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

HONDA MOTOR COMPANY
1990 ACURA INTEGRA R.S.
4-DOOR SEDAN

NHTSA NUMBER: CL5302

CALSPAN TEST NUMBER: 7804-6

February 6, 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.
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16. Abstract A 30 mph vehicle safety compliance test was conducted on a 1990 Acura Integra R.S. 4-Door Sedan. This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on February 6, 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 39°F. The subject test vehicle appears to comply with the requirements of FMVSS Nos. 208, 212, 219 (partial) and 301. <u>Type of Restraint System:</u> The test vehicle was equipped with a driver and passenger automatic torso seat belt restraint system. Manual lap belts 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 Acura Integra R.S. 4-Door Sedan, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS No. 212, "Windshield Mounting"; FMVSS No. 219 (partial), "Windshield Zone Intrusion"; and FMVSS No. 301, "Fuel System Integrity". This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-208-08.

Section 2

SUMMARY OF TEST NUMBER CL5302

A frontal barrier was impacted by a 1990 Acura Integra 4-Door Sedan at a velocity of 29.5 mph. The test was performed at the Calspan Corporation Advanced Technology Center on February 6, 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 275. The maximum chest deceleration over 3 milliseconds was 38.7 g's. The maximum force on the driver's left femur was 1135 pounds and 1729 pounds on the right femur.

The right front passenger's HIC was 518. The maximum chest deceleration over 3 milliseconds was 44.3 g's and loads were 805 and 1692 pounds on the left and right femurs respectively.

Table 1

CRASH TEST SUMMARYVehicle NHTSA No.: CL5302 Test Mode: 30 mph Frontal BarrierTest Date.: February 6, 1990 Time: 11:25 Temperature: 39°FVehicle Make/Model/Body Style: 1990 Acura Integra RSVehicle Test Weight: 3030 lbs.Vehicle/Barrier Impact Angle: 0°Impact Velocity: 29.5 mphMaximum Static Crush: 15.7"Vehicle Rebound: 15.1"DUMMIES:DRIVERPASSENGER

Type:

Part 572Part 572

Restraint System:

Automatic TorsoAutomatic TorsoBeltBeltNumber of Data Channels: 23Number of Cameras: 1 Real Time14 High SpeedDOOR OPENING DATA: operable - Left Frontoperable - Right Front

Front Seat(s) Data:

DRIVERPASSENGER

Seat Track Failure:

0.00.0

inches of shift

Seat Back Failure:

NoneNoneVISIBLE DUMMY CONTACT POINTS:DRIVERPASSENGER

Head:

top of head - upper steering
rim, chin - with chestchin with chest

Abdomen

lower steering rimno contact

Chest

no contactno contact

Knees

lower instrument paneldash panel

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1990 Acura Integra RS 4-Door Sedan
 NHTSA No. CL5302 ; VIN: JH4DB1542LS014650 ; Color: Blue
 Engine Data: 4 cylinders; - CID; 1.8 Litres; - cc
 Placement - Longitudinal or In-Line; X Transverse or Lateral
 Transmission Data: 5 speeds; X Manual; - Automatic; - Overdrive
 Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive
 Major Options: - A/C; X Pwr. Strg.; X Pwr. Brakes; - Pwr. Windows
- Power Door Locks
 Date Received: 11-15-89 ; Odometer Reading 030.7 miles
 Selling Dealer: Acura of Amherst
 & Address 7460 Transit Road, Amherst, NY 14221

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Honda Motor Company, Ltd.
 Date of Manufacture: 8-89
 GVWR: 3615 lbs.; GAWR: 1940 lbs. FRONT; 1720 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 28 psi FRONT
28 psi REAR
 Recommended Tire Size: 195/60R14 85H Load Range: Std.
 Recommended Cold Tire Pressure: 28 psi FRONT; 28 psi REAR
 Size of Tires on Test Vehicle: 195/60R14 85H; Manufacturer: Yokohama
 Vehicle Capacity Data:
 Type of Front Seats: - Bench; X Bucket; - Split Bench
 Number of Occupants: 2 Front; 3 Rear; 5 Total
 Vehicle Capacity Weight (VCW) = 850 lbs.
 No. of Occupants x 150 lbs. = 750 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 100 lbs. (Difference)

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

Right Front = 810 lbs. Right Rear = 460 lbs.
 Left Front = 810 lbs. Left Rear = 520 lbs.
 TOTAL FRONT = 1620 lbs. TOTAL REAR = 980 lbs.
 % of Total Vehicle Weight = 62% % of Total Weight = 38%
 TOTAL DELIVERED WEIGHT = 2600 lbs.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 2600 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 100 lbs.
 Weight of 2 P.572 Dummies @ 164 ea. = 328 lbs.
 TARGET TEST WEIGHT = 3028 lbs. (sum)

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

Right Front = 870 lbs. Right Rear = 650 lbs.
 Left Front = 850 lbs. Left Rear = 660 lbs.
 TOTAL FRONT = 1720 lbs. TOTAL REAR = 1310 lbs.
 % of Total Weight = 57 % % of Total Weight = 43 %
 TOTAL TEST WEIGHT = 3030 lbs.
 Weight of Ballast Secured in Vehicle Trunk Area = 0 lbs.
 Vehicle Components Removed for Weight Reduction None

VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED: RF 27.0 LF 27.1 RR 26.6 LR 26.7
 FULLY LOADED: RF 25.8 LF 26.0 RR 24.1 LR 24.3
 AS TESTED: RF 26.3 LF 26.4 RR 24.7 LR 24.7
 Vehicle's Wheel Base: 102.4 in.
 Location of Vehicle's C.G.: 44.3 inches from front wheel center

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 13.2 gallons
 Usable Capacity Figure Furnished by COTR = 13.2 gallons
 Test Volume Range (92 to 94% of Usable Capacity) = 12.1 to 12.4 gallons
 ACTUAL TEST VOLUME = 12.3 gallons (with entire fuel system filled)

Table 3

POST IMPACT DATATYPE OF TEST:

Type of Test: Frontal Impact Impact Angle: 0°
 Test Date: February 6, 1990 Time: 11:25 Temperature: 39°F
 Vehicle NHTSA No.: CL5302
 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 = 175.2 "; C/L = 176.7 "; Left = 175.0 "
 Post-Test Right = 160.7 "; C/L = 161.0 "; Left = 160.8 "
 Crush Right = 14.5 "; C/L = 15.7 "; Left = 14.2 "
 AVERAGE = 14.8 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

Right = 15.1 "; C/L = 14.9 "; Left = 15.3 "
 AVERAGE = 15.1 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>None</u>	<u>0.0</u>

Table 3

POST IMPACT DATA (cont.)

GLAZING DAMAGE: Substantial cracking of lower windshield.

OTHER NOTABLE IMPACT FEATURES: None.

Section 3
OCCUPANT AND VEHICLE DATA

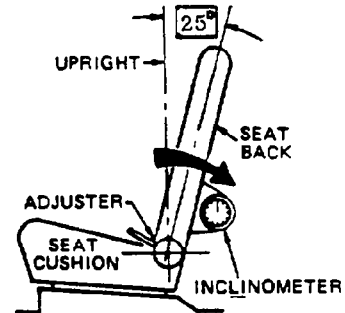
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1990 Vehicle Model: Acura Integra RS Body Style: 4-Door Sedan

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



LEFT SIDE VIEW

Seat back angle for driver's seat 25°

Measurement instructions: Seat was adjusted to the 3rd latch positions from the first locking position.

Seat back angle for passenger's seat 25°

Measurement instructions: Same as driver.

2. Seat Fore and Aft Positioning

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

Positioning of the driver's seat: Seat placed in mid position (10th detent of 19 total detents).

Positioning of the passenger's seat (if applicable): Same as driver.

3. Fuel Tank Capacity Data

A. "Usable Capacity" of the standard equipment fuel tank is 13.2 gallons

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

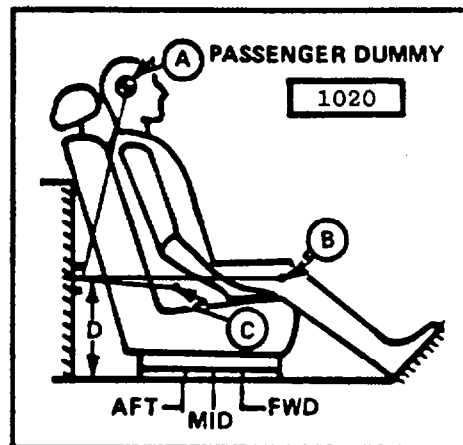
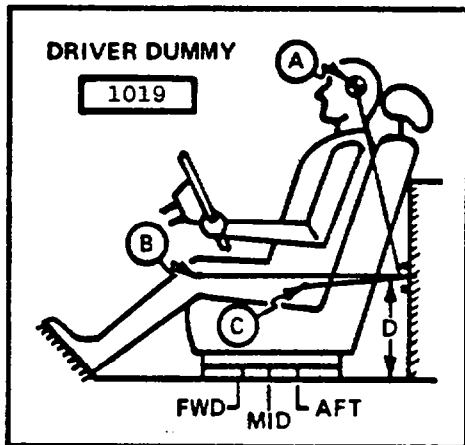
Additional Instructions: None.

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION

Test No.: CL5302 Vehicle: 1990 Acura Integra RS 4-Door Sedan

SEAT TYPE: Bench ADJUSTER TYPE: X Manual SEAT BACK TYPE: Fixed
 X Bucket - Power X Adjustable Reclining
 - Split Bench

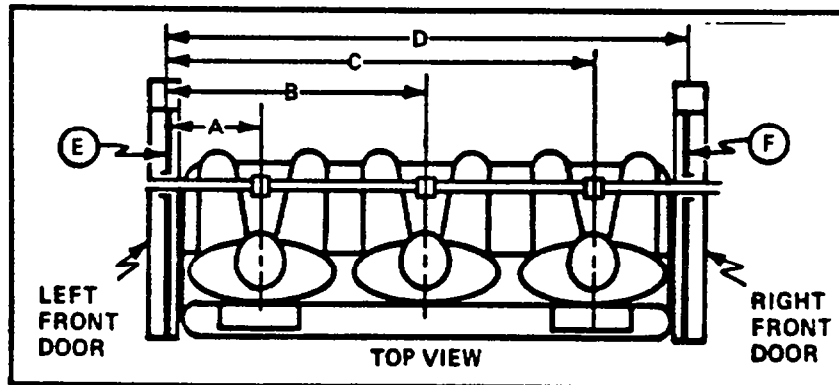


MEASUREMENT LOCATION

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

A = 19.3 in. -5 Degrees
 B = 22.5 in. 102 Degrees
 C = 8.8 in. 134 Degrees
 D = 14.0 in.

A = 19.3 in. -6 Degrees
 B = 22.3 in. 104 Degrees
 C = 9.0 in. 135 Degrees
 D = 14.0 in.



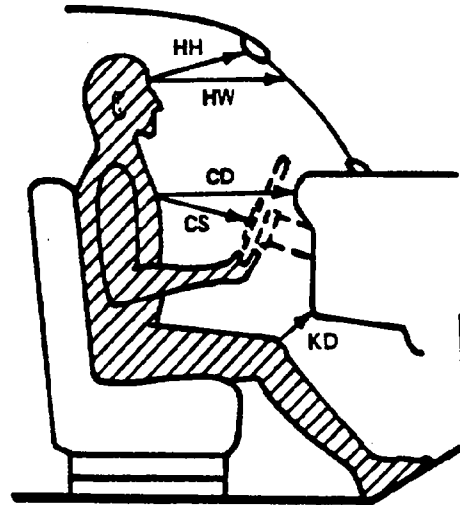
S/N 1019 DUMMY ID 1020

A = Left Door to Driver Centerline 12.0 in.
 B = Left Door to Center Passenger Centerline in.
 C = Left Door to Right Passenger Centerline 38.2 in.
 D = Left Door to Right Door 49.7 in.
 E,F = Window Glass Height (Right and Left Must Be Equal) 9.5 in.

Figure 3

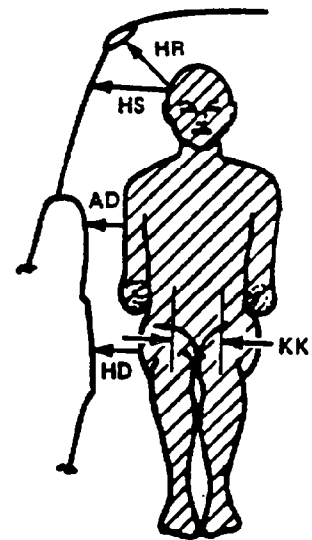
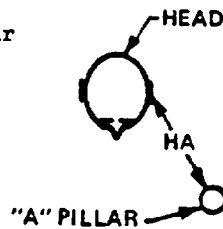
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	15.3	15.1
HW	21.4	21.1
CD	24.3	24.5
CS	16.0	-
KDL	6.0	6.5
KDR	6.5	6.3
SA	See Note	See Note
TA	25°	26°



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

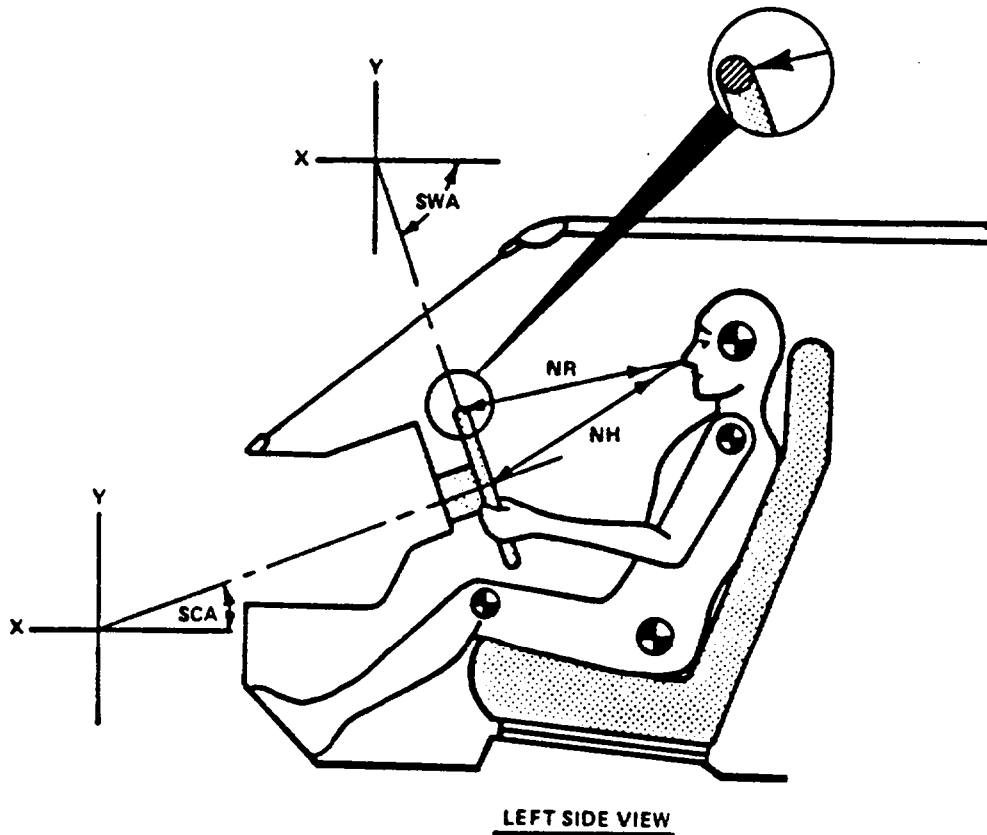


	DRIVER	PASSENGER
HR	5.3	5.3
HS	8.9	8.4
AD	3.9	3.7
HD	6.6	6.8
KK	9.8	8.0
HA	19.7	19.7

Note: Seat back was positioned as specified by manufacturer.

Figure 4

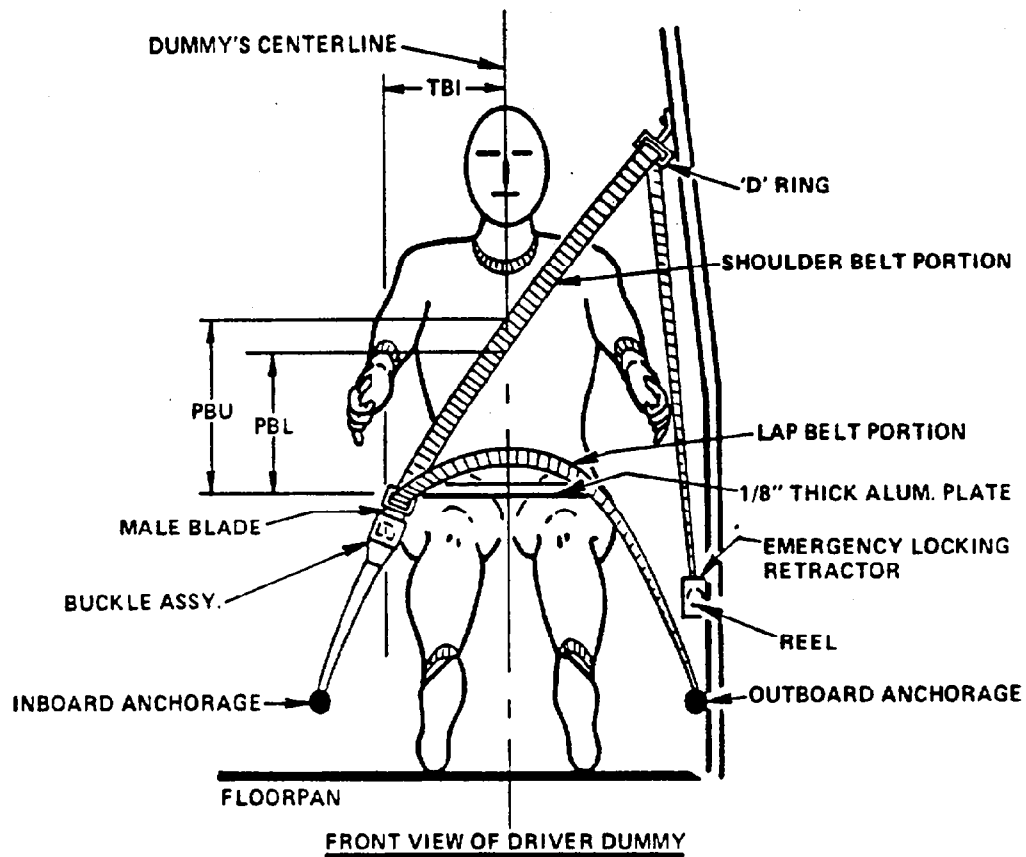
DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



LEFT SIDE VIEW

		MEASUREMENTS	
<u>NR</u>	-- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	21.3	Inches
<u>NH</u>	-- Distance from tip of dummy's nose to center of steering column hub	22.0	Inches
<u>SCA</u>	-- Angle of steering column relative to the horizontal X axis	23.5	Degrees
<u>SWA</u>	-- Angle of steering wheel relative to the horizontal X axis	-66.5	Degrees

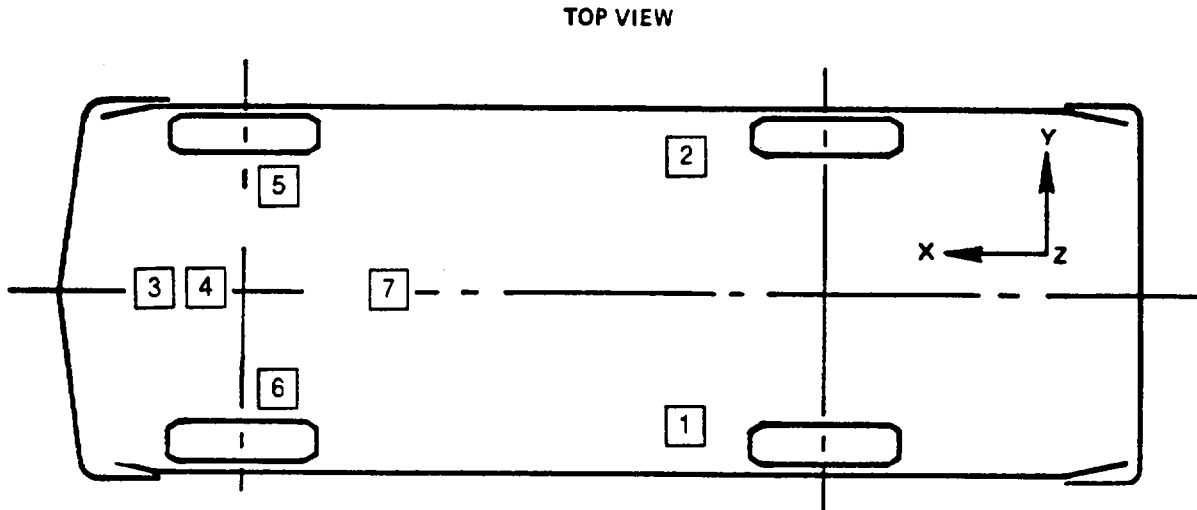
Figure 5
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	10.8	10.8
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	14.0	14.0
<u>TBI</u> -- Distance from torso centerline to buckle	*	*

*Automatic torso seat belt used only, 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.

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:	66.9	18.1	15.4				
		POST:	66.8	18.1	15.0				
	LONGITUDINAL ACCELERATION					4	134	-35	48
2	REAR SEAT X-MEMBER AT RIGHT SIDE	PRE:	66.9	-18.1	15.4				
		POST:	66.8	-18.1	15.0				
	LONGITUDINAL ACCELERATION					4	98	-34	48
3	TOP OF ENGINE BLOCK	PRE:	150.4	3.0	30.4				
		POST:	145.8	5.3	29.9				
	LONGITUDINAL ACCELERATION					15	50	-93	32
4	BOTTOM OF ENGINE	PRE:	145.5	7.8	9.6				
		POST:	144.7	7.4	9.4				
	LONGITUDINAL ACCELERATION					40	47	-94	34
5	BRAKE CALIPER AT LEFT SIDE	PRE:	136.9	21.5	16.7				
		POST:	136.3	21.5	16.4				
	LONGITUDINAL ACCELERATION					29	62	-79	32
6	BRAKE CALIPER AT RIGHT SIDE	PRE:	136.9	-21.5	16.7				
		POST:	136.2	-21.3	16.4				
	LONGITUDINAL ACCELERATION					50	64	-59	31
7	DASH PANEL	PRE:	111.3	7.3	28.2				
		POST:	111.3	6.9	28.3				
	LONGITUDINAL ACCELERATION					81	66	-122	59

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

**
 LONGITUDINAL:
 LATERAL:
 VERTICAL:

POSITIVE
 FORWARD
 LEFTWARD
 UPWARD

NEGATIVE
 REARWARD
 RIGHTWARD
 DOWNWARD

DISTANCE MEASUREMENTS IN INCHES

Figure 7

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5.

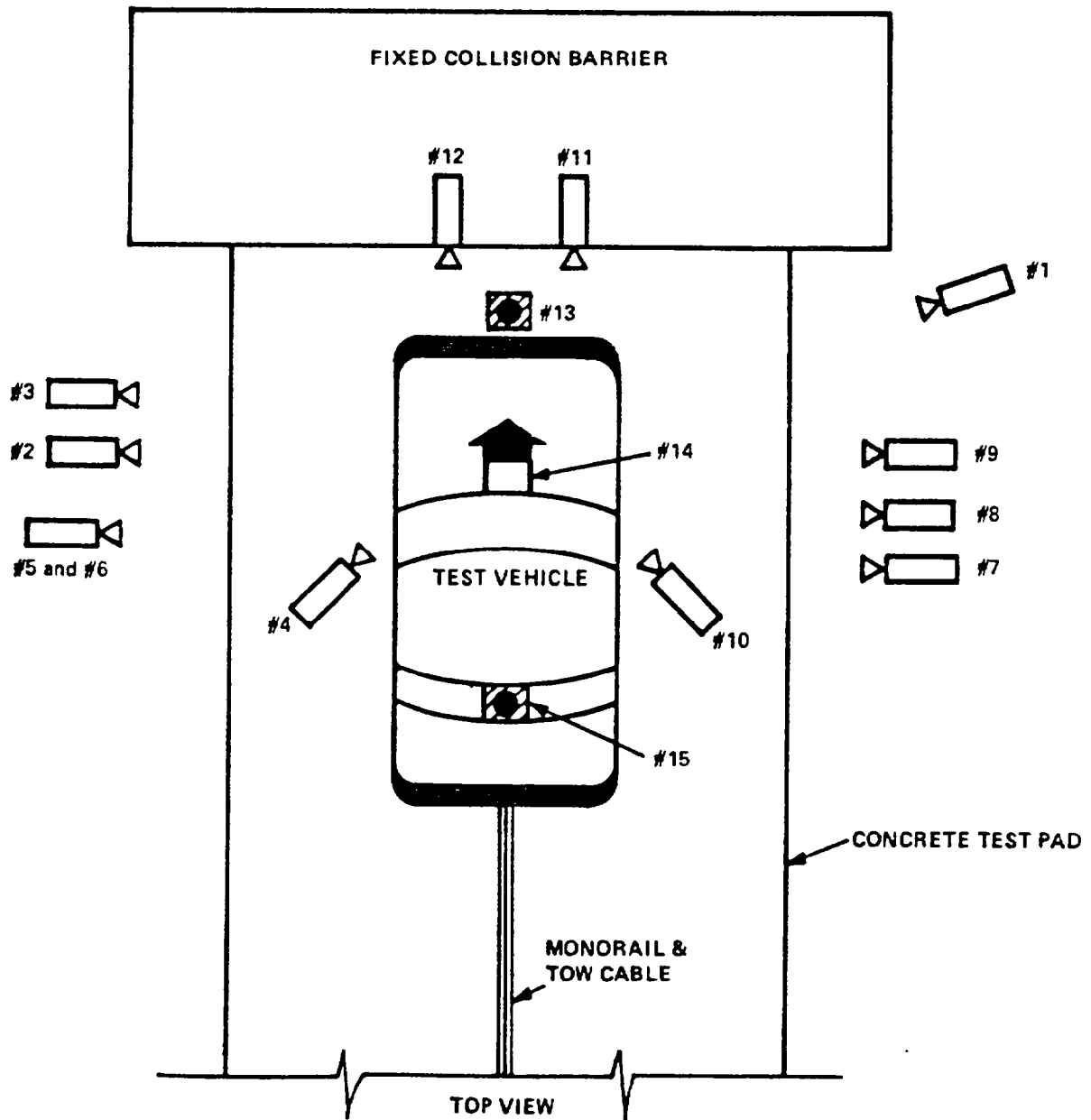


Table 5
HIGH-SPEED CAMERA LOCATIONS

CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	224.0	65.0	41.0	-3	207.8	13	545
3	Left Side View	295.0	41.0	41.0	-3	278.8	25	545
4	Driver and Interior View	109.0	106.0	74.0	-19	-	13	780
5	Steering Column (Bottom)	280.0	85.0	46.0	-4	263.8	25	575
6	Steering Column (Top)	279.0	85.0	70.0	-9	262.8	25	570
7	Overall Right Side	231.0	70.0	41.0	-3	214.8	13	800
8	Right Side View	303.0	53.0	41.0	-2	286.8	25	720
9	Right Passenger View	299.0	72.0	56.0	-2	282.8	35	670
10	Passenger and Interior View	99.0	107.0	74.0	-23	-	13	620
11	Passenger Front View	24.5	18.0	75.0	-48	-	13	600
12	Driver Front View	21.5	16.5	74.5	-47	-	13	540
13	Windshield View	0.0	0.0	130.0	-49	-	25	505
14	Pit View of Engine	0.0	36.0	-120.0	90	-	13	780
15	Pit View of Fuel Tank	0.0	96.0	-120.0	90	-	13	700

*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

Technical drawings of a vehicle for a crash test, showing dimensions in inches.

Top View: Shows the vehicle's footprint. The width is 89.4 inches. The distance from the left side to the centerline (C/L) is 44.7 inches (89.4 / 2). The distance from the C/L to the right side is 44.7 inches. The distance from the front to the C/L is 13.2 inches. The distance from the C/L to the rear is 21.3 inches. The distance from the front to the rear is 34.5 inches.

Side View: Shows the vehicle's profile. The total width is 89.4 inches. The distance from the front to the centerline (C/L) is 44.7 inches. The distance from the C/L to the rear is 44.7 inches. The distance from the front to the front wheel center is 53.7 inches. The distance from the front wheel center to the C/L is 33.6 inches. The distance from the C/L to the rear wheel center is 33.4 inches. The distance from the rear wheel center to the rear is 4.7 inches. The total length is 91.8 inches (53.7 + 33.6 + 33.4 + 4.7). The distance from the front to the front wheel center is 53.7 inches. The distance from the front wheel center to the C/L is 33.6 inches. The distance from the C/L to the rear wheel center is 33.4 inches. The distance from the rear wheel center to the rear is 4.7 inches. The total length is 91.8 inches (53.7 + 33.6 + 33.4 + 4.7). The distance from the front to the front wheel center is 53.7 inches. The distance from the front wheel center to the C/L is 33.6 inches. The distance from the C/L to the rear wheel center is 33.4 inches. The distance from the rear wheel center to the rear is 4.7 inches. The total length is 91.8 inches (53.7 + 33.6 + 33.4 + 4.7).

Rear View: Shows the vehicle's rear profile. The total width is 89.4 inches. The distance from the left side to the centerline (C/L) is 44.7 inches. The distance from the C/L to the right side is 44.7 inches. The distance from the front to the C/L is 13.2 inches. The distance from the C/L to the rear is 21.3 inches. The distance from the front to the rear is 34.5 inches.

7804-6

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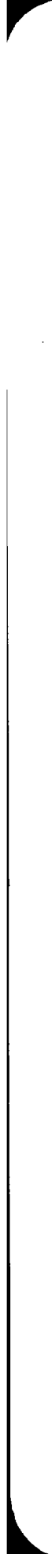


Table 6

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	176.7	161.0	15.7
X2	Rear Surface of Vehicle to Front of Engine	156.0	151.0	5.0
X3	Rear Surface of Vehicle to Firewall	134.1	131.7	2.4
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	119.5	118.8	0.7
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	120.3	119.3	1.0
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	120.5	119.8	0.7
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	120.9	119.6	1.3
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	79.1	78.7	0.4
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	79.5	78.6	0.9
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	80.5	79.4	1.1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	80.4	79.2	1.2
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	122.3	119.8	2.5
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	122.4	121.4	1.0
X14	Rear Surface of Vehicle to Firewall, Right Side	133.7	130.3	3.4
X15	Rear Surface of Vehicle to Firewall, Left Side	133.8	131.5	2.3
X16	Rear Surface of Vehicle to Steering Column	105.0	103.8	1.2
X17	Center of Steering Column to "A" Post	16.3	17.0	-0.7
X18	Center of Steering Column to Headliner	18.0	19.0	-1.0
X19	Rear Surface of Vehicle to Right Side of Front Bumper	175.2	160.7	14.5
X20	Rear Surface of Vehicle to Left Side of Front Bumper	175.0	160.8	14.2
X21	Length of Engine Block	18.0	18.0	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.: CL5302 Vehicle: 1990 Acura Integra RS 4-Door Sedan

	MAXIMUM ACCELERATION (g's)							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
Dummy (1)	-31	-28	56	39	-40	-17	-16	38.7
Dummy (2)	-31	22	50	44	-44	15	16	44.3

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	1135	1729
Dummy (2)	805	1692

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc. (g) t ₁ TO t ₂
		t ₁ (SEC)	t ₂ (SEC)	
Dummy (1)	275	.07110	.10710	35.8
Dummy (2)	518	.06390	.09990	46.0

*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 = 5.7 sec.

Log time duration of reminder light operation = * 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 = 6.4 sec.

Note wording of visual warning:

Fasten Seat Belt -

Fasten Belt -

Symbol 101-80 X

*Continuous if shoulder belts are not used.

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.: CL5302

Make/Model: 1990 ACURA INTEGRA RS

Date of Comfort/Convenience Check: FEBRUARY 6, 1990

Technician Performing Check: VMP

GVWR: 3615 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 belt 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 0.4 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" and 0.9" rubber and metal trim on top and sides of windshield respectively. Bottom of windshield is covered by a plastic shroud.

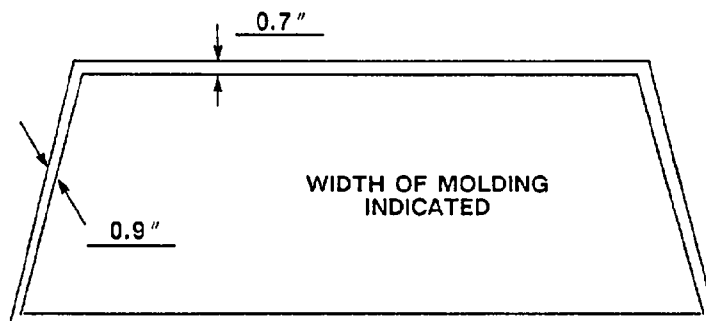
FMVSS 212 REQUIREMENTS:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

FMVSS 212 TEST DATA:

	WINDSHIELD PERIPHERY		PERCENT RETENTION
	PRE-TEST (in.)	POST-TEST (in.)	
RIGHT SIDE	85.5	85.5	100%
LEFT SIDE	85.5	85.5	100%
TOTAL	171.0	171.0	100%

AREA OF RETENTION FAILURE:



FRONT VIEW

FAILURE DETAILS: None.

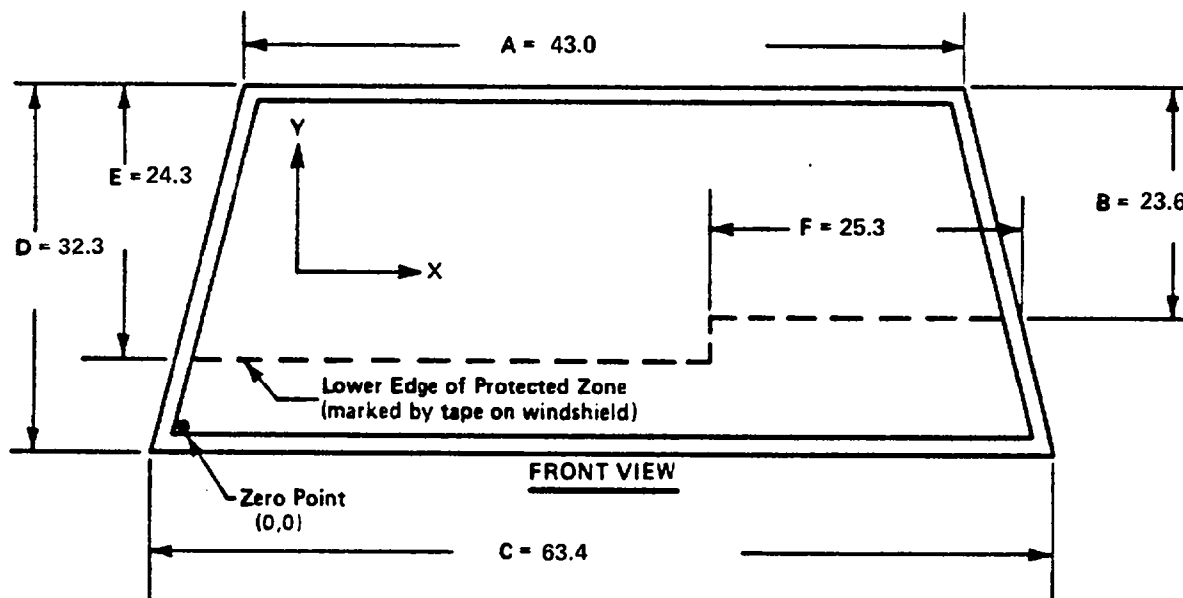
Figure 11

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:



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

(Show location of penetration on above sketch)

None

	COORDINATES	
	X	Y
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3.		
4.		

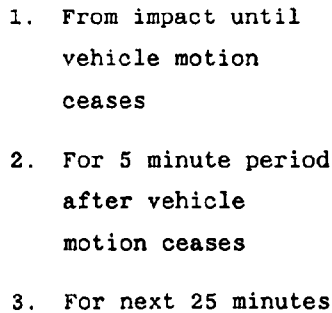
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

TEST VEHICLE NHTSA NO.: CL5302 TEST DATE: February 6, 1990

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.

[illegible]

FUEL SPILLAGE MEASUREMENT:



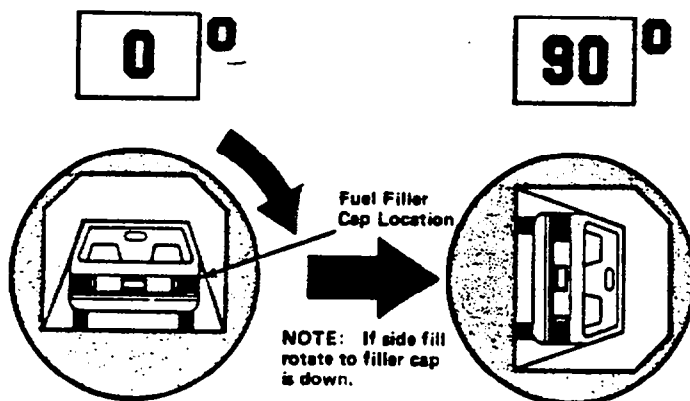
ACTUAL	MAX ALLOWED
0	1 oz.
0	5 oz.
0	1 oz./1 min.

None

Table 12

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE:

Vehicle NHTSA ID No.:

CL5302I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 02 minutes 55 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 05 minutes 00 seconds

TOTAL

07 minutes 55 seconds

Next whole minute interval

08 minutesII. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
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(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
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III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
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Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

None

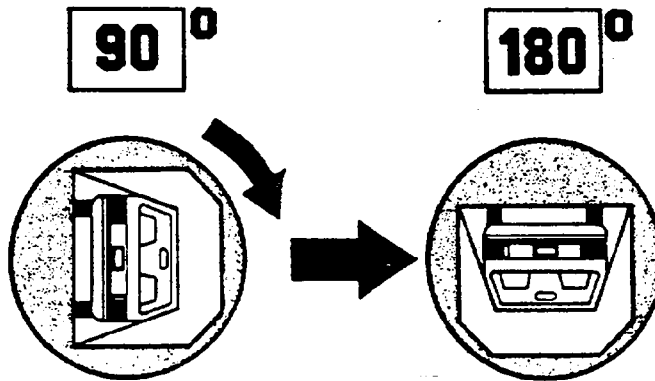
Table 12

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

TEST PHASE:

Vehicle NHTSA ID No.:

CL5302



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
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III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
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Note: Record spillage for whole minute intervals only as determined above.

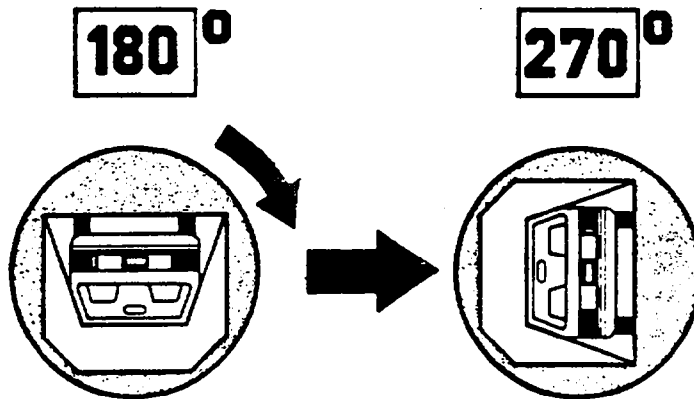
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 12

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

Vehicle NHTSA ID No.:

CL5302I. 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 minutesII. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
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Note: Record spillage for whole minute
intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

None

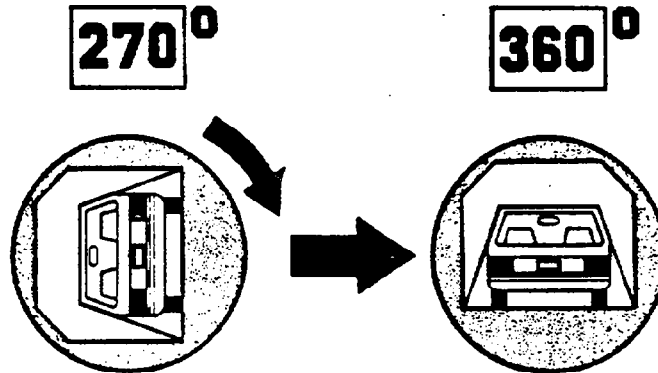
Table 12

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

TEST PHASE:

Vehicle NHTSA ID No.:

CL5302



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
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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: February 6, 1990 Vehicle NHTSA No.: CL5302

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

Model Year: 1990 VIN: JH4DB1542LS014650

Body Style: 4-Door Sedan Build Date: November 15, 1989

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

Impact Velocity: 29.5 mph Time of Test: 11:25

Type of Automatic Restraint System: Driver and passenger automatic torso seat belt restraint system. Manual lap belts not used for test.

