

V2080

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212-CAL-94-15
301-CAL-94-15

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

VOLKSWAGEN DE MEXICO S.A. DE C.V.
1994 Volkswagen Golf III GL
4-door hatchback

NHTSA NUMBER: CR5803

CALSPAN TEST NUMBER: 8183-6

June 23, 1994

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



FINAL REPORT

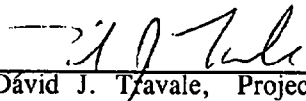
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U. S. Department of Transportation
National Highway Traffic Safety Administration
ENFORCEMENT
Office of Vehicle Safety Compliance
400 Seventh Street, S. W.
Room No. 6115 (NEF-30)
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Prepared By:


David J. Travale, Project Engineer

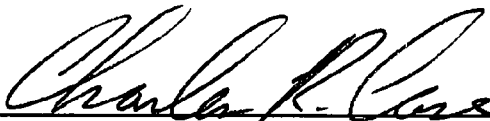
Approved By:


Walter E. Levan, Program Manager
Transportation Sciences Center

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4. Title and Subtitle Final Report of FMVSS 208, 212, 219 (Partial), and 301 Compliance Testing of a 1994 Volkswagen Golf III GL 4-door hatchback NHTSA No. CR5803		5. Report Date June 23, 1994	6. Performing Organization Code CAL
7. Author(s) David J. Travale, Project Engineer Walter E. Levan, Program Manager		8. Performing Organization Report No. 8183-6	
9. Performing Organization Name and Address Calspan Advanced Technology Center P.O. Box 400 Buffalo, New York 14225		10. Work Unit No. X56-6-1422	11. Contract or Grant No. DTNH22-93-D-11089
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (NEF-30) 400 Seventh St , S.W., Rm. 6115, Washington, D.C. 20590		13. Type of Report and Period Covered Final -	
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16. Abstract A 30 mph vehicle safety compliance test was conducted on a 1994 Volkswagen Golf III GL 4-door hatchback. This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on June 23, 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 29.0 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. <u>Type of Restraint System:</u> The test vehicle was equipped with a driver airbag and a passenger airbag restraint system. The manual seat belts were not used for this test.			
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TABLE OF CONTENTS

<u>Section</u>	<u>Page No.</u>
1 PURPOSE AND TEST PROCEDURE	1-1
2 SUMMARY OF FRONTAL BARRIER IMPACT TEST	2-1
3 OCCUPANT AND VEHICLE INFORMATION	3-1
4 SUMMARY OF RESULTS FOR: FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219 (Partial), "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"	4-1
APPENDIX A PHOTOGRAPHS	A-1
APPENDIX B VEHICLE AND DUMMY RESPONSE DATA	B-1
APPENDIX C VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS	C-1

LIST OF FIGURES

<u>Figure No.</u>		<u>Page No.</u>
1	TEST VEHICLE INFORMATION	3-2
2	PART 572 DUMMY IN-VEHICLE POSITION	3-3
3	SEAT BELT POSITIONING DATA	3-5
4	VEHICLE ACCELEROMETER LOCATIONS	3-6
5	CAMERA POSITION FOR FRONTAL IMPACT	3-8
6	VEHICLE TARGET LOCATIONS	3-10
7	TEST VEHICLE MEASUREMENTS	3-11
8	FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA SHEET	4-12
9	FMVSS NO. 219 - (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA SHEET	4-13

LIST OF TABLES

<u>Table No.</u>		<u>Page No.</u>
1	CRASH TEST SUMMARY	2-2
2	GENERAL TEST AND VEHICLE PARAMETER DATA	2-3
3	POST-IMPACT DATA	2-5
4	FRONT SEAT OCCUPANT MEASUREMENTS	3-4
5	VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY	3-7
6	HIGH SPEED CAMERA LOCATIONS	3-9
7	VEHICLE MEASUREMENTS	3-12
8	DUMMY INJURY CRITERIA VALUES	4-2
9	FMVSS NO. 208 - SEAT BELT WARNING SYSTEM CHECK	4-3
10	FMVSS NO. 208 - LABELING AND DRIVER'S MANUAL INFORMATION	4-4
11	FMVSS NO. 208 - READINESS INDICATOR	4-5
12	FMVSS NO. 208 - COMFORT AND CONVENIENCE TEST SUMMARY	4-6
13	FMVSS NO. 301 - "FUEL SYSTEM INTEGRITY" POST-IMPACT TEST DATA	4-14
14	FMVSS NO. 301 - STATIC ROLLOVER DATA SHEET	4-15
15	POST TEST AIR BAG DATA	4-19
16	ACCIDENT INVESTIGATION DIVISION DATA	4-20
17	TEST VEHICLE NONCOMPLIANCE NOTICE	4-21

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 Volkswagen Golf III GL 4-door hatchback, 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 CR5803

A frontal barrier was impacted by a 1994 Volkswagen Golf III GL 4-door hatchback at a velocity of 29.0 mph. The test was performed at the Calspan Corporation Advanced Technology Center on June 23, 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 and chest three axis (x, y, and z) accelerometers, chest displacement potentiometers and left/right femur load cells. These ATDs had been certified prior to the test.

The 44 channels of data were recorded on a P.C. based data acquisition system. Appendix B contains the vehicle and dummy response data traces.

The driver's HIC was 407.06. The maximum chest deceleration over 3 milliseconds was 45.636 g's with 0.7 inches of deflection. The maximum force on the driver's left femur was -1484.9 pounds and -1756.2 pounds on the right femur.

The right front passenger's HIC was 106.51. The maximum chest deceleration over 3 milliseconds was 41.239 g's with 1.6 inches of deflection. Loads of -983.6 and -1212.4 pounds were recorded on the left and right femurs respectively.

Table 1

CRASH TEST SUMMARY

Vehicle NHTSA No. :	CR5803	Test Mode :	30 mph Frontal Barrier
Test Date :	June 23, 1994	Time:	10:58 Temperature : 70 °F
Vehicle Make/Model/Body Style :	1994 Volkswagen Golf III GL 4-door hatchback		
Vehicle Test Weight :	3240	lbs	
Vehicle/Barrier Impact Angle :	0	°	
Impact Velocity :	29.0	mph	
Maximum Static Crush :	13.8	inches	
Vehicle Rebound :	13.7	inches	
<u>DUMMIES:</u>	<u>DRIVER</u>	<u>PASSENGER</u>	
Type :	Part 572E	Part 572E	
Restraint System :	Airbag	Airbag	
Number of Data Channels :	44		
Number of Cameras :	1	Real Time	
	14	High Speed	
<u>DOOR OPENING DATA :</u>	Closed/Operable	- Left Front	
	Closed/Operable	- Right Front	
Front Seat(s) Data :	<u>DRIVER</u>	<u>PASSENGER</u>	
Seat Track Failure :	None	None	
		Inches of shift	
Seat Back Failure :	0.0	0.0	
<u>VISIBLE DUMMY CONTACT POINTS :</u>	<u>DRIVER</u>	<u>PASSENGER</u>	
Head :	Face with air bag rear of head with headrest	Face and top of head with airbag, top of head with right roof-rail and "B" pillar, rear of head with headrest.	
Abdomen :	Air bag	Air bag	
Chest	Air bag	Air bag	
Knees	Lower dash	Legs with knee bolster	

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION :

Year/Make/Model/Body Style : 1994 Volkswagen Golf III GL 4-door hatchback
 NHTSA No. : CR5803 ; VIN: 3VWFB81H2RM049618 ; Color : White
 Engine Data: 4 cylinders; - CID; 2.0 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 : X A/C; X Pwr.Strg.; X Pwr. Brakes
 - Pwr. Windows; - Pwr. Door Locks; - Tilt Wheel
 Date Received : June 1, 1994 ; Odometer Reading 152.0 miles
 Selling Dealer : Delia Volkswagen
 & Address: 1500 W. Falls Blvd., Tonawanda

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by : VOLKSWAGEN DE MEXICO S.A. DE C.V.
 Date of Manufacture November, 1993
 GVWR : 3616 lbs.; GAWR: 1962 lbs. FRONT; 1764 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load : 34 psi FRONT
 39 psi REAR
 Recommended Tire Size : P18560/R14 H6JX14
 * Recommended Cold Tire Pressure : 34 psi FRONT; 39 psi REAR
 Size of Tires on Test Vehicle: P18560/R14 82H ; Manufacturer: GOODYEAR
 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) = 996 lbs.
 No. of Occupants x 150 lbs. = 750 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 246 lbs.

*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	=	780	lbs.	Right Rear	=	530	lbs.
Left Front	=	840	lbs.	Left Rear	=	490	lbs.
TOTAL FRONT	=	1,620	lbs.	TOTAL REAR	=	1,020	lbs.
TOTAL DELIVERED WEIGHT = 2,640.0 lbs.							

% of Total Front of Vehicle Weight = 61.4 % of Total Rear Weight = 38.6 %

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT :

Total Delivered Weight	=	2,640	lbs.
Rated Cargo/Luggage Weight (RCLW)	=	246	lbs.
Weight of 2 p.572 Dummies @ 167 each	=	334	lbs.
TARGET TEST WEIGHT	=	3,220	lbs.

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 266 POUNDS OF CARGO WEIGHT:

Right Front	=	860	lbs.	Right Rear	=	780	lbs.
Left Front	=	870	lbs.	Left Rear	=	730	lbs.
TOTAL FRONT	=	1,730	lbs.	TOTAL REAR	=	1,510	lbs.
TOTAL TEST WEIGHT = 3,240.0 lbs.							

% of Total Front Weight = 53.4 % % of Total Rear Weight = 46.6 %

Weight of Ballast Secured in Vehicle Trunk Area = 200.0 lbs.

Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimension in inches) :

AS DELIVERED :	RF	26.2	LF	26.4	RR	25.9	LR	25.9
FULLY LOADED :	RF	25.3	LF	25.6	RR	24.2	LR	24.4
AS TESTED :	RF	25.4	LF	25.8	RR	24.2	LR	24.5
Vehicle's Wheel Base : 97.3 in.								

Location of Vehicle's C.G. : 45.3 inches rearward of front wheel center.

FUEL SYSTEM DATA :

Fuel System Capacity From Owner's Manual	=	14.5	gallons
Usable Capacity Figure Furnished by COTR	=	14.5	gallons
Test Volume Range (92 to 94% of Usable Capacity)	=	13.3	to 13.6 gallons
ACTUAL TEST VOLUME	=	13.5	gallons (with entire fuel system filled)

Table 3

POST IMPACT DATATYPE OF TEST:

Type of Test : Frontal Barrier Impact Angle : 0°
 Test Date : June 23, 1994 Time: 10:58 Temperature: 70 °F
 Vehicle NHTSA No. : CR5803
 Required Impact Velocity Range : 28.9 to 29.9 mph

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

Trap No. 1 = 29.0 mph; Trap No. 2 = 29.1 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 = 157.1 ; C/L = 160.9 ; Left = 156.6
 Post-Test Right = 143.2 ; C/L = 145.0 ; Left = 145.0
 Crush Right = 13.9 ; C/L = 15.9 ; Left = 11.6
 AVERAGE = 13.8 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point :

Right = 13.7 ; C/L = 13.3 ; Left = 14.2
 AVERAGE = 13.7 inches

DOOR OPENING :

	Left	Right
Front	<u>Closed/Operable</u>	<u>Closed/Operable</u>
Rear	<u>Closed/Operable</u>	<u>Closed/Operable</u>

SEAT MOVEMENT :

	Seat Back Failure	Seat Shift
Front	<u>None</u>	<u>0.0</u>
Rear	<u>N/A</u>	<u>N/A</u>

Table 3

POST IMPACT (cont.)

GLAZING DAMAGE :

Windshield cracked throughout, particularly near passenger "A" pillar.

OTHER NOTABLE IMPACT FEATURES :

Steering column appeared to rotate upward.

Section 3

OCCUPANT AND VEHICLE DATA

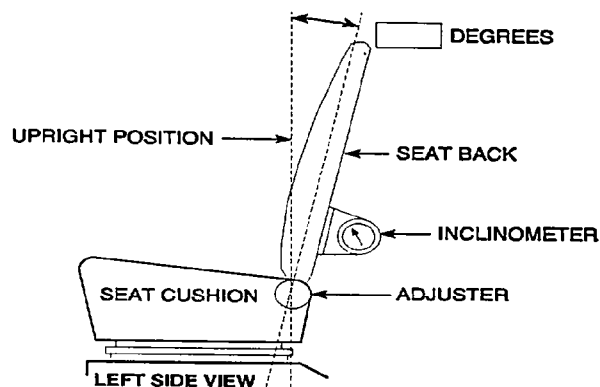
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 1994 Vehicle Model: Volkswagen Golf III GL Body Style : 4-door hatchback

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 : 21 deg.

Measurement instructions : Seat back angle set using 3-dimensional H-point machine.

Seat back angle for passenger's seat : 21 deg.

Measurement instructions : Same as driver.

2. Seat Fore and Aft Positioning

Positioning of the driver's seat : Seat set at 6th locking position (first detent rearward of mid-position). Rearmost detent equals position 1 of 12 total detents.

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 14.5 gallons

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

4. Steering Column Position :

Non-adjustable.

5. Other:

Driver seat height set at lowest position.

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

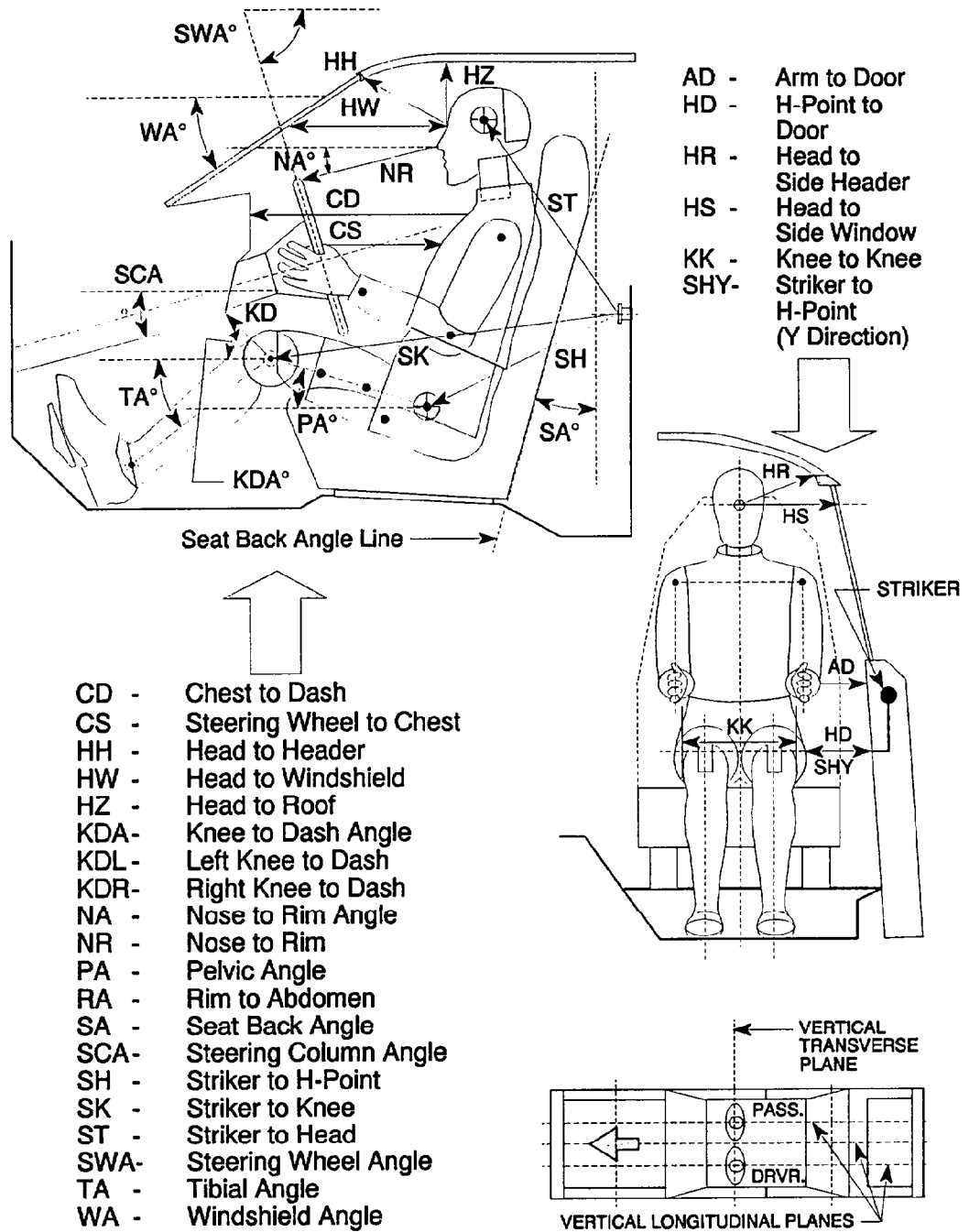


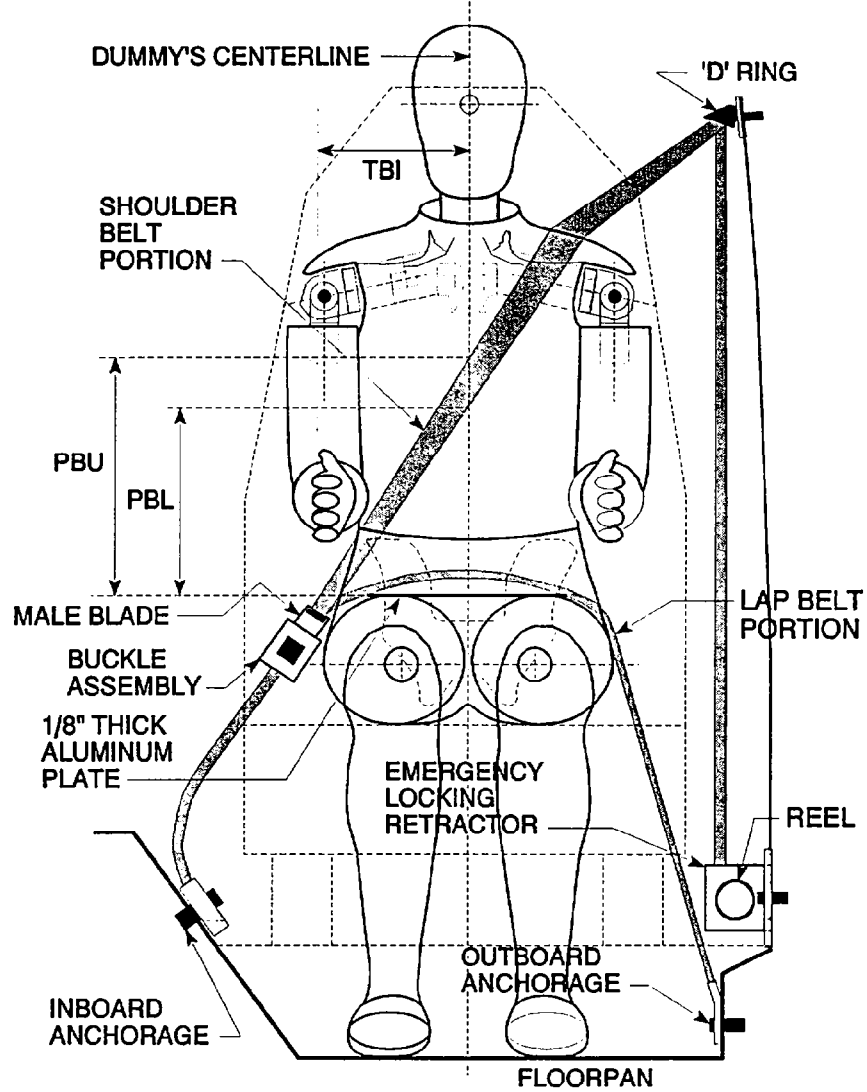
Table 4

FRONT SEAT OCCUPANT MEASUREMENTS

	DRIVER (Serial #313)	PASS. (Serial #290)
WA°	32 deg.	-
SWA°	63 deg.	-
SCA°	27 deg.	-
SA°	21 deg.	21 deg.
HZ	7.8	6.3
HH	15.6	13.6
HW	24.2	20.1
HR	8.5	7.2
NR	17.6 Angle 10 deg.	-
CD	23.3	20.0
CS	14.7	-
RA	9.2	-
KDL	7.1 Angle (KDA) 29 deg.	5.5
KDR	7.5	5.6 Angle (KDA) 31 deg.
PA°	23 deg.	23 deg.
TA°	37 deg.	41 deg.
KK	12.9	10.5
ST	16.4 Angle 11 deg.	17.2 Angle 18 deg.
SK	23.3 Angle 106 deg.	24.5 Angle 105 deg.
SH	11.4 Angle 144 deg.	13.5 Angle 139 deg.
SHY	9.7	9.7
HS	12.7	11.0
HD	5.4 (To door pocket)	5.6 (To door pocket).
AD	4.2	4.5

Figure 3

SEAT BELT POSITIONING DATA



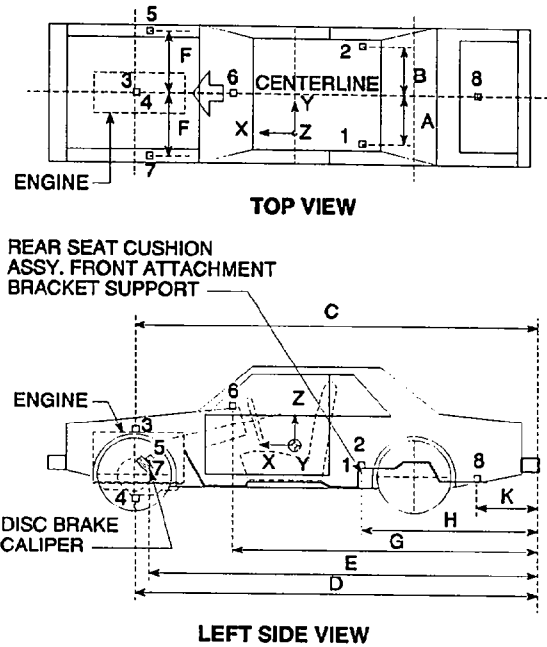
FRONT VIEW OF DUMMY

	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	*	*
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	*	*
<u>TBI</u> -- 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



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	24.3	24.3
B	24.3	24.3
C	131.7	126.6
D	135.8	126.8
E	125.5	Left = 123.0 Right = 122.8
F	22.8	Left = 22.8 Right = 21.5
G	97.0	97.0
H	58.6	58.6
K	8.8	8.8

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE			
		Pos.	msec.	Neg.	msec.
1	Rear Seat X-Member @ Left Side	3.4	131.3	-50.7	56.0
2	Rear Seat X-Member @ Right Side	4.4	129.4	-56.6	57.7
3	Top of Engine Block	30.4	38.6	-128.6	30.4
4	Bottom of Engine	229.3	181.4	-244.9	190.0
5	Disc Brake Caliper @ Right Side	5.7	170.6	-85.0	38.0
6	Instrument Panel	15.7	50.8	-70.6	43.9
7	Disc Brake Caliper @ Left Side	31.5	35.8	-45.8	49.3
8	Trunk	115.3	19.9	-47.5	70.1

Figure 5

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information shown on Table 5.

CAMERA POSITIONS FOR FRONTAL IMPACTS

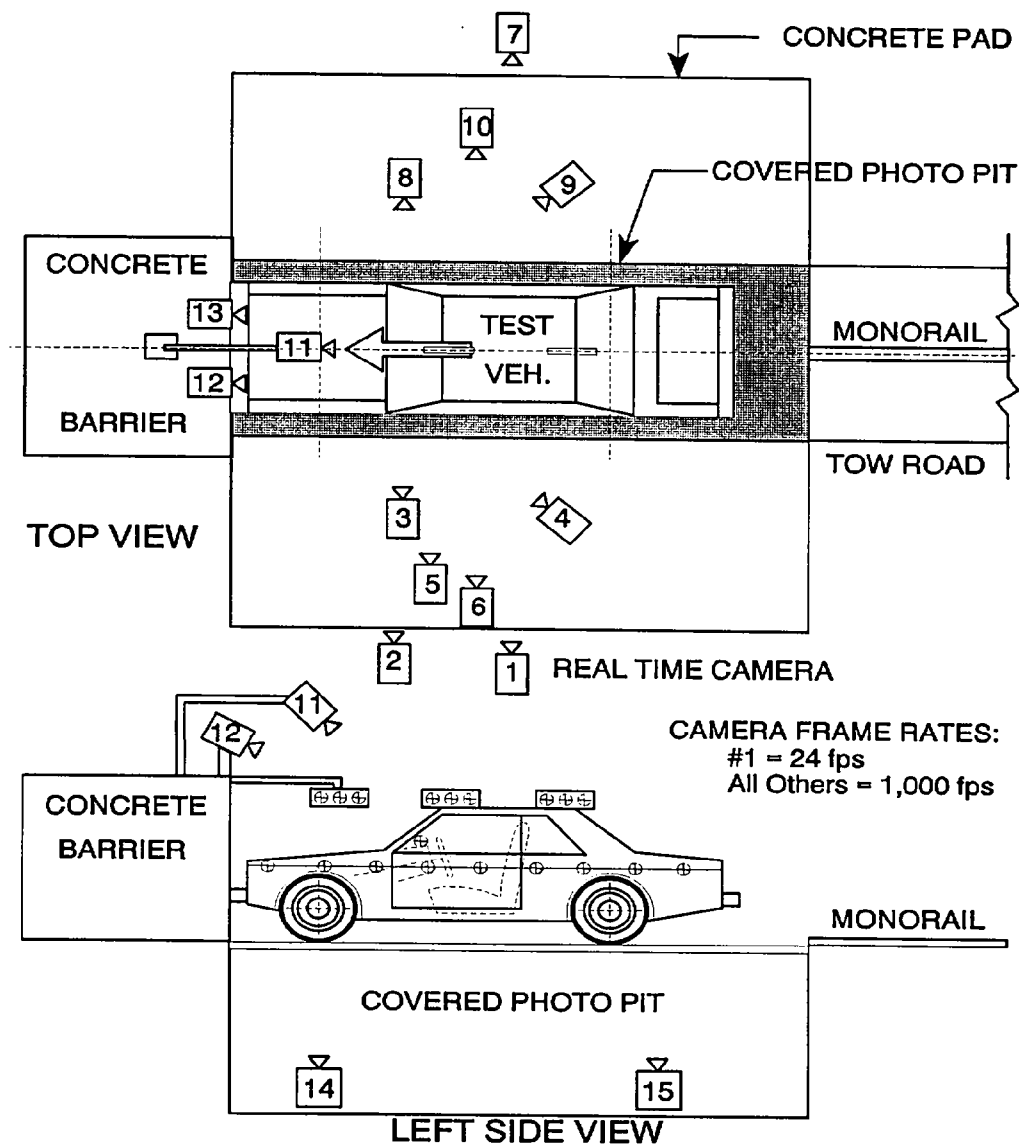


Table 6

HIGH-SPEED CAMERA LOCATIONS

Test No.	CR5803	Vehicle:	1994 Volkswagen Golf III GL 4-door hatchback					
Camera No.	VIEW	CAMERA POSITIONS (In.)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	216	67	41	-2	200.8	13	1010
3	Left Side View	297	42	41	-3	281.8	25	950
4	Driver and Interior View	104	104	70	-21	-	13	995
5	Steering Column (Bottom)	258	80	46	-4	242.8	25	900
6	Steering Column (Top)	258	80	70	-9	242.8	25	1035
7	Overall Right Side	228	65	42	-2	212.8	13	1105
8	Right Side View	291	50	41	-2	275.8	25	1000
9	Right Passenger View	299	69	59	-5	283.8	35	NT
10	Passenger and Interior View	99	105	72	-22	-	13	900
11	Passenger Front View	24	19	71	-46	-	8	1005
12	Driver Front View	24	19	71	-46	-	8	1005
13	Windshield View	10	0	127	-61	-	13	1100
14	Pit View of Engine	38	0	-86	90	-	13	700
15	Pit View of Fuel Tank	123	0	-86	90	-	13	690

*X = film plane to monorail centerline

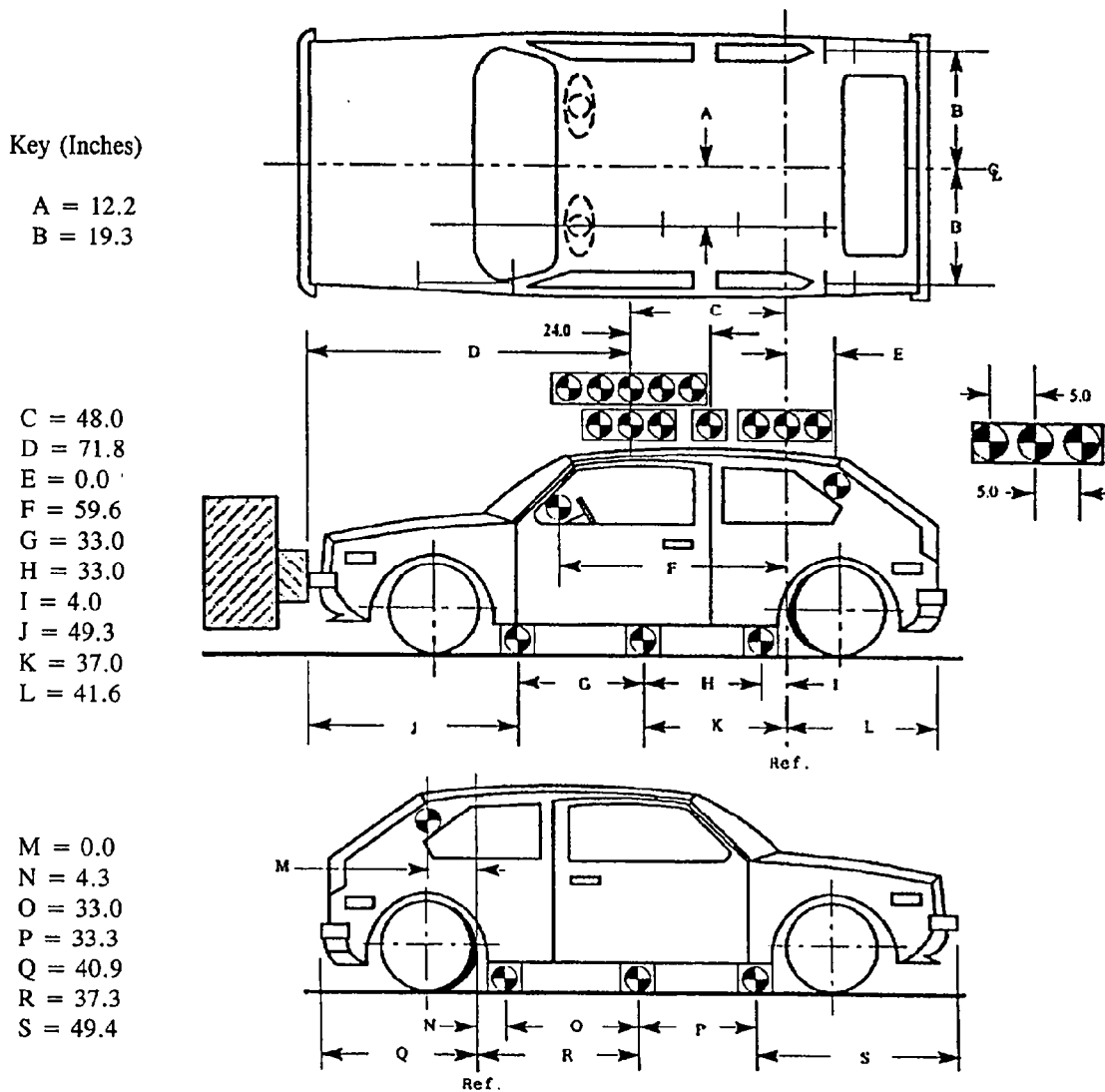
Y = film plane to impact location

Z = film plane to ground

** = referenced to horizontal plane

Figure 6

VEHICLE TARGET LOCATIONS
(All dimensions in inches)



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

Figure 7
TEST VEHICLE MEASUREMENTS

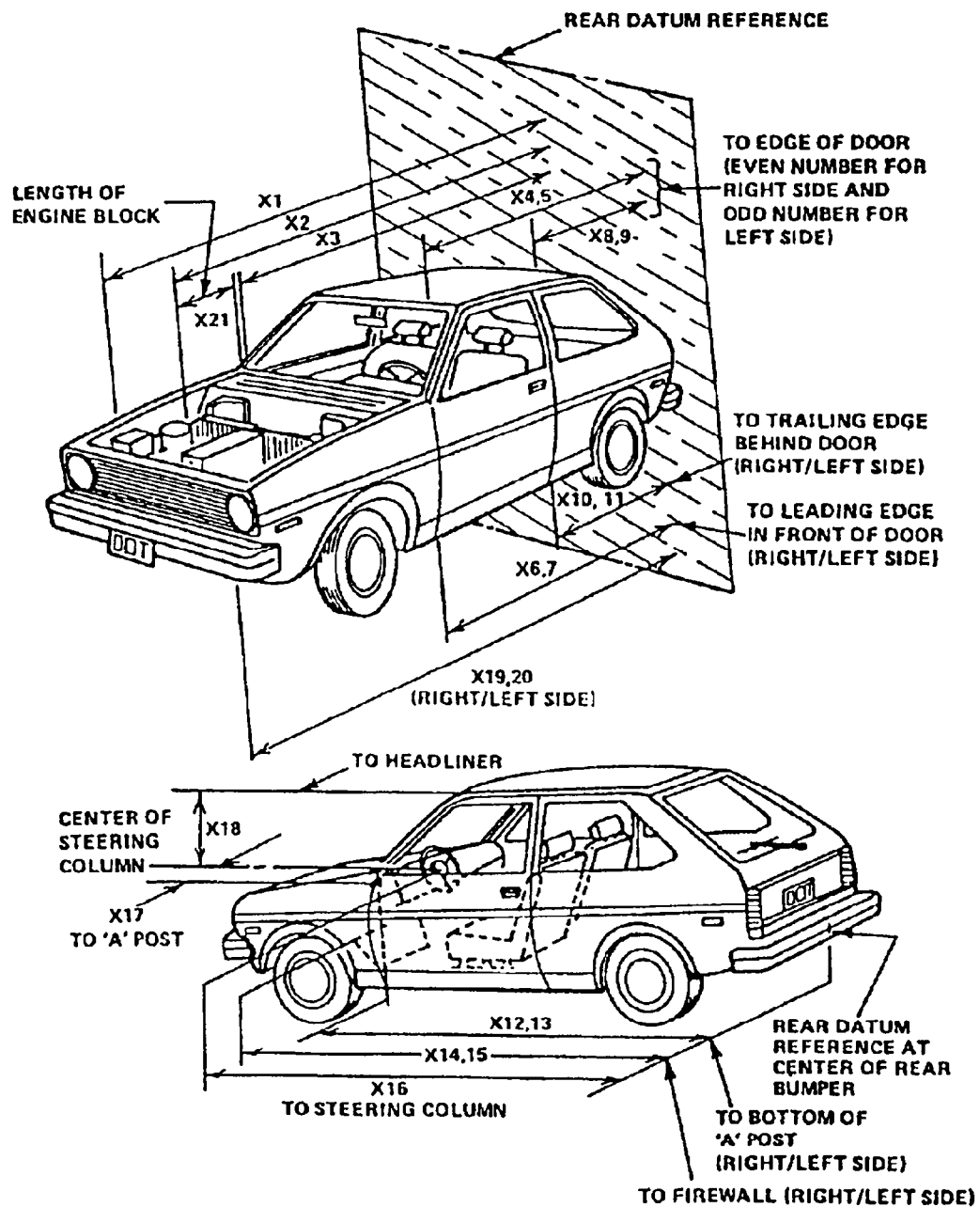


Table 7

VEHICLE MEASUREMENTS

No.		All Dimensions in inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	160.9	145.0	15.9
X2	Rear Surface of Vehicle to Front of Engine	139.5	133.4	6.1
X3	Rear Surface of Vehicle to Firewall	121.6	119.7	1.9
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	111.7	110.9	0.8
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	111.8	111.1	0.7
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	109.9	108.9	1.0
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	110.1	109.1	1.0
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	69.5	68.6	0.9
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	69.6	68.8	0.8
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	69.9	69.0	0.9
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	70.3	69.2	1.1
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	110.5	109.5	1.0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	110.8	109.8	1.0
X14	Rear Surface of Vehicle to Firewall, Right Side	123.0	118.8	4.2
X15	Rear Surface of Vehicle to Firewall, Left Side	122.7	121.5	1.2
X16	Rear Surface of Vehicle to Steering Column	92.8	96.5	-3.7
X17	Center of Steering Column to "A" Post	15.8	18.3	-2.5
X18	Center of Steering Column to Headliner	17.3	15.0	2.3
X19	Rear Surface of Vehicle to Right Side of Front Bumper	157.1	143.0	14.1
X20	Rear Surface of Vehicle to Left Side of Front Bumper	156.6	145.0	11.6
X21	Length of Engine Block	17.8	17.8	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 VALUESNHTSA No. : CR5803 Vehicle : 1994 Volkswagen Golf III GL 4-door hatchback

	MAXIMUM ACCELERATION (g's)								
	HEAD				CHEST				
	X	Y	Z	R	X	Y	Z	R*	Displacement
Dummy (1)	-45.4	21.6	45.2	55.8	-51.6	12.6	29.5	45.636	-0.7
Dummy (2)	-30.4	-14.5	24.2	32.0	-42.0	-8.2	14.9	41.239	-1.6

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	-1484.9	-1756.2
Dummy (2)	-983.6	-1212.4

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc (g)
		t ₁ (msec)	t ₂ (msec)	t ₁ TO t ₂
Dummy (1)	407.06	66.120	102.000	41.87
Dummy (2)	106.51	46.320	82.200	24.49

* 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 = 5 sec.

Log time duration of reminder light operation = 5 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 = 0 sec.
(audible warning should not operate)

Log time duration of reminder light operation = 5 sec.

Note wording of visual warning :

Fasten Seat Belt -

Fasten Belt -

Symbol 101 X

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 driver sunvisor.

The label states, "inspect the airbag system four and eight years after manufacture and every two years thereafter".

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. :	CR5803
Make/Model :	1994 Volkswagen Golf III GL 4-door hatchback
Date of Comfort/Convenience Check :	June 21, 1994
Technician Performing Check :	D.J.T.
GVWR :	3616 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 - NO X

(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.

** Manual seat belts not used for this test.

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 - 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 NA 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 | <u>N/A</u> | NO | <u>N/A</u> |
| b. The latch plate is released from the buckle. | YES | <u>N/A</u> | NO | <u>N/A</u> |
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 | <u>N/A</u> | NO | <u>N/A</u> |
|--|-----|------------|----|------------|

(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 | <u>-</u> | NO | <u>X</u> |
|--|-----|----------|----|----------|
2. Seat are adjusted according to instructions in Appendix B.
- | | | | | |
|--|-----|----------|----|----------|
| | YES | <u>X</u> | NO | <u>-</u> |
|--|-----|----------|----|----------|
3. The test dummies are positioned according to dummy position placement instructions in Appendix B and Appendix C.
- | | | | | |
|--|-----|----------|----|----------|
| | YES | <u>X</u> | NO | <u>-</u> |
|--|-----|----------|----|----------|
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 0.4 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 | <u> X </u> | NO | <u> - </u> |
| 2. | Attach the inboard and outboard reach string. | YES | <u> X </u> | NO | <u> - </u> |
| 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 | <u> X </u> | NO | <u> - </u> |
| 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 | <u> X </u> | NO | <u> - </u> |

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 | <u> X </u> | NO | <u> - </u> |
| 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 | <u> X </u> | NO | <u> - </u> |
| 3. | Outboard armrests which are capable of being stowed on vehicle seats shall be placed in their stowed positions. | YES | <u> X </u> | NO | <u> - </u> |
| 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 | <u> X </u> | NO | <u> - </u> |

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	<u>X</u>	NO	<u>-</u>
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	<u>X</u>	NO	<u>-</u>
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	<u>N/A</u>	NO	<u>N/A</u>

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	<u>X</u>	NO	<u>-</u>
-----	----------	----	----------
2. The remaining two seat belt parts are accessible under normal conditions.

YES	<u>X</u>	NO	<u>-</u>
-----	----------	----	----------

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 | <u> X </u> | NO <u> - </u> |
| | b. The seat is moved to any position to which it is designed to be adjusted. | YES | <u> X </u> | NO <u> - </u> |
| | c. The seat back, if foldable, is folded forward as far as possible and then moved backward into positions. | YES | <u> X </u> | NO <u> - </u> |
| 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 | <u> X </u> | NO <u> - </u> |

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 | <u> X </u> | NO <u> - </u> |
| 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 | <u> X </u> | NO <u> - </u> |
| 3. | That releases at a single point by a push button action. | YES | <u> X </u> | NO <u> - </u> |

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 0.3 inch plastic trim along the top and 1.8 inch rubber trim along the sides. The lower portion of the windshield is covered by a plastic shroud.

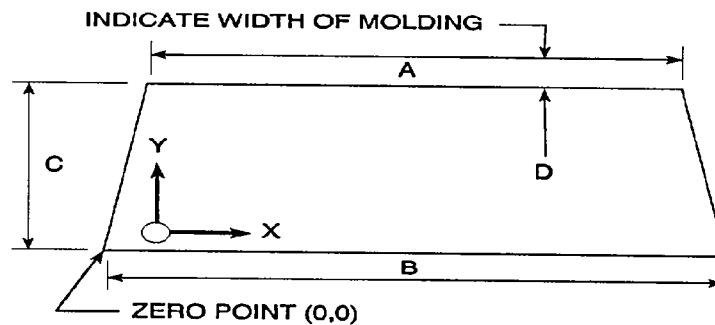
FMVSS 212 REQUIREMENTS :

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		PERCENT RETENTION
	PRE - TEST (in.)	POST - TEST (in.)	
RIGHT SIDE	78.75	78.75	100.0
LEFT SIDE	78.75	78.75	100.0
TOTAL	157.5	157.5	100.0

AREA OF RETENTION FAILURE:



FRONT VIEW OF WINDSHIELD

FAILURE DETAILS :

None

Figure 9

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

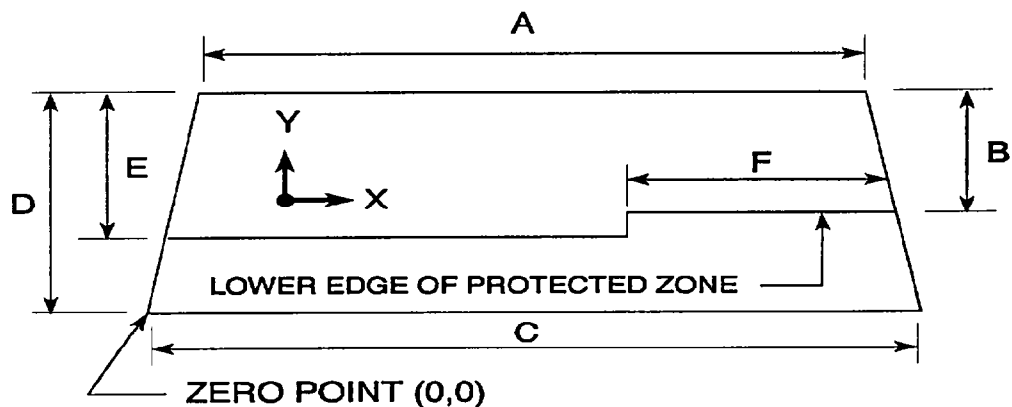
PROTECTED ZONE LOWER EDGE REQUIREMENT :

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 = 41.5
B = 14.8
C = 58.0
D = 29.0
E = 17.8
F = 37.8



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. : CR5803 TEST DATE : June 23, 1994Vehicle Mfgr./Make/Model : 1994 Volkswagen Golf III GL 4-door hatchback

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 :

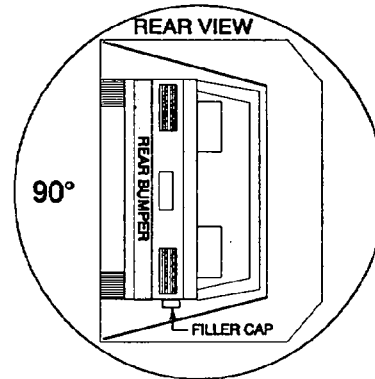
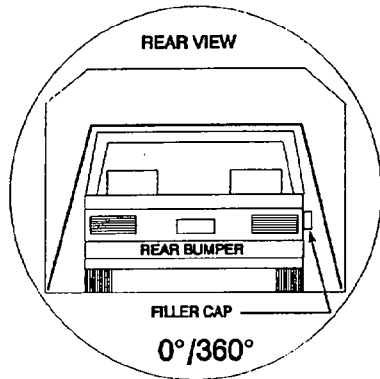
None

Table 14

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE :
0-90 Deg.

Vehicle NHTSA ID No. :
CR5803

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.

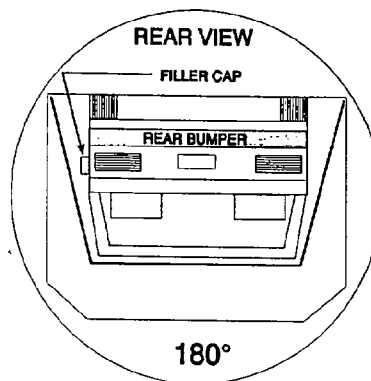
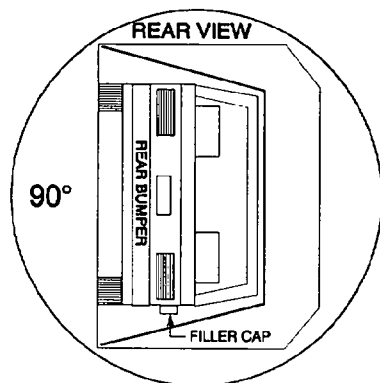
IV. SOLVENT SPILLAGE LOCATION(S) :

None

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

TEST PHASE :
90-180 Deg.

Vehicle NHTSA ID No. :
CR5803



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	58	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	58	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.

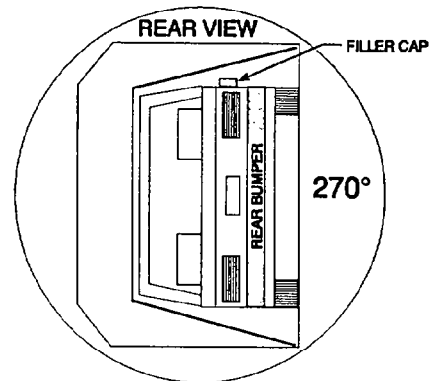
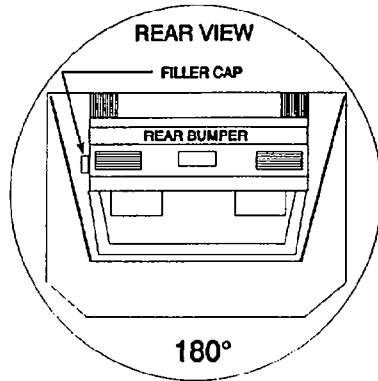
IV. SOLVENT SPILLAGE LOCATION(S) :

None

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

TEST PHASE :
180-270 Deg.

Vehicle NHTSA ID No. :
CR5803



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	37	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	37	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.

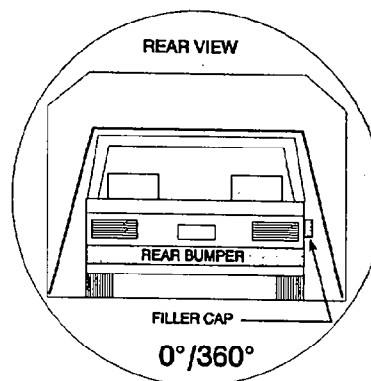
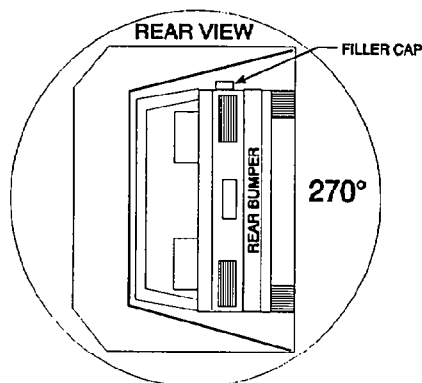
IV. SOLVENT SPILLAGE LOCATION(S) :

None

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

TEST PHASE :
270-360 Deg.

