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

FORD MOTOR COMPANY  
1990 FORD TAURUS L  
4-DOOR SEDAN

NHTSA NUMBER: CLO203

CALSPAN TEST NUMBER: 7804-4

January 25, 1990

CALSPAN CORPORATION  
ADVANCED TECHNOLOGY CENTER  
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FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation  
National Highway Traffic Safety Administration  
Office of Vehicle Safety Compliance  
400 Seventh Street, S.W.  
Room No. 6115 (NEF-31)  
Washington, DC 20590

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16. Abstract A 30 mph vehicle safety compliance test was conducted on a 1990 Ford Taurus 1 4-Door Sedan.  This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on January 25, 1990. 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 29.5 mph. The ambient temperature at the impact face was 44°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 front passenger 3-point continuous loop manual seat belt. Driver side 3-point manual seat belt 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 400 Seventh St., S.W., Washington, DC 20590		
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## Section I

### PURPOSE AND TEST PROCEDURE

This 30 mph frontal barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208, 212, 219 (partial) and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by Calspan Advanced Technology Center under Contract No. DTNH22-88-C-01038. The purpose of this test was to determine if the subject vehicle, a 1990 Ford Taurus L 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-208-07.

## Section 2

### SUMMARY OF TEST NUMBER CLO203

A frontal barrier was impacted by a 1990 Ford Taurus L 4-Door Sedan at a velocity of 29.5 mph. The test was performed at the Calspan Corporation Advanced Technology Center on January 25, 1990. 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. The NHTSA number shown on the vehicle photo placard was inadvertently recorded as CLO202. The NHTSA number should read CLO203.

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

Both ATDs were fully instrumented with head and chest triaxial accelerometers and left/right femur load cells. These ATDs had been certified prior to the test.

The 23 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 249. The maximum chest deceleration over 3 milliseconds was 53.4 g's. The maximum force on the driver's left femur was 1491 pounds and 1999 pounds on the right femur.

The right front passenger's HIC was 192. The maximum chest deceleration over 3 milliseconds was 36.1 g's and loads were 591 and 323 pounds on the left and right femurs respectively.

Table 1  
CRASH TEST SUMMARY

Vehicle NHTSA No.: CLO203 Test Mode: 30 mph Frontal Barrier

Test Date.: January 24, 1990 Time: 10:50 Temperature: 44°F

Vehicle Make/Model/Body Style: 1990 Ford Taurus L 4-Door Sedan

Vehicle Test Weight: 3700 lbs.

Vehicle/Barrier Impact Angle: 0°

Impact Velocity: 29.5 mph

Maximum Static Crush: 14.4"

Vehicle Rebound: 8.5"

<u>DUMMIES:</u>	<u>DRIVER</u>	<u>PASSENGER</u>
Type:	<u>Part 572</u>	<u>Part 572</u>
Restraint System:	<u>Air Bag</u>	<u>3-Point Continuous Loop Belt System</u>

Number of Data Channels: 23

Number of Cameras: 1 Real Time

14 High Speed

DOOR OPENING DATA: closed operable - Left Front  
closed operable - Right Front

Front Seat(s) Data:	<u>DRIVER</u>	<u>PASSENGER</u>
Seat Track Failure:	<u>0.0</u>	<u>0.0</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>air bag &amp; sun visor</u>	<u>sun visor</u>
Abdomen	<u>air bag</u>	<u>-</u>
Chest	<u>air bag</u>	<u>chin with upper chest</u>
Knees	<u>dash panel</u>	<u>glove box</u>

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1990 Ford Taurus L 4-Door Sedan  
 NHTSA No. CLO203 ; VIN: 1FACP5OU1LG125325 ; Color: Light Blue  
 Engine Data: 6 cylinders; - CID; 3.0 Litres; - cc  
 Placement - Longitudinal or In-Line; X Transverse or Lateral  
 Transmission Data: 4 speeds; - Manual; X Automatic; X Overdrive  
 Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive  
 Major Options: X A/C; X Pwr. Strg.; X Pwr. Brakes; - Pwr. Windows  
- Power Door Locks  
 Date Received: 12-13-89 ; Odometer Reading 18.0 miles  
 Selling Dealer: Culligan Toyota, Inc.  
 & Address 2352 Delaware Ave., Buffalo, NY 14216

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Ford Motor Company  
 Date of Manufacture: 10-89  
 GVWR: 4660 lbs.; GAWR: 2599 lbs. FRONT; 2092 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 35 psi FRONT  
P205/70R14 or 35 psi REAR  
 Recommended Tire Size: P205/65R15 or P215/65R15 95V Load Range: Std.  
 Recommended Cold Tire Pressure: 35 psi FRONT; 35 psi REAR  
 Size of Tires on Test Vehicle: P205/70R14 ; Manufacturer: Goodyear

Vehicle Capacity Data:

Type of Front Seats: - Bench; - Bucket; X Split Bench  
 Number of Occupants: 3 Front; 3 Rear; 6 Total  
 Vehicle Capacity Weight (VCW) = 1100 lbs.  
 No. of Occupants x 150 lbs. = 900 lbs.  
 Rated Cargo/Luggage Weight (RCLW) = 200 lbs. (Difference)

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

Right Front = 1050 lbs. Right Rear = 540 lbs.  
 Left Front = 1000 lbs. Left Rear = 575 lbs.  
 TOTAL FRONT = 2050 lbs. TOTAL REAR = 1115 lbs.  
 % of Total Vehicle Weight = 65% % of Total Weight = 35%  
 TOTAL DELIVERED WEIGHT = 3165 lbs.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 3165 lbs.  
Rated Cargo/Luggage Weight (RCLW) = 200 lbs.  
Weight of 2 P.572 Dummies @ 164 ea. = 328 lbs.  
TARGET TEST WEIGHT = 3693 lbs. (sum)

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

Right Front = 1100 lbs.      Right Rear = 750 lbs.  
Left Front = 1080 lbs.      Left Rear = 770 lbs.  
TOTAL FRONT = 2180 lbs.      TOTAL REAR = 1520 lbs.  
% of Total Weight = 59 %      % of Total Weight = 41 %  
TOTAL TEST WEIGHT = 3700 lbs.  
Weight of Ballast Secured in Vehicle Trunk Area = 78 lbs.  
Vehicle Components Removed for Weight Reduction None

VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED:      RF 28.2"    LF 27.7"    RR 25.6"    LR 25.2"  
FULLY LOADED:      RF 27.2"    LF 27.1"    RR 23.1"    LR 22.7"  
AS TESTED:      RF 27.9"    LF 27.6"    RR 23.8"    LR 23.5"  
Vehicle's Wheel Base: 106.1 in.  
Location of Vehicle's C.G.: 43.6 inches from front wheel center

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 16.0 gallons  
Usable Capacity Figure Furnished by COTR = 16.0 gallons  
Test Volume Range (92 to 94% of Usable Capacity) = 14.7 to 15.0 gallons  
ACTUAL TEST VOLUME = 14.9 gallons (with entire fuel system filled)

Table 3

POST IMPACT DATA

TYPE OF TEST:

Type of Test: 30 mph Frontal Impact Impact Angle: 0°  
 Test Date: January 25, 1990 Time: 10:50 Temperature: 44 °F  
 Vehicle NHTSA No.: CL0203  
 Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.5 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	=	<u>183.6</u> "	C/L =	<u>188.2</u> "	Left =	<u>184.1</u> "
Post-Test	Right	=	<u>170.1</u> "	C/L =	<u>172.7</u> "	Left =	<u>170.0</u> "
Crush	Right	=	<u>13.5</u> "	C/L =	<u>15.5</u> "	Left =	<u>14.1</u> "
AVERAGE		=	<u>14.4</u>	inches			

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

	Right	=	<u>9.4</u> "	C/L =	<u>7.0</u> "	Left =	<u>9.0</u> "
AVERAGE		=	<u>8.5</u>	inches			

DOOR OPENING:

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

SEAT MOVEMENT:

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

Table 3  
POST IMPACT DATA (cont.)

GLAZING DAMAGE: None.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

OTHER NOTABLE IMPACT FEATURES: None.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Section 3

OCCUPANT AND VEHICLE DATA

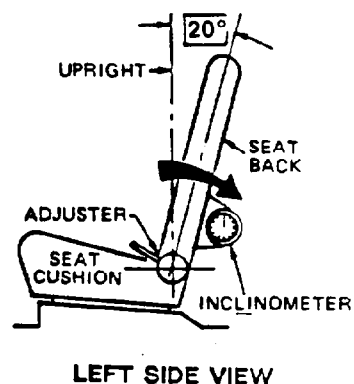
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1990 Vehicle Model: Ford Taurus L 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



Seat back angle for driver's seat 20°

Measurement instructions: Measure 13" up from seat back hinge point. Place inclinometer along frame on rear of seat. Set seat angle to 20° from vertical.

Seat back angle for passenger's seat 20°

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 at midpoint (7th detent of 13 total detents).

Positioning of the passenger's seat (if applicable): Seat placed at midpoint (6th detent of 11 total detents).

3. Fuel Tank Capacity Data

A. "Usable Capacity" of the standard equipment fuel tank is 16.0 gallons

B. "Usable Capacity" of the optional equipment fuel tank is 18.6 gallons

Additional Instructions: Vehicle is equipped with standard fuel tank only.

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION

Test No.: CL0203 Vehicle: 1990 Ford Taurus L 4-Door Sedan

SEAT TYPE:

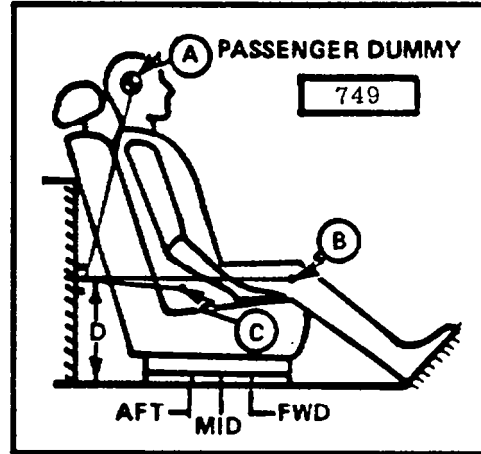
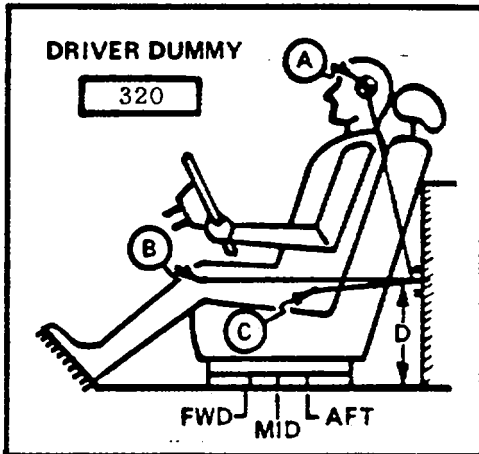
     Bench  
     Bucket  
  X   Split Bench

ADJUSTER TYPE:

  X   Manual  
     Power

SEAT BACK TYPE:

     Fixed  
  X   Adjustable Reclining

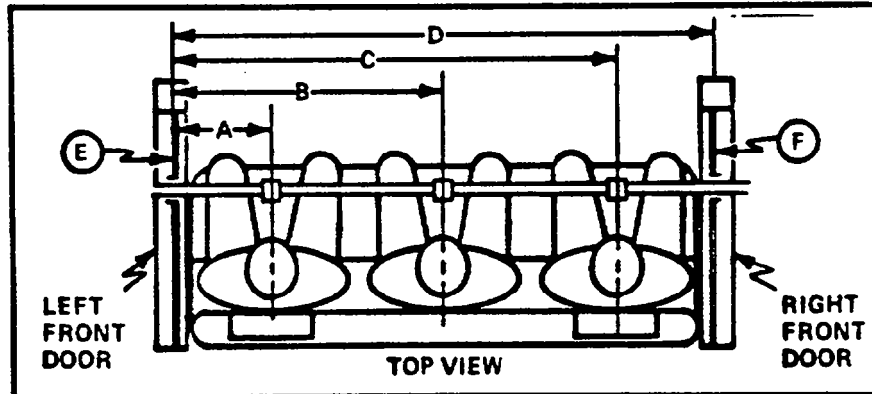


MEASUREMENT LOCATION

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

A = 21.9 in. 7 Degrees  
 B = 22.7 in. 103 Degrees  
 C = 8.0 in. 135 Degrees  
 D = 13.5 in.

A = 21.4 in. 5 Degrees  
 B = 21.8 in. 101 Degrees  
 C = 7.7 in. 136 Degrees  
 D = 13.5 in.



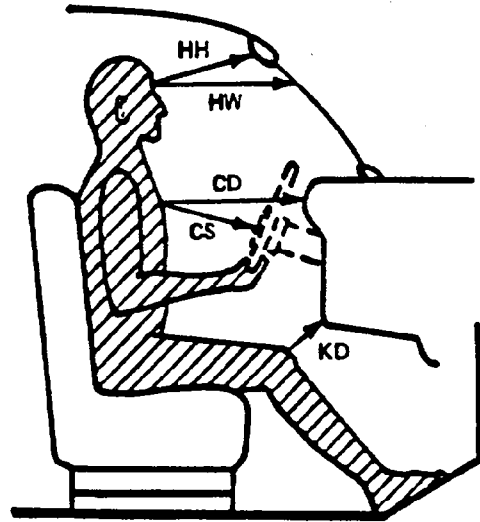
S/N 320 DUMMY ID 749

A = Left Door to Driver Centerline 12.2 in.  
 B = Left Door to Center Passenger Centerline      in.  
 C = Left Door to Right Passenger Centerline 40.5 in.  
 D = Left Door to Right Door 53.1 in.  
 E, F = Window Glass Height (Right and Left Must Be Equal) 12.4 in.

Figure 3

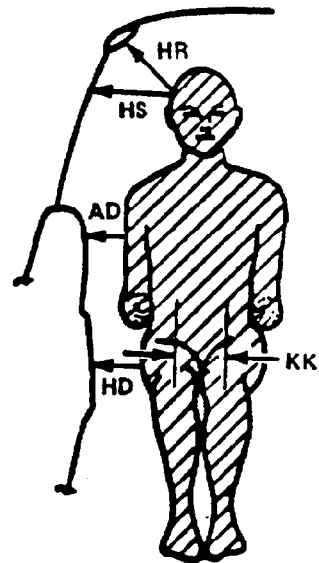
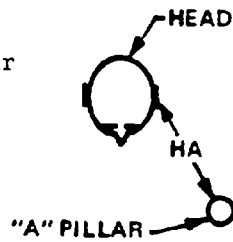
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	12.8	12.6
HW	18.2	18.1
CD	20.8	20.5
CS	12.1	-
KDL	4.2	6.7
KDR	4.3	6.7
SA	See Note	See Note
TA	21°	21°



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

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

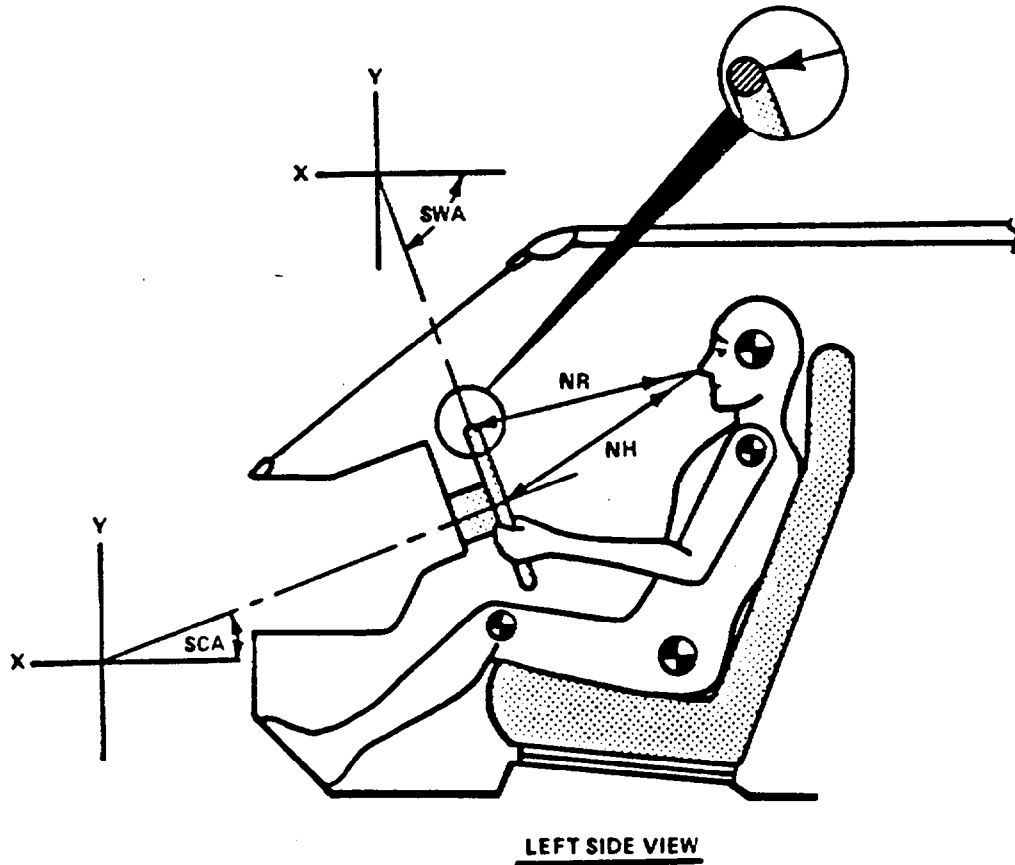


	DRIVER	PASSENGER
HR	5.4	5.4
HS	9.1	9.4
AD	4.4	5.1
HD	7.2	7.4
KK	8.3	9.1
HA	15.7	15.8

Note: Seat back angle was positioned as specified by manufacturer.

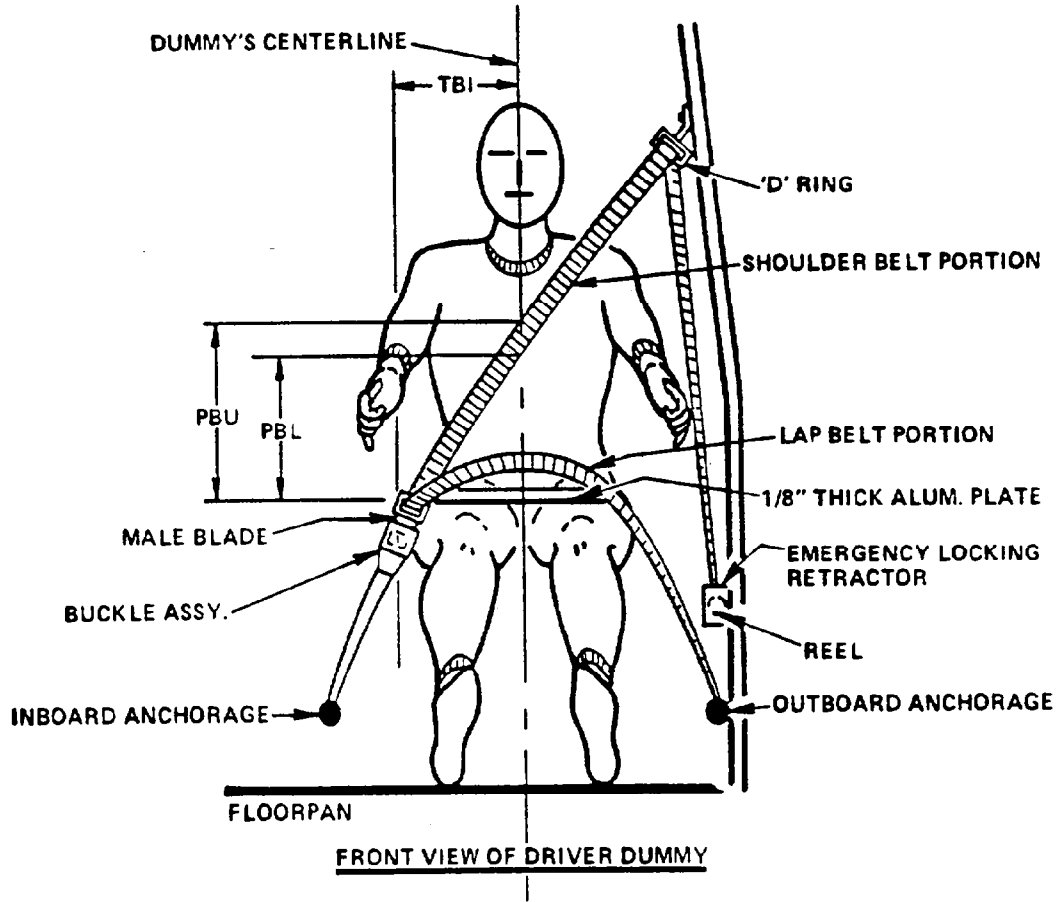
Figure 4

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



	MEASUREMENTS	
<u>NR</u> -- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	15.3	Inches
<u>NH</u> -- Distance from tip of dummy's nose to center of steering column hub	16.0	Inches
<u>SCA</u> -- Angle of steering column relative to the horizontal X axis	23	Degrees
<u>SWA</u> -- Angle of steering wheel relative to the horizontal X axis	-67	Degrees

Figure 5  
SEAT BELT POSITIONING DATA

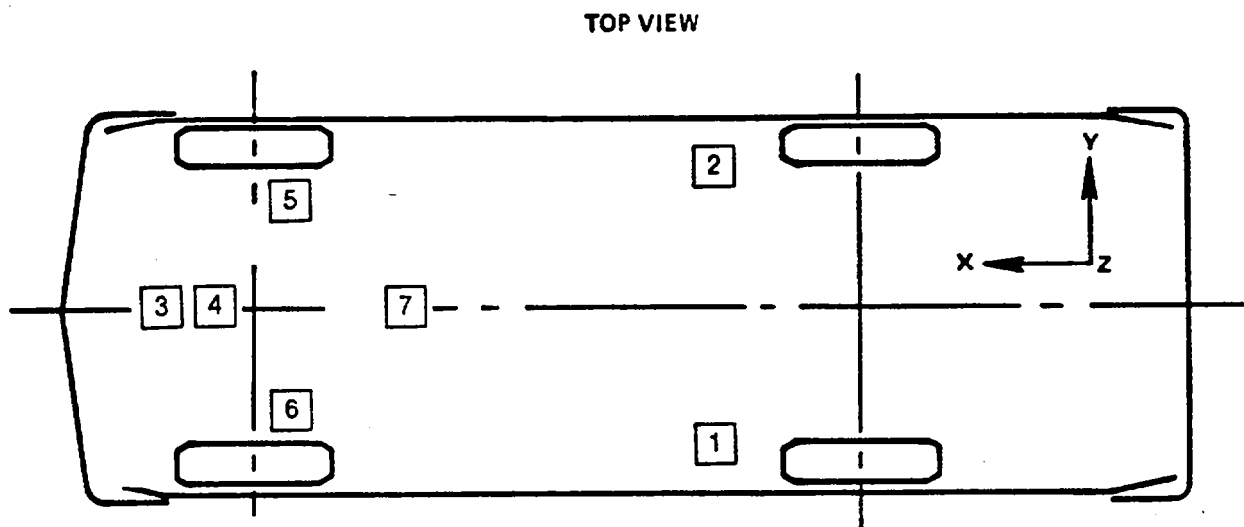


	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	*	11.5
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	*	15.0
<u>TBI</u> -- Distance from torso centerline to buckle	*	8.4

\*Driver side equipped with airbag.

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:	74.7	21.1	17.1				
		POST:	74.6	21.2	17.1				
	LONGITUDINAL ACCELERATION				2	128	-30	46	
2	REAR SEAT X-MEMBER AT RIGHT SIDE	PRE:	74.6	-21.7	17.0				
		POST:	74.6	-21.7	16.9				
	LONGITUDINAL ACCELERATION				2	128	-29	48	
3	TOP OF ENGINE BLOCK	PRE:	165.2	-5.5	31.7				
		POST:	159.2	-3.9	30.5				
	LONGITUDINAL ACCELERATION				25	50	-104	33	
4	BOTTOM OF ENGINE	PRE:	141.1	8.5	7.9				
		POST:	140.7	8.9	7.3				
	LONGITUDINAL ACCELERATION				13	54	-84	37	
5	BRAKE CALIPER AT RIGHT SIDE	PRE:	148.7	-24.8	16.1				
		POST:	145.1	-24.3	16.3				
	LONGITUDINAL ACCELERATION				47	50	-79	33	
6	BRAKE CALIPER AT LEFT SIDE	PRE:	148.5	25.3	15.5				
		POST:	146.1	24.7	15.6				
	LONGITUDINAL ACCELERATION				20	56	-70	36	
7	DASH PANEL	PRE:	117.5	3.7	32.7				
		POST:	117.0	3.2	32.7				
	LONGITUDINAL ACCELERATION				21	53	-71	62	

\*\* POSITIVE DIRECTION: FORWARD, LEFTWARD, UPWARD  
 \*\* NEGATIVE DIRECTION: REARWARD, RIGHTWARD, DOWNWARD

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

DISTANCE MEASUREMENTS IN INCHES

Figure 7

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5.

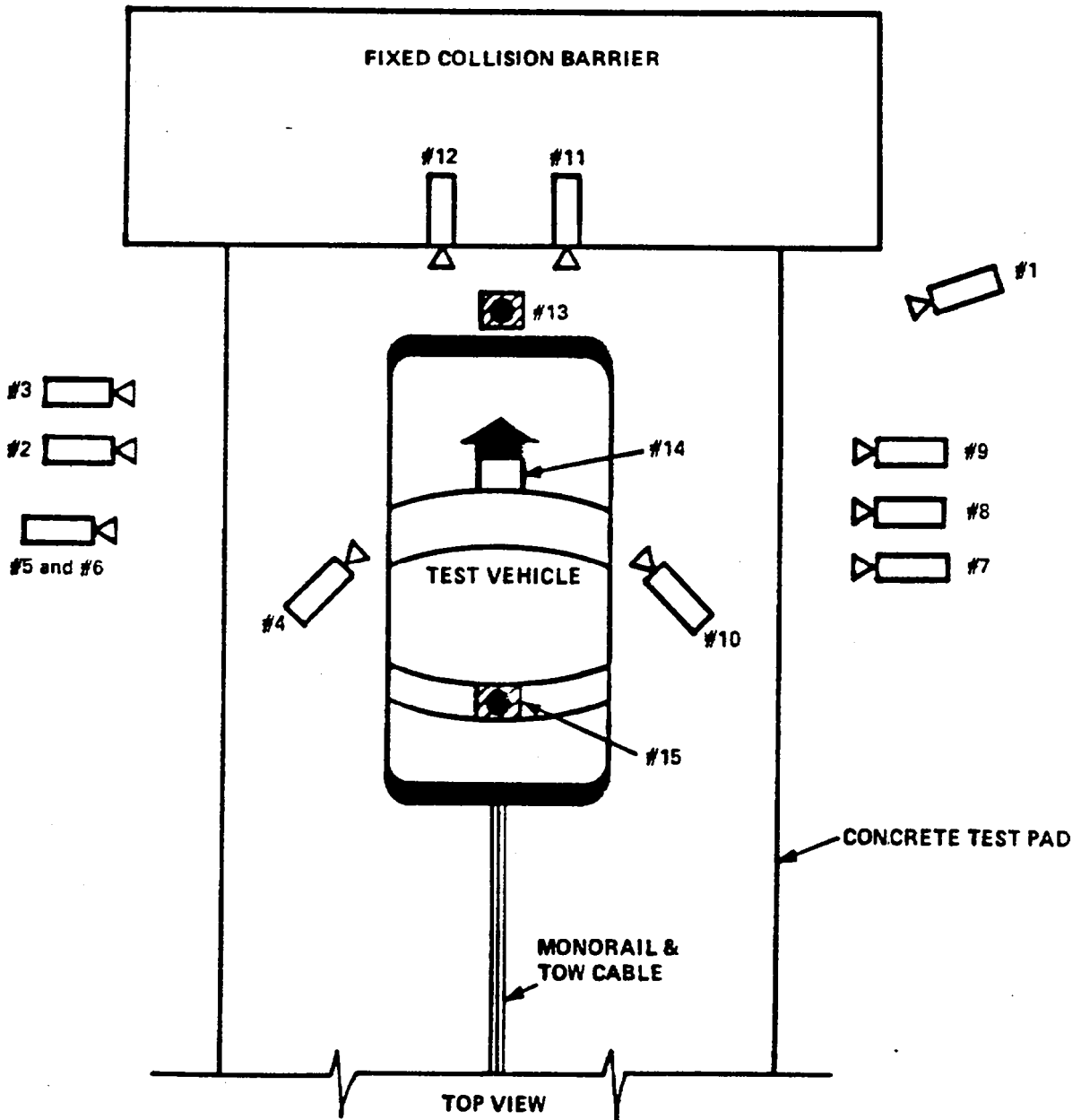


Table 5

## HIGH-SPEED CAMERA LOCATIONS

Vehicle: 1990 Ford Taurus L 4-Door Sedan

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	235.0	68.0	41.0	-2.0	218.7	540	
3	Left Side View	310.0	37.0	41.0	-2.0	293.7	535	
4	Driver and Interior View	111.0	107.0	75.0	-22.0	-	800	
5	Steering Column (Bottom)	299.0	86.0	45.0	-3.0	282.7	570	
6	Steering Column (Top)	298.0	86.0	70.0	-10.0	281.7	565	
7	Overall Right Side	241.0	75.0	42.0	-4.0	224.7	800	
8	Right Side View	304.0	55.0	42.0	-1.0	287.7	***	
9	Right Passenger View	308.0	77.0	56.0	-3.0	291.7	685	
10	Passenger and Interior View	100.0	109.0	72.0	-19.0	-	605	
11	Passenger Front View	24.0	17.0	77.0	-44.0	-	570	
12	Driver Front View	24.0	17.0	77.0	-43.0	-	530	
13	Windshield View	0.0	0.0	130.0	-47.0	-	500	
14	Pit View of Engine	0.0	36.0	-120.0	90.0	-	780	
15	Pit View of Fuel Tank	0.0	128.0	-120.0	90.0	-	690	

\*X = film plane to monorail centerline  
 Y = film plane to impact location  
 Z = film plan to ground  
 \*\* = referenced to horizontal plane  
 \*\*\* = timing marks not available

Figure 8

VEHICLE TARGET LOCATIONS

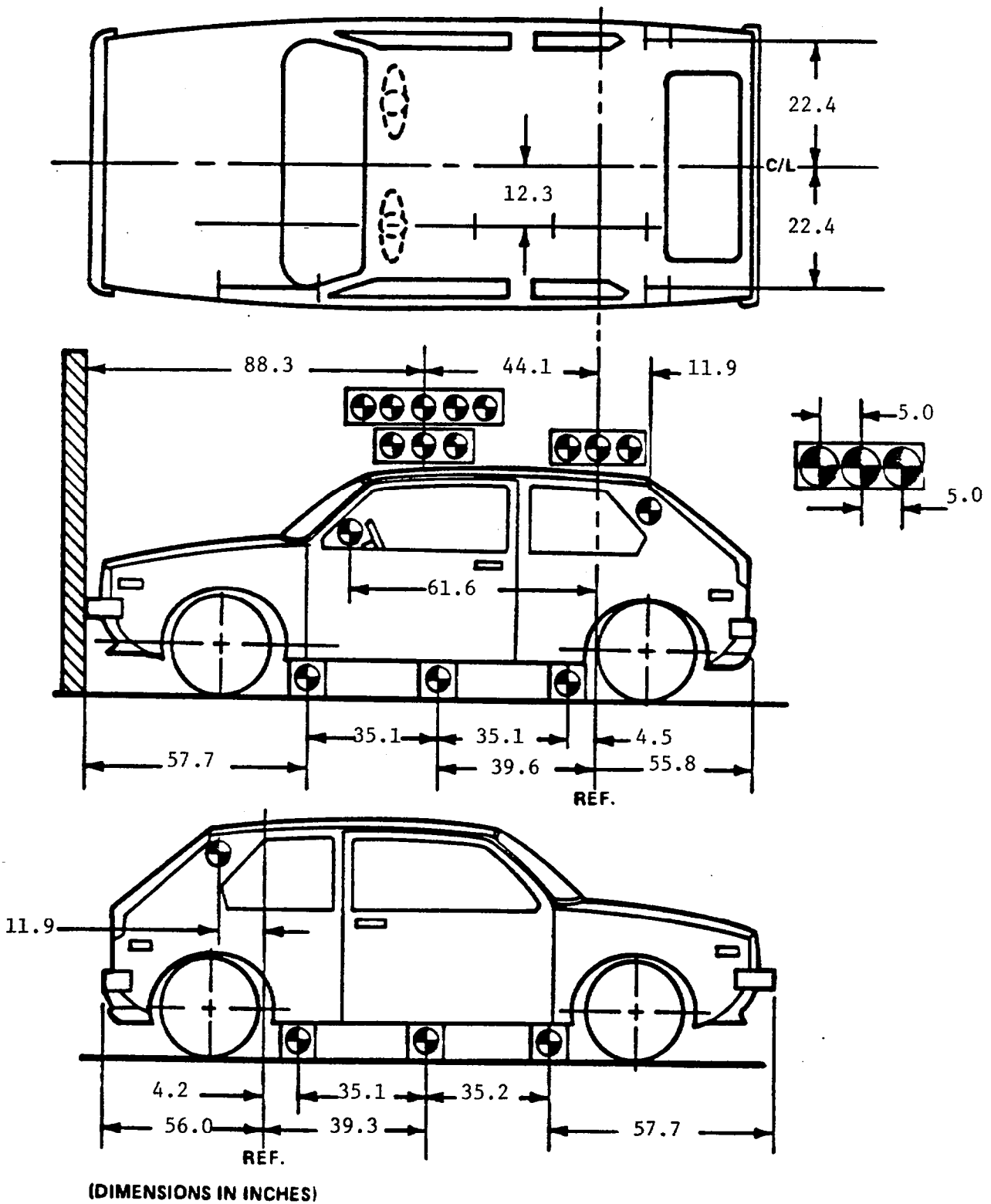


Figure 9

TEST VEHICLE MEASUREMENTS

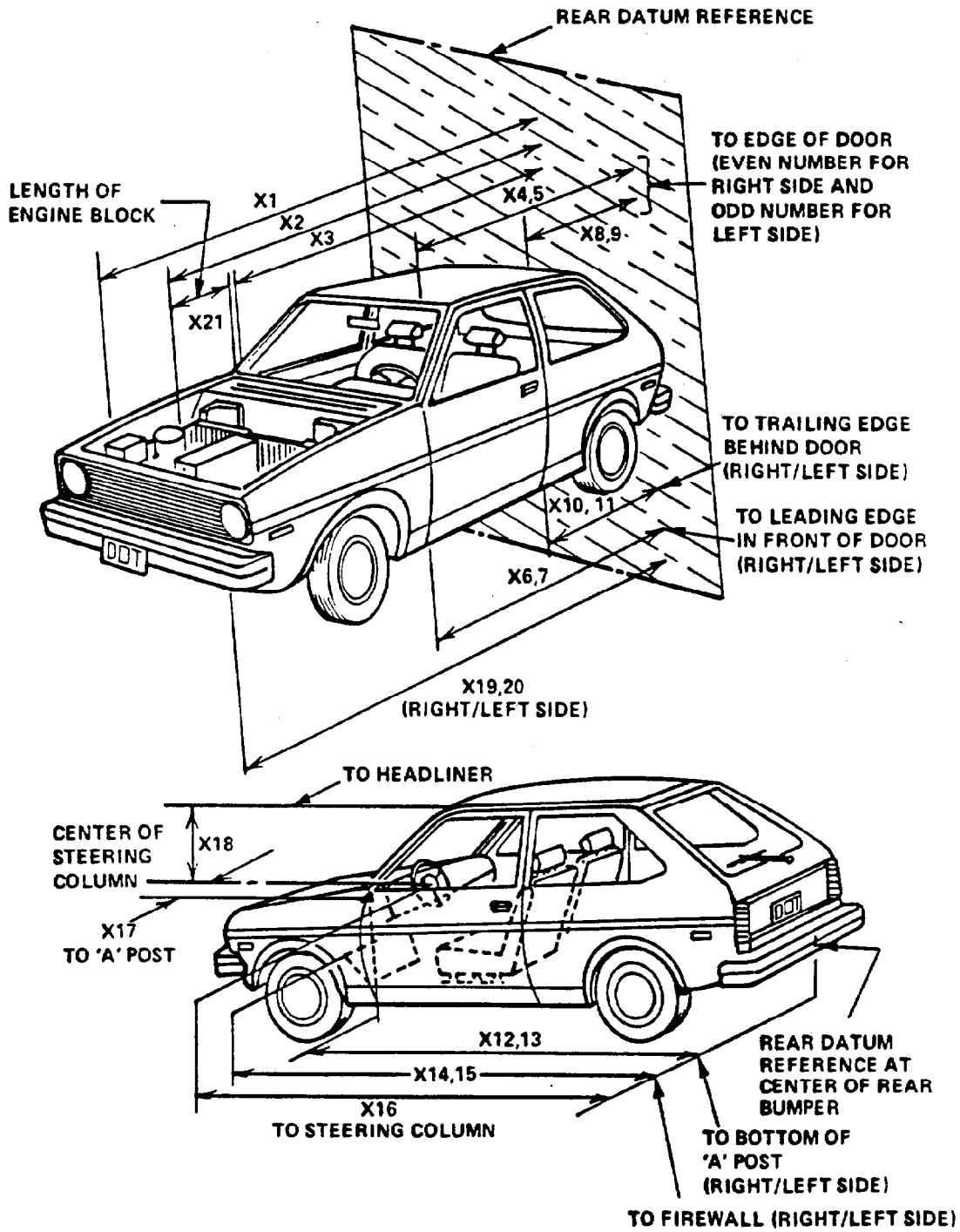


Table 6

## VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	188.2	172.7	15.5
X2	Rear Surface of Vehicle to Front of Engine	166.9	161.7	5.2
X3	Rear Surface of Vehicle to Firewall	141.7	141.7	0.0
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	129.2	129.8	-0.6
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	129.5	129.2	0.3
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	127.4	127.5	-0.1
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	127.4	127.3	0.1
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	86.8	87.8	-1.0
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	87.3	87.2	0.1
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	86.5	86.5	0.0
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	128.1	128.0	0.1
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	128.1	127.5	0.6
X14	Rear Surface of Vehicle to Firewall, Right Side	140.1	134.7	5.4
X15	Rear Surface of Vehicle to Firewall, Left Side	139.6	139.2	0.4
X16	Rear Surface of Vehicle to Steering Column	109.9	113.4	-3.5
X17	Center of Steering Column to "A" Post	17.0	16.4	0.6
X18	Center of Steering Column to Headliner	15.9	16.3	-0.4
X19	Rear Surface of Vehicle to Right Side of Front Bumper	183.6	170.1	13.5
X20	Rear Surface of Vehicle to Left Side of Front Bumper	184.1	170.0	14.1
X21	Length of Engine Block	17.0	17.0	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 VALUES

NHTSA No.: CLO203 Vehicle: 1990 Ford Taurus L 4-Door Sedan

	MAXIMUM ACCELERATION (g's)							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
Dummy (1)	-62	10	36	72	55	-9	16	53.4
Dummy (2)	-15	19	34	40	-29	29	-19	36.1

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	1491	1999
Dummy (2)	591	323

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc. (g) t <sub>1</sub> TO t <sub>2</sub>
		t <sub>1</sub> (SEC)	t <sub>2</sub> (SEC)	
Dummy (1)	249	0.05632	0.07305	46.7
Dummy (2)	192	0.07410	0.11010	31.0

\*Defined as exceeding 0.003 sec. duration

\*\*As defined in FMVSS No. 208

Table 8

FMVSS NO. 208 - SEAT BELT WARNING SYSTEM CHECK

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

Log time duration of audible warning signal = 6.2 sec.

Log time duration of reminder light operation = 6.2 sec.

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

Log time duration of audible warning signal = 0.0 sec.  
(audible warning should not operate)

Log time duration of reminder light operation = 6.2 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:      Glove compartment door.

The manufacturers recommended schedule no maintenance is needed unless:

1. "Air bag" lamp does not light when key is turned on.
2. "Air bag" lamp flashes or stays lit.
3. Groups of five "beeps" are heard.
4. An air bag has inflated.

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

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

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

Was an owner's manual provided?      YES   X        NO       

Did the owner's manual contain appropriate information concerning maintenance and/or replacement and a description of the functional operation of the systems?      YES   X        NO

Table 10

FMVSS NO. 208 - READINESS INDICATOR

An occupant restraint system that deploys in the event of a crash shall have a monitoring system with a readiness indicator. A totally mechanical system is exempt from this requirement.

Is the system totally mechanical? YES \_\_\_\_\_ NO  X

Describe the location of the readiness indicator:

Lower right 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.: CLO203  
Make/Model: 1990 Ford Taurus L  
Date of Comfort/Convenience Check: January 22, 1990  
Technician Performing Check: VMP  
GVWR: 4660 lbs.

Seat belt comfort and convenience requirements cover vehicles manufactured on or after September 1, 1986, which have a gross vehicle weight rating of 10,000 pounds or less. Exemptions to this rule are belts installed in a walk-in, van-type vehicle and manual Type 2 belt systems installed in the front outboard seating positions of passenger automobiles. On or after September 1, 1989, the exemption of the type 2 manual seat belts installed in the front outboard seating positions of passenger automobiles will change depending on the states' enactment of mandatory usage laws.

