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REPORT NUMBERS: 208-CAL-90-09
212-CAL-90-09
301-CAL-90-09

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

**DIAMOND-STAR MOTORS CORP.
1990 PLYMOUTH LASER
2-DOOR HATCHBACK**

NHTSA NUMBER: CL0305

CALSPAN TEST NUMBER: 7804-9

March 15, 1990

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
Office of Vehicle Safety Compliance
400 Seventh Street, S.W.
Room No. 6115 (NEF-31)
Washington, DC 20590

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Prepared: *David J. TREVALE*
David J. Trevale, Project Engineer

Approved: *Walter E. LEVAN*
Walter E. Levan, Program Manager
Transportation Sciences Center

FINAL REPORT ACCEPTED BY:

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

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16. Abstract <p>A 30 mph vehicle safety compliance test was conducted on a 1990 Plymouth Laser 2-Door Hatchback.</p> <p>This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on March 15, 1990. The purpose of this test was to determine compliance with the performance requirements of the following Federal Motor Vehicle Safety Standards:</p> <ol style="list-style-type: none">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" <p>The test mode was perpendicular (0°) and the impact velocity was 29.3 mph. The ambient temperature at the impact face was 74°F.</p> <p>The subject test vehicle appears to comply with the requirements of FMVSS Nos. 208, 212, 219 (partial) and 301.</p> <p><u>Type of Restraint System:</u> The test vehicle was equipped with a driver and passenger automatic torso belt restraint. The manual lap belt restraint was not used in this test.</p>					
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 Plymouth Laser 2-Door Hatchback, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS No. 212, "Windshield Mounting"; FMVSS No. 219 (partial), "Windshield Zone Intrusion"; and FMVSS No. 301, "Fuel System Integrity". This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-208-08.

Section 2

SUMMARY OF TEST NUMBER CLO305

A frontal barrier was impacted by a 1990 Plymouth Laser 2-Door Hatchback at a velocity of 29.3 mph. The test was performed at the Calspan Corporation Advanced Technology Center on March 15, 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.

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 406. The maximum chest deceleration over 3 milliseconds was 28.4 g's. The maximum force on the driver's left femur was 731 pounds and 738 pounds on the right femur.

The right front passenger's HIC was 496. The maximum chest deceleration over 3 milliseconds was 32.7 g's and loads were 670 and 629 pounds on the left and right femurs respectively.

Table 1
CRASH TEST SUMMARY

Vehicle NHTSA No.: CLO305 Test Mode: 30 mph Frontal Barrier

Test Date.: March 15, 1990 Time: 11:50 Temperature: 75°F

Vehicle Make/Model/Body Style: 1990 Plymouth Laser 2-Door Hatchback

Vehicle Test Weight: 3120 lbs.

Vehicle/Barrier Impact Angle: 0°

Impact Velocity: 29.3 mph

Maximum Static Crush: 19.7"

Vehicle Rebound: 8.6"

<u>DUMMIES:</u>	<u>DRIVER</u>	<u>PASSENGER</u>
Type:	<u>Part 572</u>	<u>Part 572</u>
Restraint System:	<u>Automatic Torso</u> <u>Belt</u>	<u>Automatic Torso</u> <u>Belt</u>

Number of Data Channels: 23

Number of Cameras: 1 Real Time
14 High Speed

DOOR OPENING DATA: operable - Left Front
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>top of head - upper steering rim</u> <u>head - upper steering rim & hub</u>	<u>no contact</u>
Abdomen	<u>no contact</u>	<u>no contact</u>
Chest	<u>no contact</u>	<u>no contact</u>
Knees	<u>dash panel</u>	<u>glove box & upper dash panel</u>
	2-2	7804-9

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1990 Plymouth Laser 2-Door Hatchback
 NHTSA No. CL0305 ; VIN: 4P3L534TOLE029954 ; Color: White
 Engine Data: 4 cylinders; - CID; 1.8 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: - A/C; X Pwr. Strg.; X Pwr. Brakes; - Pwr. Windows
- Power Door Locks
 Date Received: 11-29-89 ; Odometer Reading 147 miles
 Selling Dealer: Mancuso Chrysler-Plymouth, Inc.
 & Address 5160 Camp Road, Hamburg, NY

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Diamond-Star Motors Corp.
 Date of Manufacture: 6-89
 GVWR: 3494 lbs.; GAWR: 1984 lbs. FRONT; 1510 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 29 psi FRONT
26 psi REAR
 Recommended Tire Size: P185/70R14 Load Range: -
 Recommended Cold Tire Pressure: 29 psi FRONT; 26 psi REAR
 Size of Tires on Test Vehicle: P185/70R14; Manufacturer: Goodyear
 Vehicle Capacity Data:
 Type of Front Seats: - Bench; X Bucket; - Split Bench
 Number of Occupants: 2 Front; 2 Rear; 4 Total
 Vehicle Capacity Weight (VCW) = 661 lbs.
 No. of Occupants x 150 lbs. = 600 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 61 lbs. (Difference)

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

Right Front = 840 lbs. Right Rear = 500 lbs.
 Left Front = 840 lbs. Left Rear = 530 lbs.
 TOTAL FRONT = 1680 lbs. TOTAL REAR = 1030 lbs.
 % of Total Vehicle Weight = 62 % of Total Weight = 38
 TOTAL DELIVERED WEIGHT = 2710 lbs.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 2710 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 61 lbs.
 Weight of 2 P.572 Dummies @ 164 ea. = 328 lbs.
 TARGET TEST WEIGHT = 3099 lbs. (sum)

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

Right Front = 900 lbs. Right Rear = 660 lbs.
 Left Front = 920 lbs. Left Rear = 640 lbs.
 TOTAL FRONT = 1820 lbs. TOTAL REAR = 1300 lbs.
 % of Total Weight = 58 % % of Total Weight = 42 %
 TOTAL TEST WEIGHT = 3120 lbs.
 Weight of Ballast Secured in Vehicle Trunk Area = 0 lbs.
 Vehicle Components Removed for Weight Reduction None lbs.

VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED: RF 26.9 LF 27.0 RR 27.4 LR 27.4
 FULLY LOADED: RF 26.0 LF 26.3 RR 24.9 LR 25.1
 AS TESTED: RF 26.4 LF 26.8 RR 25.8 LR 25.6
 Vehicle's Wheel Base: 97.0 in.
 Location of Vehicle's C.G.: 40.4 inches from front wheel center

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 15.9 gallons
 Usable Capacity Figure Furnished by COTR = 15.9 gallons
 Test Volume Range (92 to 94% of Usable Capacity) = 14.6 to 15.0 gallons
 ACTUAL TEST VOLUME = 14.8 gallons (with entire fuel system filled)

Table 3

POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Impact Impact Angle: 0°
 Test Date: March 15, 1990 Time: 11:50 Temperature: 75°F
 Vehicle NHTSA No.: CLO305
 Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.3 mph; Trap No. 2 = 29.3 mph
 Distance from vehicle to barrier: (1) entering trap = 52 inches
 (2) exiting trap = 12 inches

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

Vehicle Length:

Pre-Test Right = 163.8 "; C/L = 170.2 "; Left = 163.8 "
 Post-Test Right = 150.7 "; C/L = 150.5 "; Left = 152.7 "
 Crush Right = 13.1 "; C/L = 19.7 "; Left = 11.1 "
 AVERAGE = 14.6 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:
 Right = 8.5 "; C/L = 9.2 "; Left = 8.1 "
 AVERAGE = 8.6 inches

DOOR OPENING:

	Left	Right
Front	<u>operable</u>	<u>operable</u>
Rear	<u>-</u>	<u>-</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: Windshield cracked on driver side along A-pillar.

OTHER NOTABLE IMPACT FEATURES: None.

Section 3

OCCUPANT AND VEHICLE DATA

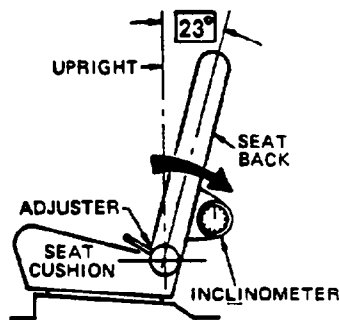
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1990 Vehicle Model: Plymouth Laser Body Style: 2-Door Hatchback

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



Seat back angle for driver's seat 23°

LEFT SIDE VIEW

Measurement instructions: Set seat back at 5th detent from first locking position. (First locking position = 0 detent.)

Seat back angle for passenger's seat 23°

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 mid-position (14th detent out of 27 total detents).

Positioning of the passenger's seat (if applicable): Seat placed in 13th detent out of 24 total detents.

3. Fuel Tank Capacity Data

A. "Usable Capacity" of the standard equipment fuel tank is 15.9 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.: CL0305 Vehicle: 1990 Plymouth Laser 2-Door Hatchback

SEAT TYPE:

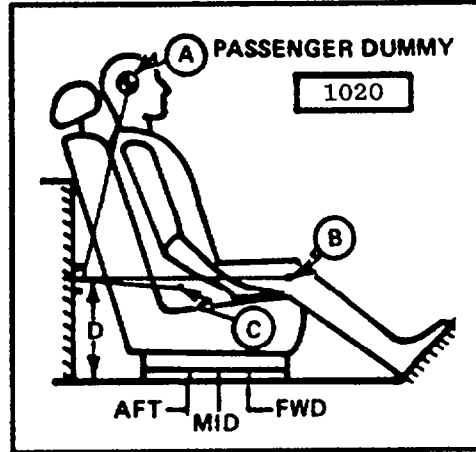
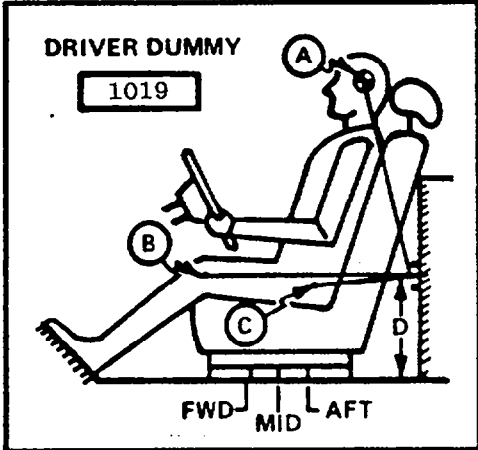
 Bench
 X Bucket
 Split Bench

ADJUSTER TYPE:

 X Manual
 Power

SEAT BACK TYPE:

 Fixed
 X Adjustable Reclining

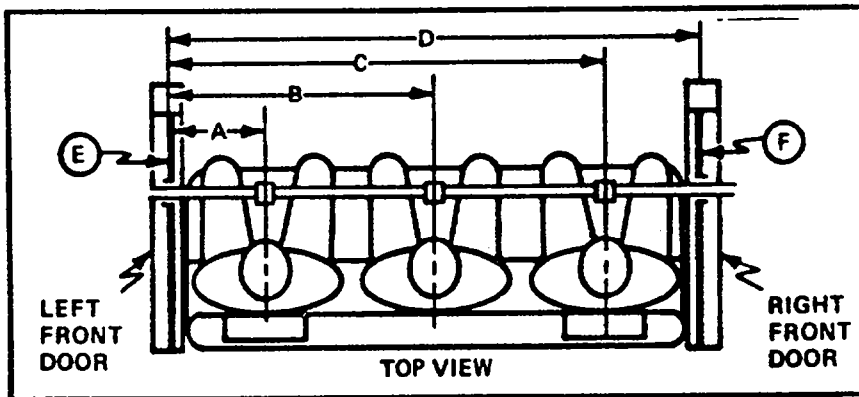


MEASUREMENT LOCATION

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

A = 20.0 in. 15 Degrees
 B = 29.3 in. 98 Degrees
 C = 15.7 in. 122 Degrees
 D = 13.5 in.

A = 20.1 in. 20 Degrees
 B = 30.4 in. 99 Degrees
 C = 16.1 in. 117 Degrees
 D = 13.5 in.



S/N 1019

DUMMY ID

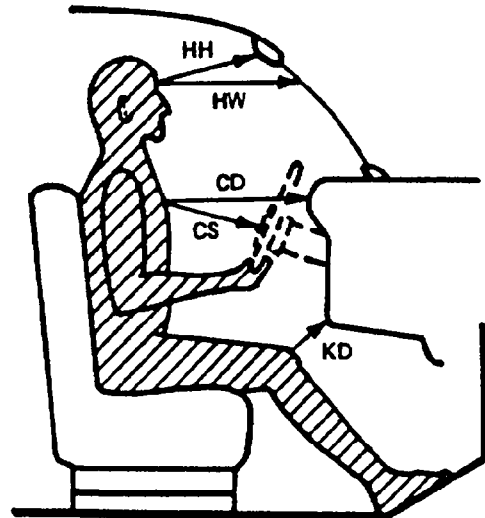
S/N 1020

A = Left Door to Driver Centerline 12.1 in.
 B = Left Door to Center Passenger Centerline in.
 C = Left Door to Right Passenger Centerline 39.0 in.
 D = Left Door to Right Door 50.5 in.
 E, F = Window Glass Height (Right and Left Must Be Equal) 10.1 in.

Figure 3

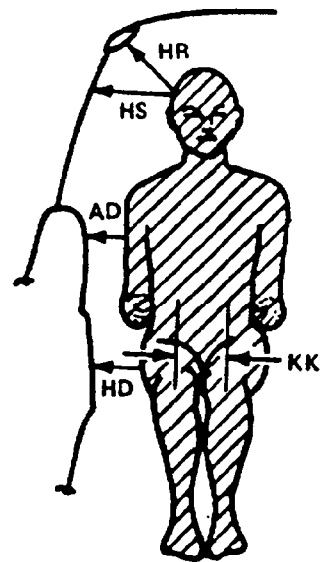
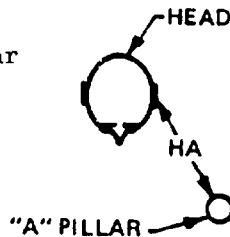
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	15.2	14.1
HW	21.5	20.4
CD	21.9	22.7
CS	15.3	-
KDL	5.9	5.9
KDR	6.3	5.7
SA	See Note	See Note
TA	22°	22°



- 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

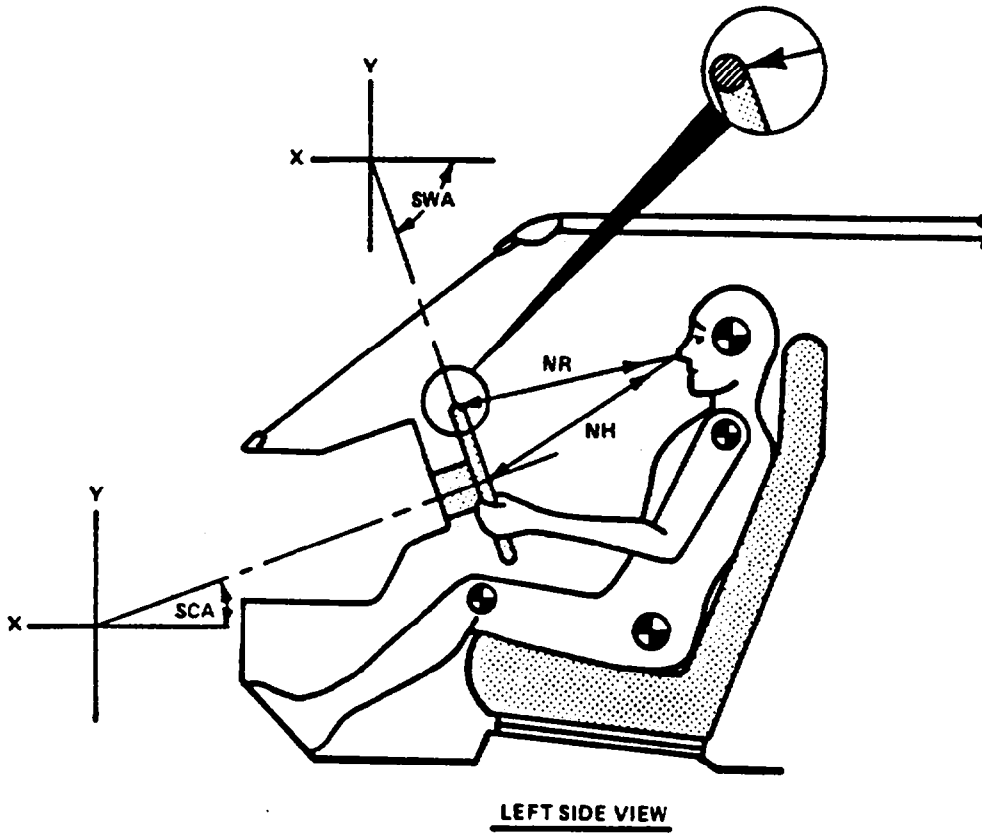


	DRIVER	PASSENGER
HR	4.1	4.0
HS	8.8	8.7
AD	3.5	3.7
HD	6.3	5.9
KK	11.3	7.5
HA	18.8	16.5

Note: Seat back was positioned as specified by manufacturer.

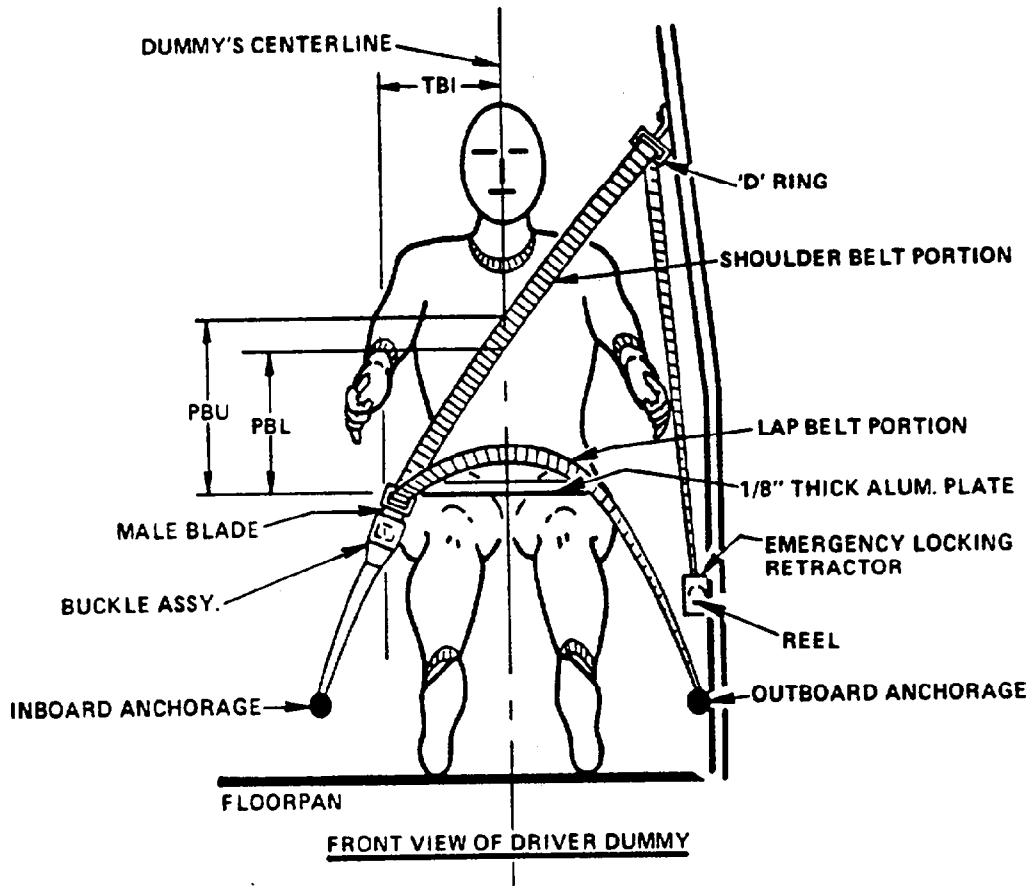
Figure 4

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



	MEASUREMENTS	
NR -- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	18.8	Inches
NH -- Distance from tip of dummy's nose to center of steering column hub	20.4	Inches
SCA -- Angle of steering column relative to the horizontal X axis	19.0	Degrees
SWA -- Angle of steering wheel relative to the horizontal X axis	-71.0	Degrees

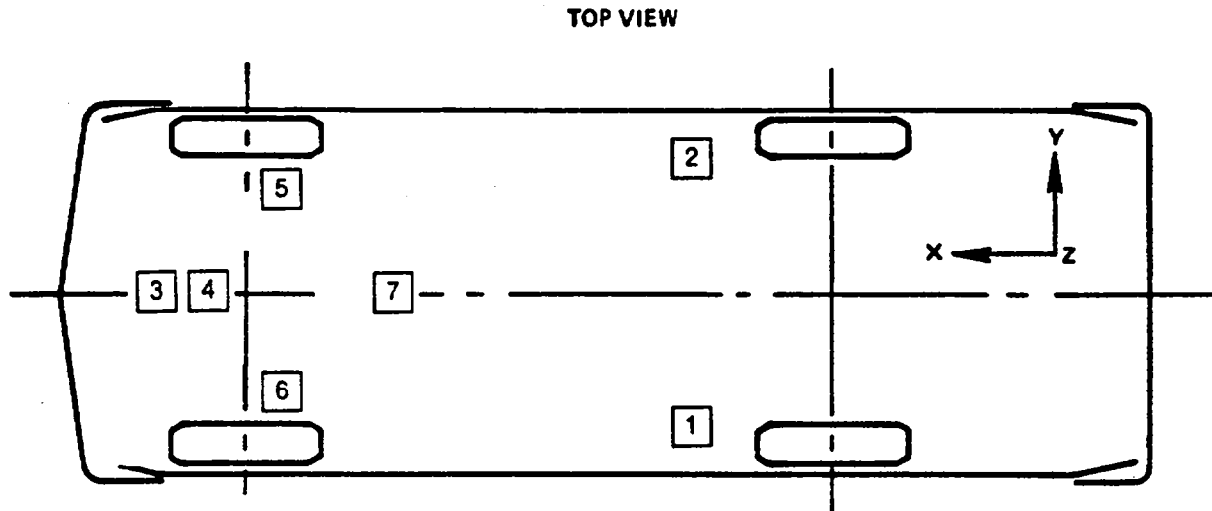
Figure 5
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	15.2	15.0
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	11.5	11.4
<u>TBI</u> -- Distance from torso centerline to buckle	*	*

*Automatic torso belt used, no inboard buckle.

Figure 6
VEHICLE ACCELEROMETER LOCATIONS



ACCELEROMETER NUMBER*	ACCELEROMETER LOCATION	DIRECTION		
		X	Y	Z
1	Left Rear Seat Crossmember	X		
2	Right Rear Seat Crossmember	X		
3	Top of Engine	X		
4	Bottom of Engine	X		
5	Right Disc Brake Caliper	X		
6	Left Disc Brake Caliper	X		
7	Instrument Panel	X		

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

Figure 7

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5.

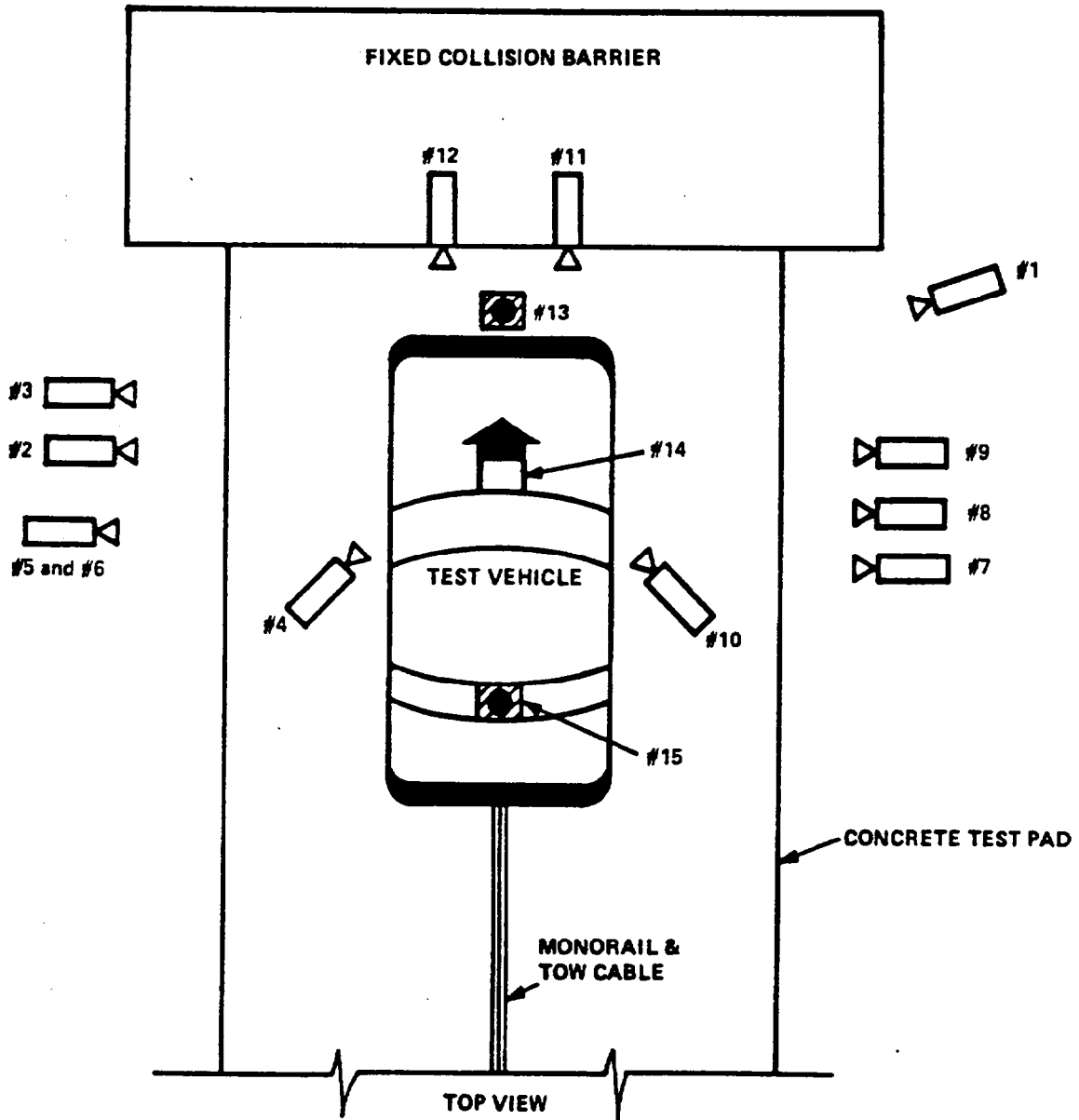


Table 5

HIGH-SPEED CAMERA LOCATIONS

Vehicle: 1990 Plymouth Laser 2-Door Hatchback

CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET (in)	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	24	
2	Overall Left Side	219.0	60.0	41.0	-4.0	202.2	540	
3	Left Side View	309.0	34.0	41.0	-3.0	292.2	530	
4	Driver and Interior View	115.0	106.0	74.0	-20.0	-	790	
5	Steering Column (Bottom)	271.0	80.0	46.0	-4.0	254.2	570	
6	Steering Column (Top)	270.0	80.0	70.0	-9.0	253.2	560	
7	Overall Right Side	224.0	78.0	41.0	-3.0	207.2	800	
8	Right Side View	304.0	59.0	41.0	-2.0	287.2	800	
9	Right Passenger View	313.0	76.0	56.0	-3.0	296.2	680	
10	Passenger and Interior View	109.0	112.0	74.0	-22.0	-	600	
11	Passenger Front View	24.0	17.0	77.0	-47.0	-	580	
12	Driver Front View	24.0	17.0	77.0	-44.0	-	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	-	800	
15	Pit View of Fuel Tank	0.0	100.9	-120.0	90.0	-	715	

*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plan to ground

** = referenced to horizontal plane

Figure 8
VEHICLE TARGET LOCATIONS

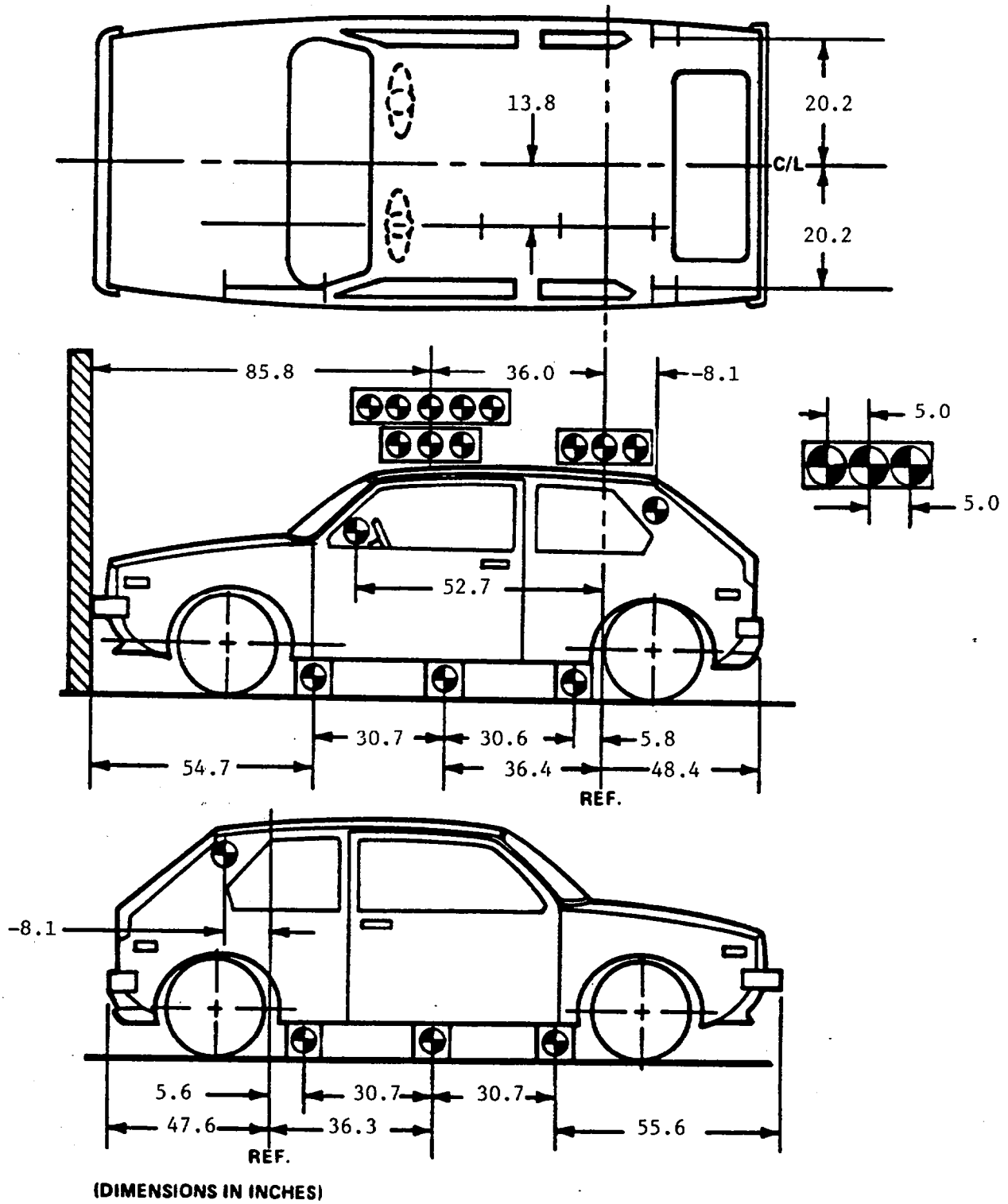


Figure 9
TEST VEHICLE MEASUREMENTS

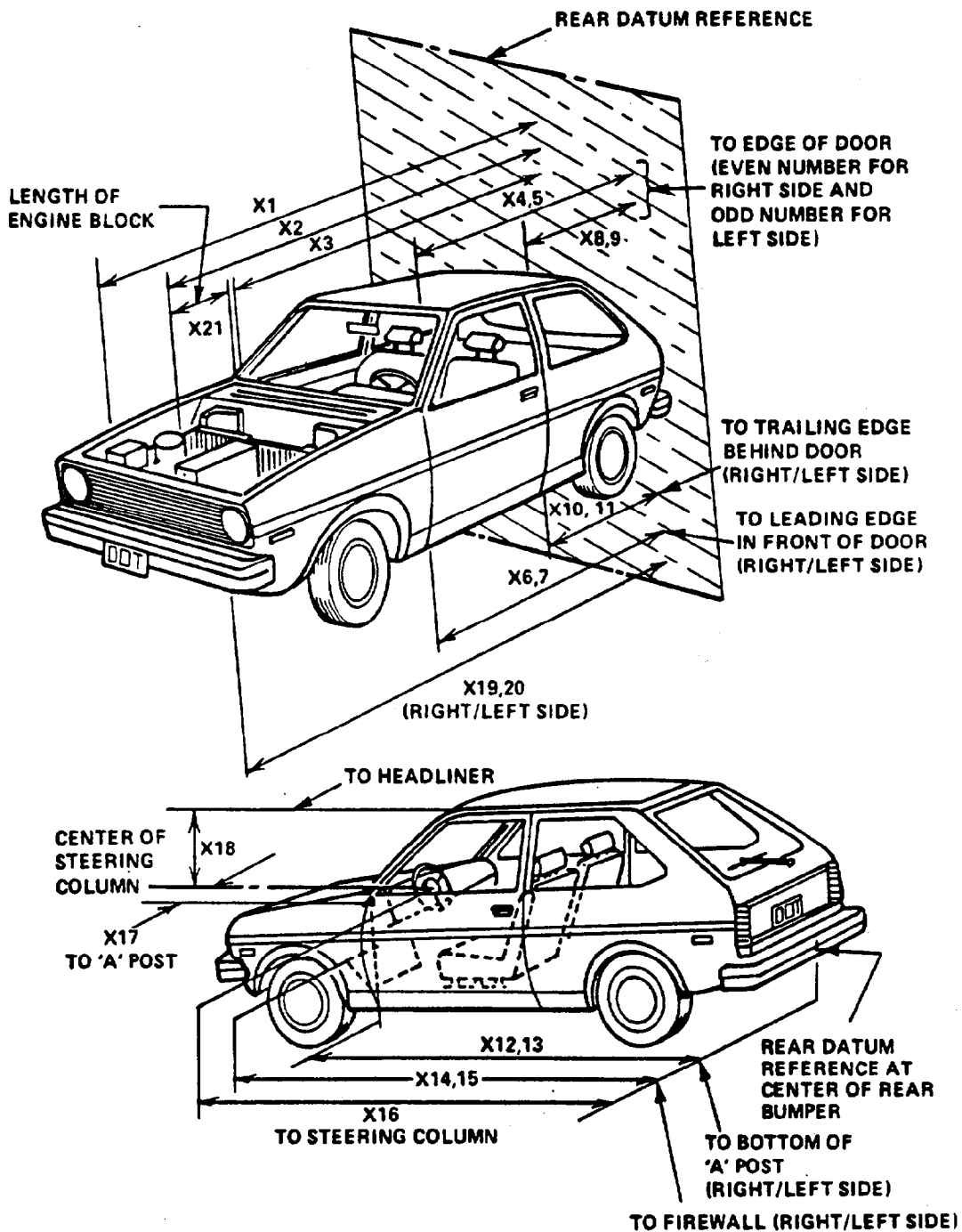


Table 6
VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	170.2	150.5	19.7
X2	Rear Surface of Vehicle to Front of Engine	145.8	143.4	2.4
X3	Rear Surface of Vehicle to Firewall	122.9	123.2	-0.3
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	110.3	109.9	0.4
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	109.6	109.8	-0.2
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	112.0	112.0	0.0
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	111.4	111.6	-0.2
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	61.4	61.4	0.0
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	61.0	61.2	-0.2
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	66.5	66.6	-0.1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	65.9	66.1	-0.2
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	112.4	112.5	-0.1
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	111.6	111.9	-0.3
X14	Rear Surface of Vehicle to Firewall, Right Side	119.4	121.5	-2.1
X15	Rear Surface of Vehicle to Firewall, Left Side	119.8	121.0	-1.2
X16	Rear Surface of Vehicle to Steering Column	94.3	93.6	0.7
X17	Center of Steering Column to "A" Post	16.7	16.8	-0.1
X18	Center of Steering Column to Headliner	16.8	16.4	0.4
X19	Rear Surface of Vehicle to Right Side of Front Bumper	163.8	150.7	13.1
X20	Rear Surface of Vehicle to Left Side of Front Bumper	163.8	152.7	11.1
X21	Length of Engine Block	14.0	14.0	0.0

Section 4

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

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

Table 7

DUMMY INJURY CRITERIA VALUESNHTSA No.: CL0305 Vehicle: 1990 Plymouth Laser 2-Door Hatchback

	MAXIMUM ACCELERATION (g's)							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
Dummy (1)	-114	-28	112	161	-29	-14	17	28.4
Dummy (2)	-35	8	54	55	-33	7	14	32.7

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	731	738
Dummy (2)	670	629

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc. (g) t ₁ TO t ₂
		t ₁ (SEC)	t ₂ (SEC)	
Dummy (1)	406	.07695	.11242	42.0
Dummy (2)	496	.07380	.10980	45.3

*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No. 208

Table 8

FMVSS NO. 208 - SEAT BELT WARNING SYSTEM CHECK

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

Log time duration of audible warning signal = 6.0 sec.

Log time duration of reminder light operation = 6.0 sec.

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

Log time duration of audible warning signal = - sec.

(audible warning should not operate)

Log time duration of reminder light operation = 6.0 sec.

Note wording of visual warning:

Fasten Seat Belt -

Fasten Belt -

Symbol 101-80 X

Table 9

FMVSS NO. 208 - READINESS INDICATOR

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

Is the system totally mechanical? YES X NO

Table 10

FMVSS NO. 208 - COMFORT AND CONVENIENCE TEST SUMMARY

Test Vehicle NHTSA No.: CLO305
 Make/Model: 1990 Plymouth Laser
 Date of Comfort/Convenience Check: March 14, 1990
 Technician Performing Check: VMP
 GVWR: 3494 lbs.

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

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

1. Automatic seat belts YES X** NO _____

If yes, go to requirements D1, D2 and D3

2. Manual seat belts* YES _____ NO X

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

YES _____ NO 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 lap belts were not used for this test.

Table 10 (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 10 (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 0.6 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 0.7" rubber trim along top edge, 1.4" metal trim along side edges, and plastic shroud covering lower edge.

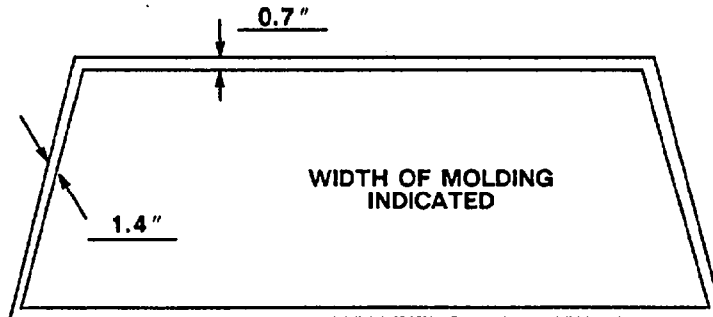
FMVSS 212 REQUIREMENTS:

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	82.0	82.0	100%
LEFT SIDE	82.0	82.0	100%
TOTAL	164.0	164.0	100%

AREA OF RETENTION FAILURE:



FRONT VIEW

FAILURE DETAILS: None.