Failure Details:

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

Appendix A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

<u>Figure</u>	<u>Photograph Title</u>	<u>Page No.</u>
Figure A-1	PRE-TEST FRONT VIEW	A-3
Figure A-2	POST TEST FRONT VIEW	A-4
Figure A-3	PRE-TEST LEFT SIDE VIEW	A-5
Figure A-4	POST TEST LEFT SIDE VIEW	A-6
Figure A-5	PRE-TEST RIGHT SIDE VIEW	A-7
Figure A-6	POST-TEST RIGHT SIDE VIEW	A-8
Figure A-7	PRE-TEST RIGHT FRONT THREE-QUARTER VIEW	A-9
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Figure A-1 PRE-TEST FRONT VIEW

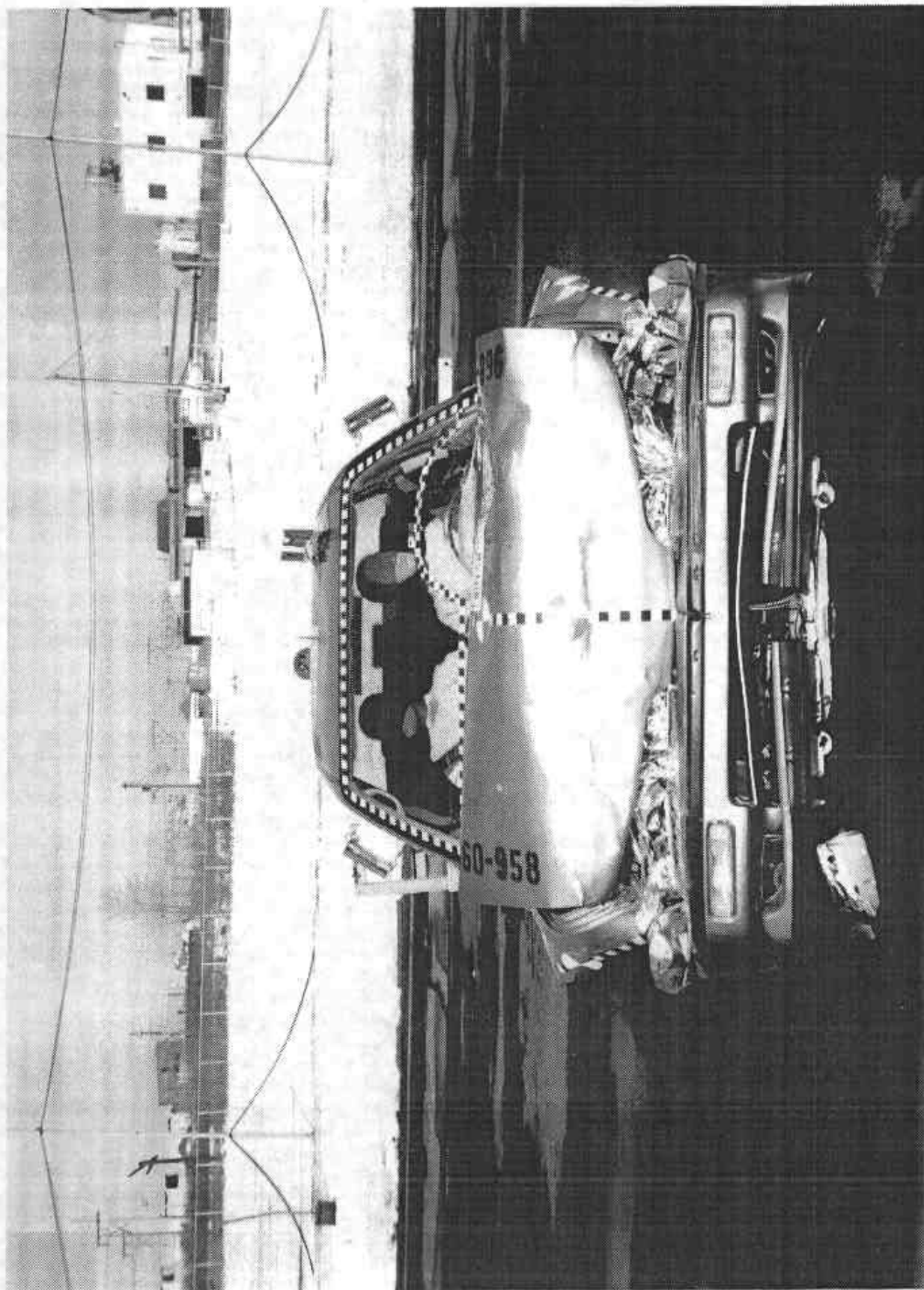


Figure A-2 POST TEST FRONT VIEW

A-4

7804-6

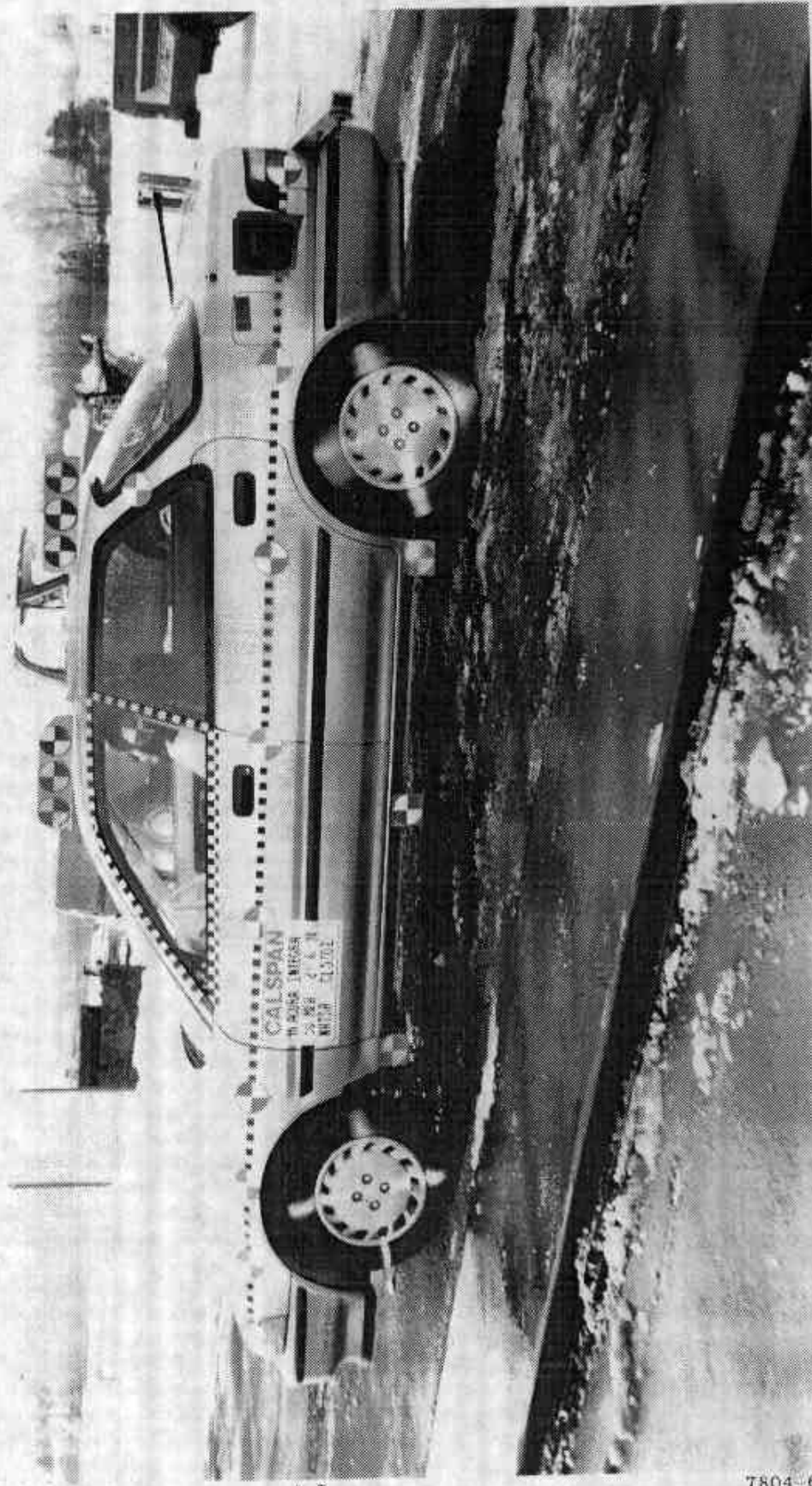


FIGURE A-3 PRE-TEST LEFT SIDE VIEW

A-5

7804-6

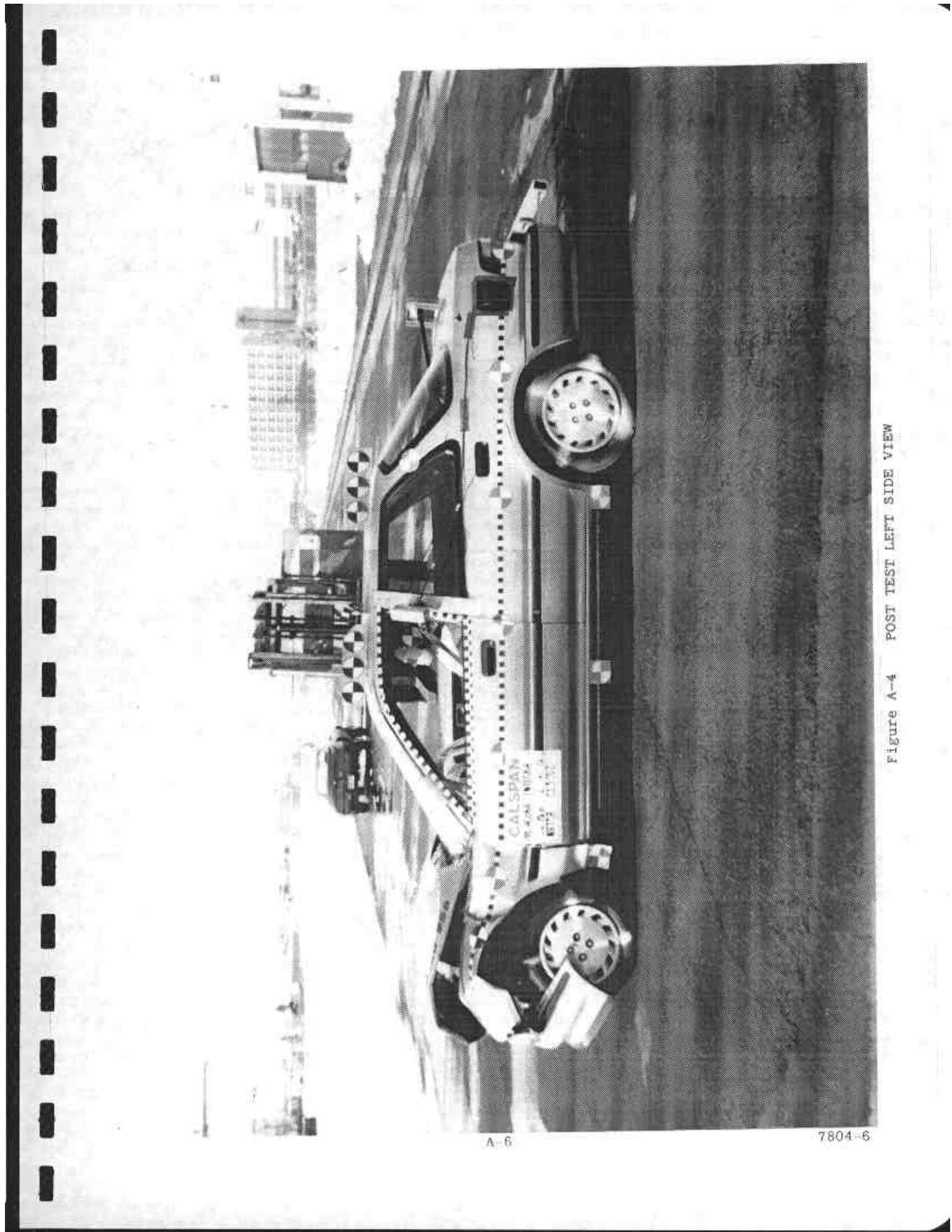


Figure A-4 POST TEST LEFT SIDE VIEW

A-6

7804-6

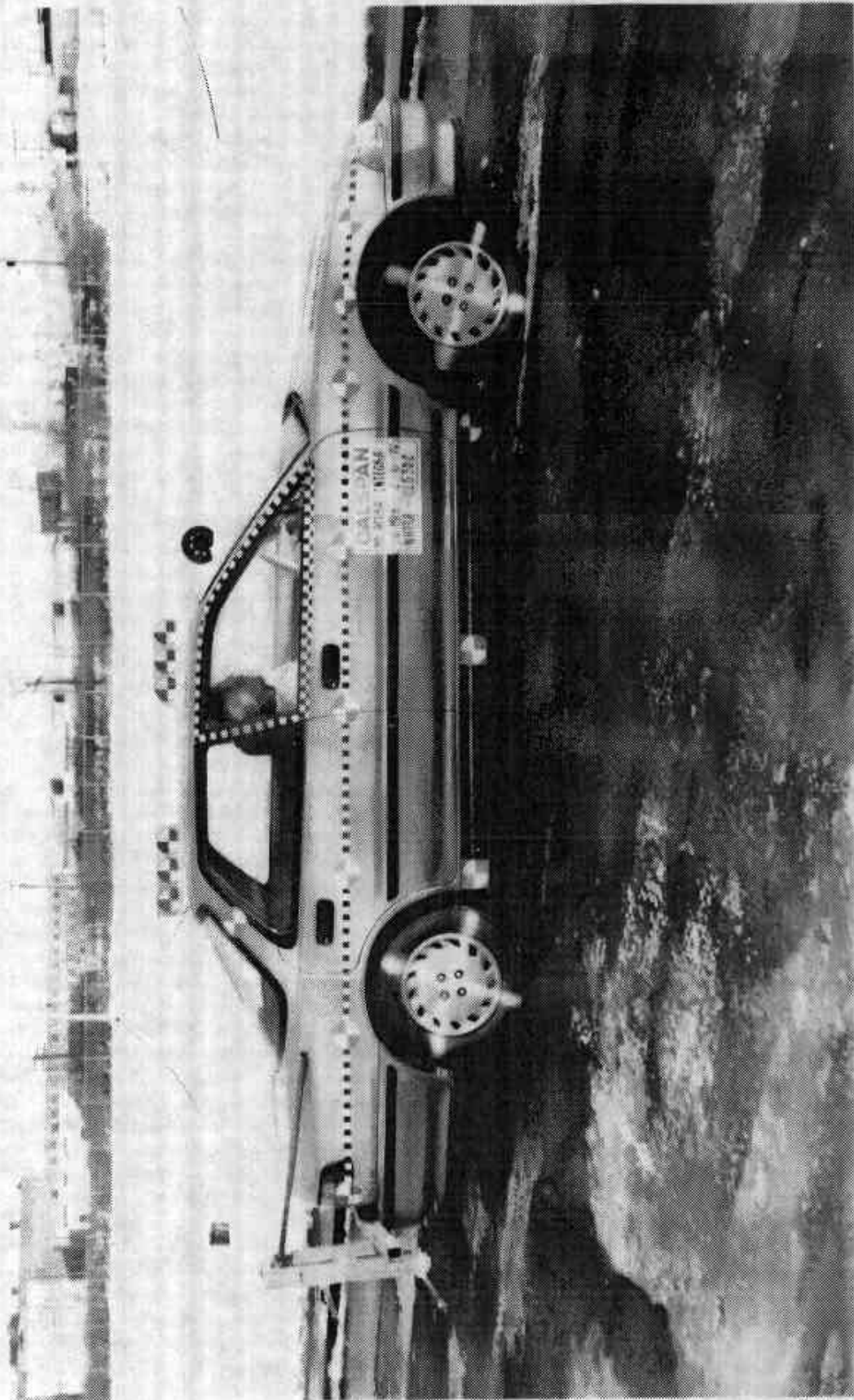


Figure A-5 PRE-TEST RIGHT SIDE VIEW

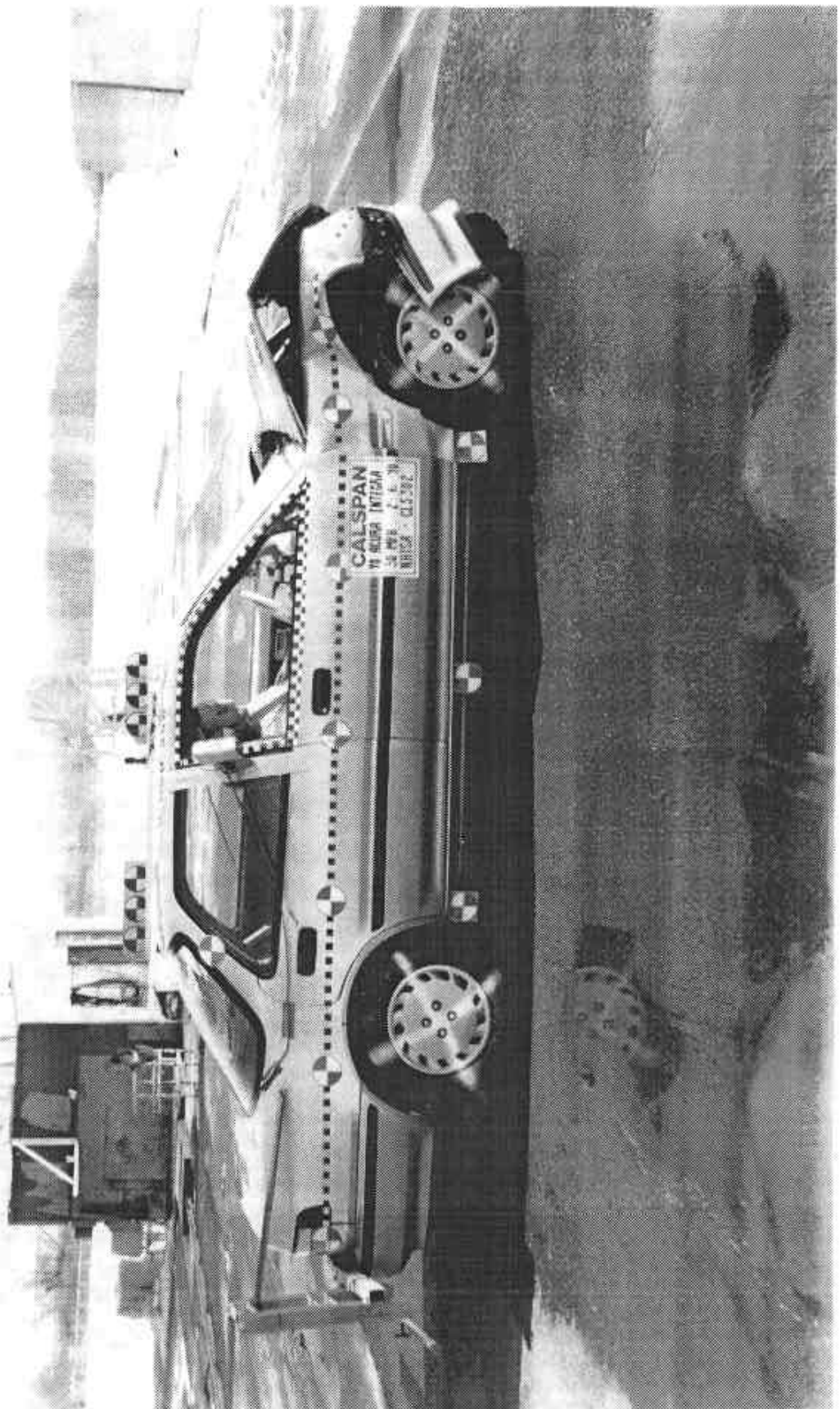


Figure A-6 POST-TEST RIGHT SIDE VIEW

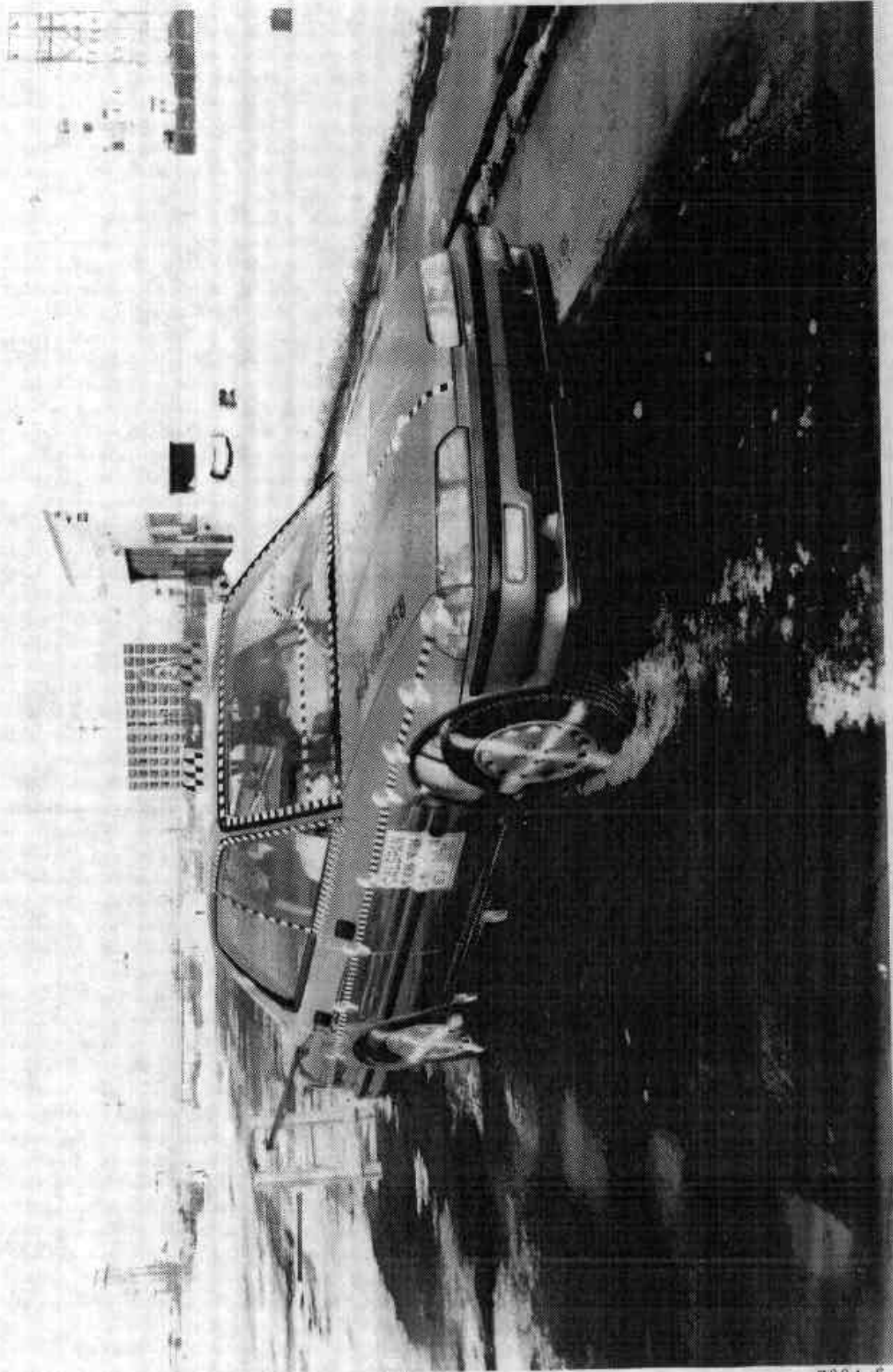


Figure A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-9

7804-6

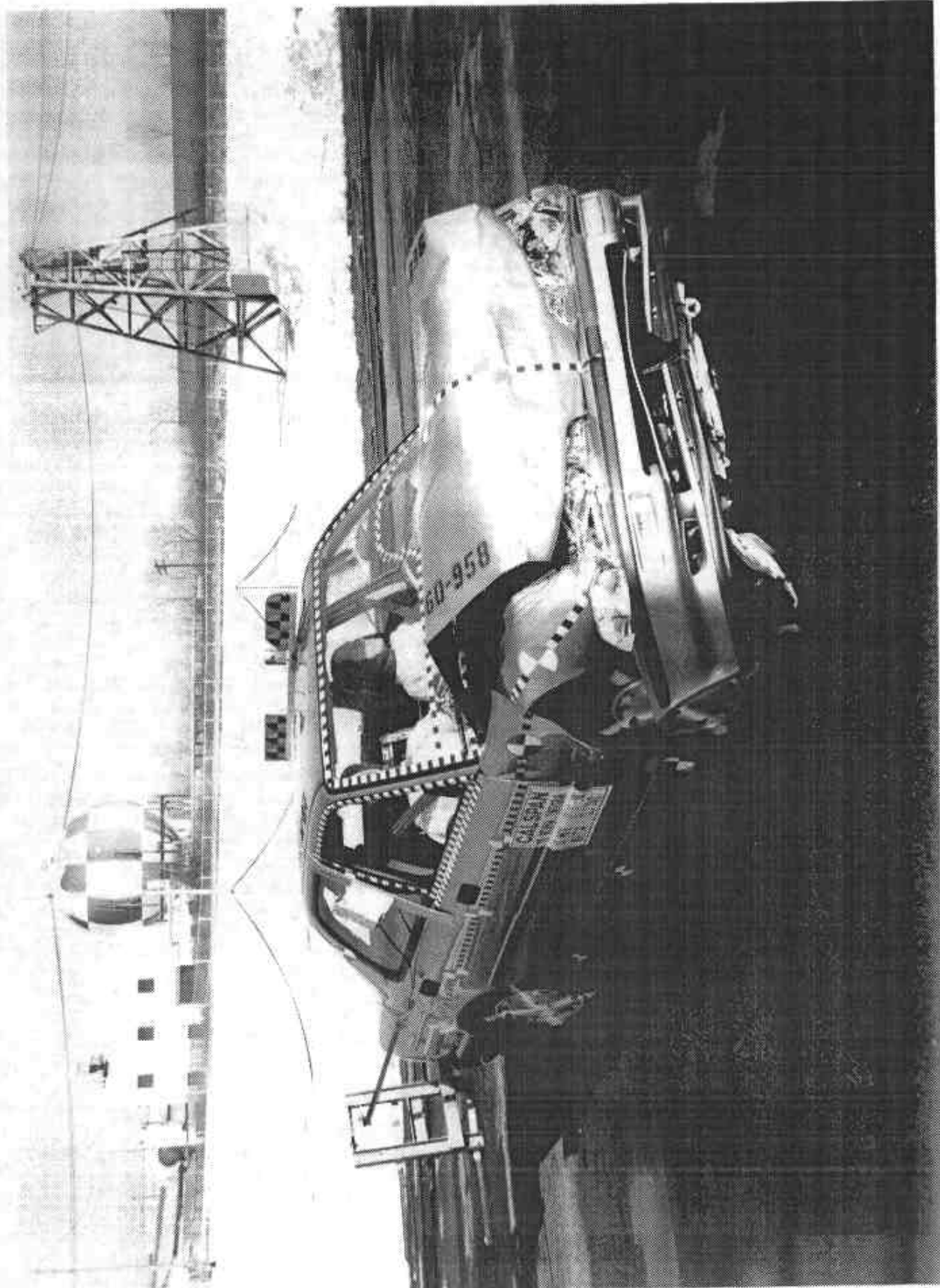


Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

7804-8



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

A-11

7804-6



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

