

1680

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

**ISUZU MOTORS LIMITED
1992 GEO STORM
2-DOOR HATCHBACK**

NHTSA NUMBER: CN0107

CALSPAN TEST NUMBER: 7979-1

January 14, 1992

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 1992 Geo Storm 2-door hatchback. This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on January 14, 1992. 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 29.6 mph. The ambient temperature at the impact face was 49°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 air bag and passenger side manual 3-point seat belt restraint. The driver side 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 Copies of this report are available from: 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 1

PURPOSE AND TEST PROCEDURE

This 30 mph frontal barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208, 212, 219 (partial) and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by Calspan Advanced Technology Center under Contract No.

DTNH22-90-C-01003. The purpose of this test was to determine if the subject vehicle, a 1992 Geo Storm 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 CN0107

A frontal barrier was impacted by a 1992 Geo Storm 2-door hatchback at a velocity of 29.6 mph. The test was performed at the Calspan Corporation Advanced Technology Center on January 14, 1992. 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, chest displacement potentiometers and left/right femur load cells. These ATDs had been certified prior to the test.

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

The driver's HIC was 75. The maximum chest deceleration over 3 milliseconds was 48.2 g's with 2.7 inches of displacement. The maximum force on the driver's left femur was 1376 pounds and 1350 pounds on the right femur.

The right front passenger's HIC was 613. The maximum chest deceleration over 3 milliseconds was 39.2 g's with 1.5 inches of displacement. Loads were 341 and 328 on the left and right femurs respectively.

Table 1
CRASH TEST SUMMARY

Vehicle NHTSA No.: CNO107 Test Mode: 30 mph Frontal Barrier
 Test Date: JANUARY 14, 1992 Time: 13:30 Temperature: 49 F°
 Vehicle Make/Model/Body Style: 1992 Geo Storm 2-door hatchback

Vehicle Test Weight: 2670 lbs.
 Vehicle/Barrier Impact Angle: 0°
 Impact Velocity: 29.6 mph
 Maximum Static Crush: 18.8 inches
 Vehicle Rebound: 18.0 inches

<u>DUMMIES:</u>	<u>DRIVER</u>	<u>PASSENGER</u>
Type:	<u>Part 572E</u>	<u>Part 572E</u>
Restraint System:	<u>Airbag</u>	<u>Manual 3-point seat belt</u>

Number of Data Channels: 25
 Number of Cameras: 1 Real Time
14 High Speed

DOOR OPENING DATA: Closed - Left Front
Closed - Right Front

Front Seat(s) Data:	<u>DRIVER</u>	<u>PASSENGER</u>
Seat Track Failure:	<u>0.2 Forward</u>	<u>0.1 Rearward</u>
	inches of shift	

Seat Back Failure:	<u>None</u>	<u>None</u>
--------------------	-------------	-------------

<u>VISIBLE DUMMY CONTACT POINTS:</u>	<u>DRIVER</u>	<u>PASSENGER</u>
Head:	<u>Face with airbag, top and rear of head with sunvisor</u>	<u>Chin with chest. Rear of head with head rest</u>
Abdomen:	<u>No Contact</u>	<u>No contact</u>
Chest:	<u>Airbag</u>	<u>No contact</u>
Knees:	<u>Lower dash, Right knee with steering column cover</u>	<u>Glove box door</u>

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1992 Geo Storm 2-door hatchback
 NHTSA No.: CNO107; VIN: J81RF2361N7509431; Color: BLUE
 Engine Data: 4 cylinders; 97 CID; 1.6 Liters; 1600 cc
 Placement: - Longitudinal or In-Line; X Transverse or Lateral
 Transmission Data: 5 speeds; X Manual; - Automatic; - Overdrive
 Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive
 Major Options: - A/C; X Pwr.Strg.; X Pwr.Brakes
- Pwr.Windows; - Pwr.Door Locks; - Tilt Wheel
 Date Received: 10-1-91; Odometer Reading 34 miles
 Selling Dealer: Daniel's Chevrolet
 & Address 5885 Big Tree Road, Orchard Park NY 14127

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Isuzu Motor's
 Date of Manufacture: 7/91
 GVWR: 3131 lbs.; GAWR: 1804 lbs. FRONT; 1376 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 30 psi FRONT
30 psi REAR
 Recommended Tire Size: P185/60R14
 *Recommended Cold Tire Pressure: 30 psi FRONT; 30 psi REAR
 Size of Tires on Test Vehicle: 185/60R14; Manufacturer: General
 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) = 665 lbs.
 No. of Occupants x 150 lbs. = 600 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 65 lbs. (Difference)

*Tires set to this pressure for test.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

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

Right Front = 730 lbs. Right Rear = 390 lbs.
 Left Front = 760 lbs. Left Rear = 410 lbs.
 TOTAL FRONT = 1490 lbs. TOTAL REAR = 800 lbs.
 % of Total Vehicle Weight = 65.1 % of Total Weight = 34.9 %
 TOTAL DELIVERED WEIGHT = 2290 lbs.

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 2290 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 65 lbs.
 Weight of 2 P.572 Dummies @ 167 ea. = 334 lbs.
 TARGET TEST WEIGHT = 2689 lbs. (sum)

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 46 POUNDS OF CARGO WEIGHT:

Right Front = 770 lbs. Right Rear = 530 lbs.
 Left Front = 810 lbs. Left Rear = 560 lbs.
 TOTAL FRONT = 1580 lbs. TOTAL REAR = 1090 lbs.
 % of Total Weight = 59.2 % % of Total Weight = 40.8 %
 TOTAL TEST WEIGHT = 2670 lbs.
 Weight of Ballast Secured in Vehicle Trunk Area = 0 lbs.
 Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED: RF 26.1" LF 26.1" RR 25.4" LR 25.1"
 FULLY LOADED: RF 25.5" LF 25.5" RR 23.5" LR 23.2"
 AS TESTED: RF 25.7" LF 25.8 " RR 23.8" LR 23.7"
 Vehicle's Wheel Base: 96.7 in.
 Location of Vehicle's C.G.: 39.5 inches rearward of front wheel center

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 12.4 gallons
 Usable Capacity Figure Furnished by COTR = 12.4 gallons
 Test Volume Range (92 to 94% of Usable Capacity) = 11.4 to 11.6 gallons
 ACTUAL TEST VOLUME = 11.5 gallons (with entire fuel system filled)

Table 3
POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
Test Date: January 14, 1992 Time: 13:30 Temperature: 49°F
Vehicle NHTSA No.: CN0107
Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.6 mph; Trap No. 2 = 29.5 mph
Distance from vehicle to barrier: (1) entering trap = 52 inches
(2) exiting trap = 12 inches

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

Vehicle Length:

Pre-Test Right = 157.1; C/L = 163.0; Left = 156.9
Post-Test Right = 142.7; C/L = 144.2; Left = 145.2
Crush Right = 14.4; C/L = 18.8; Left = 11.7
AVERAGE = 15.0 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

Right = 18.0; C/L = 18.0; Left = 17.9
AVERAGE = 18.0 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>Driver 0.2 inches forward</u> <u>Passenger 0.1 inches rearward</u>
Rear	<u>N/A</u>	<u>N/A</u>

Table 3
POST IMPACT DATA (cont.)

GLAZING DAMAGE: None

OTHER NOTABLE IMPACT FEATURES: Driver side instrument "Pod" nosed up during crash

Section 3
OCCUPANT AND VEHICLE DATA

Figure 1

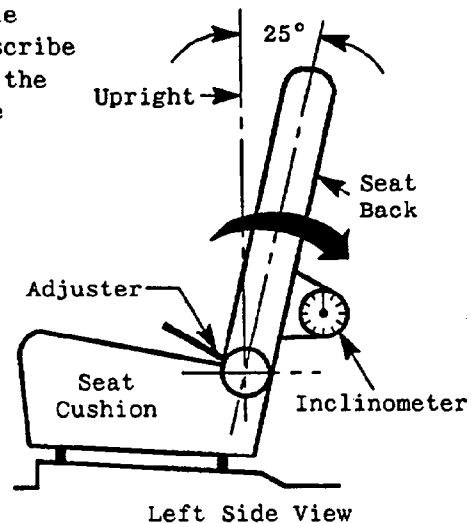
TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1992 Vehicle Model: Geo Storm Body Style: 2-door hatchback

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

- Seat full down
- No adjustable headrests



Seat back angle for driver's seat: 25°

Measurement instructions: Seat back set in 8th notch rearward from full up position.

Seat back angle for passenger's seat: 25°

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 10th detent forward of rearmost position.

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 12.4 gallons

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

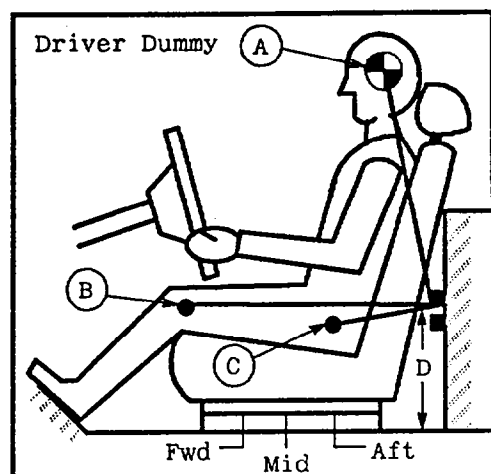
Additional Instructions: None

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION

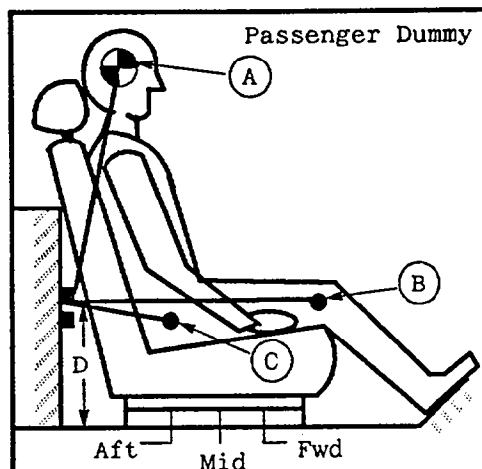
Test No.: CN0107 Vehicle: 1992 Geo Storm 2-Door Hatchback

<u>SEAT TYPE:</u>	<u>ADJUSTER TYPE:</u>	<u>SEAT BACK TYPE:</u>
<u>-</u> Bench	<u>X</u> Manual	<u>-</u> Fixed
<u>X</u> Bucket	<u>-</u> Power	<u>X</u> Adjustable Reclining
<u>-</u> Split Bench		



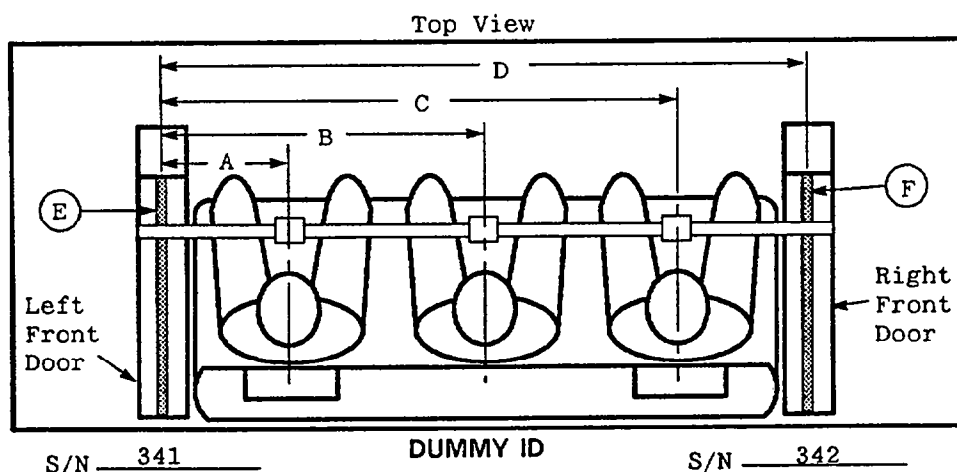
MEASUREMENT LOCATION

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



A = 23.5 in. 42 Degrees
 B = 33.5 in. 93 Degrees
 C = 19.5 in. 113 Degrees
 D = 12.5 in.

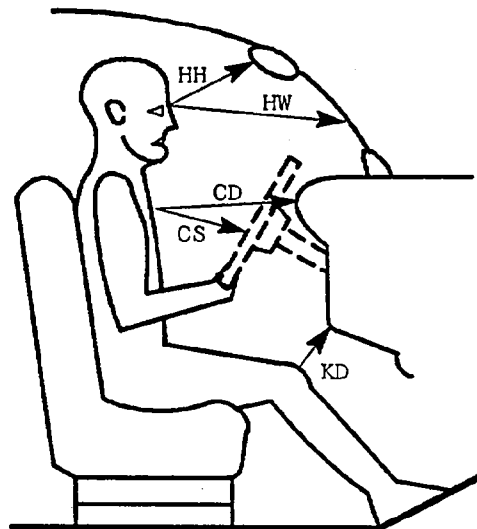
A = 24.2 in. 43 Degrees
 B = 34.1 in. 95 Degrees
 C = 20.0 in. 114 Degrees
 D = 12.5 in.



A = Left Door to Driver Centerline	<u>12.6</u> in.
B = Left Door to Center Passenger Centerline	<u>-</u> in.
C = Left Door to Right Passenger Centerline	<u>39.1</u> in.
D = Left Door to Right Door	<u>51.4</u> in.
E, F = Window Glass Height (Right and Left Must Be Equal)	<u>10.0</u> in.

Figure 3
OCCUPANT CLEARANCE DIMENSIONS
(Dimensions in inches)

	DRIVER	PASSENGER
HH	15.9	15.5
HW	23.7	23.2
CD	21.0	22.1
CS	11.8	-
KDL	5.7	6.9
KDR	5.5	6.7
SA	See Note	See Note
PA	26°	25



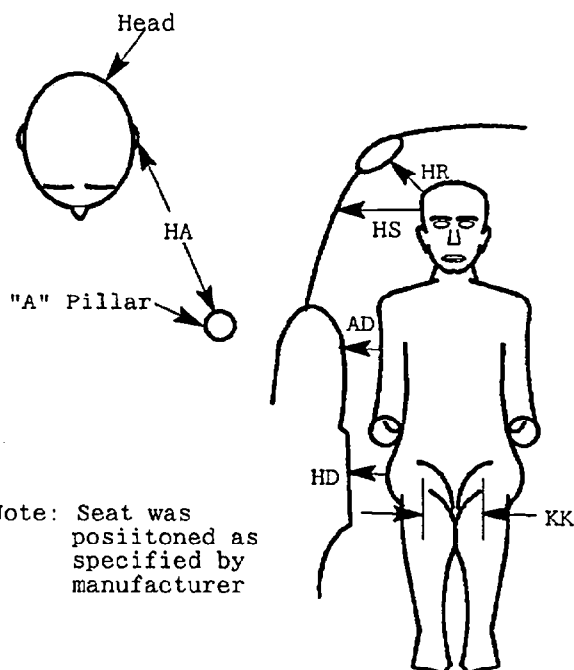
HH = Head to Windshield Header
HW = Head to Windshield
CD = Chest to Dash
CS = Chest to Steering Wheel
KD(L/R) = Knee to Dash (Left/Right)
SA = Seat Back Angle
PA = Pelvic Angle

H-Point Location				
	Longitudinal*		Vertical**	
	Target	Actual	Target	Actual
	18.4	18.2	4.3	4.3
Driver				
Passenger	18.7	18.5	4.3	4.5

*From striker **Above sill

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	6.0	5.4
HS	9.6	9.4
AD	4.2	4.7
HD	4.7**	4.9**
KK	10.2*	7.4
HA	17.4	17.1

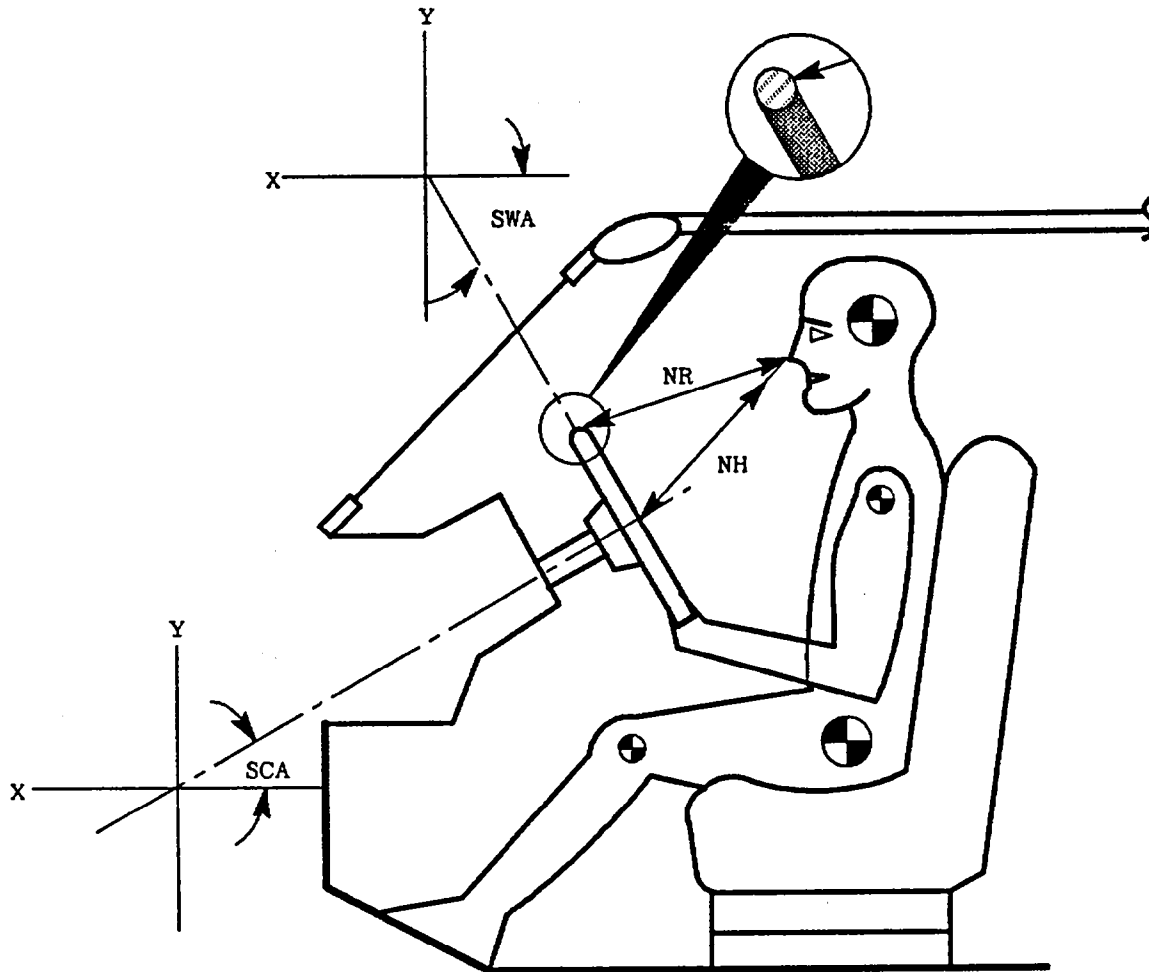


Note: Seat was positioned as specified by manufacturer

*Left foot on foot rest
**Measured to door pocket

Figure 4

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSEMBLY REFERENCE DIMENSIONS

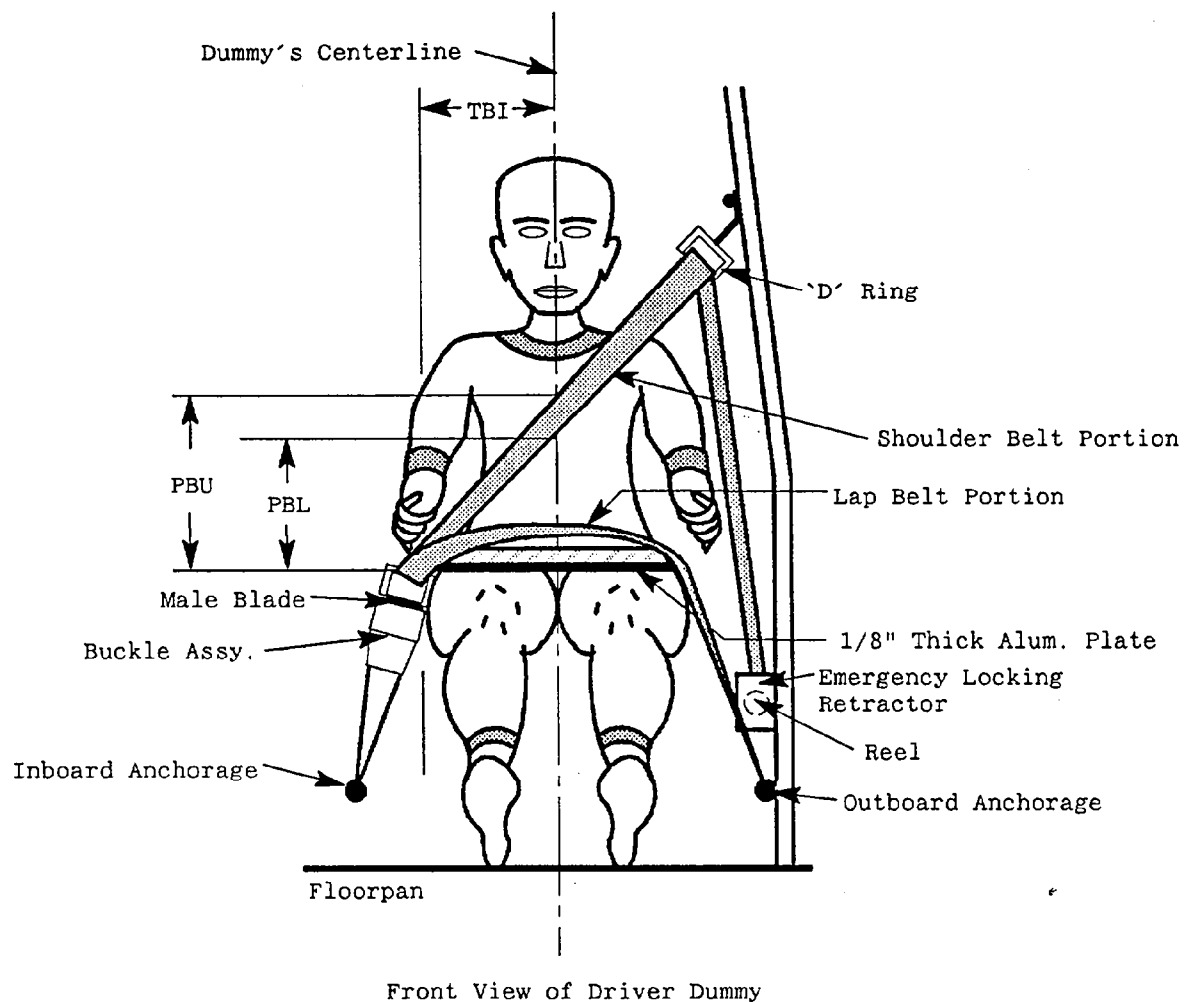


Left Side View

MEASUREMENTS		
<u>NR</u> -- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	14.2	Inches
<u>NH</u> -- Distance from tip of dummy's nose to center of steering wheel hub	15.1	Inches
<u>SCA</u> -- Angle of steering column relative to the horizontal X axis	19*	Degrees
<u>SWA</u> -- Angle of steering wheel relative to the horizontal X axis	71	Degrees

*Steering column is non-adjustable

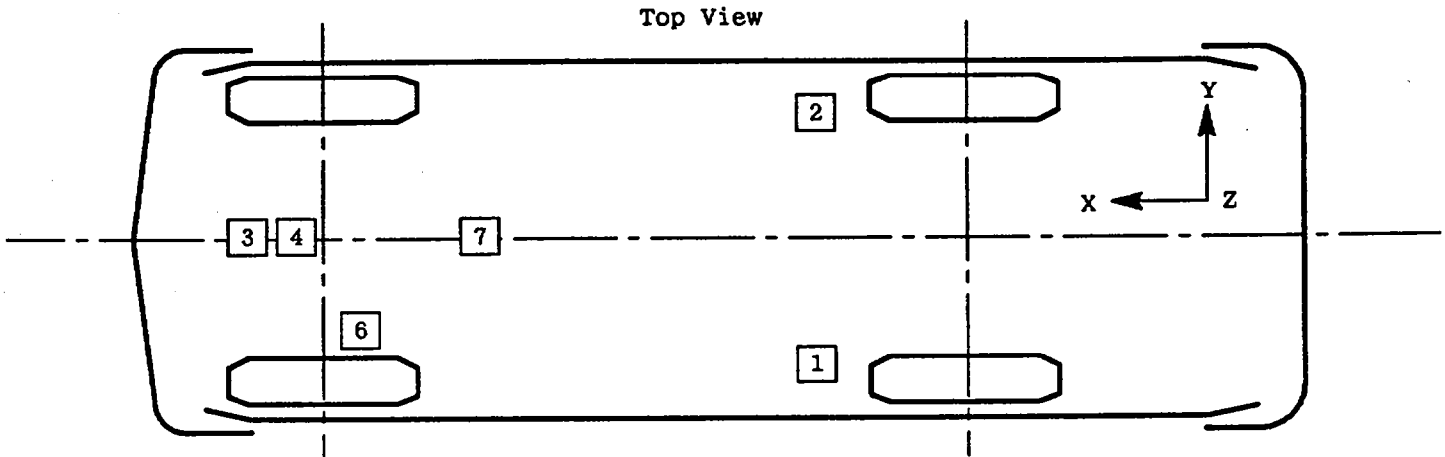
Figure 5
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	*	13.3
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	*	9.6
<u>TBI</u> -- Distance from torso centerline to buckle	*	8.0

*Only driver airbag used for test

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 AT LEFT SIDE	PRE:	56.9	21.2	13.8				
		POST:	56.9	21.2	13.6				
	LONGITUDINAL ACCELERATION					2	102	-30	63
2	REAR SEAT X-MEMBER AT RIGHT SIDE	PRE:	56.7	-21.2	13.8				
		POST:	56.7	-21.2	13.5				
	LONGITUDINAL ACCELERATION					2	115	-31	52
3	TOP OF ENGINE BLOCK	PRE:	134.1	-3.5	30.6				
		POST:	127.9	-3.5	29.3				
	LONGITUDINAL ACCELERATION					29	54	-83	42
4	BOTTOM OF ENGINE	PRE:	132.7	-12.5	10.1				
		POST:	129.7	-12.5	8.8				
	LONGITUDINAL ACCELERATION					22	57	-85	49
5	BRAKE CALIPER AT RIGHT SIDE	PRE:	123.6	-22.5	20.6				
		POST:	122.3	-22.5	20.6				
	LONGITUDINAL ACCELERATION					8	43	-77	52
6	BRAKE CALIPER AT LEFT SIDE	PRE:	123.6	22.5	20.8				
		POST:	120.5	22.5	20.8				
	LONGITUDINAL ACCELERATION					18	82	-65	56
7	DASH PANEL	PRE:	97.0	-1.8	26.1				
		POST:	96.6	-1.8	26.0				
	LONGITUDINAL ACCELERATION					4	115	-38	64

** *X + Forward from rear bumper Y + Left from vehicle centerline Z + Up from ground	LONGITUDINAL: LATERAL: VERTICAL:	<u>POSITIVE</u> FORWARD LEFTWARD UPWARD	<u>NEGATIVE</u> REARWARD RIGHTWARD DOWNWARD
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DISTANCE MEASUREMENTS IN INCHES

Figure 7

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5.

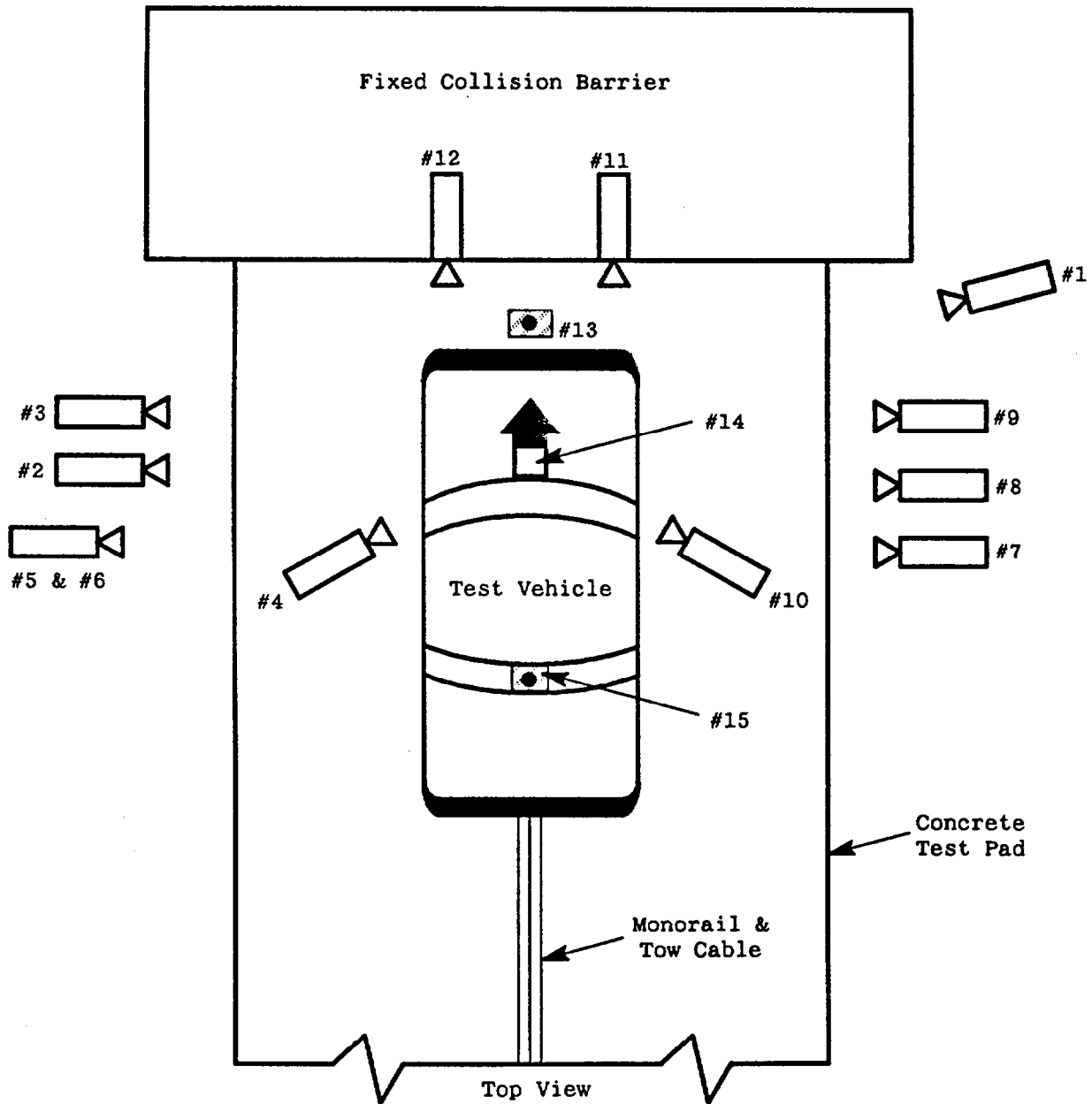


Table 5

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	214	70	41	-2	197.9	13	555
3	Left Side View	297	47	41	-4	280.9	25	580
4	Driver and Interior View	109	109	62	-16	-	13	595
5	Steering Column (Bottom)	267	82	46	-6	250.9	25	510
6	Steering Column (Top)	267	82	70	-11	250.9	25	485
7	Overall Right Side	227	76	42	-3	210.9	13	600
8	Right Side View	307	56	41	-3	290.9	25	600
9	Right Passenger View	295	74	56	-4	278.9	35	550
10	Passenger and Interior View	120	107	65	-14	-	13	505
11	Passenger Front View	22	19	75	-51	-	13	575
12	Driver Front View	22	19	75	-47	-	13	535
13	Windshield View	0	0	126	-57	-	25	505
14	Pit View of Engine	0	36	-80	90	-	13	760
15	Pit View of Fuel Tank	0	86	-80	90	-	13	900

*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

** = referenced to horizontal plane

VEHICLE TARGET LOCATIONS

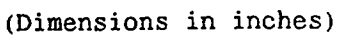


Figure 9
TEST VEHICLE MEASUREMENTS

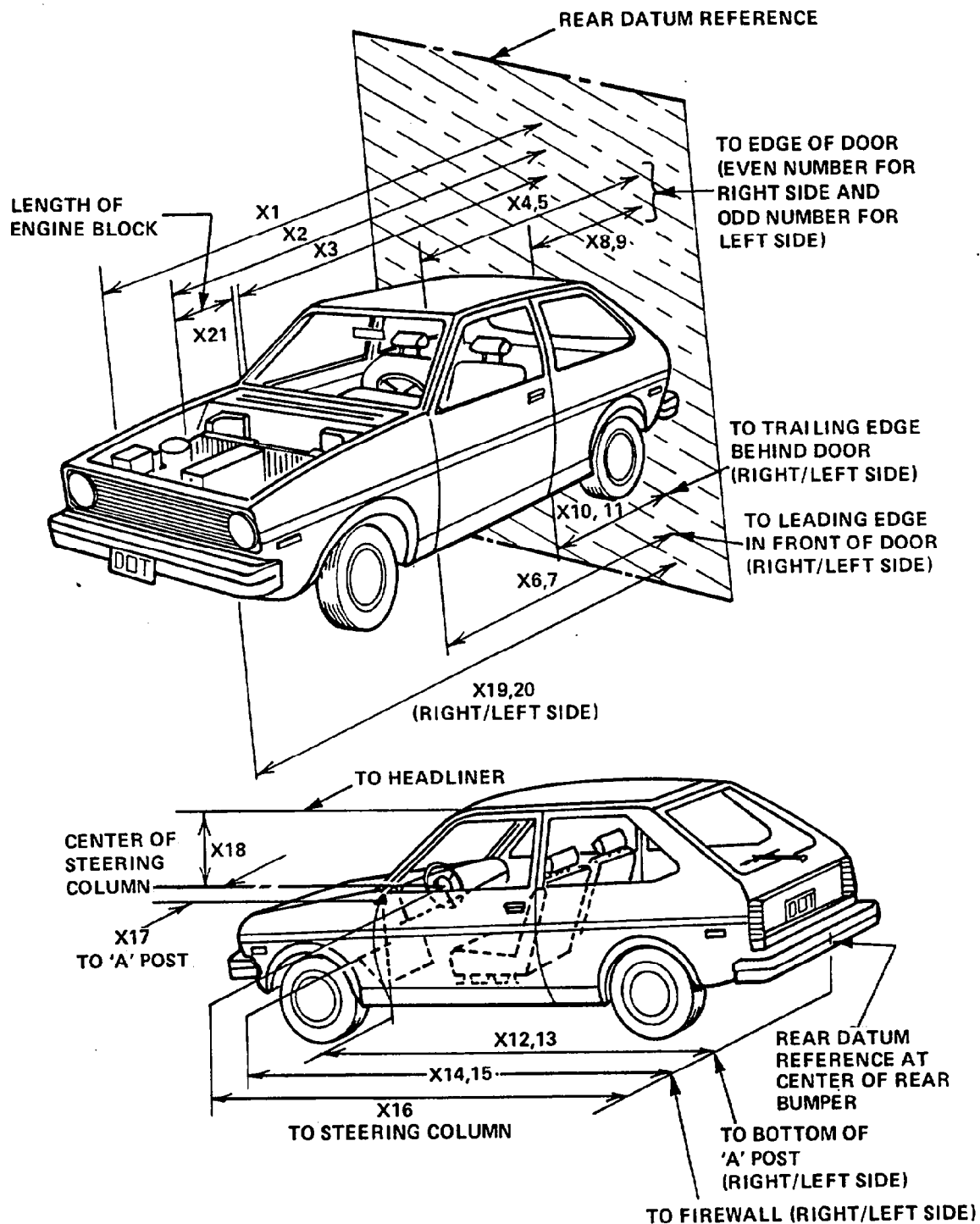
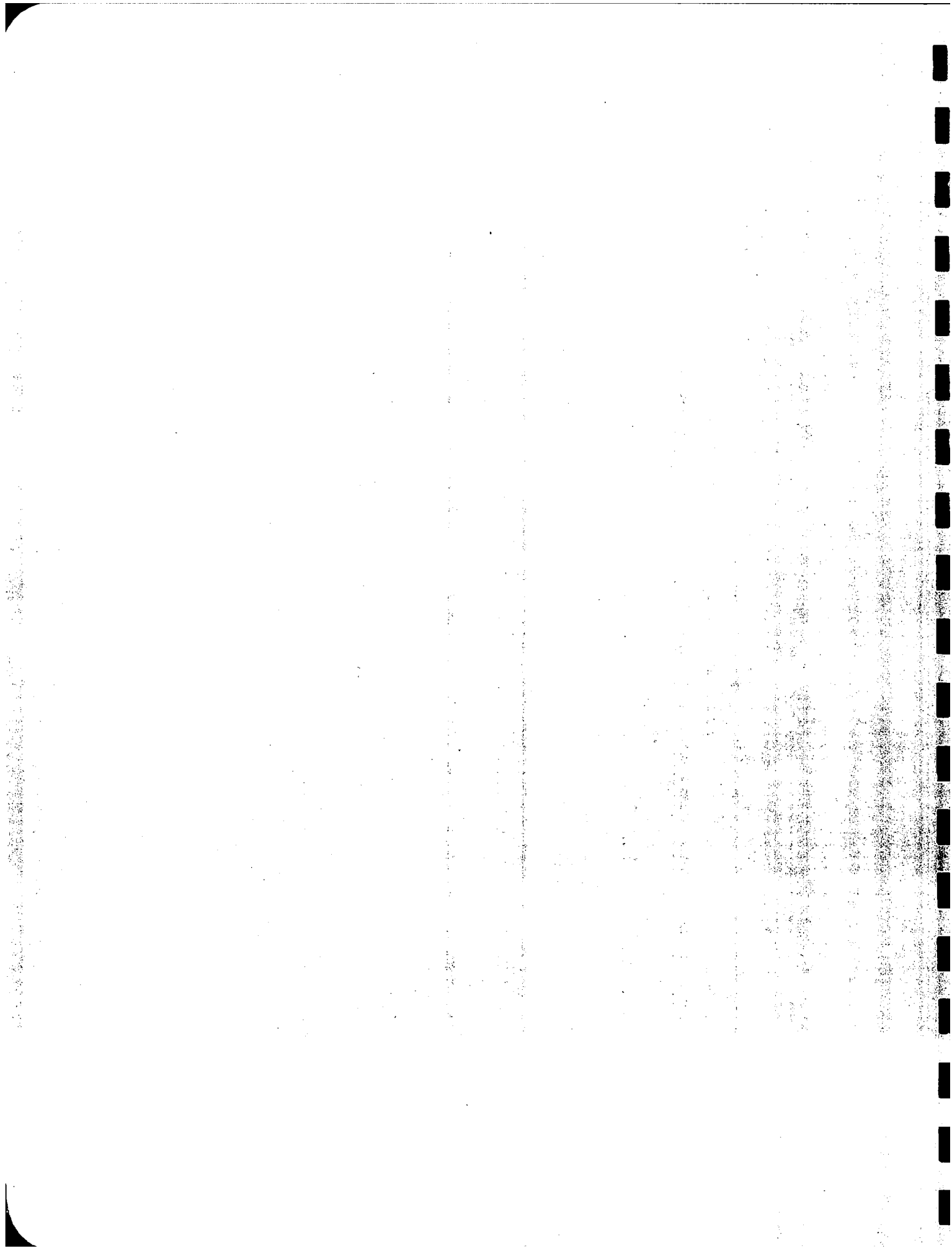


Table 6

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	163.0	144.2	18.8
X2	Rear Surface of Vehicle to Front of Engine	136.8	132.5	4.3
X3	Rear Surface of Vehicle to Firewall	120.8	121.7	-0.9
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	104.4	105.0	-0.6
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	103.6	104.5	-0.9
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	107.0	107.5	-0.5
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	106.5	107.8	-1.3
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	54.4	54.5	-0.1
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	53.9	54.5	-0.6
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	58.9	59.8	-0.9
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	58.6	59.9	-1.3
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	107.3	107.8	-0.5
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	106.9	108.0	-1.1
X14	Rear Surface of Vehicle to Firewall, Right Side	119.0	118.5	0.5
X15	Rear Surface of Vehicle to Firewall, Left Side	117.5	119.0	-1.5
X16	Rear Surface of Vehicle to Steering Column	88.9	90.5	-0.6
X17	Center of Steering Column to "A" Post	17.4	17.6	-0.2
X18	Center of Steering Column to Headliner	15.5	13.5	2.0
X19	Rear Surface of Vehicle to Right Side of Front Bumper	157.1	142.7	14.4
X20	Rear Surface of Vehicle to Left Side of Front Bumper	156.9	145.2	11.7
X21	Length of Engine Block	13.0	13.0	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.: CN0107 Vehicle: 1992 Geo Storm 2-door hatchback

	MAXIMUM ACCELERATION (g's)							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
Dummy (1)	-26	8	21	33	-49	-5	-16	48.2
Dummy (2)	-47	6	50	56	-40	-5	-11	39.2

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	1376	1350
Dummy (2)	341	328

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc. (g) t ₁ TO t ₂
		t ₁ (msec)	t ₂ (msec)	
Dummy (1)	75	55.320	91.200	21.32
Dummy (2)	613	78.120	114.000	49.31

*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 sec.

