

V1664

REPORT NUMBERS: 208-CAL-92-07
212-CAL-92-07
301-CAL-92-07

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

**TOYOTA MOTOR CORPORATION
1992 TOYOTA CAMRY
4-DOOR SEDAN**

NHTSA NUMBER: CN5104

CALSPAN TEST NUMBER: 7953-3

NOVEMBER 21, 1991

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



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

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-90-C-01003. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

Prepared: David J. Travale

David J. Travale, Project Engineer

Approved: Walter E. Levan

Walter E. Levan, Program Manager
Transportation Sciences Center

FINAL REPORT ACCEPTED BY:

Charles P. Chase

Contracting Office's Technical Representative
(COTR), NHTSA, Office of Vehicle Safety Compliance

2/4/92

Date of Report Acceptance

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 208-CAL-92-07 212-CAL-92-07 301-CAL-92-07		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of Compliance Testing for FMVSS Nos. 208, 212, 219 (Partial), and 301 on a 1992 Toyota Camry 4-Door Sedan				5. Report Date November 21, 1991	
				6. Performing Organization Code CAL	
7. Author(s) Vincent M. Paolini, Engineer David J. Travale, Project Engineer Walter E. Levan, Program Manager				8. Performing Organization Report No. 7953-3	
9. Performing Organization Name and Address Calspan Advanced Technology Center P.O. Box 400 Buffalo, New York 14225				10. Work Unit No. J86-3-1137	
				11. Contract or Grant No. DTNH22-90-C-01003	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (NEF-30) 400 Seventh St., S.W., Rm. 6115, Washington, DC 20590				13. Type of Report and Period Covered Final Report November-December 1991	
				14. Sponsoring Agency Code DOT/NHTSA/NEF/OVSC	
15. Supplementary Notes					
16. Abstract A 30 mph vehicle safety compliance test was conducted on a 1992 Toyota Camry 4-Door Sedan. This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on November 21, 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 29.6 mph. The ambient temperature at the impact face was 49°F. The subject test vehicle appears to comply with the requirements of FMVSS Nos. 212, 219 (partial) and 301 (partial). The driver ATD recorded chest accelerations which appear to exceed the FMVSS 208 requirements. <u>Type of Restraint System:</u> The test vehicle was equipped with a driver side airbag and a passenger side manual 3-point seat belt. 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 <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		
19. Security Classif. (of this report) UNCLASSIFIED		20. Security Classif. (of this page) UNCLASSIFIED		21. No. of Pages 22. Price	

TABLE OF CONTENTS

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

LIST OF FIGURES

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

LIST OF TABLES

<u>Table No.</u>		<u>Page No.</u>
1	Crash Test Summary	2-2
2	General Test and Vehicle Parameter Data	2-3
3	Post-Impact Data	2-5
4	Vehicle Accelerometer Locations and Data Summary	3-8
5	High Speed Camera Locations	3-10
6	Vehicle Measurements	3-13
7	Dummy Injury Criteria Values	4-2
8	FMVSS No. 208 - Seat Belt Warning System check	4-3
9	FMVSS No. 208 - Labeling and Driver's Manual Information	4-4
10	FMVSS No. 208 - Readiness Indicator	4-5
11	FMVSS No. 208 - Comfort and Convenience Test Summary	4-6
12	FMVSS No. 301 - "Fuel System Integrity" Post-Impact Test Data	4-14
13	FMVSS No. 301 - Static Rollover Data Sheet	4-15
14	Test Vehicle Noncompliance Notice	4-19

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 Toyota Camry 4-Door Sedan, 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 CN5104

A frontal barrier was impacted by a 1992 Toyota Camry 4-Door Sedan at a velocity of 29.6 mph. The test was performed at the Calspan Corporation Advanced Technology Center on November 21, 1991. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by one real-time camera and 14 high-speed cameras. Camera locations and other pertinent camera information can be found in this report.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right front passenger seating positions according to dummy placement instructions specified in the OVSC Laboratory Test Procedure.

Both ATDs were fully instrumented with head and chest triaxial accelerometers, 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 two 14-channel FM tape recorders. Appendix B contains the vehicle and dummy response data traces.

The driver's HIC was 428. The maximum chest deceleration over 3 milliseconds was 67.6 g's with 1.7 inches of deflection. The maximum force on the driver's left femur was 1390 pounds and 1605 pounds on the right femur.

The right front passenger's HIC was 506. The maximum chest deceleration over 3 milliseconds was 36.0 g's with 1.4 inches of deflection. Loads of 332 and 233 pounds were recorded on the left and right femurs respectively.

Table 1

CRASH TEST SUMMARYVehicle NHTSA No.: CN5104 Test Mode: 30 mph Frontal BarrierTest Date: November 21, 1991 Time: 15:35 Temperature: 49 °FVehicle Make/Model/Body Style: 1992 Toyota Camry 4-Door SedanVehicle Test Weight: 3440 lbs.Vehicle/Barrier Impact Angle: 0 °Impact Velocity: 29.6 mphMaximum Static Crush: 19.7 inchesVehicle Rebound: 28.5 inchesDUMMIES:DRIVERPASSENGER

Type:

Part 572EPart 572E

Restraint System:

Airbag3-point manual seat beltNumber of Data Channels: 25Number of Cameras: 1 Real Time14 High SpeedDOOR OPENING DATA: Closed - operable - Left FrontClosed - 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:

Face with airbag; rear
of head with headrestChin with chest

Abdomen:

No ContactNo Contact

Chest:

Lower Steering
wheel rimNo Contact

Knees:

Lower dash and
steering columnGlove box door

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1992 Toyota Camry 4-Door Sedan
 NHTSA No.: CN5104; VIN: JT2SK11EXN0004365; Color: Maroon
 Engine Data: 4 cylinders; - CID; 2.2 Liters; - cc
 Placement: - Longitudinal or In-Line; ✓ Transverse or Lateral
 Transmission Data: 5 speeds; ✓ Manual; - Automatic; - Overdrive
 Final Drive: - Rear Wheel Drive; ✓ Front Wheel Drive; - Four Wheel Drive
 Major Options: ✓ A/C; ✓ Pwr.Strg.; ✓ Pwr.Brakes
- Pwr.Windows; - Pwr.Door Locks; ✓ Tilt Wheel
 Date Received: 10-3-92; Odometer Reading 80 miles
 Selling Dealer: Stateside Toyota
 & Address 839 Foote Avenue, Jamestown, NY 14701

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Toyota Motor Corp.
 Date of Manufacture: 6/91
 GVWR: 4135 lbs.; GAWR: 2400 lbs. FRONT; 2400 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 29 psi FRONT
29 psi REAR
 Recommended Tire Size: P195/70 R14
 Recommended Cold Tire Pressure: 26 psi FRONT; 26 psi REAR
 Size of Tires on Test Vehicle: 195/70R14; Manufacturer: Dunlop
 Vehicle Capacity Data:
 Type of Front Seats: - Bench; ✓ Bucket; - Split Bench
 Number of Occupants: 2 Front; 3 Rear; 5 Total
 Vehicle Capacity Weight (VCW) = 900 lbs.
 No. of Occupants x 150 lbs. = 750 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 150 lbs. (Difference)

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

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

Right Front = 900 lbs. Right Rear = 590 lbs.
 Left Front = 880 lbs. Left Rear = 600 lbs.
 TOTAL FRONT = 1780 lbs. TOTAL REAR = 1190 lbs.
 % of Total Vehicle Weight = 59.9 % of Total Weight = 40.1 %
 TOTAL DELIVERED WEIGHT = 2970 lbs.

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 2970 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 150 lbs.
 Weight of 2 P.572 Dummies @ 167 ea. = 334 lbs.
 TARGET TEST WEIGHT = 3454 lbs. (sum)

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 136 POUNDS OF CARGO WEIGHT:

Right Front = 930 lbs. Right Rear = 780 lbs.
 Left Front = 940 lbs. Left Rear = 790 lbs.
 TOTAL FRONT = 1870 lbs. TOTAL REAR = 1570 lbs.
 % of Total Weight = 54.4 % % of Total Weight = 45.6 %
 TOTAL TEST WEIGHT = 3440 lbs.
 Weight of Ballast Secured in Vehicle Trunk Area = 75 lbs.
 Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED: RF 27.6" LF 27.3" RR 25.6" LR 25.3"
 FULLY LOADED: RF 26.2" LF 26.2" RR 24.3" LR 24.2"
 AS TESTED: RF 27.2" LF 26.8" RR 25.2" LR 24.8"
 Vehicle's Wheel Base: 103.1 in.
 Location of Vehicle's C.G.: 47.1 inches rearward of front wheel center

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 18.5 gallons
 Usable Capacity Figure Furnished by COTR = 18.5 gallons
 Test Volume Range (92 to 94% of Usable Capacity) = 17.0 to 17.4 gallons
 ACTUAL TEST VOLUME = 17.2 gallons (with entire fuel system filled)

Table 3

POST IMPACT DATATYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
 Test Date: November 21, 1991 Time: 15:35 Temperature: 49°F
 Vehicle NHTSA No.: CN5104
 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 = 29.7 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 = 182.5; C/L = 187.8; Left = 182.4
 Post-Test Right = 166.5; C/L = 168.1; Left = 168.5
 Crush Right = 16.0; C/L = 19.7; Left = 13.9
 AVERAGE = 19.9 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

Right = 28.8; C/L = 28.1; Left = 28.5
 AVERAGE = 28.5 inches

DOOR OPENING:

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

SEAT MOVEMENT:

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

Table 3
POST IMPACT DATA (cont.)

GLAZING DAMAGE: Windshield cracked near right side "A" pillar.

OTHER NOTABLE IMPACT FEATURES: Steering column stroked. Top of steering wheel
rim deformed. Lower portion of steering wheel rim deformed.

Section 3
OCCUPANT AND VEHICLE DATA

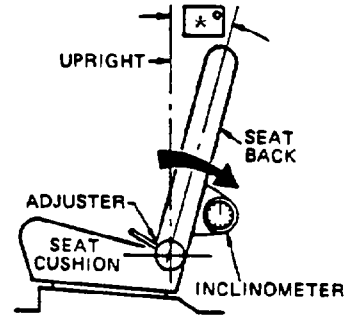
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1992 Vehicle Model: Tovota Camrv Body Style: 4 Door Sedan

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: set to manufacturer specifications.

Measurement instructions: Recline seat to the 5th notch rearward from the most upright position. Most upright position = 1st notch.

Seat back angle for passenger's seat: set to manufacturer specifications.

Measurement instructions: Same as driver.

2. Seat Fore and Aft Positioning

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

Positioning of the driver's seat: Seat placed in 9th notch rearward from foremost position. Full front position = position 1.

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 18.5 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.: CN5104 Vehicle: 1992 Toyota Camry 4-Door Sedan

SEAT TYPE:

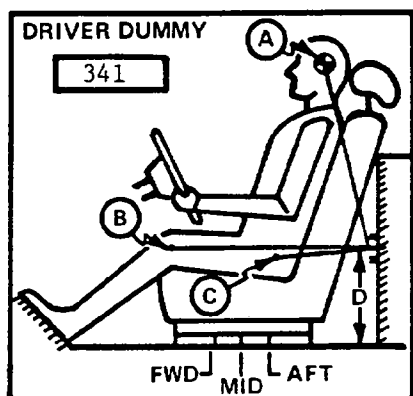
- Bench
X Bucket
- Split Bench

ADJUSTER TYPE:

X Manual
- Power

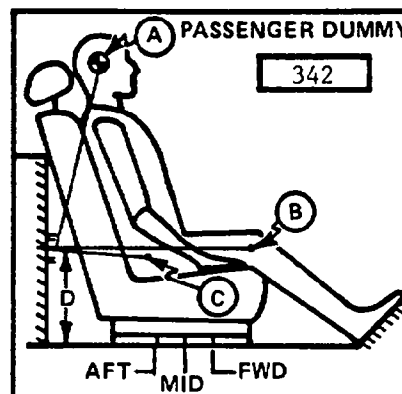
SEAT BACK TYPE:

- Fixed
X Adjustable Reclining



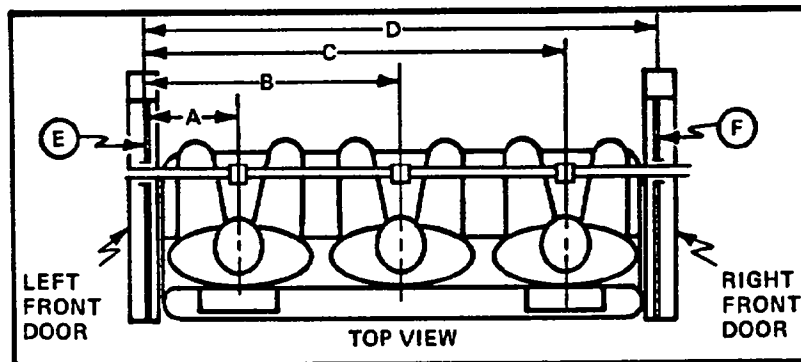
MEASUREMENT LOCATION

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



A = 17.1 in. 11 Degrees
 B = 23.5 in. 106 Degrees
 C = 11.0 in. 142 Degrees
 D = 16.2 in.

A = 17.4 in. 11 Degrees
 B = 23.5 in. 105 Degrees
 C = 11.4 in. 143 Degrees
 D = 16.2 in.



S/N 341

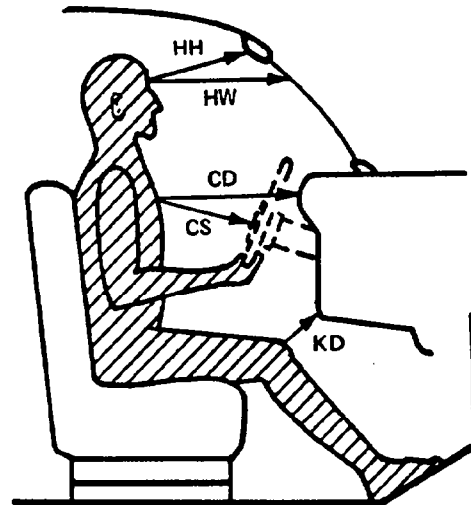
DUMMY ID

S/N 342

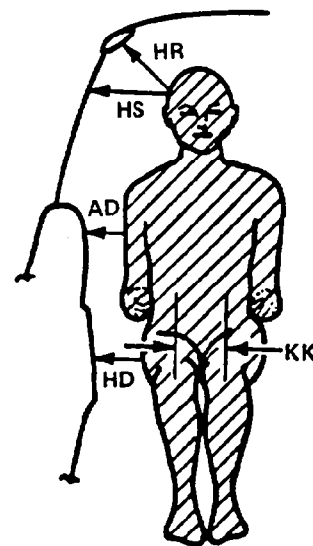
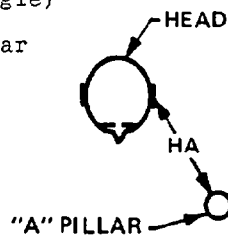
A = Left Door to Driver Centerline 13.1 in.
 B = Left Door to Center Passenger Centerline - in.
 C = Left Door to Right Passenger Centerline 42.0 in.
 D = Left Door to Right Door 54.3 in.
 E, F = Window Glass Height (Right and Left Must Be Equal) 9.6 in.

Figure 3
OCCUPANT CLEARANCE DIMENSIONS
(Dimensions in inches)

	DRIVER	PASSENGER
HH	13.5	14.0
HW	19.6	21.4
CD	22.4	21.3
CS	12.4	-
KDL	5.4	5.3
KDR	5.6	5.3
SA	See Note	See Note
TA	25°*	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
 TA = Torso Angle (*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	6.6	6.3
HS	9.9	9.3
AD	4.7	4.4
HD	7.7	8.0
KK	10.2	8.3
HA	18.7	19.4

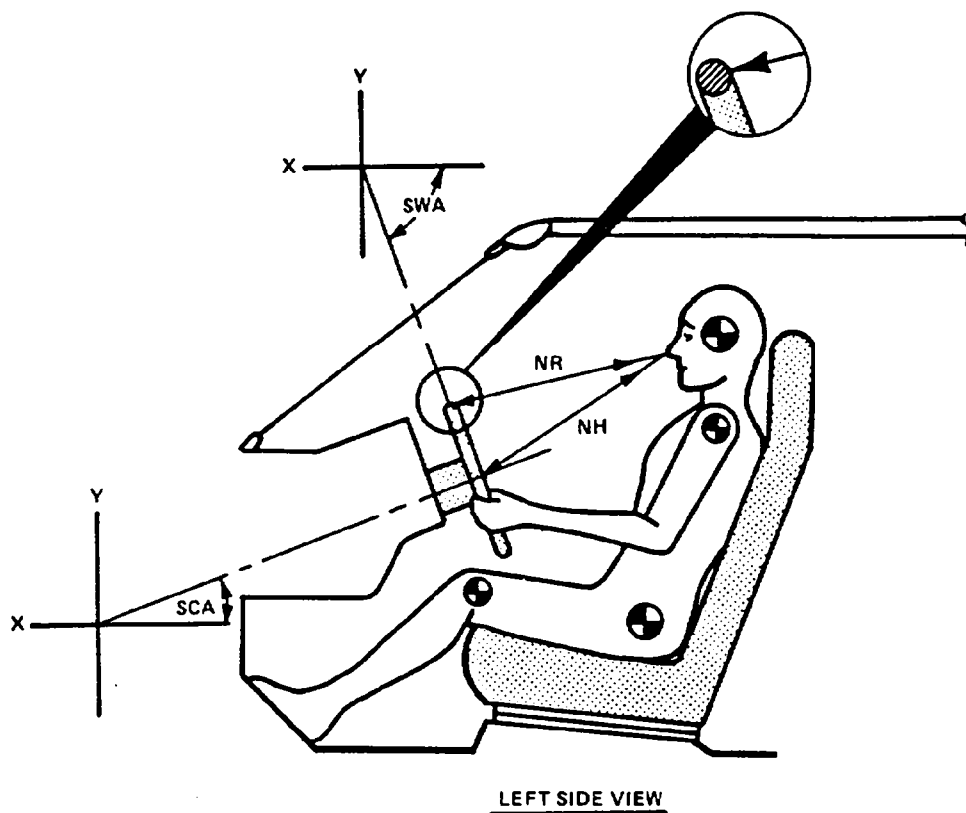
Note: Seat back was set by manufacturer specifications.

H-Point Location

	Longitudinal		Vertical	
	Target (to striker)	Actual	Target (to sill)	Actual
DRIVER	7.6	7.6	5.3	5.5
PASSENGER	7.5	7.4	5.5	5.6

Figure 4

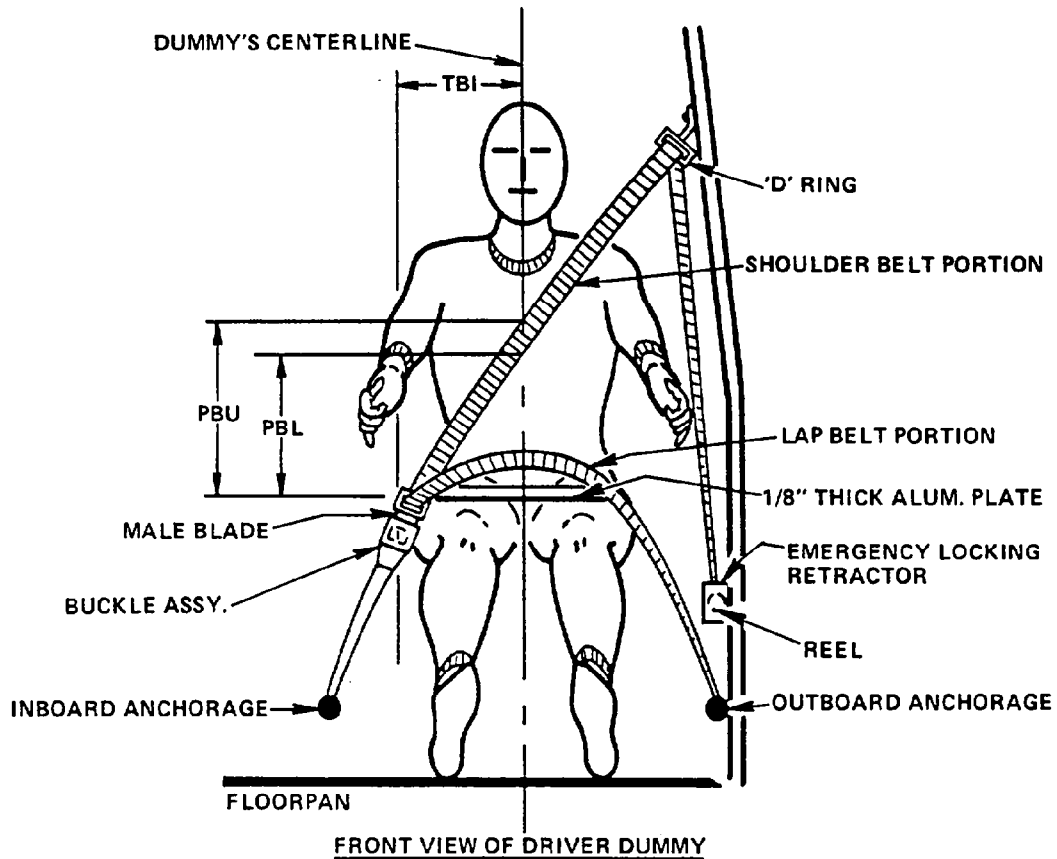
DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSEMBLY REFERENCE DIMENSIONS



LEFT SIDE VIEW

		MEASUREMENTS	
<u>NR</u>	-- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	16.2	Inches
<u>NH</u>	-- Distance from tip of dummy's nose to center of steering wheel hub	15.9	Inches
<u>SCA</u>	-- Angle of steering column relative to the horizontal X axis	25°	Degrees
<u>SWA</u>	-- Angle of steering wheel relative to the horizontal X axis	-65°	Degrees

Figure 5
SEAT BELT POSITIONING DATA

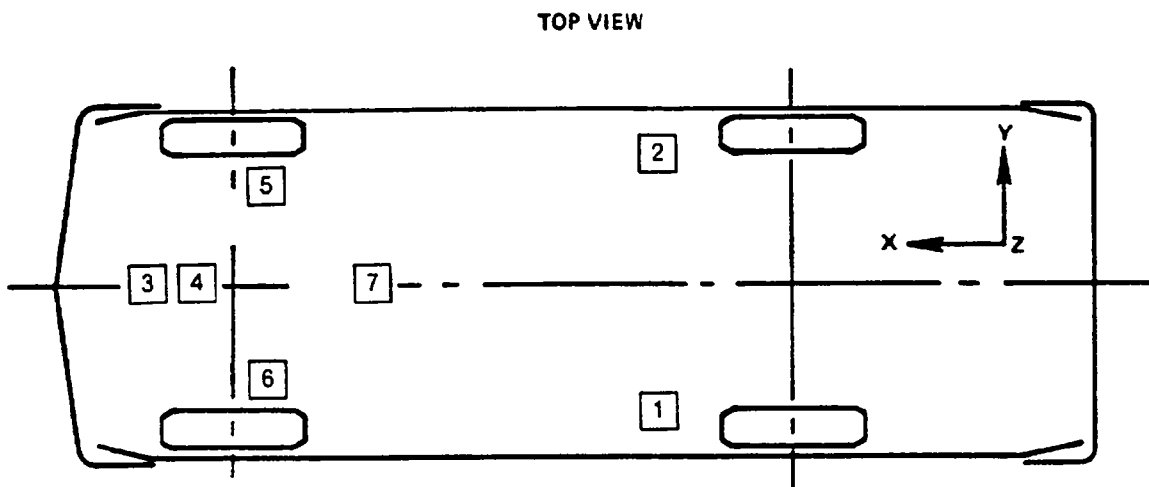


	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	*	14.2**
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	*	10.7**
<u>TBI</u> -- Distance from torso centerline to buckle	*	8.9

* Driver manual belt not used for test.

** Adjustable belt anchor in second position from top. Full up position equals position 1.

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:	71.5	25.4	16.3				
		POST:	71.5	25.4	15.6				
	LONGITUDINAL ACCELERATION					3	132	-27	66
2	REAR SEAT X-MEMBER AT RIGHT SIDE	PRE:	71.5	-25.7	16.3				
		POST:	71.5	-25.7	16.3				
	LONGITUDINAL ACCELERATION					2	123	-32	67
3	TOP OF ENGINE BLOCK	PRE:	149.8	-7.0	31.7				
		POST:	141.7	-7.0	30.8				
	LONGITUDINAL ACCELERATION					43	55	-102	40
4	BOTTOM OF ENGINE	PRE:	154.2	-9.7	9.5				
		POST:	151.2	-9.7	9.0				
	LONGITUDINAL ACCELERATION					27	58	-75	37
5	BRAKE CALIPER AT RIGHT SIDE	PRE:	147.0	-24.1	20.9				
		POST:	144.6	-24.1	22.9				
	LONGITUDINAL ACCELERATION					23	76	-69	57
6	BRAKE CALIPER AT LEFT SIDE	PRE:	147.0	24.1	20.8				
		POST:	144.7	24.1	20.9				
	LONGITUDINAL ACCELERATION					17	31	-68	51
7	DASH PANEL	PRE:	116.5	+1.0	32.9				
		POST:	116.5	+1.0	33.2				
	LONGITUDINAL ACCELERATION					60	69	-73	74

*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
--	---	---	---

DISTANCE MEASUREMENTS IN INCHES

Figure 7
CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5.

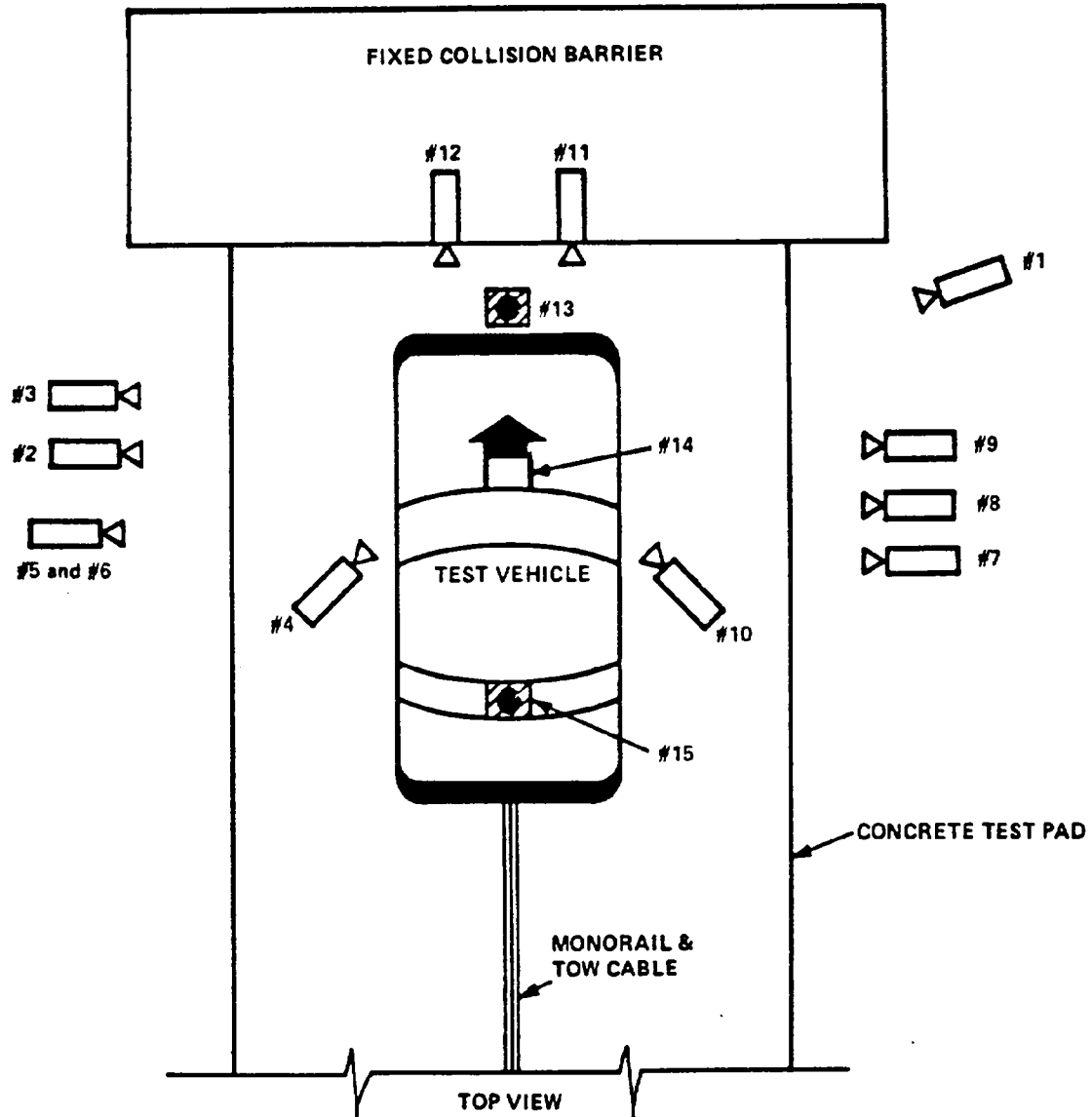


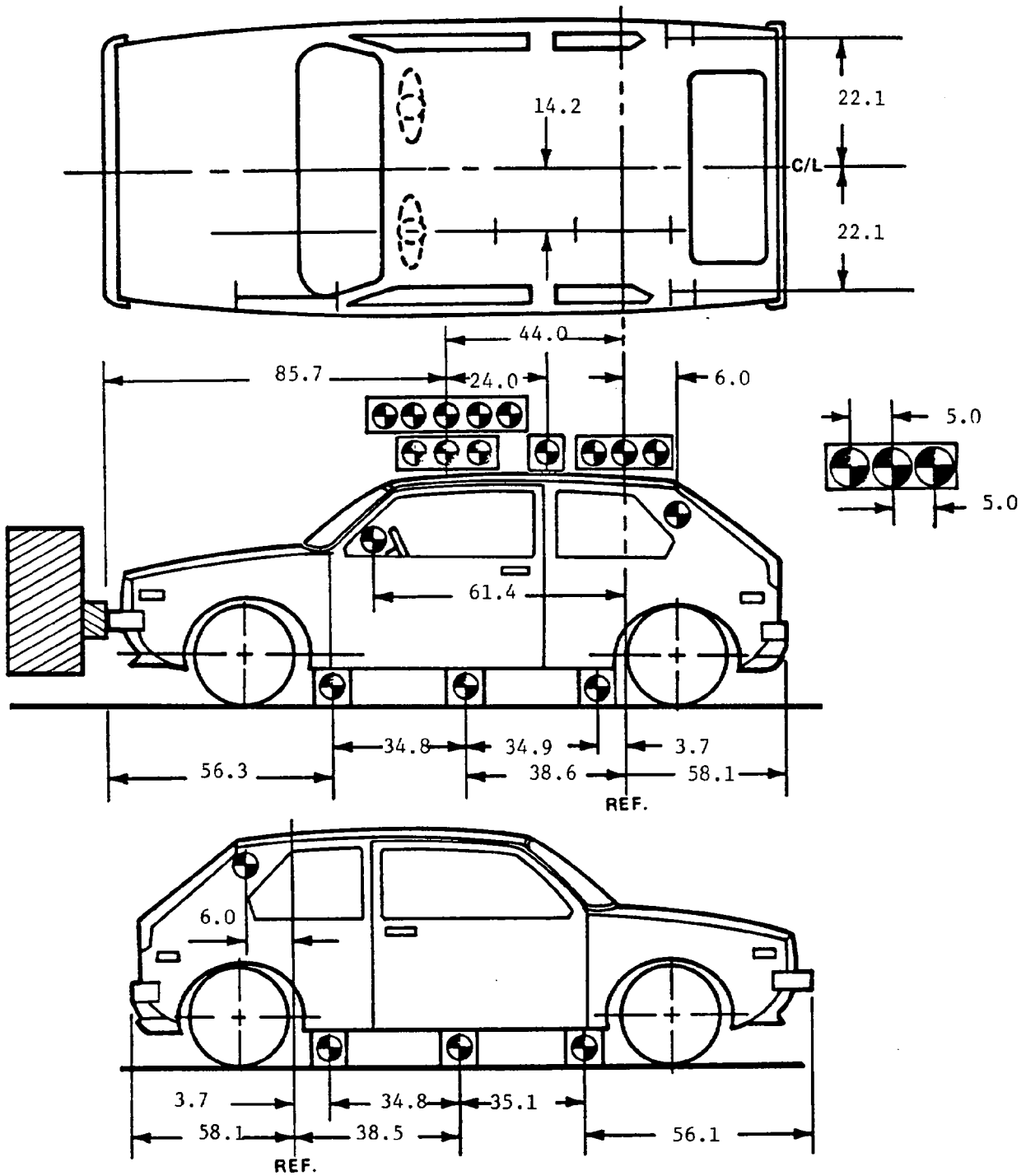
Table 5

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	228	62	41	-4	211	13	545
3	Left Side View	303	30	41	-3	286	25	570
4	Driver and Interior View	115	102	68	-17	-	13	590
5	Steering Column (Bottom)	282	76	46	-4	265	25	505
6	Steering Column (Top)	282	76	70	-10	265	25	495
7	Overall Right Side	236	75	42	-2	219	13	605
8	Right Side View	302	49	41	-2	285	25	590
9	Right Passenger View	309	69	55	-3	292	35	555
10	Passenger and Interior View	118	101	67	-17	-	13	500
11	Passenger Front View	21	19	76	-45	-	13	555
12	Driver Front View	21	19	76	-44	-	13	525
13	Windshield View	0	0	126	-55	-	13	520
14	Pit View of Engine	0	24	-86	90	-	13	N.T.
15	Pit View of Fuel Tank	0	100	-86	90	-	13	890

*X = film plane to monorail centerline
 Y = film plane to impact location
 Z = film plan to ground
 ** = referenced to horizontal plane
 N.T. No timing marks available

Figure 8
VEHICLE TARGET LOCATIONS



(DIMENSIONS IN INCHES)

Figure 9
TEST VEHICLE MEASUREMENTS

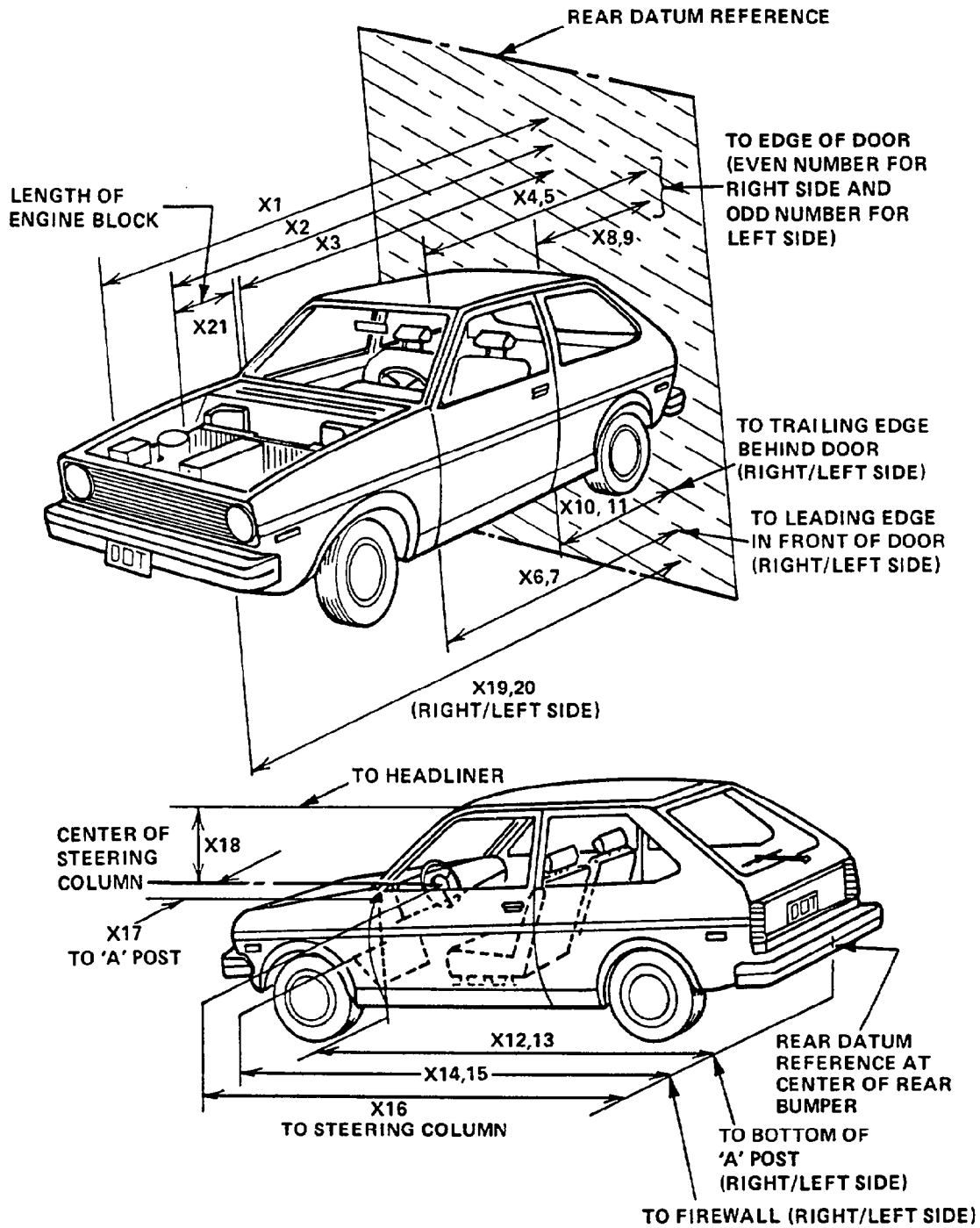


Table 6

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	187.8	168.1	19.7
X2	Rear Surface of Vehicle to Front of Engine	154.8	149.0	5.8
X3	Rear Surface of Vehicle to Firewall	139.5	138.0	1.5
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	126.8	125.2	1.6
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	126.4	125.4	1.0
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	127.4	127.0	0.4
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	126.9	127.2	-0.3
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	86.9	85.6	1.3
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	86.6	85.4	1.2
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	86.5	86.6	-0.1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	86.4	86.4	0.0'
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	125.9	126.5	-0.6
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	126.0	126.4	-0.4
X14	Rear Surface of Vehicle to Firewall, Right Side	138.4	136.7	1.7
X15	Rear Surface of Vehicle to Firewall, Left Side	137.8	136.2	1.6
X16	Rear Surface of Vehicle to Steering Column	110.0	111.5	-1.5
X17	Center of Steering Column to "A" Post	16.3	15.8	0.5
X18	Center of Steering Column to Headliner	15.8	15.8	0.0
X19	Rear Surface of Vehicle to Right Side of Front Bumper	182.5	166.5	16.0
X20	Rear Surface of Vehicle to Left Side of Front Bumper	182.4	168.5	13.9
X21	Length of Engine Block	11.5	11.5	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 VALUES

NHTSA No.: CN5104 Vehicle: 1992 Toyota Camry 4-Door Sedan

	MAXIMUM ACCELERATION (g's)							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
Dummy (1)	-57	11	34	65	-66	-6	30	67.6
Dummy (2)	-46	-4	46	56	-37	47	-12	36.0

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	1390	1605
Dummy (2)	332	233

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc. (g) t ₁ TO t ₂
		t ₁ (msec)	t ₂ (msec)	
Dummy (1)	428	74.880	101.760	47.95
Dummy (2)	506	69.480	105.360	45.68

*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 recommended schedule is:

1. After ten years from the date of manufacture noted on the certification regulation label, and every two years thereafter, this system requires periodic maintenance by a "Toyota" dealer or qualified service shop.

