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212-CAL-91-09
301-CAL-91-09

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

VOLKSWAGEN AG
1991 VOLKSWAGEN CORRADO G60
2-DOOR HATCHBACK

NHTSA NUMBER: CM5801

CALSPAN TEST NUMBER: 7853-11

APRIL 18, 1991

CALSPAN CORPORATION
ADVANCED TECHNOLOGY CENTER
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FINAL REPORT

PREPARED FOR:

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

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16. Abstract A 30 mph vehicle safety compliance test was conducted on a 1991 Volkswagen Corrado G60 2-Door Hatchback. This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on April 18, 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 53°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 and front right passenger automatic torso belt restraint systems. Manual lap belts were 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 Volkswagen Corrado G60 2-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-208-08, dated September 8, 1989.

Section 2
SUMMARY OF TEST NUMBER CM5801

A frontal barrier was impacted by a 1991 Volkswagen Corrado 2-Door Hatchback at a velocity of 29.3 mph. The test was performed at the Calspan Corporation Advanced Technology Center on April 18, 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 572B, 50th percentile male anthropomorphic test devices (ATD), 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. These ATDs had been certified prior to the test.

The 23 channels of data were recorded on two 14-channel FM tape recorders. Appendix B contains the vehicle and dummy response data traces. The left rear crossmember (X) accelerometer did not record correctly and is not included in this report. In addition, the barrier t-zero switch was contacted prematurely immediately prior to vehicle impact. The data in this report has been shifted to account for the premature trigger.

The driver's HIC was 538. The maximum chest deceleration over 3 milliseconds was 59.4 g's. The maximum force on the driver's left femur was 1475 pounds and 1344 pounds on the right femur.

The right front passenger's HIC was 486. The maximum chest deceleration over 3 milliseconds was 48.1 g's. The maximum force on the passenger's left femur was 1339 pounds and 1653 pounds on the right femur.

Table 1

CRASH TEST SUMMARYVehicle NHTSA No.: CM5801 Test Mode: 30 mph Frontal BarrierTest Date.: April 18, 1991 Time: 13:30 Temperature: 53°FVehicle Make/Model/Body Style: 1991 Volkswagen Corrado 2-Door HatchbackVehicle Test Weight: 2970 lbs.Vehicle/Barrier Impact Angle: 0°Impact Velocity: 29.3 mphMaximum Static Crush: 13.8 in.Vehicle Rebound: 9.5 in.DUMMIES:DRIVERPASSENGER

Type:

Part 572-BPart 572-B

*Restraint System:

Automatic Torso BeltAutomatic Torso BeltNumber of Data Channels: 23Number of Cameras: 1 Real Time14 High SpeedDOOR OPENING DATA:closed-operable

- Left Front

closed-operable

- Right Front

Front Seat(s) Data:

DRIVERPASSENGER

Seat Track Failure:

0.00.0

inches of shift

Seat Back Failure:

nonenoneVISIBLE DUMMY CONTACT POINTS:DRIVERPASSENGER

Head:

chin with chestchin with chest

Abdomen

--

Chest

--

Knees

lower dashlower dash

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1991 Volkswagen Corrado G60 2-Door Hatchback
 NHTSA No. CM5801 ; VIN: WVWDB4504MK002694 ; Color: White
 Engine Data: 4 cylinders; - CID; 1.8 Litres; - cc
 Placement - Longitudinal or In-Line; X Transverse or Lateral
 Transmission Data: 3 speeds; - Manual; X Automatic; - Overdrive
 Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive
 Major Options: X A/C; X Pwr. Strg.; X Pwr. Brakes; X Pwr. Windows
- Power Door Locks
 Date Received: 02-14-91 ; Odometer Reading 39 miles
 Selling Dealer: Delia Volkswagen
 & Address Tonawanda, New York 14150

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Volkswagen AG
 Date of Manufacture: 9-90
 GVWR: 3370 lbs.; GAWR: 2004 lbs. FRONT: 1564 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 36 psi FRONT
32 psi REAR
 Recommended Tire Size: 205/50R1585V Load Range: -
 Recommended Cold Tire Pressure: 36 psi FRONT; 32 psi REAR
 Size of Tires on Test Vehicle: 205/50R1586V; Manufacturer: Continental
 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) = 640 lbs.
 No. of Occupants x 150 lbs. = 600 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 40 lbs. (Difference)

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

Right Front = 830 lbs. Right Rear = 470 lbs.
 Left Front = 850 lbs. Left Rear = 470 lbs.
 TOTAL FRONT = 1680 lbs. TOTAL REAR = 940 lbs.
 % of Total Vehicle Weight = 64.1 % of Total Weight = 35.9
 TOTAL DELIVERED WEIGHT = 2620 lbs.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 2620 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 40 lbs.
 *Weight of 2 P572 Dummies 164 and 167 ea. = 328 lbs.
 TARGET TEST WEIGHT = 2988 lbs. (sum)

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

Right Front = 910 lbs. Right Rear = 590 lbs.
 Left Front = 910 lbs. Left Rear = 560 lbs.
 TOTAL FRONT = 1820 lbs. TOTAL REAR = 1150 lbs.
 % of Total Weight = 61.3 % % of Total Weight = 38.7 %
 TOTAL TEST WEIGHT = 2970 lbs.
 Weight of Ballast Secured in Vehicle Trunk Area = - lbs.
 Vehicle Components Removed for Weight Reduction Hatchback removed.

VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED: RF 25.0" LF 25.0" RR 25.3" LR 25.4"
 FULLY LOADED: RF 24.0" LF 24.1" RR 23.9" LR 24.0"
 AS TESTED: RF 24.7" LF 24.7" RR 24.7" LR 24.8"
 Vehicle's Wheel Base: 97.2 in.
 Location of Vehicle's C.G.: 37.6 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: April 18, 1991 Time: 13:30 Temperature: 53 °F
 Vehicle NHTSA No.: CM5801
 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 = 29.2 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 = 156.0 ; C/L = 158.5 ; Left = 156.2
 Post-Test Right = 143.5 ; C/L = 144.7 ; Left = 145.5
 Crush Right = 12.5 ; C/L = 13.8 ; Left = 10.7
 AVERAGE = 12.3 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

Right = 8.8 " ; C/L = 10.1 " ; Left = 9.7 "
 AVERAGE = 9.5 inches

DOOR OPENING:

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

SEAT MOVEMENT:

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

Table 3
POST IMPACT DATA (cont.)

GLAZING DAMAGE: None.

OTHER NOTABLE IMPACT FEATURES: None.

Section 3
OCCUPANT AND VEHICLE DATA

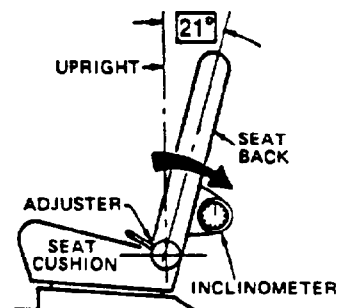
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1991 Vehicle Model: Volkswagen Corrado G60 Body Style: 2-Dr. 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



LEFT SIDE VIEW

Seat back angle for driver's seat 21°

Measurement instructions: Seat back angle set using H-point machine per SAE J826.

Seat back angle for passenger's seat: 21°

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 set in 6th hole from full forward (first position = 1).

Positioning of the passenger's seat: Same as driver.

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 14.5 gallons

Additional Instructions: None.

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION

Test No.: CM5801 Vehicle: 1991 Volkswagen Corrado G60

SEAT TYPE:

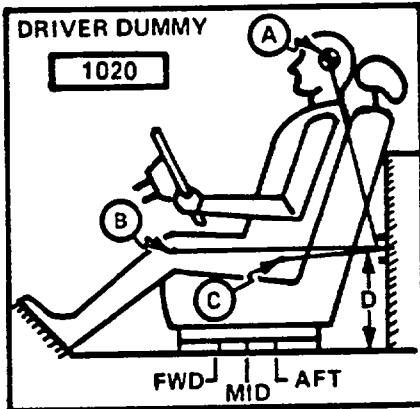
- Bench
X Bucket
- Split Bench

ADJUSTER TYPE:

X Manual
- Power (Driver)

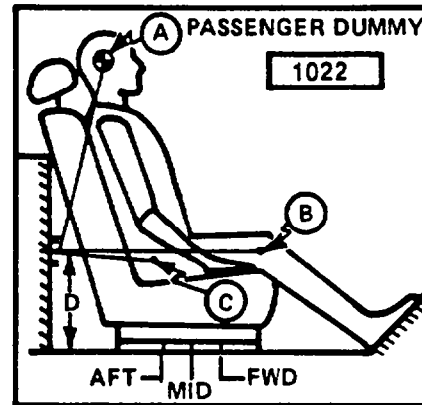
SEAT BACK TYPE:

- Fixed
X Adjustable Reclining



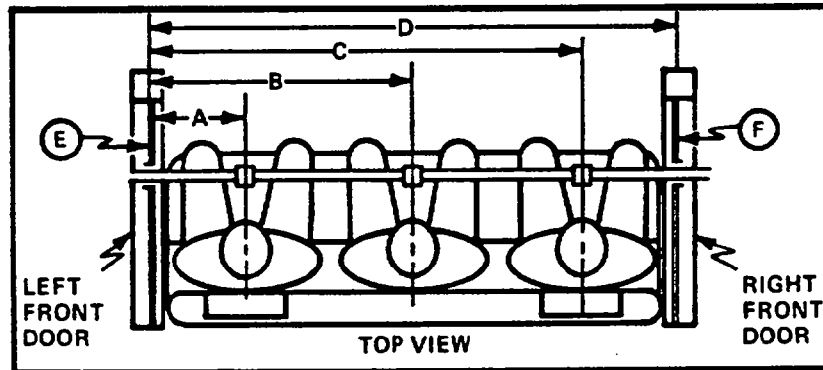
MEASUREMENT LOCATION

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



A = 18.0 in. 38 Degrees
 B = 32.5 in. 106 Degrees
 C = 21.1 in. 127 Degrees
 D = 17.5 in.

A = 17.9 in. 38 Degrees
 B = 33.1 in. 108 Degrees
 C = 21.0 in. 130 Degrees
 D = 17.5 in.



S/N 1020

DUMMY ID

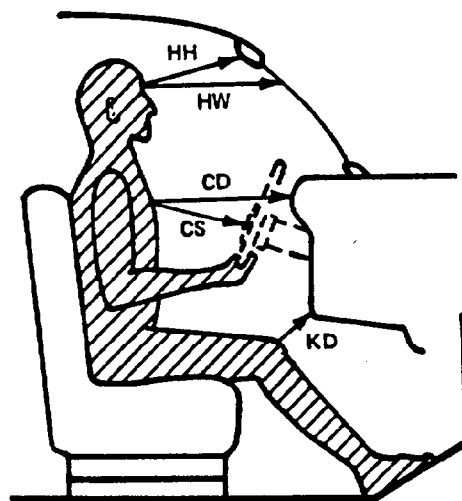
S/N 1022

A = Left Door to Driver Centerline 12.0 in.
 B = Left Door to Center Passenger Centerline - in.
 C = Left Door to Right Passenger Centerline 36.7 in.
 D = Left Door to Right Door 48.4 in.
 E, F = Window Glass Height (Right and Left Must Be Equal) 10.0 in.

Figure 3

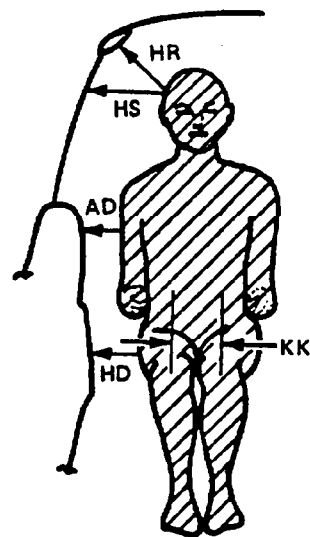
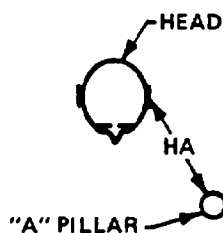
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	14.9	15.0
HW	20.6	20.3
CD	22.8	23.1
CS	16.4	-
KDL	5.8	6.0
KDR	5.6	5.9
SA	See Note	See Note
TA	21°	21°
PA	-	-



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
 PA = Pelvic 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

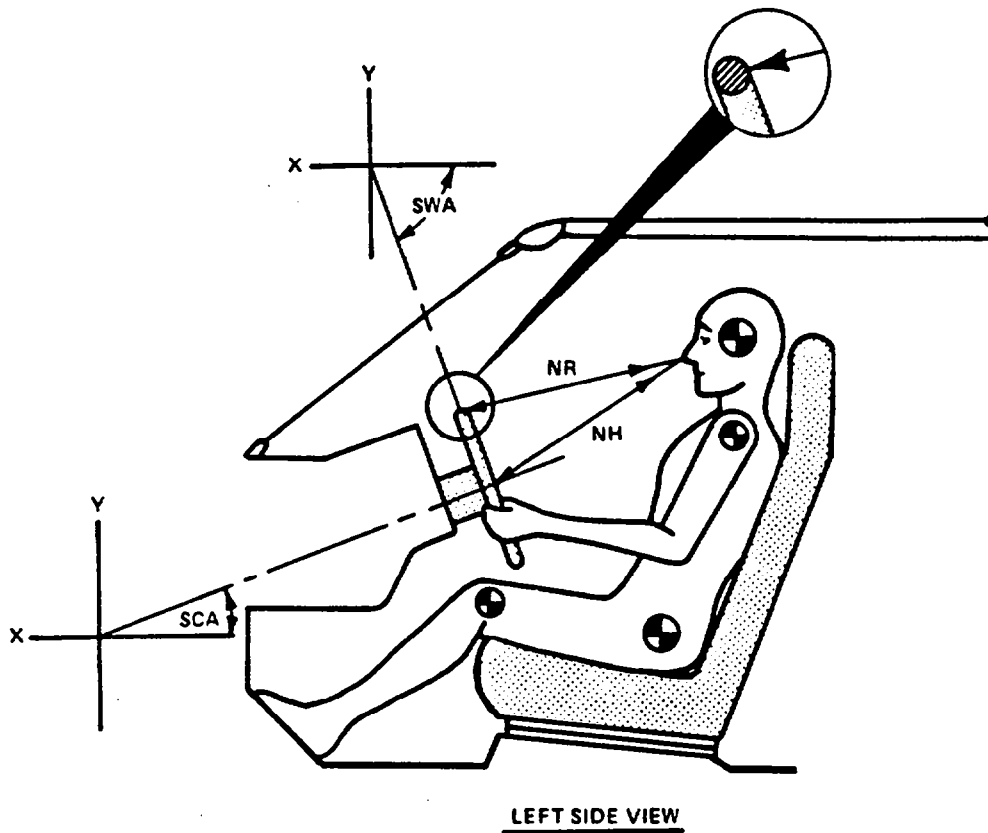


	DRIVER	PASSENGER
HR	4.7	4.6
HS	8.4	8.5
AD	4.1	4.5
HD	5.7	5.8
KK	9.9	7.8
HA	19.1	18.8

NOTE: Seat angle was positioned as specified by manufacturer.
 Left foot was placed on foot rest.

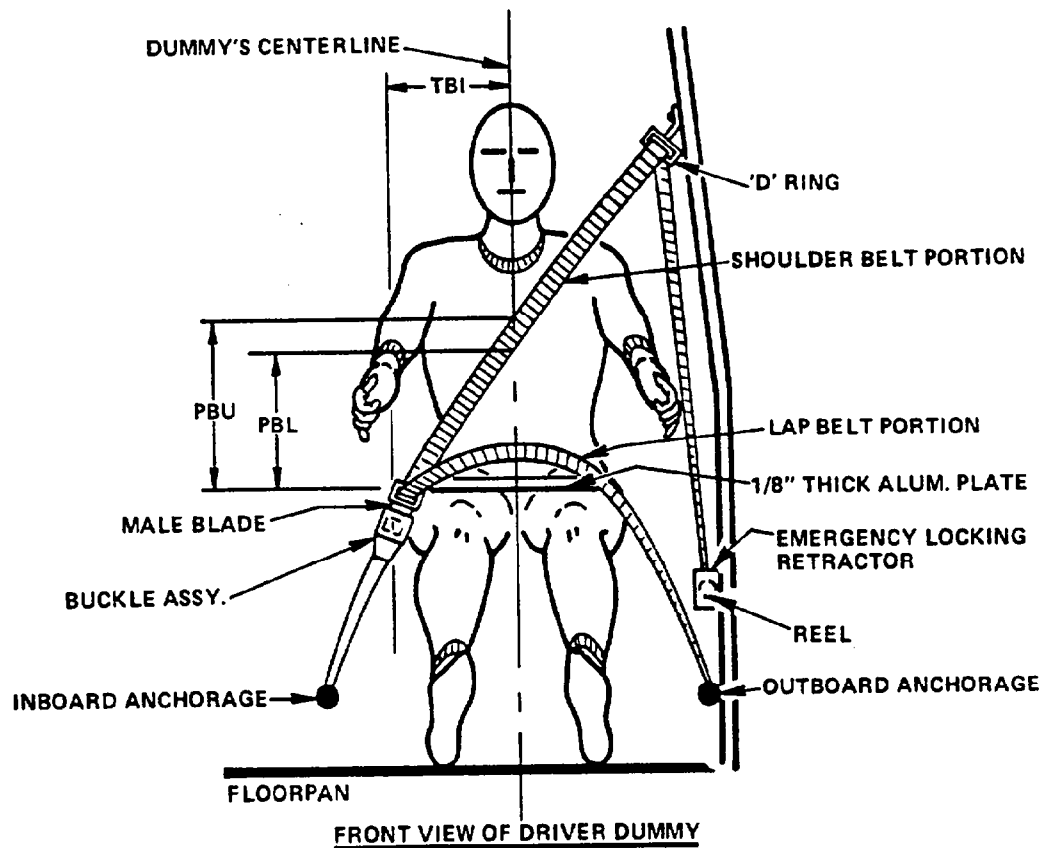
Figure 4

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	16.7	Inches
<u>NH</u>	-- Distance from tip of dummy's nose to center of steering wheel hub	20.0	Inches
<u>SCA</u>	-- Angle of steering column relative to the horizontal X axis	20	Degrees
<u>SWA</u>	-- Angle of steering wheel relative to the horizontal X axis	-70	Degrees

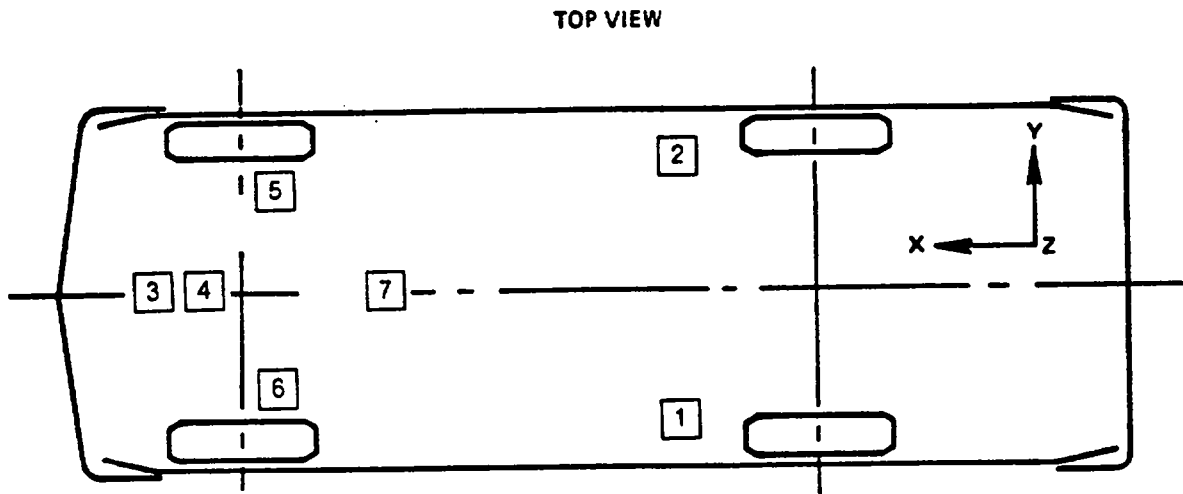
Figure 5
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	15.3	15.5
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	12.3	12.5
<u>TBI</u> -- Distance from torso centerline to buckle	*	*

*Only automatic torso belt used, no in-board buckle.

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:	54.9	16.7	17.5	Accelerometer did not record correctly.			
	AT LEFT SIDE	POST:	54.9	16.7	17.5				
	LONGITUDINAL ACCELERATION					-	-	-	-
2	REAR SEAT X-MEMBER	PRE:	55.0	-16.7	17.5				
	AT RIGHT SIDE	POST:	55.0	-16.7	17.5				
	LONGITUDINAL ACCELERATION					5	73	-45	42
3	TOP OF ENGINE BLOCK	PRE:	129.0	-8.6	30.9				
		POST:	125.1	-8.7	31.9				
	LONGITUDINAL ACCELERATION					45	35	-108	19
4	BOTTOM OF ENGINE	PRE:	133.4	-12.1	7.1				
		POST:	128.8	-12.2	8.2				
	LONGITUDINAL ACCELERATION					52	32	-118	22
5	BRAKE CALIPER AT	PRE:	120.9	-22.0	20.2				
	RIGHT SIDE	POST:	120.8	-22.0	20.1				
	LONGITUDINAL ACCELERATION					6	62	-65	40
6	BRAKE CALIPER AT	PRE:	120.9	22.0	20.0				
	LEFT SIDE	POST:	120.7	22.0	20.0				
	LONGITUDINAL ACCELERATION					12	73	-65	32
7	DASH PANEL	PRE:	94.9	-3.0	27.0				
		POST:	94.9	-3.0	27.0				
	LONGITUDINAL ACCELERATION					14	97	-63	44

*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.

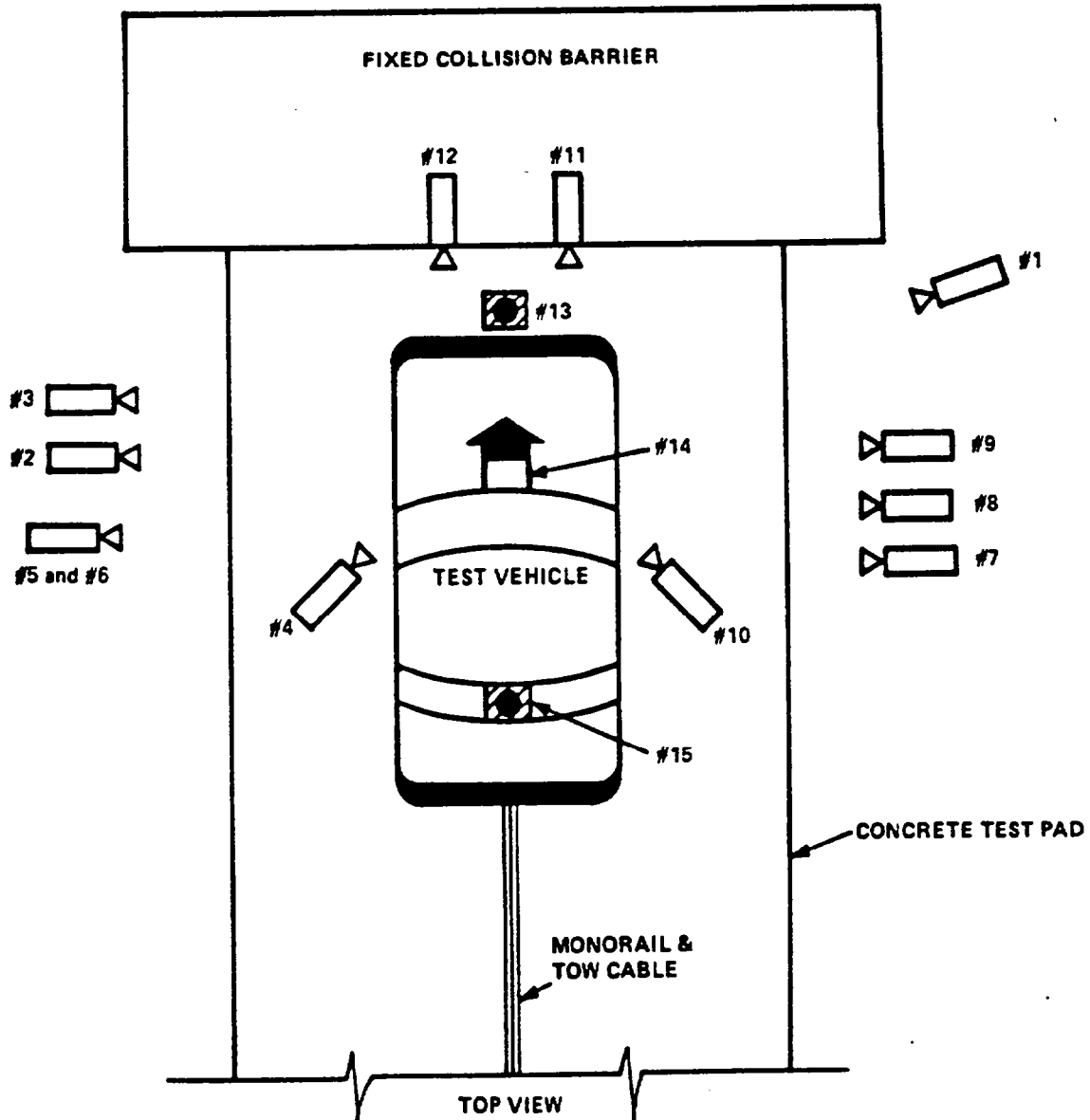


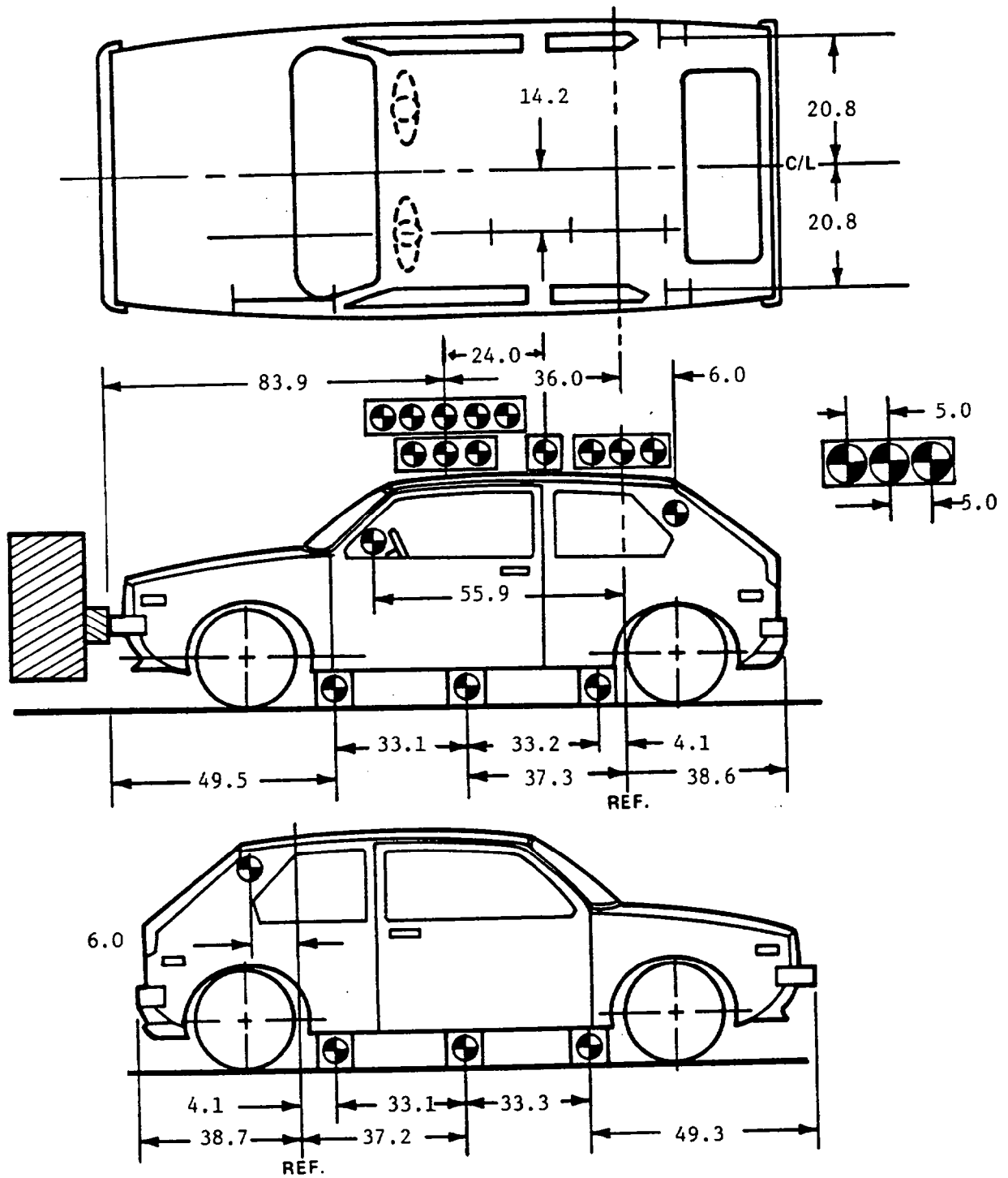
Table 5

HIGH-SPEED CAMERA LOCATIONS

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	203	64	40	-5	187.8	13	545
3	Left Side View	298	27	41	-2	282.8	25	560
4	Driver and Interior View	100	106	68	-18	-	13	550
5	Steering Column (Bottom)	250	78	46	-5	234.8	25	550
6	Steering Column (Top)	250	78	70	-11	234.8	25	570
7	Overall Right Side	218	74	42	-1	202.8	13	NT
8	Right Side View	293	59	41	-2	277.8	25	NT
9	Right Passenger View	277	73	54	-4	261.8	35	520
10	Passenger and Interior View	100	105	66	-19	-	13	430
11	Passenger Front View	22	18	76	-47	-	13	890
12	Driver Front View	22	18	76	-47	-	13	890
13	Windshield View	0	0	130	-58	-	13	550
14	Pit View of Engine	0	24	-120	90	-	13	720
15	Pit View of Fuel Tank	0	96	-120	90	-	13	670

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

Figure 8
VEHICLE TARGET LOCATIONS



(DIMENSIONS IN INCHES)

Figure 9
TEST VEHICLE MEASUREMENTS

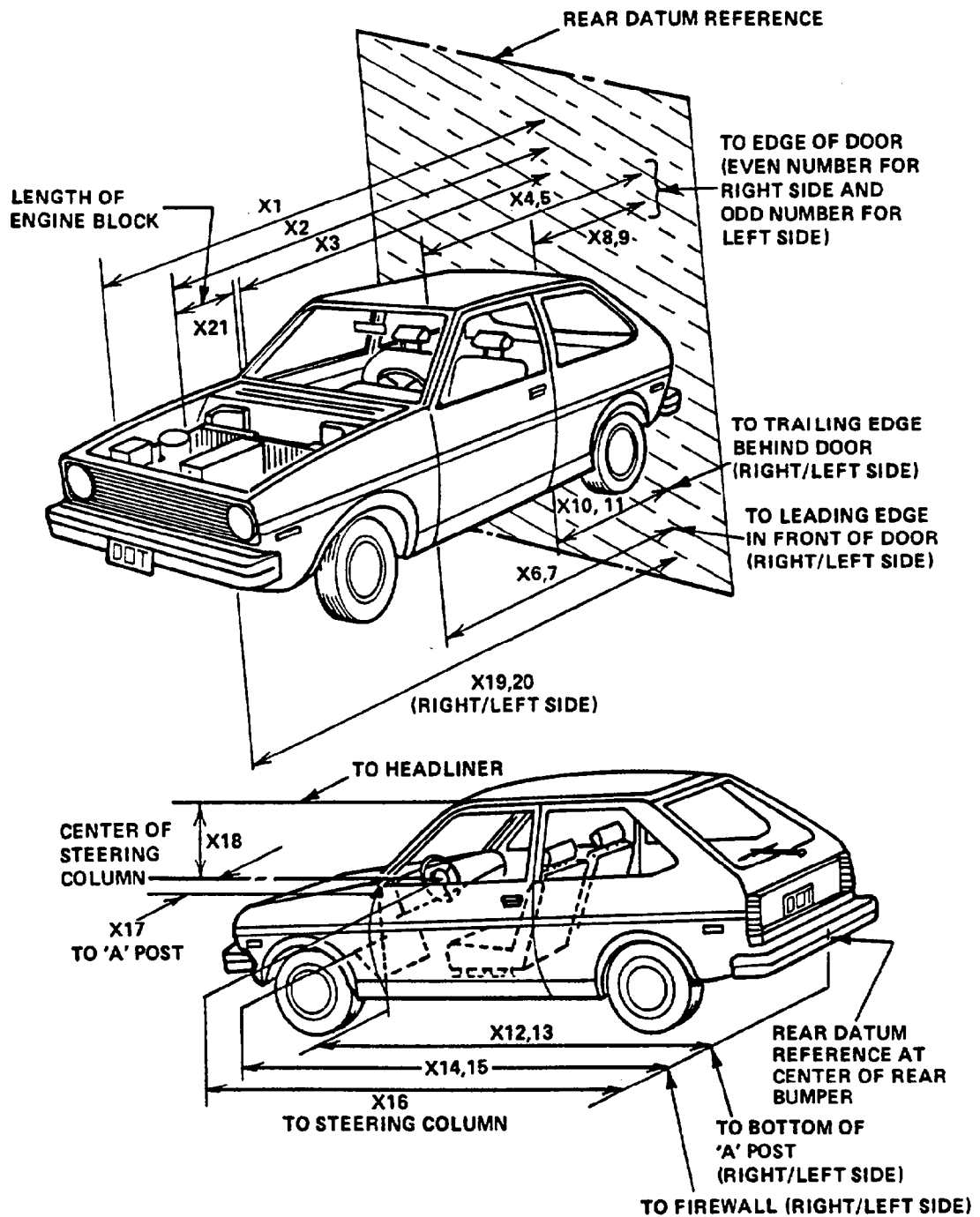


Table 6

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	158.5	144.7	13.8
X2	Rear Surface of Vehicle to Front of Engine	132.8	128.0	4.8
X3	Rear Surface of Vehicle to Firewall	116.5	115.0	1.5
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	104.2	103.2	1.0
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	103.8	103.8	0.0
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	104.8	104.3	0.5
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	104.8	104.5	0.3
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	57.4	56.6	0.8
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	57.0	56.8	0.2
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	59.0	58.8	0.2
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	58.8	58.9	-0.1
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	104.8	104.5	0.3
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	104.6	104.6	0.0
X14	Rear Surface of Vehicle to Firewall, Right Side	117.4	114.6	2.8
X15	Rear Surface of Vehicle to Firewall, Left Side	120.0	118.7	1.3
X16	Rear Surface of Vehicle to Steering Column	90.8	89.4	1.4
X17	Center of Steering Column to "A" Post	15.5	15.5	0.0
X18	Center of Steering Column to Headliner	17.0	16.3	0.7
X19	Rear Surface of Vehicle to Right Side of Front Bumper	156.0	143.5	12.5
X20	Rear Surface of Vehicle to Left Side of Front Bumper	156.2	145.5	10.7
X21	Length of Engine Block	11.3	11.3	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.: CM5801 Vehicle: 1991 Volkswagen Corrado G60 2-Door Hatchback

	MAXIMUM ACCELERATION (g's)							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
Dummy (1)	-32	-5	66	67	-65	10	20	59.4
Dummy (2)	-39	14	51	53	-50	8	-18	48.1

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	1475	1344
Dummy (2)	1339	1653

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc. (g) t ₁ TO t ₂
		t ₁	t ₂	
Dummy (1)	538	51.960	87.840	46.83
Dummy (2)	486	56.280	92.160	44.94

*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: Vehicle does not use a crash deployed occupant
protection system.

The manufacturers recommended schedule is to replace _____ or repair
_____ this system:

- a. by _____ month, _____ year
- b. by _____ miles
- c. or after a time interval of _____ months or _____ years.

Were appropriate instructions concerning maintenance and/or replacement
of this system provided? YES _____ NO _____

Was a description of the functional operation of the system provided?
YES _____ NO _____

Is there a reference to the instructions and description of the system on
the label? YES _____ NO _____

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

Describe the location of the readiness indicator:

Not applicable.

Is the readiness indicator clearly visible to the driver?

