

REPORT NOS. 208-CAL-89-07
212-CAL-89-07
301-CAL-89-07

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

NISSAN MOTOR CO.
1989 NISSAN SENTRA XE
2-DOOR COUPE

NHTSA NO. CK5202
CALSPAN TEST NO. 7715-7

MAY 25, 1989

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FINAL REPORT

Prepared for:

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16. Abstract A 30 mph vehicle safety compliance test was conducted on a 1989 Nissan Sentra XE 2-Door Coupe. This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on May 25, 1989. The purpose of this test was to determine compliance with the performance requirements of the following Federal Motor Vehicle Safety Standards (FMVSS 213): 1. FMVSS No. 208, "Occupant Crash Protection" 2. FMVSS No. 212, "Windshield Mounting" 3. FMVSS No. 219 (partial), "Windshield Zone Intrusion" 4. FMVSS No. 301, "Fuel System Integrity" The test mode was perpendicular (0°) and the impact velocity was 29.6 mph. The ambient temperature at the impact face was 76°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 automatic shoulder belt restraint on driver and passenger sides. Manual lap belts on the driver and passenger sides were not used for the test.					
17. Key Words 30 mph Vehicle Safety Compliance Testing FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219, "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity" Frontal Impact			18. Distribution Statement Copies of this report are available from: Technical Reference Division National Highway Traffic Safety Admin. Nassif Building, Room 5108 400 Seventh St., S.W., Washington, DC 20590		
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Section 1
PURPOSE AND TEST PROCEDURE

This 30 mph frontal barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208, 212, 219 (partial) and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by Calspan Advanced Technology Center under Contract No. DTNH22-88-C-01038. The purpose of this test was to determine if the subject vehicle, a 1989 Nissan Sentra XE 2-Door Coupe, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS No. 212, "Windshield Mounting"; FMVSS No. 219 (partial), "Windshield Zone Intrusion"; and FMVSS No. 301, "Fuel System Integrity". This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-208-07.

Section 2
SUMMARY OF TEST NUMBER CK5202

A frontal barrier was impacted by a 1989 Nissan Sentra XE 2-Door Coupe at a velocity of 29.6 mph. The test was performed at the Calspan Corporation Advanced Technology Center on May 25, 1989. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

The NHTSA Test No. which is presented in both Appendix A and crash film coverage was inadvertantly recorded as CK5201. The correct NHTSA Test No. is CK5202 as stated 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 27 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 509. The maximum chest deceleration over 3 milliseconds was 49.1 g's. The maximum force on the driver's left femur was 1370 lbs and 1355 lbs on the right femur.

The right front passenger's HIC was 653. The maximum chest deceleration over 3 milliseconds was 40.0 g's and femur loads were 1000 and 1190 pounds on the left and right femurs, respectively.

TABLE 1

CRASH TEST SUMMARYVEHICLE NHTSA NO.: CK5202 TEST MODE: 30 mph Frontal BarrierTEST DATE: 5/25/89 TIME: 10:50 TEMP: 76° FVEHICLE MAKE/MODEL/BODY STYLE: 1989 Nissan Sentra XE 2-Door CoupeVEHICLE TEST WEIGHT: 2720 lbsVEHICLE/BARRIER IMPACT ANGLE: 0°IMPACT VELOCITY: 29.6 mphMAXIMUM STATIC CRUSH: 16.4"VEHICLE REBOUND: 21.0"

<u>DUMMIES:</u>	<u>DRIVER</u>	<u>PASSENGER</u>
TYPE	<u>Part 572</u>	<u>Part 572</u>
RESTRAINT SYSTEM	<u>Automatic</u> <u>shoulder belt</u> <u>restraint</u>	<u>Automatic</u> <u>shoulder belt</u> <u>restraint</u>

NUMBER OF DATA CHANNELS: 27

NUMBER OF CAMERAS: <u>1</u>	Real Time
<u>14</u>	High Speed

DOOR OPENING DATA: <u>closed-operable</u>	- Left Front
<u>closed-operable</u>	- 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>

VISIBLE DUMMY CONTACT POINTS:	<u>DRIVER</u>	<u>PASSENGER</u>
Head	<u>chin with chest</u>	<u>chin with chest</u>
Chest	<u>chest with chin</u>	<u>chest with chin</u>
Knees	<u>lower instrument panel</u>	<u>glove box</u>

TABLE 2

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1989 Nissan Sentra XE 2-Door Coupe
 NHTSA No. CK5202 ; VIN JN1GB24P4KU003686 ; Color: Black
 Engine Data: 4 cylinders; 98 CID; - 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: 2/8/89 ; Odometer Reading - 35 miles
 Selling Dealer: South Towns Nissan, Inc.
 & address 3580 Southwestern Blvd. Orchard Park, NY 14127

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Nissan Motor Co. Ltd
 Data of Manufacture: October 1988 ;
 GVWR: 3117 lbs; GAWR: 1764 lbs FRONT
1786 lbs REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load 29 psi Front
26 psi Rear
 Recommended Tire Size P175/70R13
 Recommended Cold Tire Pressure 29 psi Front 26 psi Rear
 Size of Tires on Test Vehicle P175/70R13 Manufacturer Bridgestone
 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) = 659 lbs.
 No. of Occupants x 150 lbs = 600 lbs.
 Rated Cargo/Luggage Weight (RCLW)= 59 lbs. (Difference)

WEIGHT OF TEST VEHICLE AS RECEIVED AT LABORATORY (with maximum fluids):

Right Front = 710 lbs Right Rear = 460 lbs
 Left Front = 720 lbs Left Rear = 440 lbs
 TOTAL FRONT = 1430 lbs TOTAL REAR = 900 lbs
 % of Total Weight = 61.4 % % of Total Weight = 38.6 %
 TOTAL DELIVERED WEIGHT = 2330 lbs.

TABLE 2 (continued)
GENERAL TEST & VEHICLE PARAMETER DATA

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight	=	<u>2330</u>	lbs.
Rated Cargo/Luggage Weight (RCLW)	=	<u>59</u>	lbs.
Weight of 2 P.572 Dummies @ 164 ea.	=	<u>328</u>	lbs.
TARGET TEST WEIGHT	=	<u>2717</u>	lbs. (sum)

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

Right Front =	<u>770</u>	lbs.	Right Rear =	<u>590</u>	lbs.
Left Front =	<u>790</u>	lbs.	Left Rear =	<u>570</u>	lbs.
TOTAL FRONT =	<u>1560</u>	lbs.	TOTAL REAR =	<u>1160</u>	lbs.
% of Total Weight =	<u>57.4</u>	%	% of Total Weight =	<u>42.6</u>	%
TOTAL TEST WEIGHT =	<u>2720</u>	lbs.			
Weight of Ballast secured in vehicle's cargo area =	<u>0</u>	lbs.			
Vehicle Components Removed for Weight Reduction	<u>None</u>				

TEST VEHICLE ATTITUDE: (all dimensions in inches)

AS DELIVERED	RF	<u>25.1</u>	;	LF	<u>25.2</u>	;	RR	<u>25.4</u>	;	LR	<u>25.7</u>
FULLY LOADED	RF	<u>24.2</u>	;	LF	<u>24.4</u>	;	RR	<u>23.1</u>	;	LR	<u>23.7</u>
AS TESTED	RF	<u>24.5</u>	;	LF	<u>25.5</u>	;	RR	<u>23.6</u>	;	LR	<u>24.3</u>
Vehicle's Wheelbase =	<u>95.5</u>	inches									
Location of Vehicle's C.G. =	<u>40.7</u>	inches rearward of front wheel center									

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual =	<u>13.2</u>	gallons
Usable Capacity Figure Furnished by COTR =	<u>12.2</u>	gallons
Test Volume Range (92 to 94% of Usable Capacity) =	<u>11.2</u> to <u>11.5</u>	gallons
ACTUAL TEST VOLUME =	<u>11.3</u>	gallons (with entire fuel system filled)

TABLE 3
POST-IMPACT DATA

TYPE OF TEST: X Frontal IMPACT ANGLE: 0°

TEST DATE: May 25, 1989 TIME: 10:50 TEMP: 76 °F

VEHICLE NHTSA NO.: CK5202

REQUIRED IMPACT VELOCITY RANGE: 28.9 to 29.9 mph

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

Trap No. 1 = 29.6 mph; Trap No. 2 = 29.7 mph

Distance from vehicle to barrier (1) entering trap = 52 inches

(2) exiting trap = 12 inches

VEHICLE STATIC CRUSH: (for Frontal and Rear Impacts Only)

Vehicle Length: Pre-Test Right = 164.1 "; C/L = 166.2 "; Left = 163.7 "

Post-Test Right = 148.1 "; C/L = 149.8 "; Left = 150.7 "

CRUSH Right = 16.0 "; C/L = 16.4 "; Left = 13.0 "

AVERAGE = 15.1 inches

VEHICLE REBOUND: (from rigid barrier only)

Distance from front of test vehicle to impact point:

Right = 21.5 "; C/L = 20.3 "; Left = 21.3 "

AVERAGE = 21.0 inches

DOOR OPENING:

Left

Right

Front

closed-operable

closed-operable

Rear

N/A

N/A

SEAT MOVEMENT:

Seat Back Failure

Seat Shift

Front

None

0.0

Rear

None

0.0

TABLE 3 (continued)

POST-IMPACT DATA

GLAZING DAMAGE: windshield cracked

OTHER NOTABLE IMPACT FEATURES: None

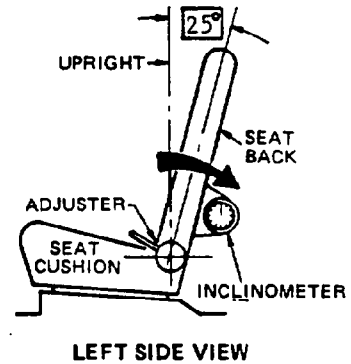
Section 3
OCCUPANT AND VEHICLE DATA

Figure 1
TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model year: 1989 Vehicle Model: Nissan Sentra XE Body Style: 2-Door Coupe

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 25°
Measurement instructions: pull folded seat back until it is locked, then release lock by reclining lever and pushing seat back 7th notch rearward.

Seat back angle for passenger's seat 25°
Measurement instructions: Same as driver seat back.

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: Pull seat track to front most position
and then by releasing lock push seat 10 notches rearward.

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

3. Fuel Tank Capacity Data

- A. "Usable Capacity" of the standard equipment fuel tank is 12.2 gallons.
- B. "Usable Capacity" of the optional equipment fuel tank is N/A gallons.

Additional Instructions: None

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION

TEST NO.: CK5202

VEHICLE: 1989 Nissan Sentra XE 2-Door Coupe

SEAT TYPE:

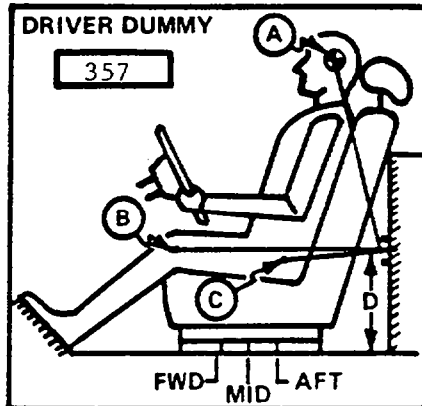
- Bench
X Bucket
- Split Bench

ADJUSTER TYPE:

X Manual
- Power

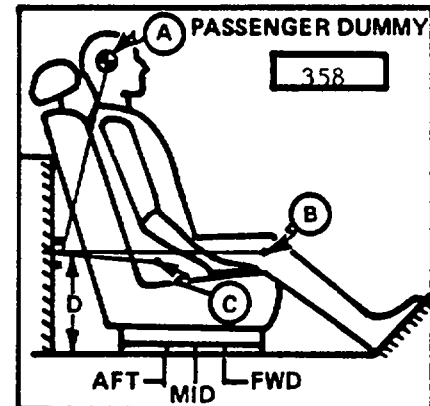
BUCKET SEAT BACK TYPE:

- Fixed
X Adjustable Reclining



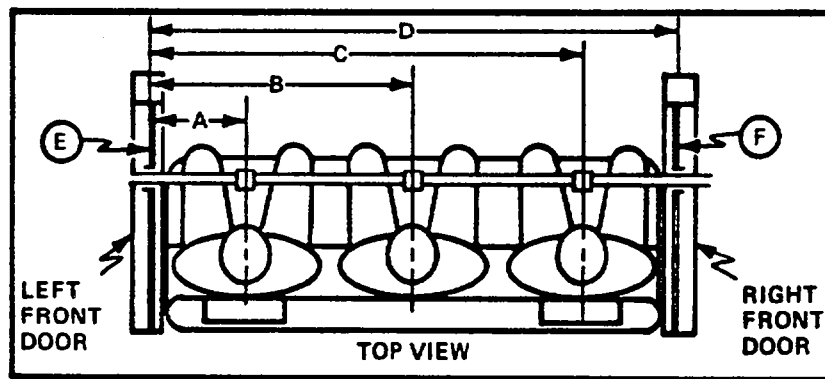
MEASUREMENT LOCATION

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



A = 21.6 in. 17 Degrees
B = 29.9 in. 96 Degrees
C = 14.9 in. 109 Degrees
D = 12.5 in.

A = 22.1 in. 16 Degrees
B = 30.1 in. 96 Degrees
C = 15.7 in. 108 Degrees
D = 12.5 in.



TOP VIEW

DUMMY ID

S/N 357

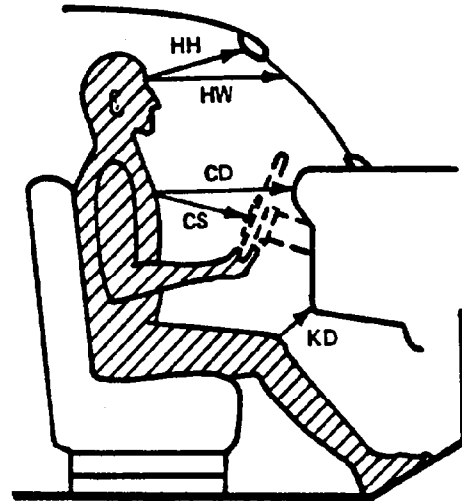
358

A = Left Door to Driver Centerline 11.6 in.
B = Left Door to Center Passenger Centerline - in.
C = Left Door to Right Passenger Centerline 37.7 in.
D = Left Door to Right Door 49.3 in.
E, F = Window Glass Height (Right and Left Must Be Equal) 10.0 in.

Figure 3

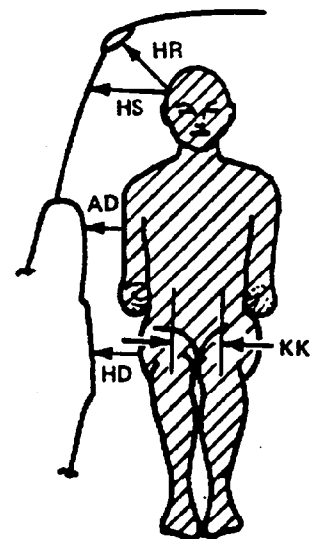
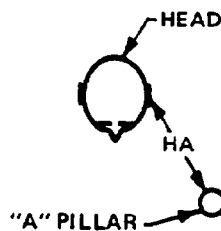
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	16.0	16.0
HW	20.6	20.3
CD	24.6	24.7
CS	15.6	-
KDL	7.1	6.5
KDR	4.5	6.5
SA	25°	25°
TA	23°	24°



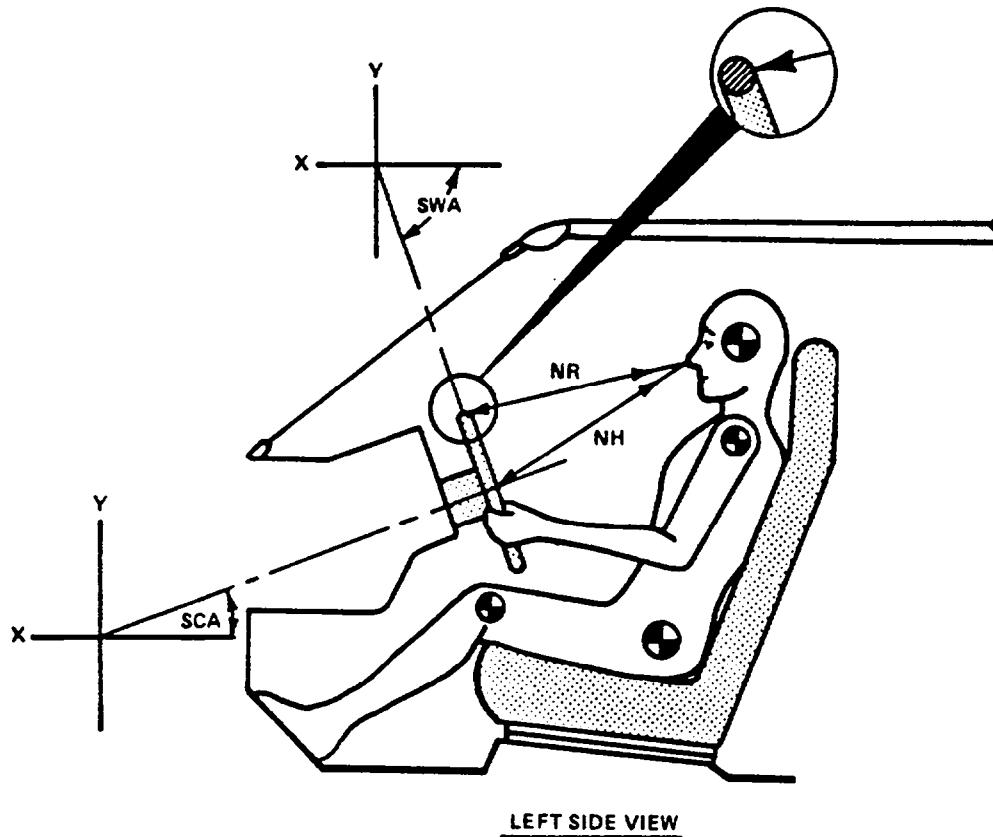
HH = Head to Windshield Header
 HW = Head to Windshield
 CD = Chest to Dash
 CS = Chest to Steering Wheel
 KD(L/R) = Knee to Dash (Left/Right)
 SA = Seat Back Angle
 TA = Torso Angle

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



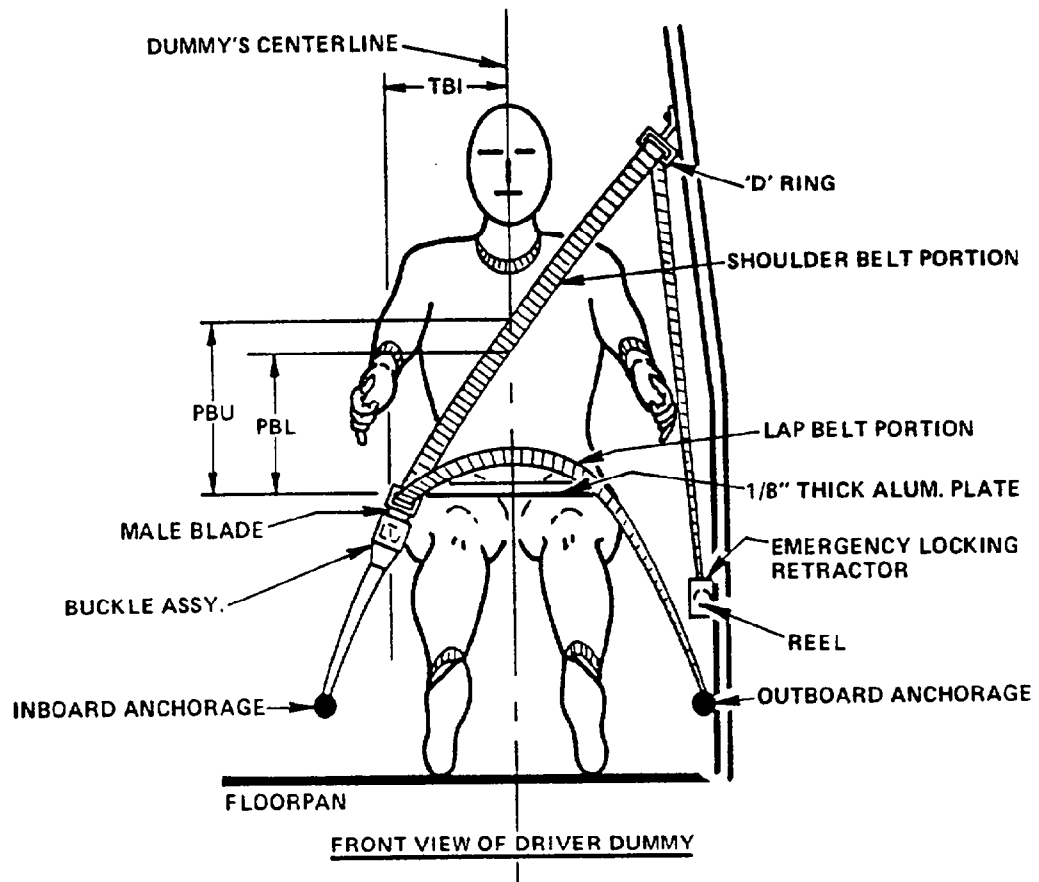
	DRIVER	PASSENGER
HR	4.3	4.3
HS	8.7	8.6
AD	4.1	4.1
HD	7.1	7.0
KK	8.8	7.6
HA	19.3	19.0

Figure 4
DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



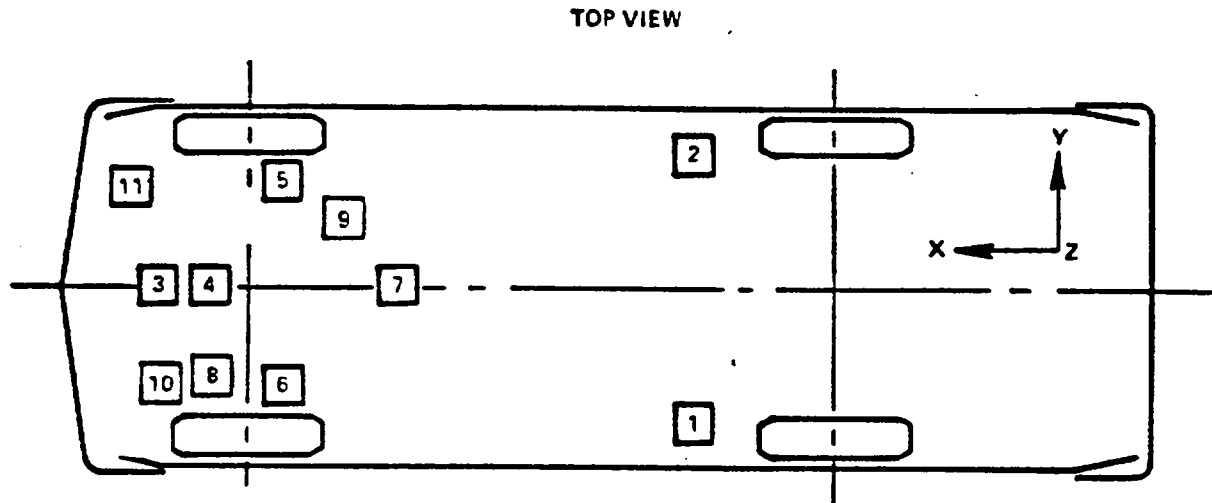
	MEASUREMENTS	
<u>NR</u> -- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	20.1	Inches
<u>NH</u> -- Distance from tip of dummy's nose to center of steering column hub	20.3	Inches
<u>SCA</u> -- Angle of steering column relative to the horizontal X axis	24	Degrees
<u>SWA</u> -- Angle of steering wheel relative to the horizontal X axis	66	Degrees

Figure 5
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	14.0	14.1
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	11.0	11.0
<u>TBI</u> -- distance from Torso centerline to buckle	N/A	N/A

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		
8	Front Shock Tower	x		
9	Firewall	x		
10	Cradle Frame	x		
11	Radiator Support	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: POST: LONGITUDINAL ACCELERATION	60.2	14.6	16.5				
		59.1	14.4	17.0				
					2	140	-31	60
2	REAR SEAT X-MEMBER AT RIGHT SIDE PRE: POST: LONGITUDINAL ACCELERATION	60.2	-14.6	16.5				
		59.1	-14.4	16.8				
					2	140	-30	60
3	TOP OF ENGINE BLOCK PRE: POST: LONGITUDINAL ACCELERATION	139.2	-11.8	30.0				
		133.2	-12.3	28.3				
					42	52	-93	36
4	BOTTOM OF ENGINE BLOCK PRE: POST: LONGITUDINAL ACCELERATION	133.1	-11.3	7.5				
		130.8	-10.9	7.4				
					47***	50	-226***	68
5	BRAKE CALIPER AT RIGHT SIDE PRE: POST: LONGITUDINAL ACCELERATION	127.7	-22.8	19.5				
		127.5	-19.1	18.4				
					22	41	-87	54
6	BRAKE CALIPER AT LEFT SIDE PRE: POST: LONGITUDINAL ACCELERATION	127.7	22.8	20.2				
		127.0	25.0	20.0				
					33	35	-50	24
7	DASH PANEL PRE: POST: LONGITUDINAL ACCELERATION	102.2	0.0	27.4				
		104.0	0.0	30.4				
					134	84	-110	78

*X + Forward from rear bumper
Y + Left from vehicle centerline
Z + Up from ground
***Accelerometer opened - data questionable after 72 ms
DISTANCE MEASUREMENTS IN INCHES

** POSITIVE NEGATIVE
LONGITUDINAL: FORWARD REARWARD
LATERAL: LEFTWARD RIGHTWARD
VERTICAL: UPWARD DOWNWARD

TABLE 4 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION**		NEGATIVE DIRECTION**	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
8	FRONT SHOCK TOWER							
	PRE:	132.2	19.2	31.0				
	POST:	128.3	19.0	29.7				
	LONGITUDINAL ACCELERATION				51	37	-61	30
9	FIREWALL							
	PRE:	122.7	15.2	31.5				
	POST:	121.3	15.8	29.0				
	LONGITUDINAL ACCELERATION				0	-20	-46	53
10	CRADLE FRAME							
	PRE:	121.7	-12.0	7.0				
	POST:	121.2	13.1	6.9				
	LONGITUDINAL ACCELERATION				6	138	-51	51
11	RADIATOR SUPPORT							
	PRE:	150.2	-18.0	27.9				
	POST:	138.2	-18.4	27.4				
	LONGITUDINAL ACCELERATION				80	20	-176	14

Figure 7

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5

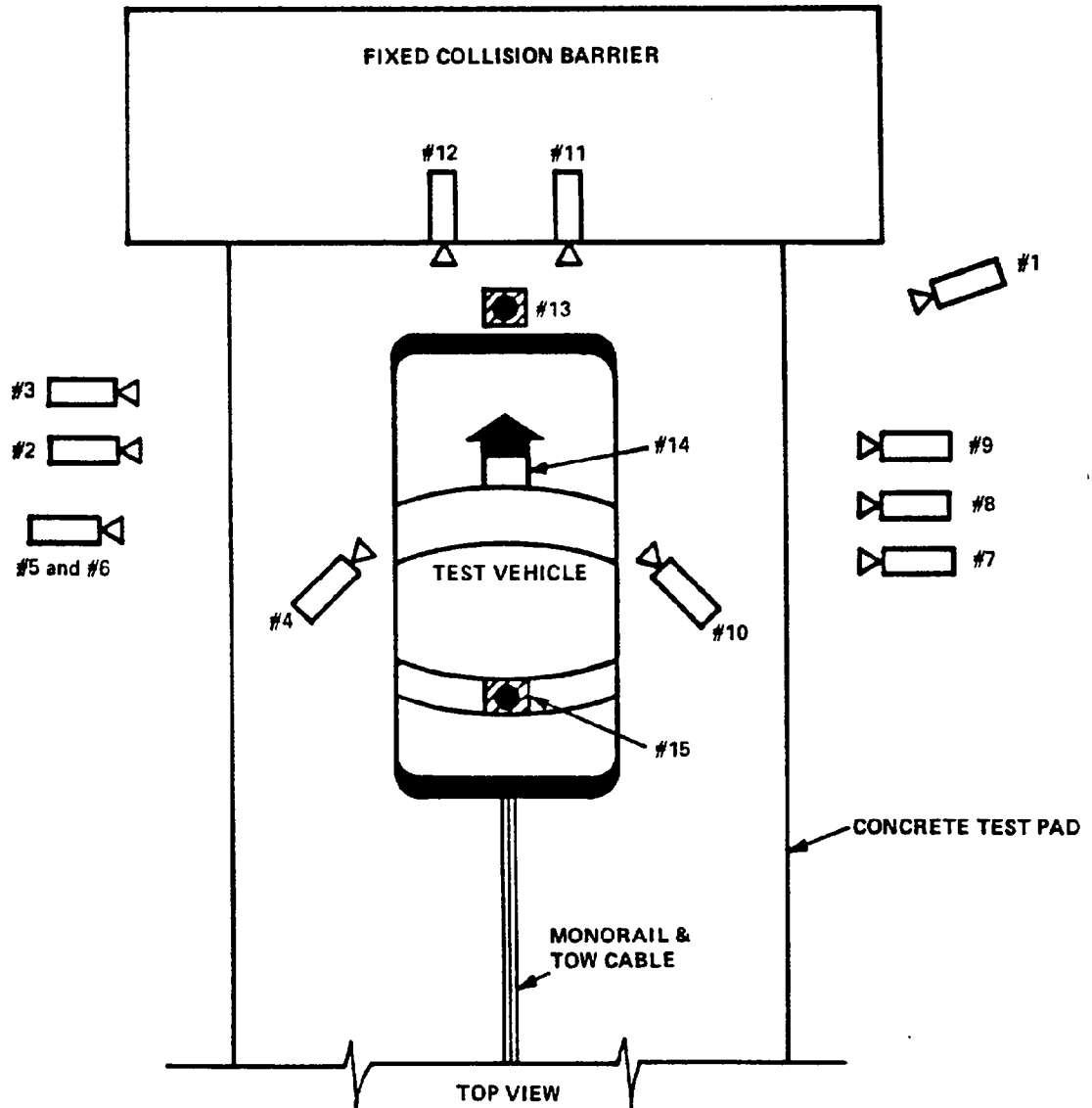
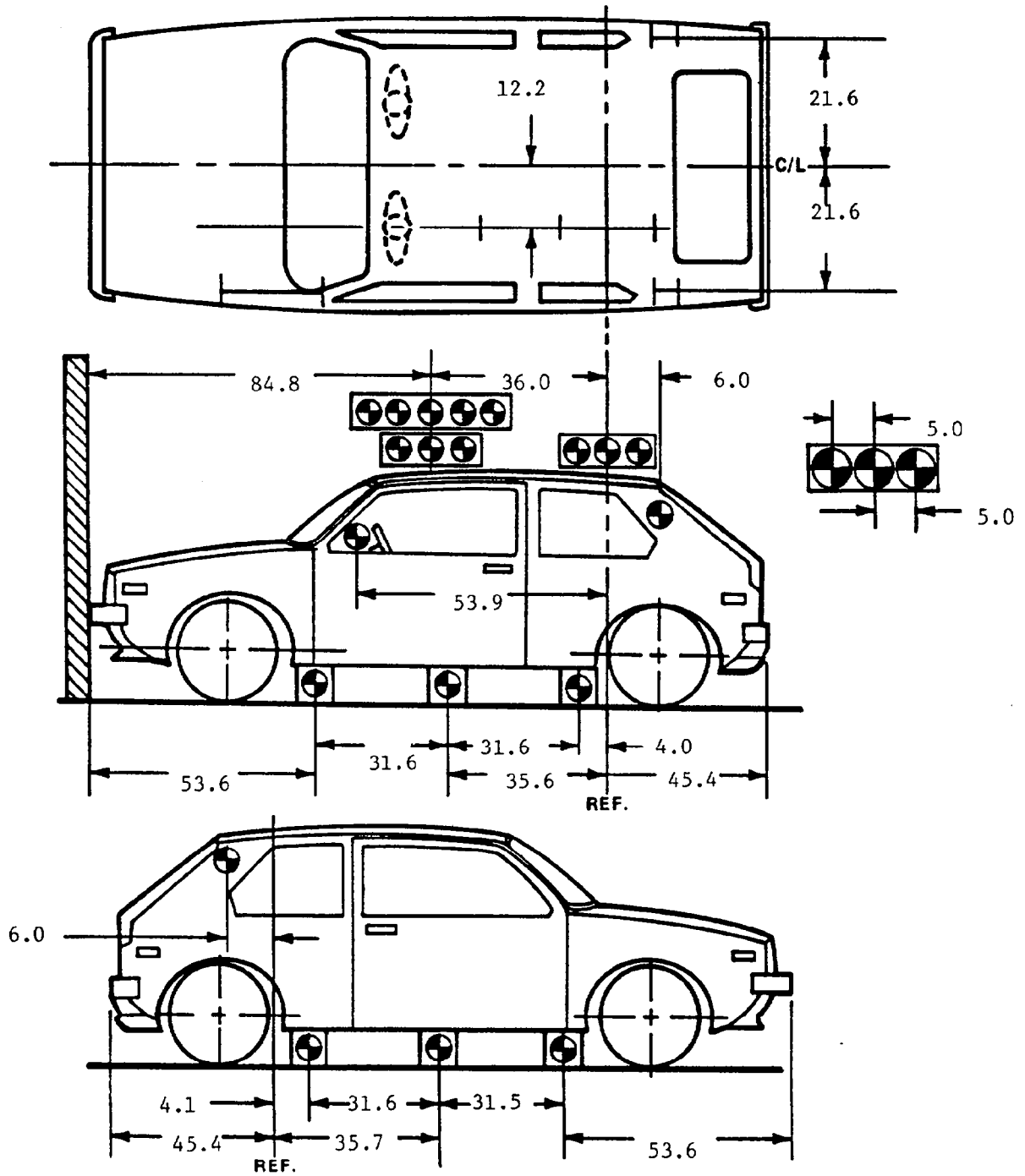


TABLE 5
HIGH-SPEED CAMERA LOCATIONS

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	219	52	41	-6	203	13	540
3	Left Side View	304	25	41	-4	288	25	535
4	Driver and Interior View	107	110	67	-15	91	13	890
5	Steering Column (bottom)	290	71	46	-4	274	25	545
6	Steering Column (top)	290	71	70	-10	274	25	550
7	Overall Right Side	288	82	42	-8	272	13	1100
8	Right Side View	305	51	40.5	-3	289	25	745
9	Right Passenger View	303	72.5	57	-4	287	35	680
10	Passenger and Interior View	95	120	68	-18	-	13	600
11	Passenger Front View	46	13	73	-48	-	13	600
12	Driver Front View	56	16	66	-45	-	13	560
13	Windshield View	0	0	126	-52	-	13	570
14	Pit View of Engine	0	36	-120	90	-	13	835
15	Pit View of Fuel Tank	0	130	-120	90	-	13	780

* X = Film plane to monorail centerline
 Y = Film plane to impact location
 Z = Film plane to ground
 ** = Referenced to horizontal plane

Figure 8
VEHICLE TARGET LOCATIONS



(DIMENSIONS IN INCHES)

Figure 9

TEST VEHICLE MEASUREMENTS

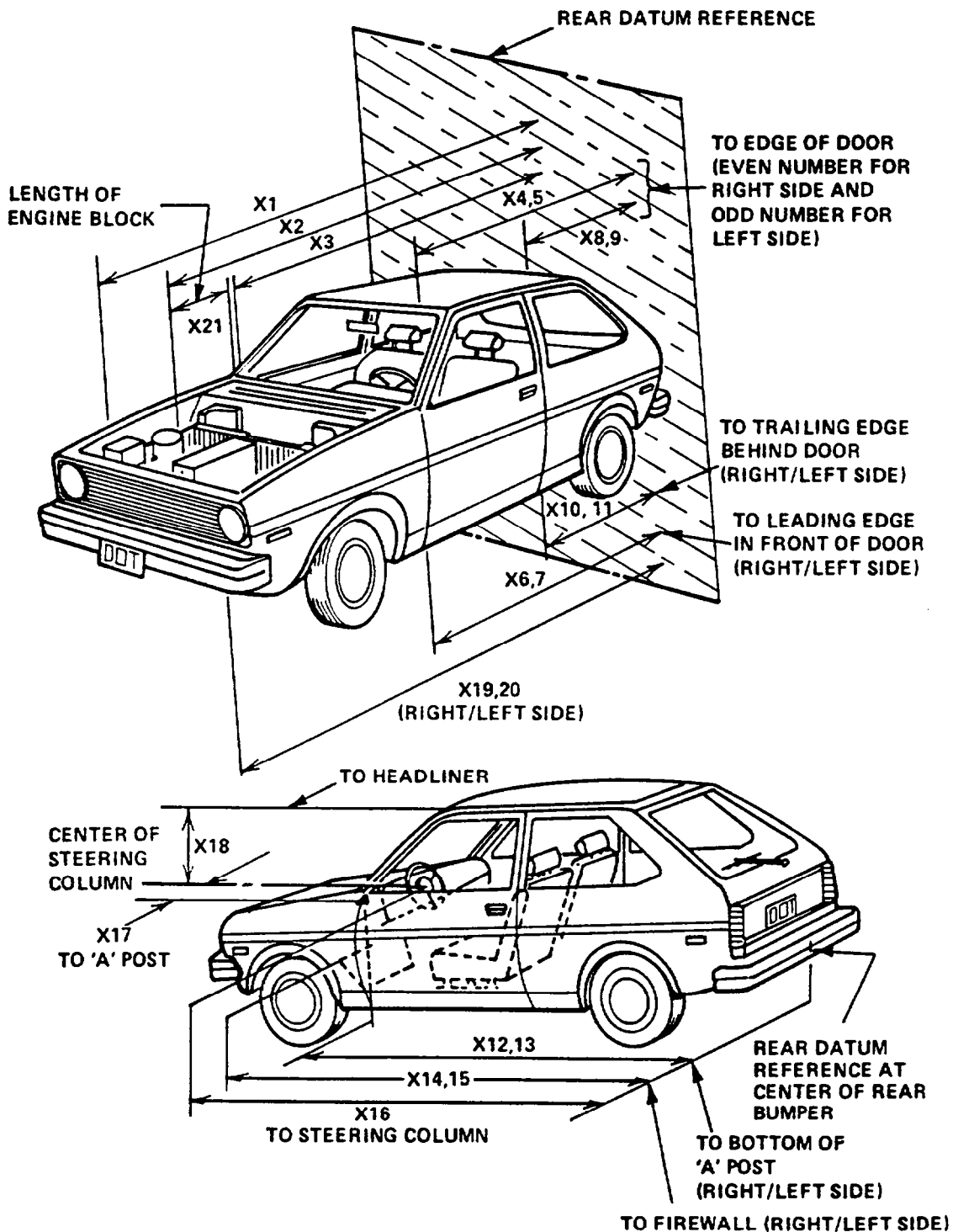


TABLE 6
VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	166.2	149.8	16.4
X2	Rear Surface of Vehicle to Front of Engine	141.3	134.3	7.0
X3	Rear Surface of Vehicle to Firewall	122.9	119.8	3.1
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	110.6	110.3	0.3
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	110.2	110.0	0.2
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	111.0	111.5	-0.5
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	110.4	111.3	-0.9
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	63.9	63.3	0.6
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	62.6	63.2	-0.6
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	64.5	64.9	-0.4
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	63.9	64.8	-0.9
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	112.4	113.0	-0.6
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	111.8	112.8	-1.0
X14	Rear Surface of Vehicle to Firewall, Right Side	121.2	119.7	1.5
X15	Rear Surface of Vehicle to Firewall, Left Side	120.5	120.3	0.2
X16	Rear Surface of Vehicle to Steering Column	93.3	92.5	0.8
X17	Center of Steering Column to "A" Post	16.5	17.6	-1.1
X18	Center of Steering Column to Headliner	15.5	14.3	1.2
X19	Rear Surface of Vehicle to Right Side of Front Bumper	164.1	148.1	16.0
X20	Rear Surface of Vehicle to Left Side of Front Bumper	163.7	150.7	13.0
X21	Length of Engine Block	12.0	12.0	0.0

Section 4

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

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

TABLE 7
DUMMY INJURY CRITERIA VALUES

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DUMMY (1)	-34	-12	59	61	-49	-14	-8	49.1
DUMMY (2)	66	19	52	68	-41	16	17	40.0

	MAXIMUM FORCE - FEMUR LOAD (LBS)	
	Left Femur	Right Femur
DUMMY (1)	1370	1355
DUMMY (2)	1000	1190

	HEAD INJURY CRITERIA **			
	HIC	36 millisecond Maximum		AVE. ACC. (g) t ₁ TO t ₂
		t ₁ (SEC)	t ₂ (SEC)	
DUMMY (1)	509	0.06772	0.10372	45.7
DUMMY (2)	653	0.06892	0.10492	50.5

*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 = 6.5 sec.

Log time duration of reminder light operation = 6.5 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 = 3.5 sec.*
(audible warning should not operate)

Log time duration of reminder light operation = 6.5 sec.

Note wording of visual warning:

Fasten seat belt -

Fasten Belt -

Symbol 101-80 X

* operates until auto. lap belt locks into position.

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.:	<u>CK5202</u>
Make/Model:	<u>1989 Nissan Sentra XE</u>
	<u>2-Door Coupe</u>
Date of Comfort/Convenience Check:	<u>5/24/89</u>
Technician Performing Check:	<u>D.J.T</u>
GVWR:	<u>3117 lbs.</u>

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

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

1. Automatic seat belts YES X NO

If yes, go to requirements D1, D2 and D3

**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 (continued)

FMVSS NO. 208 - COMFORT AND CONVENIENCE TEST SUMMARY

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.

YES _____ NO X

2. Seats are adjusted according to instructions in Appendix B.

YES X NO _____

3. The test dummies are positioned according to dummy position placement instructions in Appendix B and Appendix C.

YES X NO _____

4. Close the vehicle's adjacent door, pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest. Then fasten the latch. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point, pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest. Measure the contact force exerted by the belt webbing on the dummy's chest. The contact force is 0.4 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.:

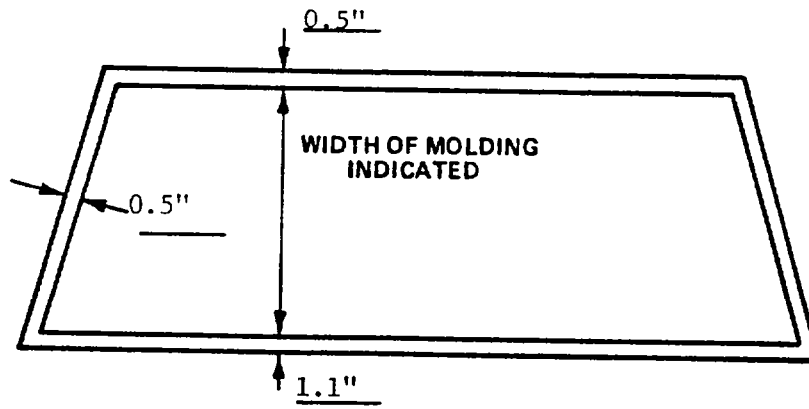
Window is bonded in place with 0.5" trim over the top and side edges.
Lower edge is covered with 1.1" trim.

FMVSS 212 REQUIREMENTS: The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

FMVSS 212 TEST DATA:

	WINDSHIELD PERIPHERY		
	PRE-TEST (in.)	POST-TEST (in.)	PERCENT RETENTION
RIGHT SIDE	78.0	78.0	100%
LEFT SIDE	78.0	78.0	100%
TOTAL	156.0	156.0	100%

AREA OF RETENTION FAILURE:



FRONT VIEW

FAILURE DETAILS:

NONE

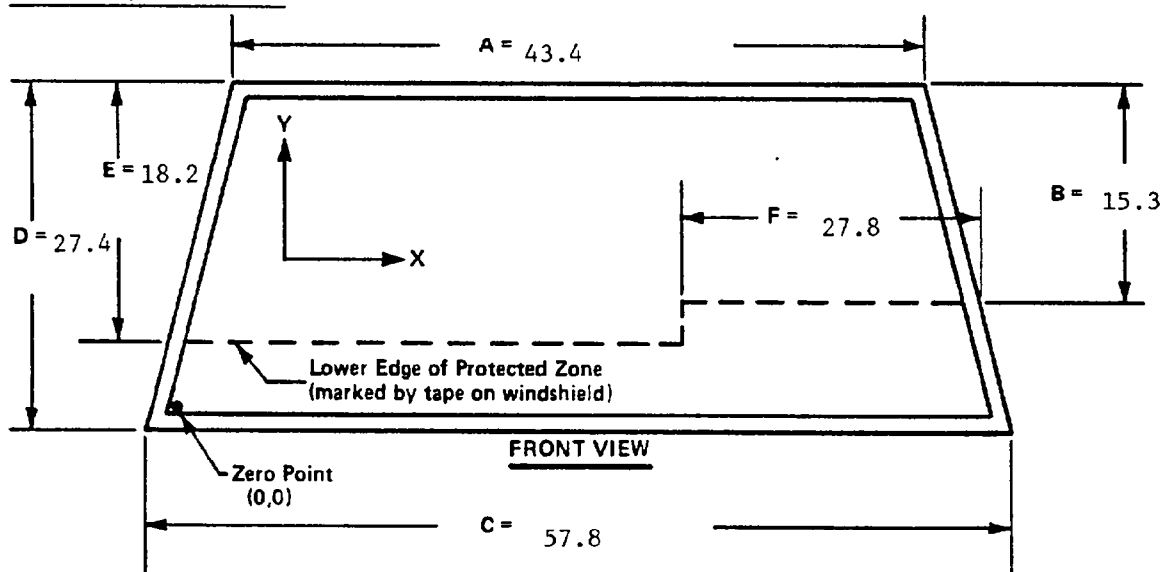
Figure 11

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)

	COORDINATES	
	X	Y
1.		
2.		
3.		
4.		

