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CAL REPORT NO. 7654-9

SIDE IMPACT PROTECTION IN PRODUCTION VEHICLES MDB-TO-CAR SIDE IMPACT TEST OF A 26° CRABBED MOVING DEFORMABLE BARRIER TO A 1988 FORD TAURUS 4-DOOR SEDAN AT 33.5 MPH

CALSPAN TEST NO. Y30-4-862

NOVEMBER 14, 1988

CALSPAN CORPORATION
ADVANCED TECHNOLOGY CENTER
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FINAL REPORT

Prepared for:

U.S. DEPARTMENT OF TRANSPORTATION
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION
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Approval date: 5/8/89

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16. Abstract

A 30/15 mph 90° Impact (Moving Deformable Barrier) test was performed at the Calspan Corporation, Advanced Technology Center Crash Test Facility in Buffalo, New York on November 14, 1988.

The impact velocity of the Moving Deformable Barrier (MDB) was 33.4 mph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 52°F. The target vehicle post-test maximum crush was 14.2 inches.

The test or target vehicle's performance is given below:

	DRIVER SID	LEFT REAR SID
Head Injury Criterion - -	149	779
Pelvic Lateral Acceleration	105.0	91.0

The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during crash.

17. Key Words	18. Distribution Statement
30/15 90° Impact (MDB) Side Impact Dummy (SID)	Copies of this report are available from: Technical Reference Division National Highway Traffic Safety Admin. Nassif Building, Room 5108 400 Seventh St., SW, Washington, DC 20590

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Section 1
PURPOSE

The main purpose of this test was to evaluate side impact protection in a 1988 Ford Taurus. The vehicle was tested using conditions not currently contained in a Federal Motor Vehicle Safety Standard.

Section 2
SUMMARY OF SIDE IMPACT TEST

A stationary 1988 Ford Taurus 4-Door Sedan was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 26° crabbed position to the monorail at a velocity of 33.4 mph on November 14, 1988. The test conditions simulate an intersection collision with the striking vehicle travelling at 30 mph and the struck vehicle travelling at 15 mph. The orientation angle of the striking vehicle was 90° counterclockwise with respect to the longitudinal axis of the struck vehicle. The leading edge of contact was to be 37 inches forward of the vehicle center of gravity which is defined by accident investigation to be the midpoint of the wheelbase. Pre-test and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SIDs) are shown in Appendix A.

Two unrestrained Side Impact Dummies (SIDs) were placed in the driver (POS. #1) and left rear (POS. #4) designated seating positions. The side impact event was documented by ten (10) cameras. Camera locations and other pertinent camera information can be found in this report.

The SIDs were instrumented with the following accelerometers:

1. Left Upper Rib (LUB) uniaxial accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial accelerometer (Y-direction)
3. Upper Thoracic Spine (T_1) uniaxial accelerometer (Y-direction)
4. Lower Thoracic Spine (T_{12}) uniaxial accelerometer (Y-direction)
5. Head assembly triaxial accelerometer (X, Y, Z-directions)
6. Pelvic section uniaxial accelerometer (Y-direction)

A summary of the side impact dummy (SID) configuration and performance verification test data can be found in Appendix C, while the dummy response and vehicle data traces can be found in Appendix B.

Section 3
SUMMARY OF TEST RESULTS

TEST VEHICLE DATA SHEETS

Vehicle Year/Make/Model/Body Style: 1988 Ford Taurus 4-Door Sedan

Vehicle Test No.: Y30-4-862 VIN: 1FABPSOD6JG1933S4

Vehicle Body Color: Cabarnet Red Month & Year of Manufacture: Feb. 1988

Engine: 4 Cyl. - CID 2.5 Litres **Placement:** - Longitudinal X Lateral

Transmission: 3 Speed; - Manual; X Automatic; - Overdrive

Final Drive: X Front Wheel - Real Wheel - Four Wheel

Odometer Reading: 30.9 miles

OPTIONS: X A/C X P/S ____ P/WDO X P/B X Cruise

DATA RECORDED FROM VEHICLE'S TIRE PLACARD

Tire Pressure (at capacity): 35 psi Front 35 psi Rear

Recommended Tire Size: P205/70R14

Tires on Vehicle: P205/70R14 Manufacturer: Goodyear

Number of Occupants: 2 Front 3 Rear - 3rd Seat 5 TOTAL

Type of Front Seats: X Bucket - Bench - Split Bench

Type of Front Seat Back: - Fixed X Adjustable with X Lever - Knob

Vehicle Maximum Capacity Loading = 900 lbs (A)

No. of Occupants x 150 lbs = 750 lbs (B)

Cargo Capacity (A - B) = 150 lbs

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Right Front = 960 lbs.

Left Front = 990 lbs.

TOTAL FRONT = 1950 lbs (65 % of TOTAL)

Right Rear = 550 lbs.

Left Rear = 520 lbs.

TOTAL REAR = 1070 lbs (35 % of TOTAL)

TOTAL WEIGHT = 3020 lbs.

CALCULATION OF TEST VEHICLE TARGET WEIGHT:

Total Test Vehicle Delivered Weight With Maximum Fluids = 3020 lbs.

Maximum Cargo Carrying Capacity of Test Vehicle* = 150 lbs.

Weight of Two (2) Side Impact Dummies (2 x 168 lbs) = 336 lbs.

TEST VEHICLE TARGET WEIGHT = 3506 lbs.

*see page 3-2

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front = 1020 lbs.

Left Front = 1060 lbs.

TOTAL FRONT = 2080 lbs (56 % of TOTAL)

Right Rear = 720 lbs.

Left Rear = 890 lbs.

TOTAL REAR = 1610 lbs (44 % of TOTAL)

TOTAL WEIGHT = 3690* lbs. (which includes 0 lbs of cargo ballast weight)

TEST VEHICLE ATTITUDE:

As Delivered -- Right Front = 28 in. Ready for Test -- Right Front = 27.8 in.

Left Front = 28 in. Left Front = 27.5 in.

Right Rear = 25.5 in. Right Rear = 23.7 in.

Left Rear = 25.5 in. Left Rear = 23.5 in.

Test Vehicle Wheelbase: 105.6 in.; C.G. = 46.1 in. rearward of front wheel centerline

Total Vehicle Length:

Right Side = 183.6 in.

Left Side = 183.5 in.

Centerline = 188.3 in.

PRE-TEST CONDITIONS

Vehicle Year/Make/Model/Body Style: 1988 Ford Taurus 4-Door Sedan

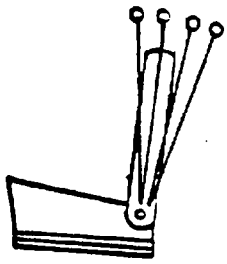
Vehicle Test No.: Y30-4-862 Test Date: November 14, 1988

Front Seat Cushion Placement: mid-point of fore/aft travel

Total Length of Adjustment Travel: 7.1 inches

Total Number of Adjustment Positions or Detents: 11

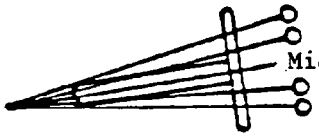
Front Seat Back Adjustment Position: 25° 4th position (3 back)
(latch position, knob rotations, etc.)



Torso Angle: 23 °

Adjustable Steering Column Position:

X Not Applicable



Midpoint of swing

Window Positions: Left Front - closed

Left Rear - closed

Right Front - open

Right Rear - open

NOTE: Windows will be in closed position on struck side of test vehicle and in open position on opposite side.

Amount of Stoddard Solvent in Fuel Tank: 2 Gallons (92 to 94% of USABLE CAPACITY)

Location of Impact Point on Test Vehicle Side to be Impacted:

Wheelbase = 105.6 inches

Impact point is 15.8 inches rearward of front axle centerline (which is 37 inches forward of the wheelbase midpoint).

CRASH TEST SUMMARY FOR TEST VEHICLE

Vehicle Year/Make/Model/Body Style: 1988 Ford Taurus 4-Door Sedan

Vehicle Test No.: Y30-4-862 VIN: 1FABP50D6JG193354

Test Date: November 14, 1988 Vehicle Build Date: 2/88

Overall Length: 188.3 inches; Overall Width: 71.6 (@96") inches.

Test Weight: Left Front = 1060 lbs; Left Rear = 890 lbs.

Right Front = 1020 lbs; Right Rear = 720 lbs.

Subtotals: Front: 2080 lbs. Rear: 1610 lbs.

TOTAL VEHICLE WEIGHT: 3690 lbs.

Wheelbase: 105.6 inches

Longitudinal C.G. from Center of Front Axle: 46.1 inches

Impact Angle with Respect to Impactor: 90 degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. Level 1 (11.5 in. above ground) = 10.0 inches
2. Level 2 (20.5 in. above ground) = 14.2 inches
3. Level 3 (25.0 in. above ground) = 12.6 inches
4. Level 4 (35.8 in. above ground) = 9.6 inches
5. Level 5 (53.0 in. above ground) = 1.8 inches.

MAXIMUM POST-TEST INTRUSION: 14.2 inches

OCCUPANTS:	DRIVER	LEFT REAR
TYPE OF DUMMY:	SID	SID
RESTRAINTS USED	None (Manual Belts)	None (Manual Belts)

INSTRUMENTATION:

NUMBER OF DATA CHANNELS: 17

NUMBER OF CAMERAS: ONBOARD = 5

OFFBOARD = 5*

TOTAL: 10*

*includes real time camera, see page 4-20.

CRASH TEST SUMMARY FOR SIDE IMPACTOR

Type of Test: 33.5 MPH, 26° Impact (MDB) Test Date: November 14, 1988

Position of Impactor (MDB) on Monorail: Crabbed 26° to left

MDB DETAILS: Overall Width of Framework Carriage = 49.35 inches

Overall Length of MDB = 162 in. (including honeycomb impact face)

Wheelbase of Framework Carriage = 102 inches

Tread of Framework Carriage (Front & Rear) = 72 inches

C.G. Location Rearward of Front Axle = 42.2 inches

MDB Weight -- Left Front = 900 lbs.; Left Rear = 550 lbs

Right Front = 800 lbs.; Right Rear = 650 lbs

Subtotal: Front = 1700 lbs.; Rear = 1200 lbs

TOTAL MDB WEIGHT = 2900 lbs.

Impact Angle (MDB C/L to Target Vehicle C/L) = 90 degrees

Impact Speed = 33.4 mph

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A at bumper level = 3.2 inches
2. Row B at mid-stack level = 1.5 inches
3. Row C at top of stack level = 3.4 inches

INSTRUMENTATION:

Number of MDB Data Channels: 5

POST-TEST OBSERVATIONS

Test Vehicle: 1988 Ford Taurus 4-Door Sedan TEST No.: Y30-4-862

VISIBLE DUMMY CONTACT POINTS:

	FRONT SID	REAR SID
HEAD	right side "B" pillar, right front head rest	"C" pillar & roof
CHEST	left front door	left rear door
ABDOMEN	-	-
LEFT KNEE	left front door	left rear door
RIGHT KNEE	-	-

DOOR OPENING:

	LEFT SIDE	RIGHT SIDE
FRONT	none	none
REAR	none	none

SEAT MOVEMENT:

GLAZING DAMAGE:

Left side side windshield cracked. Left side door glass broken.

OTHER NOTABLE IMPACT EFFECTS:

TEST ANOMALIES

The driver's (POS #1) chest displacement data contained questionable data between 67 and 101 milliseconds. The chest pot wiper arm lifted during impact.

The passenger's (POS #4) chest displacement data contained questionable data between 45 and 85 milliseconds. The chest pot wiper arm lifted during impact.

DUMMY TEMPERATURE CONTROL AND POSITIONING

The vehicle was kept inside the temperature controlled vehicle preparation building until approximately 4 hours prior to the test. Ambient temperature at the crash area was recorded to be 52°. Dummy temperature at the crash facility was maintained within specifications by means of a portable heater placed in the test vehicle.

The following Side Impact Dummy Seating Procedure summarizes the steps taken to position the instrumented, calibrated dummies in the test vehicle.

SIDE IMPACT DUMMY SEATING PROCEDURE

1. Seat Positioning

A. Place the seat at the longitudinal midpoint of fore to aft adjustment (forwardmost locking position to rearmost locking position). If no locking position is available at midtravel, use the position immediately rearward of midtravel.

B. If the seat back angle is adjustable, place it in the manufacturer's stated nominal design location. If not specified, set it at the first detent rearward of 25°.

C. Adjustable head restraints are set such that the restraint is at the top most position.

D. If the seat is equipped with adjustable side or lumbar supports, they are set in their "released" or full back positions.

E. All other seat adjustments are positioned to their midtravel locations except seats with vertical adjustment which should be placed at its lowest position. If locking positions are not available at these mid-points, use the position immediately rearward, left, or clockwise of mid-travel. Clockwise is defined looking rear to front or left to right relative to the vehicle. This also applies to adjustable steering columns.

2. H-Point Determination

A. The SAE three-dimensional H-point machine (SAE J826 (April 80) - Lower leg length - 16.3 inches and thigh segment length - 15.8) is used to locate the H-point for each surrogate.

B. The H-point machine is positioned on the seat as follows:

1. Bucket or Contoured Seats - The H-point machine is centered on the bucket or contoured seat such that its midsagittal plane is vertical and longitudinal.

2. Bench Seats

a. Driver position - The H-point machine is positioned such that its midsagittal plane is vertical, longitudinal, and contains the steering wheel center point.

b. Outboard passenger positions - The H-point machine is positioned such that its midsagittal plane is vertical, longitudinal, and the same distance from the longitudinal vehicle centerline as that for the driver position.

C. Locate the H-point position using the steps outlined in Sections 4 through 6 of SAE Standard J826 (April 80). Record the coordinates of this point, relative to the vehicle.

3. Test Dummies

A. The anthropomorphic test dummies used for evaluation of a vehicle's side impact protection must conform to the requirements of subpart F of Part 572.

B. All dummy joints are adjusted between 1 and 2 g's. This amount just barely restrains the weight of the individual limb when it is extended horizontally.

C. Each Part 572, Subpart F test dummy is clothed in form-fitting cotton stretch underwear with short sleeves and mid-calf pants. Each foot of each dummy is equipped with a size 11EE shoe which meets the configuration, size, sole, and heel thickness specifications of MIL-S-131192 and weighs 1.25 $\pm$ 0.2 pounds.

4. Initial Dummy Placement

Each SID dummy is placed in the appropriate vehicle seat with its pelvis positioned such that a lateral line passing through the dummy H-point is perpendicular to the longitudinal centerplane of the vehicle.

A. Bucket or Contoured Seats. The dummy is centered on the bucket or contoured seat such that its midsagittal plane is vertical and longitudinal. The legs are positioned as follows, keeping the femur and tibia centerlines in a plane that is as near to vertical as possible.

1. Driver position placement - The right foot of the dummy is placed on the undepressed accelerator pedal, with the heel resting on the floorpan as far forward as possible. The left knee is positioned such that the distance from the outer surface of the knee pivot bolt to the dummy's midsagittal plane is 6 inches.

2. Passenger position placement - The knees of the dummy are initially set 11½ inches apart, measured between the outer surfaces of the knee pivot bolt heads. If a center tunnel prevents this, place the feet on either side of the tunnel.

B. Bench Seats

1. Driver position placement - The dummy is placed in the seat as outlined in Section 4.A.1 except that its midsagittal plane is vertical, longitudinal, and contains the steering wheel center point.

2. Outboard passenger positions - The dummy is placed in the seat as outlined in Section 4.A.2 except that its midsagittal plane is vertical, longitudinal, and the same distance from the vehicle centerline as that for the driver position.

5. Initial Dummy Positioning

A. H-Point Positioning

1. With the dummy laterally positioned as in Section 4, insert the pelvis angle indicator bar* in the hole provided above and to the rear of the dummy H-point. Position the longitudinal pelvis angle between 23° and 25° from the horizontal. This may be accomplished by raising the legs or flexing the upper torso forward and allowing the pelvis to rotate. The lateral pelvis angle is to be horizontal ($\pm 1^{\circ}$).

2. Apply sufficient force on the lower torso in a horizontal and vertical direction to place the dummy H -point at the coordinates obtained in Section 2.

3. The H-point of the driver and passenger test dummies shall coincide within 1/2 inch in the vertical dimension and 1/2 inch in the horizontal dimension of a point 1/4 inch below the position of the H-point determined by using the equipment and procedures specified in SAE J826 (April 80).

B. Upper Torso Positioning. The dummy's upper torso should rest against the seat back. If not, adjust the upper torso, maintaining the H-point location and pelvis angle so that the dummy's back rests against the seat back. If this cannot be done, modify the H-point location and/or pelvis angle within the allowable bands until the back rests against the seat. If after doing this, the dummy's back still cannot be made to rest against the seat back, adjust the seat back until this is accomplished.

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* A 3/8-inch square bar approximately 6 inches long.

6. Final Dummy Positioning

A. Driver Position. Without inducing pelvis or torso movement, the dummy's right foot is placed on the undepressed accelerator pedal with the heel resting as far forward as possible on the floorpan. The left foot is set perpendicular to the lower leg with the heel resting on the floorpan in the same lateral line as the right heel. If possible within these constraints, the dummy's thighs should be in contact with the seatpan.

B. Front Passenger Positions. Without inducing pelvis or torso movement, place the dummy's feet on the vehicle's toeboard with the heel resting on the floorpan as close as possible to the intersection of the toeboard and floorpan. If the feet cannot be placed on the toeboard, they are set perpendicular to the lower legs and placed as far forward as possible such that the heels rest on the floorpan.

C. Rear Passenger Positions. Without inducing pelvis or torso movement, the feet are placed flat on the floorpan and beneath the front seat as far forward as possible without front seat interference. If necessary, change the distance between the knees as required to place the feet beneath the seat. Record the new distance.

D. Vehicles with wheelhouse projections in the passenger compartment. The foot (feet) in question is (are) placed in the well of the floorpan/toeboard and not on the wheelhouse projection. This is done by twisting the foot at the ankle, maintaining the upper and lower leg positions outlined in Section 4. If this does not resolve the situation, move the leg of the foot in question just enough to achieve the correct position, keeping the femur and tibia centerlines in a plane that is as near to vertical as possible. Record the new distance between the knees.

E. The knee positions are to be as outlined in Section 4, unless modified as in Section 6. The plane containing the femur and

tibia centerlines for each leg is to be as near to vertical as possible without inducing pelvis or torso movement. Record the distance between the knees for each dummy.

F. Prior to conducting the test, the dummy position is visually checked. The dummy is to be properly positioned laterally with its midsagittal plane vertical and longitudinal, and the upper torso resting against the seat back. The H-point and pelvis angle are to be within the specified ranges and the foot, knee, and leg placements are to be as outlined.

G. The final dummy position is recorded. These measurements are to include, but not be limited to, pelvis and head angles as well as actual H-point and head cg locations relative to the vehicle. The straight-line distance from the H-point to the center of the outer ankle bolt is also recorded for one of the legs (e.g., Left H-point to left ankle bolt).

Section 4
OCCUPANT AND VEHICLE INFORMATION

SIDE IMPACT DUMMY (SID) TEST DATA SUMMARY

TEST DATE: Nov. 14, 1988

TEST NO.: Y30-4-862

	FRONT DUMMY--ID # 904				REAR DUMMY--ID # 902			
	POS. DIRECT.		NEG. DIRECT.		POS. DIRECT.		NEG. DIRECT.	
	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
HEAD ACCELERATIONS:								
Longitudinal- - - - X	18.7	61.9	-19.2	51.5	6.8	88.7	-20.2	61.1
Lateral - - - - - - Y	16.2	69.6	-45.3	96.0	116.4	58.4	-16.4	69.8
Vertical- - - - - - Z	49.3	64.3	-16.5	83.6	33.1	47.1	-77.6	61.2
RESULTANT --------- R	53.0	64.9	0.4	-44.3	130.6	59.3	0.3	-43.7
HIC----------*	149	-	-	-	779	-	-	-
RIB ACCELERATIONS:								
Upper Rib Lateral - Y*	69.5	31.3	-13.3	78.8	91.5	44.4	-10.0	90.0
Lower Rib Lateral - Y*	68.9	30.6	-12.0	65.6	87.0	41.9	-21.0	75.0
SPINE ACCELERATIONS:								
Upper Longitud. - - X	NM	-	NM	-	NM	-	NM	-
Upper Lateral - - - Y	55.4	45.0	-35.0	71.9	50.9	50.0	-7.2	33.1
Upper Vertical- - - Z	NM	-	NM	-	NM	-	NM	-
Upper RESULTANT---- R	NM	-	NM	-	NM	-	NM	-
Lower Longitud. - - X	NM	-	NM	-	NM	-	NM	-
Lower Lateral - - - Y*	86.9	34.4	-11.8	72.5	46.8	42.5	-28.9	63.8
Lower Vertical- - - Z	NM	-	NM	-	NM	-	NM	-
Lower RESULTANT---- R	NM	-	NM	-	NM	-	NM	-
PELVIS ACCELERATIONS:								
Longitudinal- - - - X	NM	-	NM	-	NM	-	NM	-
Lateral - - - - - - Y*	105.0	28.8	-4.8	170.6	6.8	88.7	-20.2	61.1
Vertical- - - - - - Z	NM	-	NM	-	NM	-	NM	-
RESULTANT---------- R	NM	-	NM	-	NM	-	NM	-
RIB DEFLECTION:	**	-	-	-	**	-	-	-

* Data Required (Other data to be used by R & D)

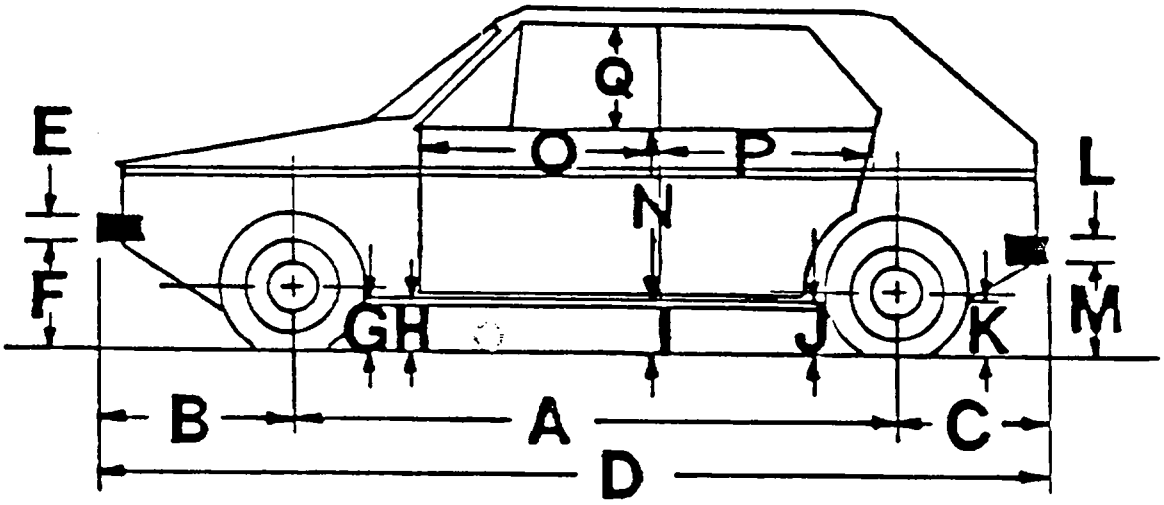
**See test anomalies

REFERENCE: Positive Direction - - Longitudinal (X) = forward
Lateral (Y) = to right
Vertical (Z) = up

