

REPORT NUMBERS: 208-CAL-91-07
212-CAL-91-07
301-CAL-91-07

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

**CHRYSLER CORPORATION
1991 DODGE SHADOW
2-DOOR CONVERTIBLE**

NHTSA NUMBER: CM0301

CALSPAN TEST NUMBER: 7853-9

March 19, 1991

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FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation
National Highway Traffic Safety Administration
ENFORCEMENT
Office of Vehicle Safety Compliance
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Washington, DC 20590

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				6. Performing Organization Code CAL	
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16. Abstract A 30 mph vehicle safety compliance test was conducted on a 1991 Dodge Shadow 2-Door Convertible. This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on March 19, 1991. 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 29.3 mph. The ambient temperature at the impact face was 39°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 side airbag and passenger side manual 3-point seat belt. Driver manual 3-point seat belt was not used for this test.					
17. Key Words 30 mph Vehicle Safety Compliance Testing FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219, "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity" Frontal Impact			18. Distribution Statement <u>Copies of this report are available from:</u> Technical Reference Division National Highway Traffic Safety Admin. Nassif Building, Room 5108 (NAD-52) 400 Seventh St., S.W., Washington, DC 20590		
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Section I
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. DTNH22-90-C-01003. The purpose of this test was to determine if the subject vehicle, a 1991 Dodge Shadow 2-Door Convertible, 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-208-08, dated September 8, 1989.

Section 2

SUMMARY OF TEST NUMBER CM0301

A frontal barrier was impacted by a 1991 Dodge Shadow 2-Door Convertible at a velocity of 29.3 mph. The test was performed at the Calspan Corporation Advanced Technology Center on March 19, 1991. 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 triaxial accelerometers and left/right femur load cells and chest potentiometers. These ATDs had been certified prior to the test.

The 25 channels of data were recorded on two 14-channel FM tape recorders. Appendix B contains the vehicle and dummy response data traces.

The driver's HIC was 201. The maximum chest deceleration over 3 milliseconds was 47.8 g's with a chest displacement of 0.5 inches. The maximum force on the driver's left femur was 1378 pounds and 1232 pounds on the right femur.

The right front passenger's HIC was 260. The maximum chest deceleration over 3 milliseconds was 43.7 g's with a chest displacement of 2.0 inches. The maximum force on the passenger's left femur was 646 pounds and 678 pounds on the right femur.

Table 1

CRASH TEST SUMMARYVehicle NHTSA No.: CM0301 Test Mode: 30 mph Frontal BarrierTest Date.: March 19, 1991 Time: 14:00 Temperature: 39°FVehicle Make/Model/Body Style: 1991 Dodge Shadow 2-Door ConvertibleVehicle Test Weight: 3370 lbs.Vehicle/Barrier Impact Angle: 0°Impact Velocity: 29.3 mphMaximum Static Crush: 22.4 in.Vehicle Rebound: 11.1 in.DUMMIES:DRIVERPASSENGERType: Part 572-E Part 572-E*Restraint System: Air Bag 3-Point Manual
Seat Belt RestraintNumber of Data Channels: 25Number of Cameras: 1 Real Time14 High SpeedDOOR OPENING DATA: closed-operable - Left Frontclosed-operable - Right Front

Front Seat(s) Data:

DRIVERPASSENGERSeat Track Failure: 3.5 0.7

inches of shift

Seat Back Failure: none noneVISIBLE DUMMY CONTACT POINTS:DRIVERPASSENGERHead: Airbag Top of Head - SunvisorAbdomen No Contact No ContactChest No Contact No ContactKnees lower dash panel Glovebox

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1991 Dodge Shadow 2-Door Convertible
 NHTSA No. CM0301 ; VIN: 3B3XP45K3MT001407 ; Color: Blue
 Engine Data: 4 cylinders; - CID; 2.5 Litres; - cc
 Placement - Longitudinal or In-Line; X Transverse or Lateral
 Transmission Data: - speeds; - Manual; X Automatic; - Overdrive
 Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive
 Major Options: - A/C; X Pwr. Strg.; X Pwr. Brakes; X Pwr. Windows
- Power Door Locks
 Date Received: 01-02-91 ; Odometer Reading 60 miles
 Selling Dealer: Hamburg Dodge Inc.
 & Address 395 Buffalo St., Hamburg, NY

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Chrysler Corporation*
 Date of Manufacture: 08-90
 GVWR: 3705 lbs.; GAWR: 2038 lbs. FRONT: 925 lbs. REAR: 779 lbs.

DATA FROM TIRE PLACARD: NOTE: No Tire Placard found on vehicle.

Tire Pressure with Maximum Capacity Vehicle Load: - psi FRONT
- psi REAR
 Recommended Tire Size: - Load Range: -
 Recommended Cold Tire Pressure: - psi FRONT; - psi REAR
 Size of Tires on Test Vehicle: P185/70R14; Manufacturer: Goodyear
 Vehicle Capacity Data:
 Type of Front Seats: - Bench; X Bucket; - Split Bench
 Number of Occupants: 2 Front; 2 Rear; 4 Total
 Vehicle Capacity Weight (VCW) = 715 lbs.
 No. of Occupants x 150 lbs. = 600 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 115 lbs. (Difference)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS) = UDW:

Right Front = 900 lbs. Right Rear = 540 lbs.
 Left Front = 930 lbs. Left Rear = 570 lbs.
 TOTAL FRONT = 1830 lbs. TOTAL REAR = 1110 lbs.
 % of Total Vehicle Weight = 62.2 % of Total Weight = 37.8
 TOTAL DELIVERED WEIGHT = 2940 lbs.

NOTE: Tag on driver's side door frame stated: "Vehicle was altered by Automobile Specialty Co., Toluca, MEX".

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight	=	<u>2940</u>	lbs.
Rated Cargo/Luggage Weight (RCLW)	=	<u>115</u>	lbs.
Weight of 2 P.572 Dummies @ 164 ea.	=	<u>328</u>	lbs.
TARGET TEST WEIGHT	=	<u>3383</u>	lbs. (sum)

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 0 POUNDS OF CARGO WEIGHT:

Right Front =	<u>950</u>	lbs.	Right Rear =	<u>700</u>	lbs.
Left Front =	<u>1030</u>	lbs.	Left Rear =	<u>690</u>	lbs.
TOTAL FRONT =	<u>1980</u>	lbs.	TOTAL REAR =	<u>1390</u>	lbs.
% of Total Weight =	<u>58.8</u>	%	% of Total Weight =	<u>41.2</u>	%
TOTAL TEST WEIGHT =	<u>3370</u>	lbs.			
Weight of Ballast Secured in Vehicle Trunk Area =	<u>0</u>	lbs.			
Vehicle Components Removed for Weight Reduction	<u>None</u>				

VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED:	RF <u>26.2"</u>	LF <u>26.1"</u>	RR <u>25.5"</u>	LR <u>25.3"</u>
FULLY LOADED:	RF <u>24.9"</u>	LF <u>24.8"</u>	RR <u>24.0"</u>	LR <u>23.7"</u>
AS TESTED:	RF <u>25.6"</u>	LF <u>25.5"</u>	RR <u>24.8"</u>	LR <u>24.5"</u>
Vehicle's Wheel Base:	<u>97.8</u>	in.		
Location of Vehicle's C.G.:	<u>40.3 inches rearward of front wheel center.</u>			

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual =	<u>13.7</u>	gallons
Usable Capacity Figure Furnished by COTR =	<u>13.7</u>	gallons
Test Volume Range (92 to 94% of Usable Capacity) =	<u>12.6</u> to <u>12.9</u>	gallons
ACTUAL TEST VOLUME =	<u>12.7</u>	gallons (with entire fuel system filled)

Table 3

POST IMPACT DATATYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
 Test Date: March 19, 1991 Time: 14:00 Temperature: 39 °F
 Vehicle NHTSA No.: CM0301
 Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.3 mph; Trap No. 2 = 29.3 mph
 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 = 168.1 ; C/L = 171.9 ; Left = 168.4
 Post-Test Right = 151.2 ; C/L = 149.5 ; Left = 154.7
 Crush Right = 16.9 ; C/L = 22.4 ; Left = 13.7
 AVERAGE = 17.7 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

Right = 11.3 " ; C/L = 10.8 " ; Left = 11.2 "
 AVERAGE = 11.1 inches

DOOR OPENING:

	Left	Right
Front	<u>operable</u>	<u>operable</u>
Rear	<u>N/A</u>	<u>N/A</u>

SEAT MOVEMENT:

	Seat Back Failure	Seat Shift
Front	<u>None</u>	<u>3.5" Driver, 0.7" Passenger</u>
Rear	<u>N/A</u>	<u>N/A</u>

Table 3
POST IMPACT DATA (cont.)

GLAZING DAMAGE: None. _____

OTHER NOTABLE IMPACT FEATURES: None. _____

Section 3
OCCUPANT AND VEHICLE DATA

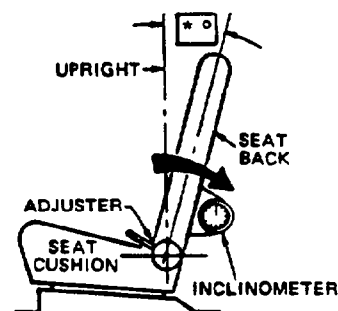
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1991 Vehicle Model: Dodge Shadow Body Style: 2-Door Convertible

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



LEFT SIDE VIEW

Seat back angle for driver's seat *

Measurement instructions: Align adjuster with 3rd mark.

Seat back angle for passenger's seat: *

Measurement instructions: Same as driver.

2. Seat Fore and Aft Positioning

Provide instructions for positioning the driver and front outboard passenger seat(s) in the center of fore and aft travel. For example, provide information to locate the detent in which the seat track is to be locked.

Positioning of the driver's seat: Seat placed in 6th detent (mid-position)
from a total of 11 detents.

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

3. Fuel Tank Capacity Data

A. "Usable Capacity" of the standard equipment fuel tank is 13.7 gallons

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

Additional Instructions: None.

*Seat was positioned according to manufacturer's specifications.

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION

Test No.: CM0301 Vehicle: 1991 Dodge Shadow 2-Door Convertible

SEAT TYPE:

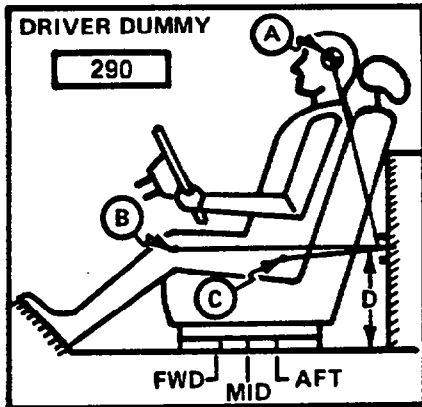
 Bench
 X Bucket
 Split Bench

ADJUSTER TYPE:

 X Manual
 Power

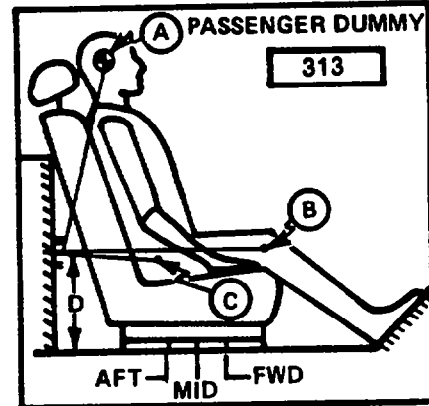
SEAT BACK TYPE:

 Fixed
 X Adjustable Reclining



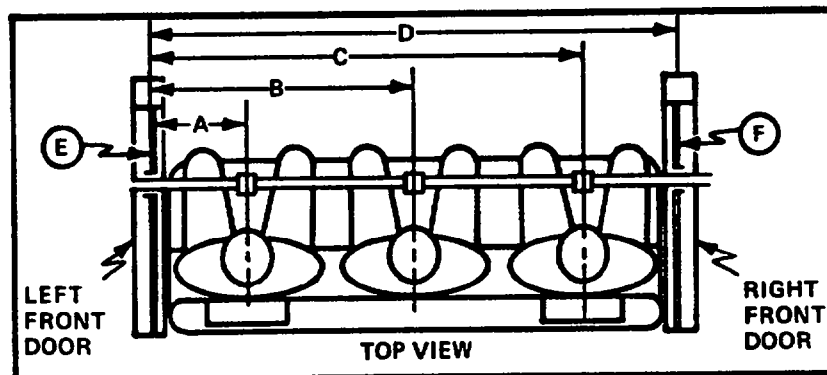
MEASUREMENT LOCATION

- A - Head Target
- B - Knee Joint
- C - Approximate 'H' Point
- D - Sill to Reference Point



A = 28.7 in. 40 Degrees
 B = 37.5 in. 92 Degrees
 C = 22.4 in. 104 Degrees
 D = 14.5 in.

A = 28.2 in. 40 Degrees
 B = 37.5 in. 93 Degrees
 C = 22.1 in. 103 Degrees
 D = 14.5 in.



S/N 290

DUMMY ID

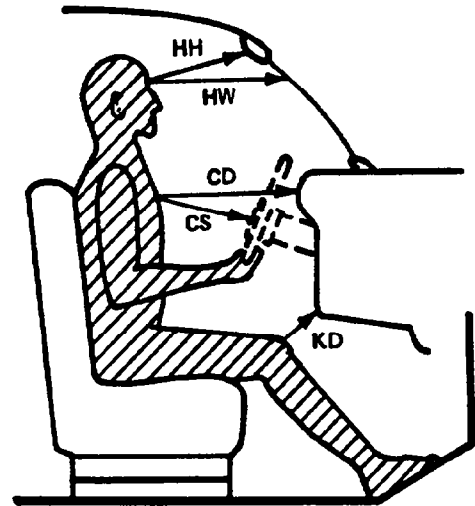
S/N 313

A = Left Door to Driver Centerline 12.7 in.
 B = Left Door to Center Passenger Centerline in.
 C = Left Door to Right Passenger Centerline 38.6 in.
 D = Left Door to Right Door 50.9 in.
 E, F = Window Glass Height (Right and Left Must Be Equal) 11.0 in.

Figure 3

OCCUPANT CLEARANCE DIMENSIONS

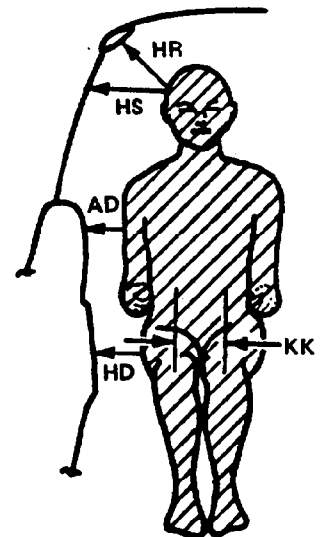
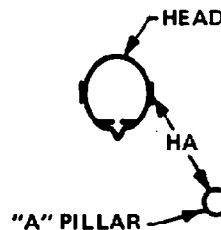
	DRIVER	PASSENGER
HH	11.7	12.0
HW	17.0	17.4
CD	17.7	20.5
CS	9.1	-
KDL	4.7	4.8
KDR	5.1	4.7
SA	See Note	See Note
TA	21°	21°



NOTE: Seat was positioned according to manufacturer's specifications.

HH = Head to Windshield Header
 HW = Head to Windshield
 CD = Chest to Dash
 CS = Chest to Steering Wheel
 KD(L/R) = Knee to Dash (Left/Right)
 SA = Seat Back Angle
 TA = Torso Angle

HA = Head Target to "A" Pillar
 HR = Head to Side Roof
 HS = Head to Side Window
 AD = Arm to Door
 HD = Hip to Door
 KK = Knee to Knee



	DRIVER	PASSENGER
HR	6.4	6.4
HS	9.6	9.4
AD	4.3	4.4
HD	7.2	7.3
KK	8.5	8.5
HA	16.8	16.7

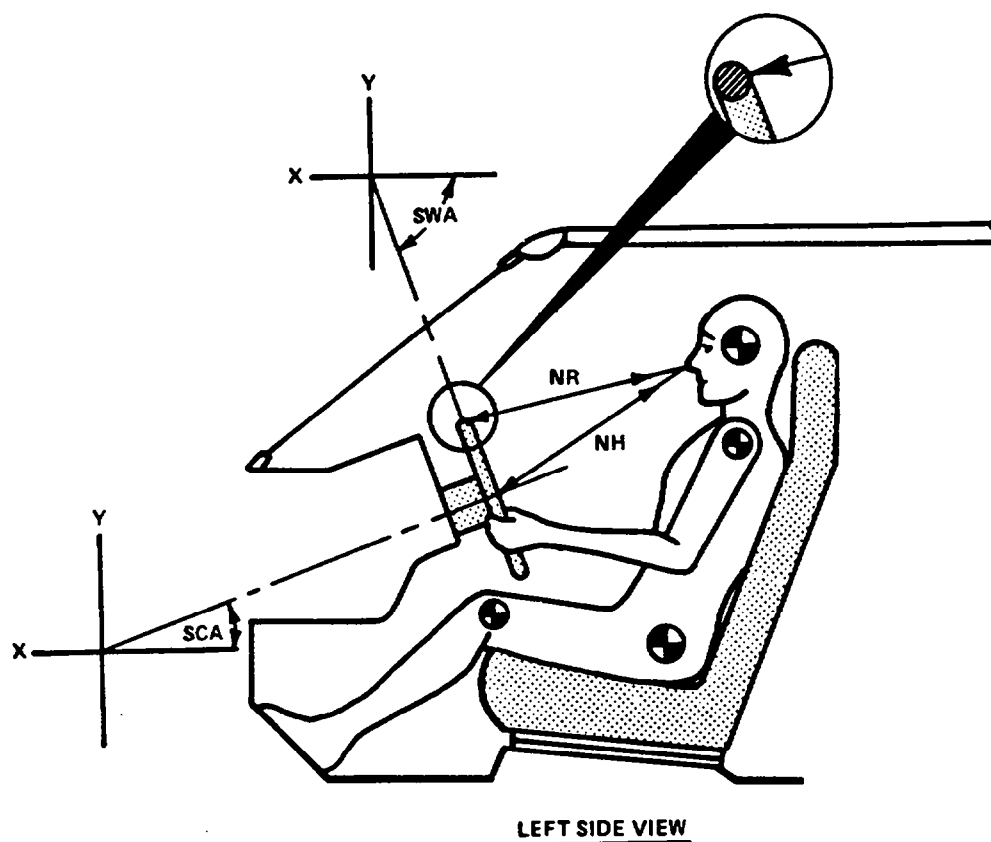
H-Point from Target ** Position

	DRIVER	PASSENGER
Longitudinal	0.3" forward	0.2" forward
Vertical	0.4" below	0.2" below

**Target position determine using H-point machine.
 Longitudinal target is: H-point machine value $\pm 0.5"$.
 Vertical target is: (H-point machine value $-0.25"$) $\pm 0.5"$

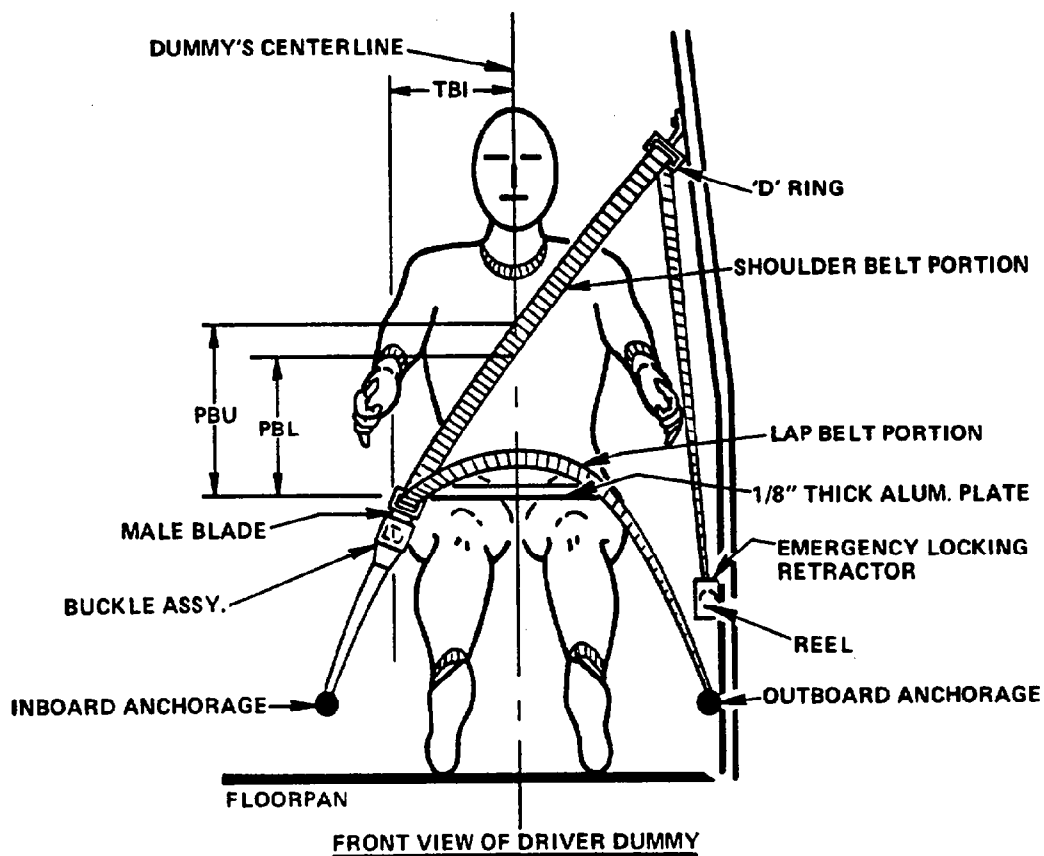
Figure 4

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



		MEASUREMENTS	
<u>NR</u>	-- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	13.4	Inches
<u>NH</u>	-- Distance from tip of dummy's nose to center of steering wheel hub	15.0	Inches
<u>SCA</u>	-- Angle of steering column relative to the horizontal X axis	24	Degrees
<u>SWA</u>	-- Angle of steering wheel relative to the horizontal X axis	-66	Degrees

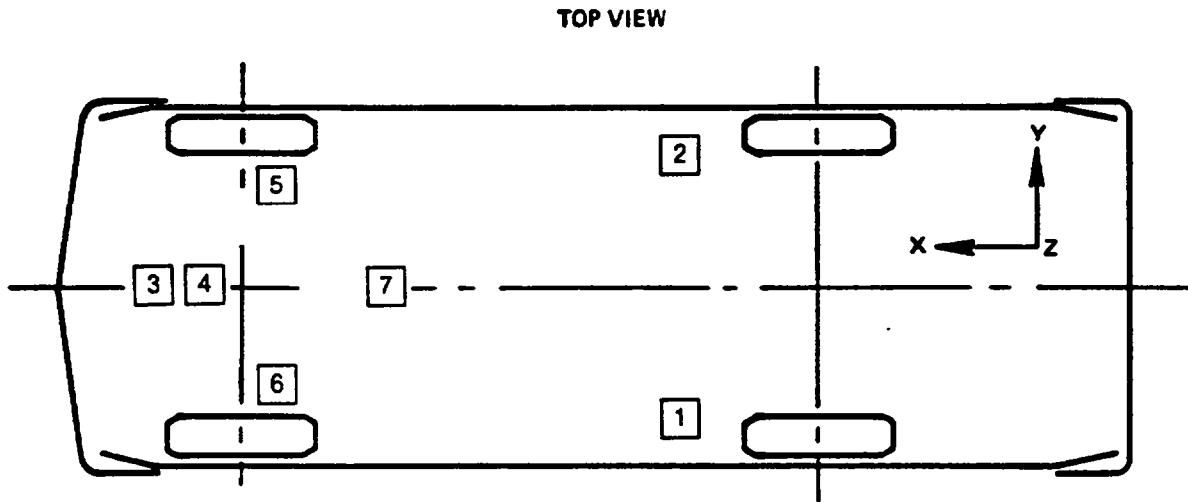
Figure 5
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	*	14.9
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	*	11.9
<u>TBI</u> -- Distance from torso centerline to buckle	*	8.3

*The driver 3-point manual restraint system was not used in this test. Driver restrained by supplemental inflatable restraint system (SIR).

Figure 6
VEHICLE ACCELEROMETER LOCATIONS



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	Left Disc Brake Caliper	X		
7	Instrument Panel	X		

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

Table 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION**		NEGATIVE DIRECTION**	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	REAR SEAT X-MEMBER PRE:	62.3	13.2	15.1				
	AT LEFT SIDE POST:	62.3	13.2	15.0				
	LONGITUDINAL ACCELERATION				4	130	-32	63
2	REAR SEAT X-MEMBER PRE:	62.3	-12.4	15.1				
	AT RIGHT SIDE POST:	62.3	-12.4	15.0				
	LONGITUDINAL ACCELERATION				3	127	-29	72
3	TOP OF ENGINE BLOCK PRE:	139.0	-10.2	34.1				
	POST:	134.2	-10.3	33.8				
	LONGITUDINAL ACCELERATION				32	55	-82	43
4	BOTTOM OF ENGINE PRE:	137.1	-8.0	8.2				
	POST:	130.0	-8.0	8.6				
	LONGITUDINAL ACCELERATION				35	46	-46	37
5	BRAKE CALIPER AT PRE:	136.1	-22.9	19.0				
	RIGHT SIDE POST:	134.0	-22.5	19.0				
	LONGITUDINAL ACCELERATION				63	74	-125	53
6	BRAKE CALIPER AT PRE:	136.1	22.9	18.7				
	LEFT SIDE POST:	133.0	22.5	18.8				
	LONGITUDINAL ACCELERATION				40	75	-93	52
7	DASH PANEL PRE:	106.9	-2.0	28.2				
	POST:	106.9	-2.0	28.2				
	LONGITUDINAL ACCELERATION				30	66	-99	56

*X + Forward from rear bumper
 Y + Left from vehicle centerline
 Z + Up from ground

**
 LONGITUDINAL:
 LATERAL:
 VERTICAL:

POSITIVE
 FORWARD
 LEFTWARD
 UPWARD

NEGATIVE
 REARWARD
 RIGHTWARD
 DOWNWARD

DISTANCE MEASUREMENTS IN INCHES

Figure 7
CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5.

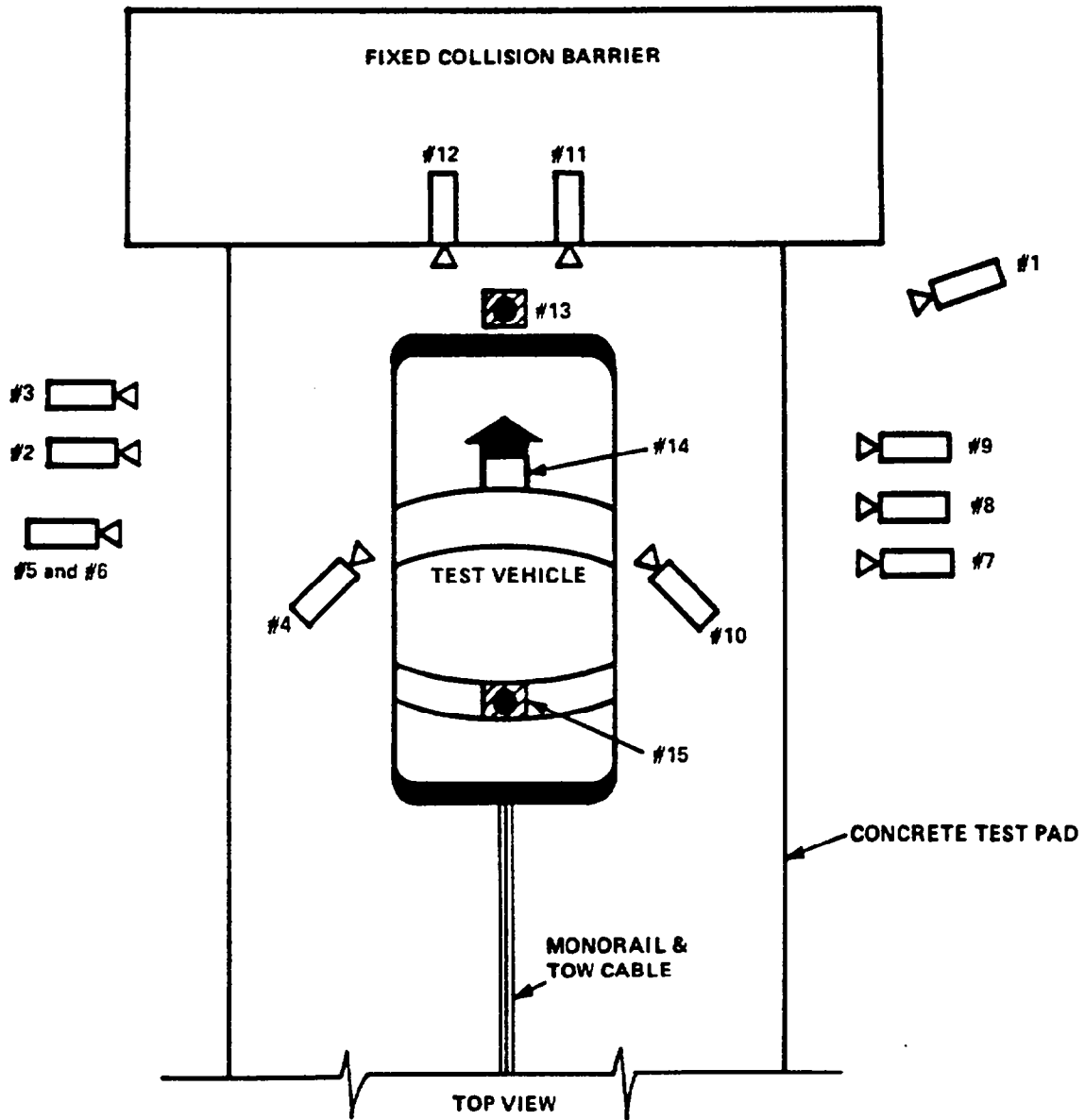


Table 5

HIGH-SPEED CAMERA LOCATIONS

Test No. J22-070-1049 Vehicle: 1991 Dodge Shadow 2-Door Convertible

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	215	52	41	-4	198.5	13	555
3	Left Side View	295	37	41	-4	278.5	25	570
4	Driver and Interior View	110	99	75	-18	-	13	655
5	Steering Column (Bottom)	261	71	46	-3	244.5	25	555
6	Steering Column (Top)	261	71	70	-8	244.5	25	555
7	Overall Right Side	225	70	41	-3	208.5	13	910
8	Right Side View	290	54	41	-3	273.5	25	620
9	Right Passenger View	294	75	57	-4	277.5	35	485
10	Passenger and Interior View	108	101	72	-19	-	13	535
11	Passenger Front View	23	18	75	-46	-	13	540
12	Driver Front View	23	18	75	-46	-	13	535
13	Windshield View	0	0	130	-53	-	13	555
14	Pit View of Engine	0	24	-120	90	-	13	810
15	Pit View of Fuel Tank	0	94	-120	90	-	13	775

*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plan to ground

** = referenced to horizontal plane

VEHICLE TARGET LOCATIONS



Figure 9
TEST VEHICLE MEASUREMENTS

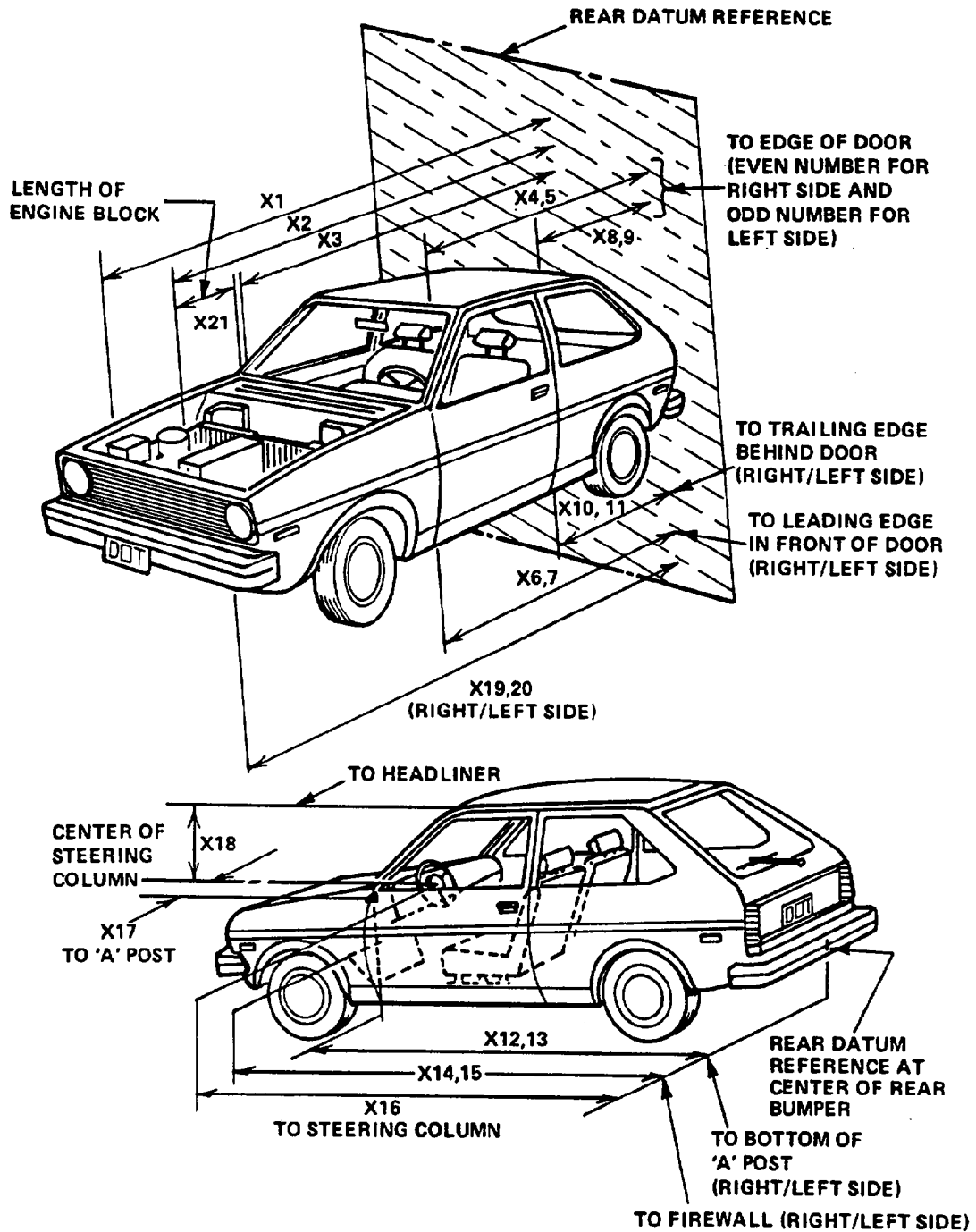


Table 6

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	171.9	149.5	22.4
X2	Rear Surface of Vehicle to Front of Engine	146.5	142.6	3.9
X3	Rear Surface of Vehicle to Firewall	125.7	122.7	3.0
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	112.5	112.0	0.5
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	112.3	112.2	0.1
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	113.0	112.8	0.2
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	112.8	112.5	0.3
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	62.5	62.5	0.0
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	62.4	62.2	0.2
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	61.3	61.0	0.3
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	61.0	60.8	0.2
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	113.3	113.3	0.0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	112.9	112.7	0.2
X14	Rear Surface of Vehicle to Firewall, Right Side	126.3	124.5	1.8
X15	Rear Surface of Vehicle to Firewall, Left Side	128.5	124.9	3.6
X16	Rear Surface of Vehicle to Steering Column	95.4	95.1	0.3
X17	Center of Steering Column to "A" Post	16.2	17.6	-1.4
X18	Center of Steering Column to Headliner	17.1	17.0	0.1
X19	Rear Surface of Vehicle to Right Side of Front Bumper	168.1	151.2	16.9
X20	Rear Surface of Vehicle to Left Side of Front Bumper	168.4	154.7	13.7
X21	Length of Engine Block	12.0	12.0	0.0

Section 4

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

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

Table 7

DUMMY INJURY CRITERIA VALUESNHTSA No.: CM0301 Vehicle: 1991 Dodge Shadow 2-Door Convertible

	MAXIMUM ACCELERATION (g's)							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
Dummy (1)	-43	12	-12	45	-48	10	-9	48
Dummy (2)	-35	10	36	43	-44	10	-12	44

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	1378	1232
Dummy (2)	646	678

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc. (g) t ₁ TO t ₂
		t ₁ (SEC)	t ₂ (SEC)	
Dummy (1)	201	.05892	.09480	31.6
Dummy (2)	260	.08652	.12240	35.0

*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No. 208

Table 8

FMVSS NO. 208 - SEAT BELT WARNING SYSTEM CHECK

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

Log time duration of audible warning signal = 6.0 sec.

Log time duration of reminder light operation = 6.0 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 = 0.0 sec.

(audible warning should not operate)

Log time duration of reminder light operation = 6.0 sec.

Note wording of visual warning:

Fasten Seat Belt -

Fasten Belt -

Symbol 101-80 X

Table 9

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: Inside surface of glove box door.

The manufacturers recommended schedule is to inspect this system:

- a. by - month, 0 year
- b. by 30,000 miles
- c. or after a time interval of - months or 3 years.
or, if airbag light does not come on momentarily after
ignition is turned on or if light flashes during driving.

