V2123

REPORT NUMBER: 208-CAL-94-18
212-CAL-94-18
301-CAL-94-18

VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT CRASH PROTECTION WINDSHIELD MOUNTING, WINDSHIELD ZONE INTRUSION (PARTIAL) AND FUEL SYSTEM INTEGRITY

KIA MOTORS COMPANY
1994 FORD ASPIRE
3-DOOR HATCH BACK

NHTSA NUMBER: CR0208

CALSPAN TEST NUMBER: 8221-2

July 28, 1994

CALSPAN CORPORATION
ADVANCED TECHNOLOGY CENTER
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FINAL REPORT

PREPARED FOR:

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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16. Abstract

A 30 mph vehicle safety compliance test was conducted on a 1994 Ford Aspire 3-door hatch back.

This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on July 28, 1994. The purpose of this test was to determine compliance with the performance requirements of the following Federal Motor Vehicle Safety Standards:

1. FMVSS No. 208, "Occupant Crash Protection"
2. FMVSS No. 212, "Windshield Mounting"
3. FMVSS No. 219 (partial), "Windshield Zone Intrusion"
4. FMVSS No. 301, "Fuel System Integrity"

The test mode was perpendicular (0°) and the impact velocity was 29.7 mph. The ambient temperature at the impact face was 70 °F.

The subject test vehicle appears to comply with the requirements of FMVSS Nos. 208, 212, 219 (partial) and 301.

Type of Restraint System: The test vehicle was equipped with a driver air bag and a passenger air bag restraint system. The manual seat belts were not used for this test.

17. Key Words	18. Distribution Statement
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Section 1

PURPOSE AND TEST PROCEDURE

This 30 mph frontal barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208, 212, 219 (partial) and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by Calspan Advanced Technology Center under Contract No. DTNH22-93-D-11089. The purpose of this test was to determine if the subject vehicle, a 1994 Ford Aspire 3-door hatch back, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS No. 212, "Windshield Mounting"; FMVSS No. 219 (partial), "Windshield Zone Intrusion"; and FMVSS No. 301, "Fuel System Integrity". This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-208-09, dated March 15, 1993.

Section 2

SUMMARY OF TEST NUMBER CR0208

A frontal barrier was impacted by a 1994 Ford Aspire 3-door hatch back at a velocity of 29.7 mph. The test was performed at the Calspan Corporation Advanced Technology Center on July 28, 1994. Pre- and Post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by one real-time camera and 14 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 OVSC Laboratory Test Procedure.

Both ATDs were fully instrumented with head, chest, and pelvis three axis (x, y, and z) accelerometers, chest displacement potentiometers, left/right femur load cells, and upper neck six axis transducers. These ATDs had been certified prior to the test.

The 43 channels of data were recorded on a P.C. based data acquisition system. Appendix B contains the vehicle and dummy response data traces. Damaged data wires caused questionable data on the Position 2 upper neck Fx and vehicle instrument panel X data channels.

The driver's HIC was 160.71. The maximum chest deceleration over 3 milliseconds was 41.142 g's with -1.1 inches of deflection. The maximum force on the driver's left femur was -1226.1 pounds and -1323.9 pounds on the right femur.

The right front passenger's HIC was 80.42. The maximum chest deceleration over 3 milliseconds was 40.354 g's with -0.8 inches of deflection. Loads of -1169.2 and -1457.7 pounds were recorded on the left and right femurs respectively.

Table 1

CRASH TEST SUMMARY

Vehicle NHTSA No. : CR0208 Test Mode : 30 mph Frontal Barrier

Test Date : July 28, 1994 Time: 11:22 Temperature : 70 °F

Vehicle Make/Model/Body Style : 1994 Ford Aspire 3-door hatch back

Vehicle Test Weight : 2390 lbs

Vehicle/Barrier Impact Angle : 0 °

Impact Velocity : 29.7 mph

Maximum Static Crush : 17.1 inches

Vehicle Rebound : 13.6 inches

DUMMIES:	DRIVER	PASSENGER
Type :	Part 572E	Part 572E
Restraint System :	Air bag	Air bag

Number of Data Channels : 43

Number of Cameras : 1 Real Time

14 High Speed

DOOR OPENING DATA : Closed/Operable - Left Front

Closed/Operable - Right Front

Front Seat(s) Data :	DRIVER	PASSENGER
Seat Track Failure :	None	None
	Inches of shift	
Seat Back Failure :	0.0	0.0

VISIBLE DUMMY CONTACT POINTS :	DRIVER	PASSENGER
Head :	Face with center of air bag,	Face with air bag, rear and top of head with sunvisor, chin with chest
Abdomen :	Air bag	Air bag
Chest	Air bag	Air bag
Knees	Steering column cover and knee bolster	Glove box door

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION :

Year/Make/Model/Body Style : 1994 Ford Aspire 3-door hatch back

NHTSA No. : CR0208 ; VIN: KNJLT05H2R6110476 ; Color : Wild Iris

Engine Data: 4 cylinders; - CID; 1.3 Liters; - cc

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

Transmission Data : 5 speeds; X Manual; - Automatic; X Overdrive

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

Major Options : - A/C; - Pwr.Strg.; X Pwr. Brakes

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

Date Received : 6-29-94 ; Odometer Reading 143.0 miles

Selling Dealer : FOX FORD

& Address: 7325 Victor-Pittsford Road, Victor, N.Y. 14564

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by : KIA MOTORS COMPANY

Date of Manufacture 1/31/94

GVWR : 2952 lbs. lbs.; GAWR: 1638 lbs. FRONT; 1314 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load : 32 psi FRONT

32 psi REAR

Recommended Tire Size : P165/70R13 78S

* Recommended Cold Tire Pressure : 32 psi FRONT; 32 psi REAR

Size of Tires on Test Vehicle: P165/70R13 78S ; Manufacturer: YOKOHAMA

Vehicle Capacity Data :

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

Number of Occupants: 2 Front; 2 Rear; 4 Total

Vehicle Capacity Weight (VCW) = 680 lbs.

No. of Occupants x 150 lbs. = 600 lbs.

Rated Cargo/Luggage Weight (RCLW) = 80

*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	= 540	lbs.	Right Rear	= 430	lbs.
Left Front	= 610	lbs.	Left Rear	= 410	lbs.
TOTAL FRONT	= 1,150	lbs.	TOTAL REAR	= 840	lbs.

TOTAL DELIVERED WEIGHT = 1,990.0 lbs.

% of Total Front of Vehicle Weight = 57.8 % of Total Rear Weight = 42.2 %

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT :

Total Delivered Weight	= 1,990	lbs.
Rated Cargo/Luggage Weight (RCLW)	= 80	lbs.
Weight of 2 p.572 Dummies @ 167 each	= 334	lbs.
TARGET TEST WEIGHT	= 2,404	lbs.

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 66 POUNDS OF CARGO WEIGHT:

Right Front	= 660	lbs.	Right Rear	= 510	lbs.
Left Front	= 700	lbs.	Left Rear	= 520	lbs.
TOTAL FRONT	= 1,360	lbs.	TOTAL REAR	= 1,030	lbs.

TOTAL TEST WEIGHT = 2,390.0 lbs.

% of Total Front Weight = 56.9 % % of Total Rear Weight = 43.1 %

Weight of Ballast Secured in Vehicle Trunk Area = 0.0 lbs.

Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimension in inches) :

AS DELIVERED :	RF	24.9	LF	24.9	RR	25.3	LR 25.0
FULLY LOADED :	RF	24.0	LF	23.7	RR	24.0	LR 23.5
AS TESTED :	RF	24.2	LF	24.0	RR	23.4	LR 23.0

Vehicle's Wheel Base : 91.4 in.

Location of Vehicle's C.G. : 39.4 inches rearward of front wheel center.

FUEL SYSTEM DATA :

Fuel System Capacity From Owner's Manual = 10.0 gallons

Usable Capacity Figure Furnished by COTR = 9.25 gallons

Test Volume Range (92 to 94% of Usable Capacity) = 9.2 to 9.4 gallons

ACTUAL TEST VOLUME= 9.3 gallons (with entire fuel system filled)

Table 3

POST IMPACT DATA

TYPE OF TEST:

Type of Test : Frontal Barrier Impact Angle : 0°

Test Date : July 28, 1994 Time: 11:22 Temperature: 70 °F

Vehicle NHTSA No. : CR0208

Required Impact Velocity Range : 28.9 to 29.9 mph

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

Trap No. 1 = 29.7 mph; Trap No. 2 = 29.6 mph

Distance from vehicle to barrier : (1) entering trap = 52 inches

(2) exiting trap = 12 inches

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

Vehicle Length:

Pre-Test	Right =	149.6	; C/L =	152.2	;Left =	149.5
Post-Test	Right =	133.1	; C/L =	134.0	;Left =	133.0
Crush	Right =	16.5	; C/L =	18.2	;Left =	16.5

AVERAGE = 17.1 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point :

Right =	12.5	; C/L =	13.8	;Left =	14.4

AVERAGE = 13.6 inches

DOOR OPENING :	Left	Right
Front	Closed-operable	Closed-operable
Rear	N/A	N/A
SEAT MOVEMENT :	**Seat Back Failure**	**Seat Shift**
Front	None	0.0
Rear	N/A	N/A

Table 3

POST IMPACT (cont.)

GLAZING DAMAGE :

Left side door glass shattered during impact, windshield cracked throughout.

OTHER NOTABLE IMPACT FEATURES :

Driver and passenger toe pan intrusion.

Section 3

OCCUPANT AND VEHICLE DATA

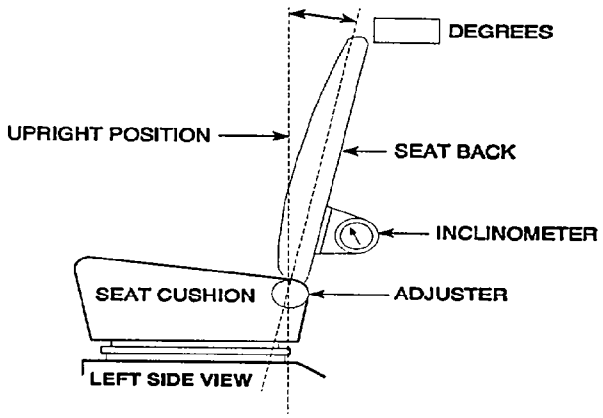
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 1994 Vehicle Model: Ford Aspire Body Style : 3-door hatch back

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



FRONT SEAT ASSEMBLY

Seat back angle for driver's seat : 22 deg.

Measurement instructions : Seat back adjusted to 3rd detent rearward of forward most locking position (zero).

Seat back angle for passenger's seat : 22 deg.

Measurement instructions : Same as driver seating position.

2. Seat Fore and Aft Positioning

Positioning of the driver's seat : Seat set at twelfth detent (mid-position) rearward of forward most locking position (zero). There are twenty four detents total.

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

3. Fuel Tank Capacity Data

A. "Usable Capacity" of the standard equipment fuel tank is 10.0 gallons

B. "Usable Capacity" of the optional equipment fuel tank is N/A gallons

4. Steering Column Position :

Non-adjustable

5. Other:

None

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

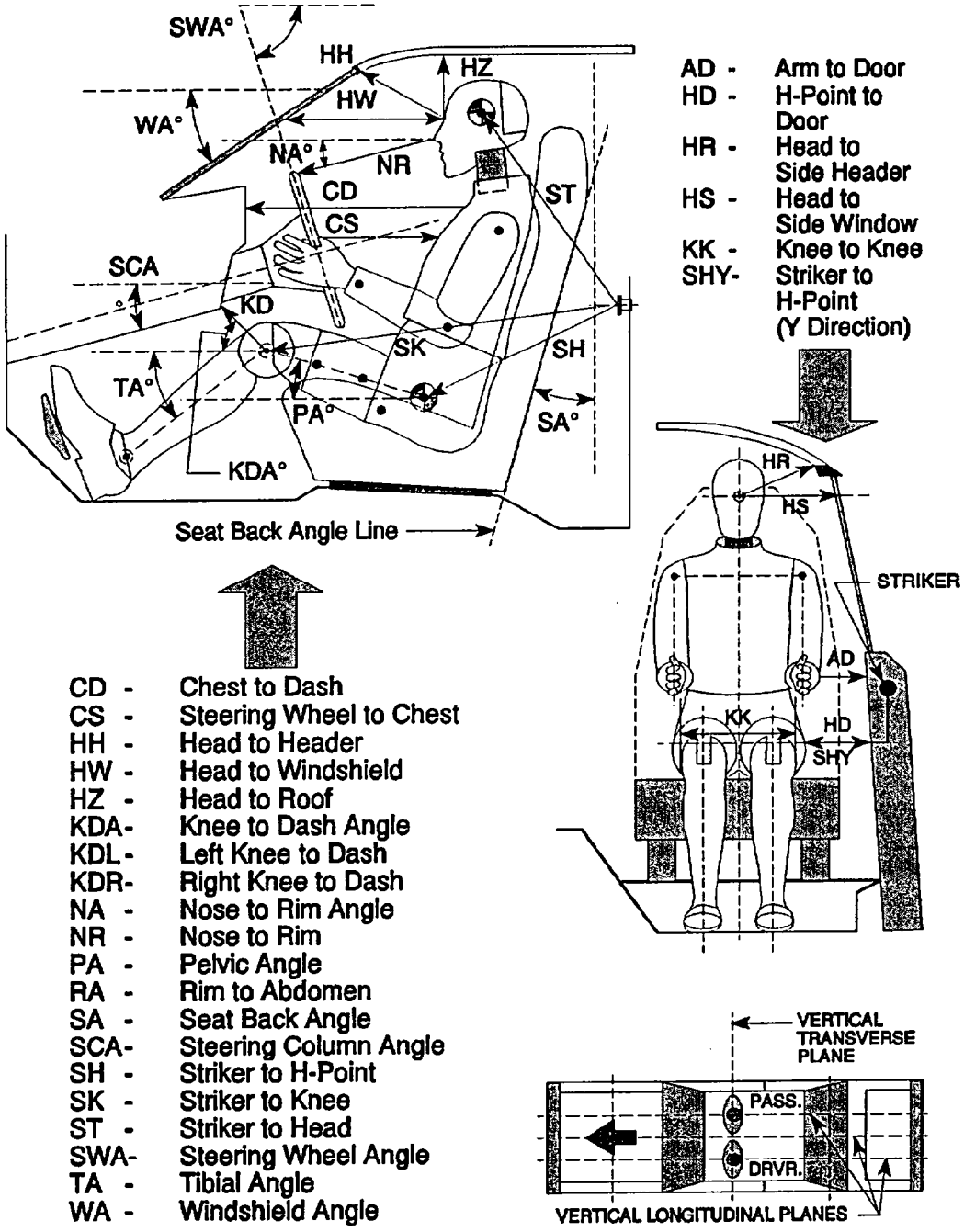


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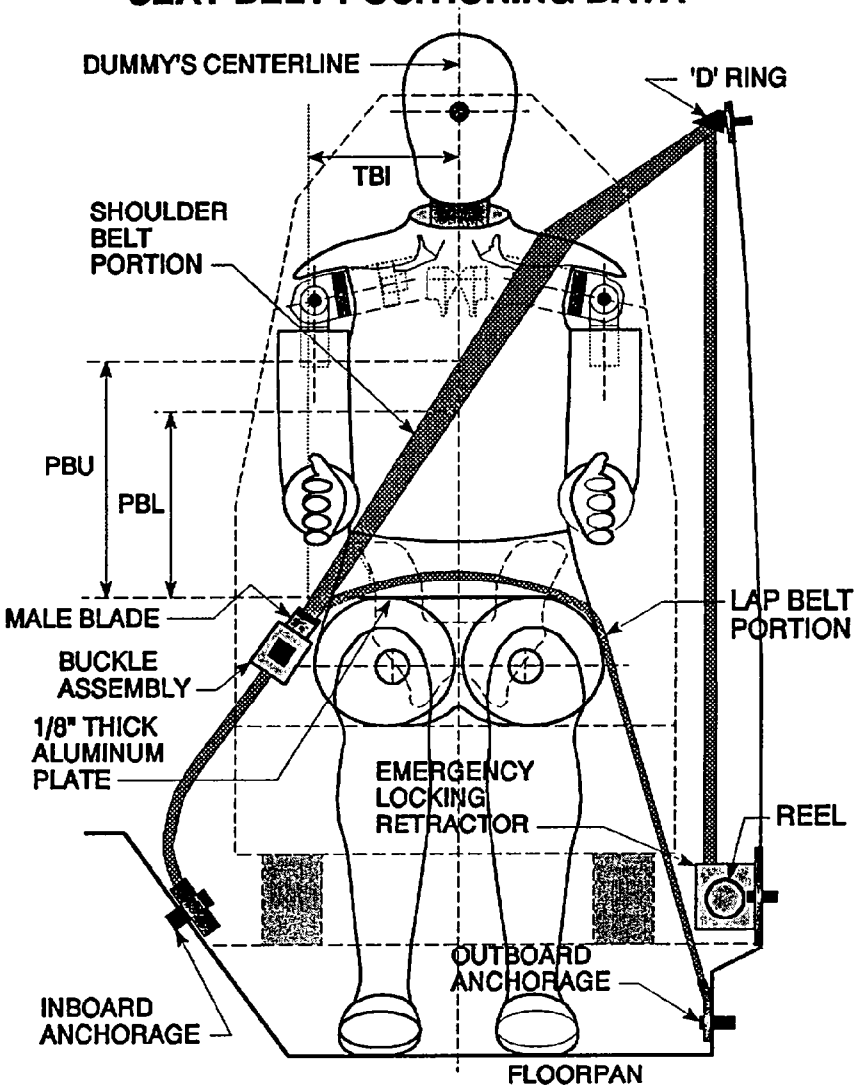
Table 4

FRONT SEAT OCCUPANT MEASUREMENTS

	DRIVER (Serial #290)	PASS. (Serial #313)
WA°	28 deg.	-
SWA°	61 deg.	-
SCA°	29 deg.	-
SA°	22 deg.	22 deg.
HZ	6.0	6.4
HH	11.2	10.6
HW	20.7	19.5
HR	8.0	8.1
NR	Not available	-
CD	19.9	20.9
CS	10.9	-
RA	6.1	-
KDL	5.7 Angle (KDA) 32 deg.	4.5
KDR	5.0	5.3 Angle (KDA) 34 deg.
PA°	23 deg.	24 deg.
TA°	42 deg.	44 deg.
KK	11.6	10.5
ST	24.0 Angle 28 deg.	24.1 Angle 31 deg.
SK	32.3 Angle 91 deg.	33.1 Angle 92 deg.
SH	18.1 Angle 106 deg.	18.3 Angle 105 deg.
SHY	8.6	8.3
HS	10.7	10.8
HD	6.2	6.0
AD	3.5	3.3

Figure 3

SEAT BELT POSITIONING DATA



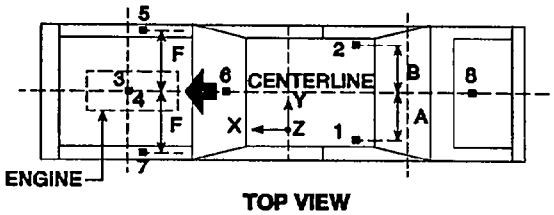
FRONT VIEW OF DUMMY

	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
PBU -- Top surface of alum. plate to upper edge	*	*
PBL -- Top surface of alum. plate to belt lower edge	*	*
TBI -- Distance from torso centerline to buckle	*	*

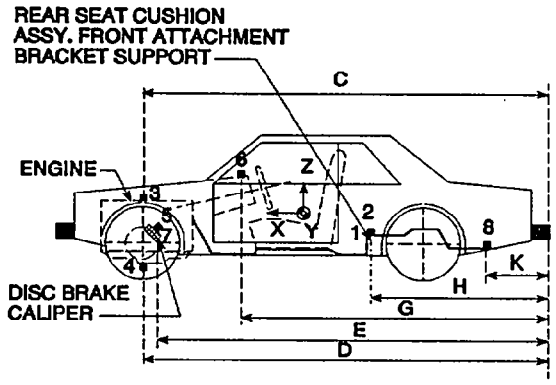
* Vehicle equipped with air bag, manual seat belt not used for this position.

Figure 4

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



TOP VIEW



LEFT SIDE VIEW

ACCELEROMETER NUMBER*	ACCELEROMETER LOCATION	DIRECTION		
		X	Y	Z
1	Left Rear Seat Crossmember	X		
2	Right Rear Seat Crossmember	X		
3	Top of Engine	X		
4	Bottom of Engine	X		
5	Right Disc Brake Caliper	X		
6	Instrument Panel	X		
7	Left Disc Brake Caliper	X		
8	Trunk Z			X

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

Table 5

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

DIMENSION	LENGTH (Inches)	
	PRE-TEST VALUES	POST-TEST VALUES
A	20.0	20.0
B	20.0	20.0
C	127.2	121.6
D	125.9	122.5
E	Left = 118.4 Right = 118.3	Left = 113.7 Right = 113.6
F	23.4	24.3
G	93.8	93.5
H	52.5	52.5
K	7.3	7.3

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE			
		Pos.	msec.	Neg.	msec.
1	Rear Seat X-Member @ Left Side	5.6	131.8	-39.5	42.2
2	Rear Seat X-Member @ Right Side	4.9	139.7	-33.2	44.4
3	Top of Engine Block	52.7	47.9	-112.8	39.4
4	Bottom of Engine	23.6	42.6	-109.4	34.4
5	Disc Brake Caliper @ Right Side	6.4	250.4	-56.6	33.4
6	Instrument Panel	250.9	92.9	-235.8	84.4
7	Disc Brake Caliper @ Left Side	18.7	58.1	-81.3	40.3
8	Trunk	22.1	45.5	-7.9	109.2

Figure 5

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information shown on Table 6.

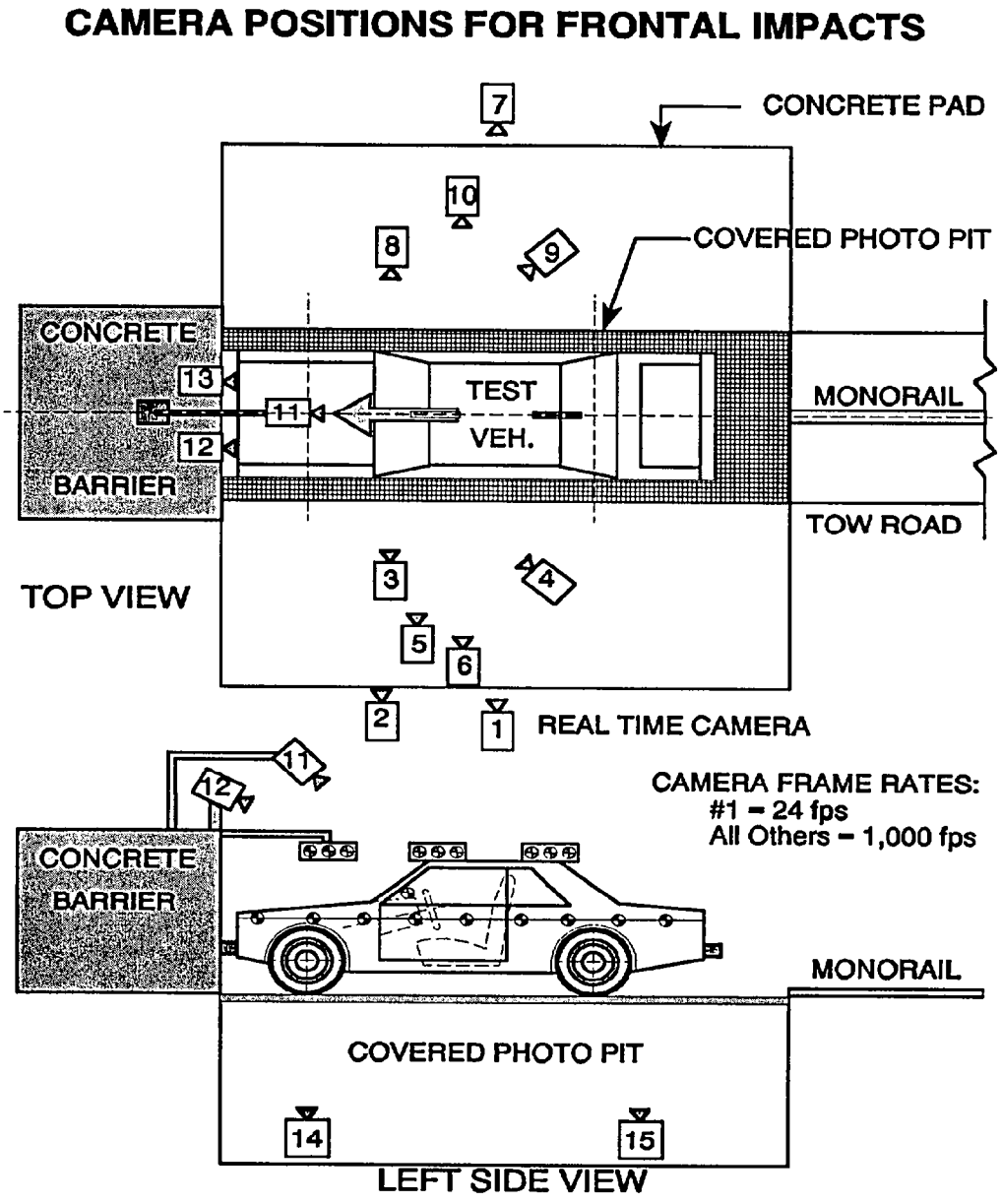


Table 6

HIGH-SPEED CAMERA LOCATIONS

Test No. CR0208 Vehicle: 1994 Ford Aspire 3-door hatch back

Camera No.	VIEW	CAMERA POSITIONS (In.)* X	Y	Z	ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	219	66	41	-2	203	13	1005
3	Left Side View	298	47	41	-2	282	25	1000
4	Driver and Interior View	108	104	73	-18	-	13	1000
5	Steering Column (Bottom)	256	79	46	-3	240	25	1060
6	Steering Column (Top)	256	79	70	-9	240	25	1120
7	Overall Right Side	220	72	42	-1	204	13	1100
8	Right Side View	286	51	41	-4	270	25	1000
9	Passenger and Interior View	105	107	72	-19	-	13	1115
10	Right Passenger View	294	69	59	-4	278	35	N.T.
11	Windshield View	9	0	127	-64	-	13	1080
12	Driver Front View	21	18	72	-46	-	8	1010
13	Passenger Front View	24	18	72	-42	-	8	1000
14	Pit View of Engine	33	0	-86	90	-	13	720
15	Pit View of Fuel Tank	109	0	-86	90	-	13	685

*X = film plane to monorail centerline
Y = film plane to impact location
Z = film plane to ground
** = referenced to horizontal plane

Figure 6

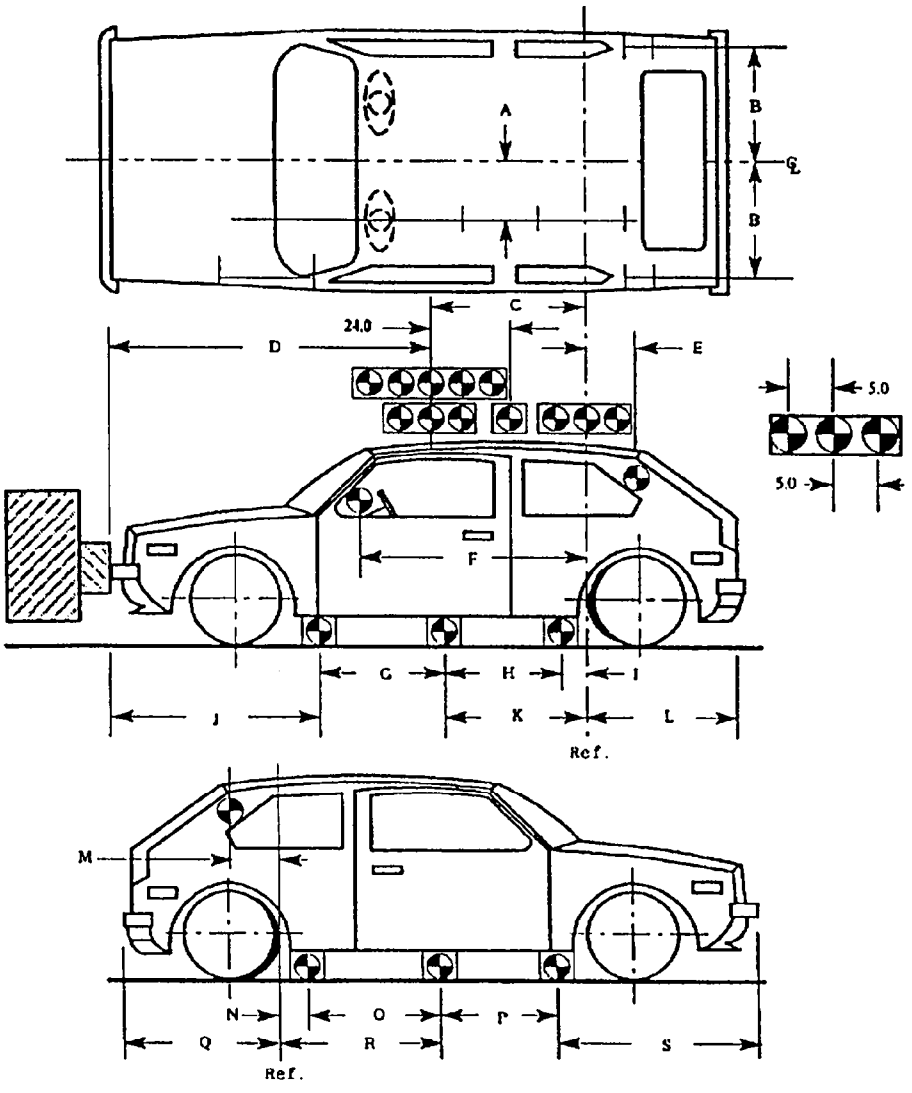
VEHICLE TARGET LOCATIONS
(All dimensions in inches)

Key (Inches)

A = 13.0
B = 19.5

C = 36.0
D = 77.4
E = 0.0
F = 54.5
G = 29.4
H = 29.3
I = 4.6
J = 49.4
K = 33.9
L = 39.5

M = 0.0
N = 5.0
O = 29.2
P = 29.0
Q = 38.5
R = 34.2
S = 50.5



Note: Targets on front fender are 12.0 inches apart.
Targets rearward of front fender are 24.0 inches apart (Targets C1 and C2 are on door per TP-208-09).

Figure 7

TEST VEHICLE MEASUREMENTS

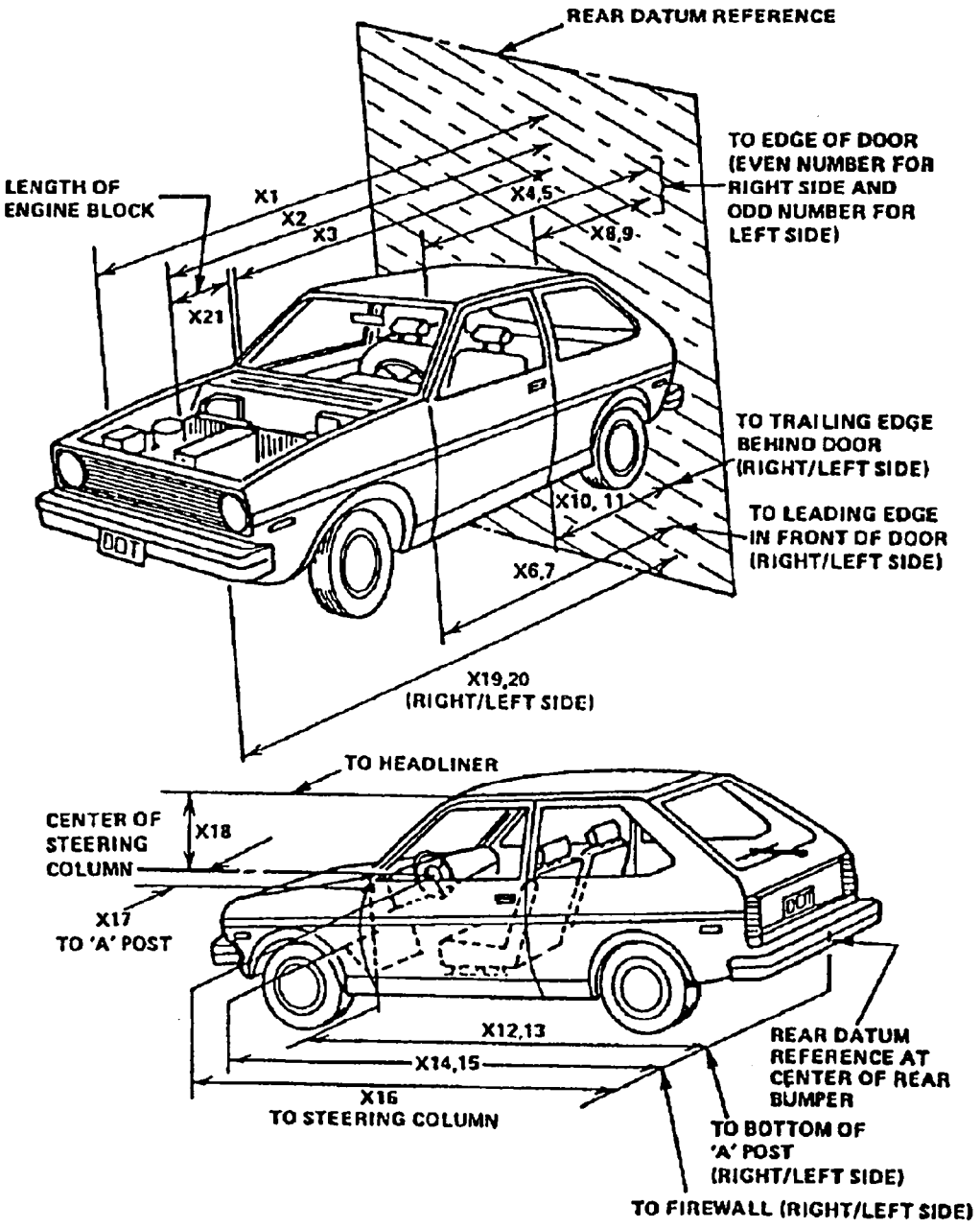


Table 7

VEHICLE MEASUREMENTS

		All Dimensions in inches		
No.		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	152.2	134.0	18.2
X2	Rear Surface of Vehicle to Front of Engine	128.7	125.0	3.7
X3	Rear Surface of Vehicle to Firewall	111.7	111.4	0.3
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	102.3	103.0	-0.7
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	102.4	103.1	-0.7
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	101.8	102.7	-0.9
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	102.2	102.7	-0.5
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	54.9	55.6	-0.7
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	55.3	55.8	-0.5
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	55.3	56.1	-0.8
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	55.4	56.0	-0.6
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	100.9	102.4	-1.5
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	101.4	102.3	-0.9
X14	Rear Surface of Vehicle to Firewall, Right Side	112.0	112.5	-0.5
X15	Rear Surface of Vehicle to Firewall, Left Side	112.0	112.7	-0.7
X16	Rear Surface of Vehicle to Steering Column	83.8	86.5	-2.7
X17	Center of Steering Column to "A" Post	16.0	15.5	0.5
X18	Center of Steering Column to Headliner	17.0	16.5	0.5
X19	Rear Surface of Vehicle to Right Side of Front Bumper	149.6	133.1	16.5
X20	Rear Surface of Vehicle to Left Side of Front Bumper	149.5	133.0	16.5
X21	Length of Engine Block	20.0	20.0	0.0

Section 4

SUMMARY OF RESULTS OF FMVSS NOS. 208, 212, 219 AND 301-75

- "Occupant Crash Protection," FMVSS No. 208 Data
- "Windshield Mounting," FMVSS No. 212 Data
- "Windshield Zone Intrusion," FMVSS No. 219 (Partial) Data
- "Fuel System Integrity," FMVSS No. 301-75

Table 8

DUMMY INJURY CRITERIA VALUES

NHTSA No. : CR0208 Vehicle : 1994 Ford Aspire 3-door hatch back

	MAXIMUM ACCELERATION (g's)								
	HEAD				CHEST				
	X	Y	Z	R	X	Y	Z	R*	Displacement
Dummy (1)	-31.7	-6.3	22.7	38.5	-42.2	3.8	16.3	41.142	-1.1
Dummy (2)	-29.9	-18.6	-20.9	33.0	-40.5	9.4	12.0	40.354	-0.8

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	-1226.1	-1323.9
Dummy (2)	-1169.2	-1457.7

	HEAD INJURY CRITERIA**			
		36 millisecond Maximum		Avg. Acc (g)
	HIC	t_1 (msec)	t_2 (msec)	t_1 TO t_2
Dummy (1)	160.71	65.280	101.160	28.87
Dummy (2)	80.42	53.640	89.520	21.89

* Defined as exceeding 0.003 sec. duration
**As defined in FMVSS No. 208

Table 9

FMVSS NO. 208 - SEAT BELT WARNING SYSTEM CHECK

With occupant in driver's position, the lap belt in stowed position, and ignition switch placed in "Start/On" position:

Log time duration of audible warning signal = 6.0 sec.

Log time duration of reminder light operation = continuous sec.

With occupant in driver's position, lap belt in use, and the ignition switch placed in "Start/On" position :

Log time duration of audible warning signal (audible warning should not operate) = 0.0 sec.

Log time duration of reminder light operation = 0.0 sec.

Note wording of visual warning :

Fasten Seat Belt	-
Fasten Belt	-
Symbol 101	X

* Seat belt reminder light remains on continuously, air bag light stays on for 6.0 seconds.

Table 10

FMVSS NO. 208 - LABELING AND DRIVER'S MANUAL INFORMATION

Locate label which describes manufacturers maintenance or replacement schedule for crash-deployed occupant protection system.

Describe location :

Label located on the inner panel of the driver and passenger sun visors.

The label states, "Regular maintenance of the air bag system is not required. If the air bag readiness light comes on while driving, or does not come on when ignition is turned on, see your dealer for service."

Were appropriate instructions concerning maintenance and/or replacement of this system provided ?

YES X NO -

Was a description of the functional operation of the system provided ?

YES X NO -

Is there a reference to the instructions and description of the system on the label ?

YES X NO -

Was an owner's manual provided ? YES X NO -

Did the owner's manual contain appropriate information concerning maintenance and/or replacement and a description of the functional operation of the system ?

YES X NO -

Table 11

FMVSS NO. 208 - READINESS INDICATOR

An occupant restraint system that deploys in the event of a crash shall have a monitoring system with a readiness indicator. A totally mechanical system is exempt from this requirement.

Is the system totally mechanical ? YES - NO X

Describe the location of the readiness indicator :

Readiness indicator located at top right of instrument cluster.

Is the readiness indicator clearly visible to the driver ? YES X NO -

Is a list of the elements in the occupant restraint system, being monitored by the readiness indicator, provided ?

YES X NO -

Table 12

FMVSS NO. 208 - COMFORT AND CONVENIENCE TEST SUMMARY

Test Vehicle NHTSA No. :	CR0208
Make/Model :	1994 Ford Aspire 3-door hatch back
Date of Comfort/Convenience Check :	7-25-94
Technician Performing Check :	R.E.
GVWR :	2952 lbs.

Seat belt comfort and convenience requirements cover vehicles manufactured on or after September 1, 1986, which have a gross vehicle weight rating of 10,000 pounds or less. Exemptions to this rule are belts installed in a walk-in, van-type vehicle and manual Type 2 belt systems installed in the front outboard seating positions of passenger automobiles. On or after September 1, 1989, the exemption of the type 2 manual seat belts installed in the front outboard seating positions of passenger automobiles will change depending on the states' enactment of mandatory usage laws.

Was vehicle built after or on September 1, 1986, and is it equipped with :

1. Automatic seat belts — YES - NO X

If yes, go to requirements D1, D2, and D3

2. Manual seat belts* — YES X NO -

a. The seat belts, other than Type 2 lap/shoulder belts, are located in the front outboard seating positions of a passenger automobile.

YES X NO -

(Go to requirements D3, D4, D5, and D6)

b. The seat belt system is Type 2 lap/shoulder belt in the front outboard seating positions or the seat belts are located in a walk-in van.

STOP

* If the seat belts are voluntarily installed by the manufacturer they do not have to comply.

Table 12 (cont.)

D1
CONVENIENCE HOOKS

A convenience hook or other device is provided to stow seat belt webbing to facilitate entering or exiting the vehicle.

YES - NO X

Check the option which applies to this test vehicle:

1. A convenience hook or other device automatically releases the webbing when the automatic belt system is operational and remains in the released mode as long as the vehicle's ignition switch is moved to the "on" or "start" position and the vehicle's drivetrain is engaged.

YES N/A NO N/A

2. A convenience hook or other device automatically releases the webbing when the automatic belt system is operational and remains in the released mode as long as the vehicle's ignition switch is moved to the "on" or "start" position and the vehicle's parking brake is in the released mode (non-engaged)

YES N/A NO N/A

D2
WEBBING TENSION - RELIEVING DEVICE

The seat belt assembly installed in the outboard designated seating position has either manual or automatic tension relieving devices permitting the introduction of slack in the webbing of the shoulder belt ("comfort clips" or "window shade" devices).

YES - NO X

Check the owner's manual and determine the maximum amount of slack recommended by the manufacturer in inches. The recommended slack is N/A inches. Introduce this slack into the shoulder belt before testing the vehicle to comply with the requirements of FMVSS 208 S5.1. A warning is included in the owner's manual that introducing slack beyond the amount specified can significantly reduce the effectiveness of the shoulder belt.

YES N/A NO N/A

(If NO, provide explanation.)

Check the option which applies to this test vehicle:

1. This vehicle is equipped with automatic seat belts and the tension relieving device is cancelled each time the adjacent door is opened.

YES N/A NO N/A

(If NO, provide explanation.)

Table 12 (cont.)

2. This vehicle is equipped with manual belts, required to meet FMVSS 208 S4.6, and the tension relieving device is cancelled each time one of the following options occurs:

a. The adjacent door is opened. YES N/A NO N/A

b. The latch plate is released from the buckle. YES N/A NO N/A

3. This is an open-body vehicle, without doors. Does the manual mean to cancel any shoulder belt slack introduced by a tension relieving device to operate properly ?

YES N/A NO N/A

(If NO, provide explanation.)

D3
BELT CONTACT FORCE

1. Do not measure the belt contact force if the manual or automatic seat belt assemblies in this vehicle incorporate a webbing tension relieving device. Does the vehicle incorporate a tension relieving device?

YES - NO X

2. Seat are adjusted according to instructions in Appendix B.

YES X NO -

3. The test dummies are positioned according to dummy position placement instructions in Appendix B and Appendix C.

YES X NO -

4. Close the vehicle's adjacent door, pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest, then fasten the latch. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point, pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest. Measure the contact force exerted by the belt webbing on the dummy's chest. The contact force is 0.3 pounds. Contact the COTR if the contact force exceeds 0.7 pounds.

Table 12 (cont.)

D4
LATCHPLATE ACCESSIBILITY

1. Position the test dummy in the driver's seat or passenger's seat in its forward most adjustment position.

YES X NO -

2. Attach the inboard and outboard reach string. YES X NO -

3. Extend each line backward and outboard to generate arcs of the reach envelope of the test dummy's arms. With the latchplate in the normal stowed position, check to assure that the latchplates are within the reach envelope.

YES X NO -

4. Using the clearance test block, determine if there is sufficient clearance between the vehicle seat and the side of vehicle interior to allow the test block to move unhindered to the latchplate or buckle.

YES X NO -

D5
RETRACTION

1. Seats and seat backs are adjusted according to instructions in Appendix B "General Test Conditions" in TP-208-09, dated March 15, 1993.

YES X NO -

2. Use anthropomorphic test dummies whose arms have been removed and position the dummies in the front outboard designated seating positions according to instructions in Appendix B and restrain the dummies, using the belt systems for the positions being tested.

YES X NO -

3. Outboard armrests which are capable of being stowed on vehicle seats shall be placed in their stowed positions.

YES N/A NO N/A

4. Check the option which applies to this test vehicle:

a. The torso and lap belt webbing of the seat belt system automatically retract to a stowed position when the adjacent vehicle door is in an open position and the seat belt latch plate is released.

YES X NO -

Table 12 (cont.)

b. The torso and lap belt webbing of the seat belt system automatically retract when the seat belt latchplate is released.

YES X NO -

5. With the webbing and hardware in the stowed position, close the door to assure that the webbing and hardware are prevented from being pinched.

YES X NO -

6. If this test vehicle has an open body (without doors) and has a belt system with a tension-relieving device, check to assure that the belt system fully retracts when the tension-relief device is manually deactivated.

YES N/A NO N/A

D6
ACCESSIBILITY

The requirements for accessibility do not apply to:

1. Seats whose seat cushions are removable so that the seat back serves a function other than seating;
2. Seats which are removable;
3. Seats which are movable so that the space formerly occupied by the seat can be used for a secondary function.

If the seats in this vehicle are different than the criteria above, then determine if:

1. Each manual seat belt assembly whose webbing is designed to pass through the seat cushion or between the seat cushion and seat back has one of the following three parts (the seat belt latchplate, the buckle, or the seat belt webbing) on top of or above the seat cushion under normal conditions (i.e., conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant).

YES N/A NO N/A

2. The remaining two seat belt parts are accessible under normal conditions.

YES X NO -

Table 12 (cont.)

3. The buckle and latchplate pass through the guides or conduits provided and do not fall behind the seat when the following events occur in order:

   a. The belt is completely retracted or, if the belt is non-retractable, the belt is unattached.

   YES X NO -

   b. The seat is moved to any position to which it is designed to be adjusted.

   YES X NO -

   c. The seat back, if foldable, is folded forward as far as possible and then moved backward into positions.

   YES X NO -

4. Is the inboard receptacle end of the seat belt assembly which is installed in the outboard designated seating position accessible with the center arm rest in any position to which it can be adjusted without moving the armrest?

   YES N/A NO N/A

D7
LATCH MECHANISM

A seat belt assembly installed in a passenger car, except an automatic belt assembly, shall have a latch mechanism:

1. Whose components are accessible to a seated occupant in both the stowed and operational positions.

   YES X NO -

2. That releases both the upper torso restraint and the lap belt simultaneously, if the assembly has a lap belt and an upper torso restraint that require unlatching for release of the occupant.

   YES X NO -

3. That releases at a single point by a push button action.

   YES X NO -

Figure 8

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA SHEET

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

The windshield is bonded in place with 0.4 inch, rubber molding along top and sides of windshield. Bottom of windshield is covered with 1 inch, rubber molding.

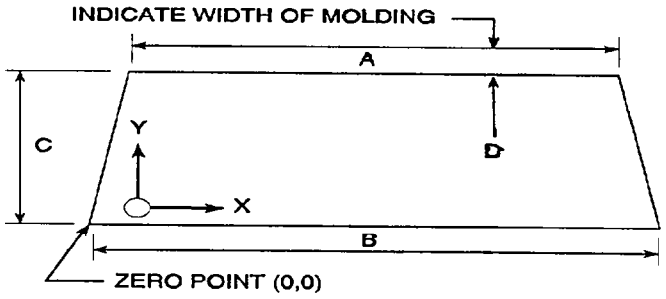
FMVSS 212 REQUIREMENTS :

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

FMVSS 212 TEST DATA :

	WINDSHIELD PERIPHERY		
	PRE - TEST (in.)	POST - TEST (in.)	PERCENT RETENTION
RIGHT SIDE	78.4	78.4	100.0
LEFT SIDE	78.4	78.4	100.0
TOTAL	156.8	156.8	100.0

AREA OF RETENTION FAILURE:



FRONT VIEW OF WINDSHIELD

FAILURE DETAILS :

None

Figure 9

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

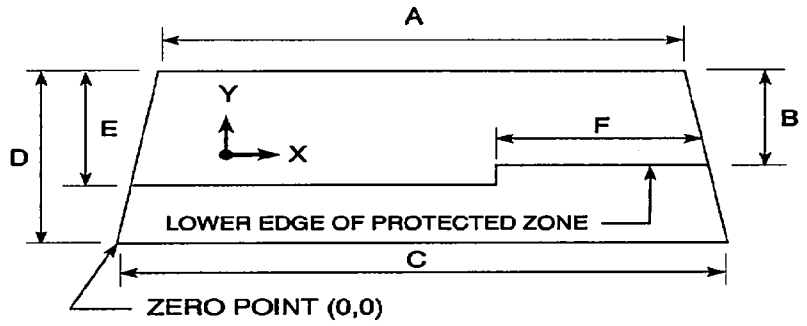
PROTECTED ZONE LOWER EDGE REQUIREMENT :

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

FMVSS 219 TEST DATA : (Dimensions in inches.)

KEY:

A= 42.5
B= 17.3
C= 55.3
D= 29.5
E= 21.0
F= 30.5



FRONT VIEW OF WINDSHIELD

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

(Show location of penetration on above sketch)

None

	COORDINATES	
	X	Y
1		
2		
3		
4		

Table 13

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

TEST VEHICLE NHTSA NO. : CR0208 TEST DATE : July 28, 1994

Vehicle Mfgr./Make/Model : 1994 Ford Aspire 3-door hatch back

Test vehicle fuel tank filled to 92% 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 :

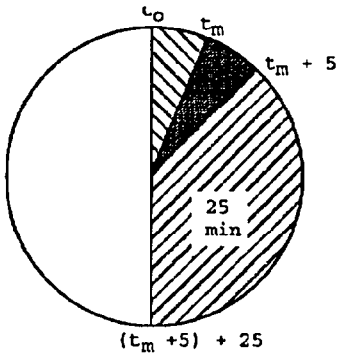
X Frontal (30 mph)

\- Oblique (30 mph) with - °barrier face first contacting - (driver/passenger) side

\- Rear Moving Barrier (30 mph)

\- Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT:



1. From impact until vehicle motion ceases
2. For 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 :

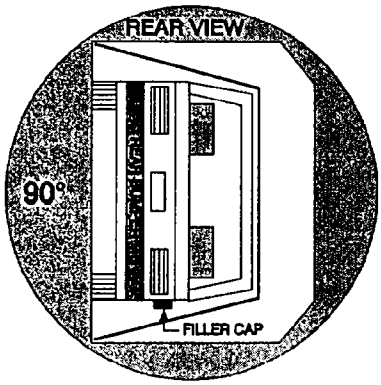
None

Table 145

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE :
0-90 Deg.

Vehicle NHTSA ID No. :
CR0208



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)		1	minutes	57	seconds
FMVSS 301 Position Hold Time +		5	minutes	00	seconds
	TOTAL	6	minutes	57	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	0	0	N/A

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

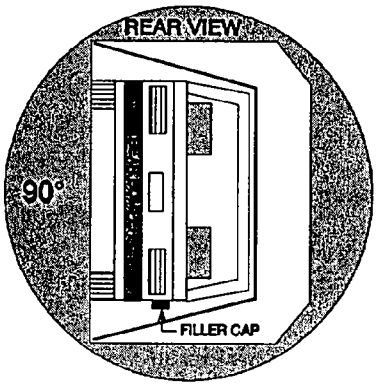
IV. SOLVENT SPILLAGE LOCATION(S) :

None

Table 14
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE :
90-180 Deg.