Log time duration of reminder light operation = 6 sec.

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

Log time duration of audible warning signal = 0 sec.
(audible warning should not operate)

Log time duration of reminder light operation = 6 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: Driver side sunvisor

The manufacturers states, "regular maintenance of the SIR is not required. The vehicle should be brought to your new car dealer if the SIR readiness light does not come on at ignition "ON", or if it comes on during vehicle operation.

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 left 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>CN0107</u>
Make/Model:	<u>1992 Geo Storm</u>
Date of Comfort/Convenience Check:	<u>1/13/92</u>
Technician Performing Check:	<u>D.J.T.</u>
GVWR:	<u>3131 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.

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 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 to operate properly?

YES N/A NO N/A

(If NO, provide explanation.)

D3

BELT CONTACT FORCE

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

YES - NO X

2. 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 force is 0.5 pounds. Contact the COTR if the contact force exceeds 0.7 pounds.

Table 11 (cont.)

D4

LATCHPLATE ACCESSIBILITY

1. Position the test dummy in the driver's seat or passenger's seat in its forward most adjustment position.
YES X NO -
2. Attach the inboard and outboard reach string. YES X NO -
3. Extend each line backward and outboard to generate arcs of the reach envelope of the test dummy's arms. With the latchplate in the normal stowed position, check to assure that the latchplates are within the reach envelope.
YES X NO -
4. Using the clearance test block, determine if there is sufficient clearance between the vehicle seat and the side of vehicle interior to allow the test block to move unhindered to the latchplate or buckle.
YES X NO -

D5

RETRACTION

1. Seats and seat backs are adjusted according to instructions in Appendix B "General Test Conditions" in TP-208-8.
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 N/A NO N/A

D7

LATCH MECHANISM

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

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

YES X NO -

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

YES X NO -

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

YES X NO -

Figure 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 trim along top and 0.8" rubber trim along sides. Lower portion of windshield covered by a plastic shield.

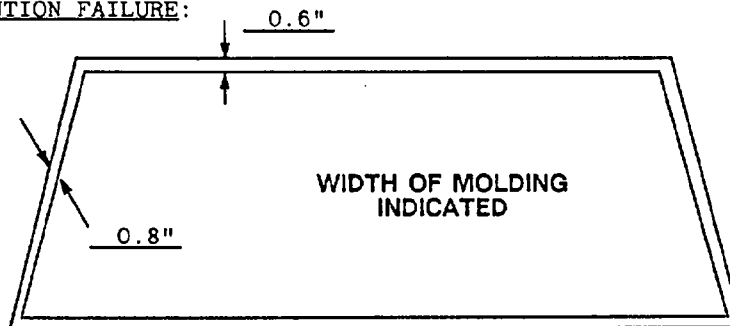
FMVSS 212 REQUIREMENTS:

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		
	PRE-TEST (in.)	POST-TEST (in.)	PERCENT RETENTION
RIGHT SIDE	83.6	83.6	100
LEFT SIDE	83.6	83.6	100
TOTAL	167.2	167.2	100

AREA OF RETENTION FAILURE:



FRONT VIEW

FAILURE DETAILS: None

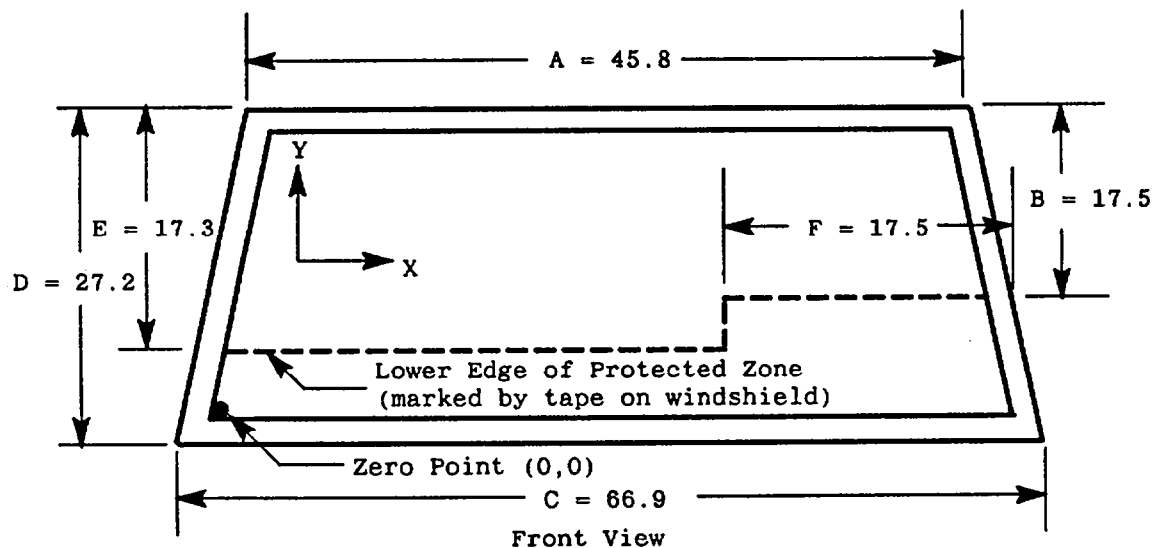
Figure 11

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)

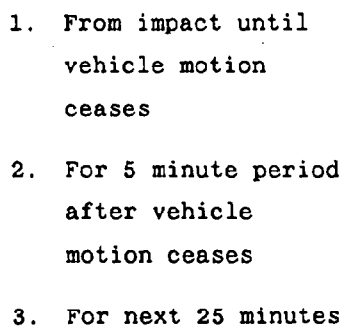
COORDINATES		
	X	Y
1.		
2.		
3.		
4.		

FMVSS NO. 301

TEST DATE: January 14, 1992

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:



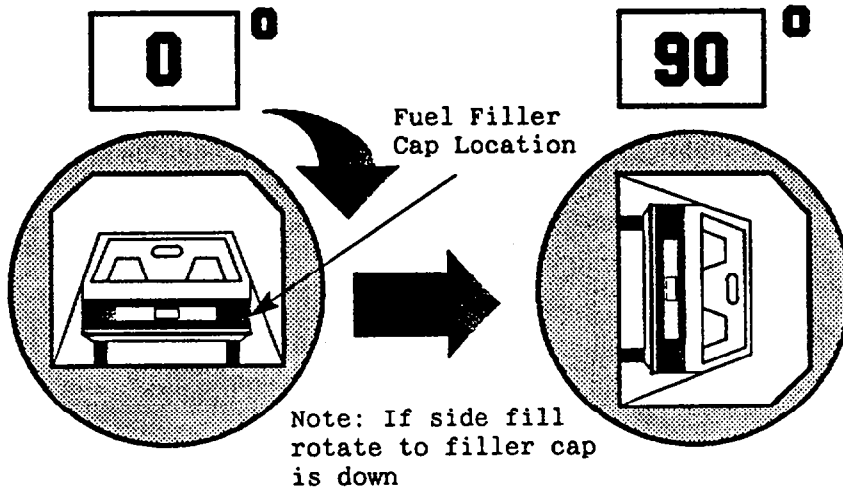
ACTUAL	MAX ALLOWED
0	1 oz.
0	5 oz.
0	1 oz./1 min.

None

Table 13
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

Vehicle NHTSA ID No.:



CN0107

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	_____ 1 _____ minutes _____ 55 _____ seconds
FMVSS 301 Position Hold Time +	_____ 5 _____ minutes _____ 00 _____ seconds
TOTAL	_____ 6 _____ minutes _____ 55 _____ seconds
Next whole minute interval	_____ 7 _____ minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 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	N/A
---	---	---	-----

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

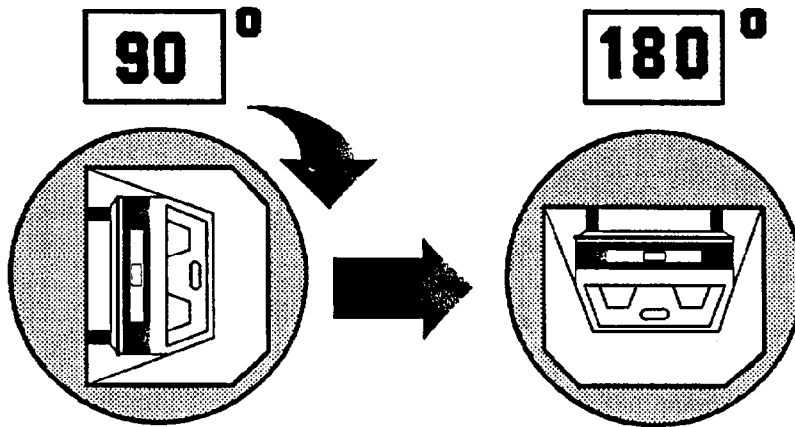
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 13
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Vehicle NHTSA ID No.:



CN0107

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time _____ 1 _____ minutes _____ 50 _____ seconds
 (Spec. Range = 1 to 3 minutes)

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

TOTAL _____ 6 _____ minutes _____ 50 _____ seconds

Next whole minute interval _____ 7 _____ minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 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	N/A
---	---	---	-----

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

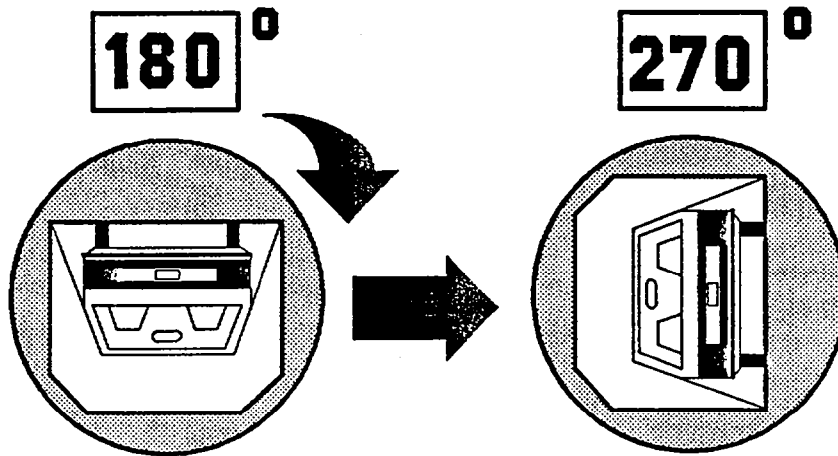
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)TEST PHASE:

Vehicle NHTSA ID No.:



CN0107

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90° Rotation Time
(Spec. Range = 1 to 3 minutes)2 minutes 15 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

7 minutes 15 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
---	---	---	---

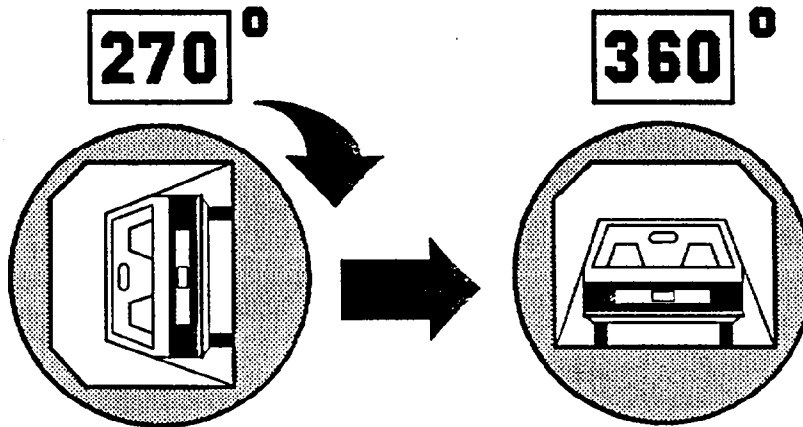
Note: Record spillage for whole minute
intervals only as determined above.IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 13
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Vehicle NHTSA ID No.:



CN0107

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time _____ 2 _____ minutes _____ 20 _____ seconds
(Spec. Range = 1 to 3 minutes)

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

TOTAL _____ 7 _____ minutes _____ 20 _____ 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: January 14, 1992 Vehicle NHTSA No.: CN0107

Vehicle Manufacturer: Isuzu Motors Limited in Japan

Model Year: 1992 VIN: J81RF2361N7509431

Model: Geo Storm Body Style: 2-door hatchback Build Date: 7/91

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

Impact Velocity: 29.6 mph Time of Test: 13:30

Type of Automatic Restraint System: Driver side airbag

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

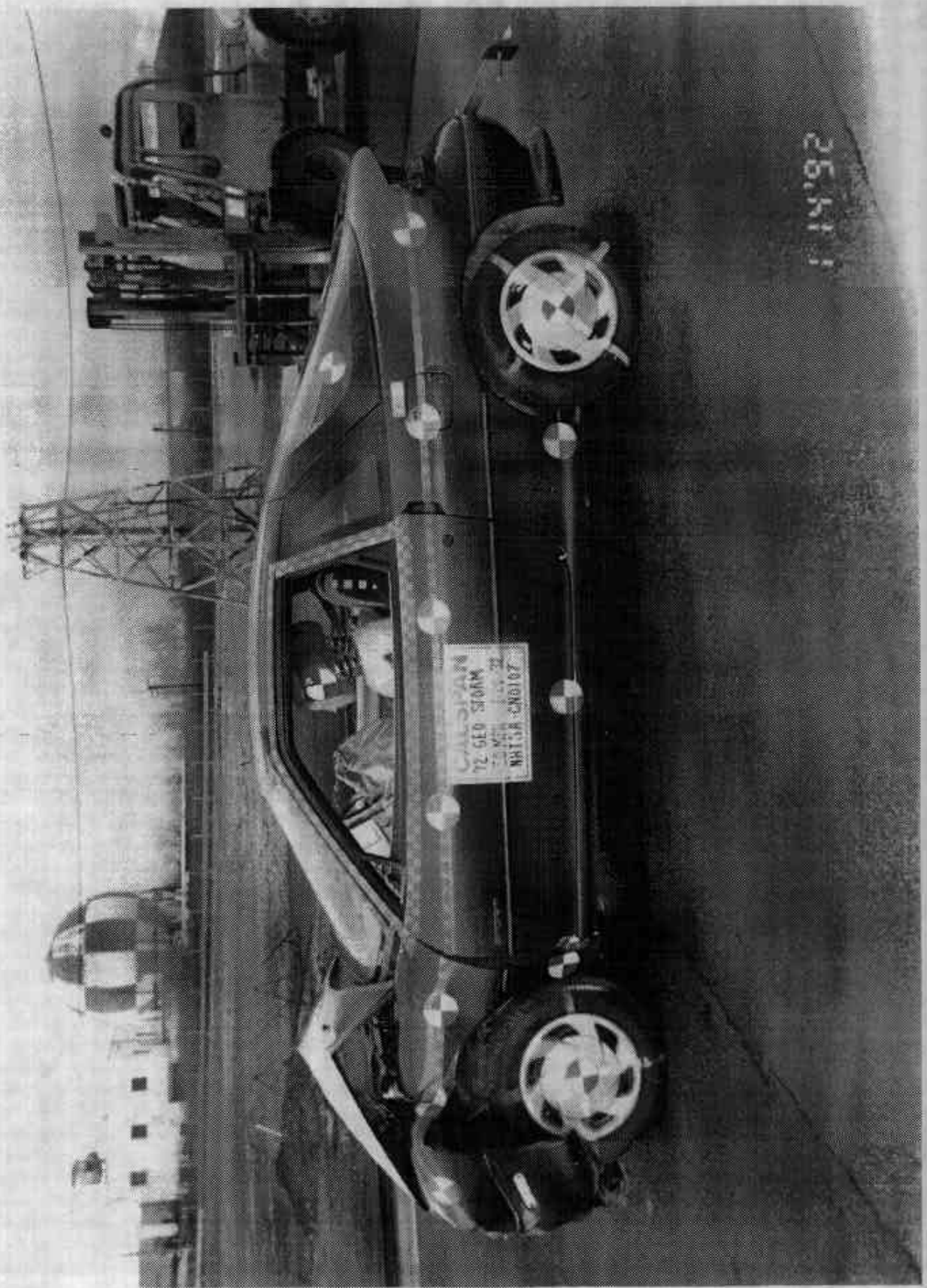


Figure A-4 POST-TEST LEFT SIDE VIEW

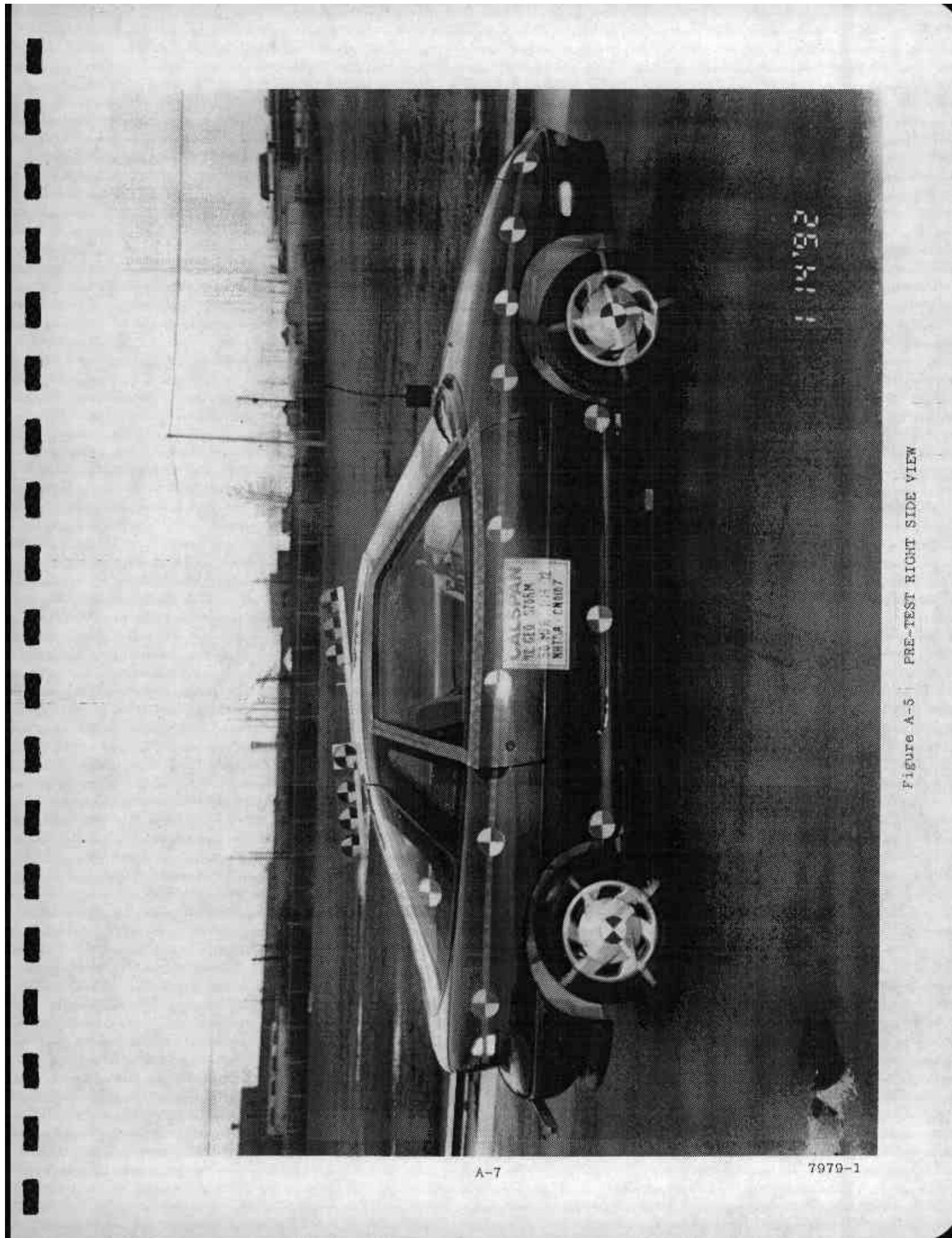
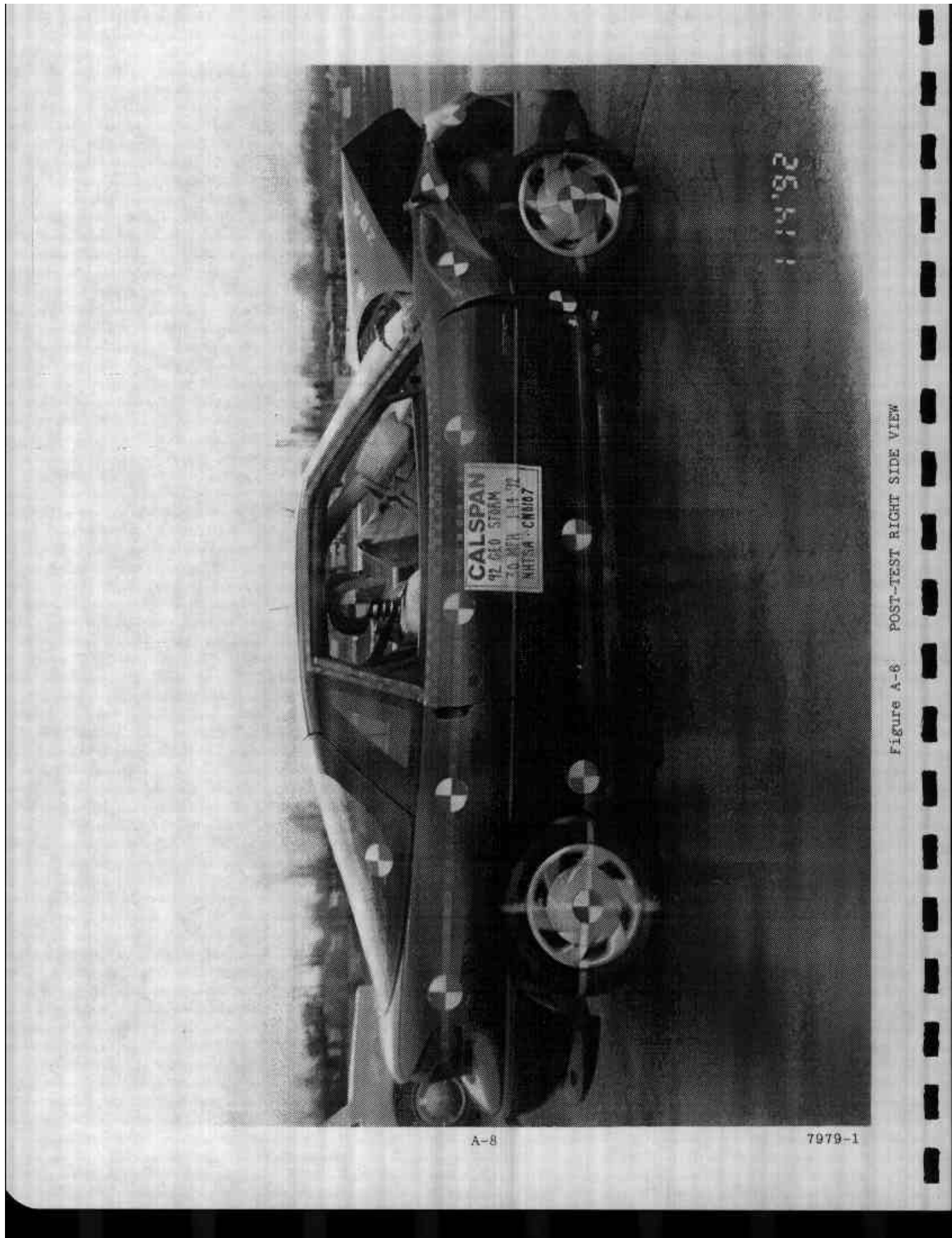


Figure A-5 PRE-TEST RIGHT SIDE VIEW



1:4:32

Figure A-6 POST-TEST RIGHT SIDE VIEW

A-8

7979-1

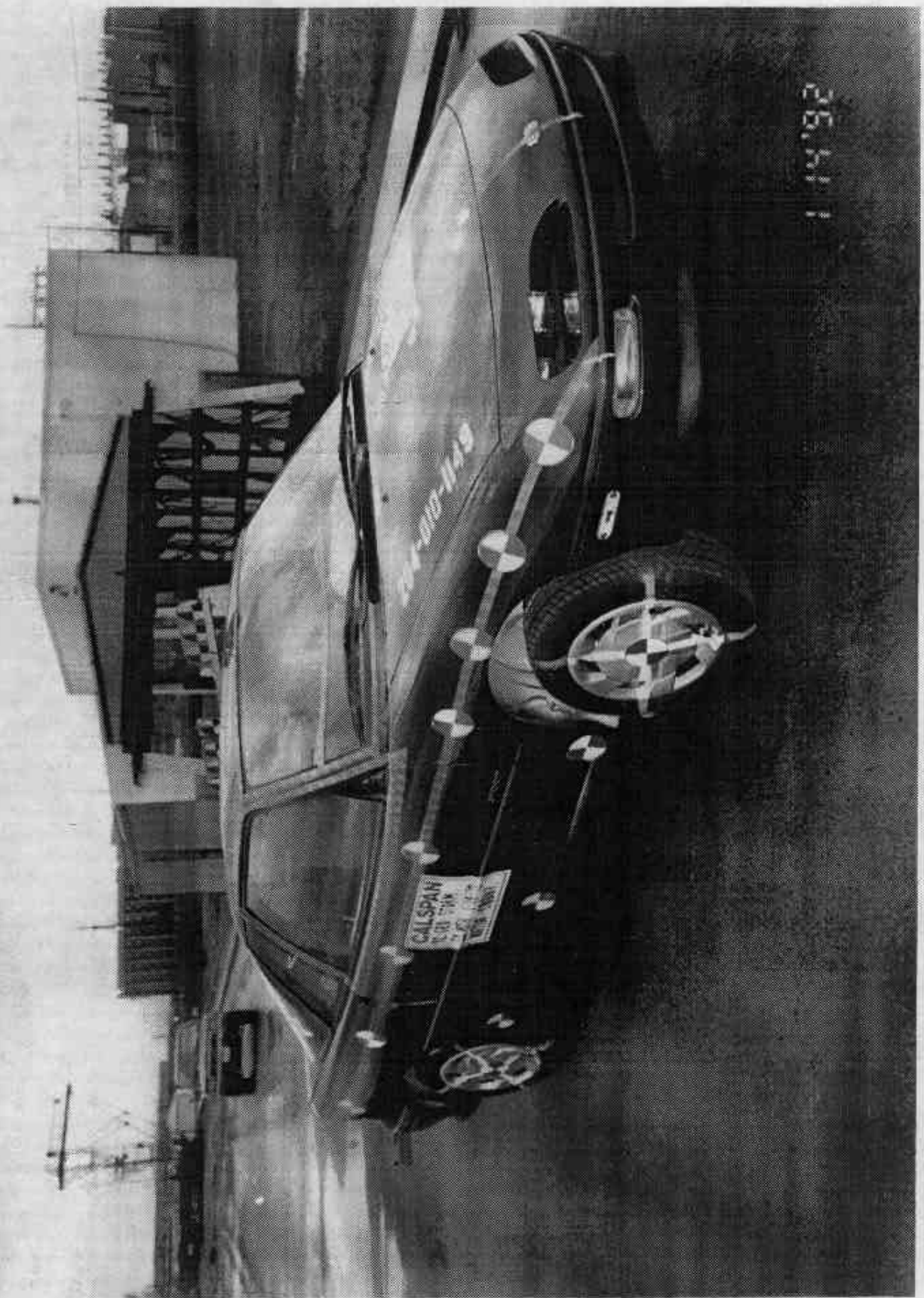


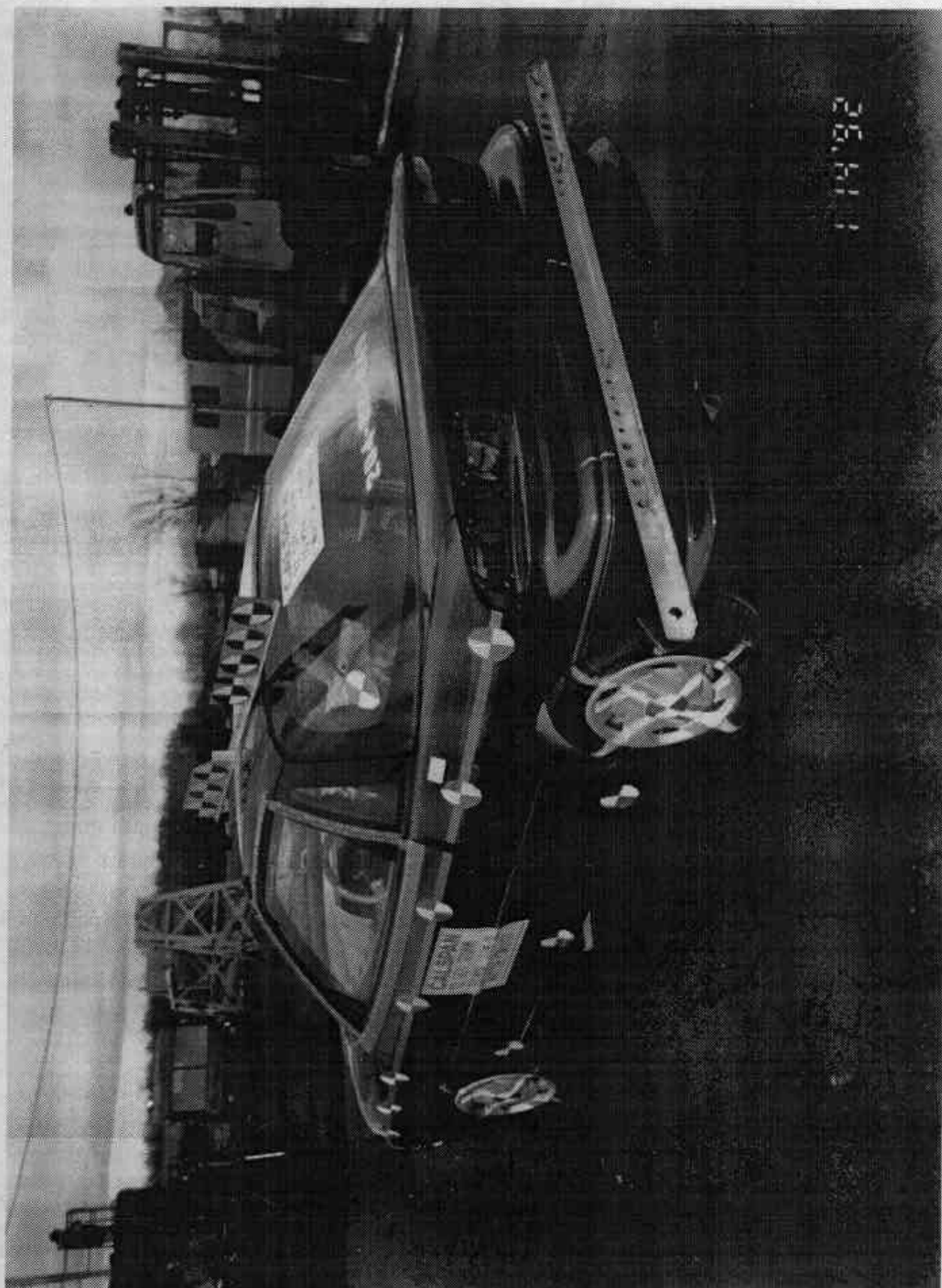
Figure A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