Negative Direction - - Longitudinal (X) = rearward
Lateral (Y) = to left
Vertical (Z) = down

NM - Not Measured

Pre-and Post-Test Measurements

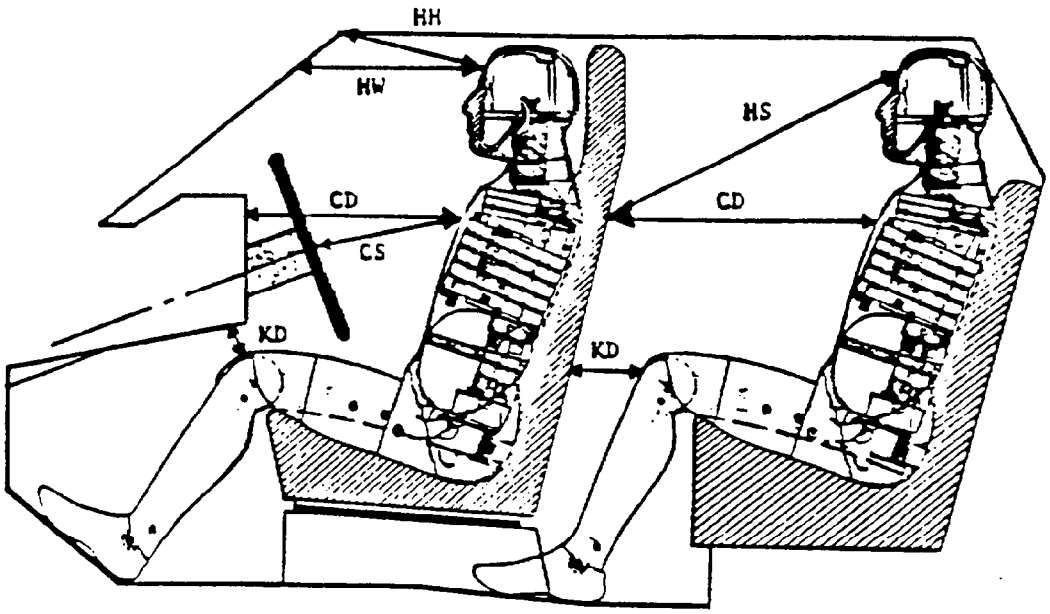


NOTE: All dimensions are in inches

	PRE - TEST	POST - TEST	Δ CHANGE
A	105.6	106.3	-0.7
B	39.3	38.4	0.9
C	43.4	43.8	-0.4
D	188.3	188.5	-0.2
E	12.5	12.0	0.5
F	9.1	10.8	-1.7
G	8.2	9.1*	-0.9
H	8.4	9.0*	-0.6
I	9.1	8.8*	0.3
J	8.2	9.0*	-0.8
K	11.1	12.0*	-0.9
L	9.1	9.3	-0.2
M	14.4	14.8	-0.4
N	25.2	23.6	1.6
O	42.4	40.5	1.9
P	39.0	36.7	2.3
Q	16.0	16.1	-0.1

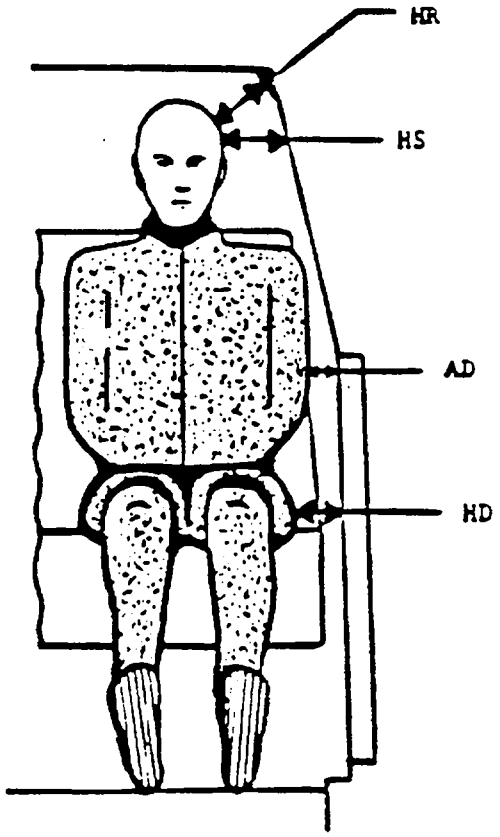
*Measured w/lower body side molding missing.

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS



	DRIVER ID #904	REAR PASSENGER ID #902
HH	15.0 "	——— "
HW	22.3 "	——— "
HS	——— "	28.2 "
CD	21.5 "	20.9 "
CS	12.8 "	——— "
KDL	5.1 "	5.6 "
KDR	5.2 "	6.0 "

SIDE IMPACT DUMMY (SID) LATERAL CLEARANCE DIMENSIONS



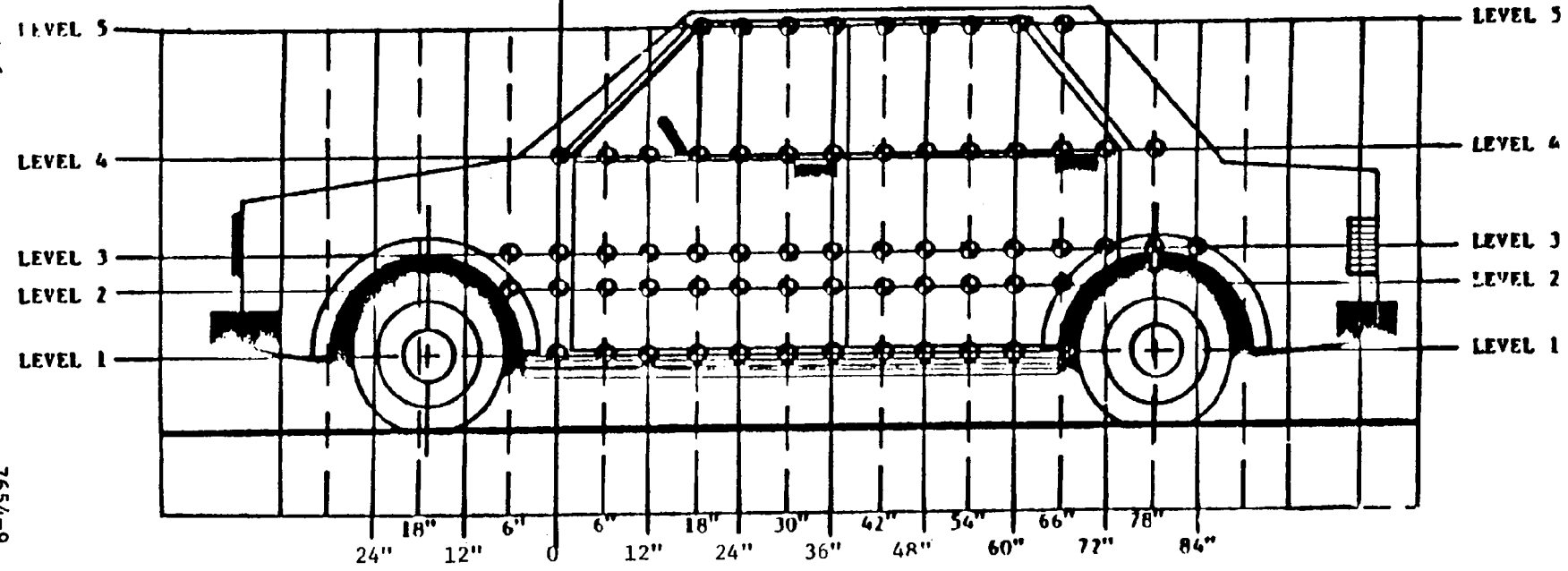
	DRIVER ID # 904	REAR PASSENGER ID # 902
HR	6.6 "	5.2 "
HS	10.6 "	9.6 "
AD	4.4 "	3.8 "
HD	7.7 "	6.5 "

Vehicle Side Measurement

TEST NO.: Y30-4-862

LEVEL 5 @ Window Top - - - - - - - =	53.0	"
LEVEL 4 @ Window Sill- - - - - - - =	35.8	"
LEVEL 3 @ Mid Door - - - - - - - - =	25.0	"
LEVEL 2 @ Occupant H-Point - - - - =	20.5	"
LEVEL 1 @ Axle Centerline Height = (or Sill Top Height)	11.5	"

NOT TO SCALE



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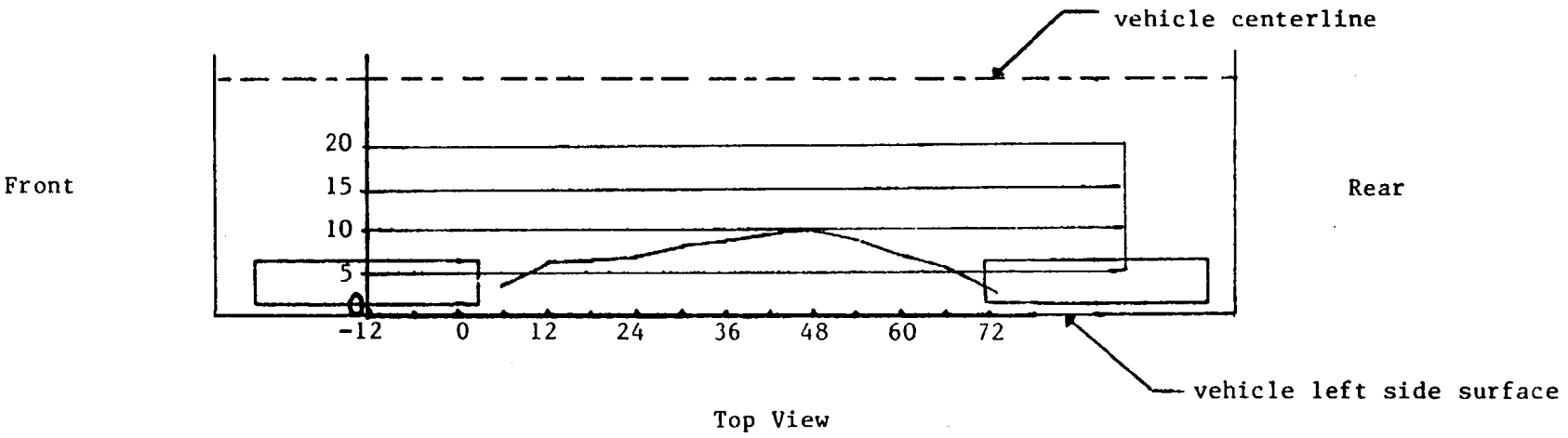
VEHICLE EXTERIOR STATIC CRUSH (IN.)

11.5 inches above ground level

Level 1



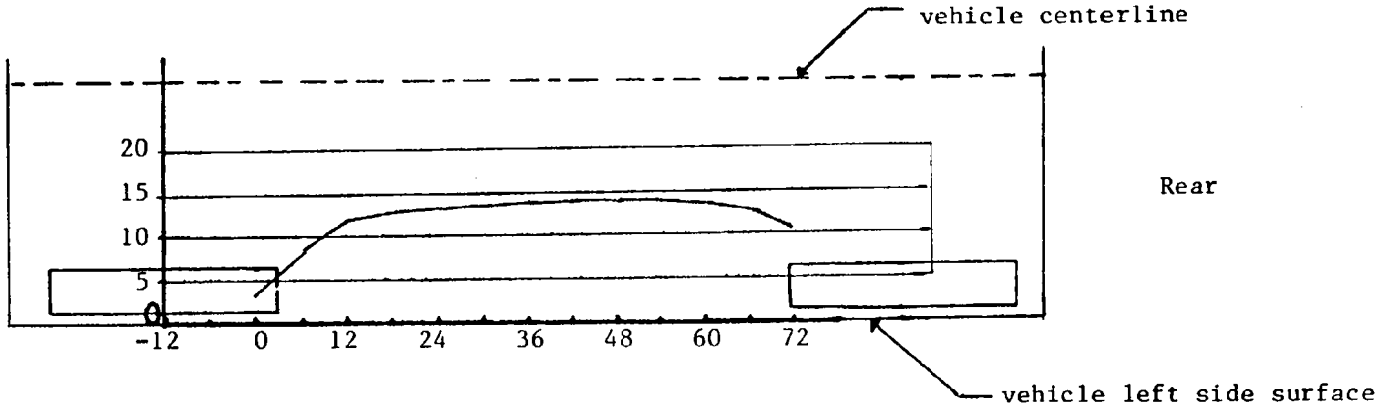
Top View

NOTES: All measurements in inches.
Left side of vehicle only.

VEHICLE EXTERIOR STATIC CRUSH (IN.)

20.5 inches above ground level

Level 2



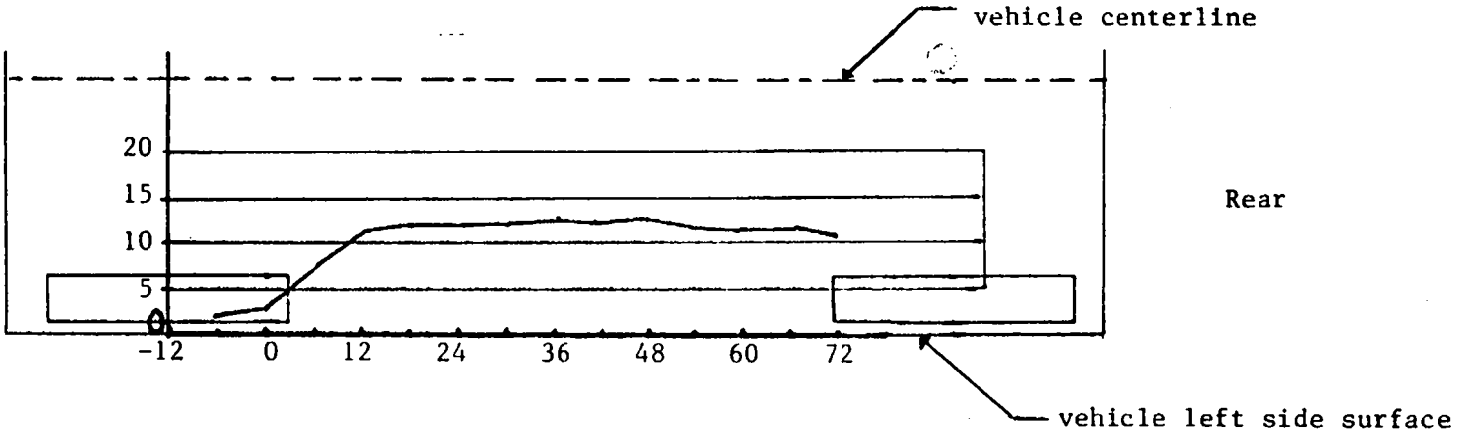
Top View

NOTES: All measurements in inches.
Left side of vehicle only.

VEHICLE EXTERIOR STATIC CRUSH (IN.)

25.0 inches above ground level

Level 3



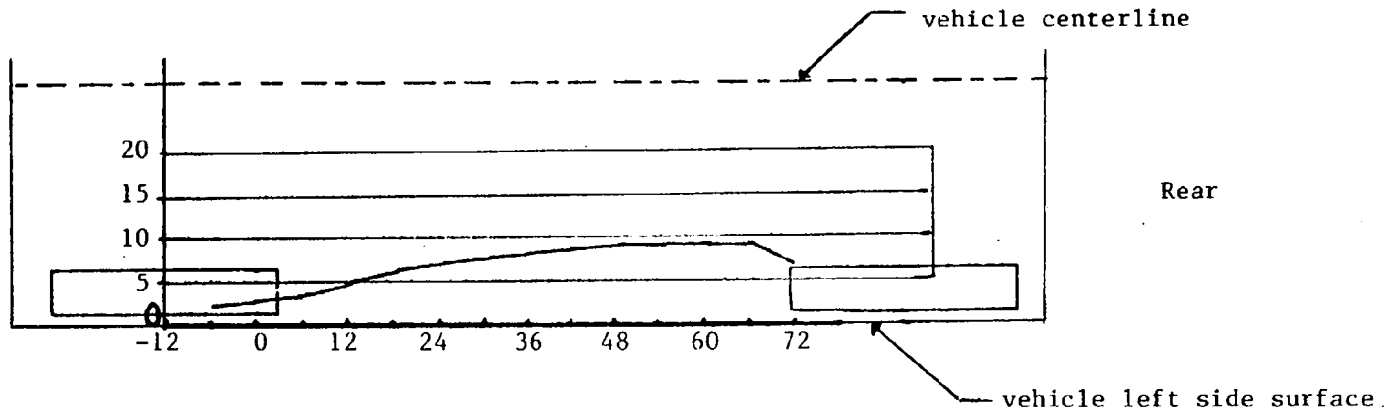
Top View

NOTES: All measurements in inches.
Left side of vehicle only.

VEHICLE EXTERIOR STATIC CRUSH (IN.)

35.8 inches above ground level

Level 4



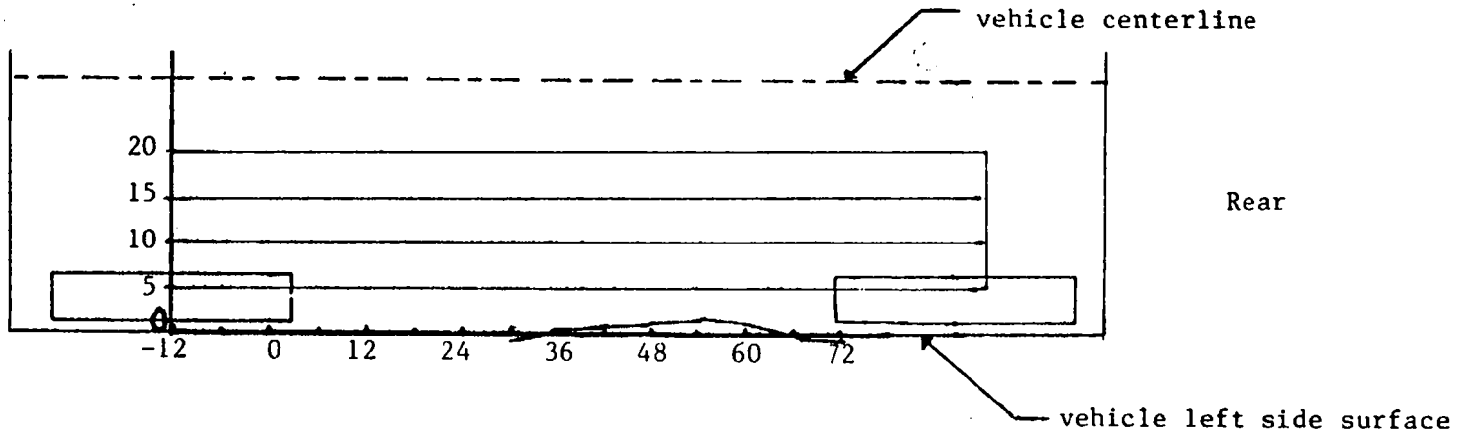
Top View

NOTES: All measurements in inches.
Left side of vehicle only.

VEHICLE EXTERIOR STATIC CRUSH (IN.)

53.0 inches above ground level

Level 5



Top View

NOTES: All measurements in inches.
Left side of vehicle only.

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE* AND STATIC CRUSH DATA

TEST DATE: NOVEMBER 14, 1988

LOCATION:	HEIGHT (in.)	PROFILES/CRUSH	Impact Point ↓ 6"	0	6"	12"	18"	24"	30"	36"	42"	48"	54"	60"	66"	72"
1. Window Top	53.0	Post-Test- - -	N/A	N/A	N/A	N/A	N/A	N/A	24.1	24.3	24.6	25.0	25.8	24.8	23.8	22.9
LEVEL 5		Pre-Test - - -	N/A	N/A	N/A	N/A	N/A	N/A	24.6	24.3	24.2	24.2	24.0	23.9	23.9	23.8
		Static Crush -	–	–	–	–	–	–	-0.5	0.0	0.4	0.8	1.8	0.9	-0.1	-0.9
2. Window Sill	35.8	Post-Test- - -	18.1	17.5	18.3	19.8	21.3	22.3	22.5	23.0	23.5	24.1	23.8	23.6	23.7	21.8
LEVEL 4		Pre-Test - - -	16.4	15.6	15.1	14.9	15.0	15.0	14.9	14.8	14.6	14.5	14.5	14.4	14.4	14.4
		Static Crush -	1.7	1.9	3.2	4.9	6.3	7.3	7.6	8.2	8.9	9.6	9.3	9.2	9.3	7.4
3. Mid-door	25.0	Post-Test- - -	14.8	15.4	20.5	24.3	24.3	24.3	24.4	24.8	24.5	24.9	24.4	24.2	24.3	24.3
LEVEL 3		Pre-Test - - -	12.7	12.9	12.8	12.6	12.5	12.5	12.4	12.4	12.4	12.3	12.4	12.4	12.4	12.5
		Static Crush -	2.1	2.5	7.7	11.7	11.8	11.8	12.0	12.4	12.1	12.6	12.0	11.8	11.9	10.8
4. H-Point	20.5	Post-Test- - -	N/A	15.6	21.0	24.4	25.4	25.7	26.0	26.3	26.5	26.4	26.4	26.0	25.4	23.0
LEVEL 2		Pre-Test - - -	N/A	12.6	12.5	12.5	12.4	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3
		Static Crush -	–	3.0	8.5	11.9	13.0	13.4	13.7	14.0	14.2	14.1	14.1	13.7	13.1	10.7
5. Axle Centerline	11.5	Post-Test- - -	N/A	N/A	19.6	21.5	21.6	21.9	23.0	23.6	24.7	24.8	23.2	21.8	20.3	18.8
LEVEL 1		Pre-Test - - -	N/A	N/A	15.1	15.1	15.0	15.0	14.9	14.8	14.8	14.8	14.8	14.8	14.9	15.0
		Static Crush -	–	–	4.4	6.4	6.6	6.9	8.1	8.8	9.9	10.0	8.4	7.0	5.4	3.8 **

* Reference Plane is parallel to and 48 inches from test vehicle longitudinal centerline

**Approx. measurements, lower body side molding missing

Exterior Static Crush for Side Impactor

Location	Height at C_L *	Distance right of Center								Distance left of Center **								
		32"	28"	24"	20"	16"	12"	8"	4"	0	4"	8"	12"	16"	20"	24"	28"	32"
Top of Stack Level	32"	2.0	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	1.3	2.4	3.4
Mid - Stack Level	22"	1.0	0.3	-0.1	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.1	0.0	0.4	1.5
Bumper Level	17"	2.4	1.4	0.8	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.5	0.6	0.8	1.2	2.0	3.2

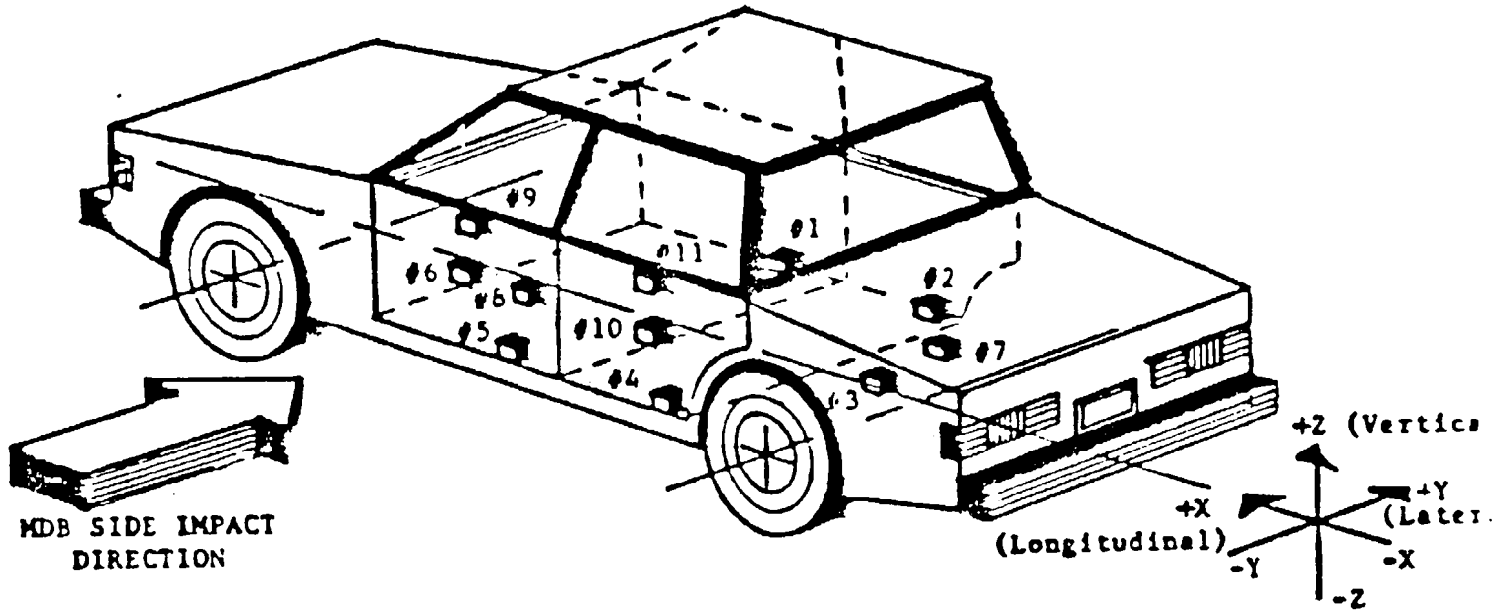
* Heights measured above ground level.

