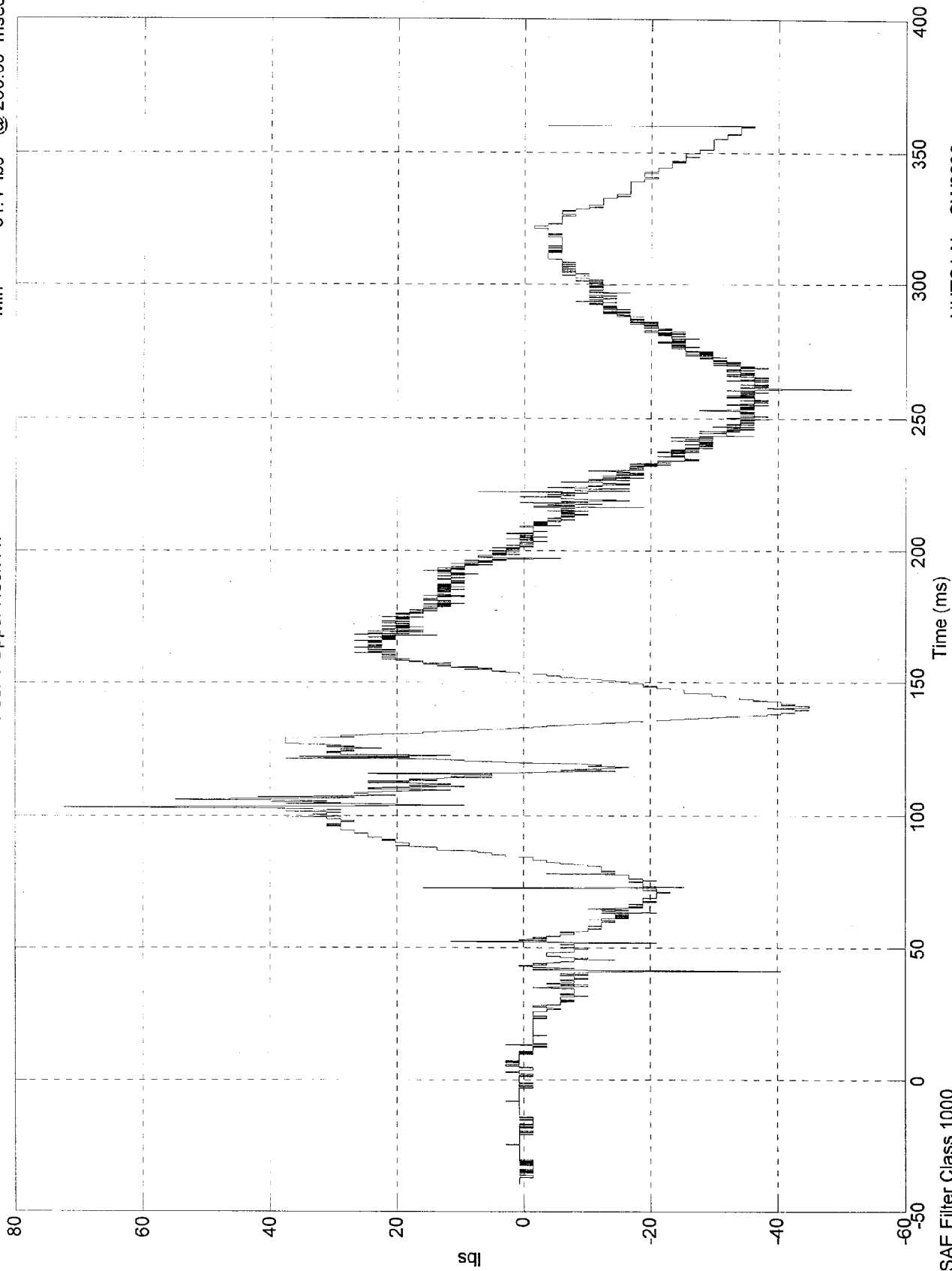


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Pos. 1 Upper Neck Fx

Max = 72.3 lbs @ 103.40 msec
Min = -51.4 lbs @ 260.80 msec

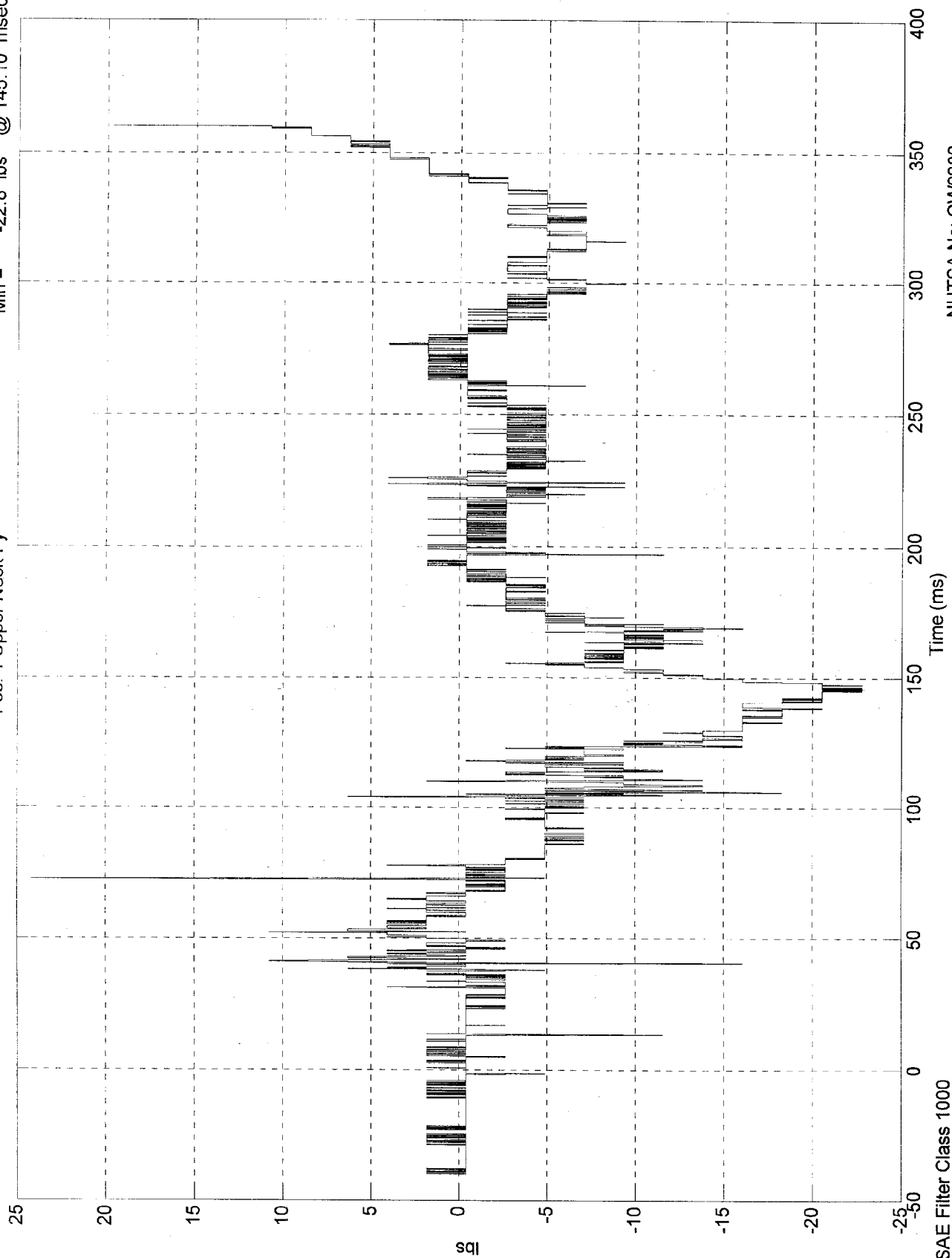


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 24.2 lbs @ 72.70 msec
Min = -22.8 lbs @ 145.10 msec