Was vehicle built after or on September 1, 1986, and is it equipped with:

1. Automatic seat belts YES \_\_\_\_\_ NO X

If yes, go to requirements D1, D2 and D3

2. Manual seat belts\* YES X\*\* NO \_\_\_\_\_

a. The seat belts, other than Type 2 lap/shoulder belts, are located in the front outboard seating positions of a passenger automobile.

YES \_\_\_\_\_ NO X

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

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

STOP

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

\*\*Manual seat belt was used only on passenger dummy. Driver position equipped with an air bag.

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 \_\_\_\_\_ NO  X

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

Table 11 (cont.)

D3

BELT CONTACT FORCE

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

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 0.5" rubber and 0.2" plastic trim along upper and side windshield molding. Bottom of windshield is covered with 1.5" plastic trim.

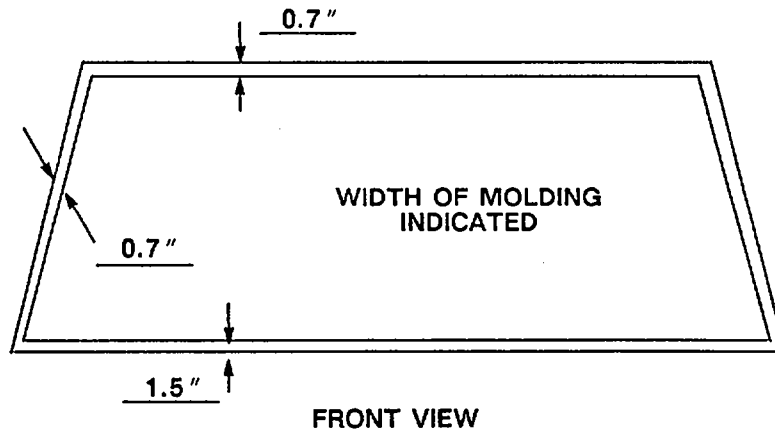
FMVSS 212 REQUIREMENTS:

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	82.75	82.75	100%
LEFT SIDE	82.75	82.75	100%
TOTAL	165.50	165.50	100%

AREA OF RETENTION FAILURE:



FAILURE DETAILS: None.

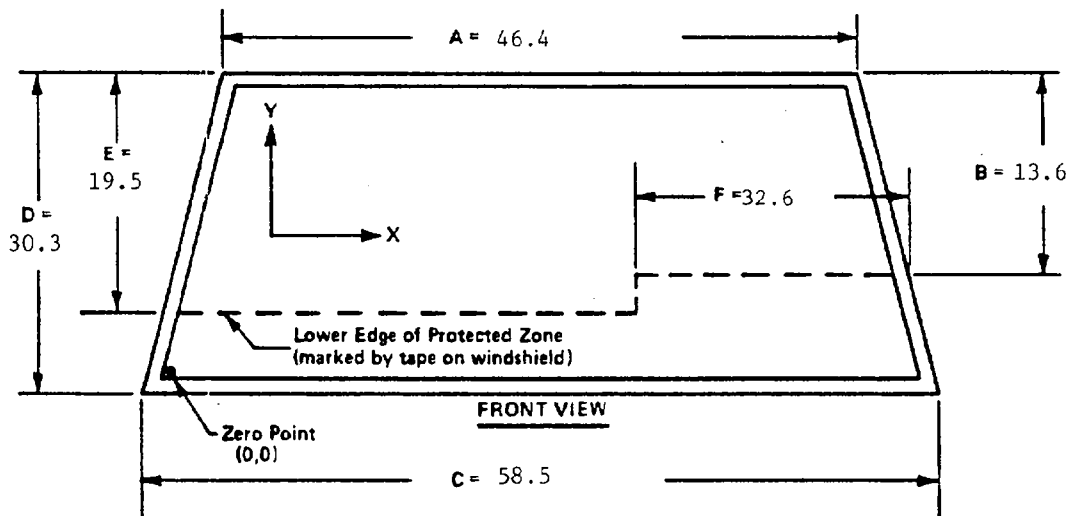
Figure 11

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:



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

(Show location of penetration on above sketch)

None

	COORDINATES	
	X	Y
1.		
2.		
3.		
4.		



Table 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

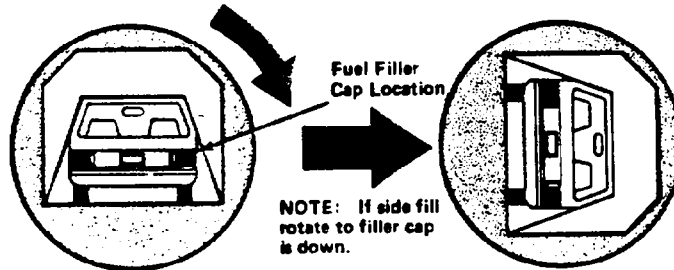
TEST PHASE:

Vehicle NHTSA ID No.:

0°

90°

CL0203



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes) 03 minutes 00 seconds

FMVSS 301 Position Hold Time + 05 minutes 00 seconds

TOTAL \_\_\_\_\_

08 minutes 00 seconds

Next whole minute interval 08 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S):

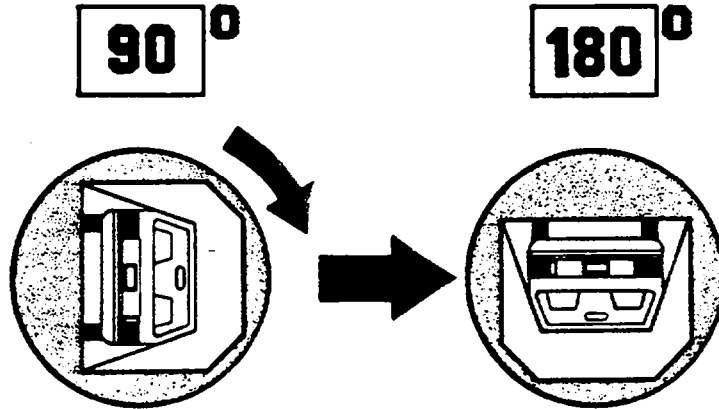
None

Table 13

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

TEST PHASE:

Vehicle NHTSA ID No.:



CLO203

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes) 03 minutes 00 seconds

FMVSS 301 Position Hold Time + 05 minutes 00 seconds

TOTAL \_\_\_\_\_

08 minutes 00 seconds

Next whole minute interval 08 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 25, 1990 Vehicle NHTSA No.: CLO203

Vehicle Manufacturer: Ford Motor Company in U.S.A.

Model Year: 1990 VIN: 1FACP5OU1LG125325

Body Style: 4-Door Sedan Build Date: October 1989

Dummy Stabilized Temperature at Time of Test: 70 °F (Spec. = 66-78°F)

Impact Velocity: 29.5 mph Time of Test: 10:50

Type of Automatic Restraint System: Driver air bag restraint, passenger 3-point manual seat belt restraint.

Failure Details:

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

Appendix A

PHOTOGRAPHS

Note: NHTSA number shown on vehicle photo placards was inadvertently recorded as CL0202. The NHTSA number should read CL0203

LIST OF PHOTOGRAPHS

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Figure A-24	CERTIFICATION LABEL	A-26
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Figure A-28	PRE-TEST PASSENGER DUMMY POSITION	A-30
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Figure A-30	PRE-TEST DRIVER DUMMY AND INTERIOR VIEW	A-32
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Figure A-36	BALLAST LOCATED IN RIGHT REAR TRUNK COMPARTMENT	A-38
Figure A-37	BALLAST LOCATED IN LEFT REAR TRUNK COMPARTMENT	A-39