A-12

7804-6

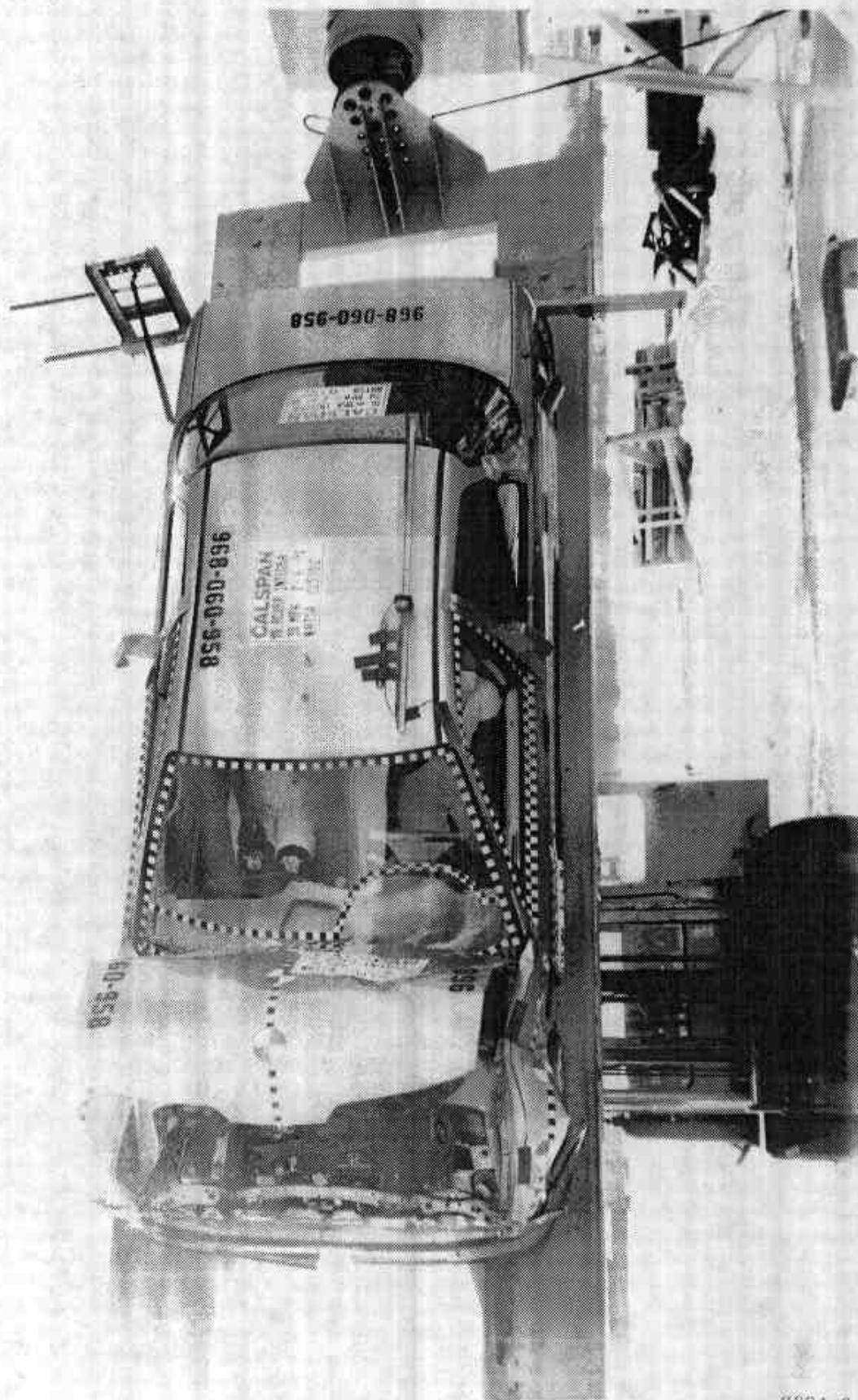


Figure A-11 POST TEST TOP VIEW

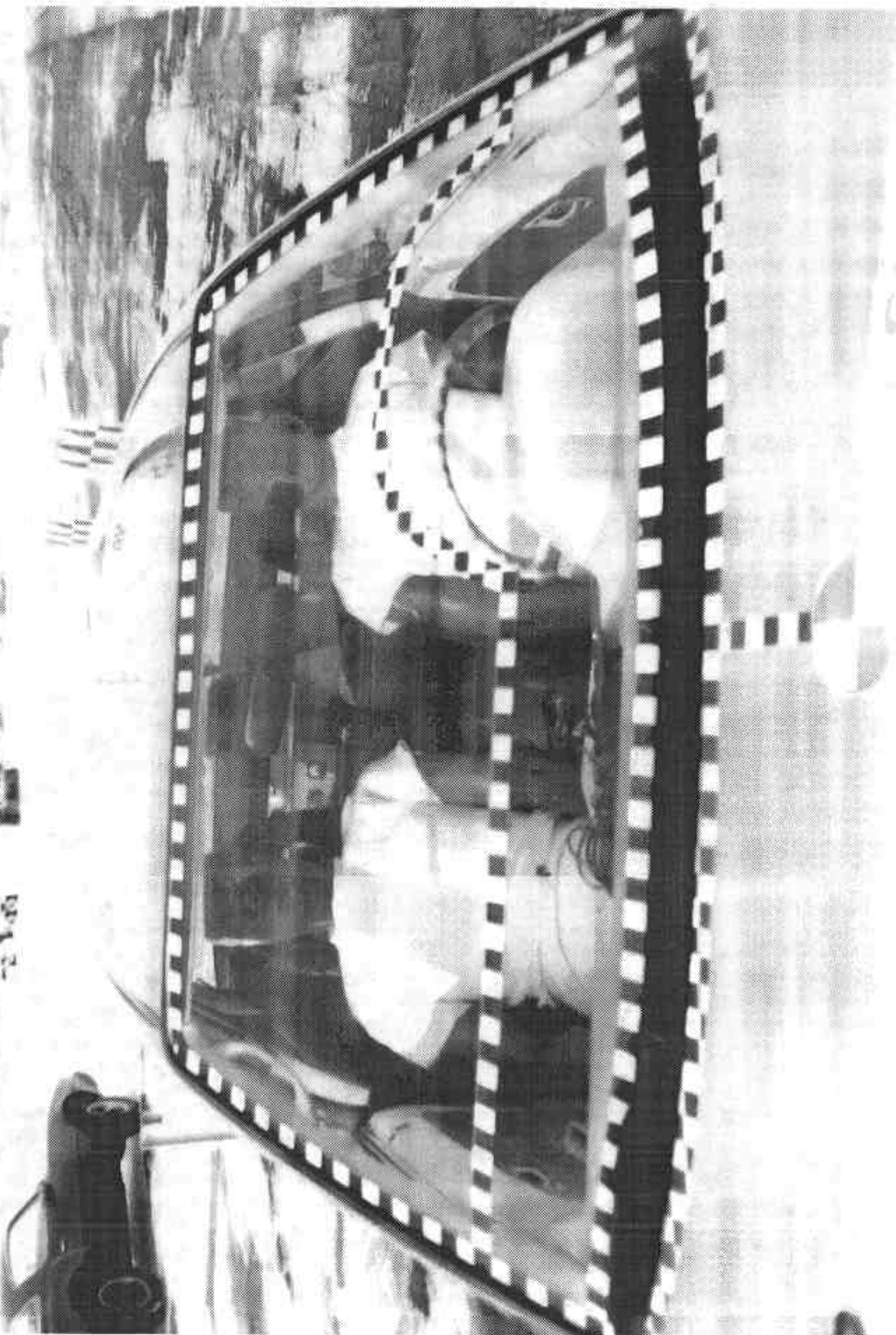


FIGURE A-12. PRE-TEST WINDSHIELD VIEW

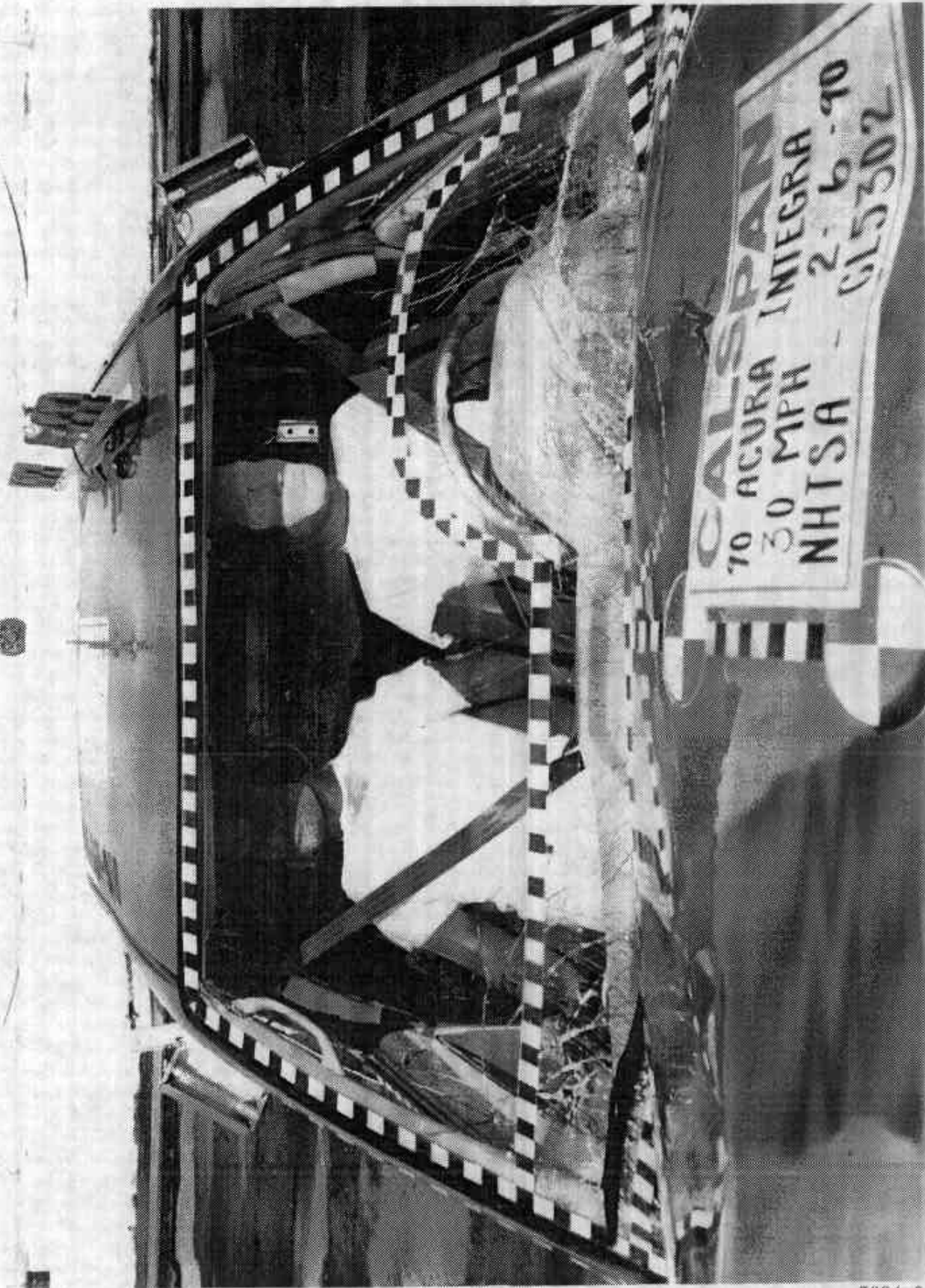


Figure A-13 POST-TEST WINDSHIELD VIEW

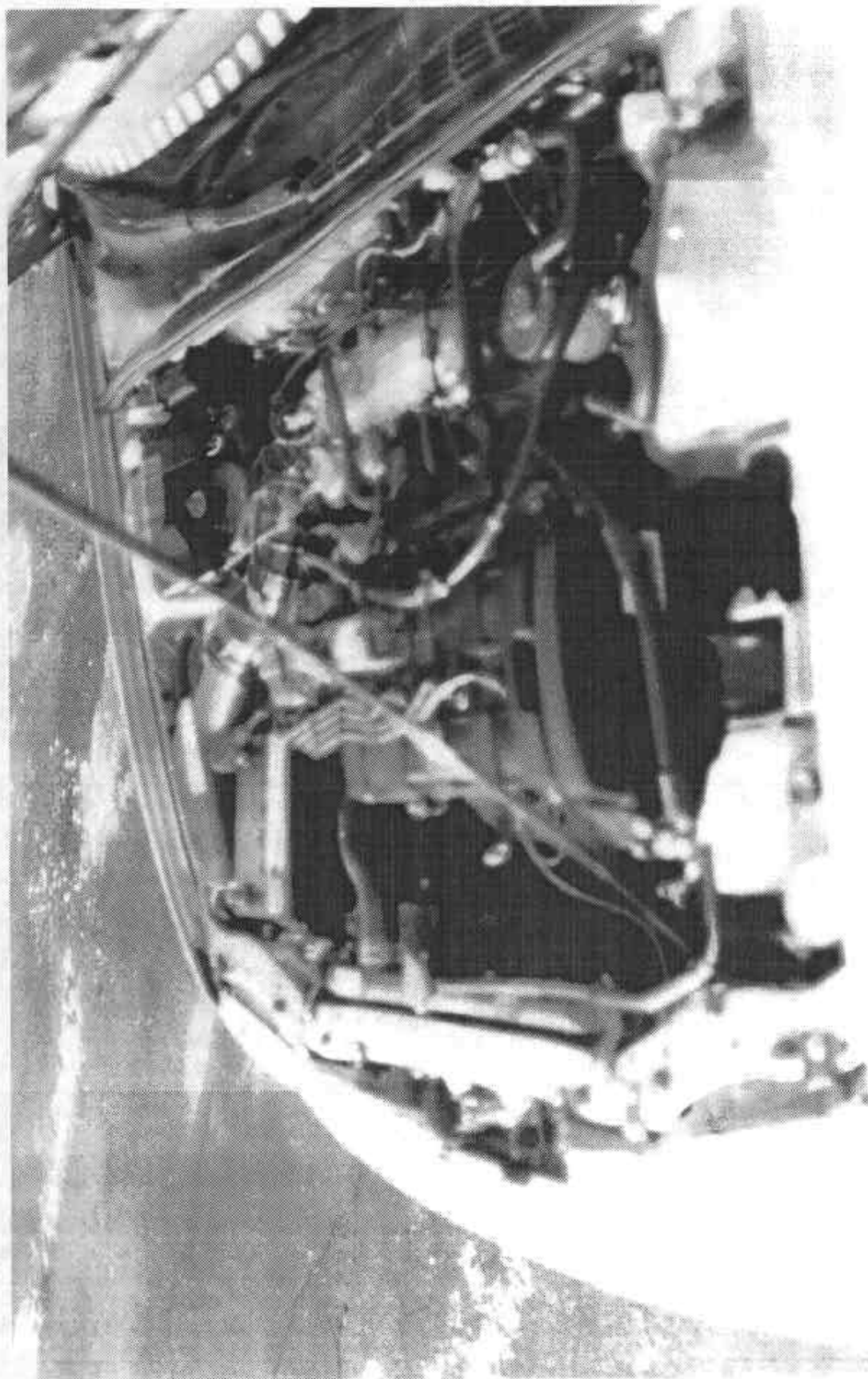


Figure A-14 PRE-TEST ENGINE COMPARTMENT SIDE VIEW

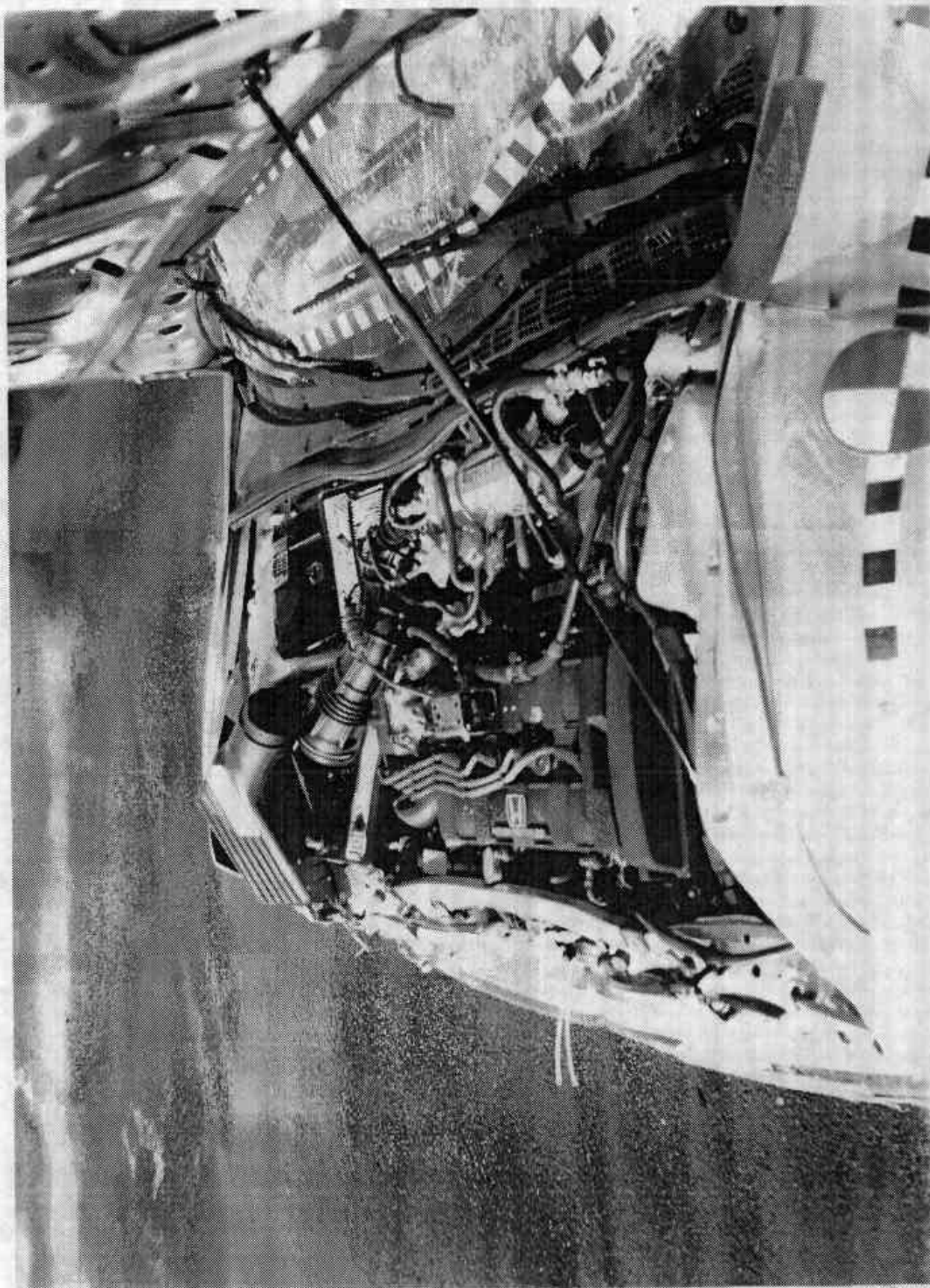


Figure A-15 POST-TEST ENGINE COMPARTMENT FRONT VIEW

A-17

7804-6

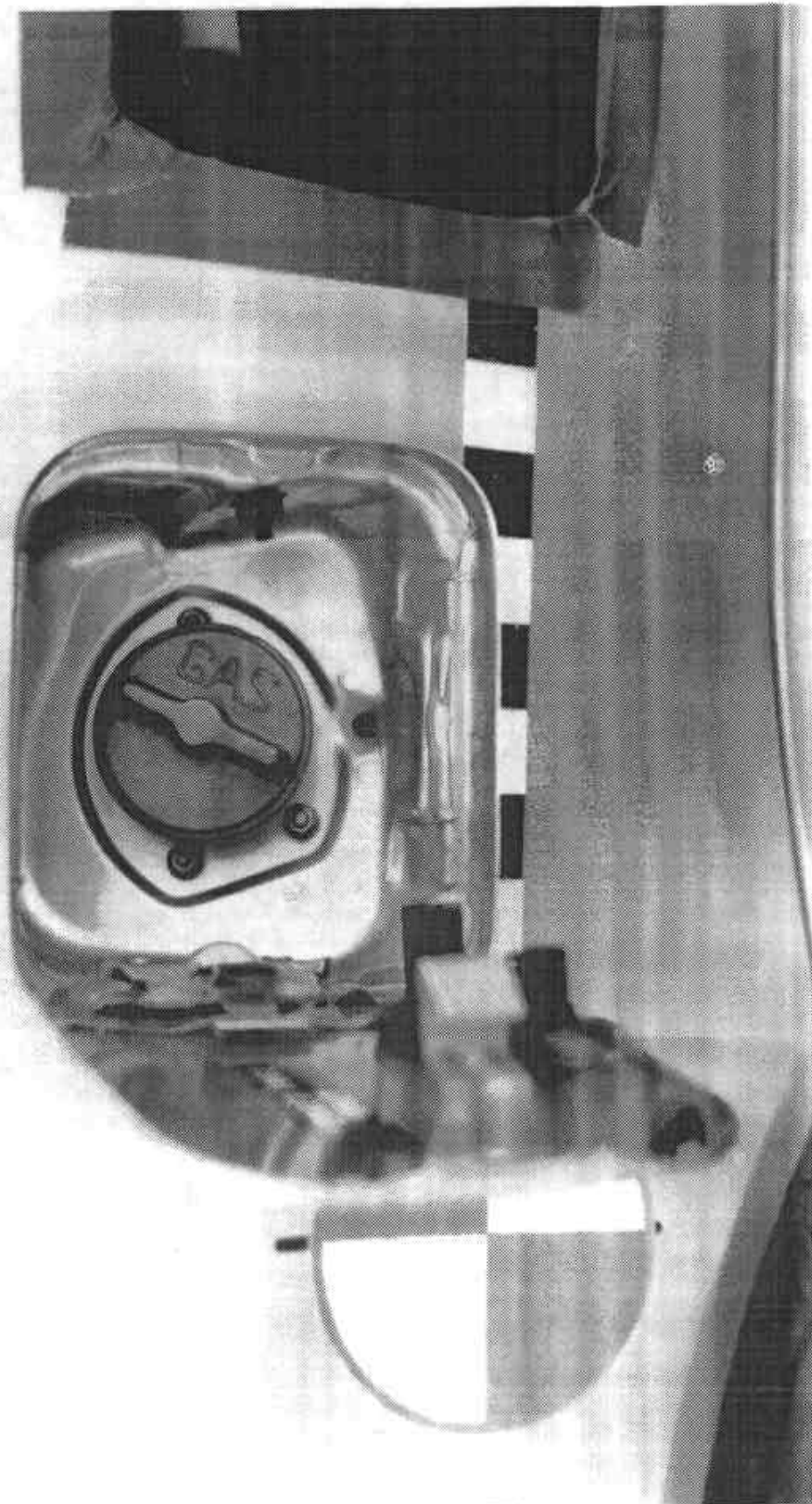


Figure A-16 PRE-TEST FUEL FILLER CAP VIEW

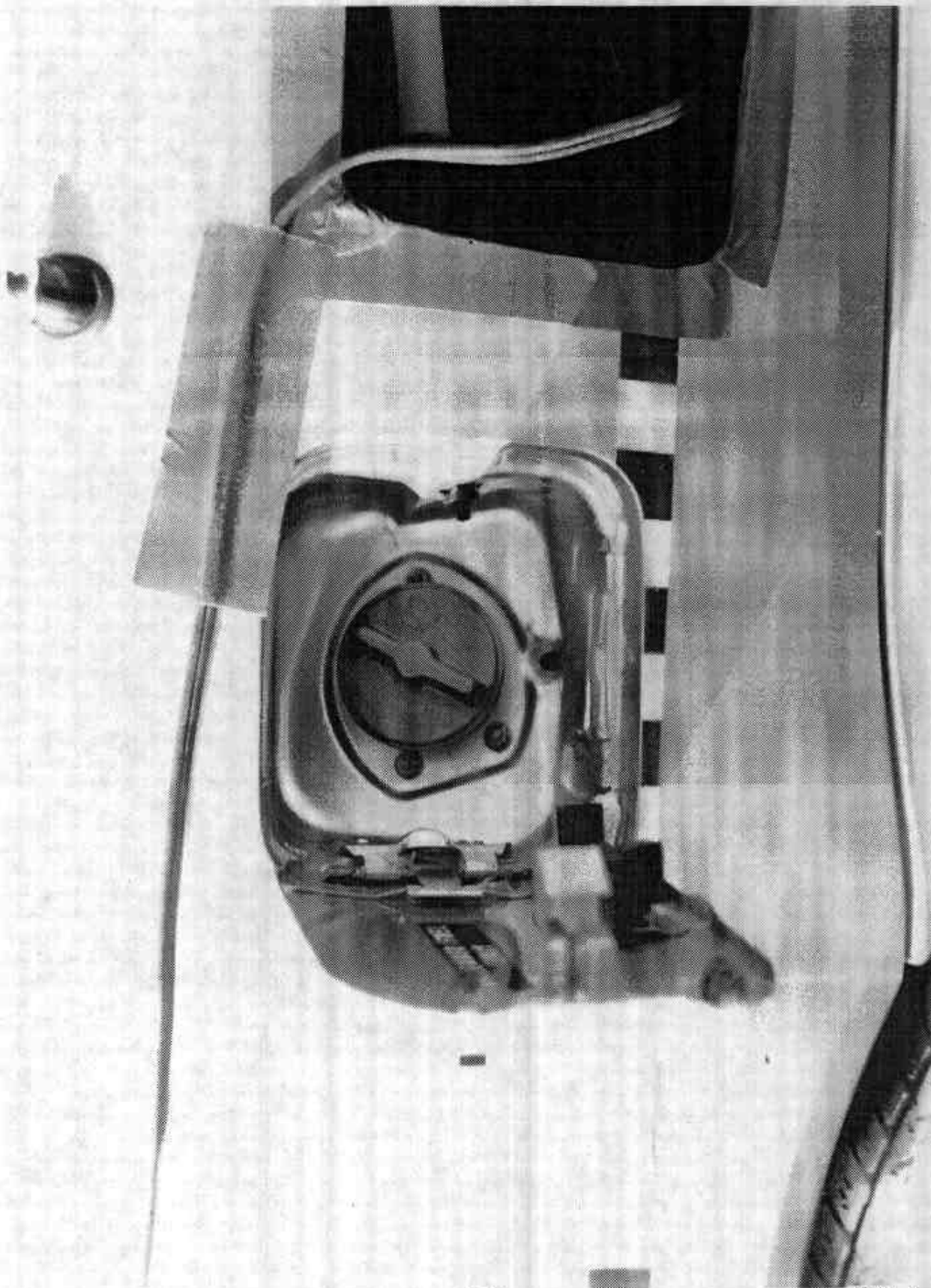


Figure A-17 POST-TEST FUEL FILLER CAP VIEW

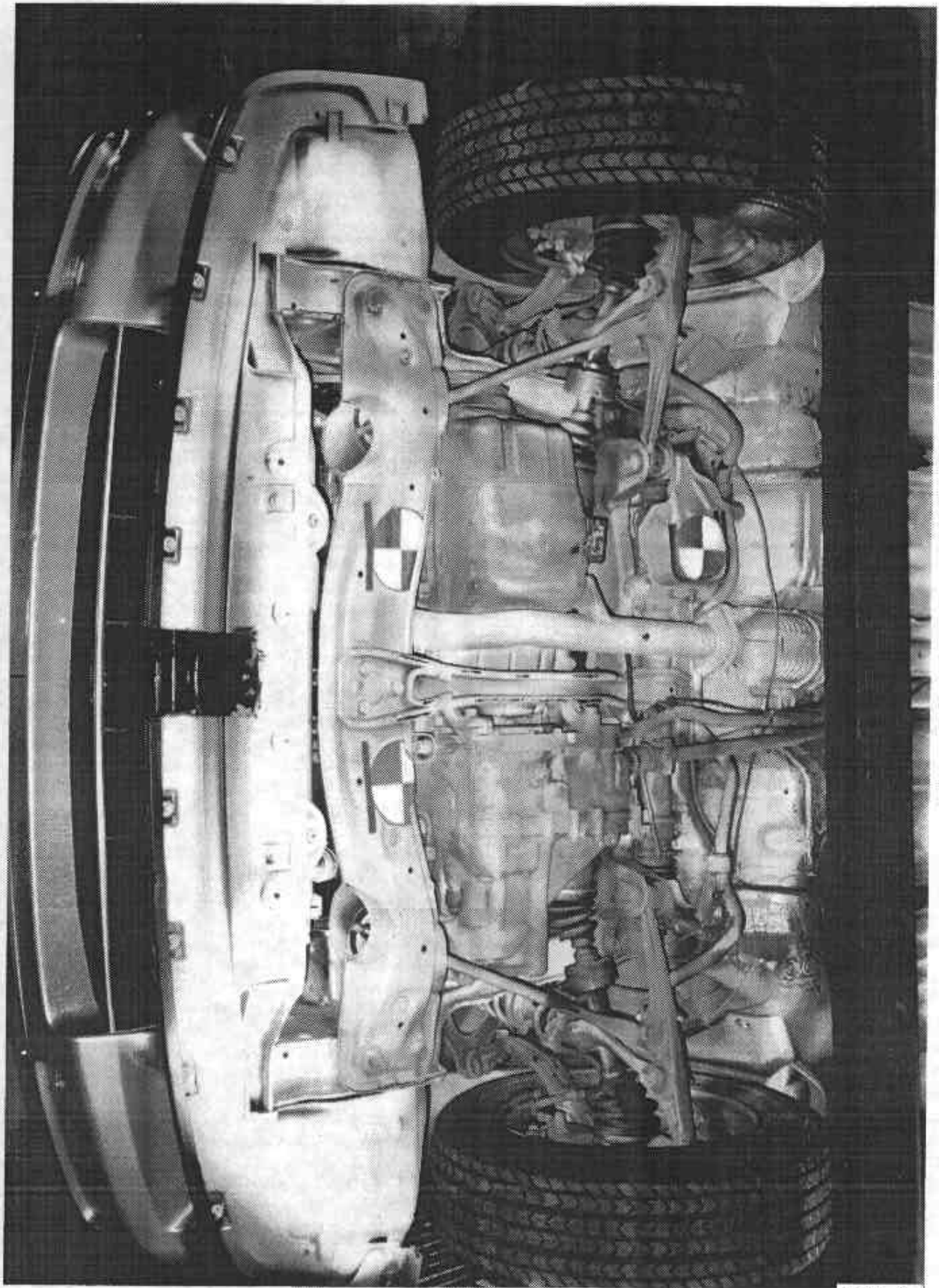


Figure A-18 PRE-TEST FRONT UNDERBODY VIEW

A-20

7804-6

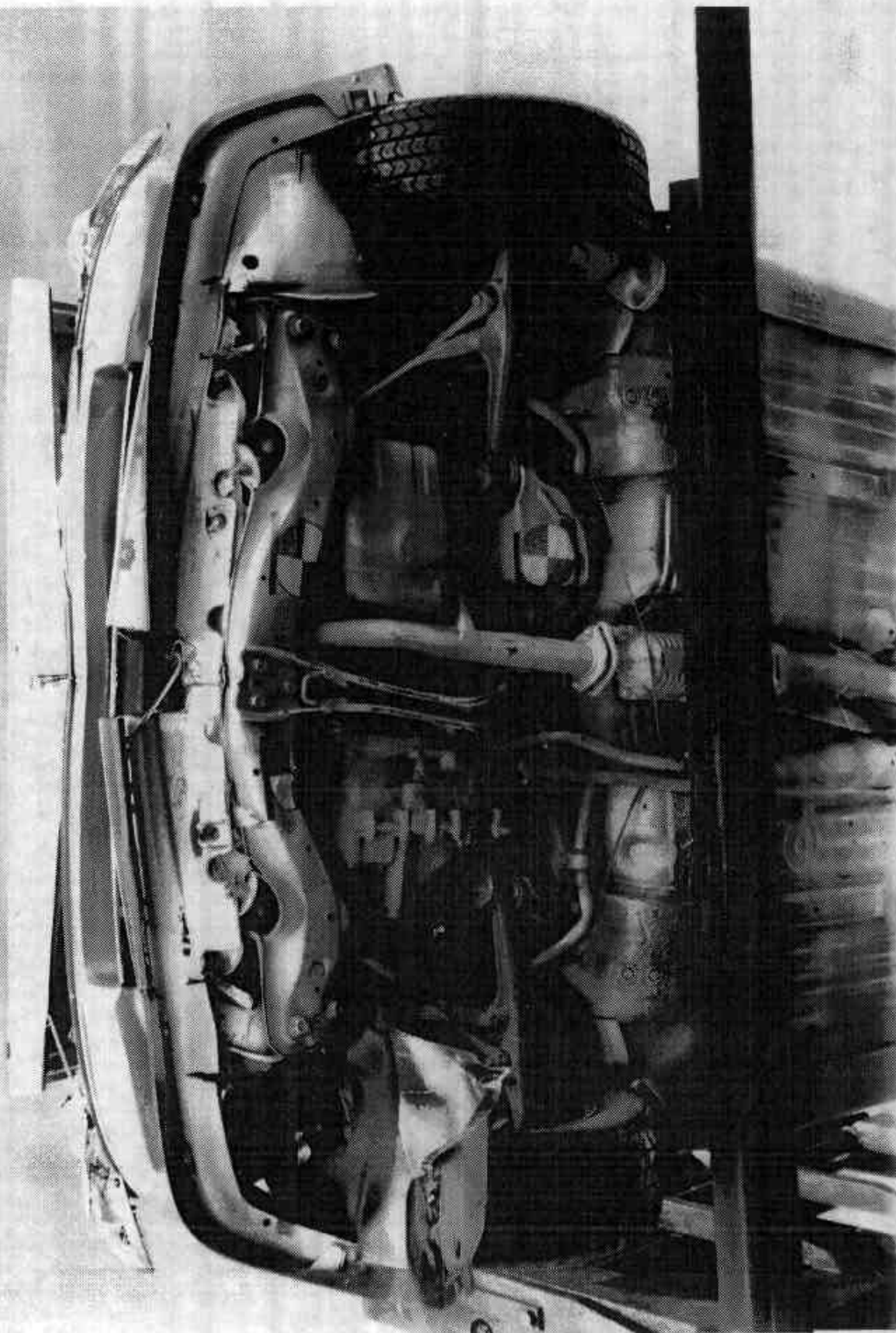


Figure A-19 POST-TEST FRONT UNDERBODY VIEW

A-21

7804-6

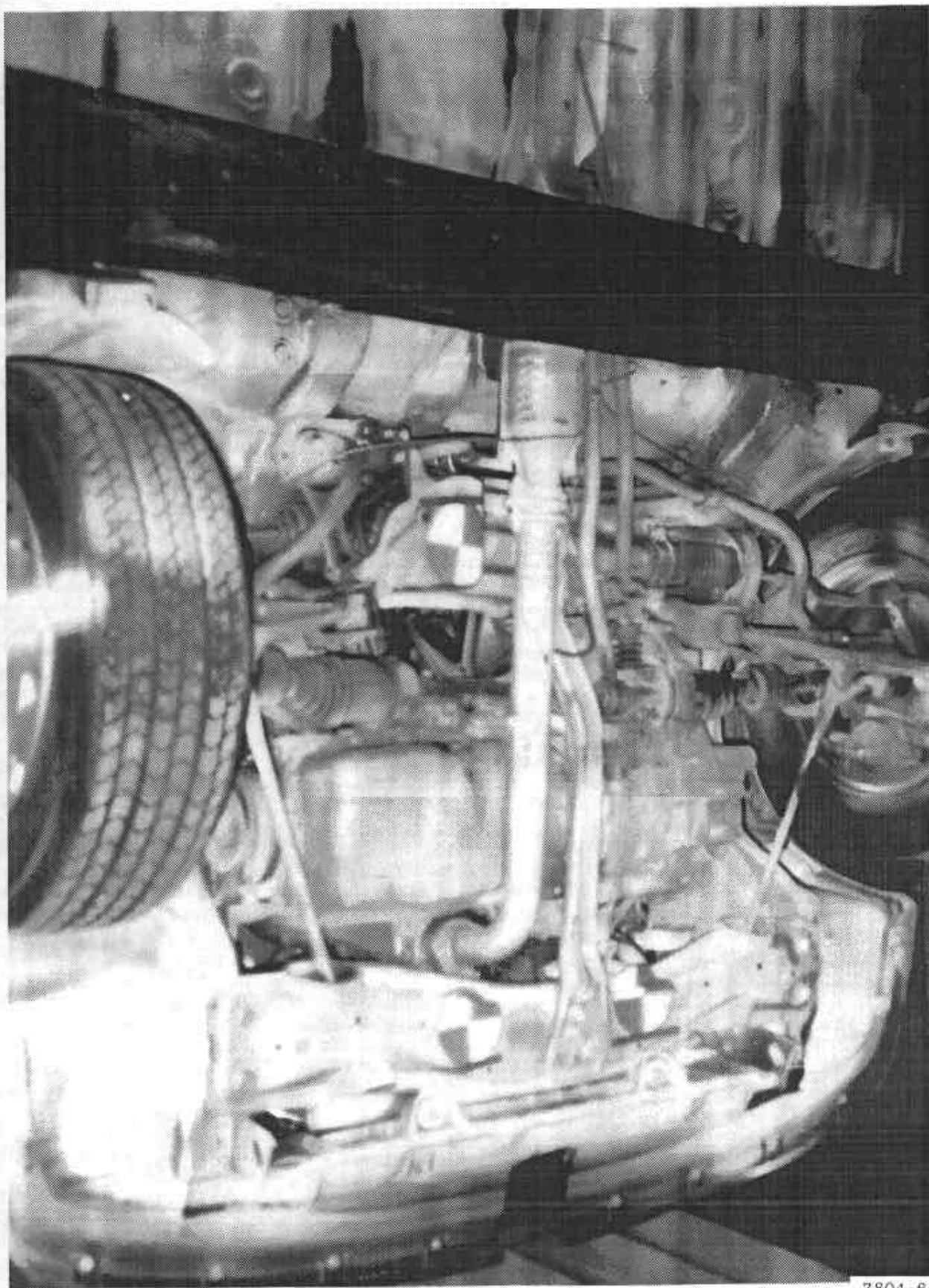


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

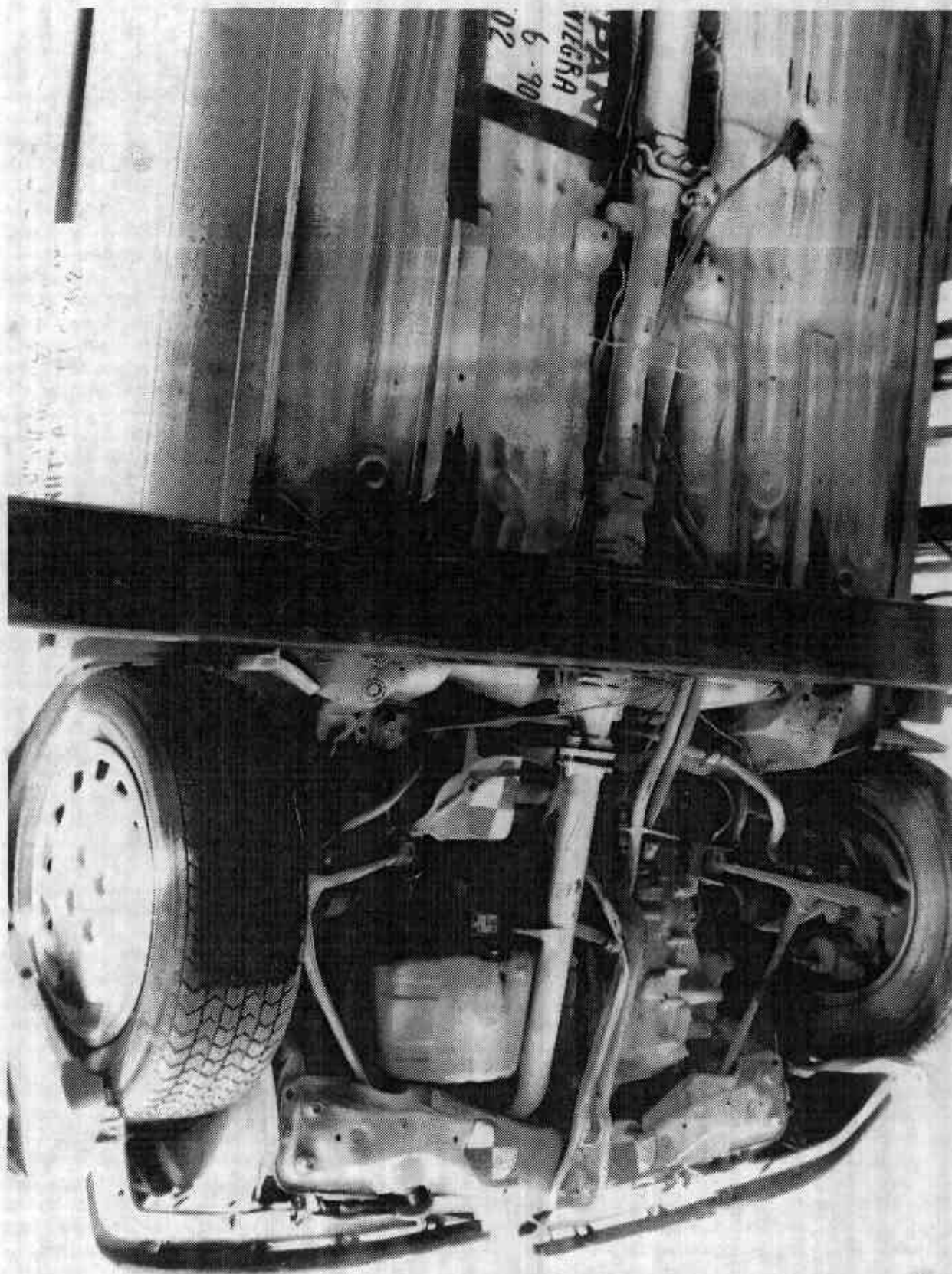


Figure A-21 POST-TEST FRONT SIDE UNDERBODY VIEW



Figure A-22 PRE-TEST REAR UNDERBODY VIEW

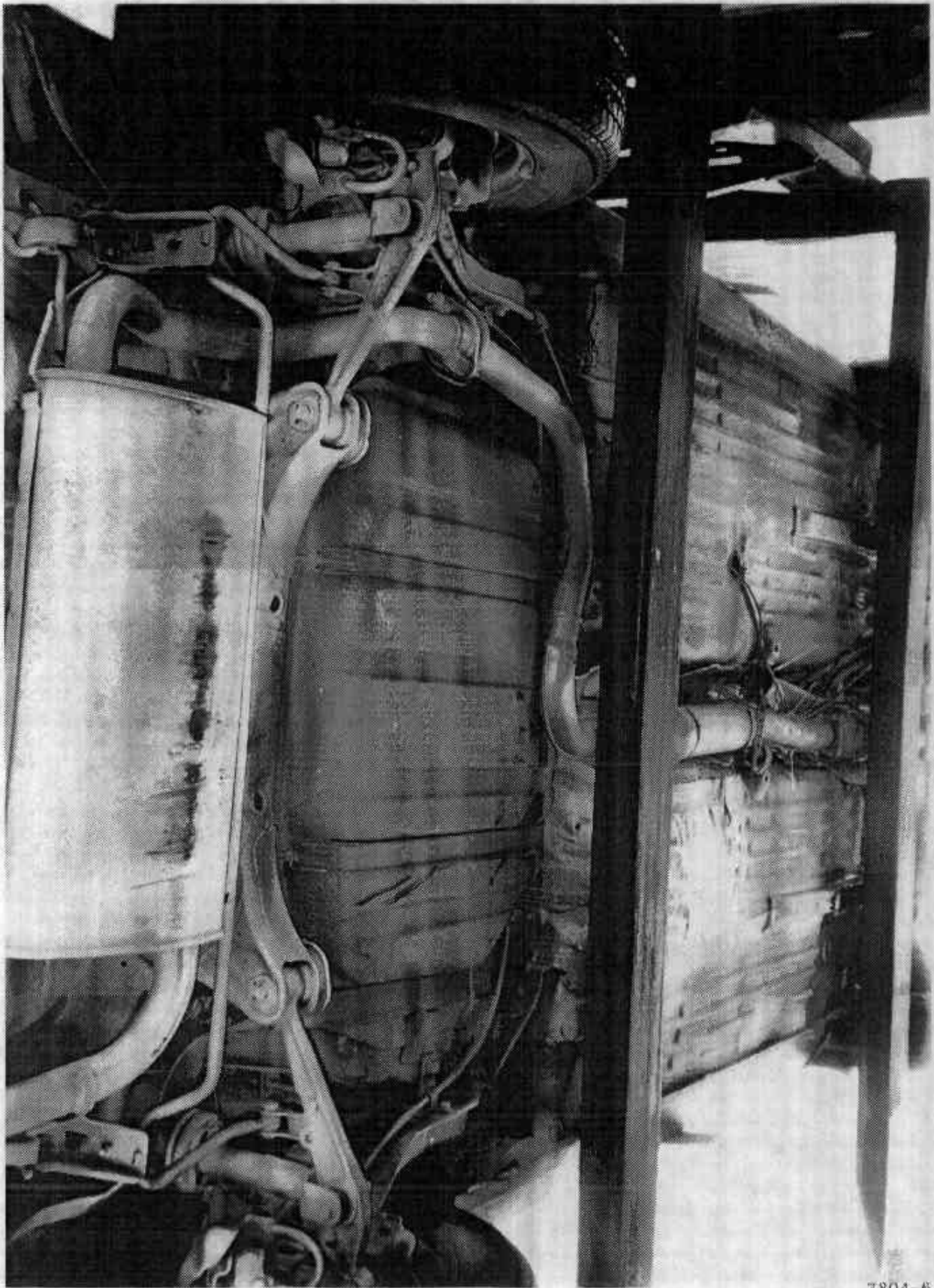


FIGURE A-23 POST-TEST REAR UNDERBODY VIEW

A-25

7804-6

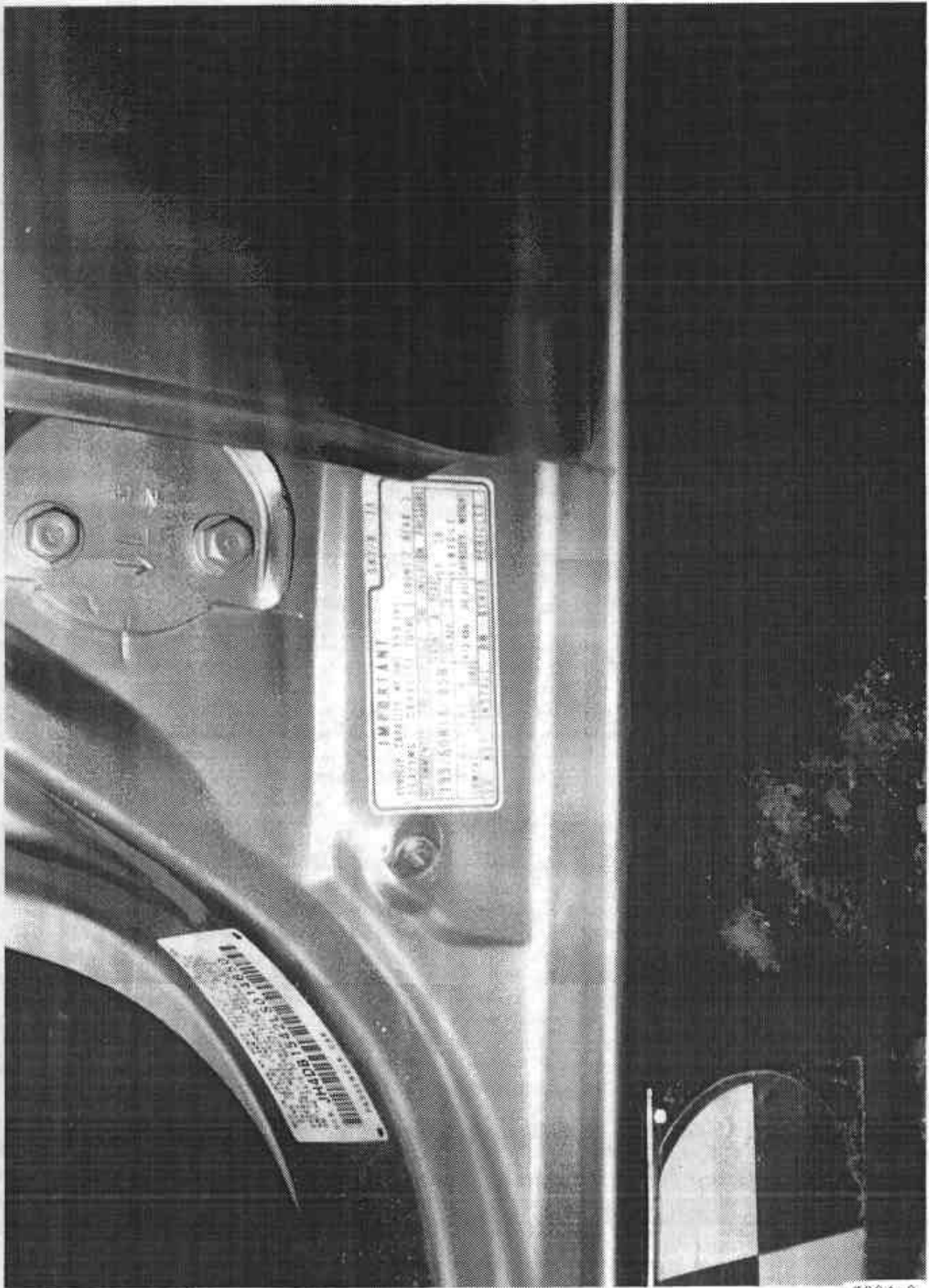


Figure A-24 CERTIFICATION LABEL AND TIRE PLACARD

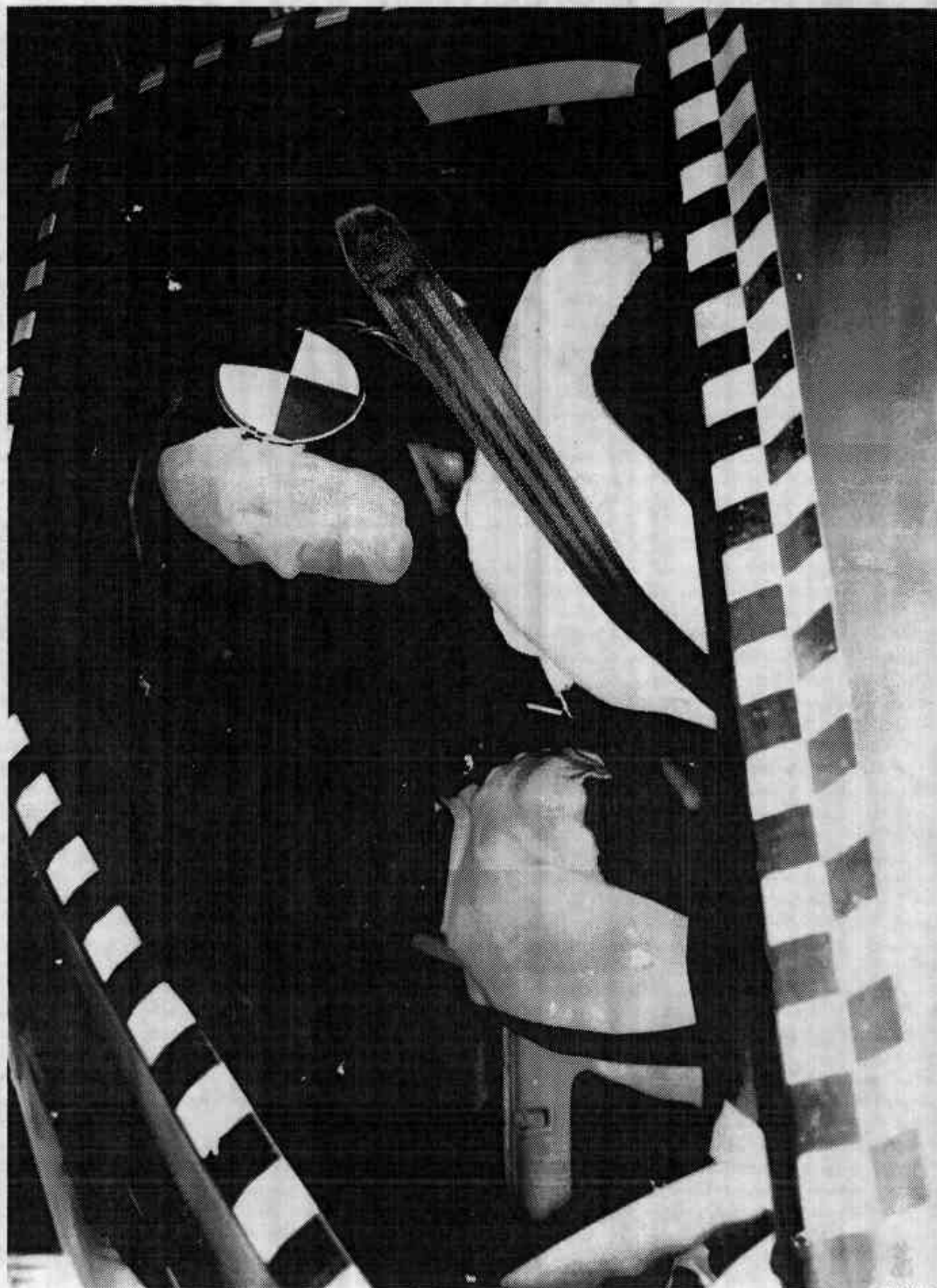