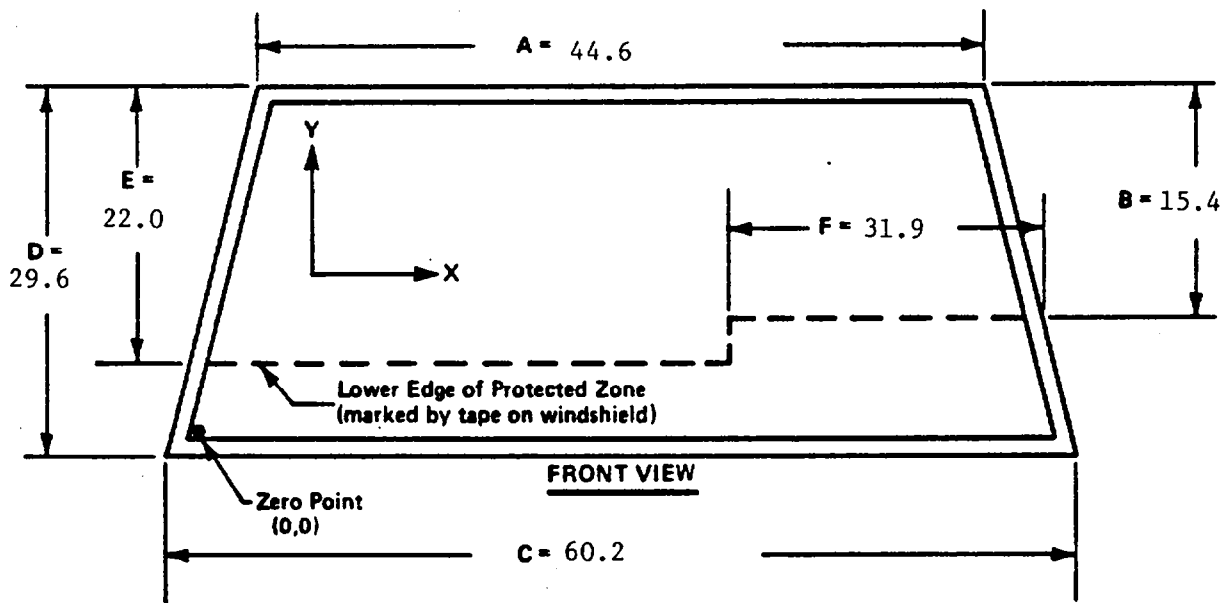
Figure 11

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 11

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

TEST VEHICLE NHTSA NO.: CL0305 TEST DATE: March 15, 1990

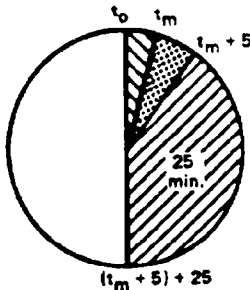
Vehicle Mfr./Make/Model: 1990 Plymouth Laser 2-Door Hatchback

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:
- 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 12

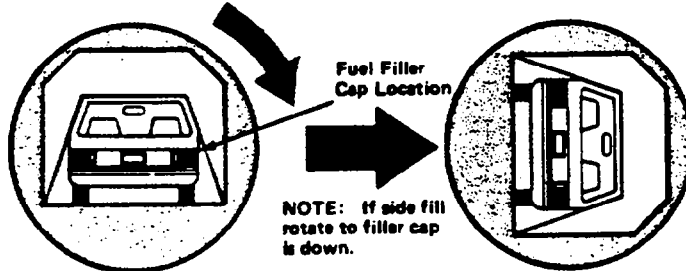
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:



Vehicle NHTSA ID No.:

CL0305



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 12

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

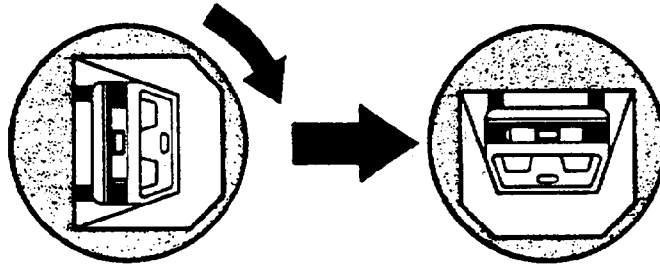
TEST PHASE:

90⁰

180⁰

Vehicle NHTSA ID No.:

CL0305



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

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 12

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

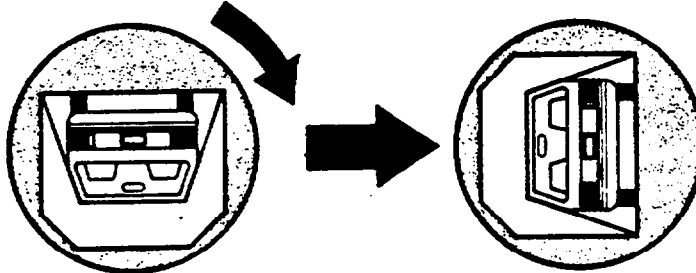
TEST PHASE:

180°

270°

Vehicle NHTSA ID No.:

CL0305



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

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 12

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

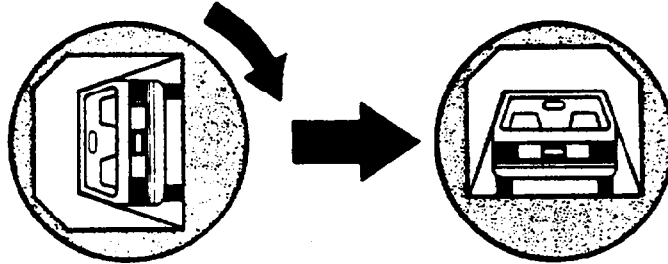
TEST PHASE:

270°

360°

Vehicle NHTSA ID No.:

CLO305



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

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

TEST VEHICLE NONCOMPLIANCE NOTICE

NHTSA Contract Lab: Calspan Advanced Technology Center

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

Date of Test: March 15, 1990 Vehicle NHTSA No.: CLO305

Vehicle Manufacturer: Diamond-Star Motor Company

Model Year: 1990 VIN: 4P3LS34TOLE029954

Body Style: 2-Door Hatchback Build Date: June 1989

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

Impact Velocity: 29.3 mph Time of Test: 11:50

Type of Automatic Restraint System: Automatic Torso Belt

Failure Details:

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

Appendix A

PHOTOGRAPHS

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Figure A-34	VEHICLE IMPACT	A-36

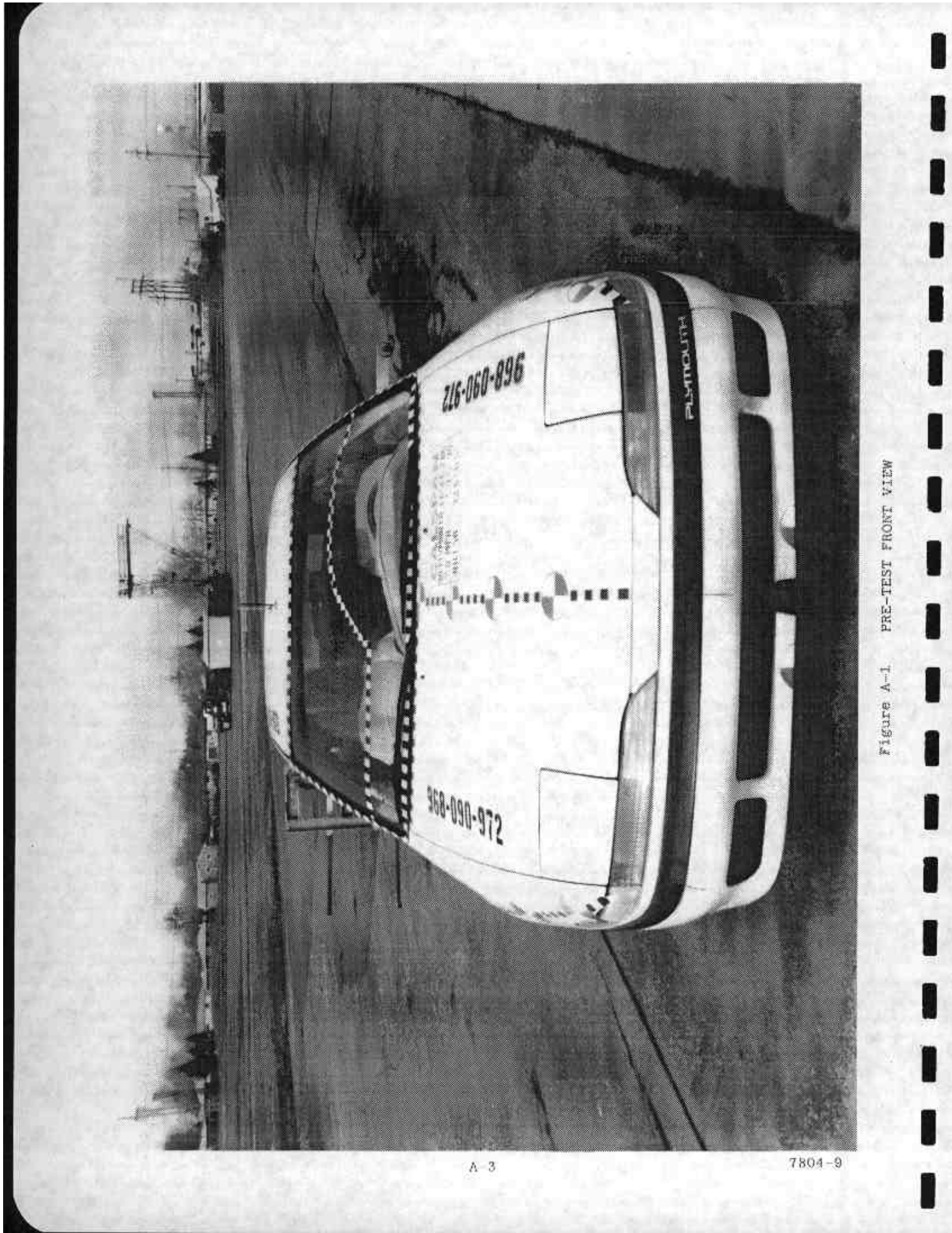


Figure A-1. PRE-TEST FRONT VIEW

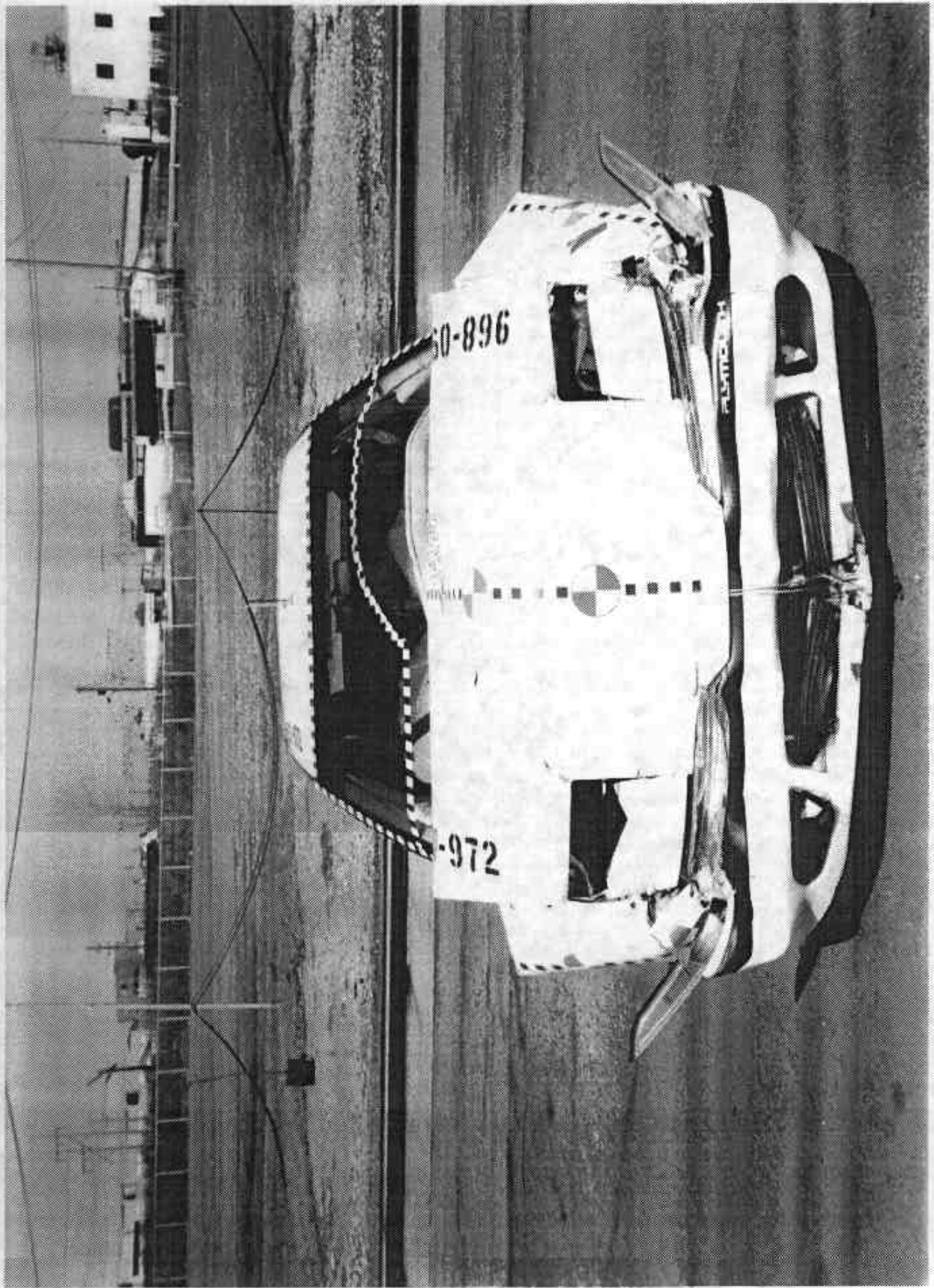


FIGURE A-2 POST TEST FRONT VIEW

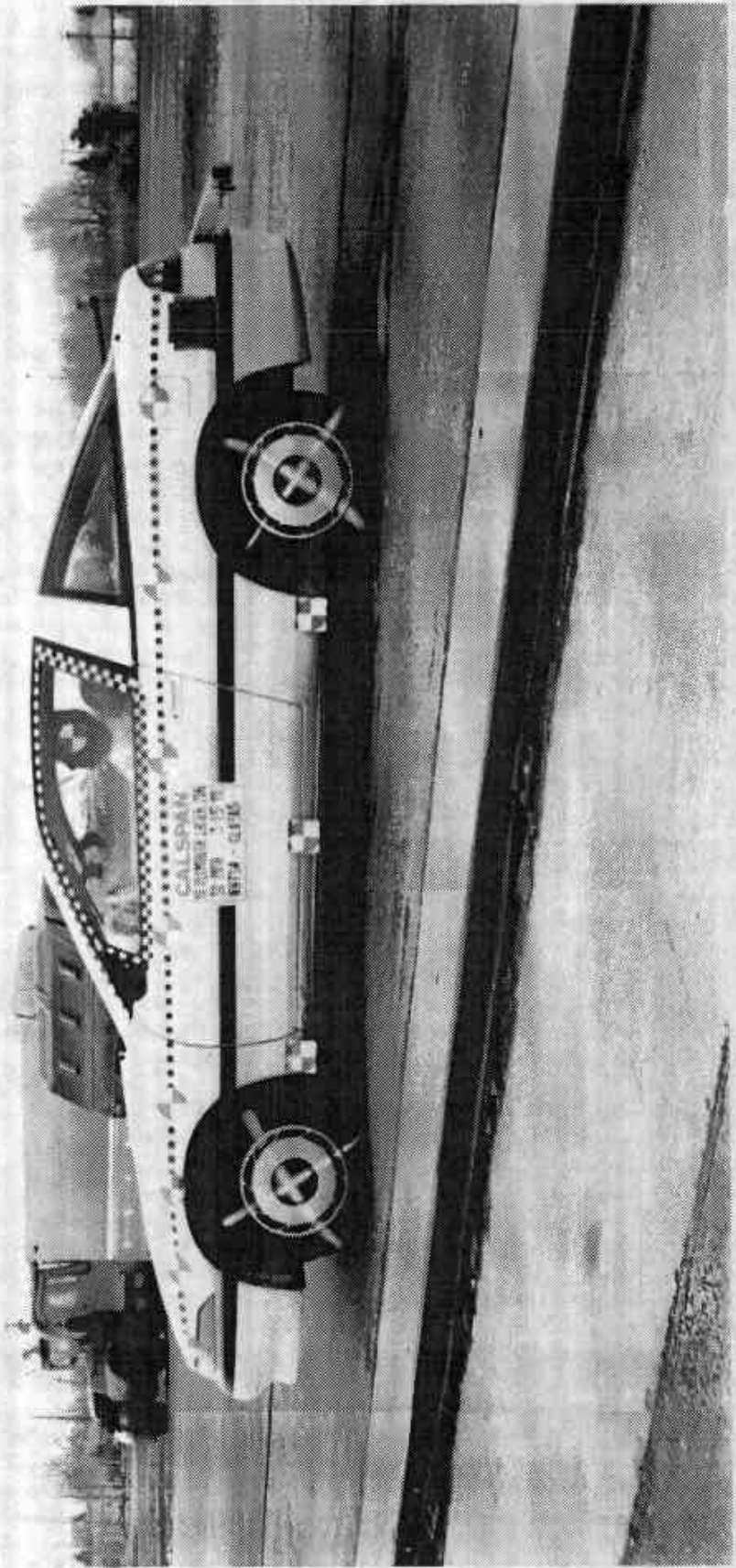


Figure A-3 PRE-TEST LEFT SIDE VIEW

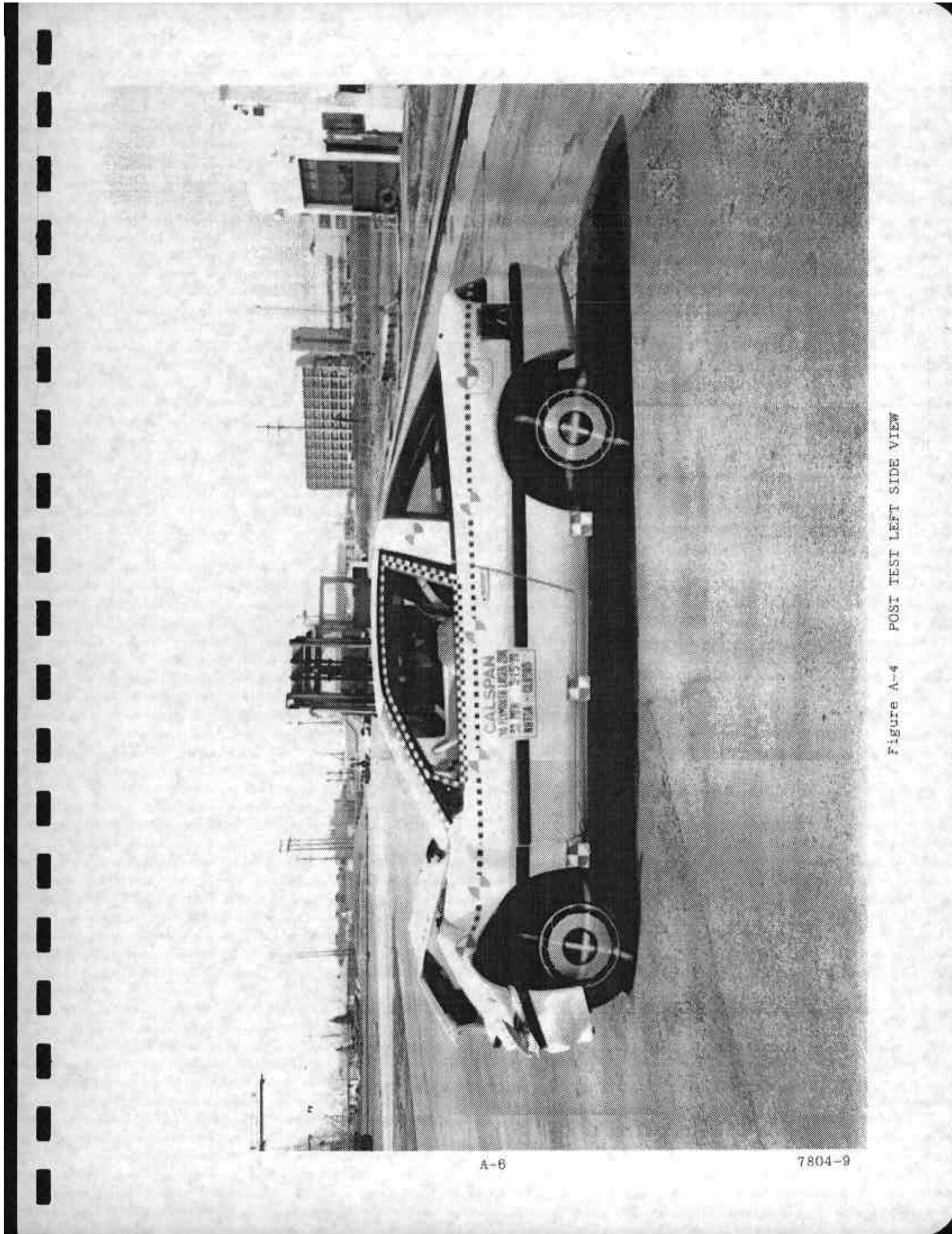


Figure A-4 POST TEST LEFT SIDE VIEW

A-6

7804-9

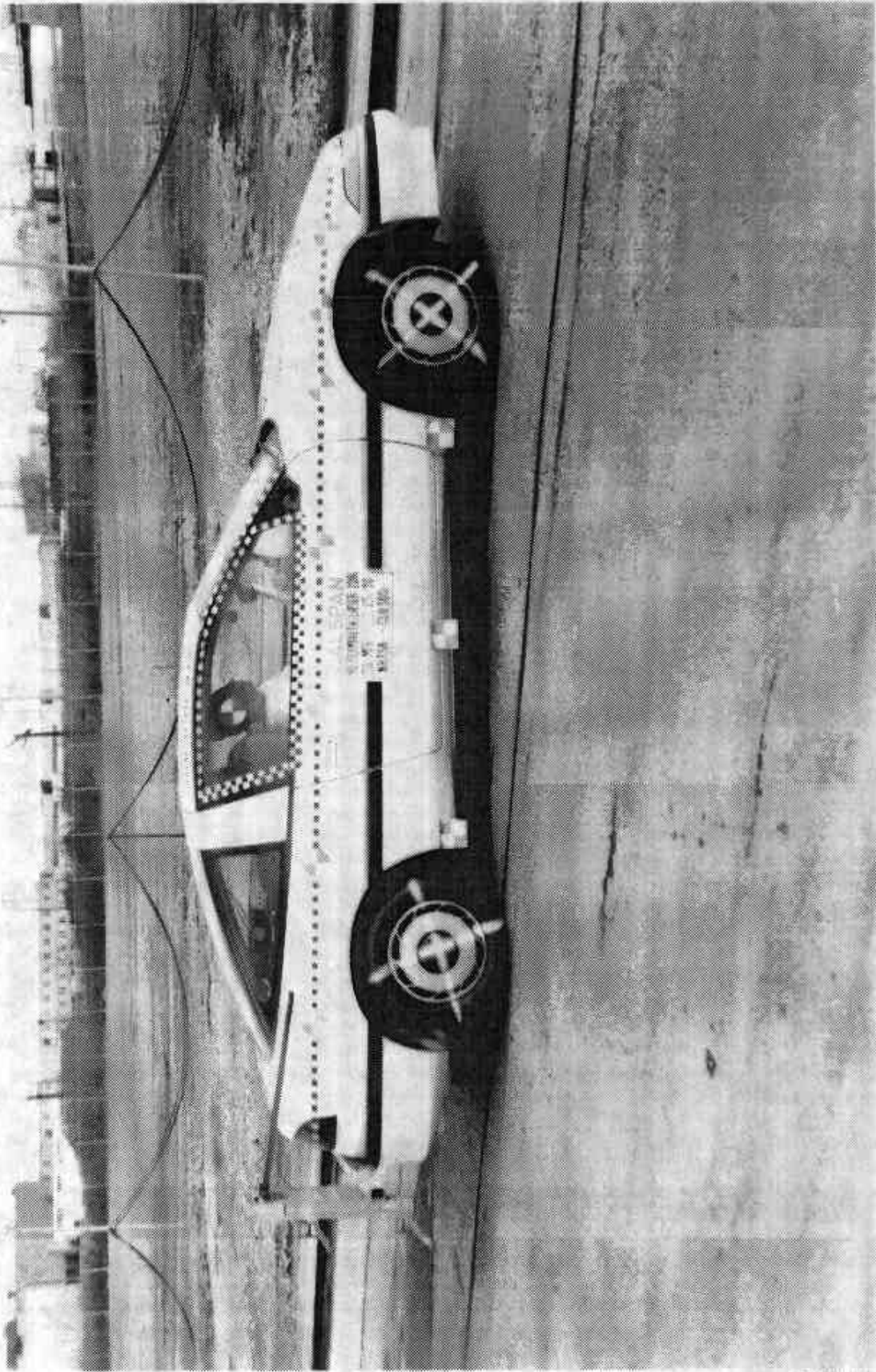


Figure A-5 PRE-TEST RIGHT SIDE VIEW

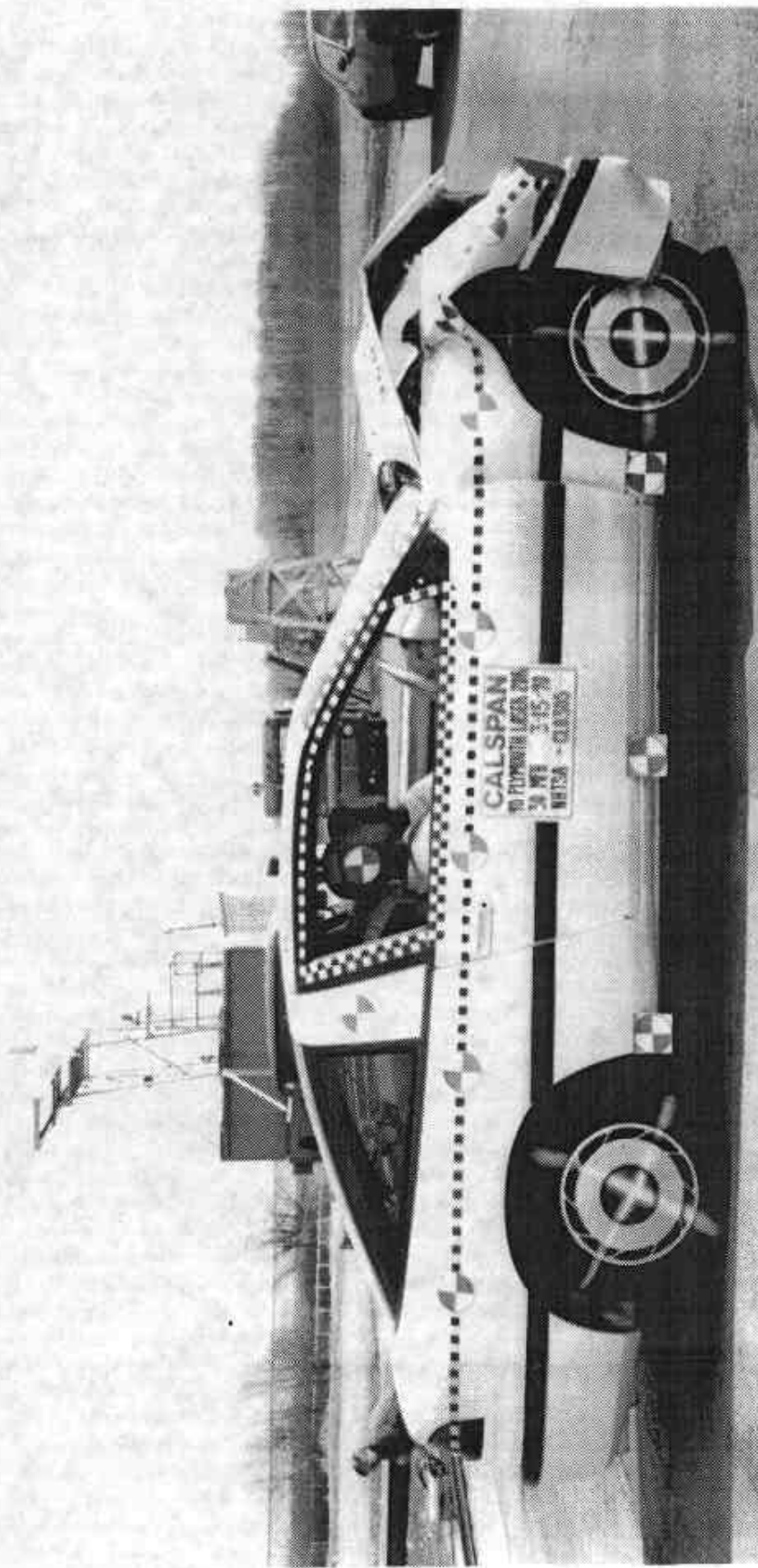


Figure A-6 POST-TEST RIGHT SIDE VIEW

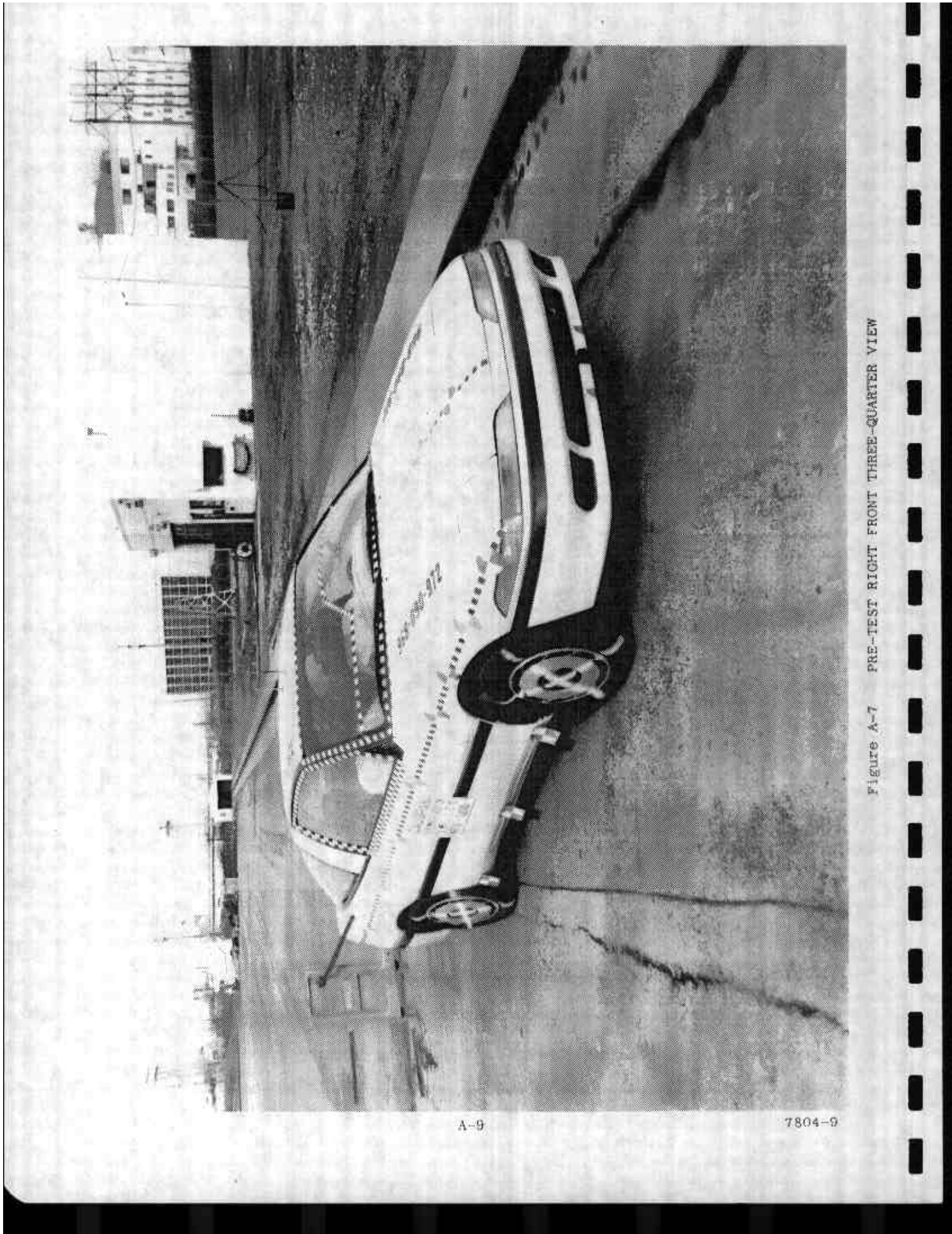


Figure A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

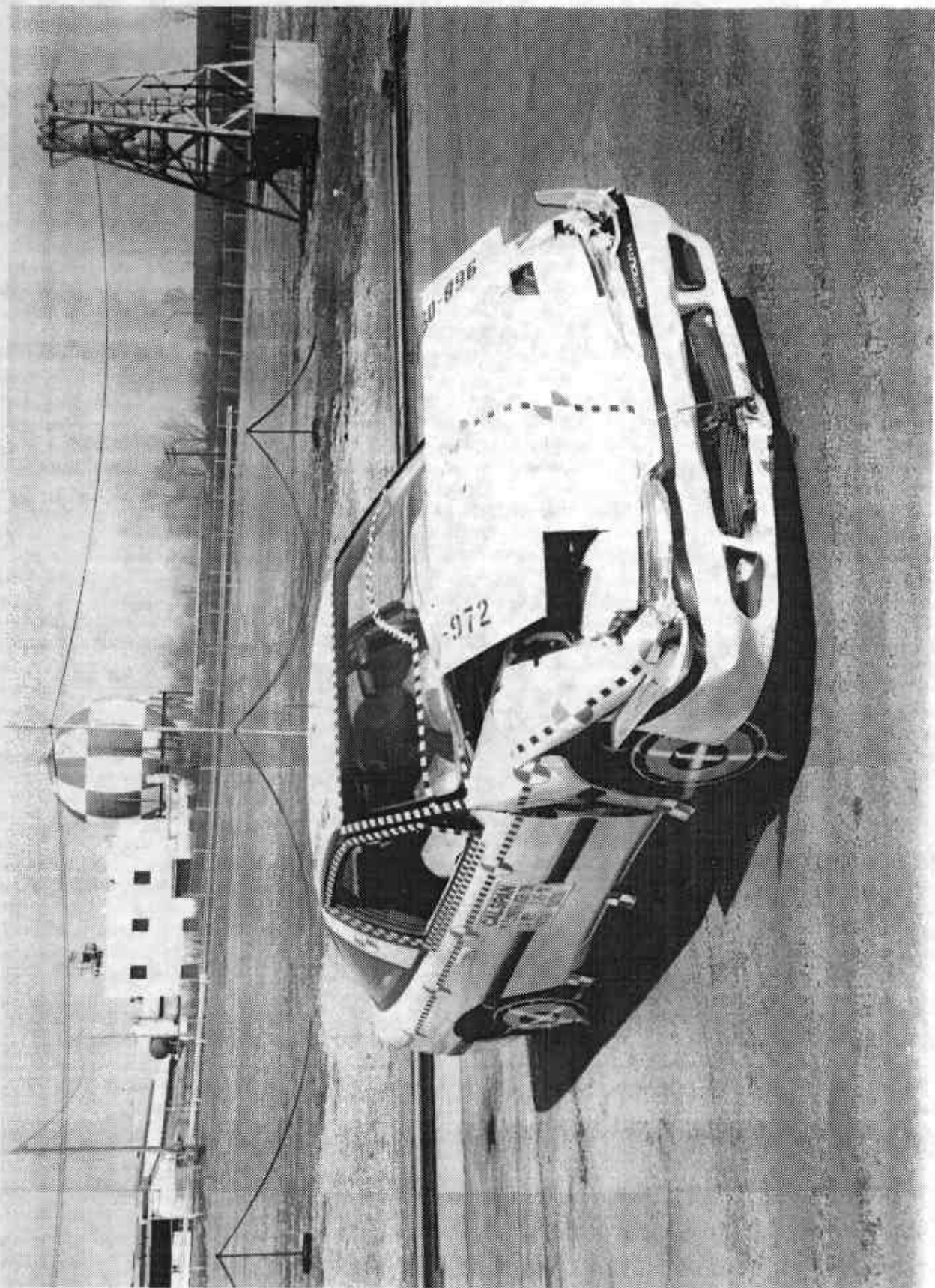


Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

7804-9



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

A-11

7804-8

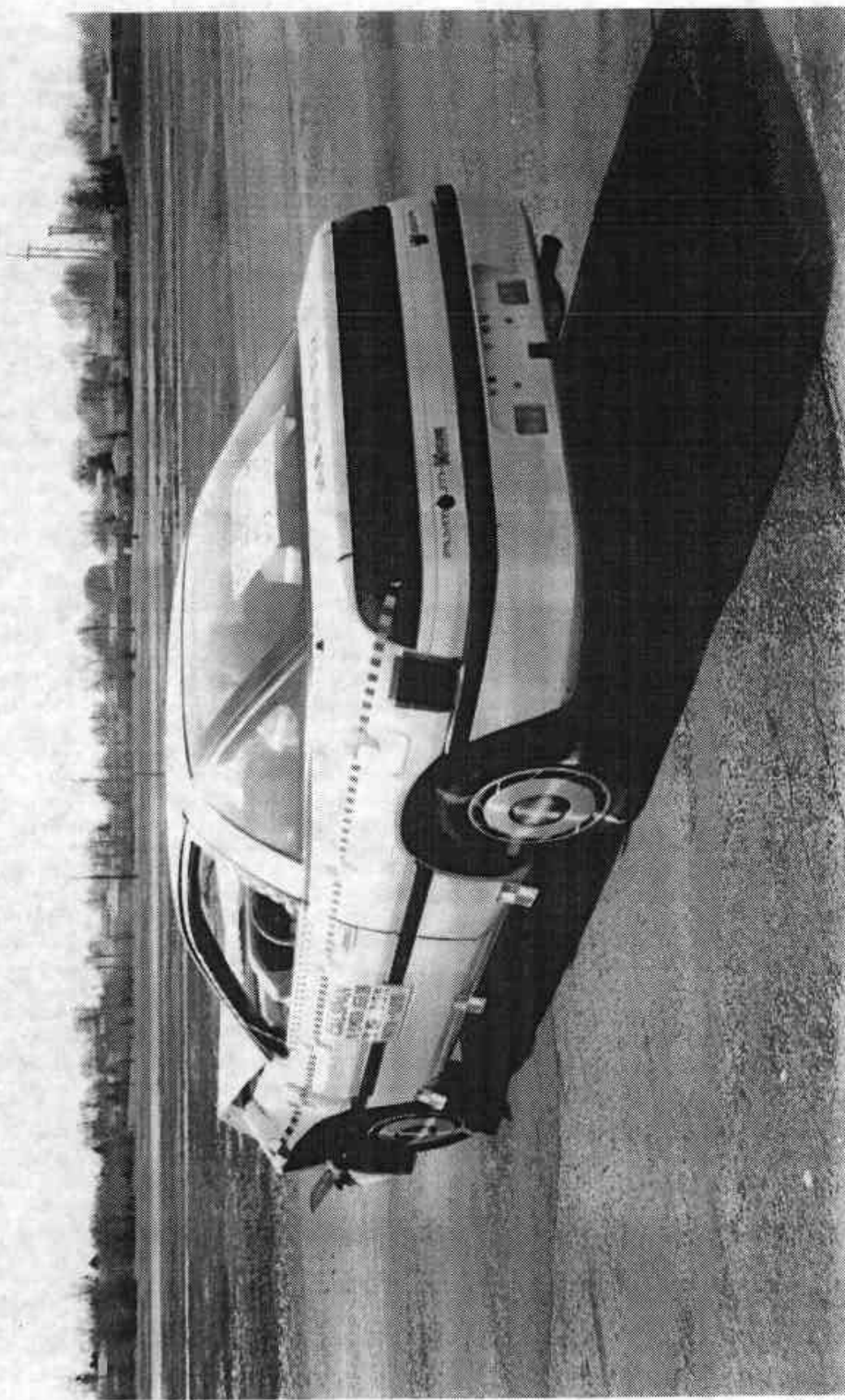


Figure A-10 POST-TEST LEFT REAR THREE-QUARTER VIEW

A-12

7804-0

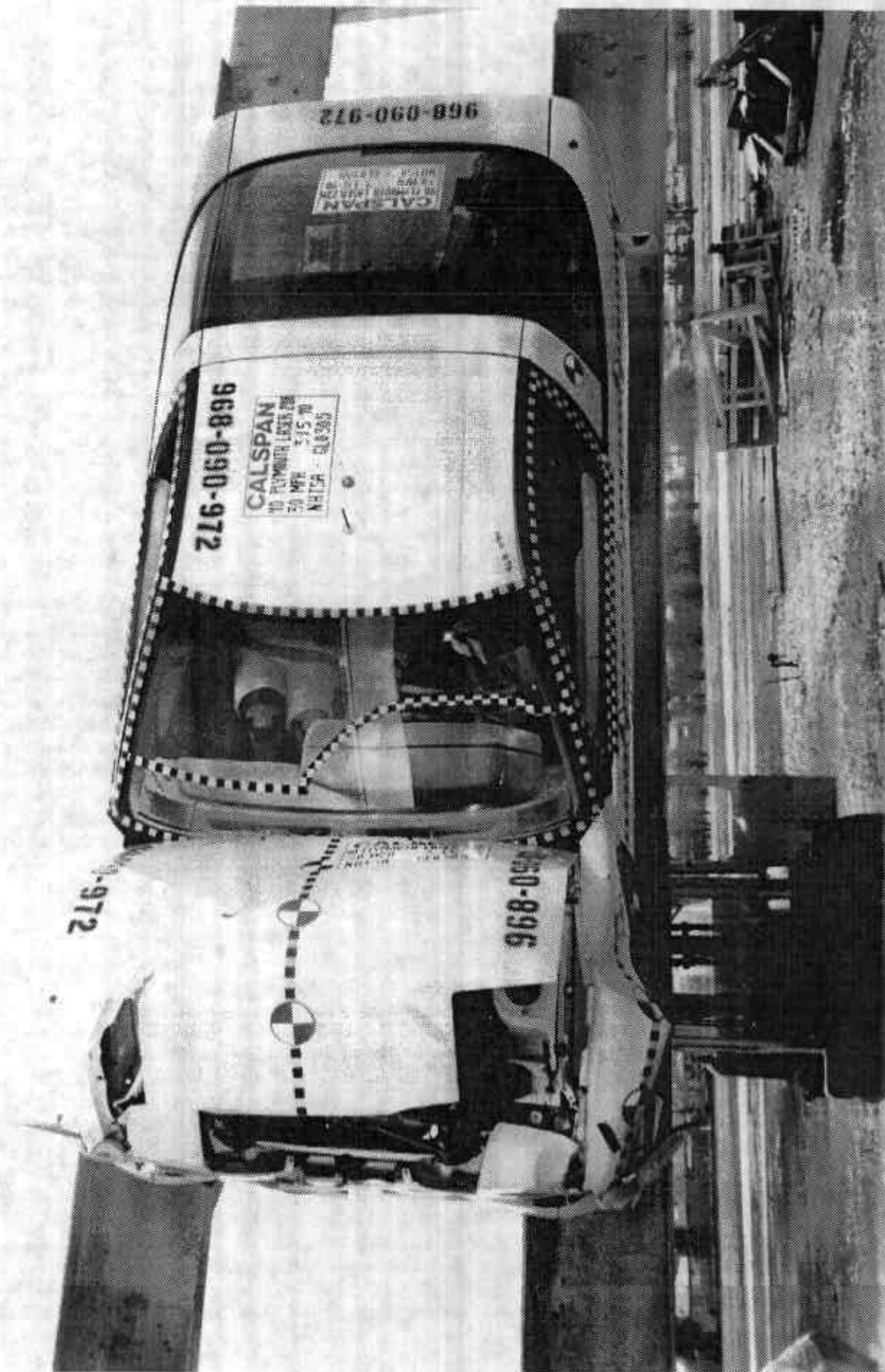
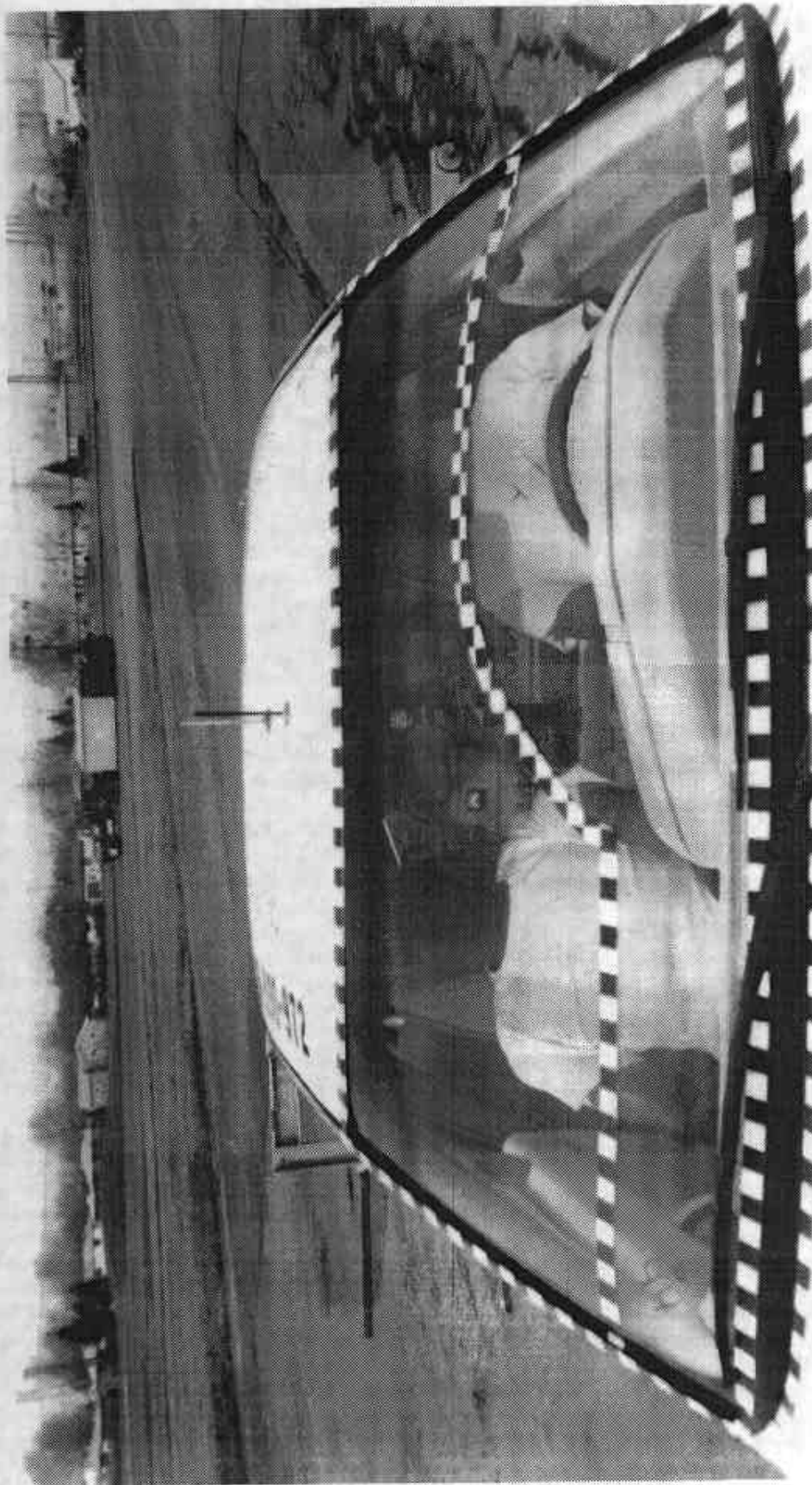


