REPORT NUMBERS: 208-CAL-90-03
212-CAL-90-03
301-CAL-90-03

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

FORD MOTOR COMPANY
1990 FORD MUSTANG LX
2-DOOR SEDAN

NHTSA NUMBER: CL0204

CALSPAN TEST NUMBER: 7804-3

January 23, 1990

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

FINAL REPORT

PREPARED FOR:

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

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-88-C-01038. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

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April 16, 1990
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Final Report of FMVSS Nos. 208, 212, 219 (partial) and 301 Compliance Testing of a 1990 Ford Mustang LX 2-Door Sedan	January 23, 1990
	6. Performing Organization Code: CAL
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15. Supplementary Notes

16. Abstract

A 30 mph vehicle safety compliance test was conducted on a 1990 Ford Mustang LX 2-Door Sedan.

This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on January 23, 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 35°F.

The subject test vehicle appears to comply with the requirements of FMVSS Nos. 208, 212, 219 (partial) and 301.

Type of Restraint System: The test vehicle was equipped with a driver air bag and passenger 3-point continuous loop seat belt restraint. Driver side seat belt not used for this test.

17. Key Words	18. Distribution Statement
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	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 I

PURPOSE AND TEST PROCEDURE

This 30 mph frontal barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208, 212, 219 (partial) and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by Calspan Advanced Technology Center under Contract No. DTNH22-88-C-01038. The purpose of this test was to determine if the subject vehicle, a 1990 Ford Mustang LX 2-Door Sedan, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS No. 212, "Windshield Mounting"; FMVSS No. 219 (partial), "Windshield Zone Intrusion"; and FMVSS No. 301, "Fuel System Integrity". This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-208-07.

Section 2

SUMMARY OF TEST NUMBER CL0204

A frontal barrier was impacted by a 1990 Ford Mustang LX 2-Door at a velocity of 29.5 mph. The test was performed at the Calspan Corporation Advanced Technology Center on January 23, 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 27 channels of data were recorded on three 14-channel FM tape recorders. Appendix B contains the vehicle and dummy response data traces. For unknown reasons, channel 25, firewall accelerometer pack 9(x), contained questionable data. The accelerometer passed pre-test inspection.

The driver's HIC was 433. The maximum chest deceleration over 3 milliseconds was 40.8 g's. The maximum force on the driver's left femur was 1737 pounds and 1328 pounds on the right femur.

The right front passenger's HIC was 262. The maximum chest deceleration over 3 milliseconds was 25.2 g's. The maximum force on the right front passenger's left femur was 250 pounds and 175 pounds on the right femur.

Table 1

CRASH TEST SUMMARY

Vehicle NHTSA No.: CL0204 Test Mode: 30 mph Frontal Barrier

Test Date.: January 23, 1990 Time: 12:35 Temperature: 35°F

Vehicle Make/Model/Body Style: 1990 Ford Mustang LX 2-Door Sedan

Vehicle Test Weight: 3430 lbs.

Vehicle/Barrier Impact Angle: 0°

Impact Velocity: 29.5 mph

Maximum Static Crush: 16.7"

Vehicle Rebound: 16.0"

DUMMIES:	DRIVER	PASSENGER
Type:	Part 572	Part 572
Restraint System:	Air Bag	3-Point Manual Belt Restraint System

Number of Data Channels: 27

Number of Cameras: 1 Real Time

14 High Speed

DOOR OPENING DATA: closed operable - Left Front

closed operable - Right Front

Front Seat(s) Data:	DRIVER	PASSENGER
Seat Track Failure:	0.0	0.0
	inches of shift	
Seat Back Failure:	None	None

VISIBLE DUMMY CONTACT POINTS:	DRIVER	PASSENGER
Head:	air bag, sun visor	no contact
Abdomen	no contact	no contact
Chest	air bag	no contact
Knees	dash panel	dash panel

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1990 Ford Mustang LX 2-Door Sedan

NHTSA No. CL0204 ; VIN: 1FACP40A6LF113922 ; Color; White

Engine Data: 4 cylinders; - CID; 2.3 Litres; - cc

Placement X Longitudinal or In-Line; - Transverse or Lateral

Transmission Data: - speeds; - Manual; X Automatic; X Overdrive

Final Drive: X Rear Wheel Drive; - Front Wheel Drive; - Four Wheel Drive

Major Options: X A/C; X Pwr. Strg.; X Pwr. Brakes; X Pwr. Windows

- Power Door Locks

Date Received: 11-20-89 ; Odometer Reading 28.1 miles

Selling Dealer: West-Herr Ford, Inc.

& Address S-5025 Camp Road, Hamburg, NY 14075

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Ford Motor Company

Date of Manufacture: 10-89

GVWR: 3780 lbs.; GAWR: 1939 lbs. FRONT; 1911 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 35 psi FRONT

35 psi REAR

Recommended Tire Size: P195/75R14 Load Range: B

Recommended Cold Tire Pressure: 35 psi FRONT; 35 psi REAR

Size of Tires on Test Vehicle: P195/75R14 ; Manufacturer: General

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) = 700 lbs.

No. of Occupants x 150 lbs. = 600 lbs.

Rated Cargo/Luggage Weight (RCLW) = 100 lbs. (Difference)

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

Right Front =	845 lbs.	Right Rear =	640 lbs.
Left Front =	900 lbs.	Left Rear =	610 lbs.
TOTAL FRONT =	1745 lbs.	TOTAL REAR =	1250 lbs.
% of Total Vehicle Weight =	58%	% of Total Weight =	42%

TOTAL DELIVERED WEIGHT = 2995 lbs.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Deliverd Weight	= 2995	lbs.
Rated Cargo/Luggage Weight (RCLW)	= 100	lbs.
Weight of 2 P.572 Dummies @ 164 ea.	= 328	lbs.
TARGET TEST WEIGHT	= 3423	lbs. (sum)

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

Right Front =	910 lbs.	Right Rear =	770 lbs.
Left Front =	950 lbs.	Left Rear =	800 lbs.
TOTAL FRONT =	1860 lbs.	TOTAL REAR =	1570 lbs.
% of Total Weight =	54 %	% of Total Weight =	46 %

TOTAL TEST WEIGHT = 3430 lbs.

Weight of Ballast Secured in Vehicle Trunk Area = 78 lbs.

Vehicle Components Removed for Weight Reduction None

VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED:	RF 27.3"	LF 26.8"	RR 28.0"	LR 27.8"
FULLY LOADED:	RF 26.1"	LF 25.9"	RR 25.6"	LR 25.7"
AS TESTED:	RF 26.9"	LF 26.8"	RR 26.2"	LR 25.9"

Vehicle's Wheel Base: 100.3 in.

Location of Vehicle's C.G.: 45.9 inches from front wheel center

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 15.4 gallons

Usable Capacity Figure Furnished by COTR = 15.4 gallons

Test Volume Range (92 to 94% of Usable Capacity) = 14.2 to 14.5 gallons

ACTUAL TEST VOLUME = 14.3 gallons (with entire fuel system filled)

Table 3

POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°

Test Date: January 23, 1990 Time: 12:35 Temperature: 35 °F

Vehicle NHTSA No.: CL0204

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 = 29.4 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	= 177.1 ";	C/L = 179.4 ";	Left = 176.7 "
Post-Test	Right	= 160.7 ";	C/L = 162.7 ";	Left = 161.5 "
Crush	Right	= 16.4 ";	C/L = 16.7 ";	Left = 15.2 "
AVERAGE		= 16.1 inches		

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

	Right	= 16.4 ";	C/L = 15.5 ";	Left = 16.0 "
AVERAGE		= 16.0 inches		

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

SEAT MOVEMENT:	Seat Back Failure	Seat Shift
Front	None	0.0
Rear	-	-

Table 3

POST IMPACT DATA (cont.)

GLAZING DAMAGE: Windshield sustained cracks but remained intact.

OTHER NOTABLE IMPACT FEATURES: Upper steering wheel rim slightly deformed during impact.

Section 3

OCCUPANT AND VEHICLE DATA

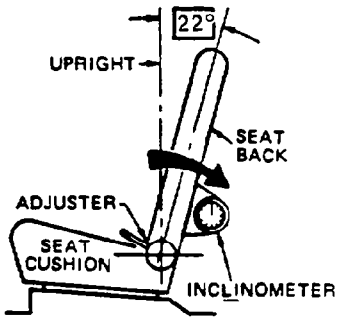
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1990 Vehicle Model: Ford Mustang LX Body Style: 2-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 22°

Measurement instructions: Measure 13" up from seat back hinge point. Place inclinometer along frame on rear of seat. Set seat angle to 22° from vertical.

Seat back angle for passenger's seat 22°

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 midpoint (8th detent of 15 total detents).

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

3. Fuel Tank Capacity Data

A. "Usable Capacity" of the standard equipment fuel tank is 15.4 gallons

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

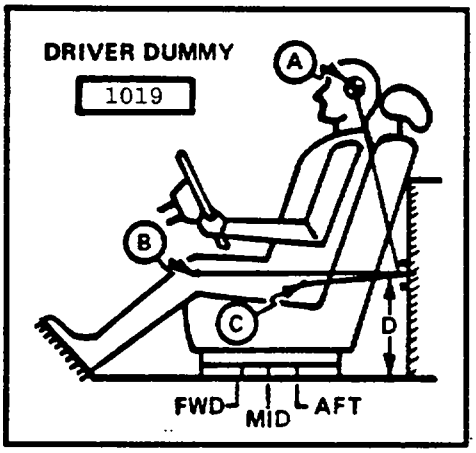
Additional Instructions: None

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION

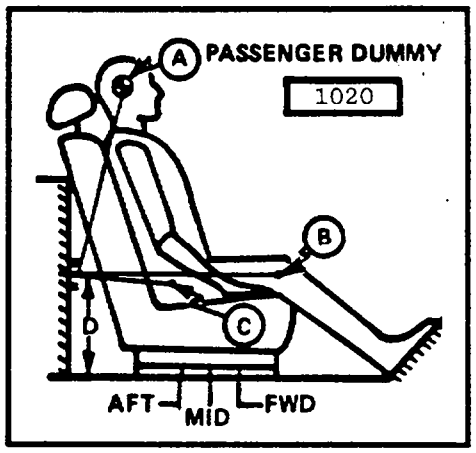
Test No.: CL0204 Vehicle: 1990 Ford Mustang LX 2-Door Sedan

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

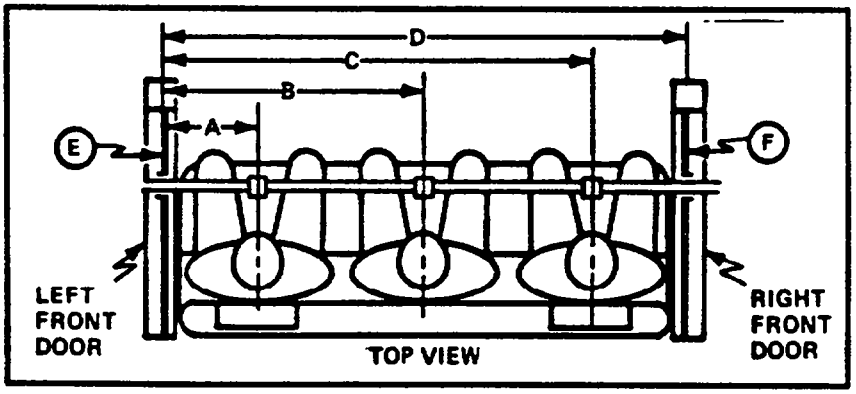


MEASUREMENT LOCATION

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



A =	25.5 in.	33 Degrees	A =	24.8 in.	33 Degrees
B =	35.0 in.	94 Degrees	B =	34.3 in.	93 Degrees
C =	20.6 in.	110 Degrees	C =	20.5 in.	110 Degrees
D =	13.5 in.		D =	13.5 in.	



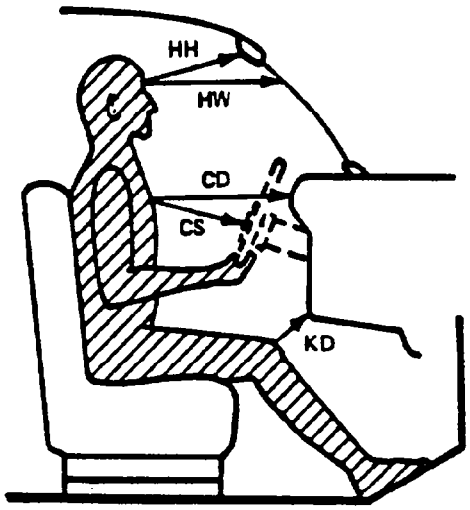
S/N 1019 DUMMY ID 1020

A	=	Left Door to Driver Centerline	10.5 in.
B	=	Left Door to Center Passenger Centerline	– in.
C	=	Left Door to Right Passenger Centerline	38.9 in.
D	=	Left Door to Right Door	49.1 in.
E,F	=	Window Glass Height (Right and Left Must Be Equal)	13.1 in.

Figure 3

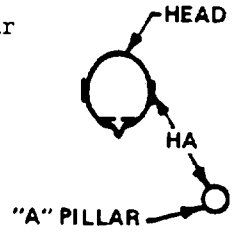
OCCUPANT CLEARANCE DIMENSIONS

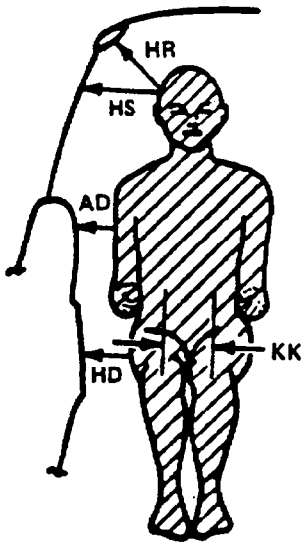
	DRIVER	PASSENGER
HH	13.3	13.8
HW	18.2	18.5
CD	21.1	22.5
CS	12.1	-
KDL	4.1	6.7
KDR	4.2	6.3
SA	See Note	See Note
TA	20°	20°



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



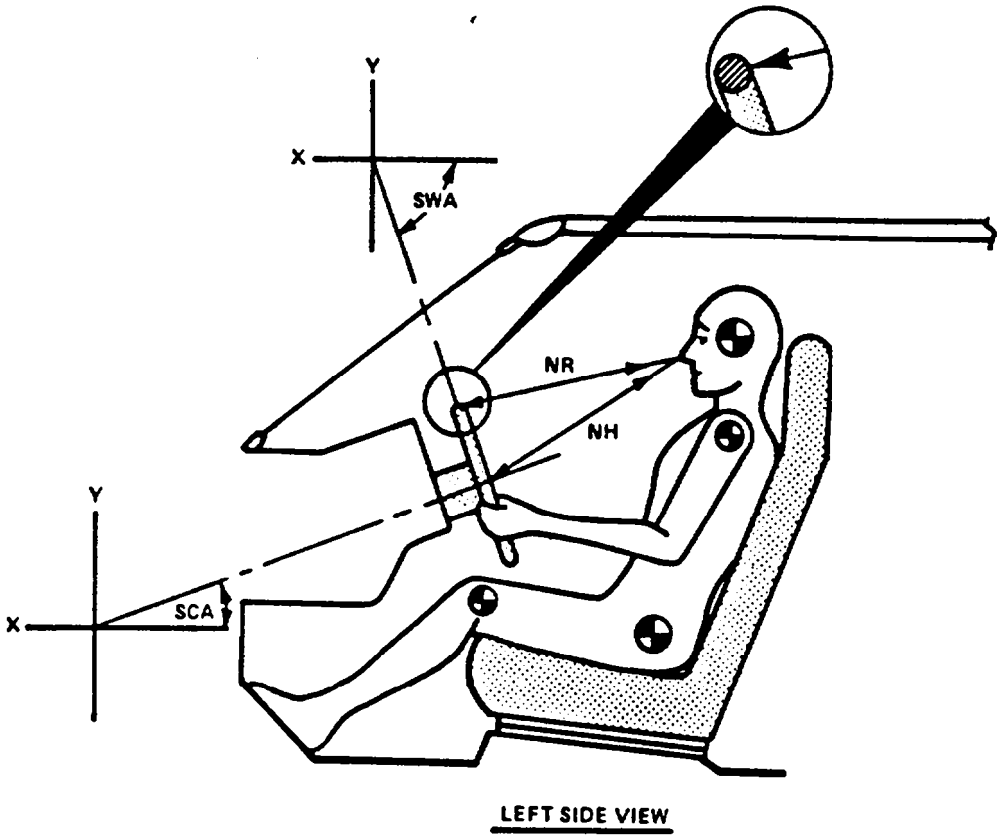


	DRIVER	PASSENGER
HR	5.0	4.9
HS	7.3	7.2
AD	3.7	3.7
HD	5.9	5.6
KK	9.3	7.5
HA	17.3	17.1

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

Figure 4

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS

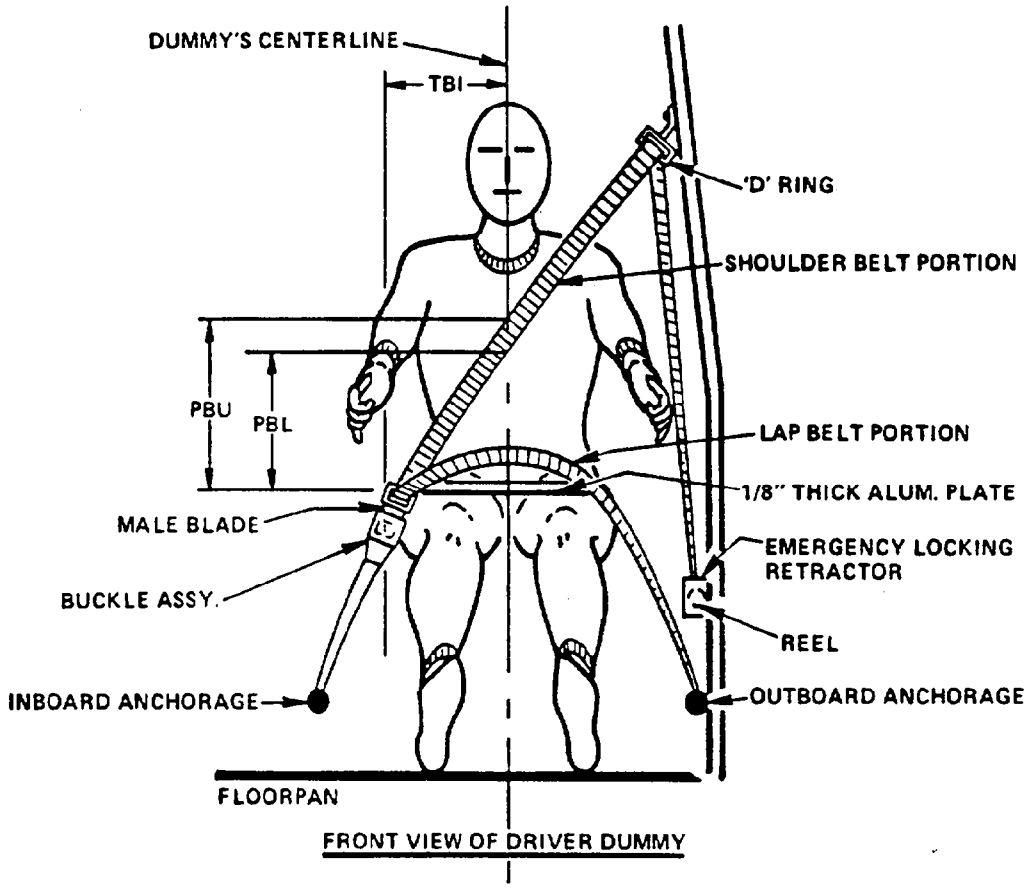


LEFT SIDE VIEW

	MEASUREMENTS	
NR -- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	16.4	Inches
NH -- Distance from tip of dummy's nose to center of steering column hub	16.9	Inches
SCA -- Angle of steering column relative to the horizontal X axis	22	Degrees
SWA -- Angle of steering wheel relative to the horizontal X axis	-68	Degrees

Figure 5

SEAT BELT POSITIONING DATA

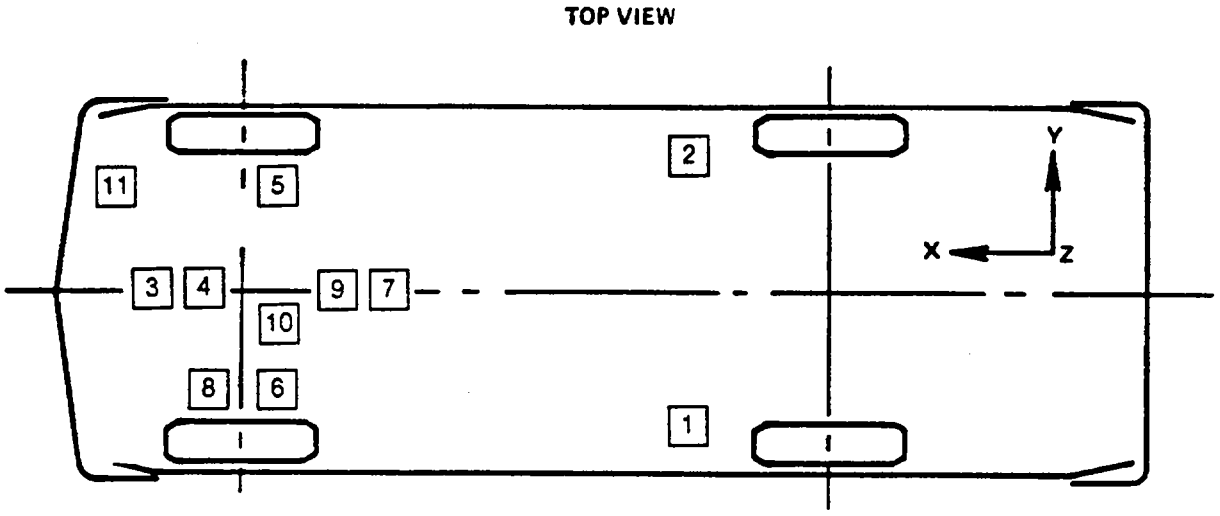


	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
PBU -- Top surface of alum. plate to upper edge	*	14.2
PBL -- Top surface of alum. plate to belt lower edge	*	11.0
TBI -- Distance from torso centerline to buckle	*	8.8

*Driver side equipped with airbag.

Figure 6

VEHICLE ACCELEROMETER LOCATIONS



ACCELEROMETER NUMBER*	ACCELEROMETER LOCATION	DIRECTION		
		X	Y	Z
1	Left Rear Seat Crossmember	X		
2	Right Rear Seat Crossmember	X		
3	Top of Engine	X		
4	Bottom of Engine	X		
5	Right Disc Brake Caliper	X		
6	Left Disc Brake Caliper	X		
7	Instrument Panel	X		
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** MAX (g)	POSITIVE DIRECTION** TIME (msec)	NEGATIVE DIRECTION** MAX (g)	NEGATIVE DIRECTION** TIME (msec)
1	REAR SEAT X-MEMBER AT LEFT SIDE	PRE:	65.7	19.9	15.3				
		POST:	65.3	20.0	15.3				
	LONGITUDINAL ACCELERATION					1	175	-27	86
2	REAR SEAT X-MEMBER AT RIGHT SIDE	PRE:	66.0	-20.4	15.6				
		POST:	65.8	-20.2	15.5				
	LONGITUDINAL ACCELERATION					2	195	-25	87
3	TOP OF ENGINE BLOCK	PRE:	146.1	-0.9	33.1				
		POST:	141.7	0.1	33.3				
	LONGITUDINAL ACCELERATION					25	92	-50	63
4	BOTTOM OF ENGINE	PRE:	134.6	3.1	10.7				
		POST:	133.5	2.7	10.5				
	LONGITUDINAL ACCELERATION					39	84	-40	60
5	BRAKE CALIPER AT RIGHT SIDE	PRE:	143.9	-21.5	22.6				
		POST:	142.0	-20.1	22.3				
	LONGITUDINAL ACCELERATION					9	124	-54	40
6	BRAKE CALIPER AT LEFT SIDE	PRE:	142.2	21.7	23.6				
		POST:	140.5	21.4	23.2				
	LONGITUDINAL ACCELERATION					34	61	-52	69
7	DASH PANEL	PRE:	113.3	-0.5	35.8				
		POST:	113.0	-0.4	35.5				
	LONGITUDINAL ACCELERATION					11	70	-42	76

		**	POSITIVE	NEGATIVE
*X	+ Forward from rear bumper	LONGITUDINAL:	FORWARD	REARWARD
Y	+ Left from vehicle centerline	LATERAL:	LEFTWARD	RIGHTWARD
Z	+ Up from ground	VERTICAL:	UPWARD	DOWNWARD

DISTANCE MEASUREMENTS IN INCHES

Table 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY (cont.)

NO.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION** MAX (g)	POSITIVE DIRECTION** TIME (msec)	NEGATIVE DIRECTION** MAX (g)	NEGATIVE DIRECTION** TIME (msec)
8	FRONT SHOCK TOWER	PRE:	141.4	15.9	30.2				
		POST:	138.3	13.7	30.3				
	LONGITUDINAL ACCELERATION					50	55	-48	39
9	FIREWALL	PRE:	128.6	-12.3	35.9				
		POST:	126.0	-12.1	33.1				
	LONGITUDINAL ACCELERATION					6	46	-103	91
10	CRADLE FRAME	PRE:	130.1	11.2	10.6				
		POST:	129.2	11.3	10.1				
	LONGITUDINAL ACCELERATION					57	52	-34	59
11	RADIATOR-SUPPORT	PRE:	163.4	-17.3	28.2				
		POST:	150.3	-17.2	27.3				
	LONGITUDINAL ACCELERATION					153	48	-106	37

		**	POSITIVE	NEGATIVE
*X	+ Forward from rear bumper	LONGITUDINAL:	FORWARD	REARWARD
Y	+ Left from vehicle centerline	LATERAL:	LEFTWARD	RIGHTWARD
Z	+ Up from ground	VERTICAL:	UPWARD	DOWNWARD

DISTANCE MEASUREMENTS IN INCHES

Figure 7

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5.

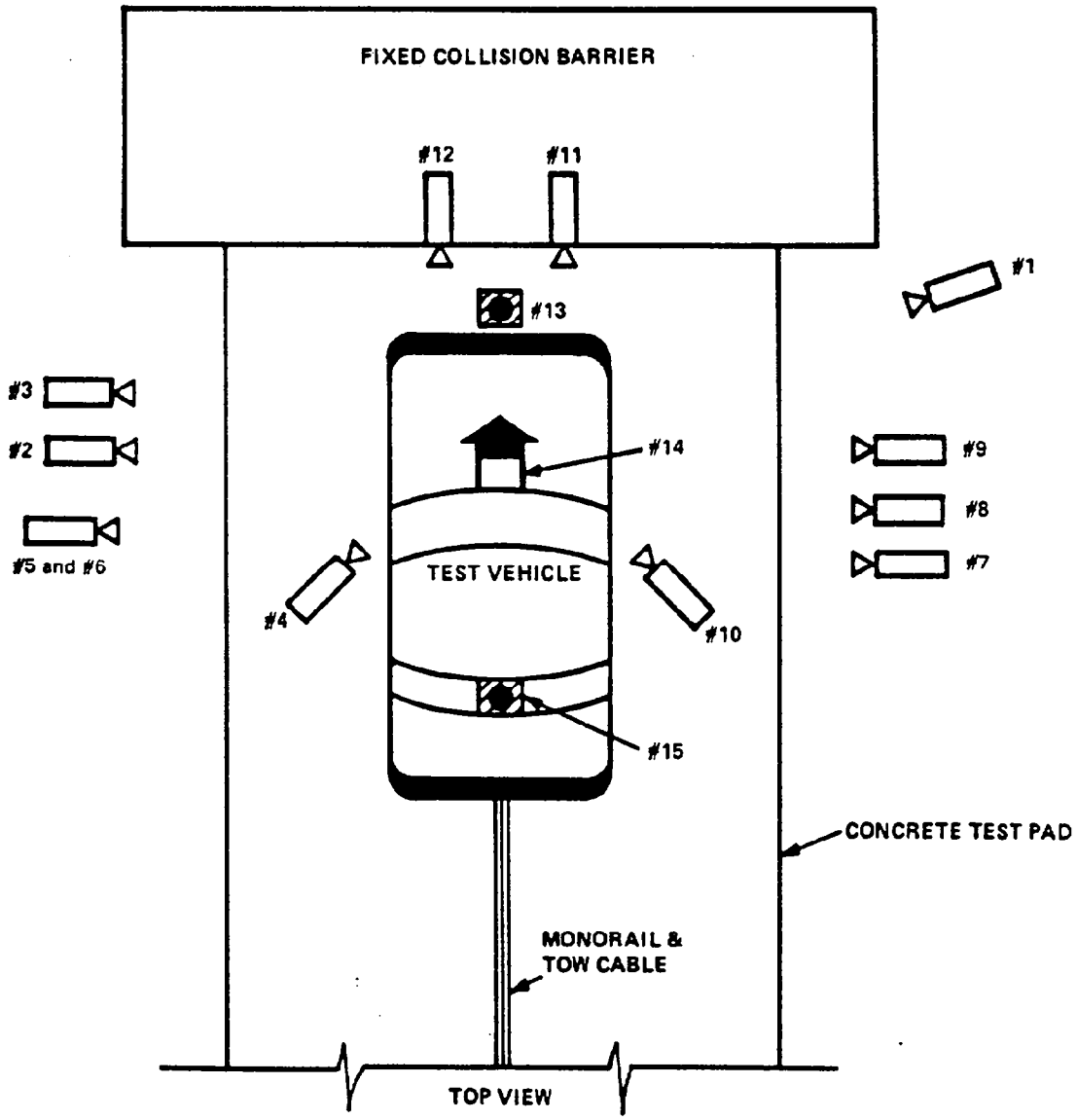


Table 5

HIGH-SPEED CAMERA LOCATIONS

Test No. CL0204 Vehicle: 1990 Ford Mustang LX 2-Door Sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (in)* X	Y	Z	ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
1	Real-Time Camera	–	–	–	–	–	–	24
2	Overall Left Side	226.0	65.0	41.0	-2	210.1	13	540
3	Left Side View	335.0	26.0	41.0	-2	319.1	25	540
4	Driver and Interior View	115.0	126.0	72.0	-17	–	13	785
5	Steering Column (Bottom)	294.0	79.0	46.0	-4	278.1	25	570
6	Steering Column (Top)	293.0	79.0	70.0	-10	277.1	25	560
7	Overall Right Side	232.0	83.0	42.0	-4	216.1	13	800
8	Right Side View	322.0	60.0	42.0	-2	306.1	25	***
9	Right Passenger View	320.0	83.0	54.0	-2	304.1	35	670
10	Passenger and Interior View	104.0	124.0	75.0	-19	–	13	610
11	Passenger Front View	23.0	17.0	76.0	-43	–	13	595
12	Driver Front View	23.0	16.0	76.0	-43	–	13	540
13	Windshield View	0.0	0.0	130.0	-55	–	25	500
14	Pit View of Engine	0.0	36.0	-120.0	90	–	13	800
15	Pit View of Fuel Tank	0.0	124.0	-120.0	90	–	13	700

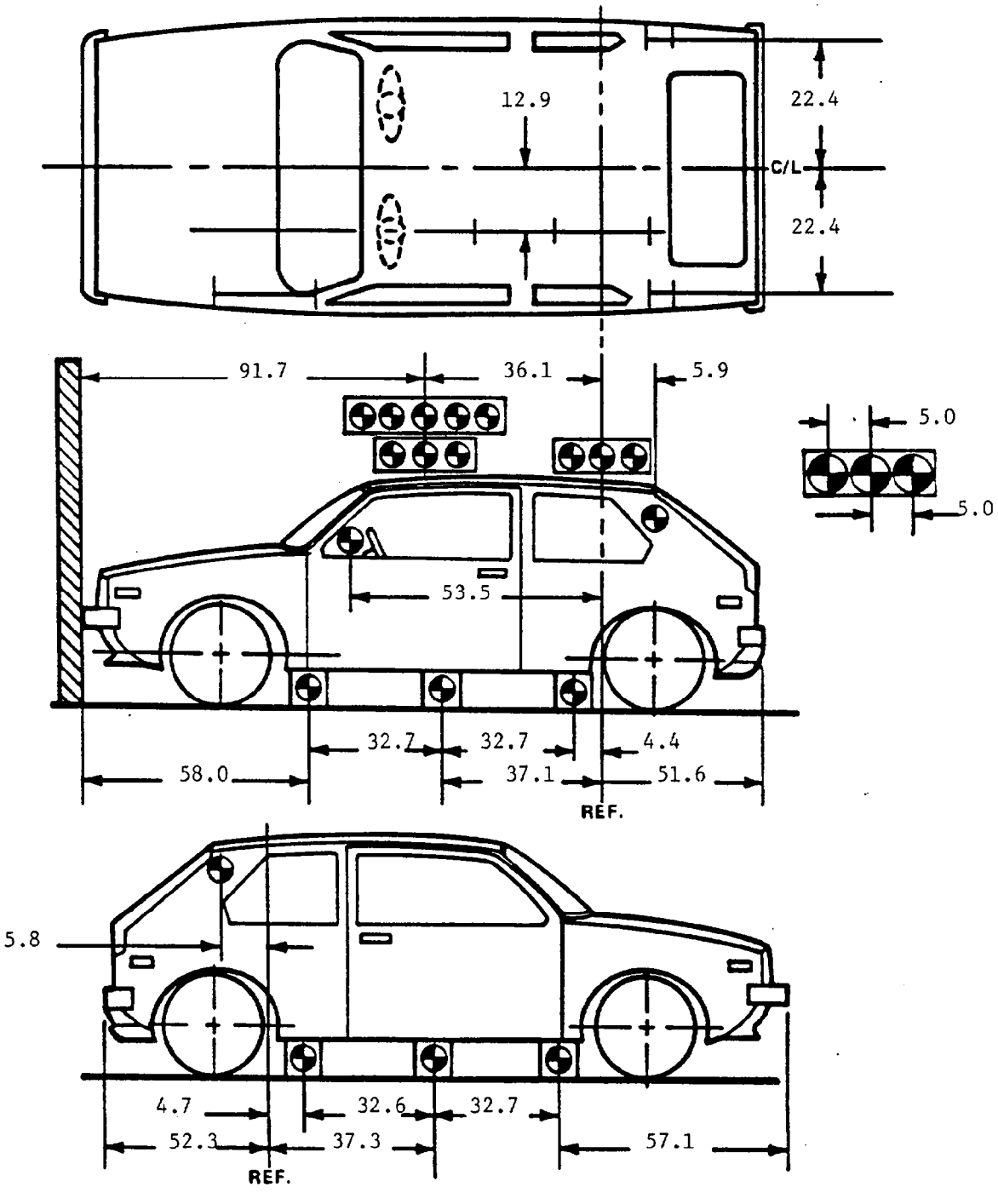
*X = film plane to monorail centerline
Y = film plane to impact location
Z = film plan to ground
** = referenced to horizontal plane
*** = timing marks not available

Table 5

HIGH-SPEED CAMERA LOCATIONS

Figure 8

VEHICLE TARGET LOCATIONS



(DIMENSIONS IN INCHES)

Figure 9

TEST VEHICLE MEASUREMENTS

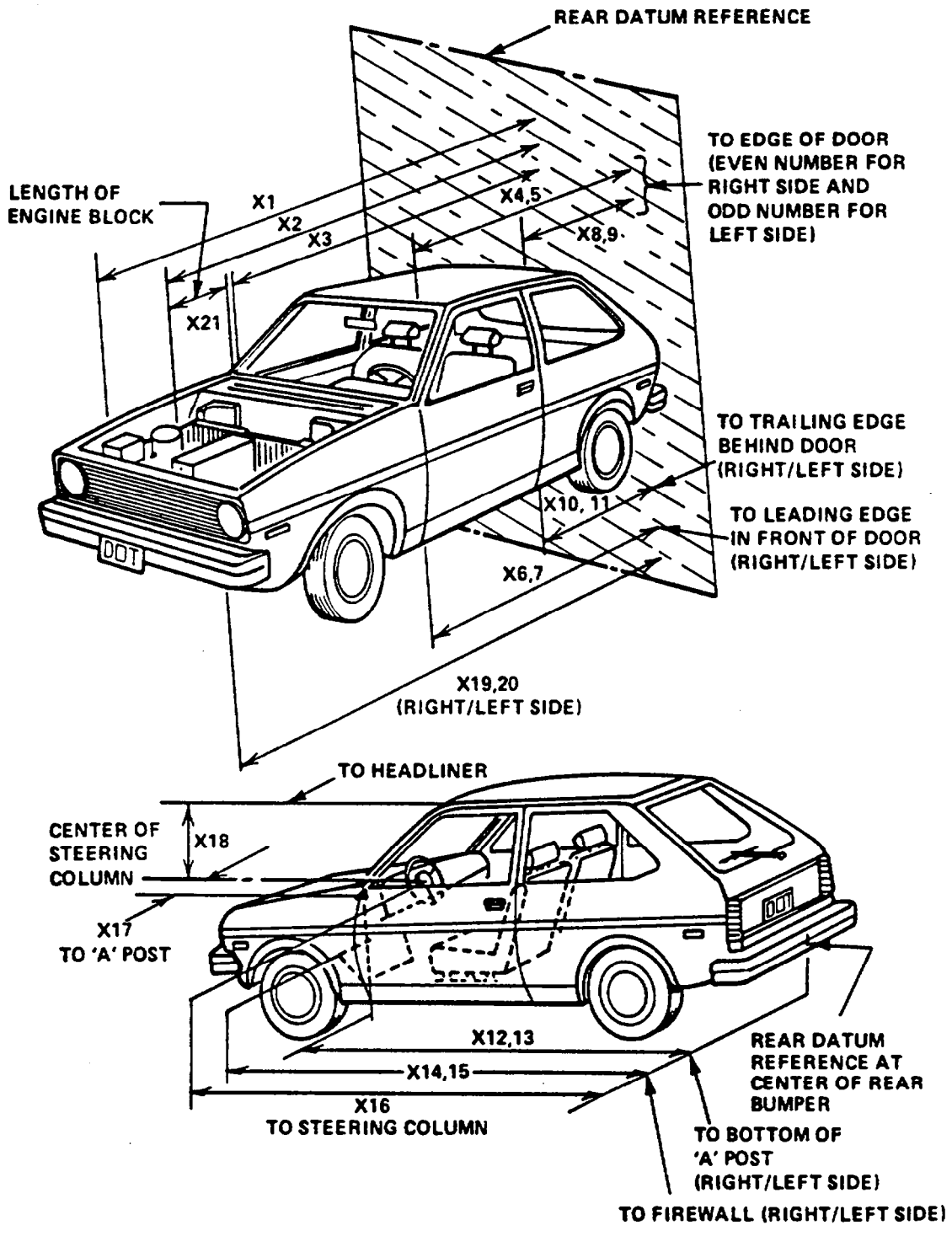


Table 6

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	179.4	162.7	16.7
X2	Rear Surface of Vehicle to Front of Engine	150.0	146.7	3.3
X3	Rear Surface of Vehicle to Firewall	127.5	126.1	1.4
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	112.5	112.5	0.0
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	112.3	112.3	0.0
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	115.3	114.2	1.1
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	114.5	113.8	0.7
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	65.6	65.4	0.2
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	65.2	64.9	0.3
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	64.9	63.8	1.1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	64.0	63.2	0.8
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	116.0	115.0	1.0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	115.2	114.5	0.7
X14	Rear Surface of Vehicle to Firewall, Right Side	127.5	126.5	1.0
X15	Rear Surface of Vehicle to Firewall, Left Side	127.1	126.4	0.7
X16	Rear Surface of Vehicle to Steering Column	98.3	100.2	-1.9
X17	Center of Steering Column to "A" Post	16.4	14.8	1.6
X18	Center of Steering Column to Headliner	16.0	17.0	-1.0
X19	Rear Surface of Vehicle to Right Side of Front Bumper	177.1	160.7	16.4
X20	Rear Surface of Vehicle to Left Side of Front Bumper	176.7	161.5	15.2
X21	Length of Engine Block	20.0	20.0	0.0

Table 6

VEHICLE MEASUREMENTS

Section 4

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

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

Table 7

DUMMY INJURY CRITERIA VALUES

NHTSA No.: CL0204 Vehicle: 1990 Ford Mustang LX 2-Door Sedan

	MAXIMUM ACCELERATION (g's)							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
Dummy (1)	-76	84	69	116	-41	-9	21	40.8
Dummy (2)	-25	27	52	54	-25	-12	-9	25.2

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	1737	1328
Dummy (2)	250	175

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc. (g)
		t_1 (SEC)	t_2 (SEC)	t_1 TO t_2
Dummy (1)	433	0.10117	0.10852	80.9
Dummy (2)	262	0.08857	0.12457	35.1

*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 = 5.9 sec.

Log time duration of reminder light operation = 5.9 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 = 5.9 sec.

Note wording of visual warning:

Fasten Seat Belt	–
Fasten Belt	–
Symbol 101-80	X

Table 9

FMVSS NO. 208 - LABELING AND DRIVER'S MANUAL INFORMATION

Locate label which describes manufacturers maintenance or replacement schedule for crash-deployed occupant protection system.