If the airbag indicator in the instrument cluster

(A) does not come on or remains on, after the key is turned to "ACC" or

"ON" position or ...

(B) comes on while driving

The system is malfunctioning and requires service by a "Toyota" dealer or qualified service shop.

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>CN5104</u>
Make/Model:	<u>1992 Toyota Camry</u>
Date of Comfort/Convenience Check:	<u>11/20/91</u>
Technician Performing Check:	<u>DJT</u>
GVWR:	<u>4135 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.

** Driver manual 3-point belt not used for this test.

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 canceled 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 canceled 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 0.25 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 X NO -
4. Check the option which applies to this test vehicle:
 - a. The torso and lap belt webbing of the seat belt system automatically retract to a stowed position when the adjacent vehicle door is in an open position and the seat belt latch plate is released.
YES X NO -

Table 11 (cont.)

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

YES X NO -

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

YES X NO -

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

YES N/A NO N/A

D6

ACCESSIBILITY

The requirements for accessibility do not apply to:

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

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

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

YES X NO -

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

YES X NO -

Table 11 (cont.)

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

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

YES - NO X

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

YES - NO X

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

YES - NO X

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

YES X NO -

D7

LATCH MECHANISM

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

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

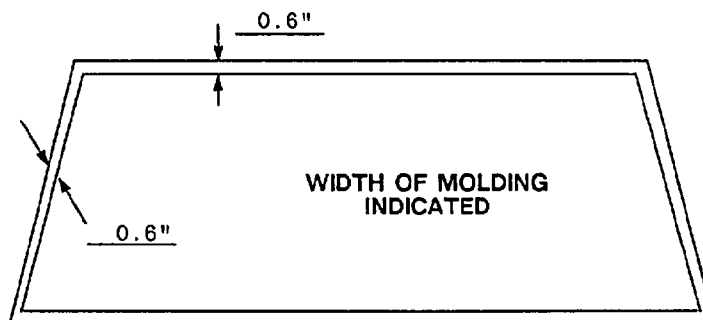
FMVSS 212 REQUIREMENTS:

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		PERCENT RETENTION
	PRE-TEST (in.)	POST-TEST (in.)	
RIGHT SIDE	82.6	82.6	100%
LEFT SIDE	82.6	82.6	100%
TOTAL	165.2	165.2	100%

AREA OF RETENTION FAILURE:



FRONT VIEW

FAILURE DETAILS:

None.

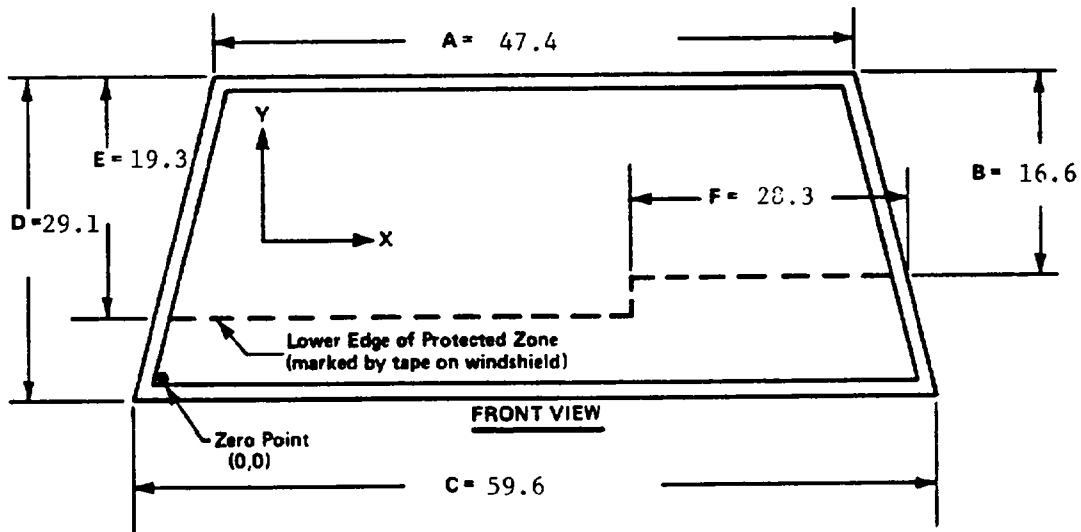
Figure 11

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)

NONE.

COORDINATES		
	X	Y
1.		
2.		
3.		
4.		

Table 12

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

TEST VEHICLE NHTSA NO.:

C	N	5	1	0	4
---	---	---	---	---	---

TEST DATE: November 21, 1991Vehicle Mfr./Make/Model: 1992 Toyota Camry 4-Door Sedan

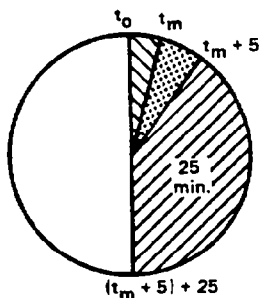
Test vehicle fuel tank filled to 92% to 94% of manufacturer's "usable" capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

.....

TEST VEHICLE IMPACT TYPE: X Frontal (30 mph)

 - Oblique (30 mph) with - ° barrier face first
contacting _____

(driver/passenger) side

 - Rear Moving Barrier (30 mph) - Lateral Moving Barrier (20 mph)FUEL SPILLAGE MEASUREMENT:

1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

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

SOLVENT SPILLAGE DETAILS:

None.

Table 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

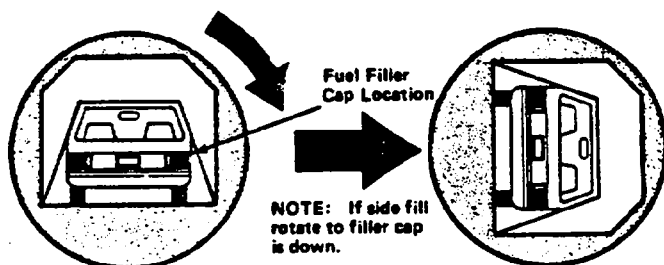
TEST PHASE:

0⁰

90⁰

Vehicle NHTSA ID No.:

CN5104



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + _____ * _____ minutes _____ seconds

TOTAL _____ * _____ minutes _____ seconds

Next whole minute interval _____ * _____ 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:

--	--	--	--

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

IV. SOLVENT SPILLAGE LOCATION(S):

*Static rollover not performed, by instruction of COTR.

Table 13

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

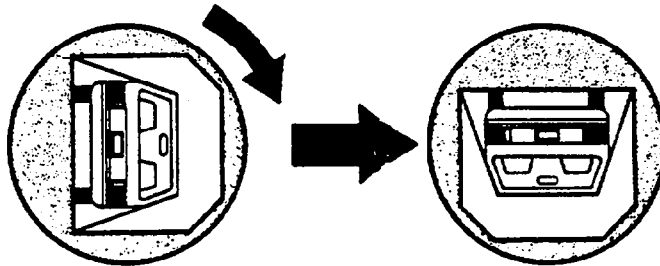
TEST PHASE:

90°

180°

Vehicle NHTSA ID No.:

CN5104



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + _____ * _____ minutes _____ seconds

TOTAL _____ * _____ minutes _____ seconds

Next whole minute interval _____ * _____ 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:

--	--	--	--

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

IV. SOLVENT SPILLAGE LOCATION(S):

* STATIC ROLLOVER NOT PERFORMED

Table 13

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

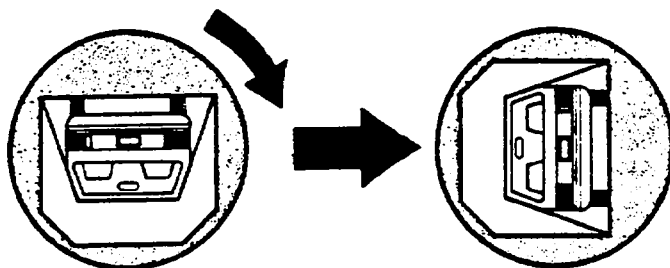
TEST PHASE:

180°

270°

Vehicle NHTSA ID No.:

CN5104



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + _____ * _____ minutes _____ seconds

TOTAL _____ * _____ minutes _____ seconds

Next whole minute interval _____ * _____ 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:

--	--	--	--

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

IV. SOLVENT SPILLAGE LOCATION(S):

* Static rollover not performed.

Table 13

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

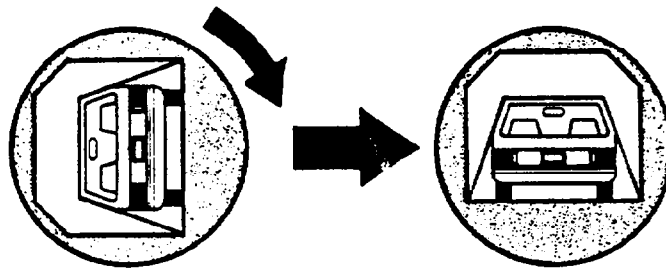
TEST PHASE:

270°

360°

Vehicle NHTSA ID No.:

CN5104



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + _____ * _____ minutes _____ seconds

TOTAL _____ * _____ minutes _____ seconds

Next whole minute interval _____ * _____ 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:

--	--	--	--

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

IV. SOLVENT SPILLAGE LOCATION(S):

* Static rollover not performed.

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: November 21, 1991 Vehicle NHTSA No.: CN5104
Vehicle Manufacturer: Toyota Motor Corporation
Model Year: 1992 VIN: JT2SK11EXN0004365
Model: Camry Body Style: 4-Door Sedan Build Date: 6/91
Dummy Stabilized Temperature at Time of Test: 70 °F (Spec. = 69-72°F)
Impact Velocity: 29.6 mph Time of Test: 15:35
Type of Automatic Restraint System: Driver side airbag.

Failure Details:

The driver ATD appeared to exceed the maximum allowable chest g's for greater
than a 3 millisecond duration. the recorded level was 67.6 g's.
The vehicle appears to comply with FMVSS Nos. 212, 219 (Partial), and 301
(Partial). The FMVSS 301 static rollover was not performed.

Requirements:

FMVSS 208 S6.1.3 states the chest resultant acceleration shall not exceed
60 g's. except for intervals whose cumulative duration is not more than
3 milliseconds.

Appendix A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

<u>Figure</u>	<u>Photograph Title</u>	<u>Page No.</u>
A-1	PRE-TEST FRONT VIEW	A-3
A-2	POST-TEST FRONT VIEW	A-4
A-3	PRE-TEST LEFT SIDE VIEW	A-5
A-4	POST-TEST LEFT SIDE VIEW	A-6
A-5	PRE-TEST RIGHT SIDE VIEW	A-7
A-6	POST-TEST RIGHT SIDE VIEW	A-8
A-7	PRE-TEST RIGHT FRONT THREE-QUARTER VIEW	A-9
A-8	POST-TEST RIGHT FRONT THREE-QUARTER VIEW	A-10
A-9	PRE-TEST LEFT REAR THREE-QUARTER VIEW	A-11
A-10	POST-TEST LEFT REAR THREE-QUARTER VIEW	A-12
A-11	POST-TEST TOP VIEW (NOT AVAILABLE)	A-13
A-12	PRE-TEST WINDSHIELD VIEW	A-14
A-13	POST-TEST WINDSHIELD VIEW	A-15
A-14	PRE-TEST ENGINE COMPARTMENT VIEW	A-16
A-15	POST-TEST ENGINE COMPARTMENT VIEW	A-17
A-16	PRE-TEST FUEL FILLER CAP PHOTO	A-18
A-17	POST-TEST FUEL FILLER CAP PHOTO	A-19
A-18	PRE-TEST FRONT UNDERBODY VIEW	A-20
A-19	POST-TEST FRONT UNDERBODY VIEW	A-21
A-20	PRE-TEST FRONT SIDE UNDERBODY VIEW	A-22
A-21	POST-TEST FRONT SIDE UNDERBODY VIEW	A-23
A-22	PRE-TEST REAR UNDERBODY VIEW	A-24
A-23	POST-TEST REAR UNDERBODY VIEW	A-25
A-24	CERTIFICATION LABEL	A-26
A-25	TIRE PLACARD	A-27
A-26	PRE-TEST DRIVER DUMMY POSITION	A-28
A-27	POST-TEST DRIVER DUMMY POSITION	A-29
A-28	PRE-TEST PASSENGER DUMMY POSITION	A-30
A-29	POST-TEST PASSENGER DUMMY POSITION (NOT AVAILABLE)	A-31
A-30	PRE-TEST DRIVER DUMMY AND INTERIOR VIEW	A-32
A-31	POST-TEST DRIVER DUMMY AND INTERIOR VIEW	A-33
A-32	PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW	A-34
A-33	POST-TEST PASSENGER DUMMY AND INTERIOR VIEW	A-35
A-34	POST-TEST DRIVER AIRBAG VIEW	A-36
A-35	VEHICLE IMPACT	A-37
A-36	BALLAST PLACED IN LEFT REAR OF TRUNK	A-38
A-37	BALLAST PLACED IN RIGHT REAR OF TRUNK	A-39

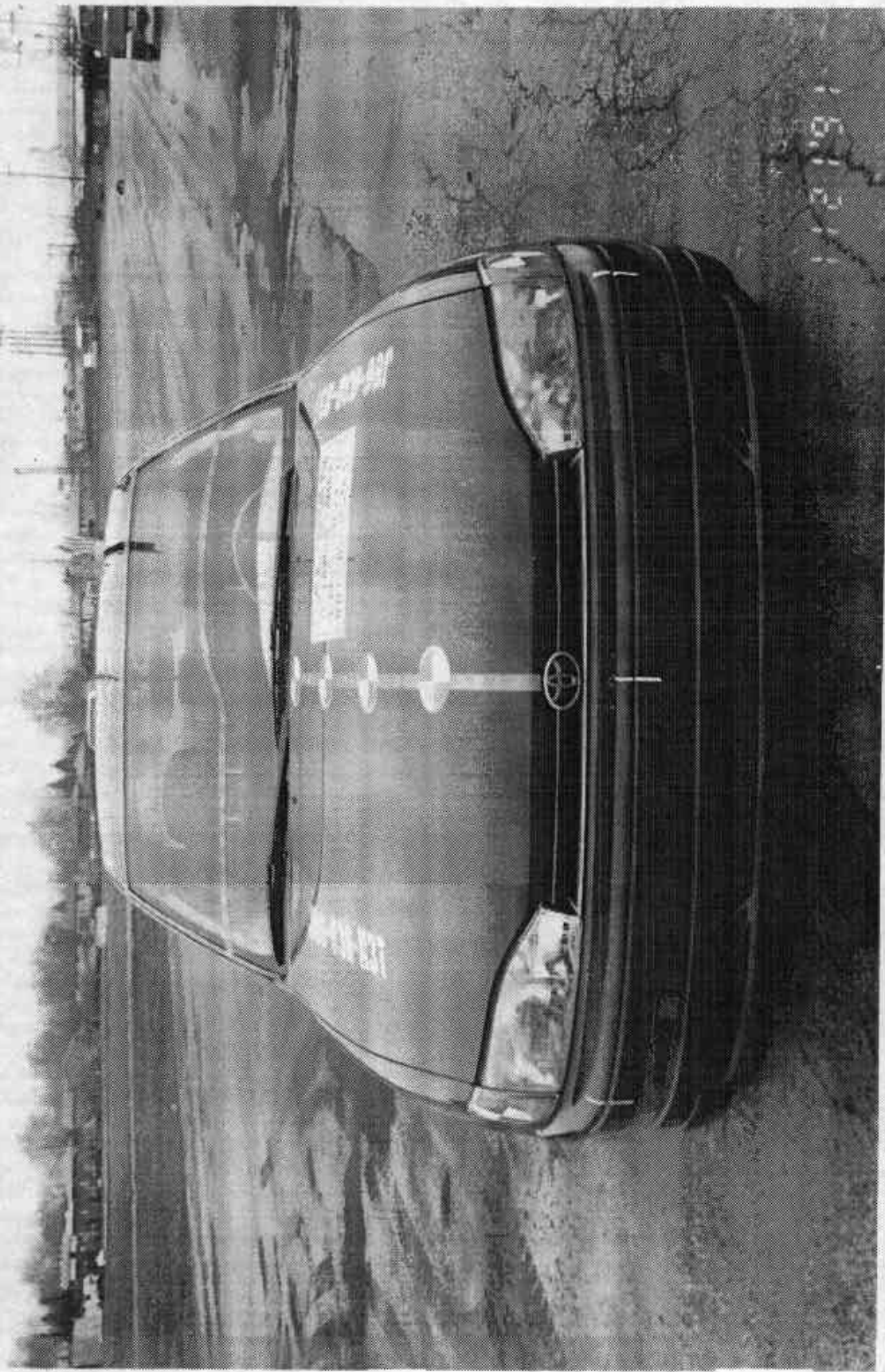


Figure A-1 PRO-TEST FRONT VIEW

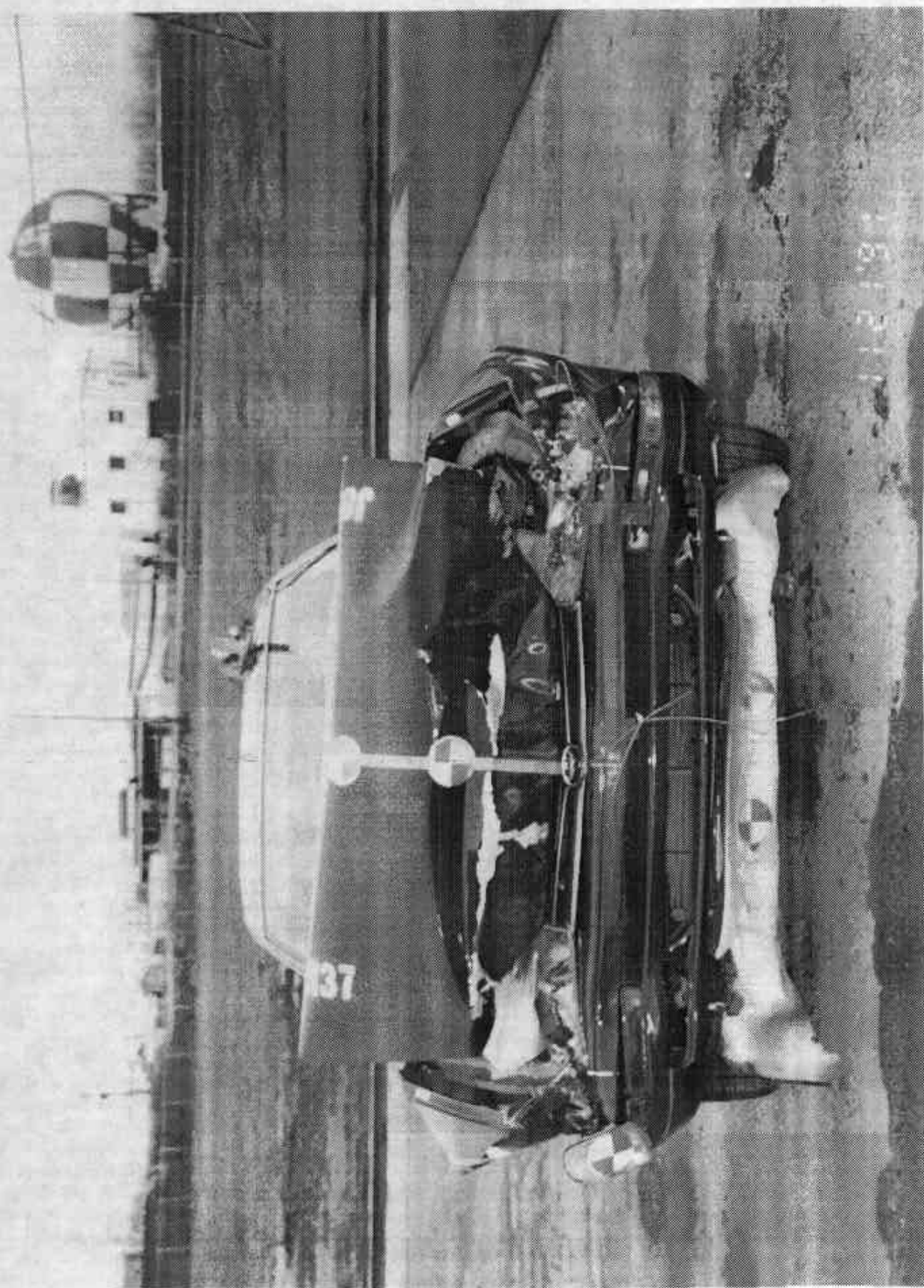


Figure A-2 POST-TEST FRONT VIEW

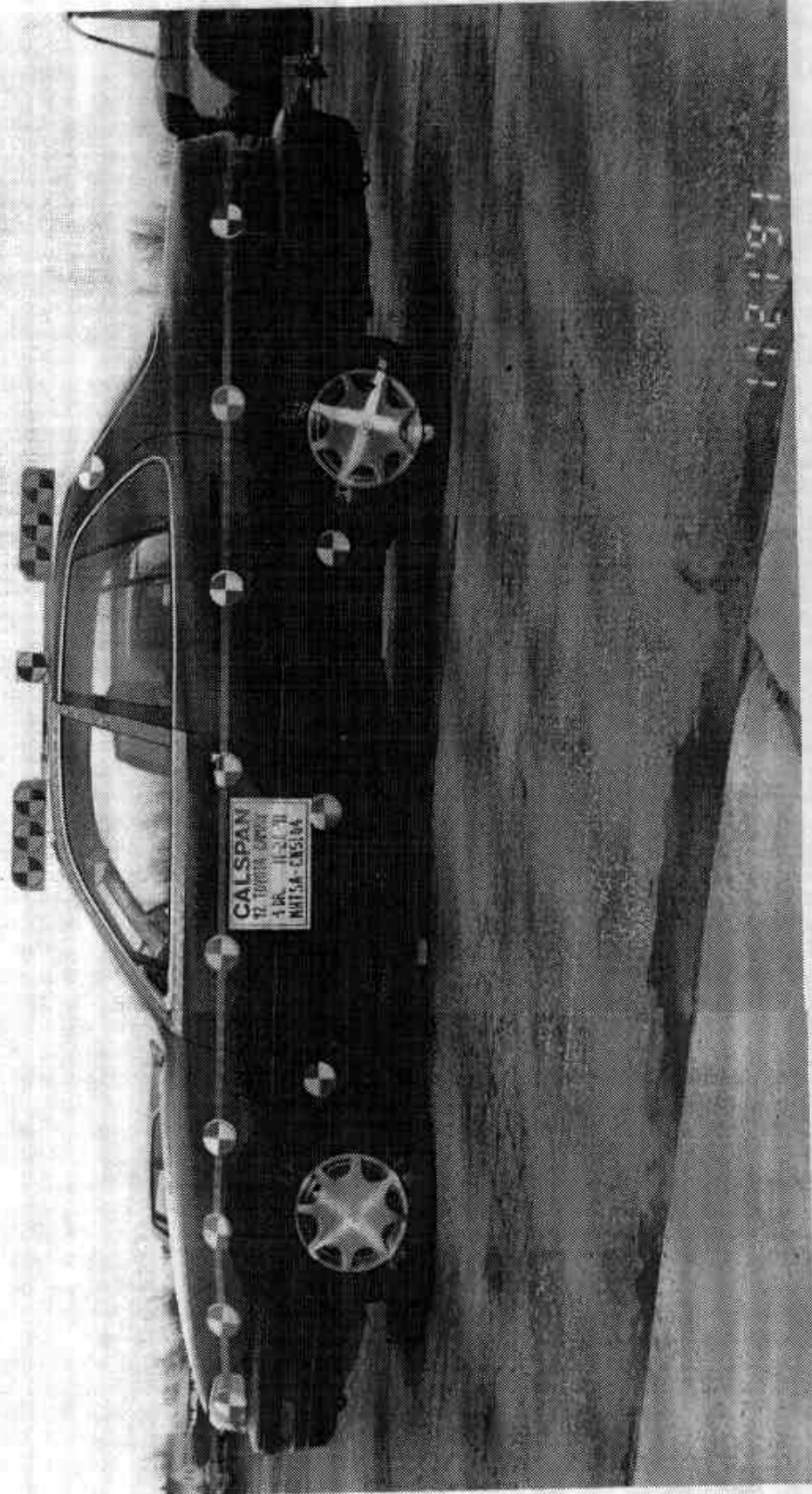


Figure A-3 PRE-TEST LEFT SIDE VIEW

A-5

7953-5

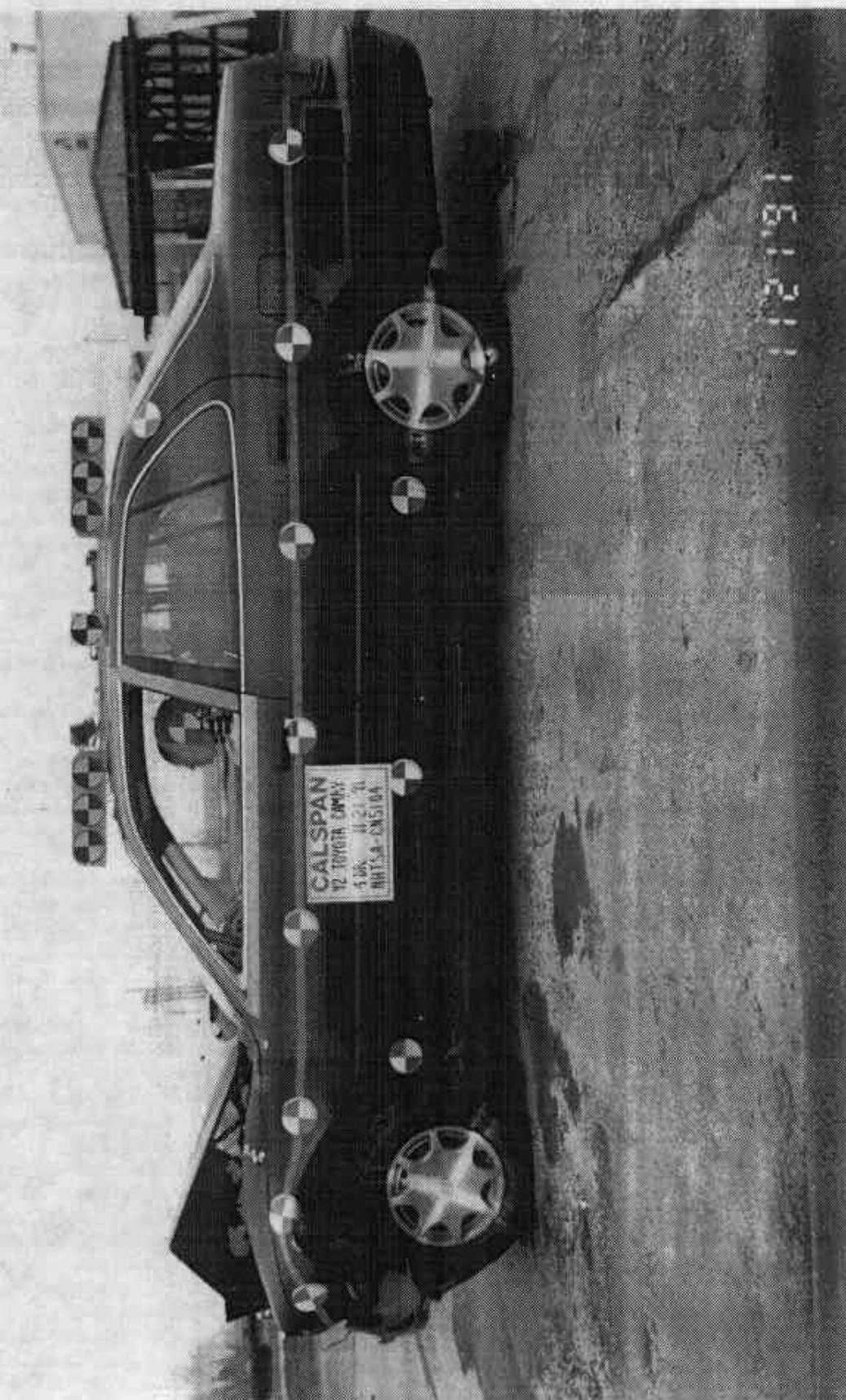


Figure A-4 POST-TEST LEFT SIDE VIEW



FIGURE A-5 PRE-TEST RIGHT SIDE VIEW

A-7

7953-3



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



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



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

A-11

7053-3



112191

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

A-12

7953-8

Figure A-11 POST-TEST TOP VIEW IS NOT AVAILABLE.

Vehicle was not subjected to Static Rollover.