YES - NO -

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

YES - NO -

Table 11

FMVSS NO. 208 - COMFORT AND CONVENIENCE TEST SUMMARY

Test Vehicle NHTSA No.: CM5801
 Make/Model: 1991 Volkswagen Corrado
 Date of Comfort/Convenience Check: 4/16/91
 Technician Performing Check: DJT
 GVWR: 3370 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 X NO -

If yes, go to requirements D1, D2 and D3

2. Manual seat belts* YES NO X

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 -

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

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

STOP

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

Table 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 - 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 - NO -

(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 - NO -

(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 - NO -
- b. The latch plate is released from the buckle.
- YES - NO -
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 - NO -

(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 0.4 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 * NO *

*Automatic torso belt.

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 * 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

*Automatic torso belt.

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 N/A NO N/A

D7

LATCH MECHANISM

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

Vehicle uses automatic belt assembly.

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

YES - 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 - NO -

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

YES - 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 1.0" rubber and plastic trim along top and sides. Lower portion of windshield is covered by a plastic shroud.

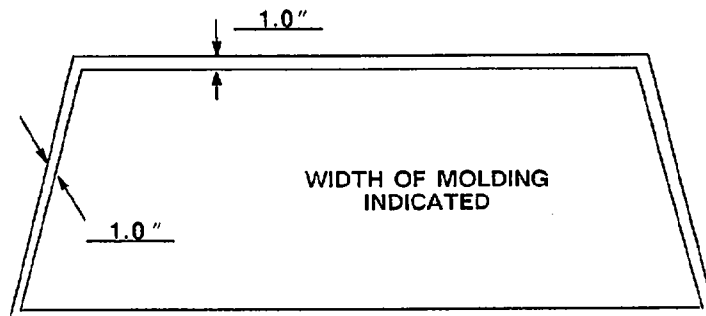
FMVSS 212 REQUIREMENTS:

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	77.55	77.55	100%
LEFT SIDE	77.55	77.55	100%
TOTAL	155.1	155.1	100%

AREA OF RETENTION FAILURE:



FRONT VIEW

FAILURE DETAILS:

None.

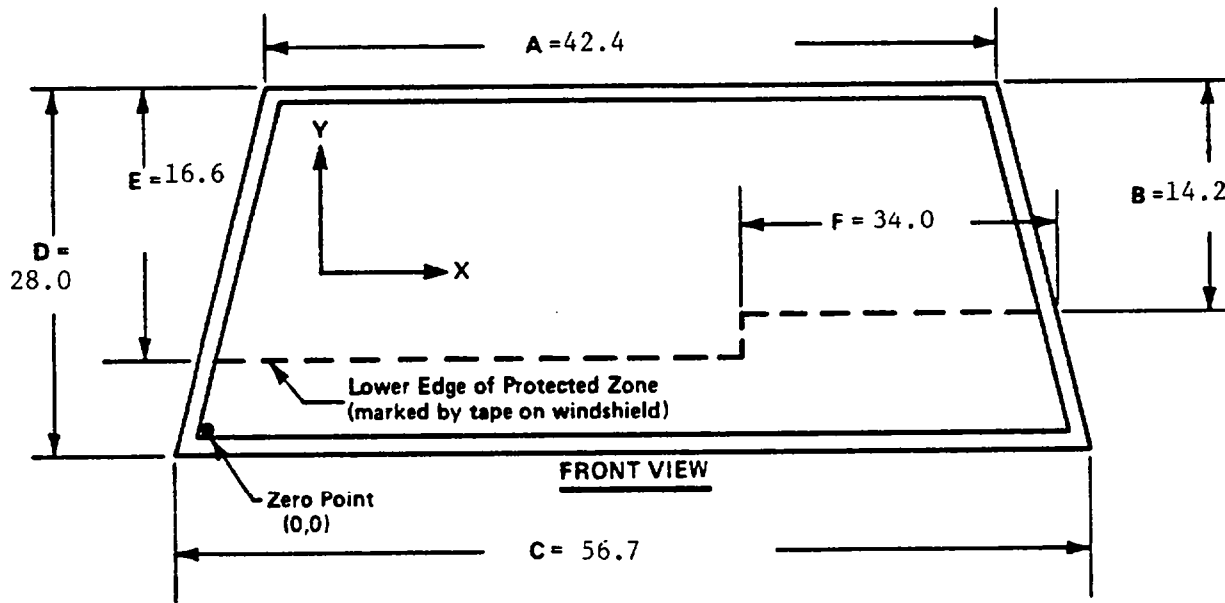
Figure 11

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.

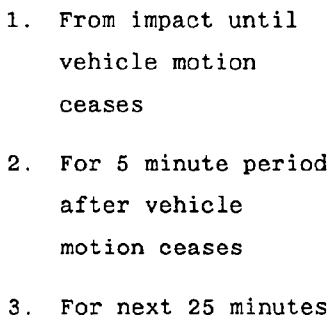
COORDINATES		
	X	Y
1.		
2.		
3.		
4.		

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

TEST VEHICLE NHTSA NO.: CM5801 TEST DATE: 4/18/91

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:

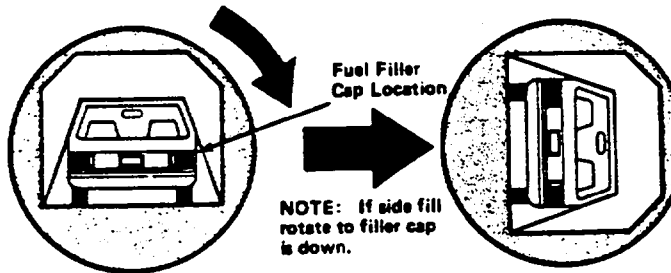


None.

Table 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:**0**⁰**90**⁰

Vehicle NHTSA ID No.:

CM5801I. 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.)

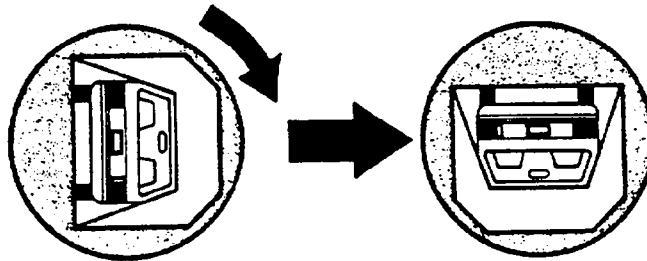
TEST PHASE:

90°

180°

Vehicle NHTSA ID No.:

CM5801



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.

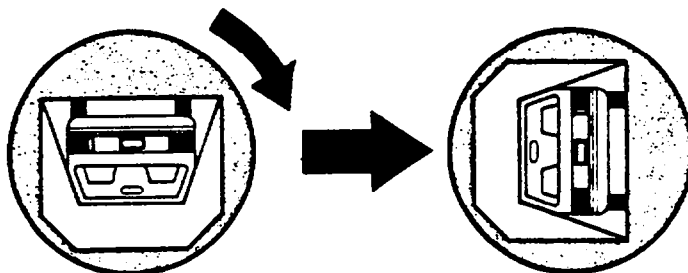
IV. SOLVENT SPILLAGE LOCATION(S):

None.

Table 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)TEST PHASE:**180°****270°**

Vehicle NHTSA ID No.:

CM5801I. 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.)

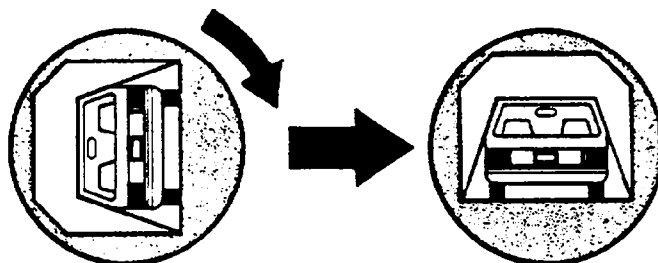
TEST PHASE:

270°

360°

Vehicle NHTSA ID No.:

CM5801



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: April 18, 1991 Vehicle NHTSA No.: CM5801

Vehicle Manufacturer: Volkswagen AG

Model Year: 1991 VIN: WVWDB4504MK002694

Body Style: 4-Door Hatchback Build Date: 9-90

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

Impact Velocity: 29.3 mph Time of Test: 13:30

*Type of Automatic Restraint System: Driver and passenger automatic torso belt
restraint system.

Failure Details:

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

Appendix A

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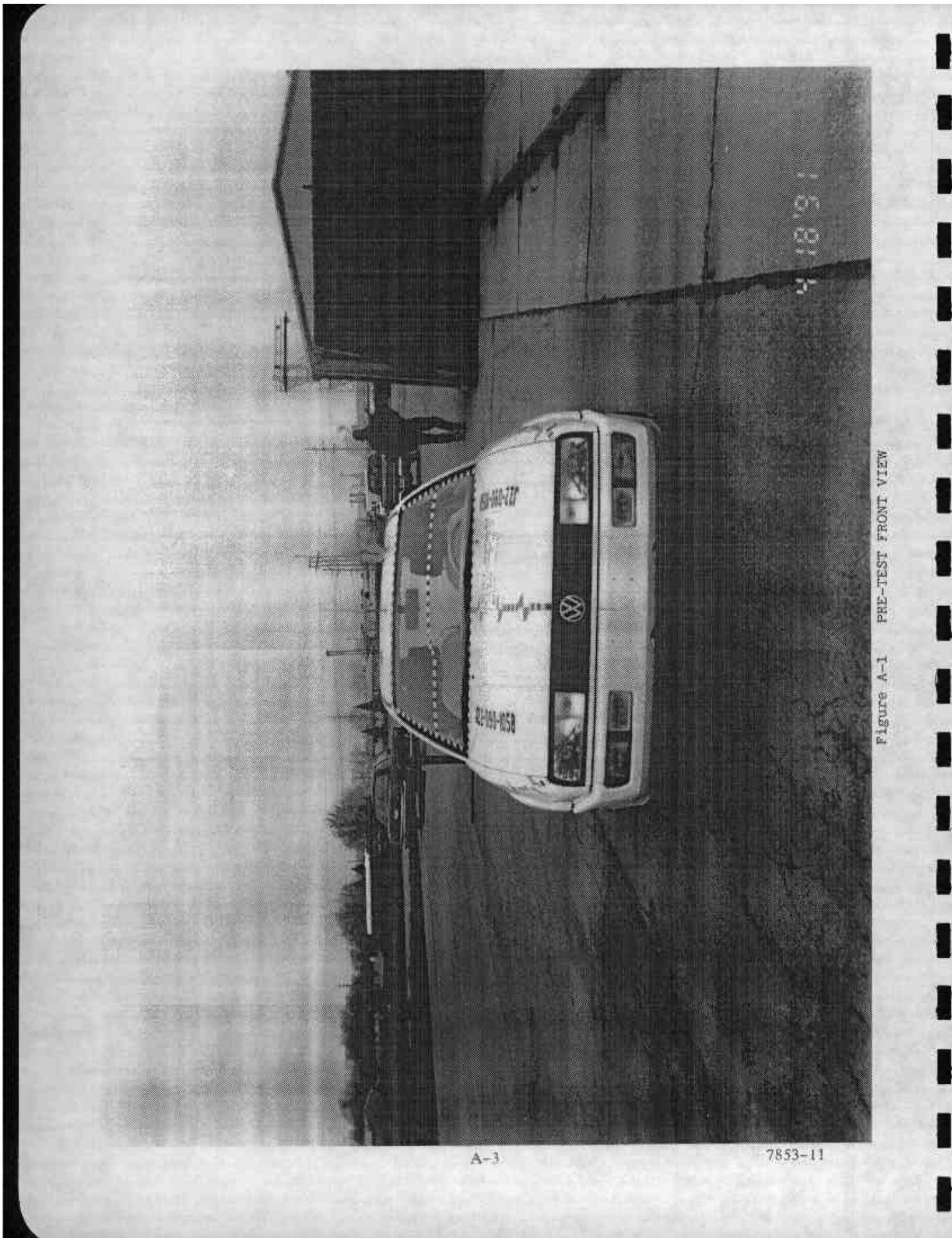


Figure A-1 PRE-TEST FRONT VIEW

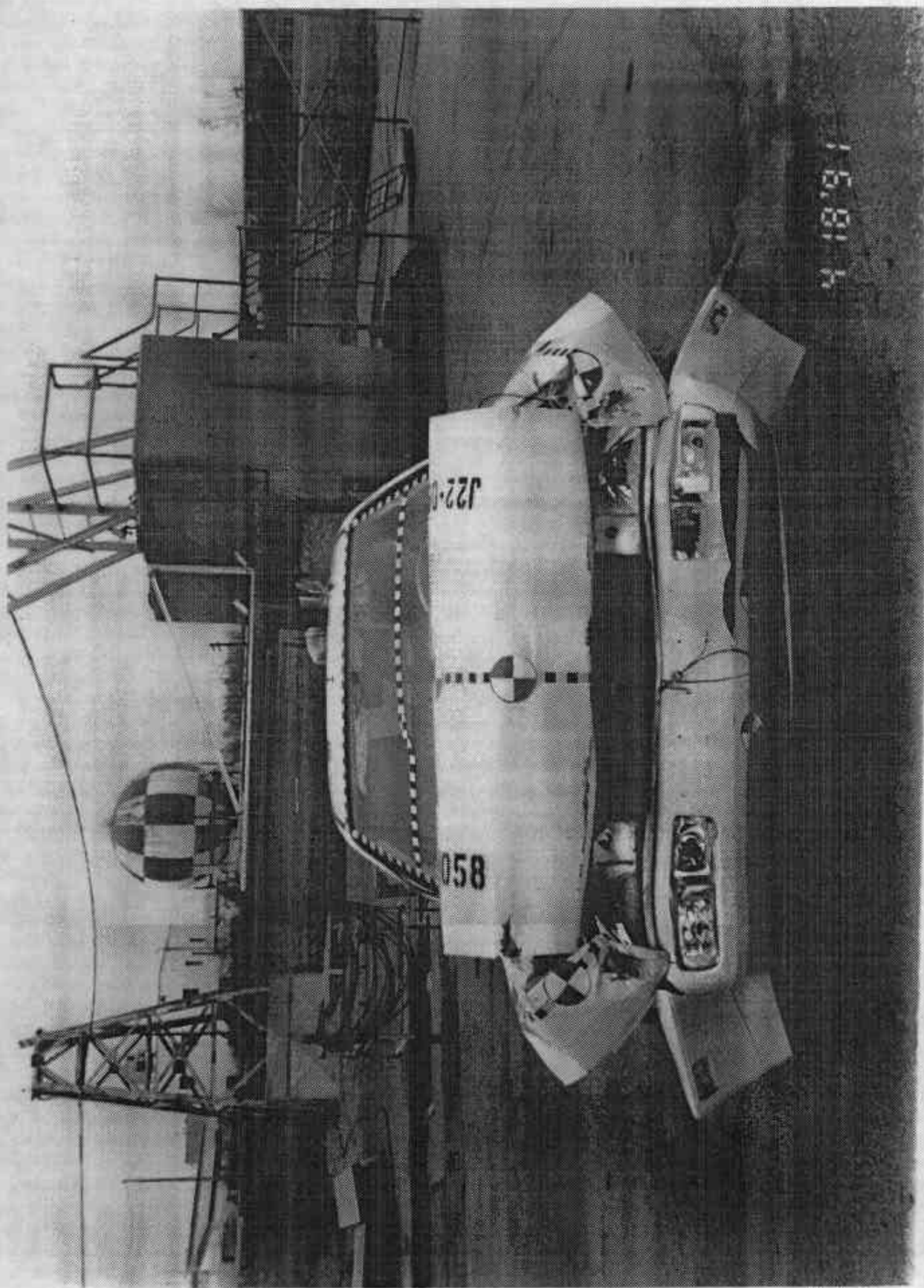


FIGURE A-2 POST TEST FRONT VIEW

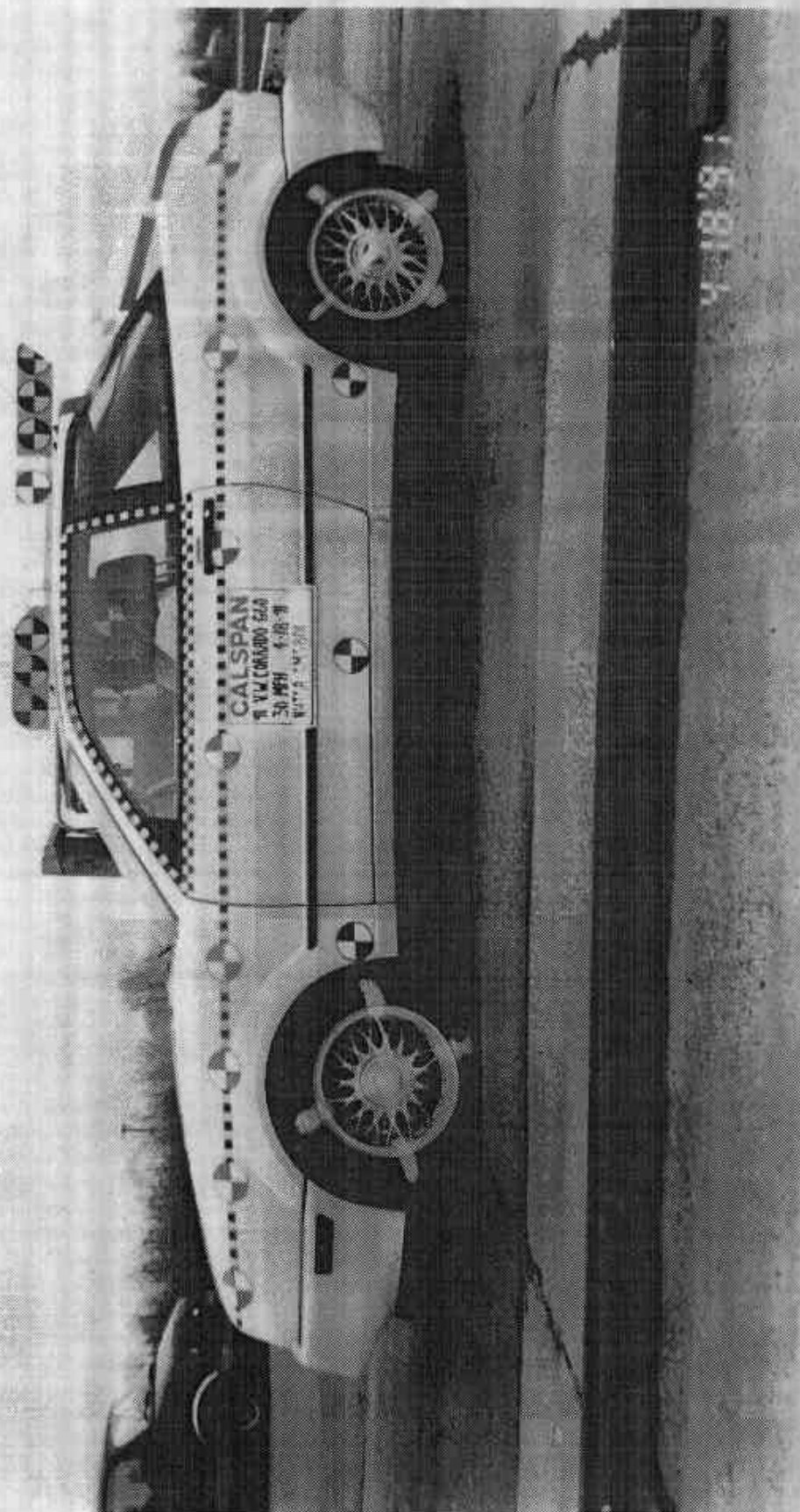


Figure A-3 PRE-TEST LEFT SIDE VIEW

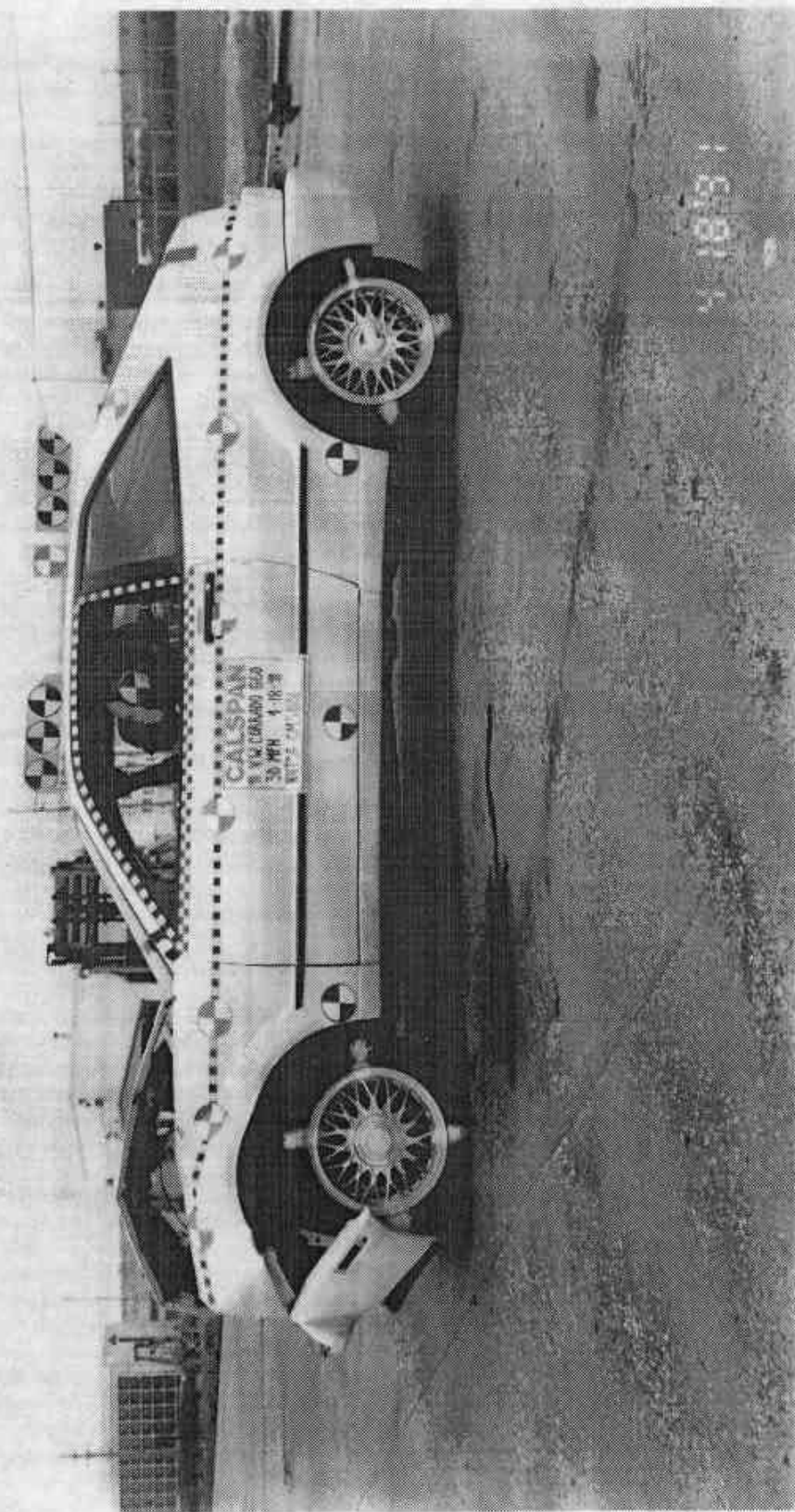


Figure A-4 POST TEST LEFT SIDE VIEW

A-6

7853-11

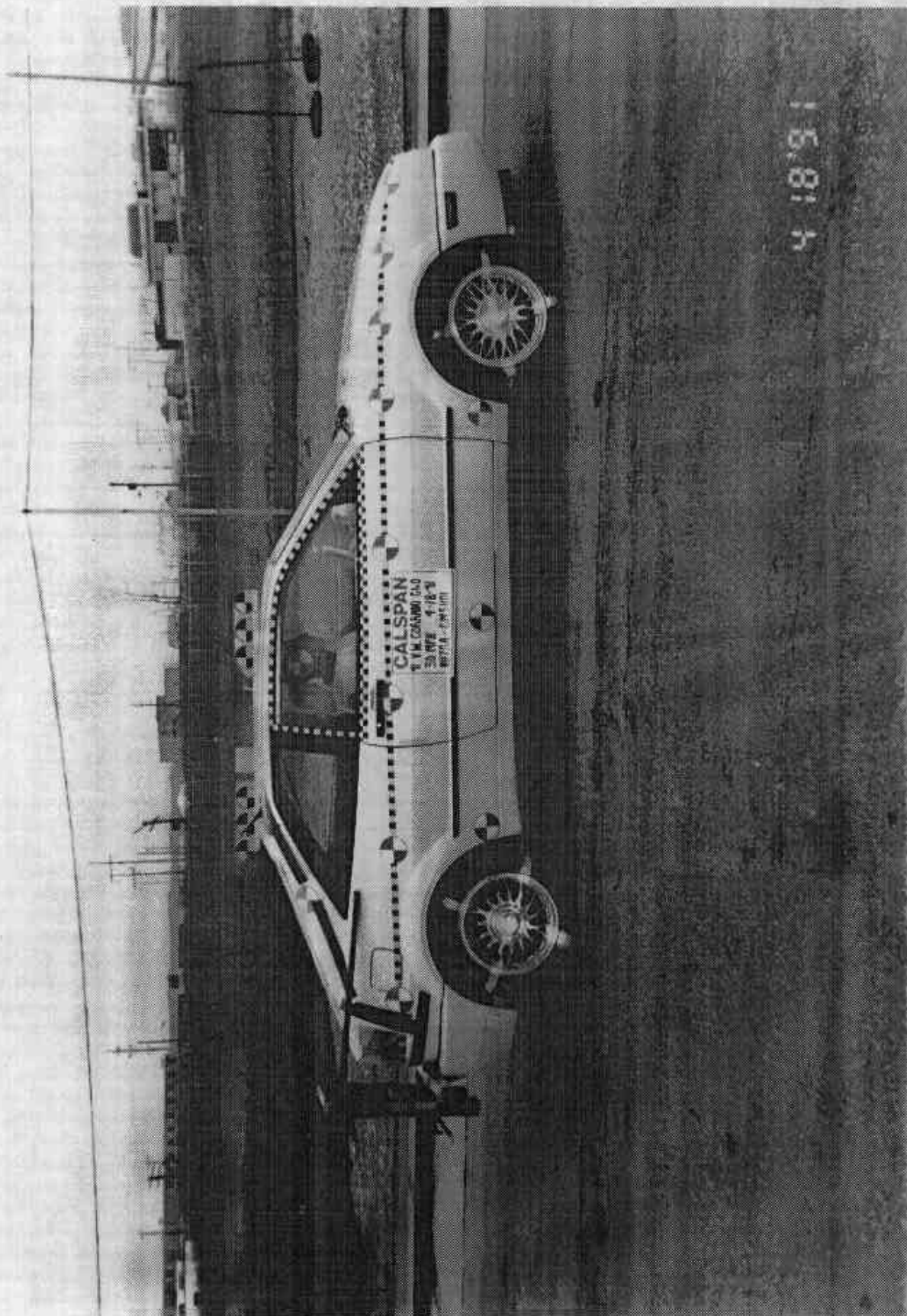


Figure A-5 PRE-TEST RIGHT SIDE VIEW

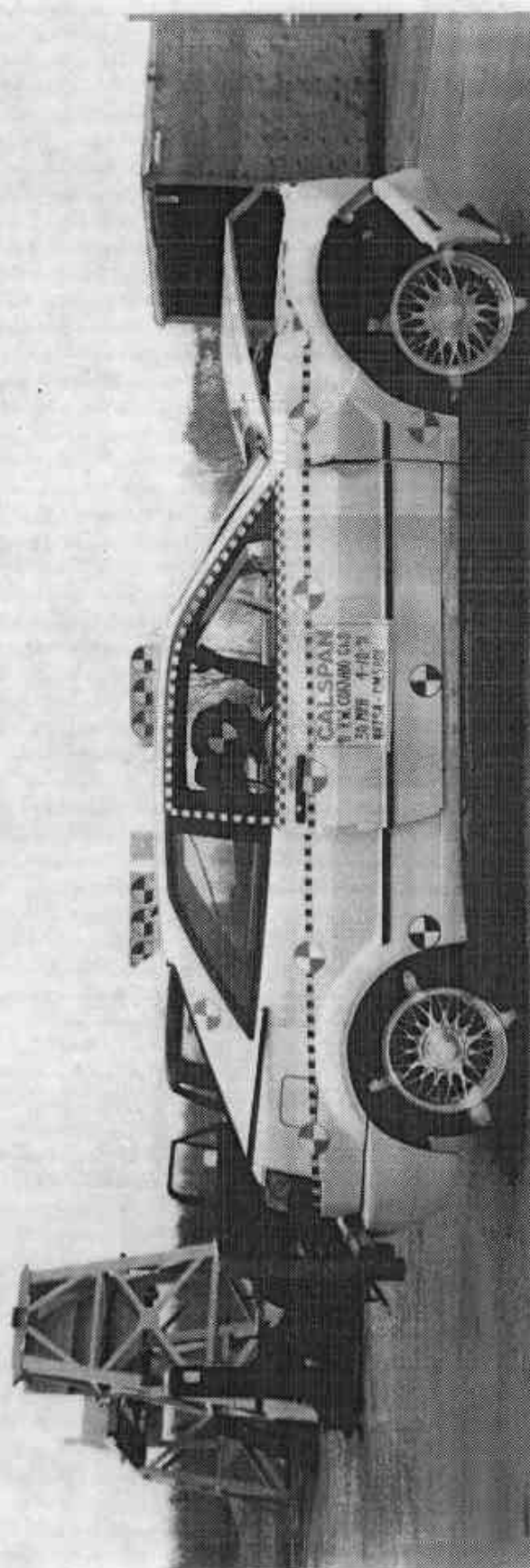


Figure A-6 POST-TEST RIGHT SIDE VIEW



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

A-9

7853-11

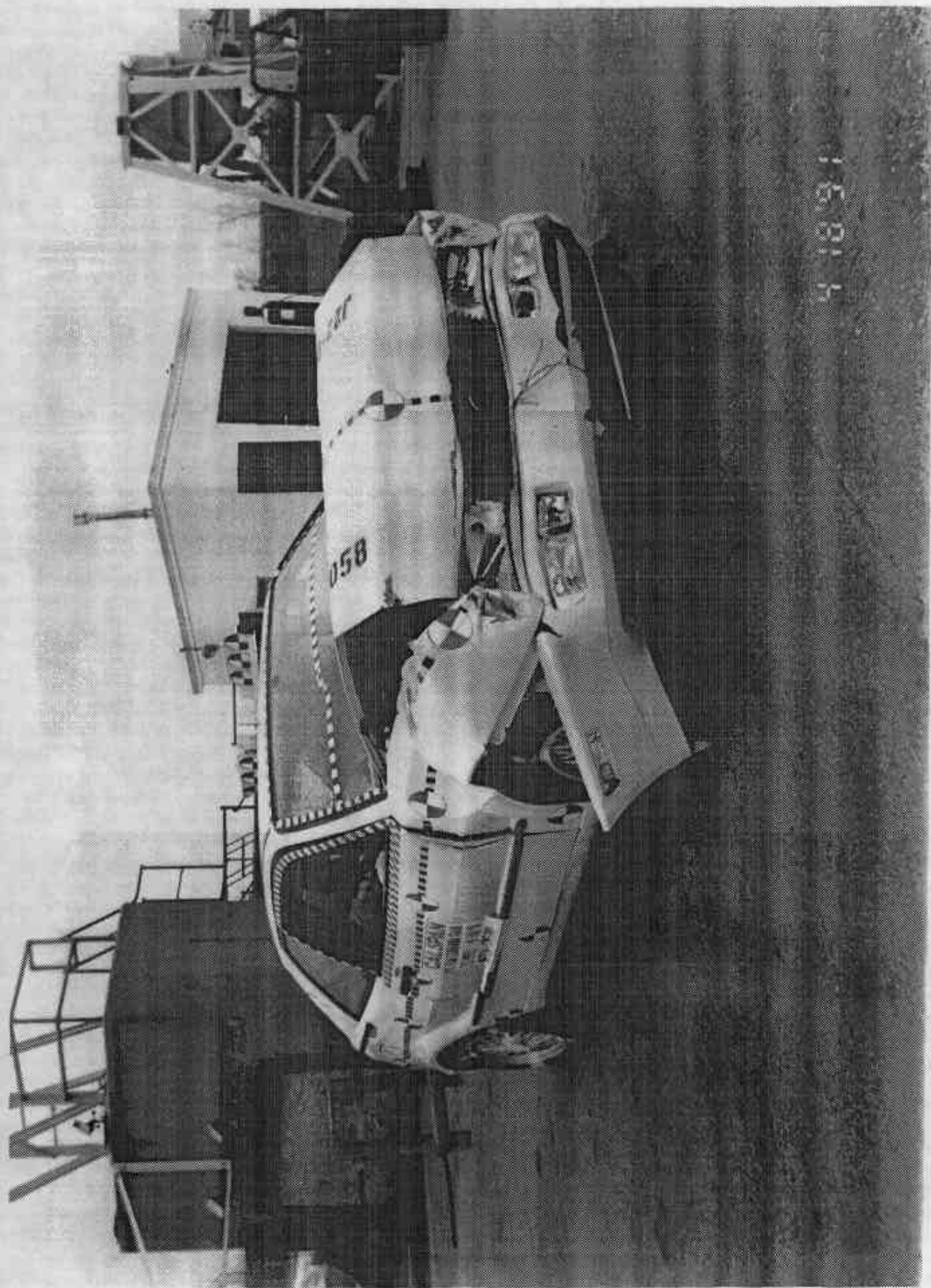


Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

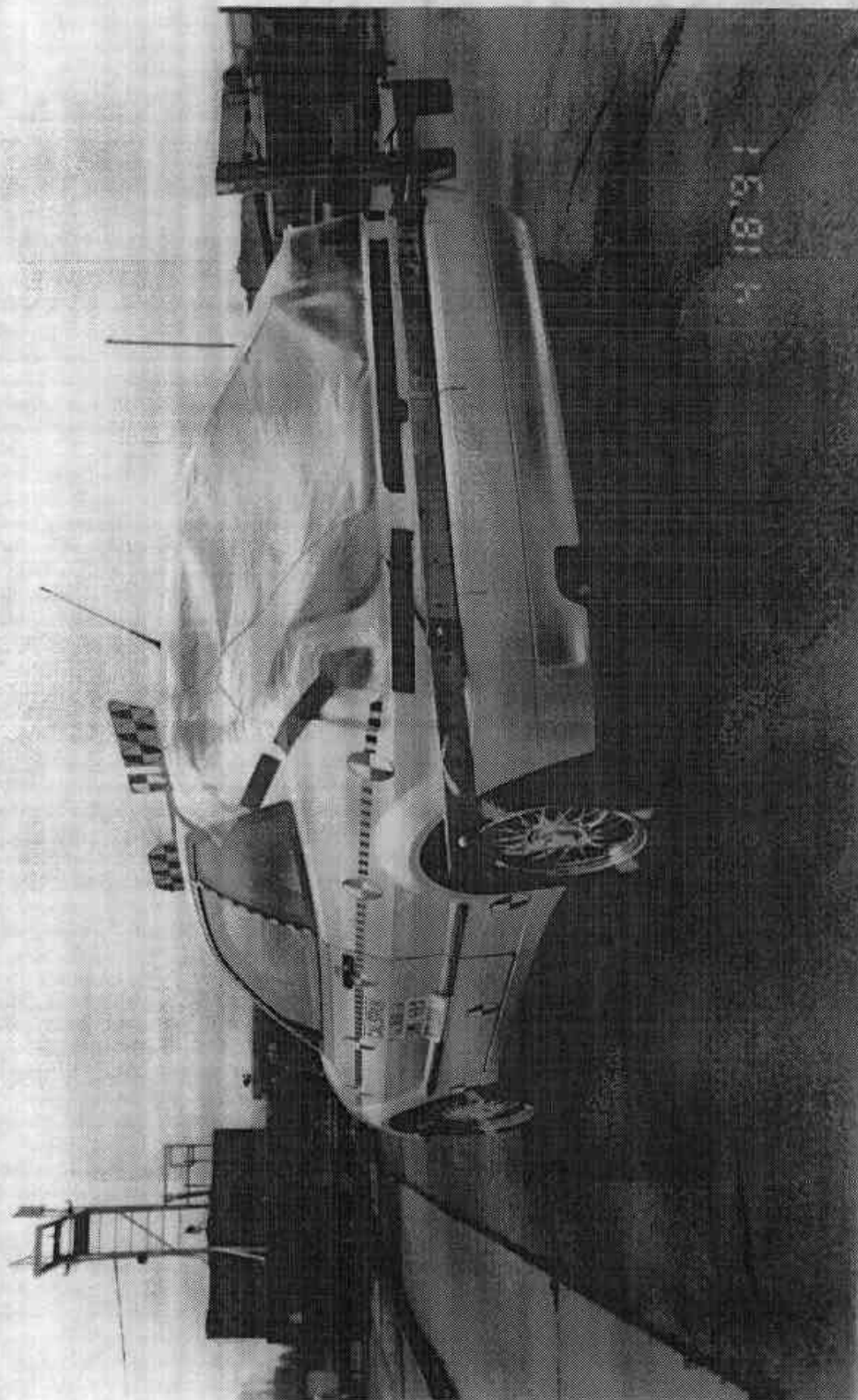
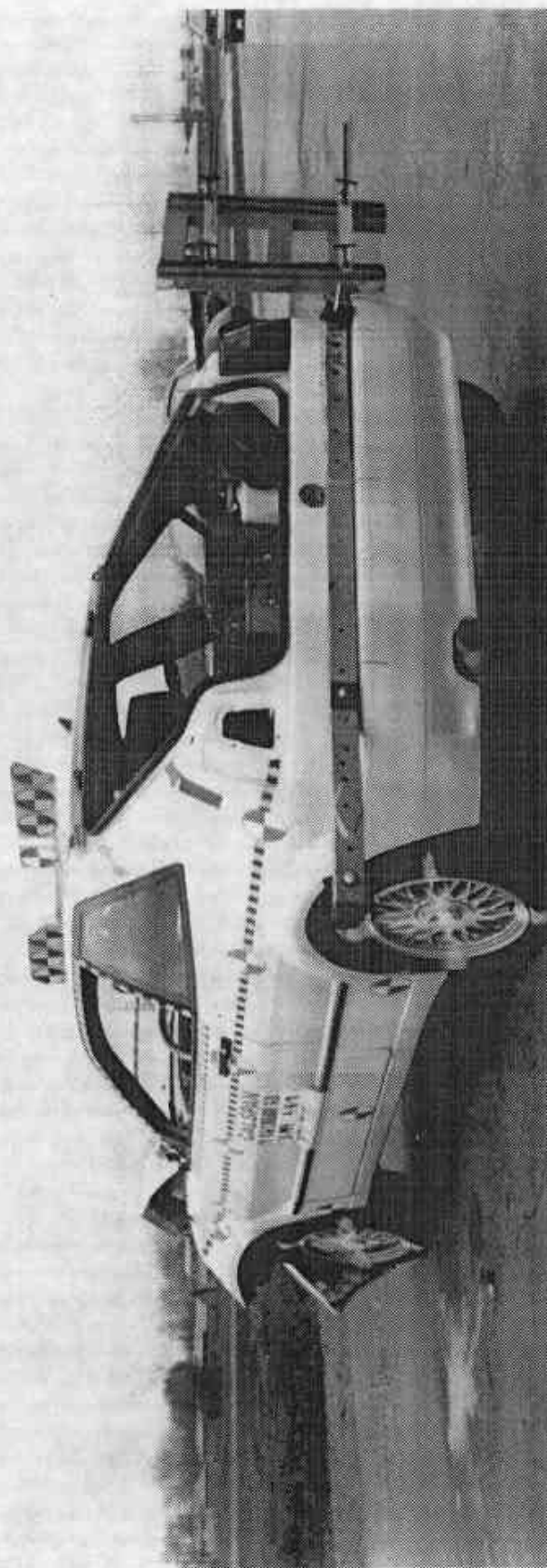