Vehicle NHTSA ID No. :
CR5803



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	59	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	59	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. : CR5803; Test Date: June 23, 1994; Technician: D.J.T.
 Vehicle Model Year/Make/Model: 1994 Volkswagen Golf III GL

A.	No. of vent holes:	<u>2</u>	-Driver	<u>0</u>	-Passenger
B.	Size of vent holes: (In. ²)	<u>1.3</u>	-Driver	<u>-</u>	-Passenger
C.	Total vent area: (In. ²)	<u>2.6</u>	-Driver	<u>-</u>	-Passenger
D.	Deflated air bag length and width dimensions or, if round, diameter. (In inches)				
	Driver:	<u>-</u>	-Length;	<u>-</u>	-Width; <u>27.0</u> -Diameter
	Passenger:	<u>24.0</u>	-Height;	<u>18.5</u>	-Width; <u>14.1</u> -Depth
E.	Is the air bag tethered?				
	Driver:	<u>X</u>	-Yes;	<u>-</u>	-No; If yes, record length of tether- <u>4ea, 10.3 inches</u>
	Passenger:	<u>-</u>	-Yes;	<u>X</u>	-No; If yes, record length of tether- <u>-</u>

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

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

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

Driver: TRW REPA 0004 2067 A / TRW REPA 0004 3801 C

Passenger: TYP 90002 / TRW REPA 0004 1710 / 0004 9543 / BAM-PT, - 0439

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 Volkswagen Golf III GL 4-door hatchback

VEHICLE NHTSA NO. : CR5803 VIN NO. : 3VWFB81H2RM049618

WHEELBASE: 97.3 BUILD DATE: 11/93 TEST DATE: June 23, 1994

VEH SIZE CATEGORY: compact TEST WEIGHT: 3240 lbs.

FRONT OVERHANG: 22.5 in OVERALL WIDTH: 65.5 in.

COLLISION DEFORMATION (CDC) CODE: 12FDEW2

IMPACT MODE: frontal

CRUSH DEPTH DIMENSIONS: (Inches)

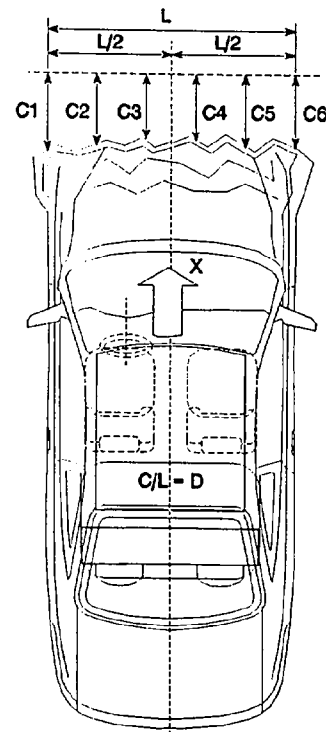
C1 = 10.7 C4 = 15.3

C2 = 13.0 C5 = 14.5

C3 = 14.7 C6 = 13.2

MIDPOINT OF DAMAGE: D =
(Vehicle Longitudinal Centerline) 30.75

LENGTH OF DAMAGE
REGION: L = 61.5



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 : June 23, 1994 Vehicle NHTSA No. : CR5803

Vehicle Manufacturer : VOLKSWAGEN DE MEXICO S.A. DE C.V.

Model Year : 1994 VIN : 3VWFB81H2RM049618

Model : Golf III GL Body Style: 4-door hatchback Build Date : 11/93

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

Impact Velocity : 29.0 mph; Time of Test : 10:58

Type of Automatic Restraint System :

Driver : Airbag

Passenger : Airbag

Failure Details :

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

Appendix A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

<u>Figure</u>	<u>Photograph Title</u>	<u>Page No.</u>
A-1	PRE-TEST FRONT VIEW	A-3
A-2	POST- TEST FRONT VIEW	A-4
A-3	PRE-TEST LEFT SIDE VIEW	A-5
A-4	POST -TEST LEFT SIDE VIEW	A-6
A-5	PRE-TEST RIGHT SIDE VIEW	A-7
A-6	POST -TEST RIGHT SIDE VIEW	A-8
A-7	PRE-TEST FRONT UNDERBODY VIEW	A-9
A-8	POST- TEST FRONT UNDERBODY VIEW	A-10
A-9	PRE-TEST DRIVER SIDE VIEW	A-11
A-10	POST-TEST DRIVER SIDE VIEW	A-12
A-11	PRE-TEST PASSENGER SIDE VIEW	A-13
A-12	POST-TEST PASSENGER SIDE VIEW	A-14
A-13	PRE-TEST UNDERBODY STEERING SHAFT	A-15
A-14	POST-TEST UNDERBODY STEERING SHAFT	A-16
A-15	PRE-TEST STEERING COLUMN/FIREWALL INSIDE VIEW (N/A)	A-17
A-16	POST-TEST STEERING COLUMN/FIREWALL INSIDE VIEW (N/A)	A-18
A-17	POST-TEST DRIVER KNEE BOLSTER	A-19
A-18	POST-TEST PASSENGER KNEE BOLSTER	A-20
A-19	VEHICLE IMPACT	A-21
A-20	CERTIFICATION PLACARD	A-22
A-21	TIRE PLACARD	A-23
A-22	POST-TEST DRIVER AIRBAG VIEW	A-24
A-23	POST-TEST PASSENGER AIRBAG VIEW	A-25



Figure A-1 PRE-TEST FRONT VIEW
A-3

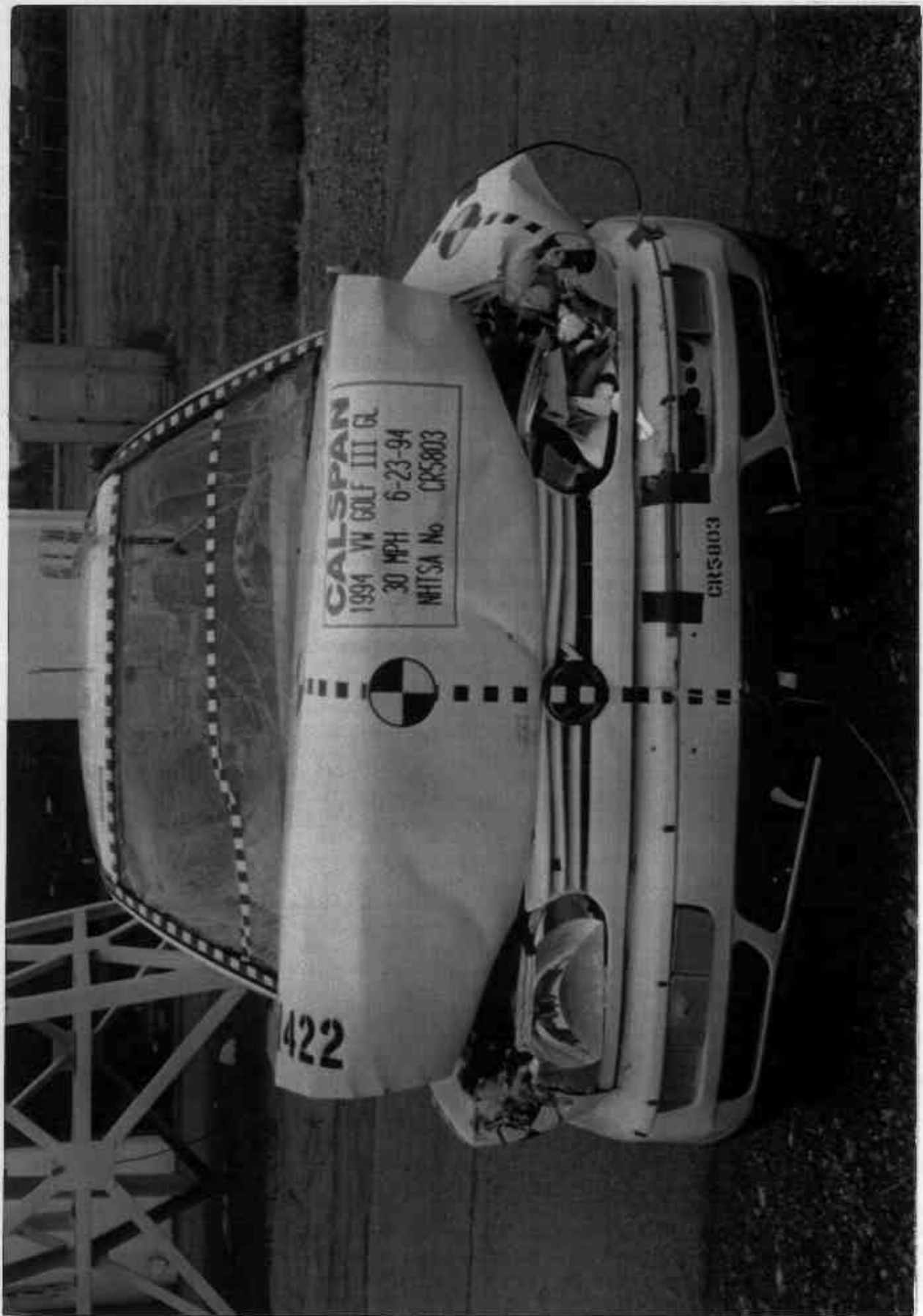


Figure A-2 POST-TEST FRONT VIEW

A-4

8183-6



Figure A-3 PRE-TEST LEFT SIDE VIEW

A-5

8183-6



Figure A-4 POST-TEST LEFT SIDE VIEW

A-6

8183-6

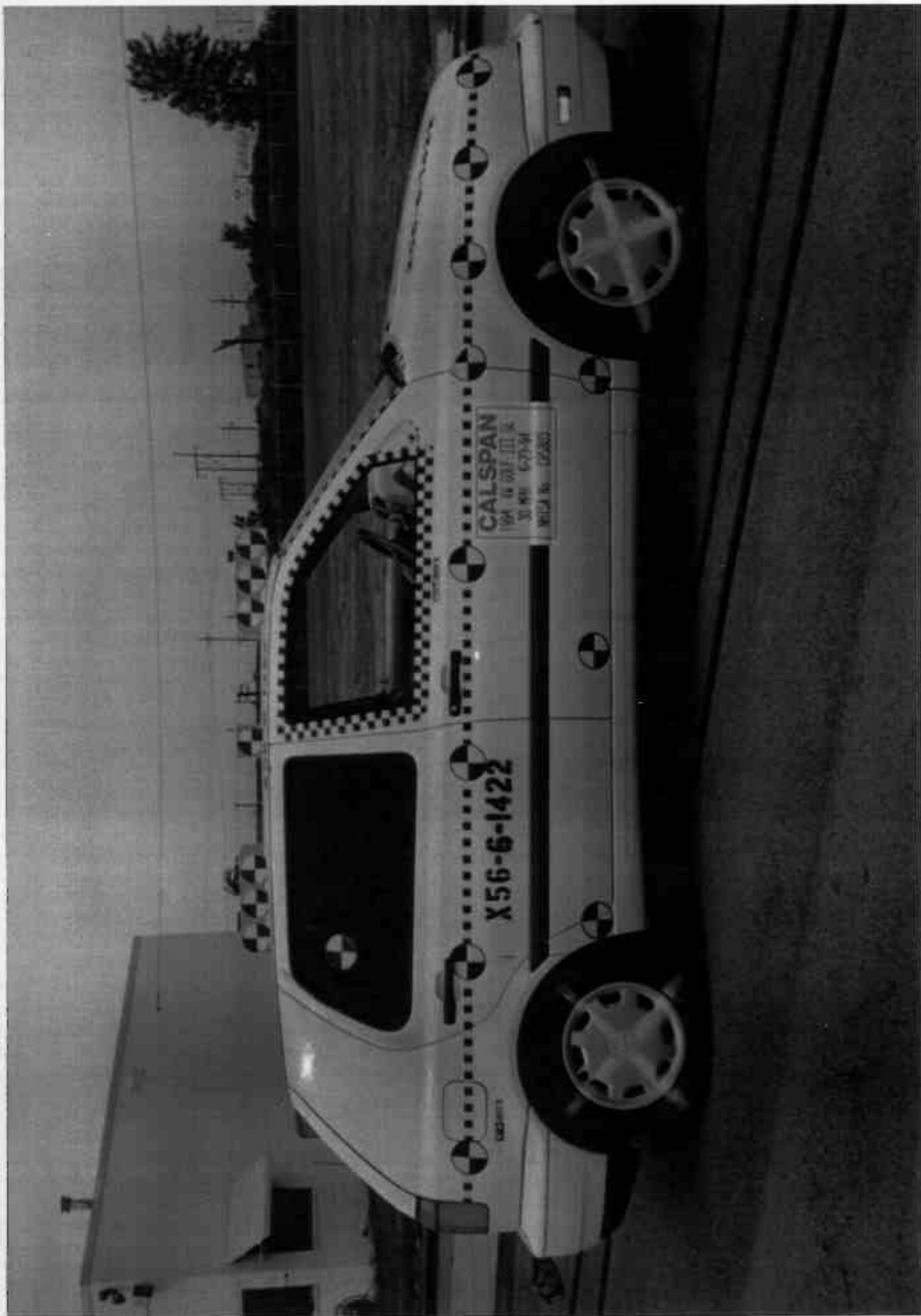


Figure A-5 PRE-TEST RIGHT SIDE VIEW

A-7

8183-6

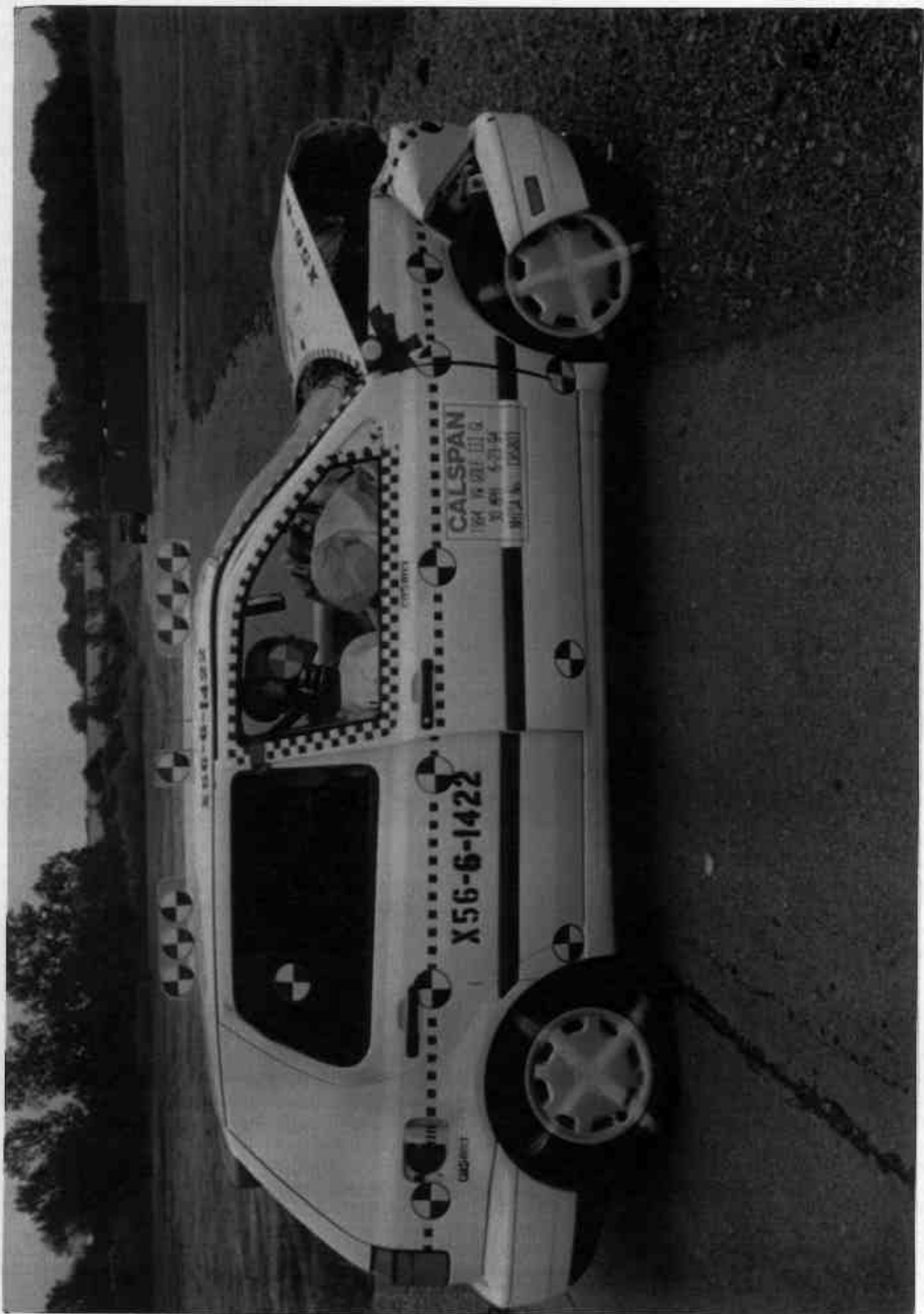


Figure A-6 POST-TEST RIGHT SIDE VIEW



Figure A-7 PRE-TEST FRONT UNDERBODY VIEW

A-9

8183-6



Figure A-8 POST-TEST FRONT UNDERBODY VIEW

A-10

8183-6



Figure A-9 PRE-TEST DRIVER SIDE VIEW
A-11



Figure A-10 POST-TEST DRIVER SIDE VIEW
A-12



Figure A-11 PRE-TEST PASSENGER SIDE VIEW

A-13

8183-6



Figure A-12 POST-TEST PASSENGER SIDE VIEW

A-14

8183-6

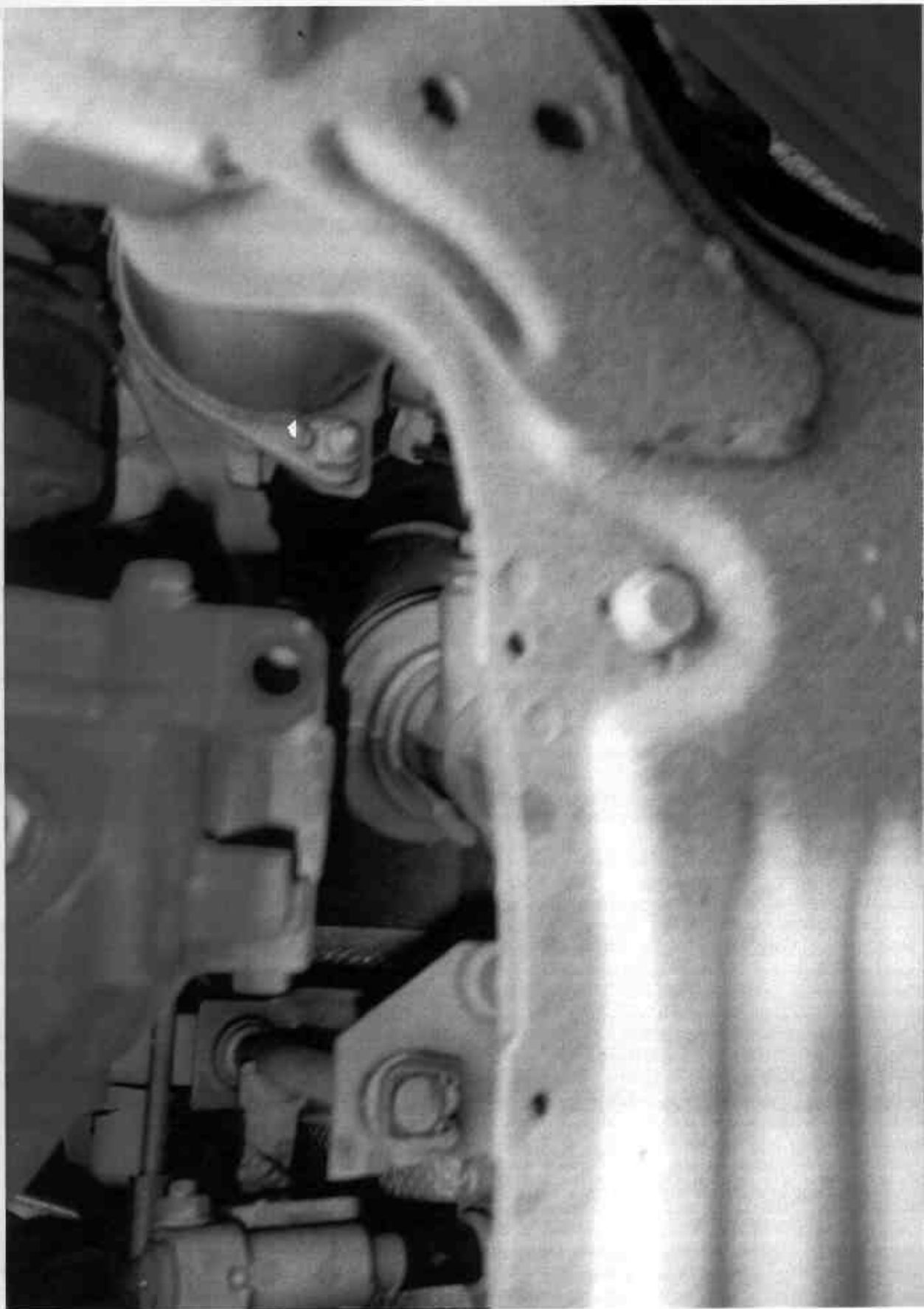


Figure A-13 PRE-TEST UNDERBODY STEERING SHAFT VIEW
A-15

8183-6



Figure A-14 POST-TEST UNDERBODY STEERING SHAFT VIEW

A-16

8183-6

PHOTOGRAPH NOT AVAILABLE

Figure A-15 PRE-TEST STEERING COLUMN/FIREWALL INSIDE VIEW



Figure A-16 POST-TEST STEERING COLUMN/FIREWALL INSIDE VIEW
A-18

8183-6

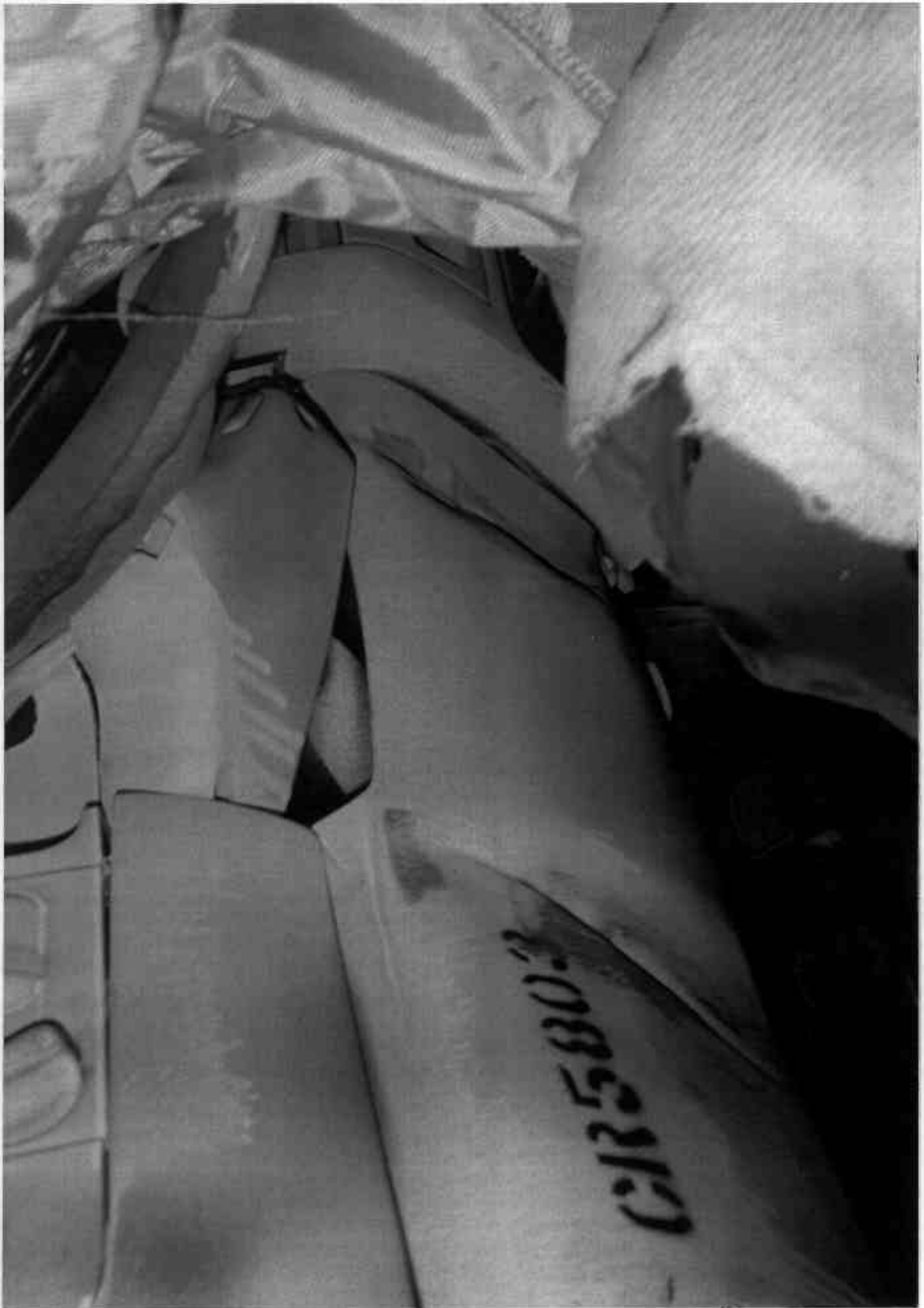


Figure A-17 POST-TEST DRIVER KNEE BOLSTER
A-19



Figure A-18 POST-TEST PASSENGER KNEE BOLSTER
A-20

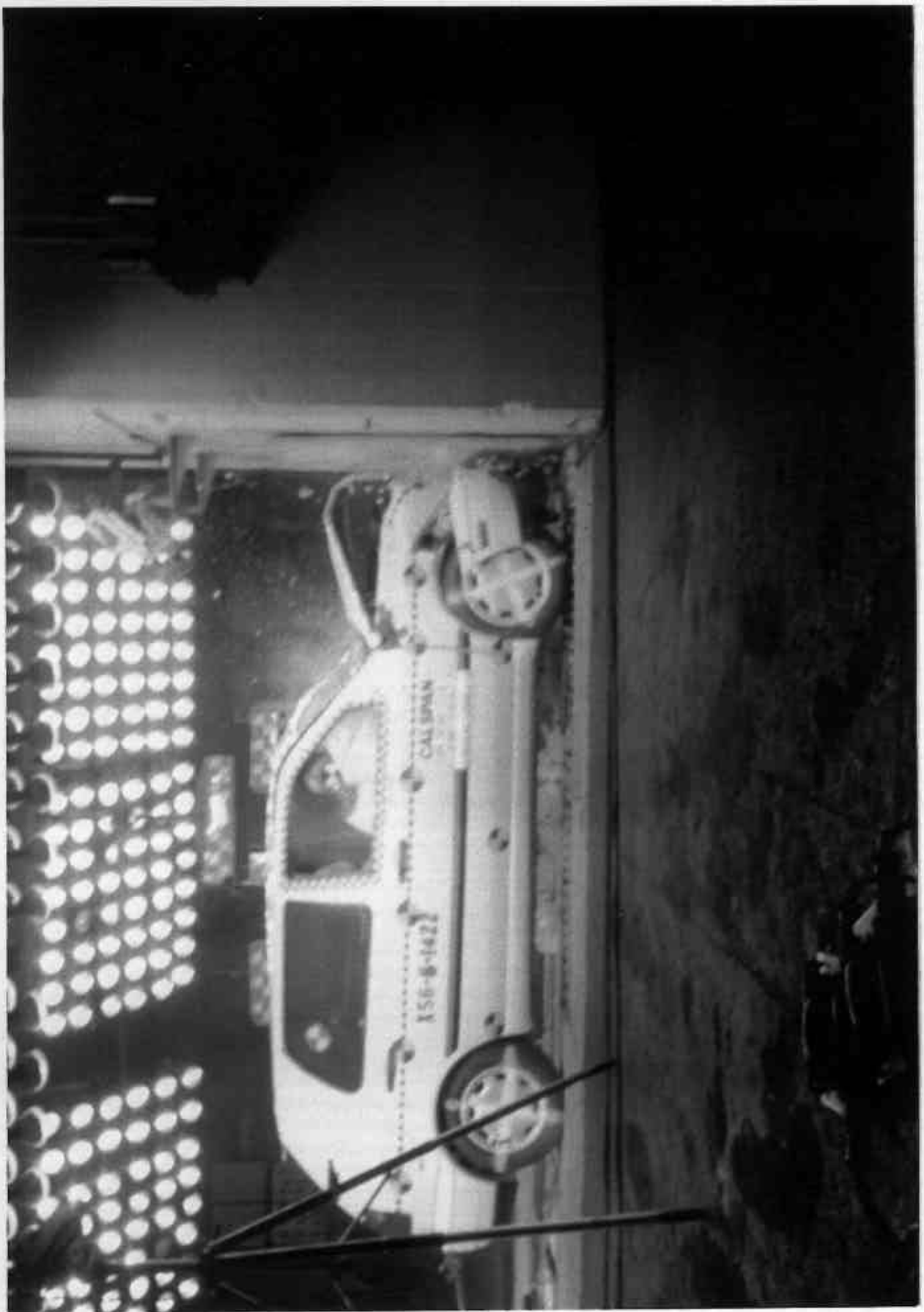
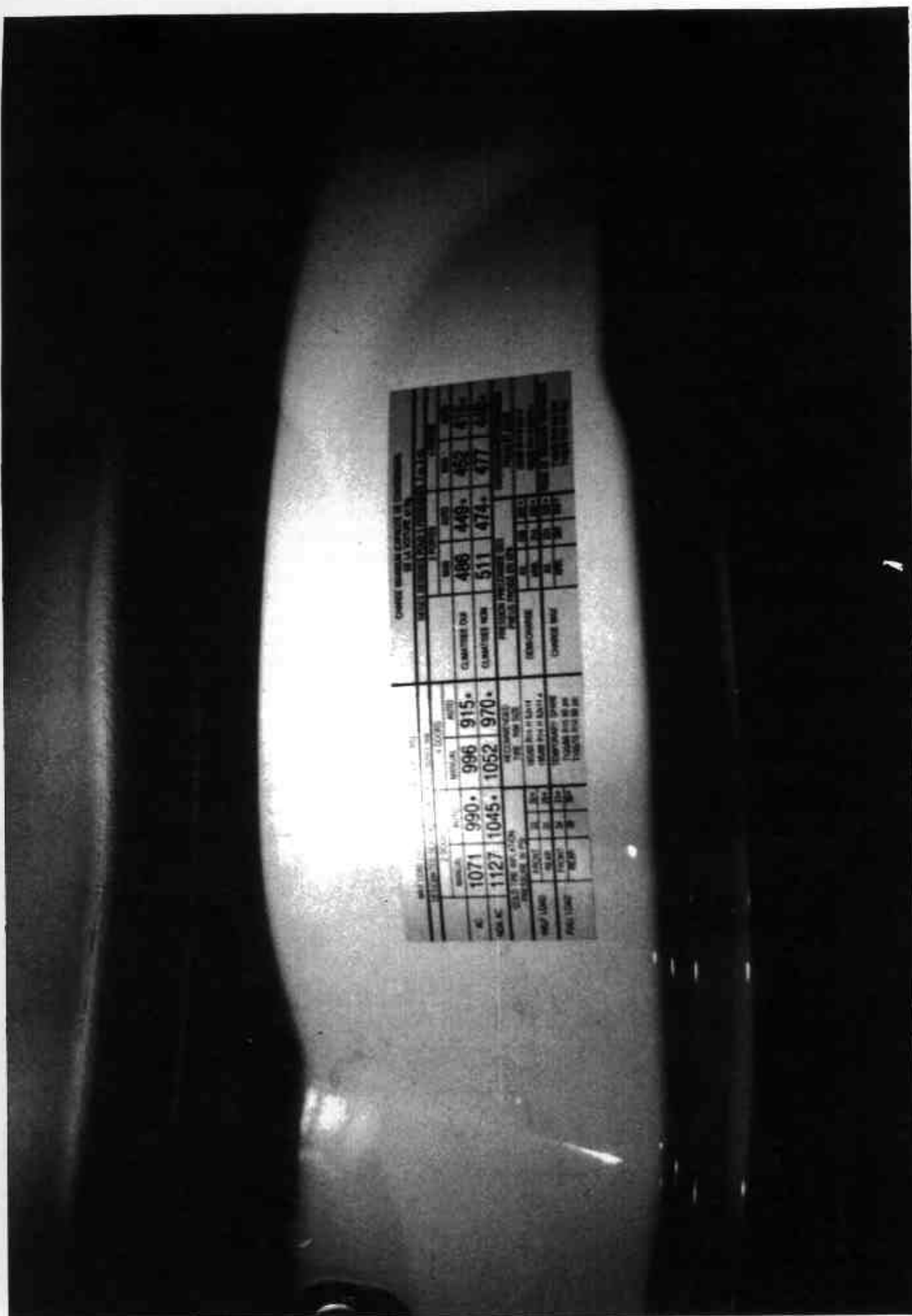


Figure A-19 VEHICLE IMPACT
A-21



Figure A-20 CERTIFICATION PLACARD



CHARGE NUMBER CHARGE IN			
IN LA 10000 CTS			
SECT 10000 10000 10000 10000			
CHARGE	CHARGE	CHARGE	CHARGE
1071	990	996	915
1127	1045	1052	970
486	448	452	477
511	474	477	477
CHARGE NUMBER CHARGE IN			
IN LA 10000 CTS			
SECT 10000 10000 10000 10000			
CHARGE	CHARGE	CHARGE	CHARGE
1071	990	996	915
1127	1045	1052	970
486	448	452	477
511	474	477	477
CHARGE NUMBER CHARGE IN			
IN LA 10000 CTS			
SECT 10000 10000 10000 10000			
CHARGE	CHARGE	CHARGE	CHARGE
1071	990	996	915
1127	1045	1052	970
486	448	452	477
511	474	477	477