** Impact side.

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST VEHICLE: 1988 FORD TAURUS 4-DOOR SEDAN ; TEST NO.: Y30-4-862

TEST DATE: November 14, 1988



ACCEL. NO.	LOCATION	Coordinates(") X*	Y*	Z*	LONG.(X) POS./NEG. MAX (g)	TIME (msec)	LAT. (Y) POS./NEG. MAX (g)	TIME (msec)	VERT.(Z) POS./NEG. MAX (g)	TIME (msec)	RESULTANT POS./NEG. MAX (g)	TIME (msec)
1	Right Side Sill At Front Seat	116.5	25.0	12.6	5.7 -4.3	53.2 16.6	22.9 -1.9	5.4 80.0	4.5 -5.3	101.6 29.6	23.1	5.4
2	Right Side Sill At Rear Seat	82.5	25.5	12.5	5.3 -4.2	54.0 31.1	22.7 -2.9	6.5 103.7	5.6 -5.6	16.9 98.7	22.8	6.5
3	Rear Floorpan Above Axle	47.8	0.0	18.8	3.1 -7.3	56.8 29.6	17.7 -3.1	42.2 114.5	12.9 -15.4	30.6 19.1	22.8	19.7
4	Left Side Sill At Rear Seat	83.0	-24.5	12.7			73.1 -31.3	4.6 18.8				
5	Left Side Sill At Front Seat	116.3	-25.0	13.0			144.0 -79.6	9.1 15.6				
6	Left Front Door On Centerline	114.1	-29.0	30.9			103.3 -61.7	10.3 25.4				
7	Right Rear Occ. Compartment	87.5	19.0	9.5	8.6 -8.8	16.1 54.6						
8	Midrear of Left Front Door	102.3	-28.7	31.7			84.3 -93.4	11.6 28.6				
9	Left Front Door Upper Centerline	107.0	-28.2	35.9			85.1 -80.2	16.1 30.3				
10	Midrear of Left Rear Door	67.6	-28.3	31.3			112.4 -40.6	10.7 40.1				
11	Left Rear Door Upper Centerline	71.8	-28.2	36.2			100.0 -53.4	17.0 31.3				

* Reference: X - Rear Bumper (+ Forward)
Y - Vehicle Centerline (+ To Right)
Z - Ground Level (+ Up)

SAE 3D H-POINT MACHINE LOCATION AND DUMMY LOCATION DATA

	DRIVER #904	PASSENGER #902
SAE 3D H-POINT MACHINE LOCATION:	X = -10.6 Z = 10.2	X = -45.2 Z = 11.5
DUMMY H-POINT LOCATION:	X = -10.6 Z = 10.2	X = -45.1 Z = 11.8
HEAD C.S. LOCATION:	X = -17.5 Z = 35.9	X = -53.7 Z = 36.3
DUMMY HEAD ANGLE:	91°	93°
DUMMY PELVIC ANGLE:	22°	23°
DUMMY HIP TO LEFT ANKLE BOLT DISTANCE:	28.9	29.2
DUMMY OUTER KNEE TO OUTER KNEE:	12.3	11.5

*All location measurements referenced to left most front seat track bolt in two-dimensional rectangular coordinates: +X = forward, +Z = upward.

All dimensions in inches except as noted.

All angles referenced to horizontal, positive is upward.

DUMMY KINEMATIC SUMMARY

DRIVER (POS. #1)

During impact, the dummy's torso contacted the left front door and rebounded laterally across the front occupant compartment. The buttocks hit the right front door and the head traveled backwards hitting the right side "B" pillar and came to rest on the right front headrest.

REAR PASSENGER (POS. #4)

During impact, the dummy's torso contacted the left rear door. The dummy moved upward, hit the left side roof and came to rest in a sitting position on the left side of the rear occupant compartment.

STATIC INTERIOR INTRUSION (in.)

In an effort to measure static interior intrusion, several interior measurements were taken across (Y-direction) the vehicle at three different door heights (lower, mid, window sill) and three different longitudinal locations (mid front door, AFT B-pillar, mid rear door).

A. LONGITUDINAL LOCATION: MID FRONT DOOR

Height Location	Pre-Test	Post-Test	Static Intrusion
Top (window sill)	57.9	50.8	7.1
Mid	54.5	49.9	4.6
Lower	58.0	50.8	7.2

B. LONGITUDINAL LOCATION: AFT B-PILLAR

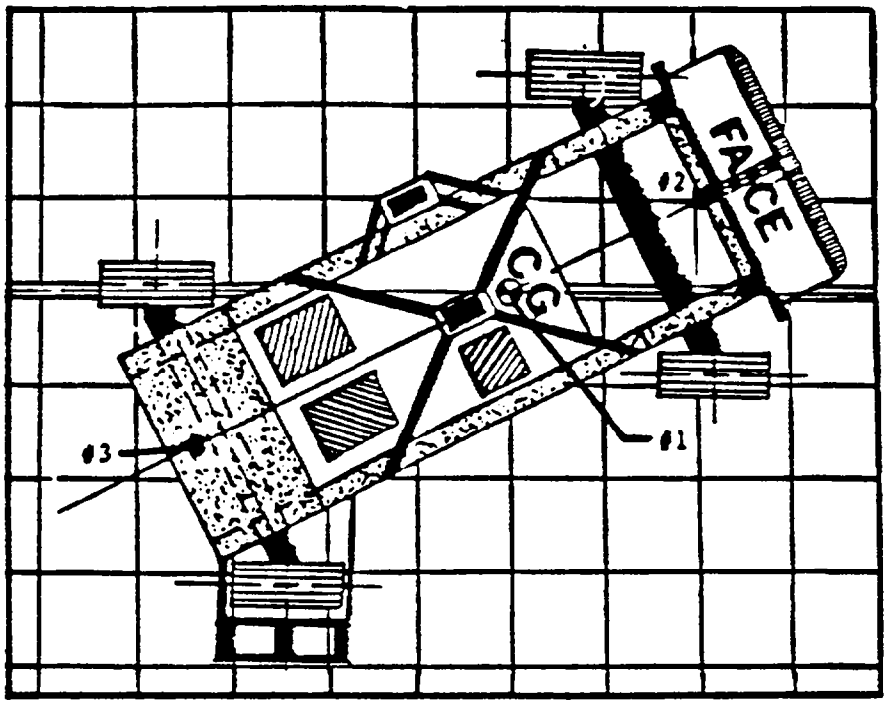
Height Location	Pre-Test	Post-Test	Static Intrusion
Top (window sill)	57.5	48.1	9.4
Mid	58.3	47.9	10.4
Lower	59.1	47.3	11.8

C. LONGITUDINAL LOCATION: MID REAR DOOR

Height Location	Pre-Test	Post-Test	Static Intrusion
Top (window sill)	58.0	50.3	7.7
Mid	54.5	46.4	8.1
Lower	N/A	N/A	-

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND SAMPLE DATA SUMMARY

TEST DATE: NOVEMBER 14, 1988



ACCEL. NO.	LOCATION	Coordinates X*	Y*	Z*	POS.DIRECT. MAX (g)	POS.DIRECT. TIME (msec)	NEG.DIRECT. MAX (g)	NEG.DIRECT. TIME (msec)
1	MDB Center of Gravity	64.6	0.0	13.0	1.4	151.6	-15.0	26.3
	Longitudinal--X				1.8	53.9	-6.5	36.8
	Lateral-------Y							
	Vertical------Z				12.7	40.2	-11.6	47.2
	Resultant-----R				19.8	40.1	-	-
2	Front Frame Member	121.3	0.0	24.0	1.3	154.1	-15.4	34.1
	Longitudinal--X							
3	Rear Frame Member	13.0	0.0	12.5	2.1	159.1	-15.3	27.0
	Longitudinal--X							

*Reference: X - Rearmost Frame Point (+ Forward)
Y - Centerline of MDB (+ Right)
Z - Ground Level (+ Up)

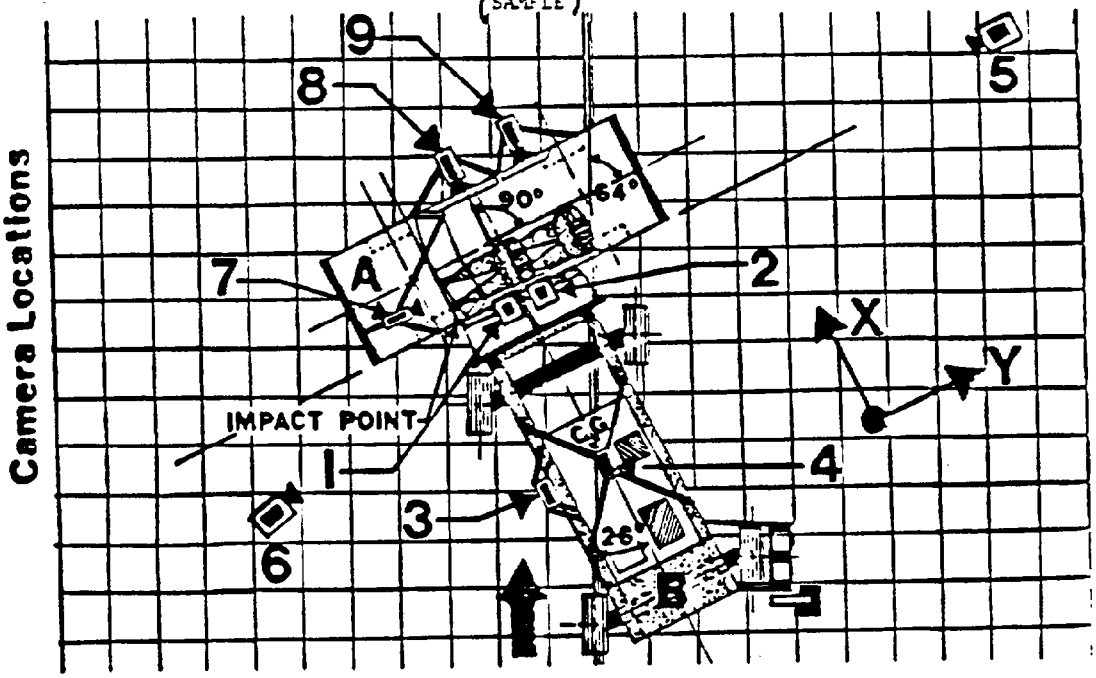
HIGH SPEED CAMERA LOCATIONS AND DATA

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	COORDINATES X*	Y*	Z*
1	Overhead view of test vehicle dynamics	Photosonic 1B	13	550	26.0	44.0	37.6
2	Overhead Closeup view of impact plane	Photosonic 1B	8	540	34.0	38.0	37.6
3	MDB Onboard Closeup view of impact point	Stalex	8	845	-	-	-
4	MDB Onboard view of driver dummy kinematics	Stalex	8	990	-	-	-
5	Right Side Ground Level--Overall View	Photosonic 1B	13	540	3.0	543.5	41.6
6	Left Side Ground Level--Overall View	Photosonic 1B	13	600	11.0	-277.0	39.8
7	Test Vehicle Onboard-driver dummy front view kinematics	Photosonic 1B	8	540	-	-	-
8	Test Vehicle Onboard-driver dummy side view kinematics	Photosonic 1B	8	550	-	-	-
9	Test Vehicle Onboard-pass. dummy side view kinematics	Photosonic 1B	8	560	-	-	-

NOTE: Real time (24 fps) film coverage of pre-test, test, and post-test events included in final print.

* Reference (from point of impact)
+X = Forward
+Y = To Right
+Z = Upward

(SAMPLE)



Angles Indicated are Hypothetical

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APPENDIX A

PHOTOGRAPHS

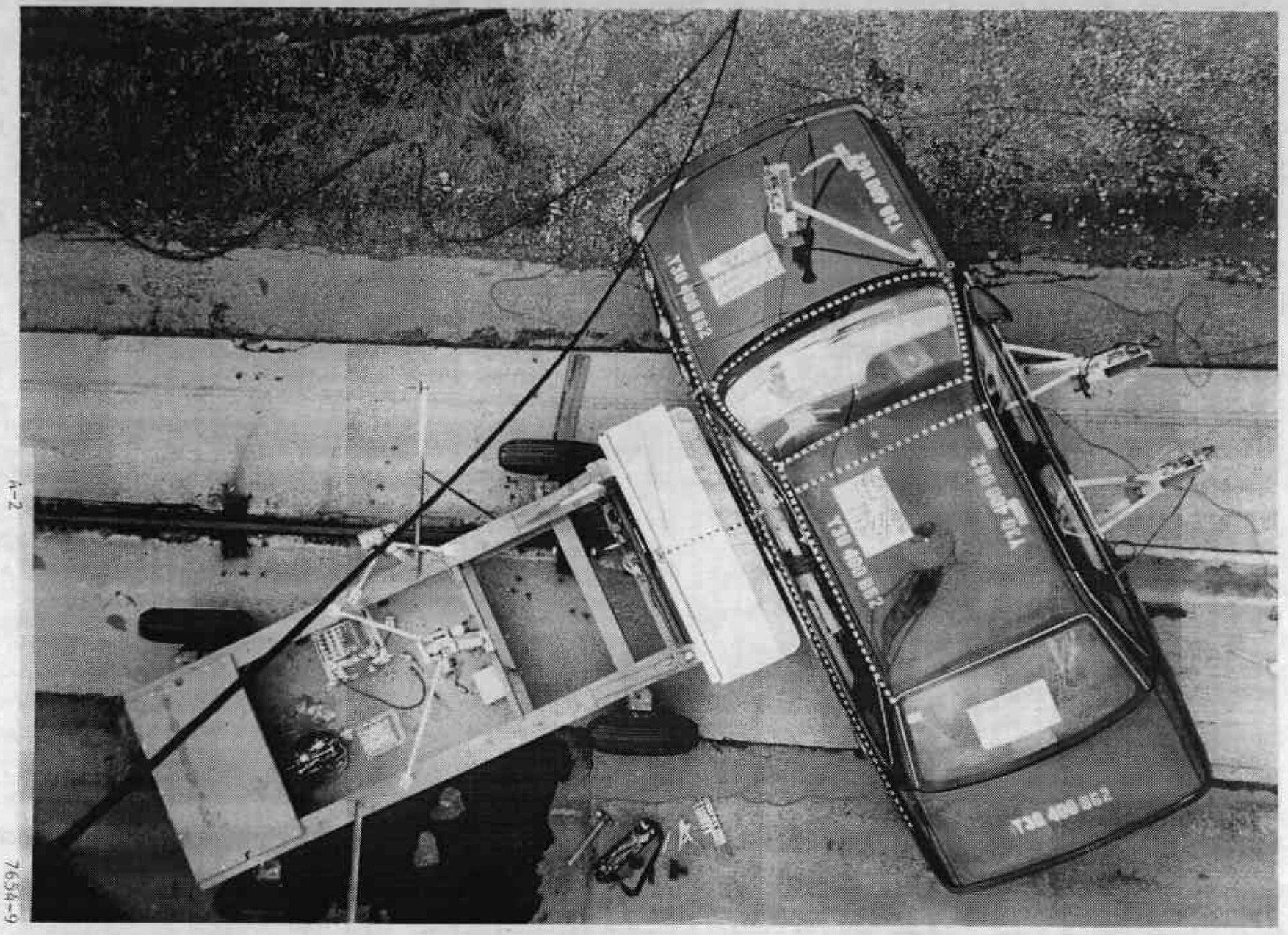

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Figure A-1 PRE-TEST OVERHEAD OVERALL VIEW

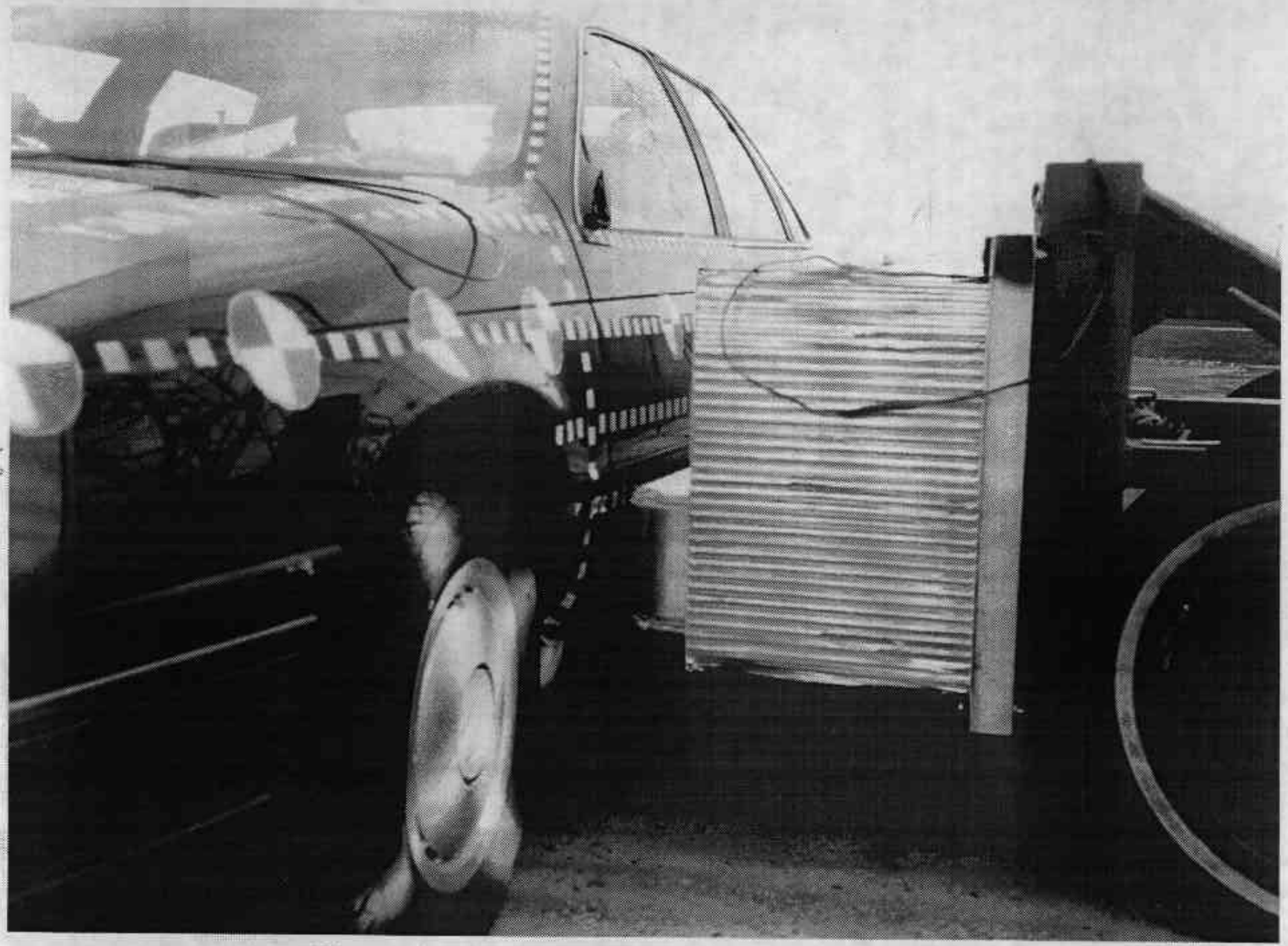

Figure A-2 PRE-TEST LEFT SIDE VIEW MDB CONTACT WITH VEHICLE

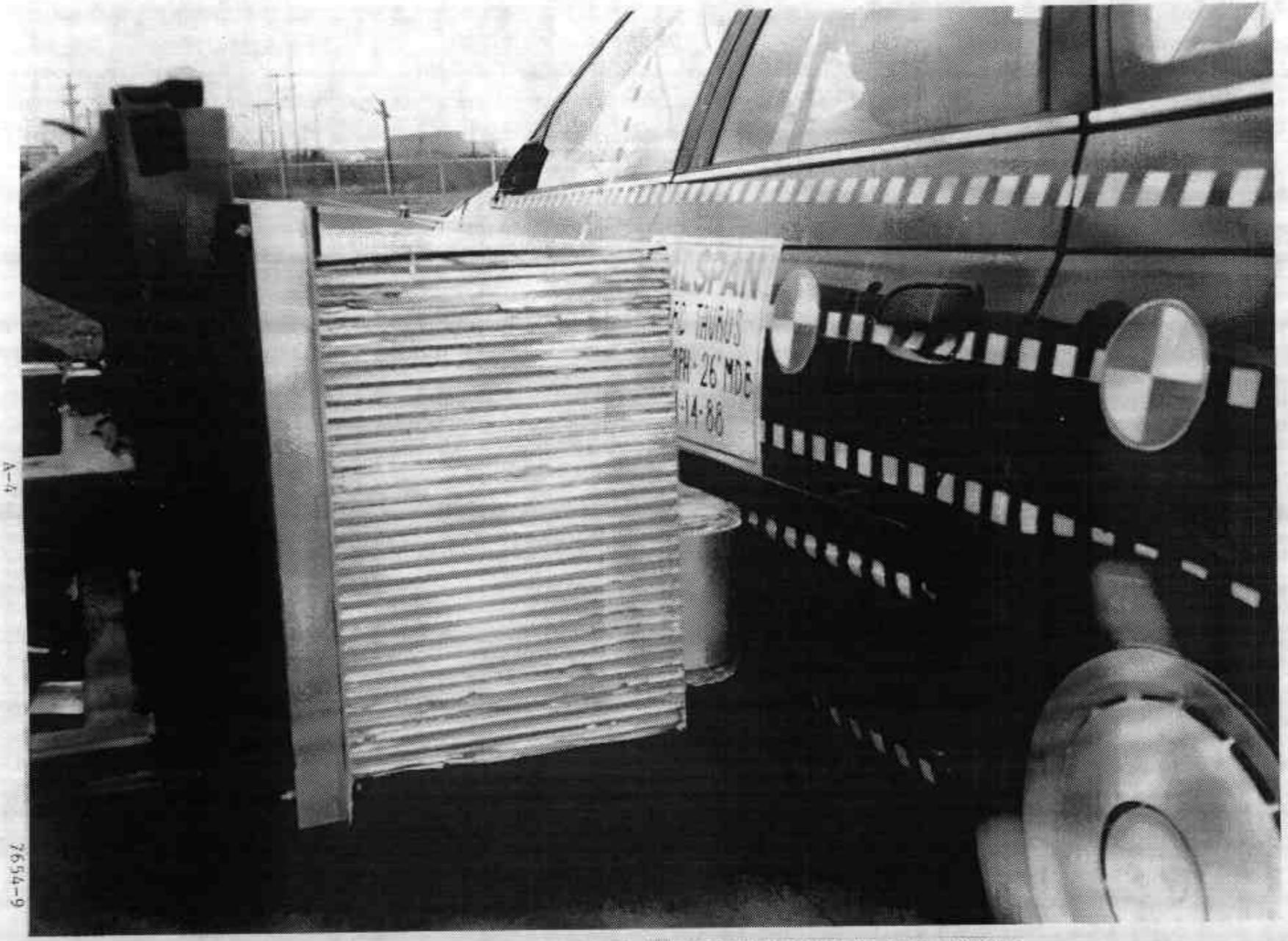

Figure A-3 PRE-TEST RIGHT SIDE VIEW MDB CONTACT WITH VEHICLE

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Figure A-4 PRE-TEST FRONT VIEW