Pos. 1 Upper Neck Fy

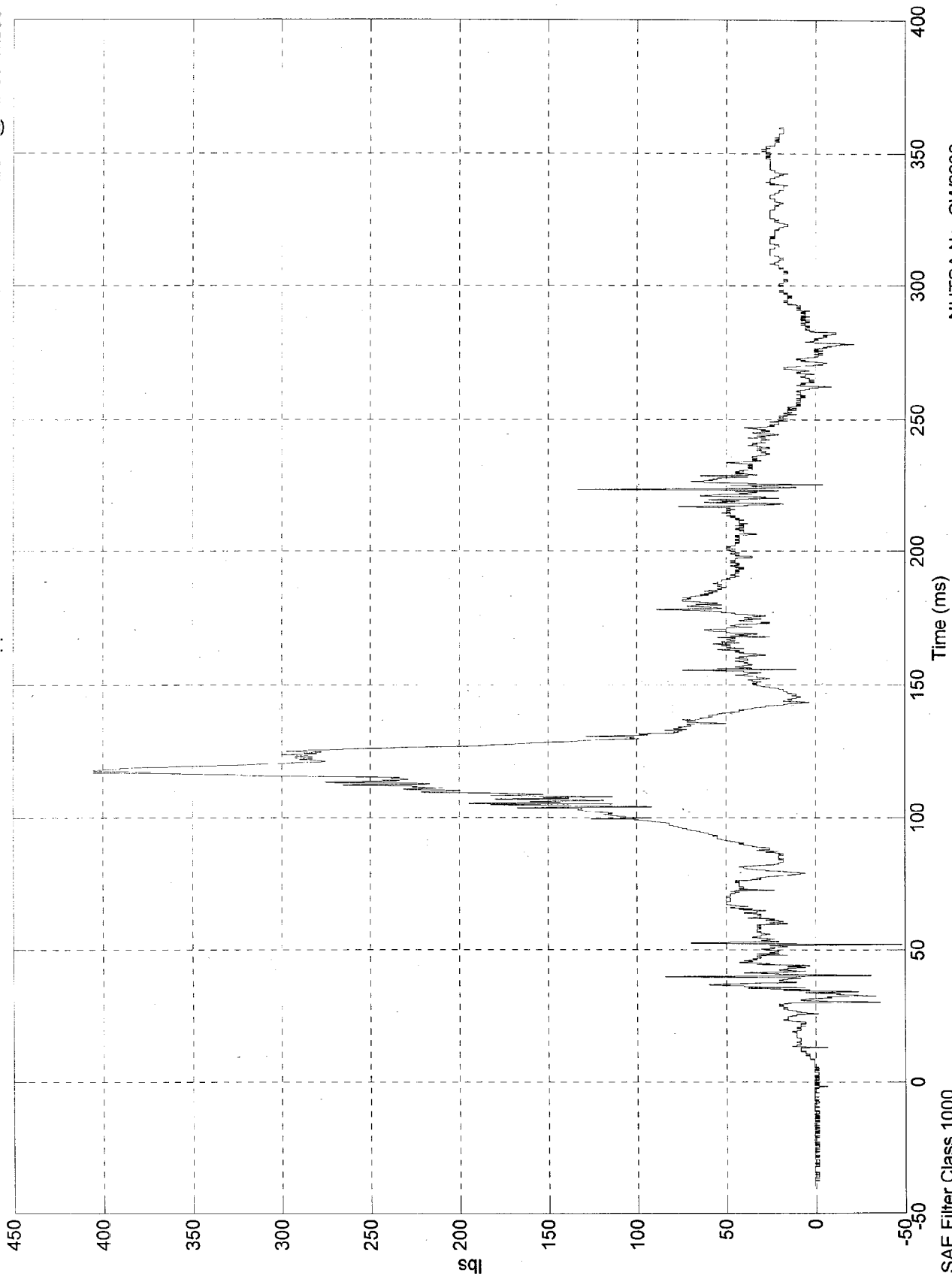


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 405 lbs @ 117.20 msec
Min = -48.1 lbs @ 52.00 msec