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

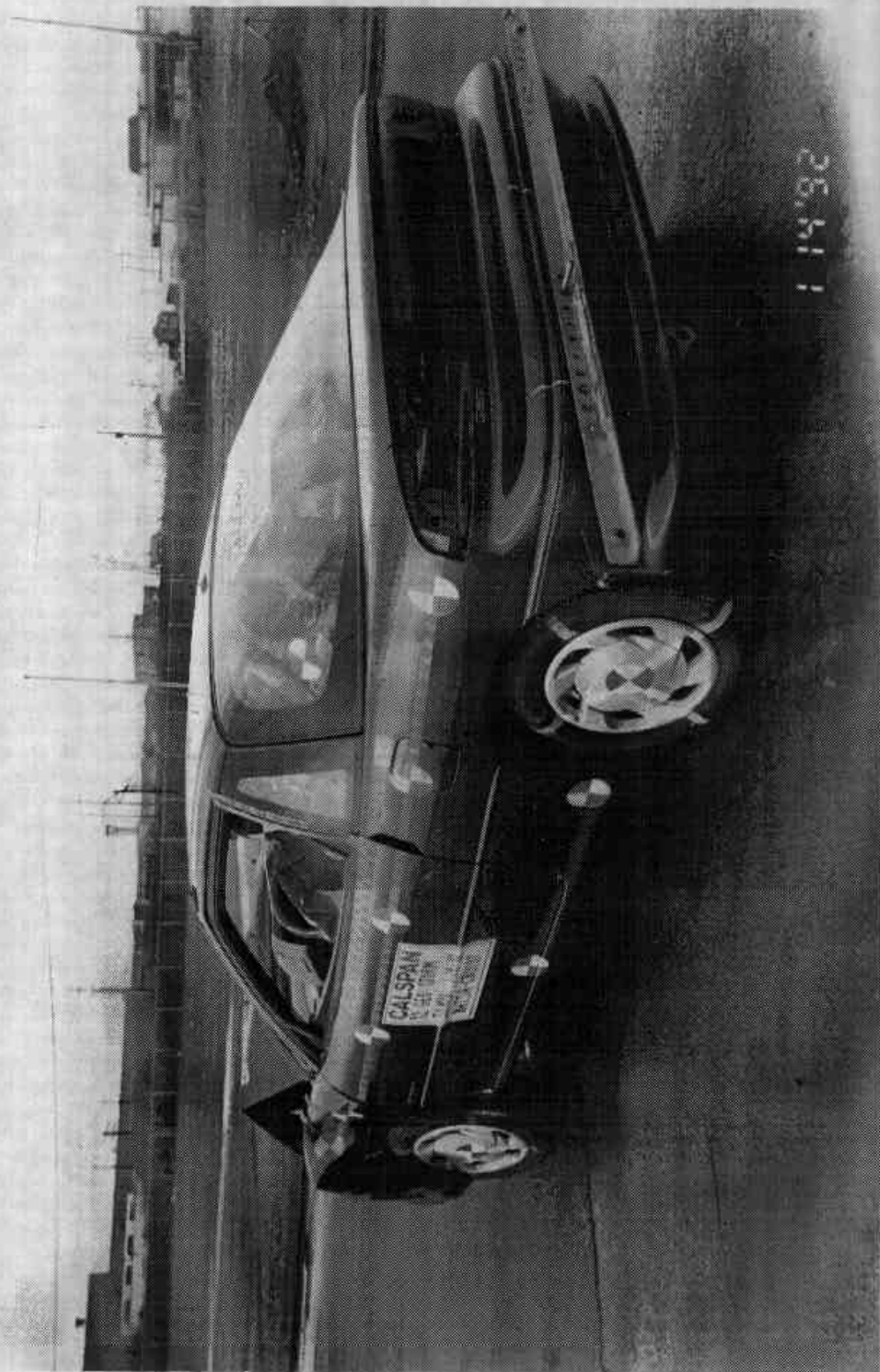
A-10

7979-1



114'92

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



114932

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

A-12

7979-1



Figure A-11 POST-TEST TOP VIEW

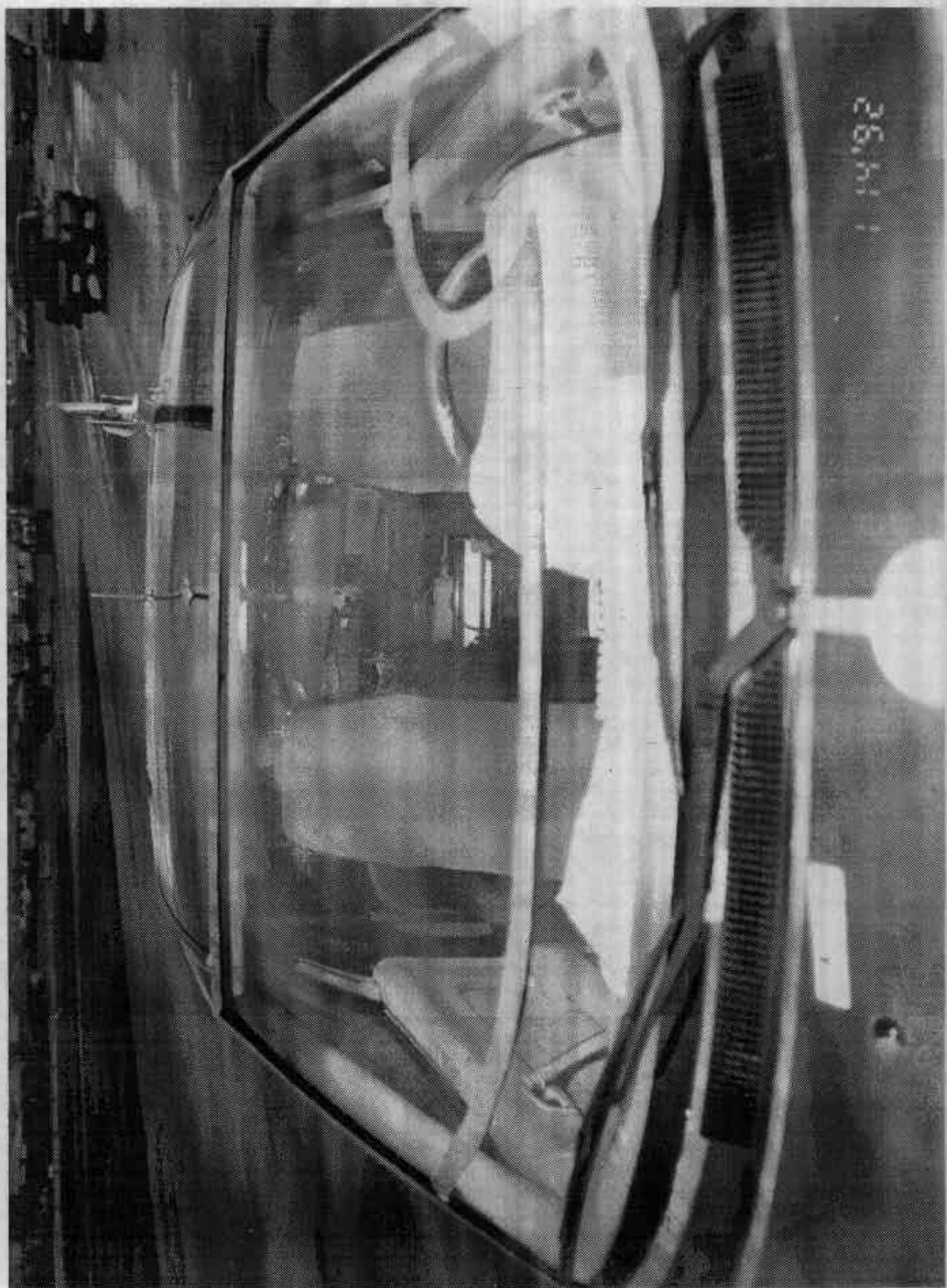


Figure A-12 PRE-TEST WINDSHIELD VIEW

A-14

7979-1



Figure A-13 POST-TEST WINDSHIELD VIEW



Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

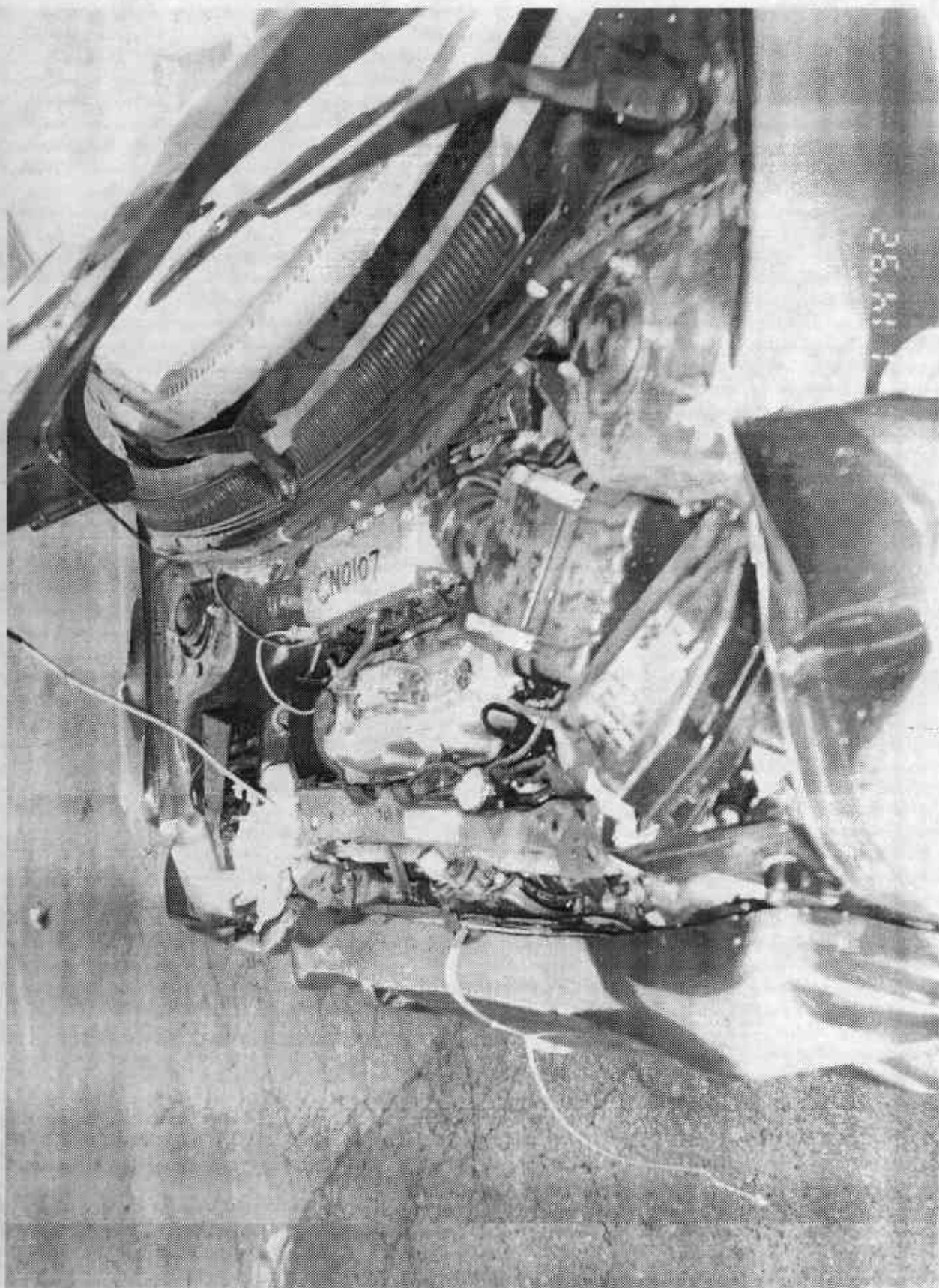


Figure A-15 POST-TEST ENGINE COMPARTMENT VIEW

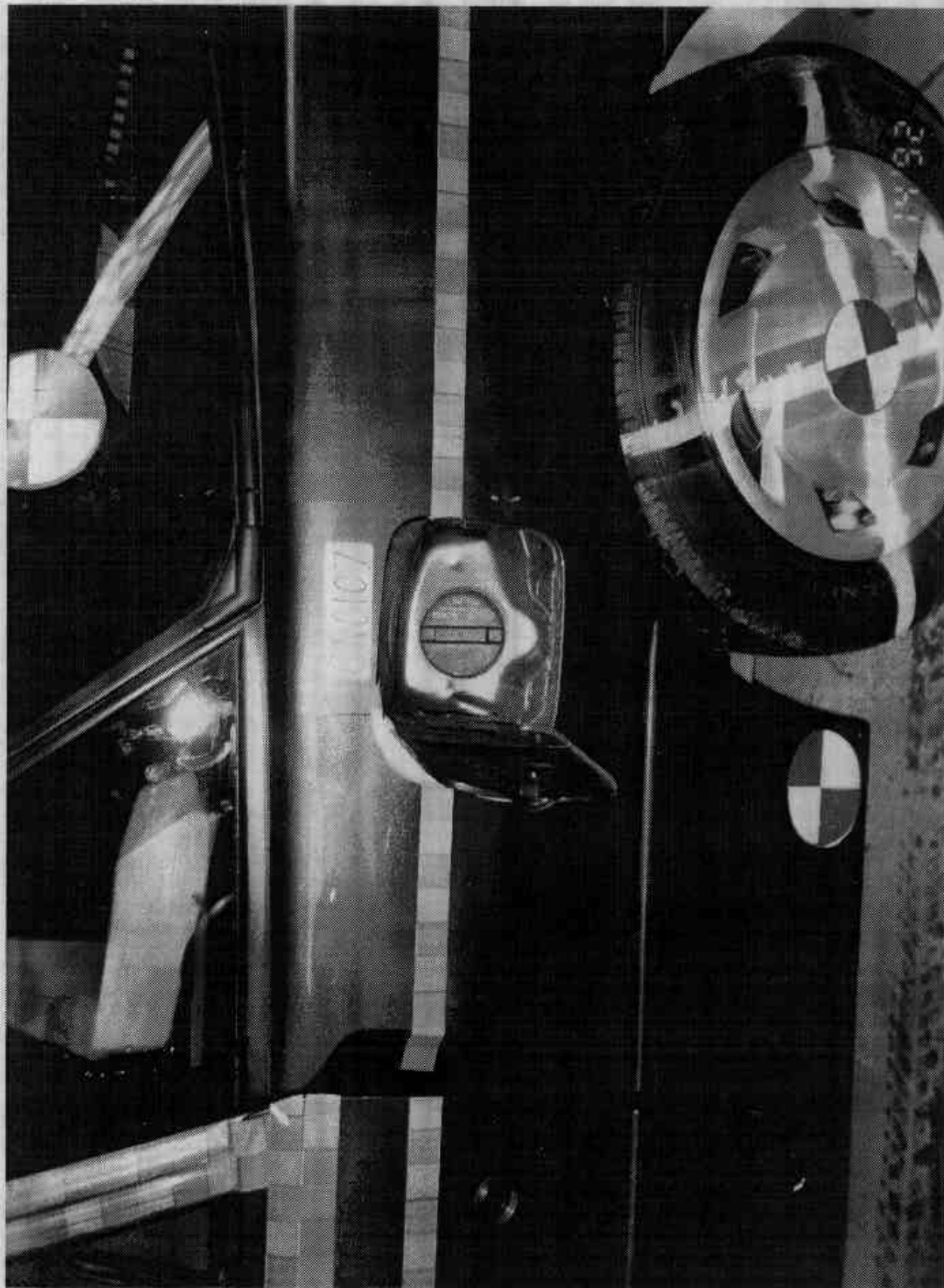


Figure A-16 PRE-TEST FUEL FILLER CAP PHOTO

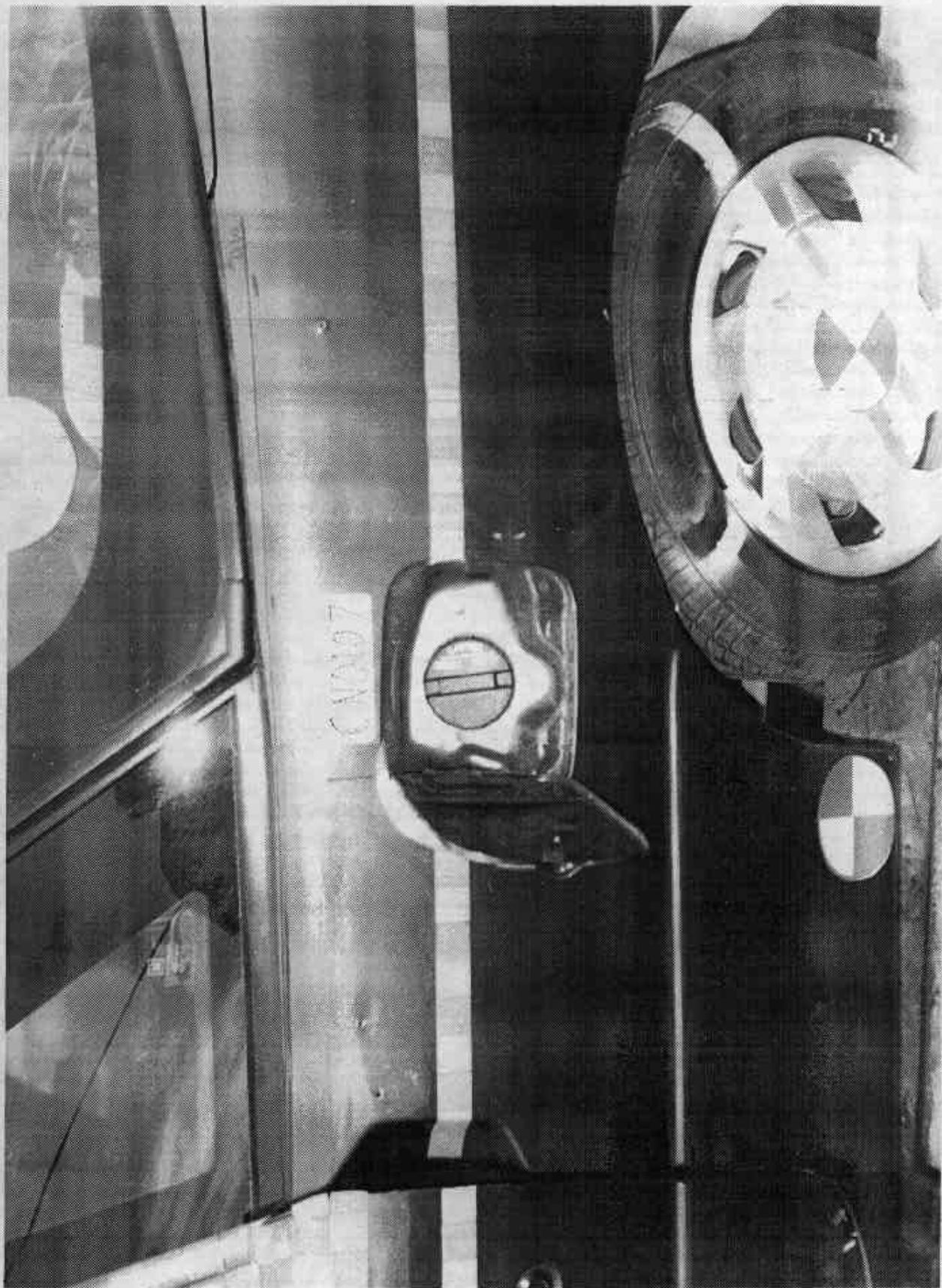


Figure A-17 POST-TEST FUEL FILLER CAP PHOTO

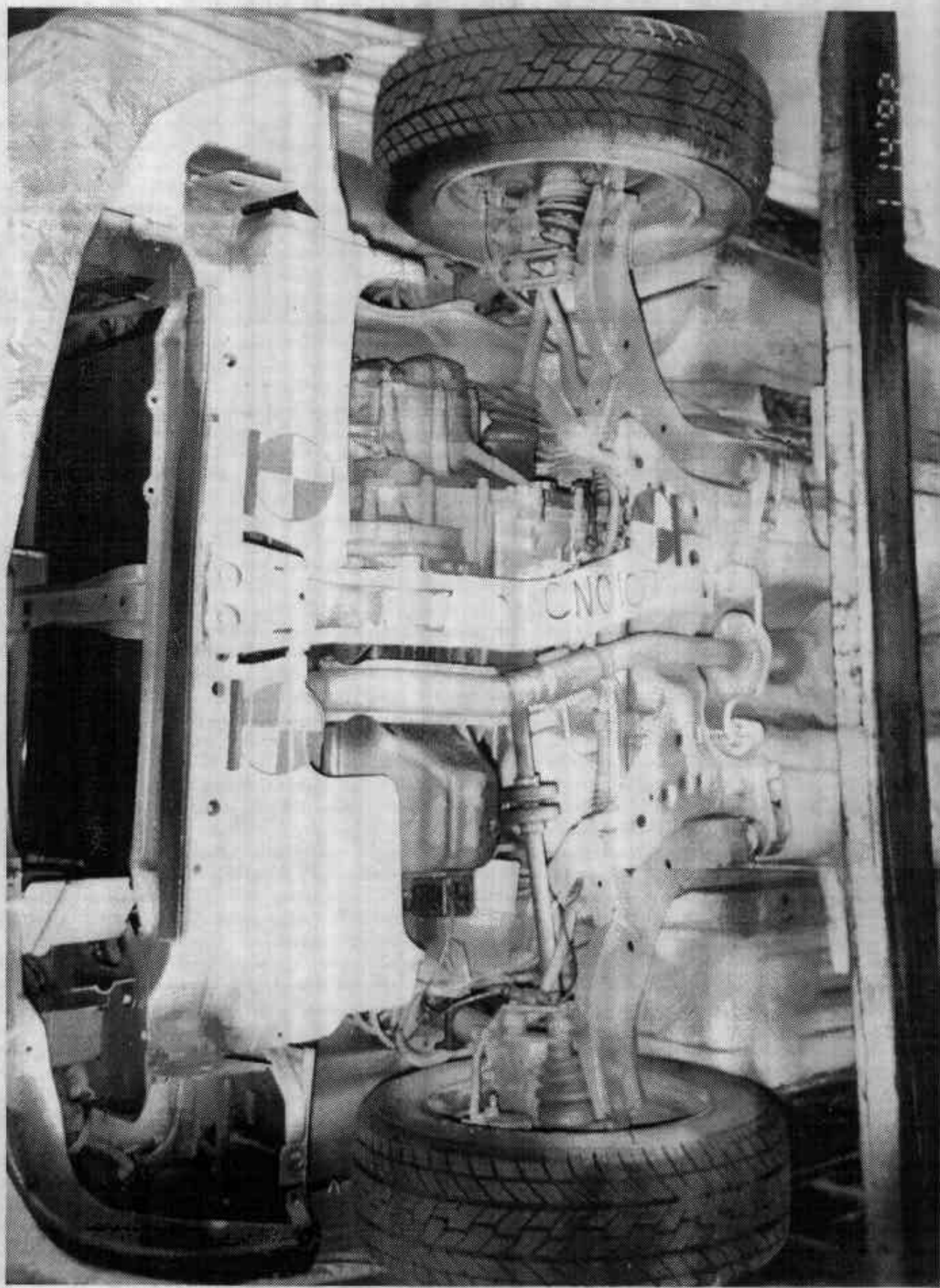


FIGURE A-18. PRE-TEST FRONT UNDERBODY VIEW

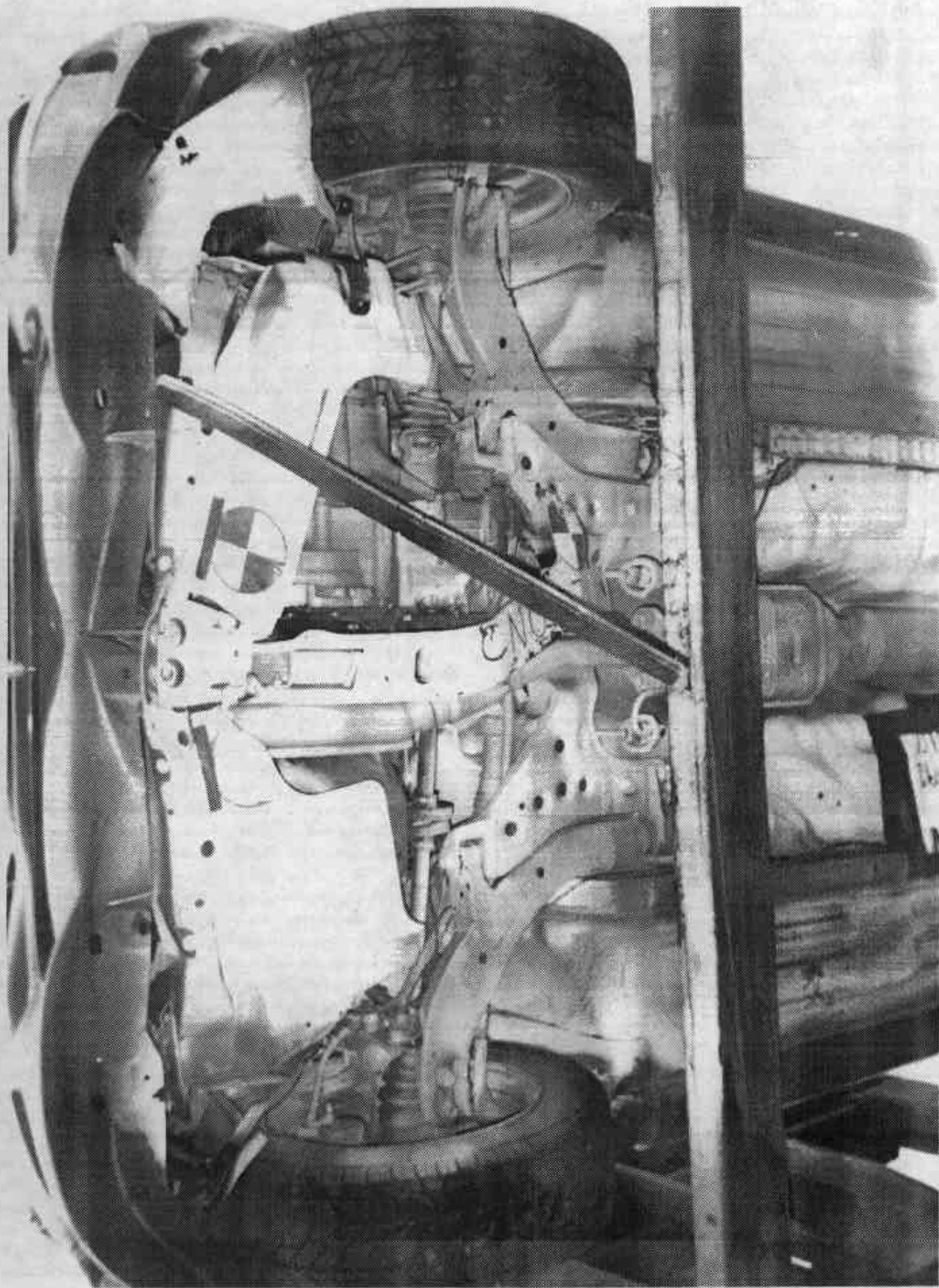


Figure A-19 POST-TEST FRONT UNDERBODY VIEW

A-21

7979-1

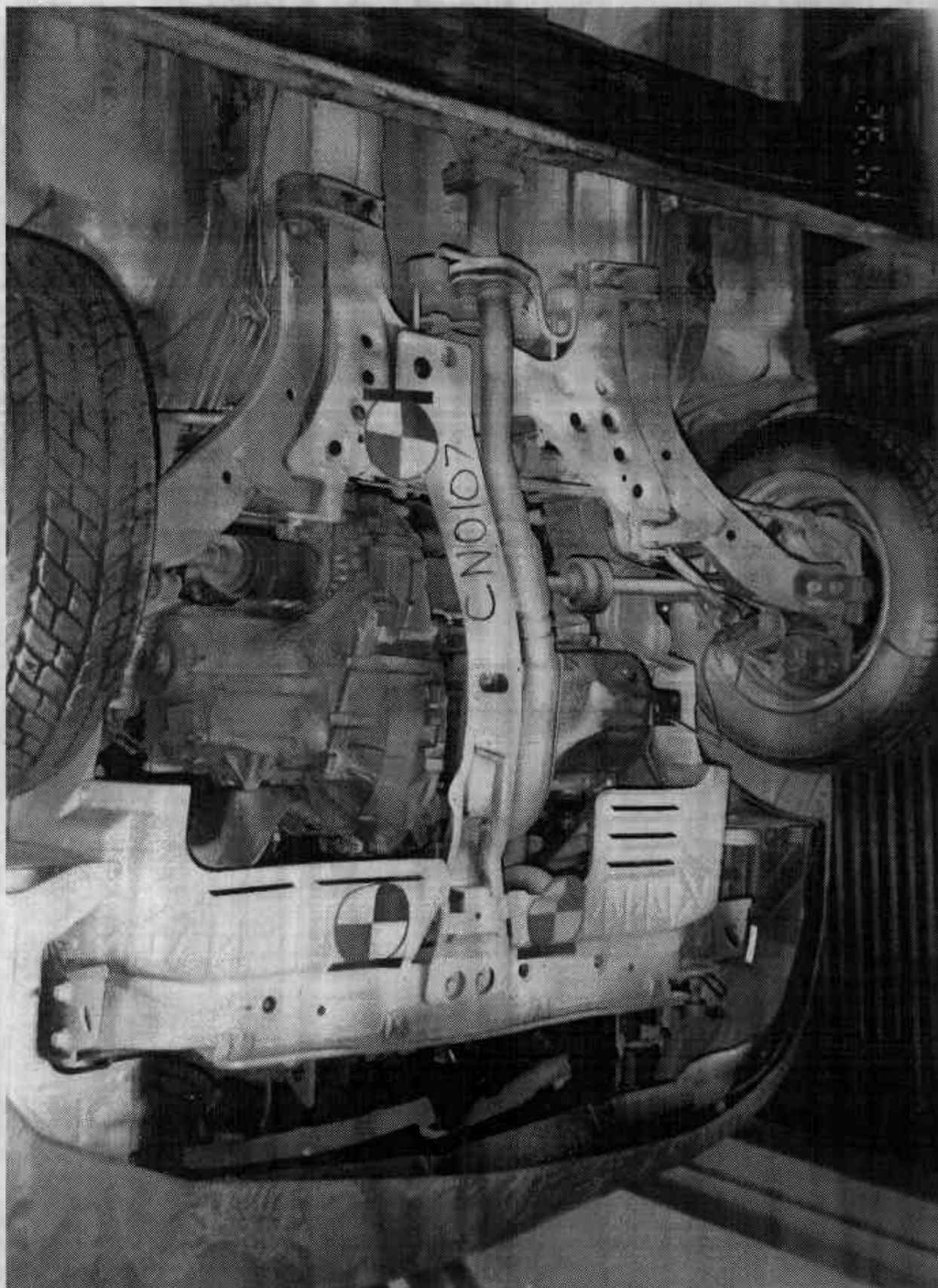


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

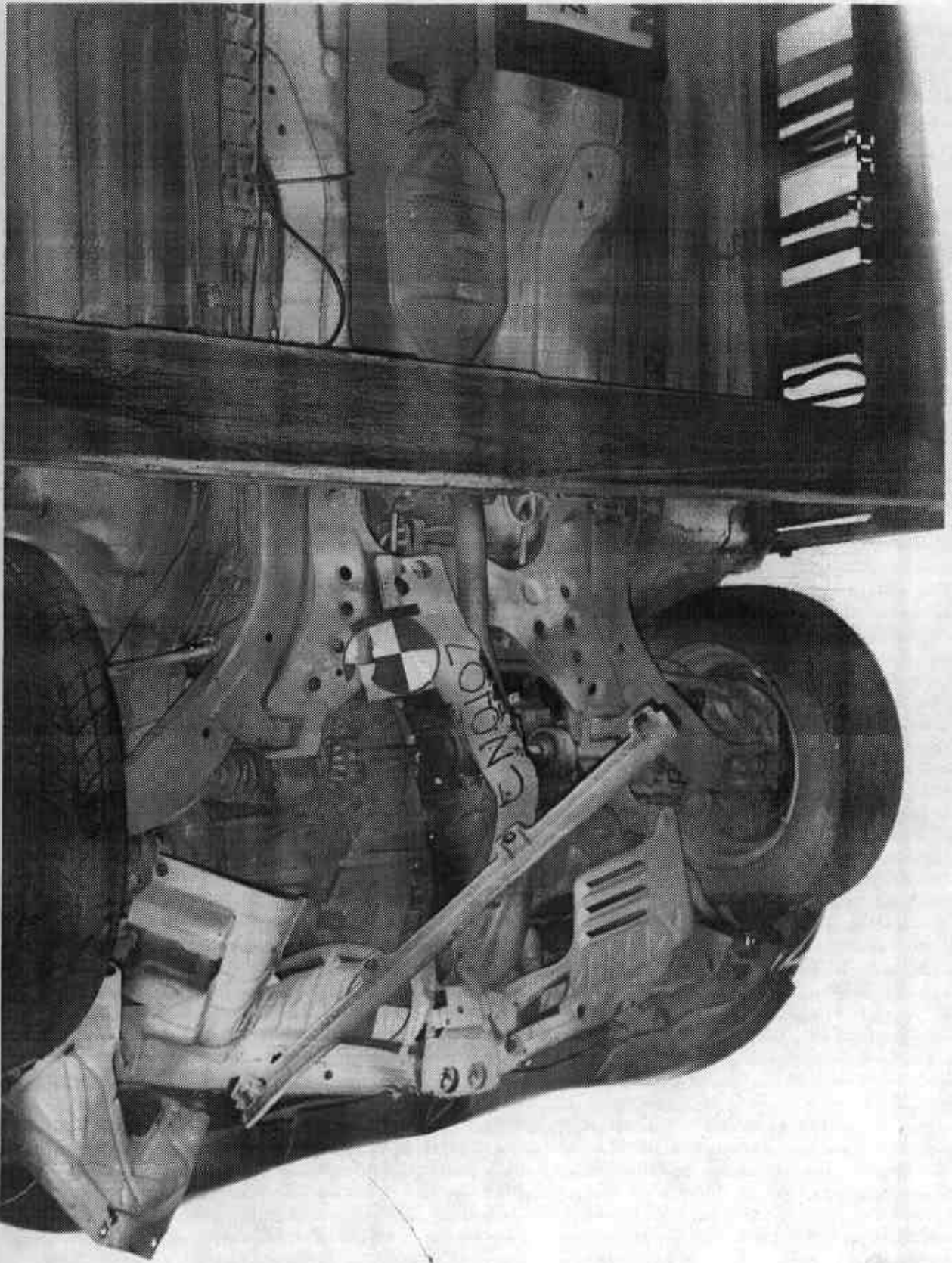


Figure A-21 POST-TEST FRONT SIDE UNDERBODY VIEW



Figure A-22 PRE-TEST REAR UNDERBODY VIEW

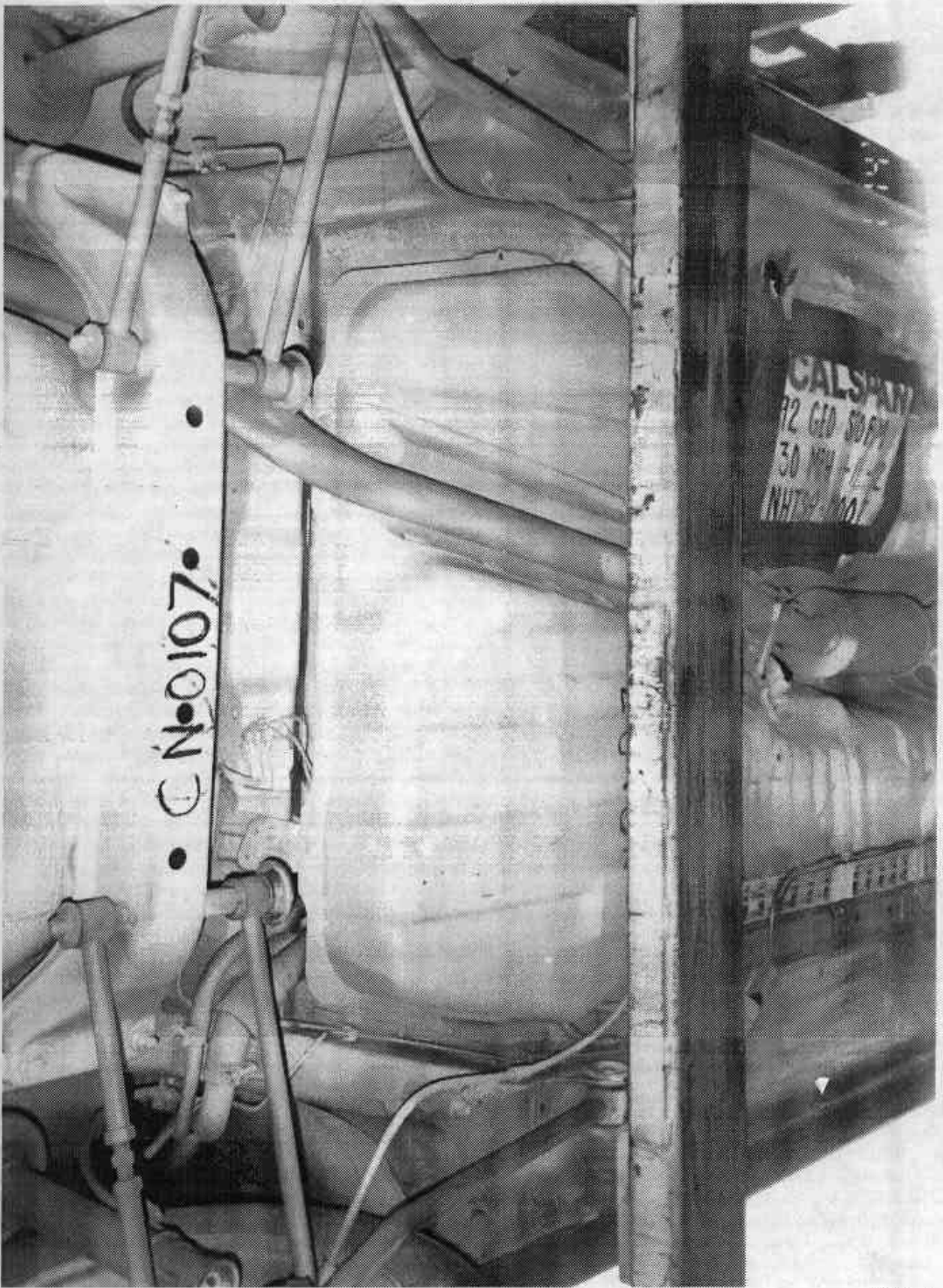


Figure A-23 POST-TEST REAR UNDERBODY VIEW



MANUFACTURED BY
ISUZU MOTORS LIMITED
IN JAPAN 07/91

GVWR 3131LBS
GAWR FT. 1804LBS RR. 1376LBS

THIS VEHICLE CONFORMS TO
ALL APPLICABLE FEDERAL
MOTOR VEHICLE SAFETY,
BUMPER AND THEFT
PREVENTION STANDARDS IN
EFFECT ON THE DATE OF
MANUFACTURE SHOWN ABOVE