Vehicle NHTSA ID No. :
CR0208



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)		1	minutes	55	seconds
FMVSS 301 Position Hold Time +		5	minutes	00	seconds
	TOTAL	6	minutes	55	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	0	0	N/A

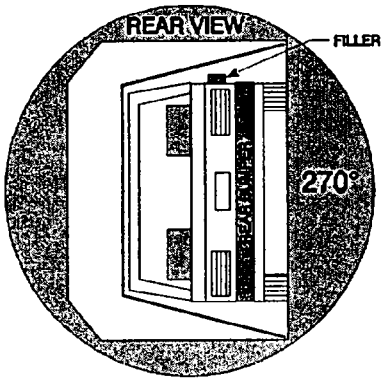
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S) :
None

Table 14
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE :
180-270 Deg.

Vehicle NHTSA ID No. :
CR0208



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)		1	minutes	50	seconds
FMVSS 301 Position Hold Time +		5	minutes	00	seconds
	TOTAL	6	minutes	50	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	0	0	N/A

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

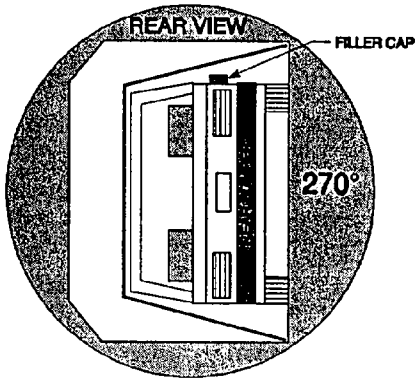
IV. SOLVENT SPILLAGE LOCATION(S) :

None

Table 14
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE :
270-360 Deg.

Vehicle NHTSA ID No. :
CR0208



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)		1	minutes	49	seconds
FMVSS 301 Position Hold Time +		5	minutes	00	seconds
	TOTAL	6	minutes	49	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	0	0	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S) :

None

Table 15

POST TEST AIR BAG DATA

NHTSA No. : CR0208; Test Date: July 28, 1994; Technician: R.E.

Vehicle Model Year/Make/Model: 1994 Ford Aspire

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

B. Size of vent holes: (In.^{2}) 1.3 -Driver 1.3 -Passenger

C. Total vent area: (In.^{2}) 2.6 -Driver 2.6 -Passenger

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

Driver: - -Length; - -Width; 27.3 -Diameter

Passenger: 24.0 -Height; 21.0 -Width; 33.5 -Depth

E. Is the air bag tethered?

Driver: X -Yes; - -No; If yes, record length of tether- 10.0

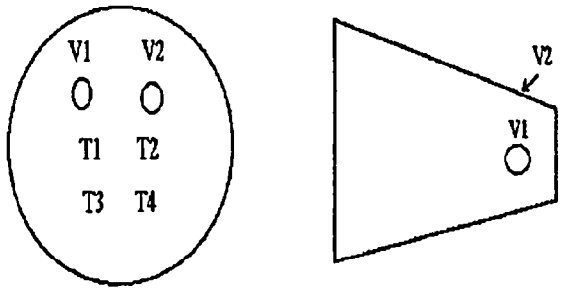
Passenger: - -Yes; X -No; If yes, record length of tether- N/A

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.

Driver air bag contains 4 tether straps connected from gas generator to front, center diameter of air bag material. Passenger air bag is not tethered.

(Note: Not to scale; V_n = Vent hole$_n$, T_n = Tether$_n$).

DRIVER AIR BAG (Font view) PASSENGER AIR BAG (Right side view)



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

Driver: Gas generator: Ford X50-57-K00D/Air bag: 315 318 C

Passenger: TRW VSSI DX50-57-K50 A / CMZ 3005 H120218

G. Cut out a 6 inch by 6 inch swatch of the bag material and at least one tether from each bag, mark the vehicle's NHTSA number on the swatch, and send these parts to the COTR with the test report.

Table 16

ACCIDENT INVESTIGATION DIVISION DATA

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1994 Ford Aspire 3-door hatch back

VEHICLE NHTSA NO. : CR0208 VIN NO. : KNJLT05H2R6110476

WHEELBASE: 91.4 in BUILD DATE: 1/31/94 TEST DATE: July 28, 1994

VEH SIZE CATEGORY: Compact TEST WEIGHT: 2390

FRONT OVERHANG: 21.5 OVERALL WIDTH: -

COLLISION DEFORMATION (CDC) CODE: 12FDEW2

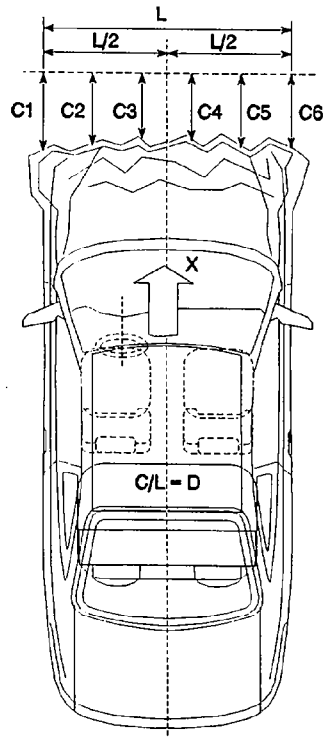
IMPACT MODE: 30 mph zero degree frontal barrier

CRUSH DEPTH DIMENSIONS: (Inches)

C1 =	12.8	C4 =	17.5
C2 =	14.6	C5 =	16.6
C3 =	16.5	C6 =	13.3

MIDPOINT OF DAMAGE: D=
(Vehicle Longitudinal Centerline) 27.9

LENGTH OF DAMAGE
REGION: L= 55.8



Remarks: None

Table 17
TEST VEHICLE NONCOMPLIANCE NOTICE

NHTSA Contract Lab : Calspan Advanced Technology Center

Lab Project Manager & Telephone No. : David J. Travale (716) 632 - 7500

Date of Test : July 28, 1994 Vehicle NHTSA No. : CR0208

Vehicle Manufacturer : KIA MOTORS COMPANY

Model Year : 1994 VIN : KNJLT05H2R6110476

Model : Aspire Body Style: 3-door hatch back Build Date : 1/31/94

Dummy Stabilized Temperature at Time of Test : 70 °F (Spec. = 69 - 72 °F)

Impact Velocity : 29.7 mph; Time of Test : 11:22

Type of Automatic Restraint System :

Driver : Air bag

Passenger : Air bag

Failure Details :

The vehicle, as tested, appears to meet the requirements of FMVSS Nos. 208, 212, 219(partial), and 301.

Appendix A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure A-1 PRE-TEST FRONT VIEW

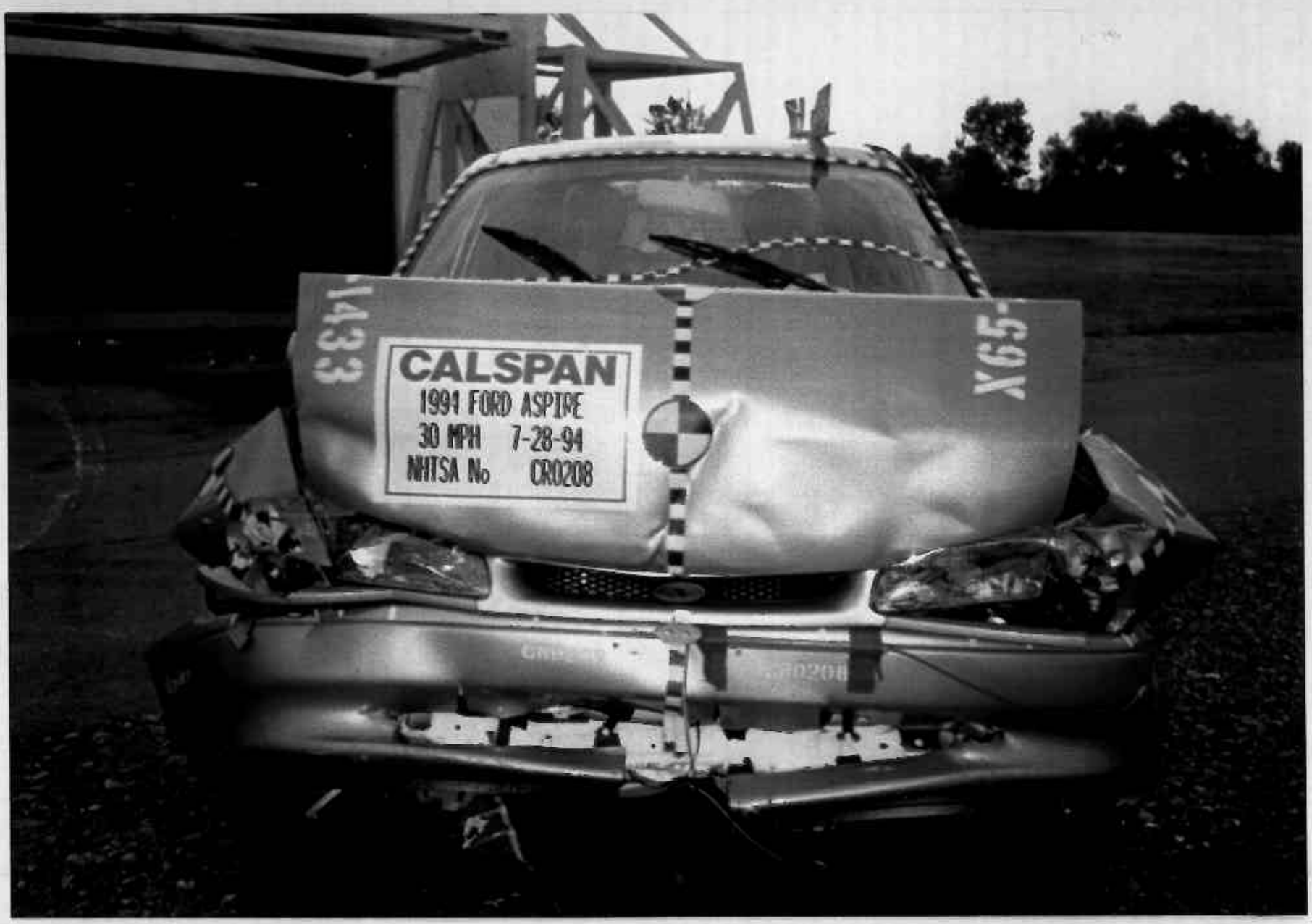


Figure A-2 POST-TEST FRONT VIEW

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

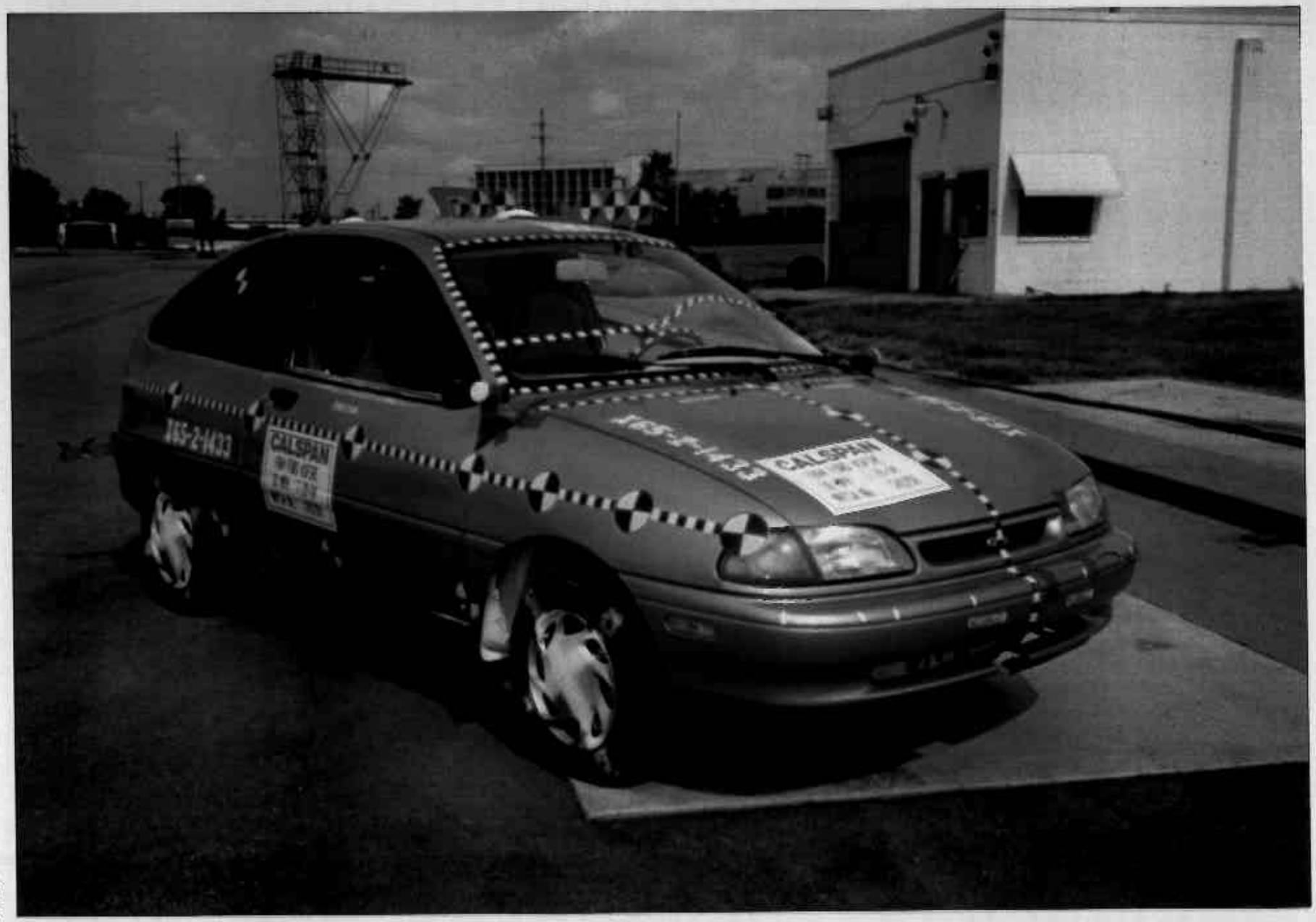


Figure A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

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

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

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

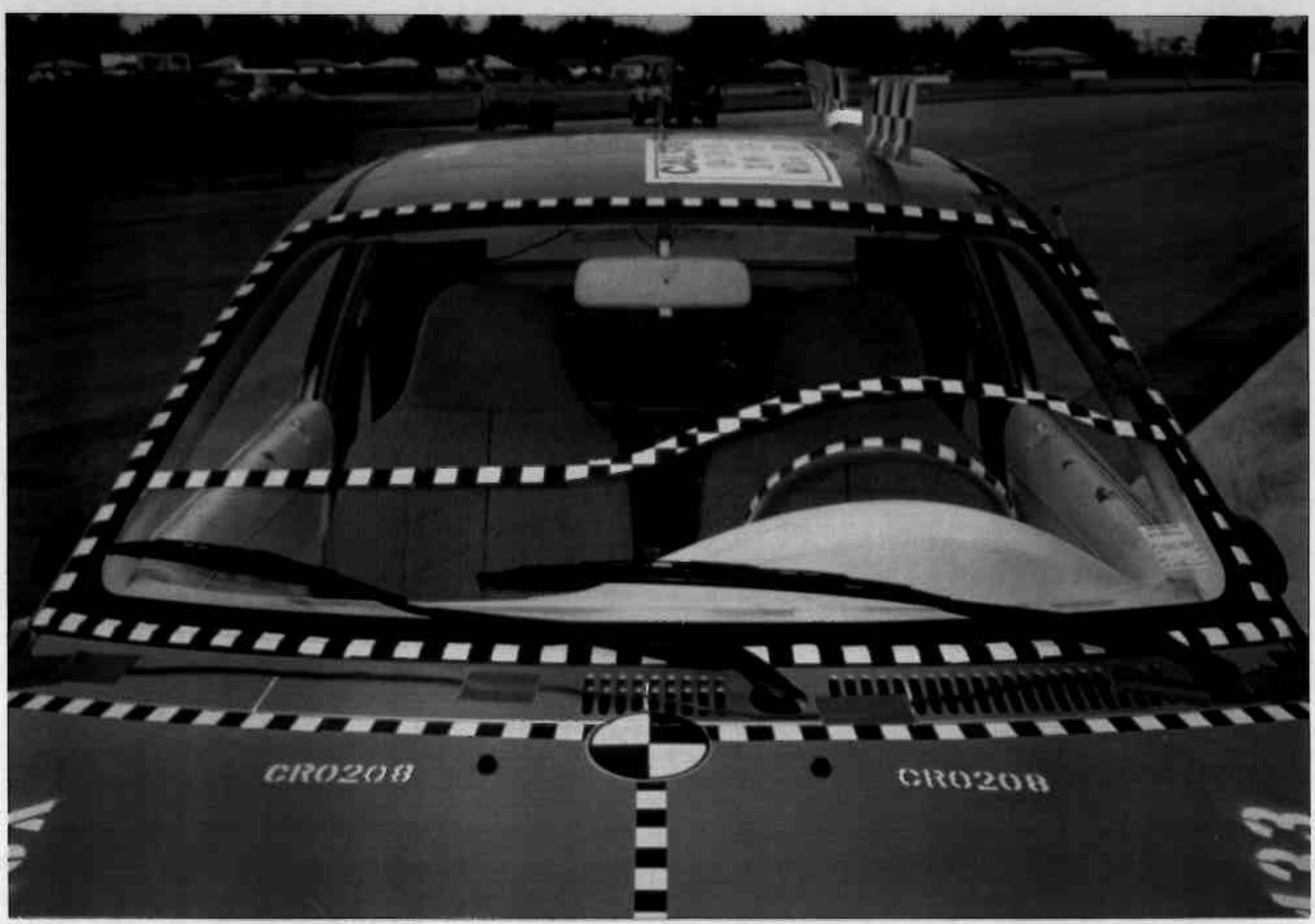


Figure A-11 PRE-TEST WINDSHIELD VIEW

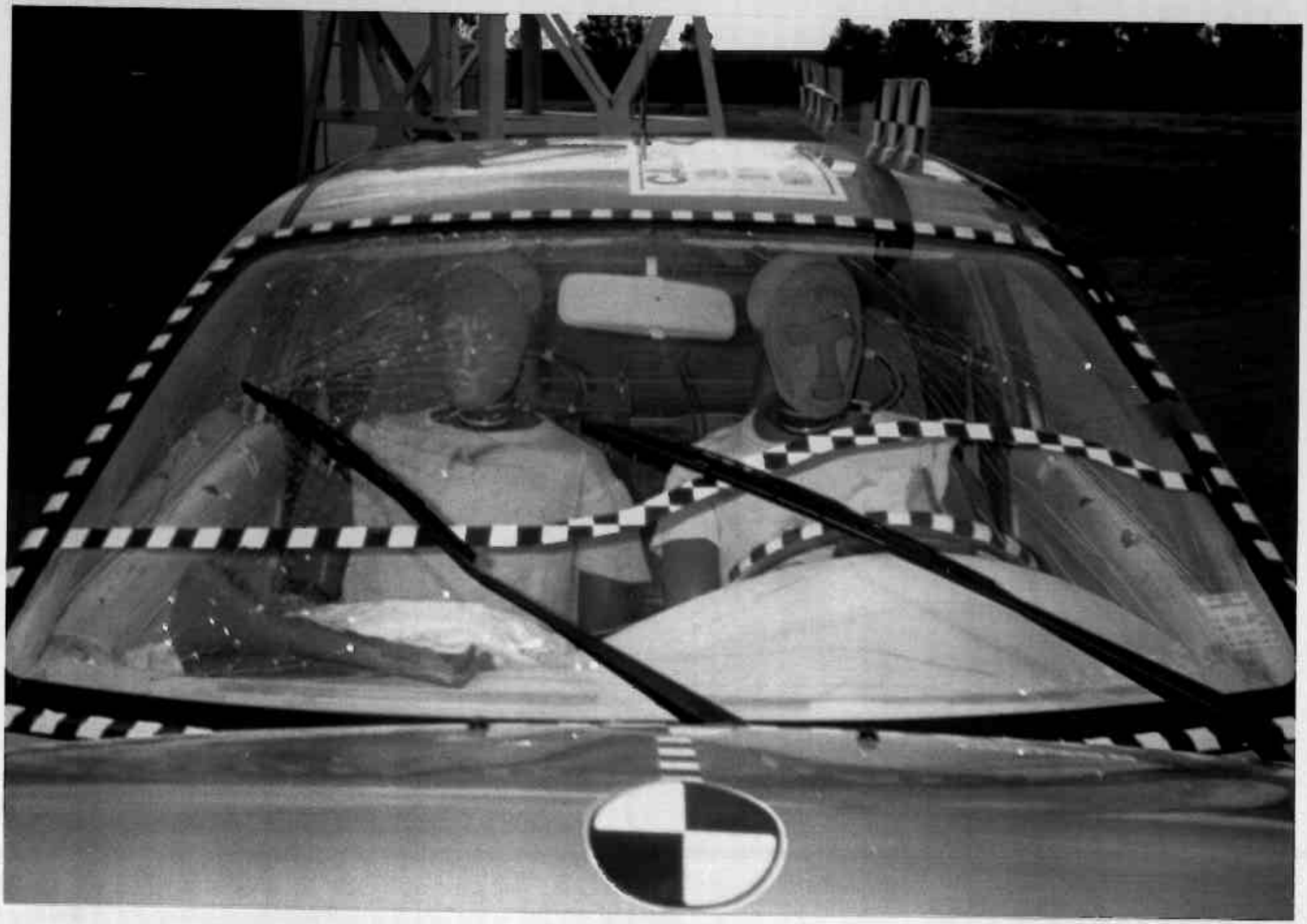


Figure A-12 POST-TEST WINDSHIELD VIEW

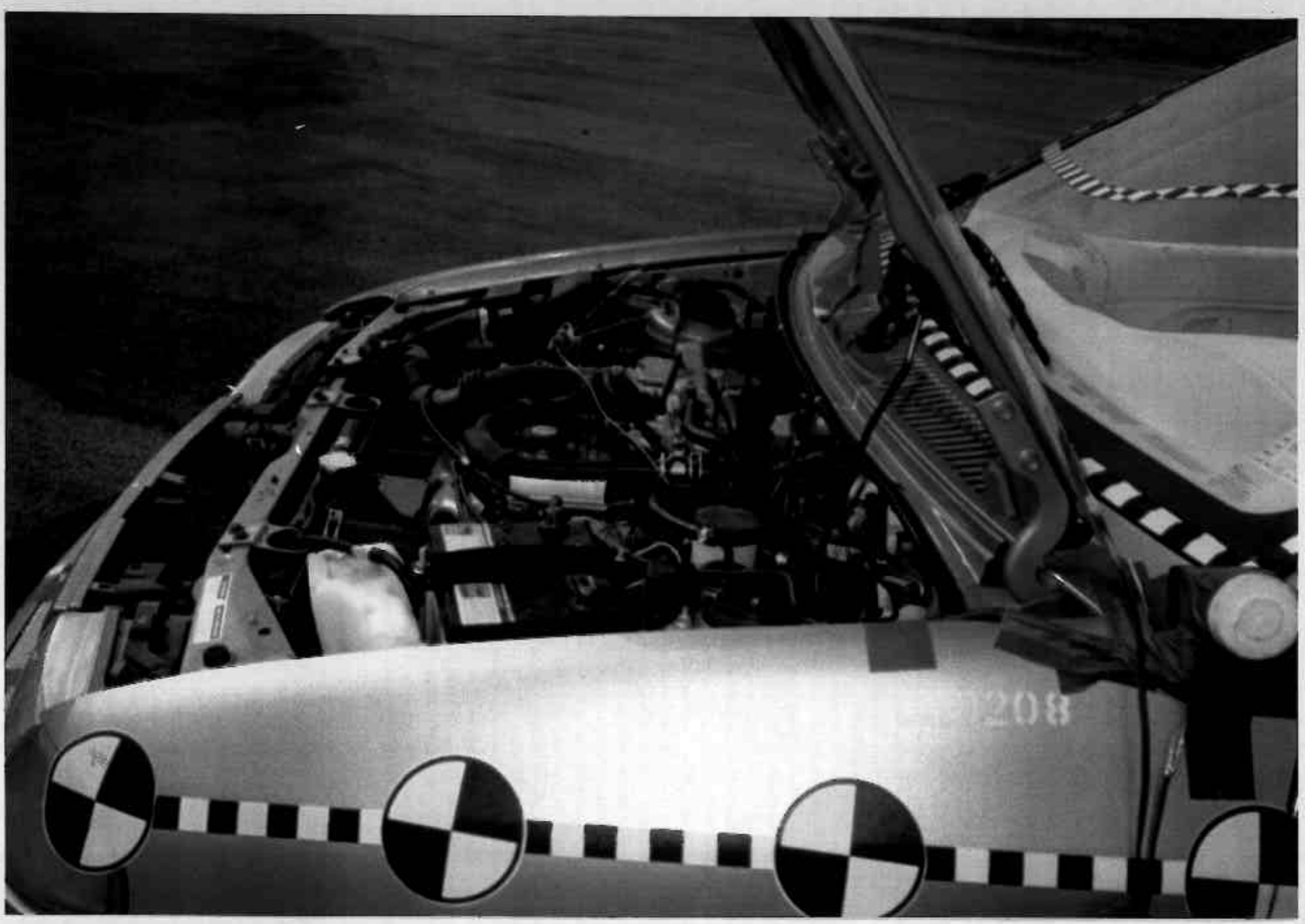


Figure A-13 PRE-TEST ENGINE COMPARTMENT VIEW

Figure A-14 POST-TEST ENGINE COMPARTMENT VIEW

A-17

8221-2

Figure A-15 PRE-TEST FUEL FILLER CAP

Figure A-16 POST-TEST FUEL FILLER CAP

8221-2

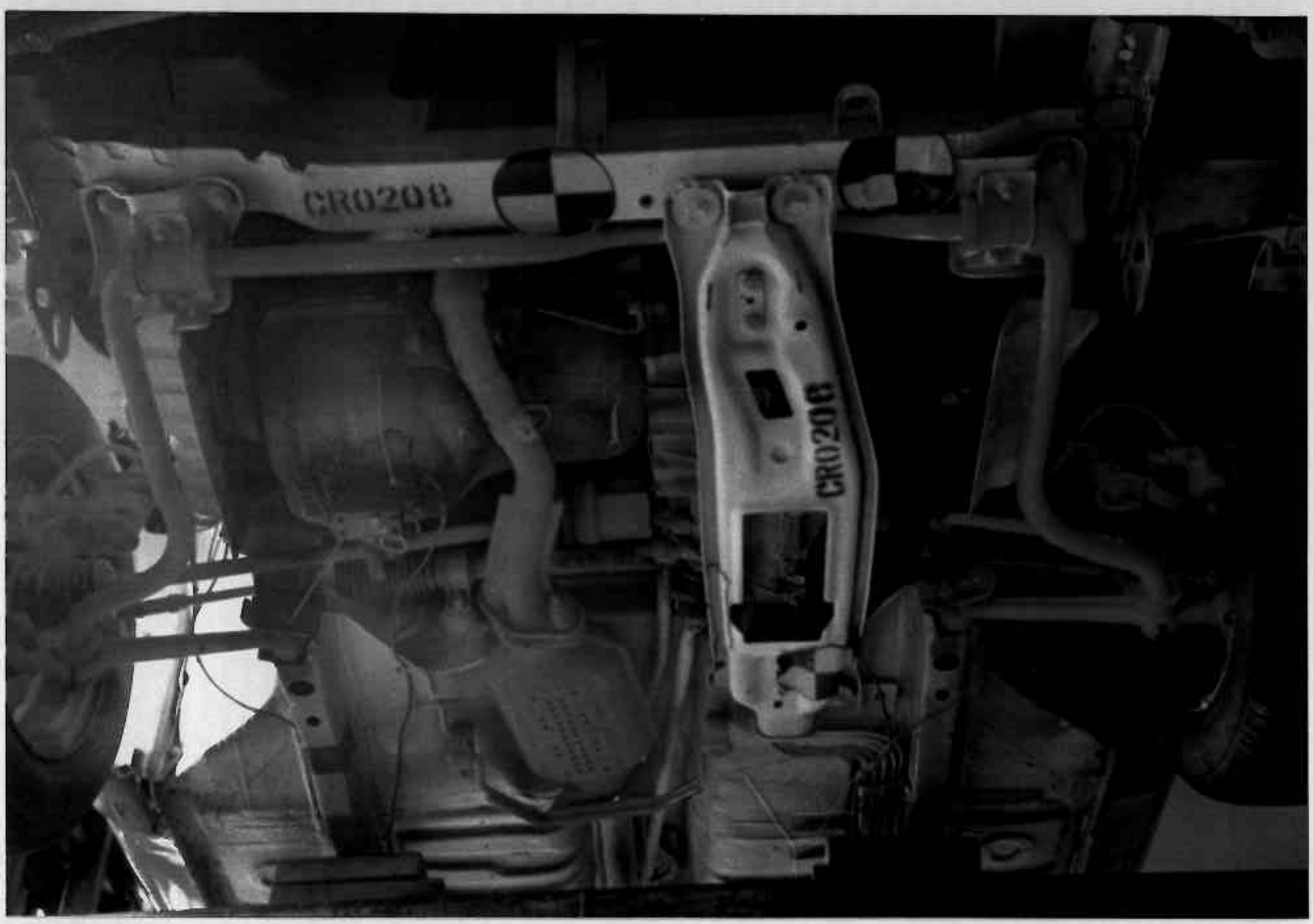


Figure A-17 PRE-TEST FRONT UNDERBODY VIEW

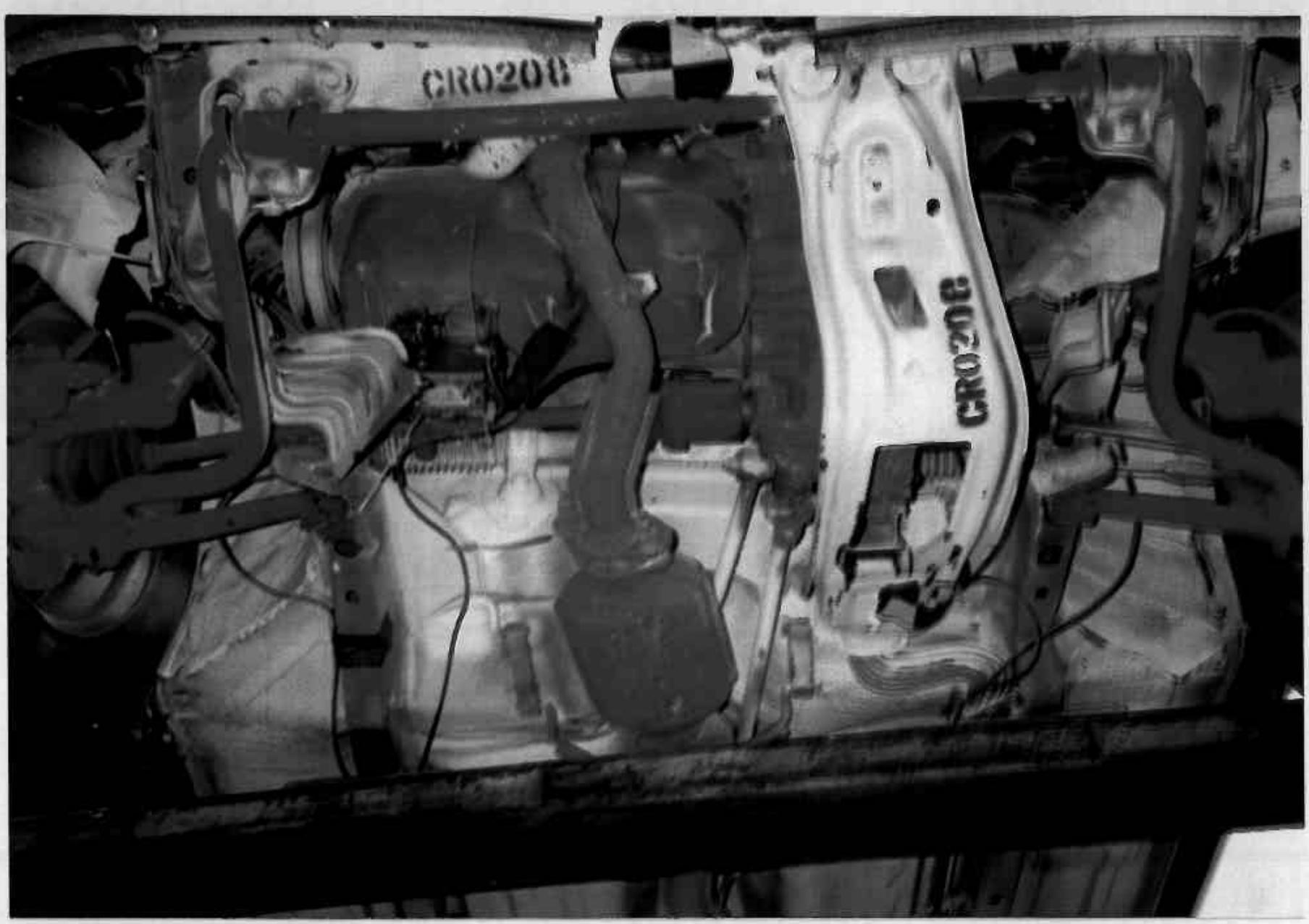


Figure A-18 POST-TEST FRONT UNDERBODY VIEW

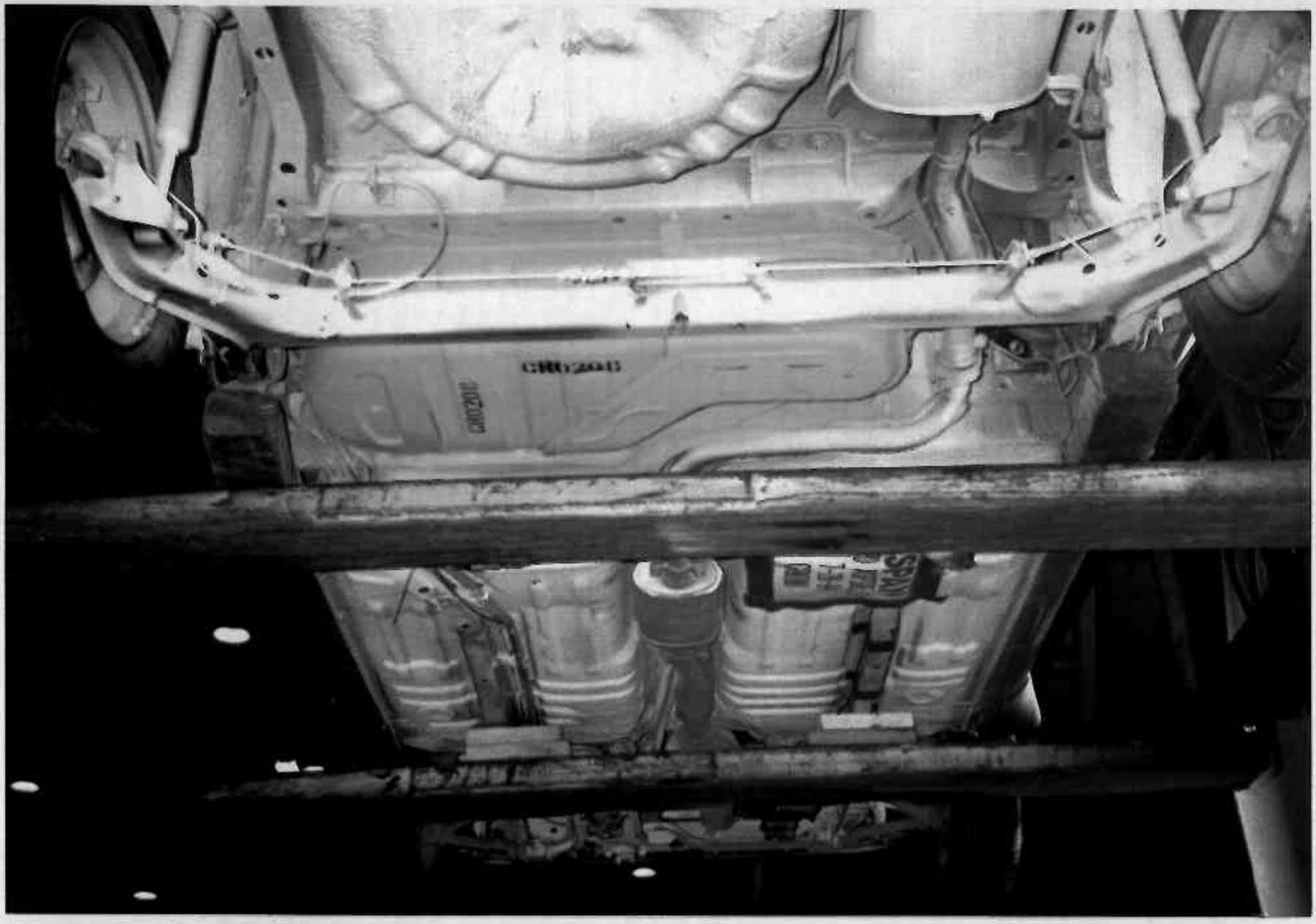


Figure A-19 PRE-TEST REAR UNDERBODY VIEW

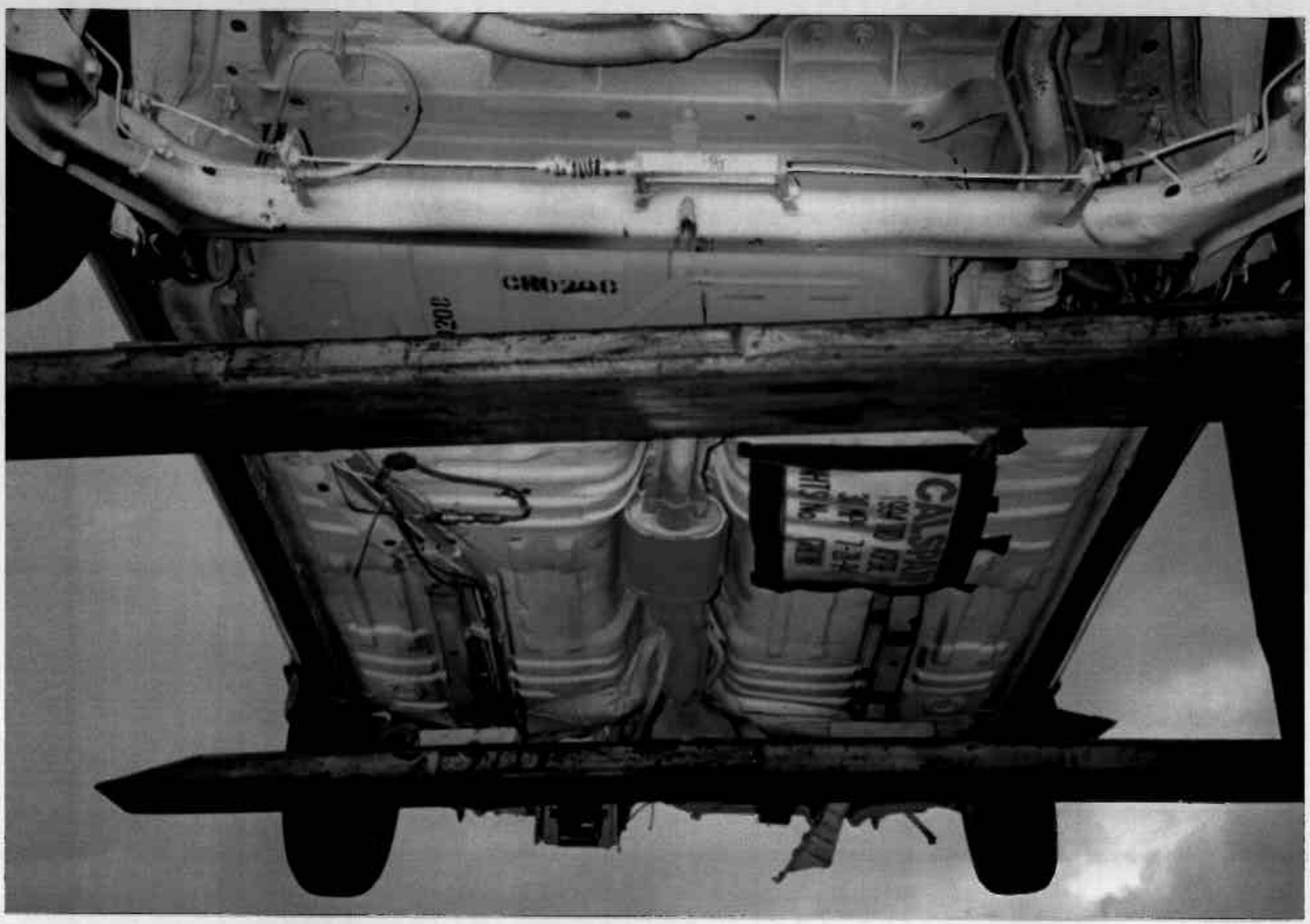


Figure A-20 POST-TEST REAR UNDERBODY VIEW

Figure A-21 PRE-TEST DRIVER SIDE VIEW

Figure A-22 POST-TEST DRIVER SIDE VIEW

Figure A-23 PRE-TEST DRIVER FRONT VIEW

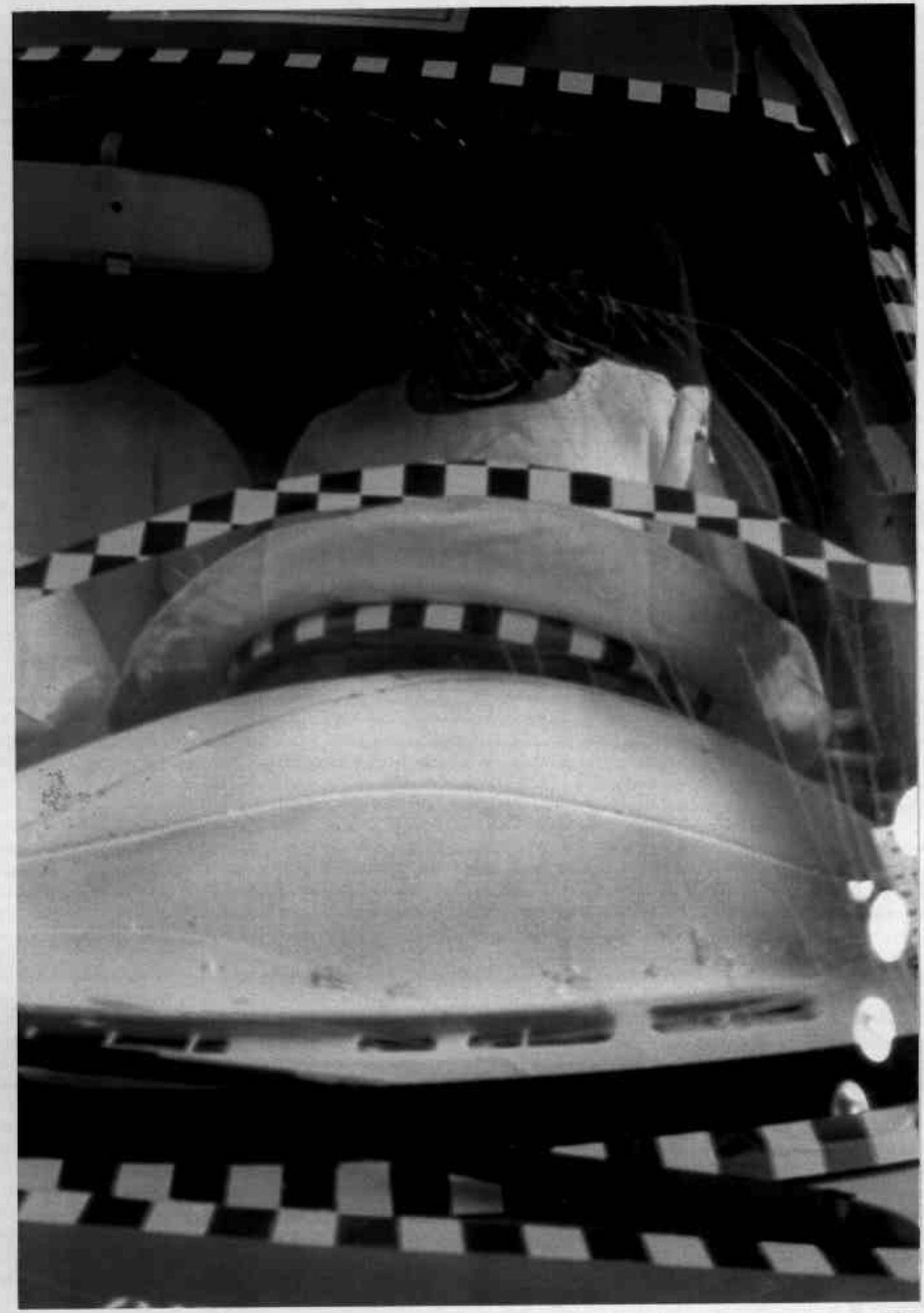


Figure A-24 POST-TEST DRIVER FRONT VIEW

Figure A-25 PRE-TEST DRIVER DUMMY AND INTERIOR VIEW

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

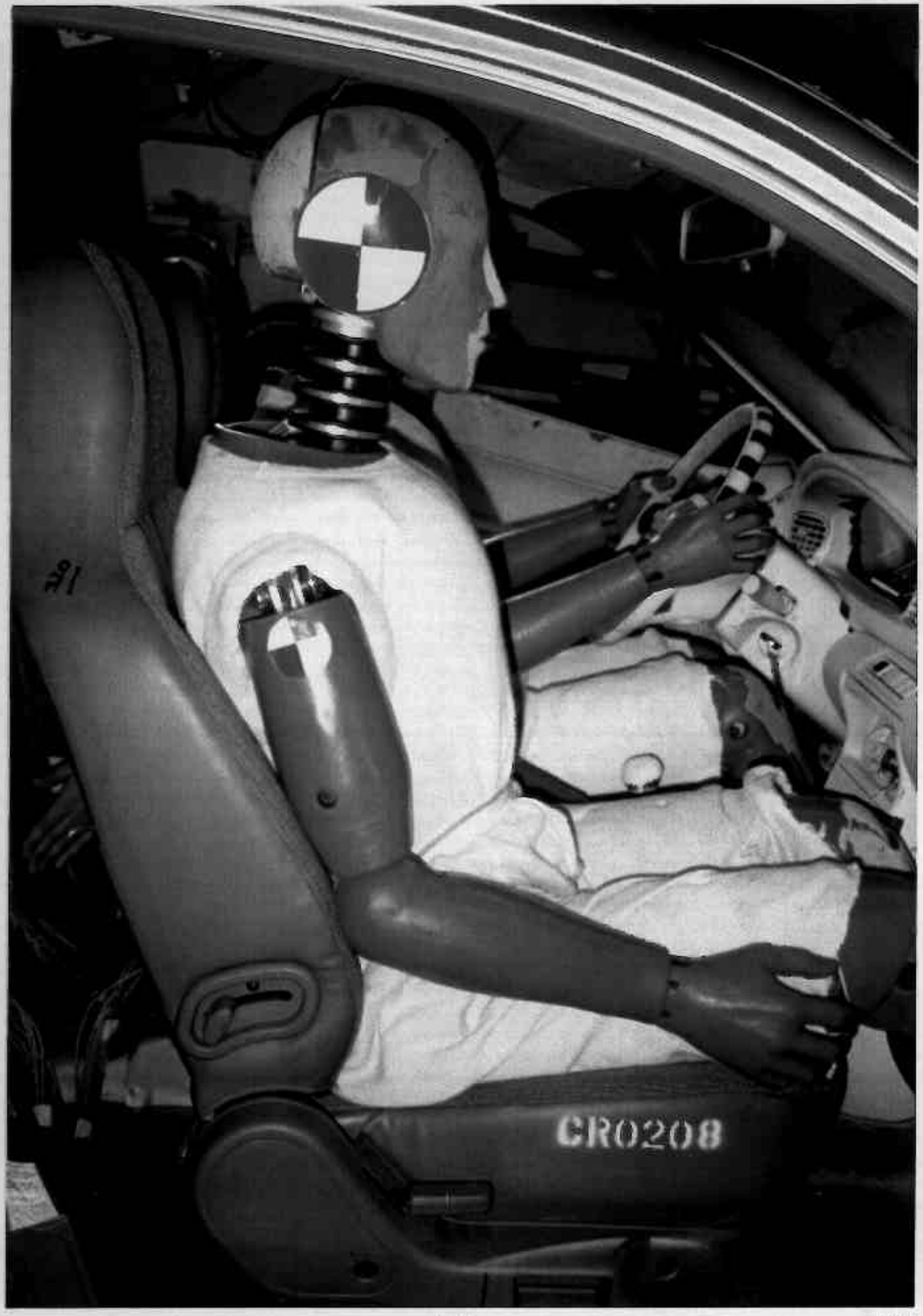


Figure A-27 PRE-TEST PASSENGER SIDE VIEW

Figure A-28 POST-TEST PASSENGER SIDE VIEW

Figure A-29 PRE-TEST PASSENGER FRONT VIEW

Figure A-30 POST-TEST PASSENGER FRONT VIEW

Figure A-31 PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW

Figure A-32 POST-TEST PASSENGER DUMMY AND INTERIOR VIEW

Figure A-33 PRE-TEST UNDERBODY STEERING SHAFT

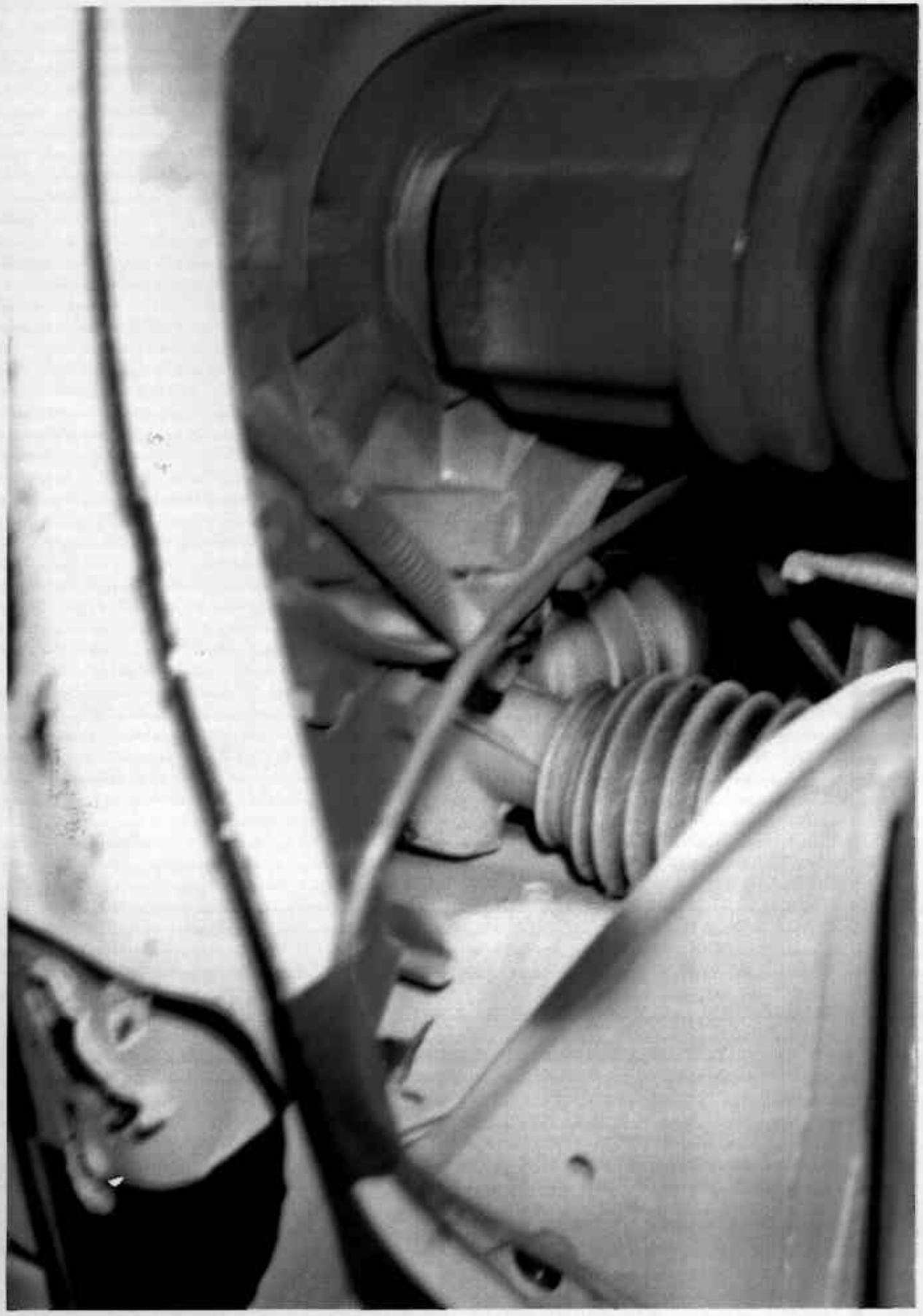


Figure A-34 POST-TEST UNDERBODY STEERING SHAFT

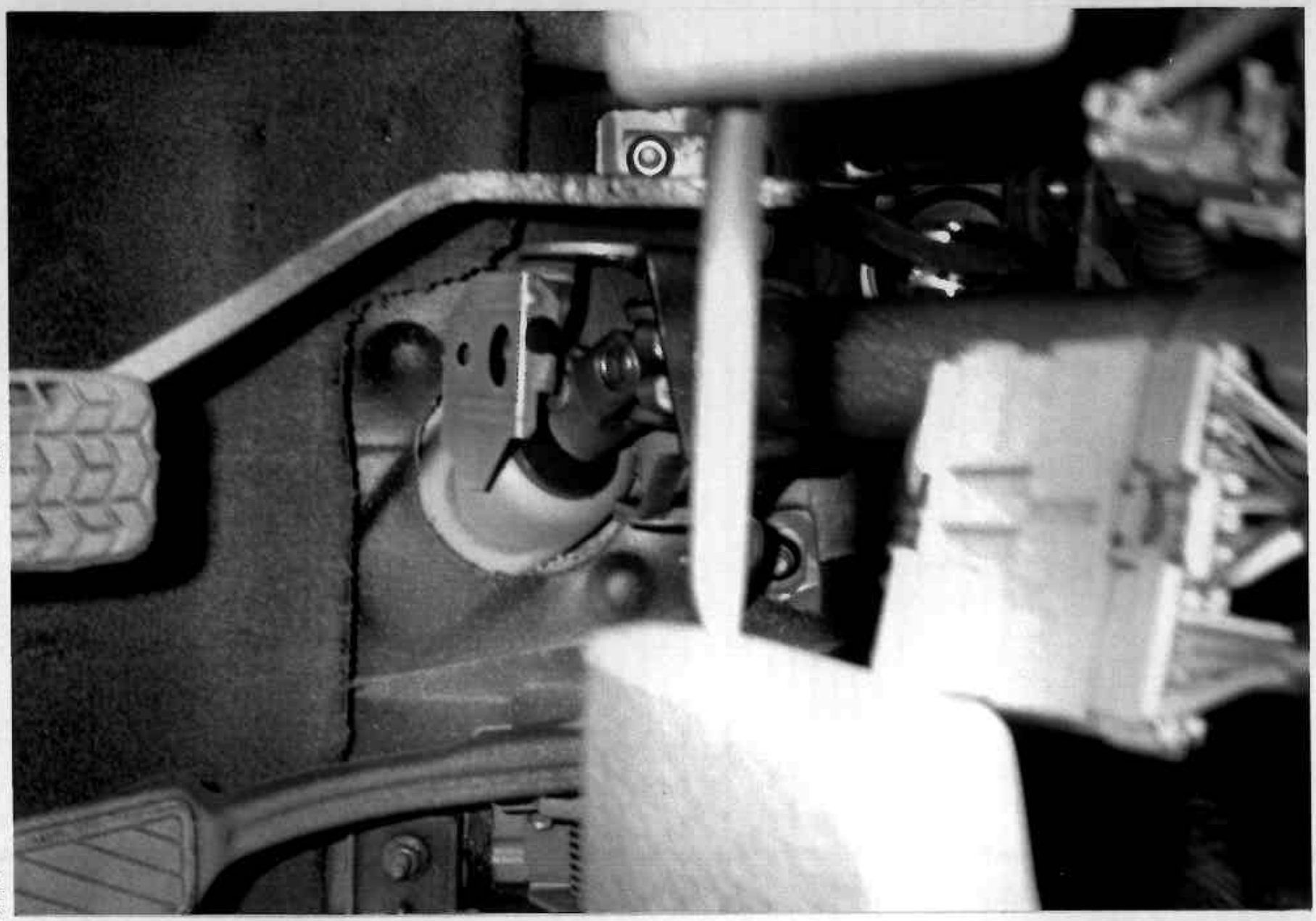


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Figure A-35 PRE-TEST STEERING COLUMN/FIREWALL INSIDE VIEW