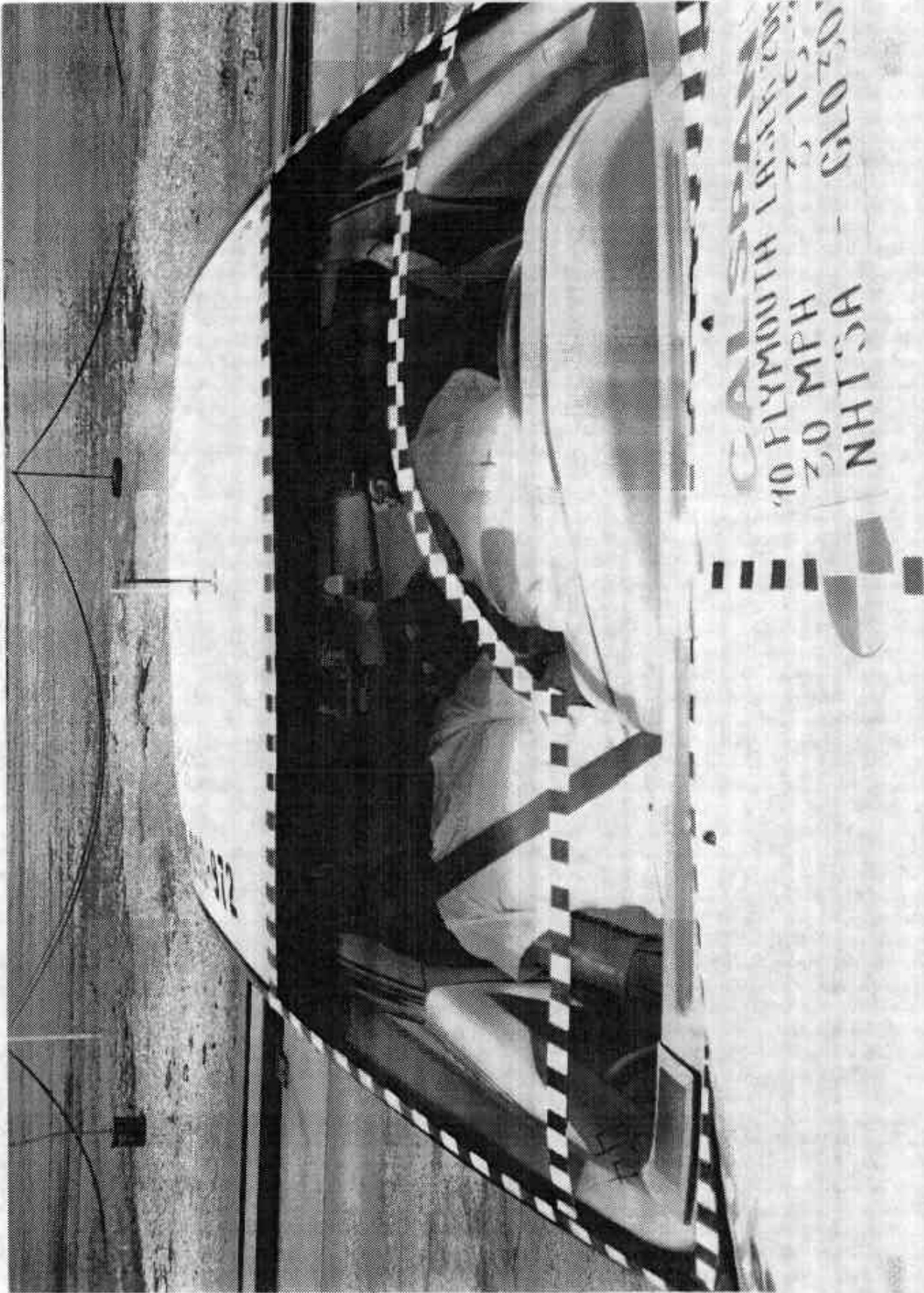
Figure A-11 POST TEST TOP VIEW



CALSPAN
'10 FLYMOUTH LASER 2DR
30 MPH 3-15-90
NHTSA - CA0705

96R.

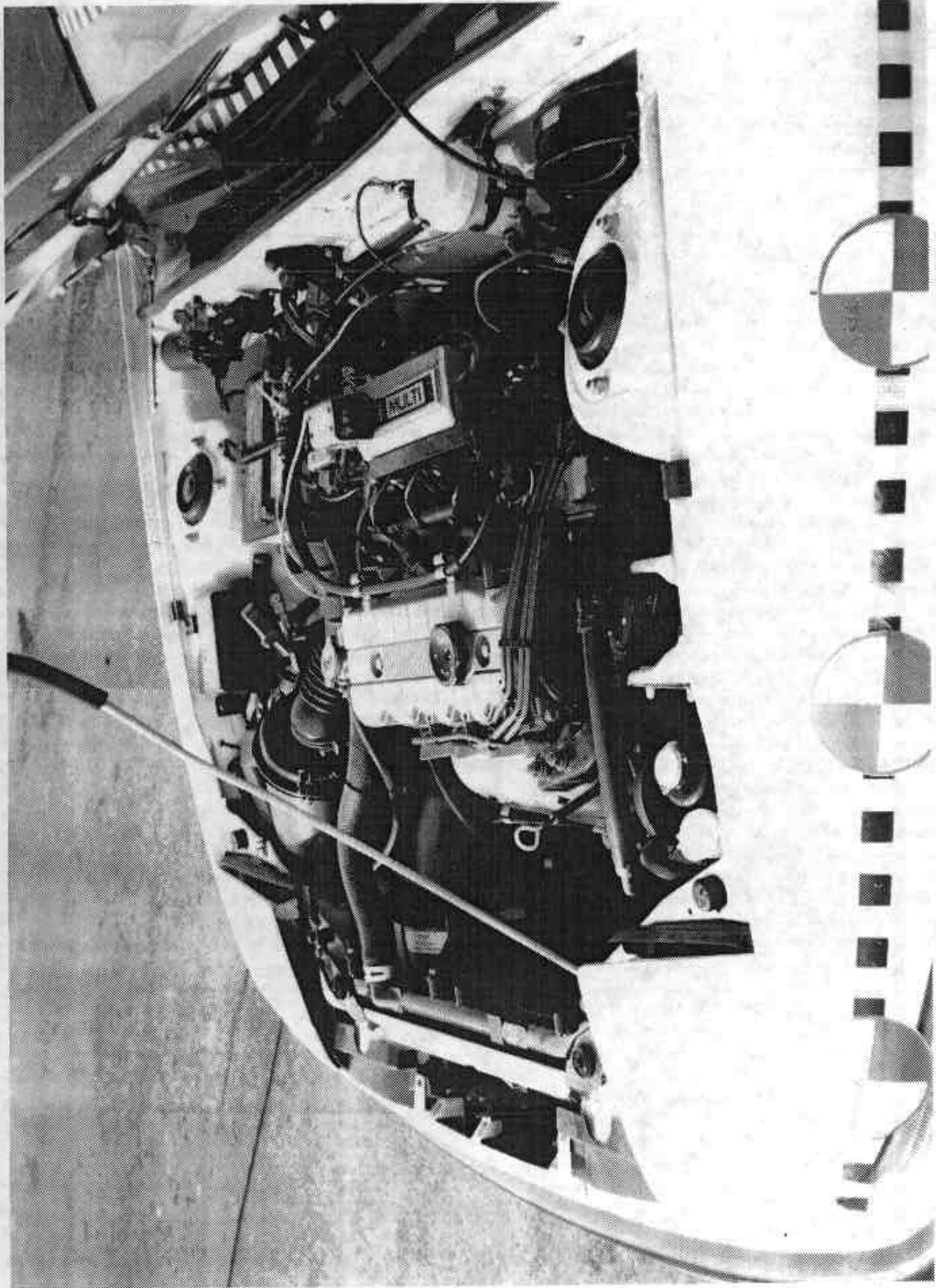
Figure A-12 PRE-TEST WINDSHIELD VIEW



A-15

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Figure A-13 POST-TEST WINDSHIELD VIEW