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Figure A-5 POST-TEST FRONT VIEW

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Figure A-6 PRE-TEST FRONT THREE-QUARTER VIEW

Figure A-7 POST-TEST FRONT THREE-QUARTER VIEW

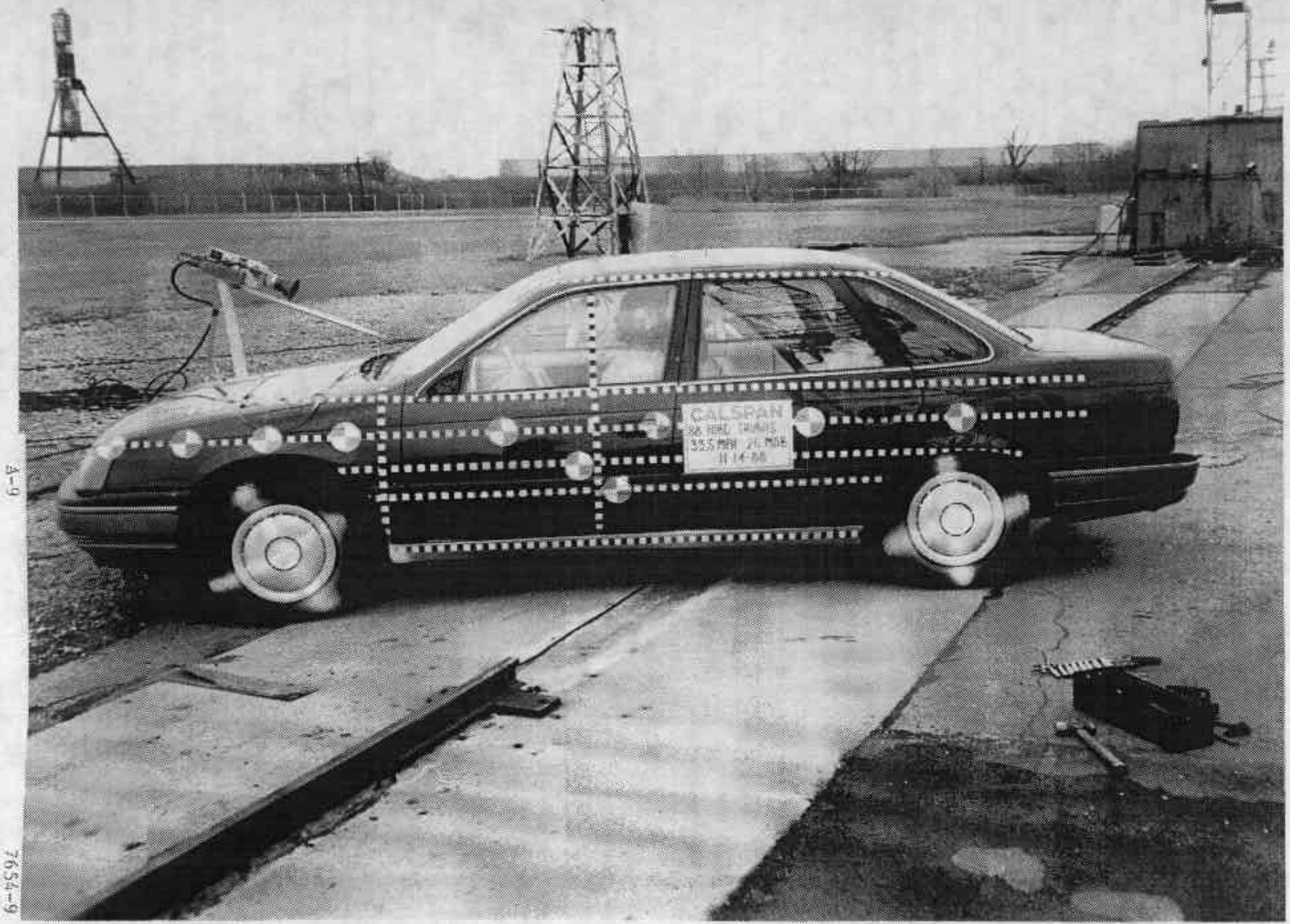

Figure A-8 PRE-TEST LEFT SIDE VIEW

Figure A-9 POST-TEST LEFT SIDE VIEW

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Figure A-10 PRE-TEST REAR THREE-QUARTER VIEW

Figure A-11 POST-TEST REAR THREE-QUARTER VIEW

Figure A-12 PRE-TEST RIGHT SIDE VIEW

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Figure A-13 POST-TEST RIGHT SIDE VIEW