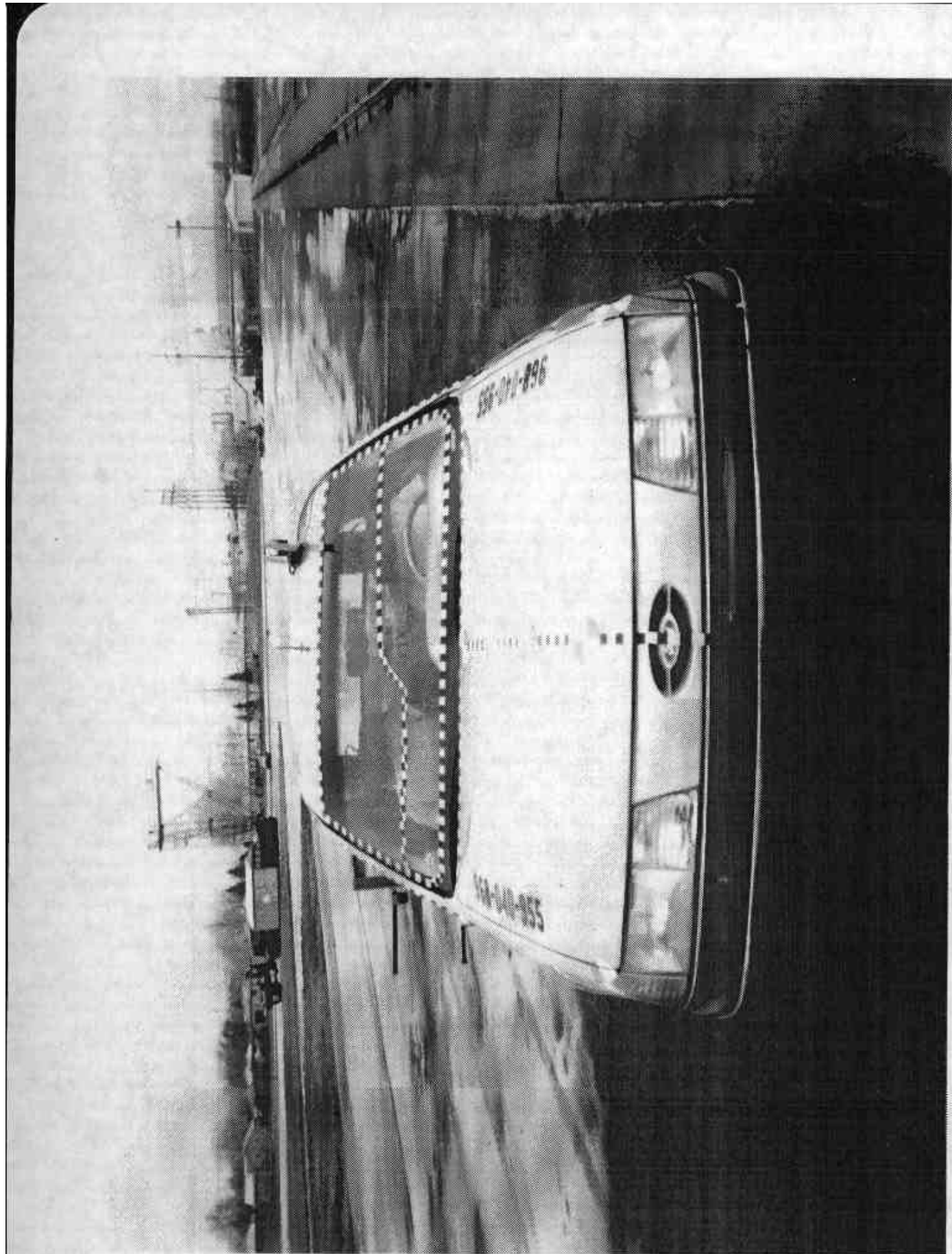


Figure A-1 PRE-TEST FRONT VIEW

A-3

7804-4

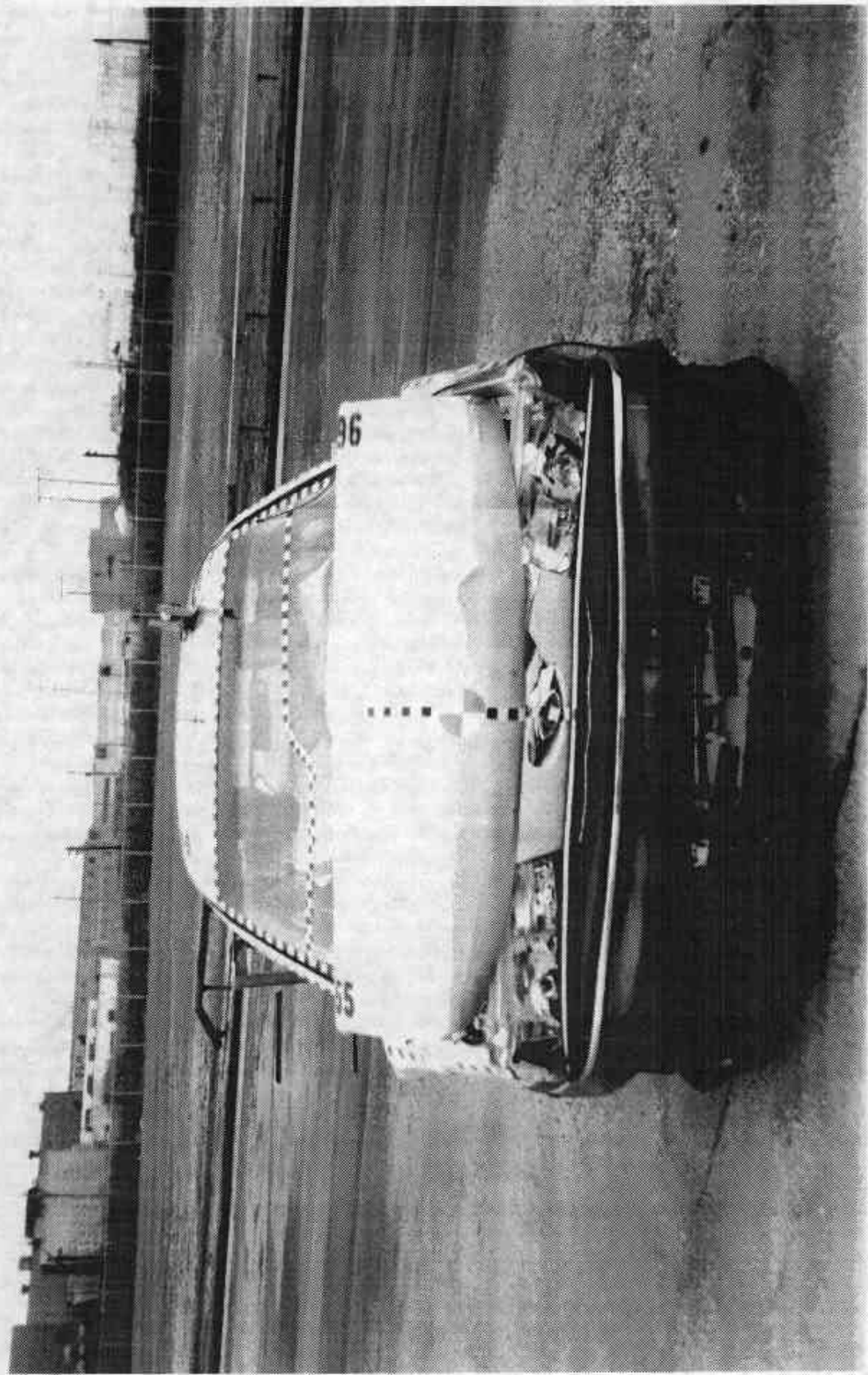


Figure A-2 POST TEST FRONT VIEW

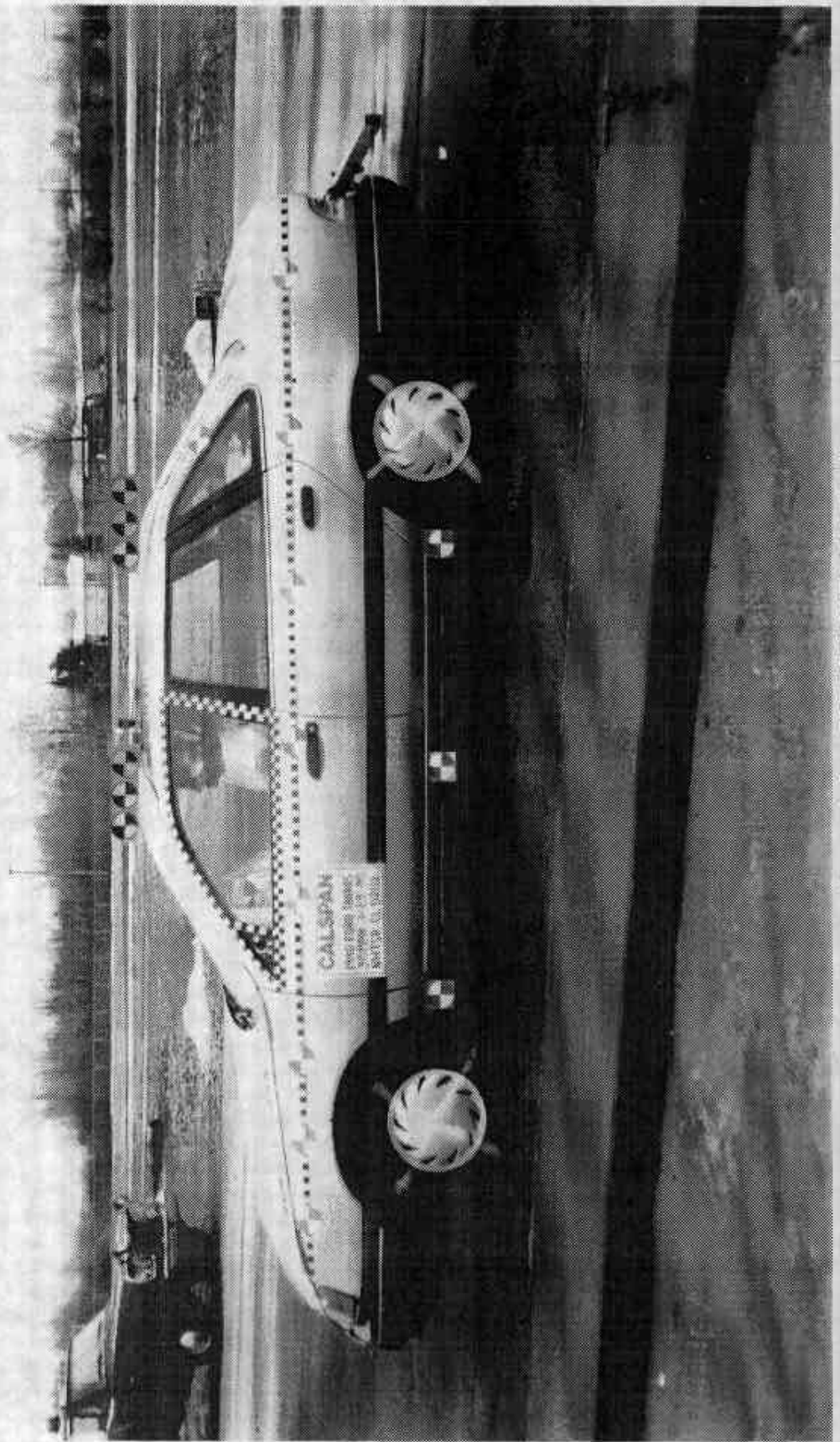


FIGURE A-3 PRE-TEST LEFT SIDE VIEW

A-5

7804-4

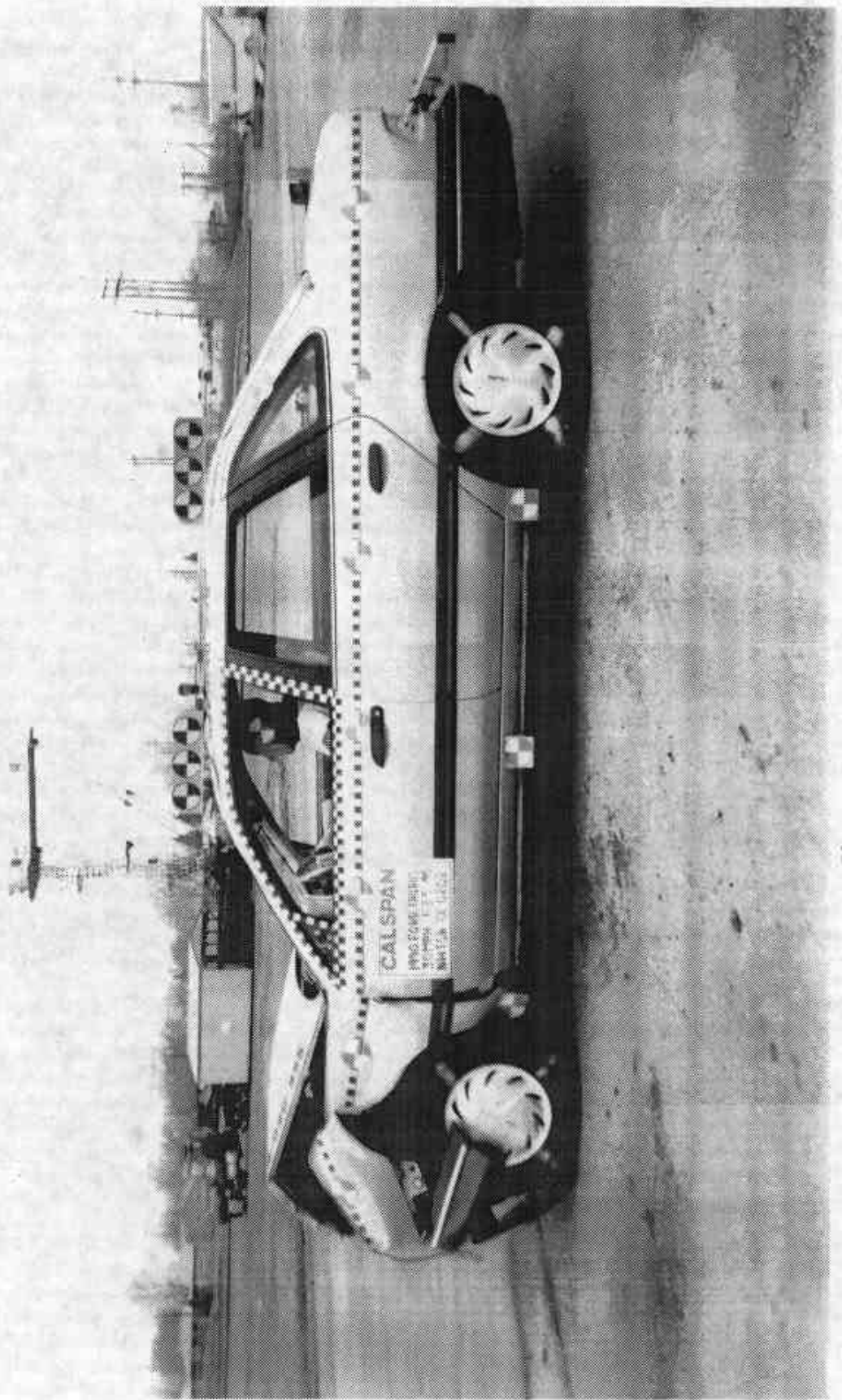


FIGURE A-4 POST TEST LEFT SIDE VIEW

A-6

7804-4

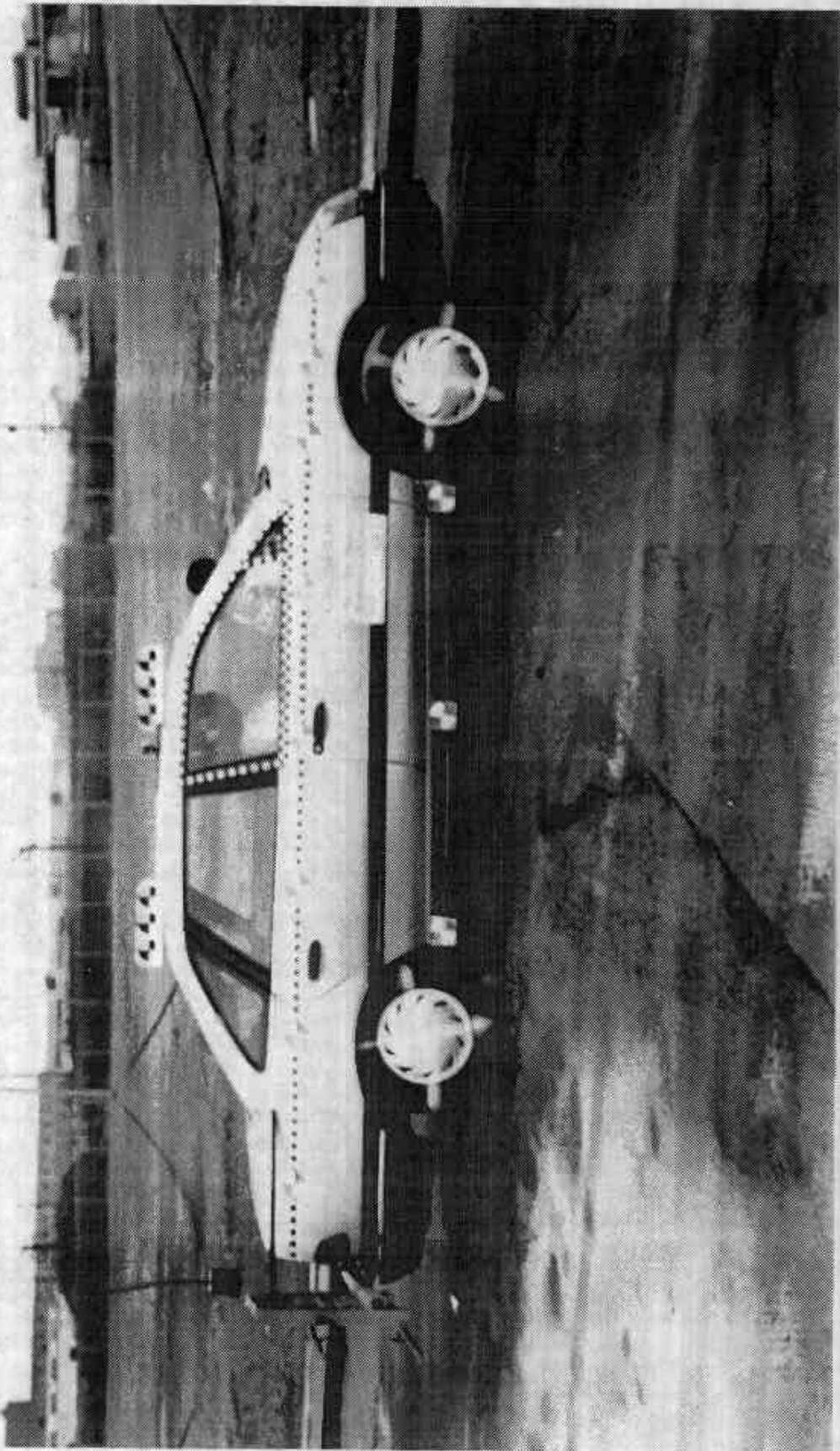


FIGURE A-5 PRE-TEST RIGHT SIDE VIEW

A-7

7804-4

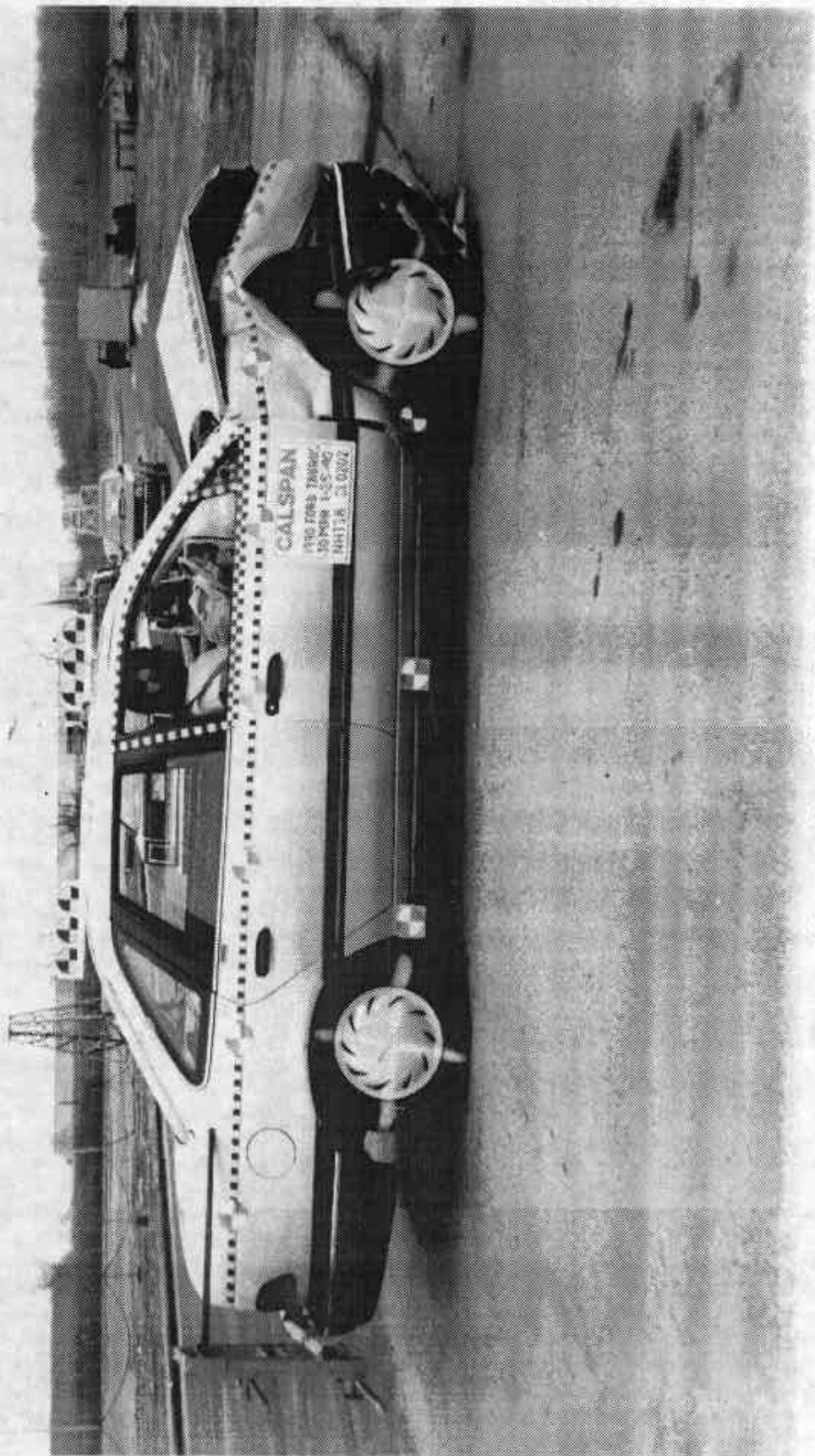


FIGURE A-8 POST-TEST RIGHT SIDE VIEW

A-8

7804-4



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

A-9

7804-4

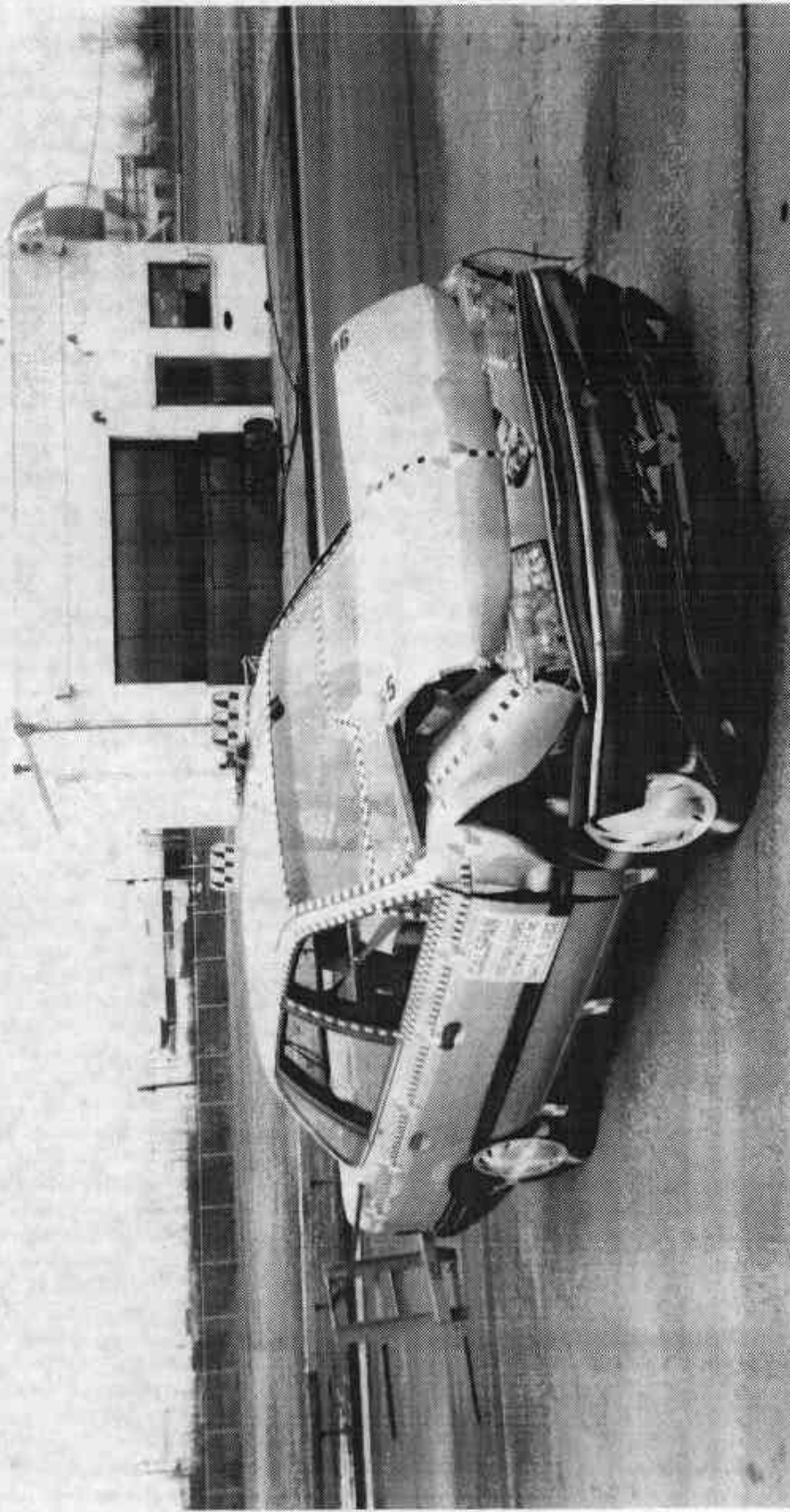


Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

7804-4



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

A-11

7804-4

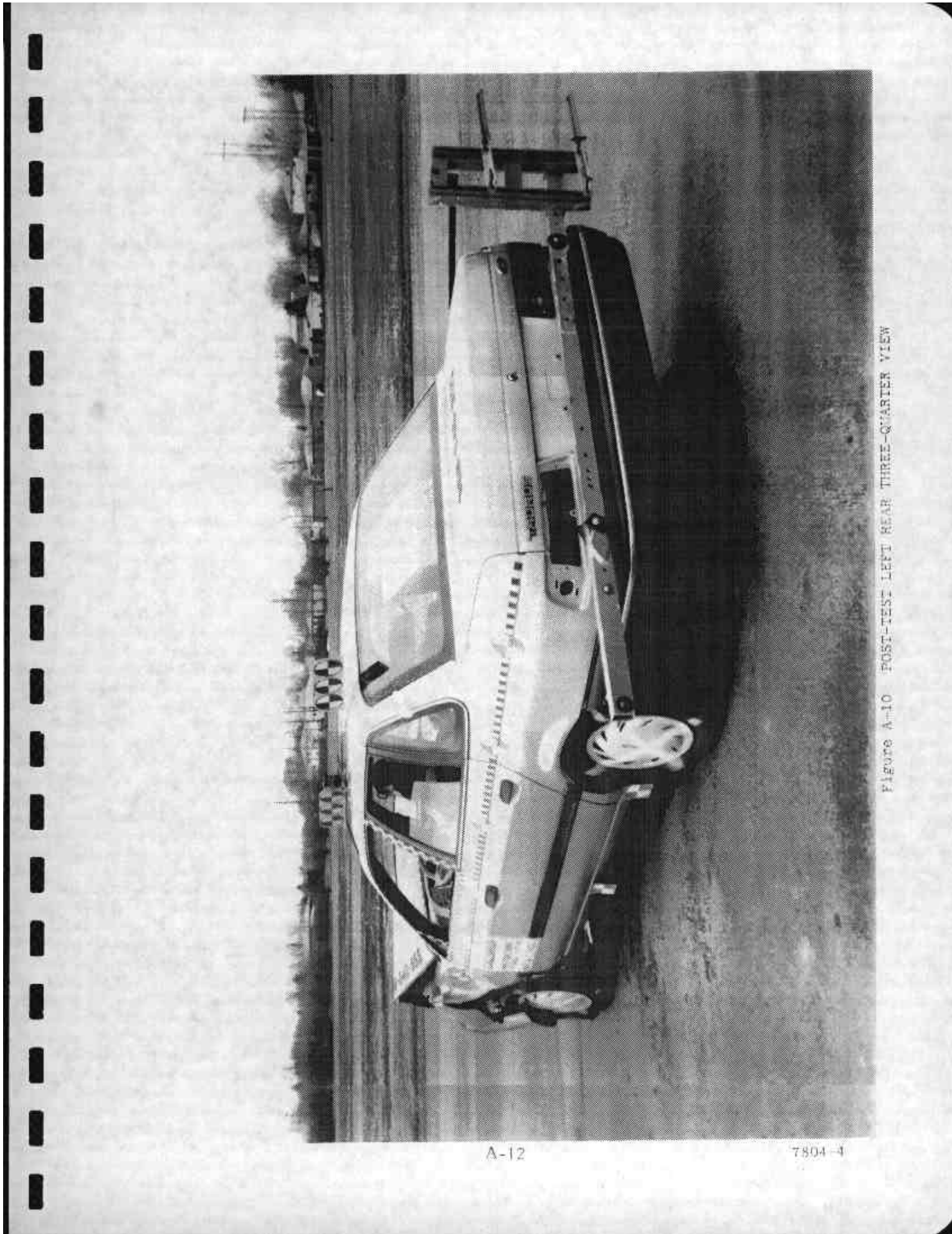


FIGURE A-10 POST-TEST LEFT REAR THREE-QUARTER VIEW

A-12

7804-4



A-13

7804-4

Figure A-11 POST TEST TOP VIEW

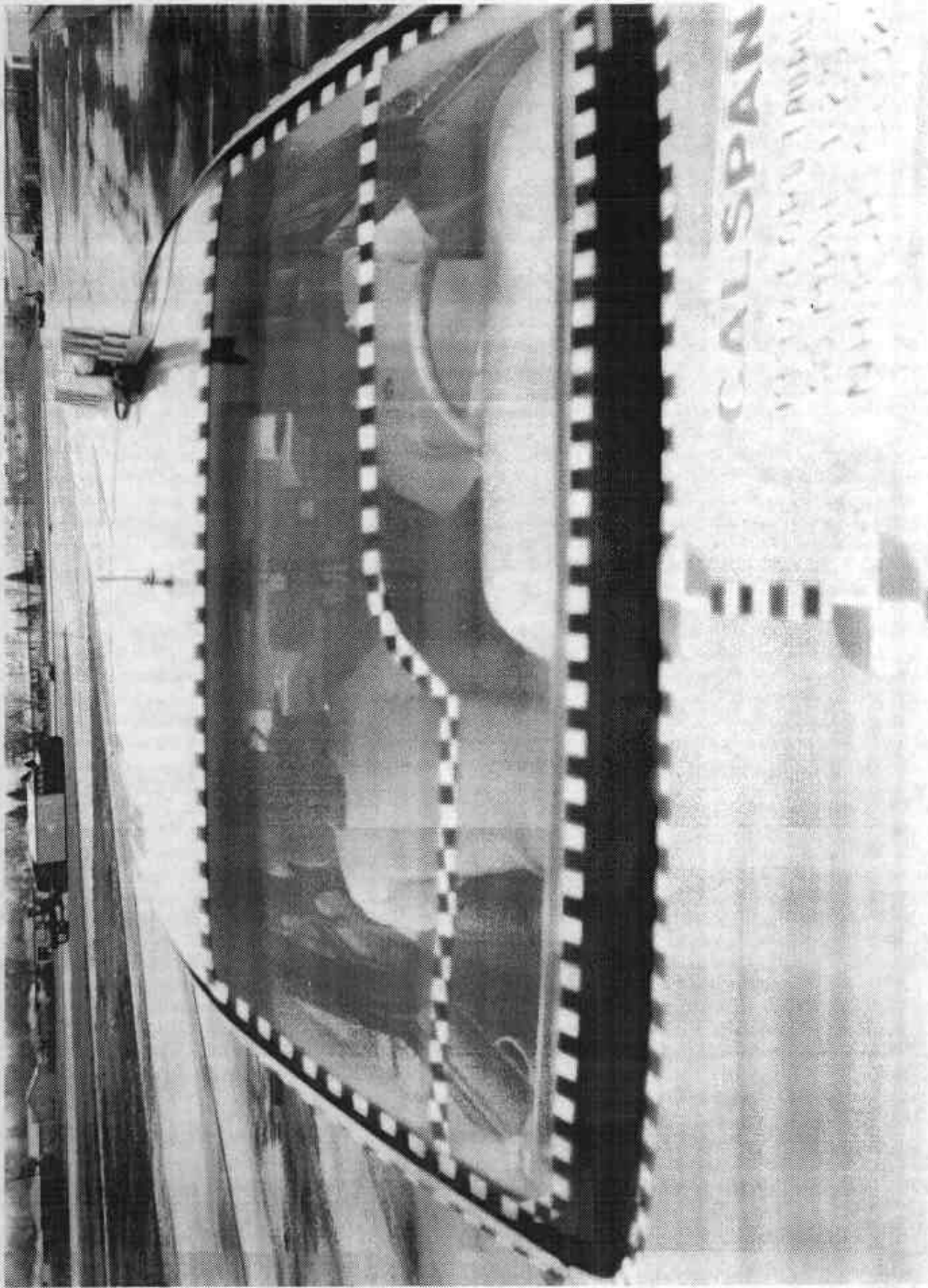


FIGURE A-12 PRE-TEST WINDSHIELD VIEW

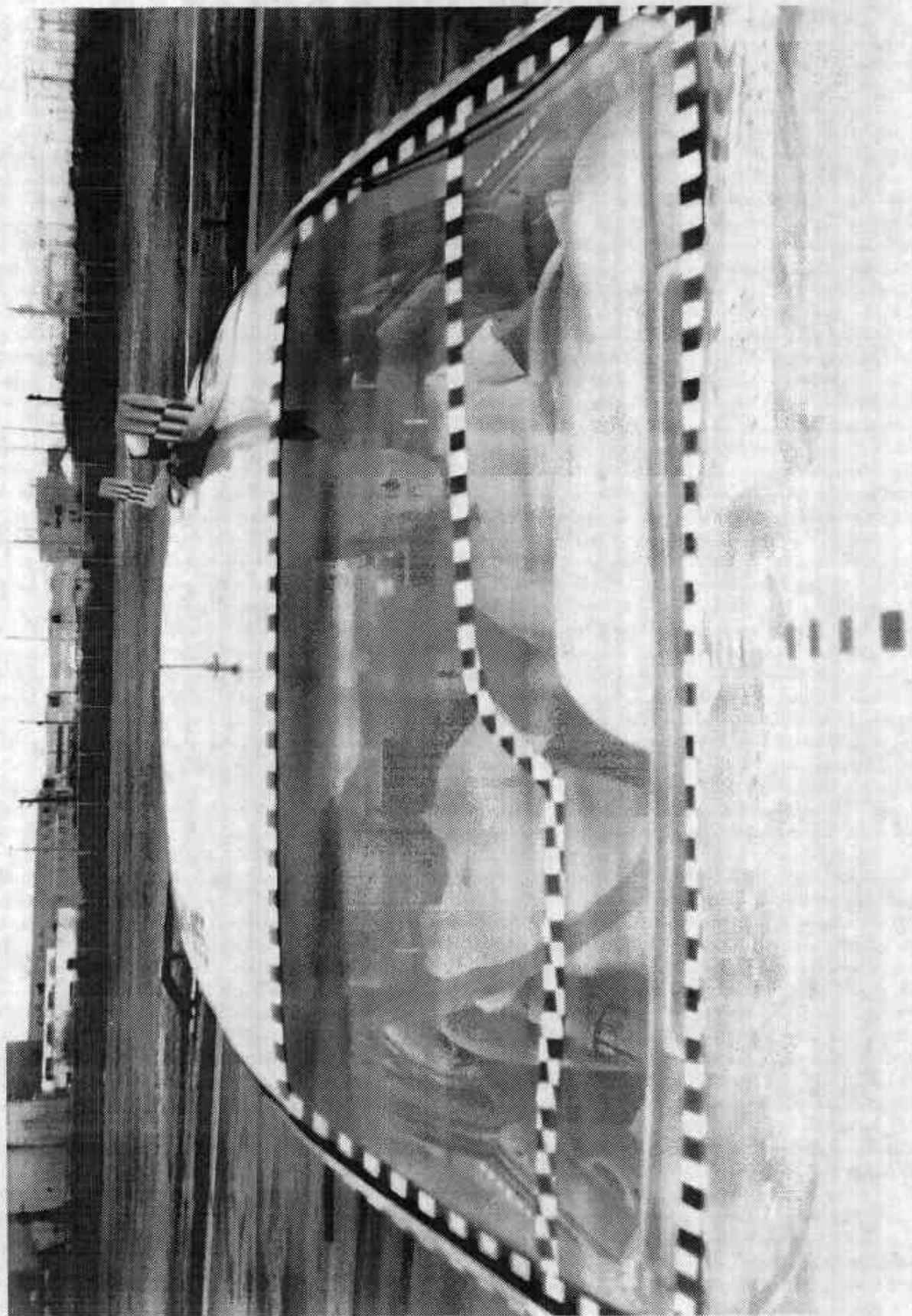


FIGURE A-13 POST-TEST WINDSHIELD VIEW

A-15

7804-4

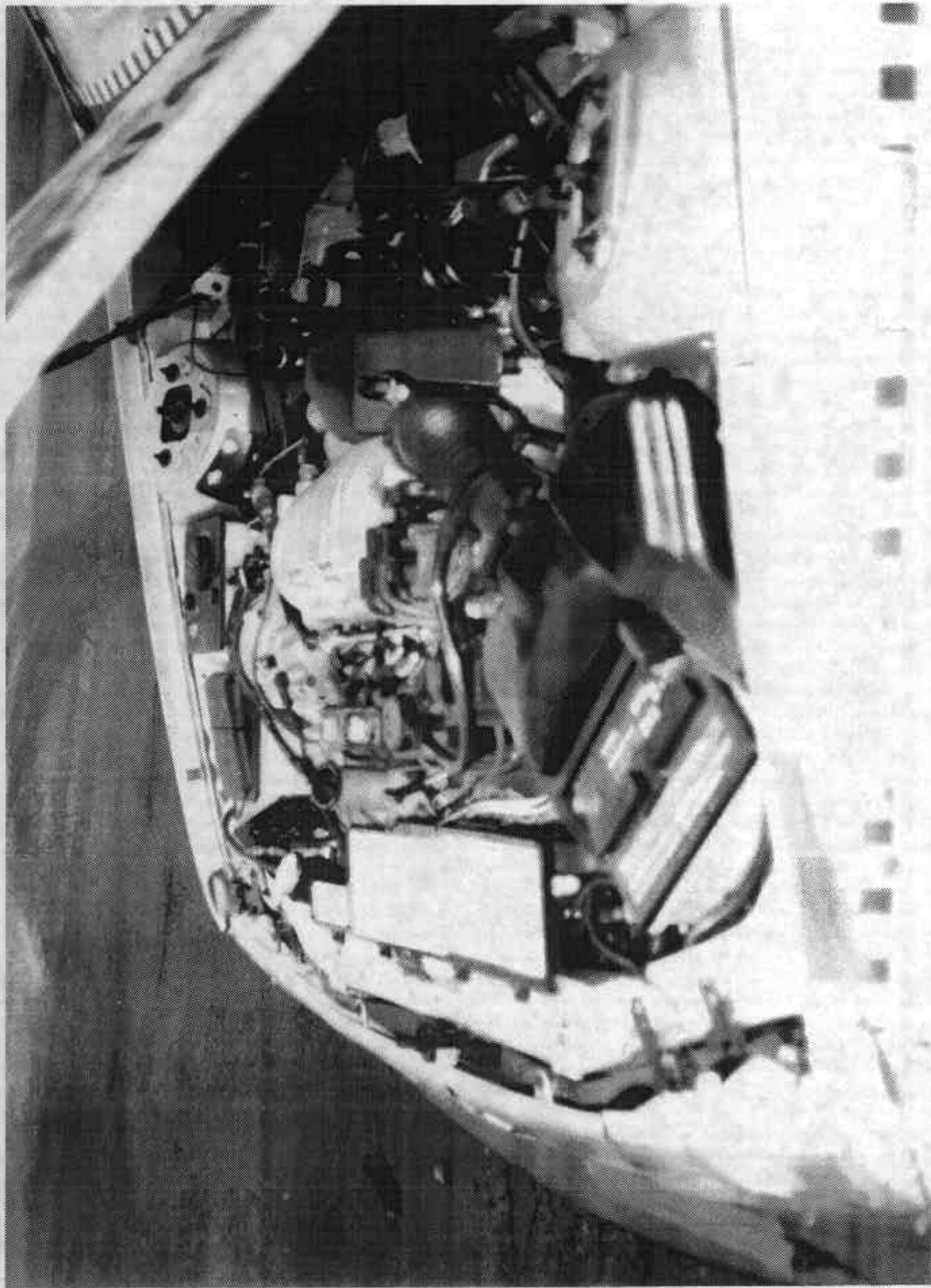
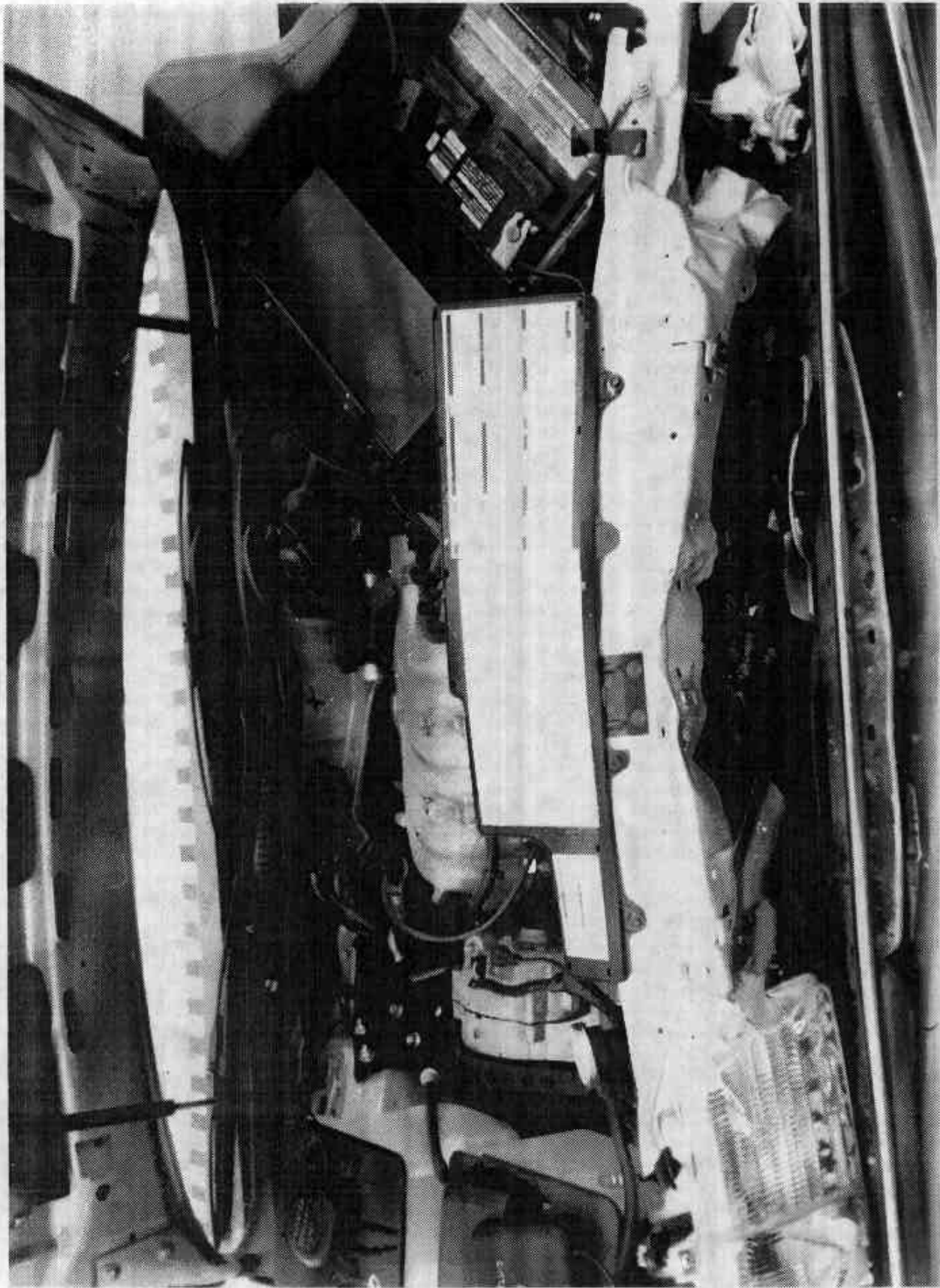


Figure A-14 PRE-TEST ENGINE COMPARTMENT SIDE VIEW



A-17

7804-4

Figure A-15. POST-TEST ENGINE COMPARTMENT, FRONT VIEW

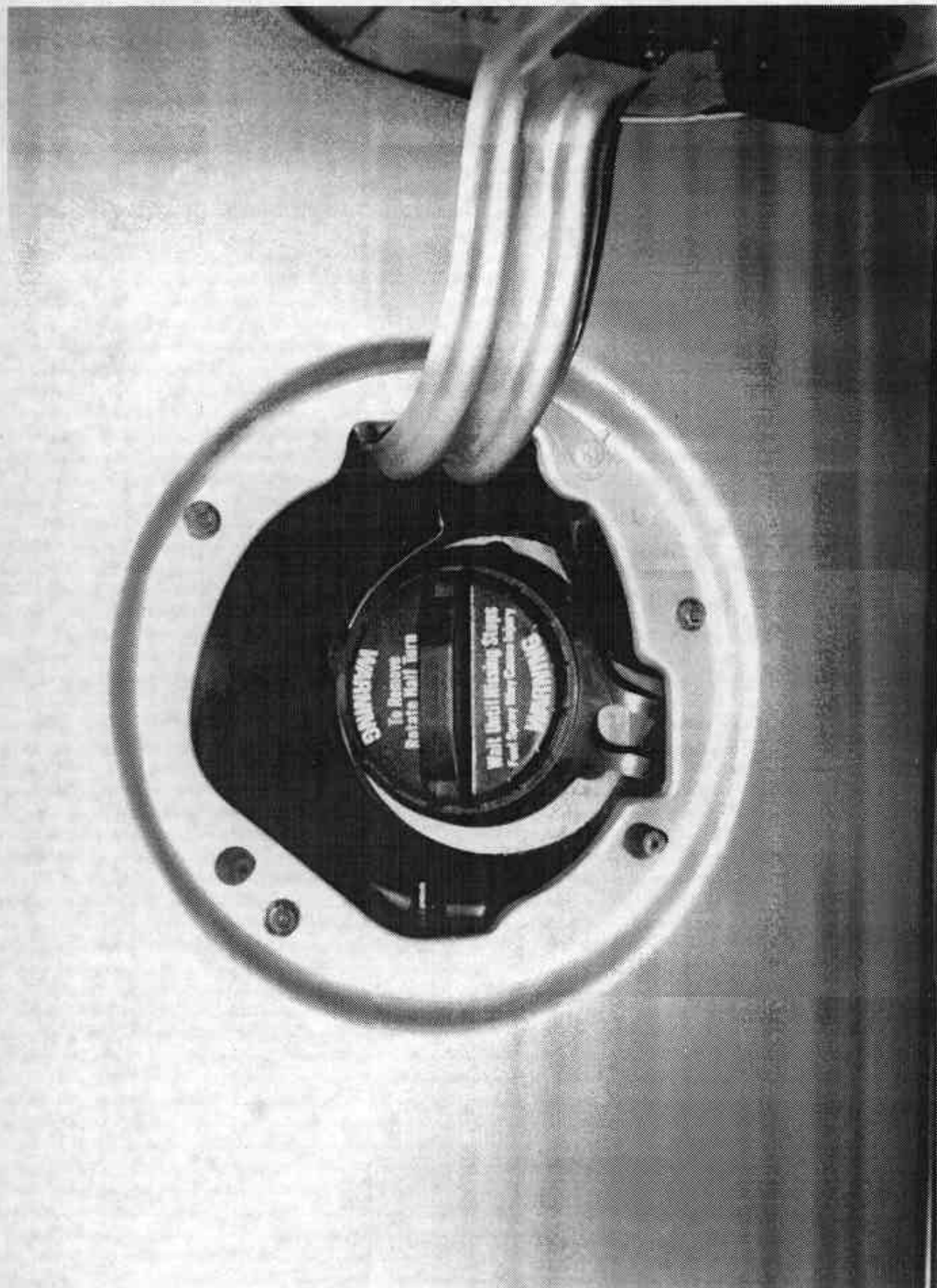


FIGURE A-16 PRE-TEST FUEL FILLER CAP VIEW

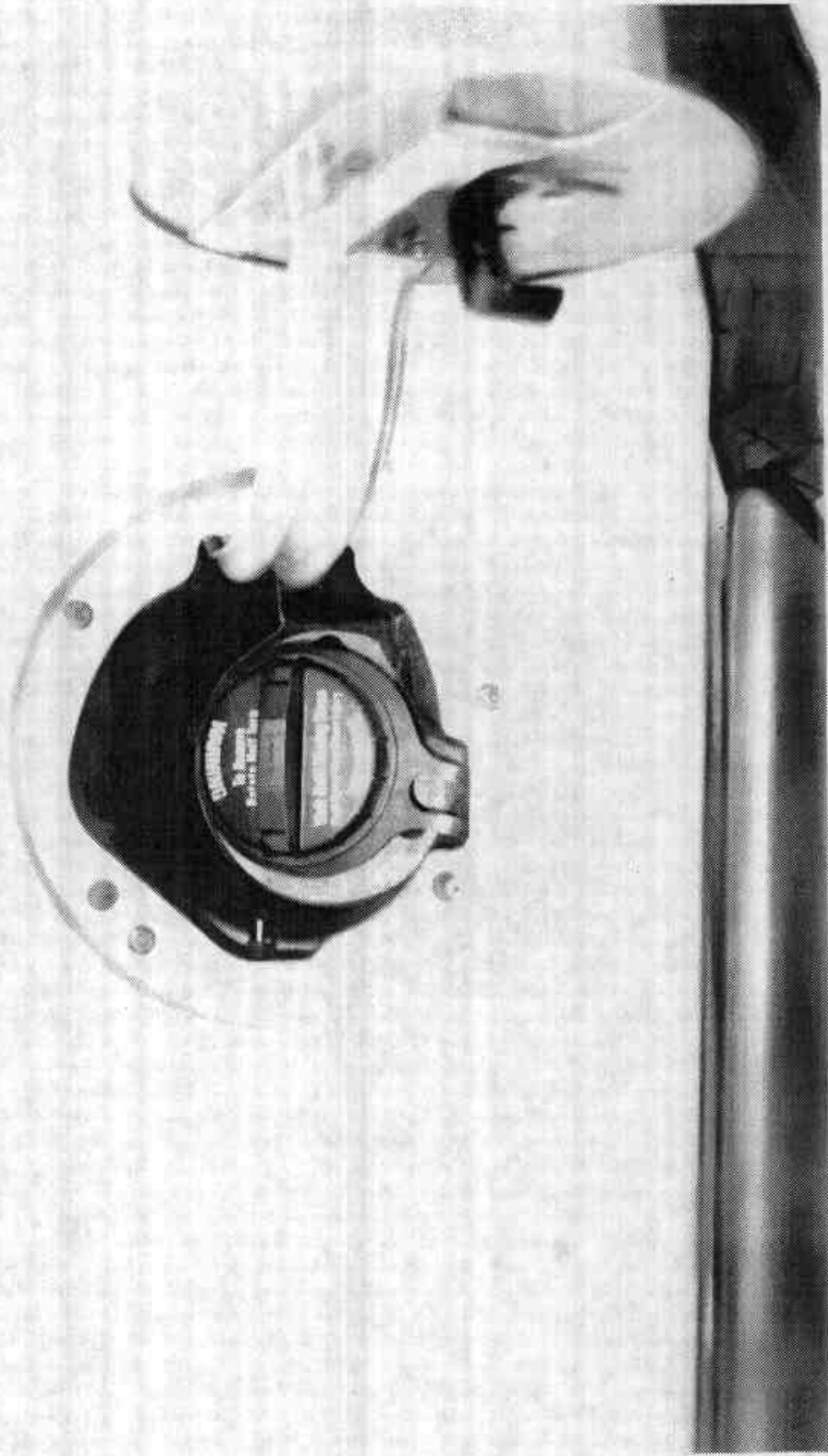


Figure A-17 POST-TEST FUEL FILLER CAP VIEW

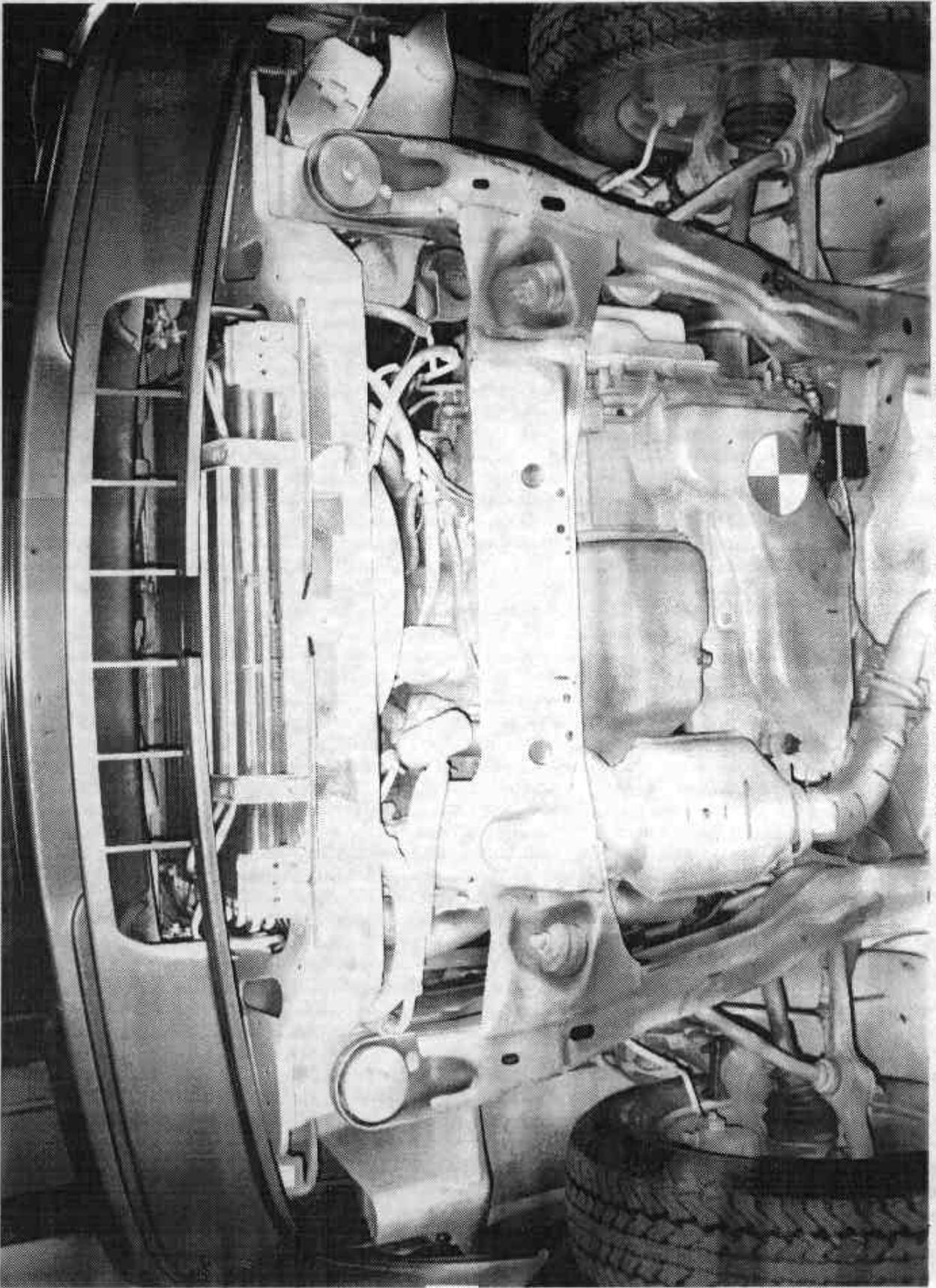


Figure A-18 PRE-TEST FRONT UNDERBODY VIEW

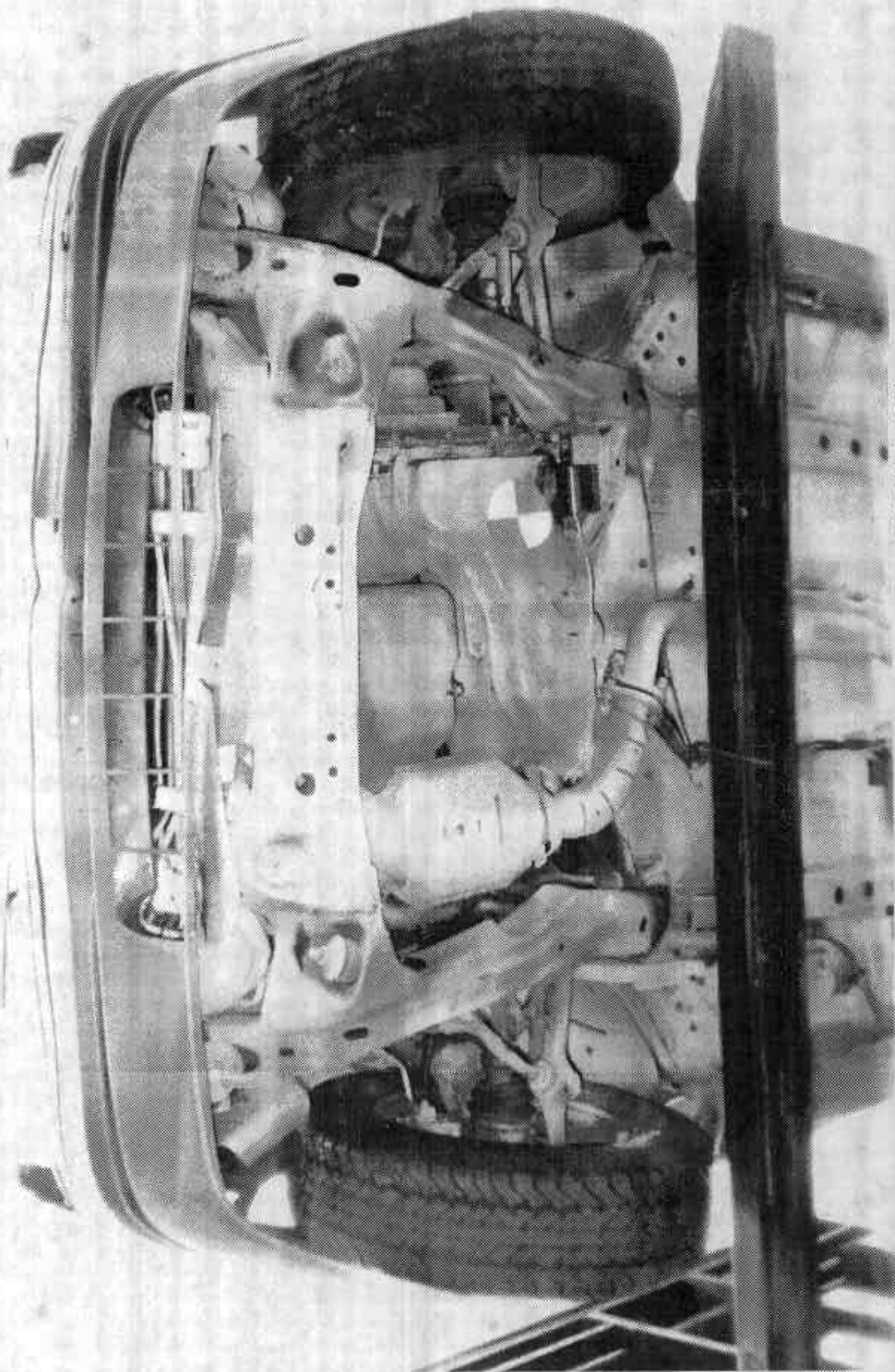


FIGURE A-19 POST-TEST FRONT UNDERBODY VIEW

A-21

7804-4

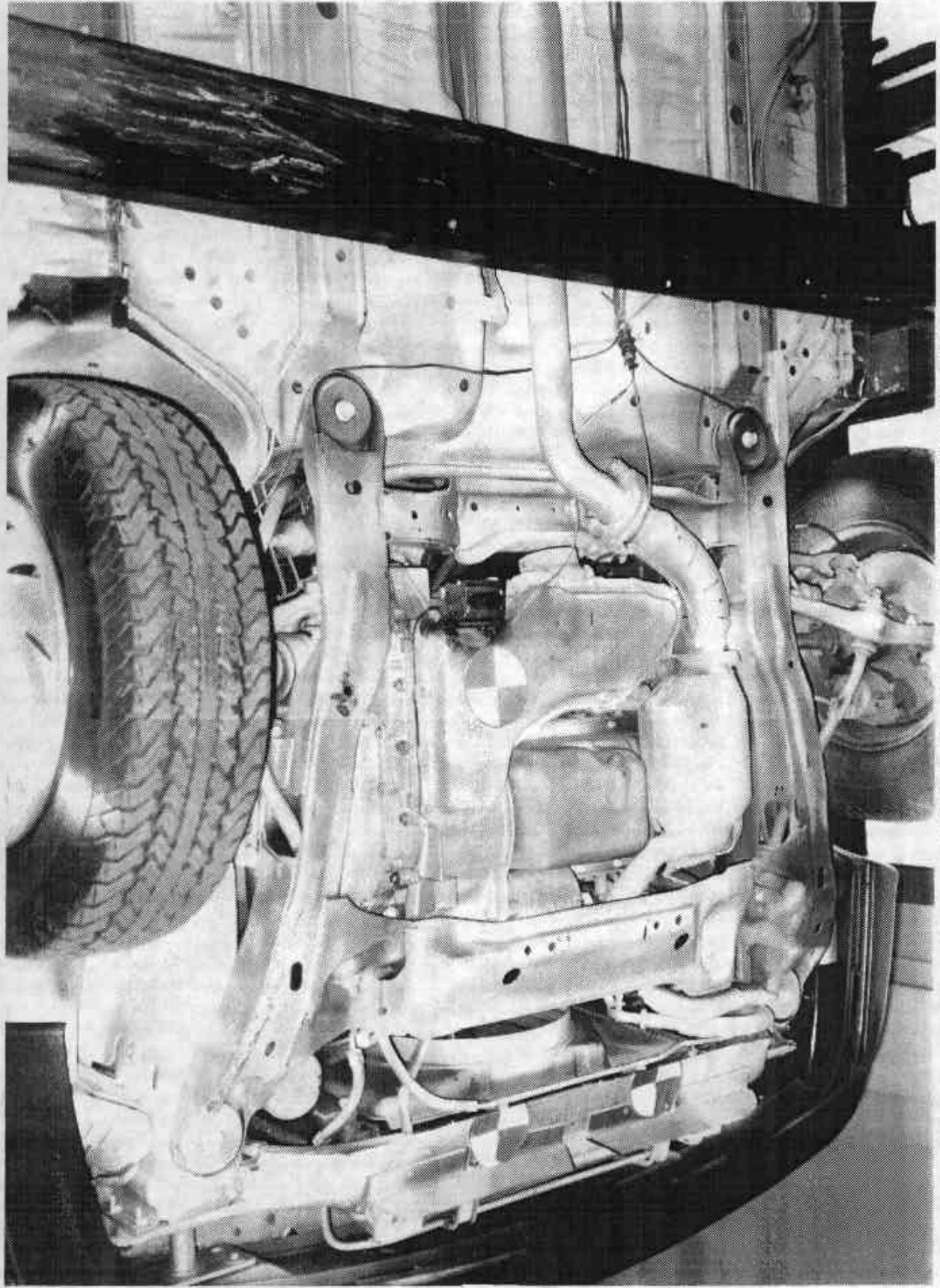


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

A-22

7804-1

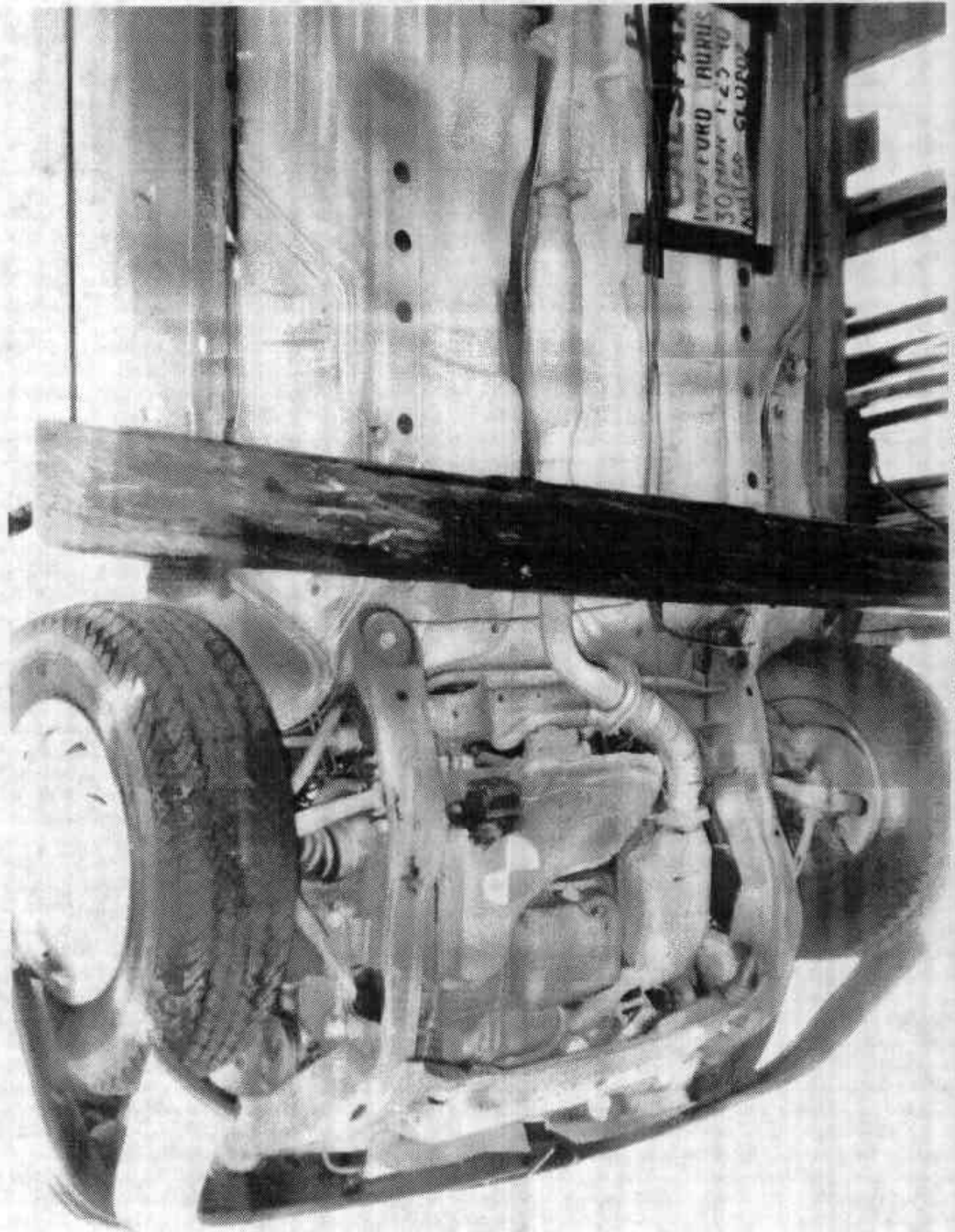
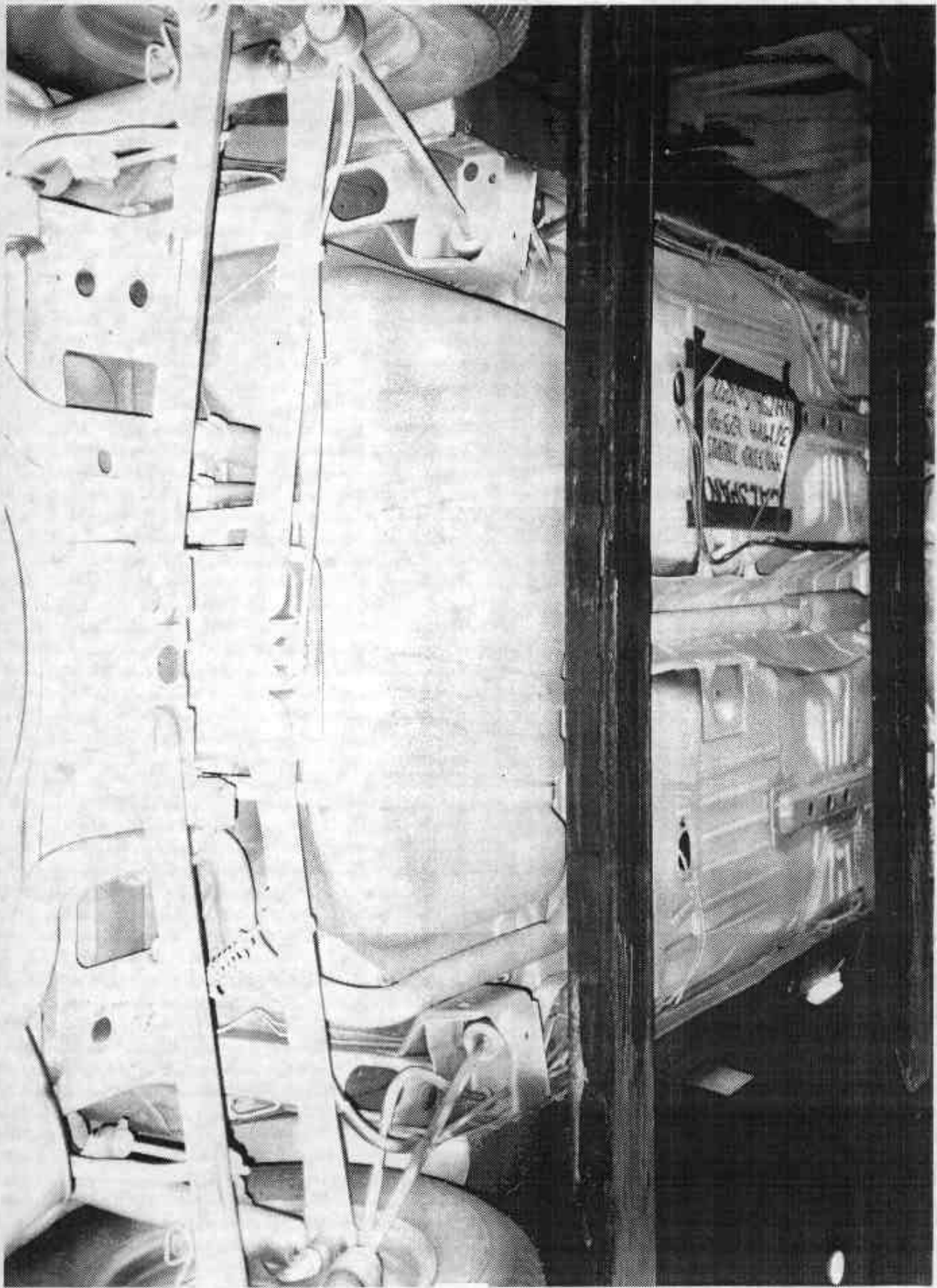