Describe location: Glove compartment door.

The manufacturers recommends no maintenance is needed unless:

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

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

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

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

Was an owner's manual provided? YES ___X___ NO _____

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

Table 10

FMVSS NO. 208 - READINESS INDICATOR

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

Is the system totally mechanical? YES_____ NO__X__

Describe the location of the readiness indicator:

Lower middle of instrument cluster.

Is the readiness indicator clearly visible to the driver?

YES__X__ NO_____

Is a list of the elements in the occupant restraint system, being monitored by the readiness indicator, provided?

YES__X__ NO_____

Table 11

FMVSS NO. 208 - COMFORT AND CONVENIENCE TEST SUMMARY

Test Vehicle NHTSA No.:	CL0204
Make/Model:	1990 Ford Mustang
Date of Comfort/Convenience Check:	January 17, 1990
Technician Performing Check:	VMP
GVWR:	3780 lbs.

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

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

1. Automatic seat belts YES _____ NO X

If yes, go to requirements D1, D2 and D3

2. Manual seat belts* YES X** NO _____

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

YES _____ NO X

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

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

STOP

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

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

Table 11 (cont.)

D1

CONVENIENCE HOOKS

A convenience hook or other device is provided to stow seat belt webbing to facilitate entering or exiting the vehicle.

YES _____ NO ___X___

D2

WEBBING TENSION - RELIEVING DEVICE

The seat belt assembly installed in the outboard designated seating position has either manual or automatic tension relieving devices permitting the introduction of slack in the webbing of the shoulder belt ("comfort clips" or "window shade" devices).

YES _____ NO ___X___

D3

BELT CONTACT FORCE

1. Do not measure the belt contact force if the manual or automatic seat belt assemblies in this vehicle incorporate a webbing tension relieving device. Does the vehicle incorporate a tension relieving device?

YES _____ NO ___X___

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

YES ___X___ NO _____

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

YES ___X___ NO _____

4. Close the vehicle's adjacent door, pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest, then fasten the latch. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point, pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest. Measure the contact force exerted by the belt webbing on the dummy's chest. The contact for is 0.5 pounds. Contact the COTR if the contact force exceeds 0.7 pounds.

Figure 10

FMVSS NO. 212 – "WINDSHIELD MOUNTING" DATA SHEET

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

Windshield is bonded in place with 0.8" metal trim along upper and side of windshield. Lower side portion of windshield is covered by metal trim 1.2" in width. Lower center portion of windshield is covered by 1.4" wide plastic trim.

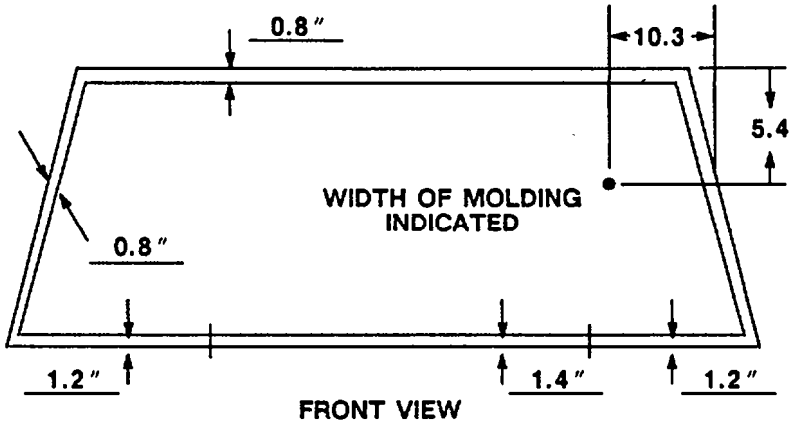
FMVSS 212 REQUIREMENTS:

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

FMVSS 212 TEST DATA:

	WINDSHIELD PERIPHERY		
	PRE-TEST (in.)	POST-TEST (in.)	PERCENT RETENTION
RIGHT SIDE	76.3	76.3	100%
LEFT SIDE	76.3	76.3	100%
TOTAL	152.6	152.6	100%

AREA OF RETENTION FAILURE:



FAILURE DETAILS: None.

NOTE: Windshield sustained a cracked windshield due to head contact. The dimension of the center of the crack is shown above (the drawing is not to scale).

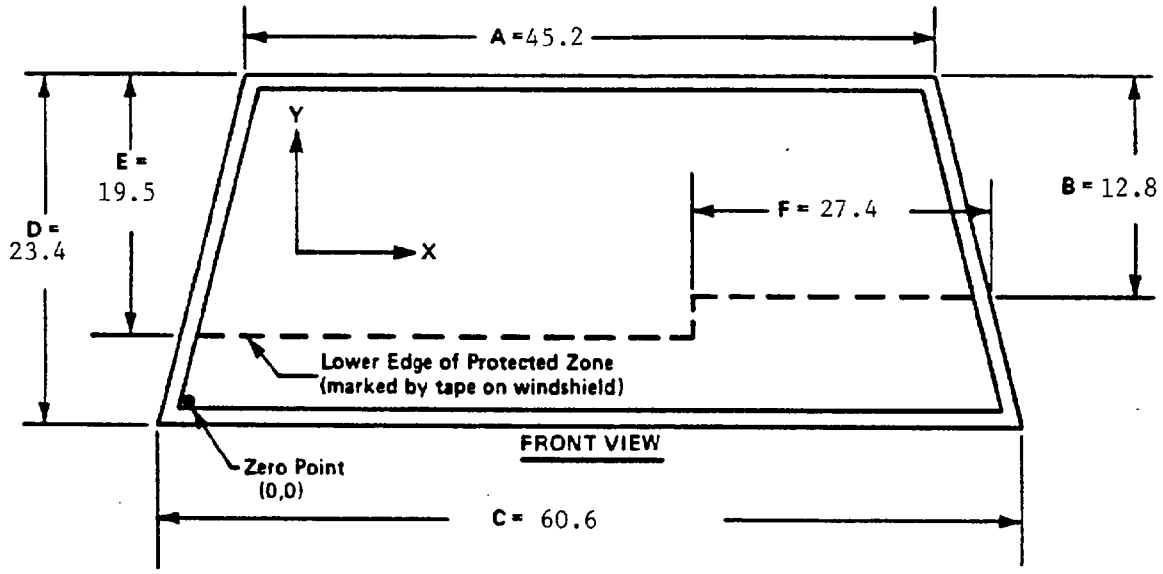
Figure 11

FMVSS NO. 219 (PARTIAL) – "WINDSHIELD ZONE INTRUSION" DATA SHEET

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5" dia. rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. The locus of points is drawn on the inner surface of the windshield contacted by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 1/2" distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection of this line onto the outer surface of the windshield.

FMVSS 219 TEST DATA:



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

(Show location of penetration on above sketch)

None

	COORDINATES	
	X	Y
1.		
2.		
3.		
4.		

Table 12

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

TEST VEHICLE NHTSA NO.: CL0204 TEST DATE: January 23, 1990

Vehicle Mfgr./Make/Model: 1990 Ford Mustang LX 2-Door Sedan

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

TEST VEHICLE IMPACT TYPE:

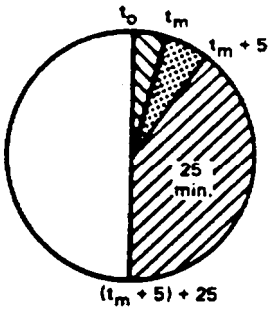
X Frontal (30 mph)

_ Oblique (30 mph) with ____° barrier face first contacting _____ (driver/passenger) side

_ Rear Moving Barrier (30 mph)

_ Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT:



	ACTUAL	MAX ALLOWED
1. From impact until vehicle motion ceases	0	1 oz.
2. For 5 minute period after vehicle motion ceases	0	5 oz.
3. For next 25 minutes	0	1 oz./1 min.

SOLVENT SPILLAGE DETAILS:

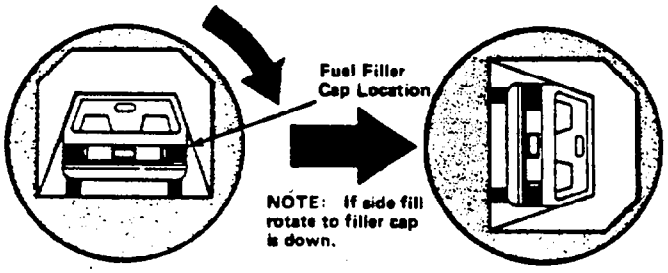
None

Table 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 0° 90°

Vehicle NHTSA ID No.: CL0204



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	03 minutes 00 seconds
FMVSS 301 Position Hold Time +	05 minutes 00 seconds
TOTAL	08 minutes 00 seconds
Next whole minute interval	08 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

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

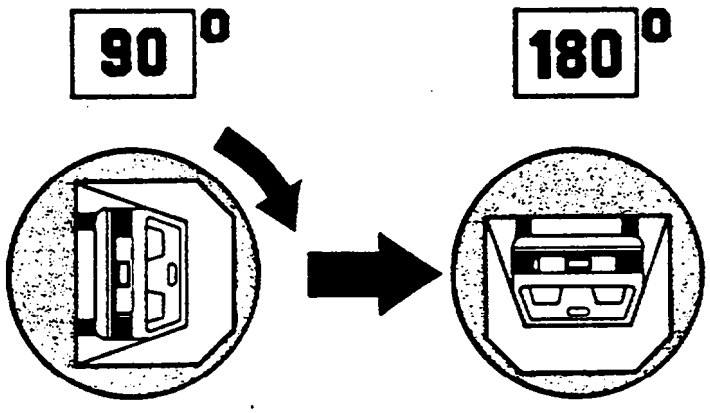
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 13

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

TEST PHASE:



Vehicle NHTSA ID No.: CLO204

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	02 minutes 55 seconds
FMVSS 301 Position Hold Time +	05 minutes 00 seconds
TOTAL	07 minutes 55 seconds
Next whole minute interval	08 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

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

IV. SOLVENT SPILLAGE LOCATION(S):

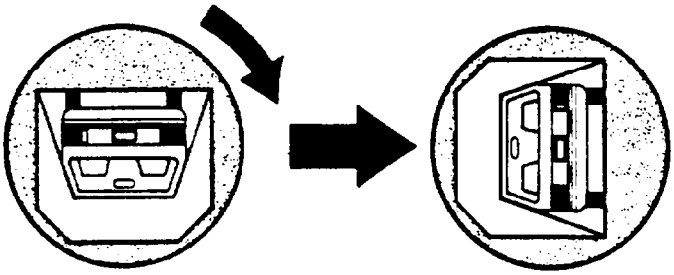
None

Table 13

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

TEST PHASE: 180° 270°

Vehicle NHTSA ID No.: CL0204



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	03 minutes 00 seconds
FMVSS 301 Position Hold Time +	05 minutes 00 seconds
TOTAL	08 minutes 00 seconds
Next whole minute interval	08 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

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

IV. SOLVENT SPILLAGE LOCATION(S):

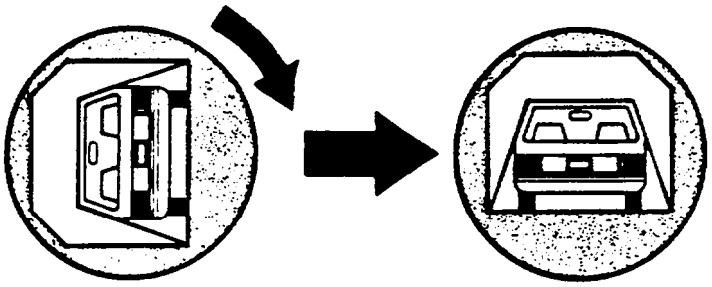
None

Table 13

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

TEST PHASE: 270° 360°

Vehicle NHTSA ID No.: CL0204



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	03 minutes 00 seconds
FMVSS 301 Position Hold Time +	05 minutes 00 seconds
TOTAL	08 minutes 00 seconds
Next whole minute interval	08 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

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

IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 14

TEST VEHICLE NONCOMPLIANCE NOTICE

NHTSA Contract Lab: Calspan Advanced Technology Center

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

Date of Test: January 23, 1990 Vehicle NHTSA No.: CL0204

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

Model Year: 1990 VIN: 1FAP40A6LF113922

Body Style: 2-Door Sedan Build Date: October 1989

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

Impact Velocity: 29.5 mph Time of Test: 12:35

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

Failure Details:

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

Appendix A

PHOTOGRAPHS

LIST OF PHOTOGRPAHS

Figure A-1 PRE-TEST FRONT VIEW

Figure A-2 POST TEST FRONT VIEW

Figure A-3 PRE-TEST LEFT SIDE VIEW

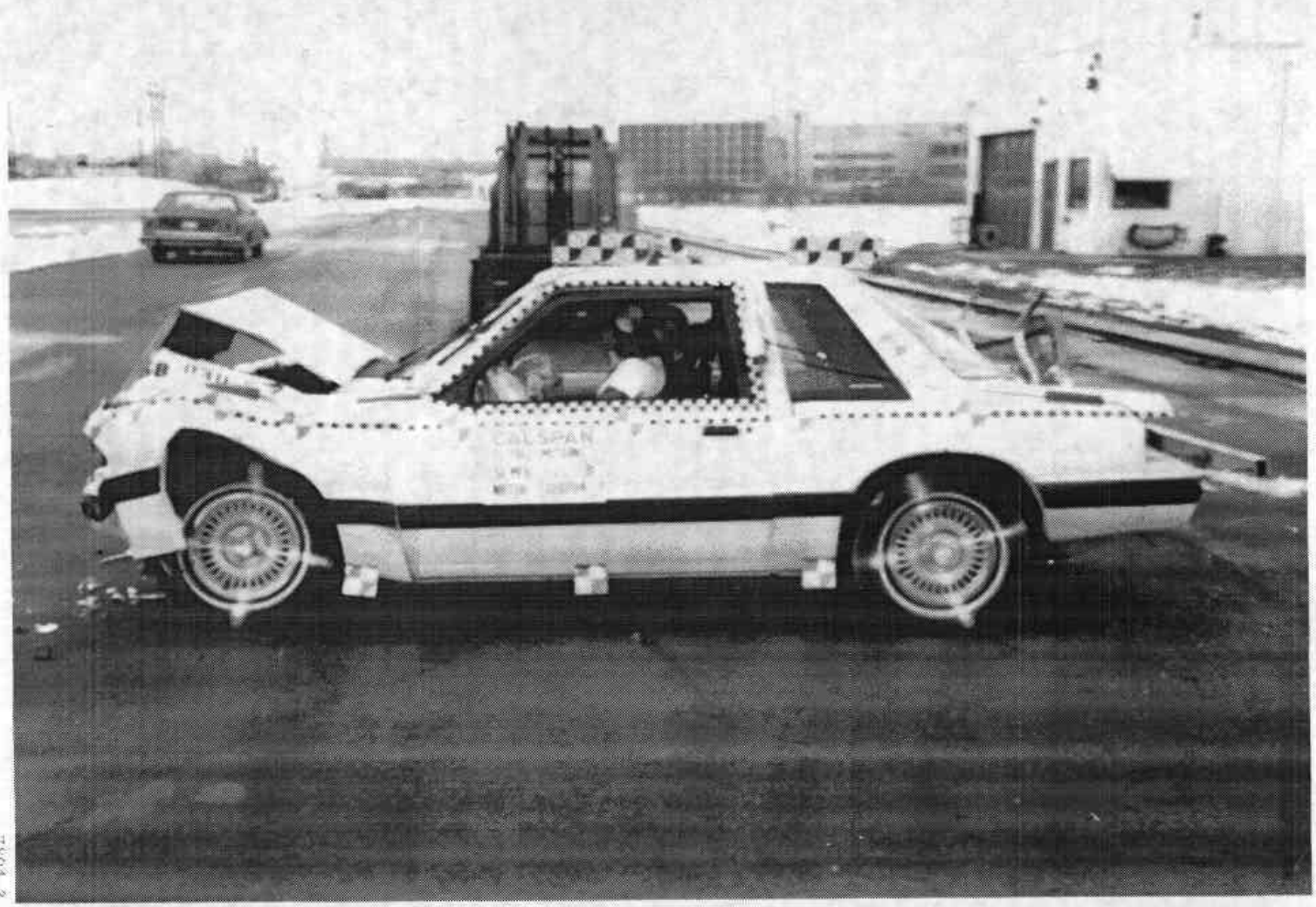


Figure A-4 POST TEST LEFT SIDE VIEW

A-7

78064-3

Figure A-5 PRE-TEST RIGHT SIDE VIEW

Figure A-6 POST-TEST RIGHT SIDE VIEW

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

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

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

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

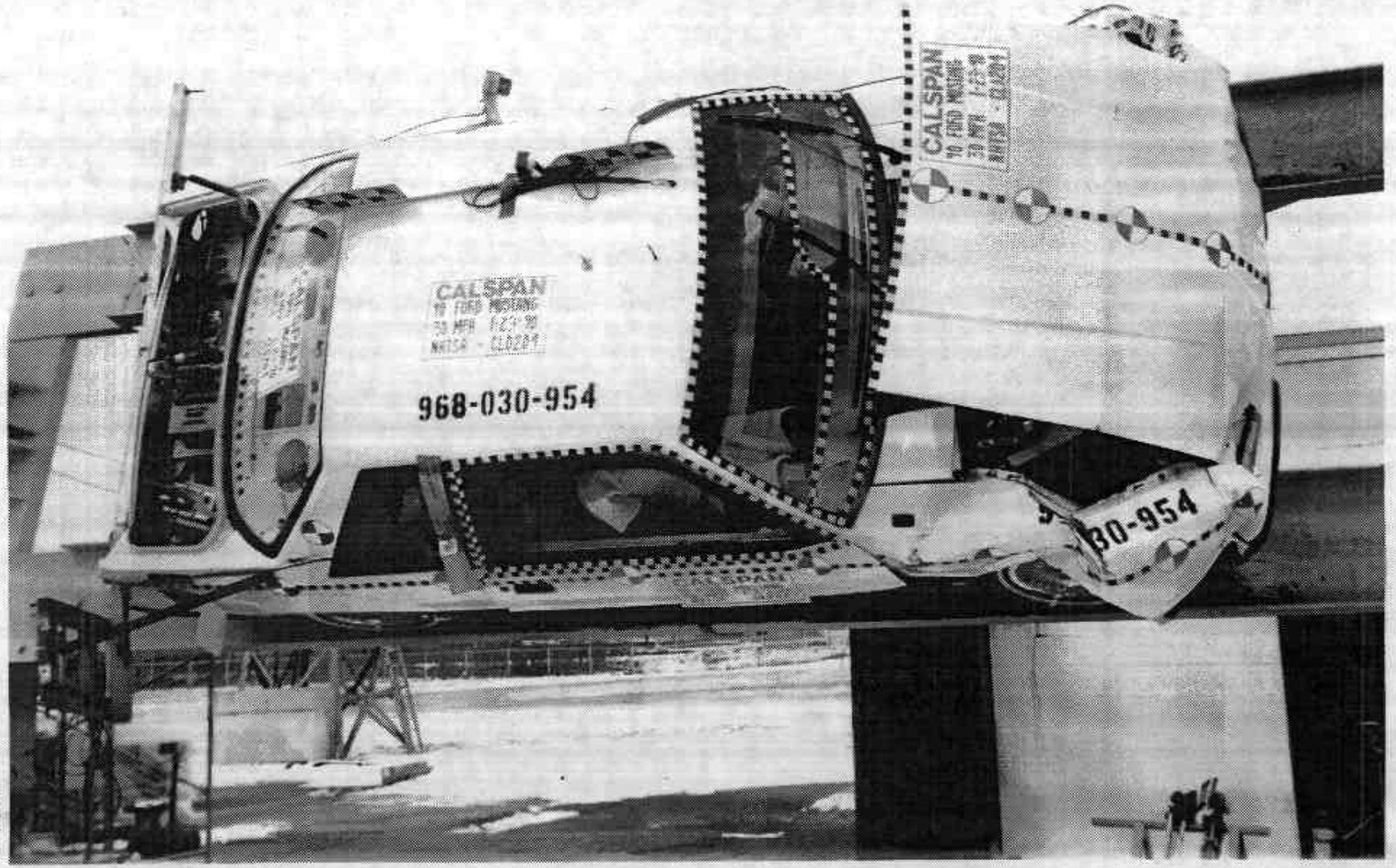


Figure A-11 POST TEST TOP VIEW

Figure A-12 PRE-TEST WINDSHIELD VIEW

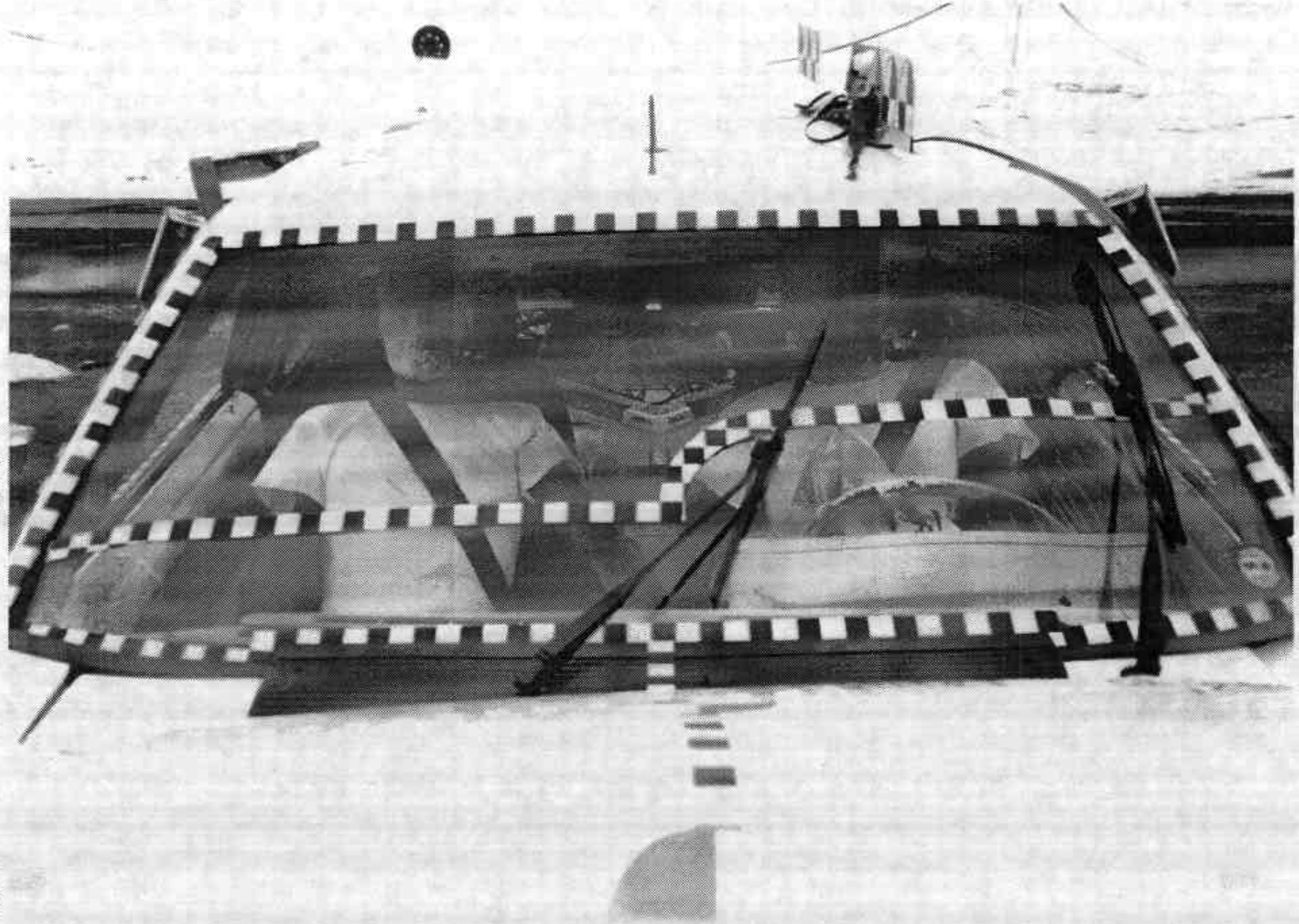


Figure A-13 POST-TEST WINDSHIELD VIEW

Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

Figure A-15 POST-TEST ENGINE COMPARTMENT VIEW

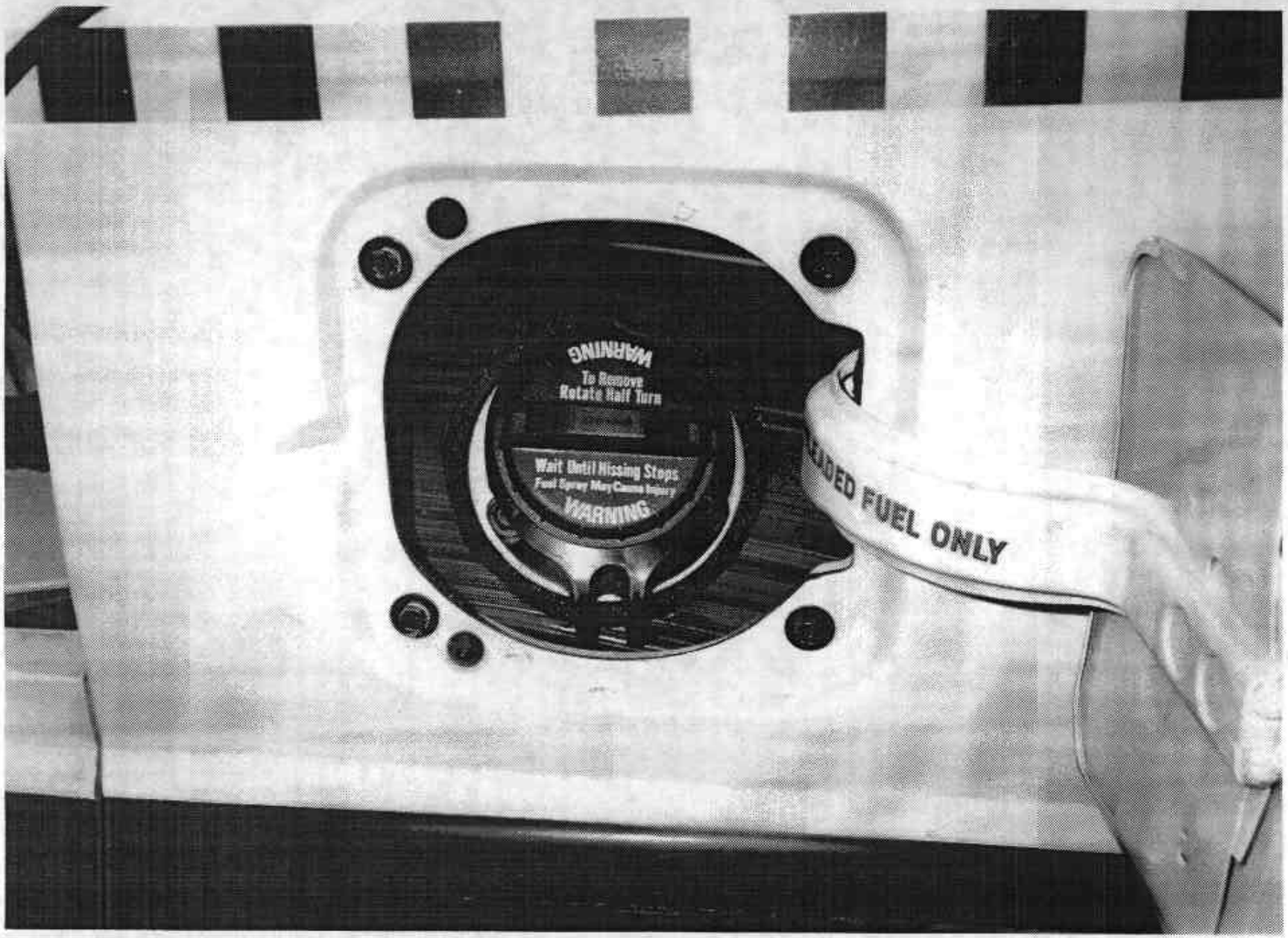


Figure A-16 PRE-TEST FUEL FILLER CAP VIEW

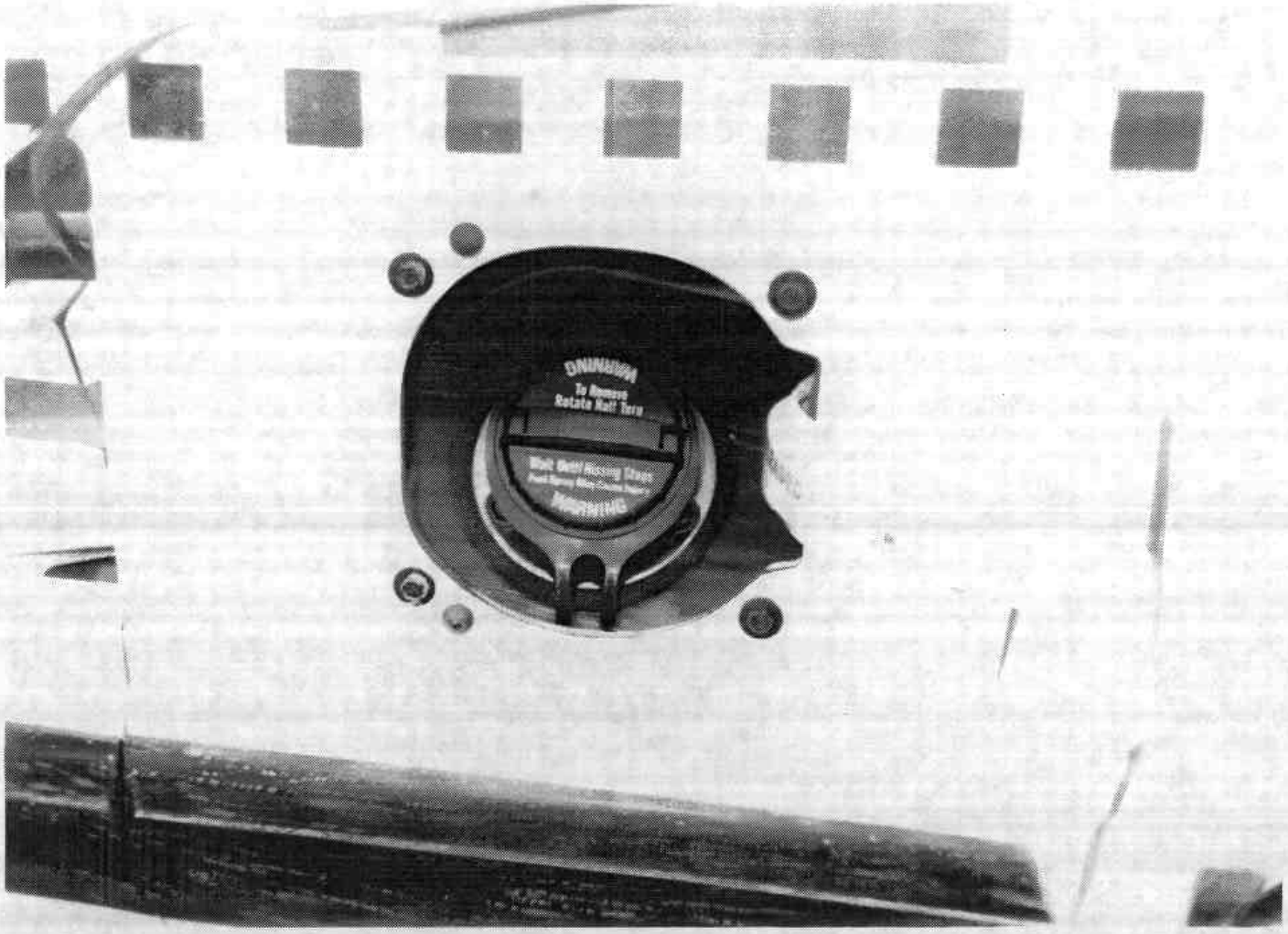


Figure A-17 POST-TEST FUEL FILLER CAP VIEW

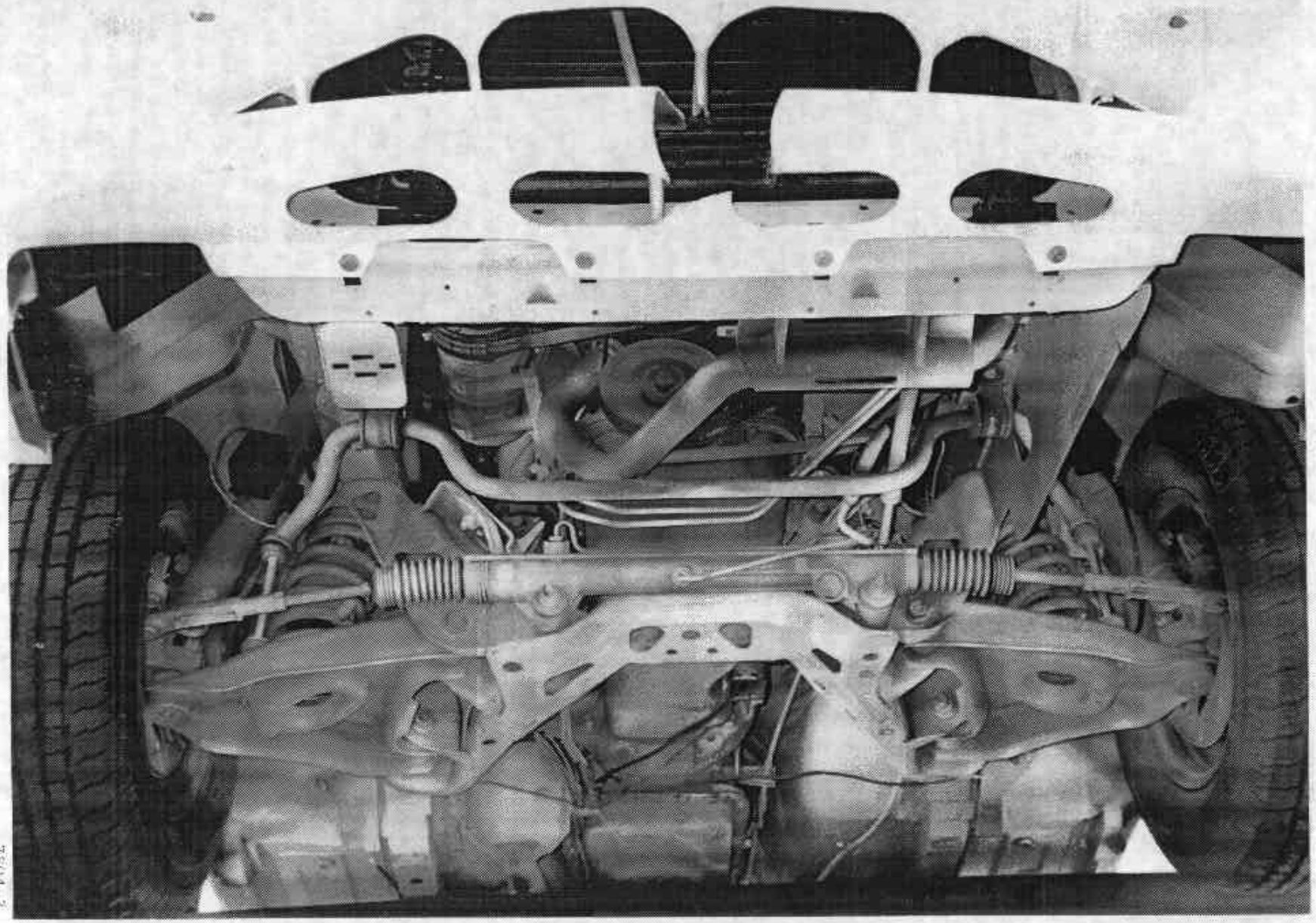


Figure A-18 PRE-TEST FRONT UNDERBODY VIEW

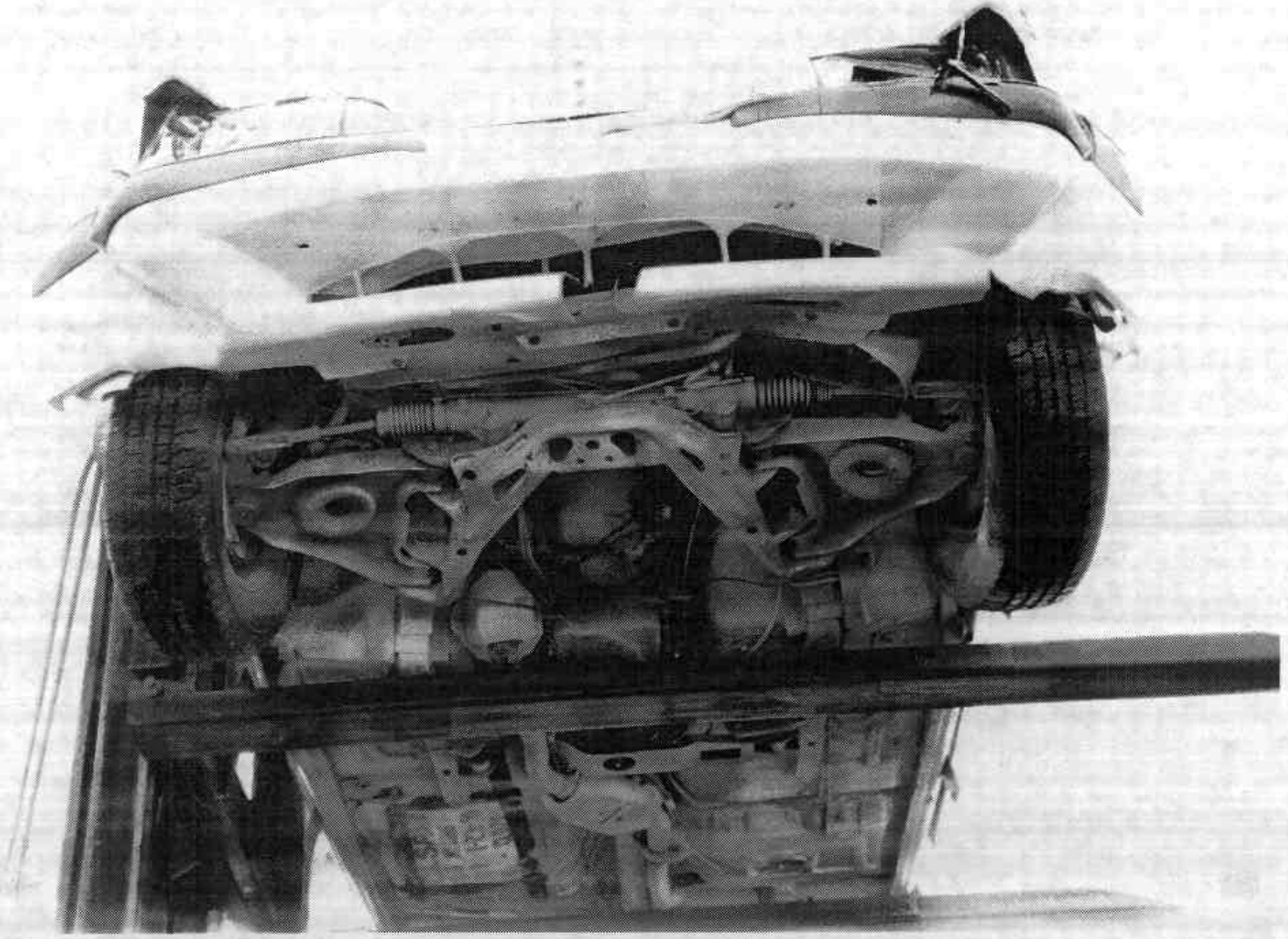


Figure A-10 POST-TEST FRONT UNDERBODY VIEW

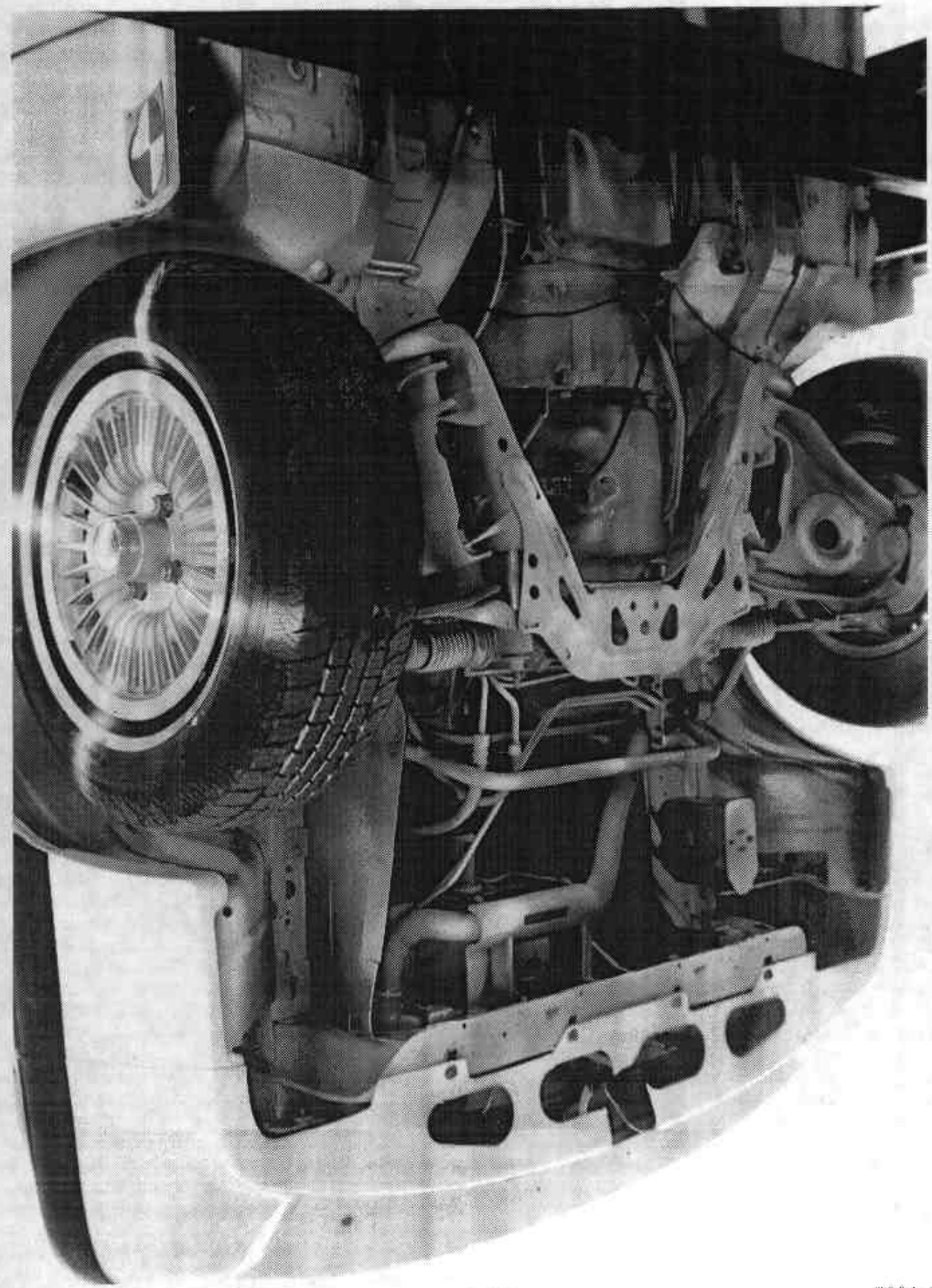


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

7804-3

Figure A-21 POST-TEST FRONT SIDE UNDERBODY VIEW

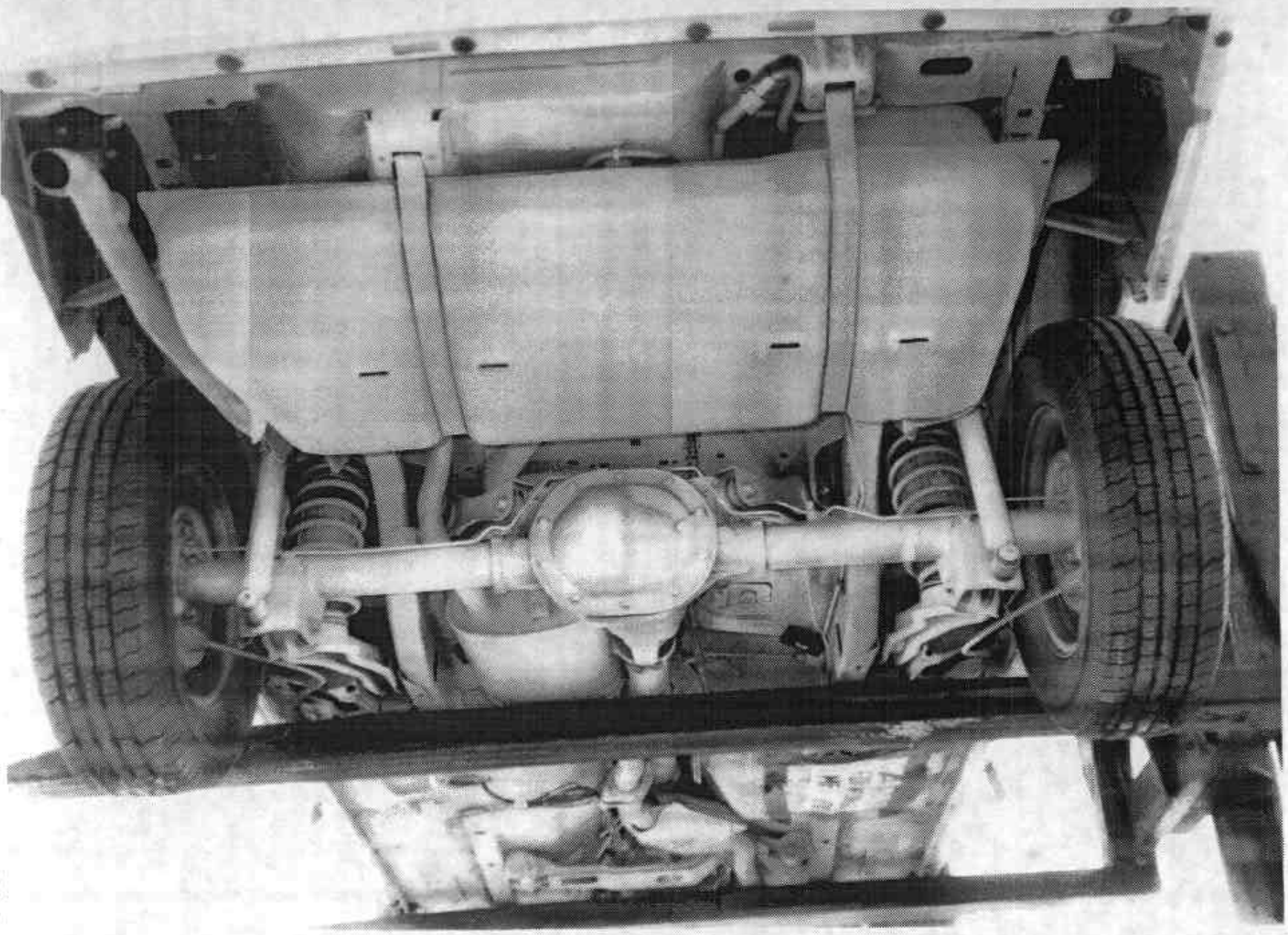


Figure A-22 PRE-TEST REAR UNDERBODY VIEW

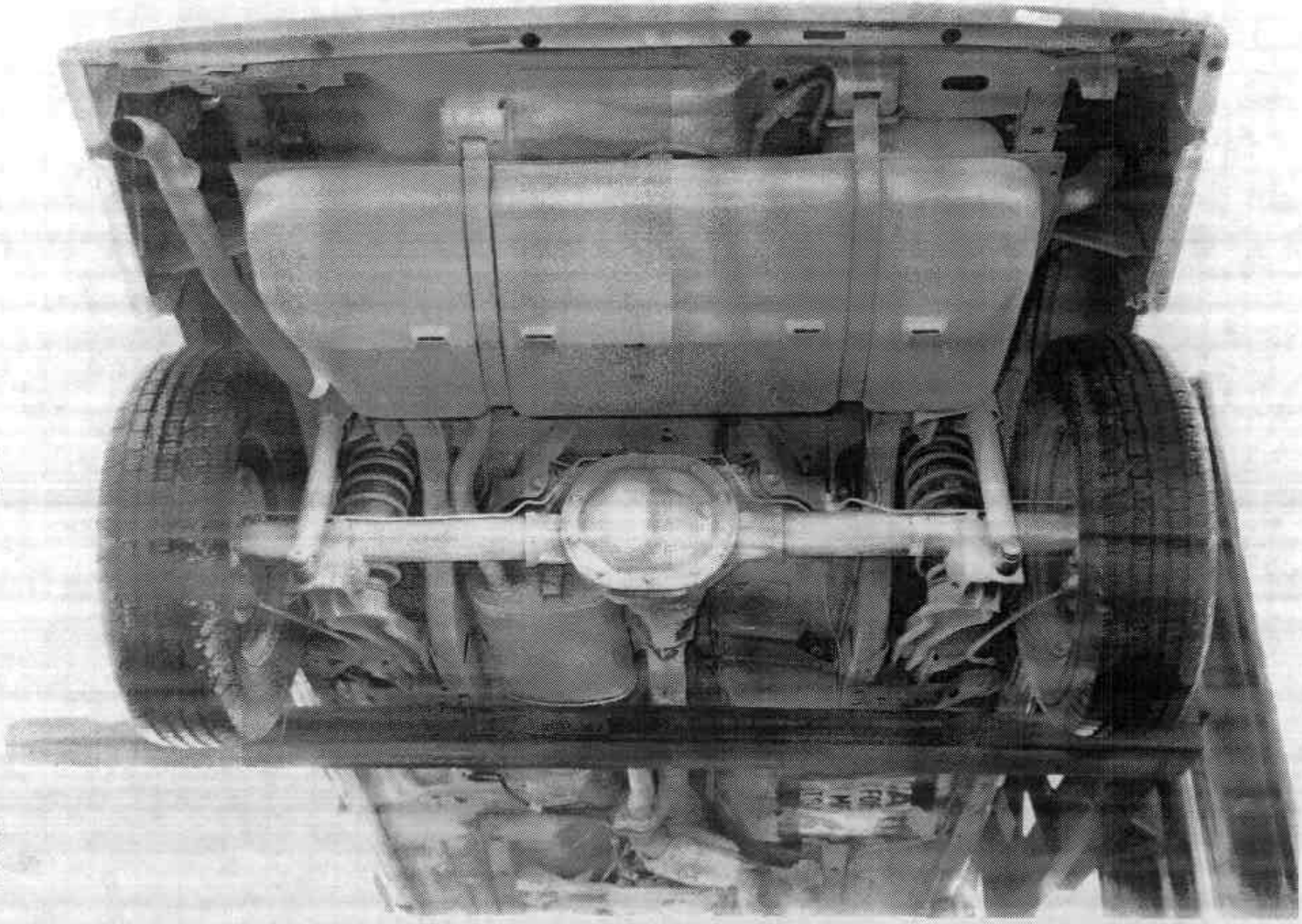


Figure A-23 POST-TEST REAR UNDERBODY VIEW

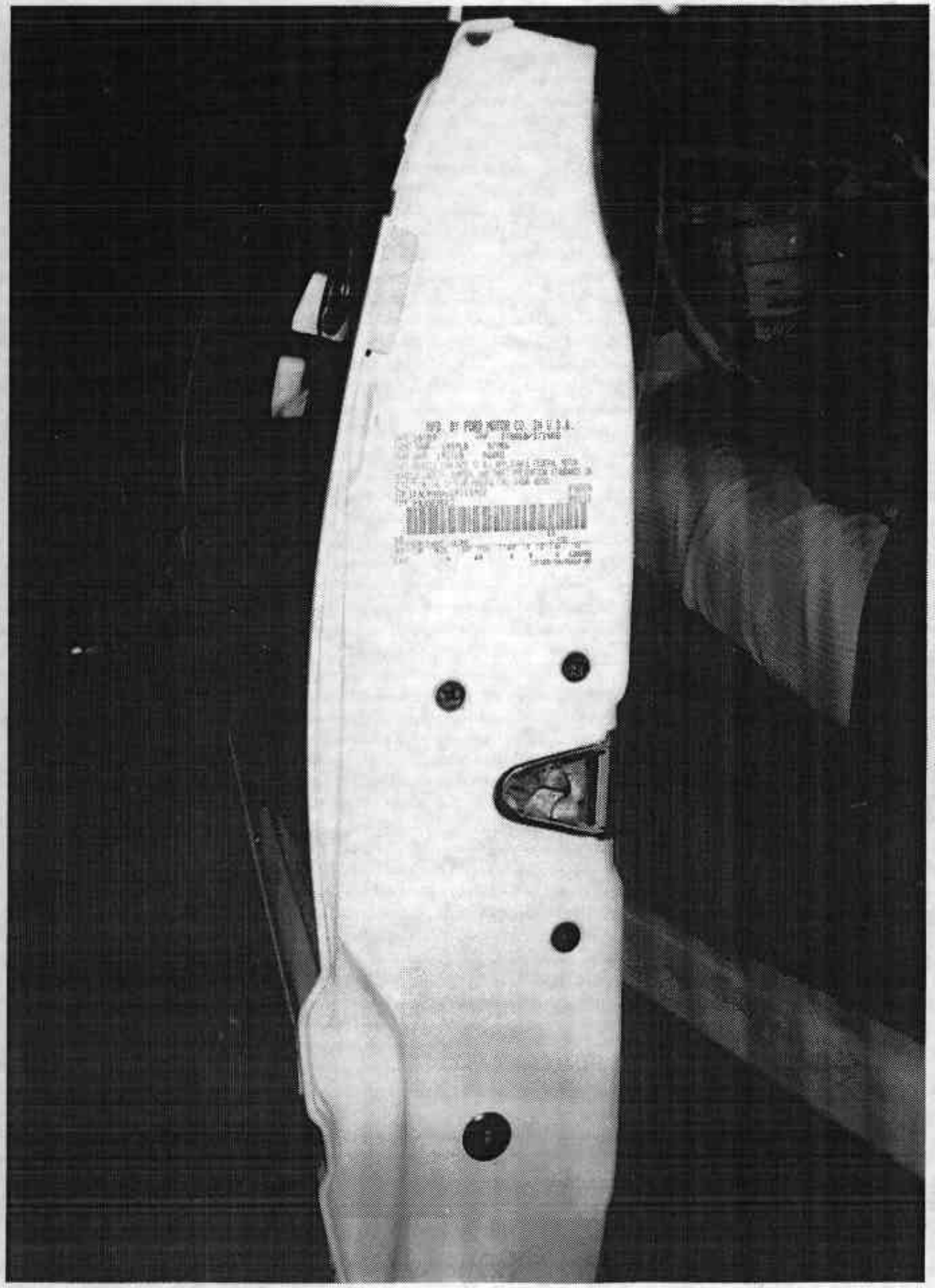


Figure A-24 CERTIFICATION LABEL

7804-3

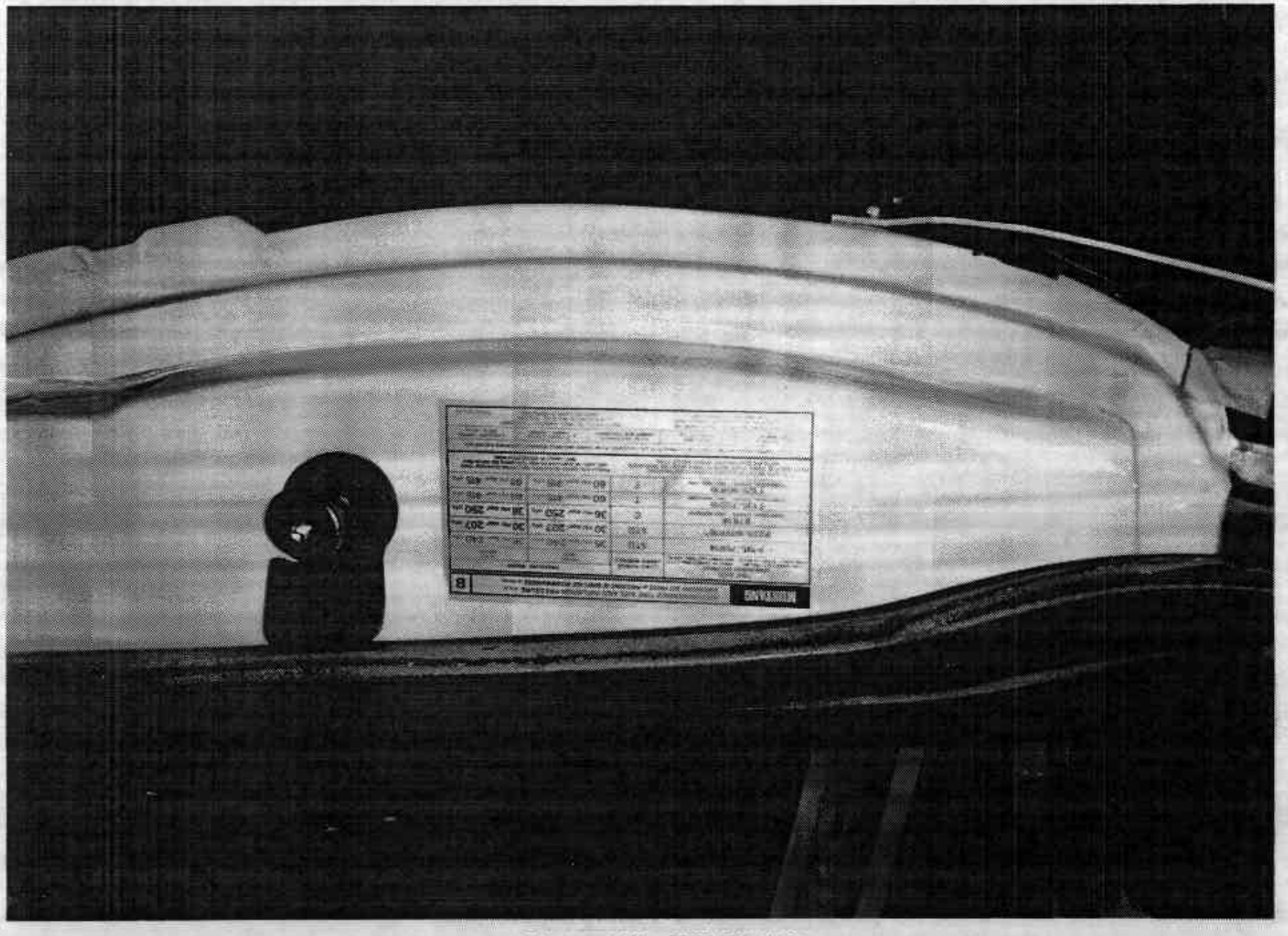


Figure A-25 TIRE PLACARD

Figure A-28 PRE-TEST DRIVER DUMMY POSITION

Figure A-27 POST-TEST DRIVER DUMMY POSITION

Figure A-28 PRE-TEST PASSENGER DUMMY POSITION

Figure A-20 POST-TEST PASSENGER DUMMY POSITION

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

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

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

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

Figure A-34 POST-TEST DRIVER AIRBAG VIEW

Figure A-35 VEHICLE IMPACT

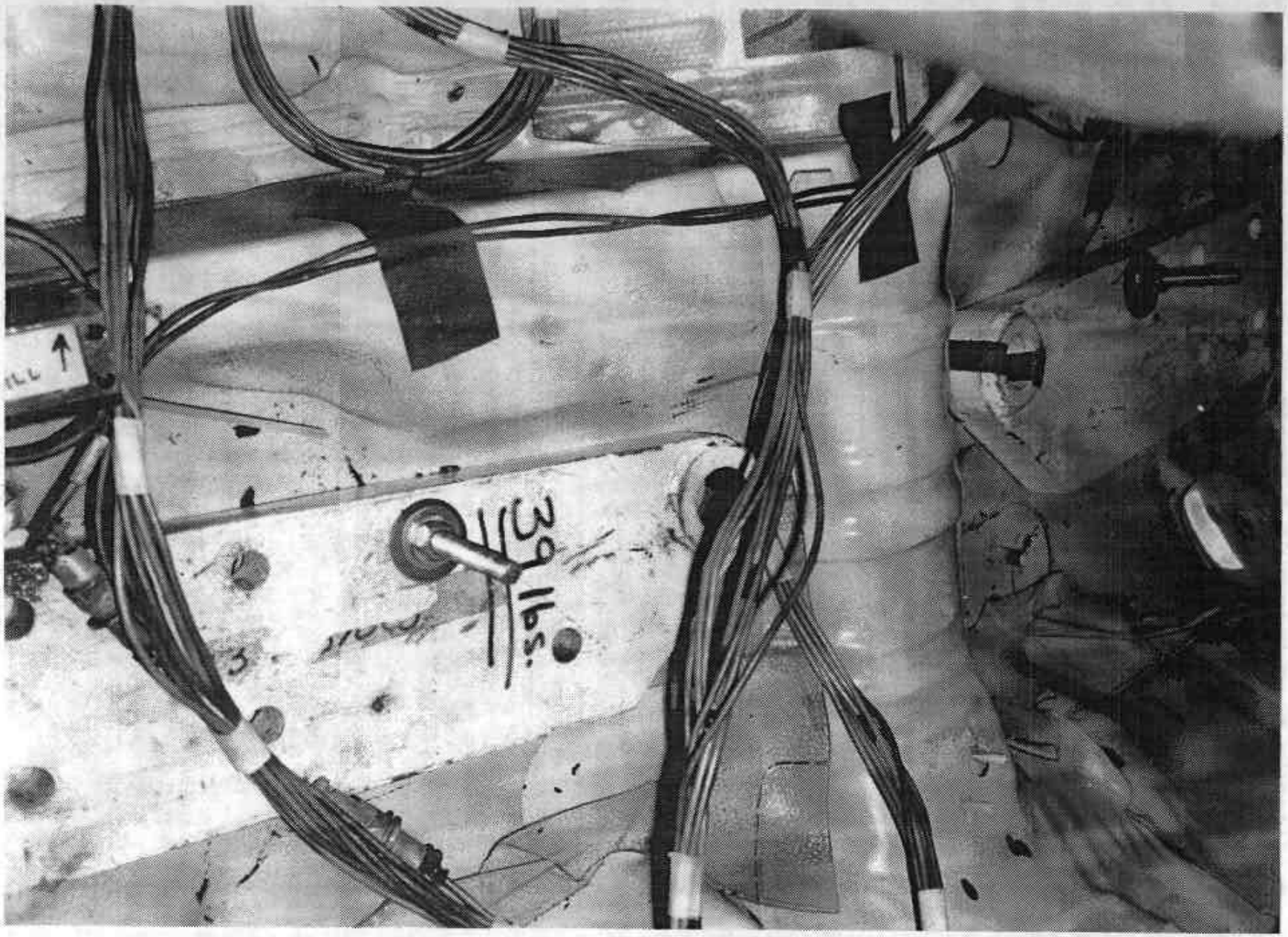


Figure A-36 BALLAST LOCATED IN REAR COMPARTMENT

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CL0204

VEHICLE DATA

FILTER CHANNEL CLASS

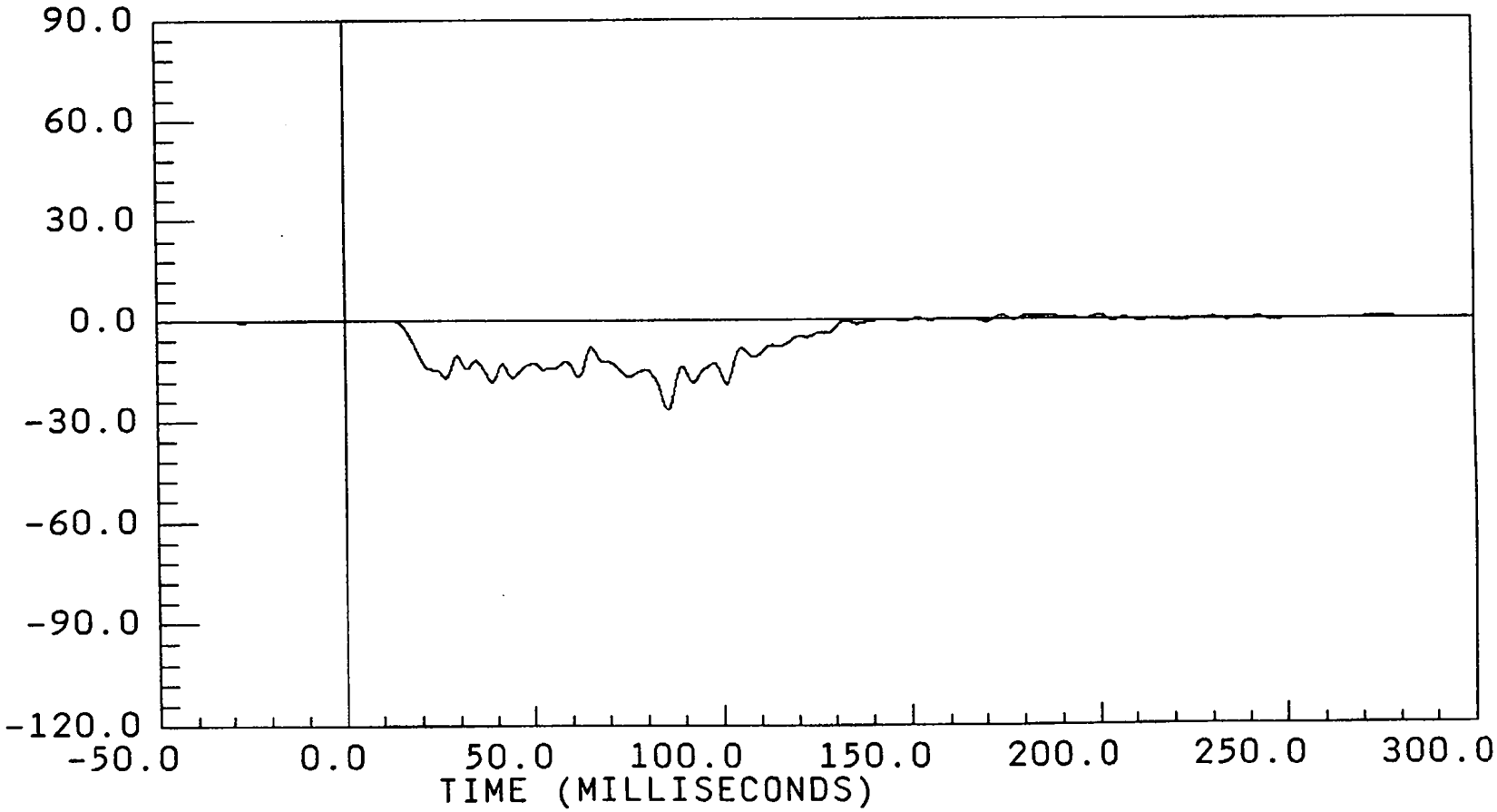
60

BW954-17.DAT

29.50 mph

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