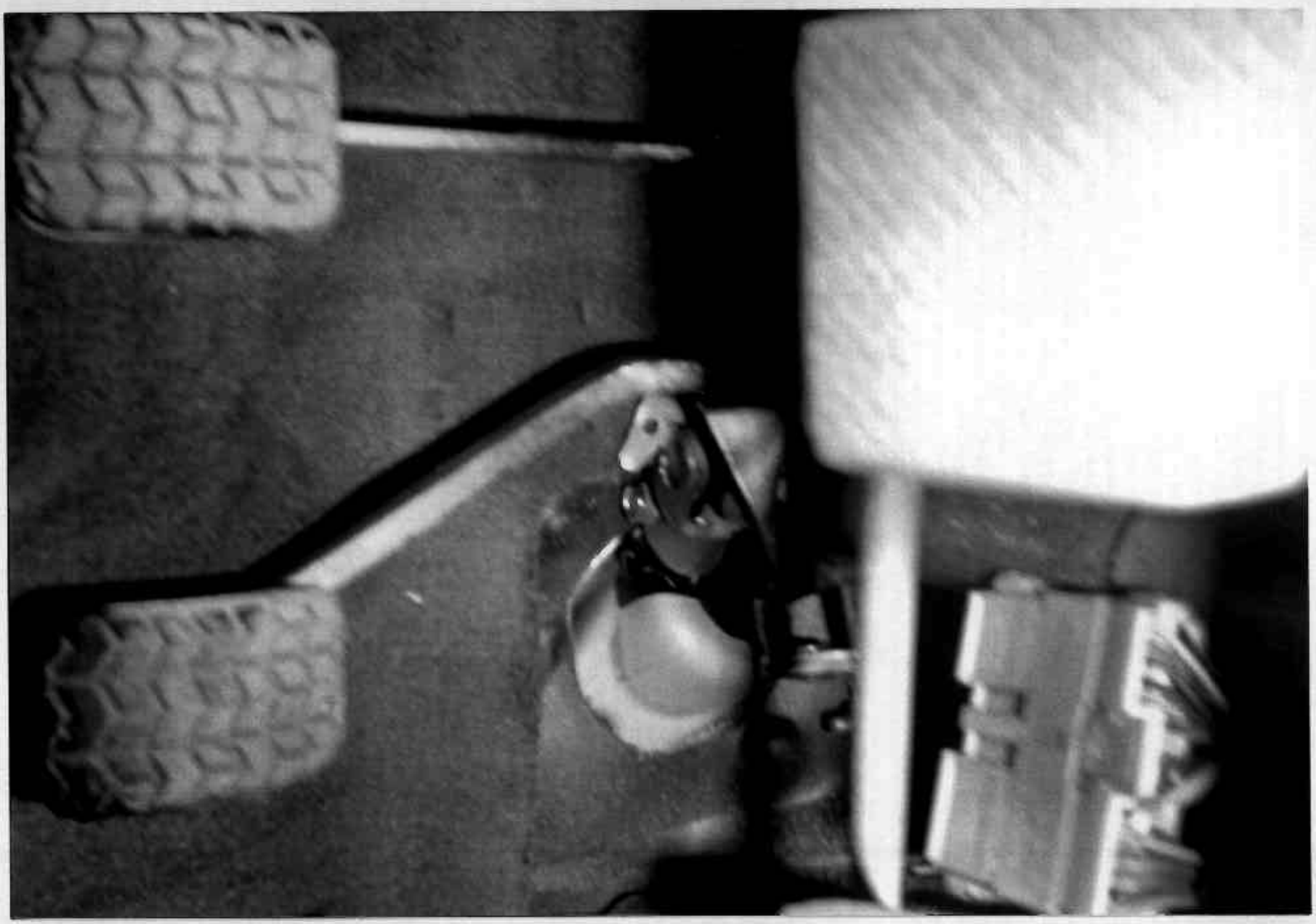
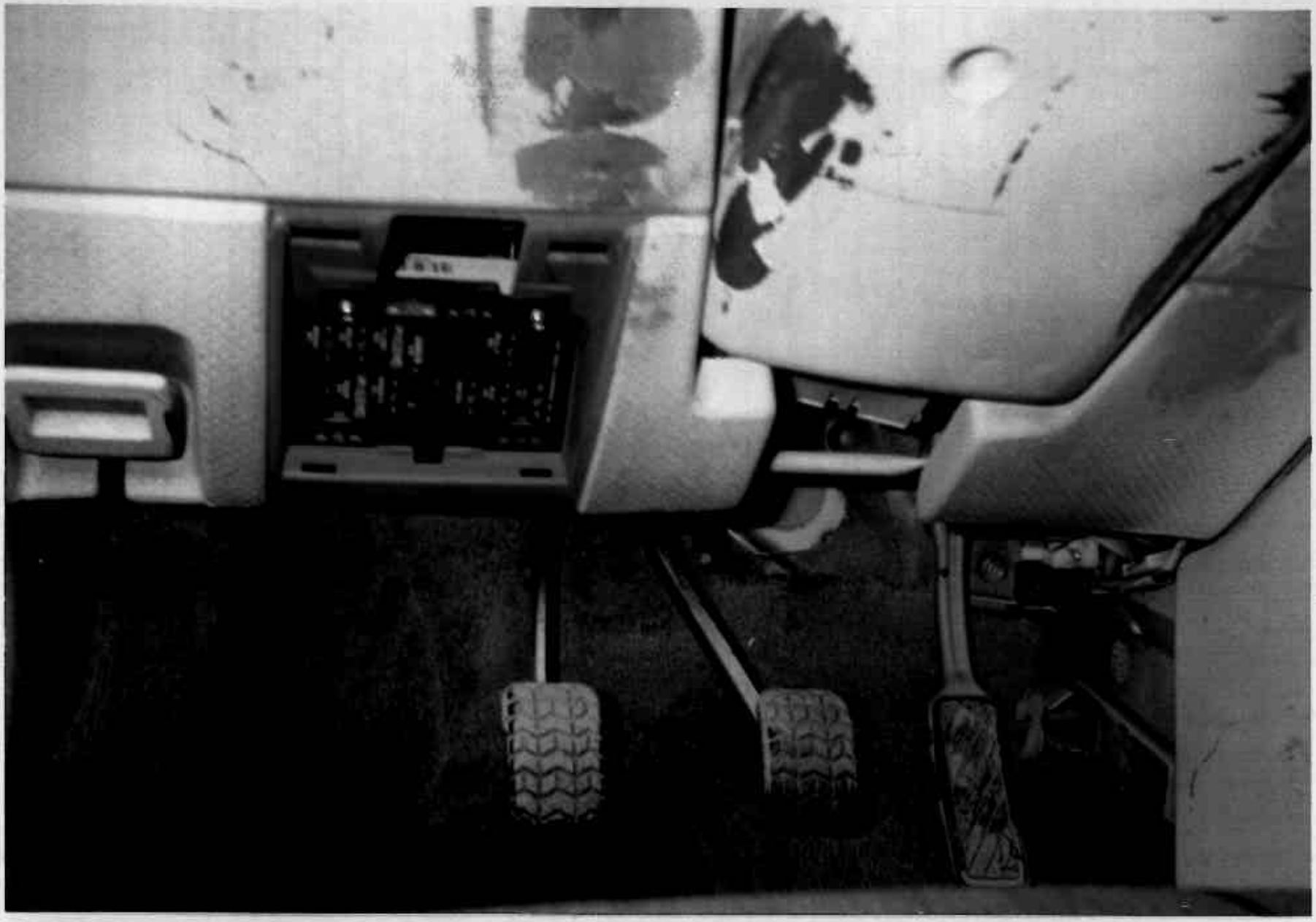


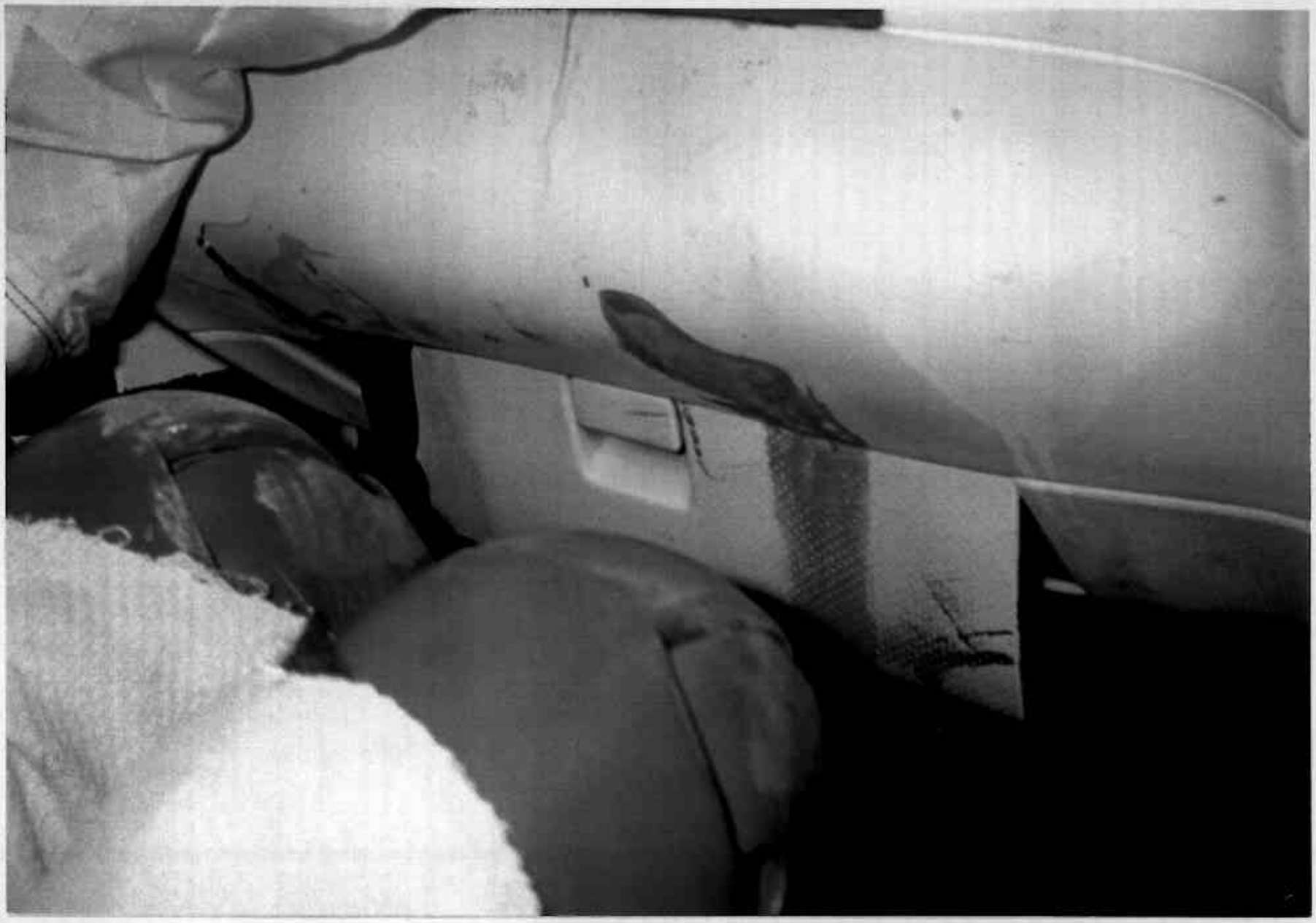
Figure A-36 POST-TEST STEERING COLUMN/FIREWALL INSIDE VIEW



A-39

8221-2

Figure A-37 POST-TEST DRIVER KNEE BOLSTER



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8221-2

Figure A-38 POST-TEST PASSENGER KNEE BOLSTER

PHOTOGRAPH NOT AVAILABLE

Figure A-39 POST-TEST VEHICLE TOP VIEW

Figure A-40 VEHICLE IMPACT

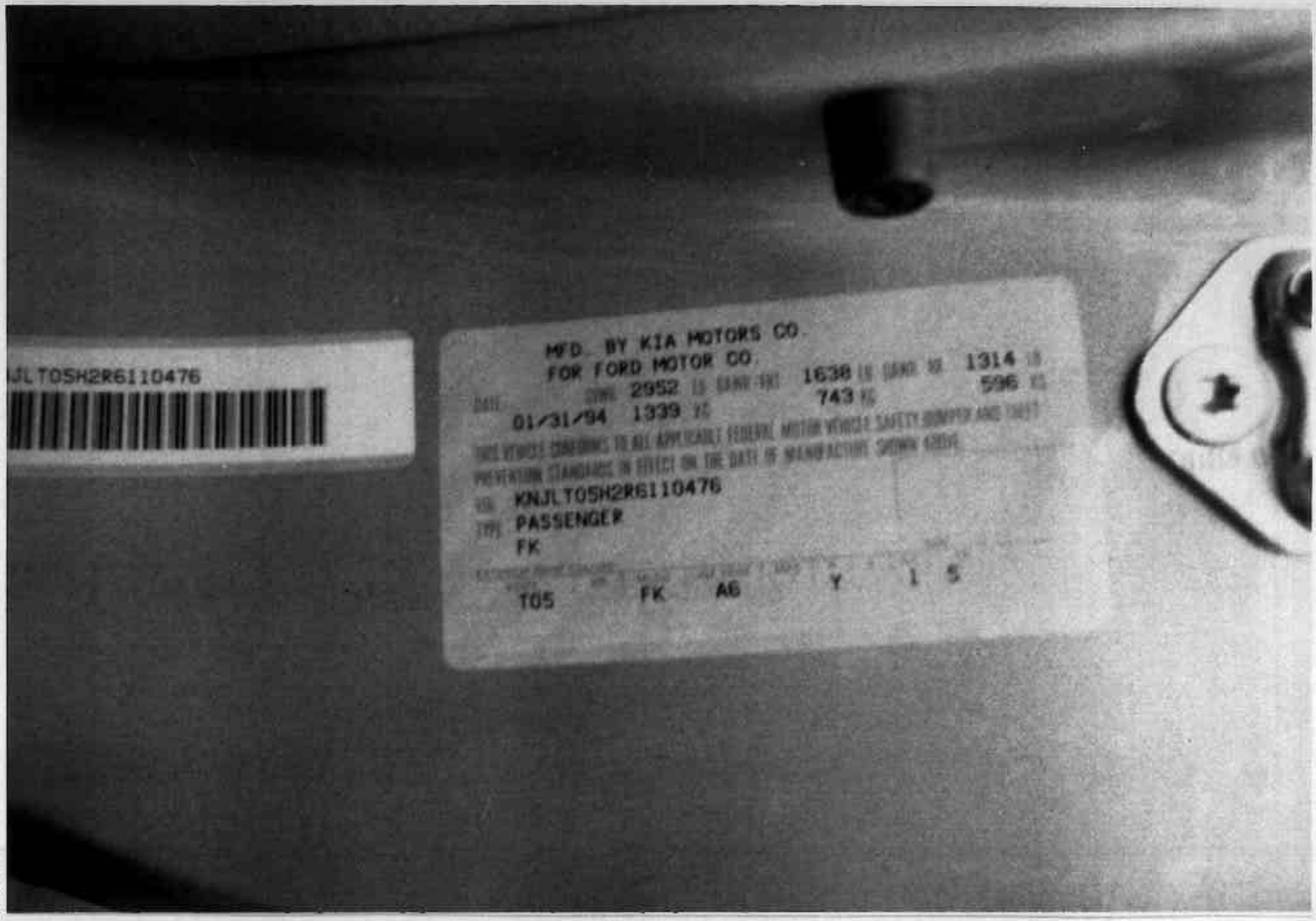


Figure A-41 CERTIFICATION PLACARD

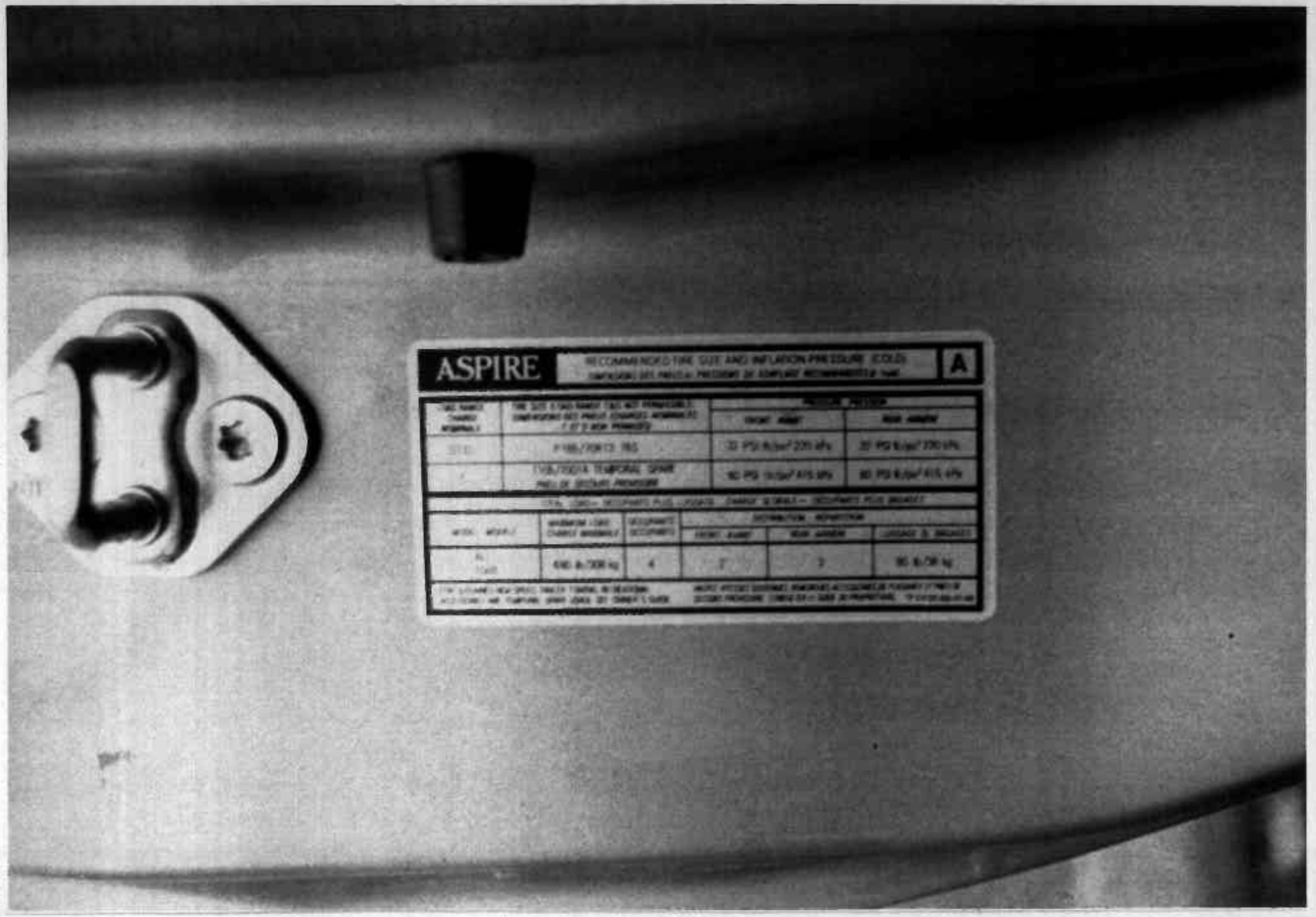


Figure A-42 TIRE PLACARD

Figure A-43 POST-TEST DRIVER AIRBAG VIEW

Figure A-44 POST-TEST PASSENGER AIRBAG VIEW

Appendix B

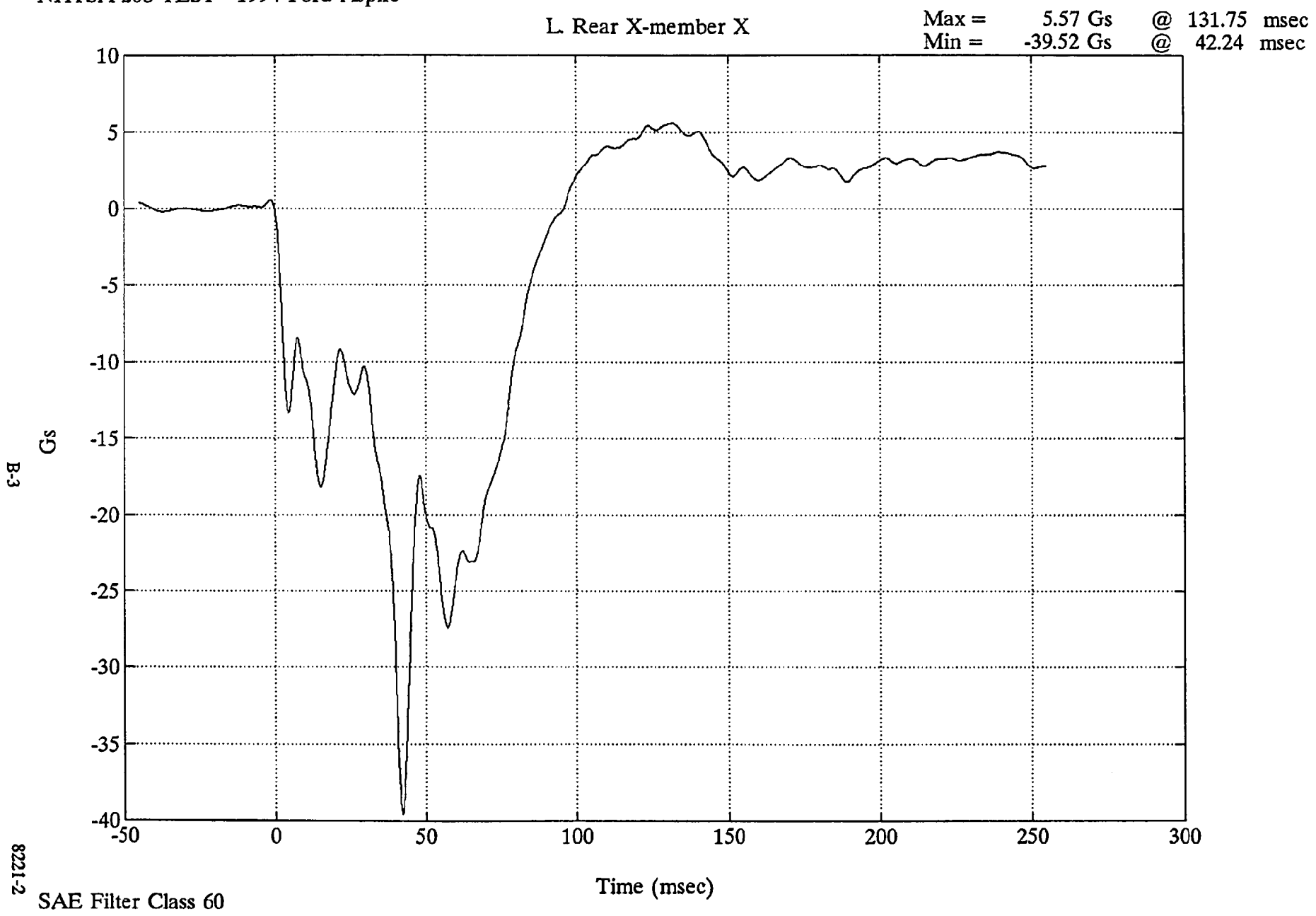
VEHICLE AND DUMMY RESPONSE DATA

NOTE : Data trace scales are automatically scaled at the request of the COTR. Use caution when reviewing data.

TEST NO. CR0208

VEHICLE	SAE FILTER CHANNEL CLASS
	60

NHTSA 208 TEST - 1994 Ford Aspire



B-3

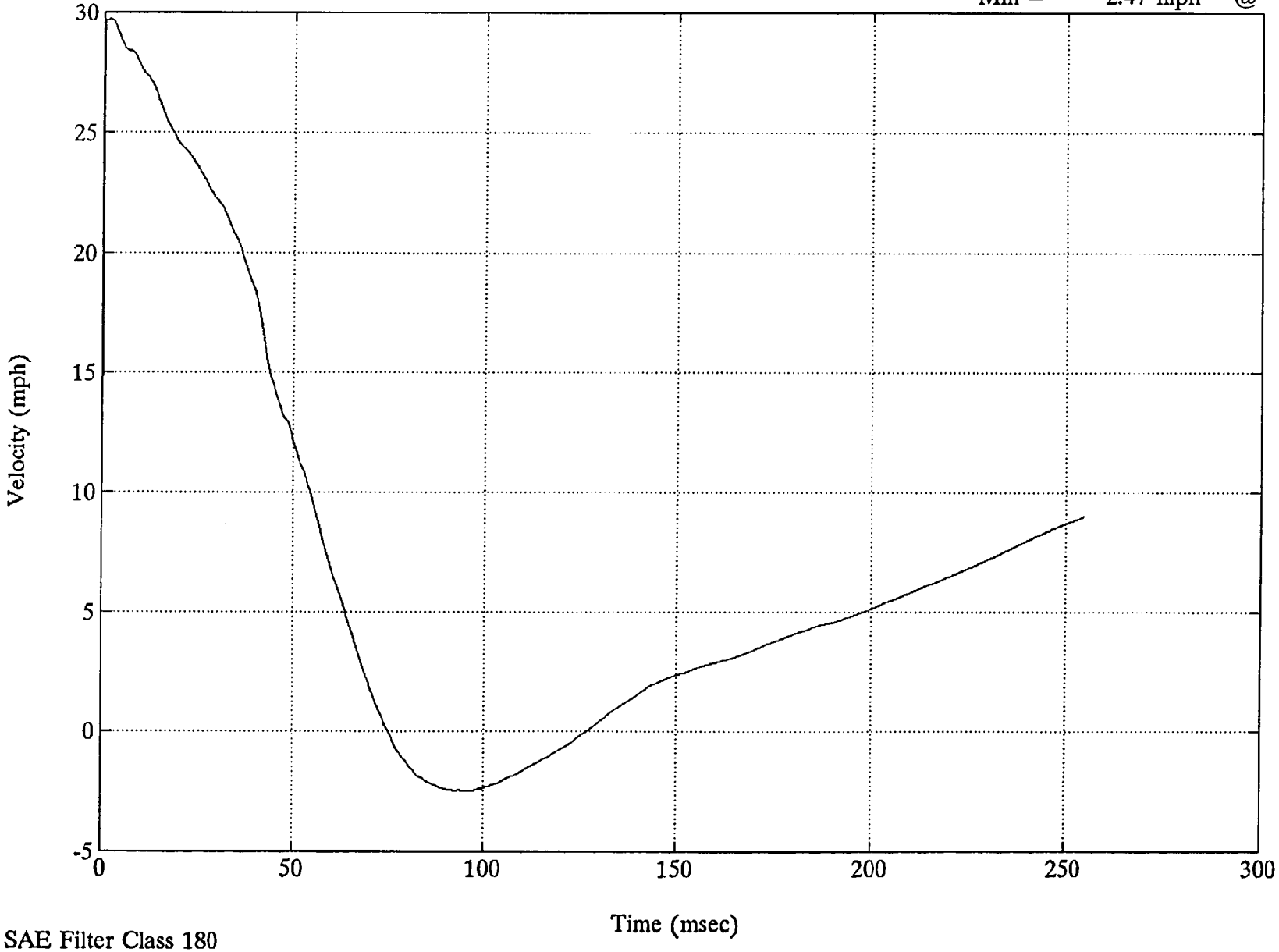
8221-2

SAE Filter Class 60

NHTSA 208 TEST - 1994 Ford Aspire

L. Rear X-member X

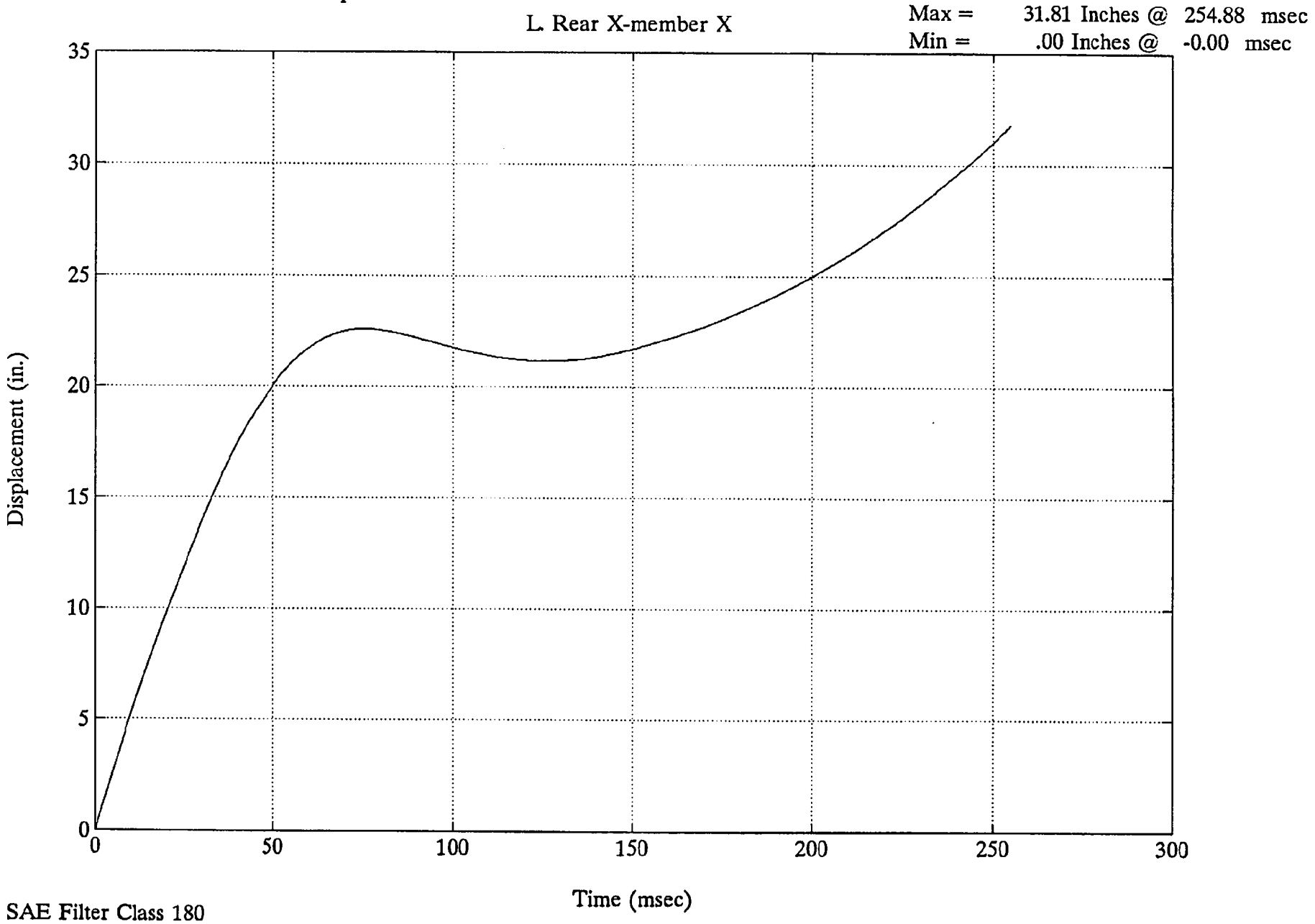
Max = 29.72 mph @ 1.55 msec
Min = -2.47 mph @ 96.00 msec



SAE Filter Class 180

8221-2

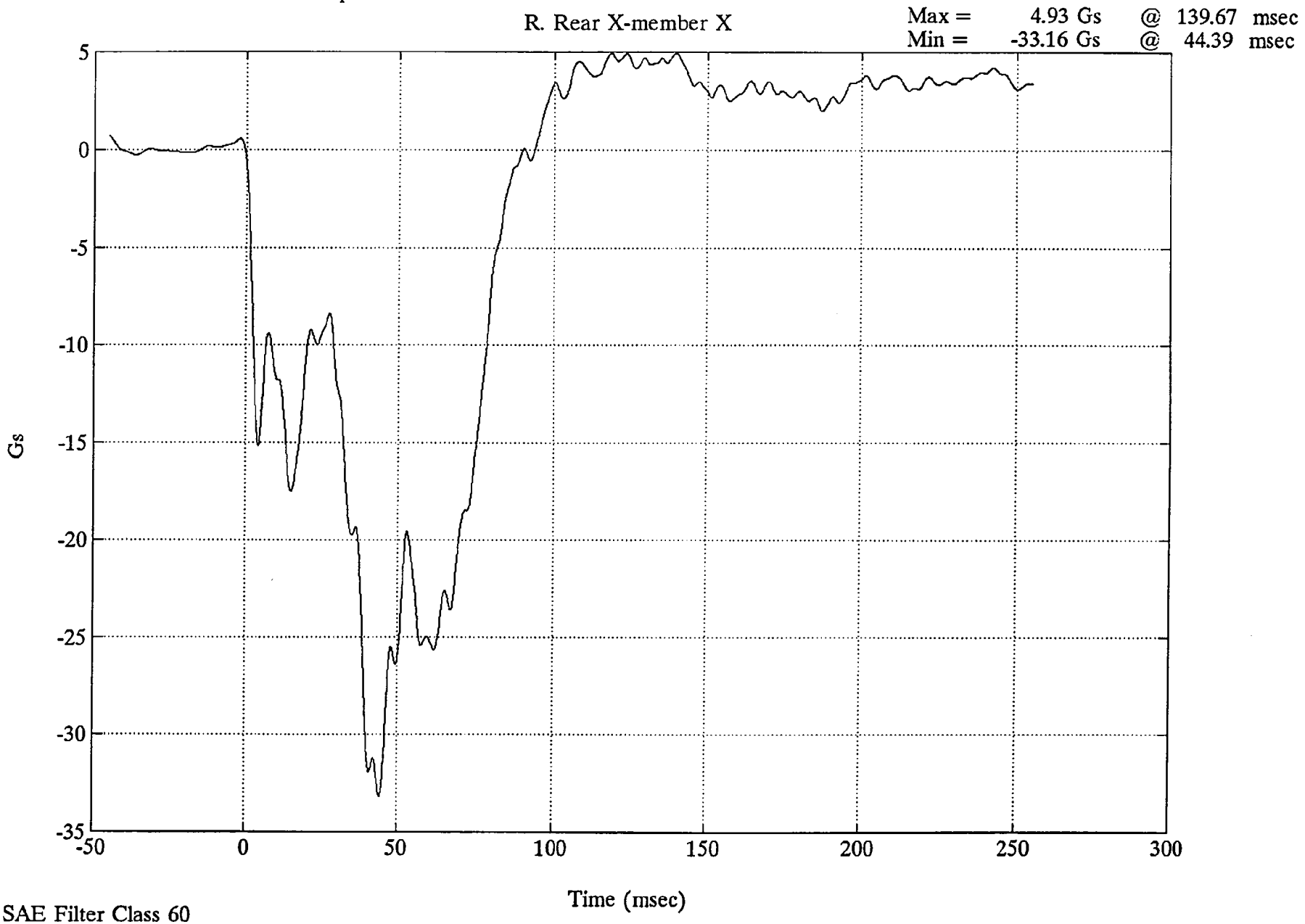
NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

8221-2

NHTSA 208 TEST - 1994 Ford Aspire



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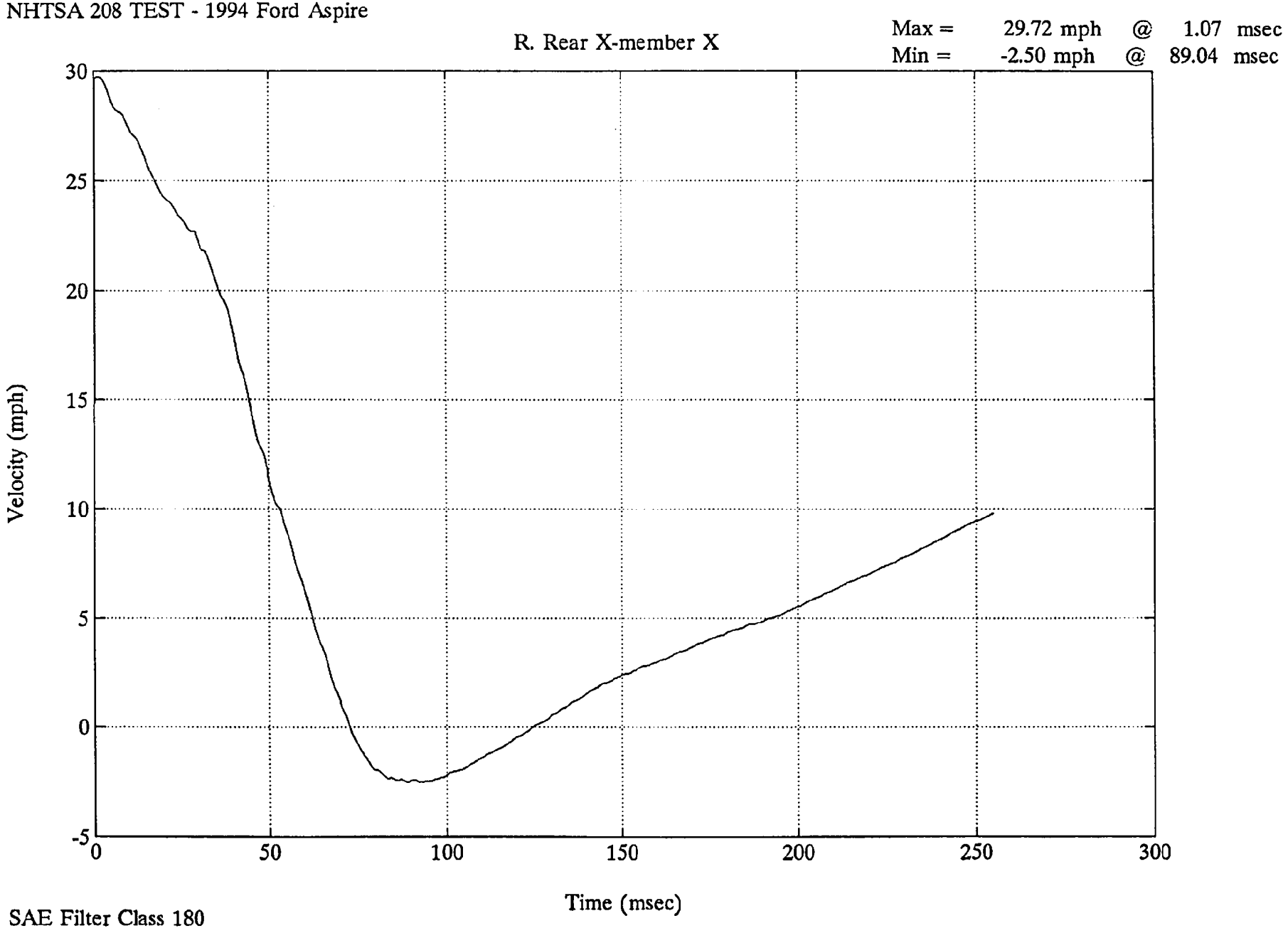
8221-2

SAE Filter Class 60

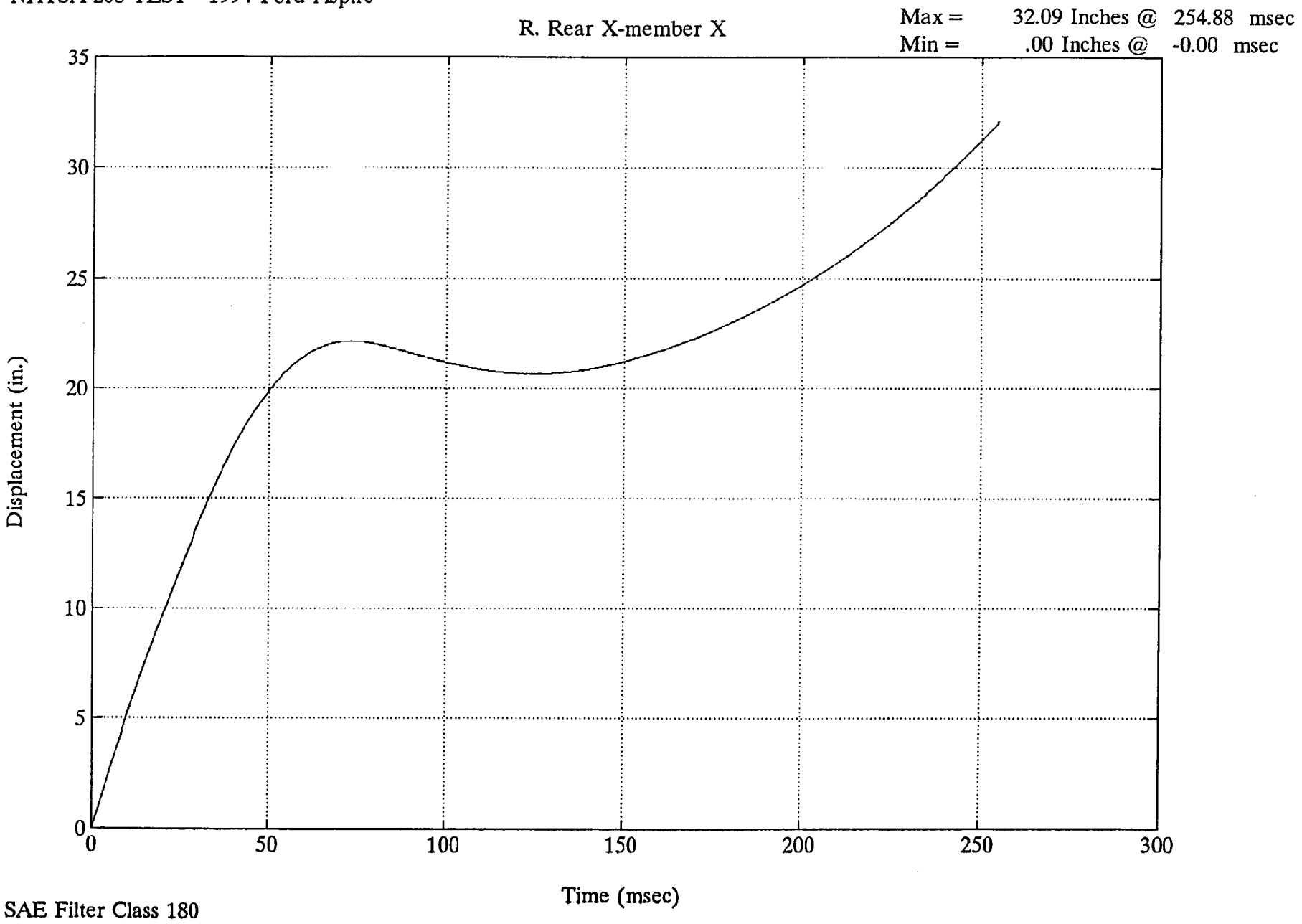
NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

8221-2

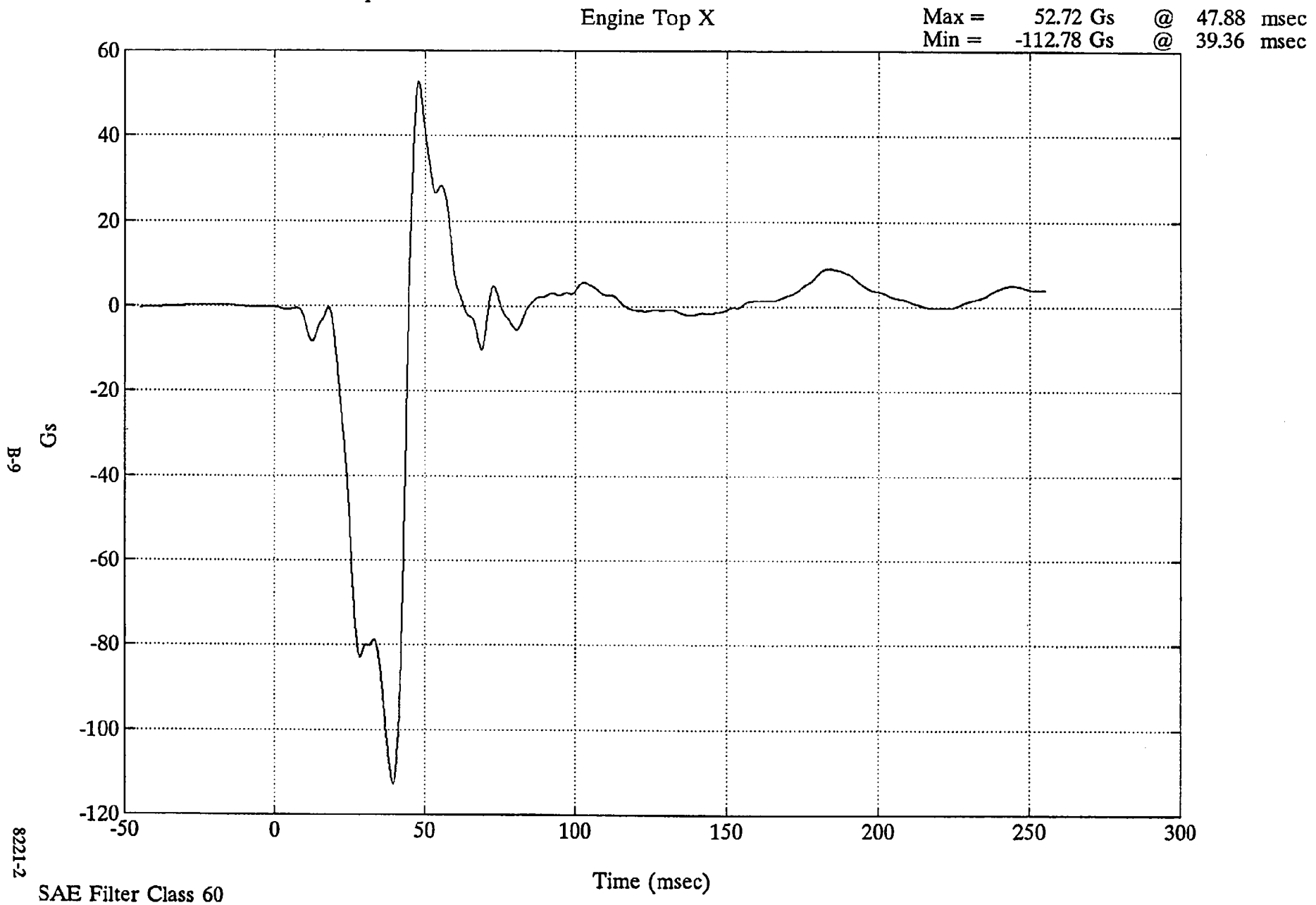
NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