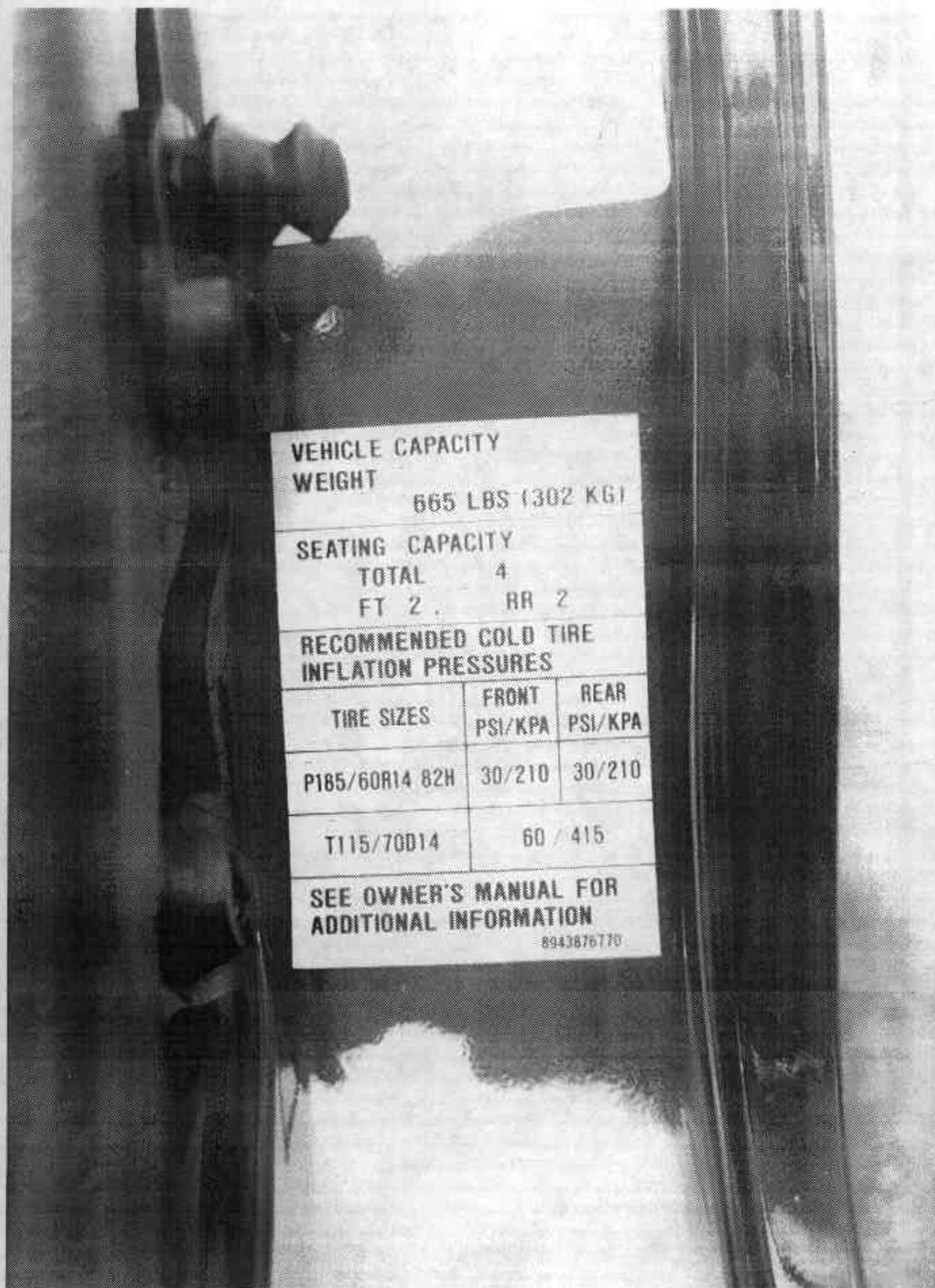
J81RF2361N7509431

PASSENGER CAR

VEHICLE CAPACITY
WEIGHT

665 LBS (302 KG)

SEATING CAPACITY



VEHICLE CAPACITY
WEIGHT

665 LBS (302 KG)

SEATING CAPACITY

TOTAL 4

FR 2 RR 2

RECOMMENDED COLD TIRE
INFLATION PRESSURES

TIRE SIZES	FRONT PSI/KPA	REAR PSI/KPA
P185/60R14 82H	30/210	30/210
T115/70D14	60 / 415	

SEE OWNER'S MANUAL FOR
ADDITIONAL INFORMATION

8943876770

Figure A-25 TIRE PLACARD



Figure A-26 PRE-TEST DRIVER DUMMY POSITION



Figure A-27 POST-TEST DRIVER DUMMY POSITION

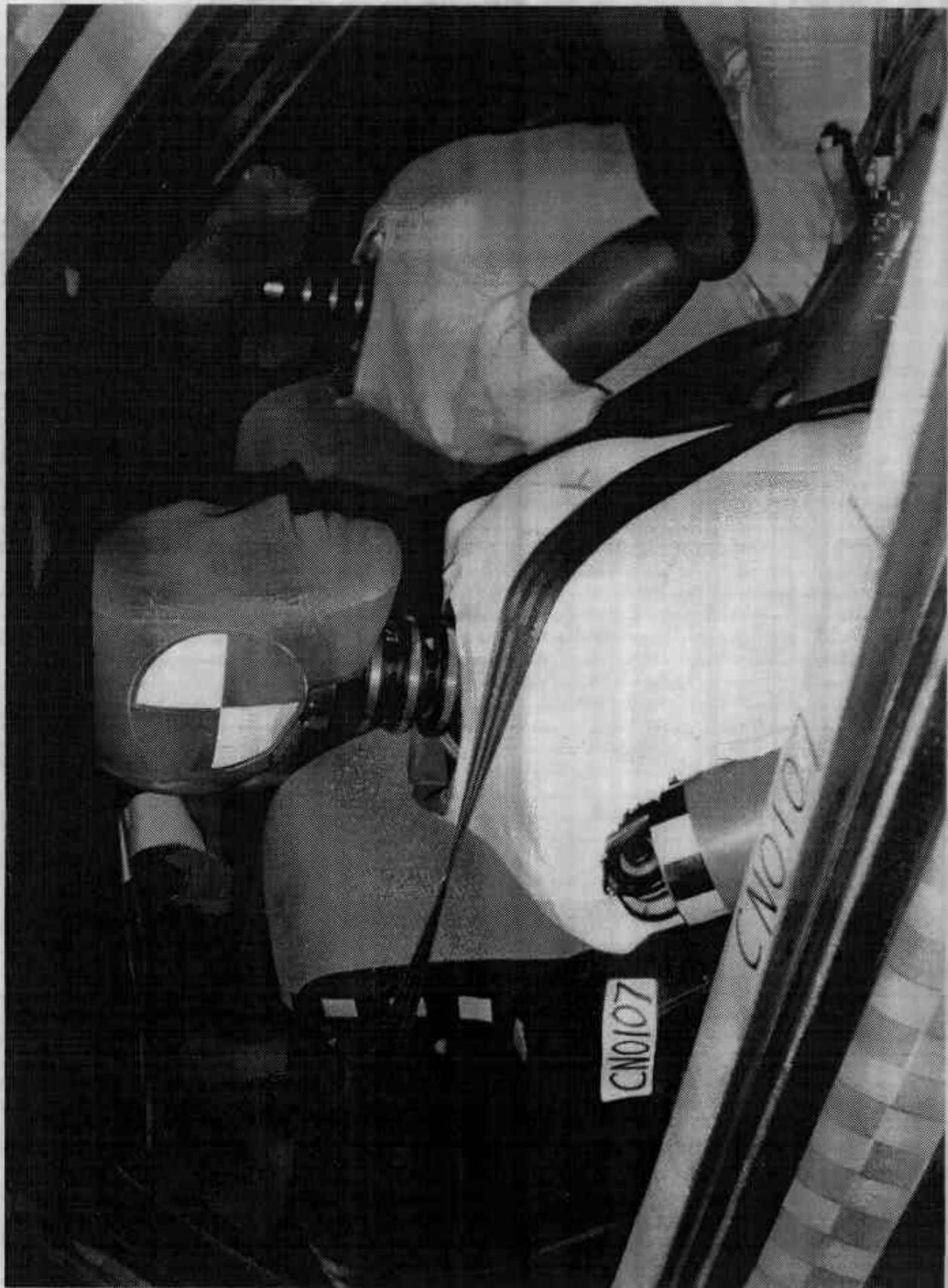


FIGURE A-28 PRE-TEST PASSENGER DUMMY POSITION

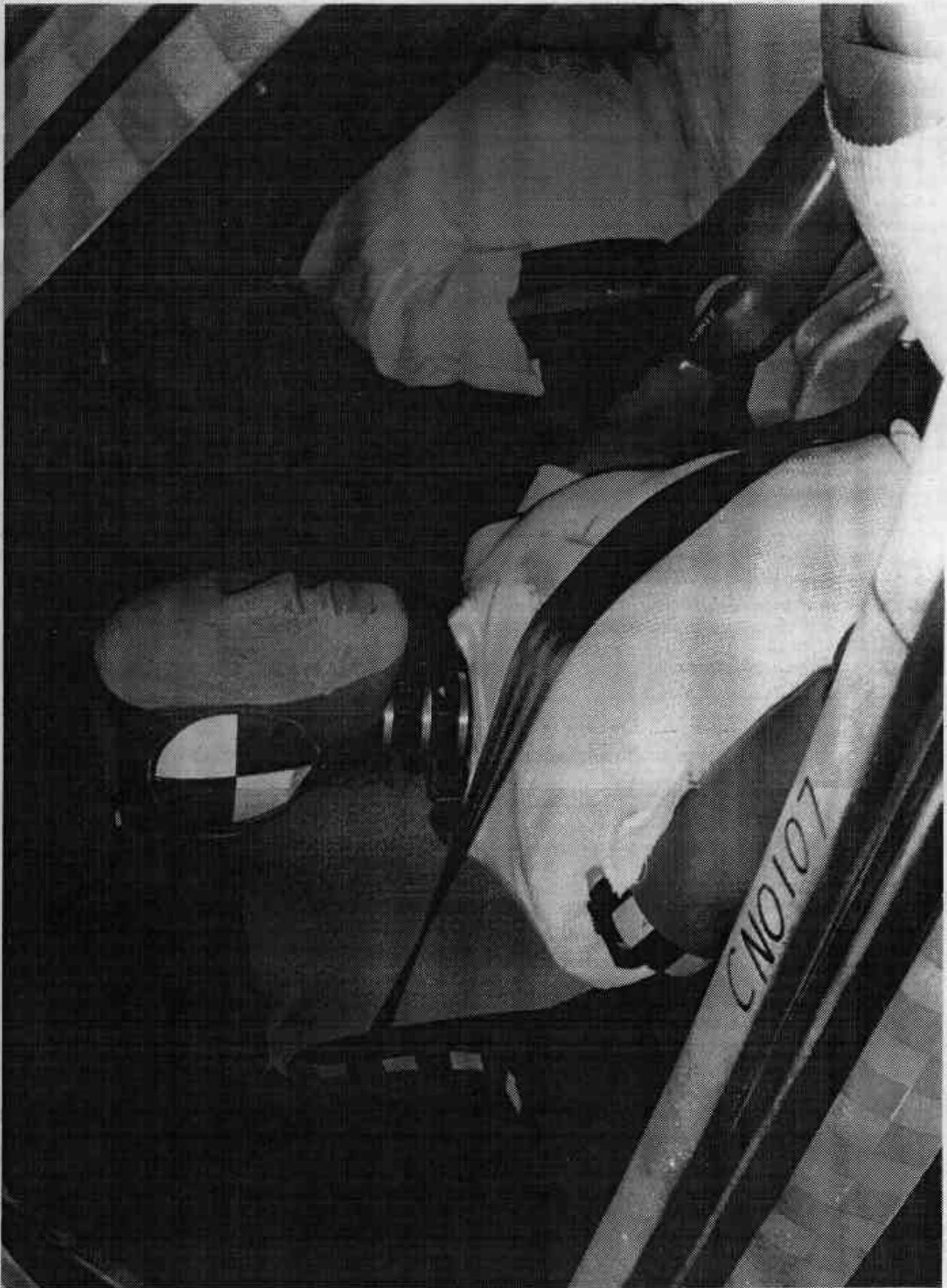


Figure A-29 POST-TEST PASSENGER DUMMY POSITION



Figure A-30. PRE-TEST DRIVER DUMMY AND INTERIOR VIEW



Figure A-31. POST-TEST DRIVER DUMMY AND INTERIOR VIEW



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



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



Figure A-34 POST-TEST DRIVER AIRBAG VIEW

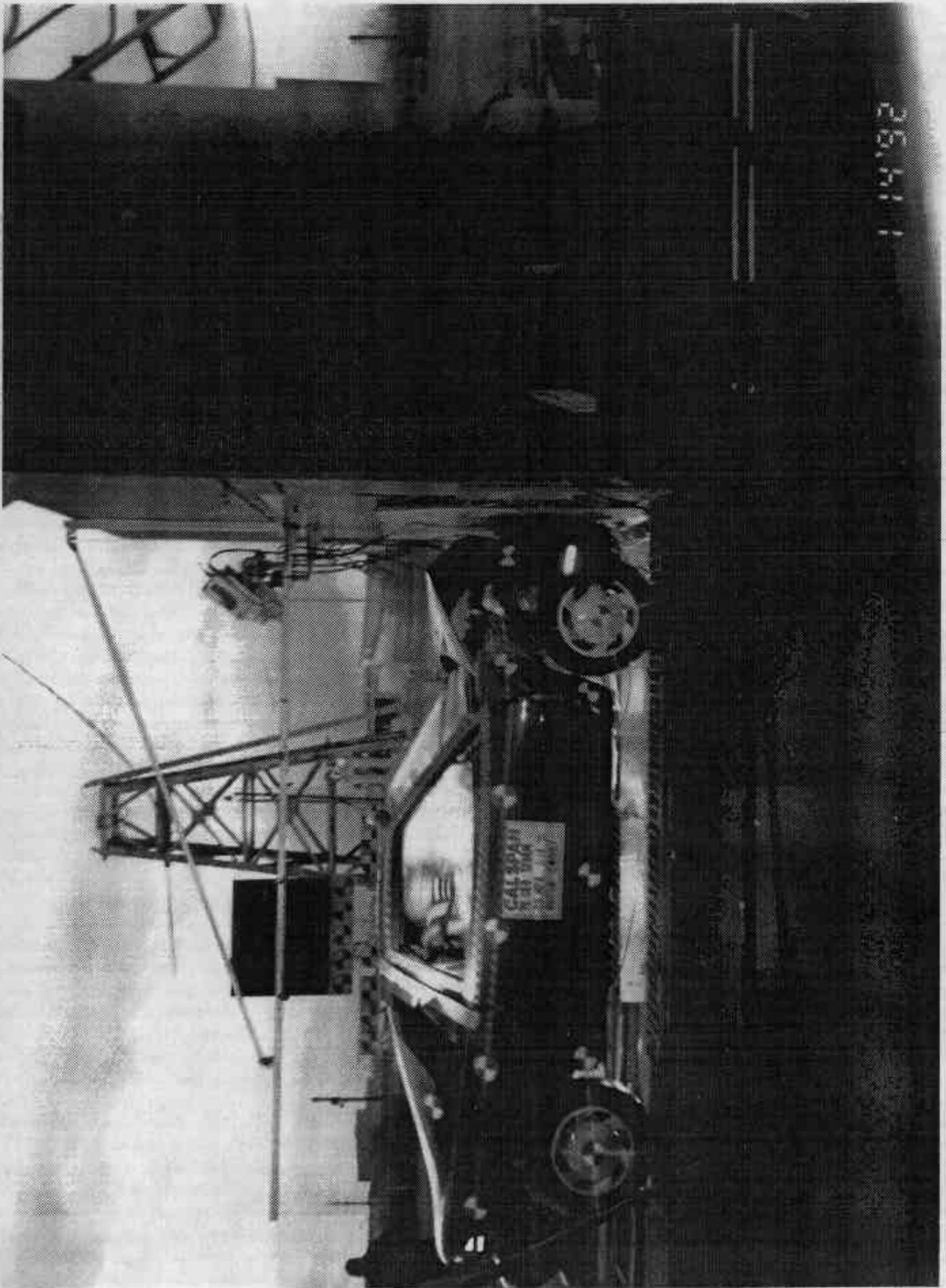


Figure A-35 VEHICLE IMPACT

A-37

7979-1

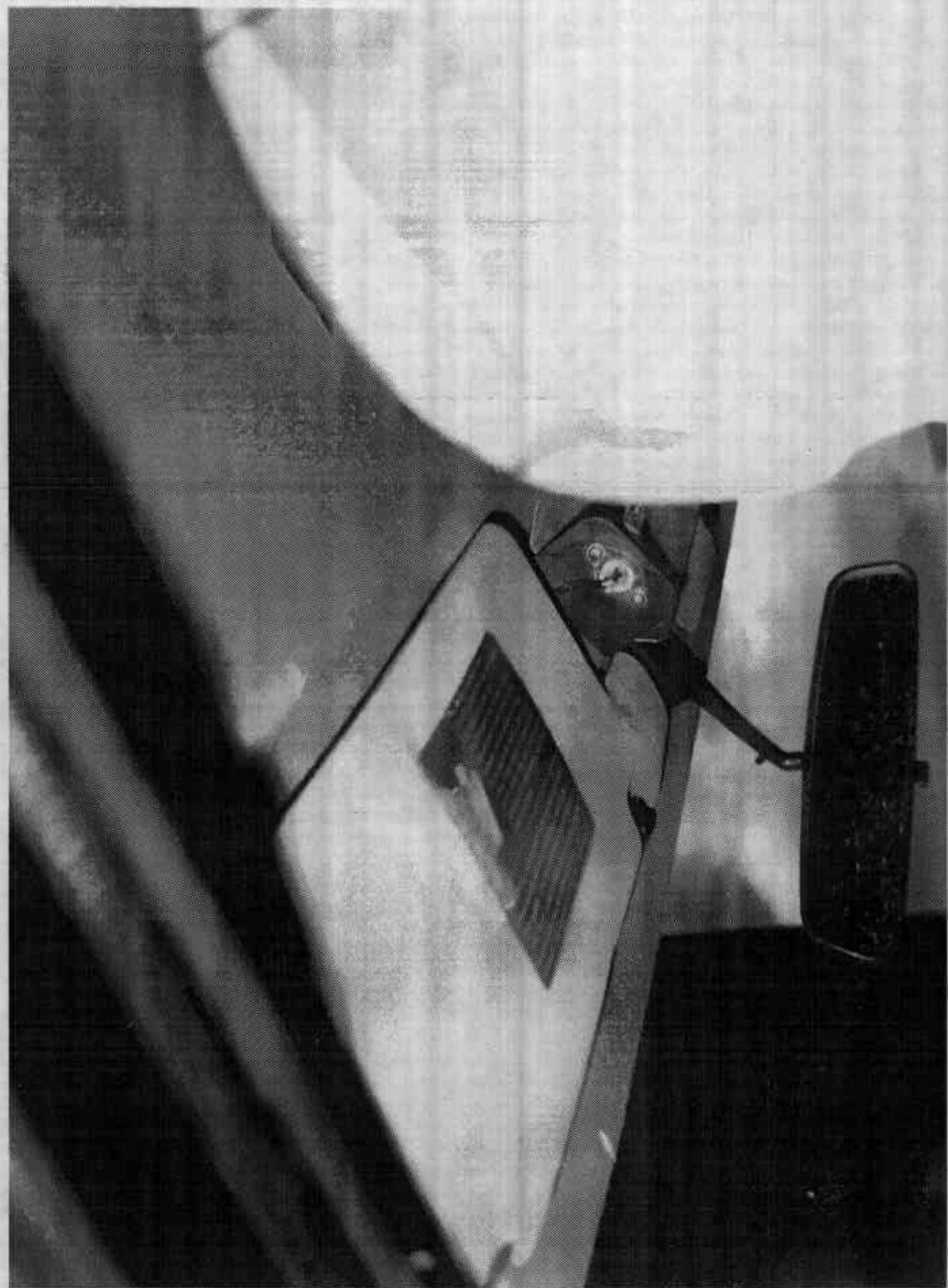


Figure A-36 DRIVER HEAD CONTACT WITH SUNVISOR

A-38

7879-1

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

Calspan meets and follows
the requirements of SAEJ211.

TEST NO. CN0107

VEHICLE DATA

SAE FILTER CHANNEL CLASS

60

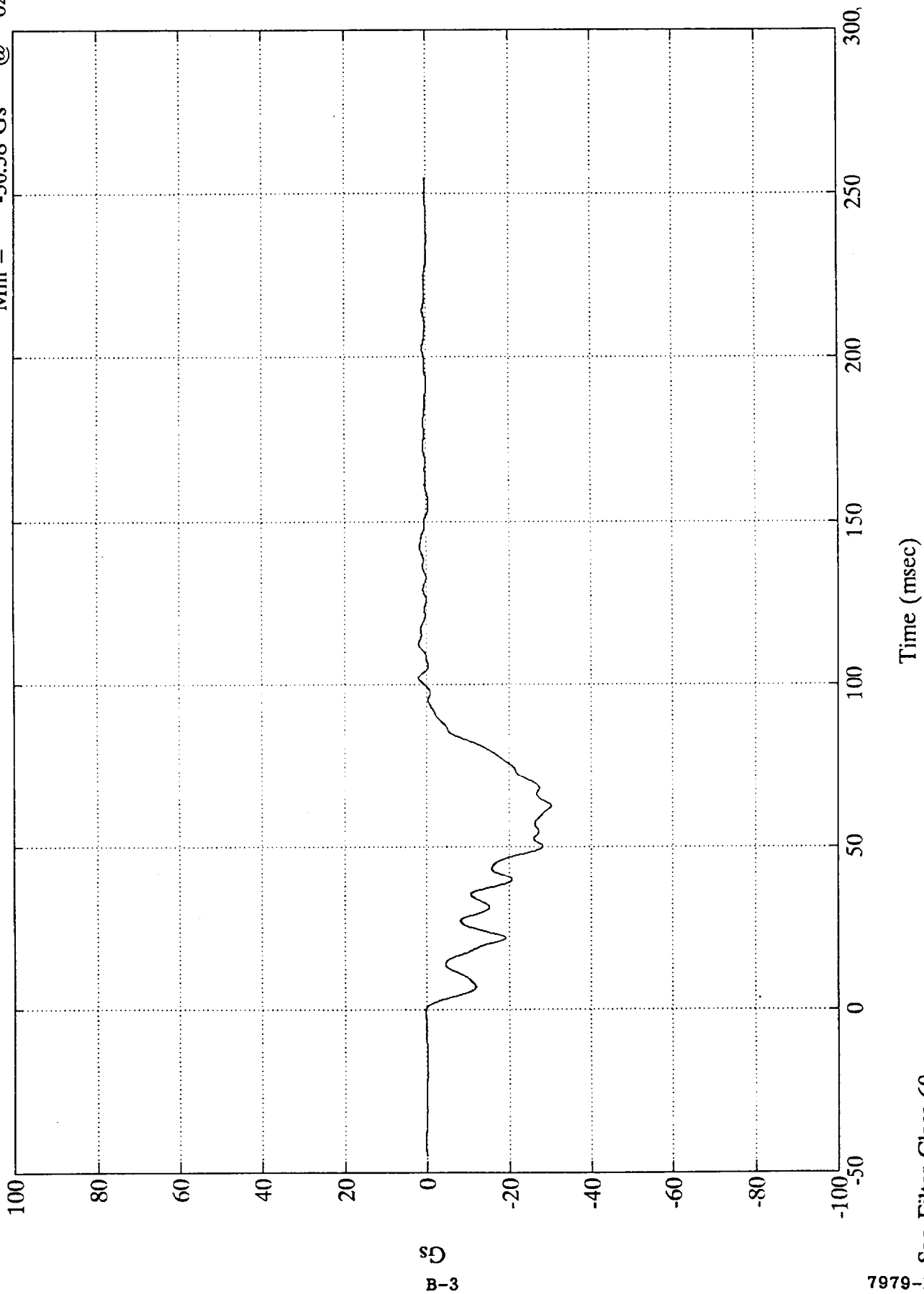
NHTSA "208" TEST 9 - 1992 GEO STORM

L. Rear X-member X (#1)

Max =
Min =

1.96 Gs
-30.38 Gs

@ 101.87 msec
@ 62.51 msec



B-3

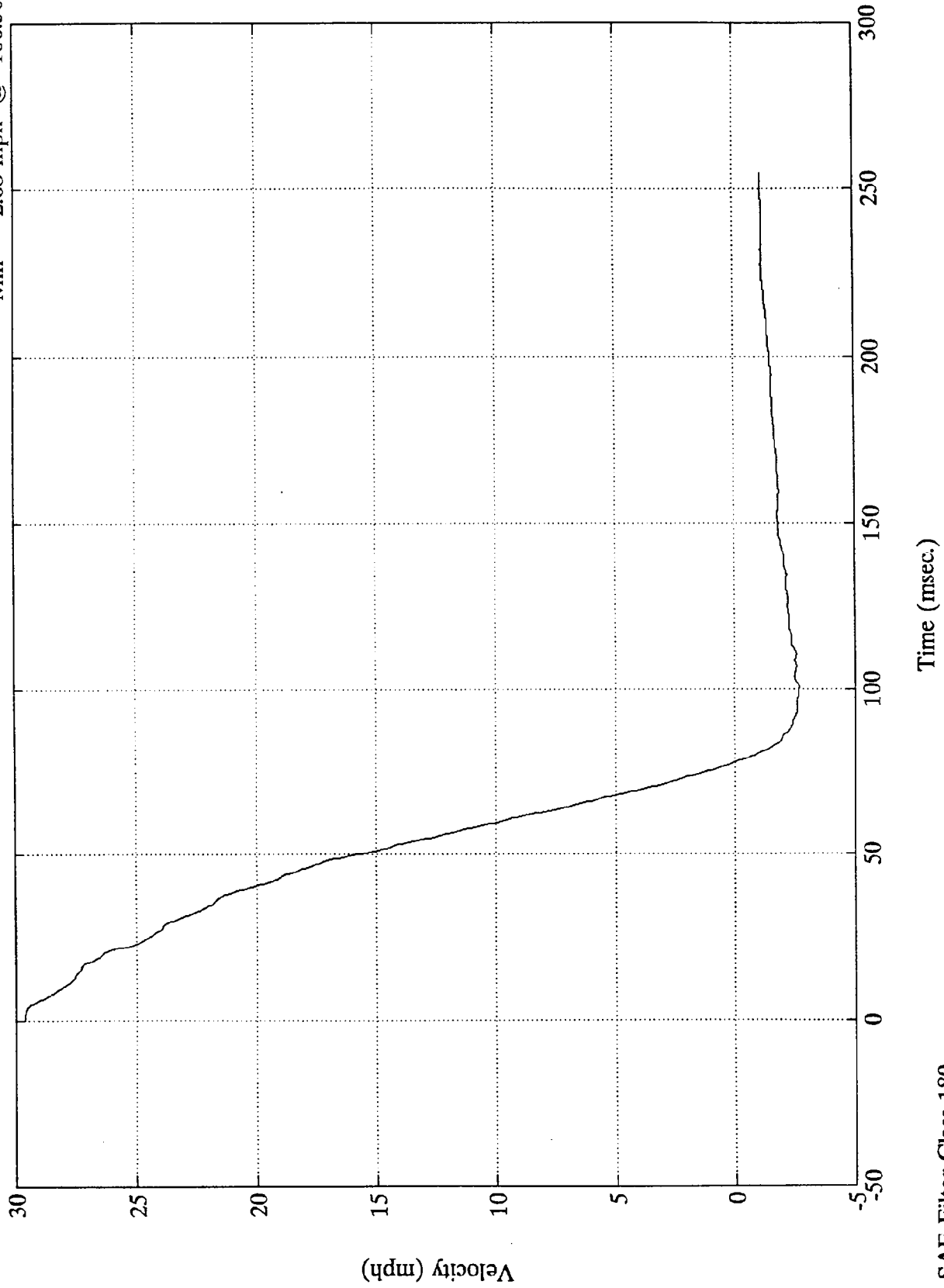
7979-1

Sae Filter Class 60

NHTSA "208" TEST 9 - 1992 GEO STORM

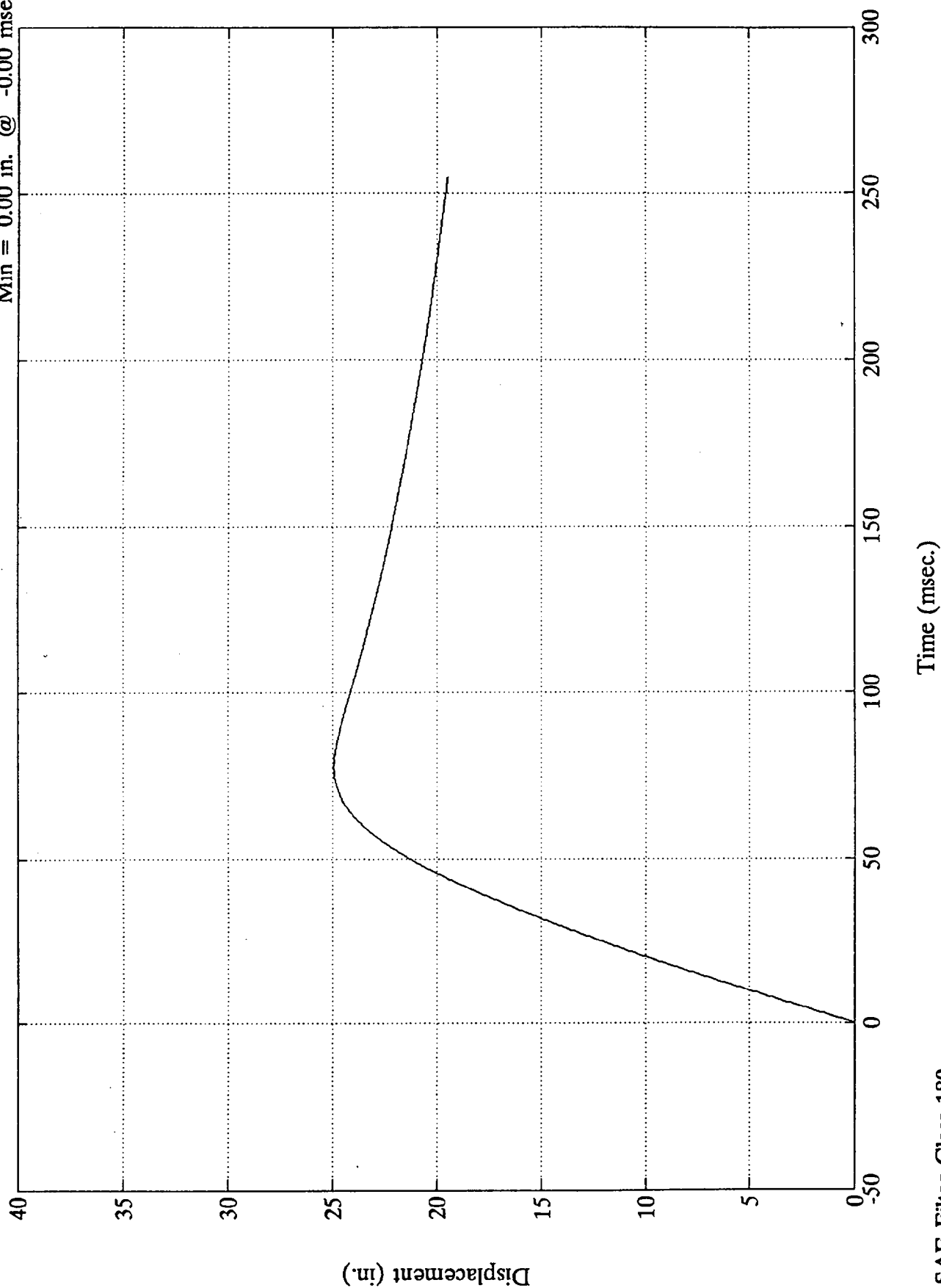
L. Rear X-member X (#1)

Max = 29.60 mph @ 1.92 msec
Min = -2.68 mph @ 100.56 msec



L. Rear X-member X (#1)

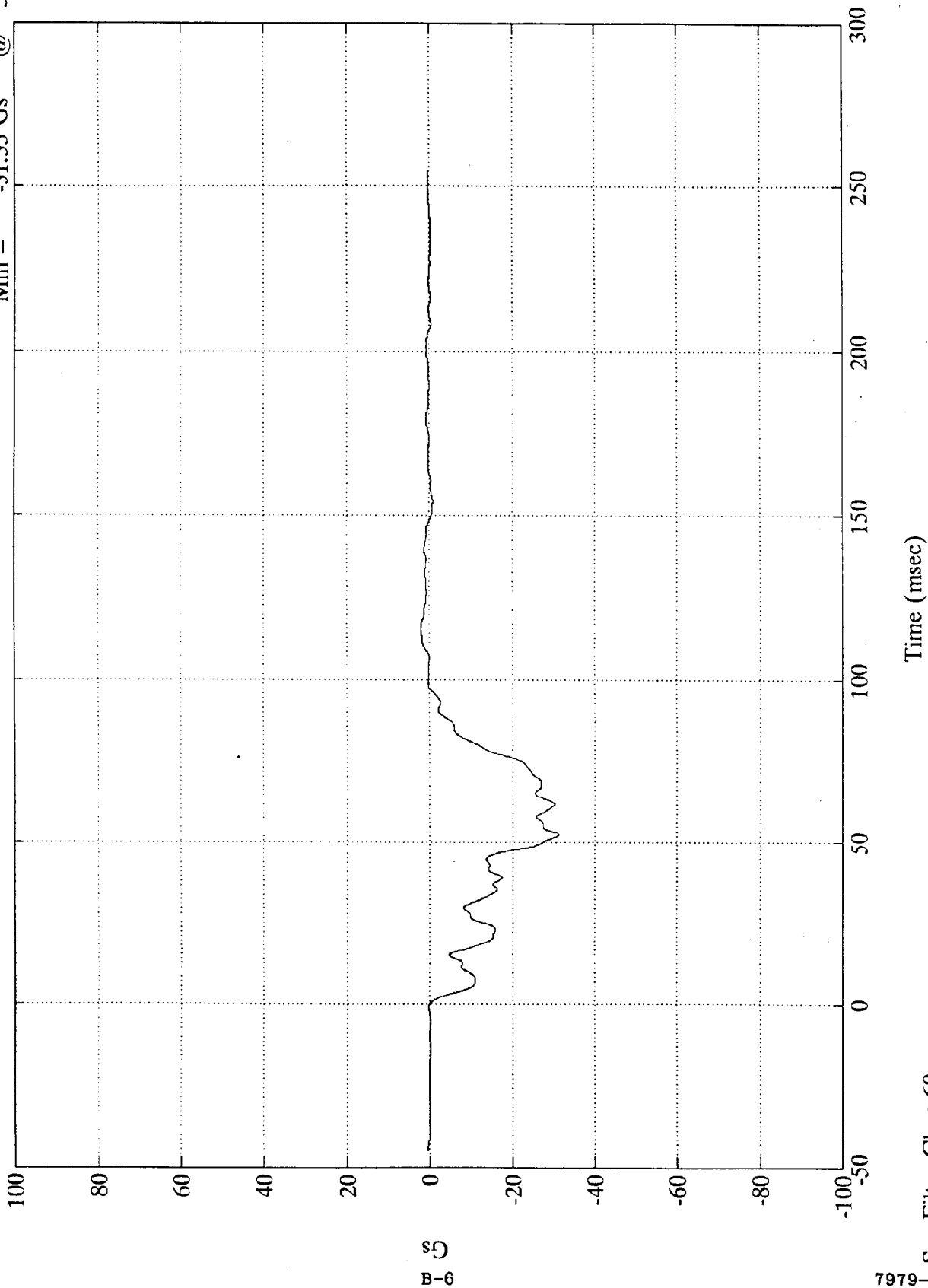
Max = 24.95 in. @ 78.24 msec
Min = 0.00 in. @ -0.00 msec



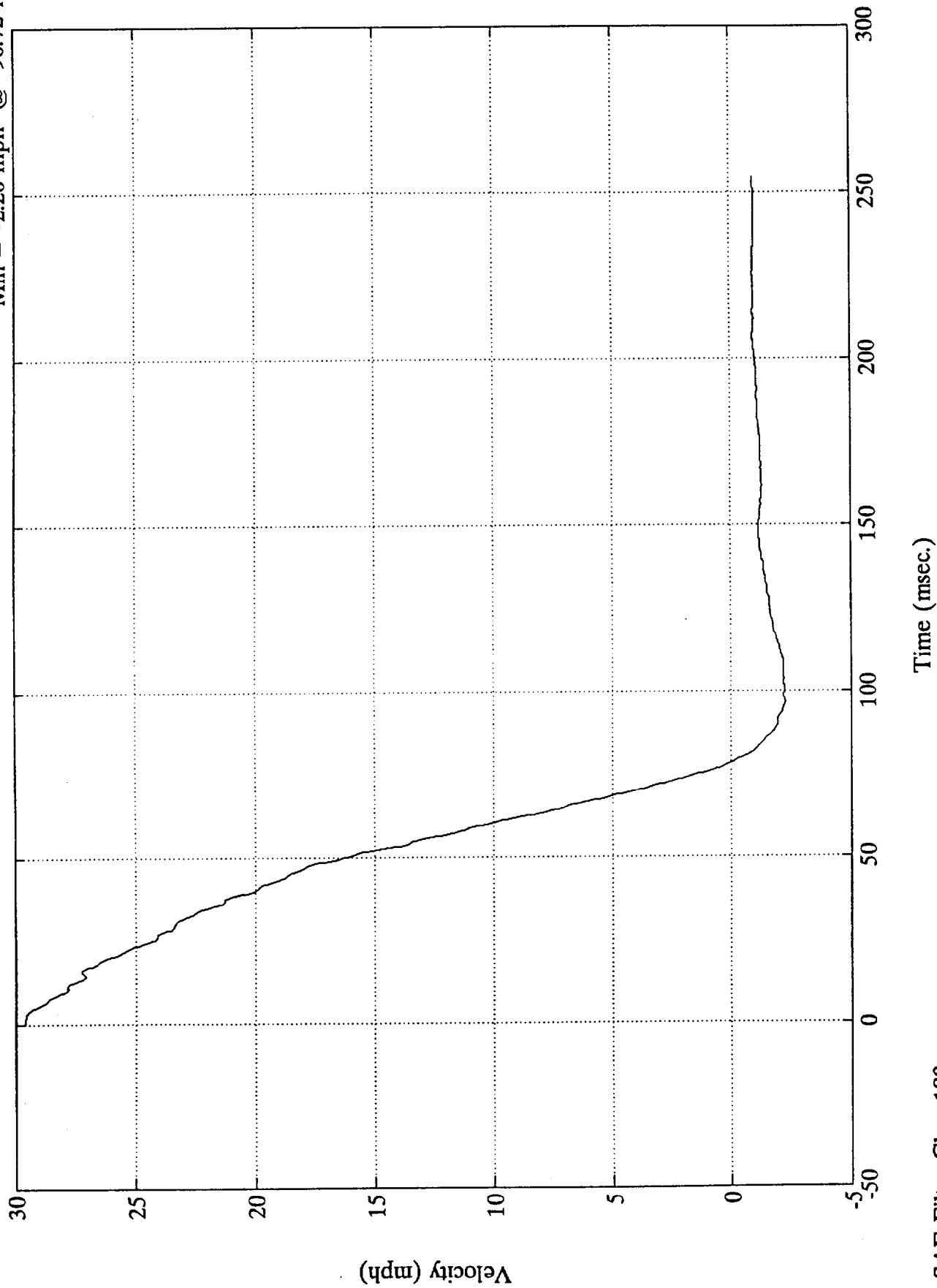
NHTSA "208" TEST 9 - 1992 GEO STORM

R. Rear X-member X (#2)

Max = 2.13 Gs @ 115.08 msec
 Min = -31.33 Gs @ 52.44 msec



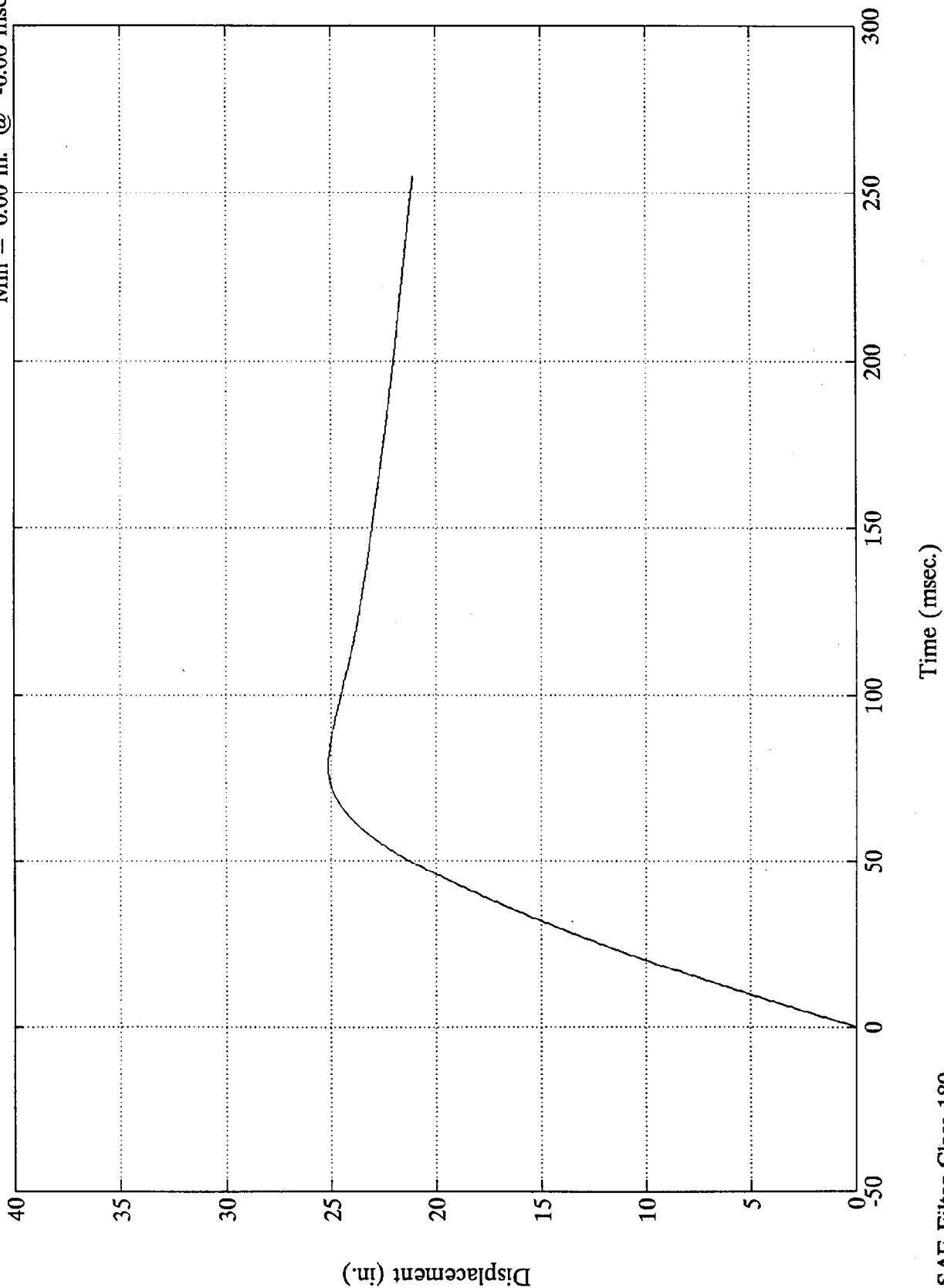
B-6



NHTSA "208" TEST 9 - 1992 GEO STORM

R. Rear X-member X (#2)

Max = 25.14 in. @ 80.16 msec
Min = 0.00 in. @ -0.00 msec



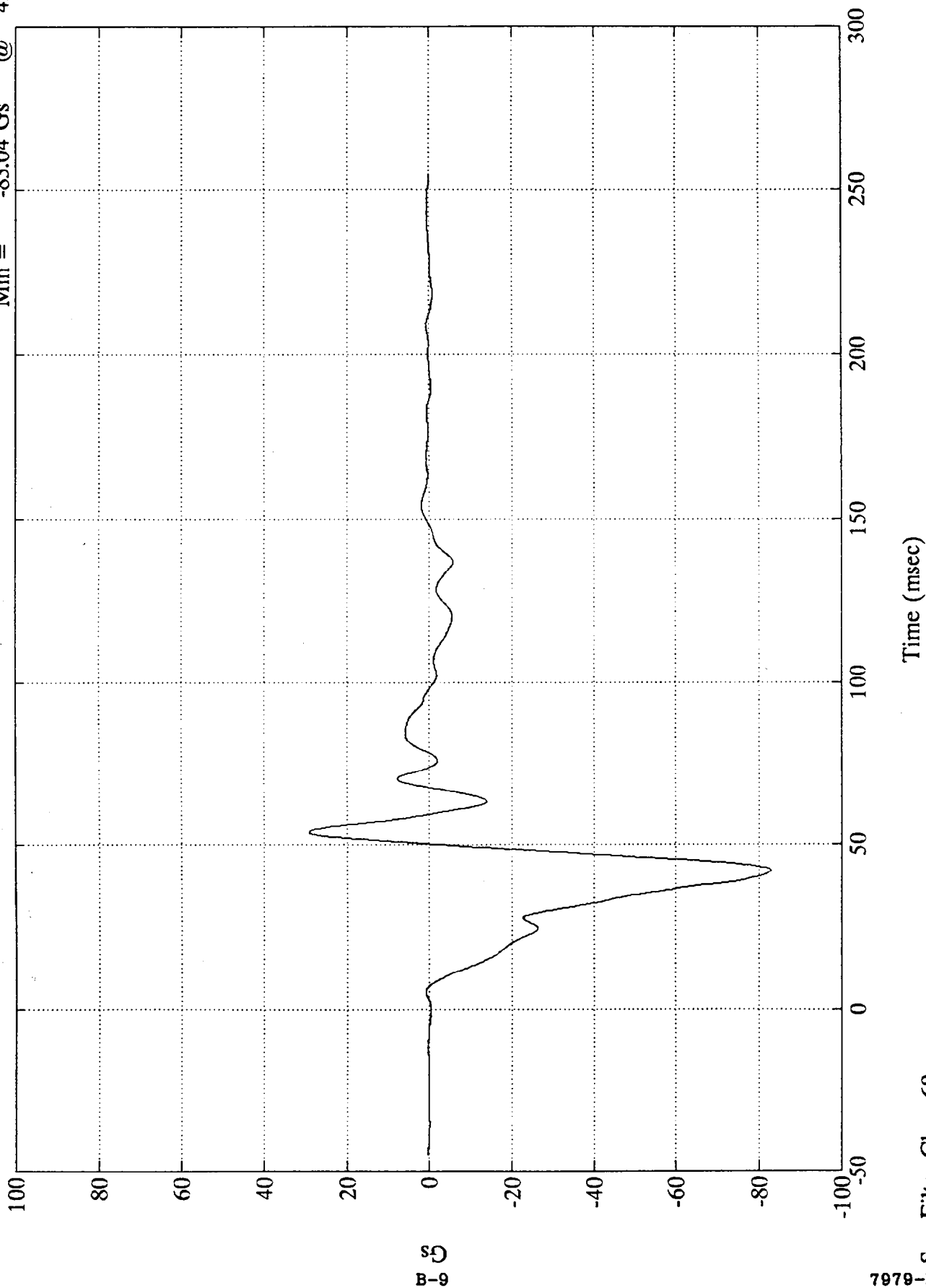
8-B

1-6979

SAE Filter Class 180

Engine Top X (#3)

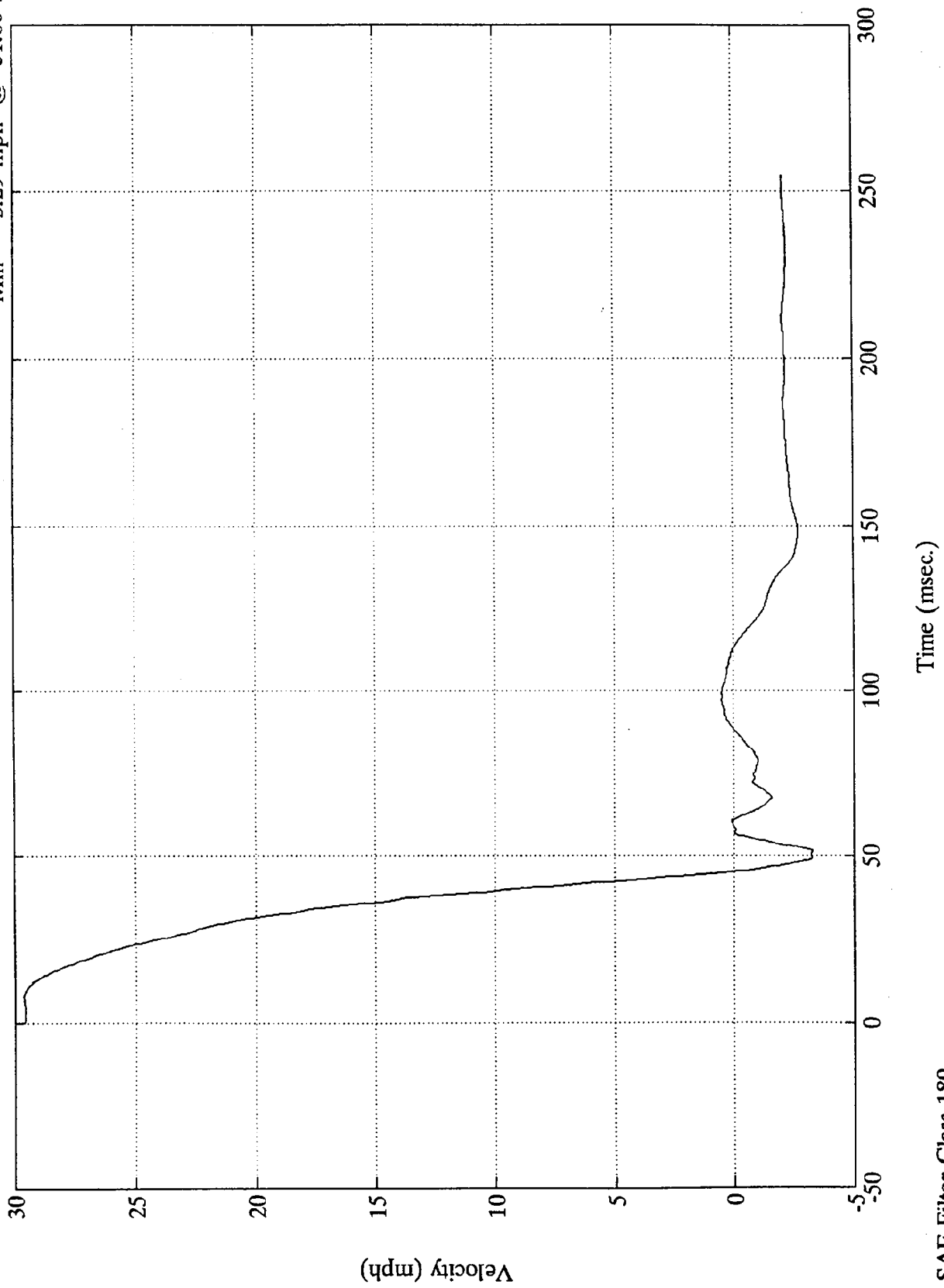
Max = 29.21 Gs @ 53.88 msec
Min = -83.04 Gs @ 42.11 msec