Figure A-21 TIRE PLACARD
A-23



Figure A-22 POST-TEST DRIVER AIR BAG VIEW
A-24



Figure A-23 POST-TEST PASSENGER AIR BAG VIEW
A-25

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. CR5803

VEHICLE

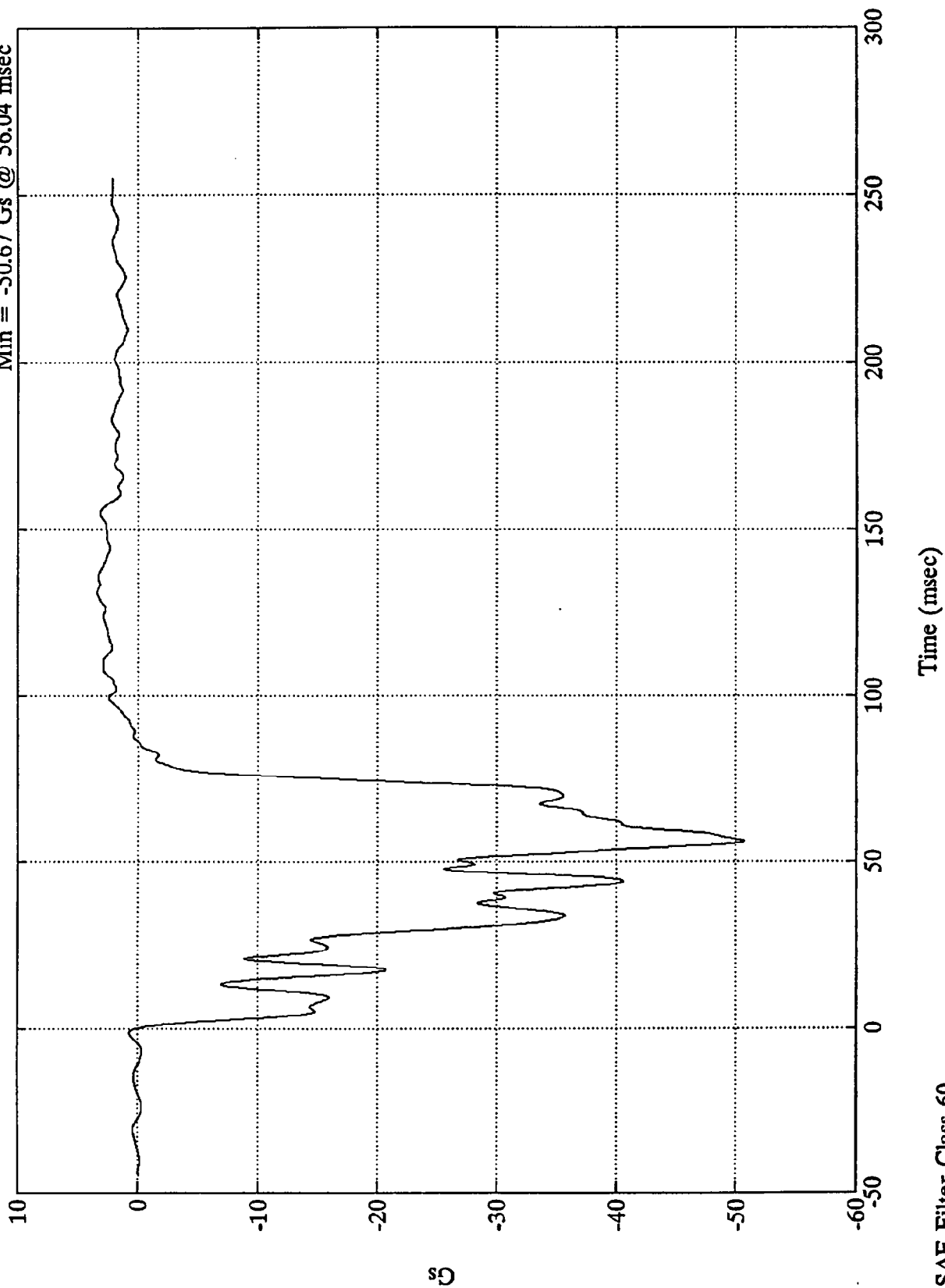
SAE FILTER CHANNEL CLASS

60

NHTSA 208 TEST #15 - 1994 VW GOLF

L. Rear X-member X

Max = 3.41 Gs @ 131.28 msec
Min = -50.67 Gs @ 56.04 msec

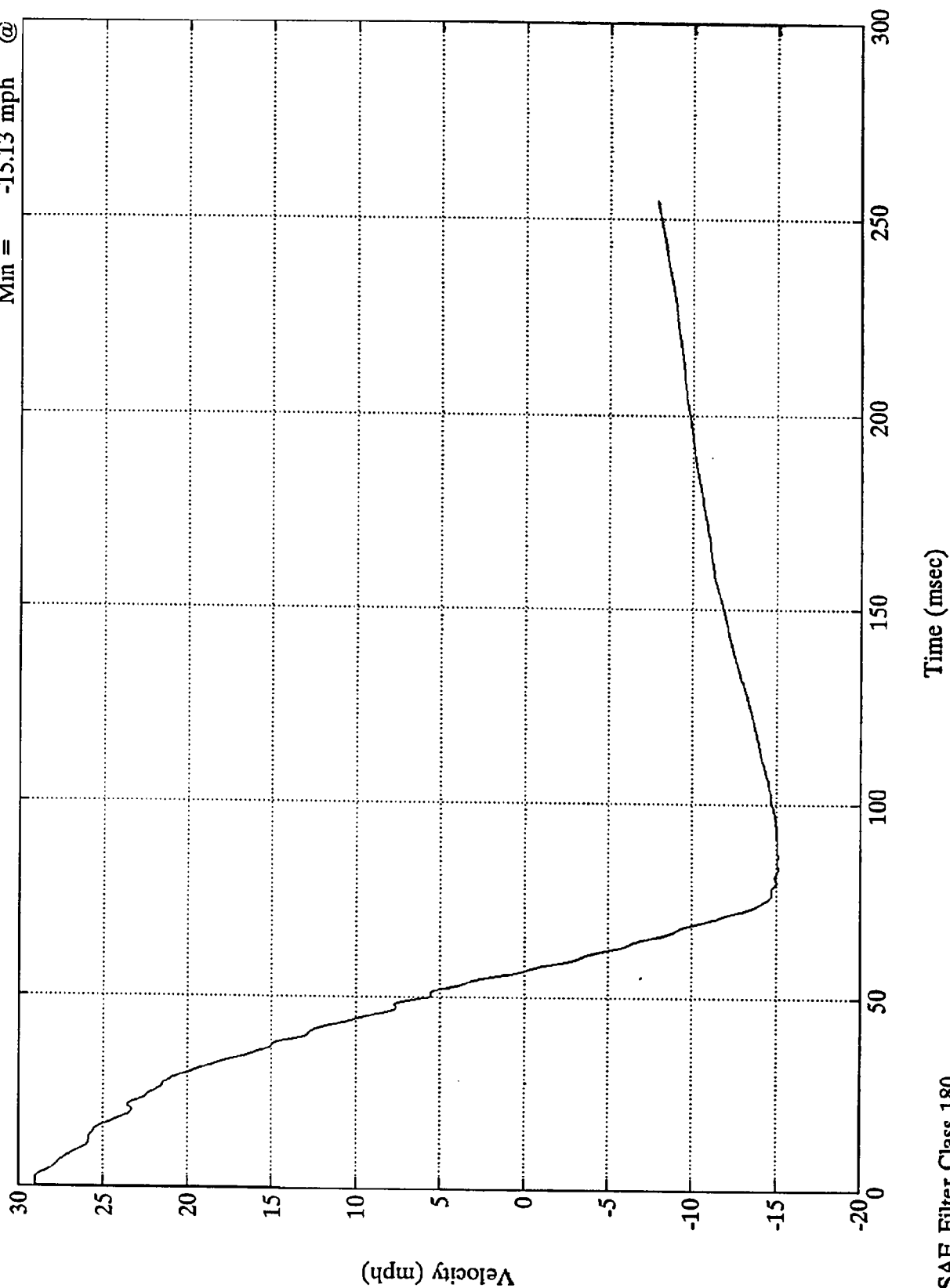


SAE Filter Class 60

NHTSA 208 TEST #15 - 1994 VW GOLF

L. Rear X-member X

Max = 29.02 mph @ 2.03 msec
Min = -15.13 mph @ 83.52 msec



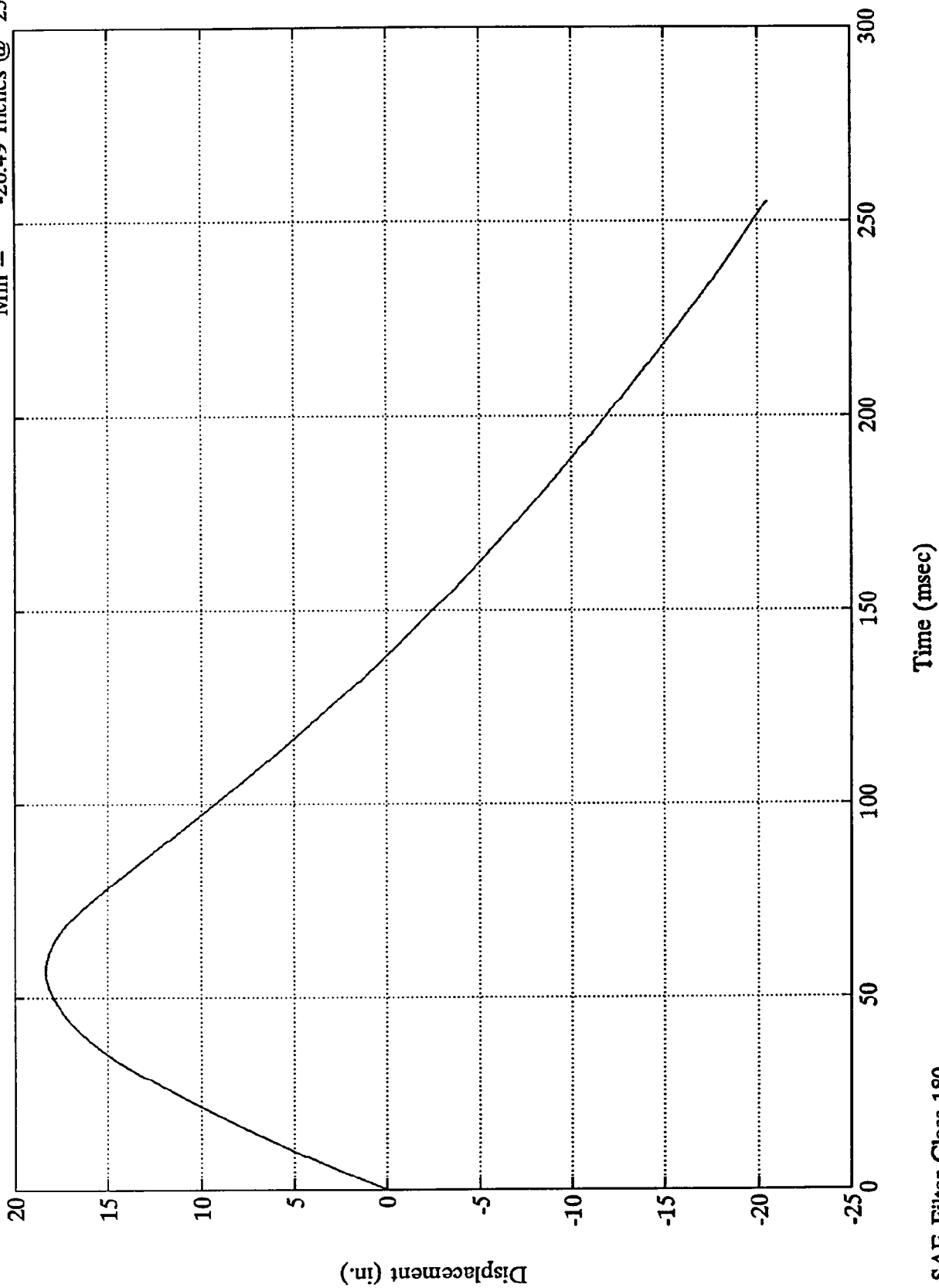
SAE Filter Class 180

8183-6

NHTSA 208 TEST #15 - 1994 VW GOLF

L. Rear X-member X

Max = 18.36 Inches @ 57.00 msec
Min = -20.49 Inches @ 254.88 msec

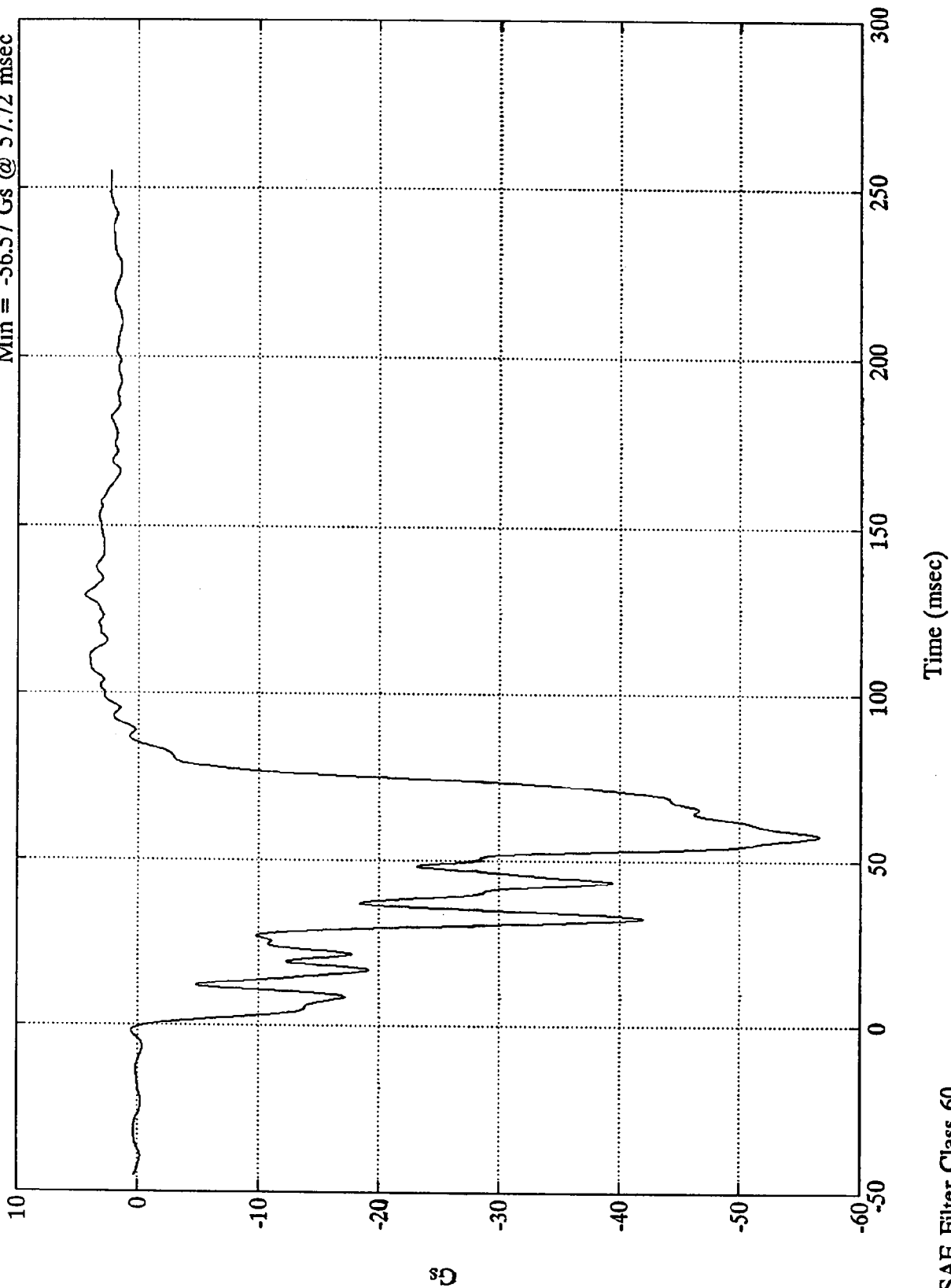


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

R. Rear X-member X

Max = 4.42 Gs @ 129.36 msec
Min = -56.57 Gs @ 57.72 msec

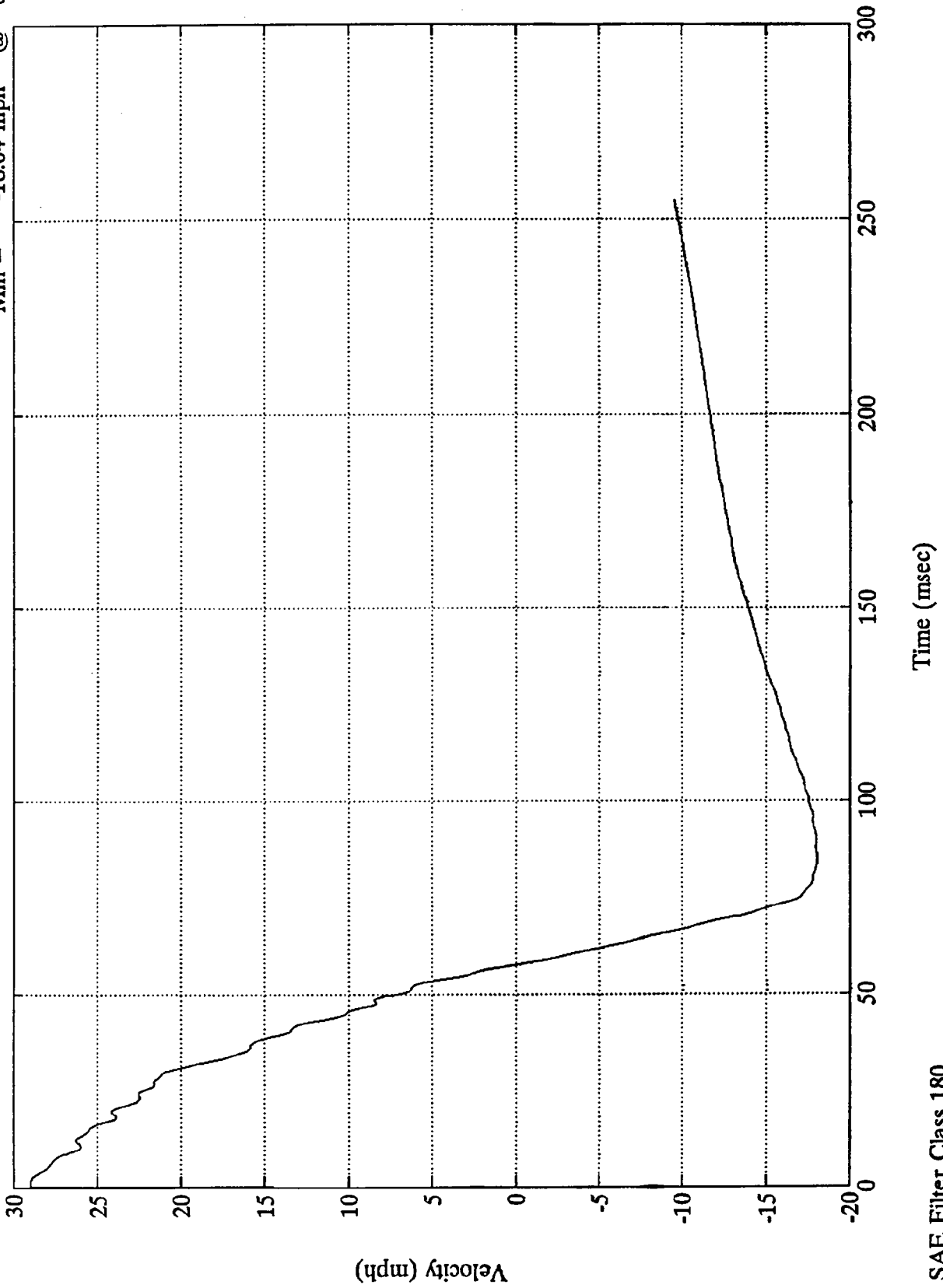


SAE Filter Class 60

NHTSA 208 TEST #15 - 1994 VW GOLF

R. Rear X-member X

Max = 29.00 mph @ 0.11 msec
Min = -18.04 mph @ 84.36 msec

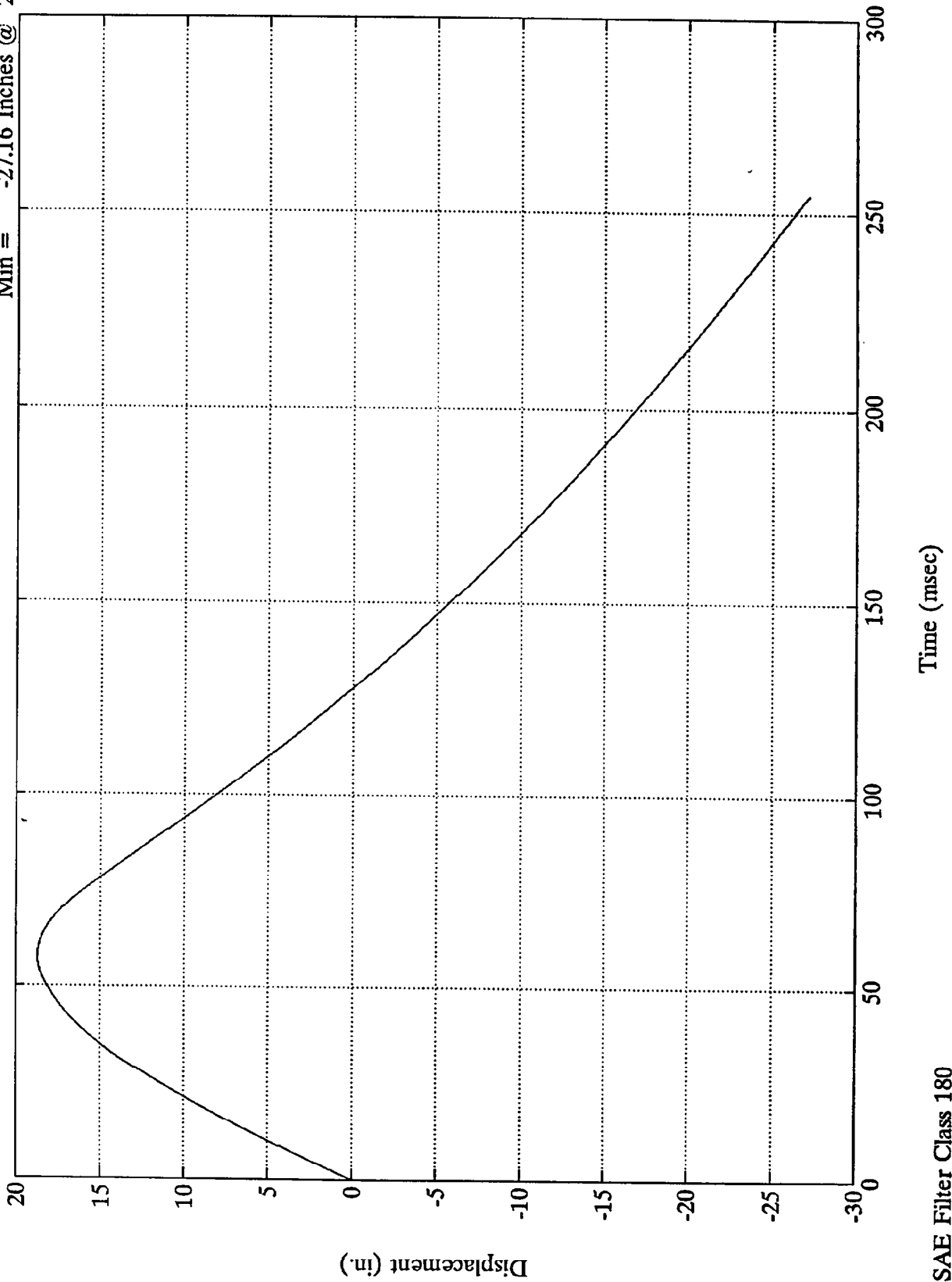


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

R. Rear X-member X

Max = 18.73 Inches @ 57.72 msec
Min = -27.16 Inches @ 254.88 msec

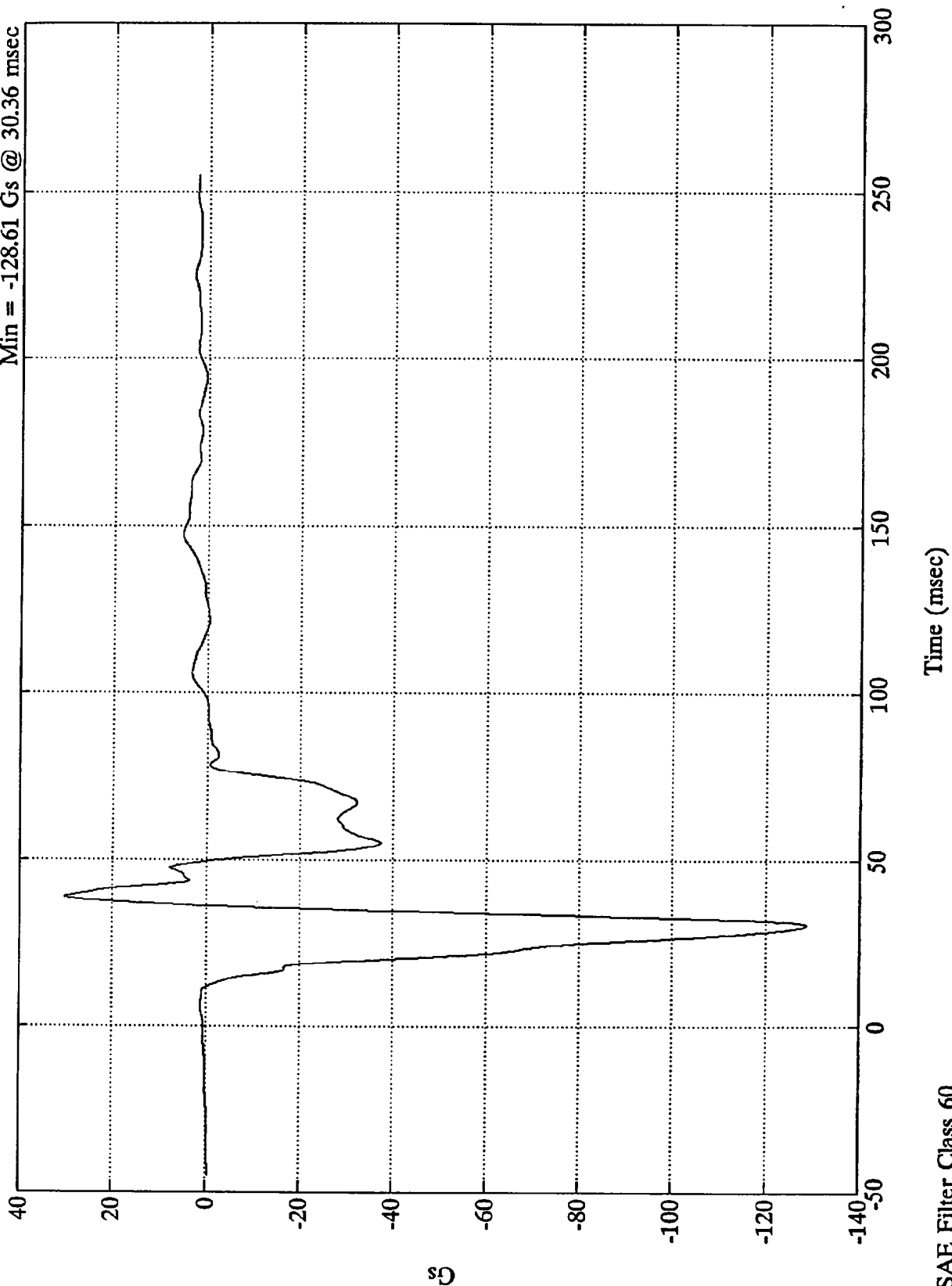


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Engine Top X

Max = 30.43 Gs @ 38.64 msec
Min = -128.61 Gs @ 30.36 msec

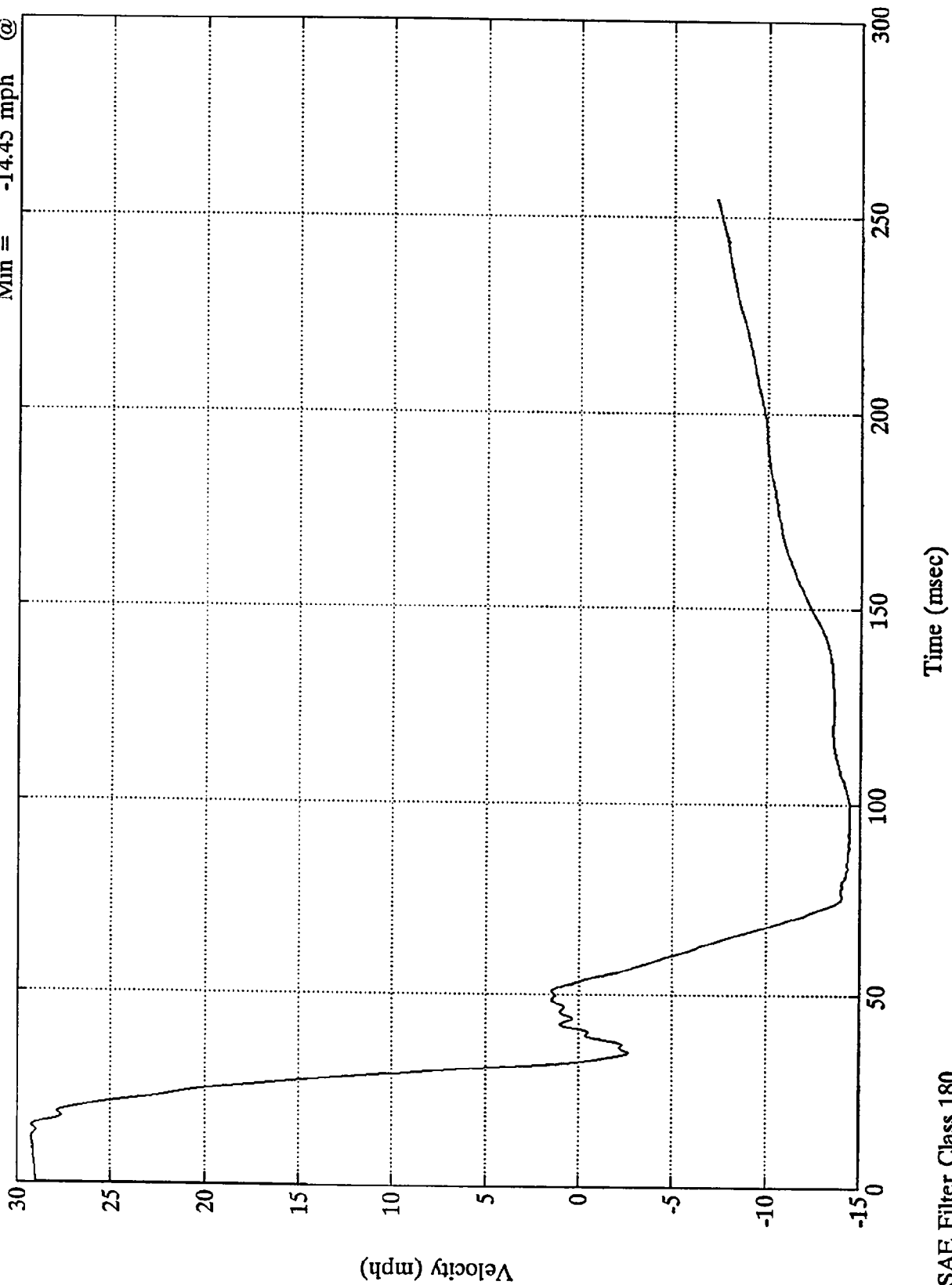


SAE Filter Class 60

NHTSA 208 TEST #15 - 1994 VW GOLF

Engine Top X (in)

Max = 29.28 mph @ 14.99 msec
Min = -14.45 mph @ 96.36 msec

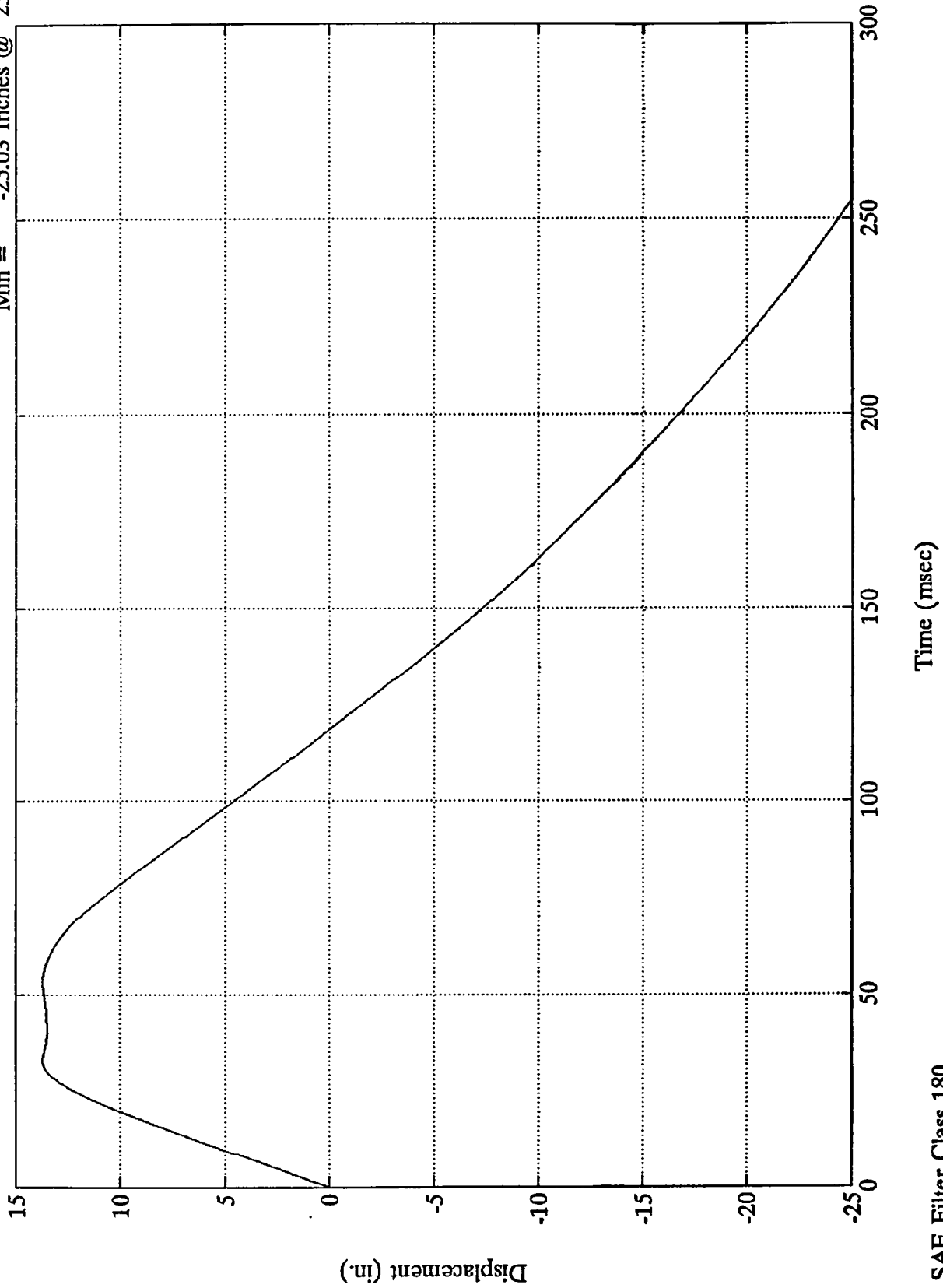


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Engine Top X (in.)

Max = 13.70 Inches @ 32.76 msec
Min = -25.03 Inches @ 254.88 msec

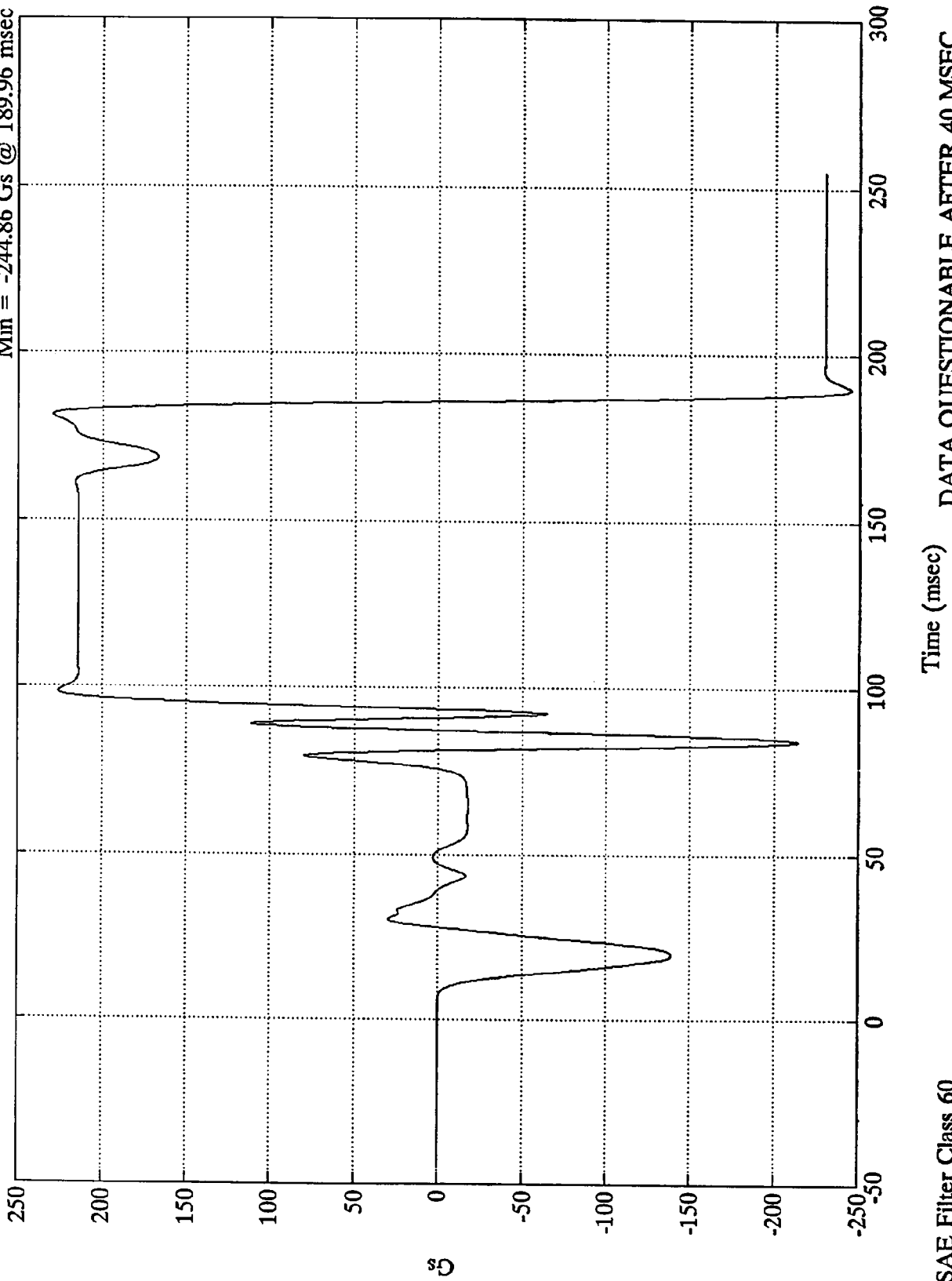


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Engine Bottom X

Max = 229.25 Gs @ 181.44 msec
Min = -244.86 Gs @ 189.96 msec



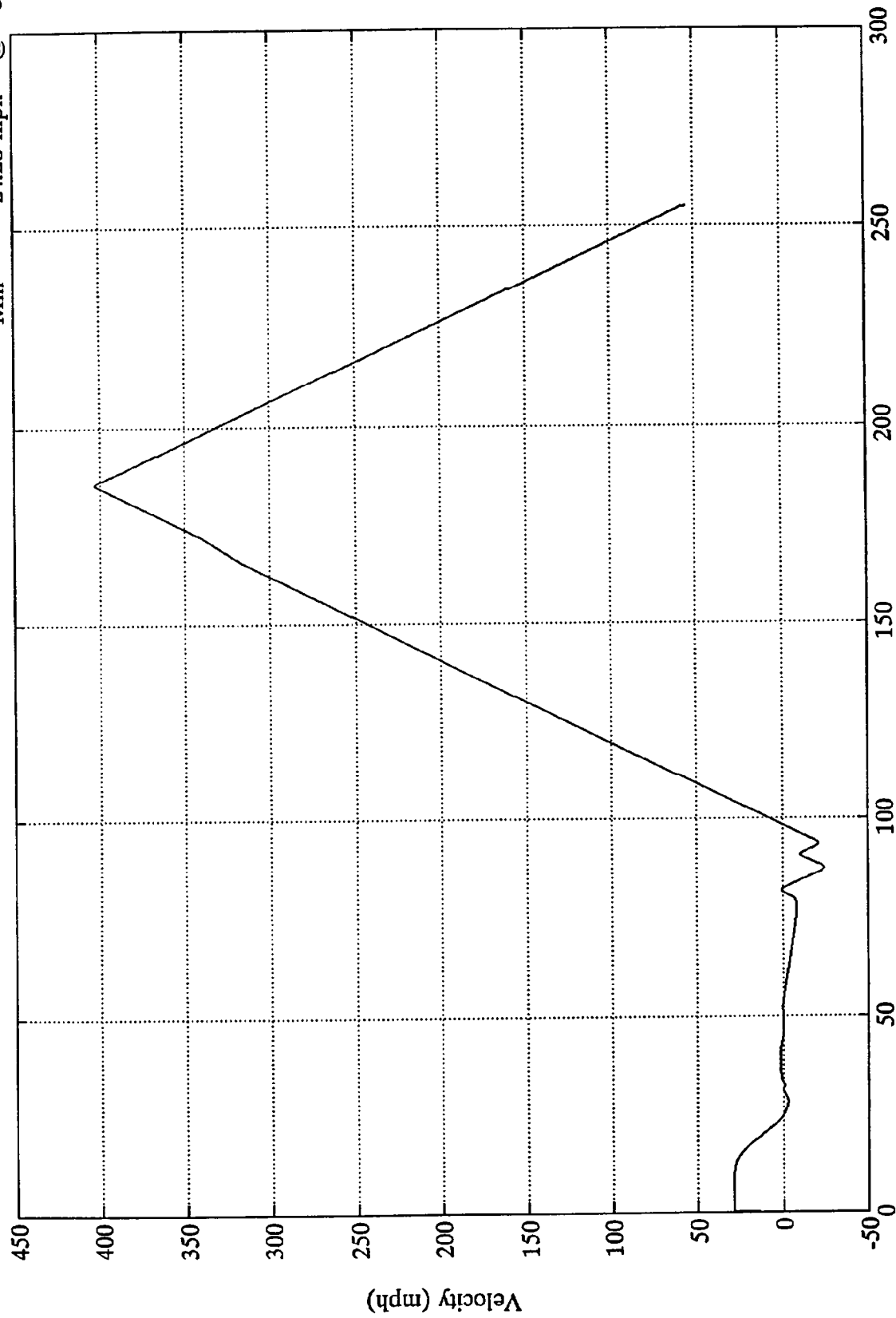
SAE Filter Class 60

Time (msec)

DATA QUESTIONABLE AFTER 40 MSEC

NHTSA 208 TEST #15 - 1994 VW GOLF

Engine Bottom X
Max = 402.37 mph @ 185.64 msec
Min = -24.28 mph @ 87.24 msec



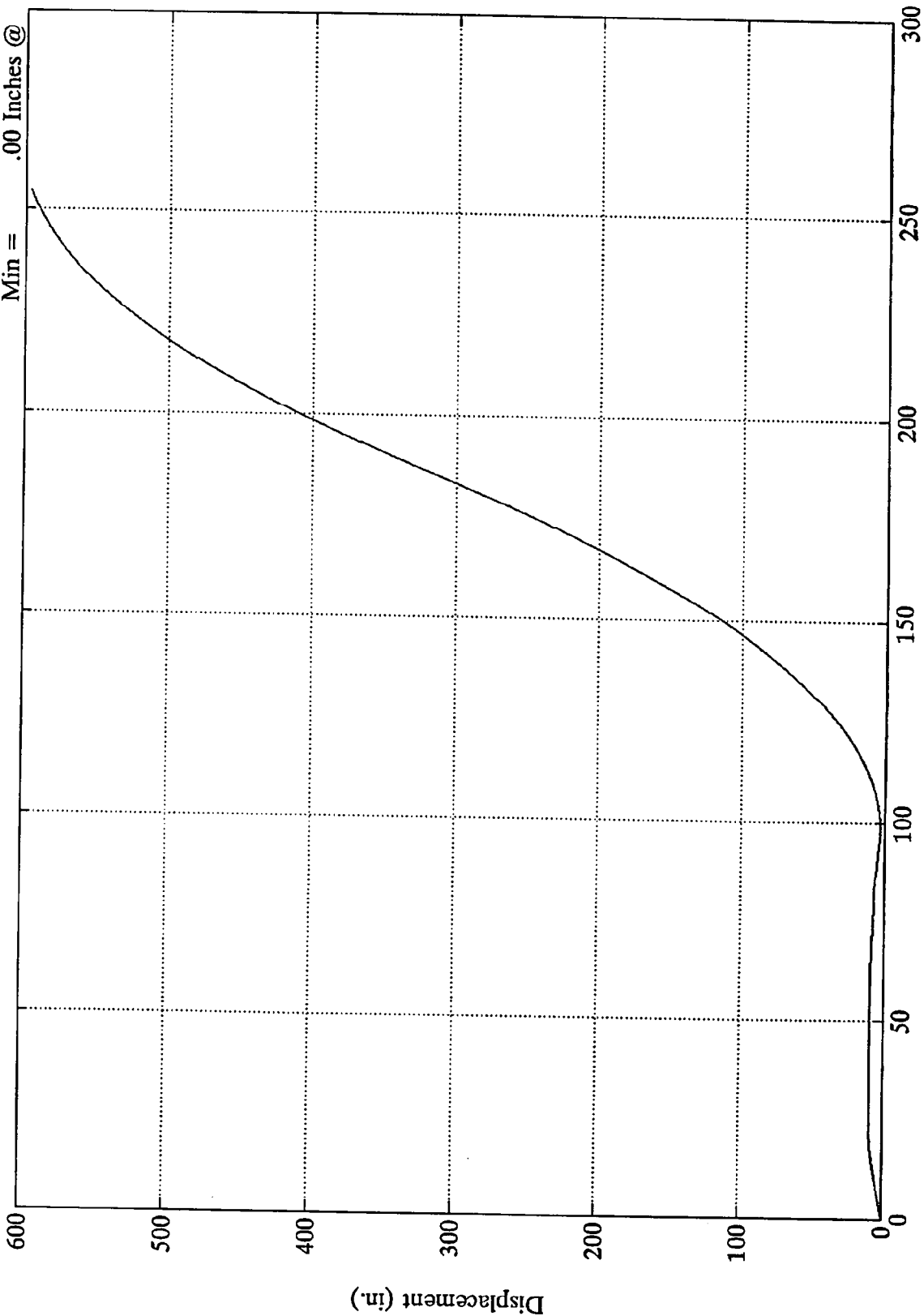
DATA QUESTIONABLE AFTER 40 MSEC

SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Engine Bottom X

Max = 596.56 Inches @ 254.88 msec
Min = .00 Inches @ -0.00 msec



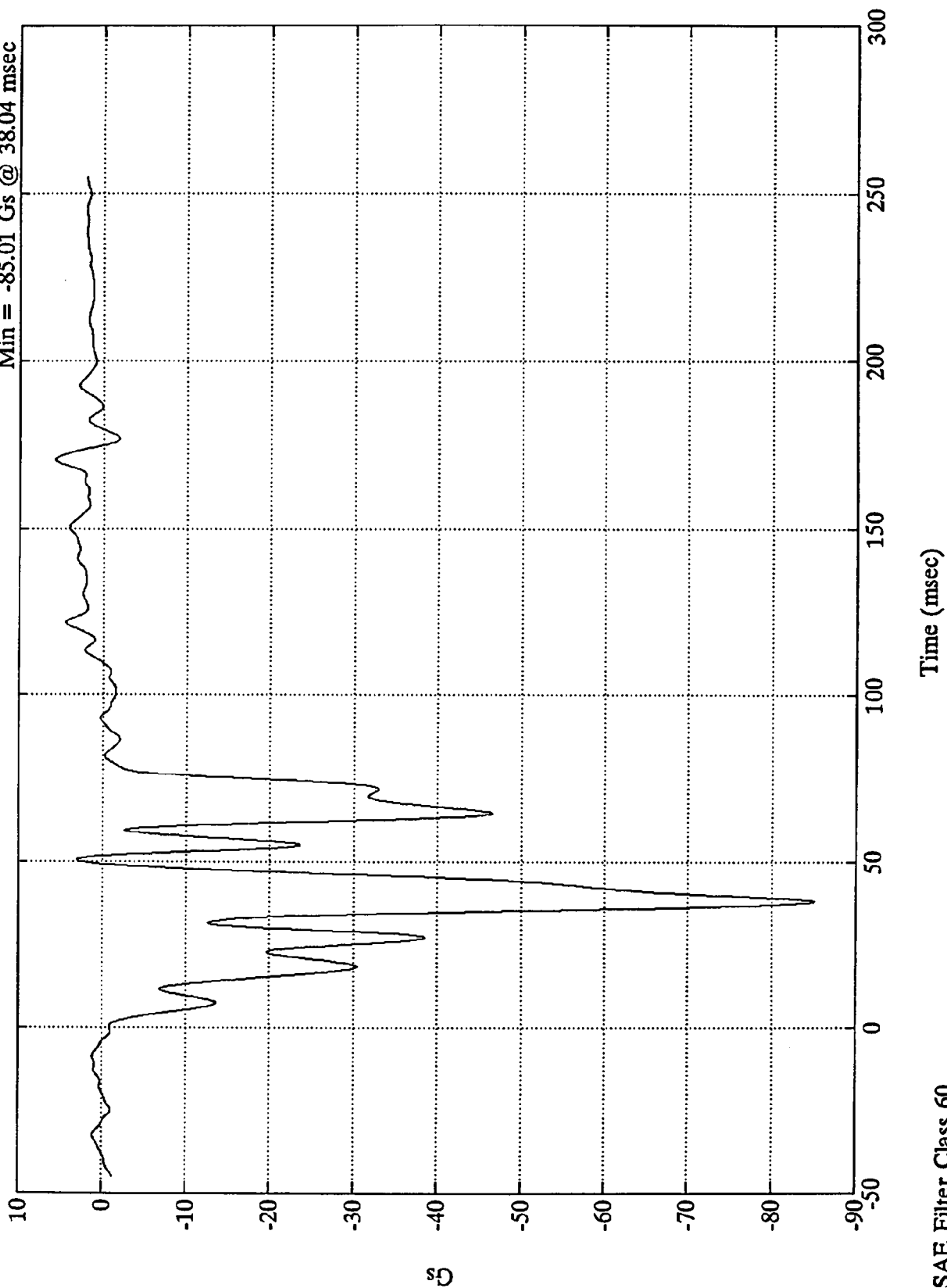
Time (msec) DATA QUESTIONABLE AFTER 40 MSEC

SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

R. Brake Caliper X

Max = 5.74 Gs @ 170.64 msec
Min = -85.01 Gs @ 38.04 msec

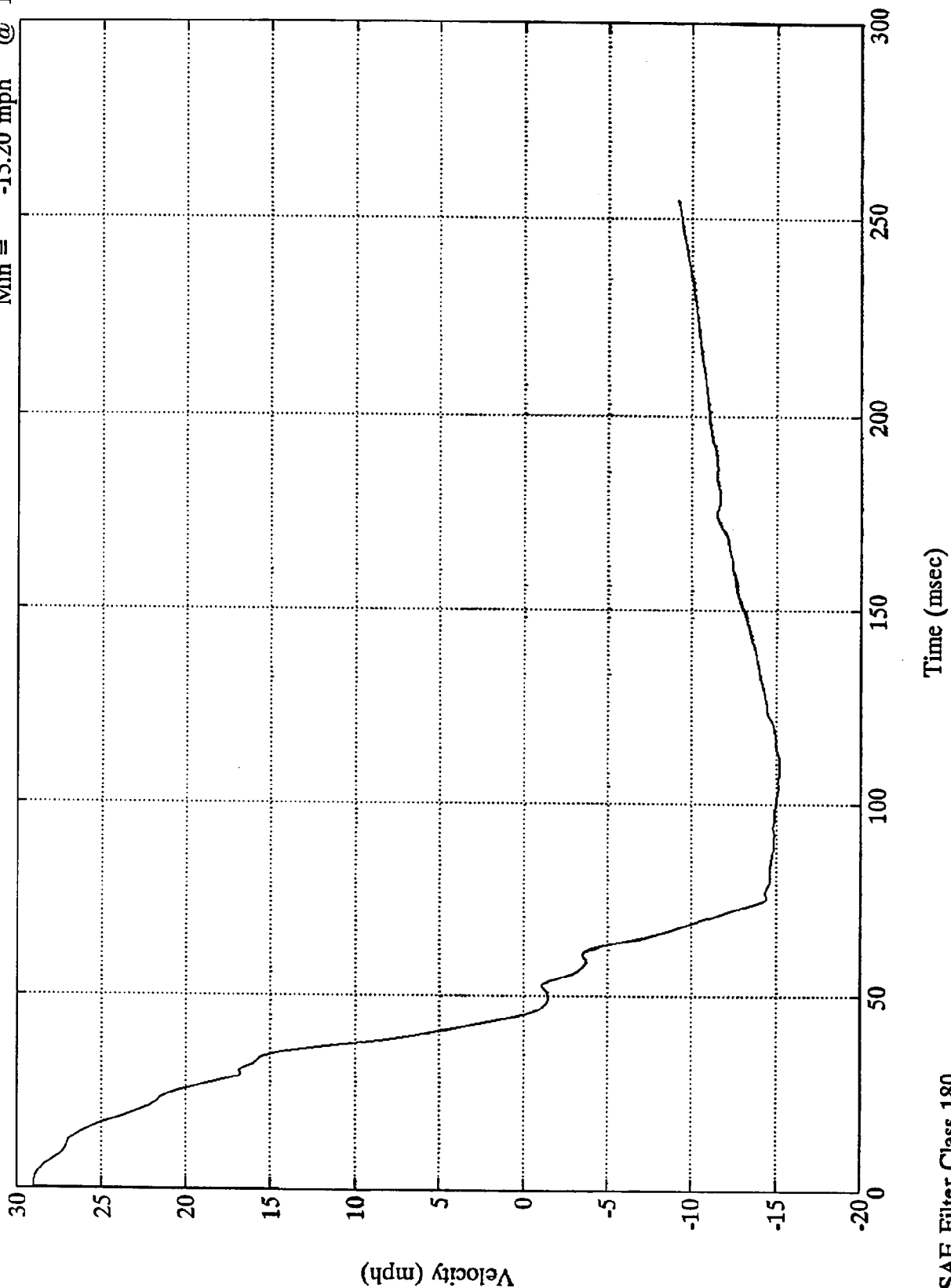


SAE Filter Class 60

NHTSA 208 TEST #15 - 1994 VW GOLF

R. Brake Caliper X ()

Max = 29.00 mph @ 1.31 msec
Min = -15.20 mph @ 108.35 msec

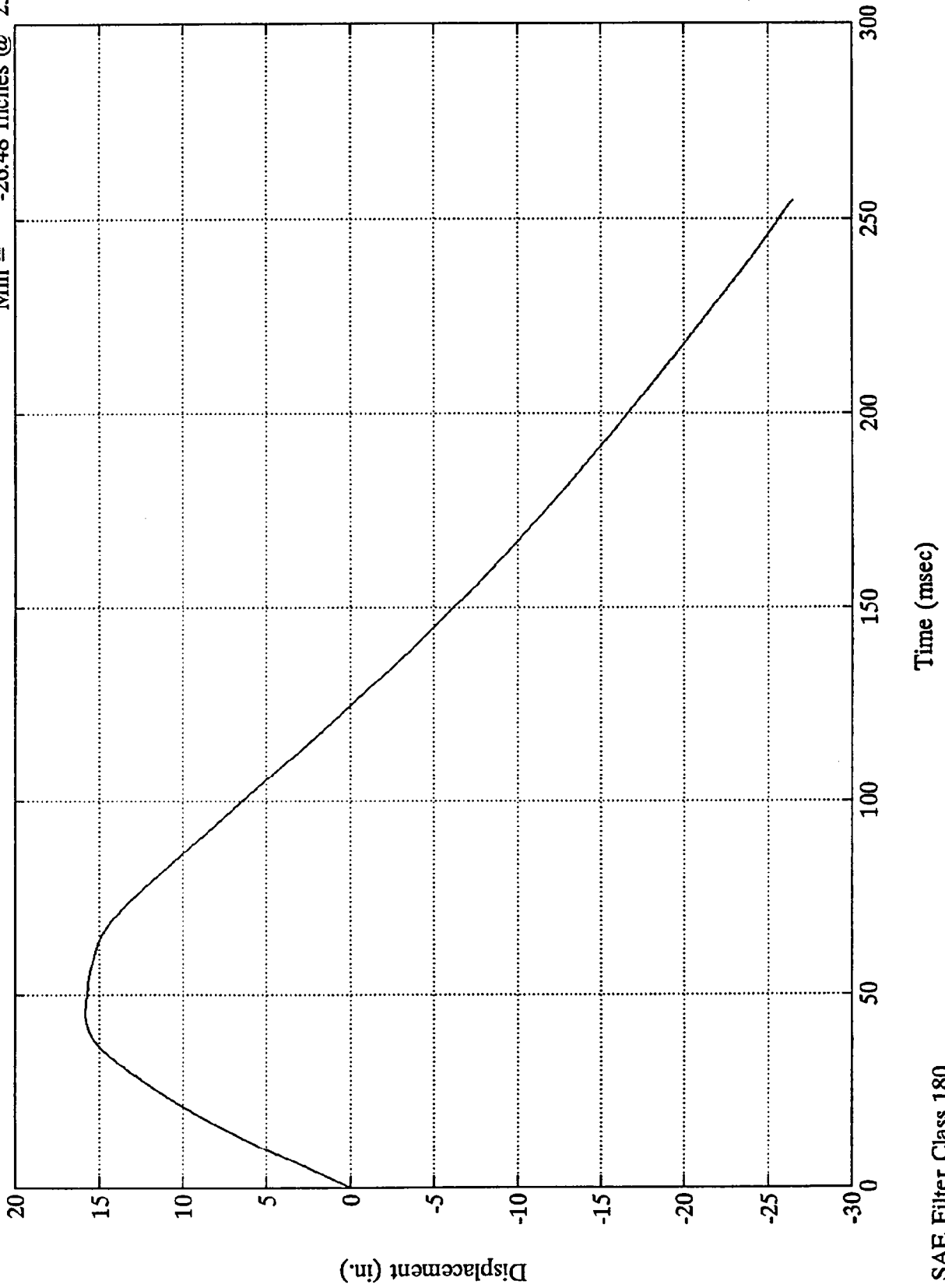


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 15.80 Inches @ 45.23 msec
Min = -26.48 Inches @ 254.88 msec