TABLE 11

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATAFMVSS NO. 301TEST VEHICLE NHTSA NO.:

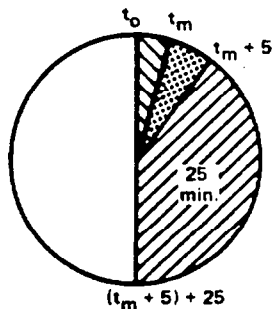
C	K	5	2	0	2
---	---	---	---	---	---

 TEST DATE: May 25, 1989Vehicle Mfr/Make/Model: 1989 Nissan Sentra XE 2-Door Coupe

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

TEST VEHICLE IMPACT TYPE

- X Frontal (30 mph)
- Oblique (30 mph) with ^o barrier face
first contacting
 - (driver/passenger) side
- Rear Moving Barrier (30 mph)
- Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENTSOLVENT SPILLAGE DETAILS

NONE

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

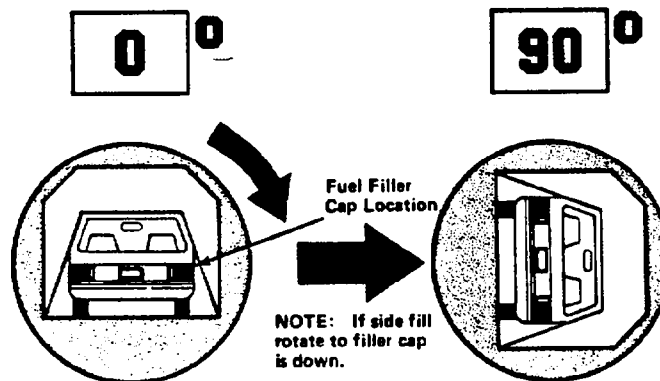
ACTUAL	MAX ALLOWED
0	1 oz
0	5 oz
0	1 oz/1 min

TABLE 12

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Veh. NHTSA ID No.:

CK5202

TEST PHASE:I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + 05 minutes 00 seconds

TOTAL

8 minutes 00 seconds

Next whole minute interval

8 minutesII. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S):

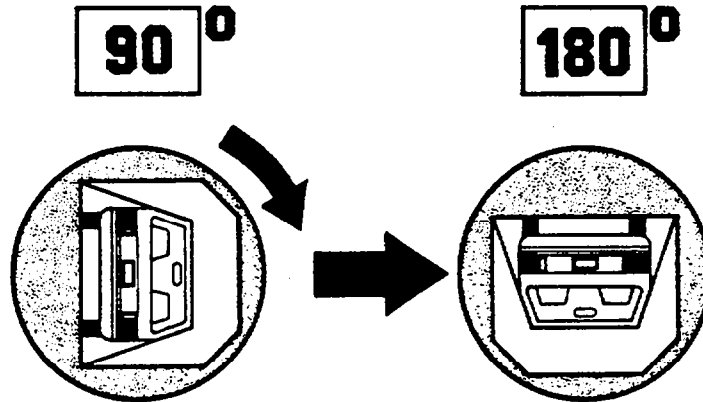
NONE

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Veh. NHTSA ID No.:

CK5202

TEST PHASE:



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 55 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 05 minutes 00 seconds

TOTAL 7 minutes 55 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

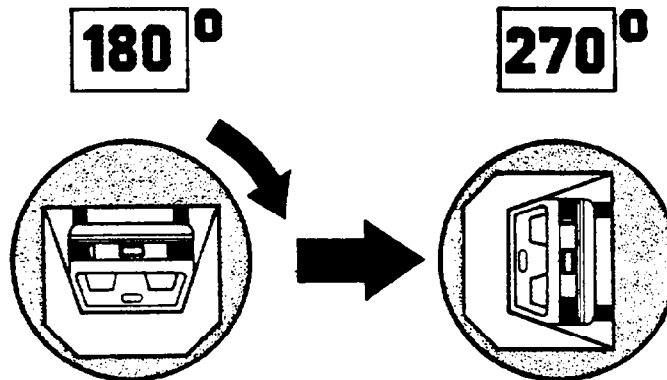
IV. SOLVENT SPILLAGE LOCATION(S):

NONE

TABLE 12 (continued)

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Veh. NHTSA ID No.:

CK5202TEST PHASE:I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + 05 minutes 00 seconds

TOTAL 8 minutes 00 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S):

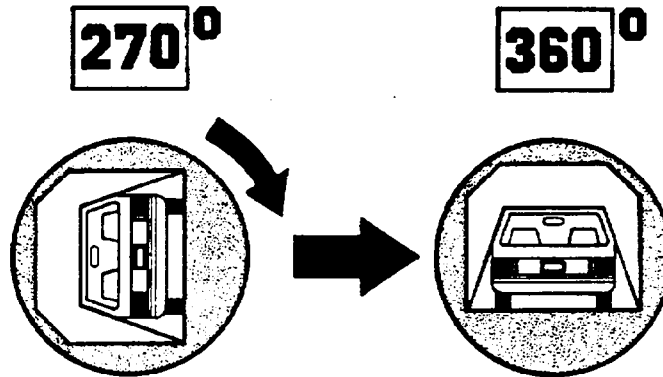
NONE

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Veh. NHTSA ID No.:

CK5202

TEST PHASE:



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

3 minutes 00 seconds

FMVSS 301 Position Hold Time +

05 minutes 00 seconds

TOTAL

8 minutes 00 seconds

Next whole minute interval

8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S):

NONE

TABLE 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: May 25, 1989 VEH. NHTSA No. CK5202
VEHICLE MANUFACTURER: Nissan Motor Company Ltd.
Model Year 1989 VIN: JN1GB24P4KU003686
Body Style: 2-Door Coupe Build Date: October, 1988
DUMMY STABILIZED TEMPERATURE AT TIME OF TEST: 68 °F (Spec. = 66-78°F)
IMPACT VELOCITY: 29.6 mph TIME OF TEST: 10:50
TYPE OF AUTOMATIC RESTRAINT SYSTEM: Automatic shoulder belt restraint.

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

Appendix A

PHOTOGRAPHS



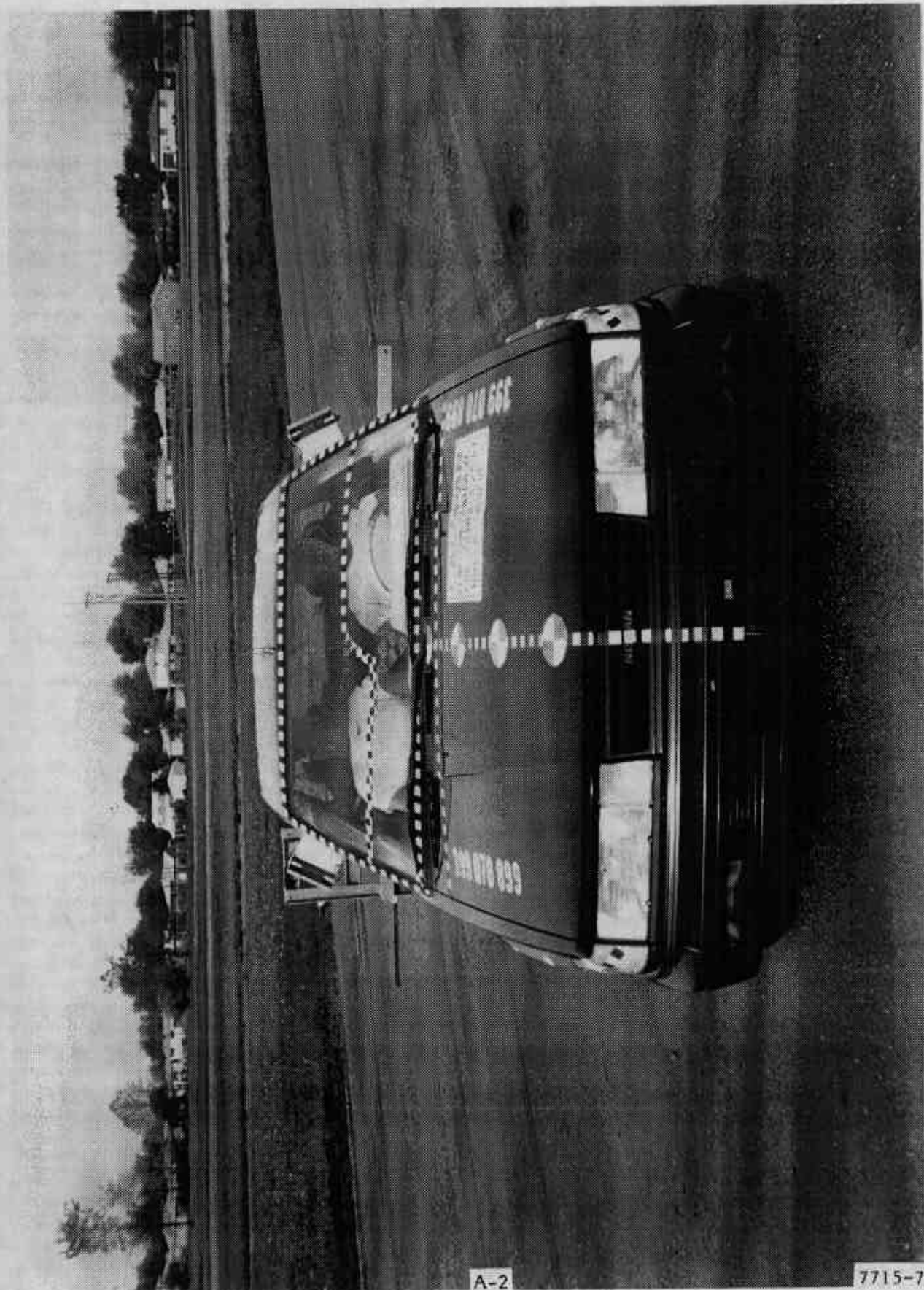


Figure A-1 PRE-TEST FRONT VIEW

A-2

7715-7

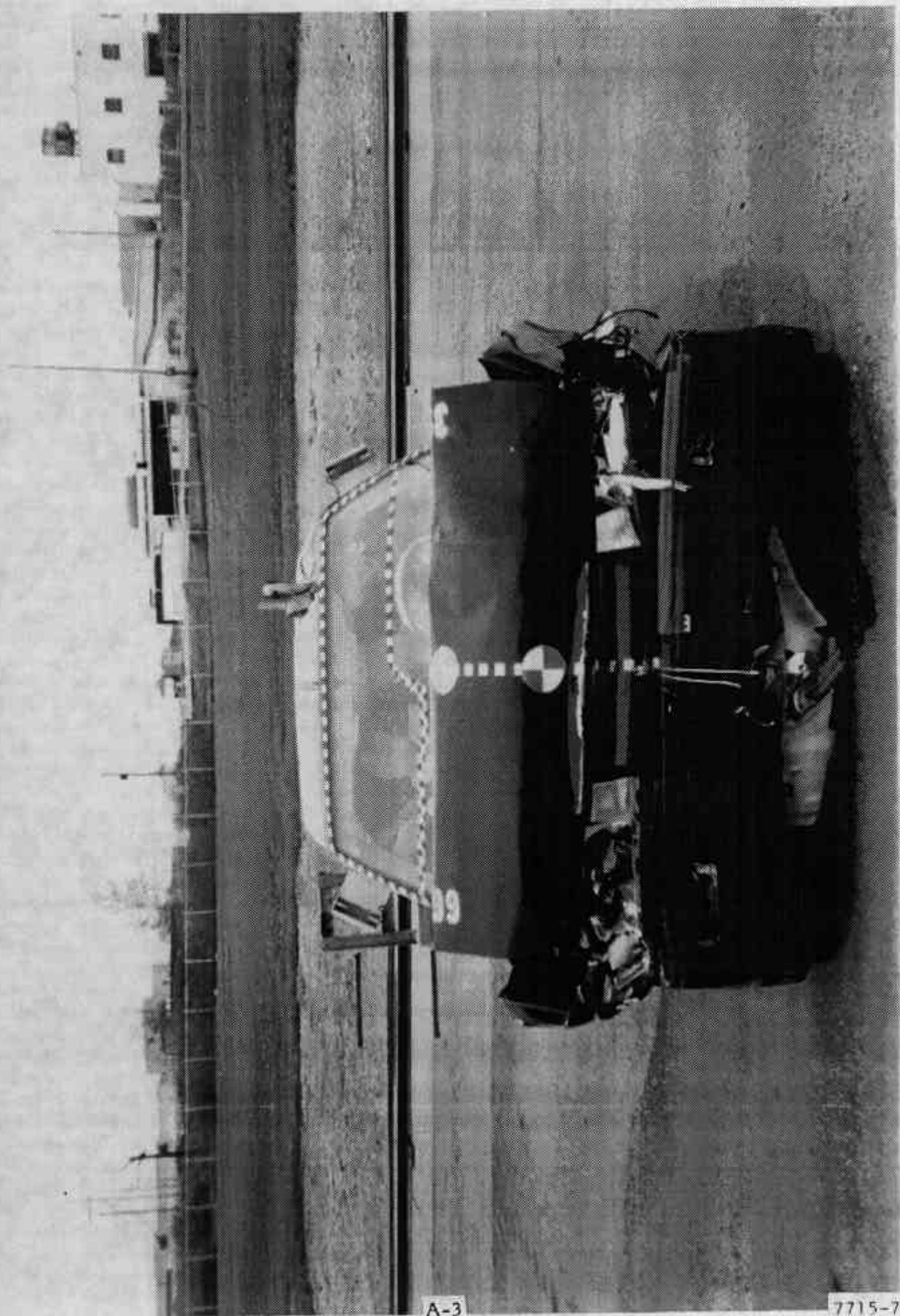


Figure A-2 POST-TEST FRONT VIEW

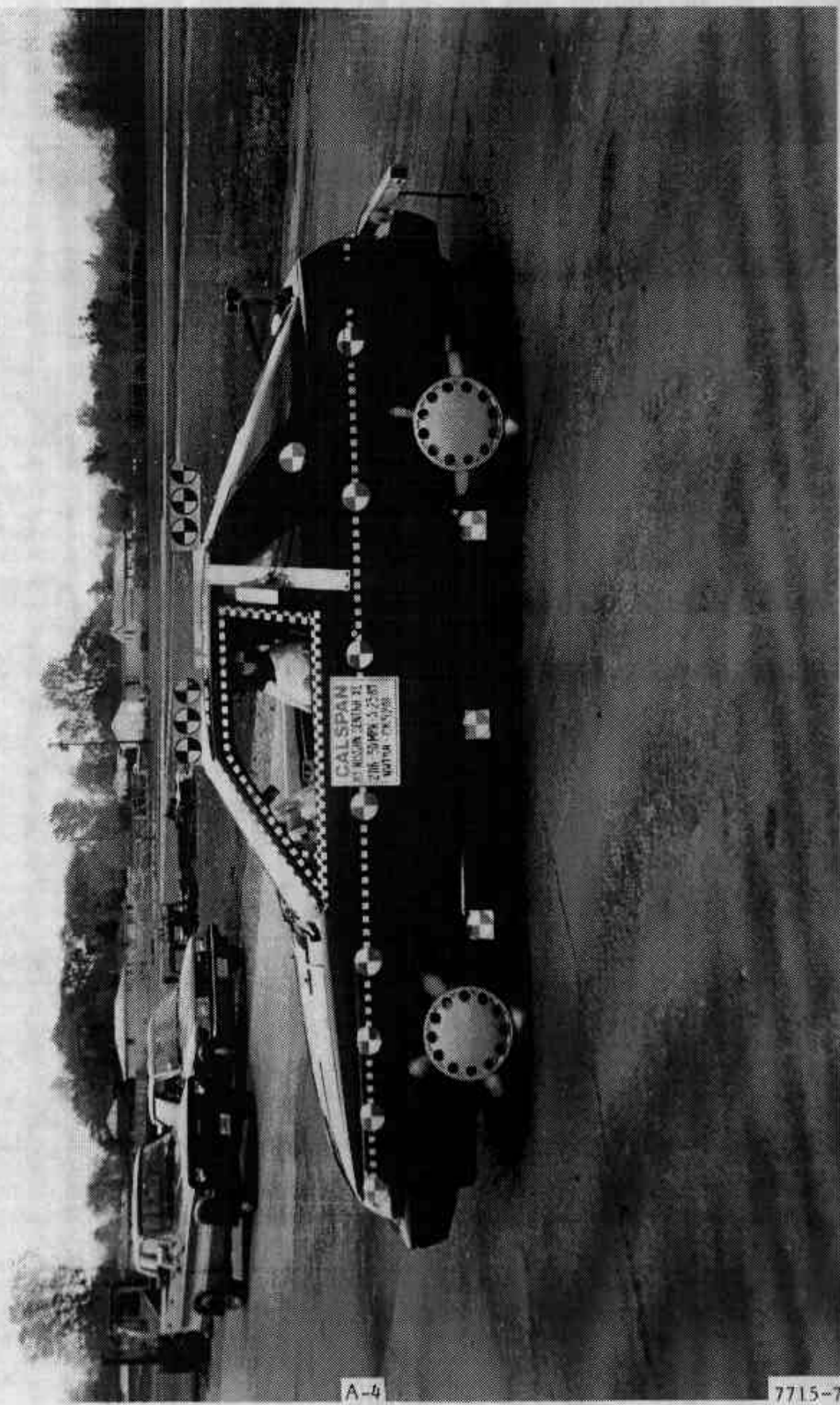


Figure A-3 PRE-TEST LEFT SIDE VIEW

A-4

7715-7

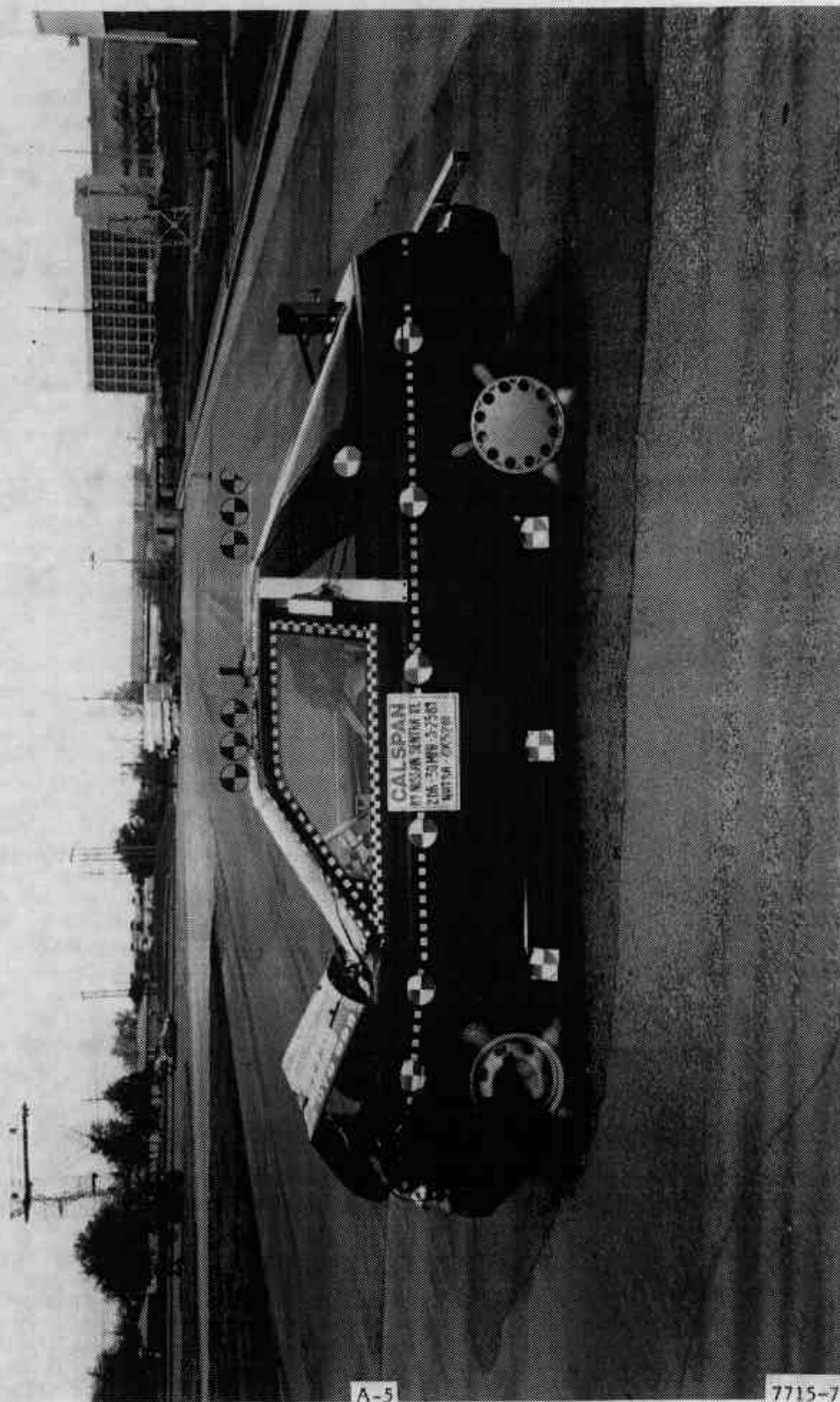


Figure A-4 POST-TEST LEFT SIDE VIEW

A-5

7715-7

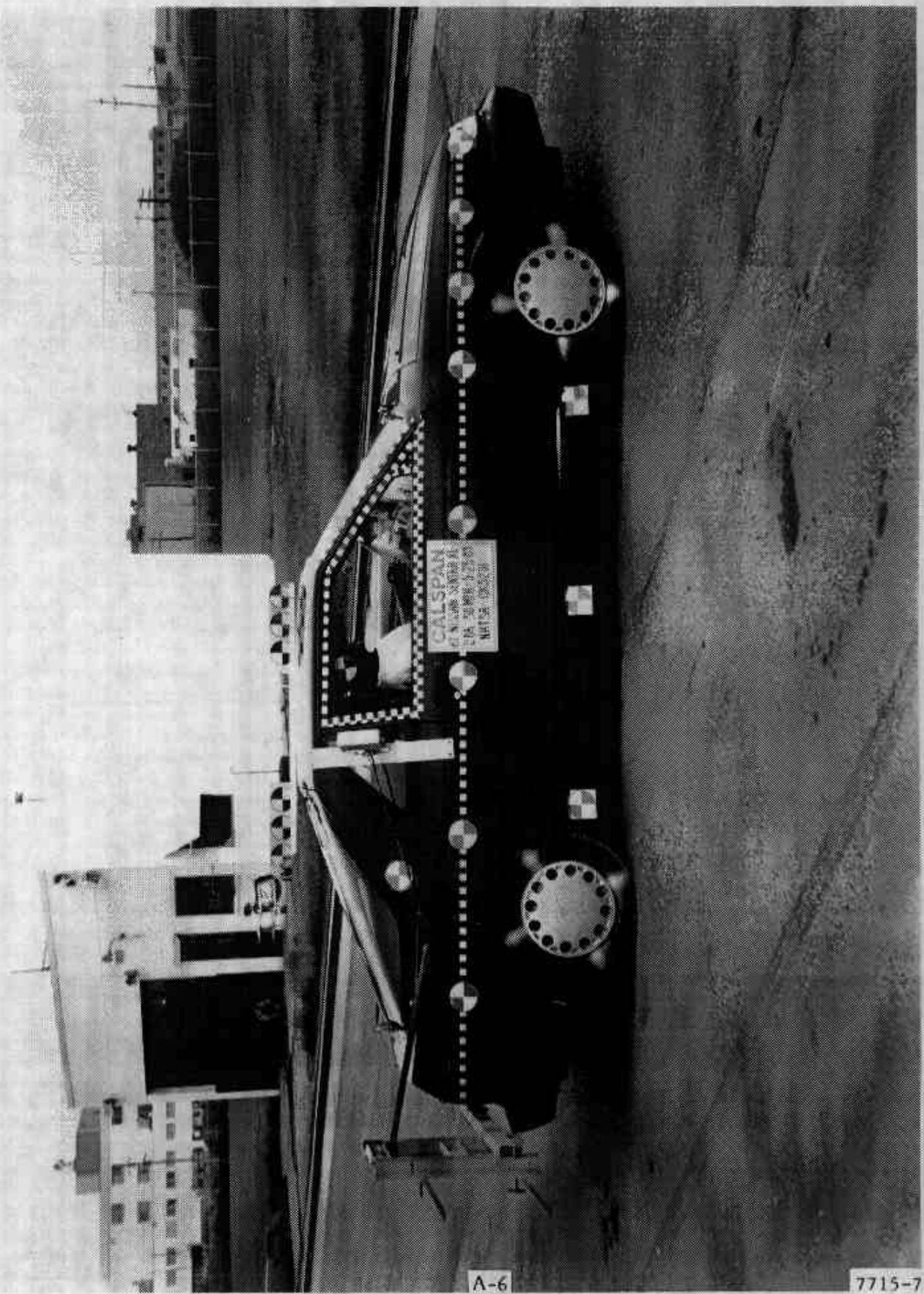


Figure A-5 PRE-TEST RIGHT SIDE VIEW



Figure A-6 POST-TEST RIGHT SIDE VIEW

A-7

7715-7

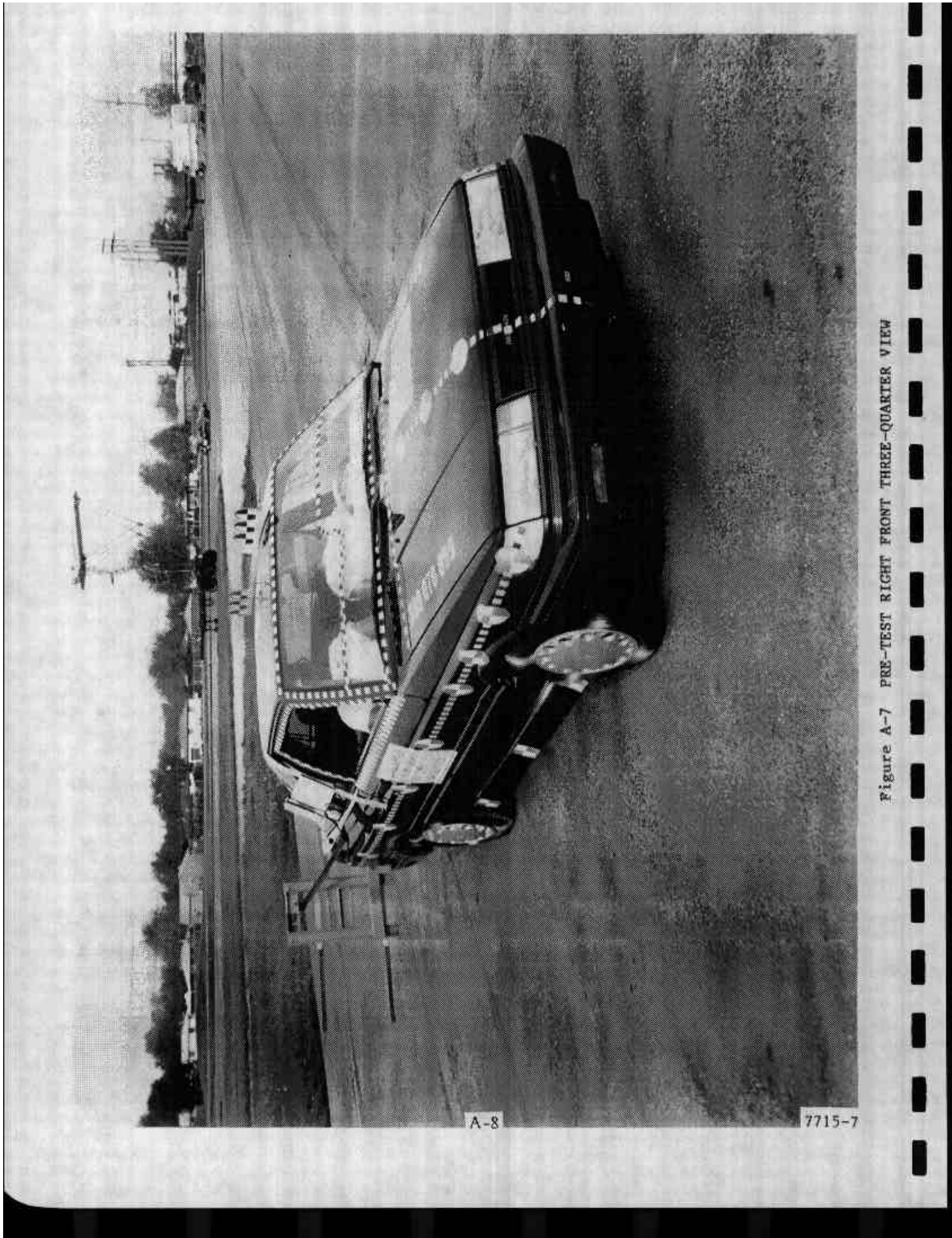


Figure A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-8

7715-7



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



A-10

7715-7

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

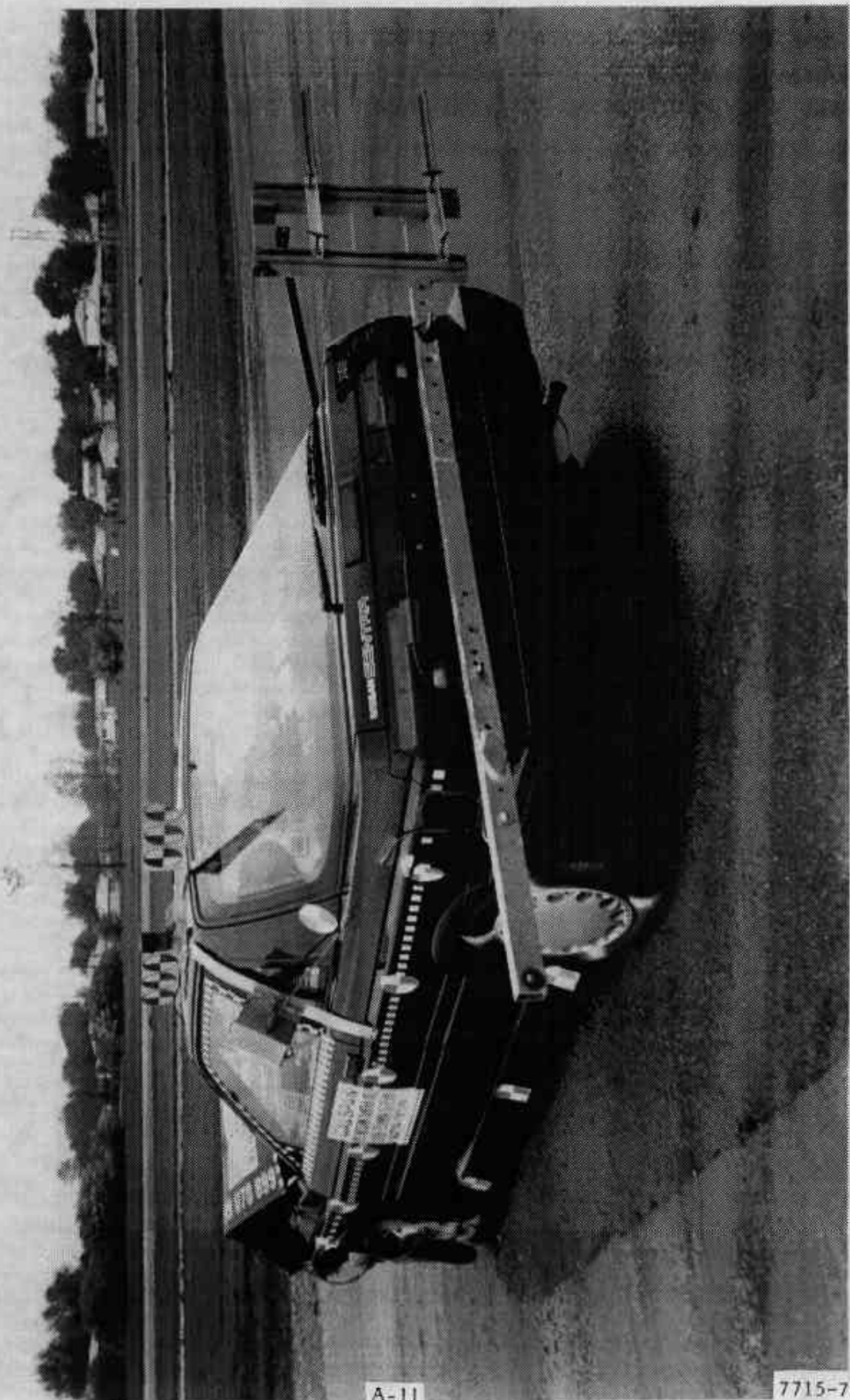


Figure A-10 POST-TEST LEFT REAR THREE-QUARTER VIEW

A-11

7715-7

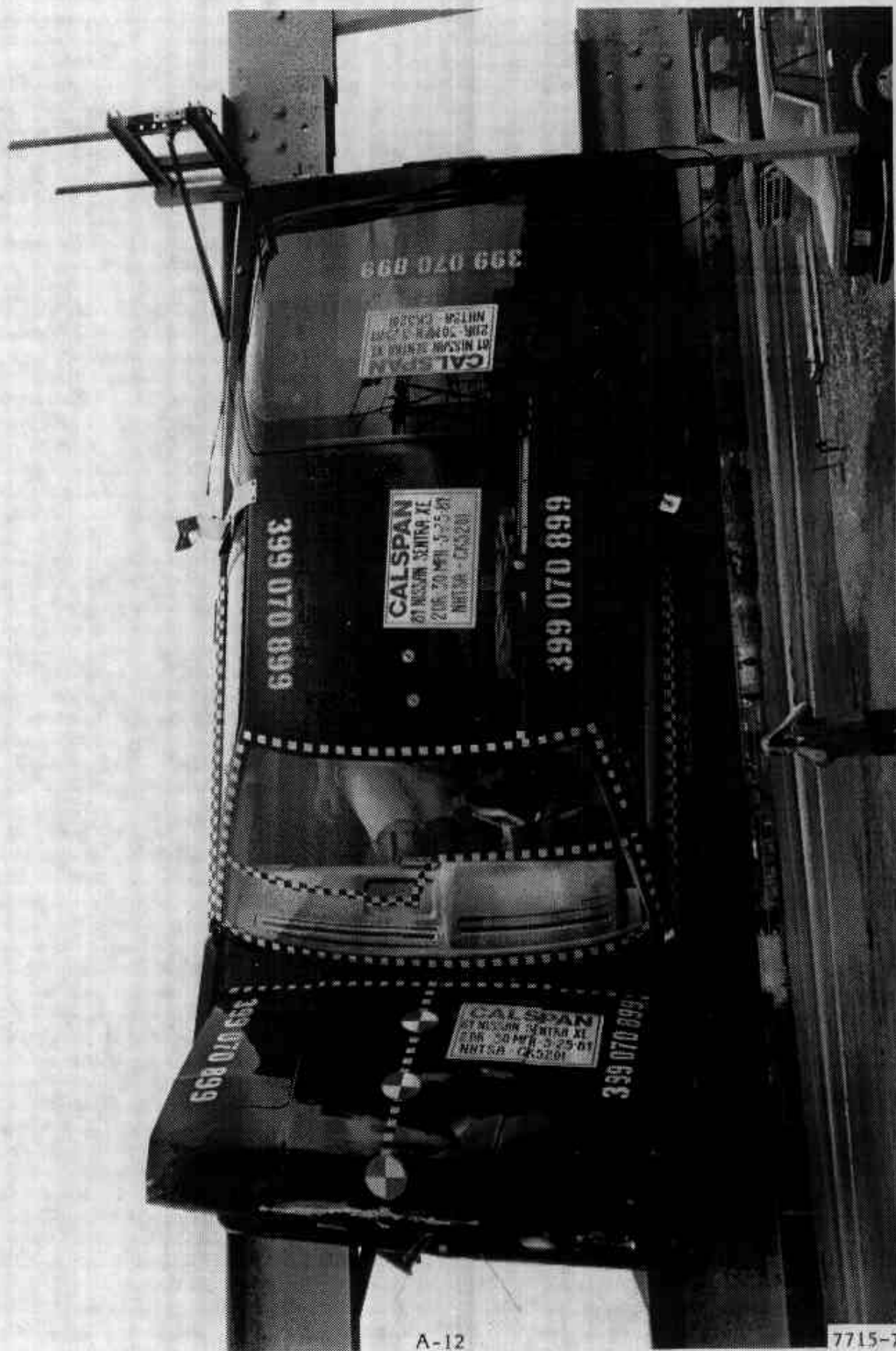


Figure A-11 POST-TEST TOP VIEW

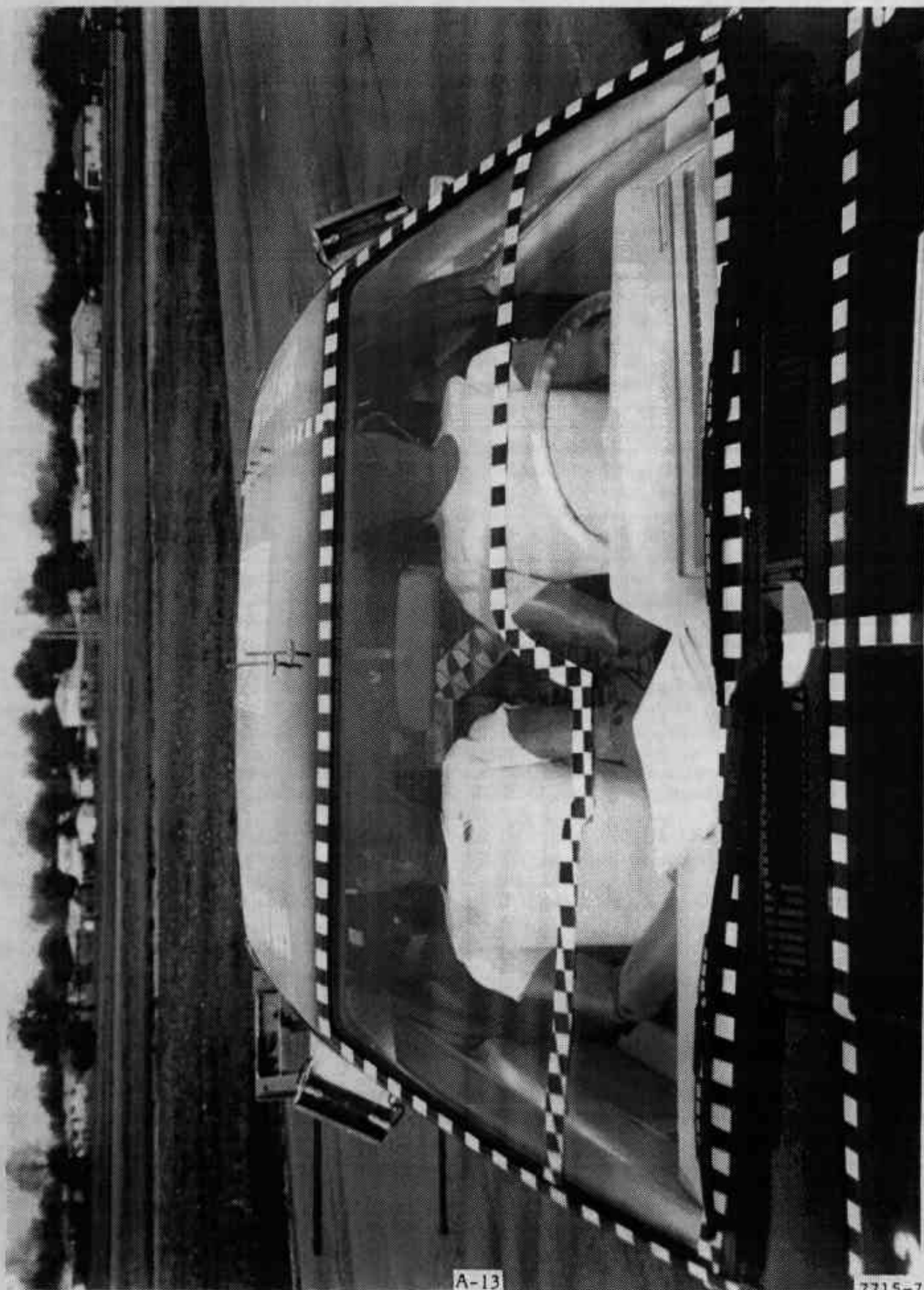
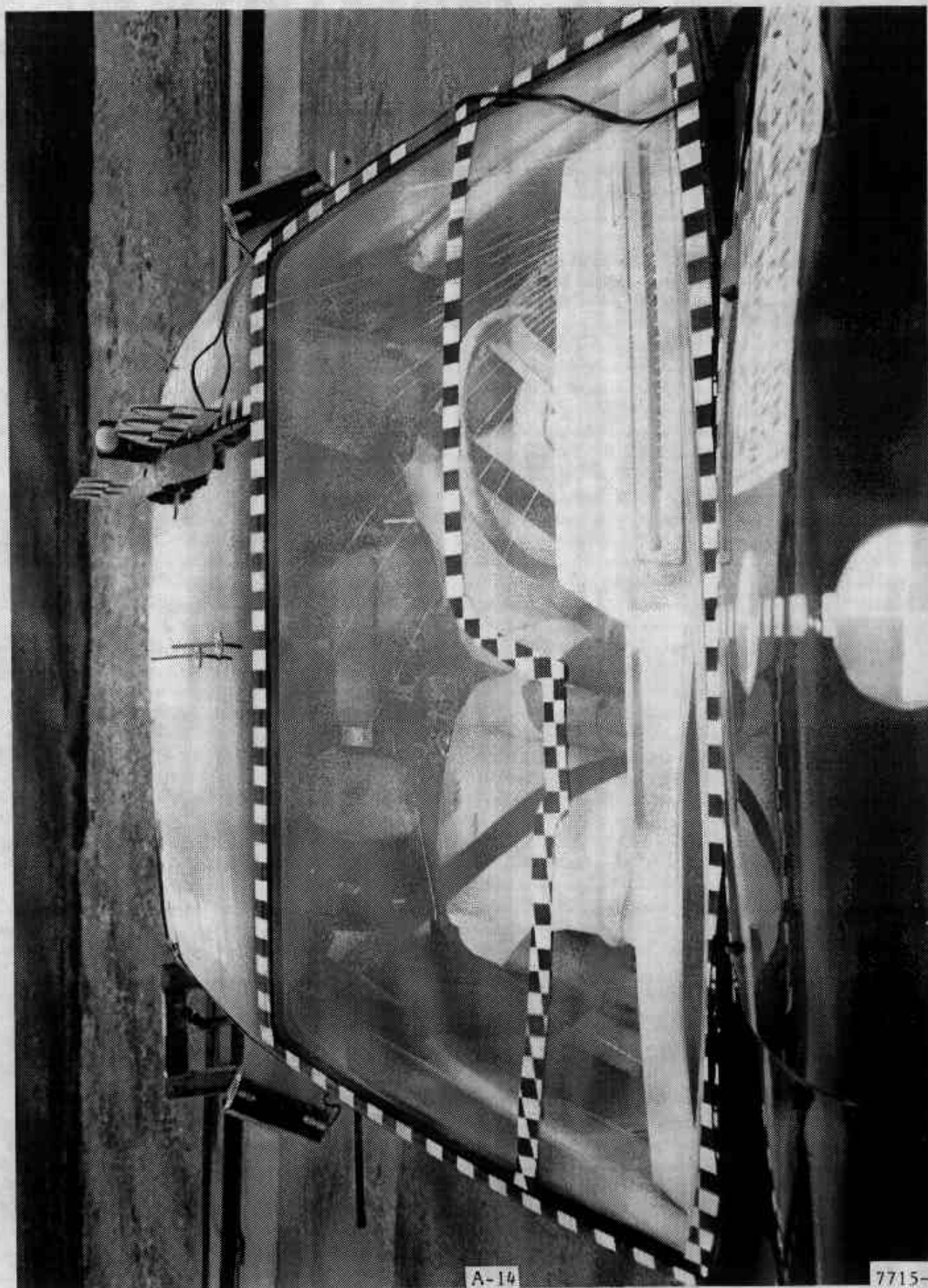