NHTSA "208" TEST 9 - 1992 GEO STORM

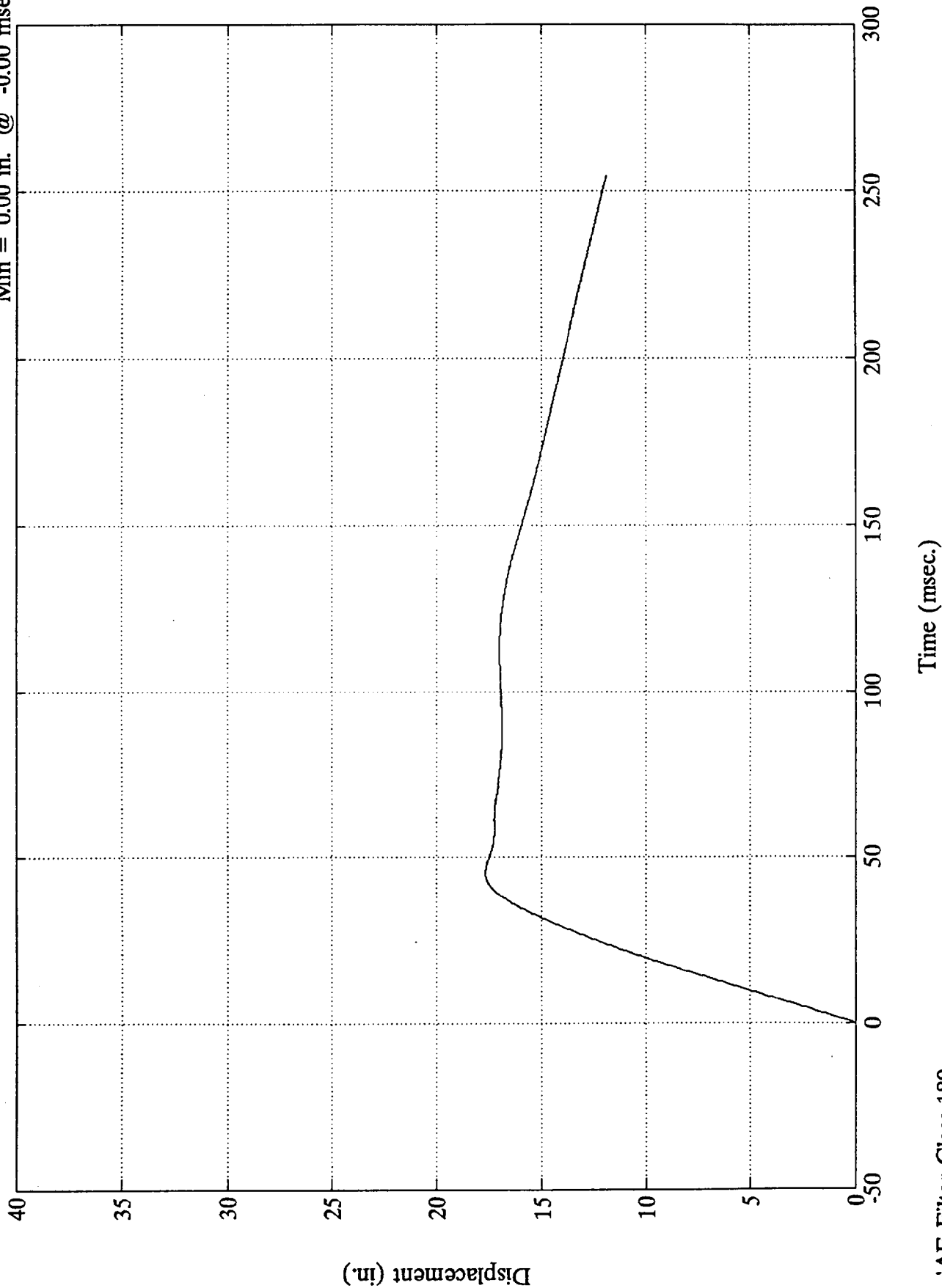
Engine Top X (#3)

Max = 29.64 mph @ 7.68 msec
Min = -3.29 mph @ 51.60 msec



Engine Top X (#3)

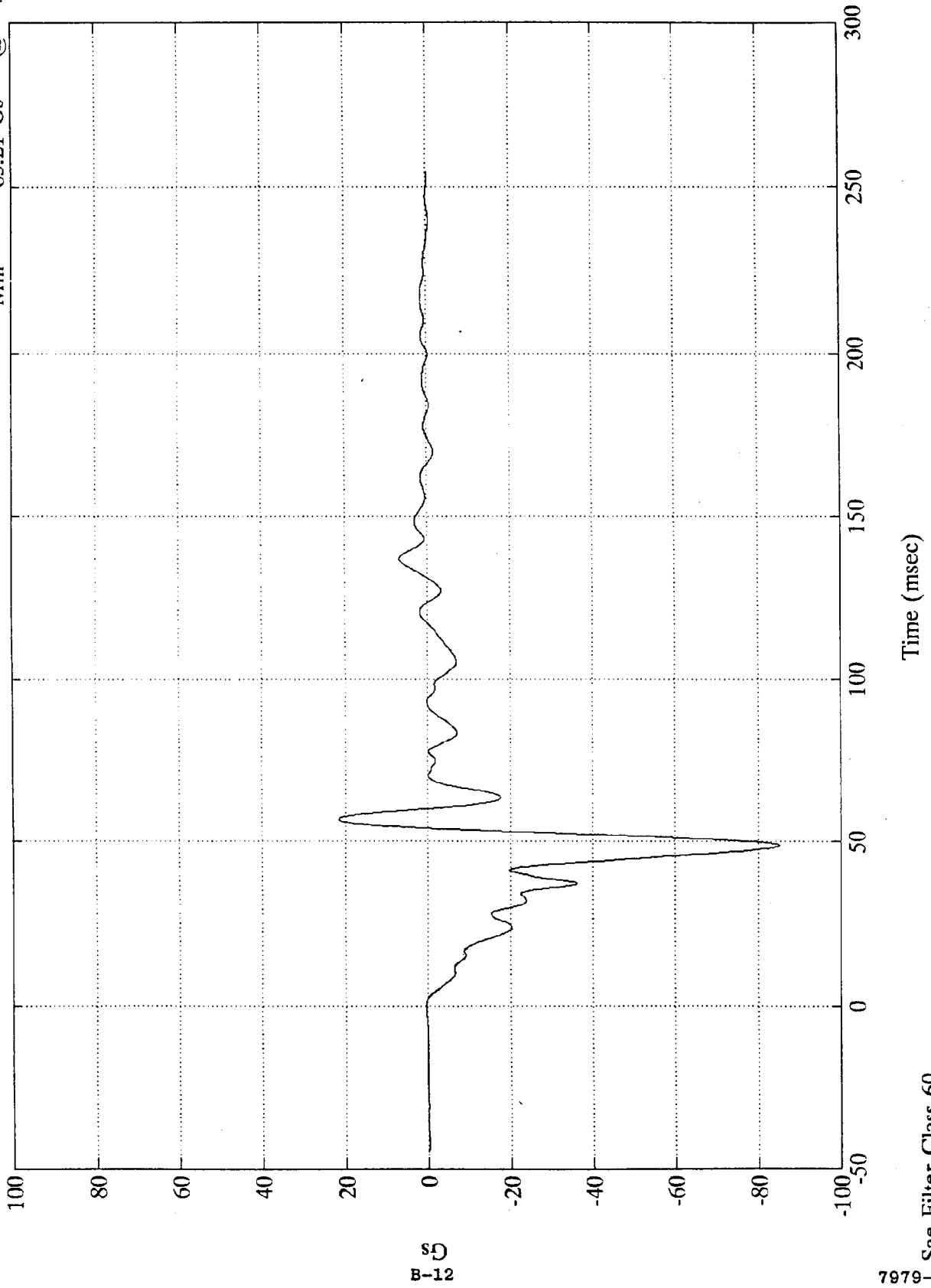
Max = 17.67 in. @ 45.60 msec
Min = 0.00 in. @ -0.00 msec



NHTSA "208" TEST 9 - 1992 GEO STORM

Engine Bottom X (#4)

Max =	21.53 Gs	@	57.11 msec
Min =	-85.21 Gs	@	48.72 msec

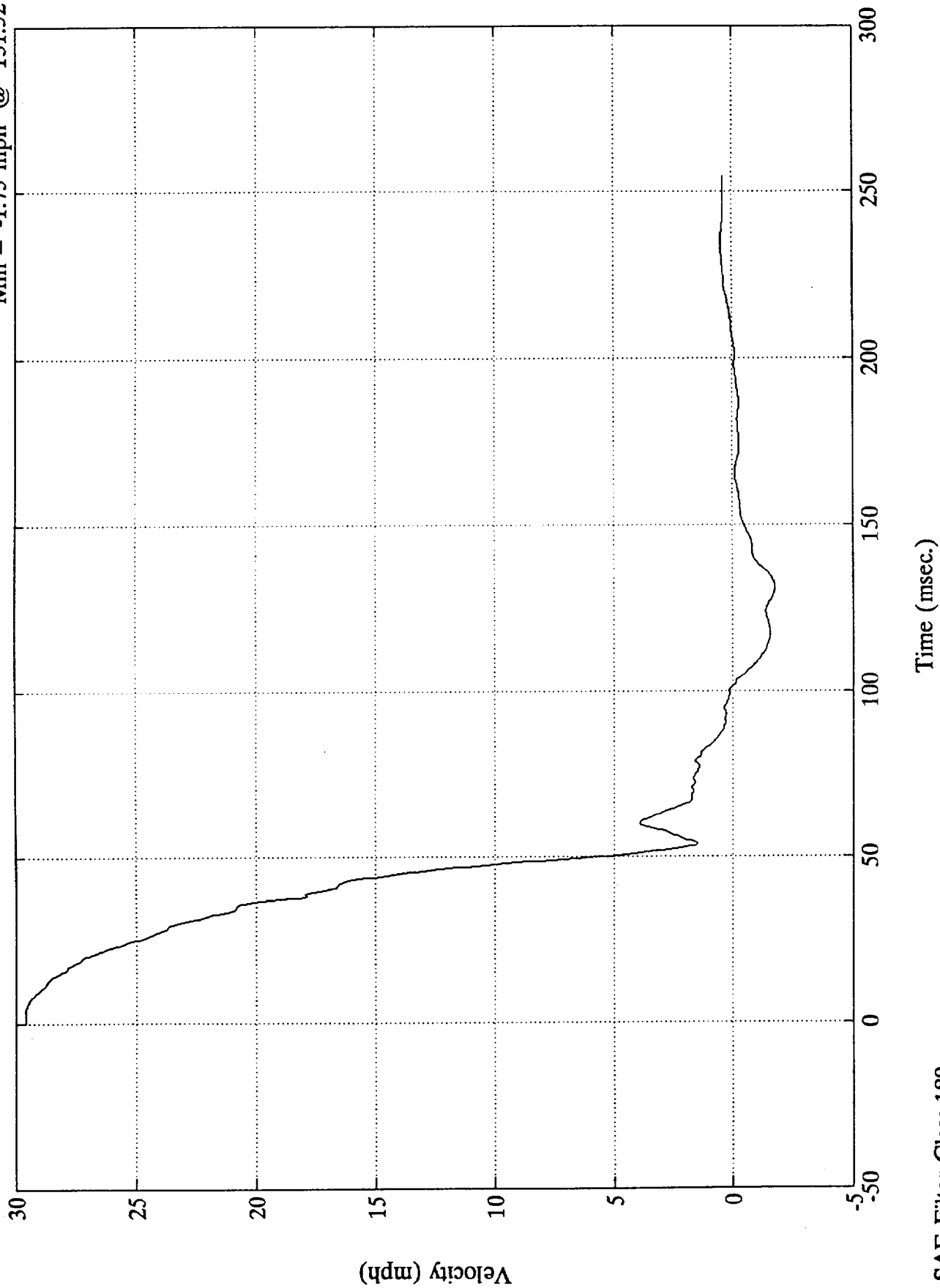


Sae Filter Class 60

7979-1

Engine Bottom X (#4)

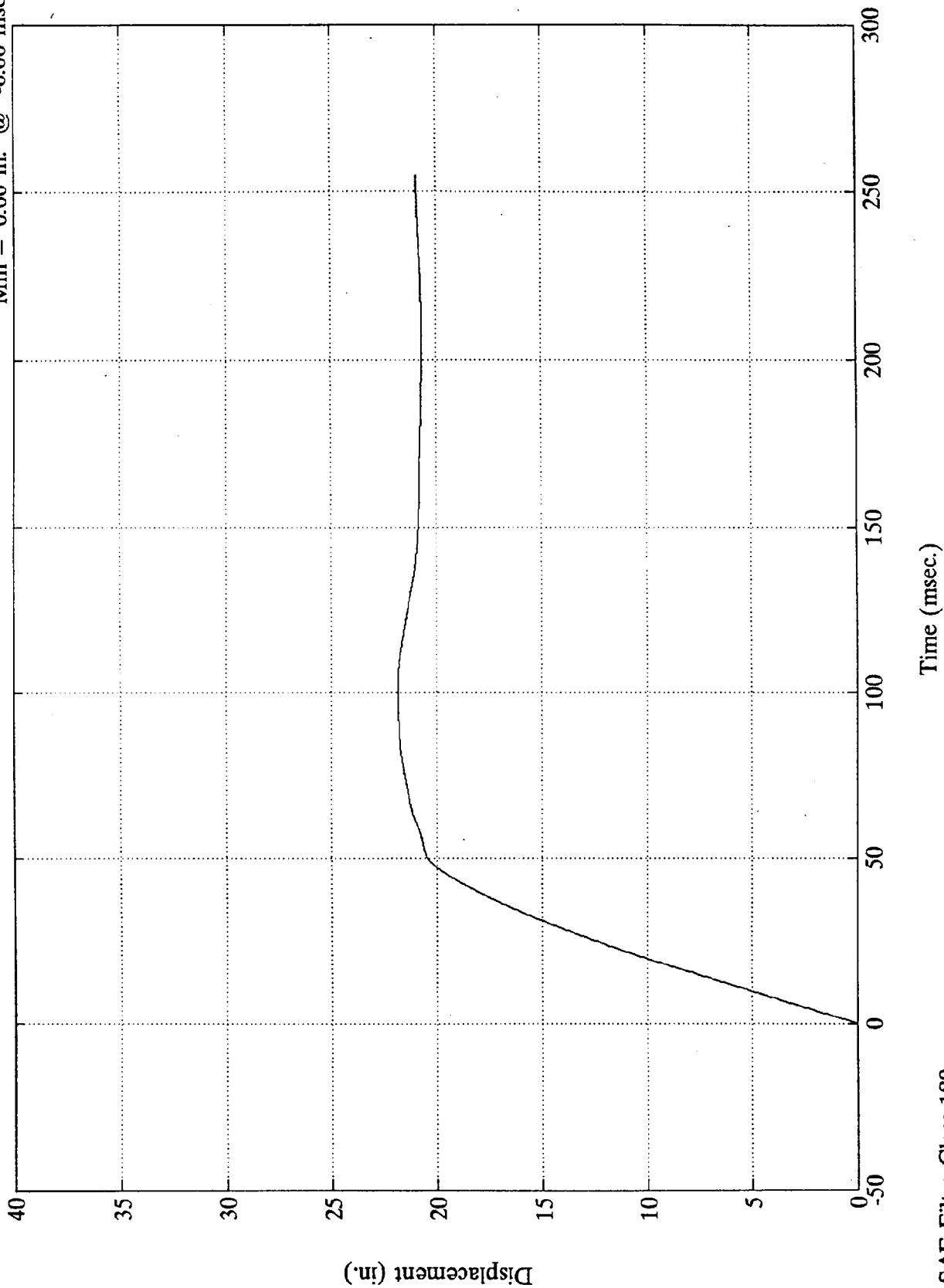
Max = 29.63 mph @ 3.60 msec
Min = -1.75 mph @ 131.52 msec



NHTSA "208" TEST 9 - 1992 GEO STORM

Engine Bottom X (#4)

Max = 21.86 in. @ 102.00 msec
Min = 0.00 in. @ -0.00 msec



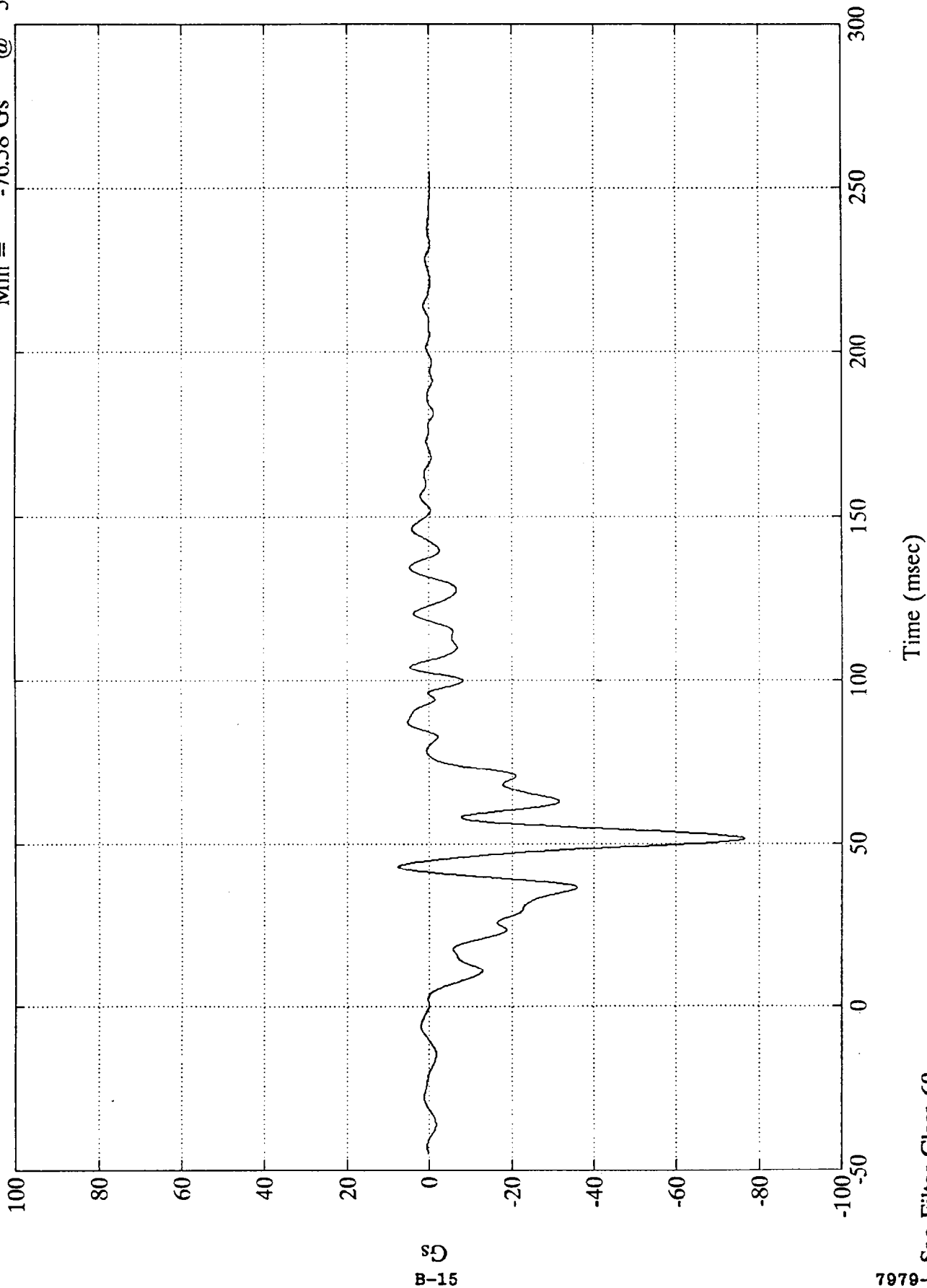
B-14

7979-1

SAE Filter Class 180

R. Brake Caliper X (#5)

Max =	7.53 Gs	@	43.20 msec
Min =	-76.58 Gs	@	51.60 msec

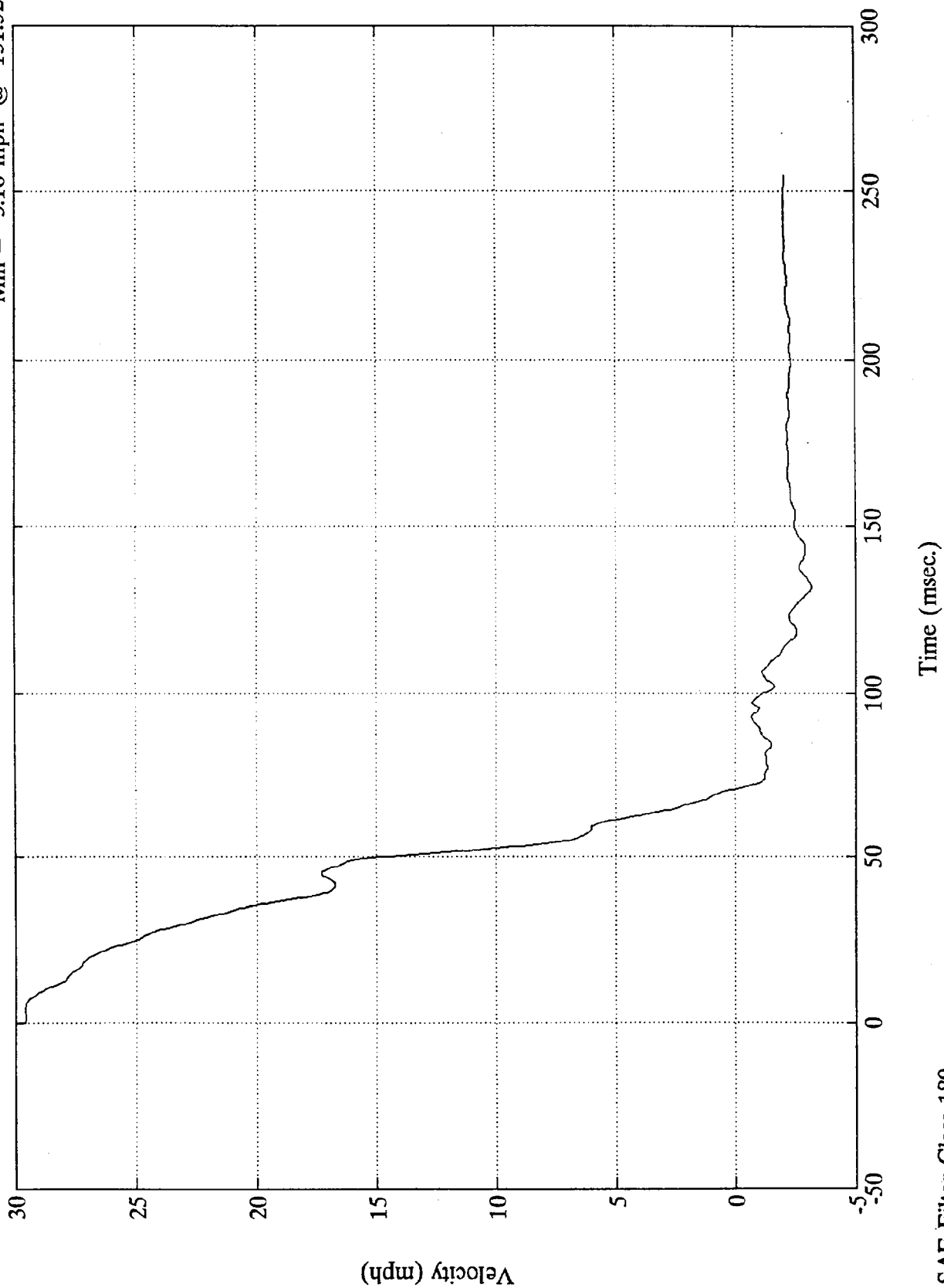


B-15

NHTSA "208" TEST 9 - 1992 GEO STORM

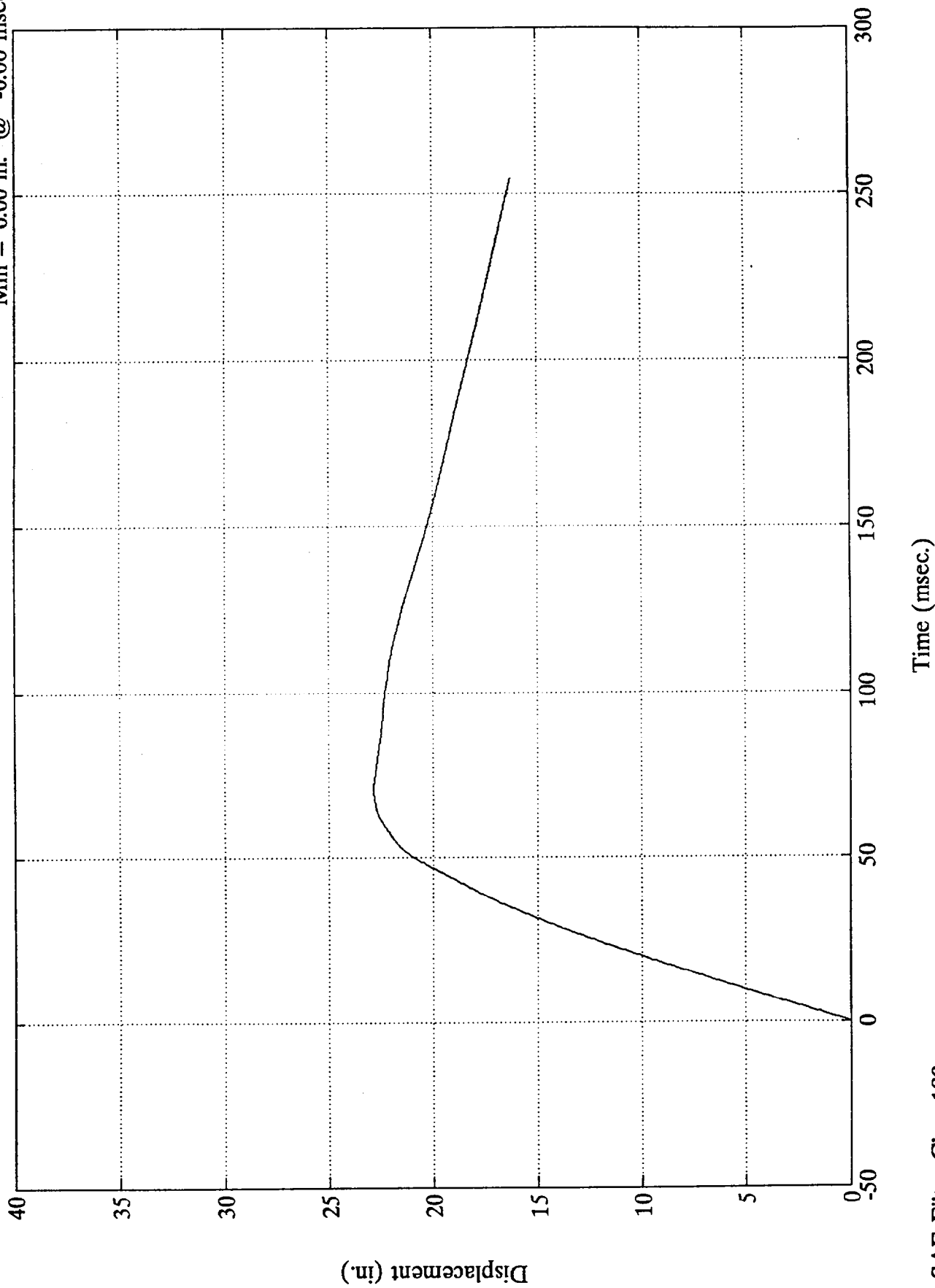
Max = 29.60 mph @ 4.32 msec
Min = -3.16 mph @ 131.52 msec

R. Brake Caliper X (#5)



R. Brake Caliper X (#5)

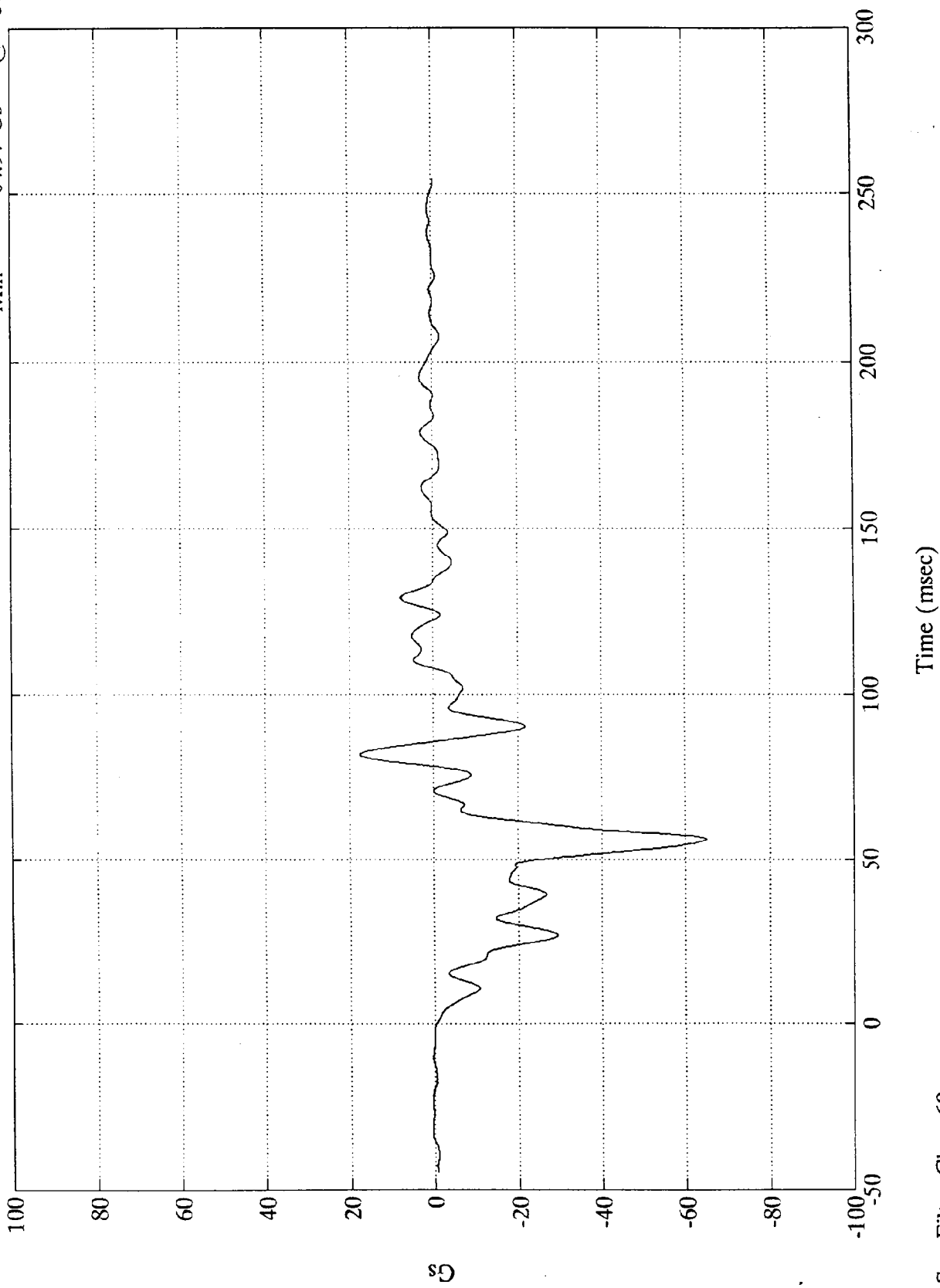
Max = 22.86 in. @ 72.00 msec
Min = 0.00 in. @ -0.00 msec



NHTSA "208" TEST 9 - 1992 GEO STORM

L. Brake Caliper X (#6)

Max = 17.45 Gs @ 81.95 msec
Min = -64.97 Gs @ 56.04 msec

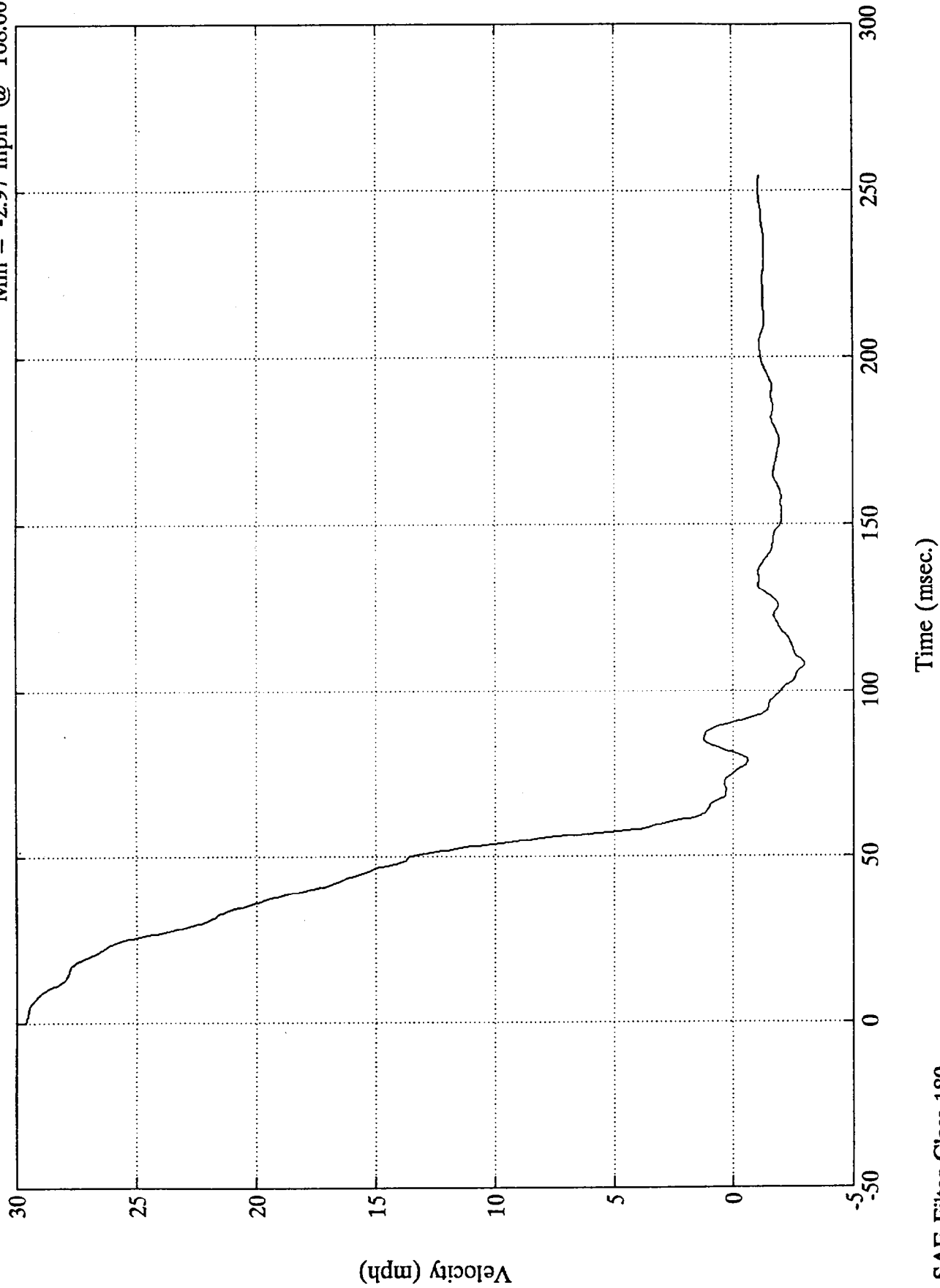


B-18

Sae Filter Class 60

L. Brake Caliper X (#6)

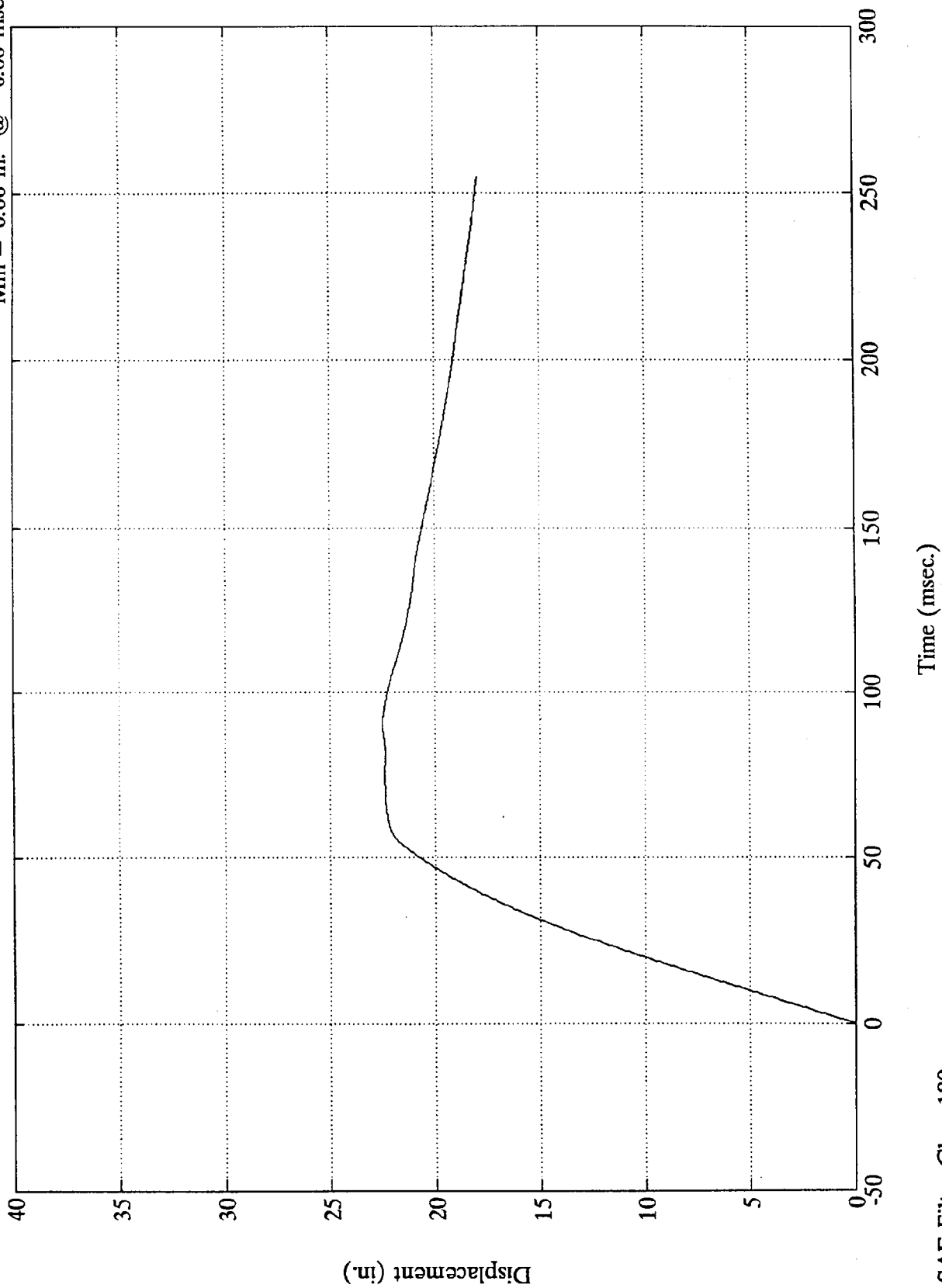
Max = 29.60 mph @ 0.24 msec
Min = -2.97 mph @ 108.00 msec