R. Brake Caliper X

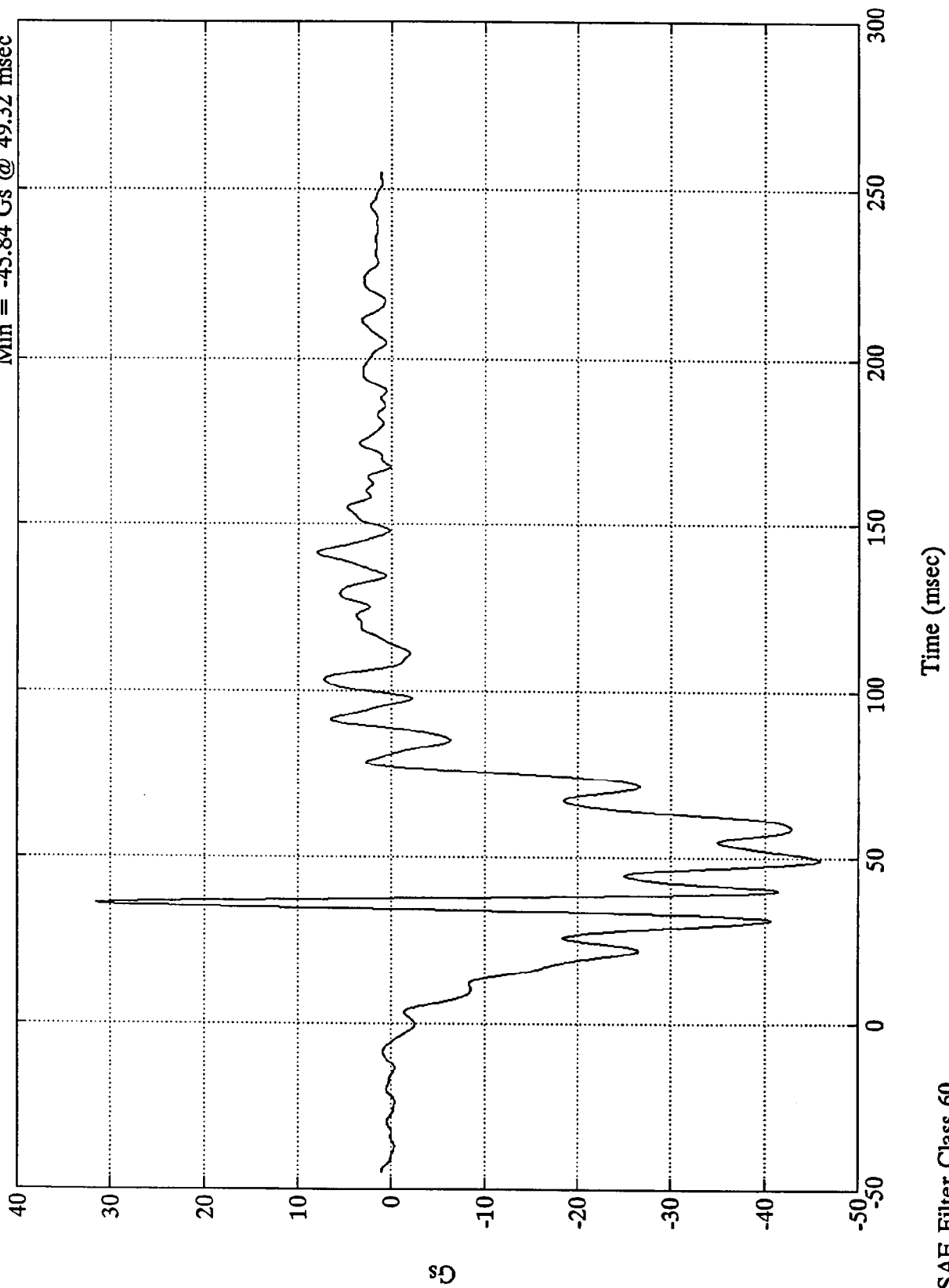


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

L. Brake Caliper X

Max = 31.53 Gs @ 35.76 msec
Min = -45.84 Gs @ 49.32 msec

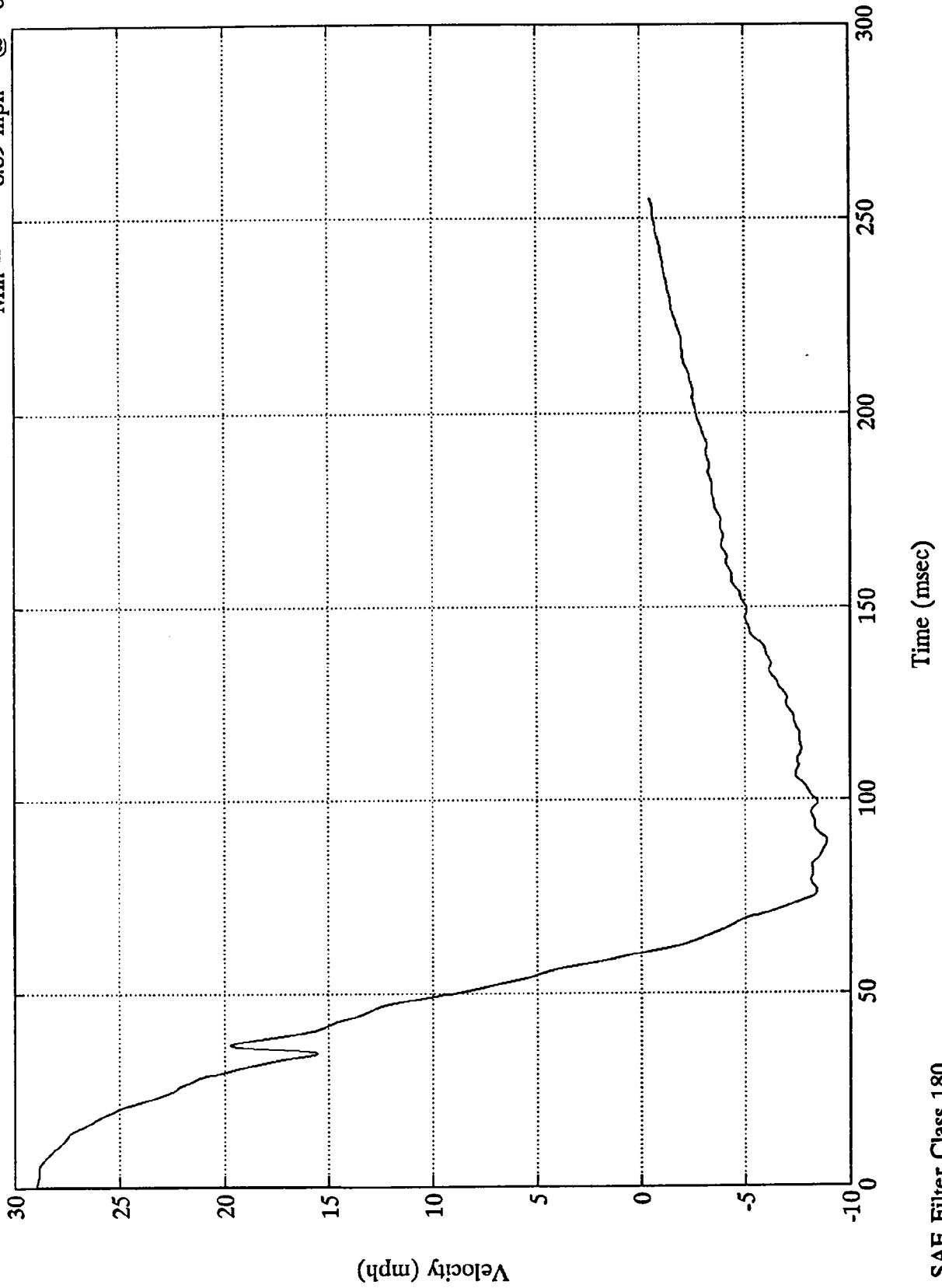


SAE Filter Class 60

NHTSA 208 TEST #15 - 1994 VW GOLF

L. Brake Caliper X

Max = 28.99 mph @ 0.11 msec
Min = -8.89 mph @ 89.28 msec

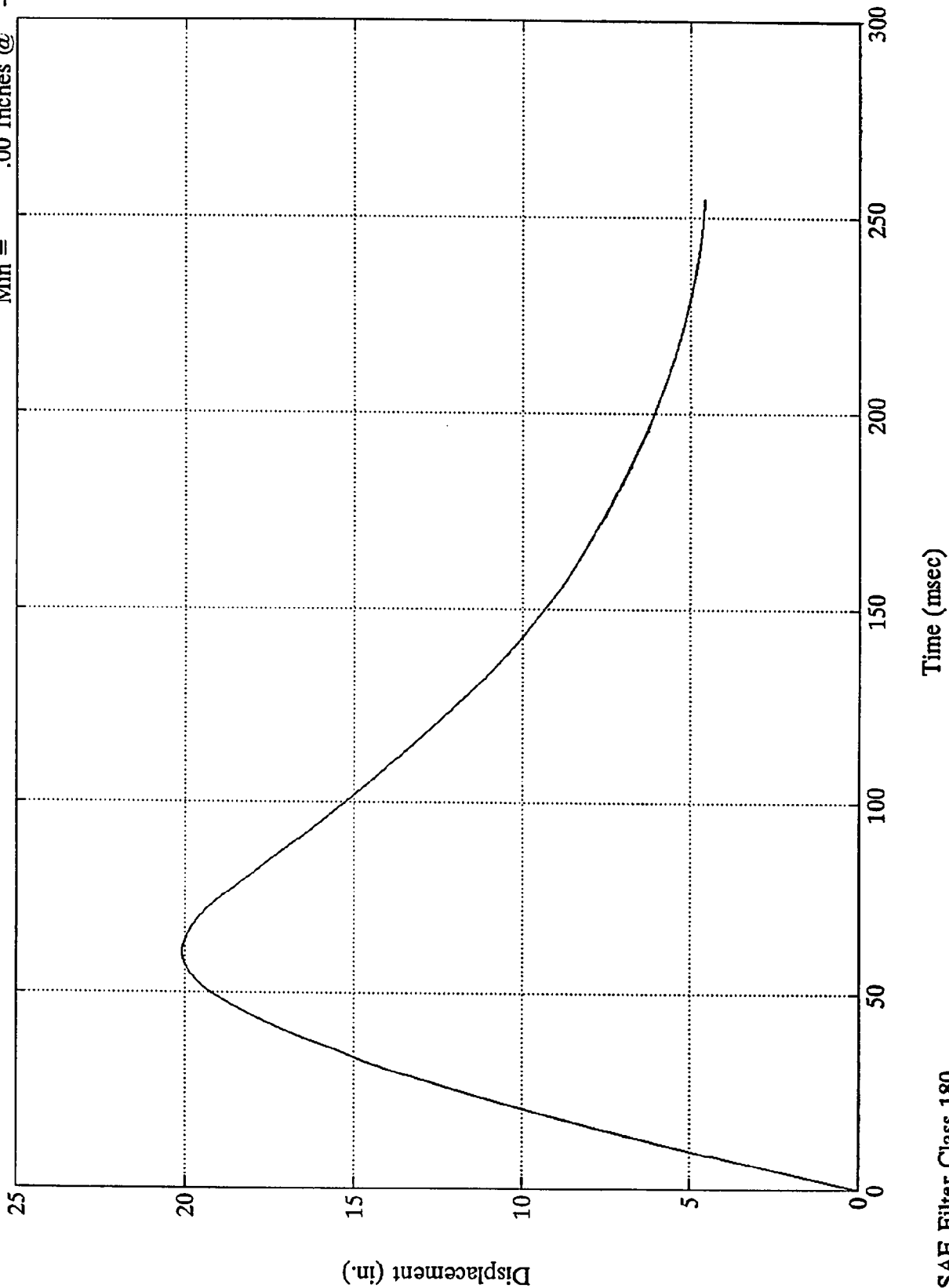


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

L. Brake Caliper X

Max = 20.08 Inches @ 60.60 msec
Min = .00 Inches @ -0.00 msec

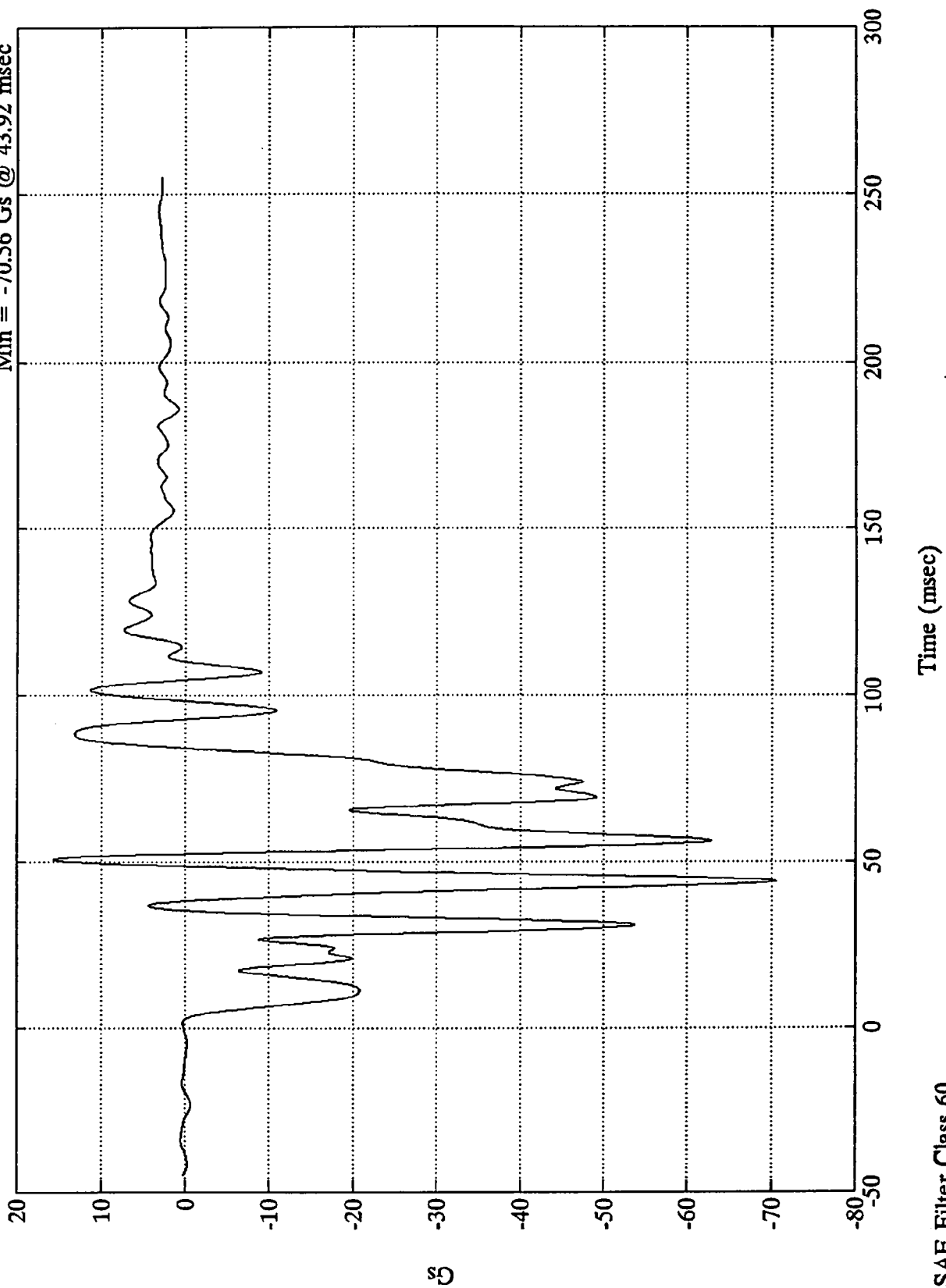


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 15.56 Gs @ 50.76 msec
Min = -70.56 Gs @ 43.92 msec

Instrument Panel X



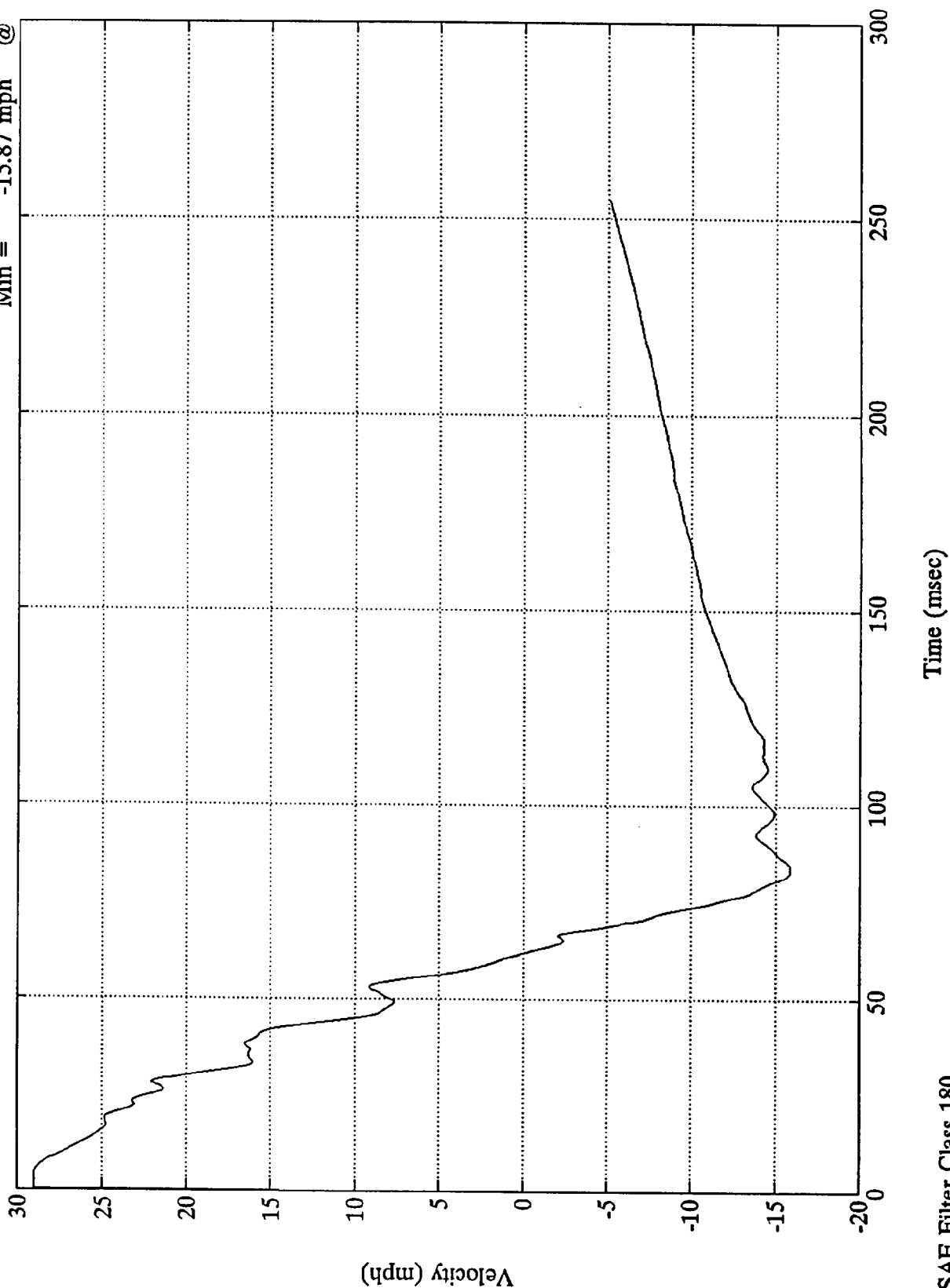
SAE Filter Class 60

8183-6

NHTSA 208 TEST #15 - 1994 VW GOLF

Instrument Panel X

Max = 29.00 mph @ 0.11 msec
Min = -15.87 mph @ 84.12 msec



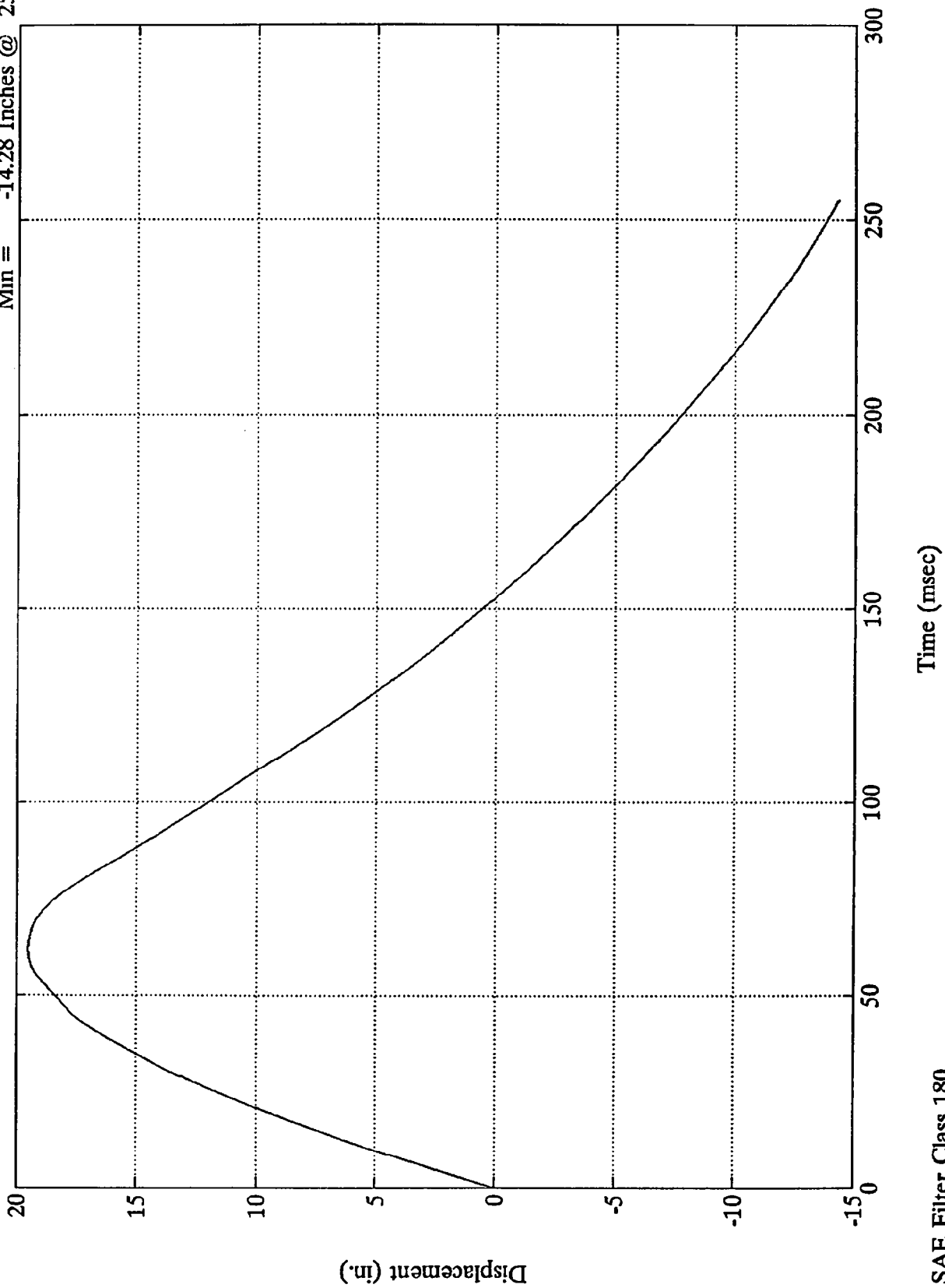
SAE Filter Class 180

8183-6

NHTSA 208 TEST #15 - 1994 VW GOLF

Instrument Panel X

Max = 19.52 Inches @ 52.04 msec
Min = -14.28 Inches @ 254.88 msec

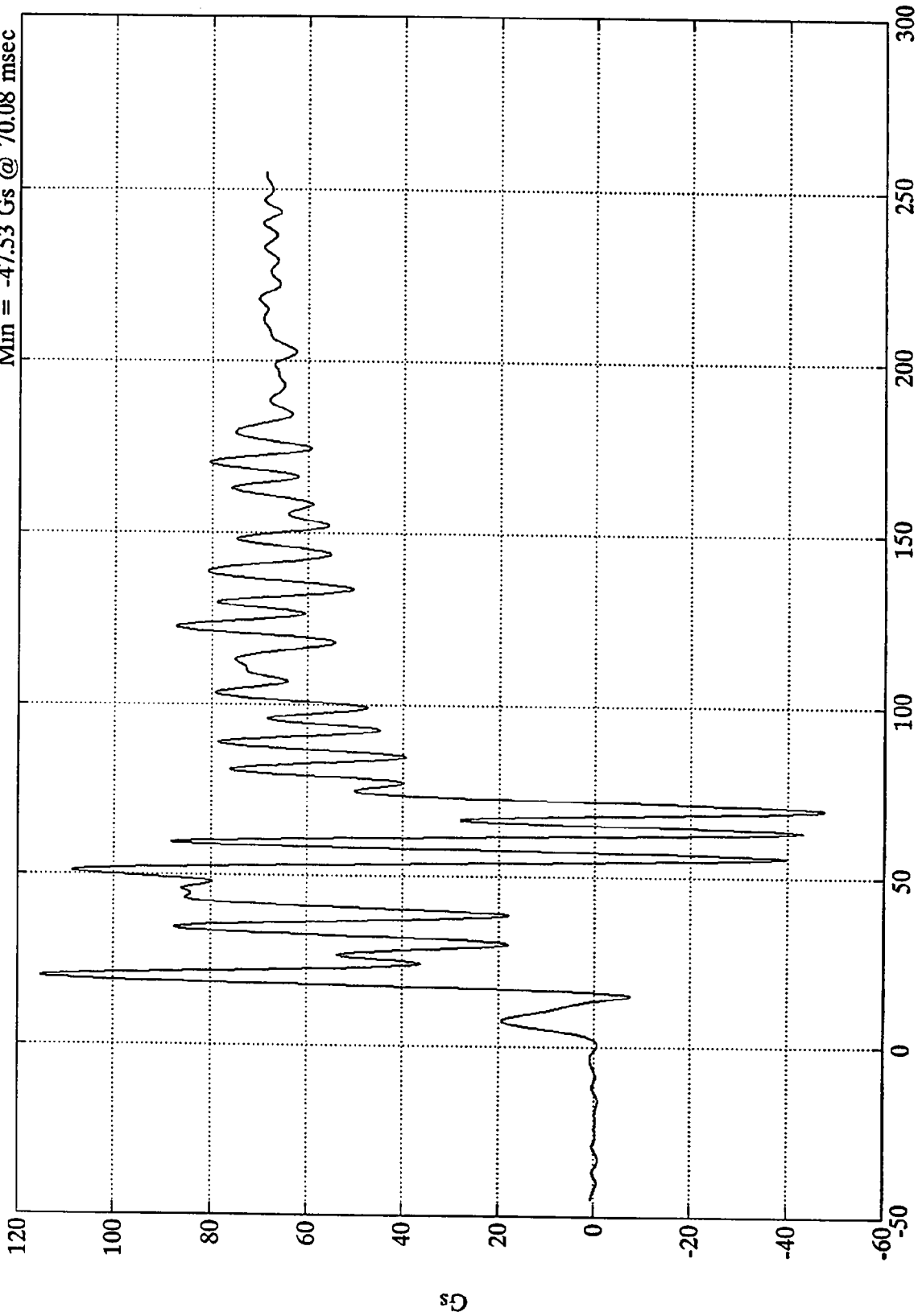


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Trunk Z

Max = 115.25 Gs @ 19.92 msec
Min = -47.53 Gs @ 70.08 msec



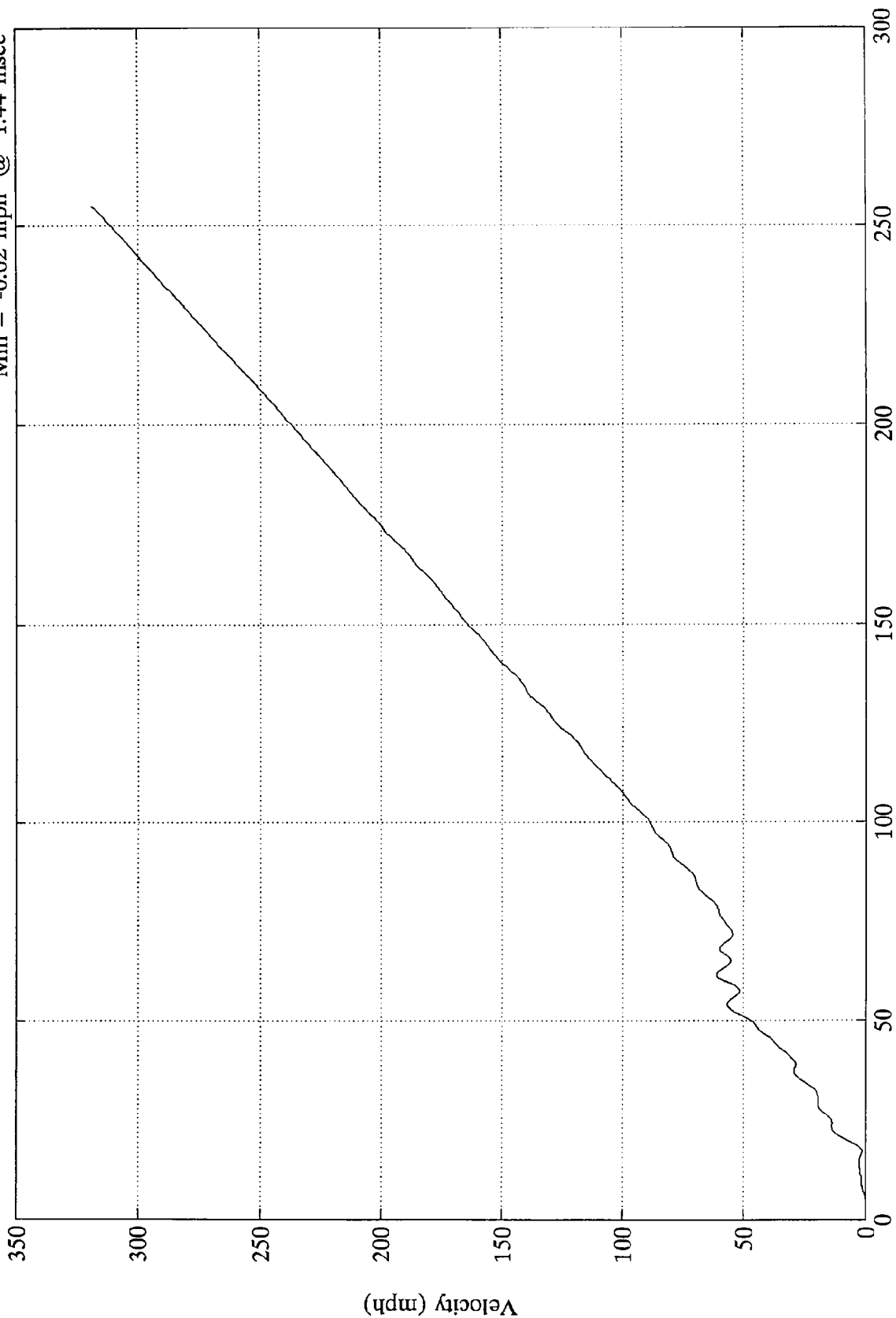
SAE Filter Class 60

Time (msec)

DATA QUESTIONABLE AFTER 50 MSEC

NHTSA 208 TEST #15 - 1994 VW GOLF

Trunk Z
Max = 318.61 mph @ 254.88 msec
Min = -0.02 mph @ 1.44 msec



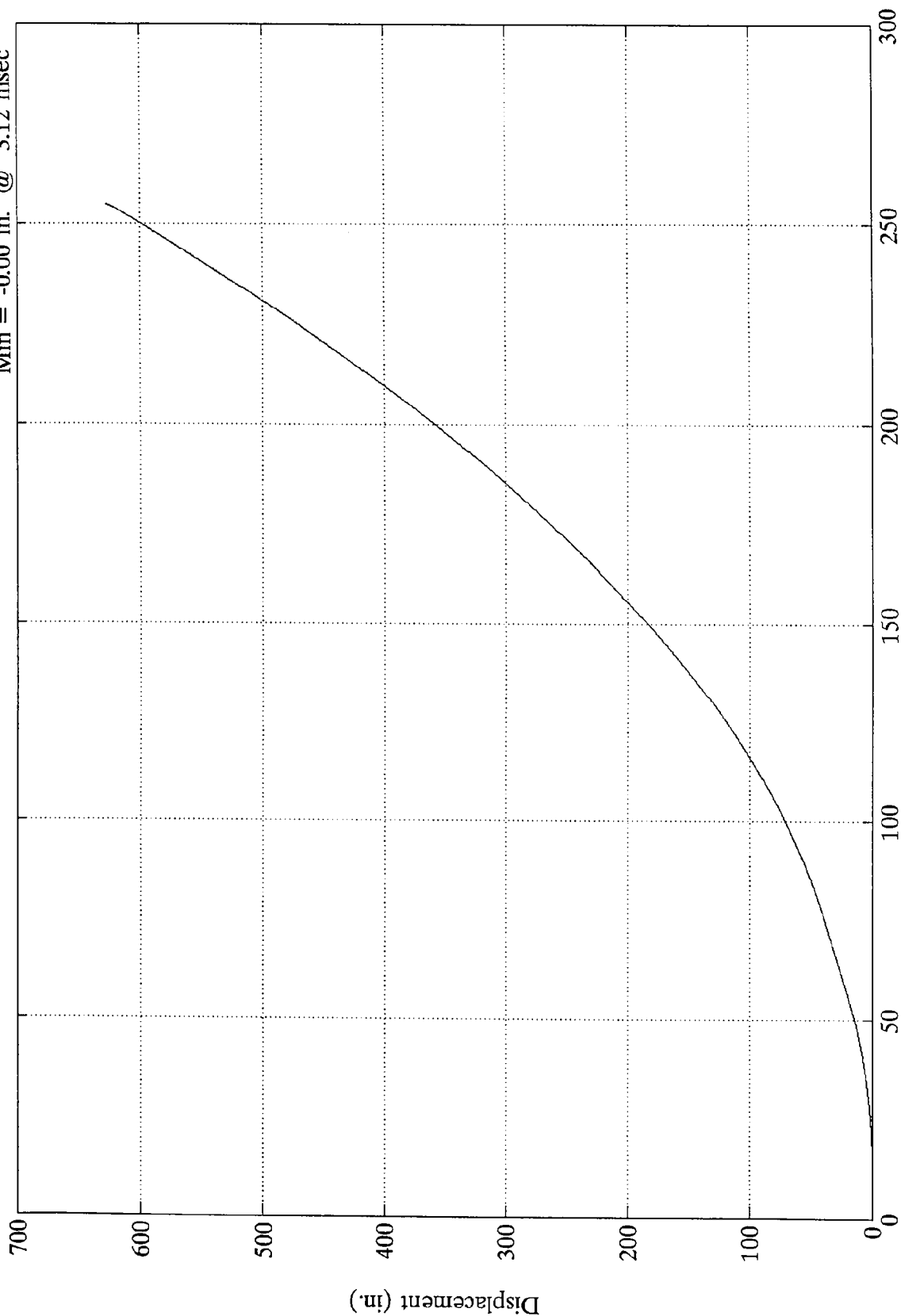
Time (msec.) DATA QUESTIONABLE AFTER 50 MSEC

SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 627.10 in. @ 254.88 msec
Min = -0.00 in. @ 3.12 msec

Trunk Z



Time (msec.) DATA QUESTIONABLE AFTER 50 MSEC

SAE Filter Class 180

TEST NO. CR5803

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

FACILITY: TRACK
RUN #: 1422
SERIES #: 15

TEST DATE: 23 Jun 1994
TEST TIME: 10:58:55
BOARD: A

TITLE: NHTSA 208 TEST #15 - 1994 VW GOLF

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Pos. 1 Head X	Gs	4.7	254.9	-45.4	89.0	1000.0
2	Pos. 1 Head Y	Gs	21.6	89.2	-2.6	31.7	1000.0
3	Pos. 1 Head Z	Gs	45.2	71.1	-29.4	98.0	1000.0
4	Pos. 1 Left Femur	lbs	21.2	17.3	-1484.9	71.4	600.0
5	Pos. 1 Chest X	Gs	5.3	145.7	-51.6	86.5	180.0
6	Pos. 1 Chest Y	Gs	12.6	83.6	-1.6	24.4	180.0
7	Pos. 1 Chest Z	Gs	29.5	68.8	-5.0	49.3	180.0
8	Pos. 1 Right Femur	lbs	18.1	183.8	-1756.2	67.3	600.0
9	Pos. 2 Head X	Gs	9.2	32.2	-30.4	53.2	1000.0
10	Pos. 2 Head Y	Gs	12.8	39.0	-14.5	74.5	1000.0
11	Pos. 2 Head Z	Gs	24.2	38.9	-8.8	28.2	1000.0
12	Pos. 2 Left Femur	lbs	33.0	22.0	-983.6	51.2	600.0
13	Pos. 2 Chest X	Gs	3.6	173.7	-42.0	63.1	180.0
14	Pos. 2 Chest Y	Gs	4.3	34.0	-8.2	73.9	180.0
15	Pos. 2 Chest Z	Gs	14.9	62.5	-3.5	29.4	180.0
16	Pos. 2 Right Femur	lbs	39.1	22.1	-1212.4	65.6	600.0
17	Pos. 1 Head Resultant	Gs	55.8	71.0	.0	-13.4	1000.0
18	Pos. 1 Chest Resultant	Gs	52.7	86.5	.0	-27.1	180.0
19	Pos. 2 Head Resultant	Gs	32.0	52.7	.0	7.4	1000.0
20	Pos. 2 Chest Resultant	Gs	44.6	63.0	.0	-37.2	180.0

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

hic: 407.06
t1 = 66.120 msec
t2 = 102.000 msec
Average G's Over Hic Duration = 41.87

CLIP SUMMARY: Pos. 1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 45.636 G's
Tstart = 73.3200 ms
Tend = 76.4400 ms
CSI = 384.876

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

hic: 106.51
t1 = 46.320 msec
t2 = 82.200 msec
Average G's Over Hic Duration = 24.49

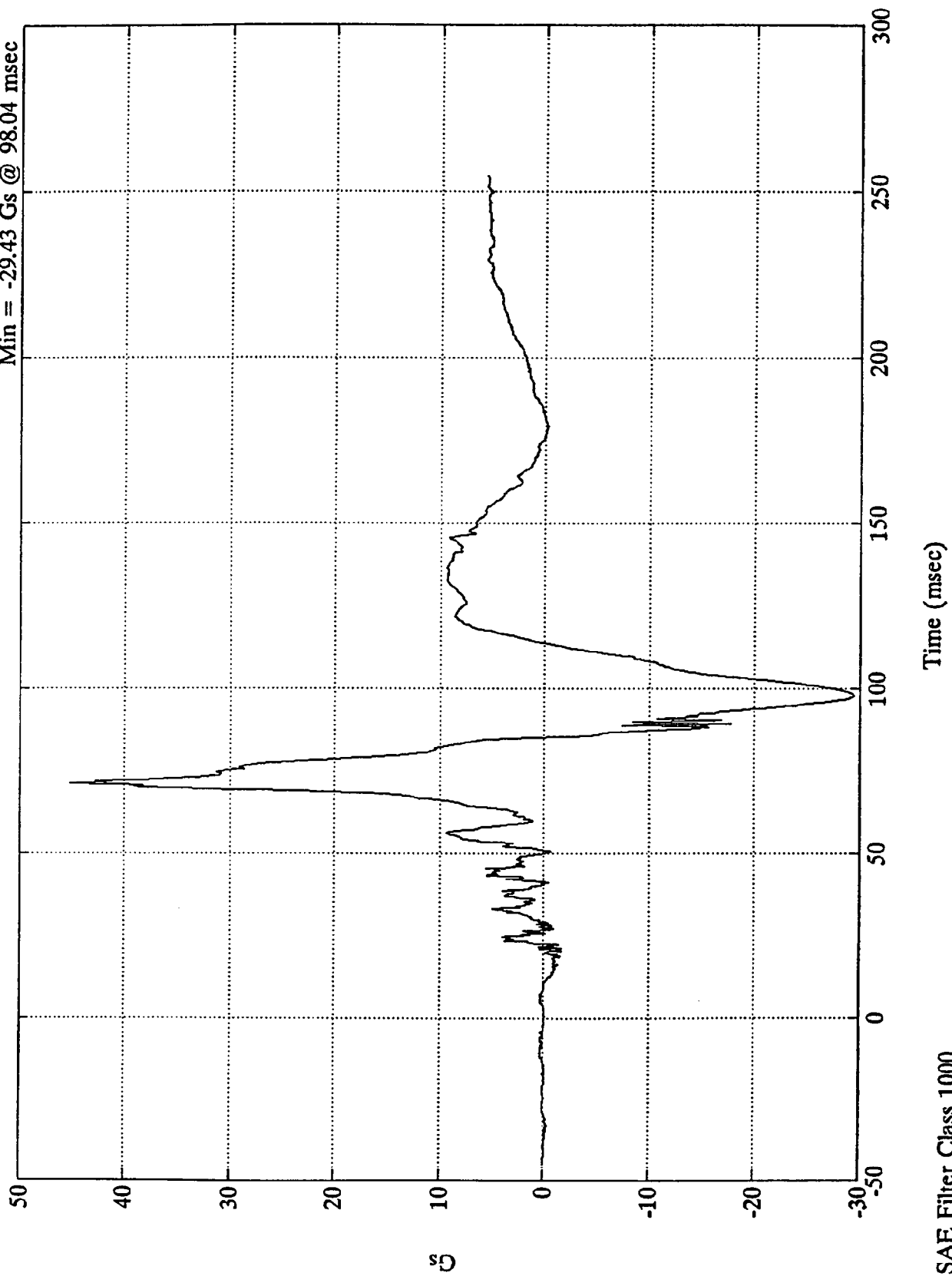
CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 41.239 G's
Tstart = 61.4400 ms
Tend = 64.5600 ms
CSI = 263.280

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 1 Head Z

Max = 45.15 Gs @ 71.04 msec
Min = -29.43 Gs @ 98.04 msec

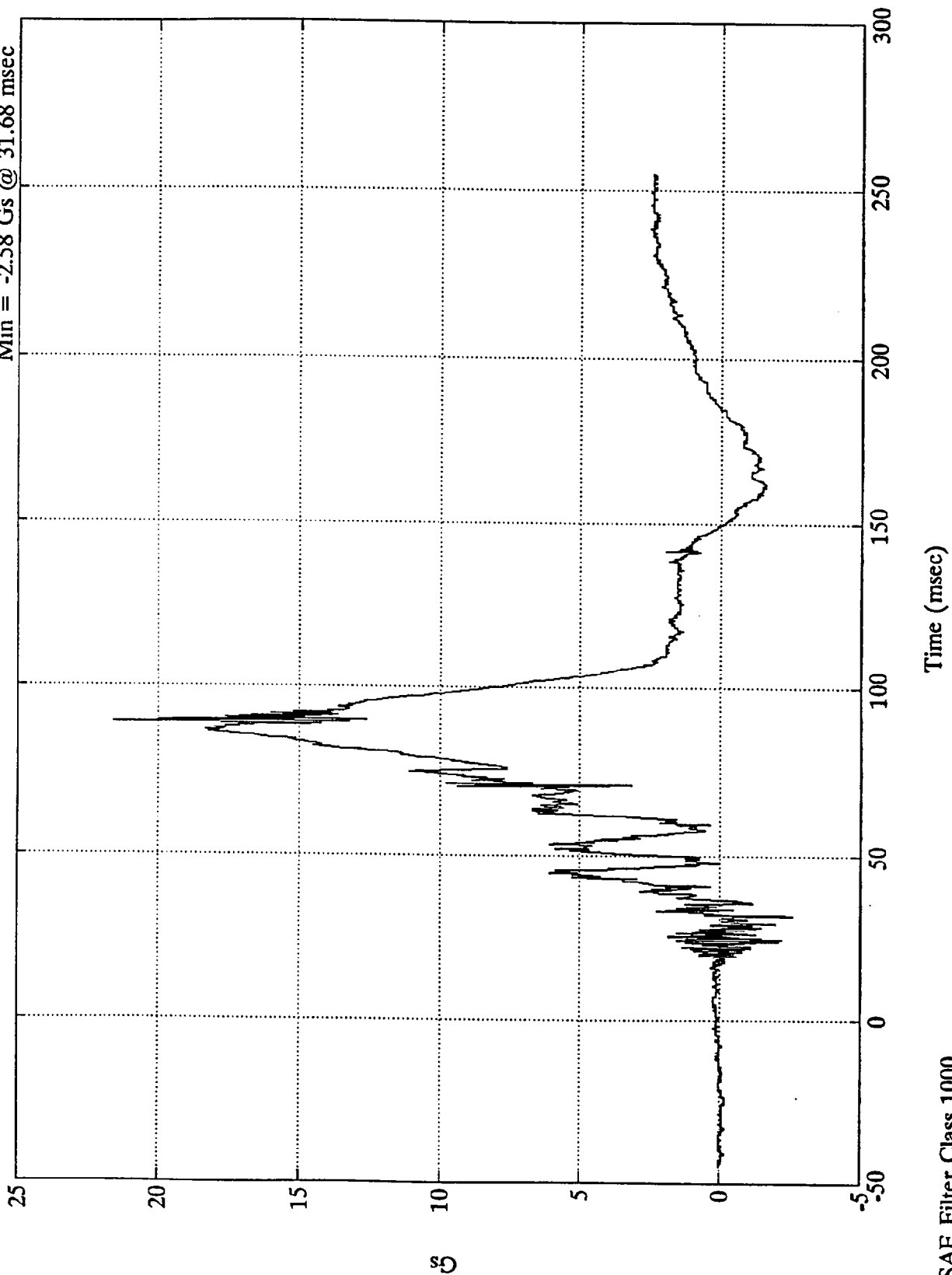


SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 21.58 Gs @ 89.16 msec
Min = -2.58 Gs @ 31.68 msec

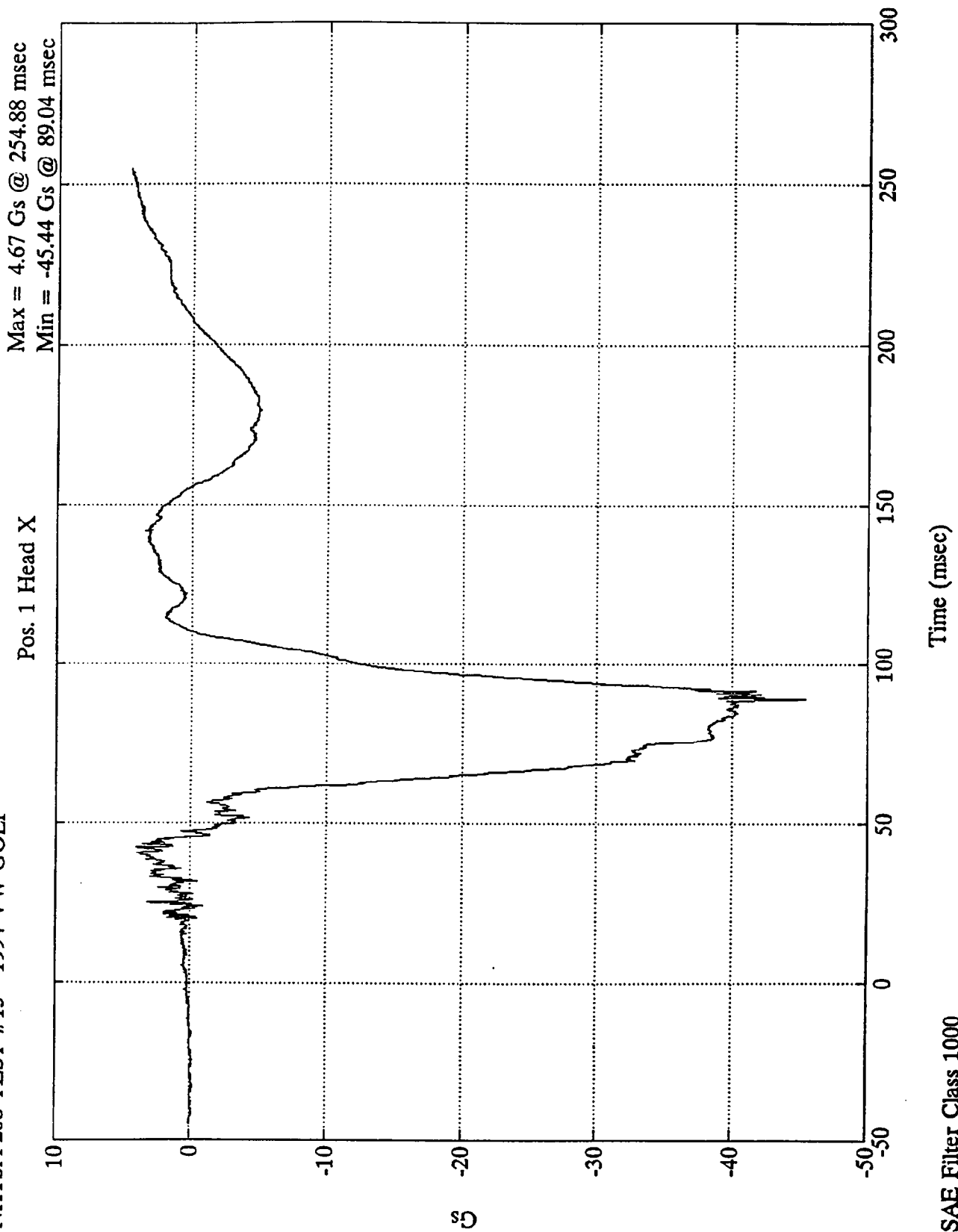
Pos. 1 Head Y



SAE Filter Class 1000

8183-6

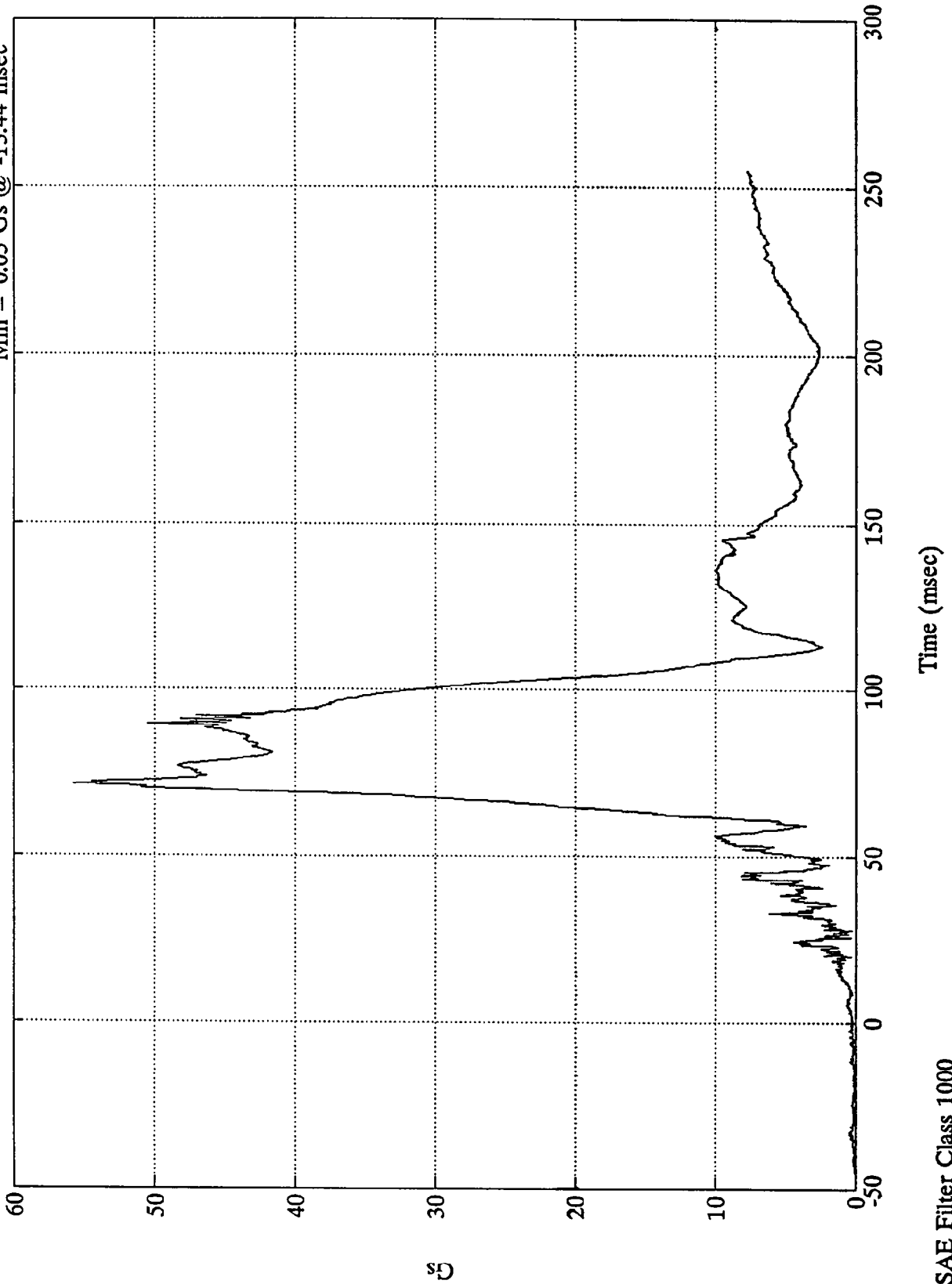
NHTSA 208 TEST #15 - 1994 VW GOLF



NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 55.78 Gs @ 71.04 msec
Min = 0.05 Gs @ -13.44 msec