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 systems? YES X NO -

Table 10

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:

Lower right side 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 11

FMVSS NO. 208 - COMFORT AND CONVENIENCE TEST SUMMARY

Test Vehicle NHTSA No.:	<u>CM0301</u>
Make/Model:	<u>1991 Dodge Shadow</u>
Date of Comfort/Convenience Check:	<u>3/18/91</u>
Technician Performing Check:	<u>DJT</u>
GVWR:	<u>3705 lbs.</u>

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.

**Vehicle equipped with driver side airbag.

Table 11 (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 X NO

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 X NO

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 (nonengaged).

YES X NO

D2

WEBBING TENSION - RELIEVING DEVICE

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

YES NO X

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

YES N/A NO N/A

(If NO, provide explanation.)

Check the option which applies to this test vehicle:

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

YES N/A NO N/A

(If NO, provide explanation.)

Table 11 (cont.)

2. This vehicle is equipped with manual belts, required to meet FMVSS 208 S4.6, and the tension relieving device is cancelled each time one of the following options occurs:
- a. The adjacent door is opened.
YES N/A NO N/A
- b. The latch plate is released from the buckle.
YES N/A NO N/A
3. This is an open-body vehicle, without doors. Does the manual mean to cancel any shoulder belt slack introduced by a tension relieving device operate properly?
YES N/A NO N/A

(If NO, provide explanation.)

D3

BELT CONTACT FORCE

1. Do not measure the belt contact force if the manual or automatic seat belt assemblies in this vehicle incorporate a webbing tension relieving device. Does the vehicle incorporate a tension relieving device?
YES NO X
2. Seats are adjusted according to instructions in Appendix B.
YES X NO
3. The test dummies are positioned according to dummy position placement instructions in Appendix B and Appendix C.
YES X NO
4. Close the vehicle's adjacent door, pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest, then fasten the latch. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point, pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest. Measure the contact force exerted by the belt webbing on the dummy's chest. The contact for is 0.5 pounds. Contact the COTR if the contact force exceeds 0.7 pounds.

Table 11 (cont.)

D4

LATCHPLATE ACCESS

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

YES X NO

2. Attach the inboard and outboard reach string.

YES X NO

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

YES X NO

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

YES X NO

D5

RETRACTION

1. Seats and seat backs are adjusted according to instructions in Appendix B "General Test Conditions" in TP-208-8.

YES X NO

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

YES X NO

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

YES N/A NO N/A

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

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

YES X NO

Table 11 (cont.)

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

YES X NO

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

YES X NO

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

YES N/A NO N/A

D6

ACCESSIBILITY

The requirements for accessibility do not apply to:

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

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

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

YES X NO

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

YES X NO

Table 11 (cont.)

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

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

YES _____ NO X

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

YES _____ NO X

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

YES _____ NO X

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 X NO _____

D7

LATCH MECHANISM

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

Automatic Belt Assembly used for this test.

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

YES X NO _____

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

YES X NO _____

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

YES X NO _____

Figure 10

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA SHEET

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

Windshield is bonded in place with 0.6" rubber and plastic trim along top and sides of windshield. Lower portion of windshield is covered by a plastic shroud.

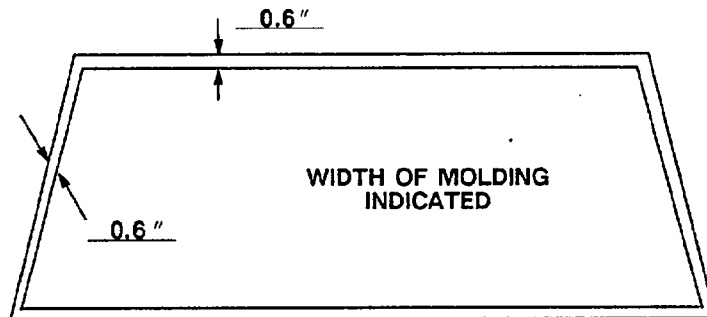
FMVSS 212 REQUIREMENTS:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles 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	77.9	77.9	100%
LEFT SIDE	77.9	77.9	100%
TOTAL	155.8	155.8	100%

AREA OF RETENTION FAILURE:



FRONT VIEW

FAILURE DETAILS:

None.

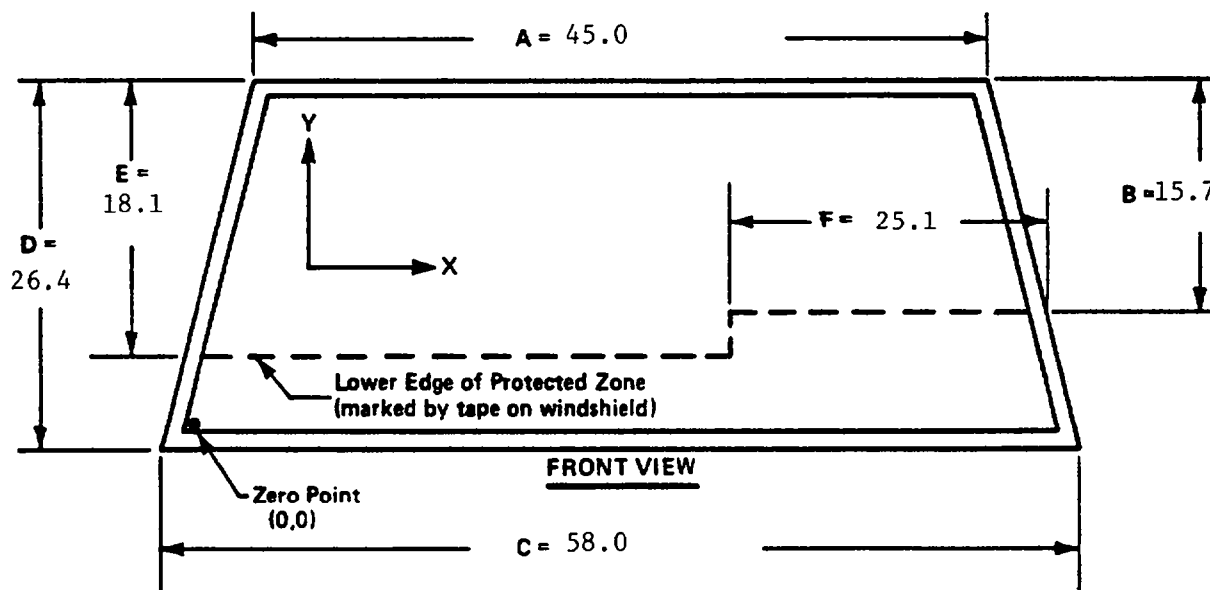
Figure 11

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.)



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

(Show location of penetration on above sketch)

None.

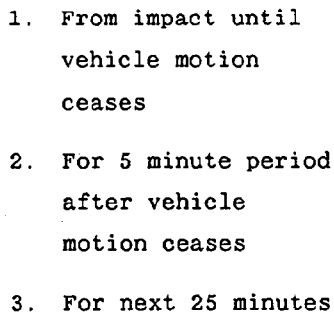
COORDINATES		
	X	Y
1.		
2.		
3.		
4.		

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

TEST VEHICLE NHTSA NO.: CM0301 TEST DATE: 3/19/91

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.

FUEL SPILLAGE MEASUREMENT:



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

None .

Table 13

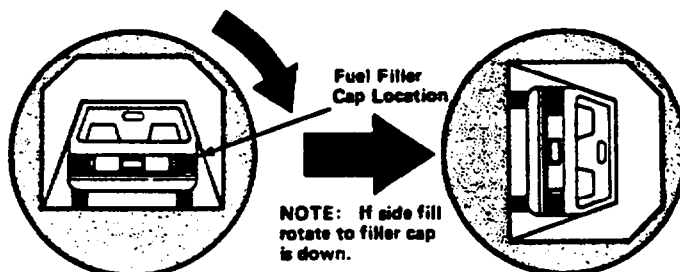
FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:

0°

90°

Vehicle NHTSA ID No.:

CM0301

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 3 minutes 00 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL

8 minutes 00 seconds

Next whole minute interval

8 minutesII. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 13

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

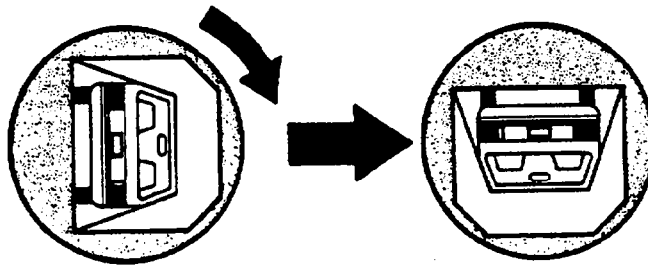
TEST PHASE:

90°

180°

Vehicle NHTSA ID No.:

CM0301



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 58 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL

7 minutes 58 seconds

Next whole minute interval

8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S):

None.

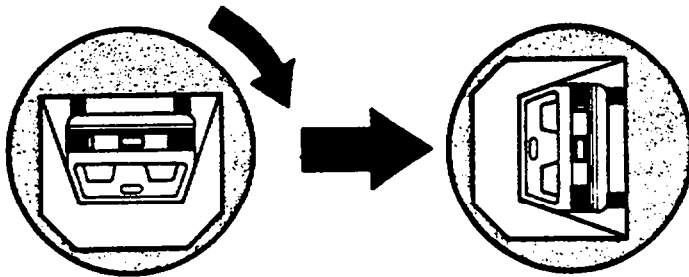
Table 13

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

TEST PHASE:

180°**270°**

Vehicle NHTSA ID No.:

CM0301I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 3 minutes 00 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL

8 minutes 0 seconds

Next whole minute interval

8 minutesII. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S):

None.

Table 13

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

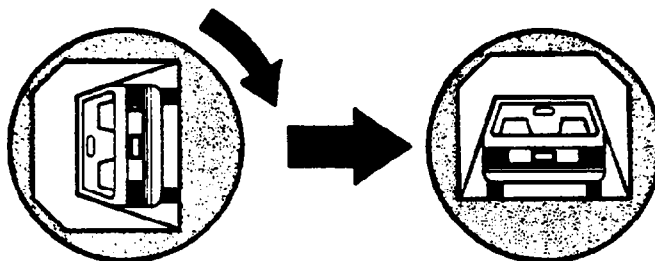
TEST PHASE:

270°

360°

Vehicle NHTSA ID No.:

CM0301



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time _____ 3 minutes _____ 00 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + _____ 5 minutes _____ 00 seconds

TOTAL

_____ 8 minutes _____ 00 seconds

Next whole minute interval

_____ 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S):

None.

Table 14

TEST VEHICLE NONCOMPLIANCE NOTICE

NHTSA Contract Lab: Calspan Advanced Technology Center

Lab Project Manager & Telephone No.: Walter E. Levan (716) 632-7500

Date of Test: March 19, 1991 Vehicle NHTSA No.: CM0301

Vehicle Manufacturer: Chrysler Corporation

Model Year: 1991 VIN: 3B3XP45K3MT001407

Body Style: 2-Door Convertible Build Date: August 1990

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

Impact Velocity: 29.3 mph Time of Test: 14:00

*Type of Automatic Restraint System: Driver side airbag, passenger side 3-point
manual belt.

Failure Details:

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

Appendix A

PHOTOGRAPHS

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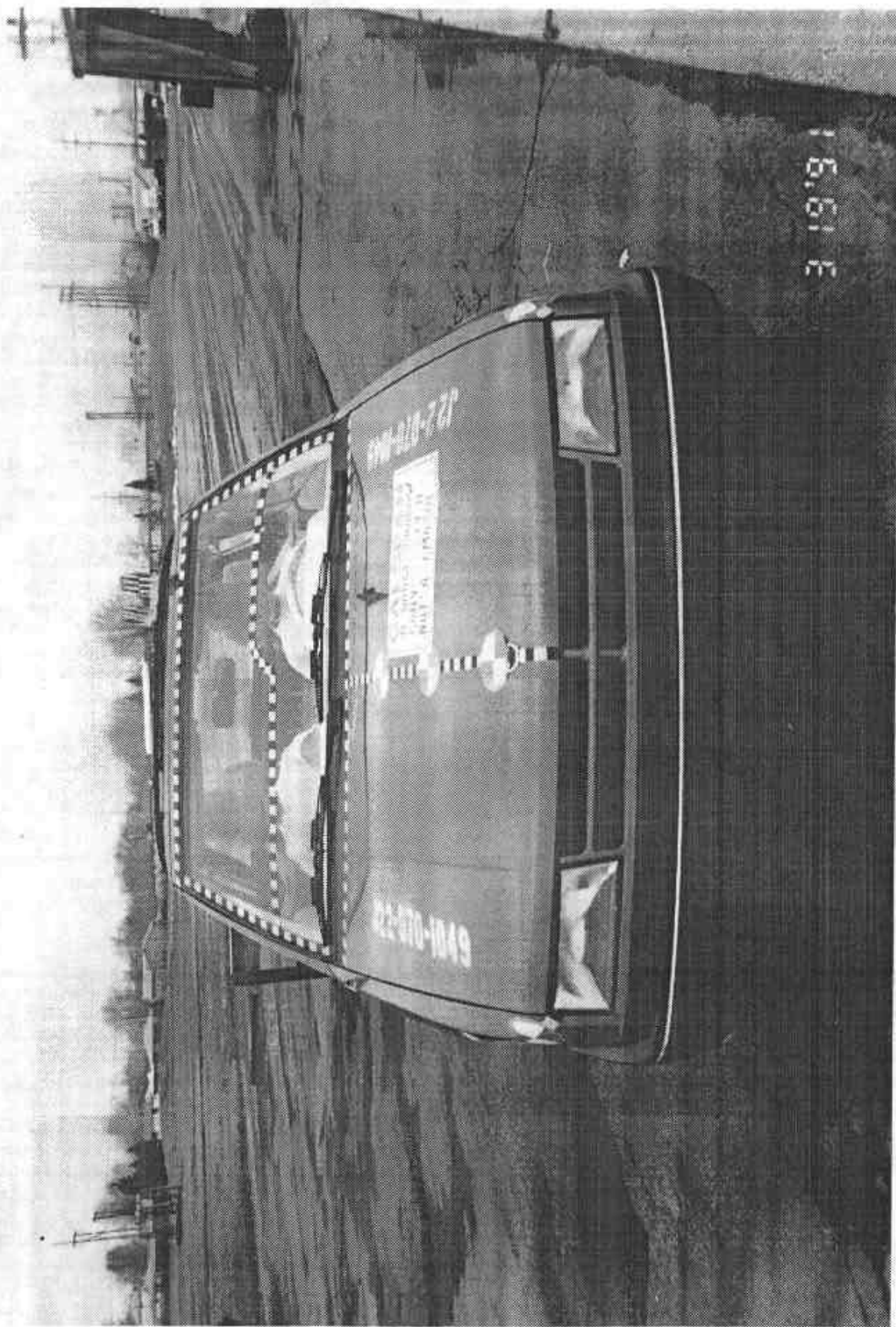


FIGURE A-1 PRE-TEST FRONT VIEW

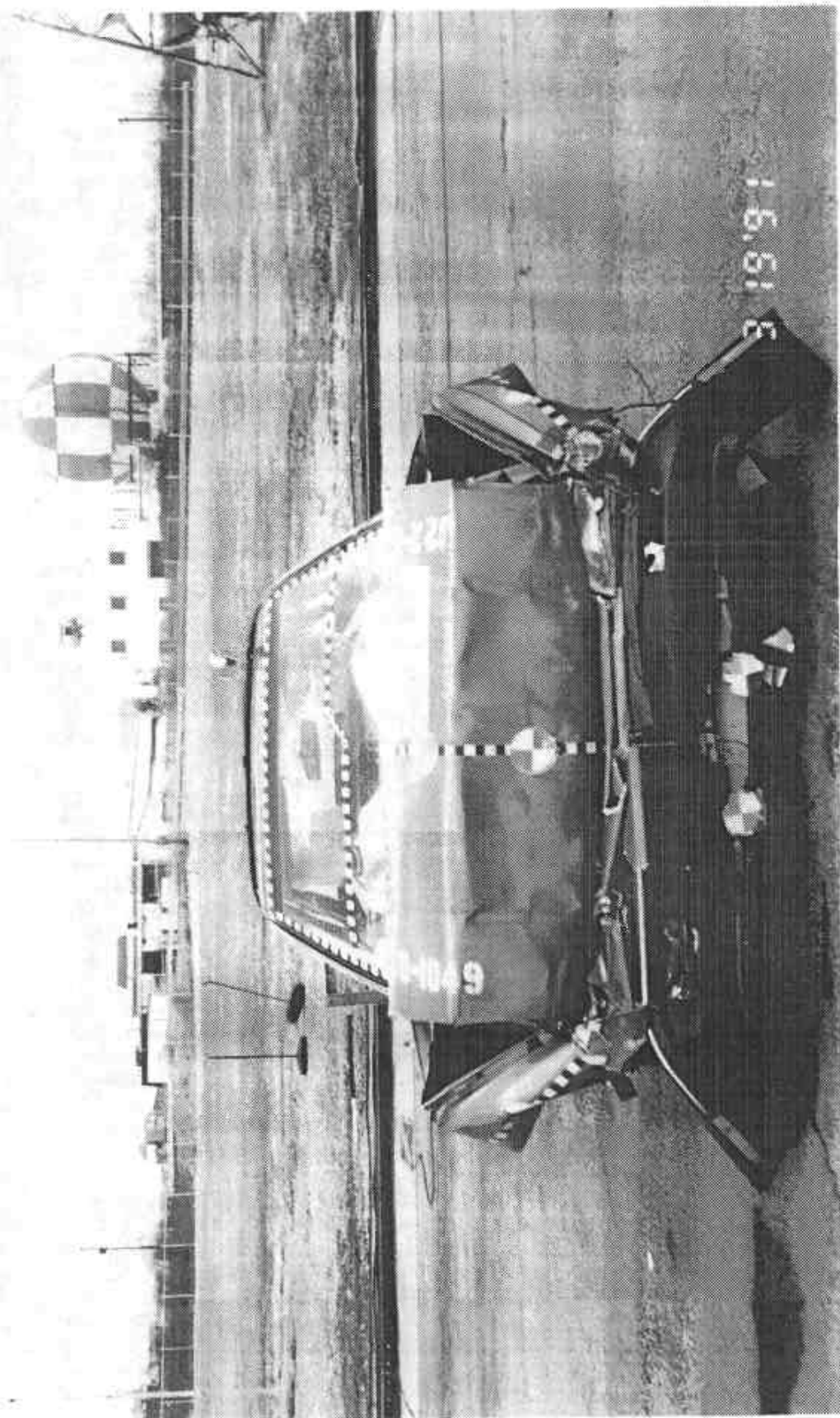


Figure A-2 POST TEST FRONT VIEW

A-4

7853-9



A-5

7853-9

Figure A-3 PRE-TEST LEFT SIDE VIEW

16.61
3 19.91

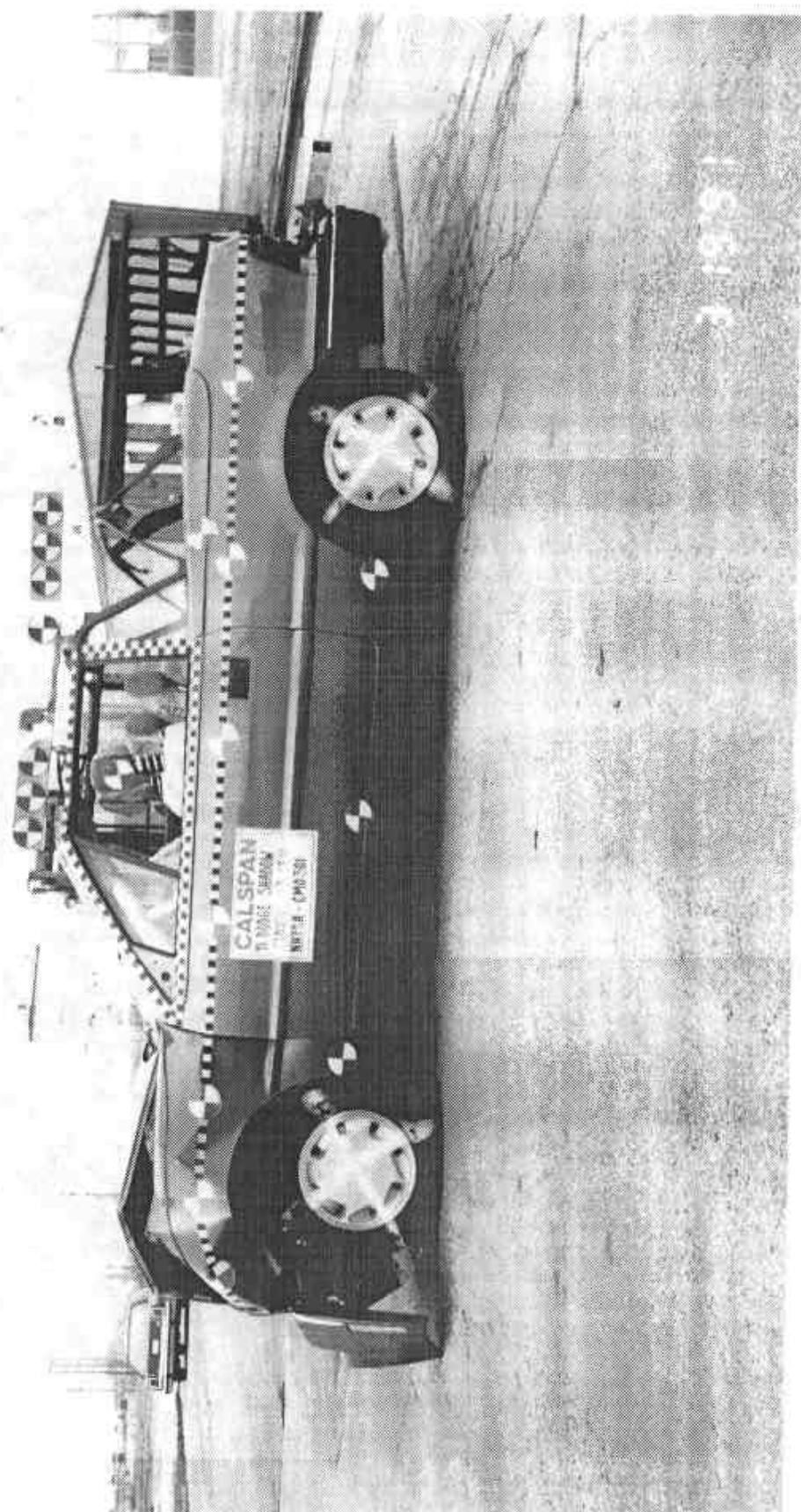


Figure A-4 POST TEST LEFT SIDE VIEW

A-6

7853-9



FIGURE A-5 PRE-TEST RIGHT SIDE VIEW

A-7

7853-0

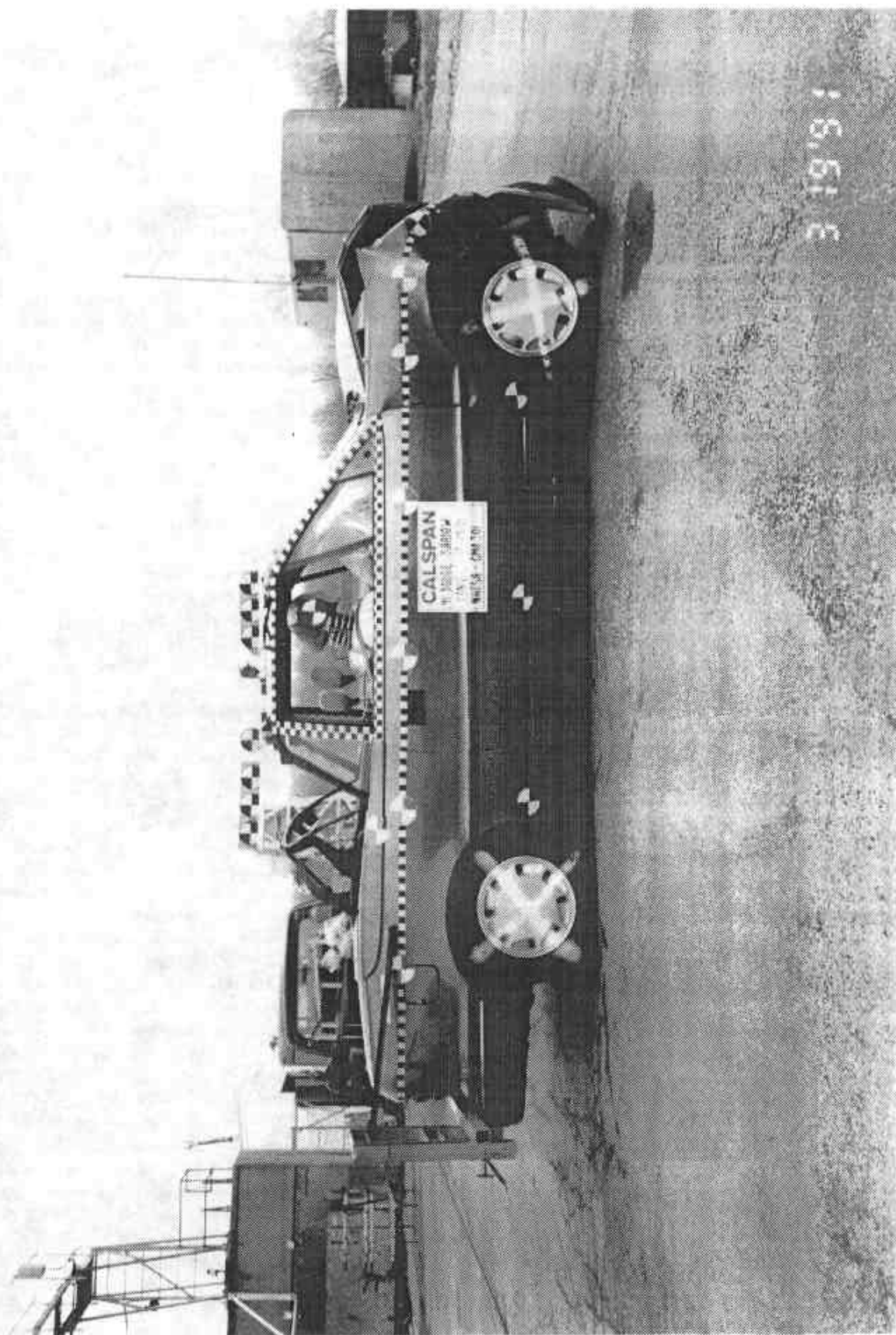
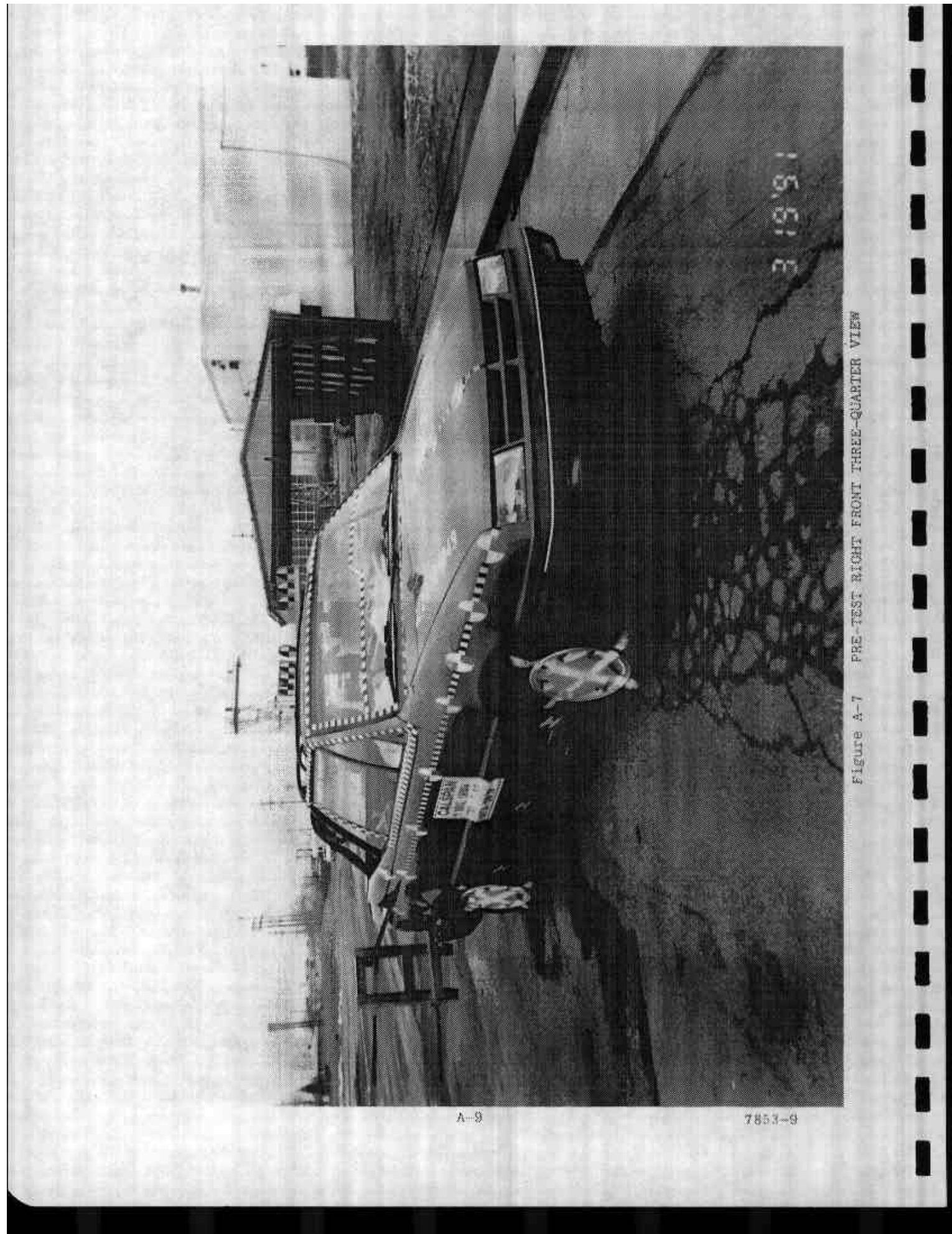