XL AXIS
YMIN =-26.66079 at 86.02500
YMAX = 1.159719 at 174.6750

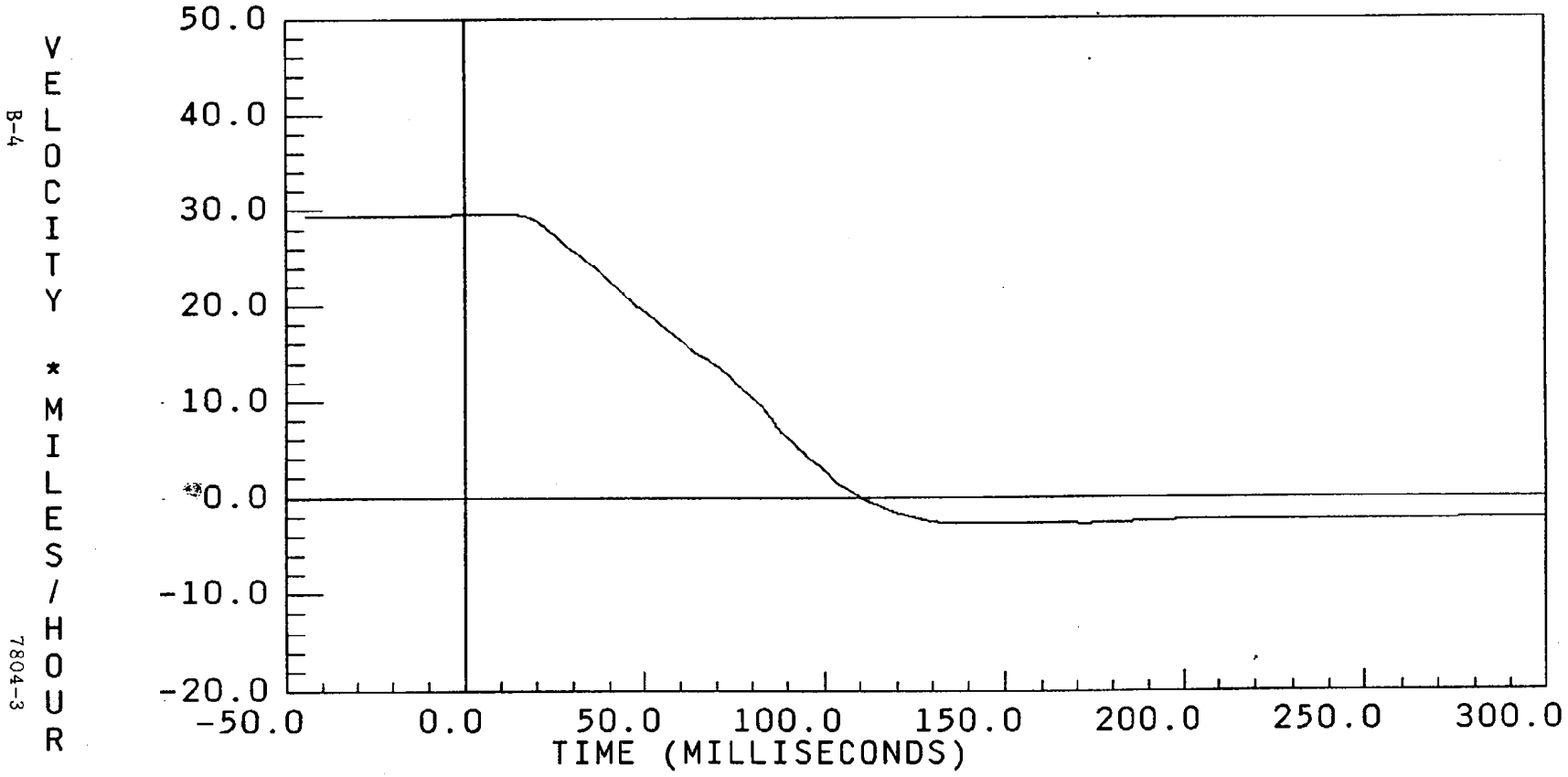


V954-17.DAT

29.50 mph

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

XL AXIS
YMIN =-2.812737 at 172.4250
YMAX = 29.51279 at 11.32500



B-4

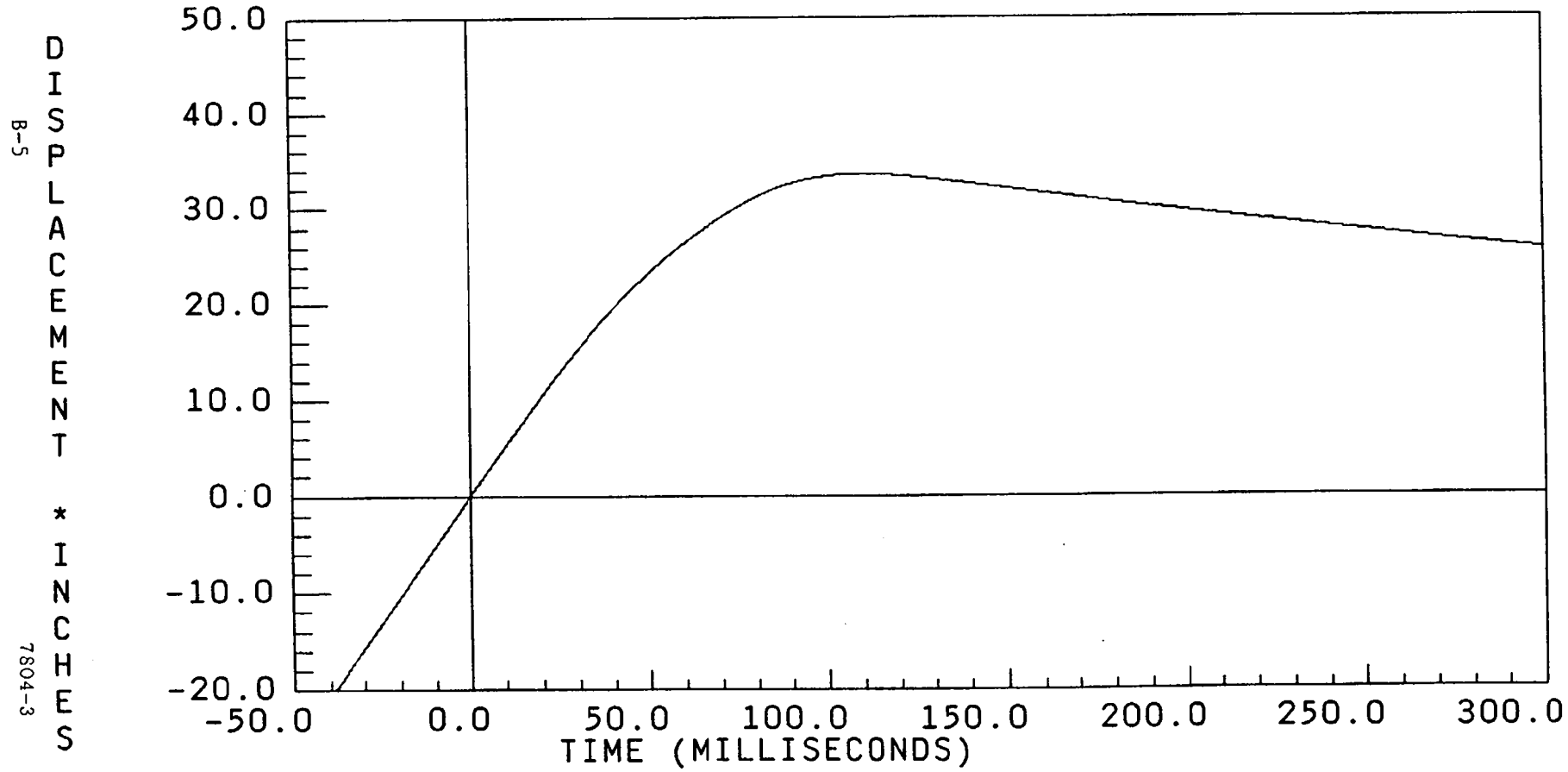
7804-3

D954-17.DAT

29.50 mph

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

XL AXIS
YMIN =-23.29684 at 172.4250
YMAX = 33.56432 at 110.3250

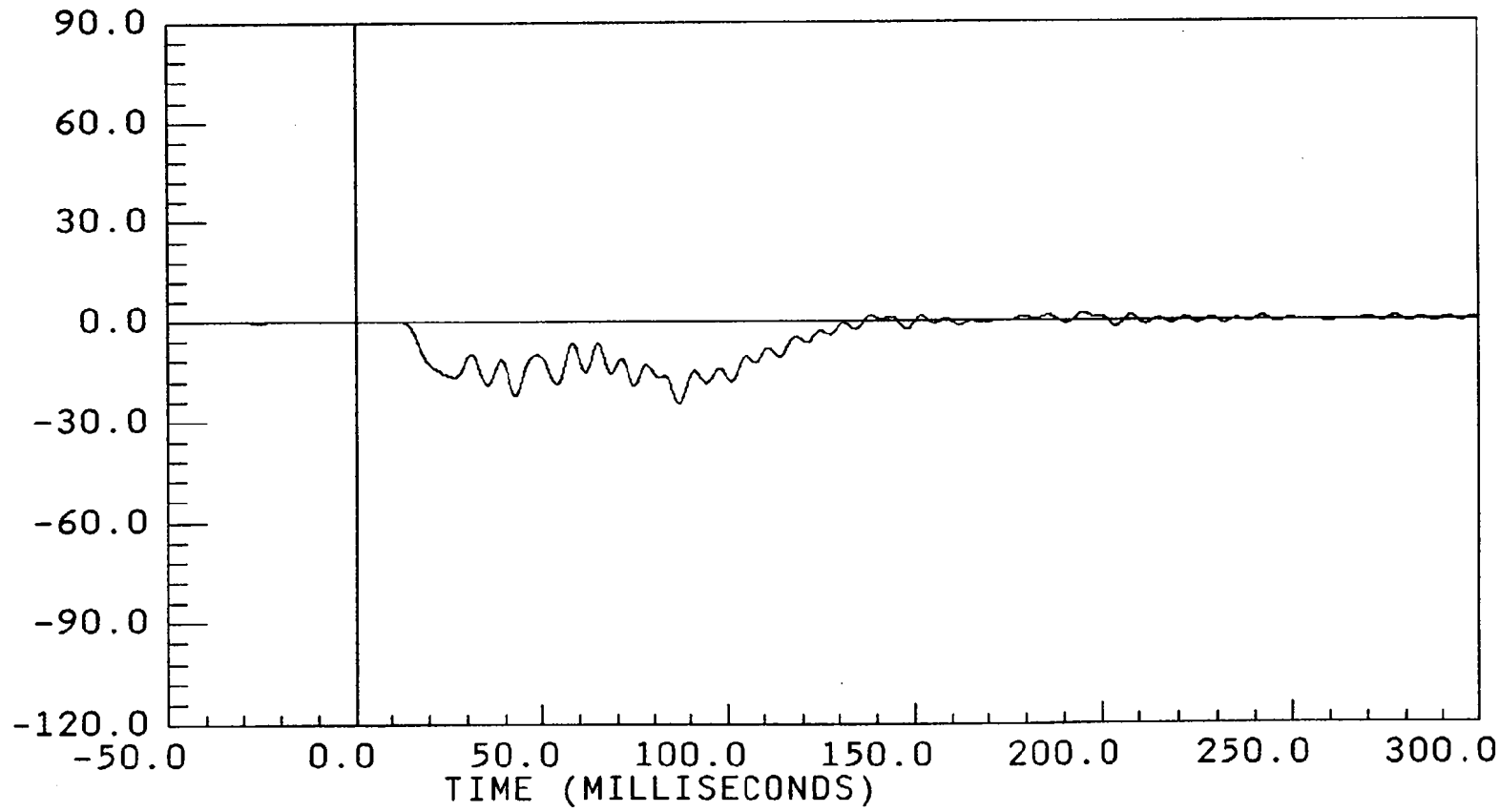


BW954-18.DAT

29.50 mph

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

XL AXIS
YMIN =-24.72154 at 87.07500
YMAX = 2.227891 at 195.5250



B-6

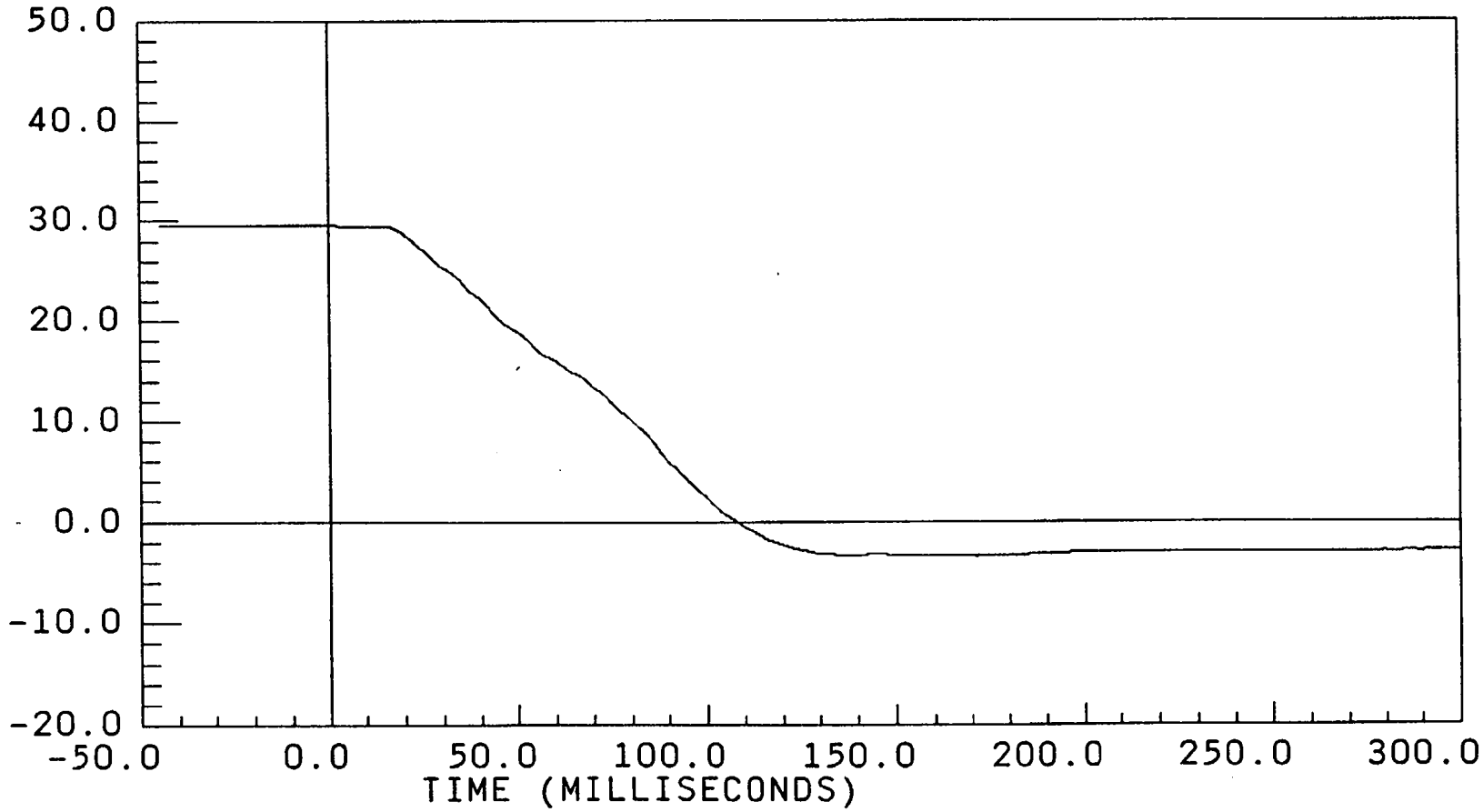
7804-3

V954-18.DAT

29.50 mph

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

XL AXIS
YMIN =-3.447167 at 171.5250
YMAX = 29.58626 at -40.95000



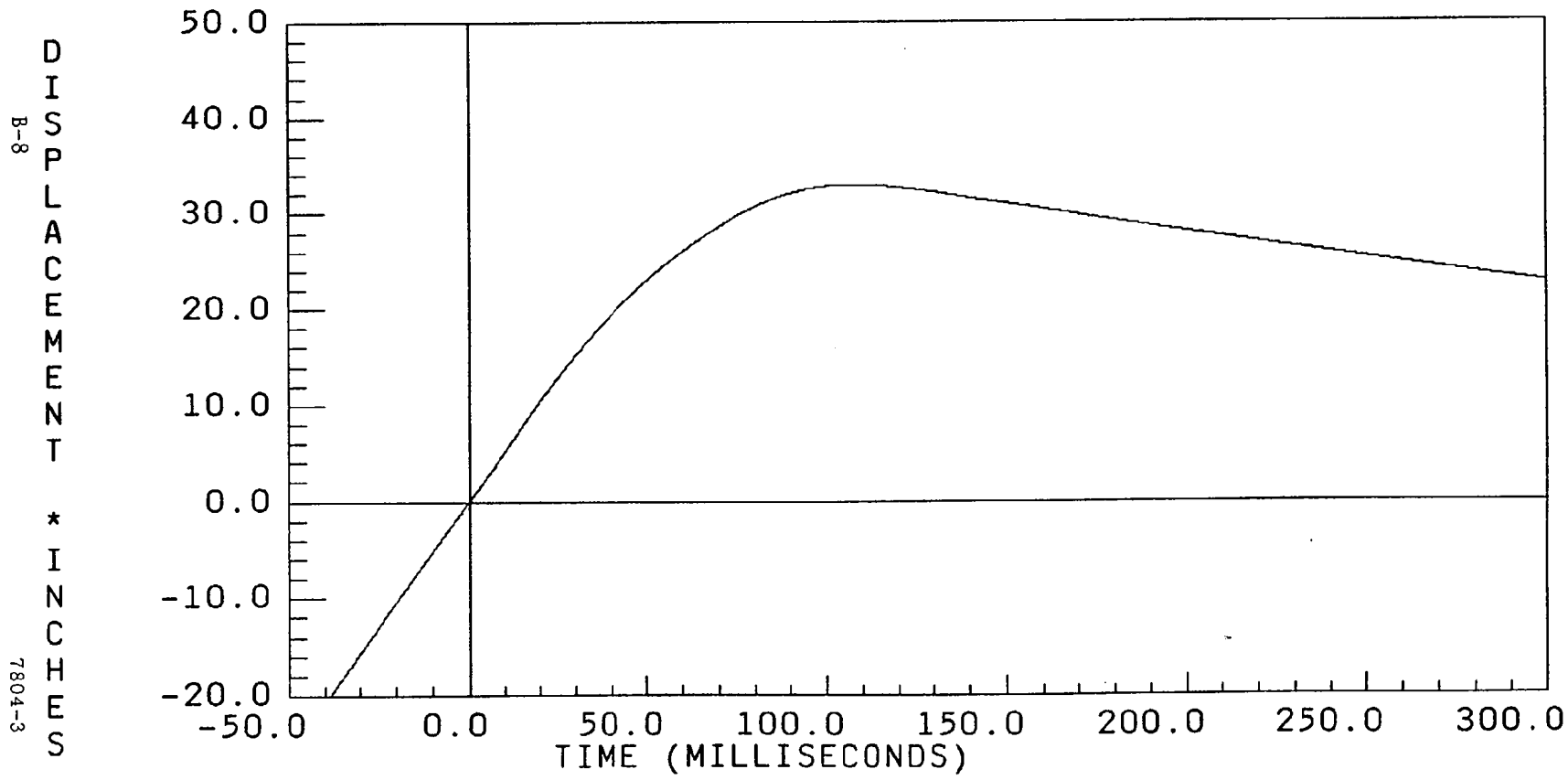
7804-3

D954-18.DAT

29.50 mph

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

XL AXIS
YMIN =-23.36431 at 171.5250
YMAX = 32.94635 at 107.9250



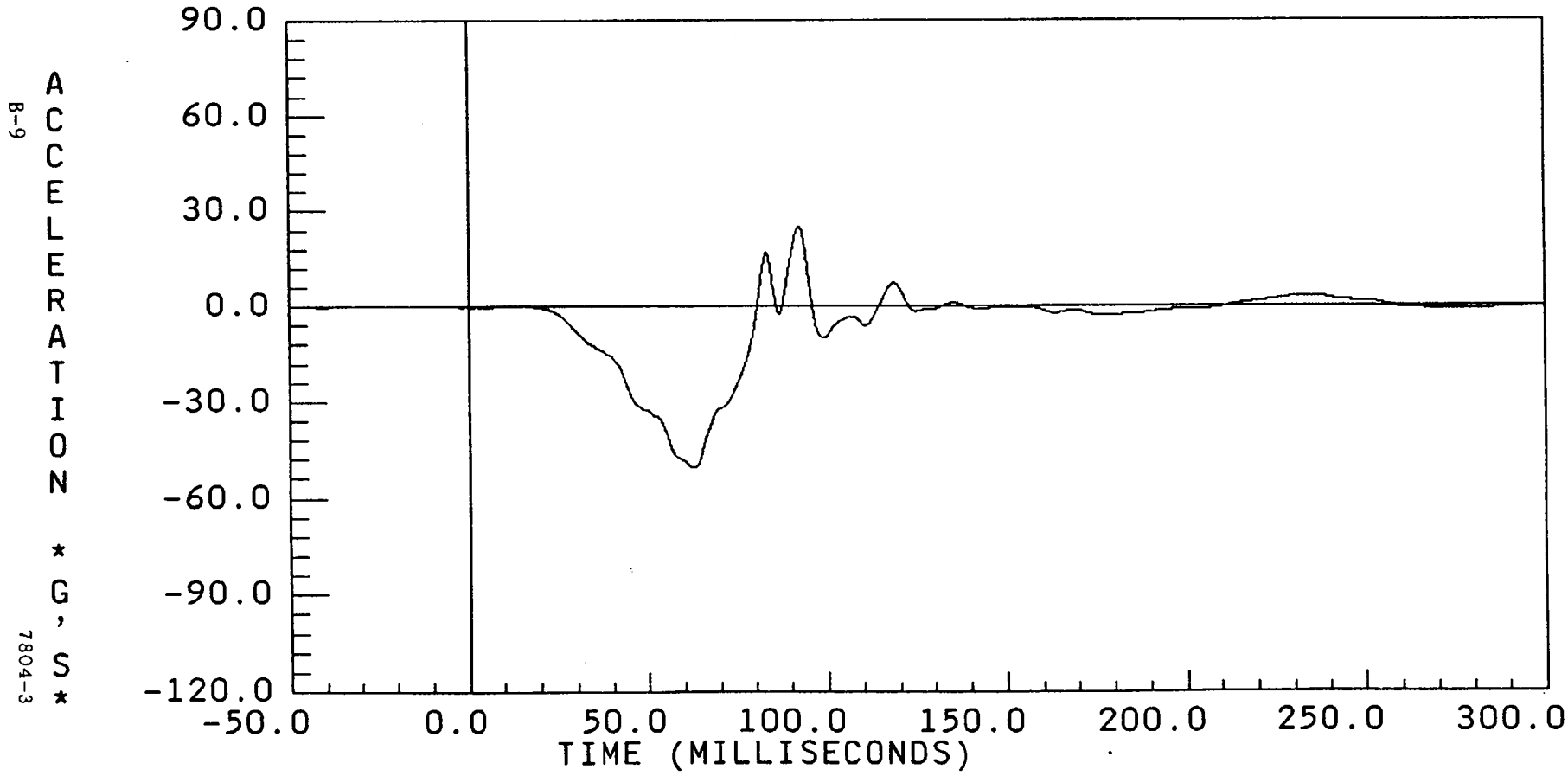
7804-3

BW954-19.DAT

29.50 mph

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

XL AXIS
YMIN =-50.45777 at 62.85000
YMAX = 25.07672 at 92.47501

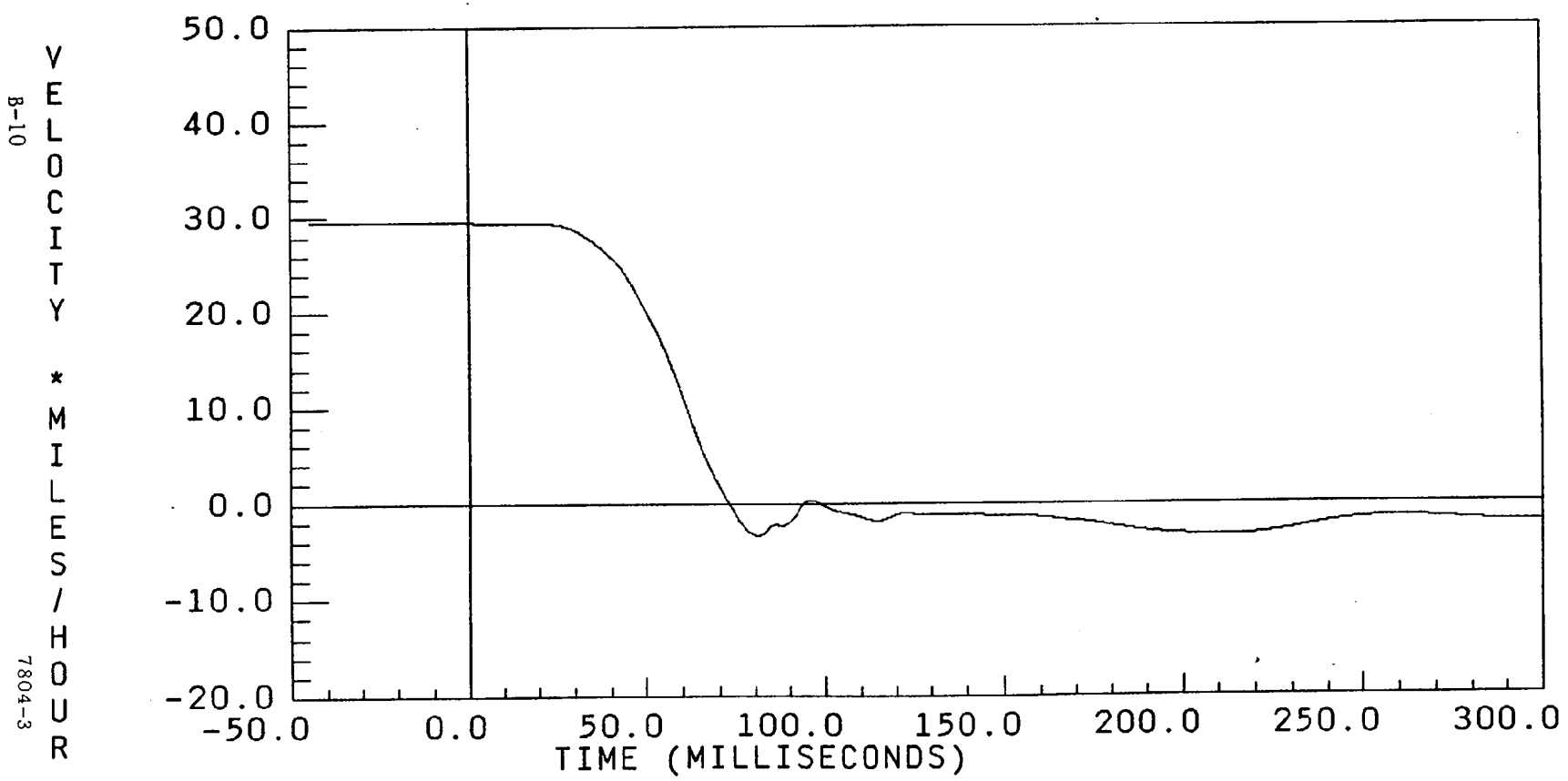


V954-19.DAT

29.50 mph

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

XL AXIS
YMIN =-3.446710 at 211.3500
YMAX = 29.58488 at 92.47501



B-10

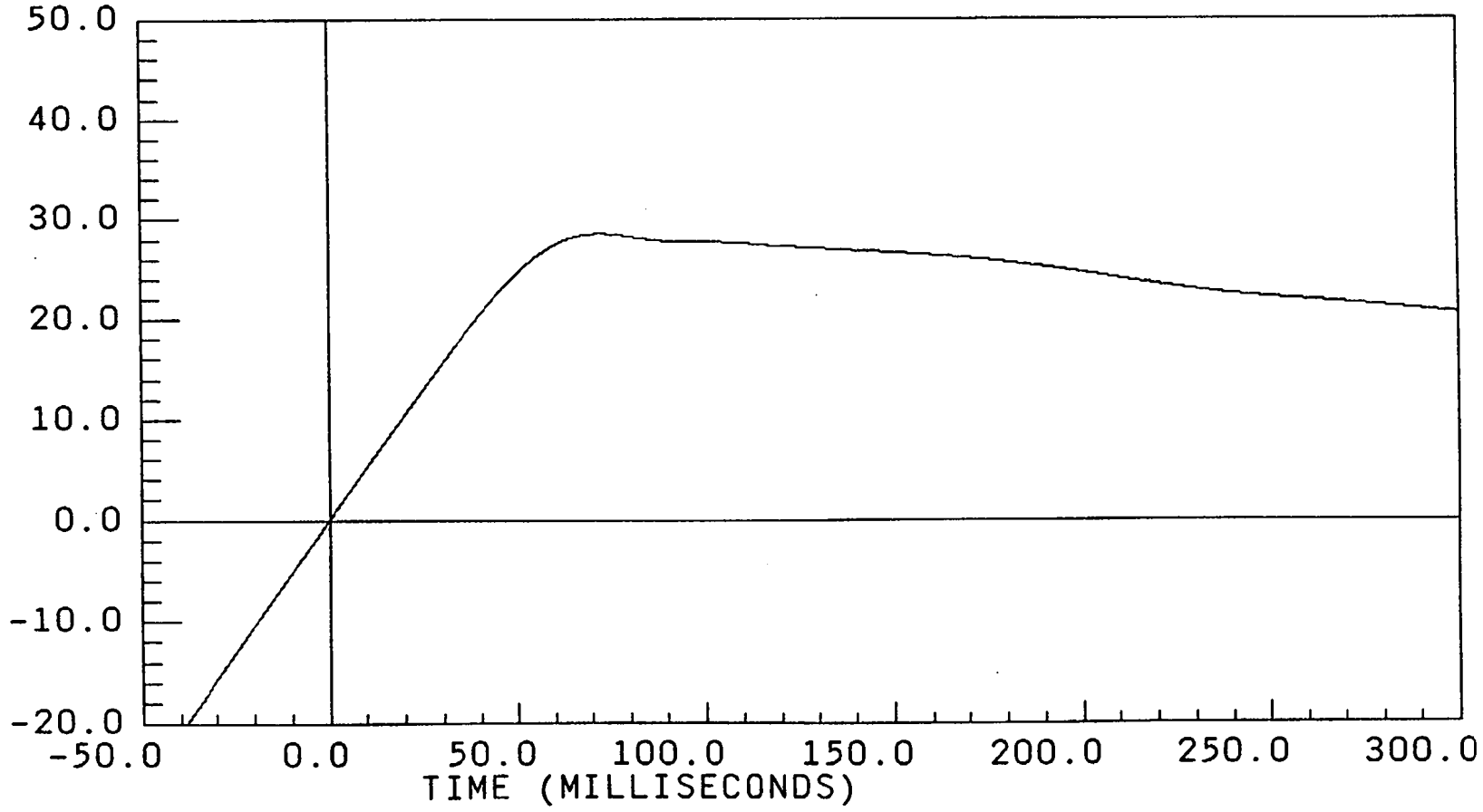
7804-3

D954-19.DAT

29.50 mph

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

XL AXIS
YMIN =-23.35667 at 211.3500
YMAX = 28.52063 at 72.82500



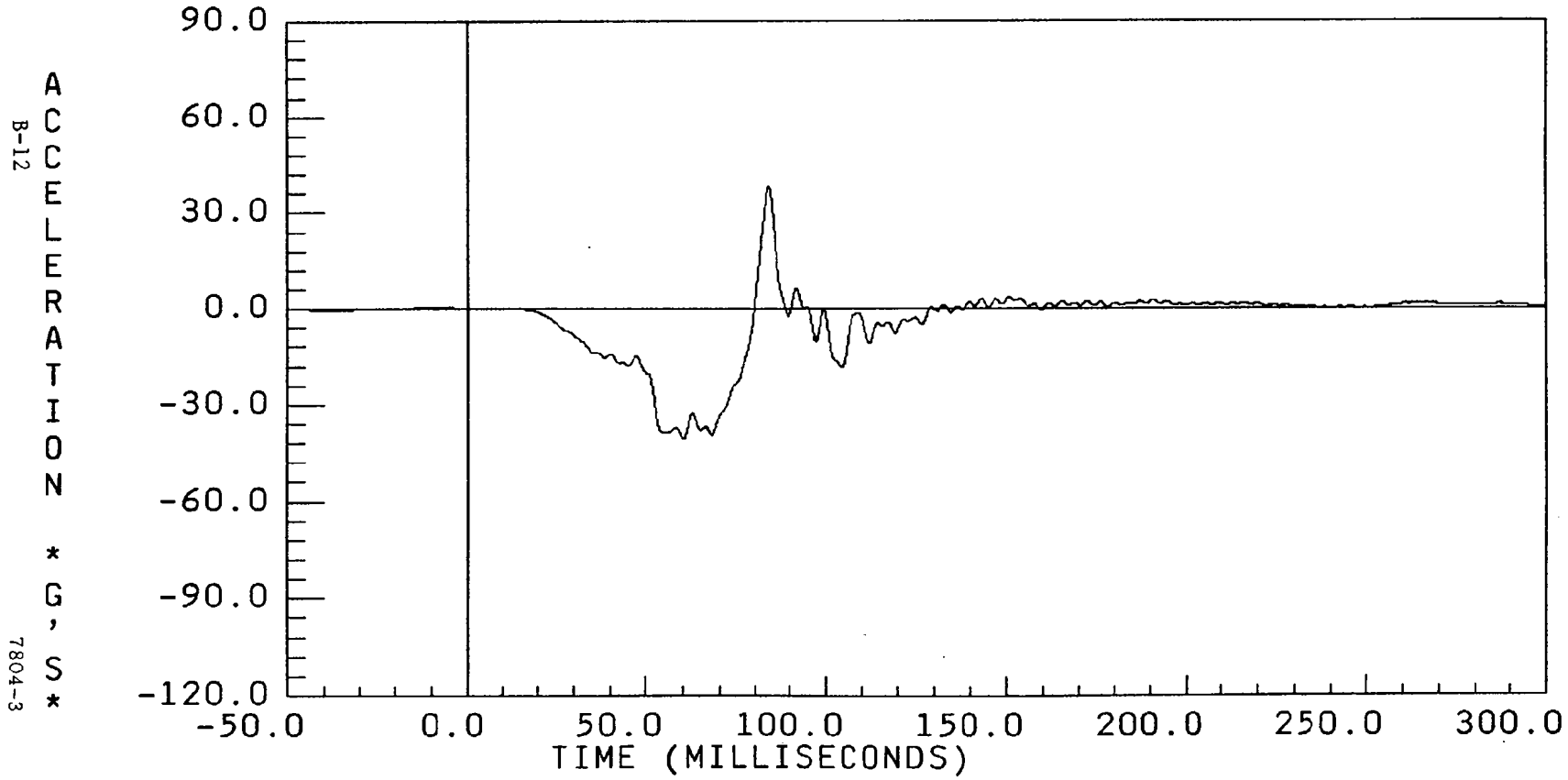
7804-3

BW954-20.DAT

29.50 mph

ACC PACK #4(X)
FILTERED
FILTER CUTOFF: 100Hz

XL AXIS
YMIN =-40.44923 at 60.30000
YMAX = 38.54938 at 84.07500

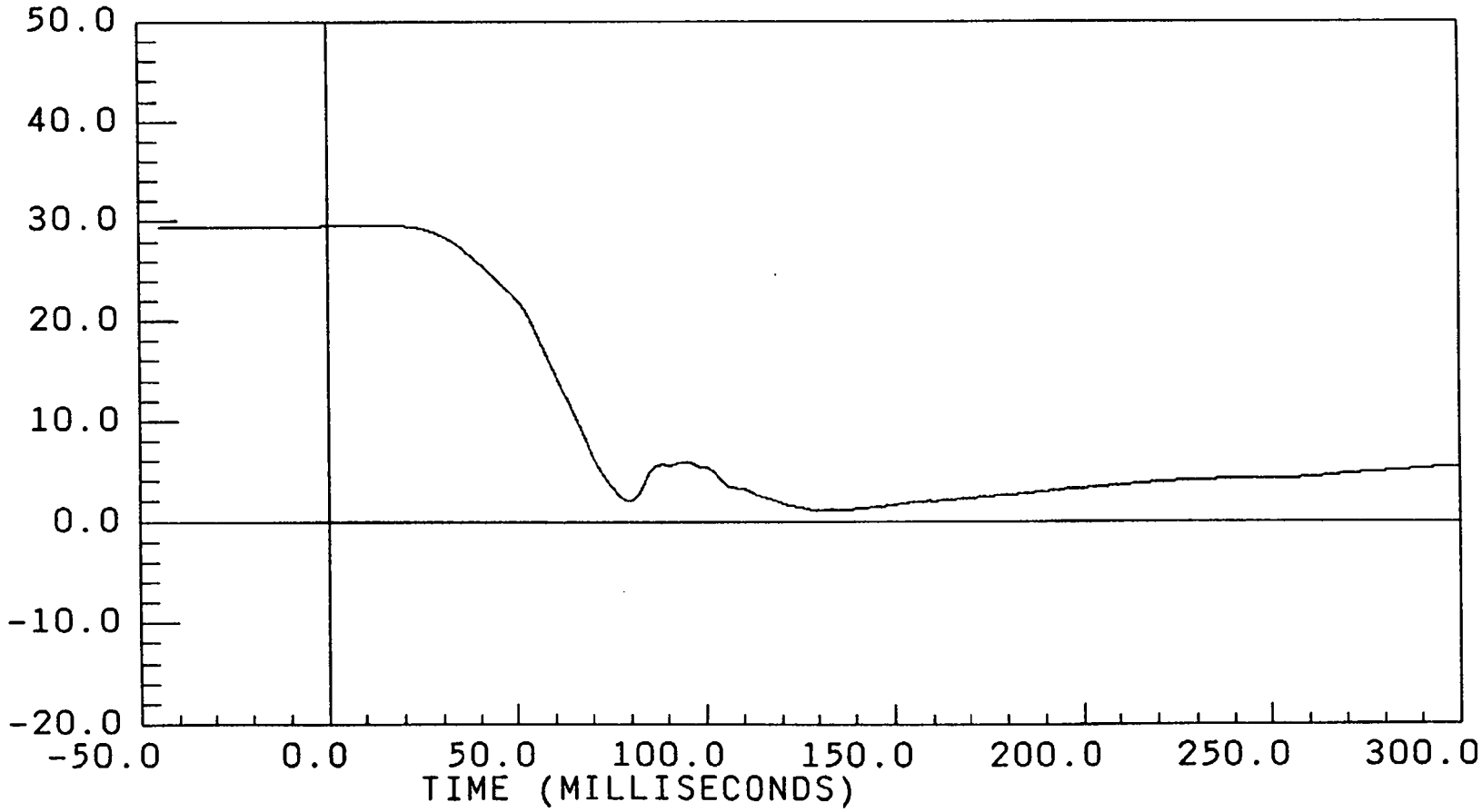


V954-20.DAT

29.50 mph

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

XL AXIS
YMIN = 1.130992 at 135.5250
YMAX = 29.55325 at 15.22500



B-13

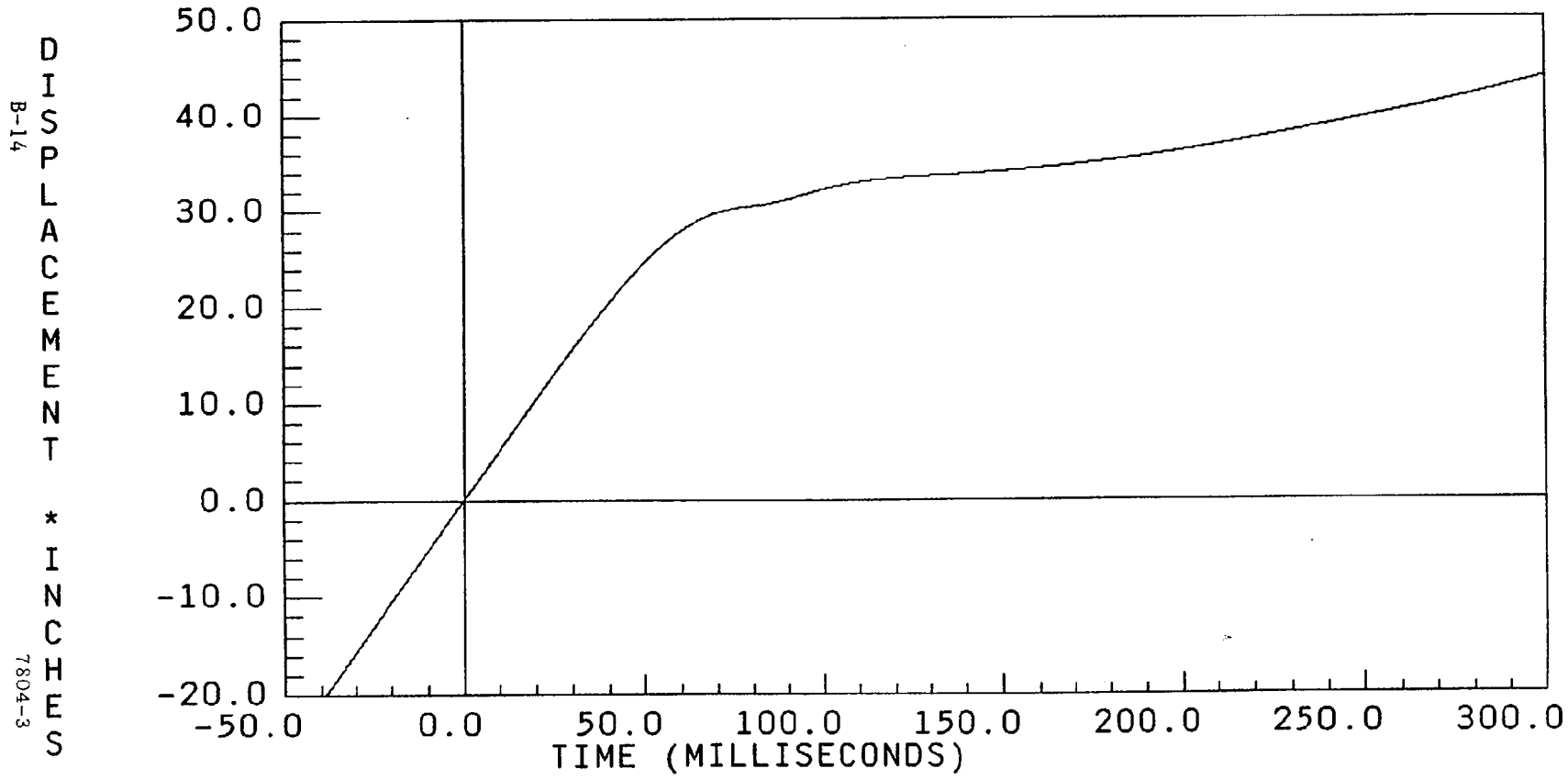
7804-3

D954-20.DAT

29.50 mph

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

XL AXIS
YMIN =-23.24356 at 135.5250
YMAX = 43.82352 at 300.0000

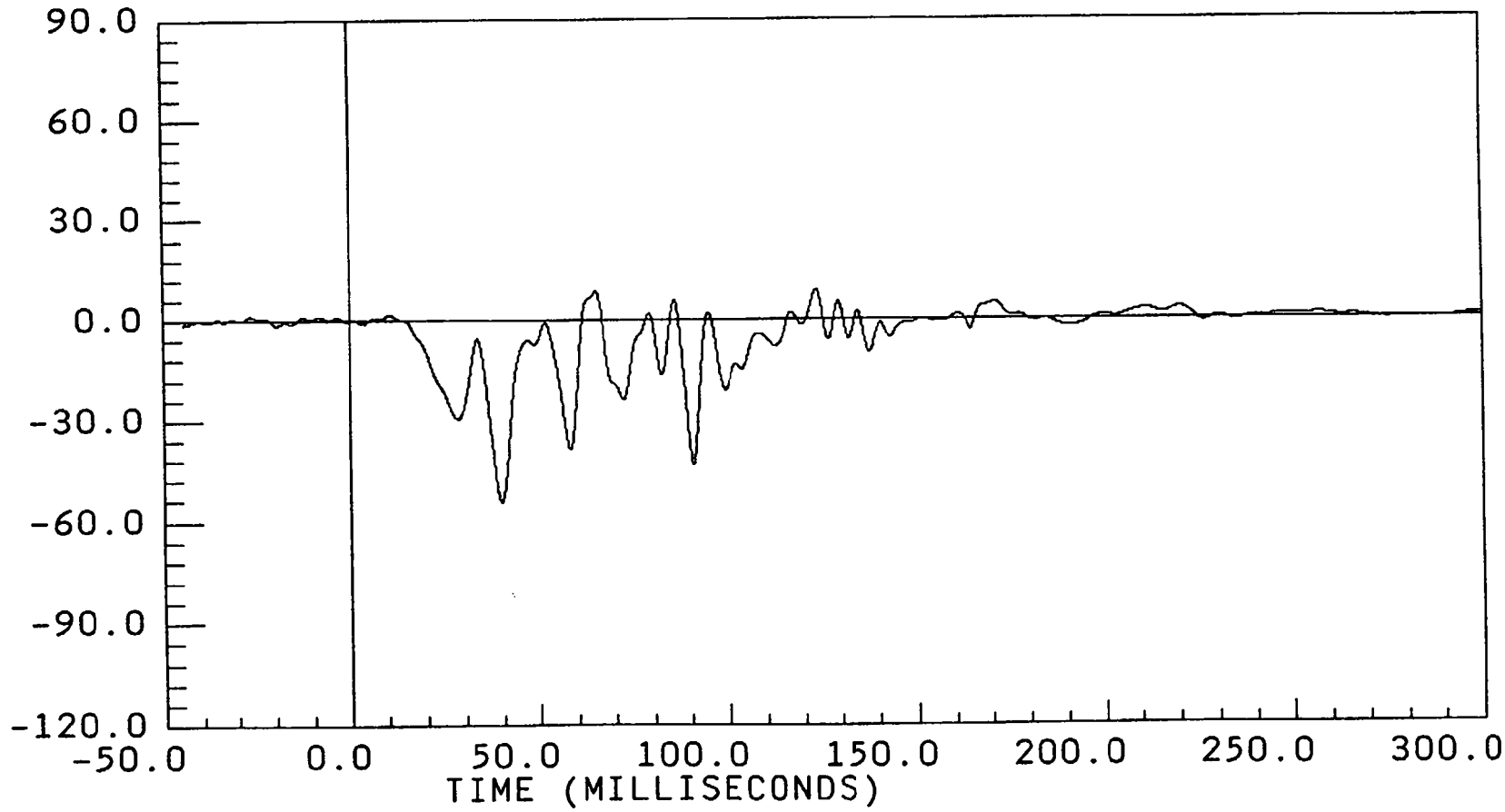


BW954-21.DAT

29.50 mph

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

XL AXIS
YMIN =-54.21652 at 39.90000
YMAX = 8.984074 at 123.8250



B-15

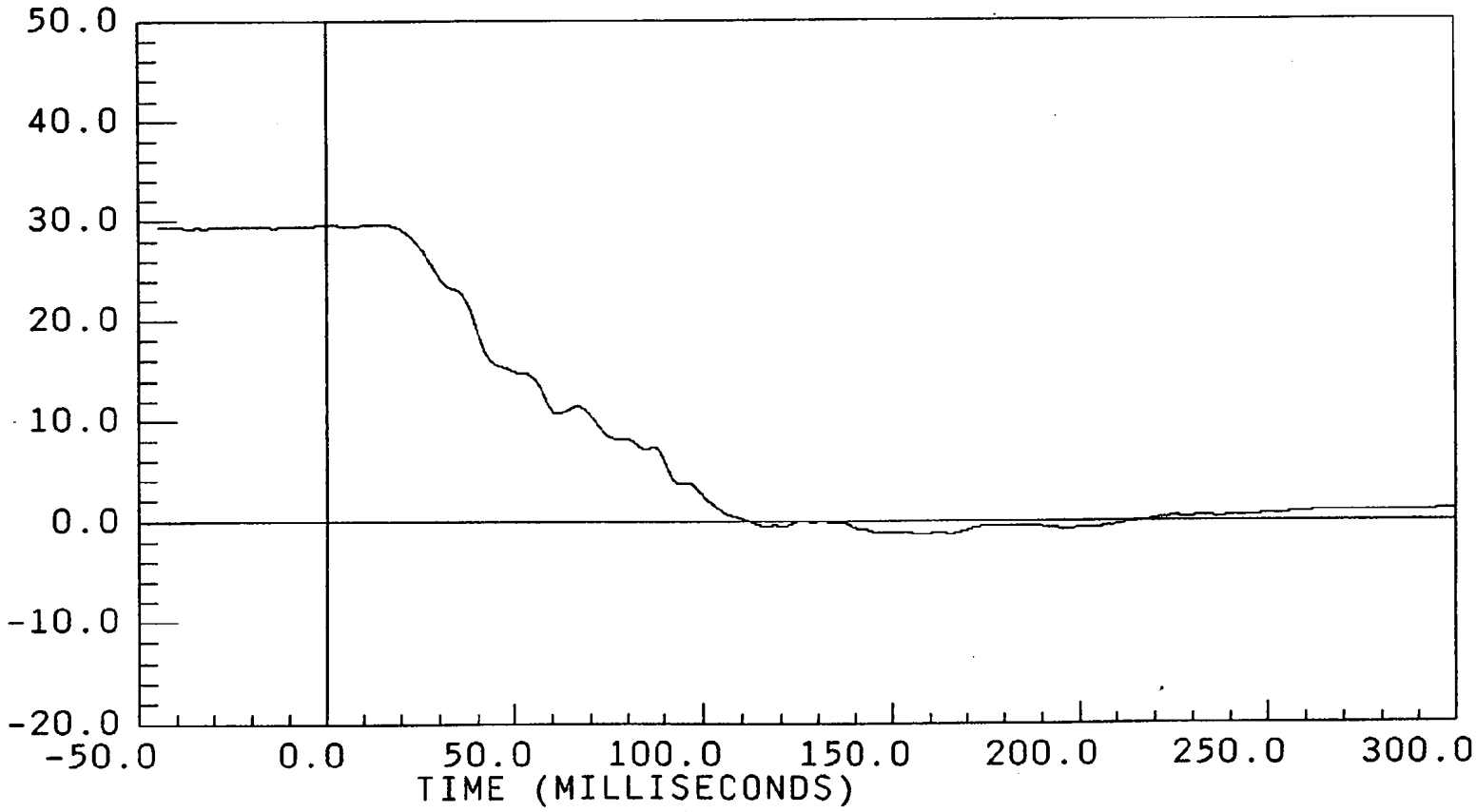
7804-3

V954-21.DAT

29.50 mph