P_{CGS}. 1 Head Resultant

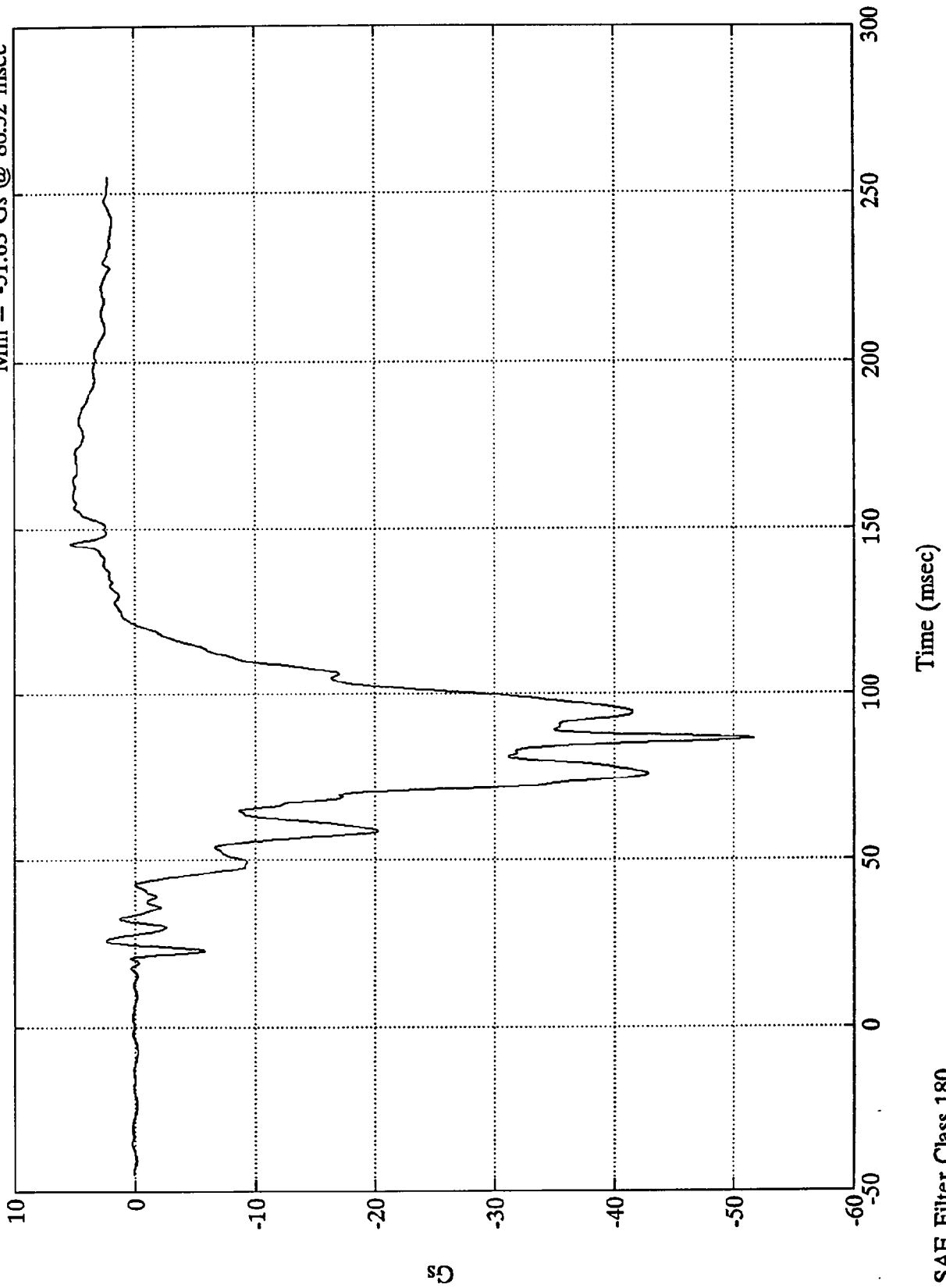


SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 5.32 Gs @ 145.68 msec
Min = -51.63 Gs @ 86.52 msec

Pos. 1 Chest X

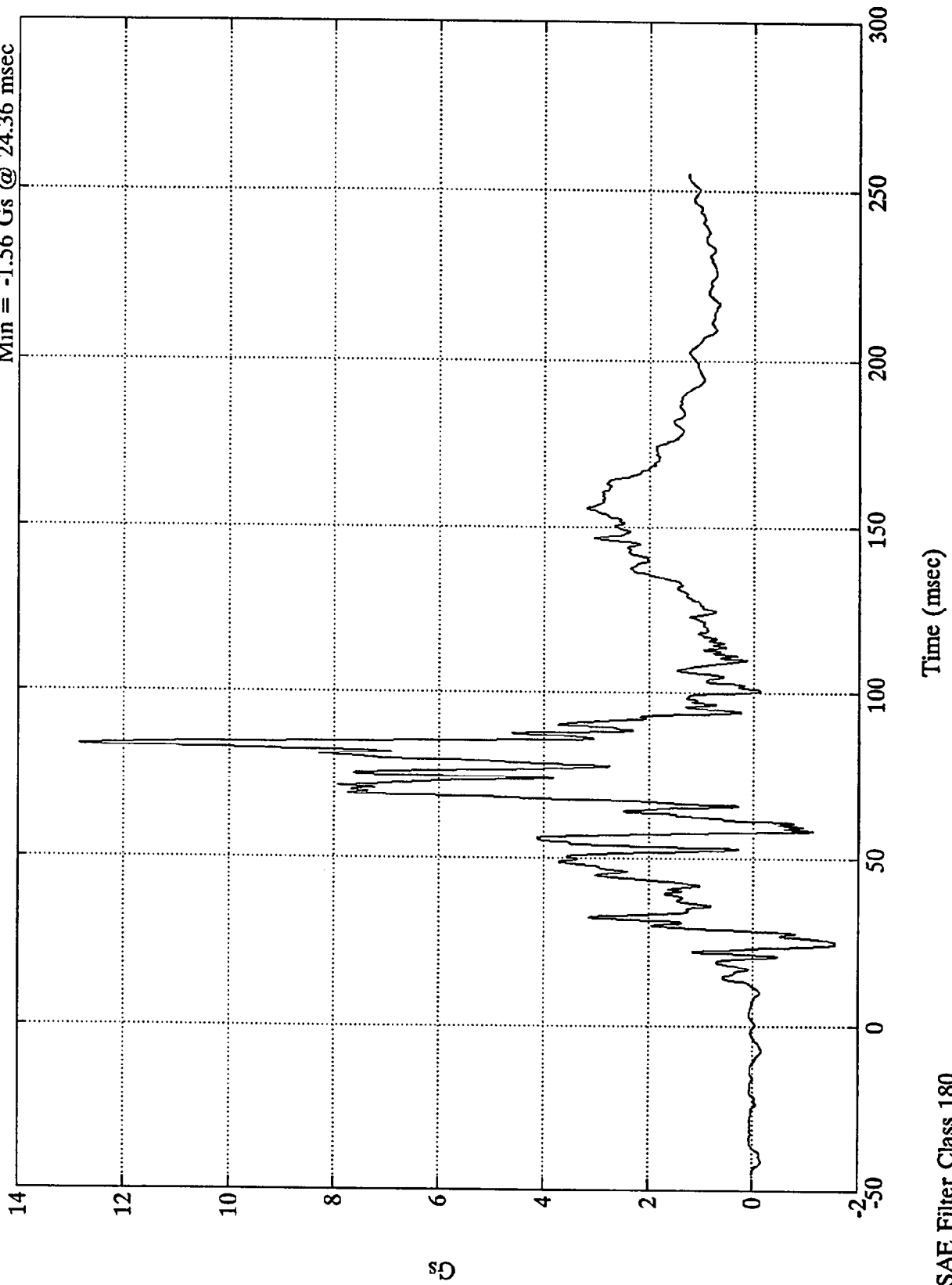


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 12.85 Gs @ 83.64 msec
Min = -1.56 Gs @ 24.36 msec

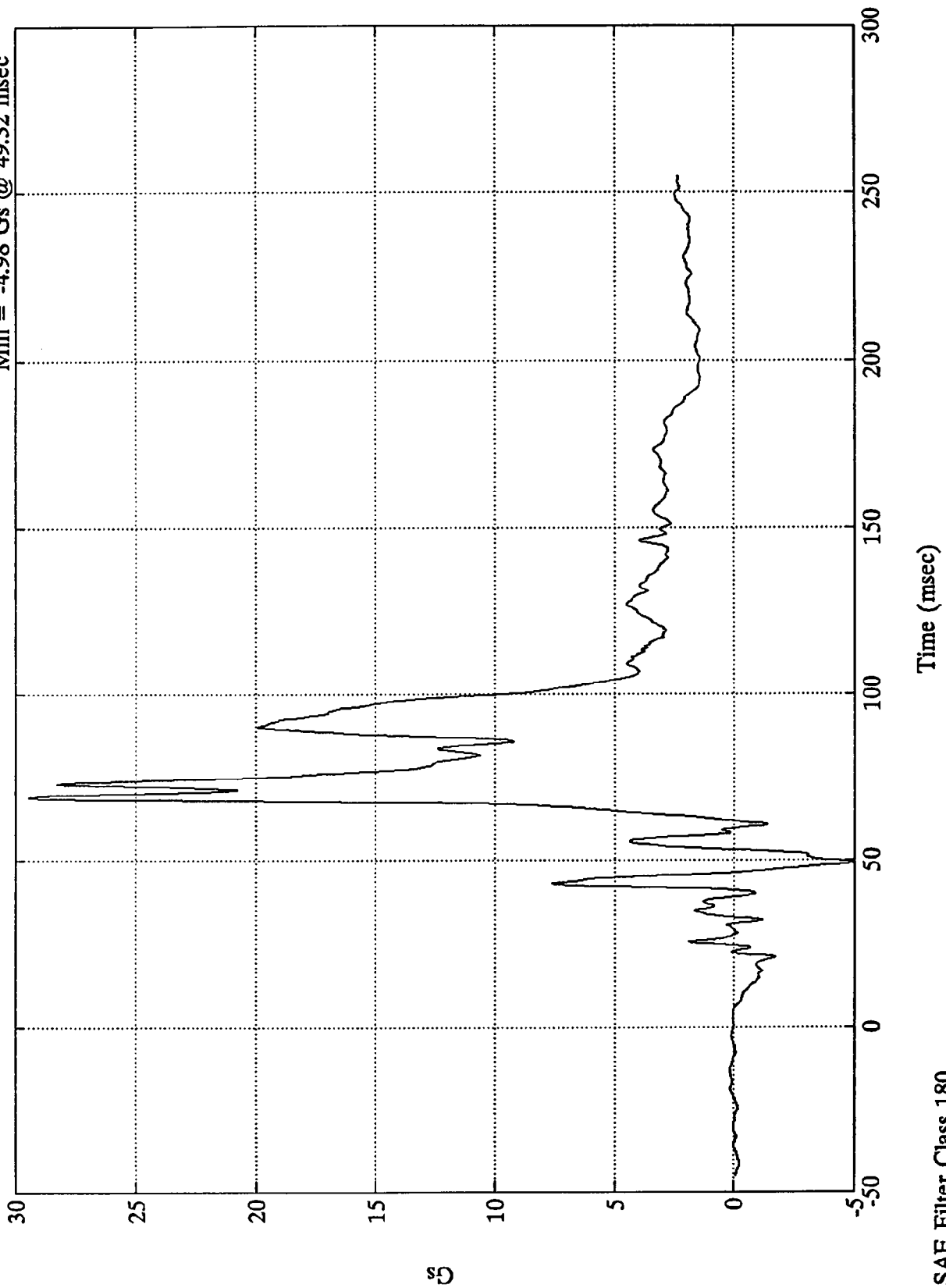
Pos. 1 Chest Y



SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 1 Chest Z
Max = 29.47 Gs @ 68.76 msec
Min = -4.98 Gs @ 49.32 msec

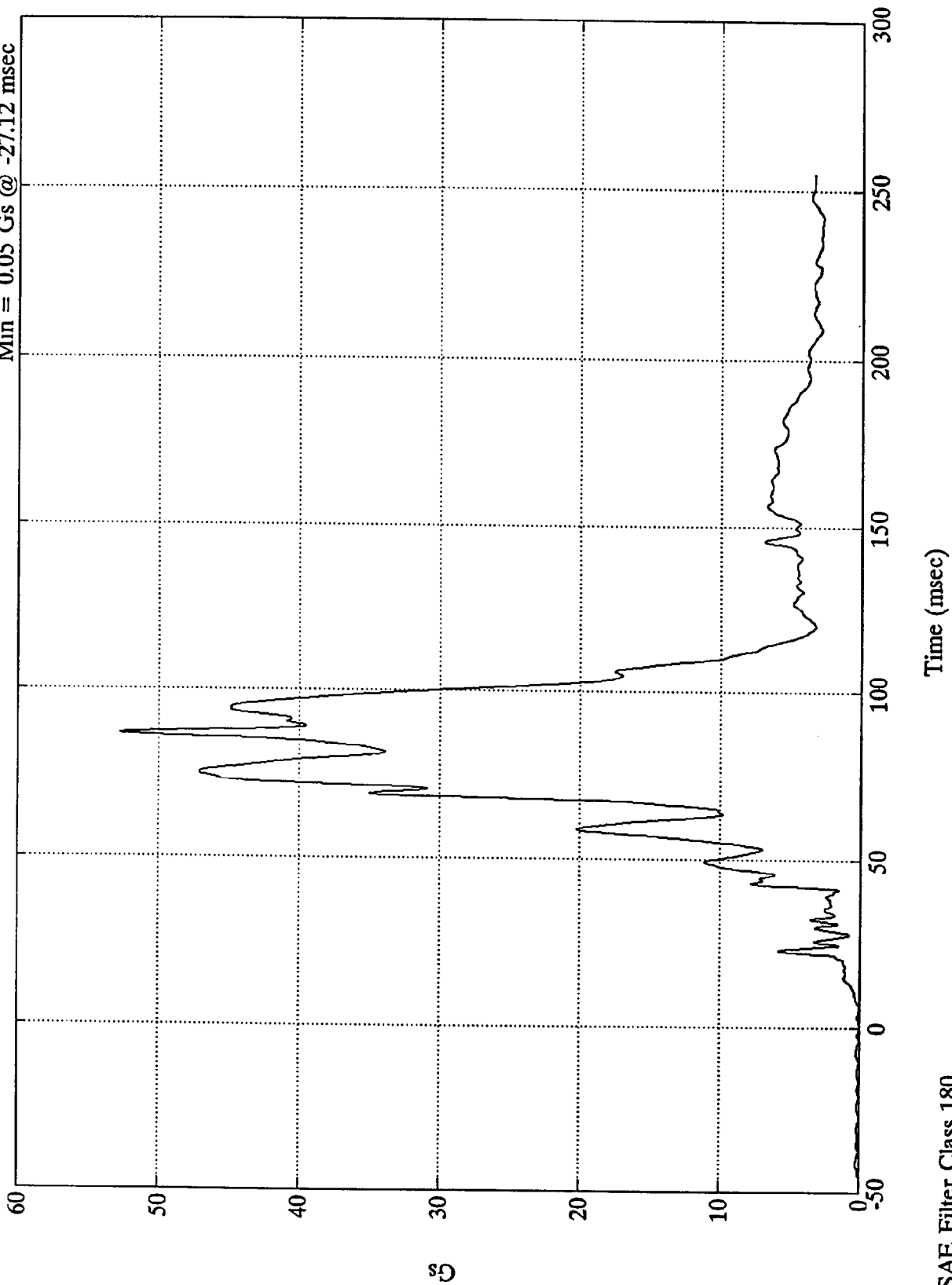


SAE Filter Class 180

8183-6

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 1 Chest Resultant
Max = 52.73 Gs @ 86.52 msec
Min = 0.05 Gs @ -27.12 msec

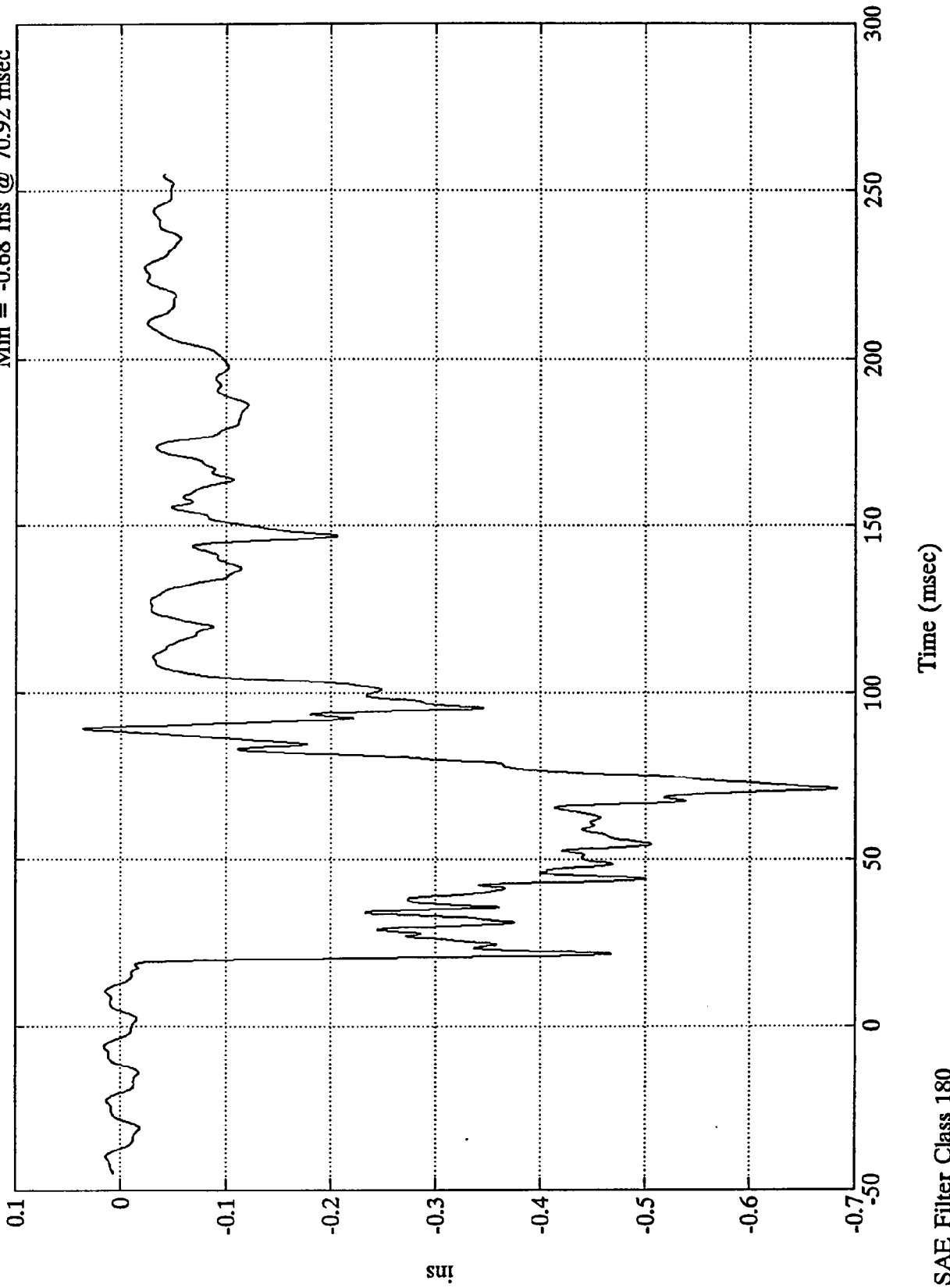


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 0.04 Ins @ 89.16 msec
Min = -0.68 Ins @ 70.92 msec

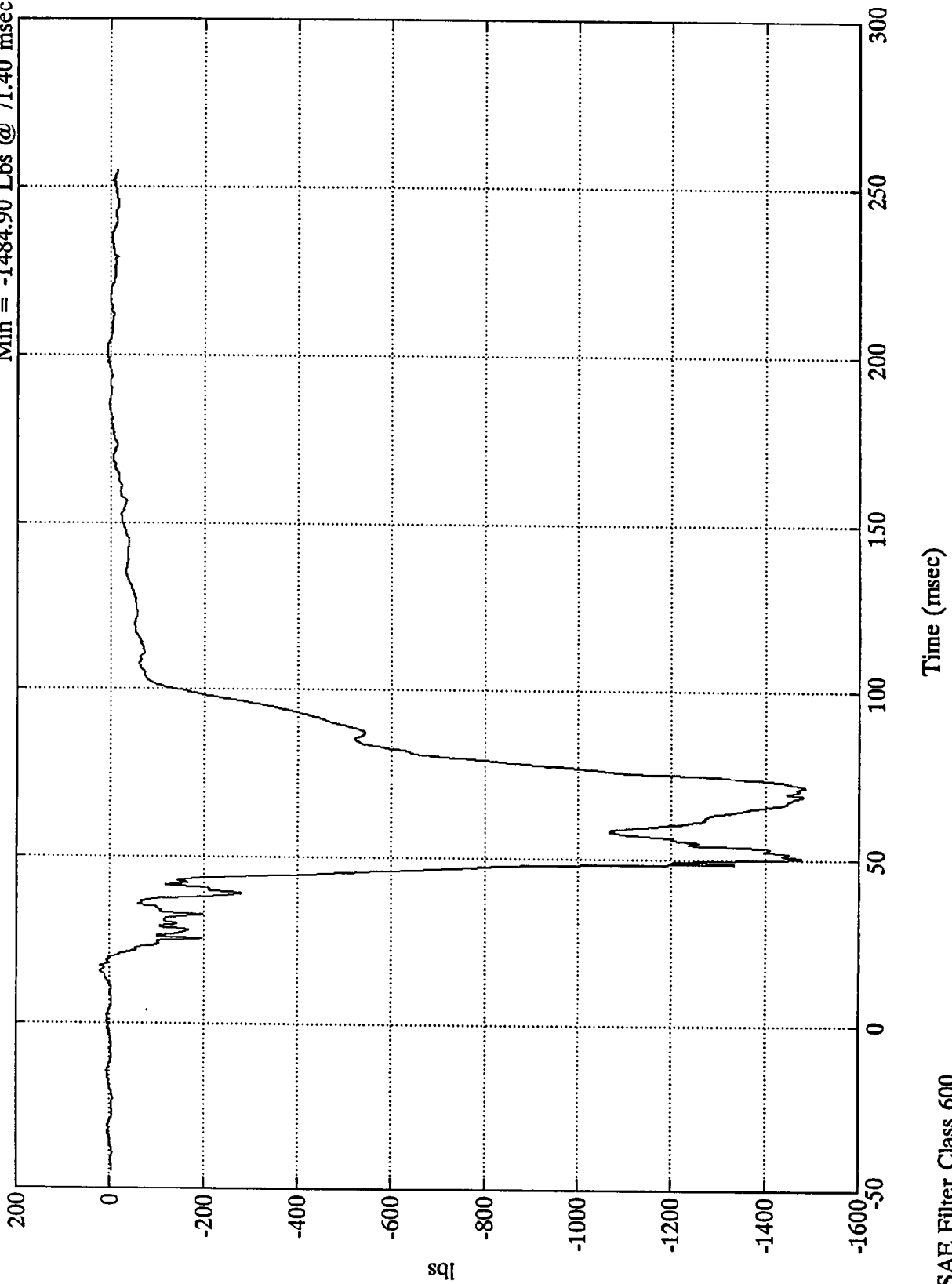
Pos.1 Chest Displacement



SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 1 Left Femur
Max = 21.23 Lbs @ 17.28 msec
Min = -1484.90 Lbs @ 71.40 msec

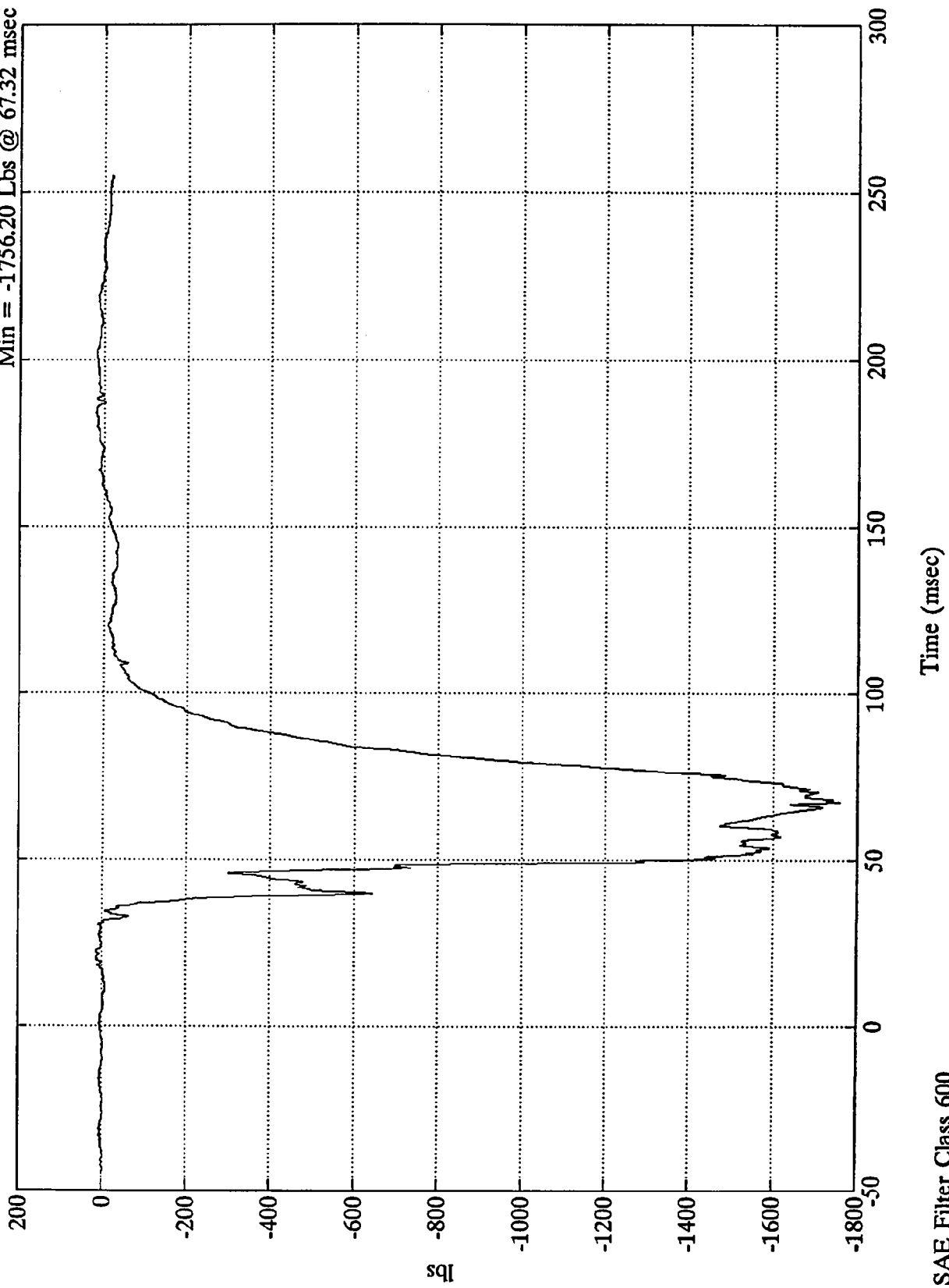


SAE Filter Class 600

8183-6

NHTSA 208 TEST #15 - 1994 VW GOLF

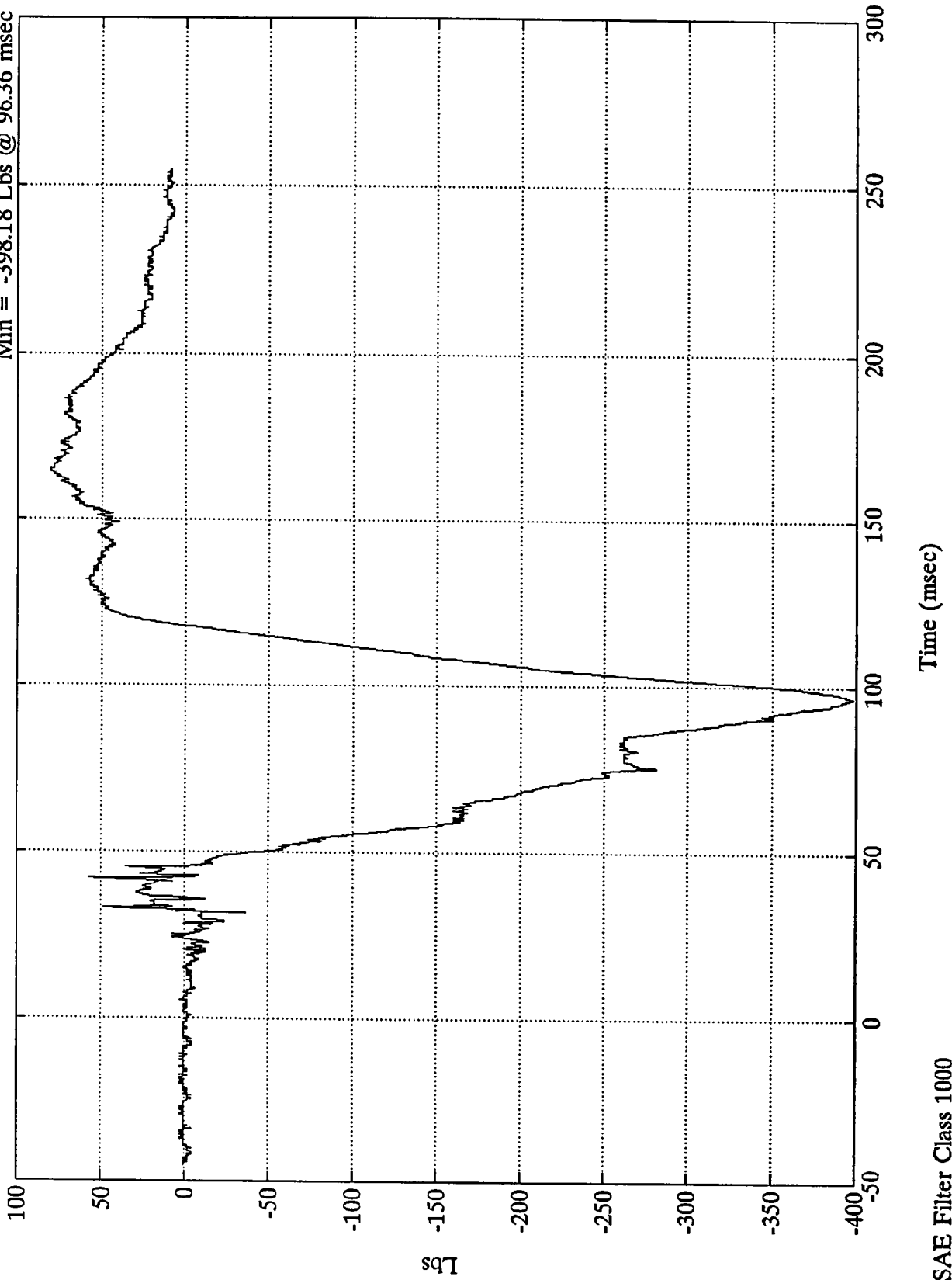
Pos. 1 Right Femur
Max = 18.10 Lbs @ 183.84 msec
Min = -1756.20 Lbs @ 67.32 msec



SAE Filter Class 600

NHTSA 208 TEST #15 - 1994 VW GOLF

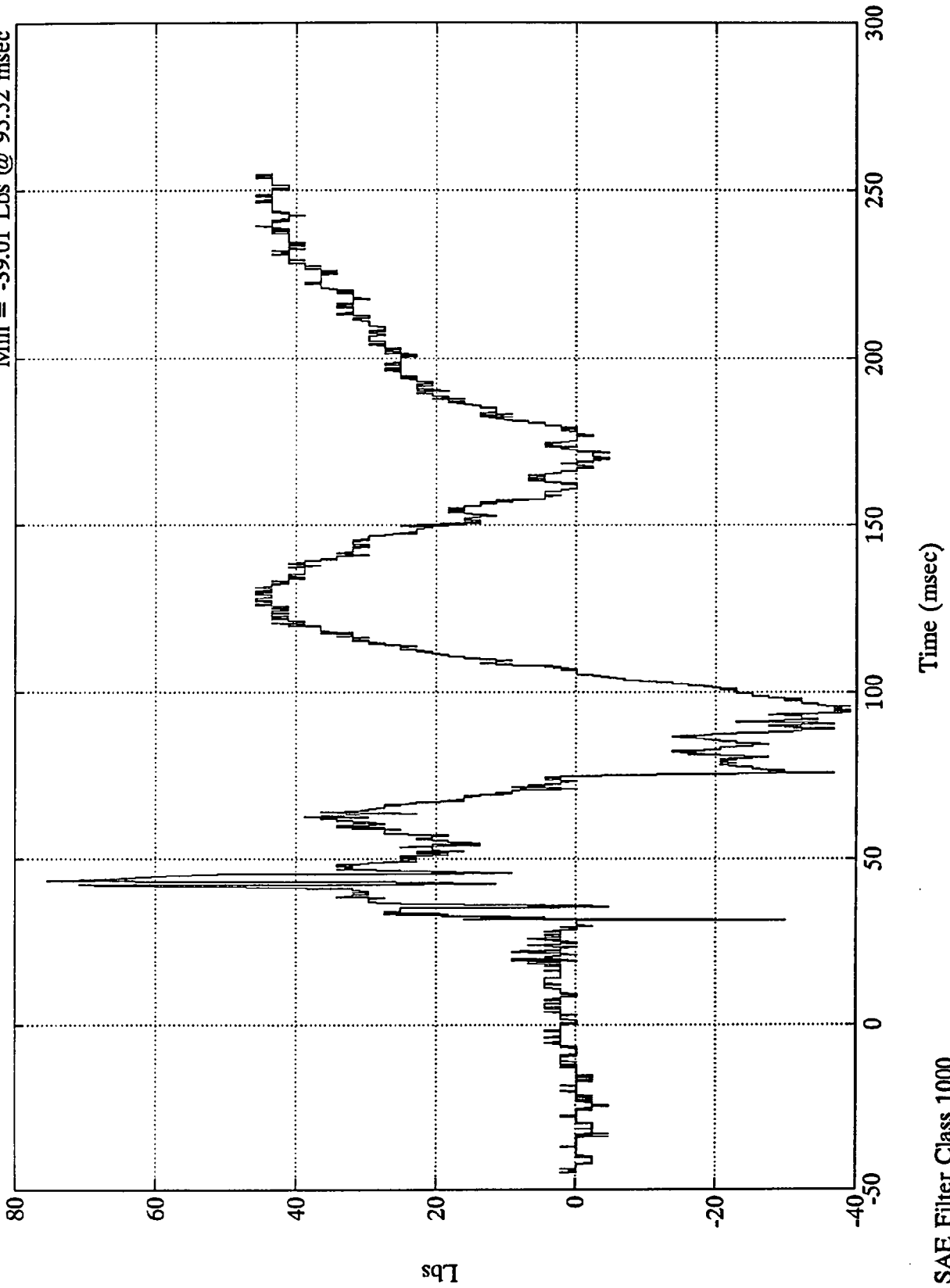
Pos.1 Upper Neck Fx
Max = 80.67 Lbs @ 165.84 msec
Min = -398.18 Lbs @ 96.36 msec



NHTSA 208 TEST #15 - 1994 VW GOLF

Pos.1 Upper Neck Fy

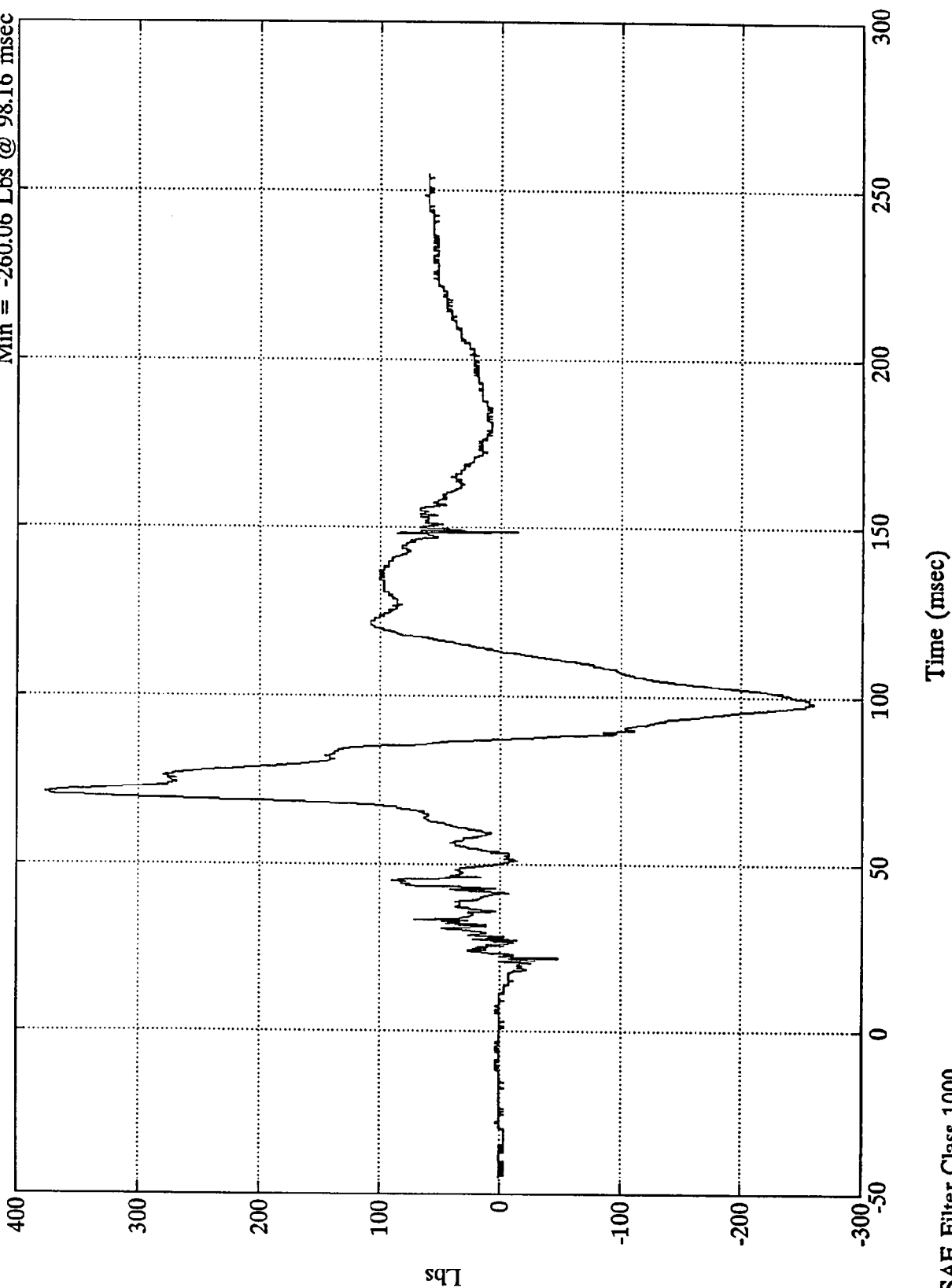
Max = 75.51 Lbs @ 43.32 msec
Min = -39.01 Lbs @ 95.52 msec



SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

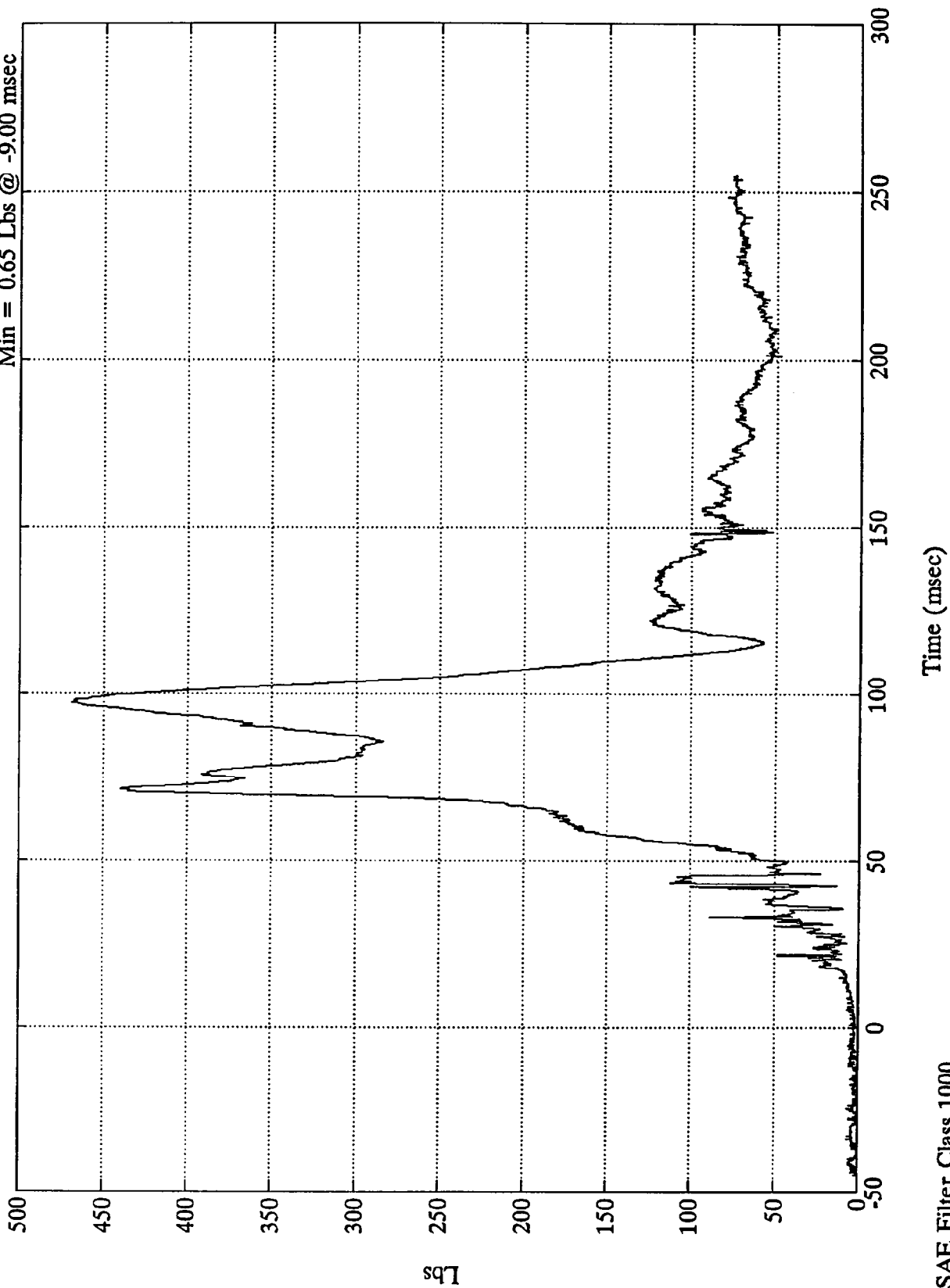
Pos.1 Upper Neck Fz
Max = 376.25 Lbs @ 71.28 msec
Min = -260.06 Lbs @ 98.16 msec



SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos.1 Neck Force Res.
Max = 469.00 Lbs @ 97.32 msec
Min = 0.65 Lbs @ -9.00 msec