Figure A-6 POST-TEST RIGHT SIDE VIEW



A-9

7853-9

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

15,513



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

A-10

7853-9



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

A-11

7853-9



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

A-12

7853-9

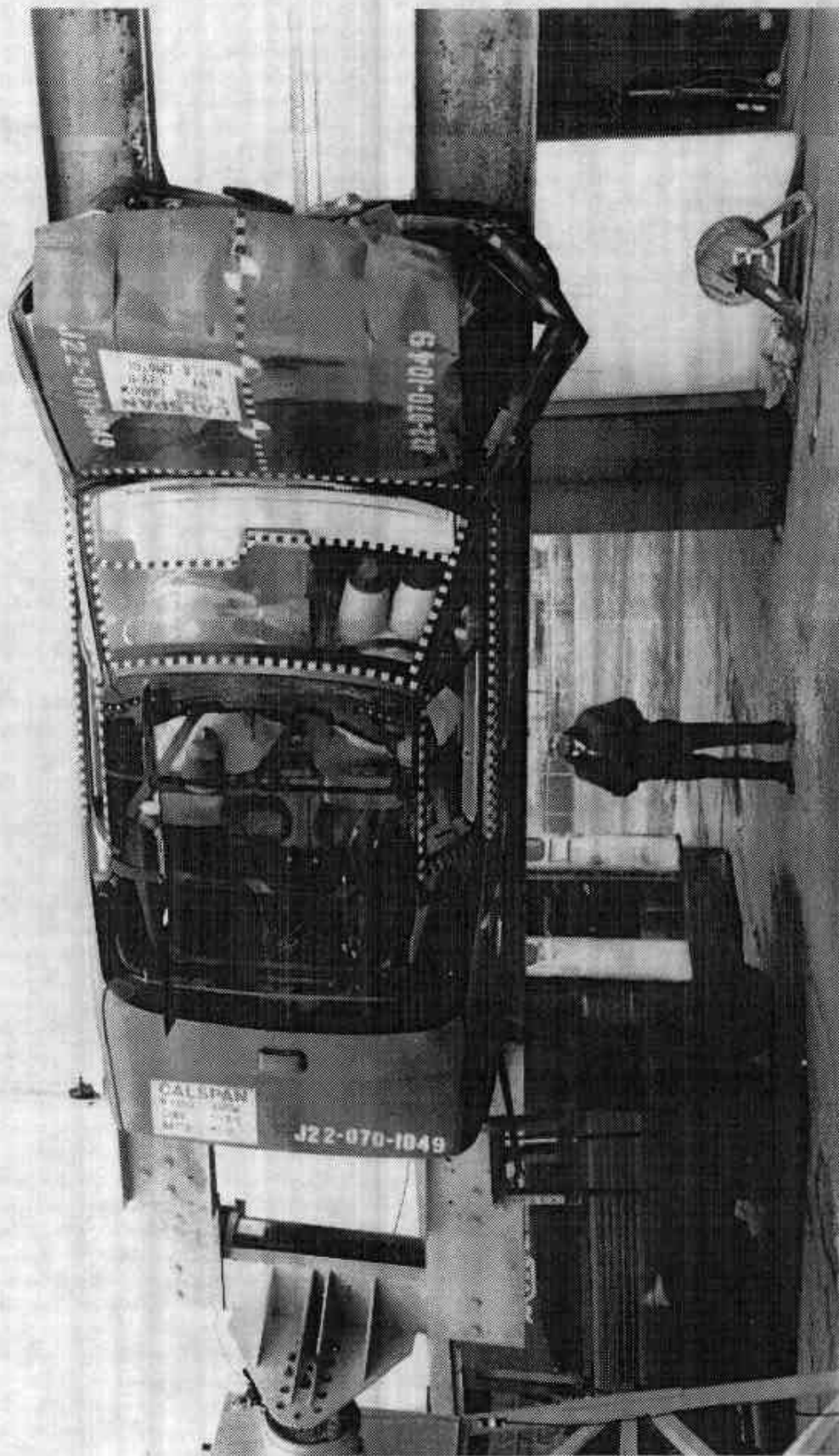


Figure A-11 POST TEST TOP VIEW

A-13

7853-9

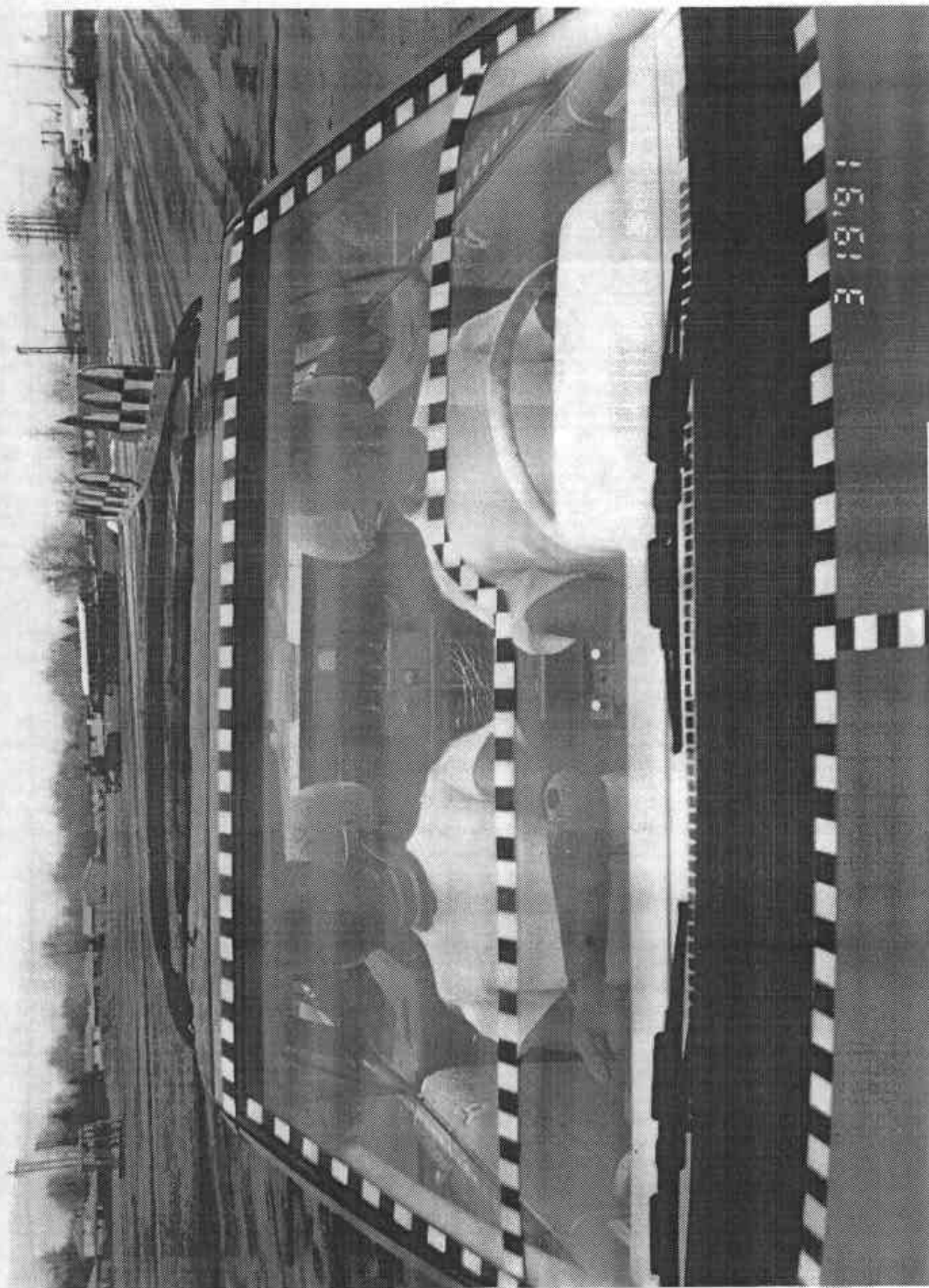


Figure A-12 PRE-TEST WINDSHIELD VIEW

A-14

7853-9

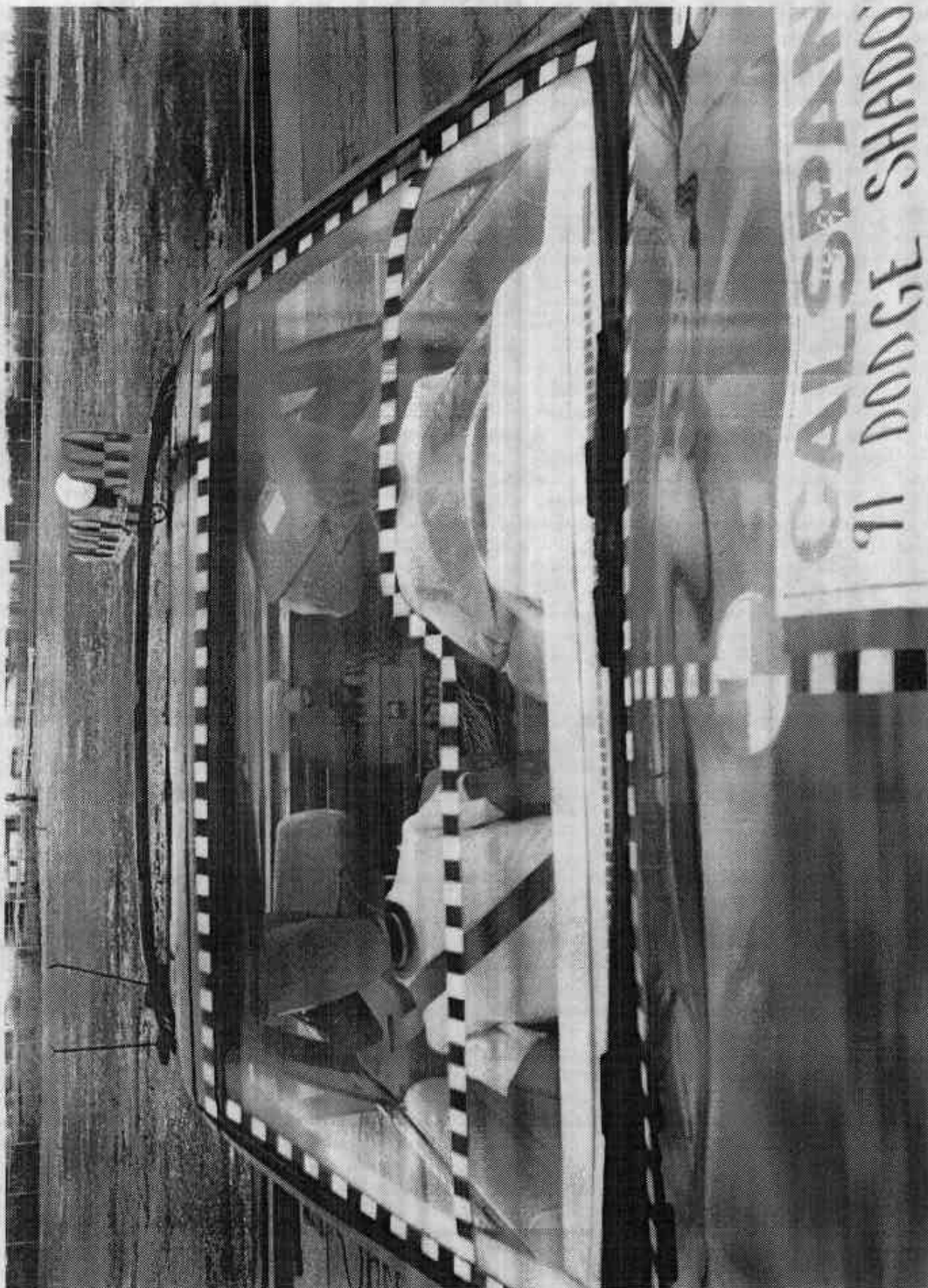


Figure A-13 POST-TEST WINDSHIELD VIEW

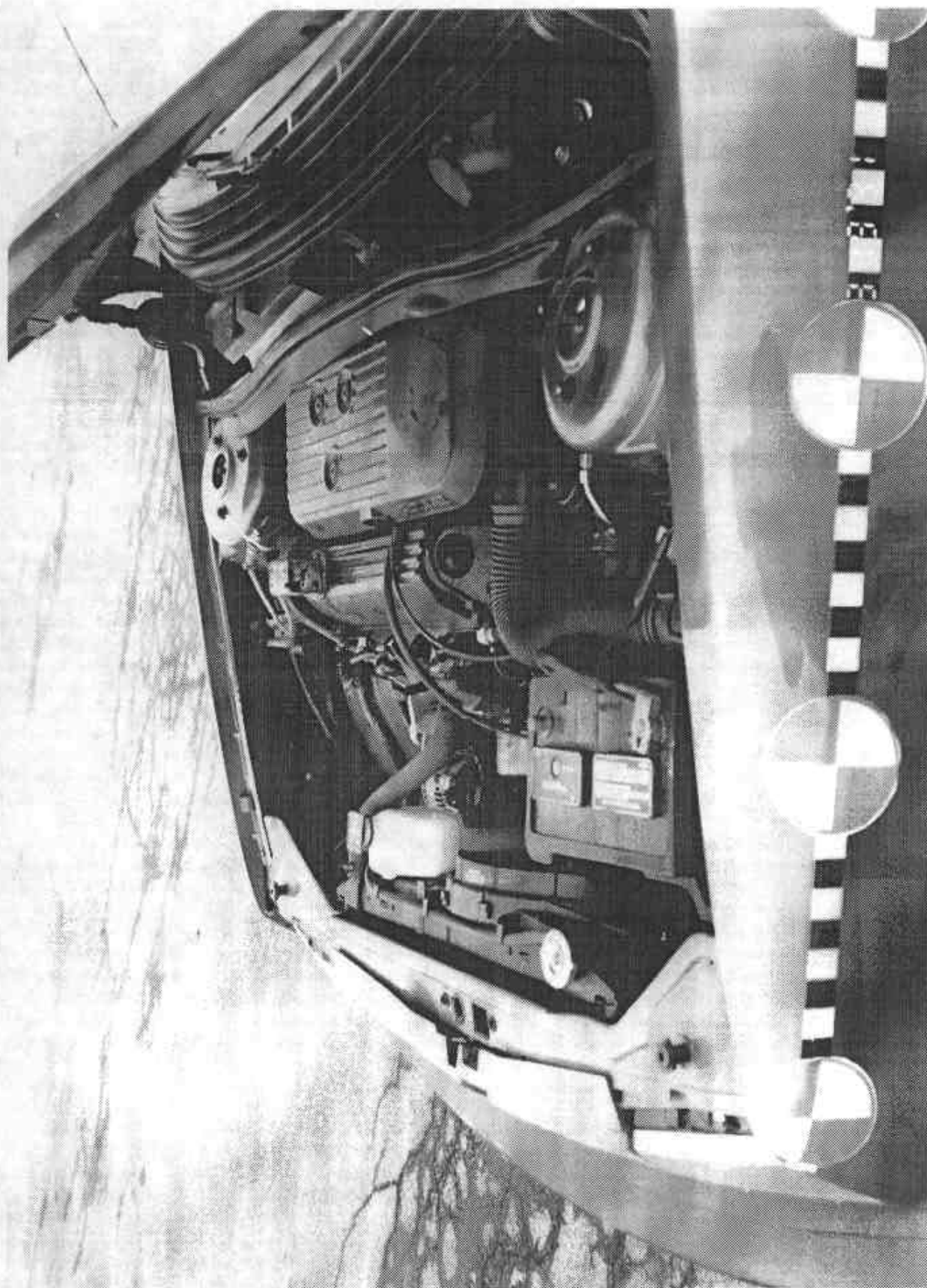


FIGURE A-14 PRE-TEST ENGINE COMPARTMENT VIEW

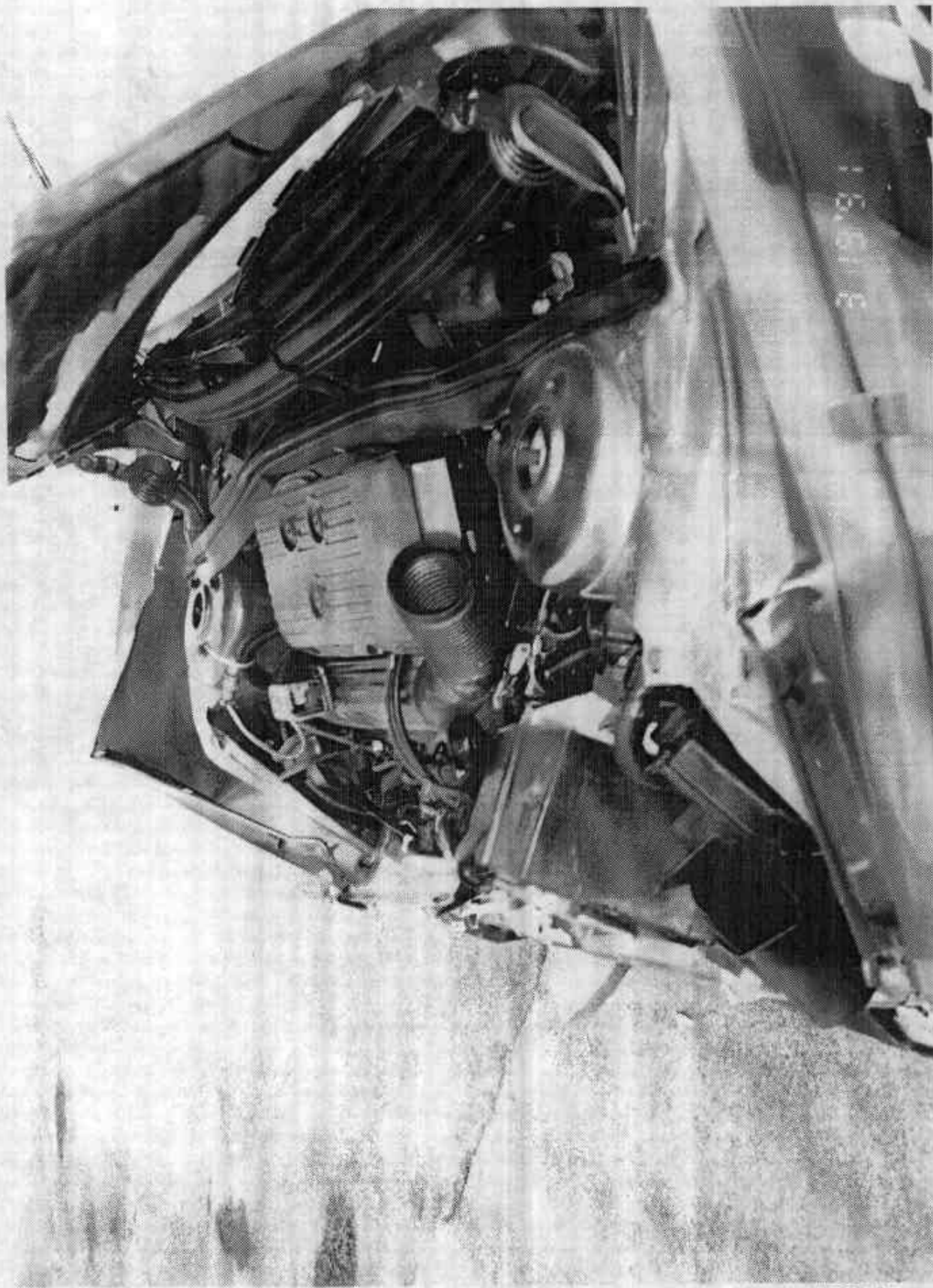


Figure A-15 POST-TEST ENGINE COMPARTMENT VIEW

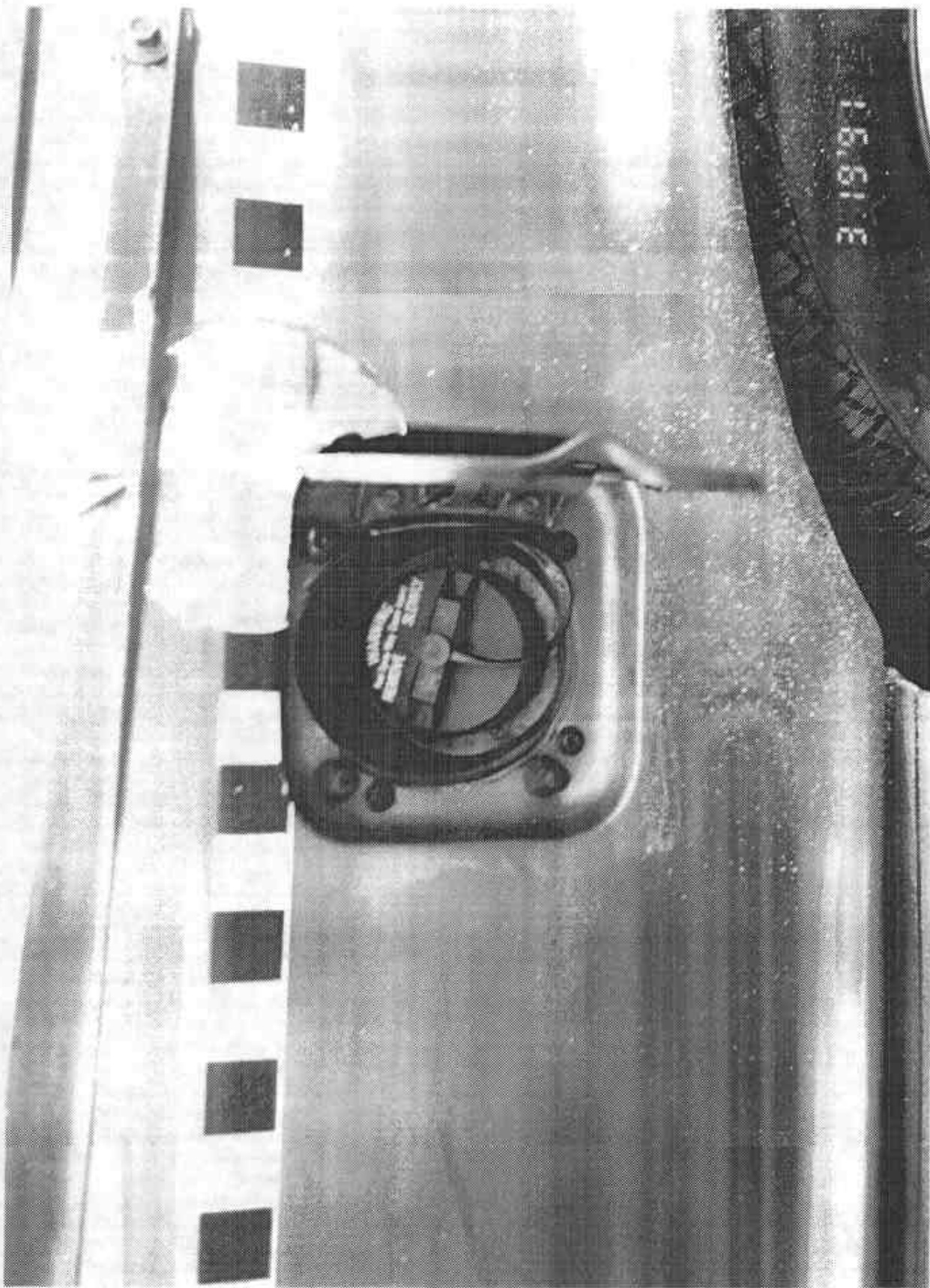
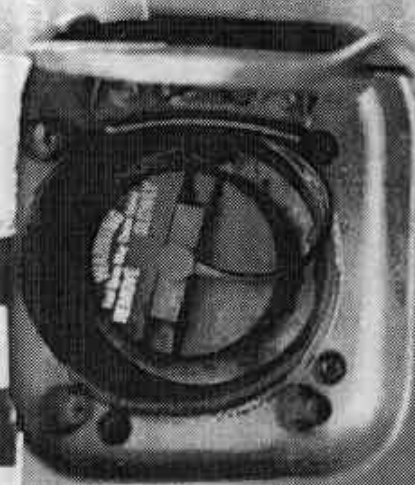