Figure A-9 PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-11

7853-11



4 18'37

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



Figure A-11 POST TEST TOP VIEW

A-13

7853-11

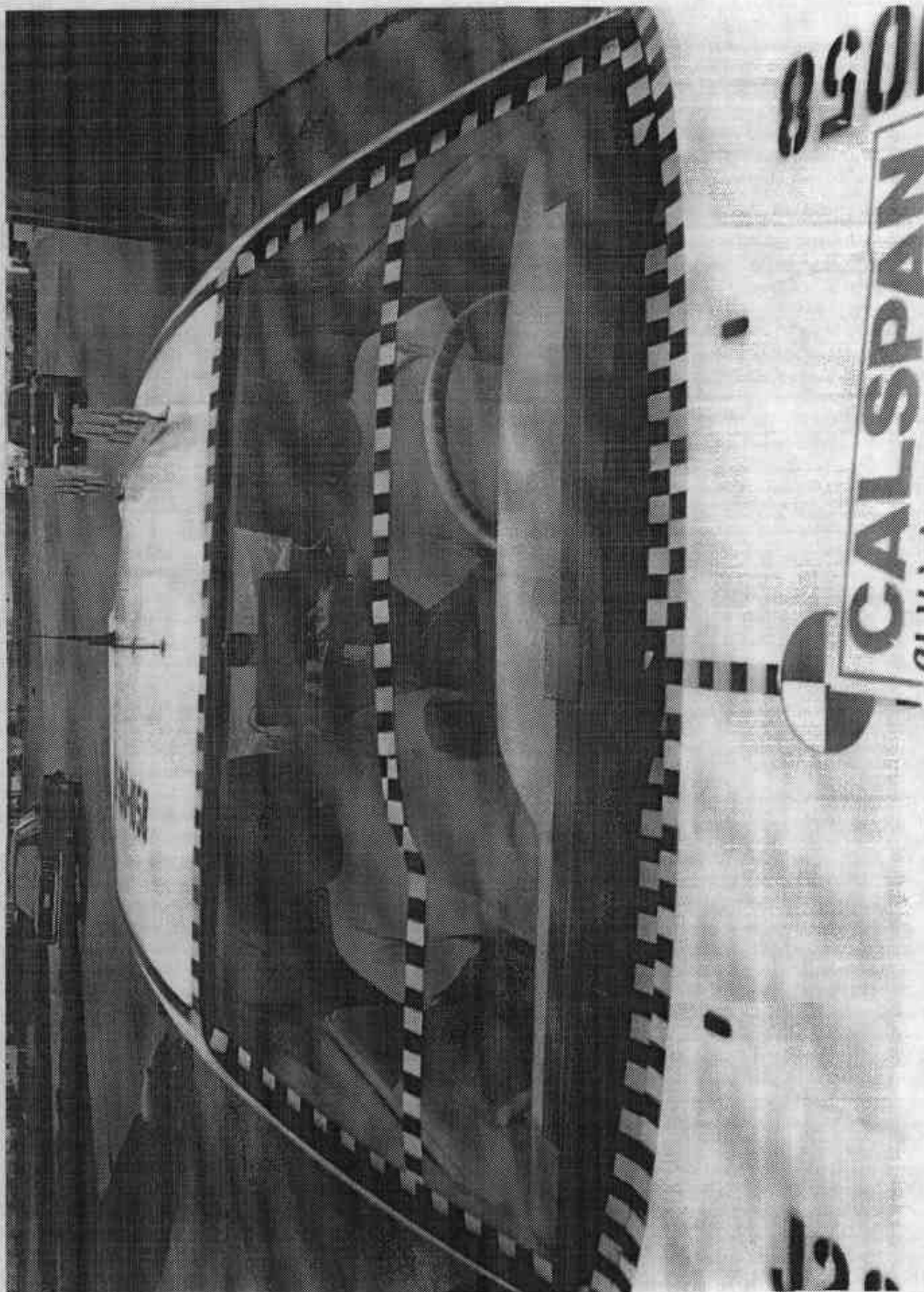


FIGURE A-12. PRE-TEST WINDSHIELD VIEW

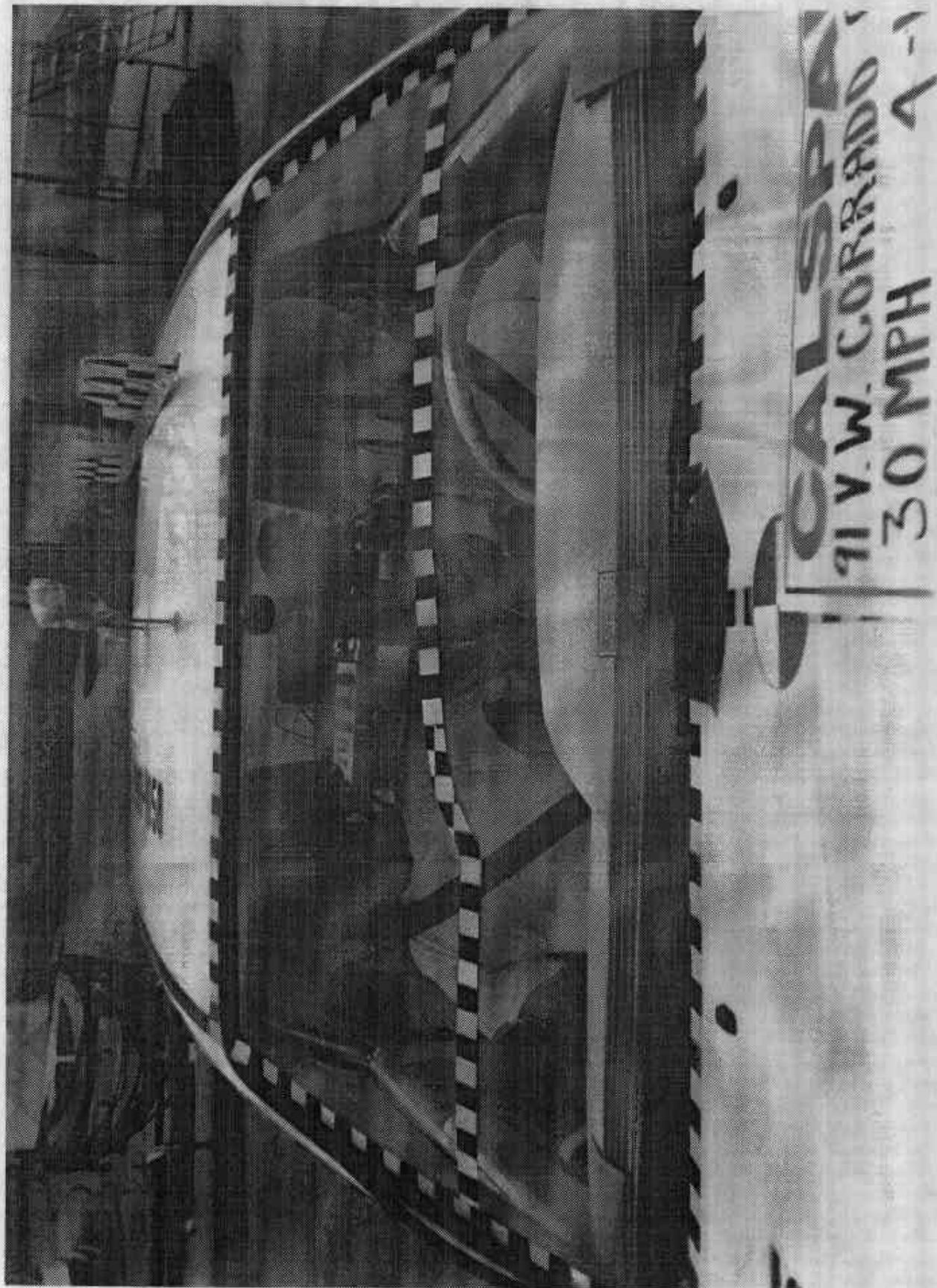


Figure A-13 POST-TEST WINDSHIELD VIEW

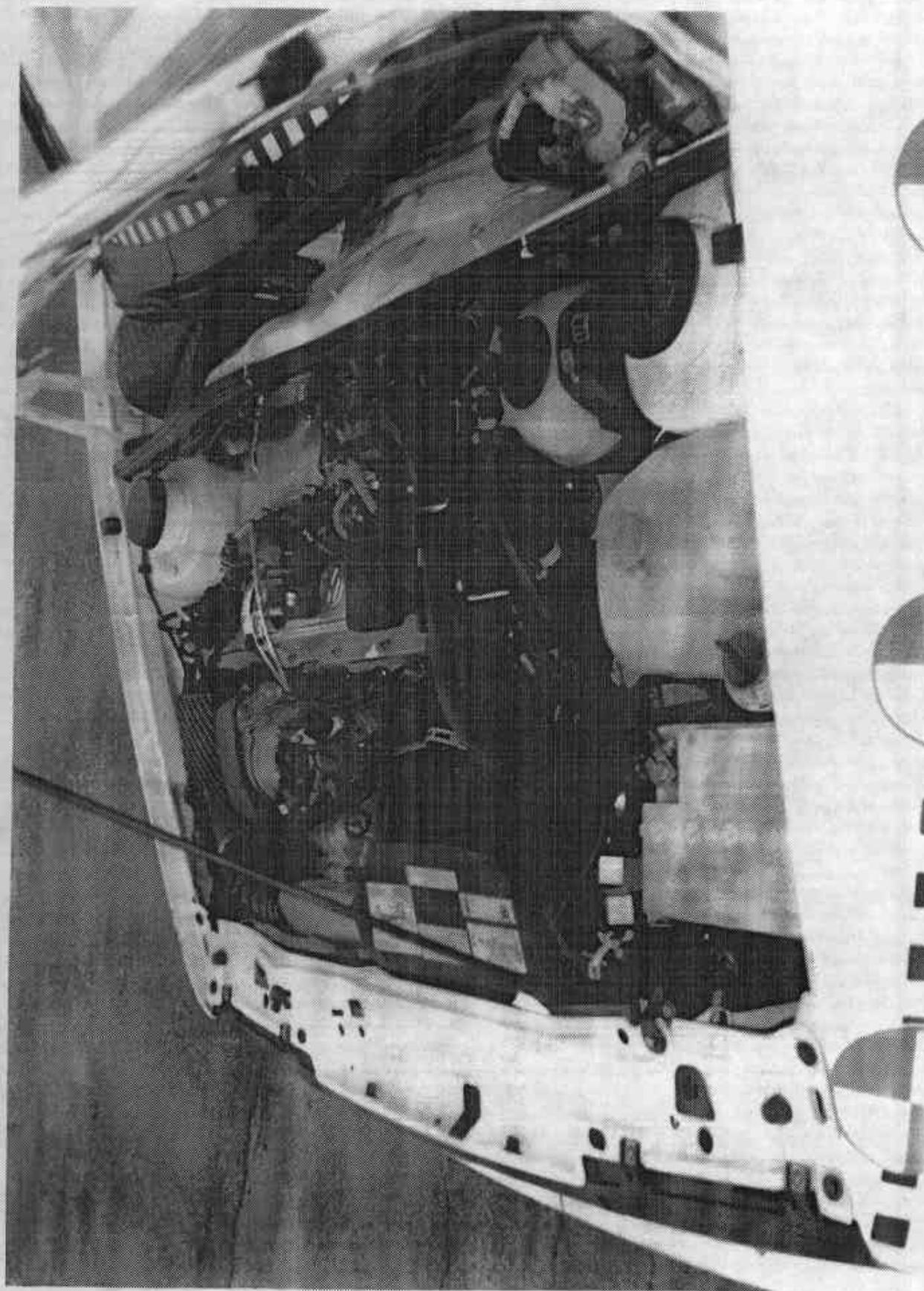


Figure A-14* PRE-TEST ENGINE COMPARTMENT VIEW

A-16

7853-11

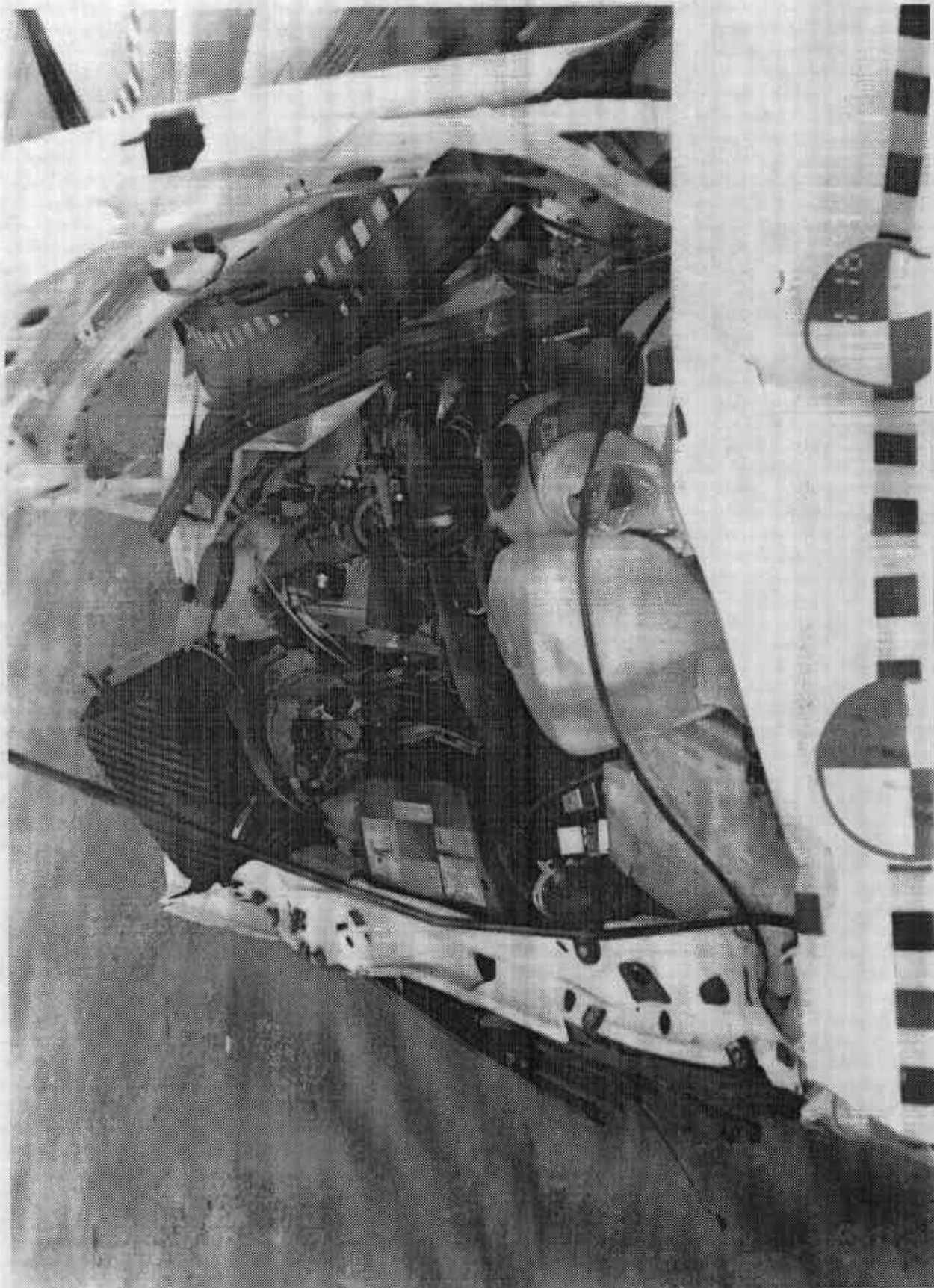


Figure A-15 POST-TEST ENGINE COMPARTMENT VIEW

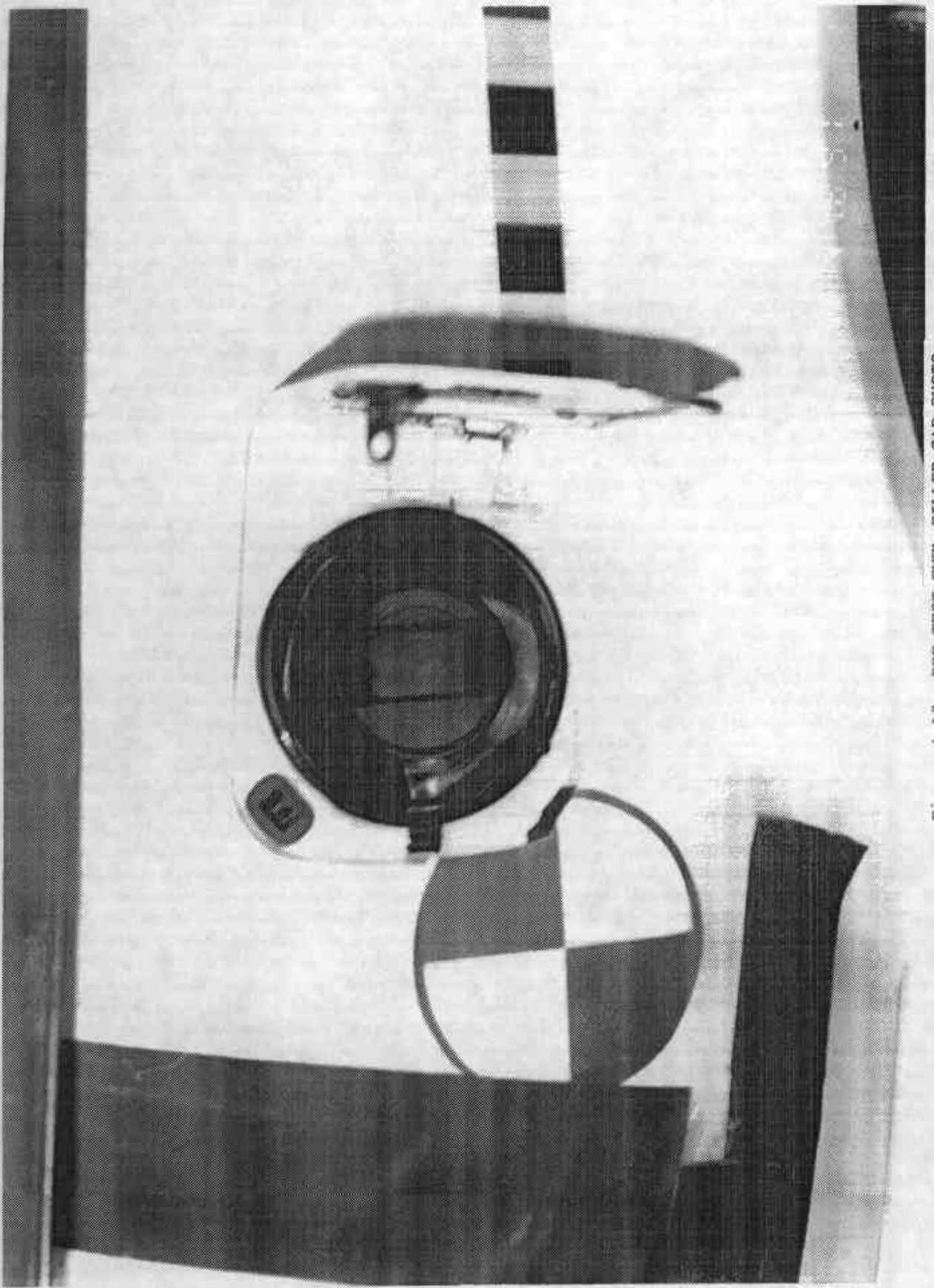


Figure A-18 PRE-TEST FUEL FILLER CAP PHOTO

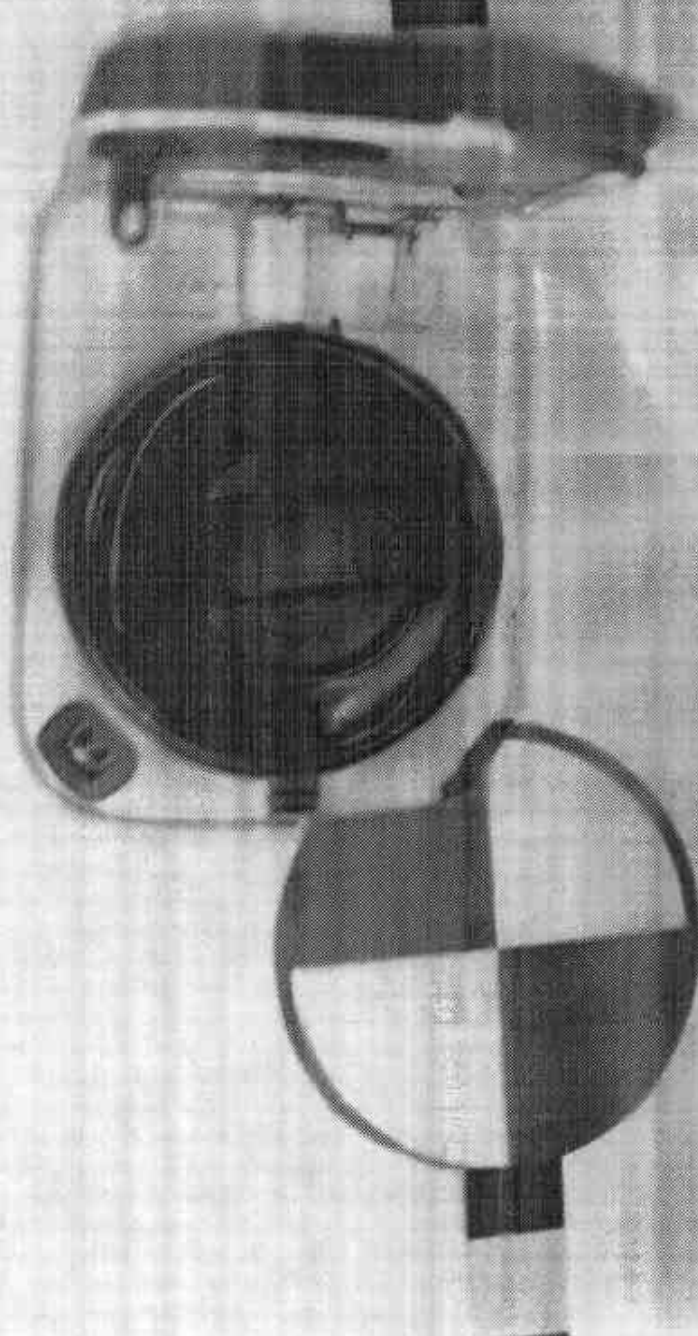


Figure A-17 POST-TEST FUEL FILLER CAP PHOTO

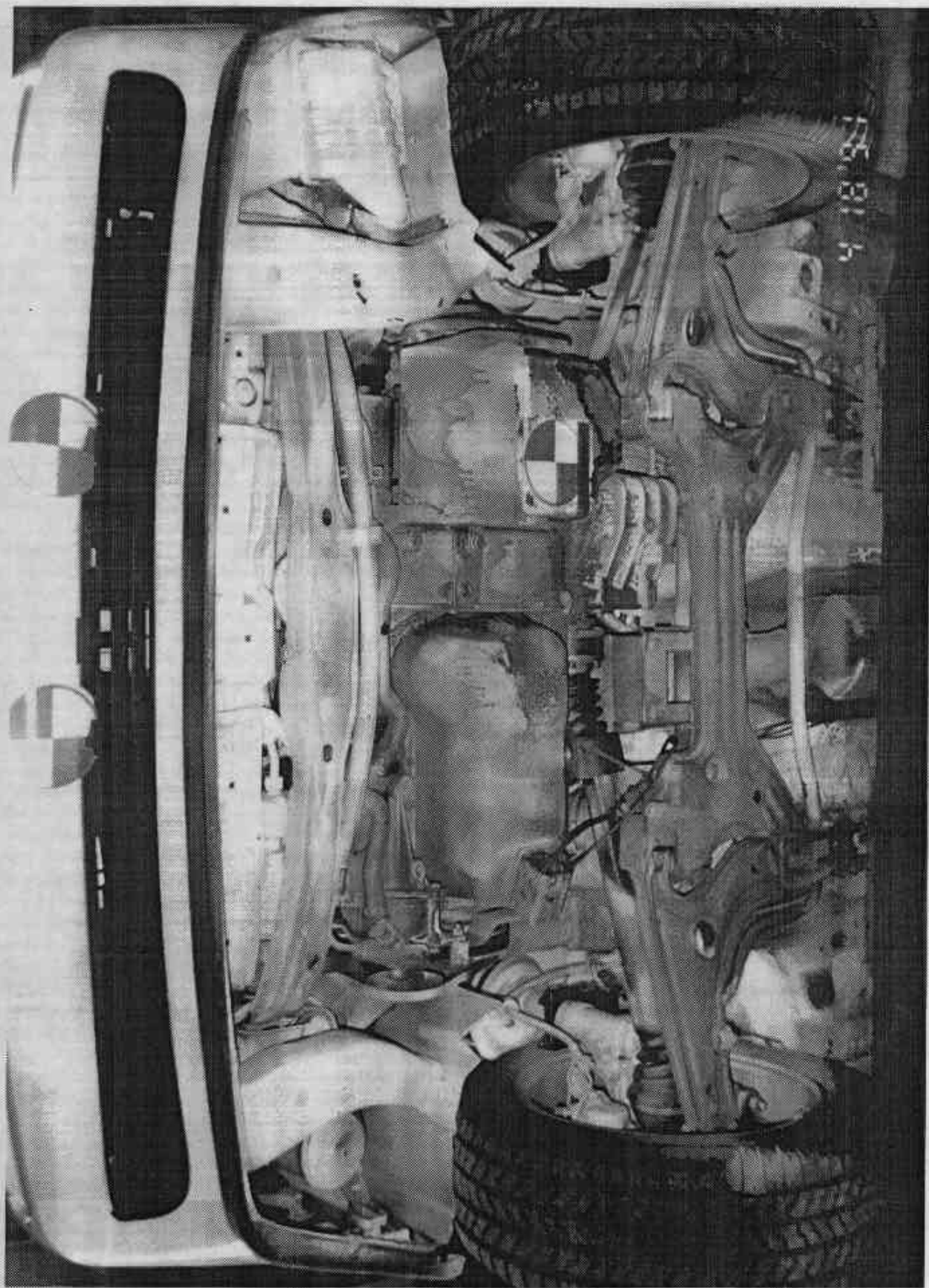


Figure A-18 PRE-TEST FRONT UNDERBODY VIEW

A-20

7853-11

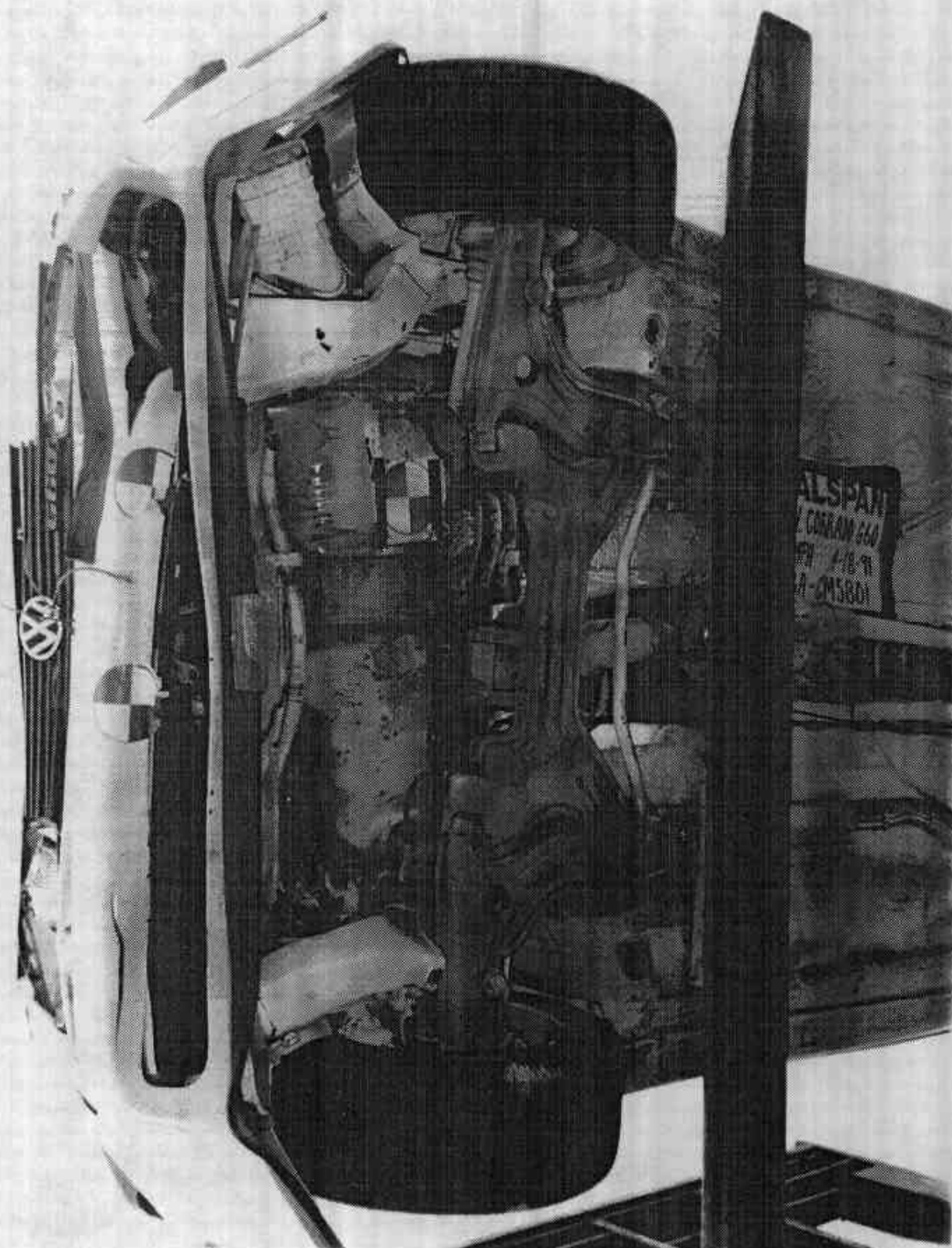


Figure A-19 POST-TEST FRONT UNDERBODY VIEW

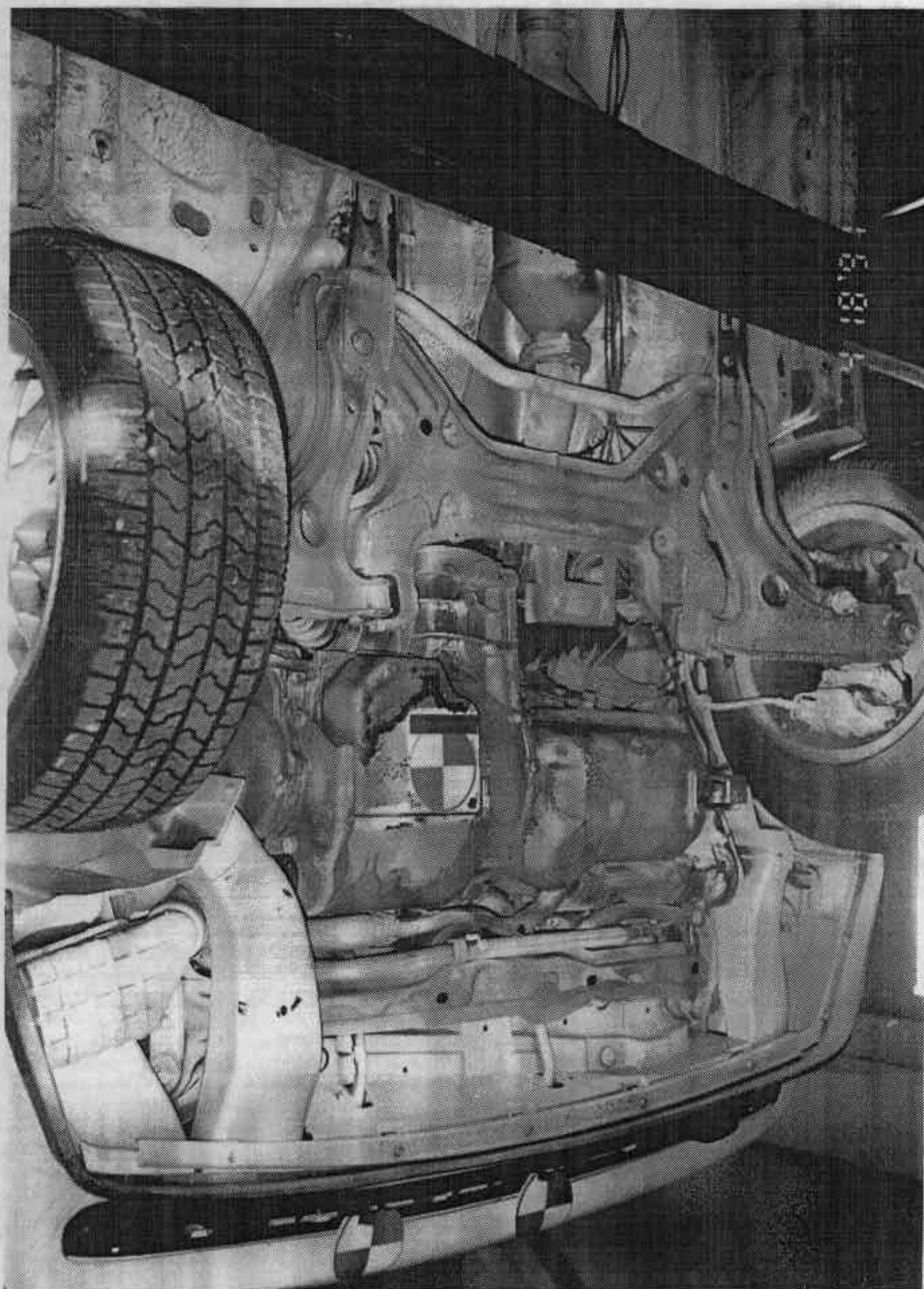


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW



Figure A-21 POST-TEST FRONT SIDE UNDERBODY VIEW



Figure A-22 PRE-TEST REAR UNDERBODY VIEW

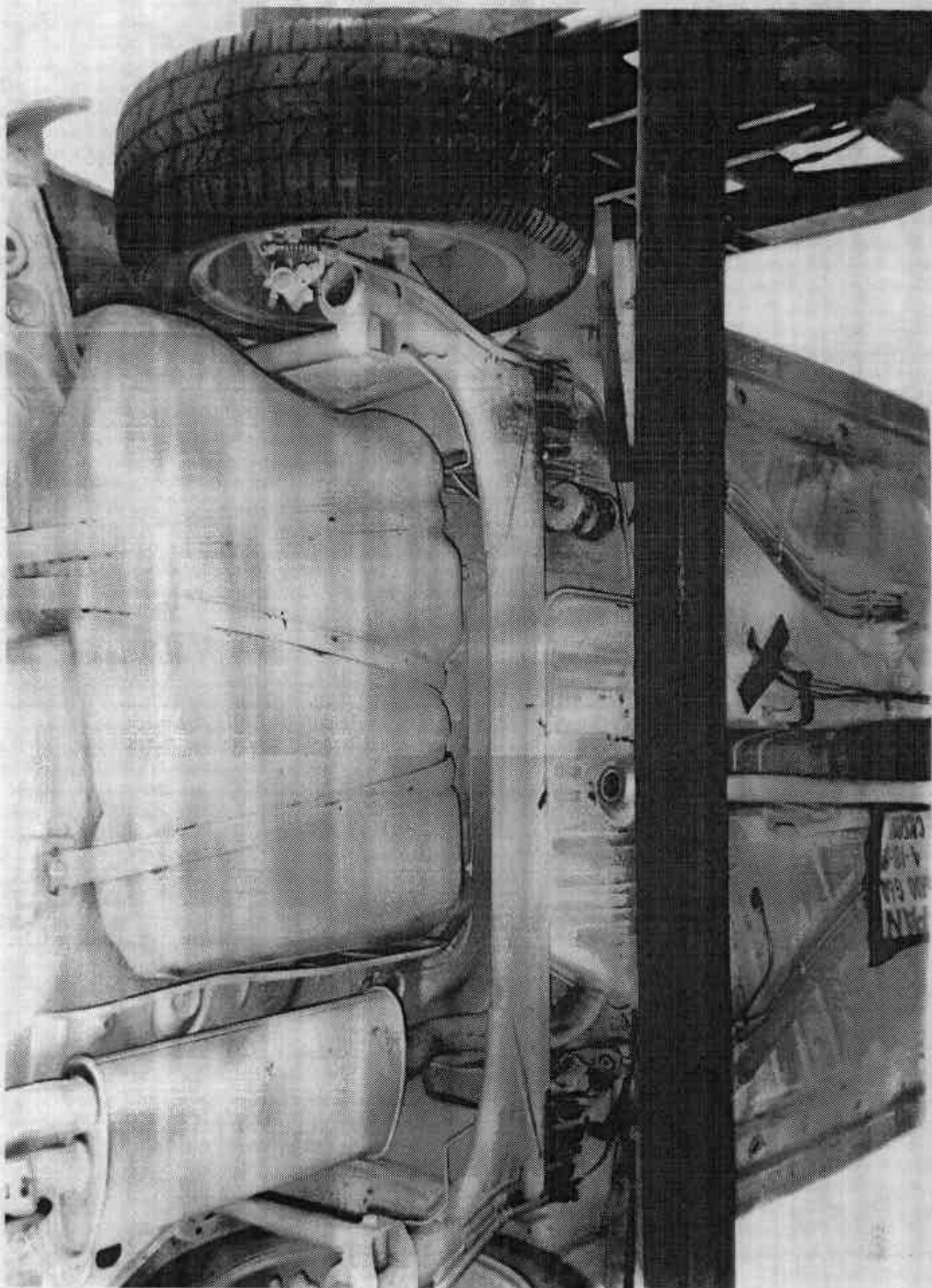


Figure A-23 POST-TEST REAR UNDERBODY VIEW