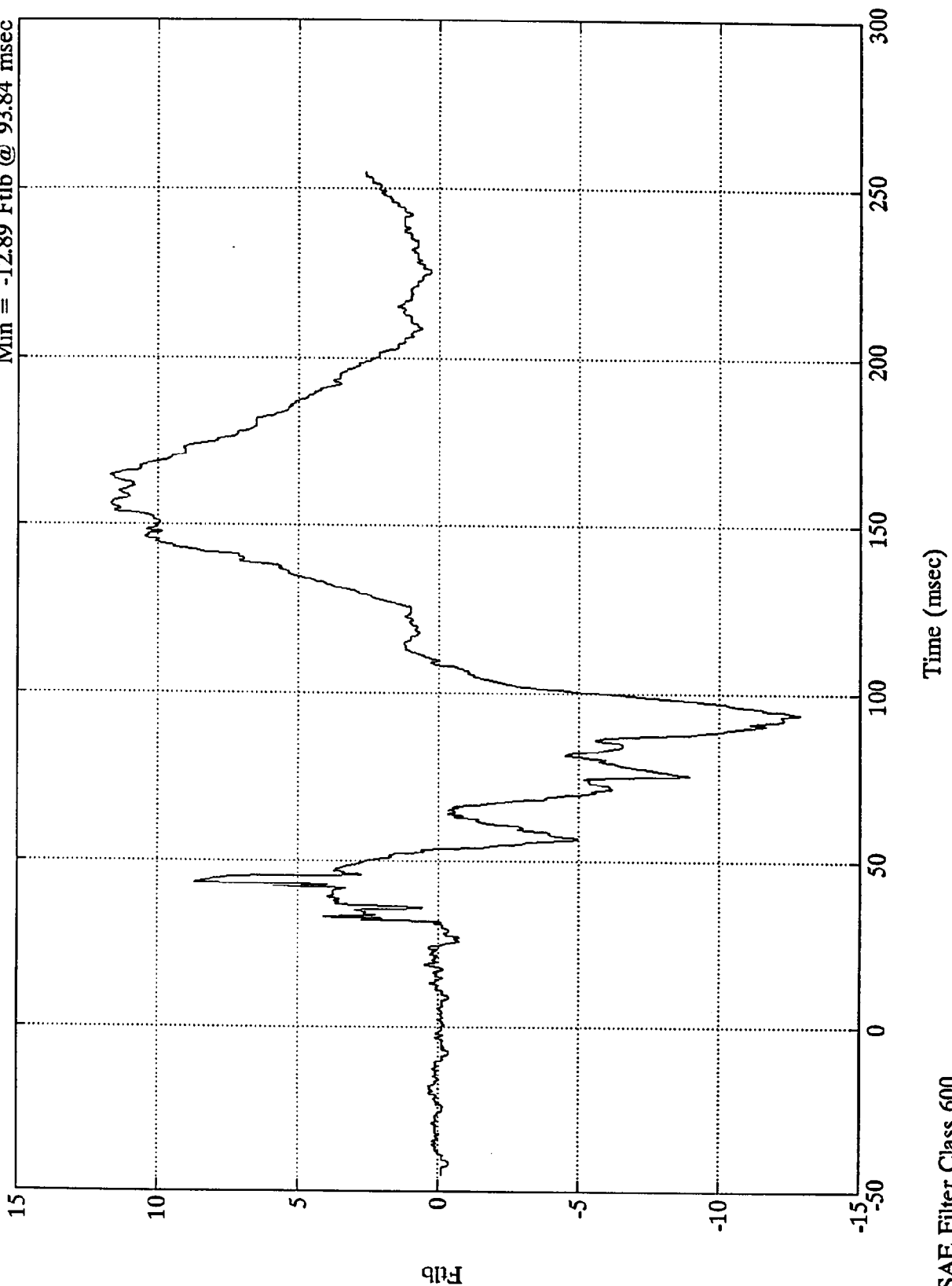


SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos.1 Upper Neck Mx

Max = 11.73 Ftlb @ 164.76 msec
Min = -12.89 Ftlb @ 93.84 msec



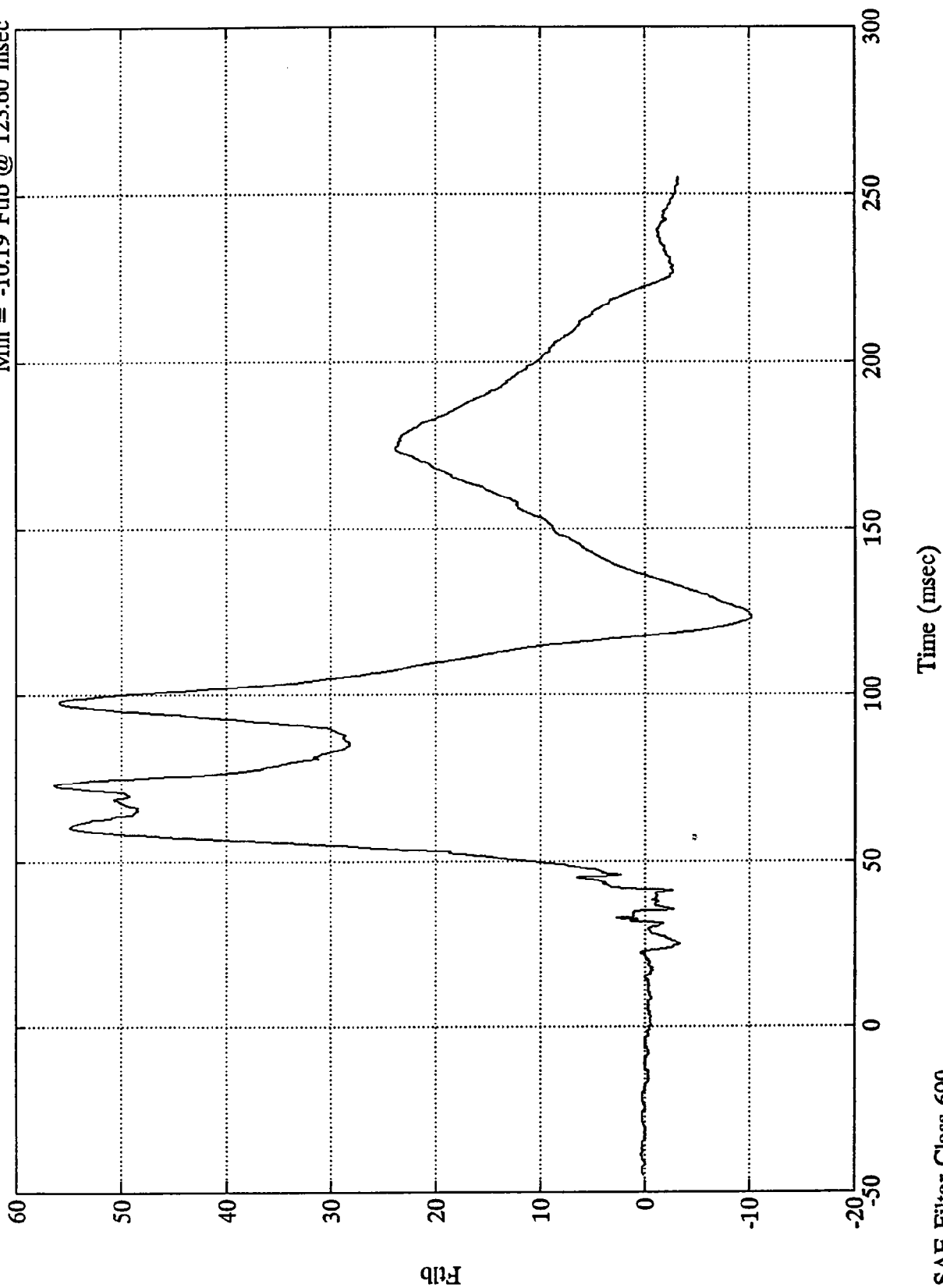
SAE Filter Class 600

8183-6

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos.1 Upper Neck My

Max = 56.39 Ftlb @ 72.84 msec
Min = -10.19 Ftlb @ 123.60 msec



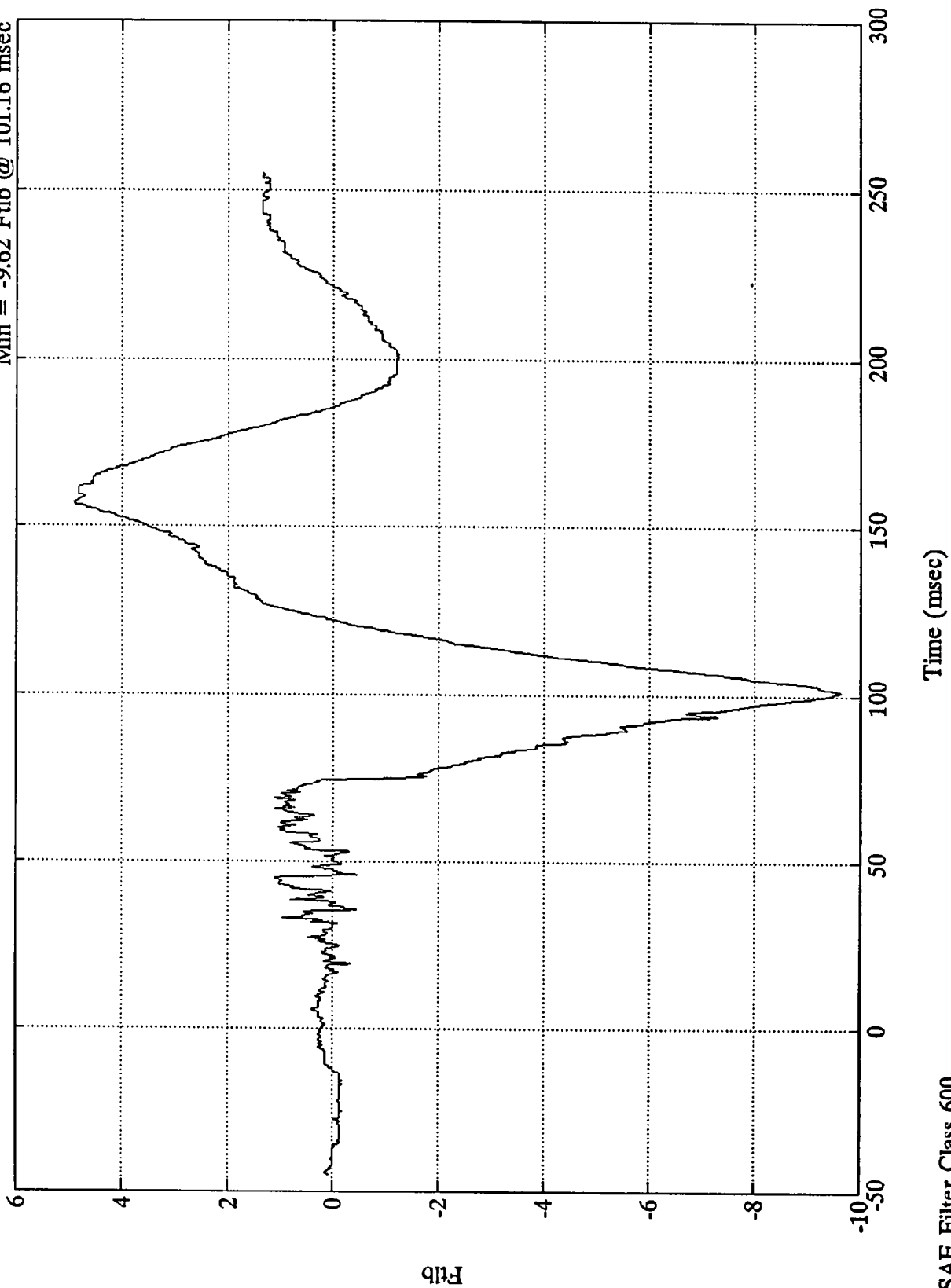
SAE Filter Class 600

8183-6

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos.1 Upper Neck Mz

Max = 4.90 Ftlb @ 156.84 msec
Min = -9.62 Ftlb @ 101.16 msec



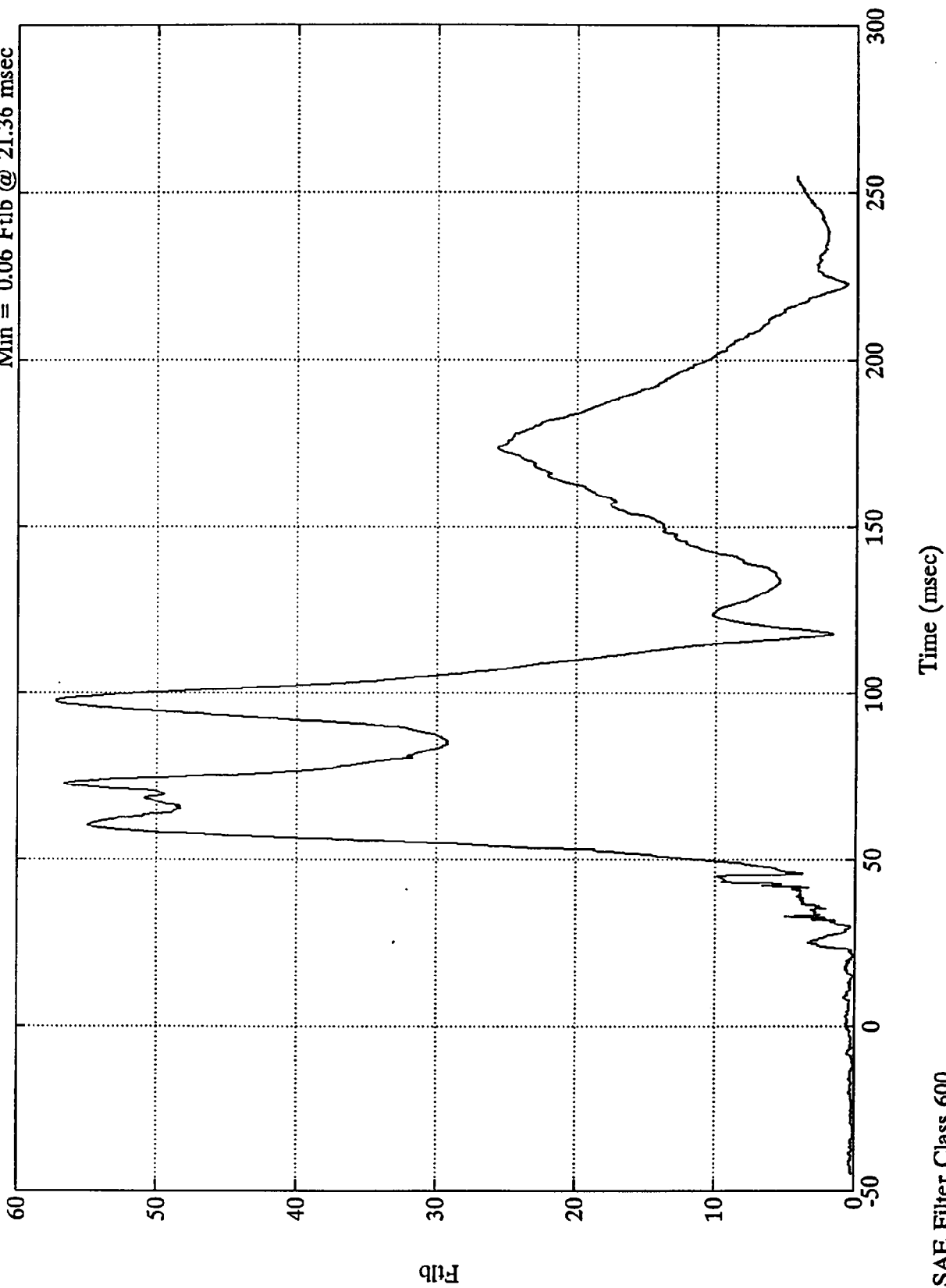
SAE Filter Class 600

8183-6

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 57.26 Ftlb @ 97.68 msec
Min = 0.06 Ftlb @ 21.36 msec

Pos.1 Neck Moment Res.

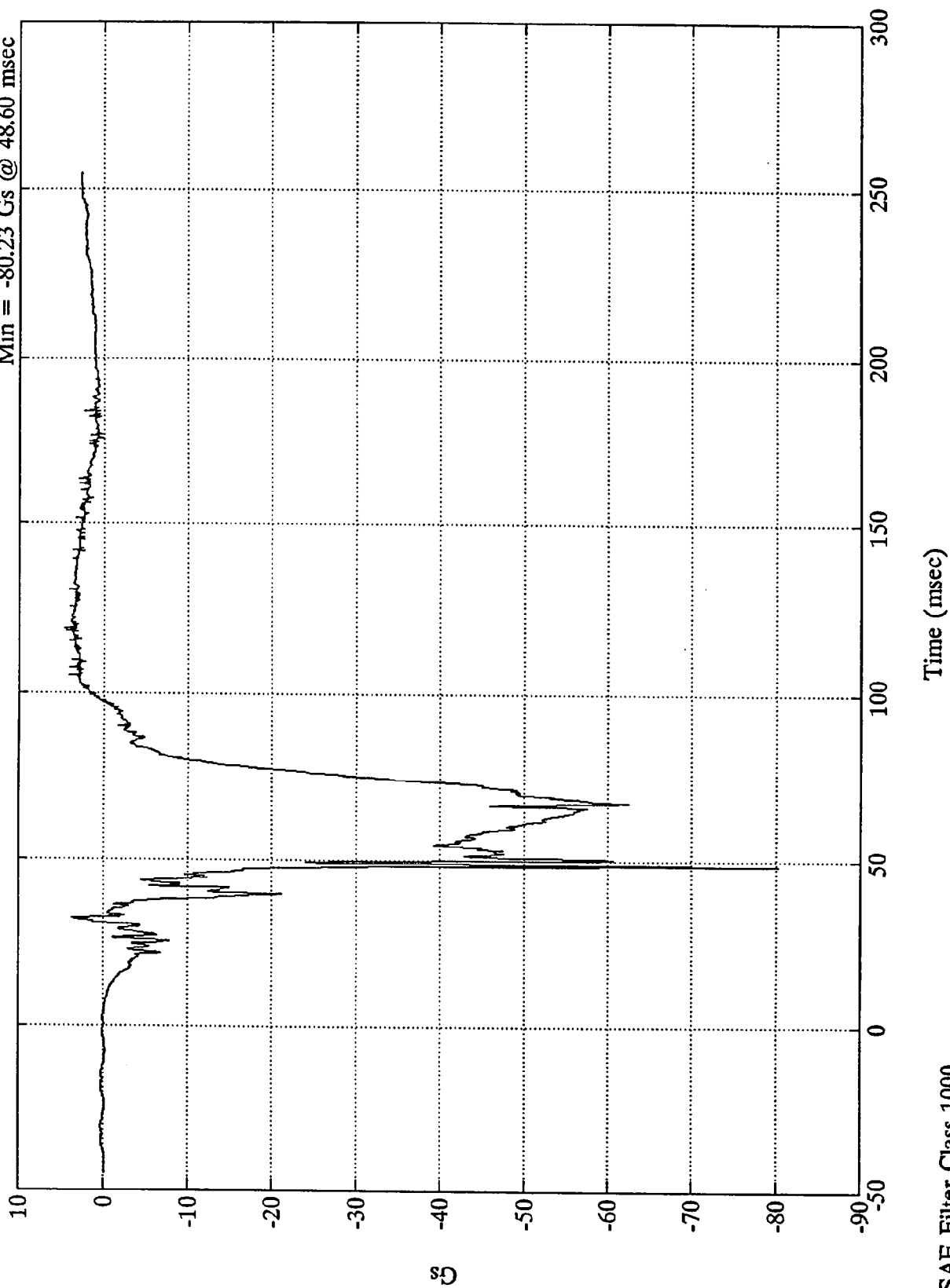


SAE Filter Class 600

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 4.69 Gs @ 119.28 msec
Min = -80.23 Gs @ 48.60 msec

Pos. 1 Pelvic X

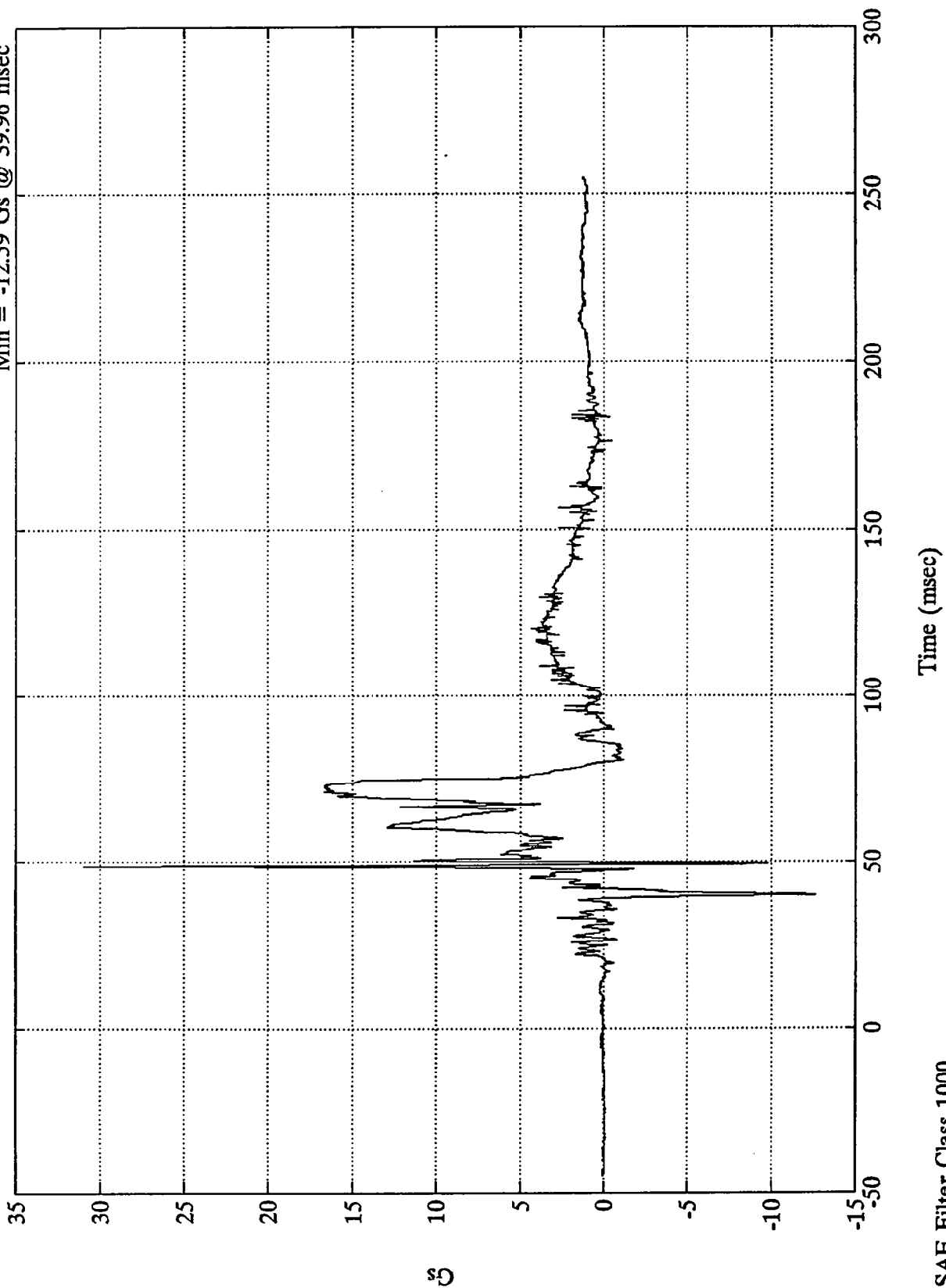


SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 30.95 Gs @ 48.72 msec
Min = -12.59 Gs @ 39.96 msec

Pos. 1 Pelvic Y

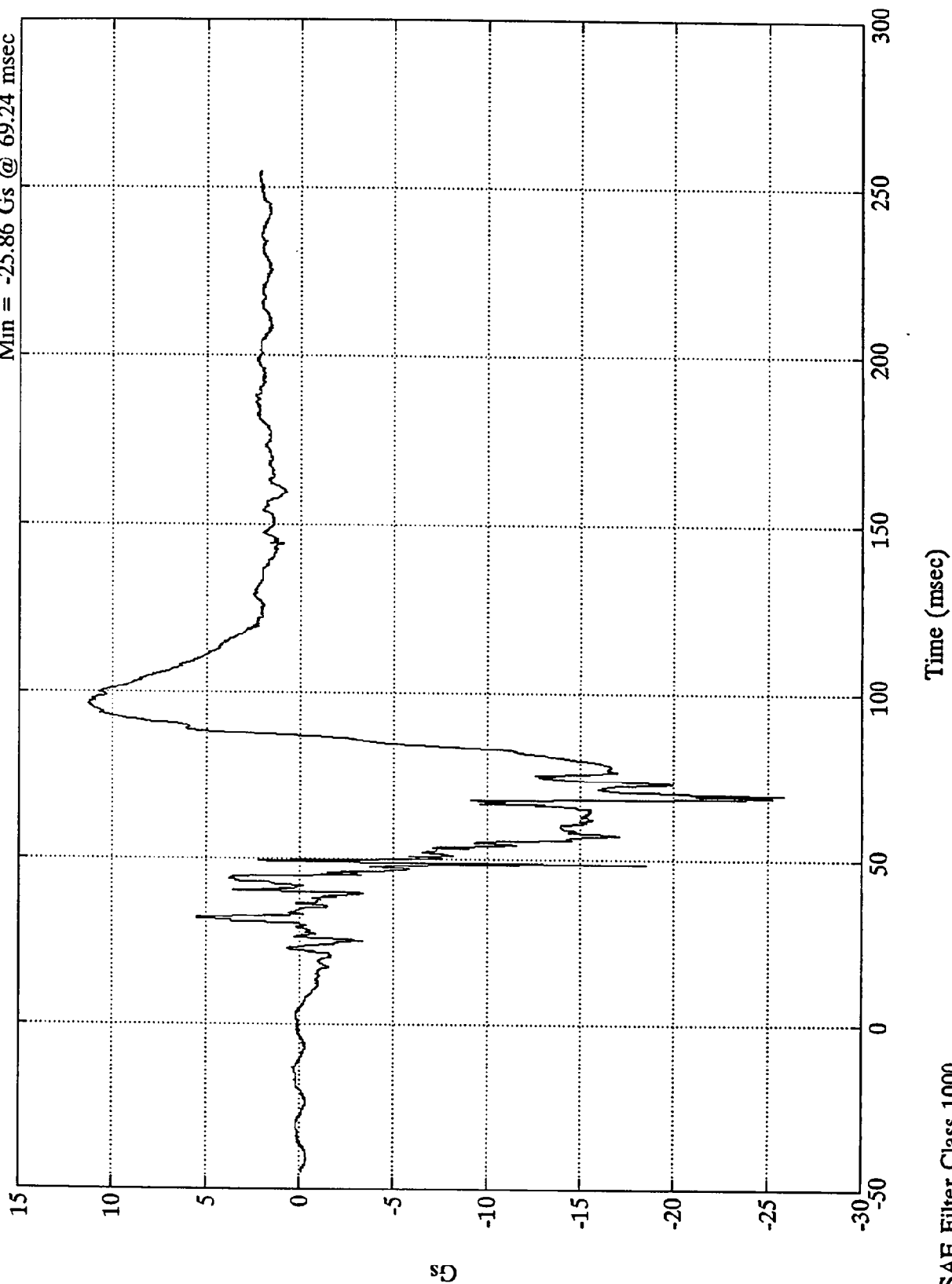


SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 11.33 Gs @ 96.24 msec
Min = -25.86 Gs @ 69.24 msec

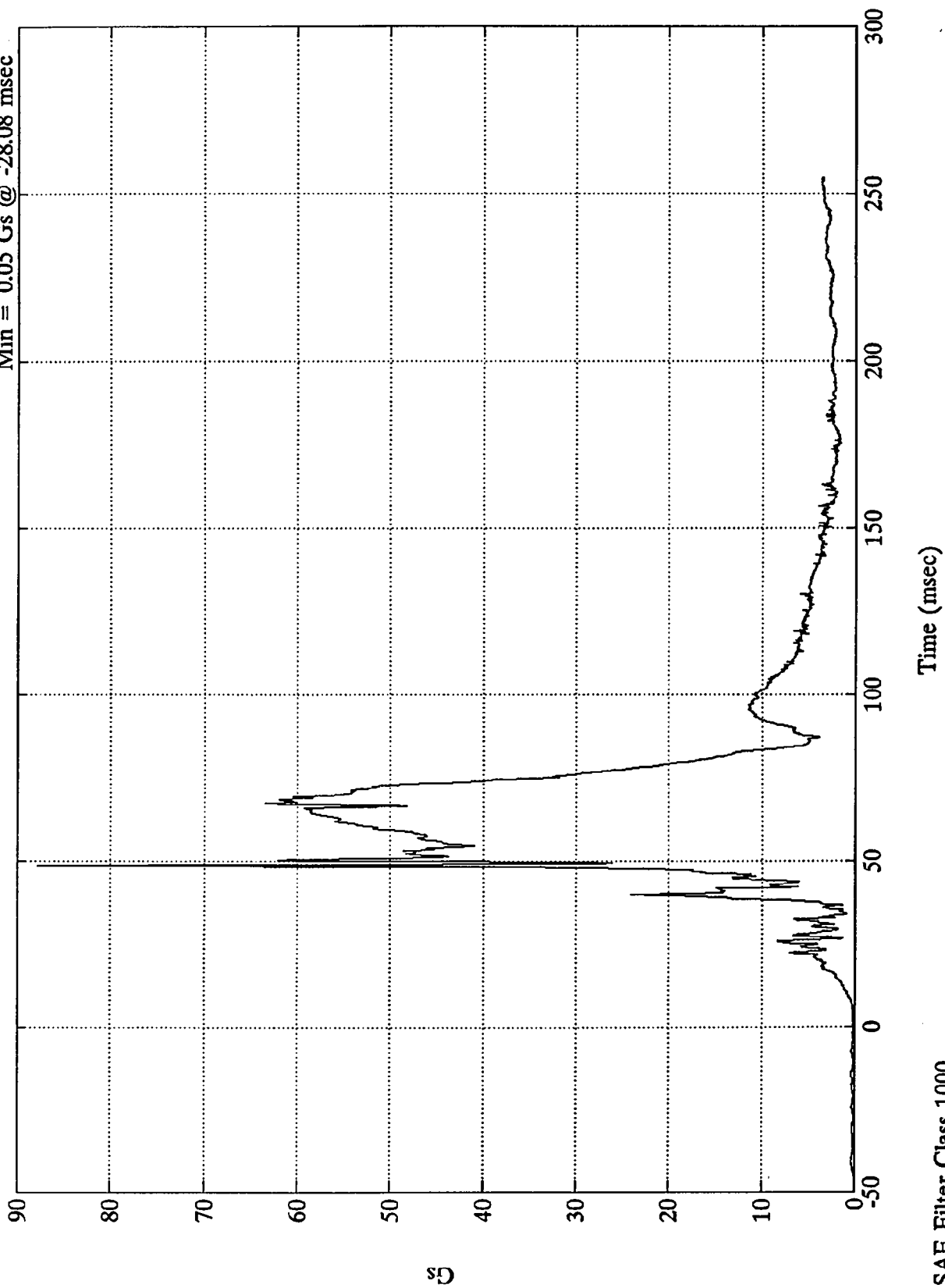
Pos. 1 Pelvic Z



SAE Filter Class 1000

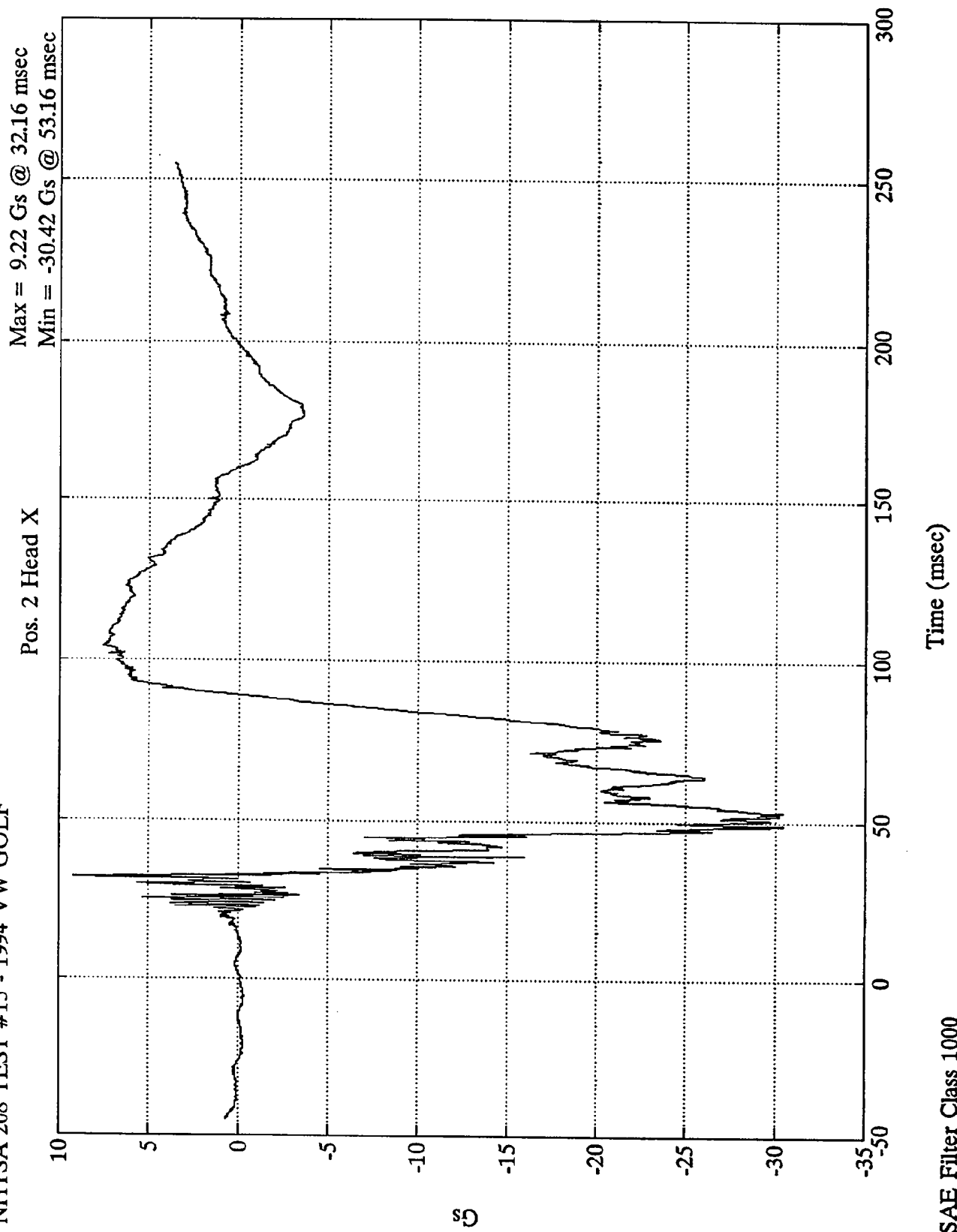
NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 1 Pelvic Resultant
Max = 87.93 Gs @ 48.60 msec
Min = 0.05 Gs @ -28.08 msec



SAE Filter Class 1000

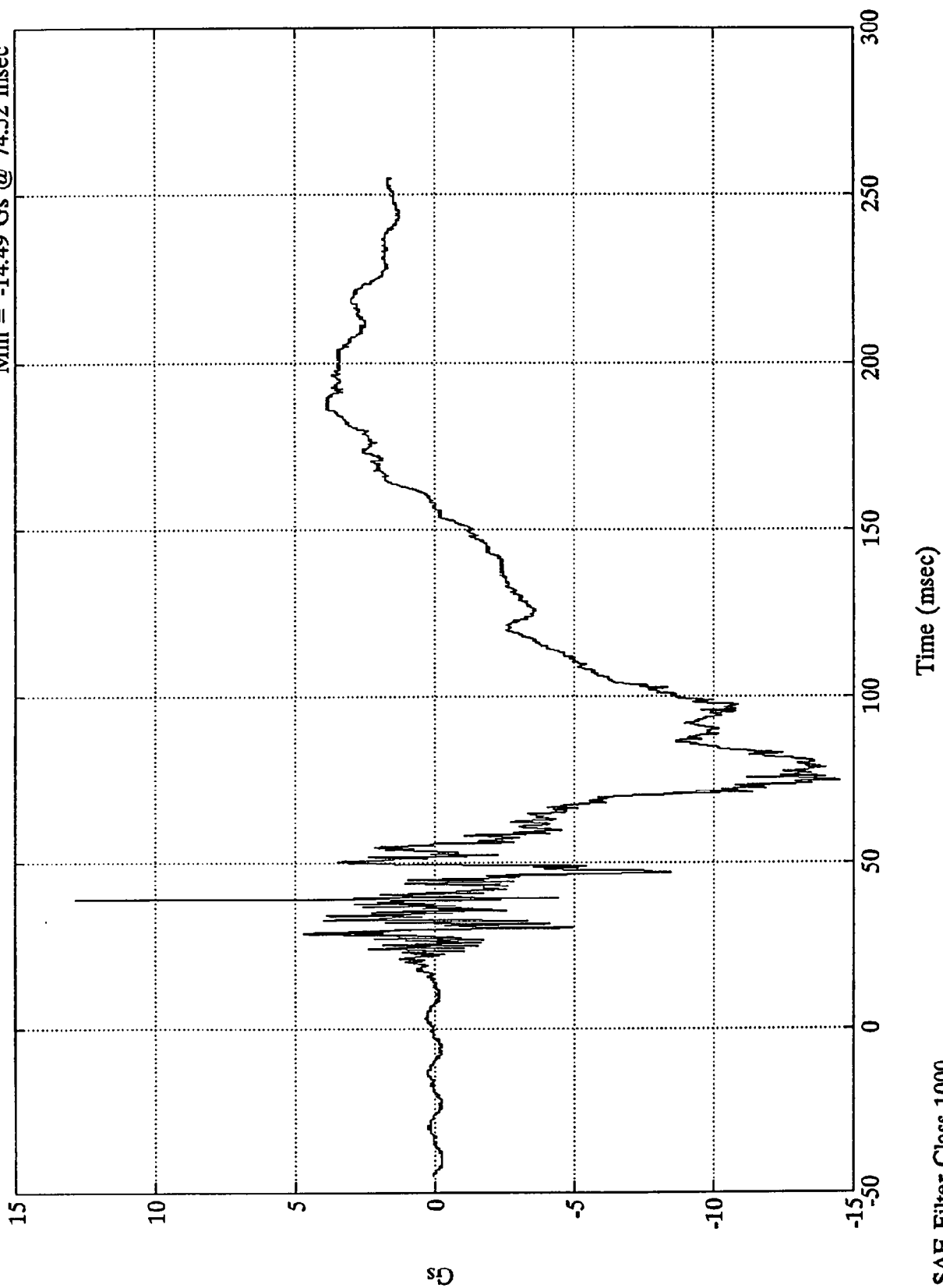
NHTSA 208 TEST #15 - 1994 VW GOLF



NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 12.84 Gs @ 39.00 msec
Min = -14.49 Gs @ 74.52 msec

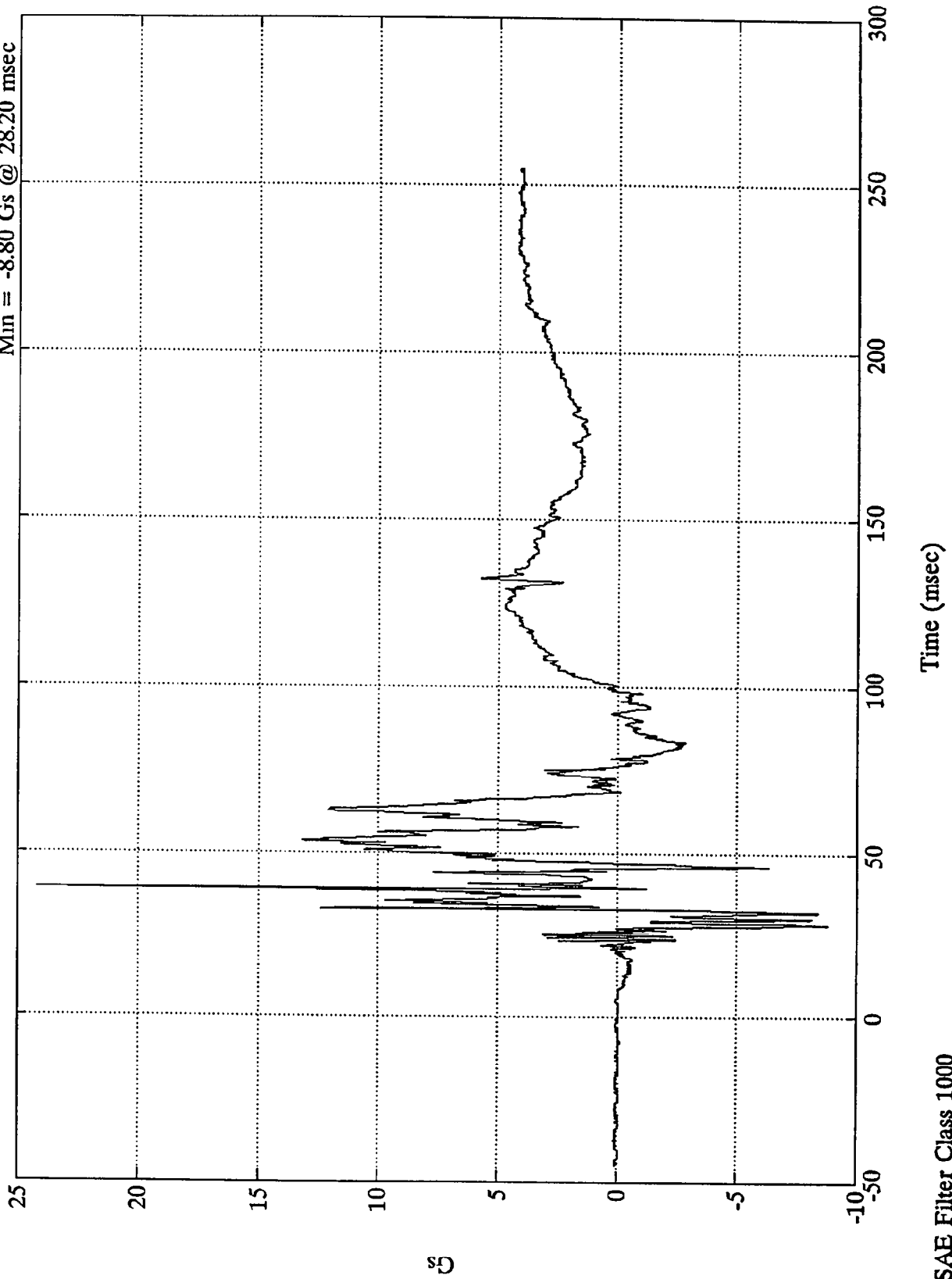
Pos. 2 Head Y



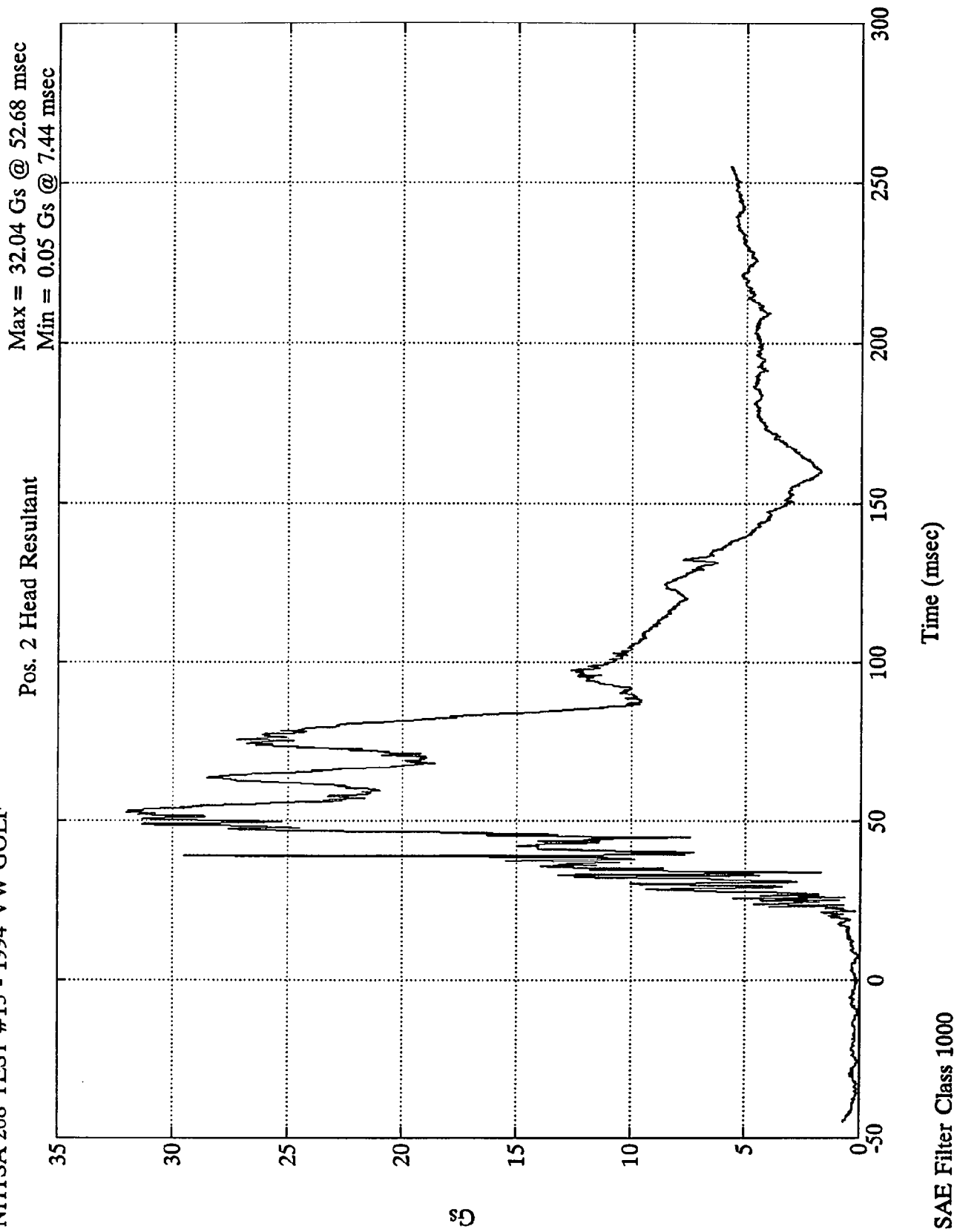
SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 2 Head Z
Max = 24.23 Gs @ 38.88 msec
Min = -8.80 Gs @ 28.20 msec



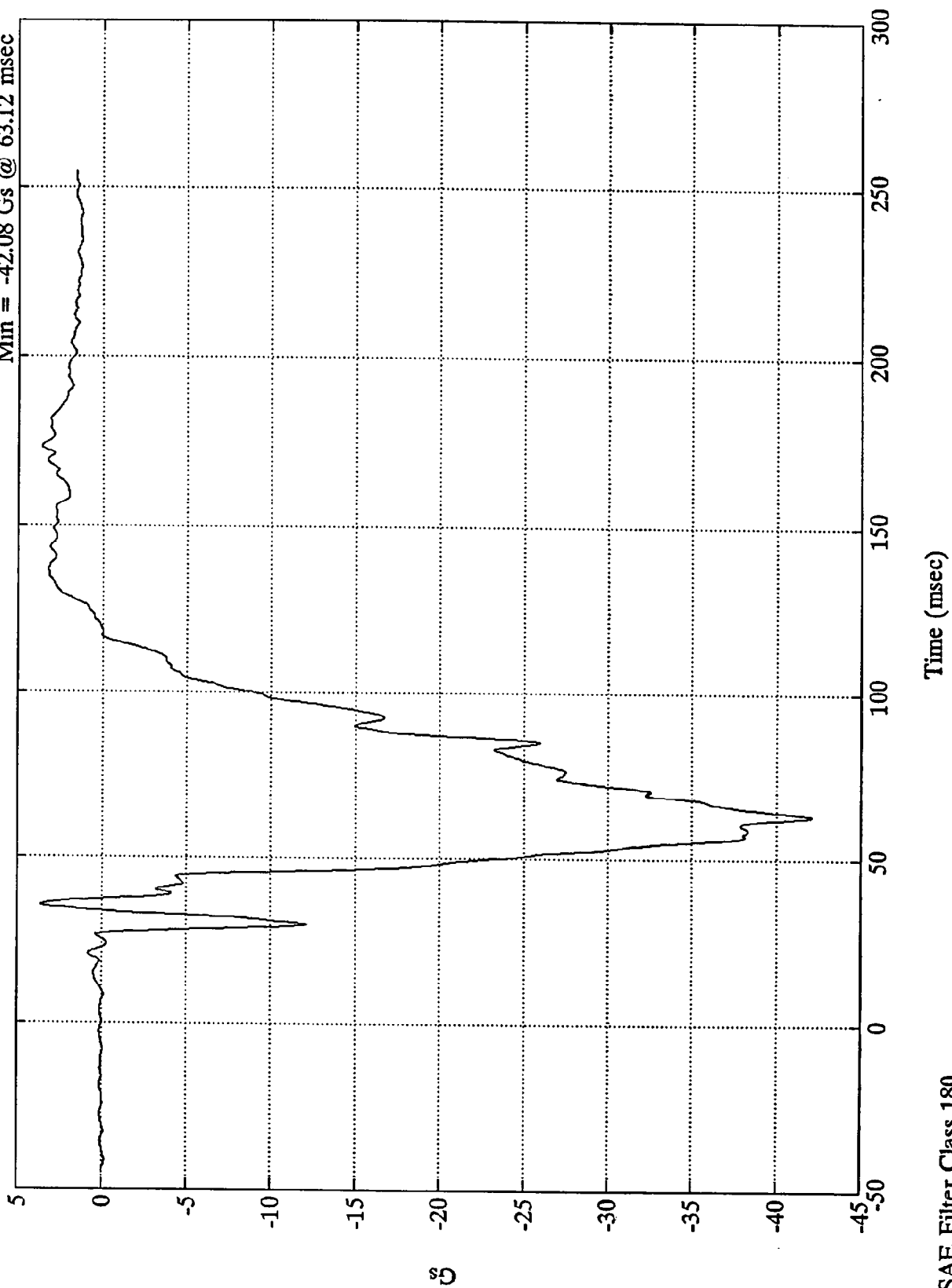
NHTSA 208 TEST #15 - 1994 VW GOLF



Gs

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 2 Chest X
Max = 3.63 Gs @ 173.76 msec
Min = -42.08 Gs @ 63.12 msec