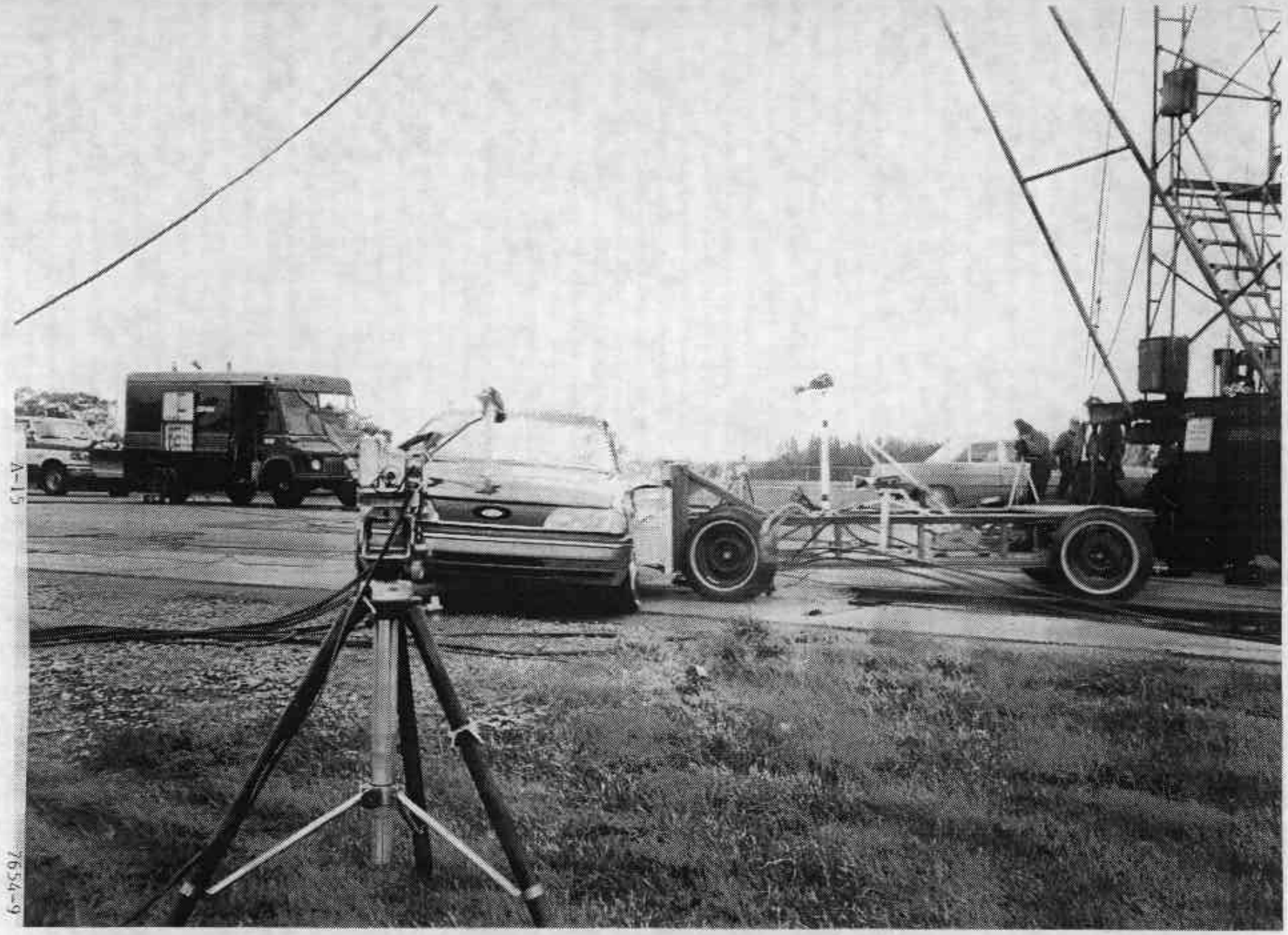

Figure A-14 IMPACT PHOTO

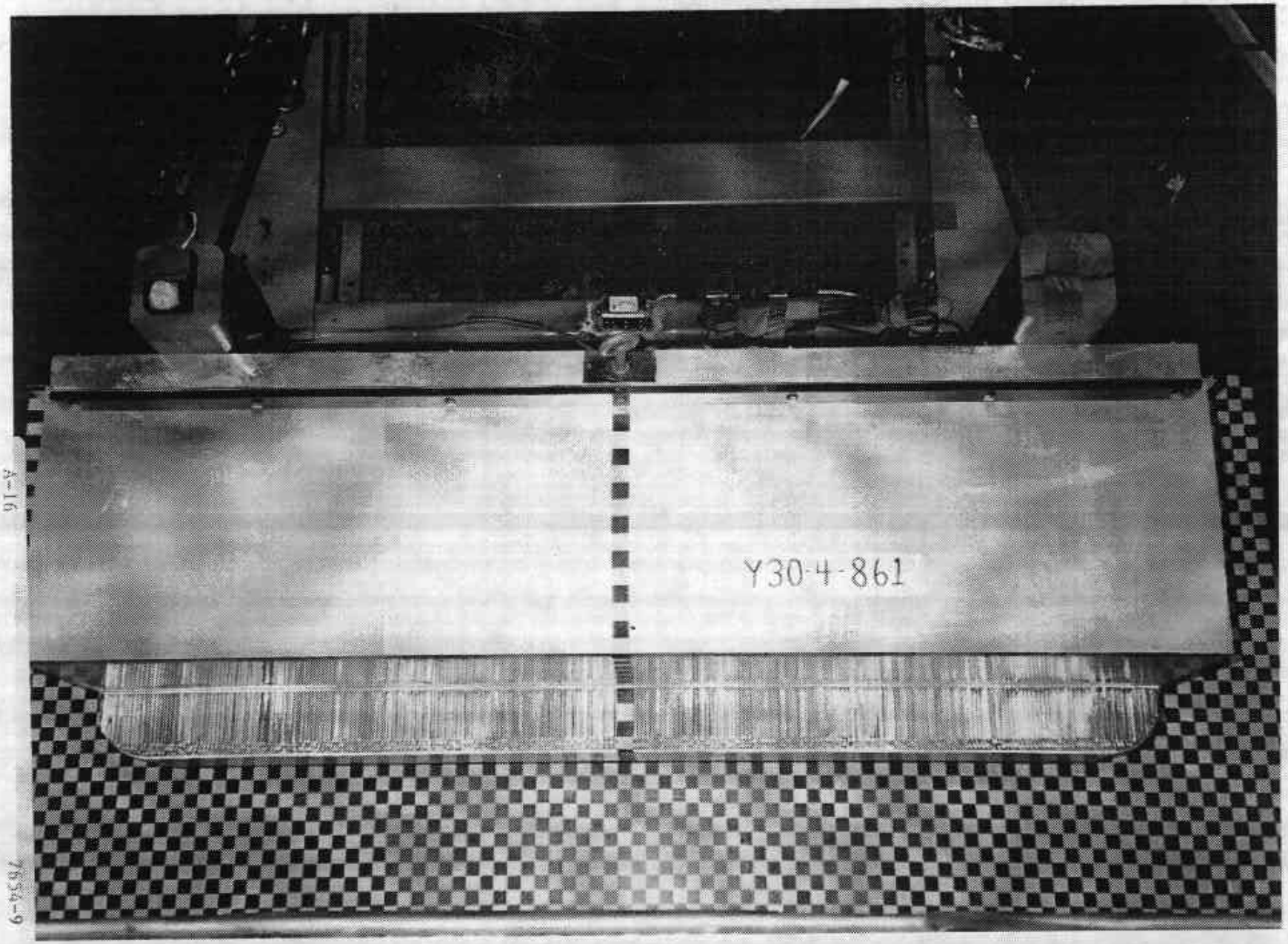

Figure A-15 PRE-TEST MDB TOP VIEW

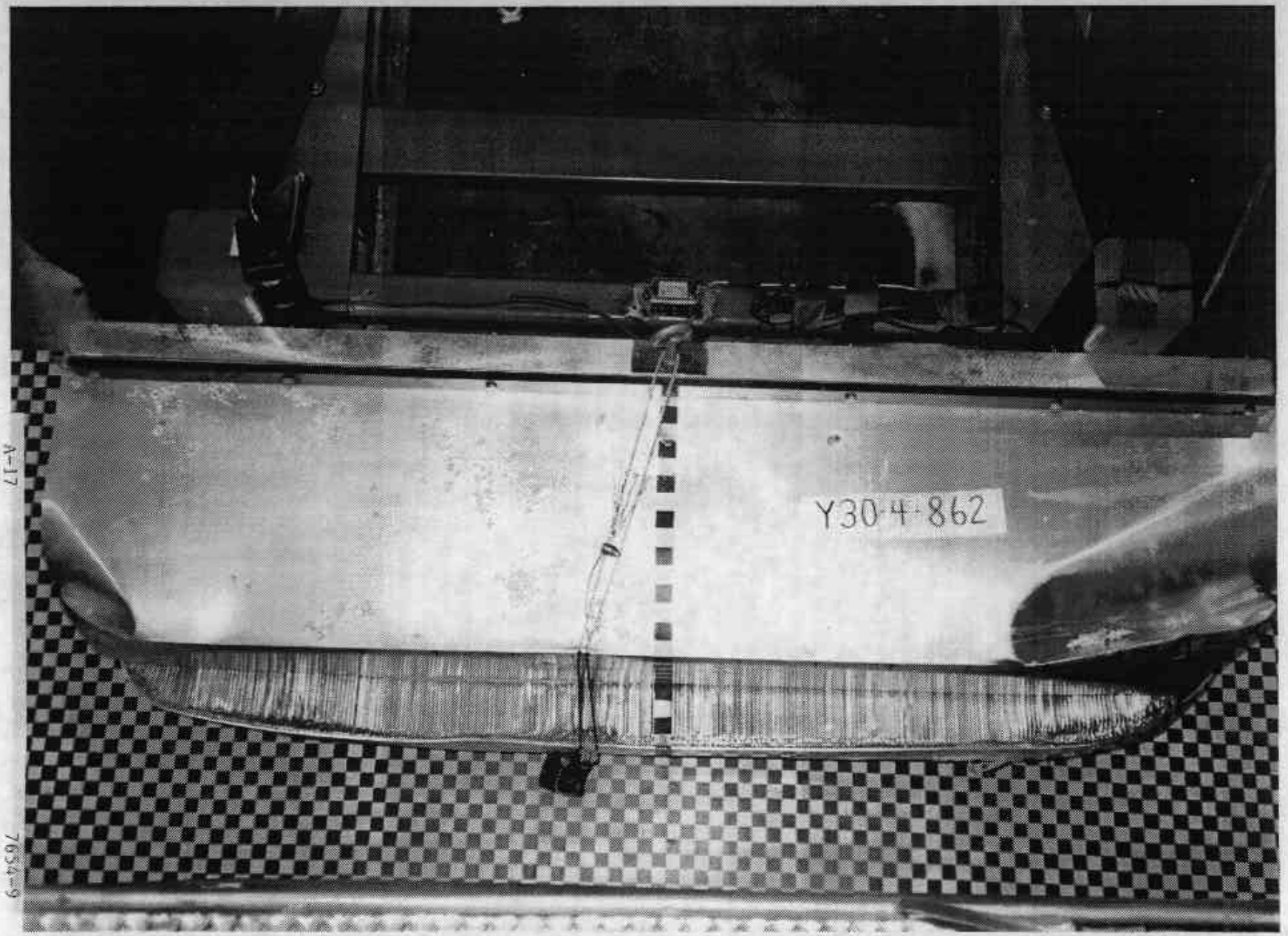

Figure A-16 POST-TEST MDB TOP VIEW

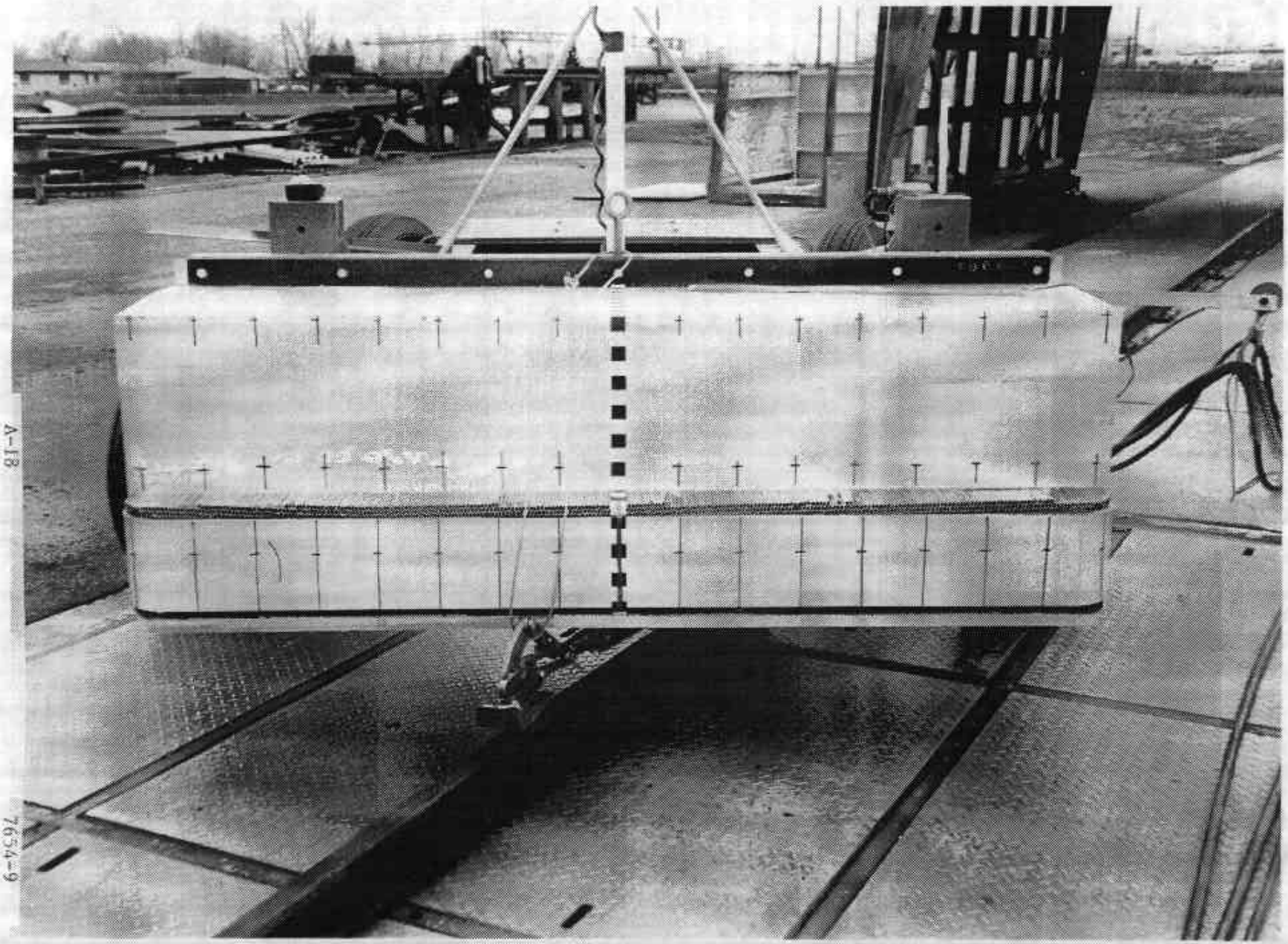

Figure A-17 PRE-TEST MDB FRONT VIEW

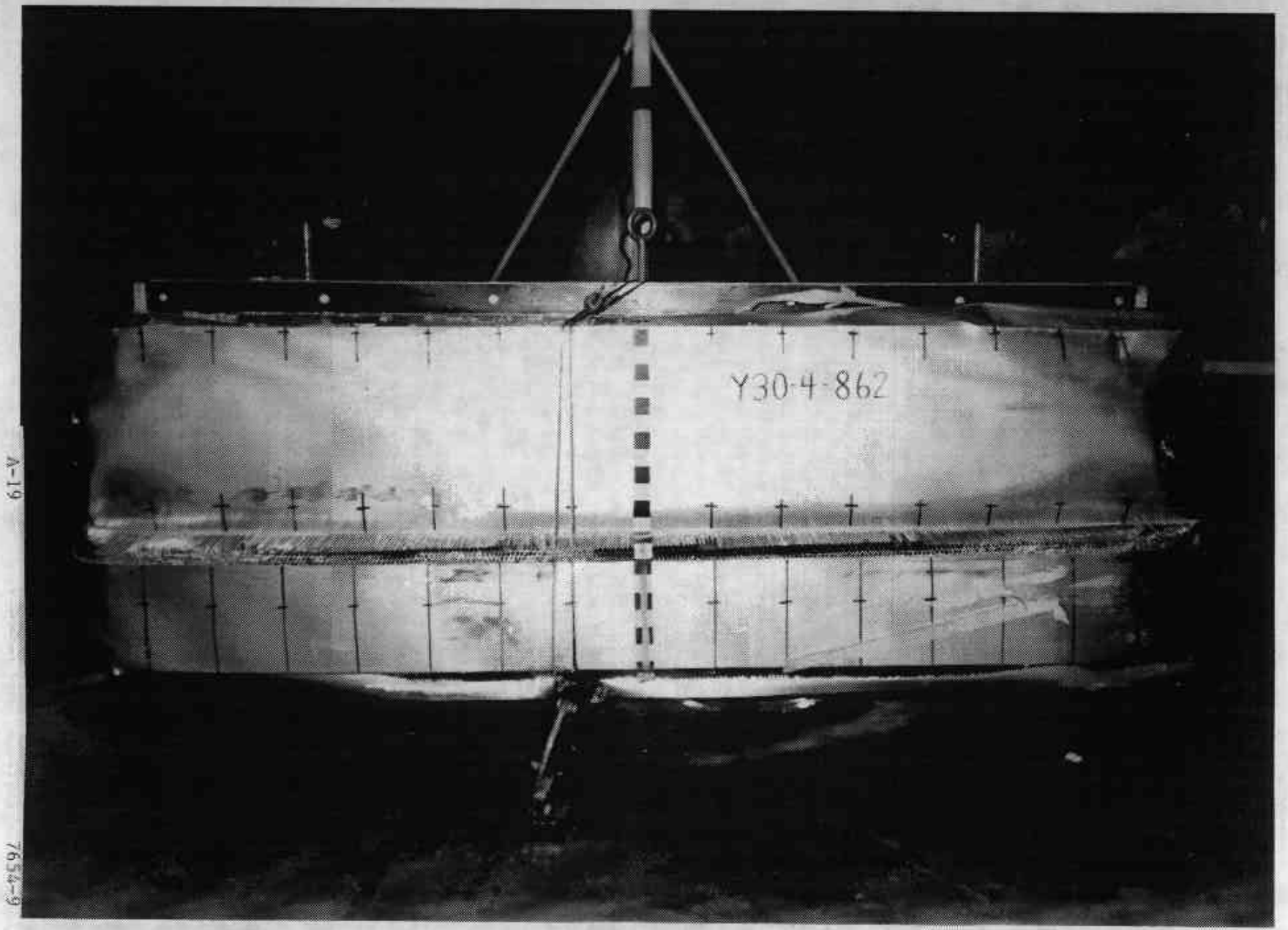

Figure A-18 POST-TEST MDB FRONT VIEW

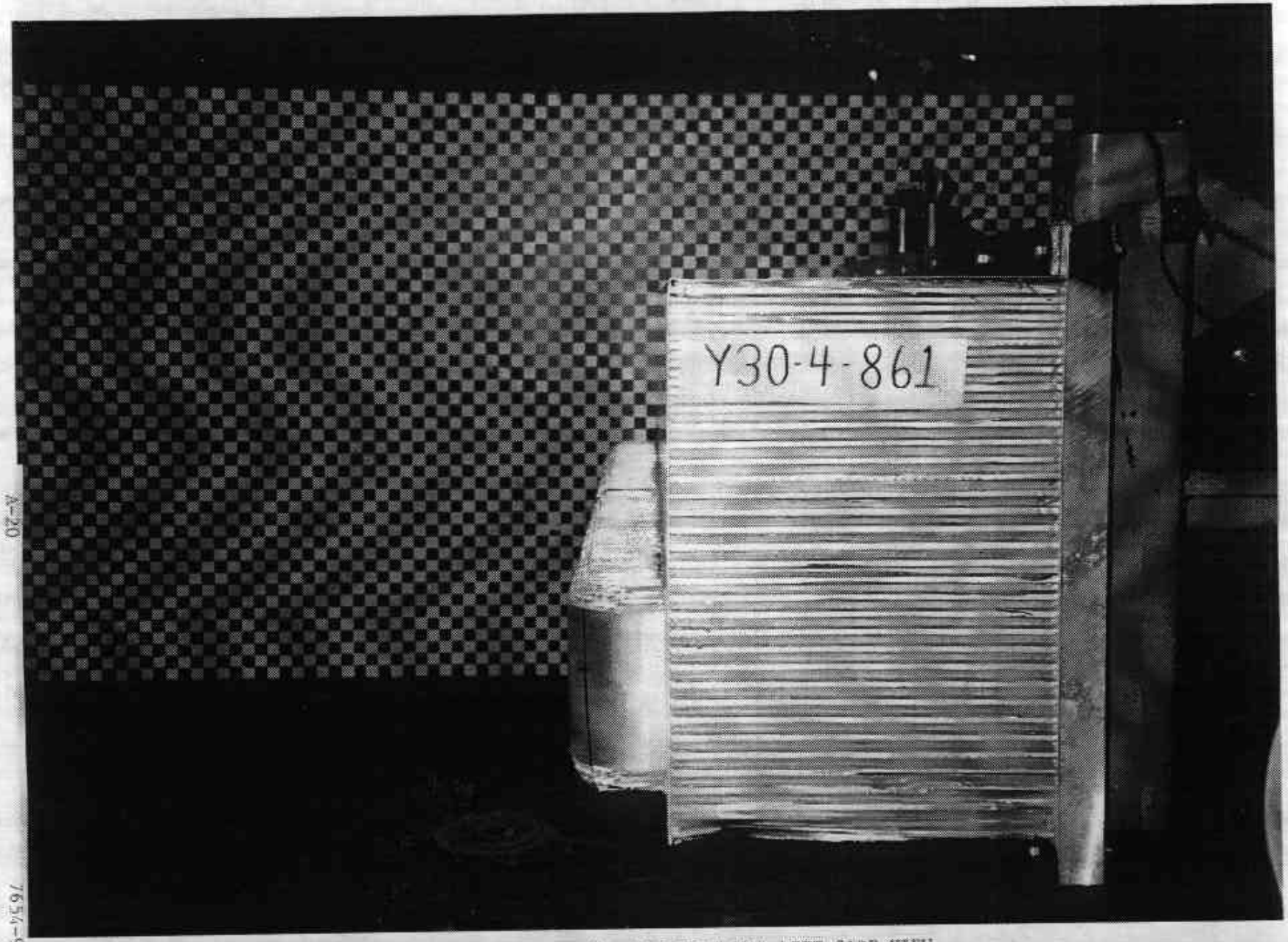

Figure A-19 PRE-TEST MDB LEFT SIDE VIEW

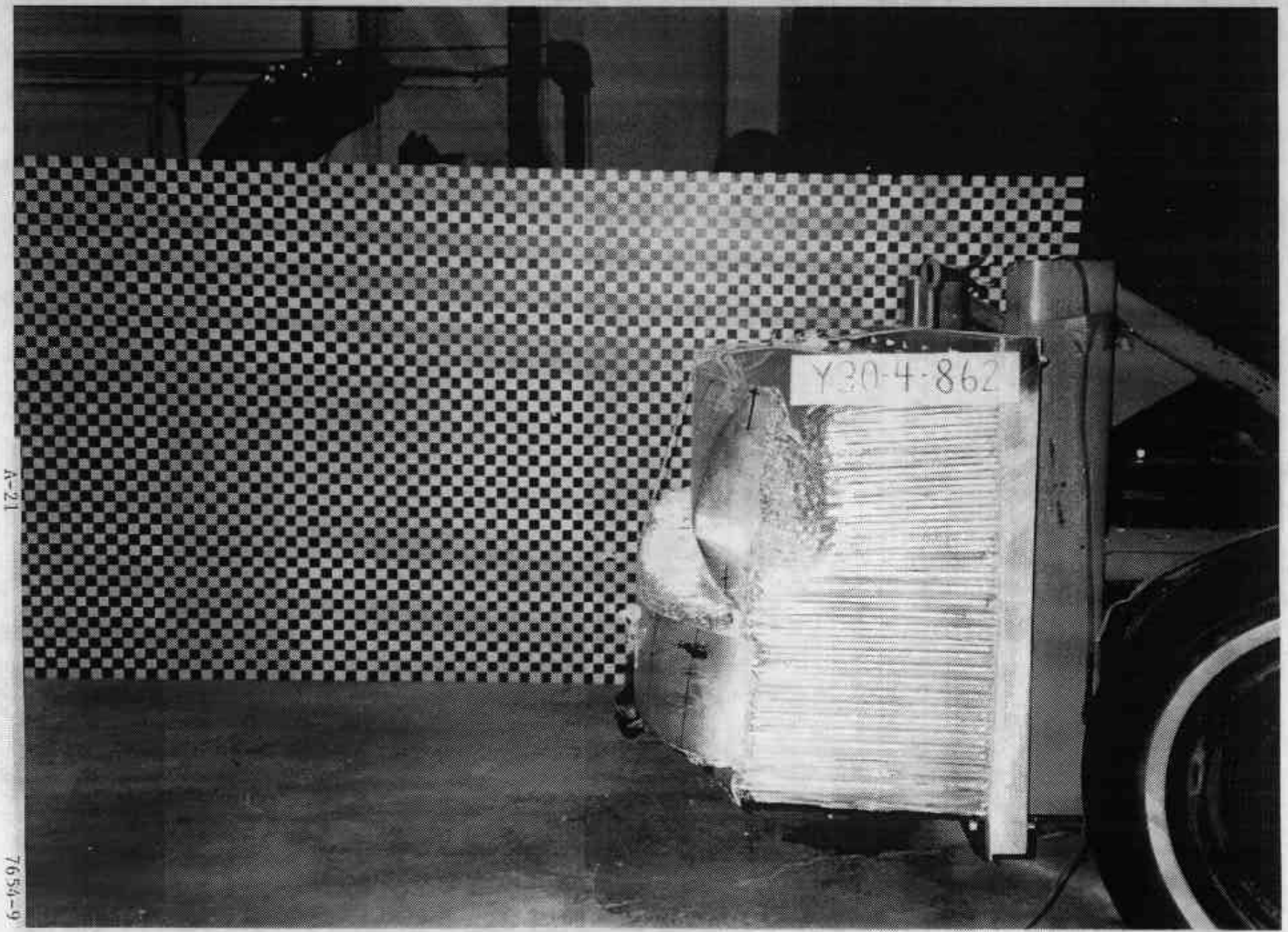

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Figure A-20 POST-TEST MDB LEFT SIDE VIEW

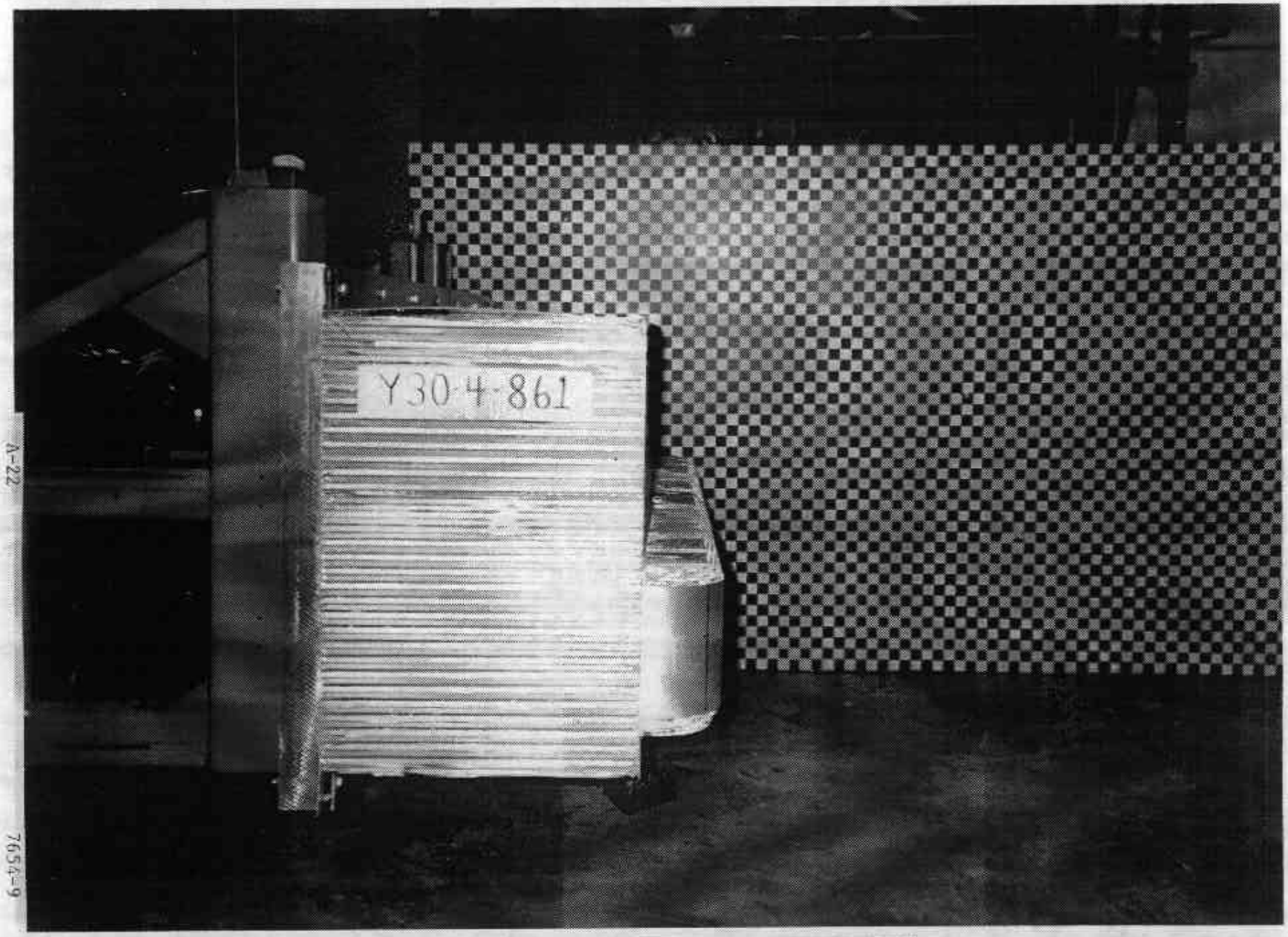

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Figure A-21 PRE-TEST MDB RIGHT SIDE VIEW

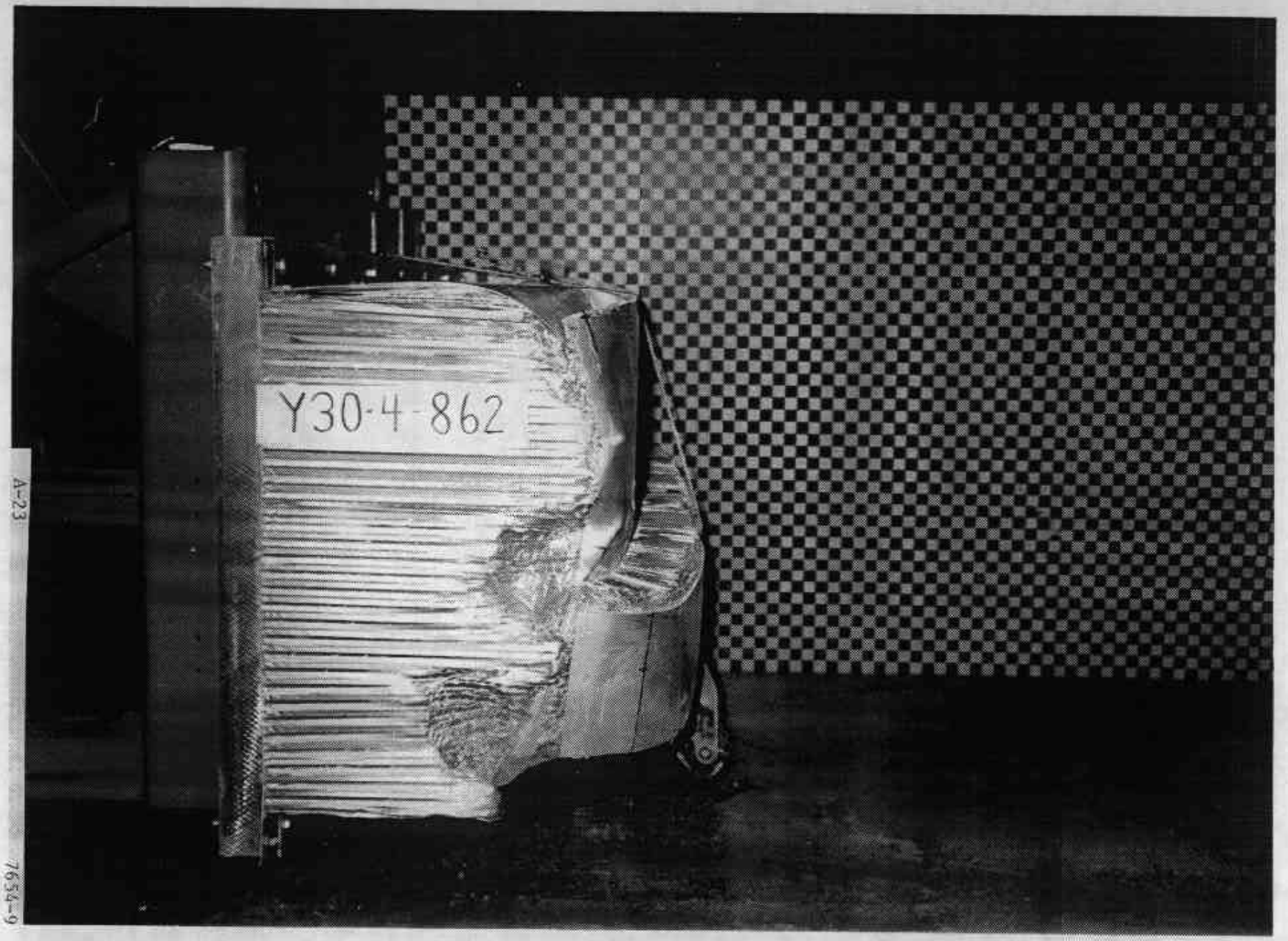

Figure A-22 POST-TEST MDB RIGHT SIDE VIEW

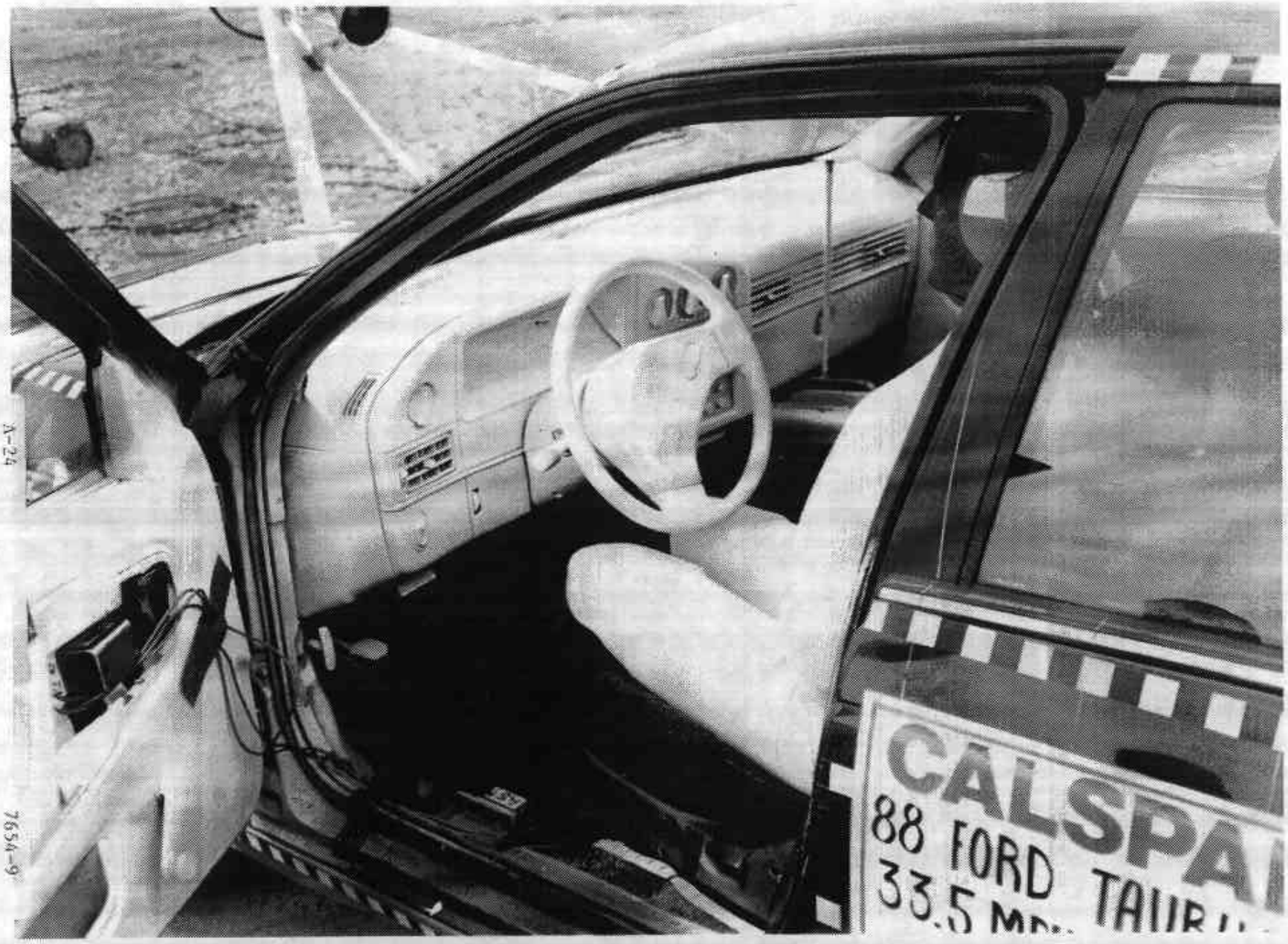

Figure A-23 PRE-TEST DRIVER POSITION AND VEHICLE INTERIOR

Figure A-24 PRE-TEST DRIVER POSITION

Figure A-25 POST-TEST DRIVER POSITION

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Figure A-26 POST-TEST DRIVER CONTACT POINTS WITH LEFT FRONT DOOR

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Figure A-27 PRE-TEST REAR PASSENGER POSITION AND VEHICLE INTERIOR

Figure A-28 PRE-TEST REAR PASSENGER POSITION

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Figure A-29 POST-TEST REAR PASSENGER POSITION

Figure A-30 POST-TEST REAR PASSENGER CONTACT POINTS

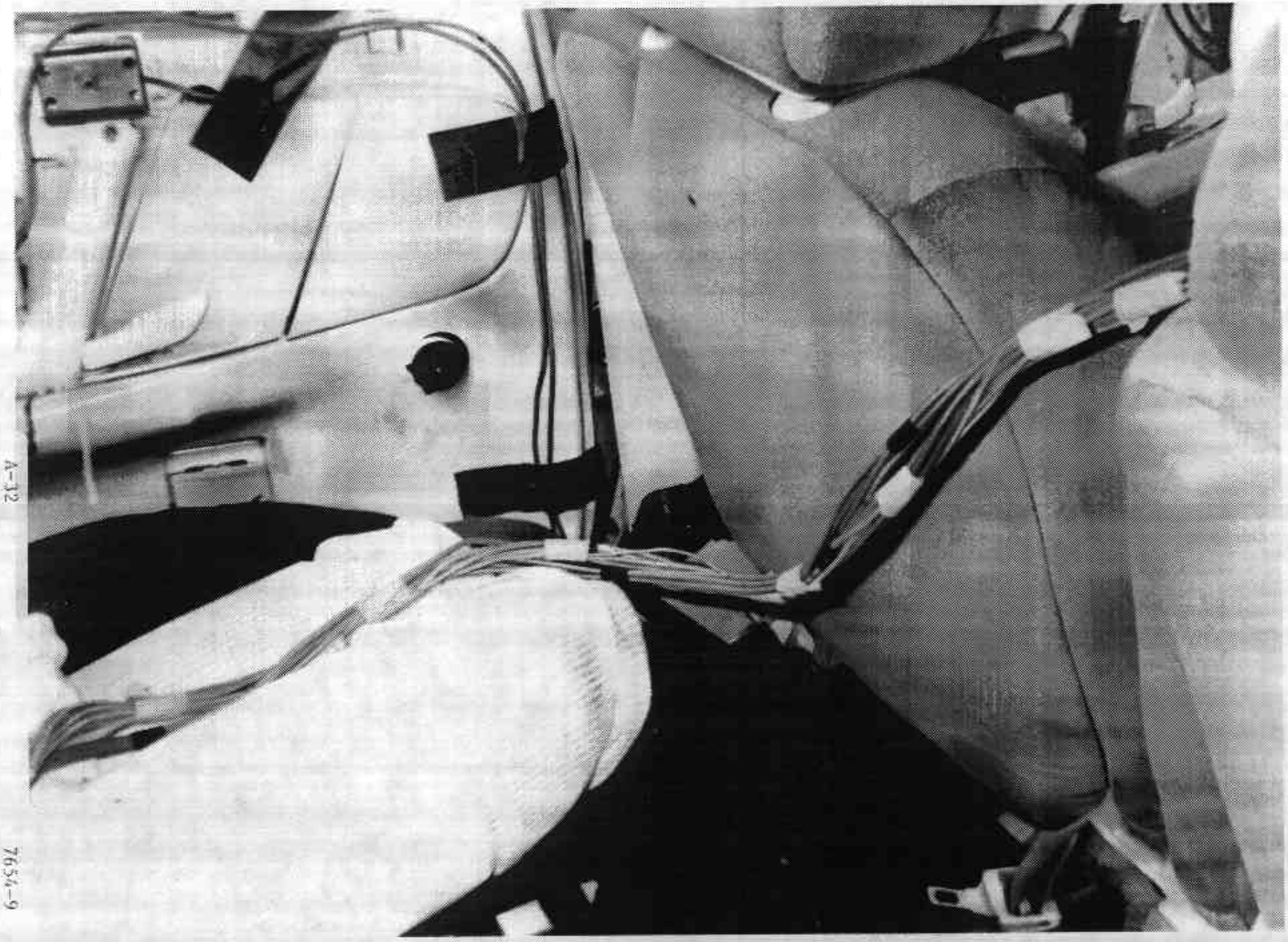


Figure A-31 POST-TEST LOWER "B" PILLAR REAR SEAT VIEW

APPENDIX B

DATA PLOTS

All vehicle data and dummy head and chest deflection data were filtered following SAE J211b. Data from the Side Impact Dummies' thorax and pelvis were filtered in the following manner:

a. Filter the data with a 300 Hz SAE Class 180 filter;

b. Subsample the data to a 1600 Hz sampling rate; and

c. Filter the data with a Finite Impulse Response (FIR) filter having the following characteristics --

1.	Passband frequency	100 Hz
2.	Stopband frequency	189 Hz
3.	Stopband gain	-50 db
4.	Passband ripple	0.0225 db.

FIR filtered data is so noted in this appendix.