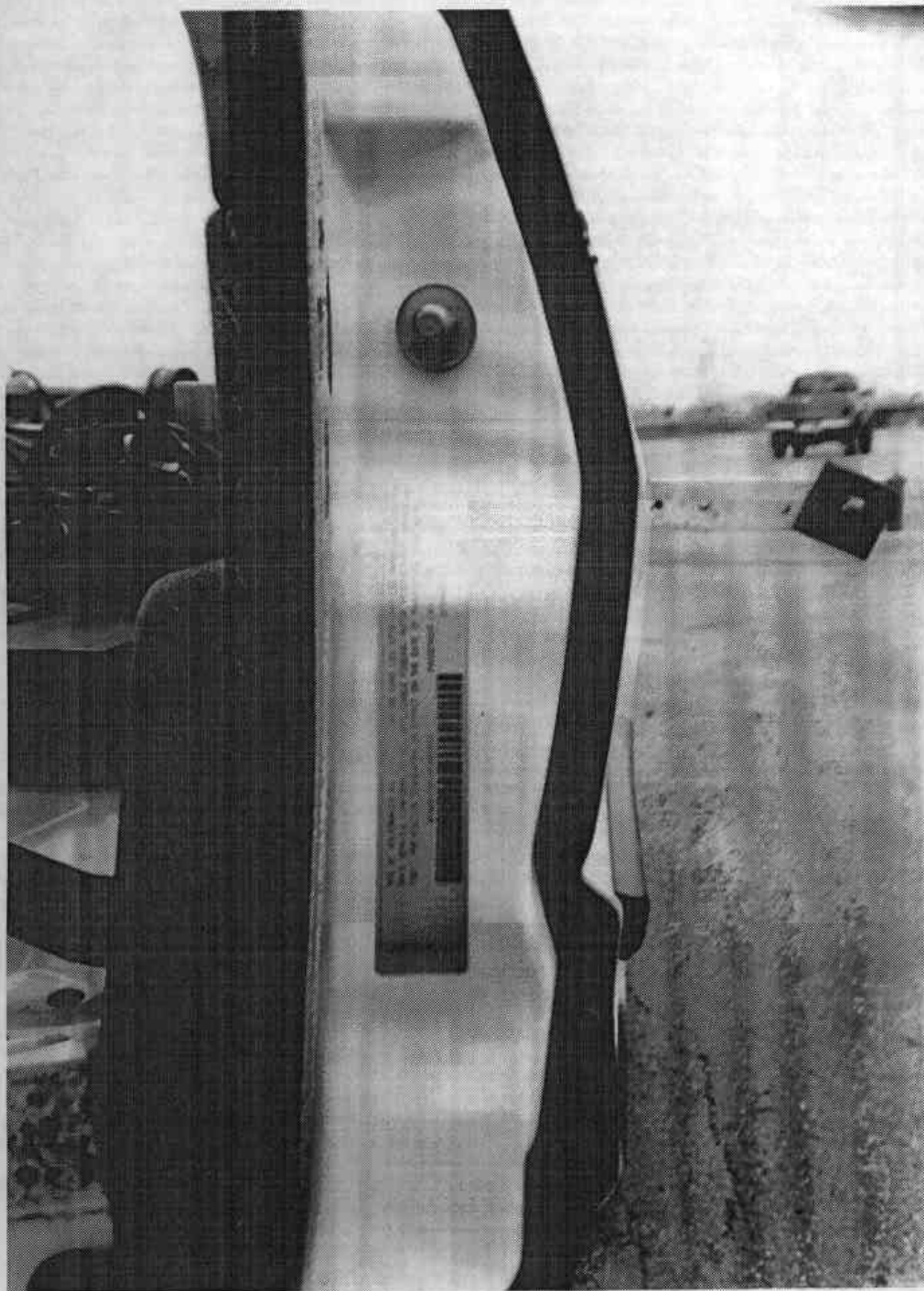


Figure A-24 CERTIFICATION LABEL



Figure A-25 TIREPLACARD

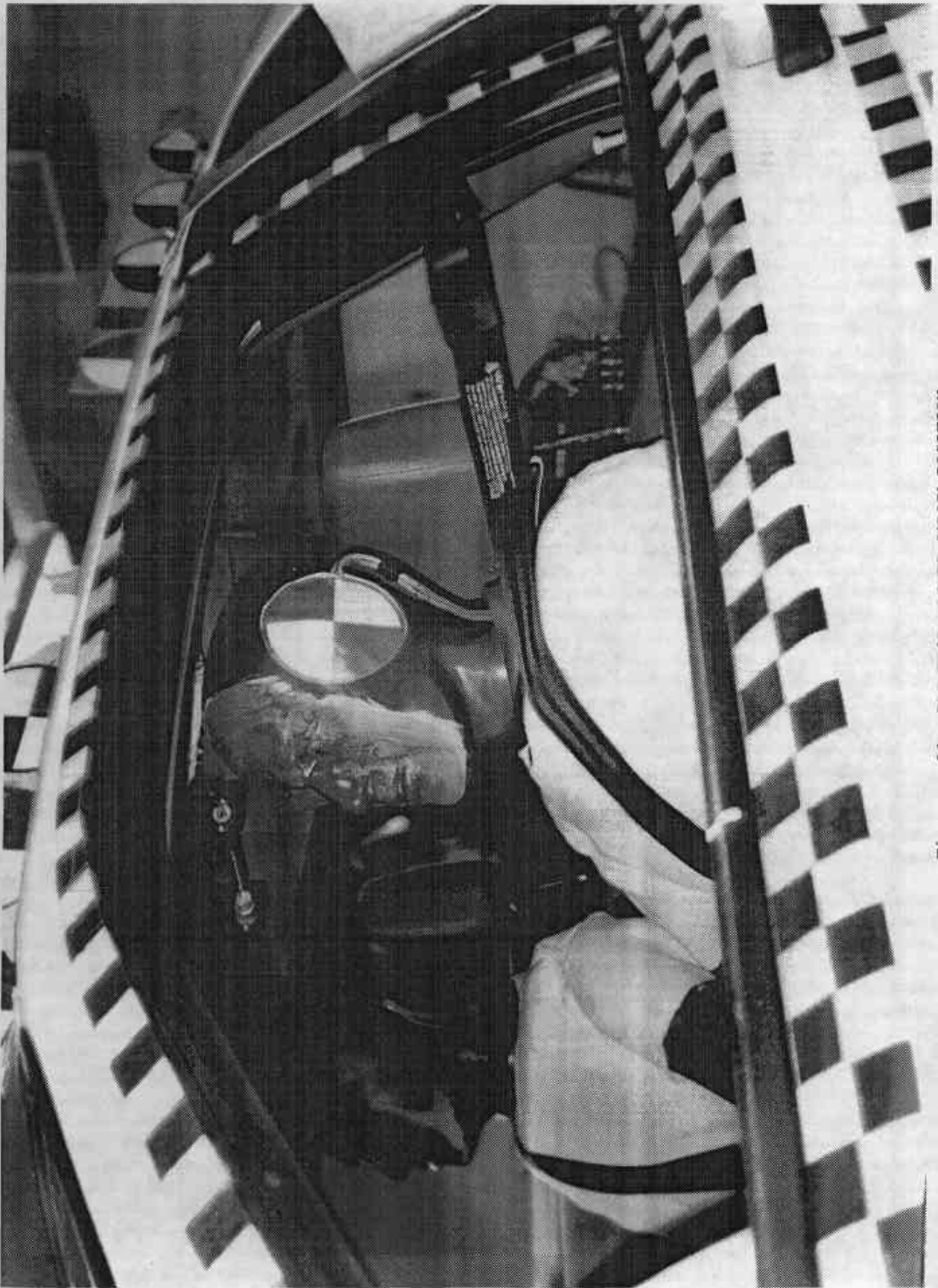


FIGURE A-26 PRE-TEST DRIVER DUMMY POSITION



FIGURE A-27 POST-TEST DRIVER DUMMY POSITION

A-29

7853-11

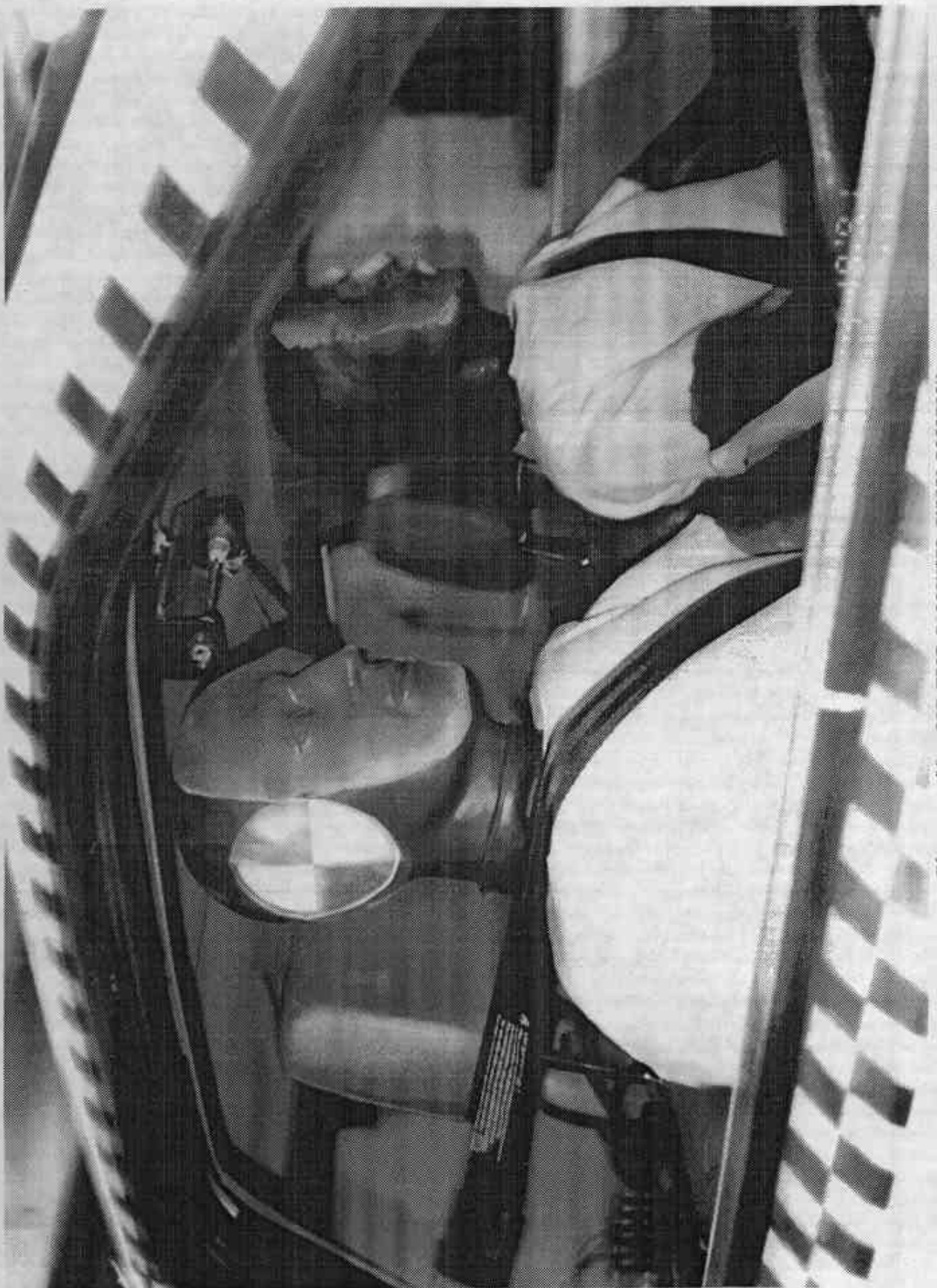


Figure A-28 PRE-TEST PASSENGER DUMMY POSITION

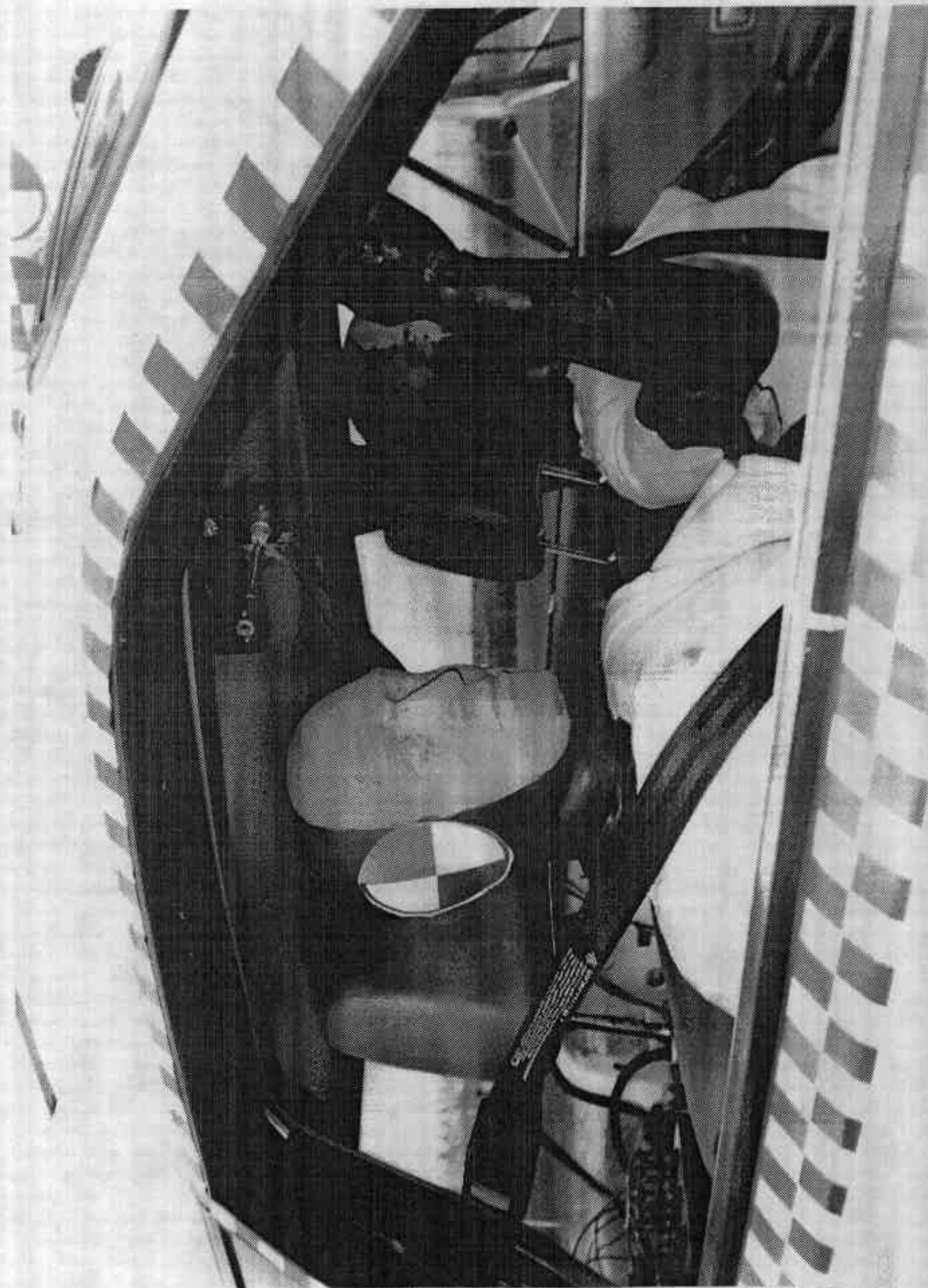


Figure A-29 POST-TEST PASSENGER DUMMY POSITION



FIGURE A-30 PRE-TEST DRIVER DUMMY AND INTERIOR VIEW



FIGURE A-31 POST-TEST DRIVER DUMMY AND INTERIOR VIEW

A-33

7853-11



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



Figure A-33 POST-TEST PASSENGER DUMMY AND INTERIOR VIEW

A-35

7853-11

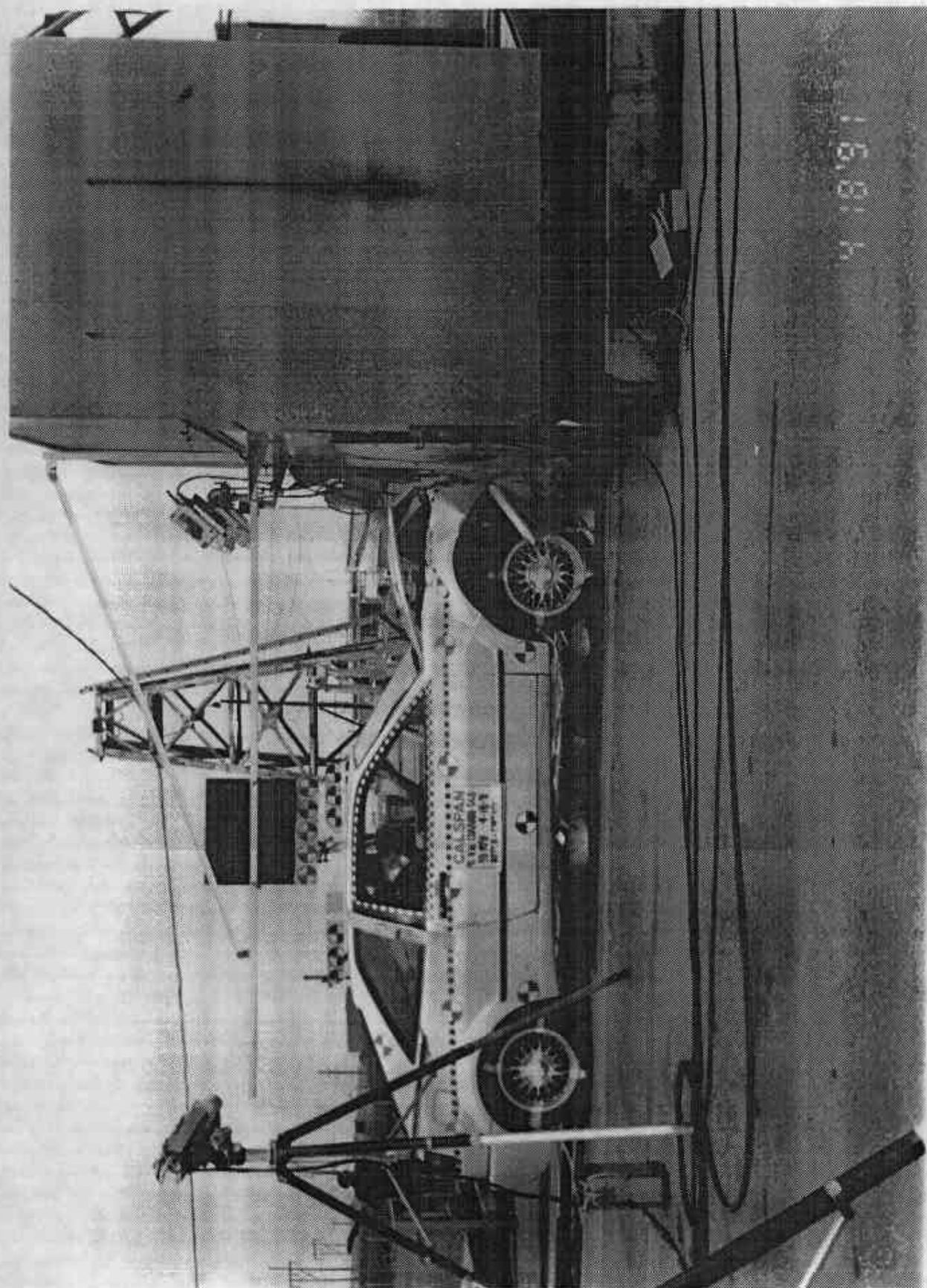


Figure A-34 VEHICLE IMPACT

A-36

7853-11

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CM5801

VEHICLE DATA

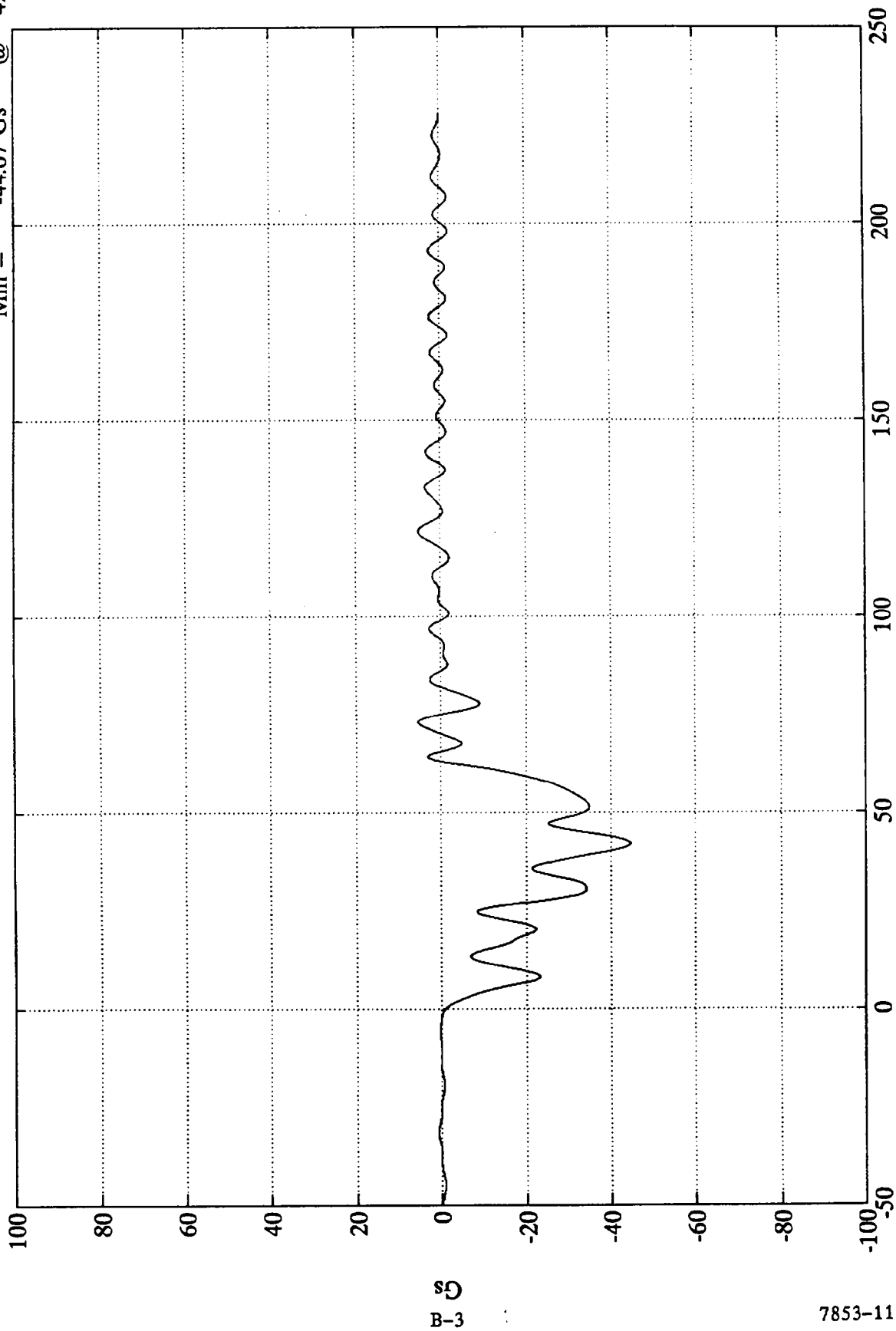
FILTER CHANNEL CLASS

60

Test 1058

R. Rear X-member X (#2)

Max = 5.32 Gs @ 73.07 msec
Min = -44.67 Gs @ 42.00 msec



Time (msec)

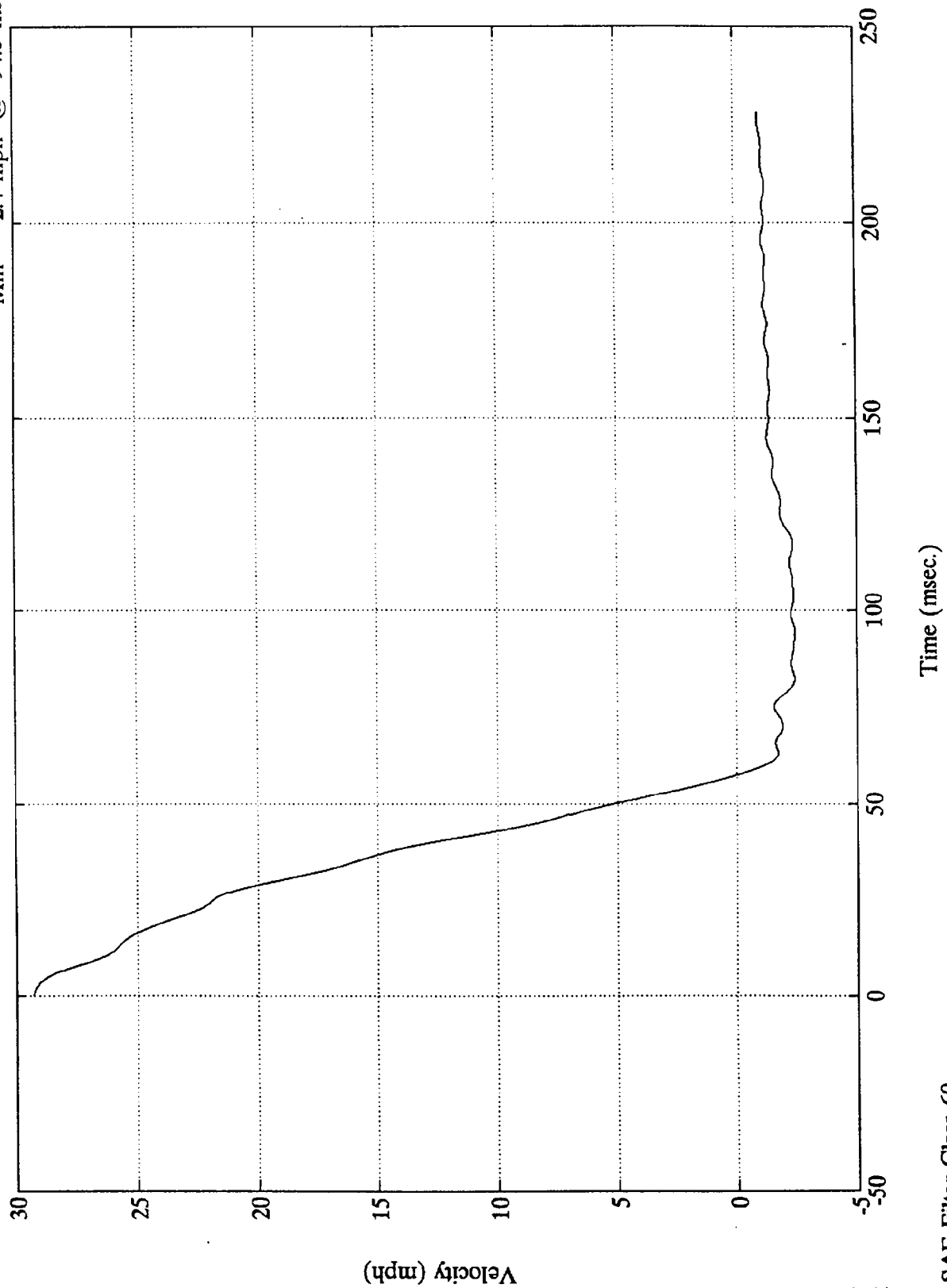
SAE Filter Class 60

7853-11

Test 1058

R. Rear X-Member X (#2)

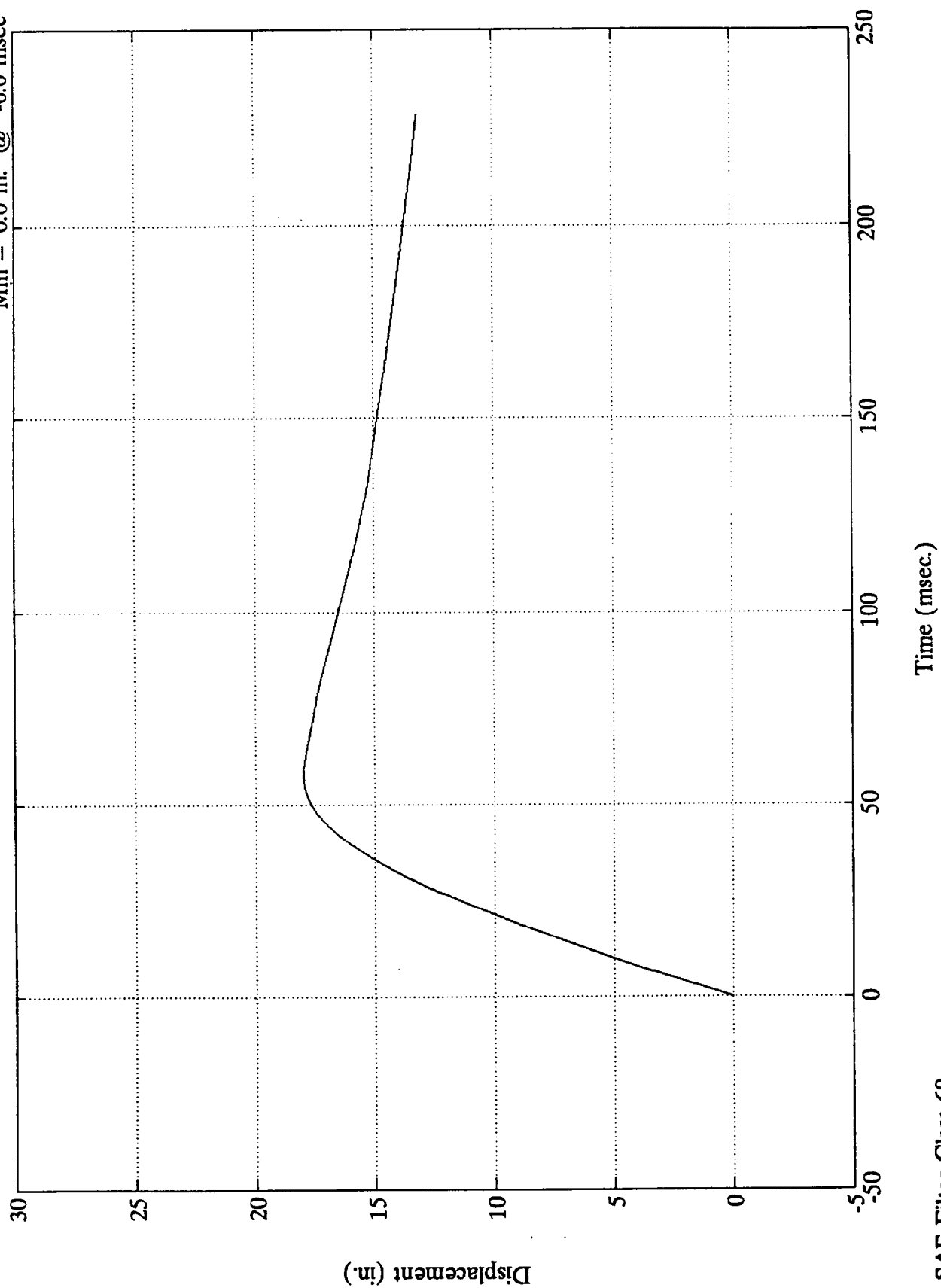
Max = 29.3 mph @ 0.2 msec
Min = -2.4 mph @ 94.3 msec