Figure A-12 PRE-TEST WINDSHIELD VIEW



Figure A-13 POST-TEST WINDSHIELD VIEW

112191

A-15

7053-3

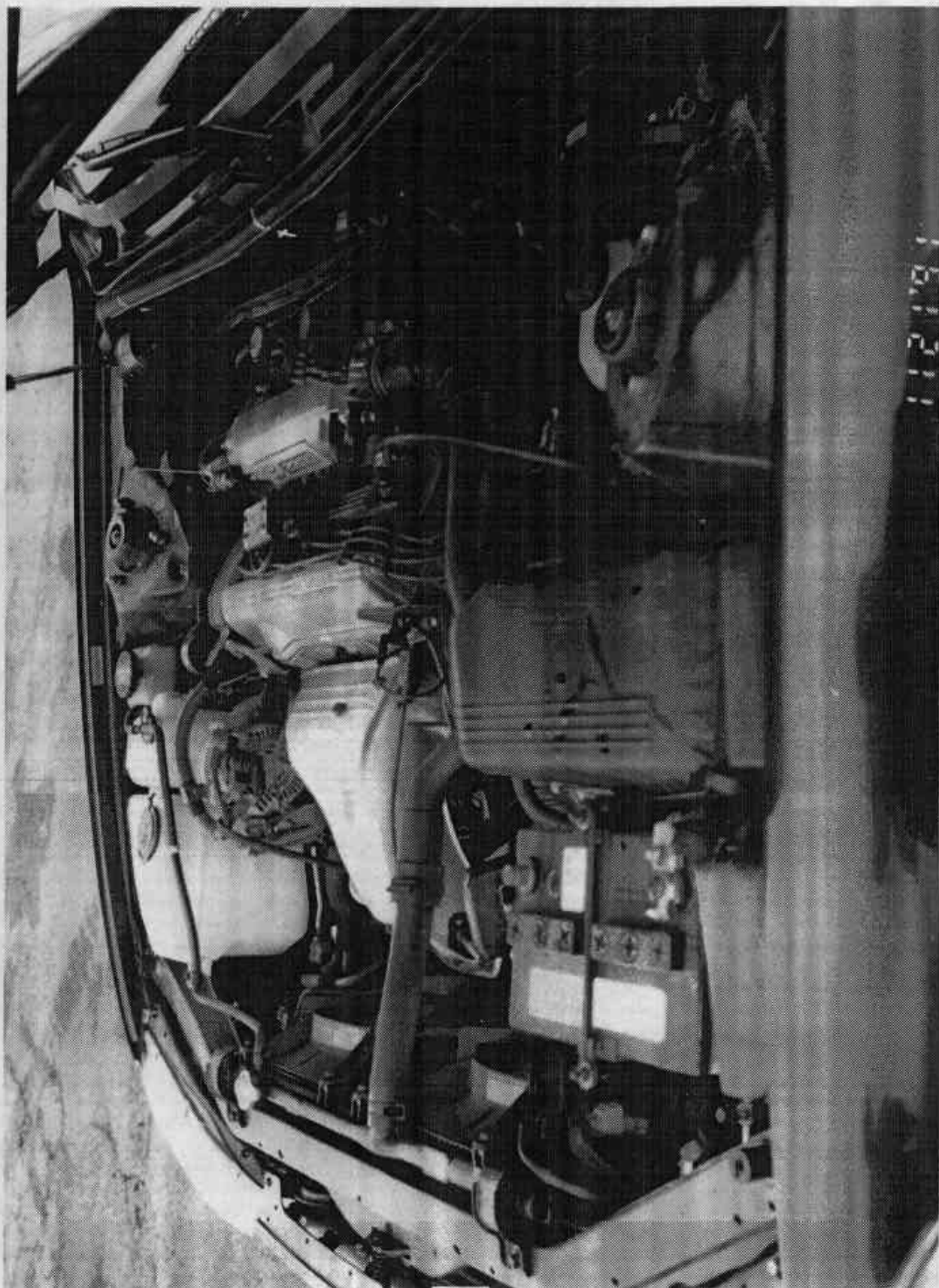


FIGURE A-14 PRE-TEST ENGINE COMPARTMENT VIEW

A-16

7953-3

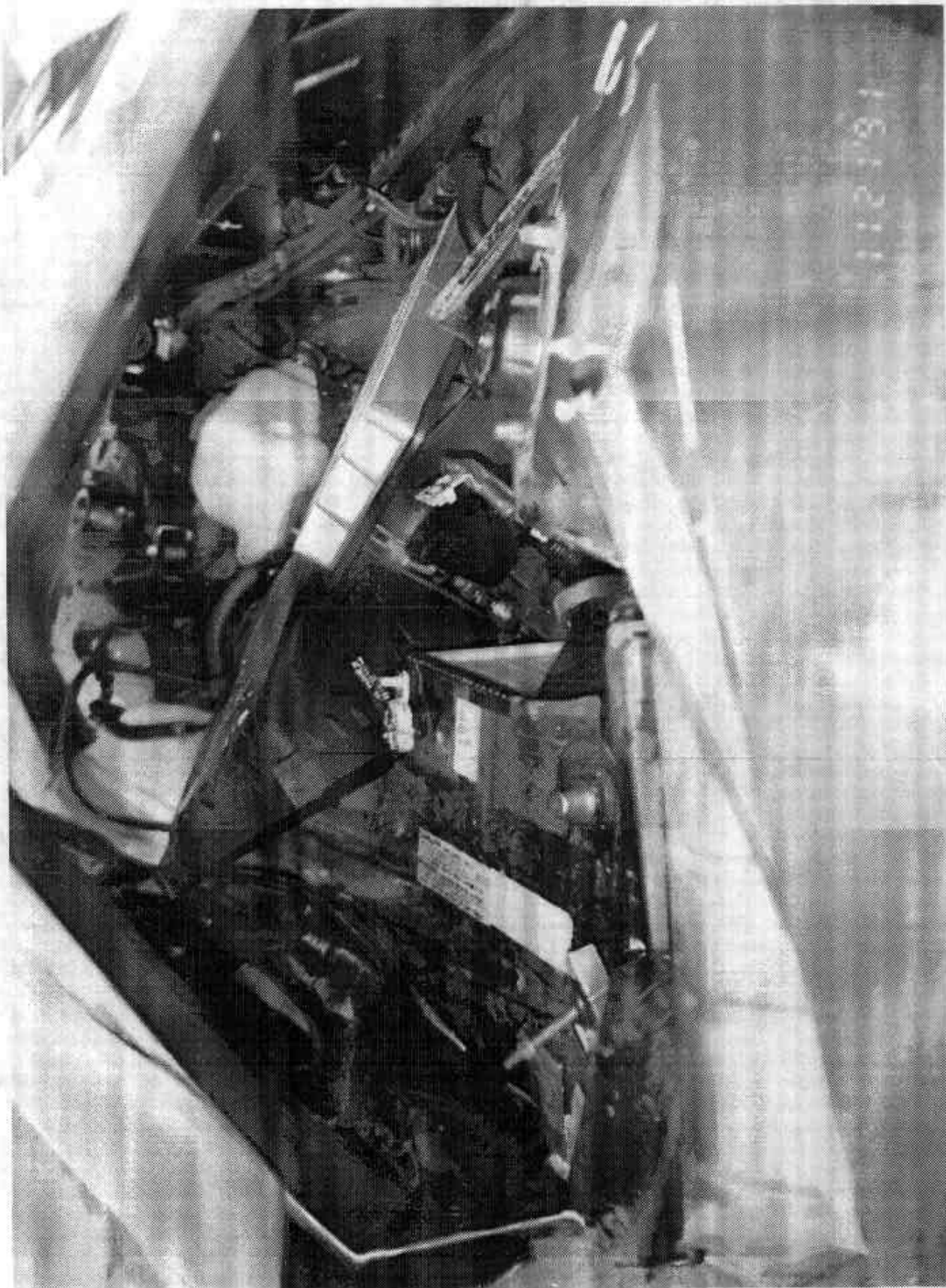


FIGURE A-15 POST-TEST ENGINE COMPARTMENT VIEW

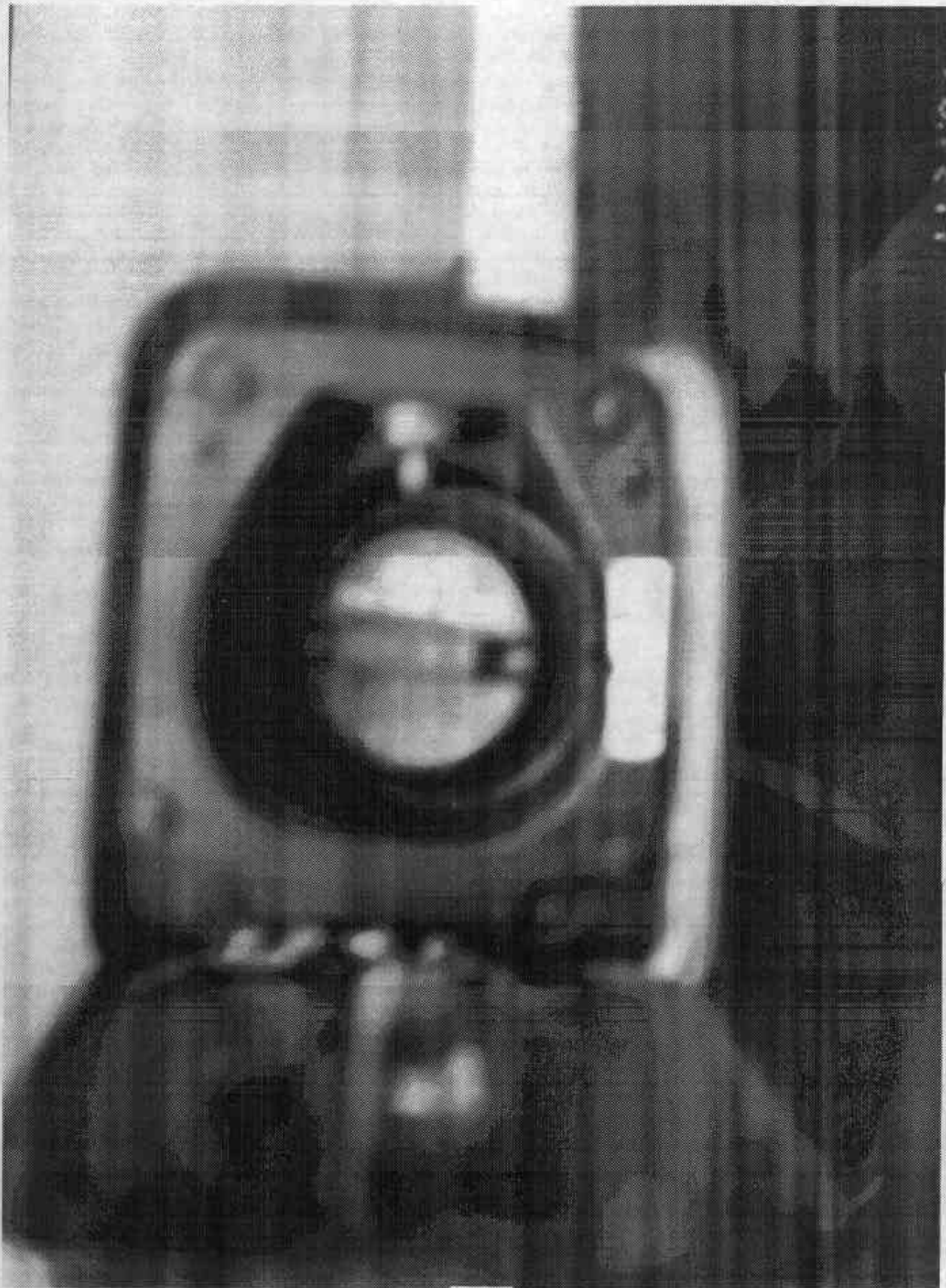


Figure A-16 PRE-TEST FUEL FILLER CAP PHOTO

A-18

7953-3

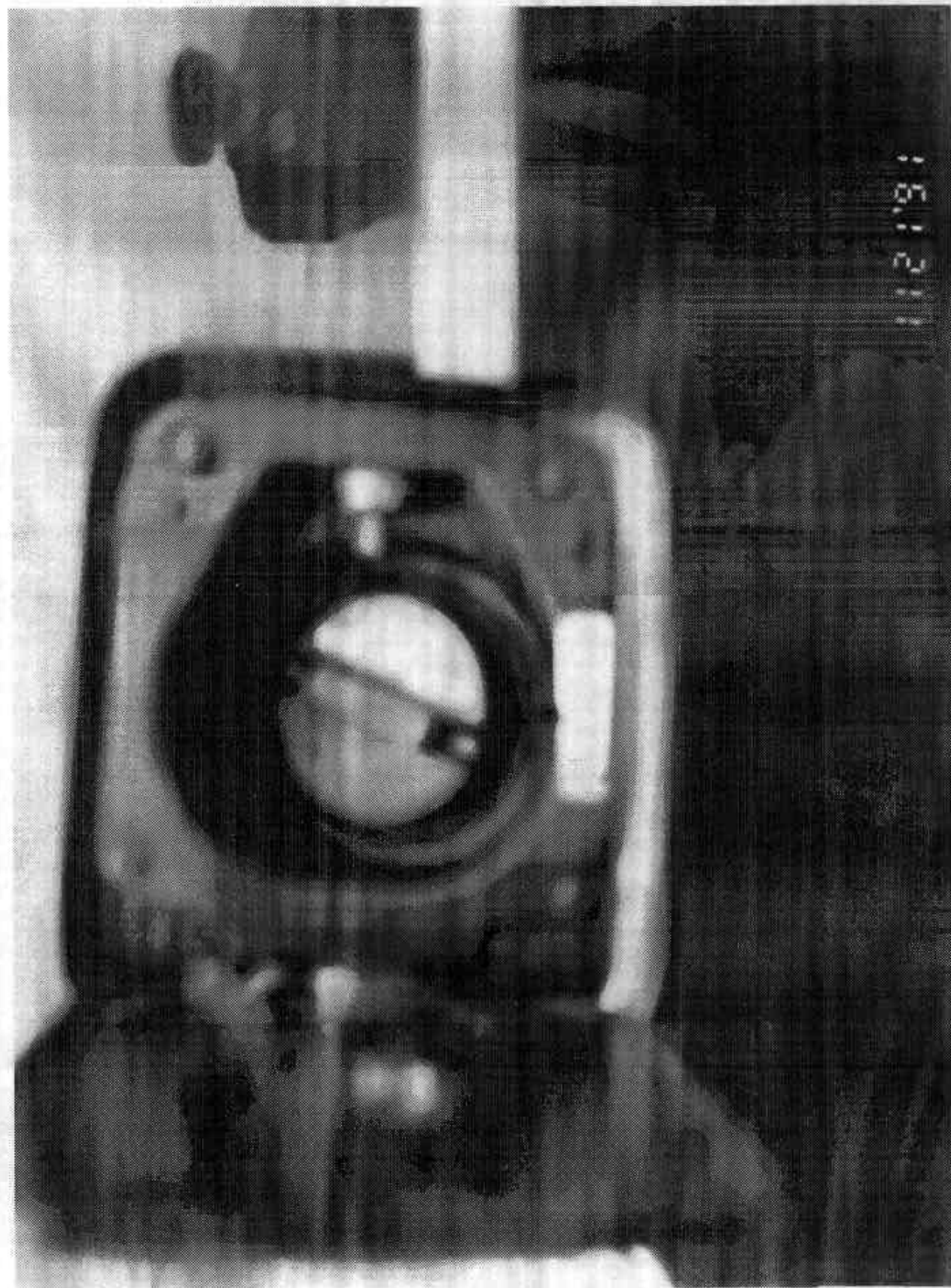


Figure A-17 POST-TEST FUEL FILLER CAP PHOTO

A-19

7058-3

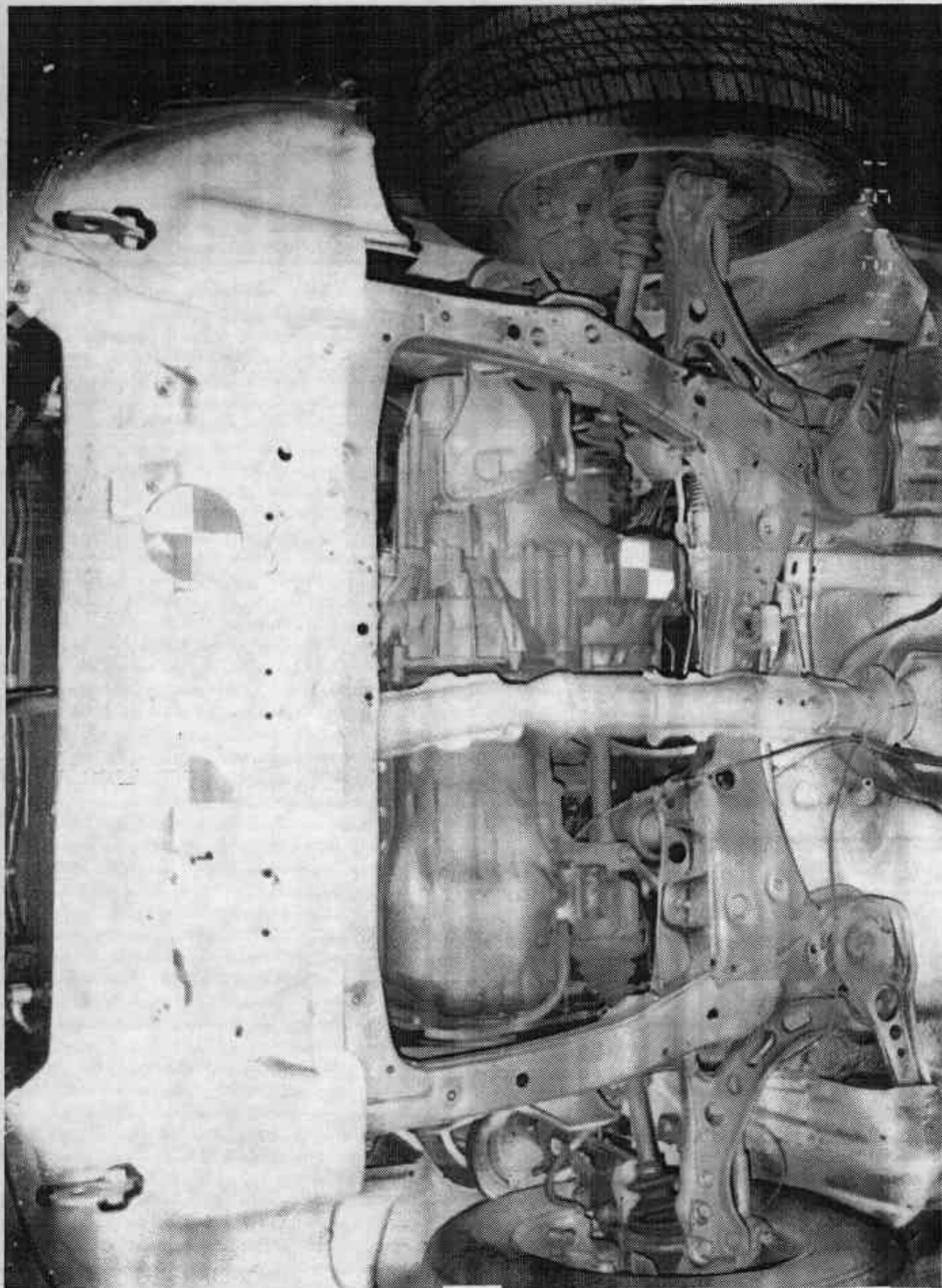


FIGURE A-18 PRE-TEST FRONT UNDERBODY VIEW

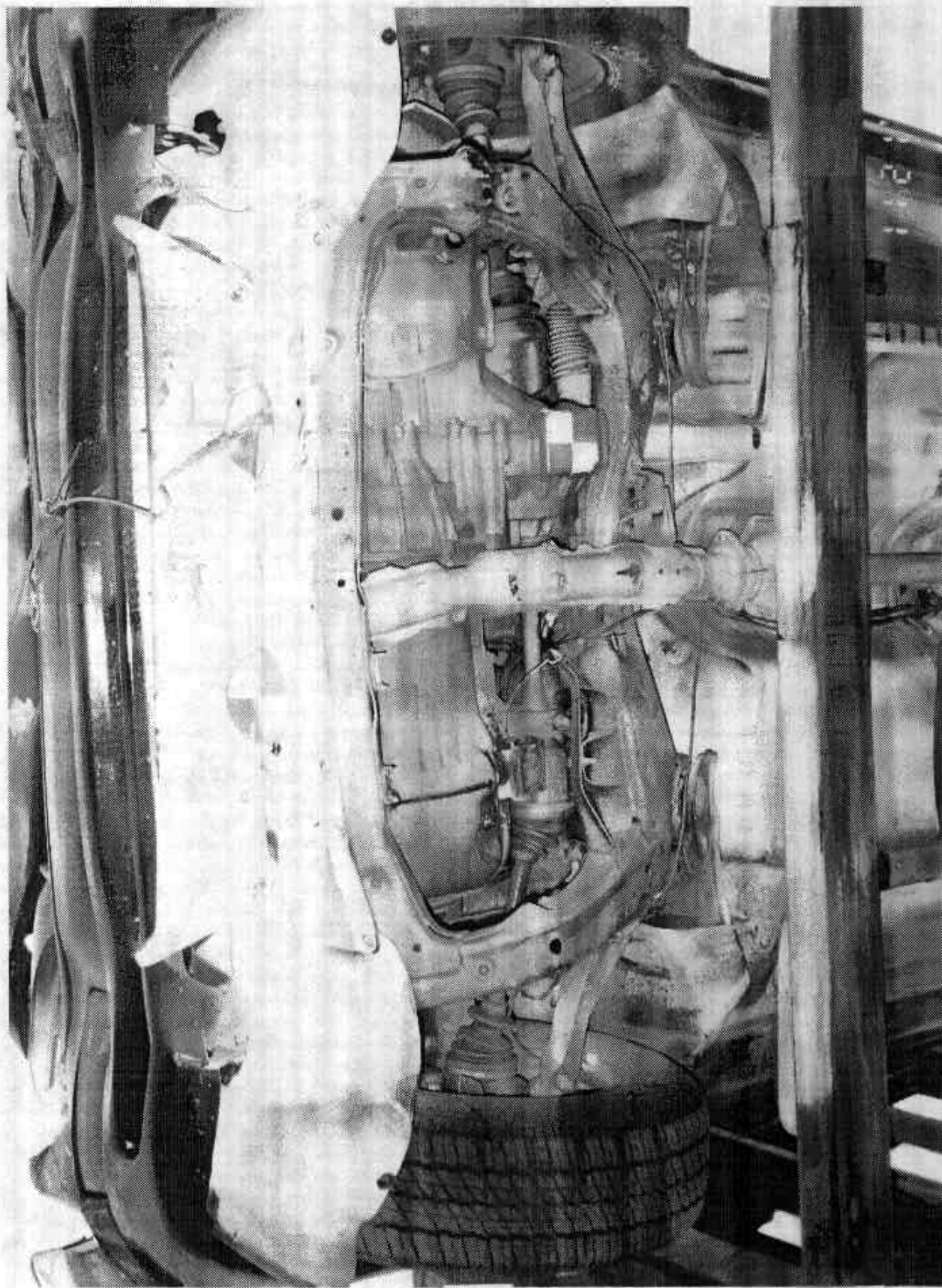


Figure A-19 POST-TEST FRONT UNDERBODY VIEW

A-21

7953-3

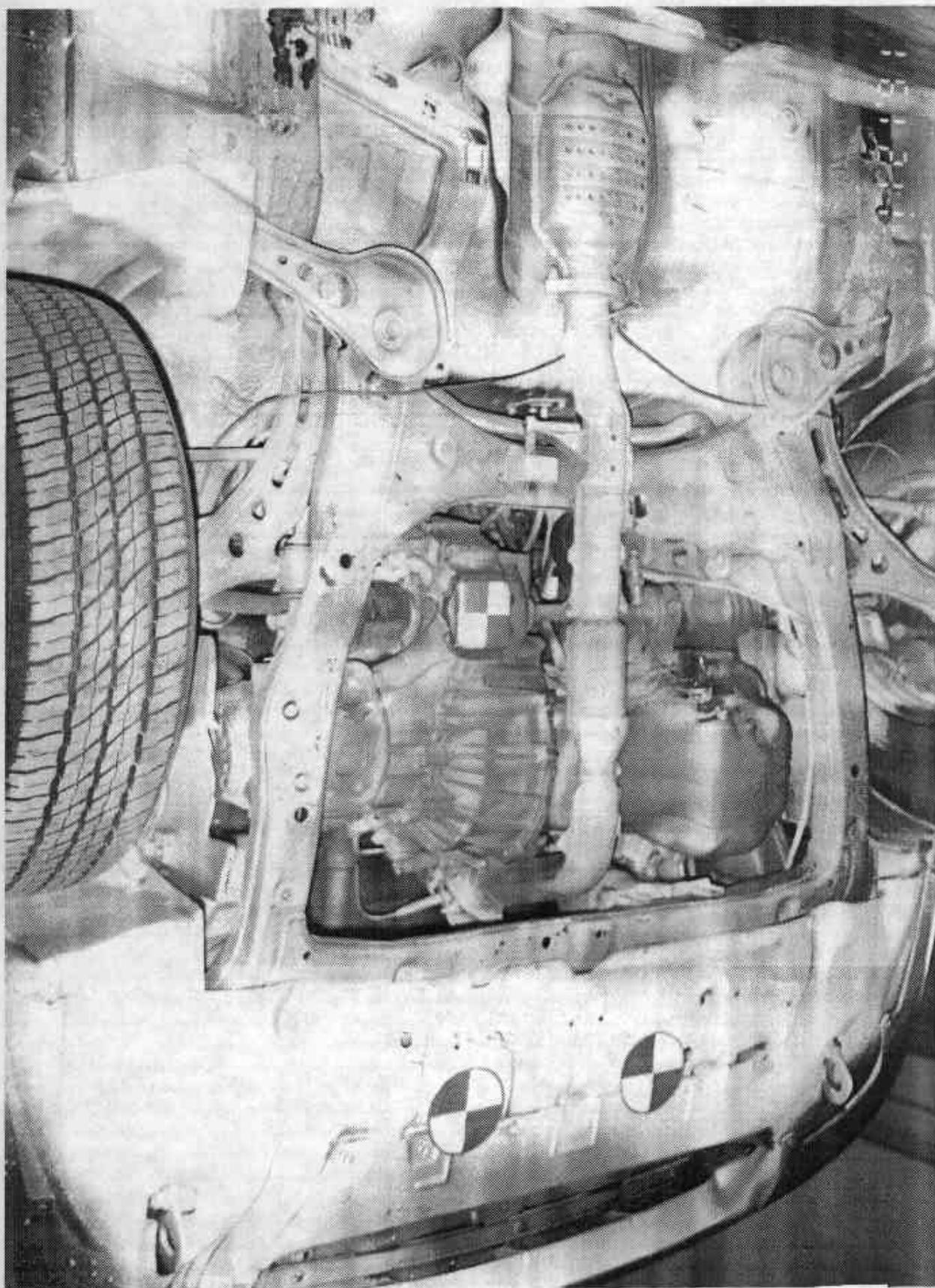


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

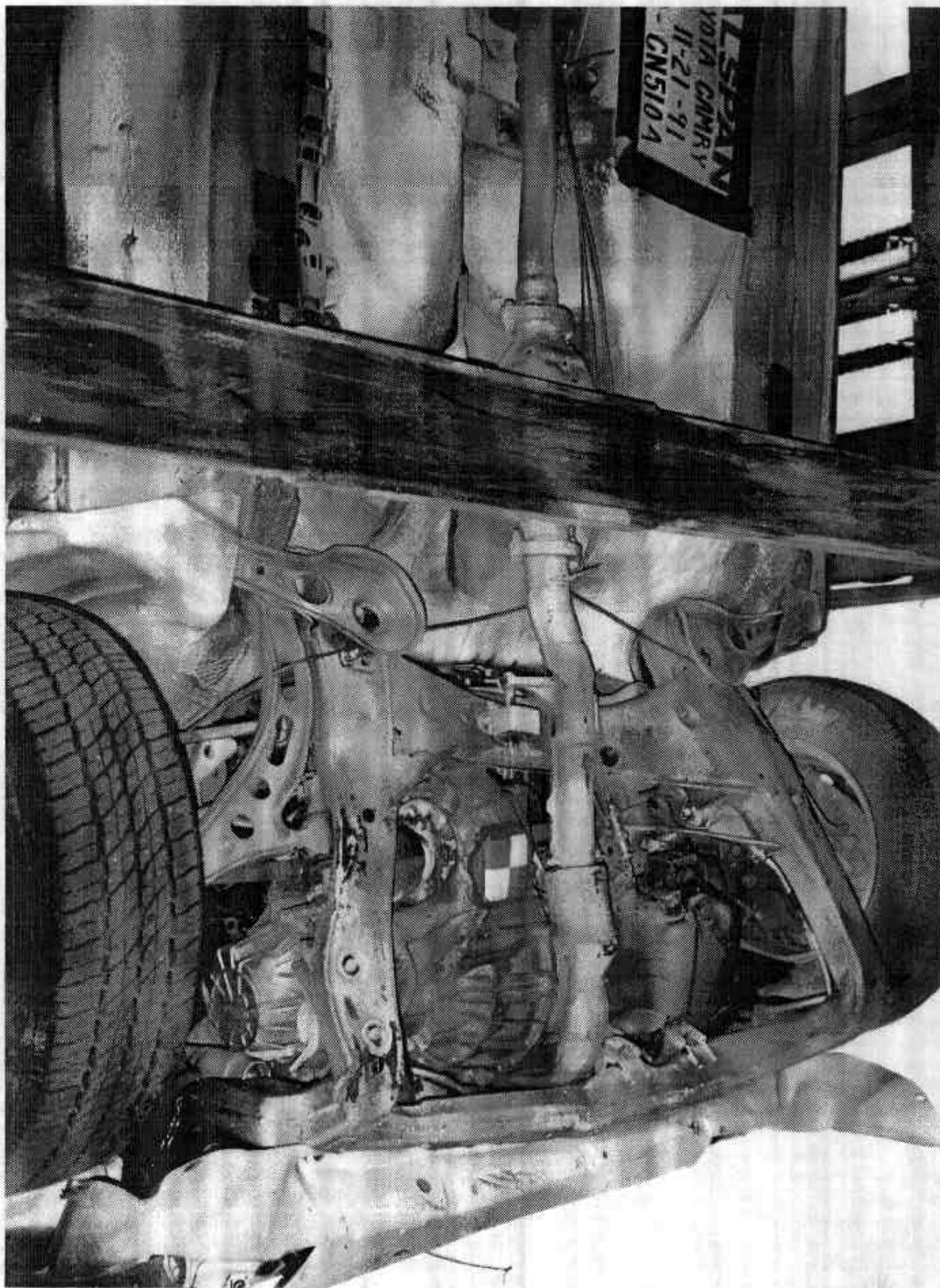


Figure A-21 POST-TEST FRONT SIDE UNDERBODY VIEW

A-23

7953 3

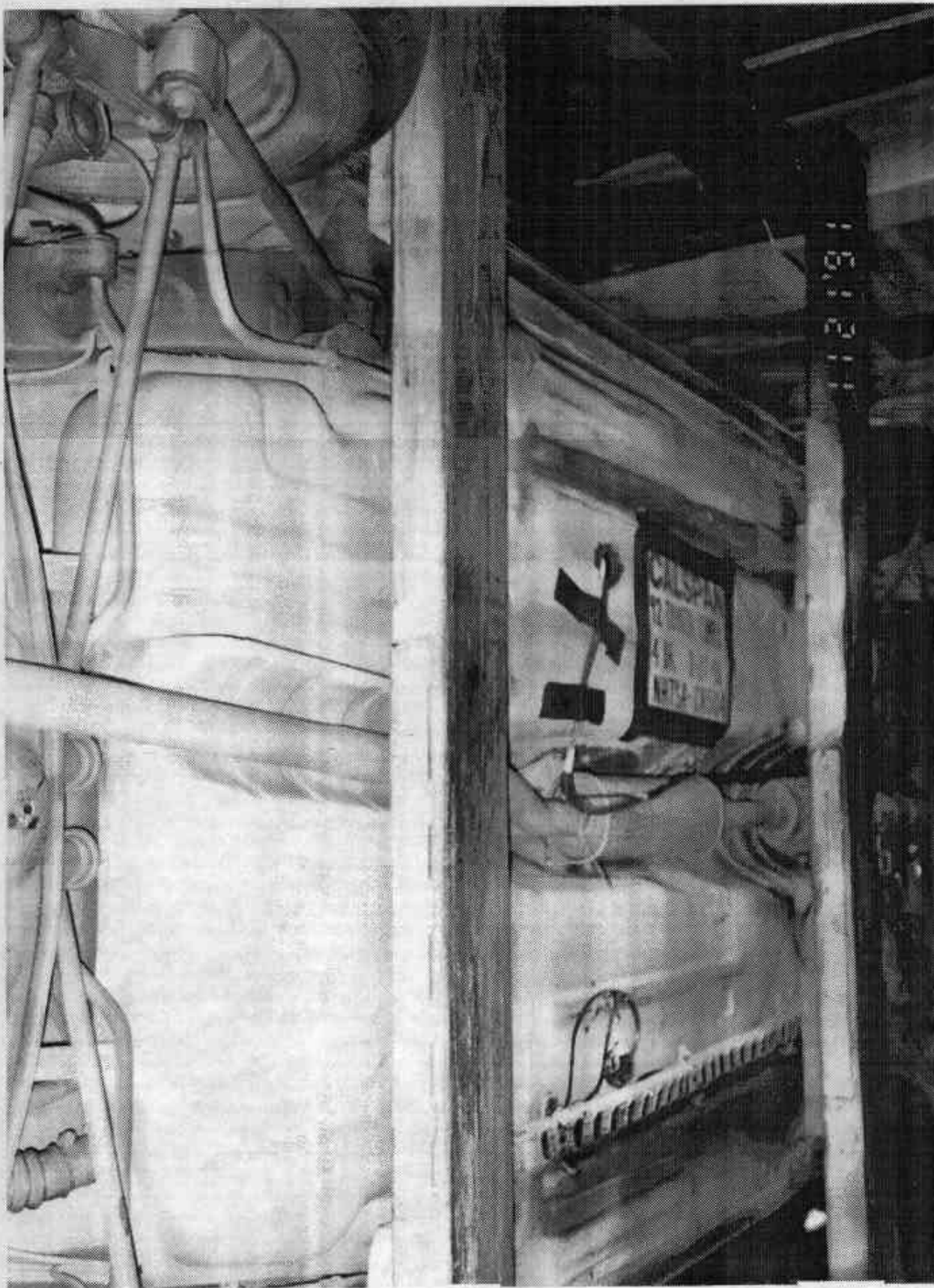


Figure A-22 PRE-TEST REAR UNDERBODY VIEW

A-24

7053-3

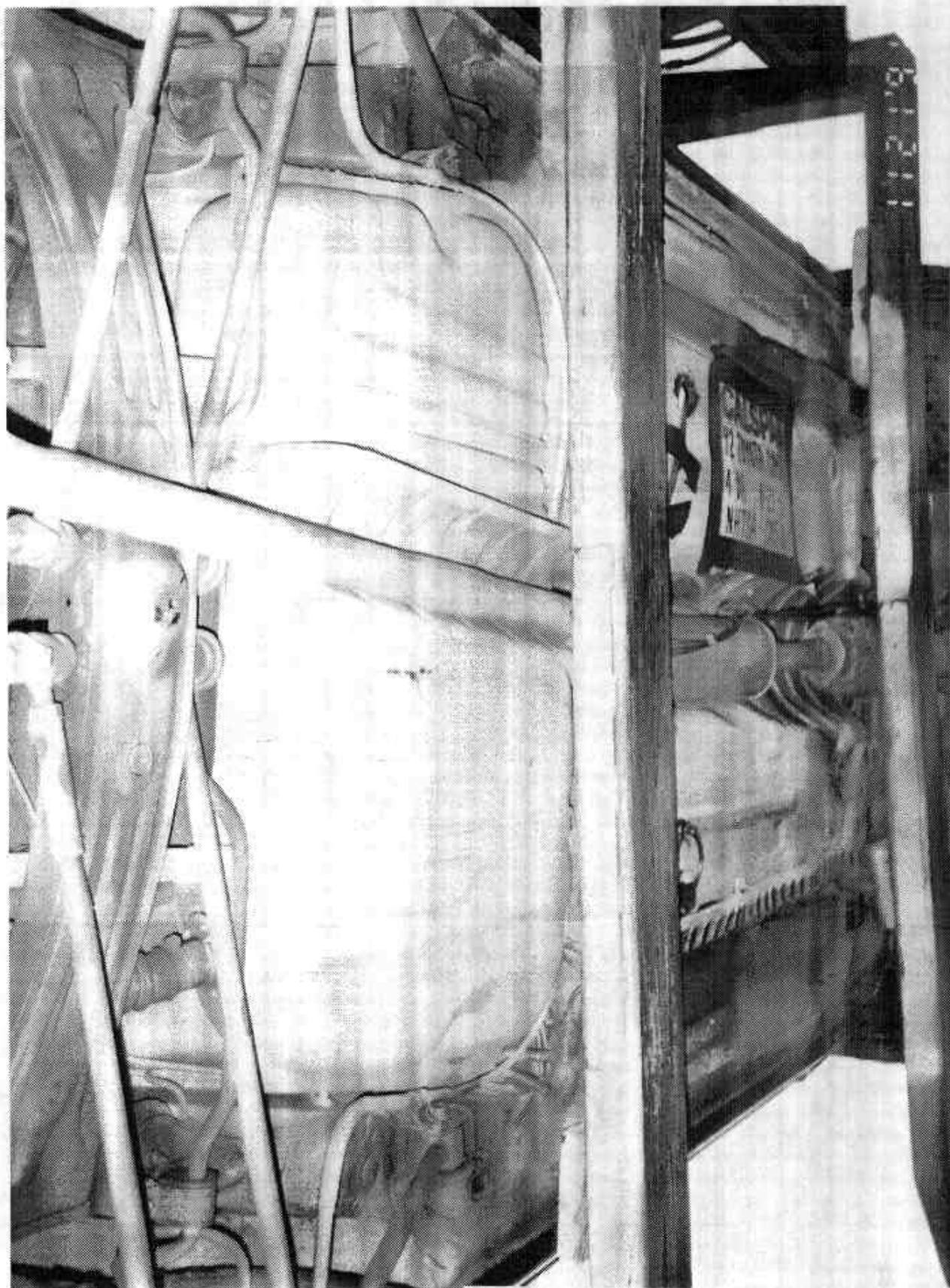


FIGURE A-23 POST-TEST REAR UNDERBODY VIEW

A-25

7552-3

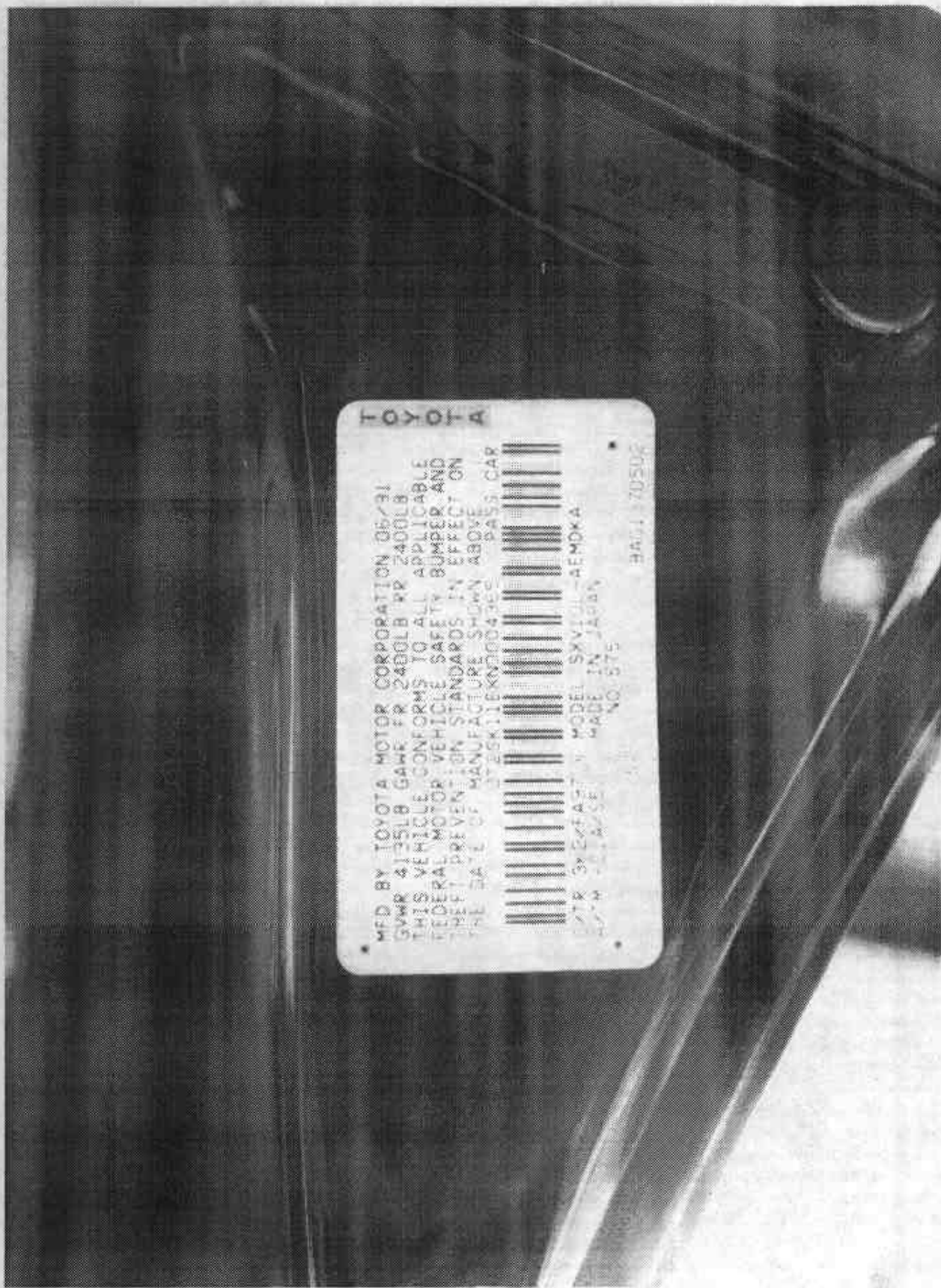


Figure A-24 CERTIFICATION LABEL

TIRE-LOADING INFORMATION
TOYOTA CAMRY SEDAN

VEHICLE CAPACITY WEIGHT 5000^{lb} (410kg)
 DESIGNATED SEATING CAPACITY FRT 2, RR 3 TOTAL 5
 RECOMMENDED COLD TIRE INFLATION PRESSURE
 • VEHICLE LOAD UP TO 4 OCCUPANTS
 FRONT 26^{psi} (180kPa), REAR 28^{psi} (180kPa)
 • VEHICLE LOAD UP TO VEHICLE CAPACITY WEIGHT
 FRONT 29^{psi} (200kPa), REAR 29^{psi} (200kPa)
 RECOMMENDED TIRE SIZE P195/70 R14 50H
 SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION

CHARGE MAXIMALE DU VEHICULE 900 livres (410kg)
 NOMBRE DESIGNE DE PLACES ASSISES
 AVANT 2 ARRIERE 3 TOTAL 5
 PRESSION RECOMMANDEE DE GONFLEMENT A FROID DES PNEUMATIQUES
 • AU POIDS DE VEHICULE CHARGE 4 PERSONNES
 AVANT 26 livres/m² (180kPa), ARRIERE 28 livres/m² (180kPa)
 • AU POIDS MAXIMAL DU VEHICULE CHARGE
 AVANT 29 livres/m² (200kPa), ARRIERE 29 livres/m² (200kPa)
 DIMENSION RECOMMANDEE DES PNEUMATIQUES
 P195/70 R14 50H
 POUR DE PLUS AMPLIS DETAILS, VOIR LE MANUEL DU PROPRIETAIRE

33020

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 IS NOT AVAILABLE.