Figure A-25 PRE-TEST DRIVER DUMMY POSITION

A-27

7804-6

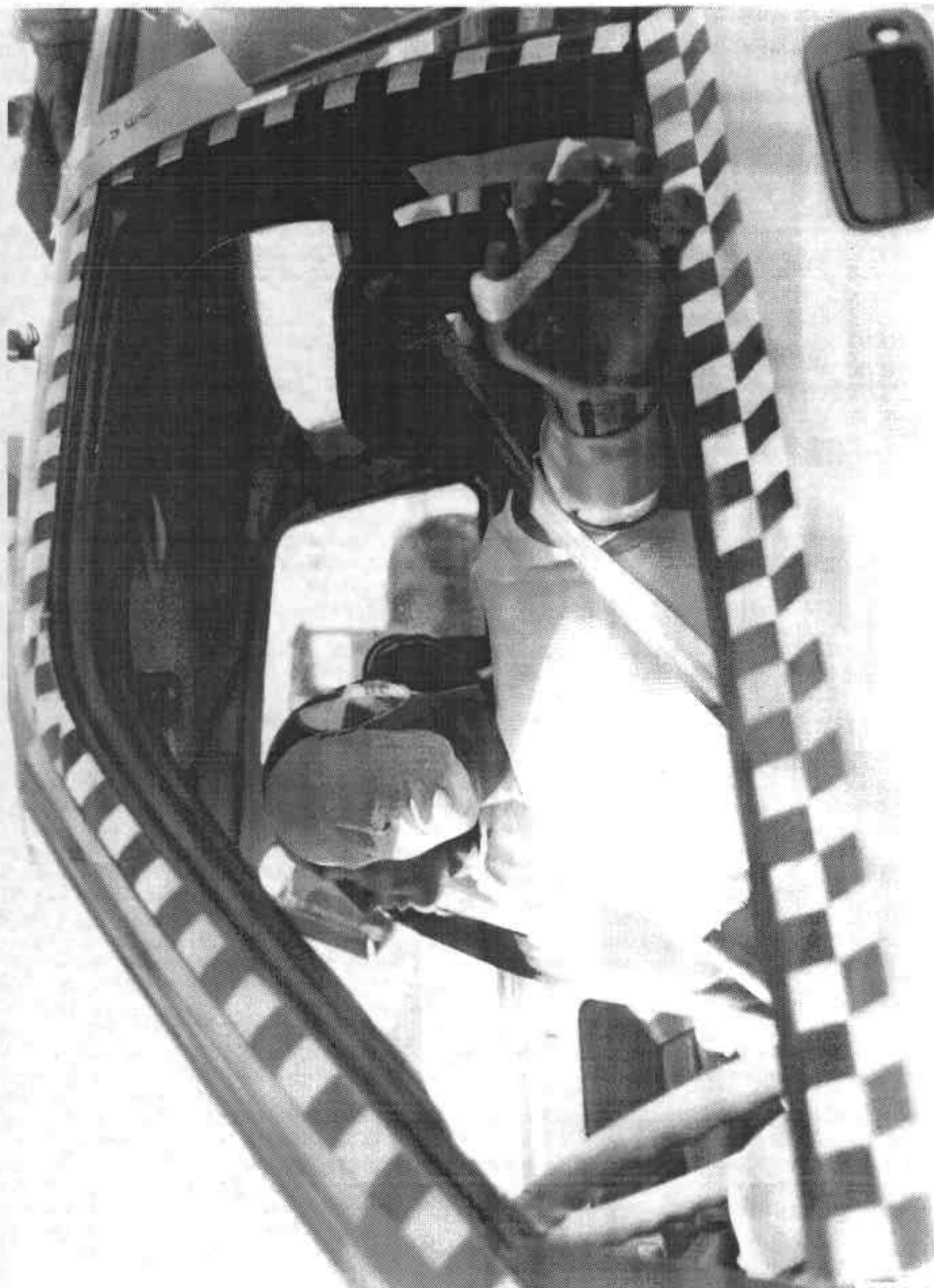


Figure A-26 POST-TEST DRIVER DUMMY POSITION

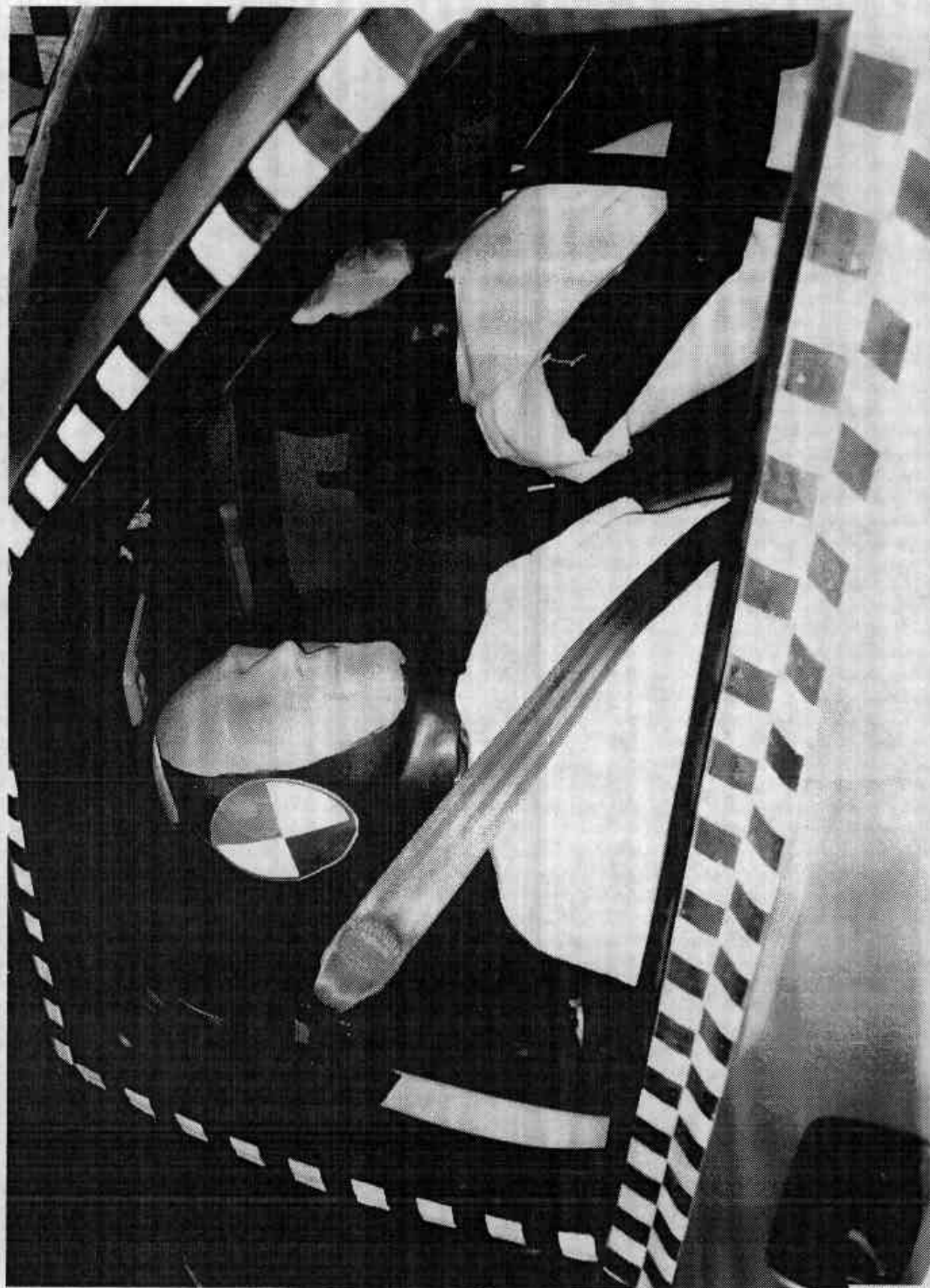


Figure A-27 PRE-TEST PASSENGER DUMMY POSITION

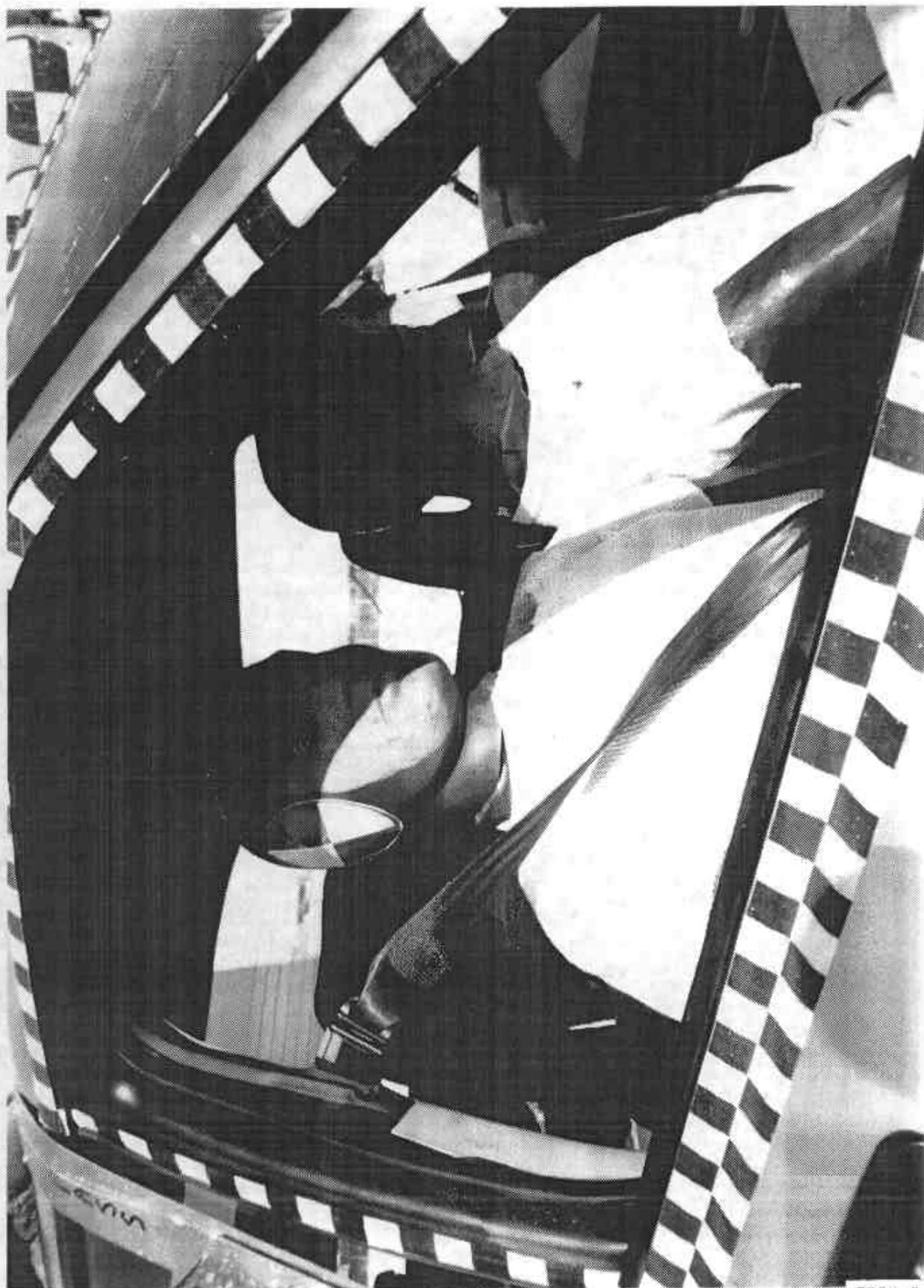


Figure A-28 POST-TEST PASSENGER DUMMY POSITION

A-30

7804-6

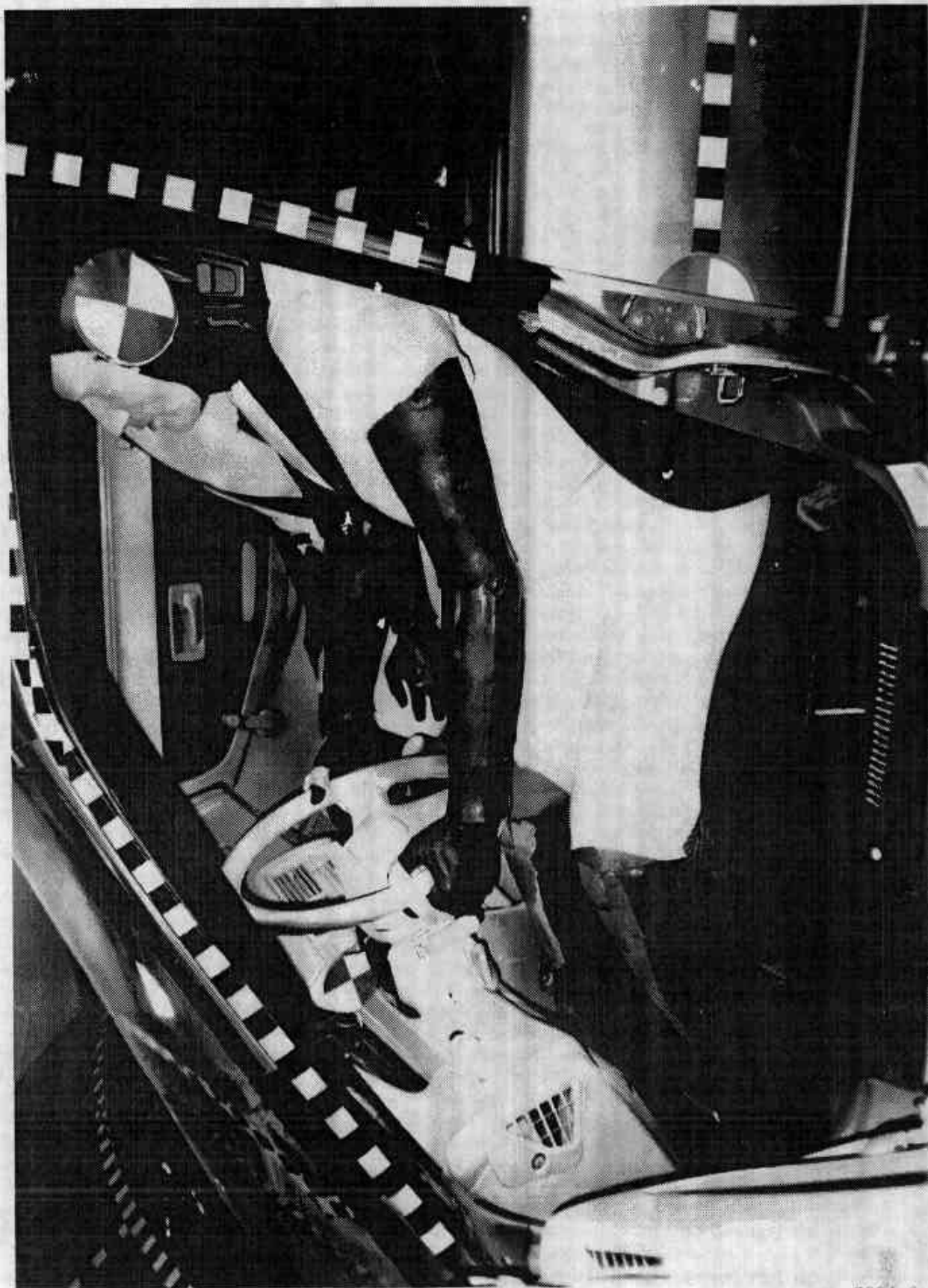


FIGURE A-29 PRE-TEST DRIVER DUMMY AND INTERIOR VIEW

A-31

7804-6



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

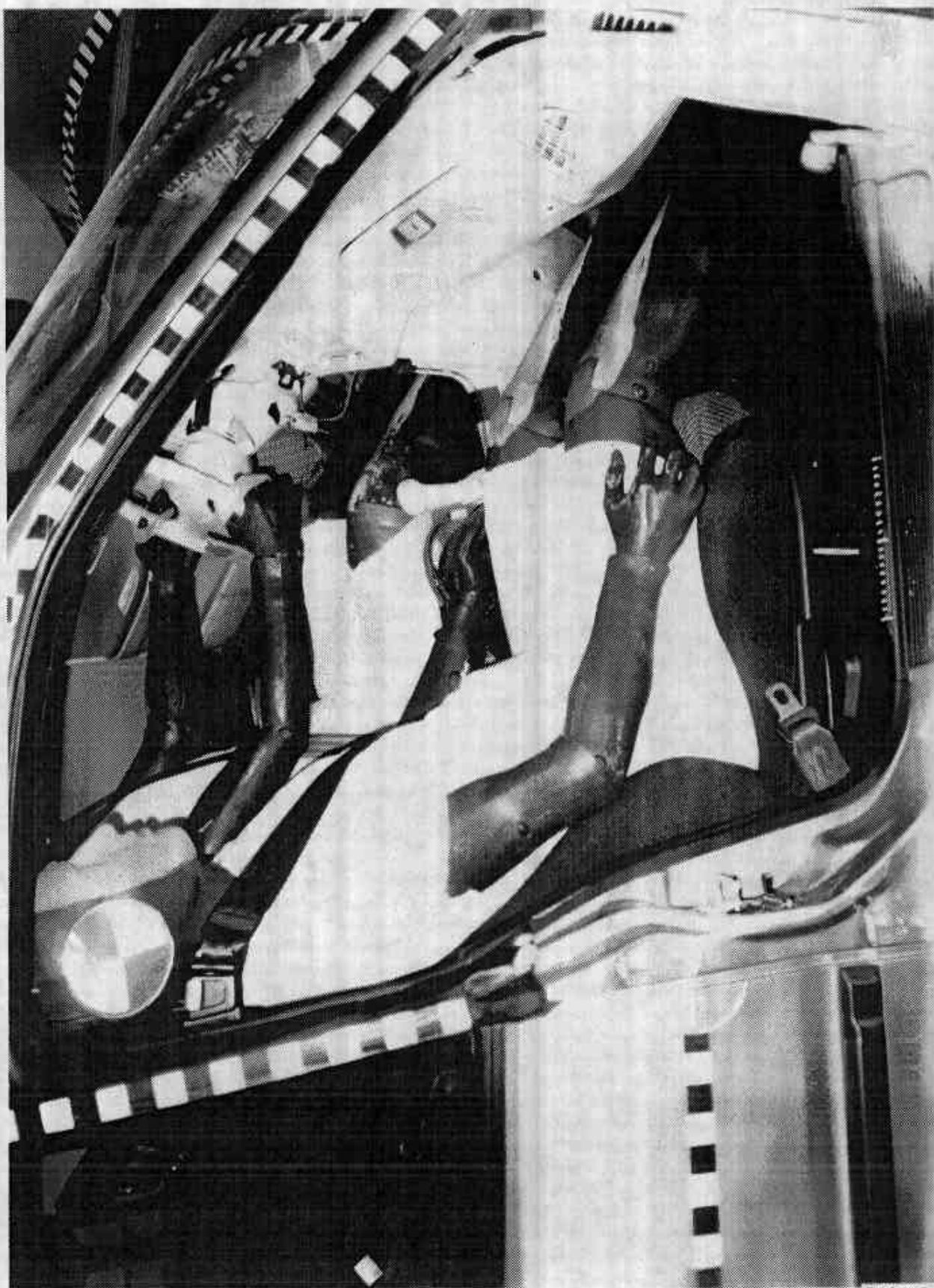


Figure A-31 PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW

A-33

7804-6

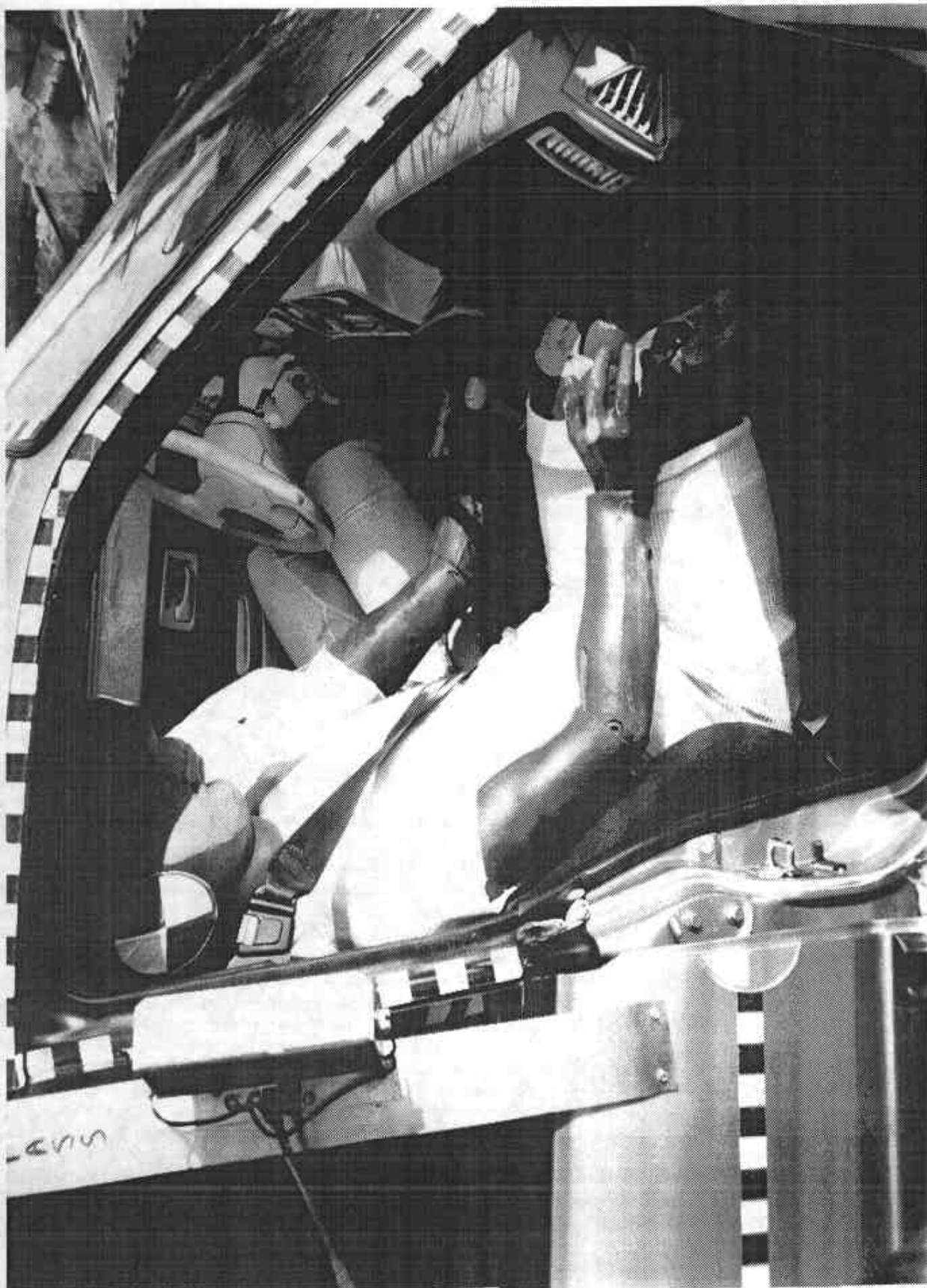


Figure A-32 POST-TEST PASSENGER DUMMY AND INTERIOR VIEW

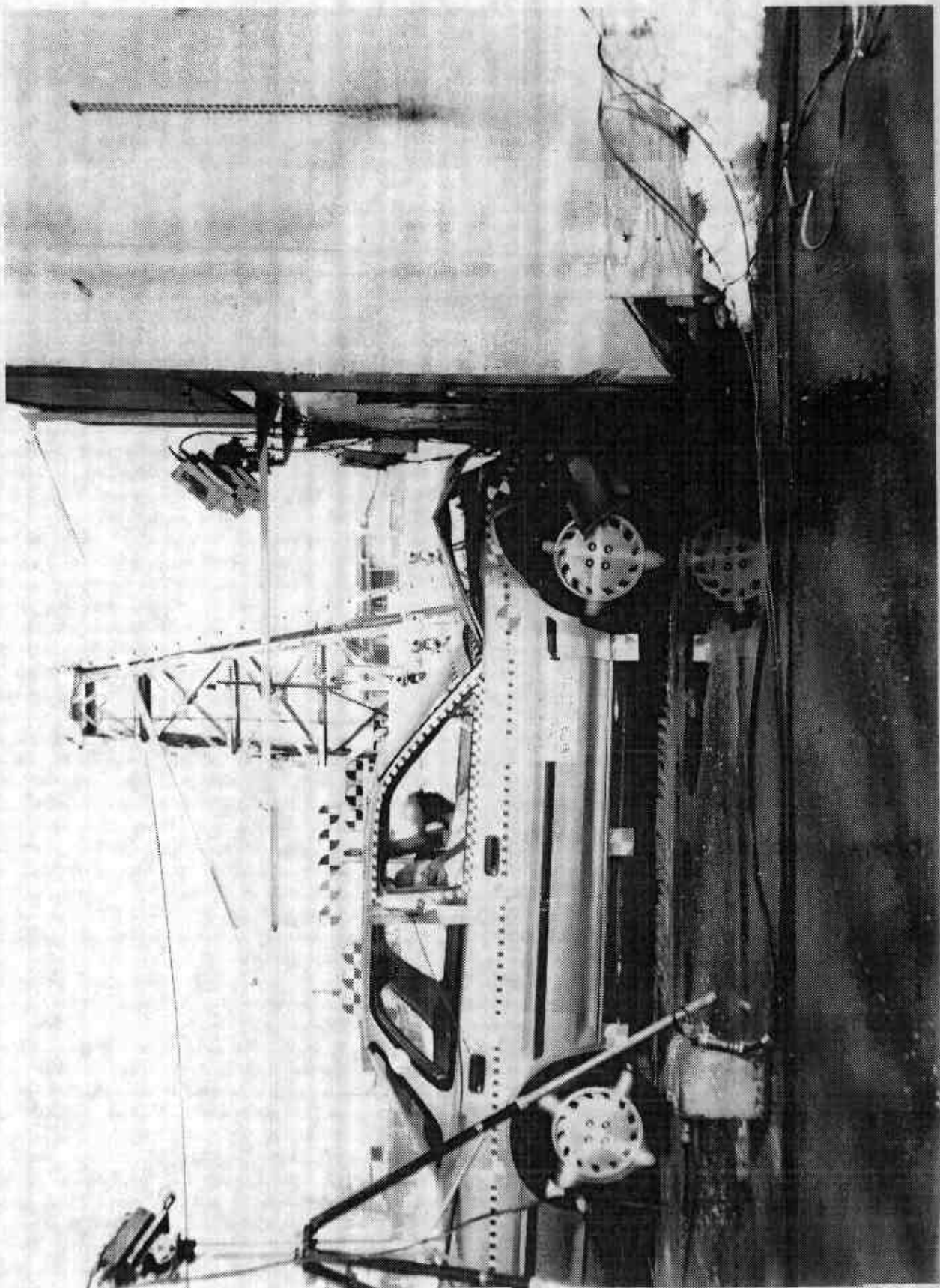


Figure A-33. VEHICLE IMPACT

A-35

7804-6

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CL5302

VEHICLE DATA

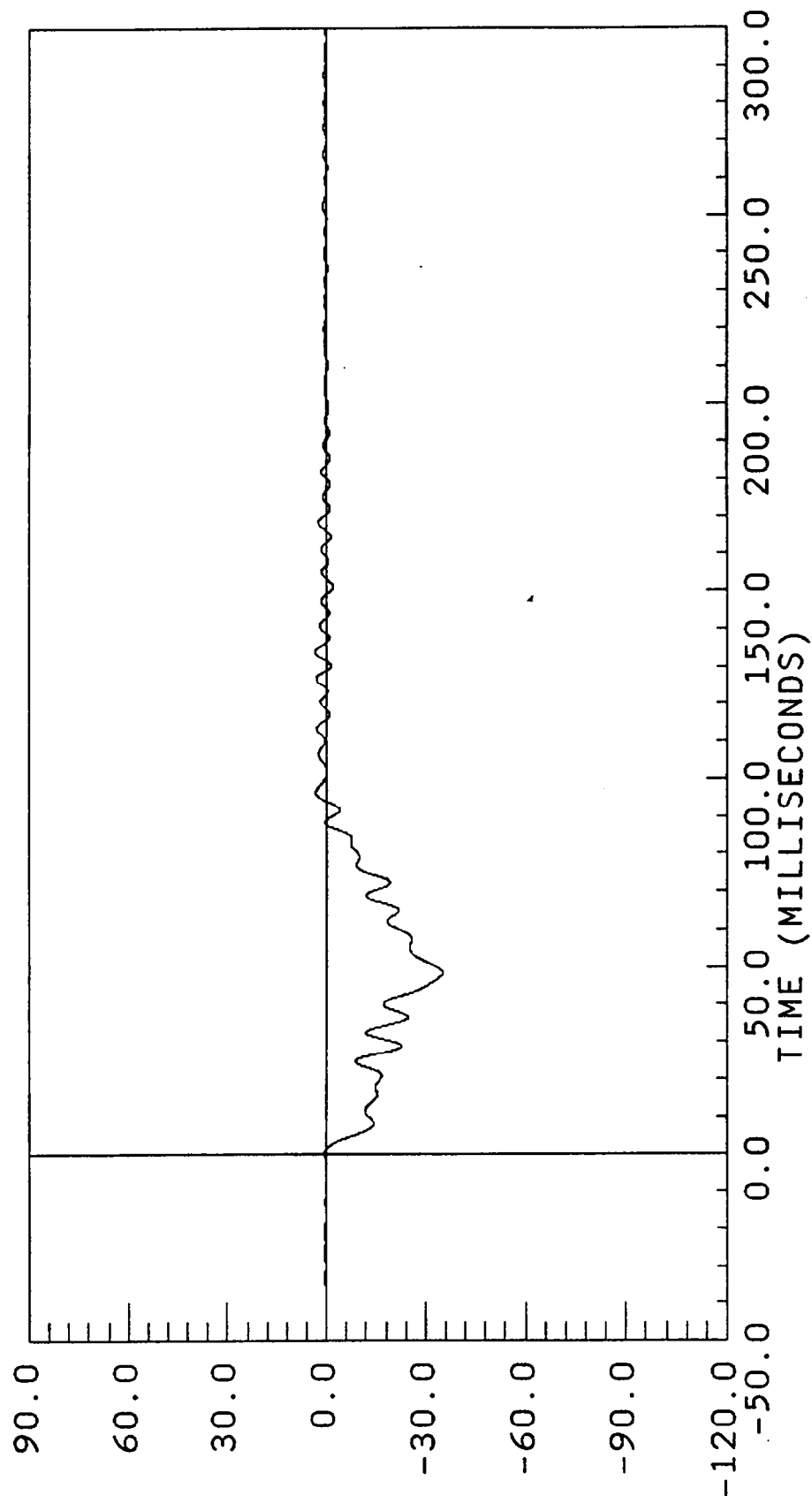
FILTER CHANNEL CLASS

60

29.50 mph

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

XL AXIS
 YMIN = -35.14943 at 48.45000
 YMAX = 3.648027 at 134.0250

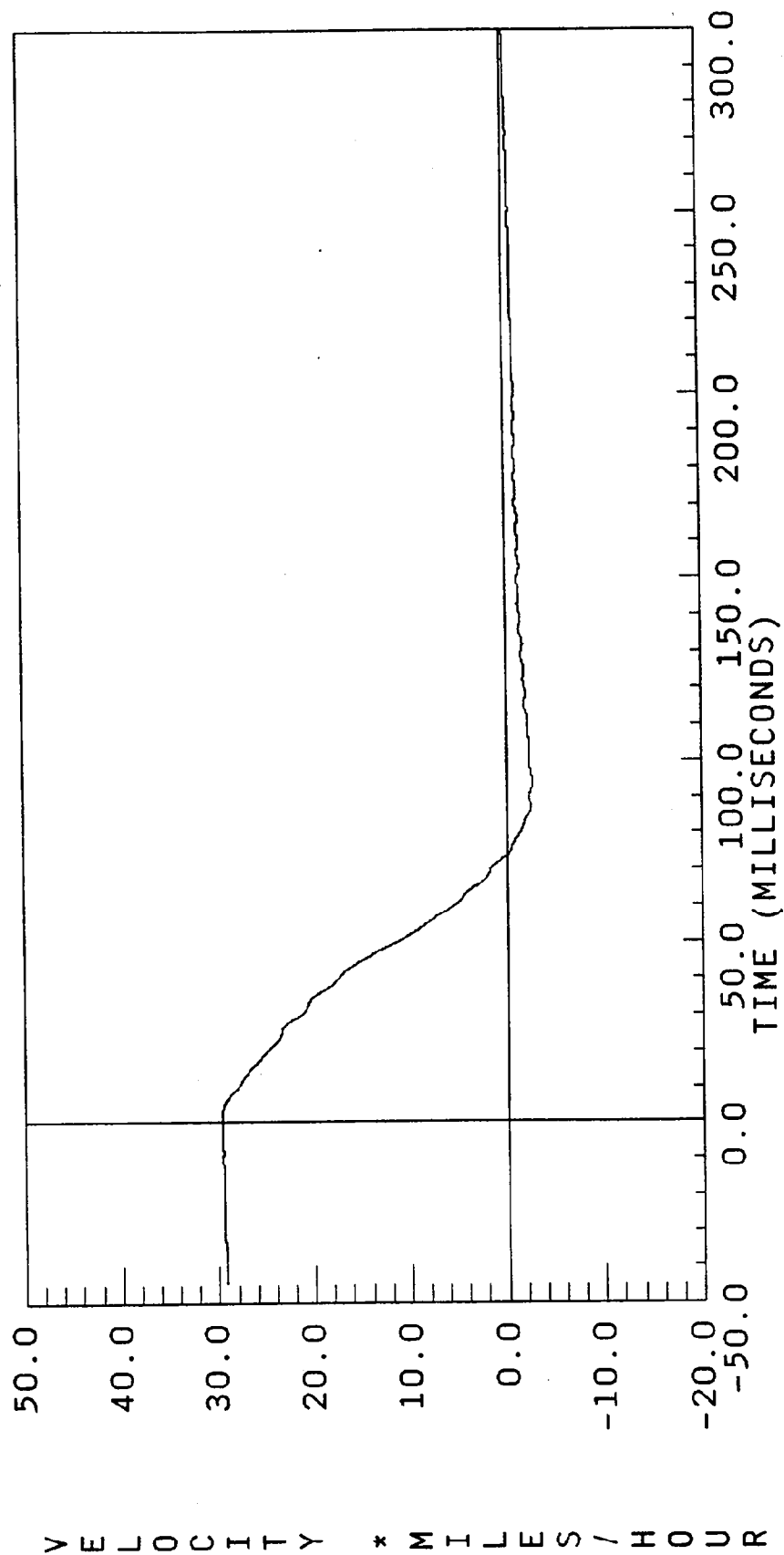


ACCELERATION * G, S *

V958-17.DAT

29.50 mph

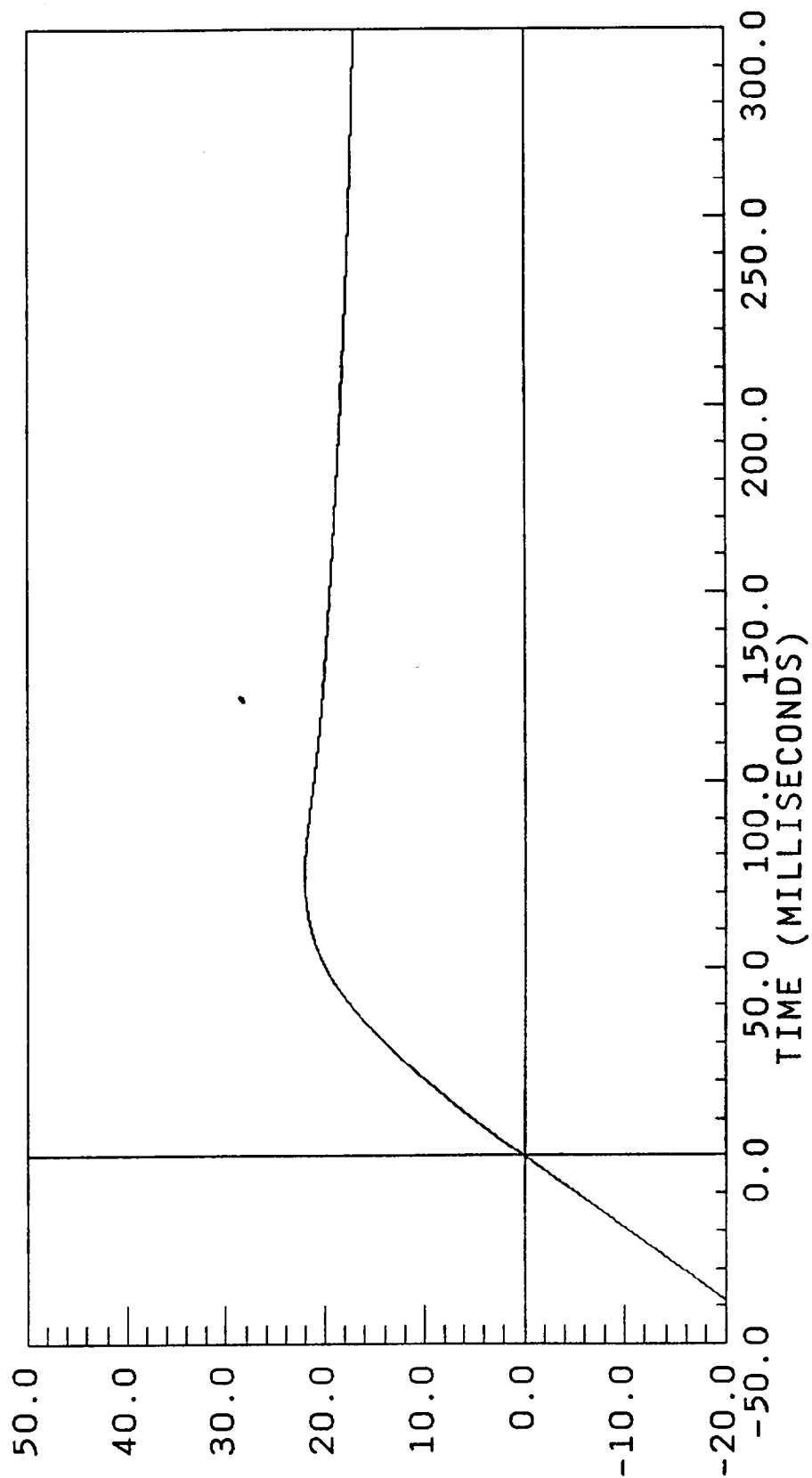
ACC PACK #1(X)
COMPUTED
FILTER CUTOFF: 0Hz
XL AXIS
YMIN = -2.756211 at 93.97501
YMAX = 29.32189 at -4.875000