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

XL AXIS
YMIN =-1.347015 at 165.6750
YMAX = 29.60480 at 14.62500



B-16

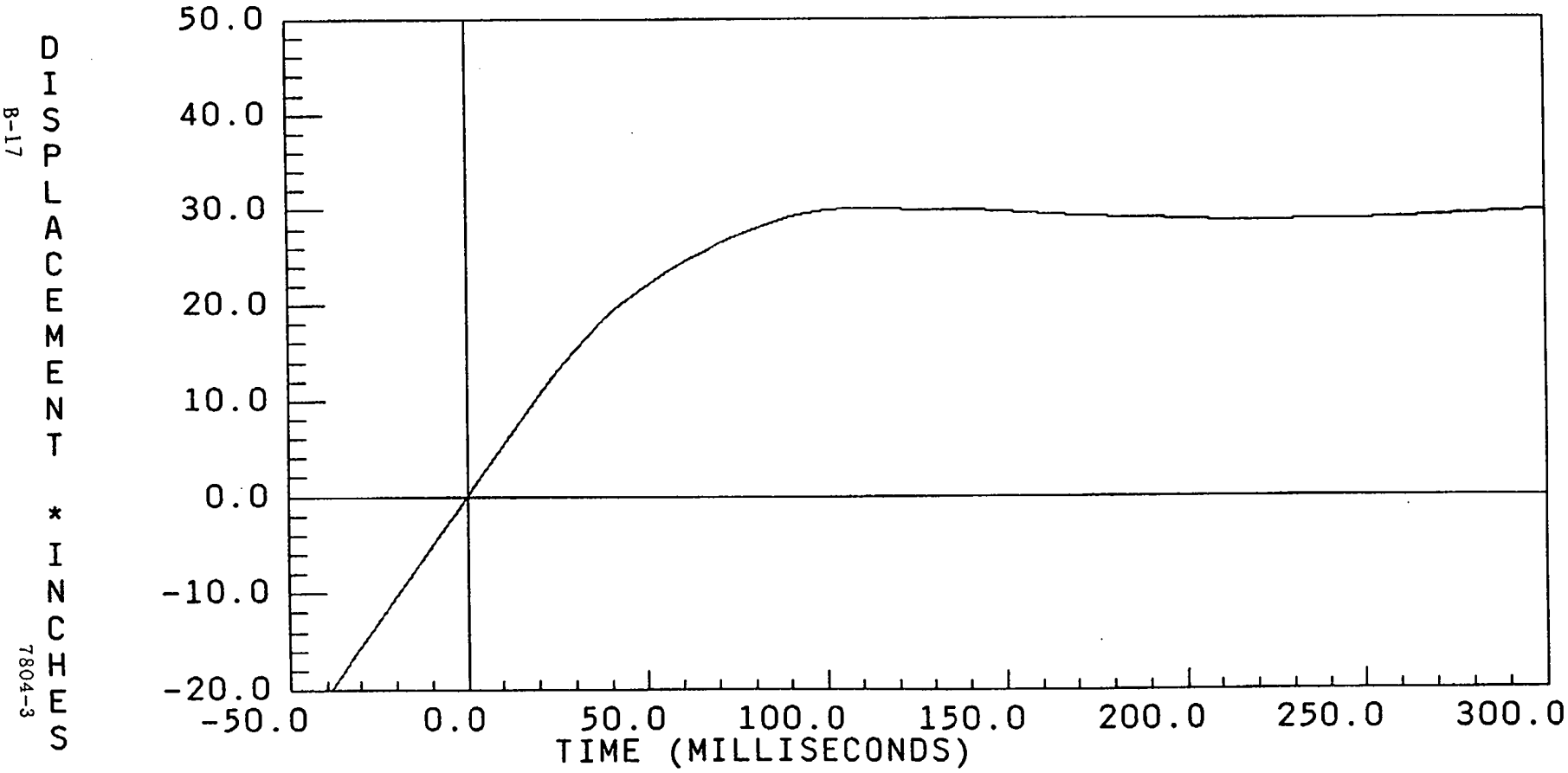
7804-3

D954-21.DAT

29.50 mph

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

XL AXIS
YMIN =-23.23358 at 165.6750
YMAX = 30.06245 at 111.8250



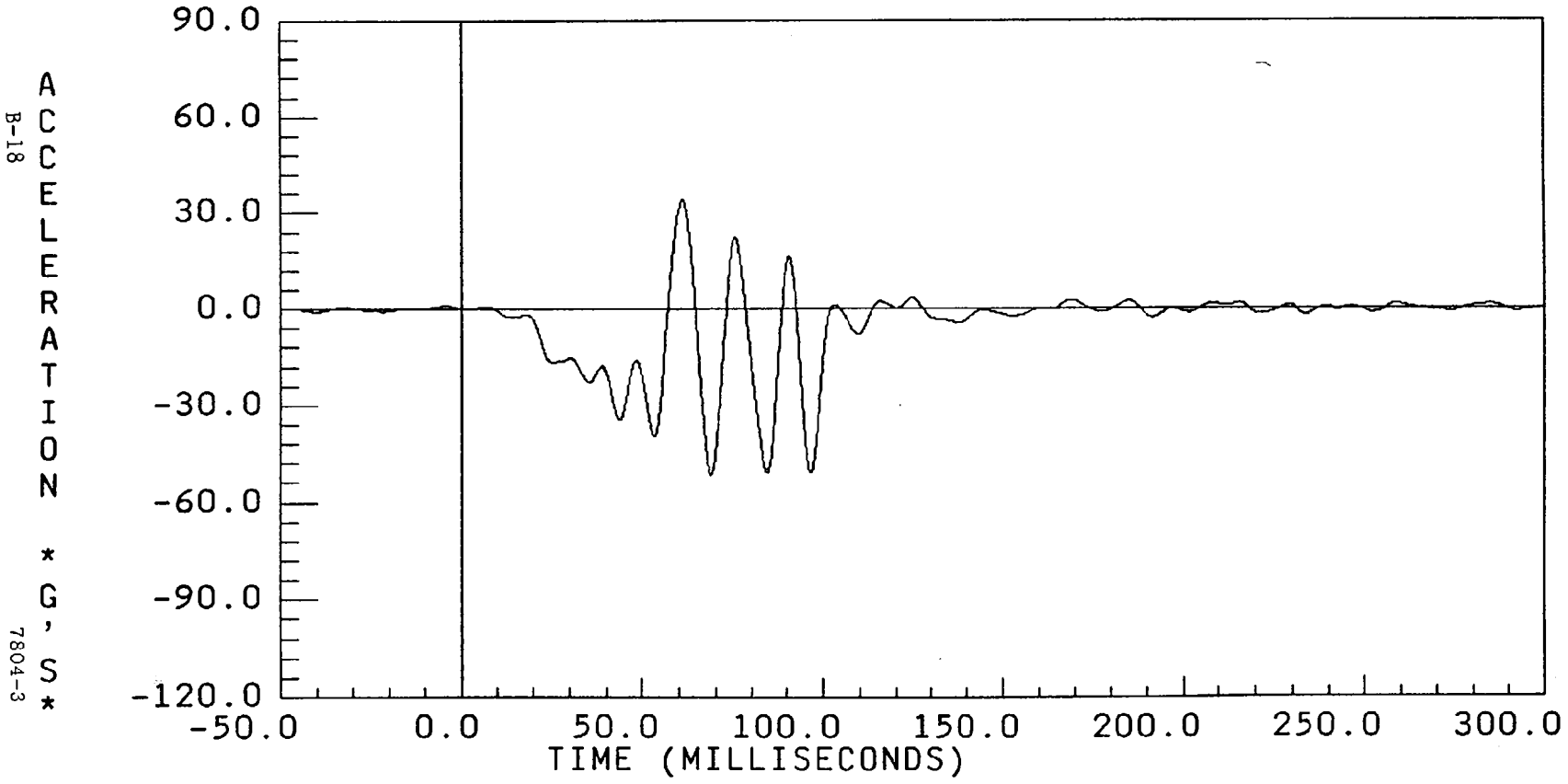
7804-3

BW954-22.DAT

29.50 mph

ACC PACK #6(X)
FILTERED
FILTER CUTOFF: 100Hz

XL AXIS
YMIN =-51.60223 at 68.85001
YMAX = 34.02642 at 61.05000

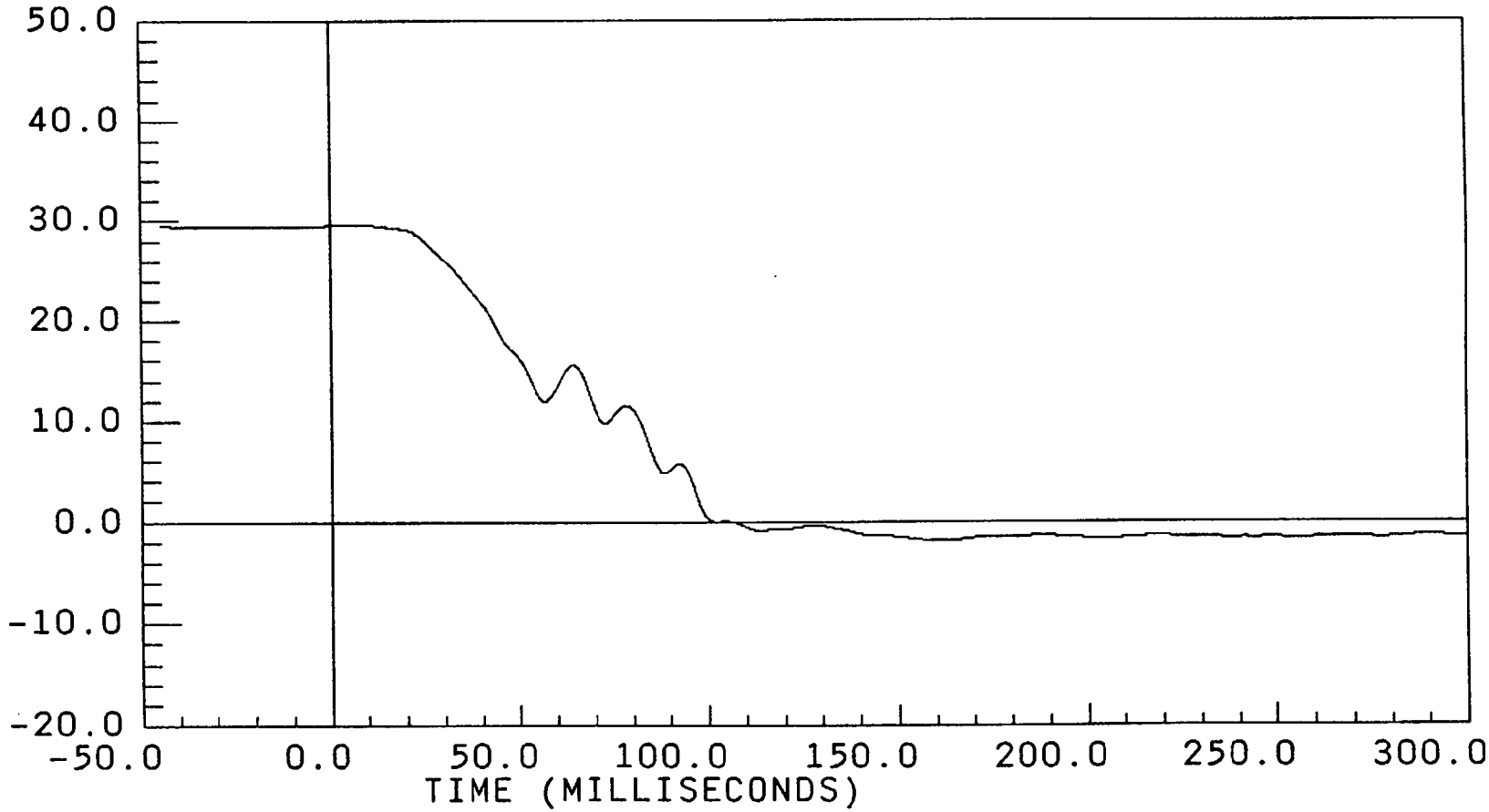


V954-22.DAT

29.50 mph

ACC PACK #6(X)
COMPUTED
FILTER CUTOFF: 100Hz

XL AXIS
YMIN =-1.855500 at 159.6750
YMAX = 29.55329 at 9.075001



B-19

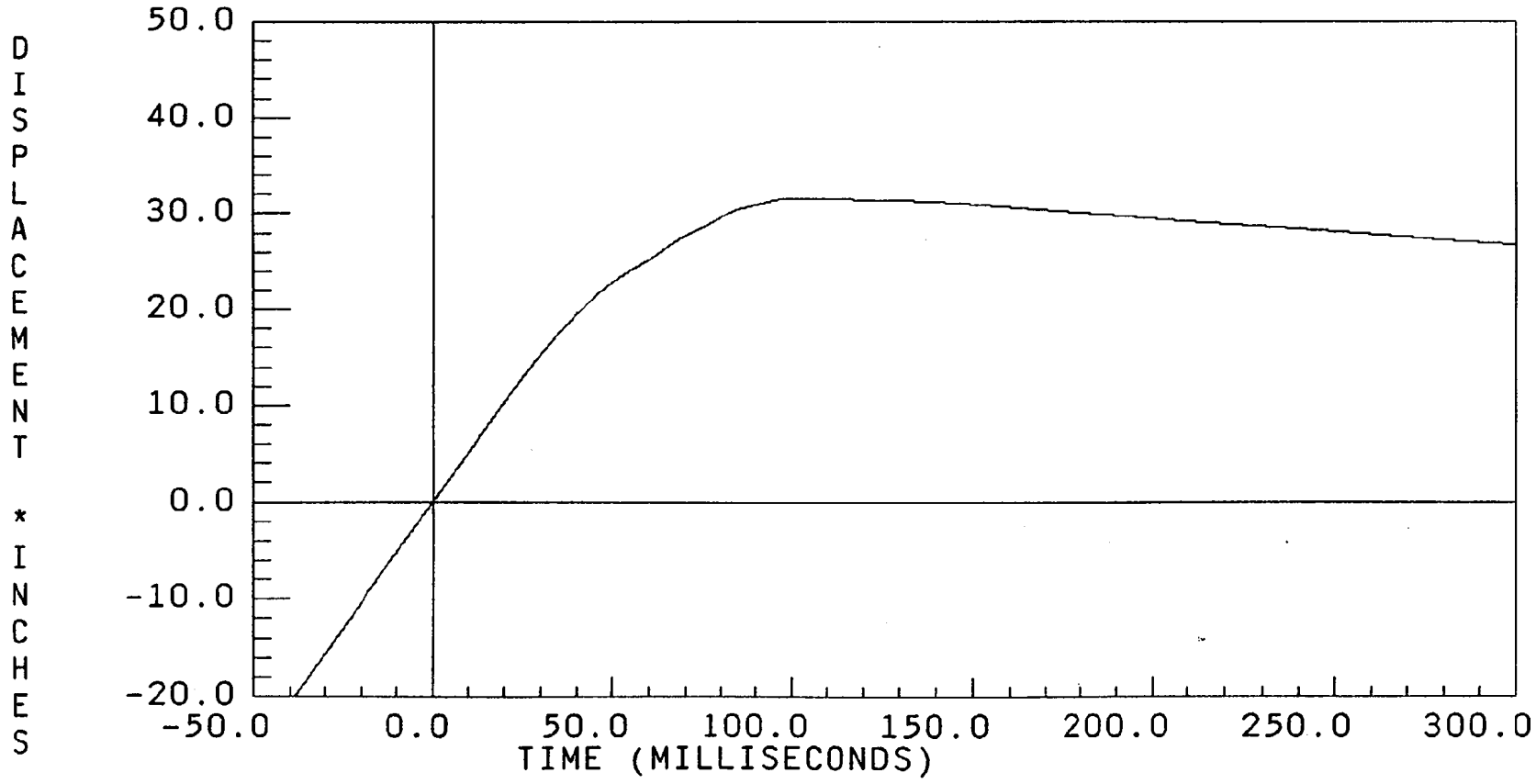
7804-3

D954-22.DAT

29.50 mph

ACC PACK #6(X)
COMPUTED
FILTER CUTOFF: 100Hz

XL AXIS
YMIN =-23.27052 at 159.6750
YMAX = 31.58227 at 105.8250



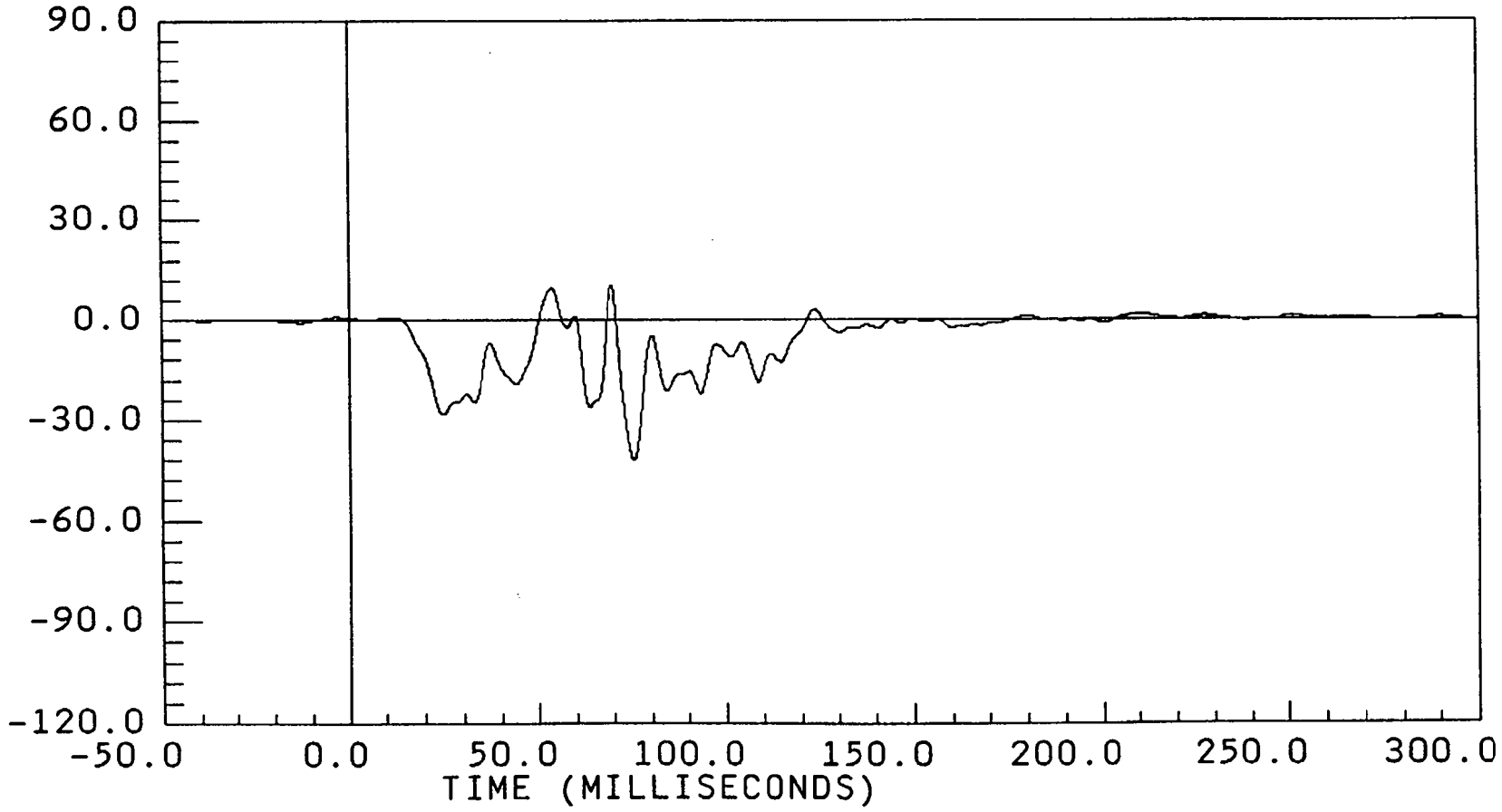
7804-3

BW954-23.DAT

29.50 mph

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

XL AXIS
YMIN =-42.03522 at 75.60001
YMAX = 10.62063 at 69.75000



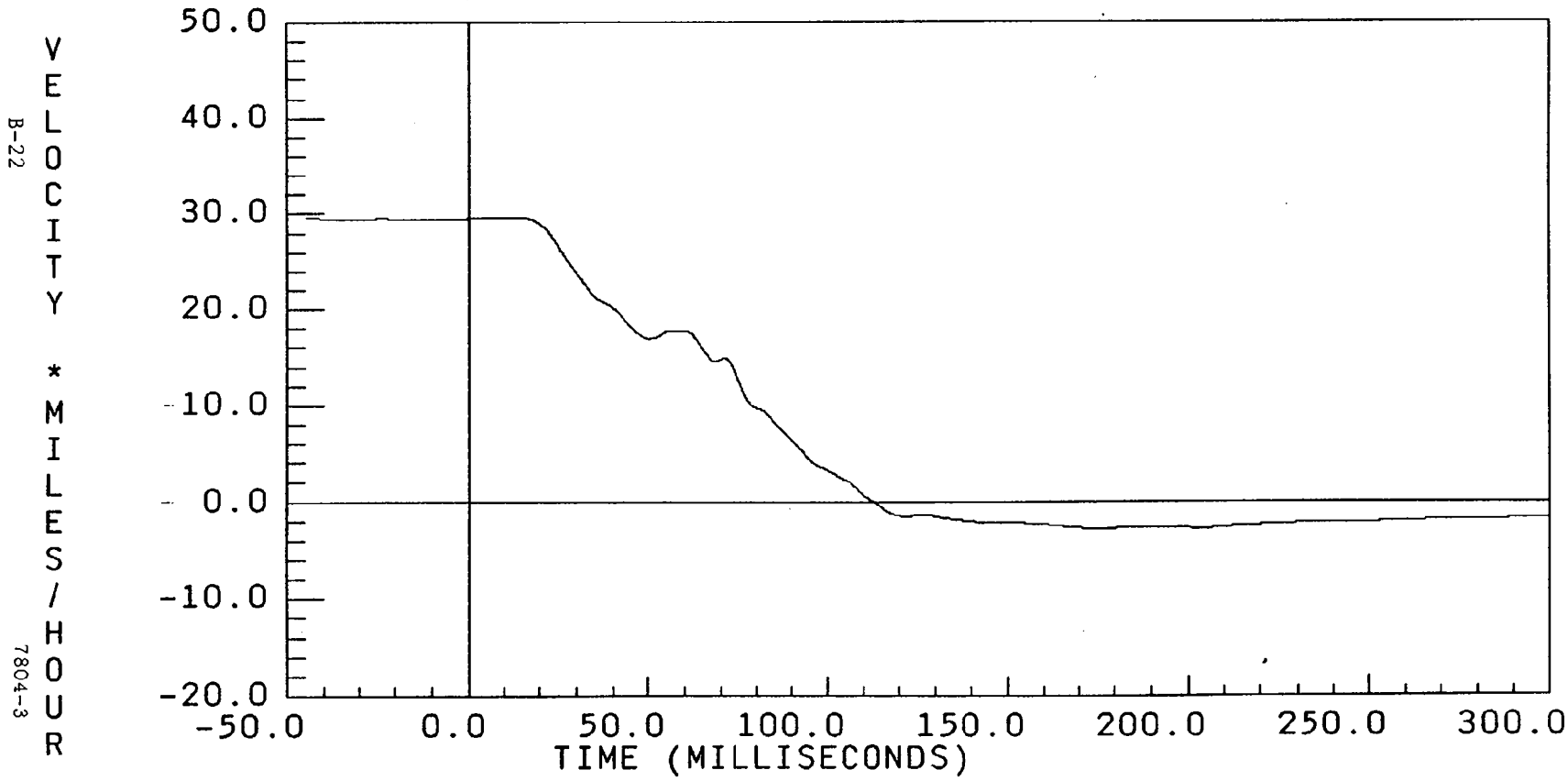
7804-3

V954-23.DAT

29.50 mph

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

XL AXIS
YMIN =-2.857239 at 176.3250
YMAX = 29.60142 at 14.40000



B-22

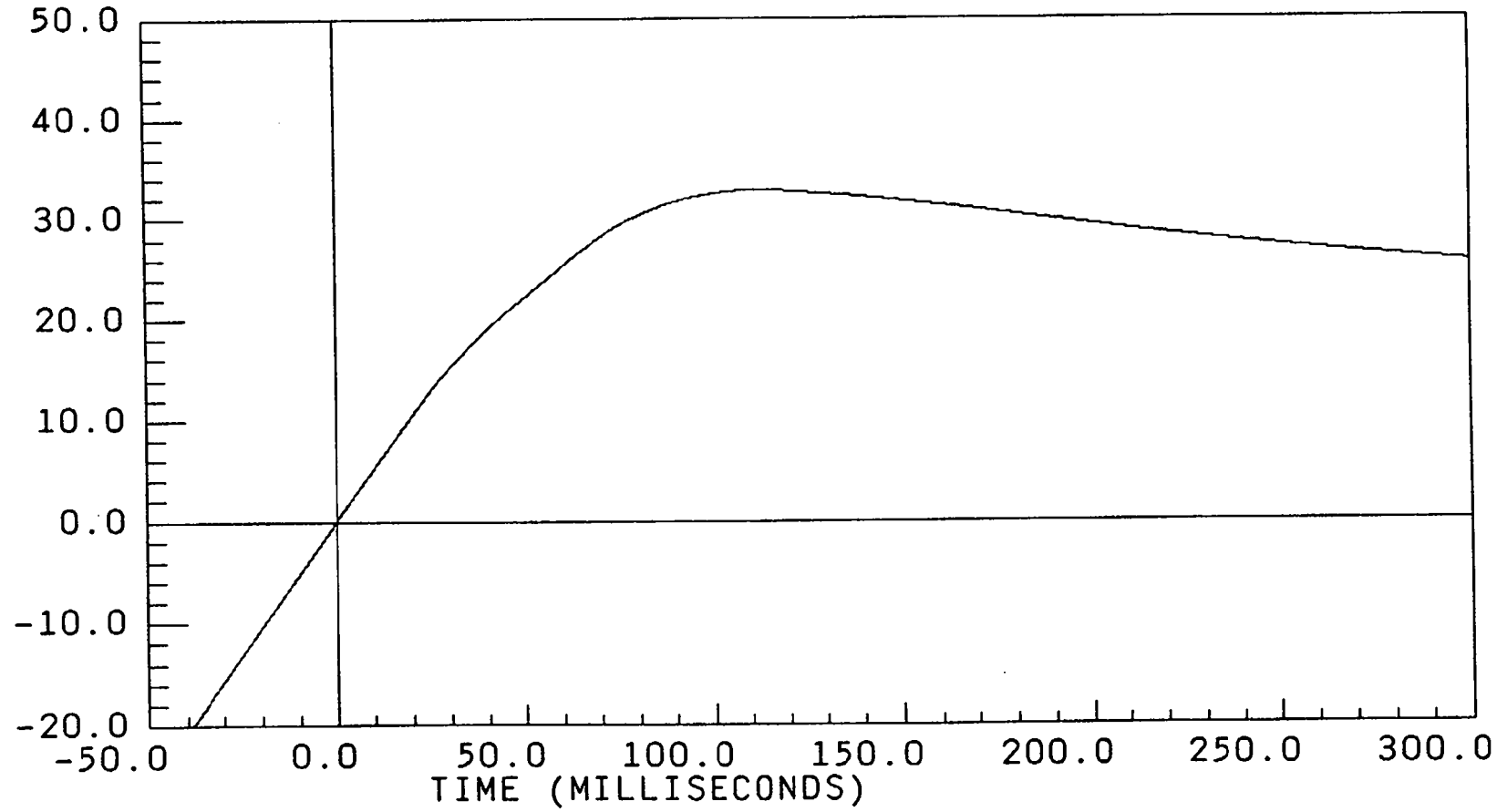
7804-3

D954-23.DAT

29.50 mph

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

XL AXIS
YMIN =-23.29629 at 176.3250
YMAX = 32.88345 at 112.7250



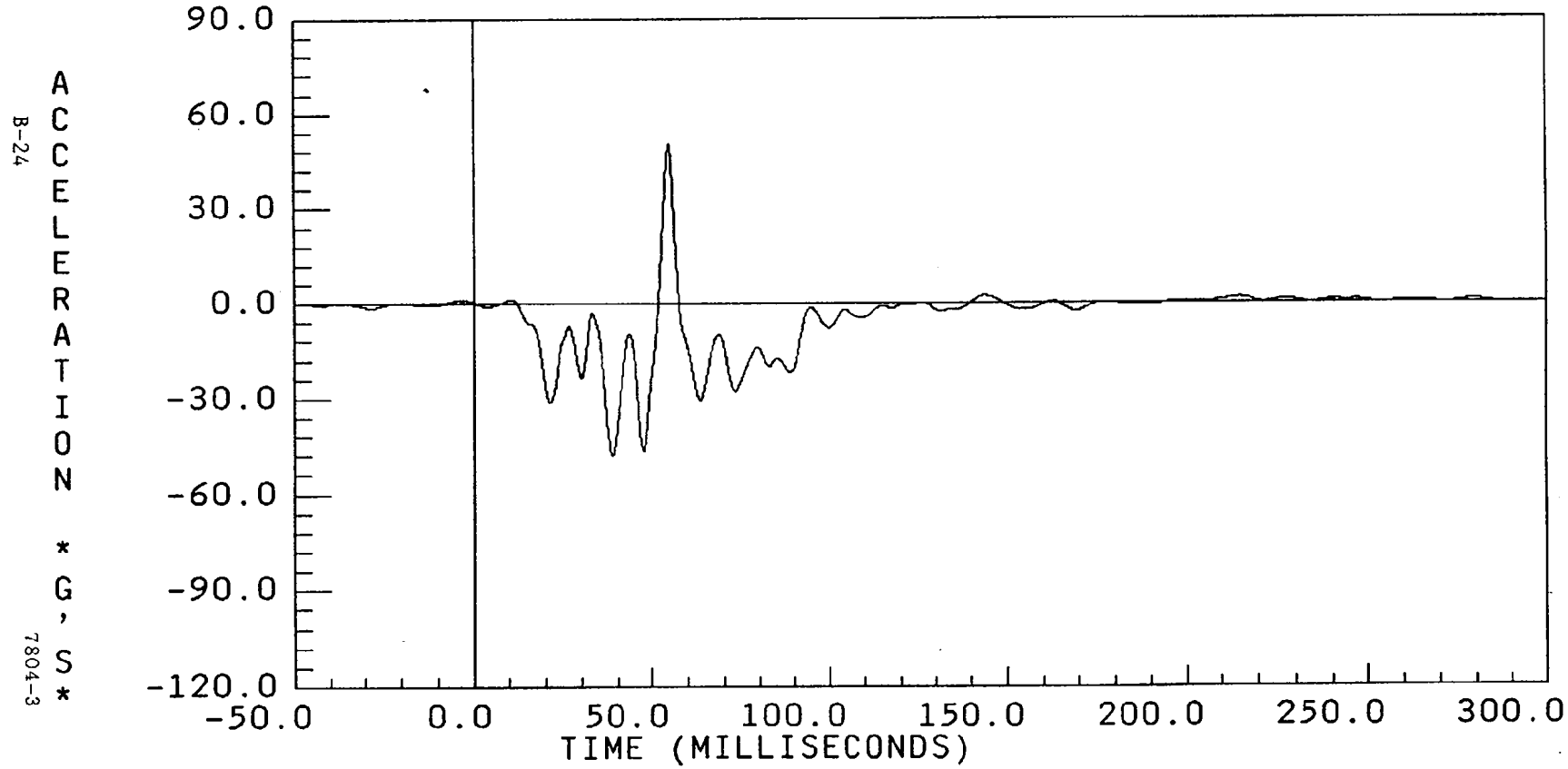
7804-3

BW954-24.DAT

29.50 mph

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

XL AXIS
YMIN =-47.99472 at 38.70000
YMAX = 50.36903 at 54.82500

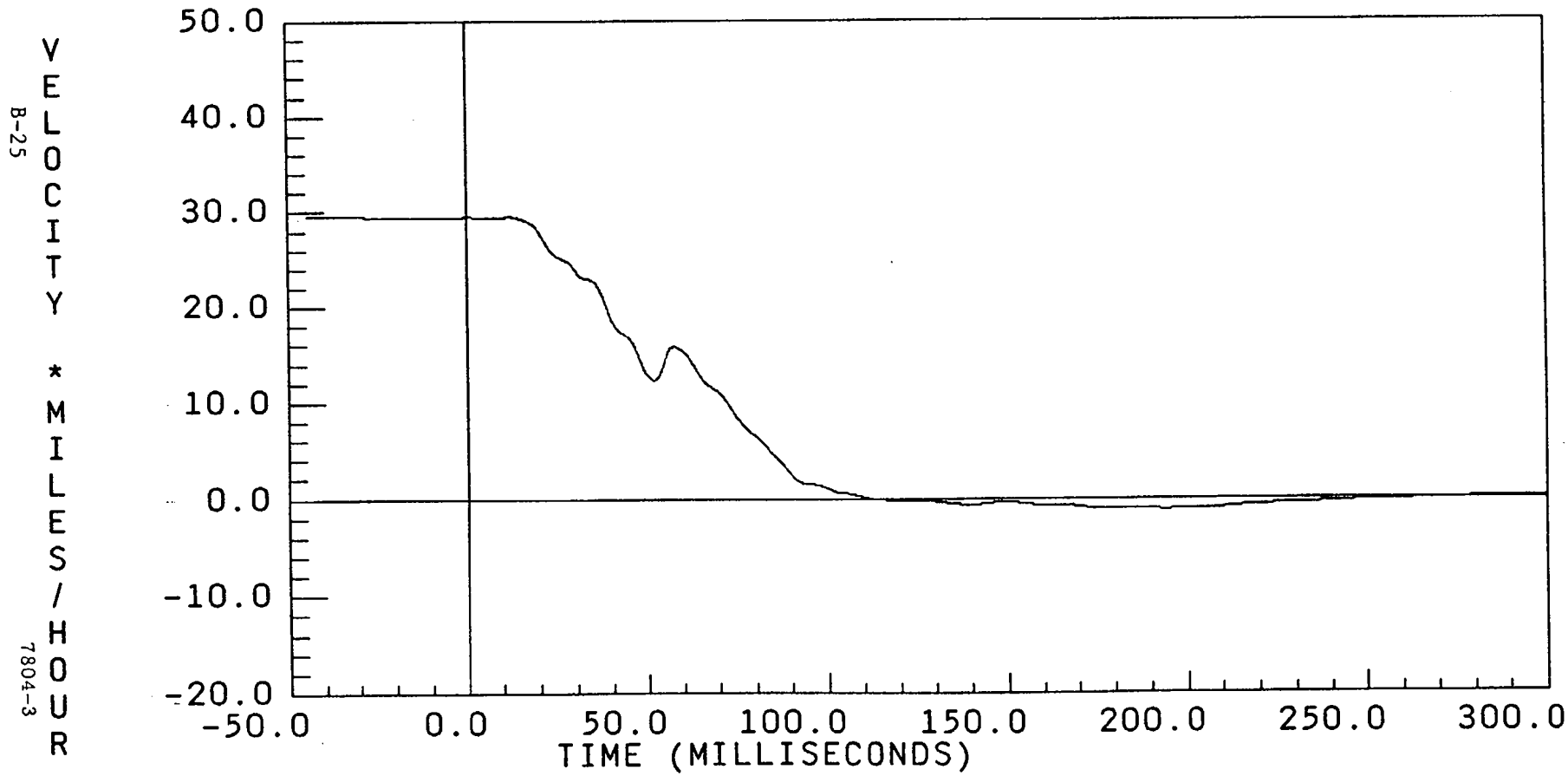


V954-24.DAT

29.50 mph

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

XL AXIS
YMIN =-1.147604 at 194.0250
YMAX = 29.60148 at 54.82500



B-25

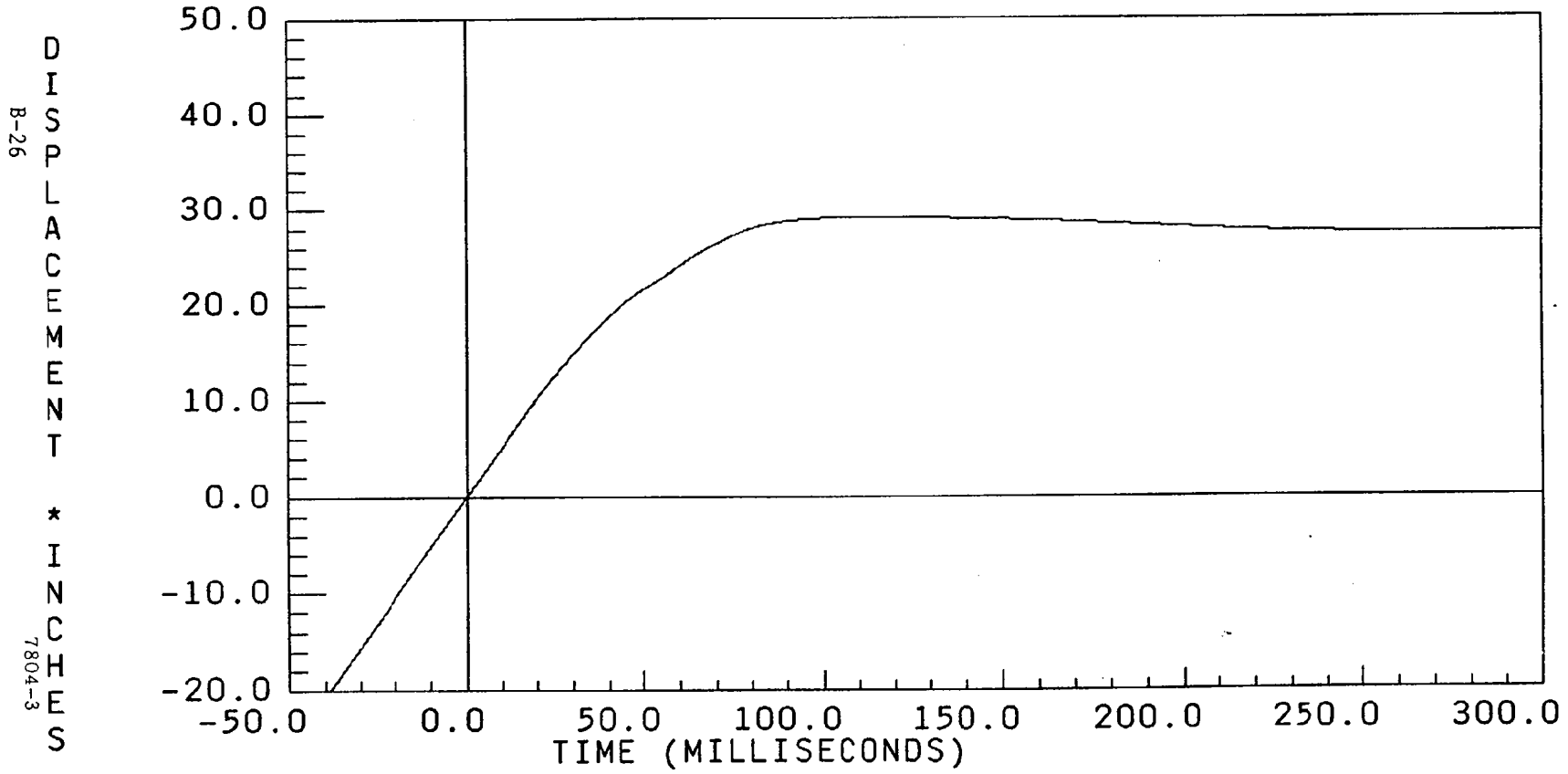
7804-3

D954-24.DAT

29.50 mph

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

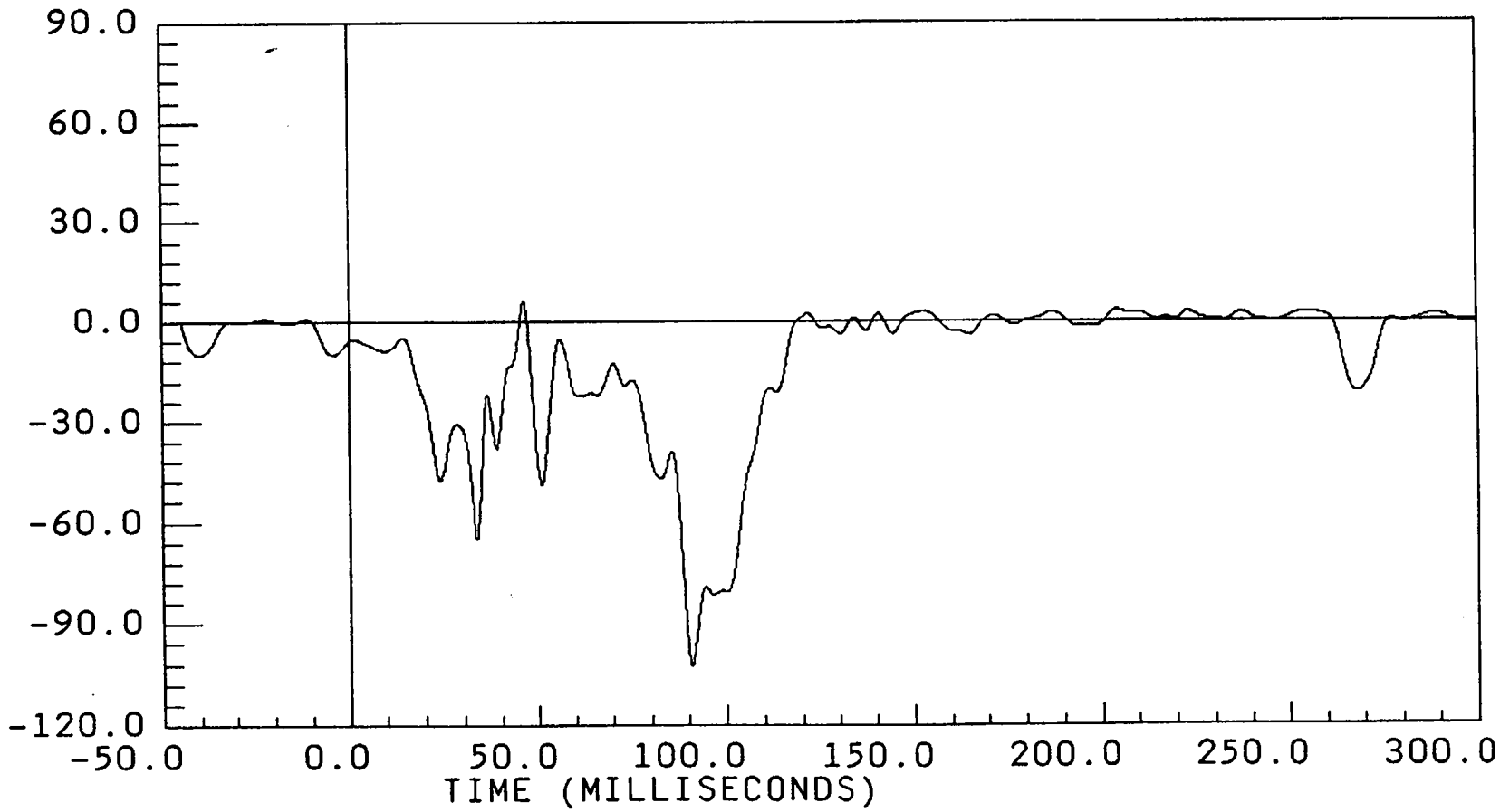
XL AXIS
YMIN =-23.30759 at 194.0250
YMAX = 29.11791 at 111.6750



BW954-25.DAT

29.50 mph

ACC PACK #9(X)
FILTERED
FILTER CUTOFF: 100Hz
XL AXIS
YMIN =-102.5857 at 90.67500
YMAX = 6.428158 at 46.42500
QUESTIONABLE DATA; ACCELEROMETER PASSED PRE-TEST VERIFICATION.



B-27

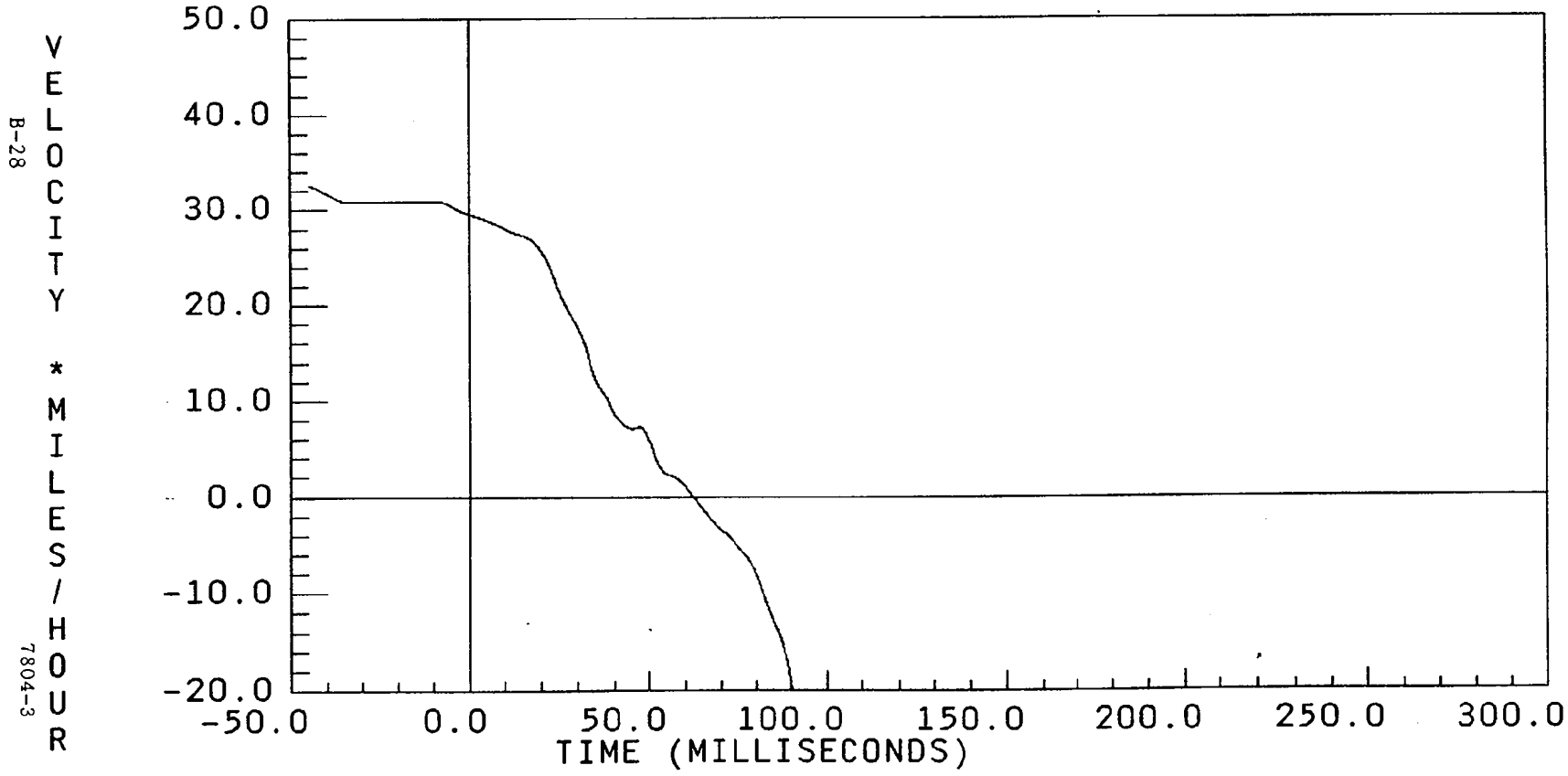
7804-3

V954-25.DAT

29.50 mph

ACC PACK #9(X)
COMPUTED
FILTER CUTOFF: 100Hz
QUESTIONABLE DATA; ACCELEROMETER PASSED PRE-TEST VERIFICATION.