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



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

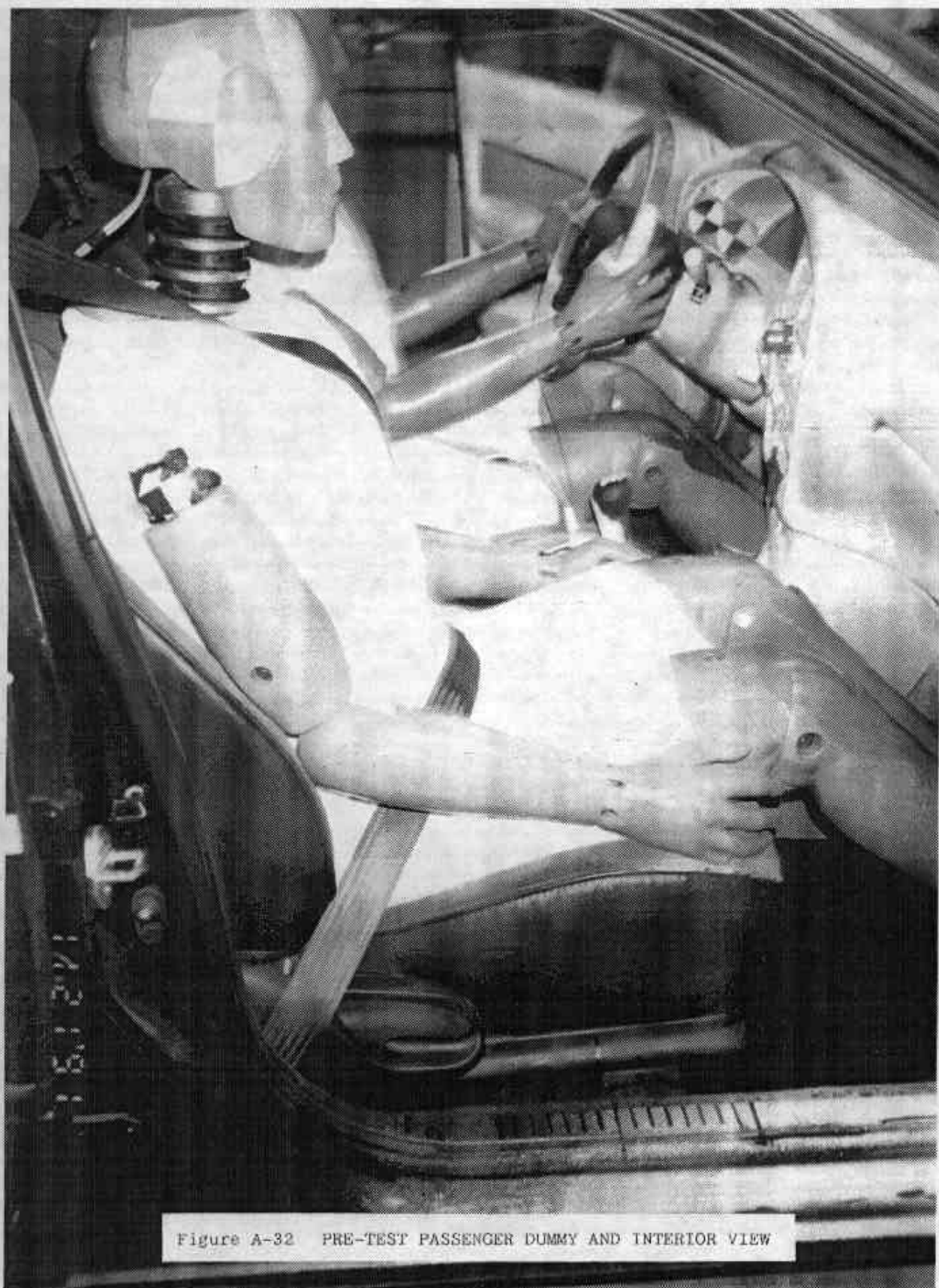


Figure A-32 PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW



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



Figure A-34 POST-TEST DRIVER AIRBAG VIEW

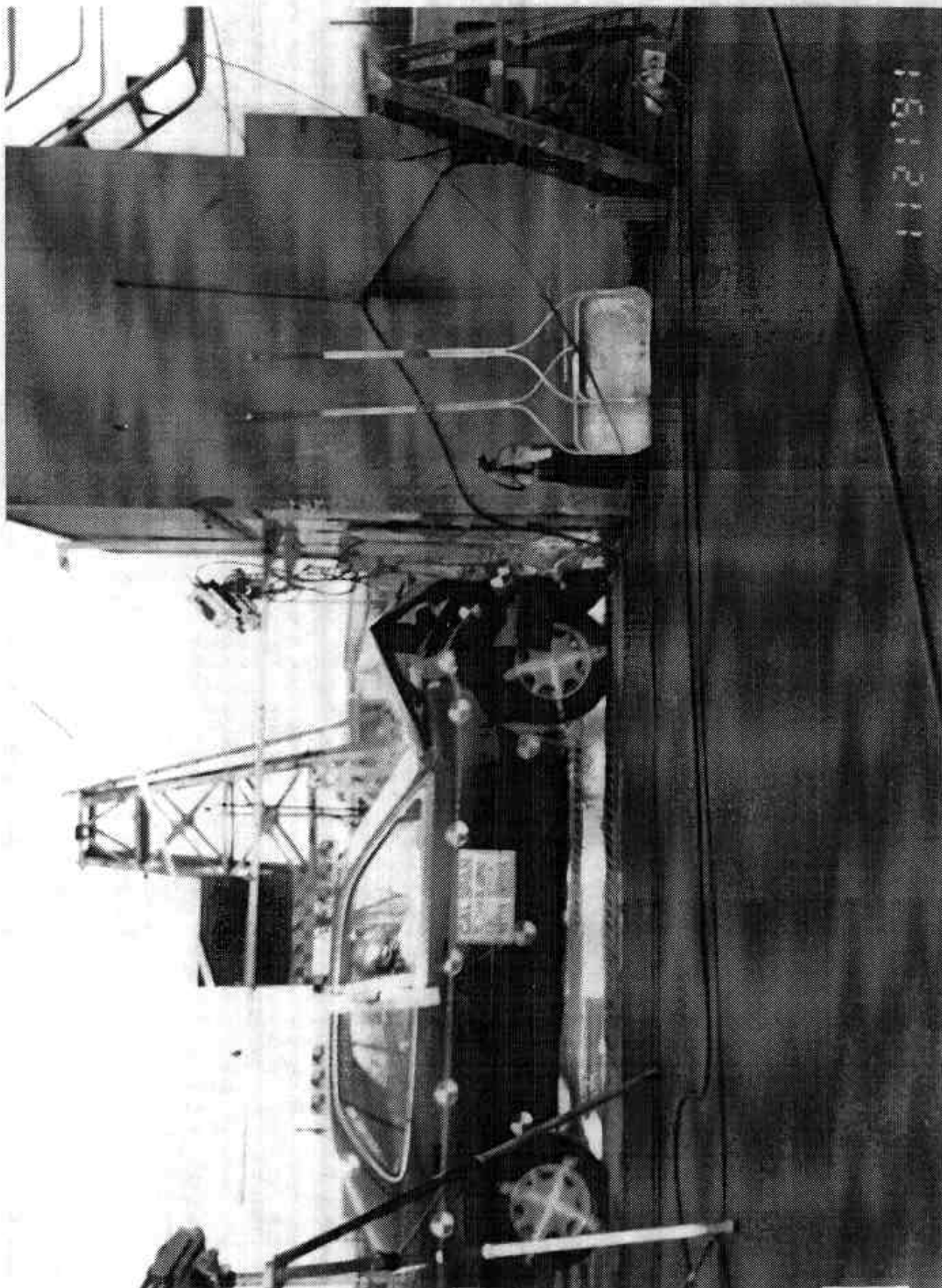


FIGURE A-35 VEHICLE IMPACT

112191

A-37

7953-3



Figure A-36 BALLAST PLACED IN LEFT REAR OF TRUNK



FIGURE A-37 BALLAST PLACED IN RIGHT REAR OF TRUNK

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

Note: Calspan meets and follows the
requirements of SAE J211.

TEST NO. CN5104

VEHICLE DATA

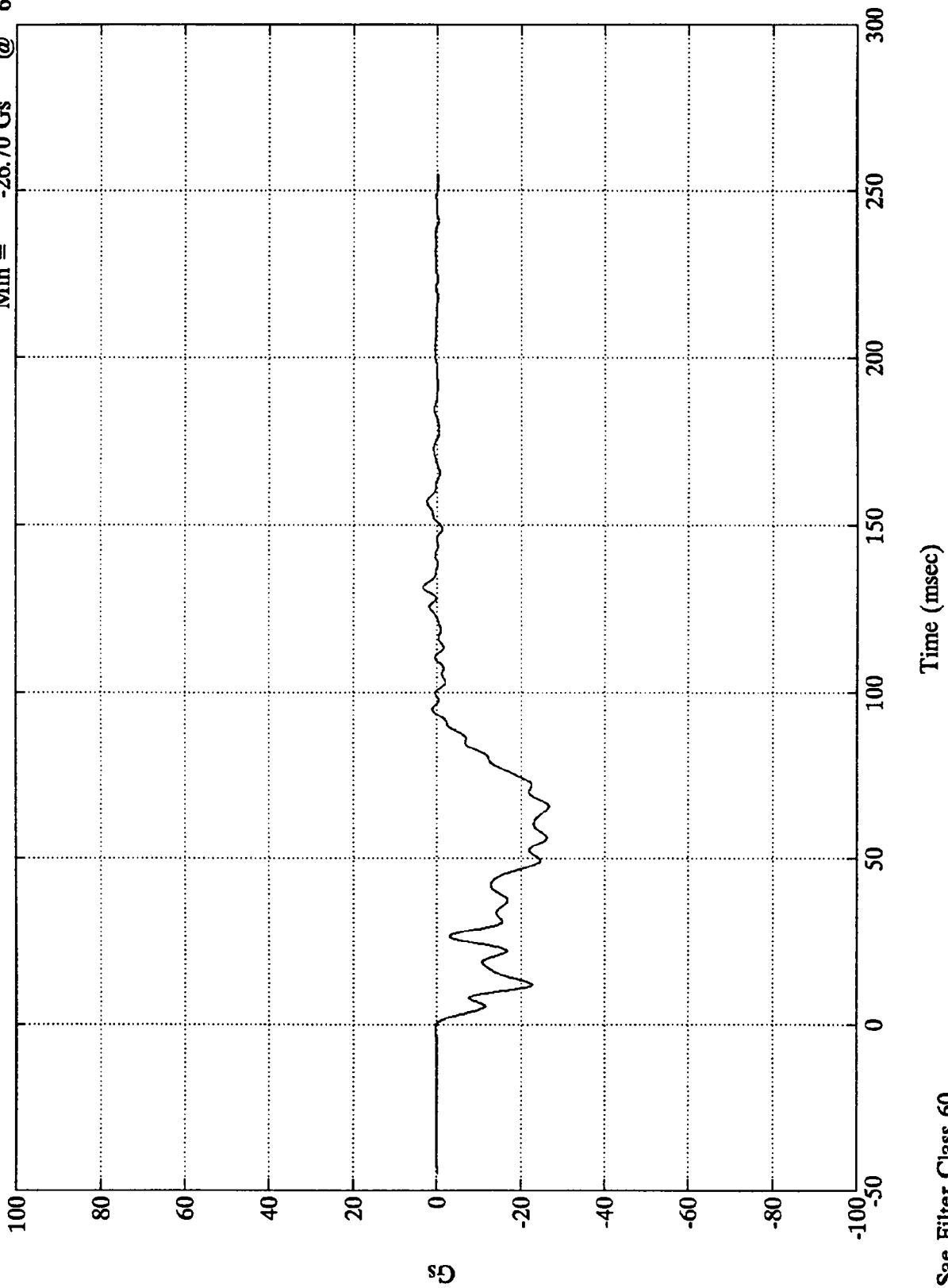
SAE FILTER CHANNEL CLASS

60

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

L. Rear X-member X (#1)

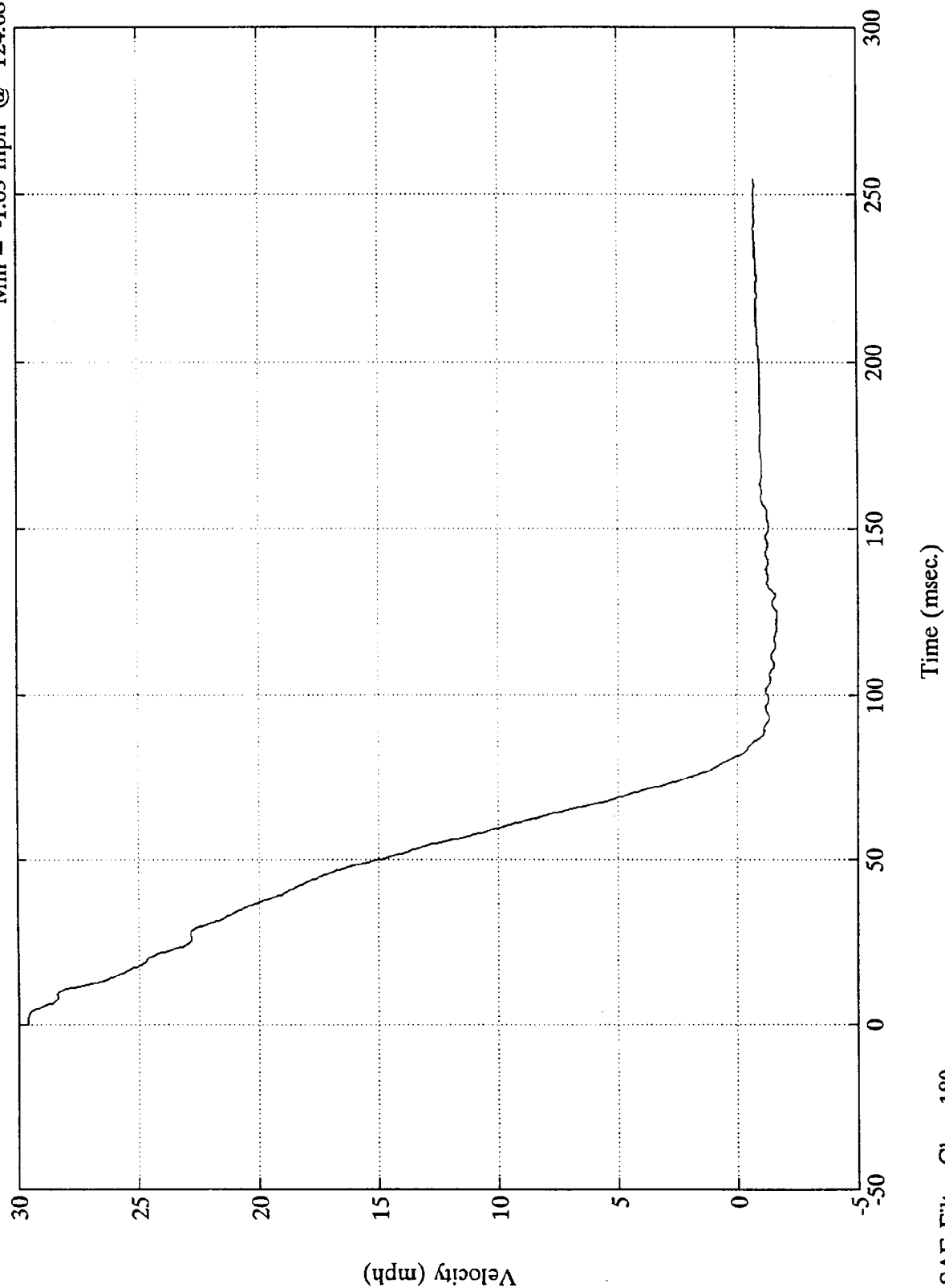
Max = 3.39 Gs @ 131.63 msec
Min = -26.70 Gs @ 65.52 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

L. Rear X-member X (#1)

Max = 29.60 mph @ 1.92 msec
Min = -1.63 mph @ 124.08 msec

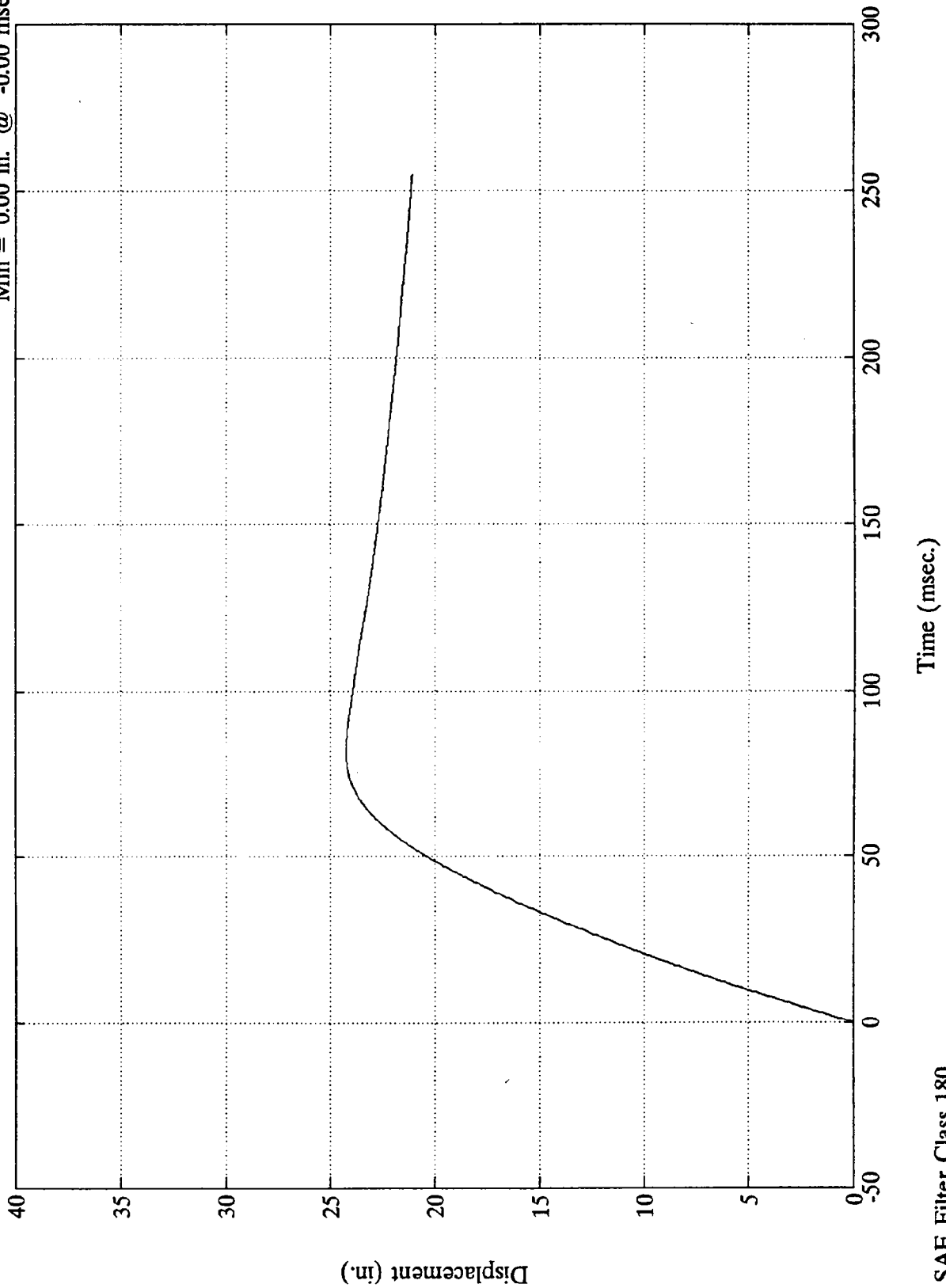


SAE Filter Class 180

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

L. Rear X-member X (#1)

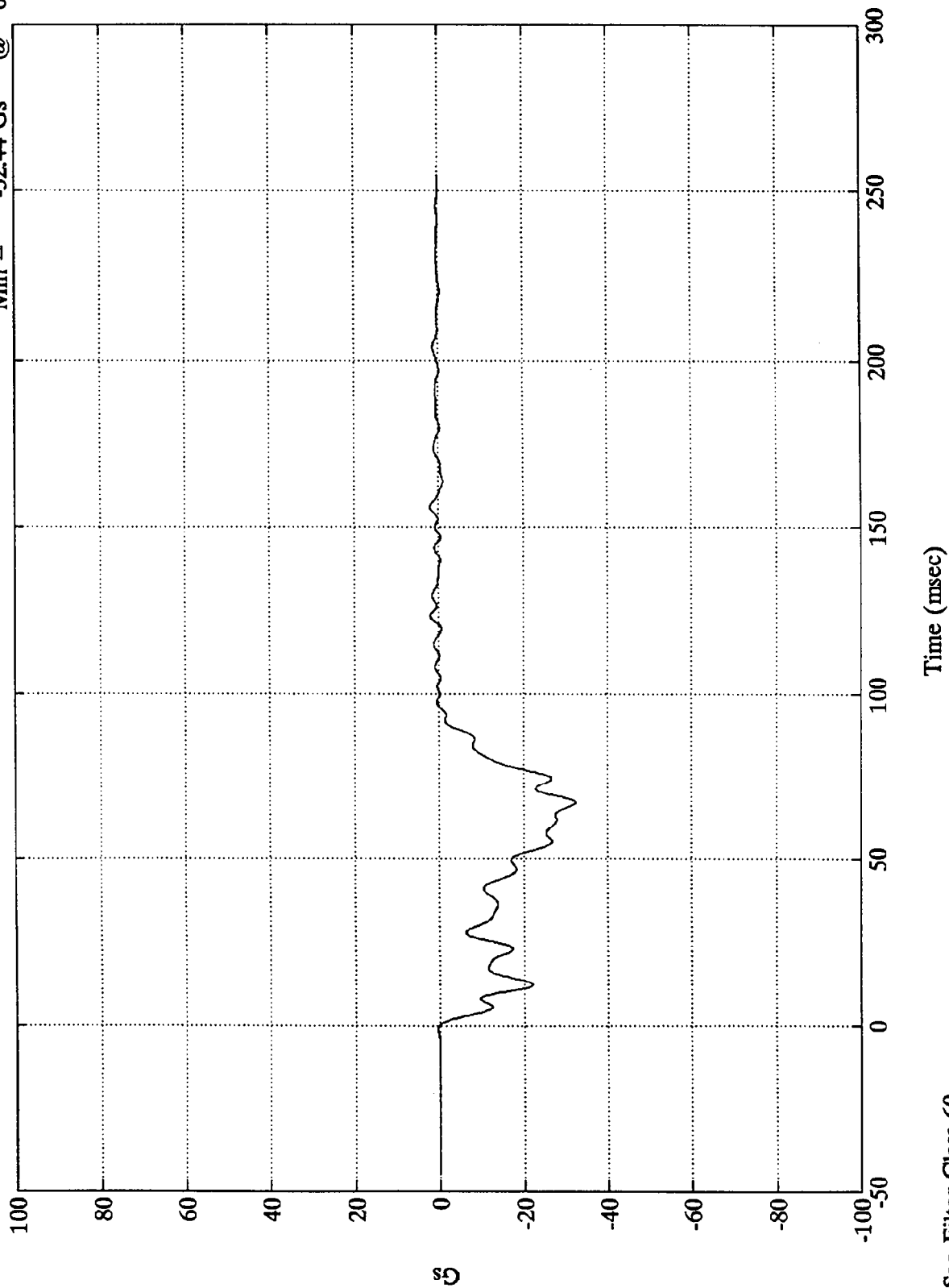
Max = 24.26 in. @ 82.80 msec
Min = 0.00 in. @ -0.00 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

R. Rear X-member X (#2)

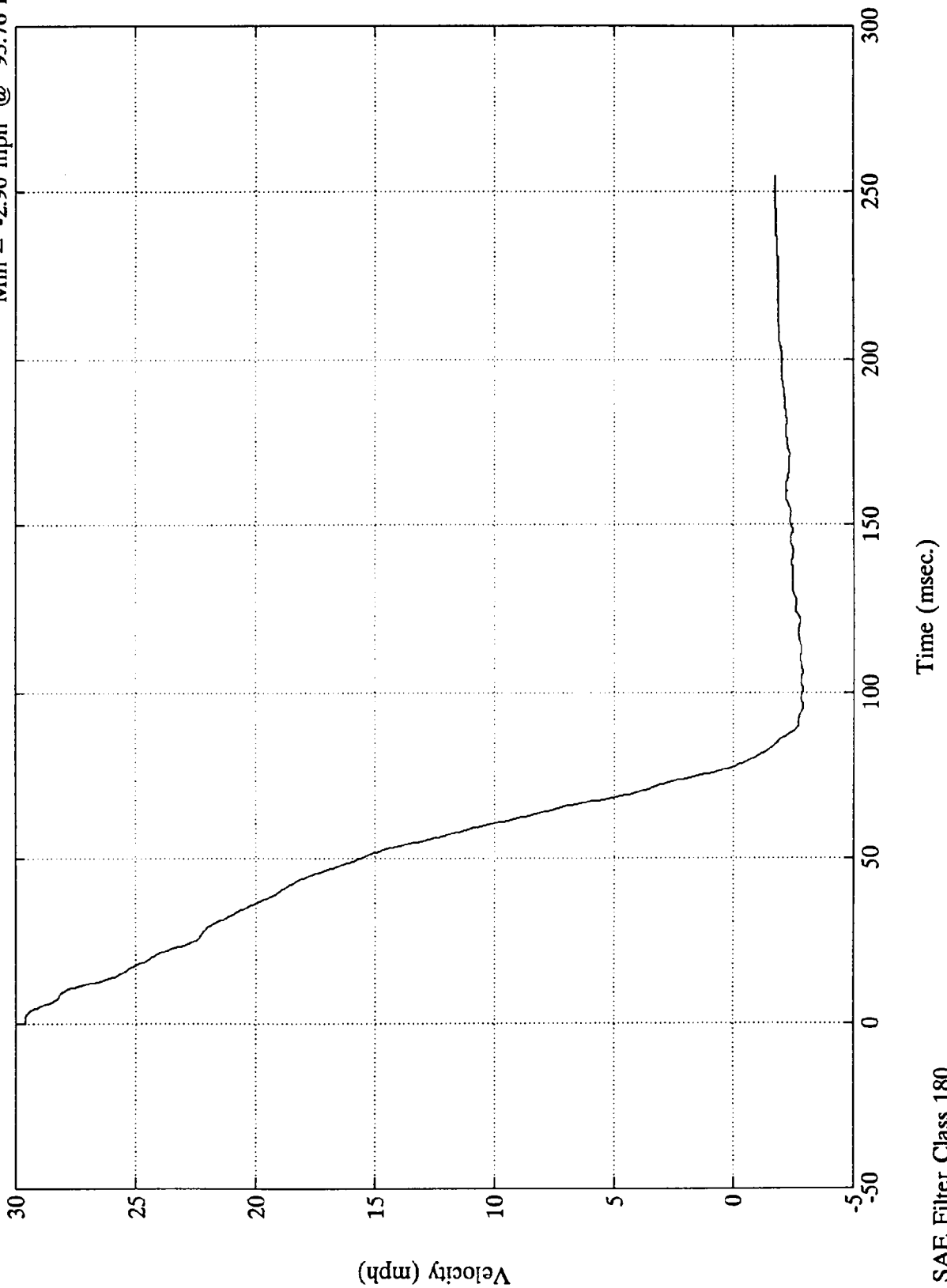
Max = 2.01 Gs @ 123.12 msec
Min = -32.44 Gs @ 67.19 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

R. Rear X-member X (#2)

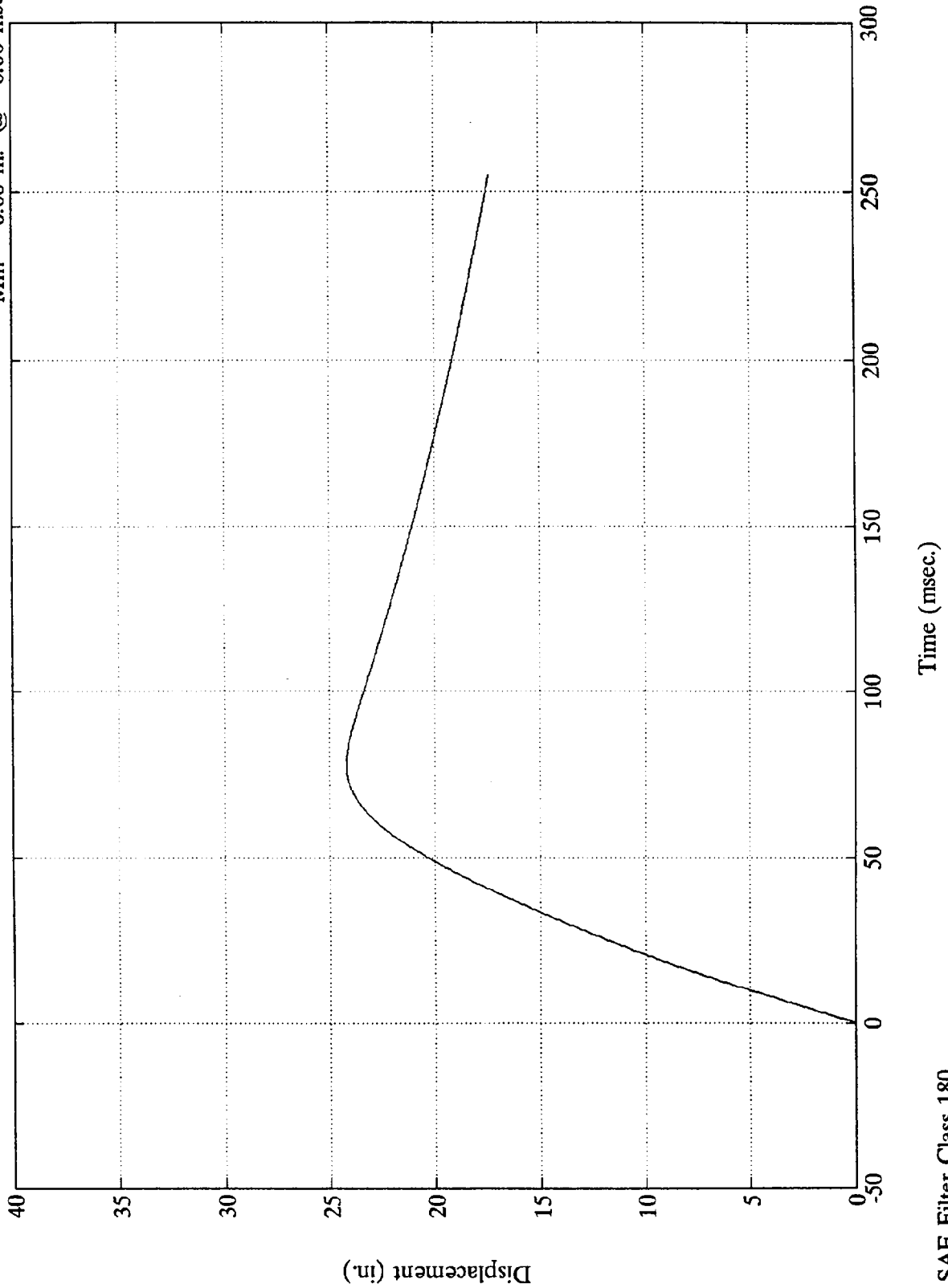
Max = 29.60 mph @ 2.16 msec
Min = -2.90 mph @ 95.76 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

R. Rear X-member X (#2)

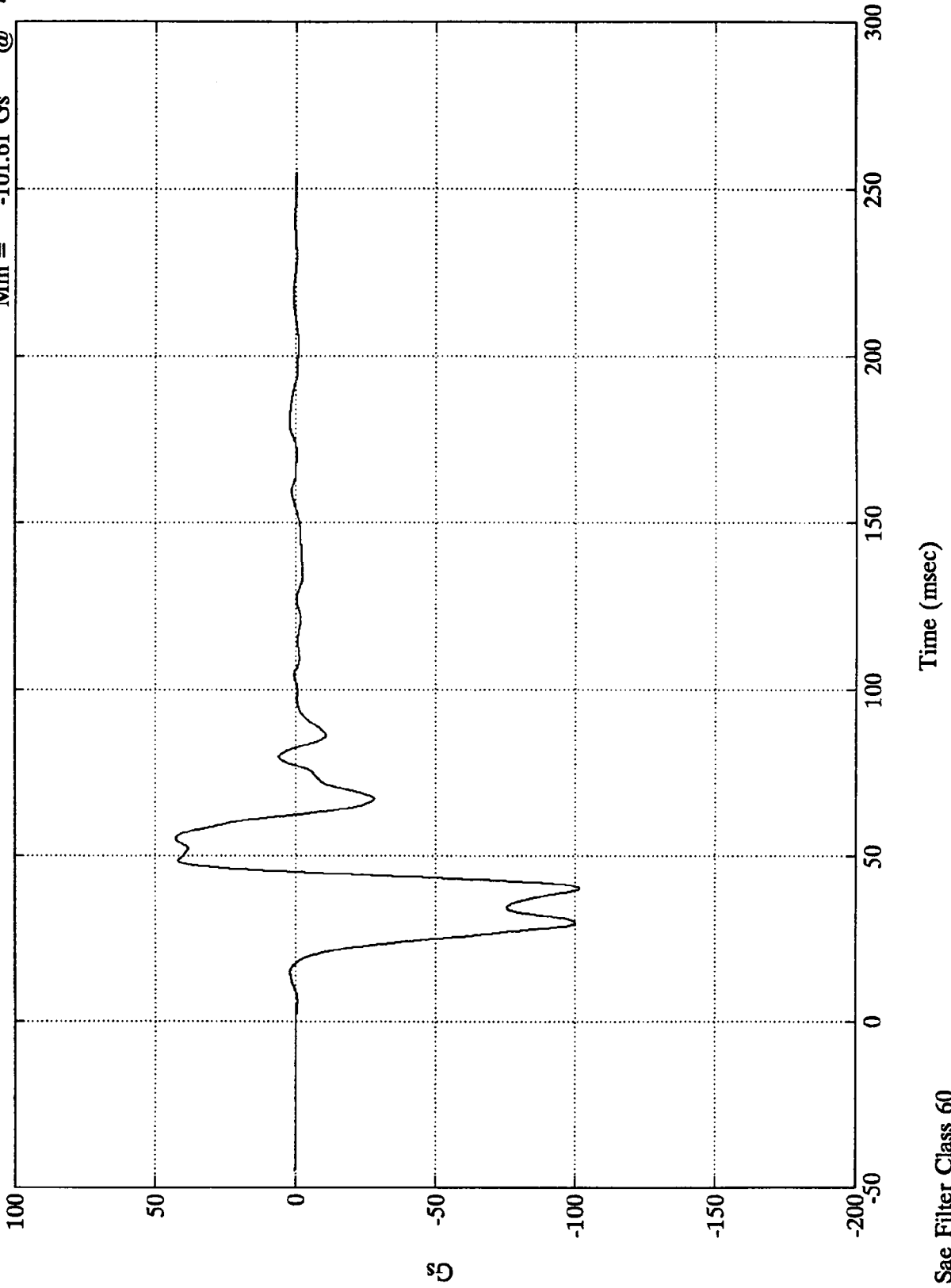
Max = 24.21 in. @ 79.20 msec
Min = 0.00 in. @ -0.00 msec



SAE Filter Class 180

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

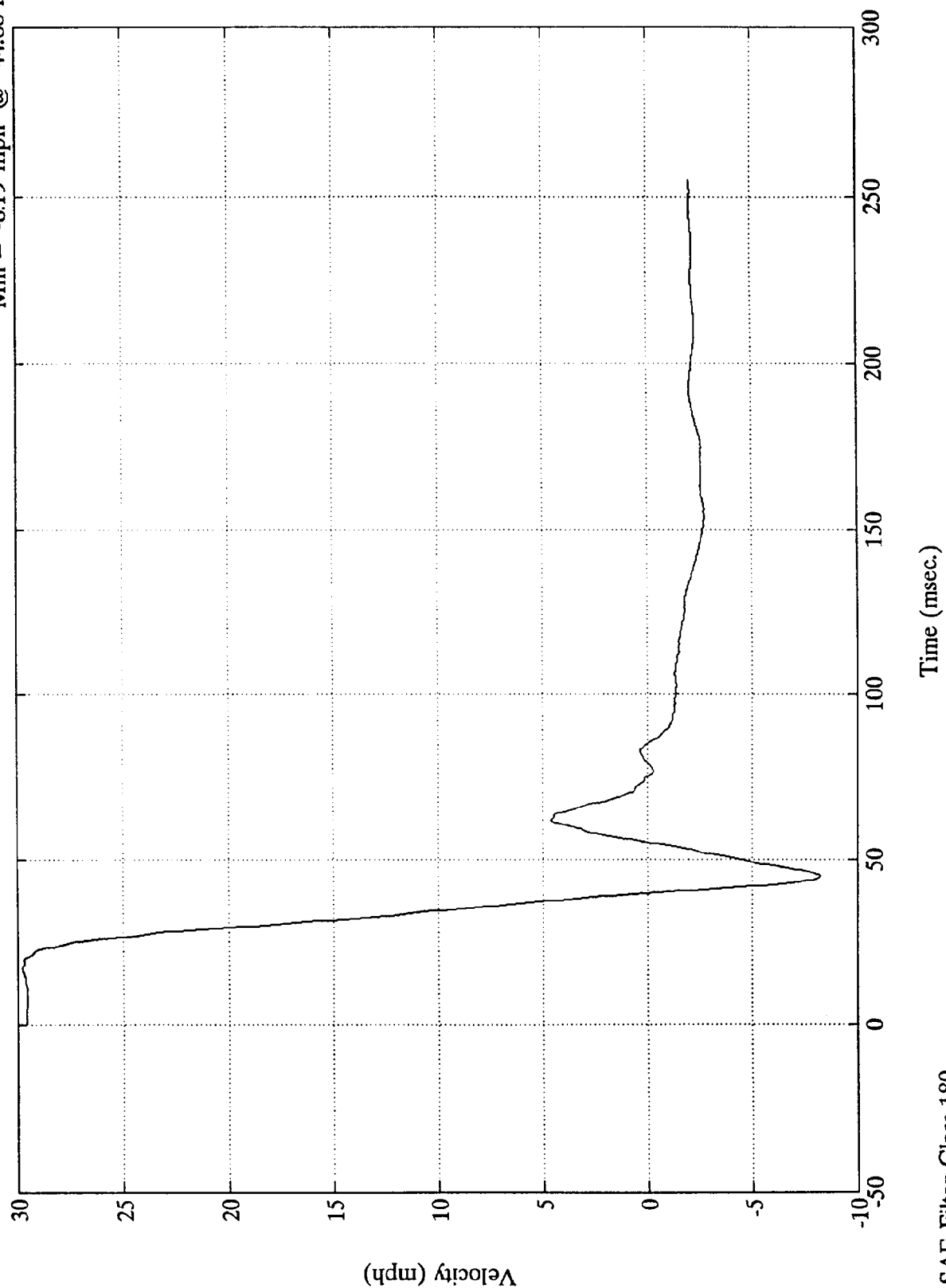
Engine Top X (#3) Max = 42.63 Gs @ 55.32 msec
 Min = -101.61 Gs @ 40.31 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Max = 29.81 mph @ 17.28 msec
Min = -8.19 mph @ 44.88 msec