29.50 mph

ACC PACK #1(X)
COMPUTED
FILTER CUTOFF: 0Hz

XL AXIS
YMIN = -23.25310 at 93.97501
YMAX = 21.99671 at 73.65000

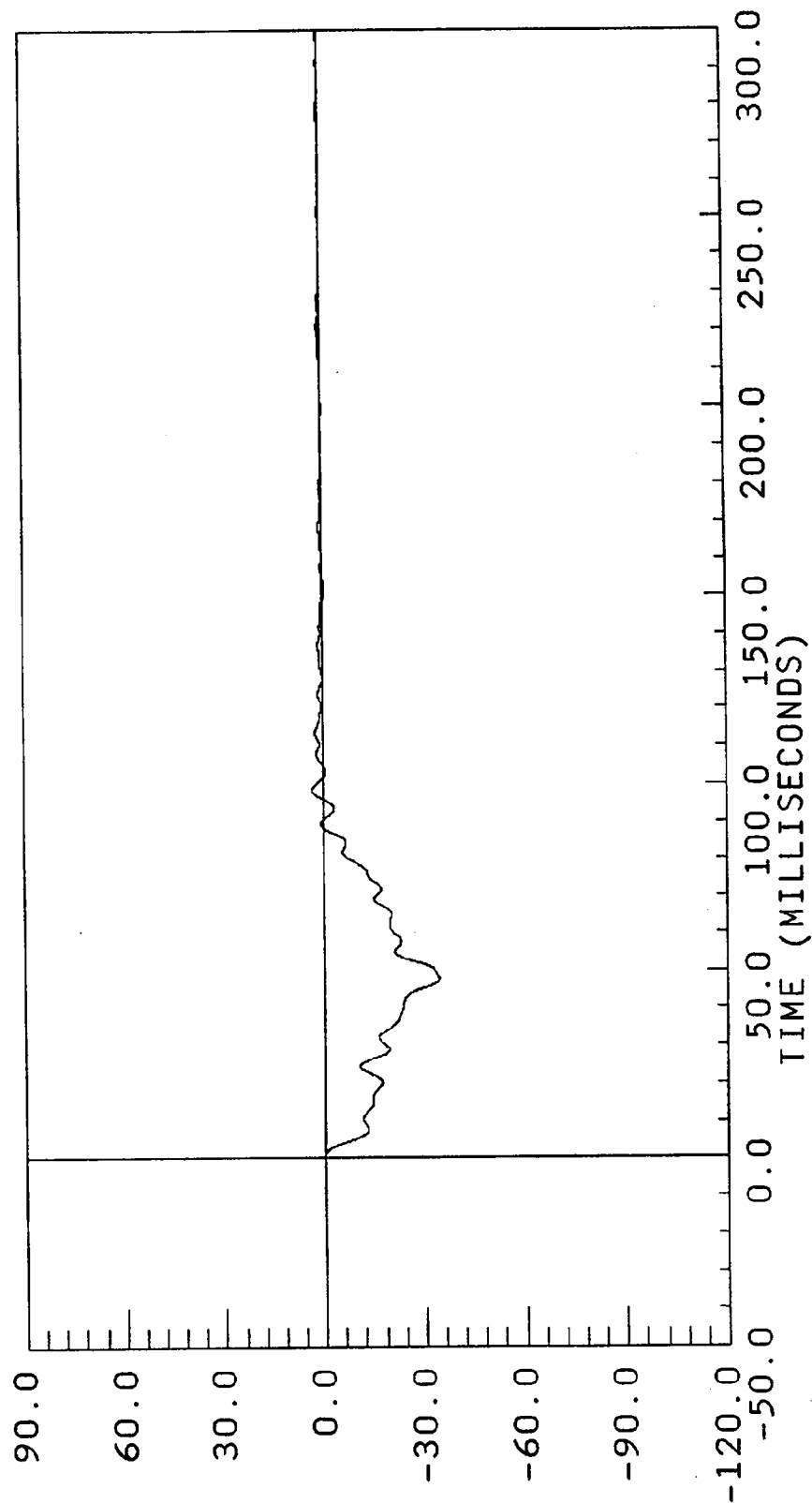


DISPLACEMENT * INCHES

BW958-18.DAT

29.50 mph

ACC PACK #2(X) XL AXIS
FILTERED YMIN = -34.32388 at 47.62500
FILTER CUTOFF: 100Hz YMAX = 3.582428 at 98.32500

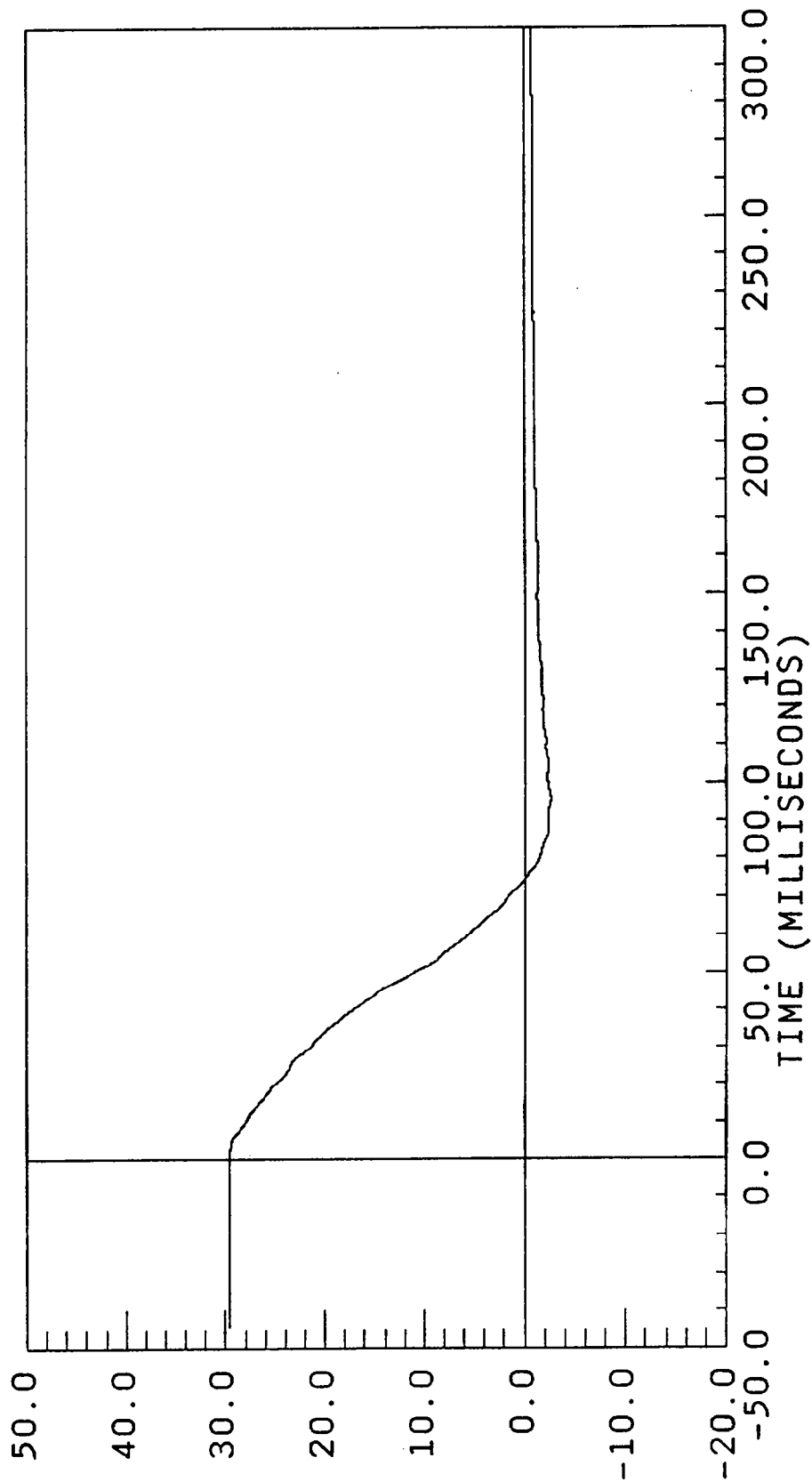


ACCELERATION * G, S *

29.50 mph

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

XL AXIS
YMIN = -2.642572 at 95.85001
YMAX = 29.53907 at 98.32500

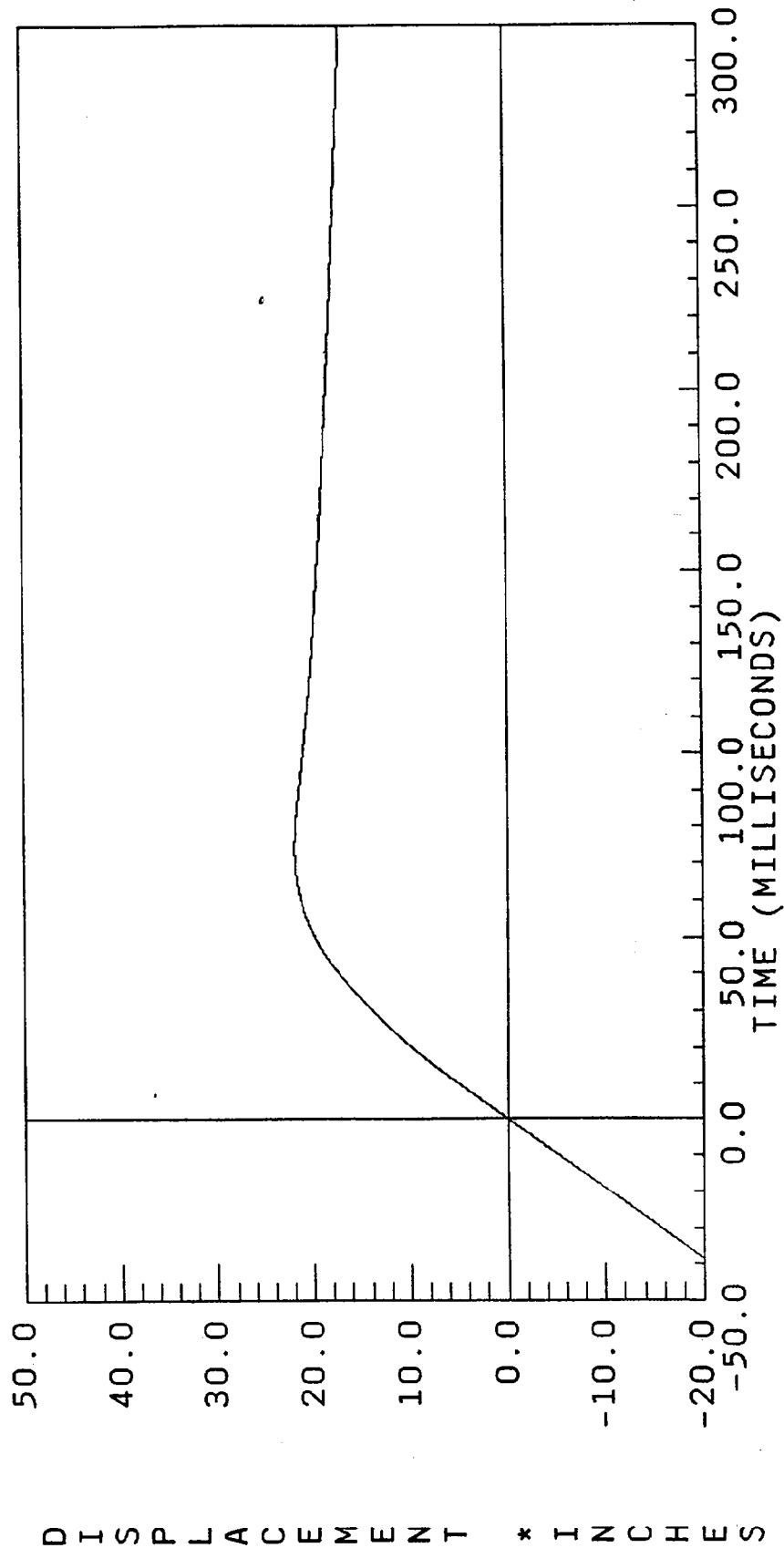


VELOCITY * MILES / HOUR

D958-18.DAT

29.50 mph

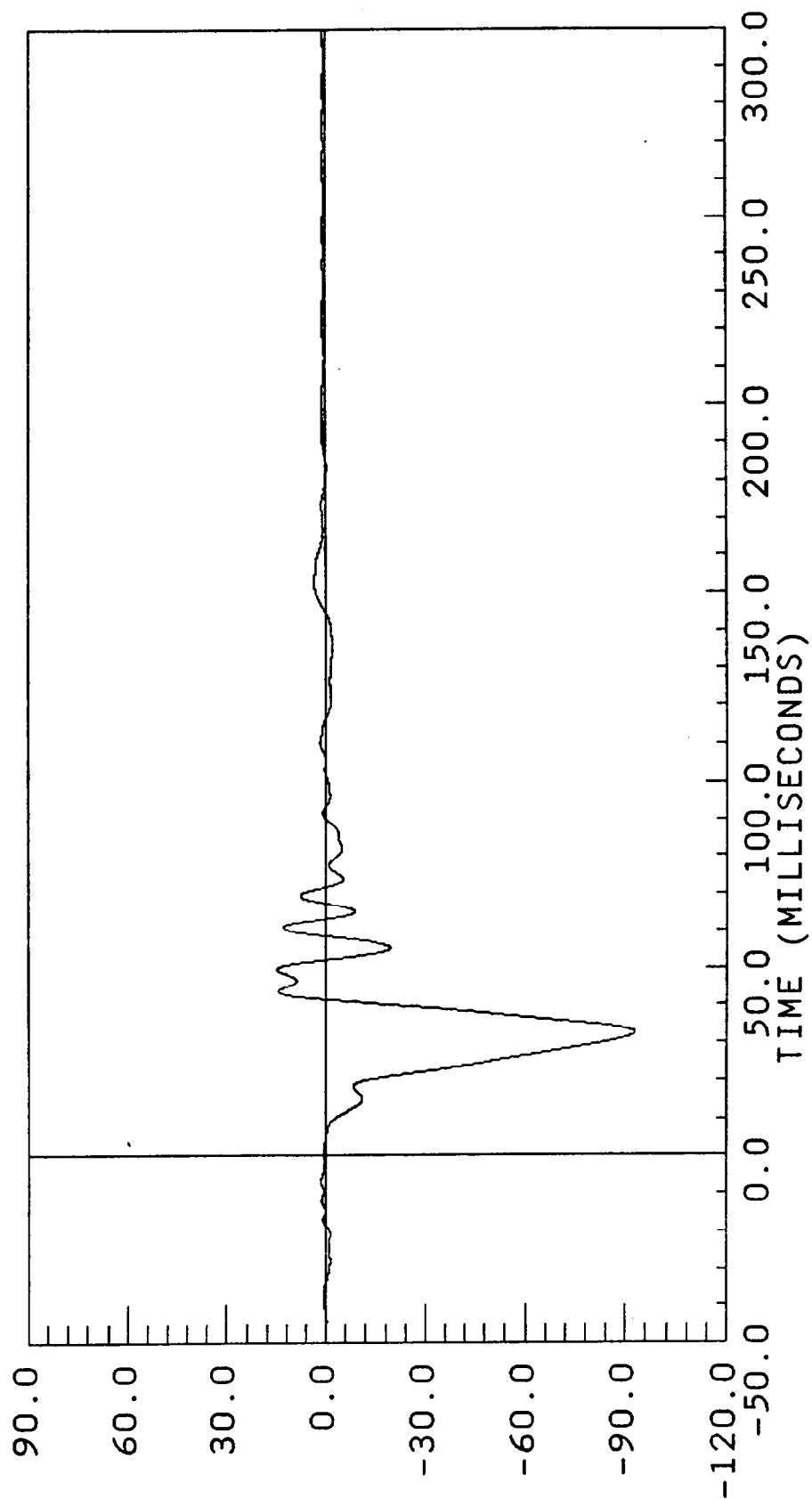
ACC PACK #2(X) XL AXIS
COMPUTED YMIN = -23.34269 at 95.85001
FILTER CUTOFF: 0Hz YMAX = 21.92609 at 74.10001



29.50 mph

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

XL AXIS
YMIN = -93.06699 at 32.47500
YMAX = 14.96668 at 49.65000

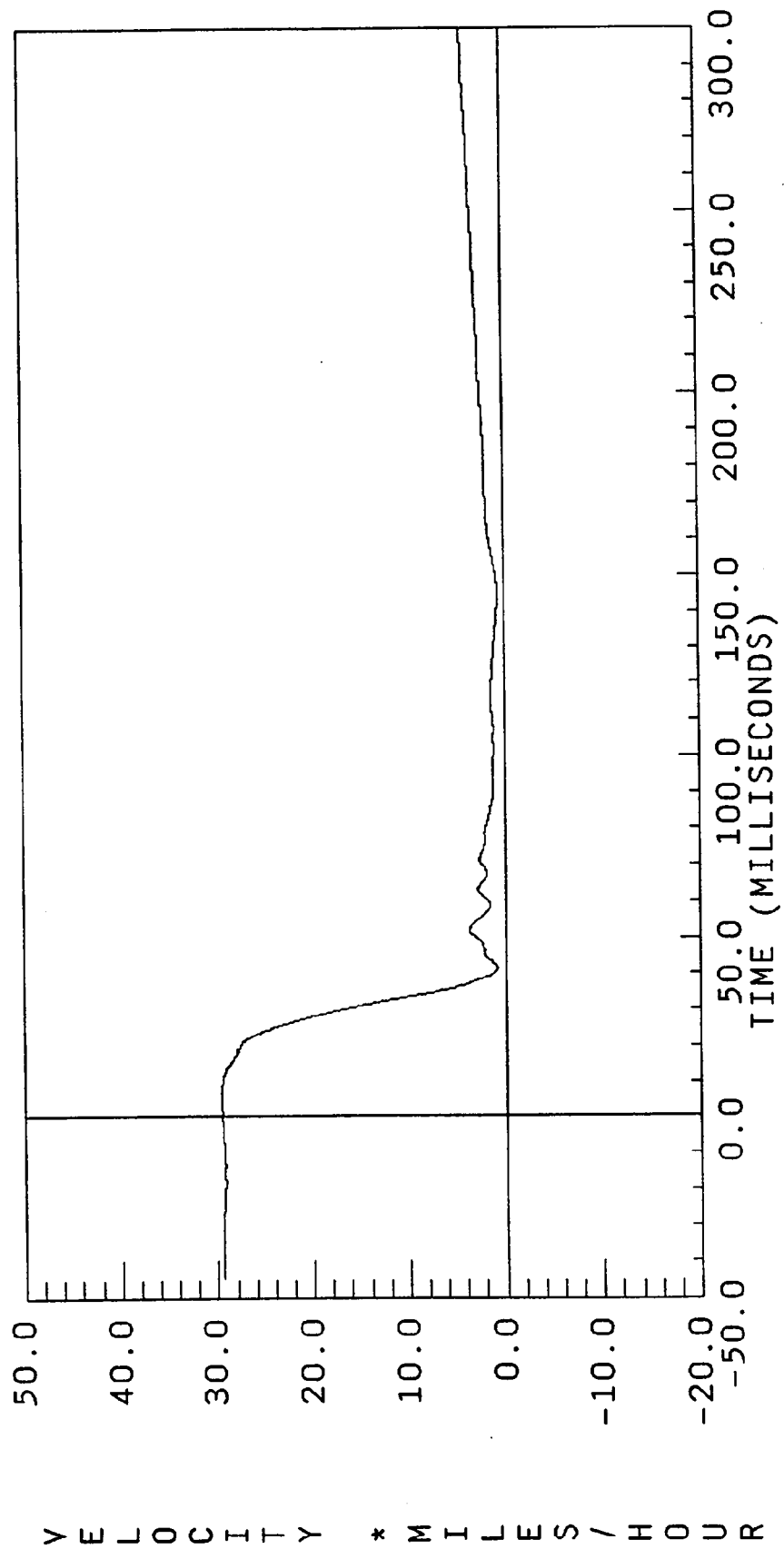


ACCELERATION * G, S *

V958-19.DAT

29.50 mph

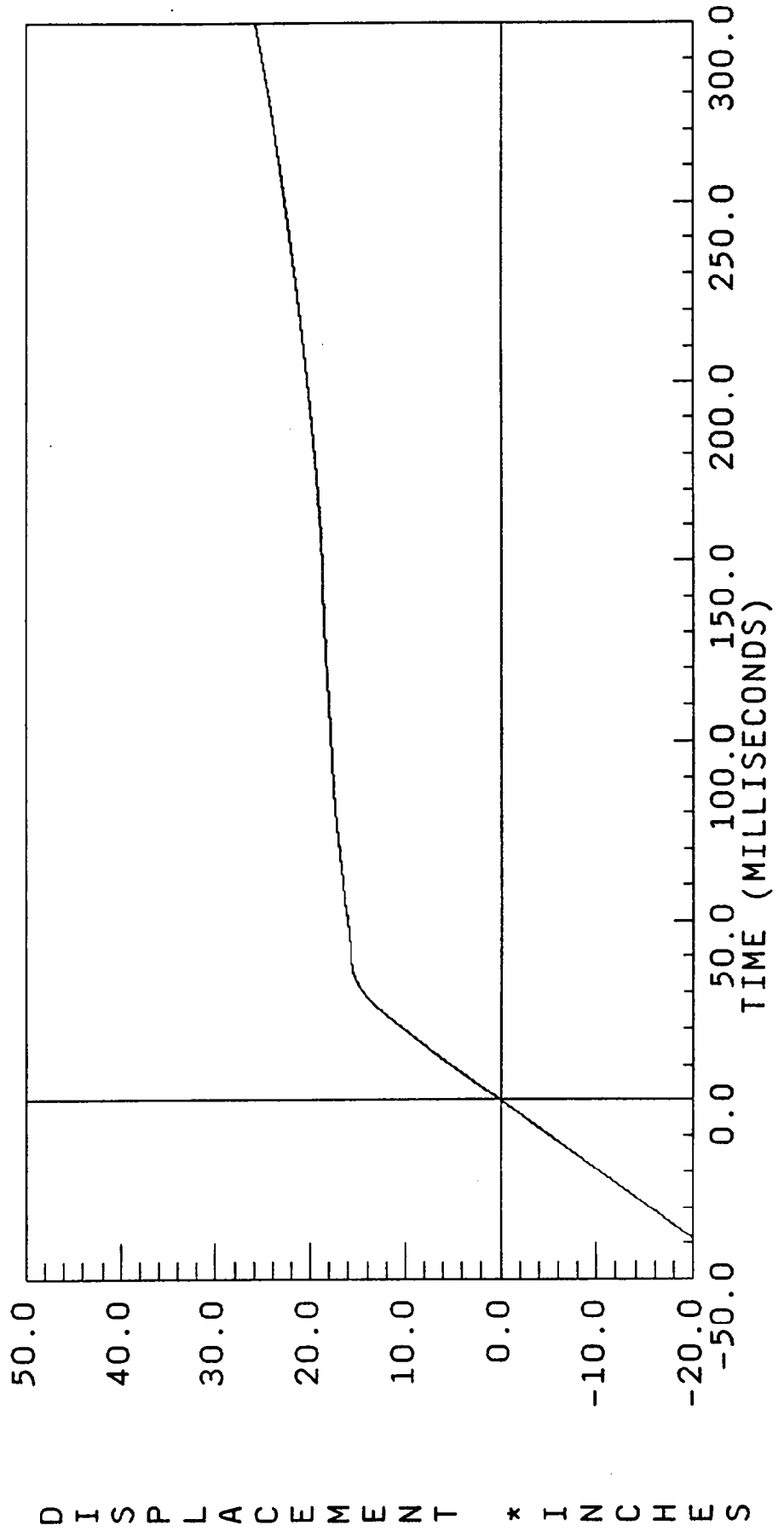
ACC PACK #3(X)
COMPUTED
FILTER CUTOFF: OHZ
XL AXIS
YMIN = 0.584392 at 144.9750
YMAX = 29.55506 at 3.900000



29.50 mph

ACC PACK #3(X)
COMPUTED
FILTER CUTOFF: 0HZ

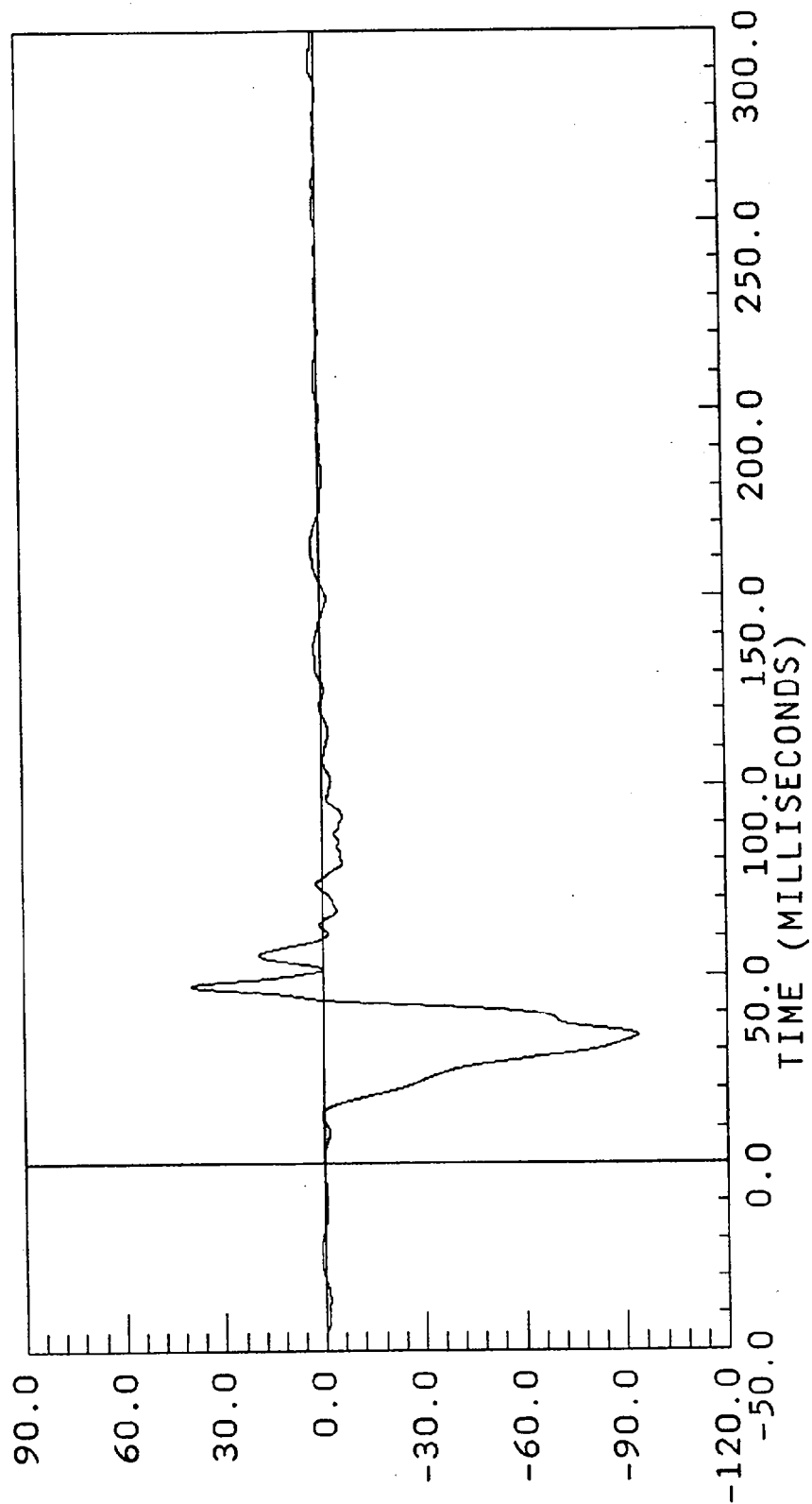
XL AXIS
YMIN = -23.20312 at 144.9750
YMAX = 25.80362 at 300.0000



BW958-20.DAT

29.50 mph

ACC PACK #4(X) XL AXIS
FILTERED YMIN = -93.80000 at 33.90000
FILTER CUTOFF: 100HZ YMAX = 39.59055 at 47.40000

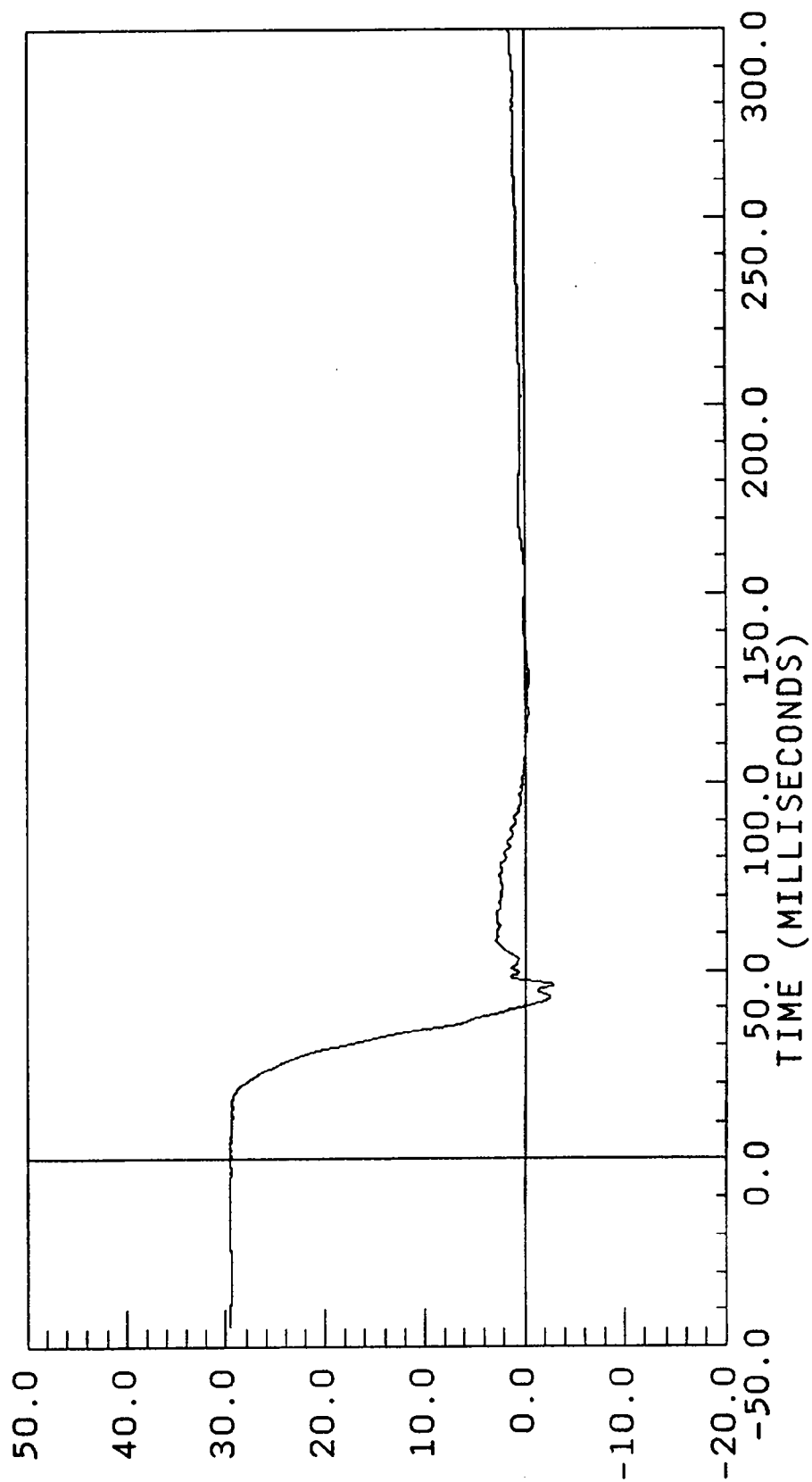


ACCELERATION * G, S *

29.50 mph

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

XL AXIS
YMIN = -2.932260 at 46.27500
YMAX = 29.64116 at 47.40000

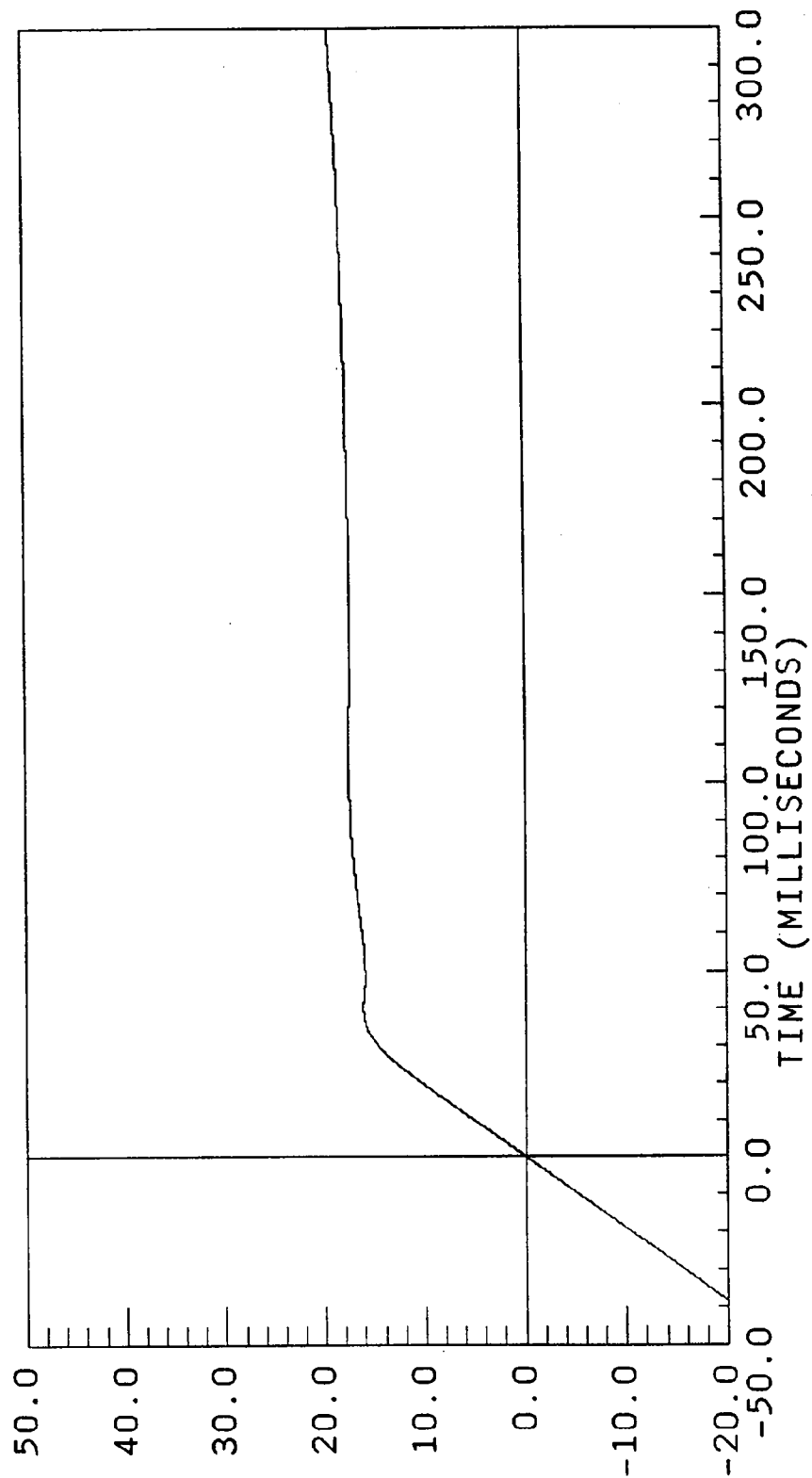


VELOCITY * MILES / HOUR

D958-20.DAT

29.50 mph

ACC PACK #4(X) XL AXIS
COMPUTED YMIN = -23.32664 at 46.27500
FILTER CUTOFF: 0HZ YMAX = 19.22713 at 300.0000



29.50 mph

ACC PACK #5(X)

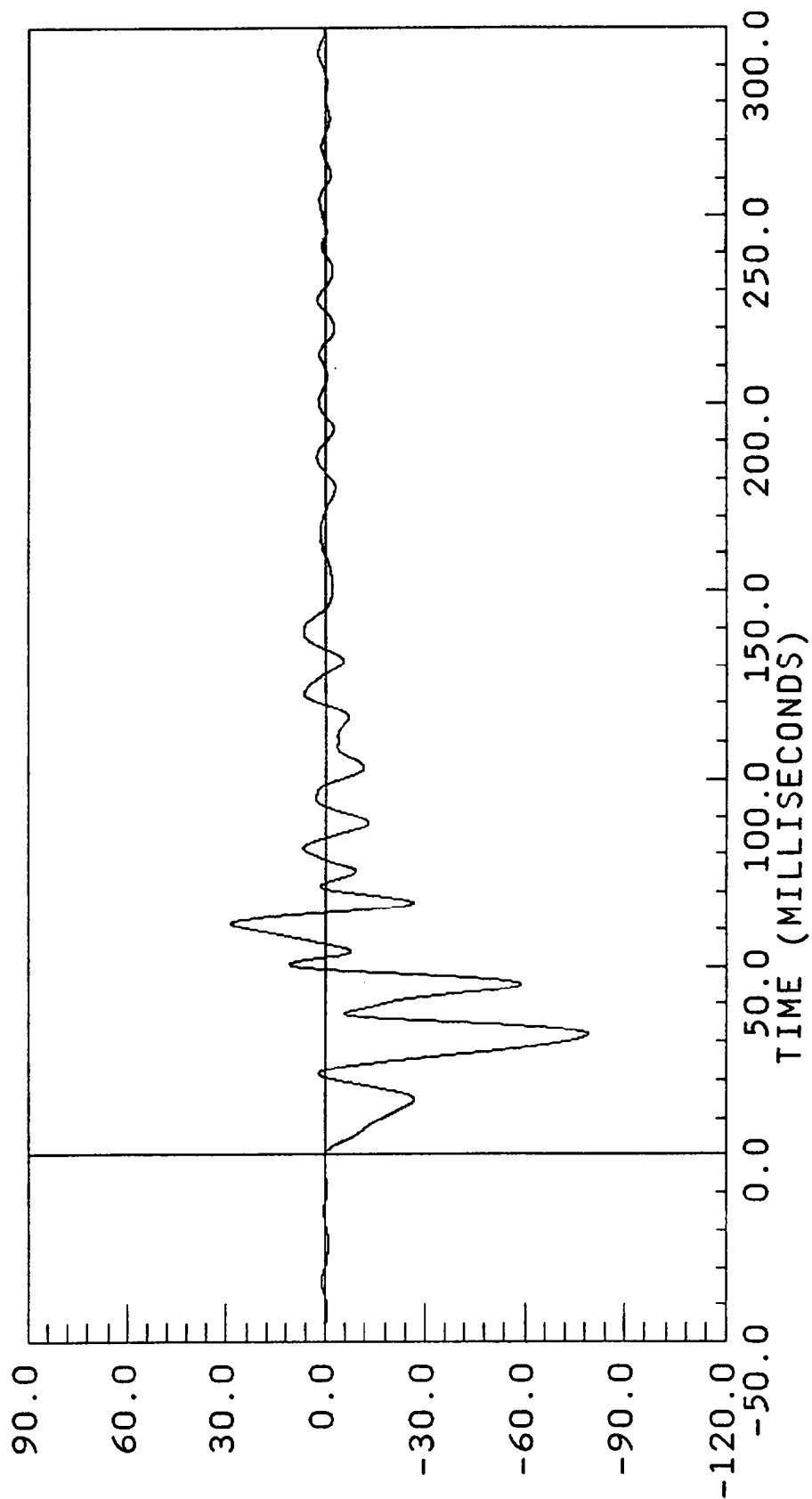
FILTERED

FILTER CUTOFF: 100Hz

XL AXIS

YMIN = -78.94994 at 31.80000

YMAX = 28.94583 at 61.57500

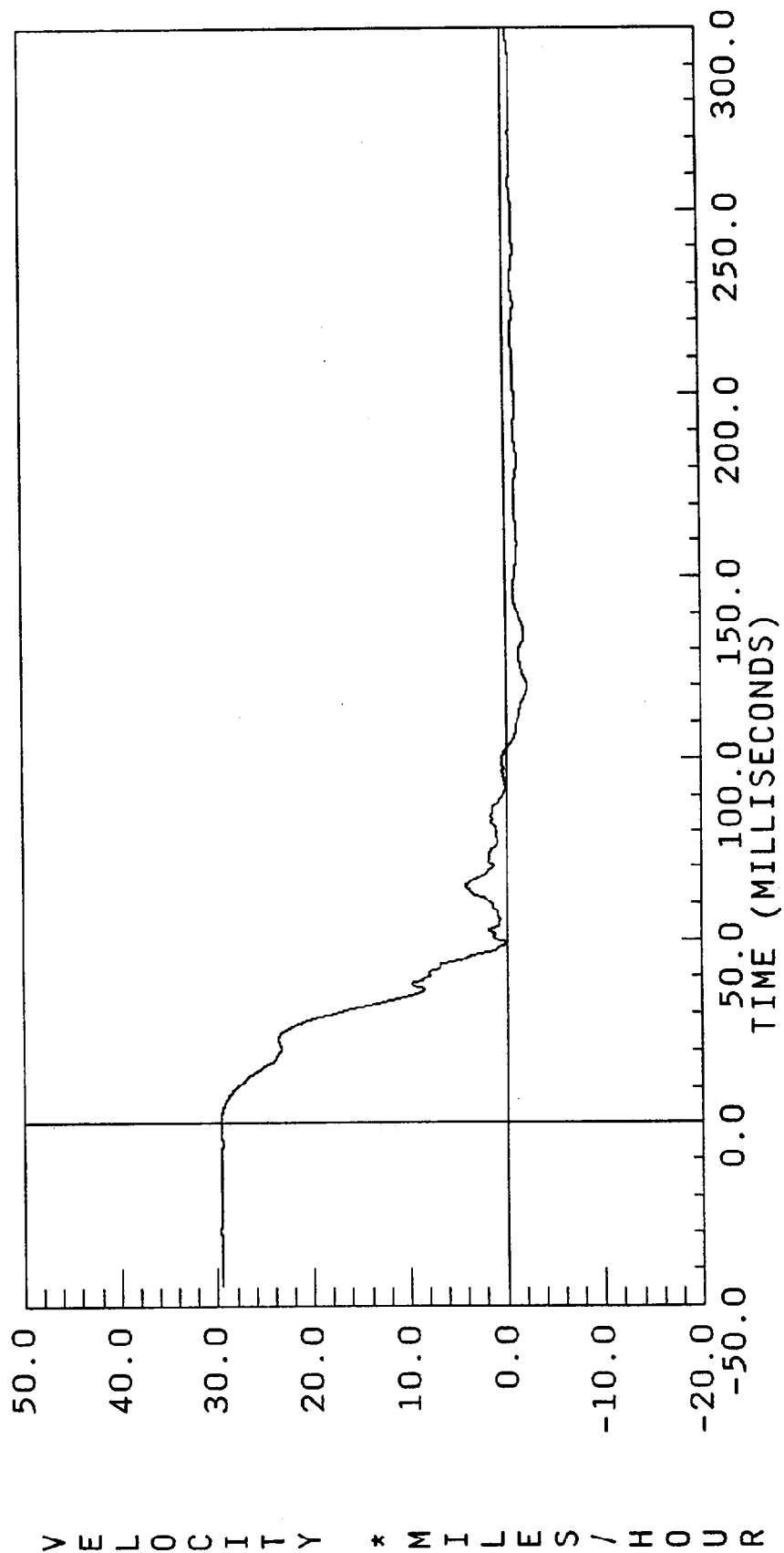


ACCELERATION * G, S *

V958-21.DAT

29.50 mph

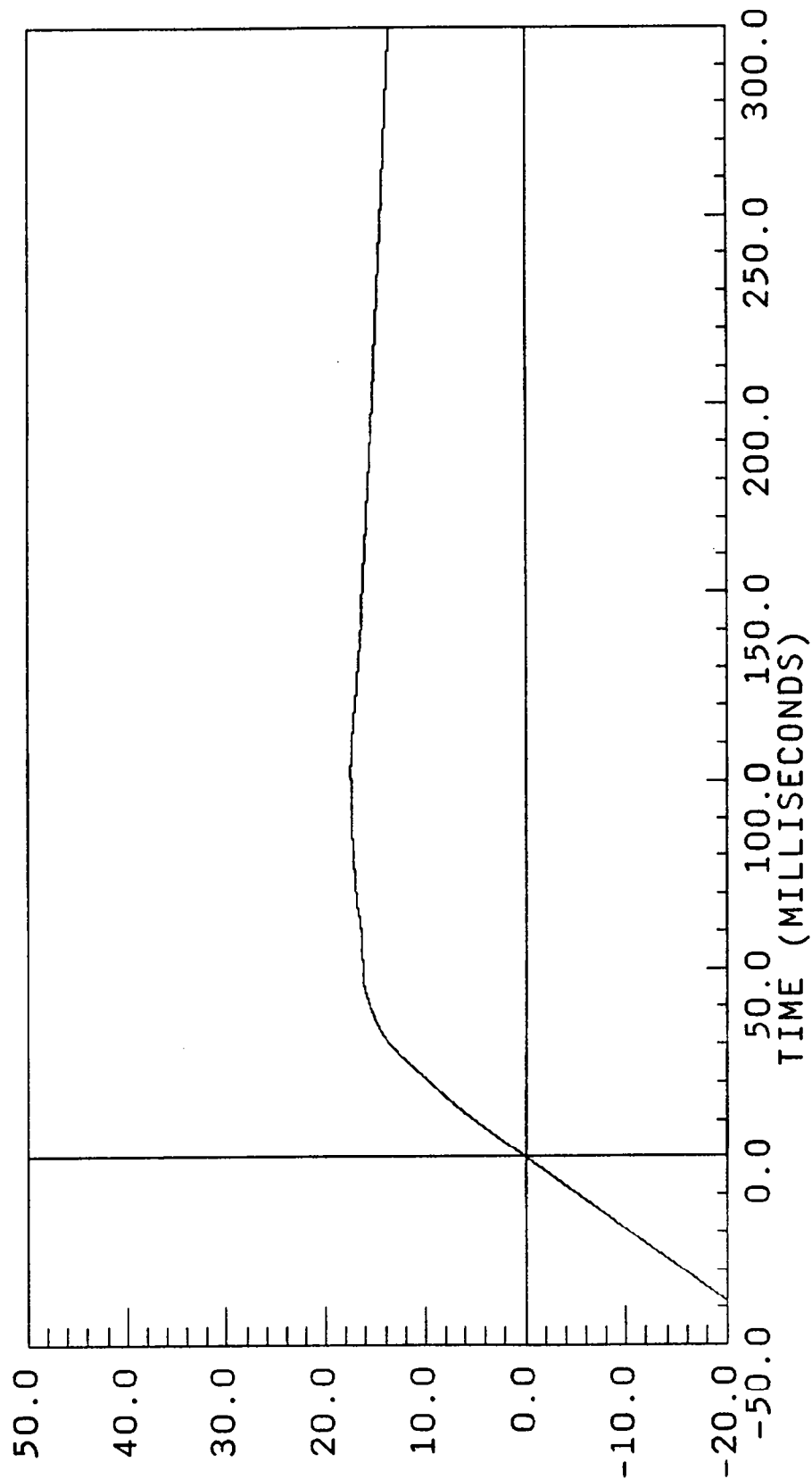
ACC PACK #5(X)
COMPUTED
FILTER CUTOFF: 0HZ
XL AXIS
YMIN = -2.259125 at 119.6250
YMAX = 29.59653 at -30.00000