FIGURE A-16 PRE-TEST FUEL FILLER CAP PHOTO

FIGURE A-17 POST-TEST FUEL FILLER CAP PHOTO



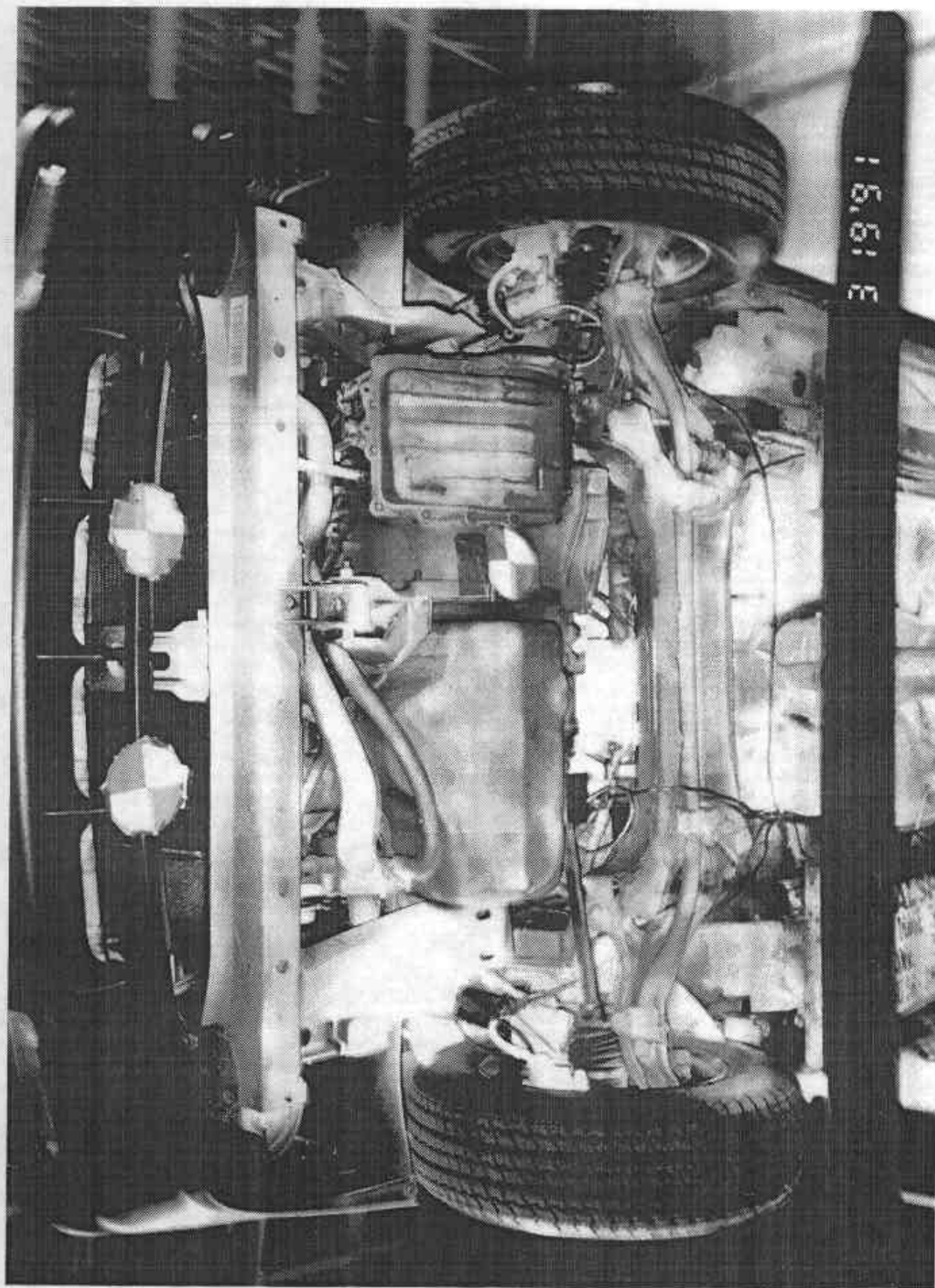


FIGURE A-18 PRE-TEST FRONT UNDERBODY VIEW

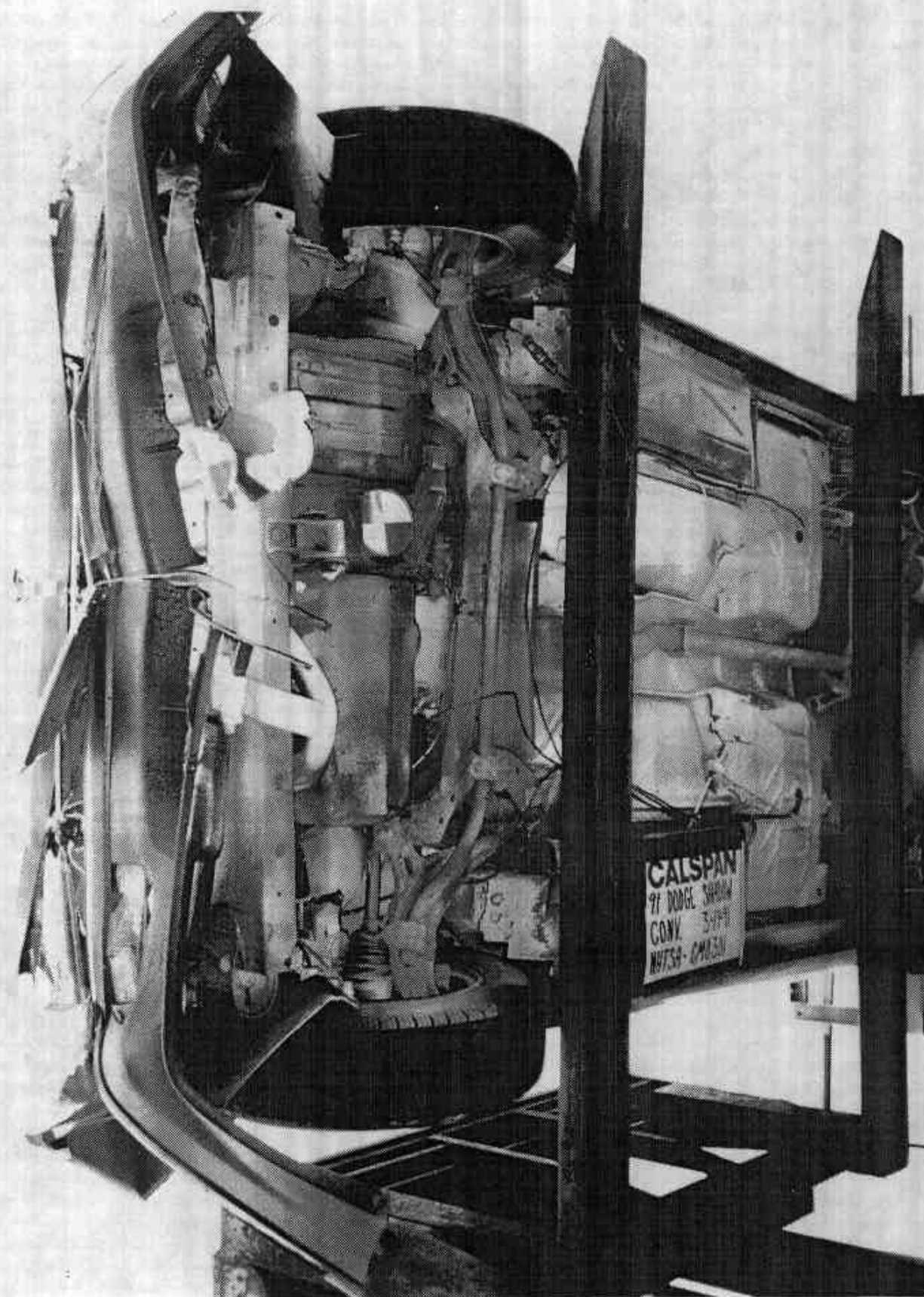


Figure A-19 POST-TEST FRONT UNDERBODY VIEW

A-21

7853-9

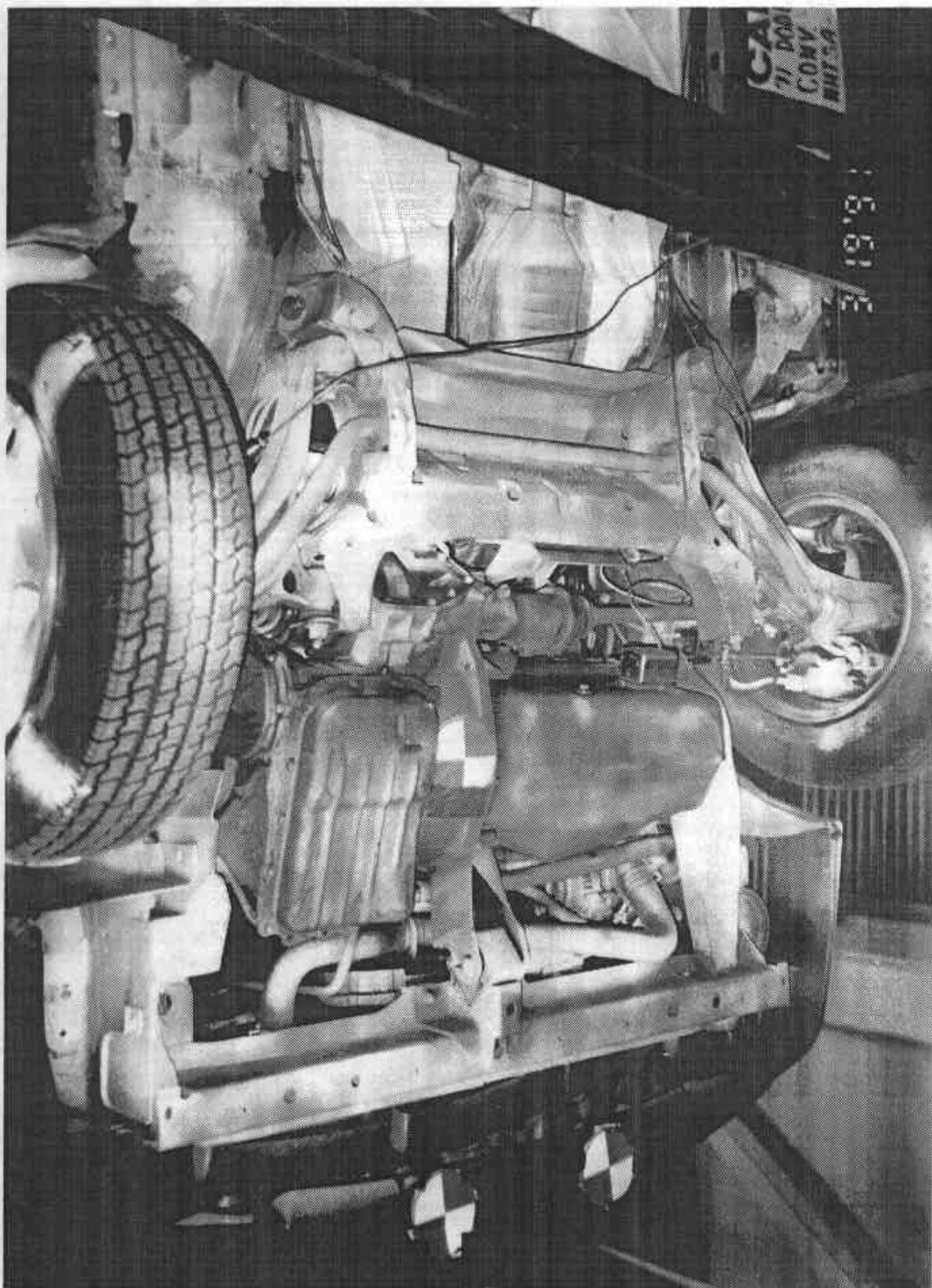


FIGURE A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

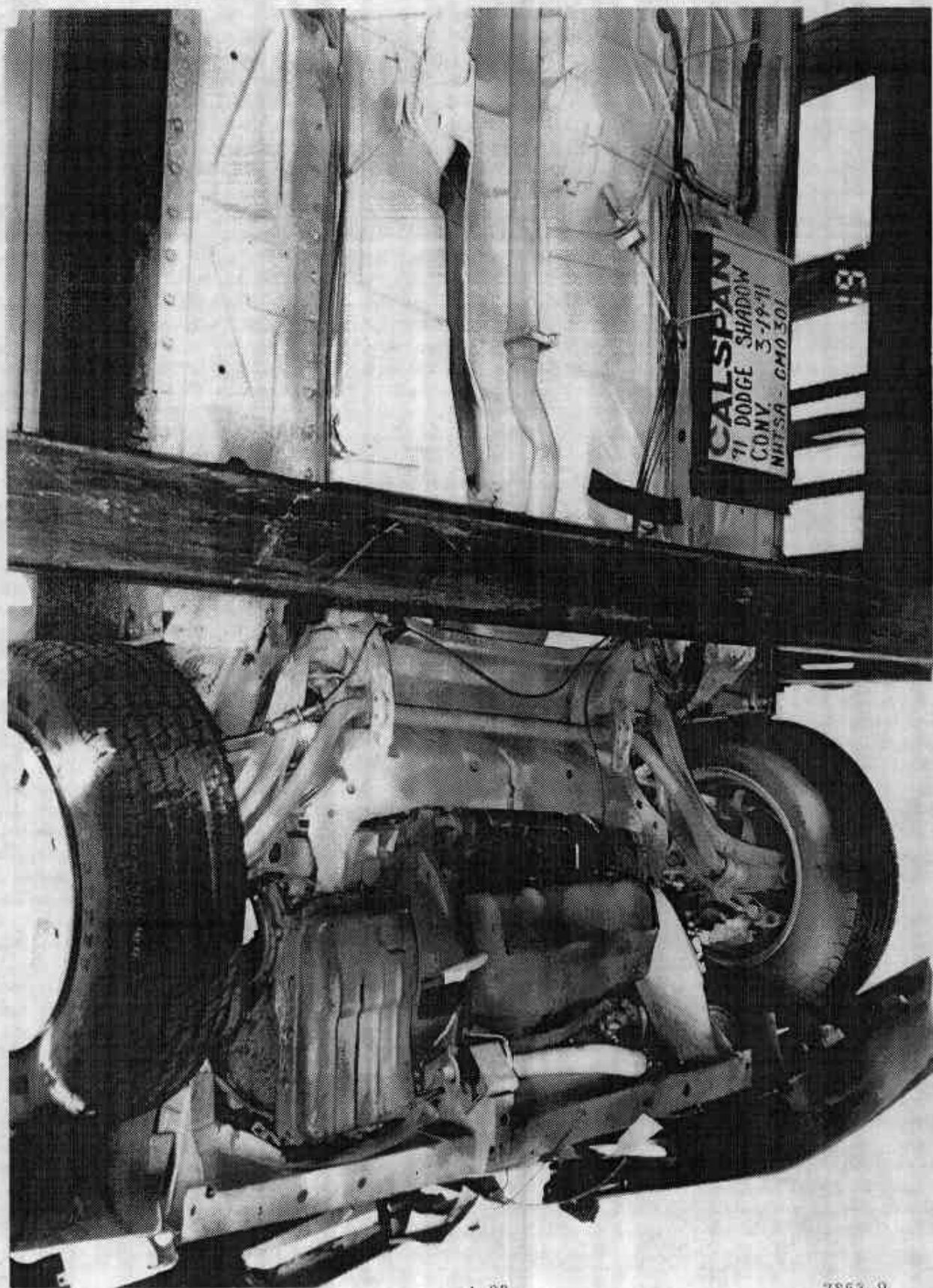


Figure A-21 FCST-TEST FRONT SIDE UNDERBODY VIEW



Figure A-22 PRE-TEST REAR UNDERBODY VIEW



A-25

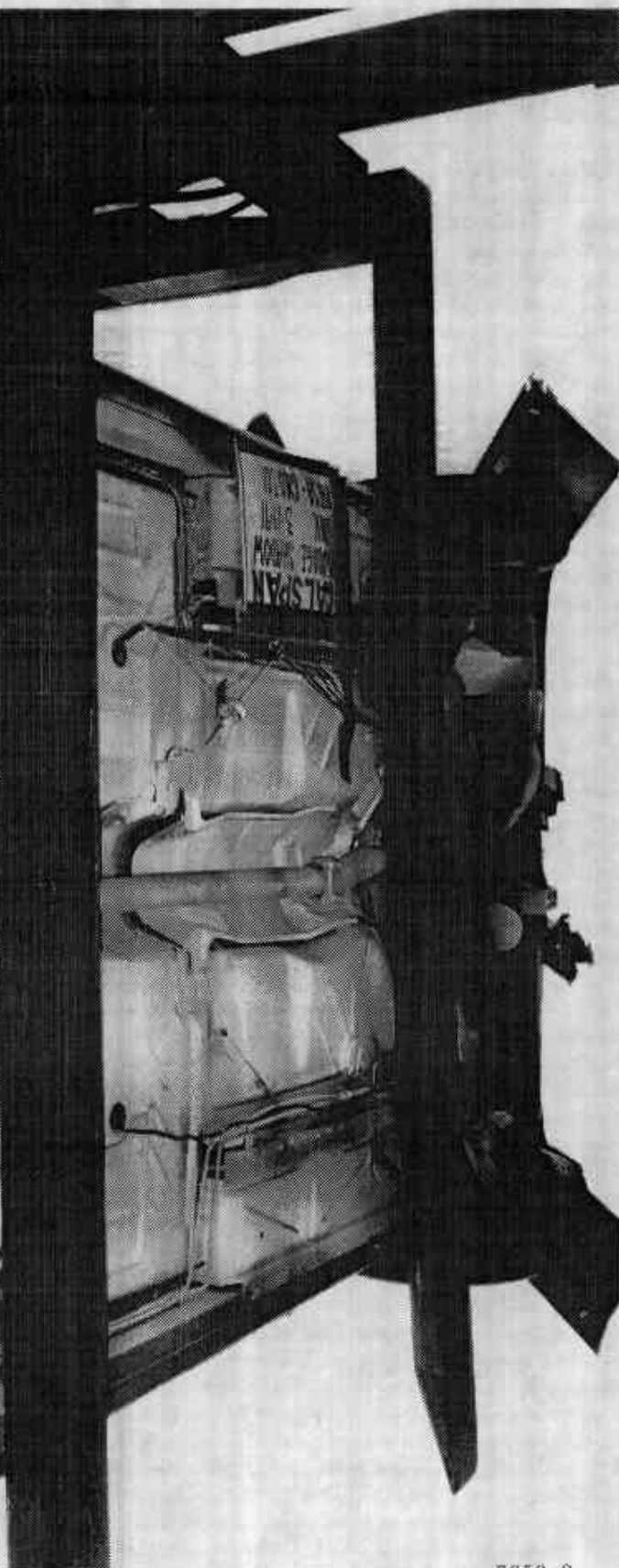


Figure A-23 POST-TEST REAR UNDERBODY VIEW

7853-9



Figure A-24 CERTIFICATION LABEL

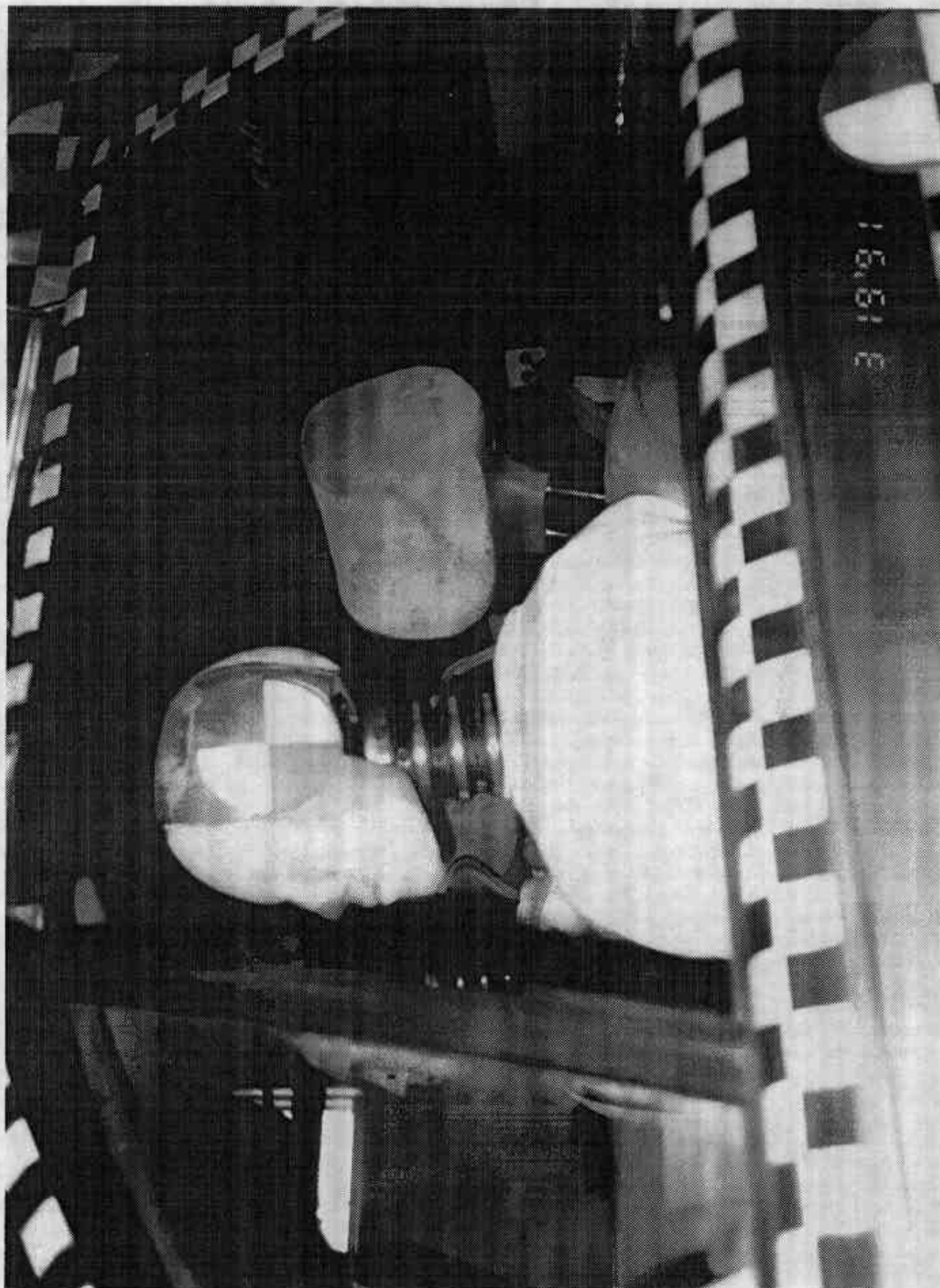


Figure A-25 PRE-TEST DRIVER DUMMY POSITION



Figure A-26 POST-TEST DRIVER DUMMY POSITION

A-28

7853-9



Figure A-27 H&C TEST PASSENGER DUMMY POSITION

A-29

7853-9



FIGURE A-28 POST-TEST PASSENGER DUMMY POSITION

A-30

7853-0



FIGURE A-29 PRE-TEST DRIVER DUMMY AND INTERIOR VIEW

A-81

7853-9



Figure A-30 POST-TEST DRIVER DUMMY AND INTERIOR VIEW



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

A-33

7853-0

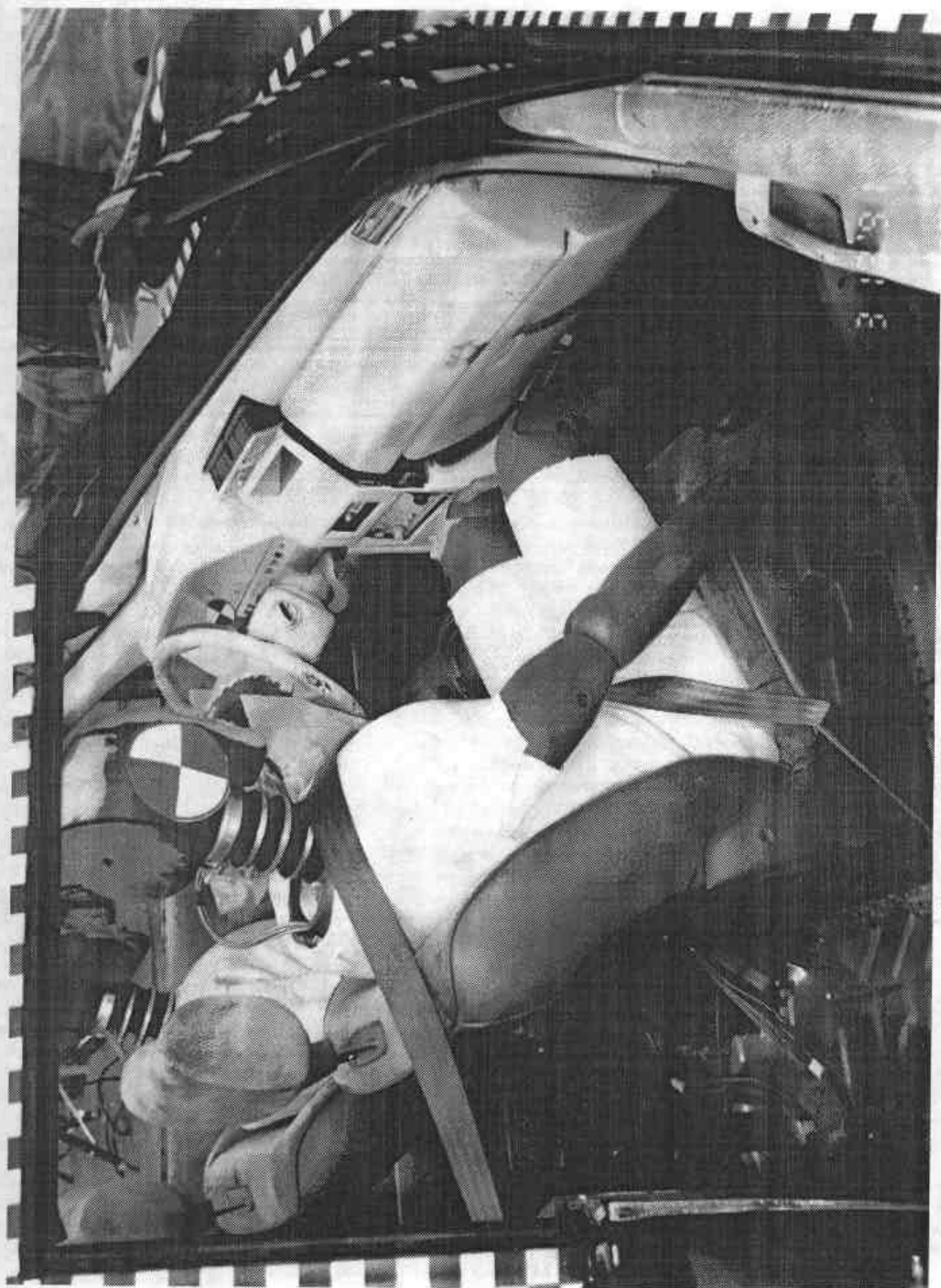


Figure A-32 POST-TEST PASSENGER DUMMY AND INTERIOR VIEW



FIGURE A-33 POST-TEST DRIVER AIRBAG VIEW

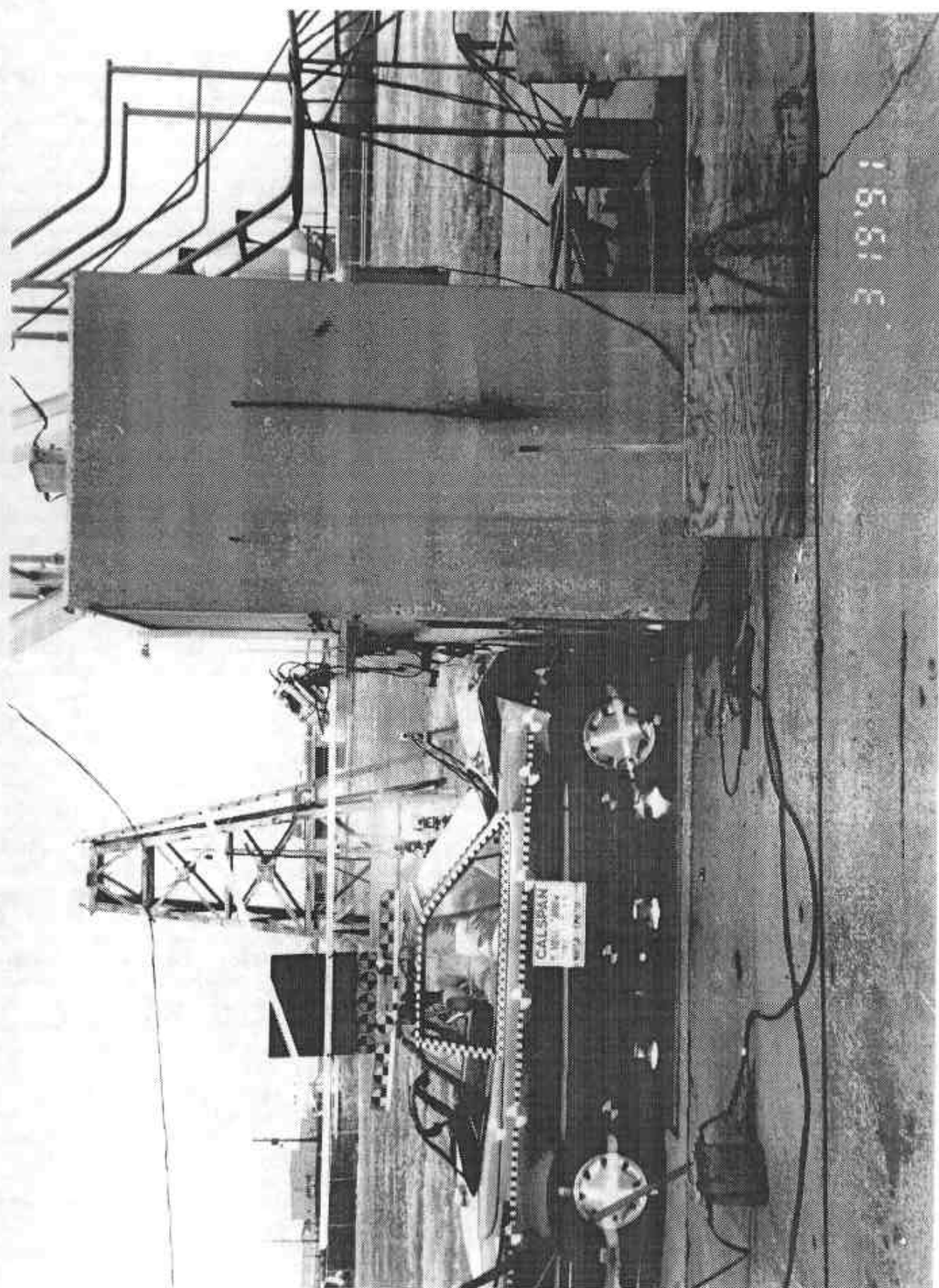


FIGURE A-24 VEHICLE IMPACT

A-39

7853-9

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CM0301

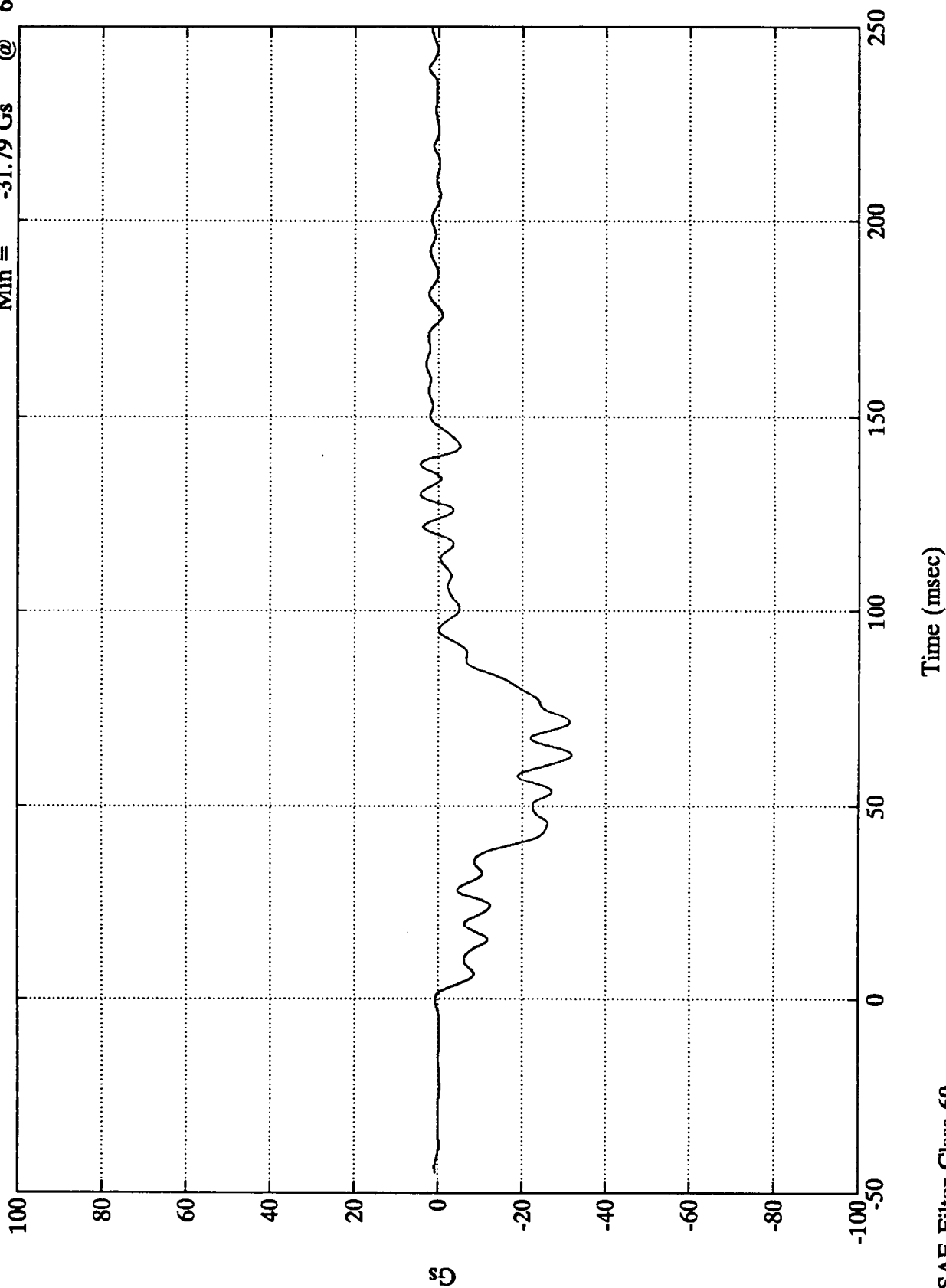
VEHICLE DATA

FILTER CHANNEL CLASS

60

L. Rear X-member X (#1)

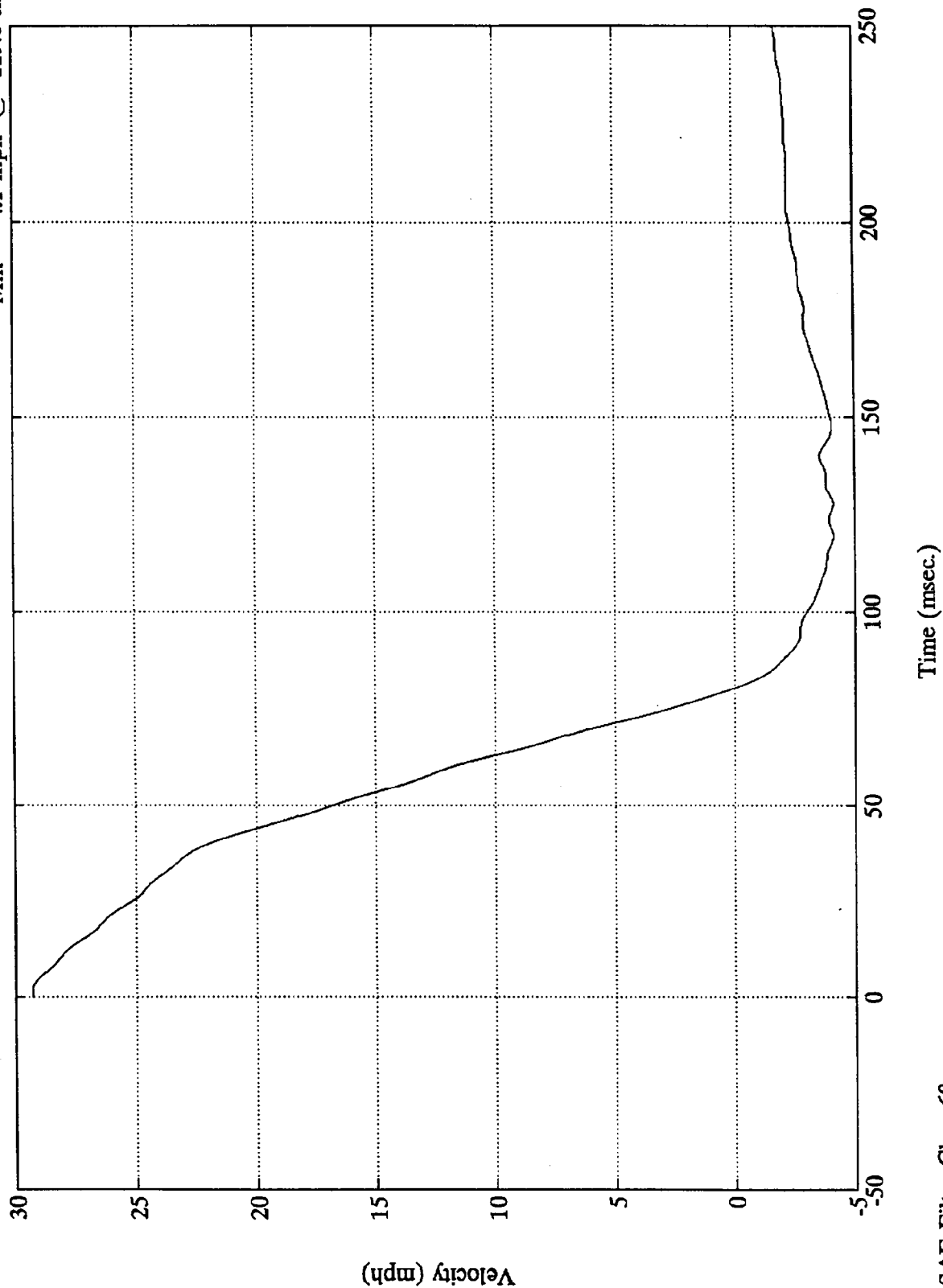
Max = 4.31 Gs @ 130.19 msec
Min = -31.79 Gs @ 63.23 msec



Test 1049

Max = 29.3 mph @ 1.9 msec
Min = -4.1 mph @ 119.8 msec

L Rear X-Member X (#1)

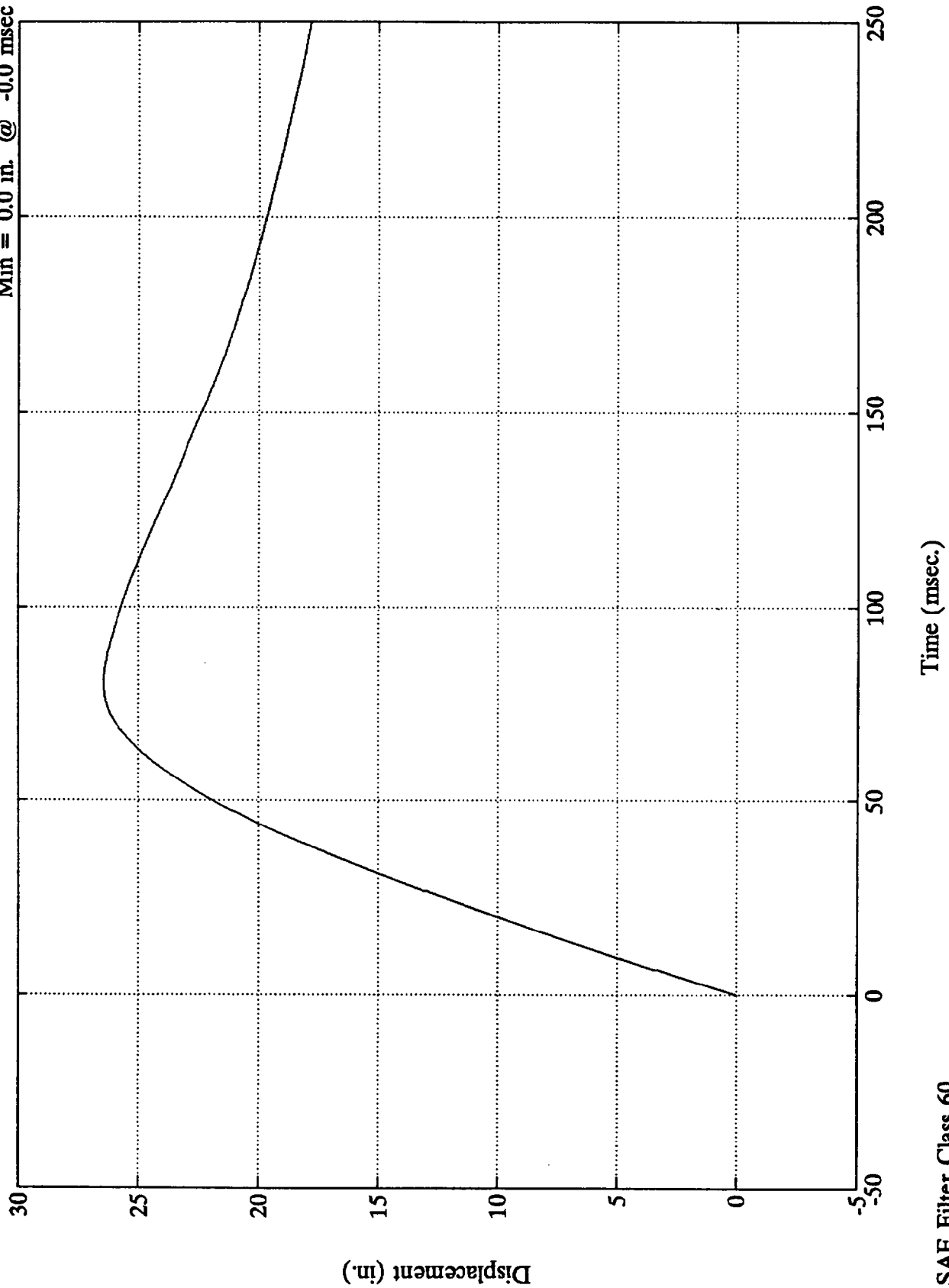


SAE Filter Class 60

Test 1049

L Rear X-Member X (#1)

Max = 26.4 in. @ 81.4 msec
Min = 0.0 in. @ -0.0 msec



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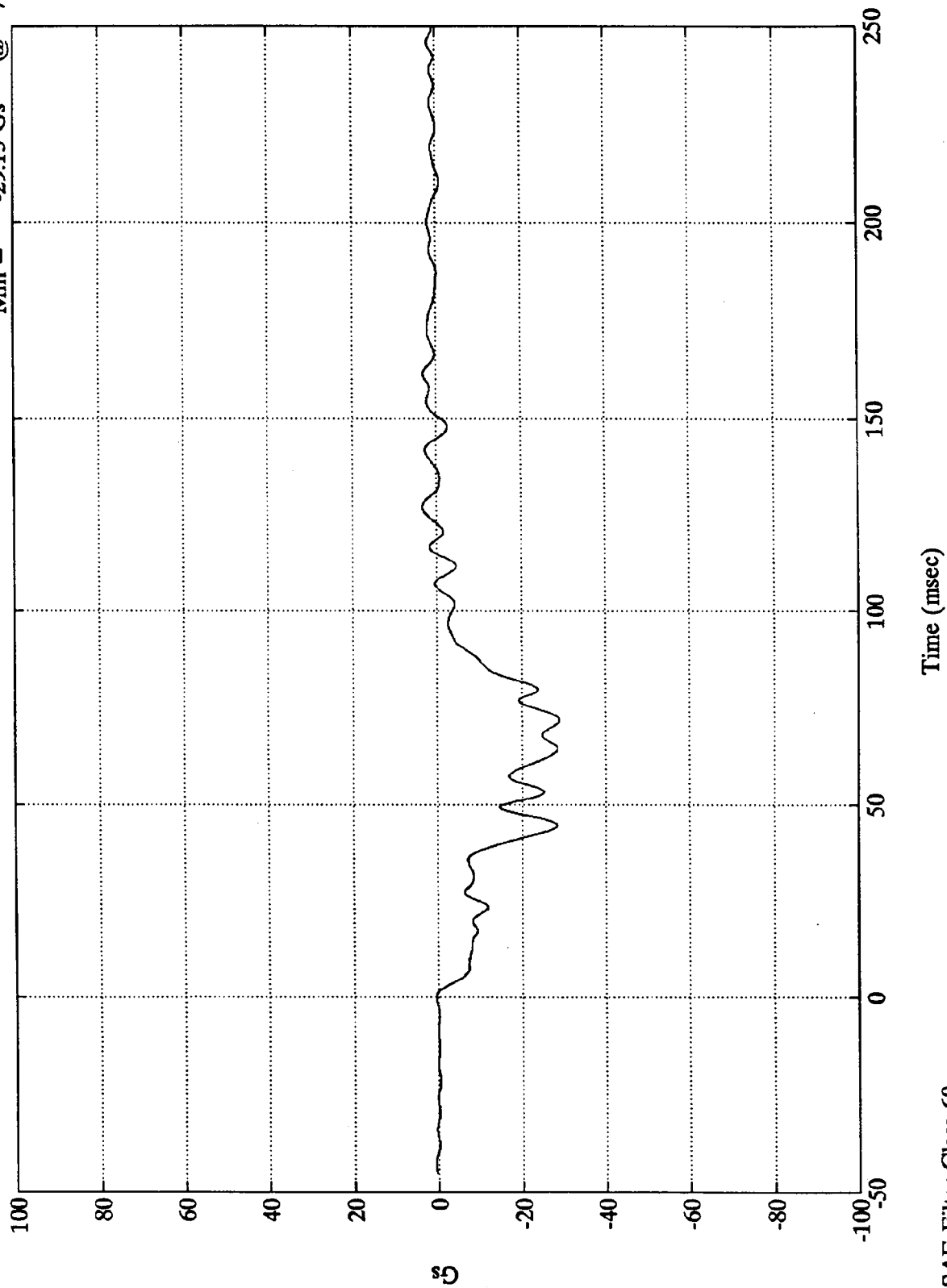
7853-9

SAE Filter Class 60

Test 1049

R. Rear X-member X (#2)

Max = 3.32 Gs @ 126.96 msec
Min = -29.13 Gs @ 71.76 msec



B-6

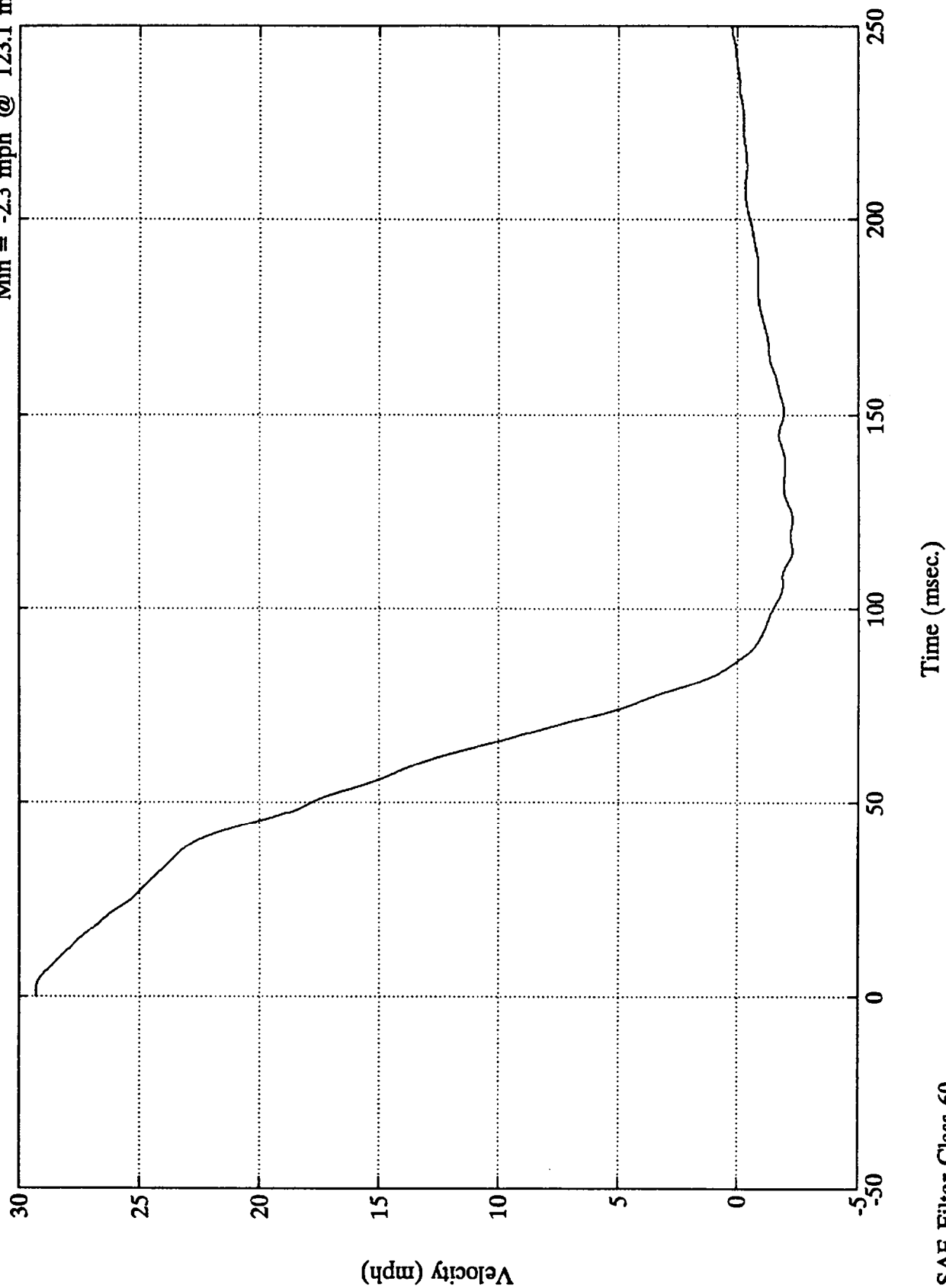
7853-9

SAE Filter Class 60

Test 1049

Max = 29.3 mph @ 1.9 msec
Min = -2.3 mph @ 123.1 msec

R. Rear X-Member X (#2)

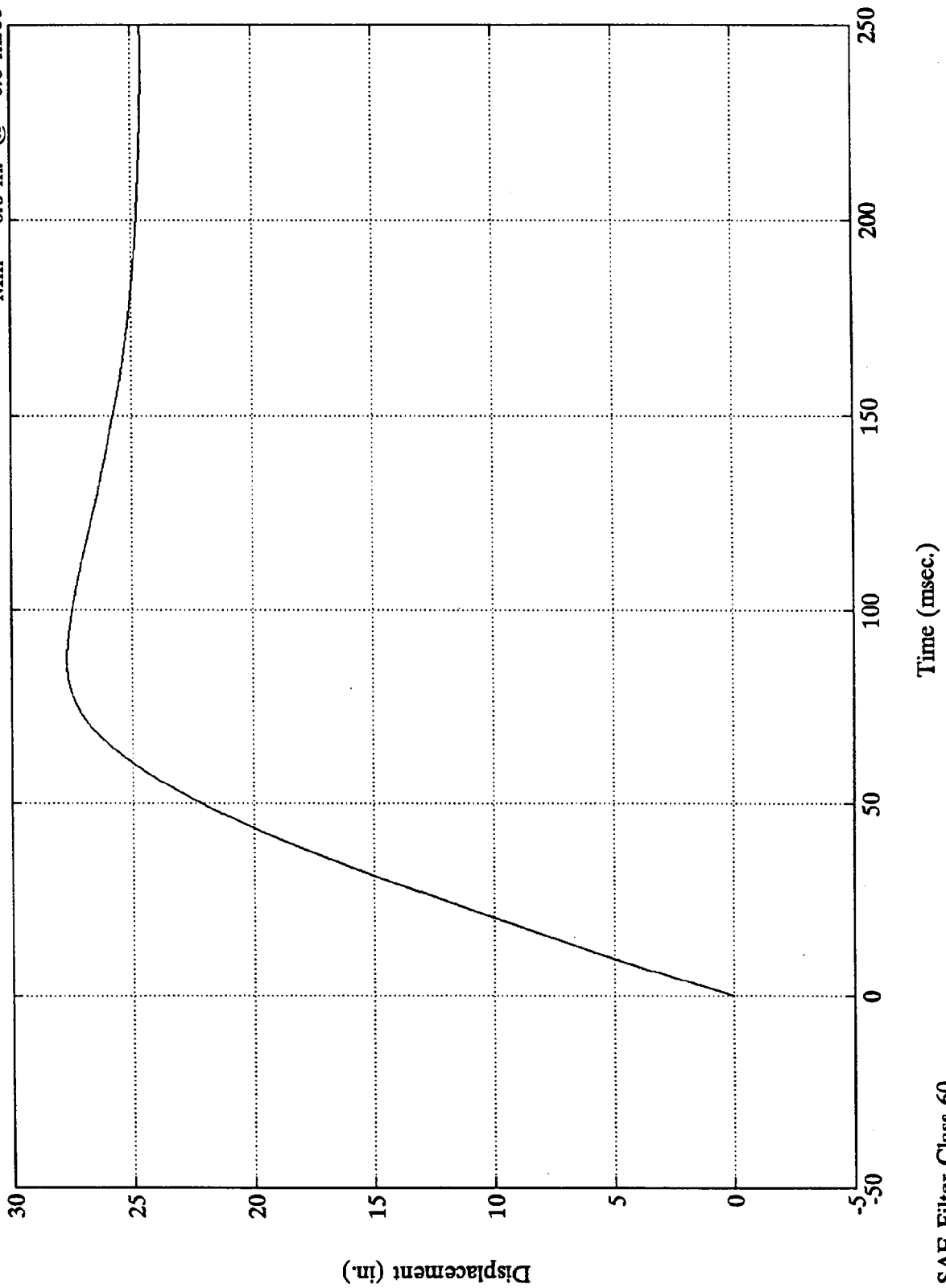


SAE Filter Class 60

Test 1049

R. Rear X-Member X (#2)

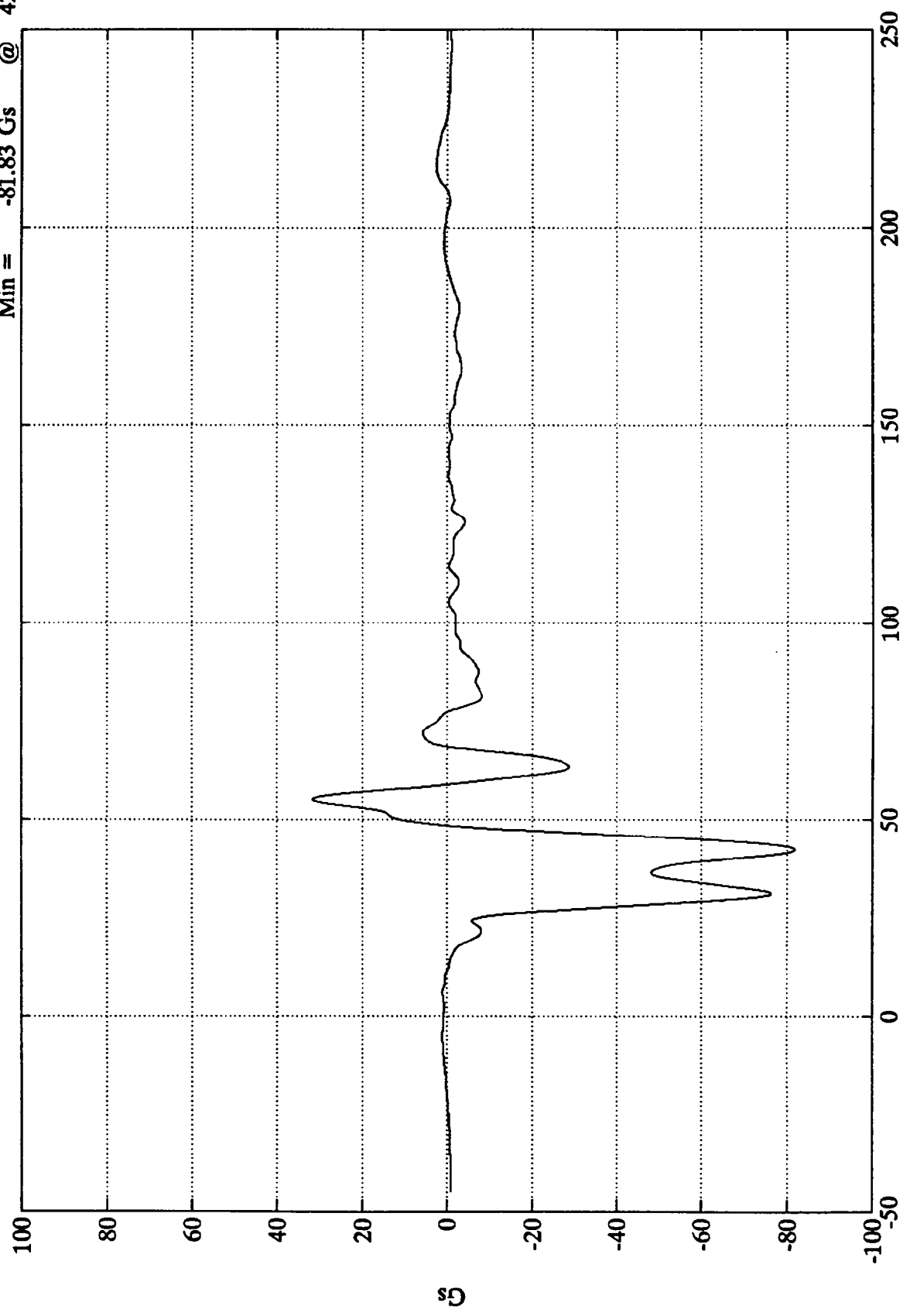
Max = 27.7 in. @ 88.3 msec
Min = 0.0 in. @ -0.0 msec