A-16

7804-0

Figure A-14 PRE-TEST ENGINE COMPARTMENT SIDE VIEW

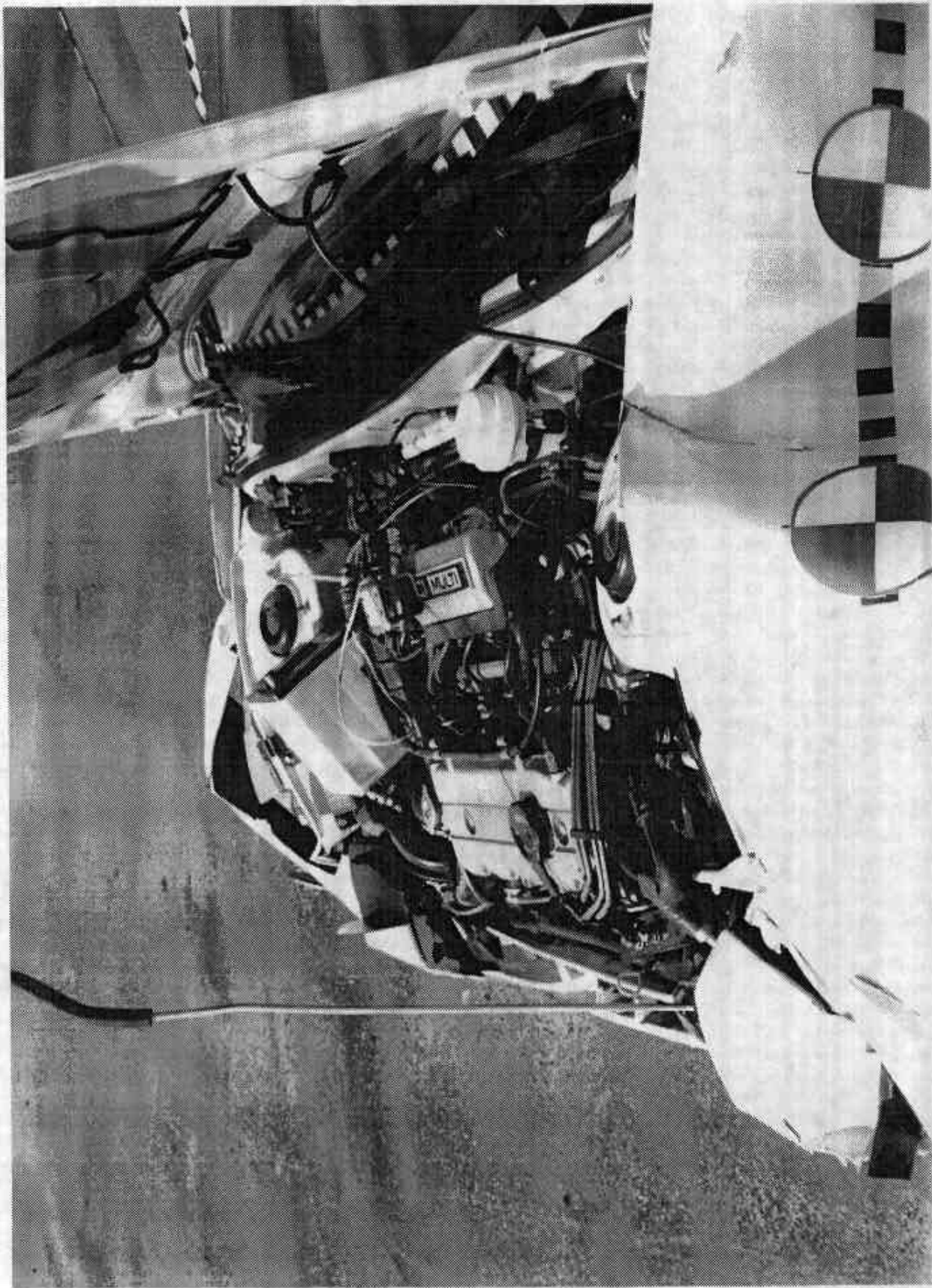


Figure A-15 POST-TEST ENGINE COMPARTMENT FRONT VIEW

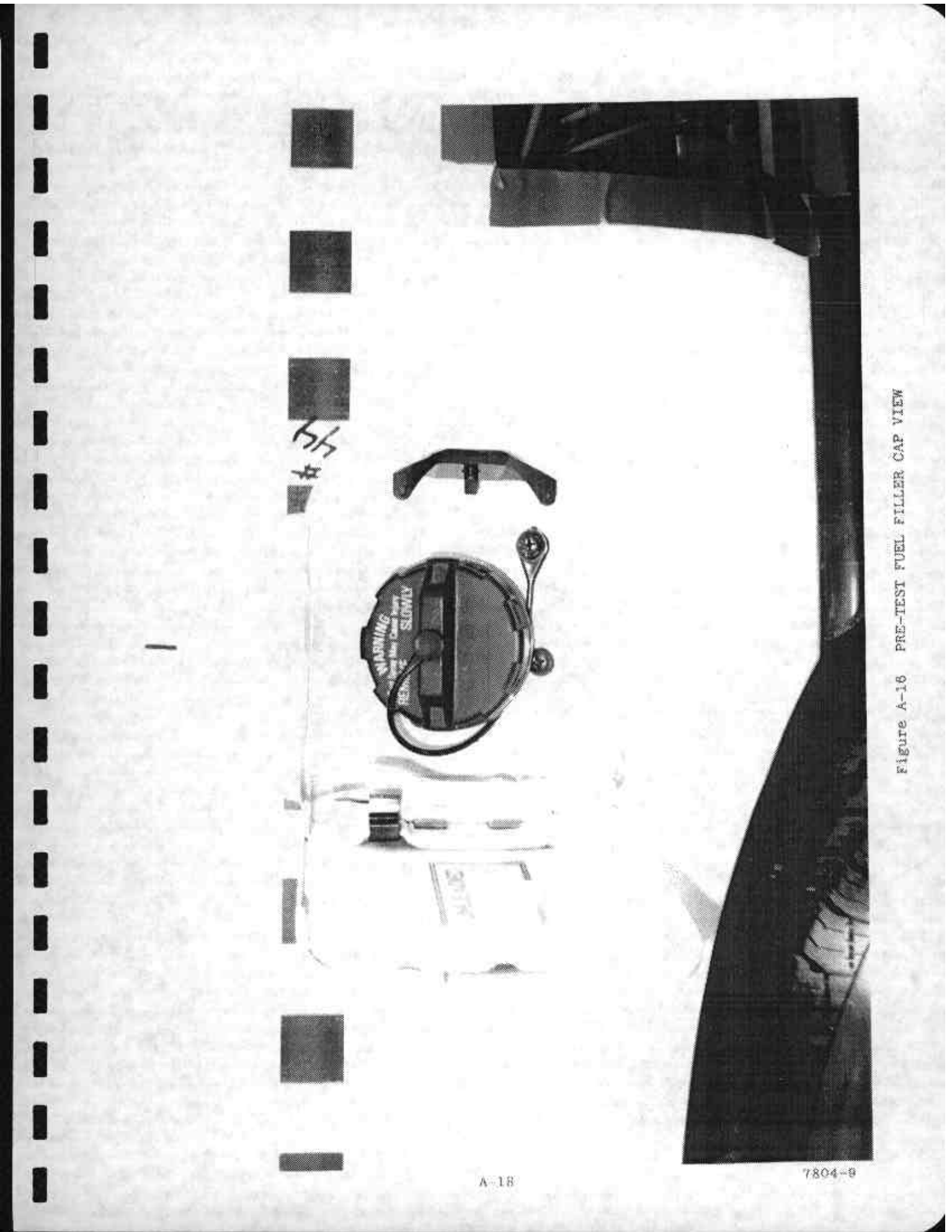


Figure A-16 PRE-TEST FUEL FILLER CAP VIEW

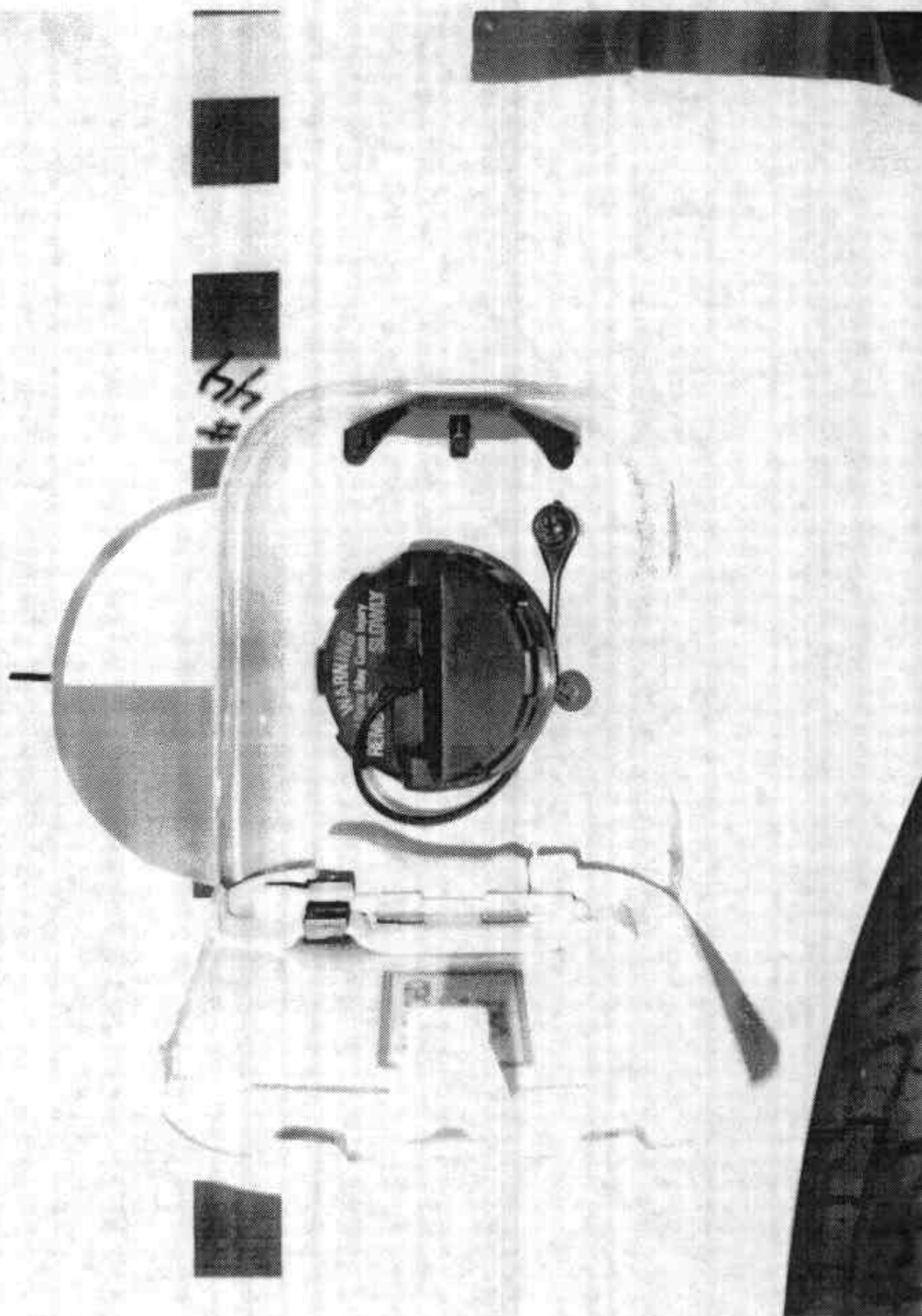


Figure A-17 POST-TEST FUEL FILLER CAP VIEW

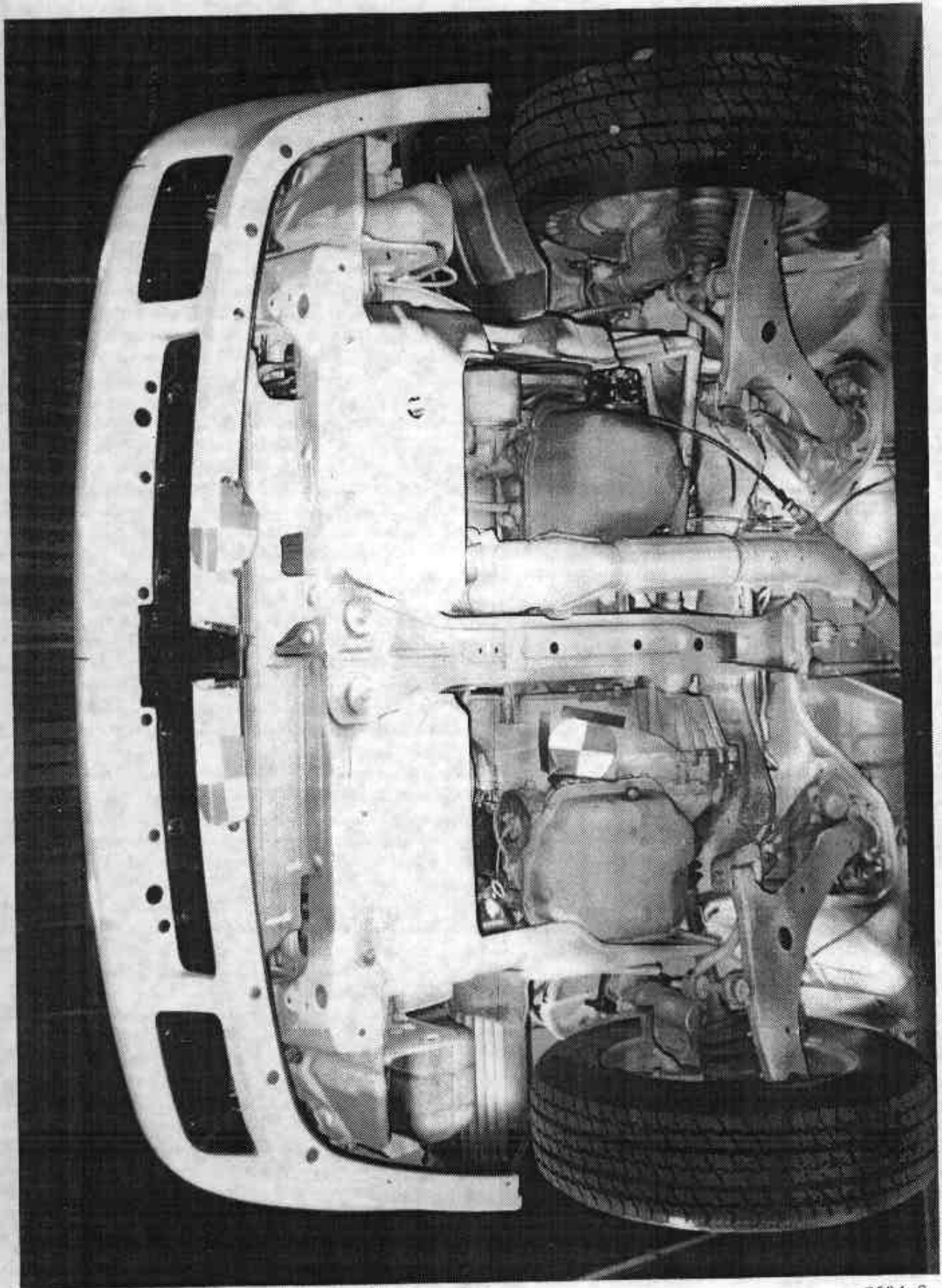


FIGURE A-18 PRE-TEST FRONT UNDERBODY VIEW

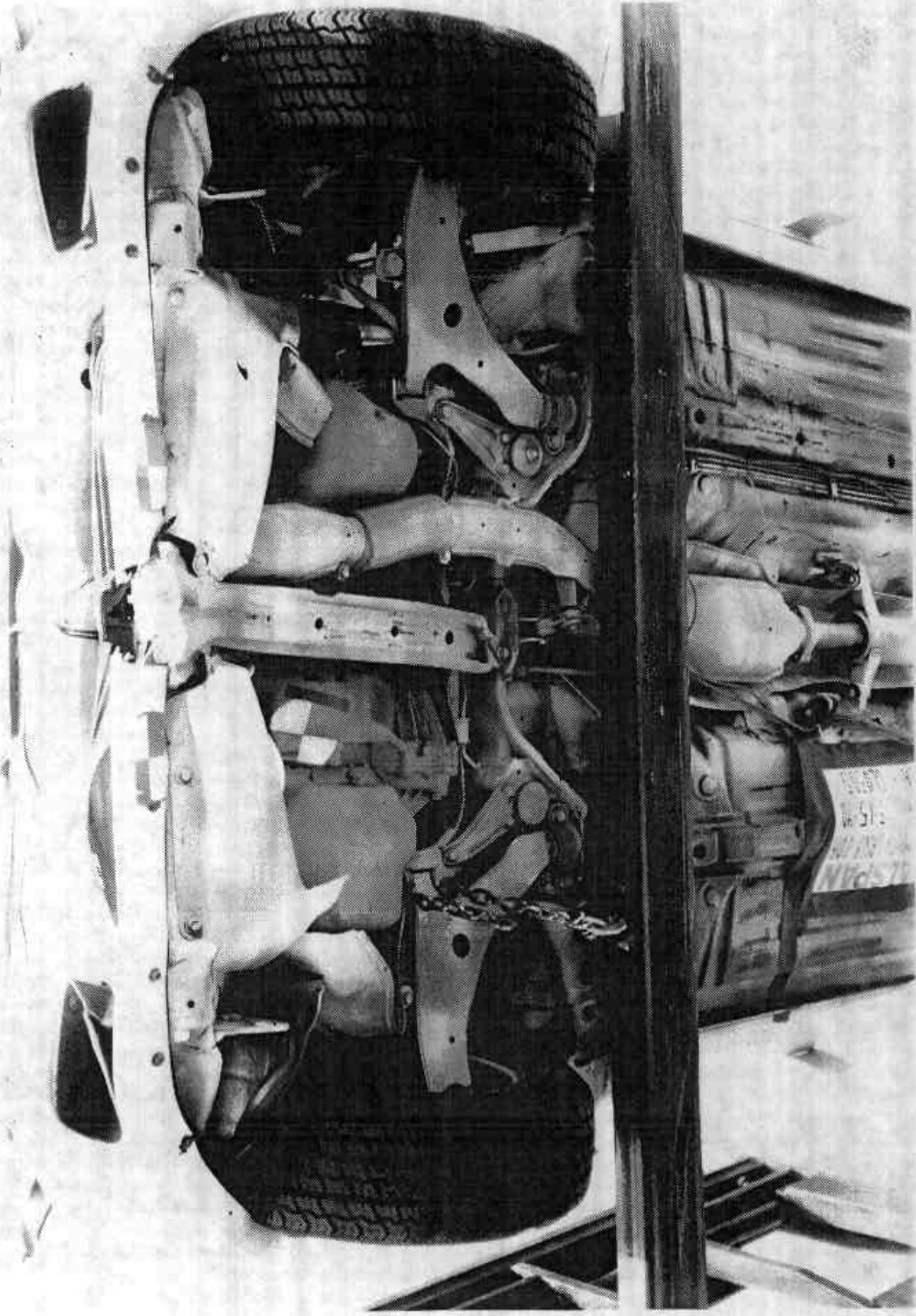


Figure A-19 POST-TEST FRONT UNDERBODY VIEW

A-21

7804-9

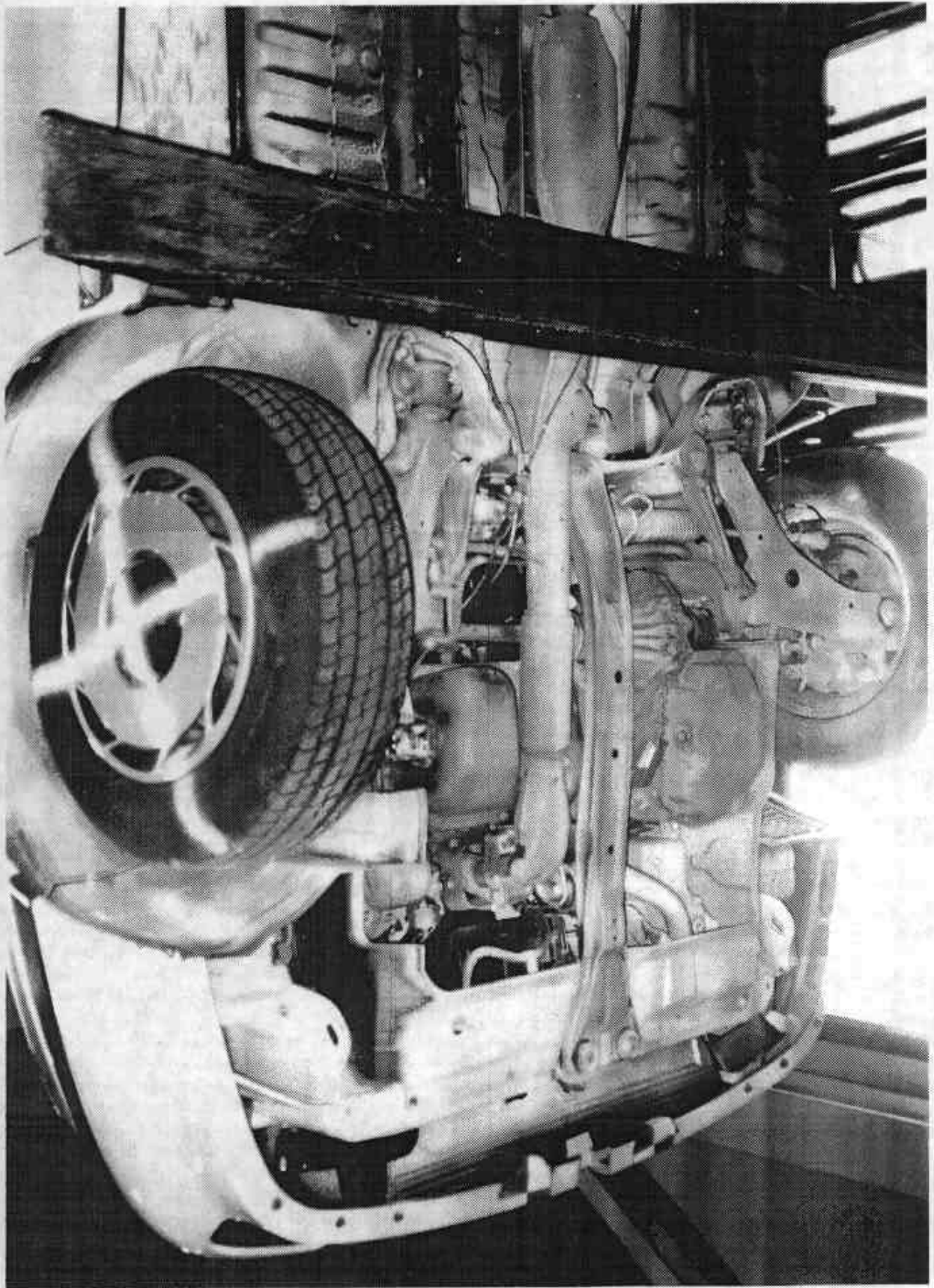


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

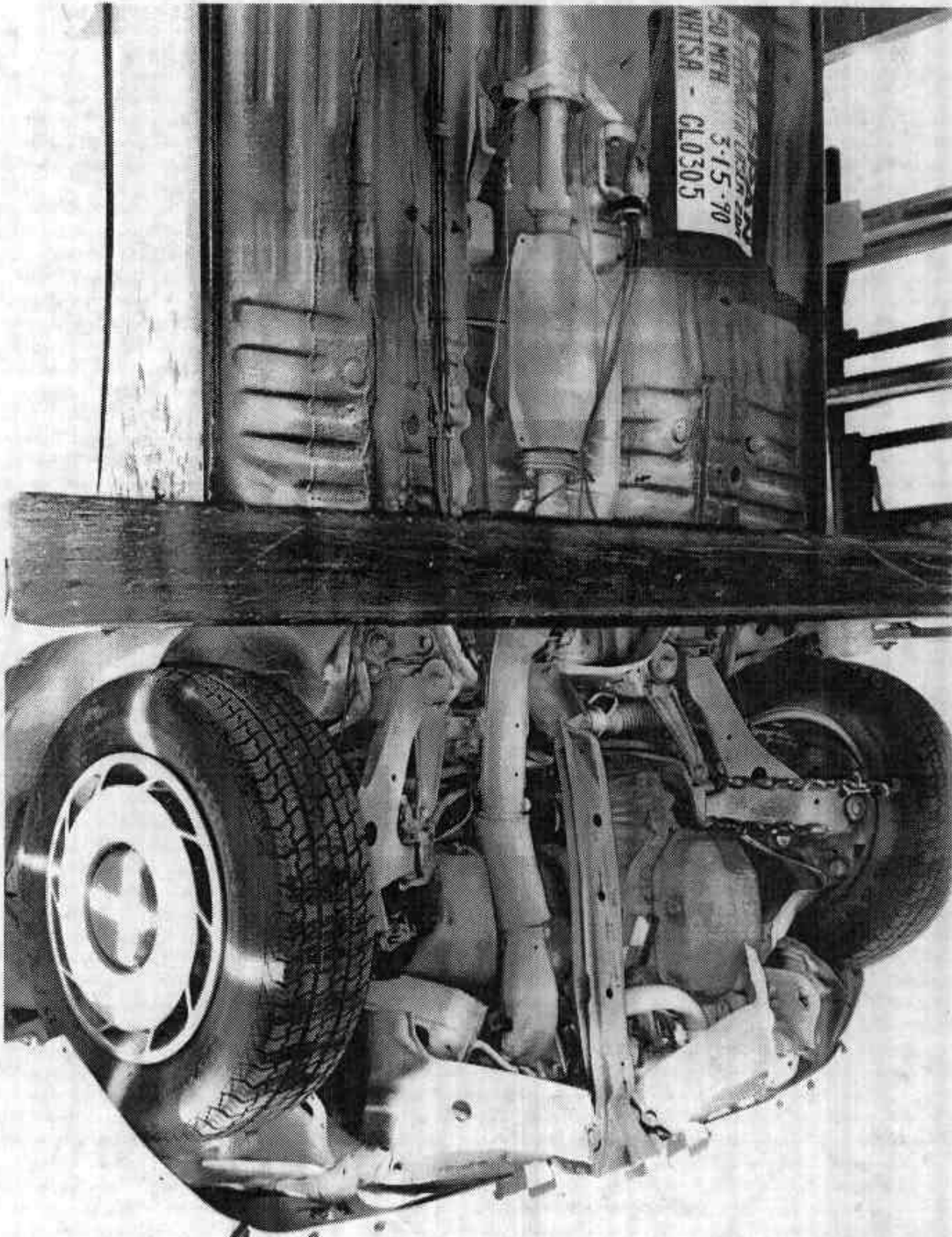


Figure A-21 POST-TEST FRONT SIDE UNDERBODY VIEW

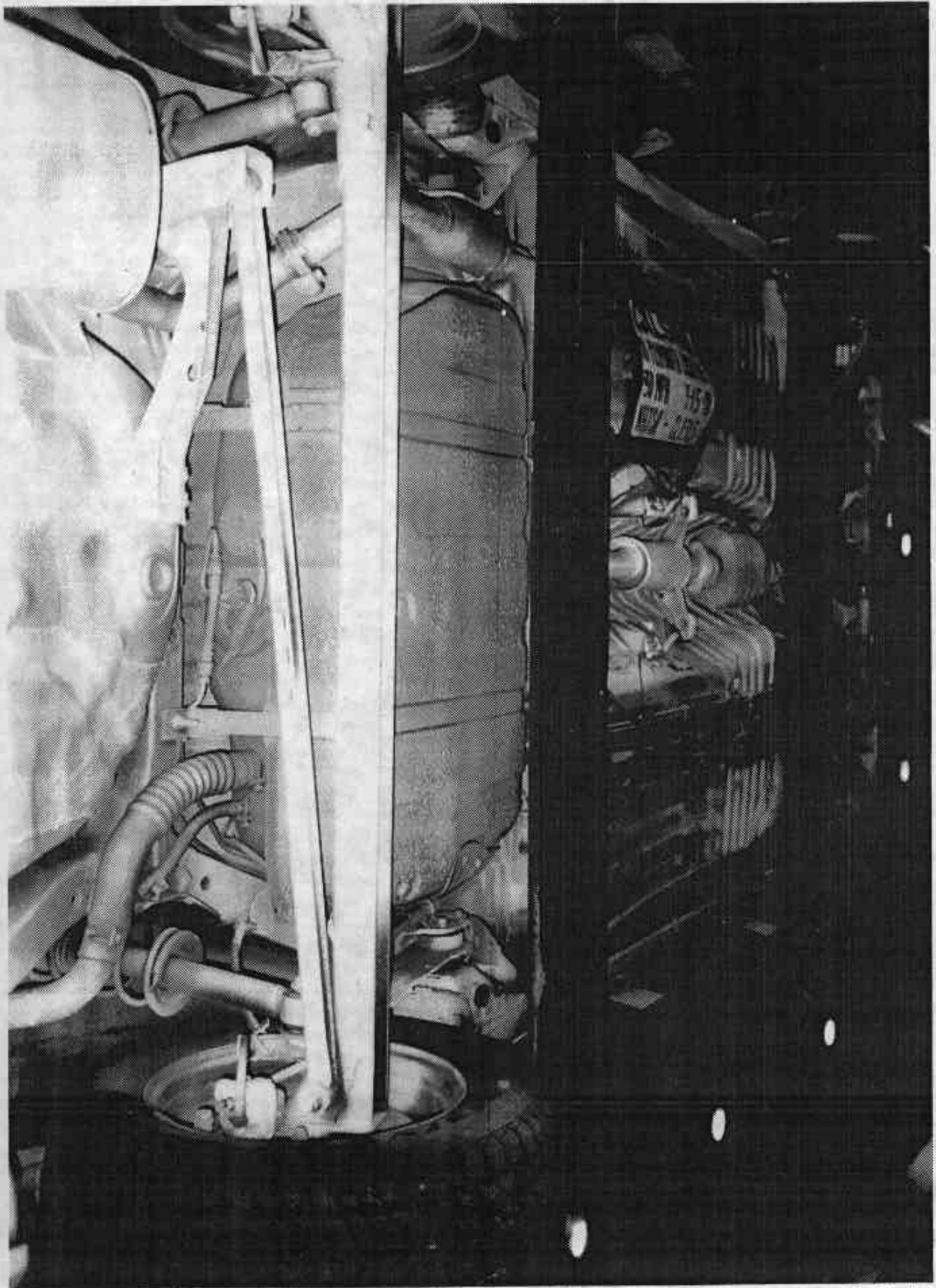


FIGURE A-22 PRE-TEST REAR UNDERSHOY VIEW

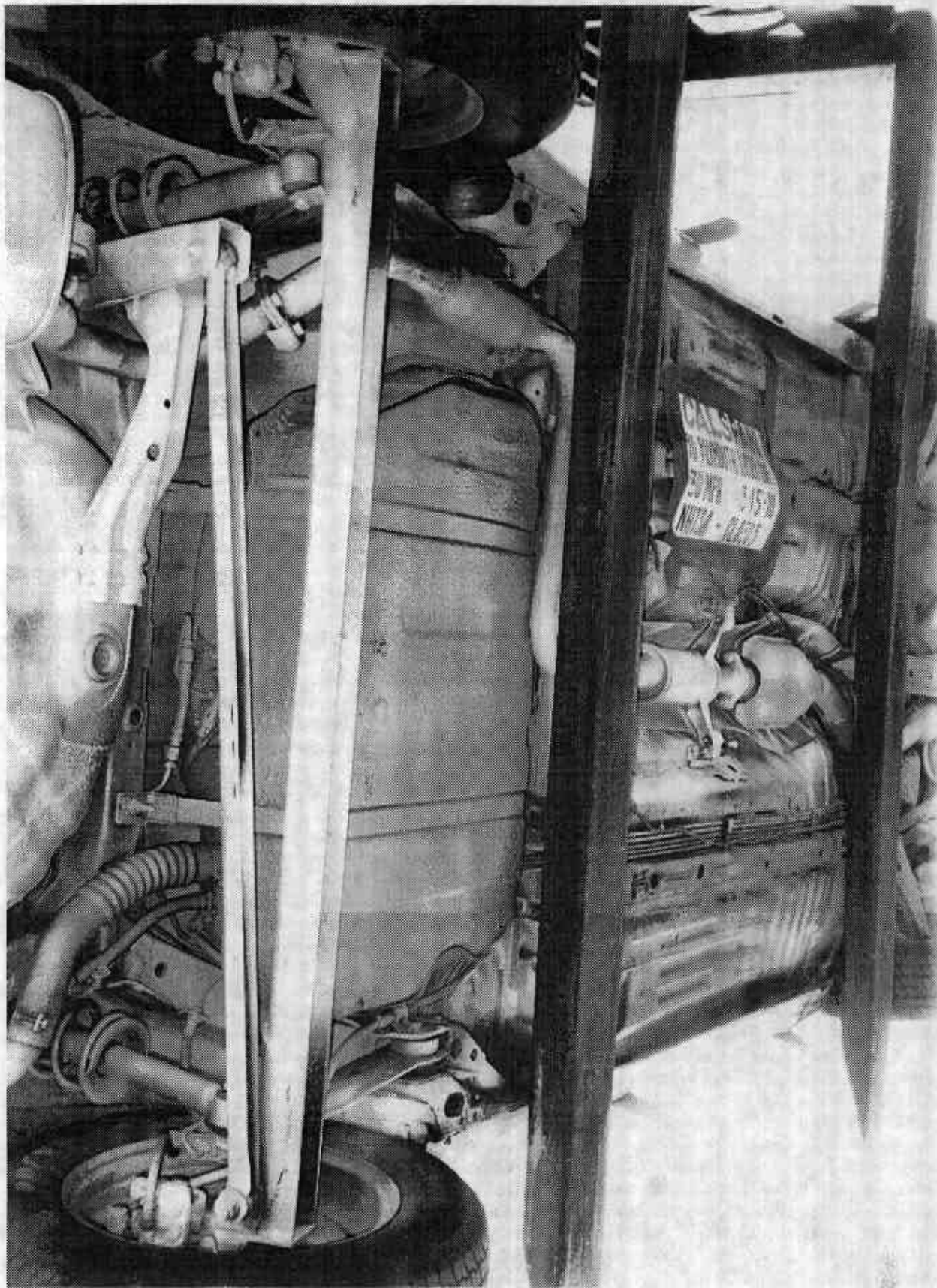


Figure A-23 POST-TEST REAR UNDERBODY VIEW

A-25

7804-9

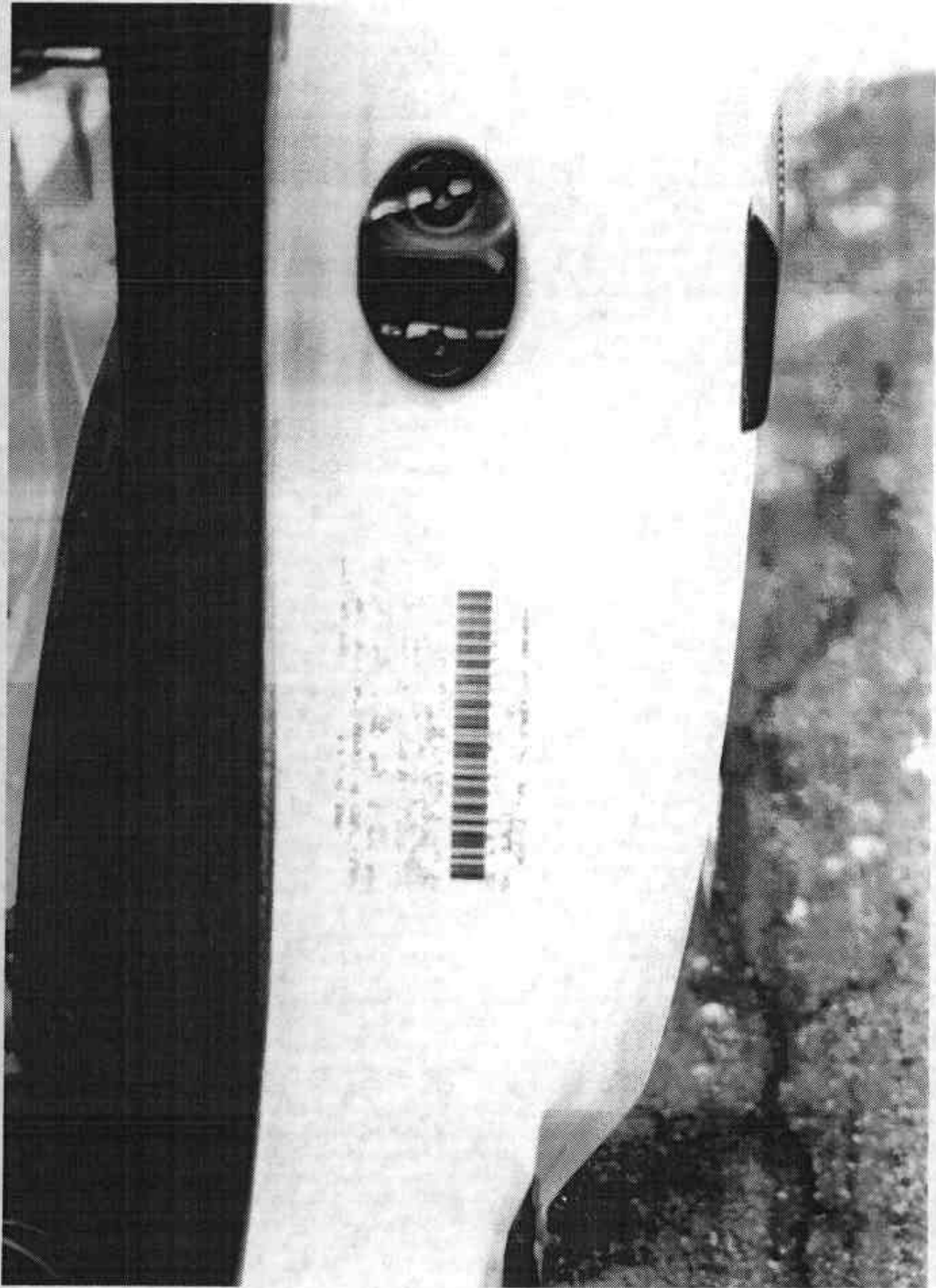


FIGURE A-24 CERTIFICATION LABEL

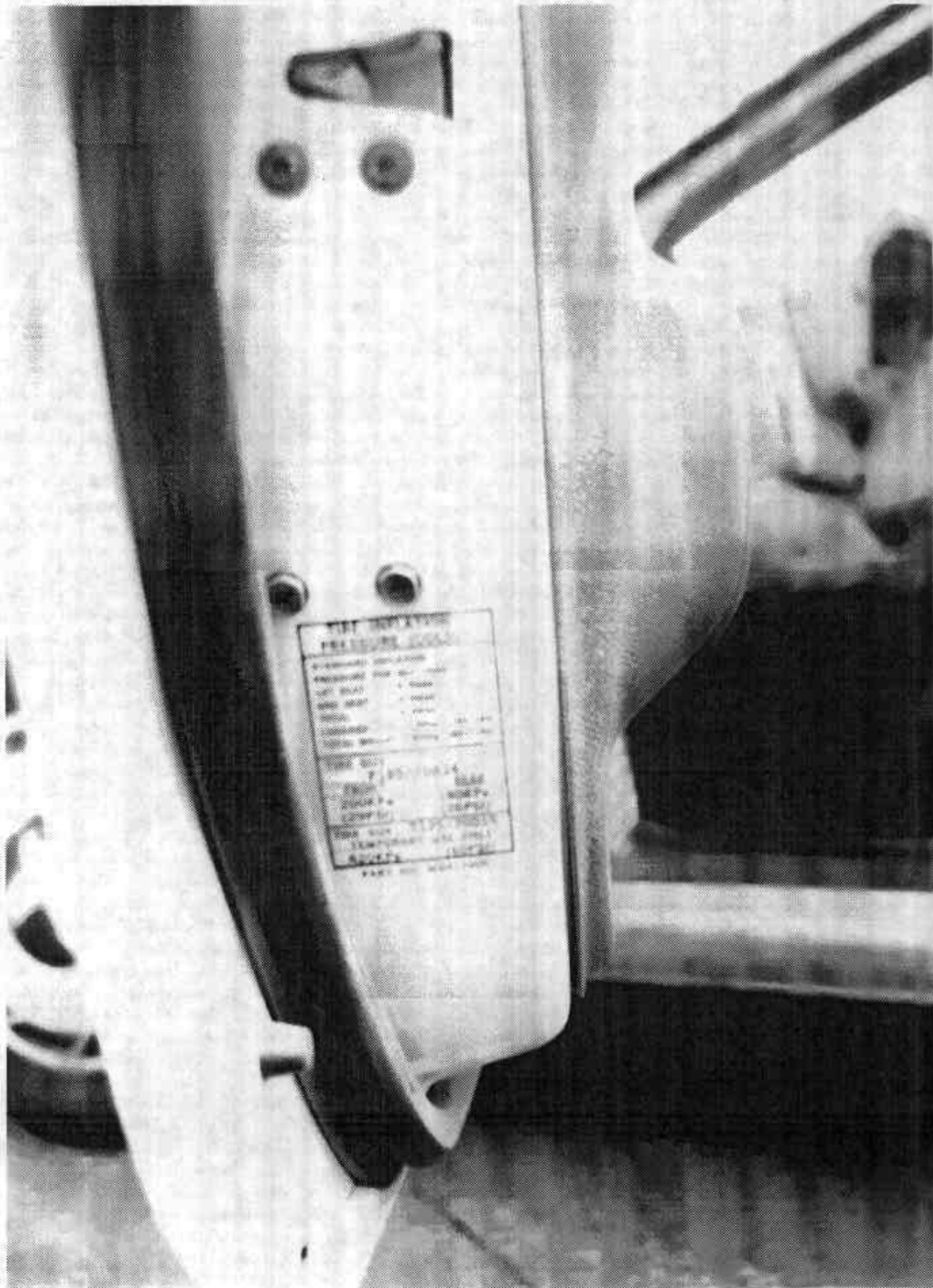


Figure A-25 TIRE PLACARD

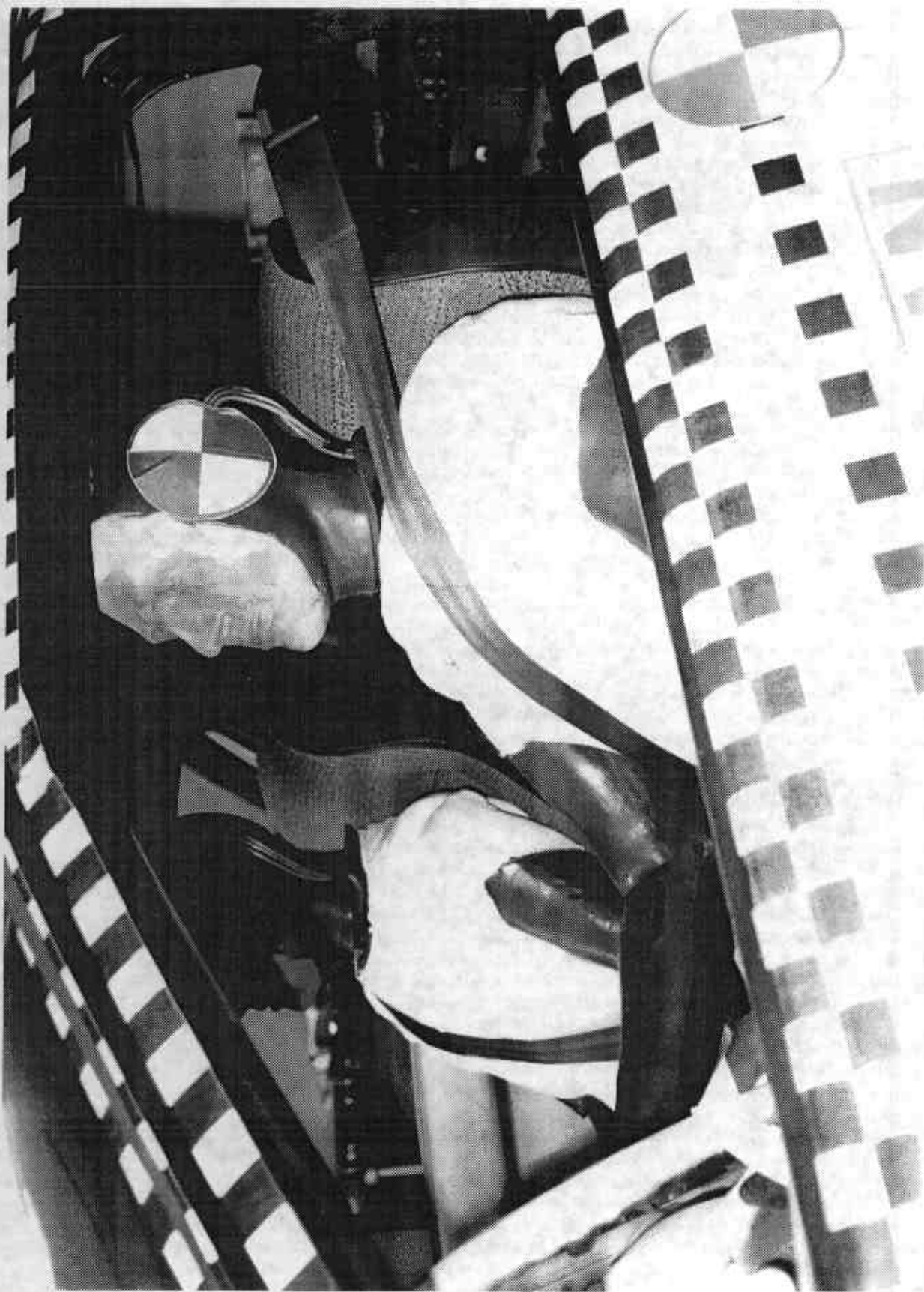


Figure A-26 PRE-TEST DRIVER DUMMY POSITION

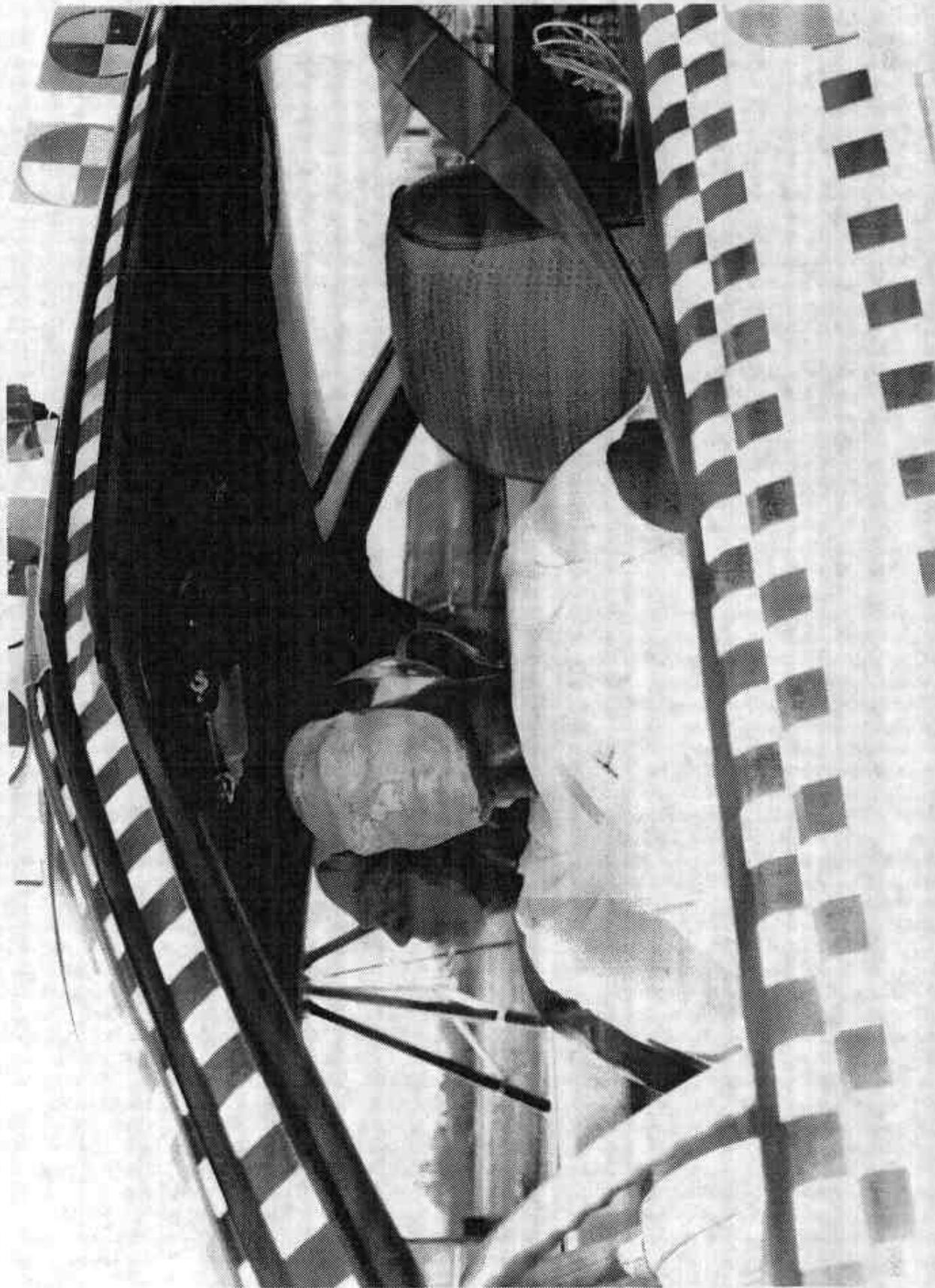


Figure A-27 POST-TEST DRIVER DUMMY POSITION

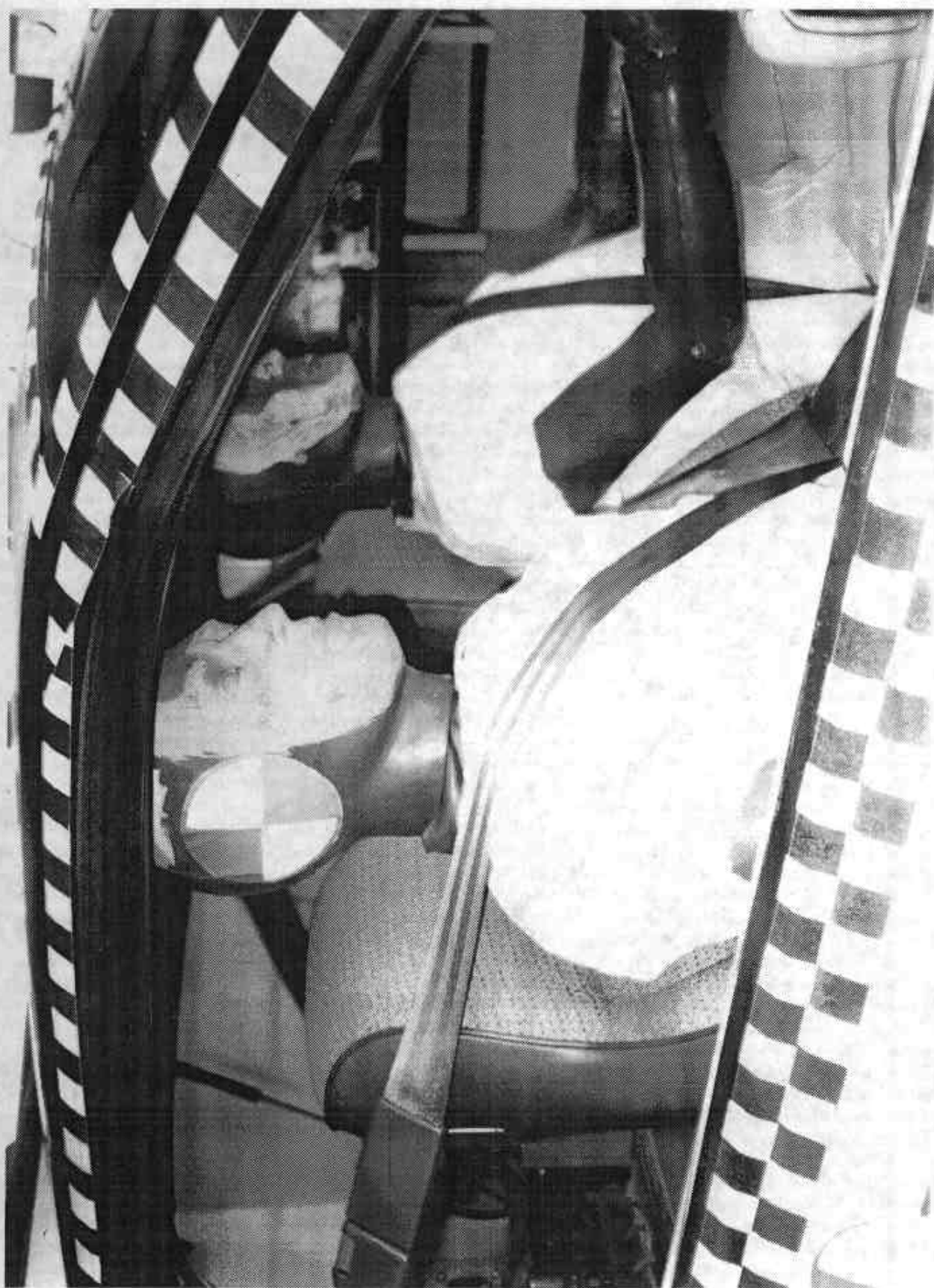


Figure A-28 PRE-TEST PASSENGER DUMMY POSITION

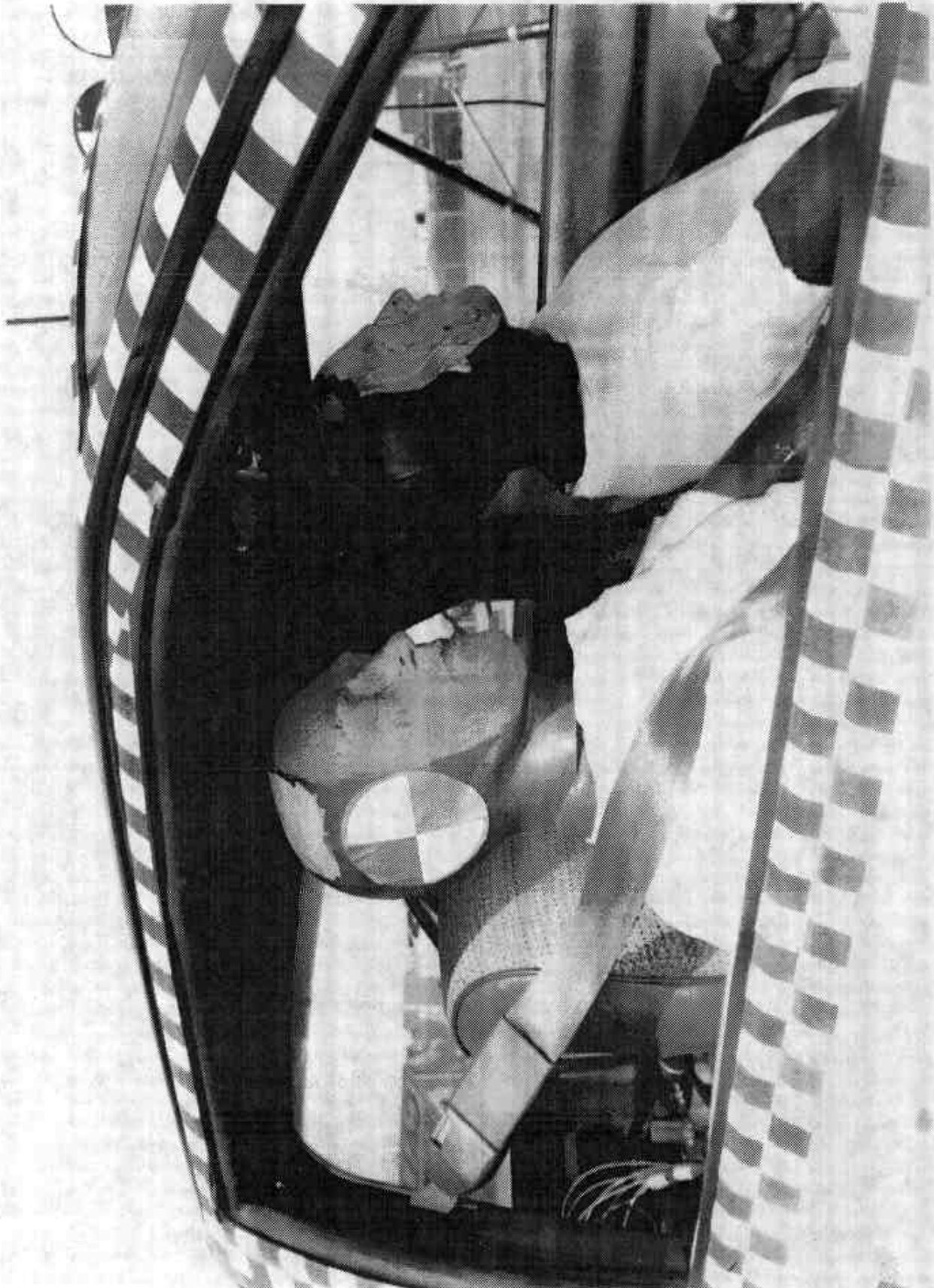


FIGURE A-29 POST-TEST PASSENGER DUMMY POSITION

A-31

7804-9



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

A-32

7804-9



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

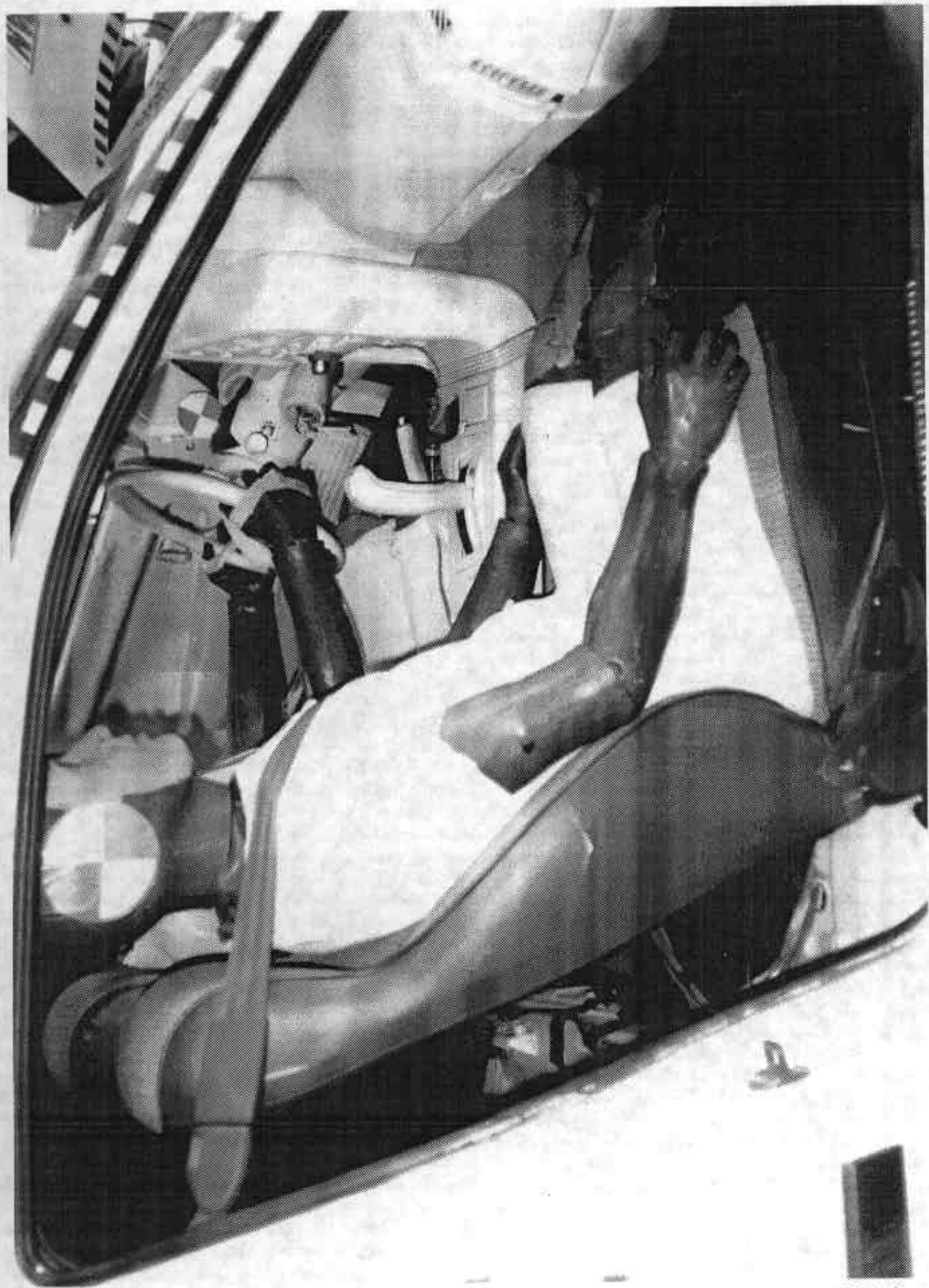


Figure A-32. PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW

A-34

7804-9



FIGURE A-33. POST-TEST PASSENGER DUMMY AND INTERIOR VIEW

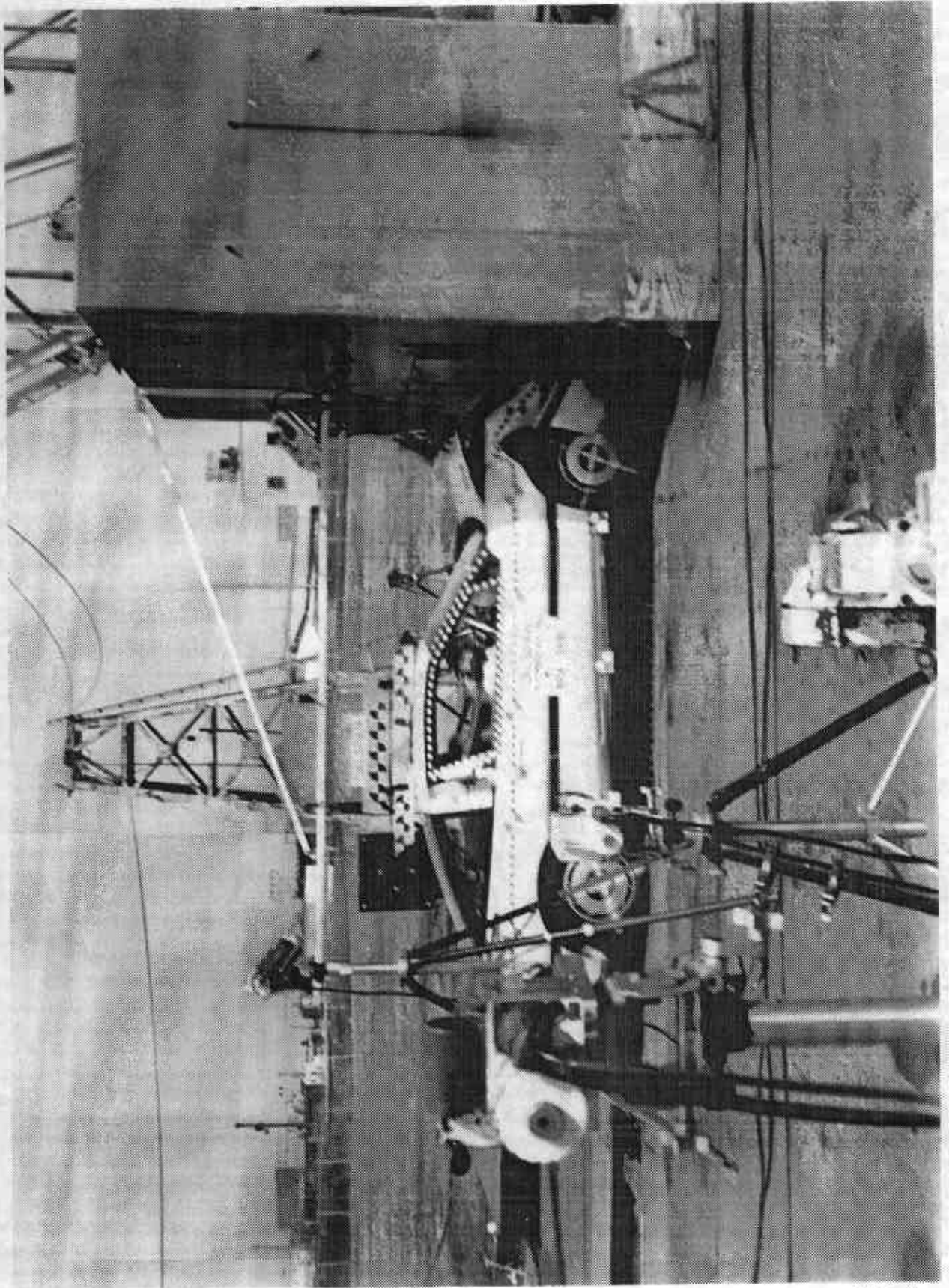


Figure A-34 VEHICLE IMPACT

A-36

7804-9

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CLO305

VEHICLE DATA

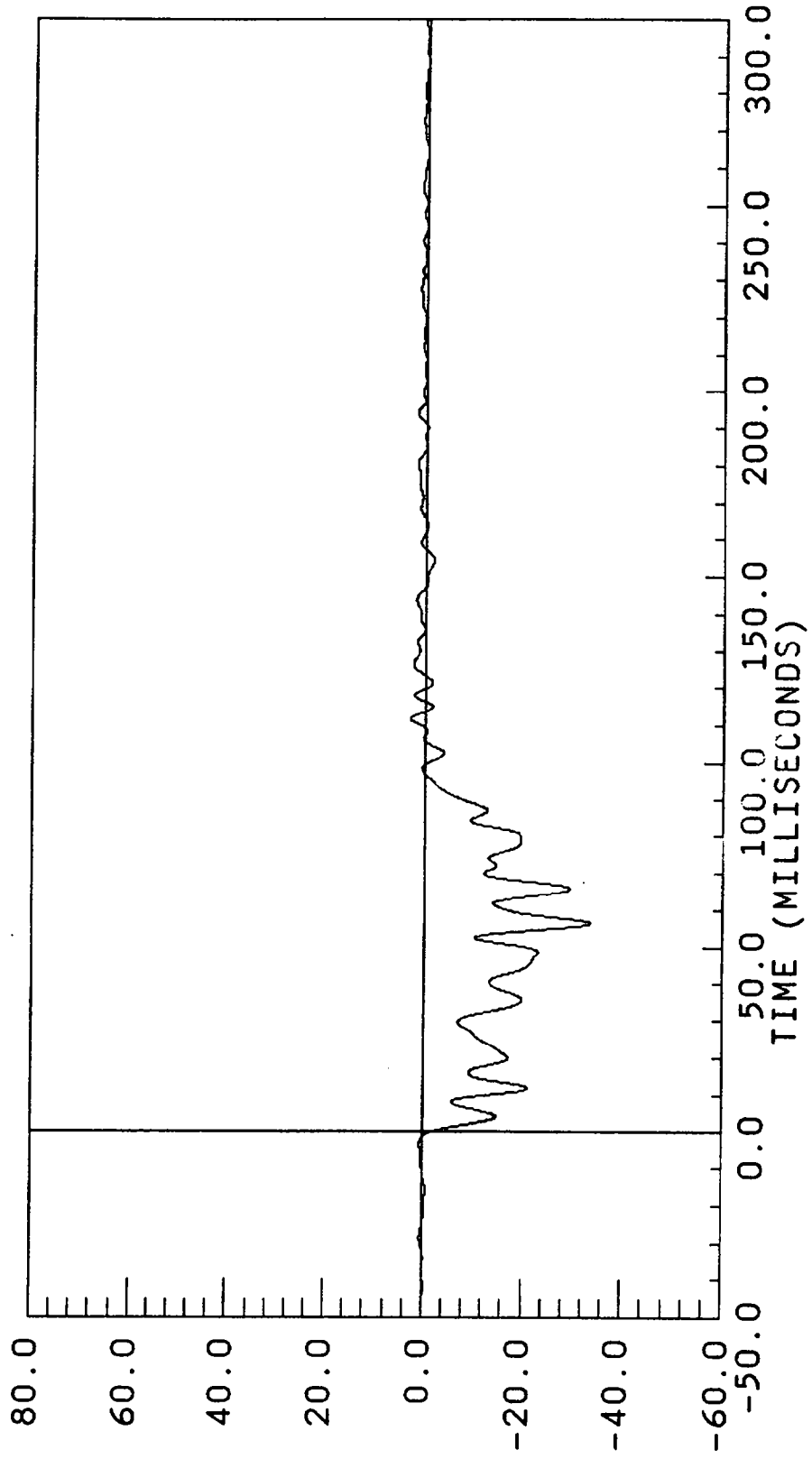
FILTER CHANNEL CLASS

60

29.30 mph

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

XL AXIS
YMIN = -33.61197 at 56.47500
YMAX = 3.047916 at 111.9750