Figure A-12 PRE-TEST WINDSHIELD VIEW



A-14

7715-7

Figure A-13 POST-TEST WINDSHIELD VIEW

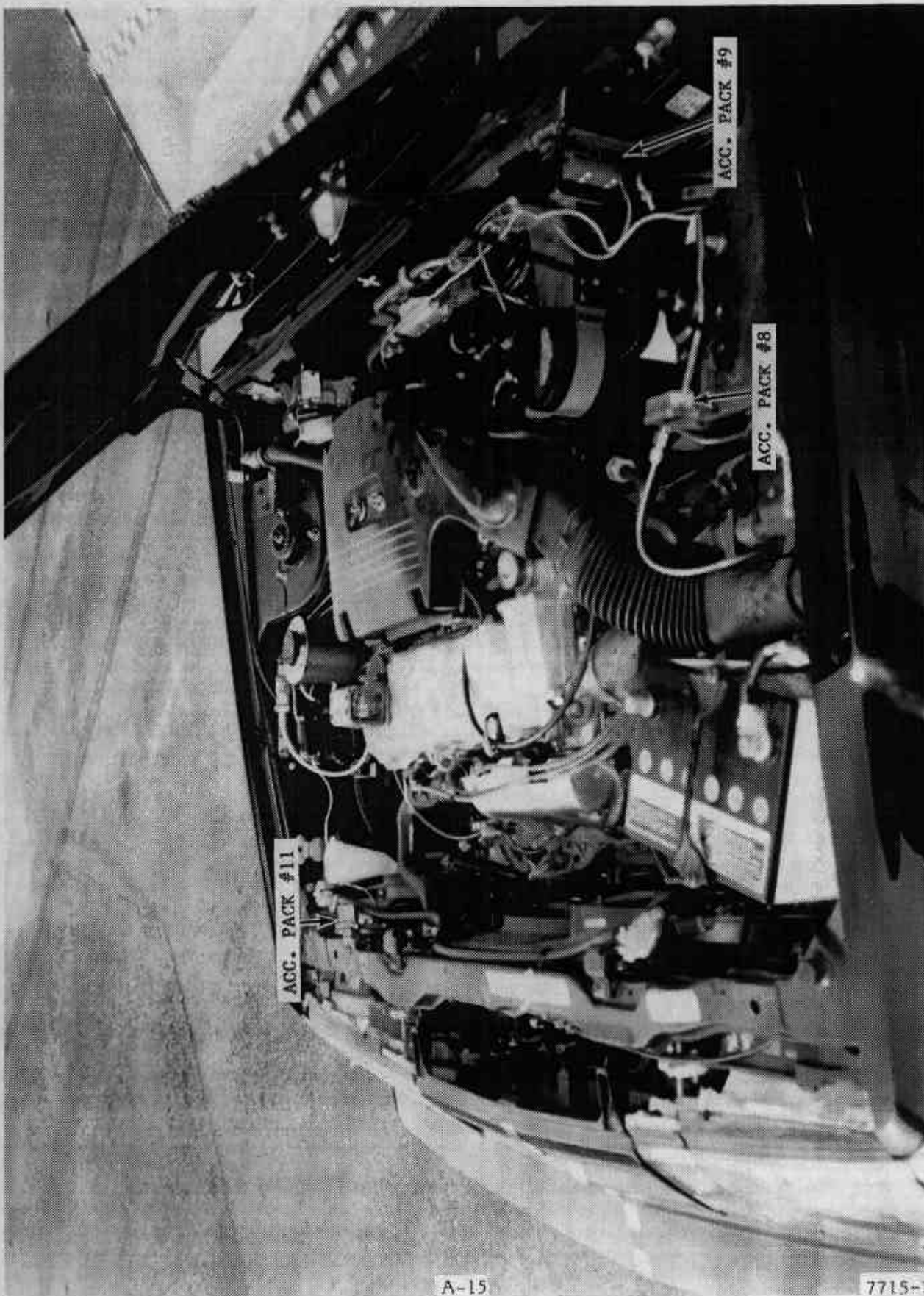


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

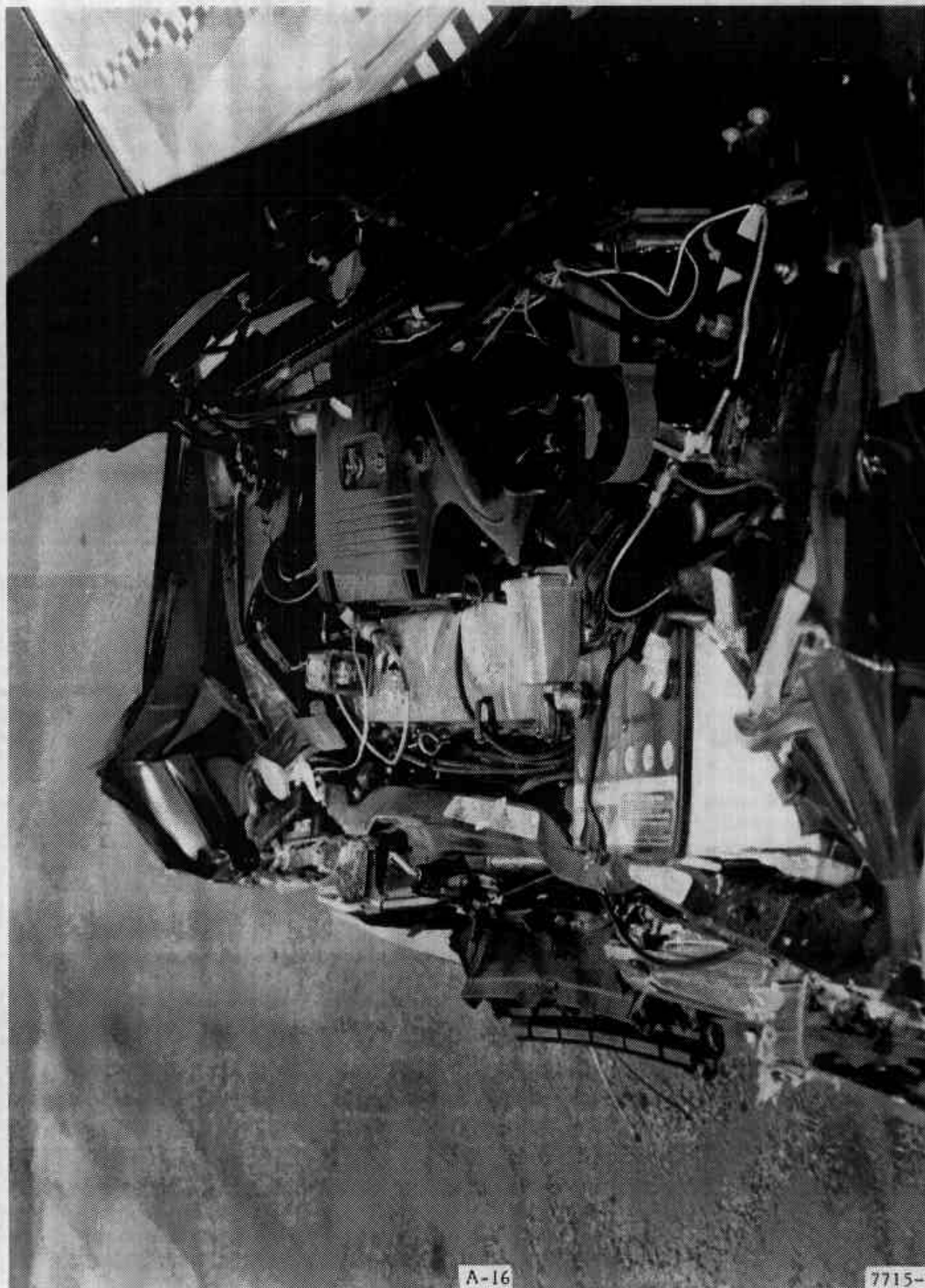


Figure A-15 POST-TEST ENGINE COMPARTMENT VIEW

A-16

7715-7

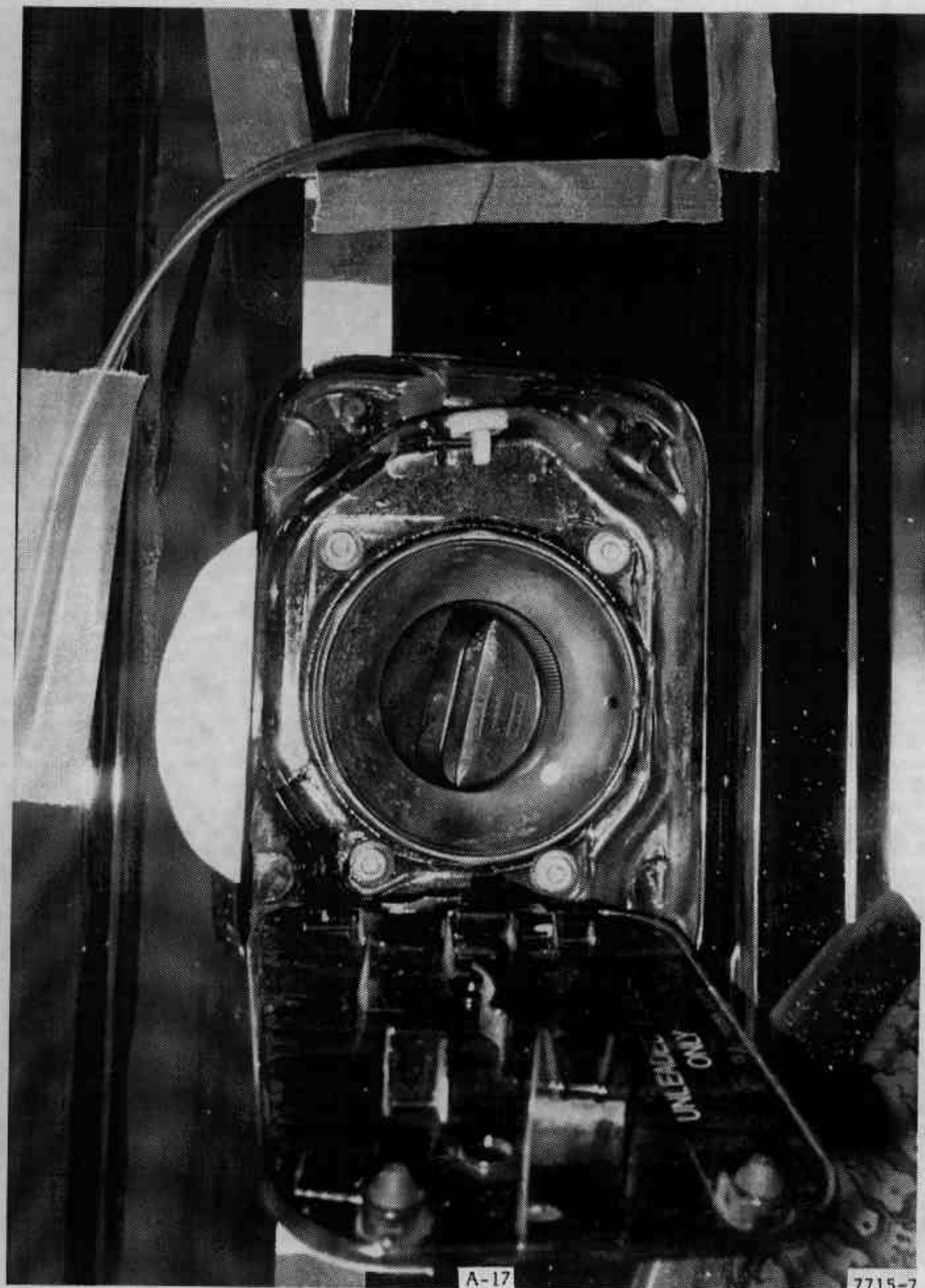


Figure A-16 PRE-TEST FUEL FILLER CAP VIEW

A-17

7715-7

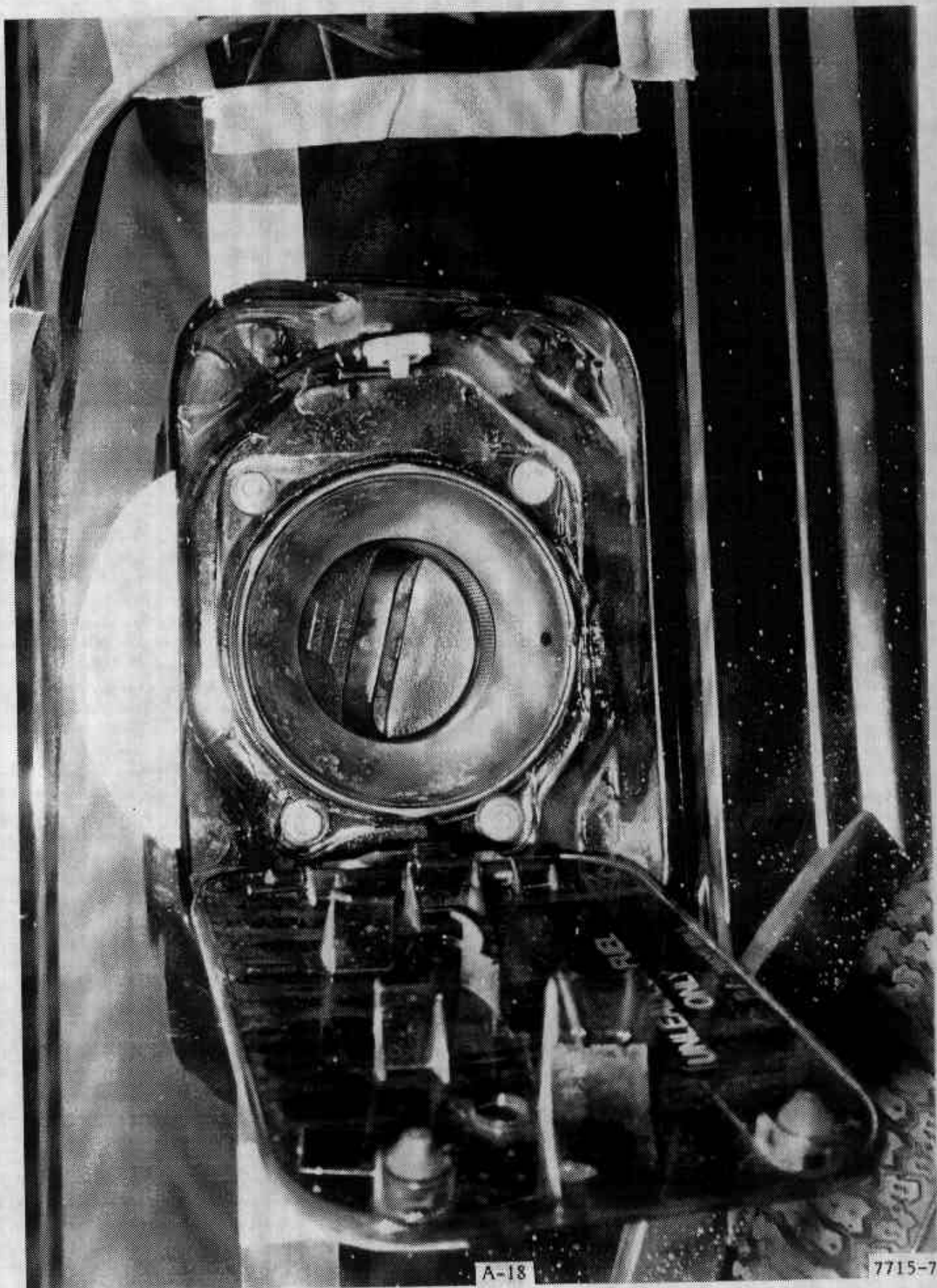


Figure A-17 POST-TEST FUEL FILLER CAP VIEW

A-18

7715-7

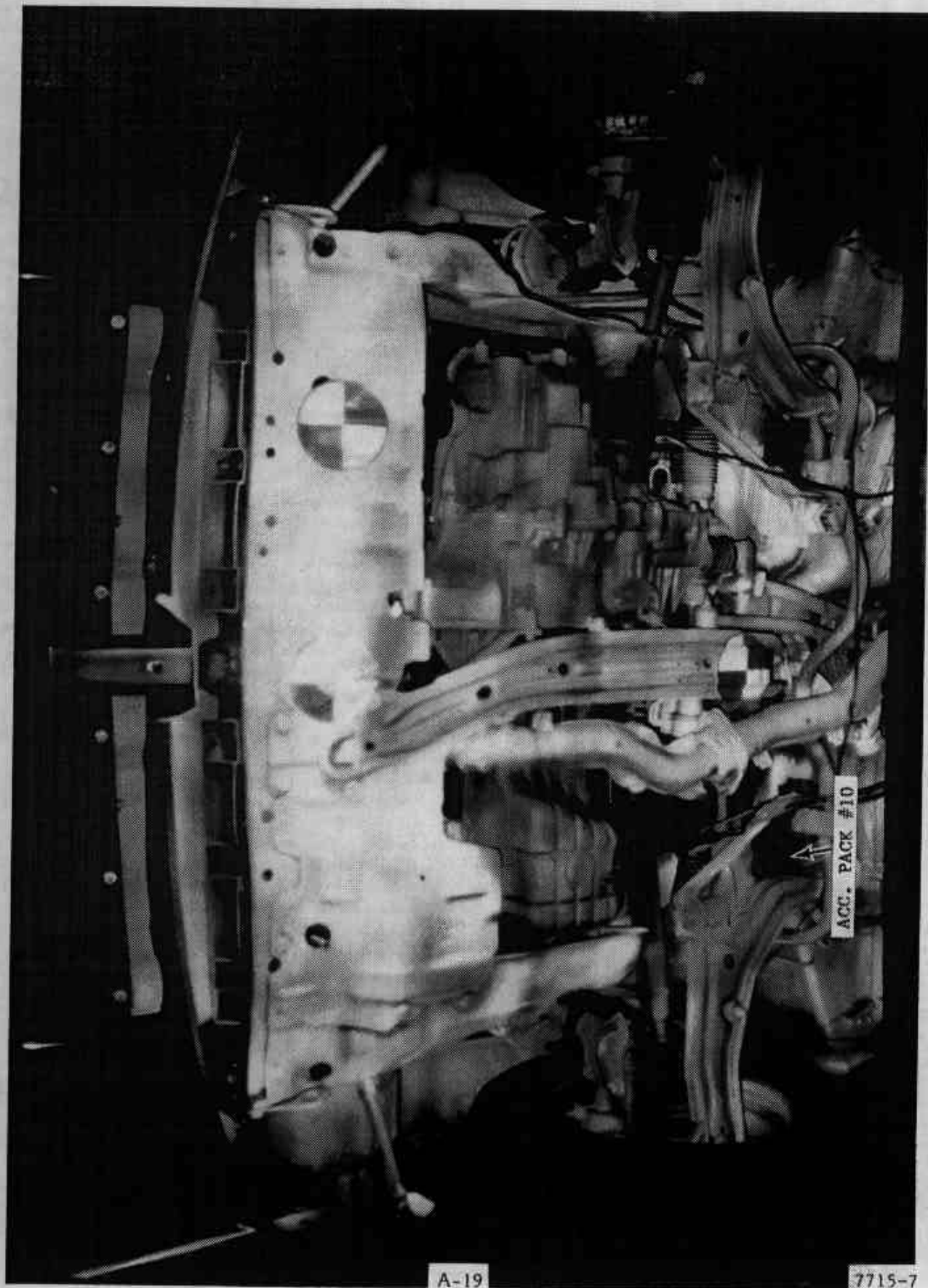


Figure A-18 PRE-TEST FRONT UNDERBODY VIEW

A-19

7715-7

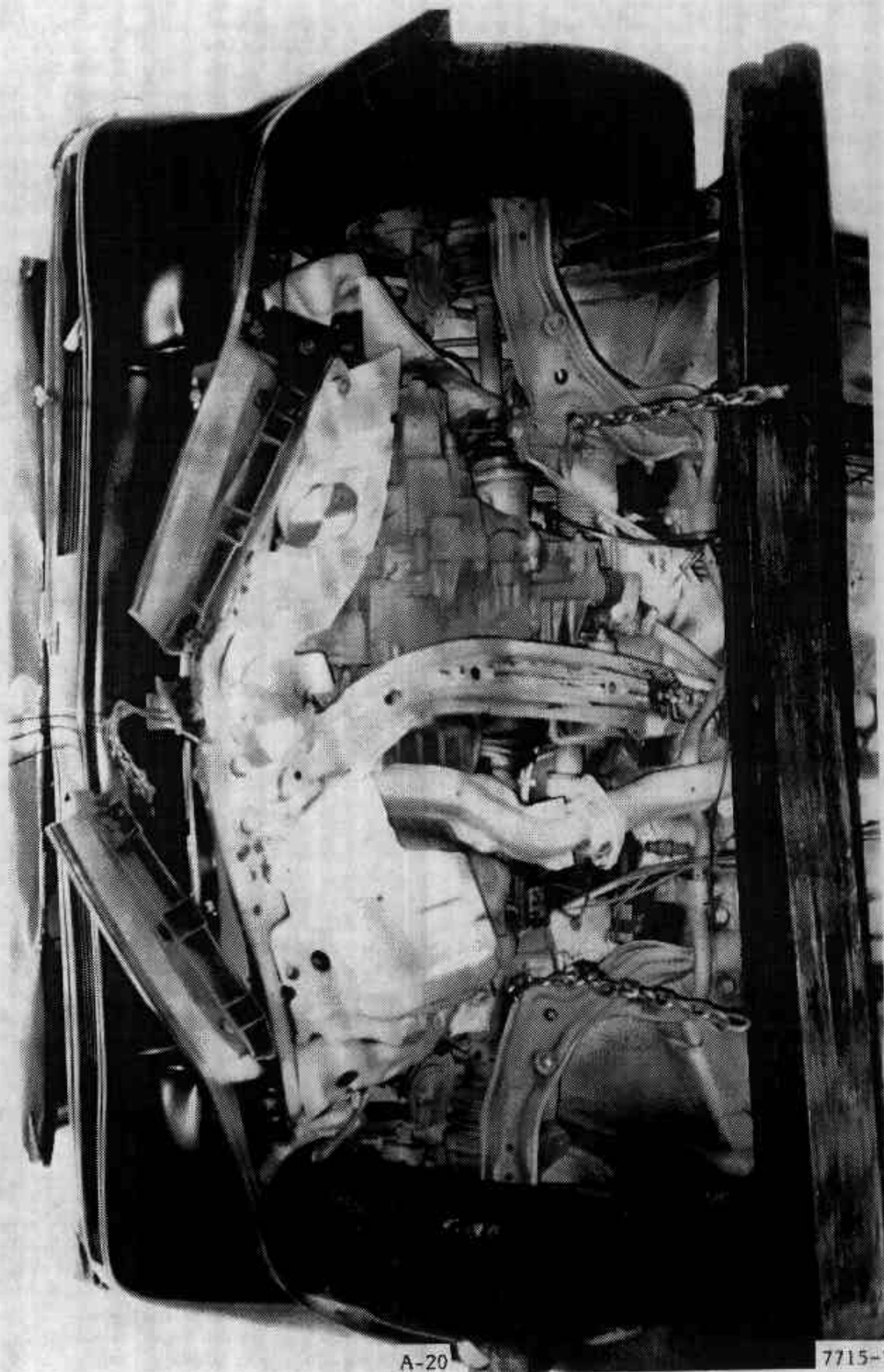


Figure A-19 POST-TEST FRONT UNDERBODY VIEW

A-20

7715-7

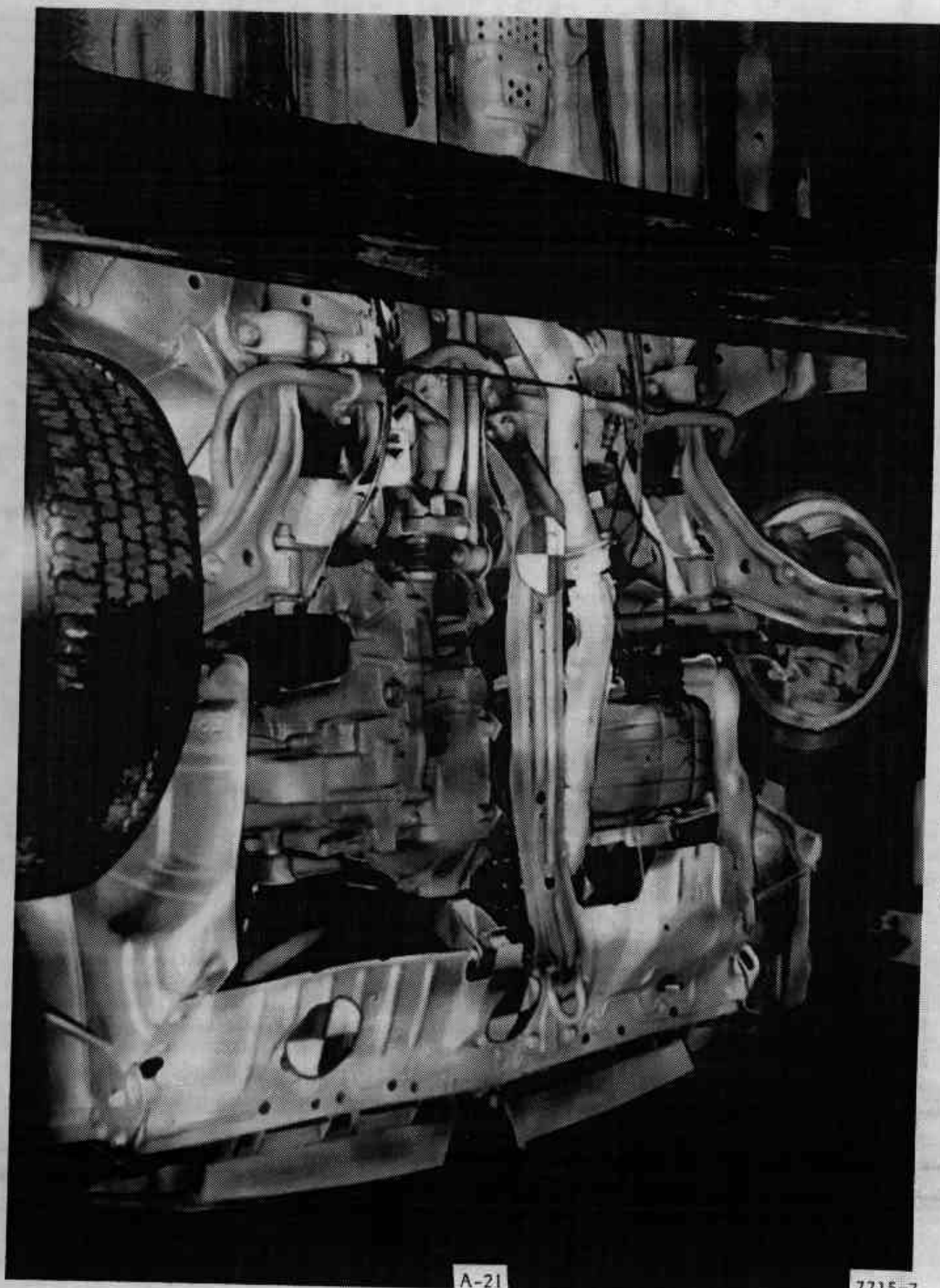


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

A-21

7715-7

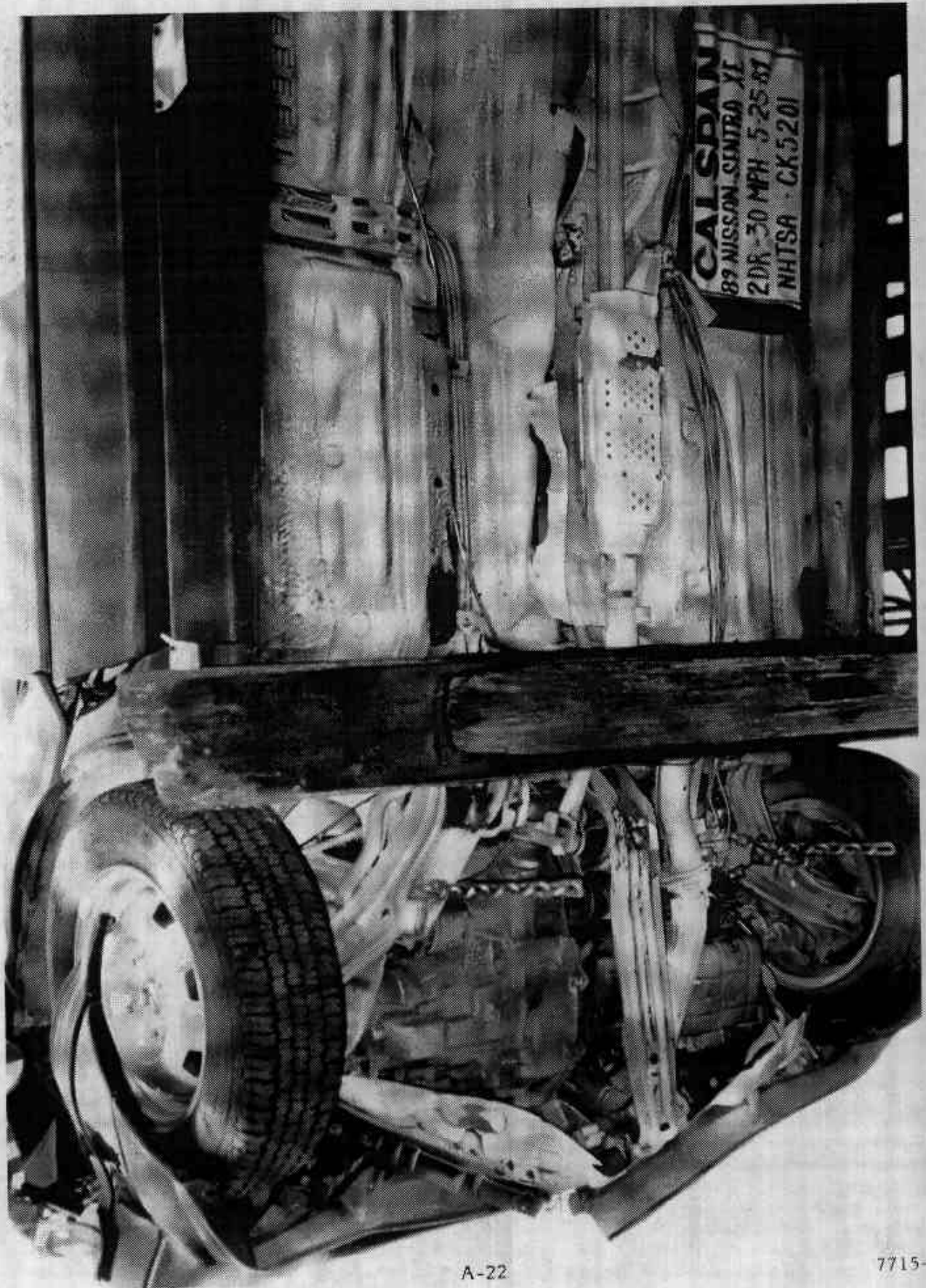


Figure A-21 POST-TEST FRONT SIDE UNDERBODY VIEW

A-22

7715-7

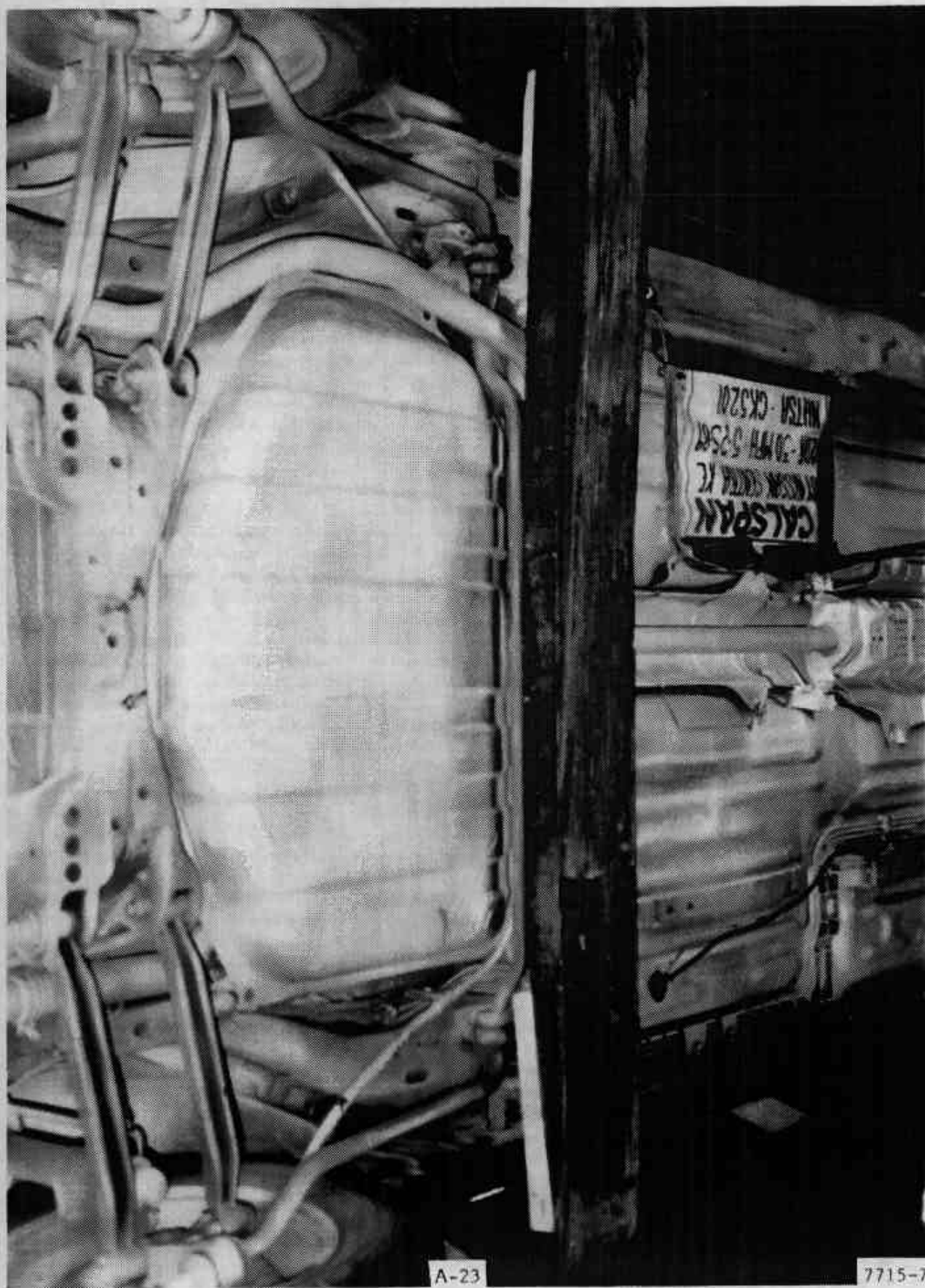


Figure A-22 PRE-TEST REAR UNDERBODY VIEW

A-23

7715-7

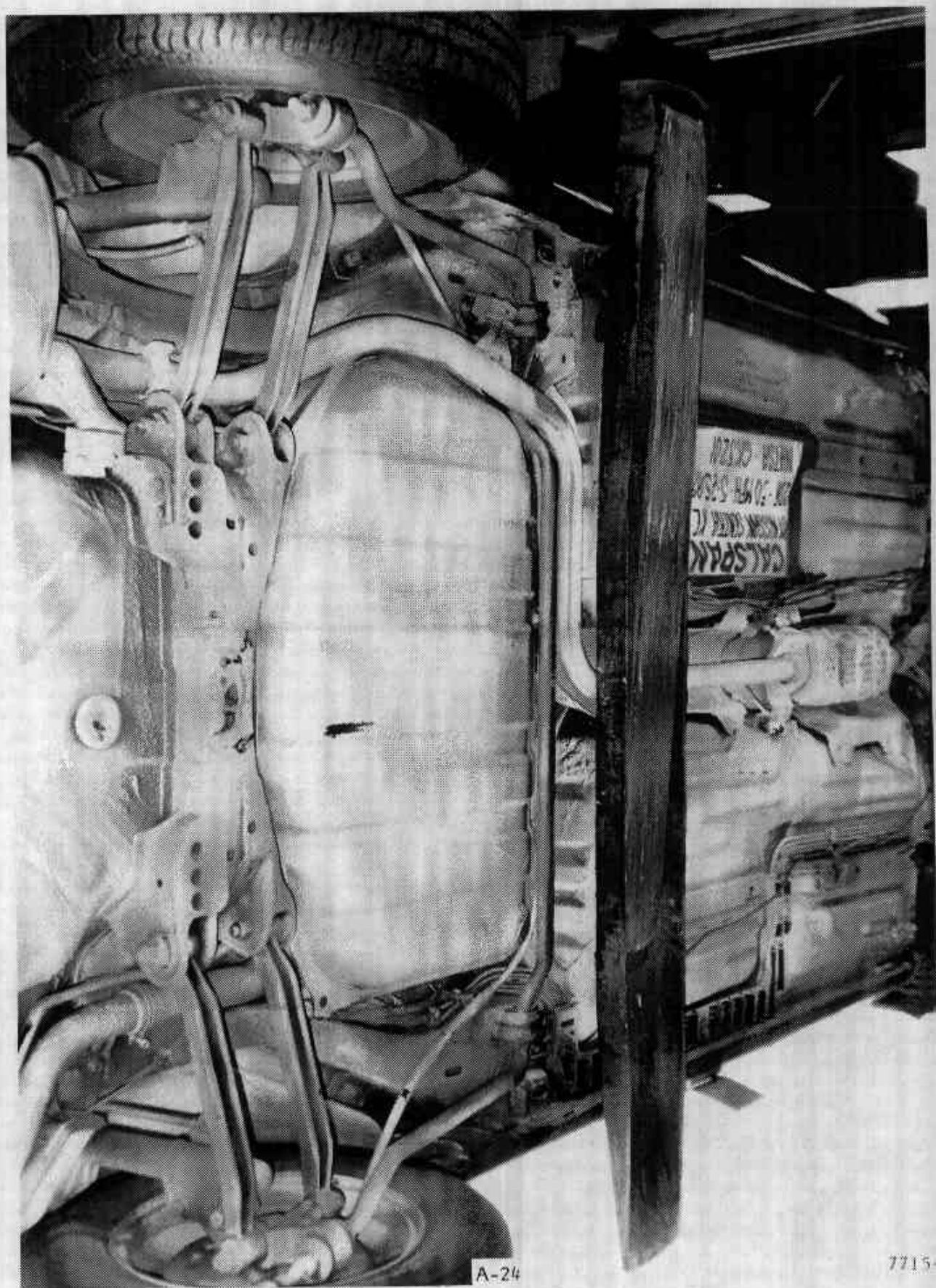


Figure A-23 POST-TEST REAR UNDERBODY VIEW

7715-7

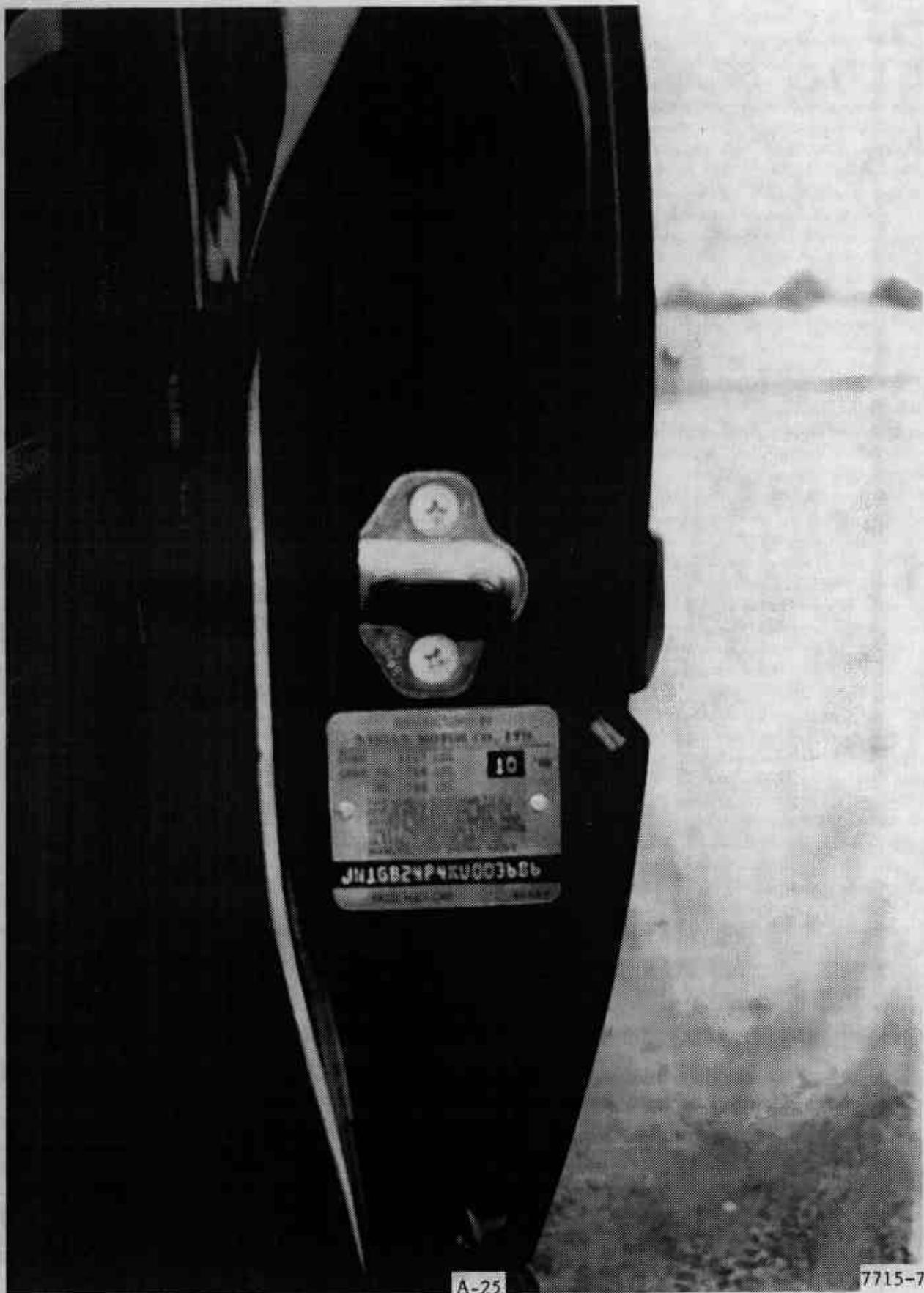


Figure A-24 CERTIFICATION LABEL

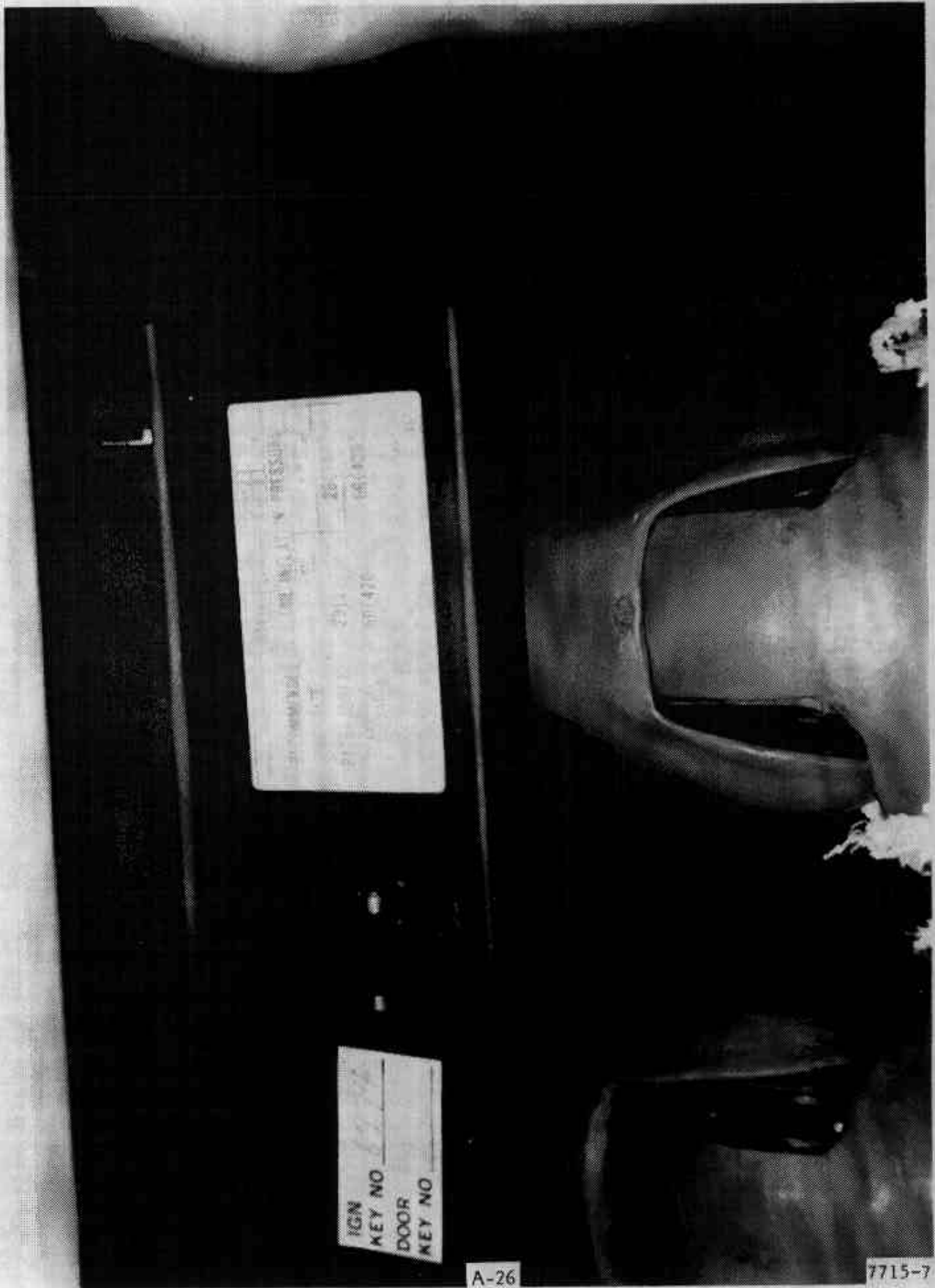


Figure A-25 TIRE PLACARD

A-26

7715-7



Figure A-26 PRE-TEST DRIVER DUMMY POSITION

A-27

7715-7



Figure A-27 POST-TEST DRIVER DUMMY POSITION



Figure A-28 PRE-TEST PASSENGER DUMMY POSITION

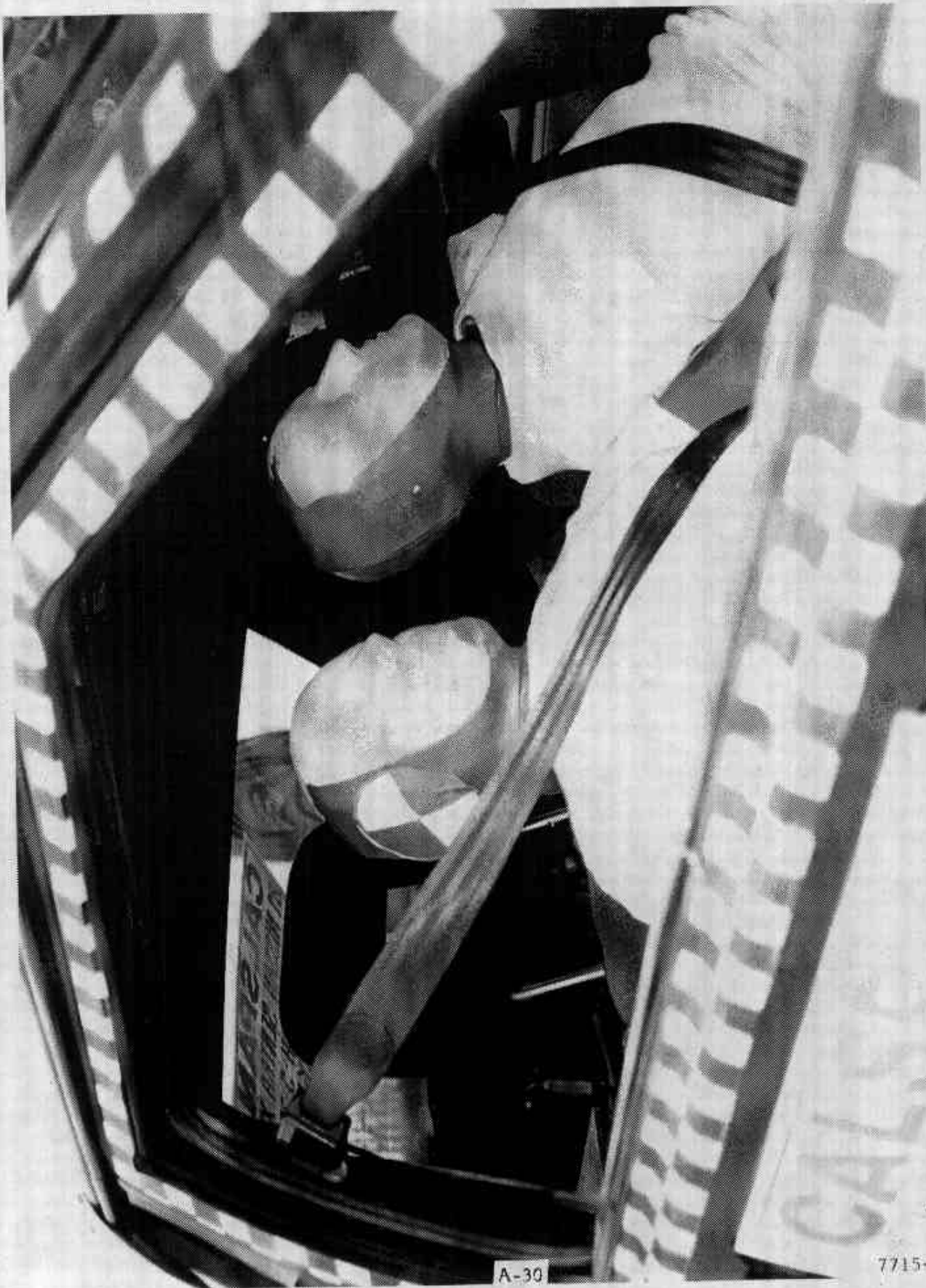


Figure A-29 POST-TEST PASSENGER DUMMY POSITION

A-30

7715-7

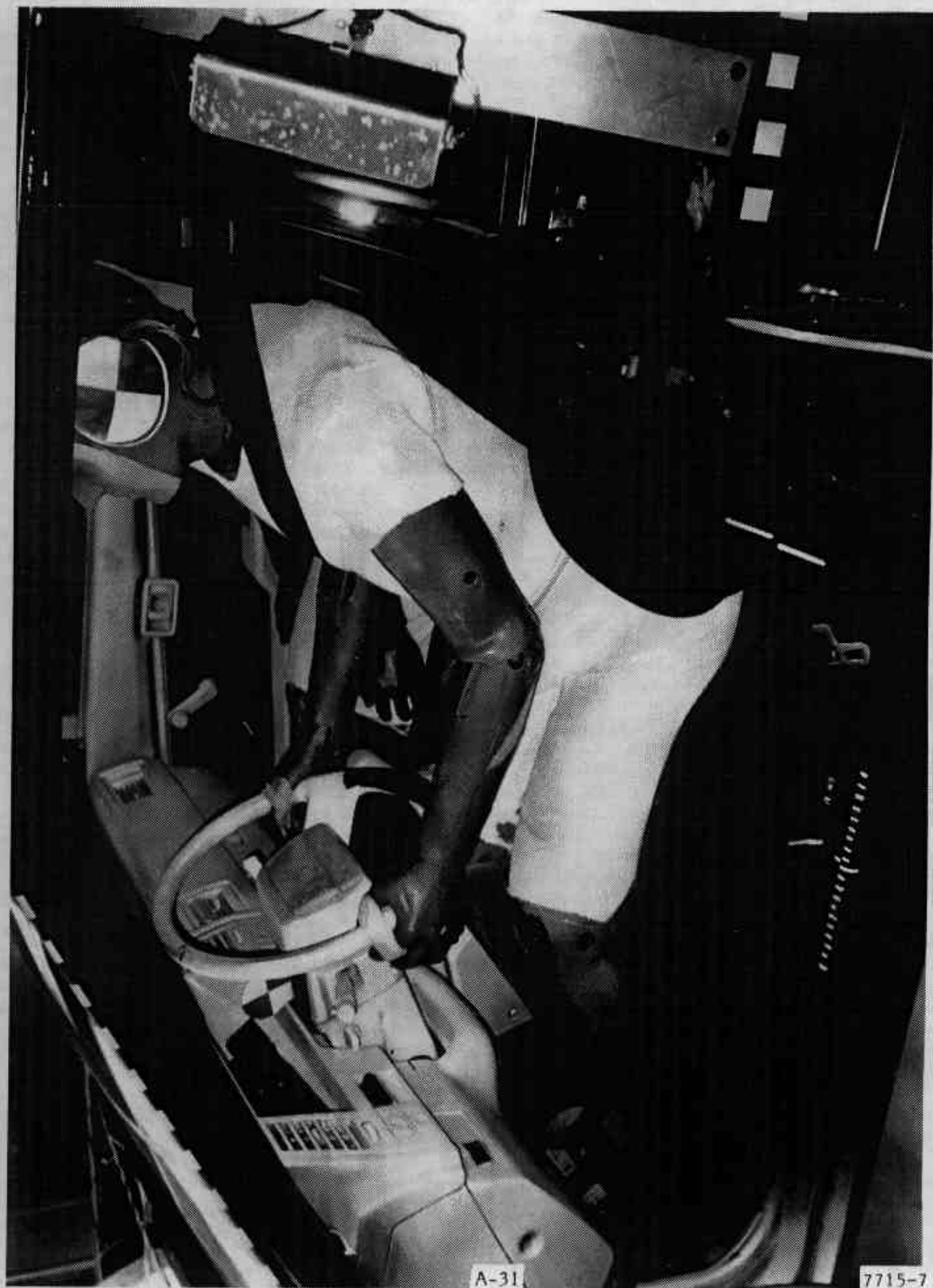


Figure A-30 PRE-TEST DRIVER DUMMY AND INTERIOR VIEW



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