NOTE: Dummy lateral primary and redundant accelerometers (y-axis) were scaled to record a maximum of 800 g's and 330 g's respectively. Vehicle left side y-axis accelerometers where scaled to record a maximum of approximately 800 g's.

MOVING BARRIER - SIDE IMPACT TEST

RUN #862 SERIES #4

CHAN	TITLE	MINIMUM/MAXIMUM		AT	TIME	
1	POS#1 HEAD X	-19.17	G'S		51.53	MS
		18.72	G'S		61.88	MS
2	POS#1 HEAD Y	-45.26	G'S		96.00	MS
		16.20	G'S		69.60	MS
3	POS#1 HEAD Z	-16.48	G'S		83.55	MS
		49.25	G'S		64.28	MS
4	POS#1 UPPER RIB Y	-13.26	G'S		78.75	MS
		69.50	G'S		31.25	MS
5	POS#1 UPPER RIB Y(R)	-6.50	G'S		86.25	MS
		86.48	G'S		30.63	MS
6	POS#1 LOWER RIB Y	-11.95	G'S		65.63	MS
		68.88	G'S		30.63	MS
7	POS#1 LOWER RIB Y(R)	-10.64	G'S		66.25	MS
		79.60	G'S		31.25	MS
8	POS#1 LOWER SPINE Y	-11.83	G'S		72.50	MS
		86.91	G'S		34.38	MS
9	POS#1 LOWER SPINE Y(R)	-13.61	G'S		72.50	MS
		87.64	G'S		35.00	MS
10	POS#1 PELVIC Y	-4.83	G'S		170.63	MS
		104.96	G'S		28.75	MS
11	POS#1 CHEST DISPLACEMENT *	-0.04	INCHES		25.80	MS
		2.74	INCHES		99.53	MS
12	POS#1 UPPER SPINE Y	-34.98	G'S		71.88	MS
		55.41	G'S		45.00	MS

* - See Test Anomalies

MOVING BARRIER - SIDE IMPACT TEST

RUN #862 SERIES #4

CHAN	TITLE	MINIMUM/MAXIMUM		AT	TIME	
13	POS#4 HEAD X	-20.22	G'S		61.13	MS
		6.75	G'S		88.65	MS
14	POS#4 HEAD Y	-16.36	G'S		69.75	MS
		116.35	G'S		58.35	MS
15	POS#4 HEAD Z	-77.56	G'S		61.20	MS
		33.07	G'S		47.10	MS
16	POS#4 UPPER RIB Y	-10.03	G'S		90.00	MS
		91.45	G'S		44.38	MS
17	POS#4 UPPER RIB Y(R)	-10.11	G'S		90.00	MS
		86.73	G'S		44.38	MS
18	POS#4 LOWER RIB Y	-20.99	G'S		75.00	MS
		87.02	G'S		41.88	MS
19	POS#4 LOWER RIB Y(R)	-21.68	G'S		74.38	MS
		80.40	G'S		41.88	MS
20	POS#4 LOWER SPINE Y	-28.86	G'S		63.75	MS
		46.81	G'S		42.50	MS
21	POS#4 LOWER SPINE Y(R)	-31.53	G'S		63.75	MS
		50.78	G'S		42.50	MS
22	POS#4 PELVIC Y	-14.32	G'S		73.13	MS
		91.03	G'S		31.25	MS
23	POS#4 CHEST DISPLACEMENT *	-.03	INCHES		41.33	MS
		3.55	INCHES		70.87	MS
24	POS#4 UPPER SPINE Y	-7.20	G'S		33.13	MS
		50.90	G'S		50.00	MS
25	DOOR SILL RIGHT FRONT X	-4.33	G'S		16.65	MS
		5.69	G'S		53.18	MS

* - See Test Anomalies

D76/side_impact/88_taurus/2

MOVING BARRIER - SIDE IMPACT TEST

RUN #862 SERIES #4

CHAN	TITLE	MINIMUM/MAXIMUM		AT TIME	
26	DOOR SILL RIGHT FRONT Y	-1.86	G'S	80.03	MS
		22.89	G'S	5.40	MS
27	DOOR SILL RIGHT FRONT Z	-5.33	G'S	29.63	MS
		4.47	G'S	101.55	MS
28	DOOR SILL RIGHT REAR X	-4.24	G'S	31.05	MS
		5.25	G'S	54.00	MS
29	DOOR SILL RIGHT REAR Y	-2.86	G'S	103.73	MS
		22.74	G'S	6.45	MS
30	DOOR SILL RIGHT REAR Z	-5.56	G'S	98.70	MS
		5.64	G'S	16.88	MS
31	FLOOR PAN REAR CL X	-7.27	G'S	29.63	MS
		3.11	G'S	56.78	MS
32	FLOOR PAN REAR CL Y	-3.13	G'S	114.53	MS
		17.67	G'S	42.23	MS
33	FLOOR PAN REAR CL Z	-15.41	G'S	19.13	MS
		12.85	G'S	30.60	MS
34	DOOR SILL LEFT REAR Y	-31.27	G'S	18.75	MS
		73.10	G'S	4.58	MS
35	DOOR SILL LEFT FRONT Y	-79.61	G'S	15.60	MS
		144.00	G'S	9.08	MS
36	LEFT FRONT DOOR CL Y	-61.73	G'S	25.35	MS
		103.29	G'S	10.28	MS
37	RIGHT REAR COMPARTMENT X	-8.82	G'S	16.13	MS
		8.59	G'S	54.60	MS
38	LEFT FRONT DOOR MID Y	-93.39	G'S	28.58	MS
		84.34	G'S	11.63	MS

D76/side_impact/88_taurus/3

MOVING BARRIER - SIDE IMPACT TEST

RUN #862 SERIES #4

CHAN	TITLE	MINIMUM/MAXIMUM		AT	TIME	
39	UPPER FRONT DOOR L. CL Y	-80.21	G'S		30.30	MS
		85.11	G'S		16.05	MS
40	MID LEFT REAR DOOR Y	-40.60	G'S		40.05	MS
		112.35	G'S		10.73	MS
41	UPPER LEFT REAR DOOR Y	-53.37	G'S		31.28	MS
		100.03	G'S		17.03	MS
42	BARRIER CG X	-14.96	G'S		26.33	MS
		1.40	G'S		151.58	MS
43	BARRIER CG Y	-6.51	G'S		36.75	MS
		1.76	G'S		53.93	MS
44	BARRIER CG Z	-11.56	G'S		47.18	MS
		12.69	G'S		40.20	MS
45	BARRIER FRONT FRAME CL X	-15.42	G'S		34.05	MS
		1.30	G'S		154.13	MS
46	BARRIER REAR FRAME CL X	-15.30	G'S		27.00	MS
		2.07	G'S		159.08	MS

MOVING BARRIER - SIDE IMPACT TEST

RUN #862 SERIES #4

CHAN	TITLE	MINIMUM/MAXIMUM		AT	TIME	
1	POS#1 HEAD R	0.39	G'S		-44.25	MS
		53.03	G'S		64.88	MS
2	POS#4 HEAD R	0.31	G'S		-43.73	MS
		130.56	G'S		59.25	MS
3	DOOR SILL RIGHT FRONT R	0.25	G'S		-4.43	MS
		23.05	G'S		5.40	MS
4	DOOR SILL RIGHT REAR R	0.35	G'S		-11.93	MS
		22.75	G'S		6.45	MS
5	FLOOR PAN REAR CL R	0.41	G'S		-43.80	MS
		22.81	G'S		19.65	MS
6	BARRIER CG R	0.36	G'S		-26.55	MS
		19.78	G'S		40.05	MS

MOVING BARRIER - SIDE IMPACT TEST

RUN #862 SERIES #4

CHAN	TITLE	MINIMUM	MAXIMUM	
26	DOOR SILL RIGHT FRONT Y VELOCITY	-0.25	12.61	MPH
26	DOOR SILL RIGHT FRONT Y DISPLACEMENT	0.10	53.32	INCHES
29	DOOR SILL RIGHT REAR Y VELOCITY	-0.18	15.53	MPH
29	DOOR SILL RIGHT REAR Y DISPLACEMENT	0.05	65.36	INCHES
32	FLOOR PAN REAR CL Y VELOCITY	-0.05	18.44	MPH
32	FLOOR PAN REAR CL Y DISPLACEMENT	-0.02	78.76	INCHES
34	DOOR SILL LEFT REAR Y VELOCITY	0.04	15.30	MPH
34	DOOR SILL LEFT REAR Y DISPLACEMENT	-0.53	32.76	INCHES
35	DOOR SILL LEFT FRONT Y VELOCITY	-0.17	20.20	MPH
35	DOOR SILL LEFT FRONT Y DISPLACEMENT	0.00	72.27	INCHES
36	LEFT FRONT DOOR CL Y VELOCITY	0.00	20.87	MPH
36	LEFT FRONT DOOR CL Y DISPLACEMENT	0.07	74.10	INCHES
38	LEFT FRONT DOOR MID Y VELOCITY	-10.24	21.29	MPH
38	LEFT FRONT DOOR MID Y DISPLACEMENT	0.00	17.72	INCHES
39	UPPER FRONT DOOR L CL Y VELOCITY	0.01	22.30	MPH
39	UPPER FRONT DOOR L CL Y DISPLACEMENT	0.00	52.79	INCHES
40	MID LEFT REAR DOOR Y VELOCITY	-0.44	20.75	MPH
40	MID LEFT REAR DOOR Y DISPLACEMENT	0.00	74.06	INCHES
41	UPPER LEFT REAR DOOR Y VELOCITY	-0.08	28.40	MPH
41	UPPER LEFT REAR DOOR Y DISPLACEMENT	0.00	90.65	INCHES
	BARRIER			
42	BARRIER CG X VELOCITY	15.98	33.41	MPH
42	BARRIER CG X DISPLACEMENT	-26.42	100.78	INCHES
45	BARRIER FRONT FRAME CL X VELOCITY	16.42	33.42	MPH
45	BARRIER FRONT FRAME CL X DISPLACEMENT	-26.43	102.26	INCHES
46	BARRIER REAR FRAME CL X VELOCITY	17.11	33.50	MPH
46	BARRIER REAR FRAME CL X DISPLACEMENT	-26.47	111.85	INCHES