NHTSA "208" TEST 9 - 1992 GEO STORM

L. Brake Caliper X (#6)

Max = 22.50 in. @ 91.68 msec
Min = 0.00 in. @ -0.00 msec



B-20

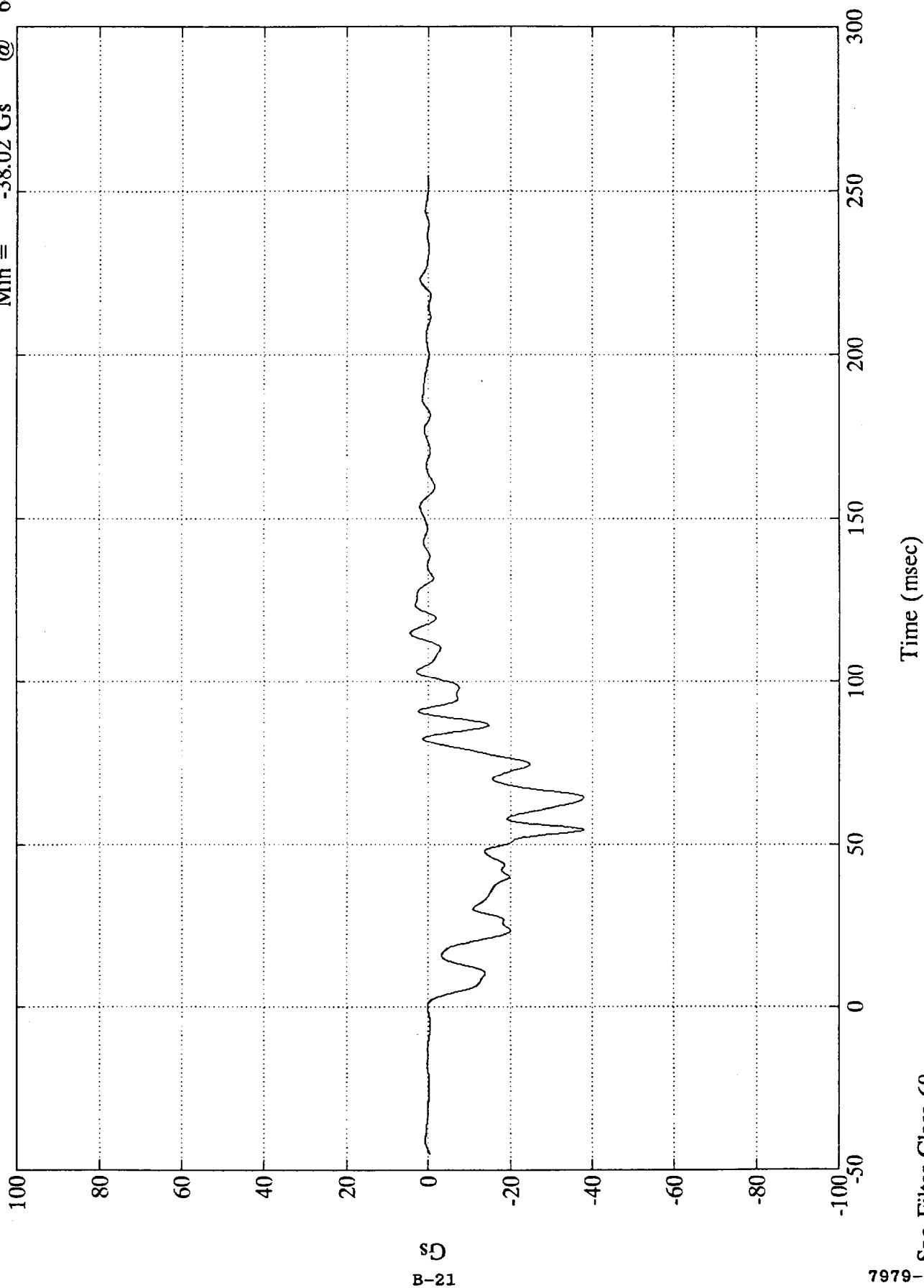
1-6979-1

SAE Filter Class 180

NHTSA "208" TEST 9 - 1992 GEO STORM

Max = 4.40 Gs @ 114.72 msec
Min = -38.02 Gs @ 64.31 msec

Instrument Panel X (#7)



B-21

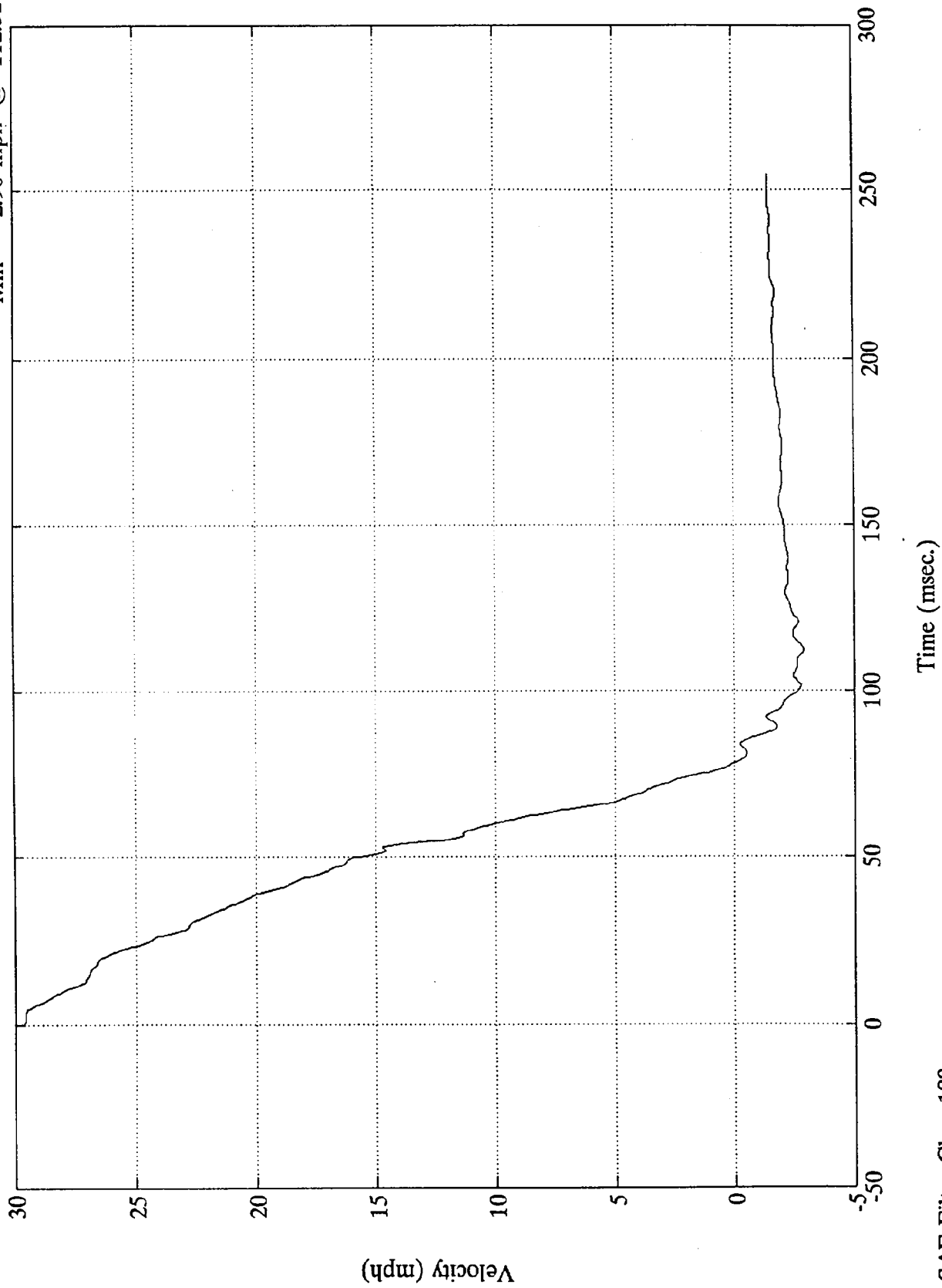
7979-1

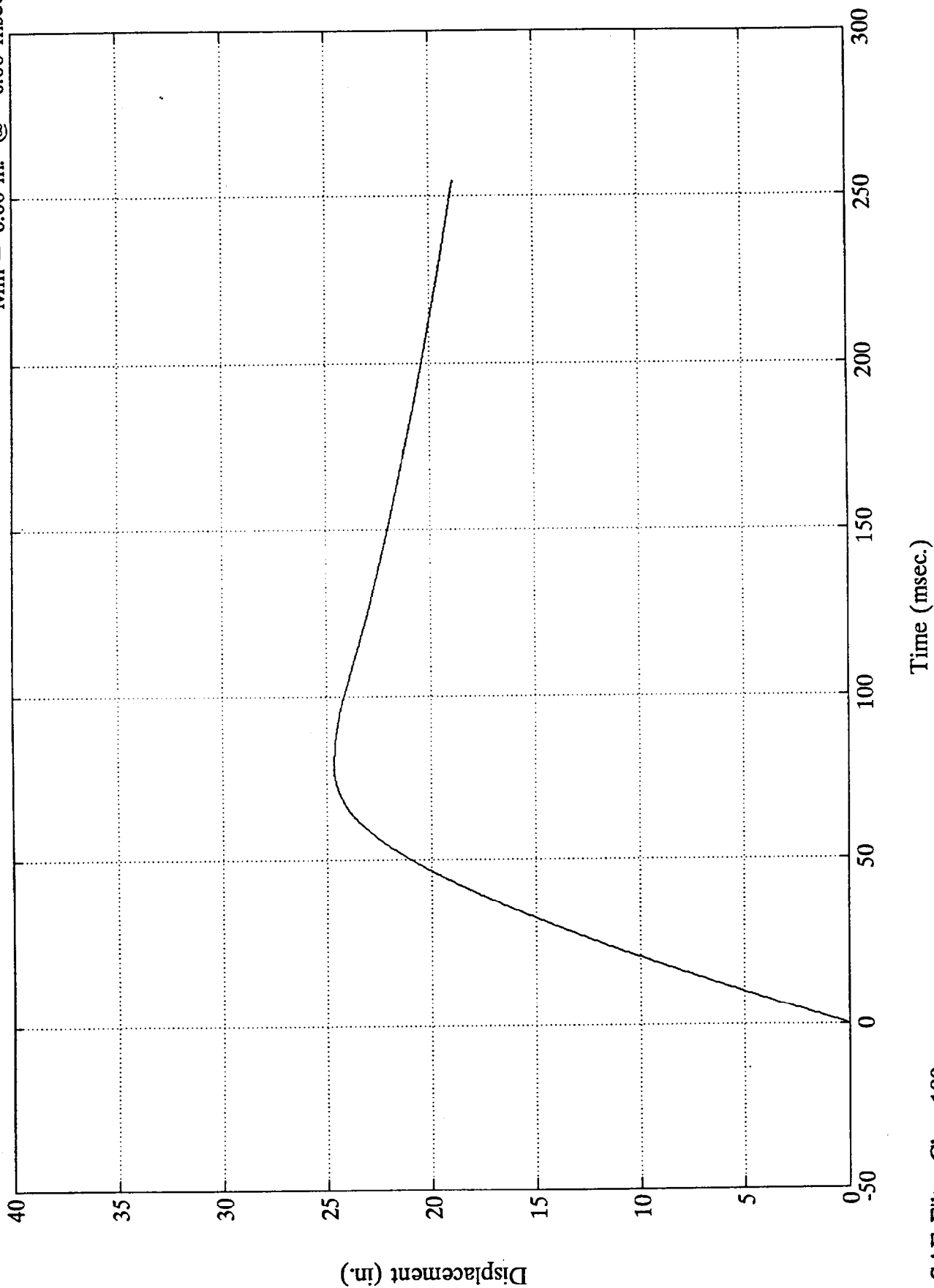
Sae Filter Class 60

NHTSA "208" TEST 9 - 1992 GEO STORM

Instrument Panel X (#7)

Max = 29.60 mph @ 0.72 msec
Min = -2.90 mph @ 112.32 msec





TEST NO. CN0107

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

FACILITY: TRACK
RUN #: 1149
SERIES #: 9

TEST DATE: 14 Jan 1994
TEST TIME: 13:30:09
BOARD: A

TITLE: NHTSA "208" TEST 9 - 1992 GEO STORM

HIC SUMMARY: Pos. 1 Head Resultant

hic: 75.29
t1 = 55.320 msec
t2 = 91.200 msec
Average G's Over Hic Duration = 21.32

HIC SUMMARY: Pos. 2 Head Resultant

hic: 612.69
t1 = 78.120 msec
t2 = 114.000 msec
Average G's Over Hic Duration = 49.31

CLIP SUMMARY: Pos. 1 Chest Resultant

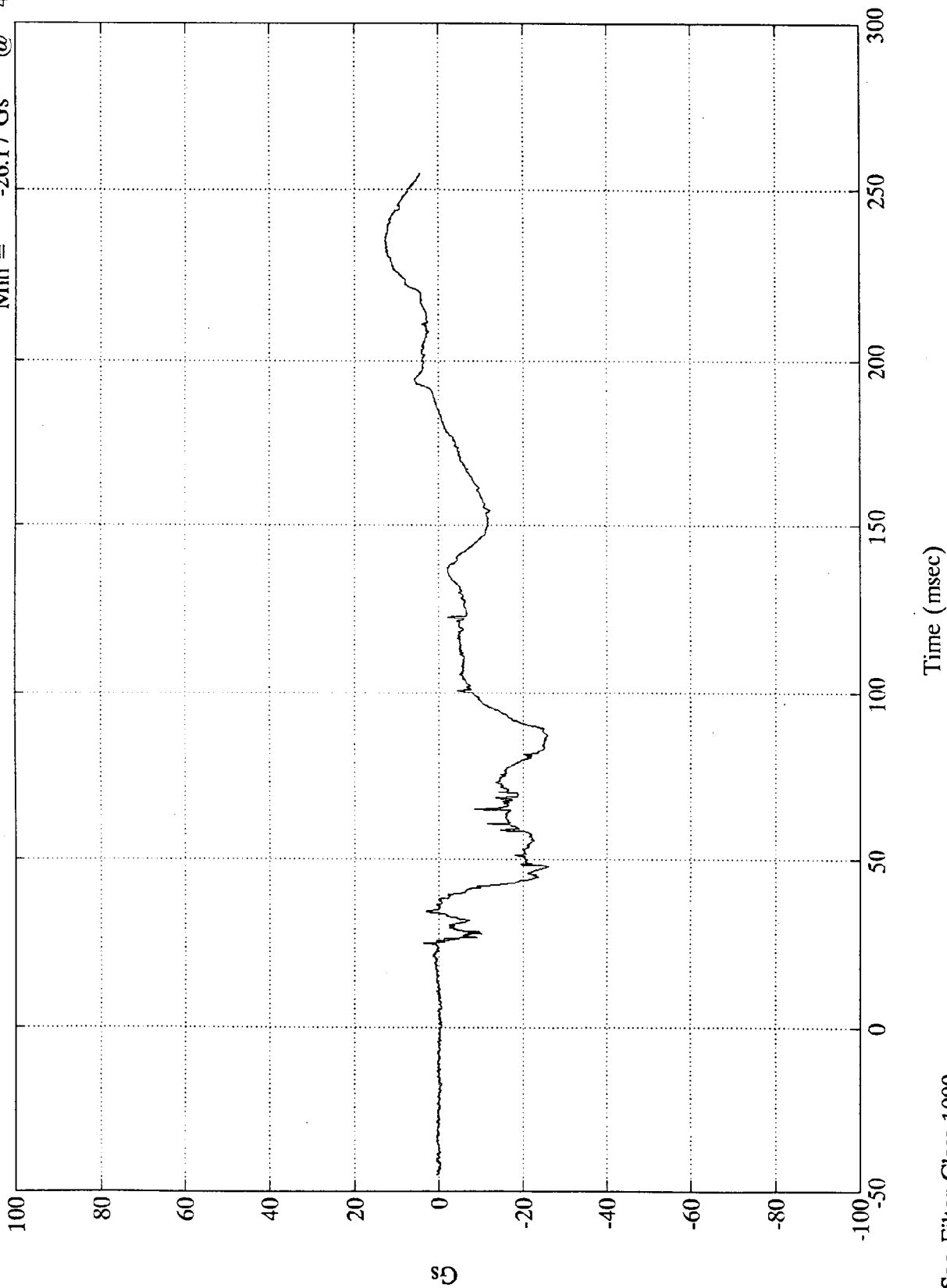
Peak Resultant (3 ms CLIPPED DURATION) = 48.180 G's
Tstart = 87.9600 ms
Tend = 91.0800 ms
CSI = 324.608

CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 39.241 G's
Tstart = 72.3600 ms
Tend = 75.4800 ms
CSI = 320.466

NHTSA "208" TEST 9 - 1992 GEO STORM

Pos. 1 Head X
 Max = 12.58 Gs @ 234.12 msec
 Min = -26.17 Gs @ 47.88 msec

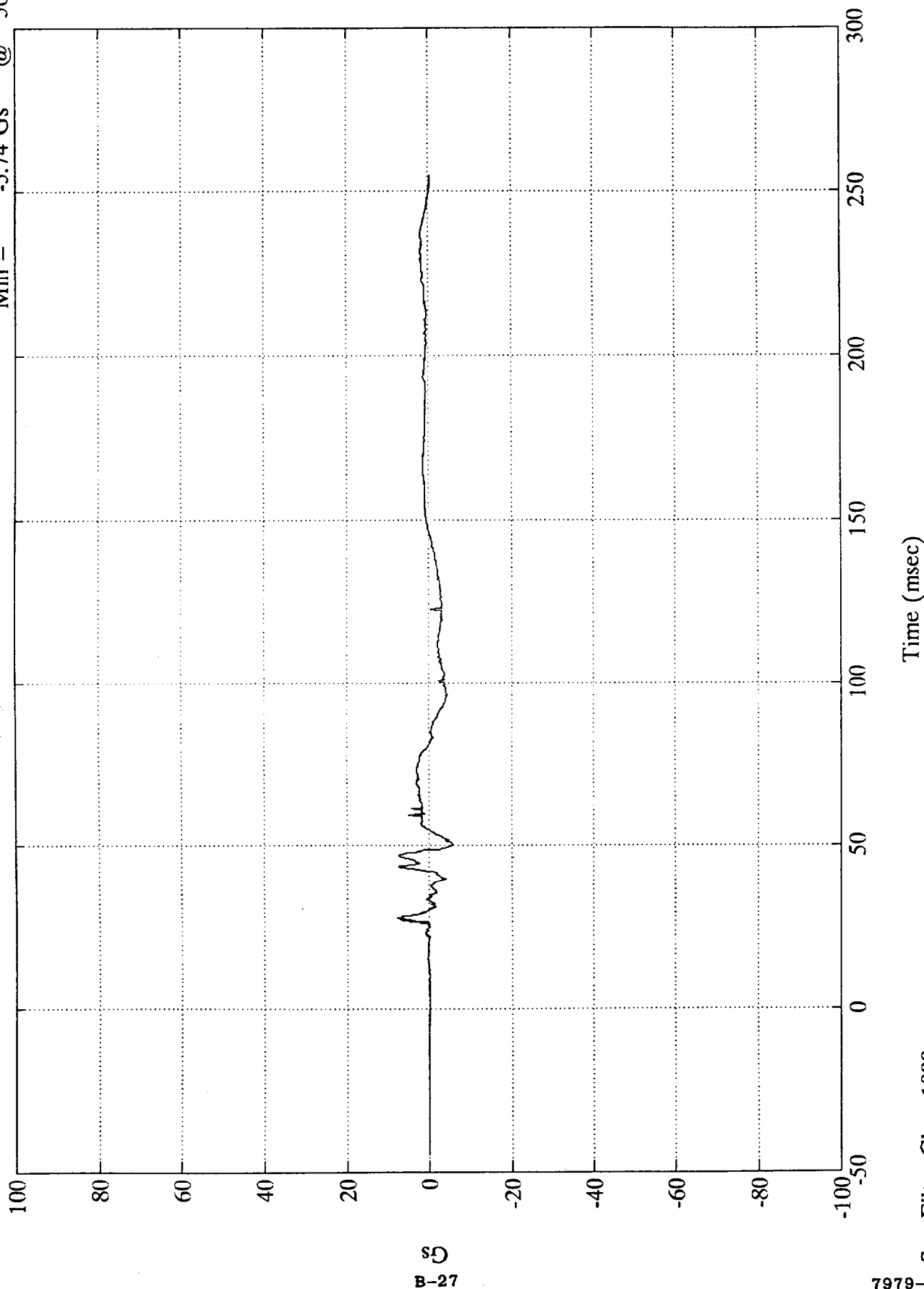


B-26

NHTSA "208" TEST 9 - 1992 GEO STORM

Max = 7.86 Gs @ 27.60 msec
Min = -5.74 Gs @ 50.28 msec

Pos. 1 Head Y

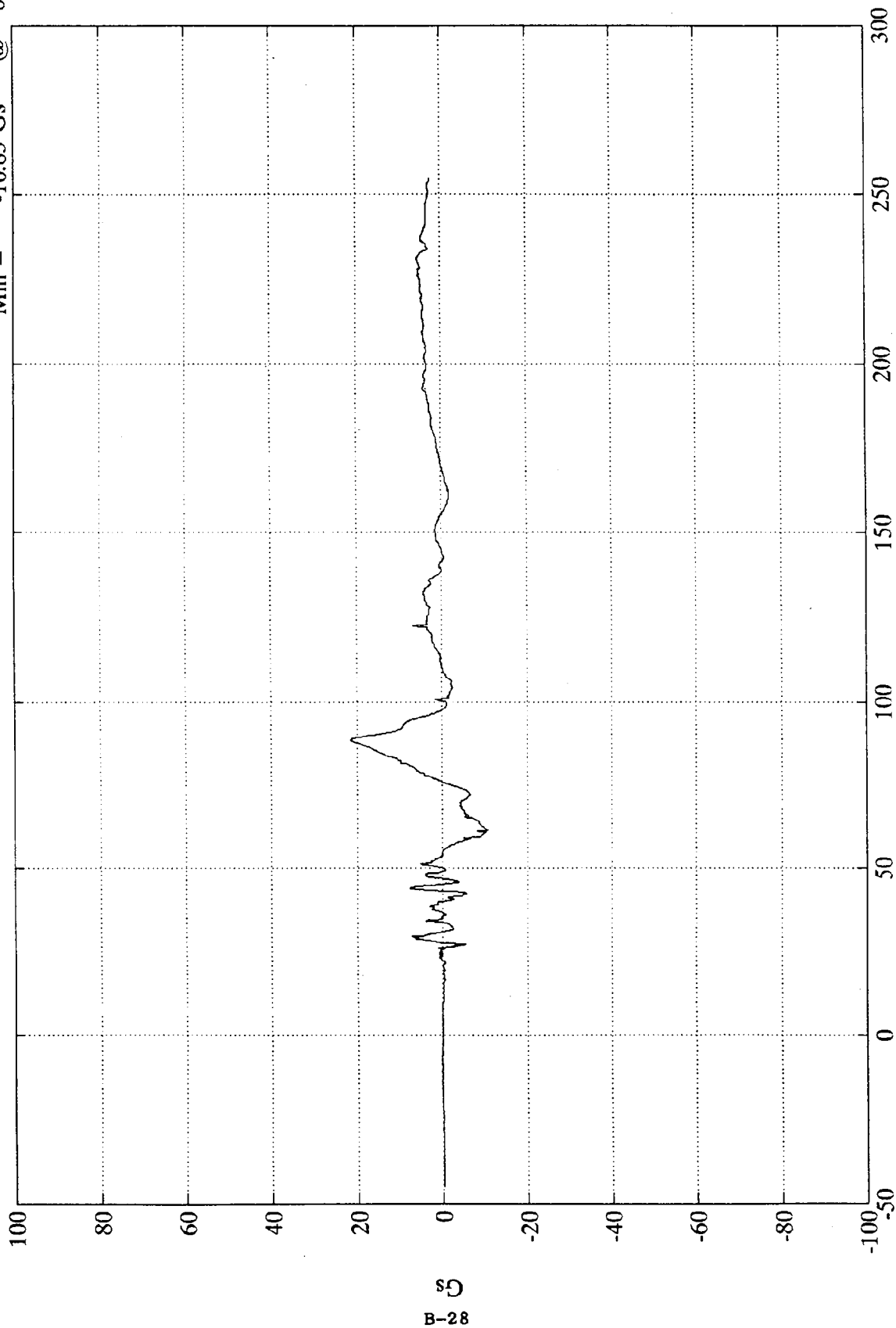


B-27

NHTSA "208" TEST 9 - 1992 GEO STORM

Max = 21.44 Gs @ 88.55 msec
 Min = -10.83 Gs @ 61.31 msec

Pos. 1 Head Z



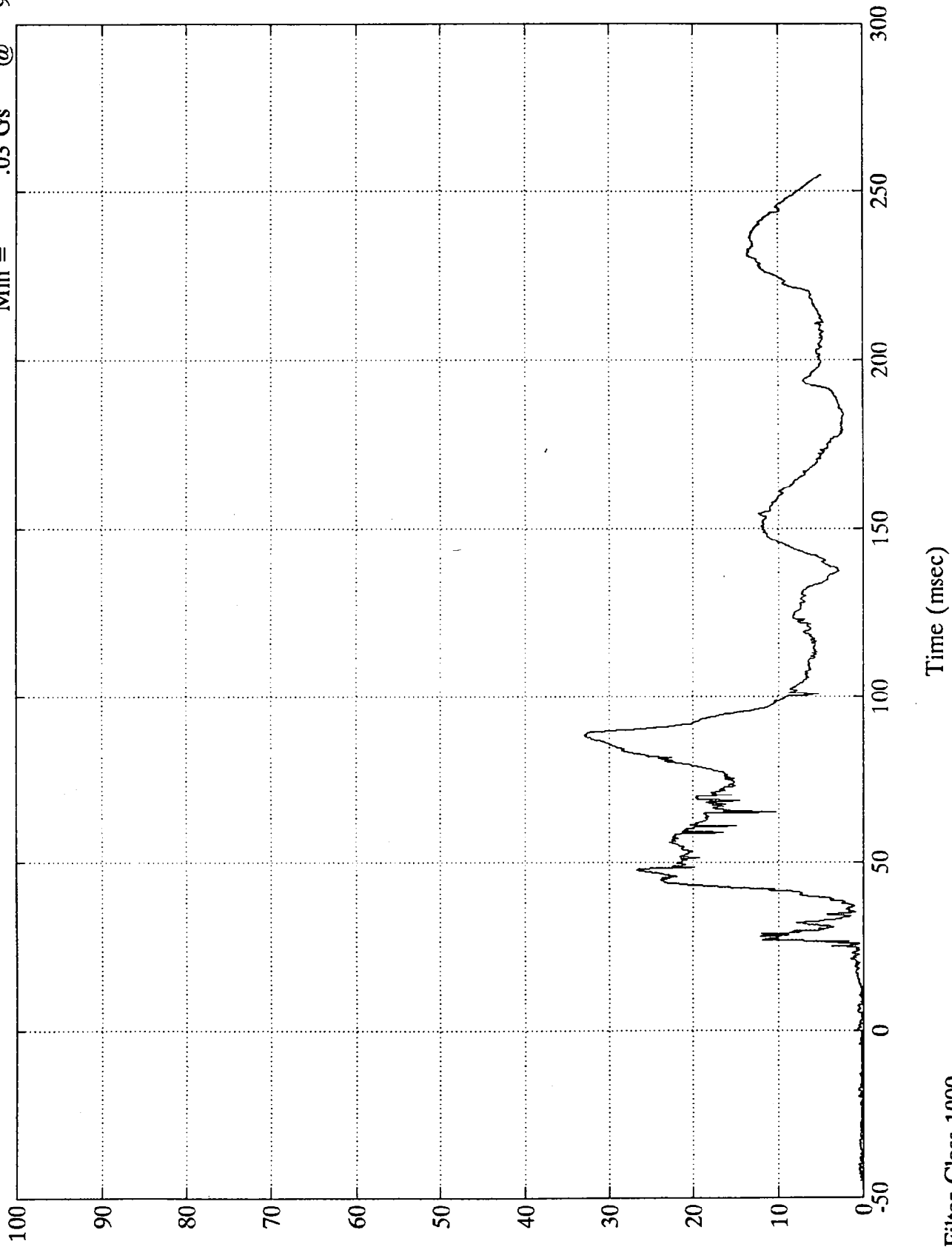
Time (msec)

Sae Filter Class 1000

NHTSA "208" TEST 9 - 1992 GEO STORM

B-29

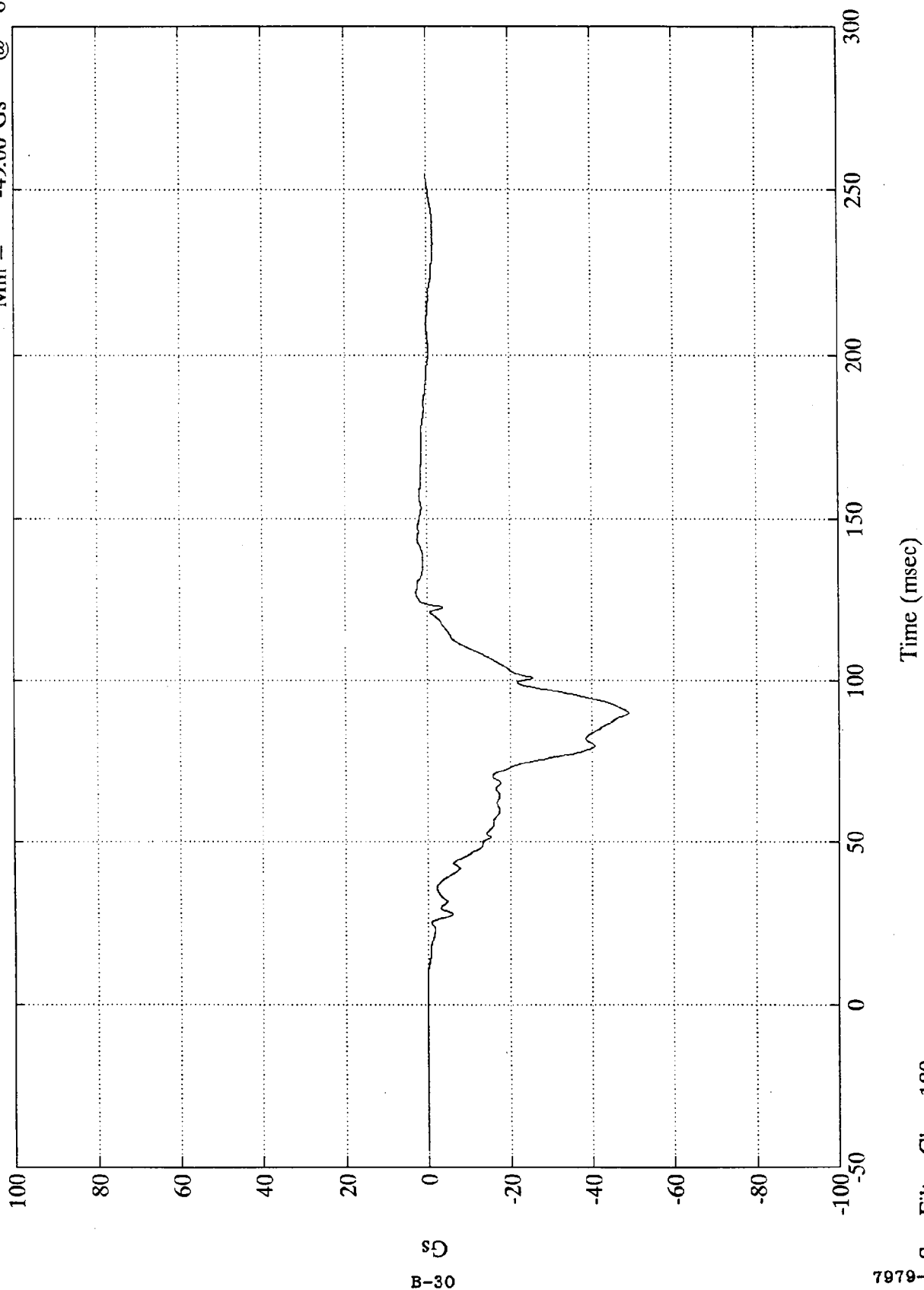
Pos. 1 Head Resultant
Max = 32.84 Gs @ 88.31 msec
Min = .03 Gs @ 9.00 msec



NHTSA "208" TEST 9 - 1992 GEO STORM

Max = 2.83 Gs @ 127.20 msec
Min = -49.00 Gs @ 89.88 msec

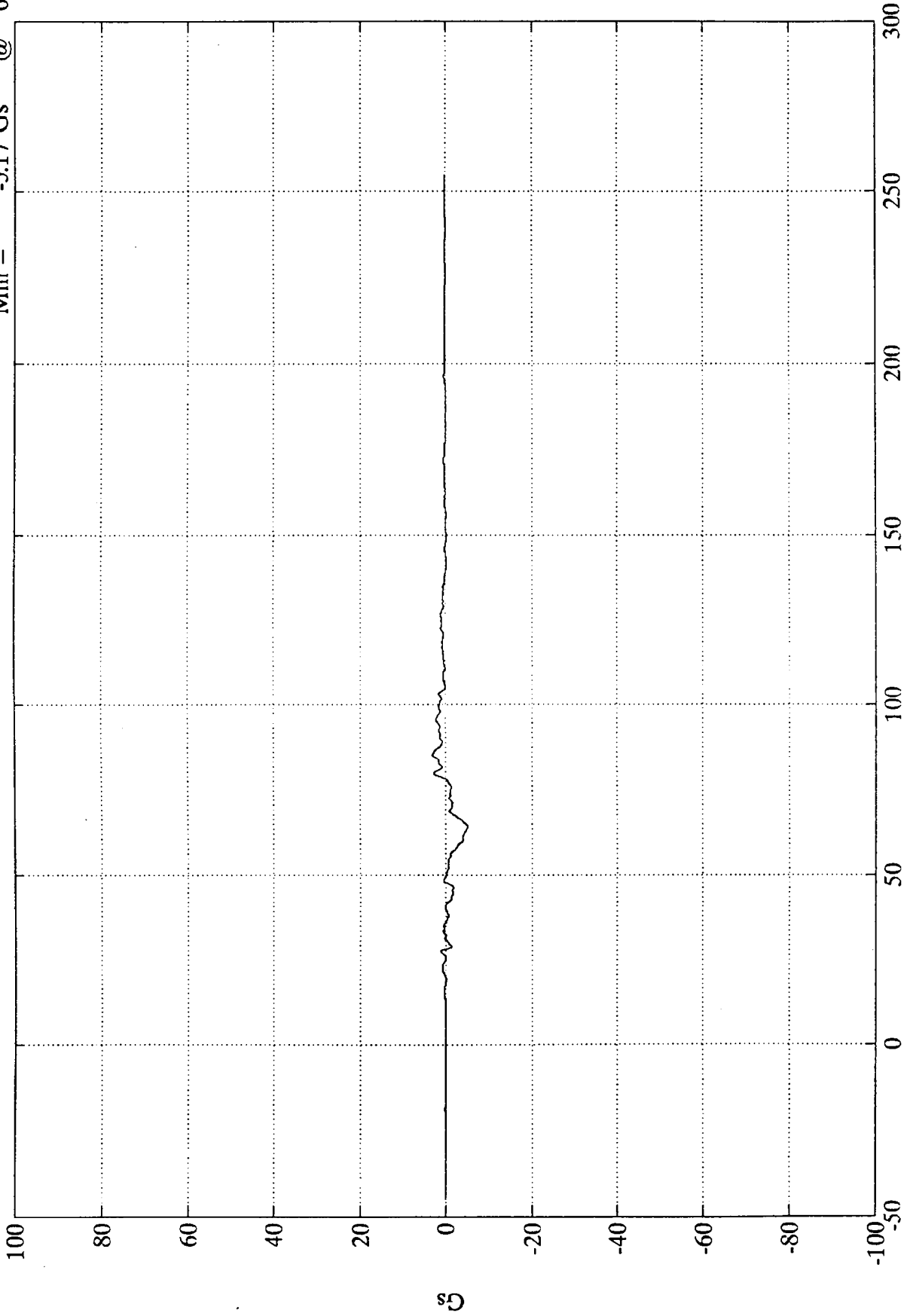
Pos. 1 Chest X



NHTSA "208" TEST 9 - 1992 GEO STORM

Max = 3.07 Gs @ 85.20 msec
Min = -5.17 Gs @ 64.08 msec

Pos. 1 Chest Y



Time (msec)