29.50 mph

ACC PACK #5(X)
COMPUTED
FILTER CUTOFF: OHZ

XL AXIS
YMIN = -23.36887 at 119.6250
YMAX = 17.47742 at 102.5250

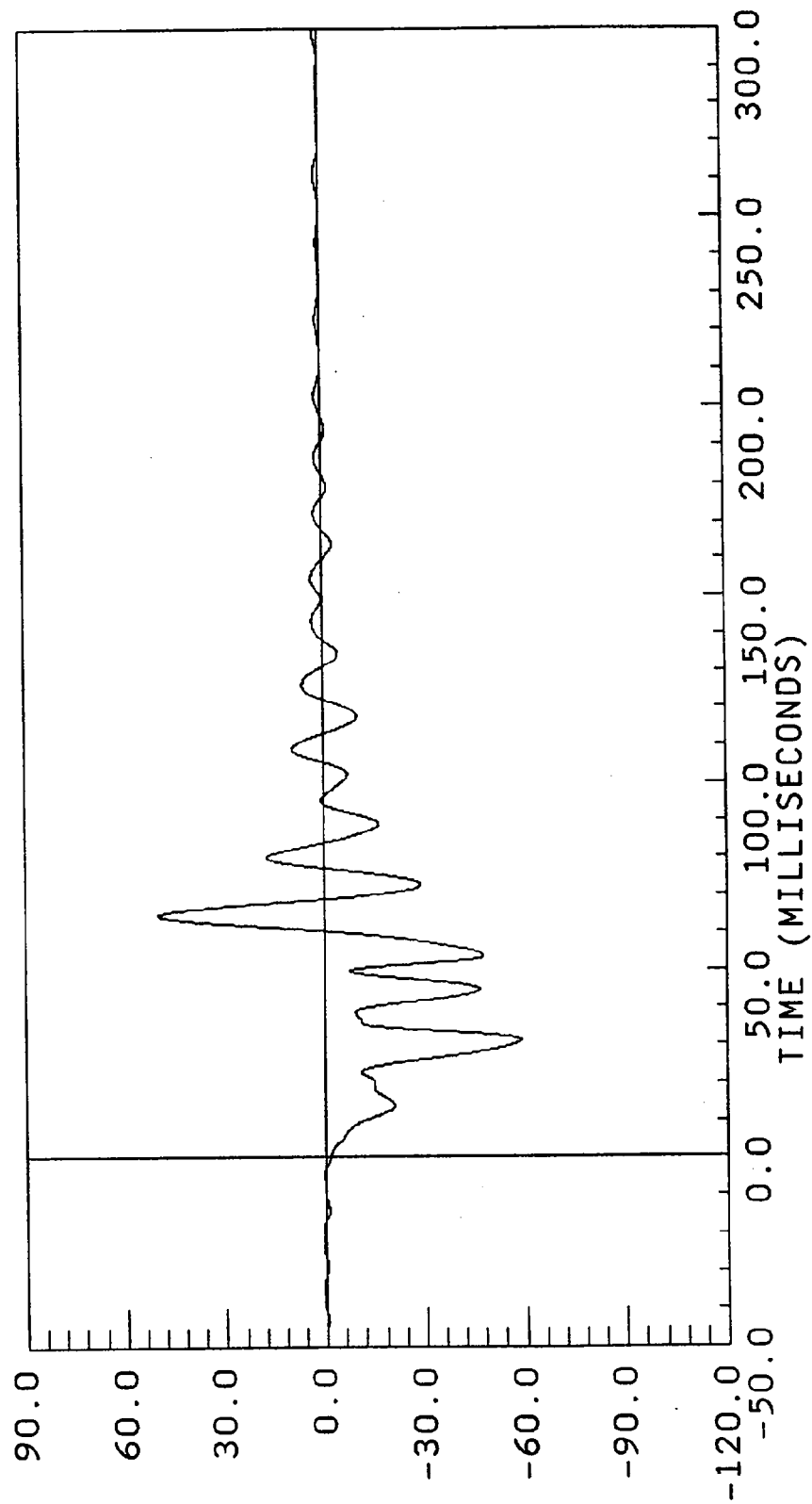


D I S P L A C E M E N T * I N C H E S

BW958-22.DAT

29.50 mph

ACC PACK #6(X)
FILTERED
FILTER CUTOFF: 100HZ
XL AXIS
YMIN = -58.63072 at 31.05000
YMAX = 50.02899 at 64.42500

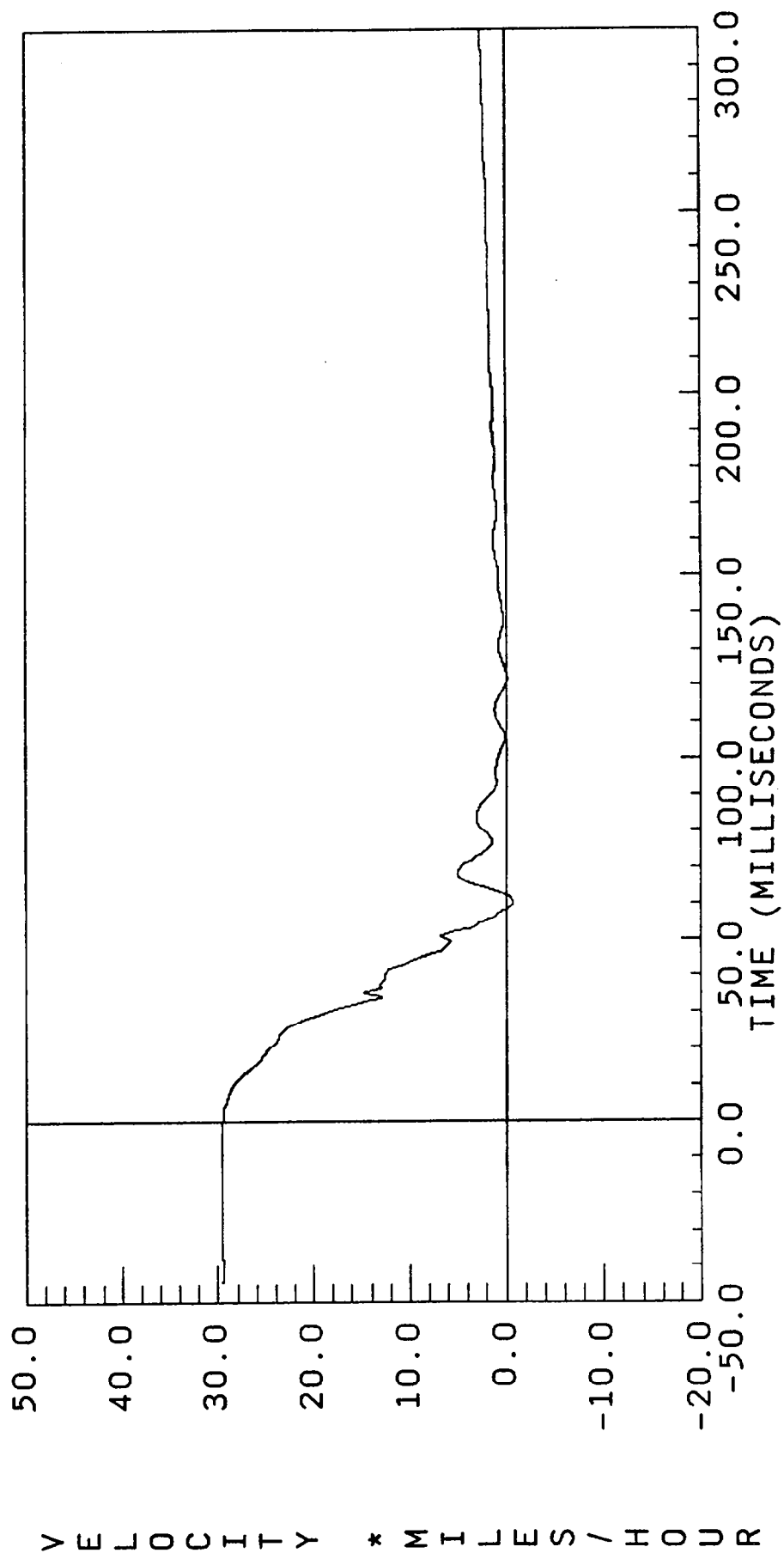


ACCELERATION * G * S

29.50 mph

ACC PACK #6(X)
COMPUTED
FILTER CUTOFF: 0Hz

XL AXIS
YMIN = -0.806688 at 60.15000
YMAX = 29.49290 at -16.42500

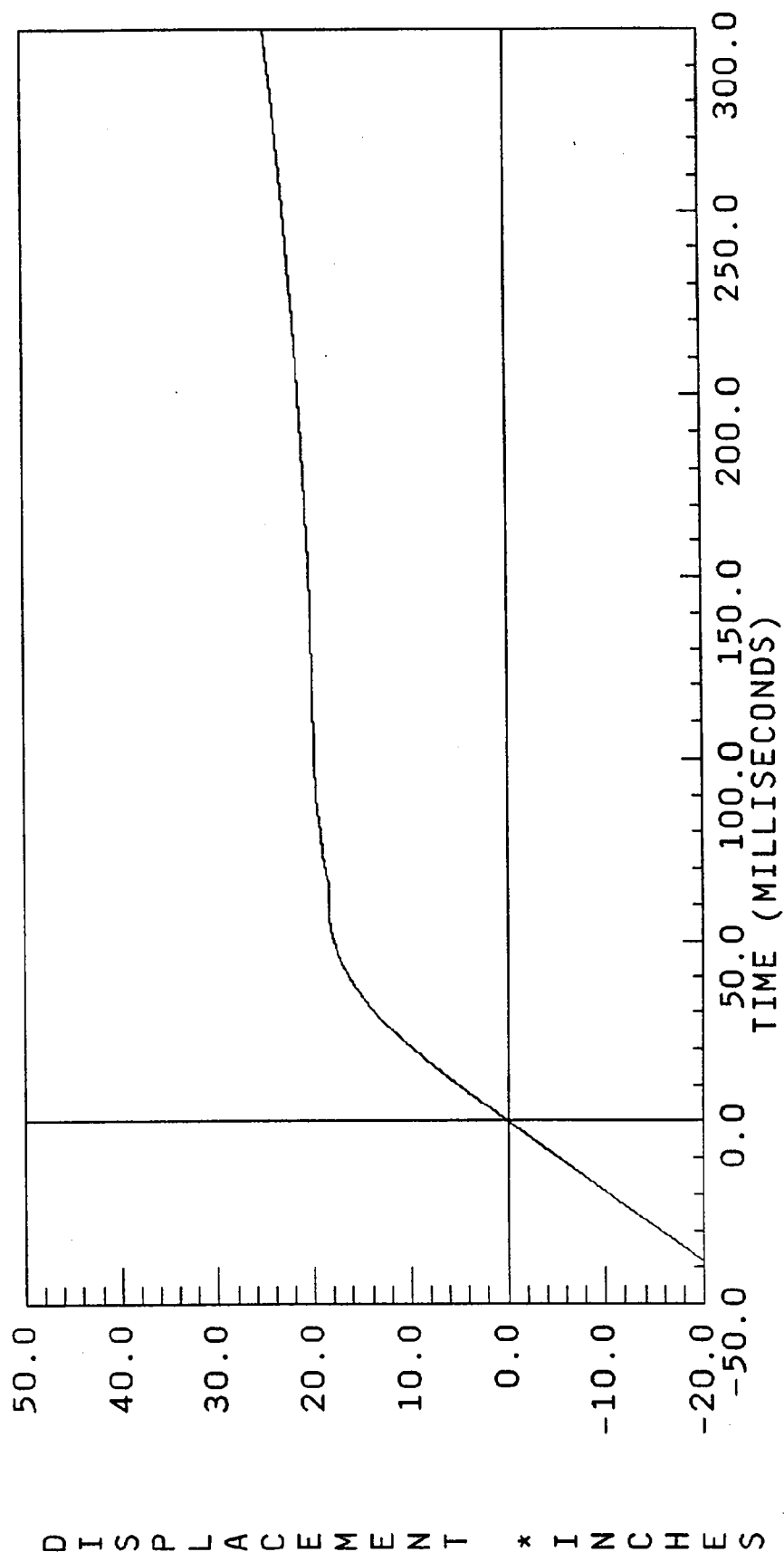


D958-22.DAT

29.50 mph

ACC PACK #6(X)
COMPUTED
FILTER CUTOFF: 0HZ

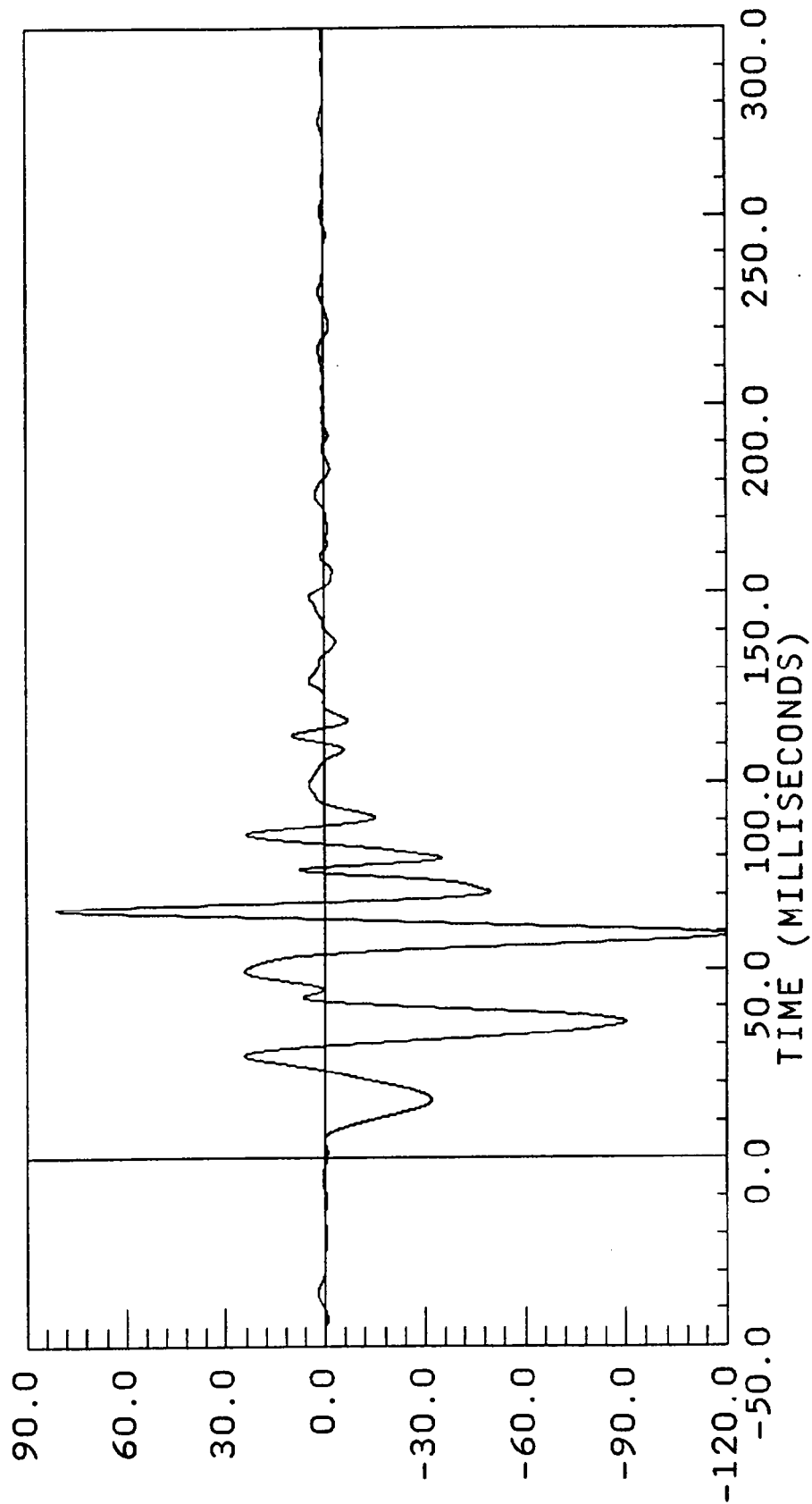
XL AXIS
YMIN = -23.35419 at 60.15000
YMAX = 24.77321 at 300.0000



29.50 mph

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

XL AXIS
 YMIN = -122.2968 at 59.02500
 YMAX = 81.16282 at 66.07500

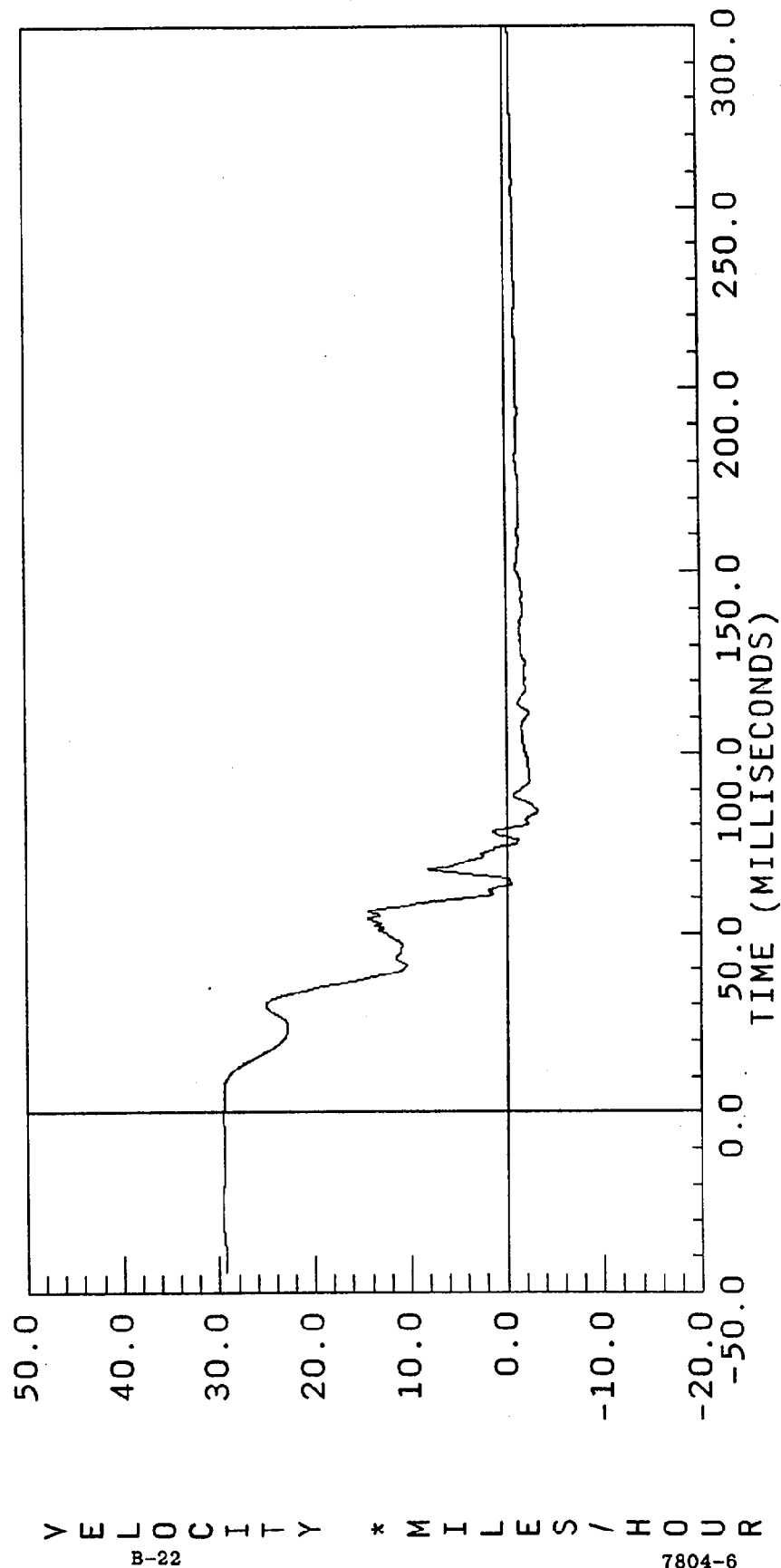


ACCELERATION * G, S *

V958-23.DAT

29.50 mph

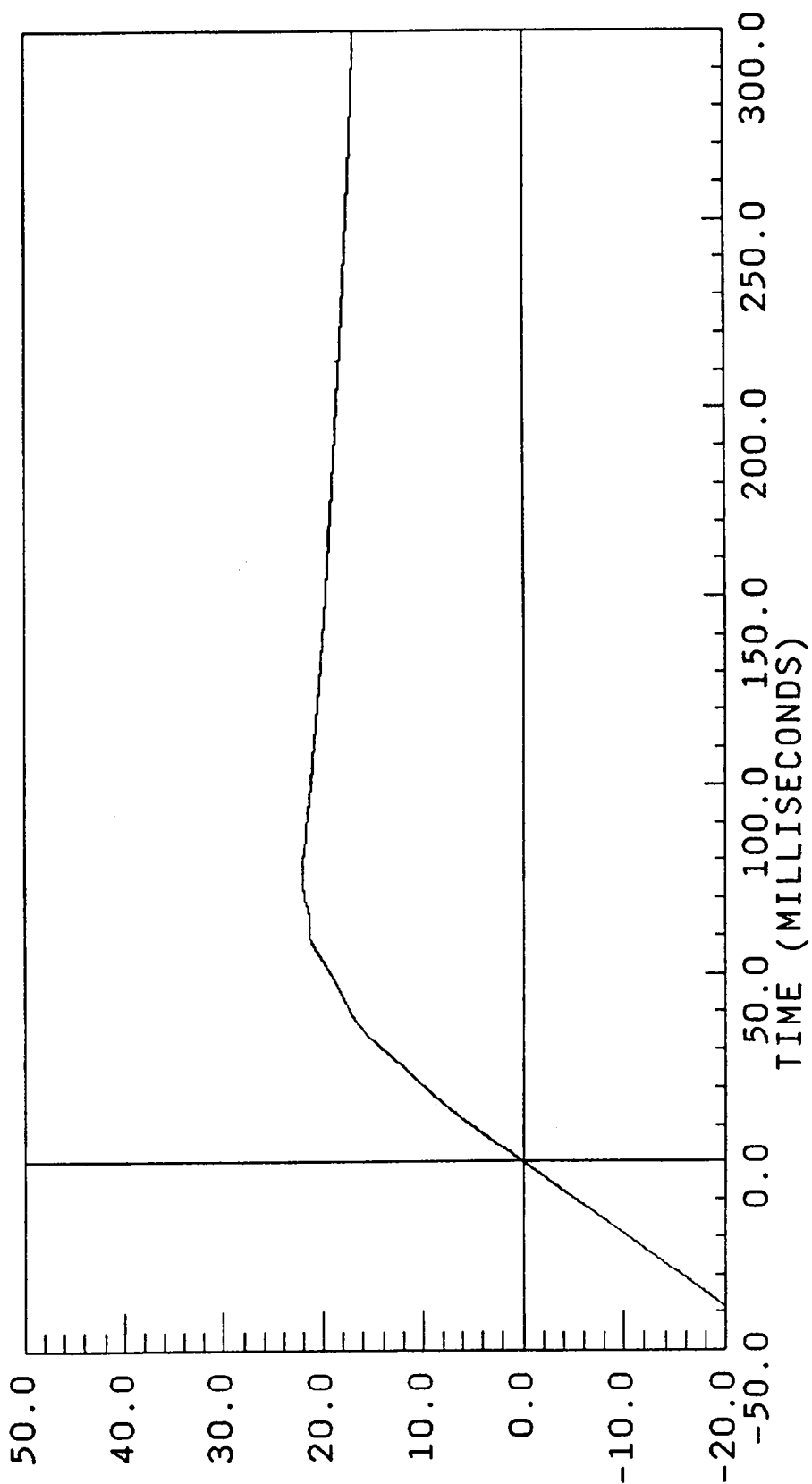
ACC PACK #7(X) XL AXIS
COMPUTED YMIN = -3.183949 at 83.85001
FILTER CUTOFF: OHZ YMAX = 29.35069 at -25.35000



29.50 mph

ACC PACK #7(X)
COMPUTED
FILTER CUTOFF: 0HZ

XL AXIS
YMIN = -23.28282 at 83.85001
YMAX = 21.98301 at 79.20000



DISPLACEMENT * INCHES

TEST NO. CL5302

DUMMY DATA

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

HEAD INJURY CRITERION
HEAD SEVERITY INDEX
35MS. MAXIMUM DURATION

NHTSA CRASH TEST - PROC. 208

PUN= 358

POS#1 HEAD R

HIC= 275.4 FROM T1= .07110 TO T2= .10710

AVERAGE ACCELERATION BETWEEN T1 AND T2= 75 G'S

EVENT TIME= 300.0 MSEC

SEVERITY INDEX= 431.8

UDS\$958-1.DAT

29.50 mph

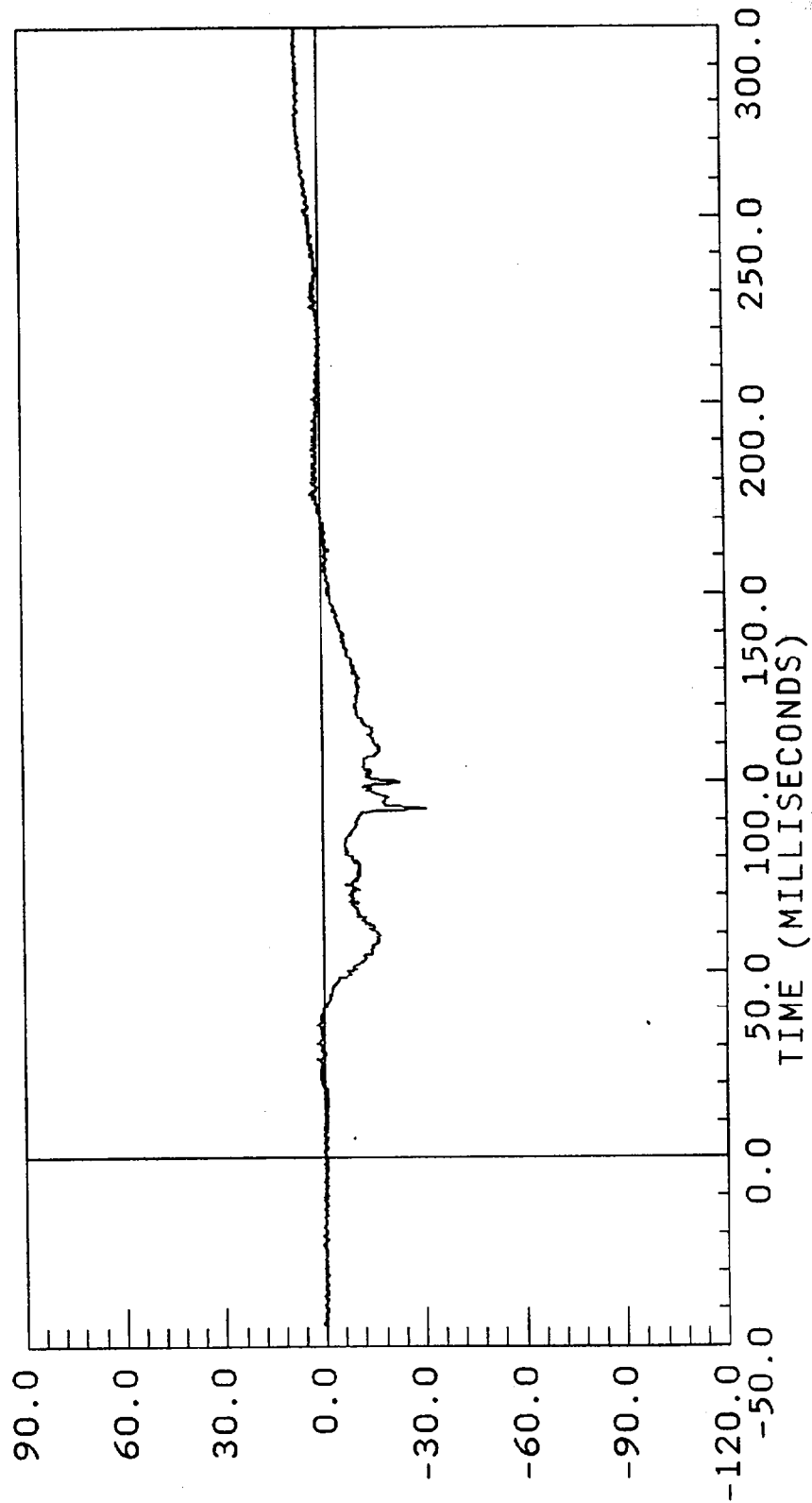
POS#1 HEAD X

XL AXIS

YMIN = -30.88600 at 93.000000

YMAX = 7.583300 at 293.5500

FILTER CUTOFF: 0Hz



ACCELERATION * G, S *

0.00 mph

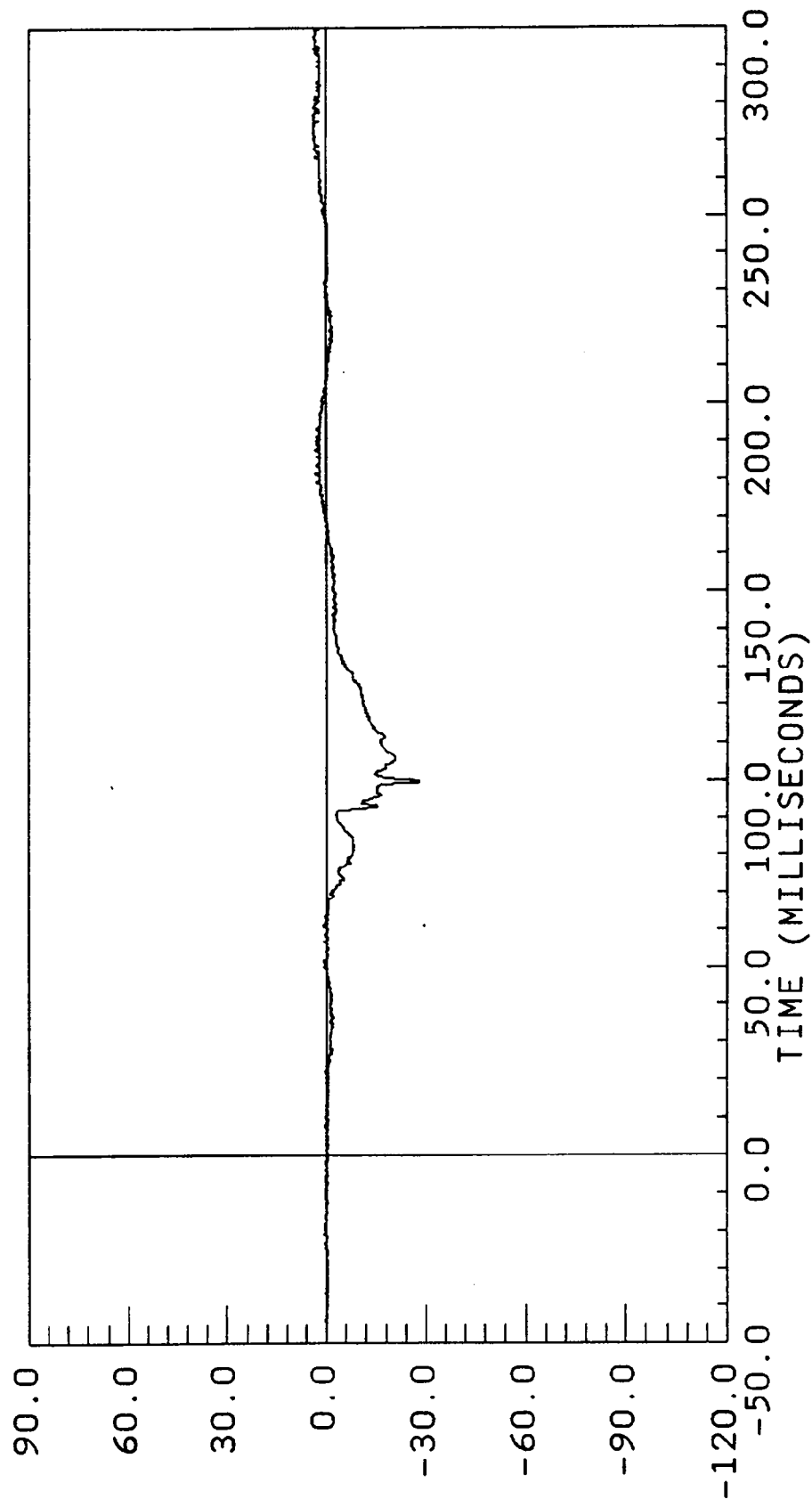
POS#1 HEAD Y

YL AXIS

YMIN = -28.27600 at 99.82500

YMAX = 3.931000 at 270.6000

FILTER CUTOFF: 0Hz



ACCELERATION * G, S *

UDS\$958-3.DAT

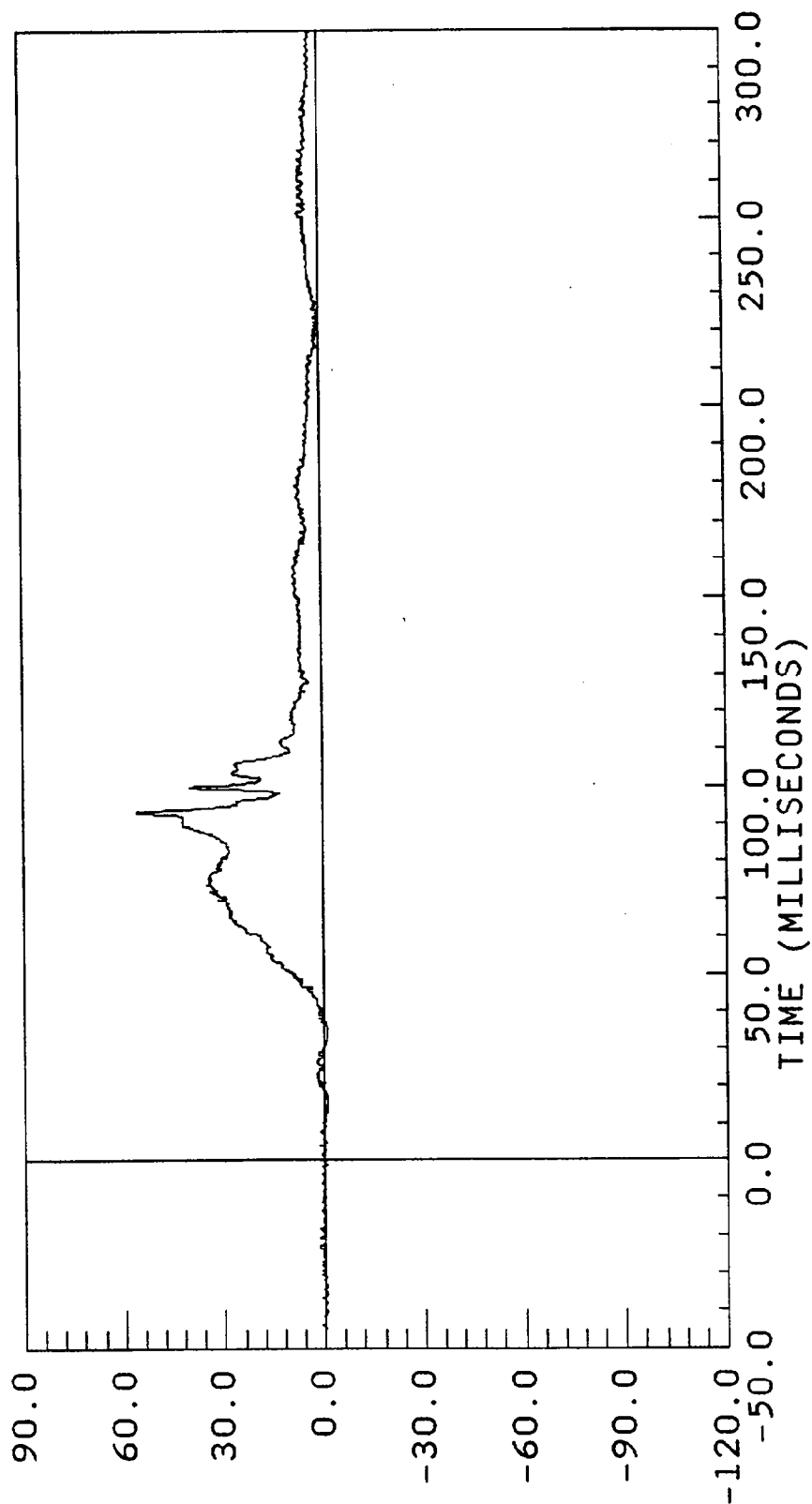
0.00 mph

POS#1 HEAD Z

ZL AXIS

YMIN = -.0157400 at -40.35000
YMAX = 55.77200 at 92.92500

FILTER CUTOFF: 0HZ



ACCELERATION * G, S *
B-28 7804-6

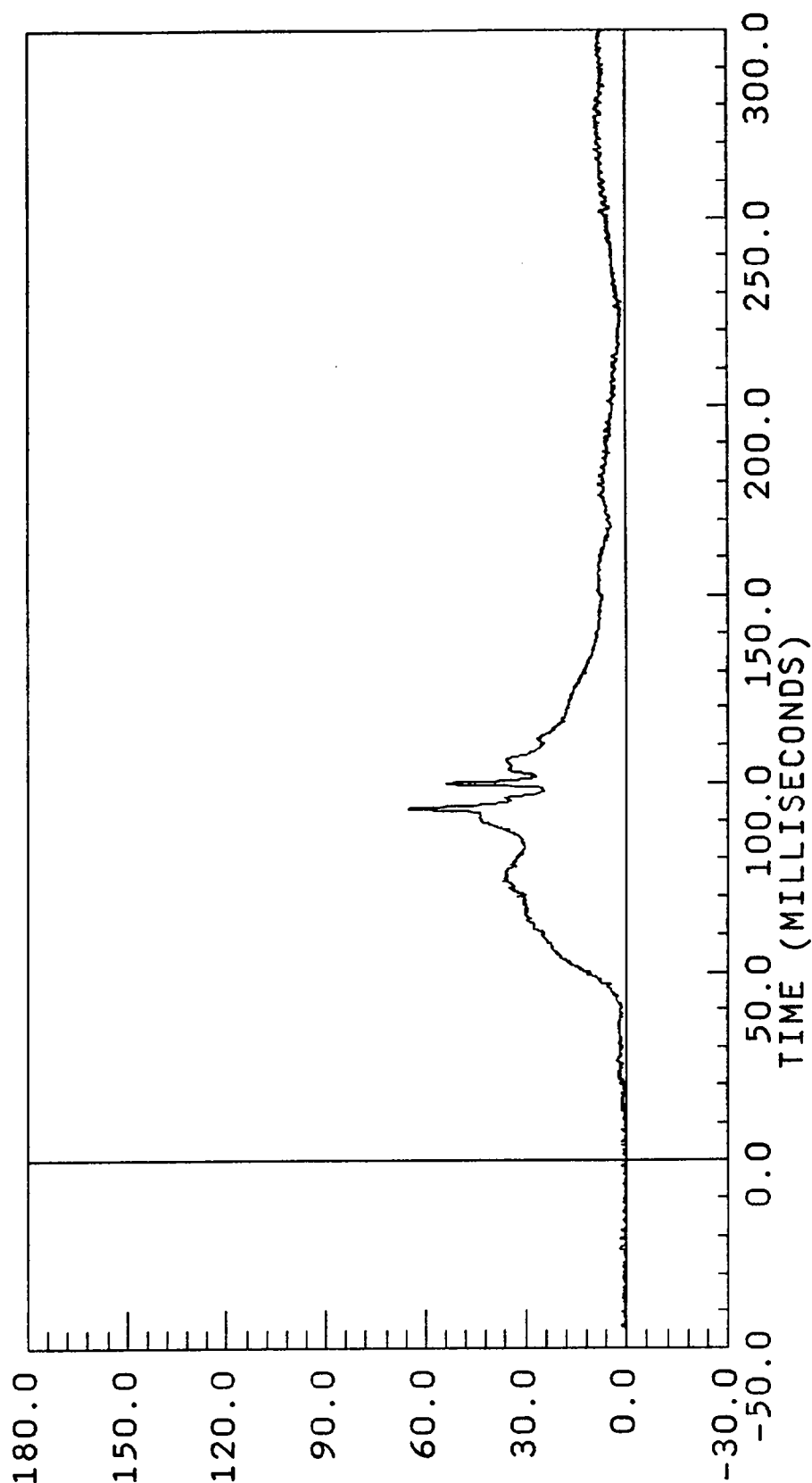
0.00 mph

POS#1 HEAD
NONSTANDARD
FILTER CUTOFF:

RS AXIS

YMIN = 0.297727 at -44.85000
YMAX = 65.50844 at 93.00000

OHZ



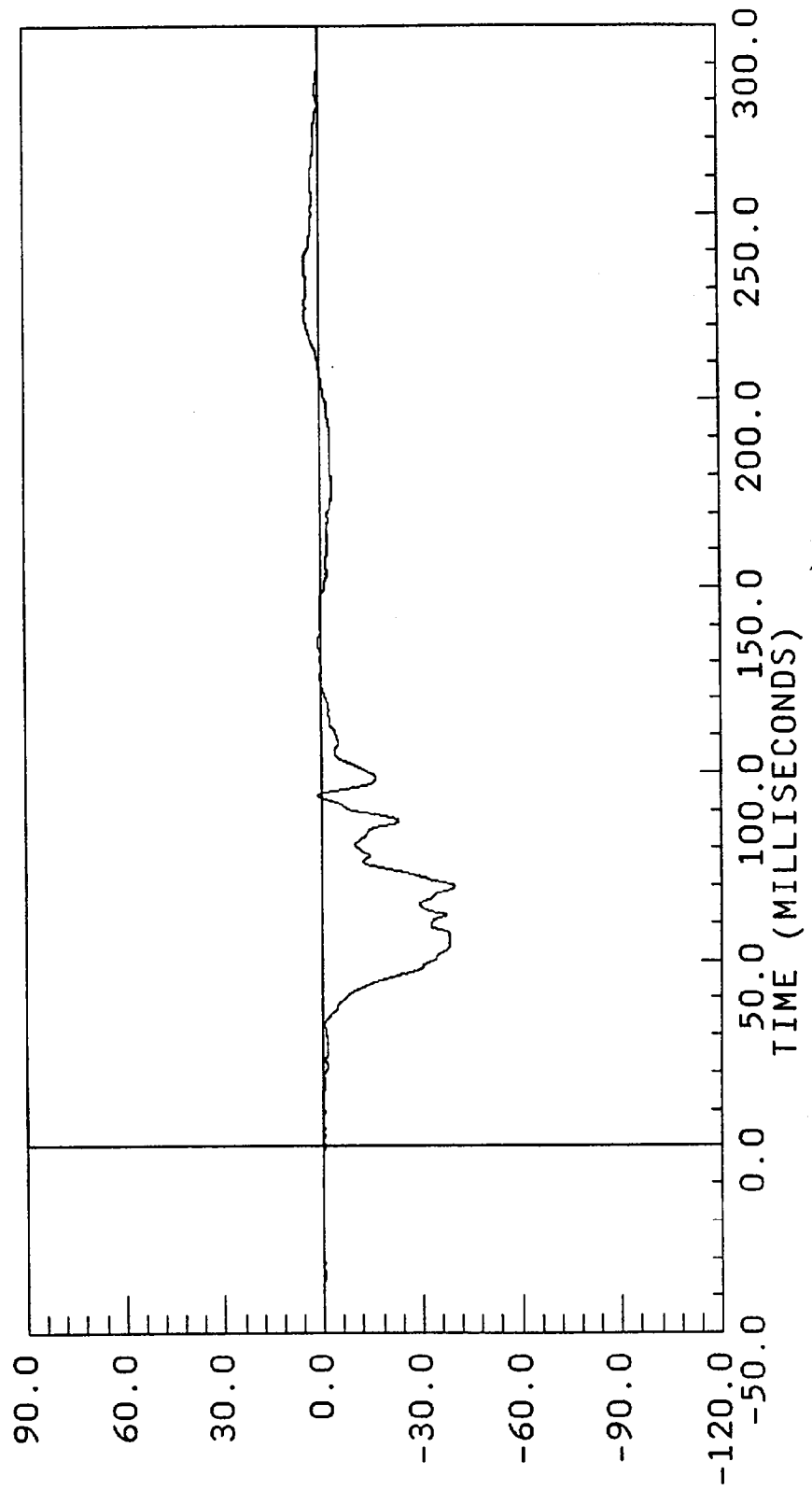
ACCELERATION * G, S *

BW958-4.DAT

29.50 mph

POS#1 CHEST X
FILTERED
FILTER CUTOFF: 300HZ

XL AXIS
YMIN = -40.02775 at 69.67500
YMAX = 4.656499 at 222.9000



ACCELERATION * G * S *

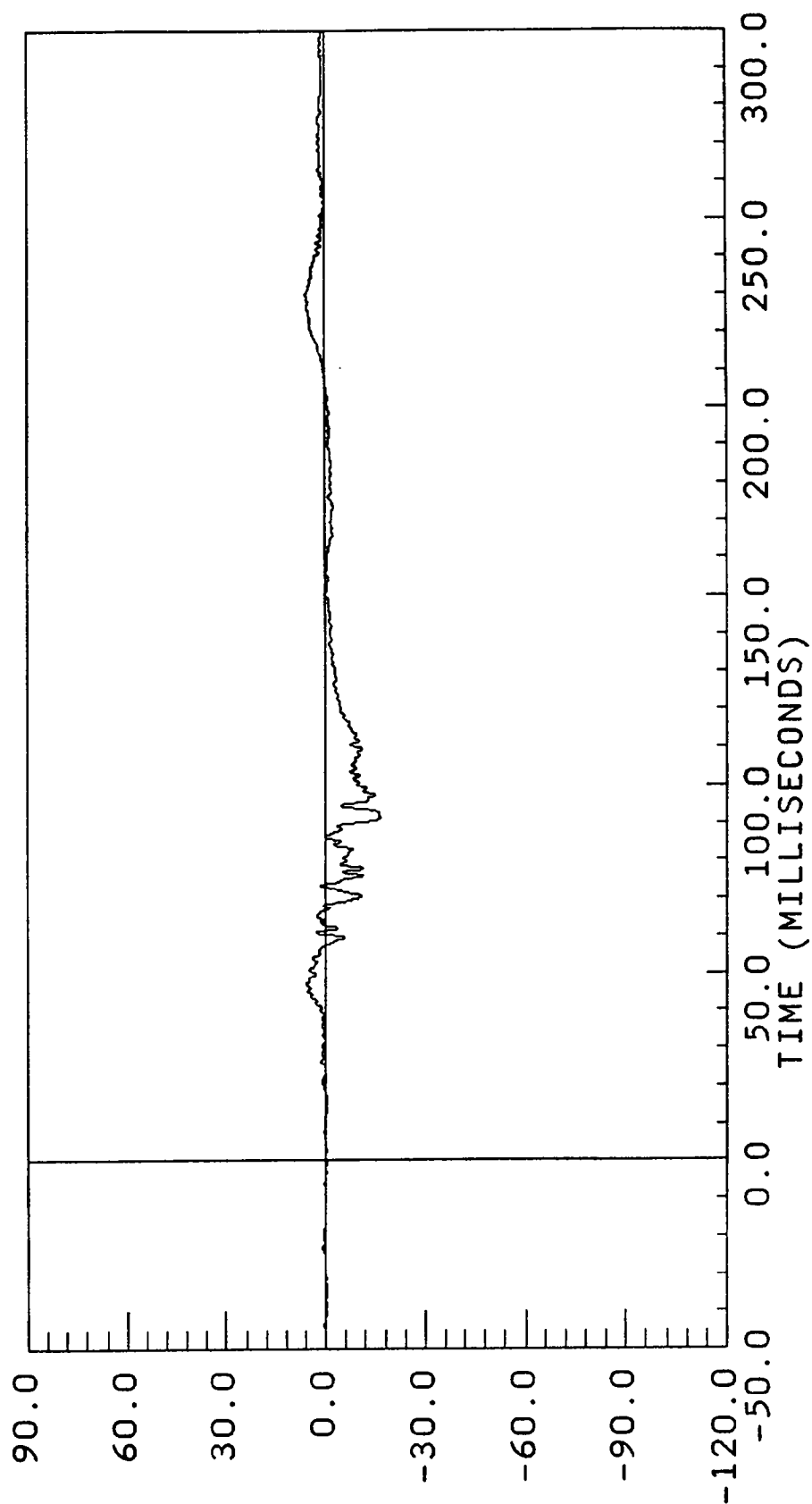
B-30

7804-6

0.00 mph

POS#1 CHEST Y
 FILTERED
 FILTER CUTOFF: 300Hz

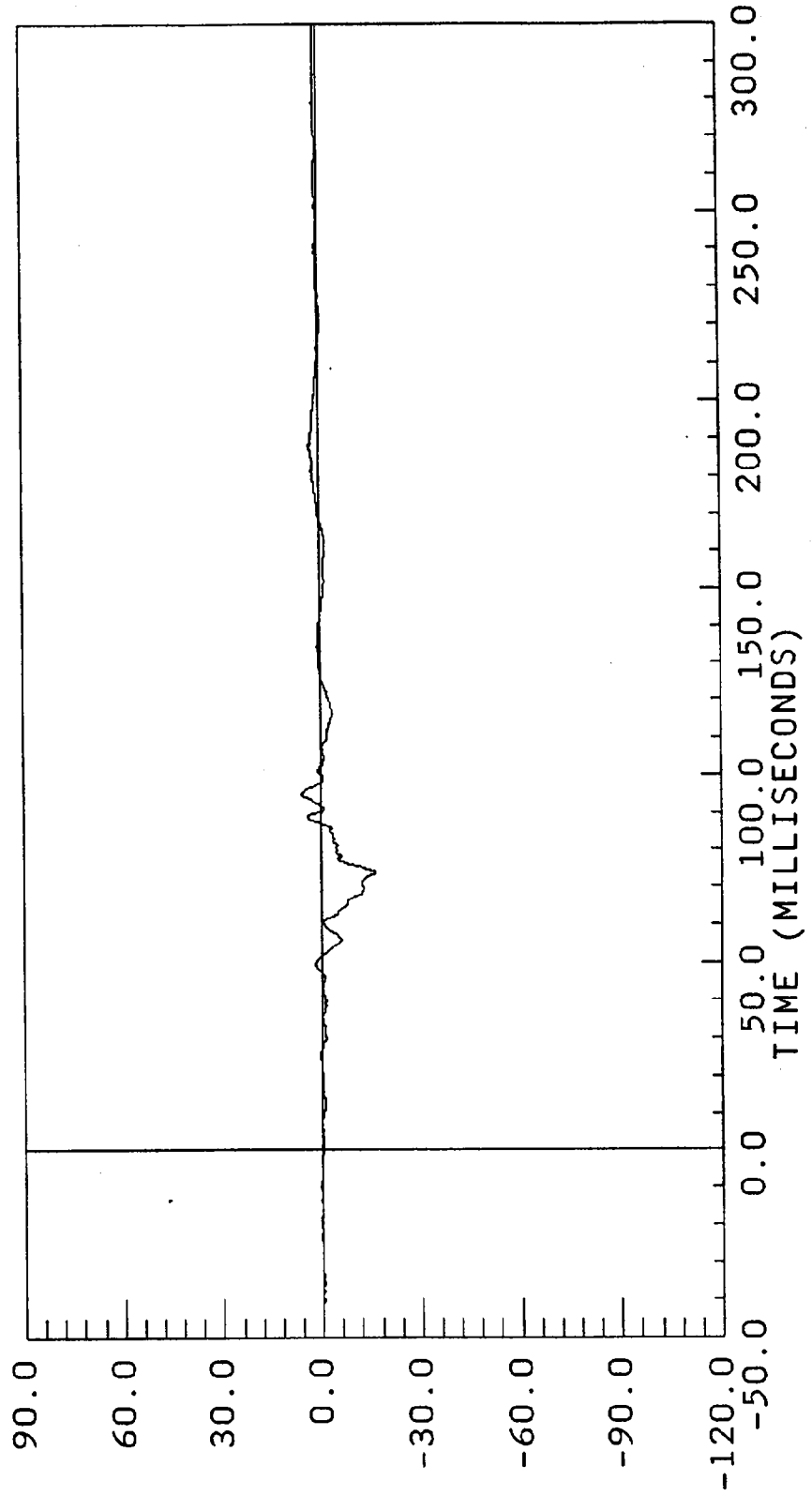
YL AXIS
 YMIN = -16.54597 at 91.42500
 YMAX = 5.918546 at 47.25000



BW958-6.DAT

0.00 mph

POS#1 CHEST Z
FILTERED
FILTER CUTOFF: 300HZ
ZL AXIS
YMIN = -16.45668 at 74.02500
YMAX = 6.074867 at 94.80000



ACCELERATION * G * S *

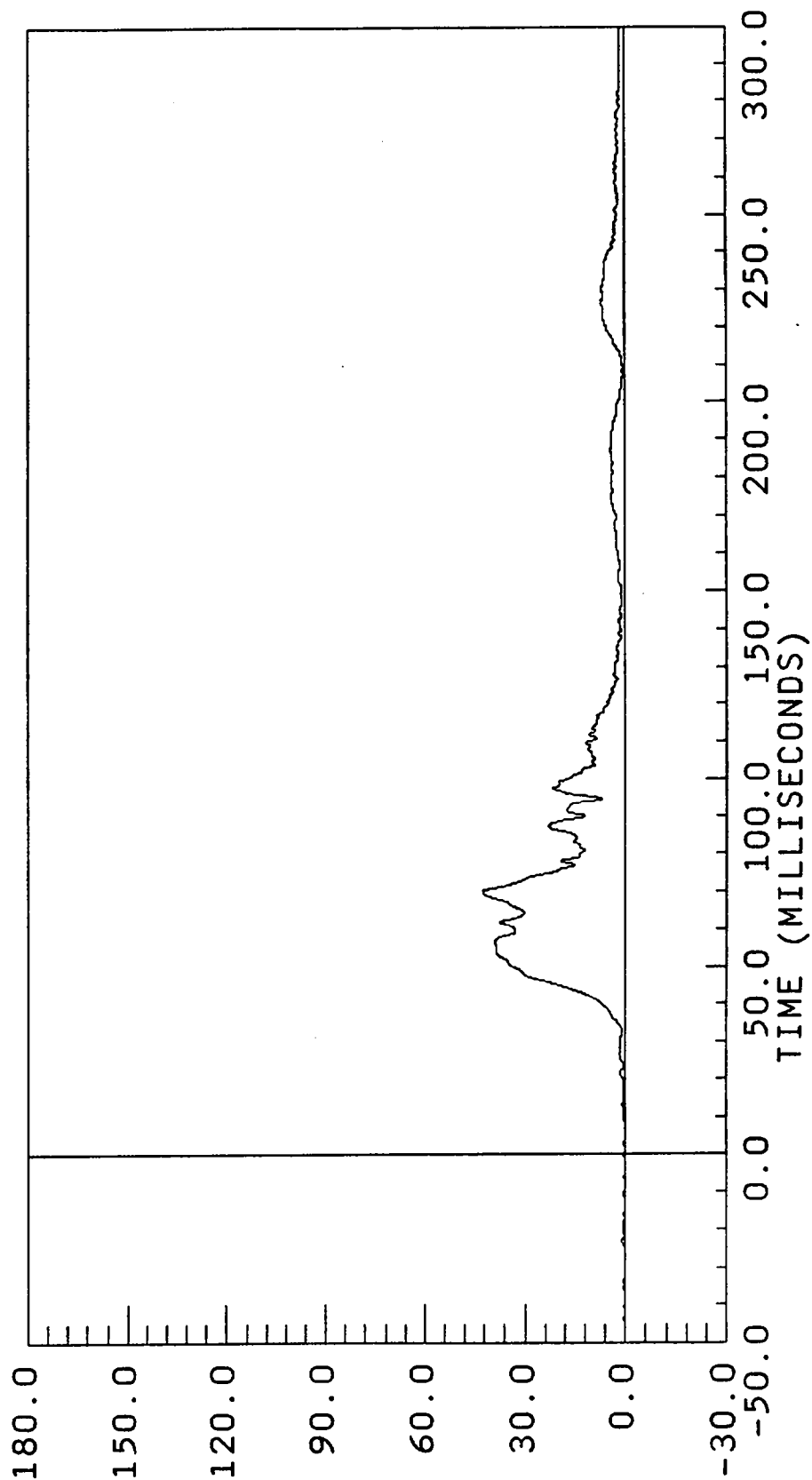
B-32

7804-6

0.00 mph

POS#1 CHEST
COMPUTED
FILTER CUTOFF: 300HZ

RS AXIS
YMIN = 0.108885 at -2.250000
YMAX = 42.69190 at 69.900000



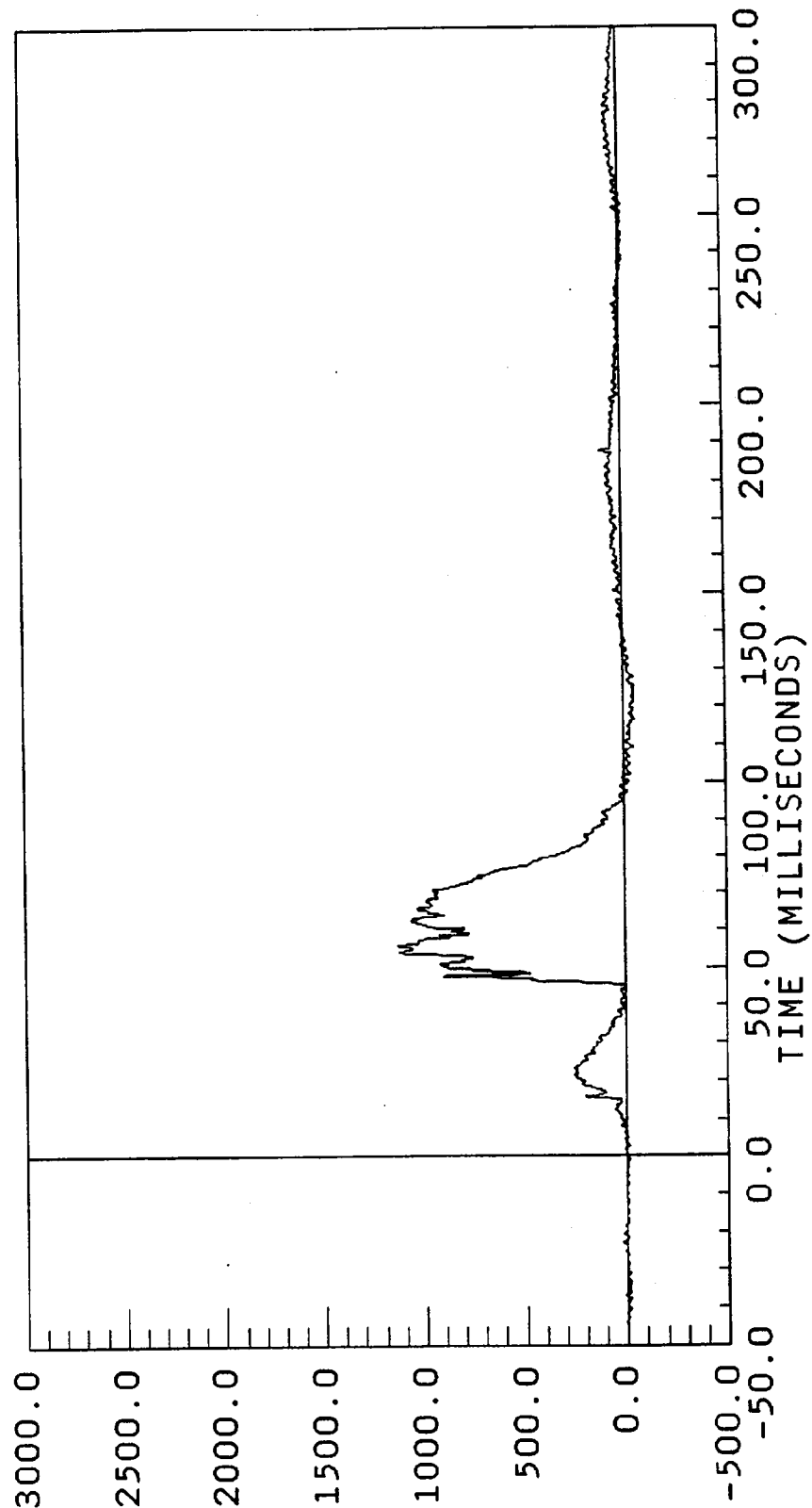
ACCELERATION * G * S *

BW958-7.DAT

0.00 mph

POS#1 LEFT FEMUR
FILTERED
FILTER CUTOFF: 1000HZ

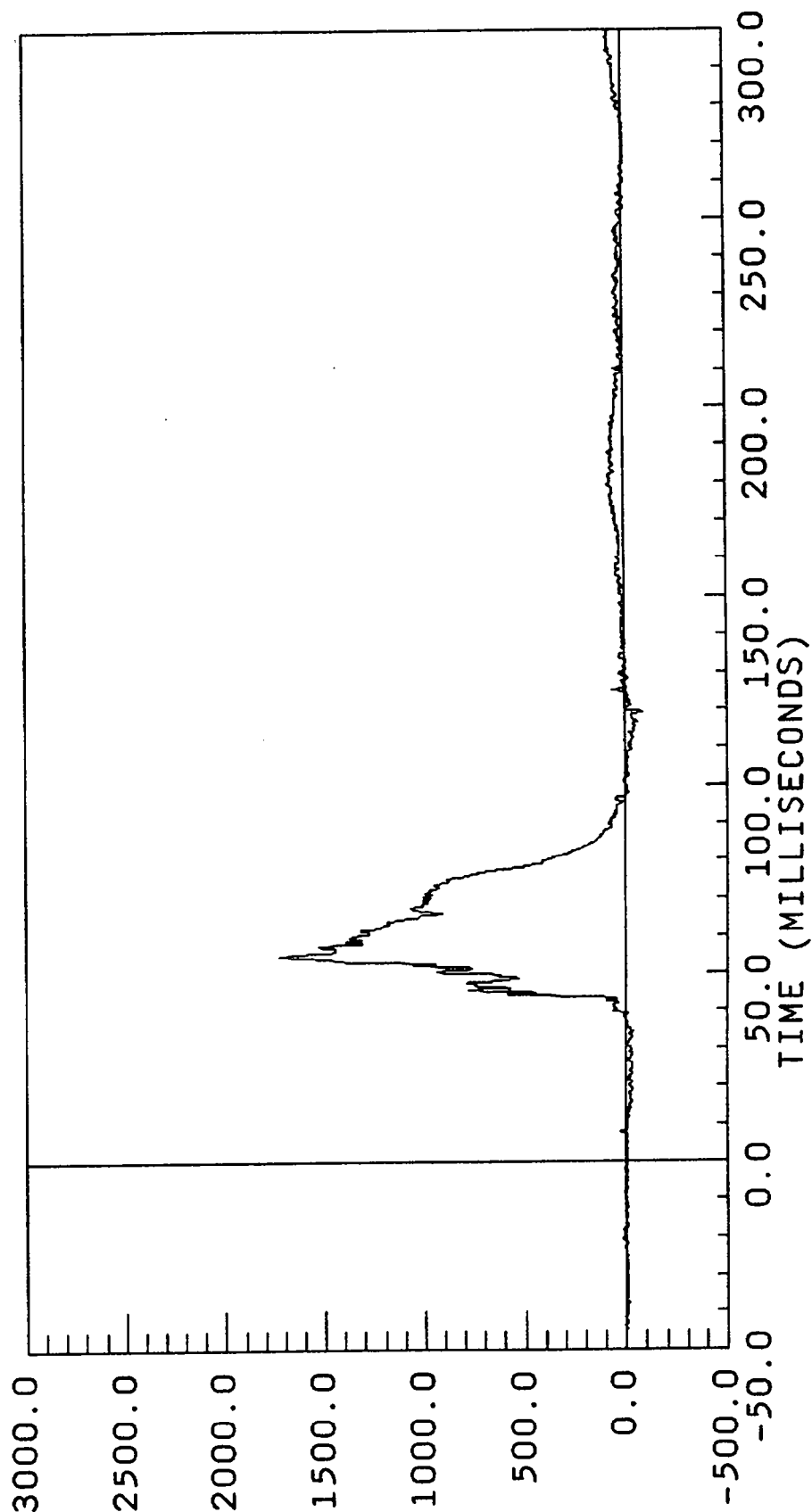
NA AXIS
YMIN = -52.52391 at 116.7750
YMAX = 1135.331 at 55.80000



* L B S *

0.00 mph

POS#1 RIGHT FEMUR
 FILTERED
 FILTER CUTOFF: 1000HZ
 NA AXIS
 YMIN = -91.01138 at 119.3250
 YMAX = 1728.907 at 54.60000



F O R C E * L B S *

HEAD INJURY CRITERION
HEAD SEVERITY INDEX
36MS. MAXIMUM DURATION

NHTSA CRASH TEST - PROC. 208

RUN= 958

POS#2 HEAD R

HIC= 517.7 FROM T1= .06390 TO T2= .09990
AVERAGE ACCELERATION BETWEEN T1 AND T2= 46.0G'S
EVENT TIME= 300.0 MSEC
SEVERITY INDEX= 811.7