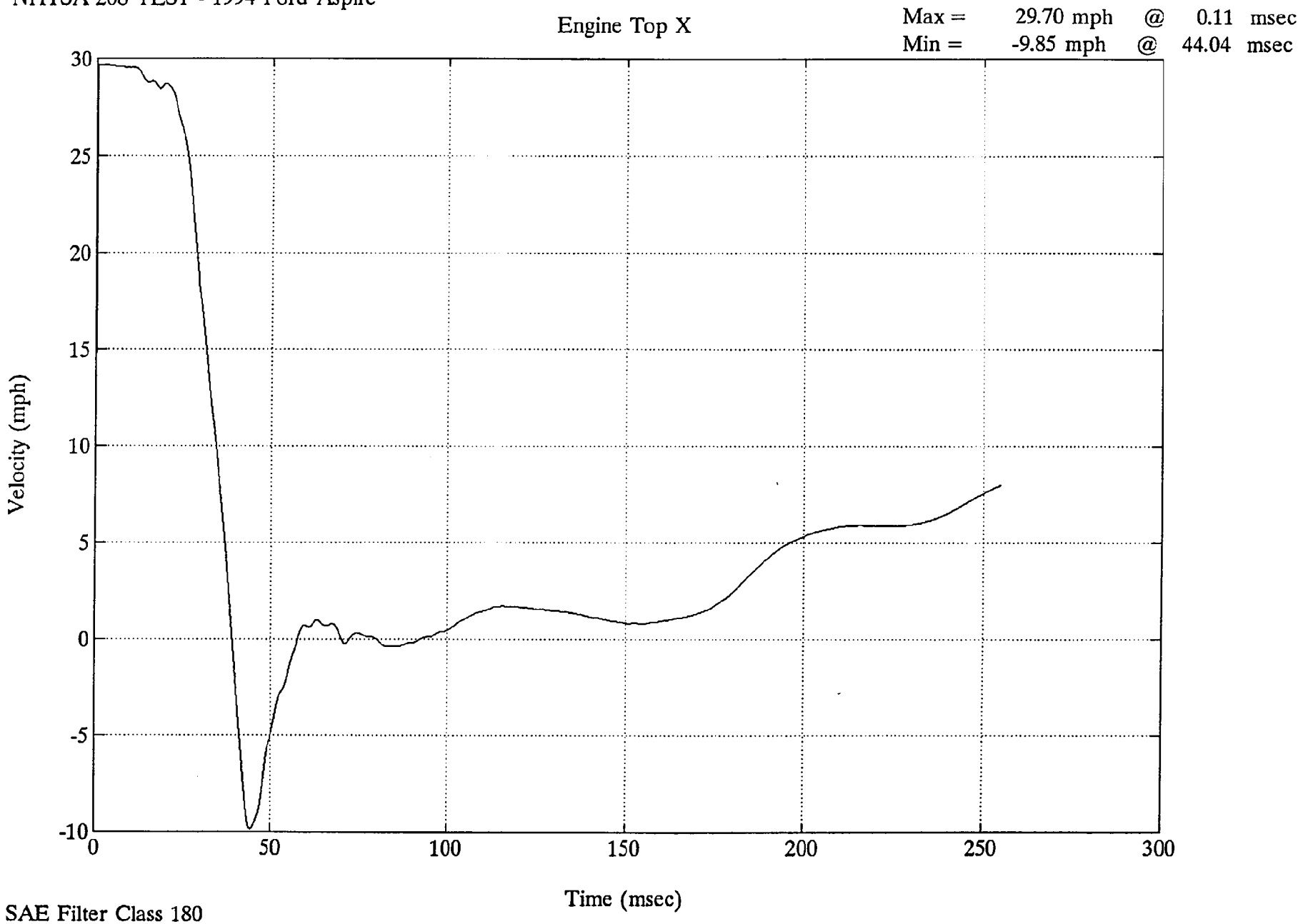
8221-2

NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 60

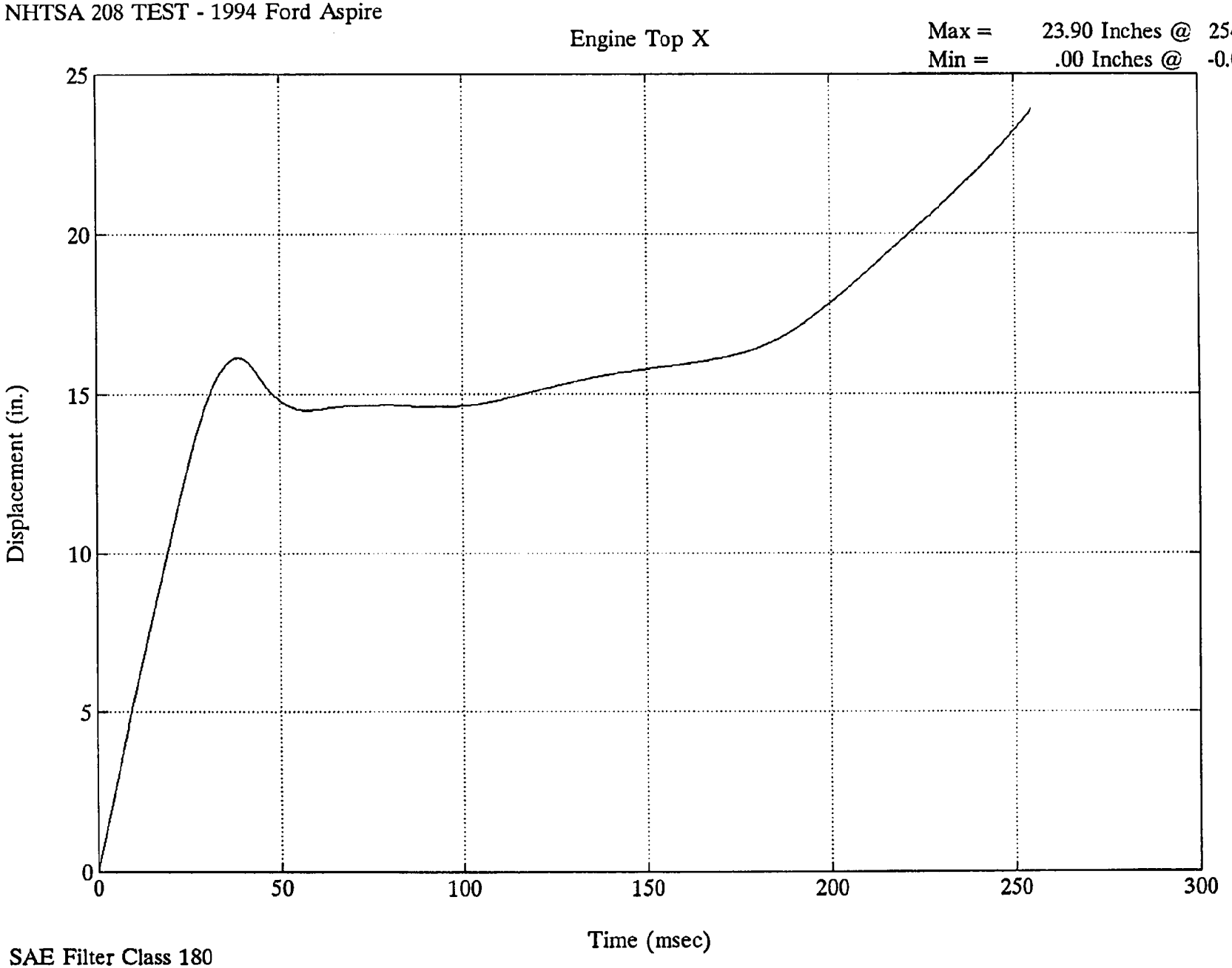
NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

8221-2

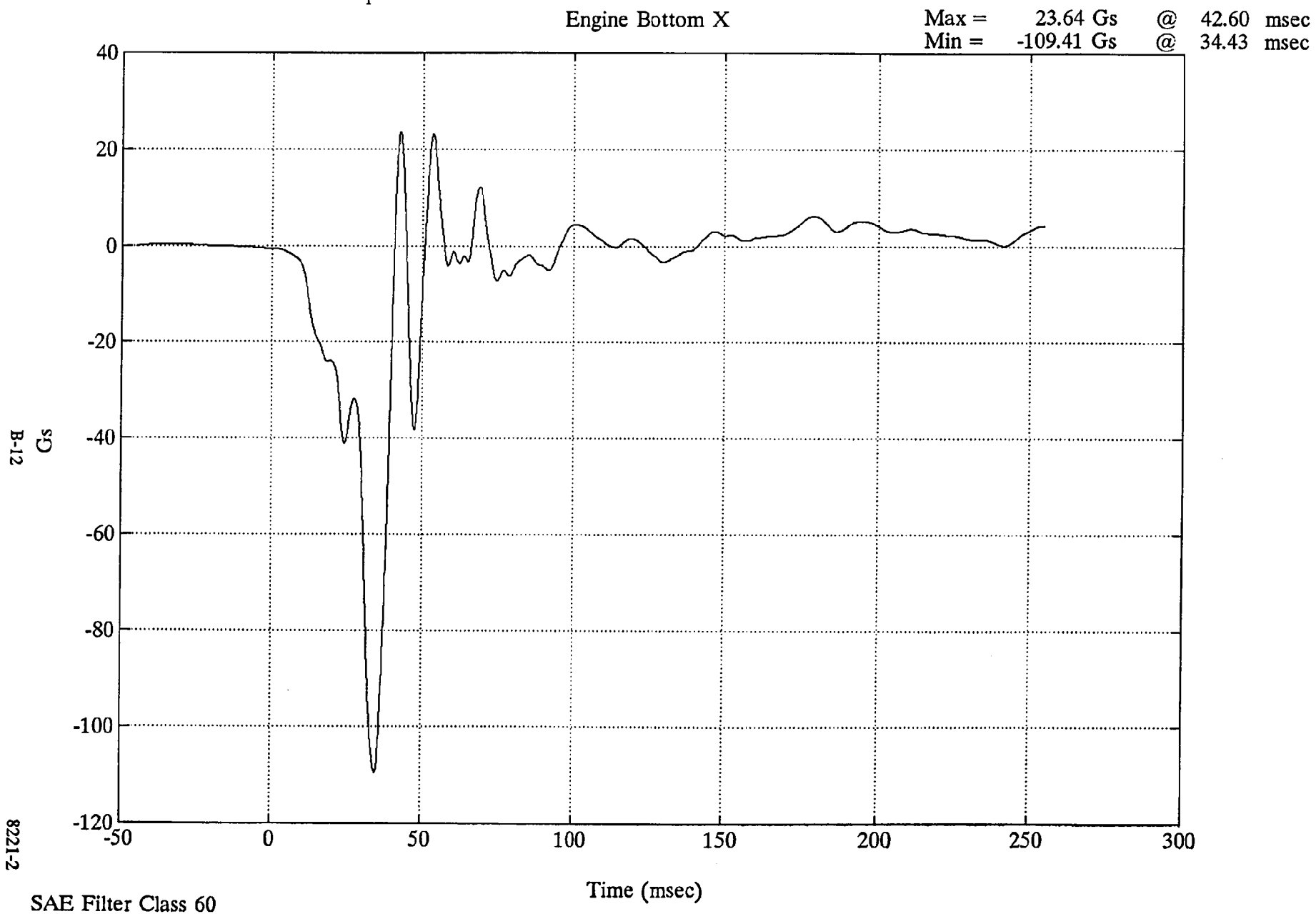
NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

8221-2

NHTSA 208 TEST - 1994 Ford Aspire



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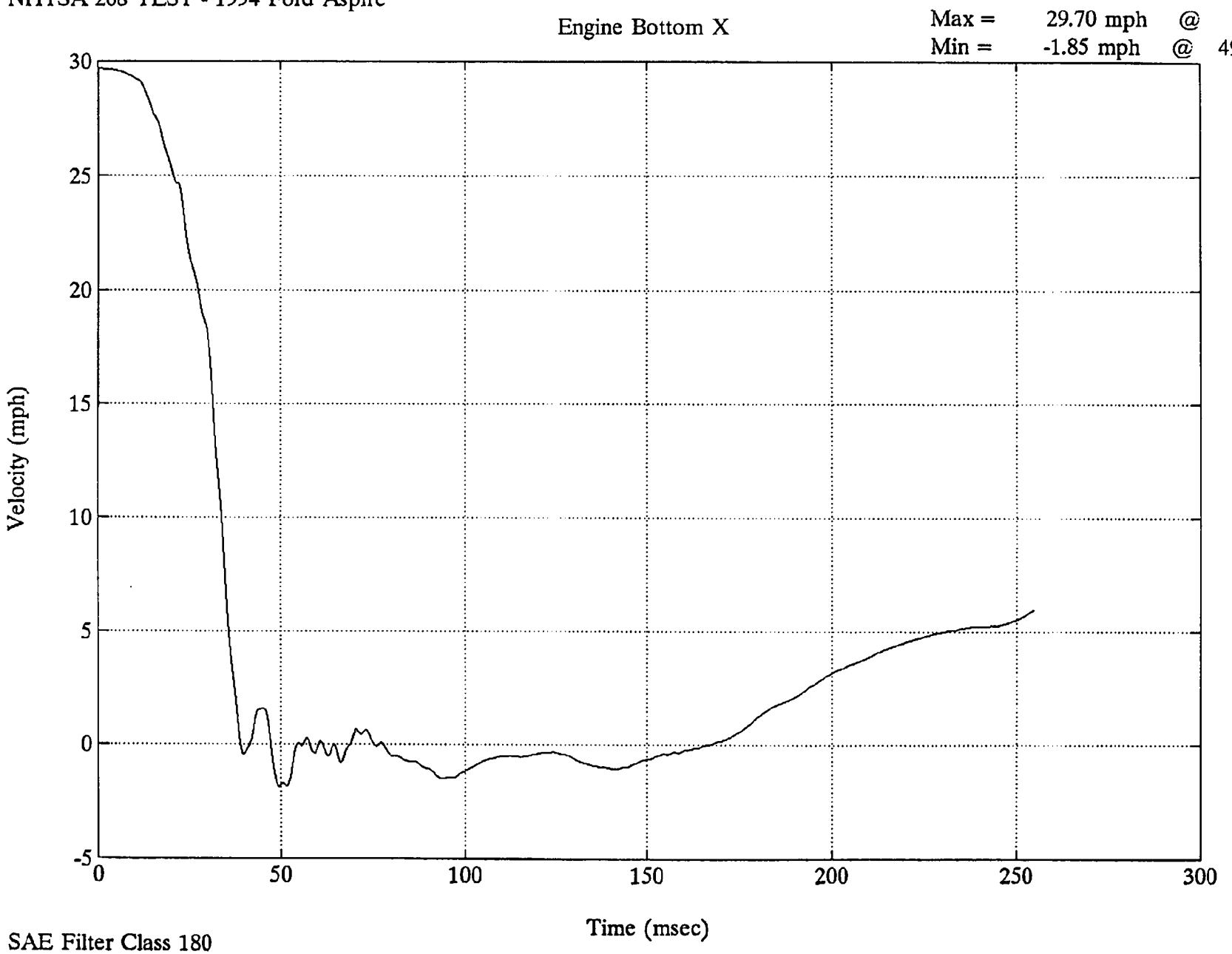
8221-2

SAE Filter Class 60

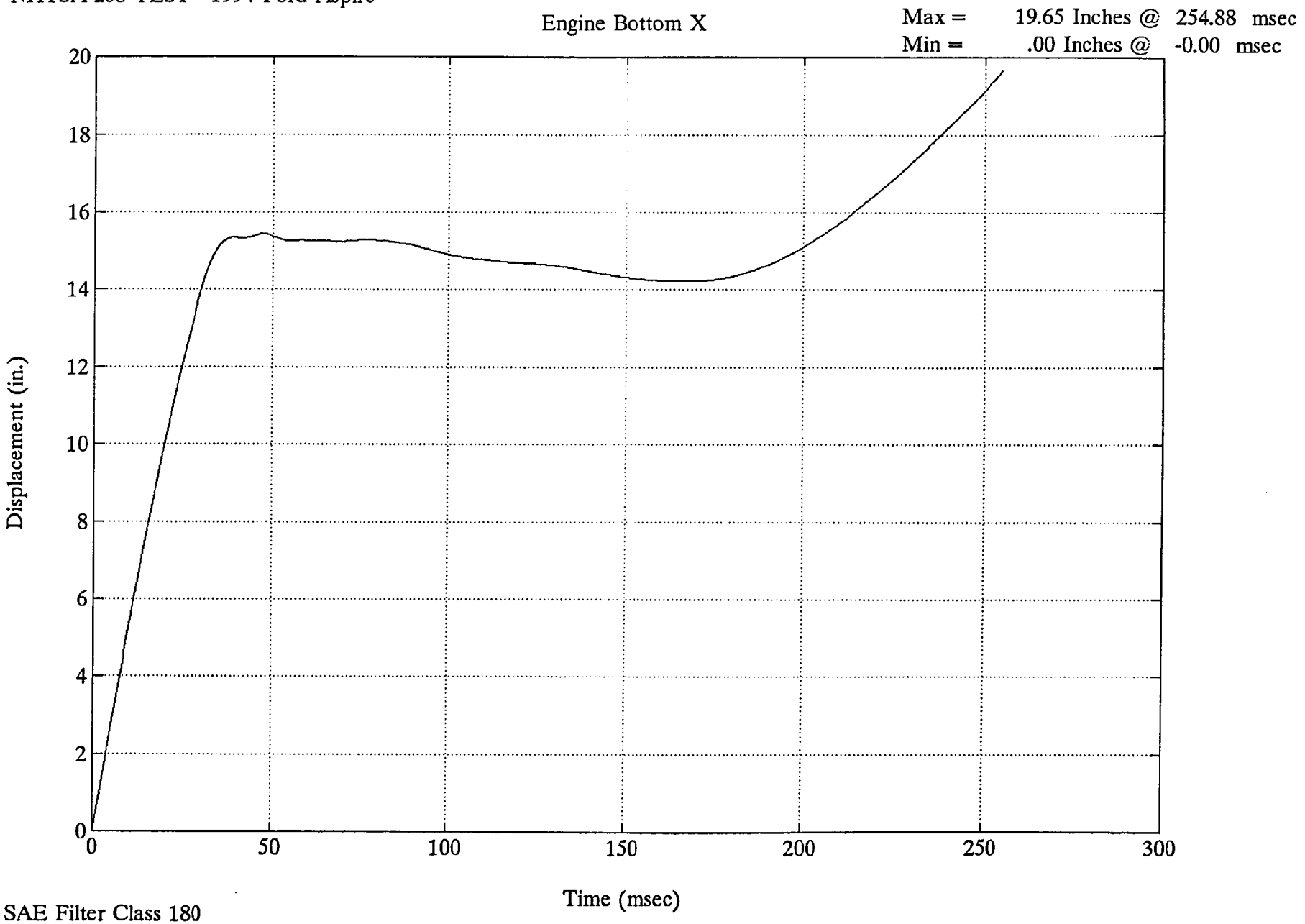
NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

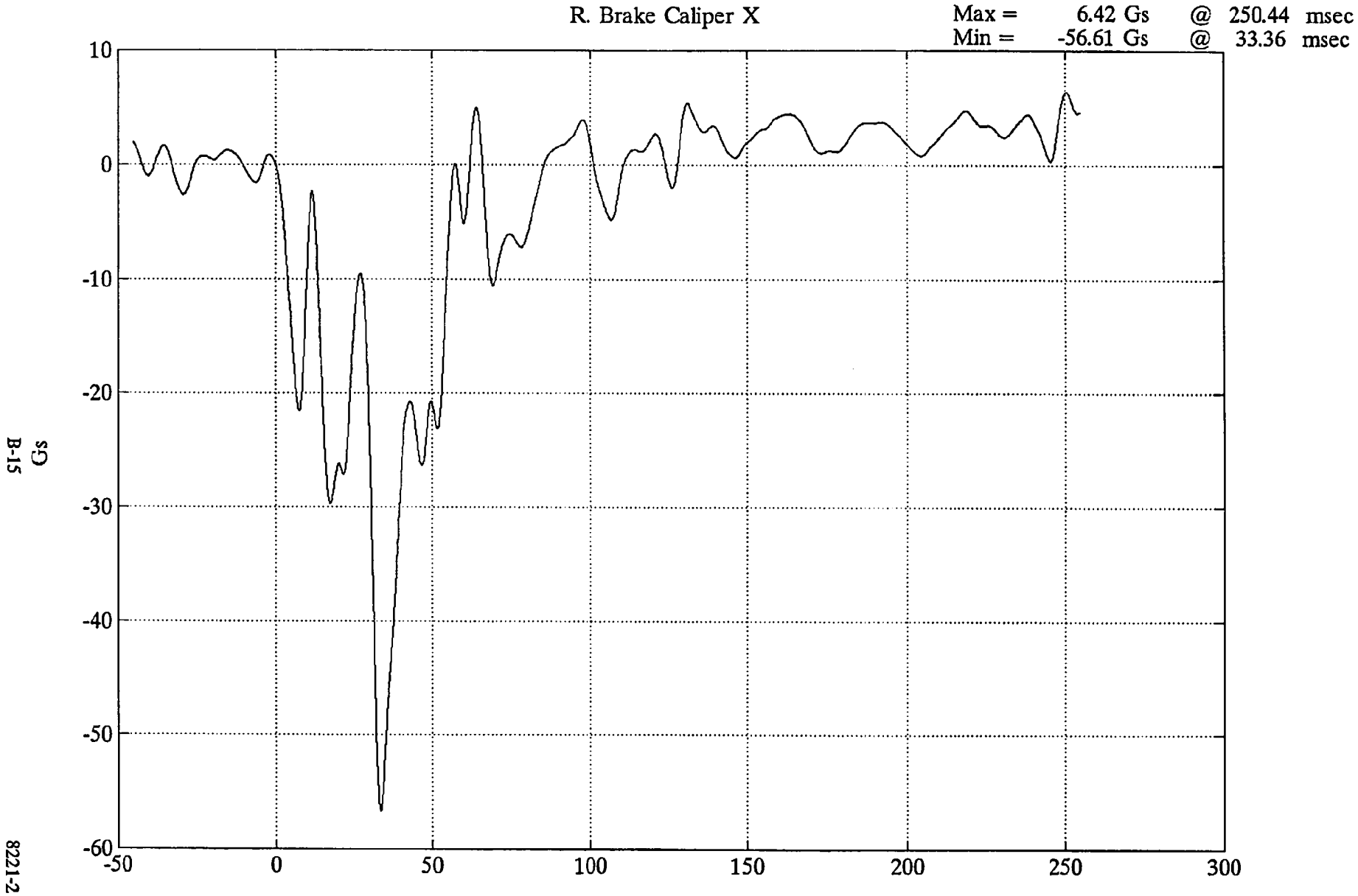
8221-2

NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

NHTSA 208 TEST - 1994 Ford Aspire

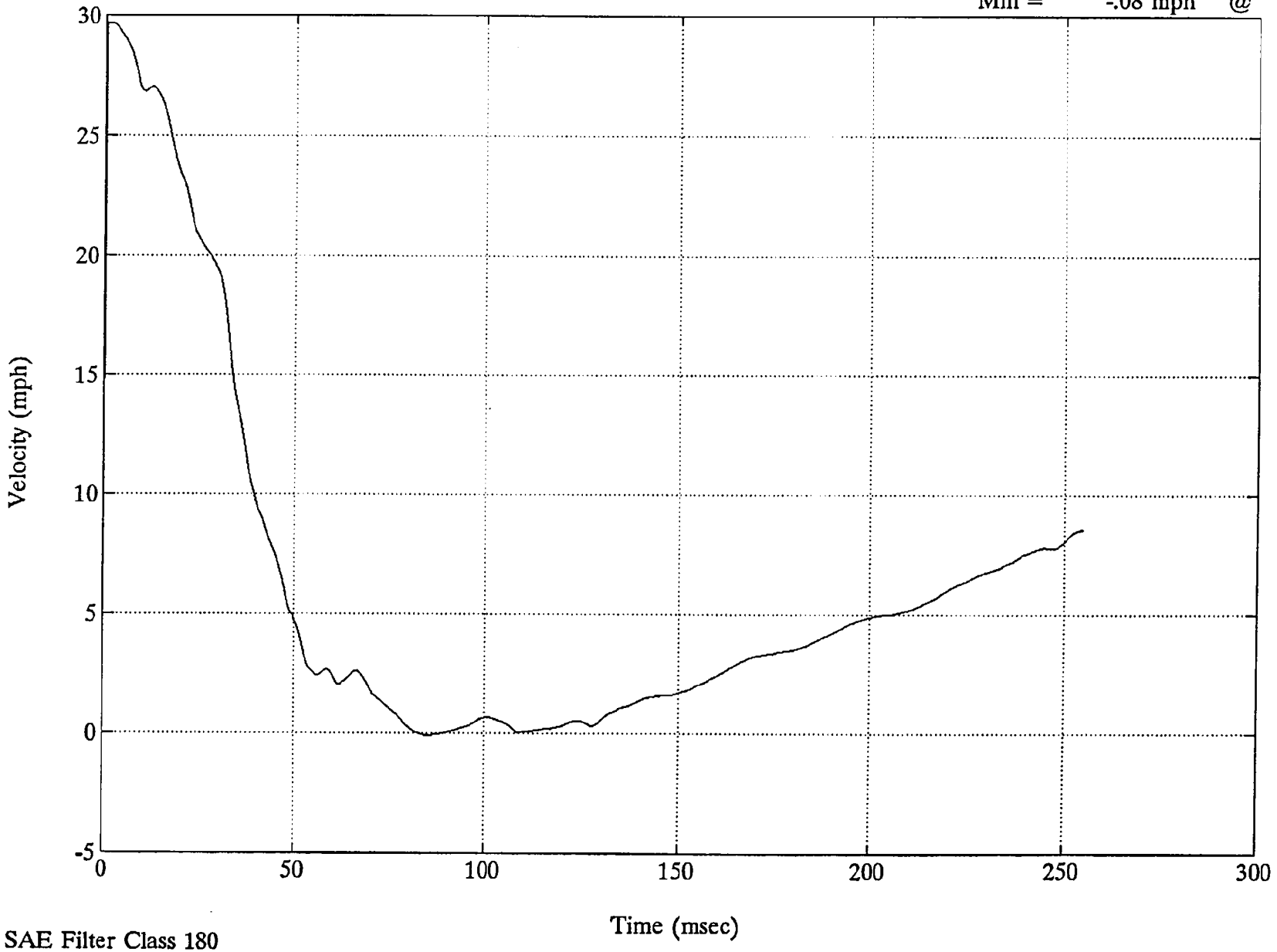


SAE Filter Class 60

NHTSA 208 TEST - 1994 Ford Aspire

R. Brake Caliper X

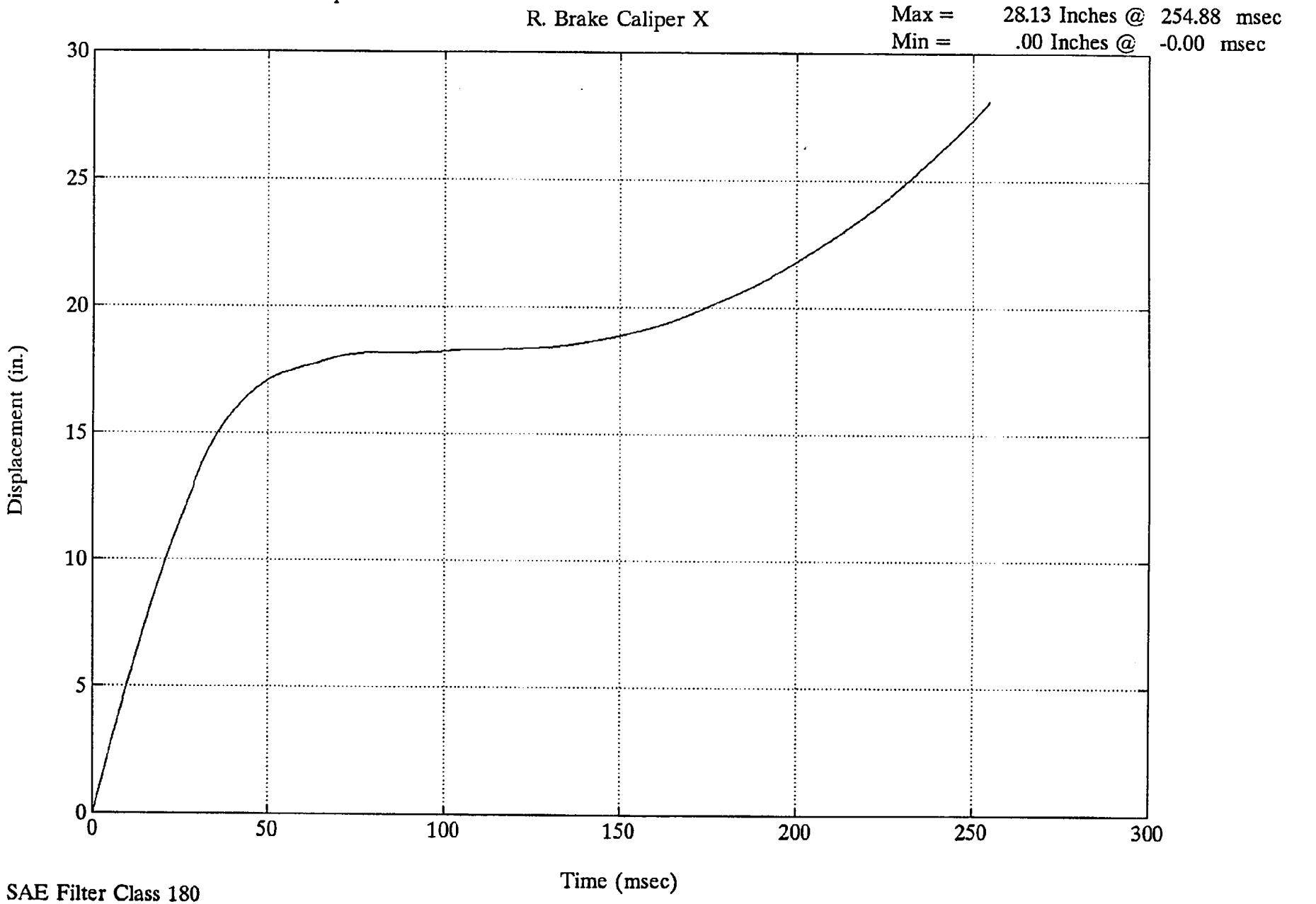
Max = 29.70 mph @ 0.11 msec
Min = -.08 mph @ 85.08 msec



SAE Filter Class 180

8221-2

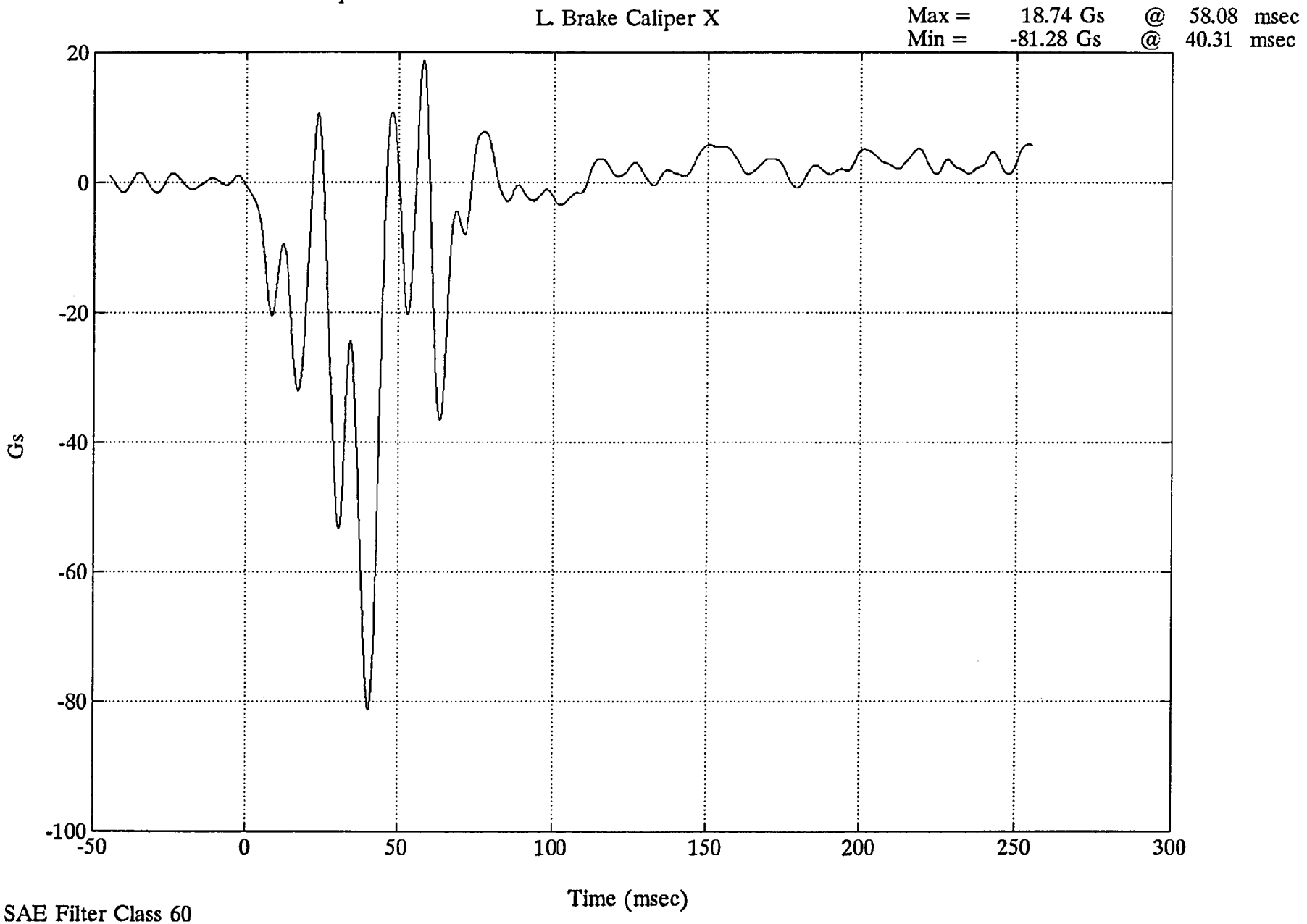
NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

8221-2

NHTSA 208 TEST - 1994 Ford Aspire

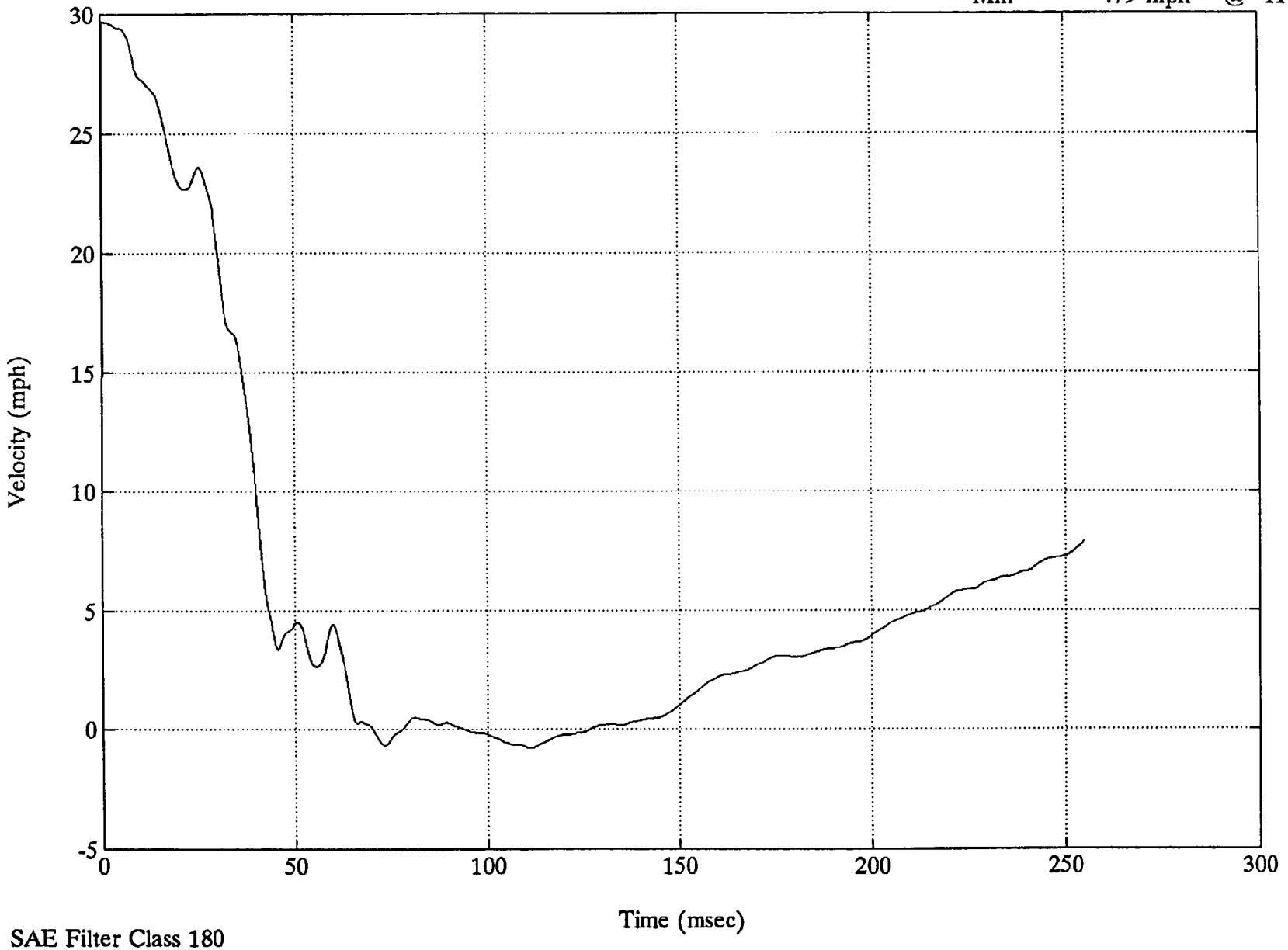


SAE Filter Class 60

NHTSA 208 TEST - 1994 Ford Aspire

L. Brake Caliper X

Max = 29.70 mph @ 0.11 msec
Min = -.79 mph @ 111.12 msec



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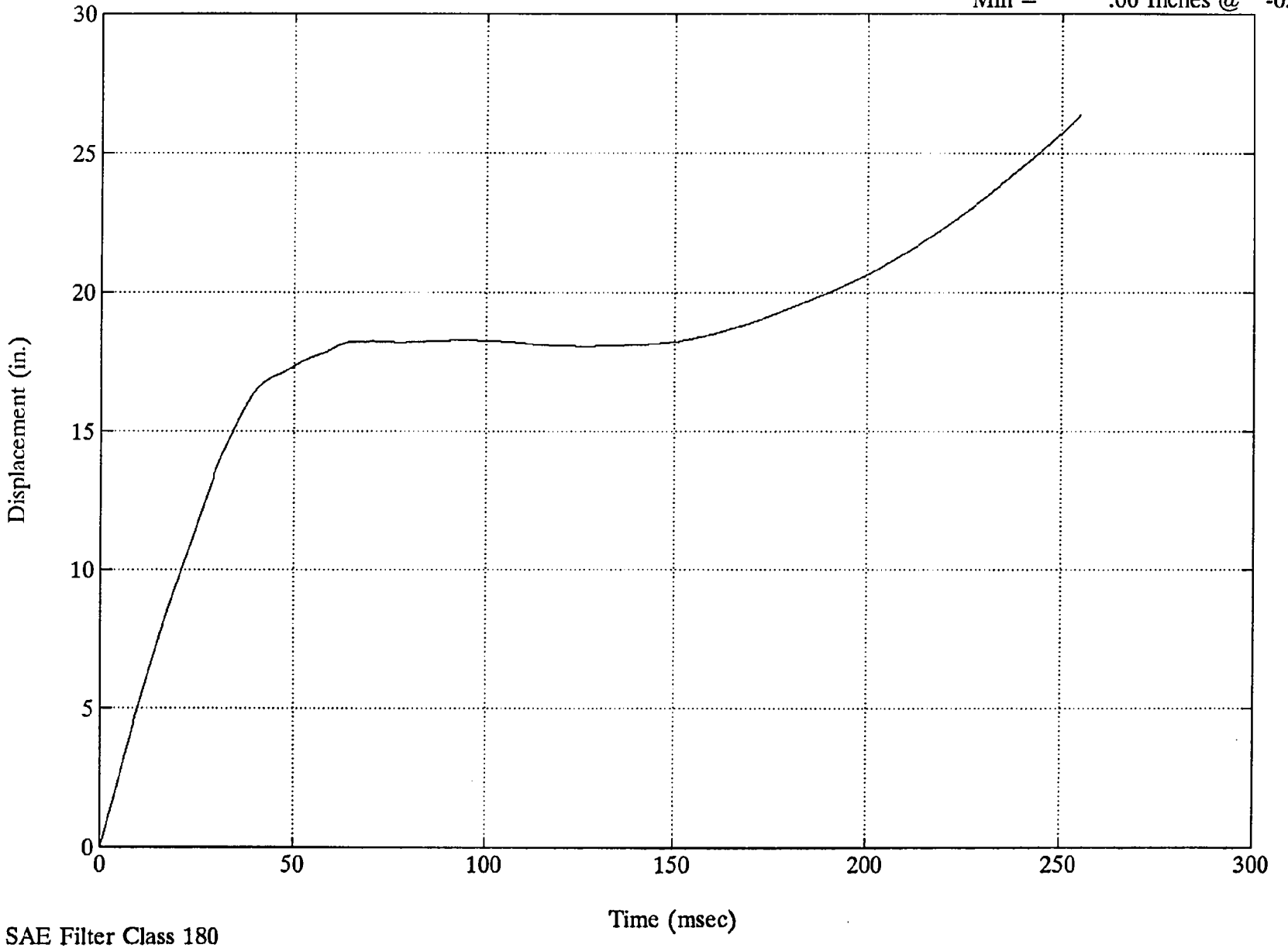
8221-2

SAE Filter Class 180

NHTSA 208 TEST - 1994 Ford Aspire

L. Brake Caliper X

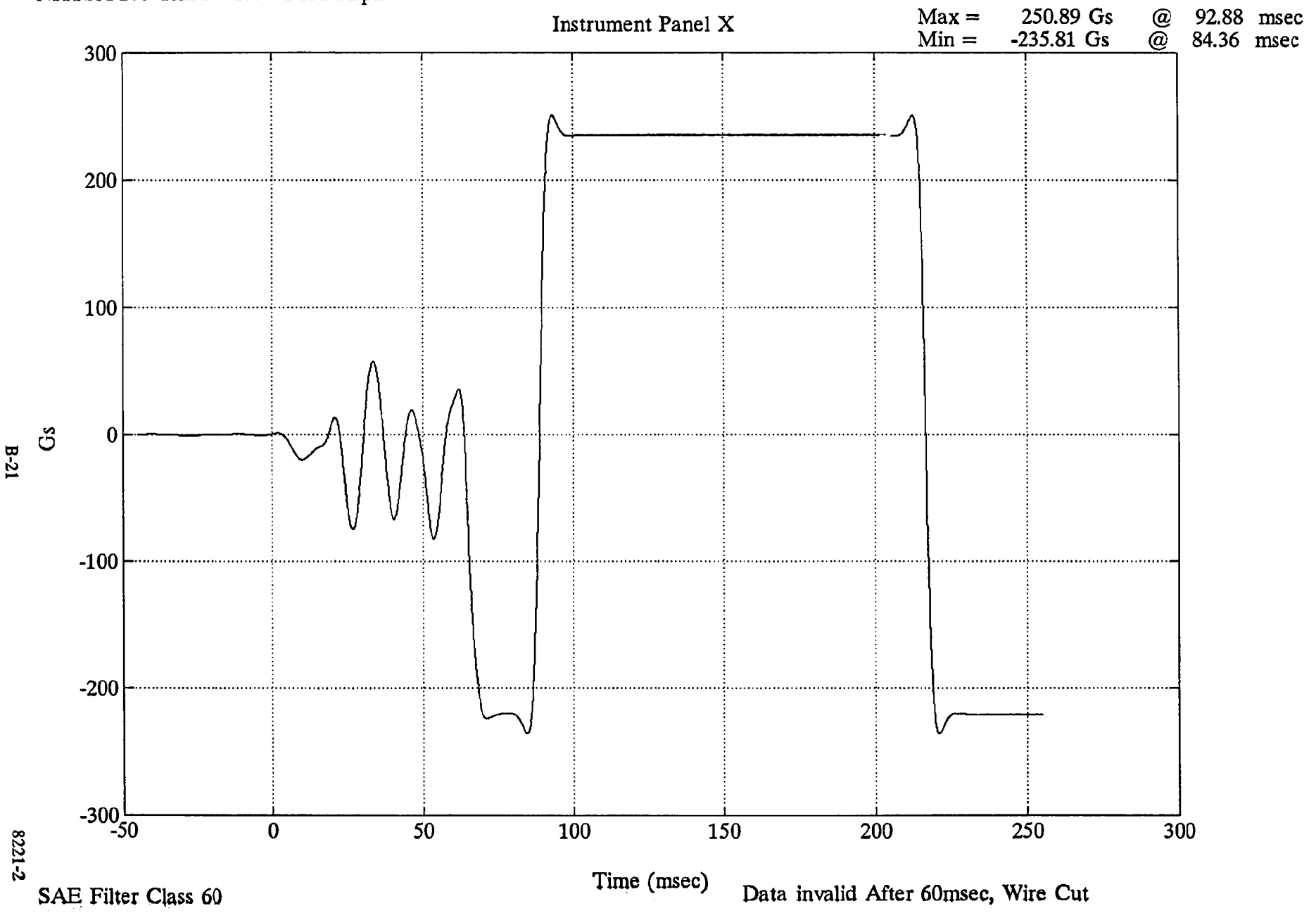
Max = 26.39 Inches @ 254.88 msec
Min = .00 Inches @ -0.00 msec



SAE Filter Class 180

8221-2

NHTSA 208 TEST - 1994 Ford Aspire



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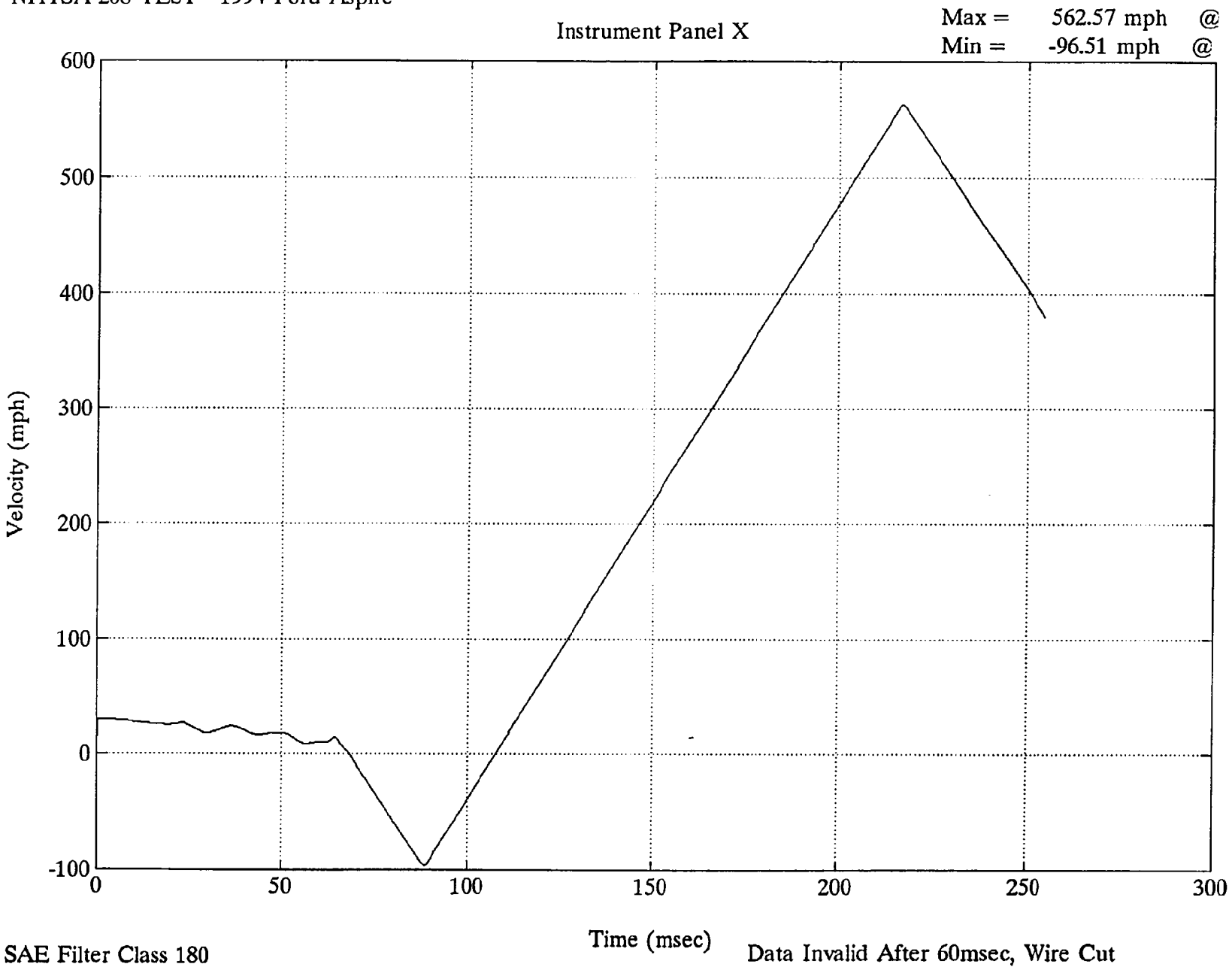
8221-2