Pos. 1 Upper Neck Fz

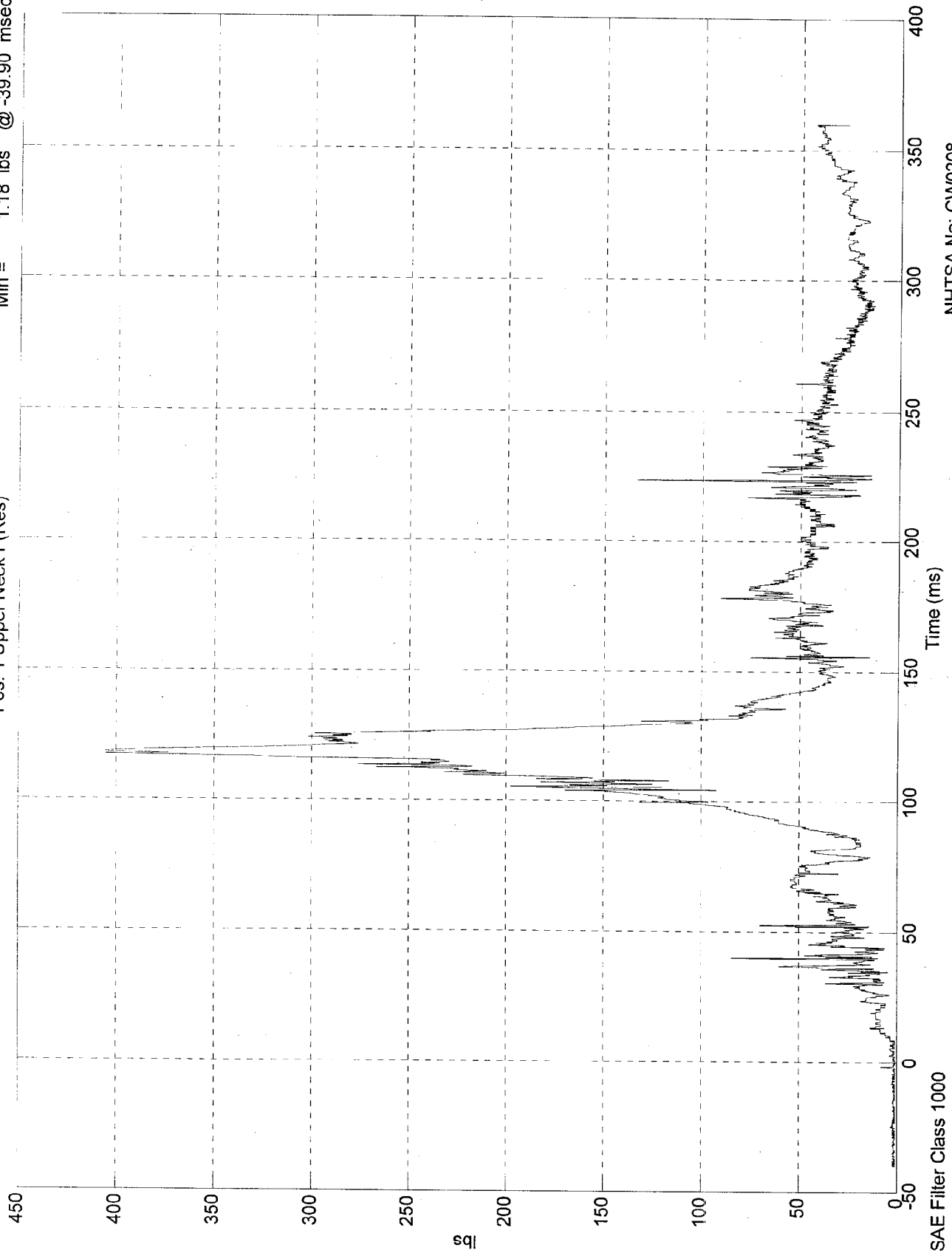


NHTSA No: CW0208
Date: 02 Mar 1998

SAE Filter Class 1000

Max = 406 lbs @ 118.20 msec
Min = 1.18 lbs @ -39.90 msec