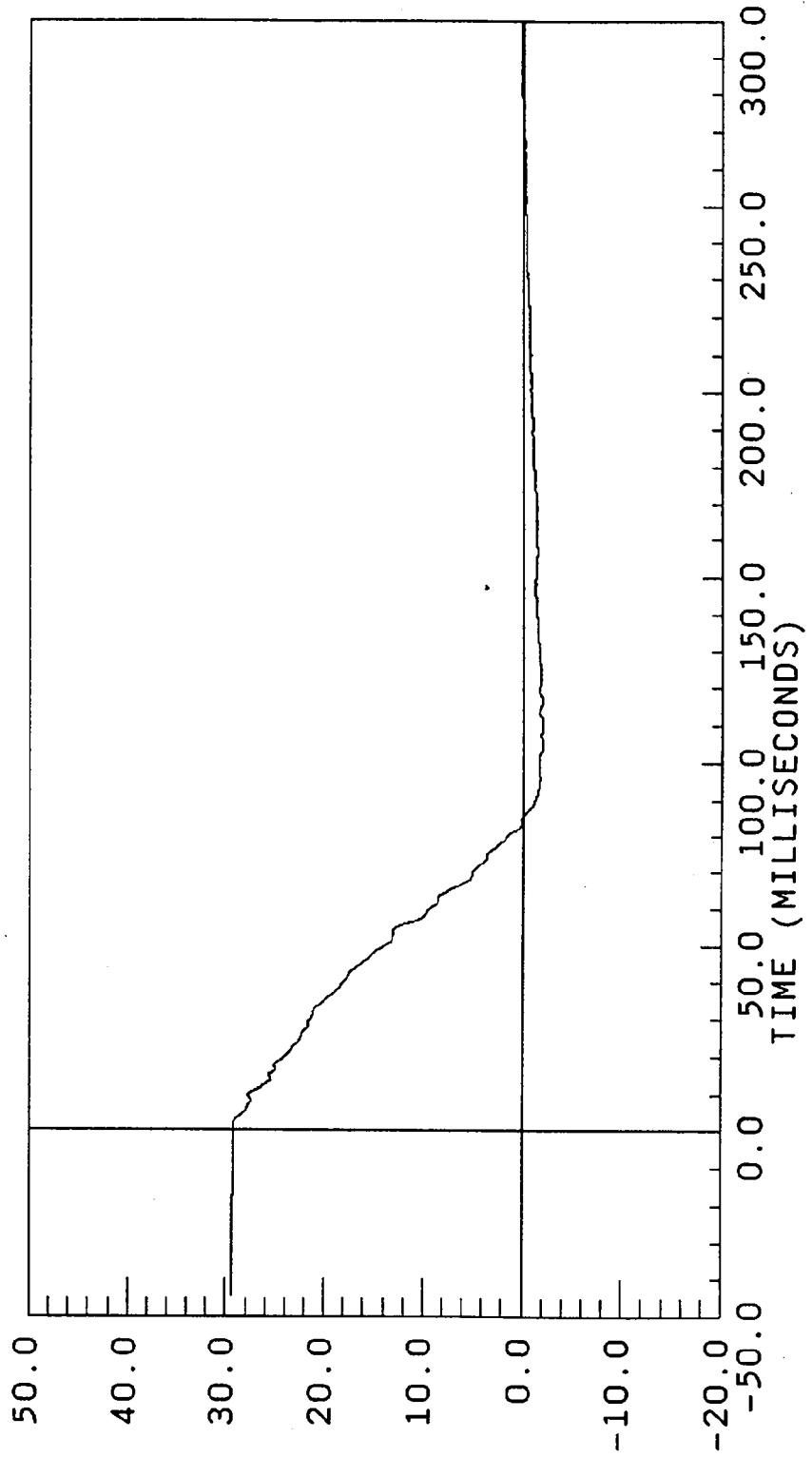


ACCELERATION * G, S *

V972-17.DAT

29.30 mph

ACC PACK #1(X) XL AXIS
COMPUTED YMIN = -2.116967 at 111.2250
FILTER CUTOFF: 0HZ YMAX = 29.39035 at -44.70000

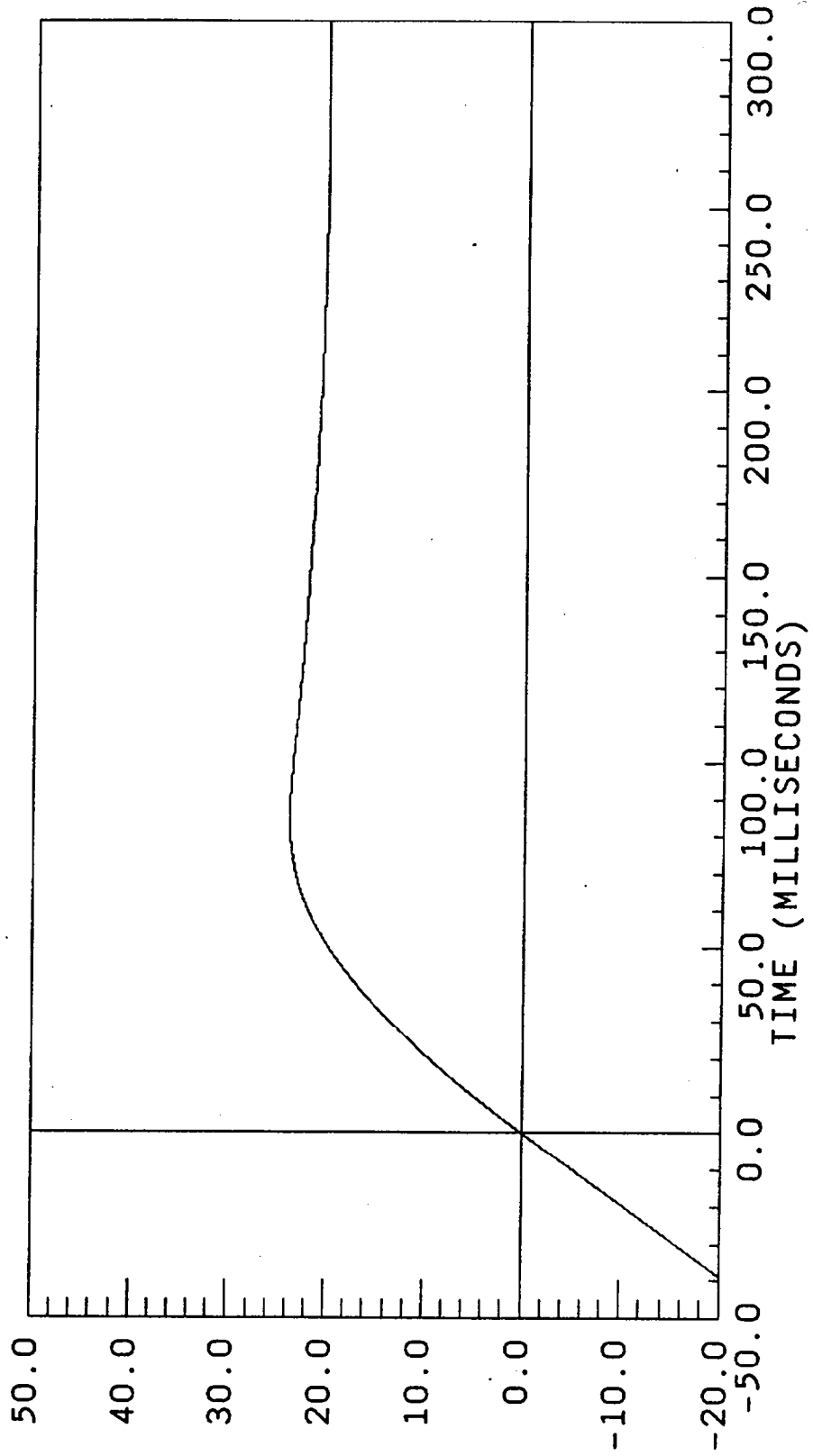


VELOCITY * MILES / HOUR

29.30 mph

ACC PACK #1(X)
COMPUTED
FILTER CUTOFF: OHZ

XL AXIS
YMIN = -23.19335 at 111.2250
YMAX = 23.82806 at 85.12500

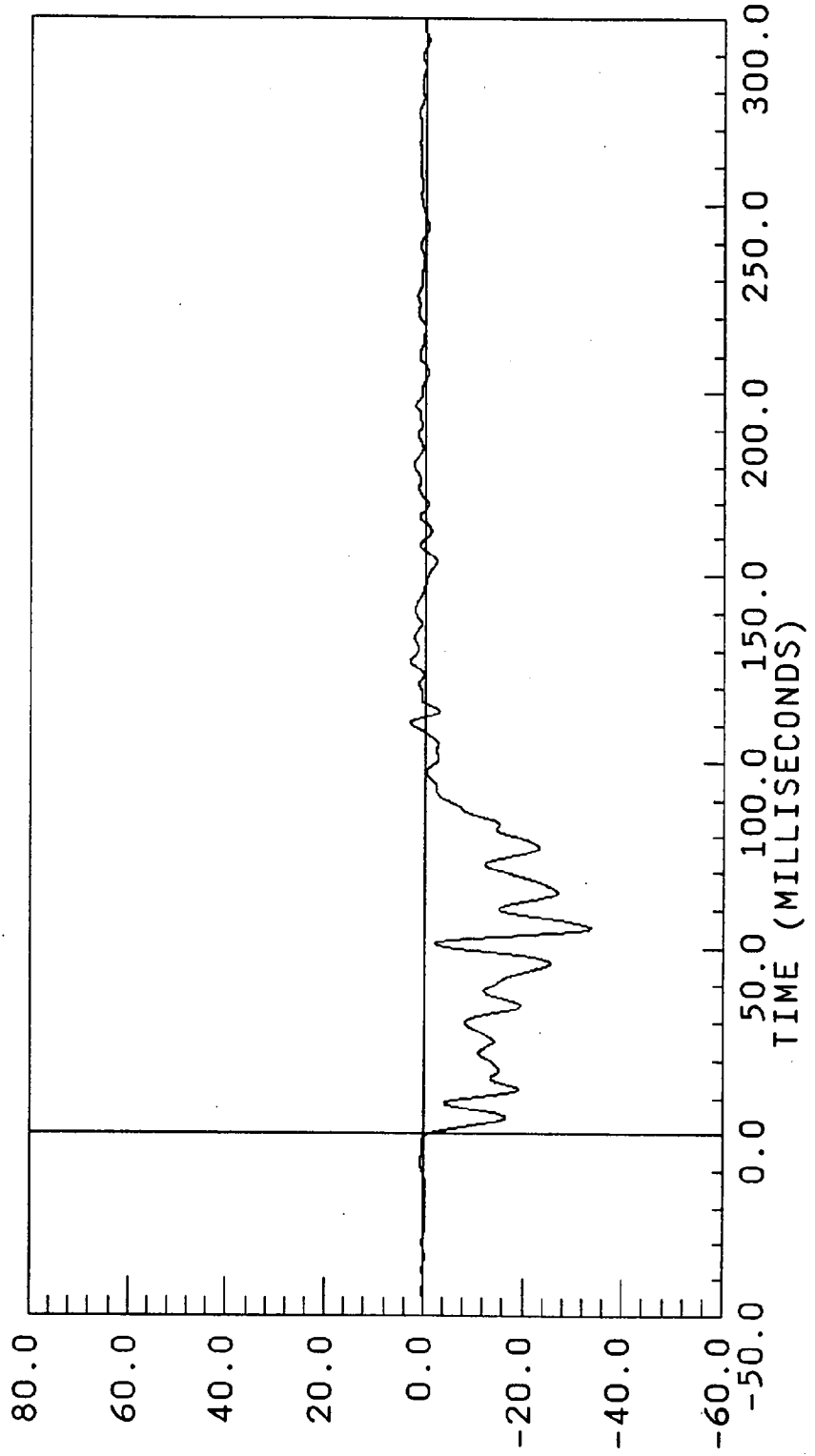


D I S P L A C E M E N T * I N C H E S

BW972-18.DAT

29.30 mph

ACC PACK #2(X) XL AXIS
FILTERED YMIN = -33.62796 at 55.12500
FILTER CUTOFF: 100HZ YMAX = 2.987452 at 110.8500

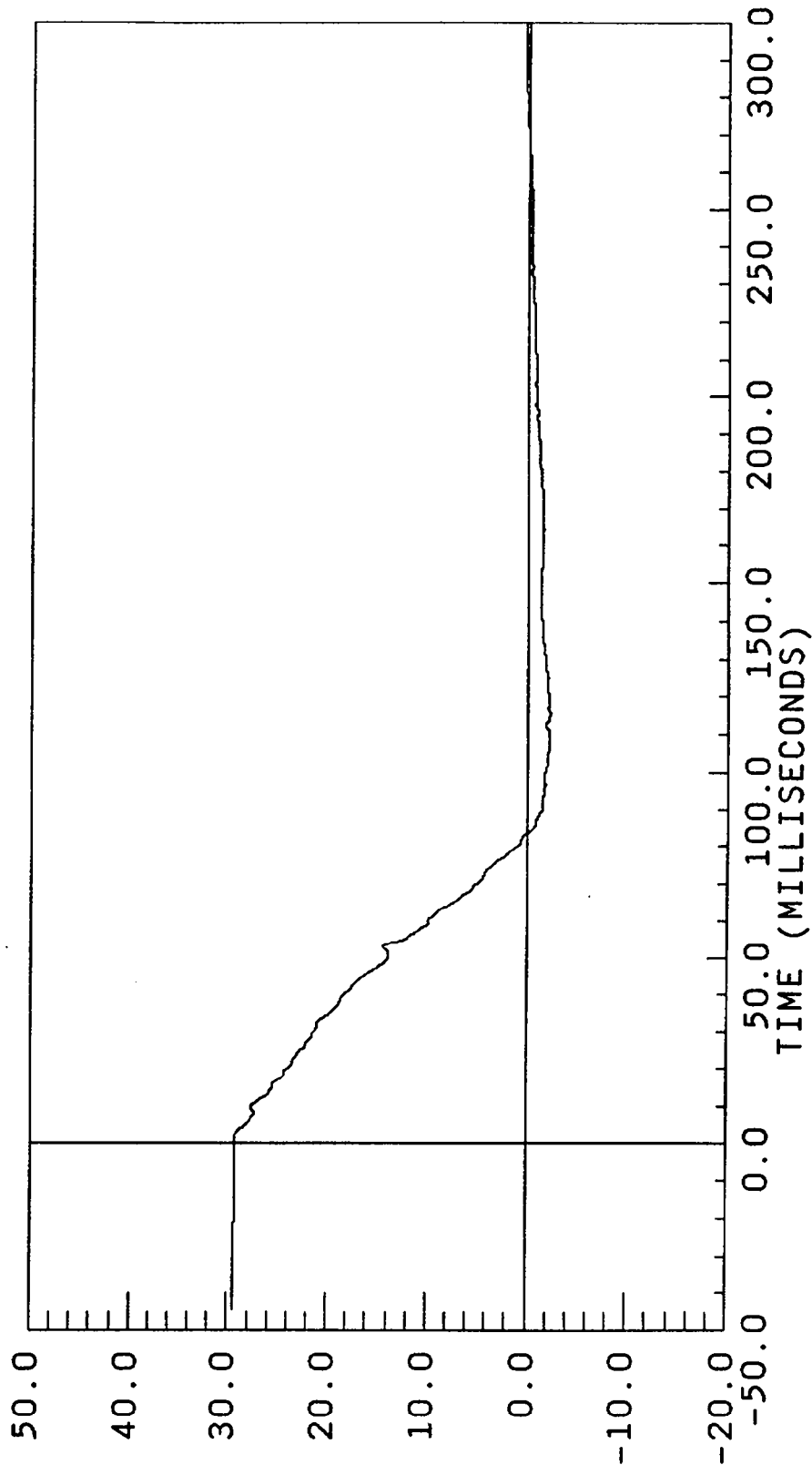


ACCELERATION * G * S *

29.30 mph

ACC PACK #2(X)
COMPUTED
FILTER CUTOFF: OHZ

XL AXIS
YMIN = -2.339391 at 115.2750
YMAX = 29.34854 at -36.60000

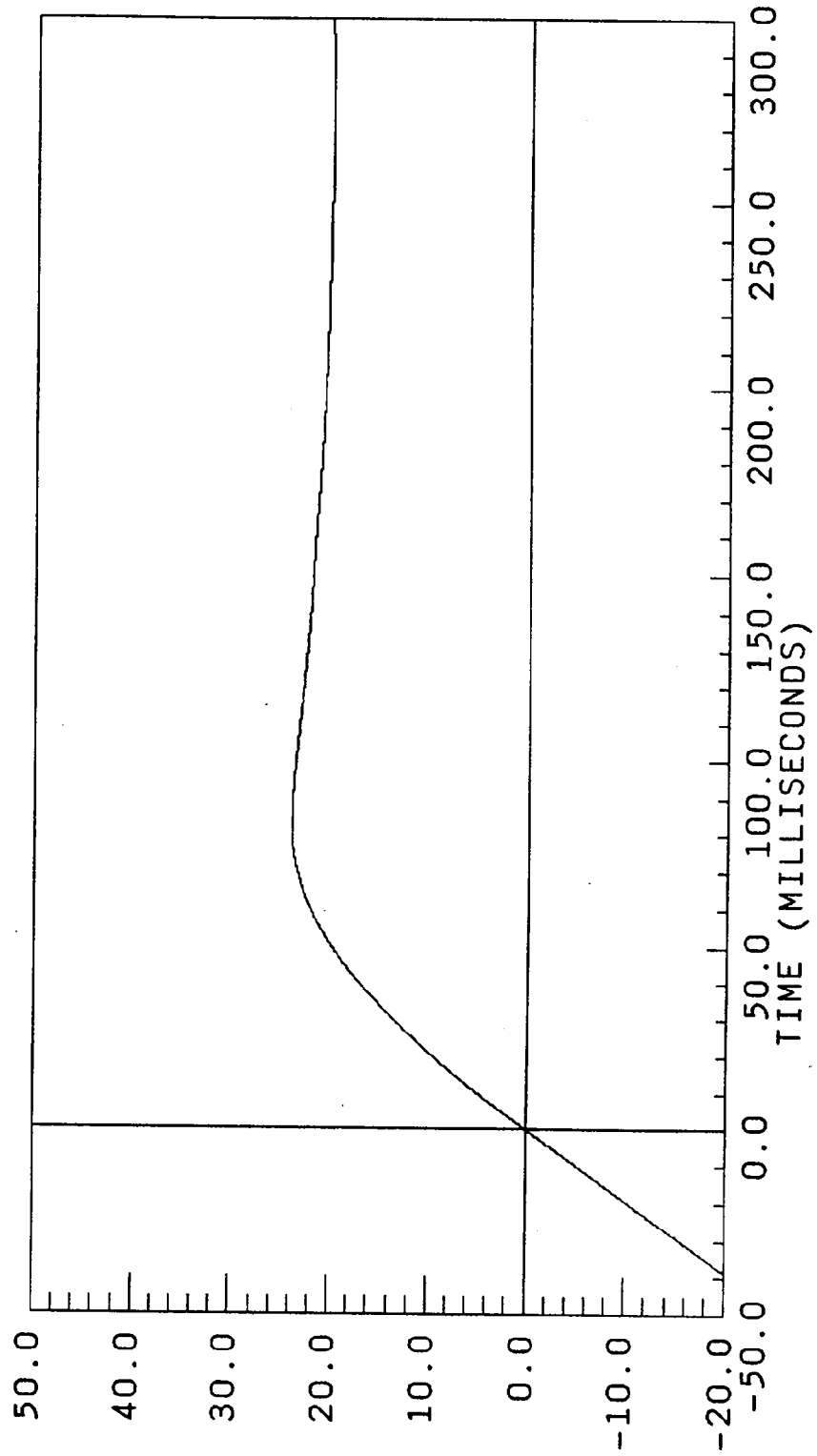


VELOCITY * MILES / HOUR

D972-18.DAT

29.30 mph

ACC PACK #2(X) XL AXIS
COMPUTED YMIN = -23.18943 at 115.2750
FILTER CUTOFF: OHZ YMAX = 23.87733 at 83.40000

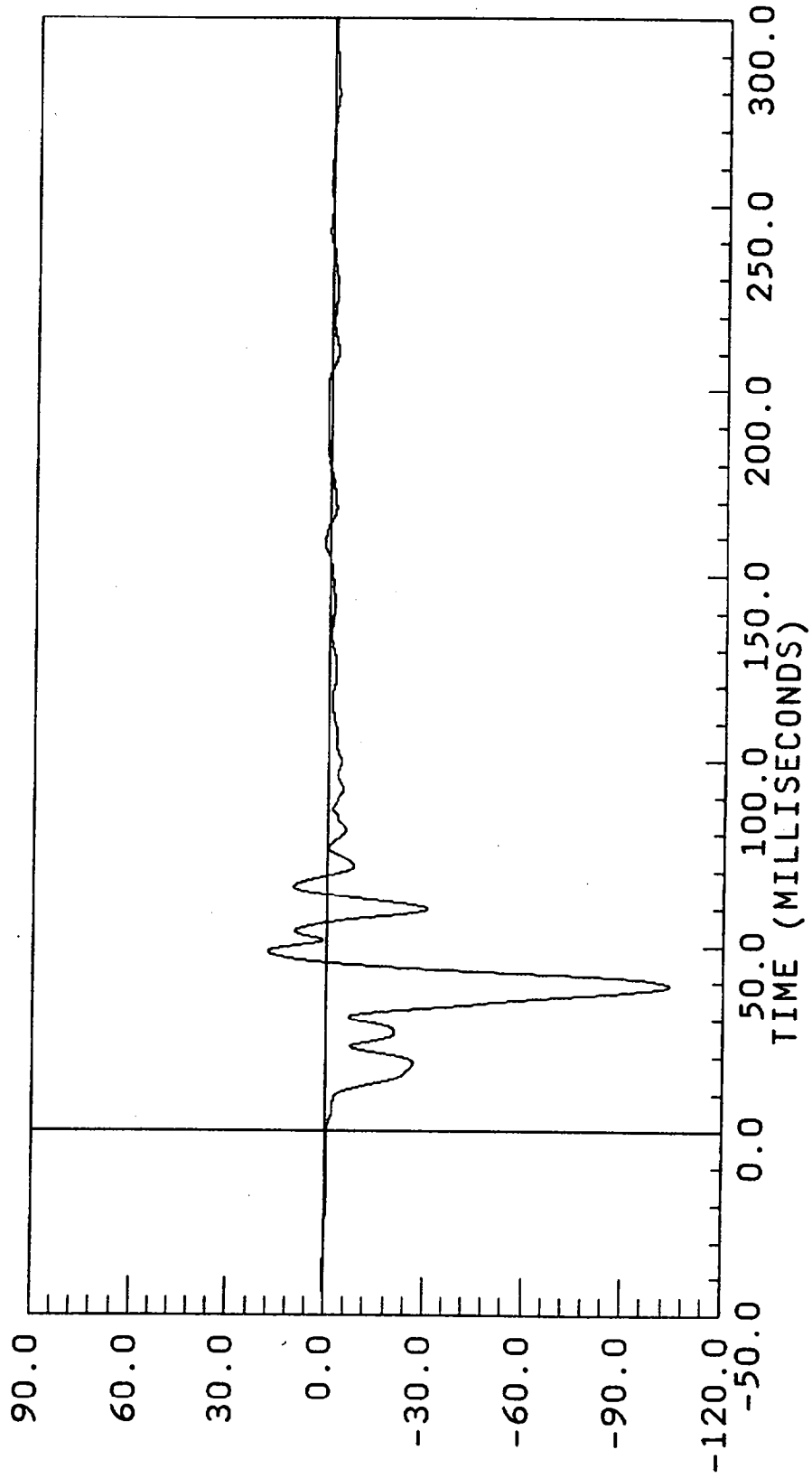


D I S P L A C E M E N T * I N C H E S

29.30 mph

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

XL AXIS
YMIN = -104.0343 at 39.22500
YMAX = 18.05908 at 48.45000



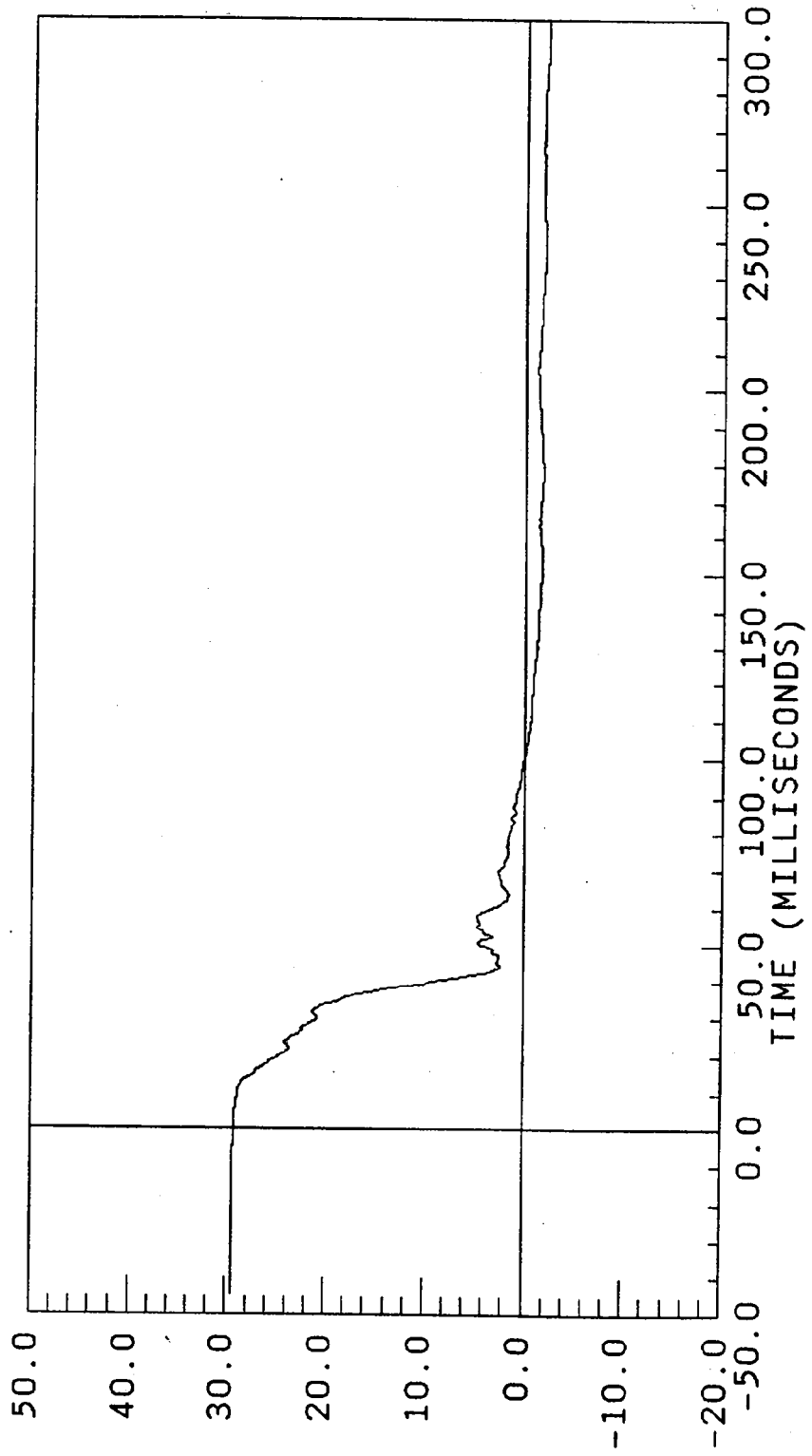
A C C E L E R A T I O N * G , S *

V972-19.DAT

29.30 mph

ACC PACK #3(X)
COMPUTED
FILTER CUTOFF: OHZ

XL AXIS
YMIN = -2.247233 at 299.1000
YMAX = 29.35433 at -32.77500



VELOCITY * MILES / HOUR

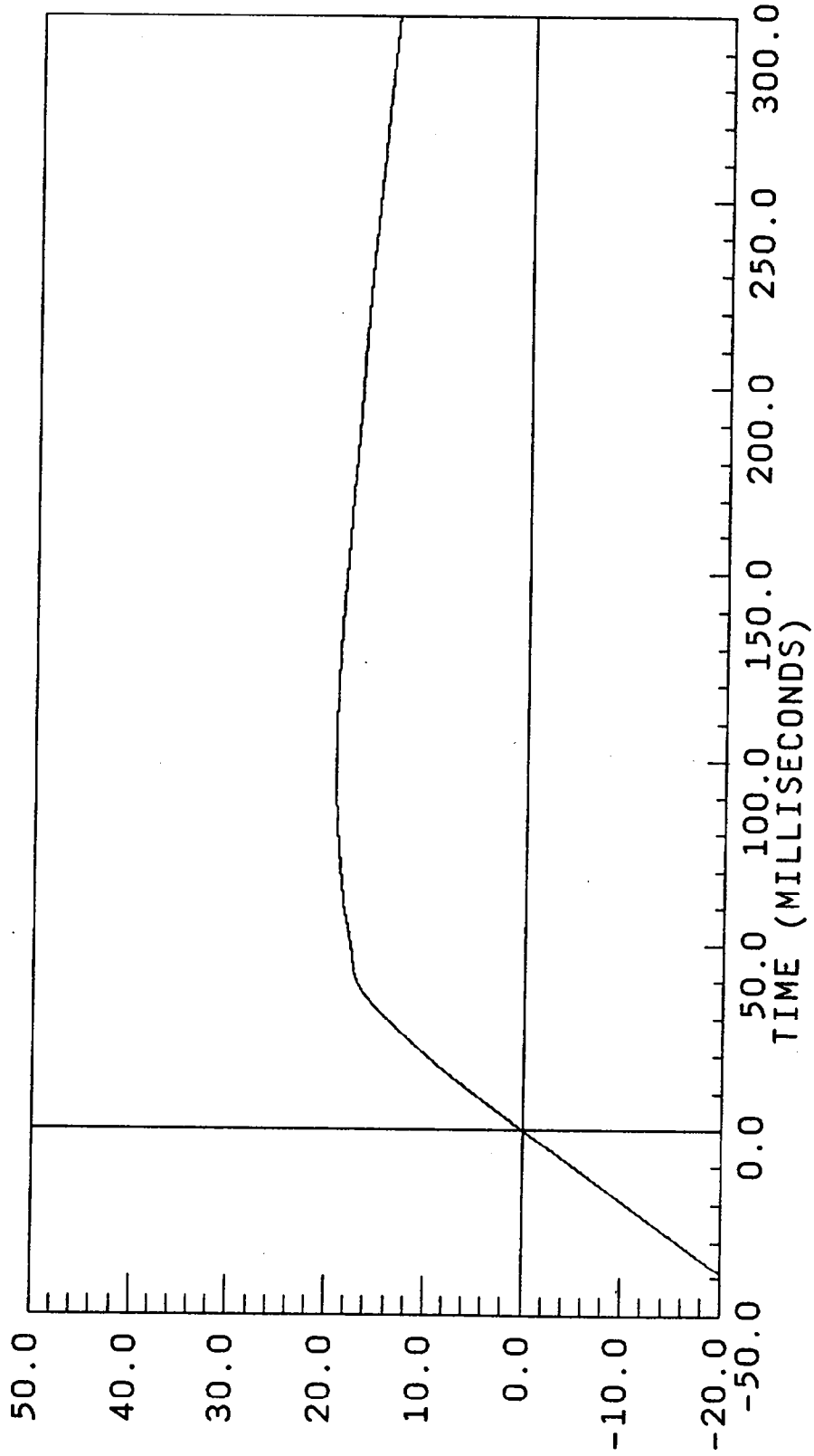
B-10

7804-9

29.30 mph

ACC PACK #3(X)
COMPUTED
FILTER CUTOFF: OHZ

XL AXIS
YMIN = -23.24966 at 299.1000
YMAX = 19.38012 at 99.60001

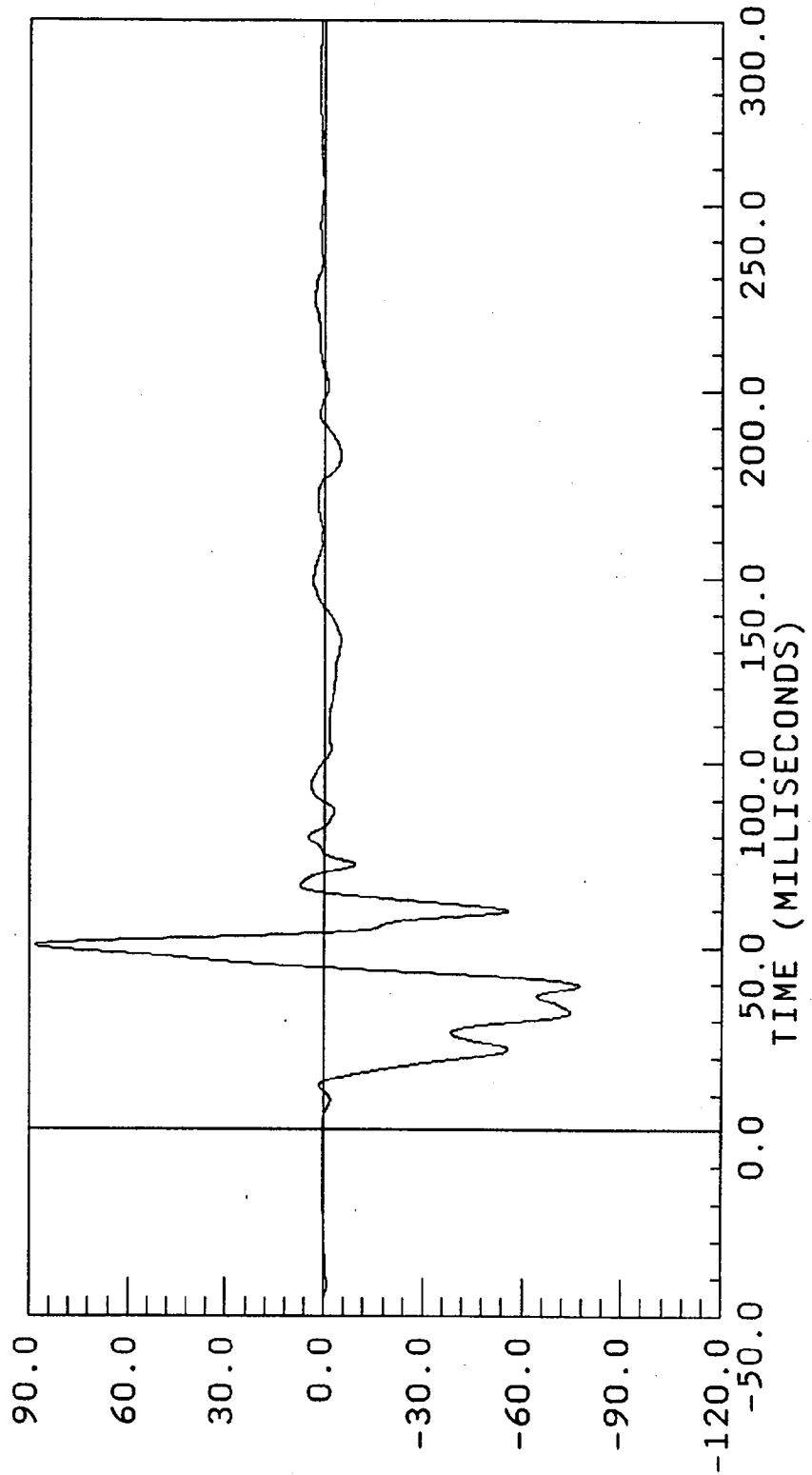


DISPLACEMENT * INCHES

BW972-20.DAT

29.30 mph

ACC PACK #4(X) XL AXIS
FILTERED YMIN = -77.29354 at 39.67500
FILTER CUTOFF: 100HZ YMAX = 88.41289 at 50.32500

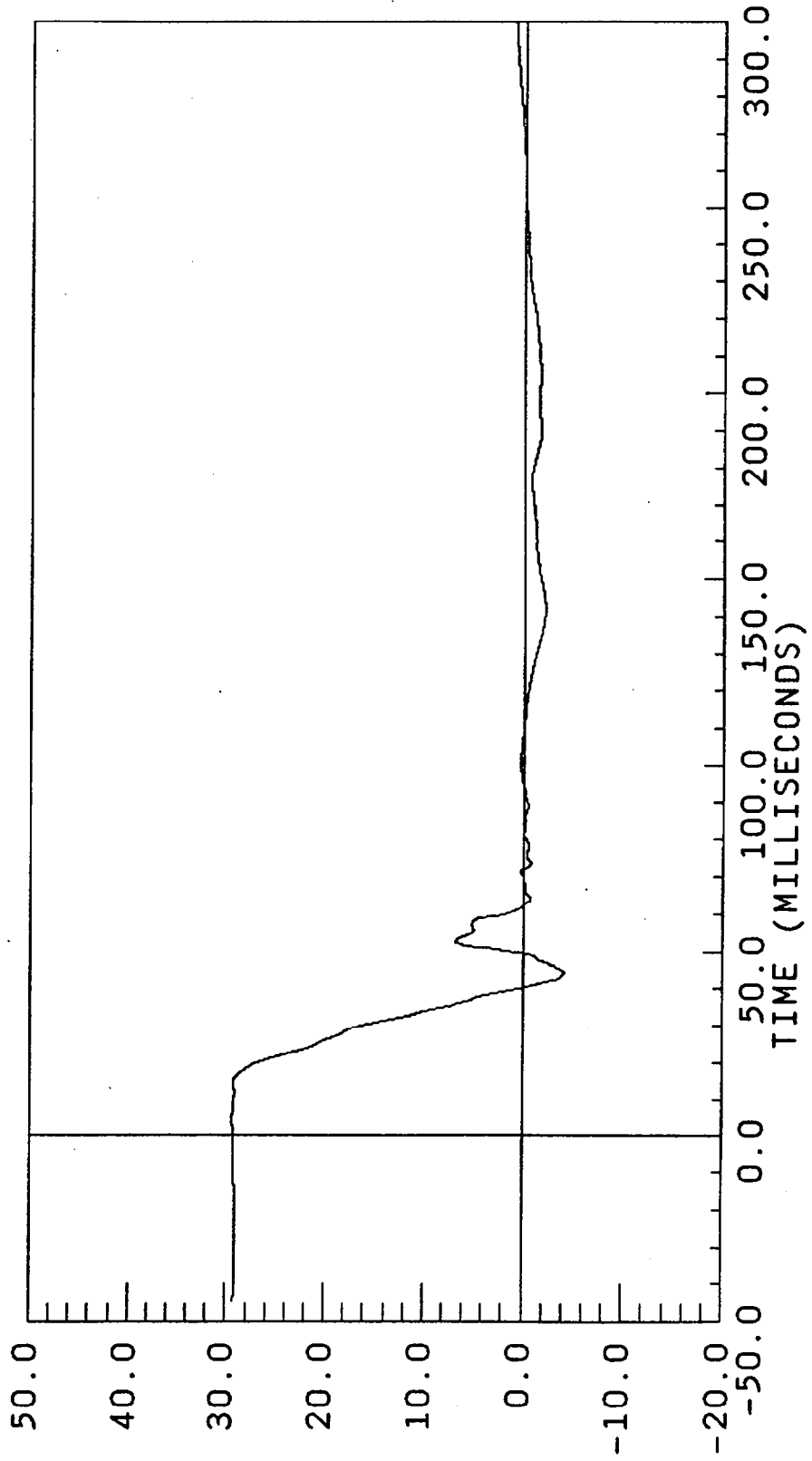


ACCELERATION * G * S *

29.30 mph

ACC PACK #4(X)
COMPUTED
FILTER CUTOFF: OHZ

XL AXIS
YMIN = -4.205728 at 44.32500
YMAX = 29.35022 at 3.975000

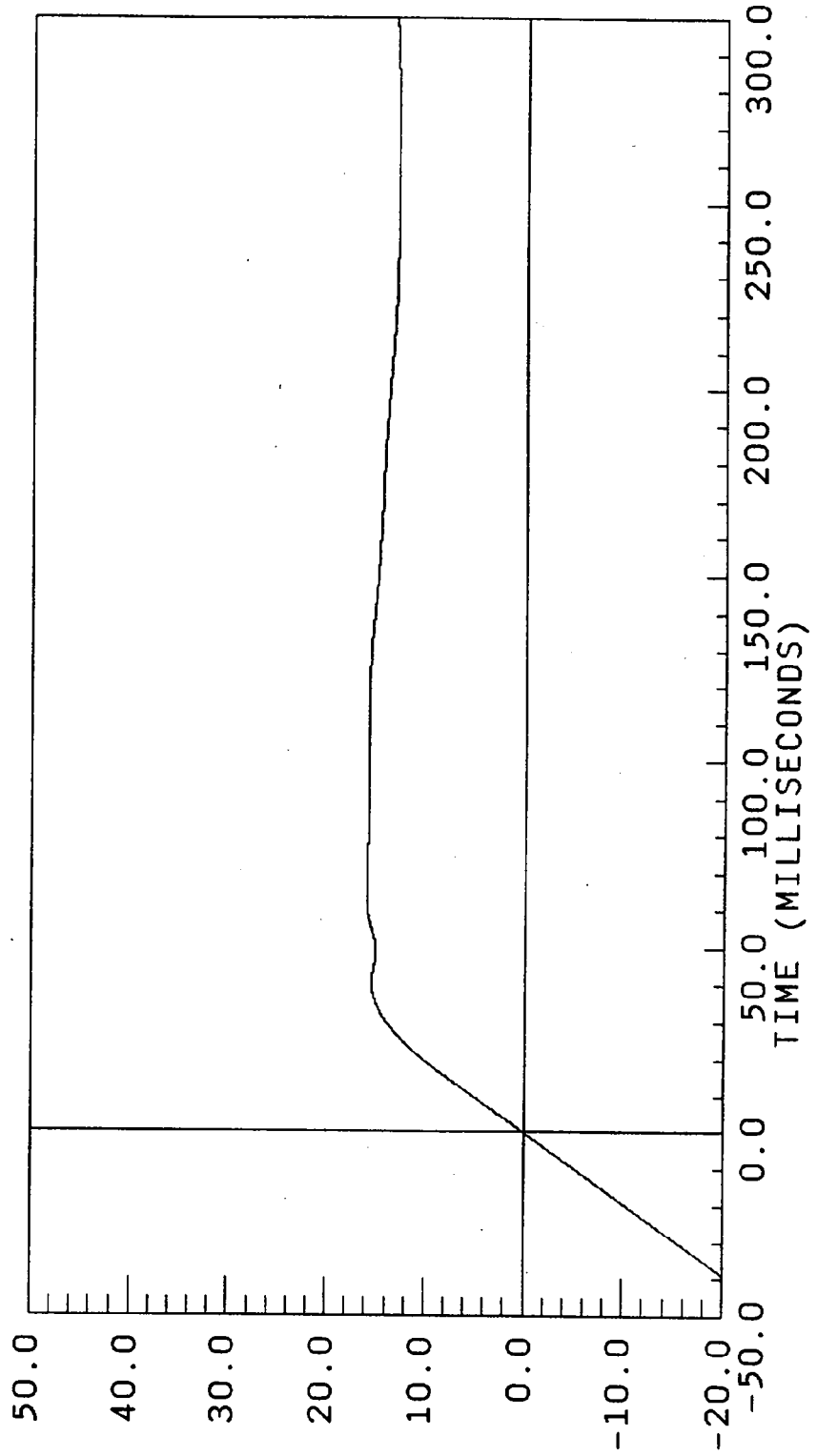