Test 1049

Engine Top X (#3)

Max = 31.80 Gs @ 55.08 msec
Min = -81.83 Gs @ 42.47 msec



Time (msec)

SAE Filter Class 60

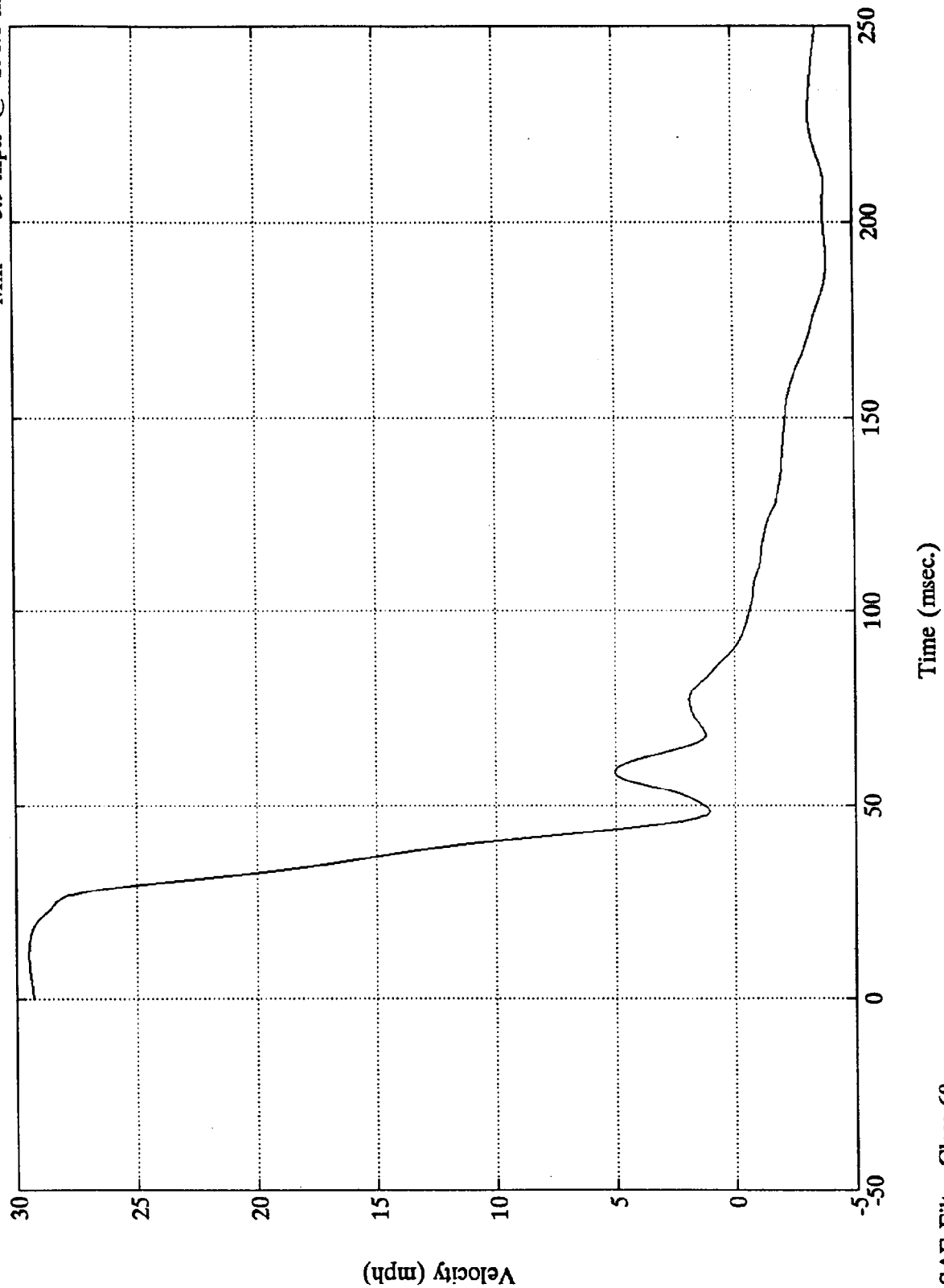
B-9

7853-9

Test 1049

Max = 29.5 mph @ 12.5 msec
Min = -3.9 mph @ 190.6 msec

Engine Top X (#3)



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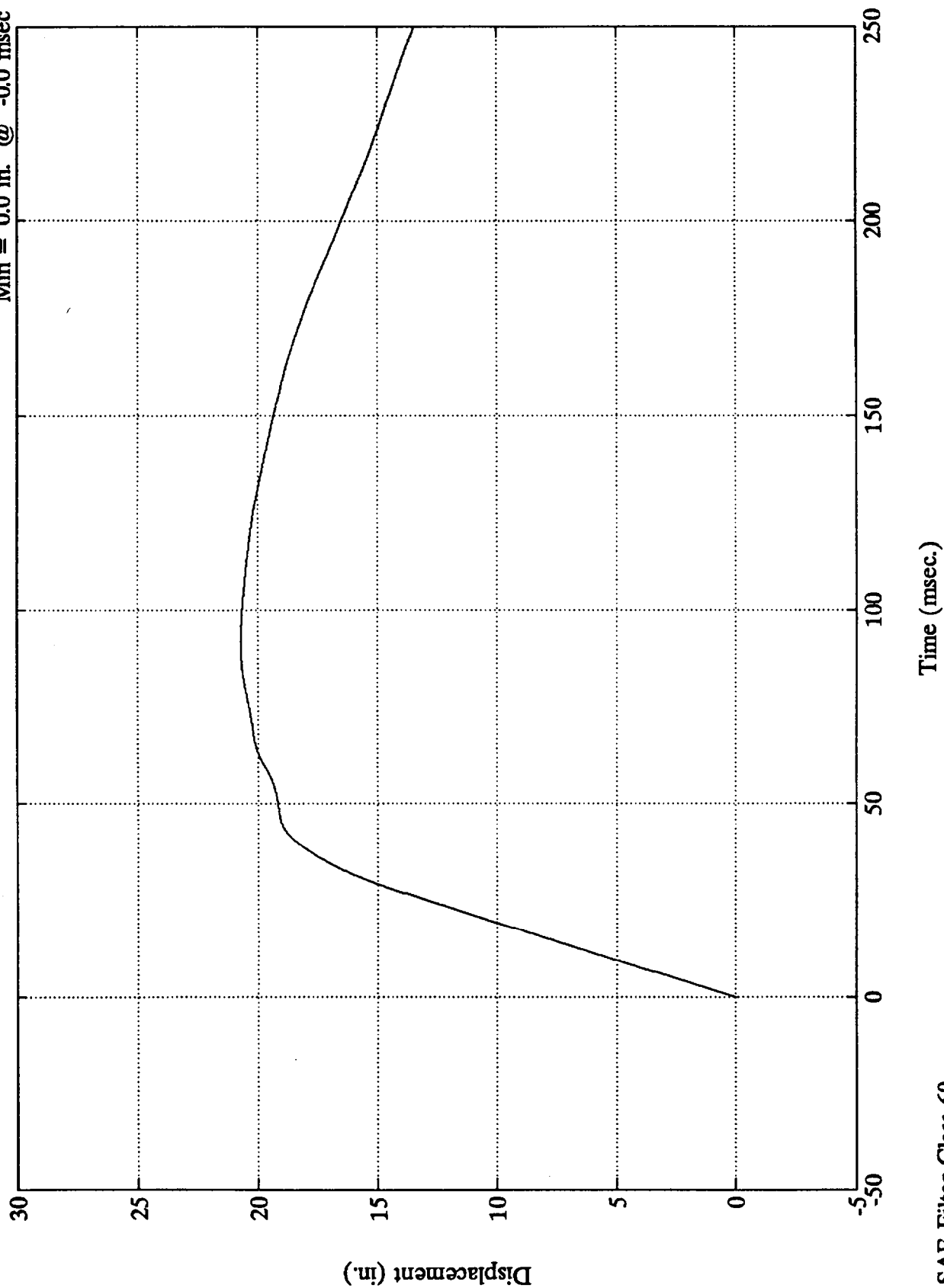
7853-9

SAE Filter Class 60

Test 1049

Engine Top X (#3)

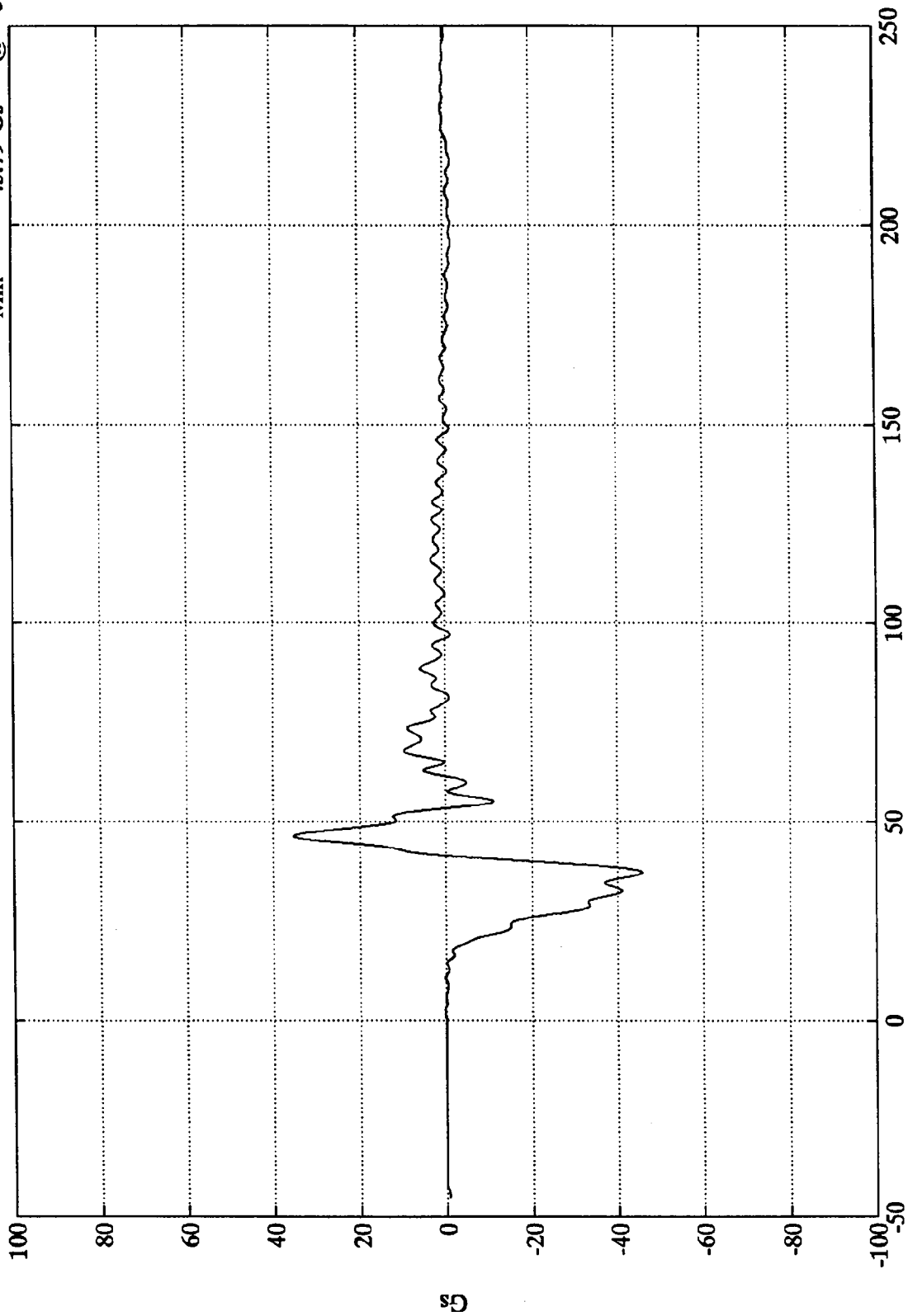
Max = 20.7 in. @ 91.9 msec
Min = 0.0 in. @ -0.0 msec



Test 1049

Engine Bottom X (#4)

Max = 35.30 Gs @ 46.44 msec
Min = -45.79 Gs @ 37.31 msec

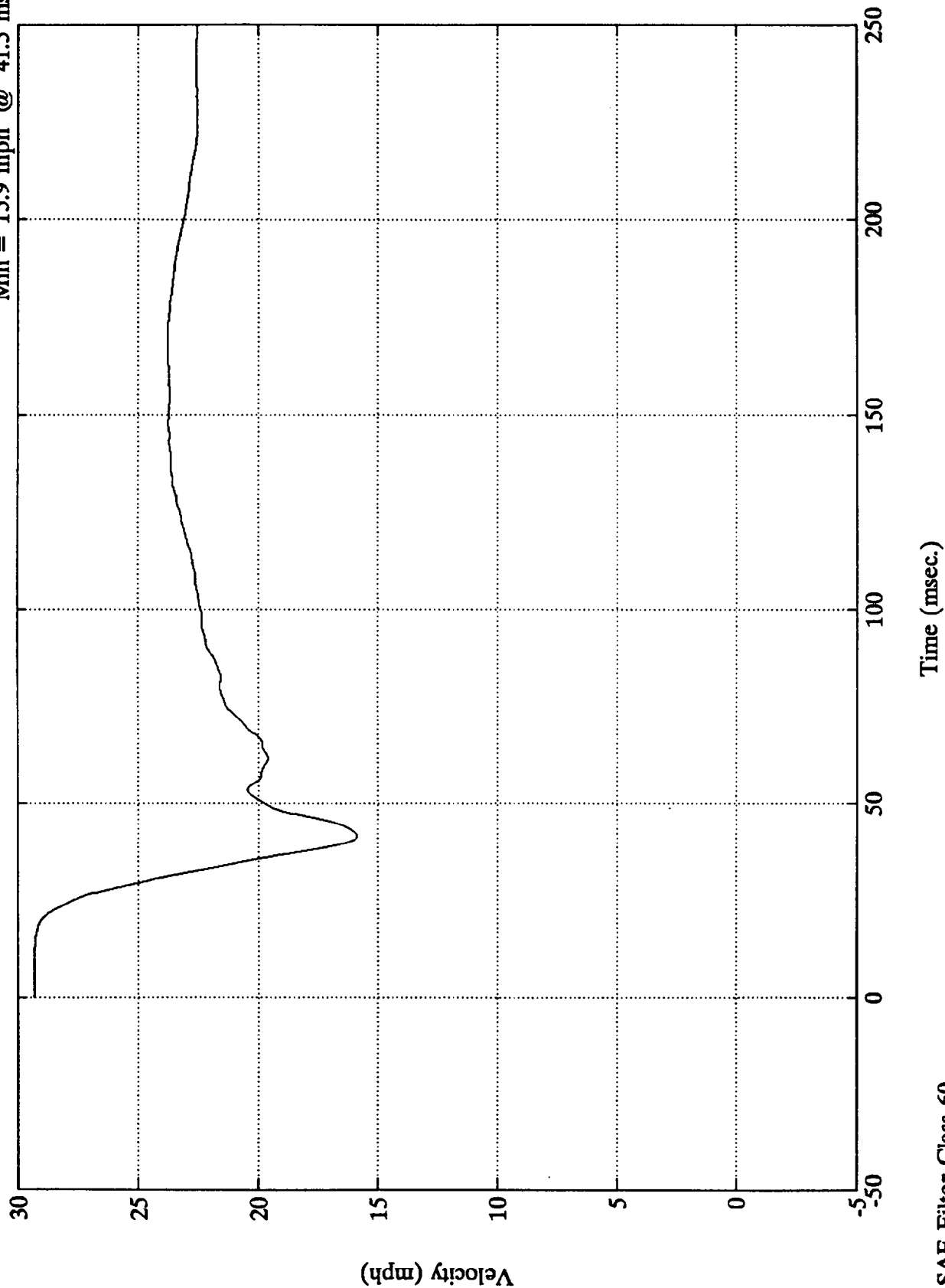


Time (msec)

SAE Filter Class 60

Test 1049

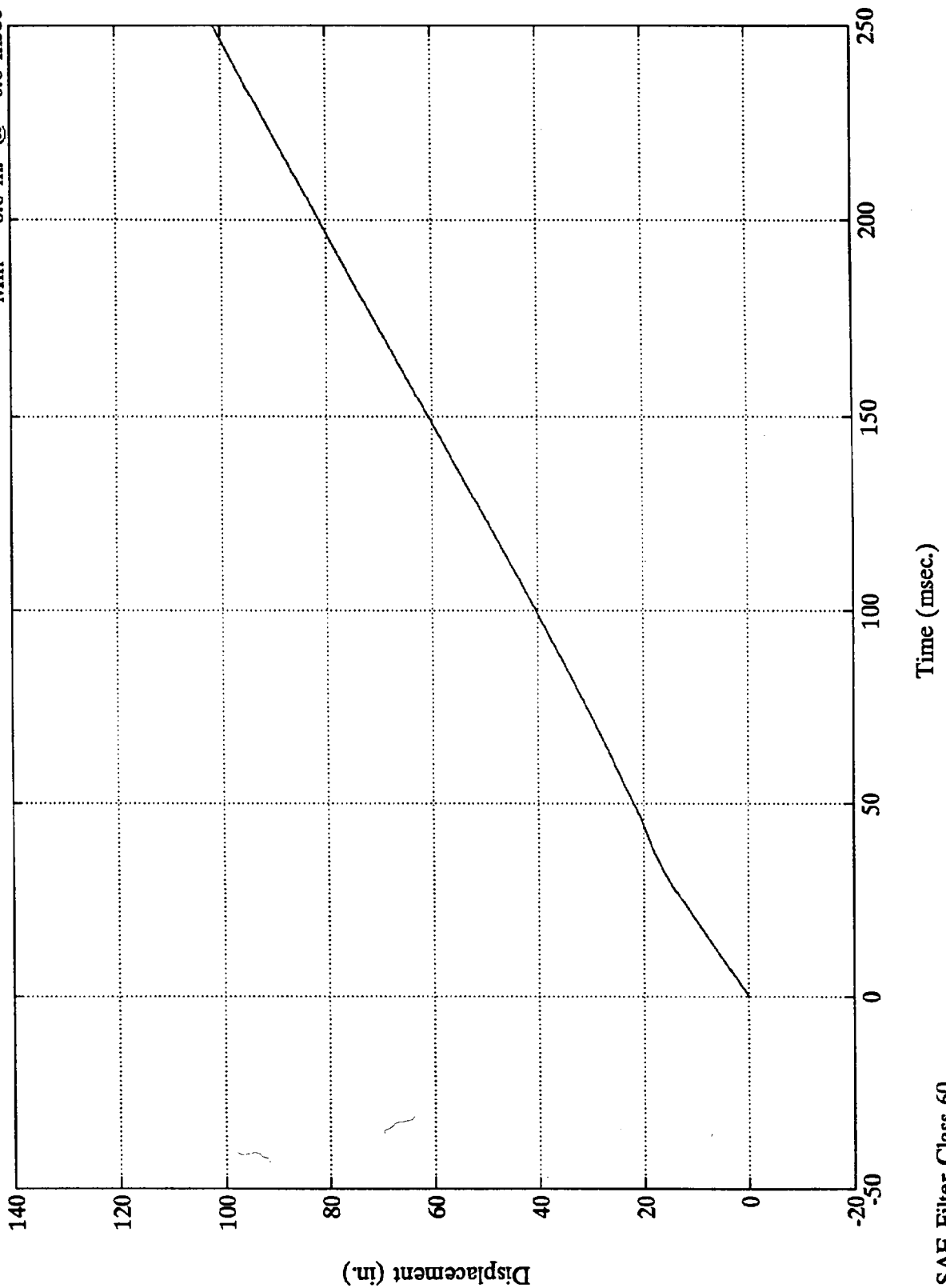
Engine Bottom X (#4)
Max = 29.3 mph @ 4.1 msec
Min = 15.9 mph @ 41.5 msec



Test 1049

Engine Bottom X (#4)

Max = 103.3 in. @ 254.9 msec
Min = 0.0 in. @ -0.0 msec

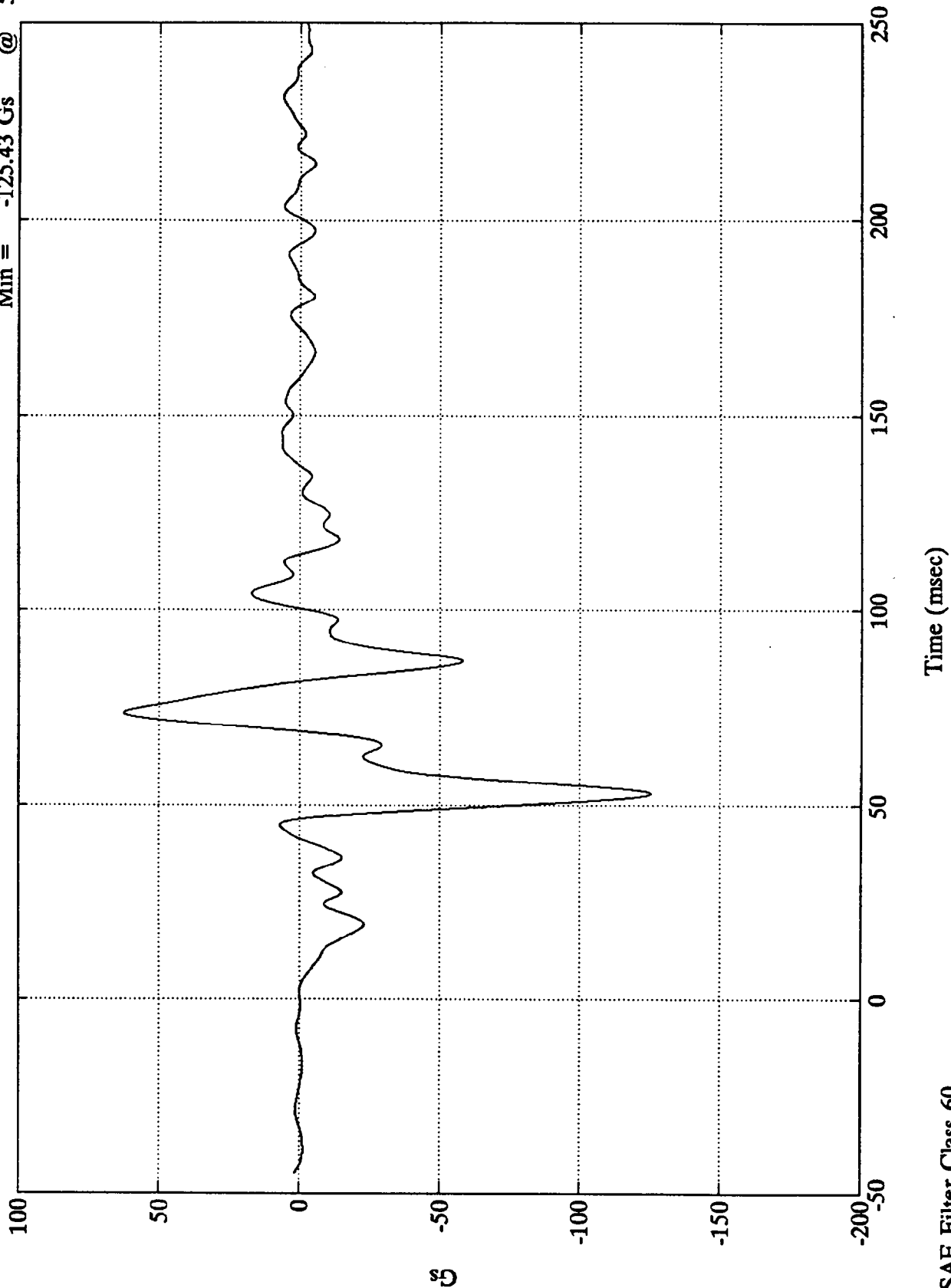


SAE Filter Class 60

Test 1049

R. Brake Caliper X (#5)

Max = 62.51 Gs @ 73.55 msec
Min = -125.43 Gs @ 53.04 msec



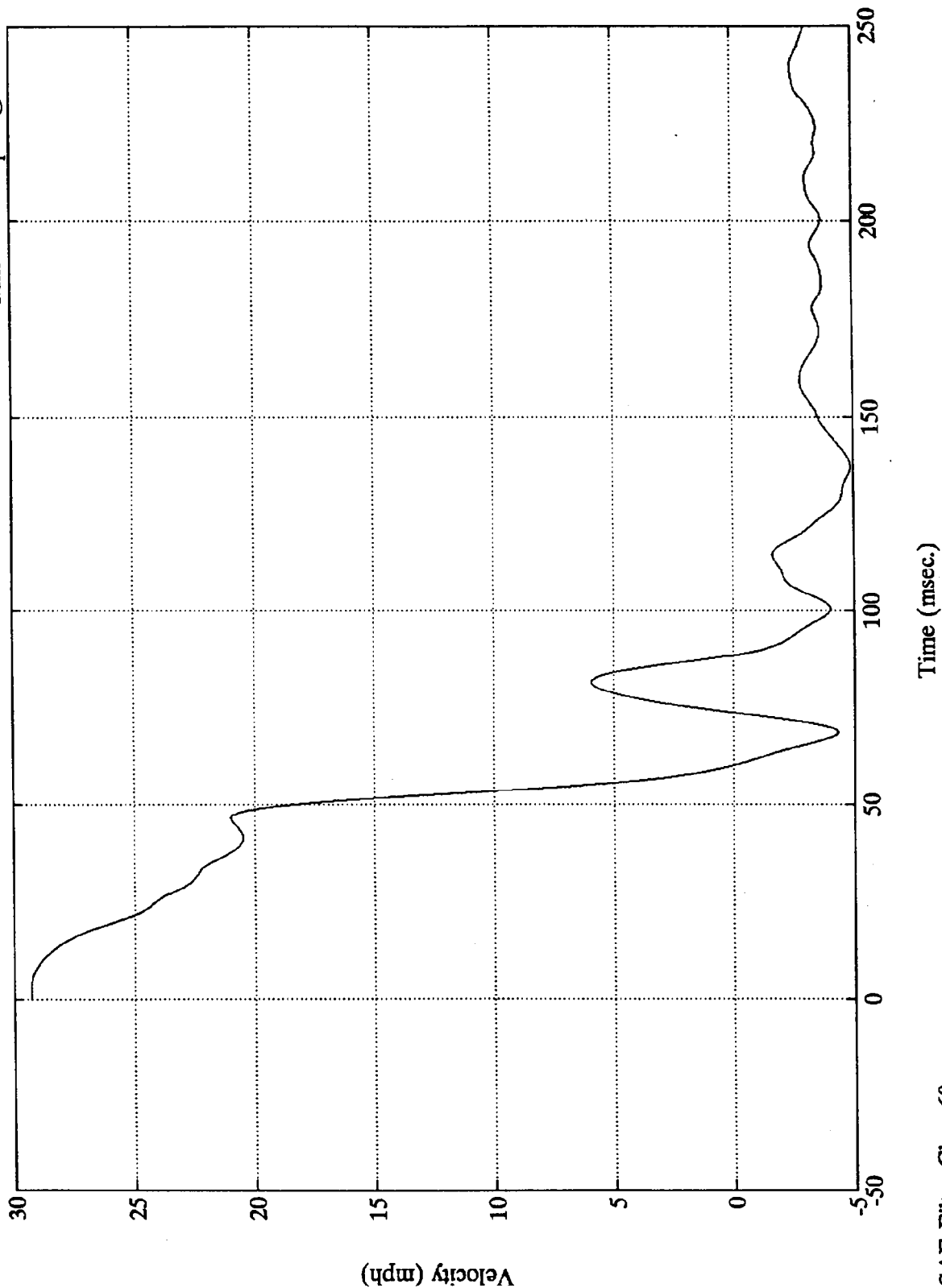
B-15

7853-9

SAE Filter Class 60

Test 1049

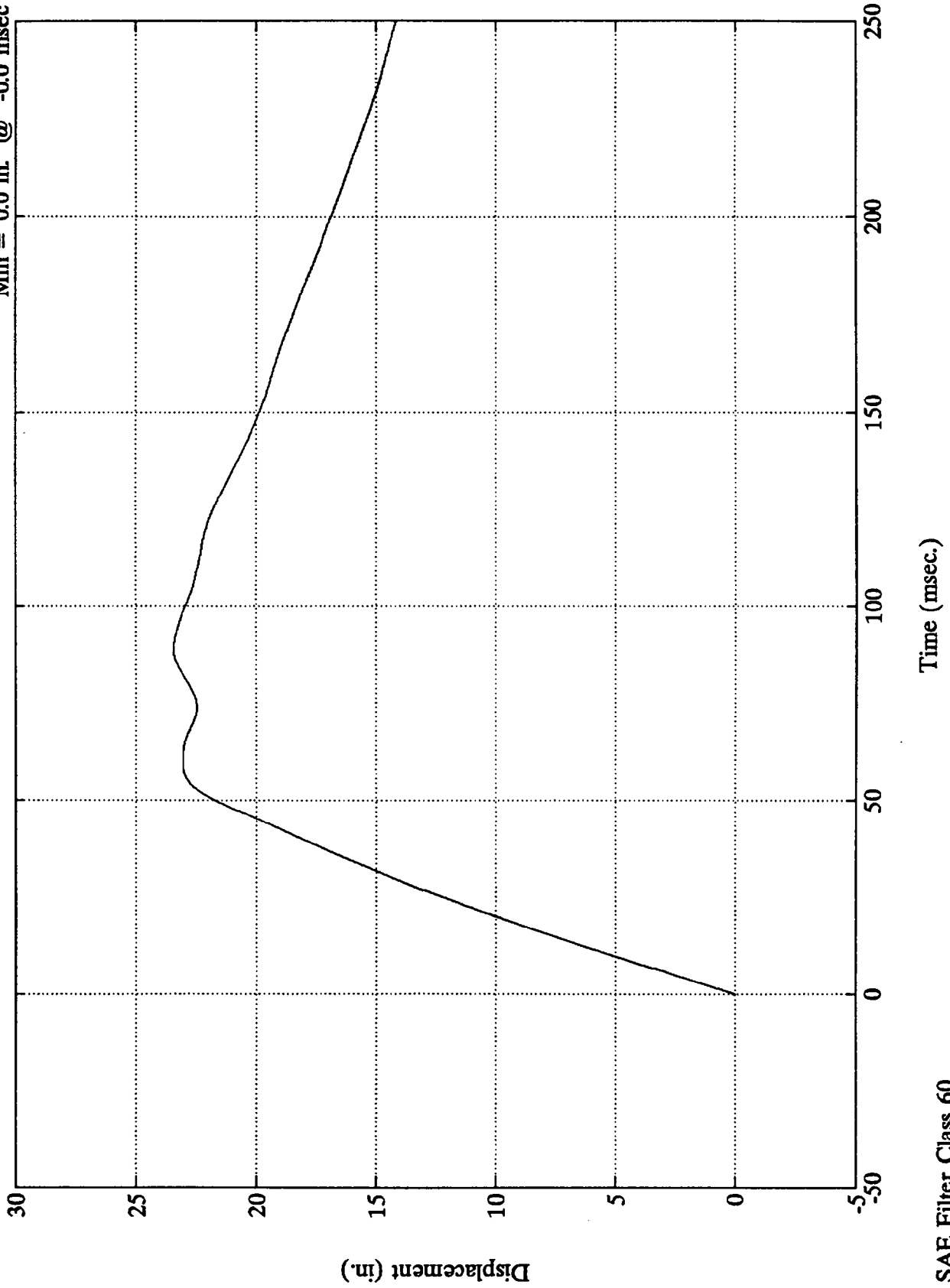
R. Brake Caliper X (#5)
Max = 29.3 mph @ 3.6 msec
Min = -4.9 mph @ 137.0 msec



Test 1049

R. Brake Caliper X (#5)

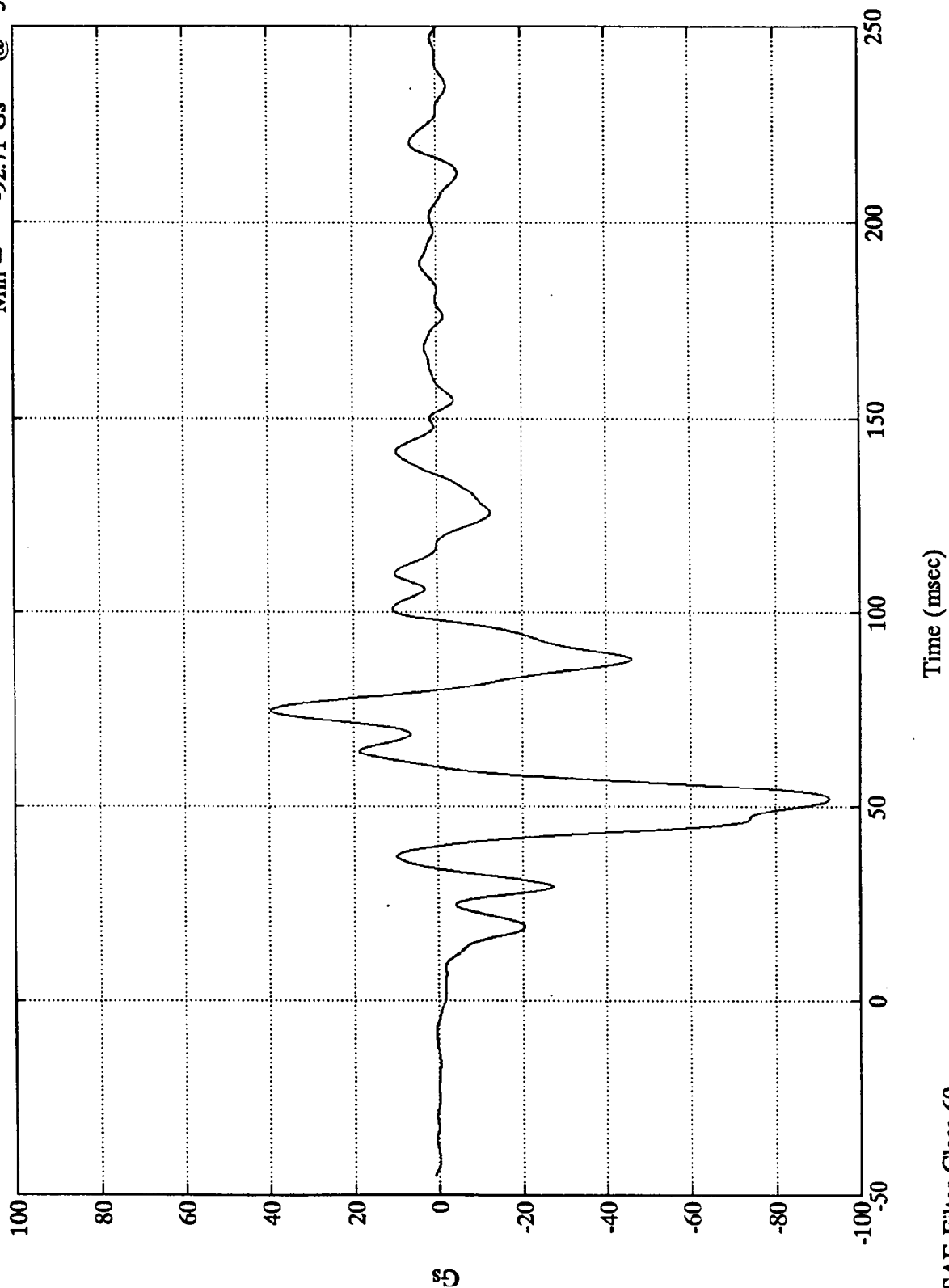
Max = 23.4 in. @ 89.5 msec
Min = 0.0 in. @ -0.0 msec