Pos. 1 Upper Neck F(Res)

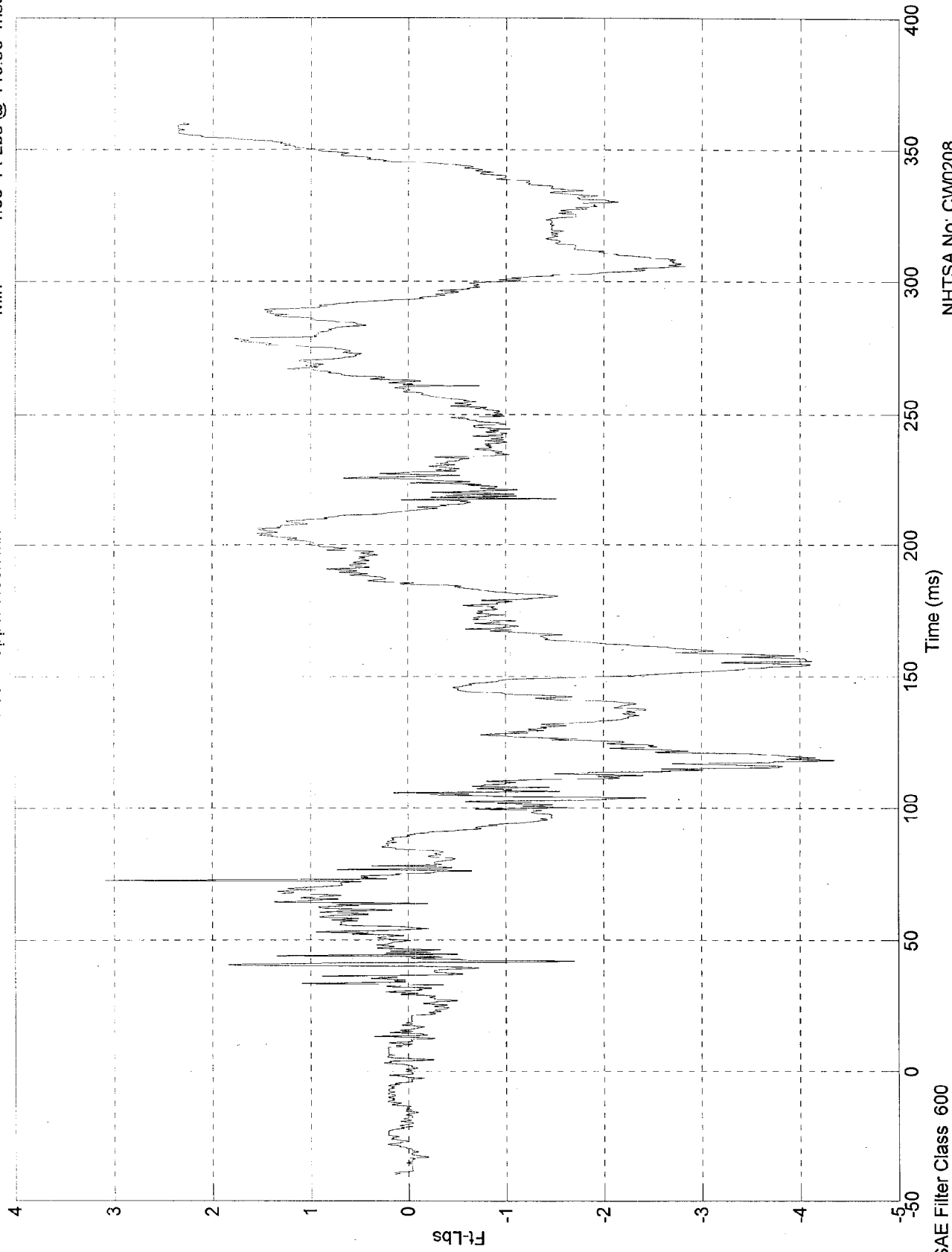


NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 3.09 Ft-Lbs @ 72.80 msec
Min = -4.35 Ft-Lbs @ 118.30 msec