FIGURE A-21 POST-TEST FRONT SIDE UNDERBODY VIEW



A-24

7804-4

FIGURE A-22 PRE-TEST REAR UNDERBODY VIEW

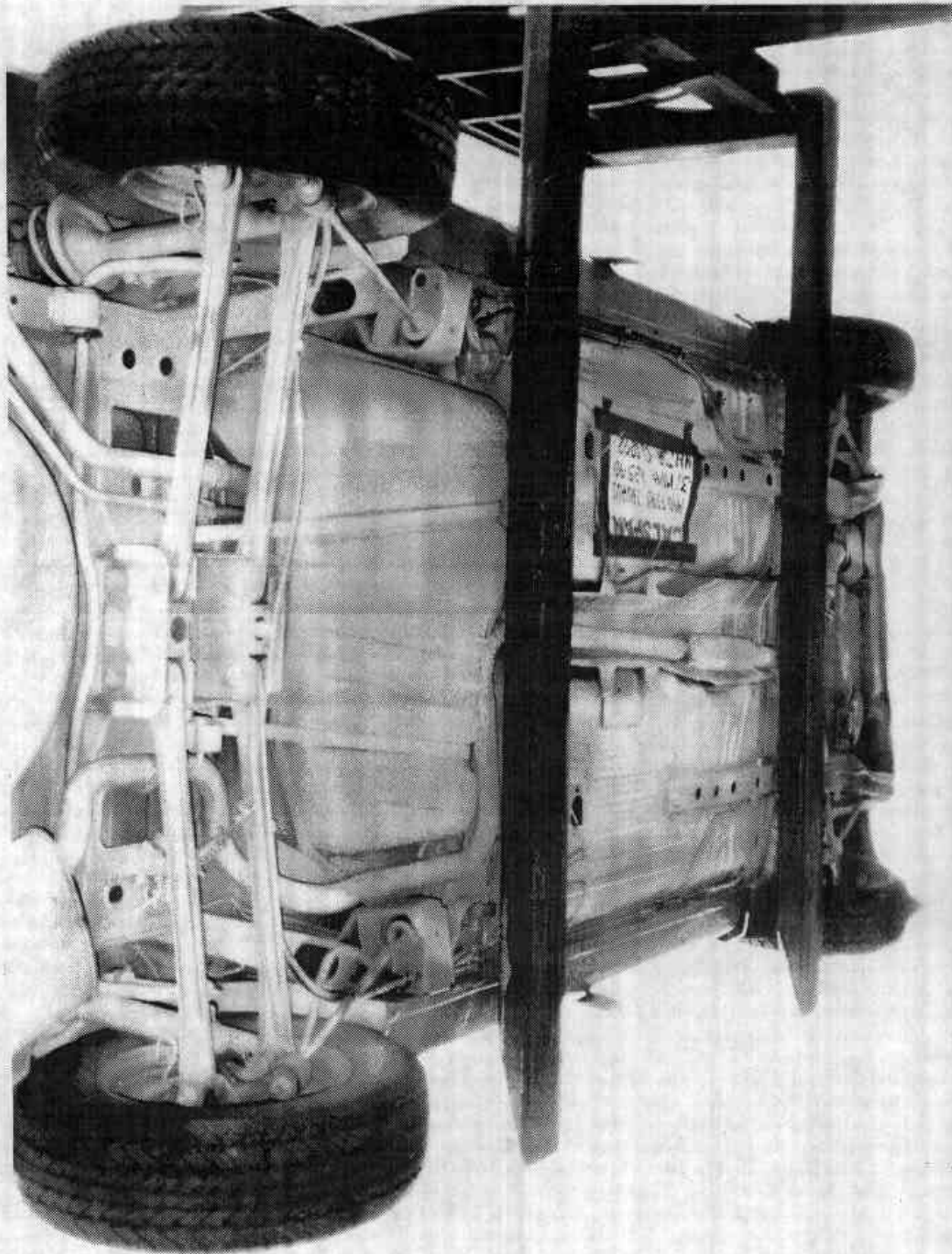


FIGURE A-23 .POST-TEST REAR UNDERBODY VIEW

A-23

7804-4

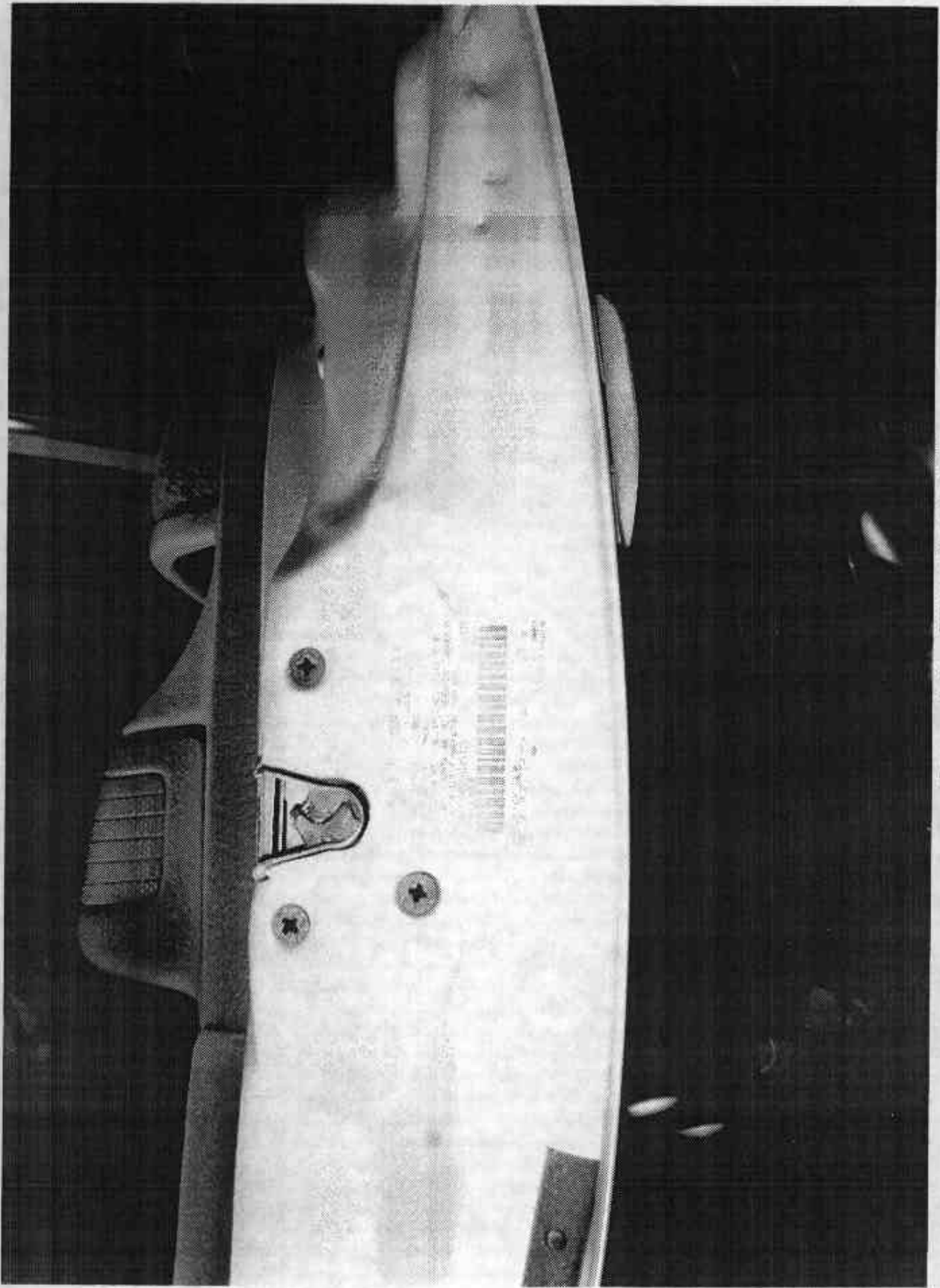


Figure A-24 CERTIFICATION LABEL

A-26

7804-4

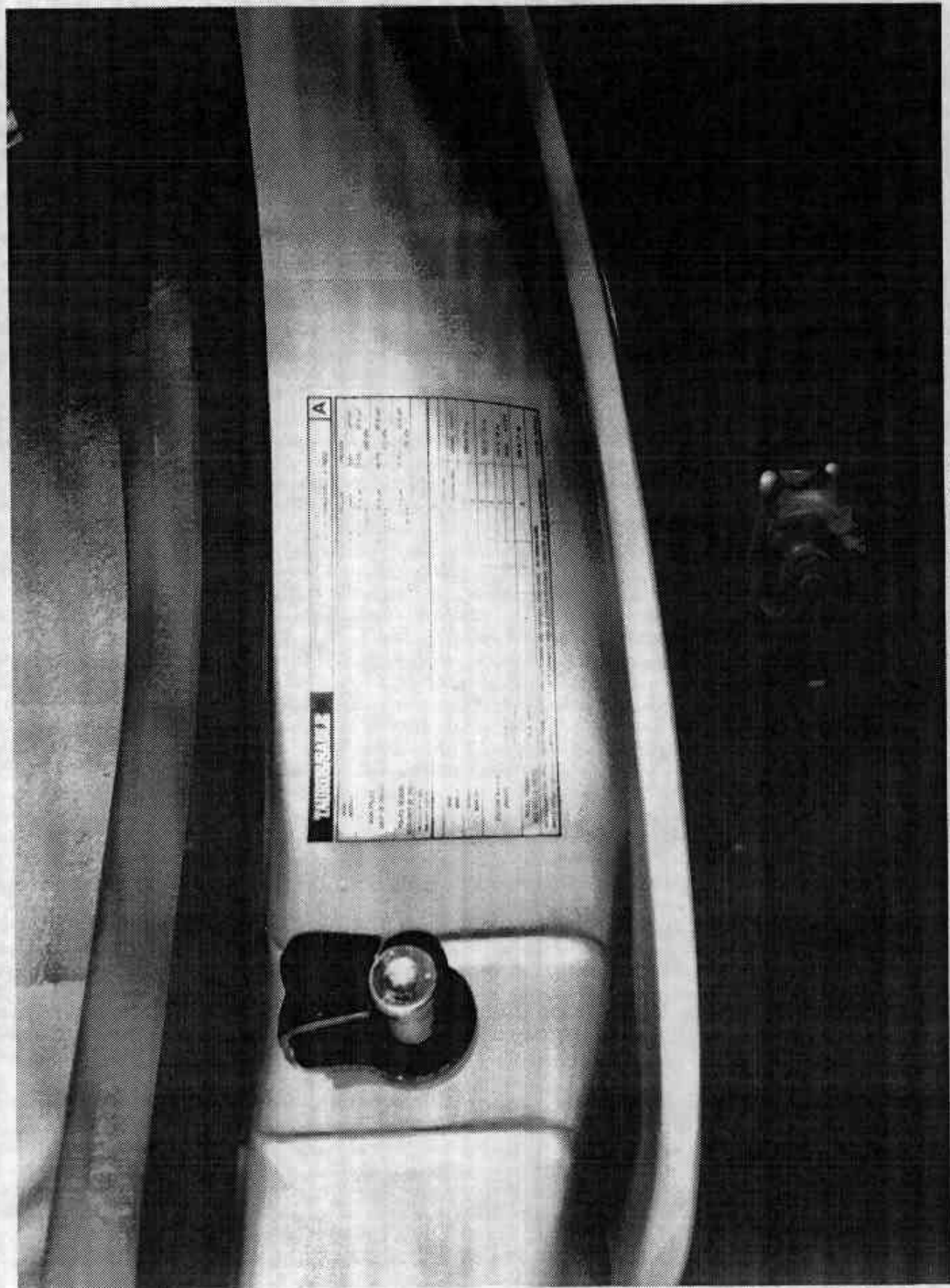


Figure A-25. TIRE PLACARD

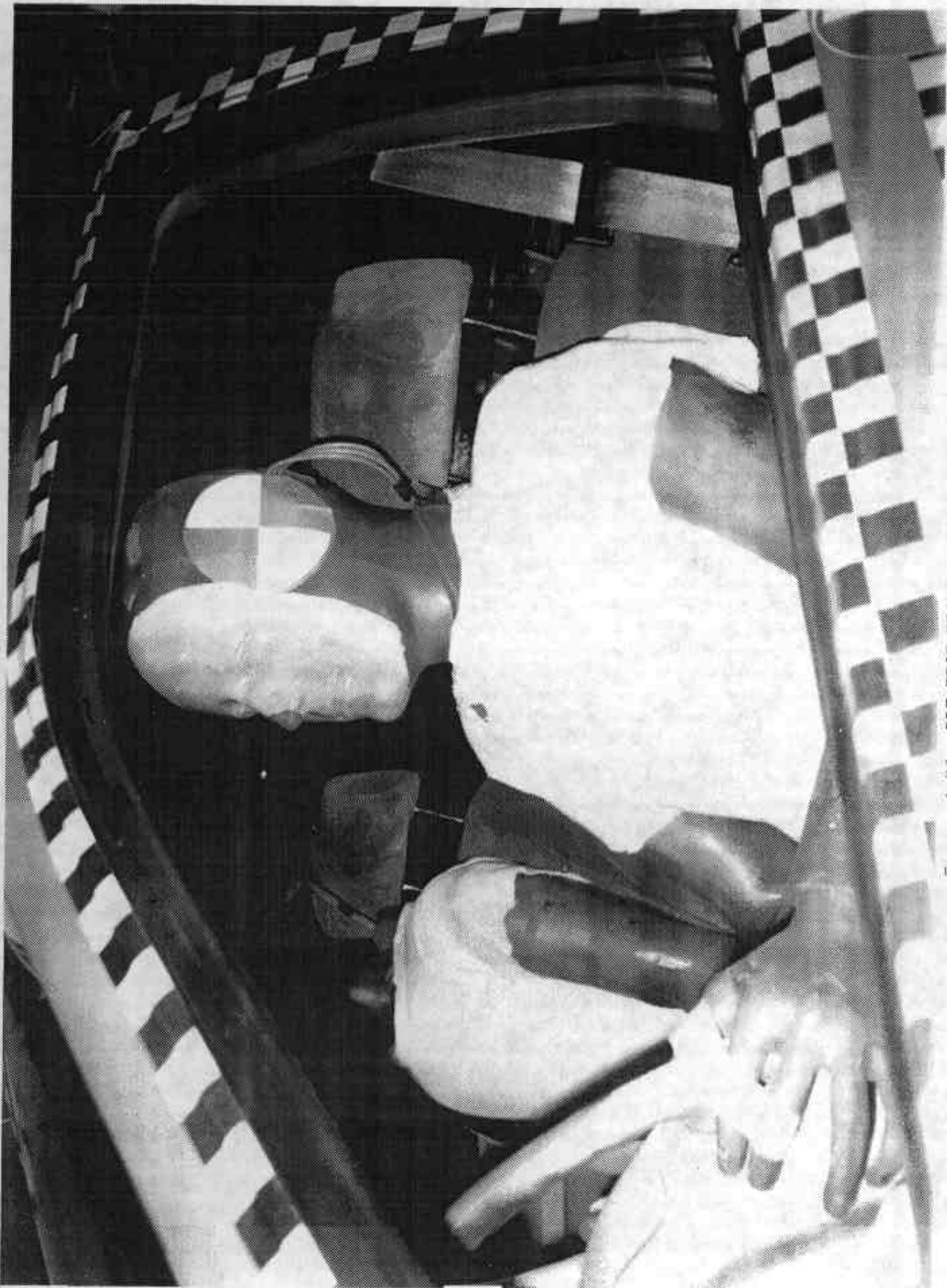


FIGURE A-26 PRE-TEST DRIVER DUMMY POSITION

A-28

7804-4



Figure A-27 POST-TEST DRIVER DUMMY POSITION

A-29

7804-4



FIGURE A-28 PRE-TEST PASSENGER DUMMY POSITION

A-30

7804-4



FIGURE A-20 POST-TEST PASSENGER DUMMY POSITION

A-31



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

A-32

7804-4



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

A-33

7804-4



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

A-34

7804-4



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

A-35

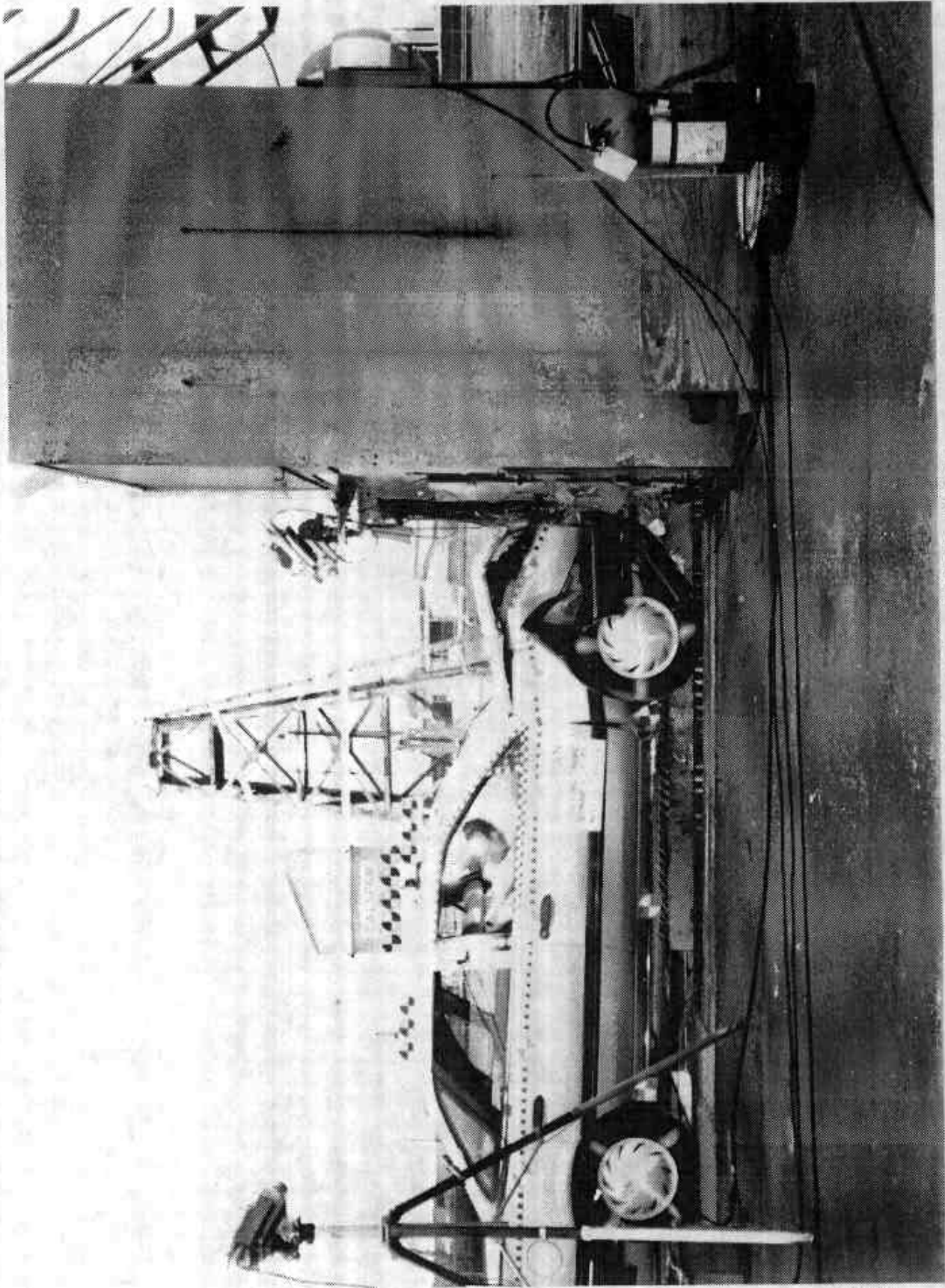
7804-4



FIGURE A-34 POST-TEST DRIVER AIRBAG VIEW

A-36

7804-4



A-37

7804-4

FIGURE A-35 VEHICLE IMPACT

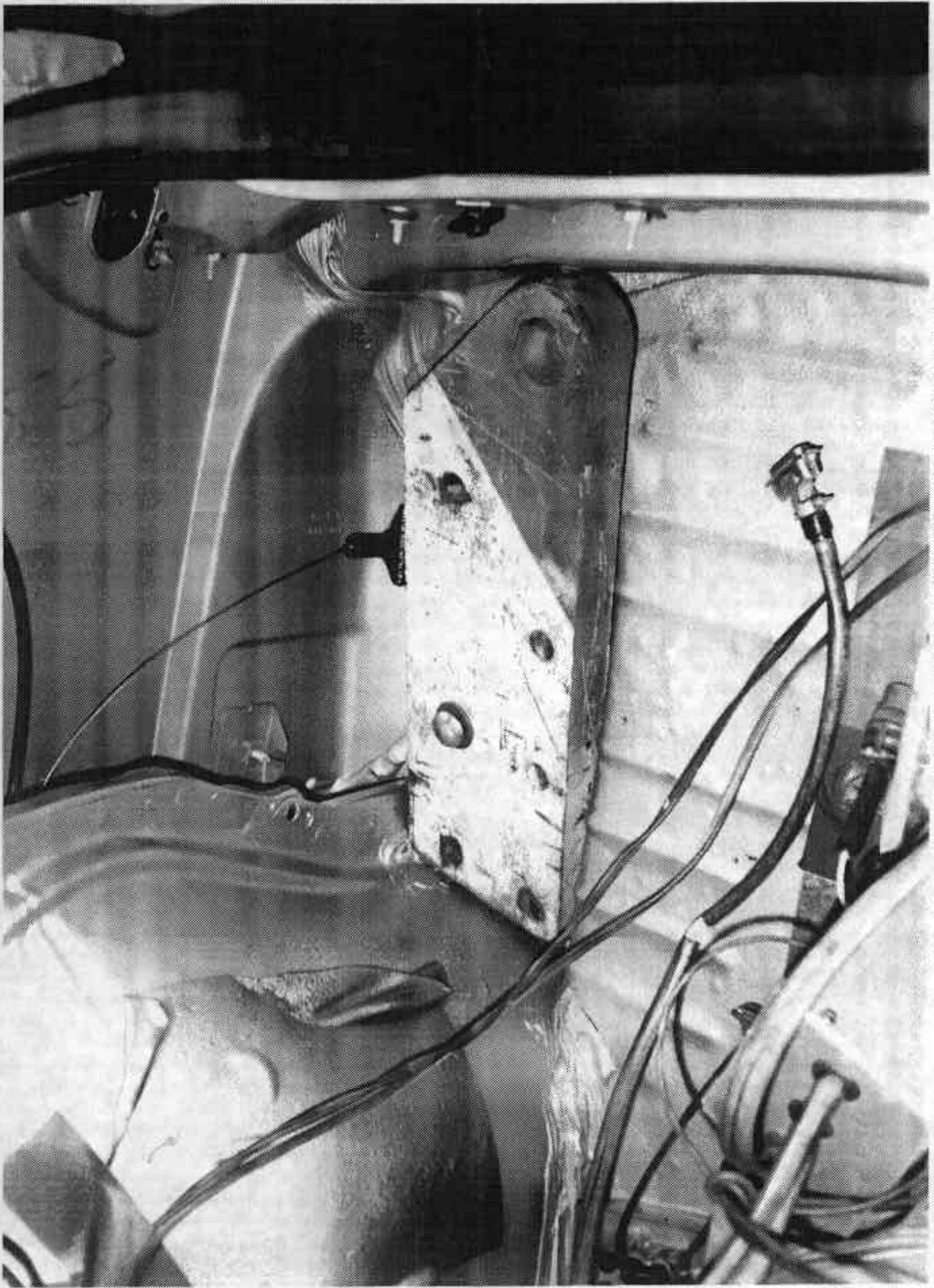


Figure A-36 BALLAST LOCATED IN RIGHT REAR TRUNK COMPARTMENT

A-38

7804-1

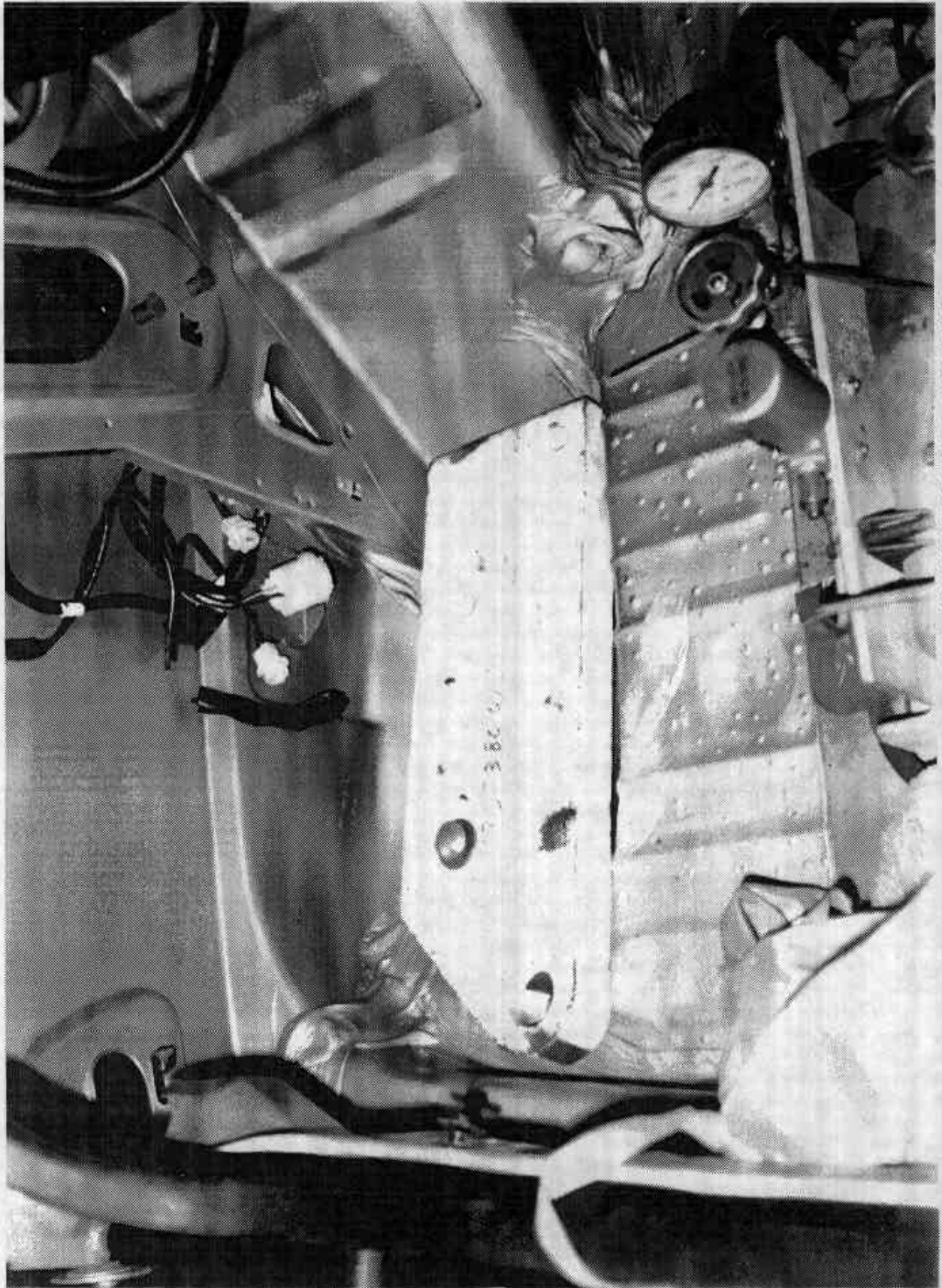


FIGURE A-37 BALLAST LOCATED IN LEFT REAR TRUNK COMPARTMENT

A-39

7804-4

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CLO203

VEHICLE DATA

FILTER CHANNEL CLASS

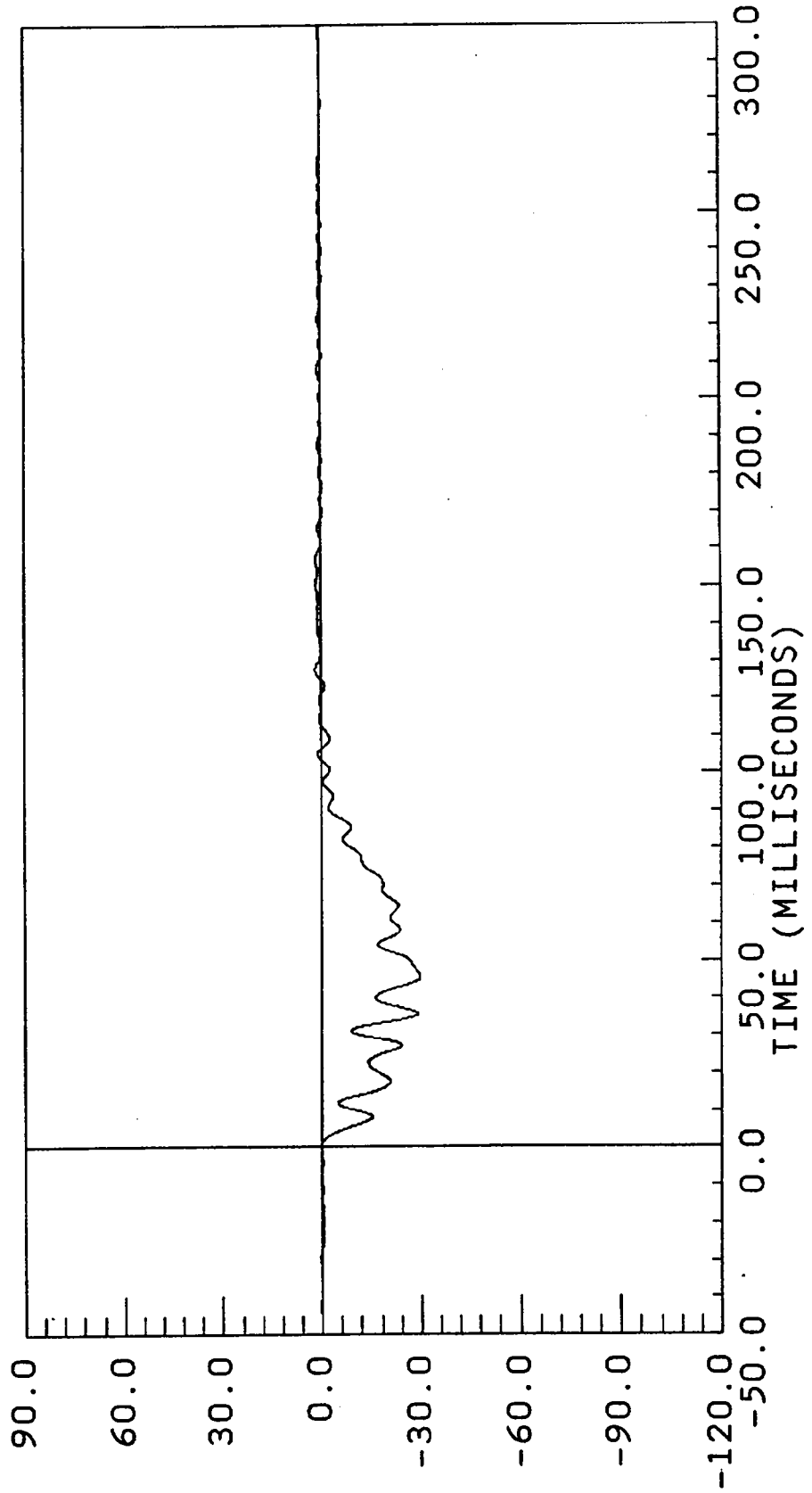
60

29.50 mph

ACC PACK #1(X)  
FILTERED  
FILTER CUTOFF: 100HZ

XL AXIS

YMIN = -29.80362 at 45.82500  
YMAX = 1.865650 at 127.8000

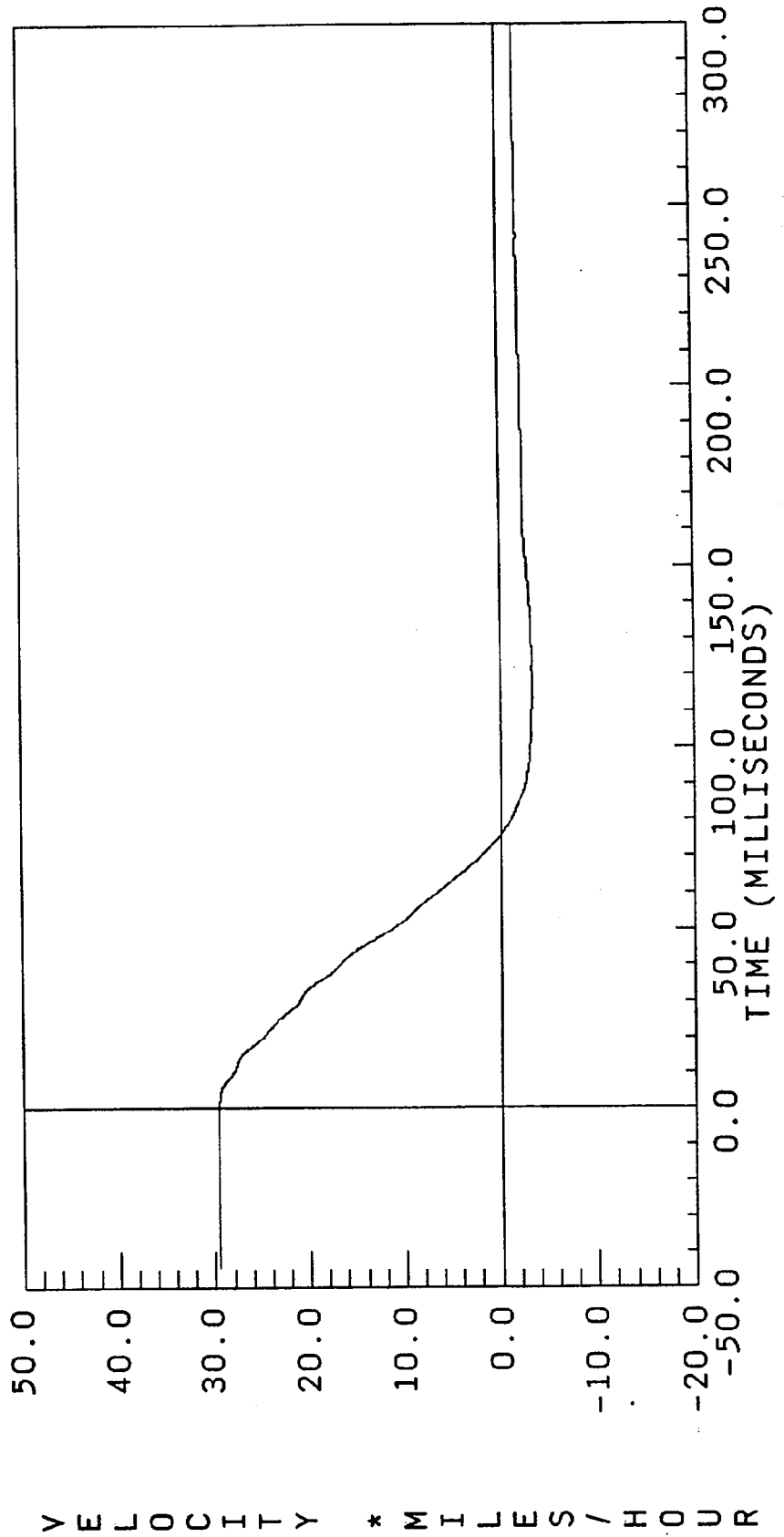


ACCELERATION \* G \* S \*

V955-17.DAT

29.50 mph

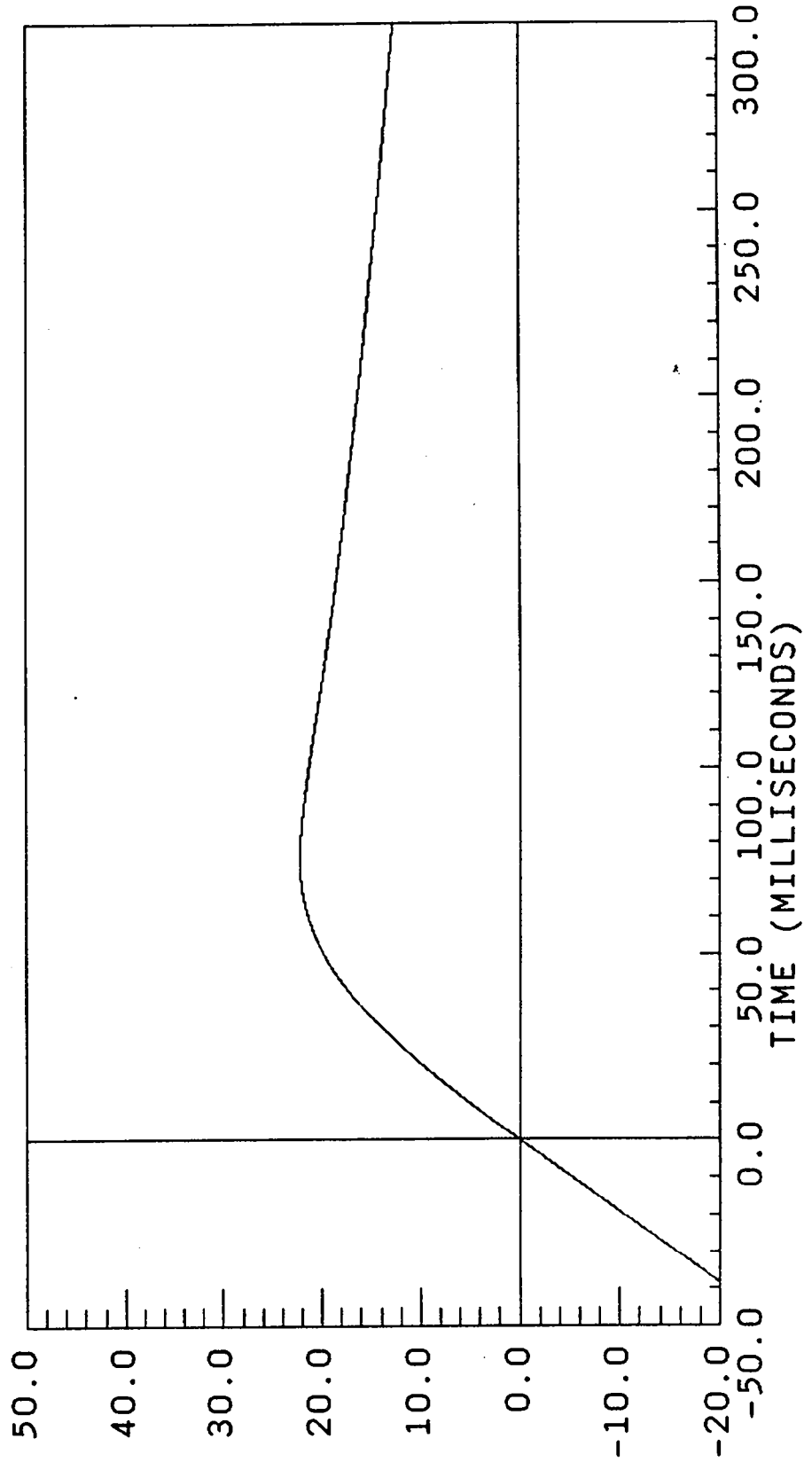
ACC PACK #1(X)  
COMPUTED  
FILTER CUTOFF: 100Hz  
XL AXIS  
YMIN = -3.354127 at 113.0250  
YMAX = 29.52550 at -27.45000