Test 1058

R. Rear X-Member X (#2)

Max = 18.0 in. @ 58.1 msec
Min = 0.0 in. @ -0.0 msec



B-5

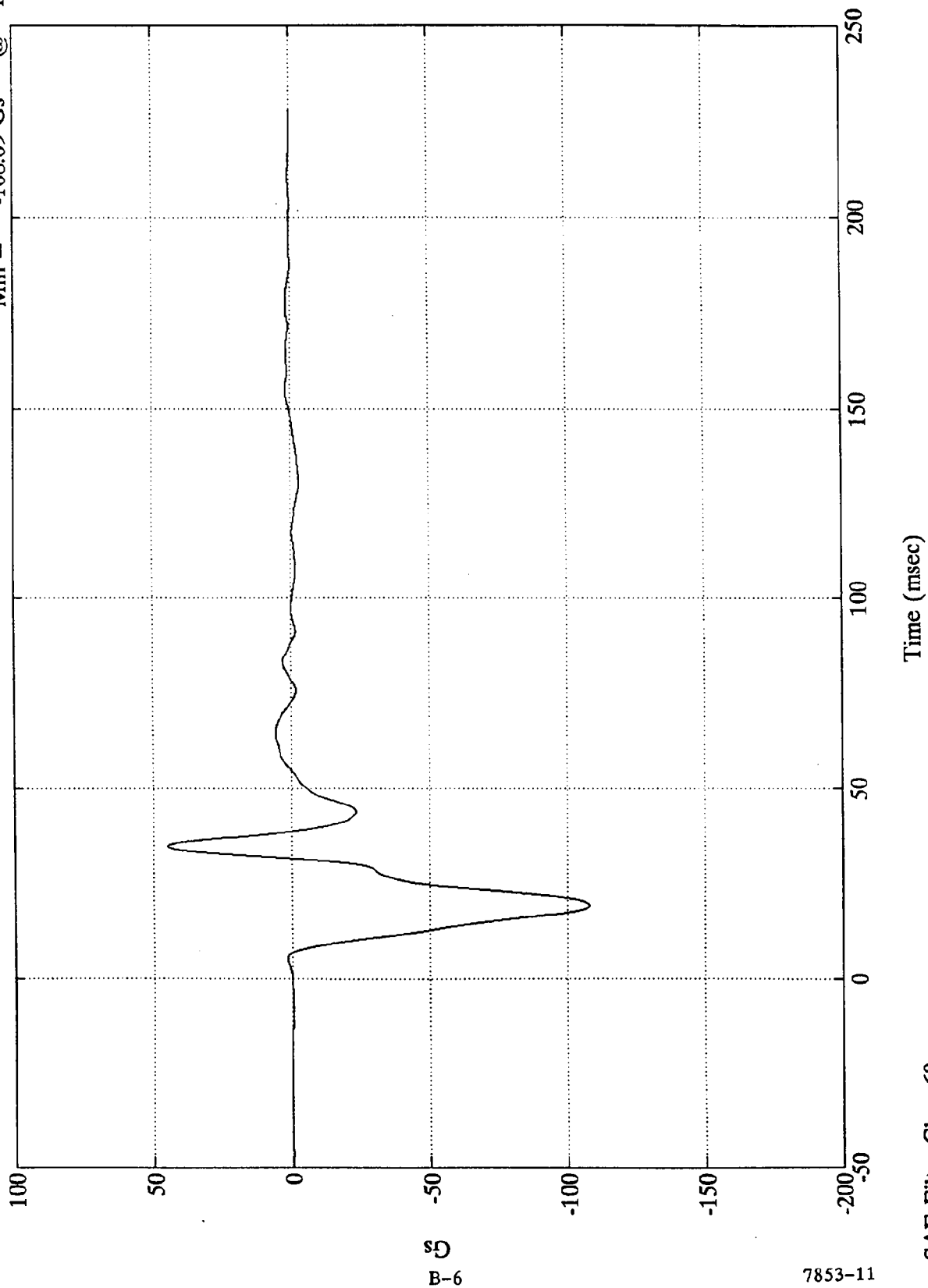
7853-11

SAE Filter Class 60

Test 1058

Engine Top X (#3)

Max = 44.95 Gs @ 34.79 msec
Min = -108.09 Gs @ 19.19 msec



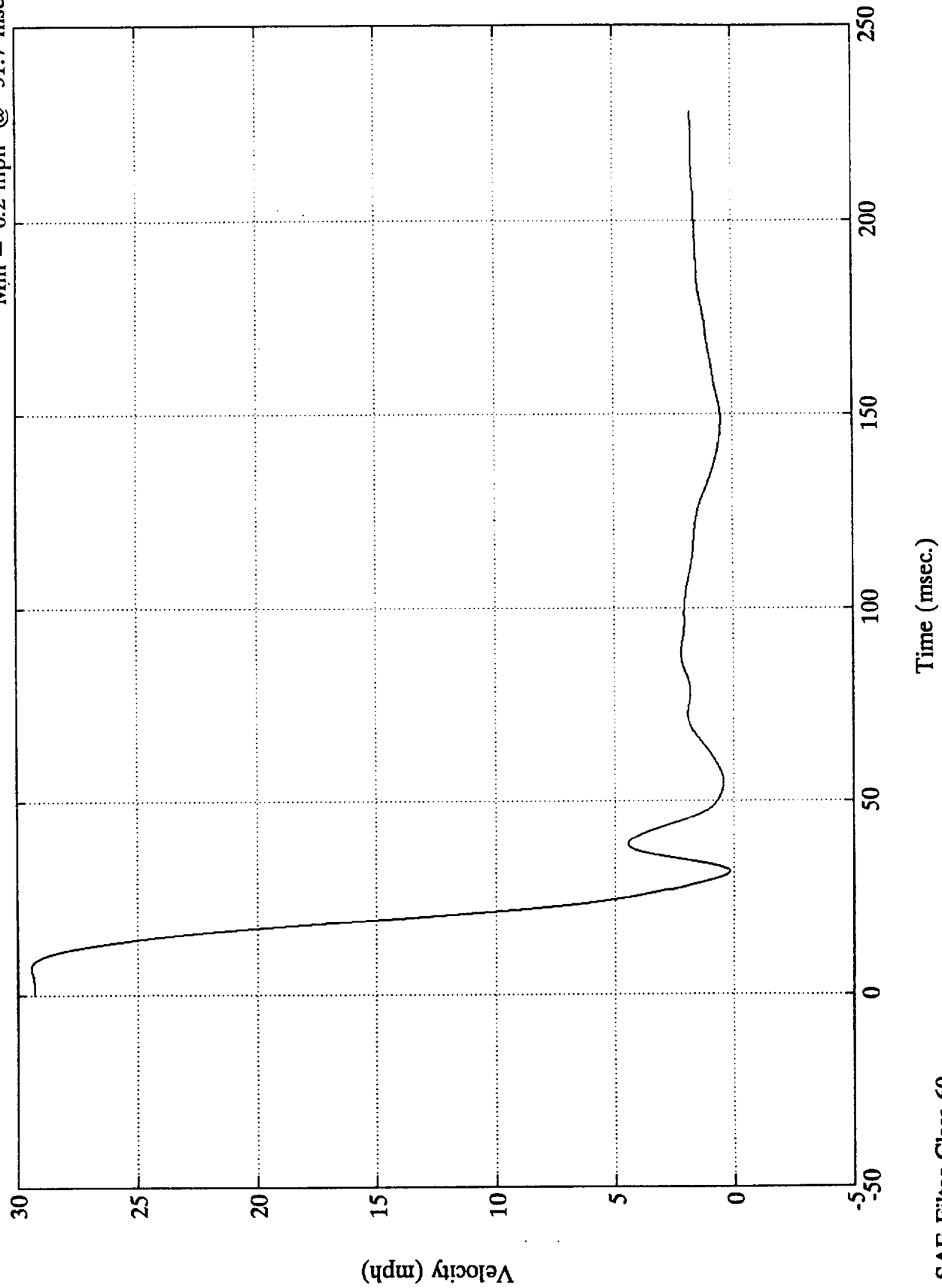
B-6

7853-11

SAE Filter Class 60

Test 1058

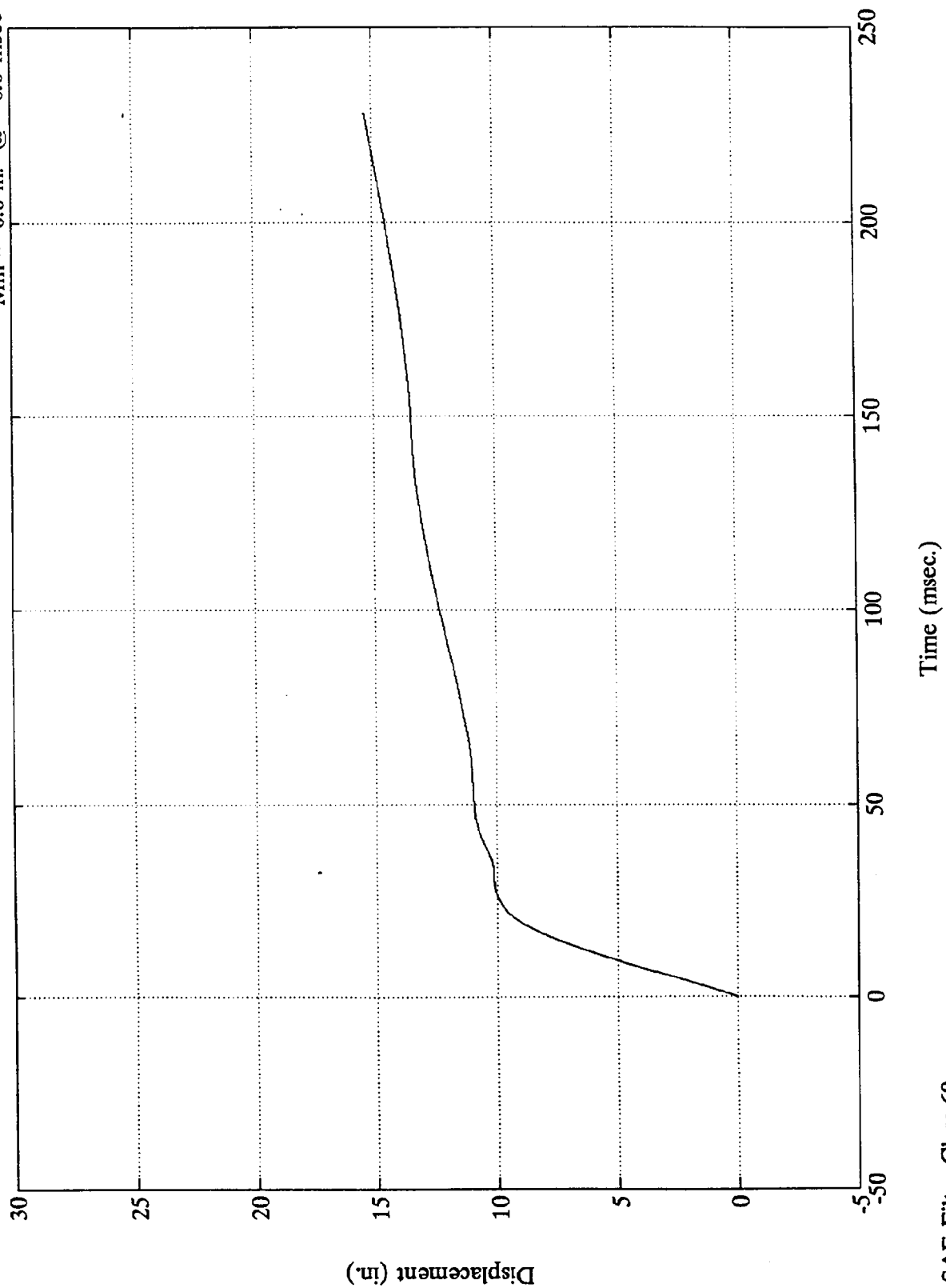
Engine Top X (#3)
Max = 29.4 mph @ 7.2 msec
Min = 0.2 mph @ 31.7 msec



Test 1058

Engine Top X (#3)

Max = 15.3 in. @ 228.0 msec
Min = 0.0 in. @ -0.0 msec



Test 1058

Engine Bottom X (#4)

Max = 51.73 Gs @ 32.39 msec
Min = -117.48 Gs @ 22.19 msec



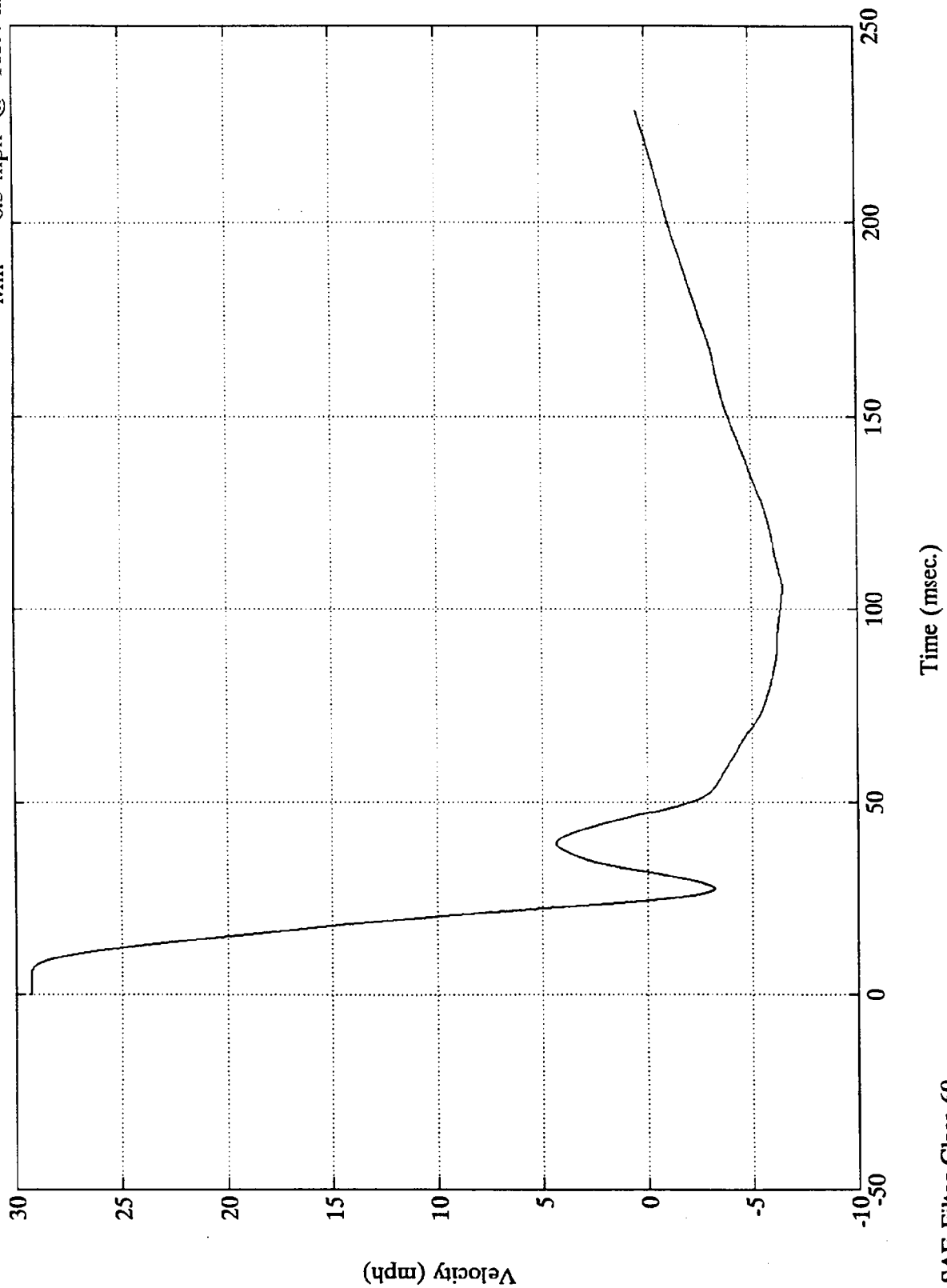
Time (msec)

SAE Filter Class 60

Test 1058

Engine Bottom X (#4)

Max = 29.3 mph @ 3.4 msec
Min = -6.5 mph @ 105.4 msec



B-10

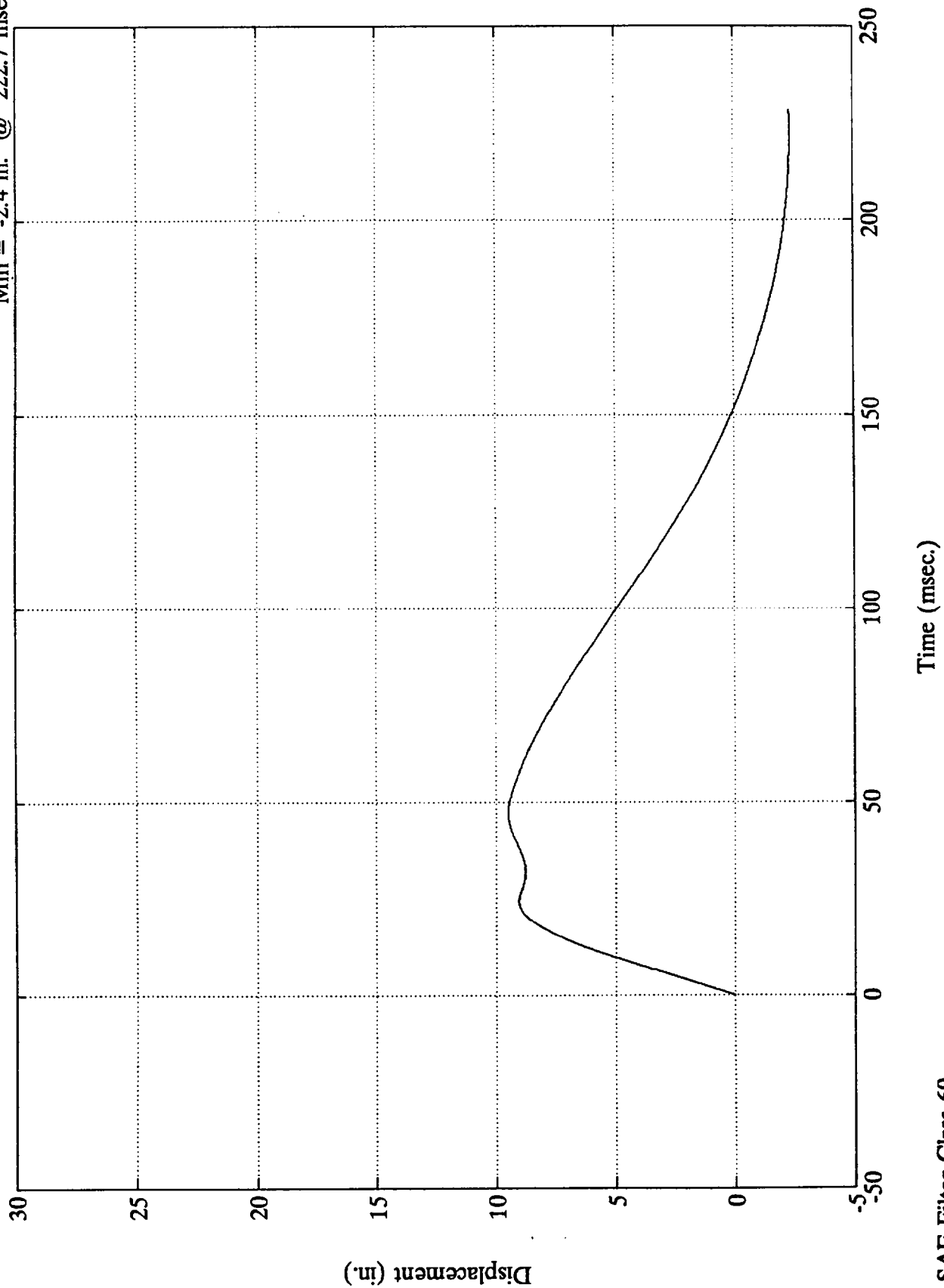
7853-11

SAE Filter Class 60

Test 1058

Engine Bottom X (#4)

Max = 9.5 in. @ 47.3 msec
Min = -2.4 in. @ 222.7 msec



B-11

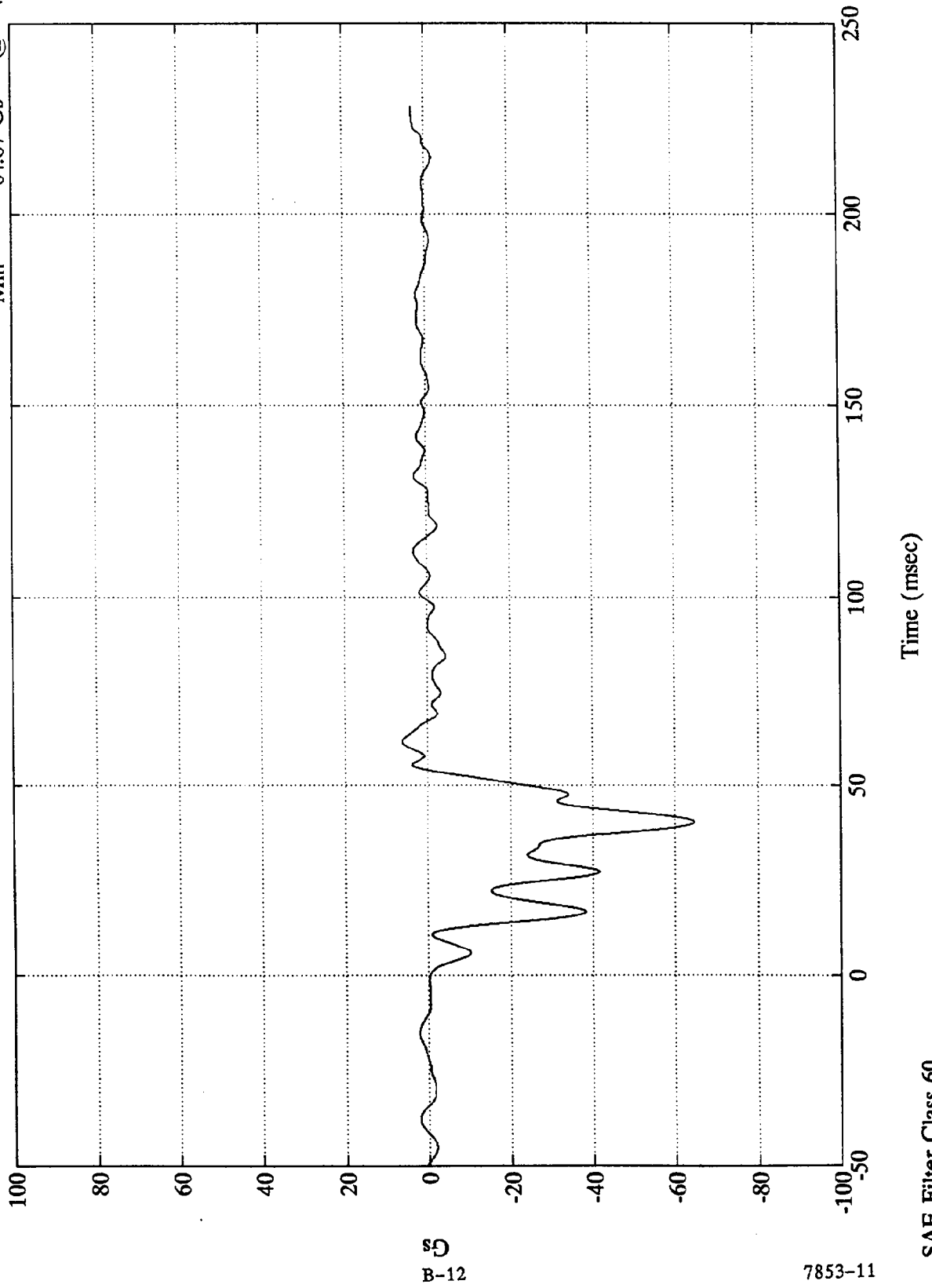
7853-11

SAE Filter Class 60

Test 1058

R. Brake Caliper X (#5)

Max = 6.14 Gs @ 61.79 msec
Min = -64.67 Gs @ 40.43 msec



B-12

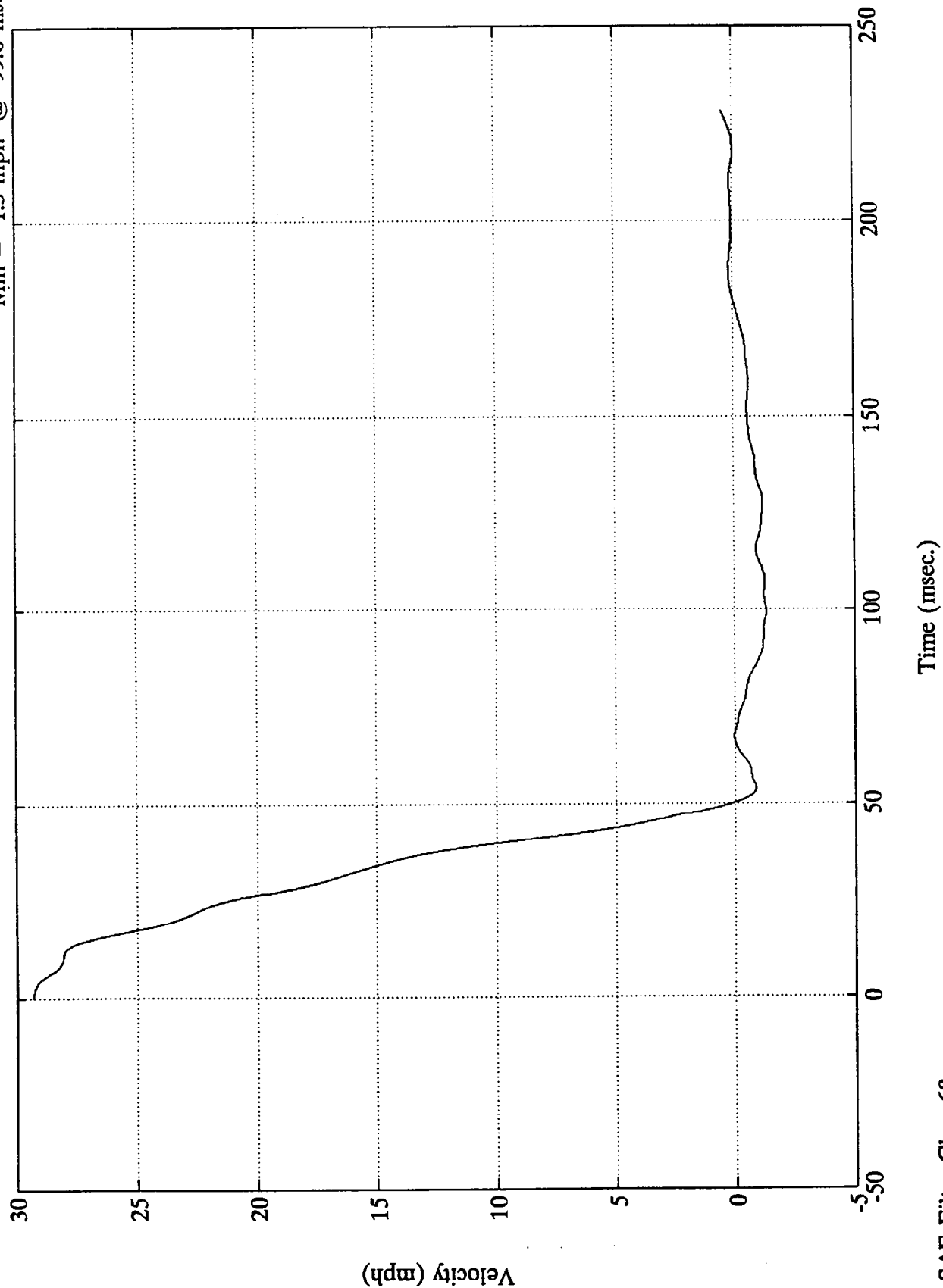
7853-11

SAE Filter Class 60

Test 1058

Max = 29.3 mph @ 0.5 msec
Min = -1.3 mph @ 99.6 msec

R. Brake Caliper X (#5)



B-13

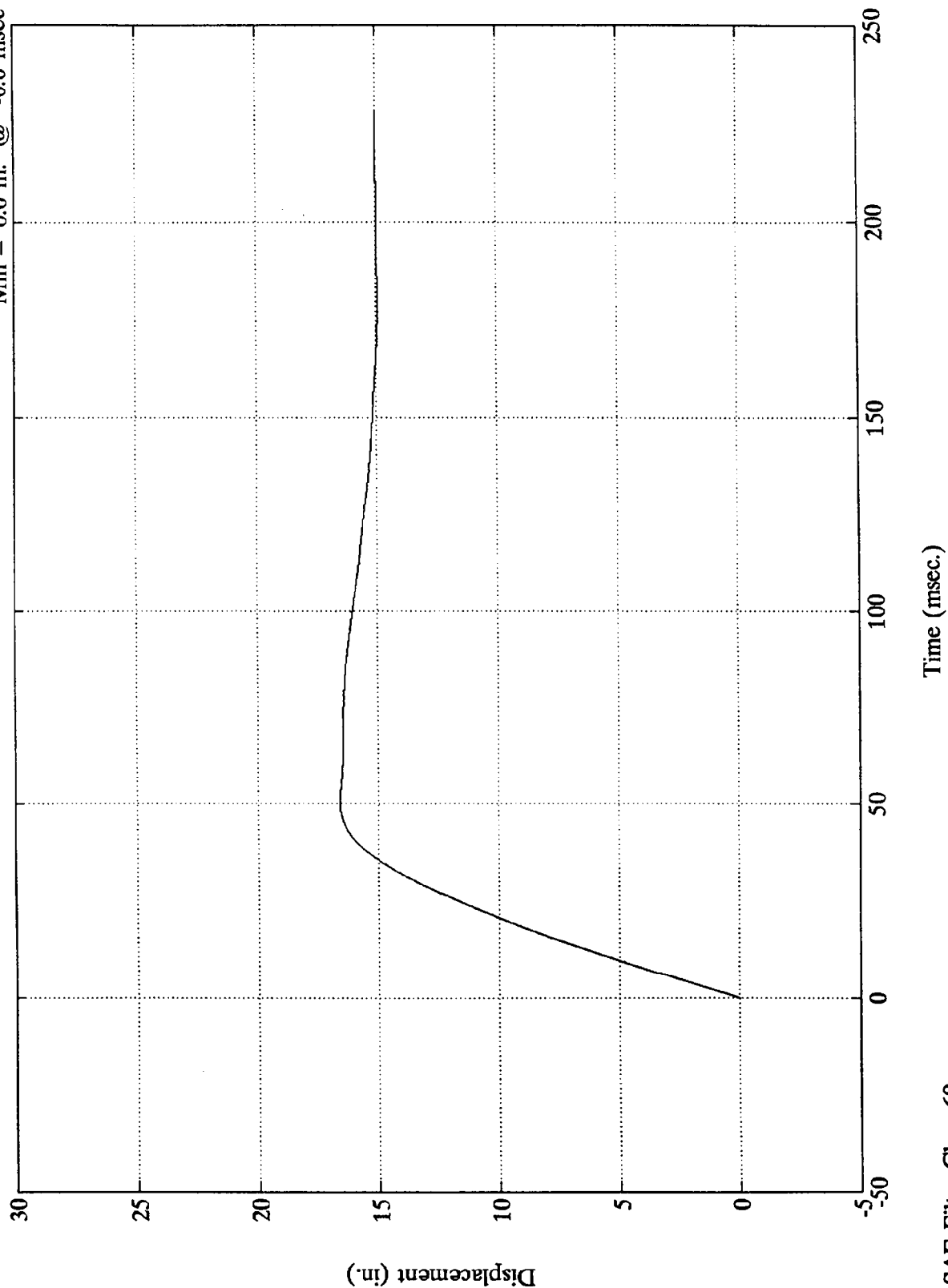
7853-11

SAE Filter Class 60

Test 1058

R. Brake Caliper X (#5)

Max = 16.6 in. @ 51.8 msec
Min = 0.0 in. @ -0.0 msec



B-14

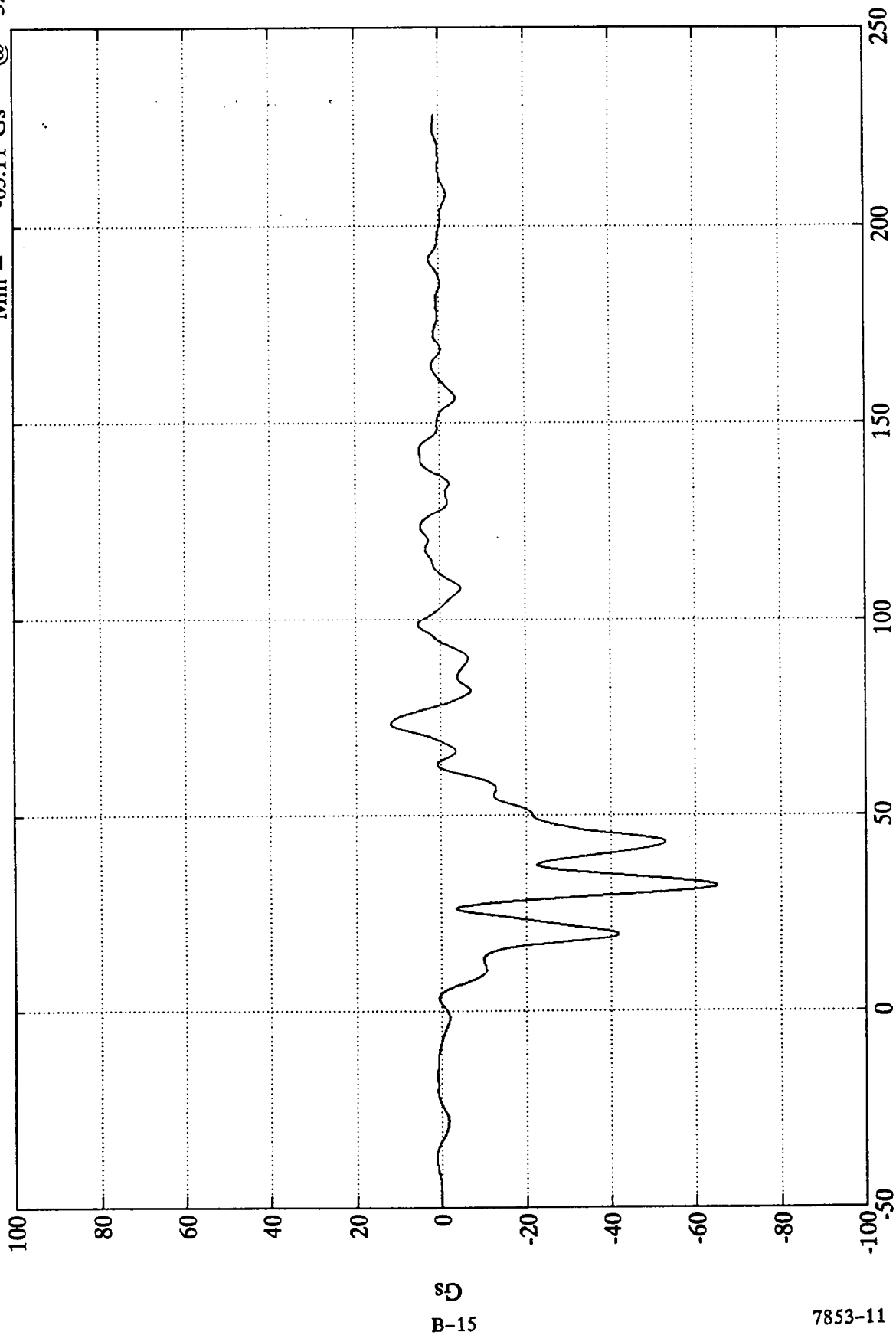
7853-11

SAE Filter Class 60

Test 1058

L. Brake Caliper X (#6)

Max =	11.66 Gs	@	73.31 msec
Min =	-65.11 Gs	@	32.03 msec



Time (msec)