A-32

7715-7

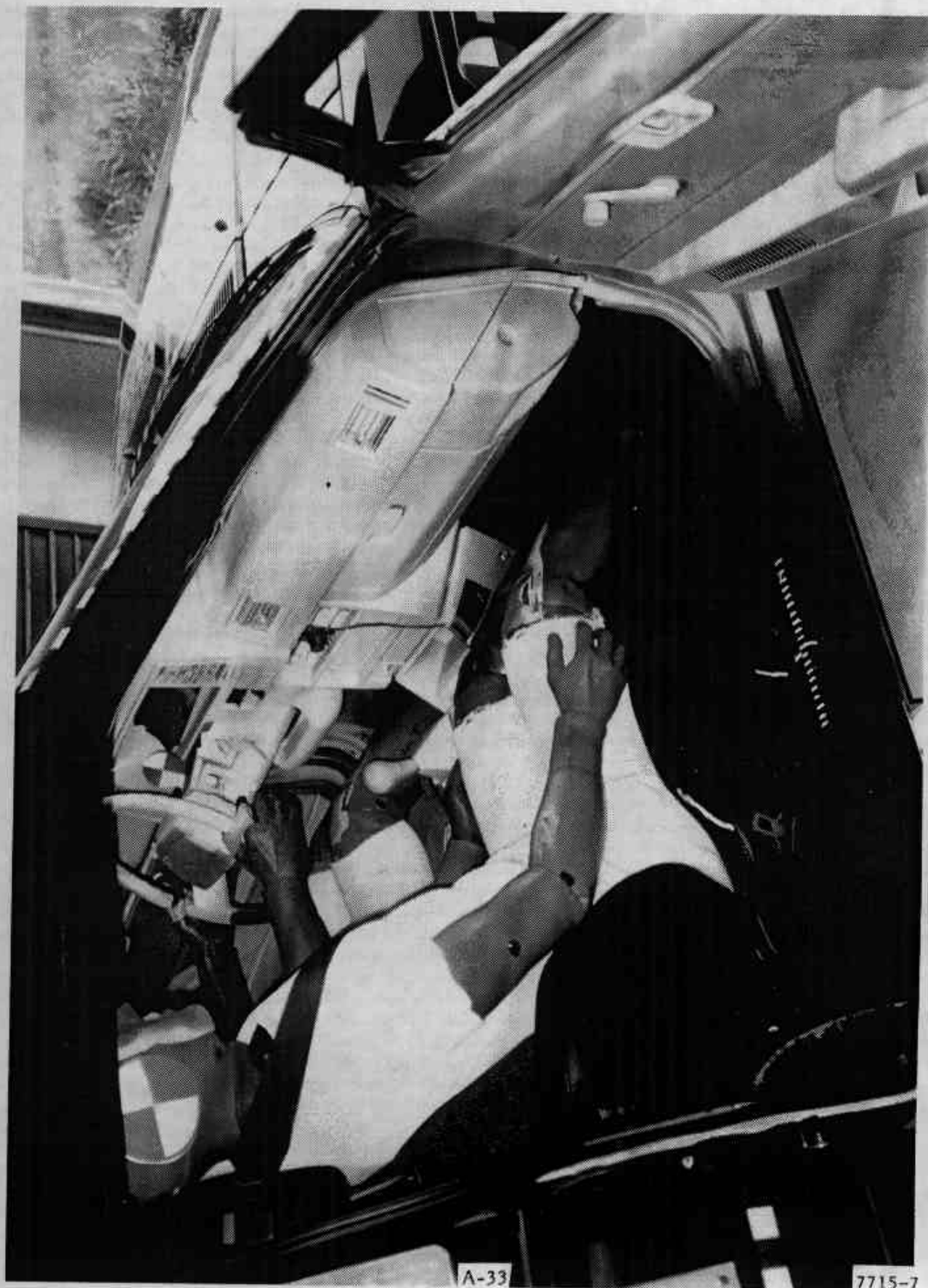


Figure A-32 PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW

A-33

7715-7



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

A-34

7715-7

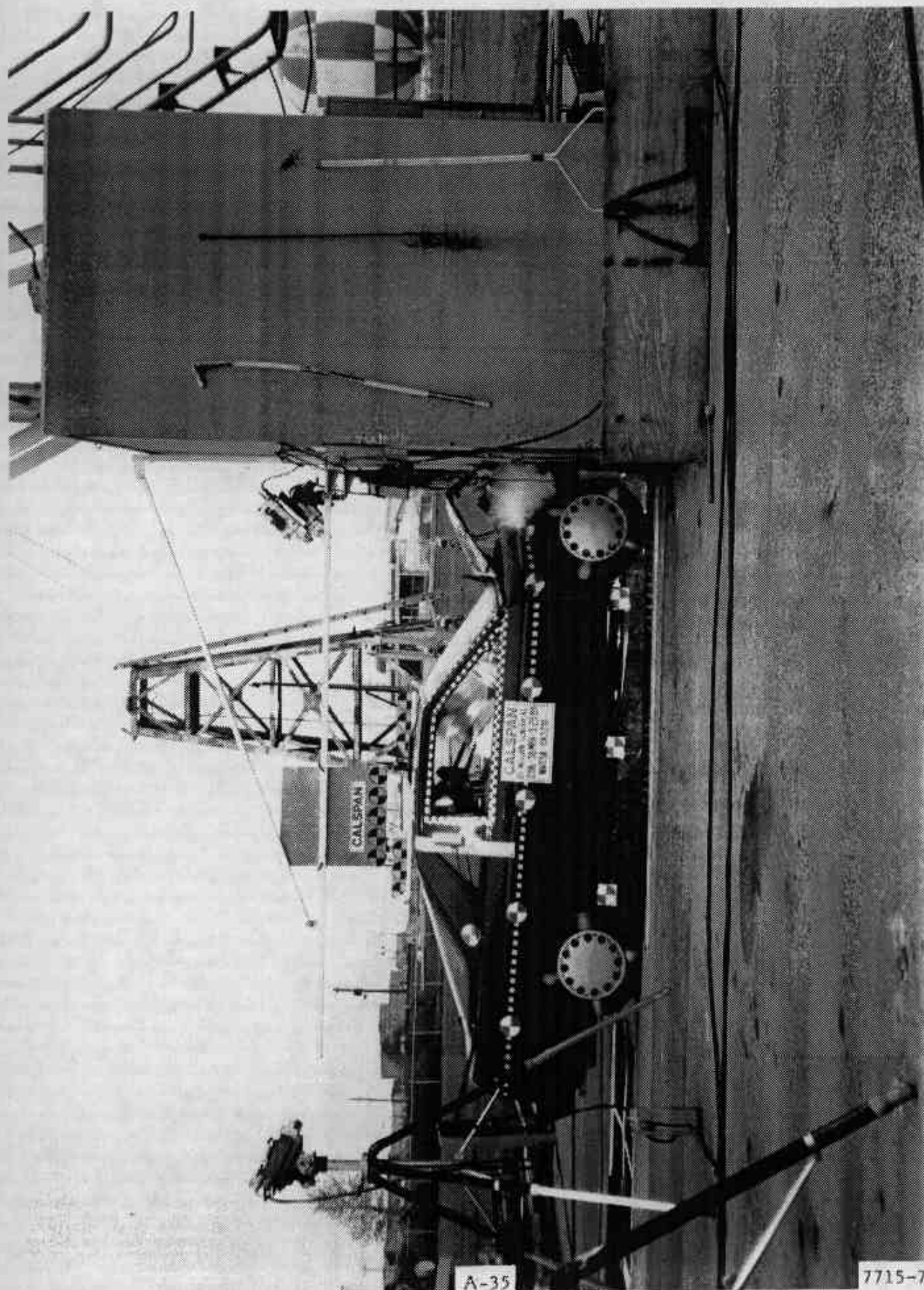


Figure A-34 VEHICLE IMPACT

A-35

7715-7

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CK5202

VEHICLE DATA

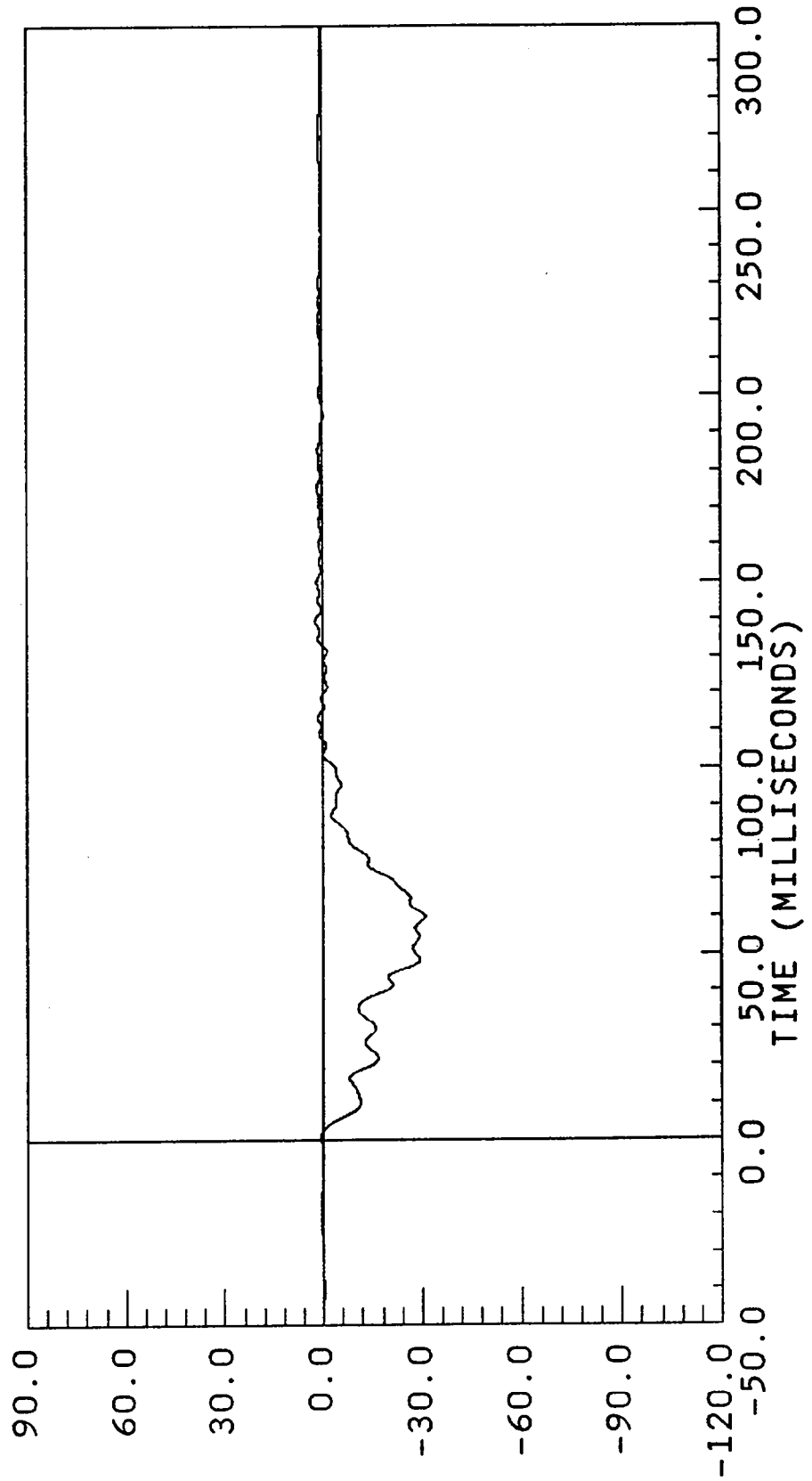
FILTER CHANNEL CLASS

60

29.60 mph

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

XL AXIS
 YMIN = -30.88264 at 60.15000
 YMAX = 2.387174 at 139.6500

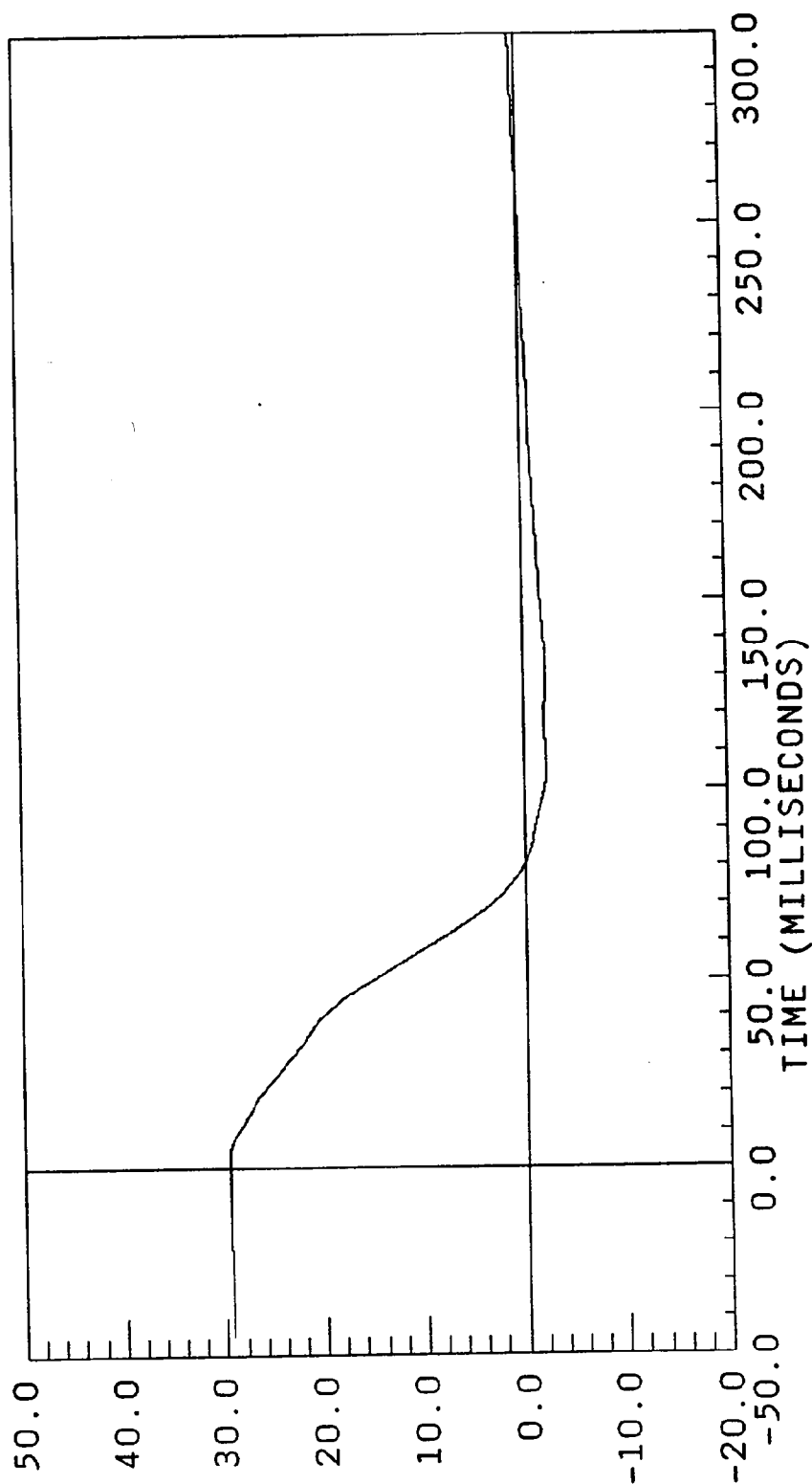


ACCELERATION * G, S *

V899-17.DAT

29.60 mph

ACC PACK #1(X)
COMPUTED
FILTER CUTOFF: 100Hz
XL AXIS
YMIN = -2.276573 at 133.0500
YMAX = 29.62023 at 2.475000



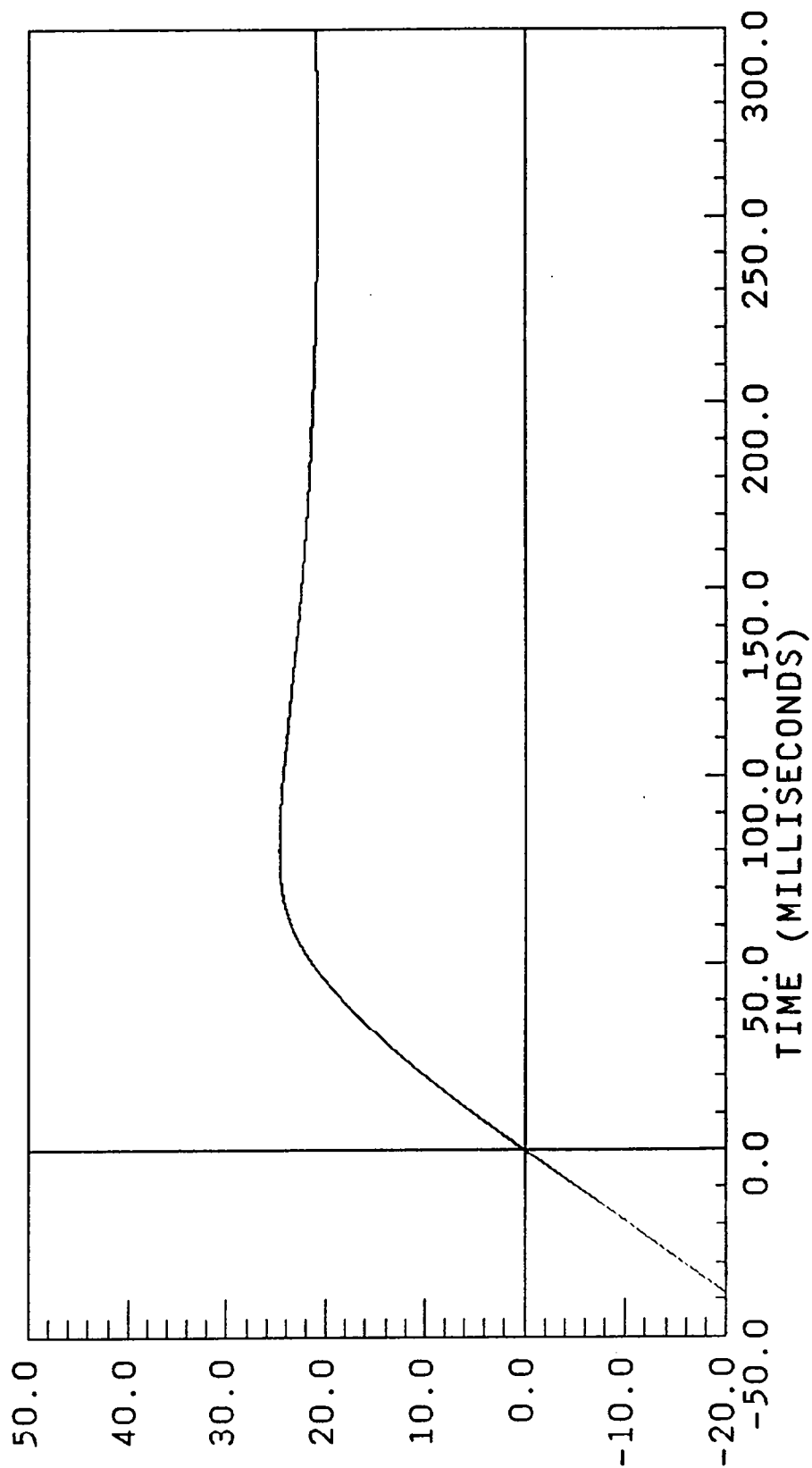
VELOCITY * MILES / HOUR

29.60 mph

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

XL AXIS

YMIN = -23.33771 at 133.0500
YMAX = 24.71772 at 80.32500



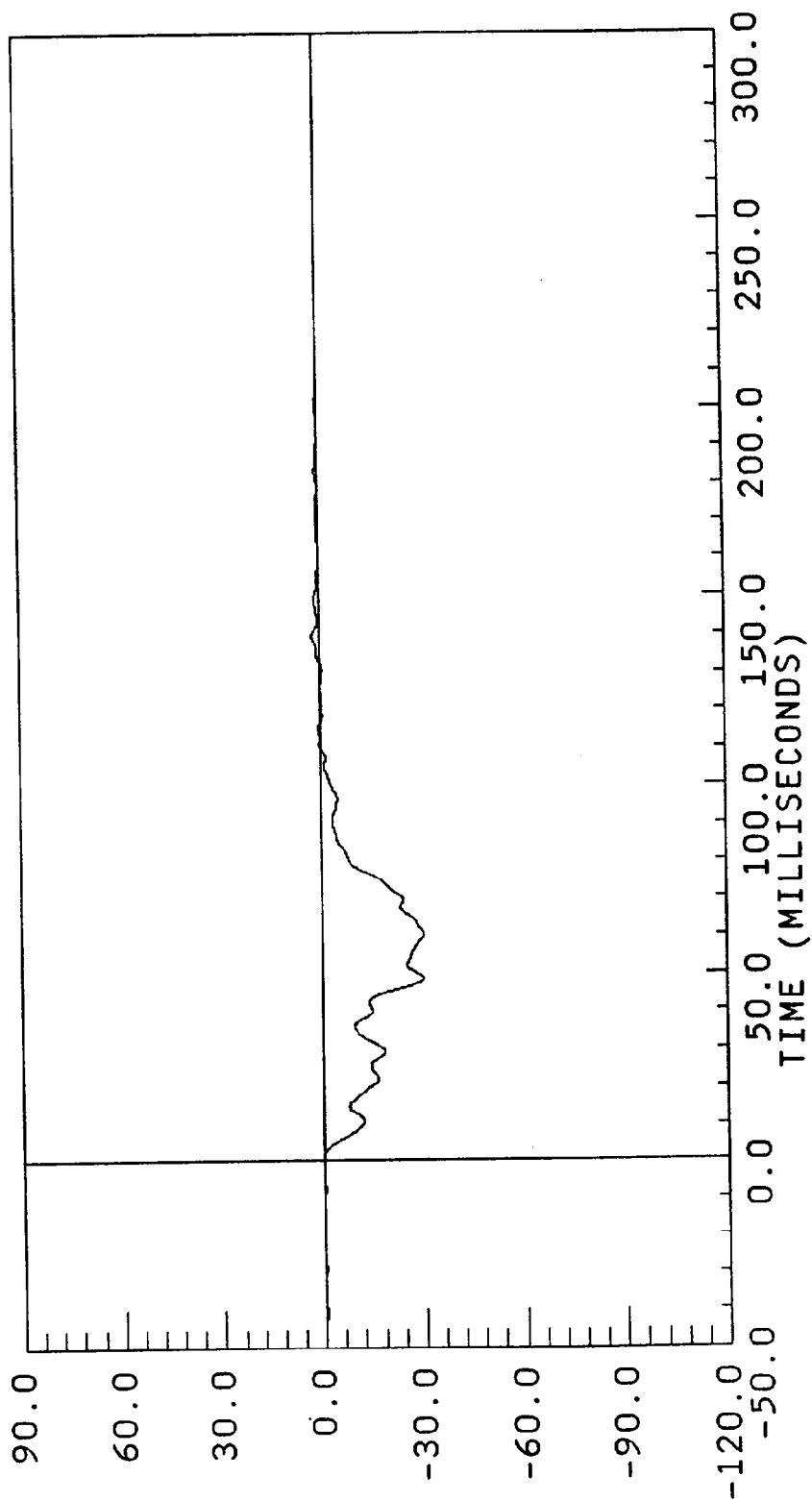
DISPLACEMENT * INCHES

BW899-18.DAT

29.60 mph

ACC PACK #2(X)
FILTERED
FILTER CUTOFF: 100Hz

XL AXIS
YMIN = -30.17154 at 60.22500
YMAX = 2.372657 at 139.5000

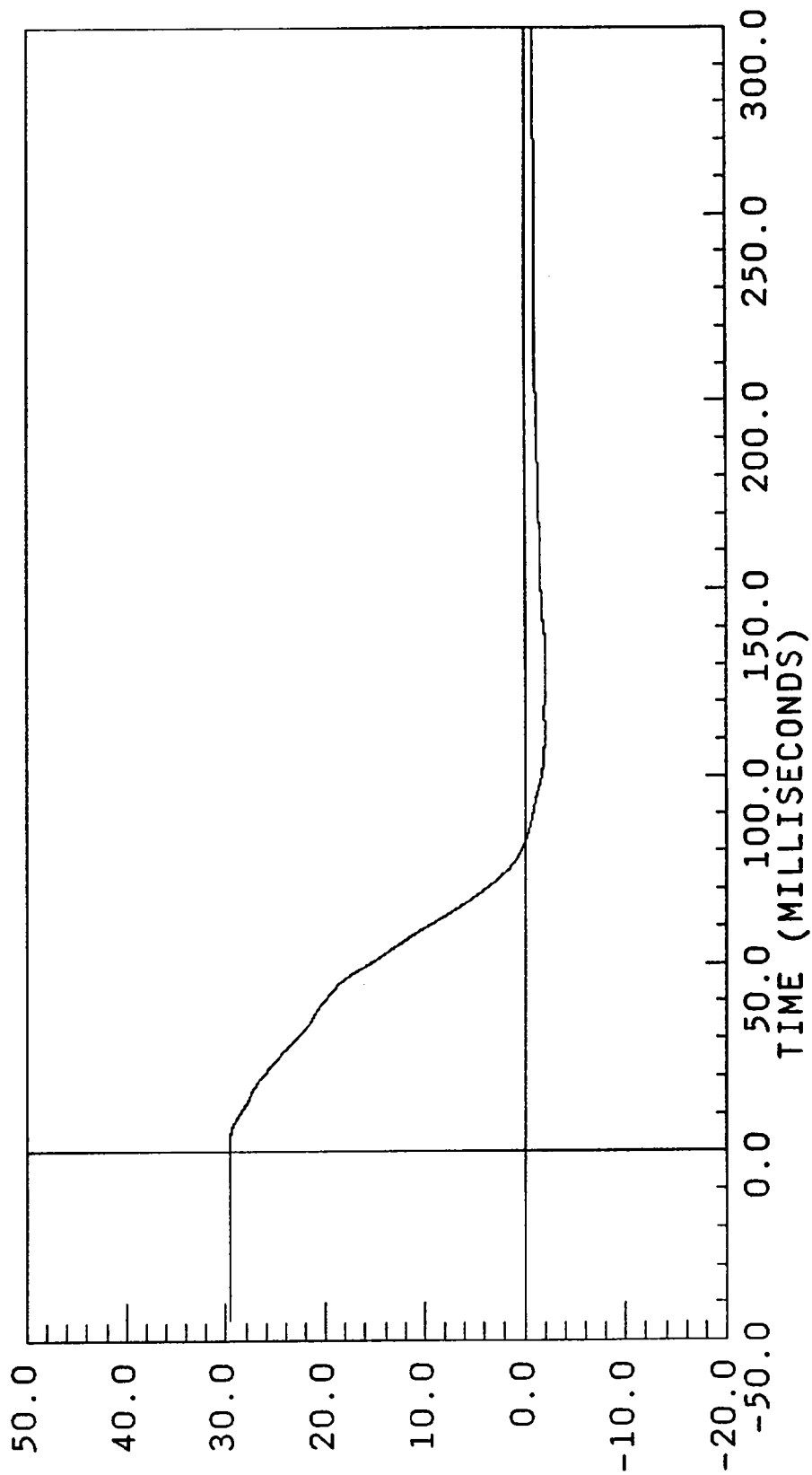


ACCELERATION * G, S *
B-6 7715-7

29.60 mph

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

XL AXIS
YMIN = -2.076901 at 132.3750
YMAX = 29.62276 at -14.47500

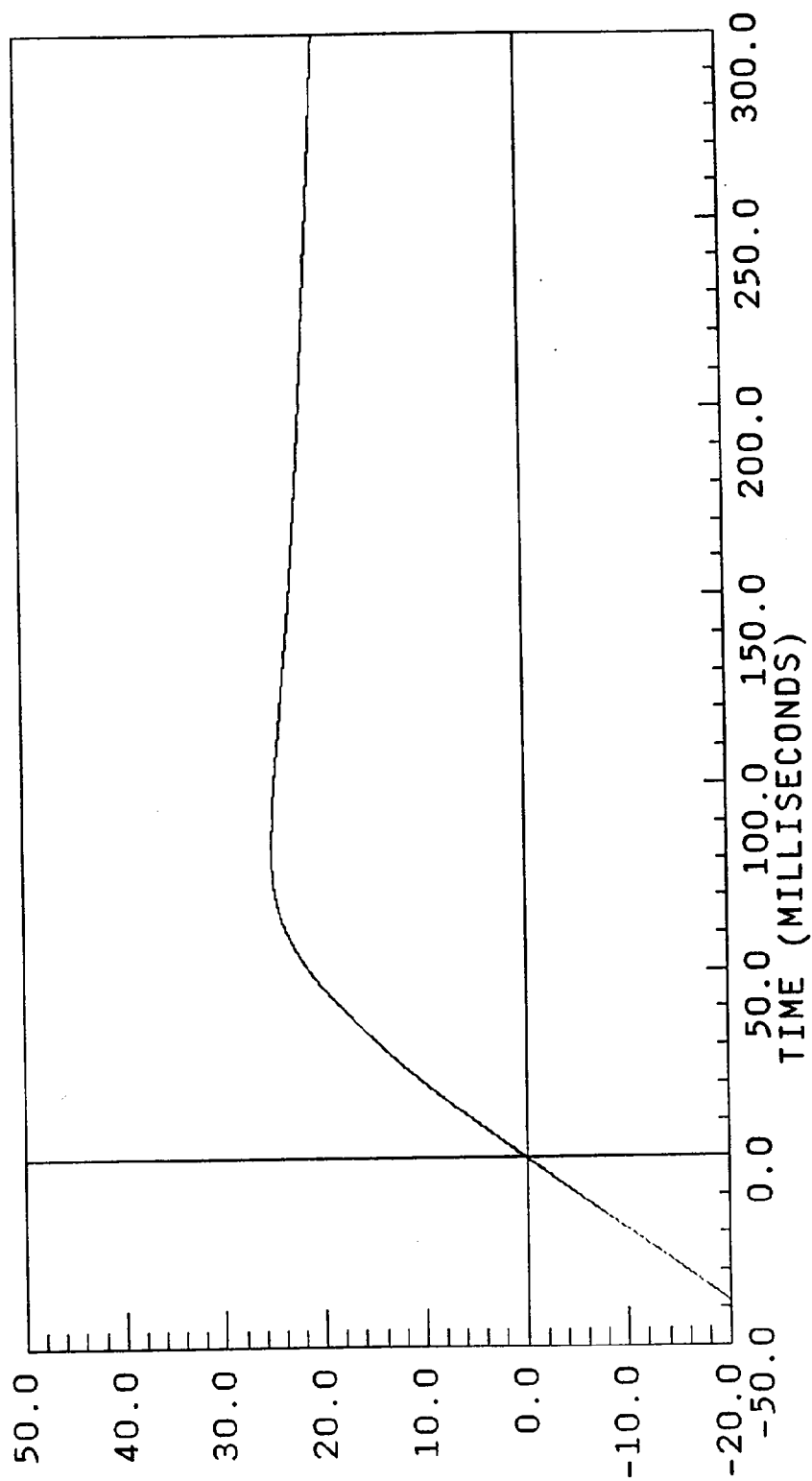


VELOCITY * MILES / HOUR

D899-18.DAT

29.60 mph

ACC PACK #2(X)
COMPUTED
FILTER CUTOFF: 100Hz
XL AXIS
YMIN = -23.40854 at 132.3750
YMAX = 25.08345 at 82.20000



DISPLACEMENT * INCHES
B-8 7715-7

29.60 mph

ACC PACK #3(X)