B-31

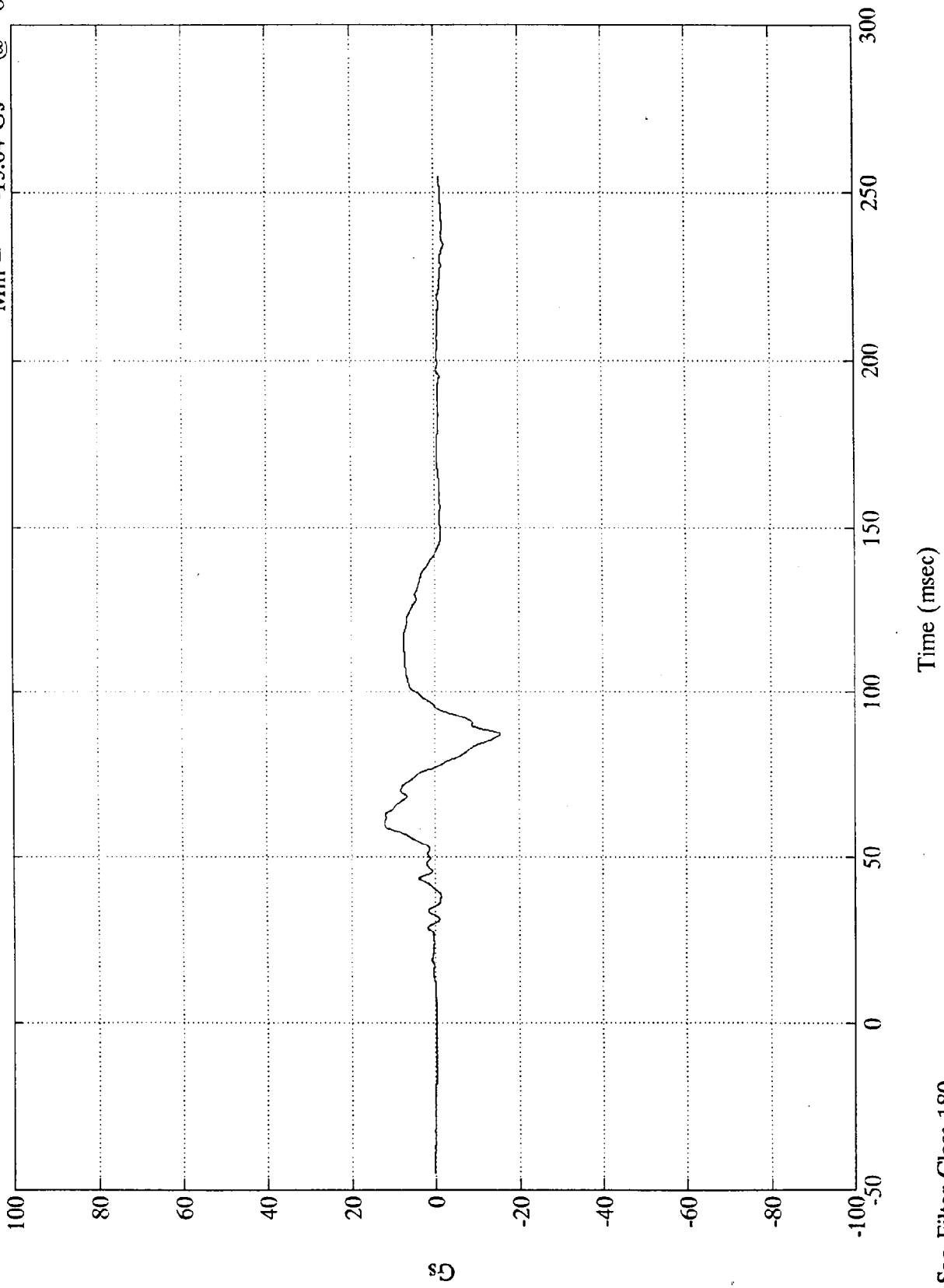
7979-1

Sae Filter Class 180

NHTSA "208" TEST 9 - 1992 GEO STORM

Max = 12.10 Gs @ 60.72 msec
 Min = -15.64 Gs @ 87.24 msec

Pos. 1 Chest Z

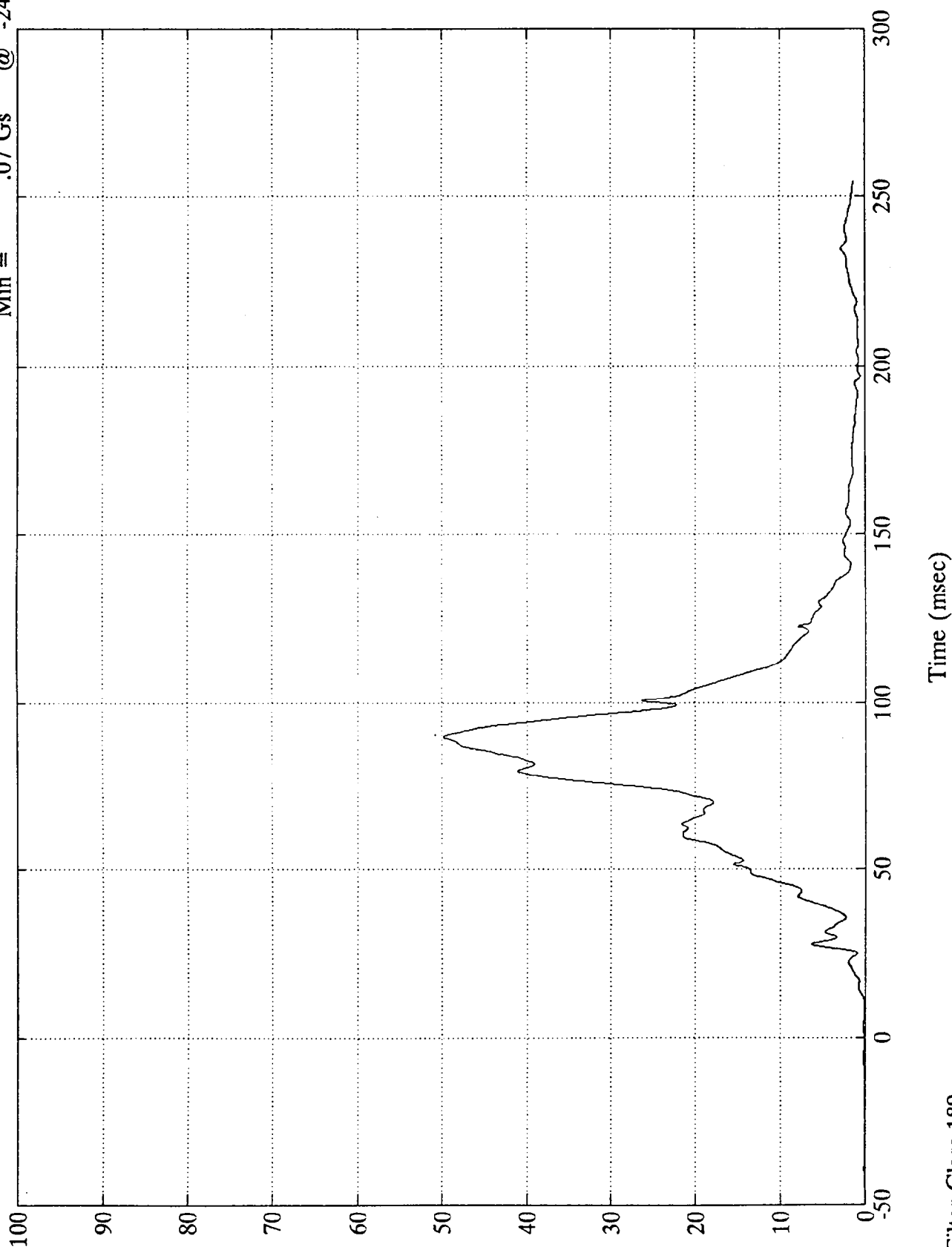


NHTSA "208" TEST 9 - 1992 GEO STORM

B-33

Max = 49.80 Gs @ 89.76 msec
Min = .07 Gs @ -24.48 msec

Pos. 1 Chest Resultant



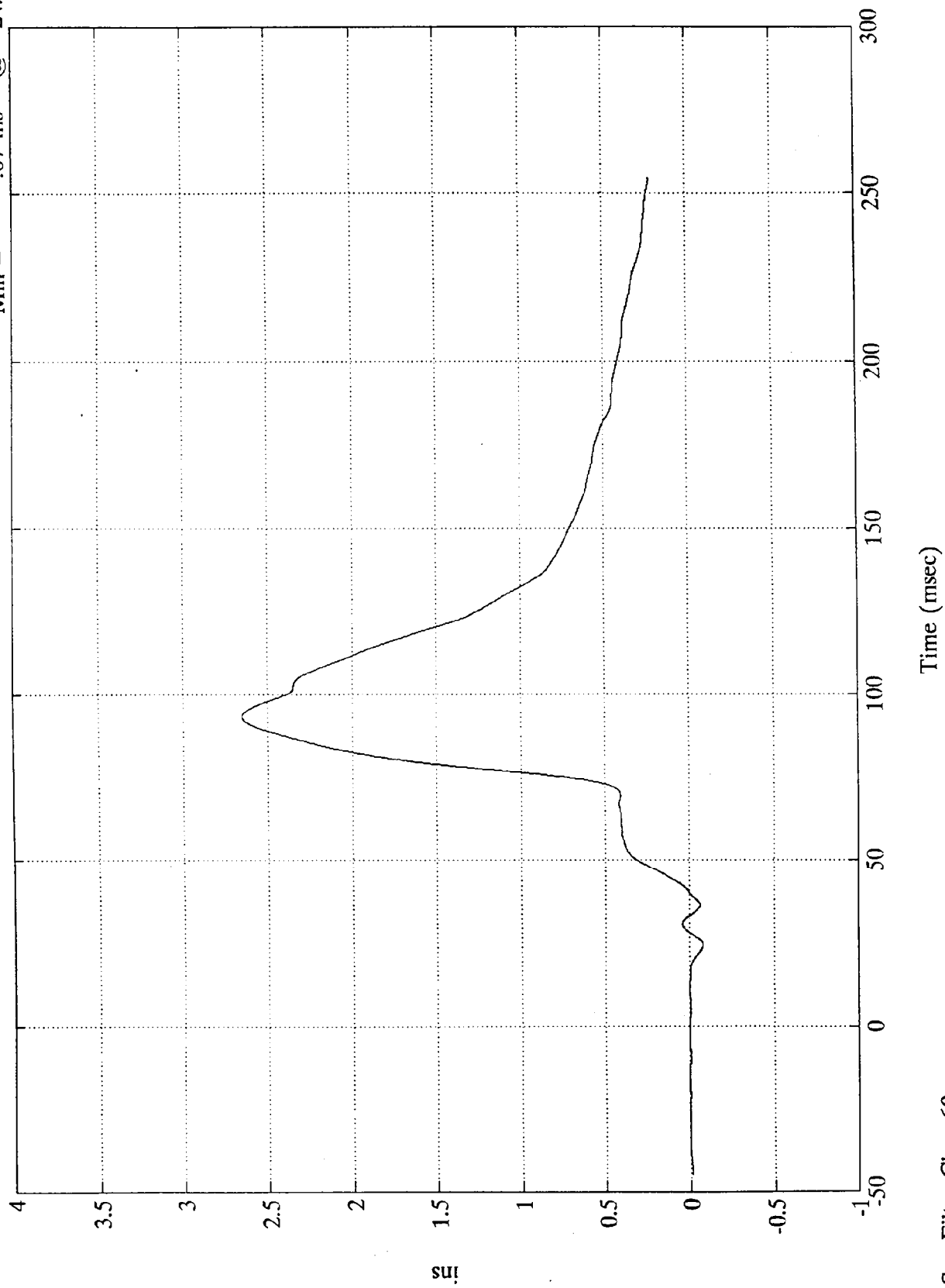
Sae Filter Class 180

7979-1

NHTSA "208" TEST 9 - 1992 GEO STORM

Max = 2.65 ins @ 93.36 msec
 Min = -.07 ins @ 24.23 msec

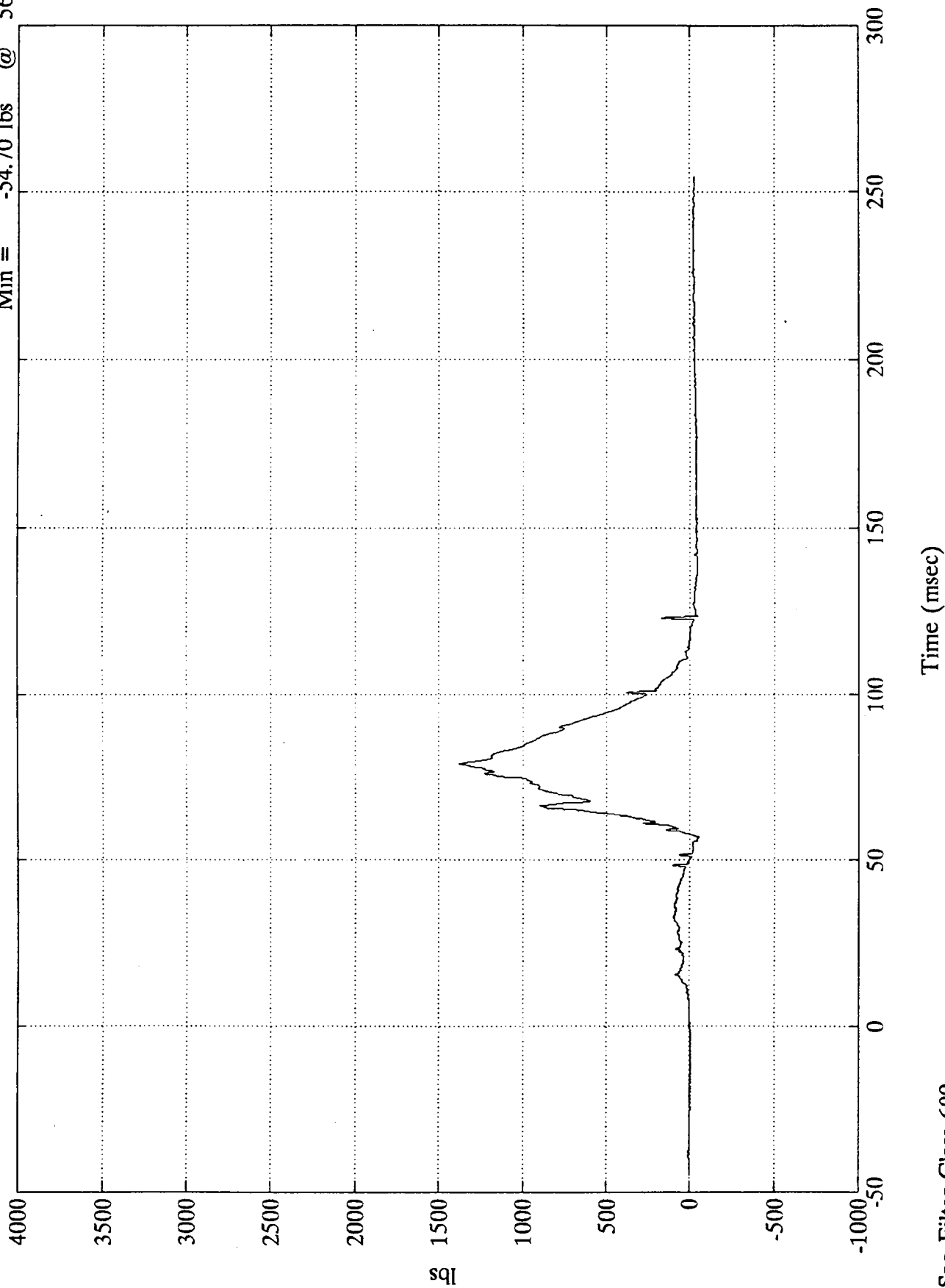
Pos 1 Chest Disp.



NHTSA "208" TEST 9 - 1992 GEO STORM

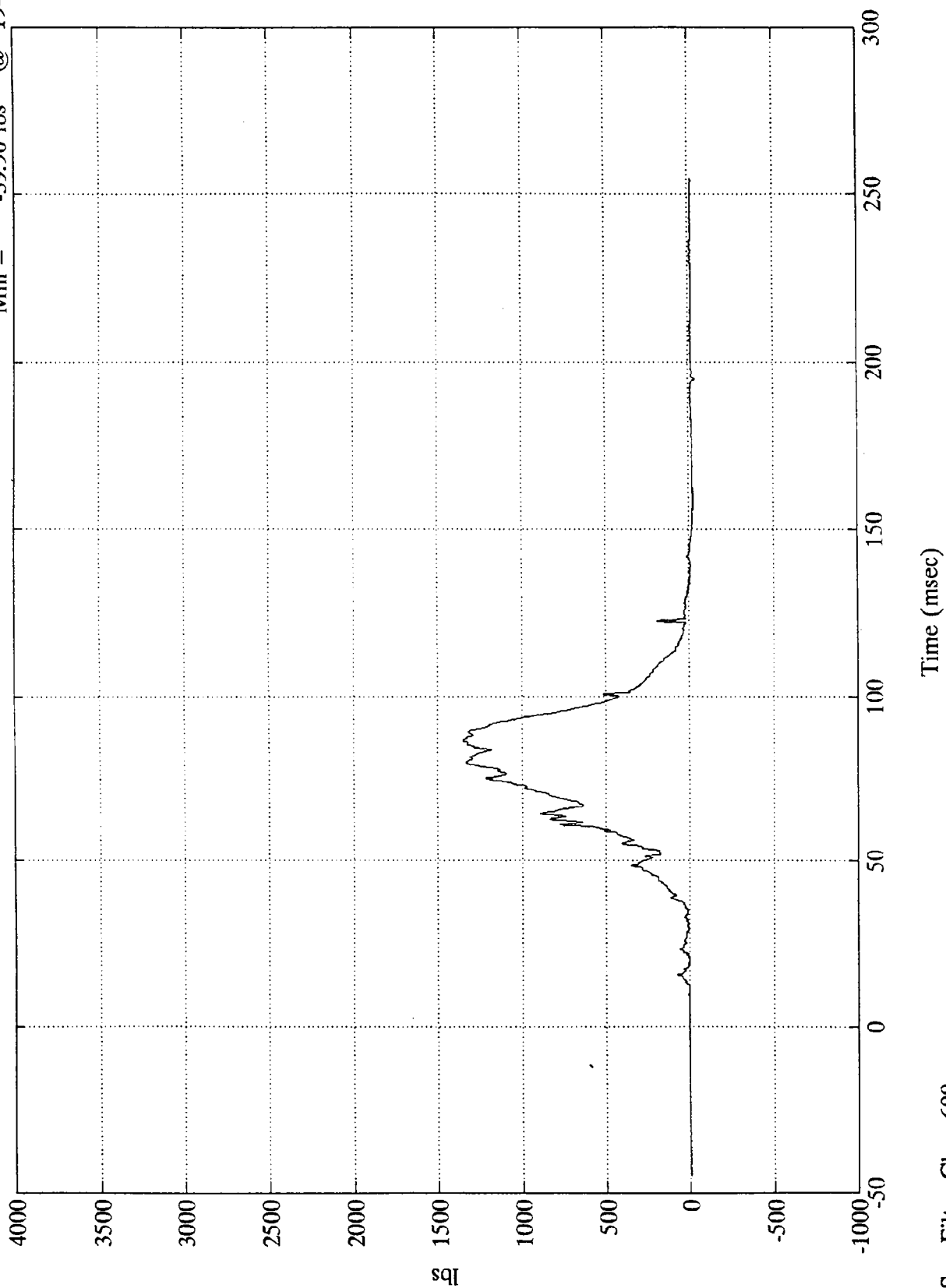
Pos. 1 Left Femur

Max = 1375.84 lbs @ 79.19 msec
Min = -54.70 lbs @ 56.88 msec



NHTSA "208" TEST 9 - 1992 GEO STORM

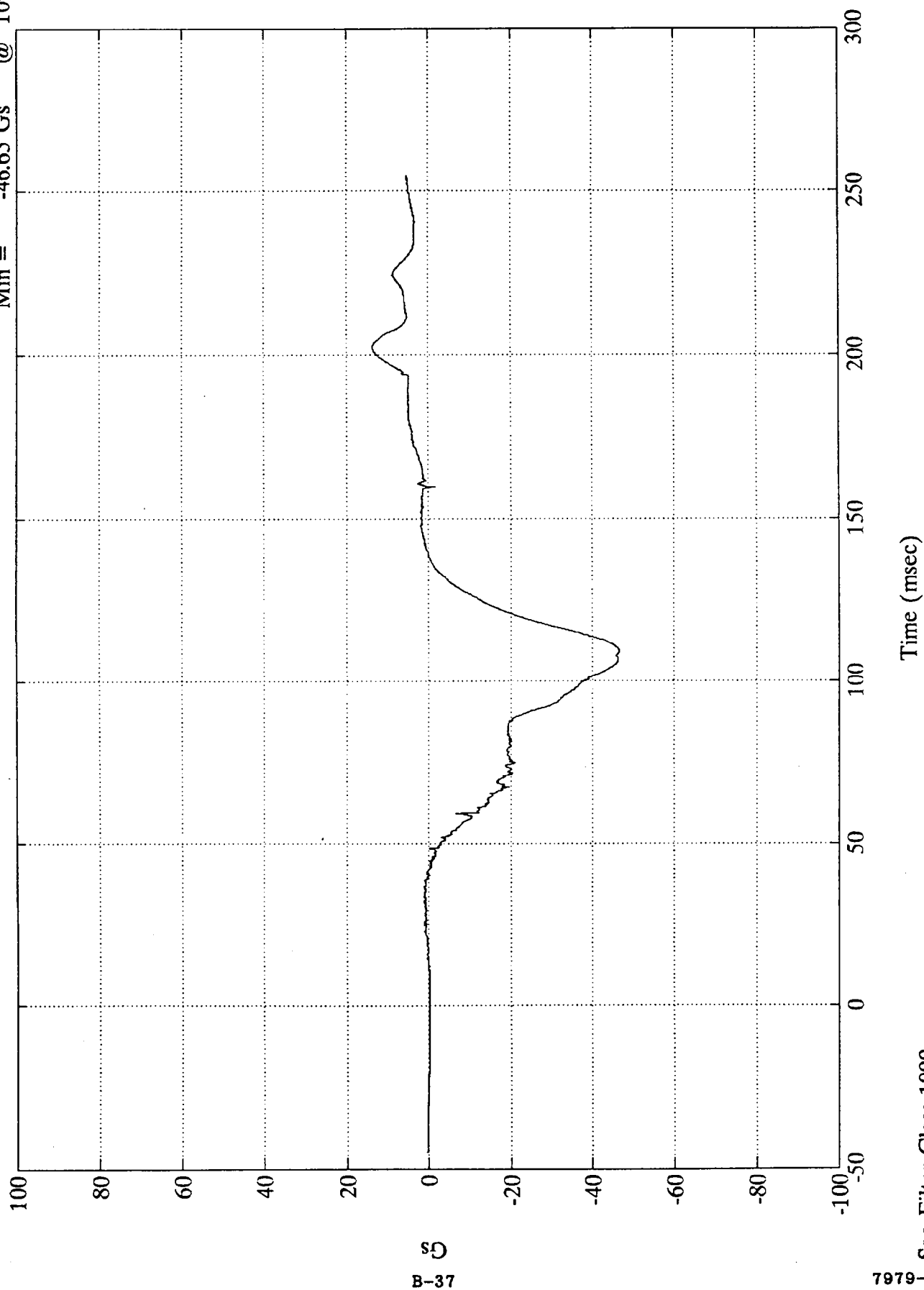
Pos. 1 Right Femur
Max = 1349.53 lbs @ 86.52 msec
Min = -39.90 lbs @ 194.88 msec



NHTSA "208" TEST 9 - 1992 GEO STORM

Pos. 2 Head X

Max = 13.68 Gs @ 202.56 msec
Min = -46.65 Gs @ 109.56 msec



B-37

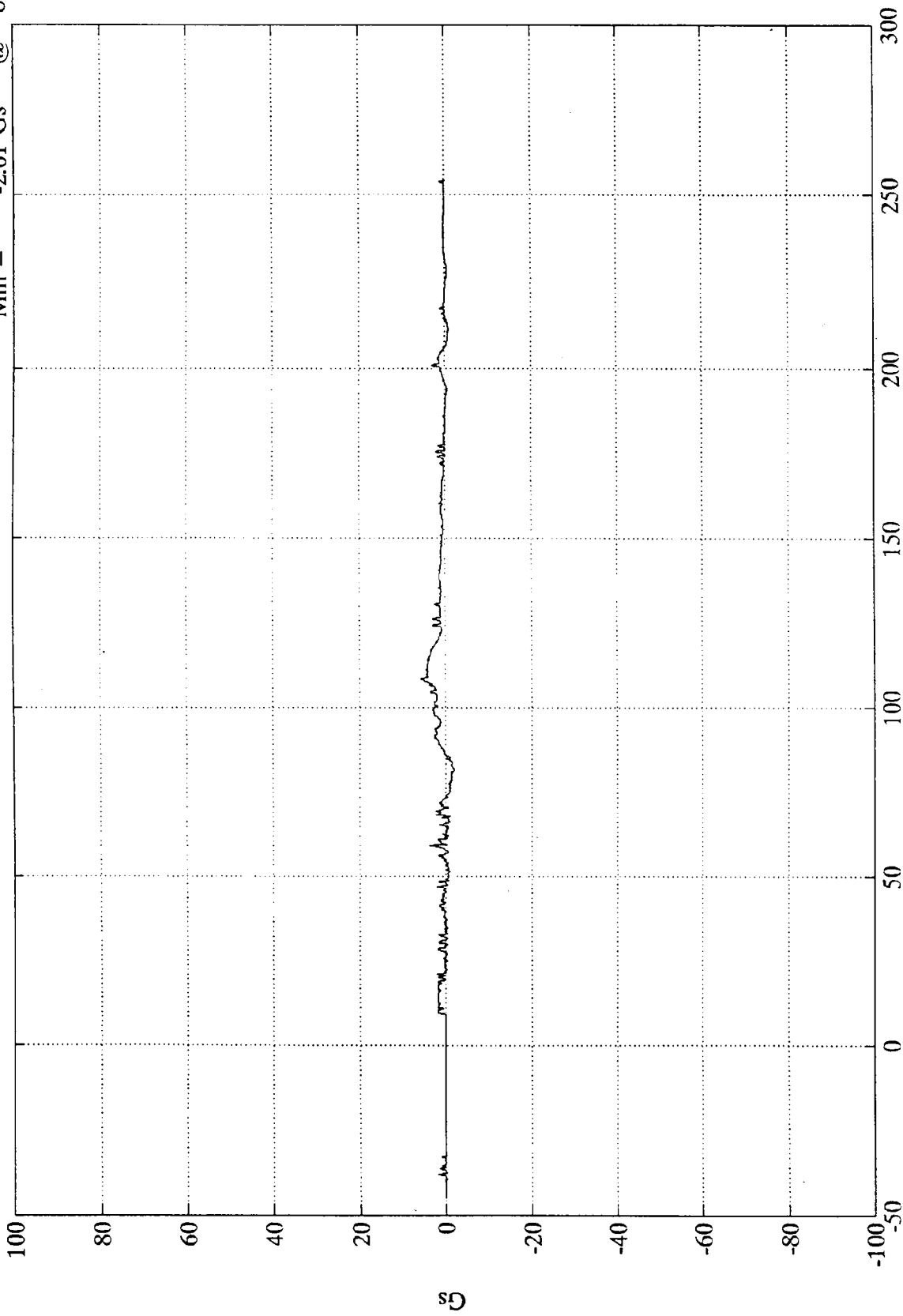
7979-1

Sae Filter Class 1000

NHTSA "208" TEST 9 - 1992 GEO STORM

Max = 5.72 Gs @ 108.60 msec
Min = -2.01 Gs @ 81.60 msec

Pos. 2 Head Y

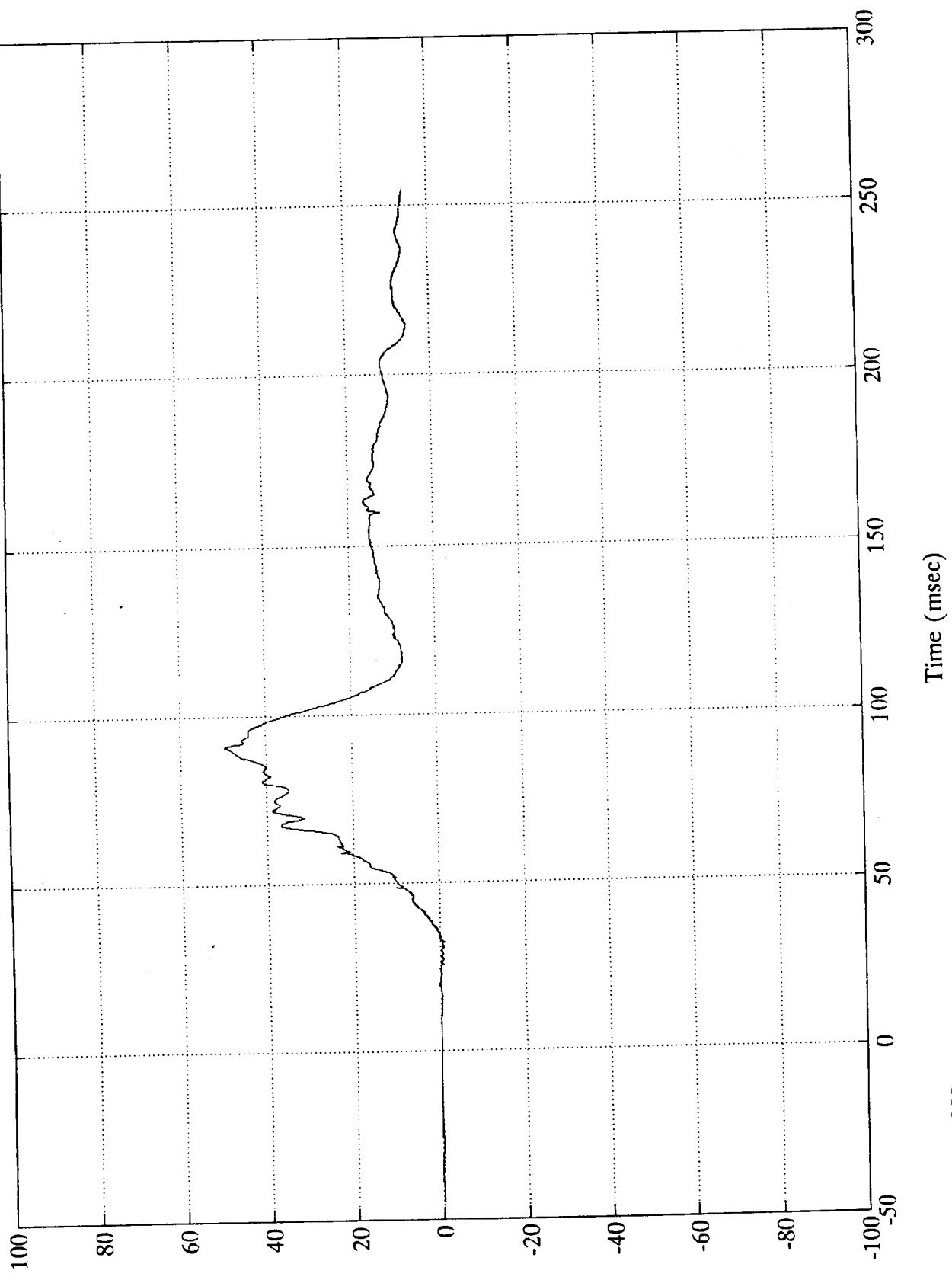


Time (msec)

Sae Filter Class 1000

Pos. 2 Head Z

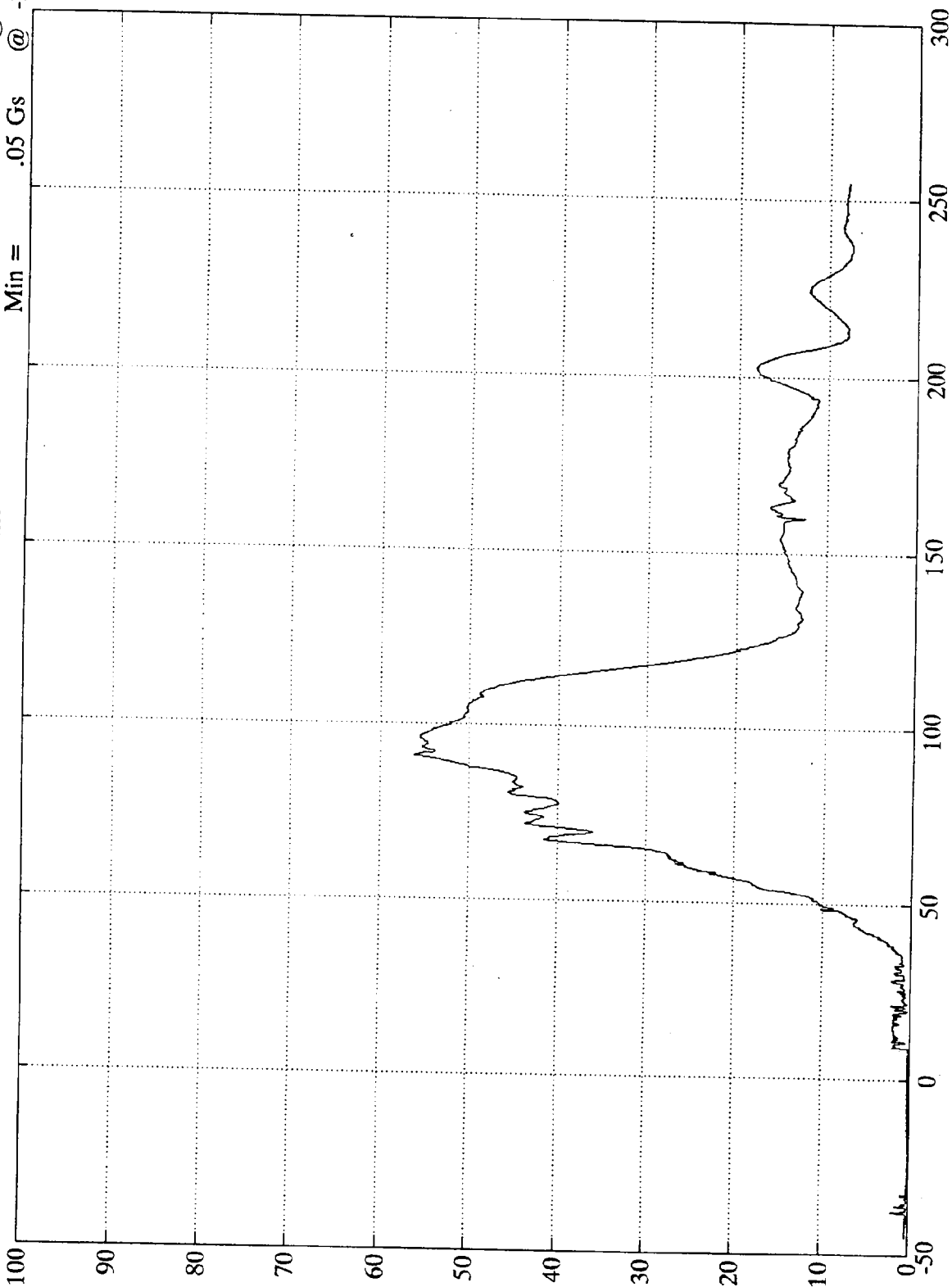
Max = 49.77 Gs @ 90.96 msec
Min = -1.00 Gs @ 32.15 msec



NHTSA "208" TEST 9 - 1992 GEO STORM

Max = 56.12 Gs @ 90.96 msec
 Min = .05 Gs @ -20.16 msec

Pos. 2 Head Resultant



Time (msec)

B-40

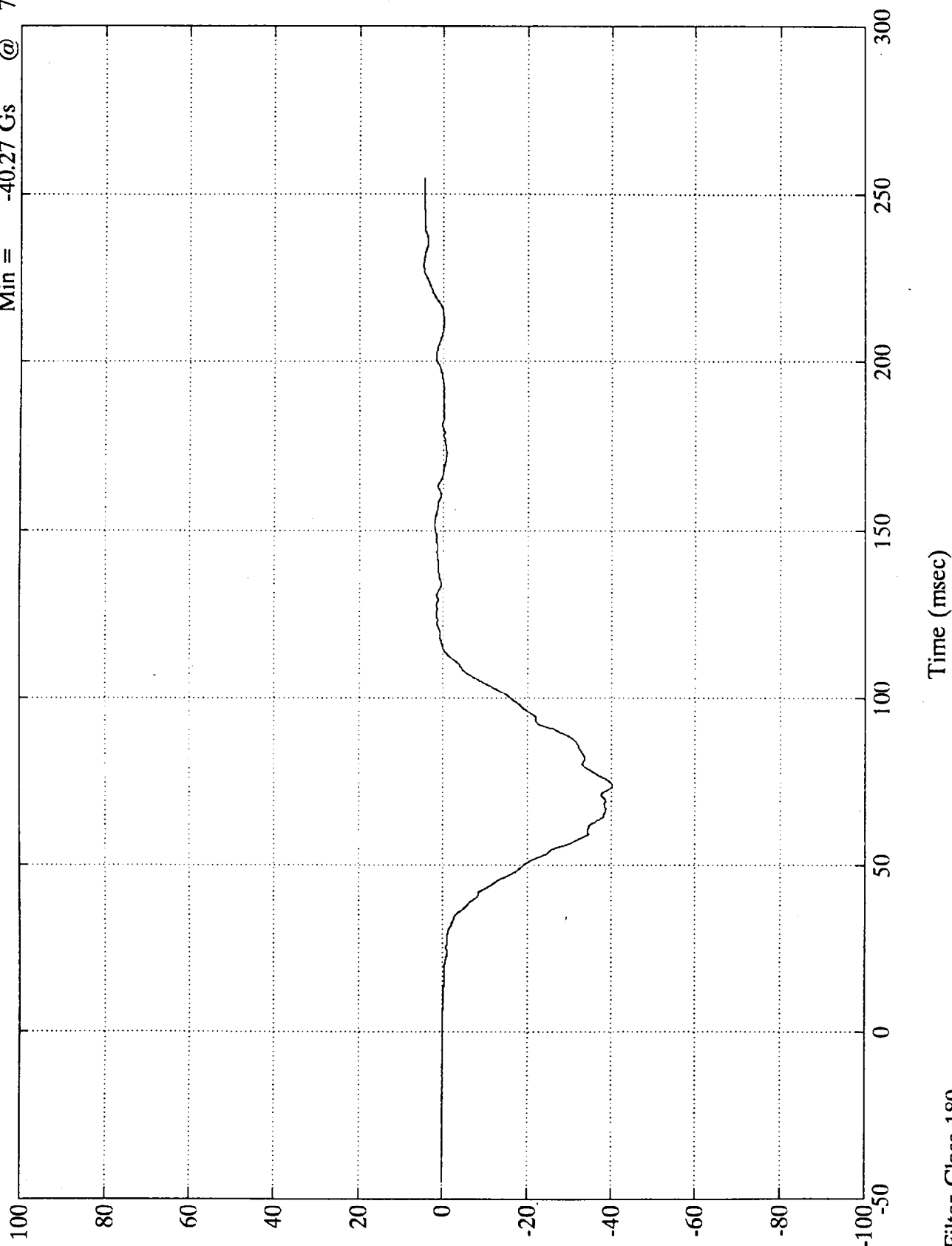
Sae Filter Class 1000

7979-1

NHTSA "208" TEST 9 - 1992 GEO STORM

Max = 4.65 Gs @ 228.96 msec
 Min = -40.27 Gs @ 73.55 msec

Pos. 2 Chest X



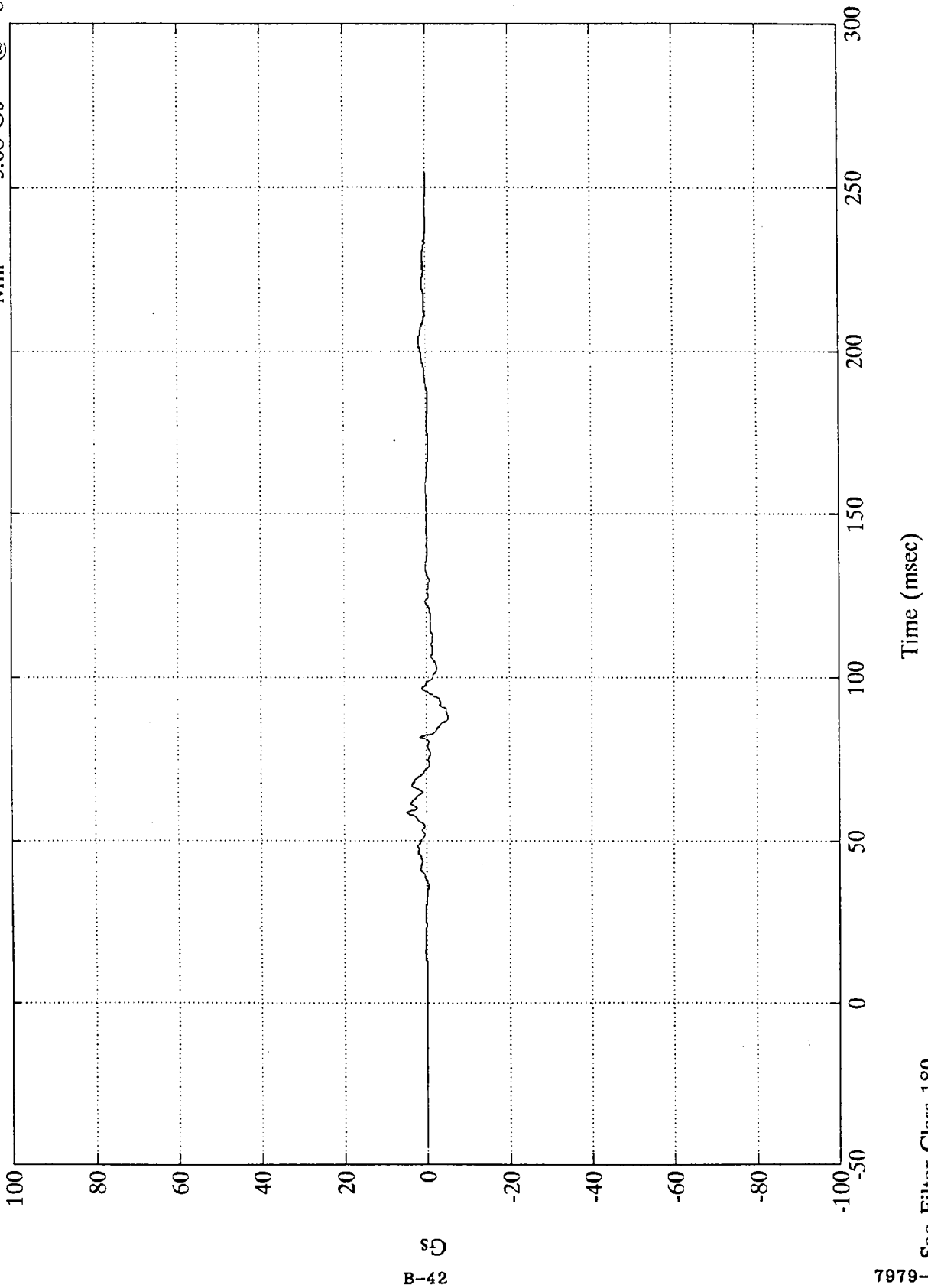
B-41

7979-1

Sae Filter Class 180

NHTSA "208" TEST 9 - 1992 GEO STORM

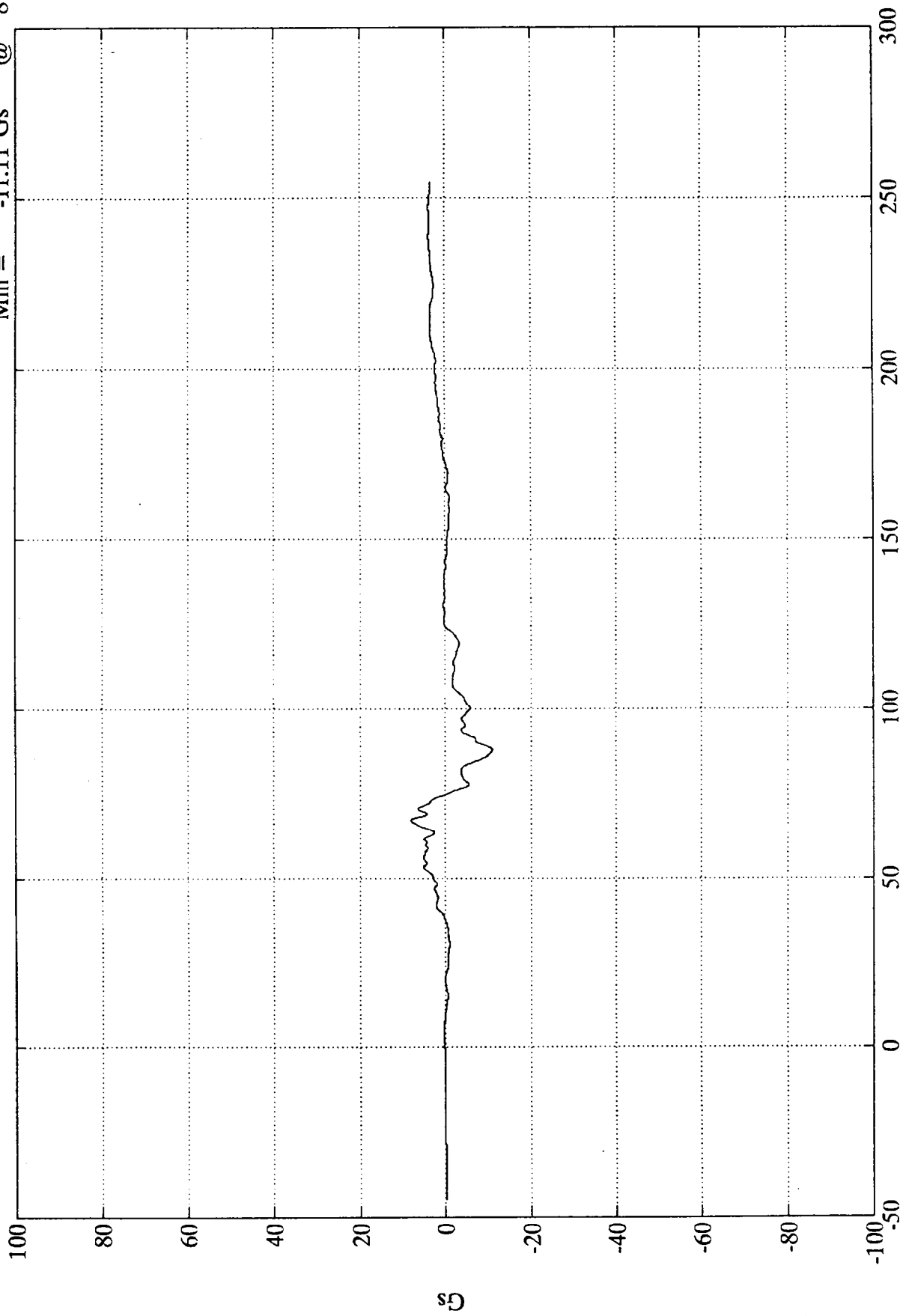
Pos. 2 Chest Y
 Max = 4.99 Gs @ 58.68 msec
 Min = -5.08 Gs @ 87.59 msec