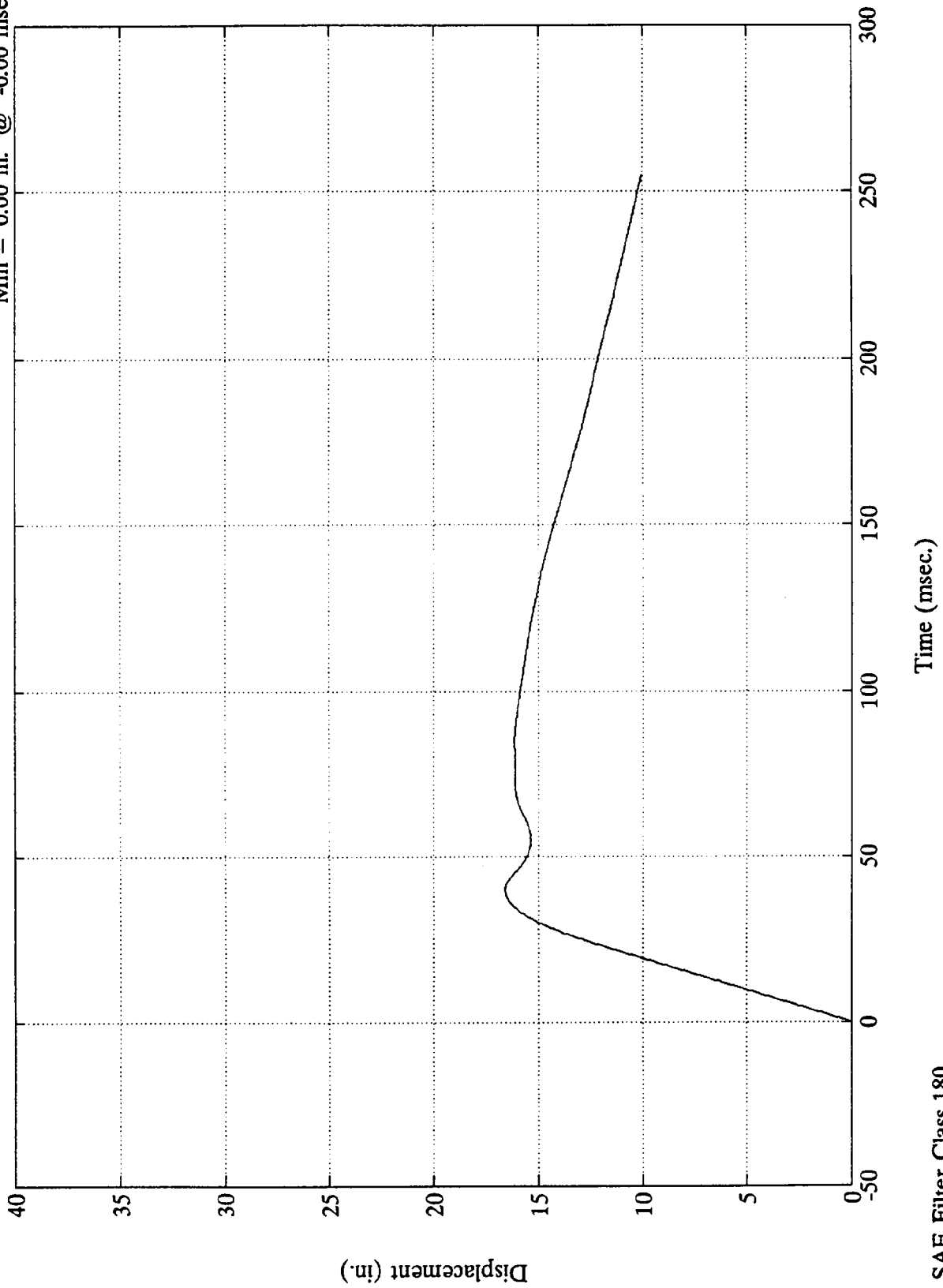
Engine Top X (#3)



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Engine Top X (#3)

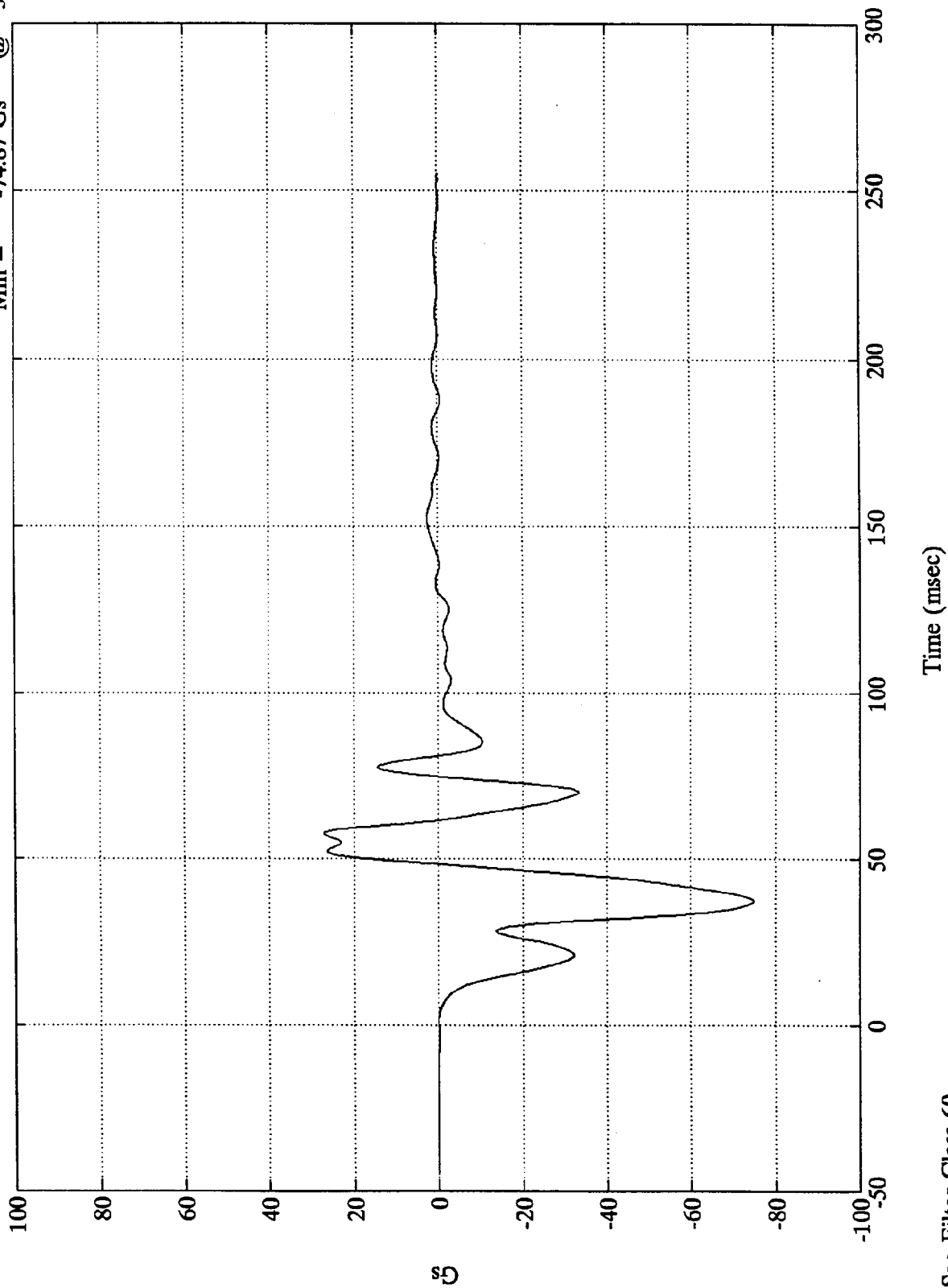
Max = 16.60 in. @ 40.08 msec
Min = 0.00 in. @ -0.00 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Max = 27.14 Gs @ 57.60 msec
Min = -74.87 Gs @ 37.08 msec

Engine Bottom X (#4)



Sae Filter Class 60

50

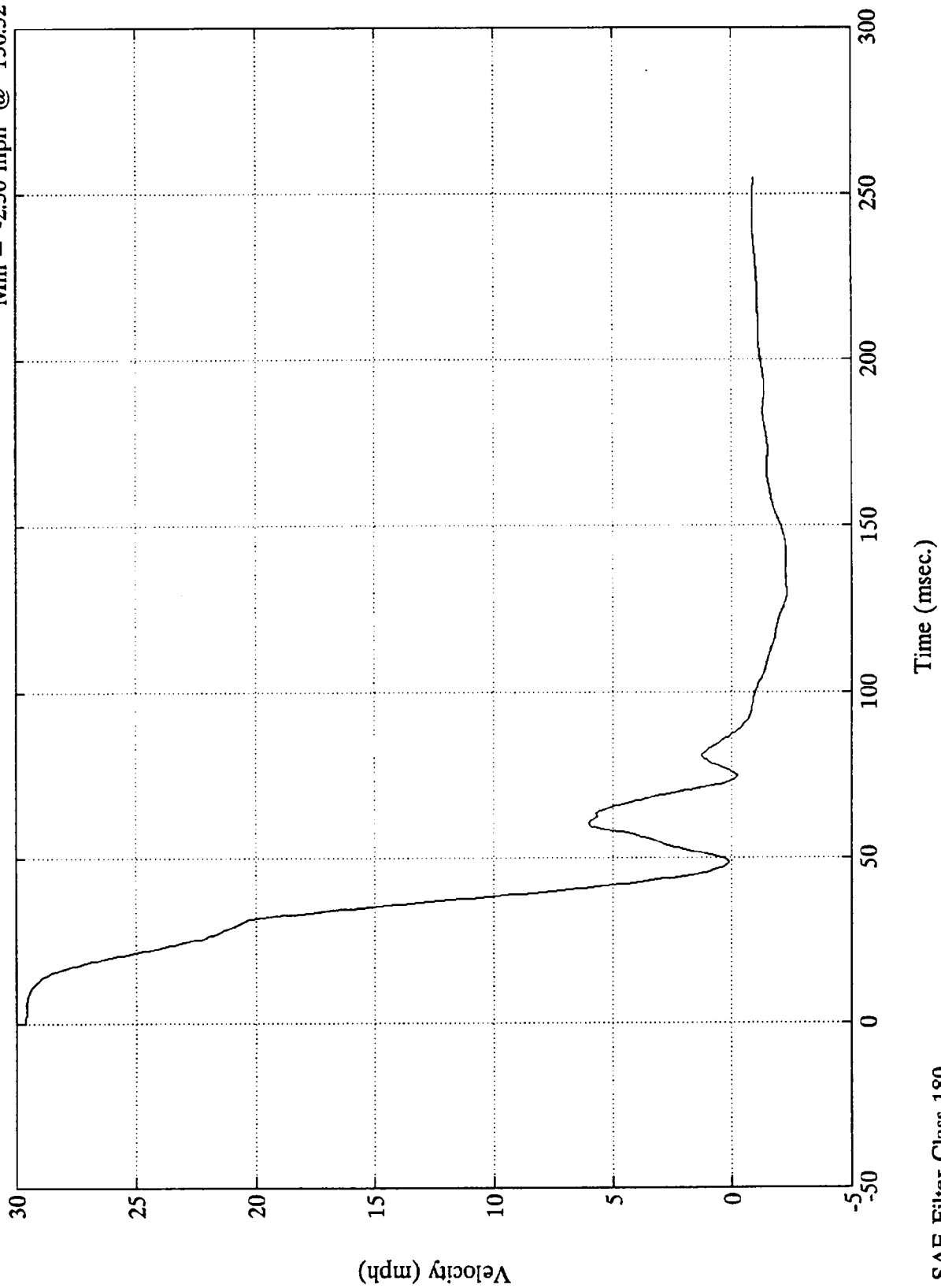
B-12

7953-3

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Engine Bottom X (#4)

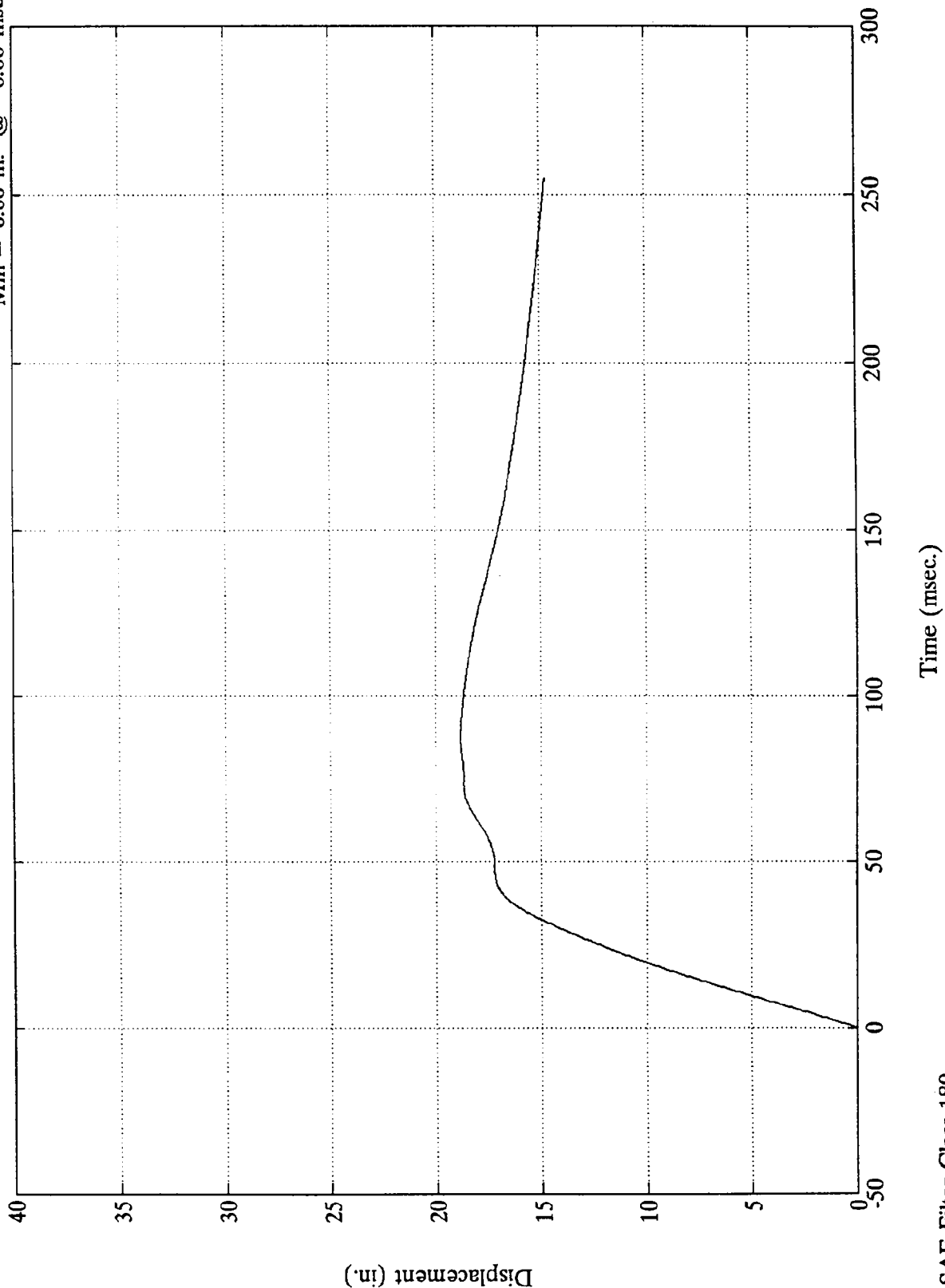
Max = 29.60 mph @ 1.92 msec
Min = -2.30 mph @ 130.32 msec



NHTSA '208" TEST 7 - 1992 TOYOTA CAMRY

Engine Bottom X (#4)

Max = 18.82 in. @ 89.28 msec
Min = 0.00 in. @ -0.00 msec

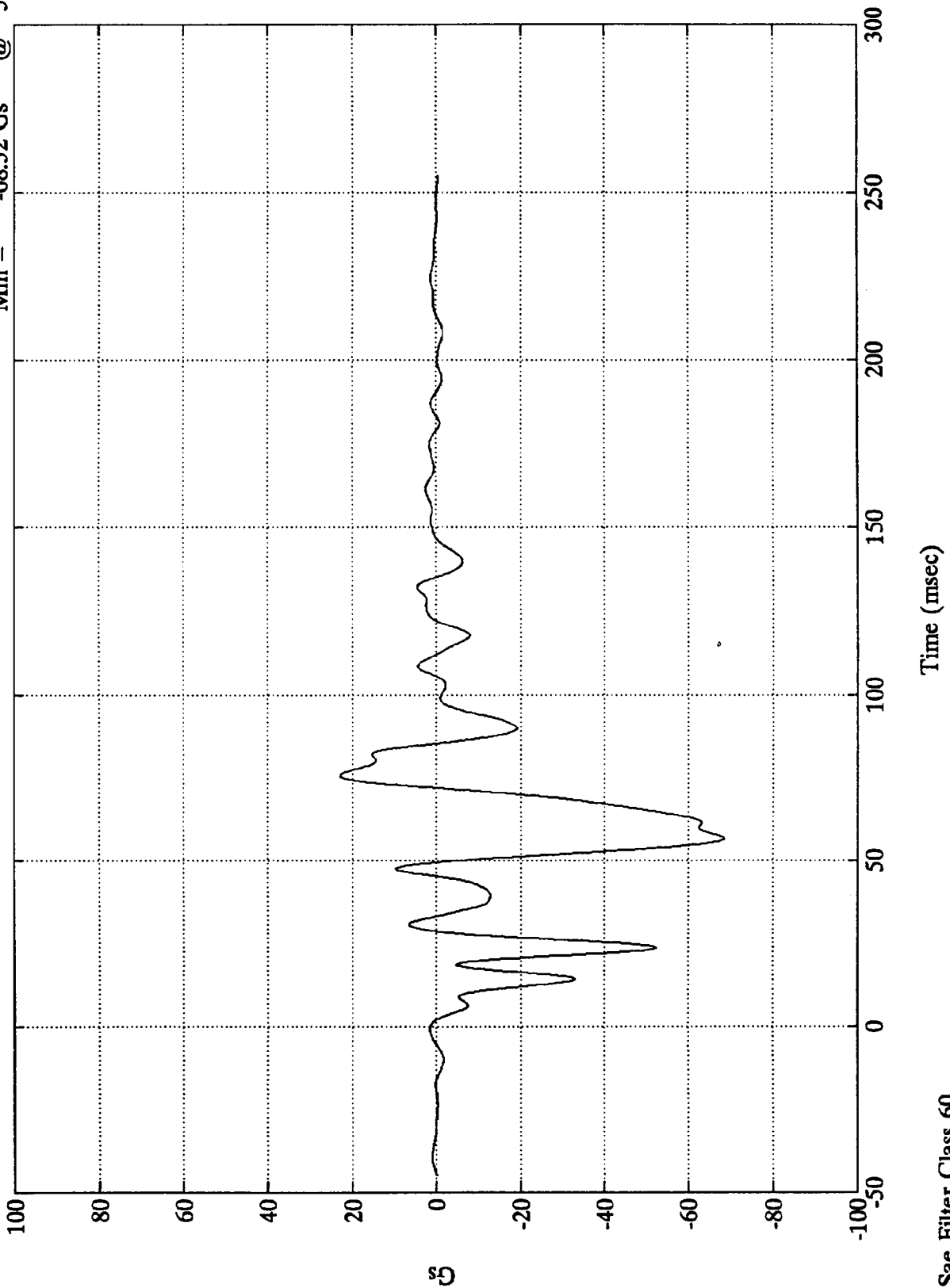


SAE Filter Class 180

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

R. Brake Caliper X (#5)

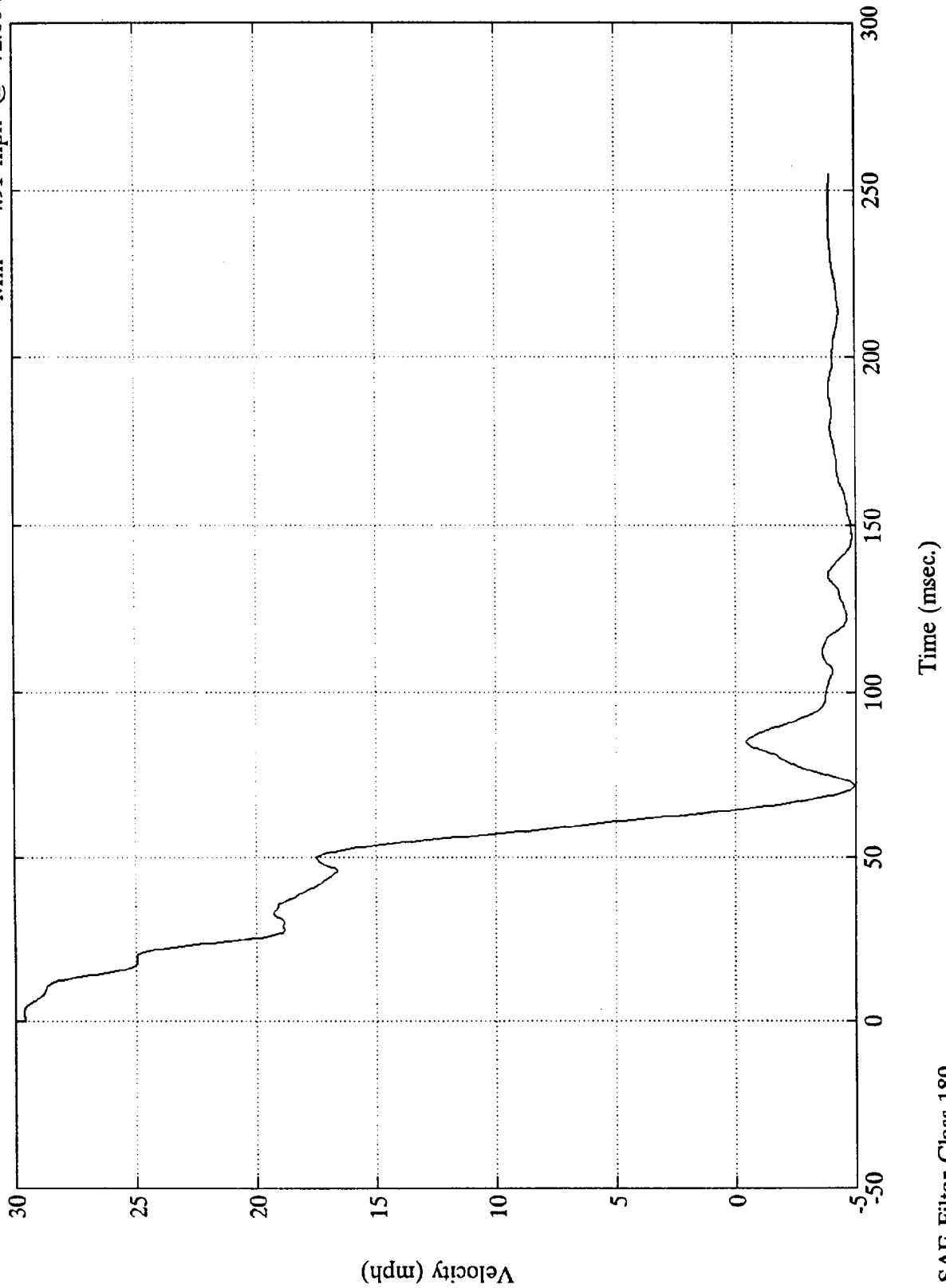
Max = 22.84 Gs @ 75.59 msec
Min = -68.52 Gs @ 56.63 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

R. Brake Caliper X (#5)

Max = 29.65 mph @ 3.12 msec
Min = -4.91 mph @ 72.00 msec

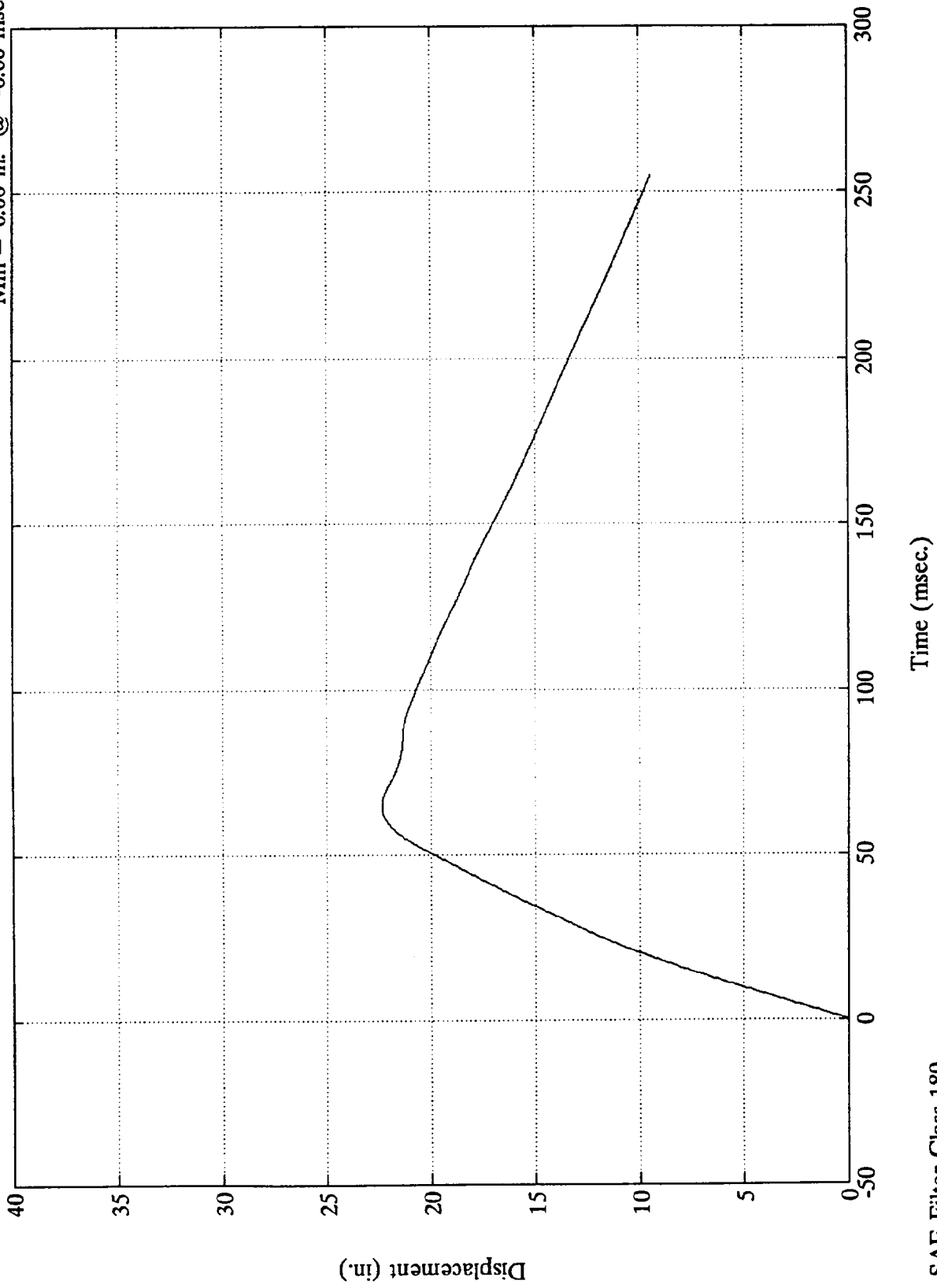


SAE Filter Class 180

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

R. Brake Caliper X (#5)

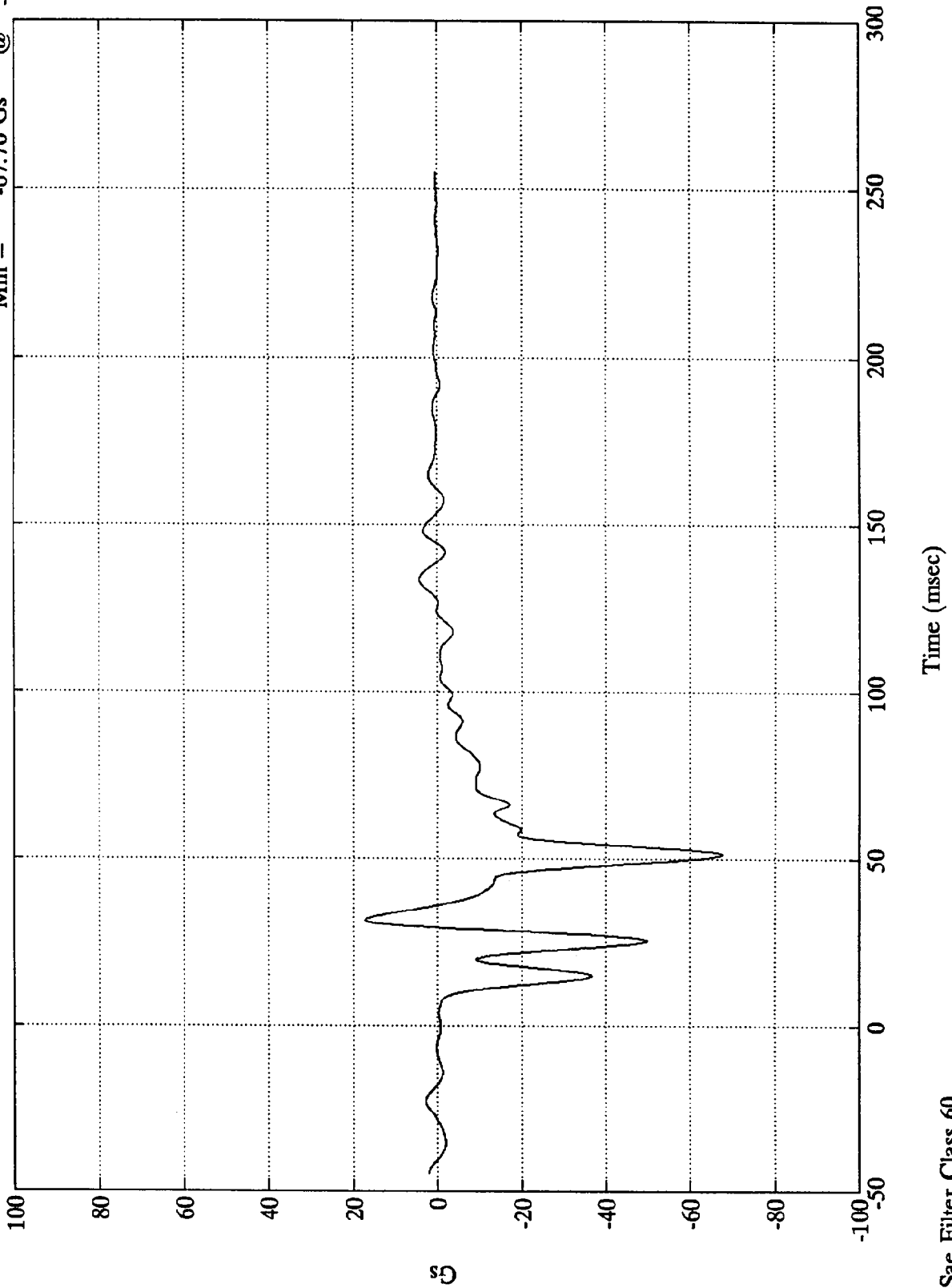
Max = 22.35 in. @ 65.52 msec
Min = 0.00 in. @ -0.00 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

L Brake Caliper X (#6)

Max = 17.22 Gs @ 31.31 msec
Min = -67.70 Gs @ 51.36 msec

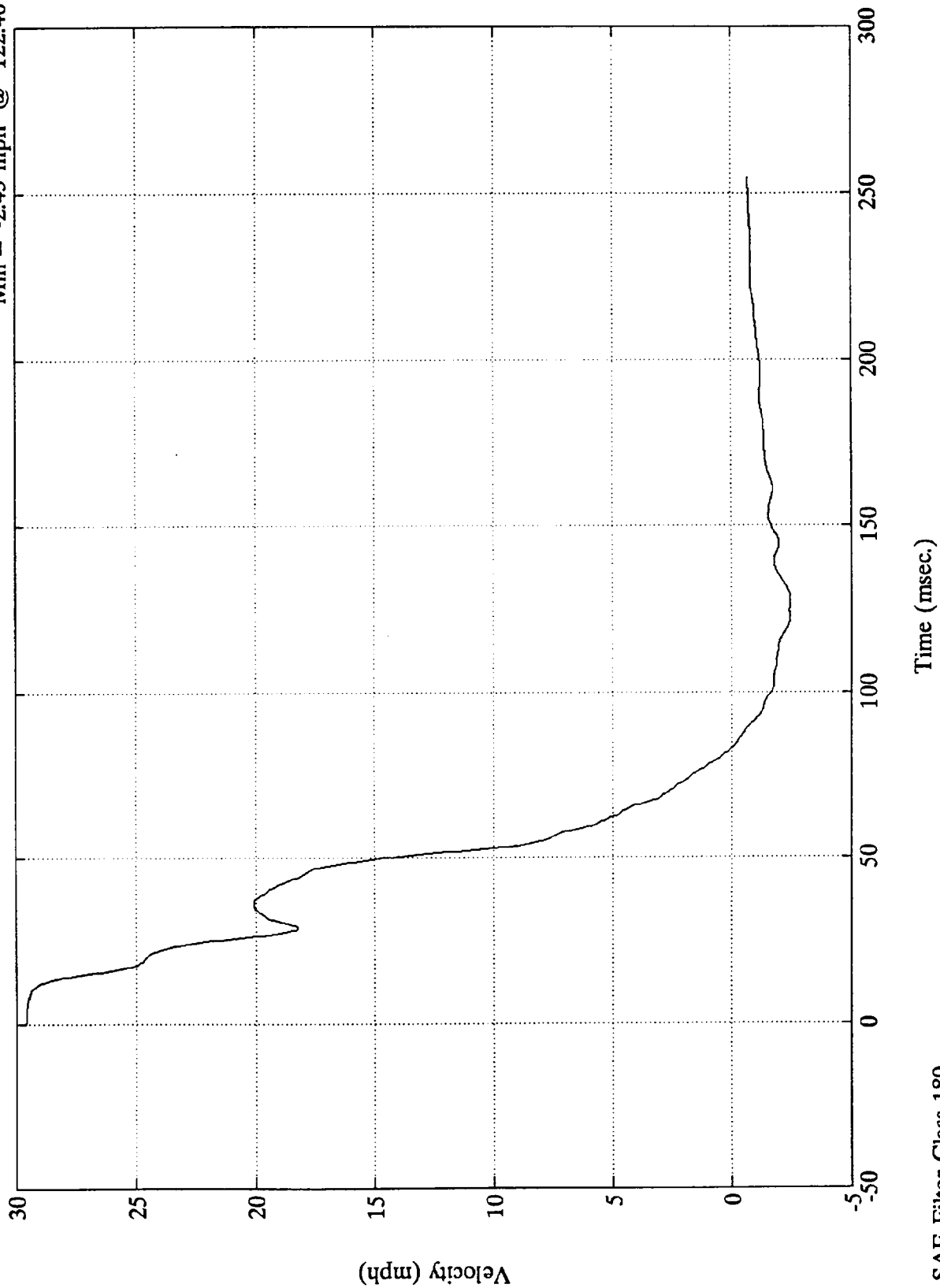


Sae Filter Class 60

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

L. Brake Caliper X (#6)

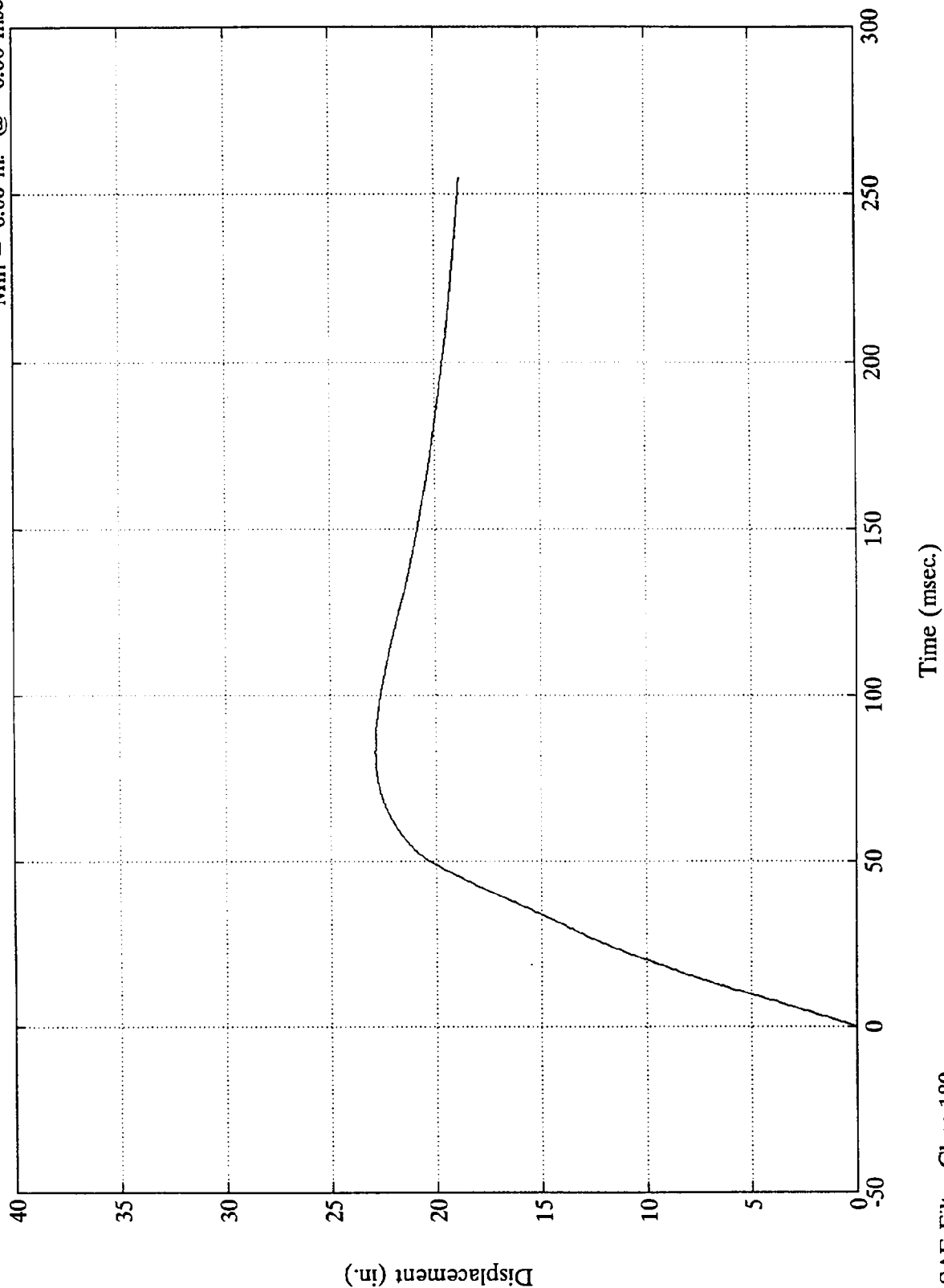
Max = 29.60 mph @ 0.24 msec
Min = -2.43 mph @ 122.40 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