Pos. 1 Upper Neck Mx

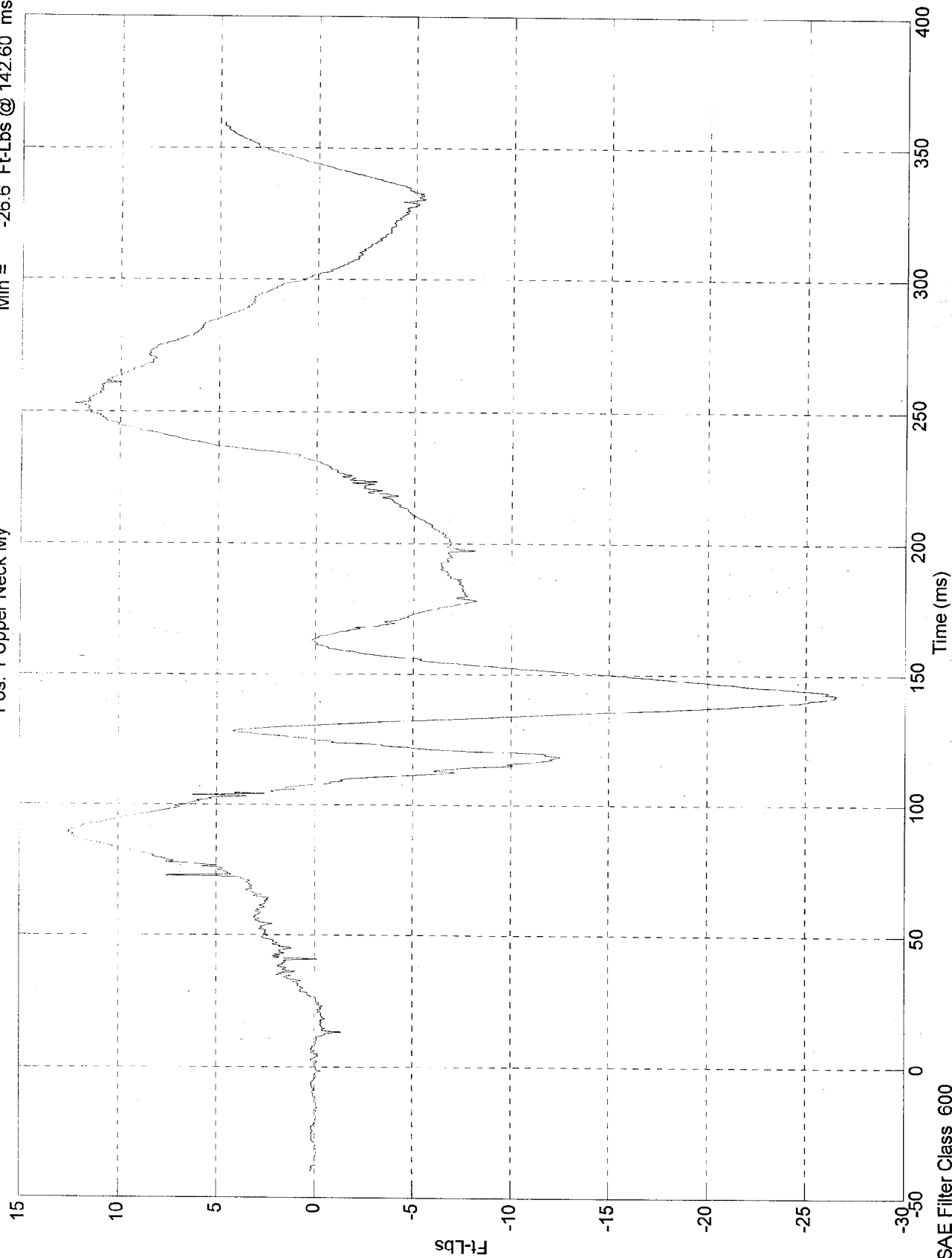


NHTSA No: CW0208
Date: 02 Mar 1998

SAE Filter Class 600

Max = 12.5 Ft-Lbs @ 89.20 msec
Min = -26.6 Ft-Lbs @ 142.60 msec

Pos. 1 Upper Neck My



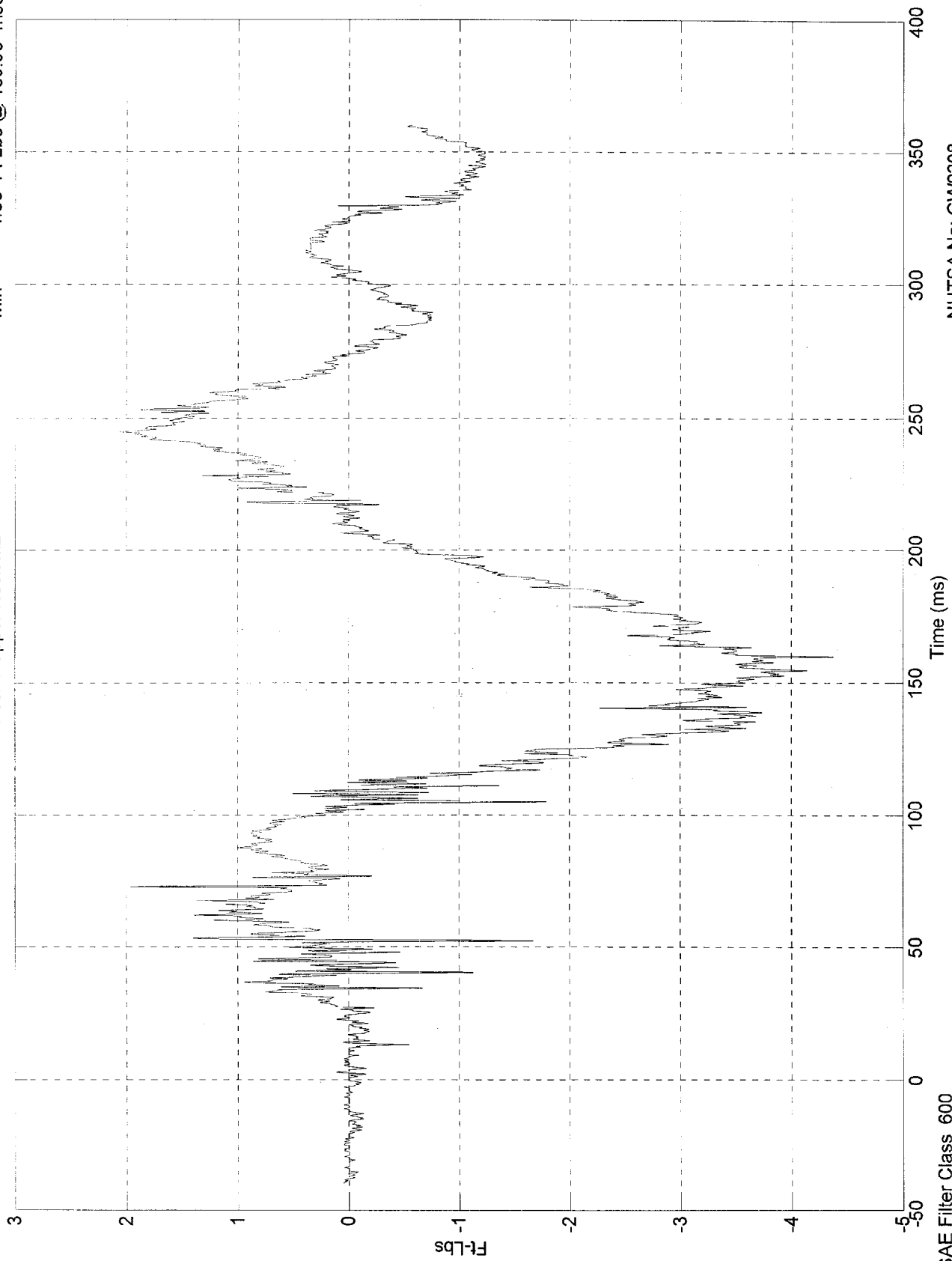
SAE Filter Class 600

NHTSA No: CW0208
Date: 02 Mar 1998

301 Rear 30 MPH-1998 Ford Expedition