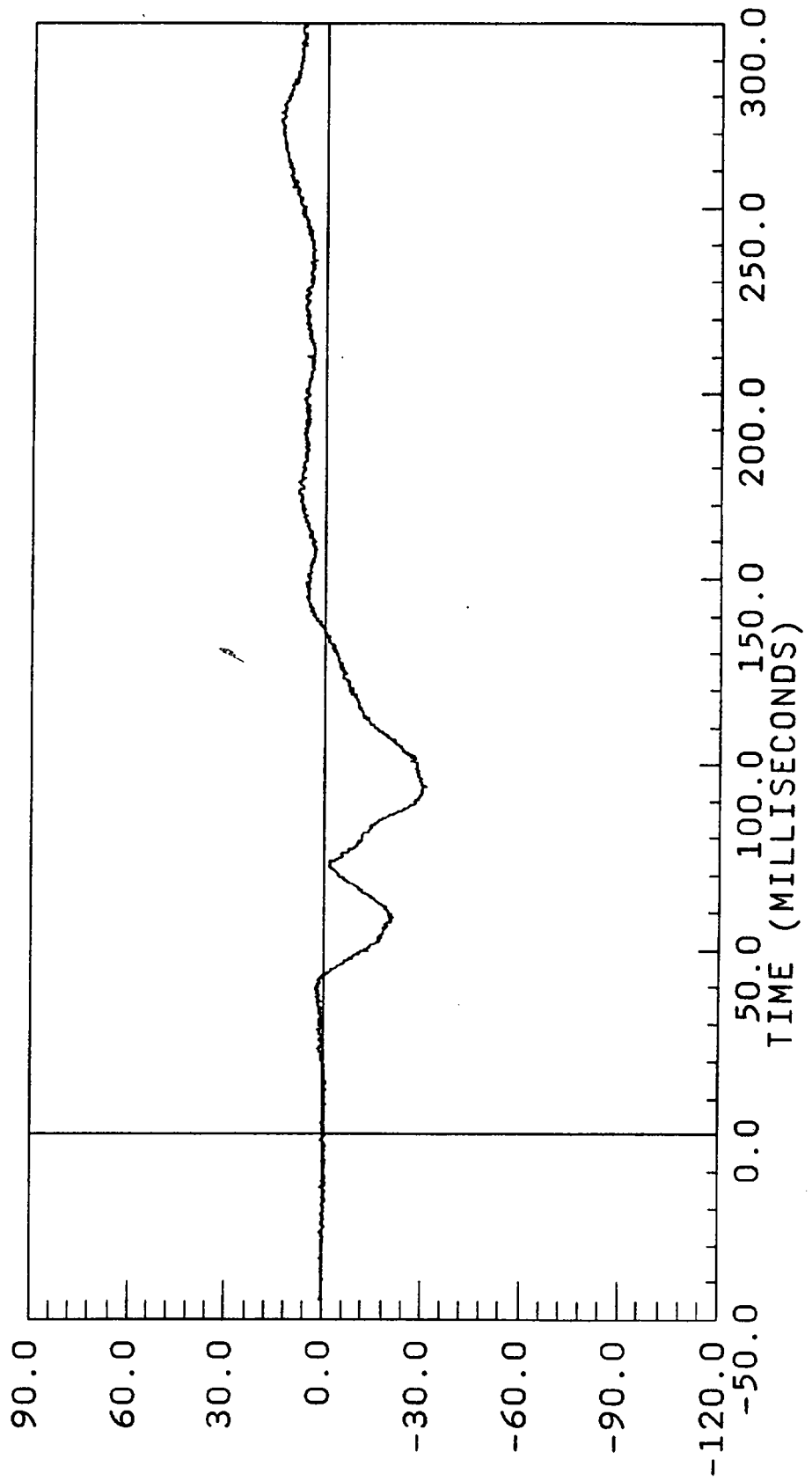
29.50 mph

POS#2 HEAD X

XL AXIS

YMIN = -31.42900 at 93.97501
YMAX = 14.27500 at 273.0750

FILTER CUTOFF: OHZ

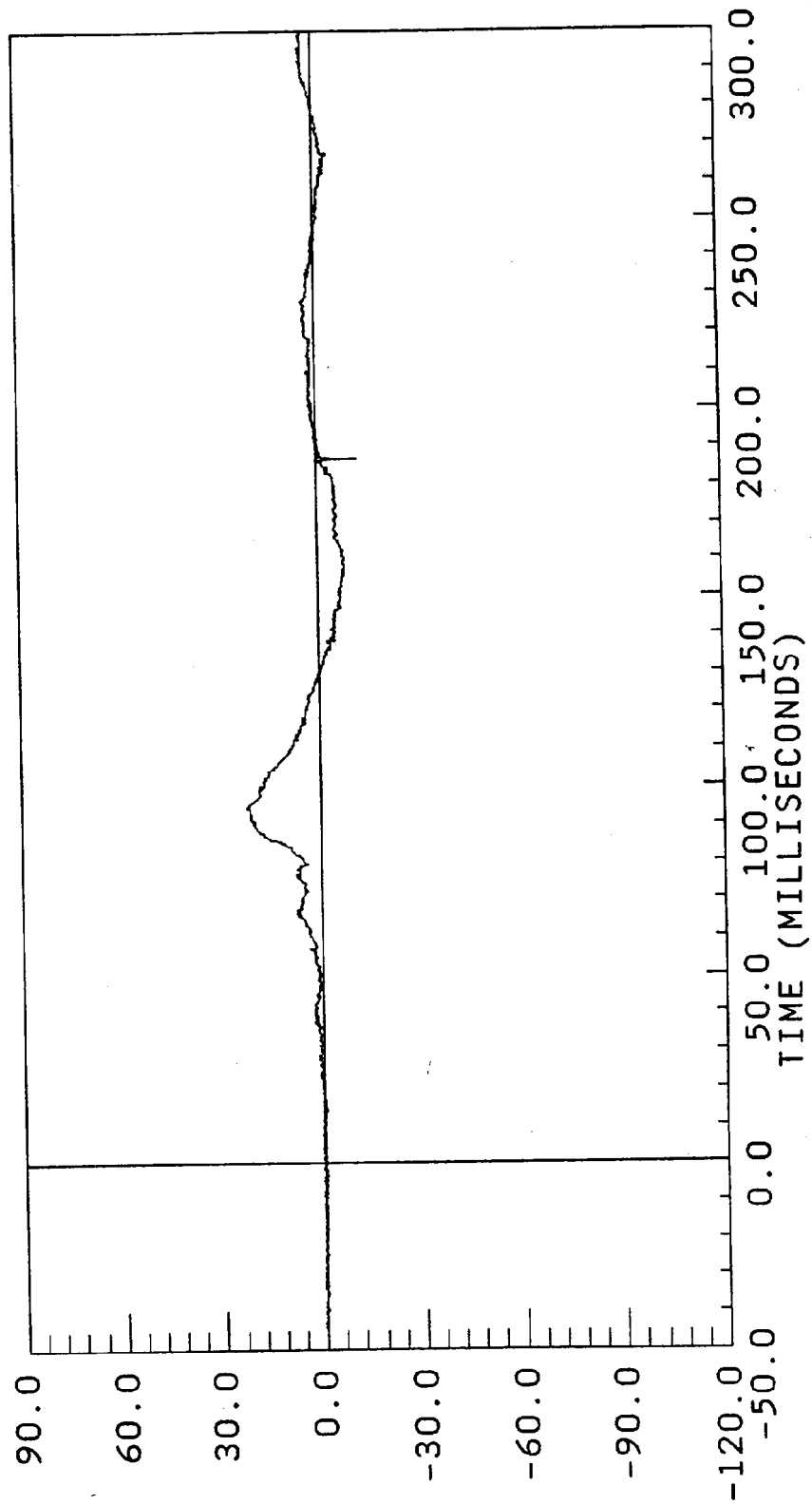


ACCELERATION * G, S *

UDS\$958-12.DA

0.00 mph

POS#2 HEAD Y. YL AXIS
YMIN = -12.43300 at 186.9750
YMAX = 22.24700 at 94.42500
FILTER CUTOFF: 0Hz



ACCELERATION * G, S *

B-38

7804-6

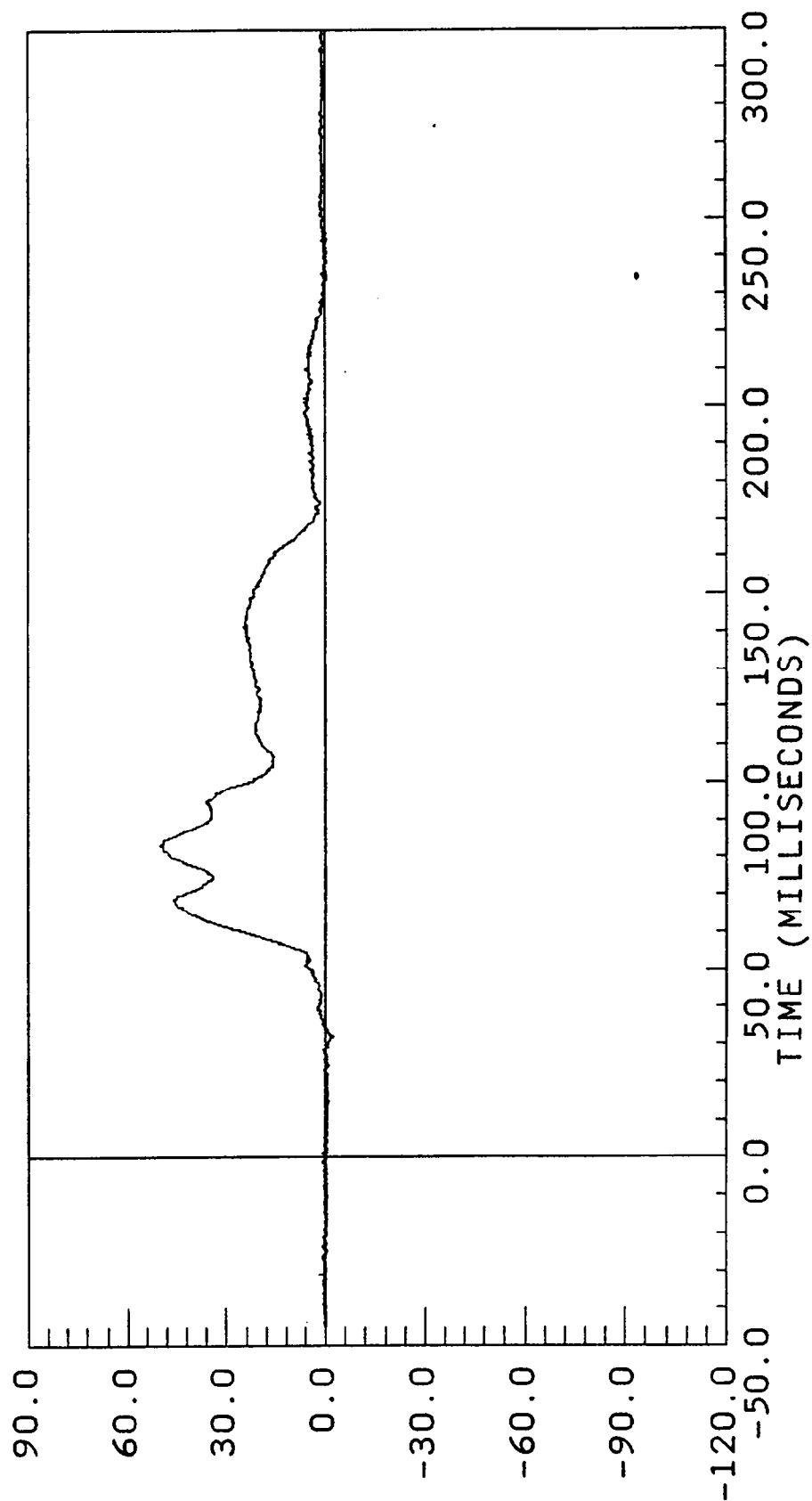
0.00 mph

POS#2 HEAD Z

ZL AXIS

YMIN = -2.434000 at 31.65000
YMAX = 49.82800 at 83.25000

FILTER CUTOFF: 0Hz

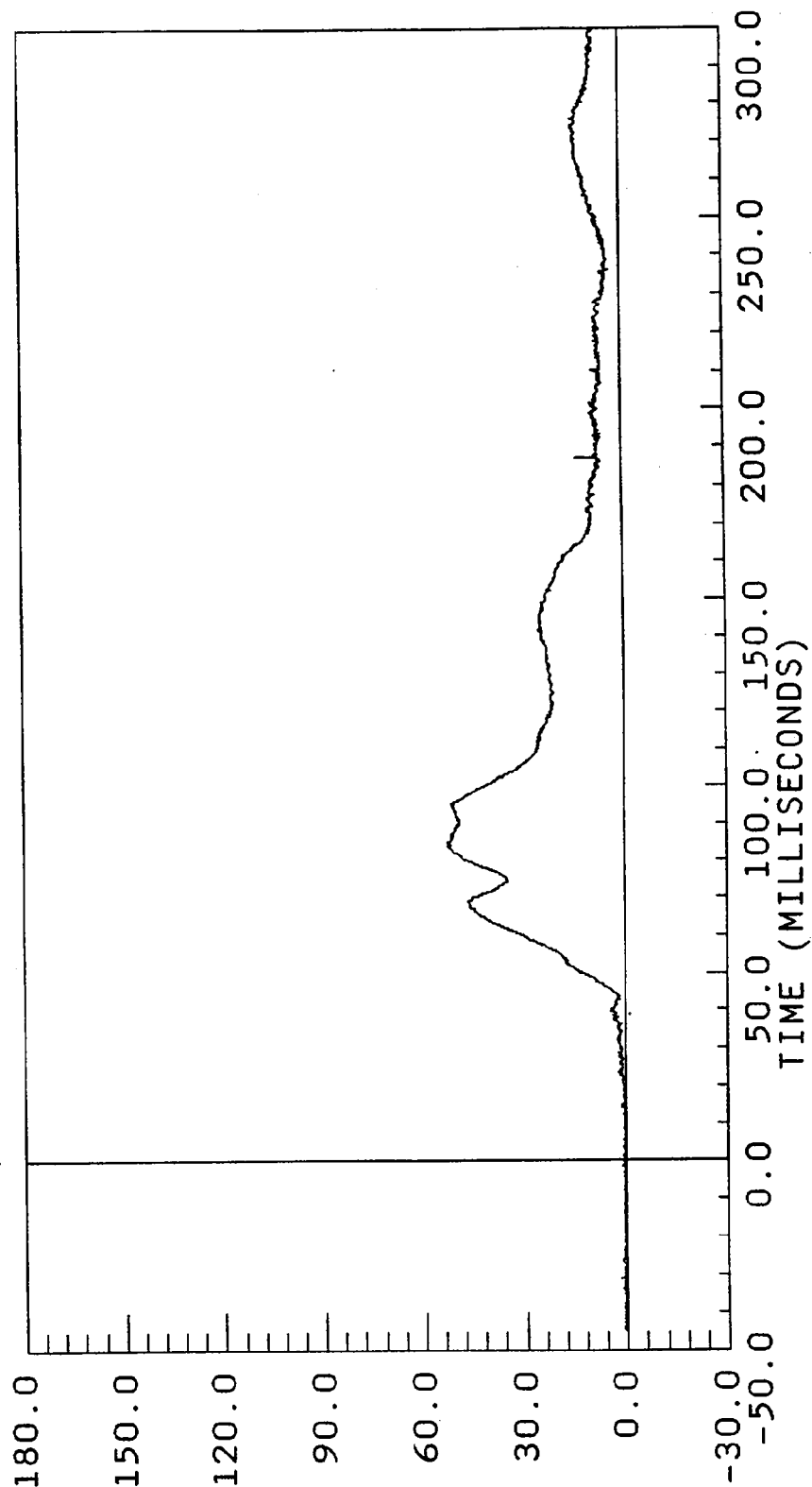


ACCELERATION * G *

HRES958-2.DAT

0.00 mph

POS#2 HEAD RS AXIS
NONSTANDARD YMIN = 1.275222 at -44.62500
FILTER CUTOFF: 0HZ YMAX = 52.82503 at 83.47501

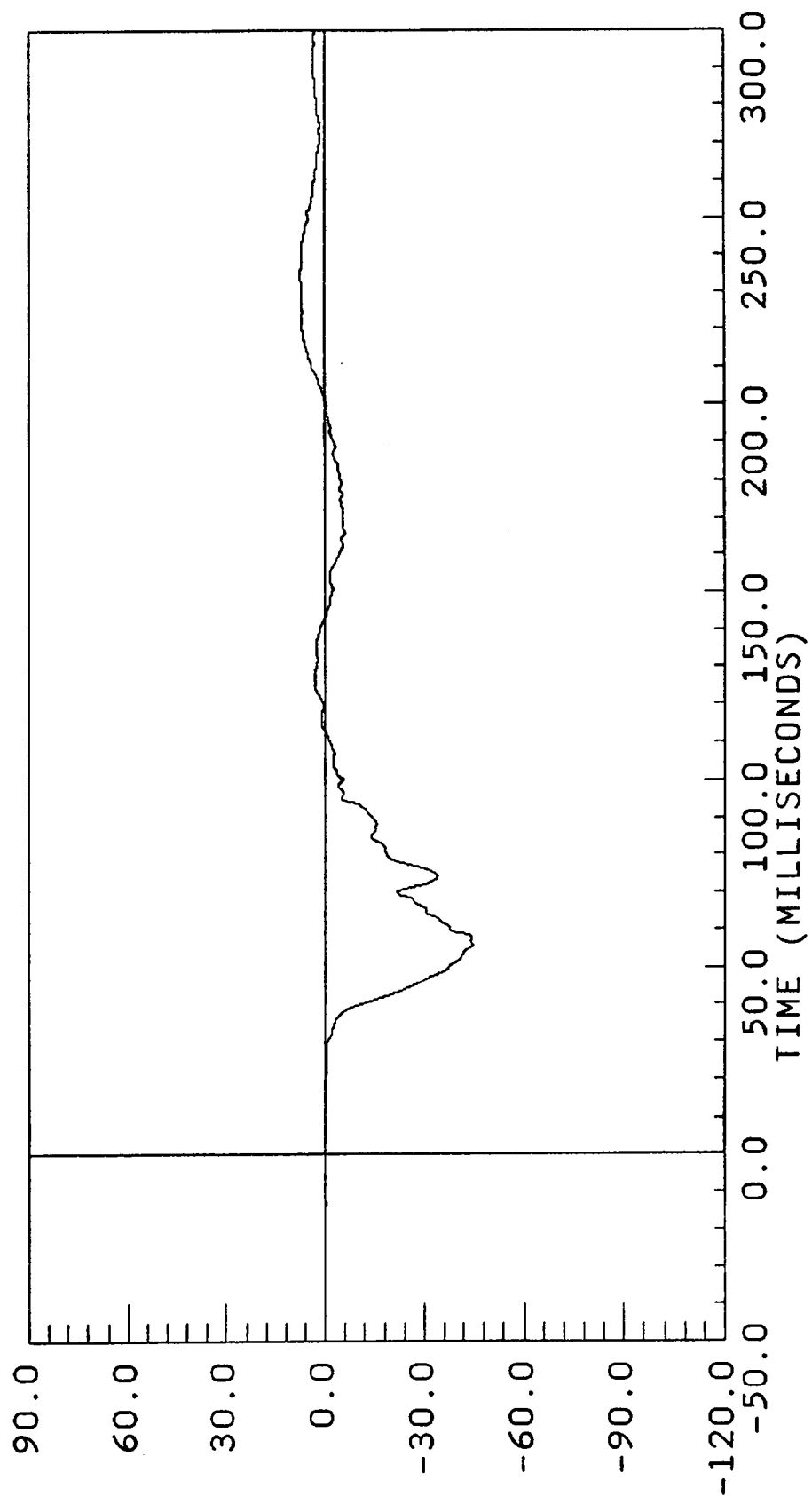


ACCELERATION * G, S *
B-40 7804-6

29.50 mph

POS#2 CHEST X
 FILTERED
 FILTER CUTOFF: 300Hz

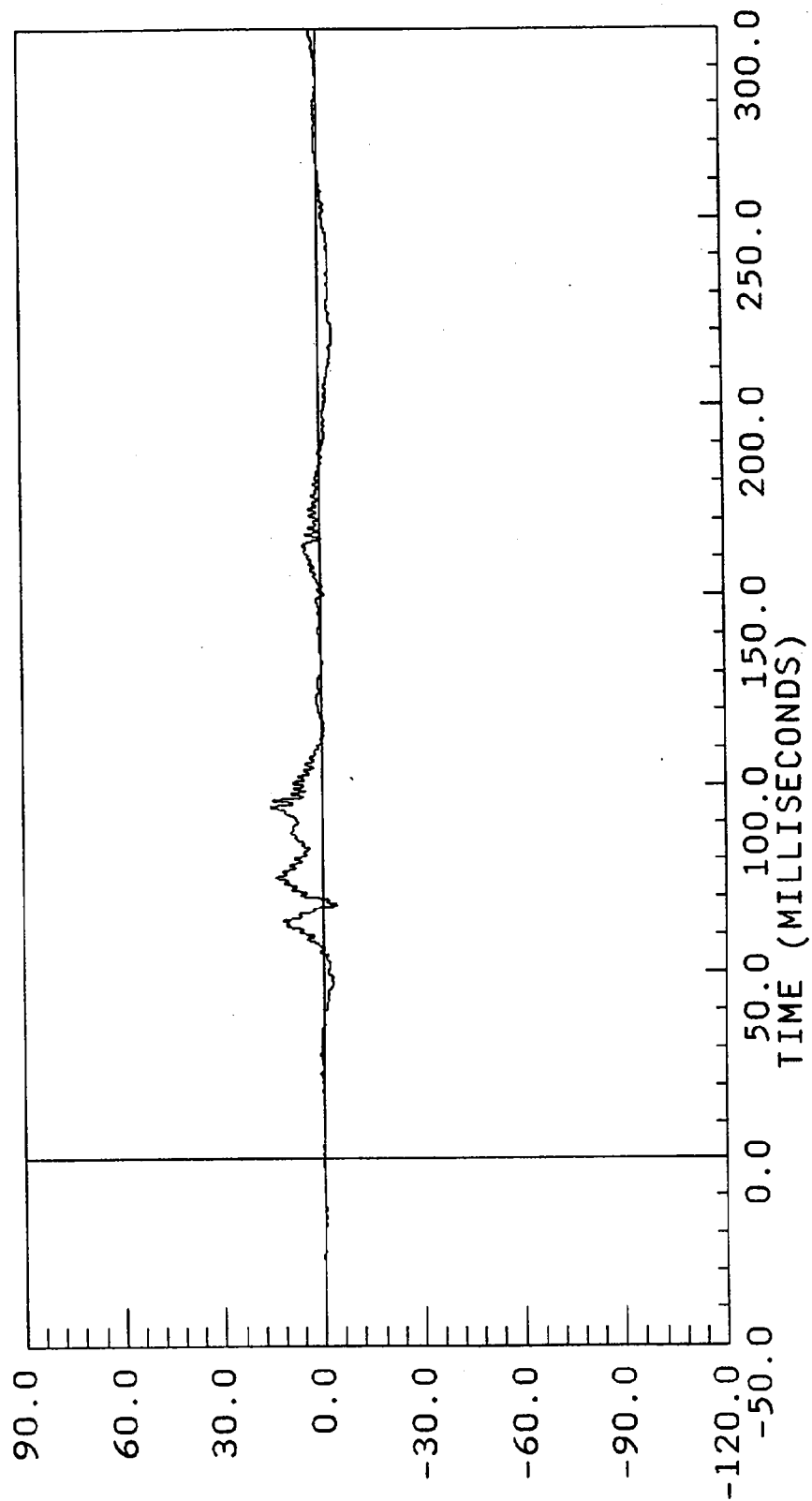
XL AXIS
 YMIN = -44.73620 at 55.87500
 YMAX = 7.543428 at 235.3500



BW958-15.DAT

0.00 mph

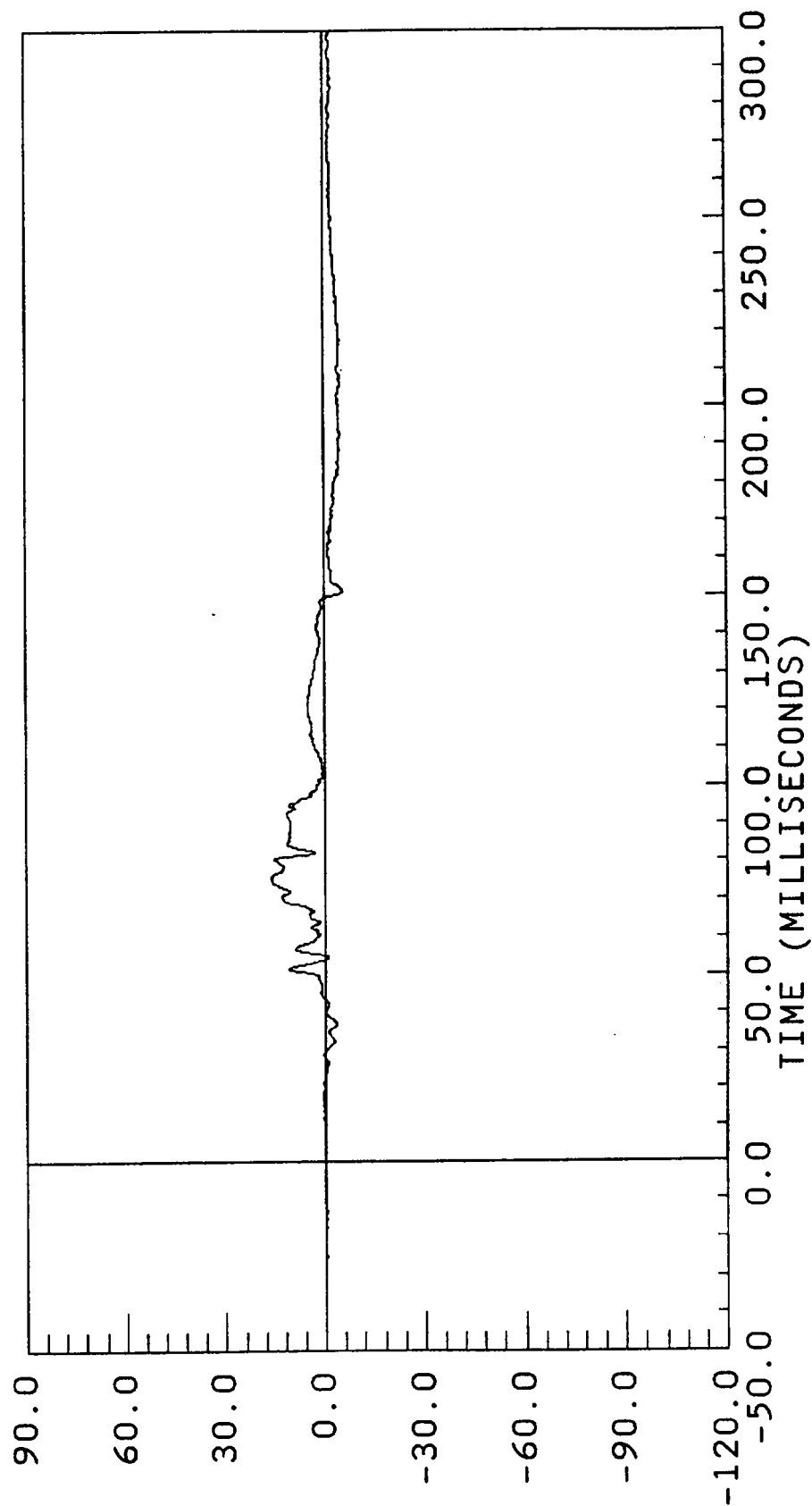
POS#2 CHEST Y
FILTERED
FILTER CUTOFF: 300HZ
YL AXIS
YMIN = -4.219976 at 67.95000
YMAX = 15.66285 at 94.05000



ACCELERATION * G, S *

0.00 mph

POS#2 CHEST Z
 FILTERED
 FILTER CUTOFF: 300Hz
 ZL AXIS
 YMIN = -5.396643 at 151.2000
 YMAX = 16.20813 at 75.60001

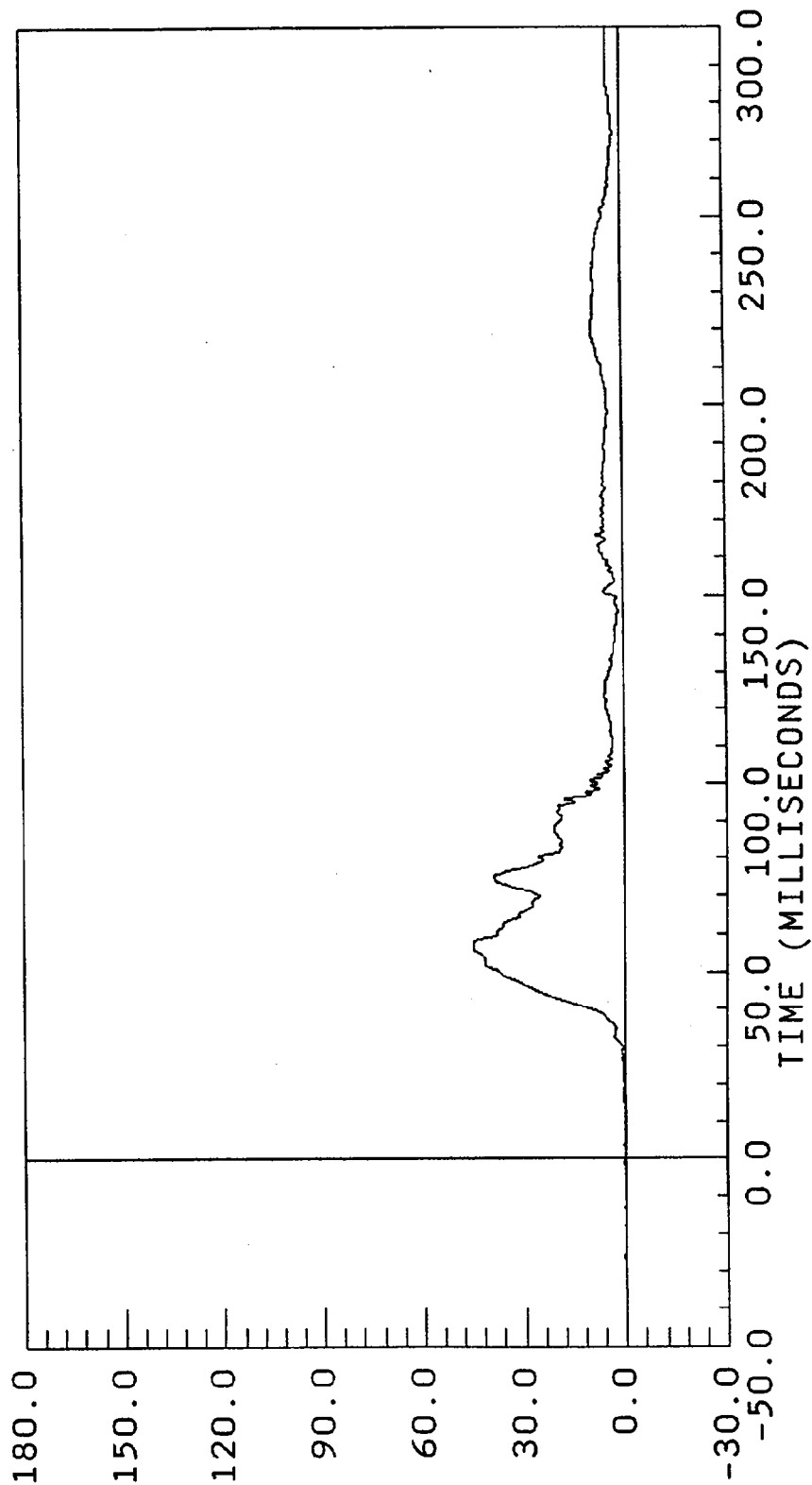


ACCELERATION * G * S *

CHST958-2.DAT

0.00 mph

POS#2 CHEST
COMPUTED
FILTER CUTOFF: 300Hz
RS AXIS
YMIN = 0.0554621 at 151.2000
YMAX = 45.19100 at 56.17500

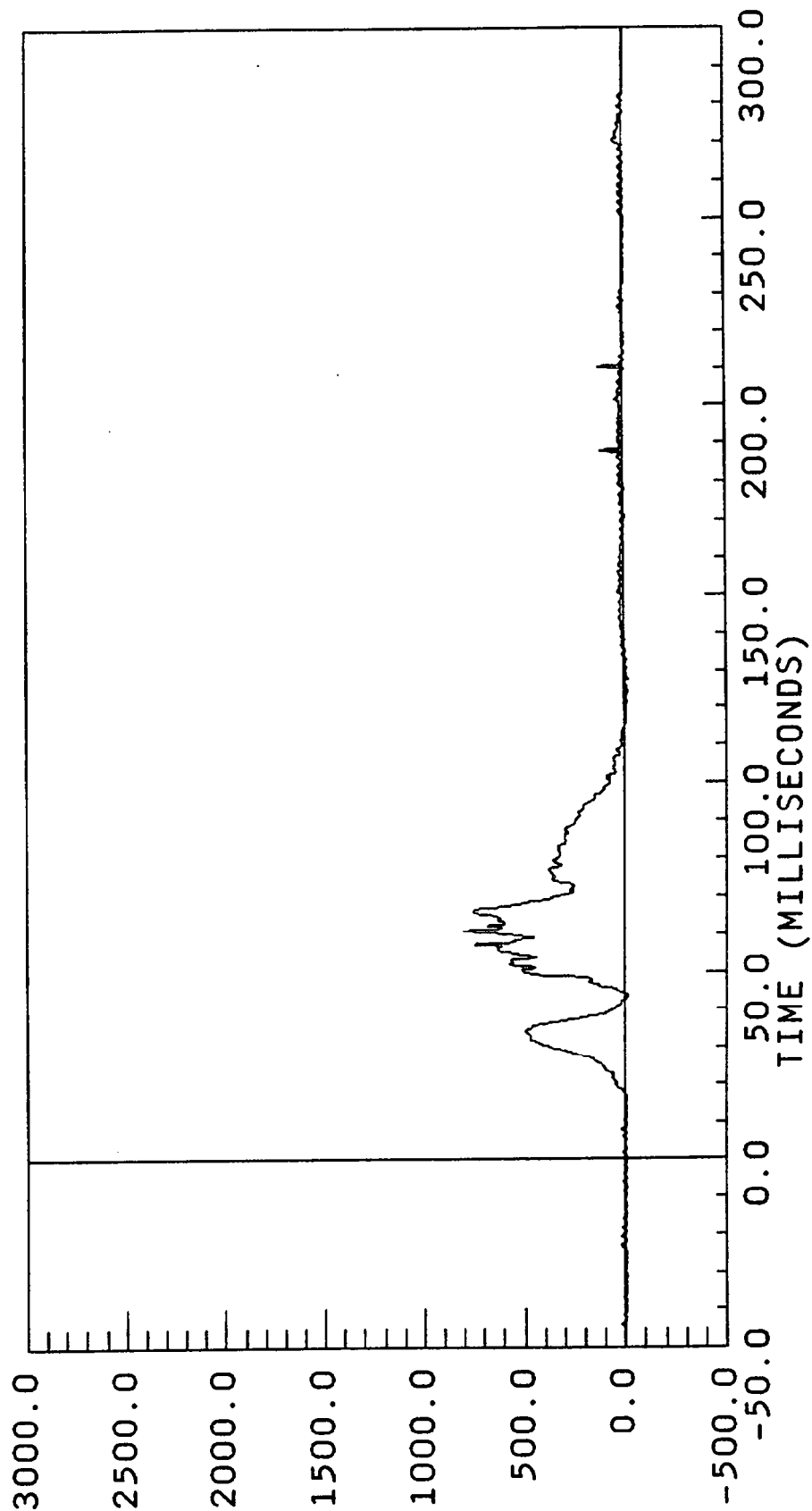


ACCELERATION * G, S

0.00 mph

POS#2 LEFT FEMUR
 FILTERED
 FILTER CUTOFF: 1000Hz

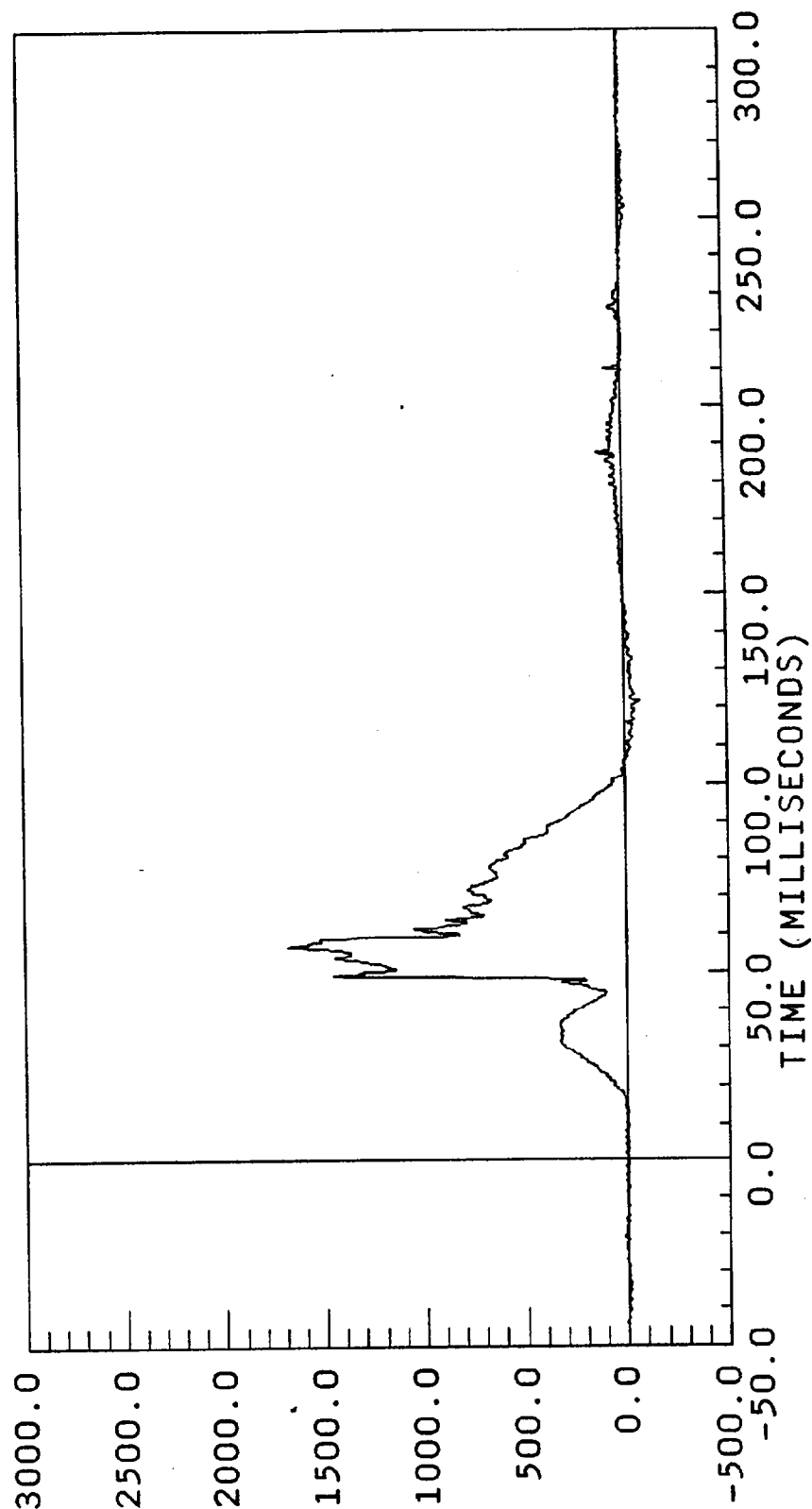
NA AXIS
 YMIN = -18.43023 at 127.8000
 YMAX = 805.3097 at 60.82500



BW958-10.DAT

0.00 mph

POS#2 RIGHT FEMUR
FILTERED
FILTER CUTOFF: 1000Hz
NA AXIS
YMIN = -70.38421 at 121.5750
YMAX = 1691.558 at 56.92500



Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

Seat Belts

Your Acura automobile is provided with seat belts to minimize the chance of injury to yourself and your passengers in a sudden stop or accident. The automatic shoulder belts and lap/shoulder belts are designed to be worn by adults and children over 140 cm (4 ft 7 in) tall. See pages 15 and 16 for precautions on using seat belts for children under 140 cm (4 ft 7 in) tall, babies, and pregnant women. Seat belts are most effective when the driver and passengers are sitting up straight and well back in their seats.

WARNING Make sure you and your passengers **ALWAYS** put on your seat belts before driving away.

CAUTION: Do not let the belts become damaged by a door or seat.

Front Seat Belts

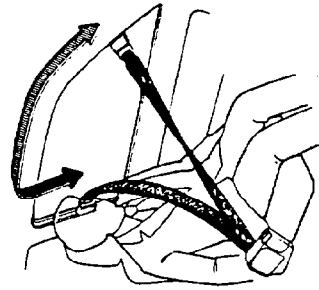
The front seats have an automatic ("passive") restraint system consisting of a shoulder belt, and a knee bolster, as well as a manual lap belt. The belts have emergency locking retractors designed to lock only during a sudden stop or impact. Otherwise, they allow you some freedom of movement in the seat.

Always wear the lap belt in addition to the shoulder belt for full protection. The shoulder belt portion should remain permanently latched.

Operation

1. Enter the car and close the door completely. Move the seat a comfortable distance from the steering wheel, sit as straight up as possible and well back in the seat.

2. Turn the ignition ON. The shoulder belt buckle will move to its rear locked position. The length of the shoulder belt will adjust automatically to your body and seating position.



Seat Belts (cont'd)

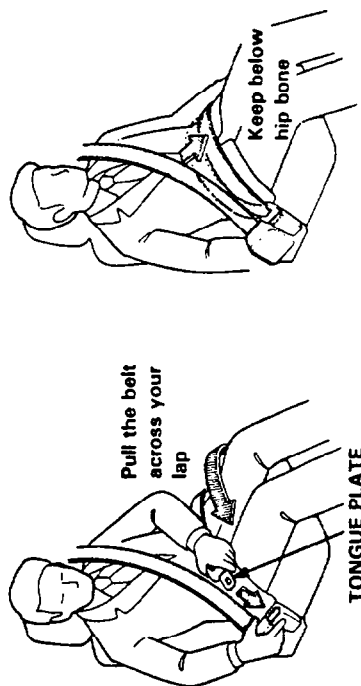
WARNING Normal movement of the shoulder belt buckle may cause injury. Be sure all parts of your body, especially fingers and hands, are clear of the shoulder buckle while it is moving.

NOTE:

- If the door is not closed completely, the shoulder belt buckle will not move and the door warning light will come on (see page 21).
 - If the door is opened with the ignition on, the buckle will release itself from its locked position and move forward.
 - If the shoulder belt buckle stops halfway or does not move at all, see page 117 for shoulder belt buckle operation.
3. Take hold of the tongue plate of the lap belt and pull it from its retractor. Be sure the belt is not twisted or caught on anything.

NOTE: If pulled too fast, the belt will lock. If this happens, allow the belt to retract then pull it out more slowly.

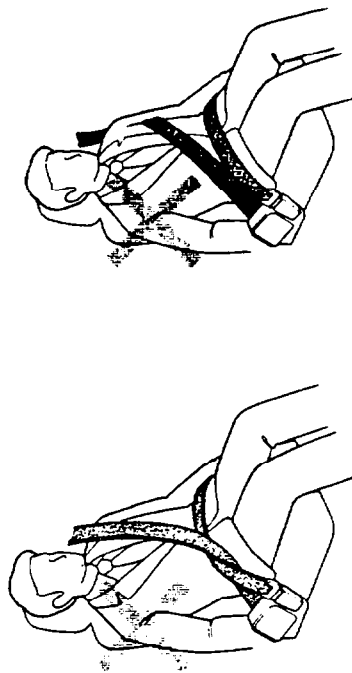
4. Push the tongue plate into the buckle until it clicks locked. Position the belt across your lap, not your abdomen, as low on your hips as possible.



WARNING

- Avoid placing the lap belt across your abdomen. In the event of a collision, the pressure of the belt on the abdomen may increase the extent of injury.
- Never use one belt for more than one person, child or adult.
- Comfort clips sold on the open market are not recommended since they could impair the function and safety of the belts.

- Make sure the strap of the shoulder belt and the lap belt are not crossed.
- Do not wear the shoulder portion of the belt under your arm or out of position. Such use could increase the chance and amount of injury in an accident.

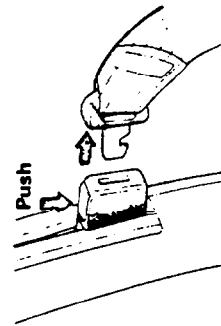


Releasing the Seat Belts

1. To release the manual lap belt, push the "PRESS" button in the buckle, the belt should retract automatically when released.
2. The driver's shoulder belt buckle will release and travel to its off position when the key is removed from the ignition.
3. The shoulder belt buckle will also release and travel to its off position when the door is opened.

Emergency Belt Release

The shoulder belt should always remain buckled. In case of an emergency, however, the shoulder belt can be released from the shoulder belt buckle by pushing the button.



Relatch the shoulder belt before operating the car, making sure the belt is not twisted.

WARNING

Driving with a twisted seat belt can increase your chance and extent of injury during a collision. Be sure the shoulder belt is not twisted before driving the car. (cont'd)

Seat Belts (cont'd)

Buckling the Rear Seat Combination Lap/Shoulder Belts

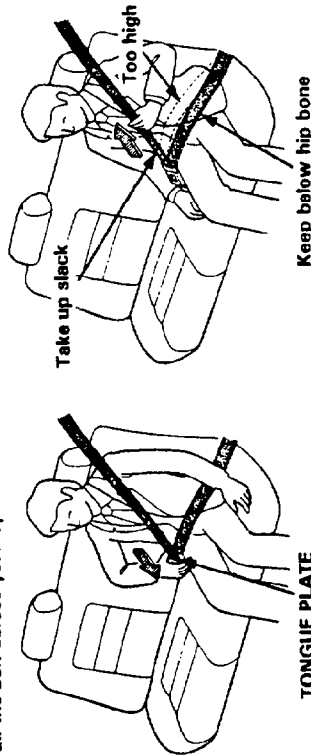
In the rear seat, there are two one-piece combination lap/shoulder belts and a center lap belt. The seat-backs and seat belts provide best restraint when the occupant is sitting well back and straight up in the seat.

The combination lap/shoulder belts with emergency locking retractors are designed to lock only during a sudden stop or impact. Otherwise, they allow you some freedom of movement in the seat.

NOTE: The emergency locking system of the rear seat belts will also be activated if you pull the belt too fast. If this happens, release the belt slightly then pull it out more slowly.

1. Take hold of the tongue plate and pull the belt across your lap. Be sure the belt is not twisted or caught on anything.

Pull the belt across your lap



Keep below hip bone

2. Push the tongue plate into the buckle until it clicks locked. Position the belt across your lap as low on your hips as possible.

WARNING Avoid placing the lap belt across your abdomen.

In the event of a collision, the pressure of the belt on the abdomen may increase the extent of injury.

3. To release the seat belt, push the "PRESS" button in the buckle; the belt should retract automatically when released. If the belt does not fully retract, pull it out and check for kinks or twists.

CAUTION: Make sure both rear shoulder belts are positioned in front of the rear seat-backs whenever the seat-backs are in their upright position.

Rear Center Seat Belt

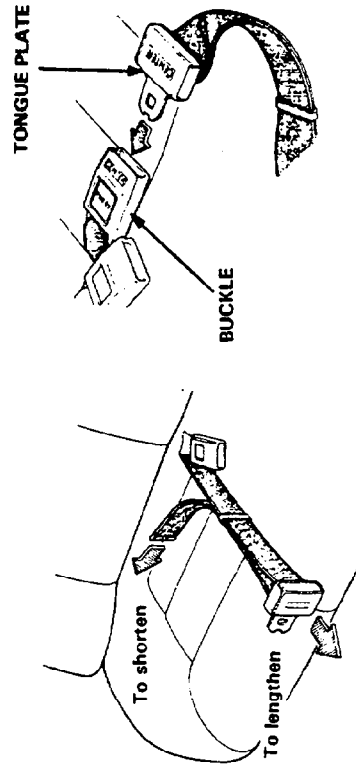
Adjust the center lap belt length to fit snugly but comfortably when buckled.

A slack belt will greatly reduce the protection afforded to the wearer. Hold the tongue plate perpendicular to the belt as shown.

- * To shorten, pull the end of the belt away from the tongue plate.
- * To lengthen, pull the tongue plate.

Push the tongue plate into the buckle until it clicks locked and position the belt across your lap, not your abdomen, as low on your hips as possible.

If worn across your abdomen, pressure of the seat belt on your abdomen may increase the extent of injury in the event of an accident.



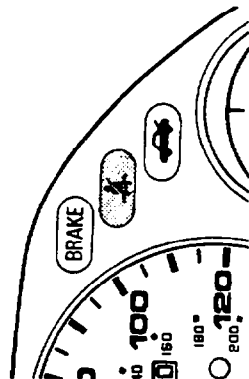
(cont'd)

Seat Belts (cont'd)

Fasten Seat Belt Warning Light and Warning Beeper

Lap Belt Warning Indicator:

Both the  light and the warning beeper will go on for about six seconds if the ignition switch is turned on when the driver's lap belt is not fastened. The beeper will not go on if the driver's lap belt is fastened, but the warning light will come on for about six seconds each time, to remind the driver to have passengers put their belts on.



Automatic Shoulder Belt Warning Indicator:

The warning light will come on if either of the automatic shoulder belts is unlatched with the ignition ON. The beeper will sound for approximately six seconds while the warning light is ON. Relatch the belt: the light should go off when the belt is latched. The warning light will also come on while the shoulder belt buckle moves from its front off position to its rear locked position.

Automatic Shoulder Belt Malfunction Indicator:

The warning light will flash and the beeper will sound rapidly if either shoulder belt buckle stops before completing its full cycle (see page 117 for normal operation).

NOTE: If the shoulder belt's tensioner mechanism locks and prevents the buckle from moving fully forward when you want to get out, recycle the system by closing the door and reopening it. The buckle should move fully forward; if it does not, recline the seat-back and use Emergency Belt Release (see page 11). When the system does not function by either method, have the system checked by an authorized Acura dealer.

WARNING

If the warning light and beeper do not function at all, or if they come on even with the belts latched and doors fully closed, it indicates a malfunction in the front seat belt system. In the event of a collision, severe personal injury could result. The system should be checked immediately by an authorized Acura dealer.

Inspection

All parts of the seat belts, including the belt fabric, should be regularly inspected for fraying, loosening, wear and other damage. Keep the belts in good condition at all times to reduce the chance of being injured in an accident, and to minimize any injuries that do occur. Make sure the buckles, retractors, tongue plates, guides and anchors all work properly.

Don't let anything get inside the buckle or the retractor; it could cause latch or retractor failure.

Cleaning

The belts should always be kept clean and dry; wet or damp belts can cause rewinding problems. To clean the belts, pull them all the way out of their retractors and scrub them with warm water and a mild soap; then let them air-dry fully extended, in the shade, with the car windows open.

WARNING

- Never bleach, dye or clean the belts with chemical solvents; it will weaken the fabric.
- Do not remove the seat belts from the car to wash them.

Replacement

Replace the seat belt if:

1. The belting is cut, punctured, burned, etc.
2. The buckle or retractor does not work properly.
3. It was being worn at the time of a collision (also check for damage at the seat belt anchor points).
4. Its condition is questionable.