SAE Filter Class 60

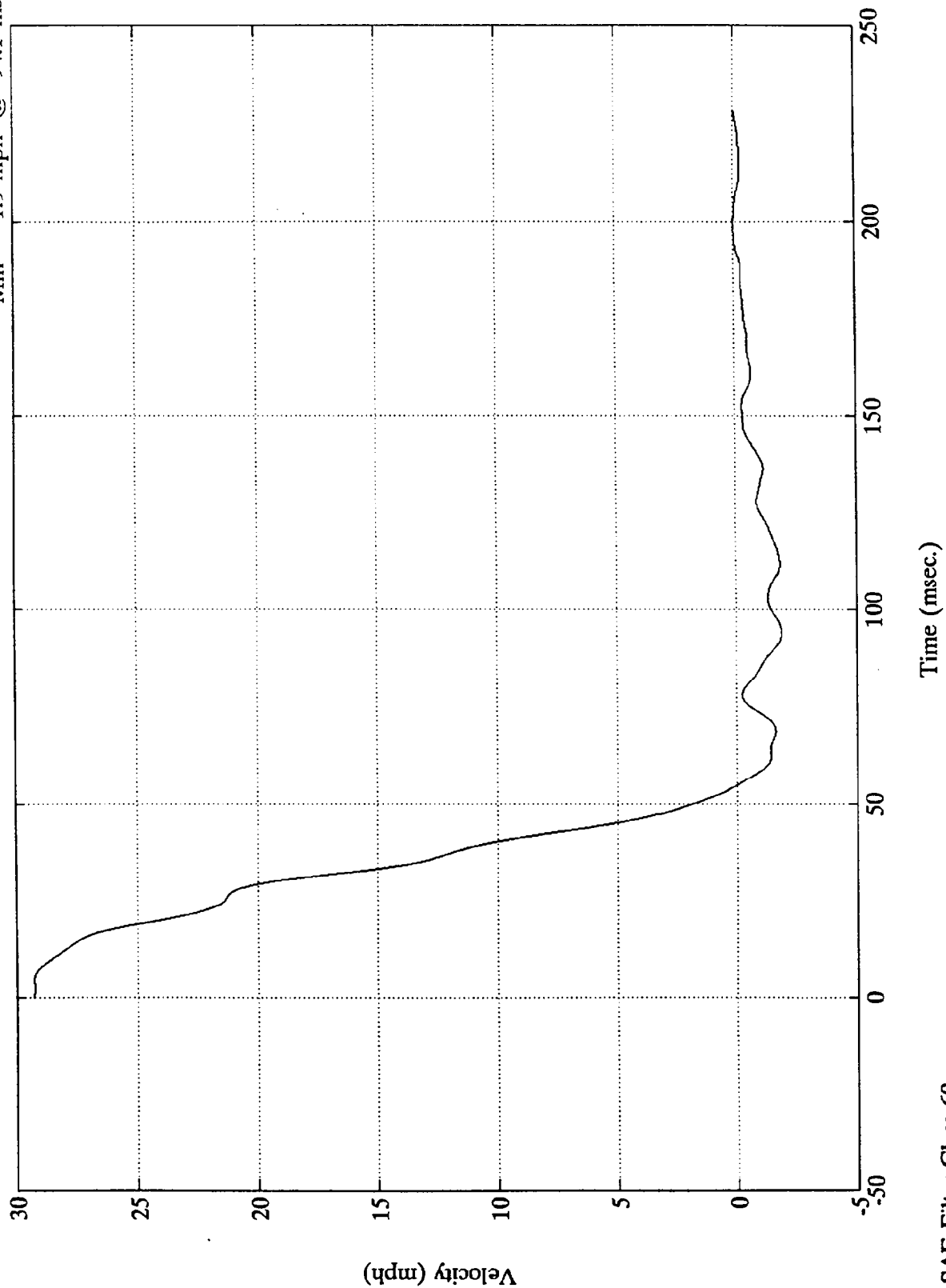
B-15

7853-11

Test 1058

L. Brake Caliper X (#6)

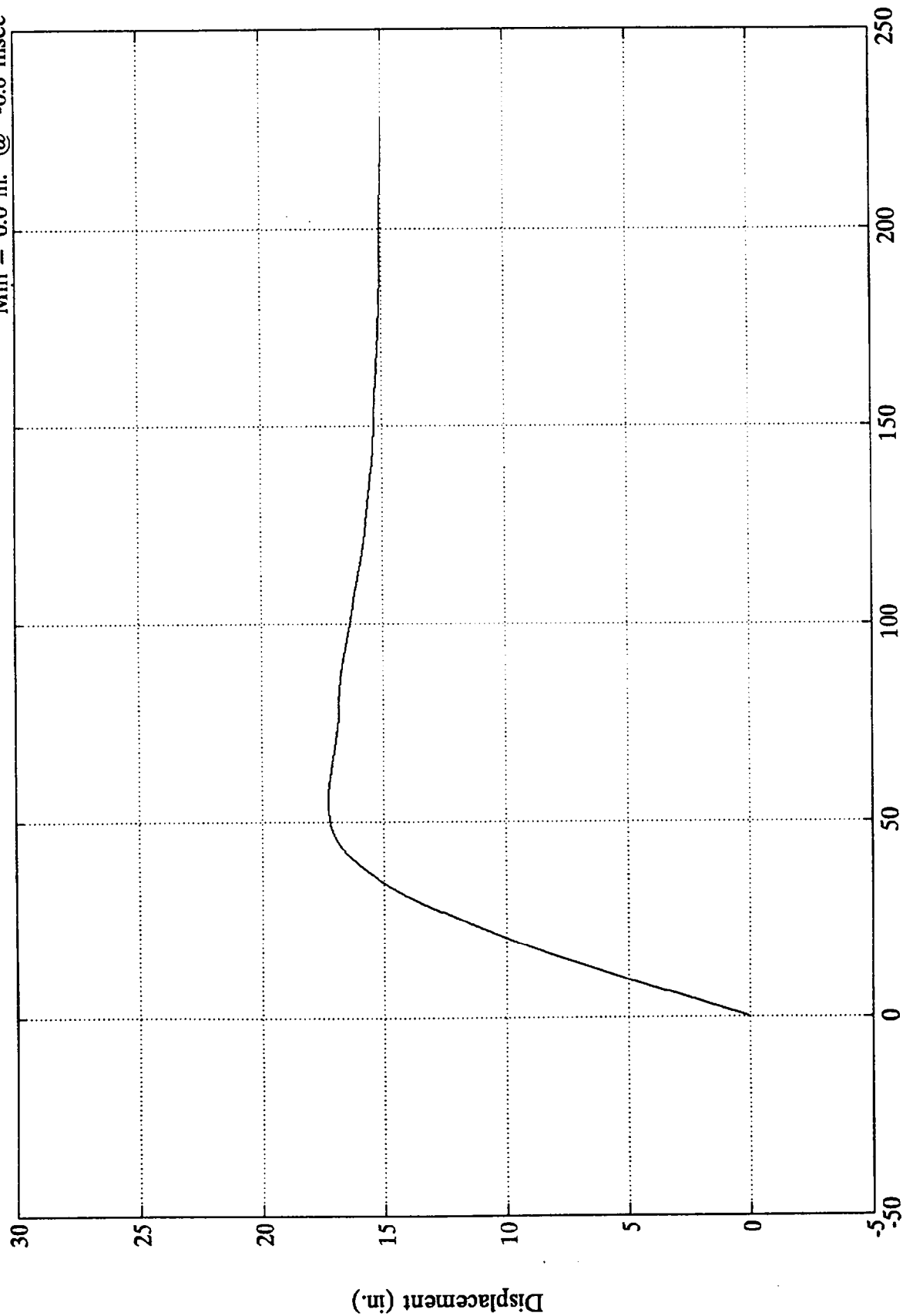
Max = 29.3 mph @ -0.0 msec
Min = -1.9 mph @ 94.1 msec



Test 1058

L. Brake Caliper X (#6)

Max = 17.3 in. @ 56.9 msec
Min = 0.0 in. @ -0.0 msec



Time (msec.)

Displacement (in.)

B-17

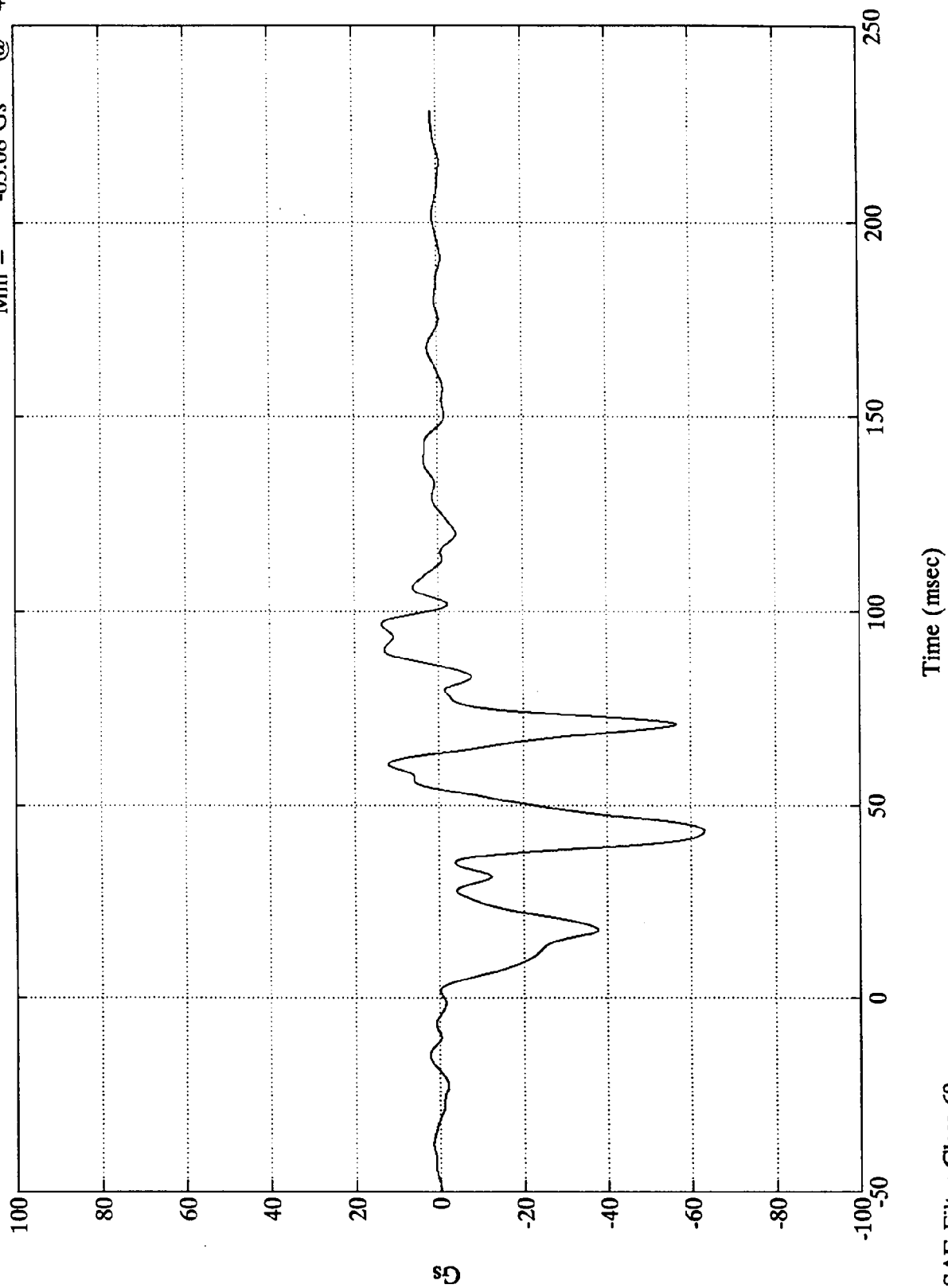
7853-11

SAE Filter Class 60

Test 1058

Instrument Panel X (#7)

Max = 13.54 Gs @ 96.72 msec
Min = -63.08 Gs @ 43.67 msec



B-18

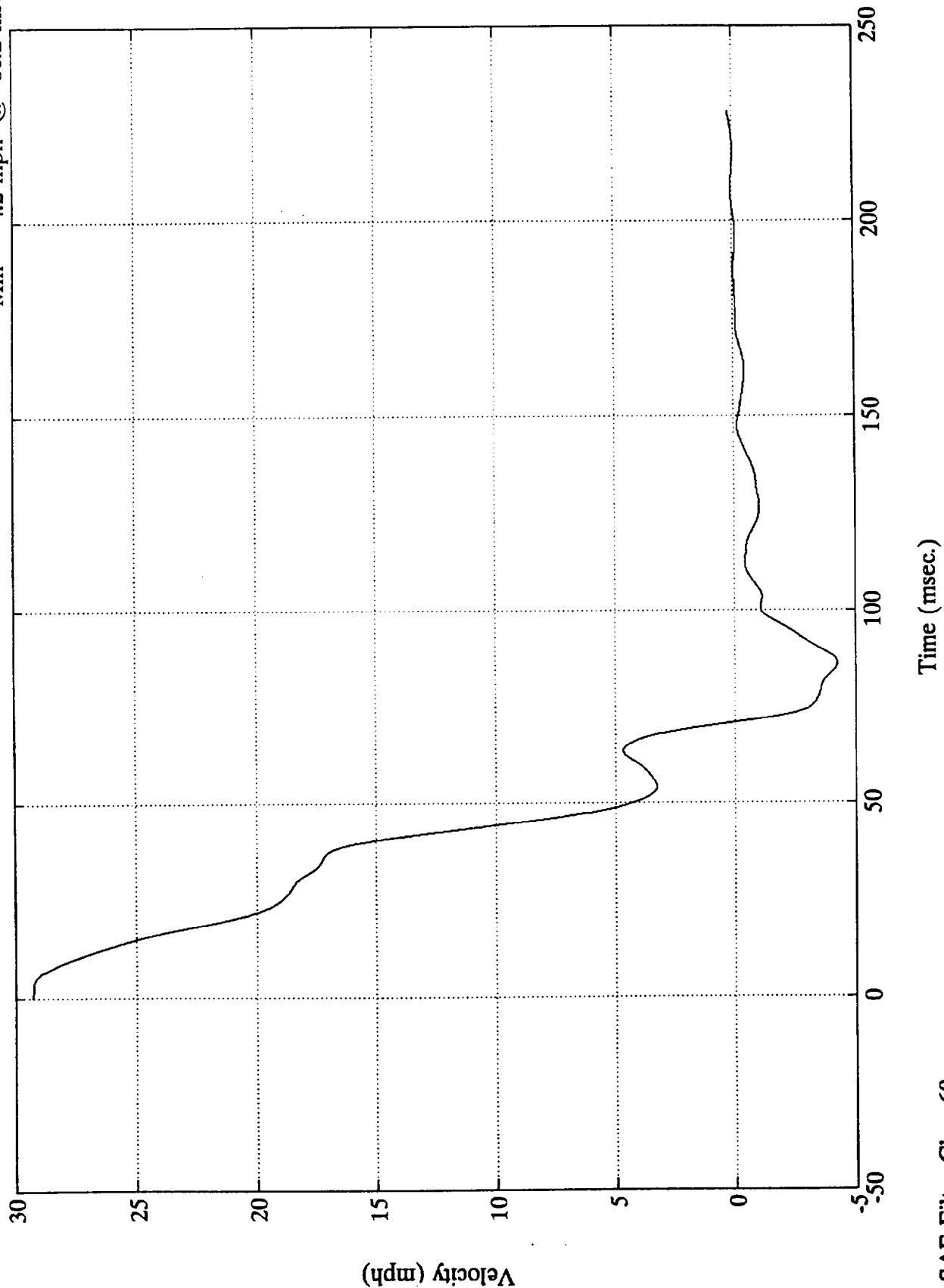
7853-11

SAE Filter Class 60

Test 1058

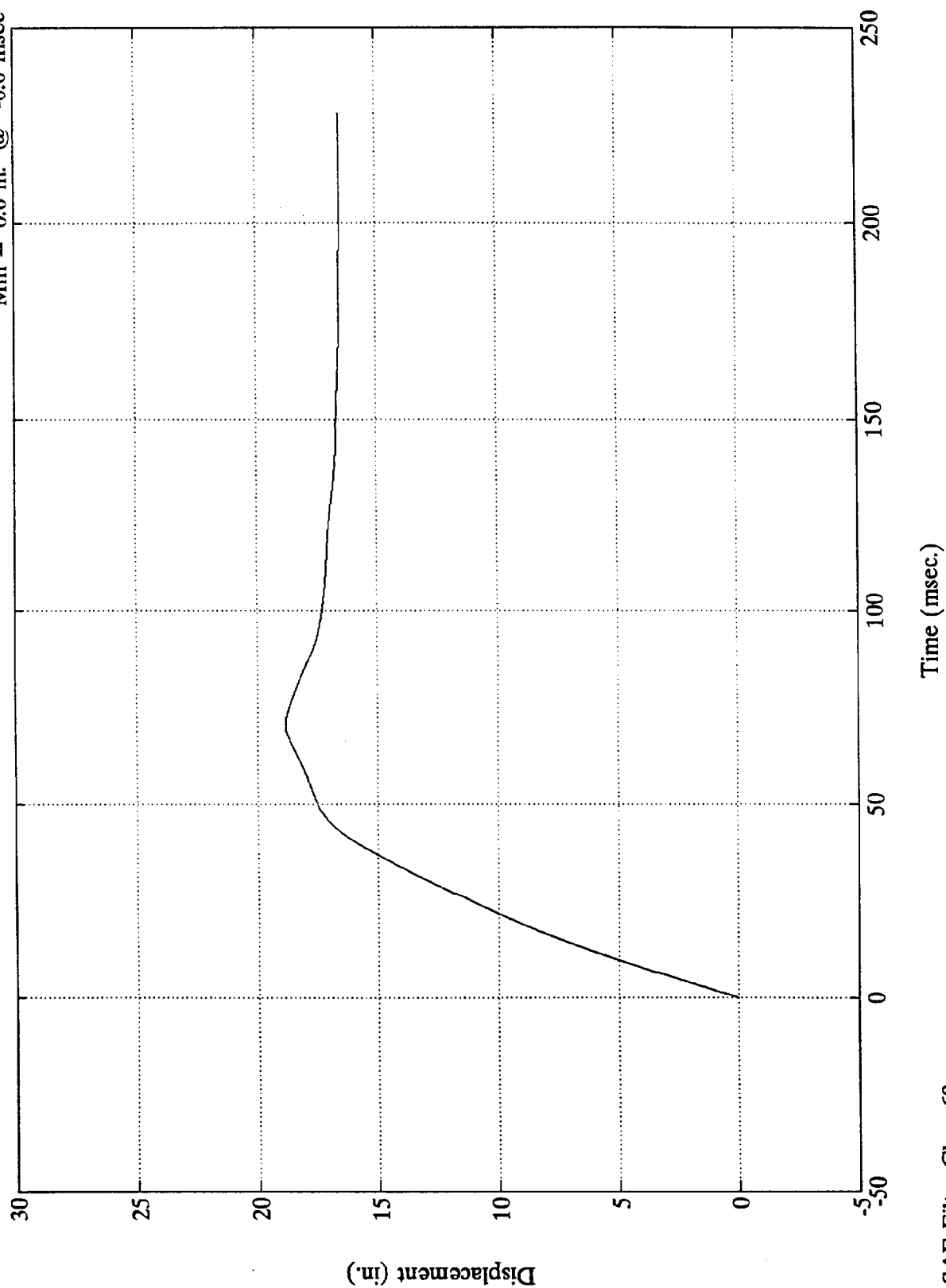
Max = 29.3 mph @ 0.2 msec
Min = -4.2 mph @ 86.2 msec

Instrument Panel X (#7)



Test 1058

Instrument Panel X (#7)
Max = 18.8 in. @ 71.8 msec
Min = 0.0 in. @ -0.0 msec



B-20

7853-11

SAE Filter Class 60

TEST NO. CM5801

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

Peak Resultant (3 ms CLIPPED DURATION) = 59.353 G's
Tstart = 61.0800 ms
Tend = 63.9600 ms
CSI = 553.019

CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 48.062 G's
Tstart = 59.6400 ms
Tend = 62.6400 ms
CSI = 469.618

HIC SUMMARY: Pos. 1 Head Resultant

hic: 538.43
t1 = 51.960 msec
t2 = 87.840 msec
Average G's Over Hic Duration = 46.83

HIC SUMMARY: Pos. 2 Head Resultant

hic: 485.85
t1 = 56.280 msec
t2 = 92.160 msec
Average G's Over Hic Duration = 44.94

Test 1058

Pos. 1 Head X

Max = 14.48 Gs @ 176.52 msec
Min = -31.61 Gs @ 86.40 msec



Time (msec)

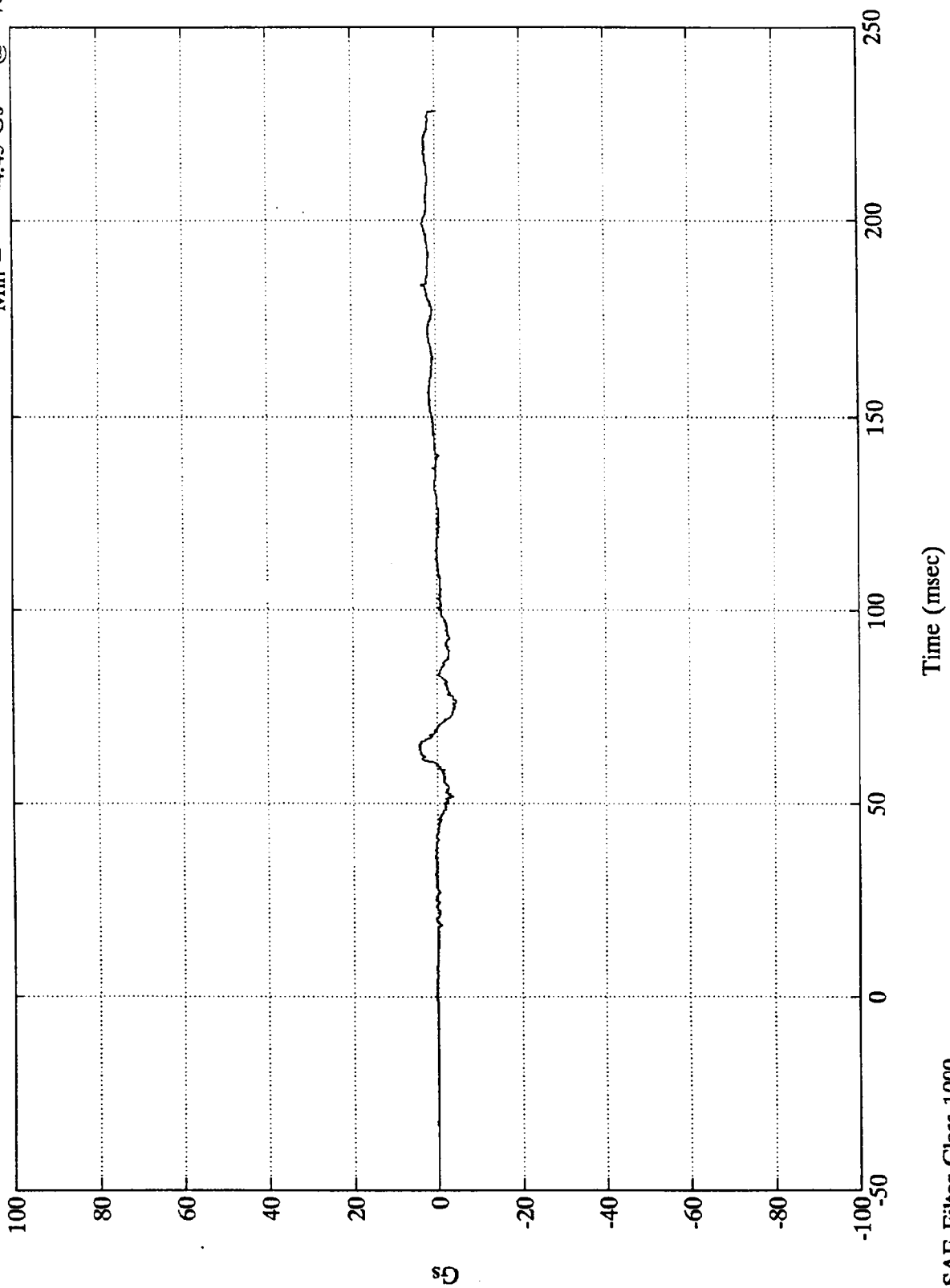
SAE Filter Class 1000

B-23

7853-11

Test 1058

Pos. 1 Head Y
Max = 4.31 Gs @ 65.51 msec
Min = -4.45 Gs @ 76.68 msec



B-24
Gs

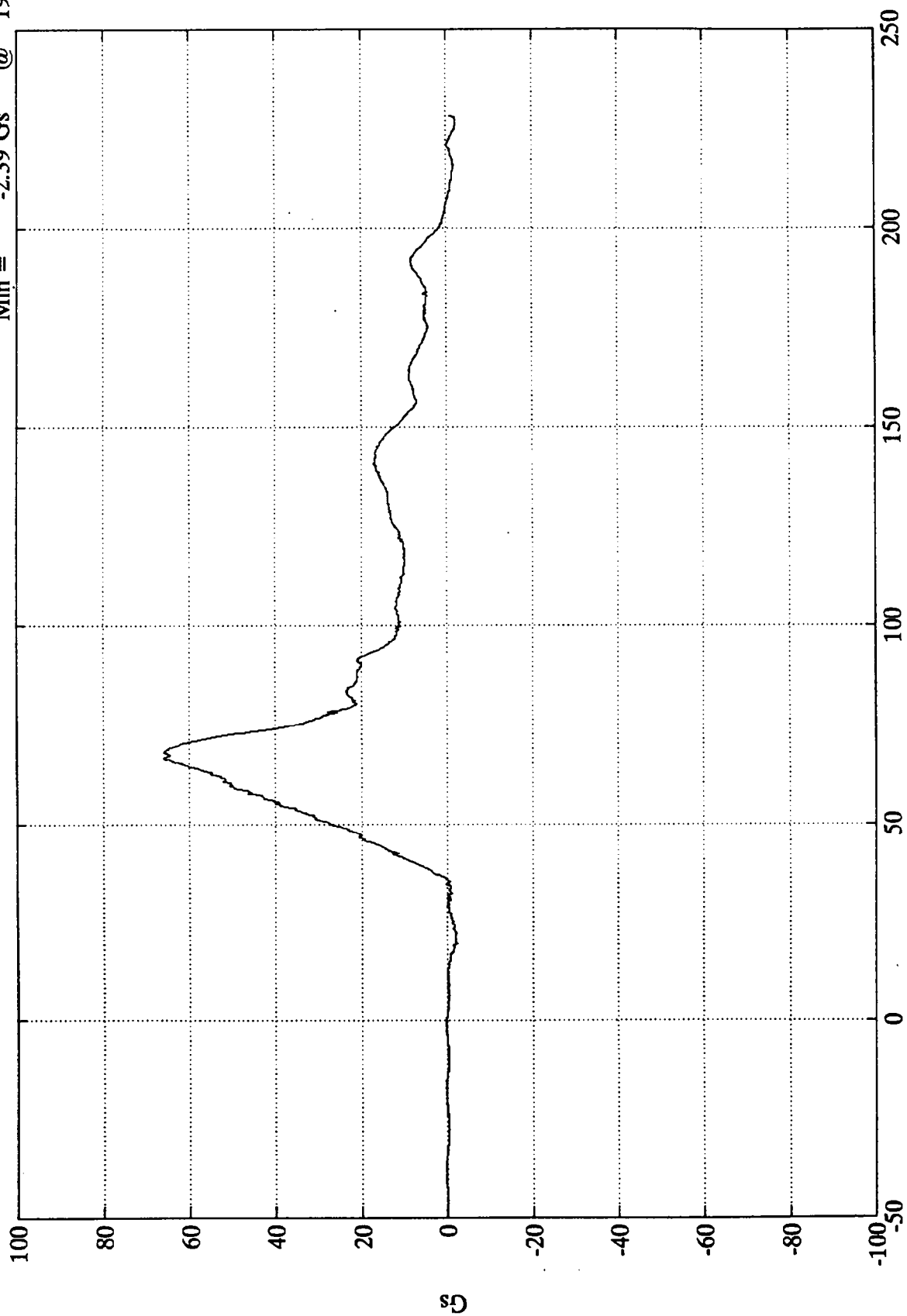
7853-11

SAE Filter Class 1000

Test 1058

Pos. 1 Head Z

Max = 66.03 Gs @ 68.15 msec
Min = -2.39 Gs @ 19.55 msec



Time (msec)

SAE Filter Class 1000

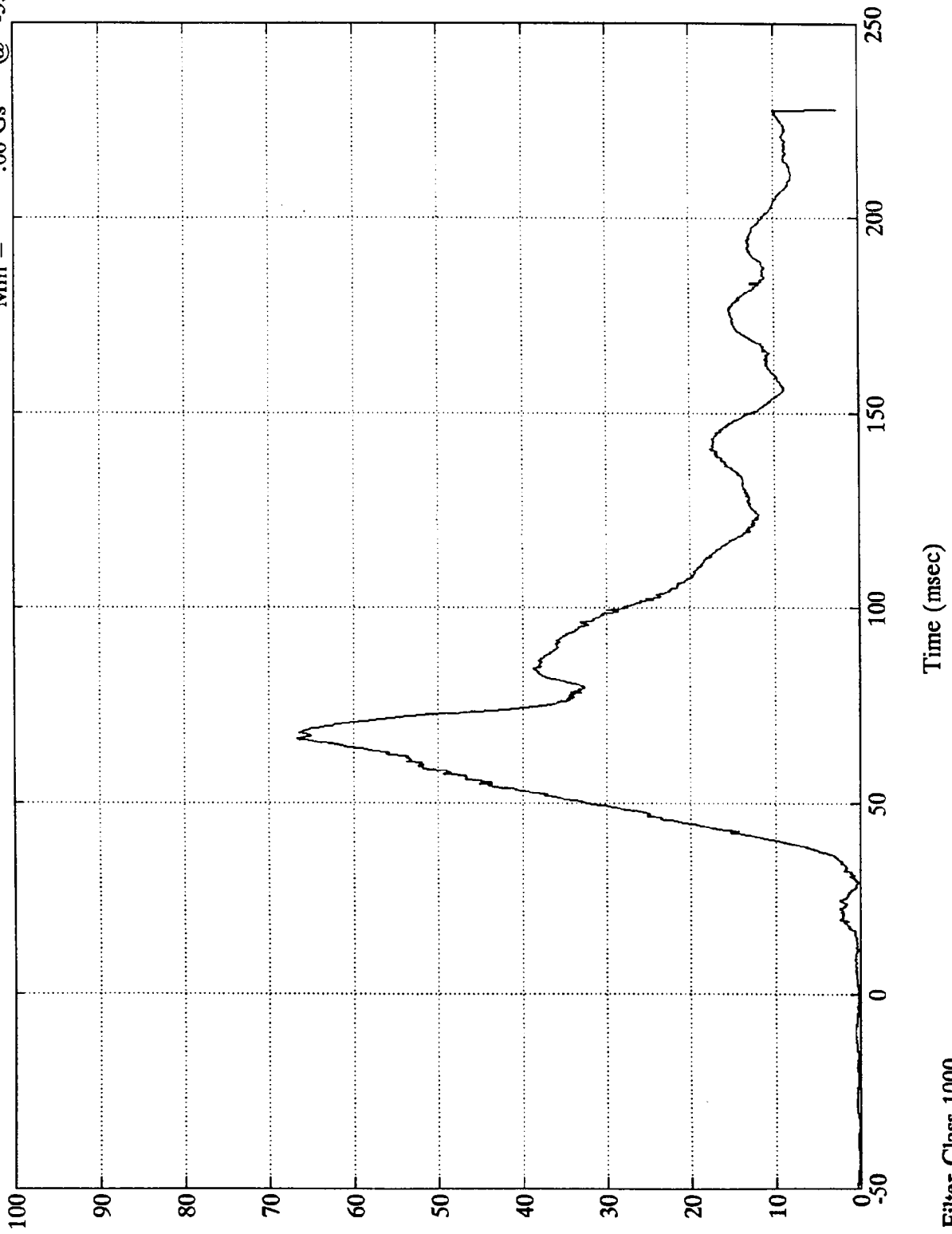
B-25

7853-11

Test 1058

Pos. 1 Head Resultant

Max = 66.62 Gs @ 66.47 msec
Min = .06 Gs @ -33.48 msec



B-26

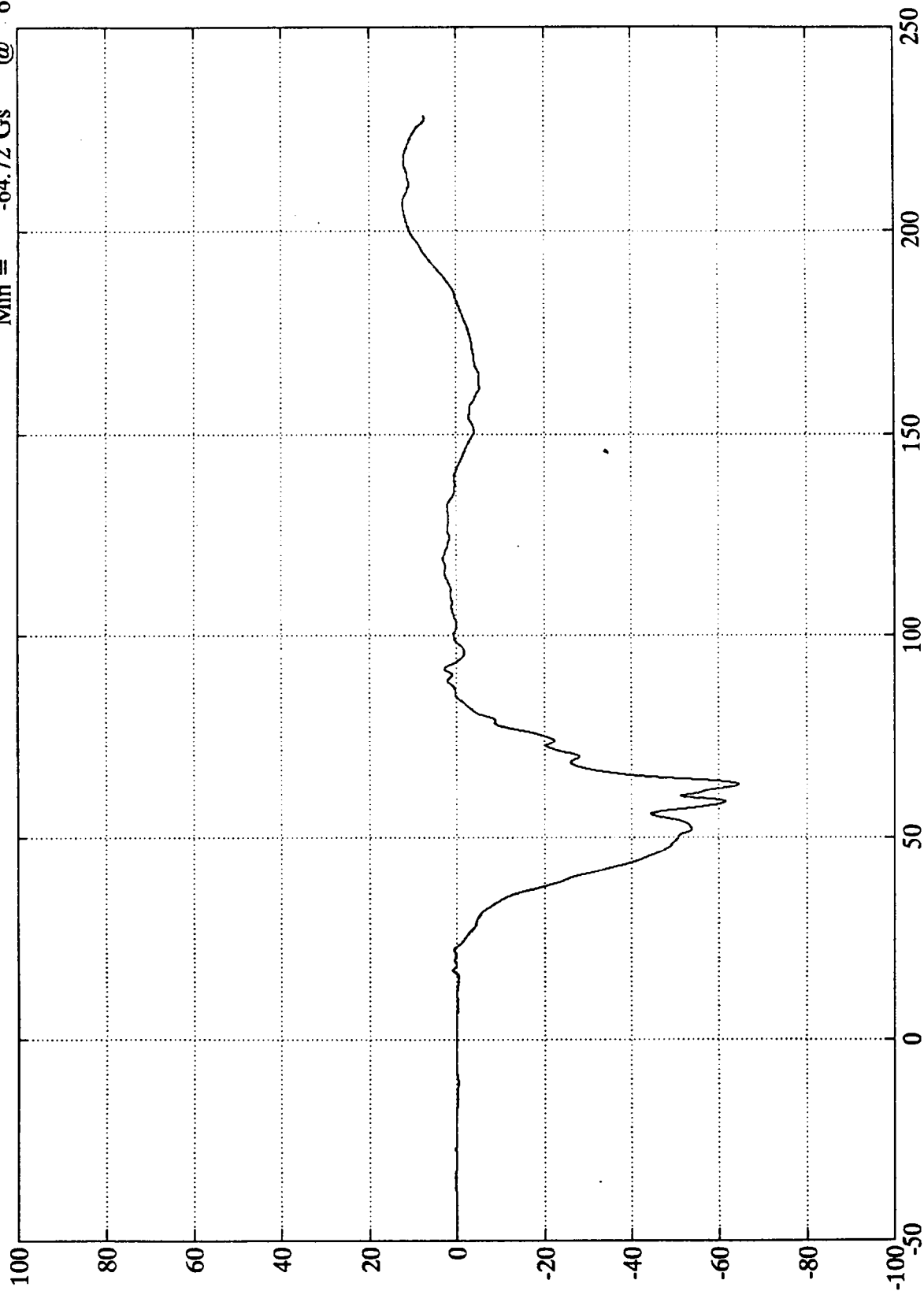
7853-11

SAE Filter Class 1000

Test 1058

Pos. 1 Chest X

Max = 12.21 Gs @ 206.52 msec
Min = -64.72 Gs @ 63.00 msec

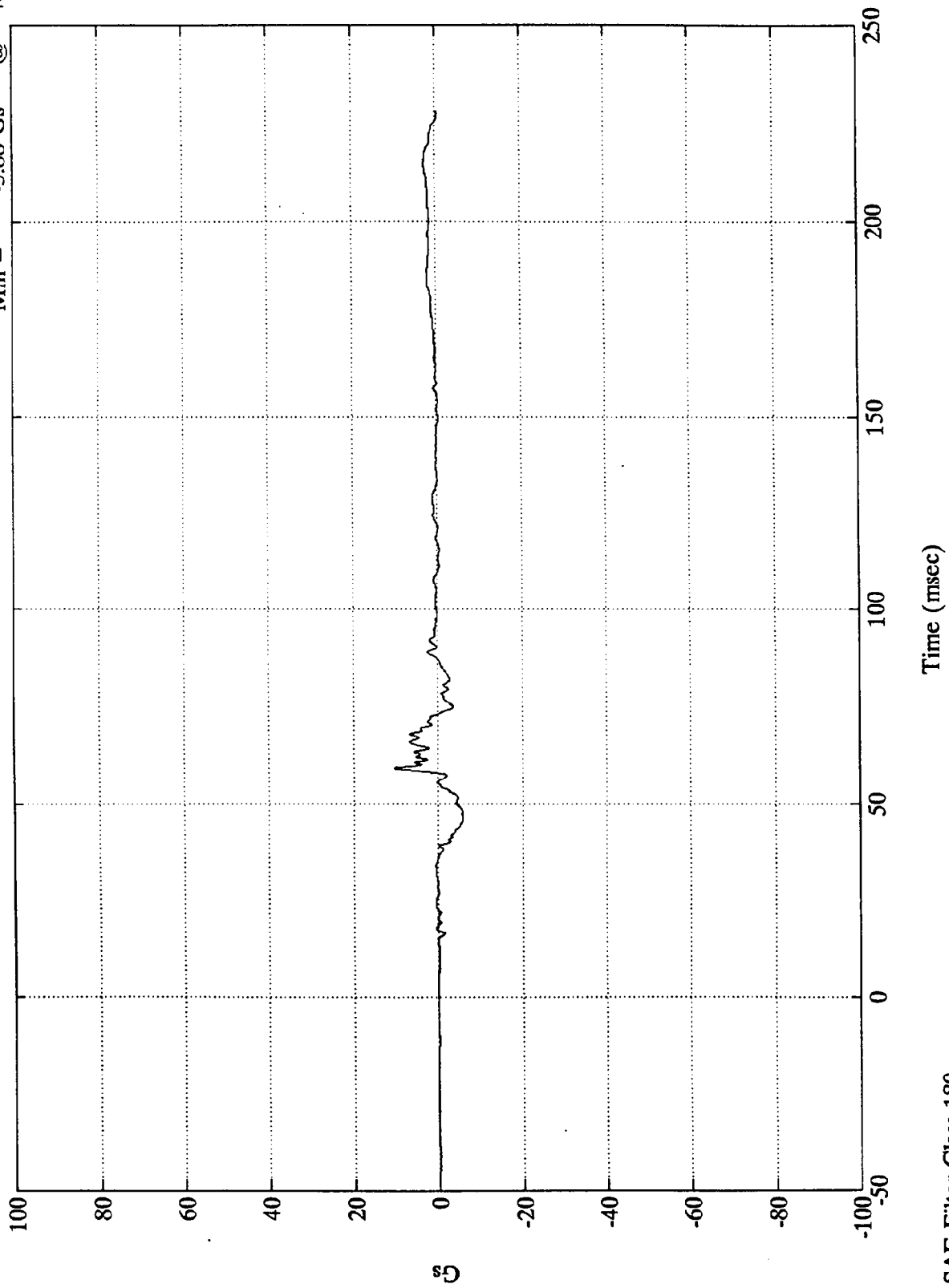


Time (msec)