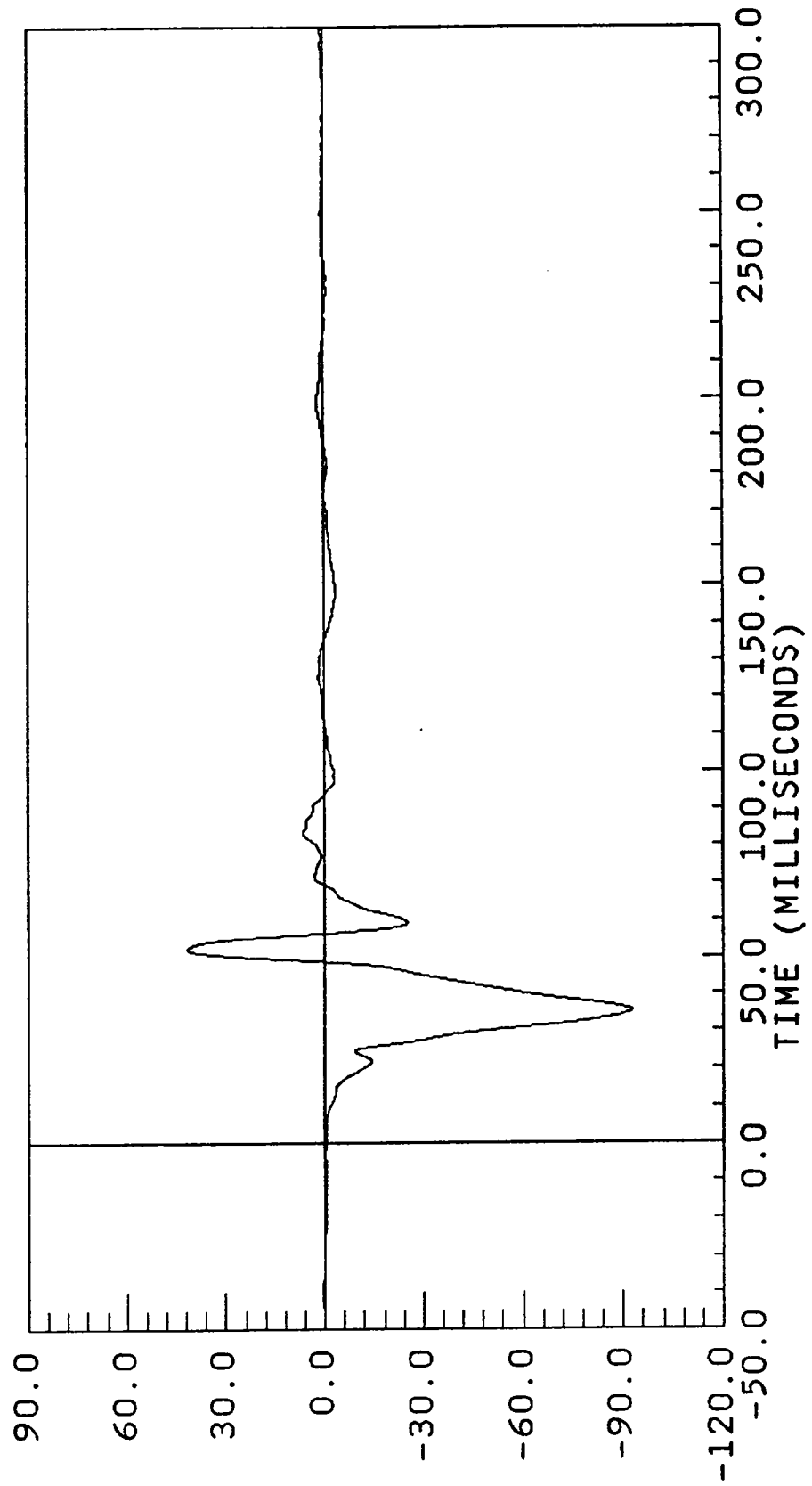
FILTERED

FILTER CUTOFF: 100HZ

XL AXIS

YMIN = -92.70277 at 35.55000

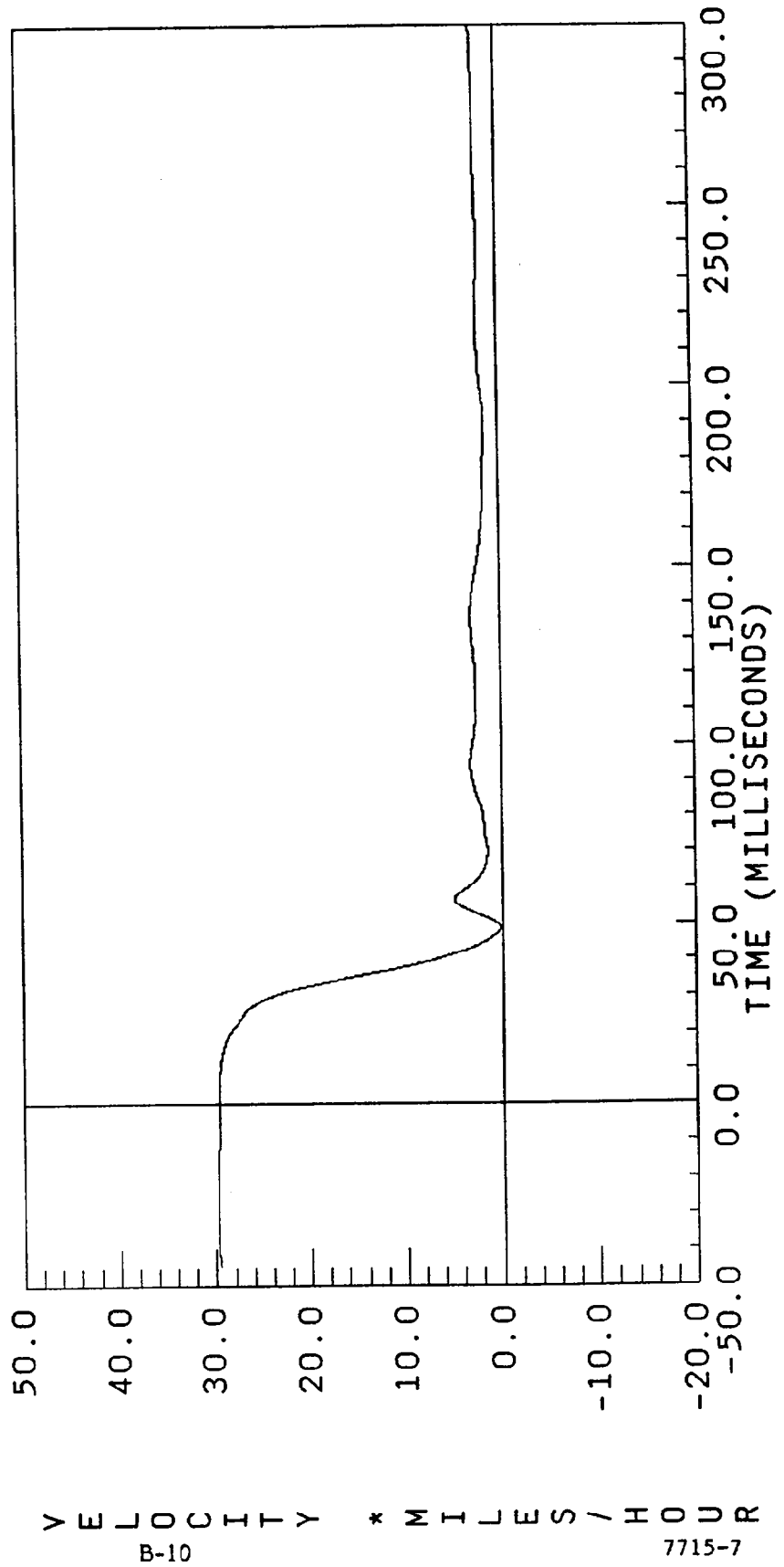
YMAX = 41.77702 at 52.20000



V899-19.DAT

29.60 mph

ACC PACK #3(X)
COMPUTED
FILTER CUTOFF: 100HZ
XL AXIS
YMIN = 0.137357 at 48.75000
YMAX = 29.62306 at -25.72500



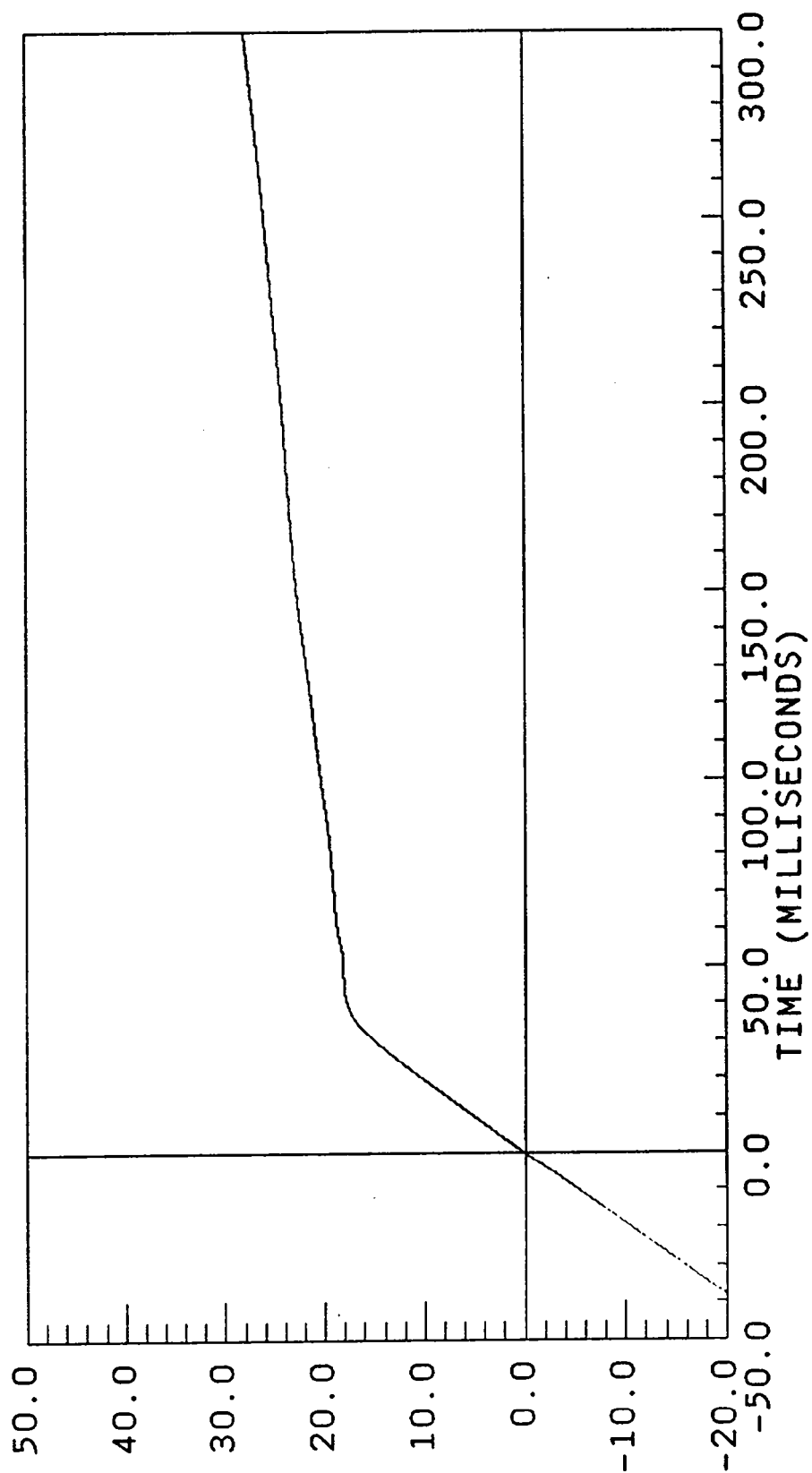
29.60 mph

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

XL AXIS

YMIN = -23.47001 at 48.75000

YMAX = 27.94354 at 300.0000



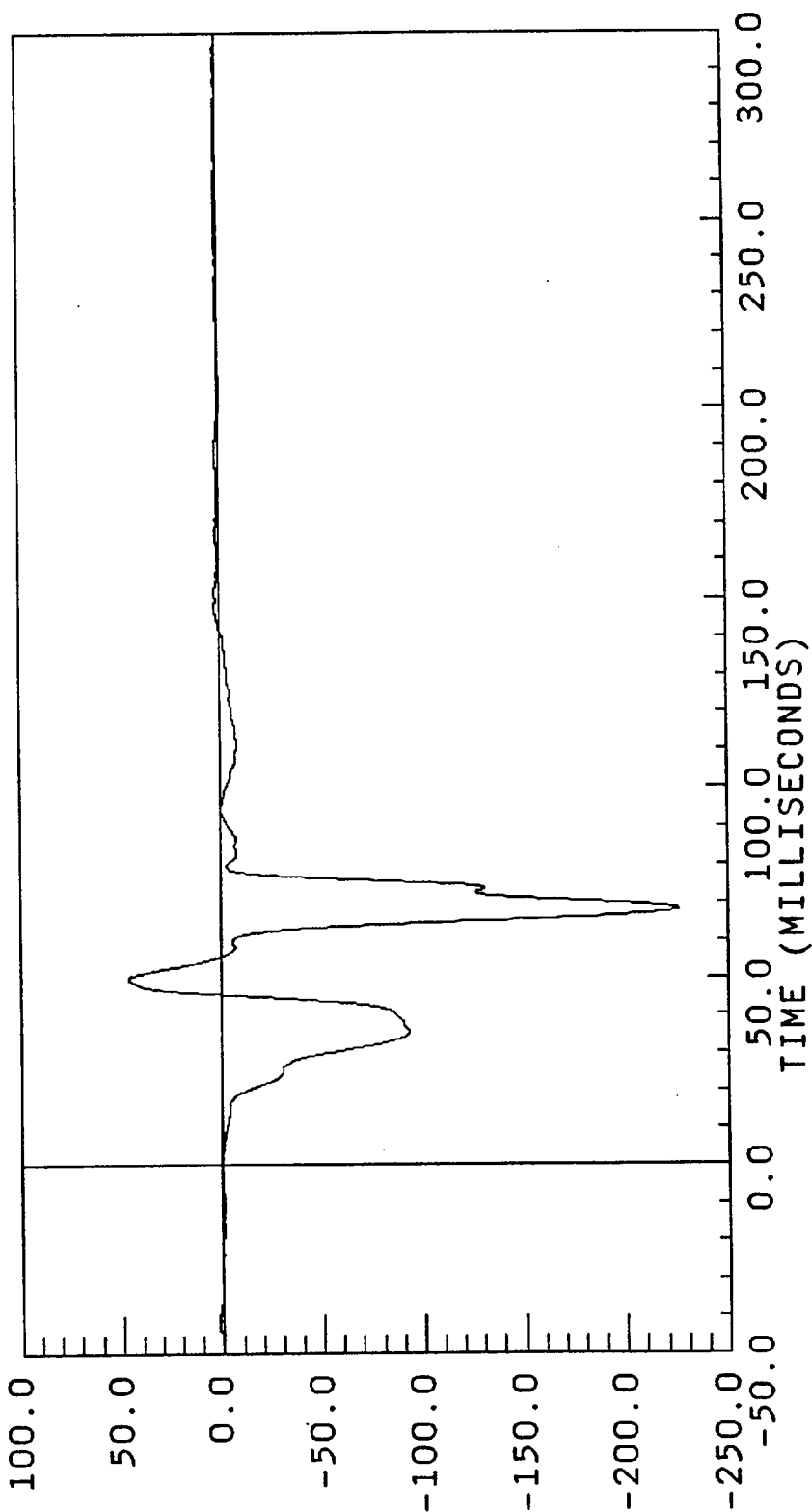
DISPLACEMENT * INCHES

BW899-20.DAT

29.60 mph

ACC PACK #4(X)
FILTERED
FILTER CUTOFF: 100HZ
ACCELEROMETER OPENED - DATA QUESTIONABLE AFTER 72 MILLISECONDS

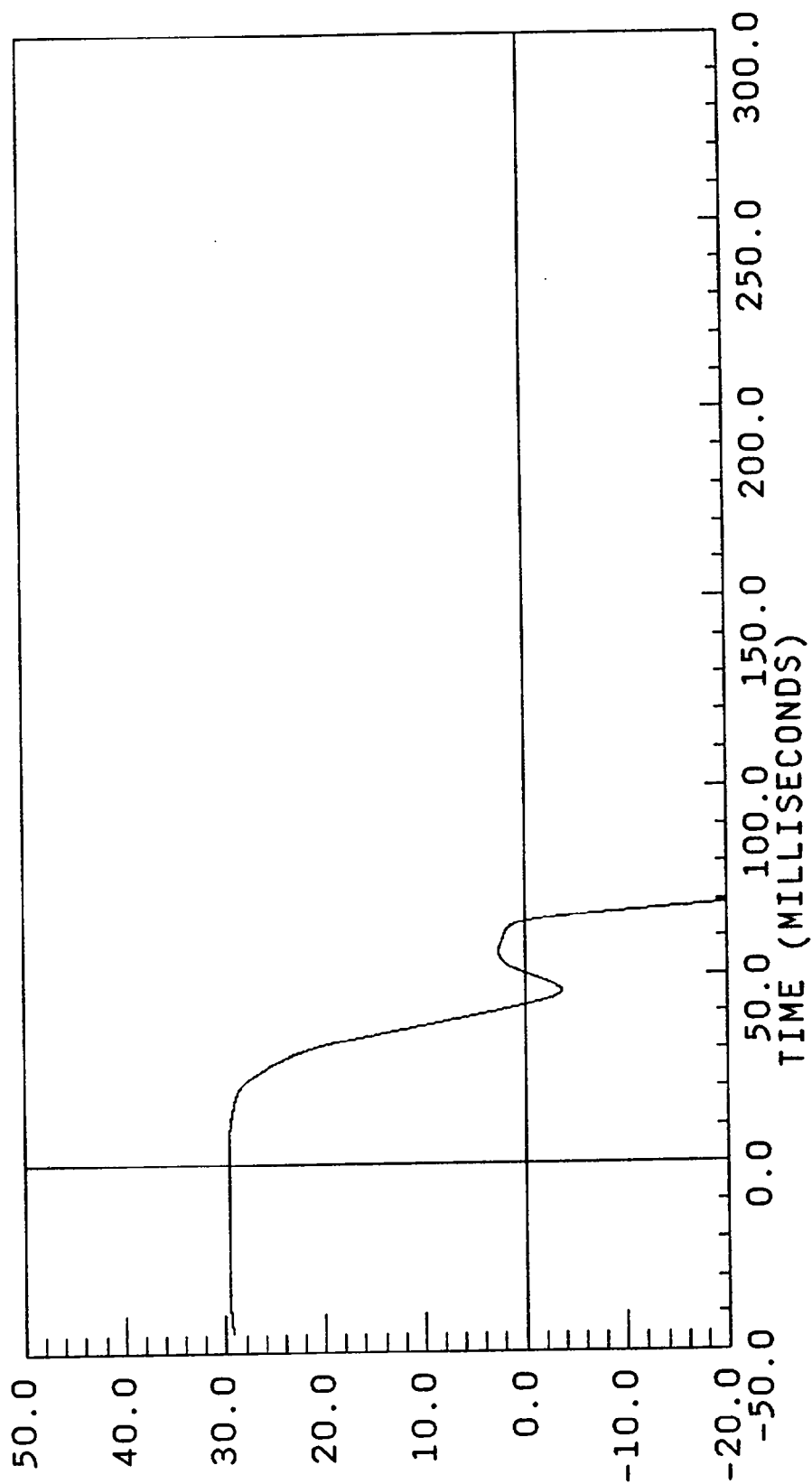
XL AXIS
YMIN = -226.3936 at 68.17500
YMAX = 46.81890 at 49.95000



29.60 mph

ACC PACK #4(X)
 COMPUTED
 FILTER CUTOFF: 100Hz
 ACCELEROMETER OPENED - DATA QUESTIONABLE AFTER 72 MILLISECOND

XL AXIS
 YMIN = -48.57145 at 141.5250
 YMAX = 29.27563 at -25.57500



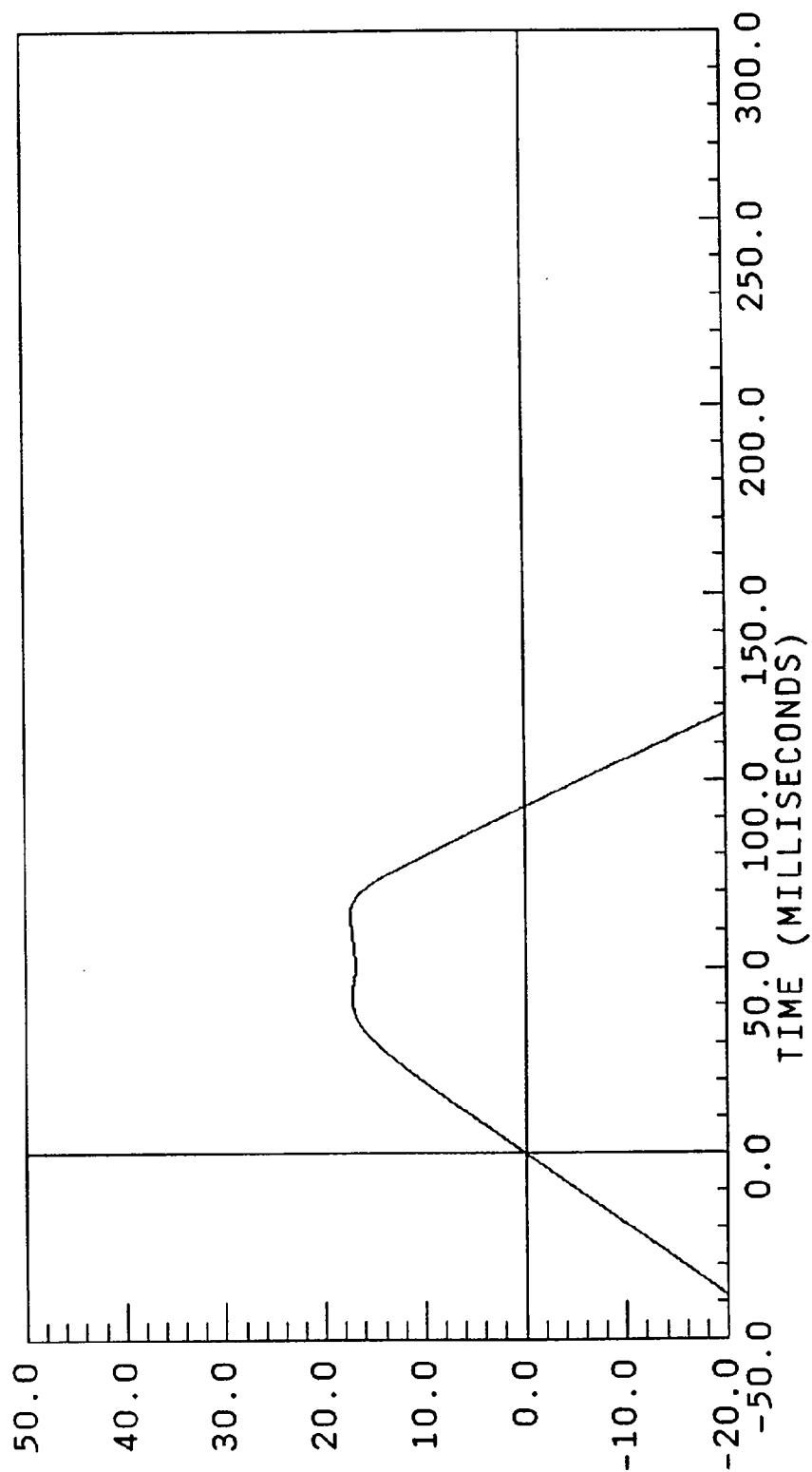
VELOCITY * MILES / HOUR

D899-20.DAT

29.60 mph

ACC PACK #4(X)
COMPUTED
FILTER CUTOFF: 100HZ
ACCELEROMETER OPENED - DATA QUESTIONABLE AFTER 72 MILLISECONDS

XL AXIS
YMIN = -169.9098 at 300.0000
YMAX = 17.37157 at 64.12500

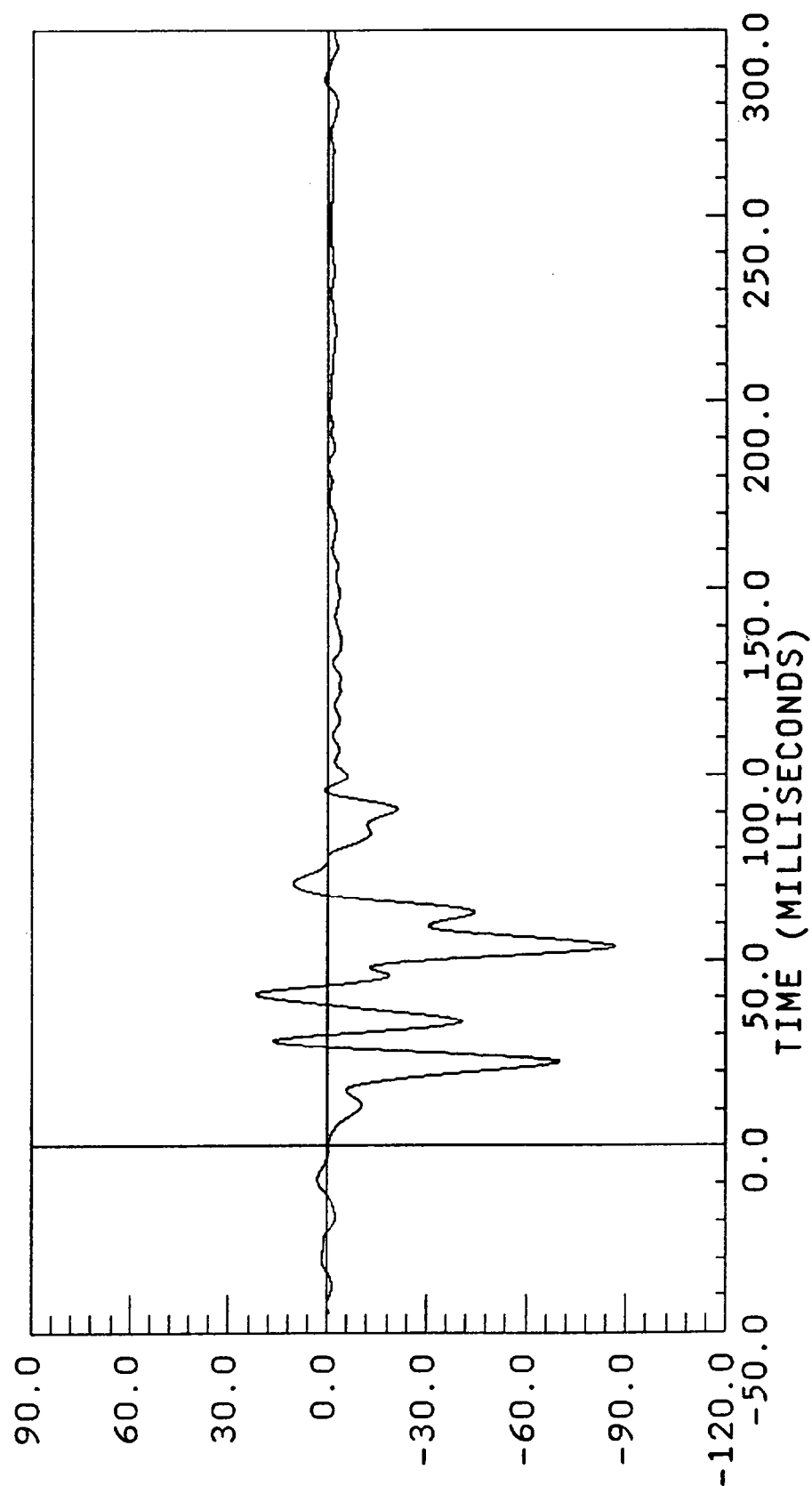


DISPLACEMENT * INCHES

29.60 mph

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

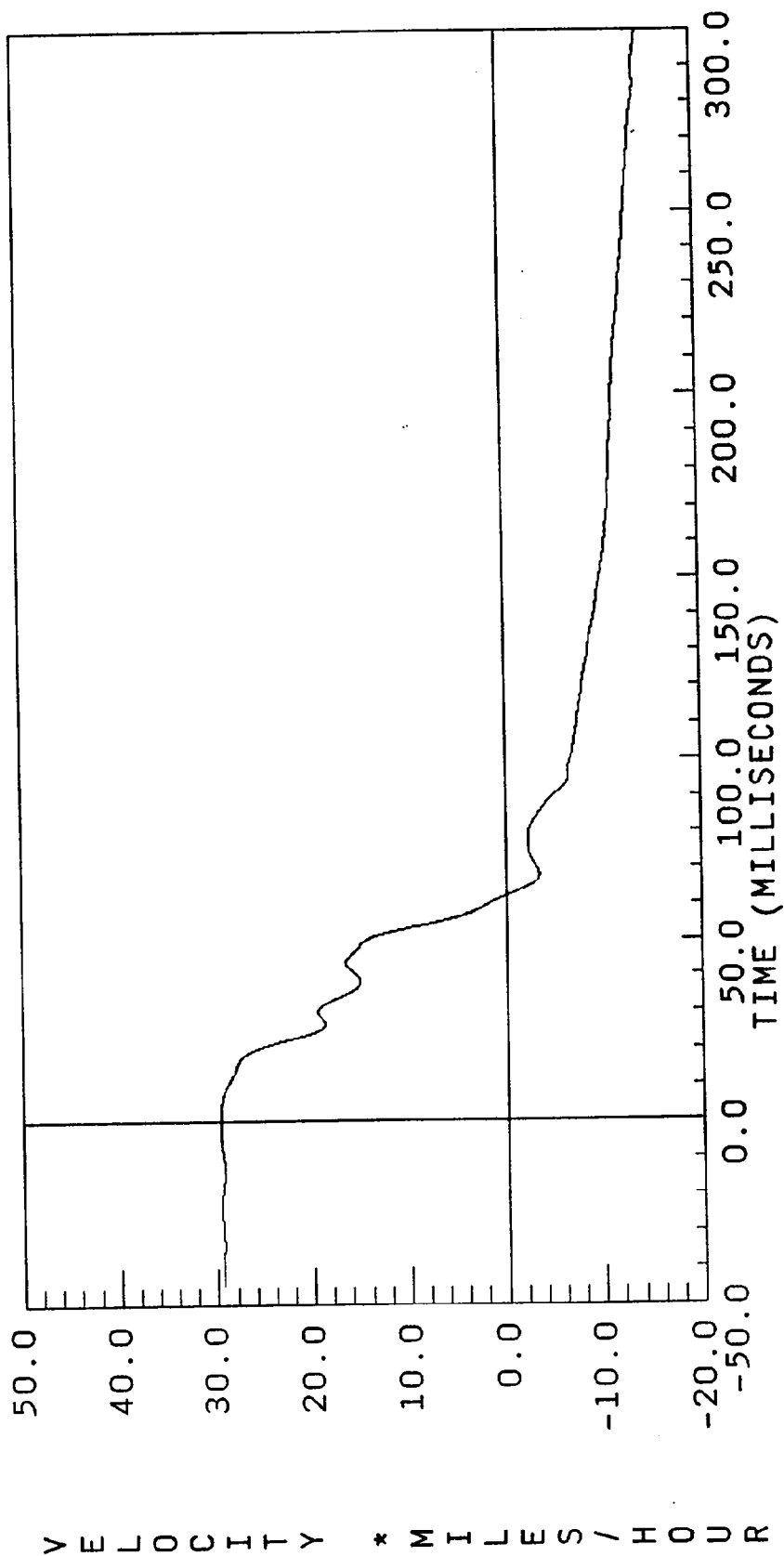
XL AXIS
 YMIN = -86.65207 at 53.70000
 YMAX = 21.93079 at 41.10000



V899-21.DAT

29.60 mph

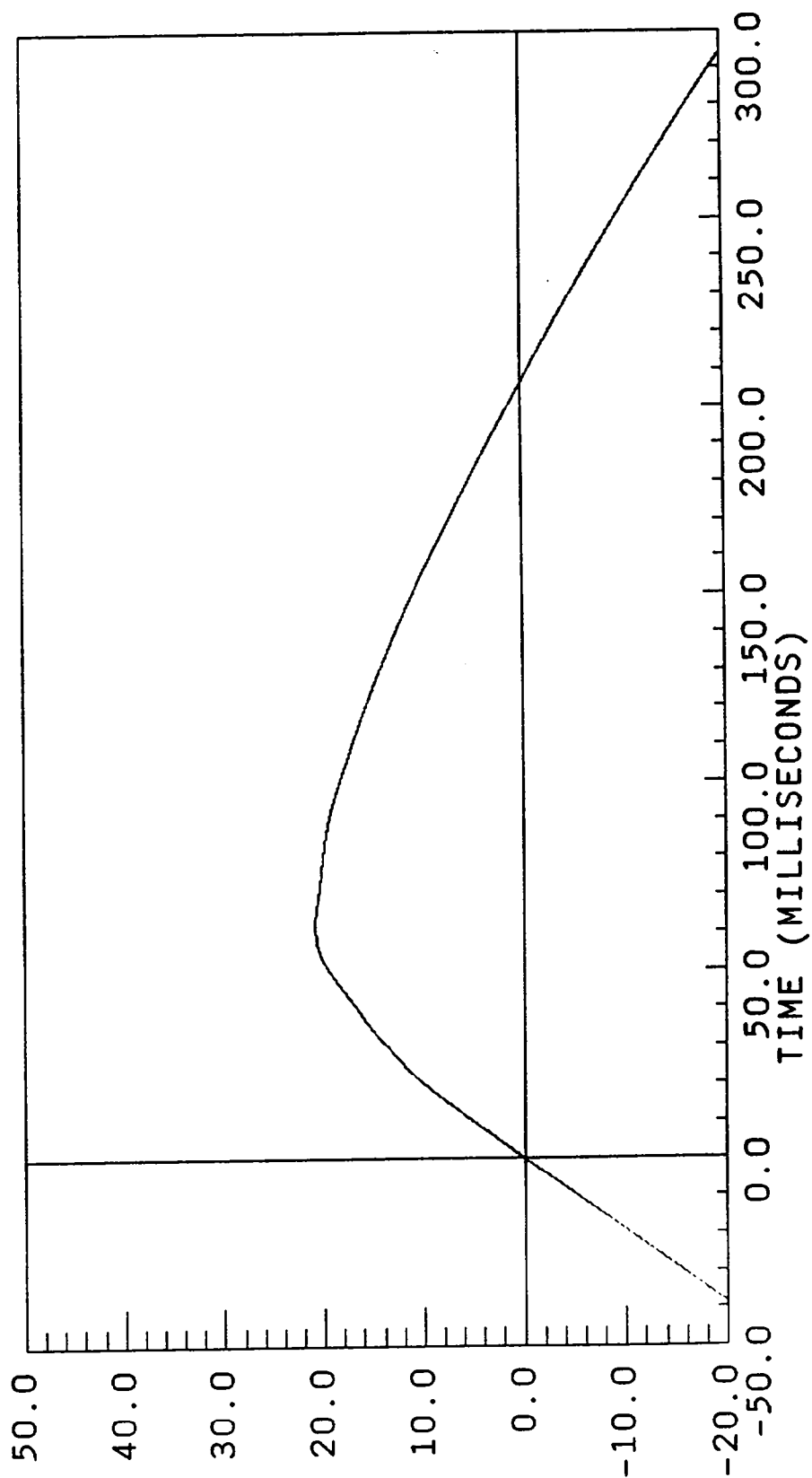
ACC PACK #5(X)
COMPUTED
FILTER CUTOFF: 100HZ
XL AXIS
YMIN = -14.51872 at 300.0000
YMAX = 29.47443 at -3.300000



29.60 mph

ACC PACK #5(X)
COMPUTED
FILTER CUTOFF: 100Hz

XL AXIS
YMIN = -23.28118 at 300.0000
YMAX = 20.81470 at 62.10000

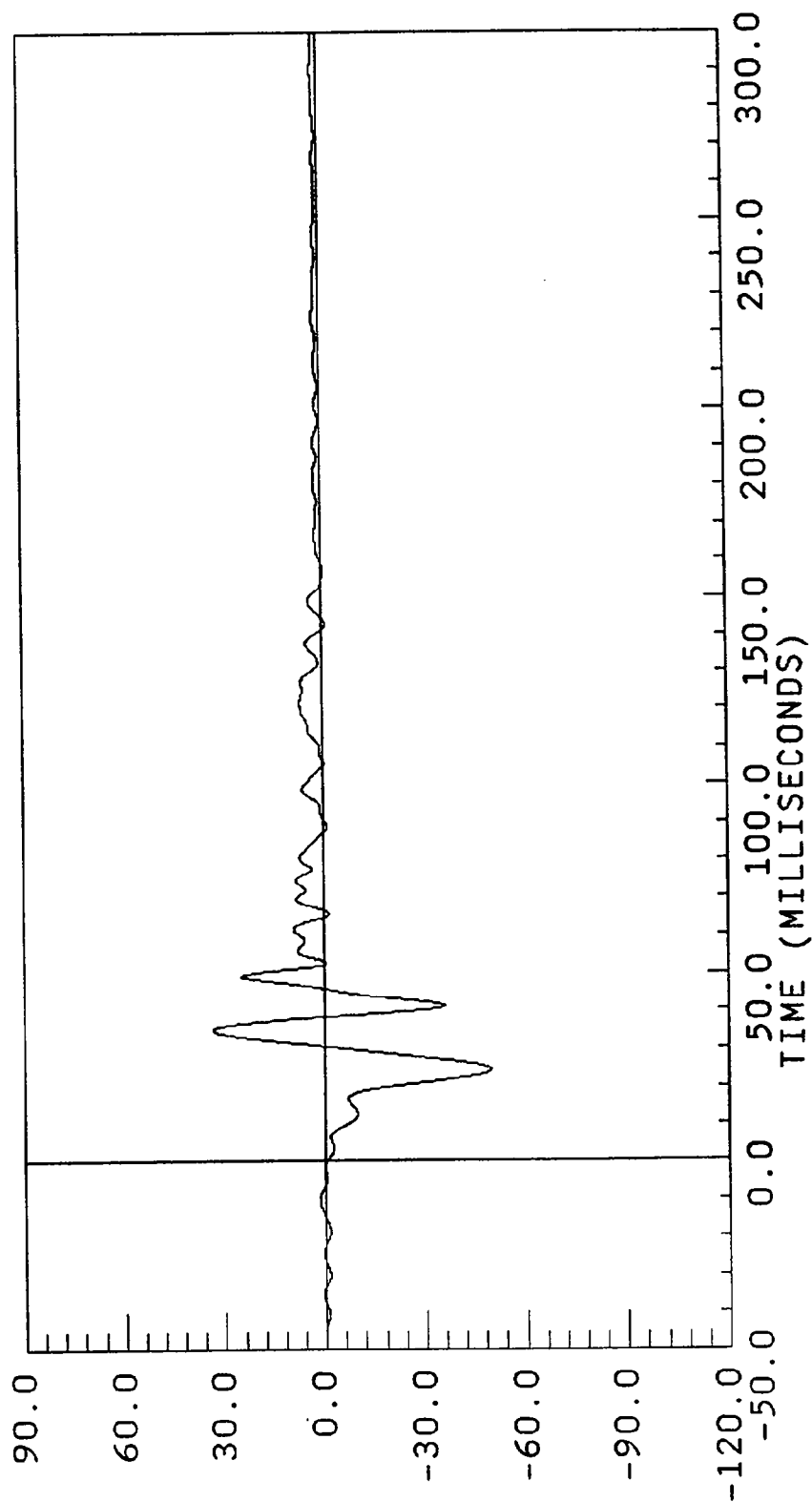


DISPLACEMENT * INCHES

BW899-22.DAT

29.60 mph

ACC PACK #6(X)
FILTERED
FILTER CUTOFF: 100Hz
XL AXIS
YMIN = -49.69891 at 24.45000
YMAX = 33.49138 at 34.95000



ACCELERATION * G, S *
B-18 7715-7

29.60 mph

ACC PACK #6(X)

COMPUTED

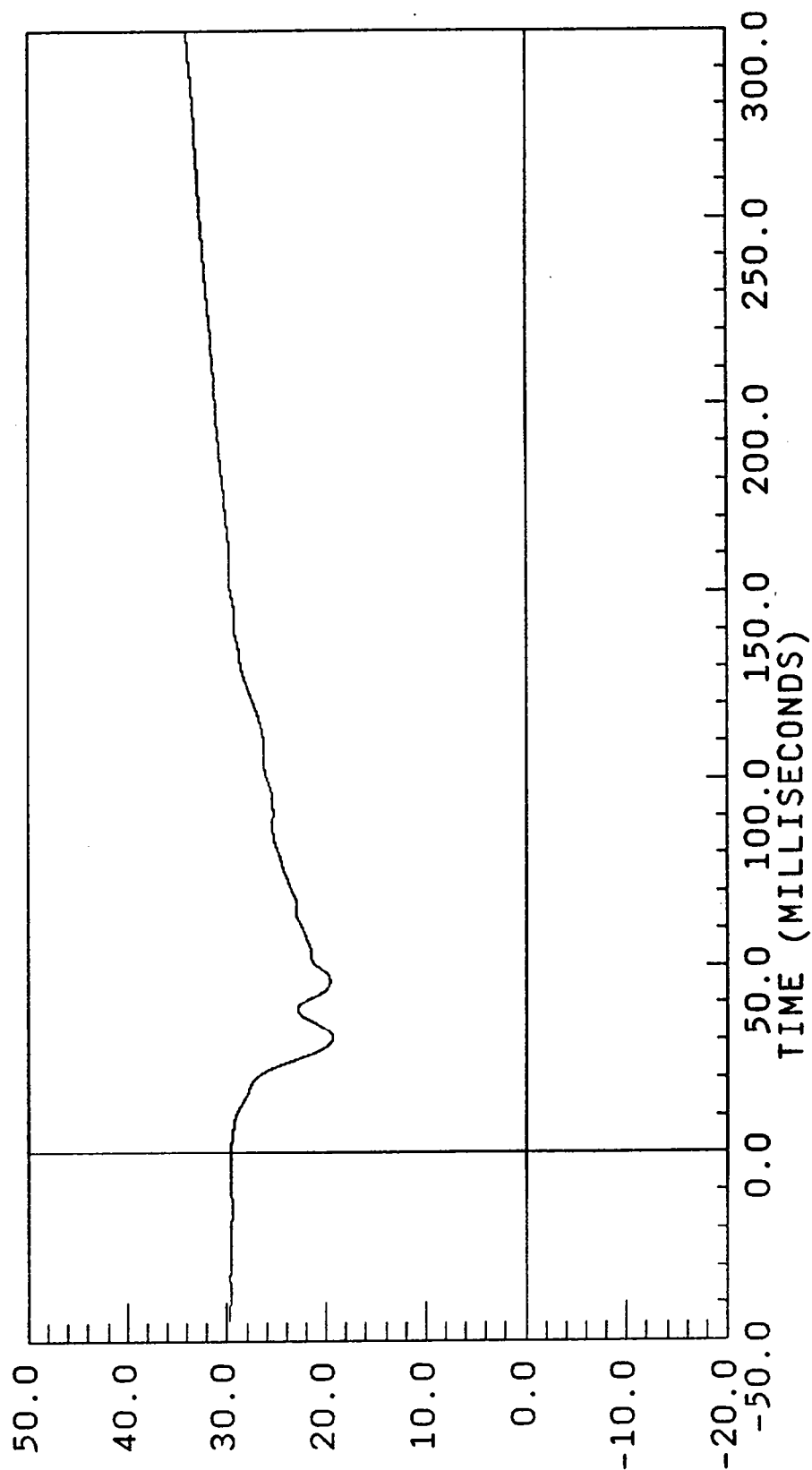
FILTER CUTOFF:

100Hz

XL AXIS

YMIN = 19.32373 at 30.60000

YMAX = 34.03589 at 300.0000

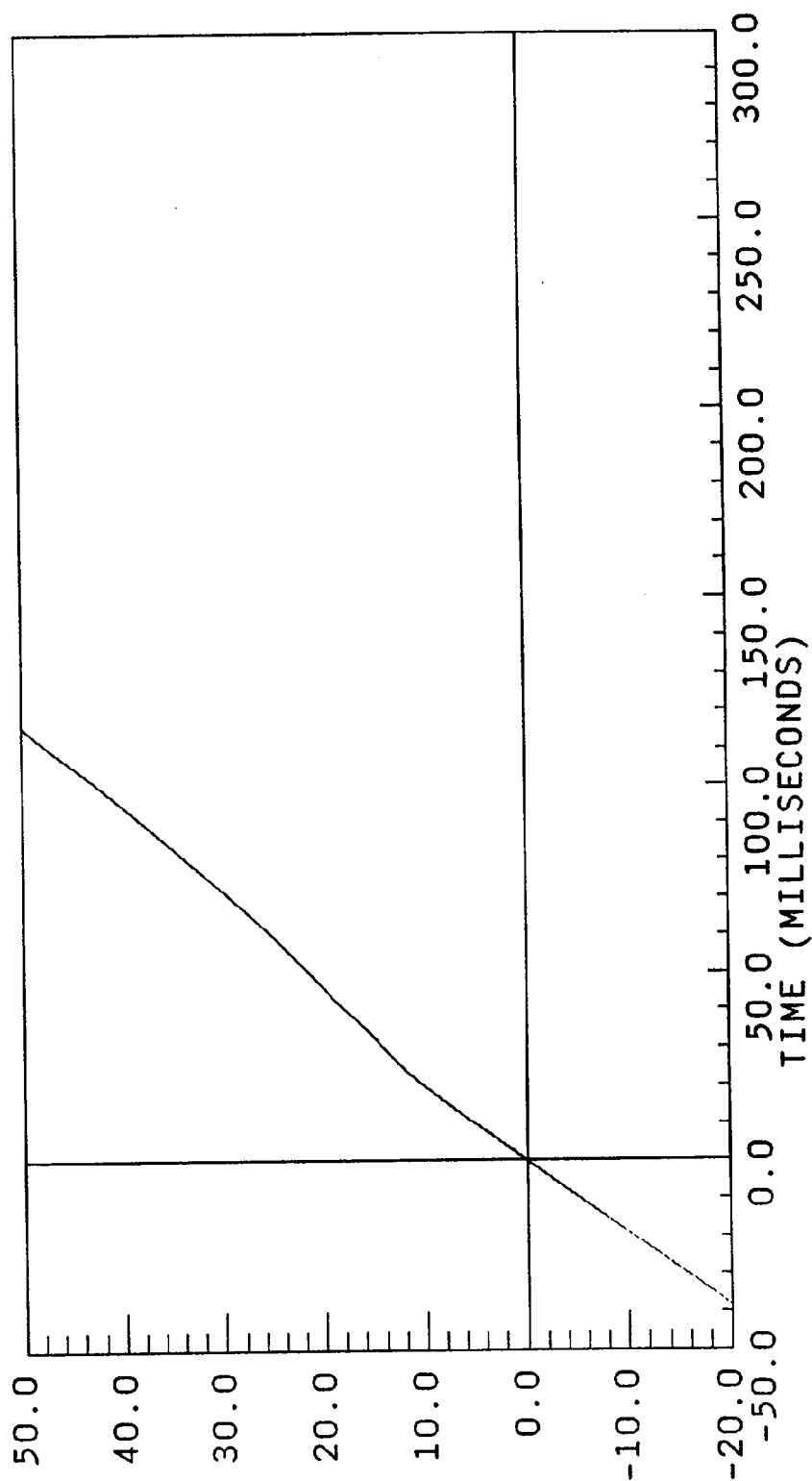


VELOCITY * MILES / HOUR

D899-22.DAT

29.60 mph

ACC PACK #6(X)
COMPUTED
FILTER CUTOFF: 100Hz
XL AXIS
YMIN = -23.39608 at 30.60000
YMAX = 150.9321 at 300.0000

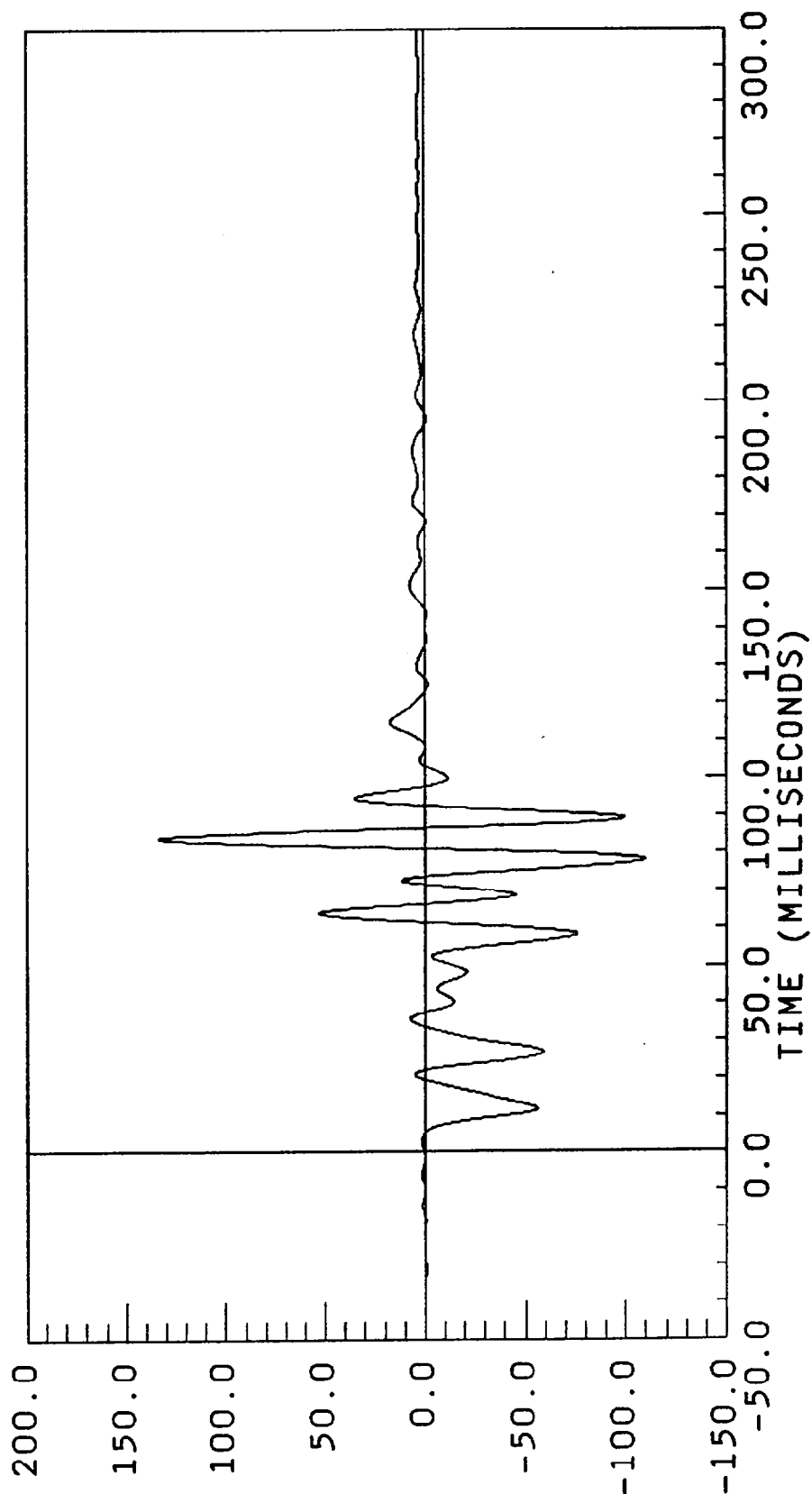


DISPLACEMENT * INCHES
B-20 7715-7

29.60 mph

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

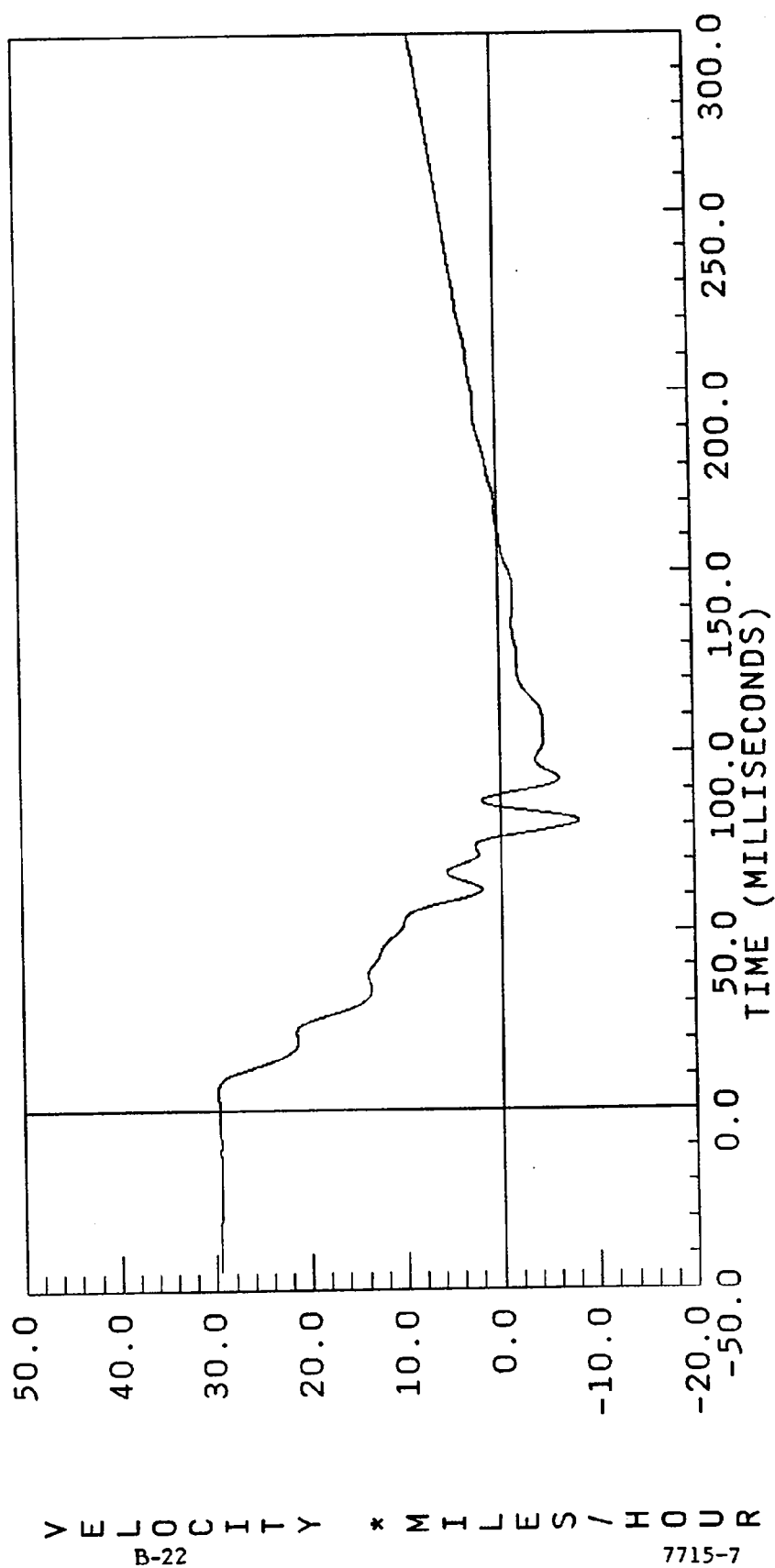
XL AXIS
 YMIN = -110.0746 at 78.07500
 YMAX = 134.2048 at 83.77500