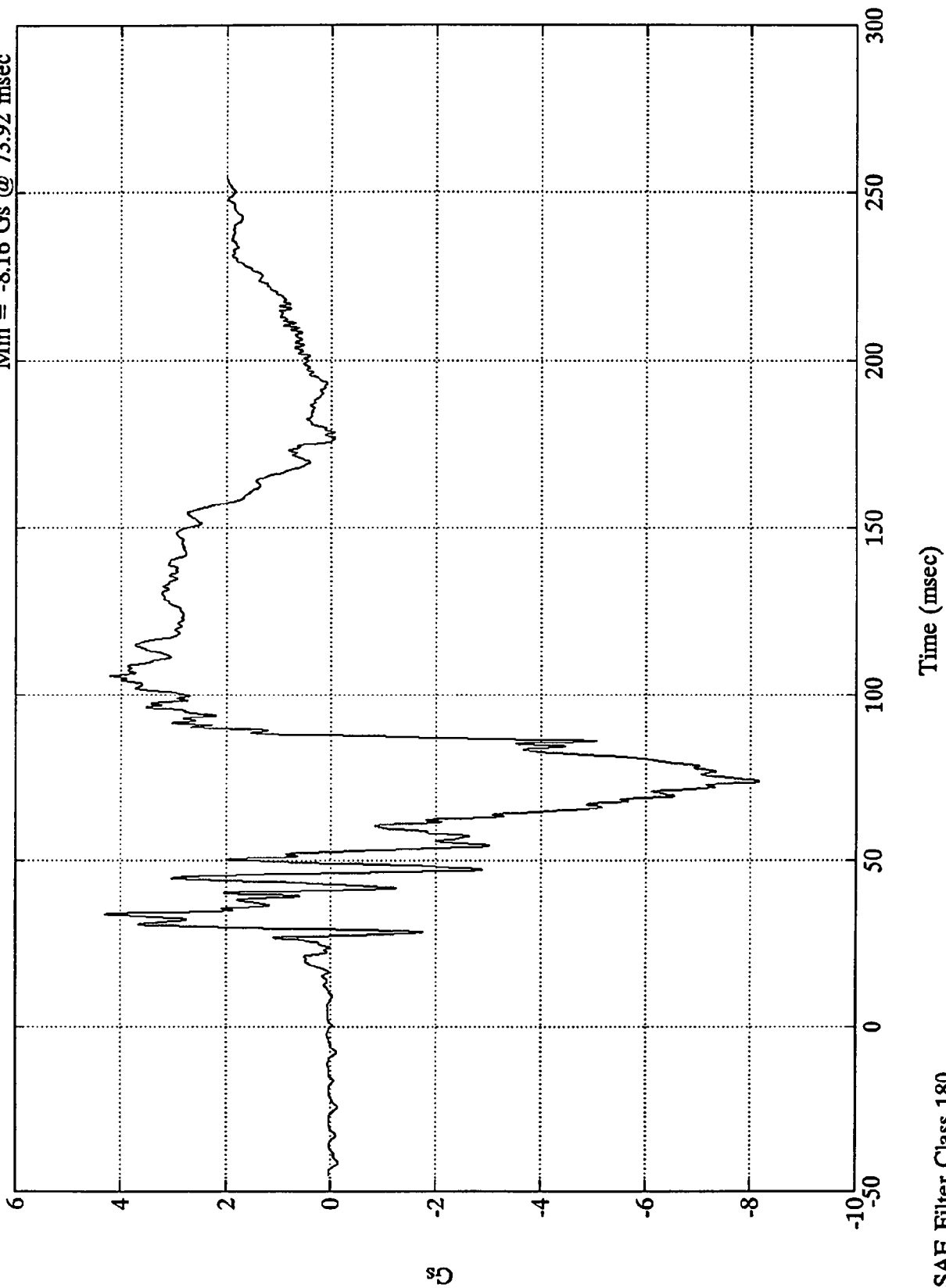


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 4.30 Gs @ 33.96 msec
Min = -8.16 Gs @ 73.92 msec

Pos. 2 Chest Y



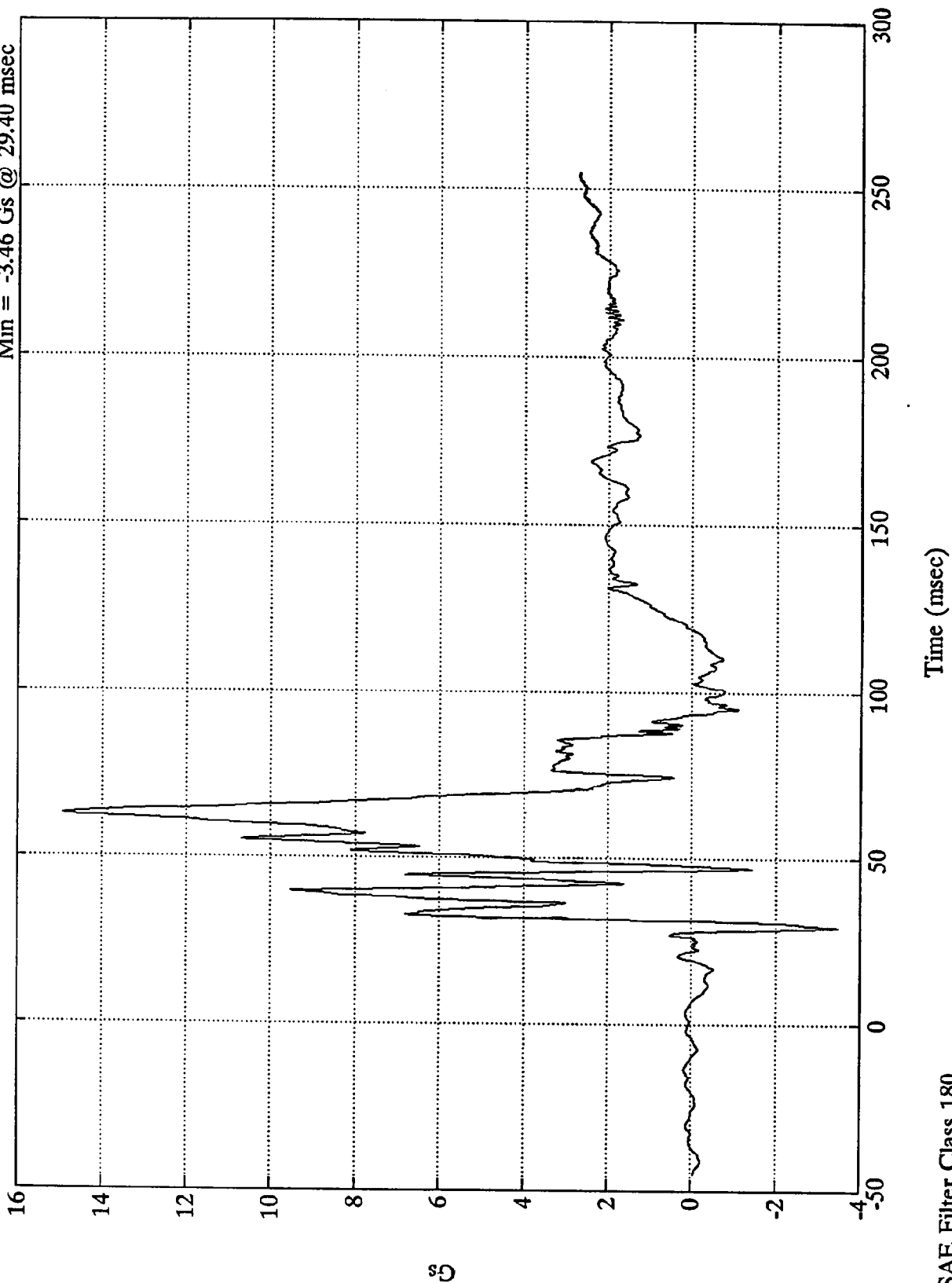
SAE Filter Class 180

8183-6

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 2 Chest Z

Max = 14.94 Gs @ 62.52 msec
Min = -3.46 Gs @ 29.40 msec

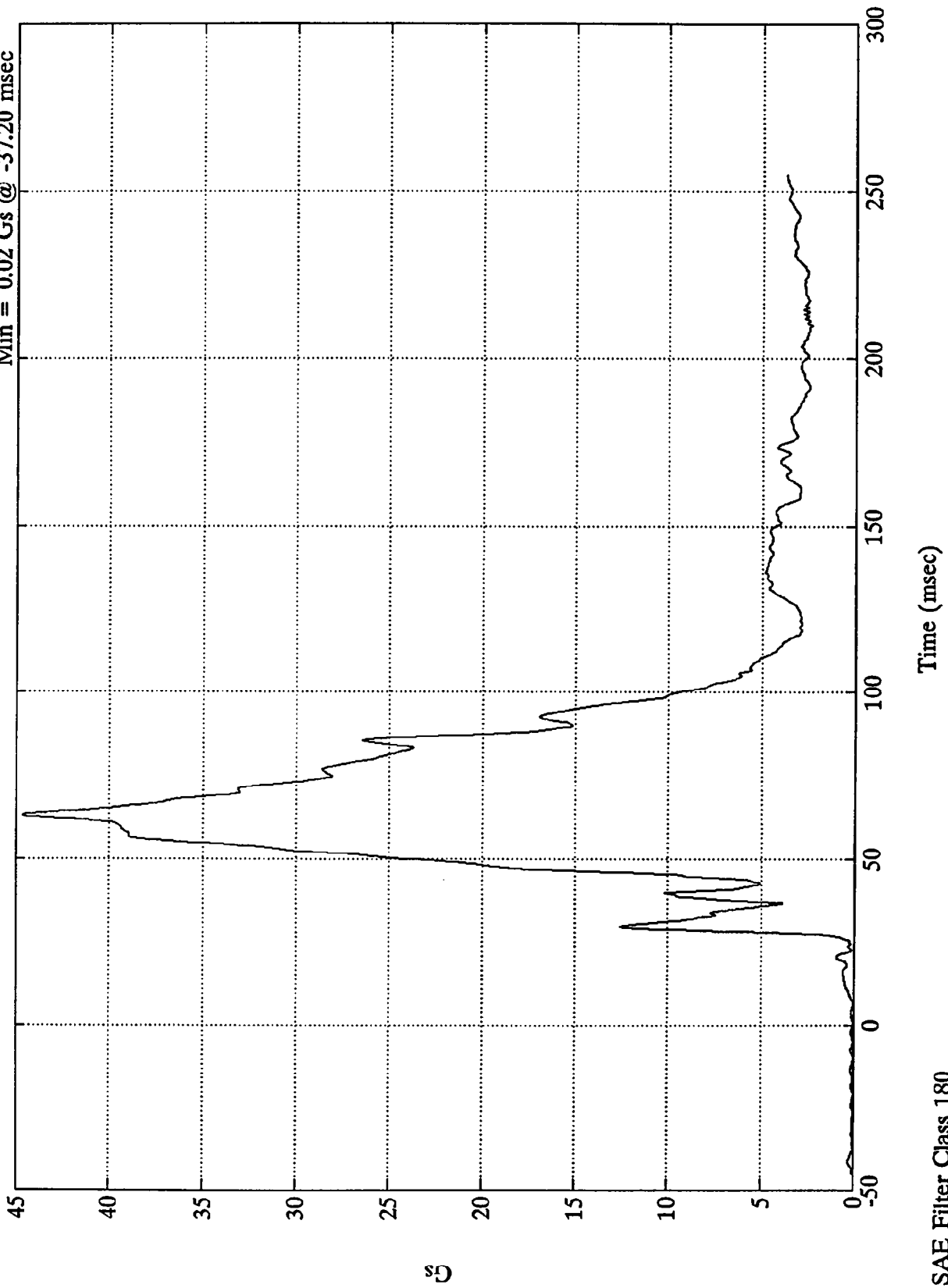


SAE Filter Class 180

8183-6

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 2 Chest Resultant
Max = 44.64 Gs @ 63.00 msec
Min = 0.02 Gs @ -37.20 msec

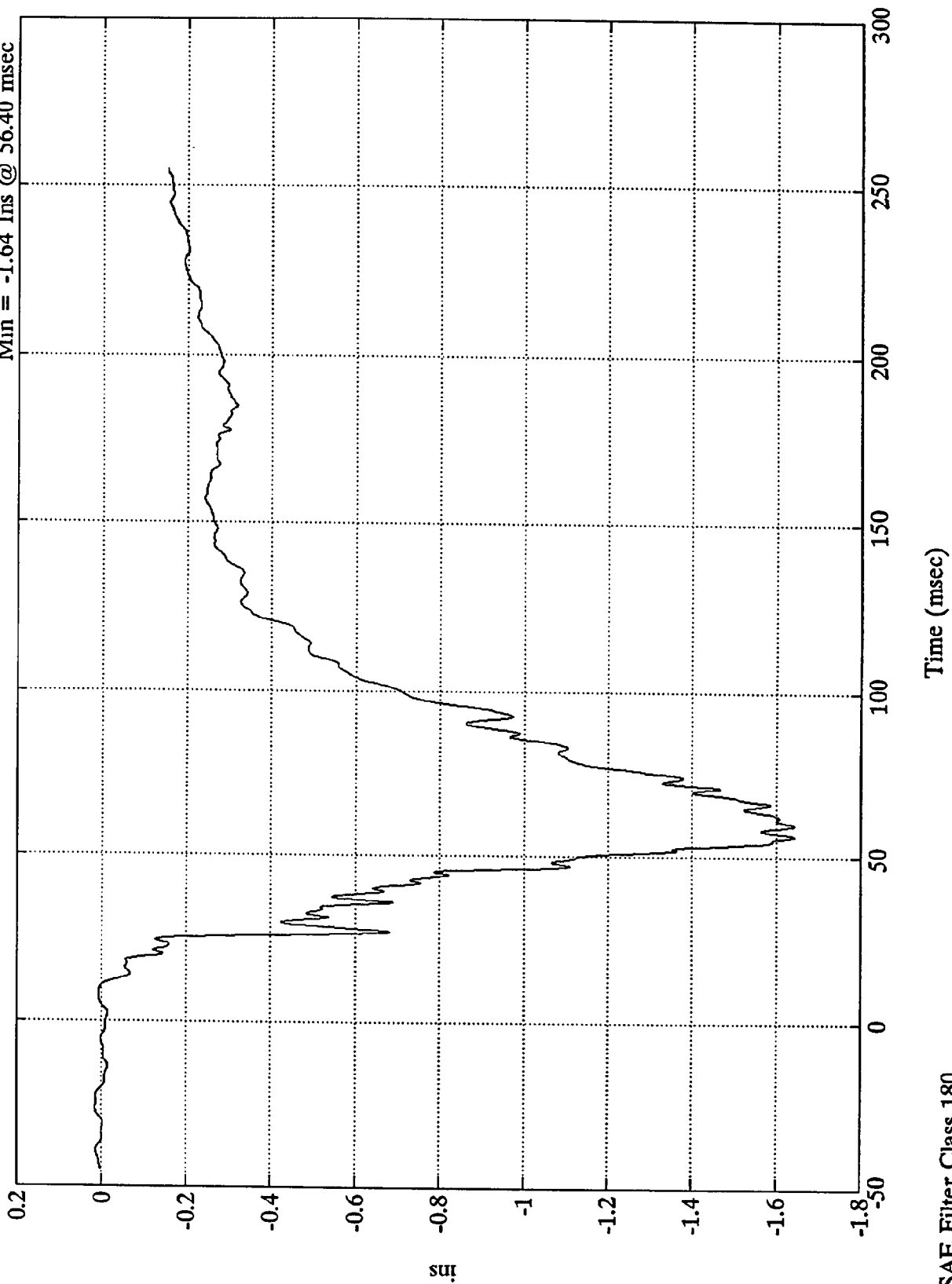


SAE Filter Class 180

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos.2 Chest Displacement

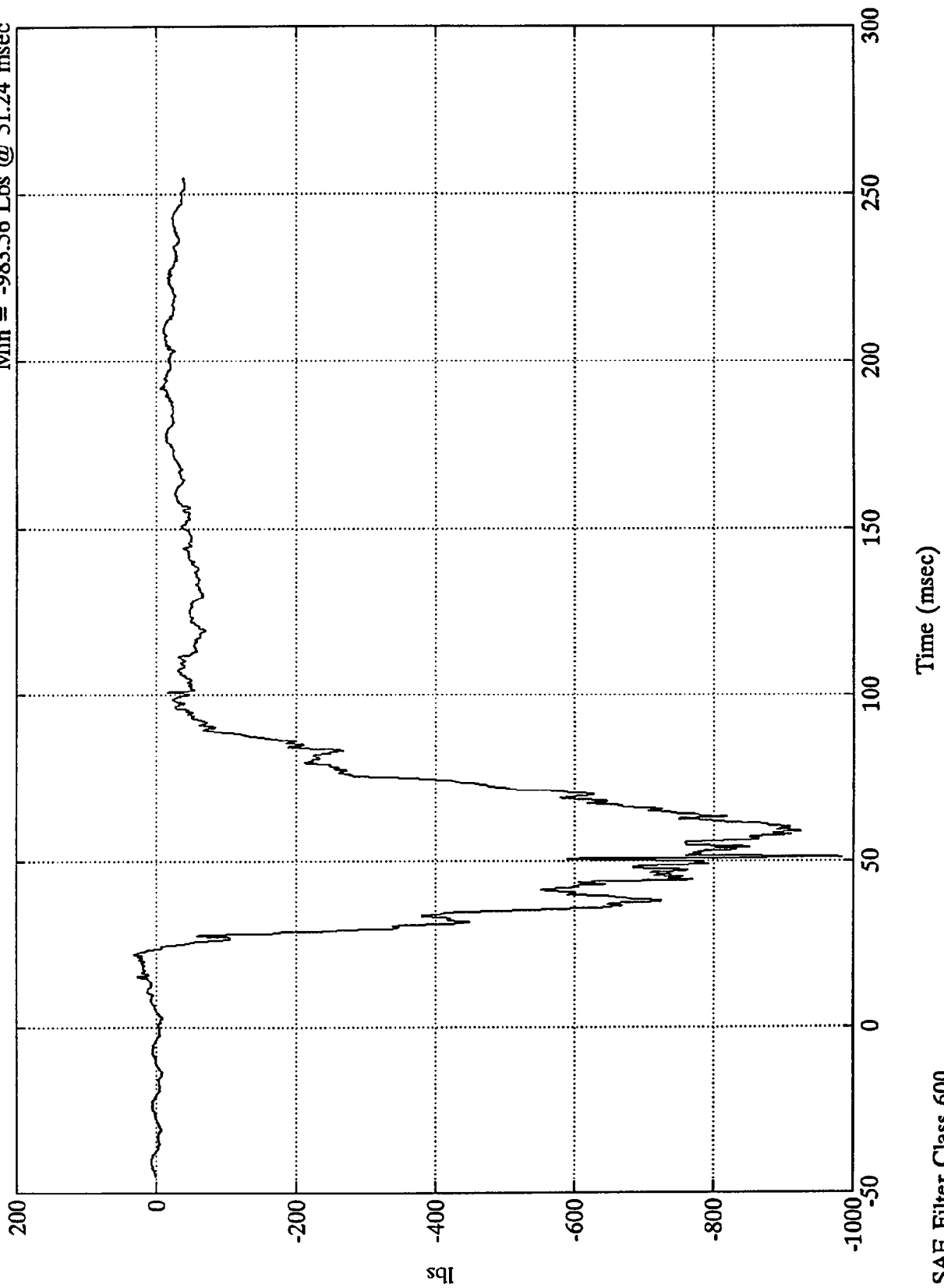
Max = 0.01 Ins @ -26.52 msec
Min = -1.64 Ins @ 56.40 msec



SAE Filter Class 180

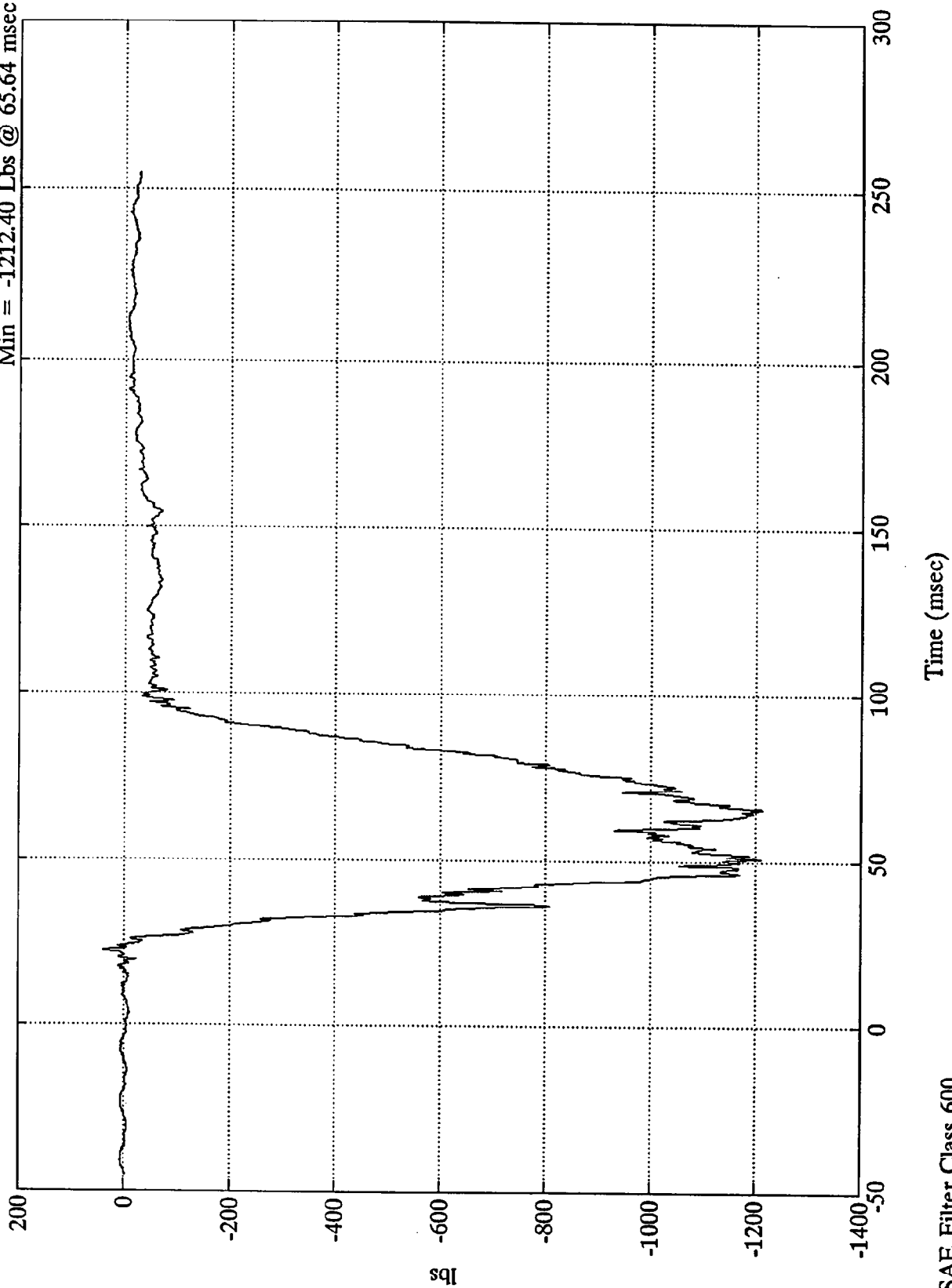
NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 2 Left Femur
Max = 32.95 Lbs @ 21.96 msec
Min = -983.56 Lbs @ 51.24 msec



NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 2 Right Femur
Max = 39.55 Lbs @ 22.08 msec
Min = -1212.40 Lbs @ 65.64 msec

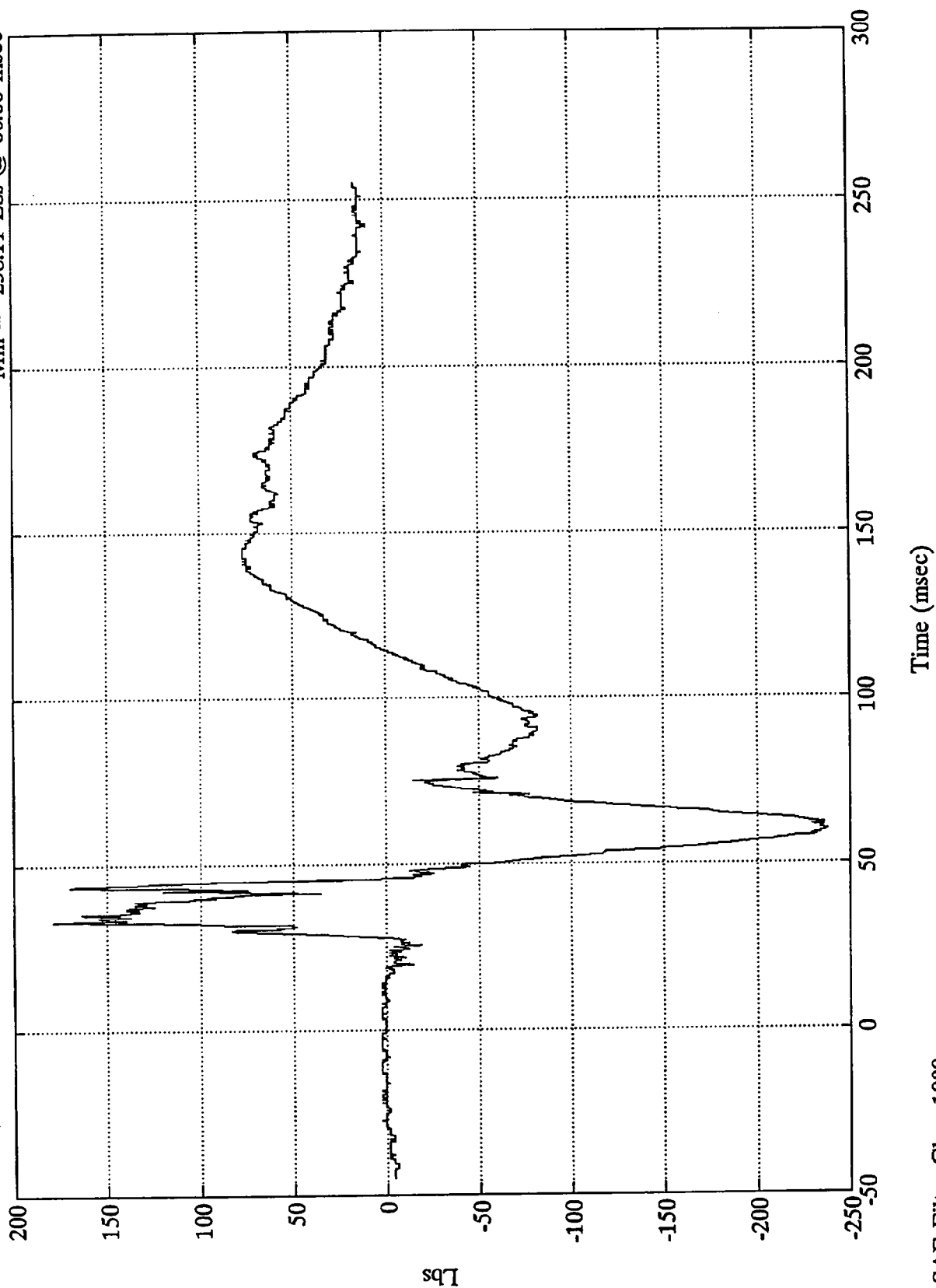


SAE Filter Class 600

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos.2 Upper Neck Fx

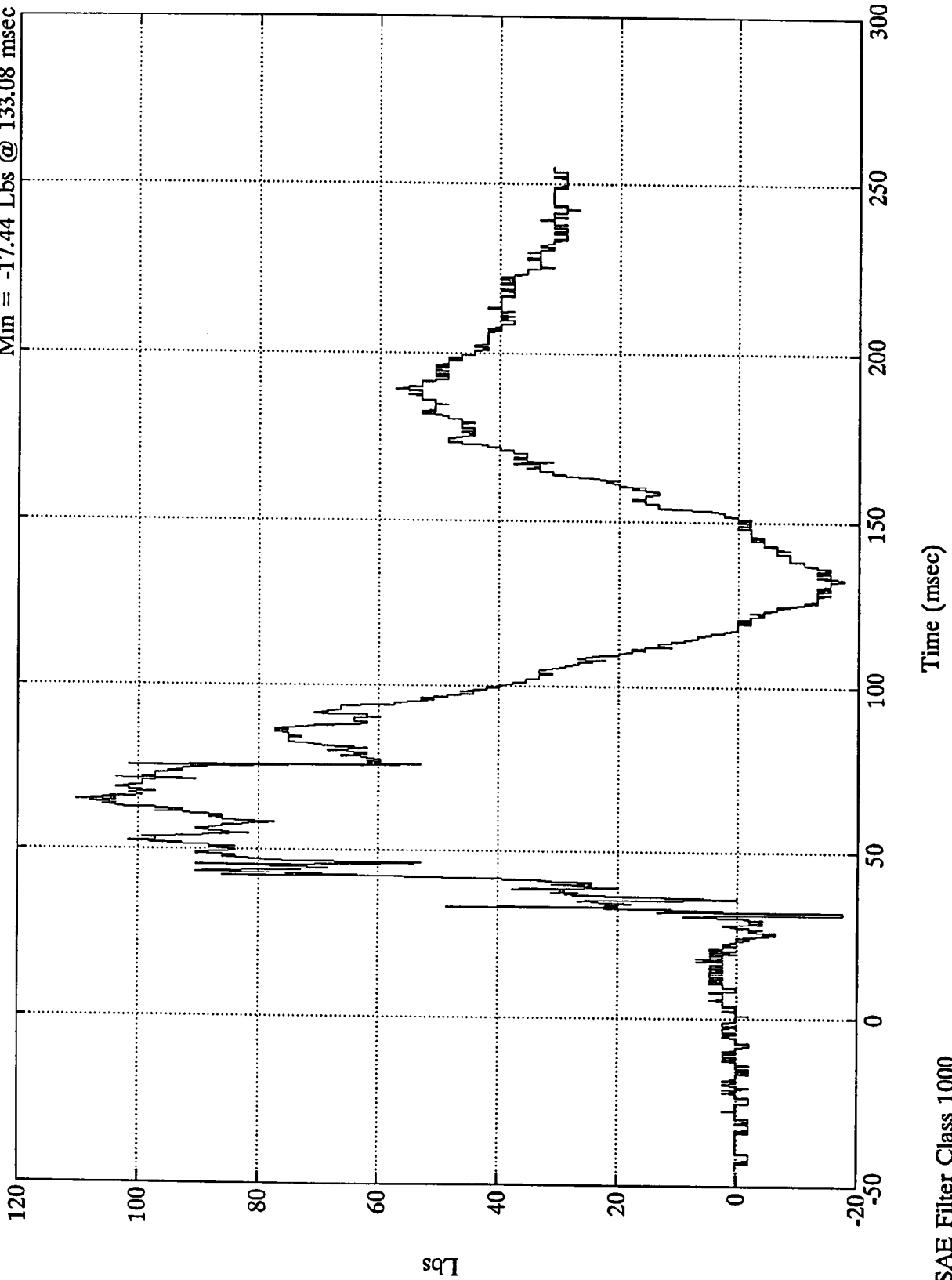
Max = 178.81 Lbs @ 33.12 msec
Min = -238.11 Lbs @ 60.00 msec



SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

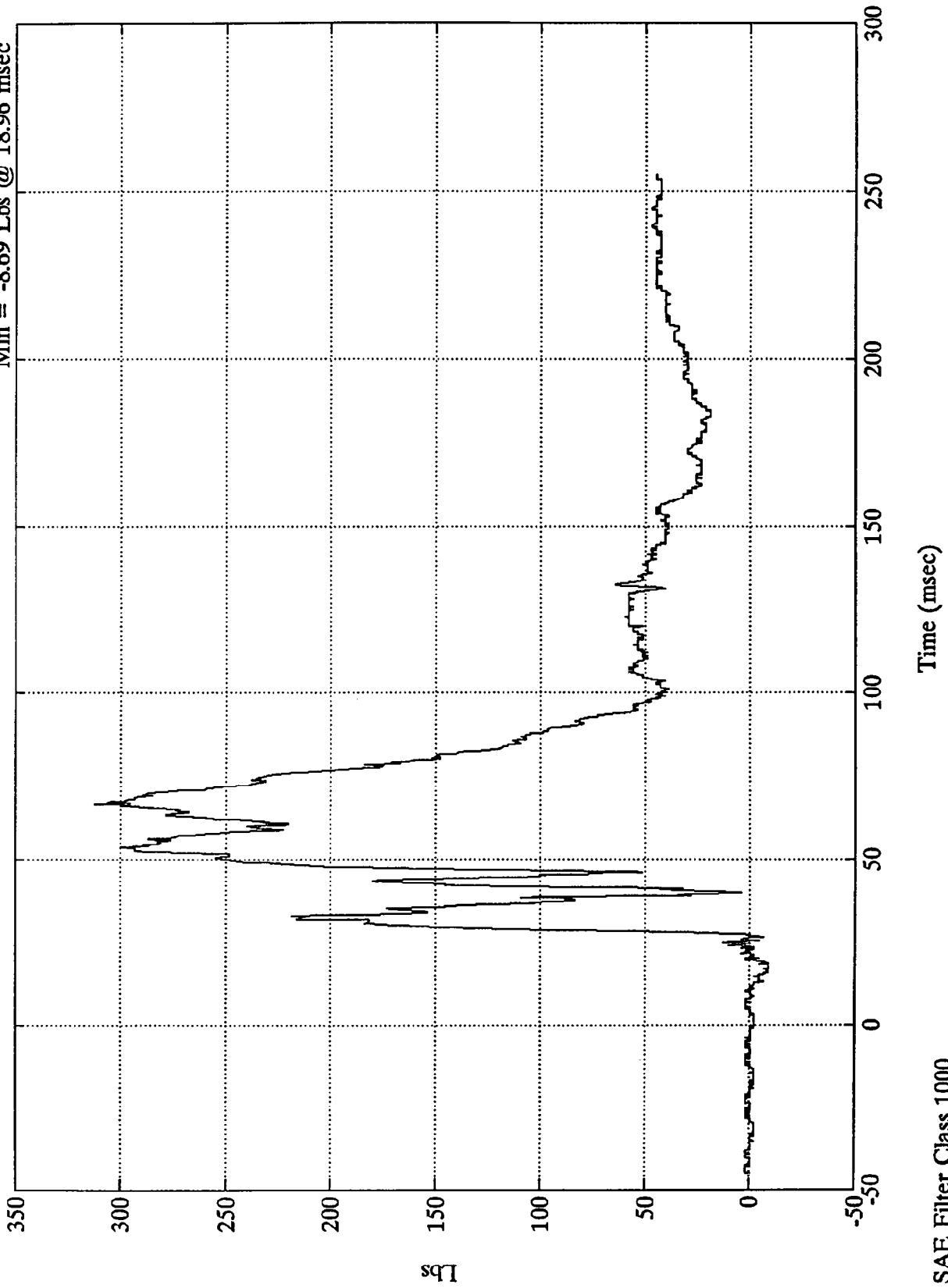
Pos.2 Upper Neck Fy
Max = 110.31 Lbs @ 64.80 msec
Min = -17.44 Lbs @ 133.08 msec



NHTSA 208 TEST #15 - 1994 VW GOLF

Pos.2 Upper Neck Fz

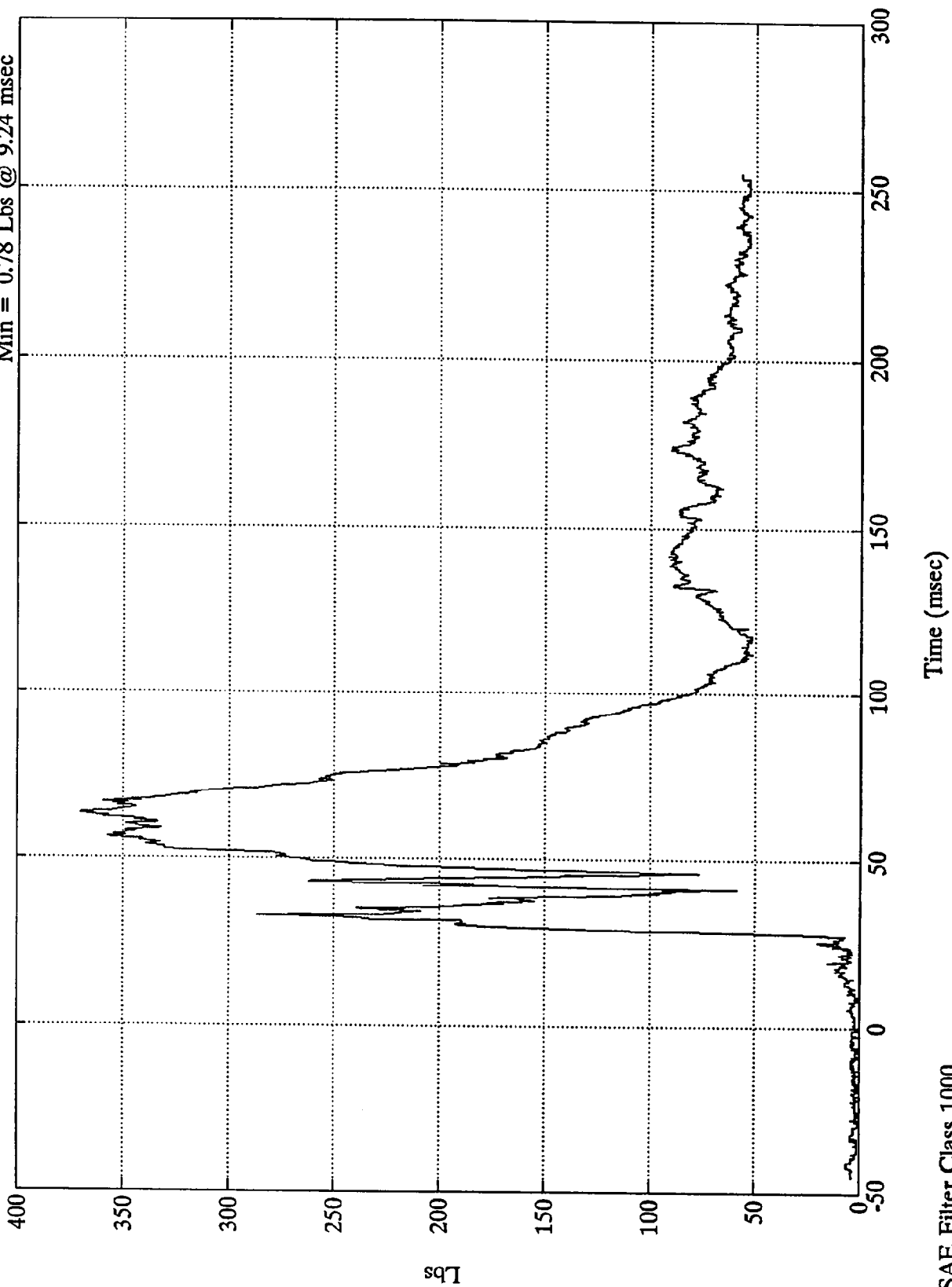
Max = 312.64 Lbs @ 66.60 msec
Min = -8.69 Lbs @ 18.96 msec



SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos.2 Neck Force Res.
Max = 370.09 Lbs @ 63.12 msec
Min = 0.78 Lbs @ 9.24 msec

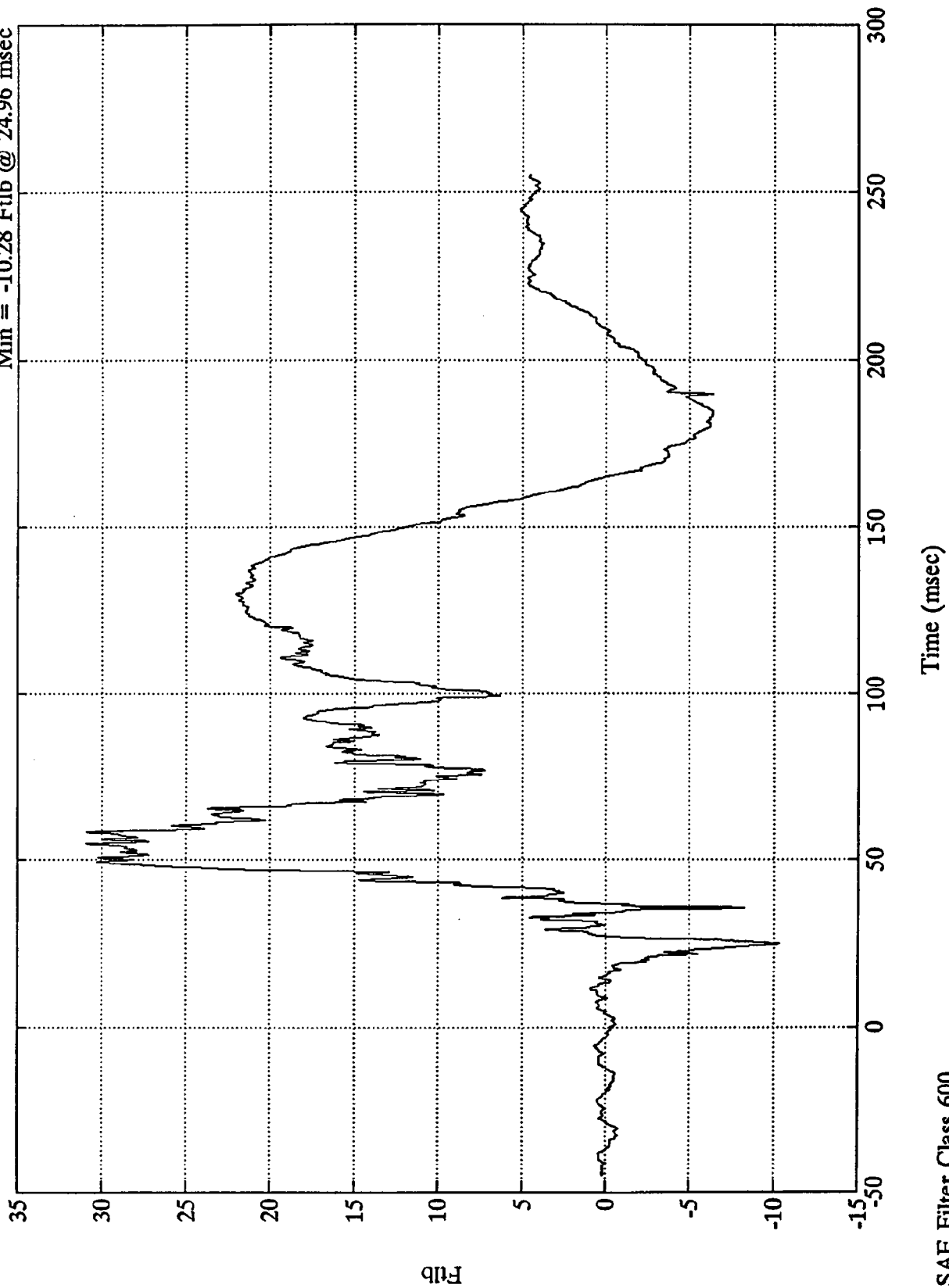


SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos.2 Upper Neck Mx

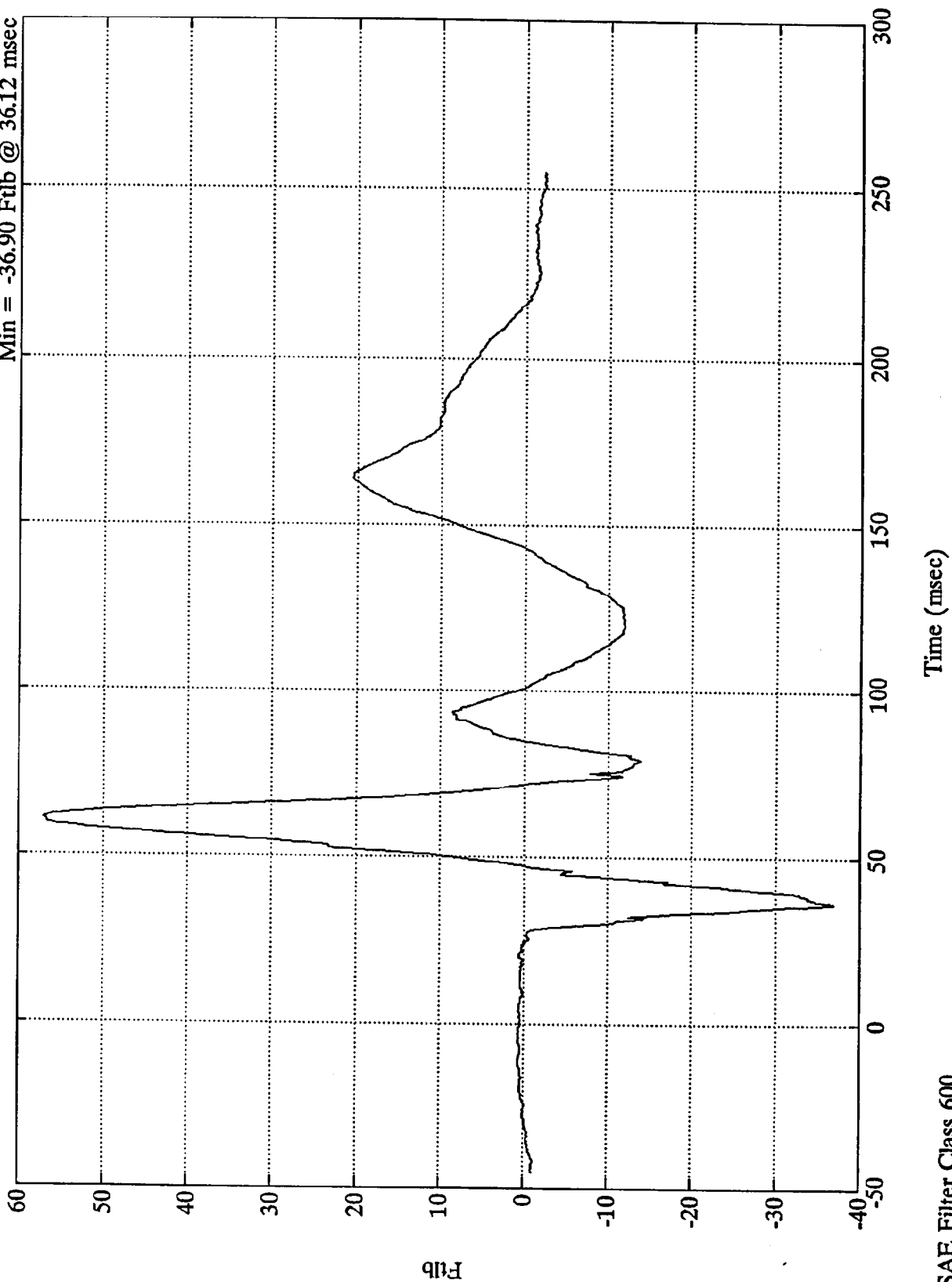
Max = 30.92 Ftlb @ 54.84 msec
Min = -10.28 Ftlb @ 24.96 msec