L. Brake Caliper X (#6)

Max = 22.90 in. @ 83.28 msec
Min = 0.00 in. @ -0.00 msec

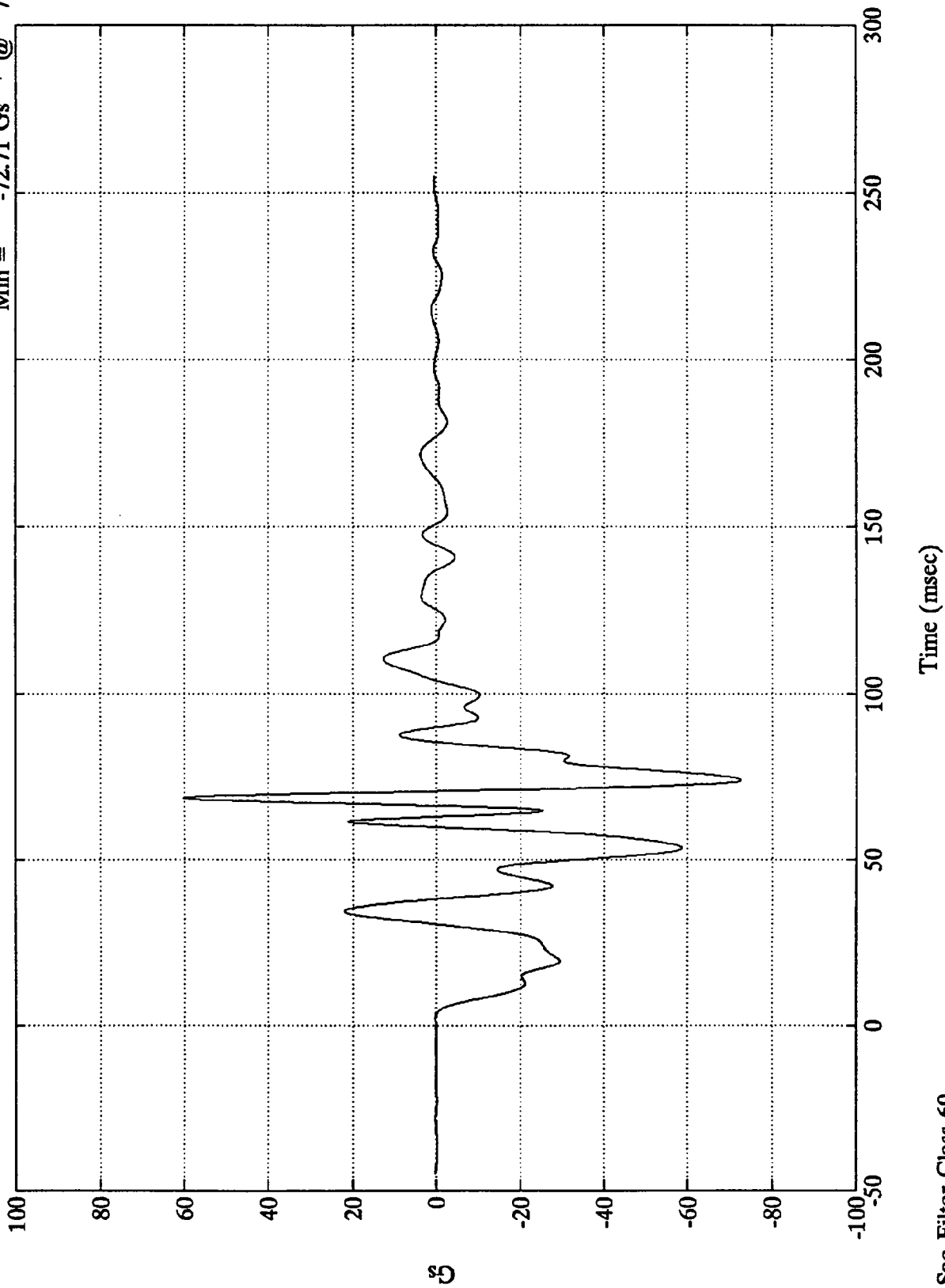


SAE Filter Class 180

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Instrument Panel X (#7)

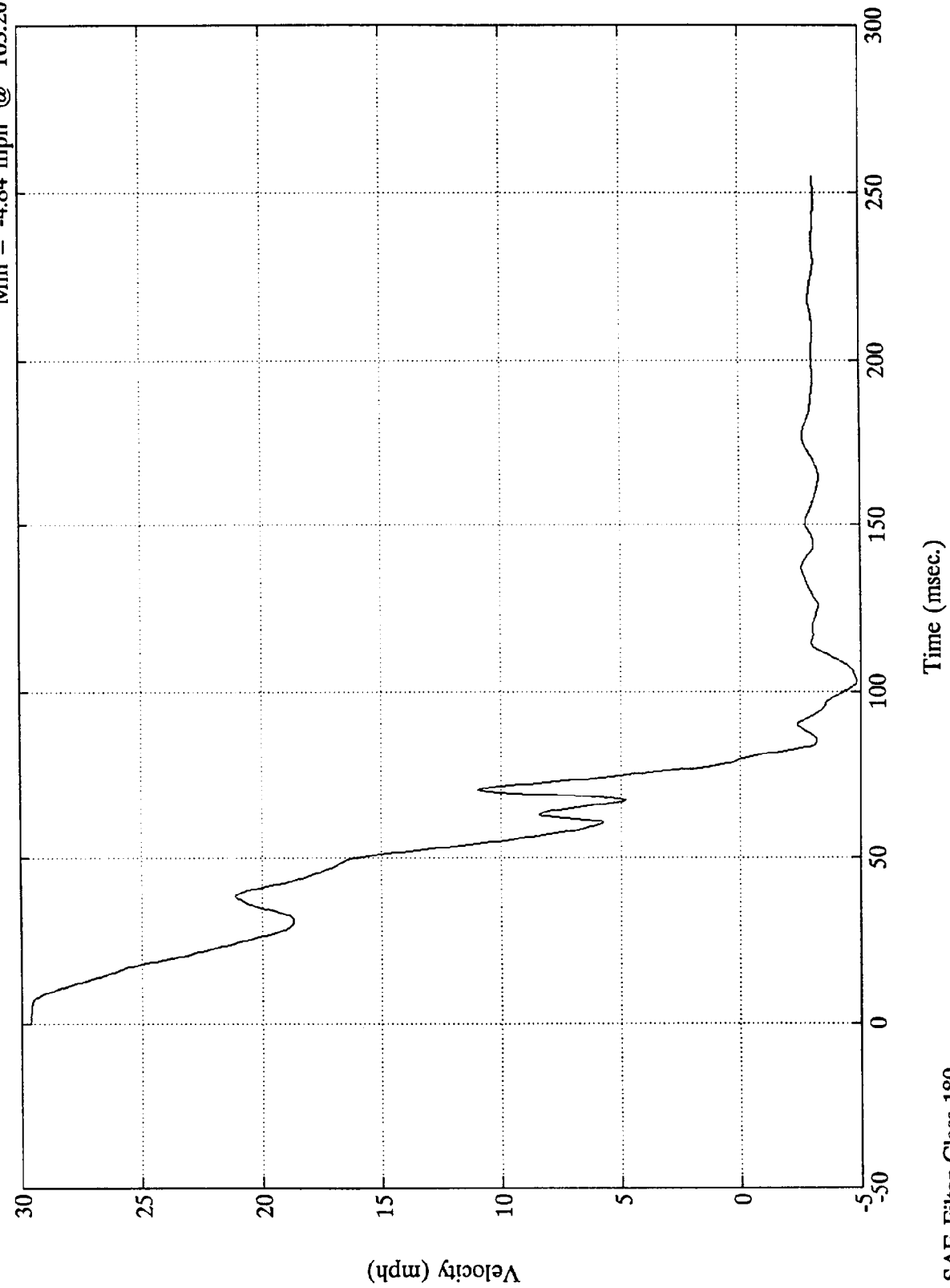
Max = 60.16 Gs @ 68.76 msec
 Min = -72.71 Gs @ 74.16 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Instrument Panel X (#7)

Max = 29.60 mph @ 2.88 msec
Min = -4.84 mph @ 103.20 msec

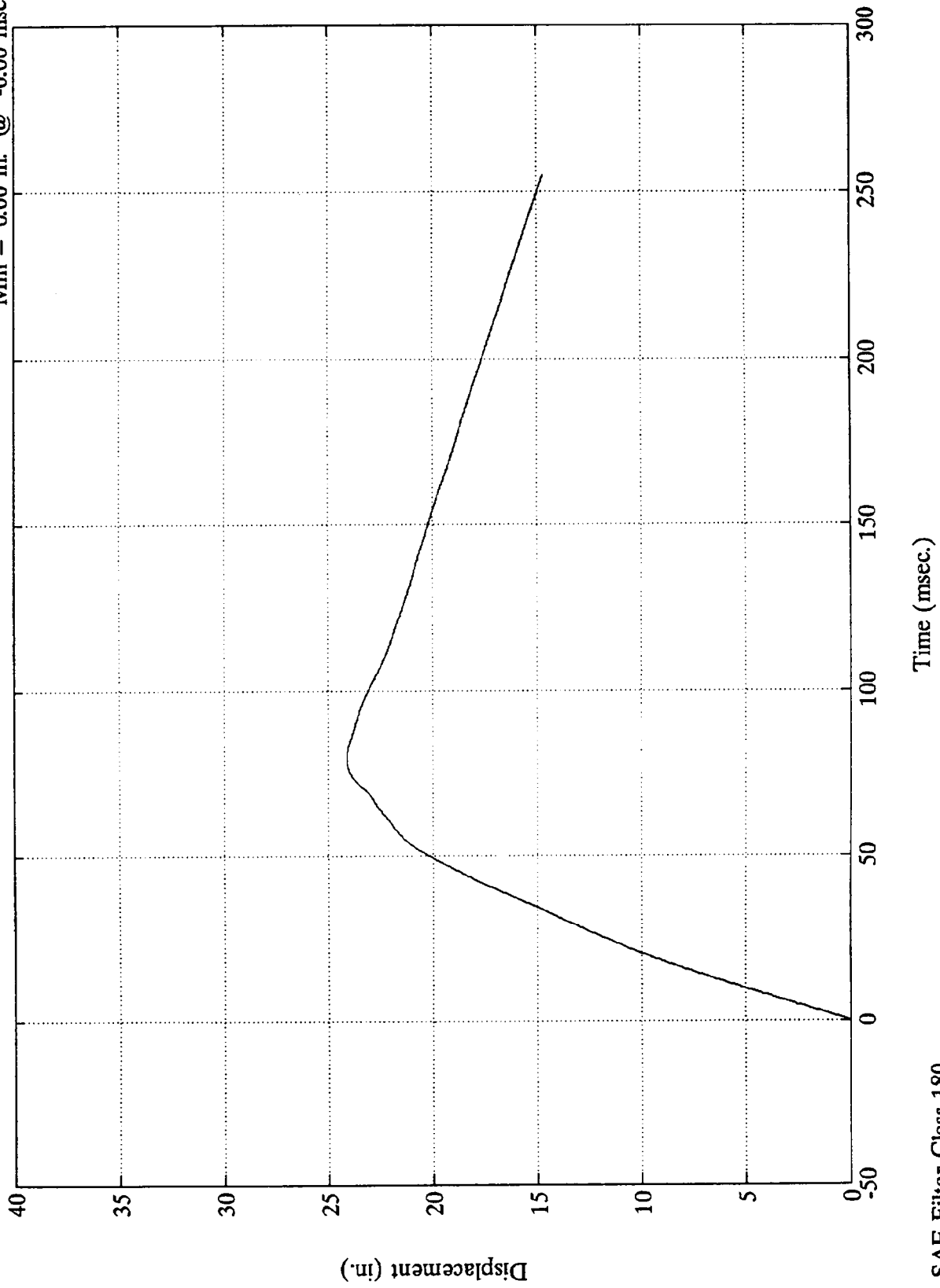


SAE Filter Class 180

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Instrument Panel X (#7)

Max = 24.12 in. @ 80.64 msec
Min = 0.00 in. @ -0.00 msec



TEST NO. CN5104

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

FACILITY: TRACK
RUN #: 1137
SERIES #: 7

TEST DATE: 21 Nov 1991

TITLE: NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

HIC SUMMARY: Pos. 1 Head Resultant

hic: 427.86
t1 = 74.880 msec
t2 = 101.760 msec
Average G's Over Hic Duration = 47.95

HIC SUMMARY: Pos. 2 Head Resultant

hic: 506.08
t1 = 69.480 msec
t2 = 105.360 msec
Average G's Over Hic Duration = 45.68

CLIP SUMMARY: Pos. 1 Chest Resultant

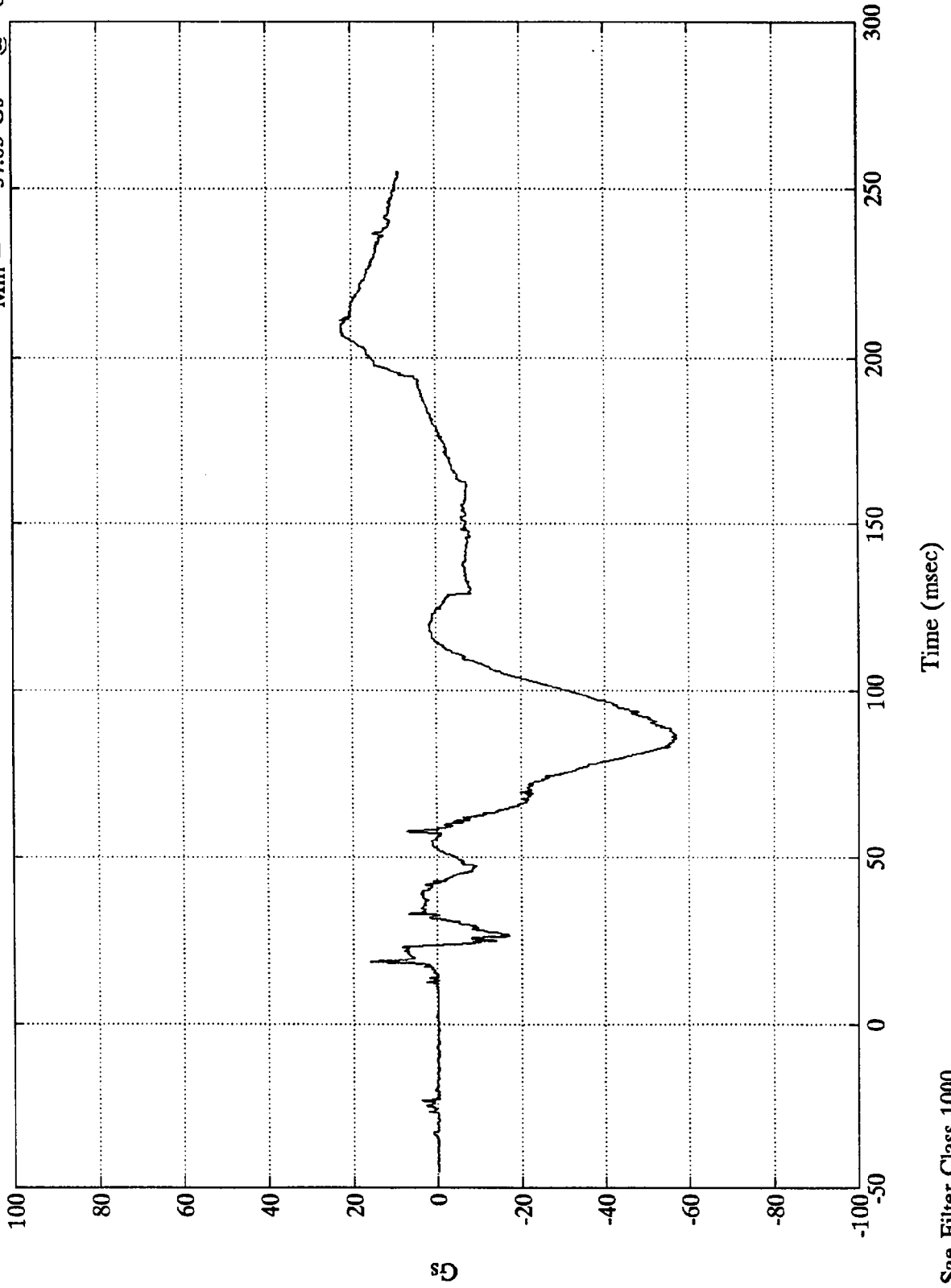
Peak Resultant (3 ms CLIPPED DURATION) = 67.581 G's
Tstart = 87.0000 ms
Tend = 90.1200 ms
CSI = 694.619

CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 36.010 G's
Tstart = 65.6400 ms
Tend = 68.7600 ms
CSI = 280.245

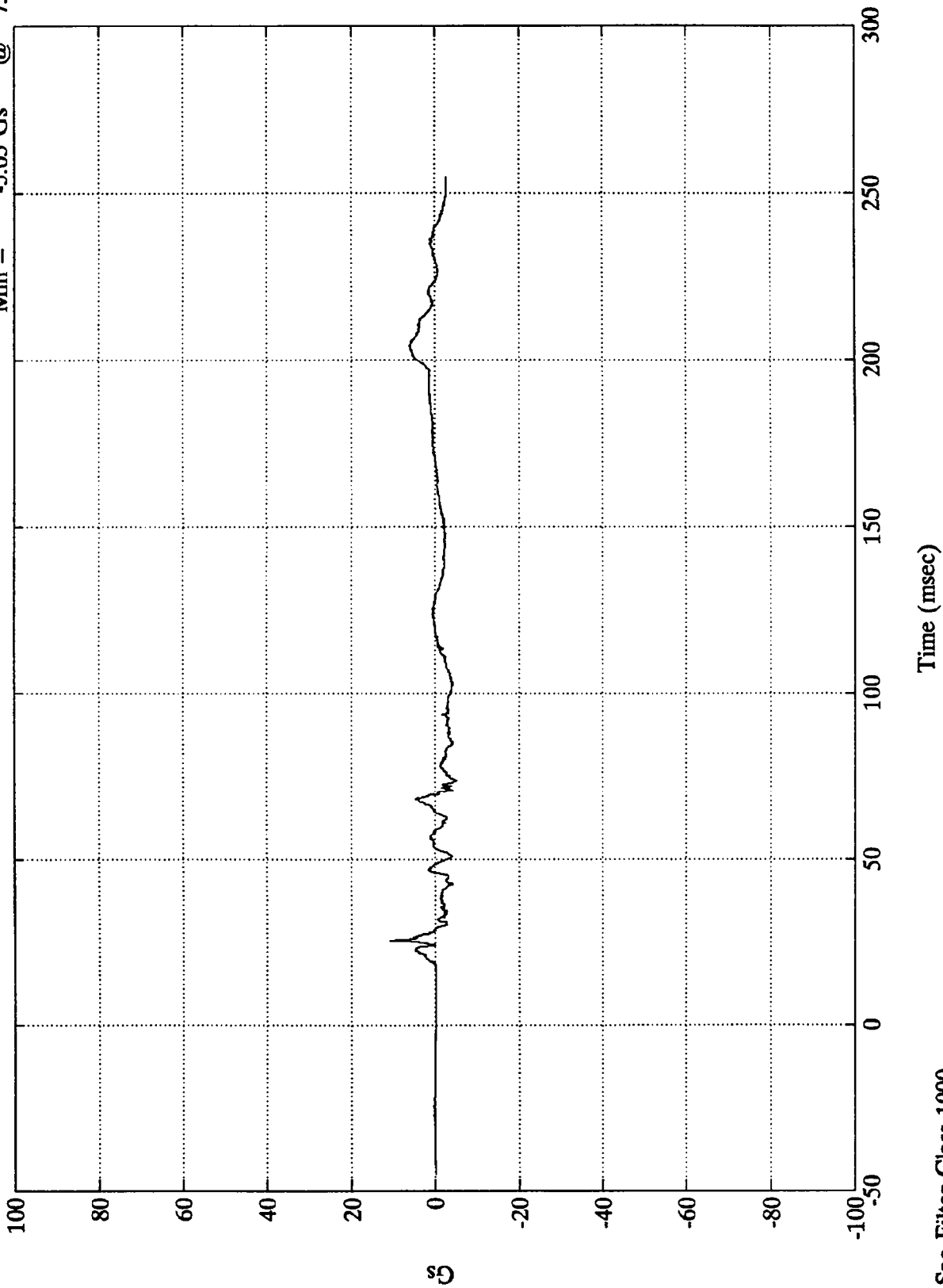
NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Pos. 1 Head X
Max = 22.61 Gs @ 211.08 msec
Min = -57.03 Gs @ 86.87 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

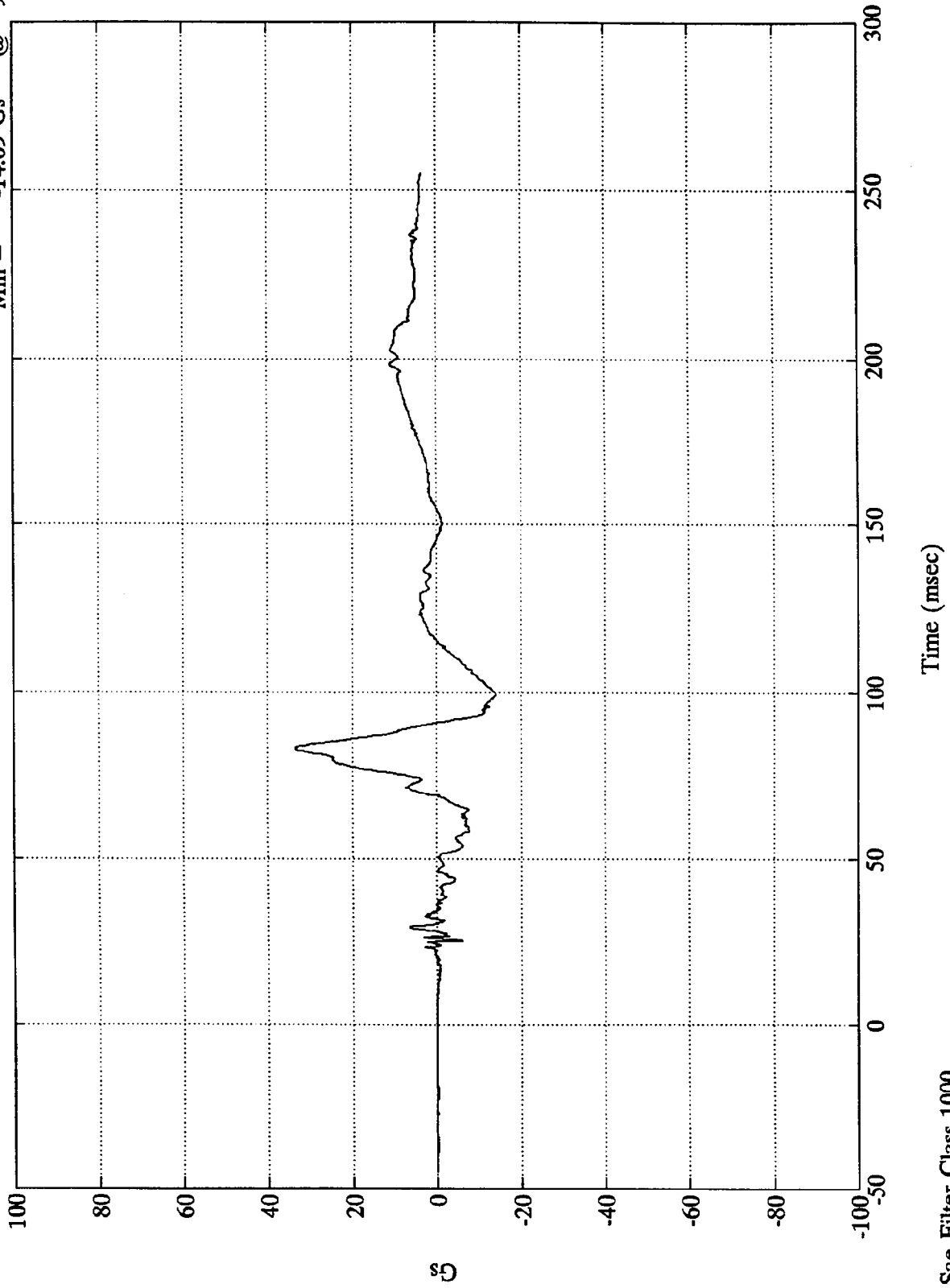
Pos. 1 Head Y
Max = 10.71 Gs @ 25.79 msec
Min = -5.05 Gs @ 73.80 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Max = 33.65 Gs @ 83.04 msec
 Min = -14.09 Gs @ 99.24 msec

Pos. 1 Head Z

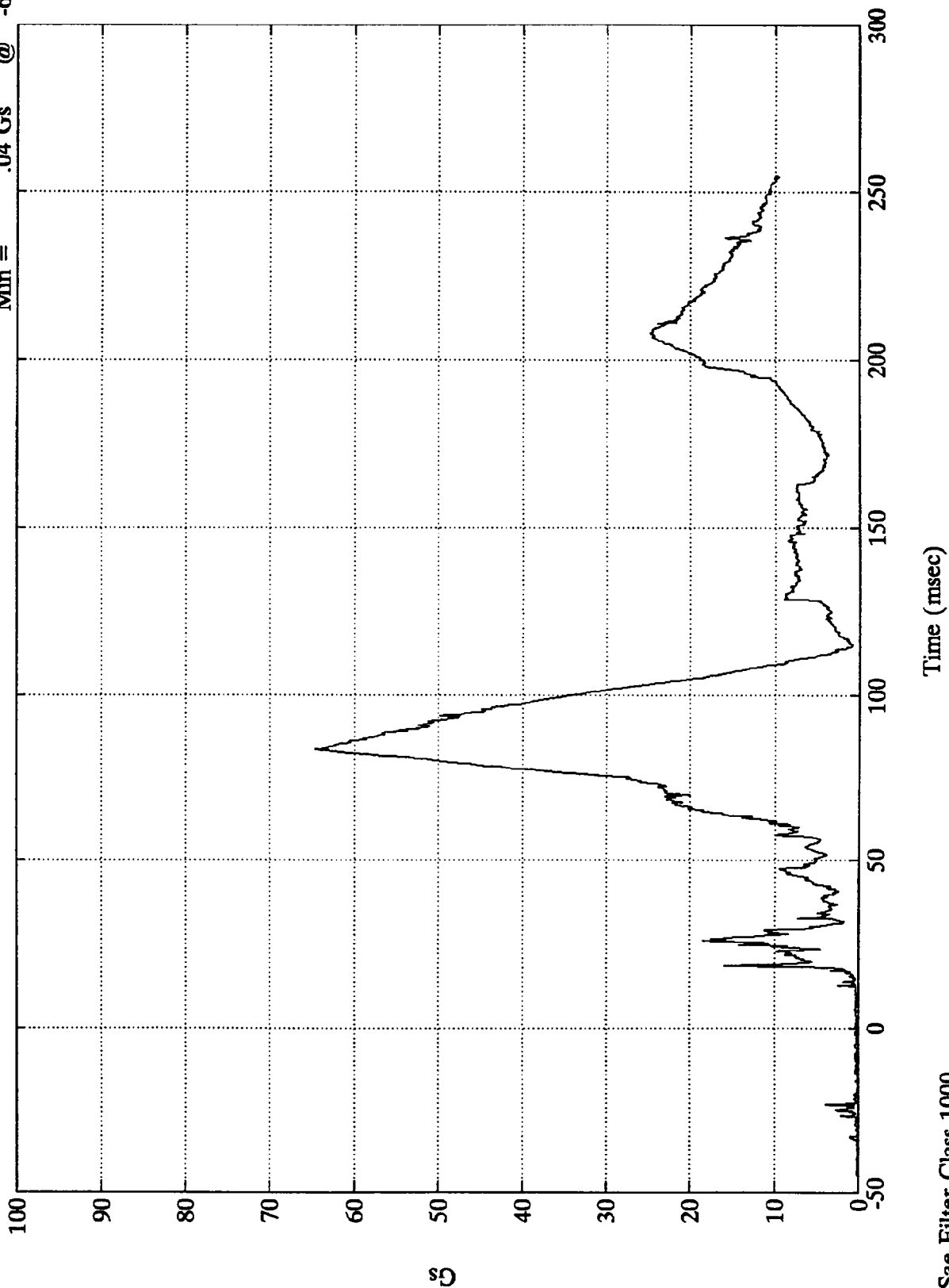


Sae Filter Class 1000

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Pos. 1 Head Resultant

Max = 64.72 Gs @ 83.40 msec
Min = .04 Gs @ -6.72 msec

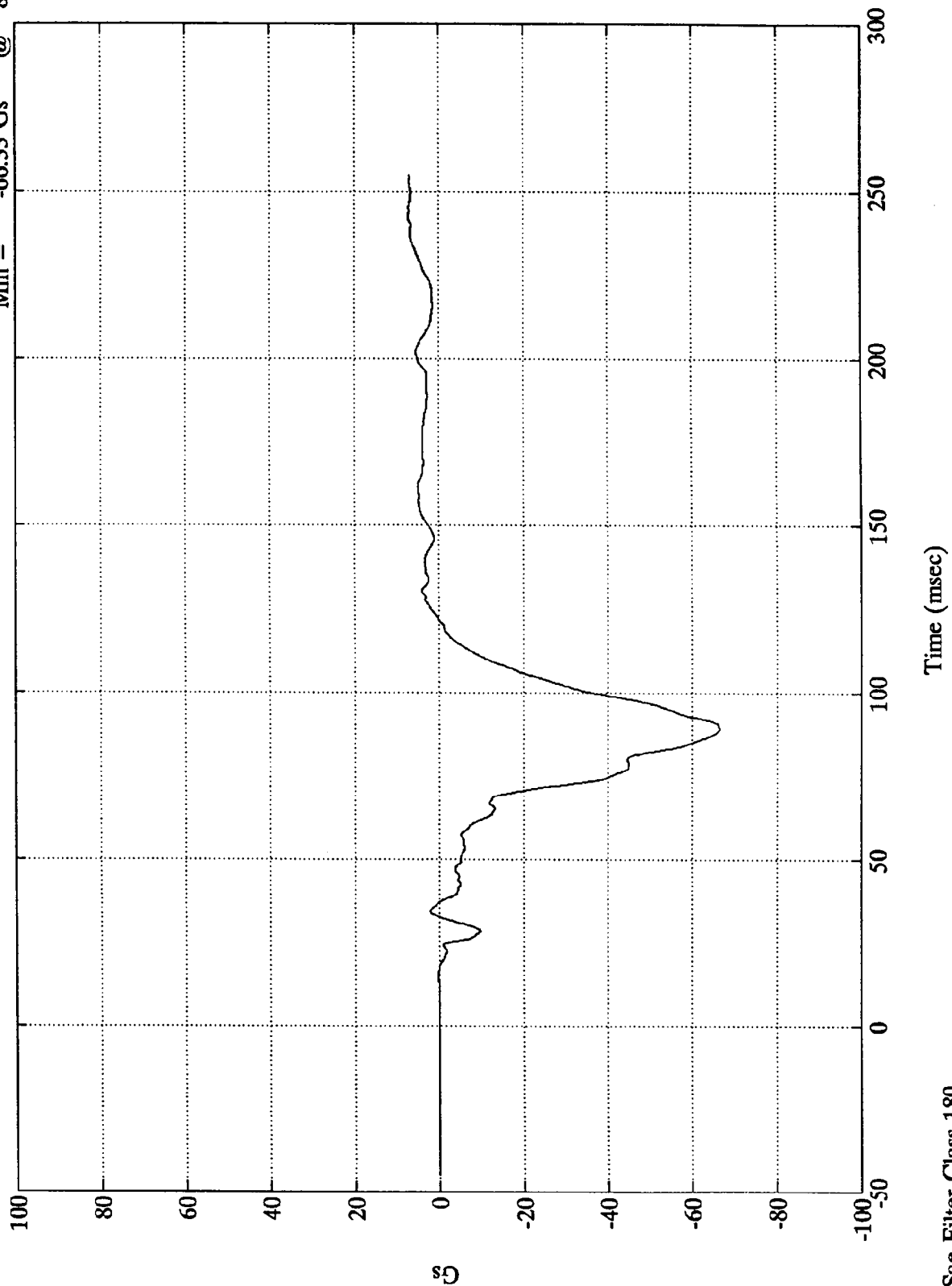


Sae Filter Class 1000

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Max = 7.25 Gs @ 242.16 msec
Min = -66.33 Gs @ 89.04 msec

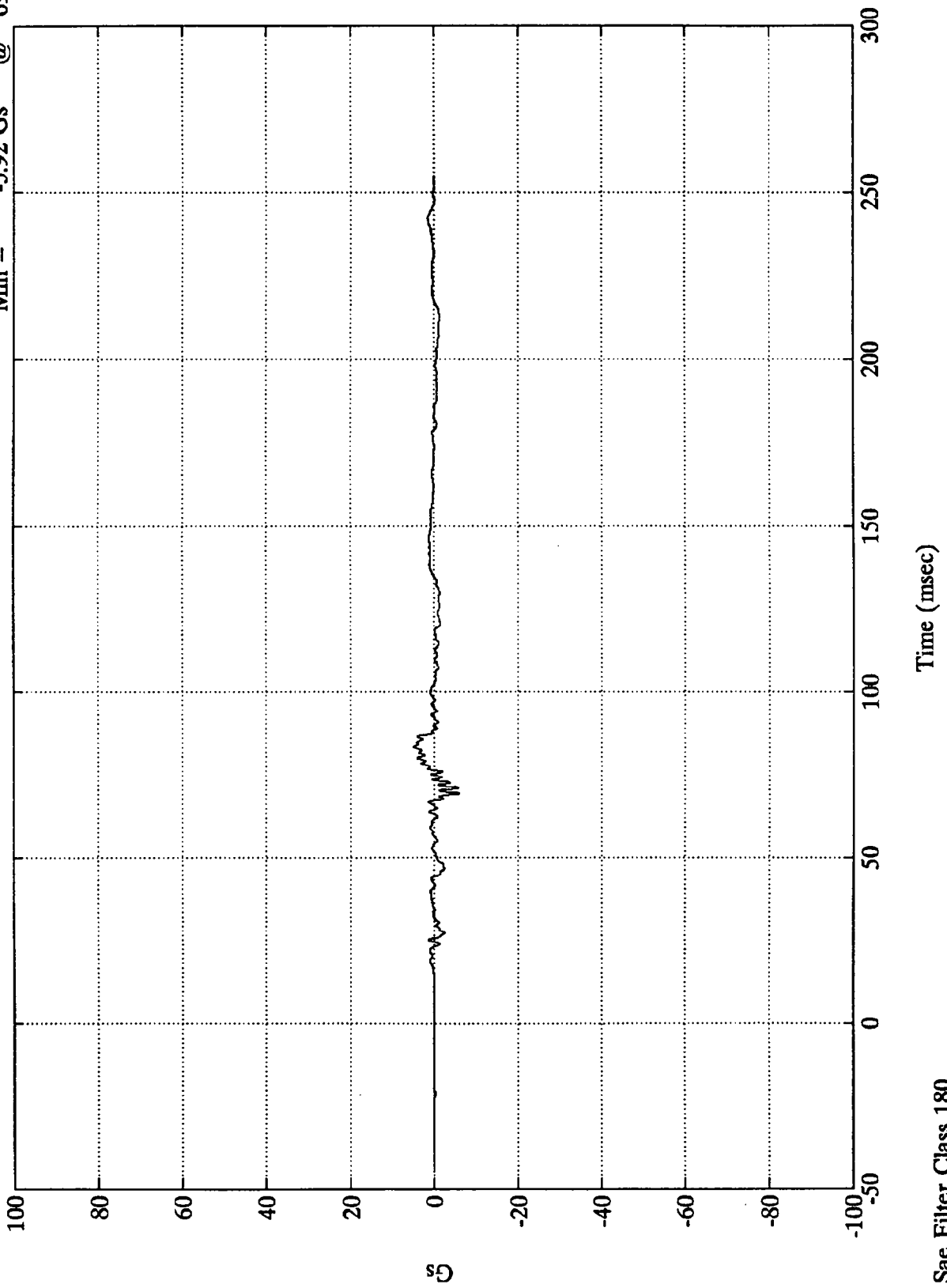
Pos. 1 Chest X



Sae Filter Class 180

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

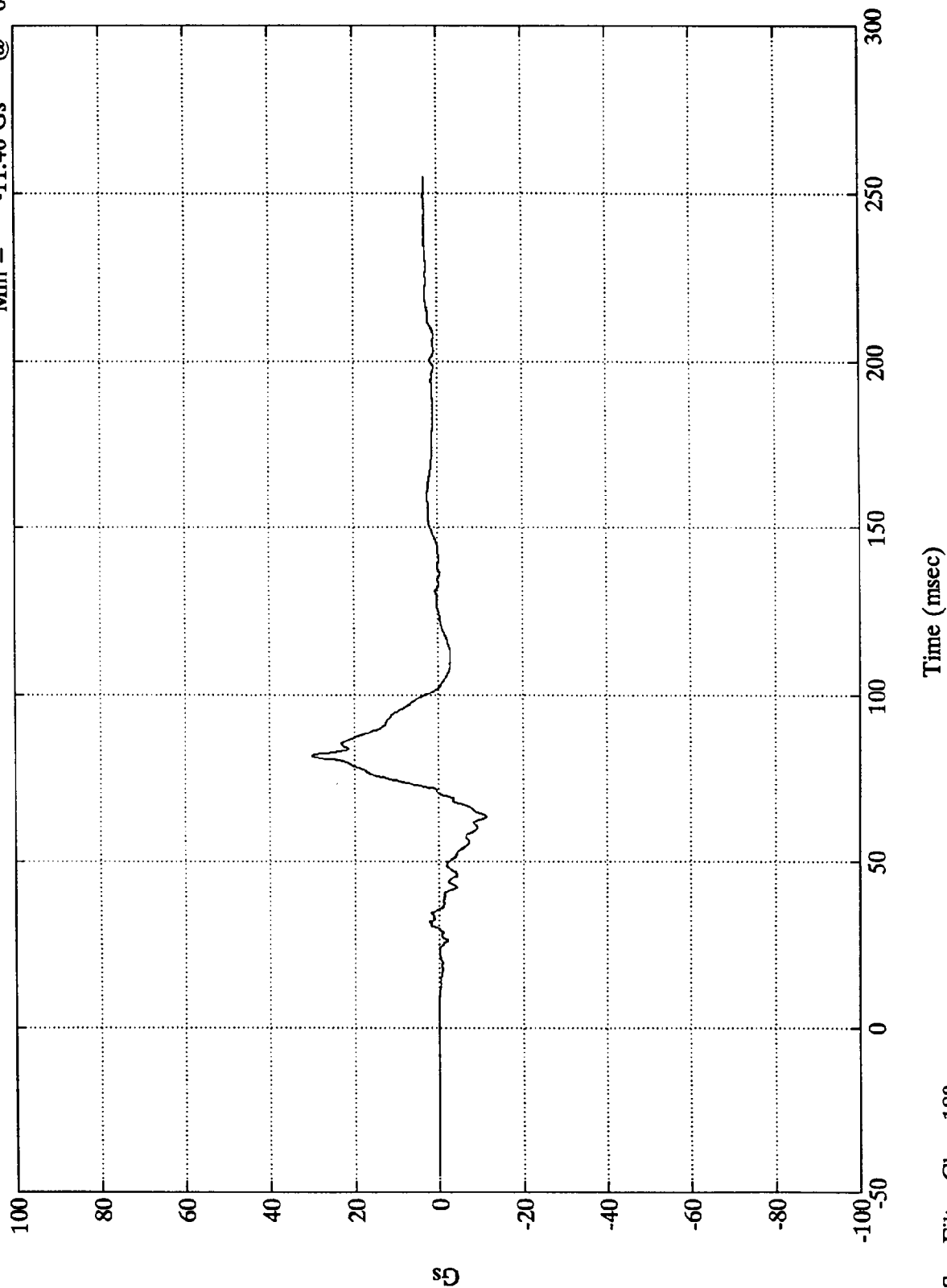
Pos. 1 Chest Y
Max = 4.97 Gs @ 83.28 msec
Min = -5.92 Gs @ 69.24 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