Test 1049

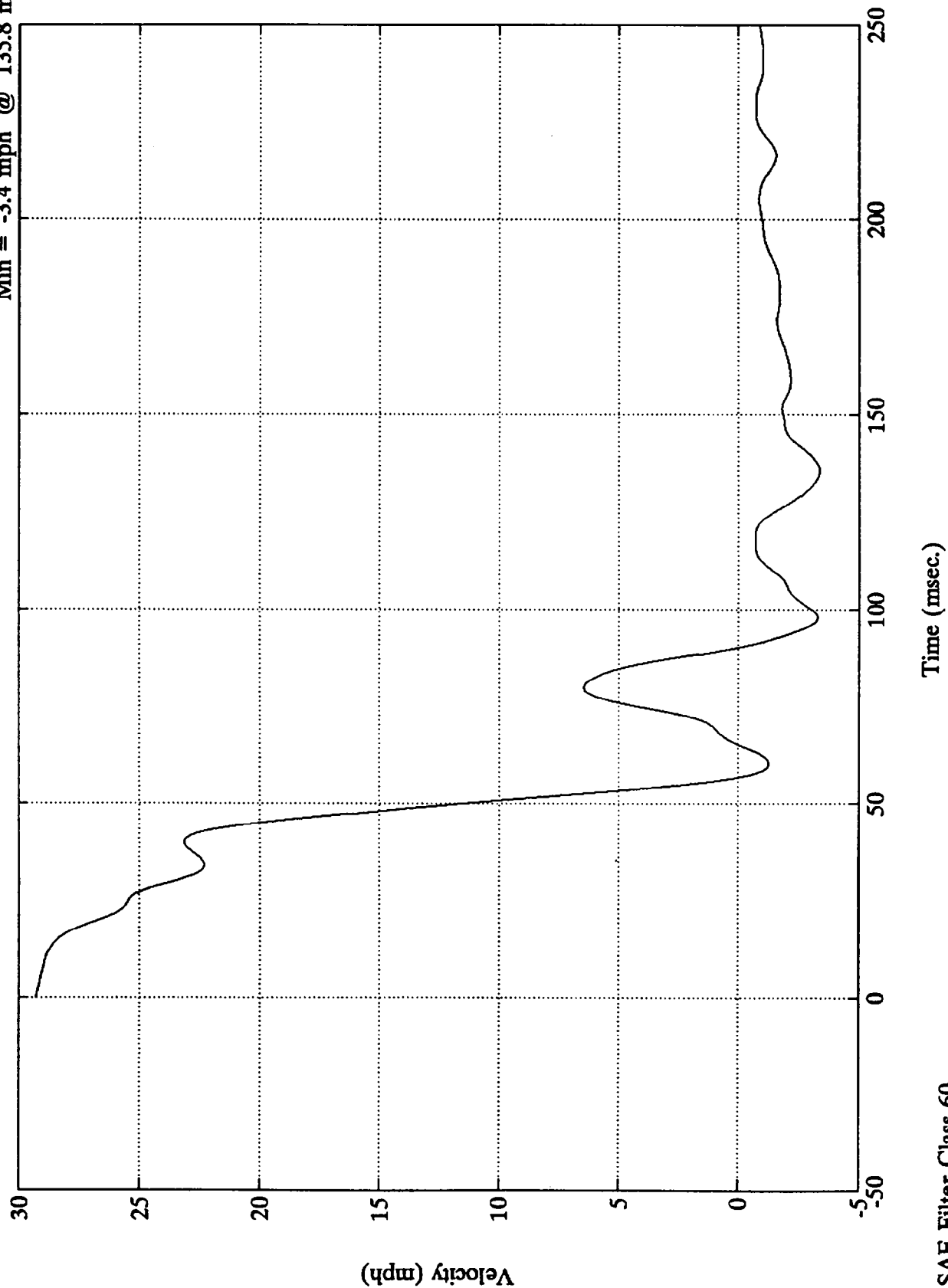
L. Brake Caliper X (#6)

Max = 39.72 Gs @ 74.51 msec
Min = -92.71 Gs @ 52.08 msec



L. Brake Caliper X (#6)

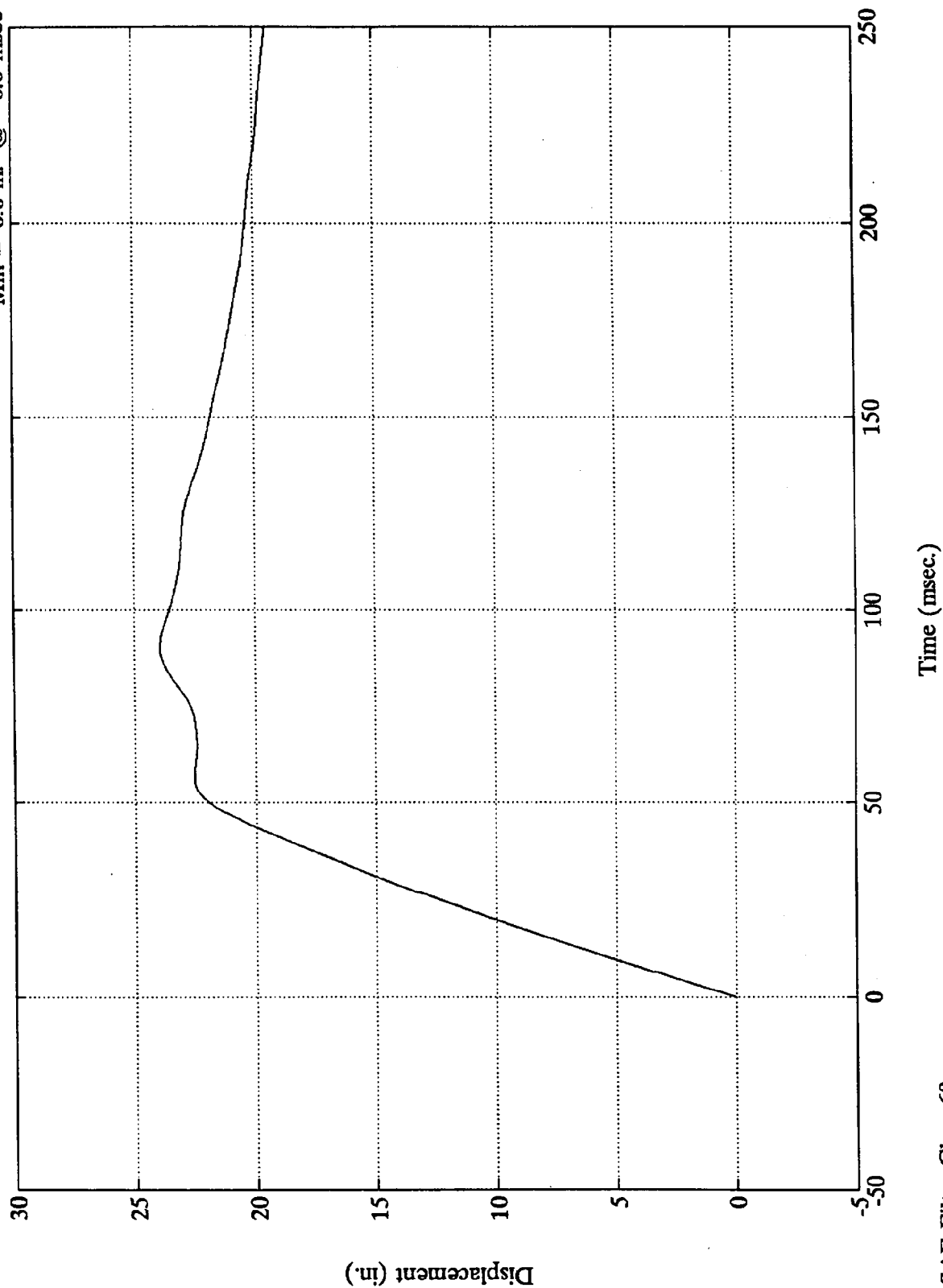
Max = 29.3 mph @ -0.0 msec
 Min = -3.4 mph @ 135.8 msec



Test 1049

L. Brake Caliper X (#6)

Max = 23.9 in. @ 91.0 msec
Min = 0.0 in. @ -0.0 msec



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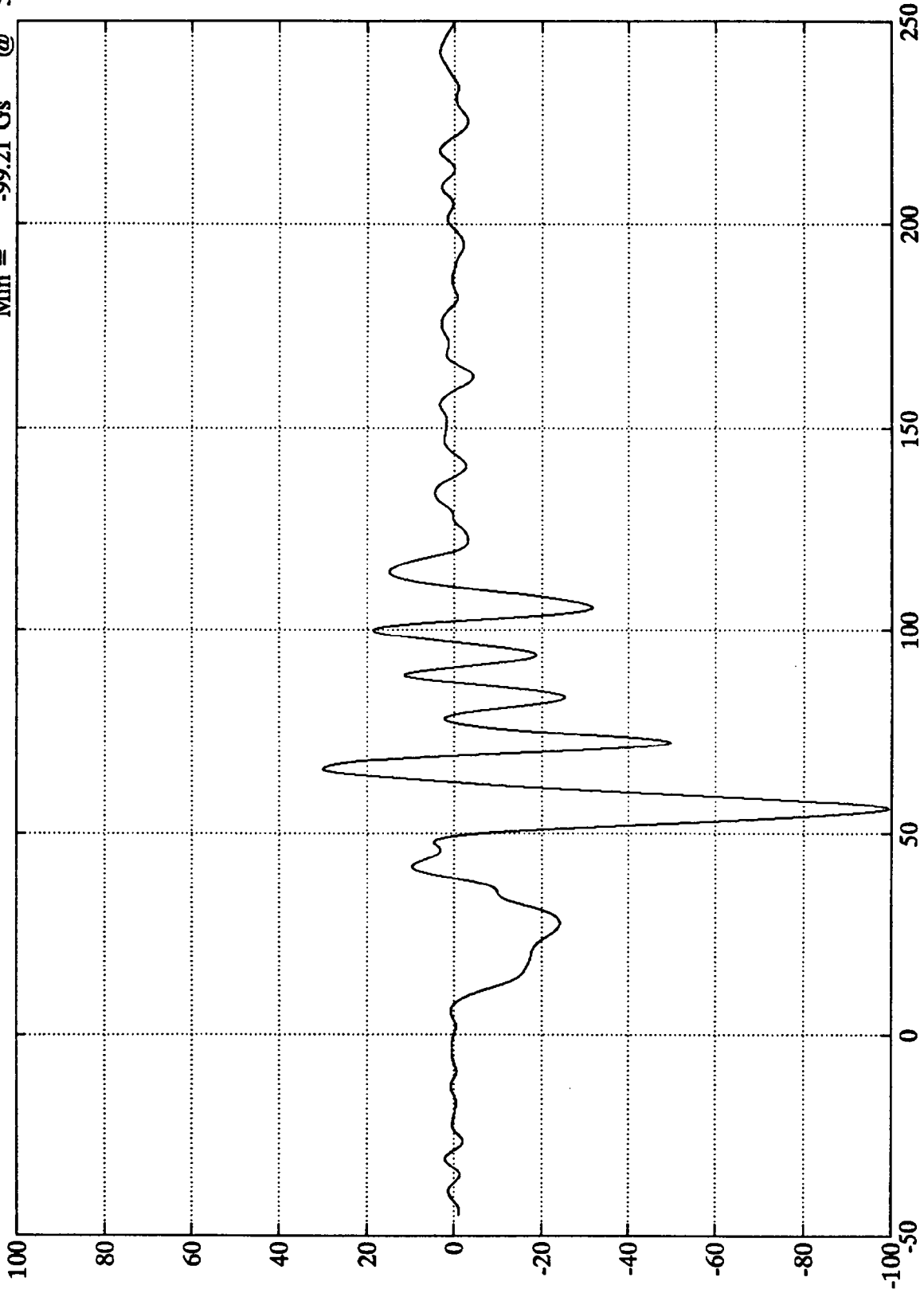
7853-9

SAE Filter Class 60

Test 1049

Instrument Panel X (#7)

Max = 30.12 Gs @ 65.87 msec
Min = -99.21 Gs @ 56.15 msec



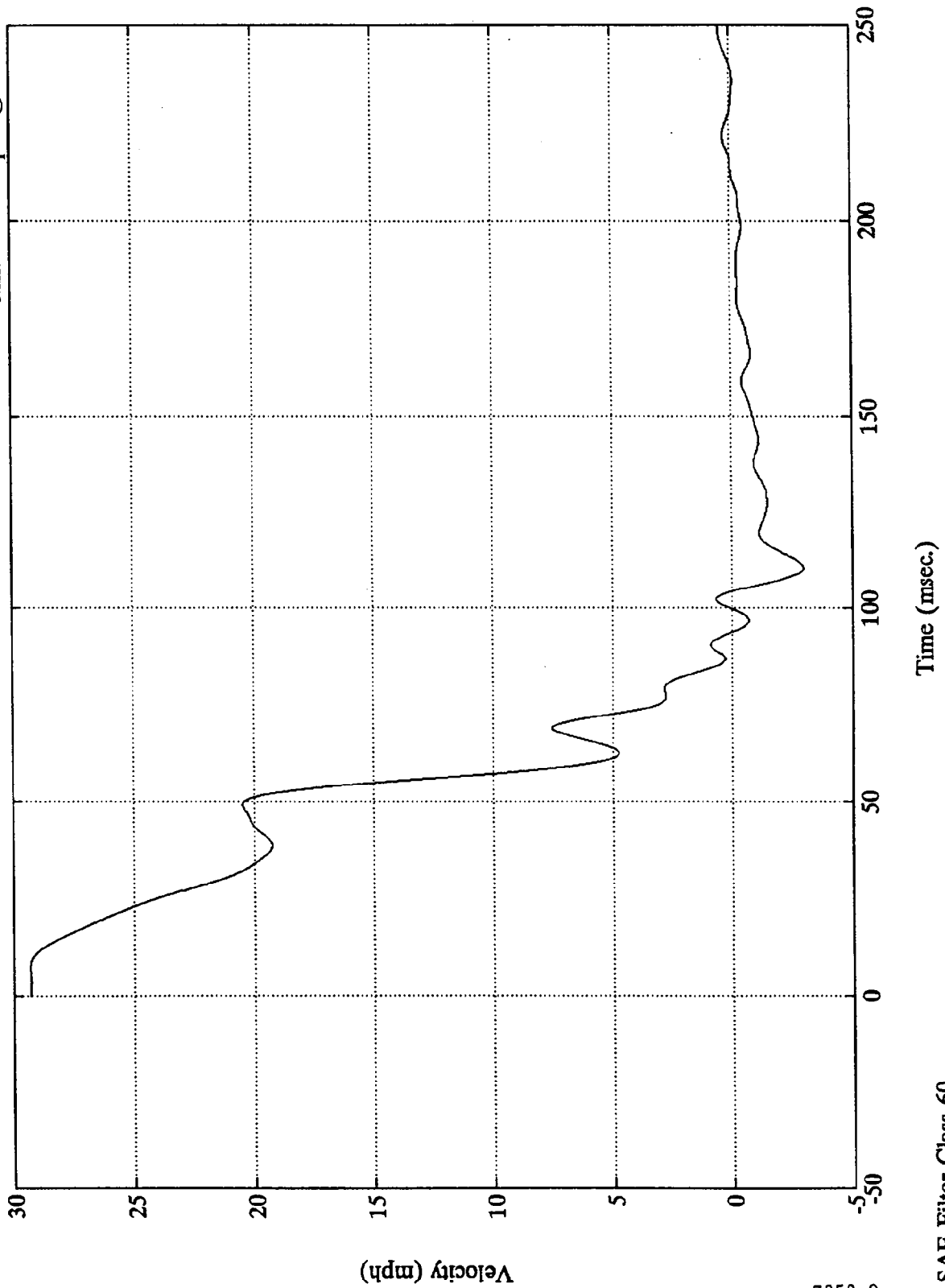
Time (msec)

SAE Filter Class 60

Test 1049

Instrument Panel X (#7)

Max = 29.3 mph @ 7.9 msec
Min = -3.0 mph @ 110.6 msec



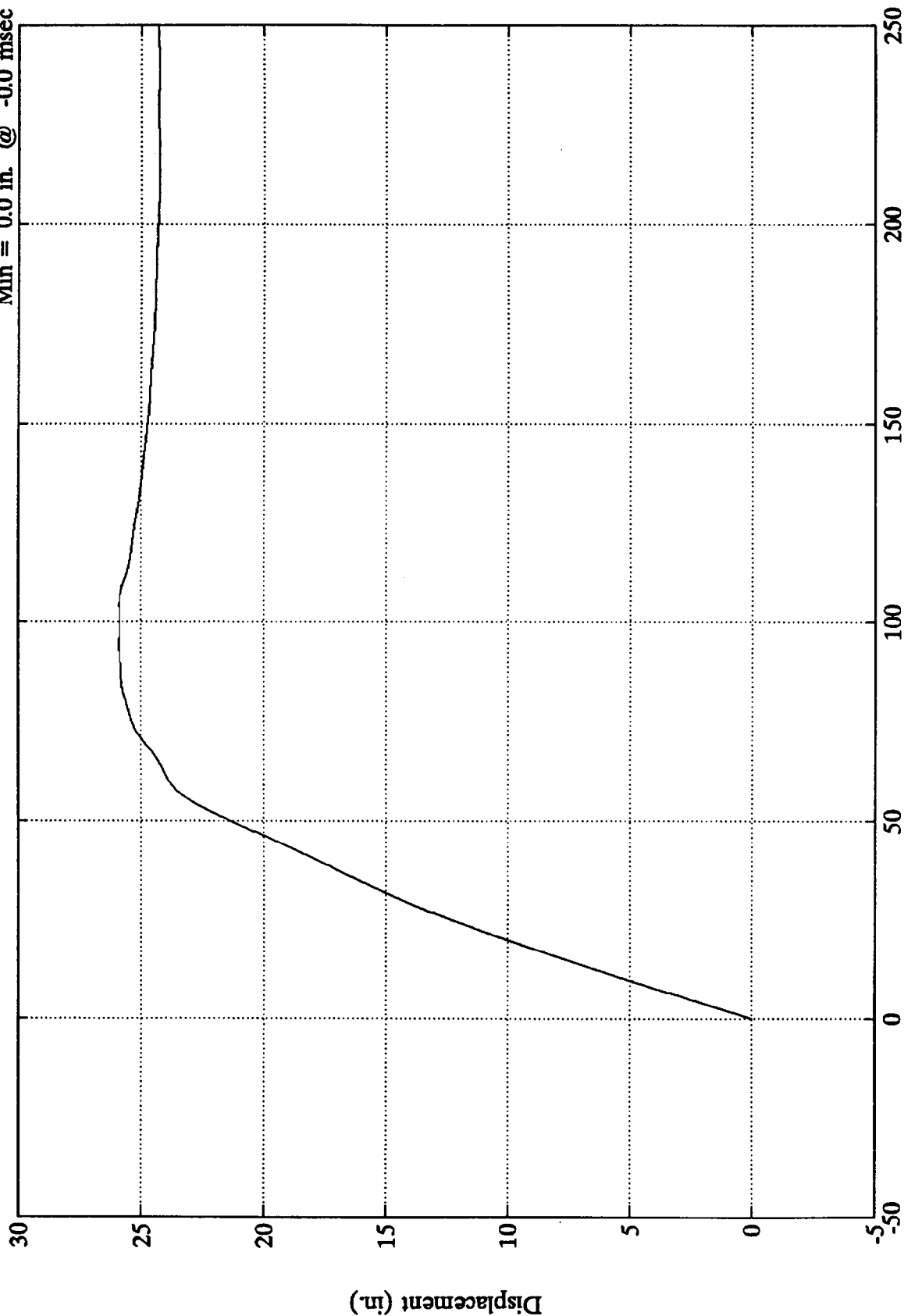
B-22

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SAE Filter Class 60

Max = 25.9 in. @ 104.6 msec
Min = 0.0 in. @ -0.0 msec

Instrument Panel X (#7)



Time (msec.)

SAE Filter Class 60

TEST NO. CM0301

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

HIC SUMMARY: Pos. 1 Head Resultant

hic: 201.13
t1 = 58.920 msec
t2 = 94.800 msec
Average G's Over Hic Duration = 31.58

HIC SUMMARY: Pos. 2 Head Resultant

hic: 260.28
t1 = 86.520 msec
t2 = 122.400 msec
Average G's Over Hic Duration = 35.01

CLIP SUMMARY: Pos. 1 Chest Resultant

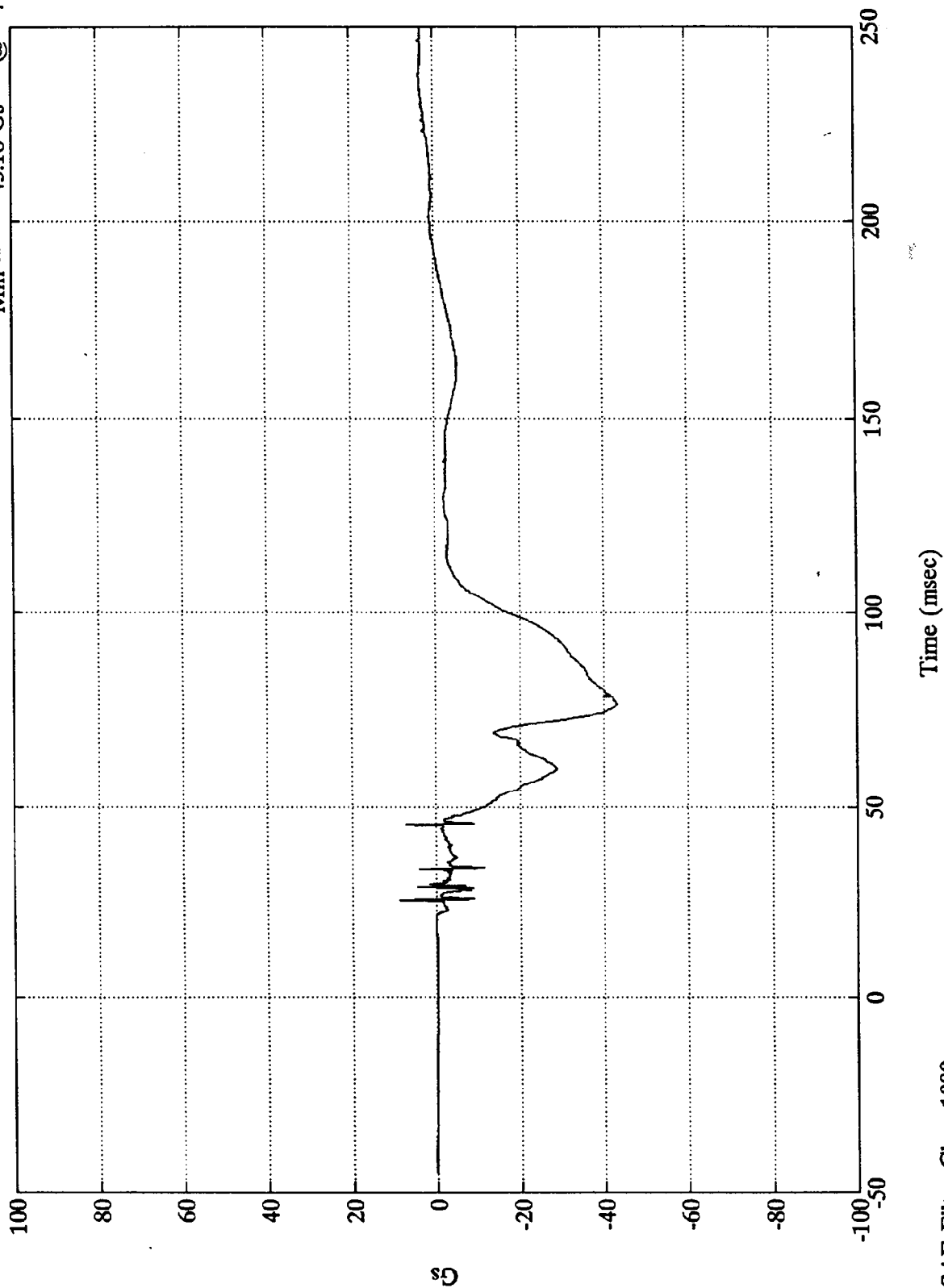
Peak Resultant (3 ms CLIPPED DURATION) = 47.825 G's
Tstart = 87.0000 ms
Tend = 90.0000 ms
CSI = 334.904

CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 43.723 G's
Tstart = 85.4400 ms
Tend = 88.4400 ms
CSI = 265.572

Test 1049

Pos. 1 Head X Max = 8.72 Gs @ 25.55 msec
Min = -43.18 Gs @ 76.31 msec



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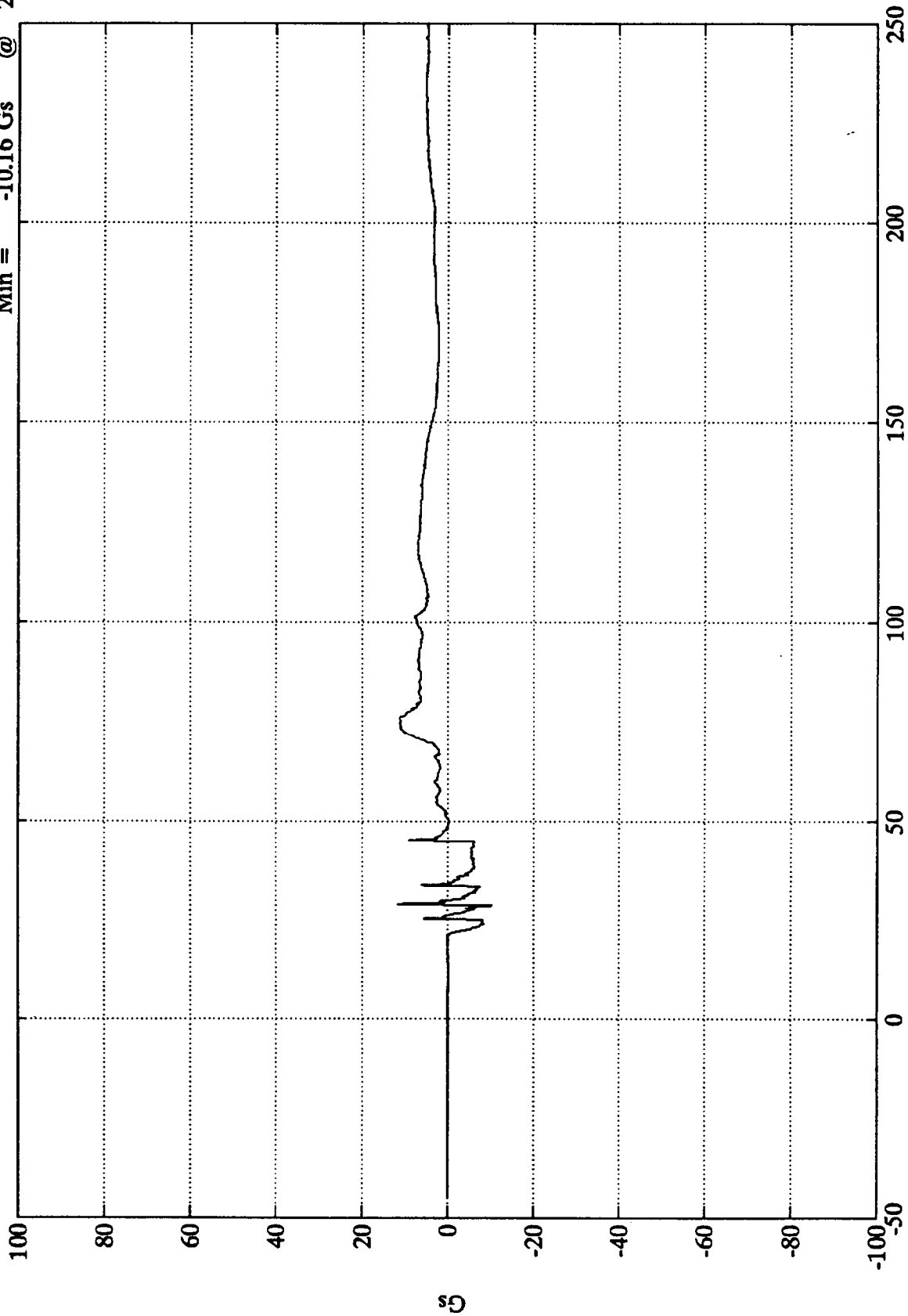
7853-9

SAE Filter Class 1000

Test 1049

Pos. 1 Head Y

Max =	11.56 Gs	@	29.27 msec
Min =	-10.16 Gs	@	28.92 msec



Time (msec)

SAE Filter Class 1000

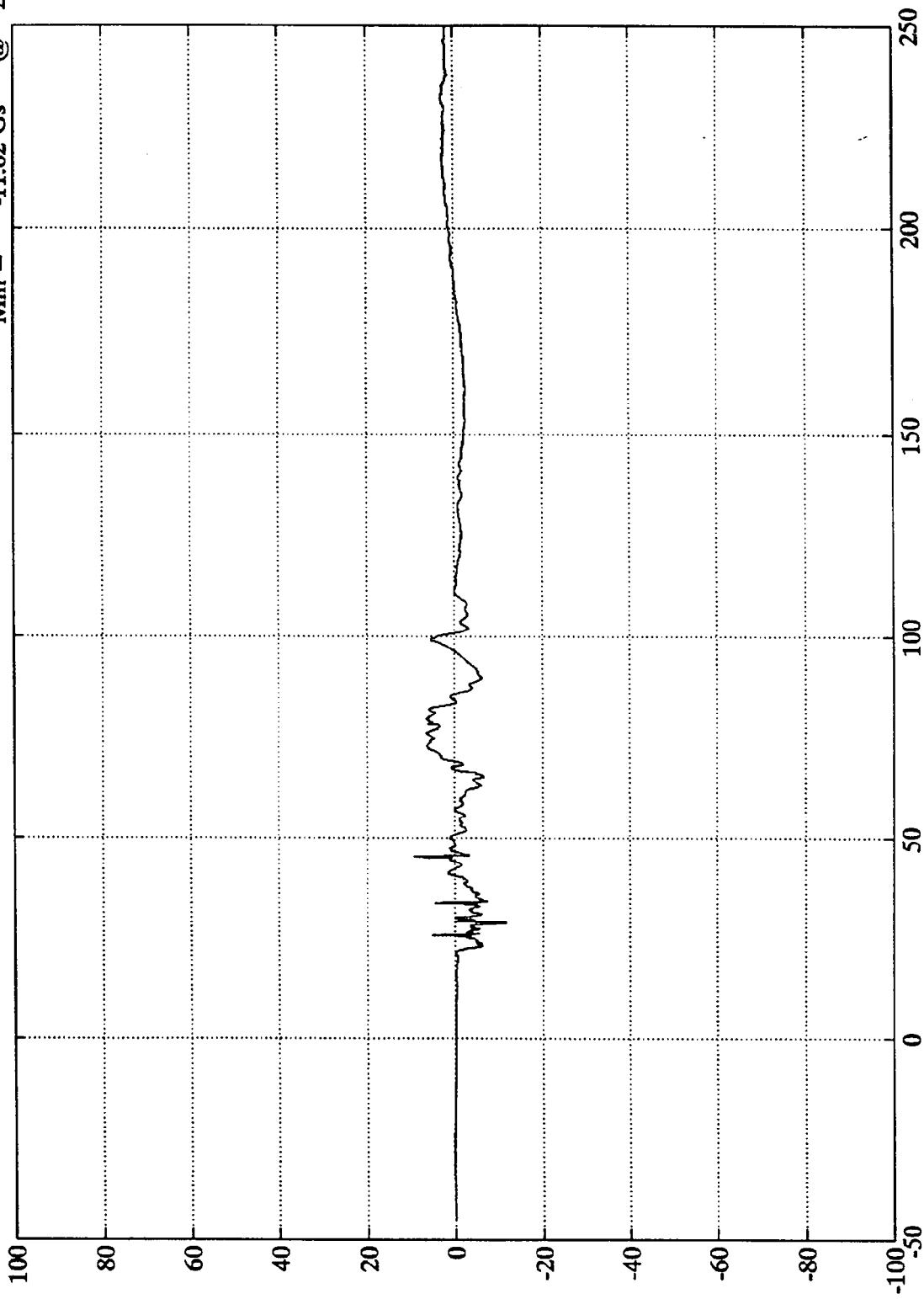
B-27

7853-9

Test 1049

Pos. 1 Head Z

Max = 9.09 Gs @ 45.36 msec
Min = -11.62 Gs @ 28.79 msec



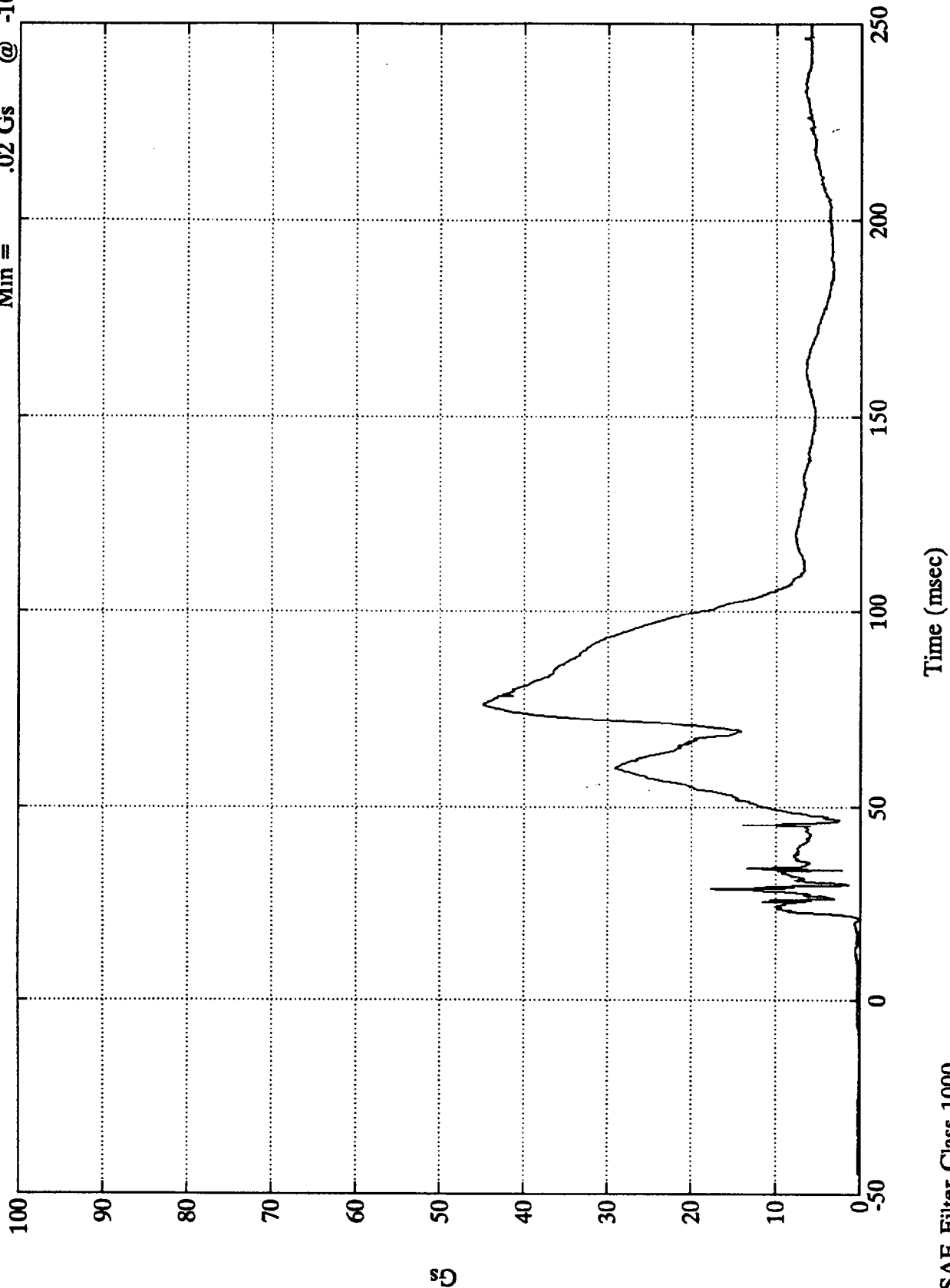
Time (msec)