SAE Filter Class 60

Data invalid After 60msec, Wire Cut

NHTSA 208 TEST - 1994 Ford Aspire

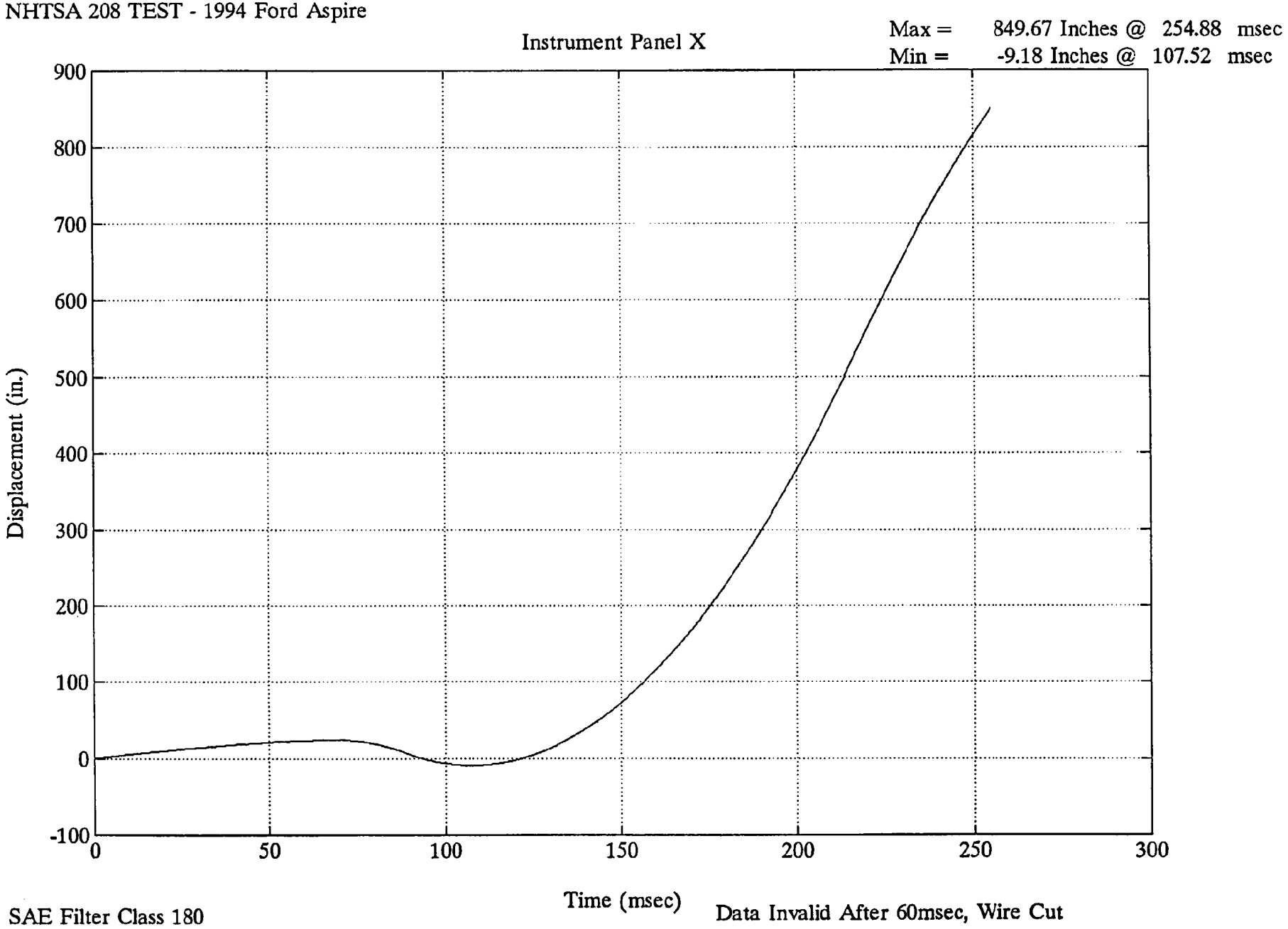


SAE Filter Class 180

Data Invalid After 60msec, Wire Cut

8221-2

NHTSA 208 TEST - 1994 Ford Aspire

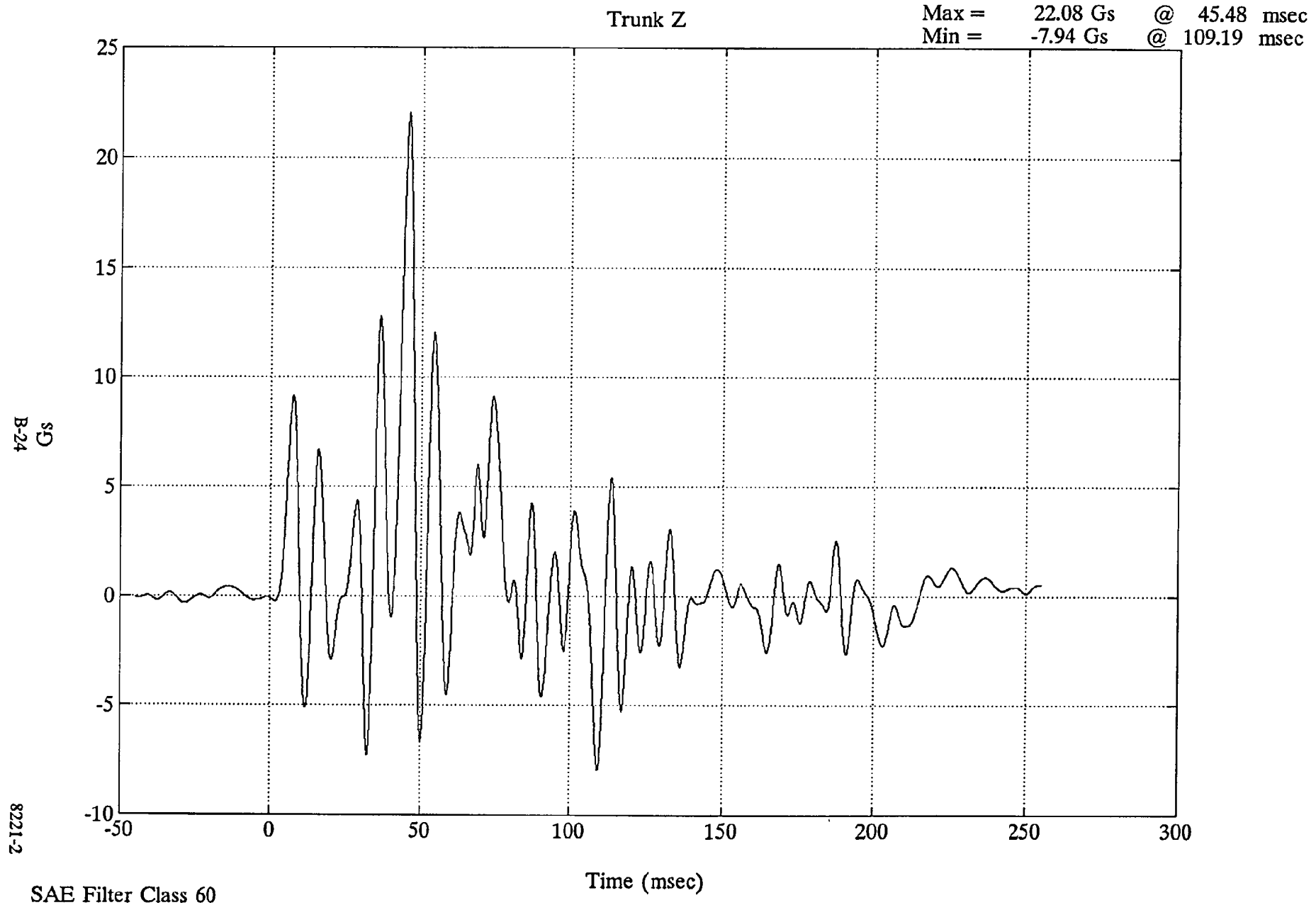


SAE Filter Class 180

Data Invalid After 60msec, Wire Cut

8221-2

NHTSA 208 TEST - 1994 Ford Aspire



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8221-2

SAE Filter Class 60

TEST NO. CR0208

DUMMY	SAE FILTER CHANNEL CLASS
Head Accelerations	1000
Chest Accelerations	180
Femur Forces	600

FACILITY: TRACK TEST DATE: 28 Jul 1994
RUN #: 1433 TEST TIME: 11:22:35
SERIES #: 16 BOARD: A

TITLE: NHTSA 208 TEST #2 - 1994 Ford Aspire

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	MAXIMUM msec	MINIMUM AMP	MINIMUM msec	FILTER CLASS
1	Pos. 1 Head X	Gs	5.0	22.1	-31.7	83.9	1000.0
2	Pos. 1 Head Y	Gs	3.9	241.9	-6.3	93.5	1000.0
3	Pos. 1 Head Z	Gs	22.7	78.4	-17.9	99.0	1000.0
4	Pos. 1 Left Femur	lbs	47.6	22.2	-1226.1	63.2	600.0
5	Pos. 1 Chest X	Gs	6.8	139.1	-42.2	89.5	180.0
6	Pos. 1 Chest Y	Gs	3.8	146.6	-2.2	24.5	180.0
7	Pos. 1 Chest Z	Gs	16.3	78.1	-4.9	58.2	180.0
8	Pos. 1 Right Femur	lbs	13.6	176.8	-1323.9	59.9	600.0
9	Pos. 2 Head X	Gs	8.2	113.3	-29.9	62.4	1000.0
10	Pos. 2 Head Y	Gs	8.3	39.0	-18.6	35.0	1000.0
11	Pos. 2 Head Z	Gs	18.1	34.0	-20.9	32.0	1000.0
12	Pos. 2 Left Femur	lbs	24.6	17.4	-1169.2	69.4	600.0
13	Pos. 2 Chest X	Gs	6.1	169.9	-40.5	76.9	180.0
14	Pos. 2 Chest Y	Gs	9.4	85.7	-9.1	61.6	180.0
15	Pos. 2 Chest Z	Gs	12.0	76.0	-7.8	45.2	180.0
16	Pos. 2 Right Femur	lbs	3.3	11.2	-1457.7	59.0	600.0
17	Pos. 1 Head Resultant	Gs	38.5	79.2	.0	-8.8	1000.0
18	Pos. 1 Chest Resultant	Gs	43.9	89.4	.0	-26.0	180.0
19	Pos. 2 Head Resultant	Gs	33.0	31.9	.1	-21.1	1000.0
20	Pos. 2 Chest Resultant	Gs	42.2	76.8	.0	-26.5	180.0

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

hic: 160.71
t1 = 65.280 msec
t2 = 101.160 msec
Average G's Over Hic Duration = 28.87

CLIP SUMMARY: Pos. 1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 41.142 G's
Tstart = 87.6000 ms
Tend = 90.7200 ms
CSI = 294.635

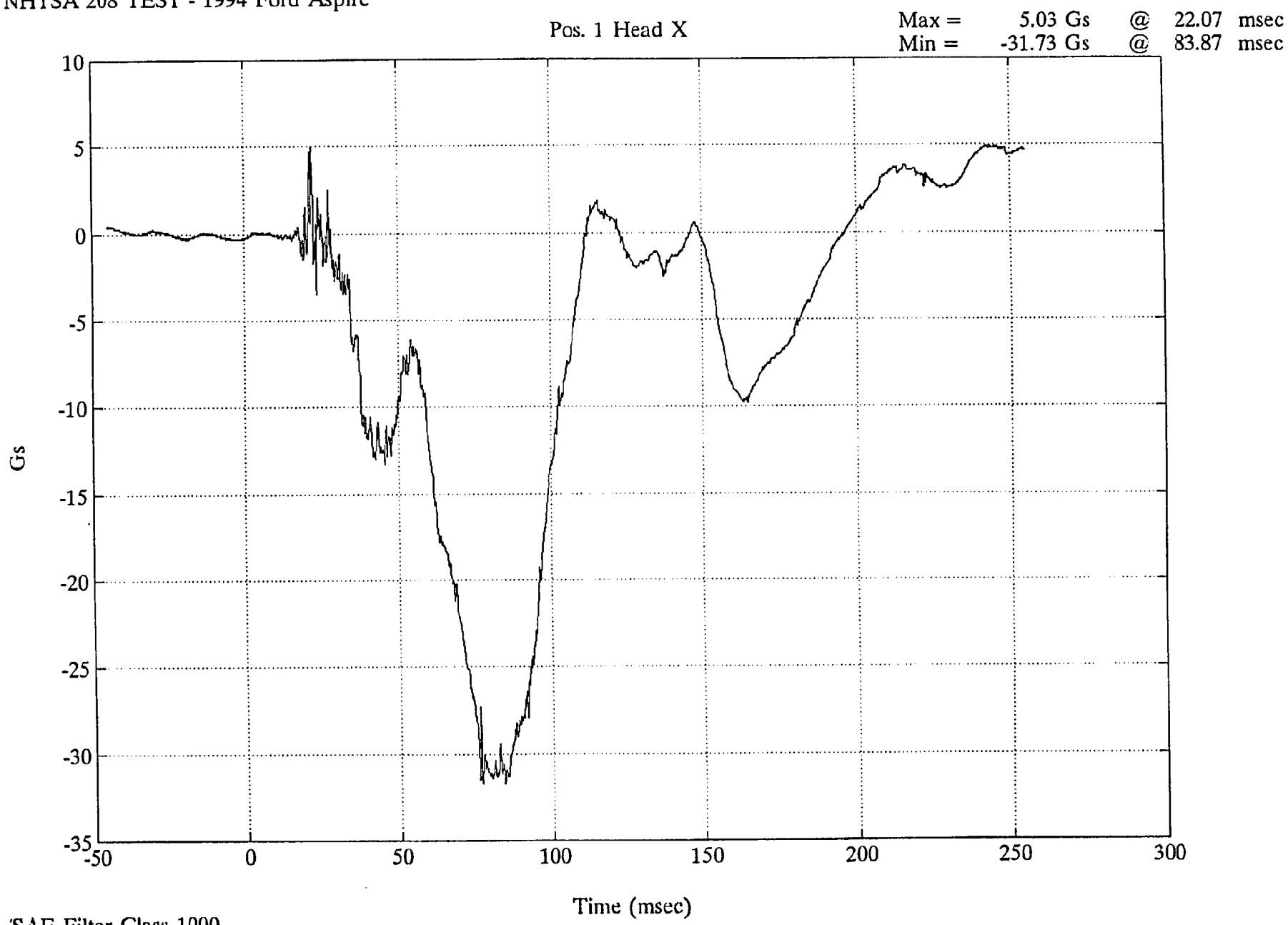
36 ms Fixed Duration HIC SUMMARY: Pos. 2 Head Resultant

hic: 80.42
t1 = 53.640 msec
t2 = 89.520 msec
Average G's Over Hic Duration = 21.89

CLIP SUMMARY: Pos. 2 Chest Resultant

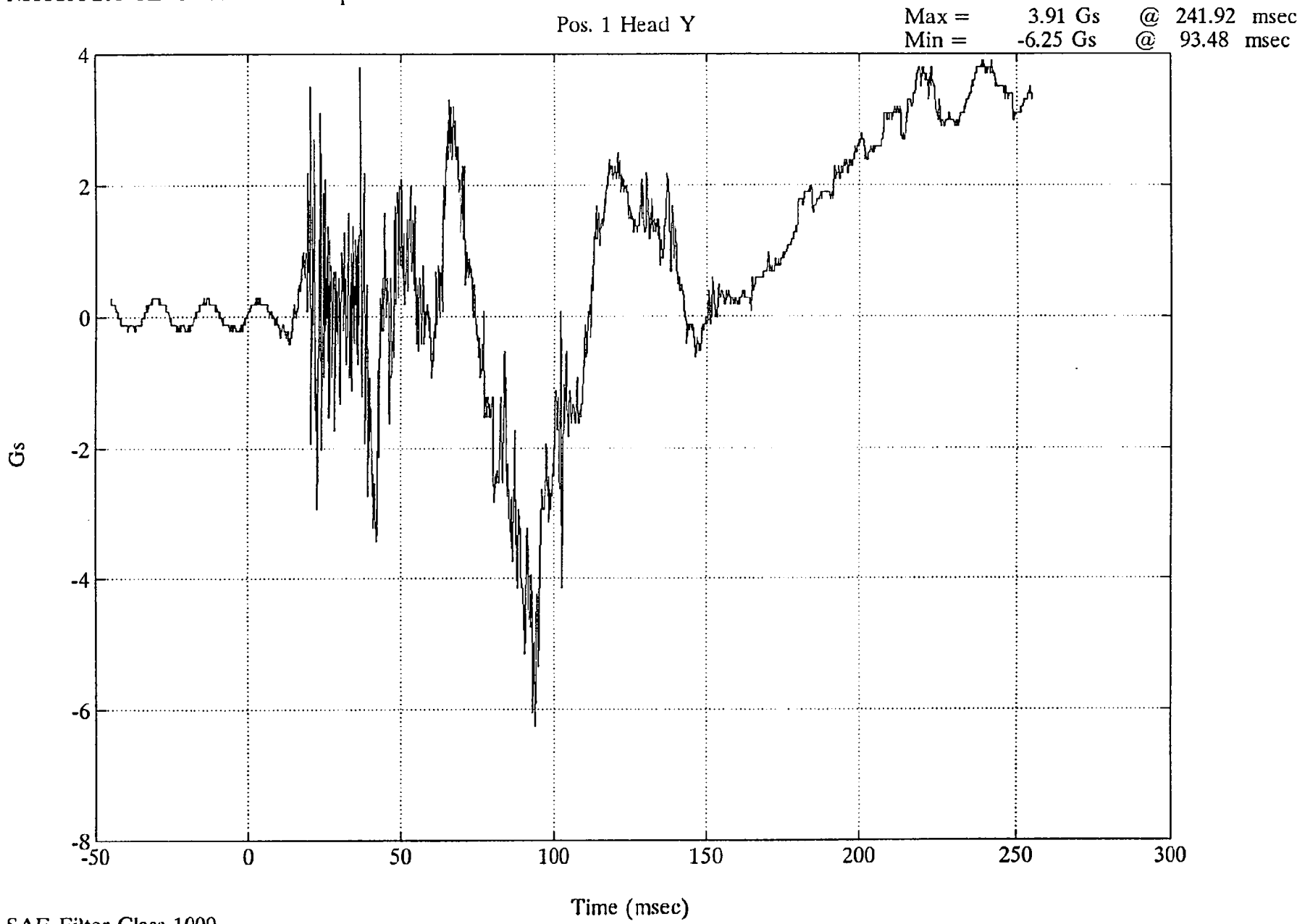
Peak Resultant (3 ms CLIPPED DURATION) = 40.354 G's
Tstart = 75.1200 ms
Tend = 78.2400 ms
CSI = 316.204

NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 1000

NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 1000

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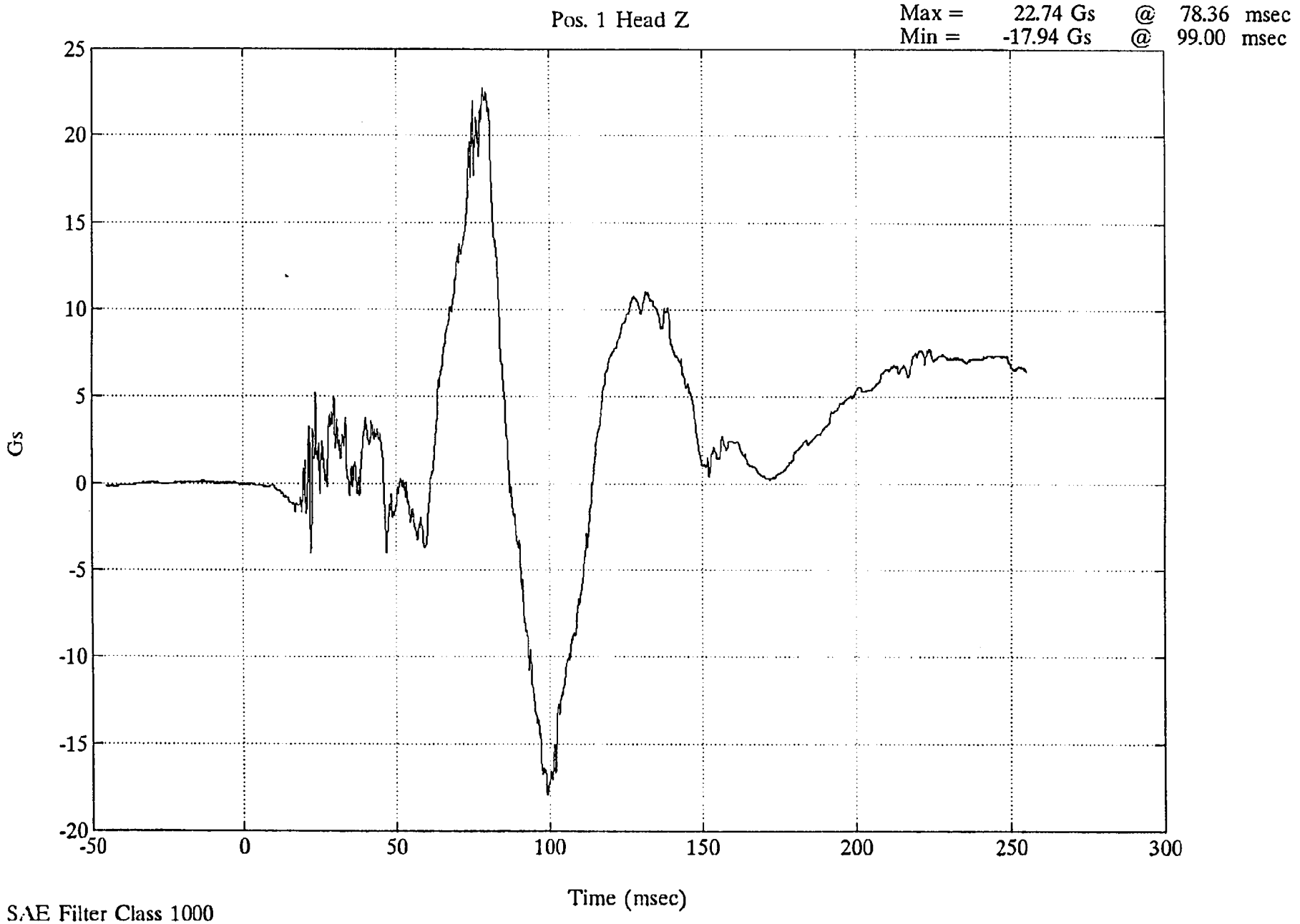
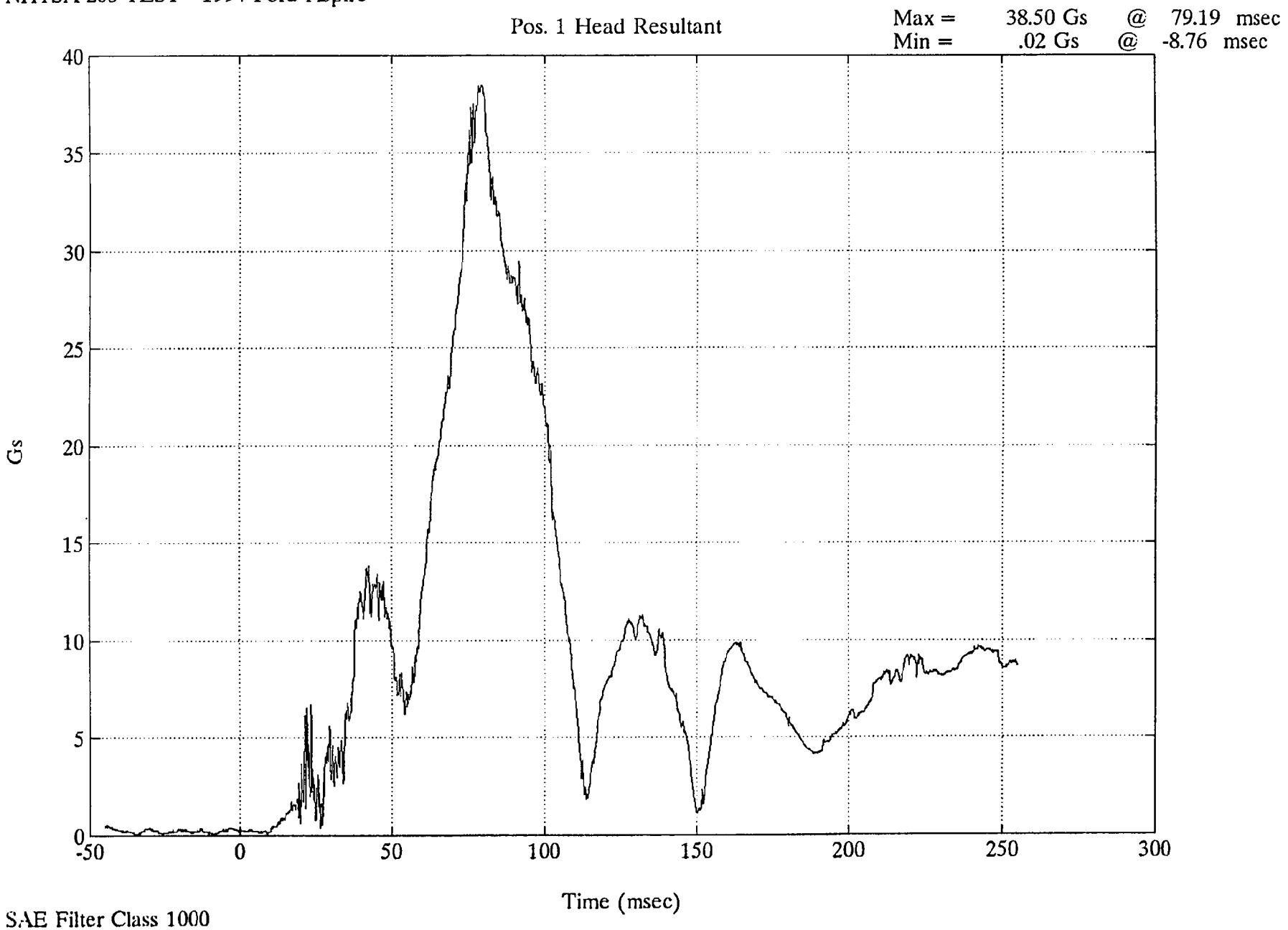
NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 1000

8221-2

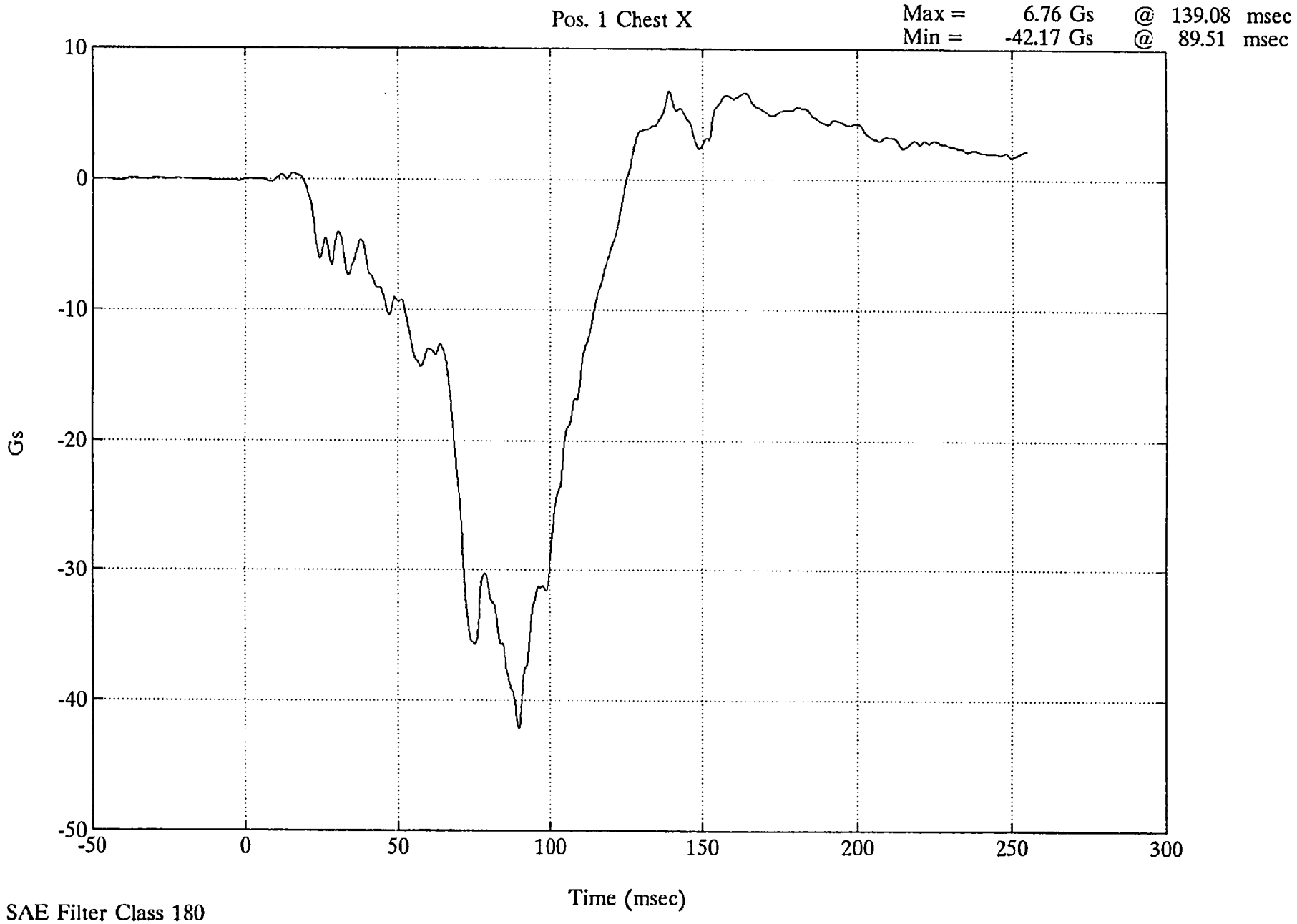
NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 1000

8221-2

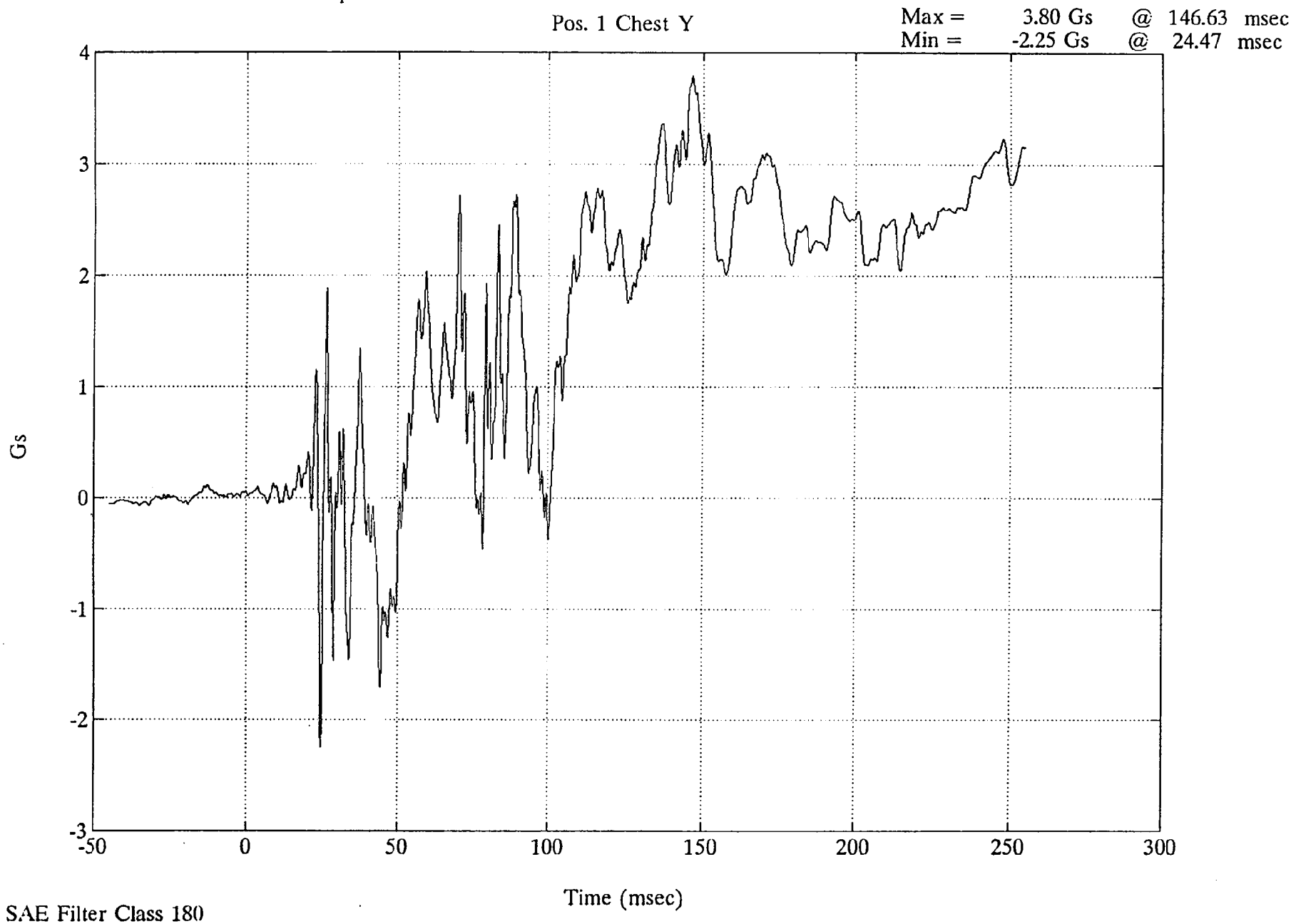
NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

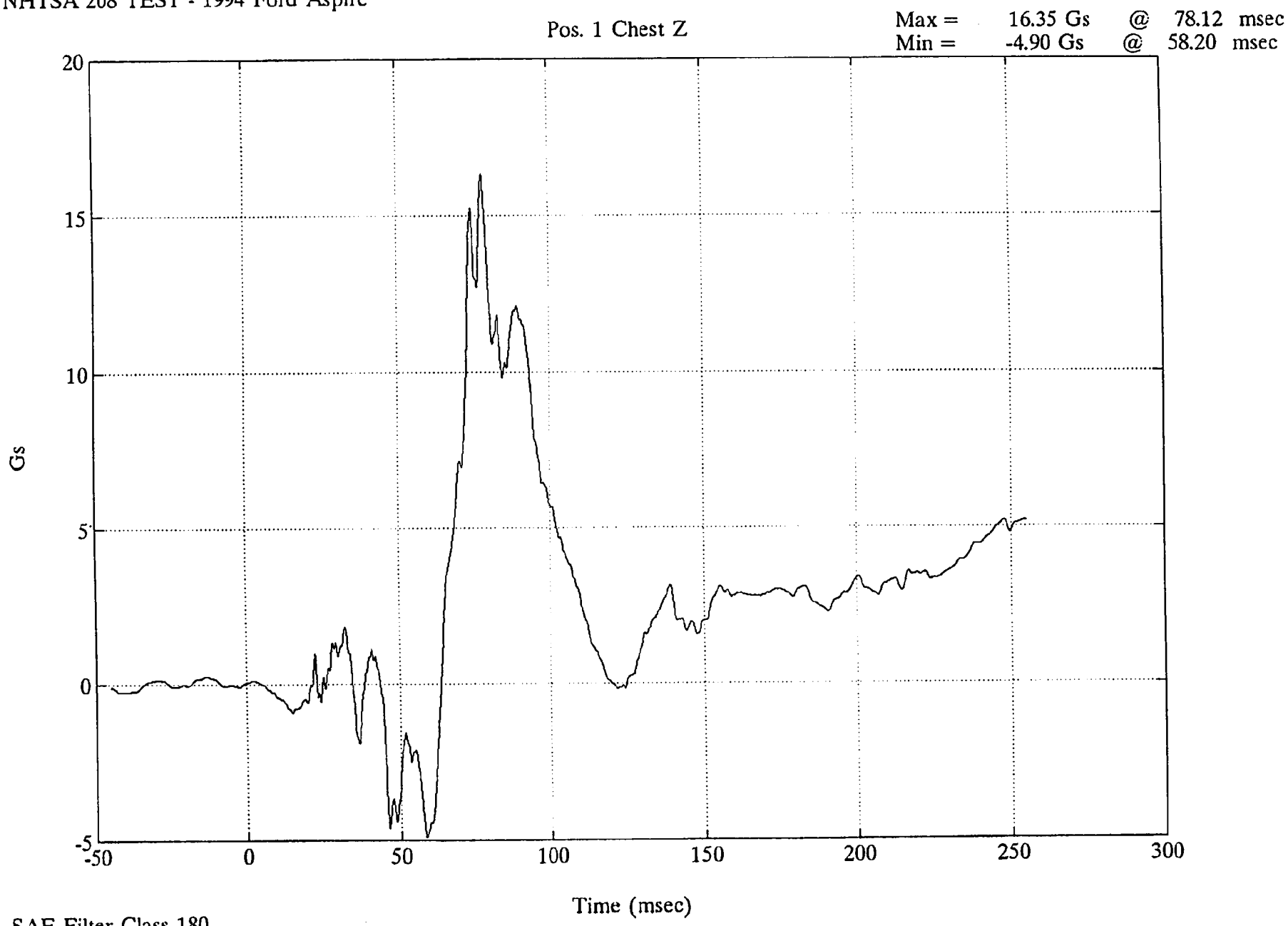
8221-2

NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

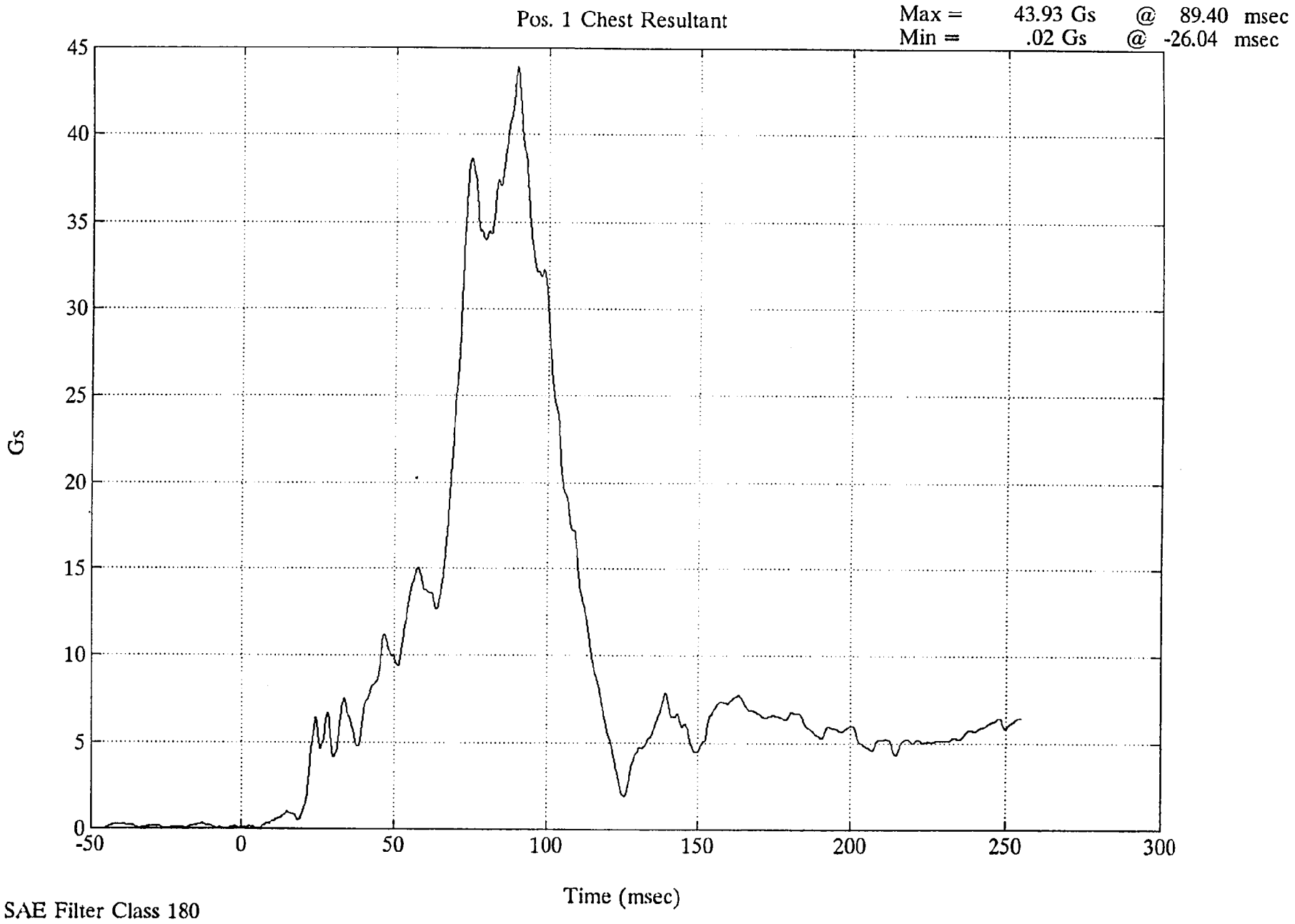
NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

8221-2

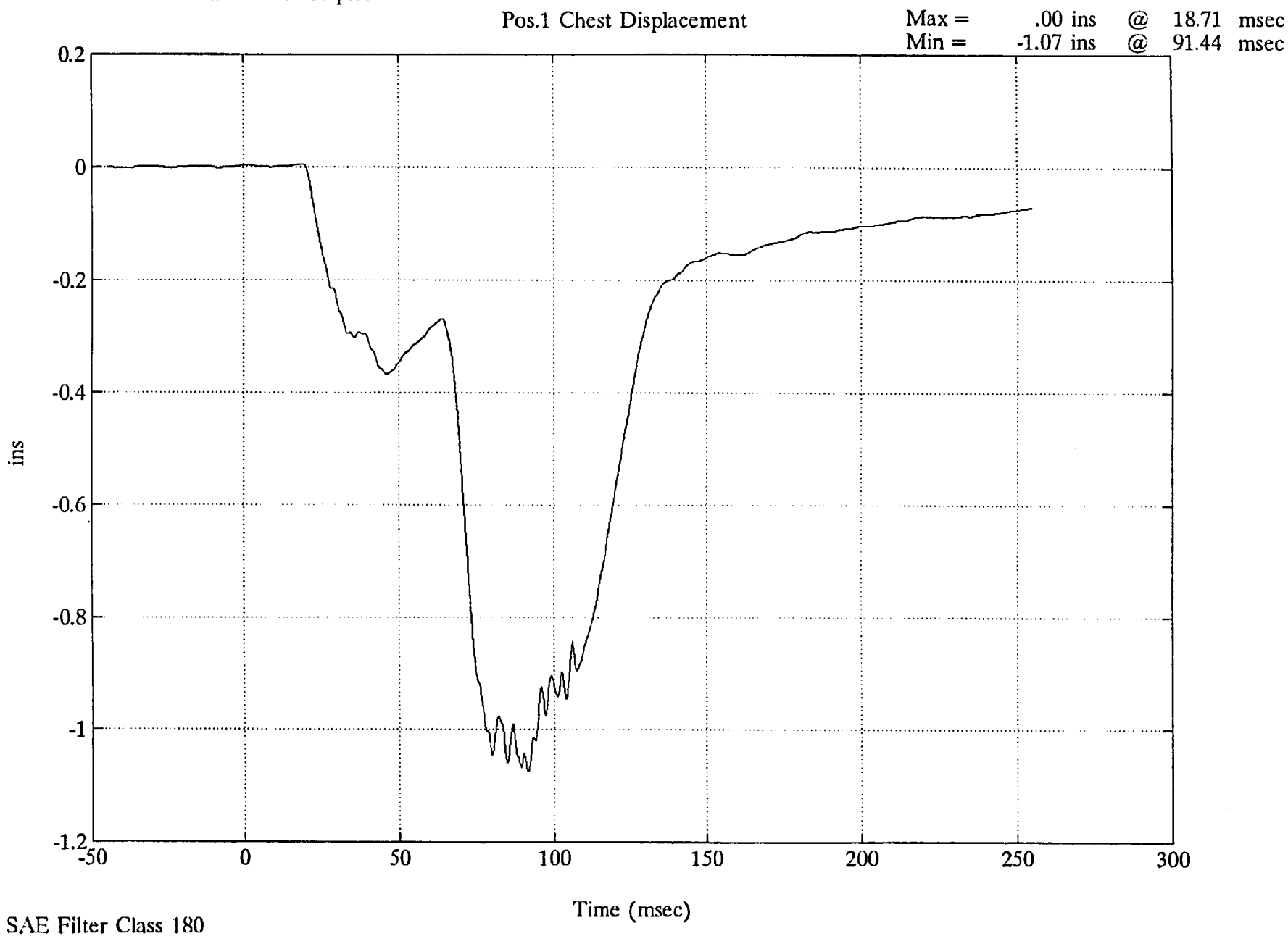
NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

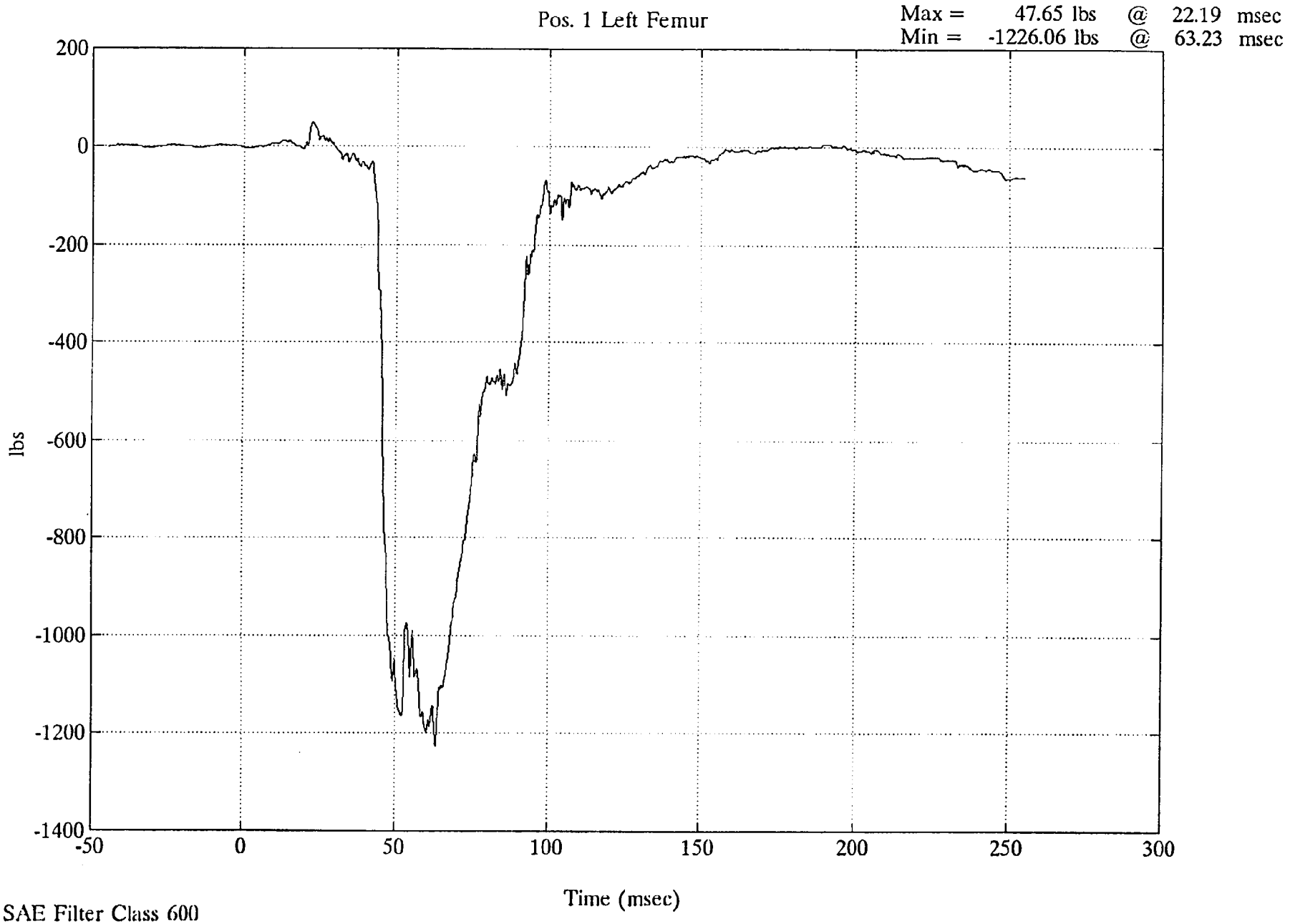
8221-2

NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 180

NHTSA 208 TEST - 1994 Ford Aspire



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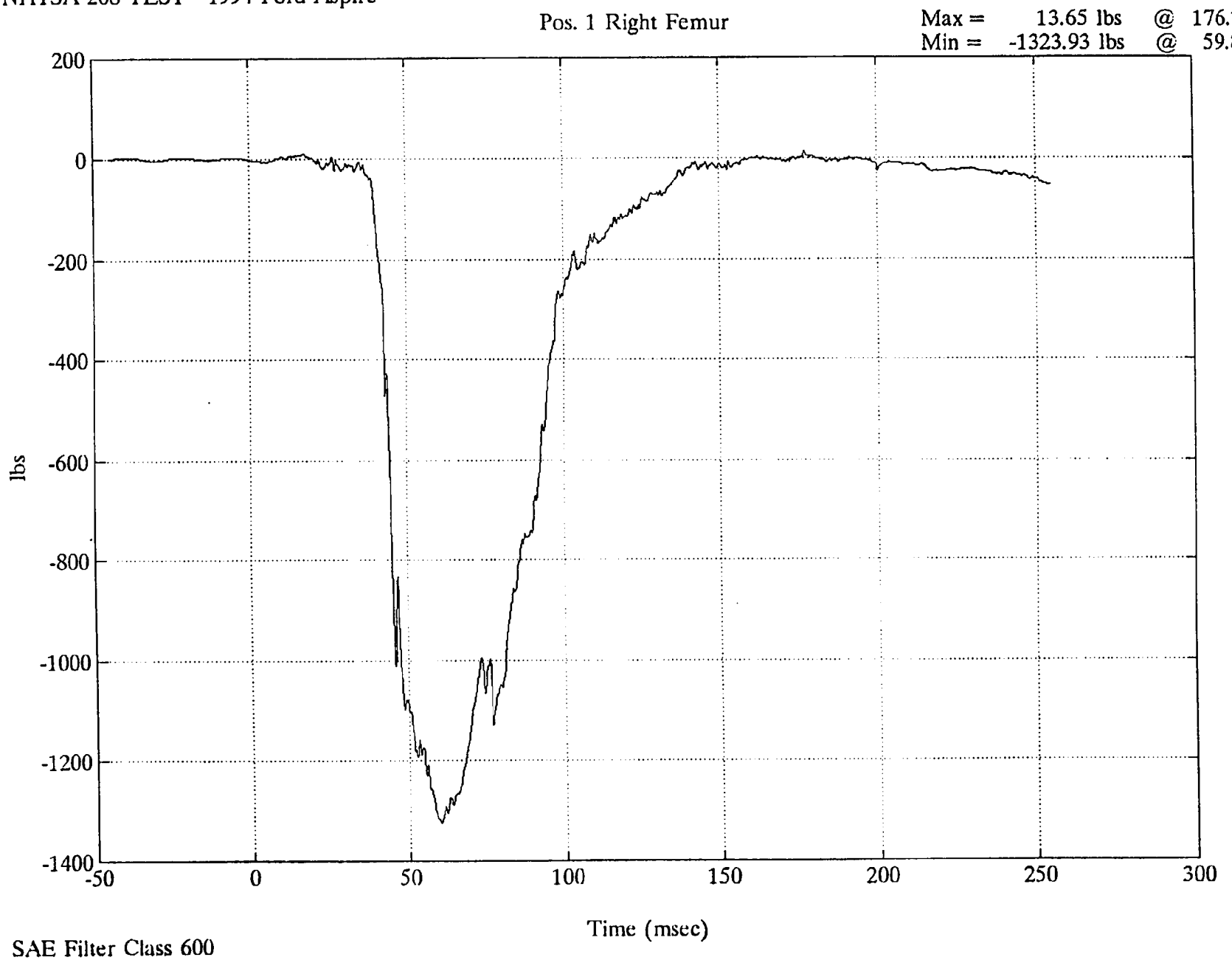
NHTSA 208 TEST - 1994 Ford Aspire