XL AXIS
YMIN =-55.63179 at 276.7500
YMAX = 32.50896 at 46.42500



B-28

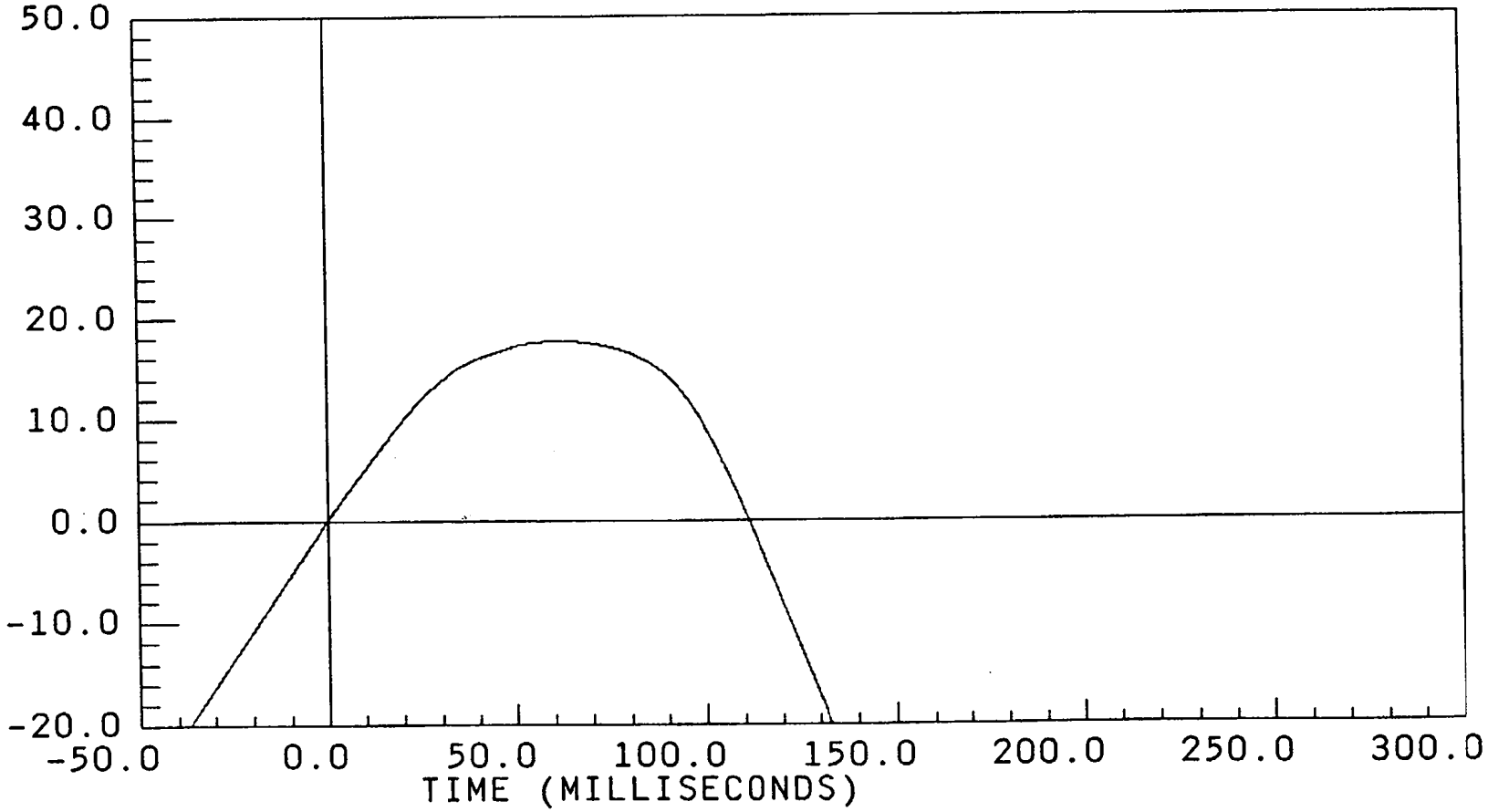
7804-3

D954-25.DAT

29.50 mph

ACC PACK #9(X)
COMPUTED
FILTER CUTOFF: 100Hz
QUESTIONABLE DATA; ACCELEROMETER PASSED PRE-TEST VERIFICATION.