NHTSA "208" TEST 9 - 1992 GEO STORM

Max = 8.14 Gs @ 67.19 msec
Min = -11.11 Gs @ 87.83 msec

Pos. 2 Chest Z



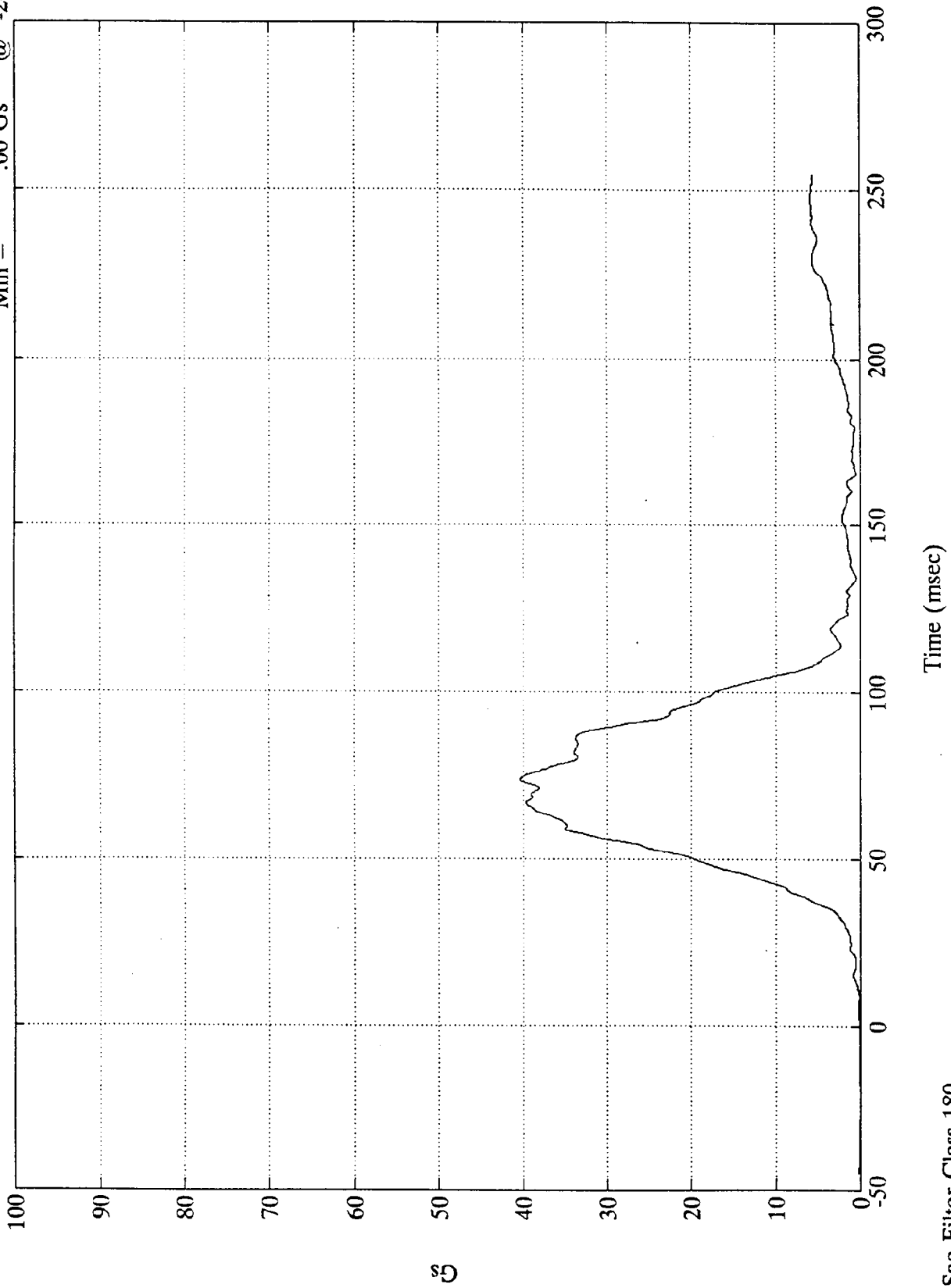
Time (msec)

B-43

NHTSA "208" TEST 9 - 1992 GEO STORM

Max = 40.38 Gs @ 73.55 msec
 Min = .00 Gs @ -24.12 msec

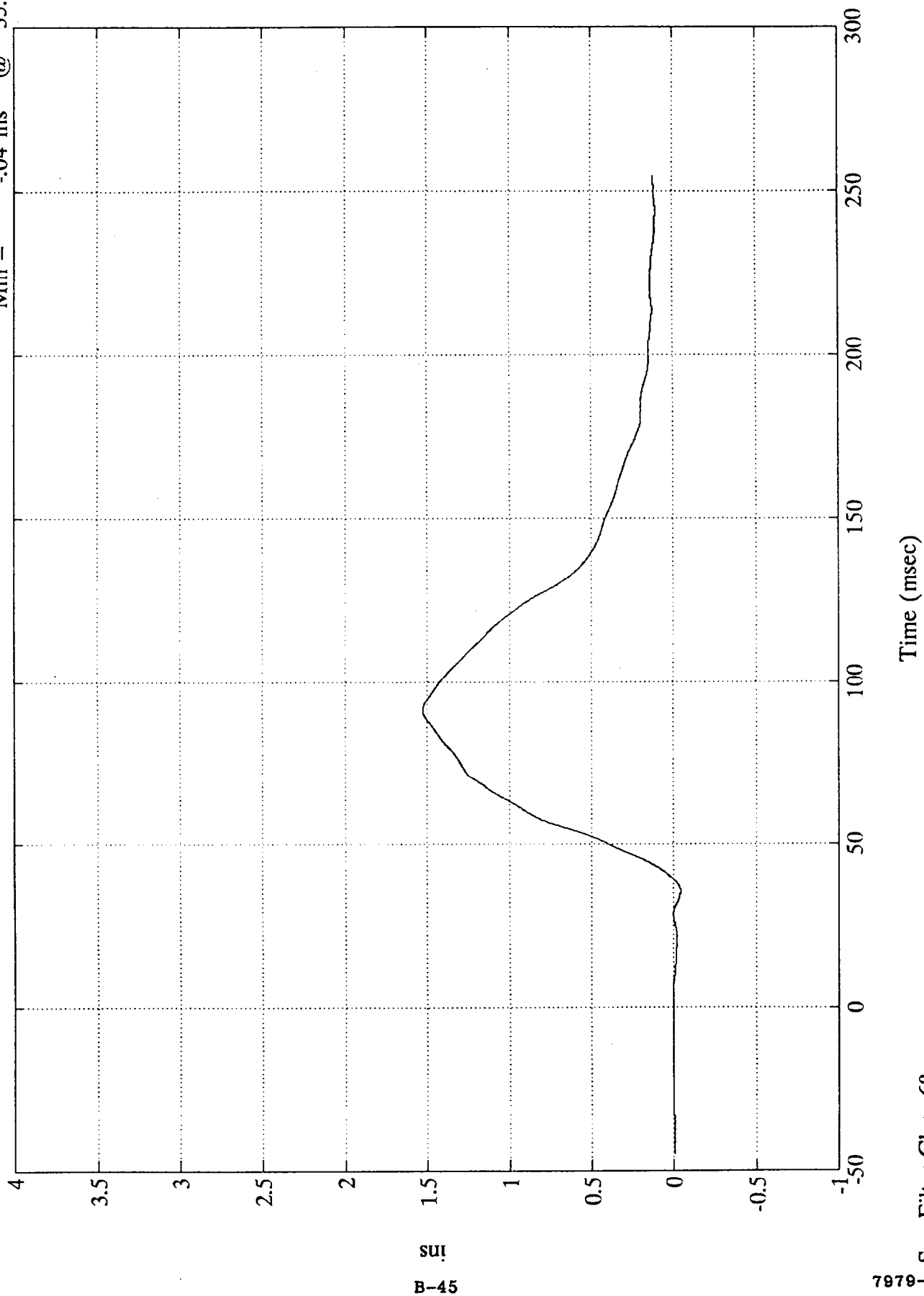
Pos. 2 Chest Resultant



NHTSA "208" TEST 9 - 1992 GEO STORM

Pos 2 Chest Disp.

Max = 1.52 ins @ 91.44 msec
Min = -.04 ins @ 35.51 msec

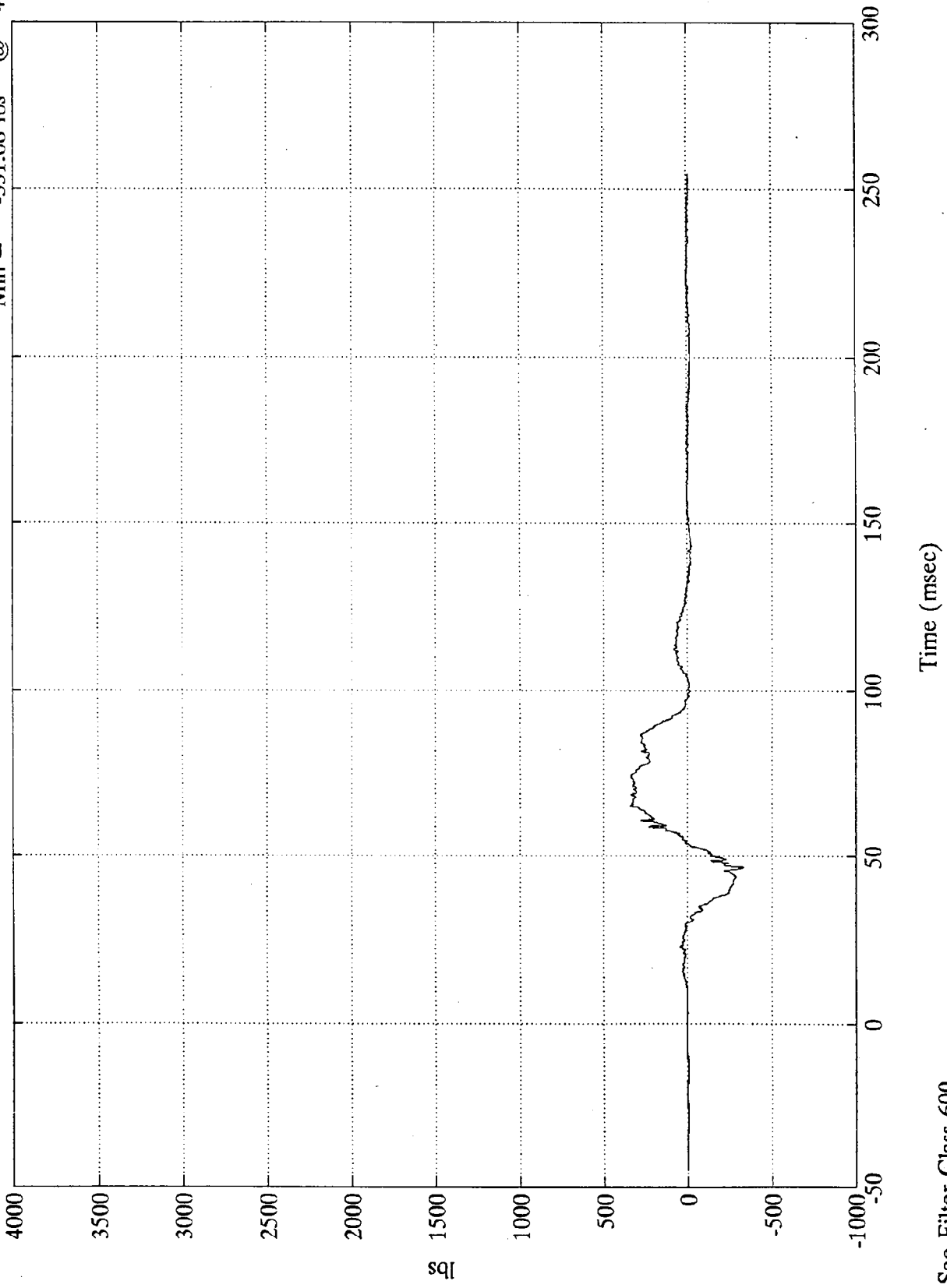


SUI
B-45

NHTSA "208" TEST 9 - 1992 GEO STORM

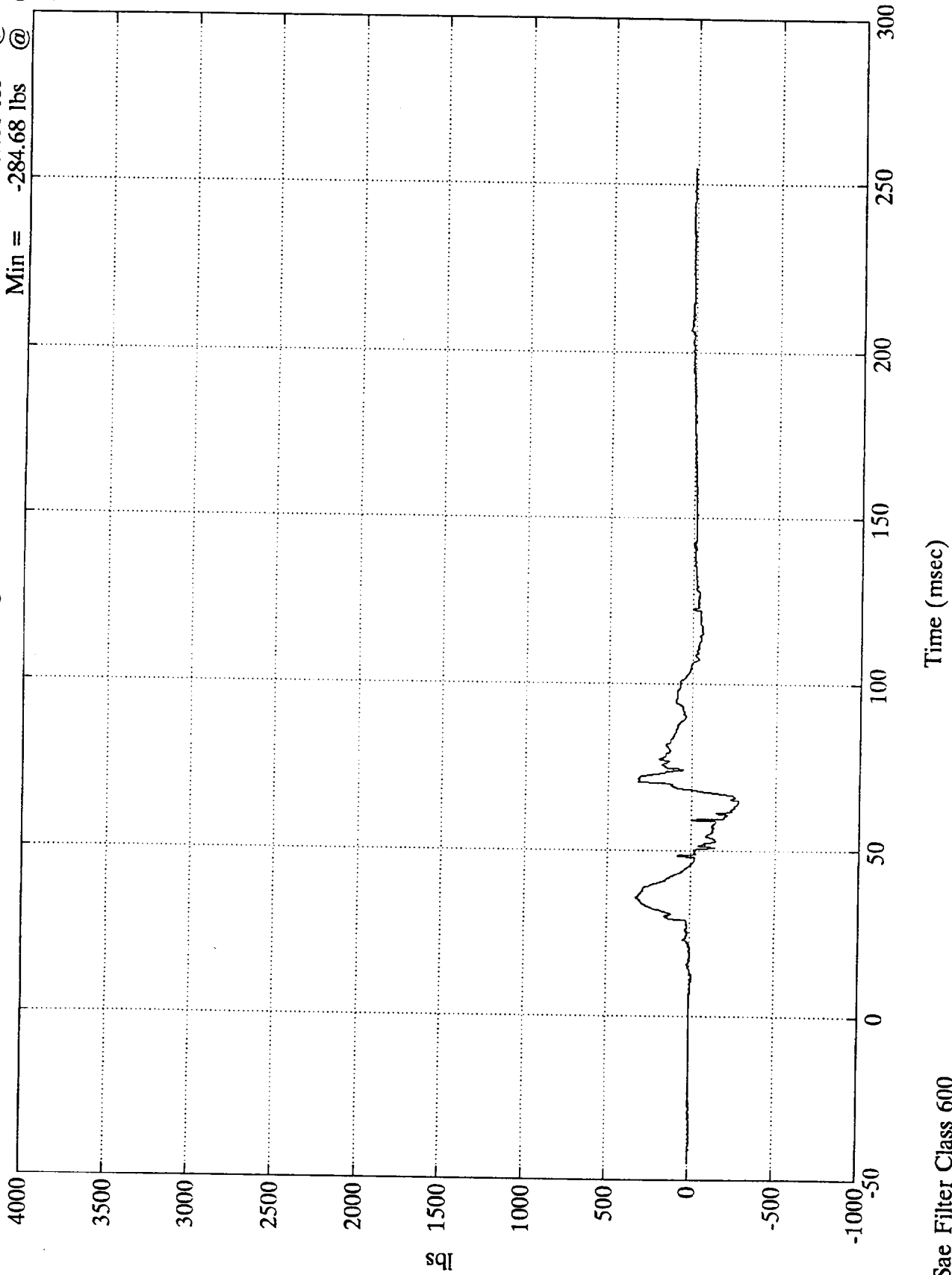
Pos. 2 Left Femur

Max = 340.87 lbs @ 65.40 msec
Min = -331.68 lbs @ 46.68 msec



Pos. 2 Right Femur

Max = 327.66 lbs @ 35.63 msec
Min = -284.68 lbs @ 64.68 msec



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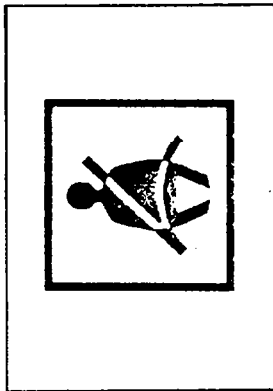
Sae Filter Class 600

Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

■ *Safety Belts: They're for Everyone*

This part of the manual tells you how to use safety belts properly. It also tells you some things you should not do with safety belts. And it explains the Supplemental Inflatable Restraint, or "air bag" system.



This figure lights up when you turn the key to ON or START when your safety belt isn't buckled, and you'll hear a buzzer, too.

It's the reminder to buckle up. In many states and Canadian provinces, the law says to wear safety belts. Here's why: **They work.**

CAUTION

⚠ Don't let anyone ride where they can't wear a safety belt properly. If you are in a crash and you're not wearing a safety belt, your injuries can be much worse. You can hit things inside the vehicle or be ejected from it. You can be seriously injured or killed. In the same crash, you might not be if you are buckled up. Always fasten your safety belt, and check that your passengers' belts are fastened properly too.

Seats & Safety Belts



You never know if you'll be in a crash. If you do have a crash, you don't know if it will be a bad one.

A few crashes are very mild. In them, you won't get hurt even if you're not buckled up. And some crashes can be so serious, like being hit by a train, that even buckled up a person wouldn't survive. But most crashes are in between. In many of them, people who buckle up can survive and sometimes walk away. Without belts they could be badly hurt or killed.

After 25 years of safety belts in vehicles, the facts are clear. In most crashes buckling up does matter . . . a lot!

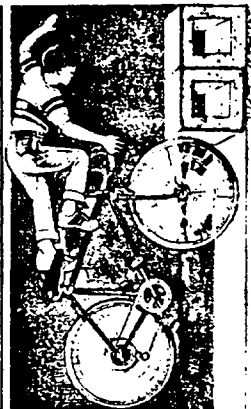
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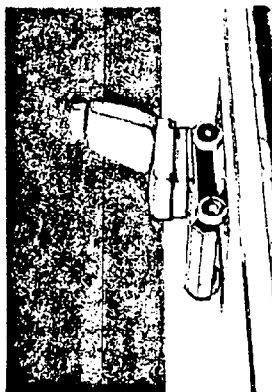
Why Safety Belts Work

When you ride in or on anything, you go as fast as it goes.

For example, if the bike is going 10 mph (16 km/h), so is the child.



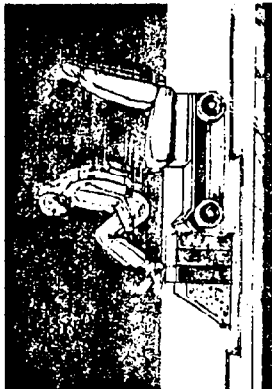
When the bike hits the block, it stops. But the child keeps going!



Take the simplest "car." Suppose it's just a seat on wheels.



Put someone on it.



Get it up to speed. Then stop the "car."
The rider doesn't stop.

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Seats & Safety Belts



The person keeps going until stopped by something.
In a real vehicle, it could be the windshield . . .



or the instrument panel . . .



or the safety belts!
With safety belts, you slow down as the vehicle does. You get more time to stop. You stop over more distance, and your strongest bones take the forces. That's why safety belts make such good sense.

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***Here Are Questions Many
People Ask about Safety Belts
— and the Answers***

Q: Won't I be trapped in the vehicle after an accident if I'm wearing a safety belt?

A: You could be — whether you're wearing a safety belt or not. But you can easily unbuckle a safety belt, even if you're upside down. And your chance of being conscious during and after an accident, so you can unbuckle and get out, is much greater if you are belted.

Q: Why don't they just put in air bags so people won't have to wear safety belts?

A: "Air bags," or Supplemental Inflatable Restraint systems, are in some vehicles today and will be in more of them in the future. But they are supplemental systems only — so they work with safety belts, not instead of them. Every "air bag" system ever offered for sale has required the use of safety belts. Even if you're in a vehicle that has "air bags," you still have to buckle up to get the most protection. That's true not only in frontal collisions, but especially in side and other collisions.

Q: If I'm a good driver, and I never drive far from home, why should I wear safety belts?

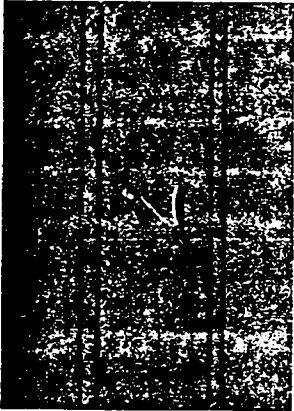
A: You may be an excellent driver, but if you're in an accident — even one that isn't your fault — you and your passengers can be hurt. Being a good driver doesn't protect you from things beyond your control, such as bad drivers.

Most accidents occur within 25 miles (40 km) of home. And the greatest number of serious injuries and deaths occur at speeds of less than 40 mph (65 km/h).

Safety belts are for everyone.

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Seats & Safety Belts



Safety Belt Reminder Light

When the key is turned to ON or START, the safety belt light and a buzzer will come on for about eight seconds to remind people to fasten their safety belts, unless the driver's safety belt is buckled. If the driver's belt is buckled, neither the buzzer nor the light will come on.

■ How to Wear Safety Belts Properly

Adults

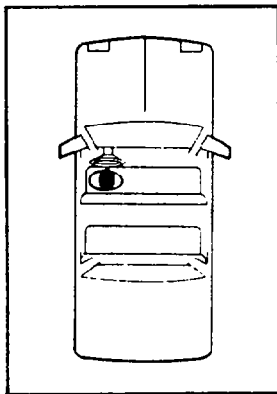
This section is only for people of adult size.

First, you'll want to know which restraint systems your vehicle has. We'll start with the driver position.

CAUTION

There are special things to know about safety belts and children. And there are different rules for babies and smaller children. If a child will be riding in your Geo, see the section after this one, called "Children." Follow these rules for everyone's protection.

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Driver Position

This section describes the driver's restraint system.



Lap-Shoulder Belt

The driver has a lap-shoulder belt. Here's how to wear it properly.

1. Close and lock the door.
2. Adjust the seat (to see how, see "Seats" in the Index) so you can sit up straight.



3. Pick up the latch plate and pull the belt across you. Don't let it get twisted.
4. Push the latch plate into the buckle until it clicks.

Seats & Safety Belts



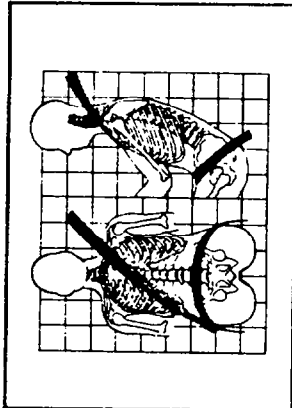
If the belt stops before it reaches the buckle, tilt the latch plate and keep pulling until you can buckle the belt.

If the belt isn't long enough, see "Safety Belt Extender" at the end of this section.

Make sure the release button on the buckle faces upward or outward so you would be able to unbuckle it quickly if you ever had to.

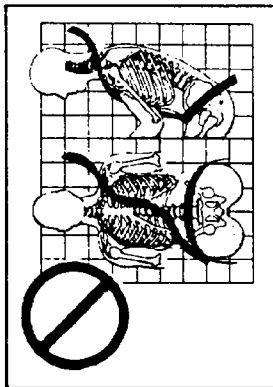


5. To make the lap part tight, pull down on the buckle end of the belt as you pull up on the shoulder belt.



The lap part of the belt should be low and snug below the hips, just touching the thighs. In a crash, this applies force to the strong pelvic bones. And you'd be less likely to slide under the lap belt. If you slid under it, the belt would apply force at your abdomen. This could cause serious or even fatal injuries. The shoulder belt should go over the shoulder and across the chest. These parts of the body are best able to take belt restraining forces.

The safety belt locks only if there's a sudden stop or crash, or if you pull the belt very quickly out of the retractor.

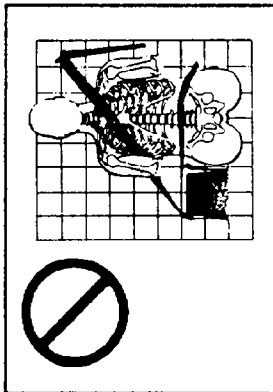


Q: What's wrong with this?

A: The shoulder belt is too loose. It won't give nearly as much protection this way.

CAUTION

You can be seriously hurt if your shoulder belt is too loose. In a crash you would move forward too much, which could increase injury. The shoulder belt should fit against your body.

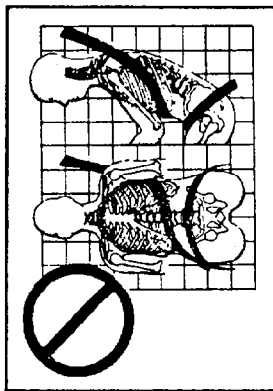


Q: What's wrong with this?

A: The belt is buckled in the wrong place.

CAUTION

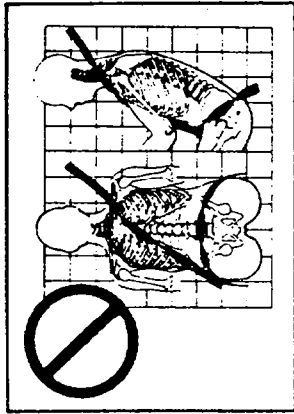
You can be seriously injured if your belt is buckled in the wrong place like this. In a crash, the belt would go up over your abdomen. The belt forces would be there, not at the pelvic bones. This could cause serious internal injuries. Always buckle your belt into the buckle nearest you.



Q: What's wrong with this?

A: The shoulder belt is worn under the arm. It should be worn over the shoulder at all times.

Seats & Safety Belts



CAUTION

⚠ You can be seriously injured if you wear the shoulder belt under your arm. In a crash, your body would move too far forward, which would increase the chance of head and neck injury. Also, the belt would apply too much force to the ribs, which aren't as strong as shoulder bones. You could also severely injure internal organs like your liver or spleen.

Q: What's wrong with this?

A: The belt is twisted across the body.

CAUTION

⚠ You can be seriously injured by a twisted belt. In a crash, you wouldn't have the full width of the belt to take impact forces. If a belt is twisted, make it straight so it can work properly, or ask your dealer to fix it.



To unlatch the belt, just push the button on the buckle. The belt should go back out of the way.

Before you close the door, be sure the belt is out of the way. If you slam the door on it, you can damage both the belt and your vehicle.

Supplemental Inflatable Restraint System

This section explains the driver's "air bag," or Supplemental Inflatable Restraint (SIR) system. Here's the most important thing to know:

CAUTION

⚠ If you are ever in a crash and you're not wearing a safety belt, your injuries may be much worse. You can hit things inside the vehicle or be ejected from it. You can be seriously injured or killed. In the same crash, you might not be if you're buckled up. That's true even when you have the SIR system. And, a driver whose body is against or very close to the steering wheel when the "air bag" inflates can be injured. For protection in frontal and all other collisions, everyone in the vehicle should be properly restrained.



Supplemental Inflatable Restraint Light

There is an inflatable restraint light on the instrument panel. The system checks itself and the light tells you if there is a problem.

You will see this light flash for a few seconds when you turn your ignition to **ON** or **START**. Then the light should go out, which means the system is ready.

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Seats & Safety Belts



CAUTION

⚠ If the inflatable restraint light doesn't come on, or stays on, or comes on when you are driving, your inflatable restraint system may not work properly. Have your vehicle serviced right away.

How the SIR System Works

The "air bag" part of the SIR system is in the middle of the steering wheel.

The "air bag" system is intended to inflate only in moderate and severe frontal crashes. The "air bag" inflates in a fraction of a second. It is not intended to inflate during rear or side impacts, rollovers or low speed frontal crashes, so always wear your safety belt. The "air bag" helps restrain the driver, and then it quickly deflates.

Some gray "smoke" is normal when this happens, and some people have reported mild coughing and watery eyes from it. But all of these have been temporary. The "air bag" can give extra protection for the driver's upper body.

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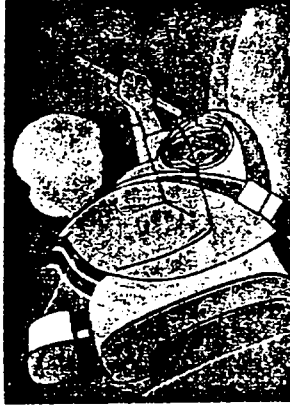
CAUTION

- Don't attach anything to the steering wheel pad. It might injure the driver if the SIR inflates.
- The SIR is designed to inflate only once. After it inflates, you'll need some new parts for your SIR system. If you don't get them, the SIR system won't be there to help protect you in another crash. A new system will include the "air bag" module and possibly other parts. The service manual has information about the need to replace other parts.
- Let only qualified technicians work on your SIR system. Improper service can mean that your SIR system won't work properly. See your dealer for service.

Servicing Your Geo with the SIR System

Please tell or remind anyone who works on your Geo that it has the SIR system. There are parts of the SIR system in several places around your vehicle. You don't want the system to inflate while someone is working on your car. The SIR system does not need regular maintenance. Your Geo dealer and the 1992 Storm Service Manual have information about the SIR system, including repair or disposal.

Seats & Safety Belts



CAUTION

For up to 10 minutes after the ignition key is turned off and the battery disconnected, an "air bag" can still inflate during improper service. You can be injured if you are close to an "air bag" when it inflates. Be sure to follow the proper service procedures.

When electrical work is done under the hood or inside the car, the ignition should be in **LOCK** if possible.

Avoid wires wrapped with yellow tape, or orange connectors. They are probably part of the SIR system.

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But if the ignition has to be on for electrical work, or if the steering column is to be disassembled, the SIR system should be disconnected. To do this:

- Remove the SIR fuse (see "Fuses and Circuit Breakers" in the Index).

- Disconnect the orange connectors at the base of the steering column.

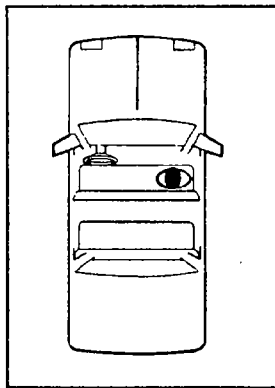
When the work is complete, if the SIR system was disconnected, be sure to reattach everything and replace the fuse before turning the ignition on. When you turn the ignition key on, be sure you see the inflatable restraint light on the instrument panel. If you don't see this light flash and then go out as usual, have your SIR system repaired.

Safety Belt Use during Pregnancy

Safety belts work for everyone, including pregnant women. Like all occupants, they are more likely to be seriously injured if they don't wear safety belts.

A pregnant woman should wear a lap-shoulder belt, and the lap portion should be worn as low as possible throughout the pregnancy.

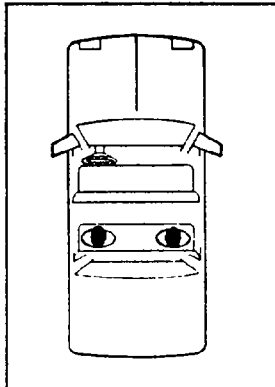
The best way to protect the fetus is to protect the mother. When a safety belt is worn properly, it's more likely that the fetus won't be hurt in a crash. For pregnant women, as for anyone, the key to making safety belts effective is wearing them properly.



Passenger Positions

Right Front Passenger Position

The right front passenger's safety belt works the same way as the driver's safety belt. See "Driver Position," earlier in this part.



Rear Seat Passengers

It's very important for rear seat passengers to buckle up! Accident statistics show that unbelted people in the rear seat are hurt more often in crashes than those who are wearing safety belts.

Rear passengers who aren't safety belted can be thrown out of the vehicle in a crash. And they can strike others in the vehicle who are wearing safety belts. The rear seats have lap-shoulder belts. Here's how to wear one properly.



1. Pick up the latch plate and pull it across you. Don't let it get twisted.
2. Push the latch plate into the buckle until it clicks.

Seats & Safety Belts



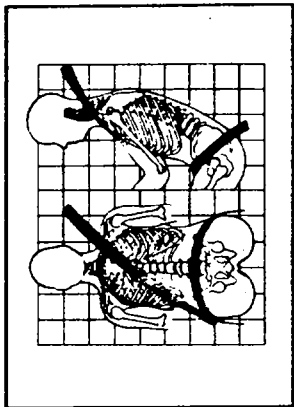
If the belt stops before it reaches the buckle, tilt the latch plate and keep pulling until you can buckle it.

If the belt is not long enough, see "Safety Belt Extender" at the end of this part.

Make sure the release button on the buckle faces upward or outward so you would be able to unbuckle it quickly if you ever had to.



3. To make the lap part tight, pull down on the buckle end of the belt as you pull up on the shoulder part.



The lap part of the belt should be low and snug below the hips, just touching the thighs. In a crash, this applies force to the strong pelvic bones. And you'd be less likely to slide under the lap belt. If you slid under it, the belt would apply force at your abdomen. This could cause serious or even fatal injuries. The shoulder belt should go over the shoulder and across the chest. These parts of the body are best able to take restraining forces.

The safety belt locks if there's a sudden stop or a crash, or if you pull it very quickly out of the retractor.

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To unlatch the belt, just push the button on the buckle.



■ Children

Everyone in a vehicle needs protection! That includes infants and all children smaller than adult size. In fact, the law in every state and Canadian province says children up to some age must be restrained while in a vehicle.

CAUTION

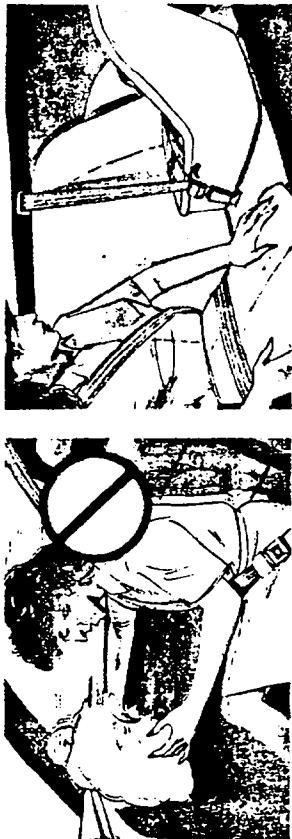
 You can be seriously hurt if your shoulder belt is too loose. In a crash you would move forward too much, which could increase injury. The shoulder belt should fit against your body.

Seats & Safety Belts

Smaller Children and Babies

CAUTION

Smaller children and babies should always be restrained in a child or infant restraint. The instructions for the restraint will say whether it is the right type and size for your child. A very young child's hip bones are so small that a regular belt might not stay low on the hips, as it should. Instead, the belt will likely be over the child's abdomen. In a crash the belt would apply force right on the child's abdomen, which could cause serious or fatal injuries. So, be sure that any child small enough for one is always properly restrained in a child or infant restraint.



CAUTION

Never hold a baby in your arms while riding in a vehicle. A baby doesn't weigh much — until a crash. During a crash a baby will become so heavy you can't hold it. For example, in a crash at only 25 mph (40 km/h), a 12-pound (5.5 kg) baby will suddenly become a 240-pound (110 kg) force on your arms. The baby would be almost impossible to hold. Secure the baby in an infant restraint.

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Child Restraints

Be sure to follow the instructions for the restraint. You may find these instructions on the restraint itself or in a booklet, or both. These restraints use the belt system in your vehicle, but the child also has to be secured within the restraint to help reduce the chance of personal injury. The instructions that come with the infant or child restraint will show you how to do that.

Where to Put the Restraint

Accident statistics show that children are safer if they are restrained in the rear rather than the front seat. We at General Motors therefore recommend that you put your child restraint in the rear seat unless the child is an infant and you're the only adult in the vehicle. In that case, you might want to secure the restraint in the front seat where you can keep an eye on the baby.

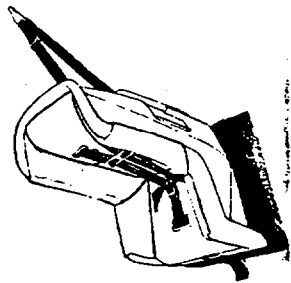
Wherever you install it, be sure to secure the child restraint properly.

CAUTION

 An unsecured child restraint can move around in a collision or sudden stop and injure people in the vehicle — even when no child is in it.

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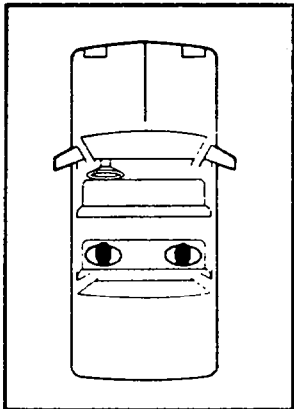
Seats & Safety Belts



Top Strap

If your child restraint has a top strap, it should be anchored.

If you need to have an anchor installed, you can ask your Geo dealer to put it in for you. If you want to install an anchor yourself, your dealer can tell you how to do it.



Securing a Child Restraint in the Rear Seat

You'll be using the lap-shoulder belt. See the earlier section about the top strap if the child restraint has one.

1. Put the restraint on the seat. Follow the instructions for the child restraint.
2. Secure the child in the child restraint as the instructions say.
3. Pull out the vehicle's safety belt and run the lap part through or around the restraint. The child restraint instructions will show you how. Tilt the latch plate to adjust the belt if needed.

See if the shoulder belt would go in front of the child's face or neck. If so, put it behind the child restraint.

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4. Buckle the belt. Make sure the release button faces upward or outward, so you'll be able to unbuckle it quickly if you ever need to.

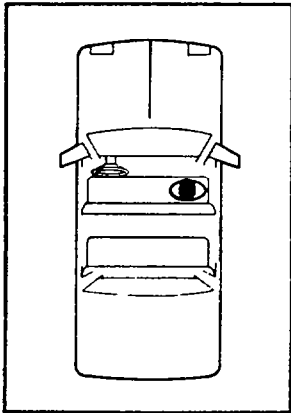


5. To tighten the belt, pull up on the shoulder belt while you push down on the child restraint.



6. Push and pull the child restraint in different directions to be sure it is secure.
To remove the child restraint, just unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger.

Seats & Safety Belts

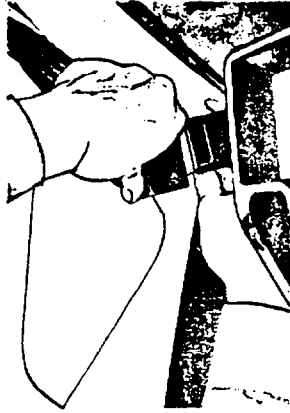


Securing a Child Restraint in the Right Front Seat

You'll be using the lap-shoulder belt. See the earlier section about the top strap if the child restraint has one.

1. Put the restraint on the seat. Follow the instructions for the child restraint.
2. Secure the child in the child restraint as the instructions say.
3. Pull out the vehicle's safety belt and run the lap part through or around the restraint. The child restraint instructions will show you how. Tilt the latch plate to adjust the belt if needed.

See if the shoulder belt would go in front of the child's face or neck. If so, put it behind the child restraint.



4. Buckle the belt. Make sure the release button faces upward or outward, so you'll be able to unbuckle it quickly if you ever need to.

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5. To tighten the belt, pull up on the shoulder belt while you push down on the child restraint.



6. Push and pull the child restraint in different directions to be sure it is secure.

To remove the child restraint, unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger.



Larger Children

Children who have outgrown child restraints should wear the vehicle's safety belts.

Accident statistics show that children are safer if they are restrained in the rear seat. But they need to use the safety belts properly.

- Children who aren't buckled up can be thrown out in a crash.