Max = 2.06 Ft-Lbs @ 245.00 msec
Min = -4.38 Ft-Lbs @ 159.90 msec

Pos. 1 Upper Neck Mz



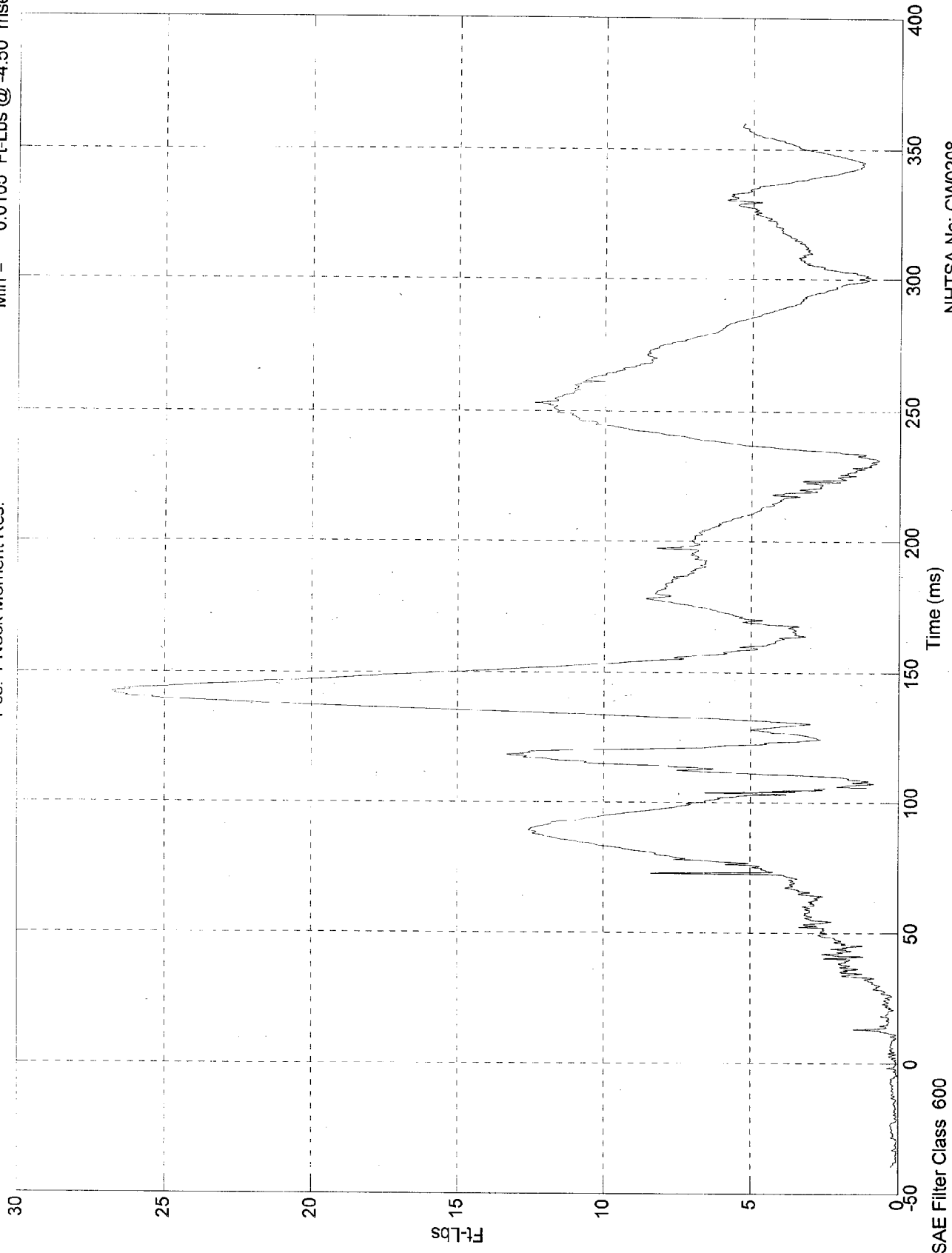
NHTSA No: CW0208
Date: 02 Mar 1998

SAE Filter Class 600

301 Rear 30 MPH-1998 Ford Expedition

Max = 26.8 Ft-Lbs @ 142.60 msec
Min = 0.0105 Ft-Lbs @ -4.50 msec

Pos. 1 Neck Moment Res.