XL AXIS
YMIN =-176.9122 at 300.0000
YMAX = 17.73445 at 62.17500



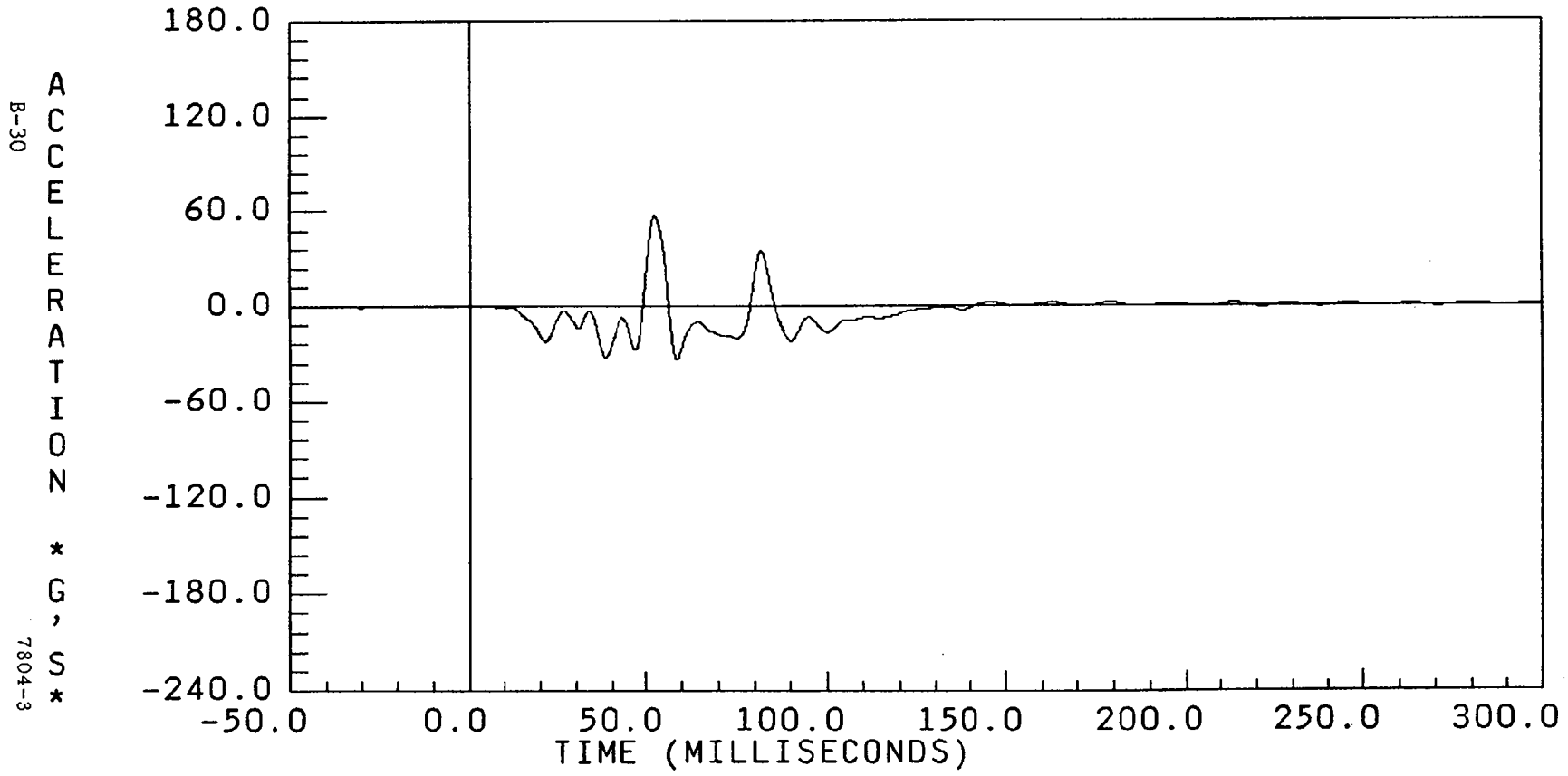
7804-3

BW954-26.DAT

29.50 mph

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

XL AXIS
YMIN =-33.80363 at 58.72500
YMAX = 57.26711 at 52.42500

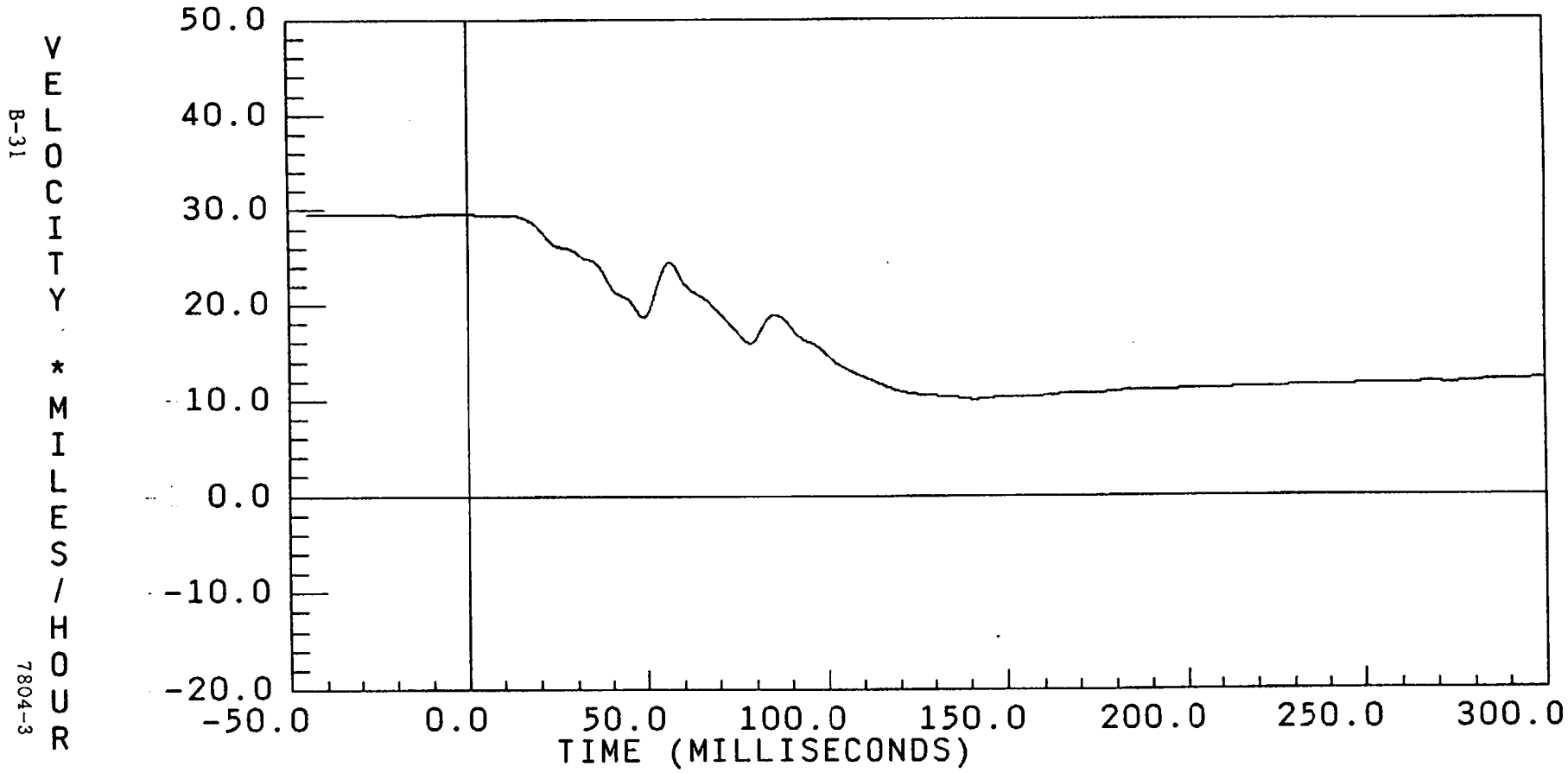


V954-26.DAT

29.50 mph

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

XL AXIS
YMIN = 10.04911 at 141.4500
YMAX = 29.49692 at -31.80000



B-31

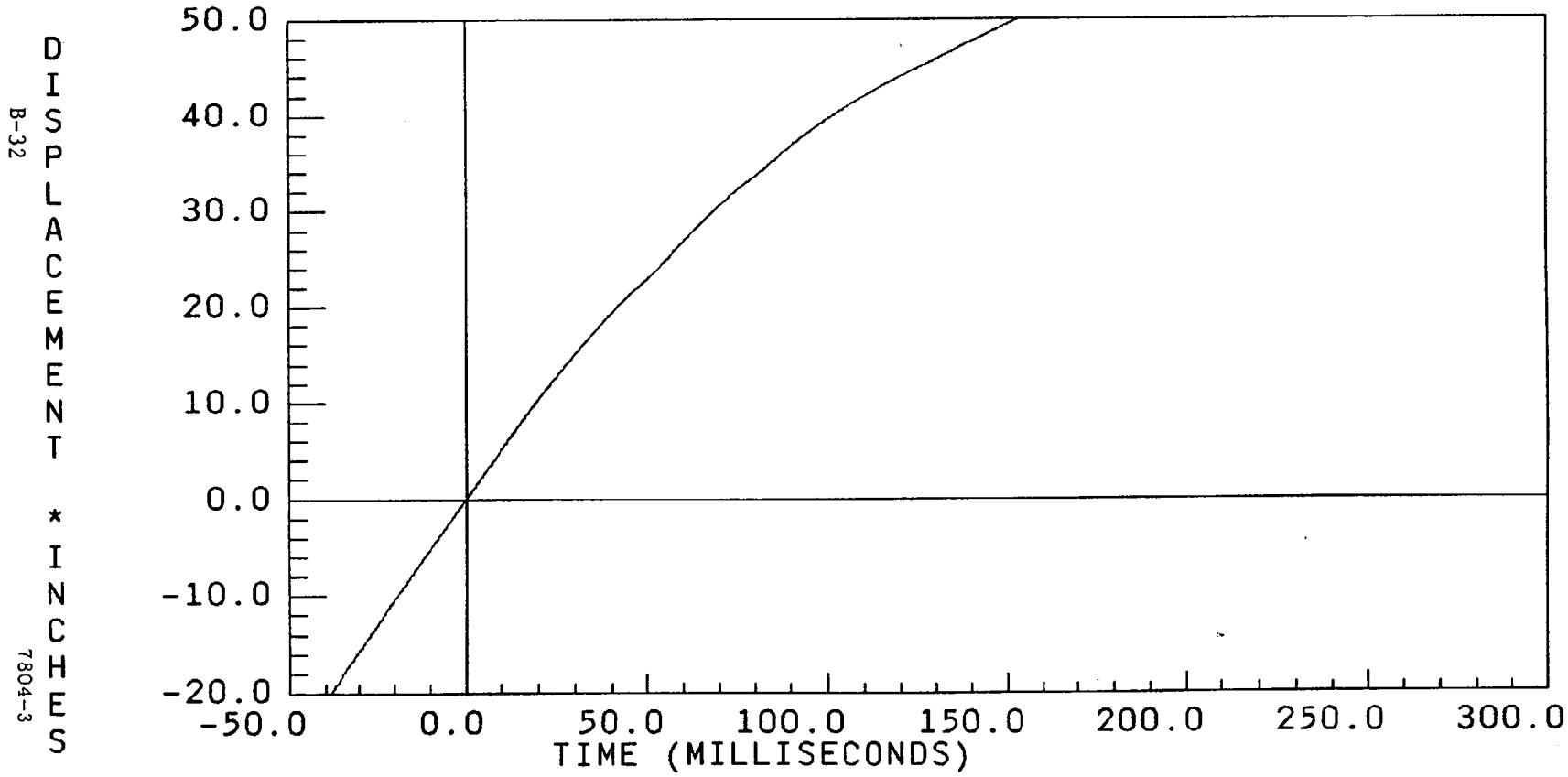
7804-3

D954-26.DAT

29.50 mph

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

XL AXIS
YMIN =-23.32793 at 141.4500
YMAX = 79.09748 at 300.0000

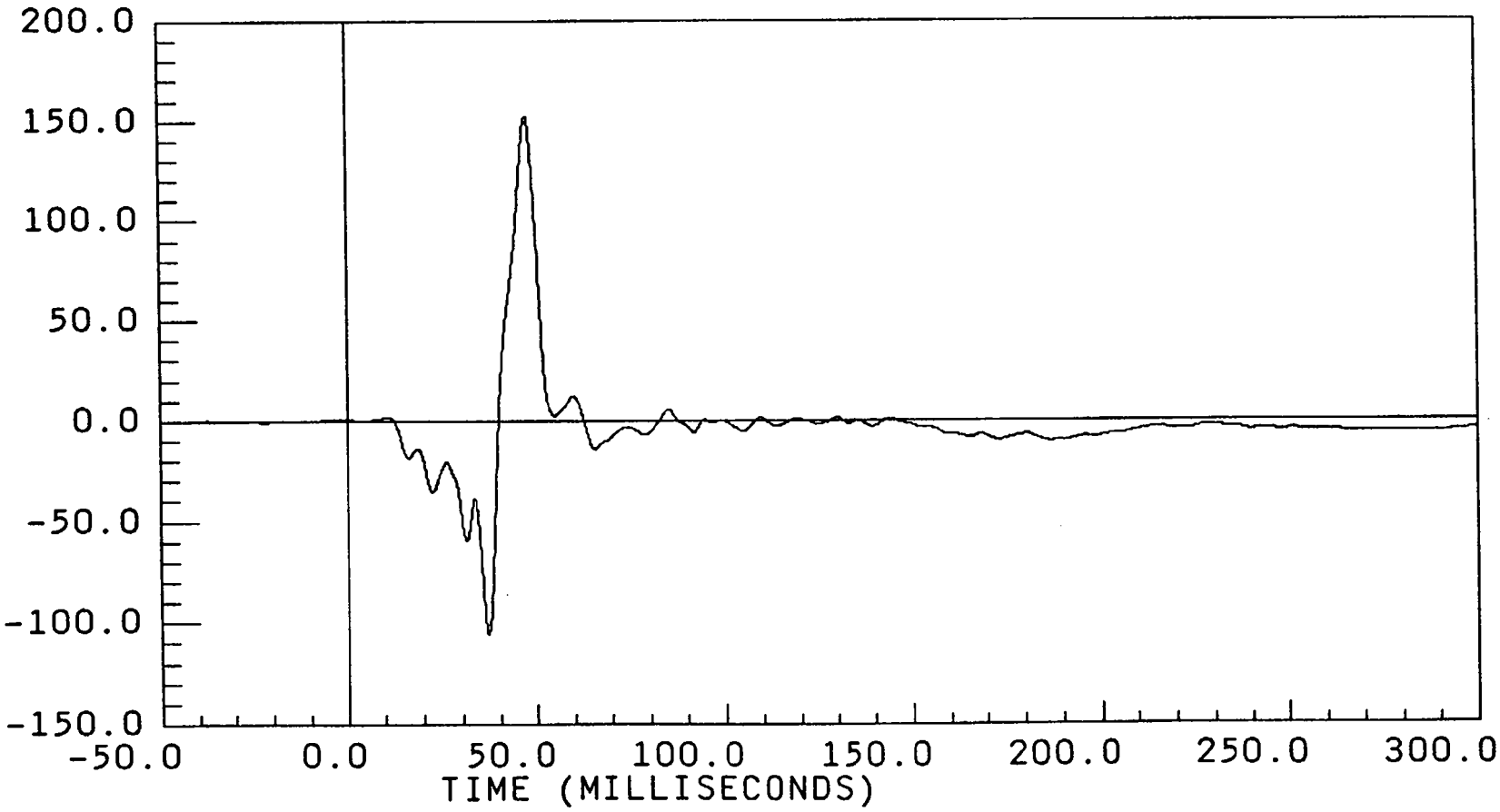


BW954-27.DAT

29.50 mph

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

XL AXIS
YMIN =-106.0836 at 37.05000
YMAX = 152.4911 at 47.62500

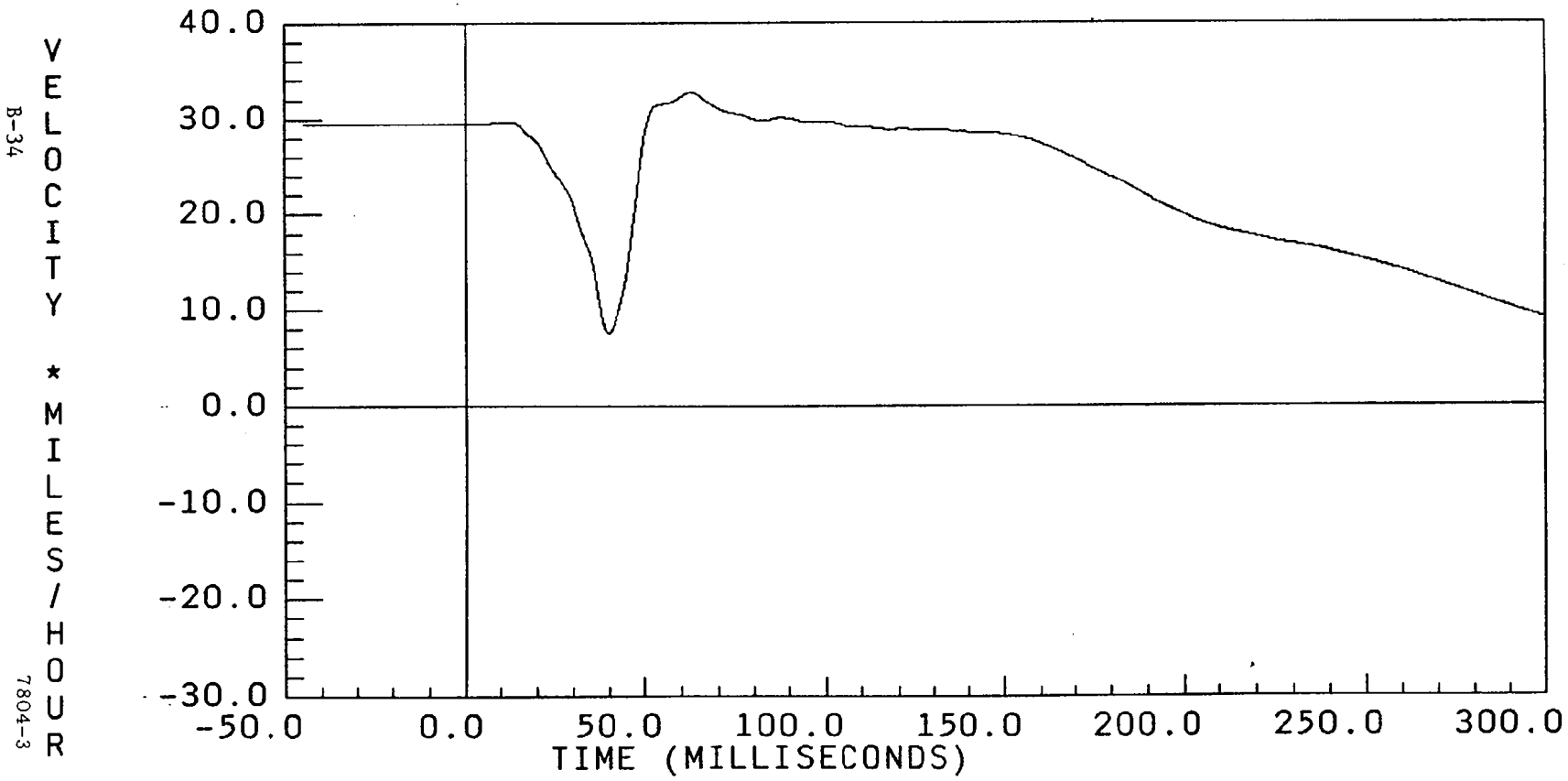


V954-27.DAT

29.50 mph

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

XL AXIS
YMIN = 7.514594 at 40.05000
YMAX = 32.73837 at 62.77500



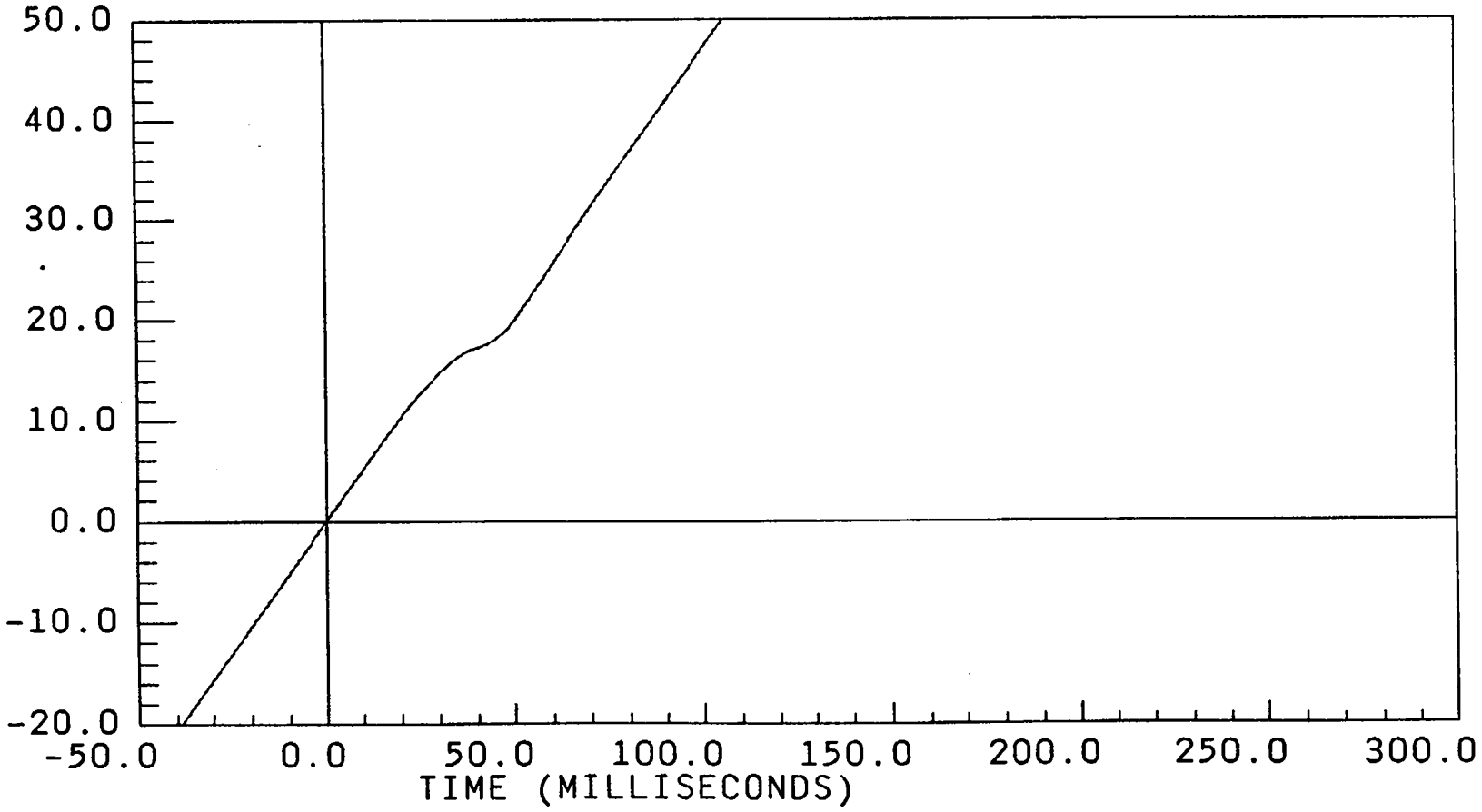
7804-3

D954-27.DAT

29.50 mph

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

XL AXIS
YMIN =-23.28829 at 40.05000
YMAX = 119.9486 at 300.0000



TEST NO. CL0204

DUMMY DATA

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

HEAD INJURY CRITERION
HEAD SEVERITY INDEX
36MS. MAXIMUM DURATION

NHTSA CRASH TEST - PROC. 208

RUN= 954

POS#1 HEAD R

HIC= 433.2 FROM T1= .10117 TO T2= .10852

AVERAGE ACCELERATION BETWEEN T1 AND T2= 80.9G'S

EVENT TIME= 300.0 MSEC

SEVERITY INDEX= 659.3

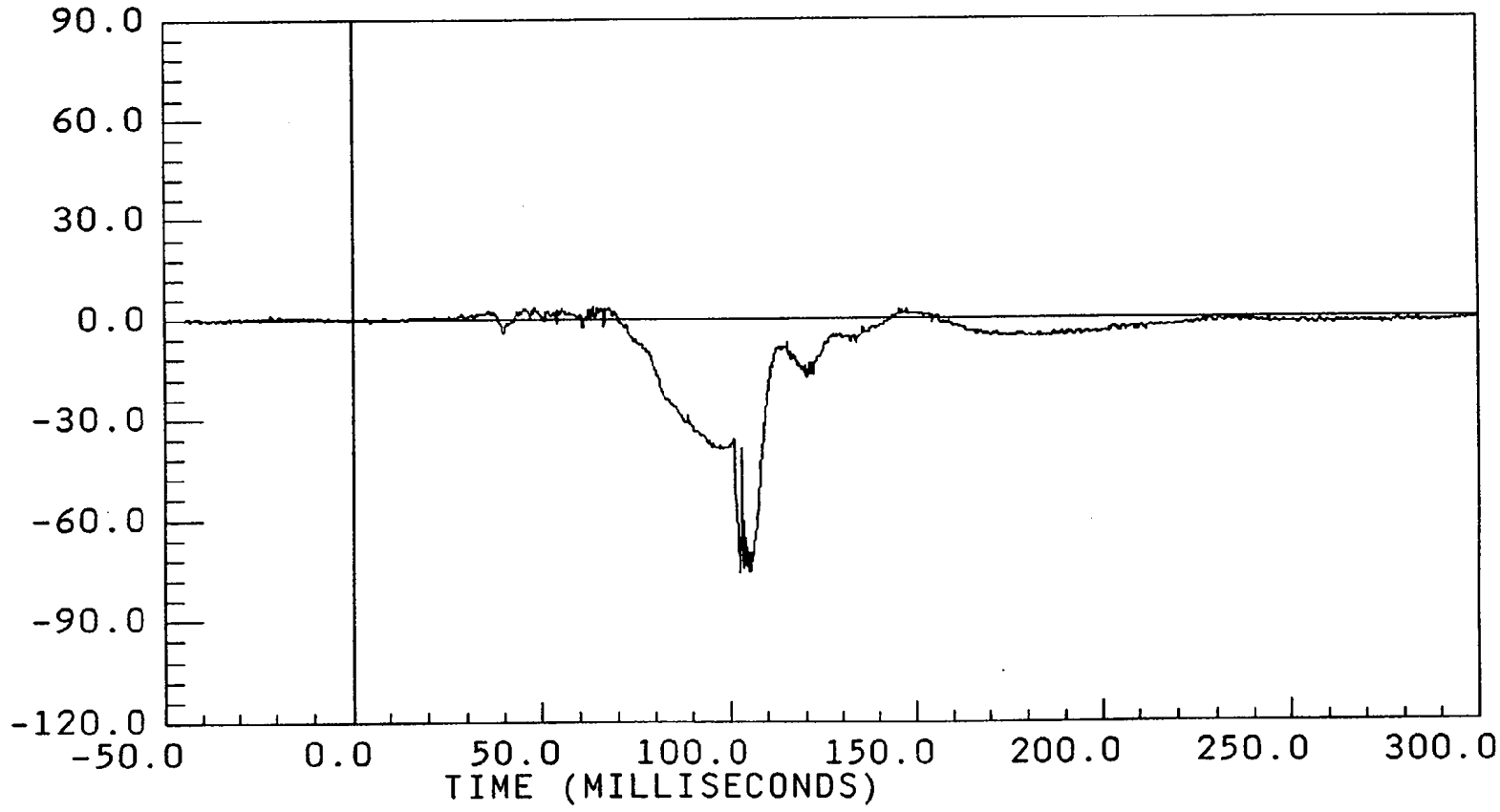
UDS$954-1.DAT

29.50 mph

POS#1 HEAD X

FILTER CUTOFF: OHz

XL AXIS
YMIN =-76.13900 at 102.6750
YMAX = 4.217400 at 63.75000



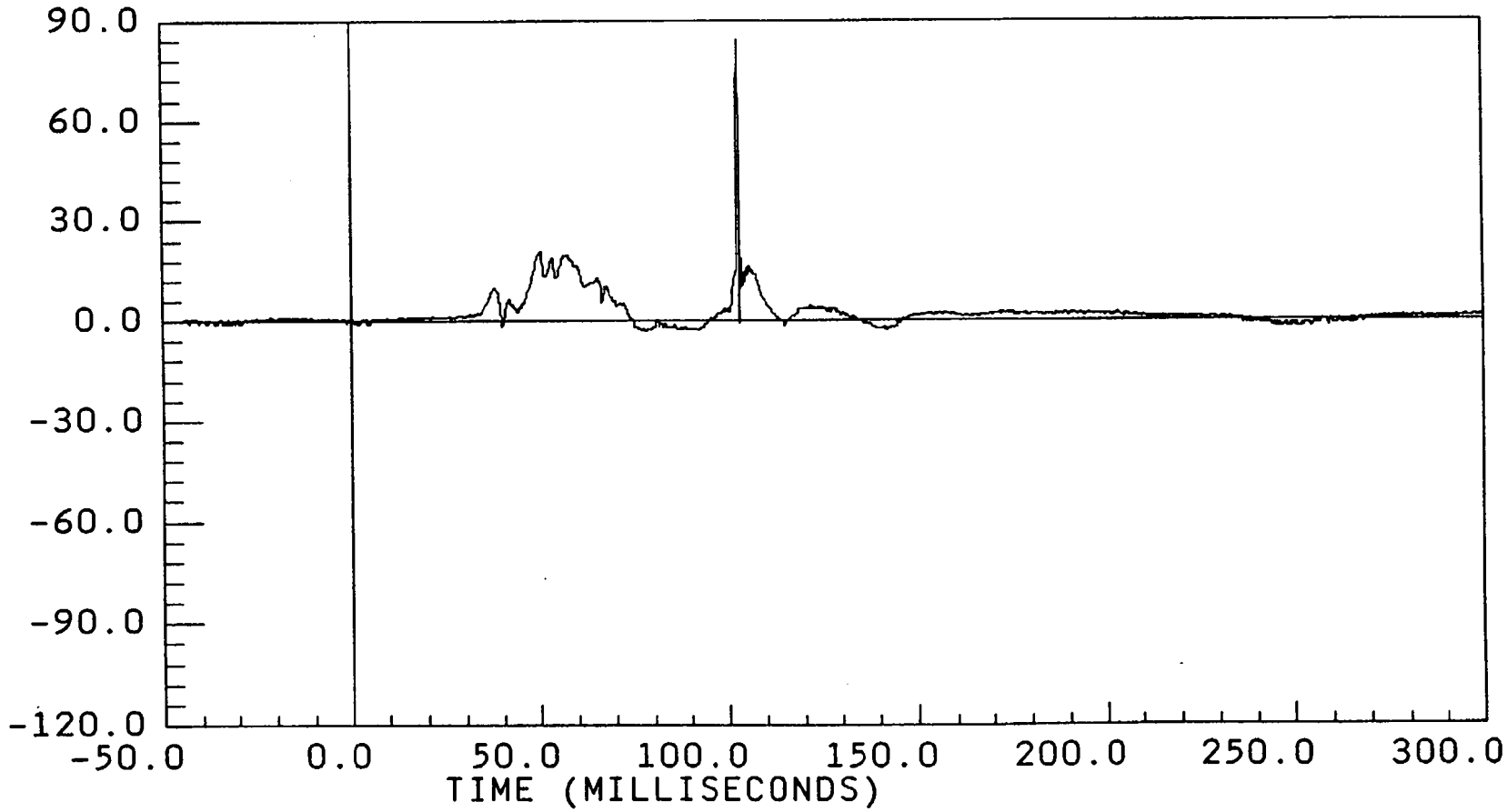
UDS$954-2.DAT

0.00 mph

POS#1 HEAD Y

FILTER CUTOFF: OHz

YL AXIS
YMIN =-2.761900 at 77.02500
YMAX = 84.33900 at 103.0500



B-39

7804-3

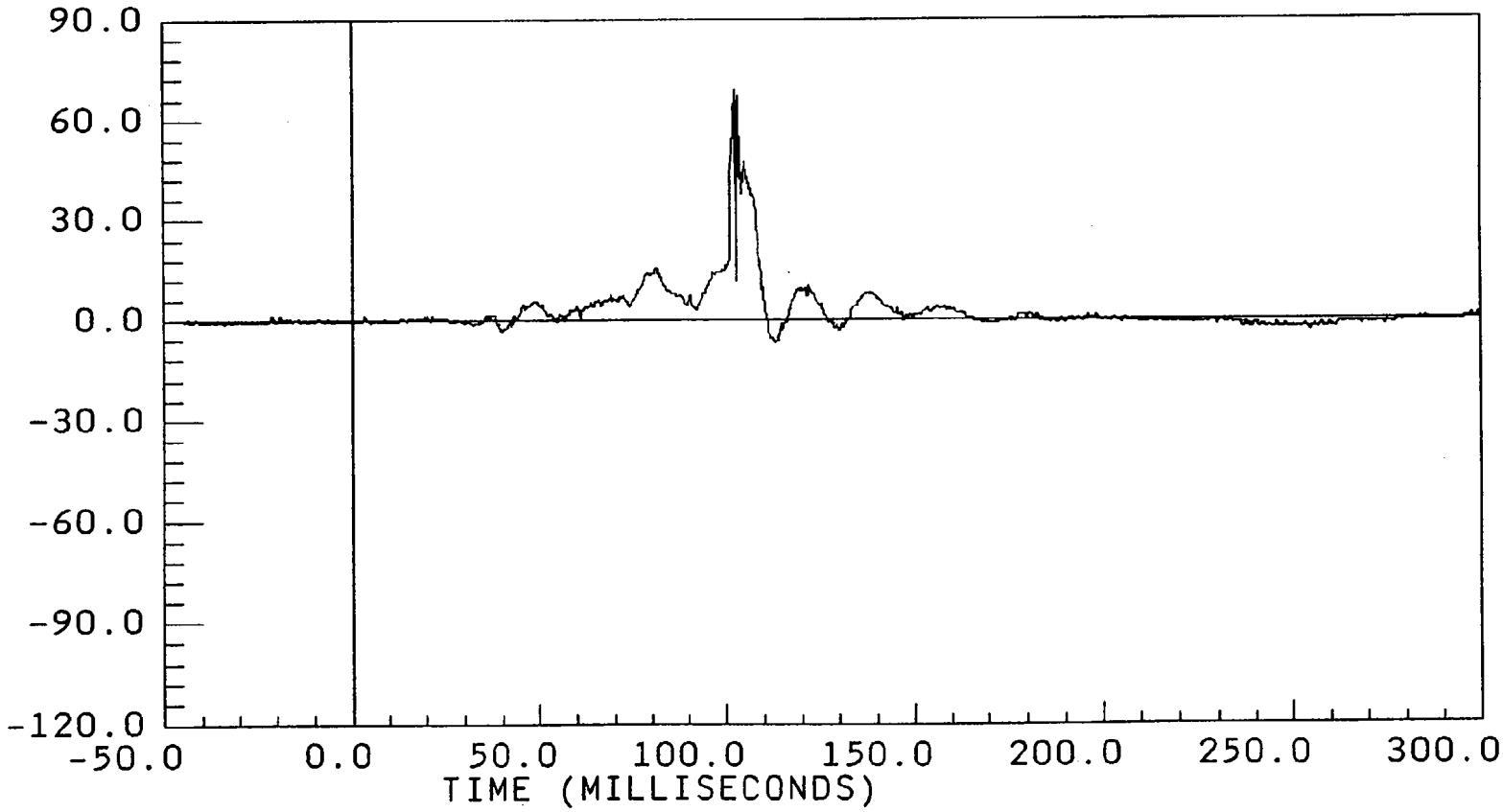
UDS$954-3.DAT

0.00 mph

POS#1 HEAD Z

FILTER CUTOFF: 0Hz

ZL AXIS
YMIN =-6.953600 at 113.0250
YMAX = 69.04600 at 102.6000



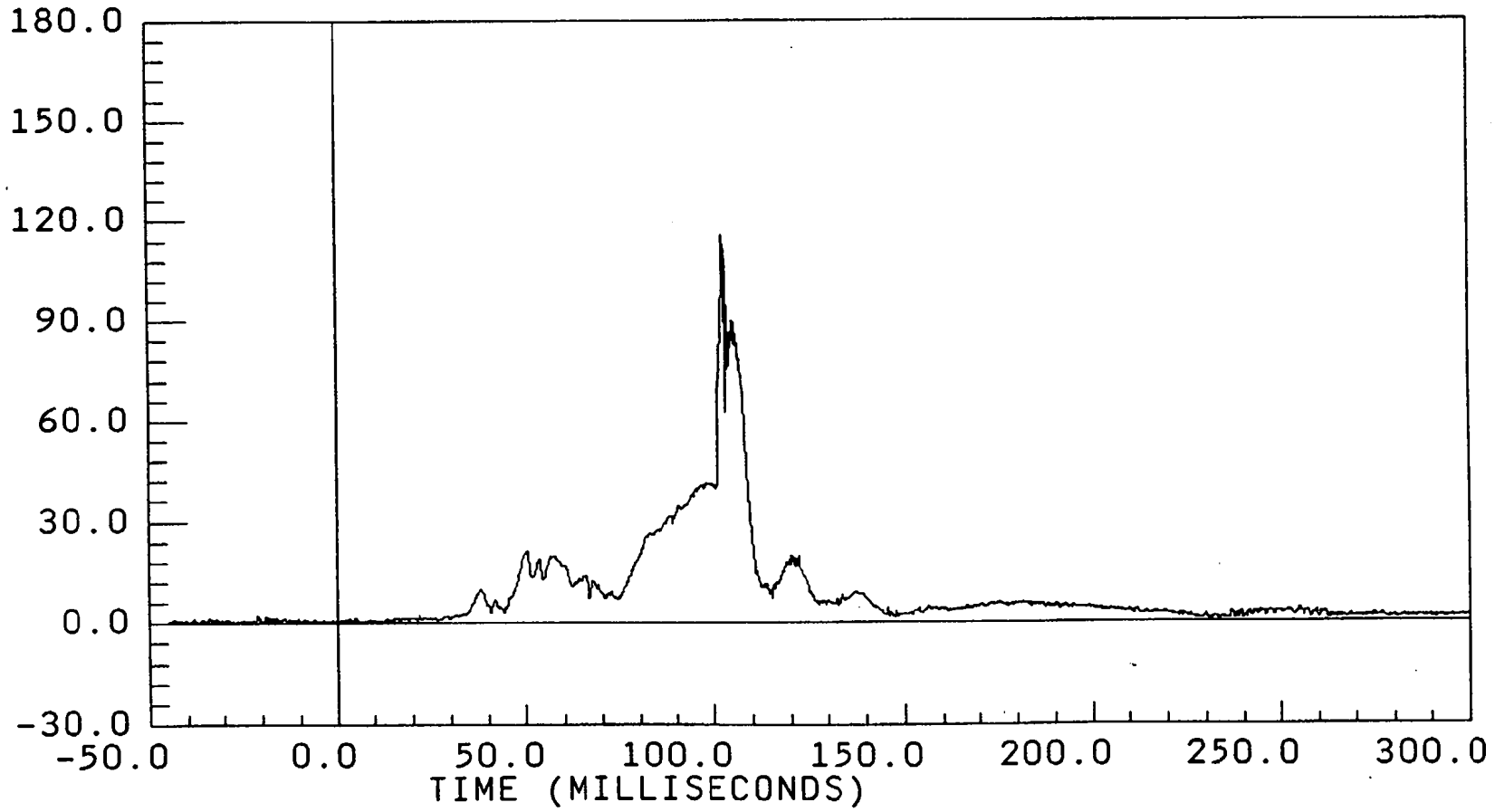
7804-3

HRES954-1.DAT

0.00 mph

POS#1 HEAD
NONSTANDARD
FILTER CUTOFF: 0Hz

RS AXIS
YMIN = 0.560068 at -44.85000
YMAX = 115.6385 at 102.7500



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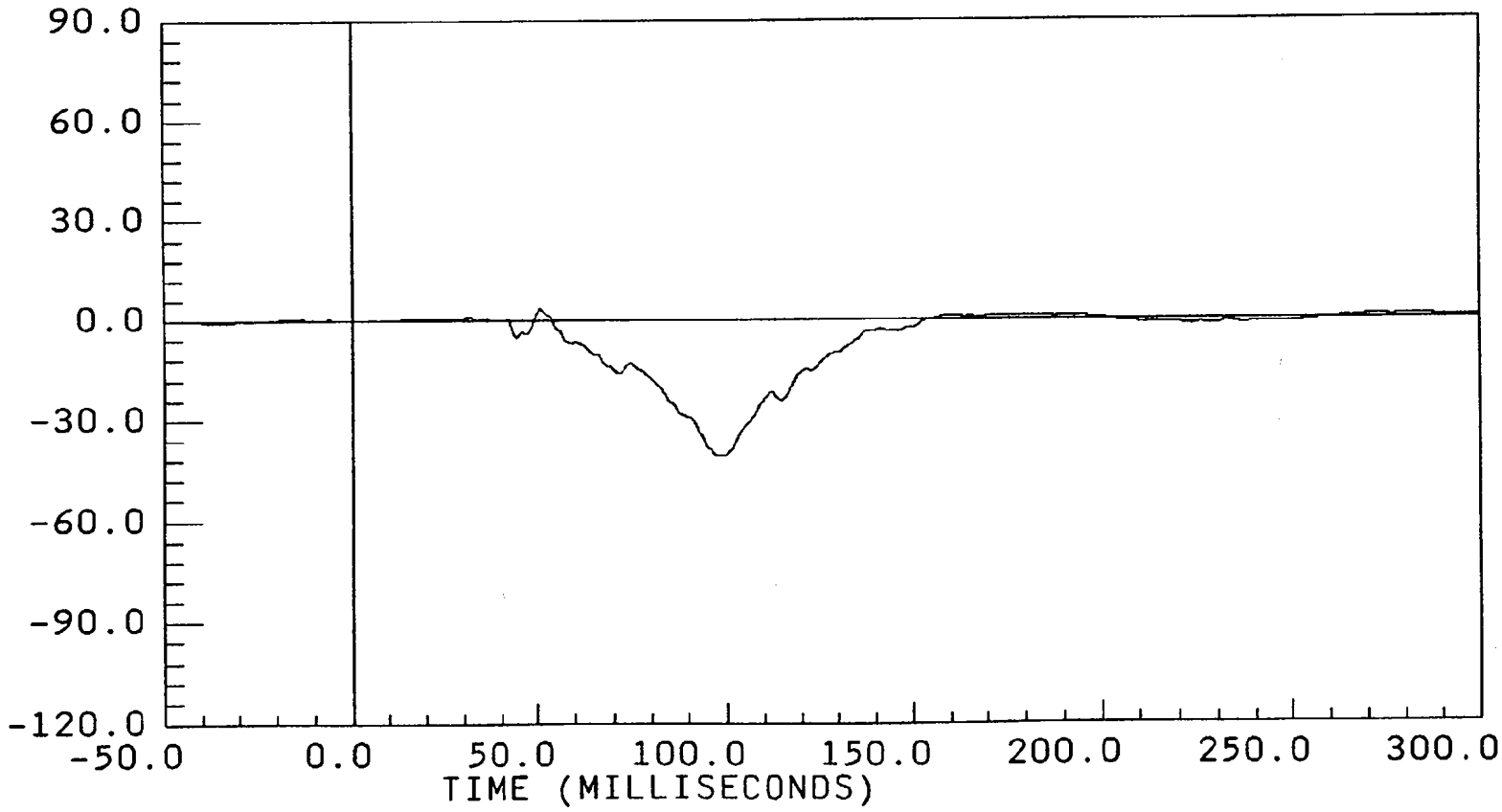
7804-3

BW954-4.DAT

29.50 mph

POS#1 CHEST X
FILTERED
FILTER CUTOFF: 300Hz

XL AXIS
YMIN =-40.67431 at 98.02500
YMAX = 3.411948 at 50.92500



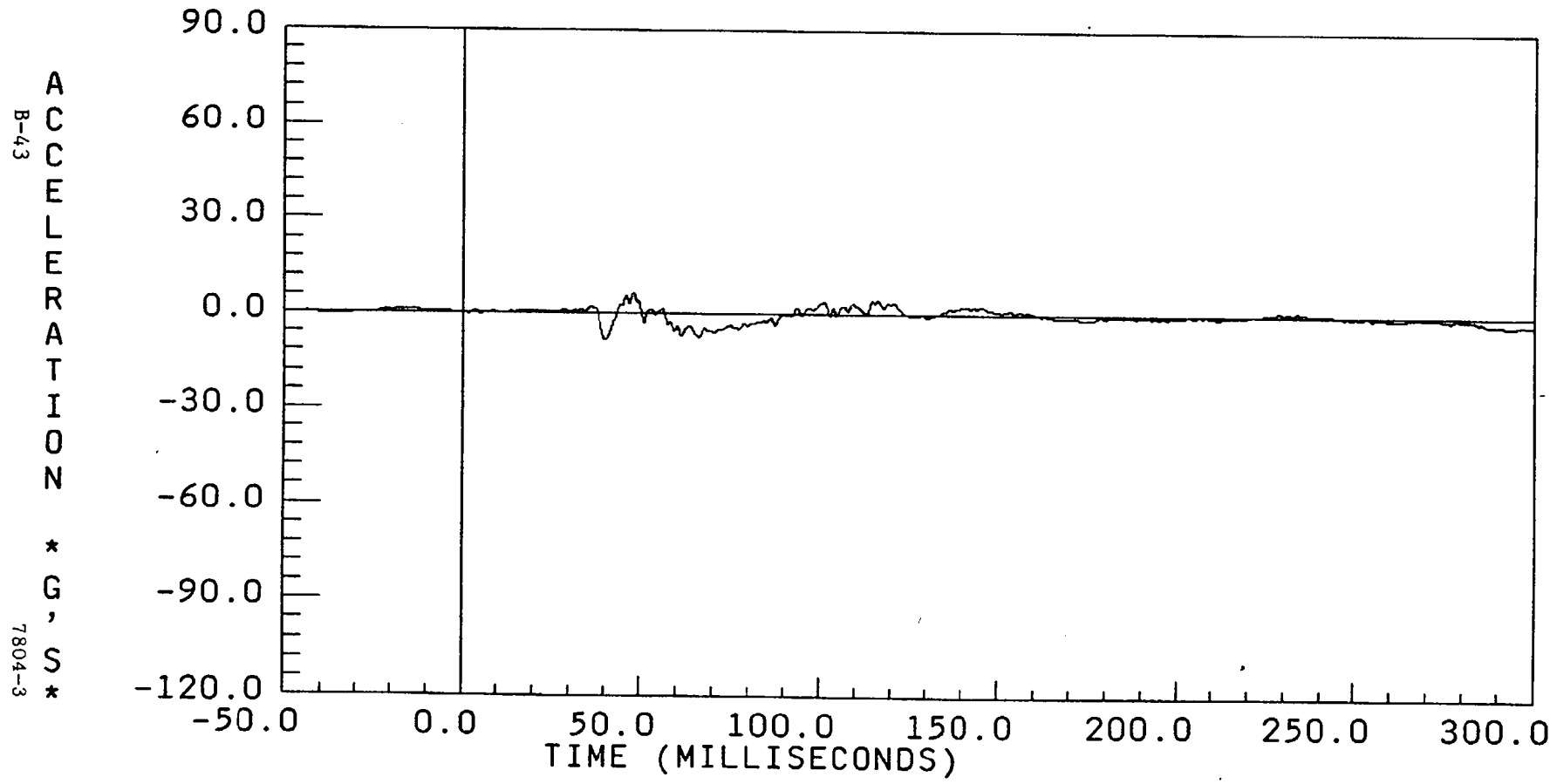
7804-3

BW954-5.DAT

0.00 mph

POS#1 CHEST Y
FILTERED
FILTER CUTOFF: 300Hz

YL AXIS
YMIN =-8.556803 at 40.35000
YMAX = 6.651744 at 48.00000

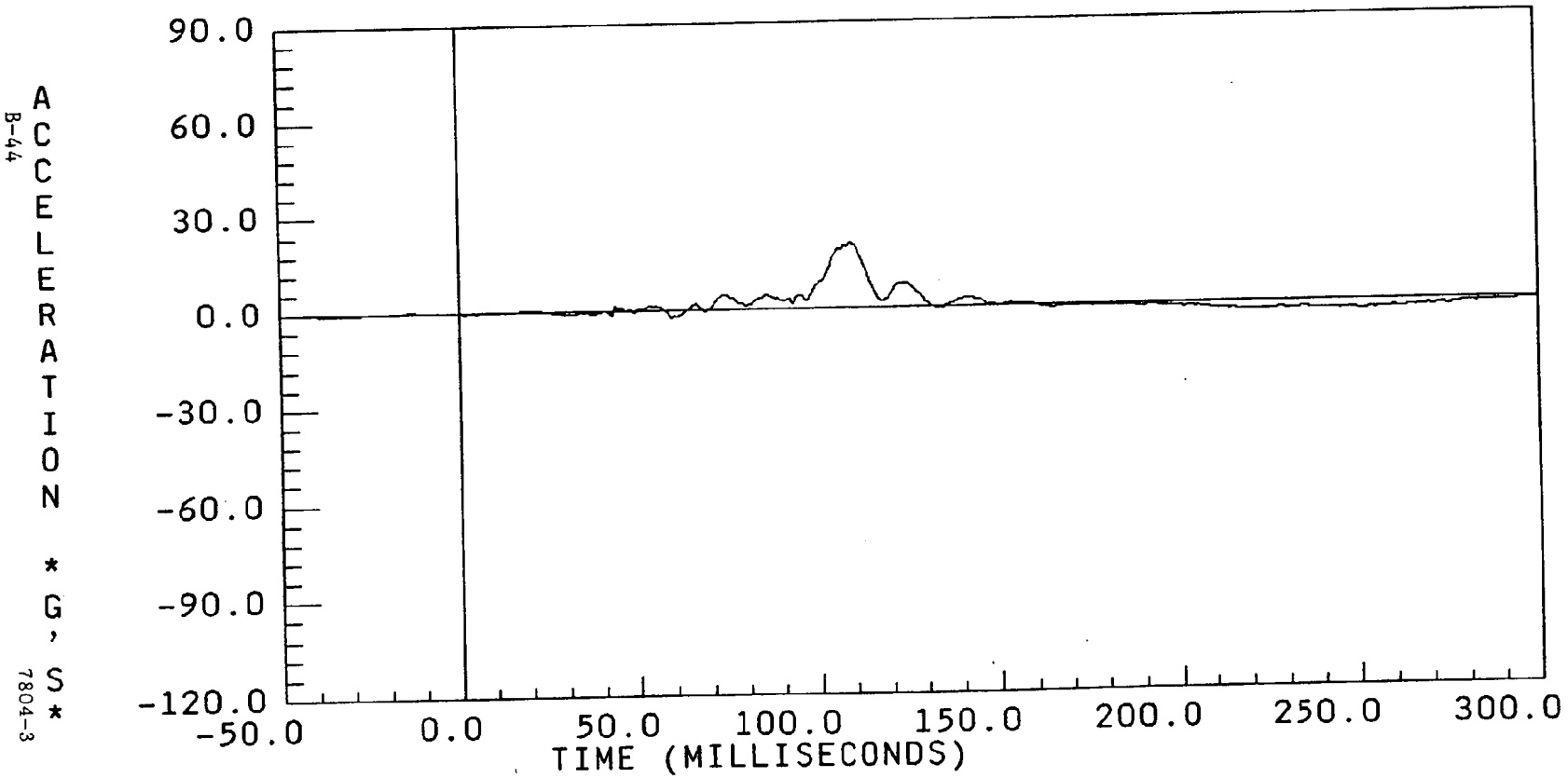


BW954-6.DAT

0.00 mph

POS#1 CHEST Z
FILTERED
FILTER CUTOFF: 300Hz

ZL AXIS
YMIN =-3.017980 at 251.5500
YMAX = 20.65440 at 109.0500

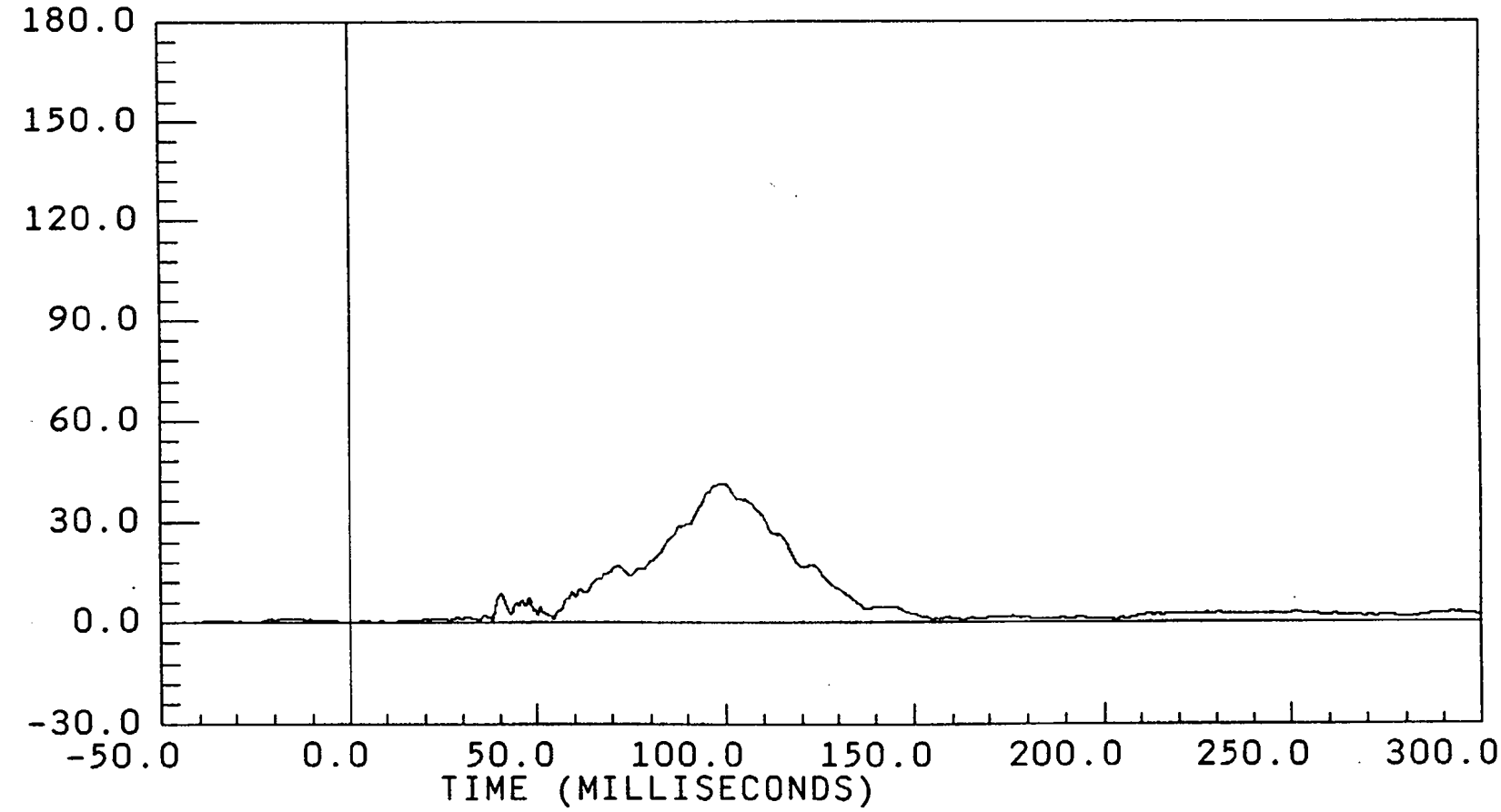


CHST954-1.DAT

0.00 mph

POS#1 CHEST
COMPUTED
FILTER CUTOFF: 300Hz

RS AXIS
YMIN =0.0142868 at 0.000000
YMAX = 41.36140 at 99.60001

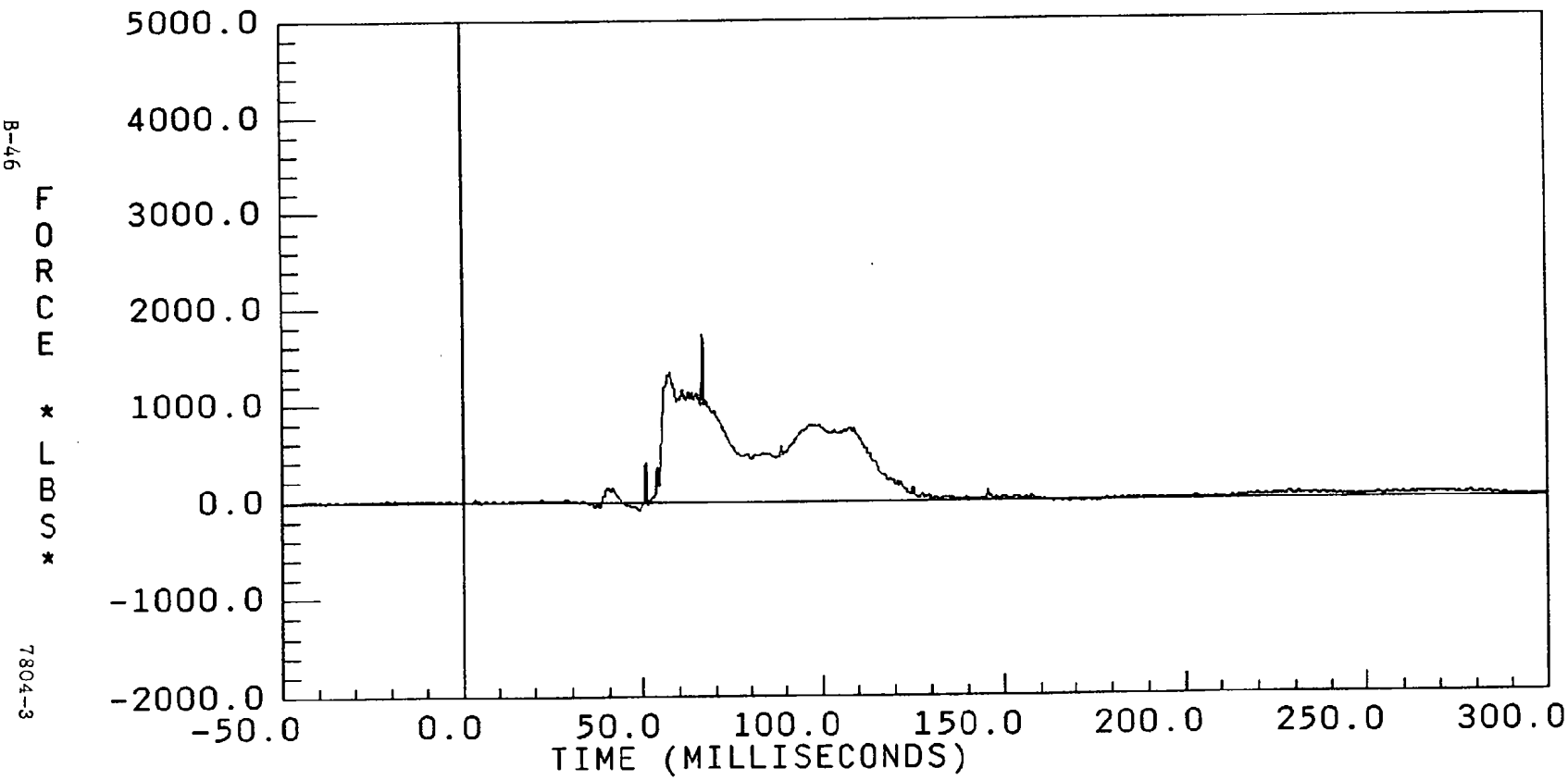


BW954-7.DAT

0.00 mph

POS#1 LEFT FEMUR
FILTERED
FILTER CUTOFF: 1000Hz

NA AXIS
YMIN =-92.80624 at 49.12500
YMAX = 1737.266 at 66.67500



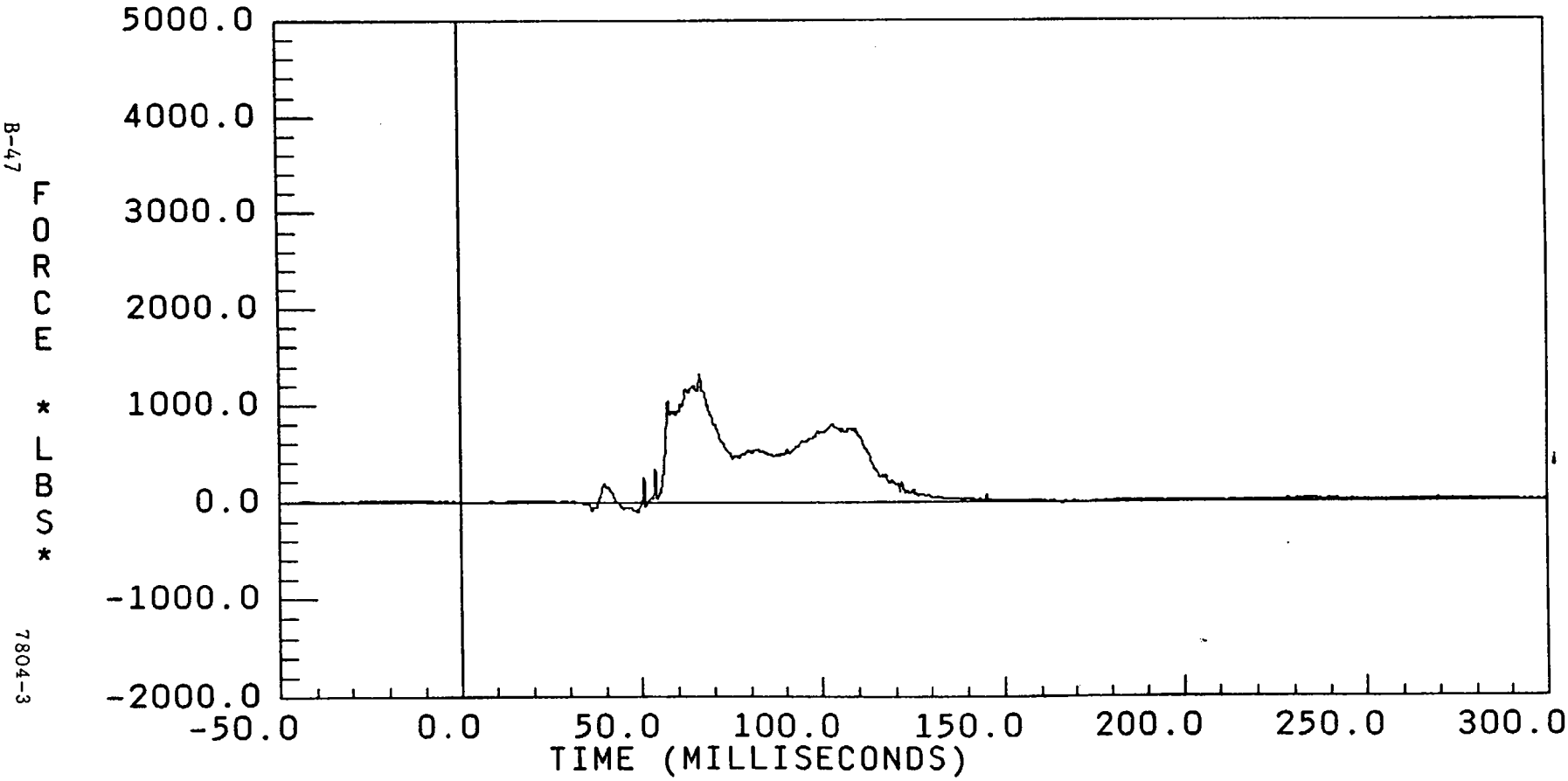
7804-3

BW954-8.DAT

0.00 mph

POS#1 RIGHT FEMUR
FILTERED
FILTER CUTOFF: 1000Hz

NA AXIS
YMIN =-110.2082 at 49.20000
YMAX = 1328.291 at 66.52500



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HEAD INJURY CRITERION
HEAD SEVERITY INDEX
36MS. MAXIMUM DURATION

NHTSA CRASH TEST - PROC. 208

RUN= 954

POS#2 HEAD R

HIC= 262.4 FROM T1= .08857 TO T2= .12457

AVERAGE ACCELERATION BETWEEN T1 AND T2= 35.1G'S

EVENT TIME= 300.0 MSEC

SEVERITY INDEX= 600.1

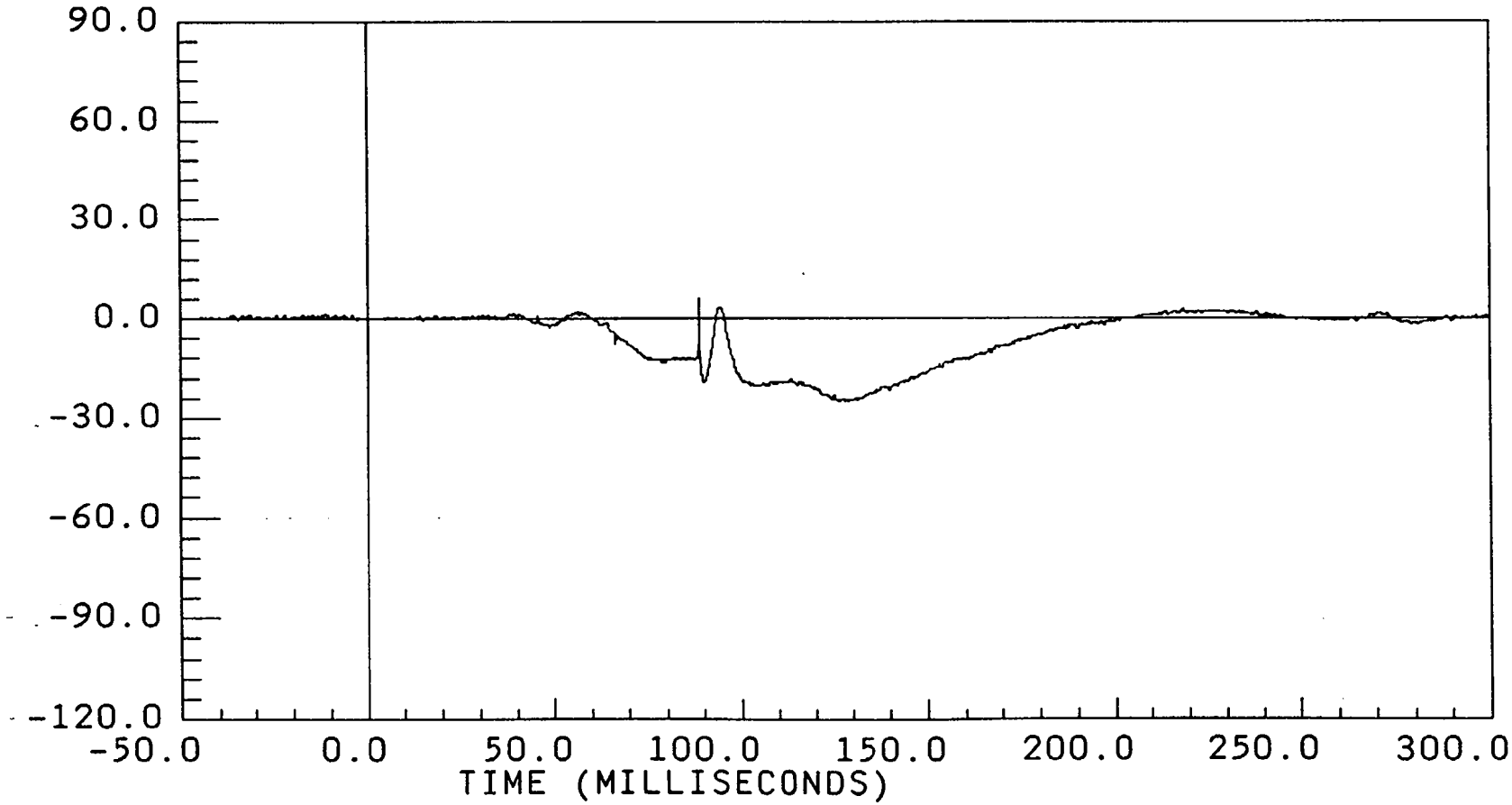
UDS$954-11.DA

29.50 mph

POS#2 HEAD X

FILTER CUTOFF: 0Hz

XL AXIS
YMIN =-25.35700 at 126.5250
YMAX = 6.636100 at 88.87500



7804-3

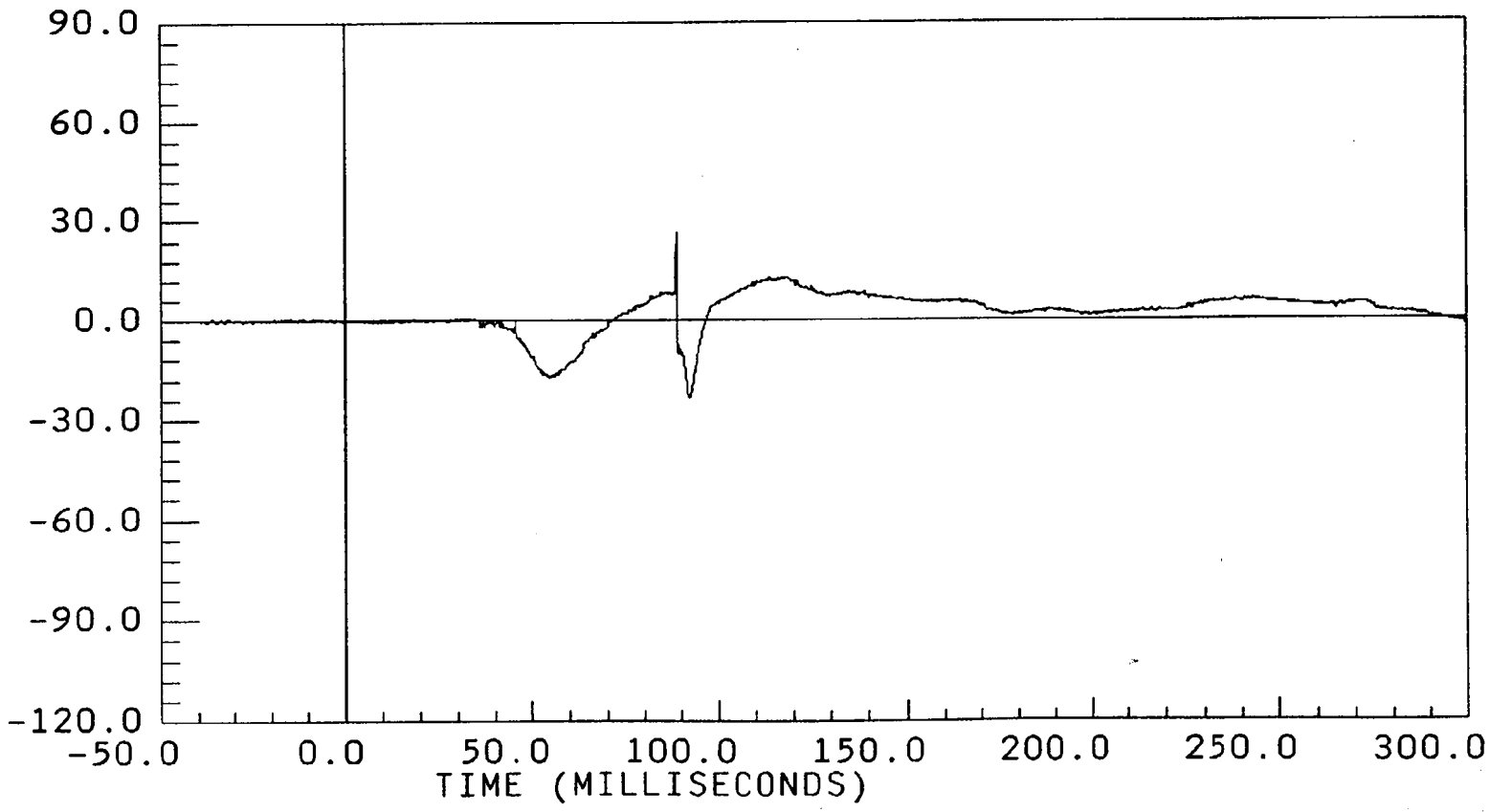
UDS$954-12.DA

0.00 mph

POS#2 HEAD Y

FILTER CUTOFF: 0Hz

YL AXIS
YMIN =-23.16100 at 91.95000
YMAX = 26.53500 at 88.72501



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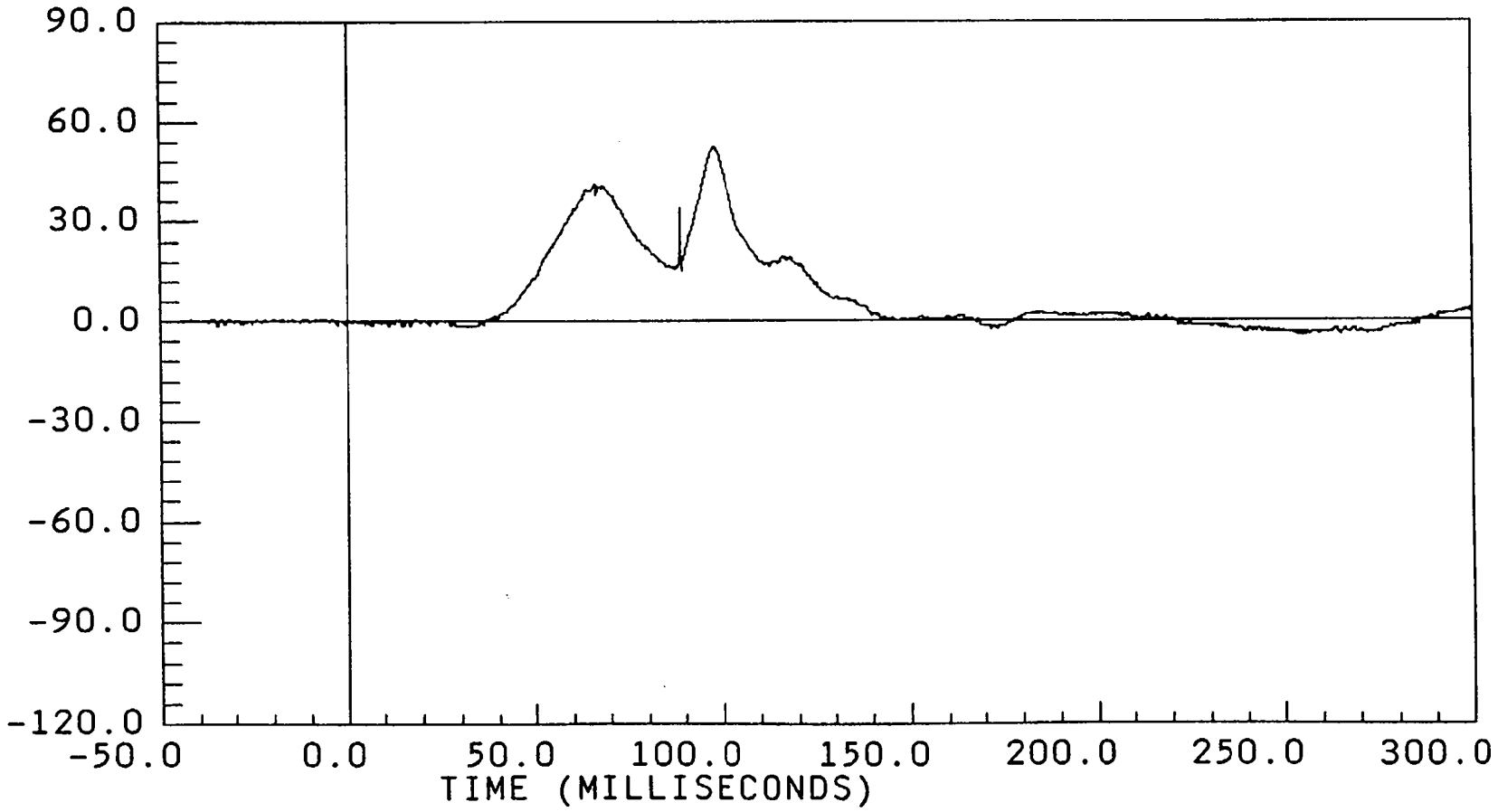
UDS$954-13.DA