VELOCITY * MILES / HOUR

D972-20.DAT

29.30 mph

ACC PACK #4(X)
COMPUTED
FILTER CUTOFF: 0HZ
XL AXIS
YMIN = -23.03857 at 44.32500
YMAX = 15.91676 at 62.17500

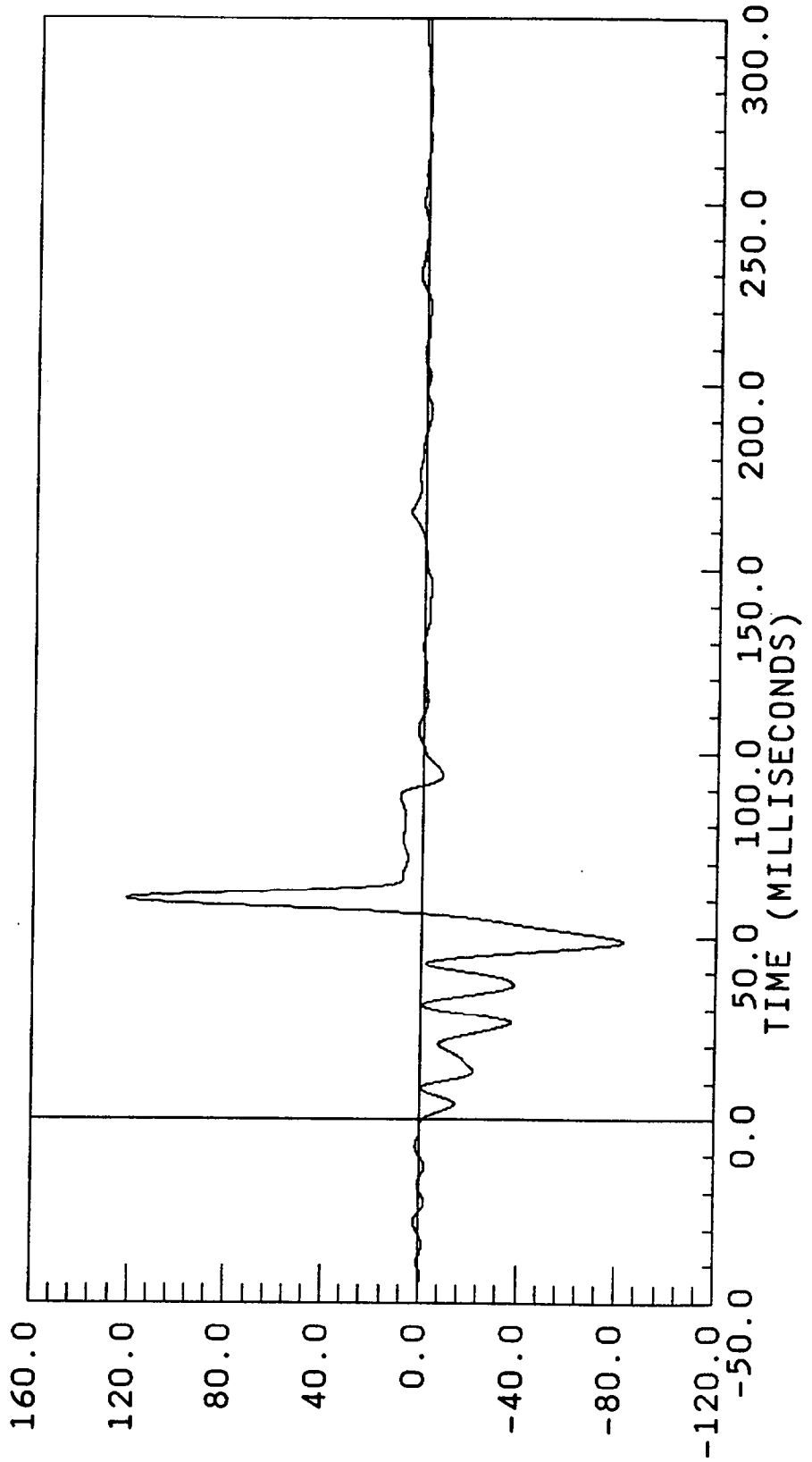


DISPLACEMENT * INCHES

29.30 mph

ACC PACK #5(X)
FILTERED
FILTER CUTOFF: 100HZ

XL AXIS
YMIN = -82.41628 at 48.75000
YMAX = 121.6586 at 60.22500

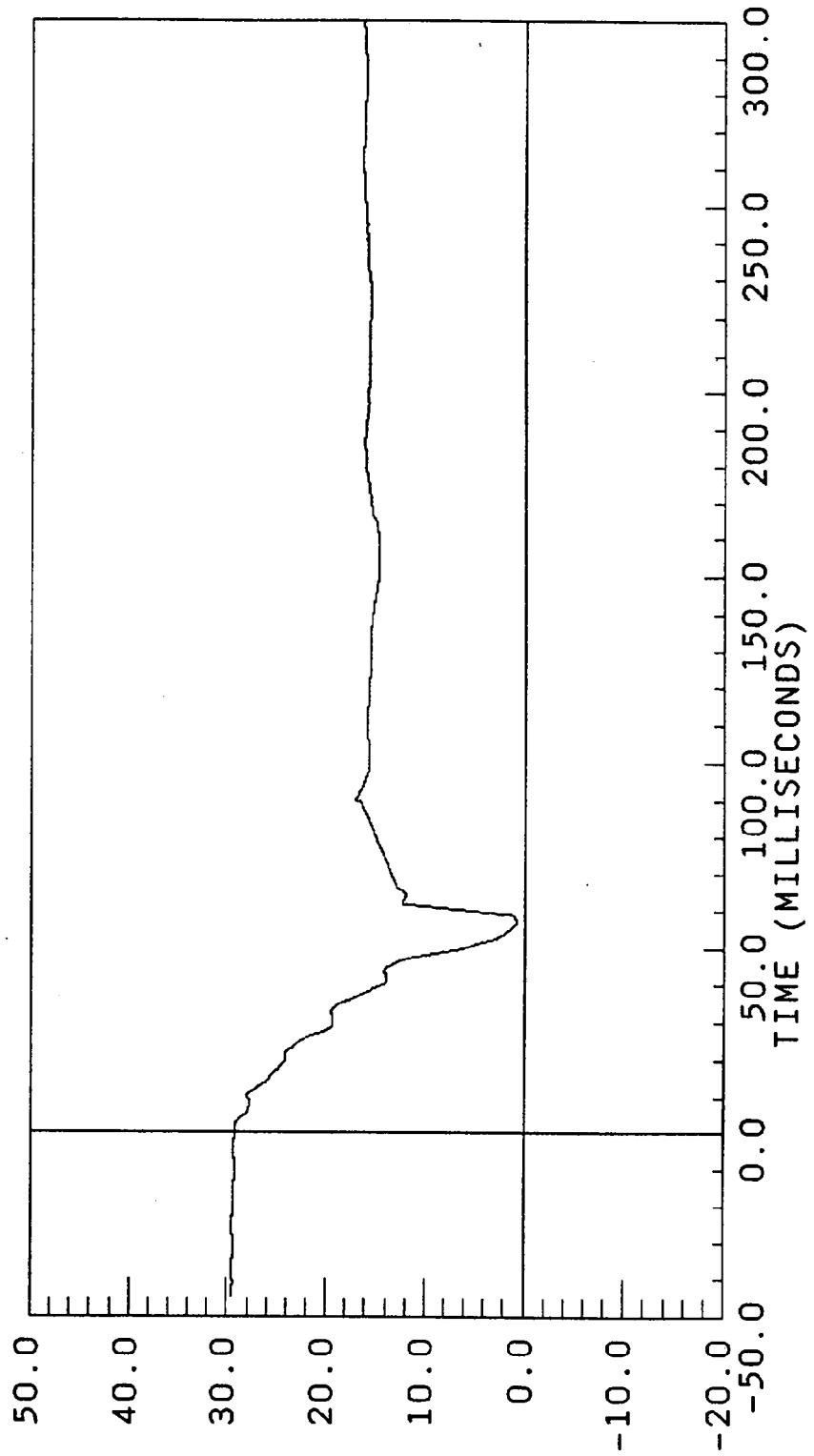


ACCELERATION * G S *

V972-21.DAT

29.30 mph

ACC PACK #5(X) XL AXIS
COMPUTED YMIN = 0.789820 at 57.07500
FILTER CUTOFF: OHZ YMAX = 29.62638 at 60.22500

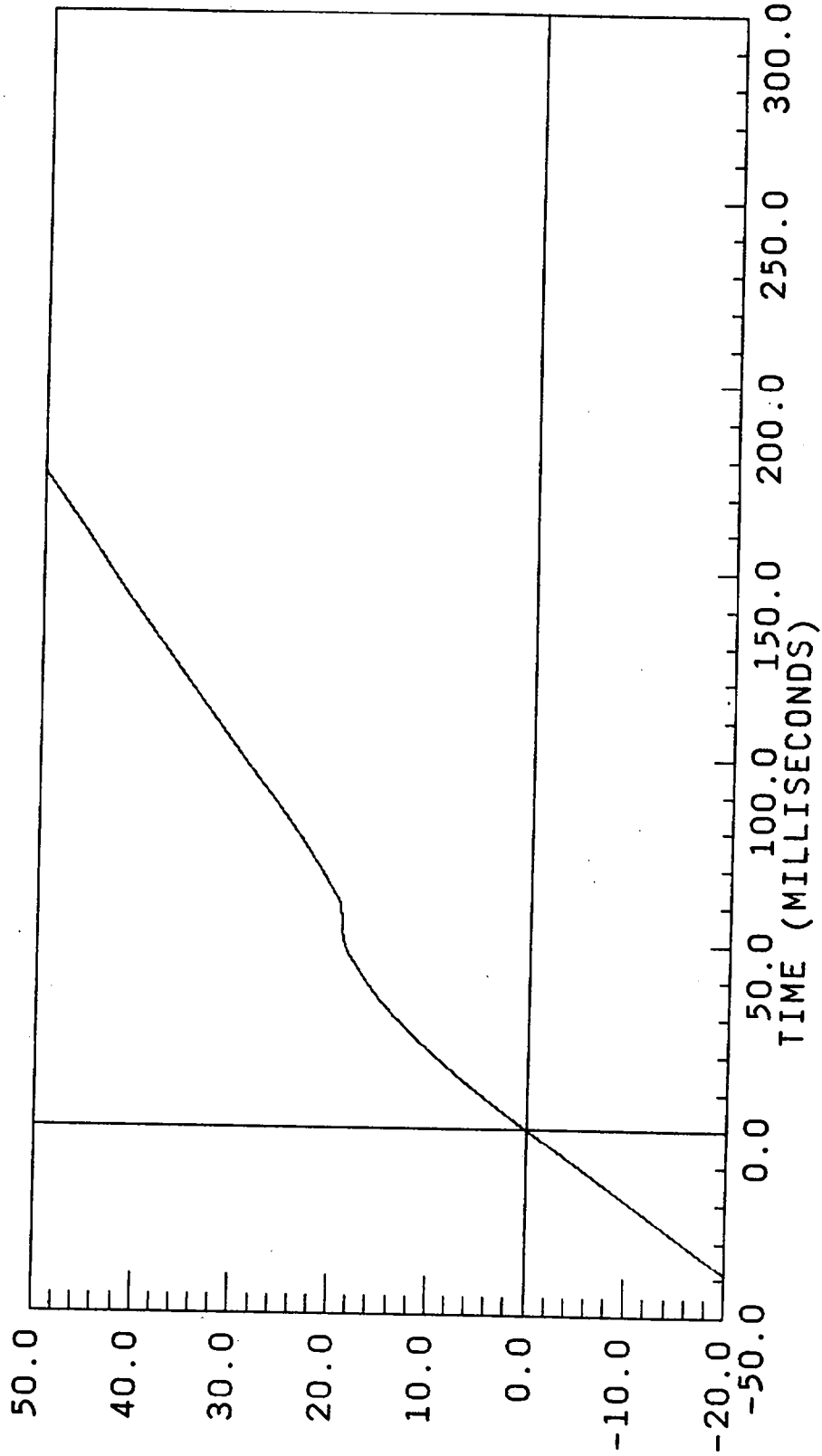


VELOCITY * MILES / HOUR

29.30 mph

ACC PACK #5(X)
COMPUTED
FILTER CUTOFF: 0HZ

XL AXIS
YMIN = -23.26702 at 57.07500
YMAX = 85.00465 at 300.0000

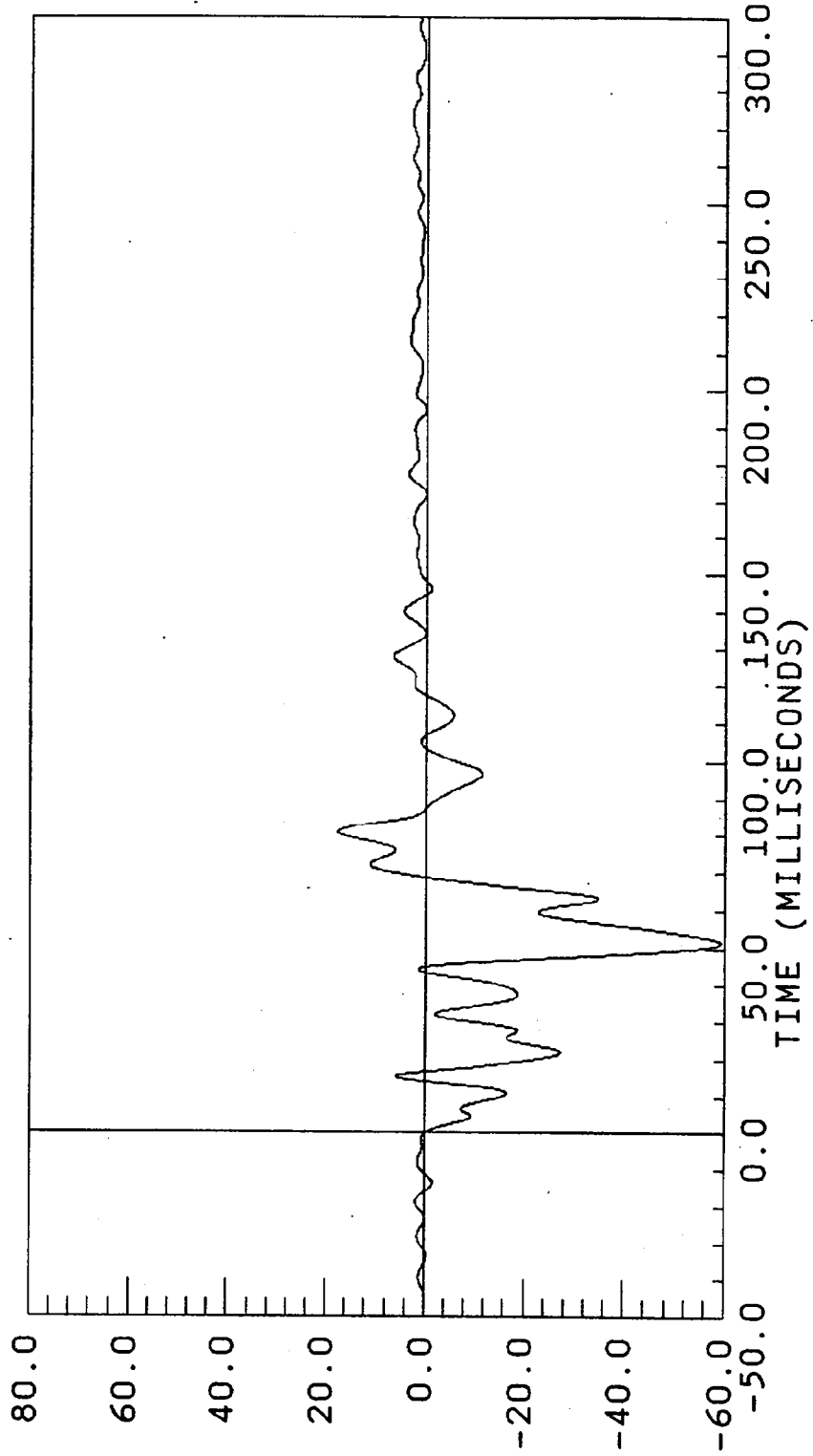


DISPLACEMENT * INCHES

BW972-22.DAT

29.30 mph

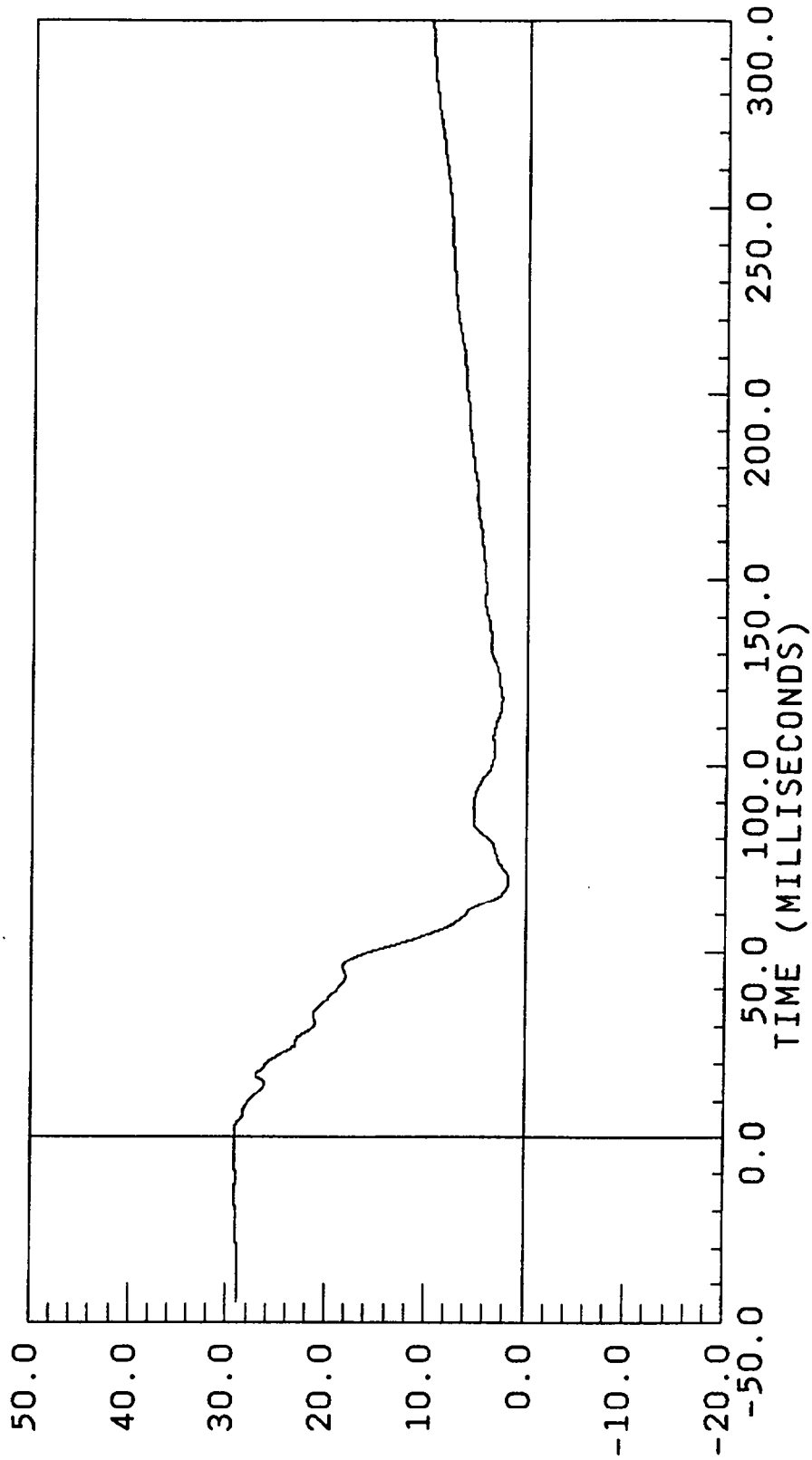
ACC PACK #6(X)
FILTERED
FILTER CUTOFF: 100HZ
XL AXIS
YMIN = -59.23157 at 51.45000
YMAX = 17.69587 at 80.92500



29.30 mph

ACC PACK #6(X)
COMPUTED
FILTER CUTOFF: OHZ

XL AXIS
YMIN = 1.679424 at 68.47501
YMAX = 29.30352 at 0.750000

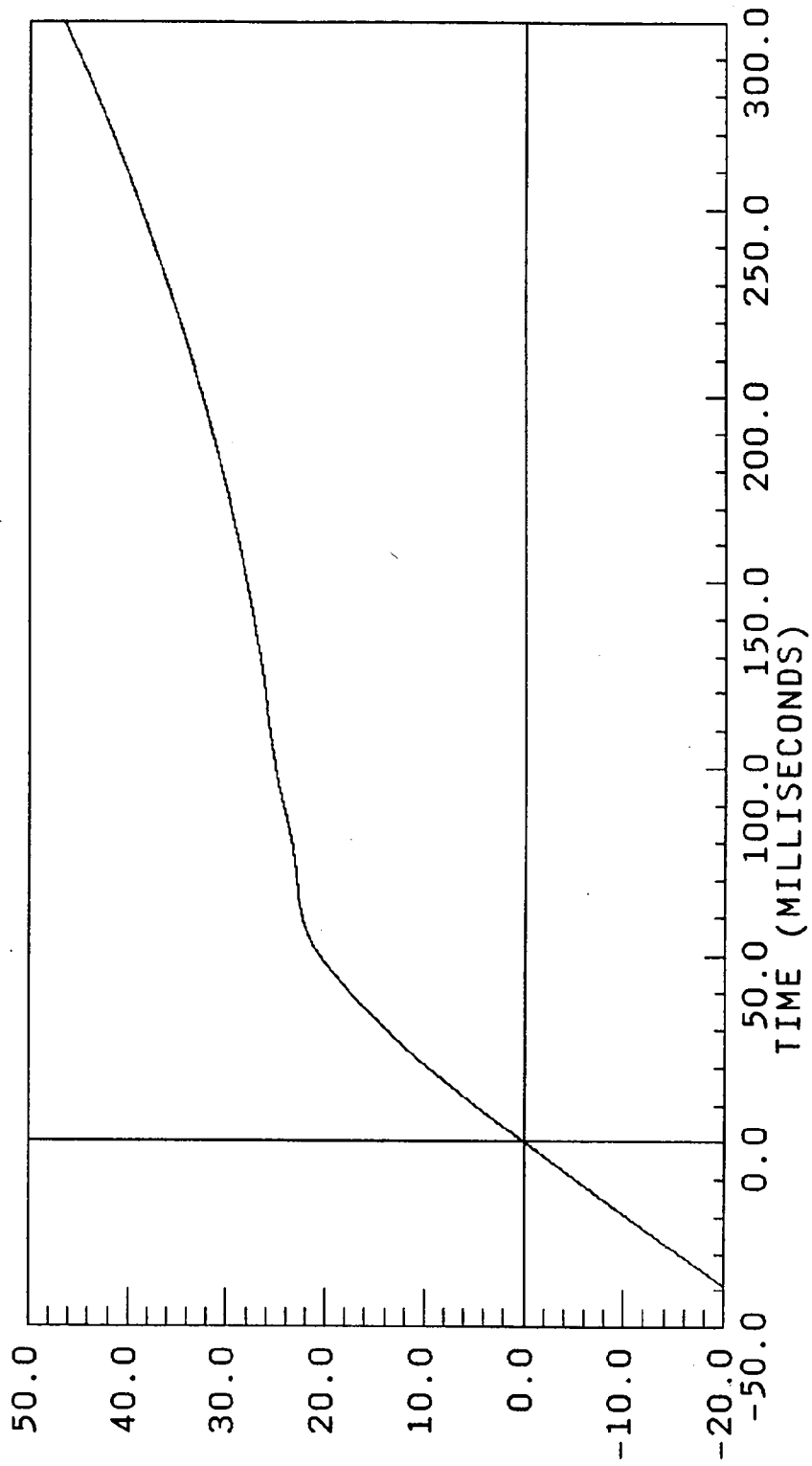


VELOCITY * MILES / HOUR

D972-22.DAT

29.30 mph

ACC PACK #6(X)
COMPUTED
FILTER CUTOFF: 0HZ
XL AXIS
YMIN = -23.00100 at 68.47501
YMAX = 46.56120 at 300.0000

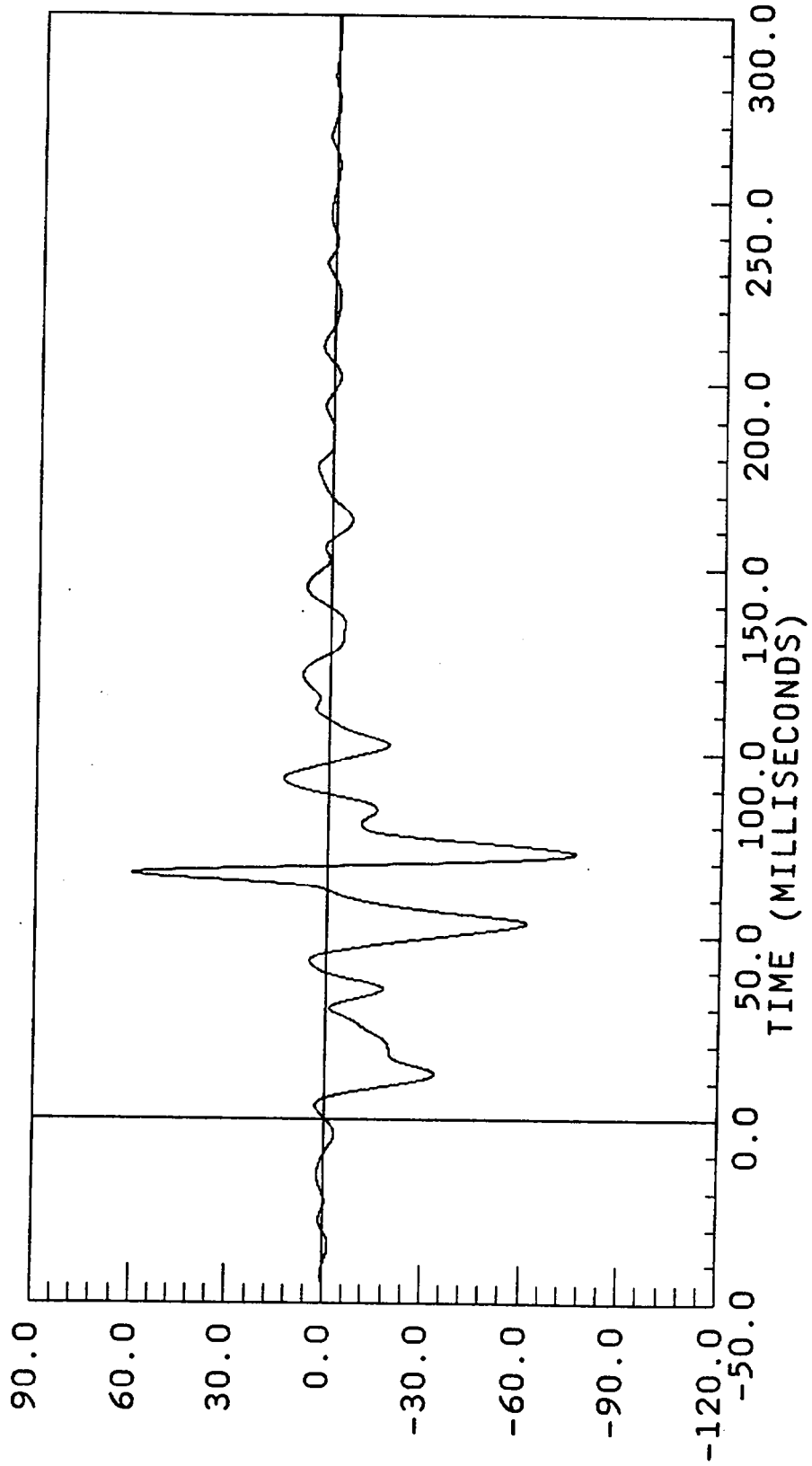


DISPLACEMENT * INCHES

29.30 mph

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

XL AXIS
YMIN = -75.90908 at 72.75000
YMAX = 60.22630 at 67.20000

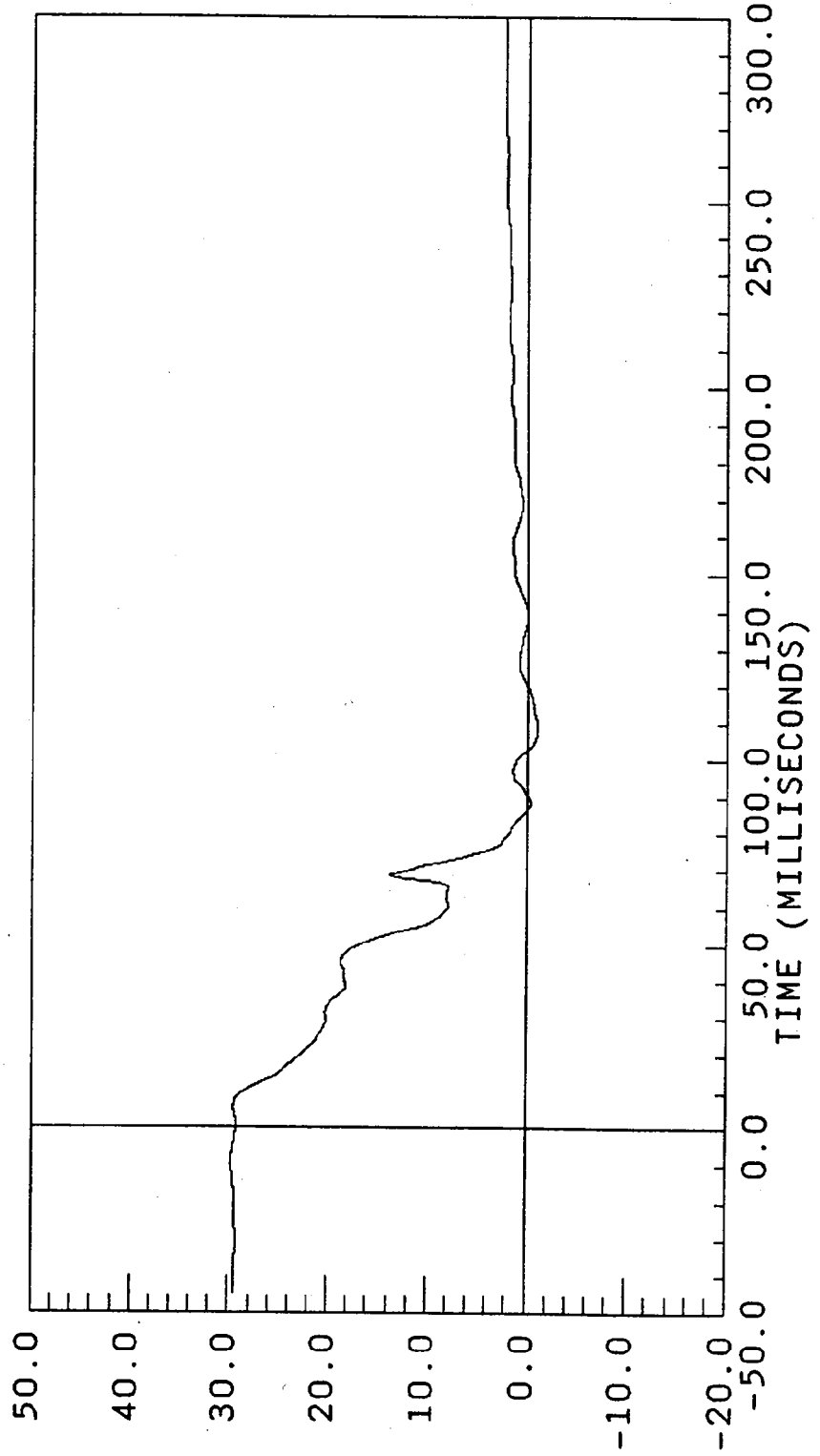


ACCELERATION * G, S *

V972-23.DAT

29.30 mph

ACC PACK #7(X) XL AXIS
COMPUTED YMIN = -1.111444 at 109.8000
FILTER CUTOFF: 0HZ YMAX = 29.37112 at -9.375000



VELOCITY * MILES / HOUR

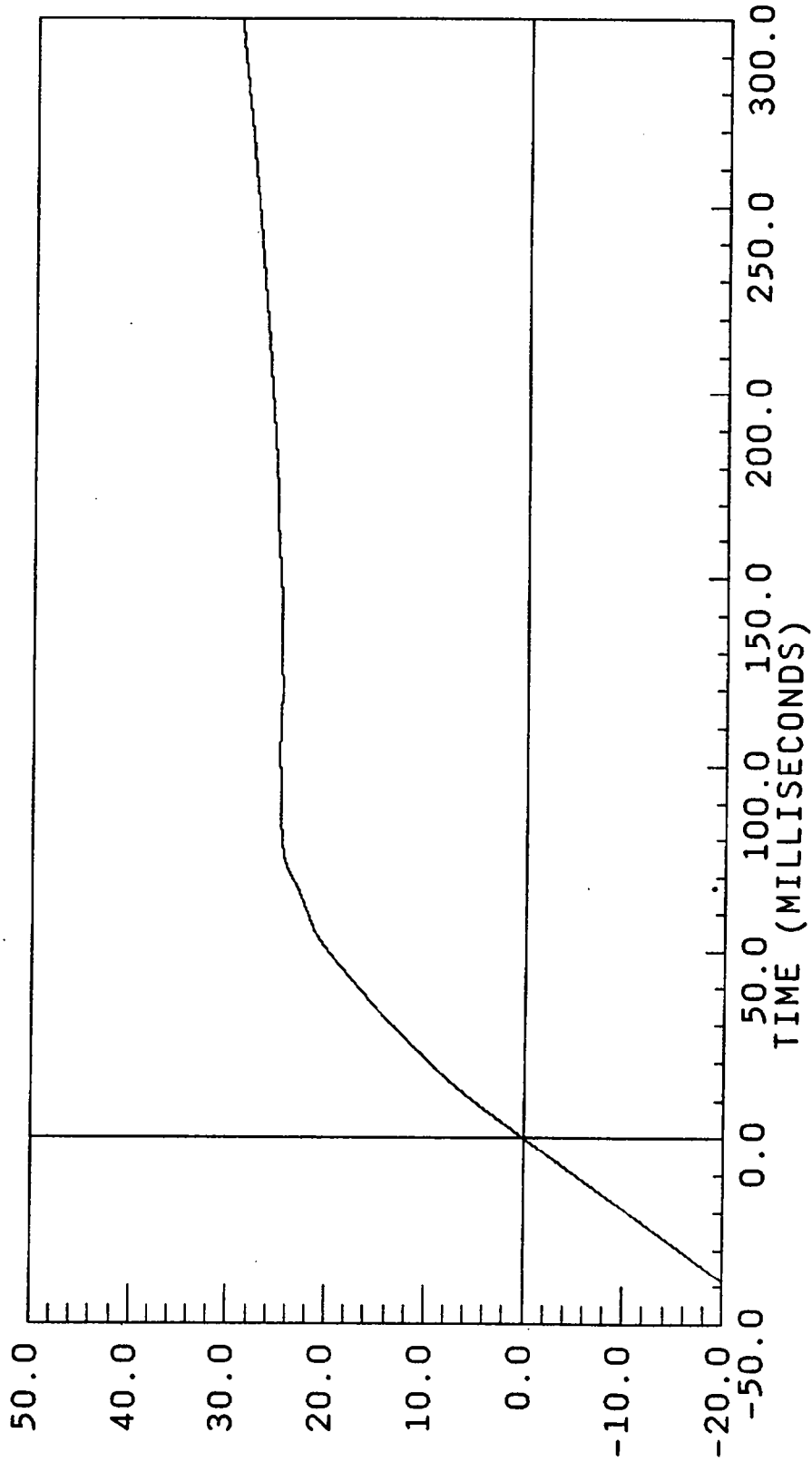
B-22

7804-9

29.30 mph

ACC PACK #7(X)
COMPUTED
FILTER CUTOFF: OHZ

XL AXIS
YMIN = -23.27436 at 109.8000
YMAX = 29.30997 at 300.0000



DISPLACEMENT * INCHES

TEST NO. CLO305

DUMMY DATA

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

HEAD INJURY CRITERION
HEAD SEVERITY INDEX
26MS. MAXIMUM DURATION.