29.50 mph

ACC PACK #1(X)  
COMPUTED  
FILTER CUTOFF: 100HZ

XL AXIS  
YMIN = -23.36230 at 113.0250  
YMAX = 22.18109 at 75.60001

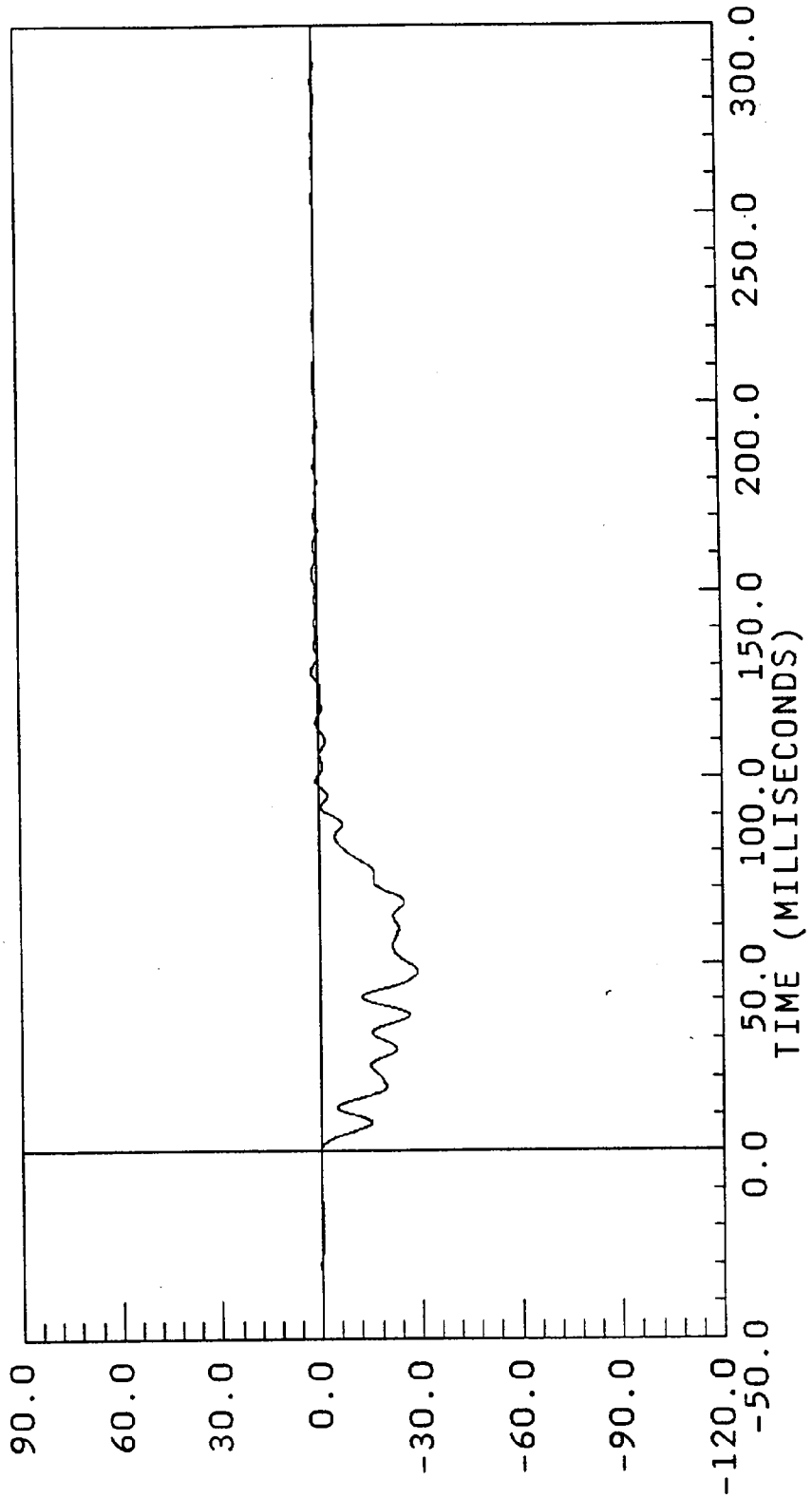


DISPLACEMENT \* INCHES

BW955-18.DAT

29.50 mph

ACC PACK #2(X) XL AXIS  
FILTERED YMIN = -29.25693 at 47.92500  
FILTER CUTOFF: 100HZ YMAX = 2.196325 at 128.4000

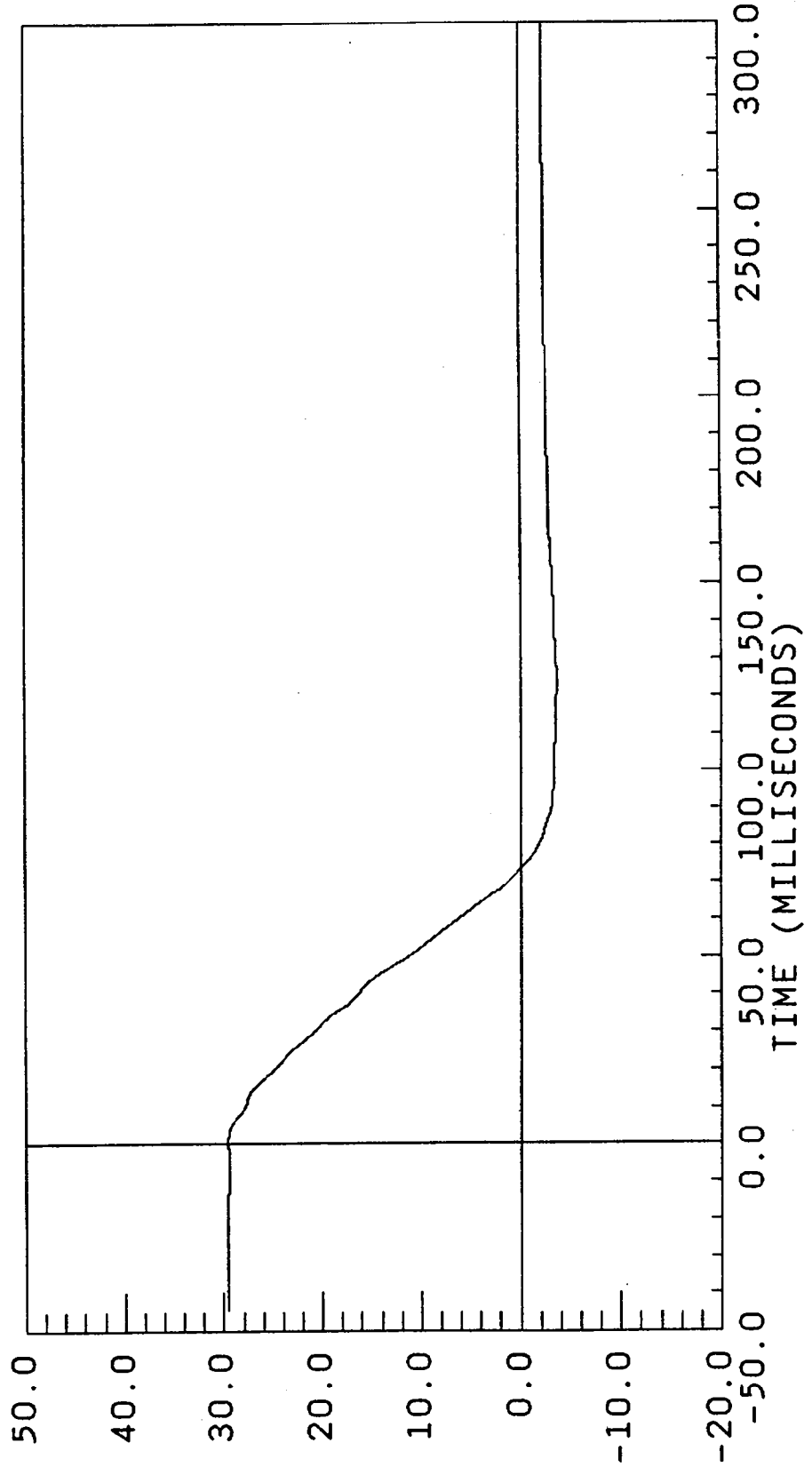


ACCELERATION \* G \* S \*

29.50 mph

ACC PACK #2(X)  
COMPUTED  
FILTER CUTOFF: 100HZ

XL AXIS  
YMIN = -3.662417 at 125.2500  
YMAX = 29.54818 at -28.27500

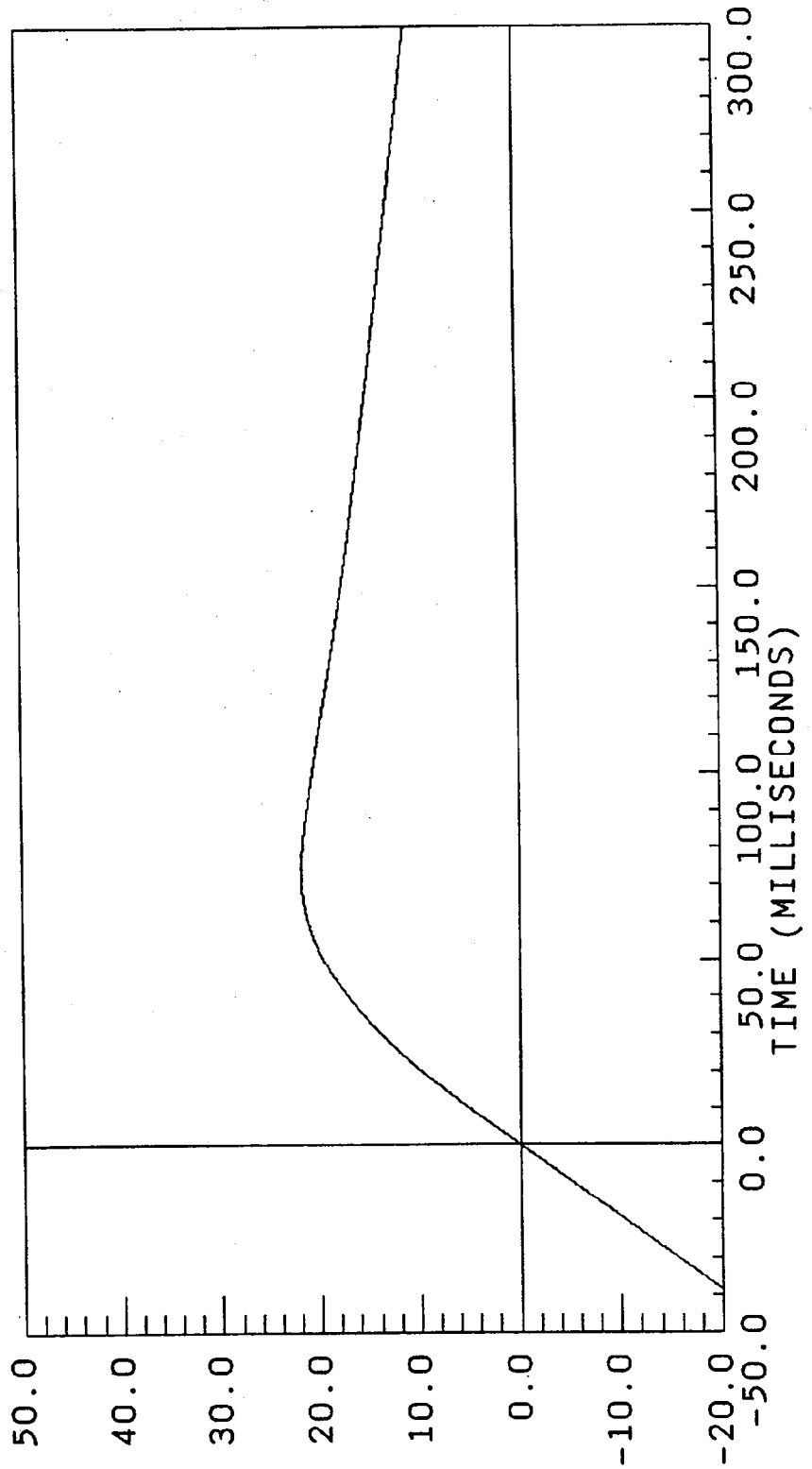


VELOCITY \* MILES / HOUR

D955-18.DAT

29.50 mph

ACC PACK #2(X)  
COMPUTED  
FILTER CUTOFF: 100Hz  
XL AXIS  
YMIN = -23.35206 at 125.2500  
YMAX = 21.85320 at 73.42500

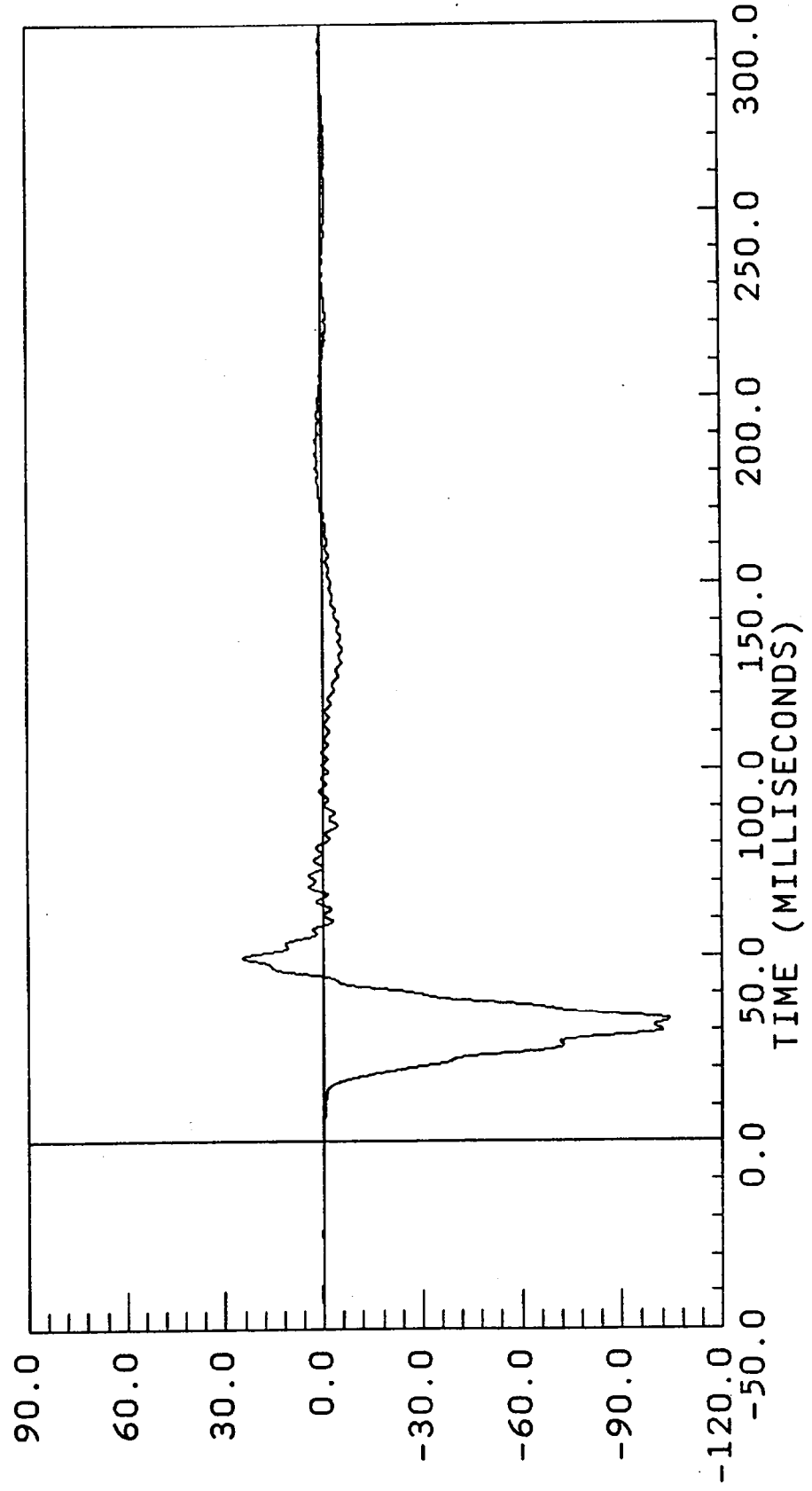


DISPLACEMENT \* INCHES

29.50 mph

ACC PACK #3(X)  
FILTERED  
FILTER CUTOFF: 100HZ

XL AXIS  
YMIN = -104.2860 at 32.70000  
YMAX = 24.57414 at 49.72500

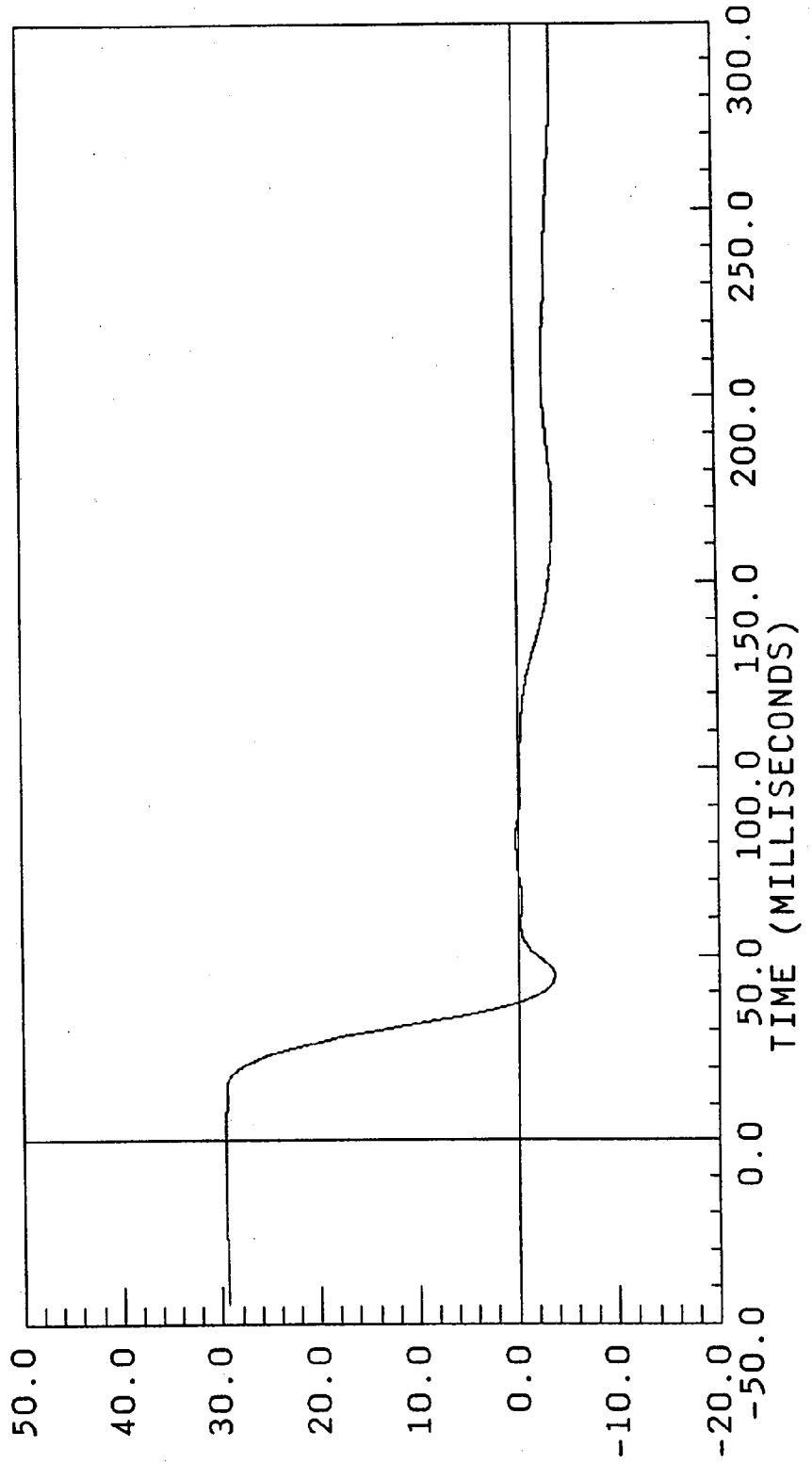


ACCELERATION \* G S \*

V955-19.DAT

29.50 mph

ACC PACK #3(X)  
COMPUTED  
FILTER CUTOFF: 100HZ  
XL AXIS  
YMIN = -3.856259 at 284.1000  
YMAX = 29.41659 at -21.22500

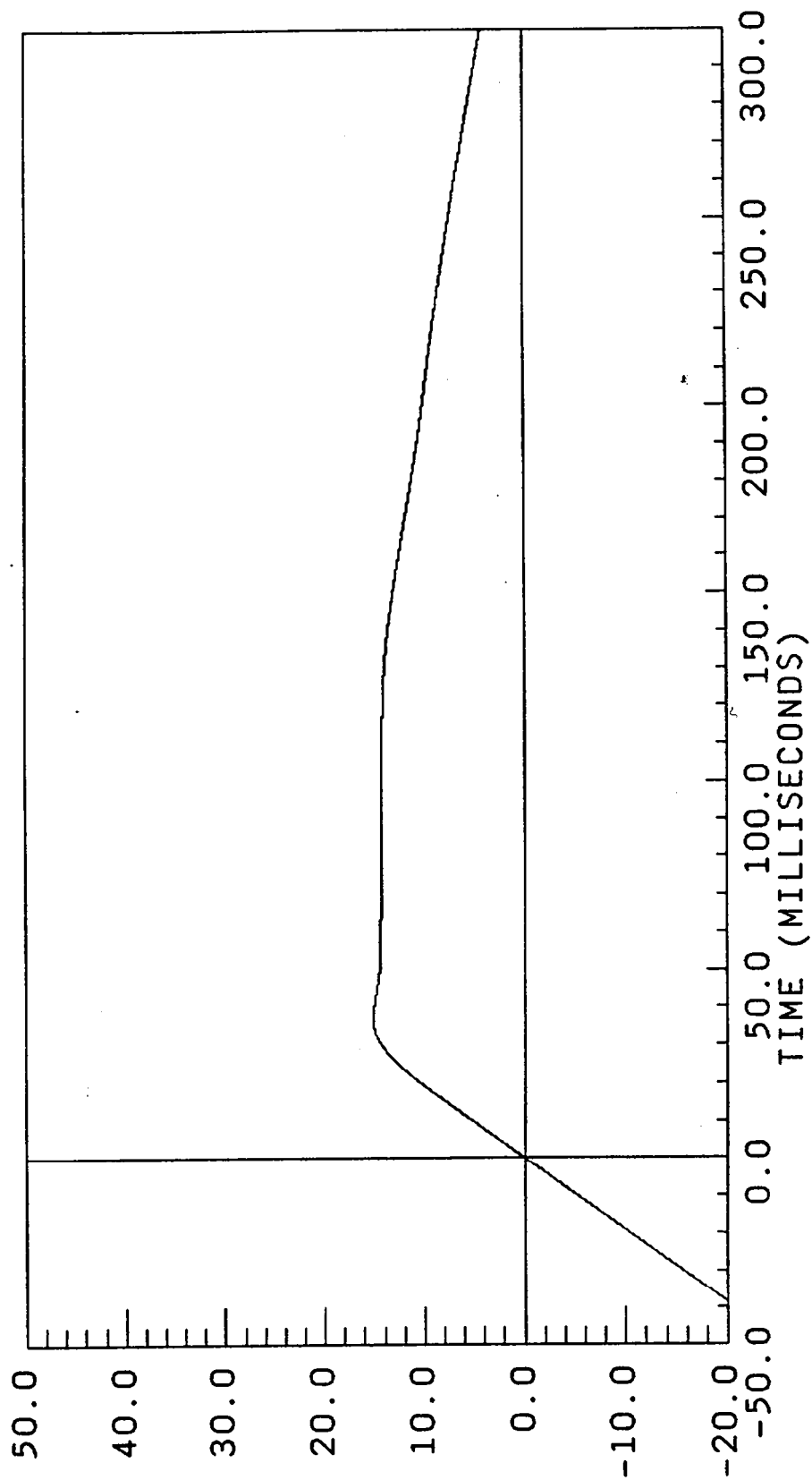


VELOCITY \* MILES / HOUR

29.50 mph

ACC PACK #3(X)  
COMPUTED  
FILTER CUTOFF: 100HZ

XL AXIS  
YMIN = -23.31882 at 284.1000  
YMAX = 15.09815 at 37.27500

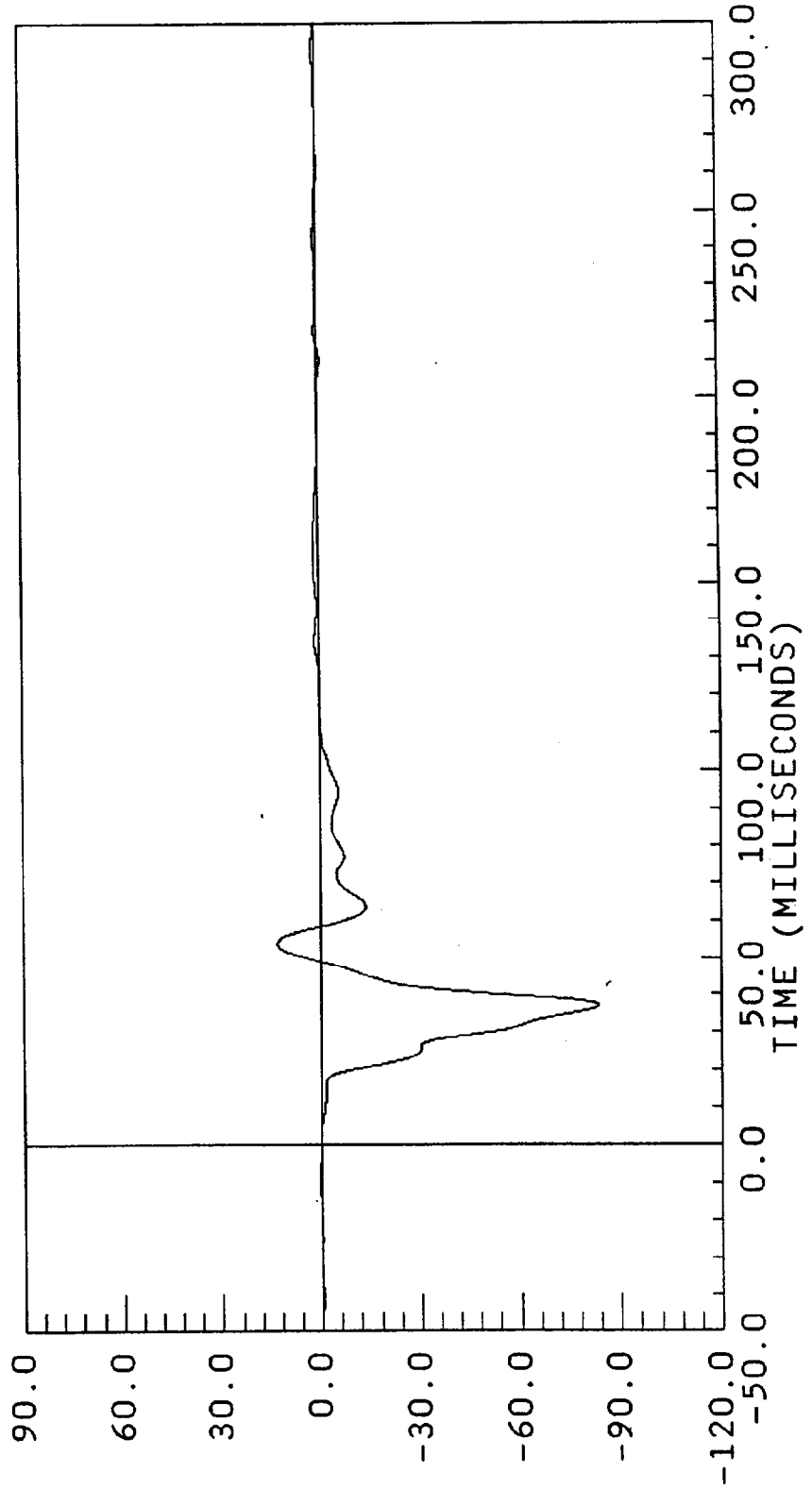


DISPLACEMENT \* INCHES

BW955-20.DAT

29.50 mph

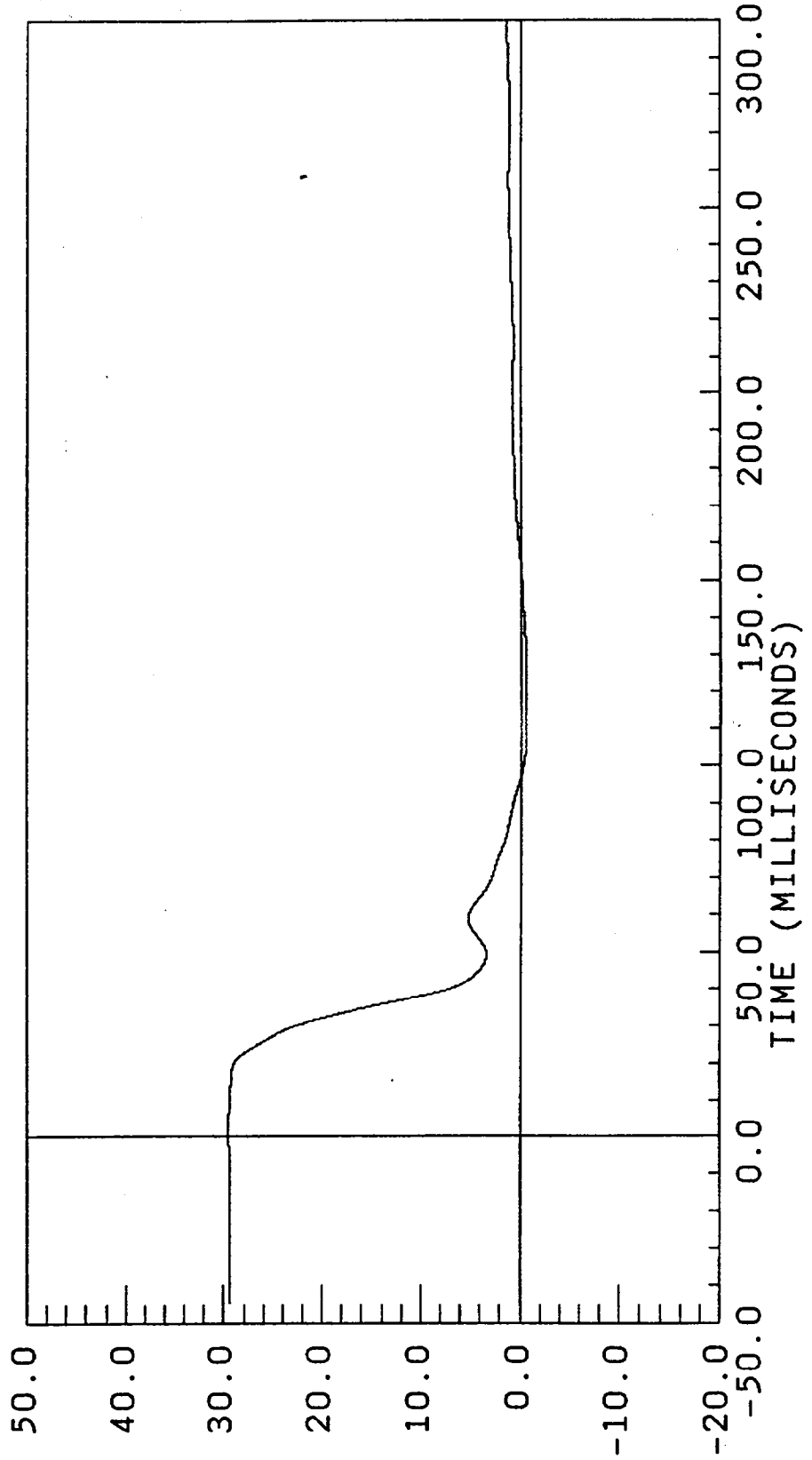
ACC PACK #4(X)  
FILTERED  
FILTER CUTOFF: 100HZ  
XL AXIS  
YMIN = -83.59010 at 37.12500  
YMAX = 13.20865 at 54.07500



29.50 mph

ACC PACK #4(X)  
COMPUTED  
FILTER CUTOFF: 100HZ

XL AXIS  
YMIN = -0.645071 at 117.3750  
YMAX = 29.50175 at 1.875000

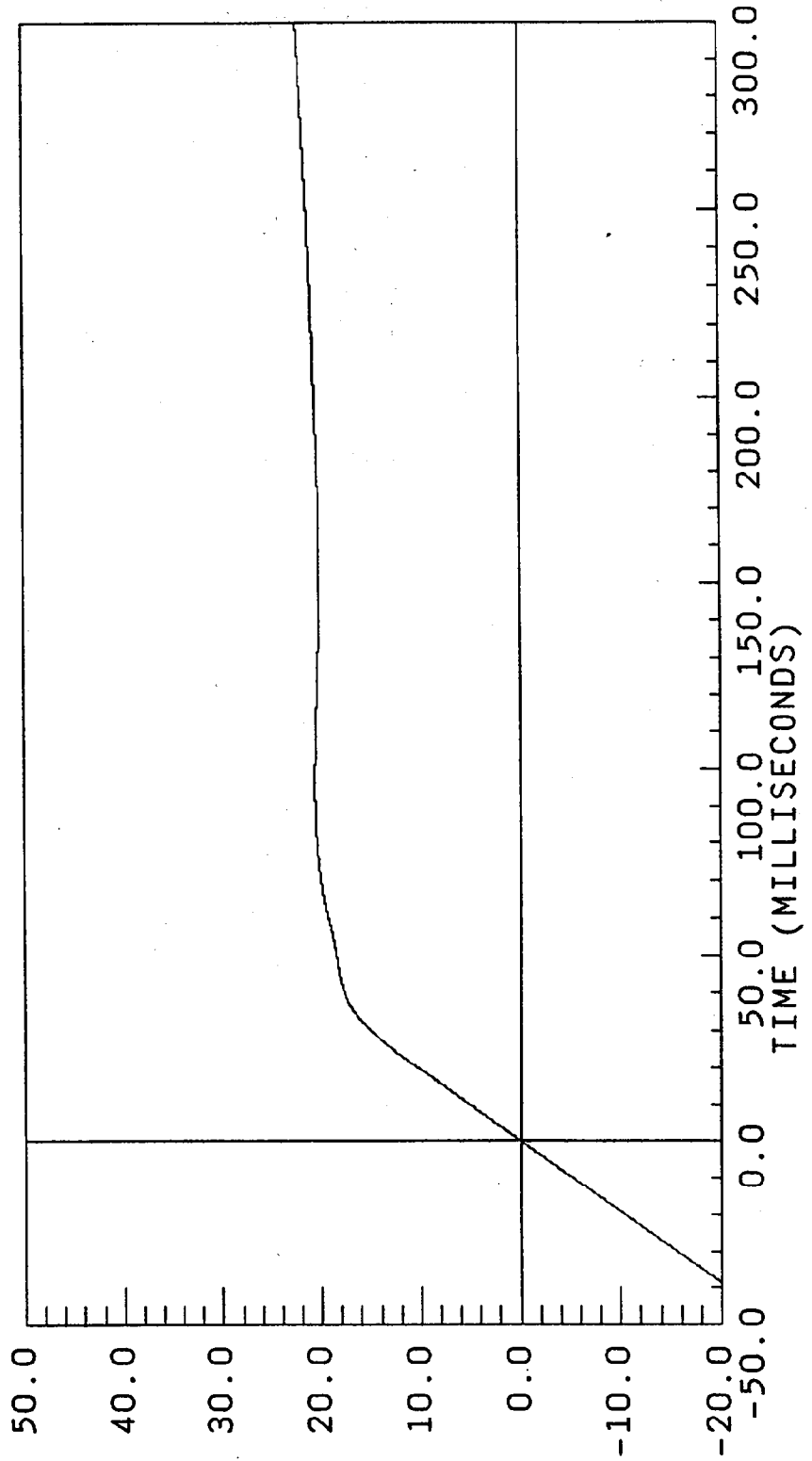


VELOCITY \* MILES / HOUR

D955-20.DAT

29.50 mph

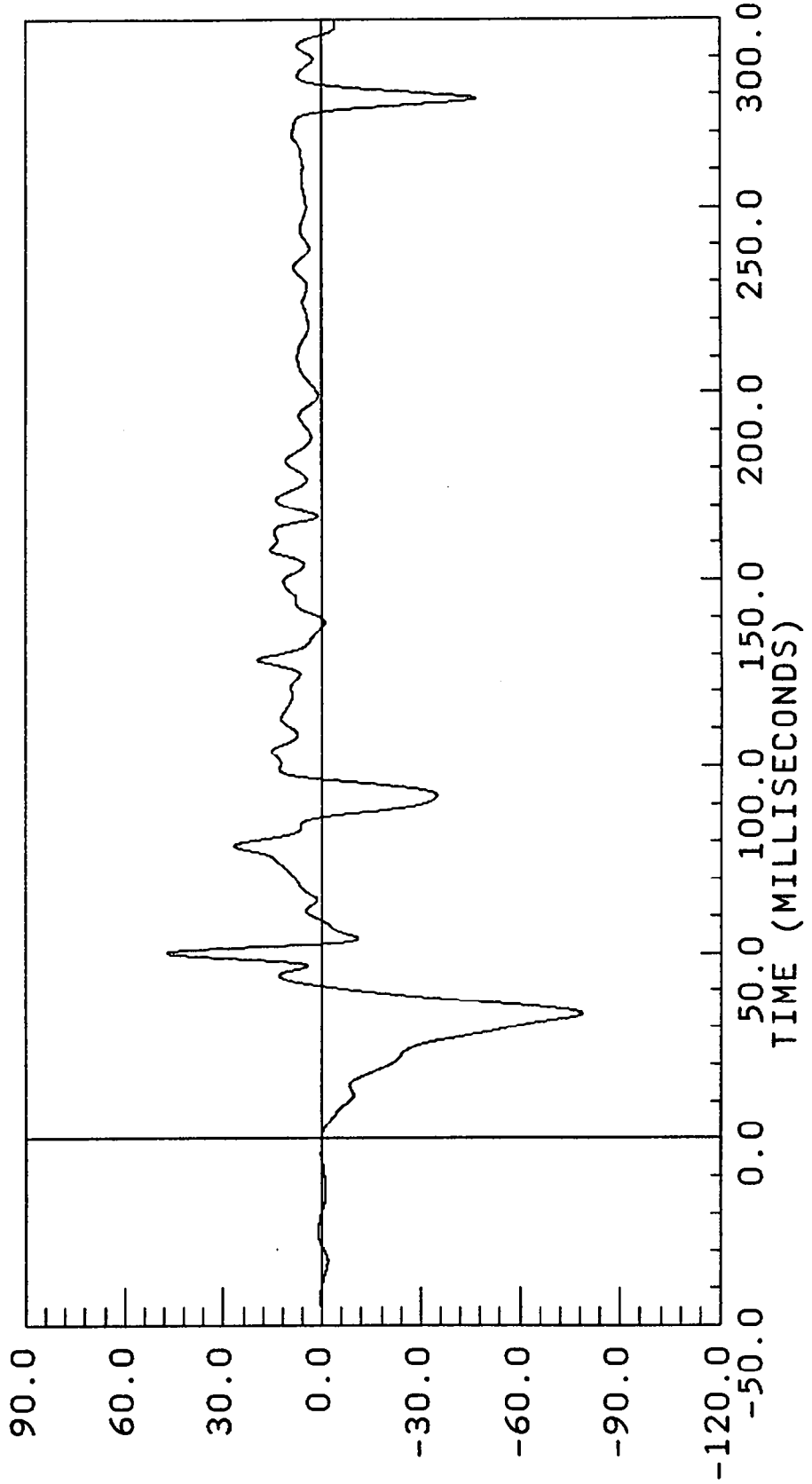
ACC PACK #4(X) XL AXIS  
COMPUTED YMIN = -23.25410 at 117.3750  
FILTER CUTOFF: 100HZ YMAX = 22.30457 at 300.0000



DISPLACEMENT \* INCHES

29.50 mph

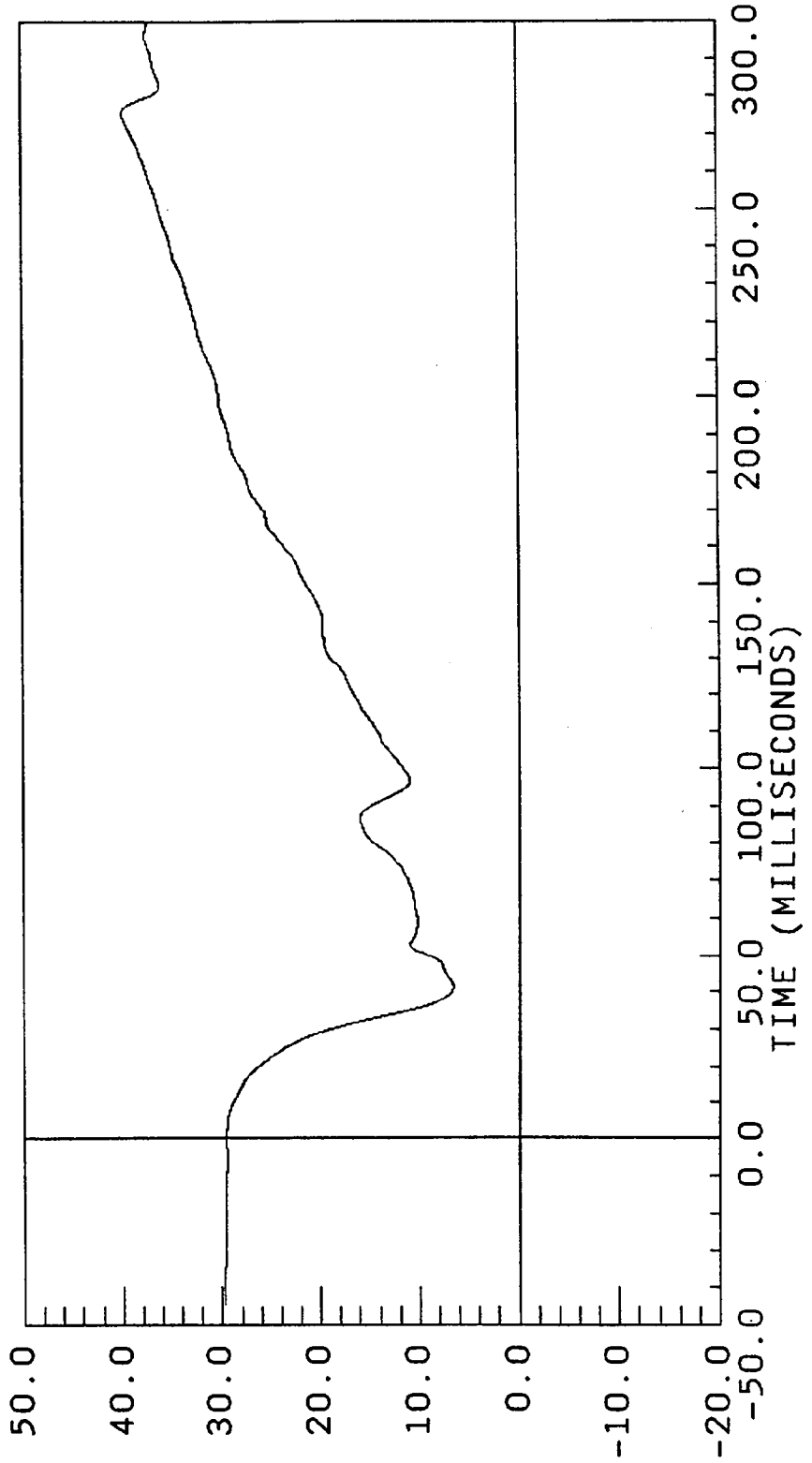
ACC PACK #5(X) XL AXIS  
FILTERED YMIN = -78.87079 at 33.52500  
FILTER CUTOFF: 100HZ YMAX = 47.15711 at 50.40000  
ACCELEROMETER EXPERIENCED CUT WIRE AT APPROX. 37 MSEC.



V955-21.DAT

29.50 mph

ACC PACK #5(X) XL AXIS  
COMPUTED YMIN = 6.567957 at 41.32500  
FILTER CUTOFF: 100HZ YMAX = 39.79283 at 275.6250  
ACCELEROMETER EXPERIENCED CUT WIRE AT APPROX. 37 MSEC.