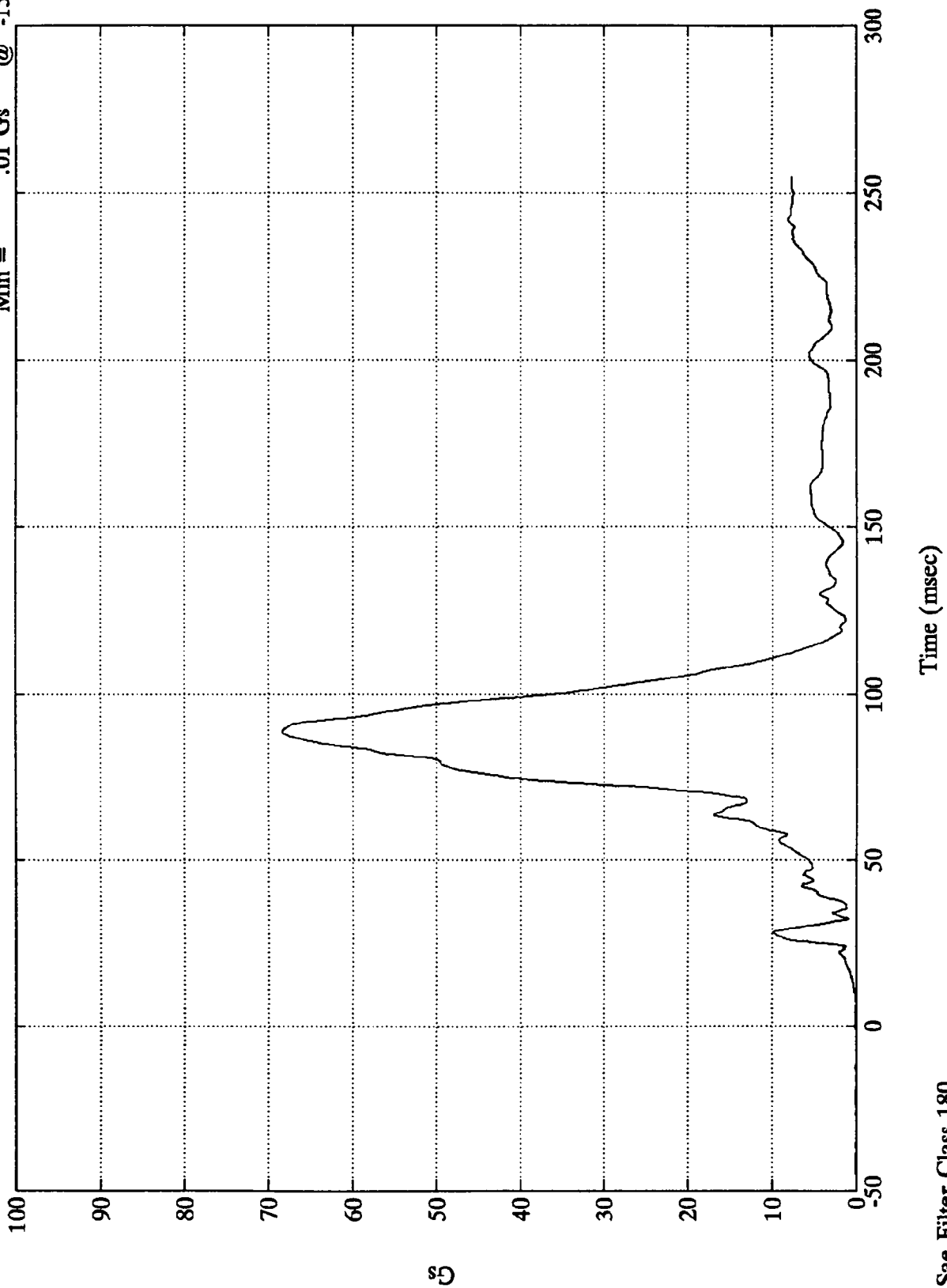
Max = 30.00 Gs @ 81.60 msec
Min = -11.40 Gs @ 63.48 msec

Pos. 1 Chest Z



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

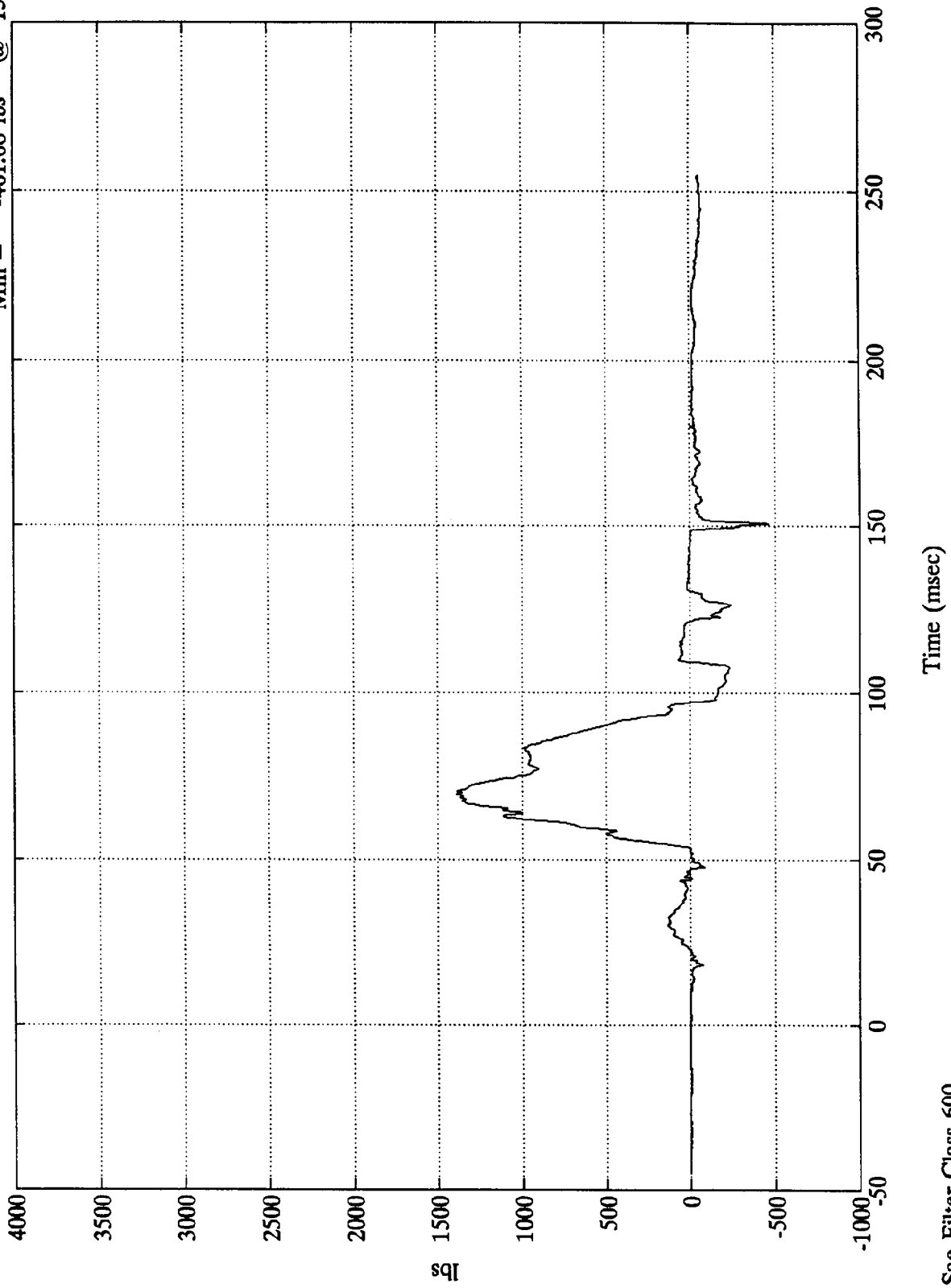
Pos. 1 Chest Resultant
 Max = 68.38 Gs @ 88.31 msec
 Min = .01 Gs @ -15.84 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Pos. 1 Left Femur

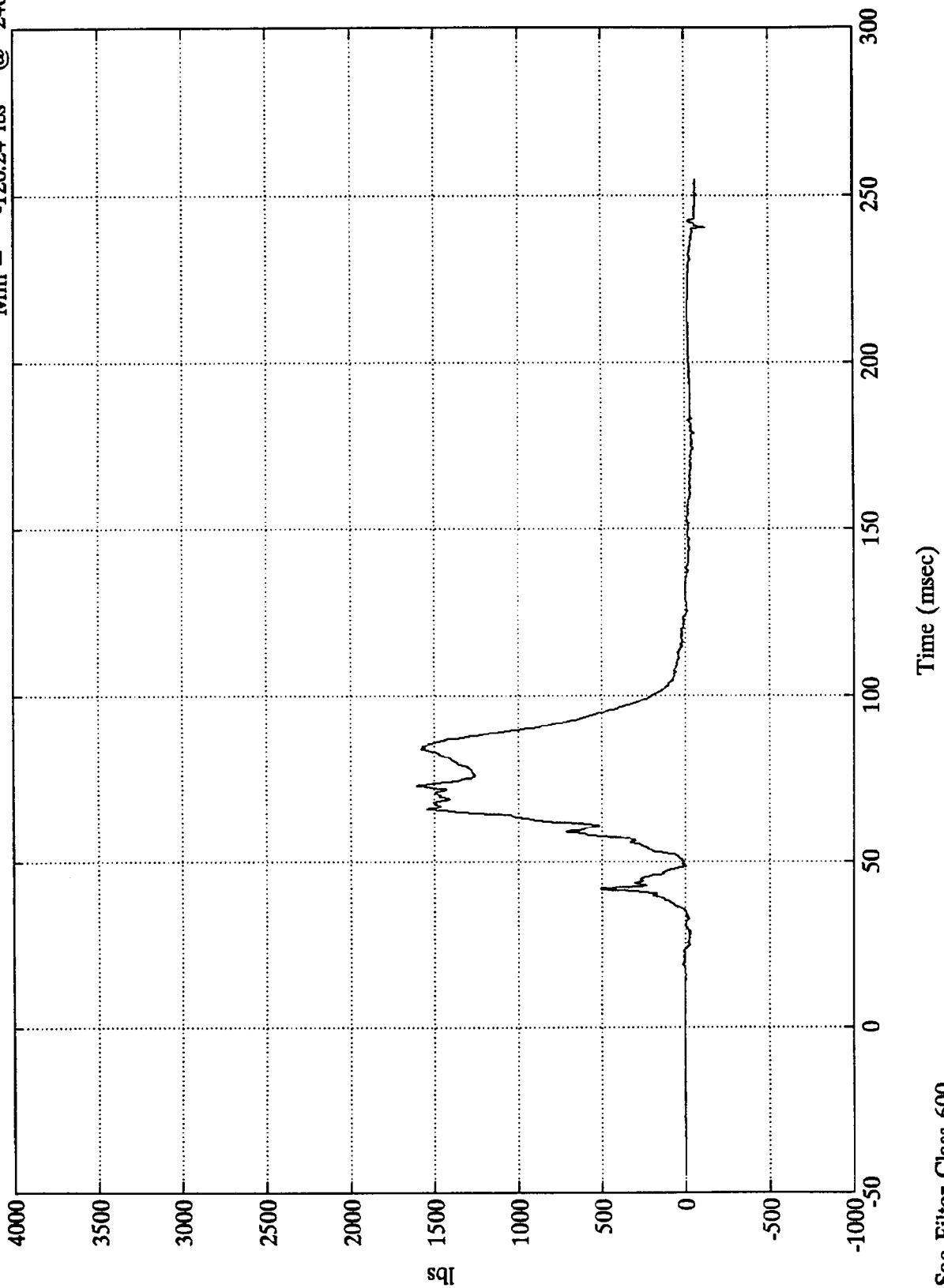
Max = 1390.20 lbs @ 69.72 msec
Min = -461.08 lbs @ 150.72 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

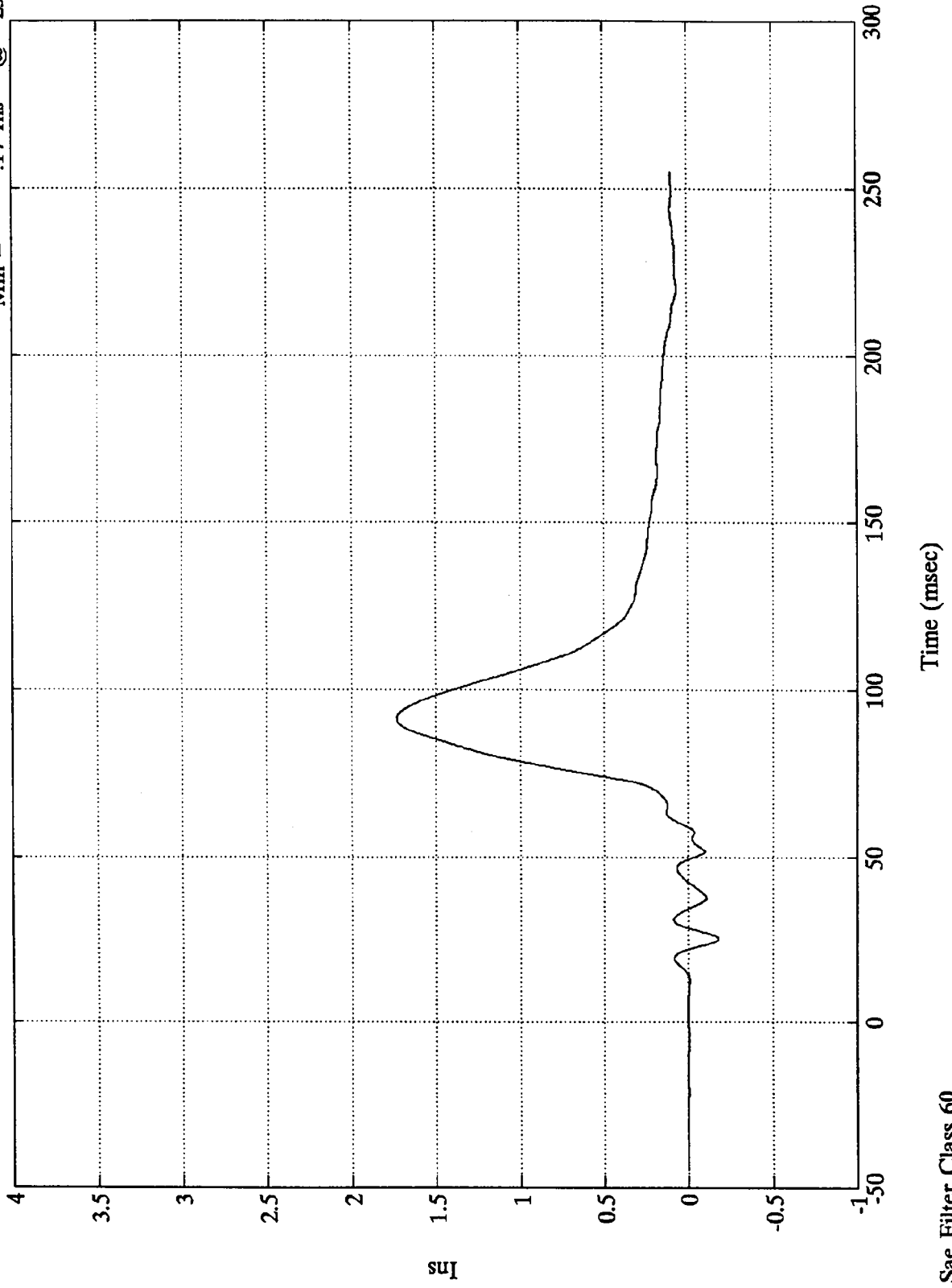
Pos. 1 Right Femur

Max = 1605.14 lbs @ 73.08 msec
Min = -126.24 lbs @ 240.24 msec



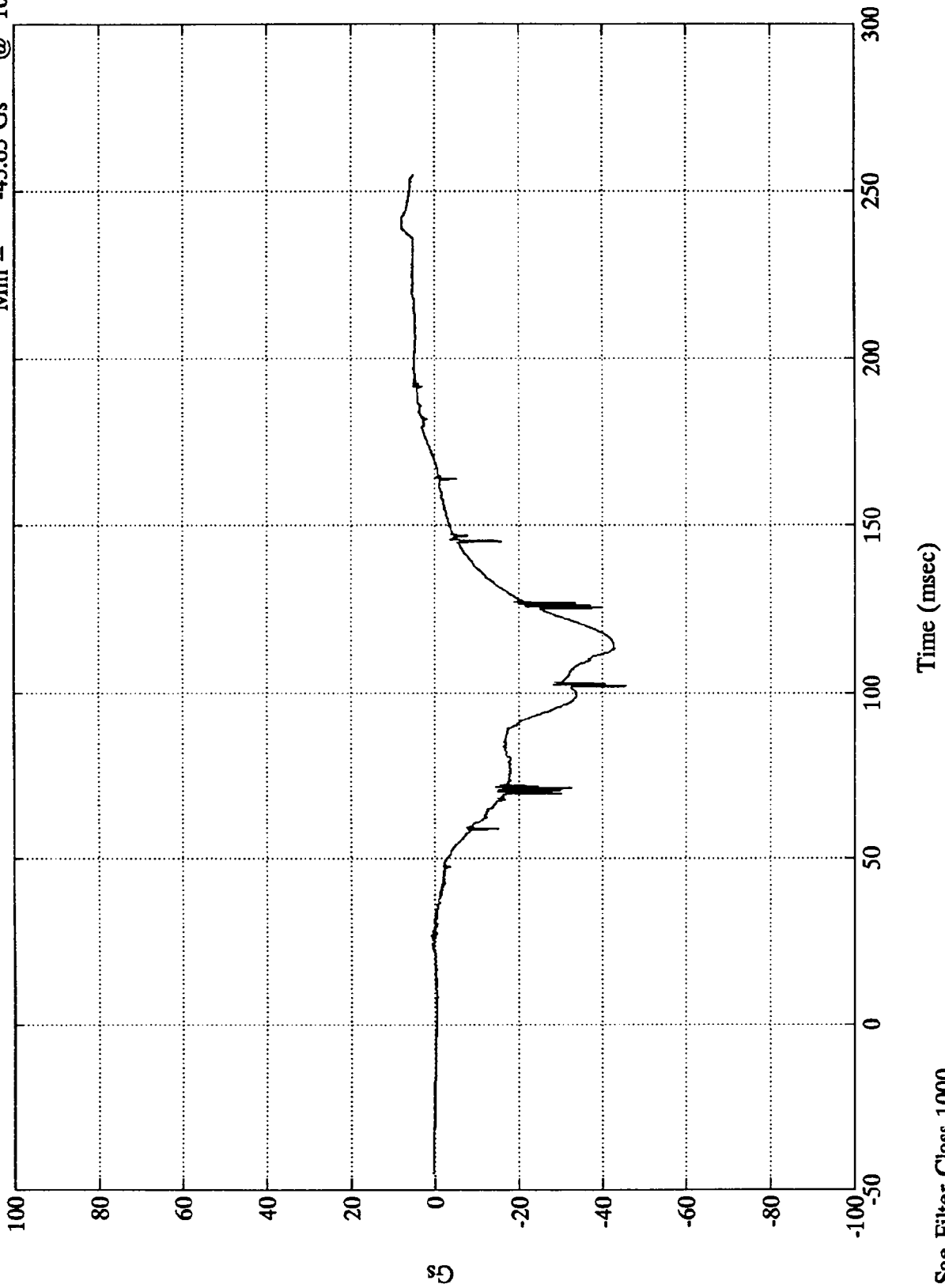
NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Pos #1 Chest Disp. Max = 1.73 Ins @ 91.08 msec
Min = -.17 Ins @ 25.31 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

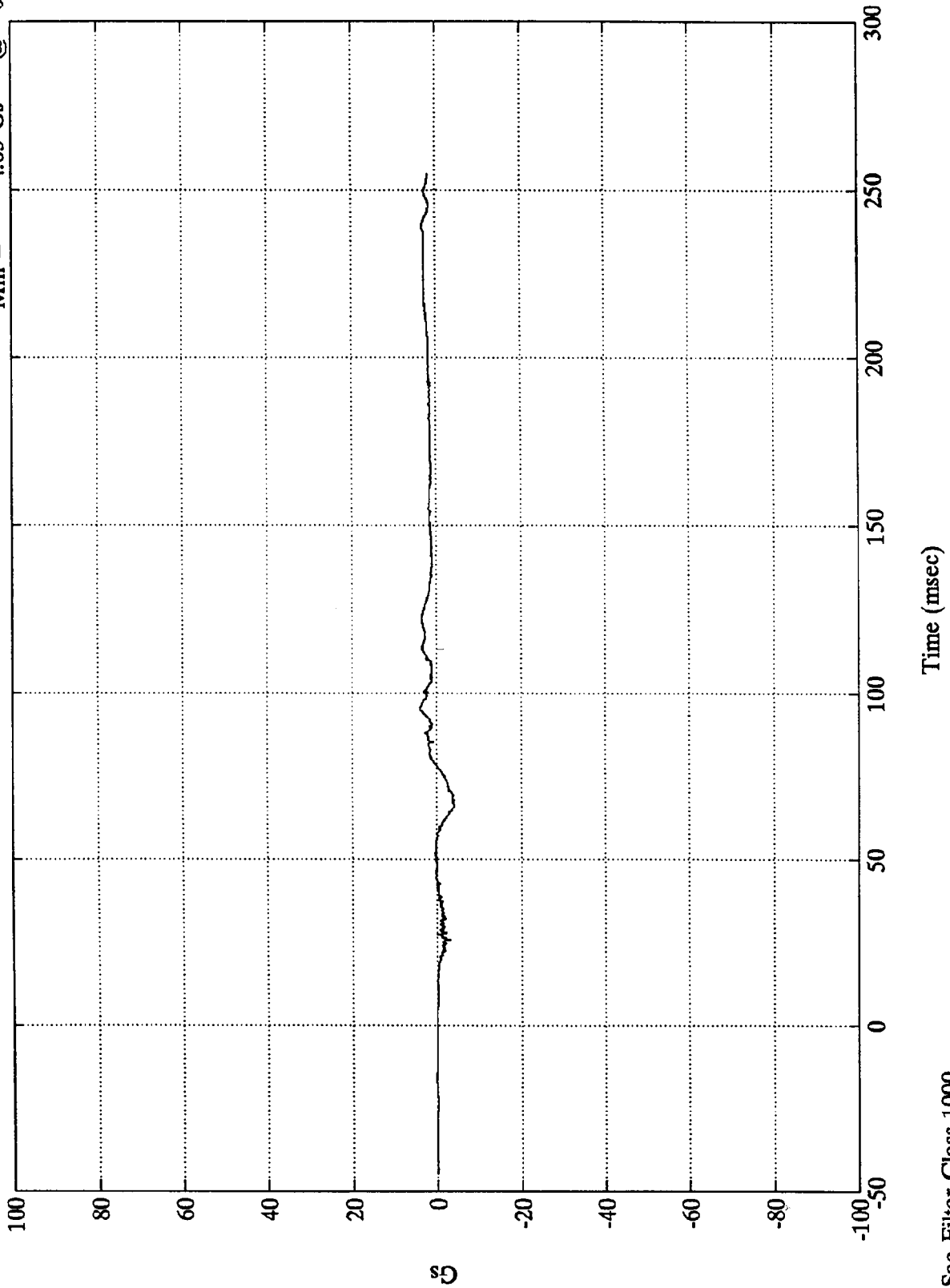
Pos. 2 Head X
Max = 7.90 Gs @ 241.80 msec
Min = -45.65 Gs @ 102.12 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Pos. 2 Head Y

Max = 3.97 Gs @ 95.52 msec
 Min = -4.05 Gs @ 67.19 msec

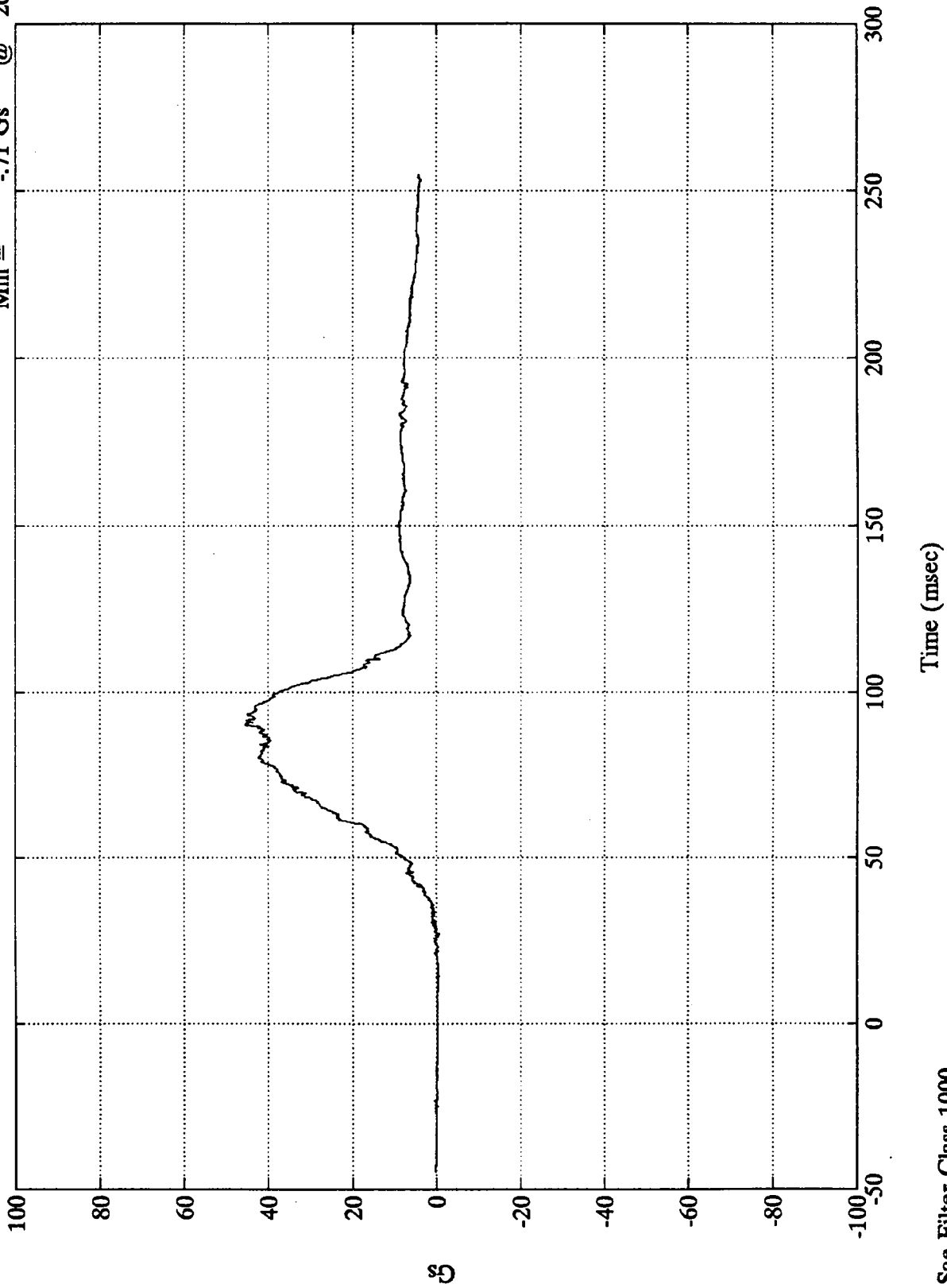


Sae Filter Class 1000

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

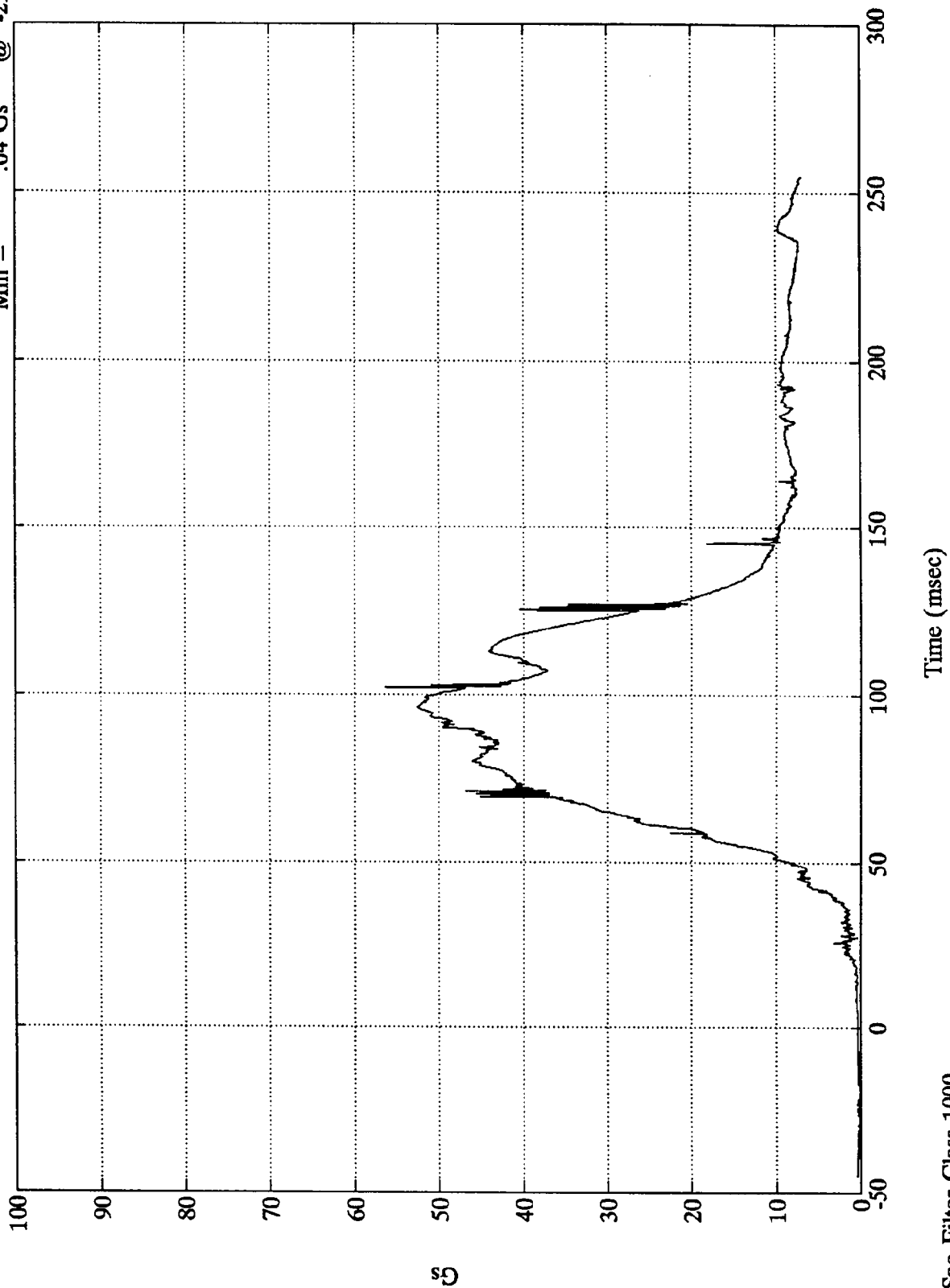
Max = 45.54 Gs @ 90.12 msec
Min = -7.1 Gs @ 26.87 msec

Pos. 2 Head Z



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

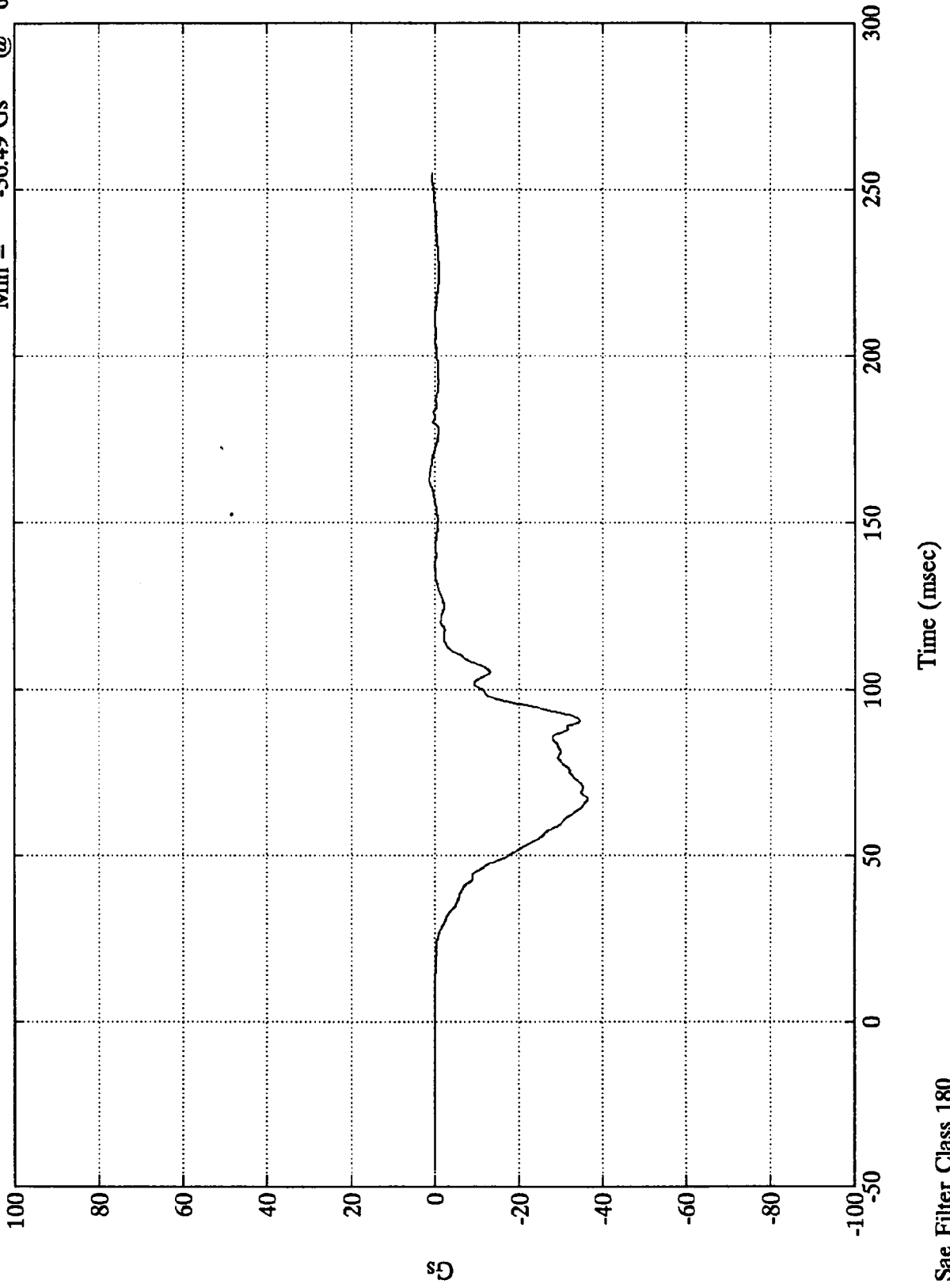
Pos. 2 Head Resultant
Max = 56.39 Gs @ 102.12 msec
Min = .04 Gs @ -21.24 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Pos. 2 Chest X

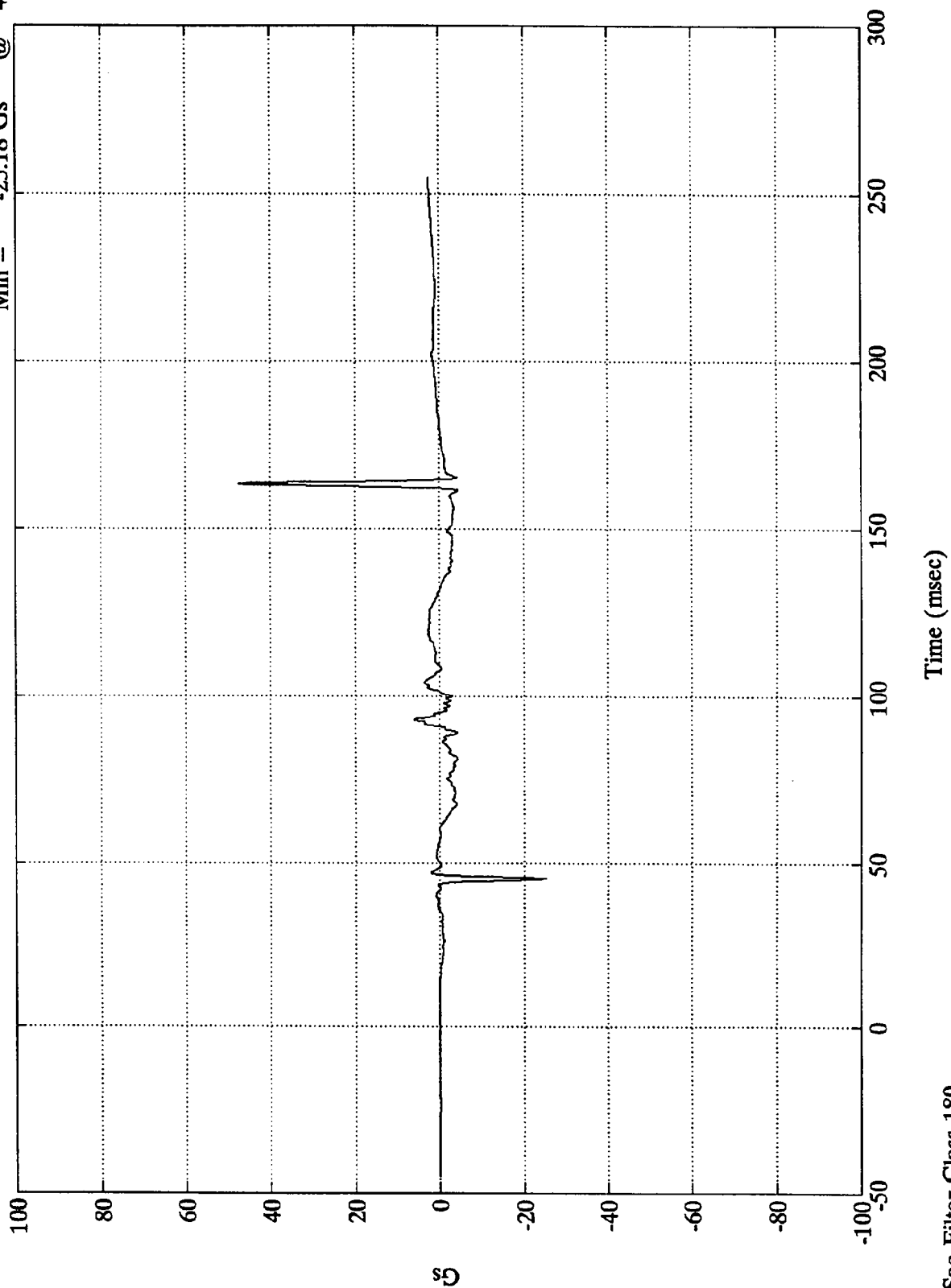
Max = 1.29 Gs @ 162.84 msec
Min = -36.49 Gs @ 67.19 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