SAE Filter Class 180

Test 1058

Pos. 1 Chest Y Max = 10.33 Gs @ 59.27 msec
Min = -5.88 Gs @ 46.68 msec



B-28

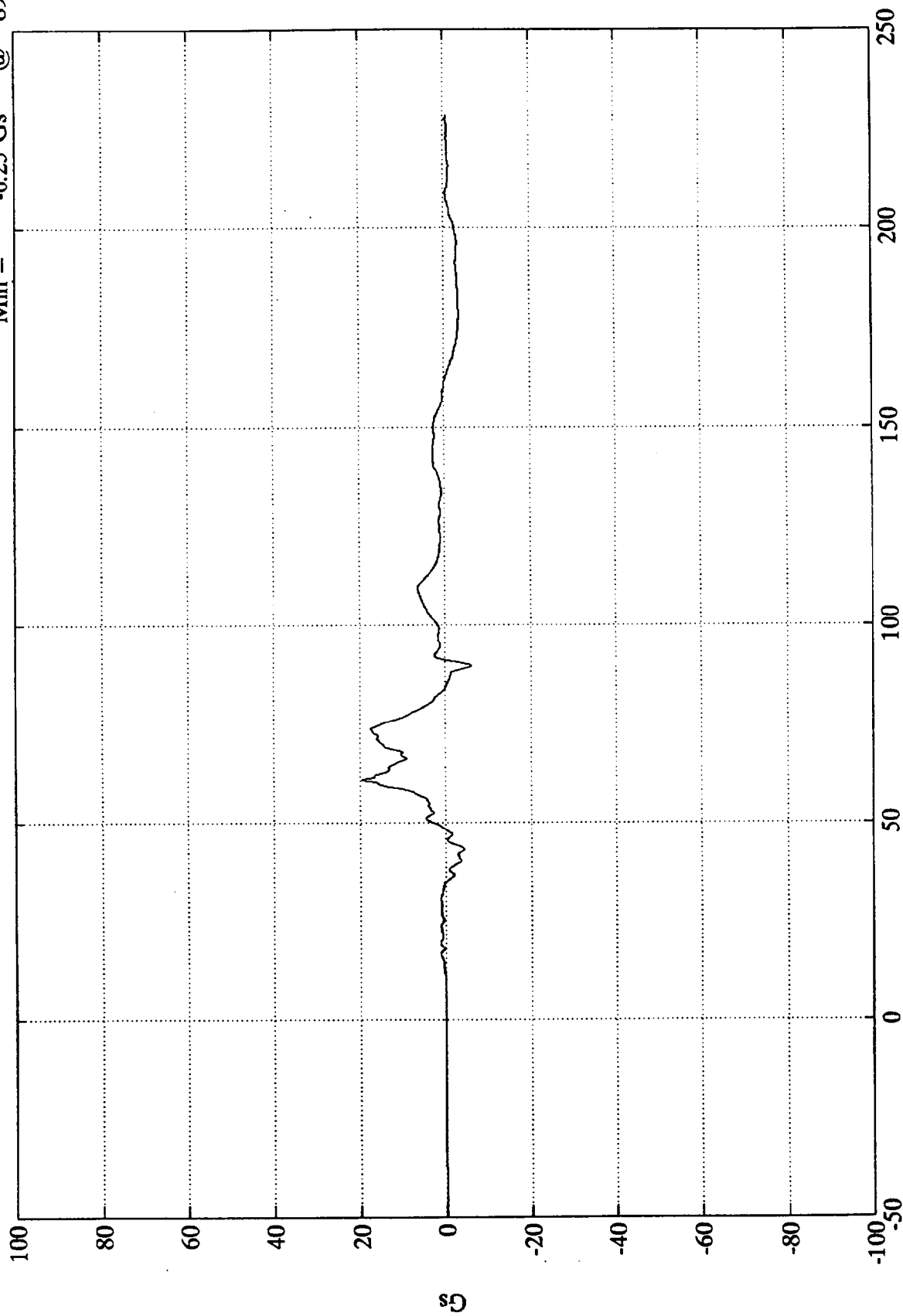
7853-11

SAE Filter Class 180

Test 1058

Pos. 1 Chest Z

Max = 19.51 Gs @ 60.95 msec
Min = -6.25 Gs @ 89.99 msec



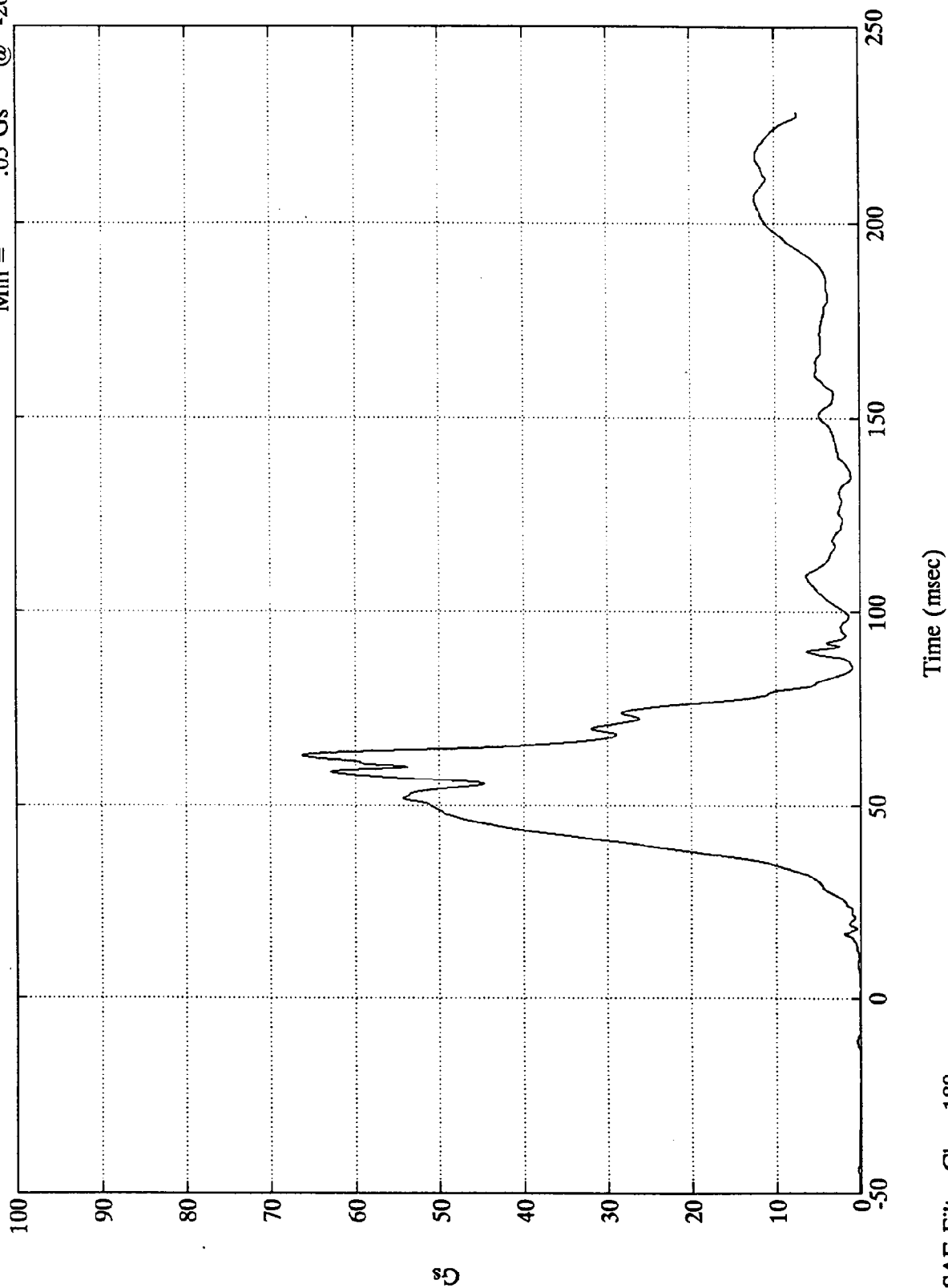
B-29

7853-11

SAE Filter Class 180

Test 1058

Pos. 1 Chest Resultant
Max = 66.28 Gs @ 63.00 msec
Min = .05 Gs @ -20.64 msec



B-30

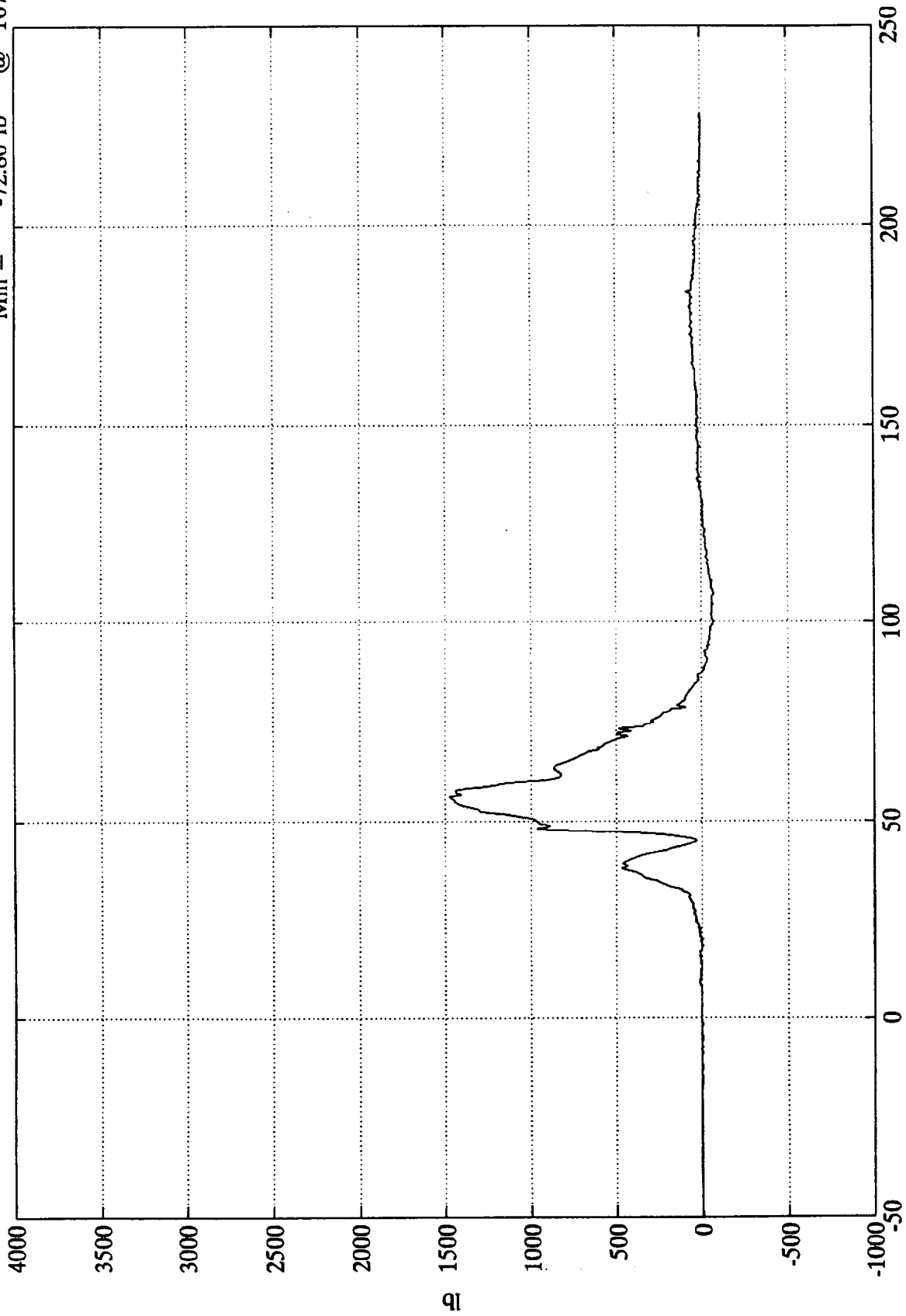
7853-11

SAE Filter Class 180

Test 1058

Pos. 1 Left Femur

Max = 1474.50 lb @ 56.15 msec
Min = -72.80 lb @ 107.27 msec



B-31

7853-11

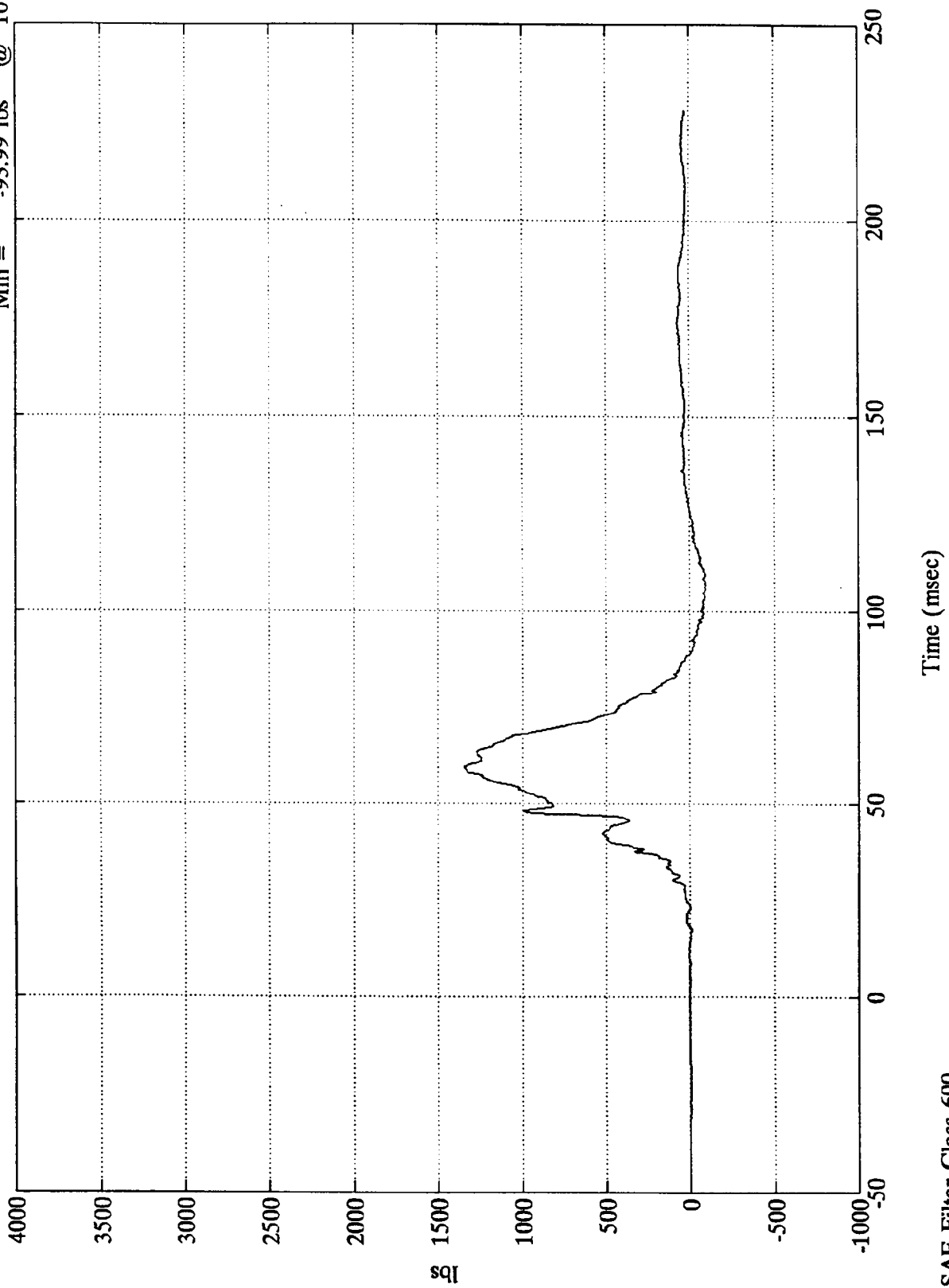
SAE Filter Class 600

Time (msec)

Test 1058

Pos. 1 Right Femur

Max = 1343.47 lbs @ 59.40 msec
Min = -93.99 lbs @ 107.04 msec



B-32

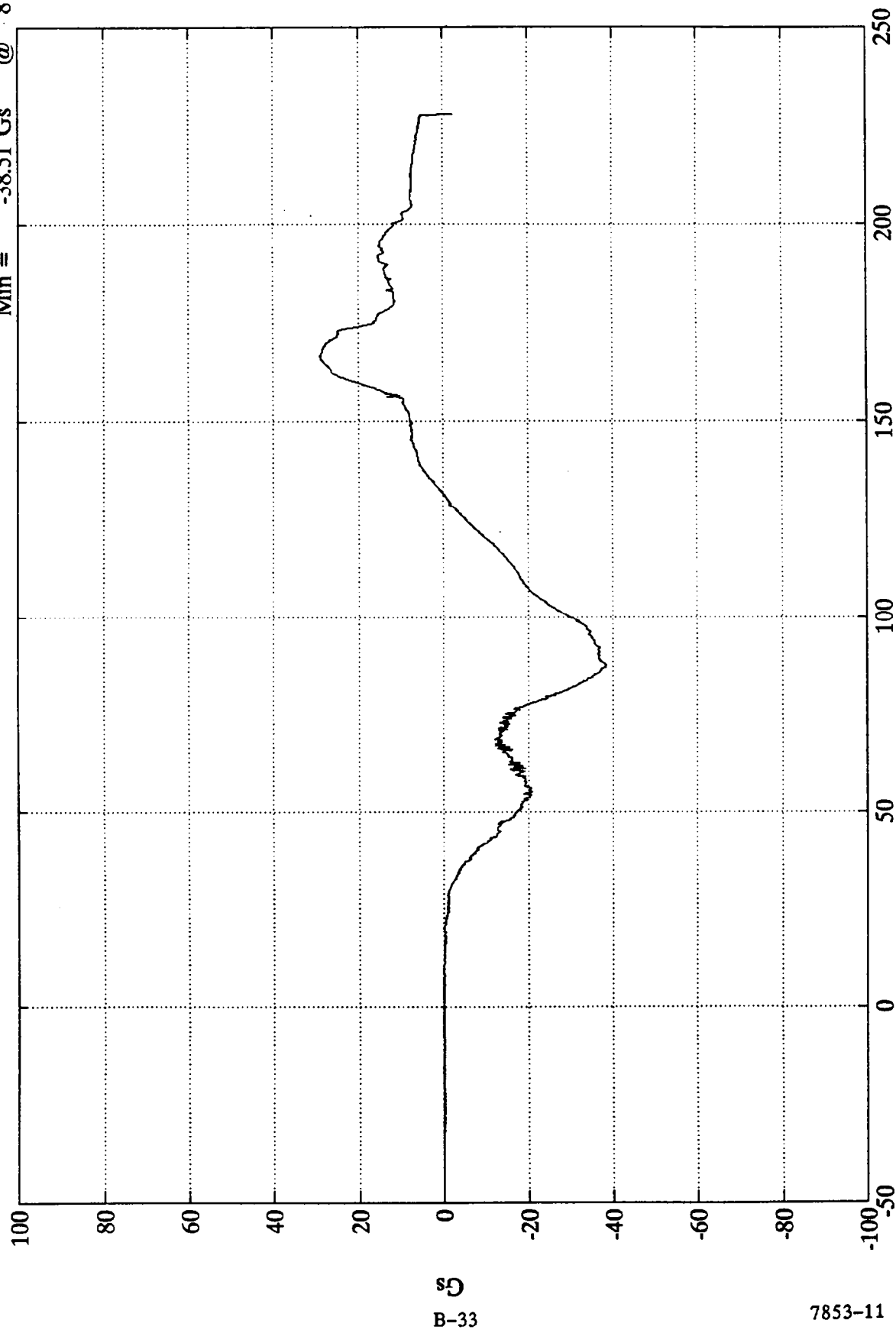
7853-11

SAE Filter Class 600

Test 1058

Pos. 2 Head X

Max = 29.08 Gs @ 166.56 msec
Min = -38.51 Gs @ 87.11 msec



Time (msec)

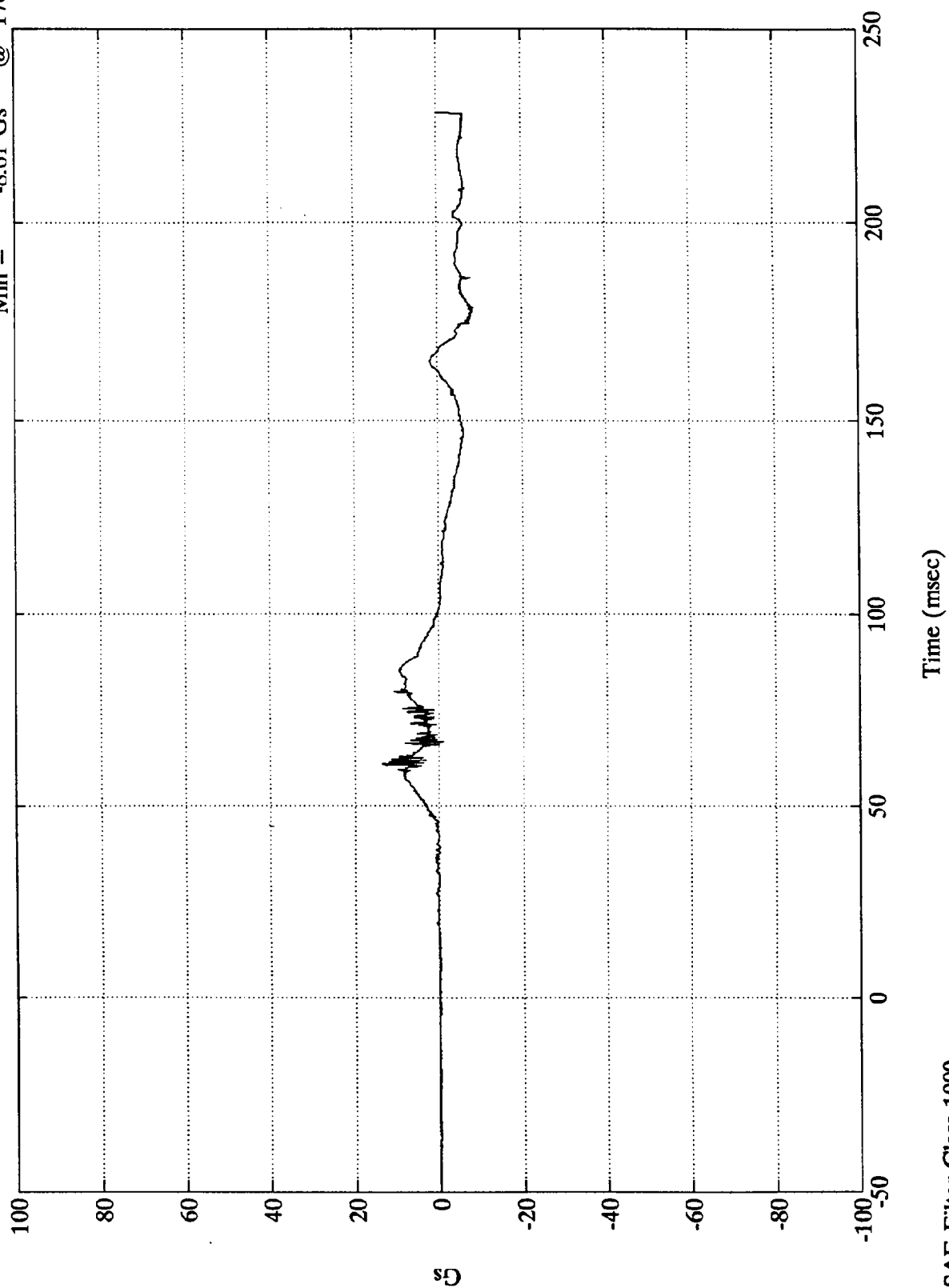
SAE Filter Class 1000

B-33

7853-11

Test 1058

Pos. 2 Head Y
Max = 13.56 Gs @ 60.95 msec
Min = -8.61 Gs @ 178.20 msec



B-34

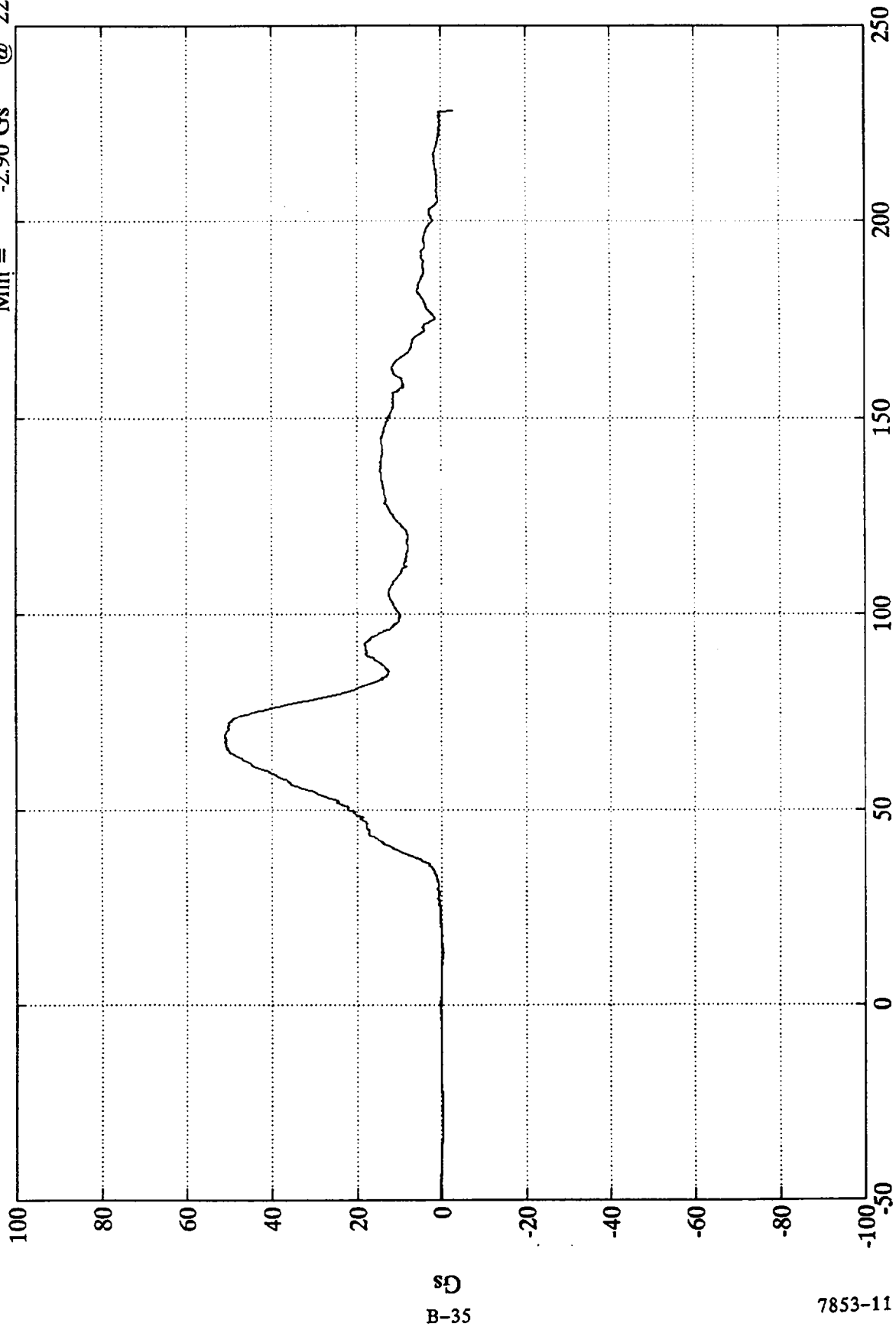
7853-11

SAE Filter Class 1000

Test 1058

Pos. 2 Head Z

Max = 51.06 Gs @ 69.48 msec
Min = -2.90 Gs @ 228.00 msec



Time (msec)

SAE Filter Class 1000

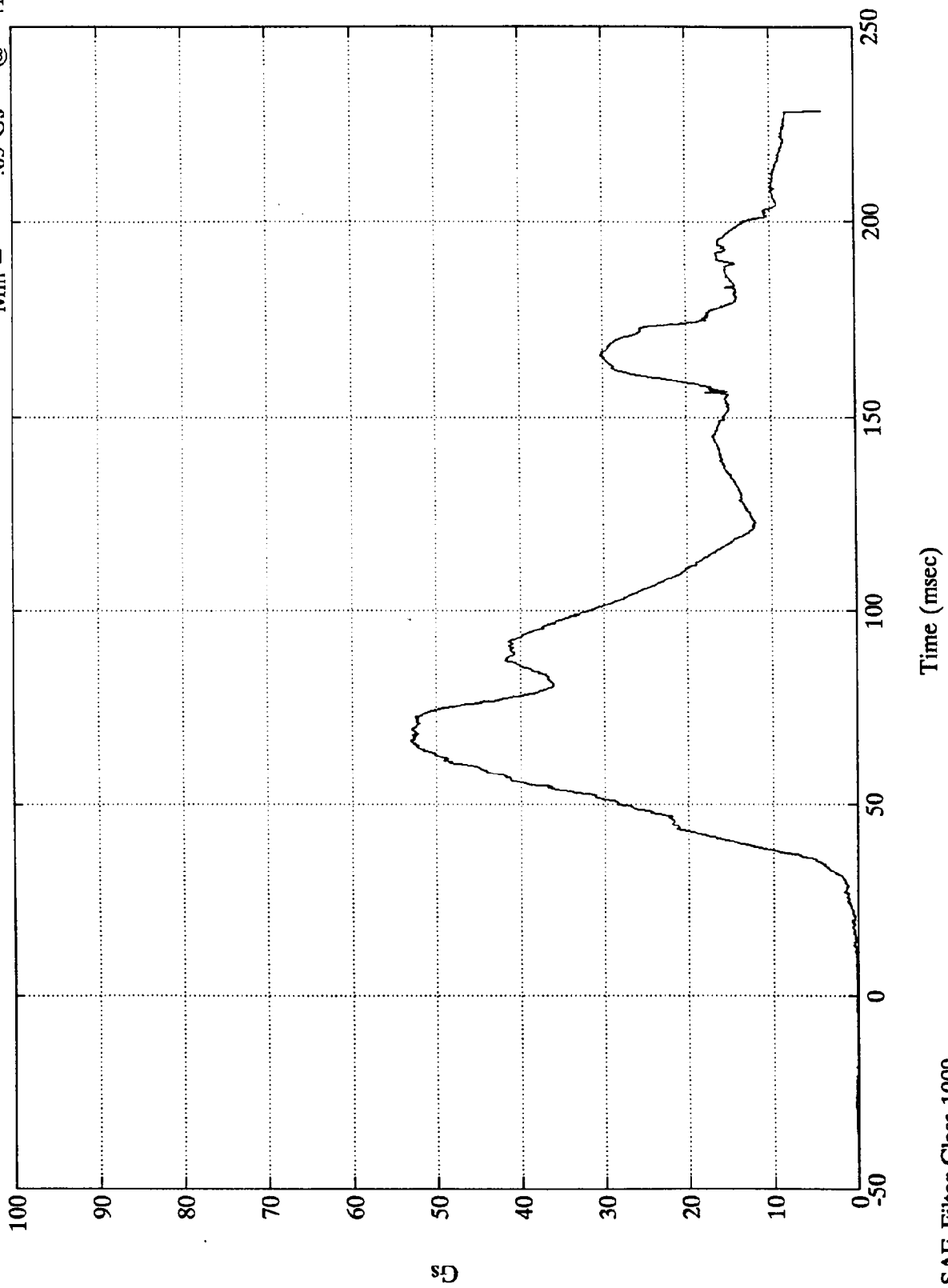
B-35

7853-11

Test 1058

Max = 53.00 Gs @ 66.23 msec
Min = .05 Gs @ -41.40 msec

Pos. 2 Head Resultant



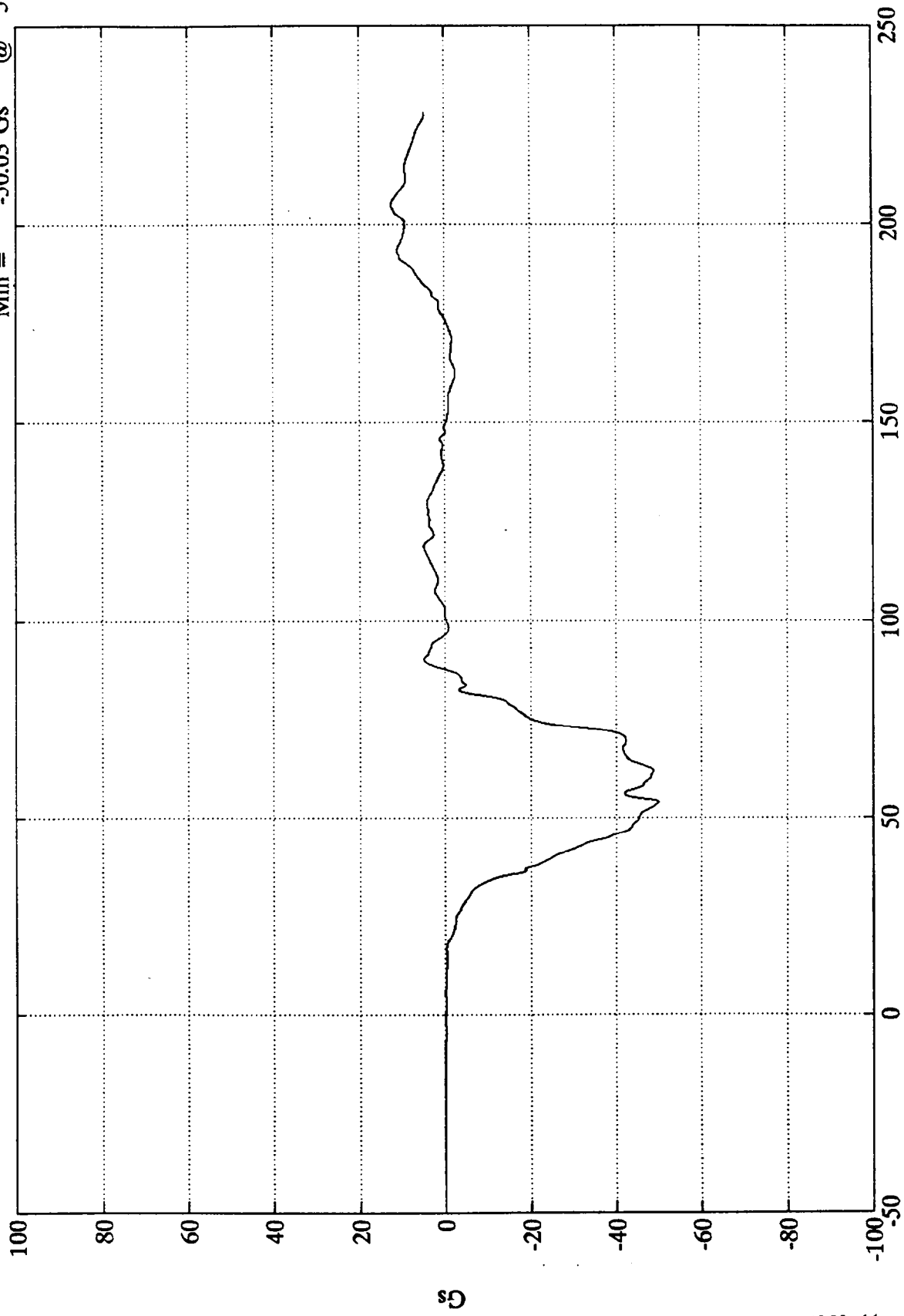
B-36

7853-11

SAE Filter Class 1000

Test 1058

Pos. 2 Chest X
Max = 12.41 Gs @ 204.96 msec
Min = -50.03 Gs @ 53.99 msec



B-37

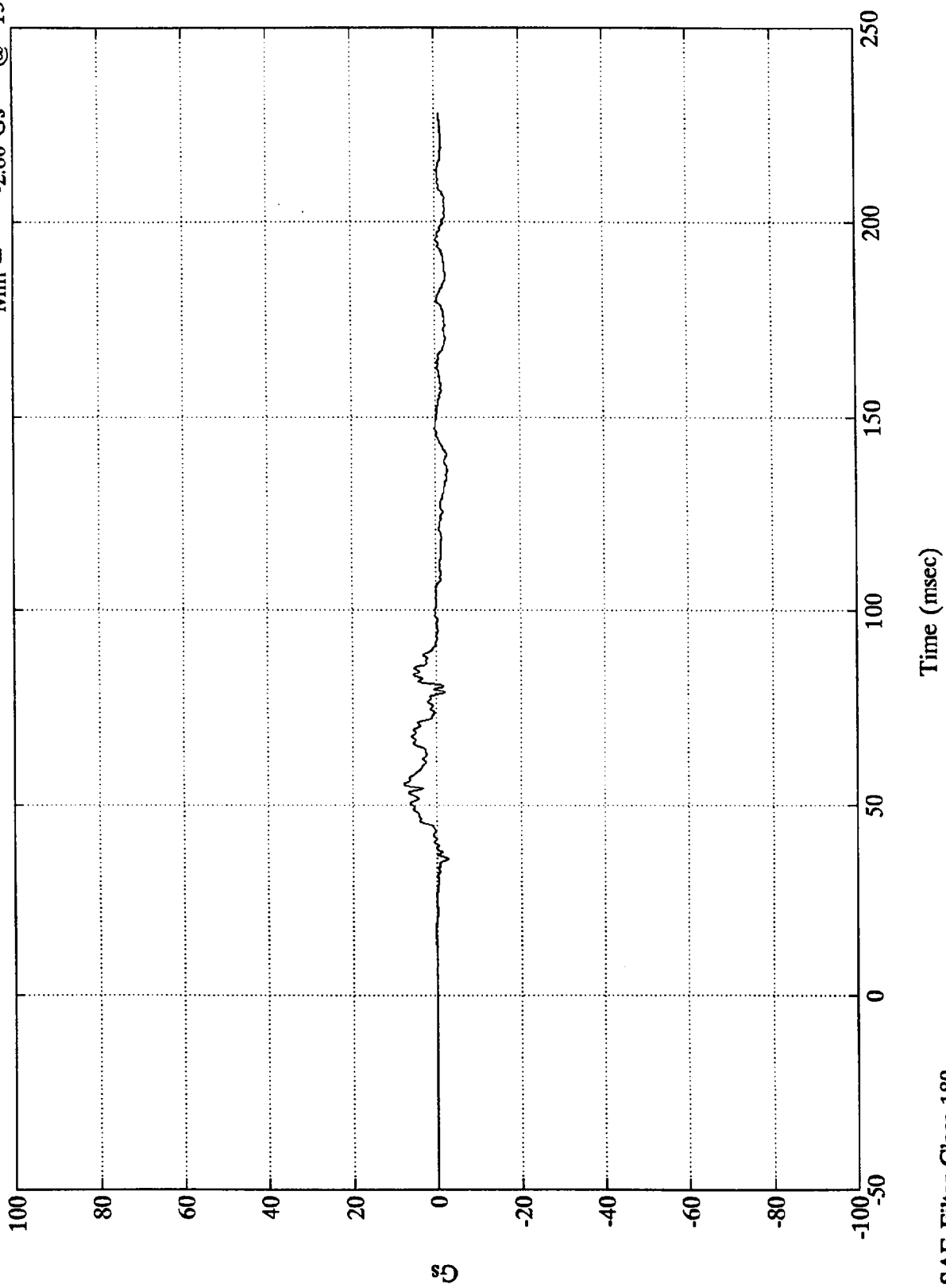
7853-11

Time (msec)