V899-23.DAT

29.60 mph

ACC PACK #7(X)
COMPUTED
FILTER CUTOFF: 100HZ
XL AXIS
YMIN = -8.194574 at 81.00000
YMAX = 29.71303 at 5.250000

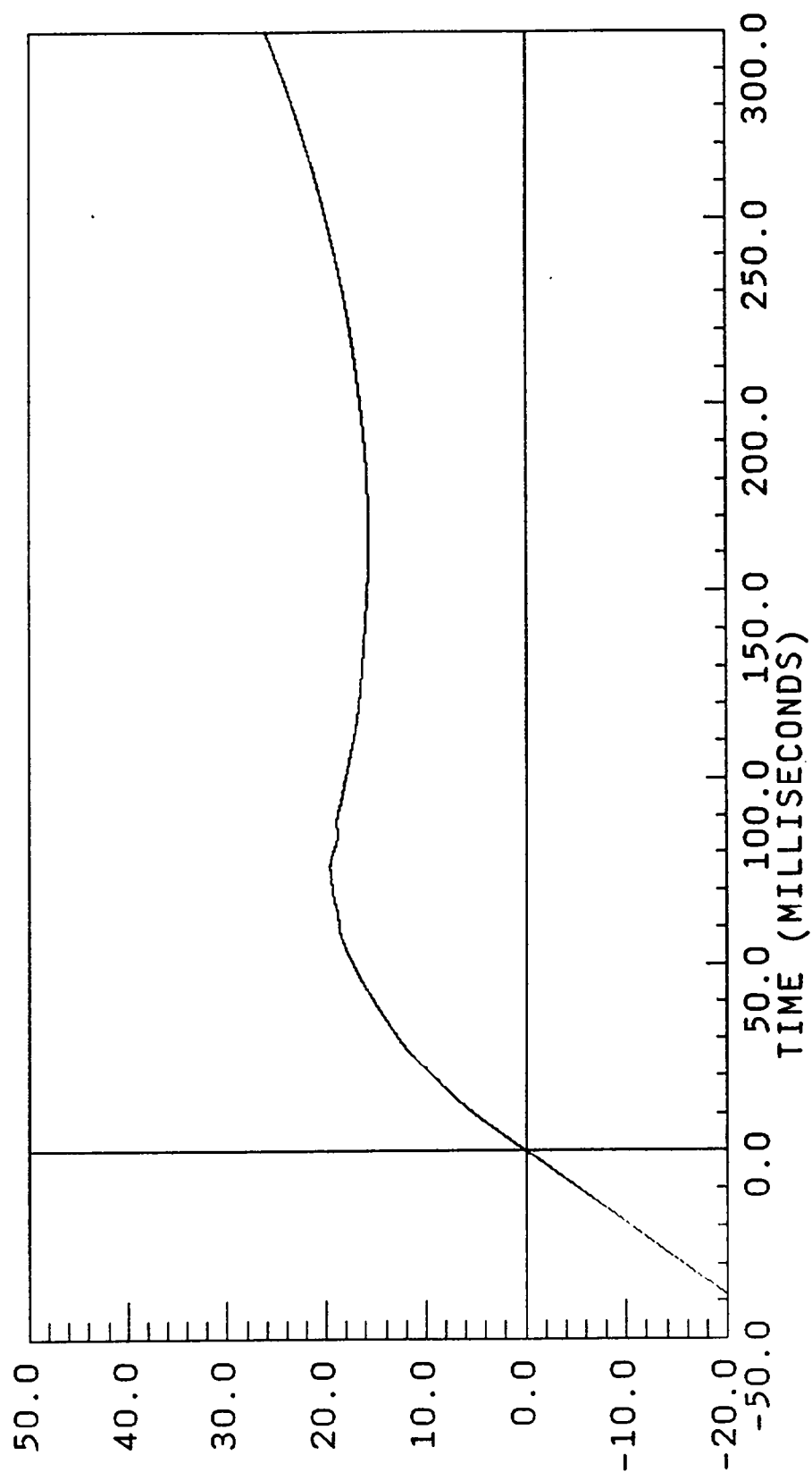


29.60 mph

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

XL AXIS

YMIN = -23.32632 at 81.00000
YMAX = 26.12084 at 300.00000

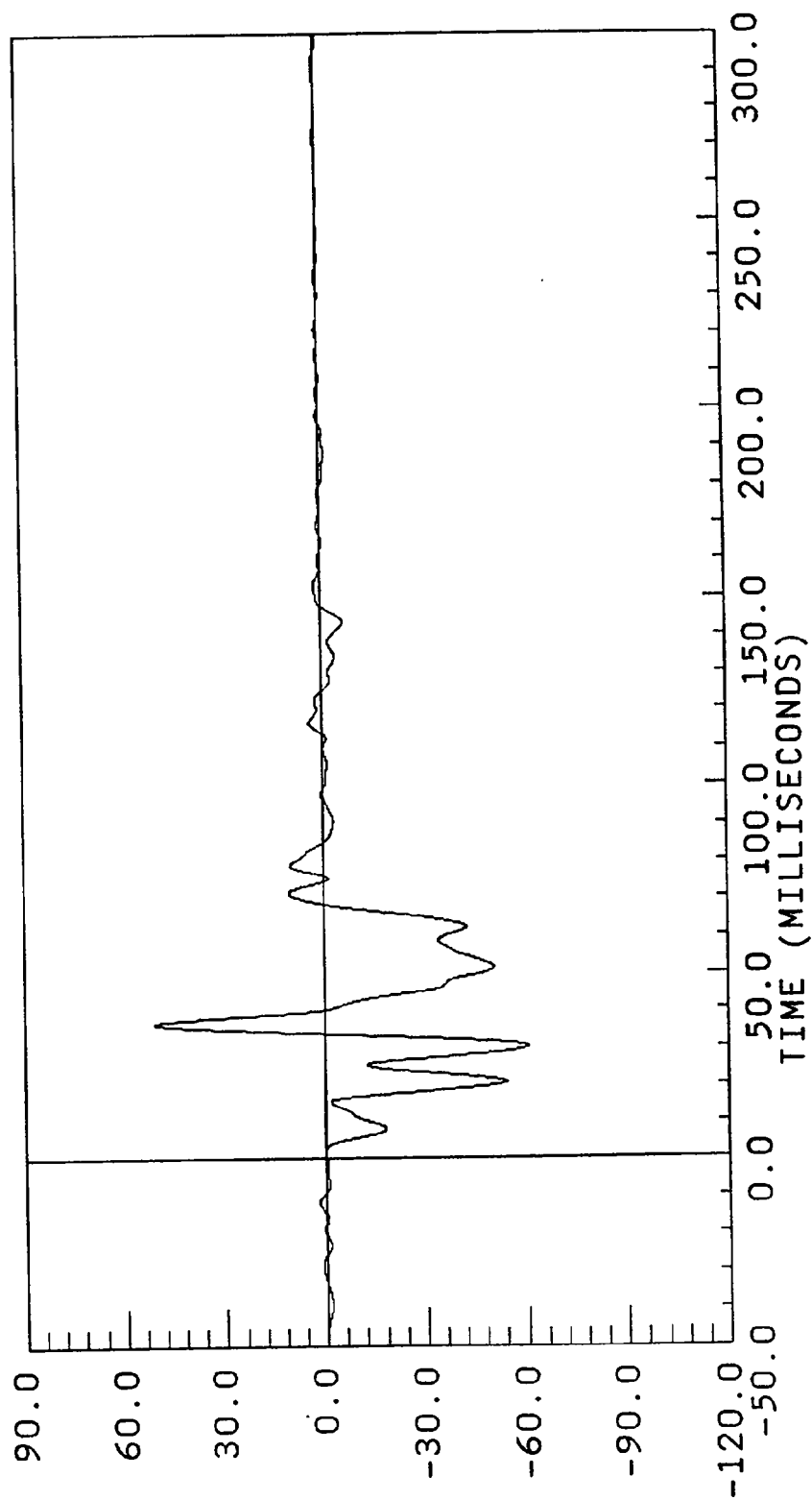


DISPLACEMENT * INCHES

BW899-24.DAT

29.60 mph

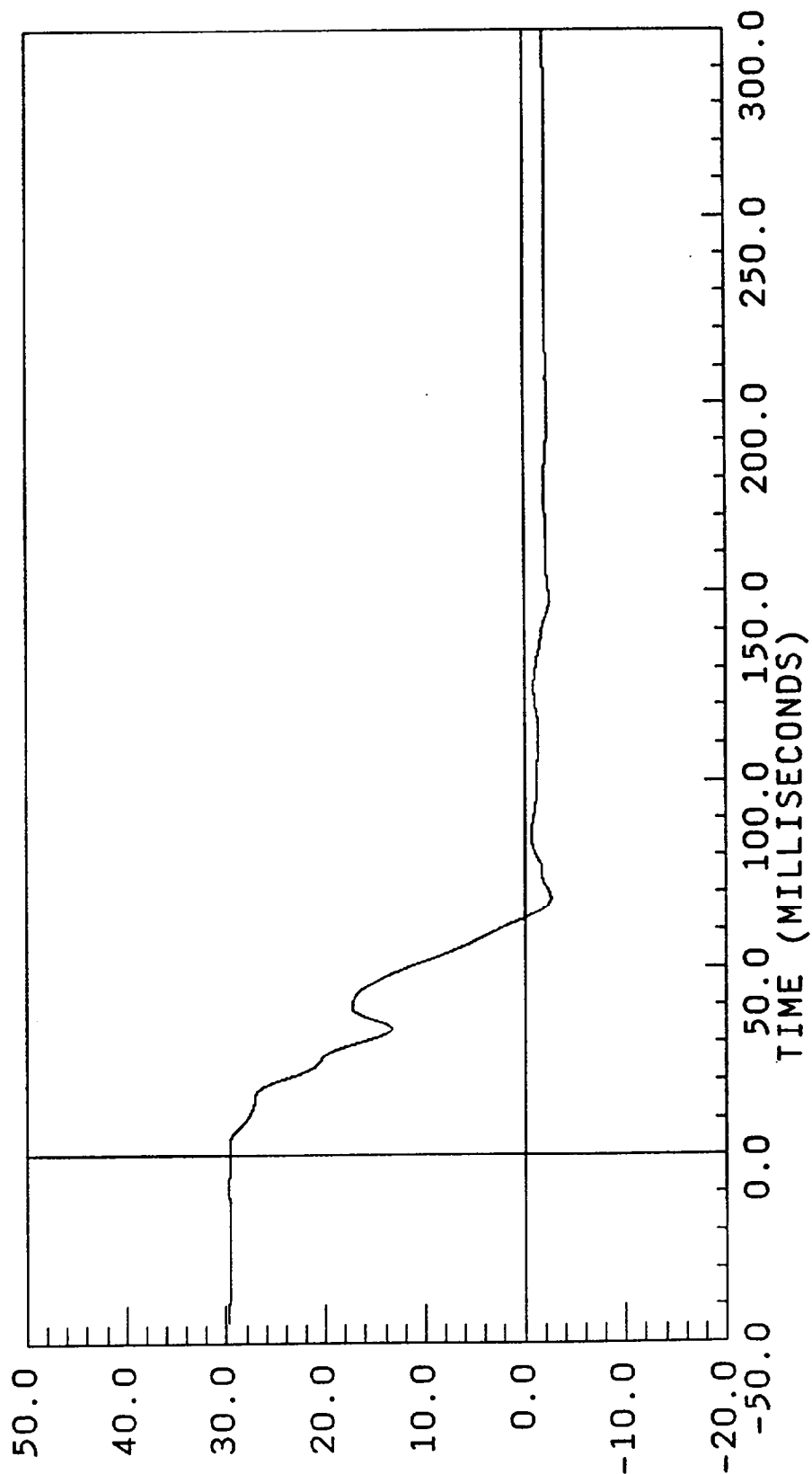
ACC PACK #8(X)
FILTERED
FILTER CUTOFF: 100Hz
XL AXIS
YMIN = -60.60985 at 30.30000
YMAX = 51.00475 at 36.52500



29.60 mph

ACC PACK #8(X)
COMPUTED
FILTER CUTOFF: 100Hz

XL AXIS
YMIN = -2.639997 at 68.32500
YMAX = 29.75272 at 36.52500

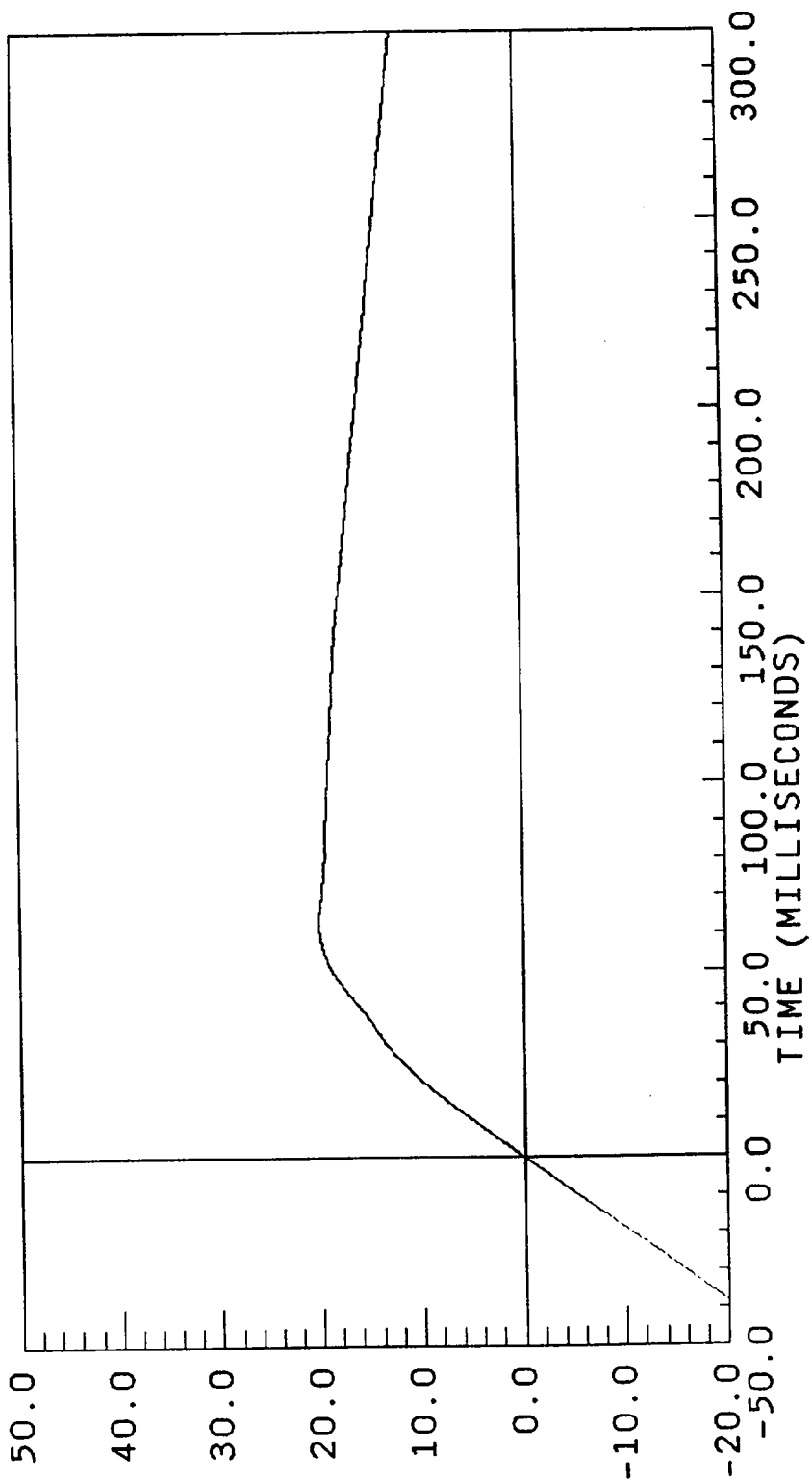


VELOCITY * MILES / HOUR

D899-24.DAT

29.60 mph

ACC PACK #8(X)
COMPUTED
FILTER CUTOFF: 100Hz
XL AXIS
YMIN = -23.42107 at 68.32500
YMAX = 20.15628 at 62.92500



DISPLACEMENT * INCHES

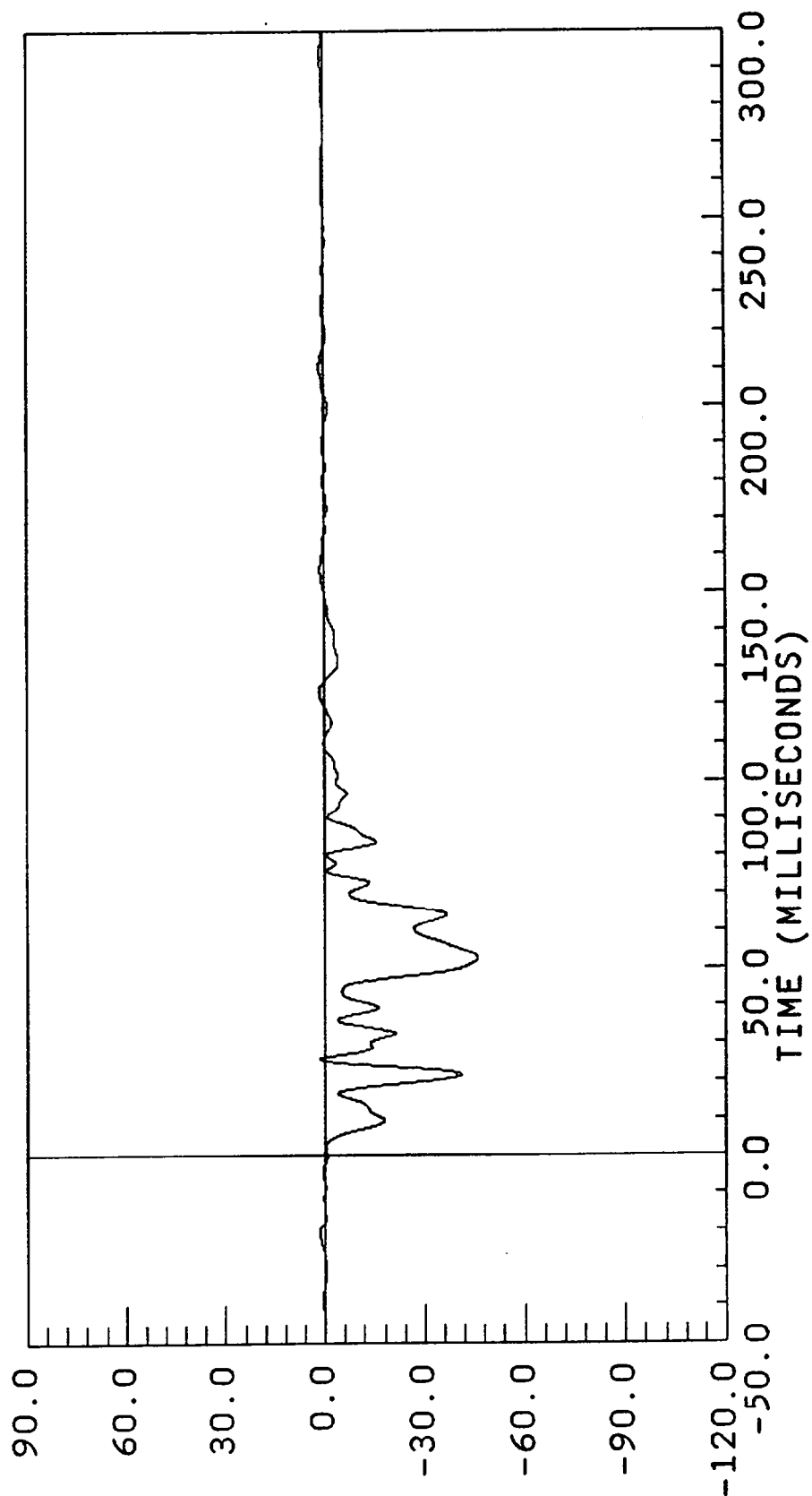
29.60 mph

ACC PACK #9(X)
FILTERED
FILTER CUTOFF: 100Hz

XL AXIS

YMIN = -46.04422 at 52.80000

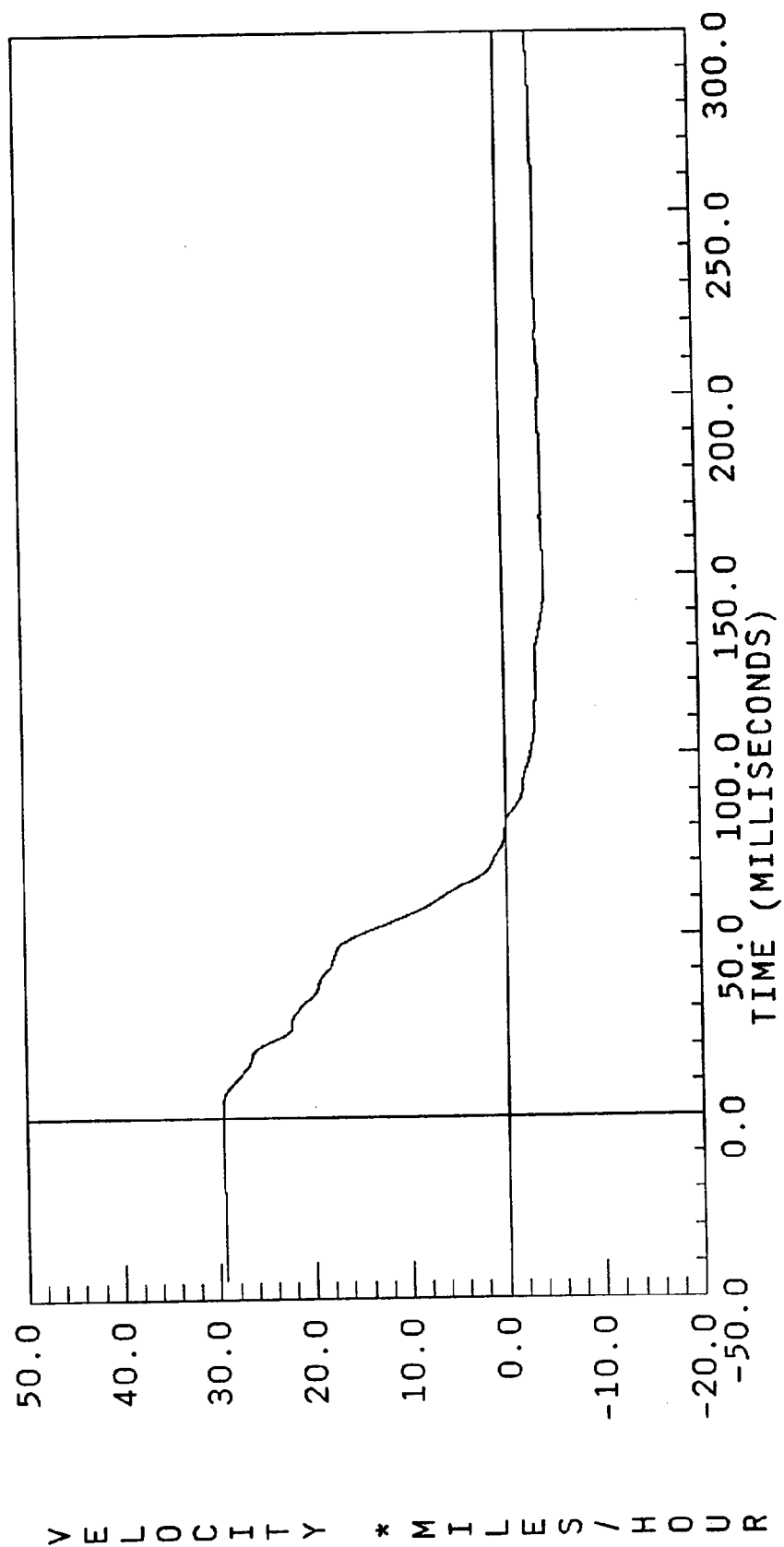
YMAX = 0.248304 at -20.40000



V899-25.DAT

29.60 mph

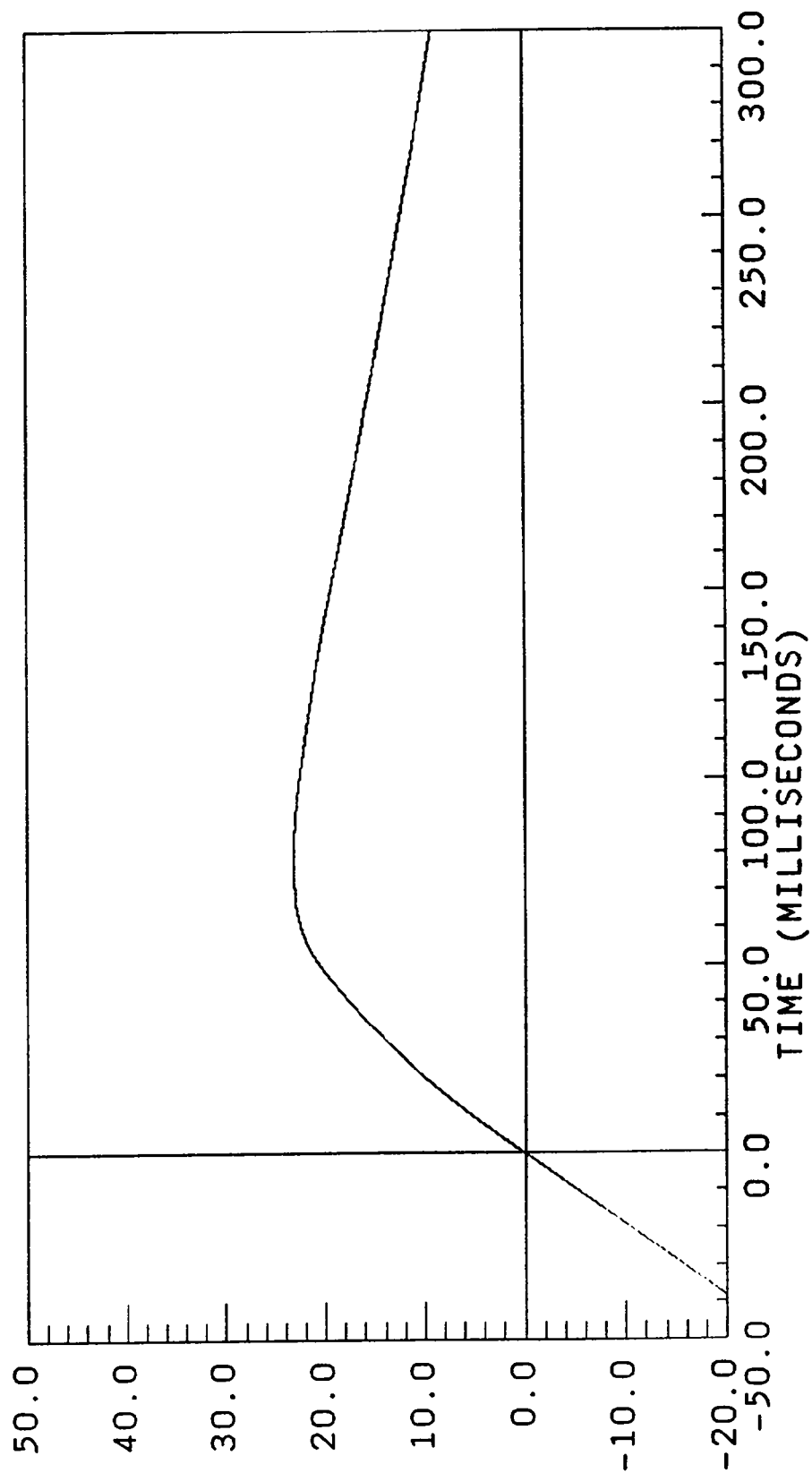
ACC PACK #9(X)
COMPUTED
FILTER CUTOFF: 100Hz
XL AXIS
YMIN = -4.396351 at 148.9500
YMAX = 29.35766 at -2.400000



29.60 mph

ACC PACK #9(X)
COMPUTED
FILTER CUTOFF: 100Hz

XL AXIS
YMIN = -23.30523 at 148.9500
YMAX = 23.12985 at 79.57500

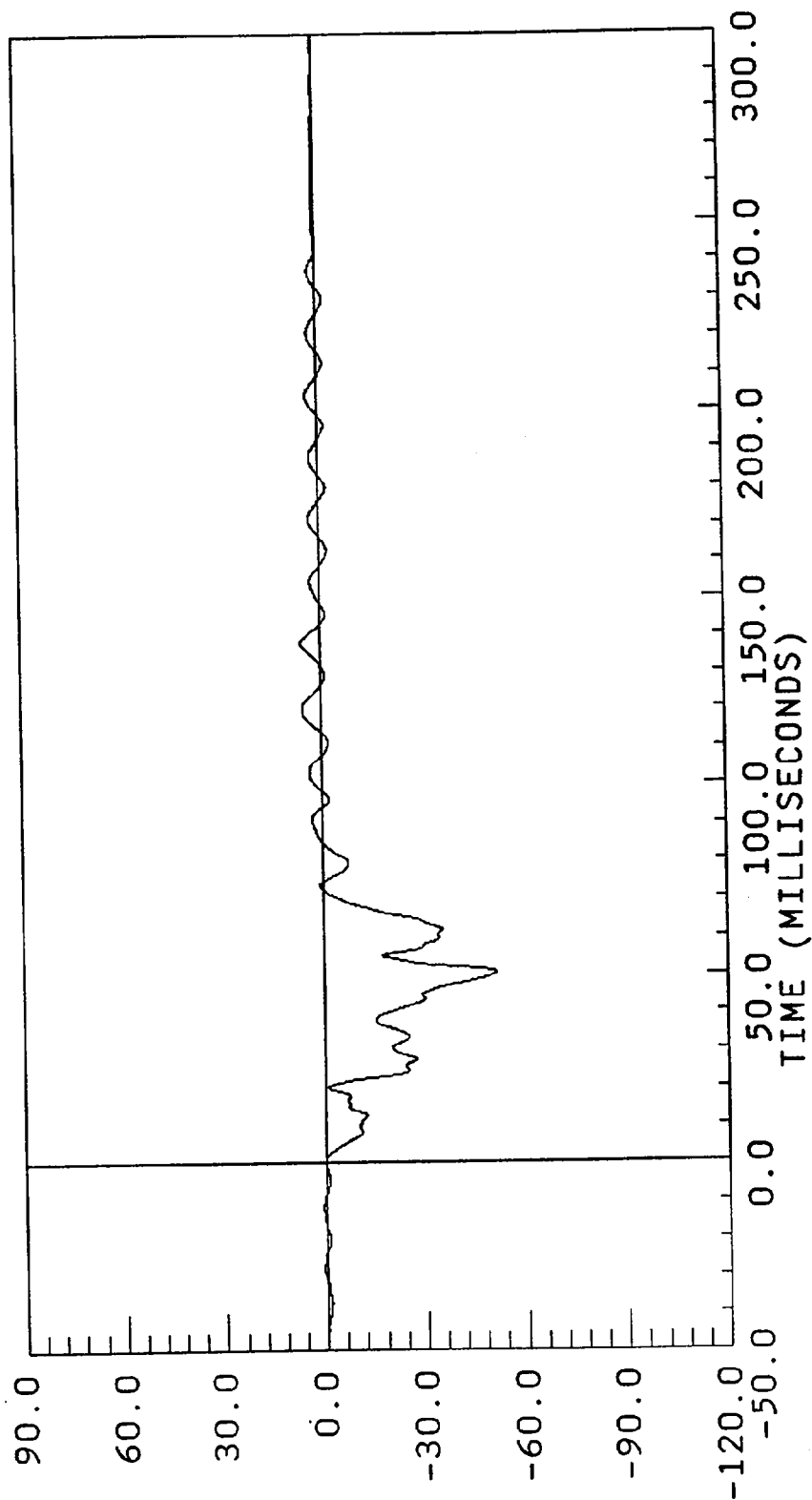


DISPLACEMENT * INCHES

BW899-26.DAT

29.60 mph

ACC PACK #10(X)
FILTERED
FILTER CUTOFF: 100Hz
XL AXIS
YMIN = -51.33734 at 50.62500
YMAX = 6.008293 at 137.6250

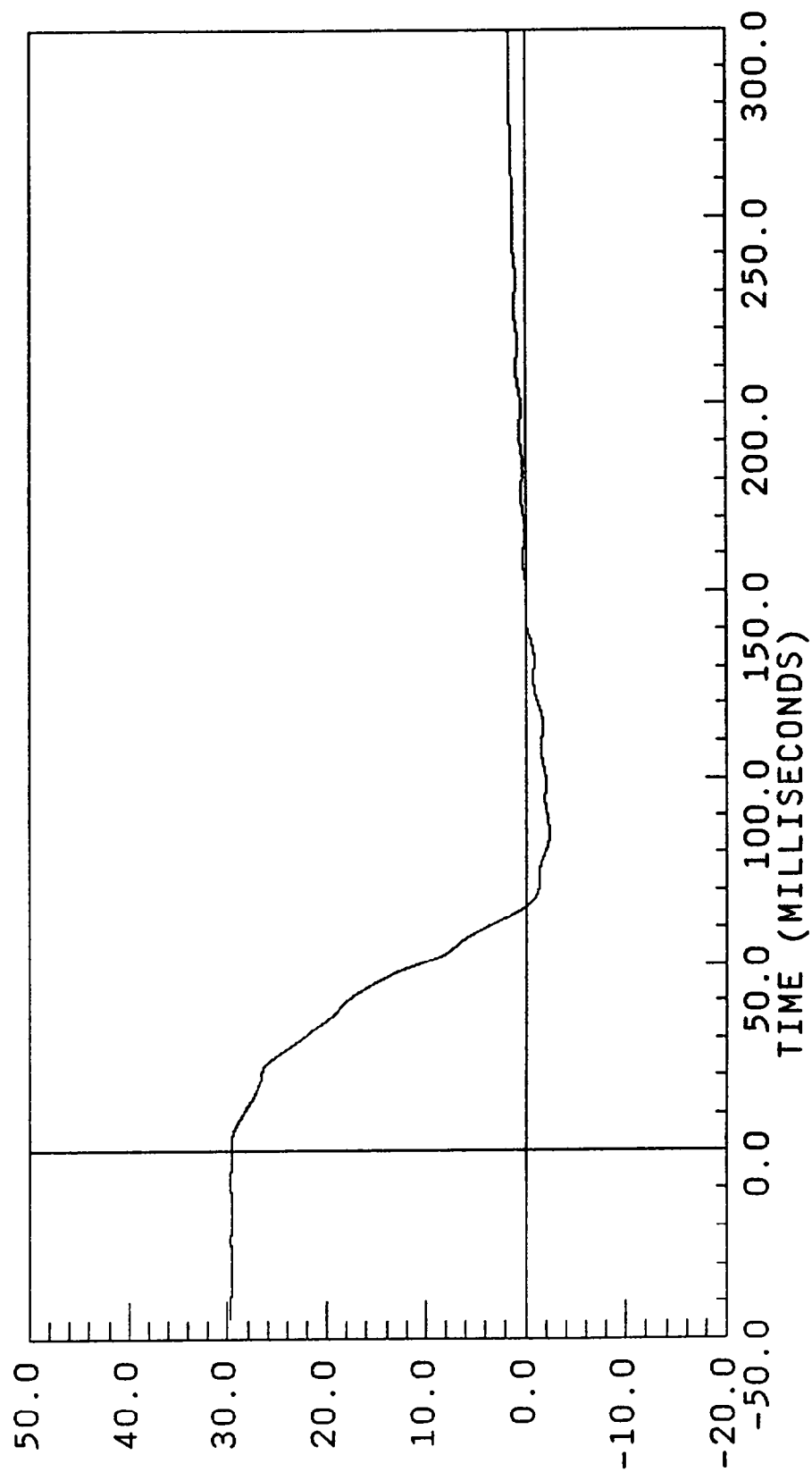


ACCELERATION * G * S *
B-30 7715-7

29.60 mph

ACC PACK #10(X)
COMPUTED
FILTER CUTOFF: 100Hz

XL AXIS
YMIN = -2.351173 at 84.60001
YMAX = 29.73432 at 137.6250

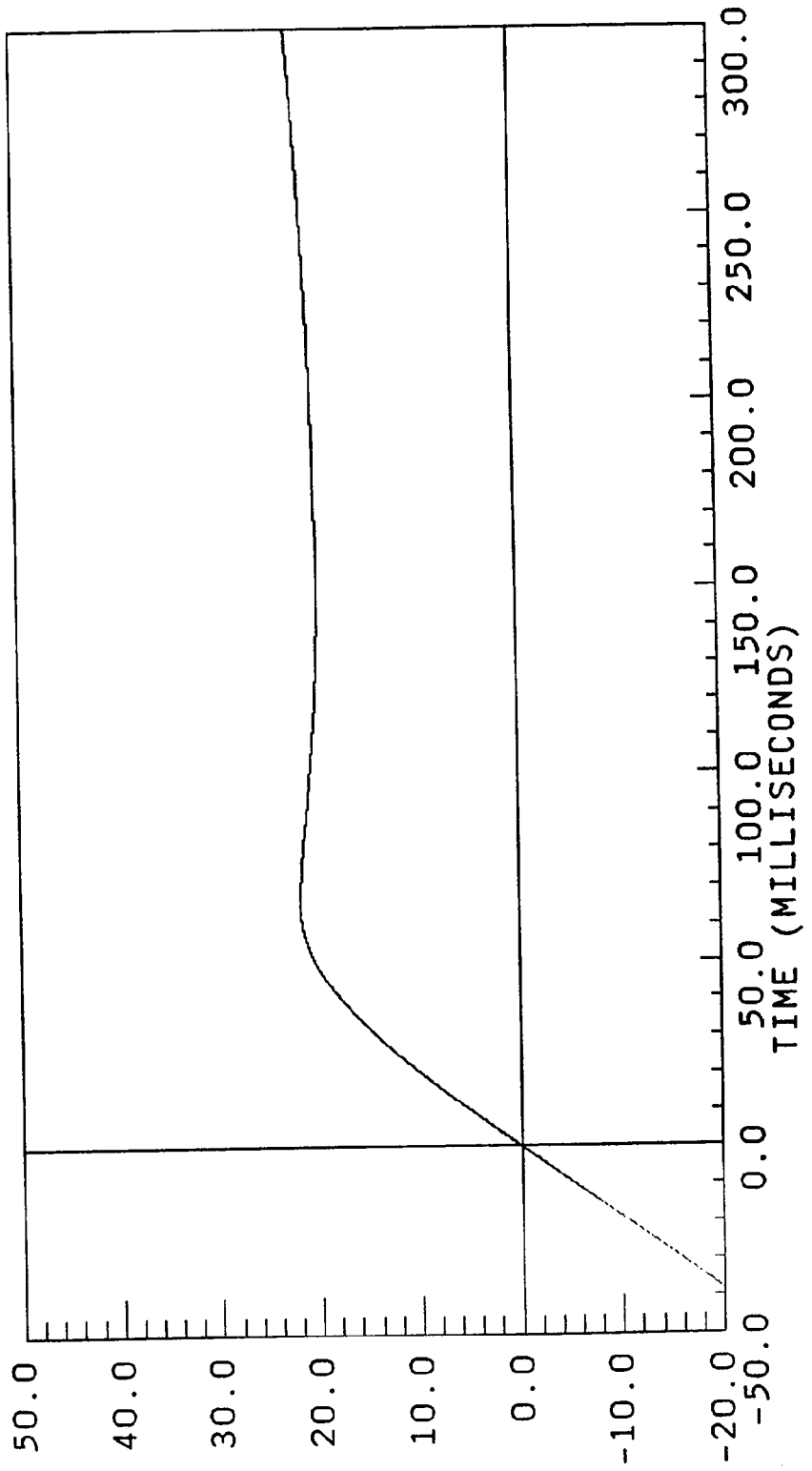


VELOCITY * MILES / HOUR

D899-26.DAT

29.60 mph

ACC PACK #10(X)
COMPUTED
FILTER CUTOFF: 100Hz
XL AXIS
YMIN = -23.43024 at 84.60001
YMAX = 22.27631 at 300.0000

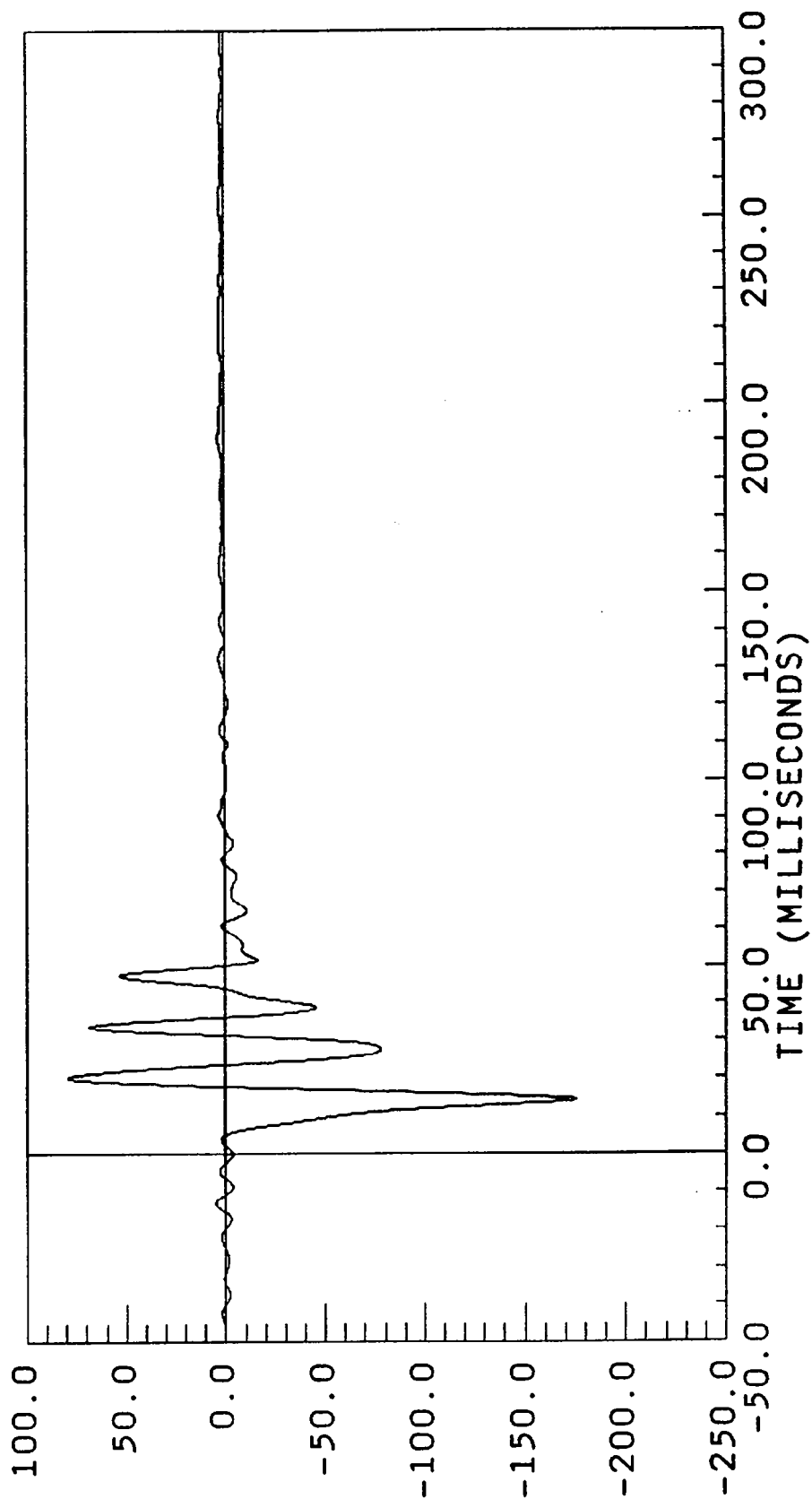


DISPLACEMENT * INCHES

29.60 mph

ACC PACK #11(X)
 FILTERED
 FILTER CUTOFF: 100HZ

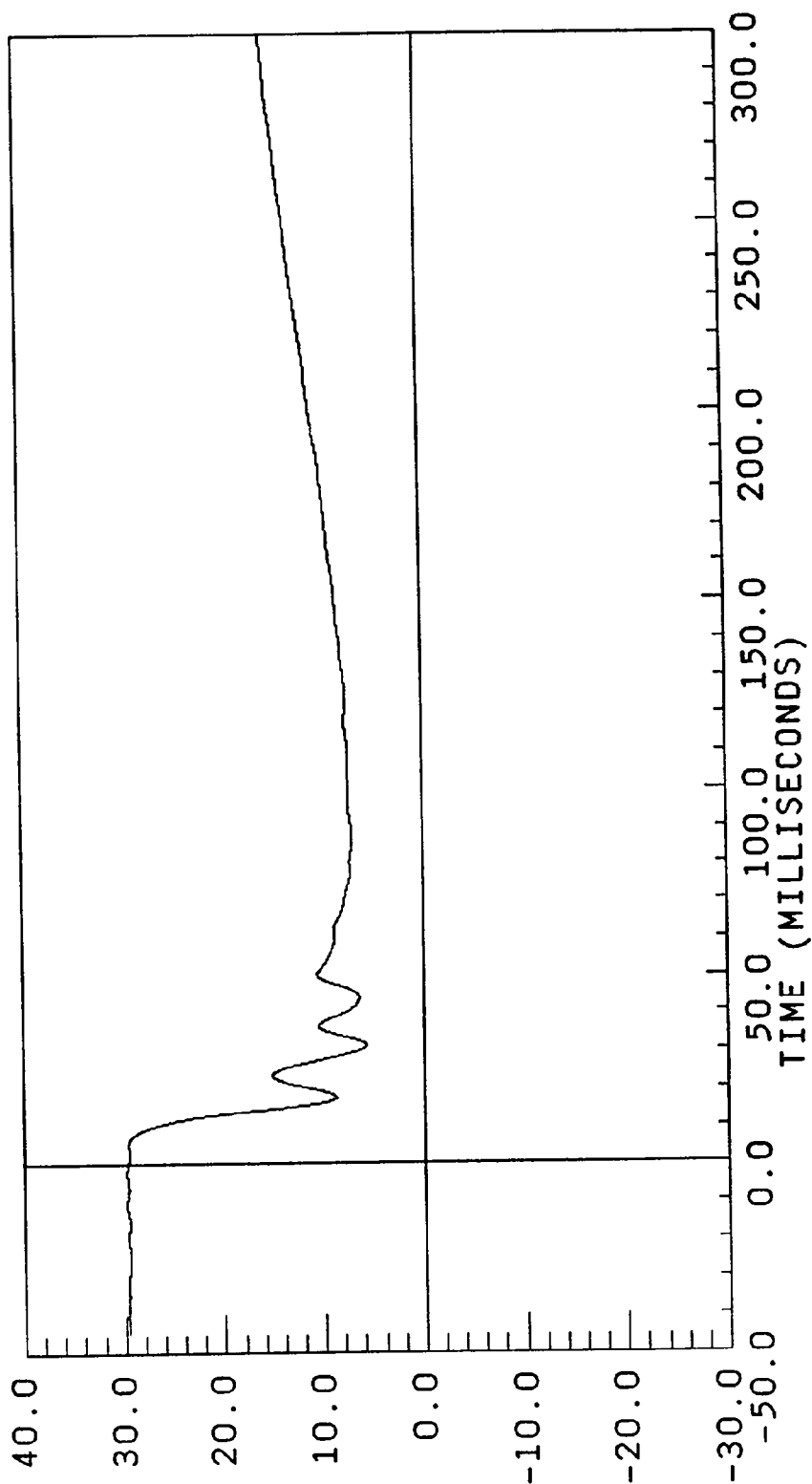
XL AXIS
 YMIN = -175.9954 at 14.17500
 YMAX = 79.57734 at 20.17500