NHTSA CRASH TEST - PROC. 209

RUN= 972

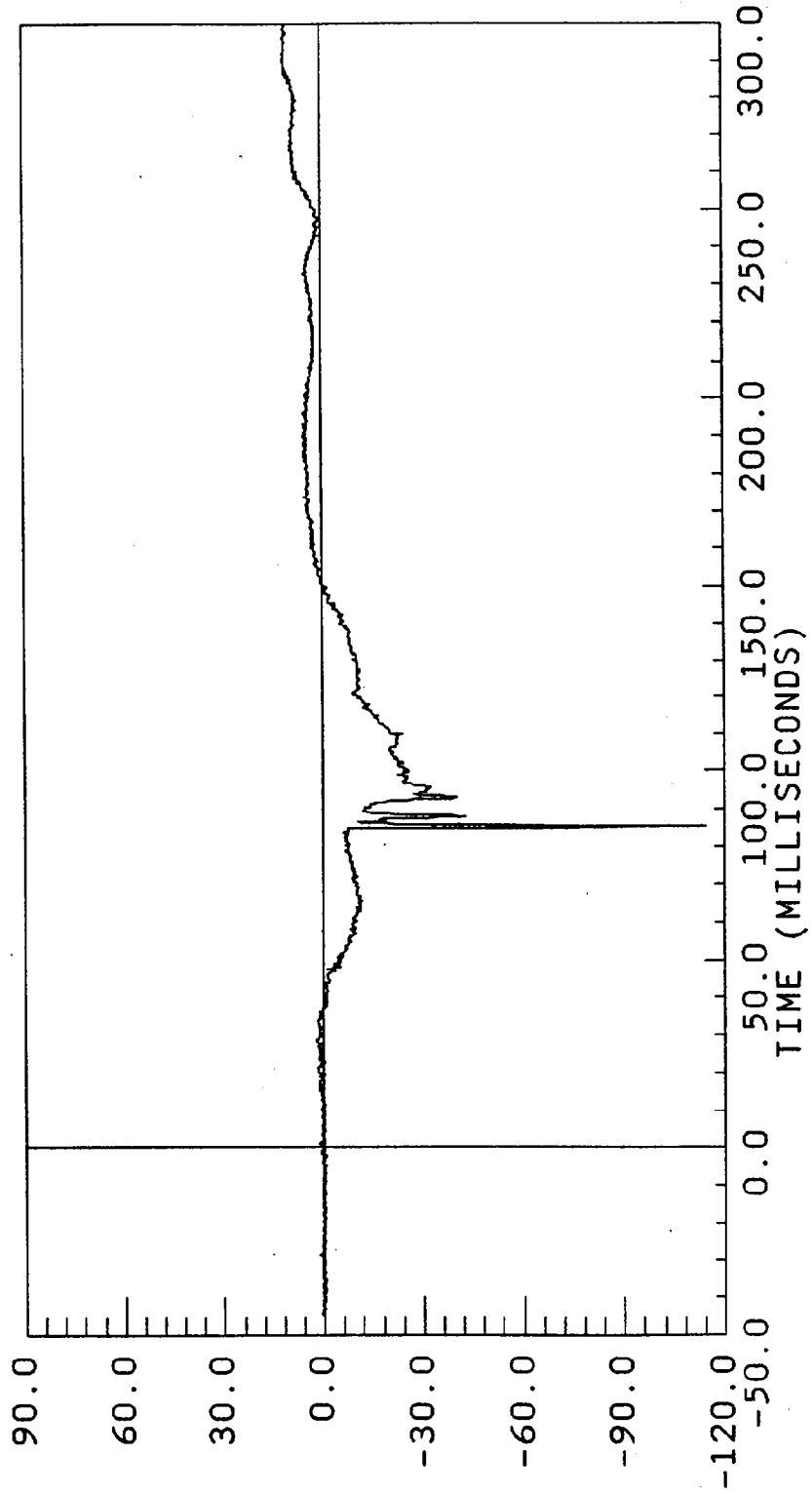
POS#1 HEAD R

HIC= 405.6 FROM T1= .07595 TO T2= .11242
AVERAGE ACCELERATION BETWEEN T1 AND T2= 42.0G'S
EVENT TIME= 300.0 MSEC
SEVERITY INDEX= 592.0

UDS\$972-1.DAT

29.30 mph

POS#1 HEAD X
XL AXIS
YMIN = -114.5000 at 85.35001
YMAX = 11.45000 at 289.4250
FILTER CUTOFF: 0HZ



ACCELERATION * G, S *
B-26 7804-9

0.00 mph

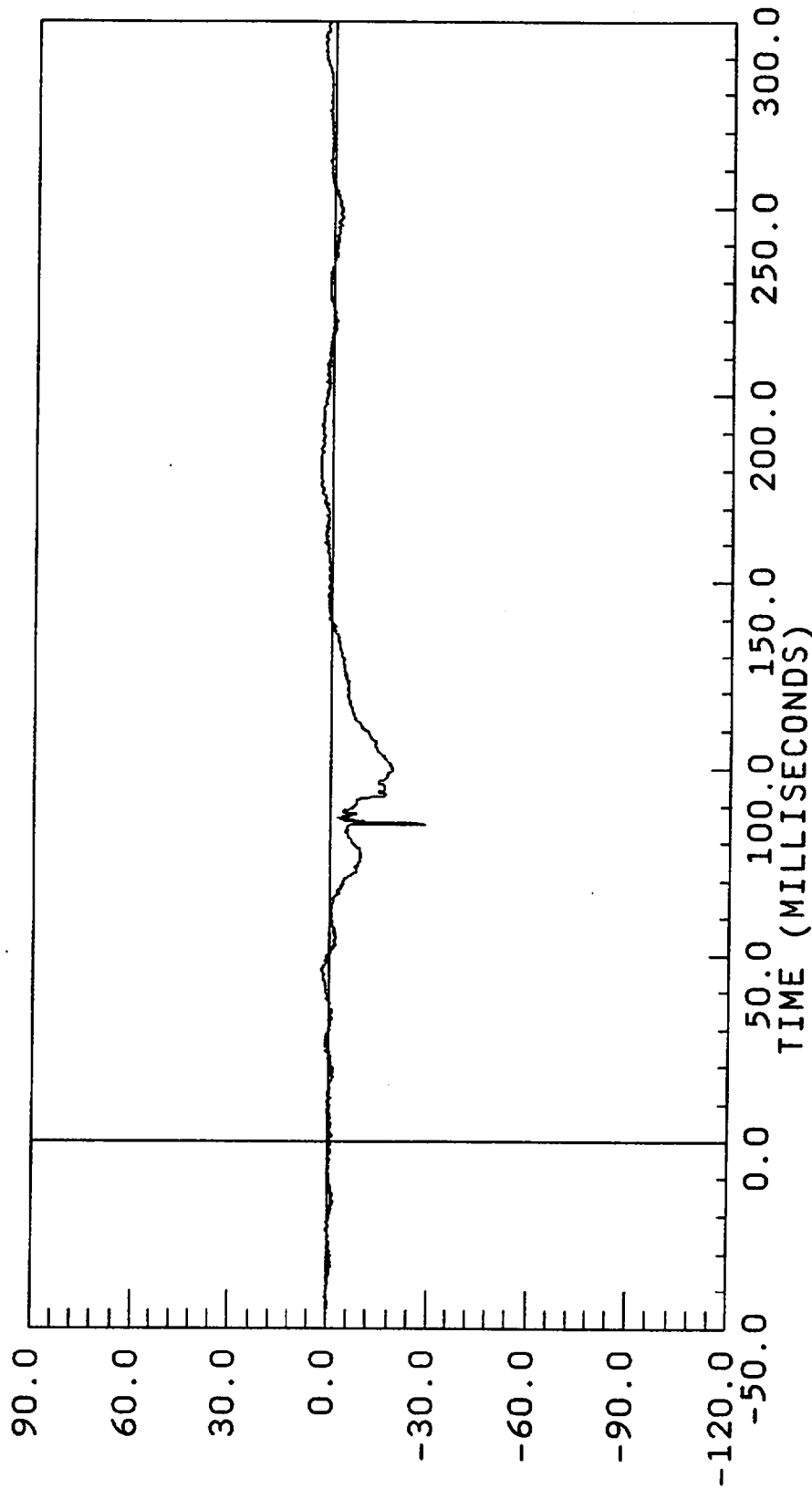
POS#1 HEAD Y

YL AXIS

YMIN = -28.34600 at 85.20000

YMAX = 3.697300 at 177.9000

FILTER CUTOFF: OHZ



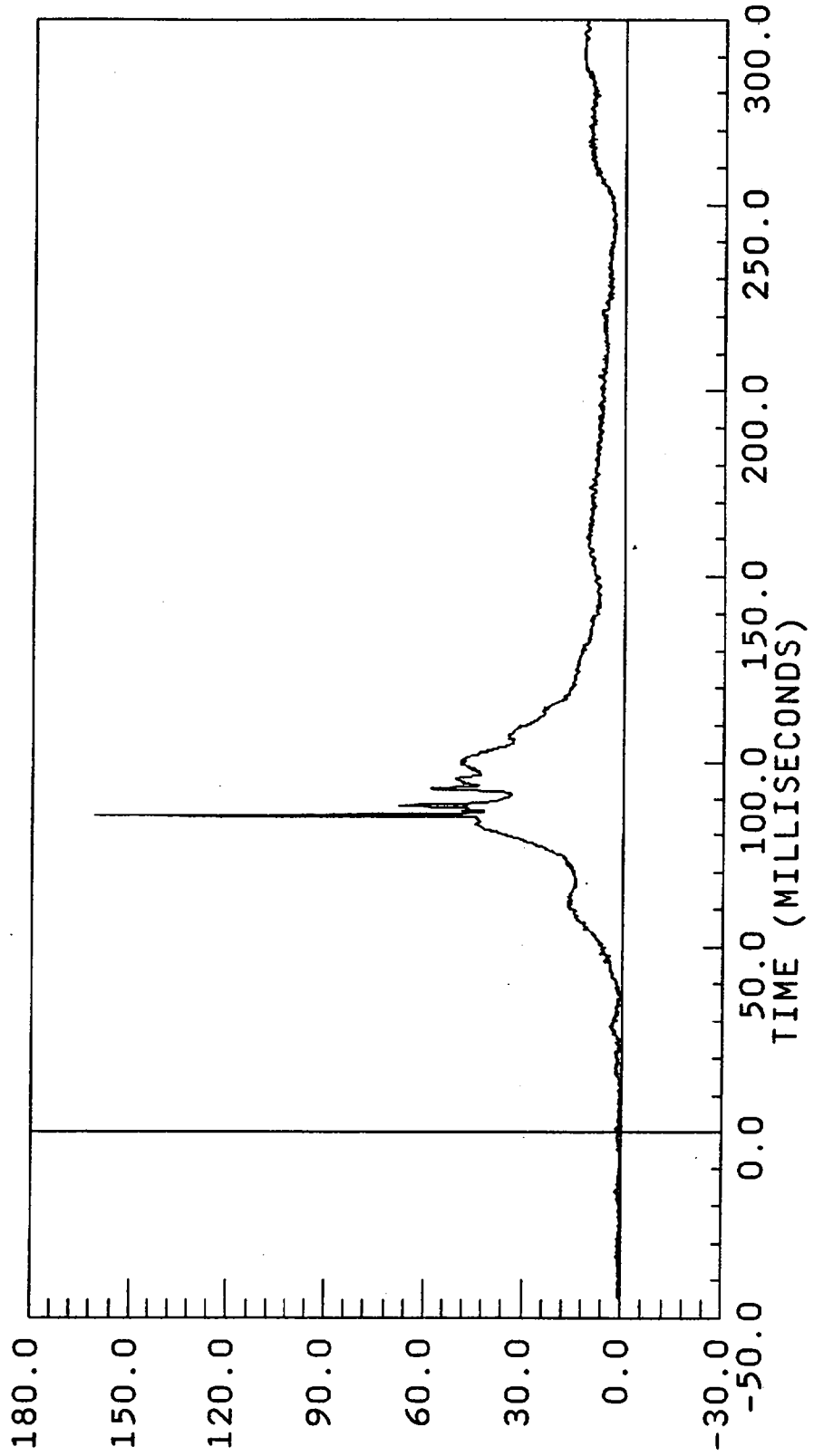
ACCELERATION * G , S *

B-27

7804-9

0.00 mph

POS#1 HEAD
NONSTANDARD
FILTER CUTOFF: OHZ
RS AXIS
YMIN = 0.871927 at -39.30000
YMAX = 161.2491 at 85.35001

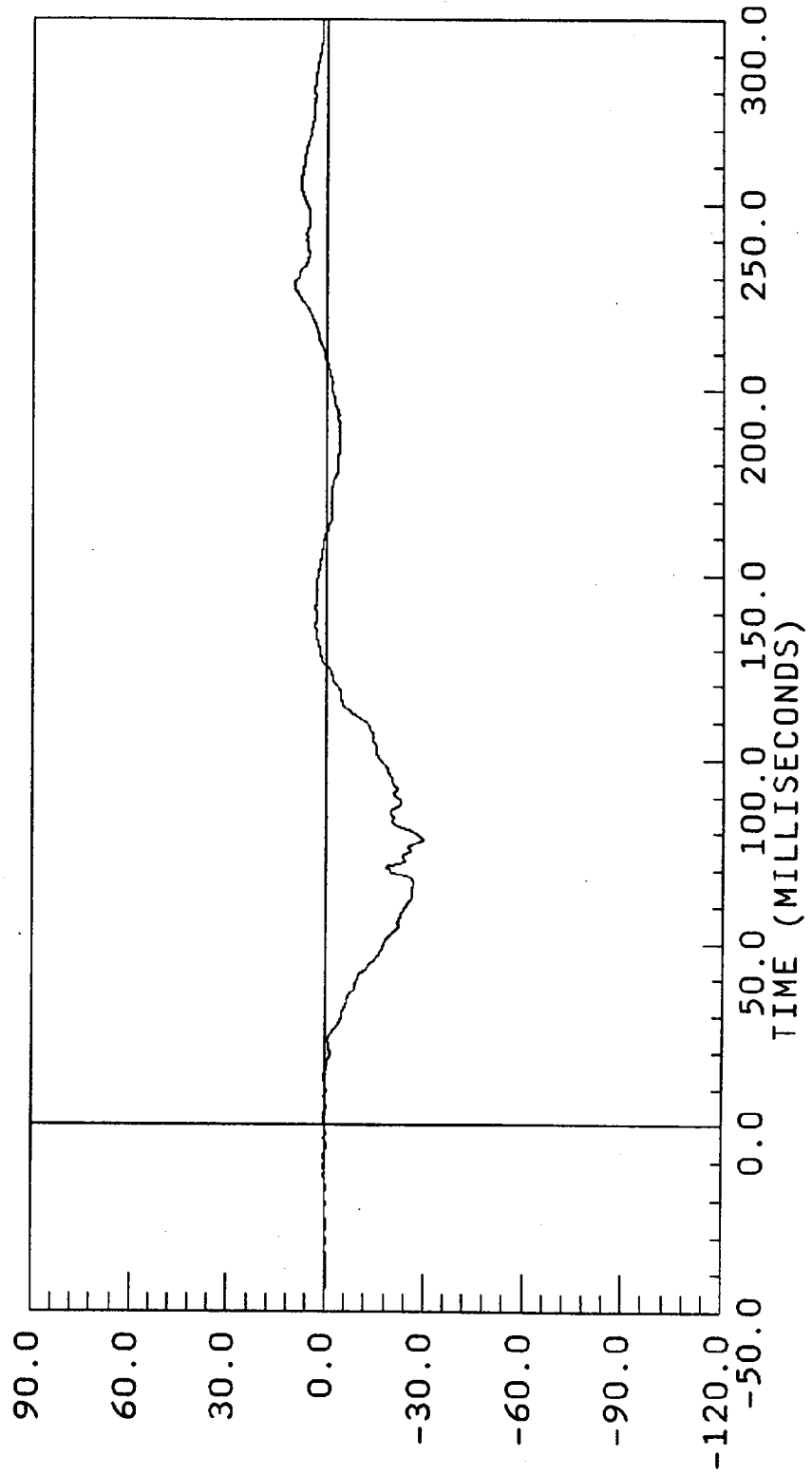


ACCELERATION * G , S *

BW972-4.DAT

29.30 mph

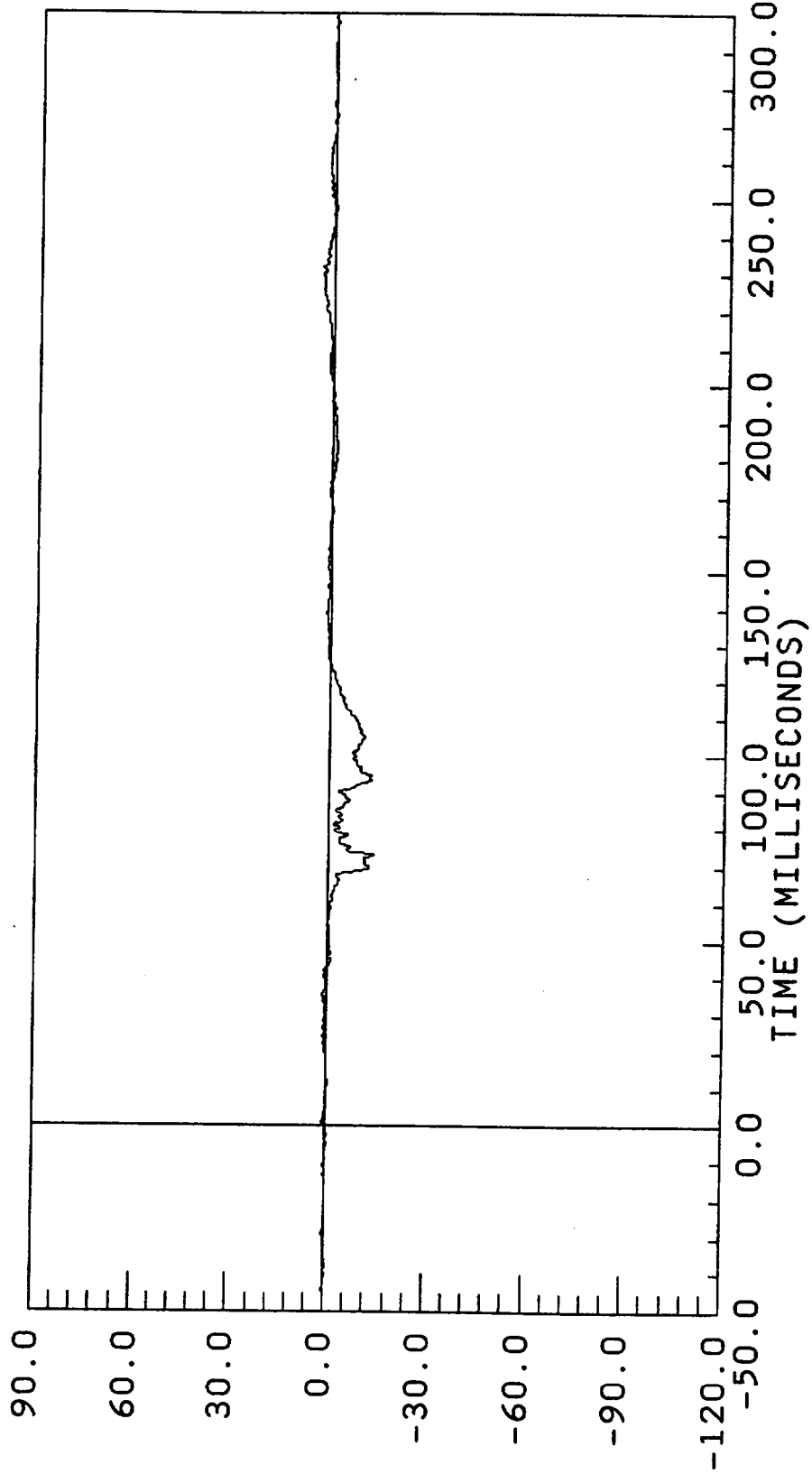
POS#1 CHEST X
FILTERED
FILTER CUTOFF: 300HZ
XL AXIS
YMIN = -29.47847 at 78.37500
YMAX = 10.19007 at 228.1500



ACCELERATION * G * S *
B-30 7804-9

0.00 mph

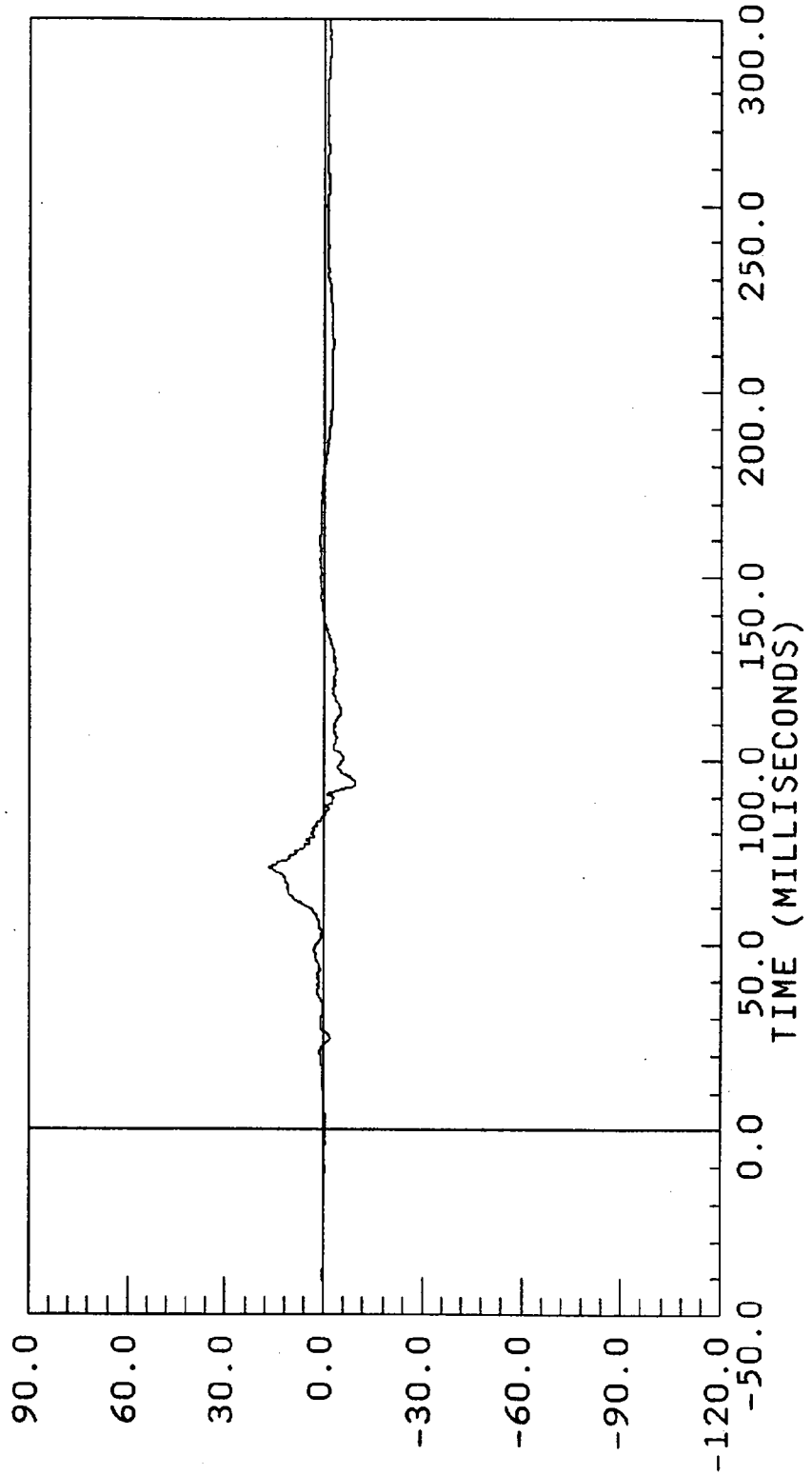
POS#1 CHEST Y
FILTERED
FILTER CUTOFF: 300HZ
YL AXIS
YMIN = -13.75280 at 73.20000
YMAX = 3.460103 at 230.0250



BW972-6.DAT

0.00 mph

POS#1 CHEST Z
FILTERED
FILTER CUTOFF: 300HZ
ZL AXIS
YMIN = -9.510132 at 93.97501
YMAX = 16.71536 at 70.72501



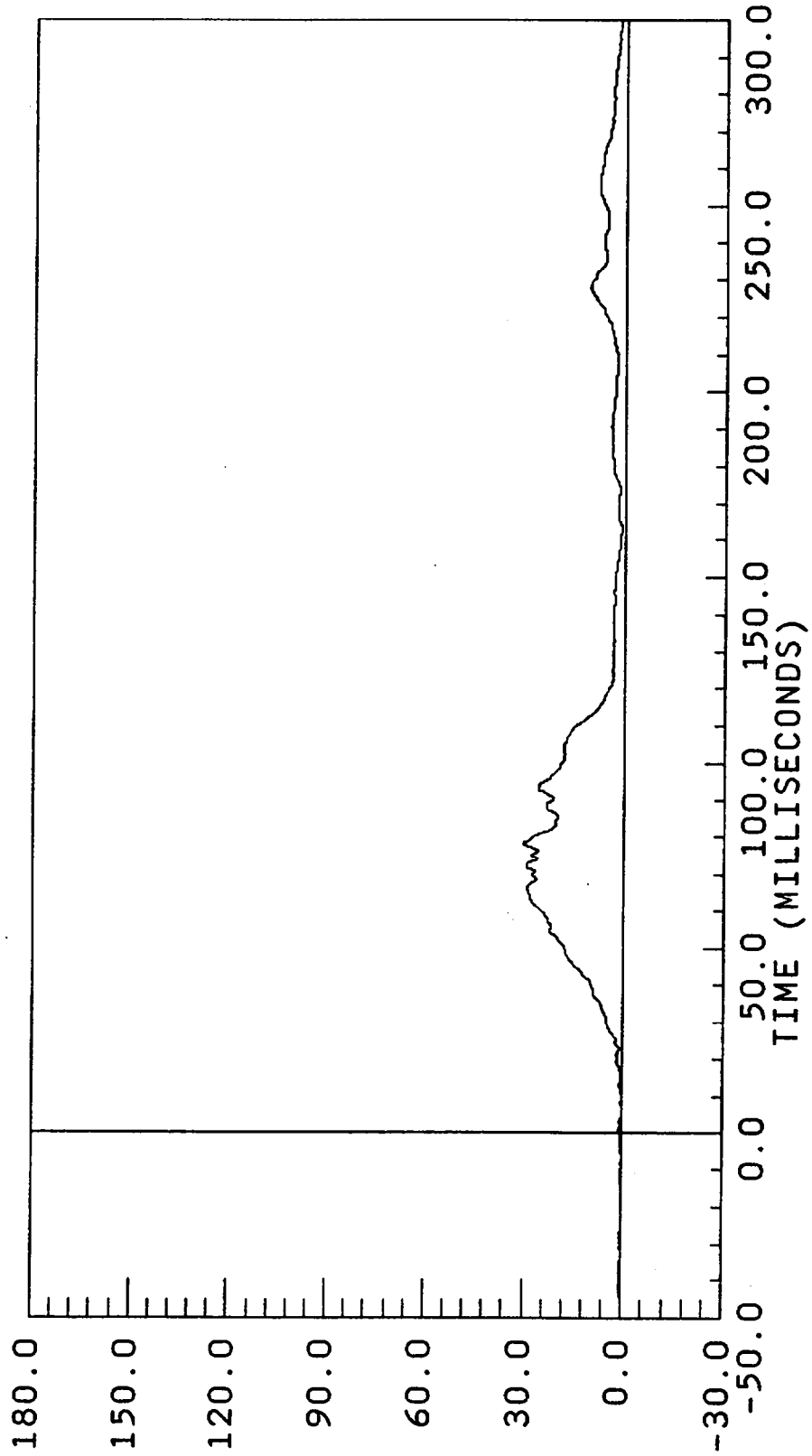
ACCELERATION * G, S *

B-32

7804-9

0.00 mph

POS#1 CHEST
COMPUTED
FILTER CUTOFF: 300HZ
RS AXIS
YMIN = 0.0794324 at -19.95000
YMAX = 30.44809 at 78.37500



ACCELERATION * G, S *

B-33

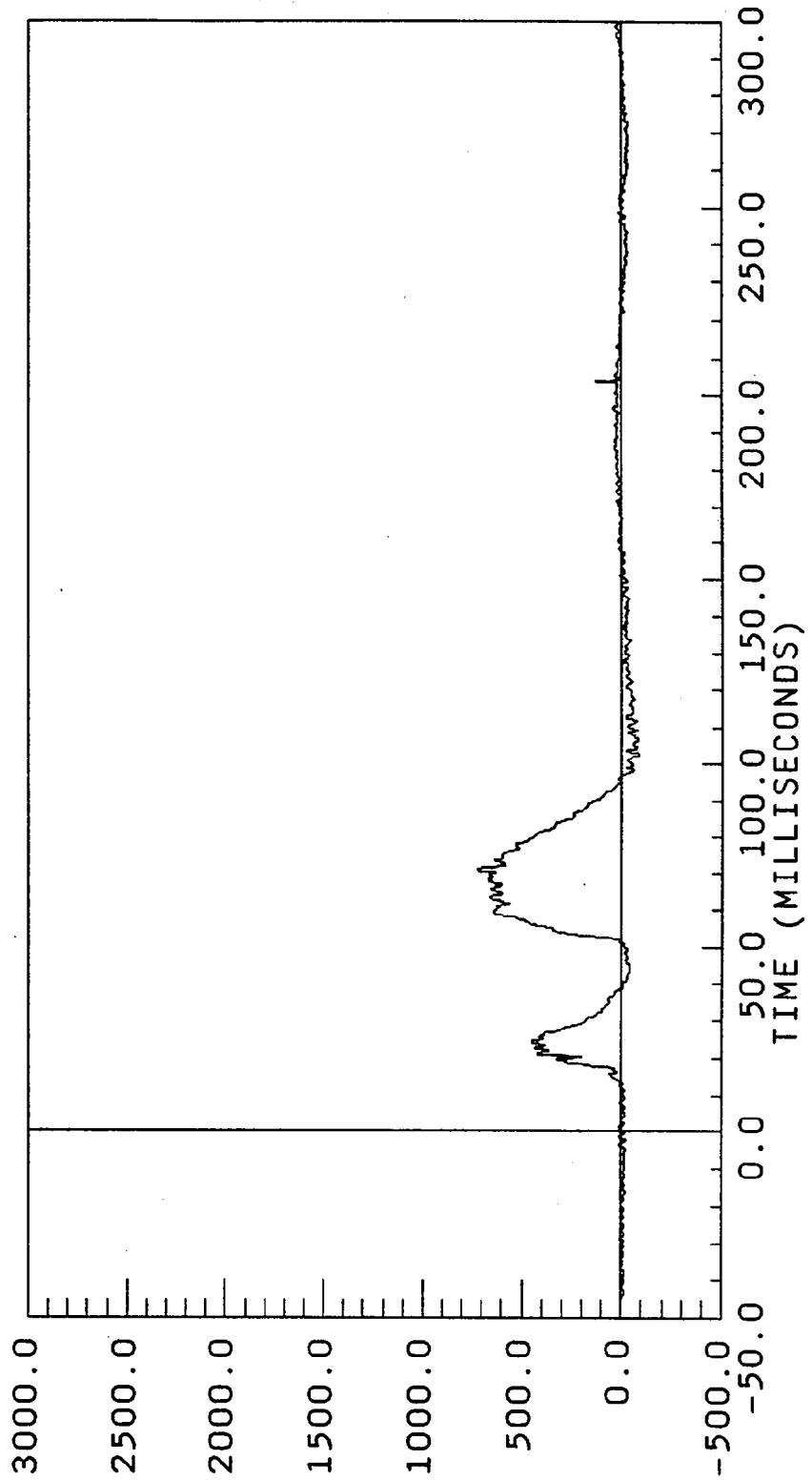
7804-9

BW972-7.DAT

0.00 mph

POS#1 LEFT FEMUR
FILTERED
FILTER CUTOFF: 1000HZ

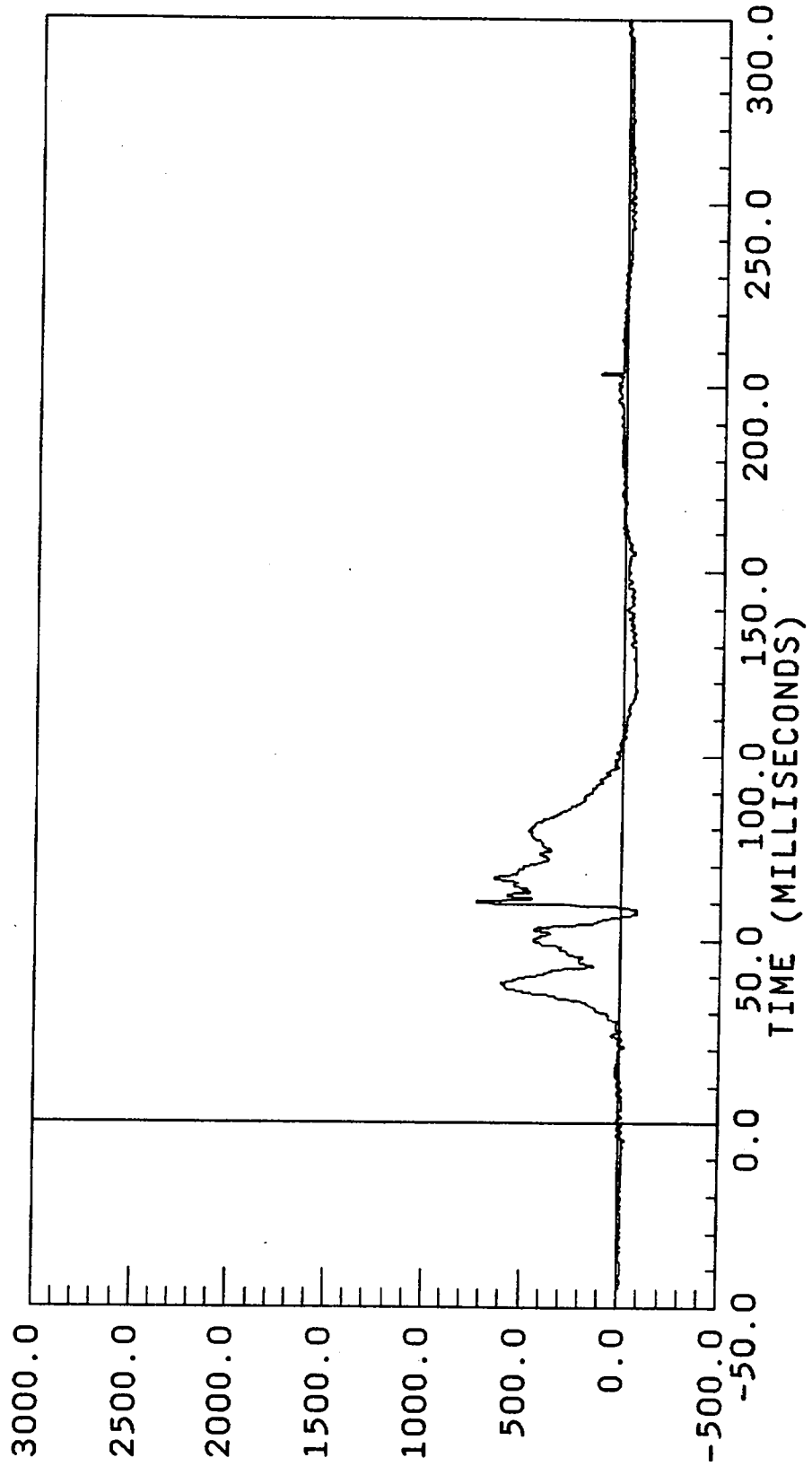
NA AXIS
YMIN = -92.32914 at 102.5250
YMAX = 730.5729 at 71.10001



0.00 mph

POS#1 RIGHT FEMUR
FILTERED
FILTER CUTOFF: 1000HZ

NA AXIS
YMIN = -83.71457 at 57.97500
YMAX = 737.9240 at 60.15000



HEAD INJURY CRITERION
HEAD SEVERITY INDEX
35MS. MAXIMUM DURATION

NHTSA CRASH TEST - PROC. 208

PJIN= 972

F03#2 HEAD R

HIC= 496 1 FROM T1= .07300 TO T2= 10980
AVERAGE ACCELERATION BETWEEN T1 AND T2= 45.36'S
EVENT TIME= 300.0 MSEC
SEVERITY INDEX= 732.7