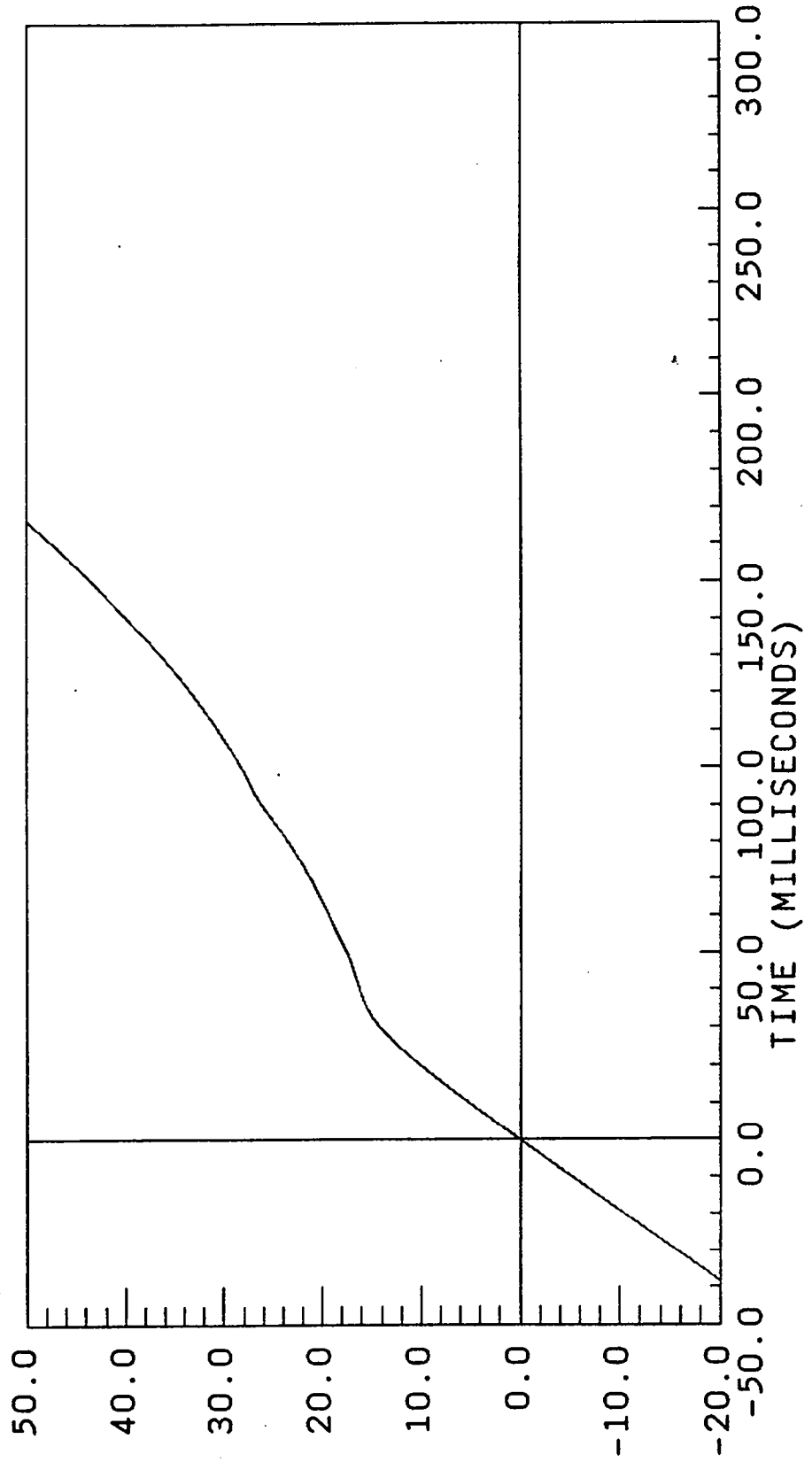


VELOCITY \* MILES / HOUR

29.50 mph

ACC PACK #5(X)  
COMPUTED  
FILTER CUTOFF: 100Hz  
ACCELEROMETER EXPERIENCED CUT WIRE AT APPROX. 37 MSEC.

XL AXIS  
YMIN = -23.39514 at 41.32500  
YMAX = 128.7031 at 300.0000

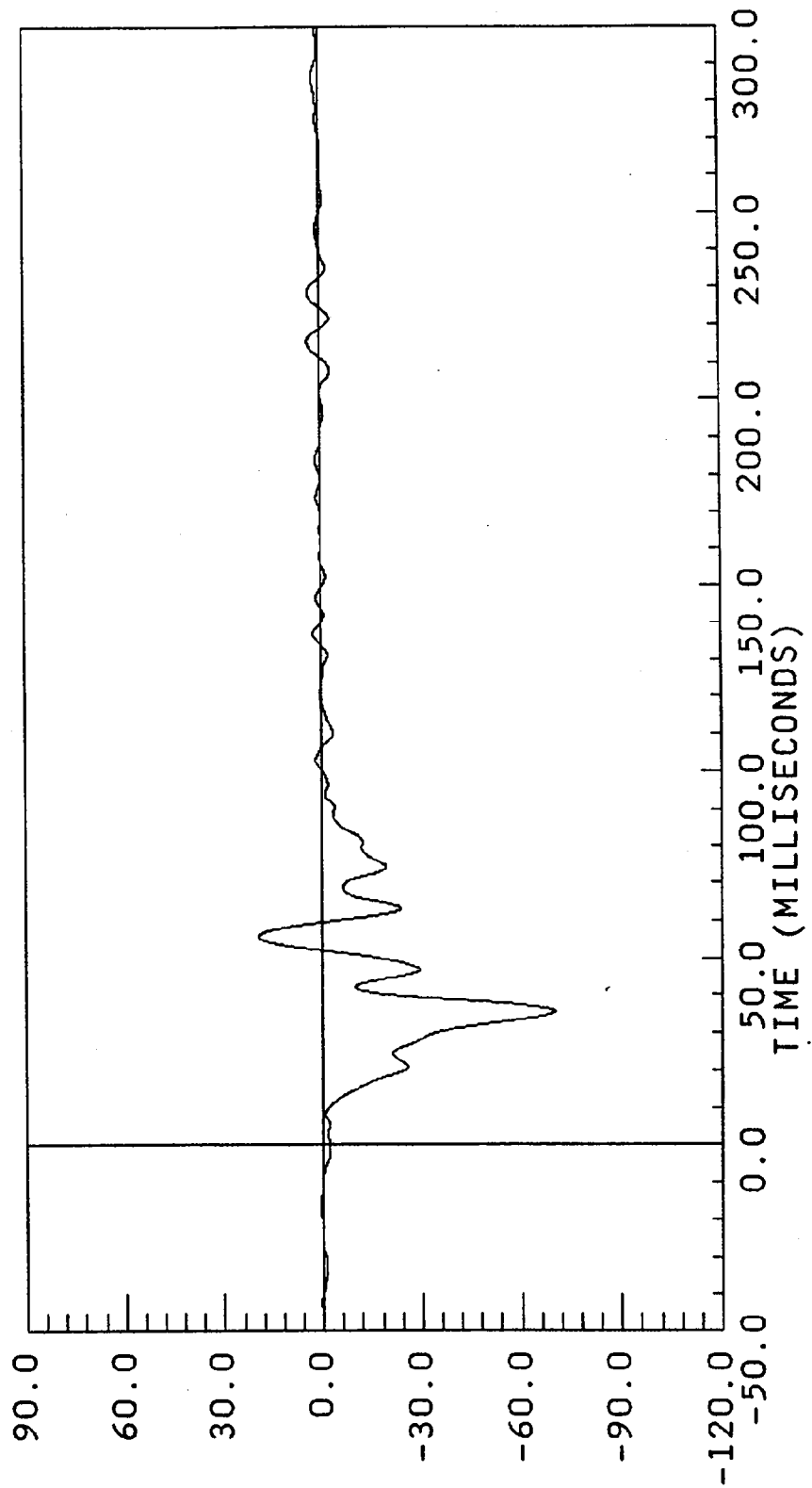


DISPLACEMENT \* INCHES

BW955-22.DAT

29.50 mph

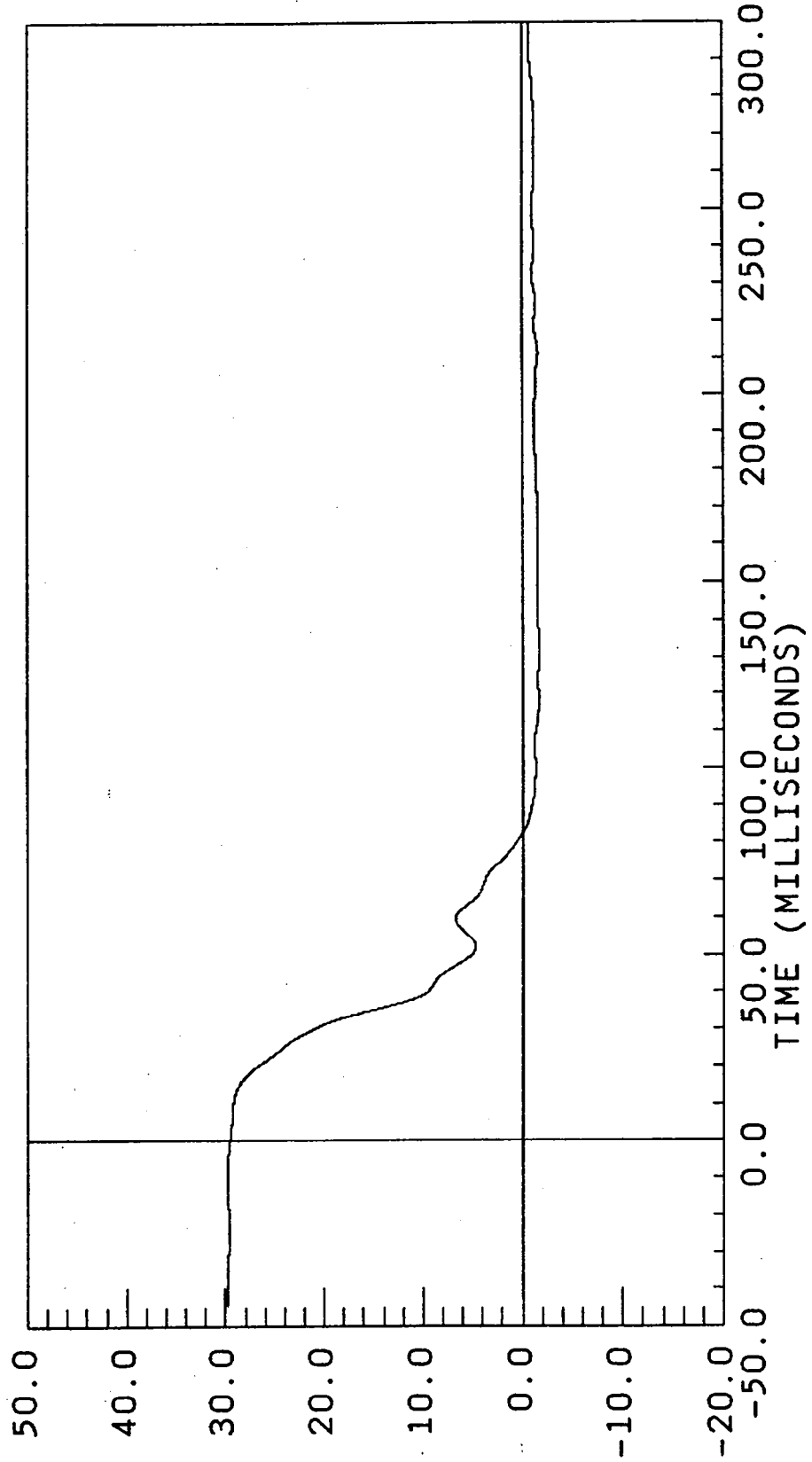
ACC PACK #6(X)                    XL AXIS  
FILTERED                            YMIN = -70.00215 at 35.62500  
FILTER CUTOFF: 100HZ               YMAX = 19.50442 at 55.80000



ACCELERATION \* G \* S \*

29.50 mph

ACC PACK #6(X) XL AXIS  
COMPUTED YMIN = -1.796481 at 133.6500  
FILTER CUTOFF: 100HZ YMAX = 29.77052 at -39.90000

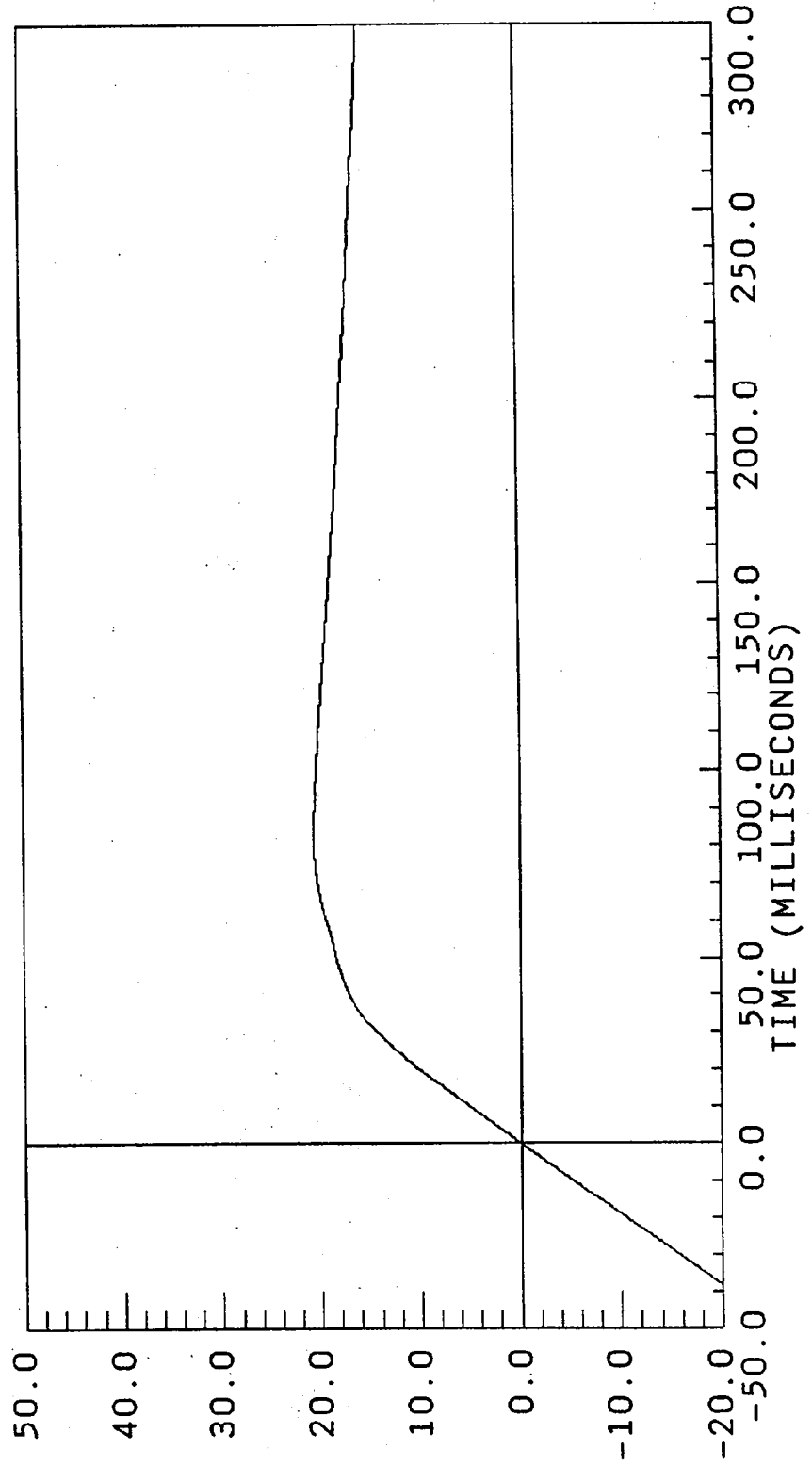


VELOCITY \* MILES / HOUR

D955-22.DAT

29.50 mph

ACC PACK #6(X)  
COMPUTED  
FILTER CUTOFF: 100HZ  
XL AXIS  
YMIN = -23.47826 at 133.6500  
YMAX = 20.67373 at 82.27500

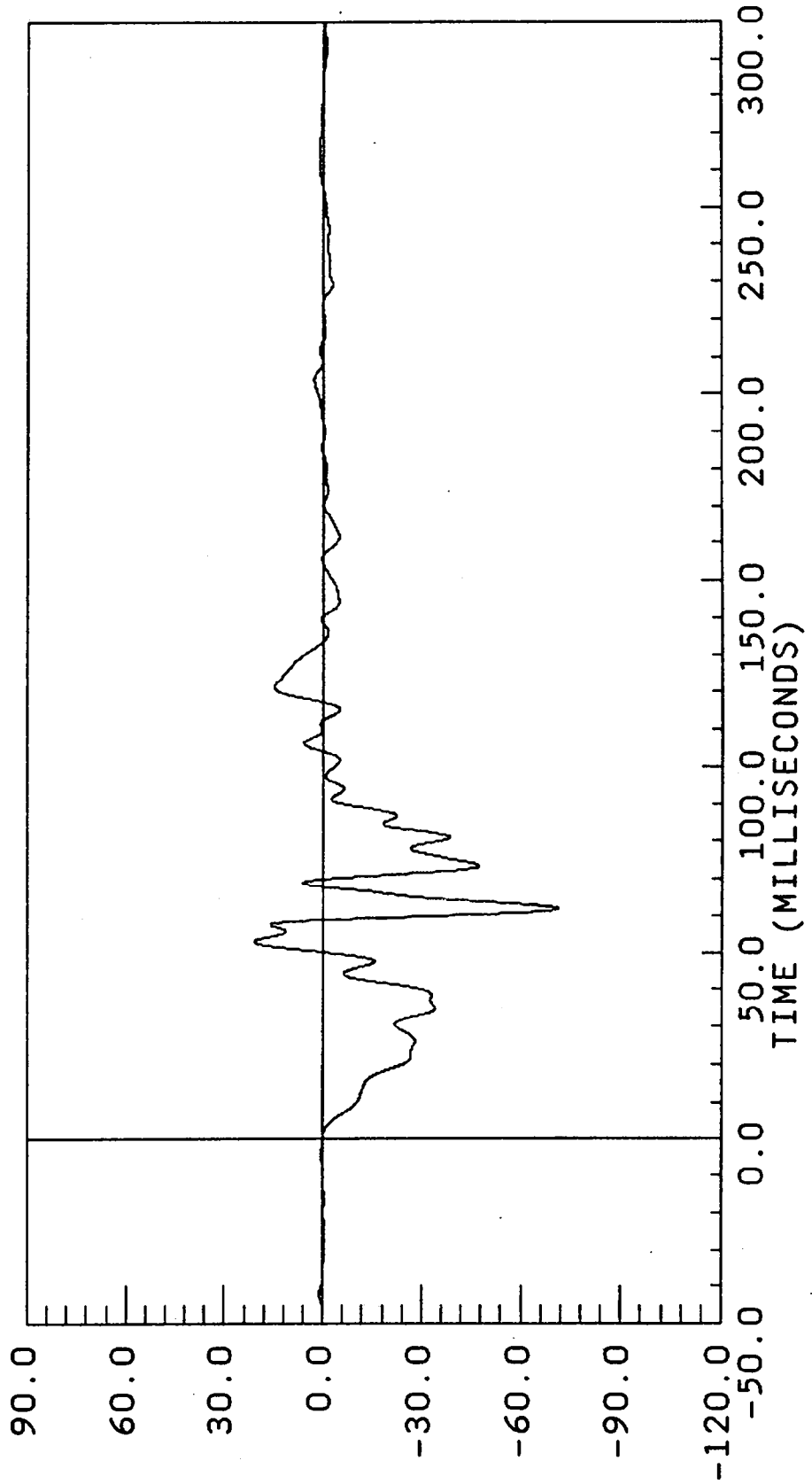


DISPLACEMENT \* INCHES

29.50 mph

ACC PACK #7(X)  
FILTERED  
FILTER CUTOFF: 100HZ

XL AXIS  
YMIN = -71.24761 at 61.87500  
YMAX = 20.90898 at 53.10000

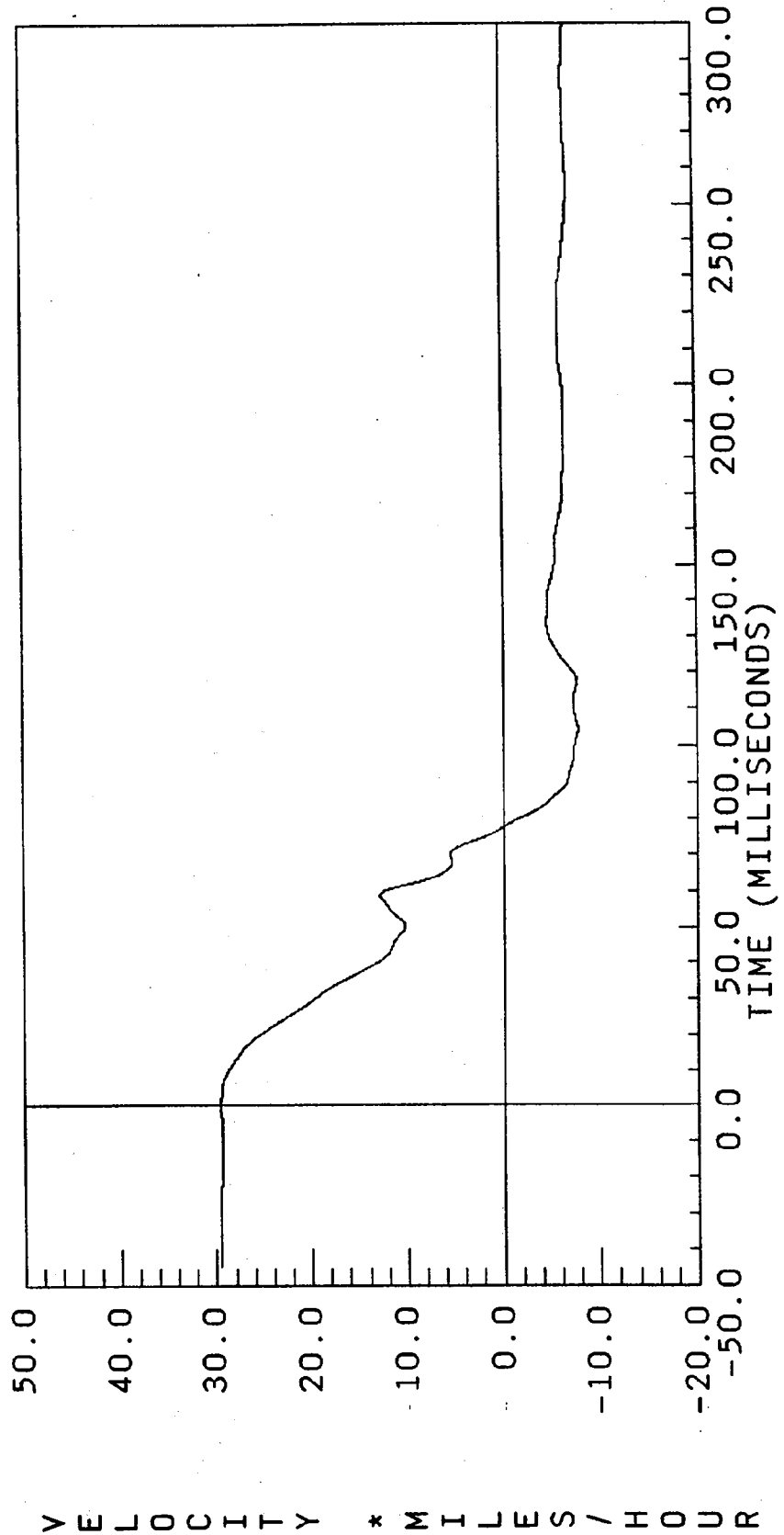


ACCELERATION \* G, S \*

V955-23.DAT

29.50 mph

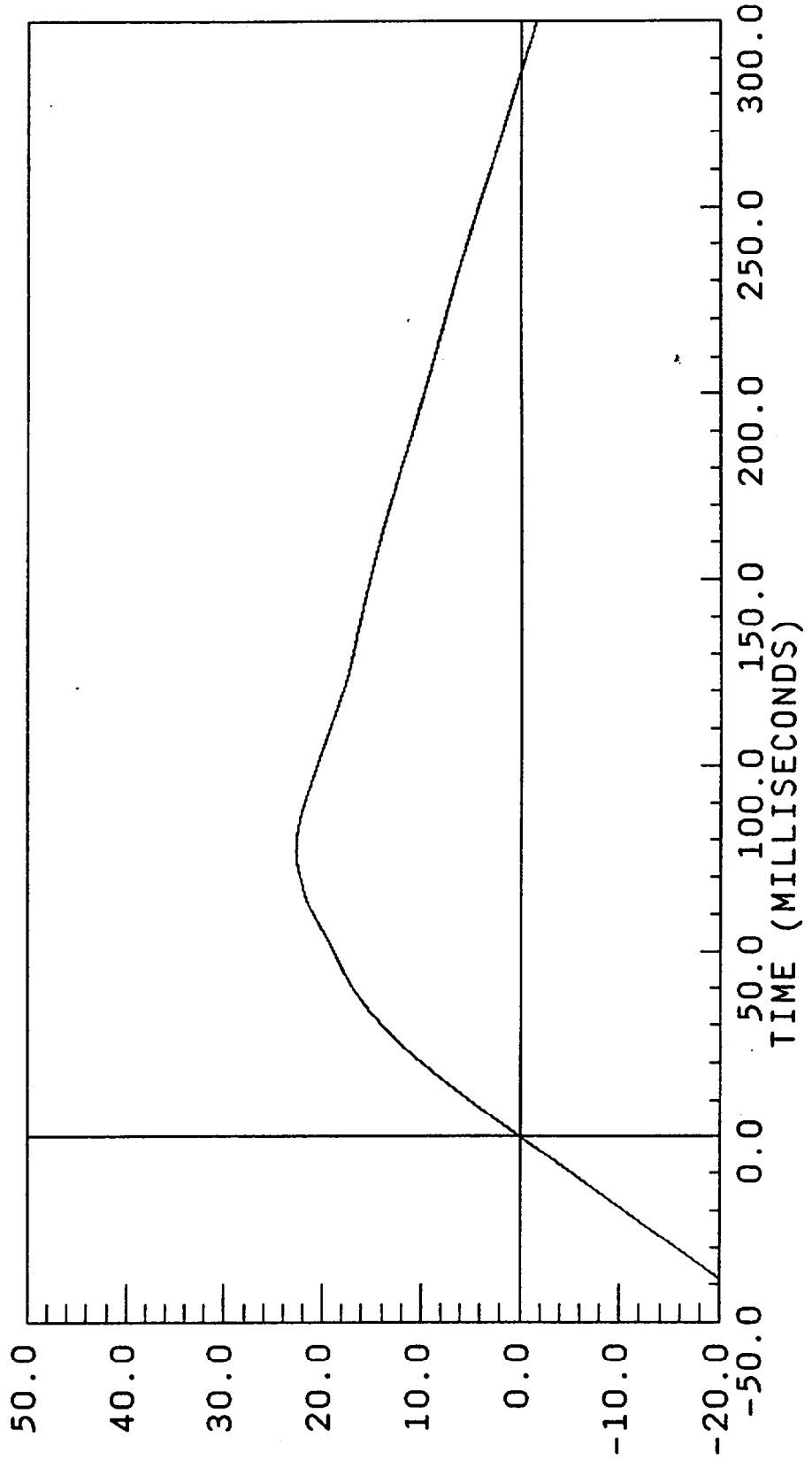
ACC PACK #7(X)  
COMPUTED  
FILTER CUTOFF: 100HZ  
XL AXIS  
YMIN = -7.760104 at 104.4000  
YMAX = 29.52199 at -34.57500



29.50 mph

ACC PACK #7(X)  
COMPUTED  
FILTER CUTOFF: 100HZ

XL AXIS  
YMIN = -23.34274 at 104.4000  
YMAX = 22.67970 at 77.62500



DISPLACEMENT \* INCHES

TEST NO. CLO203

DUMMY DATA

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

HEAD INJURY CRITERION  
HEAD SEVERITY INDEX  
36MS. MAXIMUM DURATION

NHTSA CRASH TEST - PROC. 208

PUN= 955

POS#1 HEAD R

HIC= 248.9 FROM T1= .05532 TO T2= 07305

AVERAGE ACCELERATION BETWEEN T1 AND T2= 46.75'S

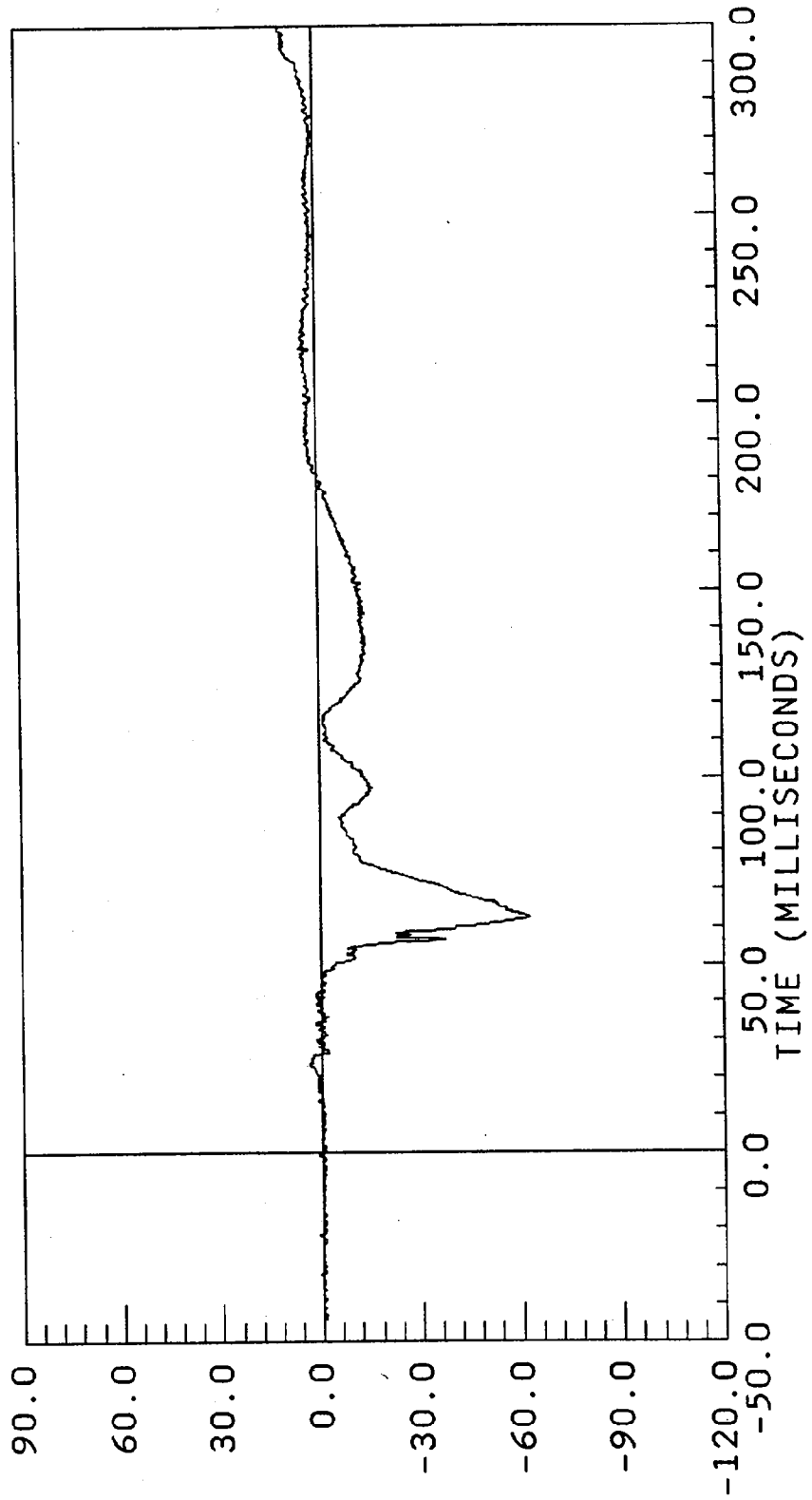
EVENT TIME= 300.9 MSEC

SEVERITY INDEX= 399.1

UDS\$955-1.DAT

29.50 mph

POS#1 HEAD X  
XL AXIS  
YMIN = -62.47200 at 62.55000  
YMAX = 10.36200 at 298.5750  
FILTER CUTOFF: OHZ



ACCELERATION \* G, S \*  
B-26

0.00 mph

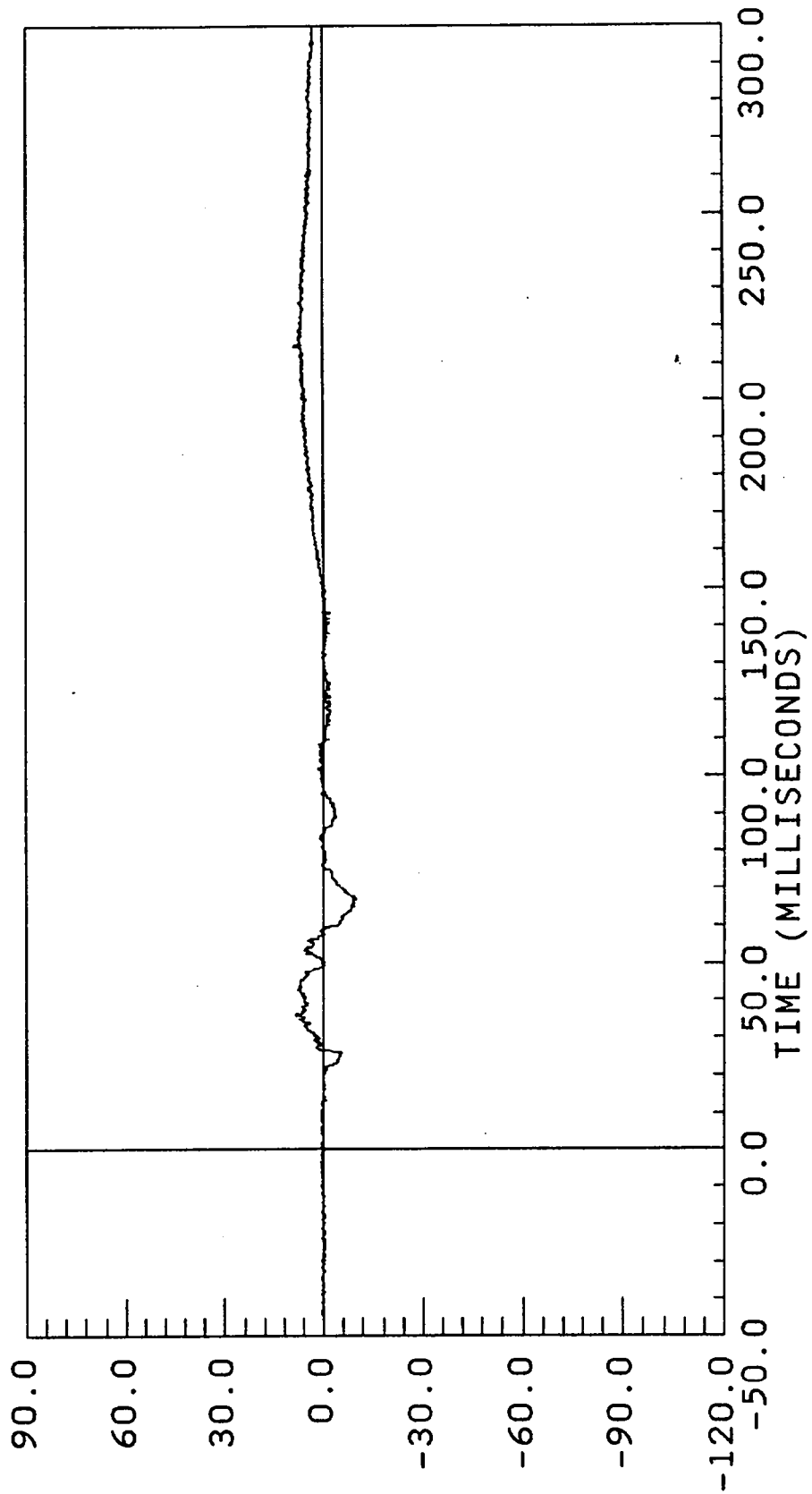
POS#1 HEAD Y

YL AXIS

YMIN = -9.744900 at 67.12500

YMAX = 8.834500 at 214.8000

FILTER CUTOFF: 0HZ

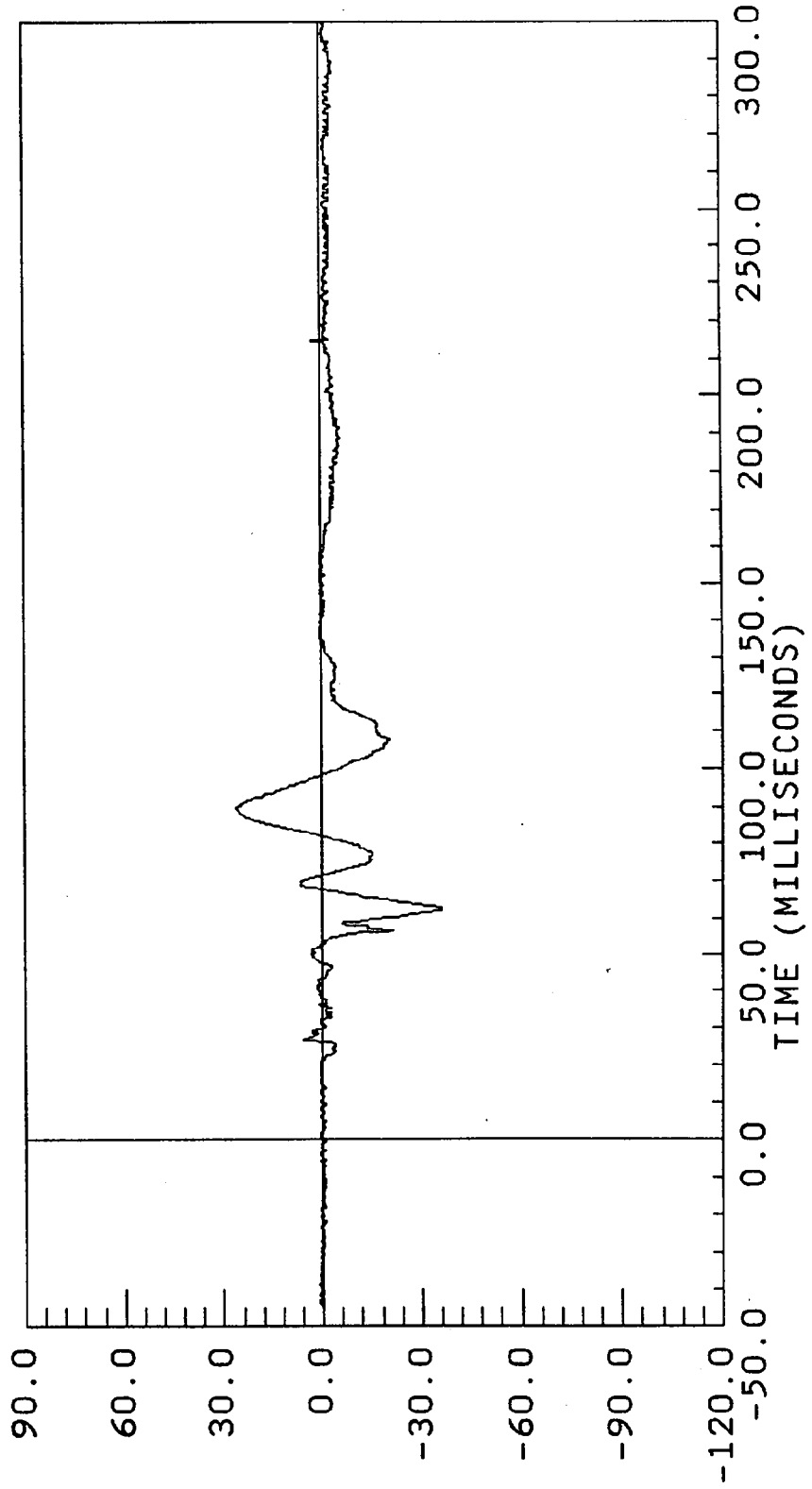


ACCELERATION \* G , S \*

UDS\$955-3.DAT

0.00 mph

POS#1 HEAD Z                    ZL AXIS  
                                  YMIN = -35.76400 at 62.32500  
FILTER CUTOFF:                  OHZ                    YMAX = 26.38500 at 89.55000