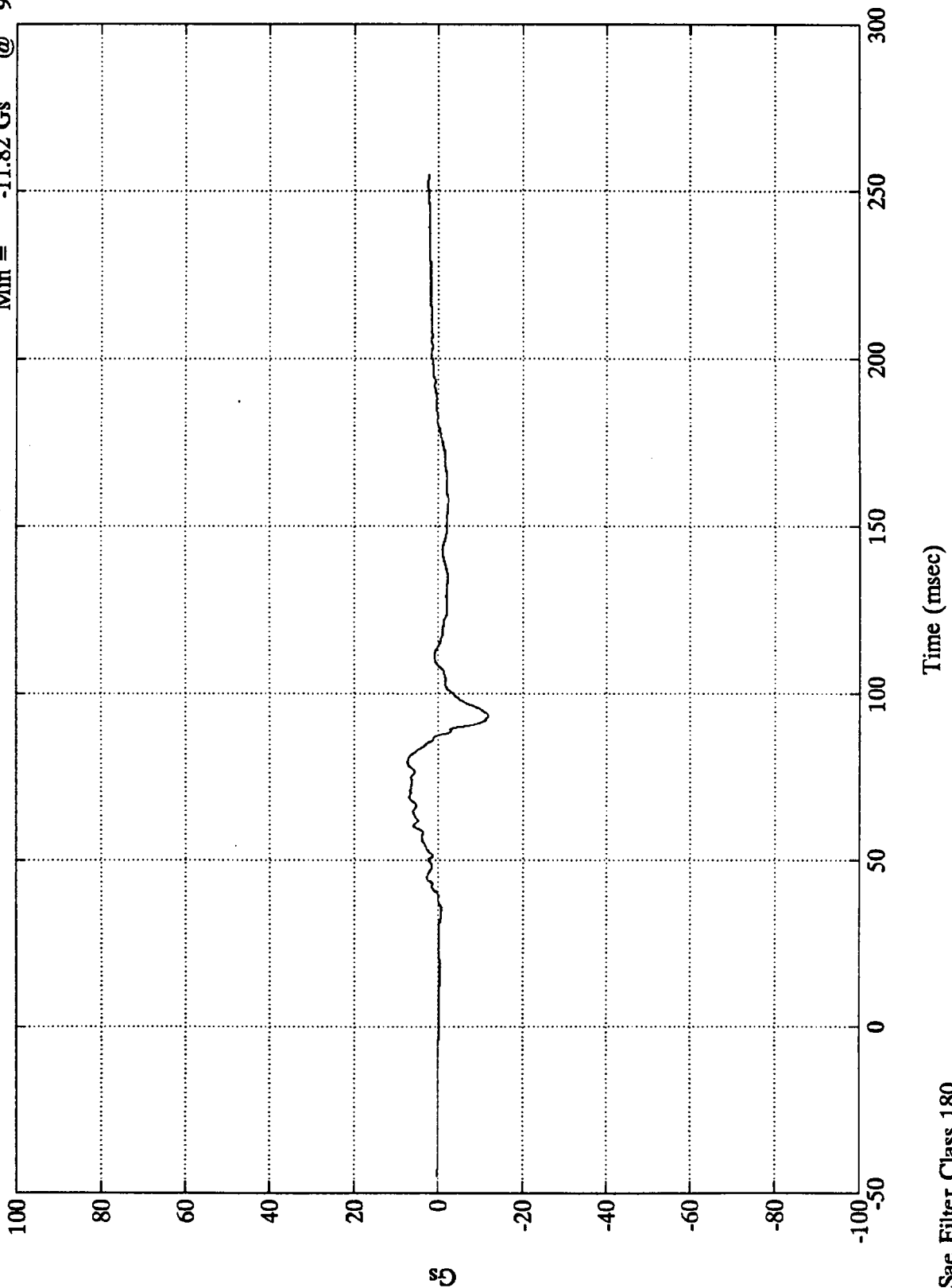
Max = 47.42 Gs @ 163.32 msec
Min = -25.18 Gs @ 45.48 msec

Pos. 2 Chest Y



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

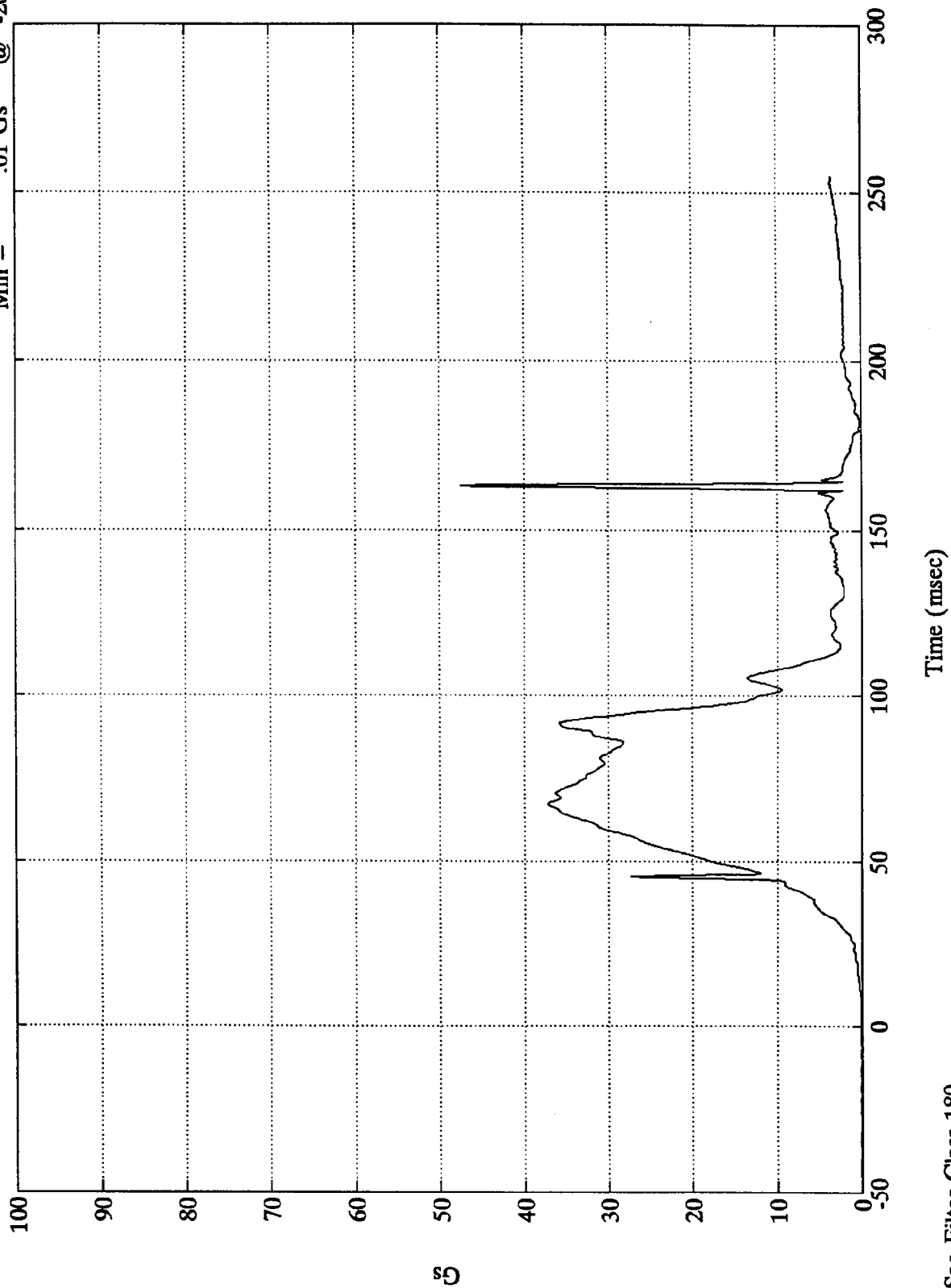
Pos. 2 Chest Z
 Max = 7.31 Gs @ 79.44 msec
 Min = -11.82 Gs @ 93.00 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Max = 47.48 Gs @ 163.32 msec
Min = .01 Gs @ -20.76 msec

Pos. 2 Chest Resultant

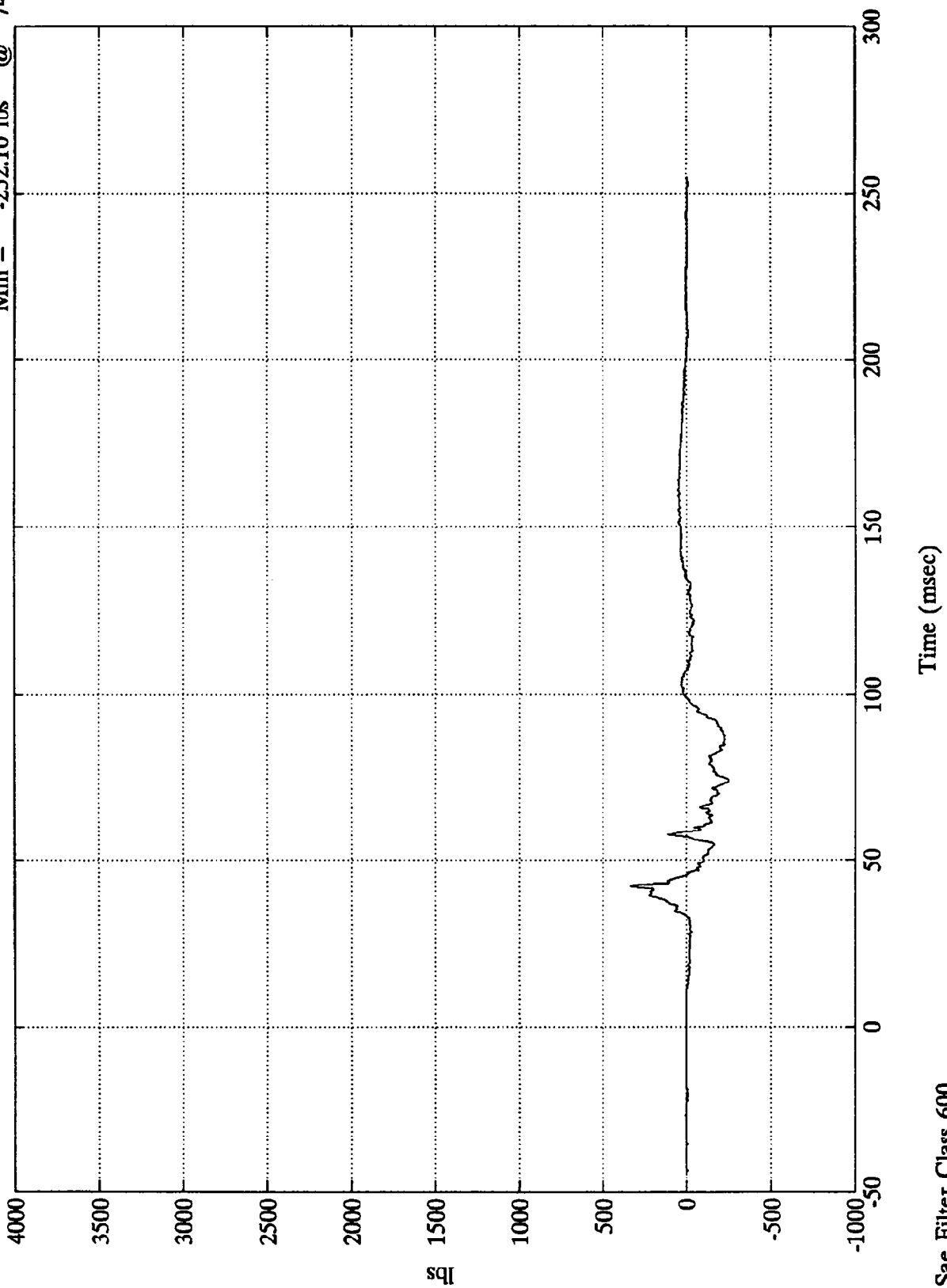


Sae Filter Class 180

NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Max = 331.61 lbs @ 42.24 msec
Min = -252.10 lbs @ 74.27 msec

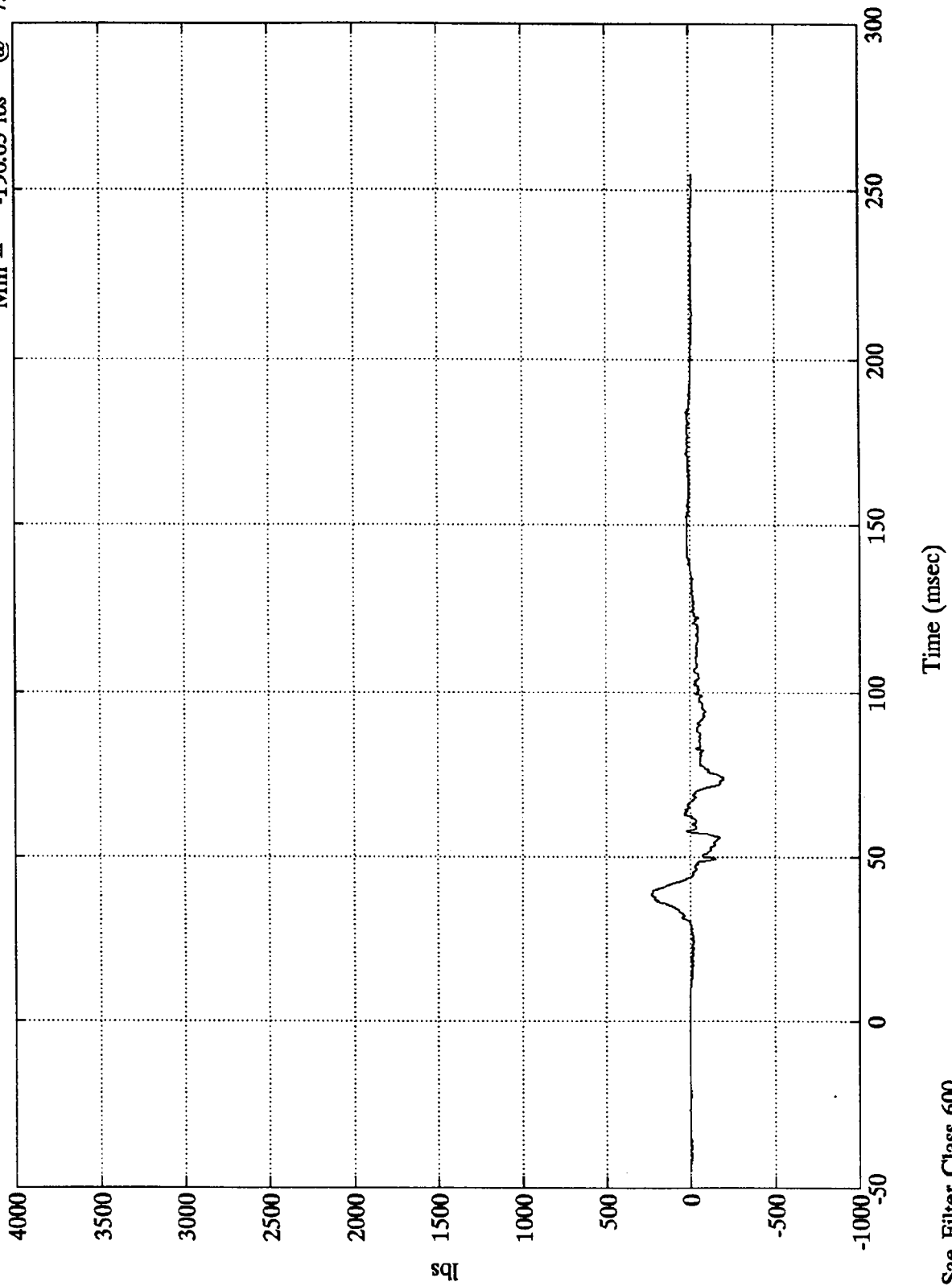
Pos. 2 Left Femur



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Pos. 2 Right Femur

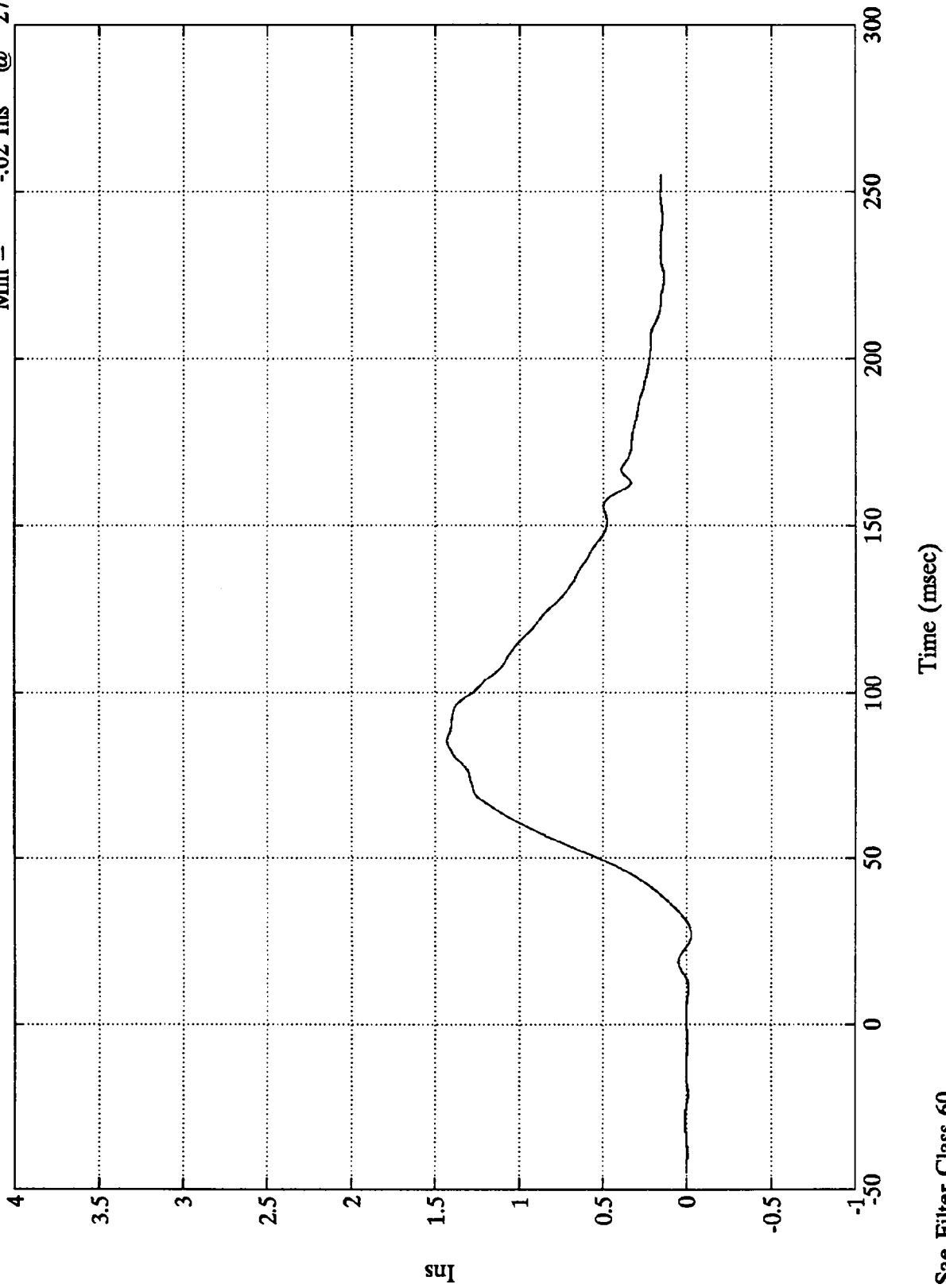
Max = 232.76 lbs @ 38.52 msec
Min = -196.03 lbs @ 73.80 msec



NHTSA "208" TEST 7 - 1992 TOYOTA CAMRY

Pos #2 Chest Disp.

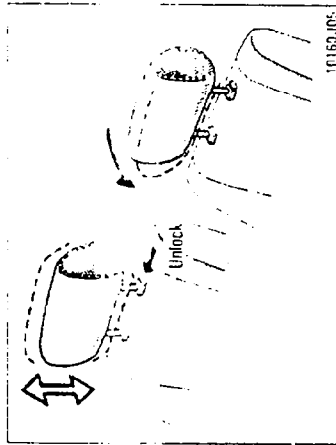
Max = 1.43 Ins @ 85.31 msec
Min = -.02 Ins @ 27.00 msec



Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

Headrests (vertically and rotationally adjustable type)



To raise the headrest, pull it up. To lower it, press the lock release button and push the headrest down. To move the headrest forward, pull on the top.

Pulling the top of the headrest as far as it can go will return it to the upright position.

The headrest is most effective when it is close to your head. Therefore, using a cushion on the seatback is not recommended.

Seat belts—

—Seat belt precautions

Toyota recommends that the driver and passengers in the vehicle be properly restrained at all times with the seat belts provided. Failure to do so could increase the chance of injury and or the severity of injury in accidents.

Baby or small child. Use a child restraint system which fits your vehicle. See "Child restraint" for details.

Child. If a child is too big for a child restraint system, the child should sit in the rear seat and must be restrained with the seat belt. According to accident statistics, the child is safer when properly restrained in the rear seat than in the front seat. Do not allow the child to stand up or kneel on the seat. If the shoulder belt falls across the child's neck or face, move the child to the center position and use the center lap belt.

Pregnant woman. Toyota recommends the use of a seat belt. Ask your doctor for specific recommendations. The lap belt should be worn securely and as low as possible over the hips and not on the waist.

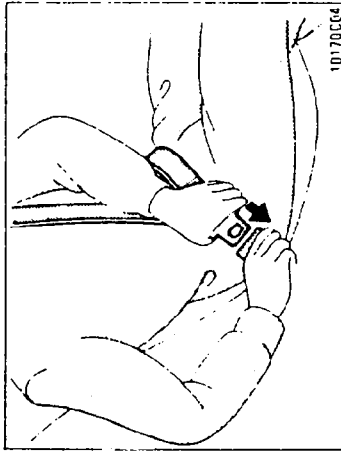
Injured person. Toyota recommends the use of a seat belt. Depending on the injury, however, first check with your doctor.

CAUTION:~~~~~

- Adjust the top of the headrest so that it is closest to the top of your ears.
- After adjusting the headrest, make sure it is locked in position.
- Do not drive with the headrests removed.

~~~~~

## — Front seat belts



**Adjust the seat as needed and sit up straight and well back in the seat. To fasten your belt, pull it out of the retractor and insert the tab into the buckle.**

You will hear a click when the tab locks into the buckle.

The seat belt length automatically adjusts to your size and the seat position.

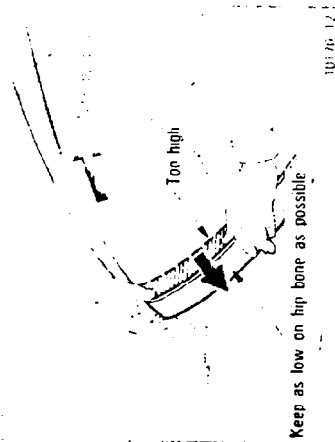
The retractor will lock the belt during a sudden stop or on impact. At other times you can move around freely.

If the seat belt can not be pulled out of the retractor, firmly pull the belt and release it. You will then be able to smoothly pull the belt out of the retractor.

- Inspect the belt system periodically. Check for cuts, frays, and loose parts. Damaged parts should be replaced. Do not disassemble or modify the system.
- Keep the belts clean and dry. If they need cleaning, use a mild soap solution or lukewarm water. Never use bleach, dye, or abrasive cleaners—they may severely weaken the belts.
- Replace the belt assembly if it has been used in a severe impact. The entire assembly should be replaced even if damage is not obvious.

**CAUTION:** Persons should ride in their seats properly wearing their seat belts whenever the vehicle is moving. Otherwise, they are much more likely to suffer serious bodily injury in the event of sudden braking or a collision. When using the seat belts, observe the following:

- Use the belt for only one person at a time. Do not use a single belt for two or more people—even children.
- After inserting the tab, make sure that the connection is secure and the belt is not twisted.
- Avoid reclining the seatbacks too much. The seat belts provide maximum protection when the seatbacks are in the upright position. (See the seat adjustment instructions.)
- Be careful not to damage the belt webbing or hardware, and take care that they do not get caught or pinched in the seat or doors.

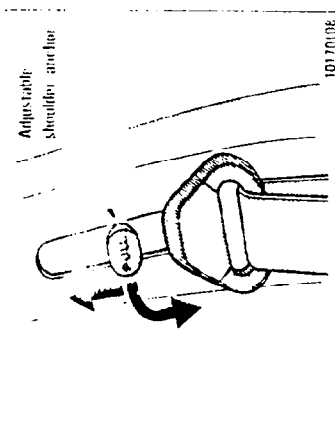


#### Adjust the position of the lap and shoulder belts.

Position the lap belt as low as possible on your hips—not on your waist, then adjust it to a snug fit by pulling the shoulder portion upward through the latch plate.

#### CAUTION:

- High-positioned lap belts and loose-fitting shoulder belts both could increase the chance of injury due to sliding under the lap belt during an accident.
- For your safety, do not place the shoulder belt under your arm.

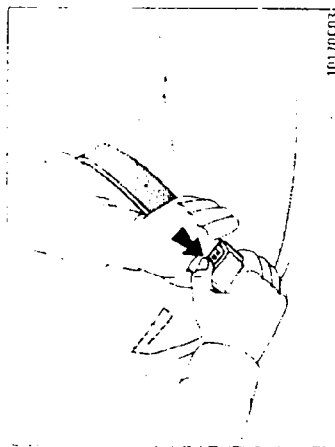


#### Adjust the shoulder anchor position to your size.

To raise the anchor position, push the anchor up. To lower the anchor position, pull the knob and slide the anchor down. After adjustment, make sure the anchor is locked in position.

#### CAUTION:

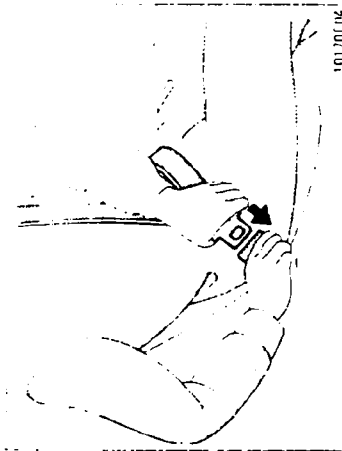
Always be sure that the belt is positioned across your shoulder, as close to your neck as possible; not on your upper arm or neck. Failure to do so could reduce the amount of protection in an accident and increase the chance of injury.



#### To release the belt, press the buckle-release button and allow the belt to retract.

If the belt does not retract smoothly, pull it out and check for kinks or twists. Then make sure that it remains untwisted as it retracts.

## – Rear outside seat belts



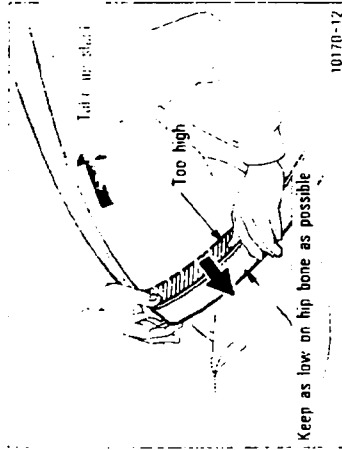
**Sit up straight and well back in the seat. To fasten your belt, pull it out of the retractor and insert the tab into the buckle.**

You will hear a click when the tab locks into the buckle.

The seat belt length automatically adjusts to your size.

The retractor will lock the belt during a sudden stop or on impact. At other times you can move around freely.

If the seat belt can not be pulled out of the retractor, firmly pull the belt and release it. You will then be able to smoothly pull the belt out of the retractor.



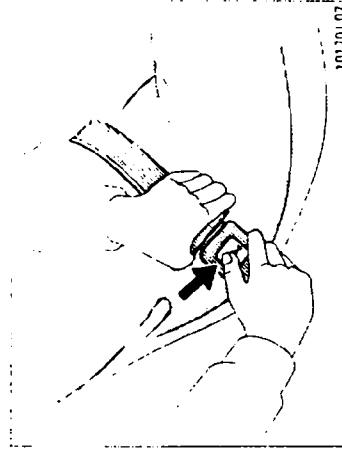
**Adjust the position of the lap and shoulder belts.**

Position the lap belt as low as possible on your hips – not on your waist, then adjust it to a snug fit by pulling the shoulder portion upward through the latch plate.

**CAUTION:**

- High-positioned lap belts and loose-fitting shoulder belts both could increase the chance of injury due to sliding under the lap belt during an accident.

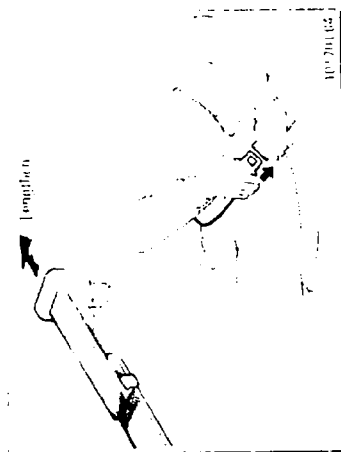
- For your safety, do not place the shoulder belt under your arm.



**To release the belt, press the buckle-release button and allow the belt to retract.**

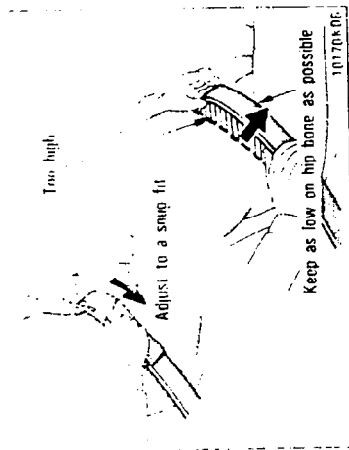
If the belt does not smoothly retract, pull it out and check for kinks or twists. Then make sure that it remains untwisted as it retracts.

—Rear center seat belt\*



Sit up straight and well back in the seat. To fasten your belt, insert the tab into the buckle.

You will hear a click when the tab locks into the buckle. If the belt is not long enough for you, hold the tab at a right angle to the belt and pull on the tab.

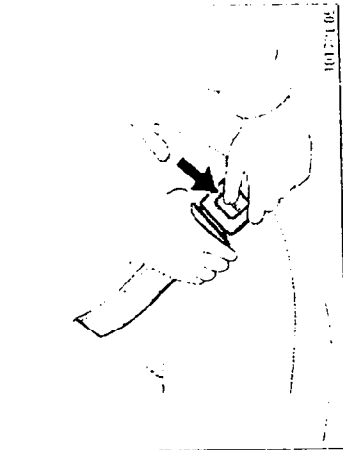


Remove excess length of the belt and adjust the belt position.

To shorten the belt, pull the free end of the belt.

Position the lap belt as low as possible on your hips—not on your waist, then adjust it to a snug fit.

**CAUTION:** High-positioned lap belt could increase the chance of injury due to sliding under the lap belt during an accident.



To release the belt, press the buckle-release button.

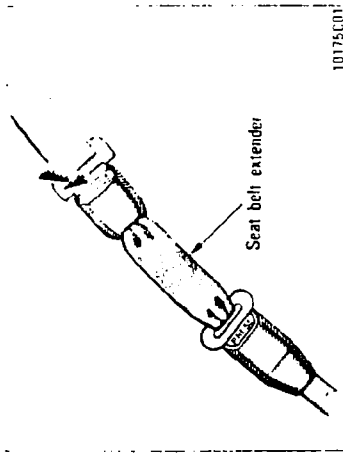
## —Seat belt extender

If your seat belt cannot be fastened securely because it is too loose, consult a parts dealer. A seat belt extender is available from your Toyota dealer free of charge.

Please contact your local Toyota dealer so that the dealer can order the proper required length for the extender. Bring the heaviest coat you expect to wear for proper measurement and selection of length. Additional ordering information is available at your Toyota dealer.

**CAUTION:** When using the seat belt extender, observe the following. Failure to follow these instructions could result in less effectiveness of the seat belt restraint system in case of vehicle accident, increasing the chance of personal injury.

- Never use the seat belt extender if you can fasten the seat belt without it.
- Remember that the extender provided for you may not be safe when used on a different vehicle, or for another person and at different seating position than specified.



To connect the extender to the seat belt, insert the tab into the seat belt buckle so that the buckle-release buttons of the extender and the seat belt are located on the same side as shown.

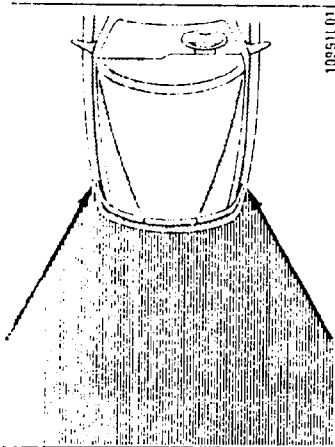
You will hear a click when the tab locks into the buckle.

When releasing the seat belt, press on the buckle-release button on the extender, not on the seat belt. This helps prevent damage to the vehicle interior and extender itself.

When not in use, remove the extender and store in the vehicle for future use.

**CAUTION:** After inserting the tab, make sure that the connection is secure and the seat belt extender is not twisted.

SRS airbag



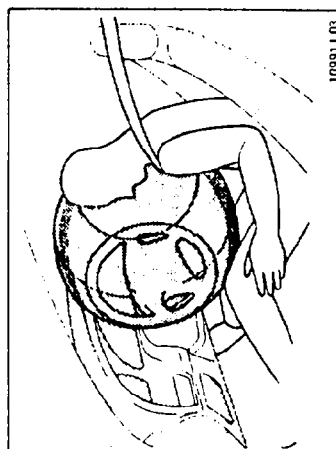
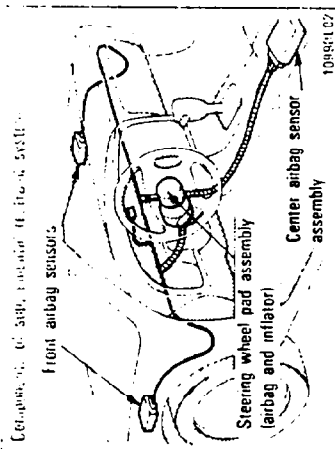
The SRS (Supplemental Restraint System) airbag is designed to be activated in response to a severe frontal impact within the shaded area as shown in the illustration, and to provide the driver with further protection in addition to the protection provided by the driver's seat belt.

The SRS airbag system is not designed to protect the driver from an impact from the side or rear, or if the vehicle overturns.

For instructions and precautions concerning the seat belt system, see "Seat belt".

**CAUTION**

The SRS airbag system is designed only as a supplement to the driver's seat belt system. To obtain maximum protection in an accident, the driver and all passengers in the vehicle should always wear his/her seat belts when driving.



The center airbag sensor assembly consists of a safing sensor and center airbag sensor. In the event of a severe frontal impact, a front airbag sensor and safing sensor, or center airbag sensor and safing sensor detect the shock, the center airbag sensor assembly triggers the inflator, and the inflator fills the bag to restrain the driver's forward motion.

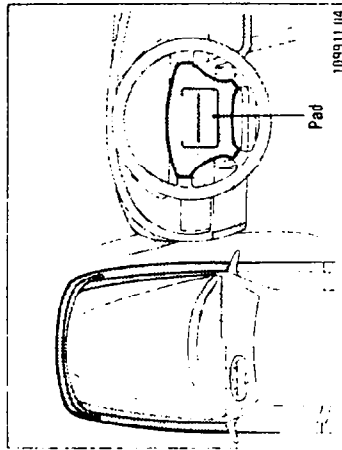
When the SRS airbag inflates, an operating noise will be heard and a small amount of smoke-like gas will be released. This gas is harmless and does not indicate that a fire is occurring.

**CAUTION:** Do not modify or remove any component or wiring, such as the steering wheel, column cover, center airbag sensor assembly or front airbag sensors. Doing any of these may cause sudden SRS airbag inflation or disable the system, which could result in personal injury.

**NOTICE:**

Do not perform any of the following changes without prior approval from Toyota dealers. Repairs or service of this kind can interfere with proper operation of the SRS airbag system in some cases.

24



- The front part of the vehicle (shown in the illustration) was involved in an accident which was not of the extent to cause the SRS airbag to inflate.

- The pad section of the steering wheel is scratched, cracked, or otherwise damaged.

**NOTICE:**

Do not disconnect the battery cables before contacting your Toyota dealer.

- Installation of electronic items such as a mobile two-way radio, cassette tape player or Compact Disc player.

- Repairs made on or near the front fenders, front and rear console, steering column or steering wheel.

In the following cases, contact your Toyota dealer as soon as possible:

- The SRS airbag system malfunctions. This SRS airbag system has a warning light to indicate operating problems. See "Warning lights and buzzers" in Chapter 1-5.

- The SRS airbag has been inflated.