SAE Filter Class 1000

Test 1049

Pos. 1 Head Resultant

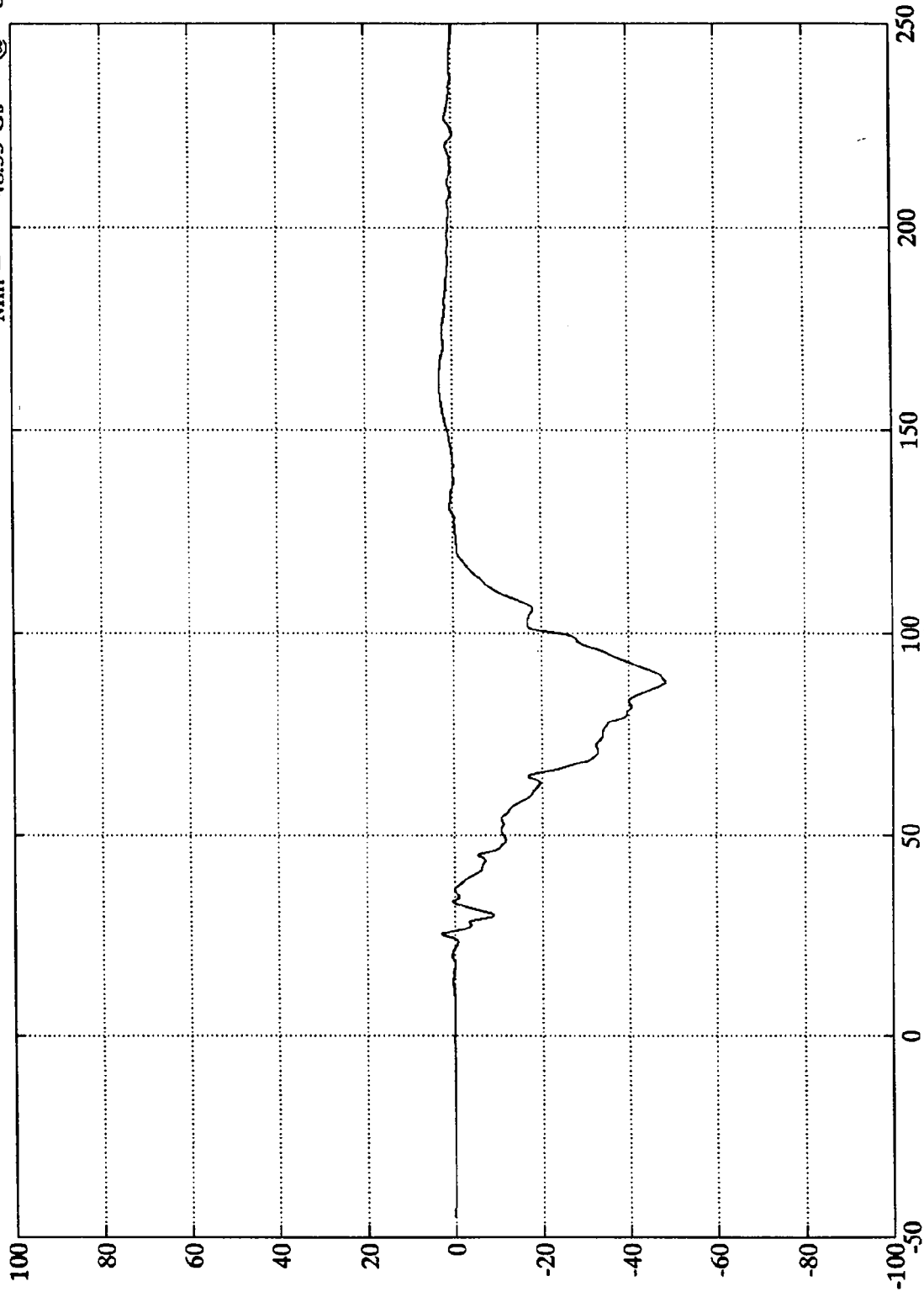
Max =	44.87 Gs	@	76.20 msec
Min =	.02 Gs	@	-10.92 msec



Test 1049

Pos. 1 Chest X

Max = 3.02 Gs @ 25.55 msec
Min = -48.33 Gs @ 88.08 msec



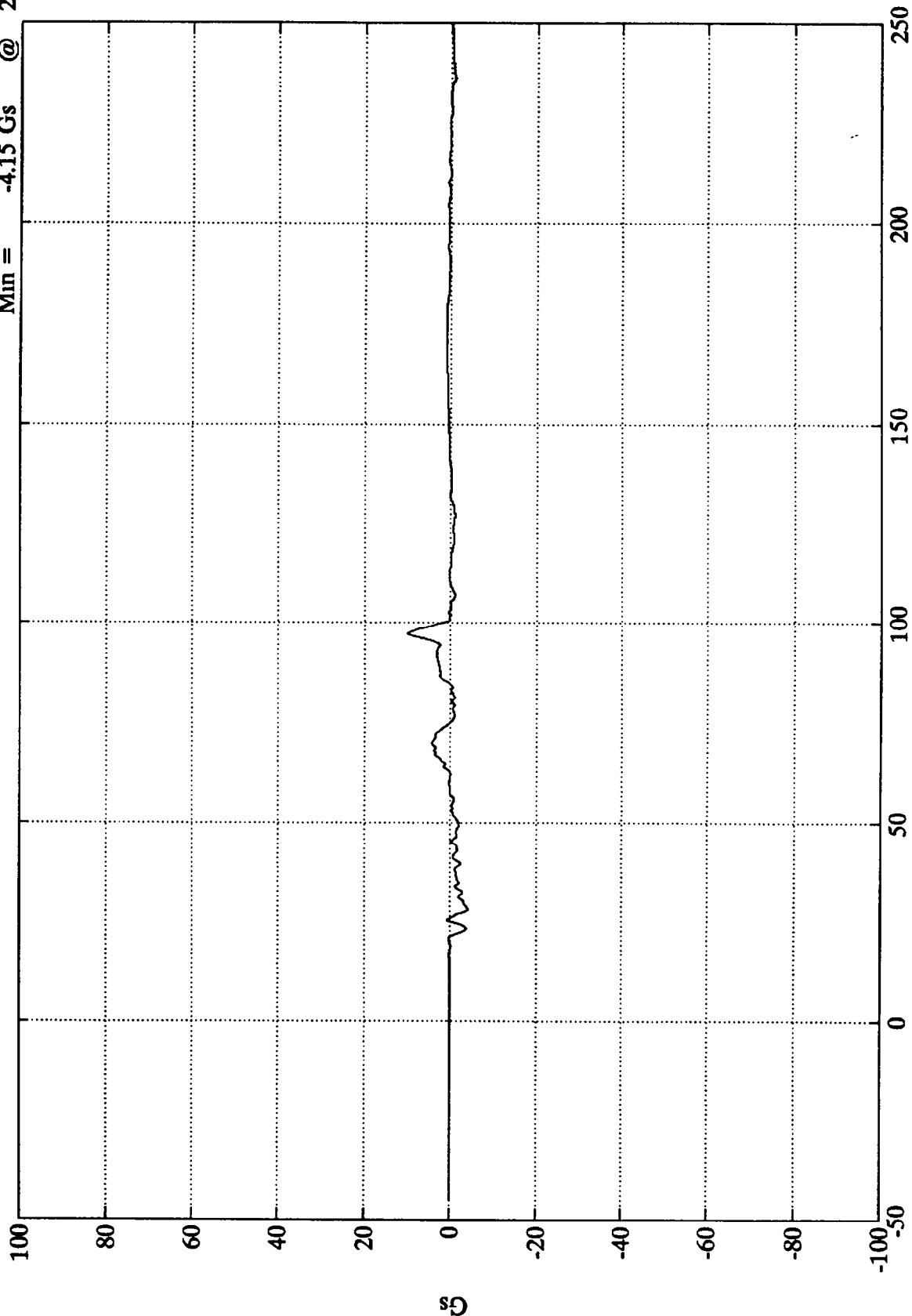
Time (msec)

SAE Filter Class 180

Test 1049

Pos. 1 Chest Y

Max =	9.84 Gs	@	97.19 msec
Min =	-4.15 Gs	@	28.20 msec



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7853-9

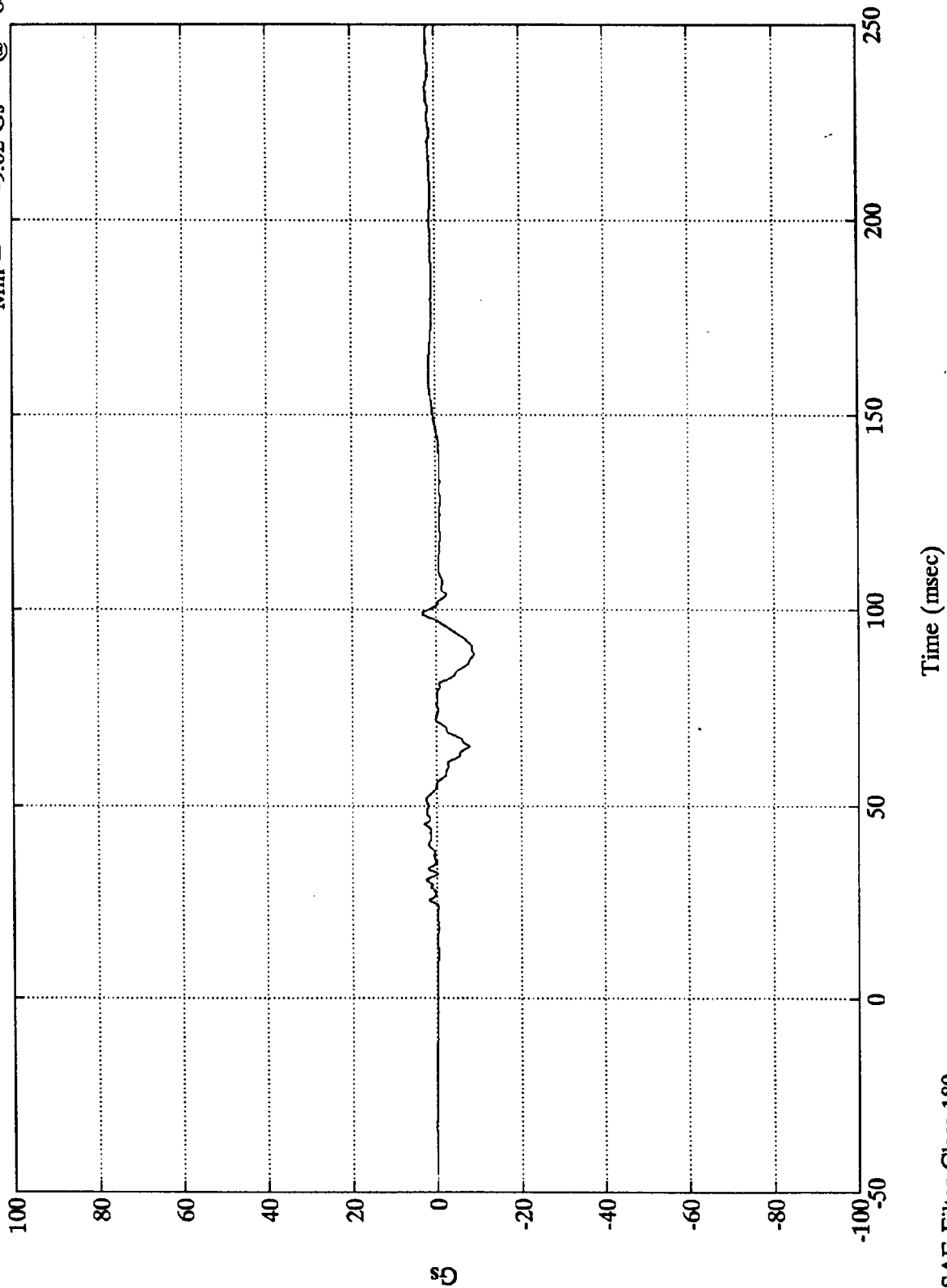
Time (msec)

SAE Filter Class 180

Test 1049

Pos. 1 Chest Z

Max =	3.24 Gs	@	99.12 msec
Min =	-9.02 Gs	@	88.68 msec



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7853-9

SAE Filter Class 180

Test 1049

Pos. 1 Chest Resultant
Max = 49.15 Gs @ 88.20 msec
Min = .01 Gs @ -13.92 msec



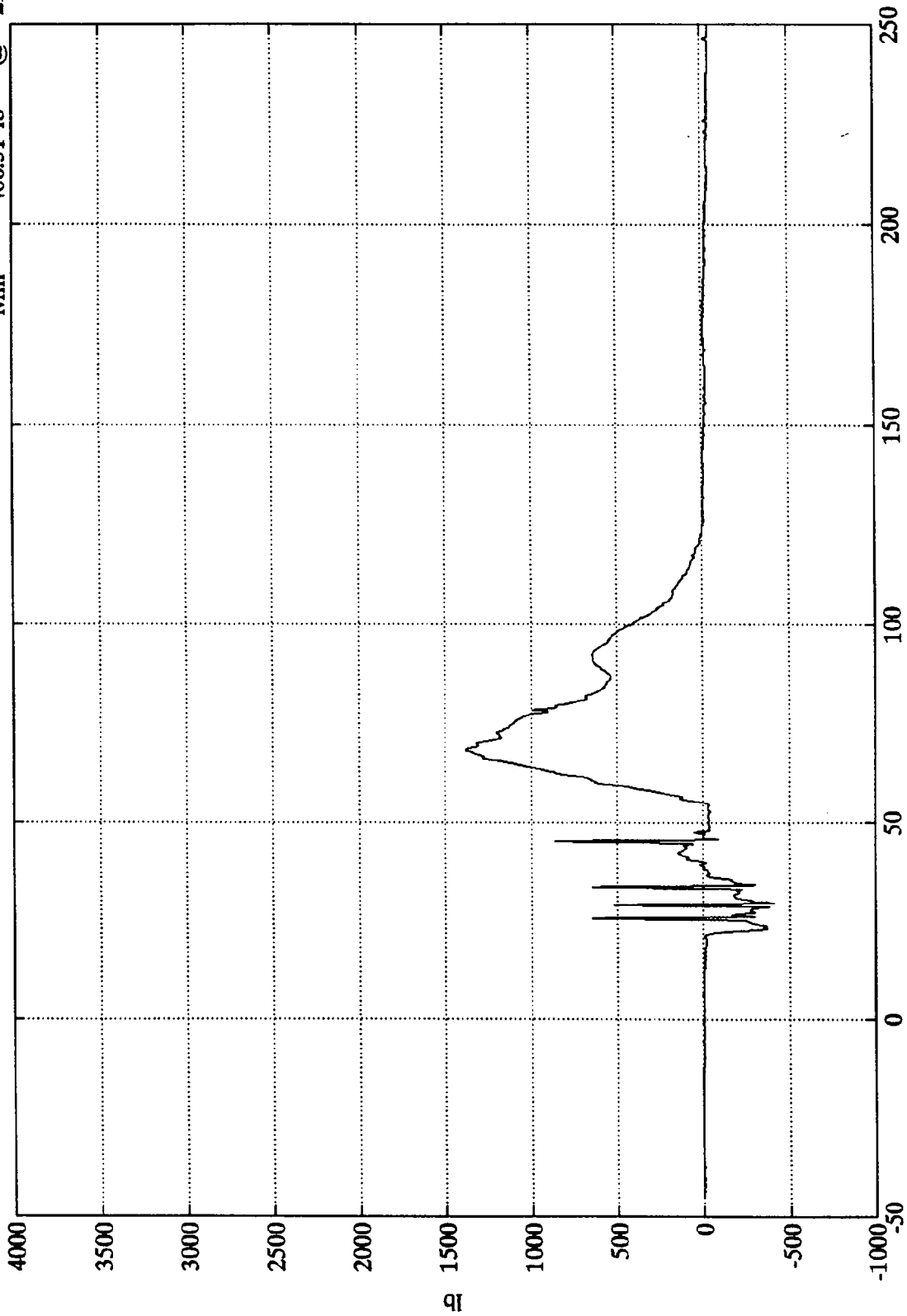
Time (msec)

SAE Filter Class 180

Test 1049

Pos. 1 Left Femur

Max = 1378.22 lb @ 68.28 msec
Min = -406.51 lb @ 29.76 msec

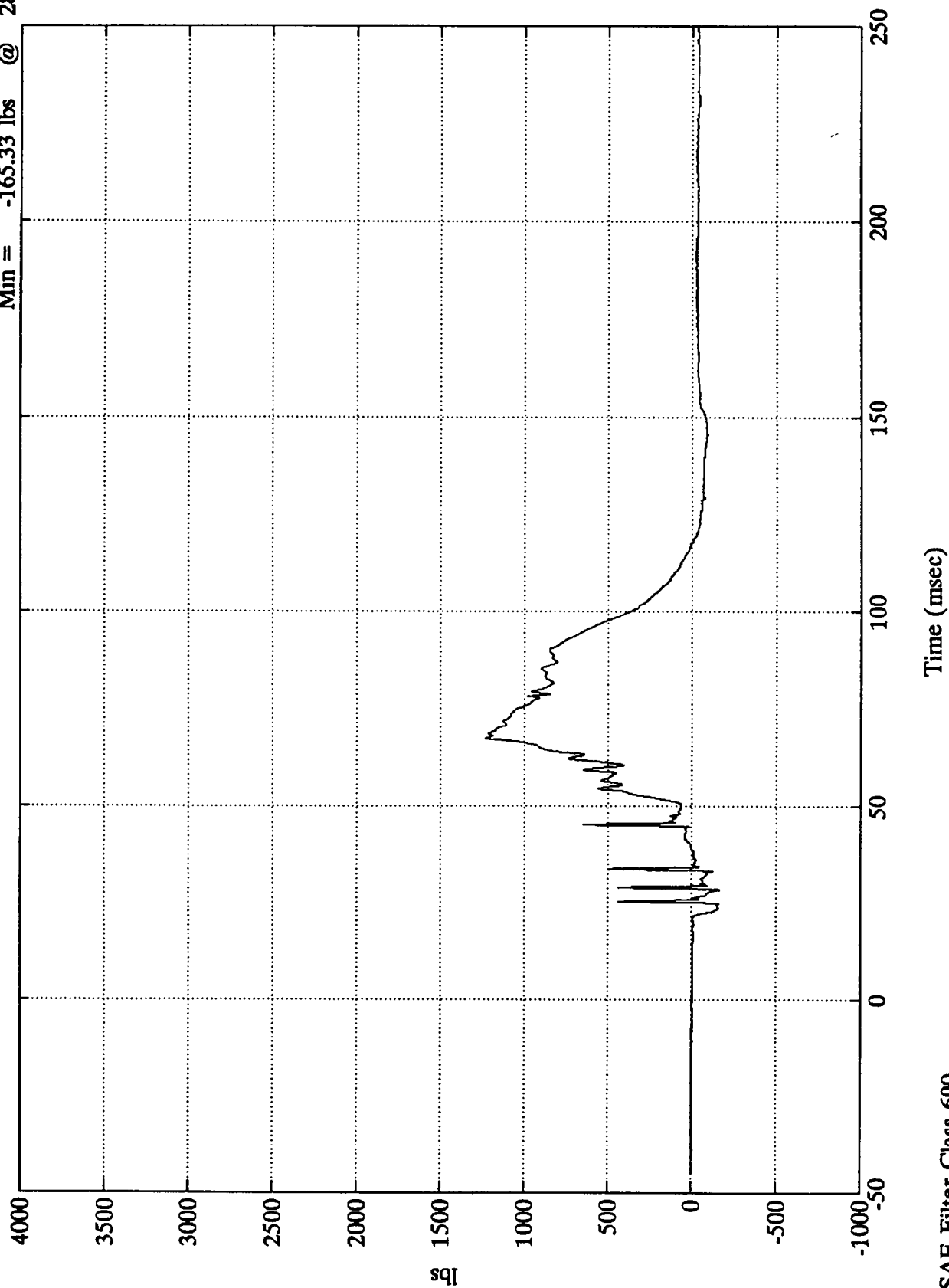


Time (msec)

SAE Filter Class 600

Test 1049

Pos. 1 Right Femur
Max = 1231.56 lbs @ 67.32 msec
Min = -165.33 lbs @ 28.68 msec



B-35

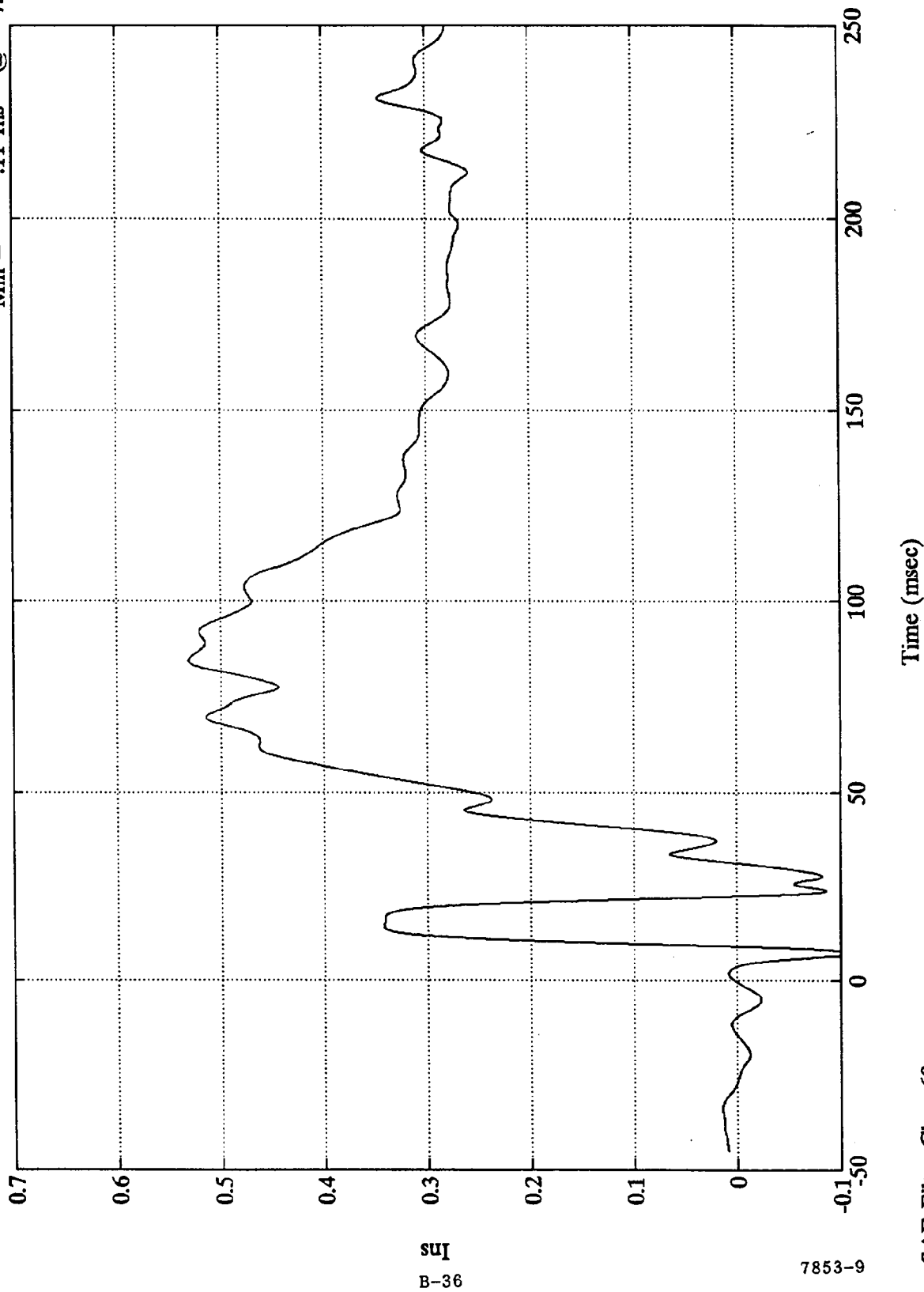
7853-9

SAE Filter Class 600

Test 1049

Pos. #1 Chest Disp.

Max = .53 Ins @ 84.48 msec
Min = -.11 Ins @ 7.43 msec



Ins
B-36

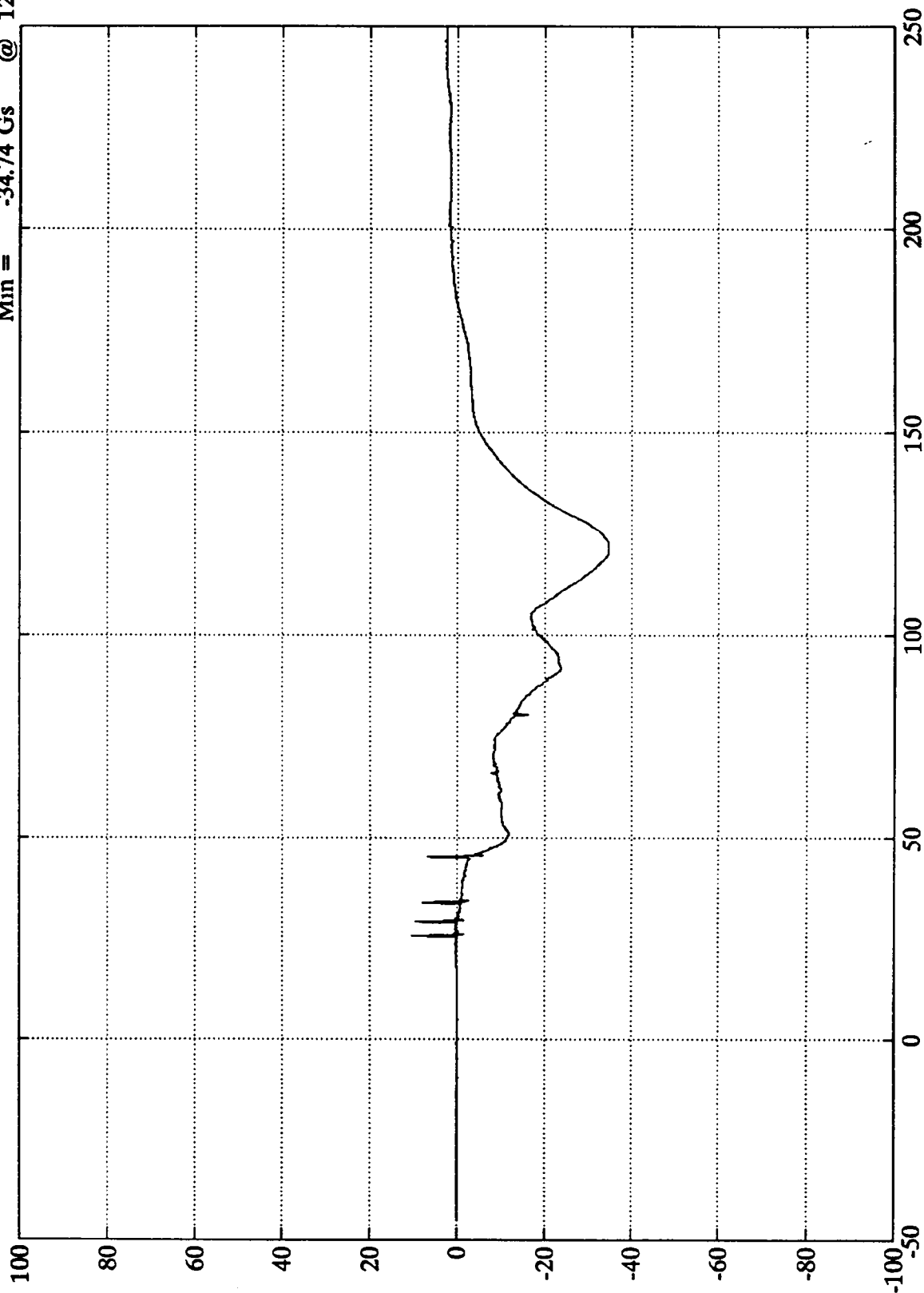
7853-9

SAE Filter Class 60

Test 1049

Pos. 2 Head X

Max = 10.42 Gs @ 25.44 msec
Min = -34.74 Gs @ 121.68 msec



Time (msec)

SAE Filter Class 1000

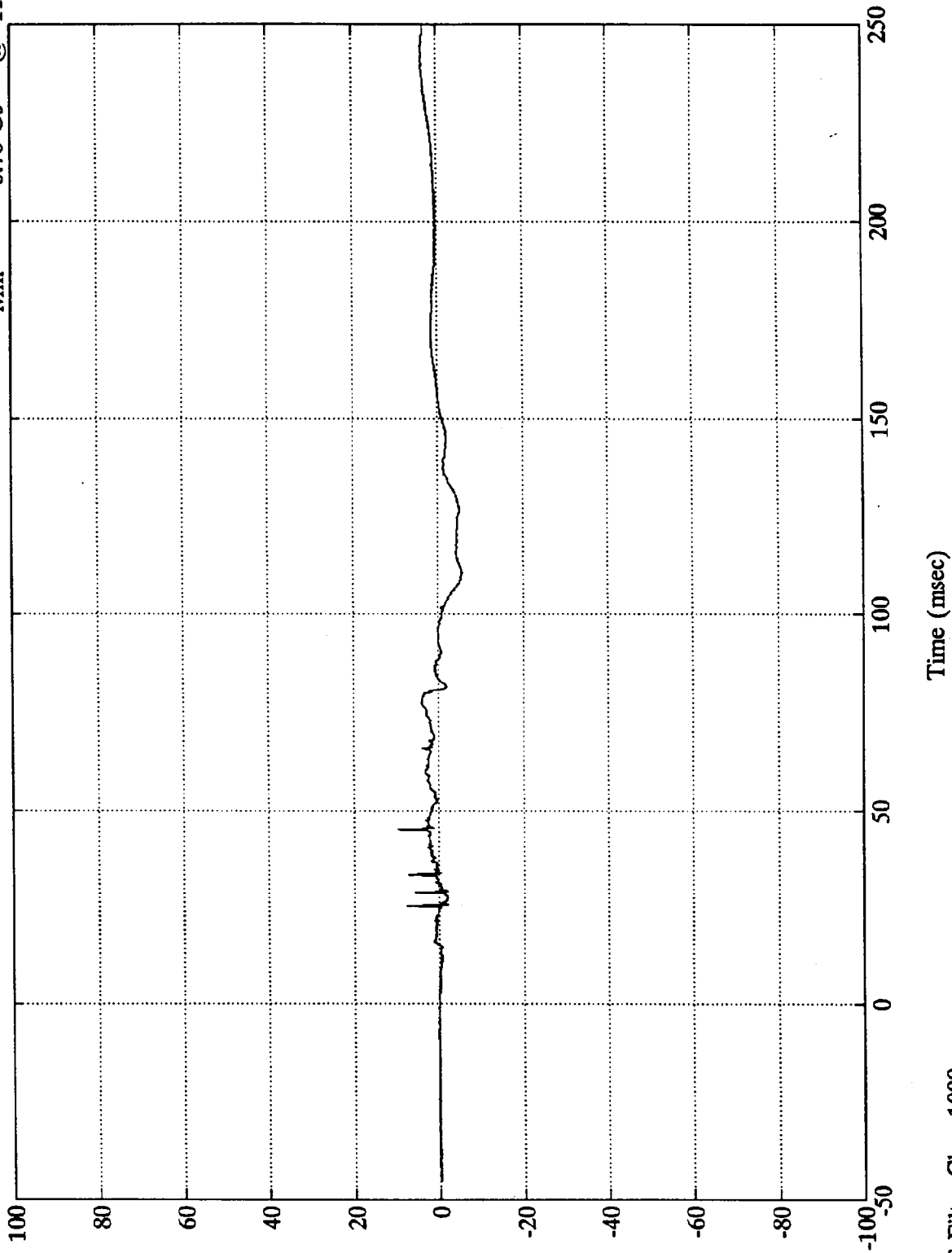
B-37

7853-9

Test 1049

Pos. 2 Head Y

Max = 9.65 Gs @ 45.36 msec
Min = -5.76 Gs @ 110.88 msec



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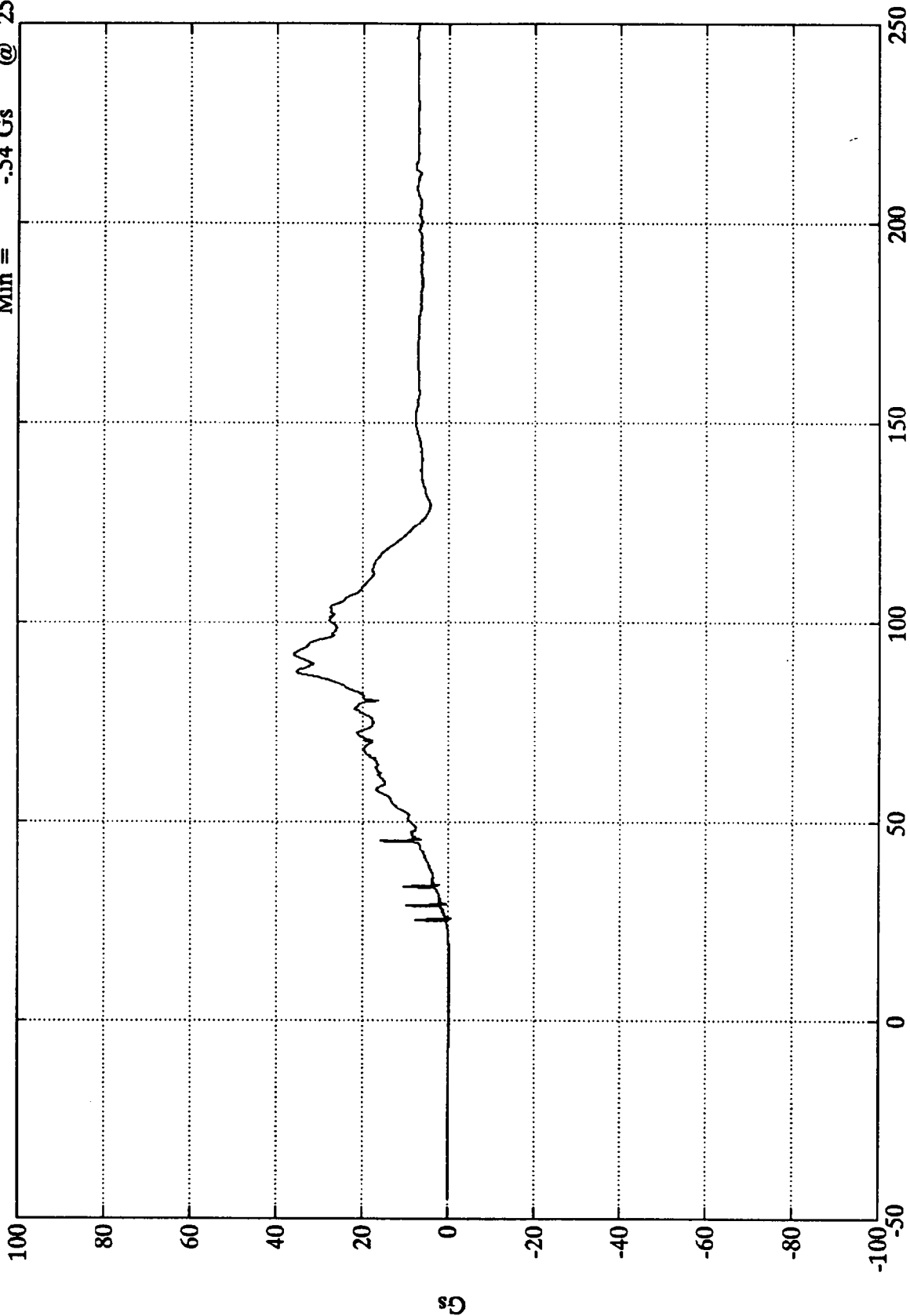
7853-9

SAE Filter Class 1000

Test 1049

Pos. 2 Head Z

Max = 35.86 Gs @ 92.16 msec
Min = -.54 Gs @ 254.88 msec



B-39

7853-9

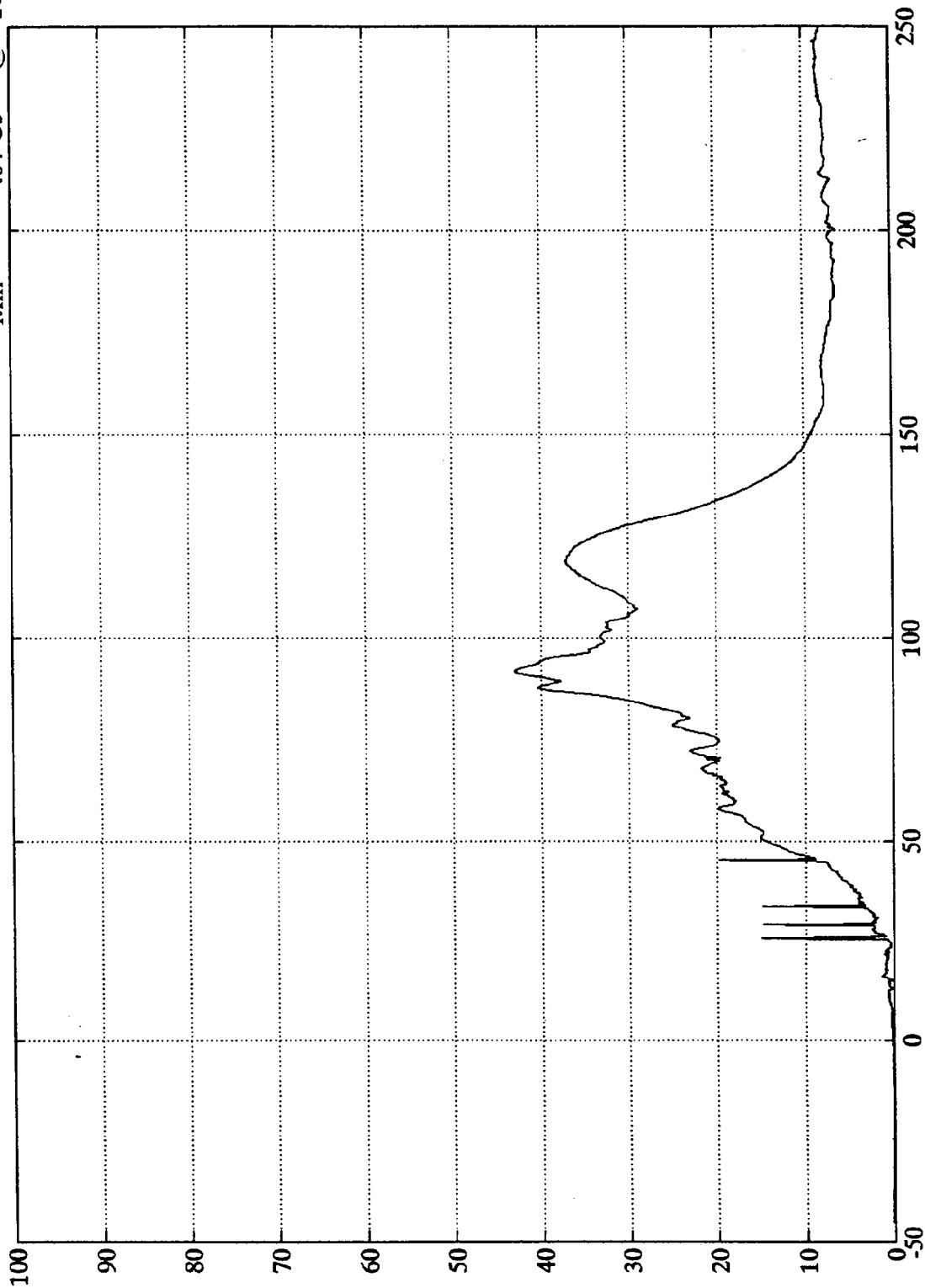
Time (msec)