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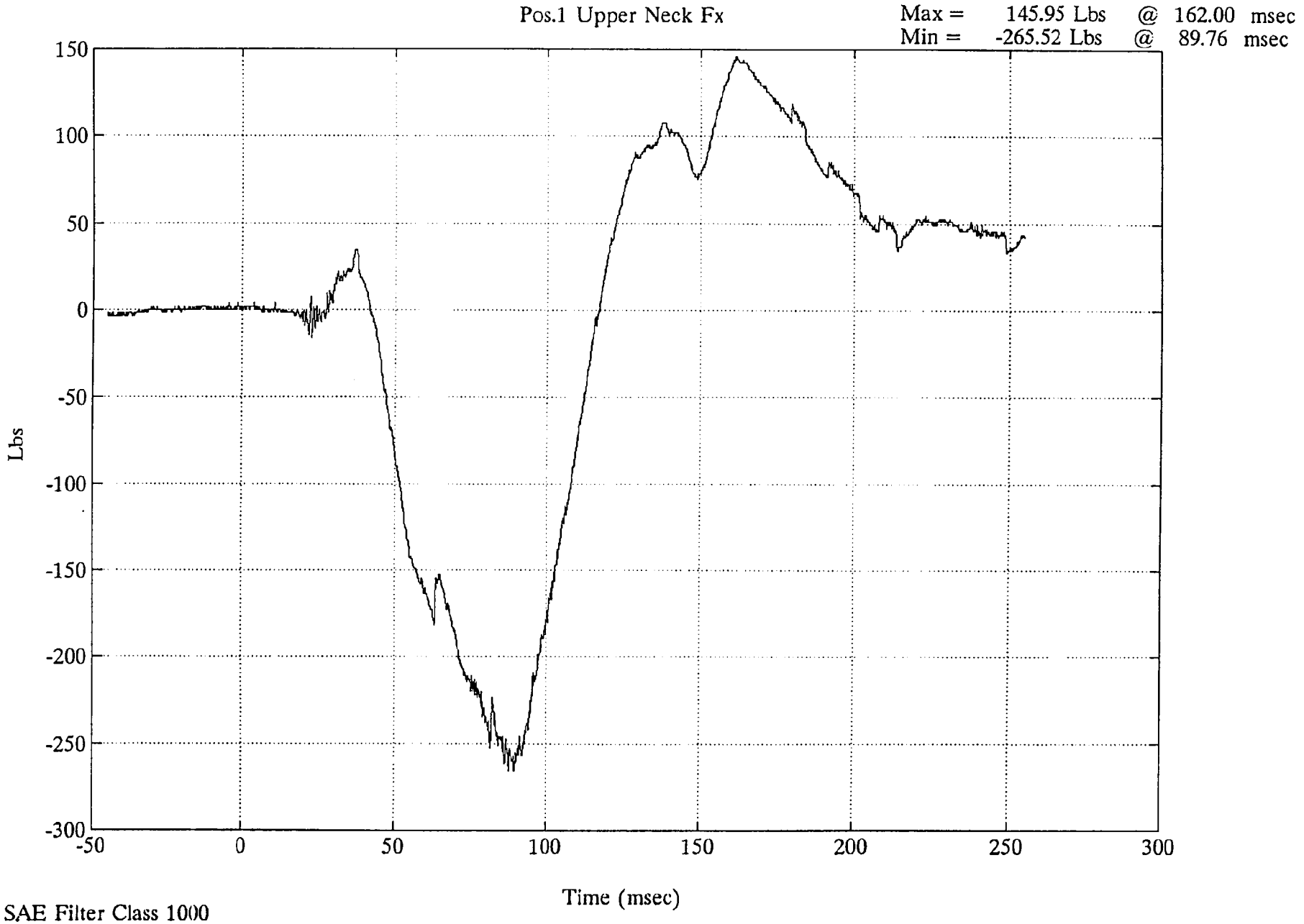

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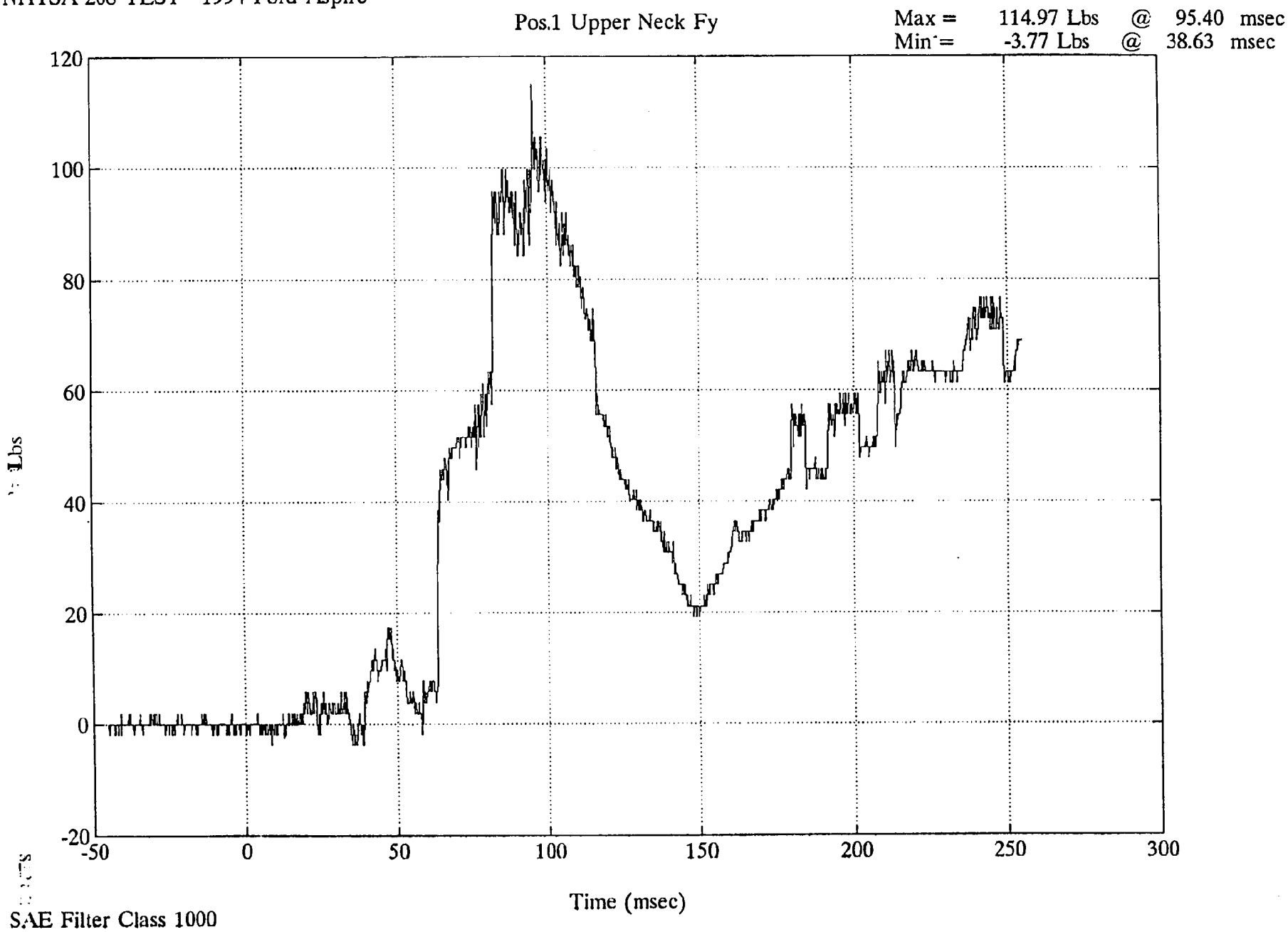

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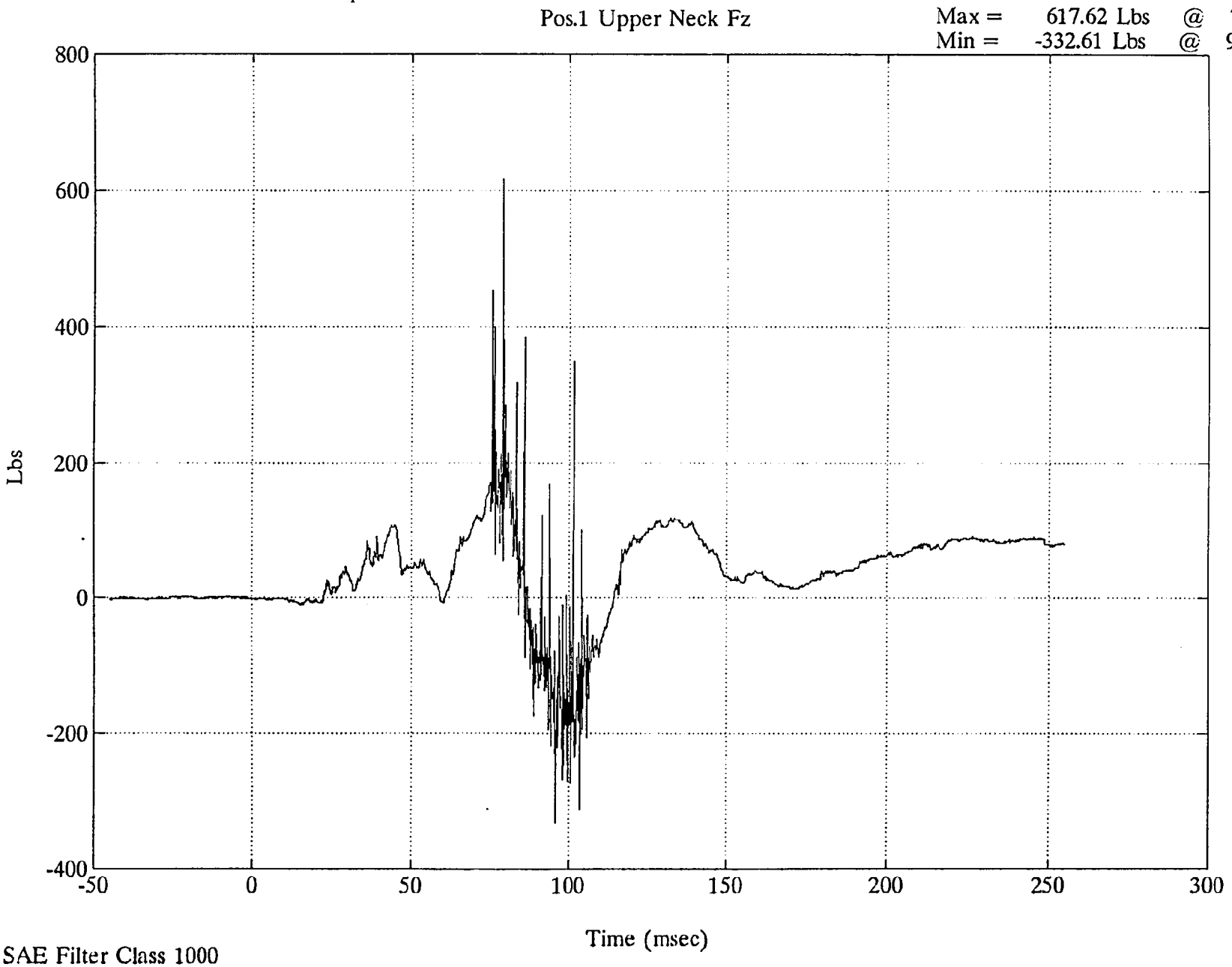

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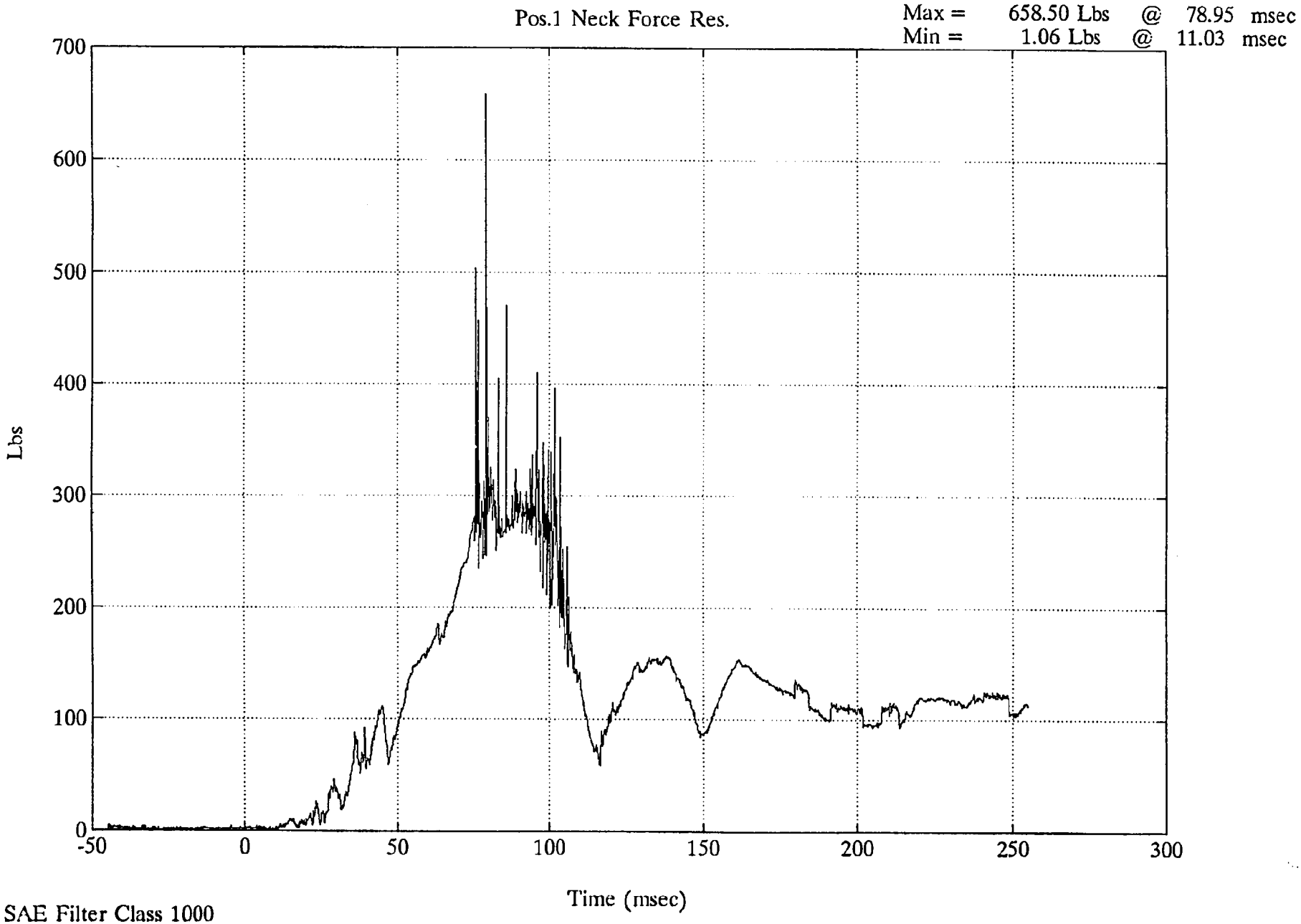

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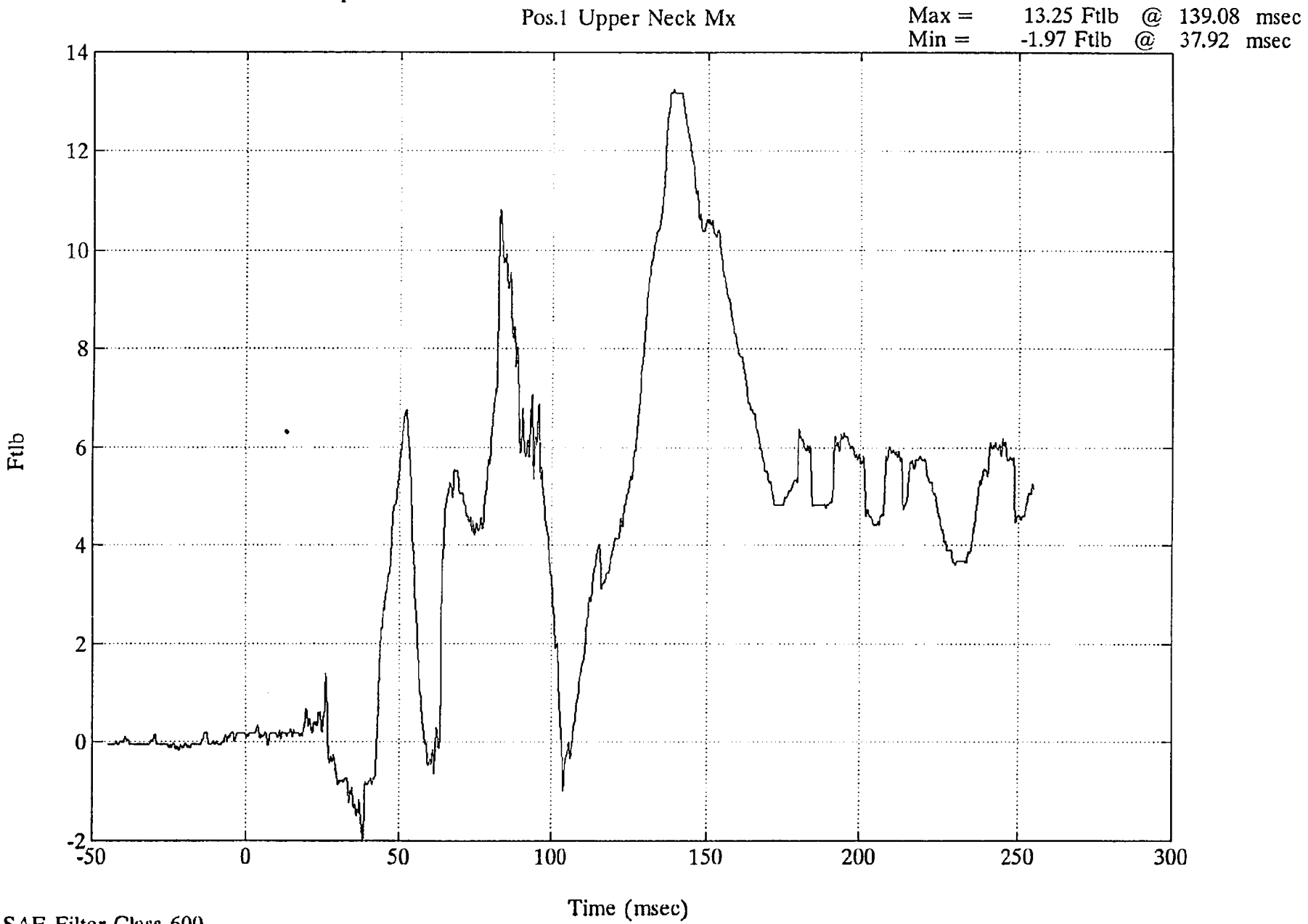

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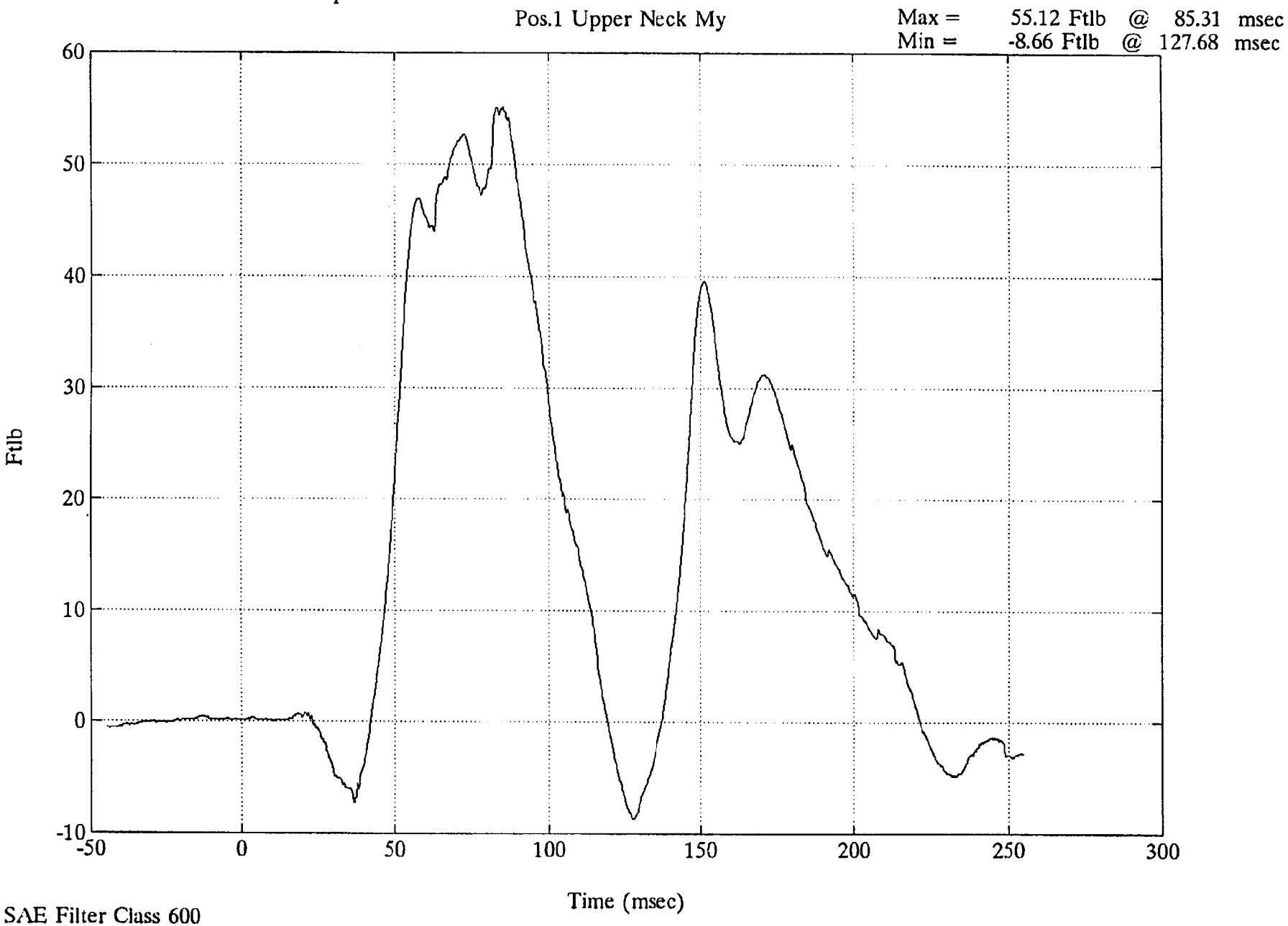

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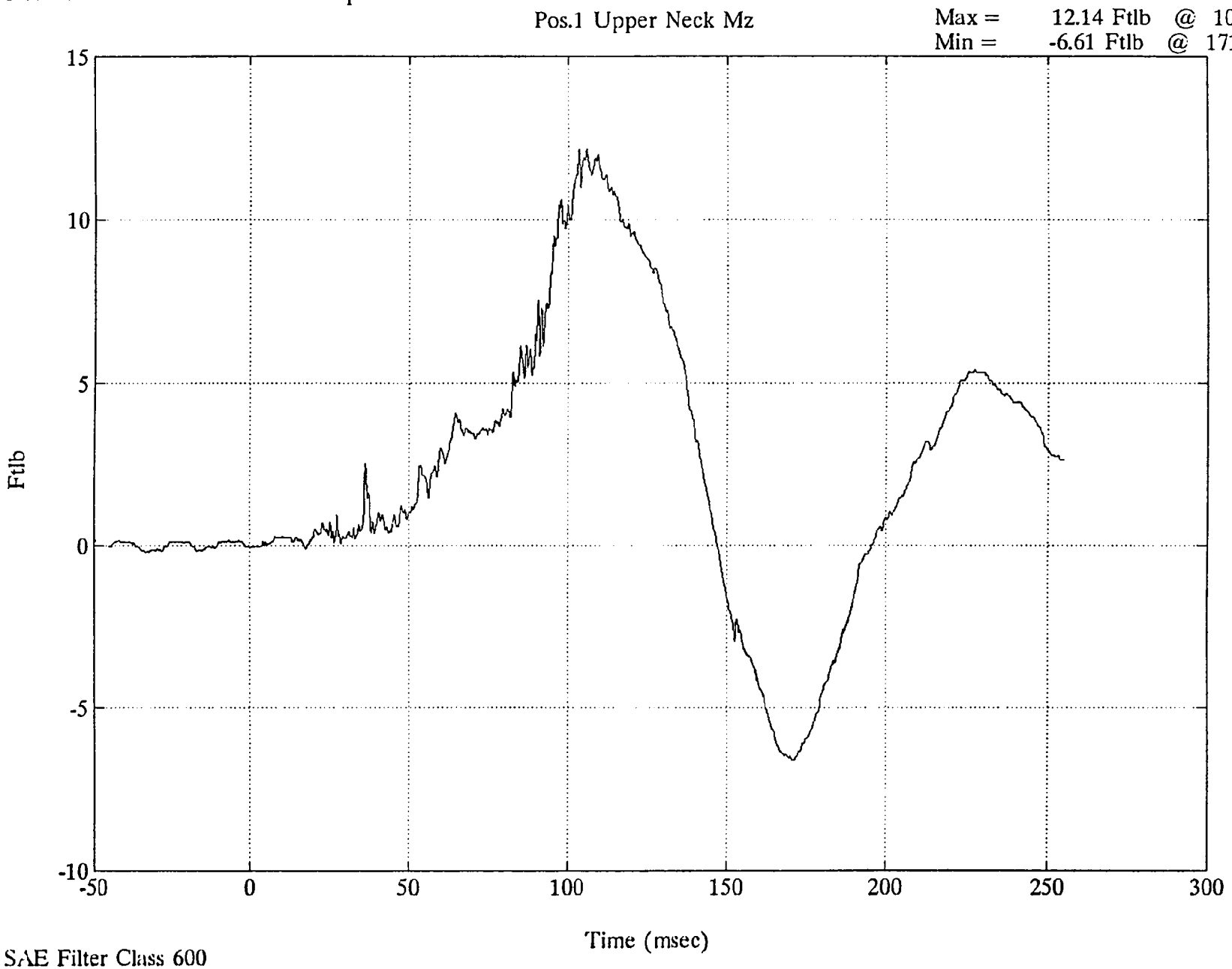

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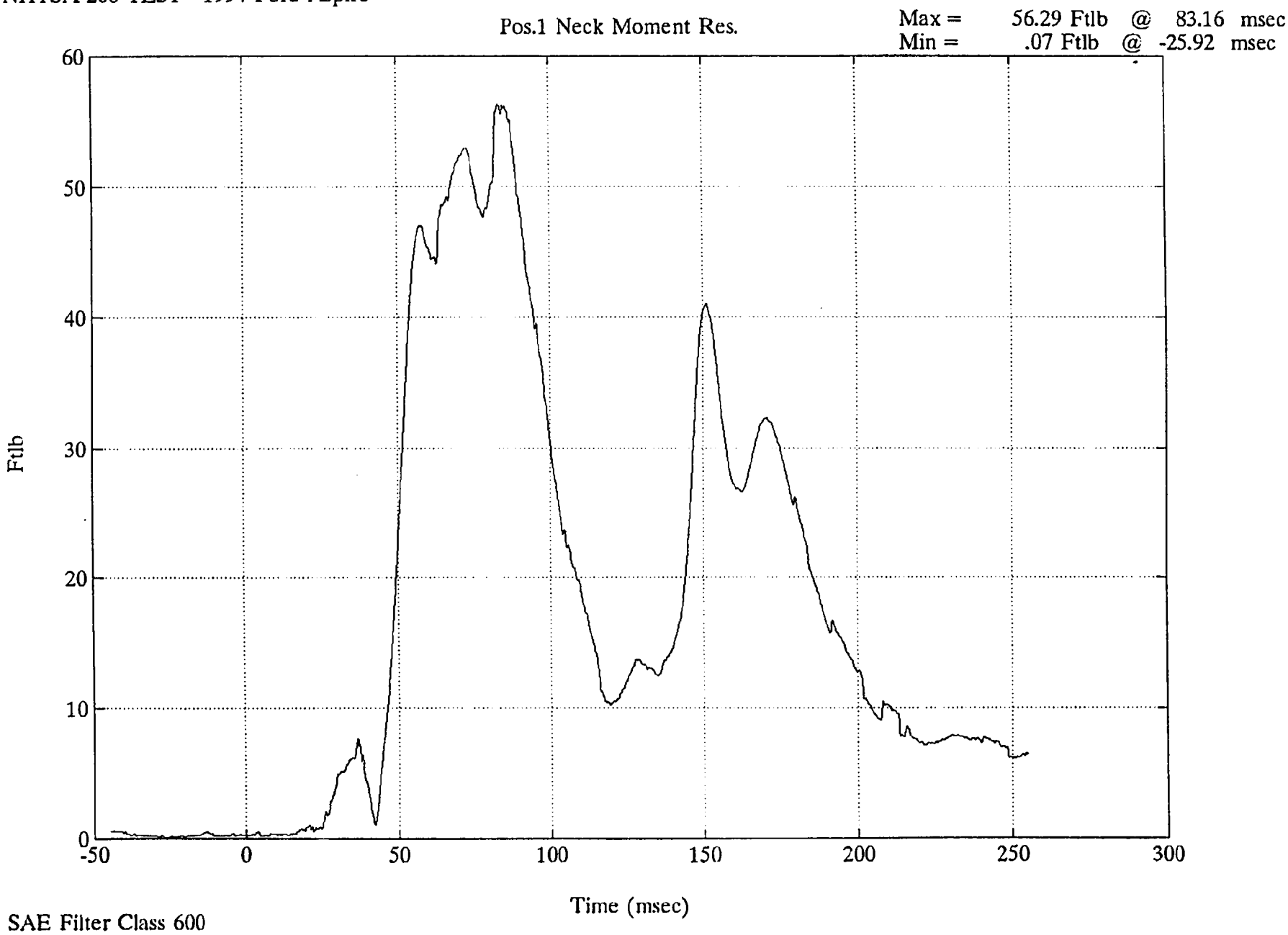

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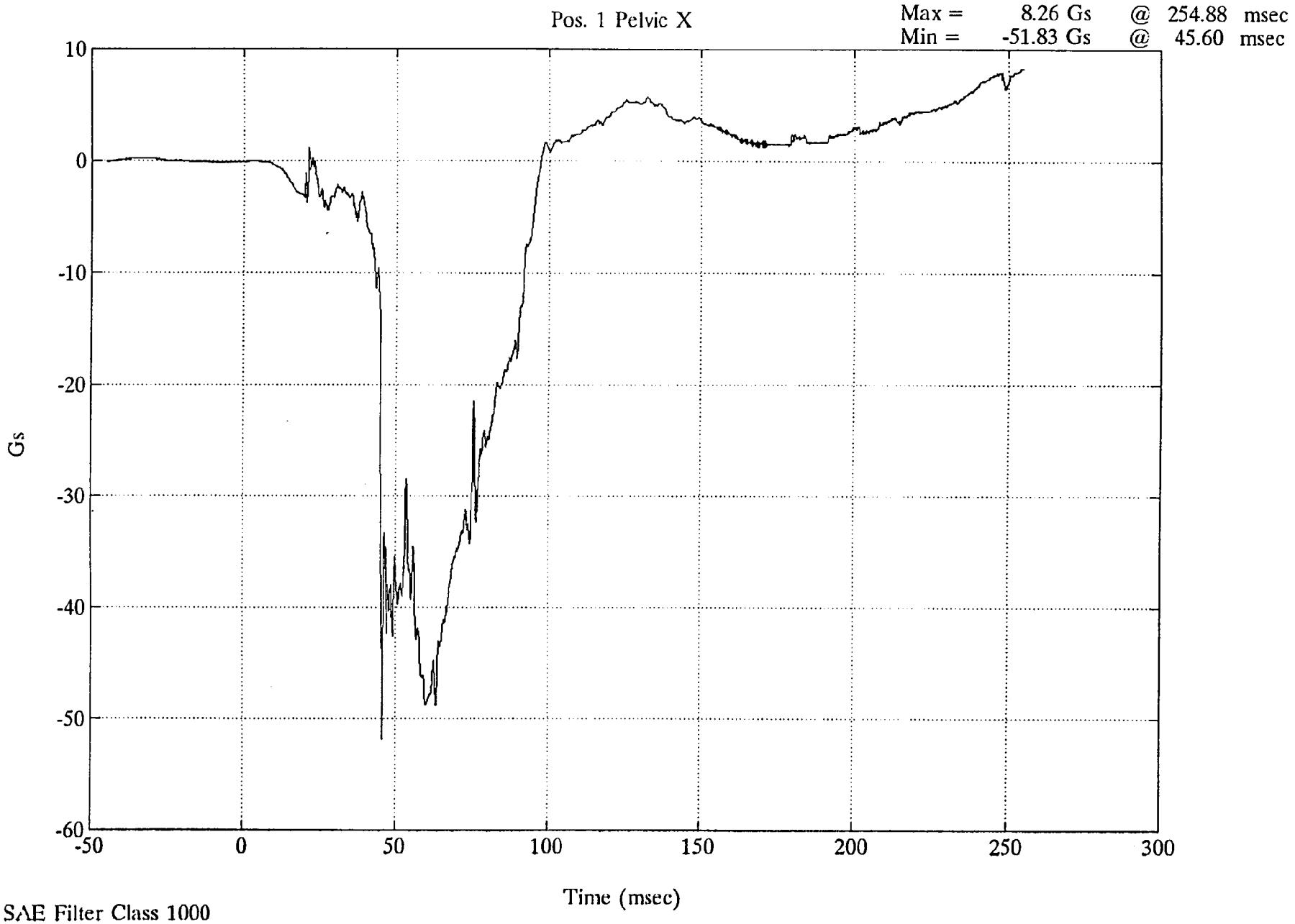

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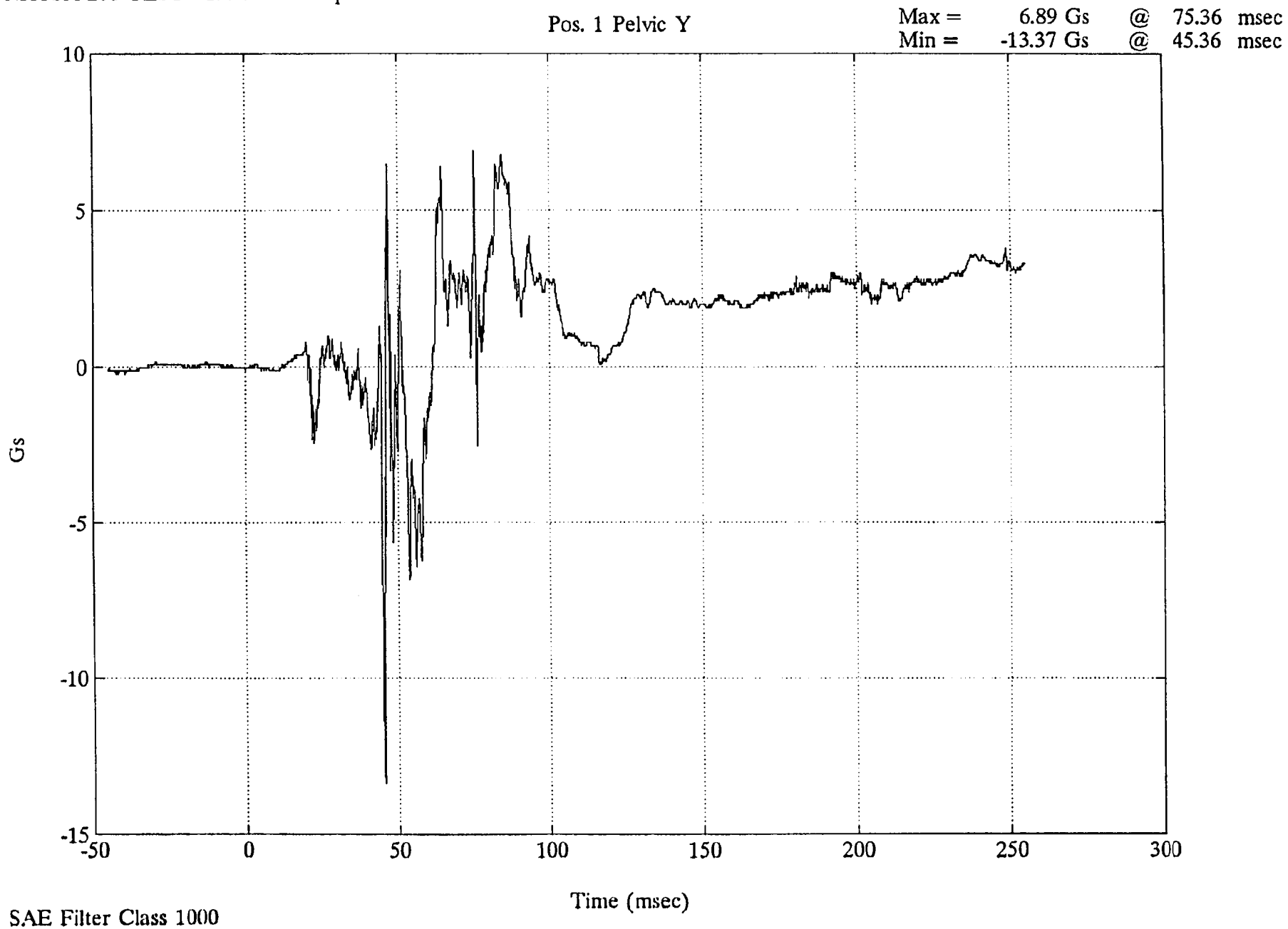

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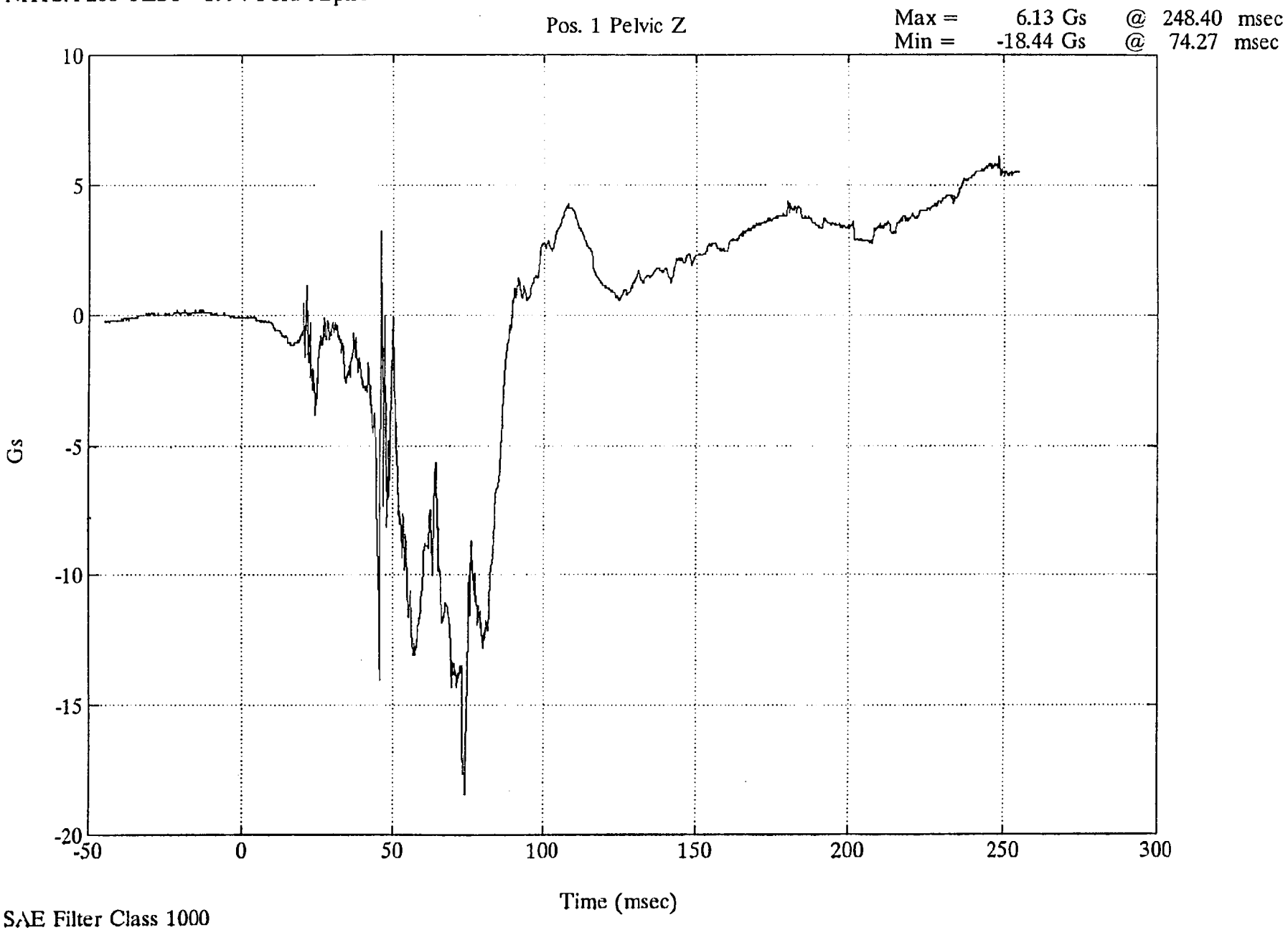

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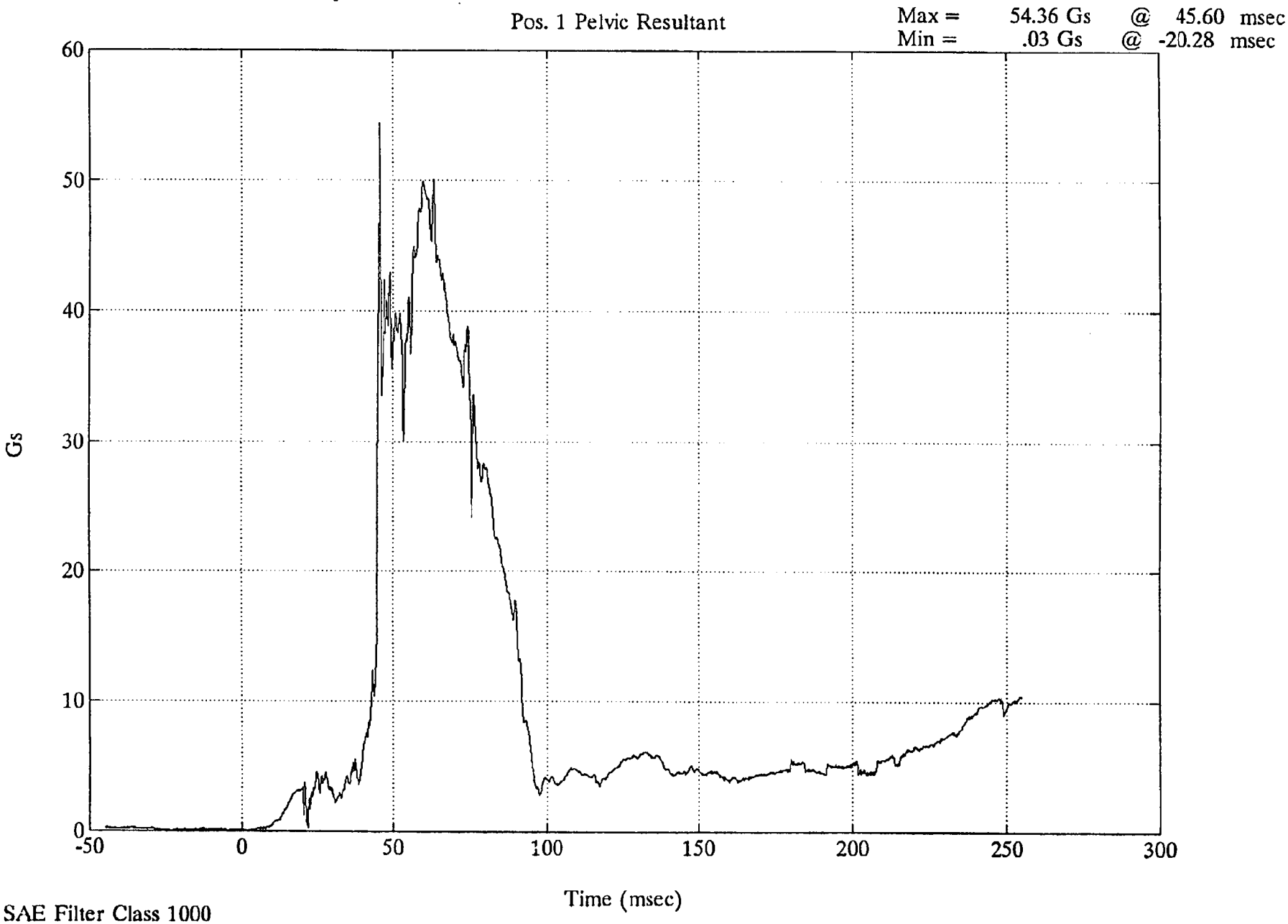

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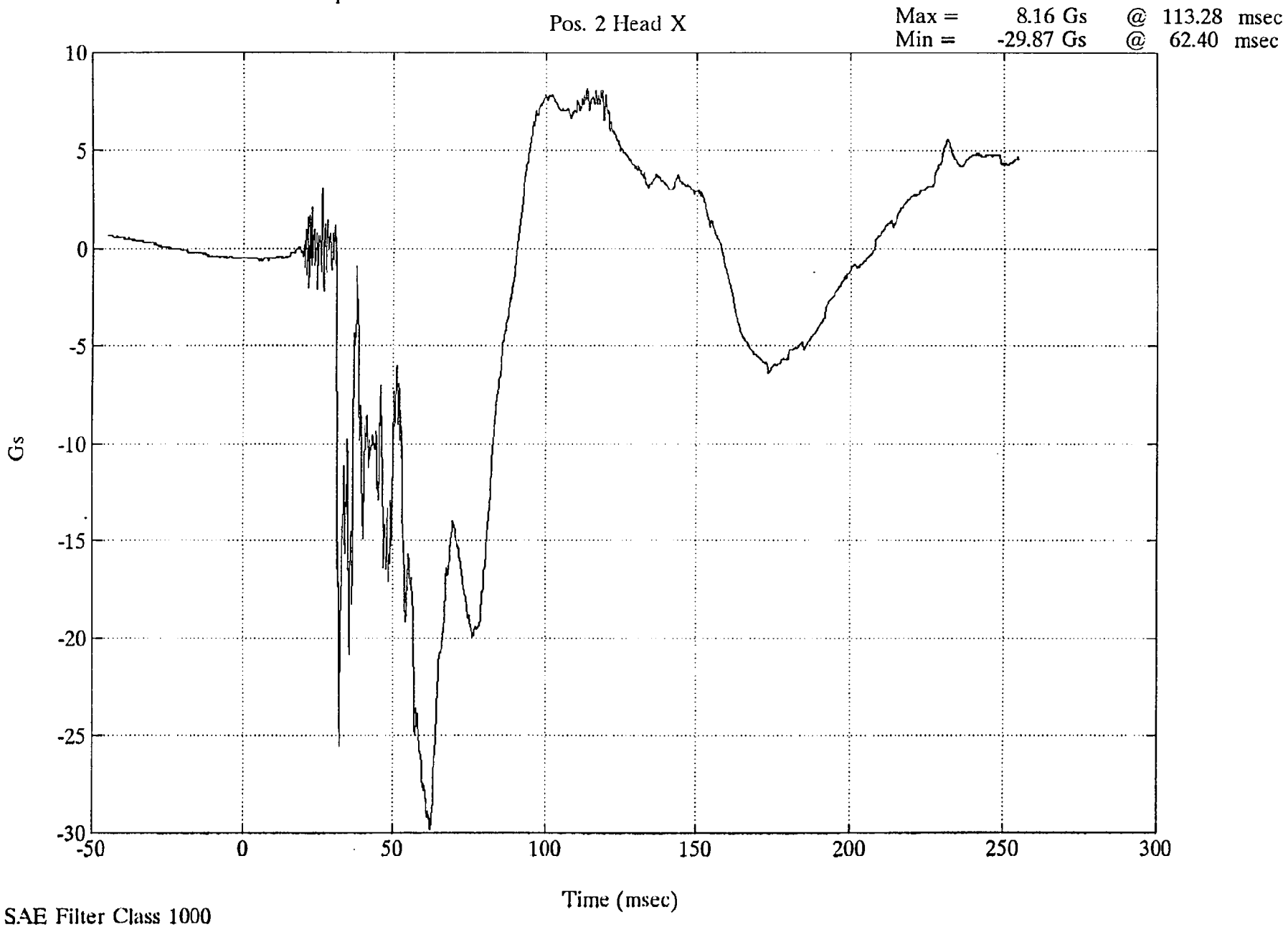