SAE Filter Class 180

Test 1058

Pos. 2 Chest Y
Max = 7.88 Gs @ 55.79 msec
Min = -2.80 Gs @ 136.31 msec



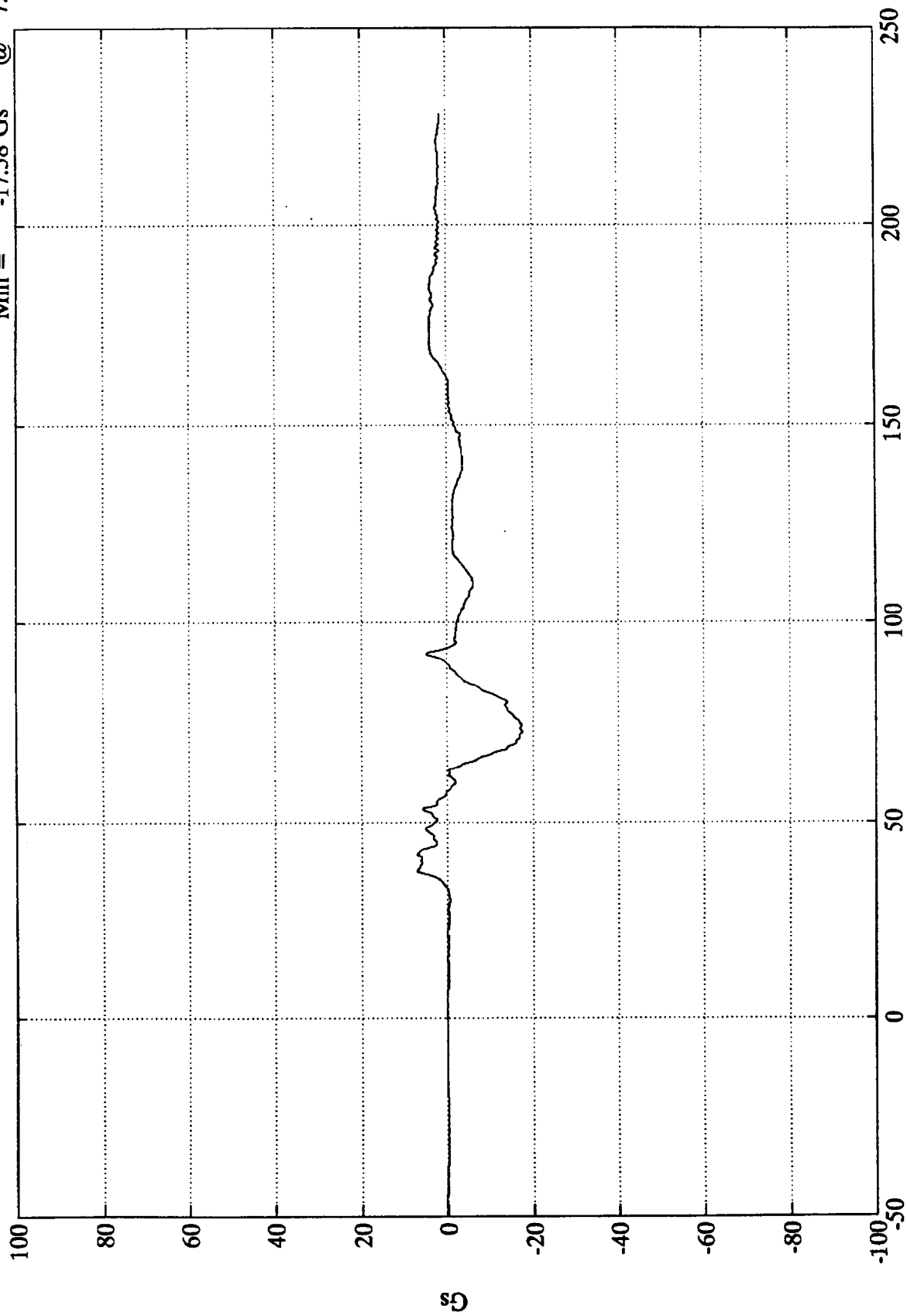
B-38

7853-11

SAE Filter Class 180

Test 1058

Pos. 2 Chest Z
Max = 6.97 Gs @ 37.55 msec
Min = -17.58 Gs @ 72.59 msec



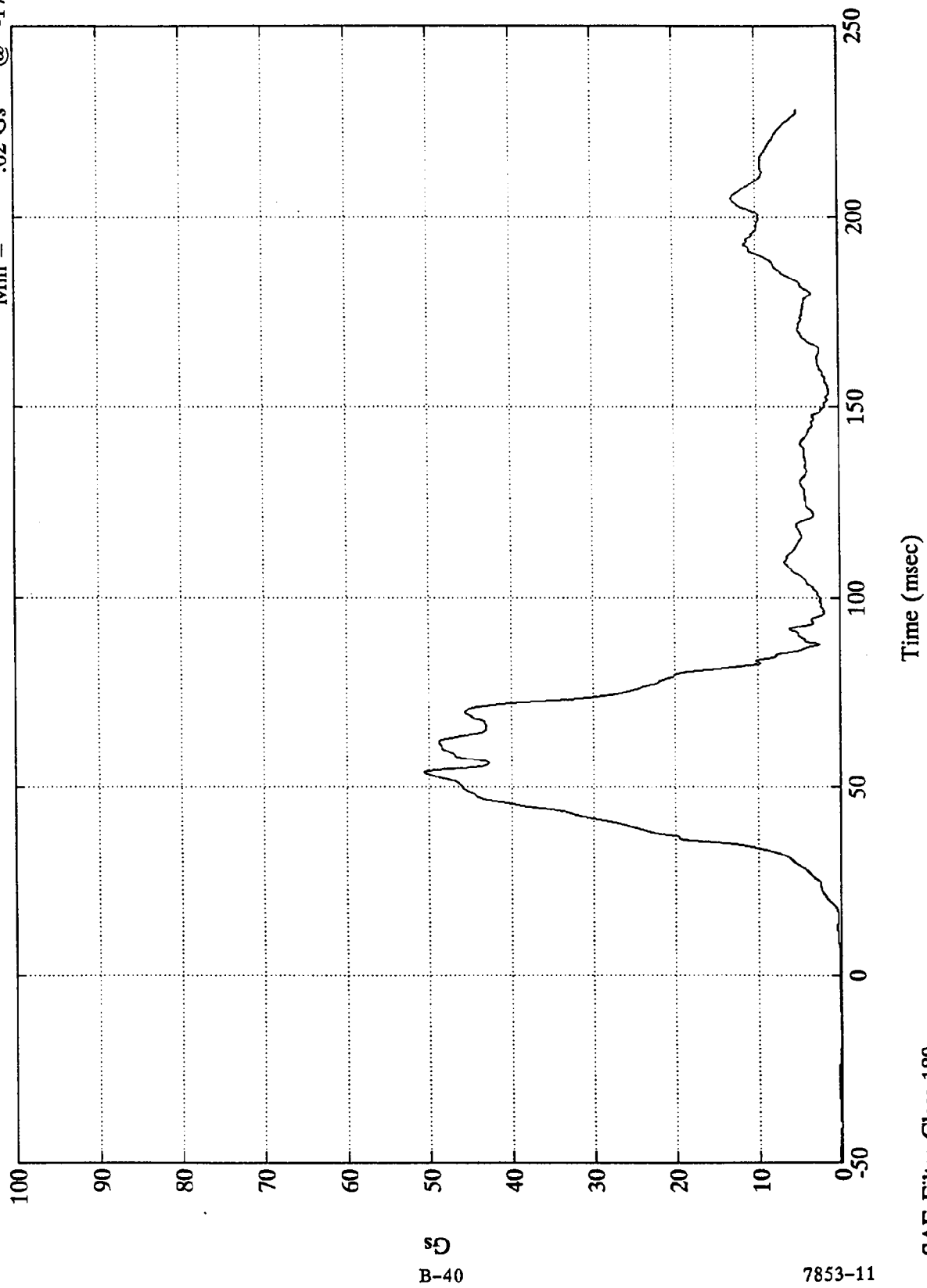
Time (msec)

SAE Filter Class 180

Test 1058

Pos. 2 Chest Resultant

Max = 50.54 Gs @ 53.75 msec
Min = .02 Gs @ -17.04 msec



B-40

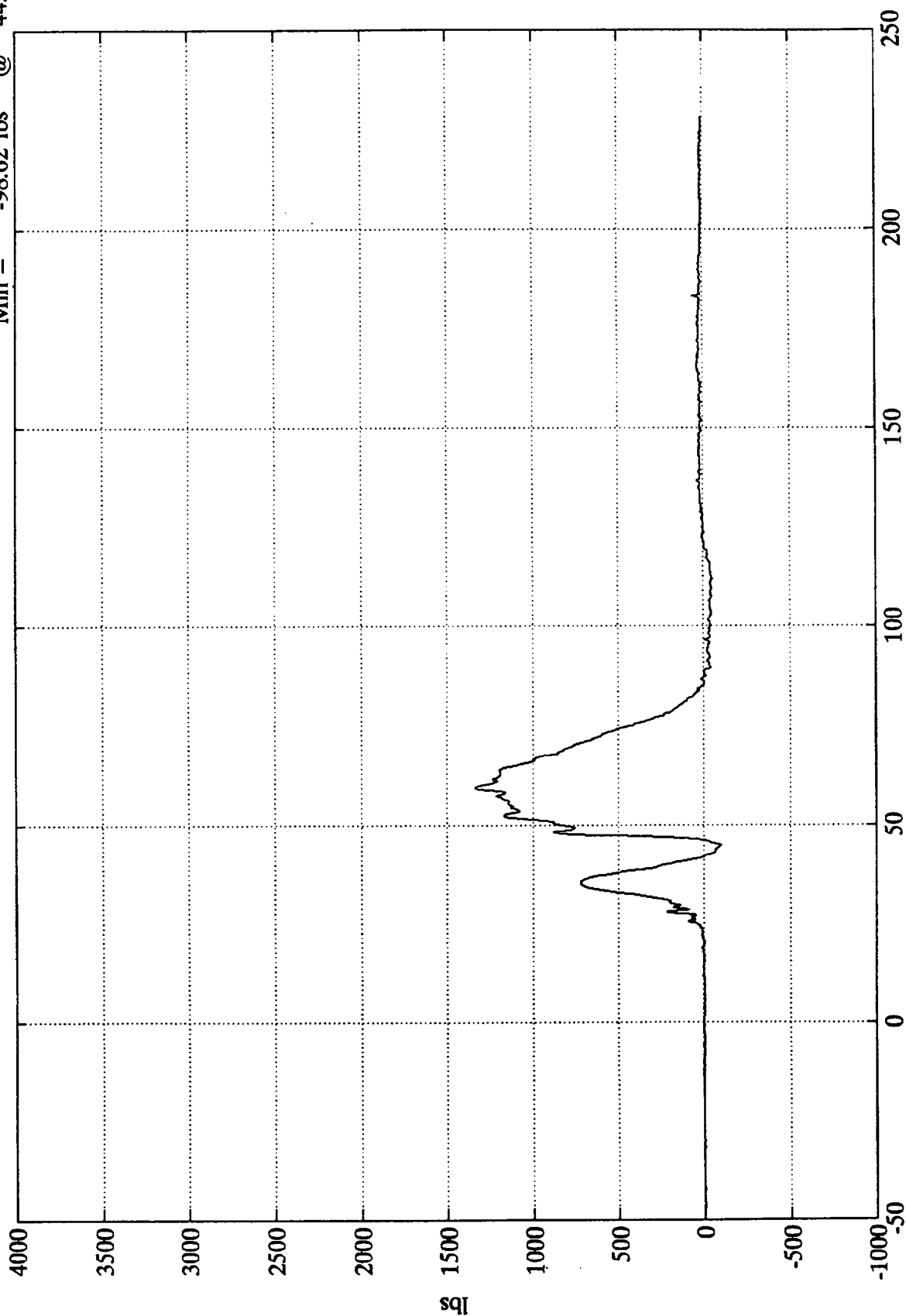
7853-11

SAE Filter Class 180

Test 1058

Max = 1338.74 lbs @ 59.40 msec
Min = -98.62 lbs @ 44.87 msec

Pos. 2 Left Femur



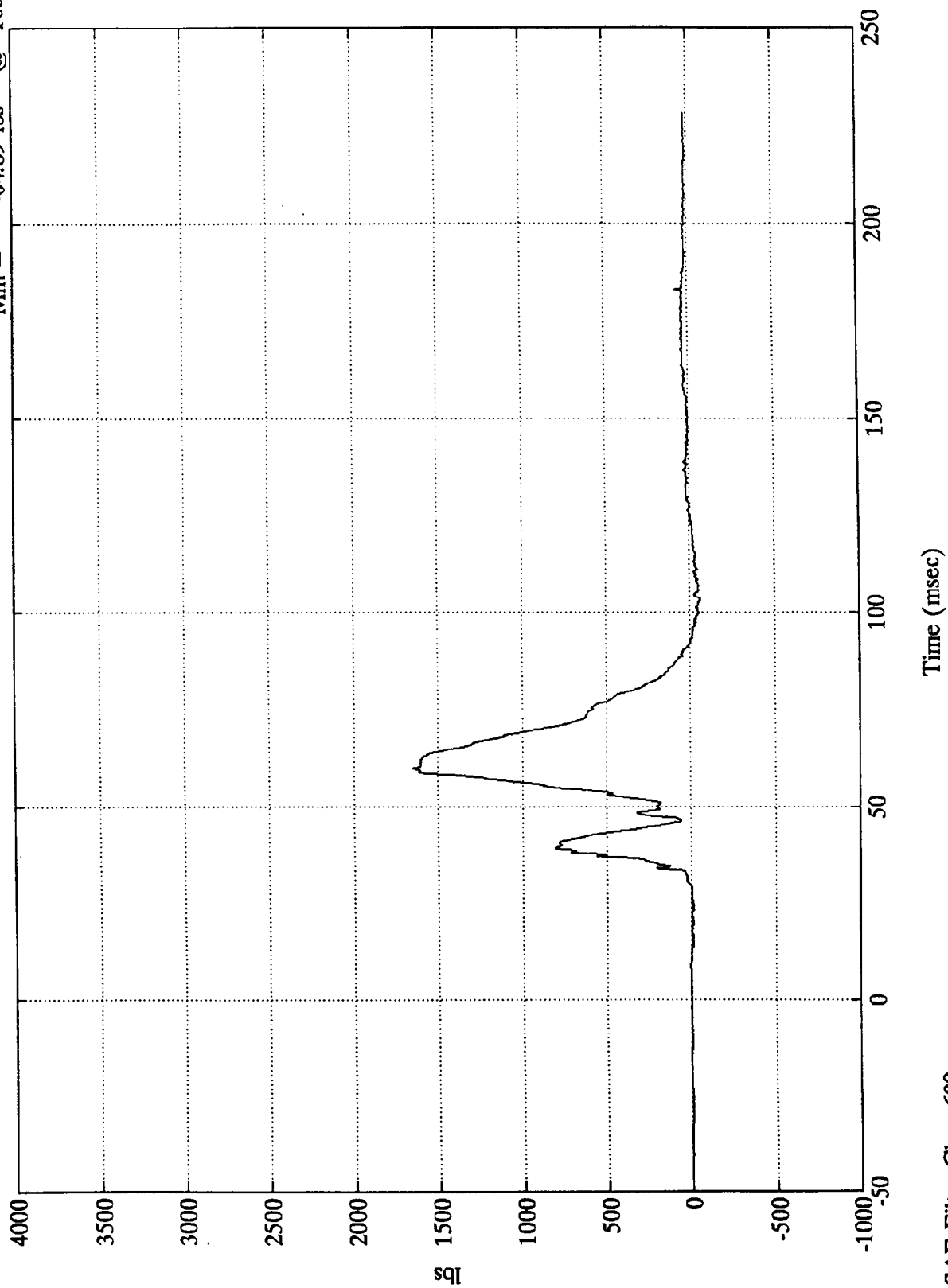
Time (msec)

SAE Filter Class 600

Test 1058

Pos. 2 Right Femur

Max = 1652.69 lbs @ 60.11 msec
Min = -64.89 lbs @ 103.44 msec



SAE Filter Class 600

Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

CONTROLS AND EQUIPMENT

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. Also, pregnant women, injured or physically impaired persons should use safety belts.

In order to provide the maximum level of protection safety belts must be properly positioned on the body. Improperly positioned safety belts can cause serious personal injury in case of an accident. Therefore read and always observe all of the following instructions and warnings pertaining to the use of the safety belts installed in your vehicle.

- The shoulder belt should be positioned midway over the shoulder – never across the neck. See illustration on page 17.

- 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.

- 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.

- Do not 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.

- 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.

- The lap belt must be worn low and tight across the pelvis. Make sure any slack is wound on the retractor.

- Belts should not be worn twisted.

- Do not wear belts over rigid or breakable objects in or on your clothing, such as eye glasses, pens, keys, etc. as these may cause injury.

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

- Keep belt buckles free of any obstruction that may prevent secure locking.

- Make sure the belts of the unoccupied seats are in their stowed positions.

- Belts that have been subjected to excessive stretch forces in an accident must be replaced.

- Belts must not rub against sharp objects.

- Do not allow safety belts to become damaged by becoming caught in door or seat hardware.

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

- If belts do not work properly, see your Volkswagen dealer.

- Do not modify or disassemble the safety belts in your vehicle.

- The belts must be kept clean as otherwise the retractors may not work properly (also see "Vehicle care", page 73).

- Never bleach or dye safety belts.

- Do not allow safety belts to retract until they are completely dry.

The front seats of your vehicle may be equipped with either a Passive Restraint System with motorized belts (see next column) or with common lap/shoulder belts (see page 17).

Notes

- The chapter "Lap/shoulder belts" on page 17 does not only apply to the front seats but also for both seating positions of the rear seats.
- You can find the chapter "Child Safety" on page 18.

Passive Restraint System with motorized belts*

The Volkswagen Automatic Seatbelt System is a passive restraint system. Driver and front seat passenger are buckled up automatically as they sit down, close the door and the ignition key is turned in the lock.

How the automatic seatbelt system works

The front seats of your Corrado are equipped with an automatic passive restraint system consisting of a motorized upper torso belt and an integrated knee bar. The Corrado is also equipped with an additional lap belt.

The upper torso restraint automatically moves rearwards along a track above the door opening after you have entered the car, closed the door and turned the ignition key in the lock.

The safety belt warning light (see page 42) and an acoustic signal come on briefly to check the system. See next page if both devices do not go out after the belt slides are in the final, fully latched position.

WARNING

- Never attach the Driver's torso belt to belt slide on the passenger's side. Conversely never attach the passenger's torso belt to the slide on the Driver's side.
- Make sure that the belt is positioned midway over the shoulder – it must never rest against the neck. If necessary, use the seat height adjustment to fit the upper torso belt properly.
- Make sure no objects like sunvisors or other obstructions near or in the window track interfere with the movement of belt slide and/or belt.
- Front seat passengers should not 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 on the next page.
- Do not hold on to the torso belt or buckle while entering or exiting the car.

CONTROLS AND EQUIPMENT



WARNING continued

■ Never lean out of the opened driver's or passengers door with ignition key in. The upper torso belt will move forward and could cause injury. This will not apply to the driver's door with the ignition on and the gearshift lever in R.

Always heed WARNING on page 12.

Upon opening the door or removing the ignition key, the upper torso belt moves forward and out of the way without any action on your part.

Note

On driver's side the upper torso restraint will not move forward when you shift into reverse with ignition on.

WARNING

The automatic seatbelt must never be used to hold a child's seat as the diagonal belt will not provide the needed protection. For details see page 19.

Belt warning system

If the safety belt warning light and the acoustic signal go out after the torso belt slides are in the final, fully latched position, the restraint system is working properly. The warning light does not go out, if

- a door is not closed
- the belt buckle is not properly engaged on the driver's side,
- the torso belts are buckled on the wrong sides.
- a belt slide is not in the final, fully latched position.

The acoustic signal sounds, when

- the driver's door is opened with the ignition key in the lock. The signal sounds as long as the door is open.
- the passenger's door is opened with the ignition switched on. The signal sounds only a few seconds.

Note

If the seatbelt system does not work properly and the warning light does not go

CONTROLS AND EQUIPMENT

out, use the additional special latching ton-
gues on **driver's and passenger's side**
— see next page — and contact your near-
est Volkswagen dealer.

Inertia reel retractor

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

In a sudden stop or impact, the belt's iner-
tia 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

The knee bar integrated into the dash-
board 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 under-
neath 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.

Additional lap belt

The additional lap belt offers those front
seat occupants who are more accustomed
to a combination lap shoulder belt the abi-
lity to use system which more closely re-
sembles the seatbelts on previous vehi-
cles which they have become used to.

The lap belt may also offer additional com-
fort under more extreme road and driving
conditions when it may be difficult to main-
tain firm contact with the seat. Further-
more in some types of accidents the lap
belt may provide additional occupant
restraint and mitigate certain types of
occupants injury.

WARNING

**The additional lap belt must be routed
in front of the automatic belt — see illu-
stration on page 14.**

Note

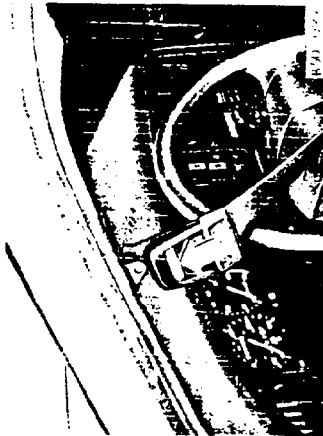
On the passenger's side, the lap belt must
not be used to secure a child restraint —
please see page 19 for details.

CONTROLS AND EQUIPMENT



Special latching tongues

Remove the cover plates and turn out the special latching tongues (arrow), e. g. by use of the ignition key.



Release torso belt buckles by pushing the red buttons located on the window side of the buckles. Then fasten buckles to special latching tongues.

Lap-shoulder belt

The combination lap-shoulder belt is equipped with 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.

■ Before fastening the safety belt first adjust seat. – See page 22.

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

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

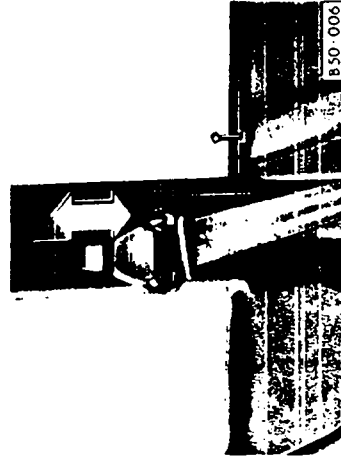
■ Pull upwards on shoulder section to make sure belt fits snugly across the pelvis.

■ The shoulder belt must be positioned midway over the shoulder – **it must never rest against the neck.** See left illustration.

■ Belts should fit snugly across the pelvis and chest. **Make sure any slack is wound up on the retractor.**



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■ Adjust height of belt anchorage, if necessary. Do not wear shoulder part of belt under your arm or otherwise out of position. This would increase the possibility of serious injury in case of an accident.

■ To unfasten belt, push in release button on buckle. Belt will spring out of buckle.

■ To release a locked belt, lean back to take the body pressure off the belt.

■ To store lap-shoulder belt, allow belt to wind up on retractor as you guide belt tongue to its stowed position.

Adjusting shoulder seatbelt

The front seat shoulder belt anchor on the door pillar can be adjusted* up or down to accommodate the height of the driver and the front passenger. The second position from top is the standard position.

■ Before changing the seat belt position, adjust the seat height.

■ To adjust the shoulder belt, push the handle up or down to position the shoulder belt midway over the shoulder – never across the neck. See left illustration.

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

*where applicable

Always heed WARNINGS on pages 12 and 13.

CONTROLS AND EQUIPMENT



Safety belt holder

The release lever on side of the seatback also serves as a convenient safety belt holder. Unhook the belt before pulling the lever up.

After returning the seatback to its original position, the belt should be hooked into the holder again so that it is easy to reach when buckling up.

Belt warning system

A chime and a warning light are interconnected with the driver's safety belt.

Every time the ignition is turned on, the safety belt warning light will come on for about six seconds as a reminder to buckle

up. If the driver does not fasten the safety belt, the chime will also come on for six seconds. With the driver's door closed, the chime will go off as soon as the driver has buckled up.

Injured persons and the physically impaired

We recommend that injured persons and the physically impaired wear safety belts whenever possible. Although the instructions provided above still apply, your doctor can give you special recommendations when necessary.

During pregnancy

Pregnant women should always wear safety belts. The lap belt must be worn snugly and as low as possible across the pelvis. **To avoid pressure on the abdomen the belt must never pass over the waist.**

CHILD SAFETY

WARNING

All vehicle occupants and especially children should be restrained whenever riding in a vehicle. Holding a child in your arms is not a substitute for a child restraint system. In an accident, a child held in a person's arms can be struck or crushed by any unrestrained rider. An unrestrained child could also be injured by striking the interior, or by being ejected from the vehicle during a sudden maneuver or impact. Do not allow children to stand or kneel on the seat. A child restraint system can help protect a child in a vehicle.

Accident statistics have shown that children are generally safer in the rear seat area than in the front seating positions.

A suitable child restraint properly installed and used in one of the rear seating positions provides the highest degree of protection for infants and small children in most accident situations.

Commercially available child seats are required to comply with U.S. Federal Motor Vehicle Safety Standard (FMVSS) 213 (or in Canada, CMVSS 213). These standards include installation requirements which utilize a lap

CONTROLS AND EQUIPMENT

WARNING continued

belt or the lap portion of a combination lap-shoulder belt such as that installed in your vehicle.

Should these safety belts be too short, a special lap belt adapter is available from your Volkswagen dealer.

When purchasing a child restraint, select one which properly fits your child and your vehicle.

Only use child restraint systems which fully contact the flat portion of the seat cushion. The child seat must not tip or lean to either side. We do not recommend the use of child seats which rest on legs or tube like frames because they do not provide adequate contact with the seat.

Improperly or inadequately installed child restraint systems can increase the risk of injury to children in accidents, therefore always carefully read and follow all instructions on installation and use that come with the system.

Children must be positioned so that the shoulder belt does not contact or remain in front of the face, chin, neck or throat. Failure to follow this precaution

can increase the risk or severity of injury in the event of a collision.

In summary:

Children who are less than 12 years old should always sit in the rear.

For reasons of safety a child should only occupy the front seat if all of the rear seating positions are already occupied by other children.

The children should wear, depending on age and body size, either a child restraint system or the existing safety belts:

■ Babies and children up to about 6 or 7 years should be secured with a child restraint system designed for their size.

■ Children of average size of about 6 or 7 years of age may use available safety belts. Always make sure that the shoulder belt is positioned midway over the shoulder – it must never rest against or across the neck. See illustration page 17. The lap belt must always pass as low as possible across the pelvis, never over the abdomen.

If the safety belt will not properly fit the child, we recommend the use of a suitable booster seat in a rear seating position in order to raise the child's seating height so that the safety belt will properly fit the child.

To fasten a child's seat on the front passenger seat

We recommend that child seats and booster cushions only be installed at one of the rear seating positions. See page 18.

Vehicles with Passive Restraint System

WARNING

■ If a child seat must be installed on the front passenger seat, a special lap belt adapter must be used to properly hold the child seat in place. See your dealer.

■ The upper torso belt must never be used to hold a child's seat as the diagonal belt will not provide the secure attachment needed.

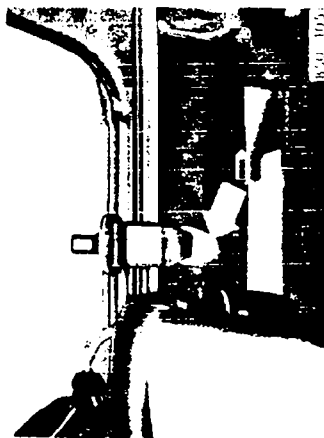
Also heed **WARNING** on pages 12/13/18.

CONTROLS AND EQUIPMENT

WARNING continued

- We recommend that you release the torso belt buckle and feed the belt into the retractor because the torso belt must never remain in front of the child's head, face or neck. In this position the torso belt can substantially increase the risk of injury or the severity of injury in the event of an accident.
- Always be sure to reconnect the belt after removing the child's seat.
- If a booster seat must be used for average sized 6 to 7 year old children on the front passenger's seat always make sure that
 - the seat is adjusted so that the child's knees are close to the knee bar or
 - that the additional lap belt is properly used and properly routed to prevent the child from passing beneath the upper torso belt.

Vehicles with common lap/shoulder belts see WARNING on page 18.



WARNING

The proper routing of the lap belt is vital to the proper attachment and performance of the child seat installed. Therefore always carefully follow all of the instructions for installation and use provided by the child seat manufacturer.

Installation of the special lap belt tongue on vehicles with Passive Restraint System

Child seats must be fastened with a special lap belt which complies with all applicable Federal Safety Standards. See your Volkswagen dealer. This belt must be mounted with a special seat belt anchor bolt to the anchorage point at the base of the right side member (see illustration).

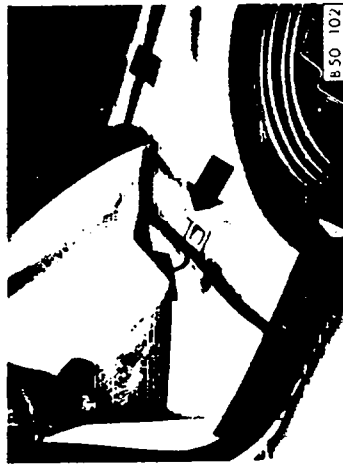
To mount the special belt tongue, first remove the precut part of the floor carpet.

The seat belt anchor bolts must be tightened to torque of 30 ft. lbs.

If you are uncertain about how to properly install the lap belt, your Volkswagen dealer will be happy to install it for you.

CONTROLS AND EQUIPMENT

HEAD RESTRAINTS



Child restraint anchorages for the rear seat

Your vehicle comes with the necessary hardware to attach a child restraint tether strap.

The two anchor points are located on the floor of the luggage compartment.

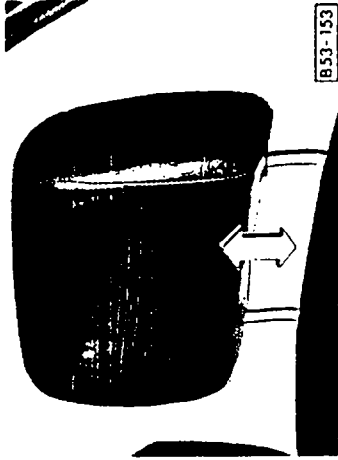
The illustration above shows the anchor point for the left side.

Note

For installation of child restraints always follow the manufacturer's instructions.

Always heed WARNING on the next page and on pages 12/13/14.

- WARNING**
- Child restraint anchorages are designed to withstand only those loads imposed by correctly fitted child restraints. Under no circumstances are they to be used for adult seat belts or harnesses.
 - Do not mount more than one child restraint on one anchor point.
 - When loading the luggage compartment, make sure that luggage is stowed next to or underneath the tether strap(s). Placing objects on the tether strap(s) may cause the objects to fly forward in an accident, especially if the luggage compartment cover has been removed.



The padded head restraints are adjustable.

Position head restraints according to the occupant's height. Properly positioned head restraints, together with the use of safety belts offer effective protection.

- For height adjustment, grasp firmly with both hands and pull up or push down.
- For maximum protection the upper edge should be at eye level.

WARNING

Do not drive the vehicle without the head restraints provided. Head restraints are designed to help reduce injuries.