29.30 mph

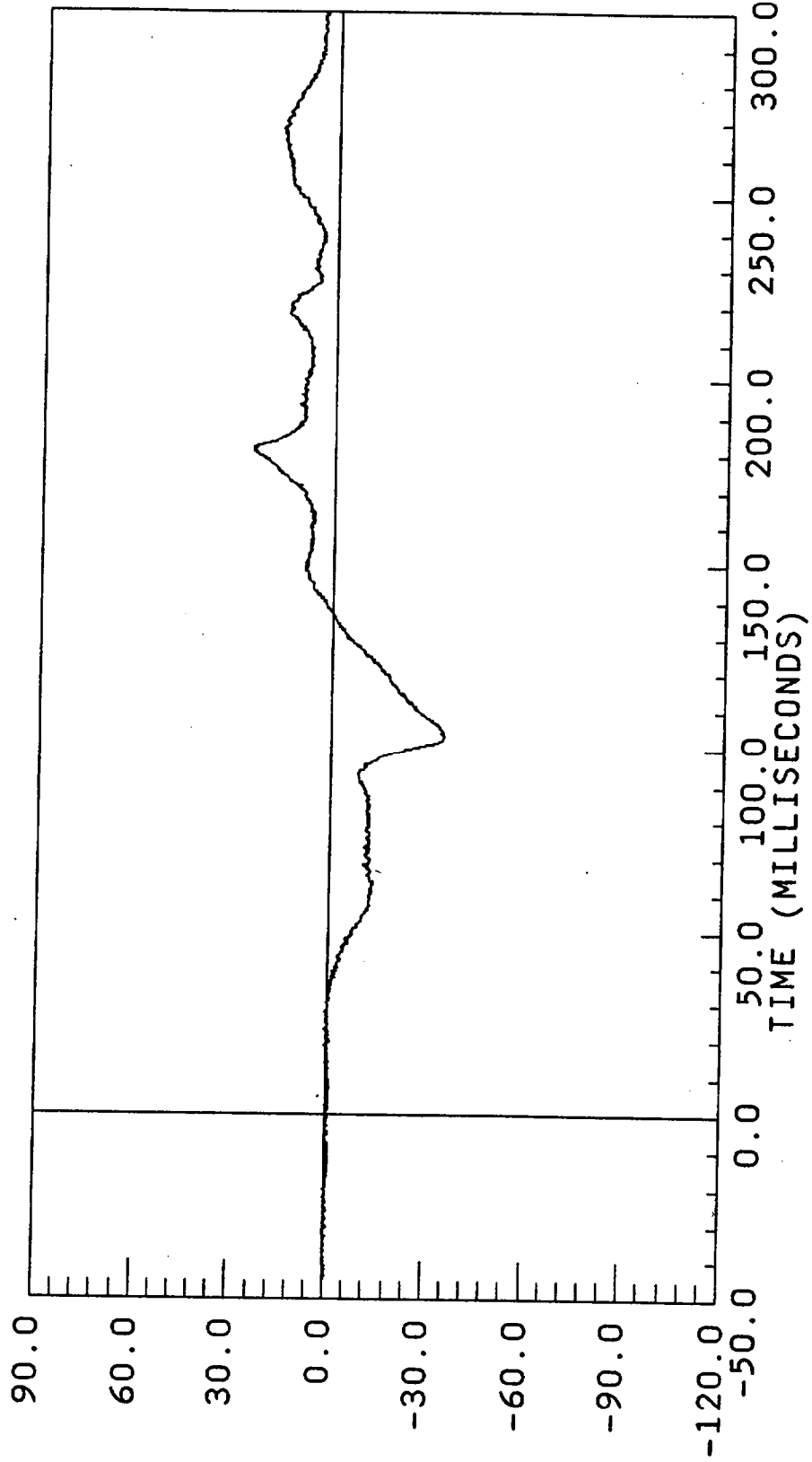
POS#2 HEAD X

XL AXIS

YMIN = -34.67800 at 102.3750

YMAX = 25.49900 at 180.7500

FILTER CUTOFF: 0HZ



ACCELERATION * G * S *

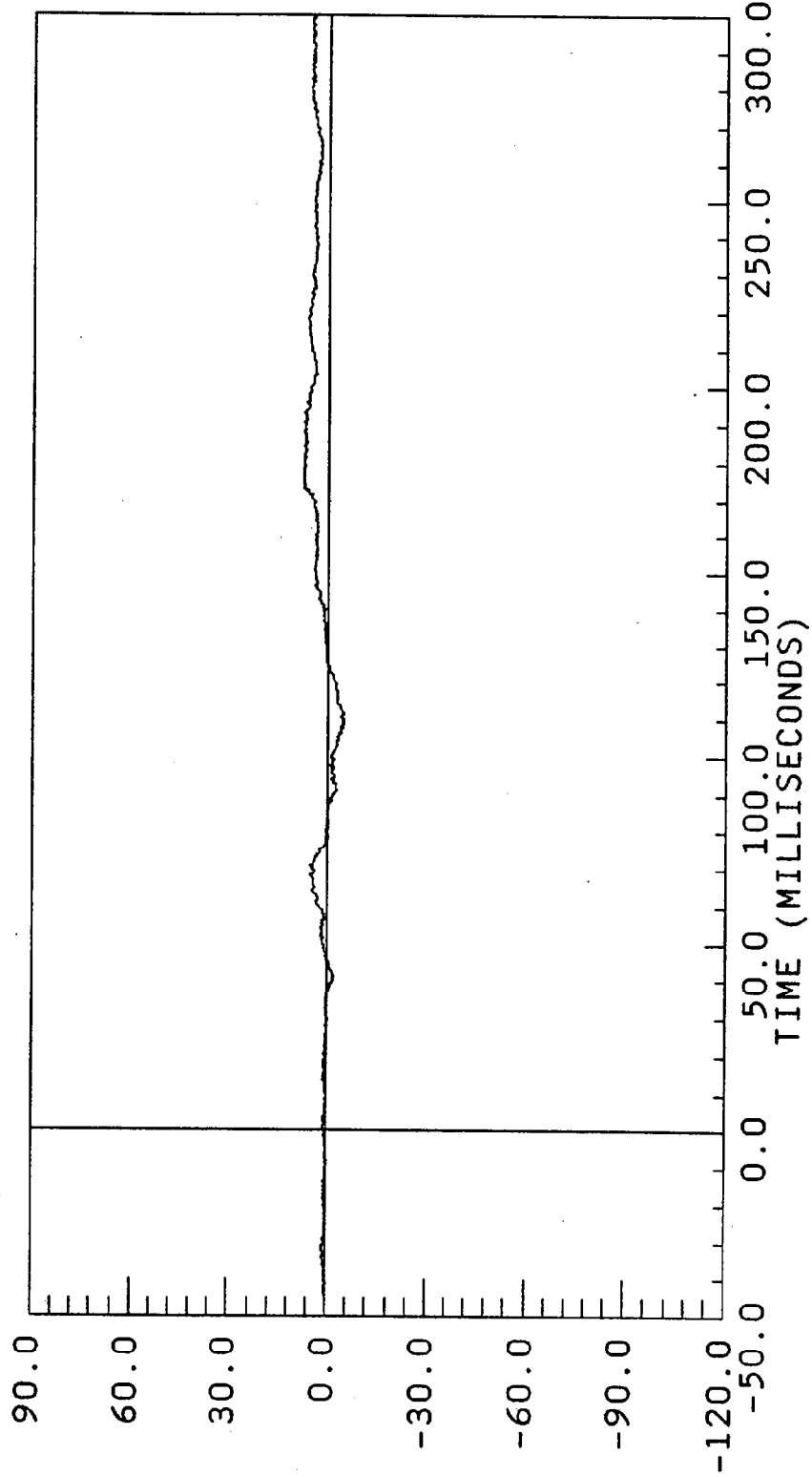
B-37

7804-9

UDS\$972-12.DA

0.00 mph

POS#2 HEAD Y
YL AXIS
YMIN = -4.628700 at 107.7000
YMAX = 8.100000 at 174.6000
FILTER CUTOFF: OHZ



ACCELERATION * G * S *

B-38

7804-9

0.00 mph

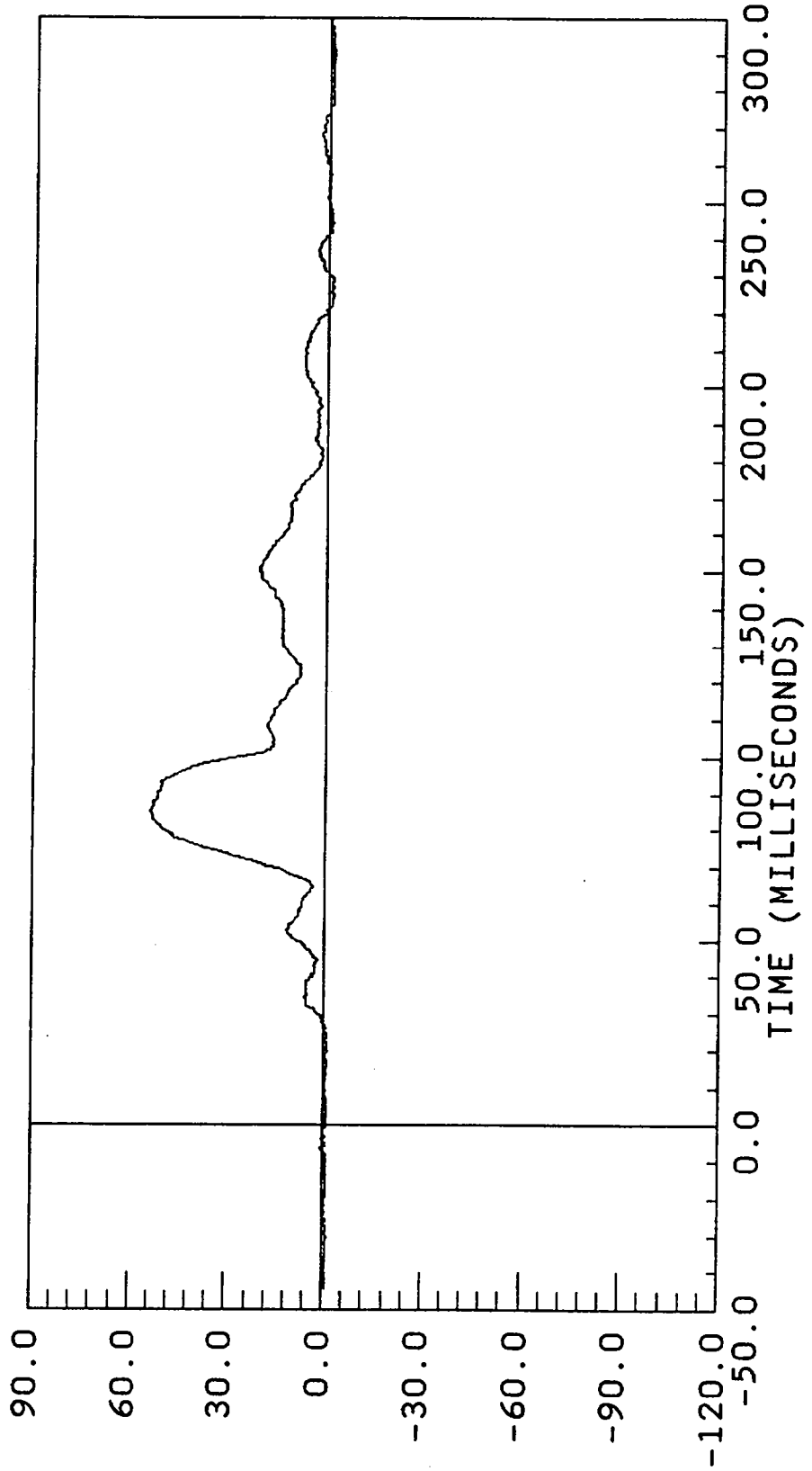
POS#2 HEAD Z

ZL AXIS

YMIN = -0.710690 at -30.60000

YMAX = 53.82400 at 85.20000

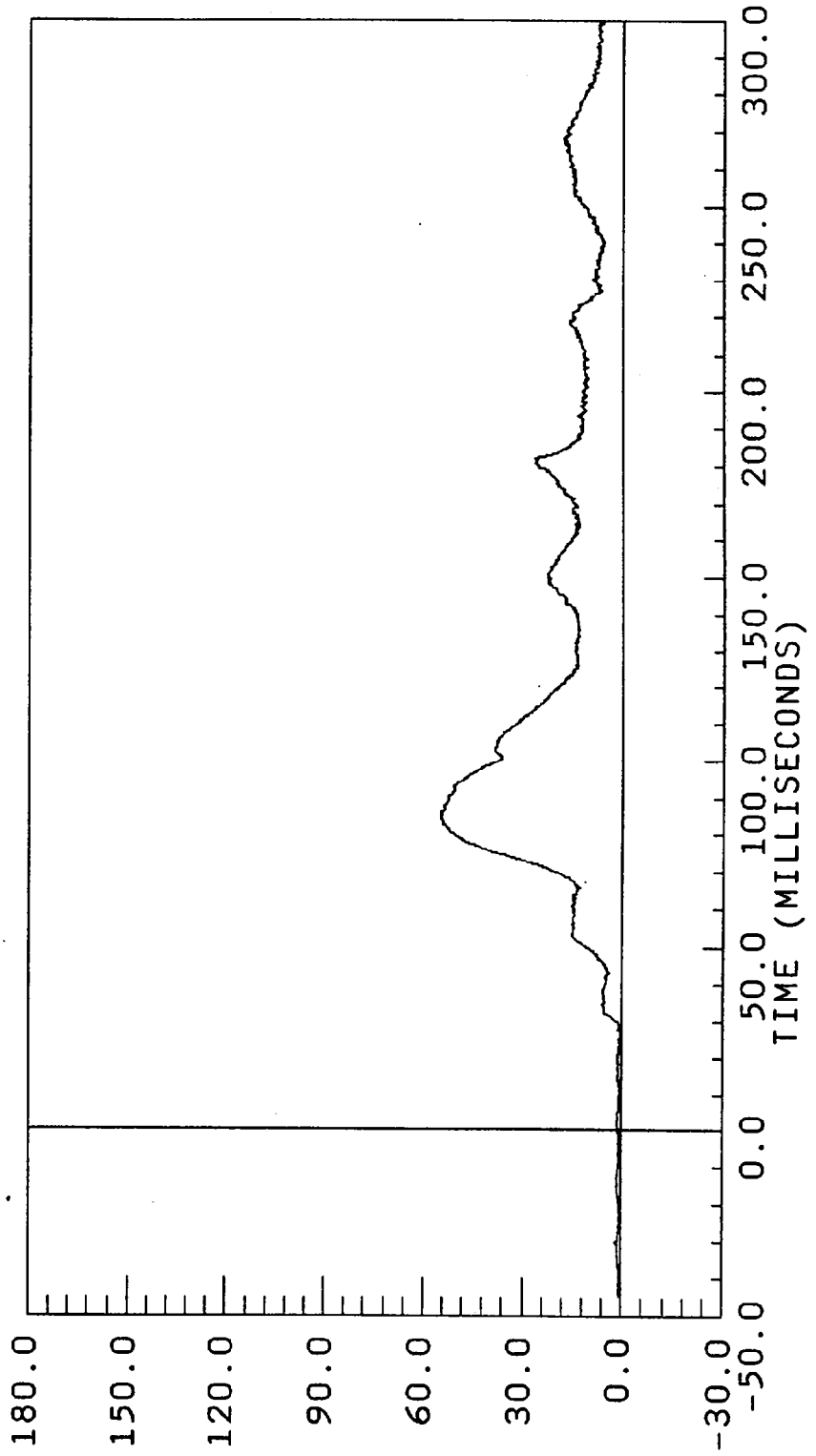
FILTER CUTOFF: OHZ



HRES972-2.DAT

0.00 mph

POS#2 HEAD RS AXIS
NONSTANDARD YMIN = 1.048831 at -7.275000
FILTER CUTOFF: 0HZ YMAX = 55.08714 at 85.27500



ACCELERATION * G ' S *

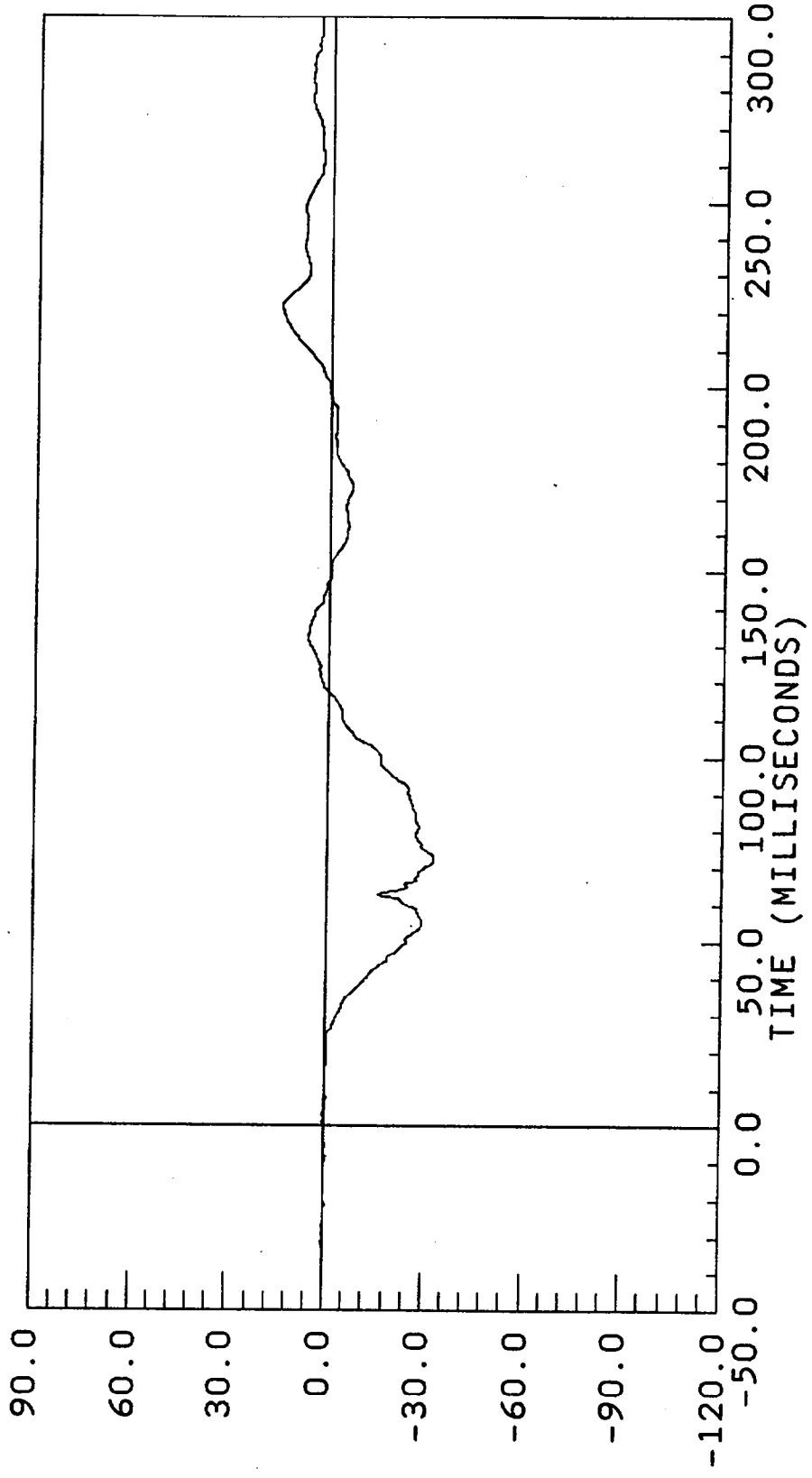
B-40

7804-9

29.30 mph

POS#2 CHEST X
FILTERED
FILTER CUTOFF: 300HZ

XL AXIS
YMIN = -32.53611 at 73.12500
YMAX = 15.49279 at 221.9250

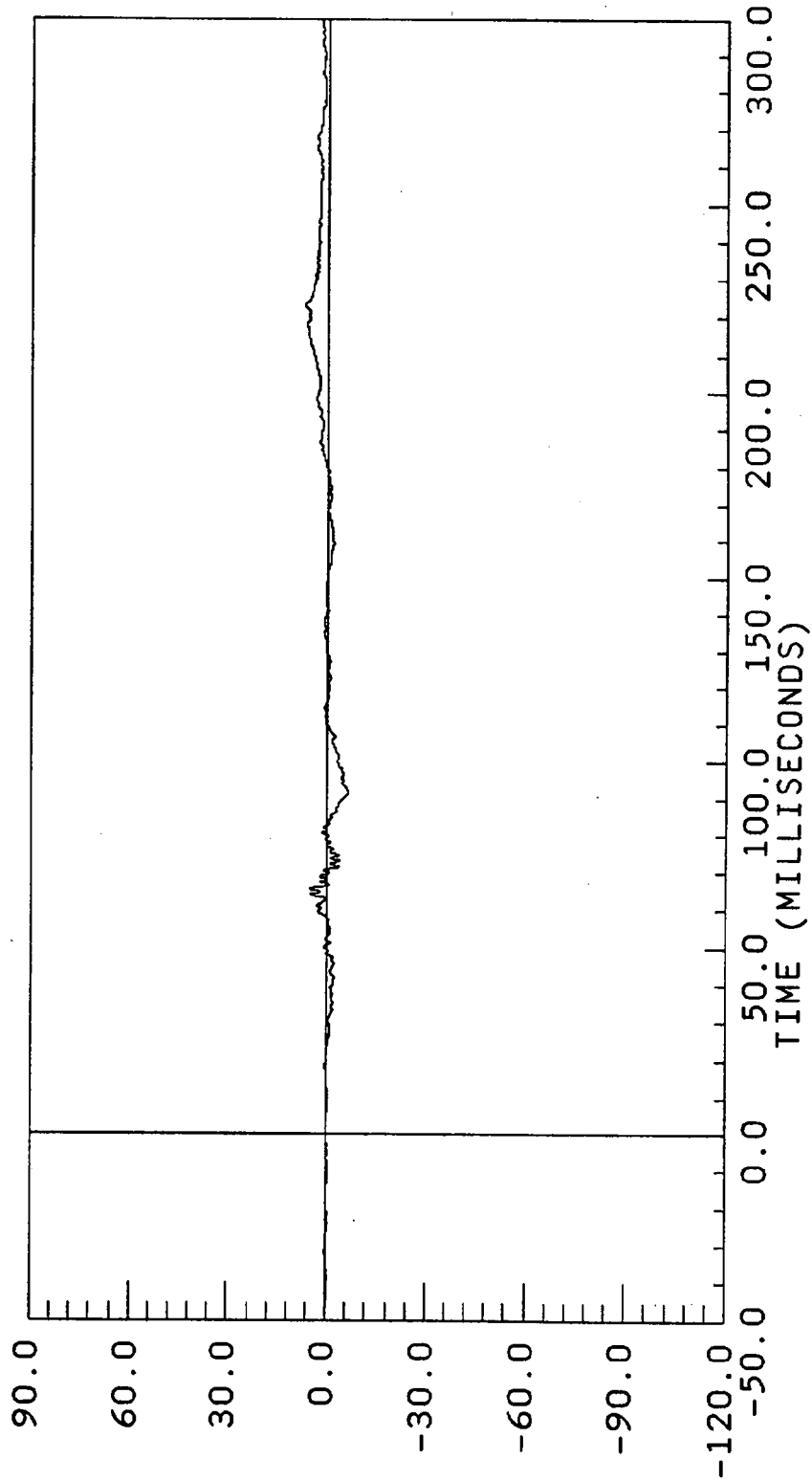


ACCELERATION * G'S *

BW972-15.DAT

0.00 mph

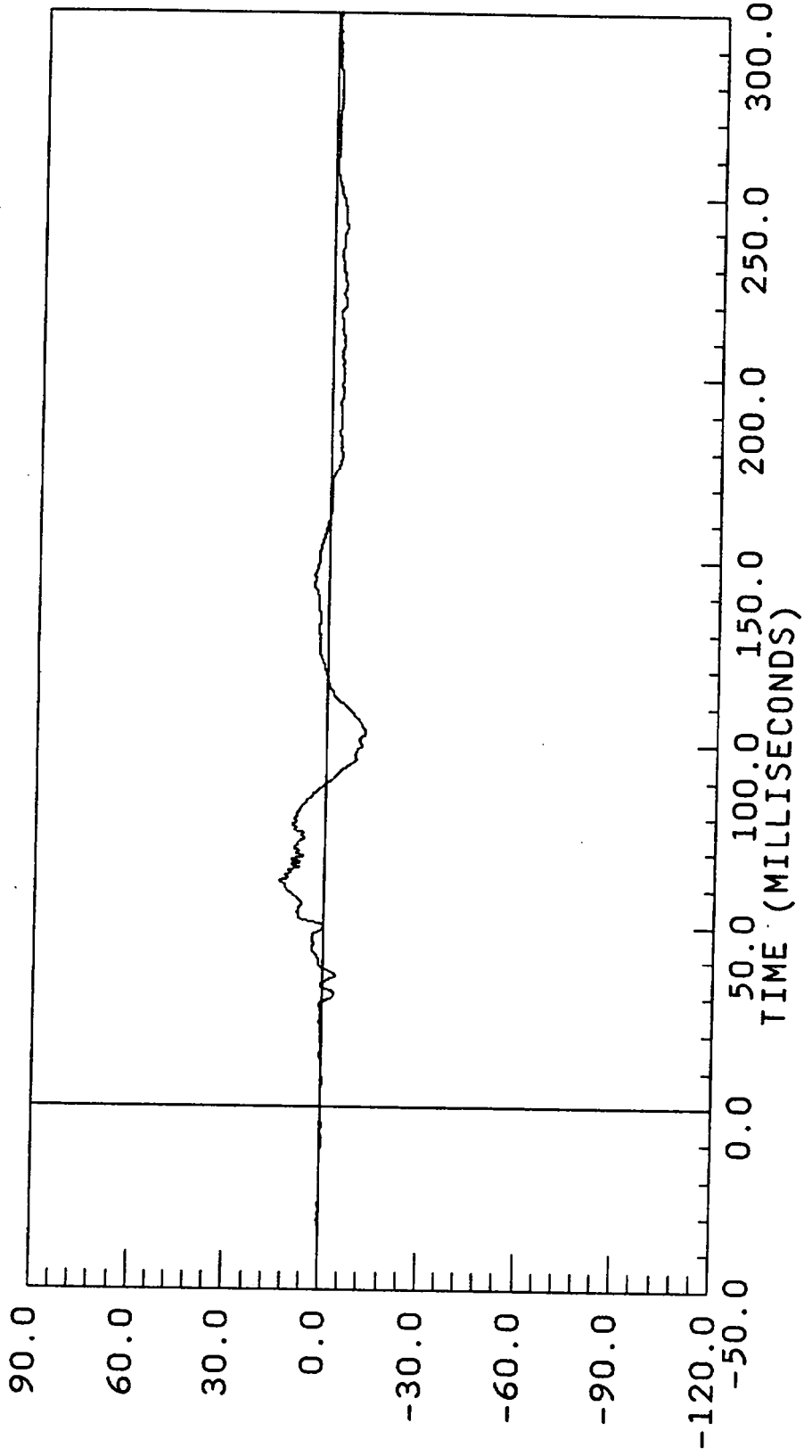
POS#2 CHEST Y
FILTERED
FILTER CUTOFF: 300HZ
YL AXIS
YMIN = -6.486965 at 91.50000
YMAX = 7.115432 at 223.2750



ACCELERATION * G * S *
B-42 7804-9

0.00 mph

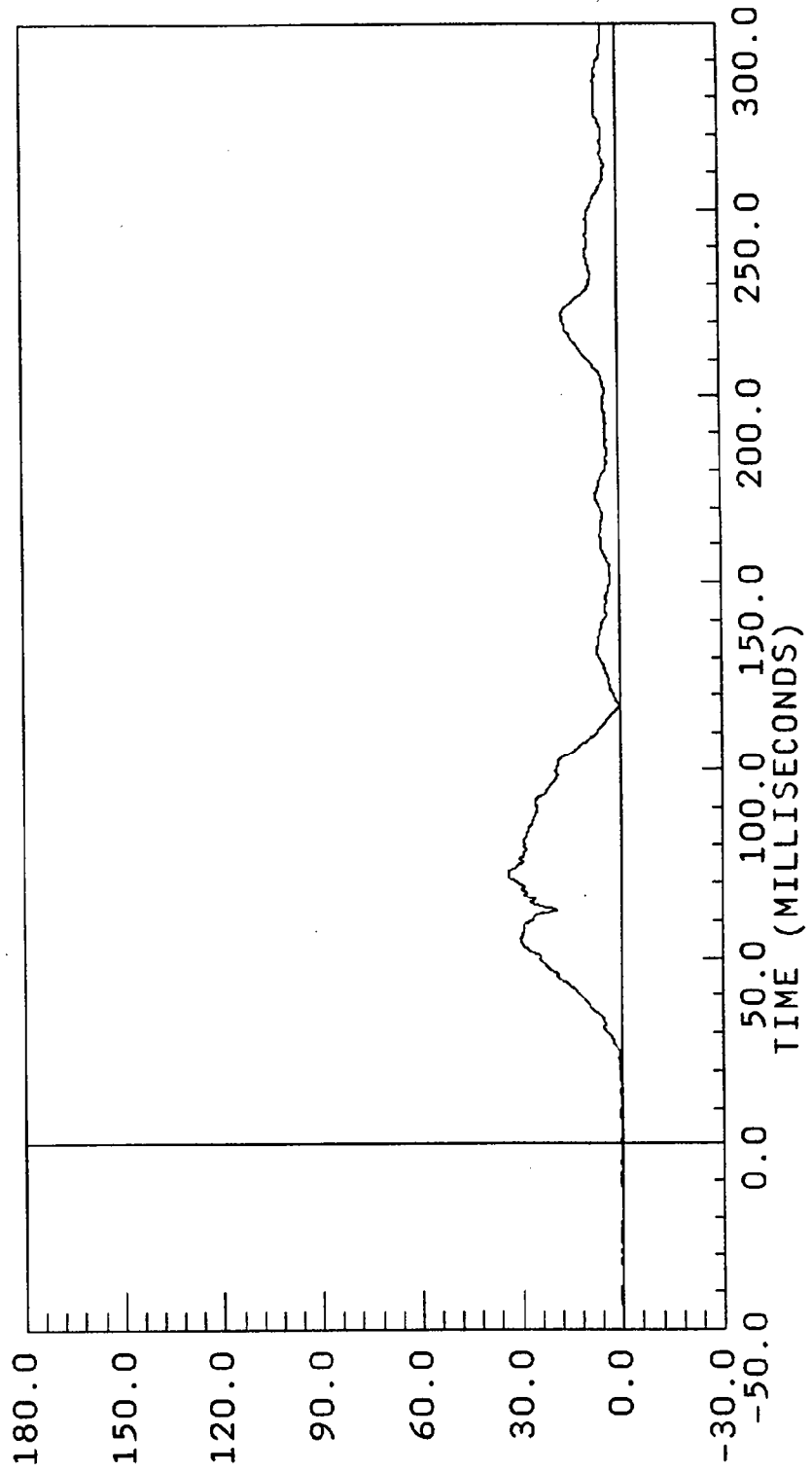
POS#2 CHEST Z
FILTERED
FILTER CUTOFF: 300HZ
ZL AXIS
YMIN = -11.77791 at 102.7500
YMAX = 14.23971 at 62.02500



CHST972-2.DAT

0.00 mph

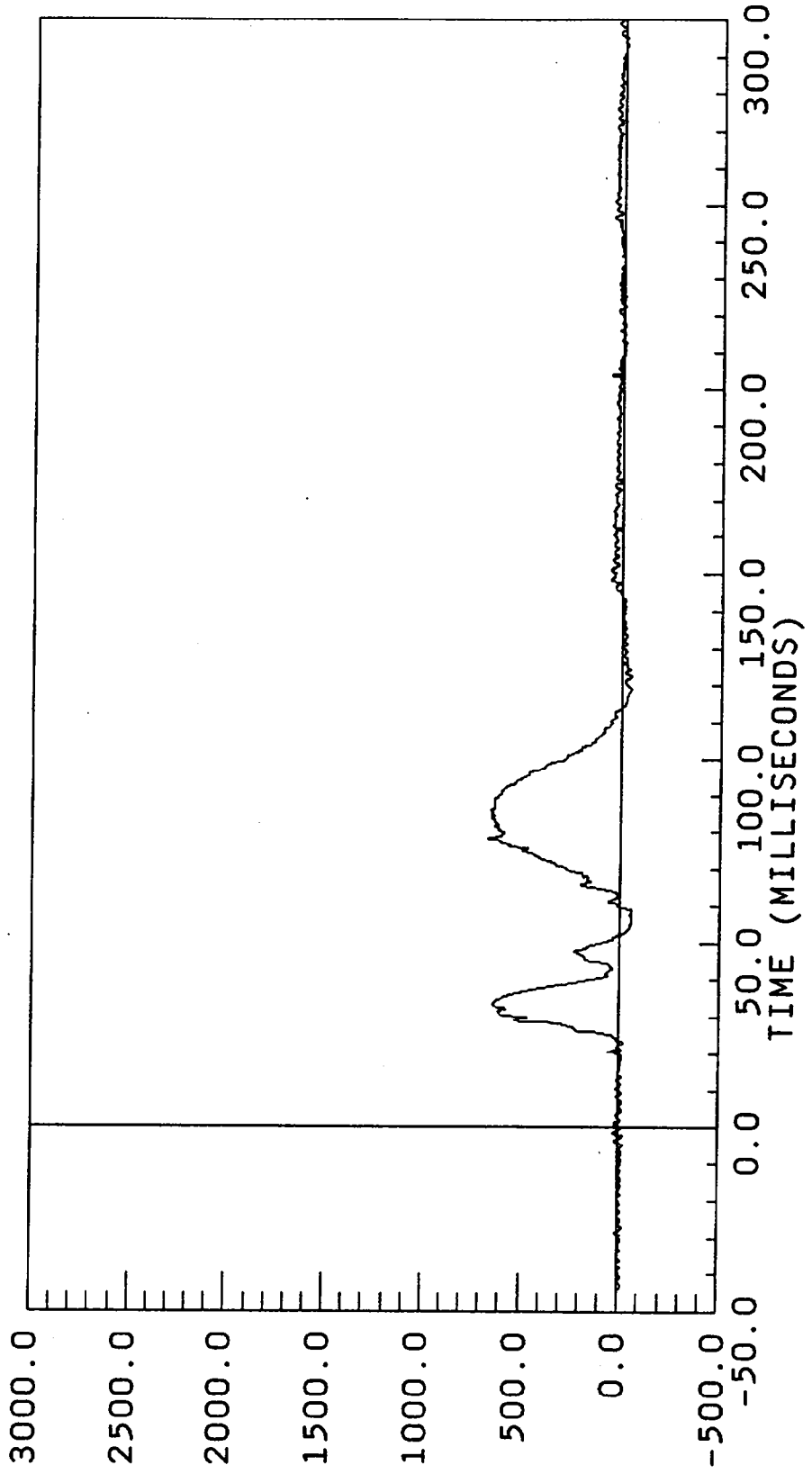
POS#2 CHEST
COMPUTED
FILTER CUTOFF: 300Hz
RS AXIS
YMIN = 0.0232314 at -19.95000
YMAX = 33.96556 at 71.55000



ACCELERATION * G * S *
B-44 7804-9

0.00 mph

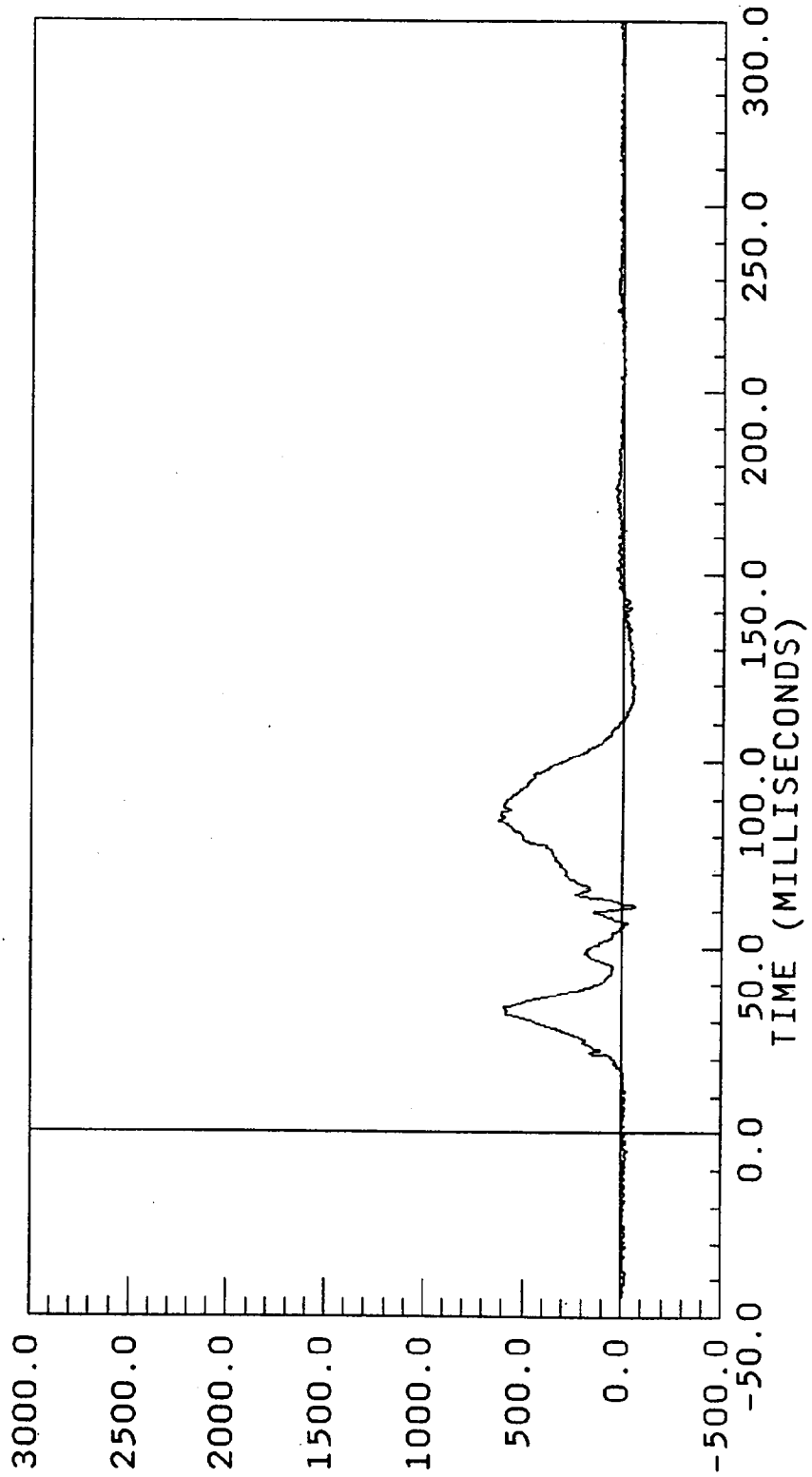
POS#2 LEFT FEMUR
FILTERED
FILTER CUTOFF: 1000HZ
NA AXIS
YMIN = -59.22078 at 58.35000
YMAX = 669.8364 at 78.22501



BW972-10.DAT

0.00 mph

POS#2 RIGHT FEMUR NA AXIS
FILTERED YMIN = -75.37506 at 61.20000
FILTER CUTOFF: 1000HZ YMAX = 629.3133 at 84.37500



Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS



Seat Belts

ND06A, Aa

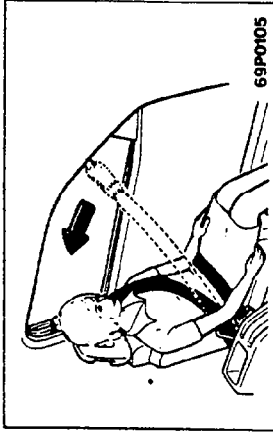
Seat belts are installed in your car for the protection of the driver and passengers. Use the seat belts. In the event of an accident, injury to the driver and passengers may be reduced if seat belts are properly used.

The following pages contain the recommended procedure for fastening, adjusting, and wearing of belts for comfort and safety.

Combined Automatic Shoulder Belt and Manual Lap Belt Restraint System

ND06B, Fa

For models destined for the United States, the front seat belt restraint system consists of the automatic shoulder belt and the manual lap belt. This system is designed to provide comfort and safety by automatic fastening and unfastening of the shoulder belt as well as automatic retraction of the belts during normal car operation. Sensing devices inside the belt retractors (for shoulder and lap belts) are designed to lock the retractors in the event of an abrupt change in car motion.



CAUTION

For full restraint, the manual lap belt and the automatic shoulder belt must be securely fastened.

Adjust the front seat position so that the front passenger's shoe soles may touch the toeboard when he or she sits up straight and well back in the seat. Failure to follow these instructions could increase the chance and/or the severity of injury in accident.



Automatic Shoulder Belt

ND06D-H

The shoulder belt moves automatically to the set position (fasten) when a door is closed and the ignition key is turned to the "ON" position. When the door is opened, the shoulder belt automatically moves to the set-off (unfastened) position. For the driver's seat, the shoulder belt automatically moves to the set-off position when the ignition key is removed from the ignition.

Seat Belt Reminder Light/Warning Light and Buzzer

The seat belt reminder light/warning light will illuminate or blink on and off and/or the buzzer will sound in the following instances.

(1) LAP BELT REMINDER LIGHT AND BUZZER

When the ignition key is turned to the "ON" position, the reminder light in the instrument cluster will illuminate for about 6 seconds. If the driver does not fasten his/her lap belt, the buzzer will also sound for about 6 seconds intermittently. The buzzer will immediately stop sounding, however, when the lap belt is fastened.

(2) SHOULDER BELT INSTALLATION REMINDER LIGHT

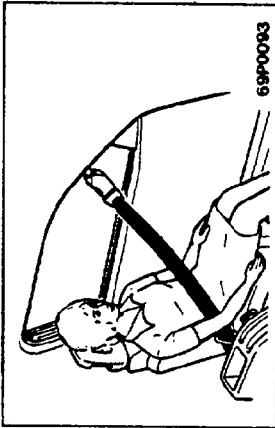
While the shoulder belt moves automatically to the set position (fasten), when the door is closed and the ignition key is turned to the "ON" position, the shoulder belt reminder light will blink on and off during that time.

(3) SHOULDER BELT RELEASE BUCKLE WARNING LIGHT AND BUZZER

If the release button for the belt at the driver's seat side is accidentally pressed, the buzzer will sound for about 6 seconds and the warning light will also blink on and off continuously for about one minute; for the belt at the passenger seat side, the warning light will illuminate for about one minute. If this happens, again buckle the shoulder belt, the buzzer will stop when the belt is buckled, and the warning light will stop.

(4) SHOULDER BELT RELEASE REMINDER BUZZER

When the door is opened and the sliding anchor begins to move to release the shoulder belt, the buzzer sounds for about one second.



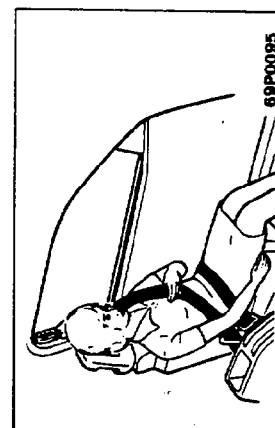
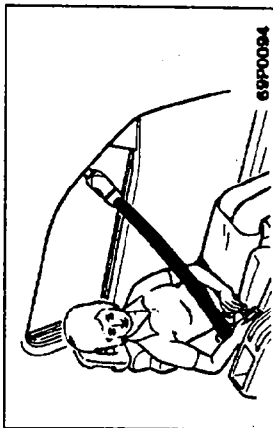
Front Seat Belt Instructions

1. Get in the car, close the door and adjust the seat position.
2. Grasp the lap belt latch plate and pull the webbing, then push the latch plate into the buckle until a "click" is heard.

NOTE

Pull the lap belt fully out to convert the ELR (emergency locking retractor) to the ALR (automatic locking retractor) function in order to install a child restraint system to the front passenger's seat. (See "Installing a Child Restraint System to the Front Passenger's Seat" on page 27.)

3. Turn the ignition key to the "ON" position; the shoulder belt will move automatically to the set position (fasten).

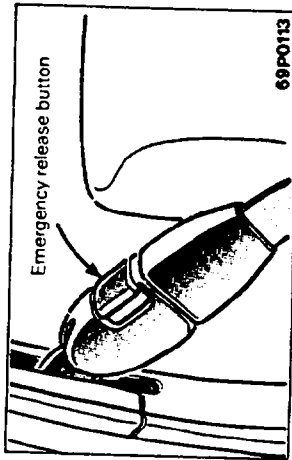


CAUTION

Be careful that the driver's or a passenger's finger is not caught and pinched by the shoulder belt sliding anchor while it is moving. Be careful that the shoulder and lap belts do not cross. If they do, the lap belt could injure the abdomen in the event of sudden braking or a collision.



4. Pull up the shoulder belt and lap belt slightly to be sure that there is no excess slack or tightness in the belts. The belts will retain a small amount of looseness necessary for comfort during driving. If a belt is too tight, pull it up slightly and let it return. The belts will not tighten during normal use; therefore you can set them once for safe, comfortable snugness.

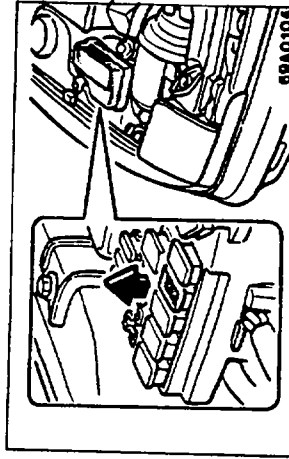


Emergency Release Button
If the shoulder belt sliding anchor is locked in an emergency, push the emergency release button to release the shoulder belt. Use this button only when the shoulder belt prevents you from leaving the car in an accident or when installing a child restraint system to the front passenger's seat.

CAUTION

Do not press the emergency release button except in an emergency in order to maintain the normal shoulder belt restraint.

5. The belts will allow unrestricted movement under normal conditions. The belts will lock in the event of an accident.



MANUAL INSTALLATION OF AUTOMATIC SHOULDER BELTS

If the automatic shoulder belt sliding anchor stops before its movement is complete and does not move farther, follow the steps below to turn the motor manually, move the sliding anchor to the installation position, and then attach the shoulder belt to the buckle. Before driving, be sure your belt is properly fastened. When the motor is turned manually, remove the fusible link in the relay box.

CAUTION

if the fusible link is not removed, an injury may result when the motor starts.