D76/side_impact/88_taurus/6

HEAD INJURY CRITERION
HEAD SEVERITY INDEX
36MS. MAXIMUM DURATION

MOVING BARRIER - SIDE IMPACT TEST

RUN= 862

POS#1 HEAD R

HIC= 149.4 FROM T1= .05992 TO T2= .07485

AVERAGE ACCELERATION BETWEEN T1 AND T2= 39.8G'S

EVENT TIME= 300.0 MSEC

SEVERITY INDEX= 306.6

HEAD INJURY CRITERION
HEAD SEVERITY INDEX
36MS. MAXIMUM DURATION

MOVING BARRIER - SIDE IMPACT TEST

RUN= 862

POS#4 HEAD R

HIC= 779.0 FROM T1= .05550 TO T2= .06367

AVERAGE ACCELERATION BETWEEN T1 AND T2= 98.1G'S

EVENT TIME= 300.0 MSEC

SEVERITY INDEX=1111.7

DUMMY DATA

POS #1 - DRIVER

POS #4 - LEFT REAR PASSENGER

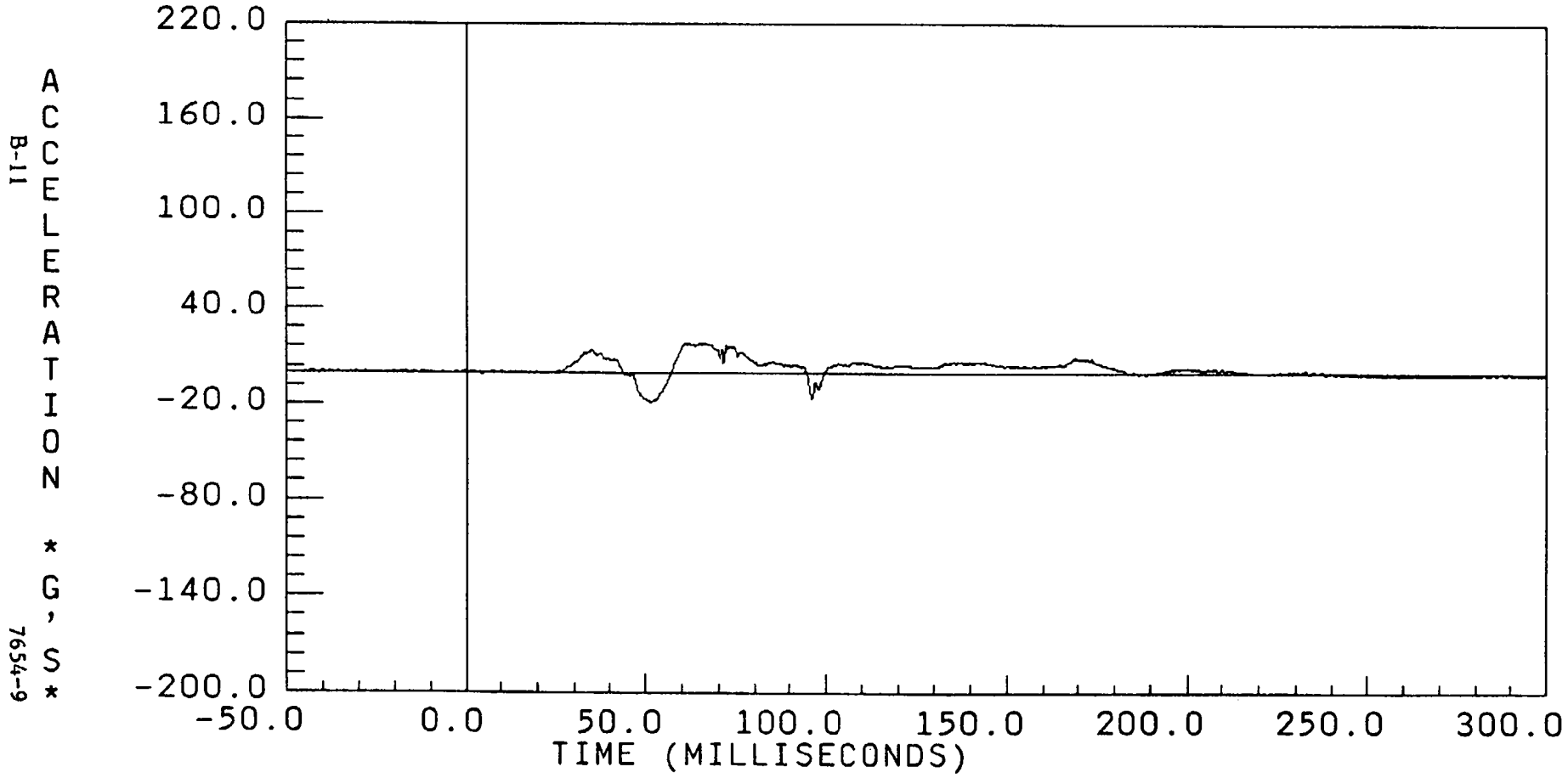
UDS$862-1.DAT

0.00 mph

POS#1 HEAD X

FILTER CUTOFF: OHz

X AXIS
YMIN =-19.17100 at 51.52500
YMAX = 18.71600 at 61.87500



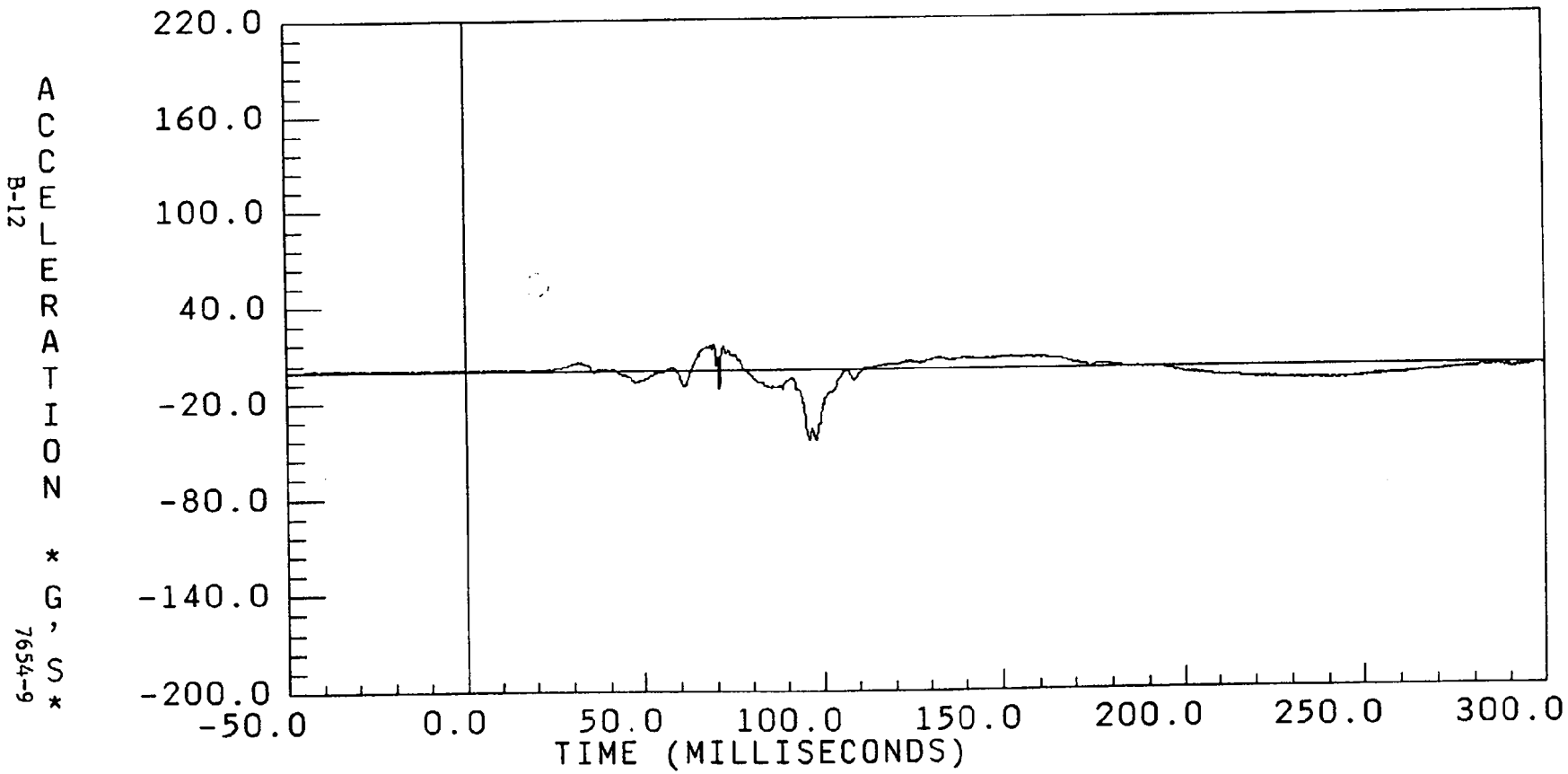
UDS$862-2.DAT

0.00 mph

POS#1 HEAD Y

FILTER CUTOFF: 0Hz

Y AXIS
YMIN =-45.26000 at 96.00001
YMAX = 16.20000 at 69.60001



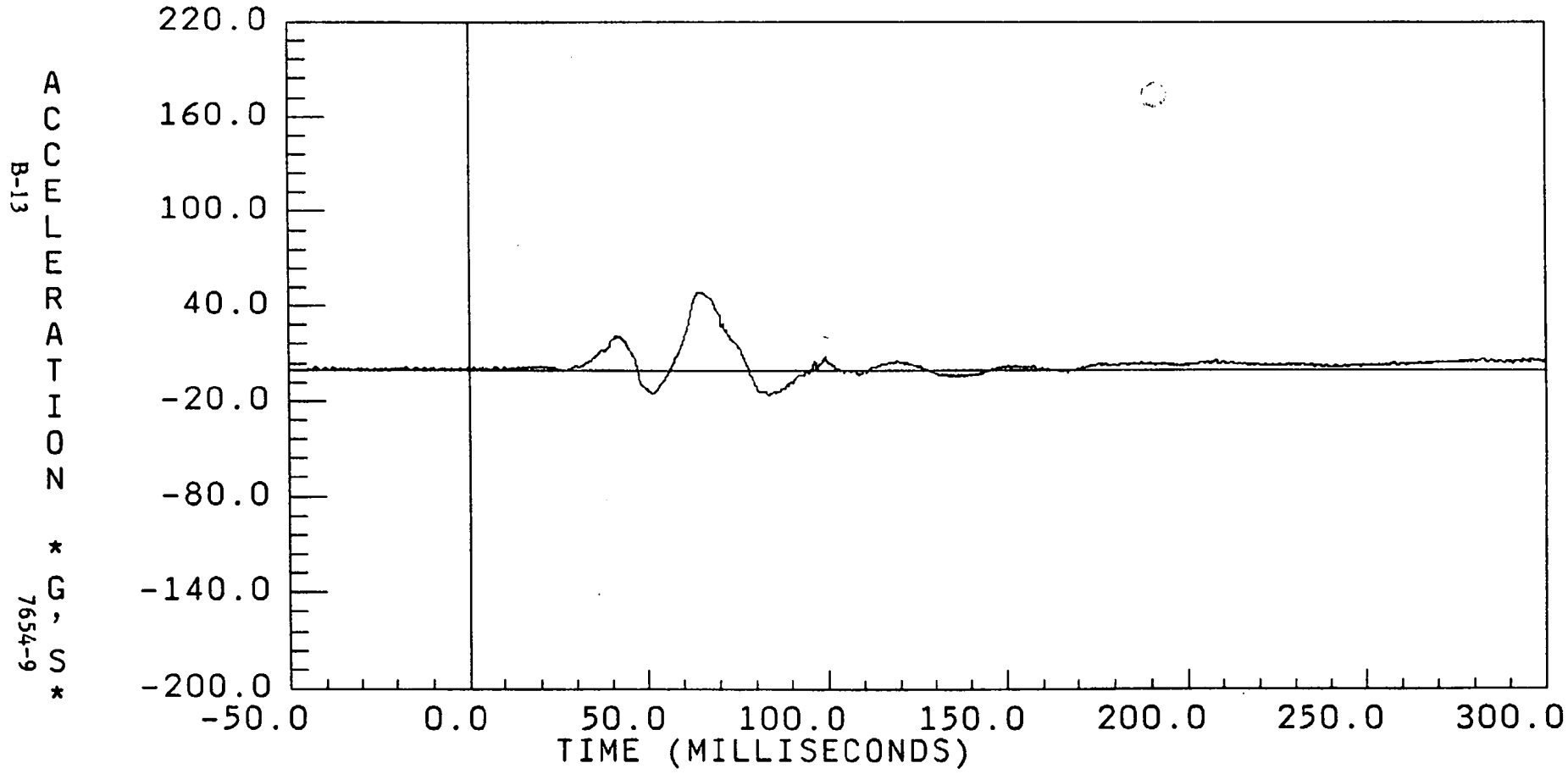
UDS$862-3.DAT

0.00 mph

POS#1 HEAD Z

FILTER CUTOFF: OHz

Z AXIS
YMIN =-16.47700 at 83.55000
YMAX = 49.25100 at 64.27500

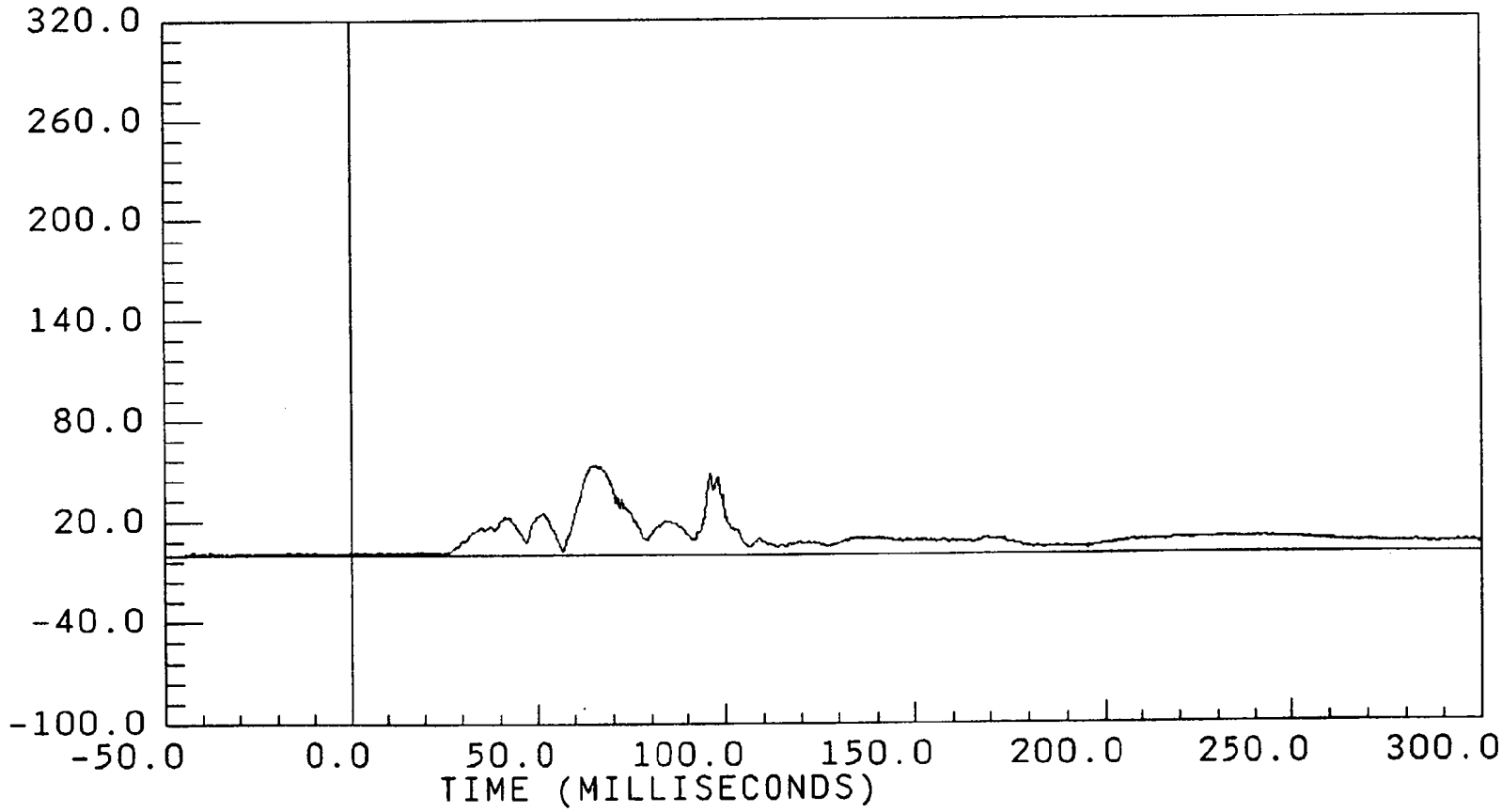


HRES862-1.DAT

0.00 mph

POS#1 HEAD
NONSTANDARD
FILTER CUTOFF: 0Hz

RS AXIS
YMIN = 0.385630 at -44.25000
YMAX = 53.03339 at 64.87500



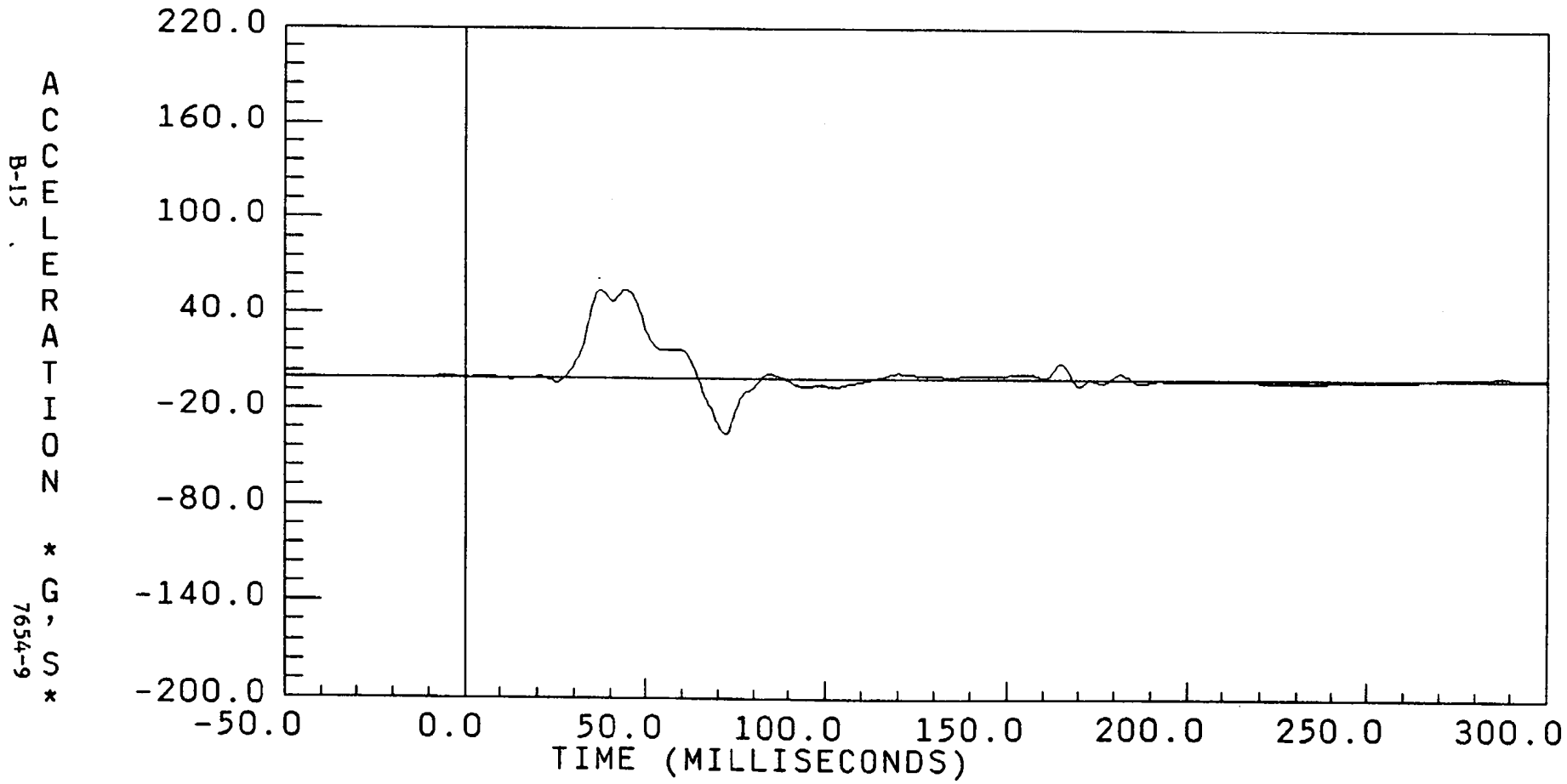
FIR862-12.DAT

0.00 mph

POS#1 UPPER SPINE Y

FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-34.98043 at 71.87500
YMAX = 55.41457 at 45.00000



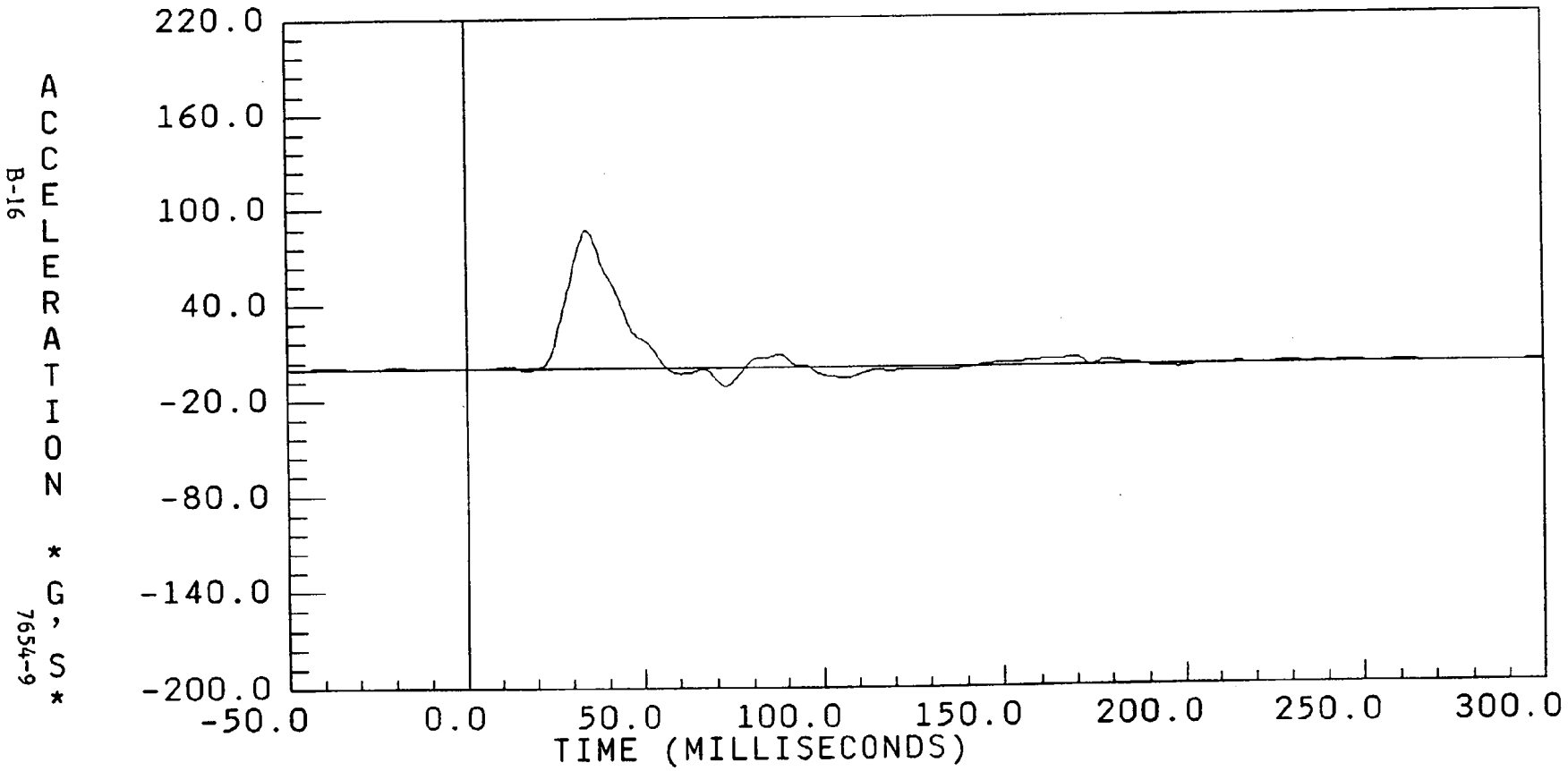
FIR862-8.DAT

0.00 mph

POS#1 LOWER SPINE Y

FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-11.83225 at 72.50000
YMAX = 86.90585 at 34.37500



7654-9

FIR862-9.DAT

0.00 mph

POS#1 LOWER SPINE Y(R)

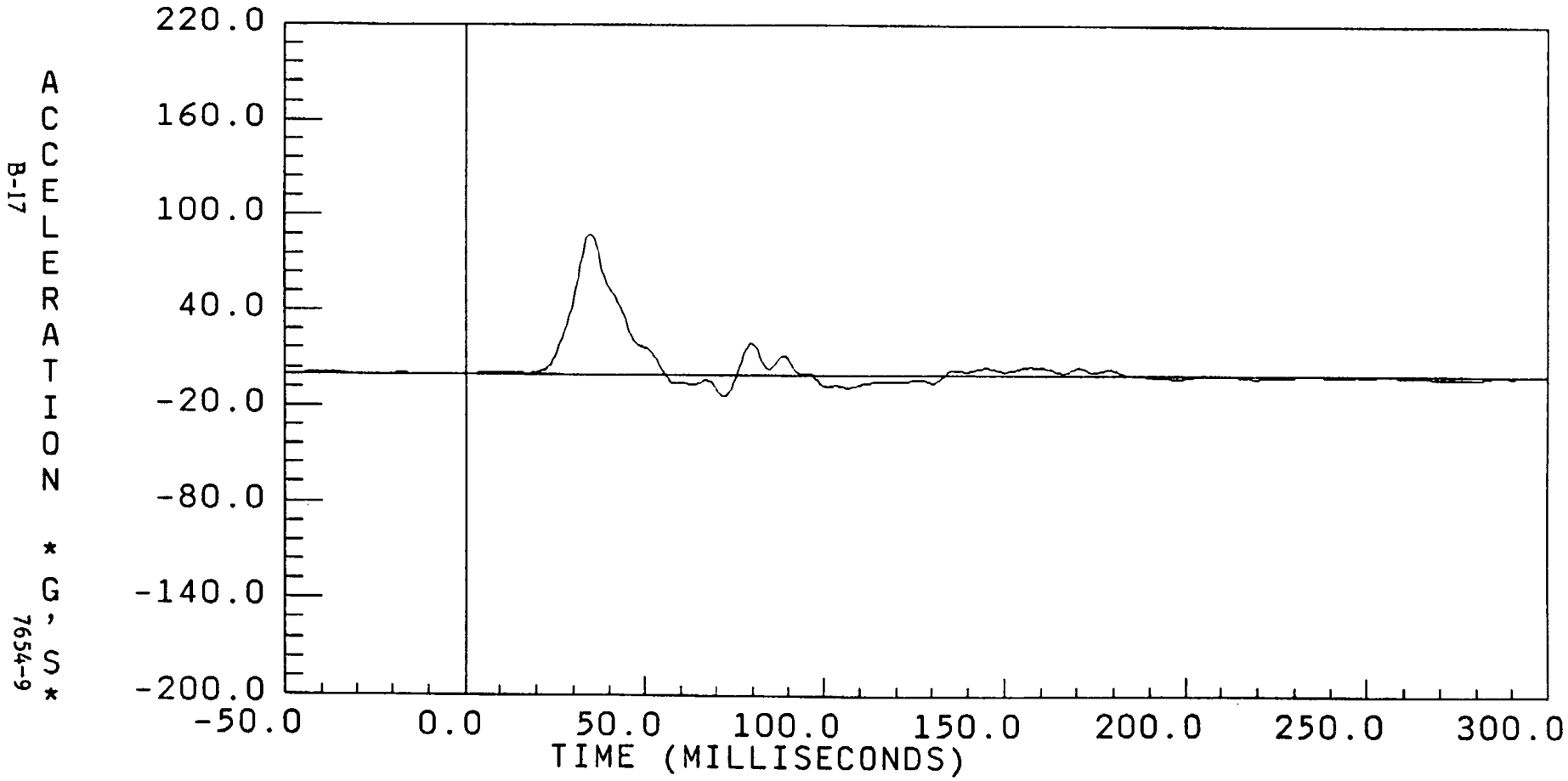
FILTER CUTOFF: 100Hz

REDUNDANT

Y AXIS

YMIN =-13.61228 at 72.50000

YMAX = 87.64480 at 35.00000



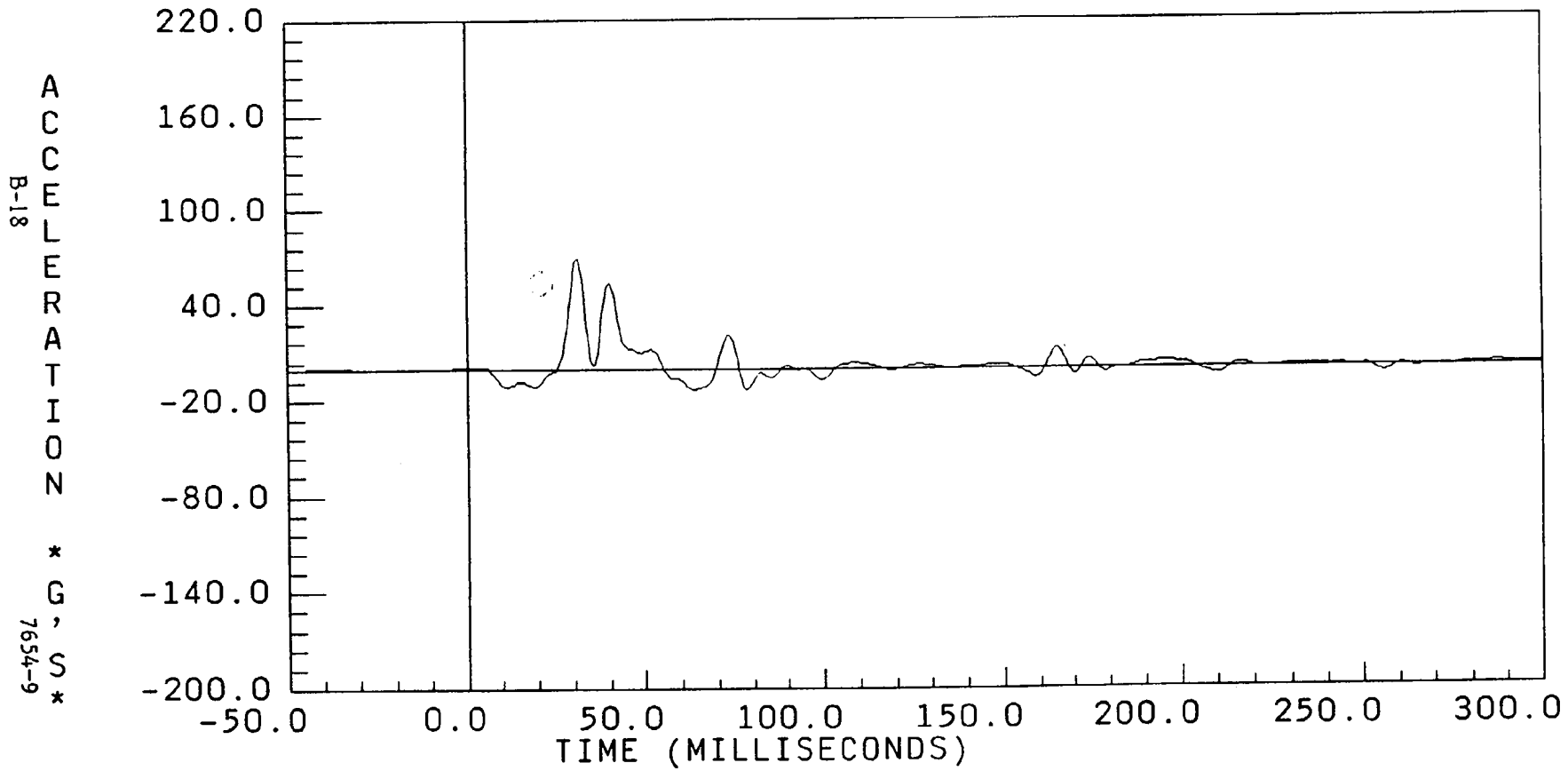
FIR862-4.DAT

0.00 mph

POS#1 UPPER RIB Y

FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-13.25978 at 78.75000
YMAX = 69.50224 at 31.25000