SAE Filter Class 1000

Test 1049

Pos. 2 Head Resultant

Max = 42.93 Gs @ 91.92 msec
Min = .04 Gs @ -10.92 msec



SD
B-40

7853-9

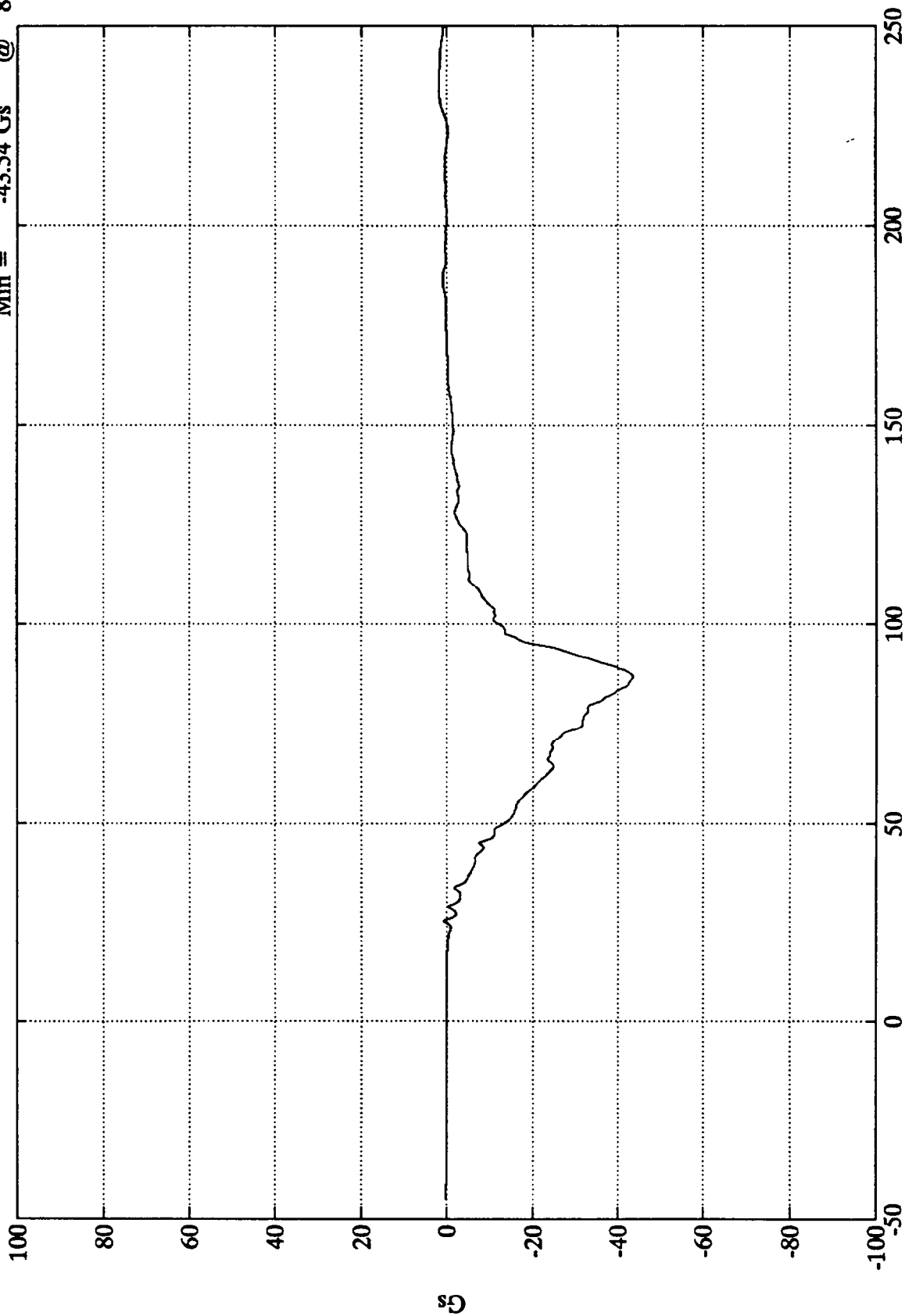
Time (msec)

SAE Filter Class 1000

Test 1049

Pos. 2 Chest X

Max = 1.92 Gs @ 233.04 msec
Min = -43.54 Gs @ 86.76 msec



Time (msec)

SAE Filter Class 180

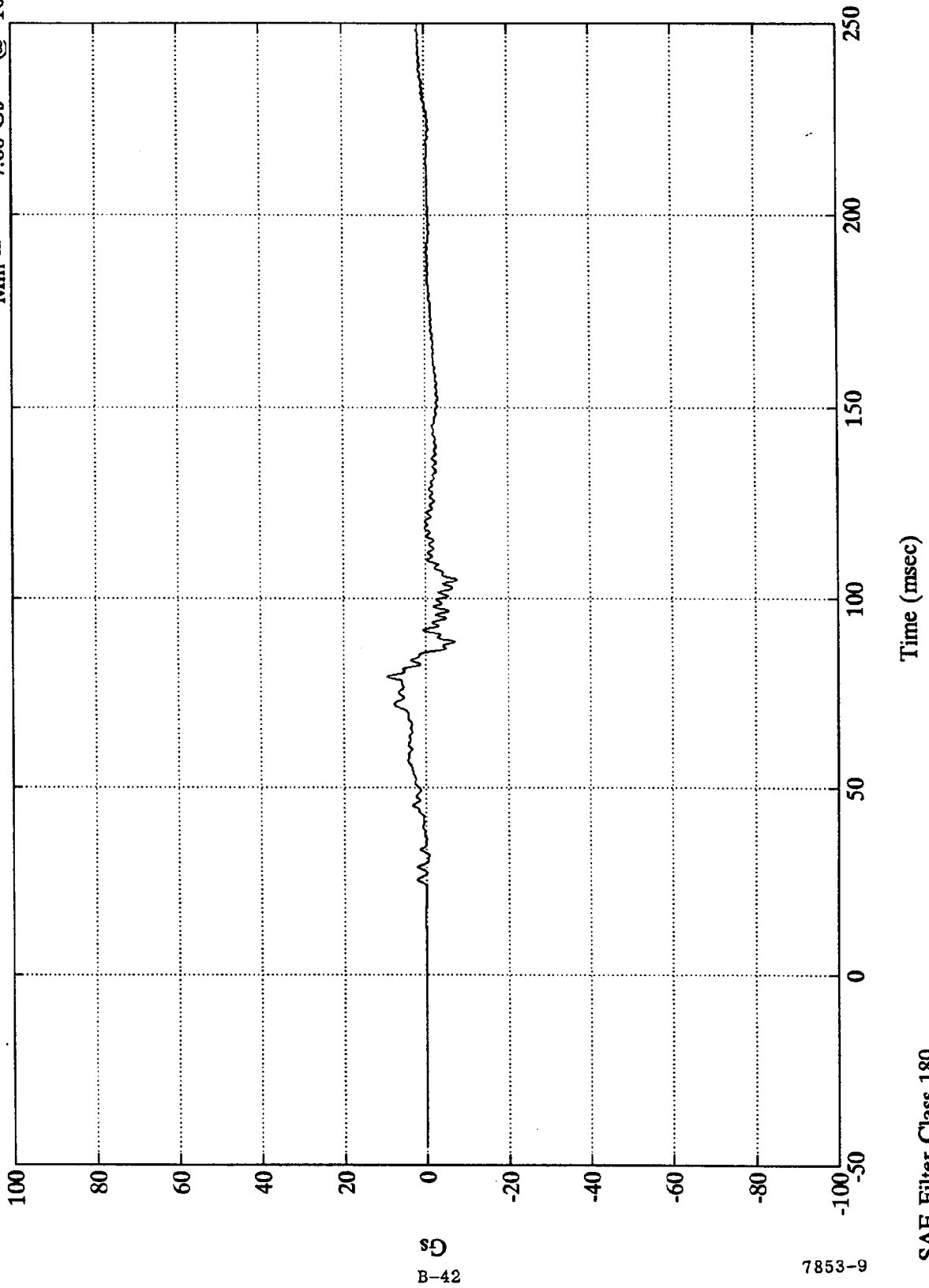
B-41

7853-9

Test 1049

Pos. 2 Chest Y

Max = 9.48 Gs @ 79.19 msec
Min = -7.66 Gs @ 105.00 msec



B-42

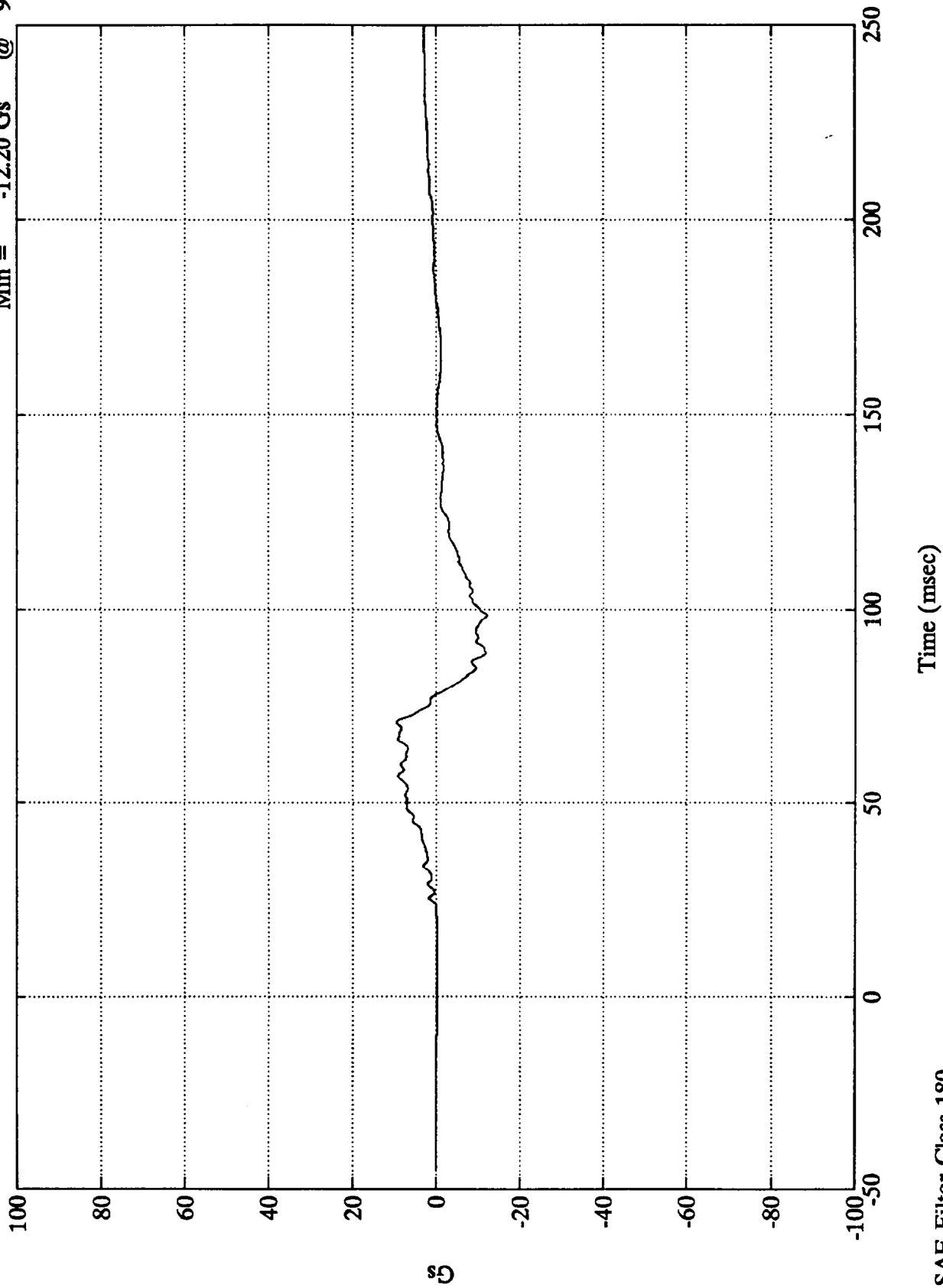
7853-9

SAE Filter Class 180

Test 1049

Pos. 2 Chest Z

Max = 9.44 Gs @ 70.79 msec
Min = -12.20 Gs @ 98.63 msec



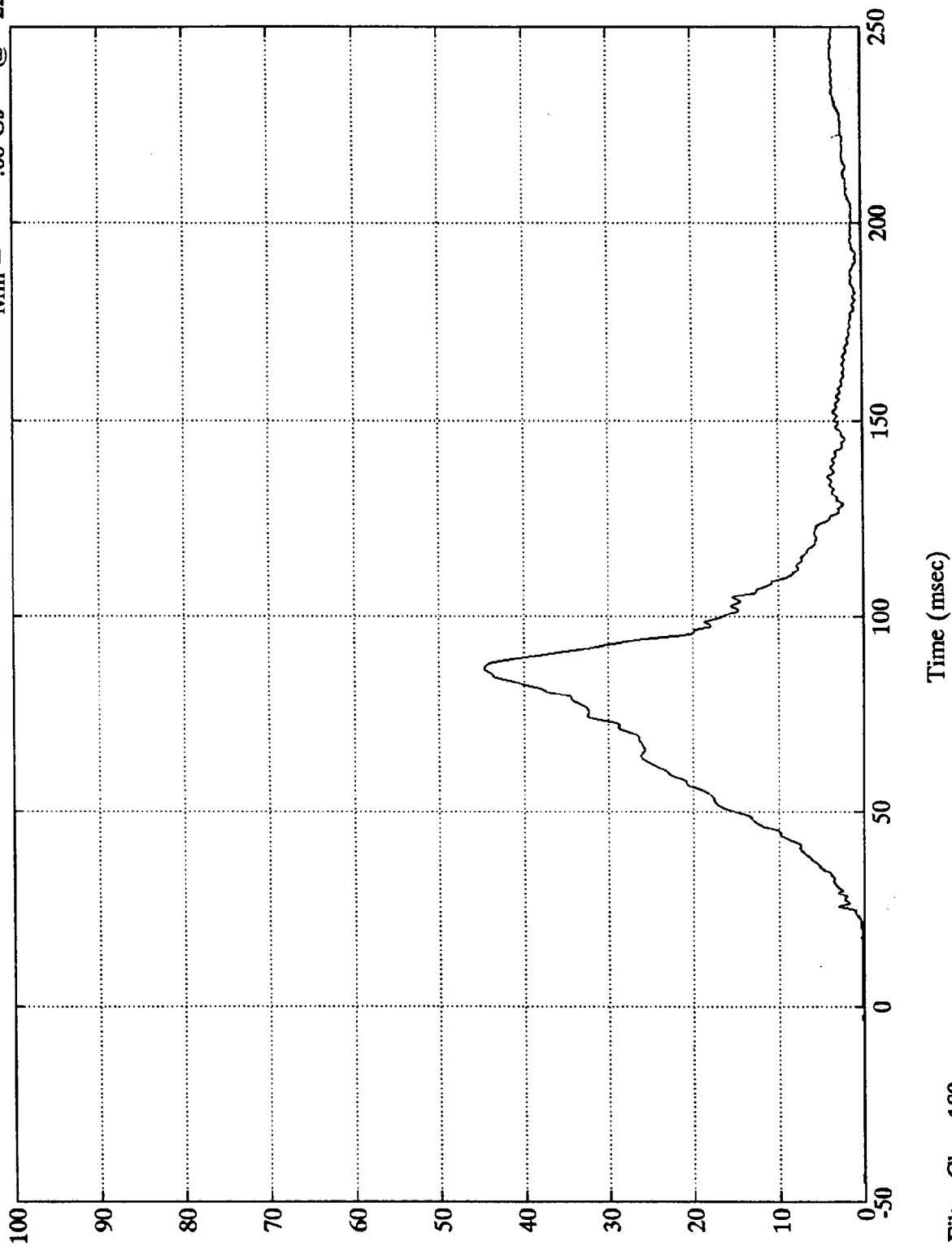
B-43

7853-9

SAE Filter Class 180

Test 1049

Pos. 2 Chest Resultant
Max = 44.67 Gs @ 86.87 msec
Min = .06 Gs @ -22.56 msec



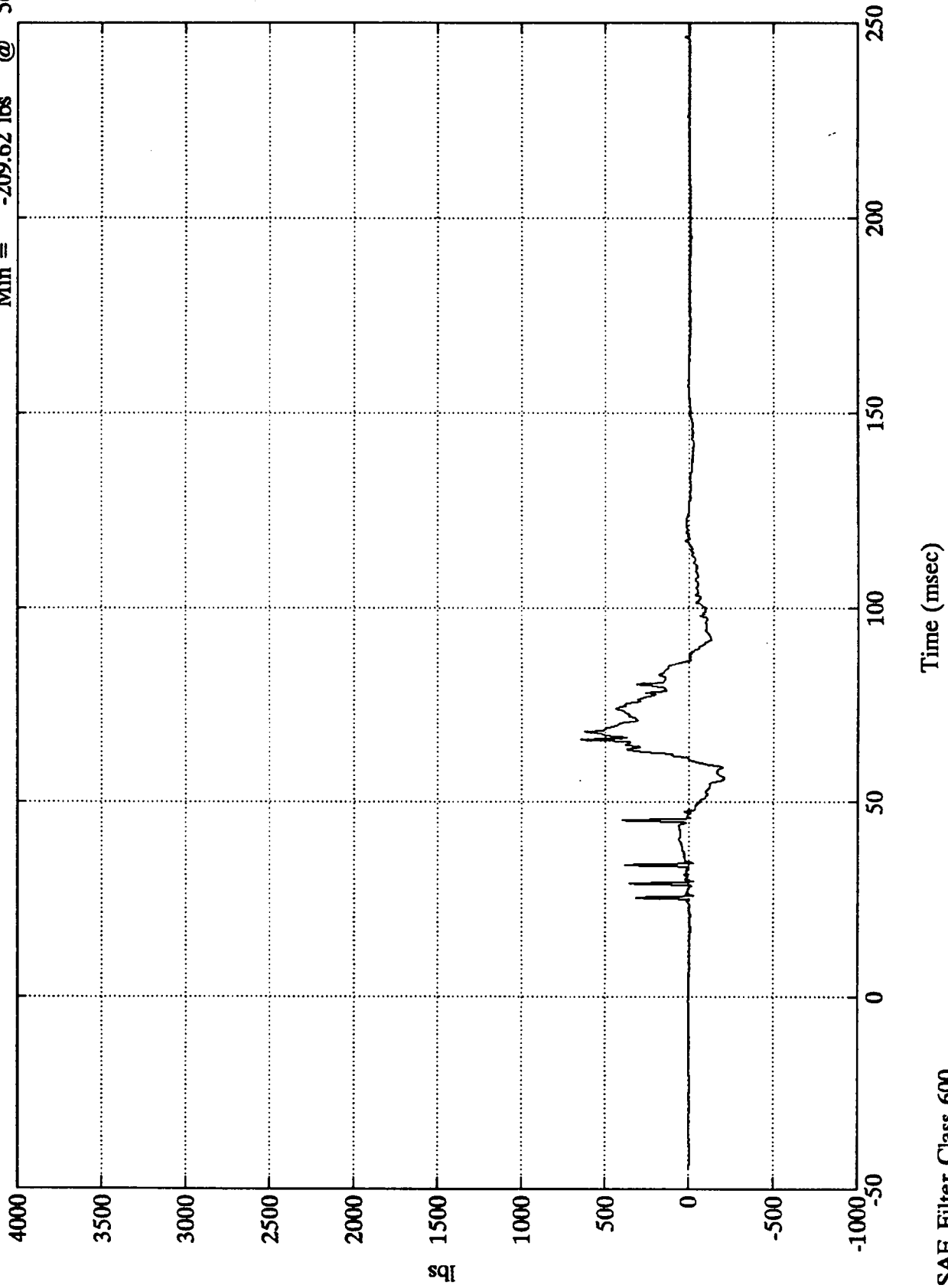
SD
B-44

7853-9

SAE Filter Class 180

Test 1049

Pos. 2 Left Femur
Max = 646.39 lbs @ 66.00 msec
Min = -209.62 lbs @ 56.28 msec



B-45

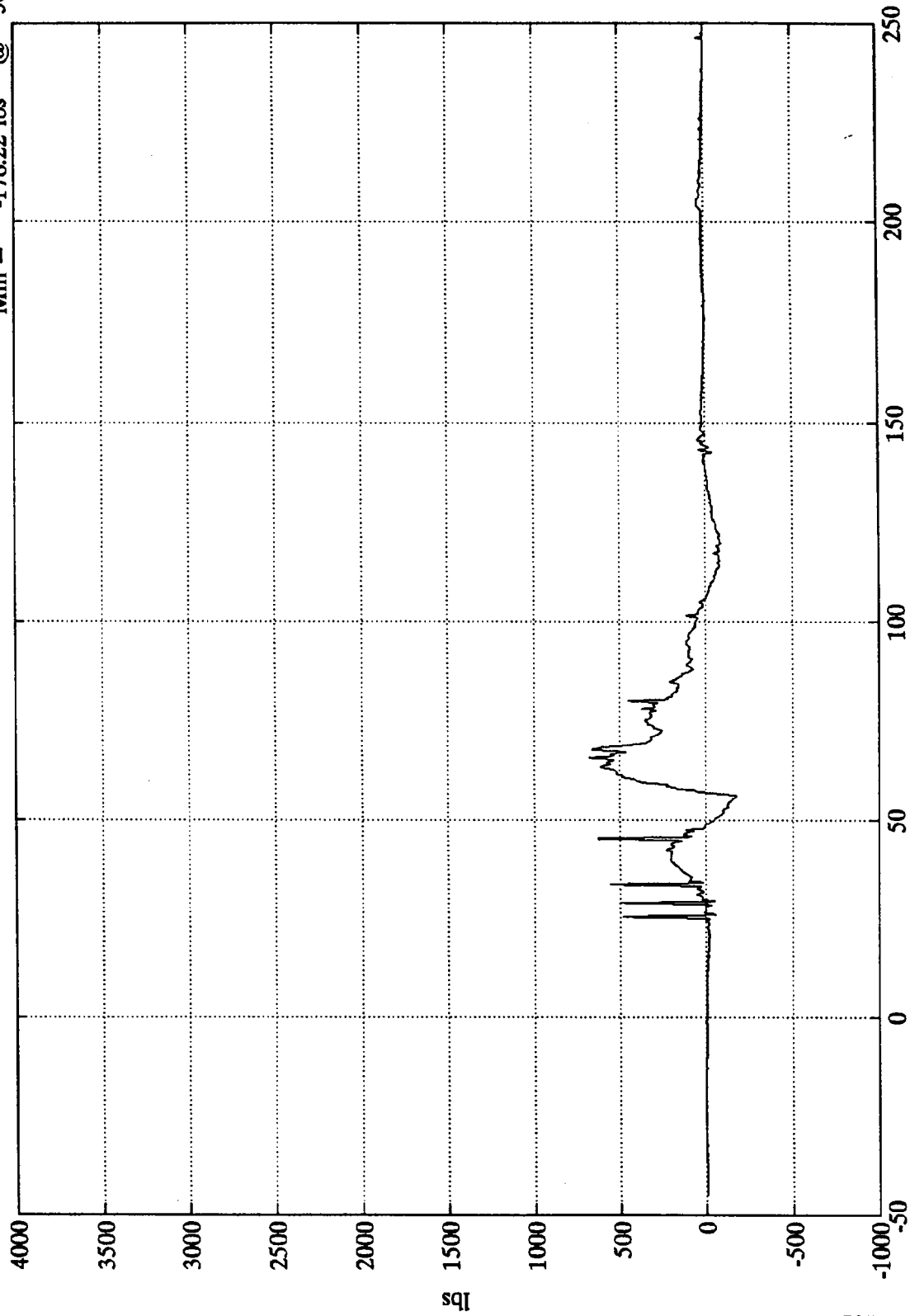
7853-9

SAE Filter Class 600

Test 1049

Pos. 2 Right Femur

Max = 677.89 lbs @ 66.00 msec
Min = -178.22 lbs @ 56.28 msec

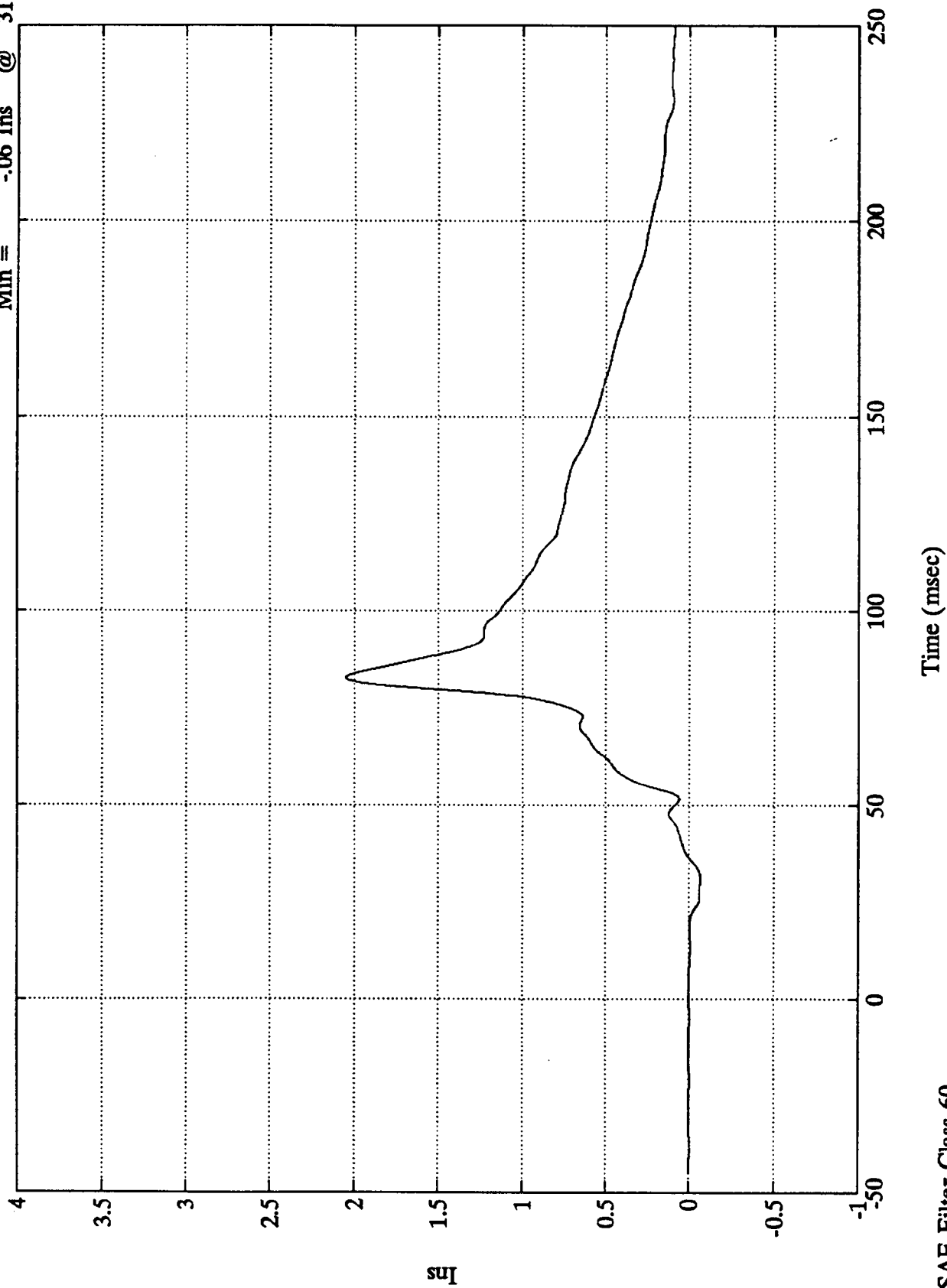


Time (msec)

SAE Filter Class 600

Test 1049

Pos. #2 Chest Disp. Max = 2.04 Ins @ 82.80 msec
Min = -.06 Ins @ 31.19 msec



B-47

7853-9

SAE Filter Class 60

Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

OCCUPANT RESTRAINTS

Seat Belts

Always use the seat belts. The chance of a serious injury is greatly reduced when the belts are properly used.

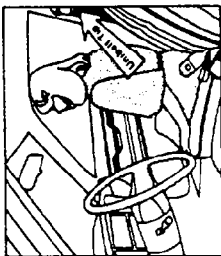
Seat belts provide protection against being thrown from the vehicle as well as reducing the risk of an injury caused by striking the interior of the vehicle.

Unibelts

The "UNIBELT", or single continuous-belt restraint system, incorporates an inertia sensitive belt webbing retractor which is designed to lock (i.e., prevent belt travel) *only during very sudden stops or impacts*. This feature allows the shoulder belt to move freely with the wearer under normal conditions. *The retractor will not lock by jerking or pulling the webbing rapidly by hand.*

UNIBELT OPERATING INSTRUCTIONS

1. Enter the vehicle and close the door. Sit back and erect and adjust the seat. Note the latch plate of the unbelt in its stowed position.



1

2. Grasp the latch plate and slide it up the webbing as far as necessary to go around your lap as you pull out the webbing.



2

3. As you pull the webbing across your lap and over your shoulder, move the latch plate toward the buckle.



3

Insert the latch plate into the buckle until a "click" is heard.

Do not wear the shoulder belt under your arm or otherwise out of position. Such use could increase the chance and/or severity of injury in a collision.

4. Position the lap belt with the upper edge of the belt drawn across the thighs and snug against the hips. Slack will automatically be removed due to tension created by the retractor. If a snug fit in the lap belt portion is desired, pull up on the shoulder belt as shown. A snug belt reduces the risk of sliding under the belt in a collision.



4

5. Position the shoulder belt on your chest so that it is comfortable and not resting on your neck. Any slack in the belt will be withdrawn automatically by the retractor.



5

6. To release the belt, push the red button marked "Press" on the buckle. The belt will automatically retract to its stowed position.

If needed, slide the latch plate down the webbing to allow the belt to fully retract.



6

DRIVER SUPPLEMENTAL RESTRAINT SYSTEM - AIRBAG (if so equipped)

This vehicle is equipped with a supplemental airbag restraint system for the driver. The seat belt continues to be the primary restraint and should be worn whenever the vehicle is in motion. It is important to wear the seat belt because it helps to provide protection in collisions for which the airbag is not designed to deploy, either because of low impact speed or non-frontal direction of impact (such as lateral, rollover or rear impacts). The seat belt also helps to position the driver for higher-speed frontal collisions in which the airbag does deploy. The steering wheel mounted airbag, lower instrument panel knee bolster and seat belt work together as a system to provide protection for the driver.

Service and general information labels about the airbag system can be found on the driver's sun visor, glove box door and in the engine compartment. Instructions on how to properly dispose of deployed airbags or airbag equipped vehicles can be obtained from your Chrysler Motors dealer.

The supplemental restraint system consists of the following items:

- impact sensors
- system diagnostic unit
- "AIRBAG" readiness lamp
- airbag module/inflator unit
- unique steering column and wheel
- interconnecting wiring
- instrument panel knee bolster

When the impact sensors located in the front of the car and in the passenger compartment detect a front end collision warranting airbag deployment, their internal switches complete an electrical circuit that actuates the inflator unit in the airbag module. This starts the process of generating a large quantity of non-toxic nitrogen gas which inflates the airbag. As the airbag inflates from its folded, stored position behind the steering wheel hub trim cover, the trim cover separates along seams and folds back out of the way to allow the airbag to inflate to its full size. The airbag fully inflates in about 50 milliseconds, about half the time it takes to blink your eye. It then begins to deflate by venting the non-toxic nitrogen gas through holes in the rear of the airbag so it will not interfere with controlling the car, and within a short amount of time, the airbag is almost entirely deflated.

Should A Deployment Occur

The airbag system is designed to deploy when the impact sensors detect a moderate to severe frontal collision, and then immediately deflate.

NOTE: A frontal collision that does not warrant airbag protection will not activate the system. This does not indicate something is wrong with the airbag system.

Should you experience a frontal collision which deploys the airbag, any or all of the following events may occur:

The nylon airbag material may under certain conditions cause abrasions and/or skin reddening to the driver as the airbag deploys and unfolds itself from its stored position. The abrasions are similar in nature to friction type rope burns or those experienced by sliding along a carpet or gymnasium floor. They are not caused by contact with chemicals, are not permanent and normally heal quickly. However, if significant healing has not occurred within a few days, or in the unlikely event that blistering occurs, seek the immediate advice of a personal physician.

As the airbag deflates from its fully inflated condition, some degree of smoke-like particles may be observed. The particles are a normal by-product of the process which generates the non-toxic nitrogen gas used for airbag inflation. These airborne particles may cause irritation of the skin, eyes, nose, or throat. Should skin or eye irritation occur, rinse the area with cool water. For nose or throat irritation, move to fresh air. If irritation continues, seek the advice of a personal physician.

Within a few seconds, the particles will begin to settle out and dissipate. As they do, the residue will settle on the interior surfaces of the vehicle. Avoid prolonged contact with this residue as it could irritate the skin and/or eyes. Should any irritation occur, rinse the skin or eyes with cool water. If the irritation continues, seek the advice of a personal physician. Should the residue come in contact with clothing, follow the garment manufacturer's instructions for cleaning.

If the vehicle is safely driveable following the airbag deployment, the deployed airbag can be tucked back inside the opening in the steering wheel hub

trim cover to make driving the vehicle somewhat easier. The airbag once deployed, will not re-deploy to provide occupant protection in a subsequent collision, and should be replaced by an authorized dealer as soon as possible.

Readiness Indicator

The diagnostic unit monitors the electrical portions of the airbag system components listed above, continuously whenever the ignition switch is in the "start" or "run" position. When the ignition switch is first turned on, the diagnostic unit will light the "AIRBAG" lamp in the instrument cluster for a period of 6 to 8 seconds and then turn the lamp off. This indicates the airbag system is ready to deploy for your protection in the event of an impact.

NOTE: *Should the "AIRBAG" lamp not come on at all, remain lit or light either momentarily or continuously while driving, a malfunction in one or more of the monitored components may have occurred and prompt service is required.*

Important Maintenance

To assure that the airbag will be ready to deploy in a collision, have the system serviced promptly by an authorized dealer if any of the following indications of a possible system malfunction occurs:

- the "AIRBAG" lamp does not light for 6 to 8 seconds when the ignition switch is first turned on;
- the "AIRBAG" lamp remains lit after the ignition switch is first turned on;
- the "AIRBAG" lamp flickers during the 6 to 8 second period when the ignition switch is first turned on;
- the "AIRBAG" lamp flickers or lights and remains lit while operating the vehicle.

WARNING! Failure to have the airbag system properly serviced by an authorized dealer should one of the above conditions exist may lead to possible injury in the event of an accident.

Aside from the maintenance required in response to the above "AIRBAG" lamp conditions, an inspection of the mechanical and electrical components of the system is included in the regular maintenance service recommended for every 3 years or 30,000 miles. (See SECTION 4 - MAINTENANCE.)

System Precautions

WARNING! Modification to the airbag system components or wiring, including the addition of any kind of badges or stickers to the steering wheel hub trim-cover or modifications to the front bumper or vehicle body structure, can adversely affect system performance and lead to possible injury.

Make sure the fuse access panel, located in the left lower portion of the knee bolster is in place before driving the vehicle, and do not mount or locate any aftermarket equipment on or behind the knee bolster. This is important to provide proper knee impact protection in the event of a collision.

Do not attempt to repair any component of the airbag system yourself. You can be injured if you are too close to the steering wheel hub and the air bag inflates. Be sure to tell anyone who works on your vehicle that it is equipped with an airbag.

Seat Belts — Convertible Models

WARNING! The convertible top does not provide the structural protection that a reinforced metal top does, and the fabric top cannot be expected to prevent the ejection of the occupants of a vehicle in the event of certain types of collisions. Therefore, it is imperative that all occupants wear their restraint systems at all times when riding in a convertible. Studies have shown that it is generally far safer to remain inside a vehicle during a collision, than to be ejected from the vehicle.

Rear Center Seat Lap Belt — Coupe and Sedan models

The lap belt should be worn with the upper edge of the belt drawn across the thighs and snug against the hips. To reduce the risk of sliding under the belt in a collision, it should be adjusted as tight as comfort will allow, while *sitting back and erect in the seat.*

The lap belt is lengthened by tilting the latch plate relative to the webbing and pulling. To shorten the belt, pull the loose end of the webbing.

Never use the same lap belt on more than one person at a time.

Use of Seat Belts During Pregnancy

Chrysler Motors recommends that pregnant women use the available seat belts. This will reduce the likelihood of injury to both the woman and the unborn child. The lap belt should be worn across the thighs and as snug against the hips as possible, *but not across the waist.*

Seat Belt Extender

If the seat belt is too short, even when fully extended, a seat belt extender can be purchased from your dealer.