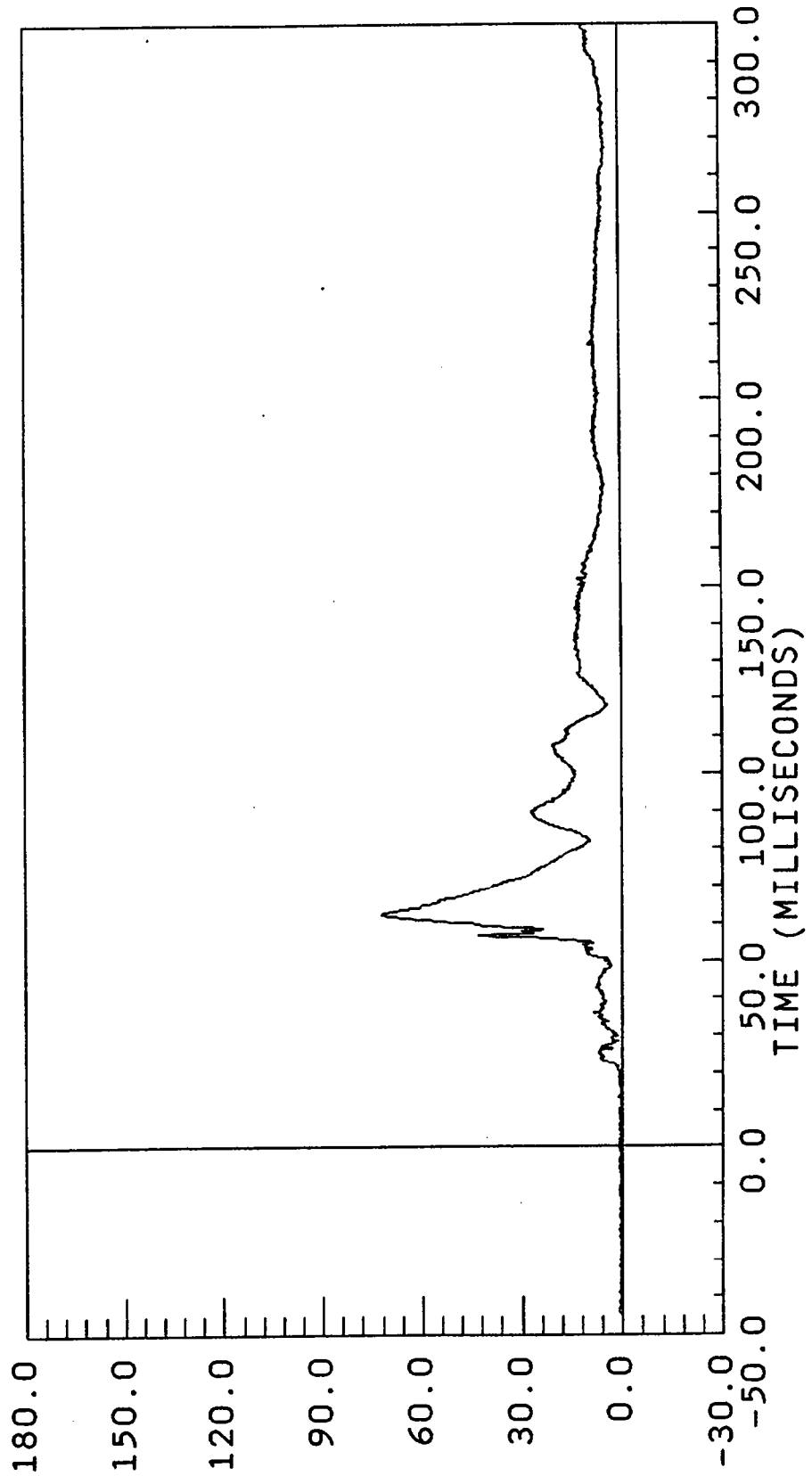


ACCELERATION \* G, S \*  
B-28

0.00 mph

POS#1 HEAD  
NONSTANDARD  
FILTER CUTOFF: 0HZ

RS AXIS  
YMIN = 0.317087 at -27.15000  
YMAX = 72.19957 at 62.55000

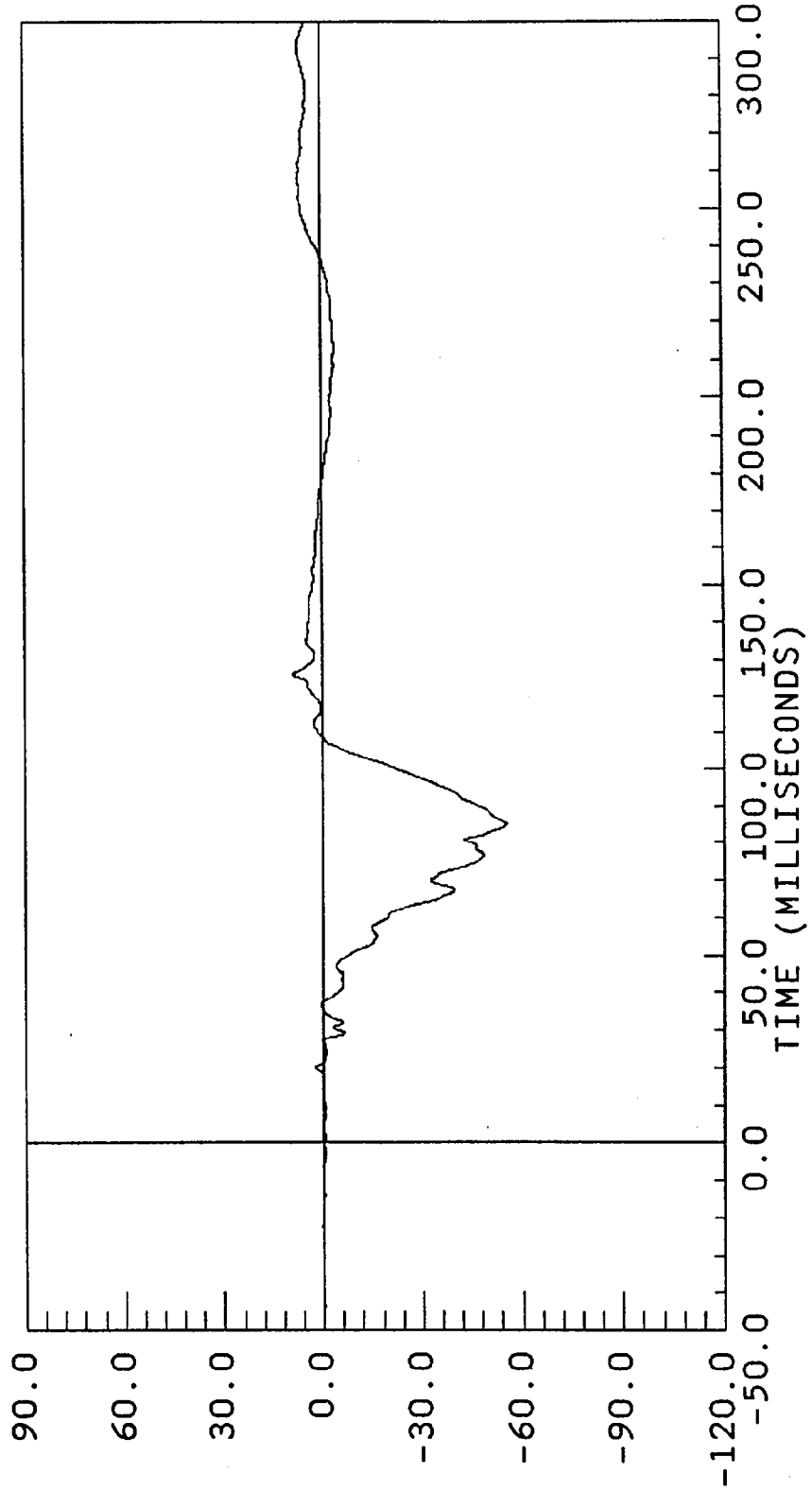


ACCELERATION \* G, S \*

BW955-4.DAT

29.50 mph

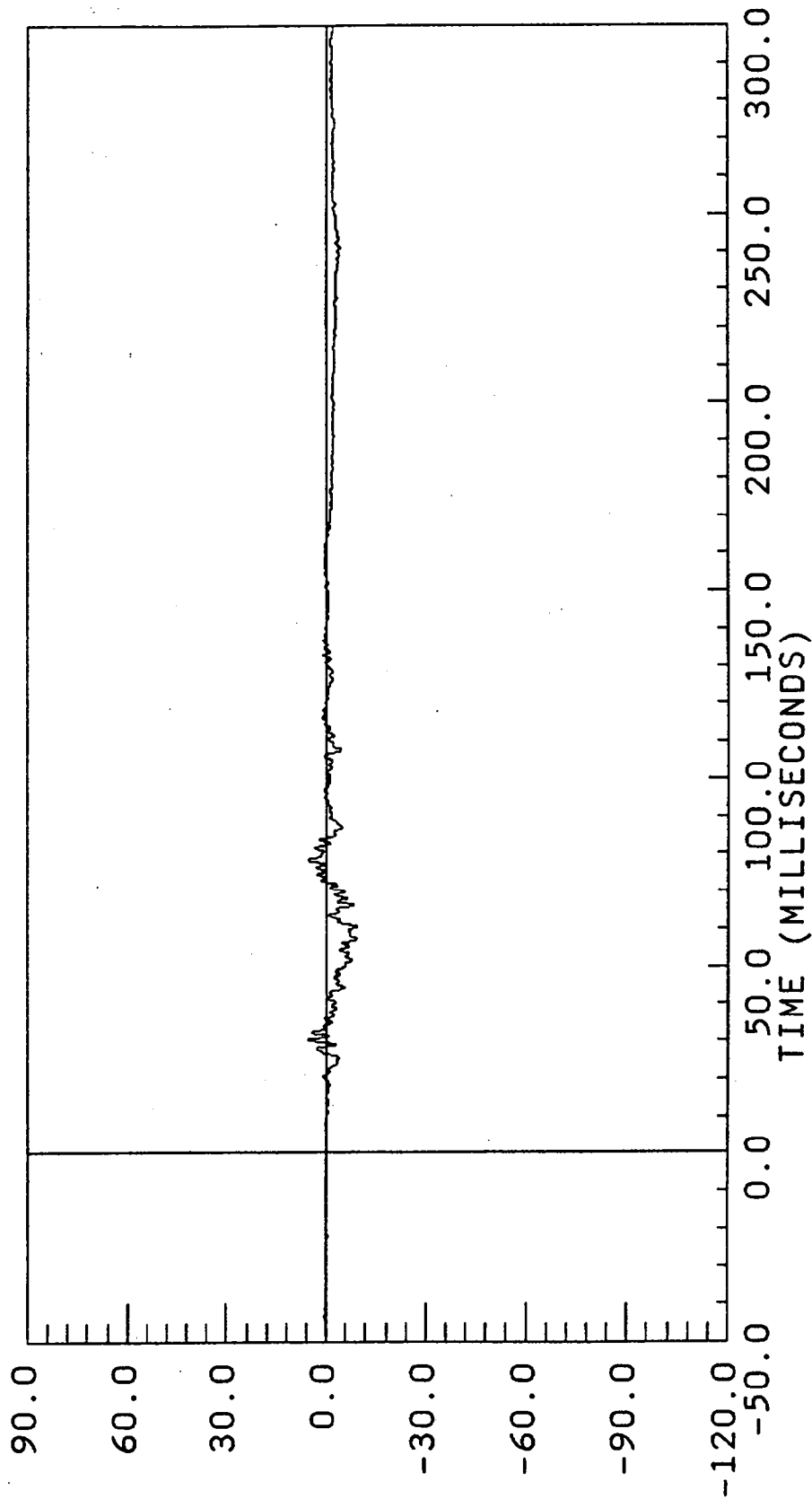
POS#1 CHEST X  
FILTERED  
FILTER CUTOFF: 300HZ  
XL AXIS  
YMIN = -55.12976 at 85.12500  
YMAX = 8.986034 at 126.0750



ACCELERATION \* G, S \*  
B-30

0.00 mph

POS#1 CHEST Y  
FILTERED  
FILTER CUTOFF: 300HZ  
YL AXIS  
YMIN = -9.471525 at 57.30000  
YMAX = 5.740107 at 78.37500

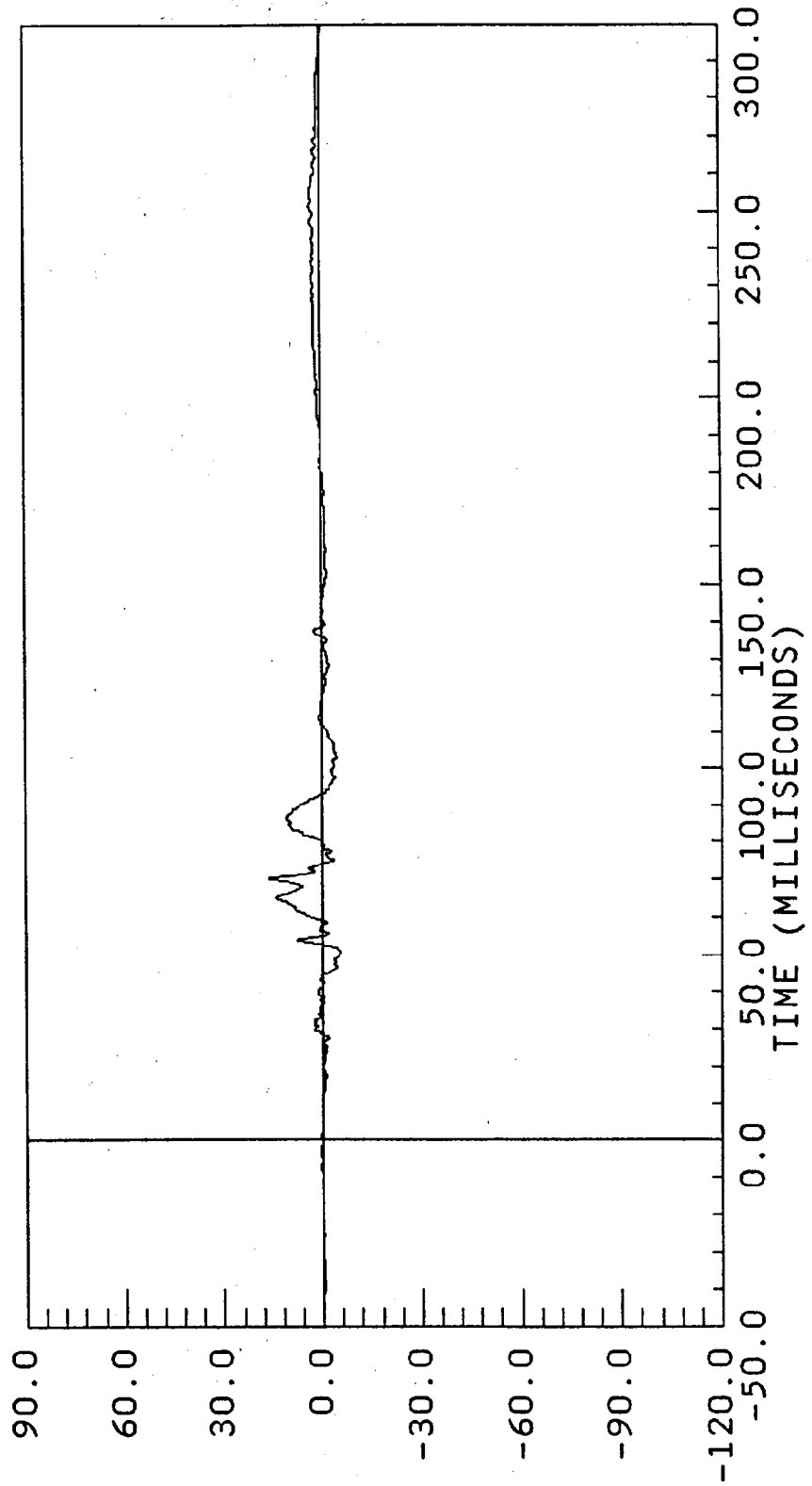


ACCELERATION \* G, S \*

BW955-6.DAT

0.00 mph

POS#1 CHEST Z  
FILTERED  
FILTER CUTOFF: 300HZ  
ZL AXIS  
YMIN = -5.437797 at 50.55000  
YMAX = 16.22855 at 70.20000

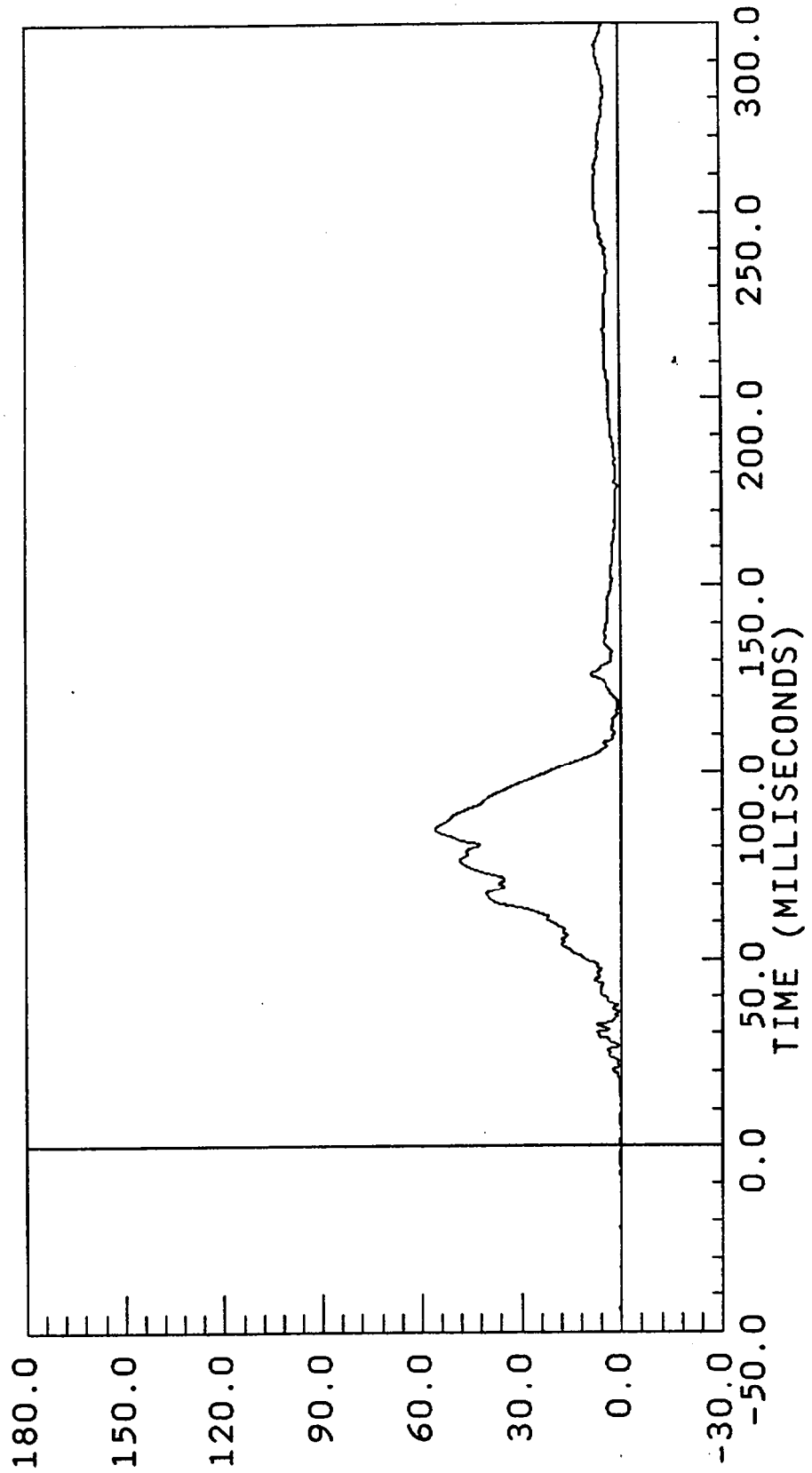


ACCELERATION \* G, S \*

0.00 mph

POS#1 CHEST  
COMPUTED  
FILTER CUTOFF: 300HZ

RS AXIS  
YMIN = 0.0850061 at 50.55000  
YMAX = 56.07755 at 85.05000

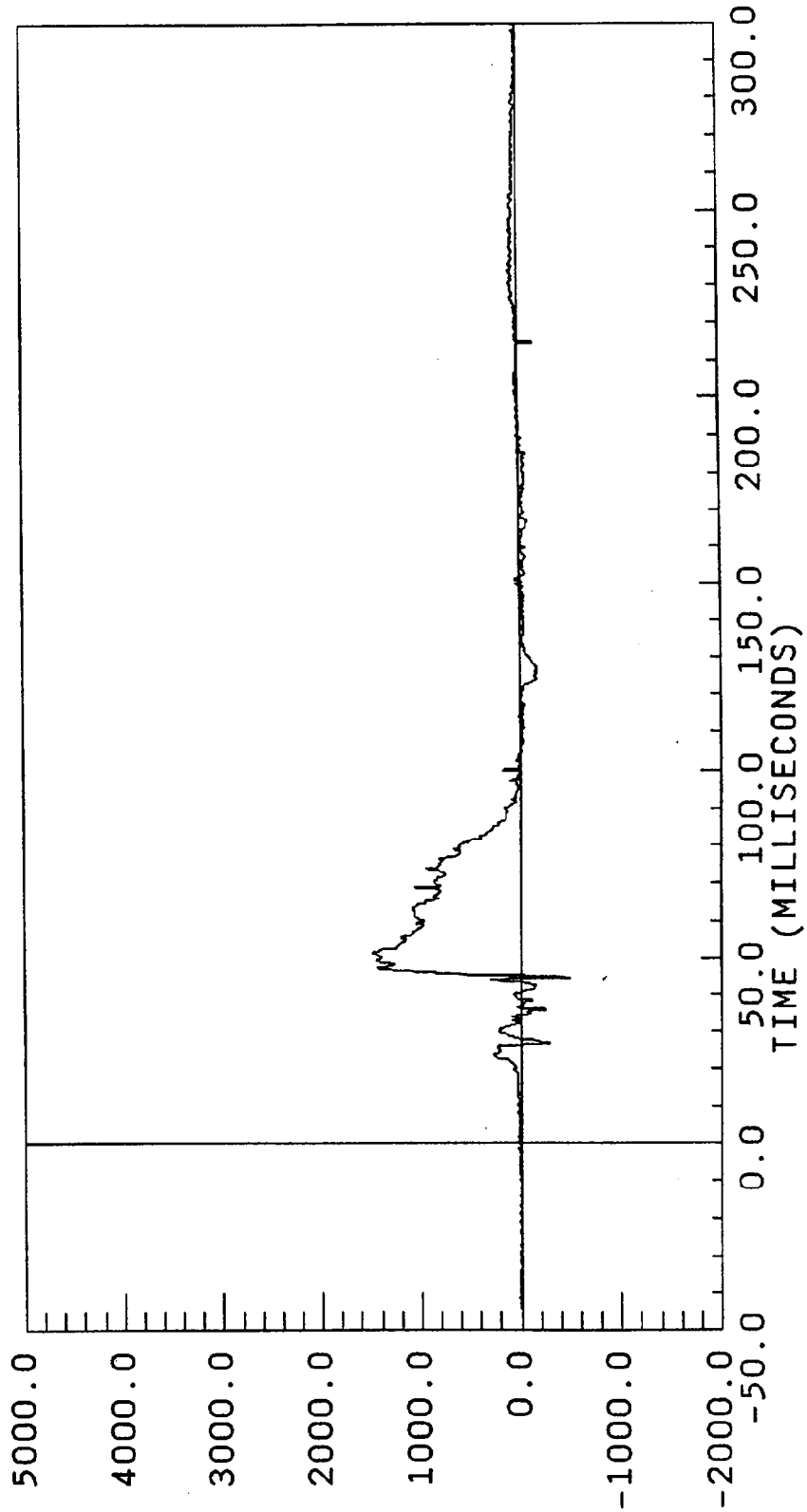


\* G , S \*

BW955-7.DAT

0.00 mph

POS#1 LEFT FEMUR  
FILTERED  
FILTER CUTOFF: 1000HZ  
NA AXIS  
YMIN = -499.1152 at 44.62500  
YMAX = 1490.821 at 51.67500

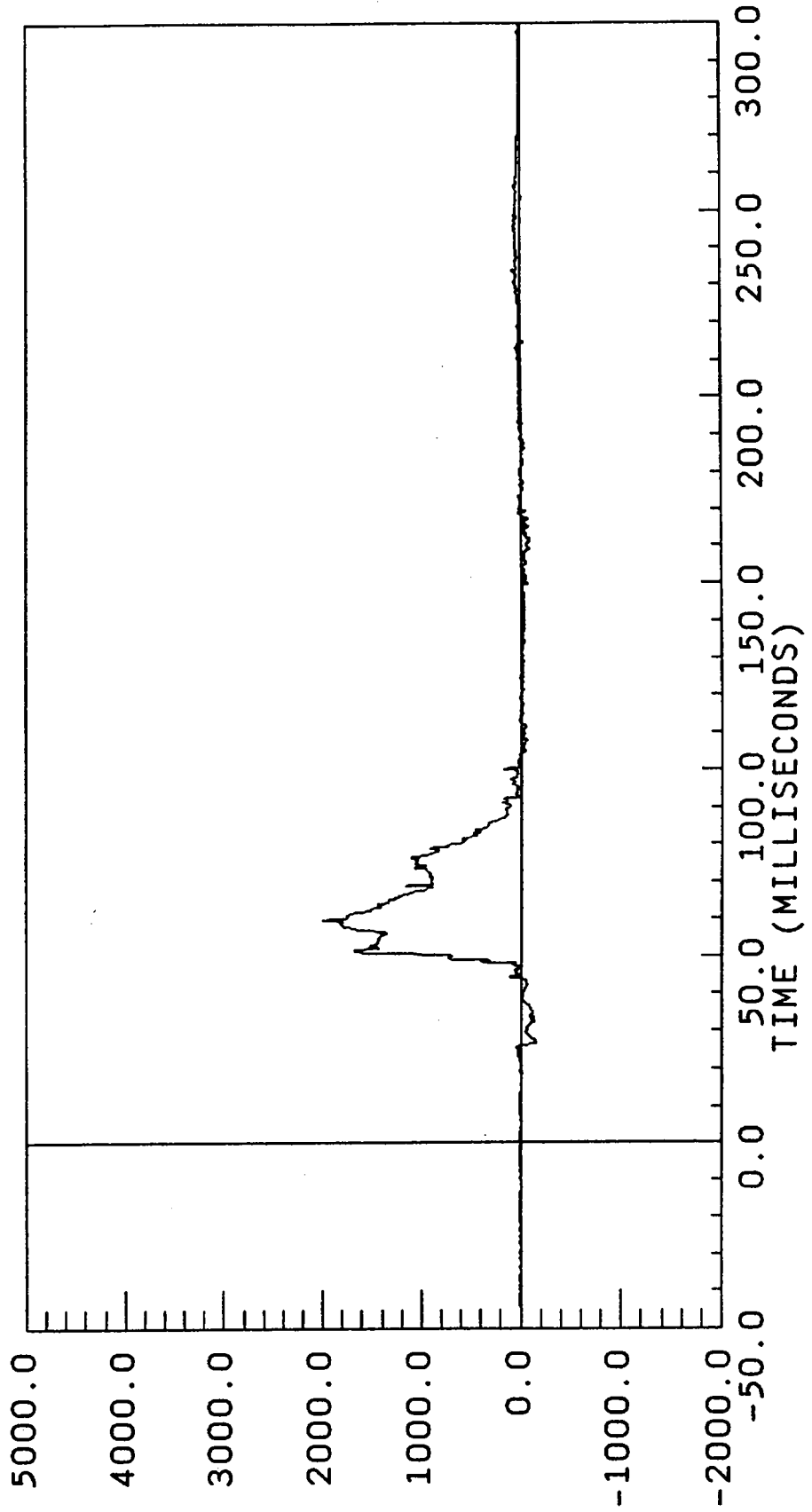


F O R C E \* L B S \*

0.00 mph

POS#1 RIGHT FEMUR  
FILTERED  
FILTER CUTOFF: 1000HZ

NA AXIS  
YMIN = -157.4569 at 26.85000  
YMAX = 1999.428 at 59.55000



HEAD INJURY CRITERION  
HEAD SEVERITY INDEX  
35MS. MAXIMUM DURATION

NHTSA CRASH TEST - PROC. 208

RUN= 955

POS#2 HEAD R

HIC= 191.9 FROM T1= .07410 TO T2= .11010  
AVERAGE ACCELERATION BETWEEN T1 AND T2= 31.0G'S  
EVENT TIME= 300.0 MSEC  
SEVERITY INDEX= 353.3