SAE Filter Class 600

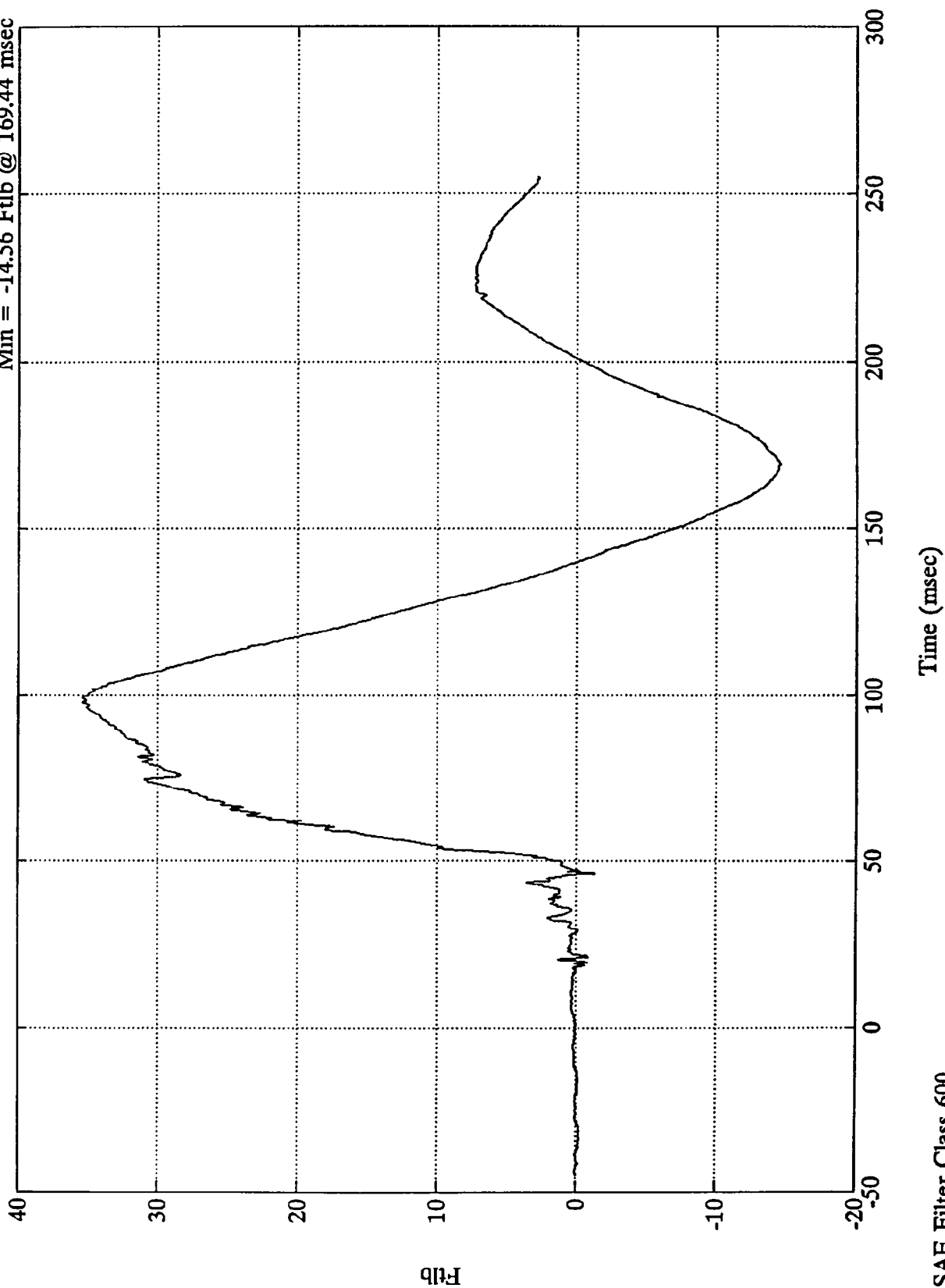
NHTSA 208 TEST #15 - 1994 VW GOLF

Pos.2 Upper Neck My
Max = 57.10 Ftlb @ 60.84 msec
Min = -36.90 Ftlb @ 36.12 msec



NHTSA 208 TEST #15 - 1994 VW GOLF

Pos.2 Upper Neck Mz
Max = 35.45 Ftlb @ 97.68 msec
Min = -14.56 Ftlb @ 169.44 msec

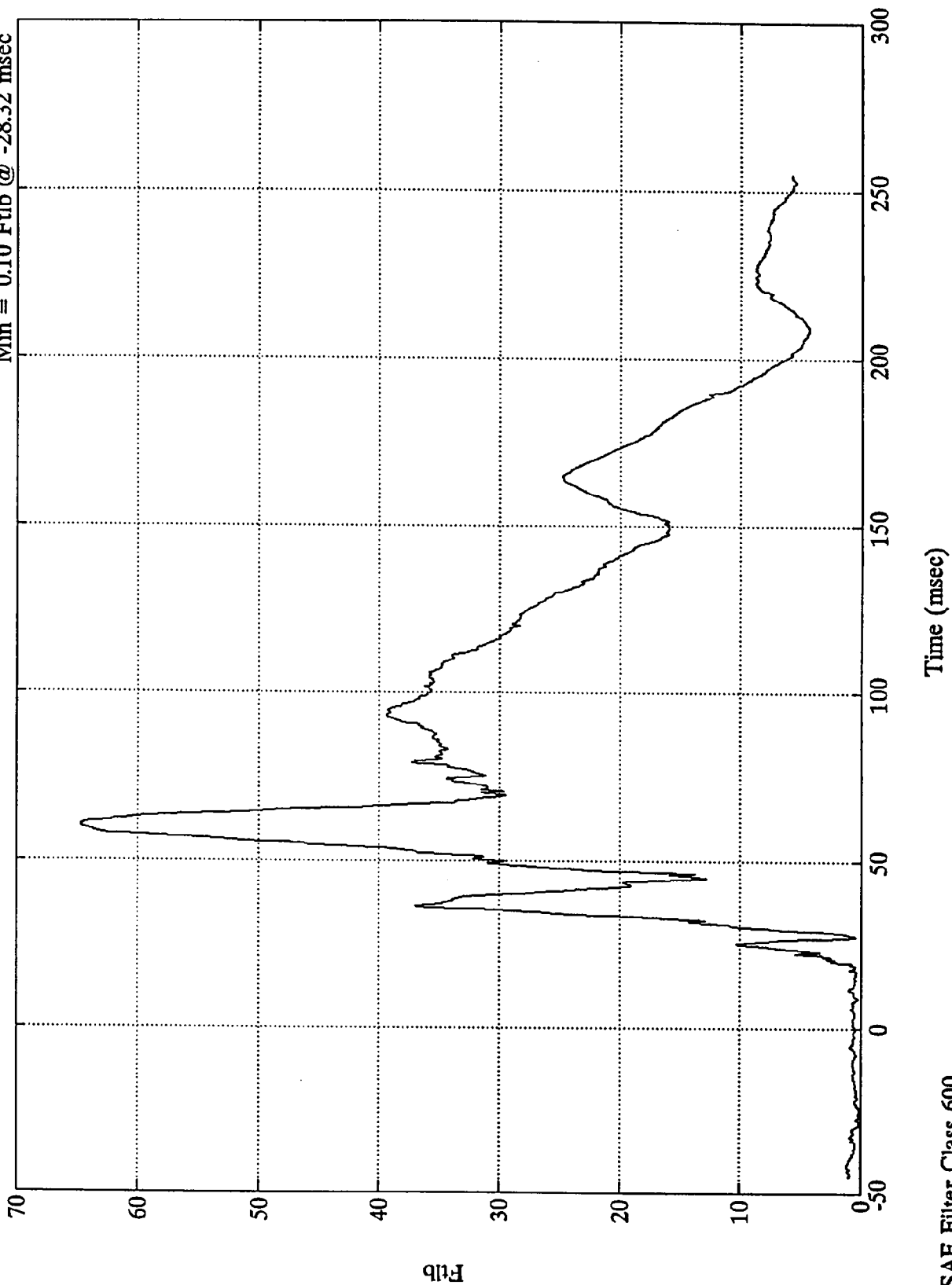


SAE Filter Class 600

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 64.68 Ftlb @ 60.24 msec
Min = 0.10 Ftlb @ -28.32 msec

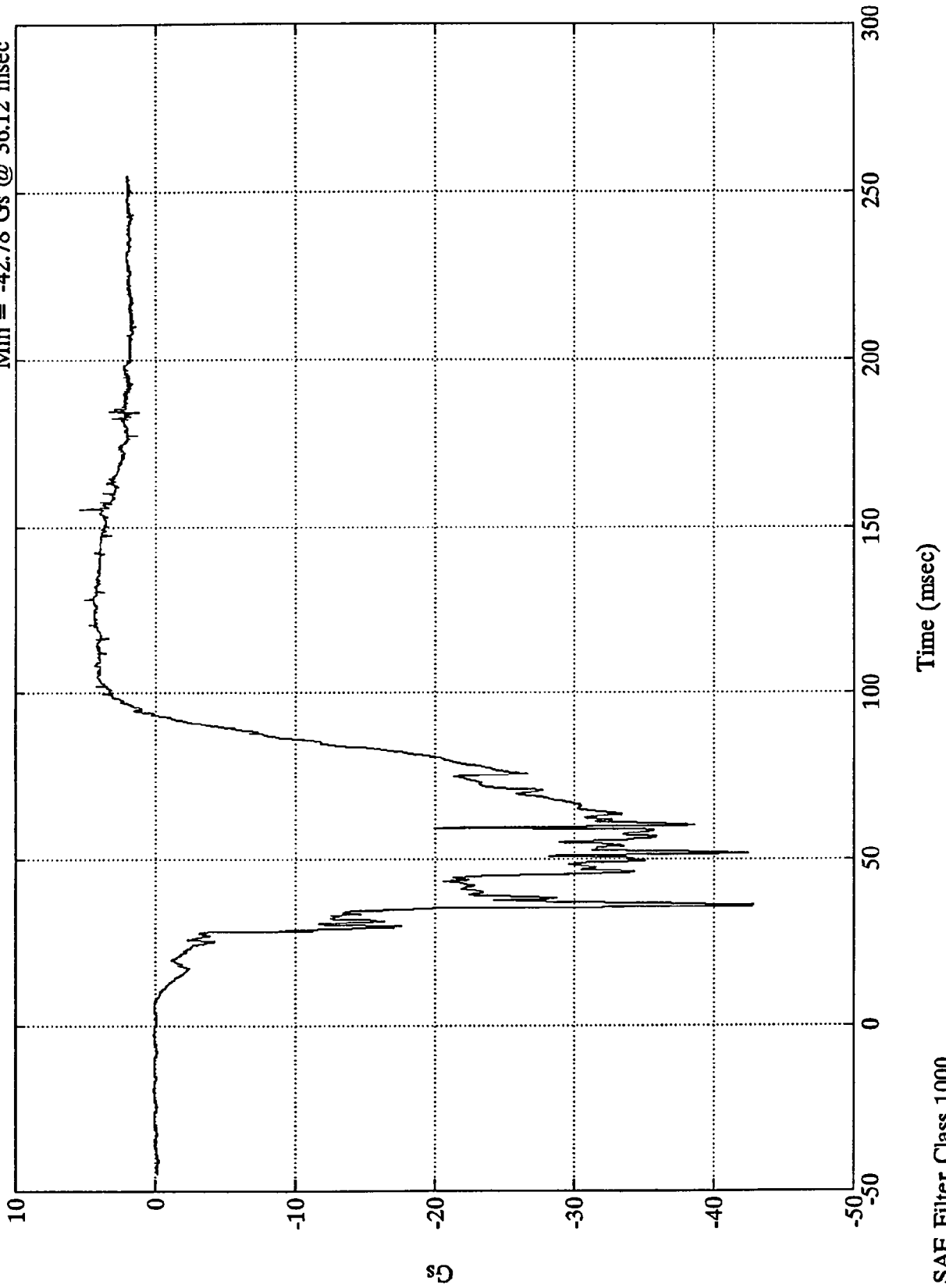
Pos.2 Neck Moment Res.



SAE Filter Class 600

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 2 Pelvic X
Max = 5.43 Gs @ 155.52 msec
Min = -42.78 Gs @ 36.12 msec

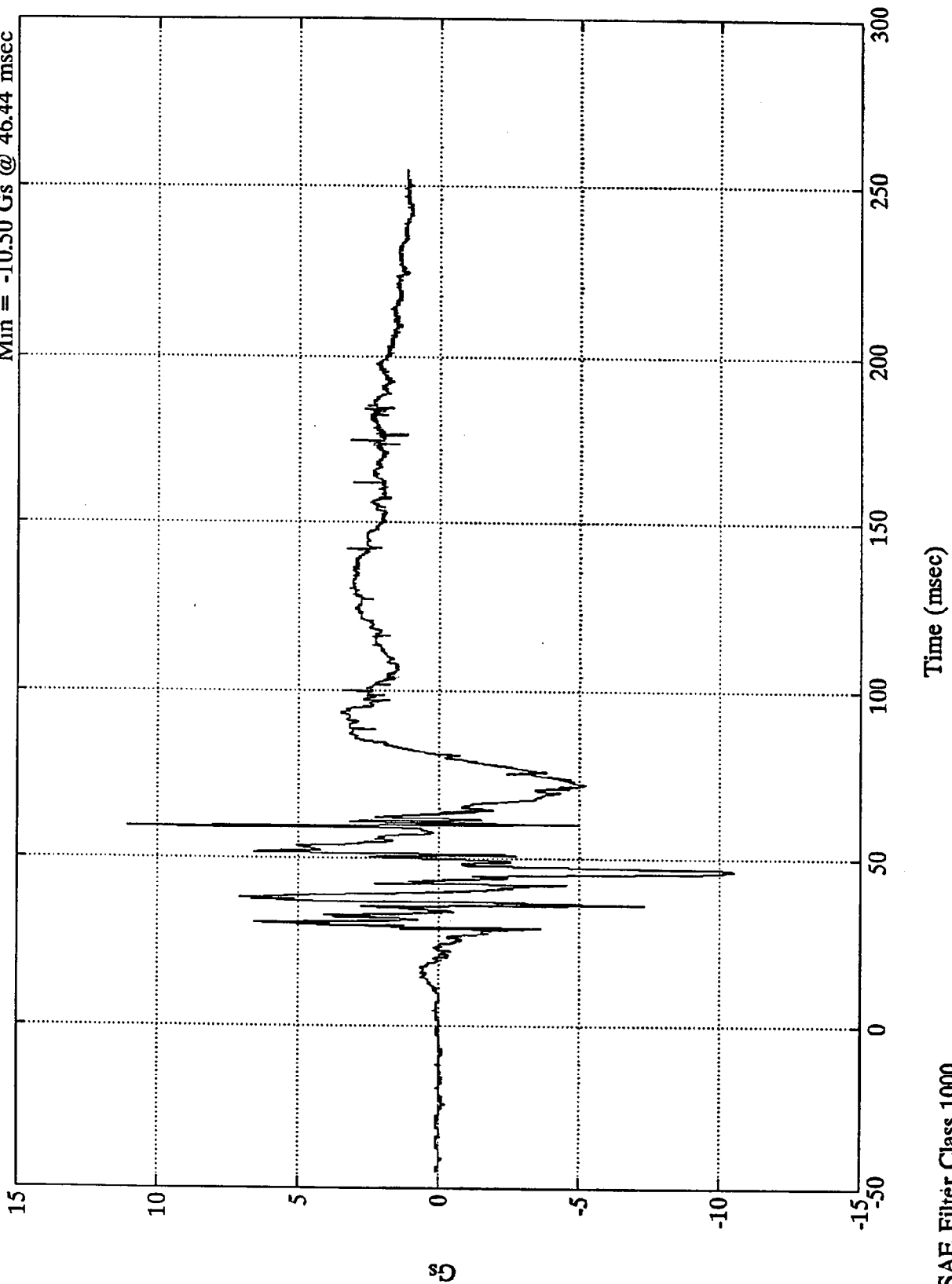


SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 11.08 Gs @ 59.28 msec
Min = -10.50 Gs @ 46.44 msec

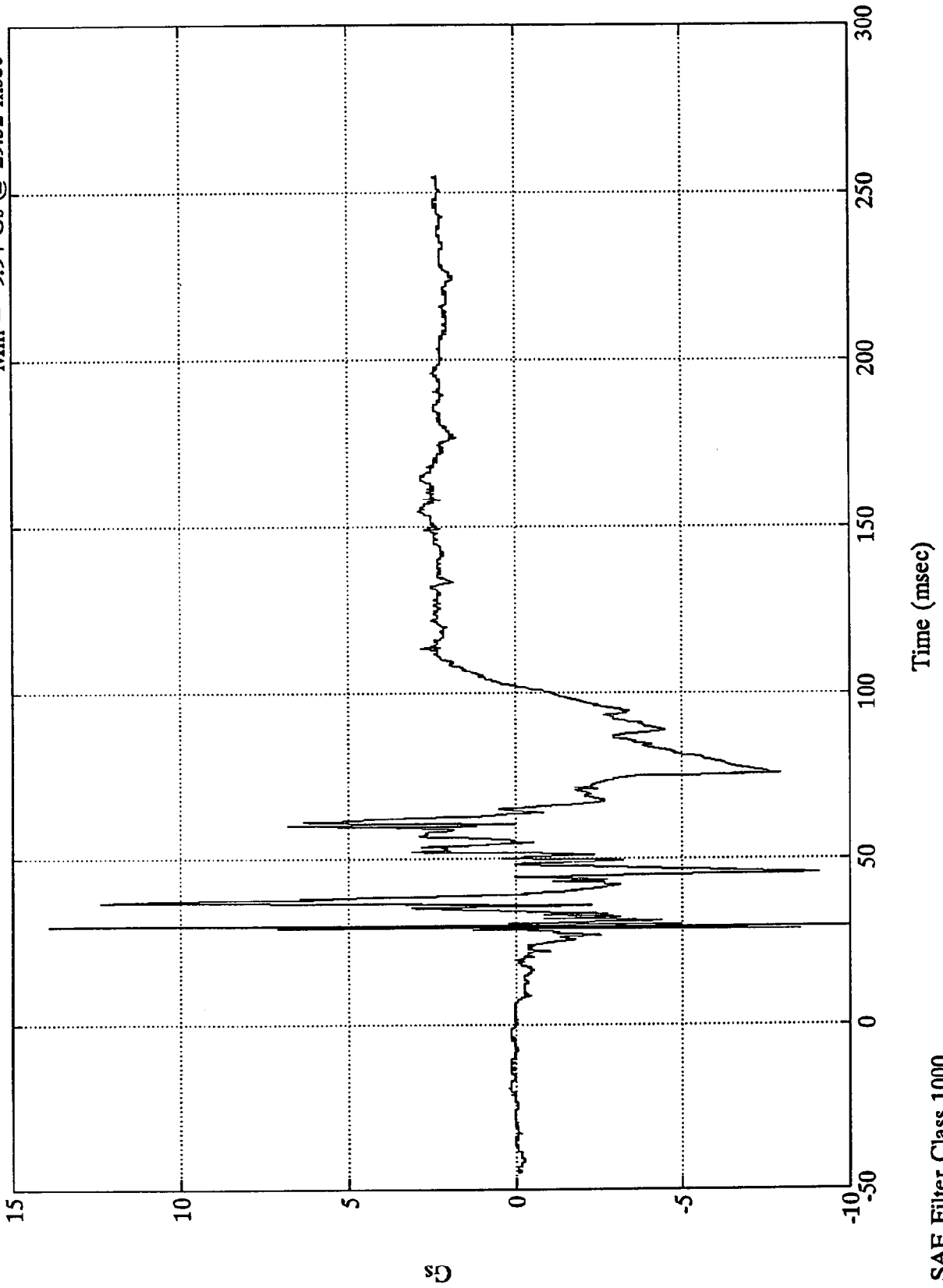
Pos. 2 Pelvic Y



SAE Filter Class 1000

NHTSA 208 TEST #15 - 1994 VW GOLF

Pos. 2 Pelvic Z
Max = 13.91 Gs @ 29.76 msec
Min = -9.94 Gs @ 29.52 msec

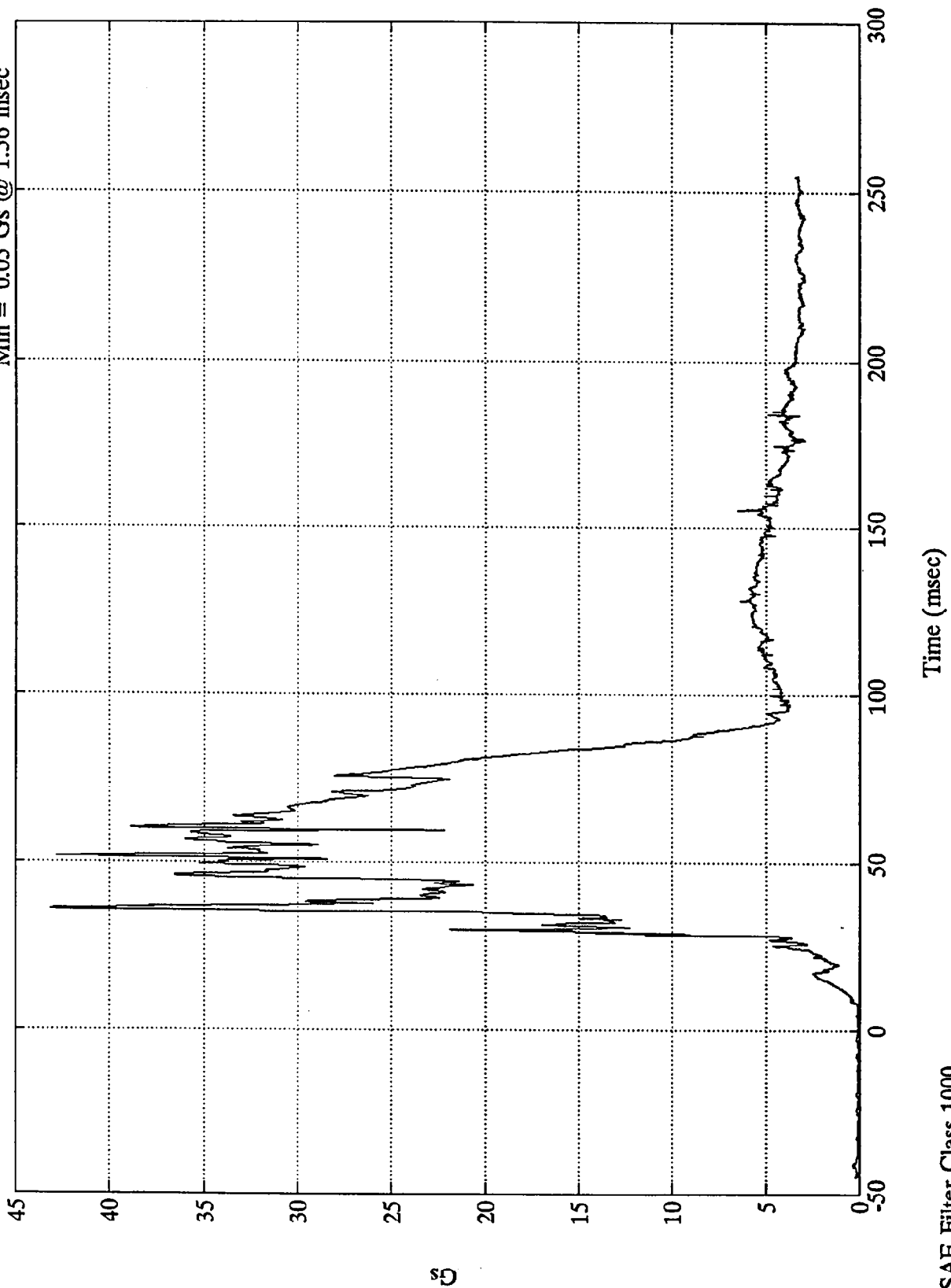


8183-6

NHTSA 208 TEST #15 - 1994 VW GOLF

Max = 43.15 Gs @ 36.00 msec
Min = 0.05 Gs @ 1.56 msec

Pos. 2 Pelvic Resultant



SAE Filter Class 1000

Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

CONTROLS AND EQUIPMENT

SAFETY BELTS

Always wear your safety belts!



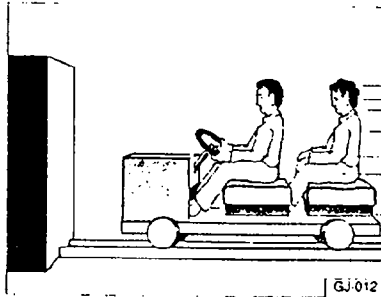
WARNING

Safety belts have been shown to be the single most effective means available for reducing the potential for serious injury and death in automobile accidents. Therefore, for your own protection as well as that of your passengers always properly wear safety belts when the vehicle is in motion.

Pregnant women, injured or physically impaired persons should also use safety belts. Like all vehicle occupants, they are more likely to be seriously injured if they do not wear safety belts. The best way to protect the fetus is to protect the mother.

Why safety belts work and how to wear them properly is explained in this chapter. Read all the information given and always observe the following instructions and warnings pertaining to the use of the safety belts installed in your vehicle.

For information on child safety see page 22.



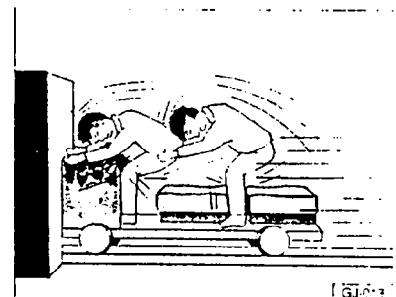
Why safety belts work

Safety belts can't work unless they are worn and worn properly.

The illustration above shows the passengers on a "vehicle" which is headed for a brick wall. They are not using safety belts.

The physical principles involved are simple. Both the vehicle and the passengers possess energy which varies with vehicle speed and body weight. Engineers call this energy "kinetic energy."

The higher the speed of the vehicle and the greater the passenger's weight, the more kinetic energy there is and the more energy which must be "absorbed" in an accident.

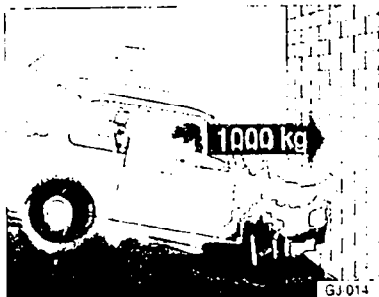


Vehicle speed is, however, the most significant factor. If the speed doubles from 15 to 30 mph (25 to 50 km/h), for example, the kinetic energy increases 4 times!

Because these passengers are not using safety belts, their kinetic energy remains unchanged. They will keep moving at the same speed the vehicle was moving just before the crash, until something gets in the way, here, the wall.

14

CONTROLS AND EQUIPMENT



The same physical principles apply to people sitting in a passenger car which is involved in a frontal collision.

Even when driving at speeds of only 20 to 30 mph (30-50 km/h), the forces acting on the body can reach one ton (2000 lb/1000 kg) or more. At greater speeds these forces are even higher.

People who do not use safety belts are also not attached to their car. In a frontal collision they will also continue to move forward at the speed their car was traveling just before the impact.



Unable to resist the tremendous forces arising at impact, they will slam violently into the steering wheel, dashboard, windshield or whatever else is in the way. Their impact with the vehicle interior takes place with all of the kinetic energy they had just before their car crashed. Those who do not use safety belts can also be thrown out of their car where even more severe or fatal injuries can occur.

Nobody is strong enough to overcome the forces of an accident by holding tight or bracing themselves against the dashboard. Safety belts can help to reduce the risk of injury caused by uncontrolled impact with the vehicle and the possibility of ejection.



Passengers sitting in the rear seats who do not use safety belts not only endanger themselves but also front seat passengers. In a frontal collision they will also move forward where they can hit and injure the driver or front seat passenger.

Safety belts protect

Safety belts used properly can make a big difference. Safety belts help to keep passengers in their seats, reduce energy levels applied to the body in an accident gradually and help prevent the uncontrolled movement which can cause serious injuries. Safety belts also help to keep passengers in their seats.

CONTROLS AND EQUIPMENT



Safety belts attach passengers to the car and give them the benefit of being slowed down more gently or "softly" through the give in the safety belts, the crumple zones and other safety features engineered into today's Volkswagens. By reducing the kinetic emergency over a longer period of time, the forces on the body become more "tolerable" and less likely to produce injury.

In addition, safety belts reduce the danger of being thrown out of the car.

Although these examples are based on a frontal collision, safety belts can also substantially reduce the risk of injury in other types of accidents. So, regardless of whether you are on a long trip or just going to the corner store, always buckle up and make sure others do, too.

The following pages provide important instructions which will enable you to use safety belts properly. Be sure to read and follow the instructions carefully and heed all warnings.

To increase the driver's and front passenger's safety, the vehicle is equipped with an Automatic Safety Belt System as standard equipment.



Belt warning system

Your vehicle has a warning light to remind you to wear your safety belt.

If you do not put on your safety belt after switching on the ignition, the warning light in the instrument cluster will come on along with a warning tone for approximately 6 seconds. Fasten your safety belt now and make sure that your passengers also properly put on their safety belts.

16

CONTROLS AND EQUIPMENT

How to wear safety belts properly

On the previous pages, you have seen how safety belts offer protection in accidents. Accident statistics show that passengers properly wearing safety belts have a lower risk of being injured and a much better chance of surviving an accident. For this reason, wearing a safety belt is legally required in most countries and in much of the United States and Canada.

WARNING

Always fasten your safety belts before driving off. Always make sure your passengers are properly restrained even those sitting in the rear.

Safety belts can only work when used properly. Always observe the following precautions:

- Never wear belts twisted.
- Never strap in more than one person, including small children, with each belt. It is especially dangerous to place a safety belt over a child sitting on your lap.
- Never place your feet on the instrument panel or on the seat. Always



keep both feet on the floor in front of the seat.

- Never wear belts over rigid or breakable objects in or on your clothing, such as eye glasses, pens, keys, etc. as these may cause injury.
- Never wear safety belts in any other way than illustrated and described in this chapter. For



instance, do not wear shoulder part of belt under your arm or otherwise out of position. This would increase the risk of serious injury in case of an accident.

■ Several layers of heavy clothing may interfere with proper positioning of belts and reduce the overall effectiveness of the system.

17

8183-6

CONTROLS AND EQUIPMENT

WARNING continued

■ Never allow safety belts to become damaged by being caught in door or seat hardware. Always keep belt buckles free of any obstruction that may prevent secure locking.

■ Never use comfort clips or devices which create slack in the shoulder belt portion and can increase the risk of injury in an accident. However such clips may be required in the proper use of some child restraint systems.

■ Inspect your belts periodically. If belts show damage to webbing, bindings, buckles or retractors, they must be replaced.

■ The belts must be kept clean as otherwise the retractors may not work properly (see also "Vehicle Care", page 86).

■ Safety belts that have been worn and loaded in an accident must be replaced by an authorized Volkswagen retailer.

■ Never modify, disassemble or attempt to repair the safety belts in your vehicle.

Your vehicle has 5 seating positions, 2 in the front and 3 in the rear. Each seating position has been provided with a safety belt, which must be used for your safety whenever the vehicle is in motion.

Three point, lap-shoulder belt*

On vehicles with the Automatic Safety Belt System, only the outside seating positions of the rear seat have the three point, lap-shoulder safety belt.

On vehicles equipped with the Supplemental Airbag System, the driver's and front passenger's seat, as well as the outside seating positions of the rear seat are equipped with a three point, lap-shoulder safety belt.

This combination lap-shoulder belt has a locking retractor. The system adjusts automatically to your size and movements as long as the pull on the belt is slow.

Hard braking or a collision locks the belt. The belt will also lock when you drive up or down a steep hill or in a sharp curve.



Fastening the safety belt

■ Before fastening the safety belt, first adjust your seat – see page 34.

WARNING

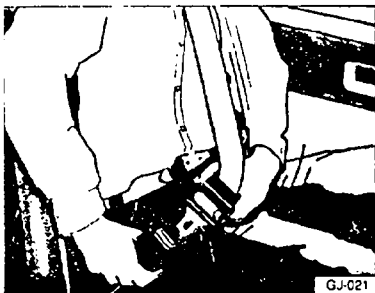
Safety belts only offer optimum protection when the seat back is upright and belts are properly positioned on the body. Improperly positioned safety belts can cause serious personal injury in an accident.

■ To fasten, grasp belt tongue and pull belt in continuous slow motion across your chest and lap.

* Where applicable

18

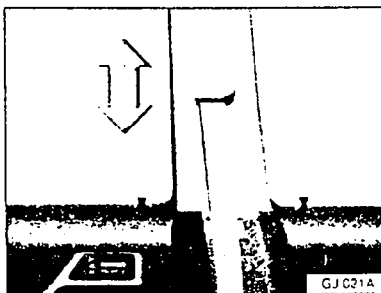
CONTROLS AND EQUIPMENT



■ Insert belt tongue into buckle on inboard side of seat. Push down until it is securely locked with an audible click. Pull belt to check.

WARNING

Always make certain that the safety belt tongue is inserted into the safety belt buckle associated with the corresponding seat. Attaching the safety belt to the buckle for another seat could reduce safety belt effectiveness and cause injury.



Safety belt height adjusters* of the front seats can be used to adjust the height of the shoulder portion of the safety belt.

■ Press the handle slowly up or down so that the shoulder portion of the safety belt is positioned nearly midway over the shoulder.

■ Pull on the shoulder belt to check whether the belt anchor is securely locked in place.

The shoulder belt must be positioned over the shoulder – It must never rest against the neck and must fit against your body. The lap belt must be worn low and tight across the pelvis. Pull belt tight if necessary.



WARNING

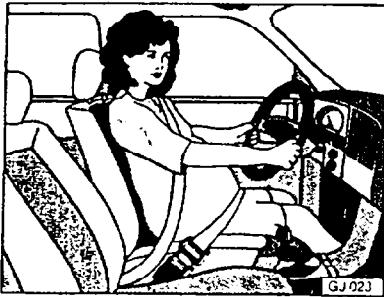
■ Always position safety belts properly over the body for maximum levels of safety. Improperly positioned safety belts can cause serious personal injury in case of an accident.

■ Safety belts worn too loose will allow too much forward movement of your body in a crash. This will increase the risk of personal injury.

* Where applicable

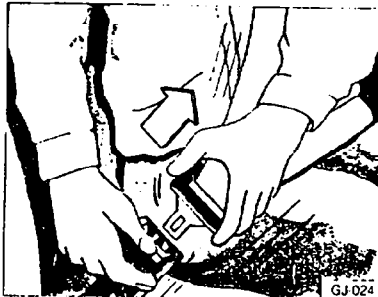
19

CONTROLS AND EQUIPMENT



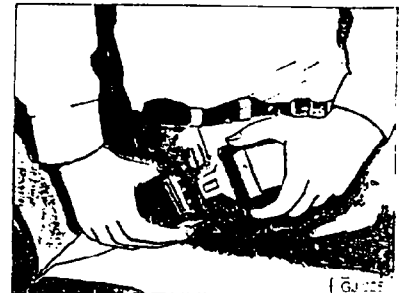
WARNING

Pregnant women should especially make sure to wear the lap portion of the safety belt as low as possible across the pelvis so that there is no pressure on the abdomen.



Unfastening the safety belt

- Push the orange release button on the buckle. The belt tongue will spring out of the buckle.
- Allow belt to wind up on retractor as you guide belt tongue to its stowed position.



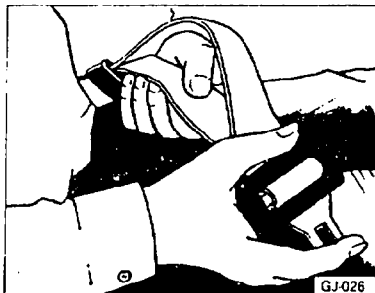
Lap belt

The rear center seating position is equipped with a lap belt.

- Pull the belt over the pelvis and insert the tongue into the buckle.

20

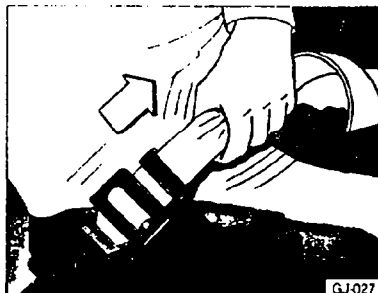
CONTROLS AND EQUIPMENT



- If the belt length is too short, you can lengthen the belt.

Hold belt tongue at a right angle to the belt and loop out the required portion.

For easy operation, press cap and tongue of buckle together.



- To tighten belt, buckle up and pull the loose end of the belt.

WARNING

To reduce the risk of injury in an accident, position the lap belt tight and as low as possible across the pelvis.

Pregnant women should especially make sure to wear the lap portion of the safety belt as low as possible across the pelvis so that there is no pressure on the abdomen.

- To unfasten belt, push in the orange release button on buckle.

Note

For safety reasons, keep the belt on top of the seat and fastened together when it is not being used.

21

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CONTROLS AND EQUIPMENT

RESTRAINT AUTOMATIC SAFETY BELT SYSTEM FOR FRONT SEATS*

The Volkswagen Automatic Safety belt System is a passive restraint system. Driver and front seat passenger are buckled up automatically as they sit down and close the door.

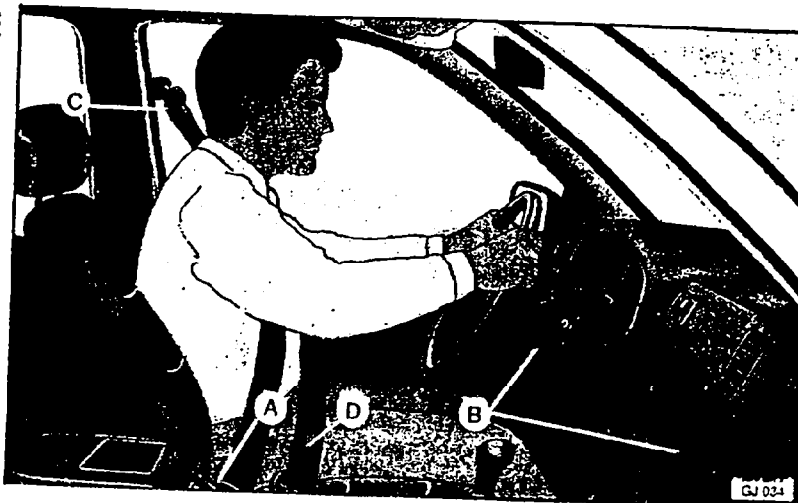
How the automatic seatbelt system works

The front seats of your vehicle are equipped with an automatic passive restraint system consisting of an upper torso belt and an integrated knee bar. The vehicle is also equipped with an additional lap belt. The upper torso restraint attached to the door frame automatically moves into position after you have entered the car and closed the door.

WARNING

■ Never attach the driver's torso belt to belt buckle on the passenger's side. Conversely never attach the passenger's torso belt to the buckle on the driver's side.

■ Make sure that the belt is positioned midway over the shoulder. It must never rest against the neck.



■ Front seat passengers should never ride in a moving vehicle with the seatback reclined. Safety belts only offer optimum protection when the seatback is in an upright position as illustrated.

■ The automatic seatbelt must never be used to hold child's seat as the diagonal belt will not provide the needed protection.

Always heed WARNINGS on page 25.

* Where applicable

26

CONTROLS AND EQUIPMENT

WARNING continued

■ If a child seat must be installed on front passenger seat, a separate lap belt must be mounted to securely the child seat in place. For details see page 28.

■ Improperly routed upper torso belt can cause serious injury in an accident. Always make sure the torso belt does not remain in front of or in contact with the child's head, face or neck. Press the emergency release on upper door frame and feed the belt into the retractor.

Always reconnect the belt after removing child's seat.

Always heed WARNINGS on page 14.

Driver's safety belt warning light and chime

The chime will sound for about six seconds, and the warning light will glow.

Inertia reel retractor (A)

The belt automatically takes up belt slack and adjusts to your normal seating position and movements so that you can conveniently reach all operating controls.

In a sudden stop or impact, the belt's inertia reel retractor automatically locks the belt. Sudden acceleration or hard braking, fast cornering or driving up or down steep hills also locks the belt. To release a locked belt, lean back to take the body pressure off the belt.

Knee bar (B)

The knee bar integrated into the dashboard is designed to restrain the forward movement of the lower torso during an impact and to prevent the occupant from sliding down in the seat and moving underneath the belt. The use of a knee bar also serves to protect the sensitive abdominal region from impact loadings and reduces the potential for serious injury in a wide range of accidents.

Note

The knee bar must not be removed.

Emergency release (C)

If required, press the emergency release on the belt buckle and pull out the belt tongue. Always reconnect the belt to the buckle.

Additional lap belt (D)

The additional lap belt offers those front seat occupants who are more accustomed to a combination lap-shoulder belt the ability to use a system which more closely resembles the seatbelts on previous vehicles which they have become used to.

The lap belt may also offer additional comfort under more extreme road and driving conditions when it may be difficult to maintain firm contact with the seat. Furthermore, in some types of accidents the lap belt may provide additional occupant restraint and mitigate certain types of occupant's injury.

WARNING

The additional lap belt must be routed in front of the automatic belt see illustration on page 26.

27

CONTROLS AND EQUIPMENT

SUPPLEMENTAL AIR BAG SYSTEM*

Your vehicle is equipped with two air bags, one for the driver and the other for the front passenger. The word "AIR BAG" is stamped into the covers on the steering wheel and the instrument panel.

The air bags are intended to supplement the three-point safety belts. When the safety belts are properly worn, the supplemental air bag restraints can provide additional protection for the chest and face of the driver and the front seat passenger in the event of a severe frontal collision.

Aside from providing proven safety benefits, the safety belts are particularly important to help keep front seat occupants in the proper seated position so that the air bag can unfold properly and provide added protection as intended.

It is very important to remember that the supplemental air bag systems are not intended to provide this added protection in side impacts, rear impacts, roll-over accidents or in less severe frontal impacts. Therefore always wear your safety belts.

The air bag system consists of the following components:

An electronic control/monitoring unit, an indicator light in the instrument panel just to the left of the headlight switch and an inflatable air bag equipped with a gas generator located inside the steering wheel and an

inflatable air bag with a gas generator inside the instrument panel.

In addition to this, your vehicle is also equipped with a kneebars for extra protection.

The indicator light (readiness light) in the instrument panel will light up for approximately 10 seconds each time the ignition is switched on.

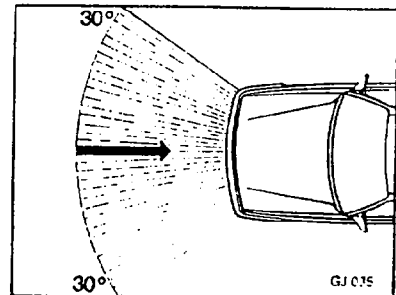
The light monitors the electronic control/monitoring unit, the ignitor and sensor circuits, and the system wiring.

The system must be inspected if the indicator light:

- does not come on when the ignition is switched on;
- does not go out approximately 10 seconds after the ignition is switched on; or
- comes on while driving.

In the event of a system malfunction, the indicator light will come on to catch the driver's attention and then stay on continuously to serve as a constant reminder to have the system repaired.

If any of these conditions occur, have the system inspected immediately by your Volkswagen retailer. If you do not do this, the air bag may not function properly in case of a frontal impact.



How the air bag system works

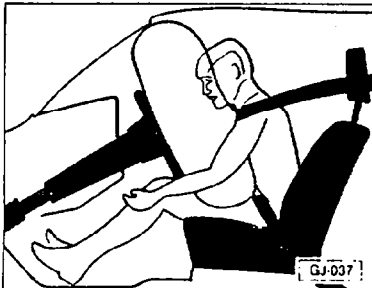
Both air bags inflate only in a severe frontal collision occurring within the area indicated in the illustration. The air bags will not inflate in minor frontal collisions, side or rear collisions, in a rollover or in cases where there is no considerable impact to the front of the vehicle.

When the system is activated, the air bag fills with a propellant gas, breaks open the padded cover and inflates between the driver and steering wheel, as well as between the front passenger and instrument panel.

* Where applicable

30

CONTROLS AND EQUIPMENT



Fully inflated air bags in combination with properly worn safety belts slow down and limit the occupant's forward movement and help to reduce the risk of injury to the head and upper torso. See illustration.

Openings in the air bags then allow the gas to escape quickly. The air bags will deflate sufficiently enabling the front occupants to see forward once the impact has been absorbed.

When the air bag system is activated, fine dust is released. This is normal and is not caused by a fire in the vehicle.

This dust is mostly made up of a powder used to lubricate the air bags as they deploy and could irritate the skin. If you have been in an accident in which the air bags have deployed be sure to wash your hands and face with mild soap and water before eating. Be careful not to get the dust into your eyes or into any cuts or scratches. If the residue should get into your eyes flush them with water.

Importance of proper seating position

In order to help the air bag to do its job, it is important, both as a driver and as a passenger to maintain a proper seating position.

In a frontal collision air bags must inflate within a fraction of a second and with a considerable amount of force in order to provide additional protection for the driver and front seat passenger. Do not sit any closer than necessary to the steering wheel and instrument panel. By keeping room between your body and the front of the passenger compartment, the air bag can inflate fully and completely as intended and do its job more effectively.

Be sure to always:

- adjust the driver's seat properly, consistent with your size. See also page 34.

- make sure that the passenger's seat is no closer than necessary to the instrument panel.

- maintain an upright seating position with your back against the backrest of your seat.

WARNING

Sitting too close to the steering wheel or dashboard will decrease the effectiveness of the air bags and can increase the risk of personal injury in an accident. Always wear safety belts properly and sit upright with the seat no closer to the steering wheel or instrument panel than necessary.

Use of child restraints on the front seat

A child seat or infant carrier installed on the front seat may be struck and knocked out of position by the rapidly inflating passenger's air bag in a frontal collision. The air bag could greatly reduce the effectiveness of the child restraint and even injure the child during inflation.

For this reason and because children are generally better Protected - When Properly restrained for their age and size - in a rear seating Position, we strongly recommend that children always sit in the back seat. See "Child Safety" on Page 22.

CONTROLS AND EQUIPMENT

If exceptional circumstances require the use of a child seat on the front seat, the child's safety and well-being require that the following precautions be taken.

WARNING

■ Never install rearward facing child seats or infant carriers on the front passenger seat. A child can be seriously injured when the passenger air bag inflates and forces the child seat or carrier and child against the backrest, center arm rest or door. Always install rearward facing child seats or infant carriers on the rear seat.

■ Forward facing child seats or infant carriers installed on the front passenger seat may interfere with the deployment of the air bag and cause serious injury to the child. Always install forward facing child seats and infant carriers on the rear seat.

If you must install a forward facing child restraint on the front passenger's seat in exceptional circumstances,

WARNING

— always make sure that the forward facing child seat has been designed and certified by its manufacturer for use on the front seat of a car which is equipped with a passenger side air bag.

— always make sure that the passenger seat is adjusted as far to the rear as possible for the maximum possible distance between the instrument panel and the child. The backrest must remain in an upright position.

Always follow the manufacturer's instructions provided with the child seat or carrier. For further details on the use of child restraints in your Volkswagen see page 25.

Care, Servicing and Disposal

There are some general requirements for air bags which must be observed to make sure that the effectiveness of the system will not be impaired and the components which have been discarded do not cause injury or pollute the environment.

WARNING

■ Do not cover, obstruct or change the steering wheel horn pad or instrument panel above the glove compartment in any way. Such action could adversely affect the performance of the air bag and increase the risk of injury.

■ For cleaning the horn pad or instrument panel, use only a soft, dry cloth or one which has been moistened with water. Solvents or cleaners could adversely affect the air bag cover and proper deployment of the system.

■ Do not make any repairs, adjustments or modifications to the air bag system. Such actions could adversely affect the performance of the air bag, bring about an inadvertent deployment thereby increasing the risk of personal injury.

■ To assure continued reliability, the Air Bag System must be inspected by a qualified Volkswagen technician 4 and 8 years from the date of manufacture appearing on the safety compliance sticker and every two years thereafter. See your authorized retailer.

CONTROLS AND EQUIPMENT

WARNING

■ The replacement date is found on the label on the upper surface of the front passenger's sun visor. It is absolutely essential to observe this date in order to assure that the system is in good working order.

■ If components of the air bag system must be discarded, or if the vehicle must be scrapped, certain safety precautions must be observed. Your Volkswagen retailer knows these precautions and can give you the necessary information. Failure to follow these precautions and procedures could increase the risk of personal injury.

■ Any work on the air bag system, such as removing/installing, repairing, or any work on the steering wheel must be performed by a qualified technician who has the training and special equipment necessary. Improper handling of the air bag system may result in serious personal injury. For any work on the air bag system, we strongly recommend that you see your Volkswagen retailer.

WARNING

■ The air bag system can only be activated once. After it has been used, it must be replaced.

■ If you sell your vehicle, be sure to inform the new owner of these important points and make certain that this manual is transferred to the new owner together with the vehicle.