V899-27.DAT

29.60 mph

ACC PACK #11(X)
COMPUTED
FILTER CUTOFF: 100Hz
XL AXIS
YMIN = 5.695332 at 31.27500
YMAX = 29.57128 at -10.87500

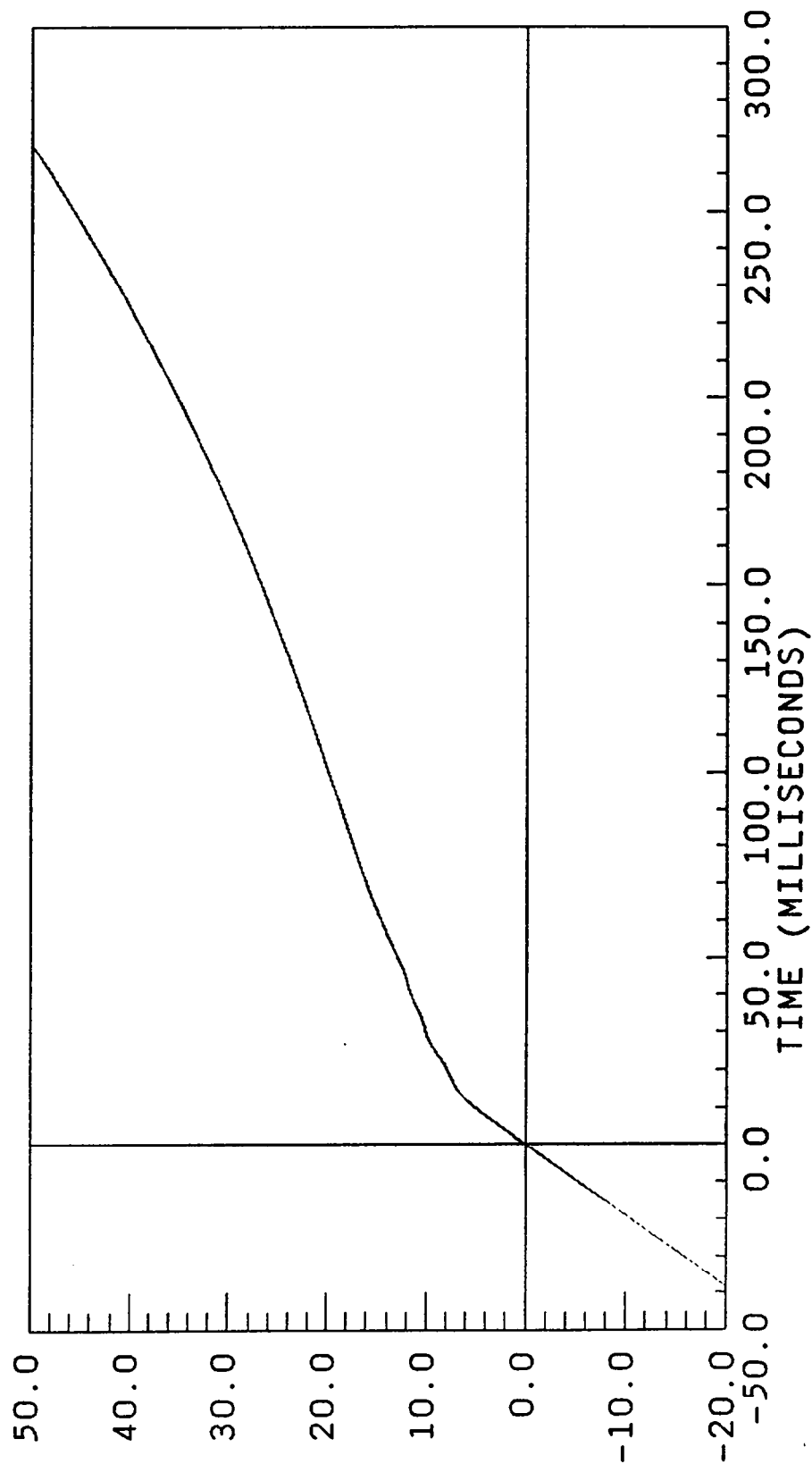


VELOCITY * MILES / HOUR
B-34 7715-7

29.60 mph

ACC PACK #11(X)
COMPUTED
FILTER CUTOFF: 100HZ

XL AXIS
YMIN = -23.39560 at 31.27500
YMAX = 58.28259 at 300.0000



DISPLACEMENT * INCHES

TEST NO. CK5202

DUMMY DATA

	FILTER CHANNEL CLASS
HEAD ACCELERATIONS	1000
CHEST ACCELERATIONS	180
FEMUR FORCES	600
BELT LOADS	60

HEAD INJURY CRITERION
HEAD SEVERITY INDEX
35MS. MAXIMUM DURATION

NHTSA CRASH TEST - PROC. 208

RUN= 999

POS#1 HEAD R

HIC= 508.6 FROM T1= .06772 TO T2= .10372

AVERAGE ACCELERATION BETWEEN T1 AND T2= 45.7G'S

EVENT TIME= 300.0 MSEC

SEVERITY INDEX= 686.8

UDS\$899-1.DAT

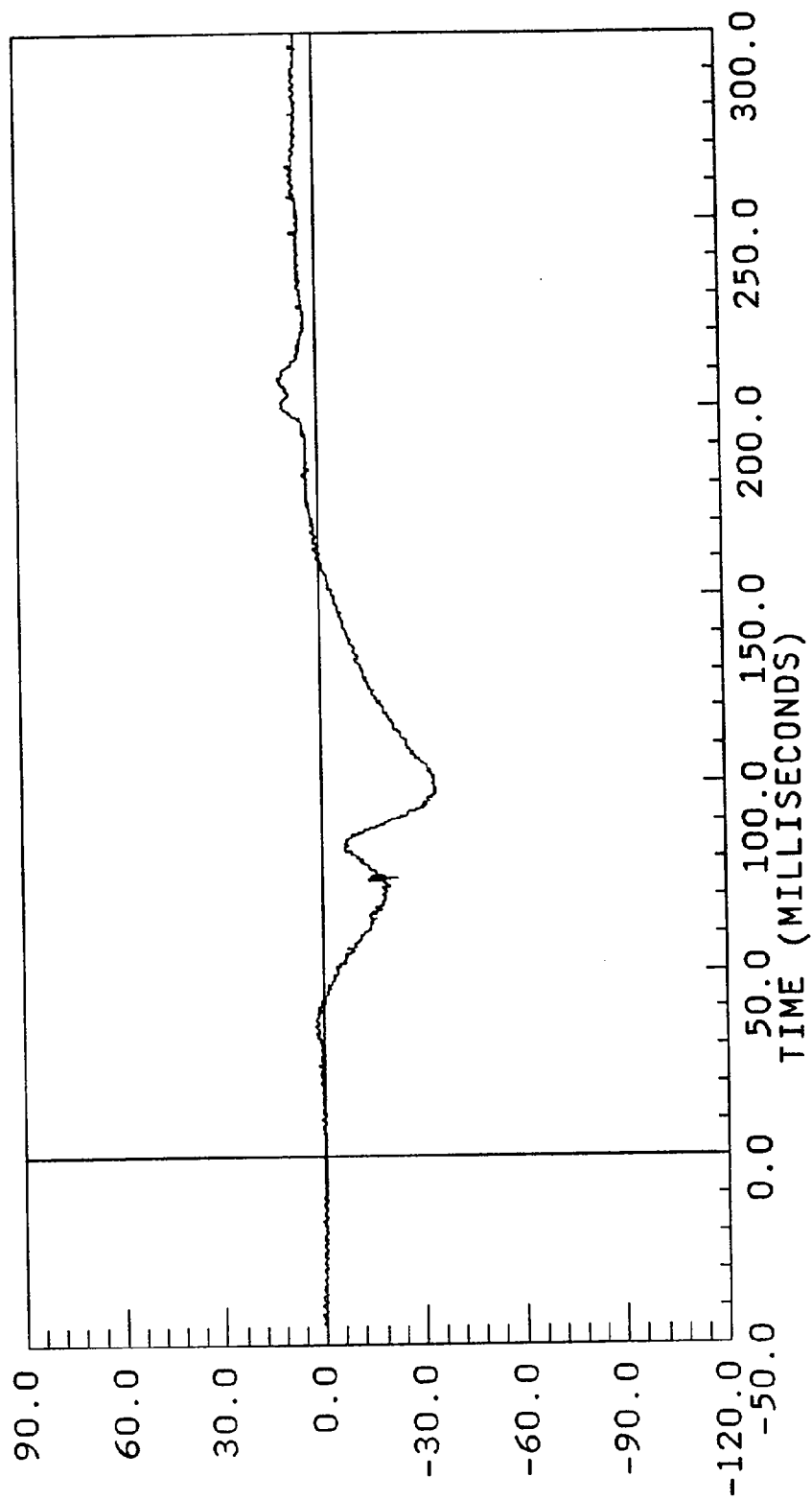
0.00 mph

POS#1 HEAD X

XL AXIS

YMIN = -34.06200 at 96.90000
YMAX = 11.23100 at 207.2250

FILTER CUTOFF: 0HZ



0.00 mph

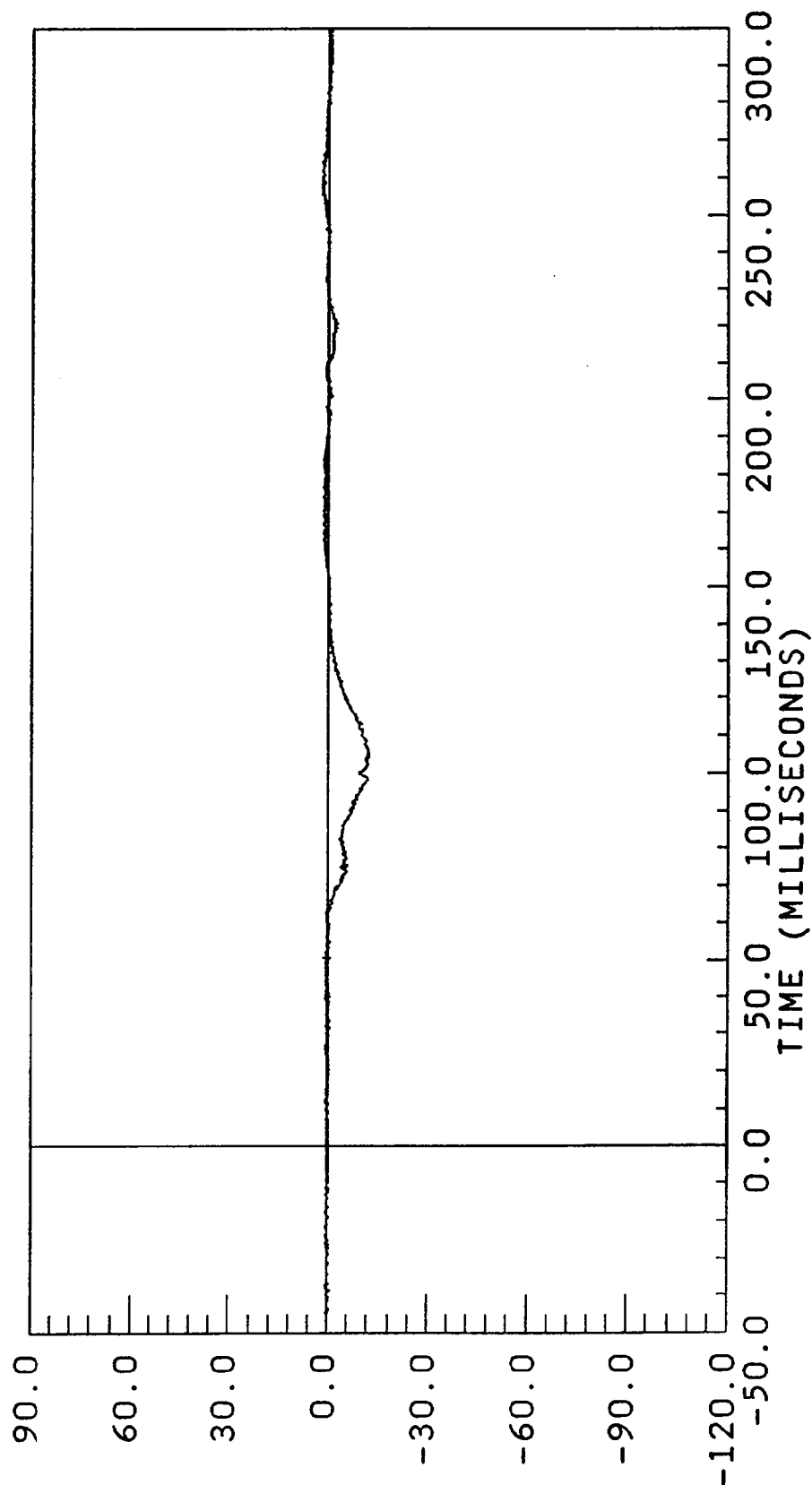
POS#1 HEAD Y

YL AXIS

YMIN = -12.14700 at 98.17500

YMAX = 2.121400 at 255.6750

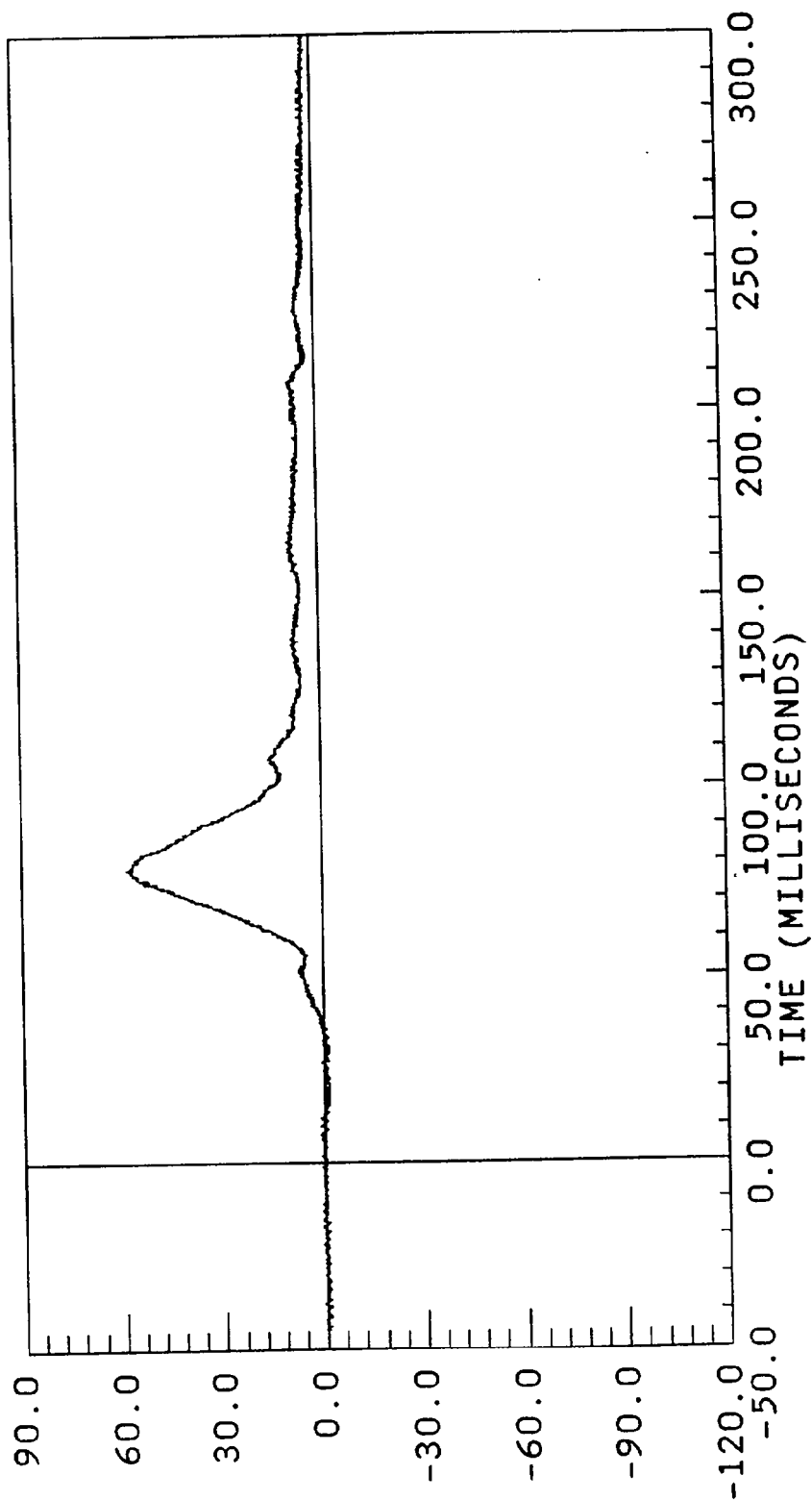
FILTER CUTOFF: 0Hz



UDS\$899-3.DAT

0.00 mph

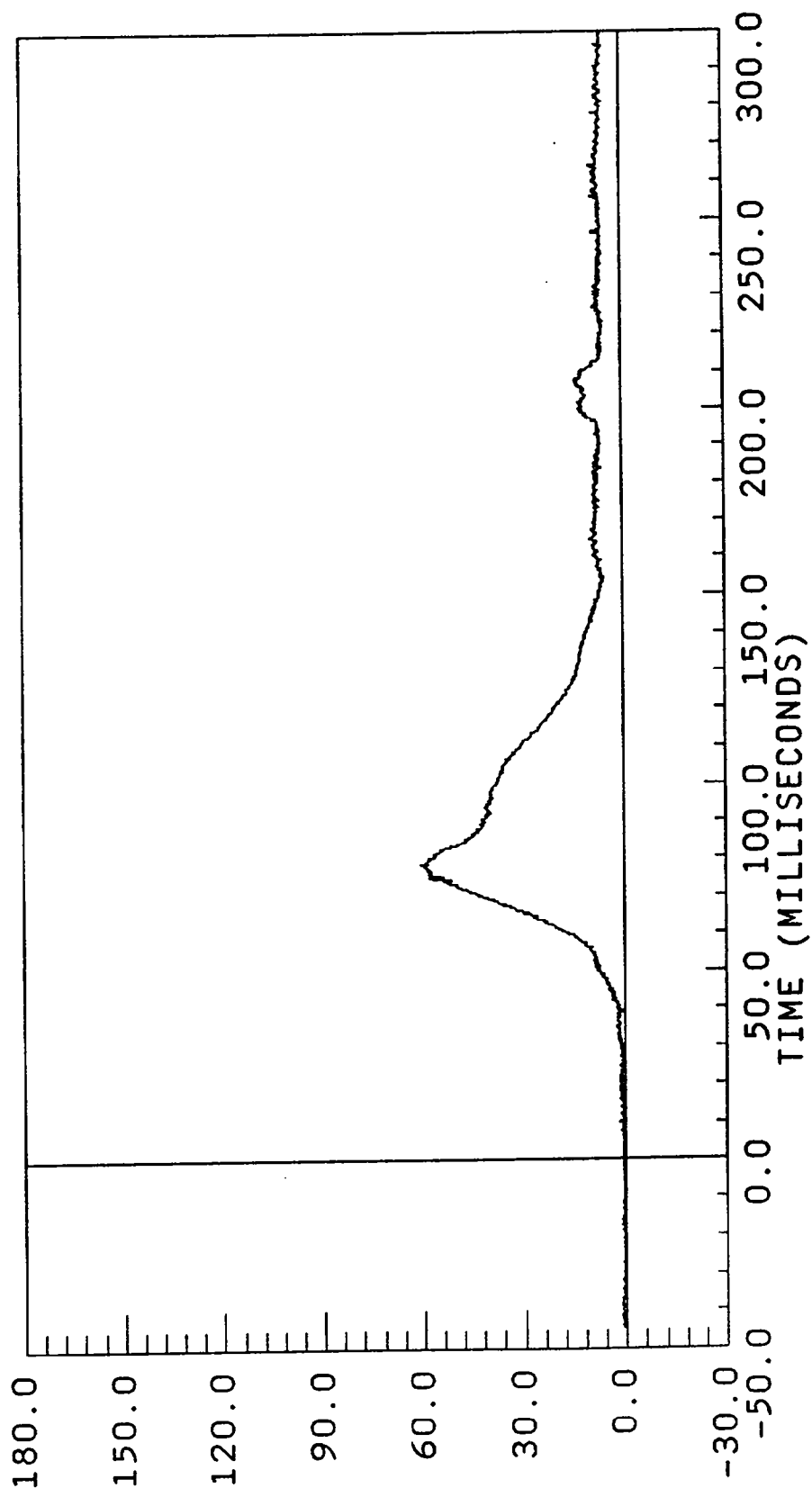
POS#1 HEAD Z
ZL AXIS
YMIN = -0.974850 at -43.80000
YMAX = 59.05900 at 78.30000
FILTER CUTOFF: 0Hz



ACCELERATION * G, S
B-40 7715-7

0.00 mph

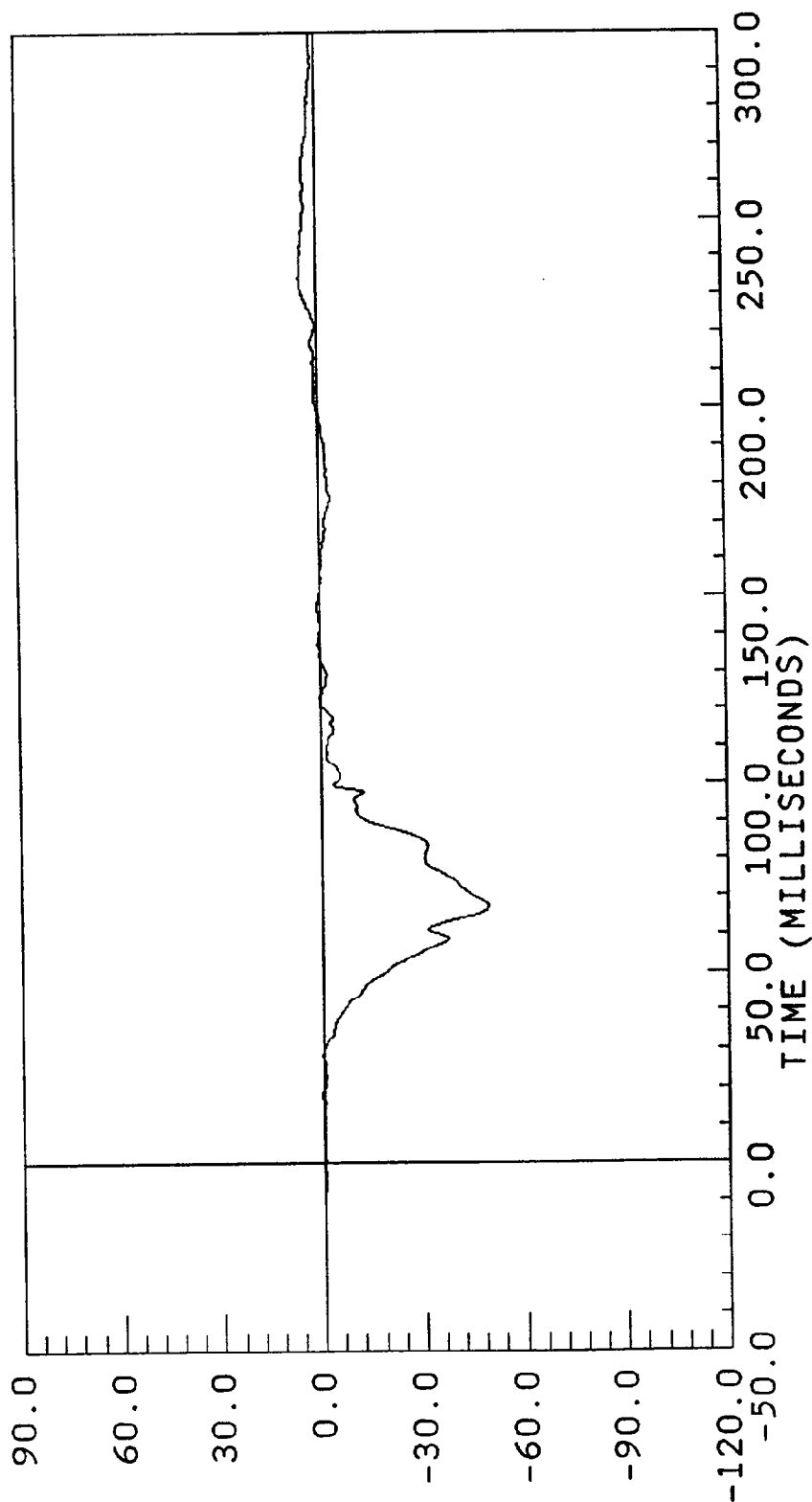
POS#1 HEAD RS AXIS
 NONSTANDARD YMIN = 1.008515 at -32.55000
 FILTER CUTOFF: OHZ YMAX = 60.81321 at 78.30000



BW899-4.DAT

0.00 mph

POS#1 CHEST X
FILTERED
FILTER CUTOFF: 300HZ
XL AXIS
YMIN = -49.28995 at 67.35001
YMAX = 5.281111 at 234.7500

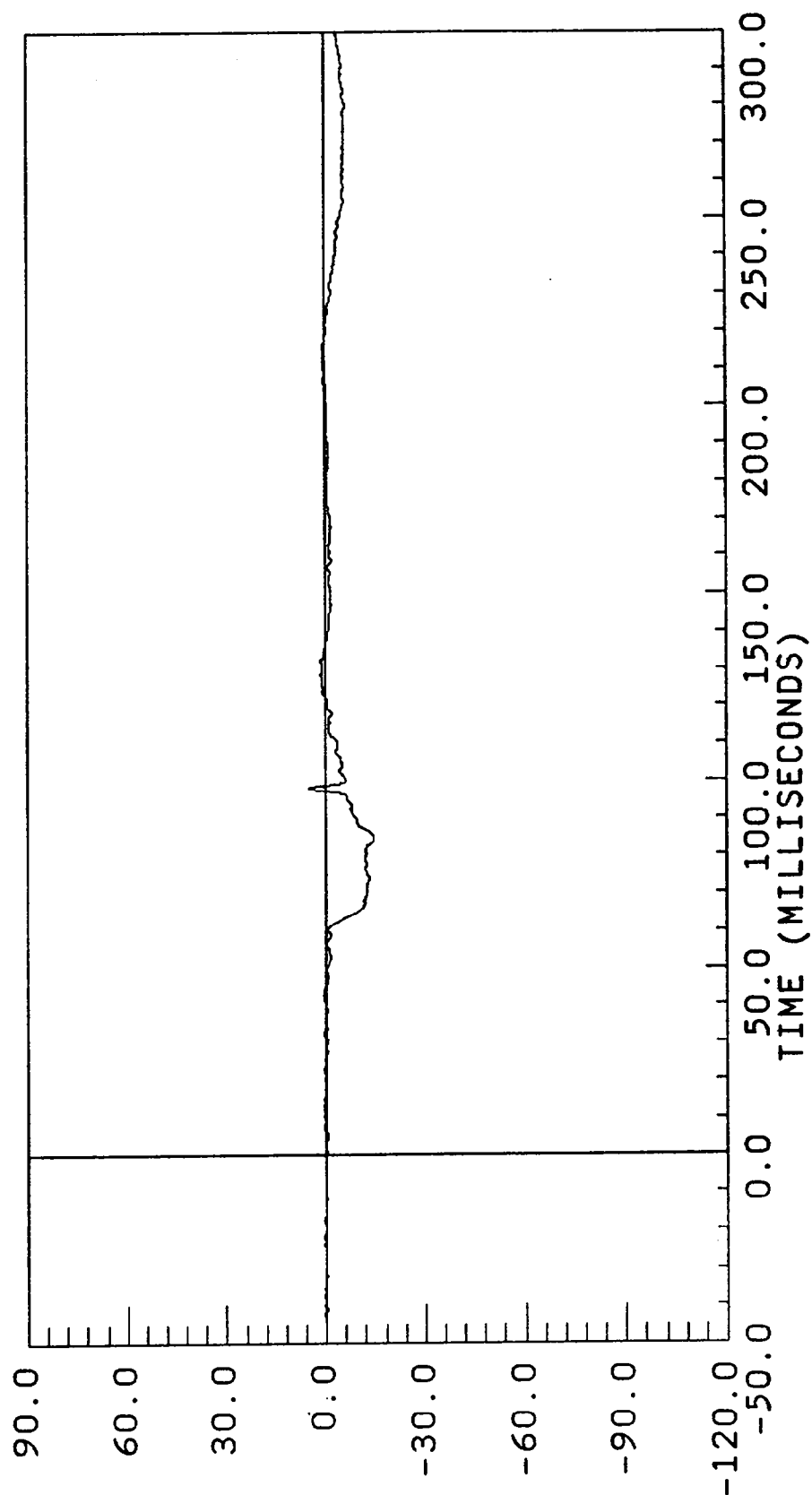


ACCELERATION * G, S *
B-42 7715-7

0.00 mph

POS#1 CHEST Y
 FILTERED
 FILTER CUTOFF: 300Hz

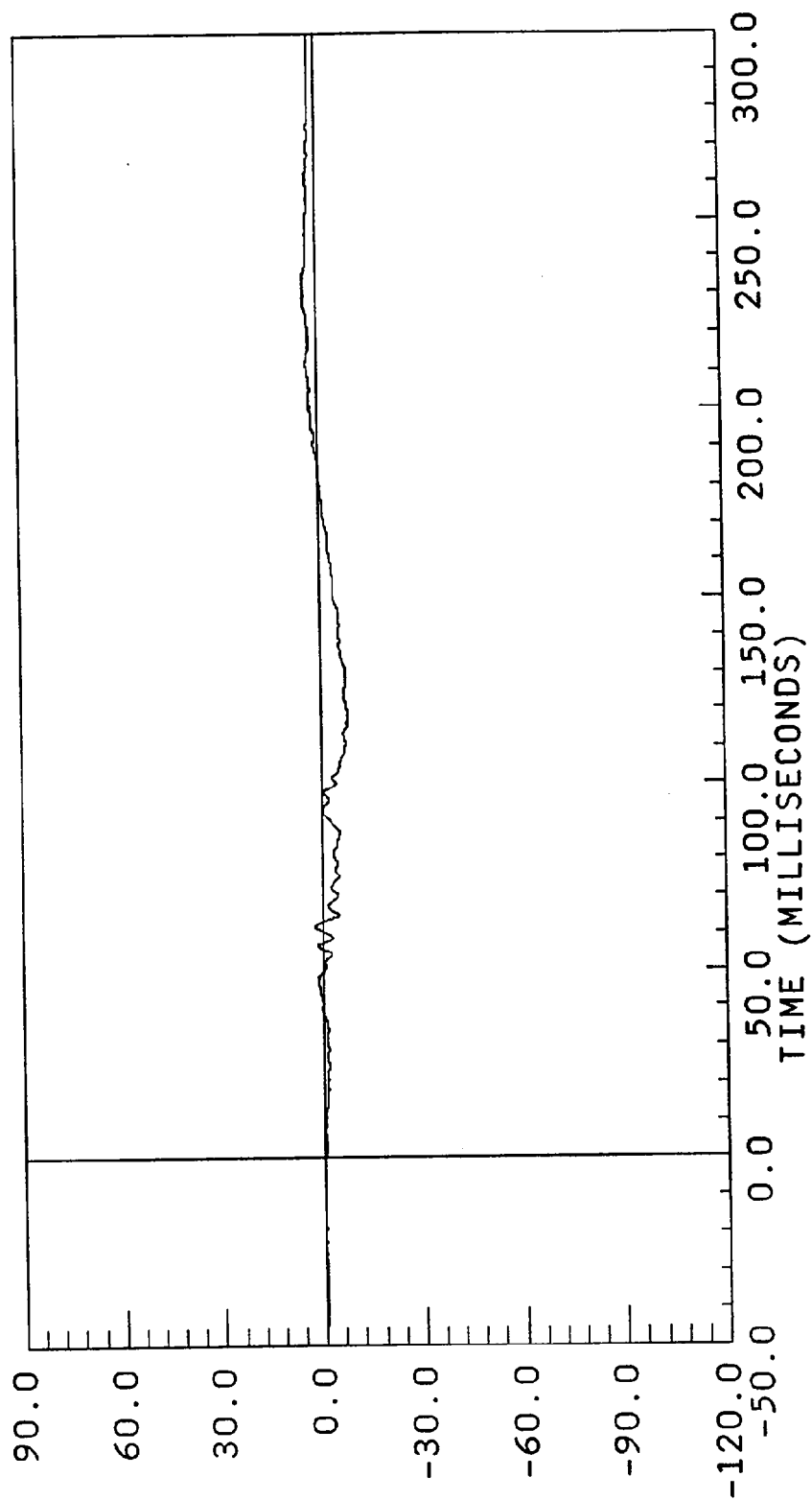
YL AXIS
 YMIN = -14.41881 at 84.07500
 YMAX = 5.126206 at 97.95000



BW899-6.DAT

0.00 mph

POS#1 CHEST Z
FILTERED
FILTER CUTOFF: 300Hz
ZL AXIS
YMIN = -7.949608 at 117.7500
YMAX = 4.064617 at 232.4250

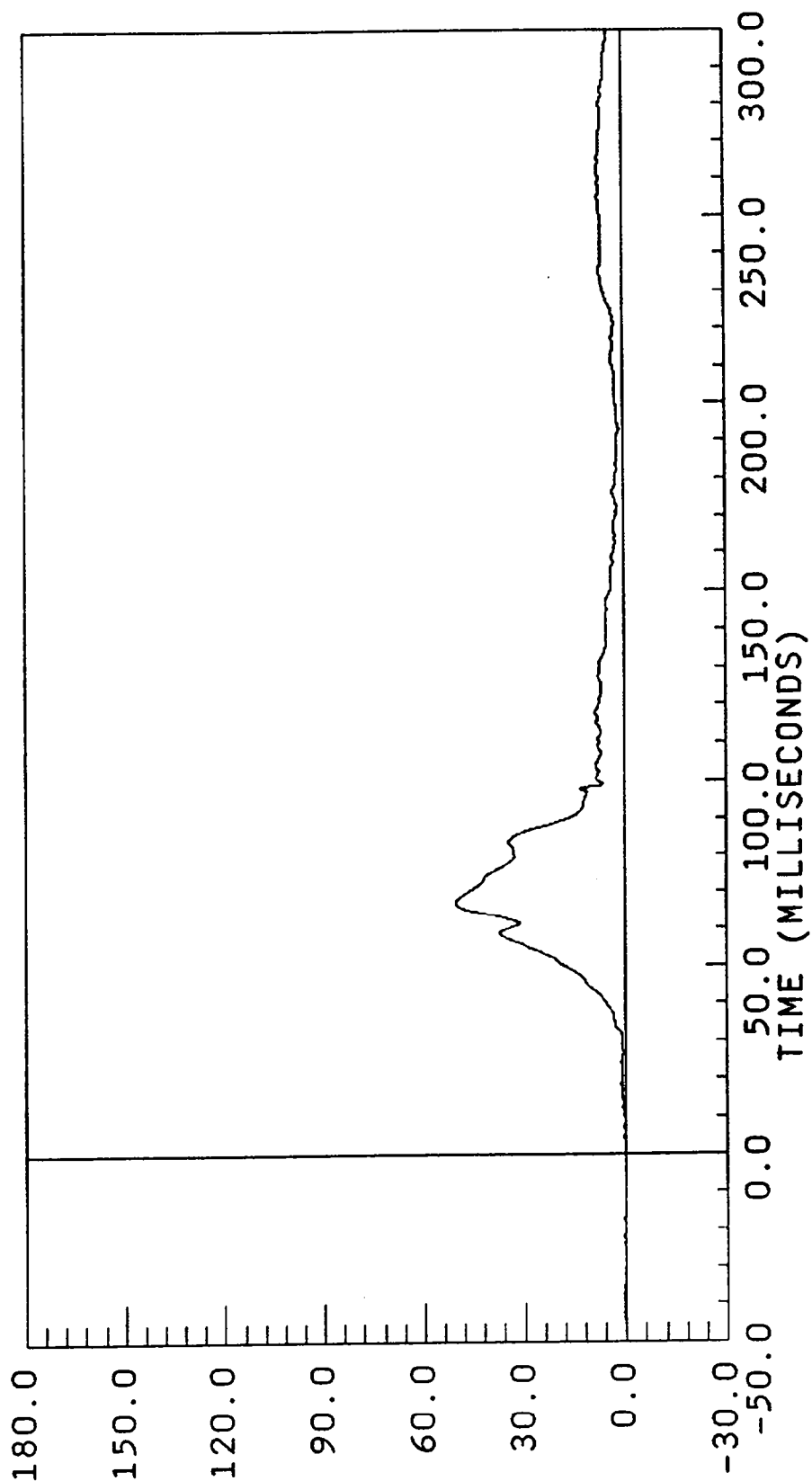


ACCELERATION * G, S *
B-44 7715-7

0.00 mph

POS#1 CHEST
COMPUTED
FILTER CUTOFF: 300HZ

RS AXIS
YMIN = 0.0646466 at -15.82500
YMAX = 50.65682 at 67.35001

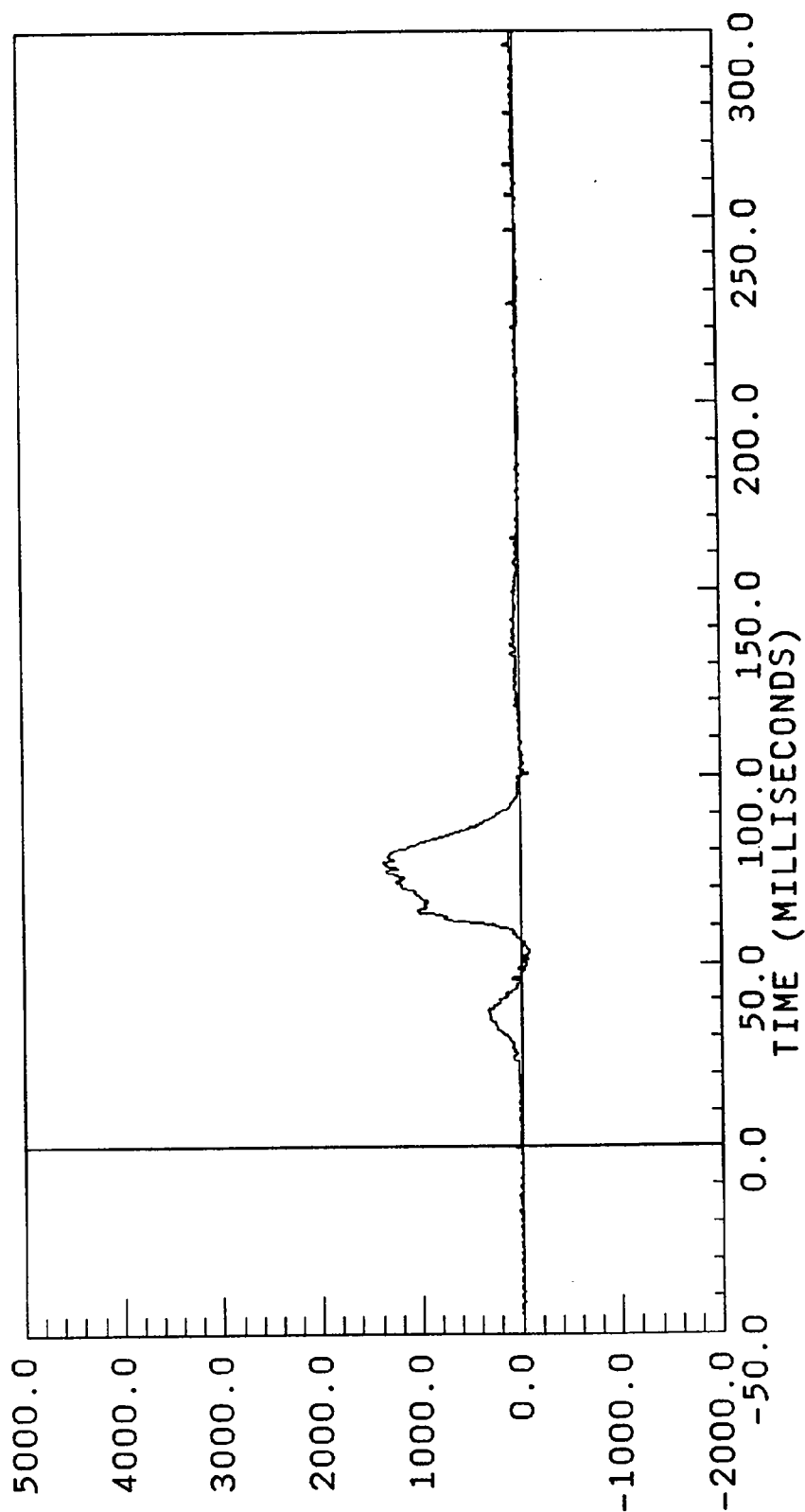


BW899-7.DAT

0.00 mph

POS#1 LEFT FEMUR
FILTERED
FILTER CUTOFF: 1000HZ

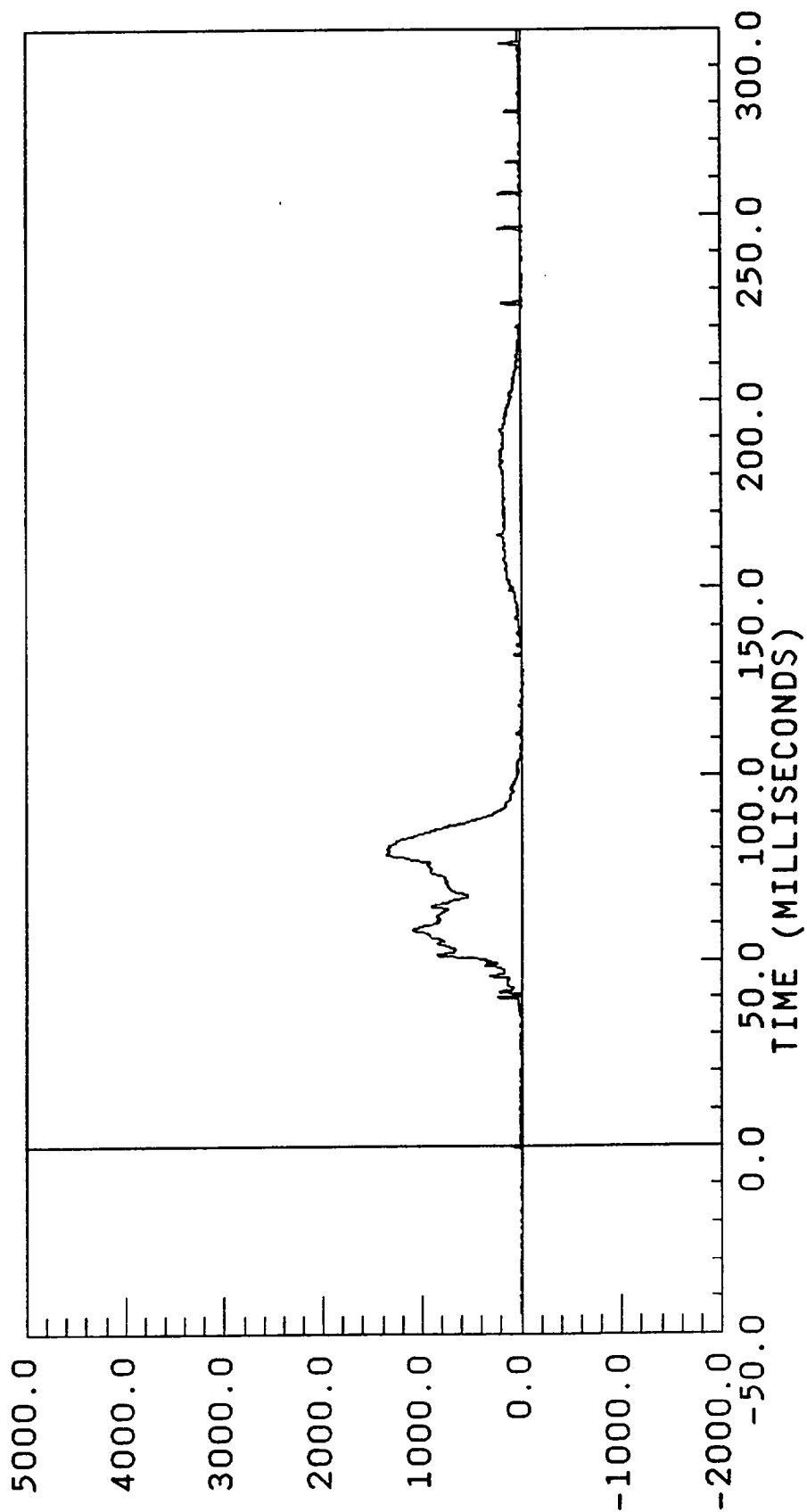
NA AXIS
YMIN = -91.27429 at 53.62500
YMAX = 1370.372 at 76.95000



0.00 mph

POS#1 RIGHT FEMUR
FILTERED
FILTER CUTOFF: 1000HZ

NA AXIS
YMIN = -31.66780 at 227.0250
YMAX = 1354.883 at 80.10001



HEAD INJURY CRITERION
HEAD SEVERITY INDEX
36MS. MAXIMUM DURATION

NHTSA CRASH TEST - PROC. 208

RUN= 899

POS#2 HEAD R

HIC= 653.4 FROM T1= .06892 TO T2= .10492
AVERAGE ACCELERATION BETWEEN T1 AND T2= 50 5G'S
EVENT TIME= 300.0 MSEC
SEVERITY INDEX=1011.8