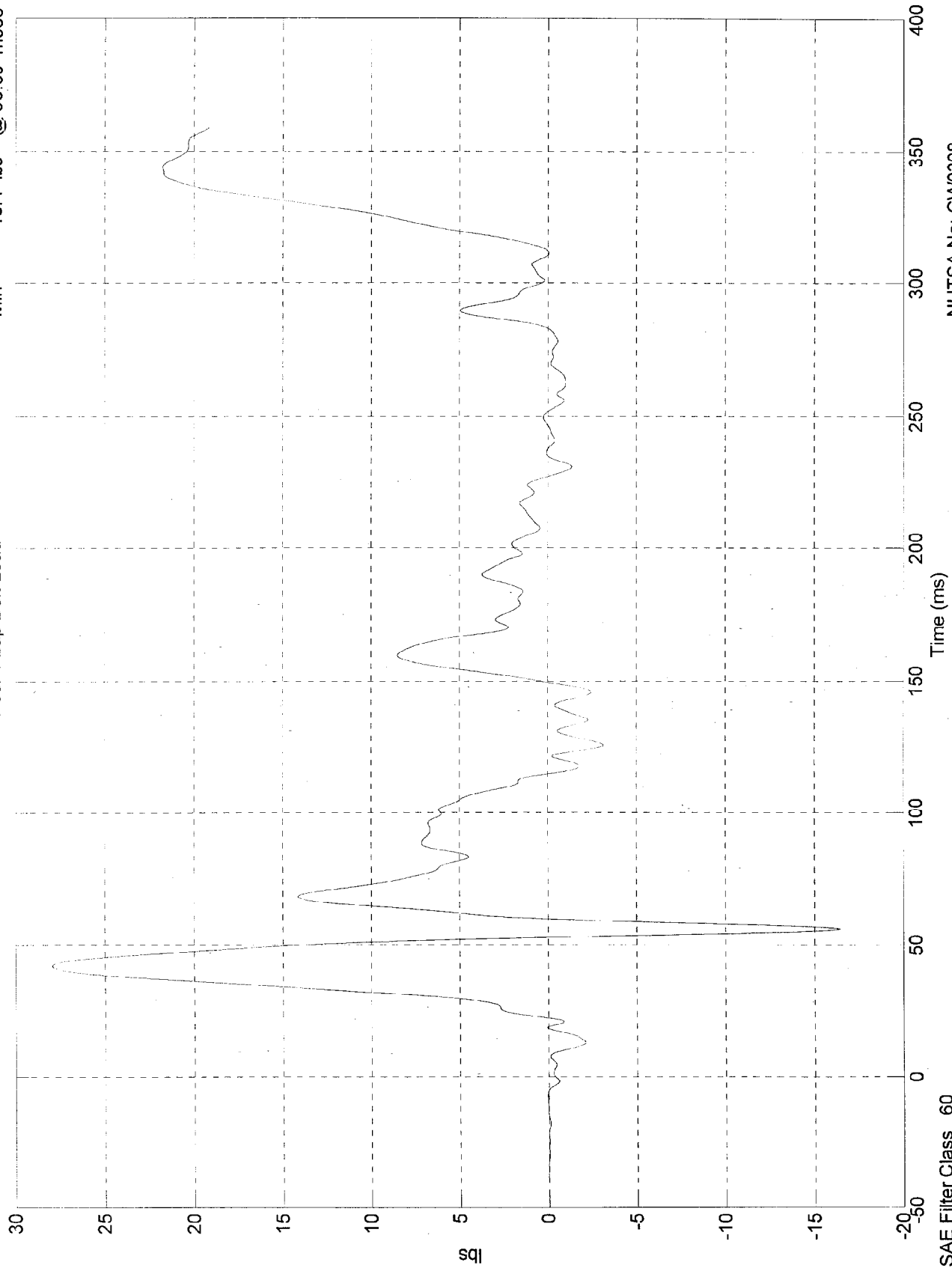


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Pos. 1 Lap Belt Load

Max = 28 lbs @ 42.30 msec
Min = -16.4 lbs @ 55.80 msec

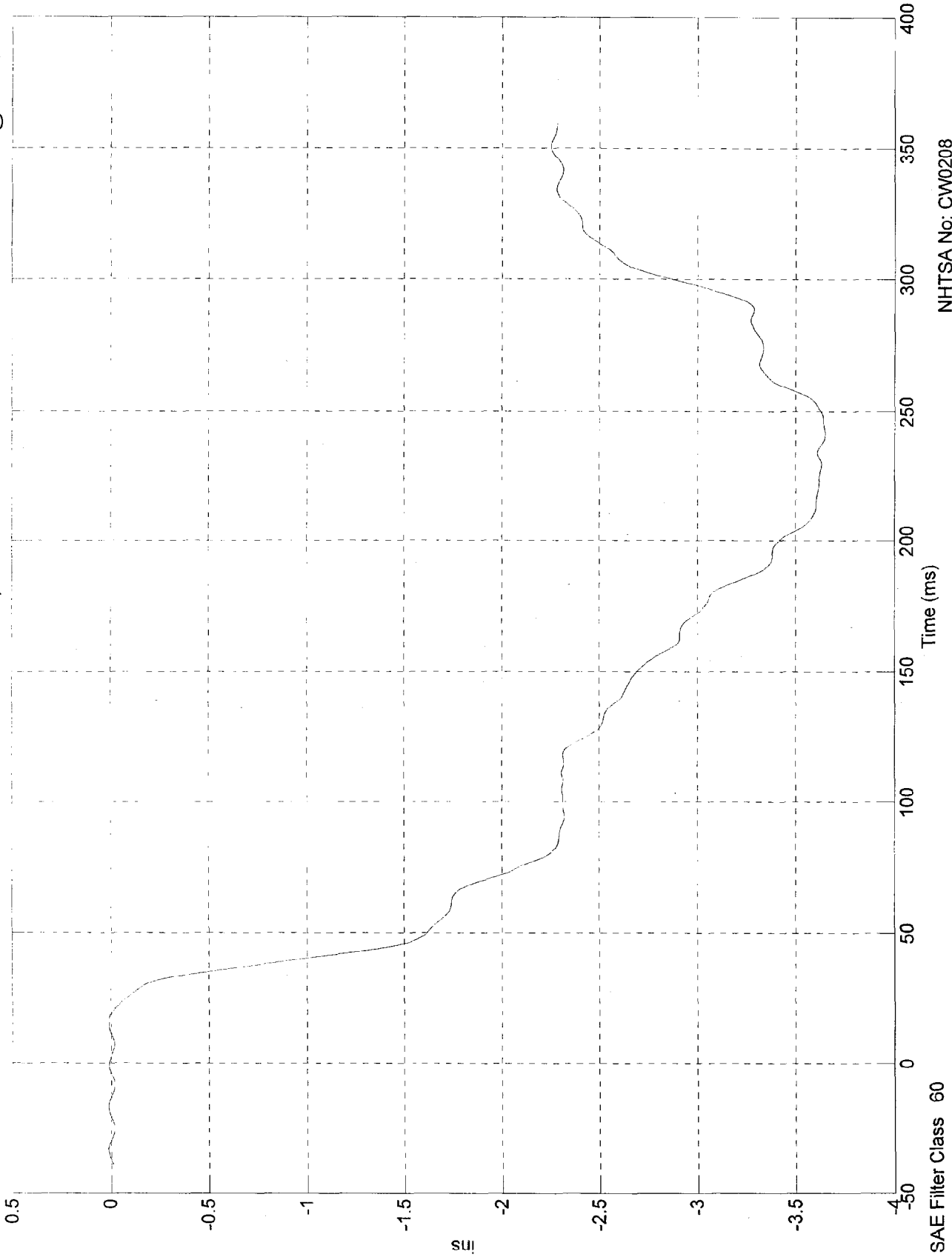


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Date: 02 Mar 1998

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Max = 0.0122 ins @ -16.60 msec
Min = -3.65 ins @ 241.20 msec

Pos. 1 Belt Spoolout



NHTSA No: CW0208
Date: 02 Mar 1998