SAE Filter Class 1000

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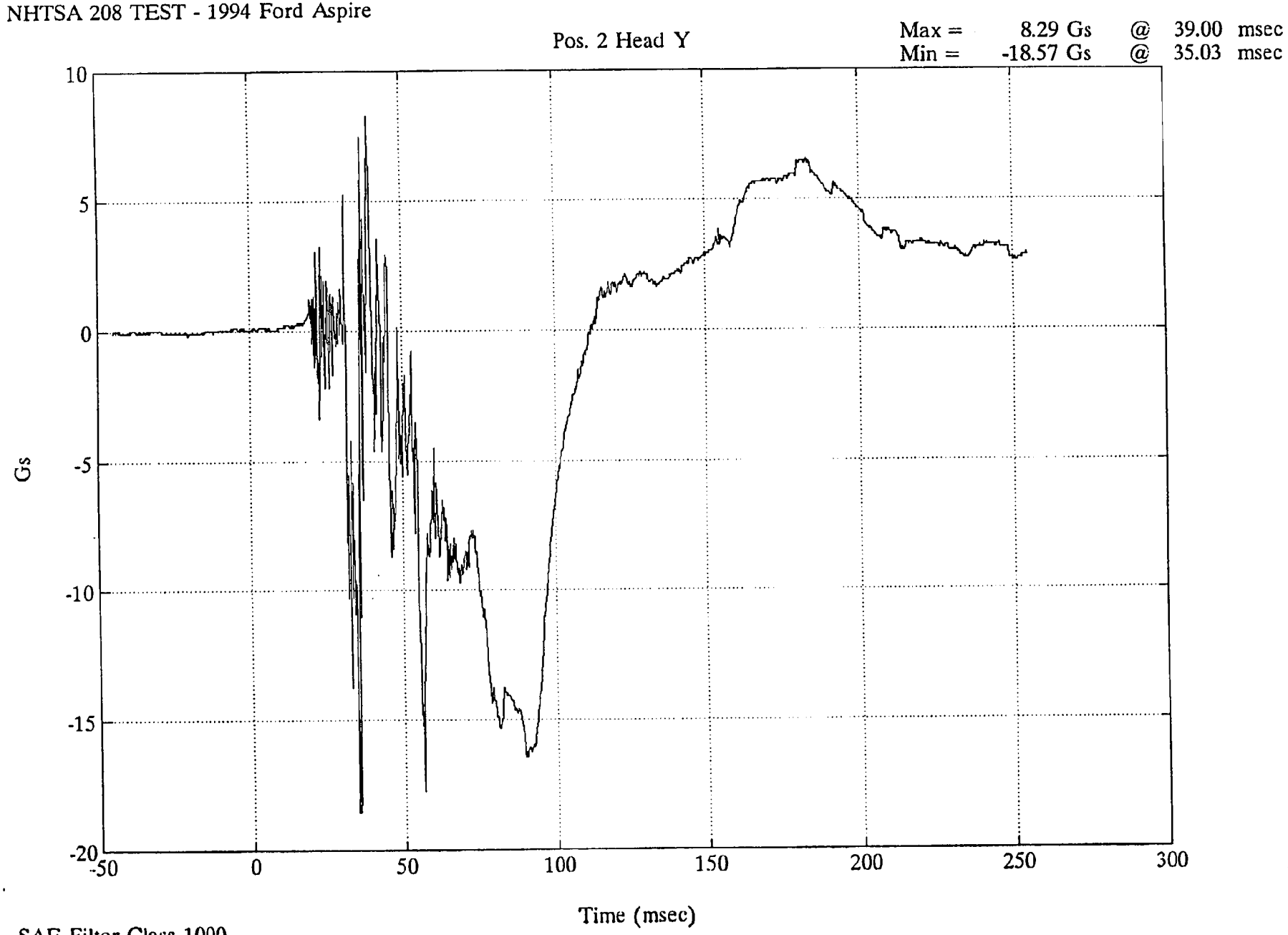
NHTSA 208 TEST - 1994 Ford Aspire



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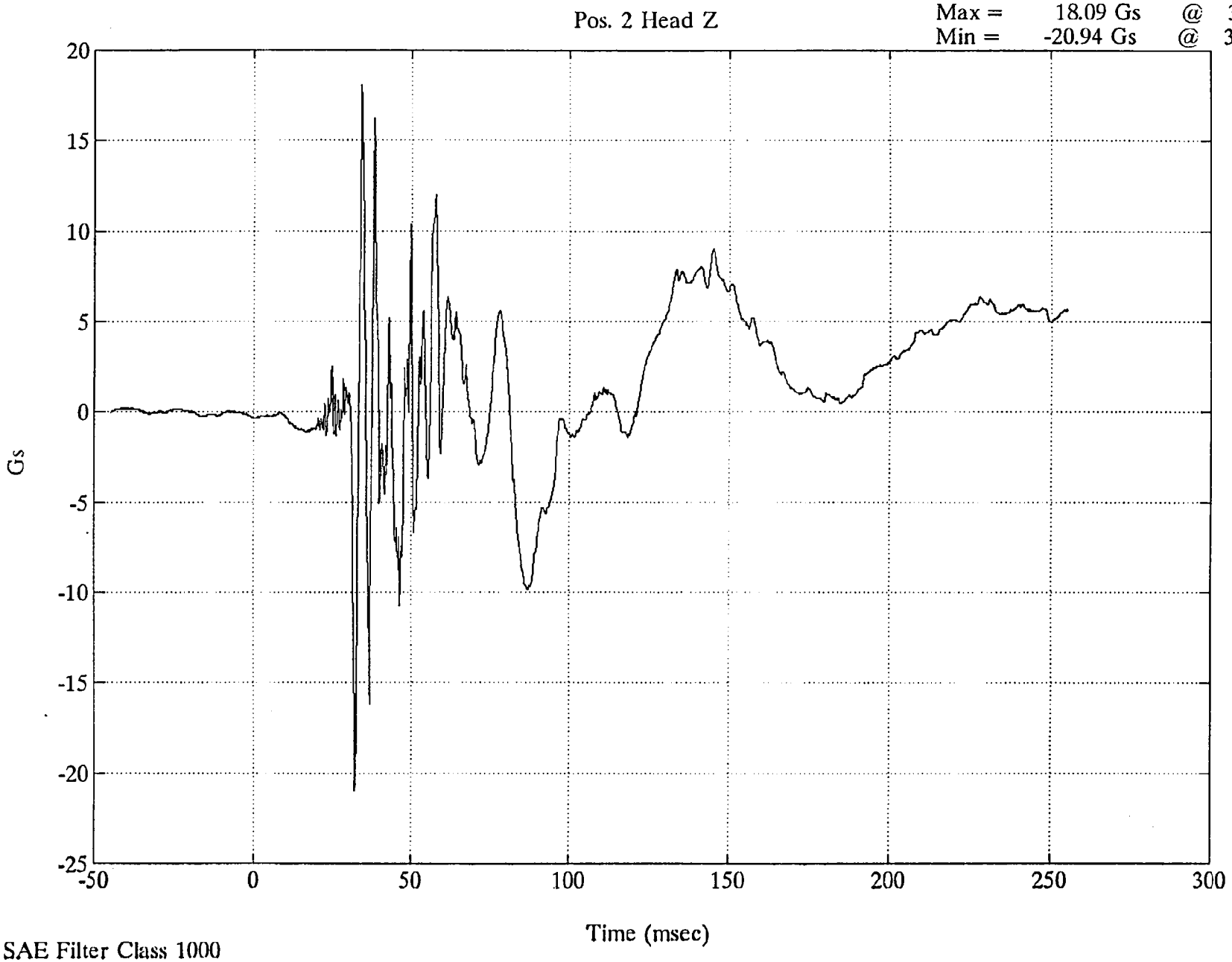

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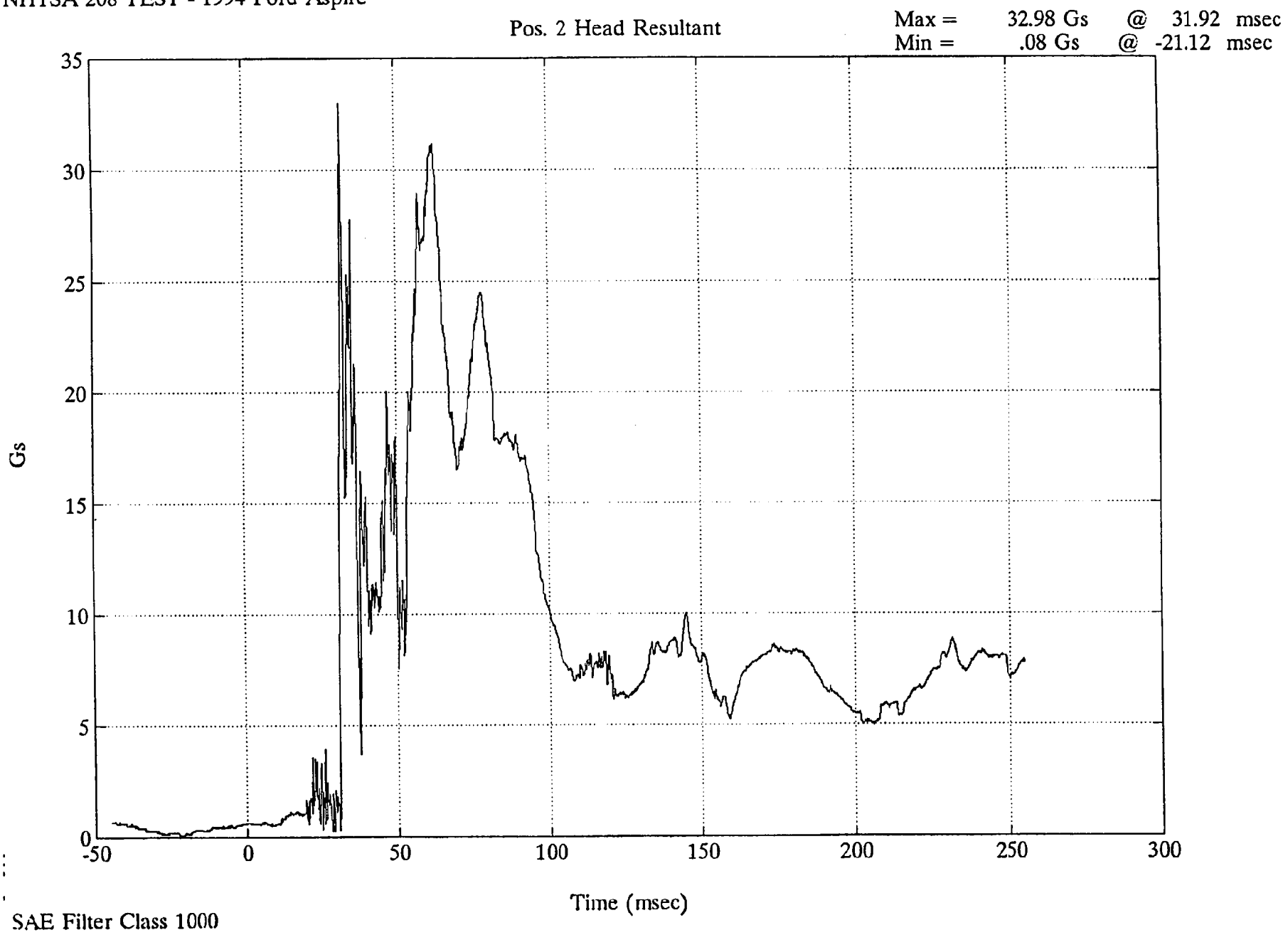

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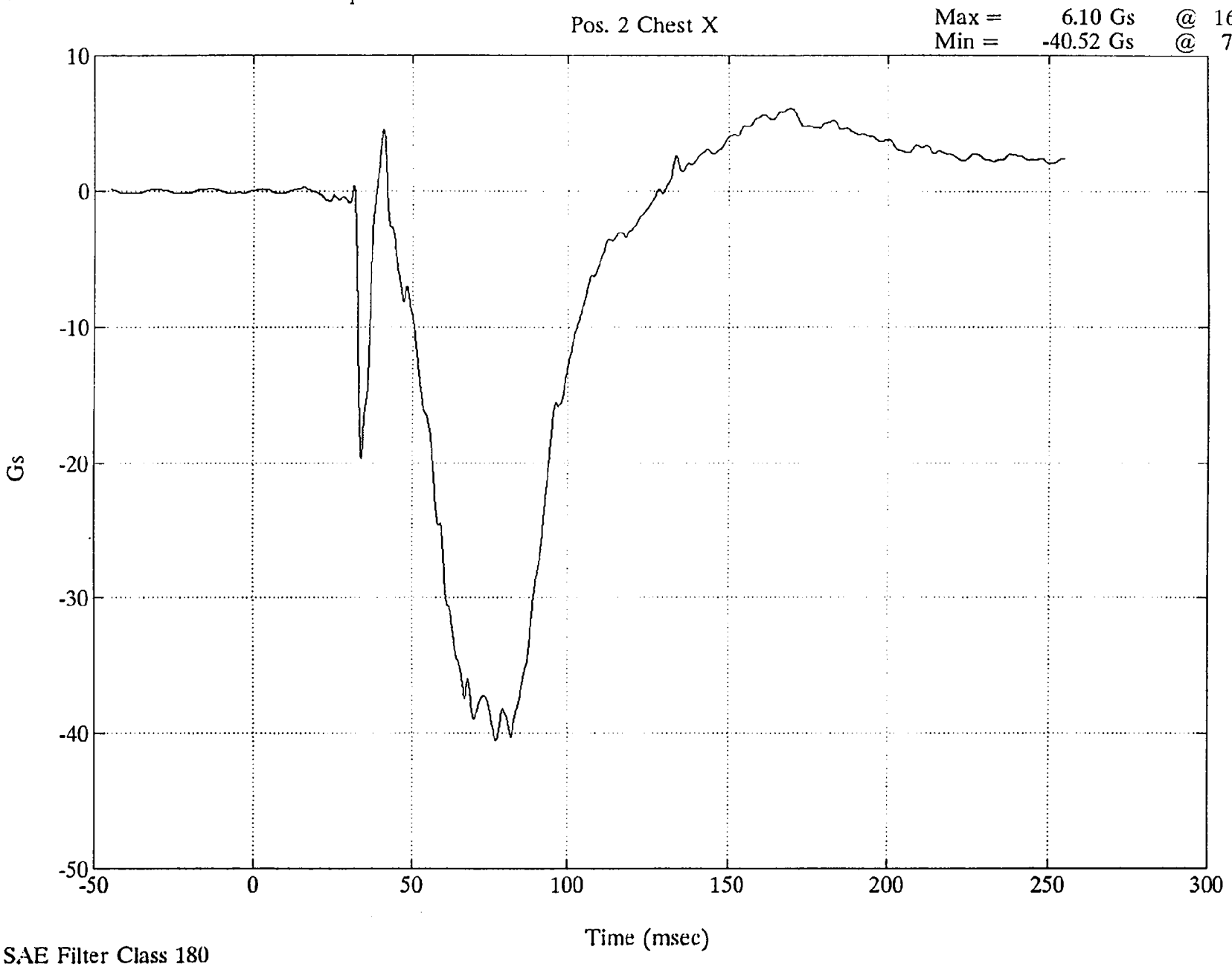

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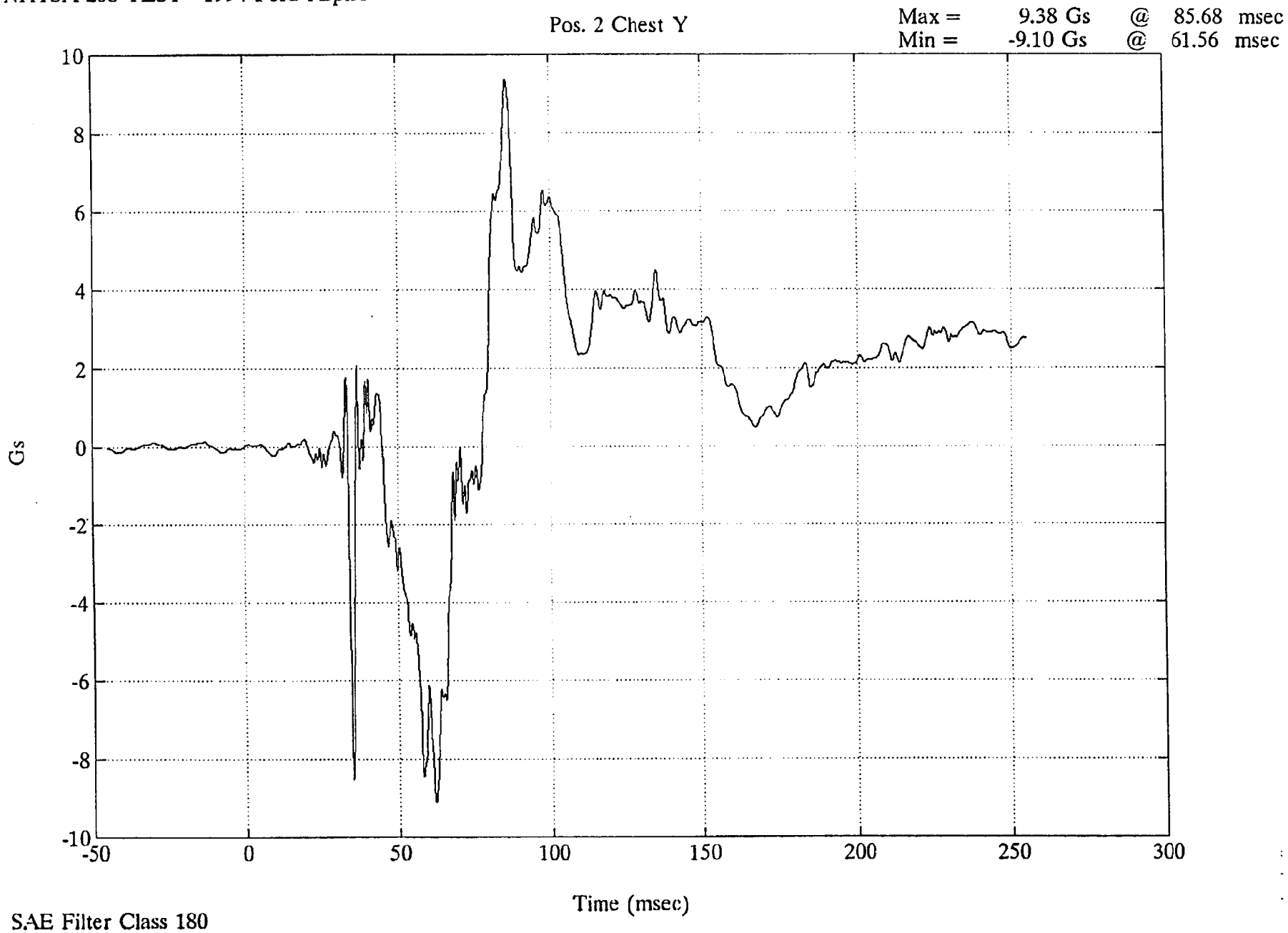

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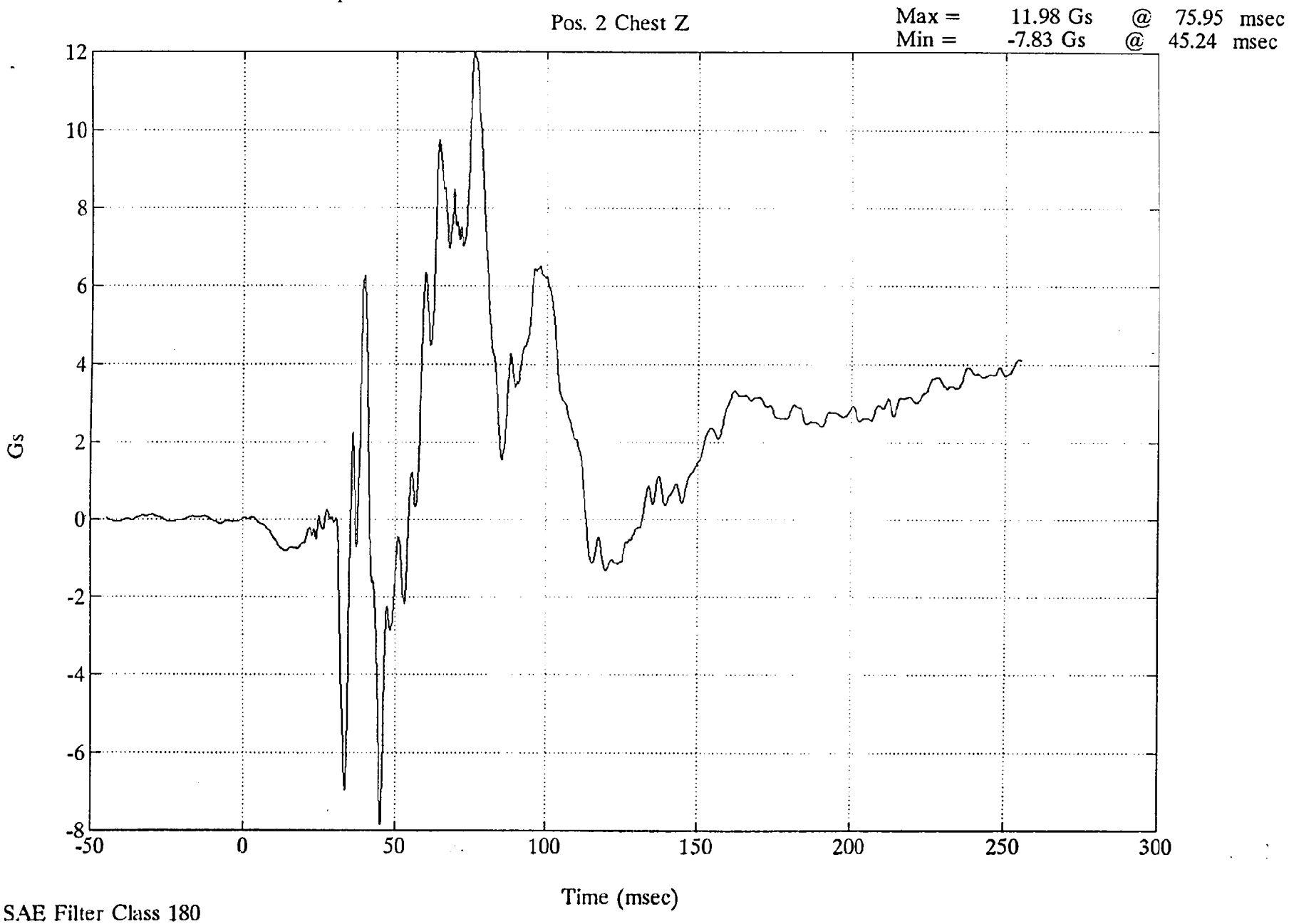

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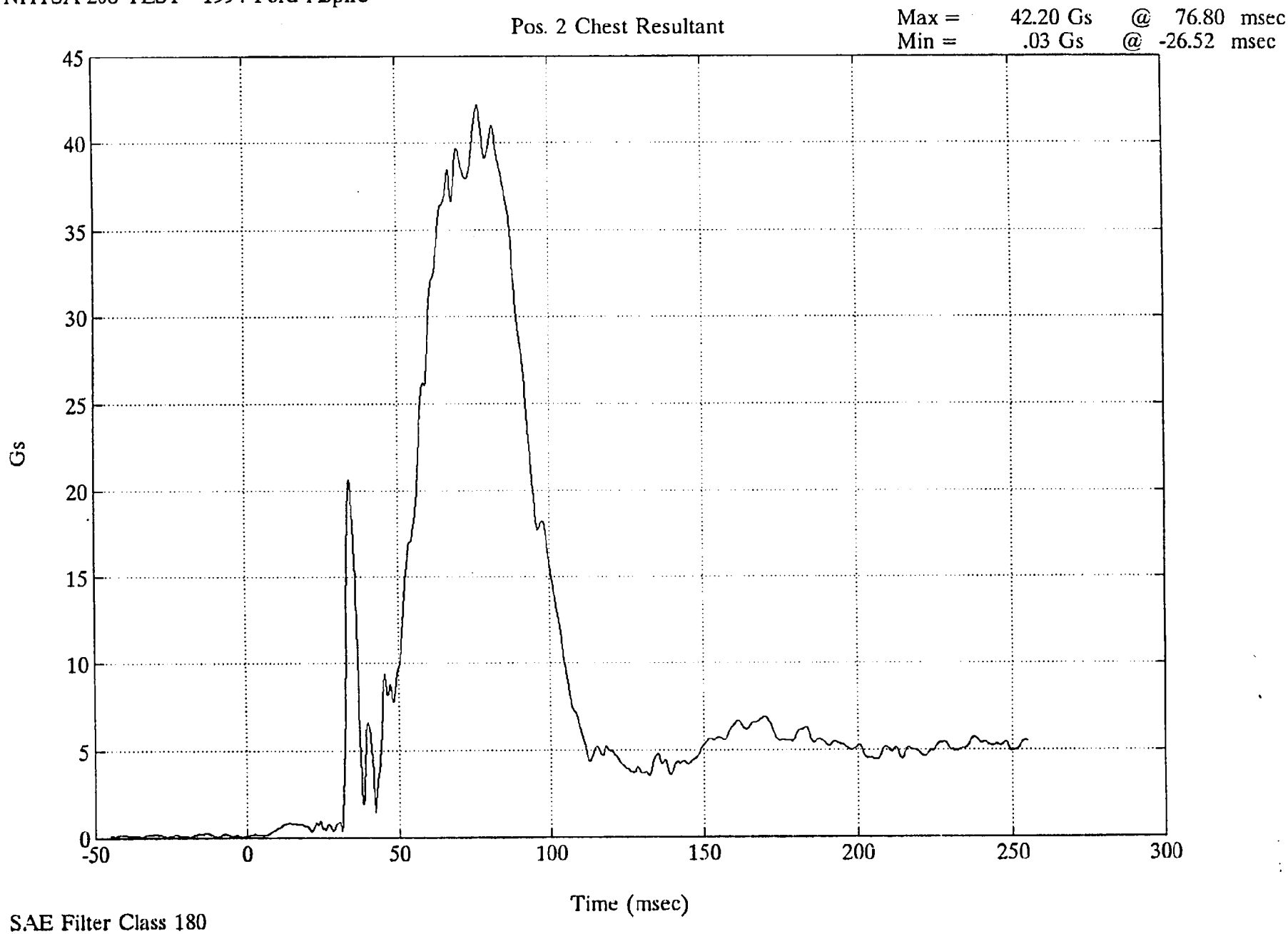

SAE Filter Class 180

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NHTSA 208 TEST - 1994 Ford Aspire

SAE Filter Class 180

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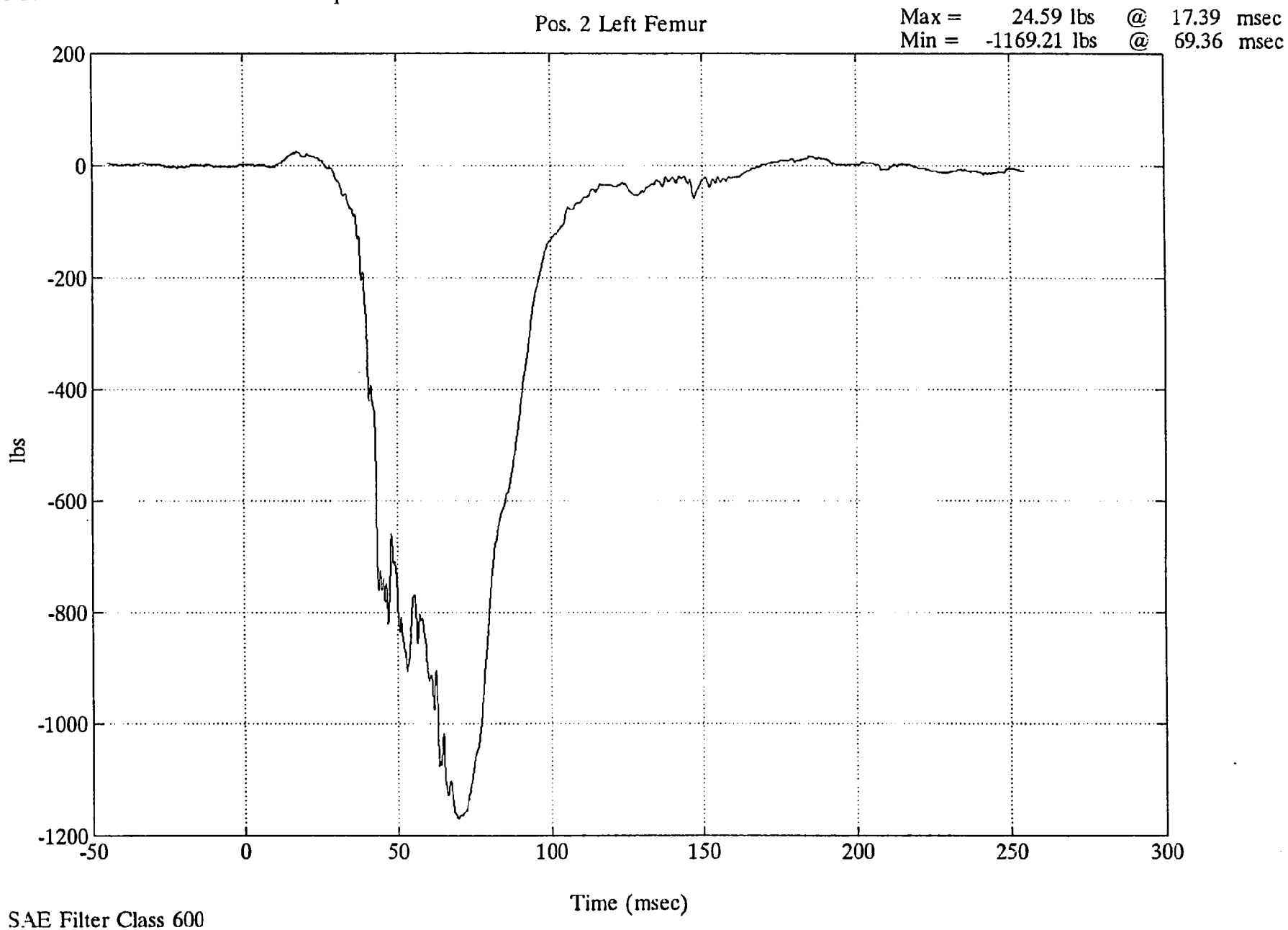

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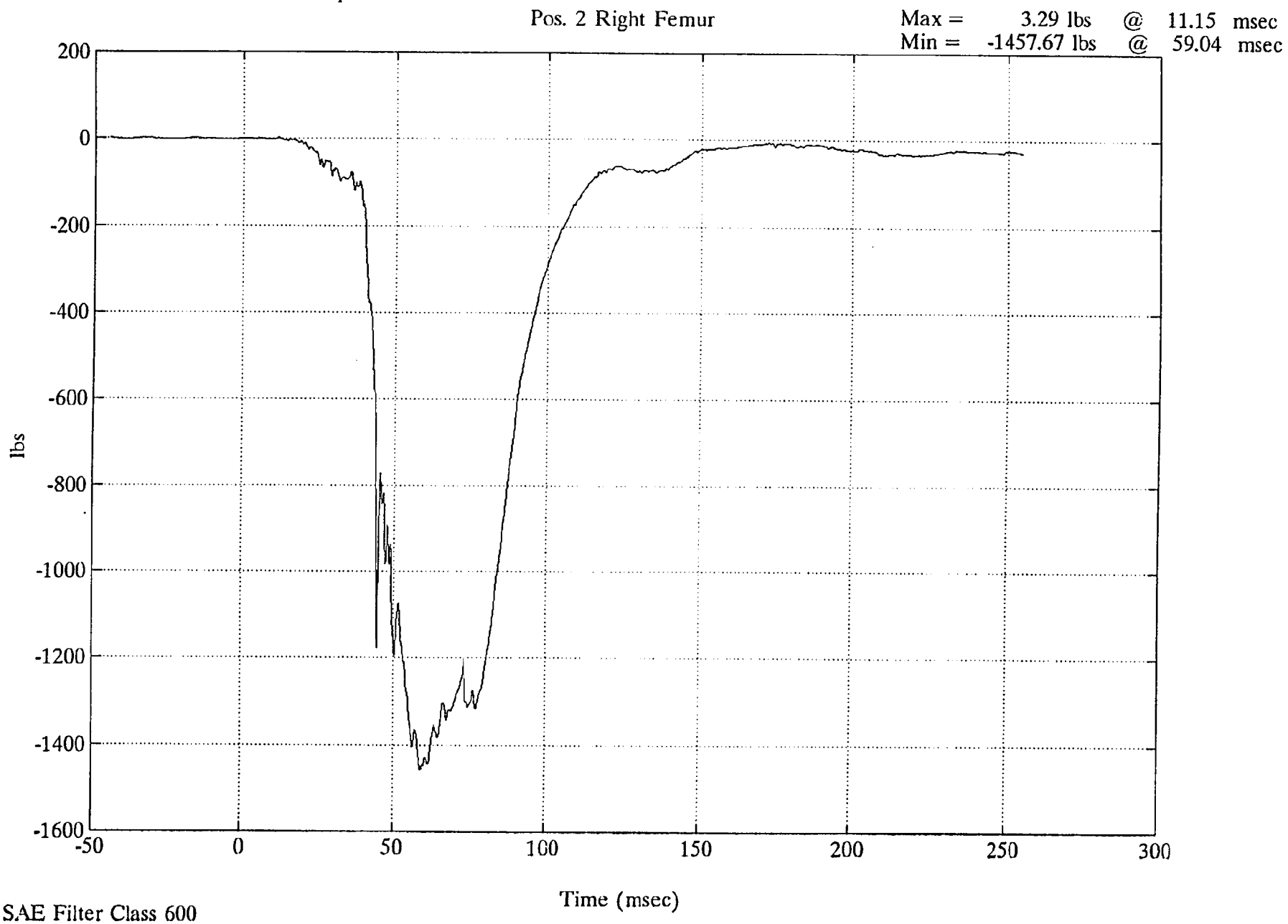

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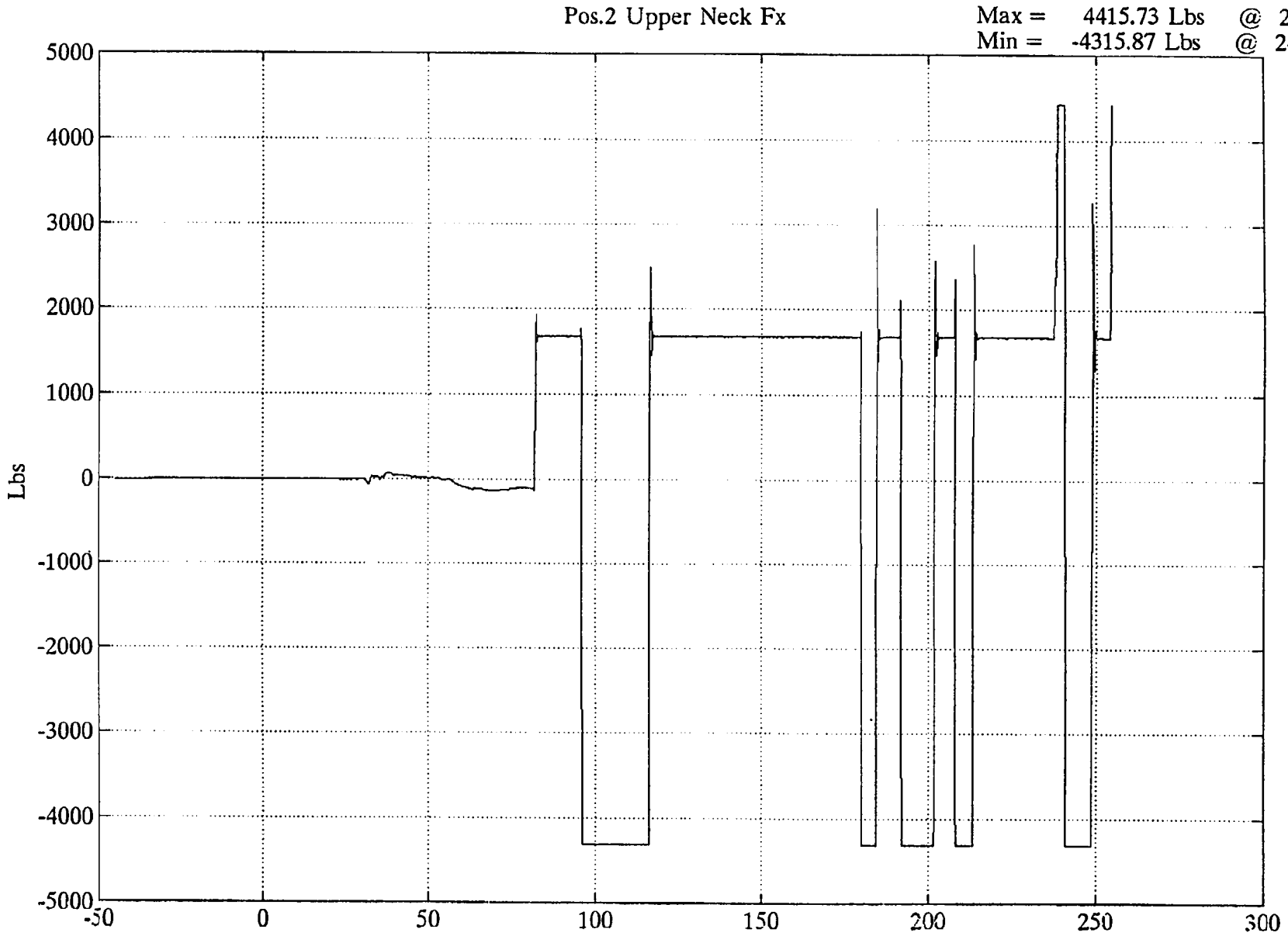

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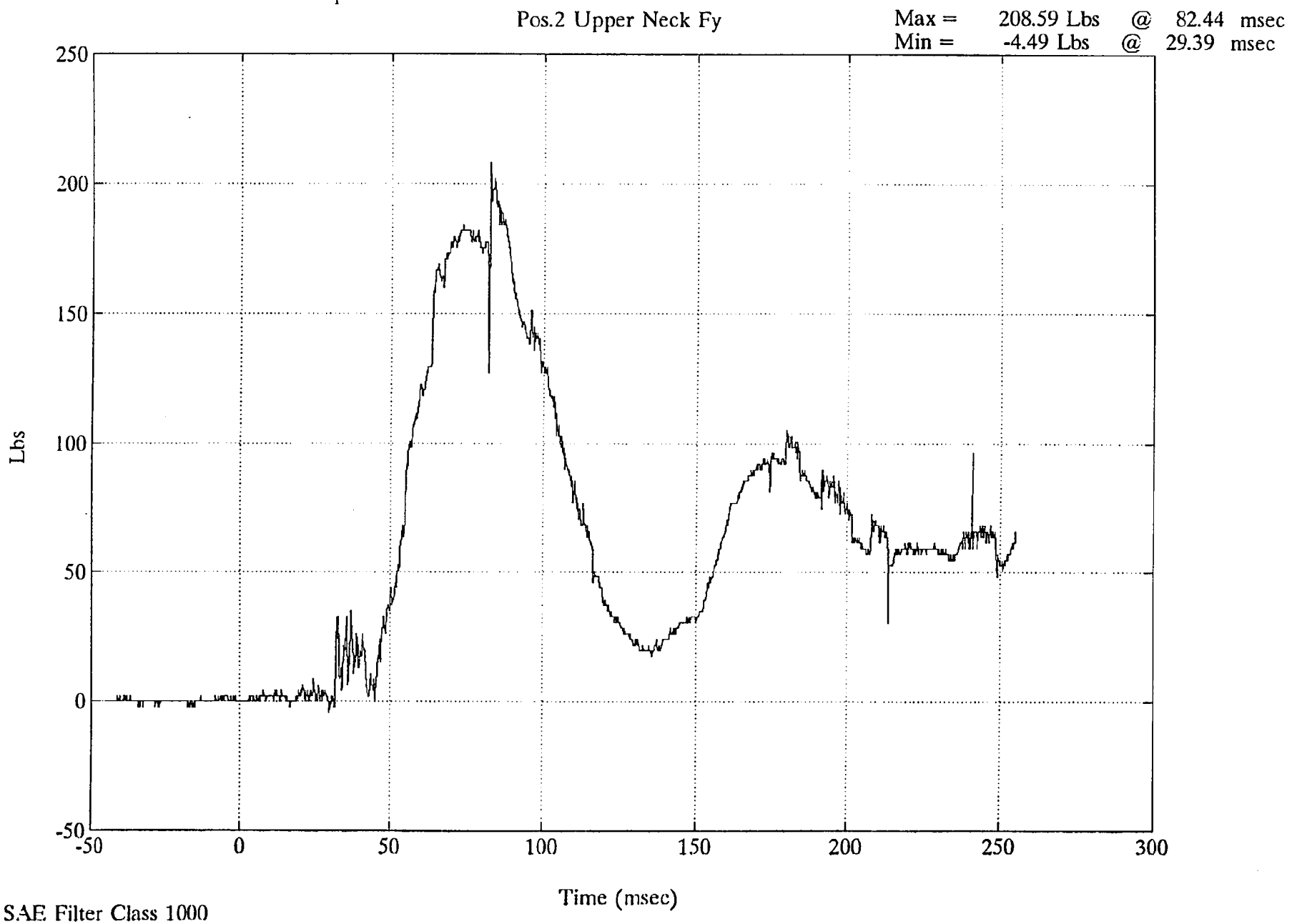
NHTSA 208 TEST - 1994 Ford Aspire



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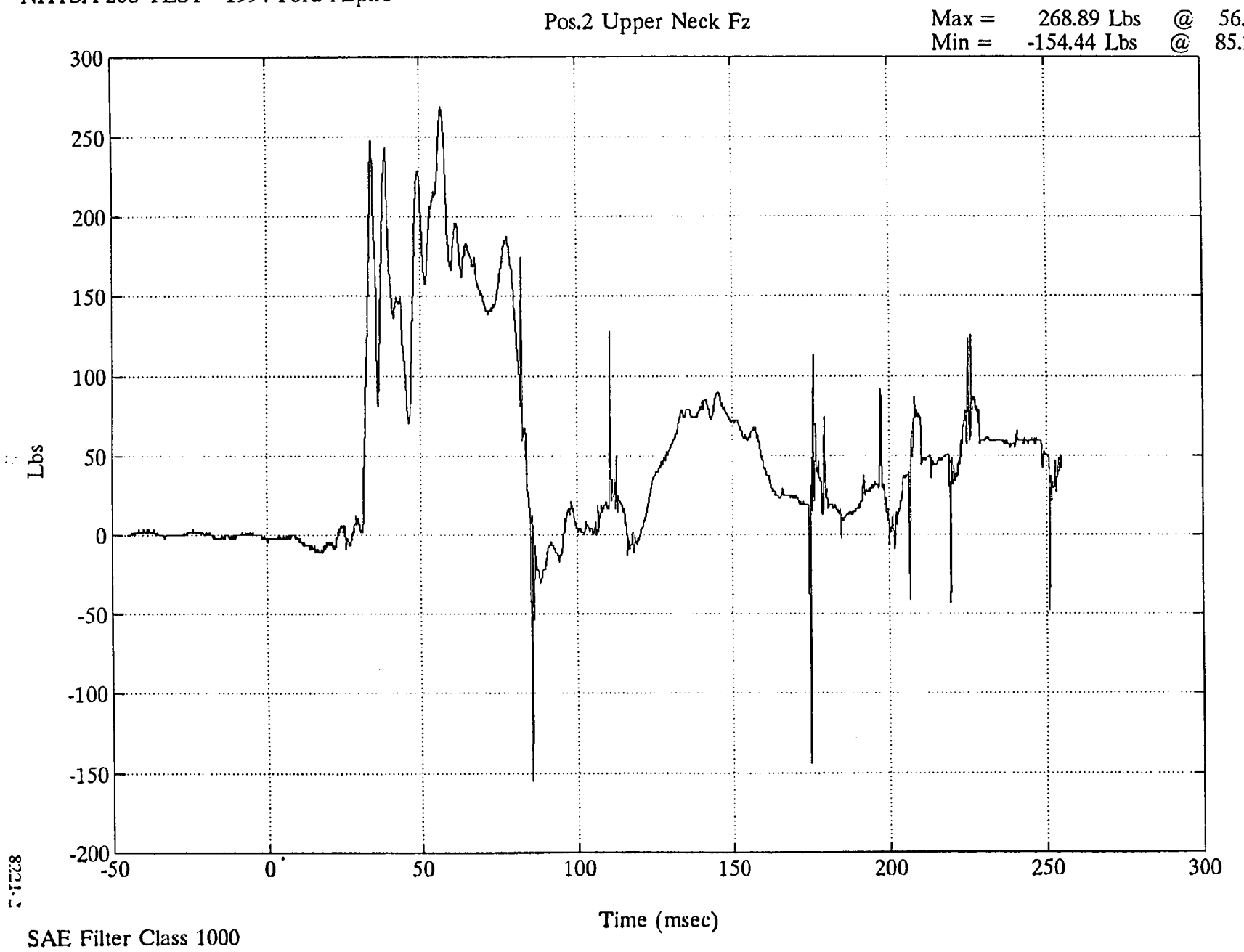

B-63

8221-2

SAE Filter Class 1000

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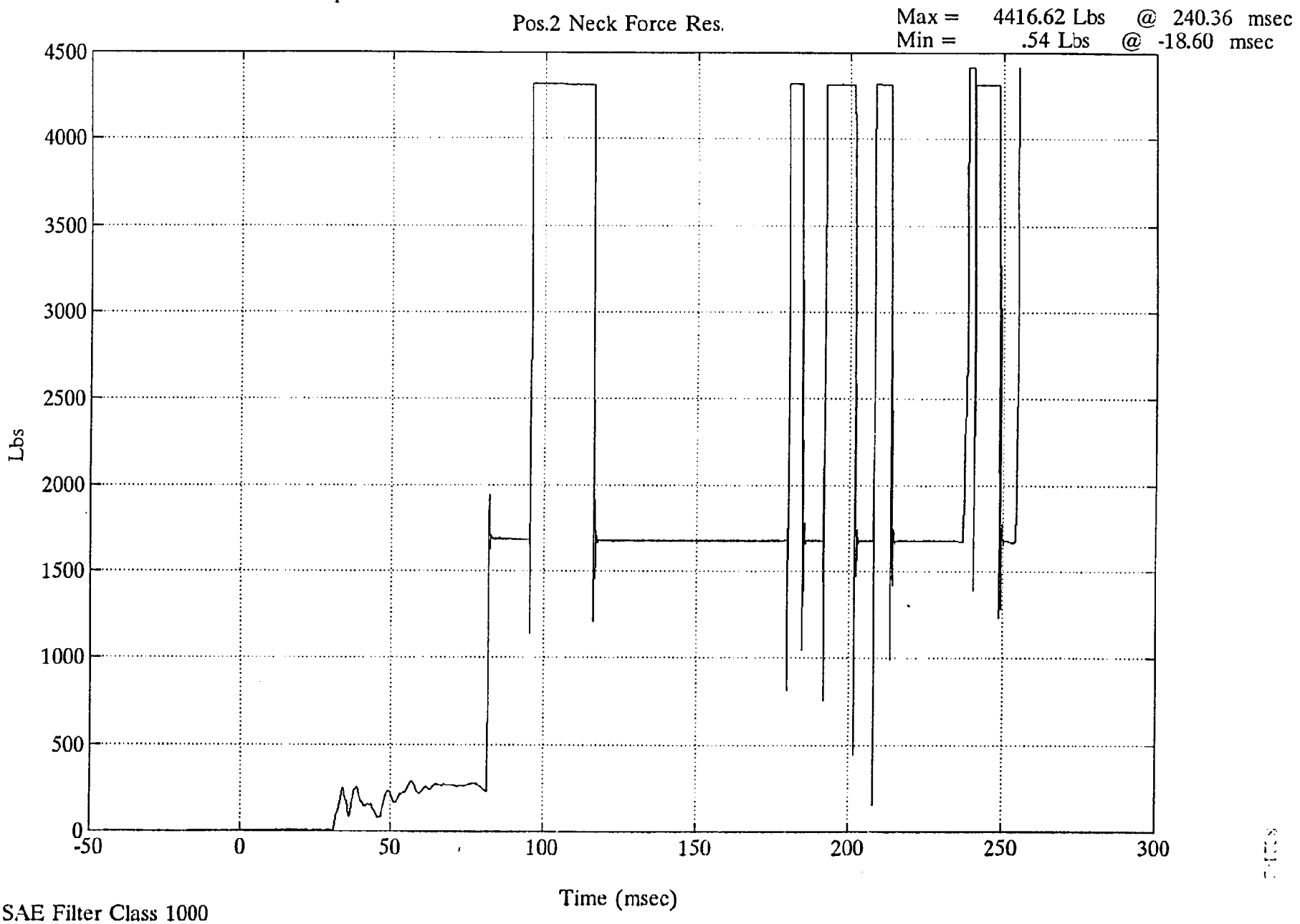

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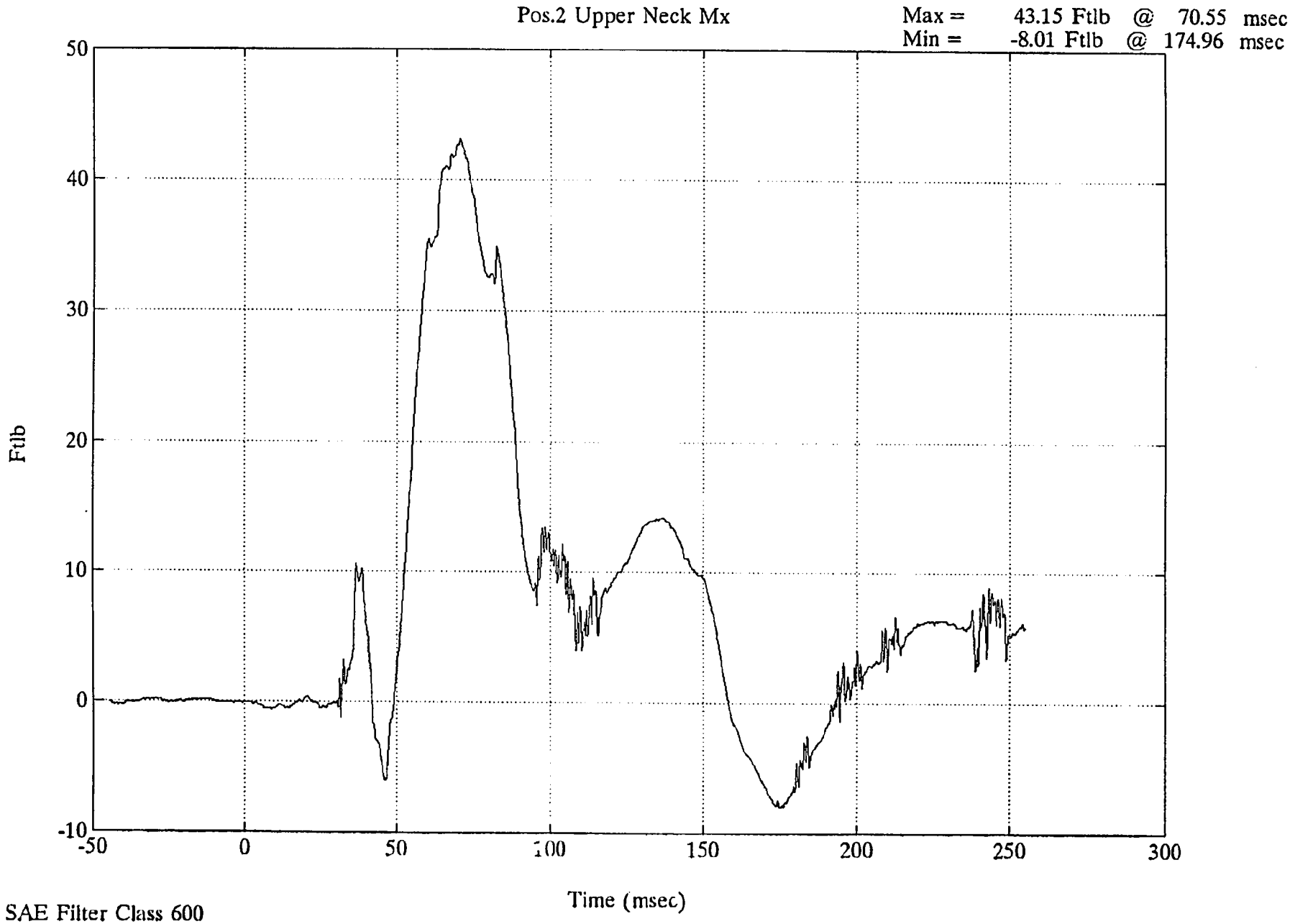