29.50 mph

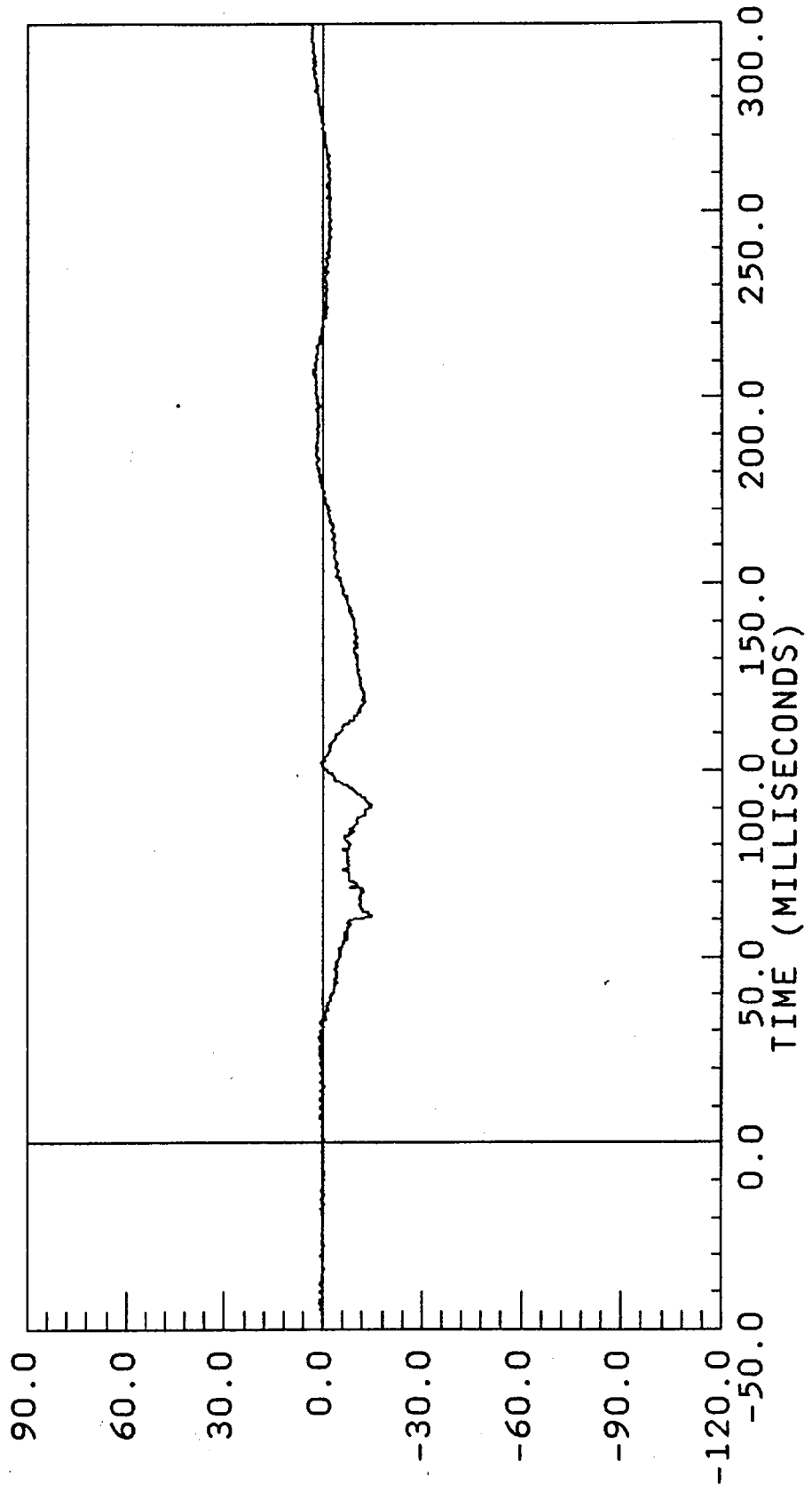
POS#2 HEAD X

XL AXIS

YMIN = -14.68700 at 60.75000

YMAX = 3.764100 at 295.7250

FILTER CUTOFF: 0HZ

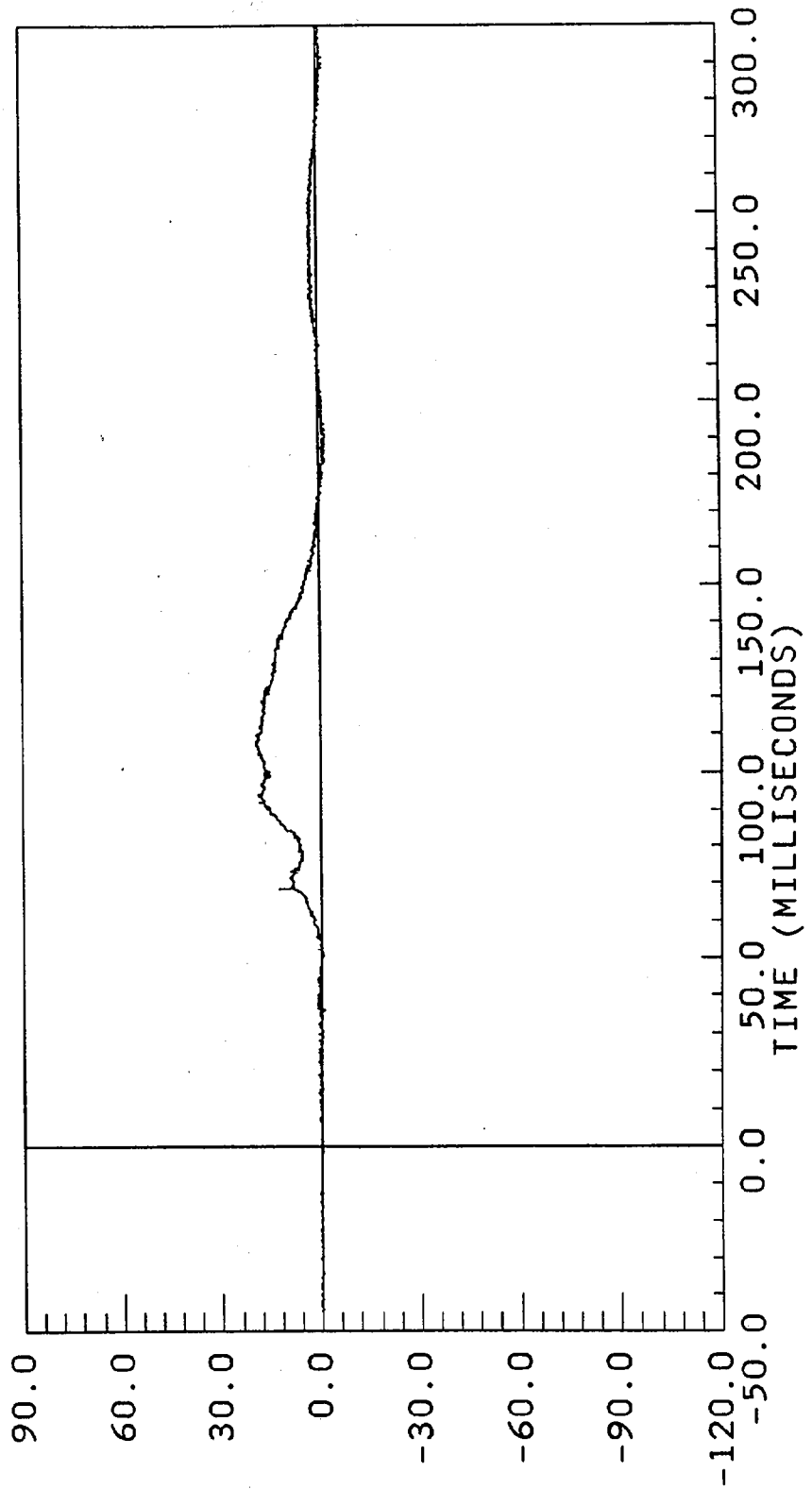


ACCELERATION \* G \* S \*  
B-37

UDS\$955-12.DA

0.00 mph

POS#2 HEAD Y  
YL AXIS  
YMIN = -1.718500 at 183.3000  
YMAX = 19.48400 at 107.1000  
FILTER CUTOFF: OHZ



ACCELERATION \* G, S \*

0.00 mph

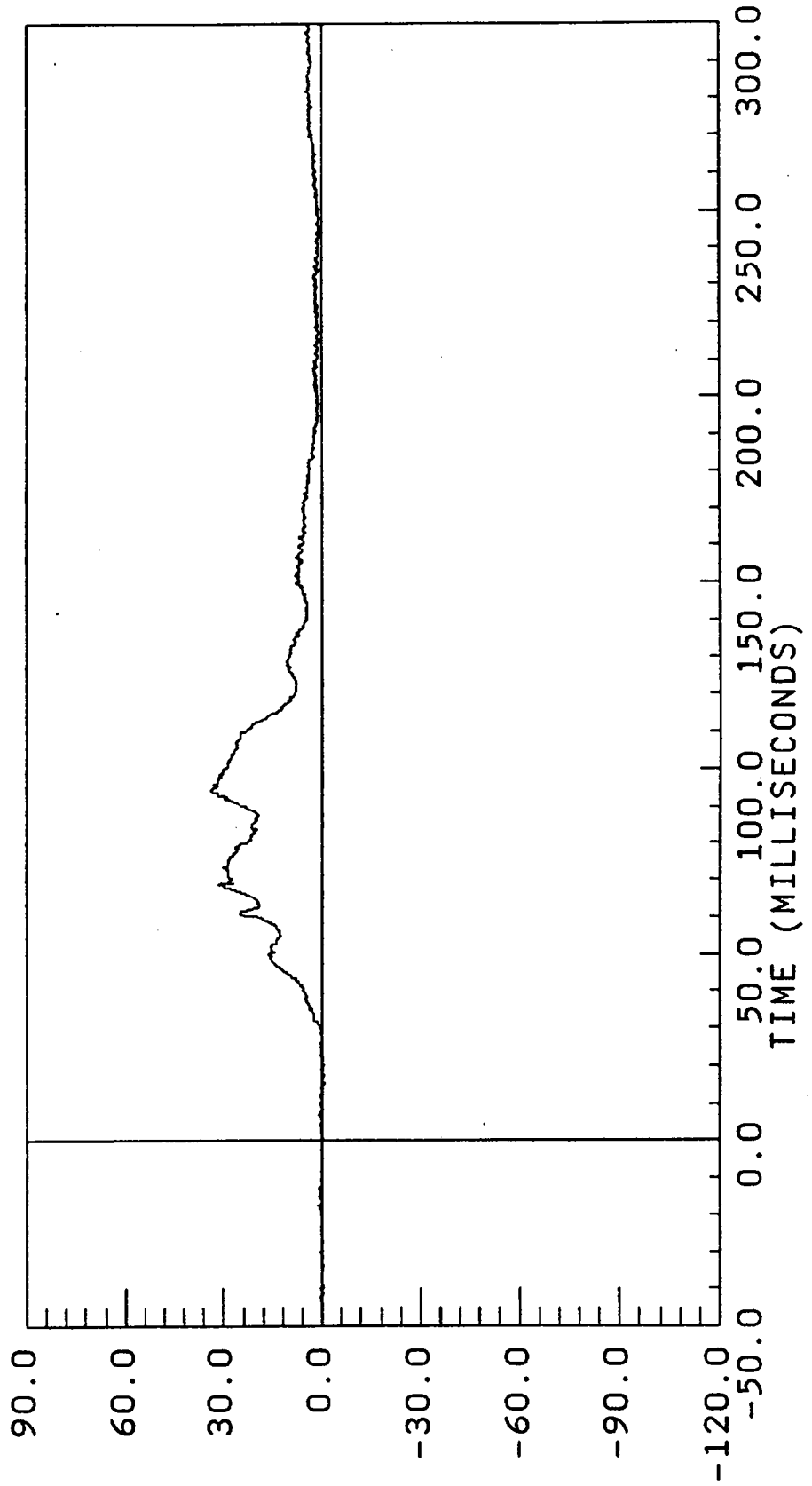
POS#2 HEAD Z

ZL AXIS

YMIN = -1.083600 at 15.30000

YMAX = 33.99100 at 94.20000

FILTER CUTOFF: 0HZ

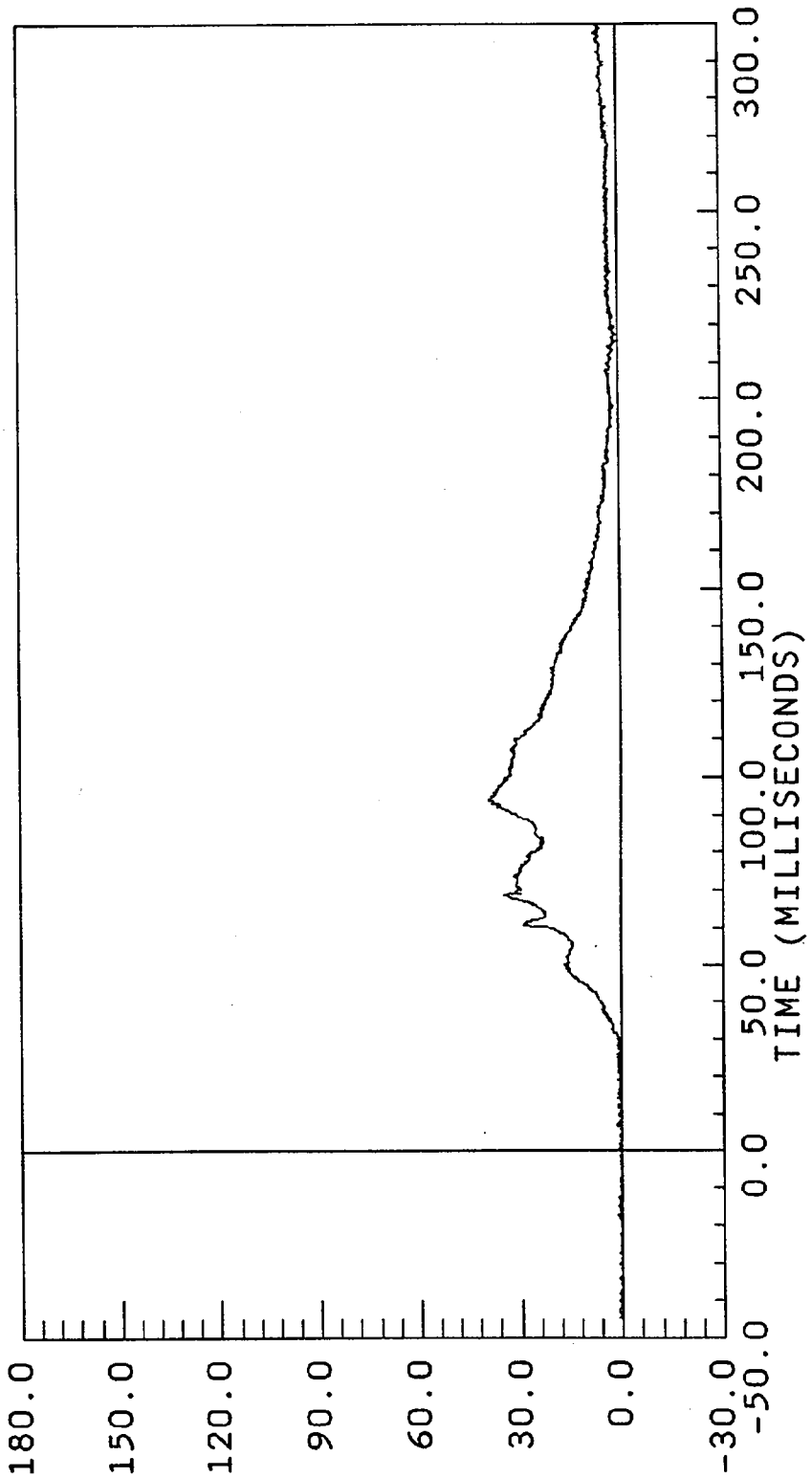


ACCELERATION \* G , S \*

HRES955-2.DAT

0.00 mph

POS#2 HEAD RS AXIS  
NONSTANDARD YMIN = 0.0936916 at 15.30000  
FILTER CUTOFF: 0HZ YMAX = 39.81431 at 94.20000



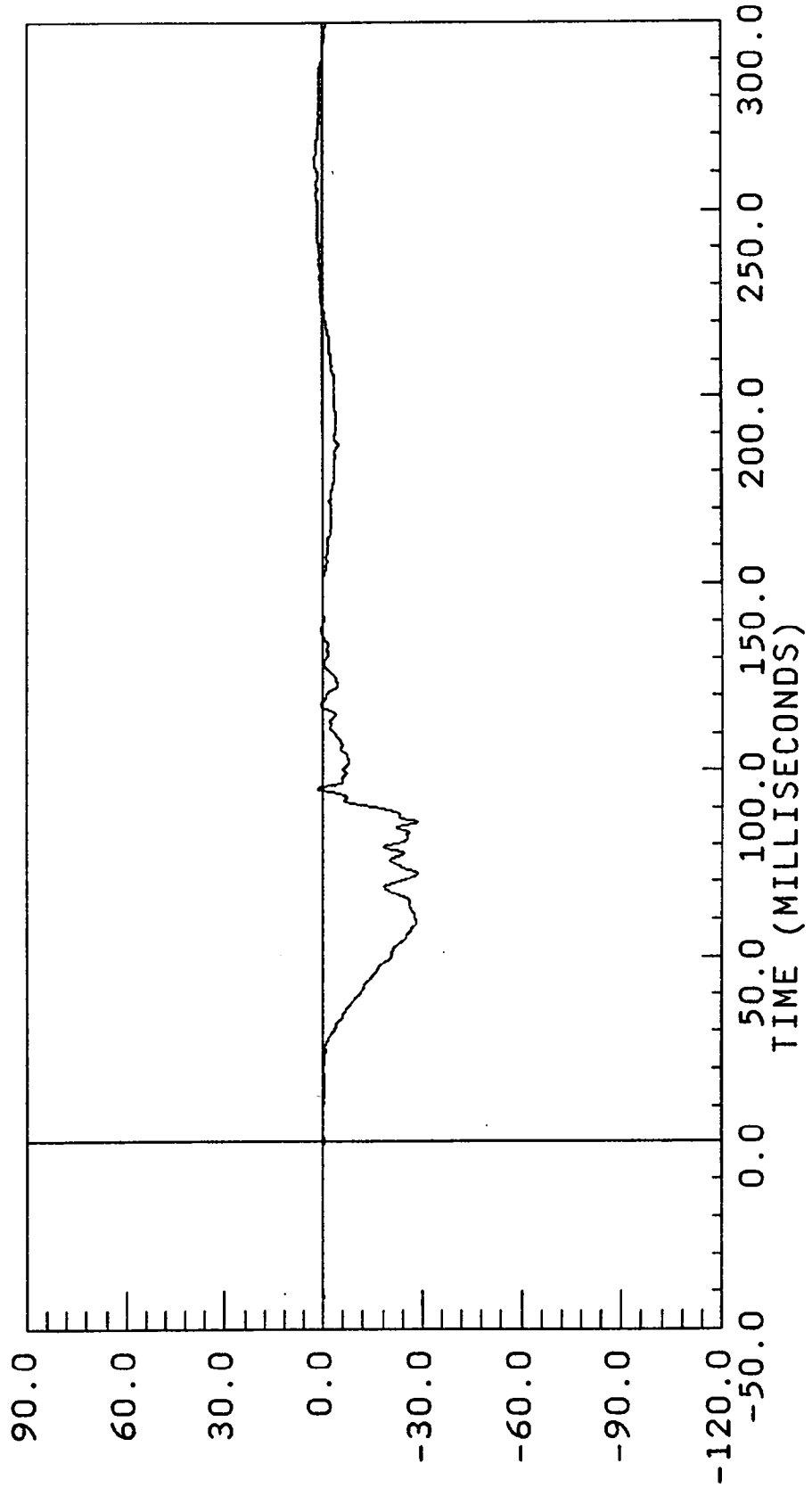
ACCELERATION \* G, S \*

B-40

29.50 mph

POS#2 CHEST X  
FILTERED  
FILTER CUTOFF: 300HZ

XL AXIS  
YMIN = -28.73665 at 86.25000  
YMAX = 2.511853 at 262.20000

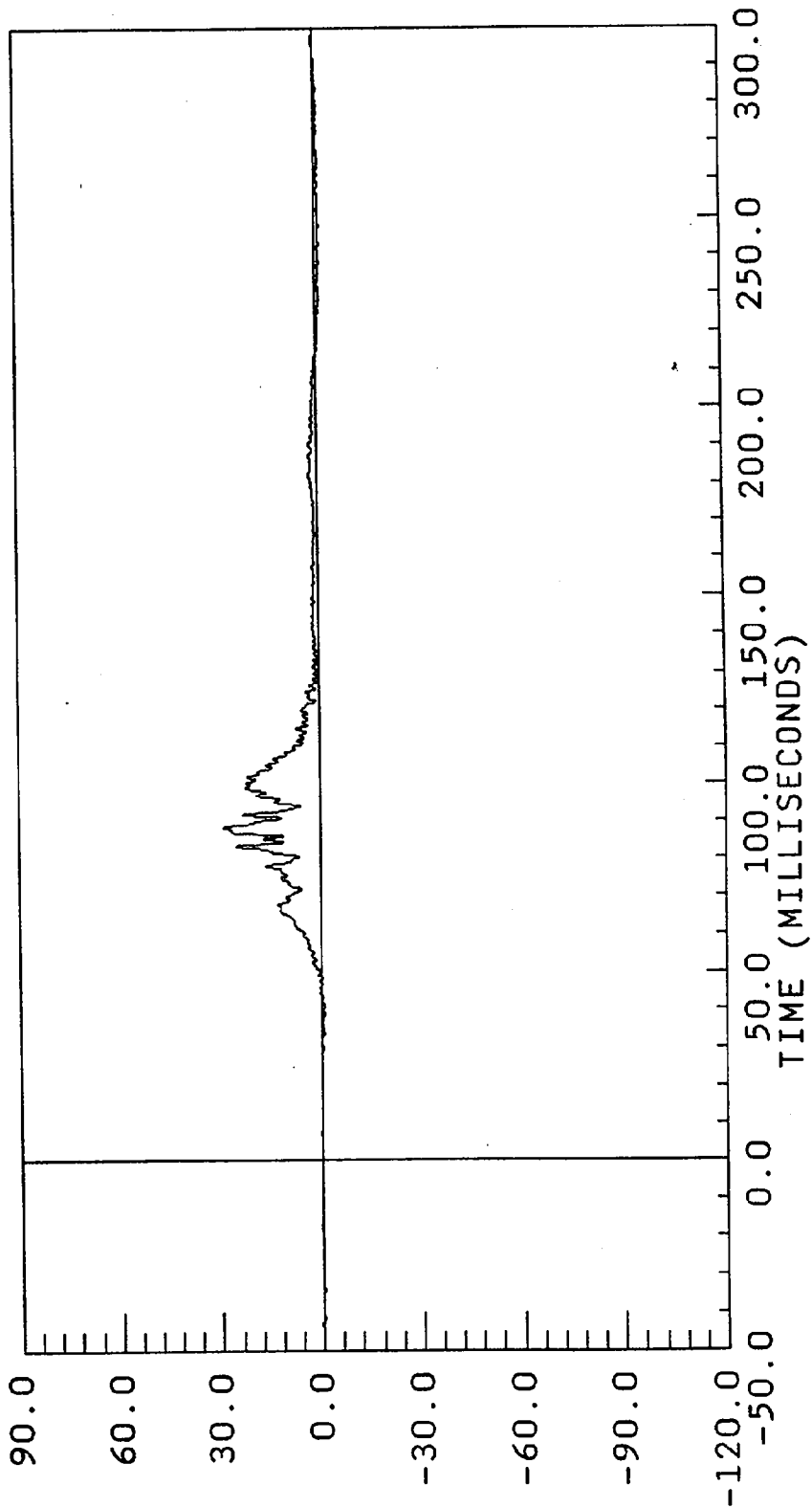


ACCELERATION \* G, S \*  
B-41

BW955-15.DAT

0.00 mph

POS#2 CHEST Y  
FILTERED  
FILTER CUTOFF: 300HZ  
YL AXIS  
YMIN = -1.281016 at 238.2750  
YMAX = 28.99075 at 88.27500



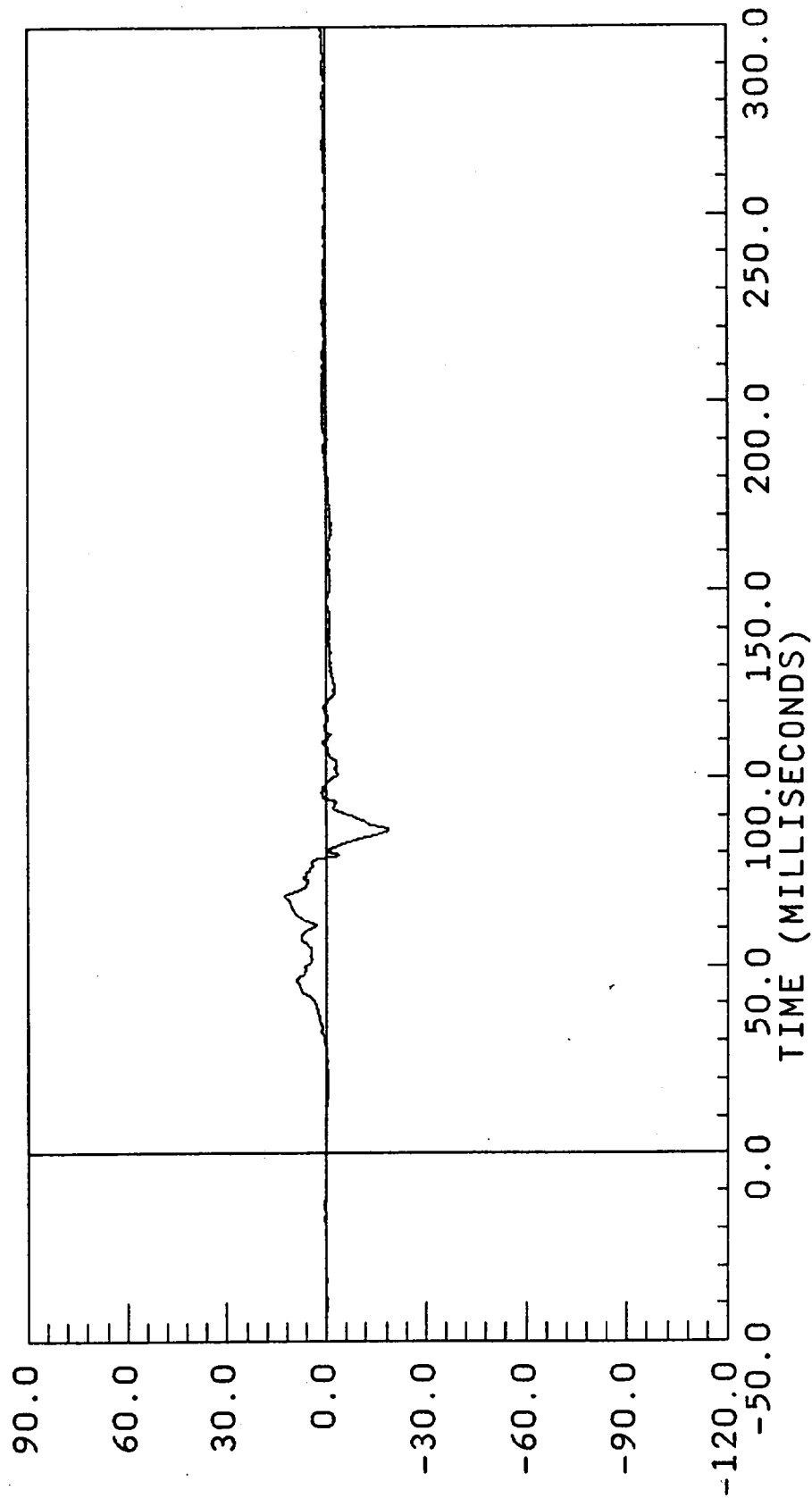
ACCELERATION \* G \* S \*

B-42

0.00 mph

POS#2 CHEST Z  
FILTERED  
FILTER CUTOFF: 300HZ

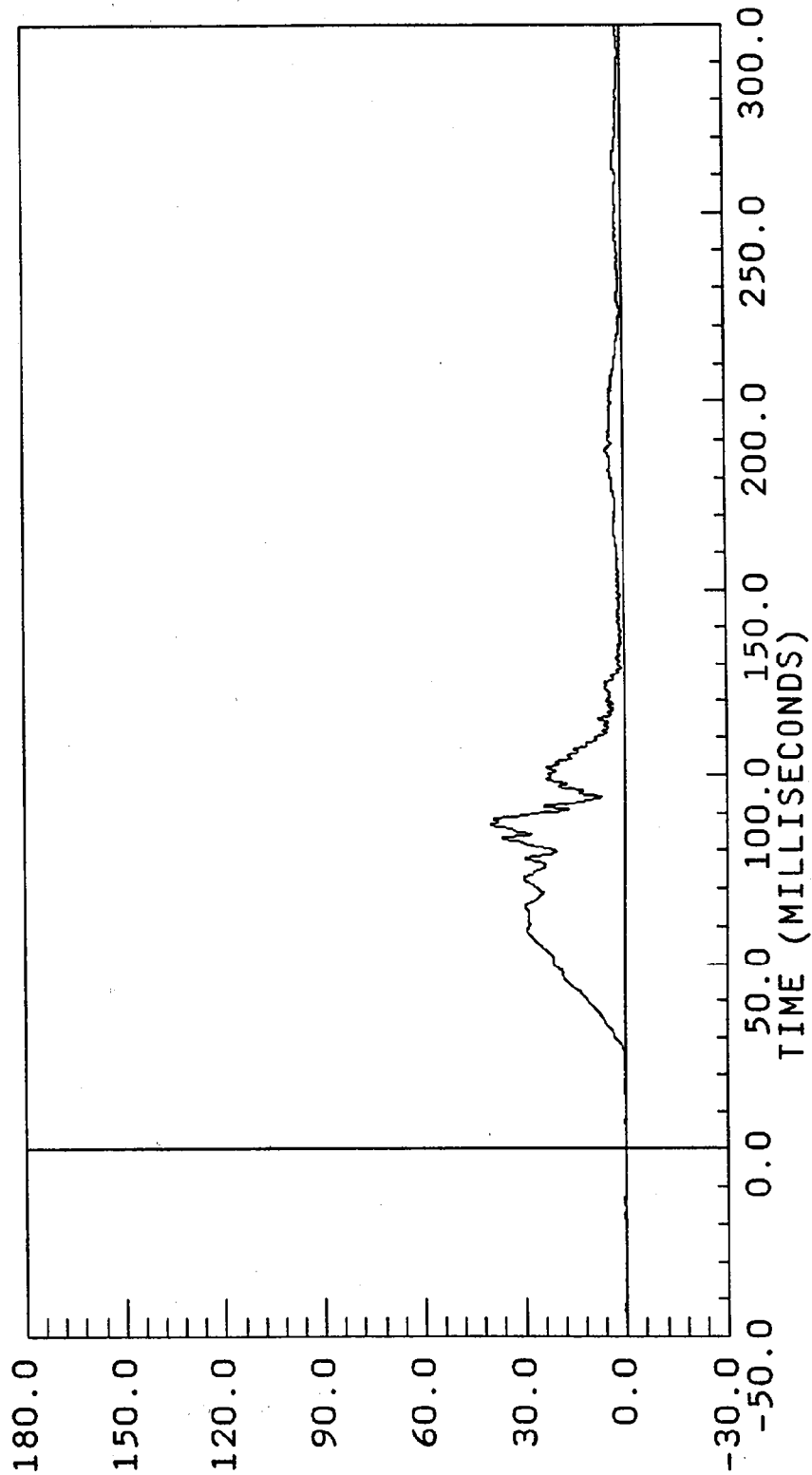
ZL AXIS  
YMIN = -18.88249 at 86.40000  
YMAX = 12.69574 at 68.62500



CHST955-2.DAT

0.00 mph

POS#2 CHEST  
COMPUTED  
FILTER CUTOFF: 300HZ  
RS AXIS  
YMIN = 0.0542237 at -3.825000  
YMAX = 40.24847 at 86.92500

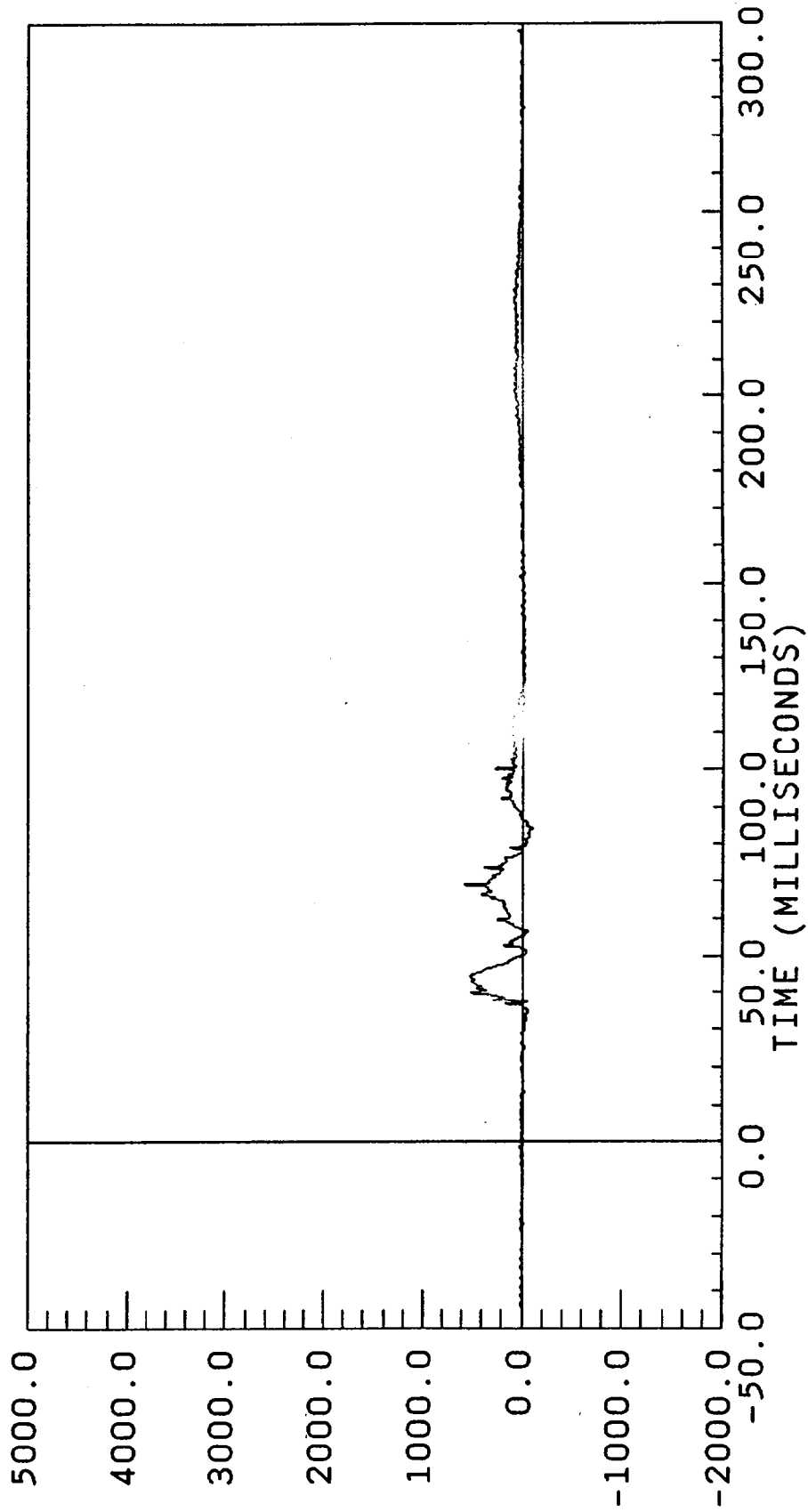


ACCELERATION \* G \* S \*

0.00 mph

POS#2 LEFT FEMUR  
FILTERED  
FILTER CUTOFF: 1000Hz

NA AXIS  
YMIN = -111.3862 at 84.52500  
YMAX = 591.3316 at 69.00000

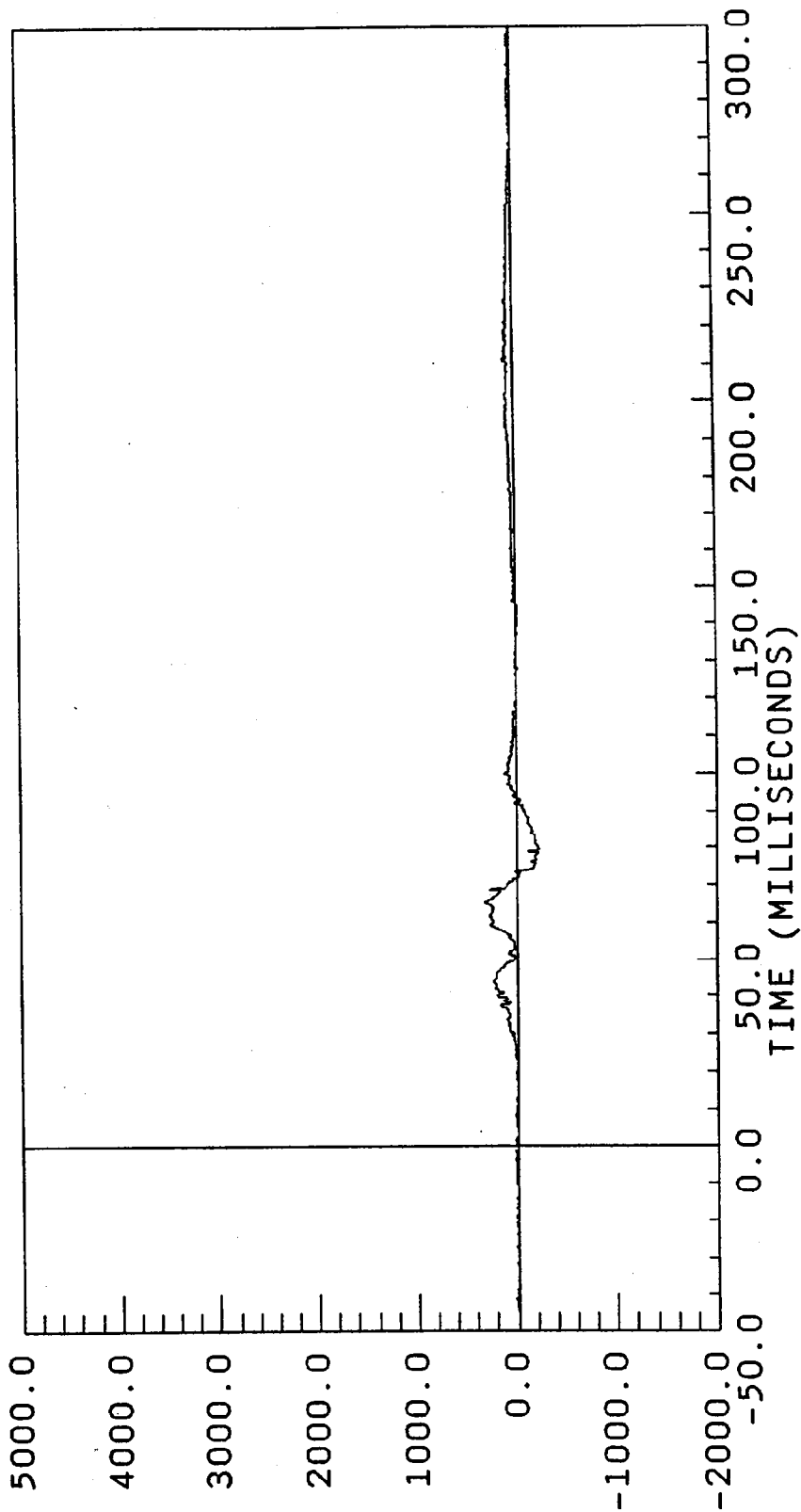


F O R C E \* L B S \*

BW955-10.DAT

0.00 mph

POS#2 RIGHT FEMUR NA AXIS  
FILTERED YMIN = -232.0987 at 79.57500  
FILTER CUTOFF: 1000HZ YMAX = 322.5237 at 65.40000



Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

**Warning:** If you see or smell gas, do not reset the switch or try to start your vehicle. You could injure yourself or others. Have all the passengers get out of the vehicle and call the local fire department or a towing service.

If your engine cranks but does not start after a collision:

1. Turn the key in the ignition to OFF.
2. Check under the vehicle for leaking gas.
3. If you do not see or smell gas, push the white reset button down. If the button is already set, you may have a different mechanical problem.
4. Turn the ignition key ON for a few seconds, then turn it OFF.
5. Check under the vehicle again for leaking gas. If you see or smell gas, do not start your vehicle again. If there is no gas, you can start your vehicle.

## Using Safety Restraints Properly

### Safety Belts

Safety belts help protect you and your passengers in case of a collision. In most states, the law requires their use. We strongly recommend that you use them every time you travel in your vehicle.

Safety belts provide best restraint when:

- the seat back is upright
- the occupant is sitting upright (not slouched)
- the lap belt is snug and low on the hips

- the shoulder belt is snug against the chest
- the knees are straight forward

For your safety, your vehicle has different types of safety belts:

- Lap and Shoulder Belts** – For people who sit next to the side windows in either the front or back seats.
- Lap Belts** – For people who use the middle seat in either the front or back seats or for passengers who sit in the third seat if you have a wagon with this option.

### Manual Front Lap and Shoulder Belts

*Available only on Canadian vehicles and vehicles equipped with the Supplemental Driver Air Bag Restraint System – for people who sit in the driver's seat or the right front passenger seat.*

See the following sections for directions on how to properly use these safety belts. Also see *Safety restraints for children* in this chapter for special instructions about using safety belts for children.

**Warning:** Make sure that you and your passengers, including pregnant women, wear safety belts. Be sure that lap belts fit snugly and as low as possible around the hips. If safety belts are not used properly, the chances of you or your passengers being injured in a collision greatly increase.

Do not allow people to ride in the cargo area of your vehicle. People who are not riding in a seat with a fastened safety belt are much more likely to be injured if you have a collision.

Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around your neck over the inside shoulder. Never use a single belt for more than one person. Failure to follow these precautions could increase the chance and/or severity of injury in an accident.

Always drive and ride with your seat back upright and the lap belt snug across the hips to reduce the risk of serious injury to the abdomen or neck that could be caused by sliding under the safety belts in a collision.

Children can slide under the safety belts more easily than adults in a collision, and therefore should always ride with the seat back upright.

Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

Never use a single belt for more than one person or across seating positions. This greatly increases the chance that one or both of the people will be injured in a collision. Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue. Each assembly is designed to be used as a pair.

**Warning:** Be sure to lock all doors before you drive away. This will lessen the risk of your being thrown from the vehicle in a collision.

### Safety Belt Maintenance

Also, check the safety belt systems periodically to make sure that they work properly and are not damaged.

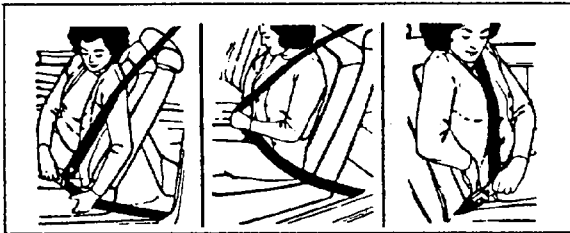
**Warning:** All safety belt assemblies including retractors and attaching hardware should be inspected after any collision. Ford recommends that all safety belt assemblies used during a collision be replaced unless the collision was minor and a qualified technician finds that the belts do not show damage and continue to operate properly. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

## Combination Lap and Shoulder Belts

While you drive, the combination lap and shoulder belt adjusts to your movement. However, if you brake hard, turn hard, or if your vehicle receives an impact of 5 mph (8 km/h) or more, the lap and shoulder belt locks.

After you get into your vehicle, close the door and lock it. Then adjust the seat to the position that suits you best.

To fasten the belt, find the long strap of the belt near the door, pull it across your shoulder and chest, and insert the tongue into the proper buckle on your seat until you hear a snap and feel it lock. Be sure to use the correct buckle and check to make sure the buckle is securely fastened.



Fastening the front seat lap and shoulder belt

**Warning:** Make sure that the lap belt is as low around your hips as possible. Do not wear the lap belt around your waist. If you do not use the lap belts properly, the chances of being injured in a collision greatly increase.

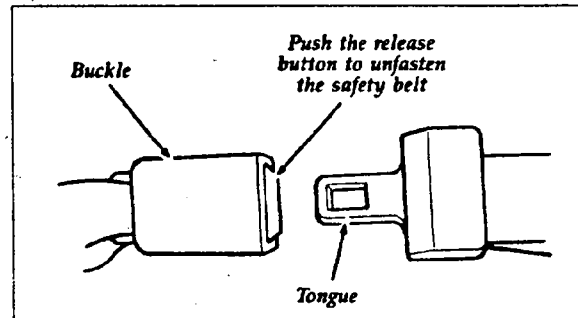
**Warning:** Front and rear seat occupants (including pregnant women) should wear both lap and shoulder belts, for optimum protection in an accident.

**Warning:** Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around your neck over the inside shoulder. Never use a single belt for more than one person. Failure to follow these precautions could increase the chance and/or severity of injury in an accident.

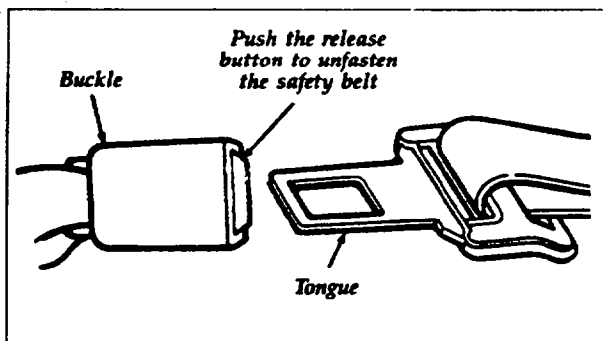
Adjust the lap part of the belt by pulling up on the shoulder belt until the lap belt fits snugly and as low as possible around your hips.

To unfasten the belt:

1. Push the release button on the buckle. This allows the tongue to unlatch from the buckle.



Unfastening the safety belts in the center front and center rear seating positions



Unfastening the safety belts

2. While the belt retracts, guide the tongue to its original position. If you do not guide the tongue, it may strike you or part of the vehicle.

### Lap Belts

The lap belts in the center of the front and back seats do not adjust automatically. You must adjust them to fit snugly and as low as possible around your hips.

If you have a wagon with a third seat, the lap belts in the third seat have retractors that adjust the belts automatically.

Before you fasten your lap belt, you may need to lengthen it.

To lengthen the belts, tip the belt tongue at a right angle to the belt. Pull the belt tongue over your lap until it reaches the buckle.

To fasten the belt, pull the belt across your hips and insert the tongue into the correct buckle on your seat until you hear a snap and feel it lock. Make sure the buckle is securely fastened.

Adjust the belt so that it fits snugly around your hips:

Combination Lap and Shoulder Belts 29

- ❑ If you need to lengthen the belt, unfasten it and repeat the procedure above.
- ❑ If you need to shorten the belt, pull on the loose end of the webbing.

To unfasten the belt, push the red release button on the end of the buckle. This allows the tongue to unlatch from the buckle.

### Safety Belt Extension Assembly

For some people, the safety belt may be too short even when it is fully extended. You can add about eight inches (20 cm) to the belt length with a safety belt extension assembly. Safety belt extensions are available from your dealer.

**Warning:** To ensure that the safety belt extension assembly will hold in the event of a collision, only safety belt extensions manufactured by the same supplier as the safety belt should be used. Manufacturer identification is located at the end of the webbing on a label.

### To Untangle the Belt:

If you should jam the lap belt retractor by allowing the belt to retract when it is twisted, you can free the webbing with this procedure:

1. Pull on the belt with both hands to tighten it on the retractor spool.
2. Feed the belt back into the retractor until it is completely retracted. Repeat previous step if necessary.
3. Pull the belt out of its holder as far as it will go and untwist the belt or remove the object that is jamming the belt. Let the belt retract.

30 Combination Lap and Shoulder Belts

4. Then pull the belt out and let it retract several times to make sure that the belt works properly.

### **Supplemental Air Bag Restraint System (SRS)**

Your car is equipped with an air bag for the driver. This air bag is a supplemental restraint system. It is designed to be used in addition to safety belts to help protect against head and chest injuries in certain moderate to severe frontal collisions.

#### **The Importance of Wearing Safety Belts**

**Warning:** Safety belts must be worn by all vehicle occupants to help reduce the risk of injury in an accident.

There are four very important reasons to use safety belts even with an air bag system. Use your safety belts to:

- help keep you in the proper position when the air bag inflates
- reduce the risk of harm in rollover, side or rear impact accidents, since an air bag is not designed to inflate in such situations
- reduce the risk of harm in frontal collisions that are not severe enough to activate the air bag
- reduce the risk of being thrown from your car

#### **The Importance of Proper Seated Position**

In an accident, the air bag must inflate extremely fast to help provide additional protection for you. In order to do this, the air bag must inflate with considerable force. If you are not seated in a normal riding position with your back against the seat back, the air bag may not protect you properly and could possibly hurt you as it inflates.

Supplemental Air Bag Restraint System (SRS) 31

**Warning:** Do not put objects in front of the air bag system storage area that might restrict inflation or that might increase personal injury.

#### **How the Supplemental Air Bag System Operates**

The supplemental driver air bag restraint system has two main parts. One part is the air bag system with the air bag and inflator. The second part is the electrical system which has impact sensors, a diagnostic module, and a backup power supply. The diagnostic module monitors the supplemental air bag electrical system readiness, including the five crash sensors and wiring connecting them to the module, readiness light, air bag power, and supplemental air bags. The driver air bag is in the center of the steering wheel.

The air bag system uses a readiness light and a tone to indicate the condition of the system. The readiness light is in the instrument cluster. When you turn the ignition key to ON, this light will light up for six seconds and then turn off. This indicates that the system is operating normally. **NOTE:** Regularly scheduled maintenance of the air bag system is not required.

If there is a problem with the system, two things may happen: the readiness light will either flash or stay lit up, or you will hear a beeping sound. If either of these things happen, have the air bag system serviced at your Ford or Lincoln-Mercury dealer immediately.

32 The Importance of Proper Seated Position

### ***Tone Generator***

The air bag readiness light indicates the air bag system condition. However, a series of five sets of five beeps will be heard only if the readiness light doesn't work and there is a problem with the air bag system. This also means that the Air Bag Restraint System (SRS) is in need of service. The tone pattern will repeat (five sets of five beeps) periodically until the problem and light are repaired. Unless serviced, the Air Bag Restraint System may not function properly in the event of an accident.

**Warning:** Do not attempt to service, repair, or modify the Supplemental Air Bag Restraint System; tampering could cause activation of the system and increase the risk of personal injury. For servicing of the Supplemental Air Bag Restraint System, see your Ford or Lincoln-Mercury dealer.

The air bag system is designed to stay out of sight until it is activated. The air bag system only operates in frontal accidents more severe than hitting a parked car of similar size and weight head-on at about 28 mph (47 km/h). In such a collision, you would be thrown forward against your safety belt. After receiving a signal from the crash sensors, the air bags inflate in about 5 one-hundredths of a second.

The air bag system is designed to inflate in moderate to severe head-on and front angle collisions, and then deflate almost immediately. The air bag and safety belt help restrain forward motion and can help reduce injuries to the head and chest. **NOTE:** Several air bag system components get hot after inflation. Do not try to touch them after inflation.

Air bags will not inflate in minor frontal collisions, even though the vehicle may be badly damaged. The fact that your air bag did not inflate in such a collision does not mean that something is wrong with the air bag system.



**Inflated Driver-Side Air Bag**

### ***Report Air Bag Inflation***

If an air bag inflates during a collision or for any other reason, Ford Motor Company wants to know. Please report the inflation to the Accident Investigation Team by calling "collect" (313) 337-8040.

The Accident Investigation Team reviews the information you provide. An investigator may contact you for more information. In some cases, the investigator may want to examine your car, and if an accident occurred, to get an accident report.

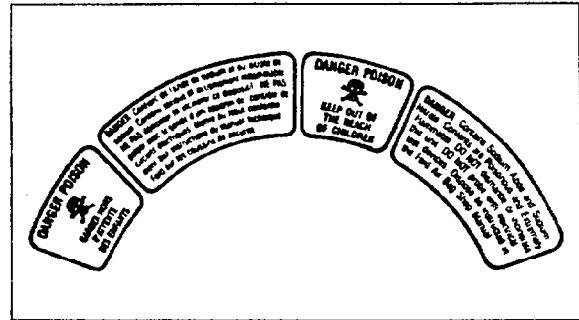
**Warning:** The air bag will inflate only once. The system is designed to function on a one-time-only basis. If the air bag is inflated, **THE AIR BAG WILL NOT FUNCTION AGAIN AND MUST BE REPLACED IMMEDIATELY.** If the air bag is not replaced, the unrepaired area will increase the risk of injury in a collision.

**Disposal of Air Bag Equipped Vehicles**

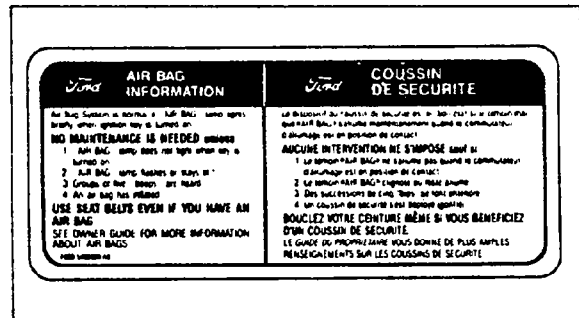
For disposal of air bags or air bag equipped vehicles, refer to the procedures in the 1990 Ford Shop Manual. Information on how to order a shop manual is available at an authorized Ford or Lincoln-Mercury Dealer. You can also order a shop manual using the order form in the back of your Owner's Guide.

**Service Information Labels**

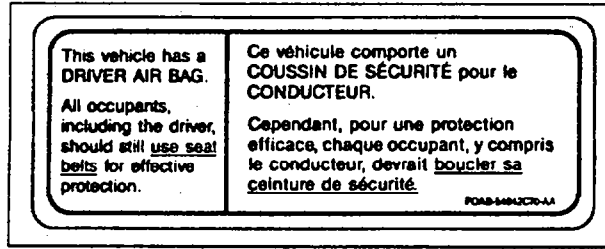
Service and information labels are attached inside the glove compartment, on both sides of the sun visor, and on the radiator support in the engine compartment.



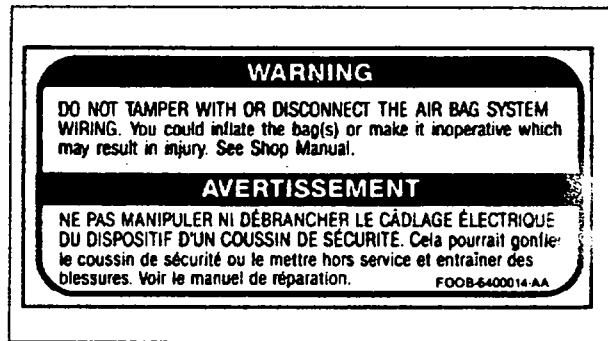
Air bag label located on rear of air bag module



Label located in glove compartment



Label located on the back of driver visor



Label located in the engine compartment

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