0.00 mph

POS#2 HEAD X

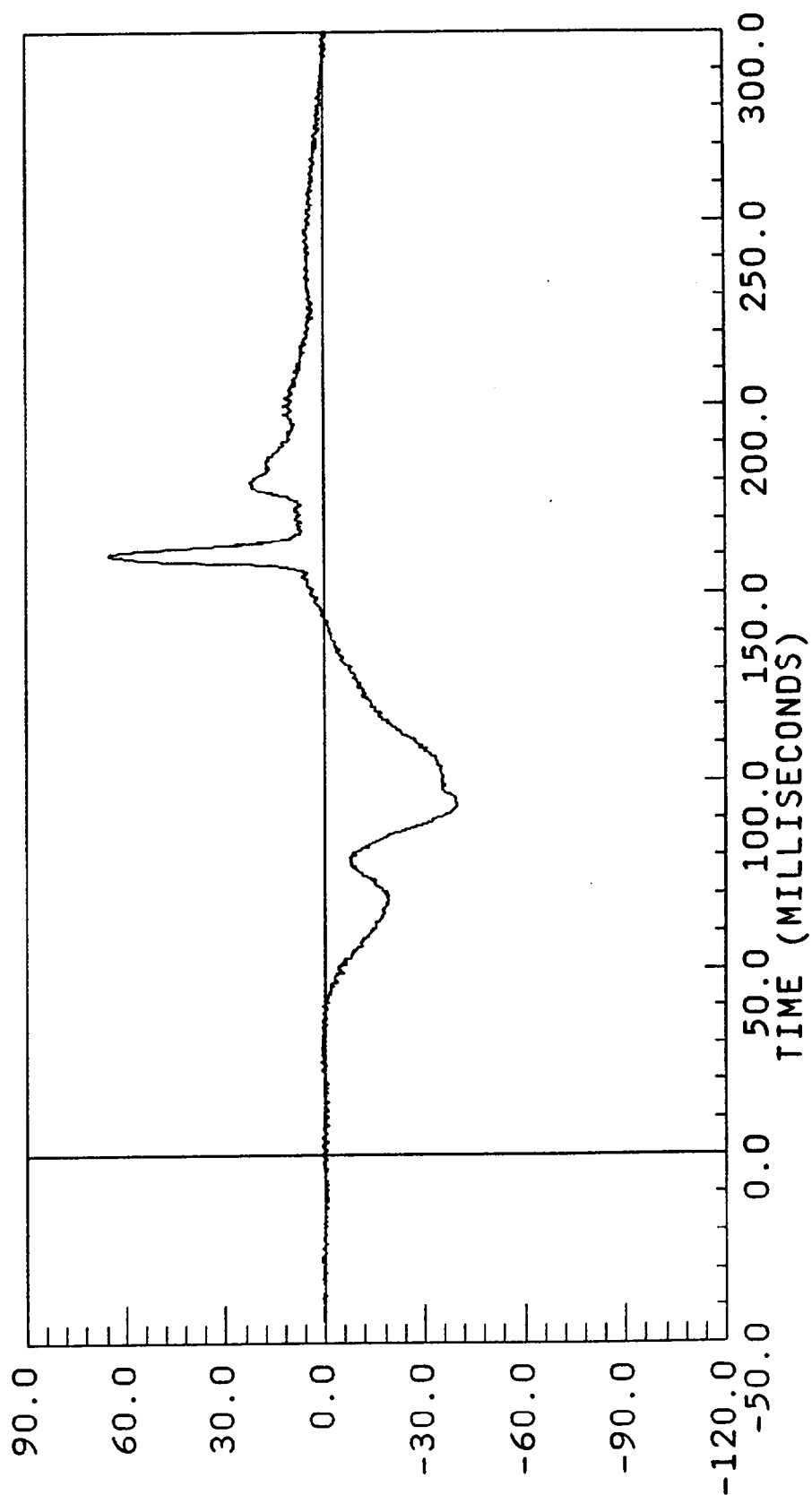
XL AXIS

YMIN = -40.11000 at 93.07500

YMAX = 65.52200 at 160.0500

0HZ

FILTER CUTOFF:

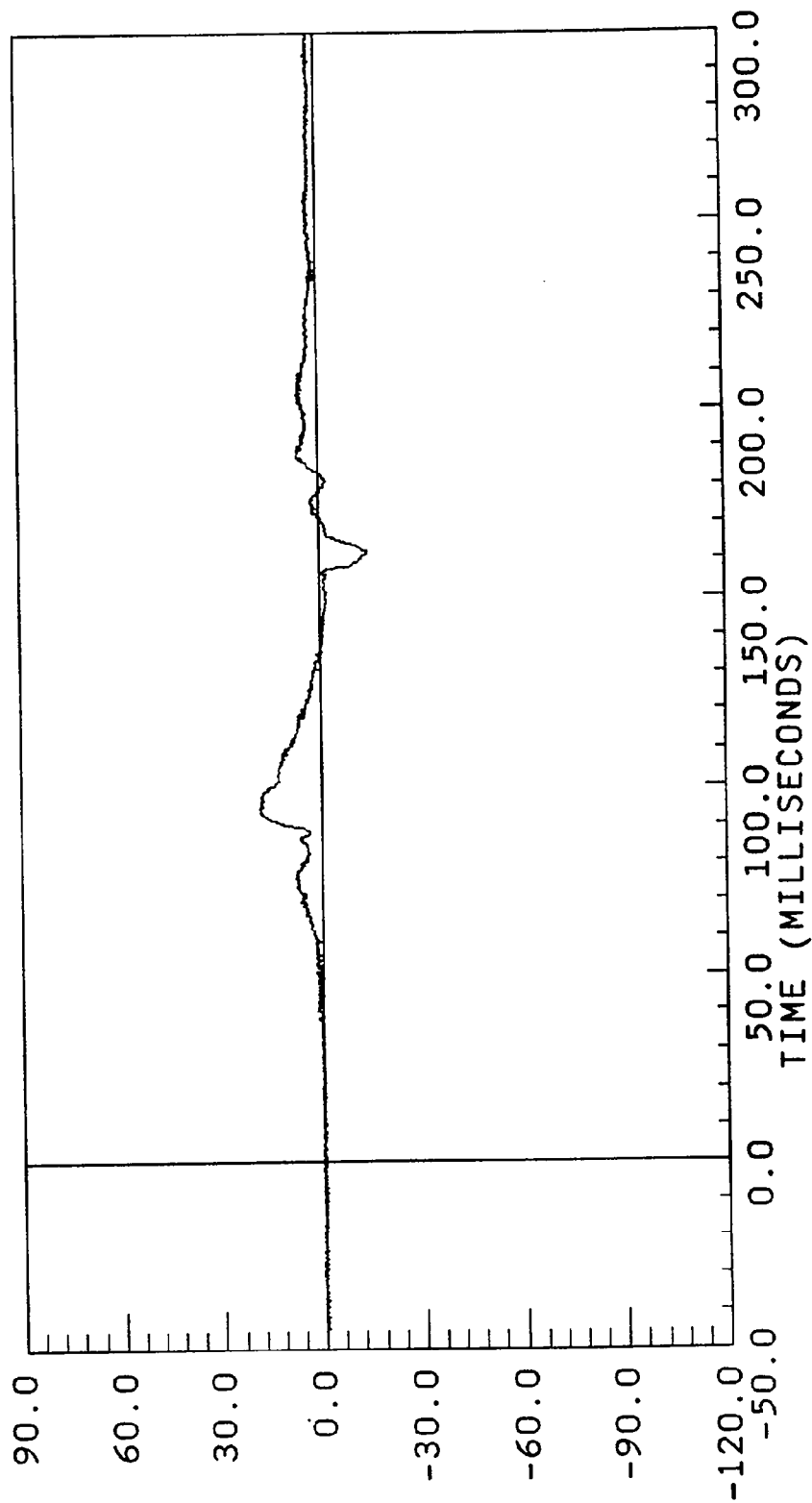


ACCELERATION * G, S *

UDS\$899-12.DA

0.00 mph

POS#2 HEAD Y
YL AXIS
YMIN = -14.12400 at 161.4750
YMAX = 19.04400 at 94.35001
FILTER CUTOFF: 0Hz



ACCELERATION * G, S *
B-50 7715-7

0.00 mph

POS#2 HEAD Z

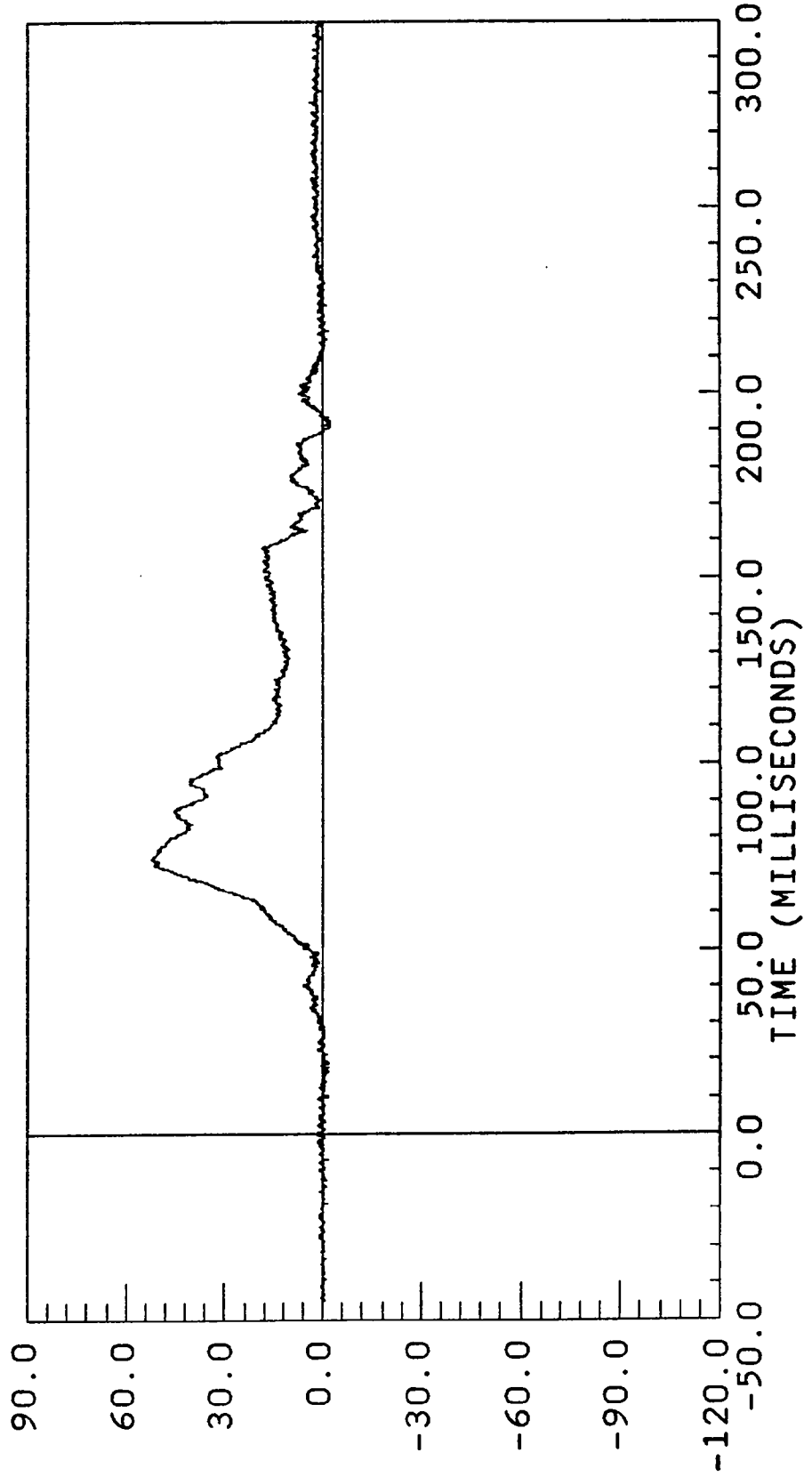
ZL AXIS

YMIN = -2.260700 at 191.0250

YMAX = 52.37800 at 74.32500

OHZ

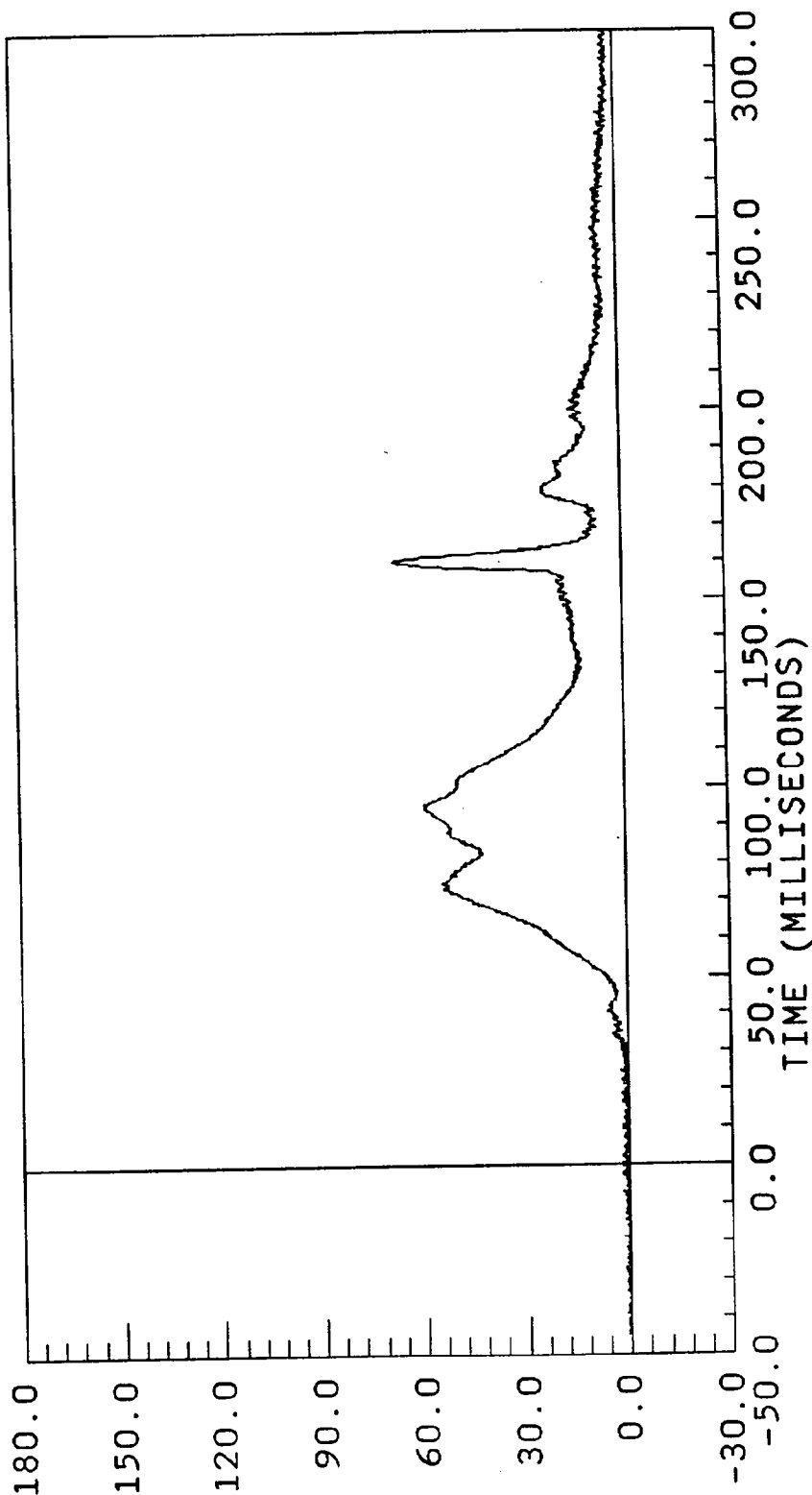
FILTER CUTOFF:



HRES899-2.DAT

0.00 mph

POS#2 HEAD
NONSTANDARD
FILTER CUTOFF: 0Hz
RS AXIS
YMIN = 0.390912 at -39.97500
YMAX = 67.72876 at 160.1250

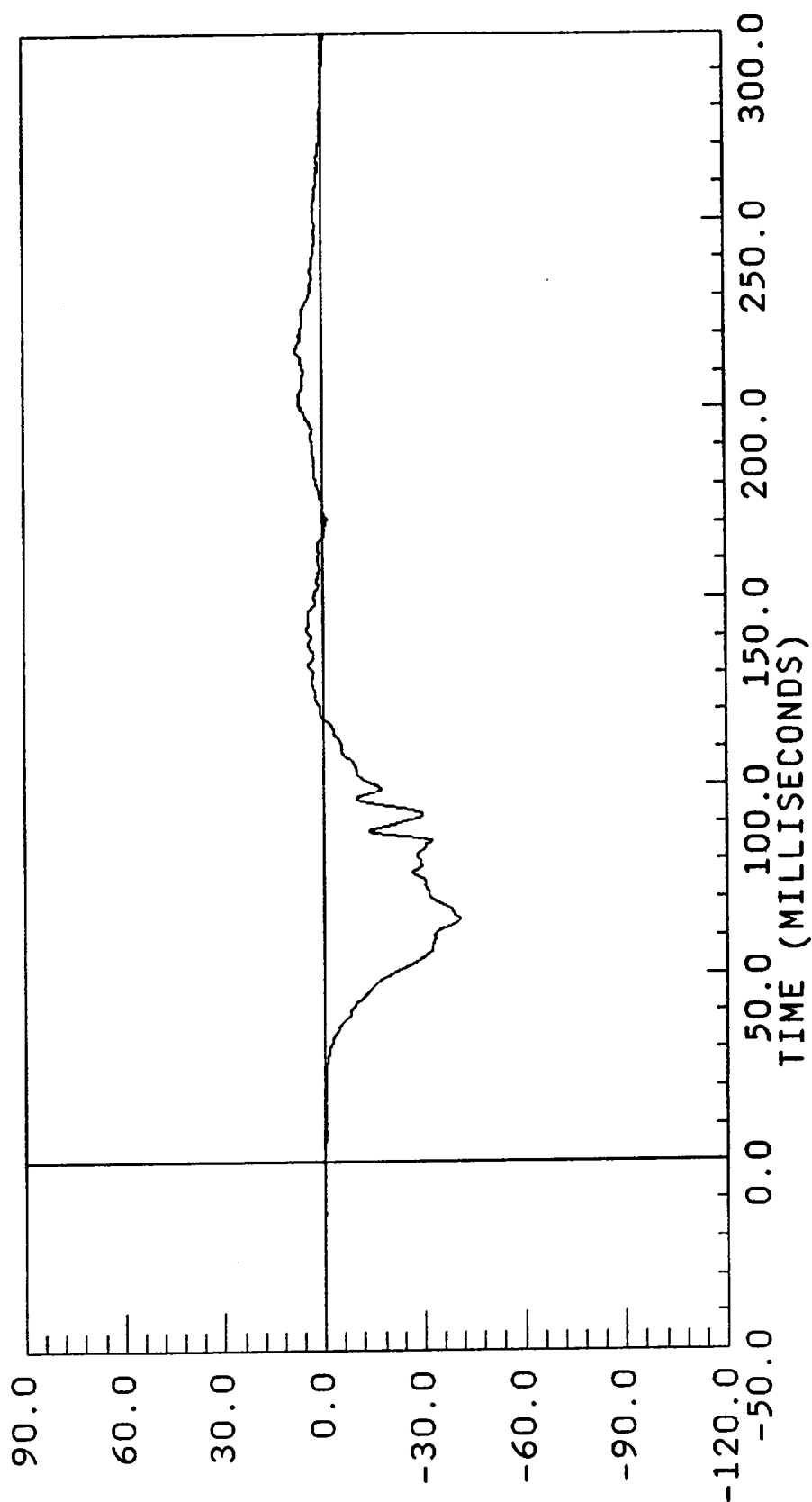


0.00 mph

POS#2 CHEST X
 FILTERED
 FILTER CUTOFF: 300HZ

XL AXIS

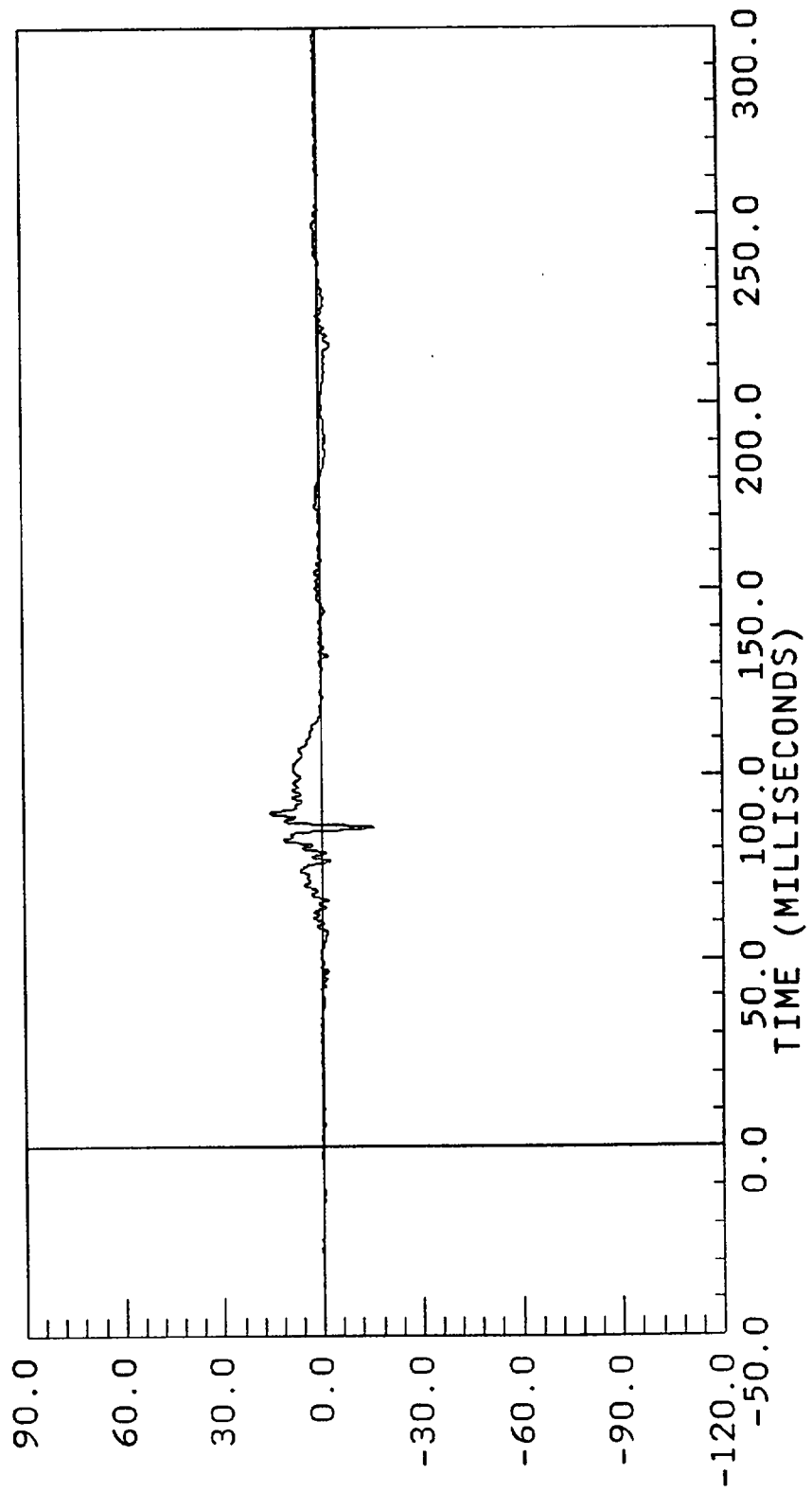
YMIN = -40.76168 at 64.35001
 YMAX = 8.185701 at 215.7750



BW899-15.DAT

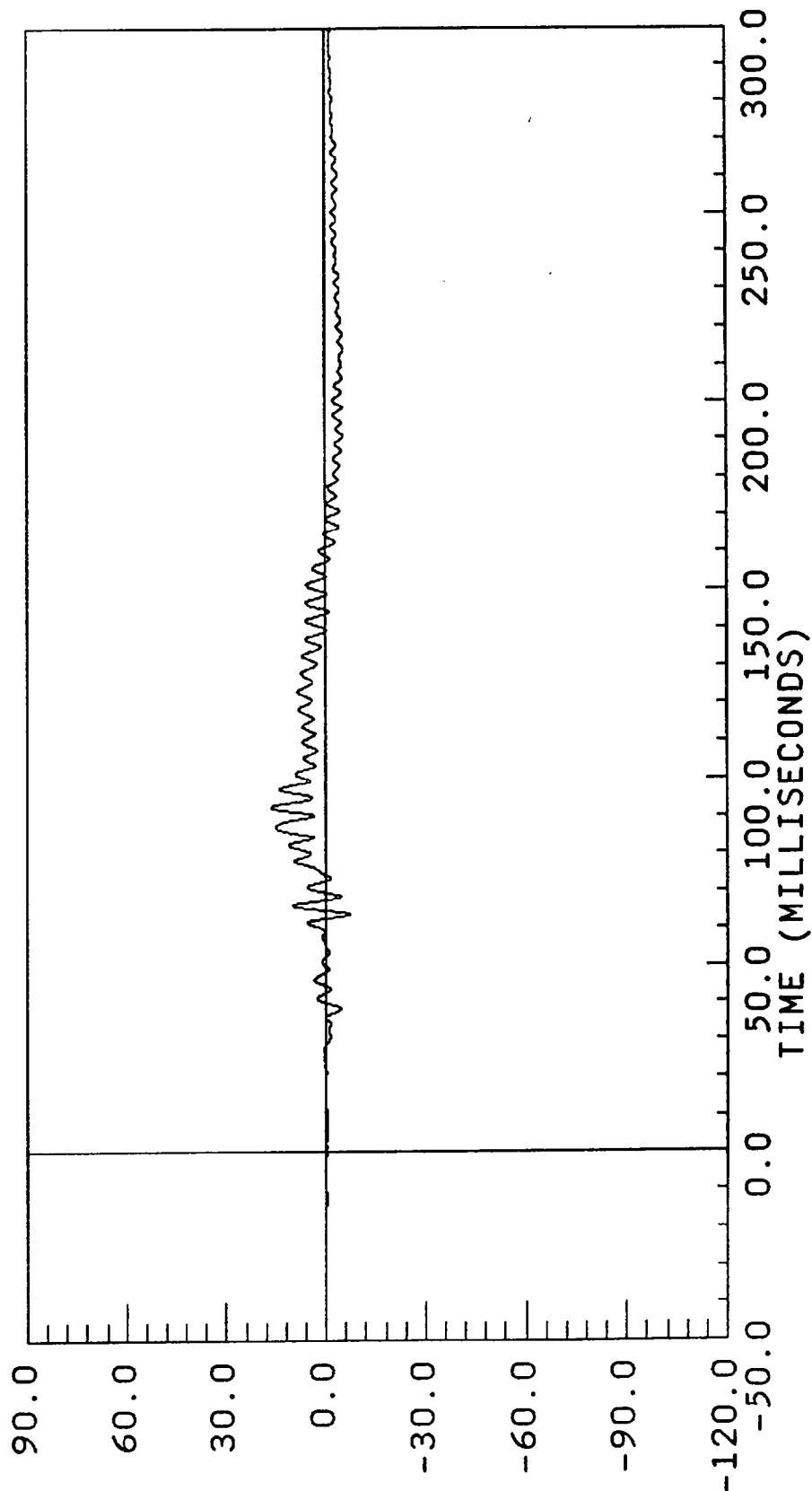
0.00 mph

POS#2 CHEST Y
FILTERED
FILTER CUTOFF: 300HZ
YL AXIS
YMIN = -15.94769 at 85.95000
YMAX = 16.02665 at 89.85001



0.00 mph

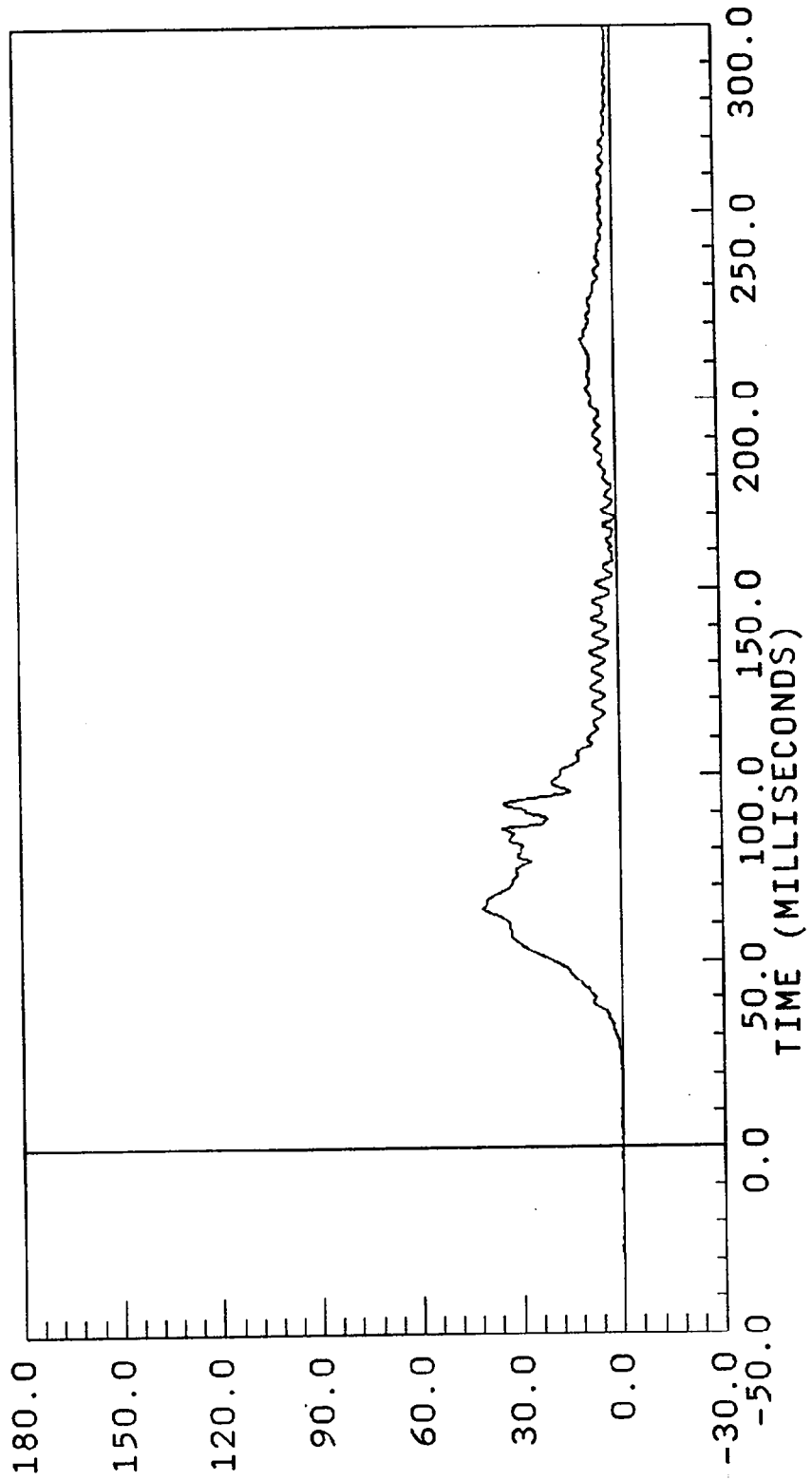
POS#2 CHEST Z
 FILTERED
 FILTER CUTOFF: 300HZ
 ZL AXIS
 YMIN = -7.378251 at 63.67500
 YMAX = 16.54330 at 92.40000



CHST899-2.DAT

0.00 mph

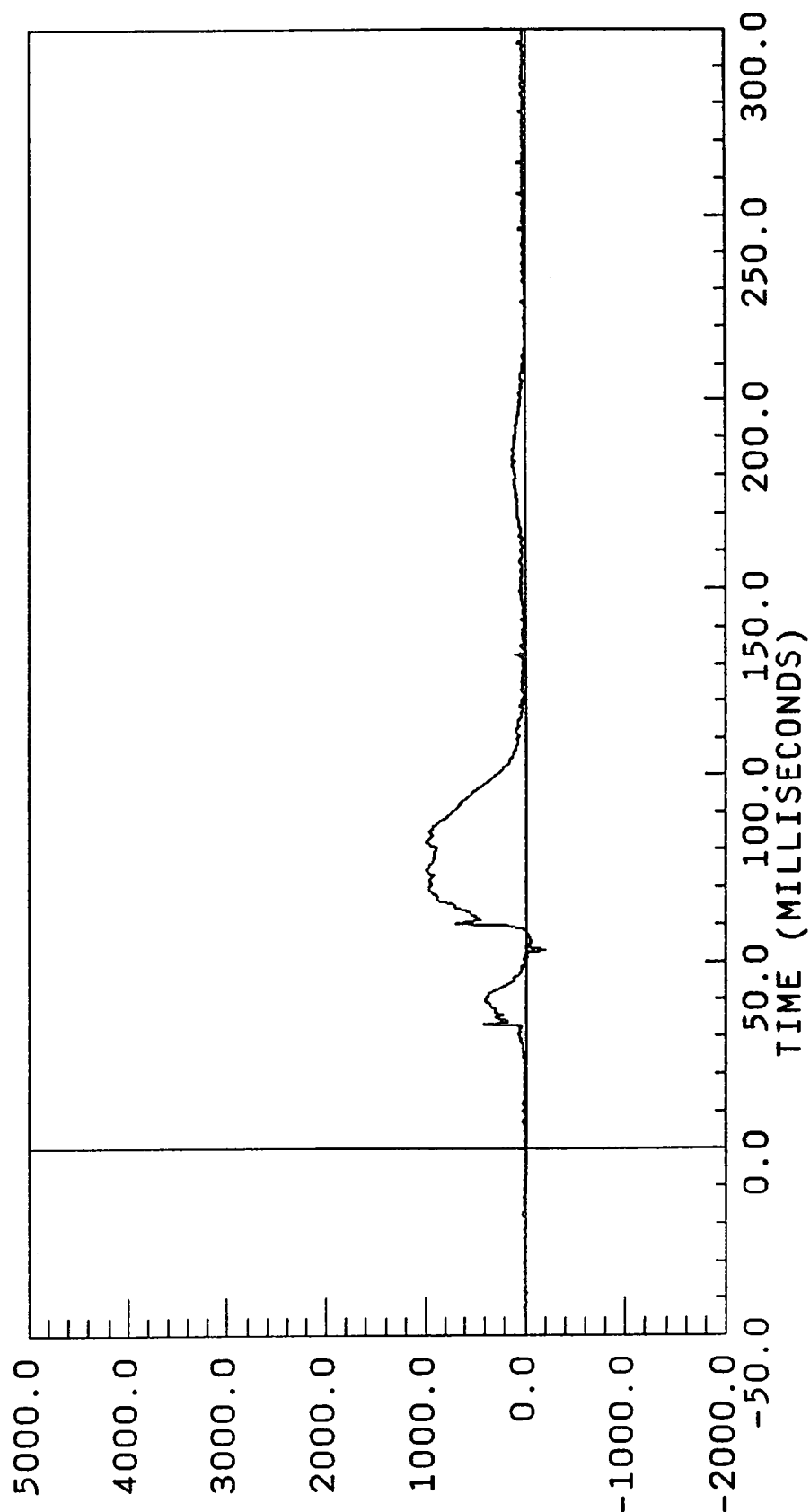
POS#2 CHEST
COMPUTED
FILTER CUTOFF: 300HZ
RS AXIS
YMIN = 0.0182445 at 63.67500
YMAX = 41.18399 at 64.05000



ACCELERATION * G, S *
B-56 7715-7

0.00 mph

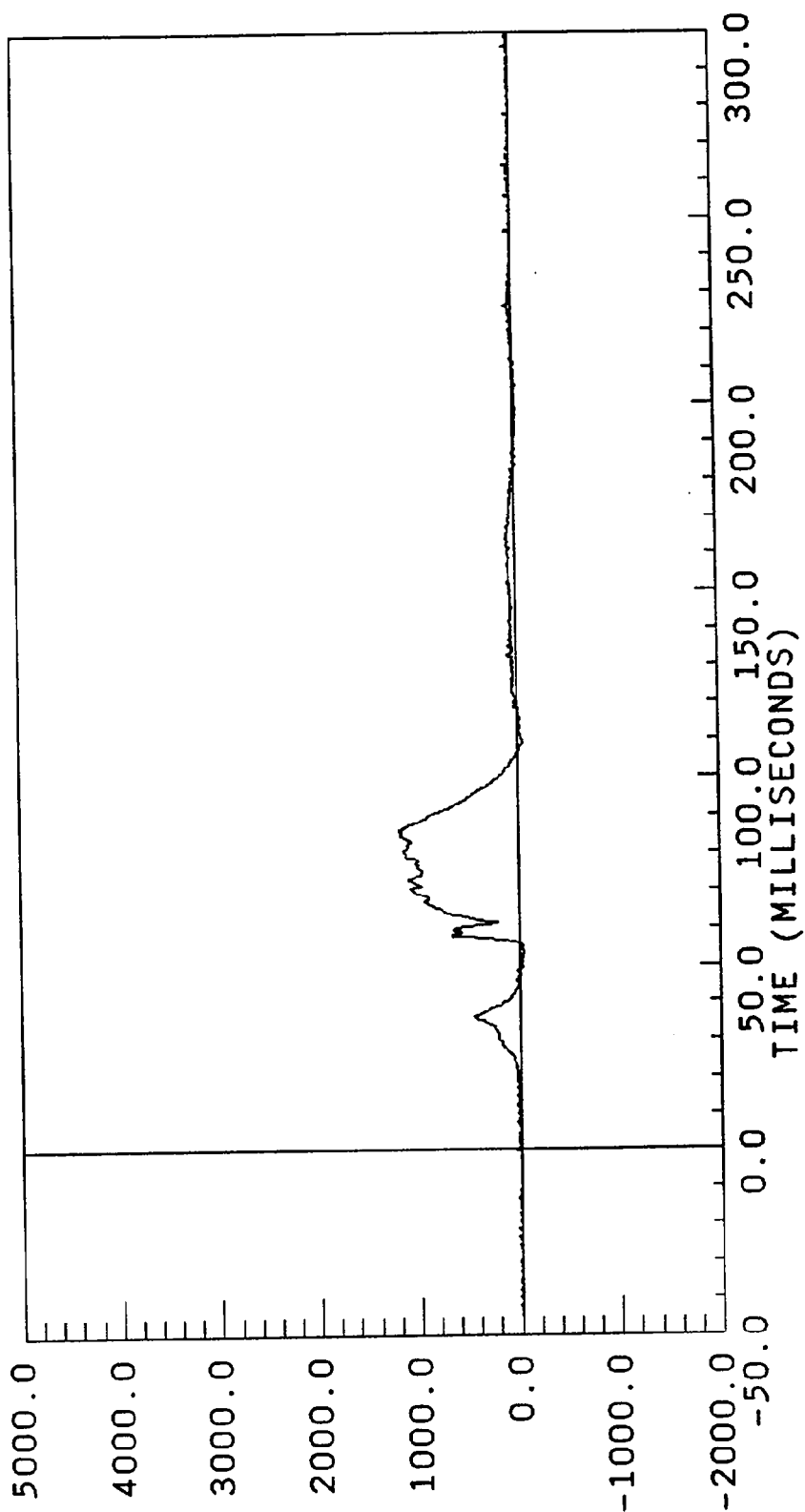
POS#2 LEFT FEMUR
 FILTERED
 FILTER CUTOFF: 1000HZ
 NA AXIS
 YMIN = -203.7213 at 53.32500
 YMAX = 999.5986 at 74.62500



BW899-10.DAT

0.00 mph

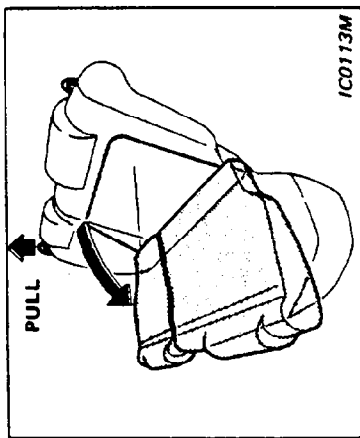
POS#2 RIGHT FEMUR
FILTERED
FILTER CUTOFF: 1000HZ
NA AXIS
YMIN = -62.02387 at 53.55000
YMAX = 1189.745 at 86.10001



Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

INTERIOR TRUNK ACCESS (Sedan)



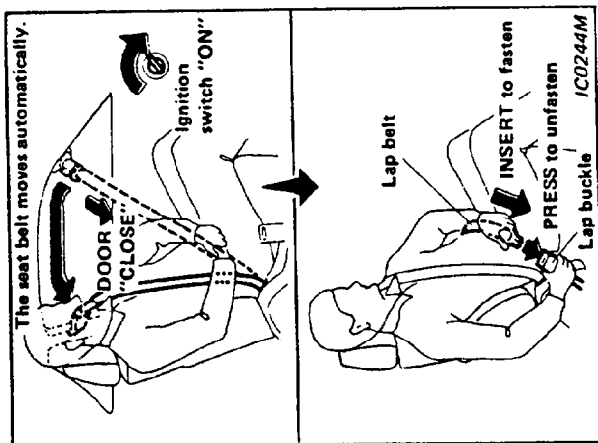
Pull the seat back lever and fold the seat back down to gain access to the trunk room from the rear seat for loading and unloading.

SEAT BELTS

AUTOMATIC SEAT BELT SYSTEM (For U.S.A.)

The automatic Seat Belt system consists of an automatic shoulder belt and a manual lap belt for the driver and front passenger seat positions. The shoulder belts automatically adjust to the body and seating positions where the door is closed and the ignition key is turned "ON".

- For most effective protection, always fasten the manual lap belt in addition to the automatic shoulder belt.
- To properly operate the automatic seat belt system, the shoulder belt tongue should always remain inserted in the shoulder belt buckle, located in the rail of the door opening.
- NISSAN recommends that children be seated in the rear seats. See Precautions on Seat Belt Usage later in this Section.



Fastening the belts

1. Open the door and make sure that the shoulder buckle is in the forward position. Then get into the vehicle and close the door.

If the ignition switch is in the "ON" position, the shoulder buckle will move to the rear position when closing the door.

2. Adjust the seat.

The seatback should not be in a reclining position any more than needed for comfort. Seat belts are most effective when the passenger sits well back and straight up in the seat.

3. Turn the ignition switch on. The shoulder buckle will move to the rear position and will fit across your chest.

Pull the shoulder belt toward the retractor to take up extra slack.

- Never touch the door guide rail while the shoulder buckle is moving.

- Do not wear the shoulder belt across the neck or under your outer arm. The shoulder belt should be positioned midway over the shoulder for the most effective protection.

4. Slowly pull the lap belt out of the retractor and insert the tongue into the lap buckle until it snaps. Position the lap belt low on the hips and pull the belt toward the retractor to take up extra slack.

- Never wear the lap belt across the shoulder belt.

- The retractors are designed to lock during a sudden stop or on impact. A slow pulling motion will permit the belt to move, and allow you some freedom of movement in the seat.

Unfastening the belts

1. To unfasten the lap belt, press the button on the lap buckle. The seat belt will automatically retract.

2. Open the door. The shoulder belt buckle will move to the front position and the shoulder belt will move away from your chest.

- Never touch the door guide rail while the shoulder buckle is moving.

- Do not unfasten the shoulder belt tongue from the buckle except in emergency. See "Operation in Emergency" later in this Section.

How the automatic shoulder belt works

While the ignition switch is on; the shoulder buckle will move to the forward position when the door is opened, and it will move to the rear position when the door is closed.

While the ignition switch is off; the shoulder buckle will remain or move to the front position when the door is opened, and it will remain in the front position when the door is closed until the ignition switch is turned "ON".

If the shoulder buckle operates abnormally, have the system checked by your NISSAN dealer.

Seat belt warning light " " and warning chime



When the ignition switch is turned on with the door open (the shoulder buckle is at the front position);

the chime will sound for about 6 seconds, and the warning light will flicker continuously. The warning light will go off when the door is closed and the shoulder buckle reaches the rear position.

When the ignition switch is turned on with the door closed;

the chime will sound and the warning light will flicker until the shoulder buckle reaches the rear position. The warning light will come on for several seconds after the shoulder buckle reaches the rear position.

If the shoulder belt tongue is disconnected from the buckle;

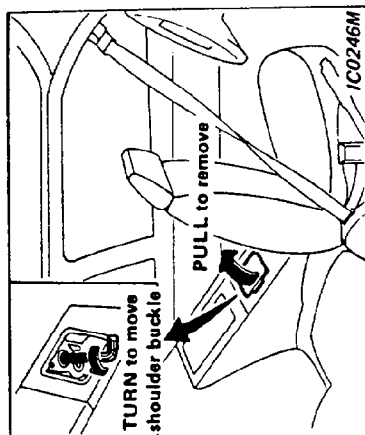
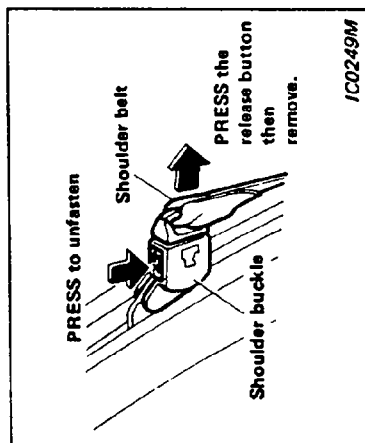
when the ignition switch is turned on and the shoulder buckle reaches the rear position, the warning light will come on for

about 100 seconds and the chime will sound for about 6 seconds until the shoulder belt is connected to the shoulder buckle. Insert the shoulder belt tongue into the shoulder buckle before driving.

If the driver side lap belt is not fastened: when the ignition switch is turned on and the shoulder buckle reaches the rear position, the warning light will come on for about 6 seconds and the chime will sound for about 6 seconds until the lap belt is fastened. Fasten the lap belt before driving.

System malfunction

If, while the ignition switch is turned "ON" with either door open, the warning light flickers and the chime sounds faster than usual for about 6 seconds, it may indicate a malfunction in the system. Have the system checked by your NISSAN dealer.



Operation in an accident

Emergency release

If you need to release the shoulder belt from the shoulder belt buckle in an emergency, press the buckle marked with "PRESS EMERGENCY". Use this feature only when the shoulder belt keeps you from leaving the vehicle in an accident.

For normal use, the shoulder belt should always be connected to the buckle.

If either shoulder belt buckle does not operate

1. Slide the seat forward as far as possible.
2. Remove the blind cap in the lower portion of the center pillar. The end of the motor shaft will be visible.
3. Using the wrench supplied in the tool bag, turn the shaft of the motor counterclockwise to move the shoulder buckle to the rear position.

Have the automatic seat belt system checked and repaired by your NISSAN dealer.