0.00 mph

POS#2 HEAD Z

FILTER CUTOFF: OHz

ZL AXIS
YMIN =-4.355300 at 253.3500
YMAX = 52.24000 at 97.87501



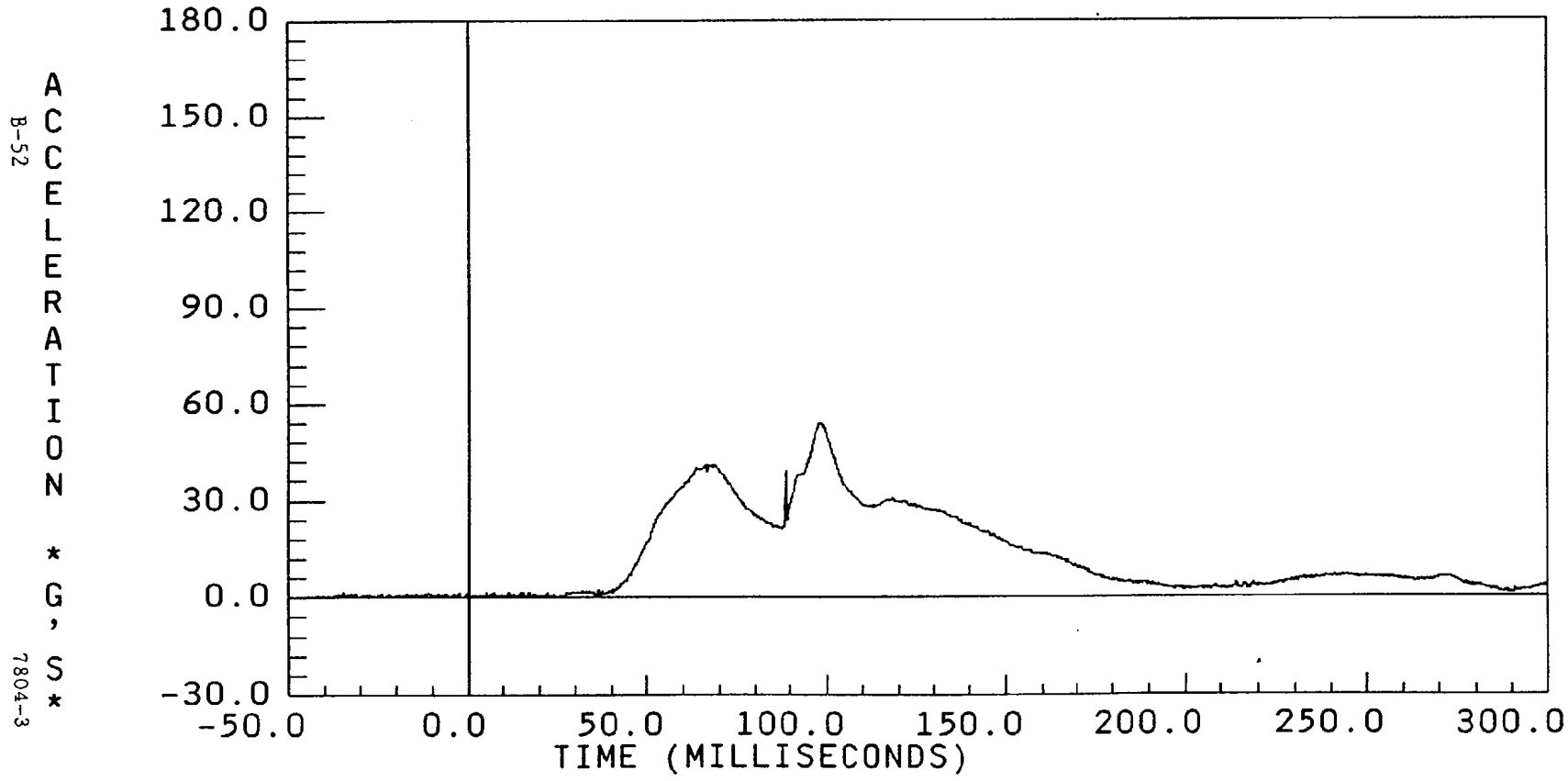
7804-3

HRES954-2.DAT

0.00 mph

POS#2 HEAD
NONSTANDARD
FILTER CUTOFF: 0Hz

RS AXIS
YMIN = 0.144157 at 253.3500
YMAX = 54.12689 at 98.17500

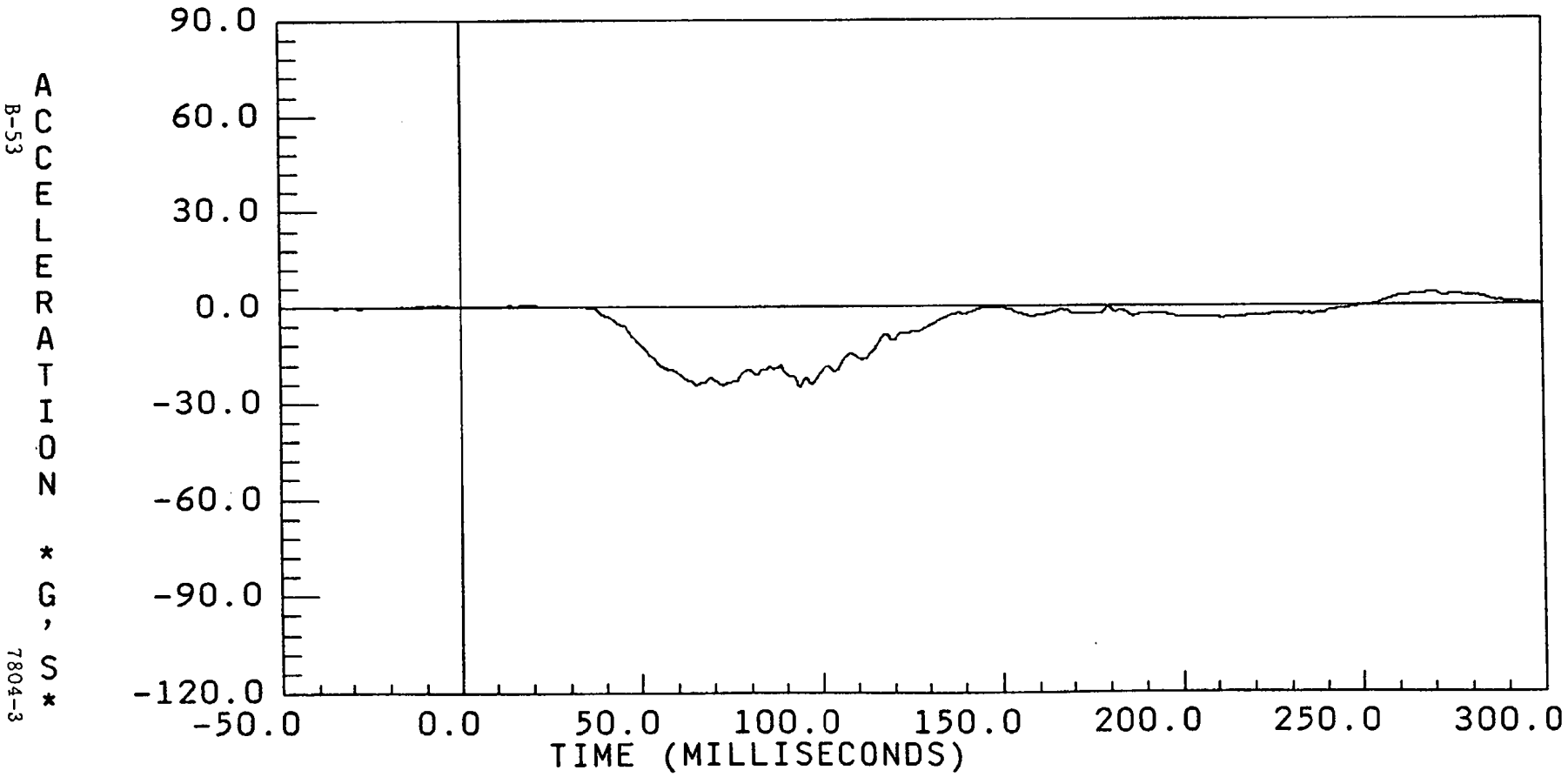


BW954-14.DAT

29.50 mph

POS#2 CHEST X
FILTERED
FILTER CUTOFF: 300Hz

XL AXIS
YMIN =-24.99339 at 93.90000
YMAX = 3.999906 at 268.8000

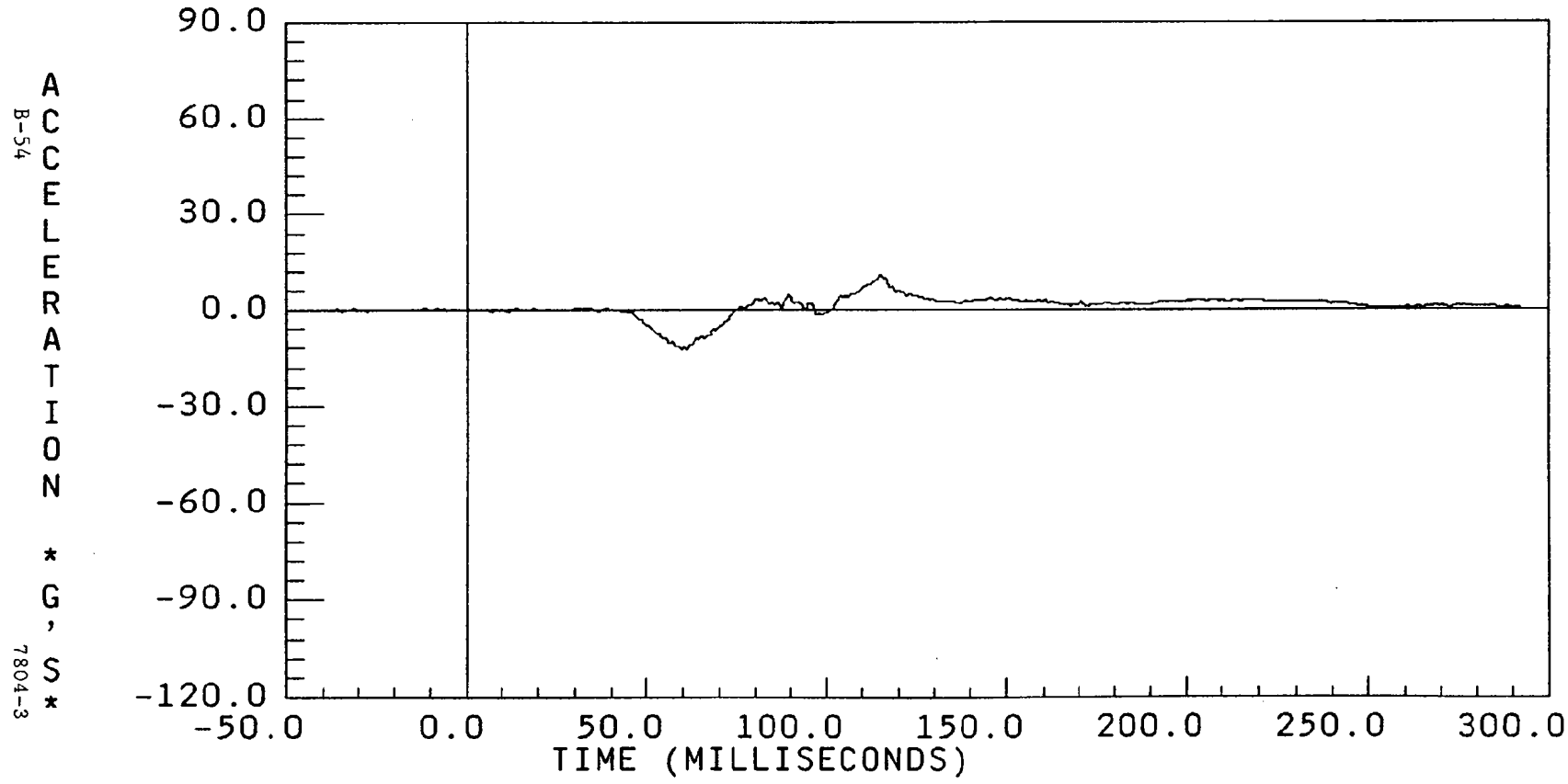


BW954-15.DAT

0.00 mph

POS#2 CHEST Y
FILTERED
FILTER CUTOFF: 300Hz

YL AXIS
YMIN =-12.17501 at 59.62500
YMAX = 10.72123 at 115.1250

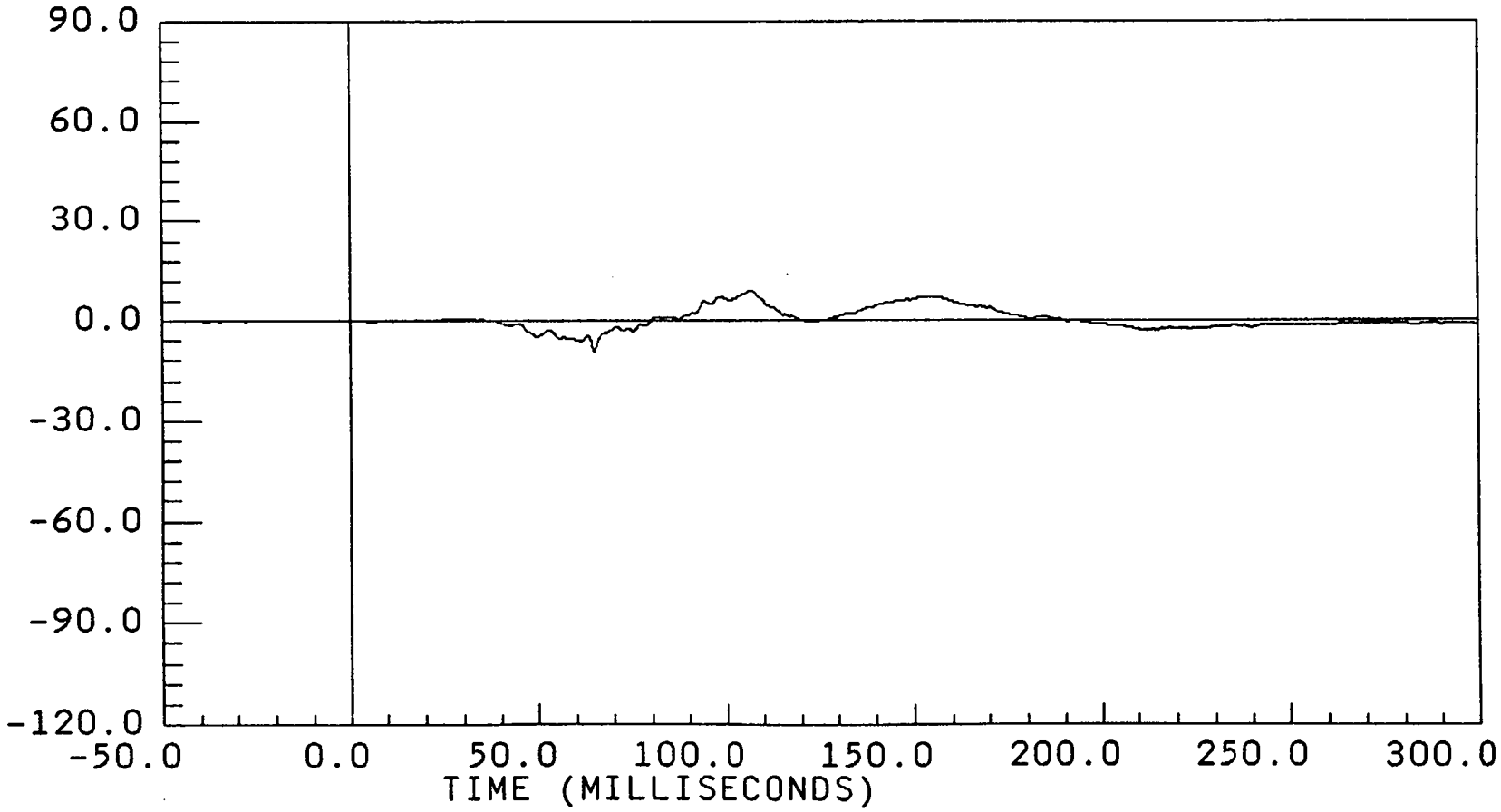


BW954-16.DAT

0.00 mph

POS#2 CHEST Z
FILTERED
FILTER CUTOFF: 300Hz

ZL AXIS
YMIN =-9.247625 at 64.95000
YMAX = 9.167122 at 106.7250



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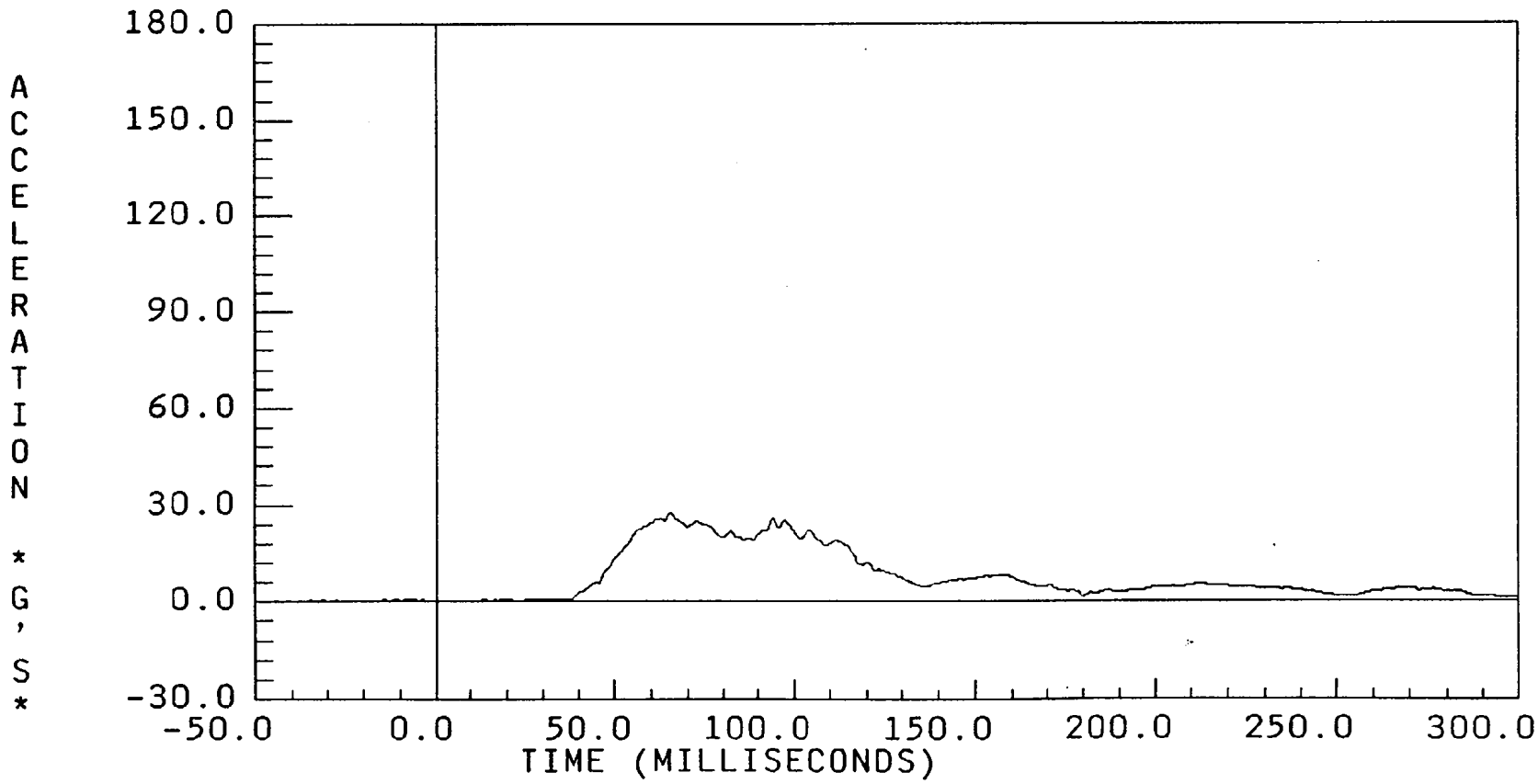
CHST954-2.DAT

0.00 mph

POS#2 CHEST
COMPUTED
FILTER CUTOFF: 300Hz

RS AXIS
YMIN =0.0128710 at 64.95000
YMAX = 27.29826 at 65.10001



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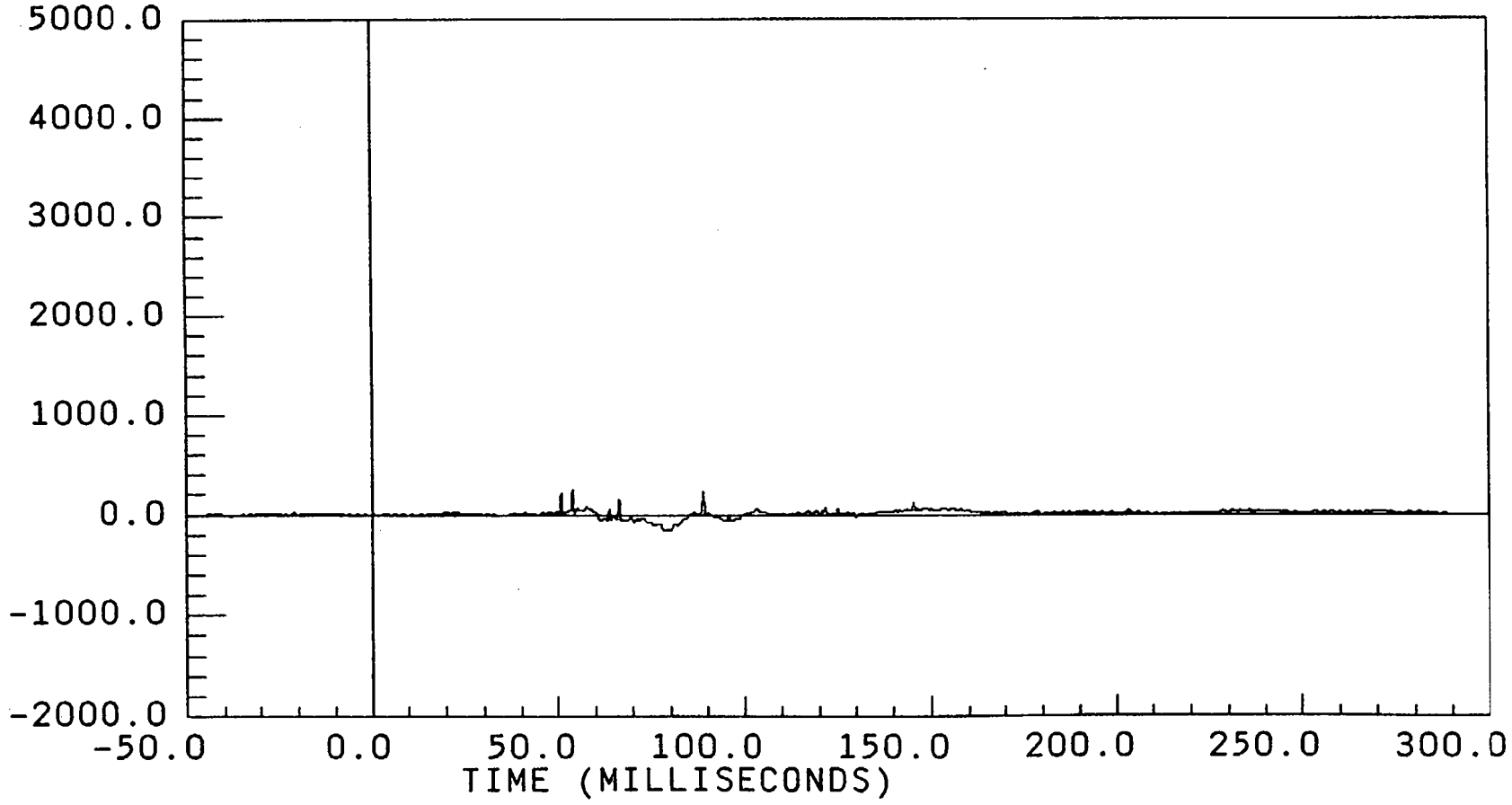
BW954-9.DAT

0.00 mph

POS#2 LEFT FEMUR
FILTERED
FILTER CUTOFF: 1000Hz

NA AXIS
YMIN =-156.4418 at 78.67500
YMAX = 250.3996 at 54.07500



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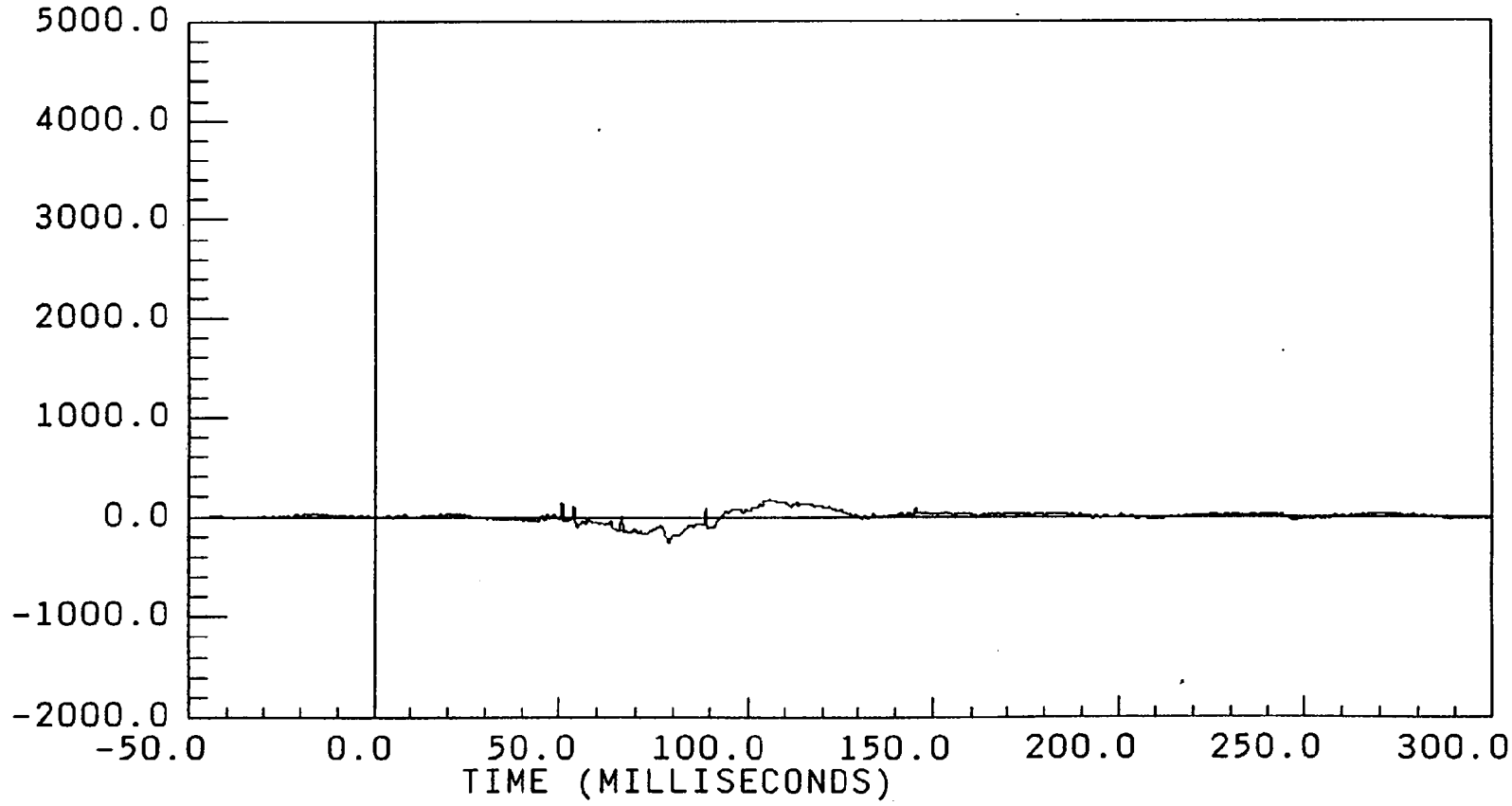
BW954-10.DAT

0.00 mph

POS#2 RIGHT FEMUR
FILTERED
FILTER CUTOFF: 1000Hz

NA AXIS
YMIN =-250.0005 at 79.12500
YMAX = 175.5316 at 105.9750



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Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

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

Pushing

Vehicles with automatic transmissions cannot be started by pushing. Vehicles with manual transmissions should not be push started due to possible catalytic converter damage. Follow the directions under Use of Jumper Cables.

Using Safety Restraints Properly

Safety Belts

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

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

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Safety belts provide best restraint when:

- ❑ the seat back is upright
- ❑ the occupant is sitting upright (not slouched)
- ❑ the lap belt is snug and low on the hips
- ❑ the shoulder belt is snug against the chest
- ❑ the knees are straight forward

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

- ❑ Front and rear lap and shoulder belts – for people who sit next to the windows in either the front or rear seats
- ❑ Manual front lap and shoulder belts (Canadian vehicles only) – for people who sit in the front seat.

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

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

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

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

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

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

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

Safety Belt Maintenance

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

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

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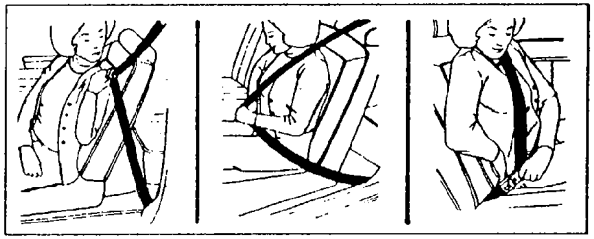
Combination Lap and Shoulder Belts

While your vehicle is in motion, the front and rear combination lap and shoulder belts adjust to your movement. However, if you brake hard, corner hard or if your vehicle receives an impact of 5 mph (8 km/h) or more, the lap and shoulder belt locks and prevents you from moving.

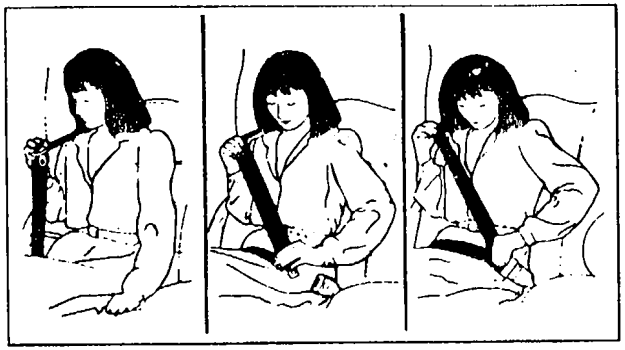
After you get into your vehicle, close the door and lock it. Then adjust the seat to the position that suits you best.

Convertible only – before fastening the front seat belt, make sure the shoulder belt passes through the belt guide loop on the top of the seat back.

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



Fastening the front seat lap and shoulder belt



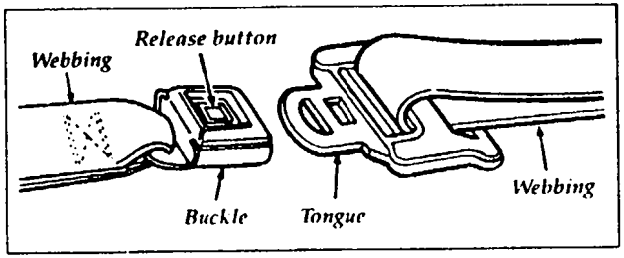
Fastening the rear seat lap and shoulder belt

Warning: Use the shoulder belt only on the shoulder that is closest to the vehicle door. Never wear the belt under your arm. If you do not use the shoulder belt properly, the chances of your being injured in a collision greatly increase.

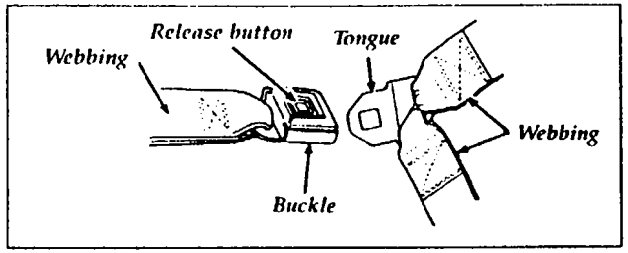
To adjust the lap part of the belt, pull up on the shoulder belt until the lap belt fits snugly low on your hips.

To unfasten the belt:

1. Push the release button in the center of the buckle. This allows the tongue to unlatch from the buckle.

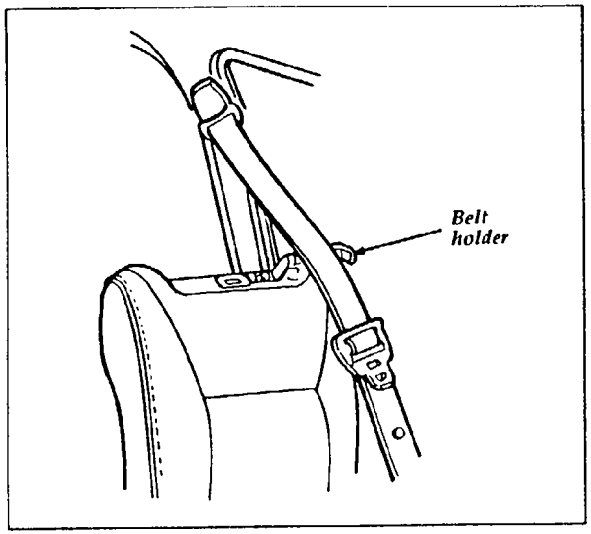


Unfastening the front (on sedans) and rear outboard lap/ shoulder belts



Unfastening the Mustang convertible front outboard lap/ shoulder belts

2. While the belt retracts, guide the tongue to its original position. If you do not guide the tongue, it may strike you or part of the vehicle.
3. (Mustang convertible only) Place the belt in the belt holder at the top of the seat back. The retracted belt should be stored on this holder when not in use, except when a passenger is entering or leaving the rear seat area of the vehicle.



Guide loop location

To Untangle the Belt:

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

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

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For the lap belt portion of the safety belts next to the windows in the front and rear seat position, pull up on the shoulder portion of the belt to adjust to a snug fit.

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

Rear Seat Lap-Shoulder Belts

Pull the lap-shoulder belt from the retractor so the shoulder portion of the belt crosses your shoulder and chest and insert the belt tongue into the proper buckle until you hear a snap and feel it latch. Pull up on the shoulder portion of the belt to tighten the lap portion to a snug fit. Be sure the belt is as low on your hips as possible.

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

Safety Lap Belt Extension Assembly

A safety belt that is too short even when fully extended can be lengthened. Available from your dealer is a safety belt extension assembly (54611C22). This assembly will add approximately eight inches (20 cm) to the length of the belt.

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

Supplemental Air Bag Restraint System (SRS)

Driver Side Only

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

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

The Importance of Wearing Safety Belts

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

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

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- reduce the risk of being thrown from your car

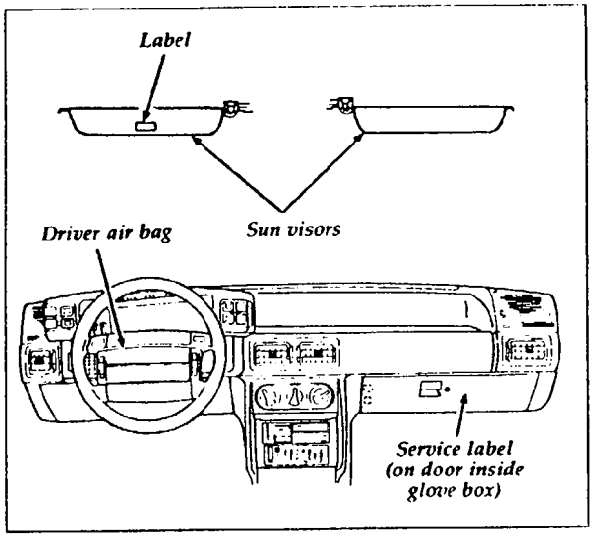
The Importance of Proper Seated Position

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

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

How the Supplemental Air Bag System Operates

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



The location of the air bag and warning labels

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

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

Tone Generator

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

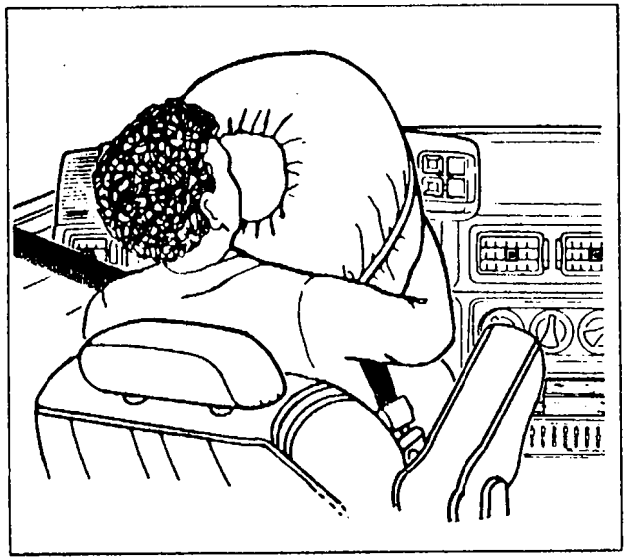
Warning: Do not attempt to service, repair, or modify the Supplemental Air Bag Restraint System; tampering could cause activation of the system and increase the risk of personal injury. For servicing of the Supplemental Air Bag Restraint System, see your Ford or Lincoln-Mercury dealer.

The air bag system is designed to stay out of sight until it is activated. The air bag system only operates in frontal accidents more severe than hitting a parked car of similar size and weight head-on at about 28 mph. In such a collision, you would be thrown forward against the safety belts. After receiving a signal from the crash sensors, the air bag inflates in about 45 milliseconds.

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

Air bags will not inflate in minor frontal collisions, even though the vehicle may be badly damaged. The fact that your air bag did not

inflate in such a collision does not mean that something is wrong with the air bag system.



The driver side supplemental air bag inflated

Report Air Bag Inflation

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

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

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

Disposal of Air Bag Equipped Vehicles

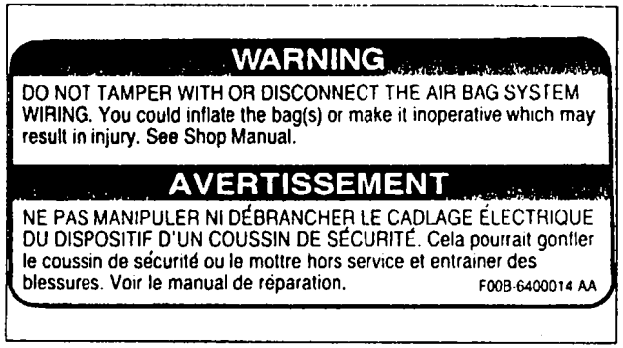
For disposal of air bags or air bag equipped vehicles, refer to the procedures in the 1990 Ford Shop Manual. Information on how to order a shop manual is available at an authorized Ford or Lincoln-Mercury Dealer. You can also order a shop manual using the order form in the back of your Owner's Guide.

Service Information Labels

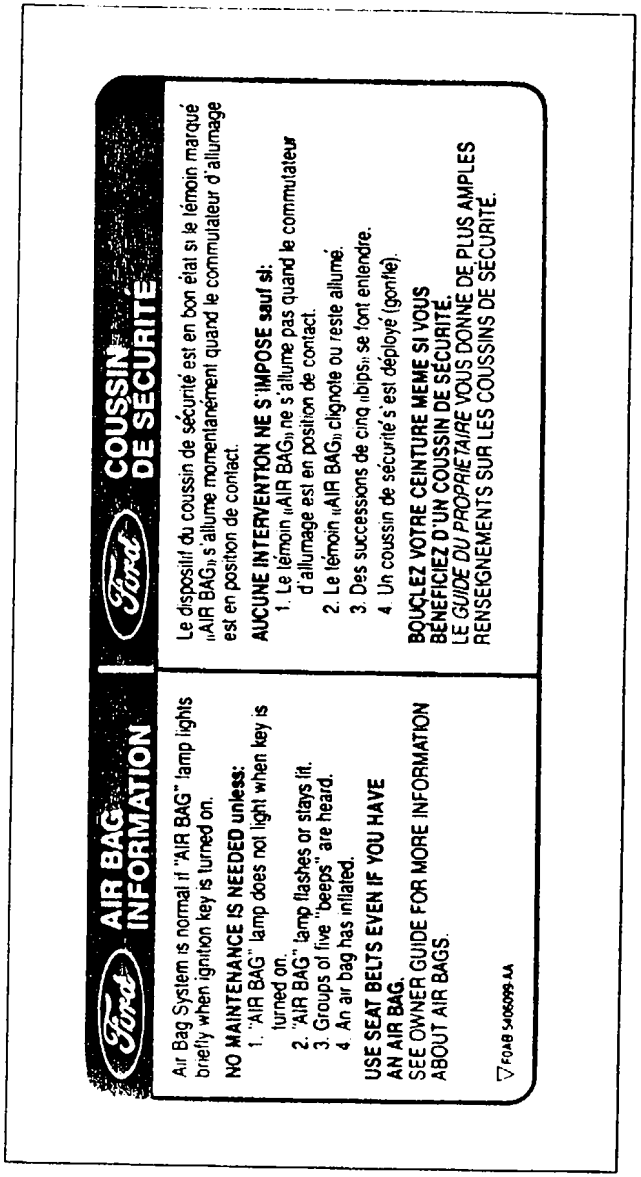
Service and information labels are attached inside the glove compartment, on the sun visor, and on the radiator support in the engine compartment.

Label on the driver sun visor in the down position

Rear of air bag module



Label on radiator support in the engine compartment



Label located in the glove compartment