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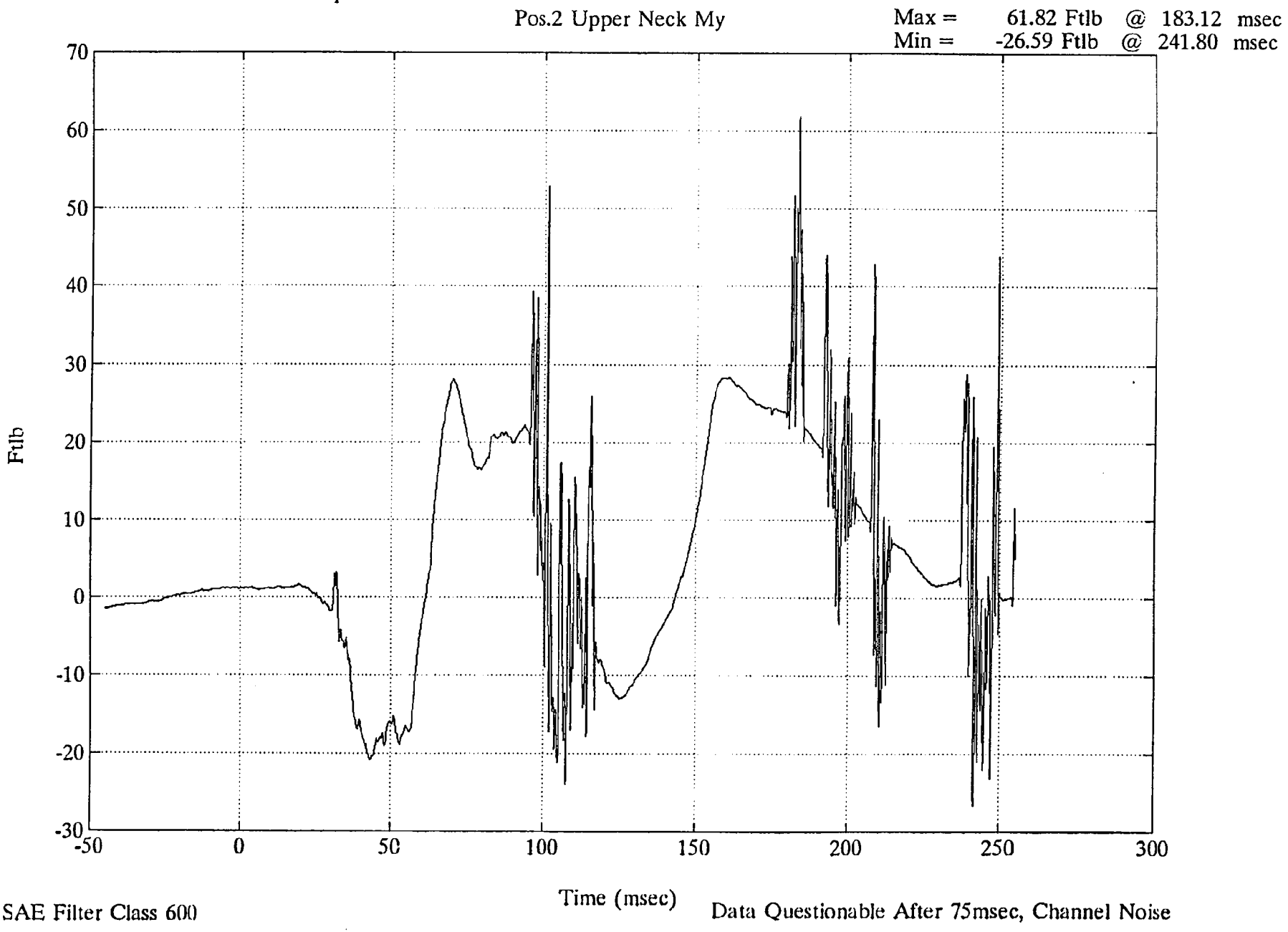

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8221-2

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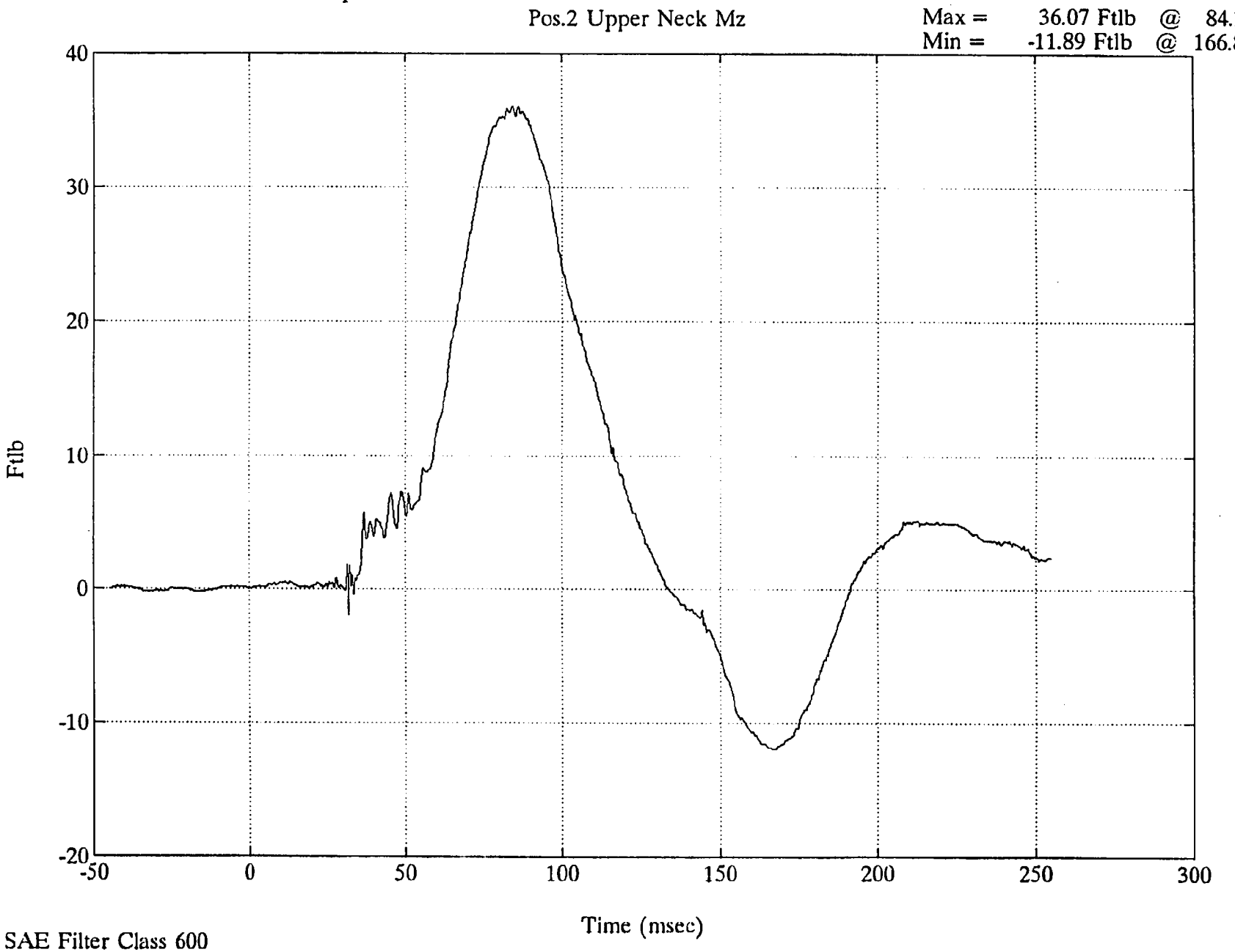

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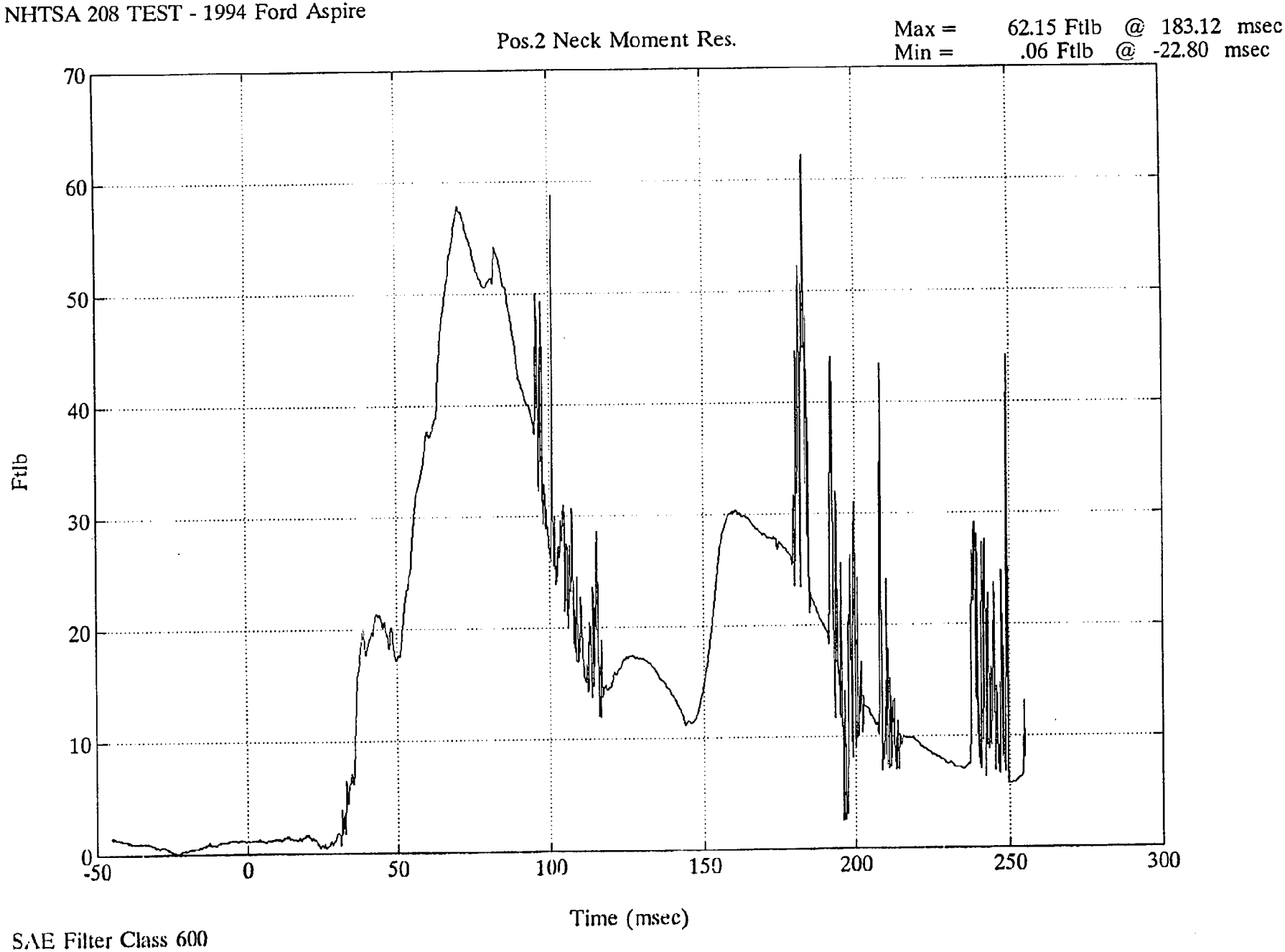
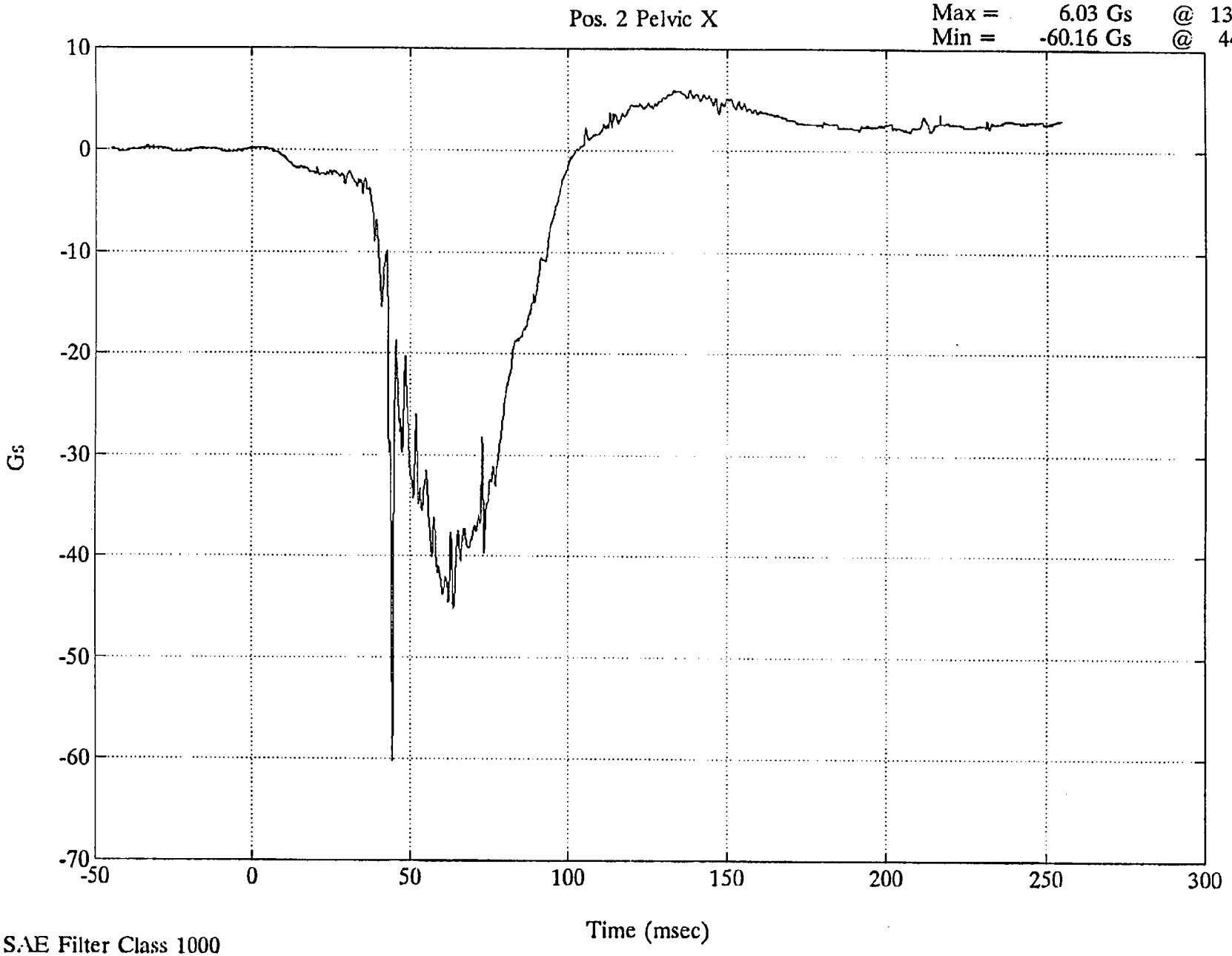


SAE Filter Class 600

B-68

8221-2

NHTSA 208 TEST - 1994 Ford Aspire



SAE Filter Class 1000

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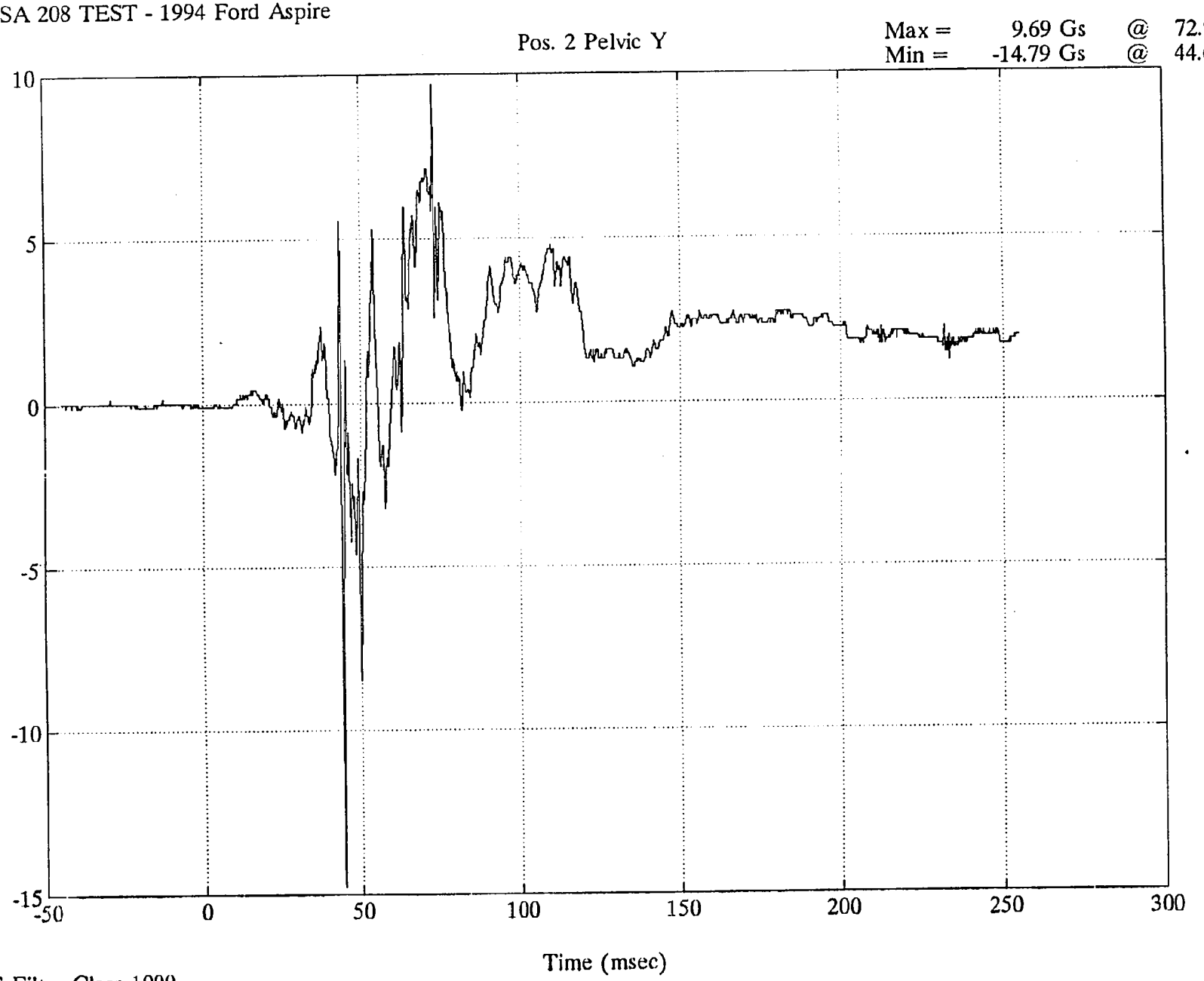

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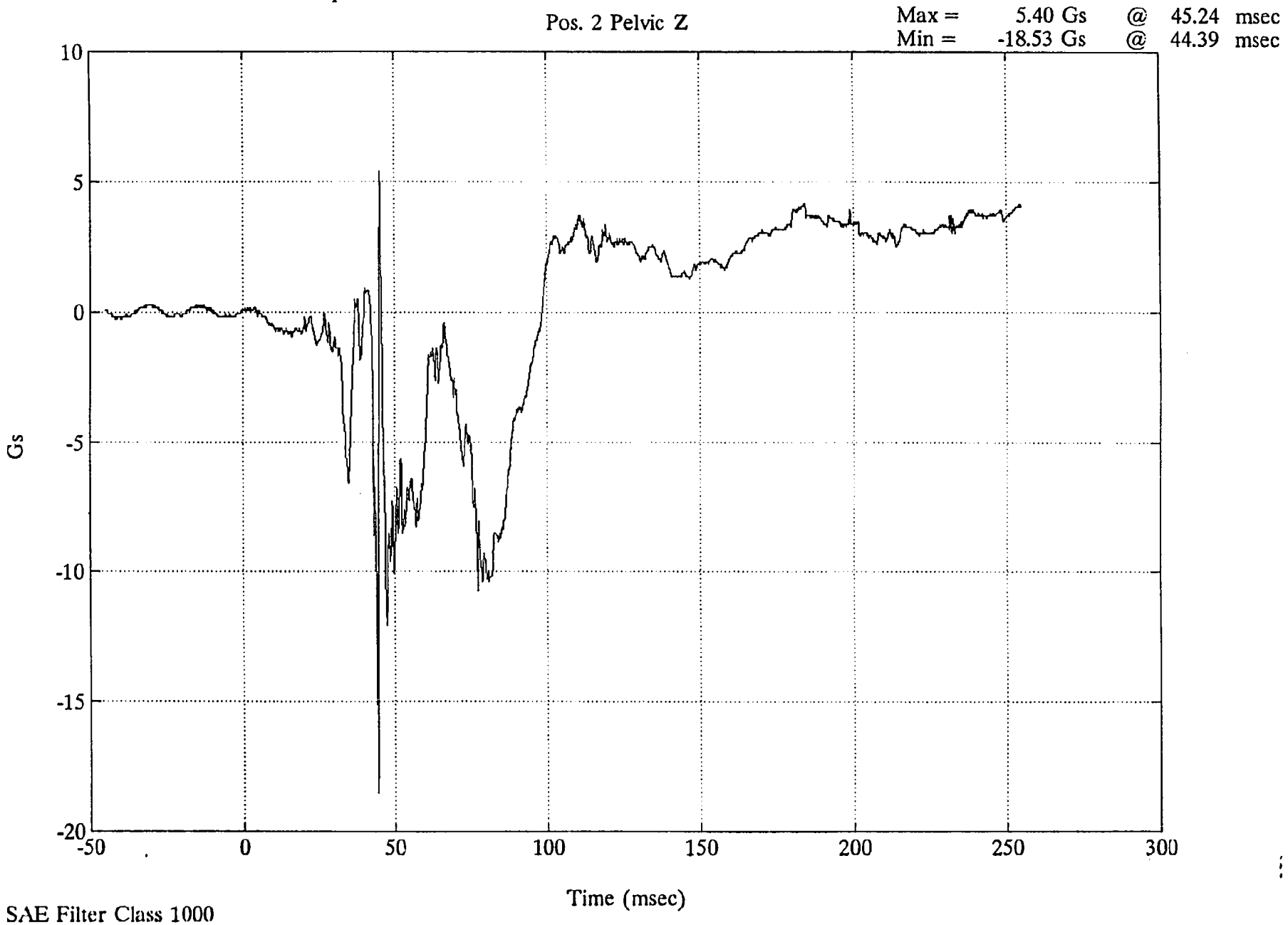

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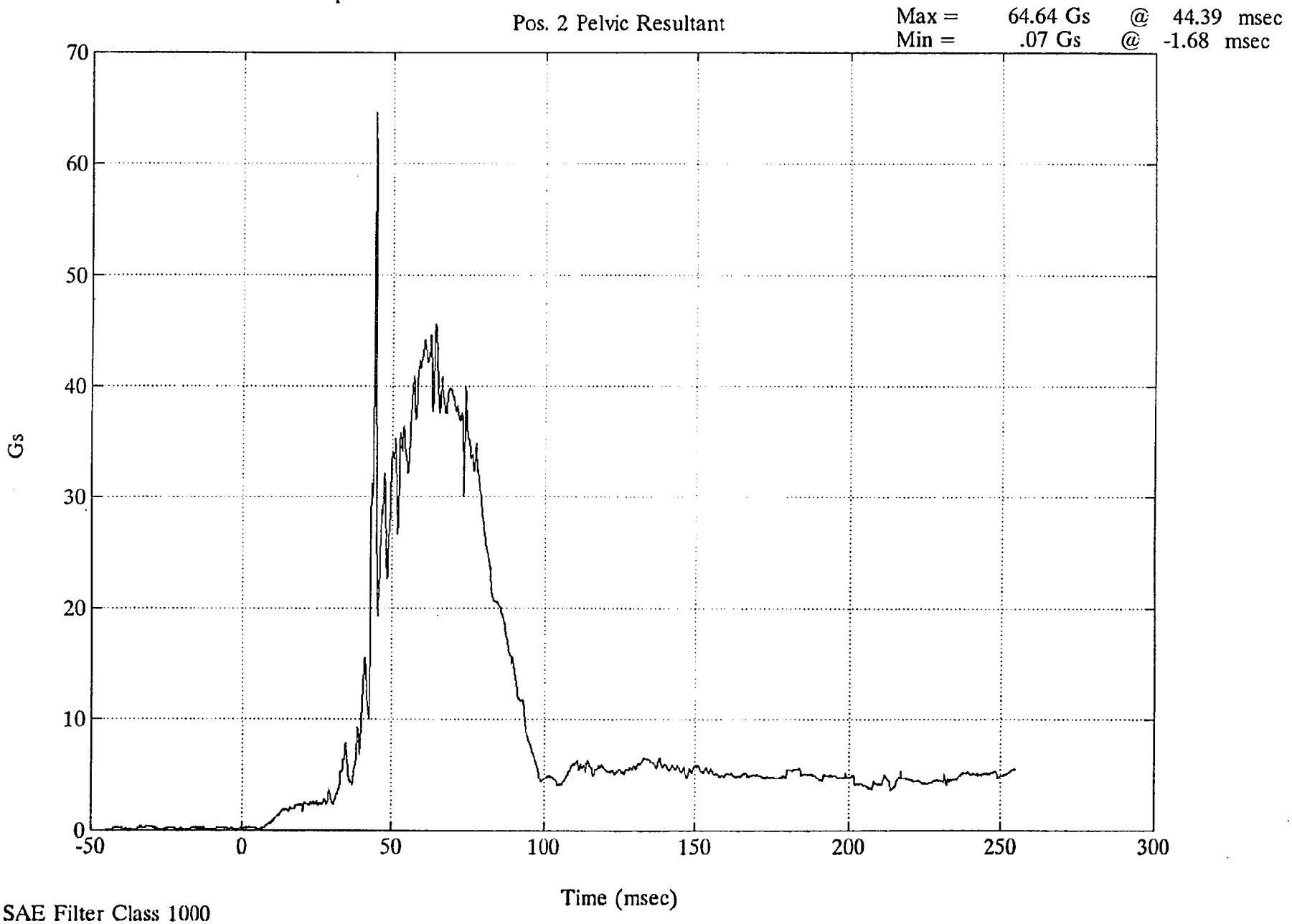


SAE Filter Class 1000

Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

Safety Belt Maintenance

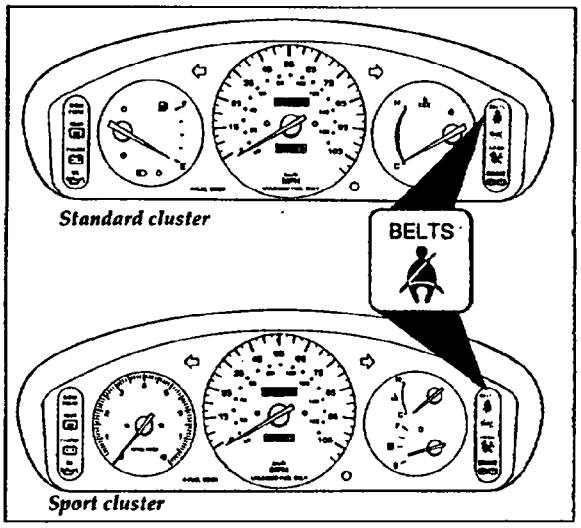
Check the safety belt systems periodically to make sure that they work properly and are not damaged.

Warning: All safety belt assemblies, including retractors, buckles, front seat belt buckle support assemblies (slide bar) (if so equipped), and attaching hardware, should be inspected after any collision. Ford recommends that all safety belt assemblies used in vehicles involved in a collision be replaced. However, if the collision was minor and a qualified technician finds that the belts do not show damage and continue to operate properly, they do not need to be replaced. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

Safety Belt Warning Light/Chime

This warning light and chime remind you to fasten your safety belt.

- If the driver does not fasten the safety belt before the ignition is turned to ON, the chime will sound for four (4) to eight (8) seconds, and the light will illuminate for one (1) to two (2) minutes, or until the safety belt is fastened.
- If the driver fastens the safety belt before the ignition is turned to ON, the chime will not sound and the light will not illuminate.



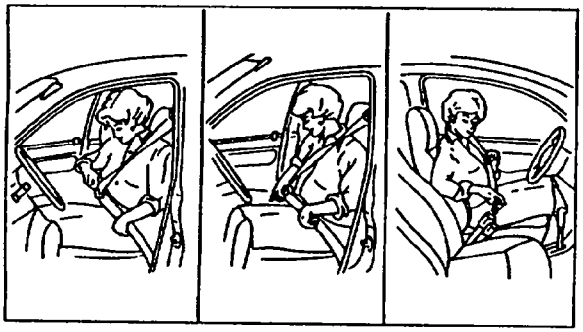
Safety belt warning lamp location

Front and Rear Seat Combination Lap and Shoulder Belts

While in motion, the combination lap and shoulder belt adjusts to your movement. However, if you brake hard, turn hard, or if your vehicle receives an impact of 5 mph (8 km/h) or more, the lap and shoulder belt locks and helps reduce your forward movement.

After you get into your vehicle, close the door and lock it. Then adjust the seat to the position that suits you best.

To fasten the belt, find the long strap of the belt near the door, pull it across your shoulder and chest, and insert the tongue into the proper buckle on your seat until you hear a snap and feel it lock. Be sure to use the correct buckle and check to make sure the buckle is securely fastened.



Fastening the safety belt

Adjust the lap part of the belt by pulling up on the shoulder belt until the lap belt fits snugly and as low as possible around your hips.

Warning: Front and rear seat occupants, including pregnant women, should wear safety belts for optimum protection in an accident.

Warning: Make sure that the lap portion of the safety belt is as low around your hips as possible. Do not wear the lap belt around your waist. If you do not use the lap belts properly, the risk of being injured in a collision greatly increases.

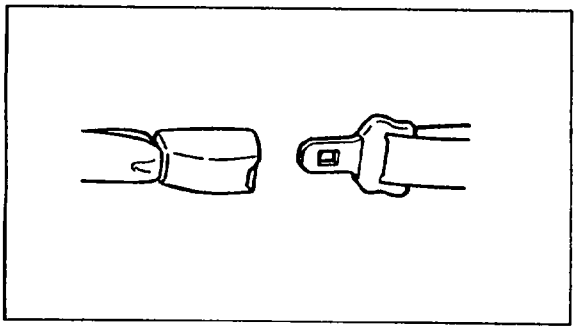
Warning: Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around the neck over the inside shoulder. Never use a single belt for more than one person. Failure to follow these precautions could increase the risk and/or severity of injury in a collision.

To reduce the risk of sliding under the lap belt during a collision, always drive and ride with seatbacks in the upright position. If the lap belt slips above the hip-bone during a collision and applies force directly to the soft areas of the abdomen, it will increase the risk of serious injury. The seatbacks and the belts provide best restraint when the seatback is upright, the occupant is sitting upright in the seat (not slouching), the lap belt is snug and low on the hips, the shoulder belt is snug against the chest and the knees are straight forward.

Children should always ride with the seatback in the fully upright position. When the seatback is not fully upright, there is a greater risk that the child will slide under the safety belt and be seriously injured in a collision.

To unfasten the belt:

1. Push the release button on the buckle. This allows the tongue to unlatch from the buckle.



Unfastening the lap and shoulder belt

2. While the belt retracts, guide the tongue to its original position. If you do not guide the tongue, it may strike you or part of the vehicle.

Important For Your Safety

Before driving, read the label on the back of the sun visor (U.S. vehicles) or on the headliner (Canadian vehicles).

Passenger Seat Lap/Shoulder Belt Retractors (Dual Locking Modes)

Your Aspire is equipped with dual locking mode retractors for all passengers, located on the upper end of the lap/shoulder belts.

The retractor modes function as follows:

Vehicle Sensitive (Emergency) Locking Mode

In this operating mode, the retractor will allow the occupant freedom of movement, locking tight only on hard braking, hard cornering, or impacts of approximately 5 mph (8 km/h) or more. The retractor cannot be made to lock by jerking on the belt.

Automatic Locking Mode

In this operating mode, the retractor will remain locked and does not allow the occupant freedom of movement.

This mode must be used when installing a child seat. To switch the retractor from the emergency locking mode to the automatic locking mode, perform the following steps:

1. Buckle the lap/shoulder belt.
2. Pull on the belt until all of the stored belt is out of the retractor and a click is heard.
3. Allow the belt to retract. A clicking sound will be heard as the belt retracts. This indicates that the retractor is in the automatic locking mode.
4. Pull to remove slack in the belt while you push down on the child seat.

NOTE: When the lap/shoulder belt is unbuckled and allowed to retract completely, the retractor will switch to the vehicle sensitive (emergency) locking mode.

The automatic locking mode is activated whenever all of the belt webbing is pulled out of the retractor.

While in this mode, the belt will retract or tighten but cannot be pulled back out to obtain more length. To disengage the automatic locking mode, unbuckle the belt and allow the webbing to retract fully.

Refer to the section called *Using the dual locking mode retractor when installing a child safety seat* later in this chapter for more detailed information.

How to Untwist or Unjam a Safety Belt Retractor

If you should jam the lap belt retractor by allowing the belt to retract when it is twisted, you can free the webbing with this procedure:

1. Work the belt slowly out of its holder as far as it will go and untwist the belt or remove the object that is jamming the belt. Let the belt retract.
2. Then, pull the belt out and let it retract several times to make sure that the belt works properly.

Procedure to Correct a Twisted Safety Belt at the "D" Ring (if so equipped) Front and/or Rear Seating Positions

NOTE: The restraint system shown in the following figures may be different than your vehicle. However, use these figures and this procedure to correct a twisted safety belt at any outboard seating position that has a "D" ring.

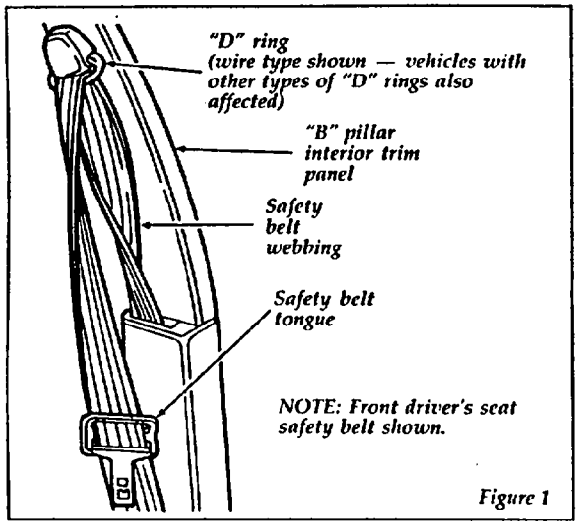


Figure 1

1. Grasp the belt webbing at the "D" ring. See Figure 2.

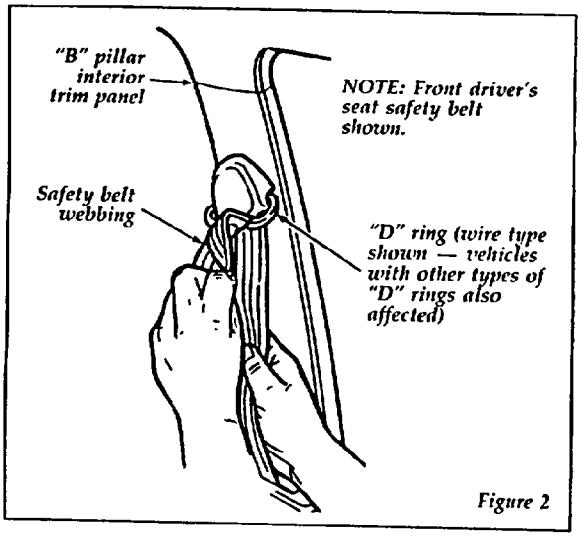


Figure 2

2. Rotate and fold the belt webbing over itself as required to remove the twist.
3. Feed the folded portion of the belt through the "D" ring.
4. When completed, safety belt should look like Figure 3.

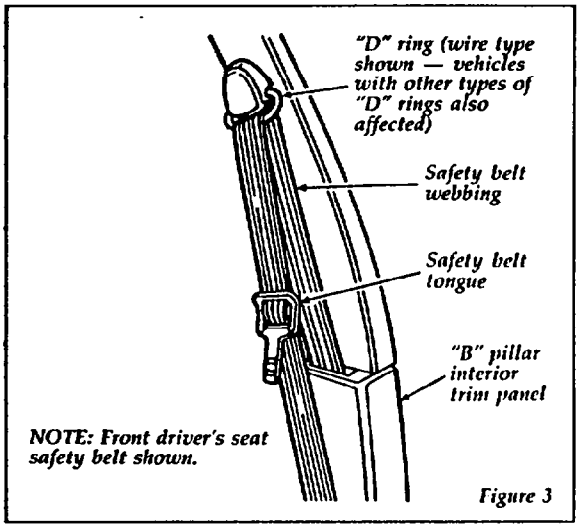


Figure 3

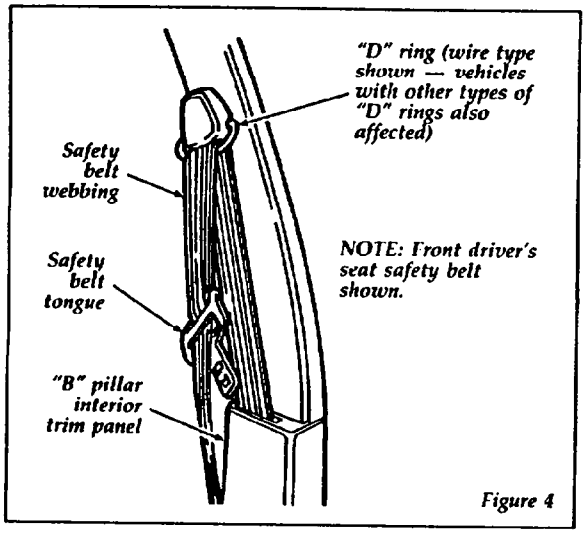
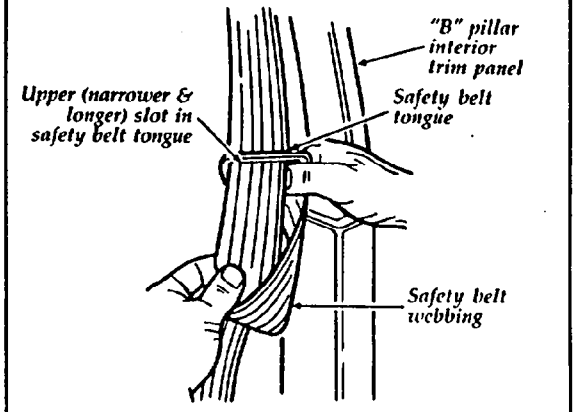


Figure 4

Procedure to Correct a Rotated Tongue on the Safety Belt (Front and/or Rear Seating Positions)

NOTE: The restraint system shown in the following figures may be different than your vehicle. However, use these figures and this procedure to correct a rotated tongue on the safety belt at any outboard seating position that has a "D" ring.

1. Grasp the belt tongue and pull down on the belt webbing closest to you to form a loop through the **upper** (narrow and longer) slot in the tongue. See Figure 5.



NOTE: Front driver's seat safety belt shown.

Figure 5

2. Working within the **upper** slot, rotate and fold the belt webbing over itself as required to remove the twist.
3. Pull the excess belt webbing back through the **upper** slot in the tongue.
4. Repeat the above steps to complete the removal of the twist at the **lower** (wider and shorter) slot in the tongue. See Figure 6.

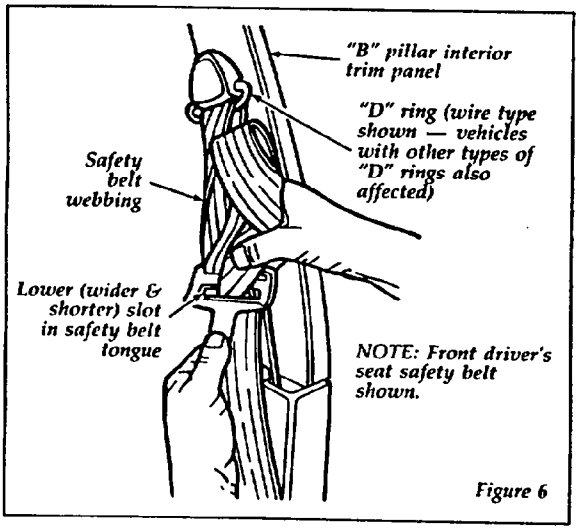


Figure 6

5. When completed, the safety belt should look like Figure 3.

Air Bag Supplemental Restraint System (SRS)

Driver and right front passenger air bags

Your vehicle is equipped with a driver side air bag supplemental restraint system, located in the steering wheel and identified by the letters "SRS" in the center of the wheel.

The letters "SRS" above the glove compartment indicate your vehicle is also equipped with a right front passenger air bag.

The driver and right front passenger air bag are Supplemental Restraint Systems (SRS), provided at these seating positions in addition to the lap/shoulder belt, and are designed to supplement the protection provided to properly belted occupants in moderate to severe frontal

collisions. The supplemental air bag system does not provide restraint to the lower body.

The Importance of Wearing Safety Belts

Warning: ALWAYS WEAR YOUR SAFETY BELT!

Warning: All occupants of the vehicle, including the driver, should always wear their safety belts, whether or not an air bag Supplemental Restraint System is also provided at their seating position. Failure to do so may increase the risk of severe injury or death in the event of a collision.

There are four very important reasons to use safety belts even with an air bag system. Use your safety belts to:

- help keep you in the proper position (away from the air bag) when it inflates
- reduce the risk of harm in rollover, side or rear impact collisions, because an air bag is not designed to inflate in such situations
- reduce the risk of harm in frontal collisions that are not severe enough to activate the air bag
- reduce the risk of being thrown from your vehicle

The Importance of Being Properly Seated

In a collision, the air bag must inflate extremely fast to help provide additional protection for you. In order to do this, the air bag must inflate with considerable force. If you are not seated in a normal riding position with your back against the seatback, the air bag may not protect you properly and could possibly hurt you as it inflates.

Warning: Your vehicle is equipped with a right front passenger air bag. Front passengers, especially children and small adults, should never sit on the edge of the seat, stand near the glove compartment of the instrument panel, or lean over with their faces near the glove compartment when the vehicle is moving. All occupants should sit with their backs against the seatback and use the safety belts. Children weighing less than 40 lbs. (18 kg) should use child or infant seats. Forward-facing child seats must have the passenger seat moved as far back from the instrument panel as possible. REAR-FACING INFANT SEATS SHOULD NEVER BE USED IN THE FRONT SEAT, BECAUSE THE FORCE OF THE RAPIDLY INFLATING PASSENGER AIR BAG COULD PUSH THE TOP OF THE REAR-FACING SEAT AGAINST THE VEHICLE SEATBACK OR CENTER ARMRESTS. REAR-FACING INFANT SEATS MUST ALWAYS BE PLACED IN THE REAR SEAT.

Warning: Do not place objects or mount equipment on or near the air bag module covers (identified by the letters "SRS") on the steering wheel and instrument panel, or in front seat areas that may come in contact with a deploying air bag, because any such objects could cause harm if the vehicle is in a collision severe enough to cause the air bag to inflate. Failure to follow this instruction may increase the risk of personal injury in the event of a collision.

How the Air Bag Supplemental Restraint System Operates

The Air Bag Supplemental Restraint System has two main parts. One part is the air bag system with the driver and passenger air bags and inflators. The second part is the electrical system which has impact sensors and a diagnostic module. The diagnostic module monitors its own internal circuits and the supplemental air bag electrical system readiness, including the crash sensors, the system wiring, the air bag readiness light, air bag back-up power, and the supplemental air bag igniters.

The driver air bag is in the center of the steering wheel. The front passenger seat air bag is in the upper right-hand section of the instrument panel ledge above the glove compartment. The letters "SRS" appear there.

The air bag system uses a readiness light and a tone to indicate the condition of the system. The readiness light is in the instrument cluster. When you turn the ignition key to ON, the light will illuminate for approximately 6 seconds and then turn off. This indicates that the system is operating normally.

NOTE: Maintenance of the air bag system is not required.

Warning: A problem with the system is indicated by one or more of the following:

- ❑ the readiness light will either flash or stay lit,
- ❑ it will not light immediately after the ignition is turned on, or
- ❑ a group of five beeps will be heard.

If any of these things happens, have the air bag system serviced at your Ford or Lincoln-Mercury dealer immediately.

Tone generator

The air bag readiness light indicates the air bag system condition. However, a series of five sets of five beeps will be heard only if the readiness light doesn't work and there is a problem with the air bag system. This also means that the Air Bag Supplemental Restraint System (SRS) is in need of service. The tone pattern will repeat (five sets of five beeps) periodically until the problem and light are repaired. Unless serviced, the Air Bag Supplemental Restraint System may not function properly in the event of a collision.

Warning: Do not attempt to service, repair, or modify the Air Bag Supplemental Restraint System; tampering could cause activation of the system and increase the risk of personal injury. For servicing of the Air Bag Supplemental Restraint System, see your dealer.

The air bag system is designed to stay out of sight until it is activated. The air bag system is designed to deploy in frontal and front-angled collisions more severe than hitting a parked vehicle of similar size and weight head-on at about 28 mph (45 km/h). Because the system senses the crash severity rather than vehicle speed, **some** frontal collisions at speeds above 28 mph (45 km/h) will not inflate the air bag.

The following four steps show how the air bag system works:

1. Sensors in the vehicle will detect the degree of severity of a frontal impact. When two sensors (one primary and one safing) close at the same time, electric current flows to the inflator and the system ignites the gas generant.
2. The propellant then rapidly burns in the metal container. The rapid burning produces nitrogen gas and small amounts of dust. The nitrogen gas and dust are cooled and filtered during inflation of the air bag.
3. The inflating air bag splits open the trim cover. The air bag then rapidly unfolds and inflates in front of the driver.

NOTE: STEPS 1-3 TAKE PLACE IN A FRACTION OF A SECOND.

4. After inflation, the gas empties through holes in the air bag. The air bag deflates at once.

The surface of the air bags and the vehicle interior may be dusted with a powdery residue. The powder is corn starch or talcum powder, which is used to lubricate the air bag as it inflates, and sodium compounds such as sodium carbonates (e.g., baking soda), and possibly a very small amount of sodium hydroxide that may be irritating to the skin and eyes, but is not toxic.

Right after air bag inflation, you may notice smoke (from the powder and dust) and smell the burnt propellant. This is normal.

Warning: Several air bag system components get hot after inflation. Do not try to touch them after inflation.

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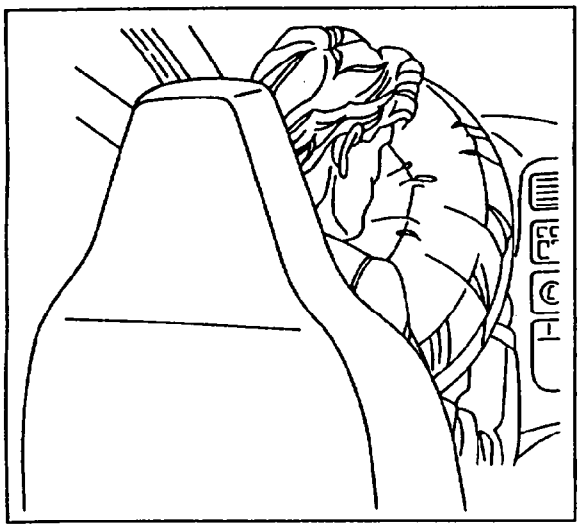
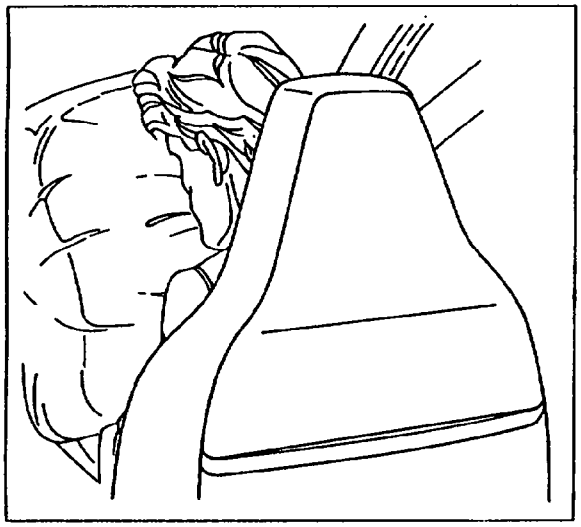


Inflated driver air bag



Inflated passenger air bag

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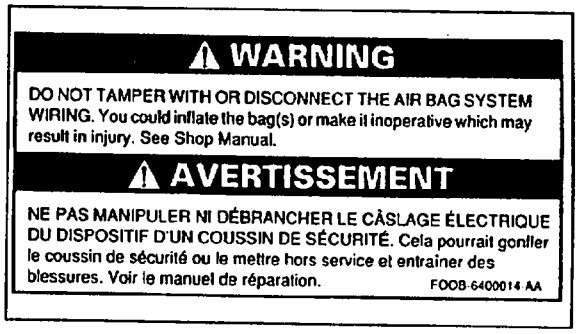

Label on the radiator

Safety Restraints for Children

In most states and in Canada, you are required by law to use safety restraints for children. If small children ride in your vehicle – this generally includes children who are four years old or younger and who weigh 40 pounds (18 kg) or less – you must put them in safety seats that are made specially for children. Safety belts alone do not provide maximum protection for these children. Check your local and state laws for specific requirements.

Warning: Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

When possible, put children in the rear seat of your vehicle. Accident statistics suggest that children are safer when properly restrained in the rear seating positions than in the front seating positions.