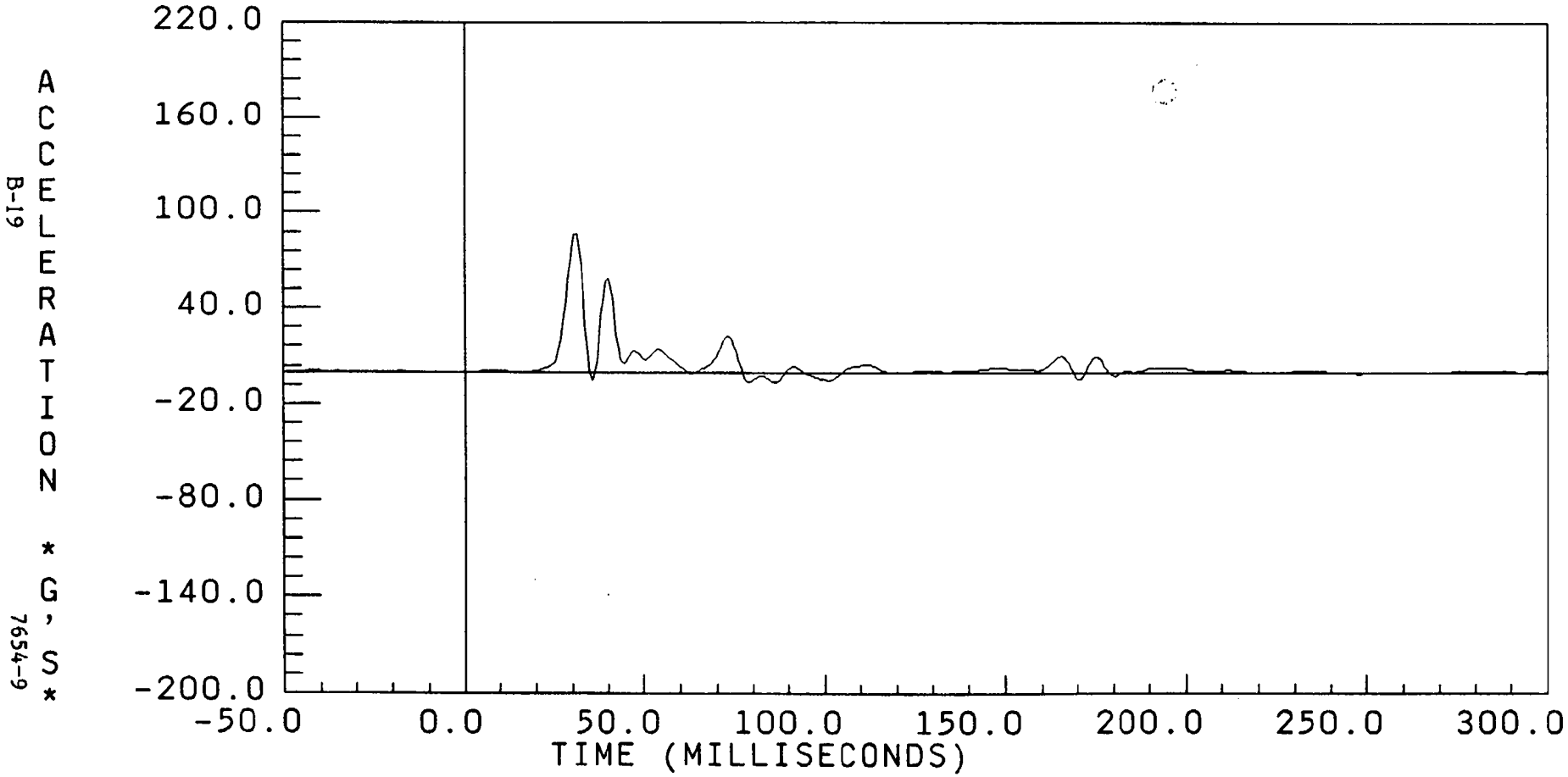
FIR862-5.DAT

0.00 mph

POS#1 UPPER RIB Y(R)

FILTER CUTOFF: 100Hz
REDUNDANT

Y AXIS
YMIN =-6.497774 at 86.25000
YMAX = 86.48098 at 30.62500



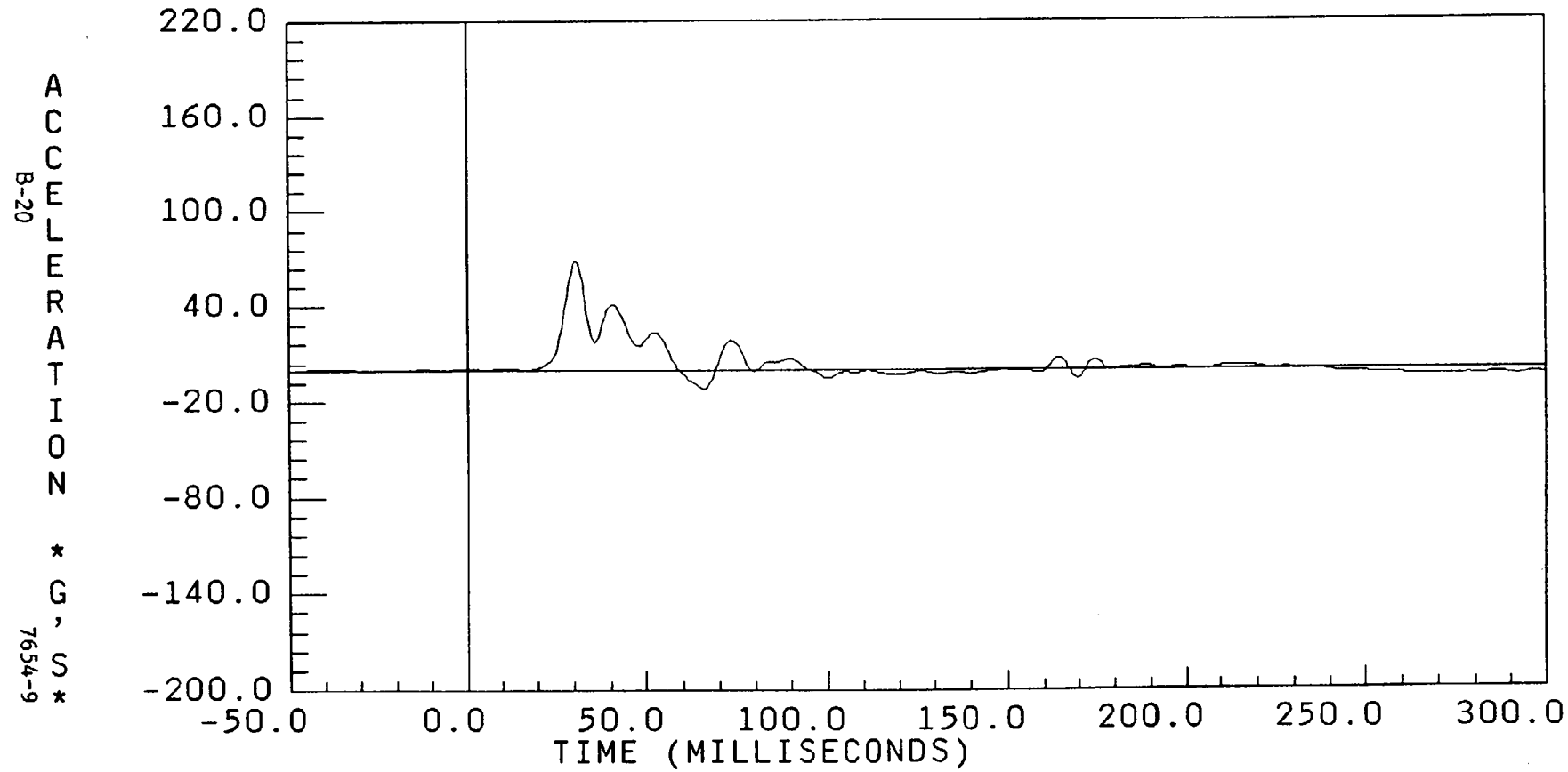
FIR862-6.DAT

0.00 mph

POS#1 LOWER RIB Y

FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-11.95452 at 65.62500
YMAX = 68.87511 at 30.62500



FIR862-7.DAT

0.00 mph

POS#1 LOWER RIB Y(R)

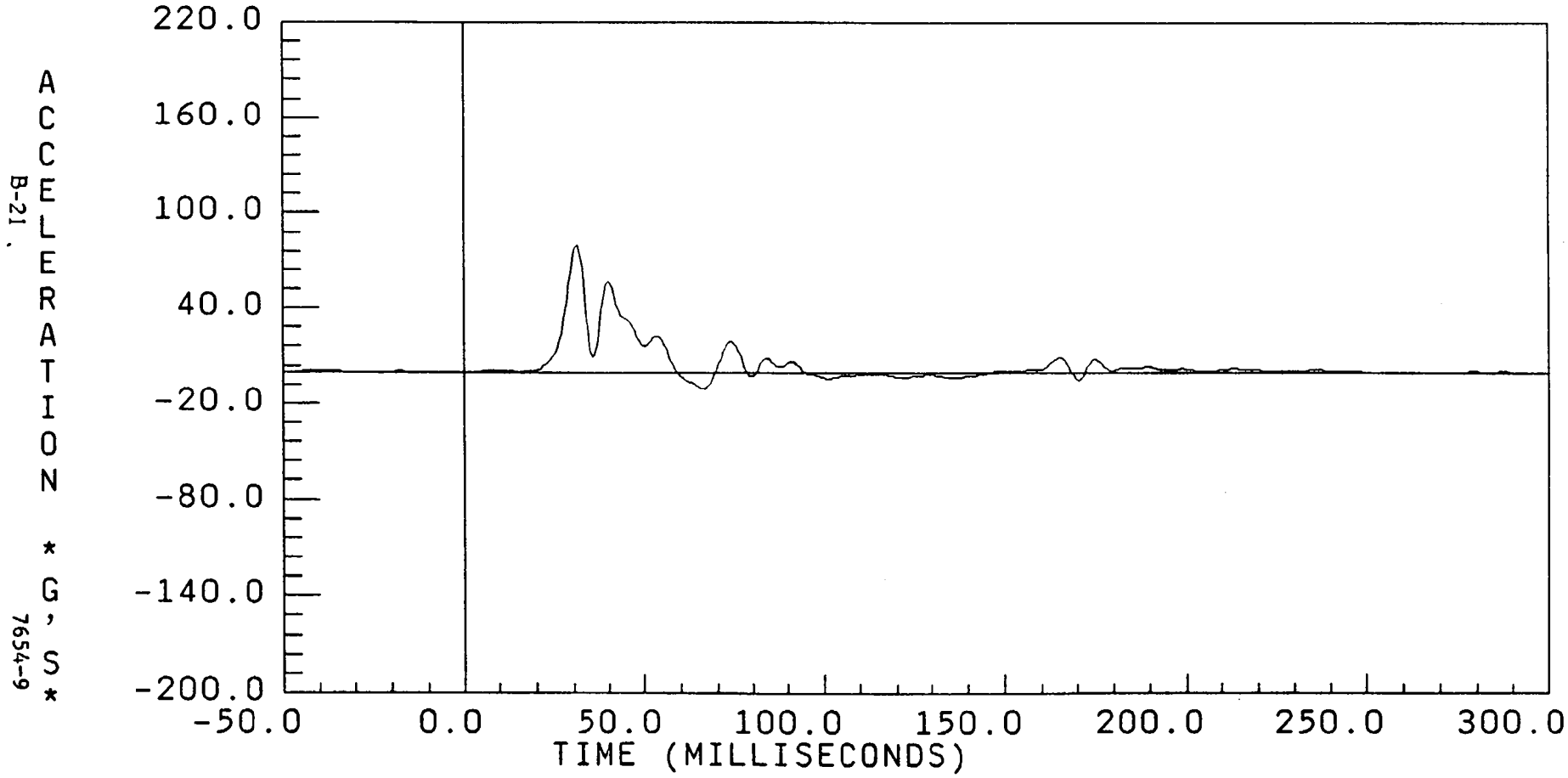
FILTER CUTOFF: 100Hz

REDUNDANT

Y AXIS

YMIN =-10.63511 at 66.25000

YMAX = 79.59842 at 31.25000



B-21

7654-9

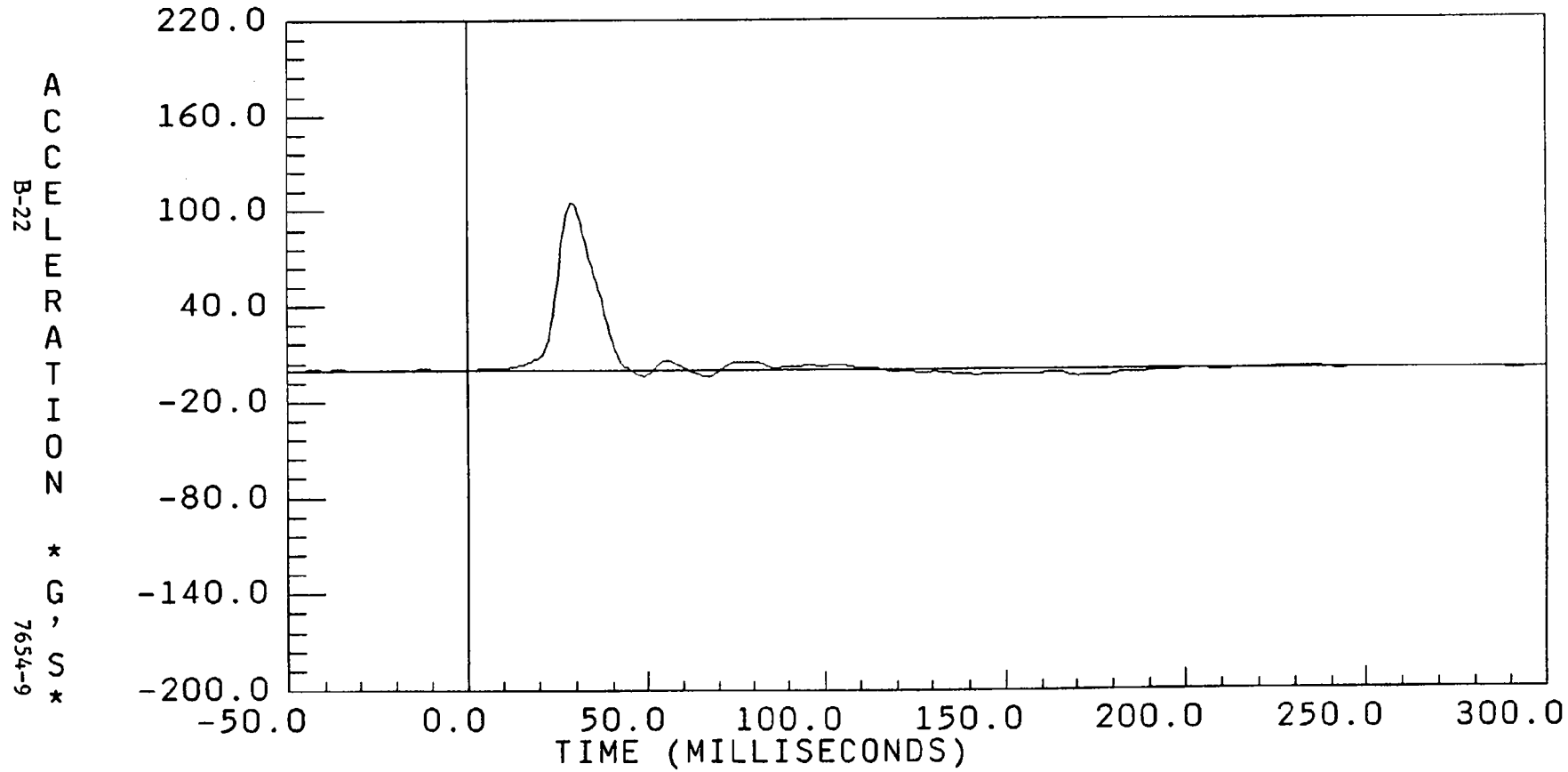
FIR862-10.DAT

0.00 mph

POS#1 PELVIC Y

FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-4.827641 at 170.6250
YMAX = 104.9567 at 28.75000

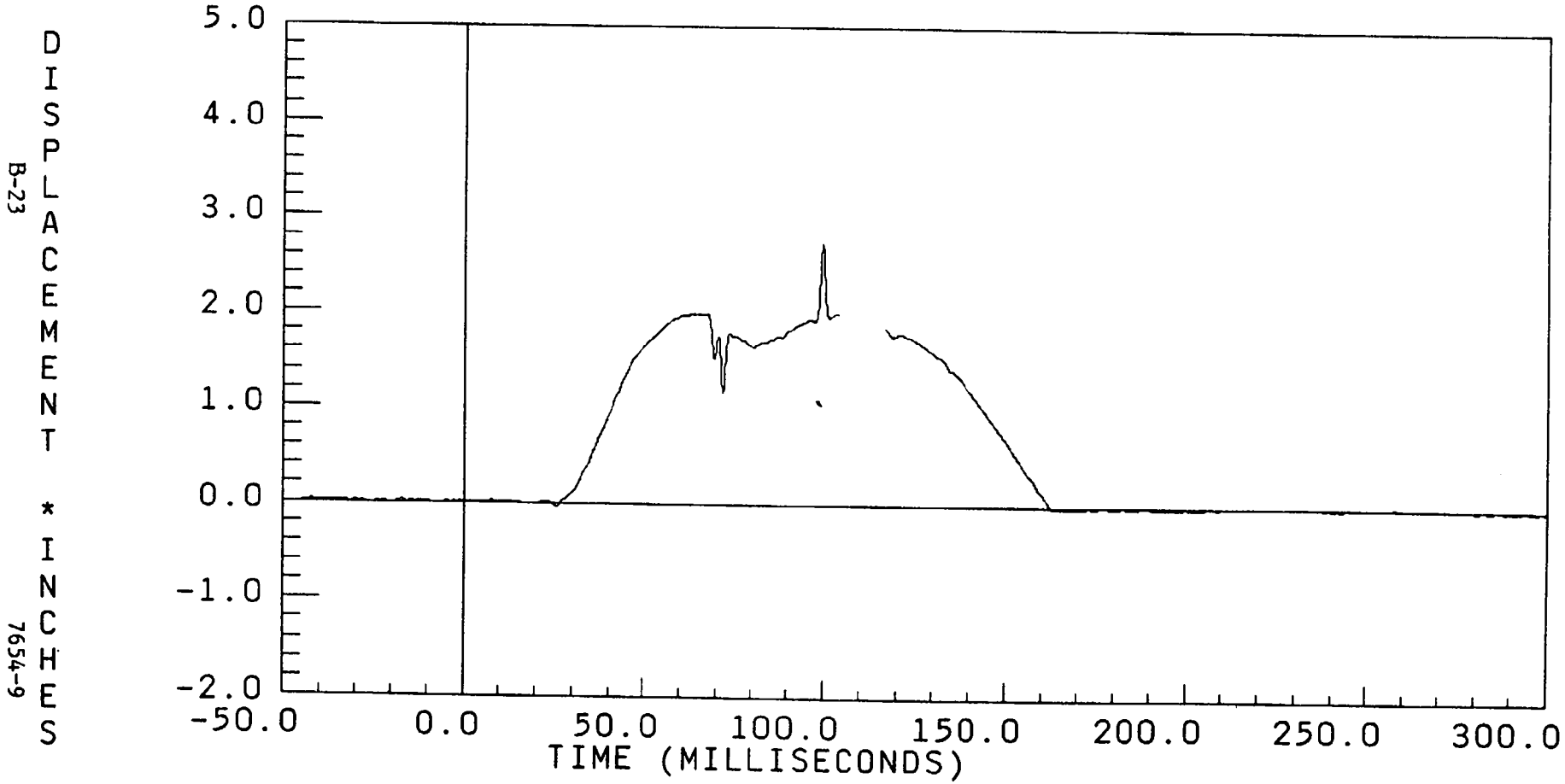


BW862-11.DAT

0.00 mph

POS#1 CHEST DISPLACEMENT
FILTERED
FILTER CUTOFF: 300Hz
SEE TEST ANOMOLIES

AXIS
YMIN =-.0446046 at 25.80000
YMAX = 2.740738 at 99.52500



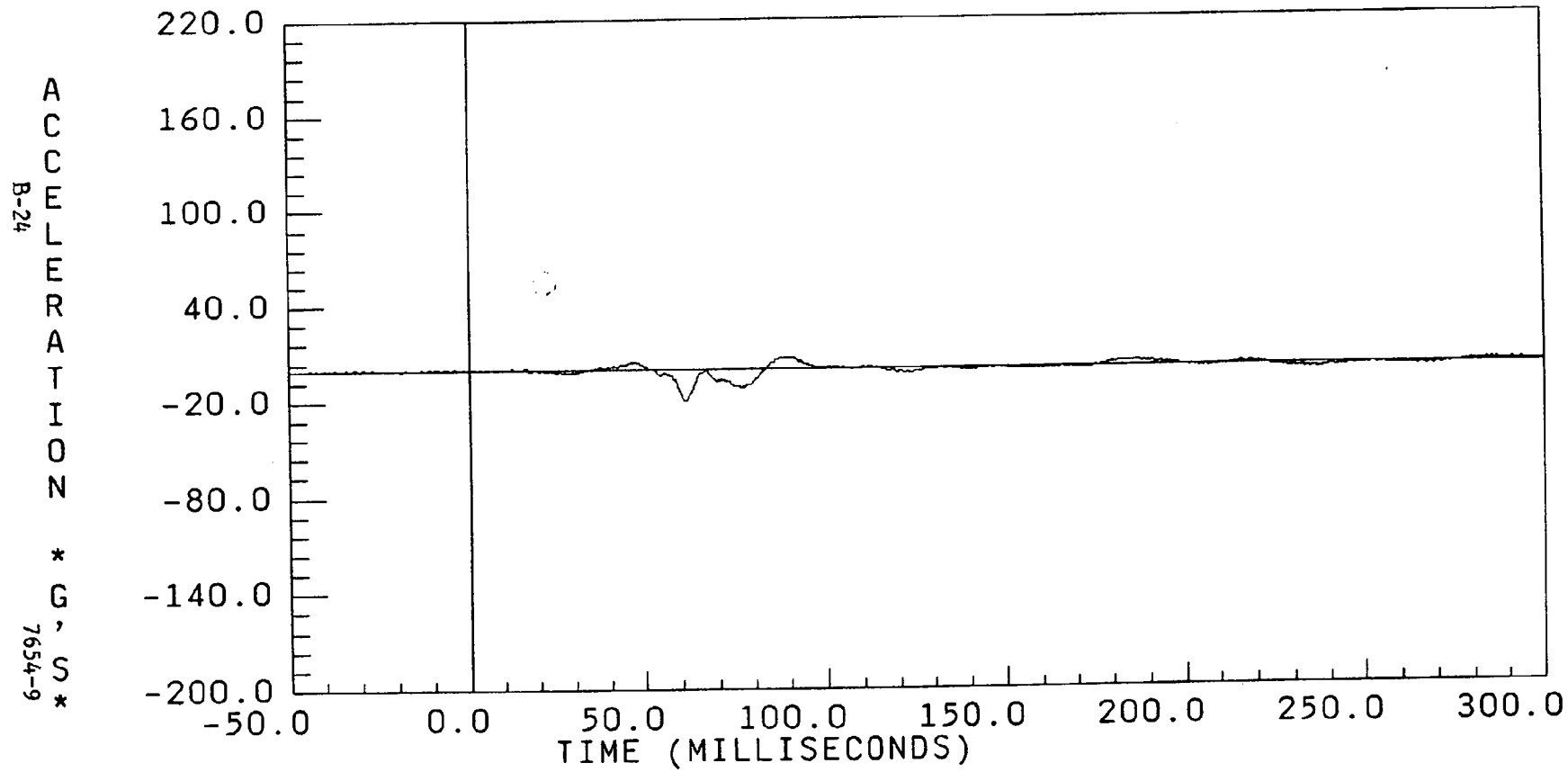
UDS$862-13.DA

0.00 mph

POS#4 HEAD X

FILTER CUTOFF: OHz

X AXIS
YMIN =-20.22100 at 61.12500
YMAX = 6.746800 at 88.65000



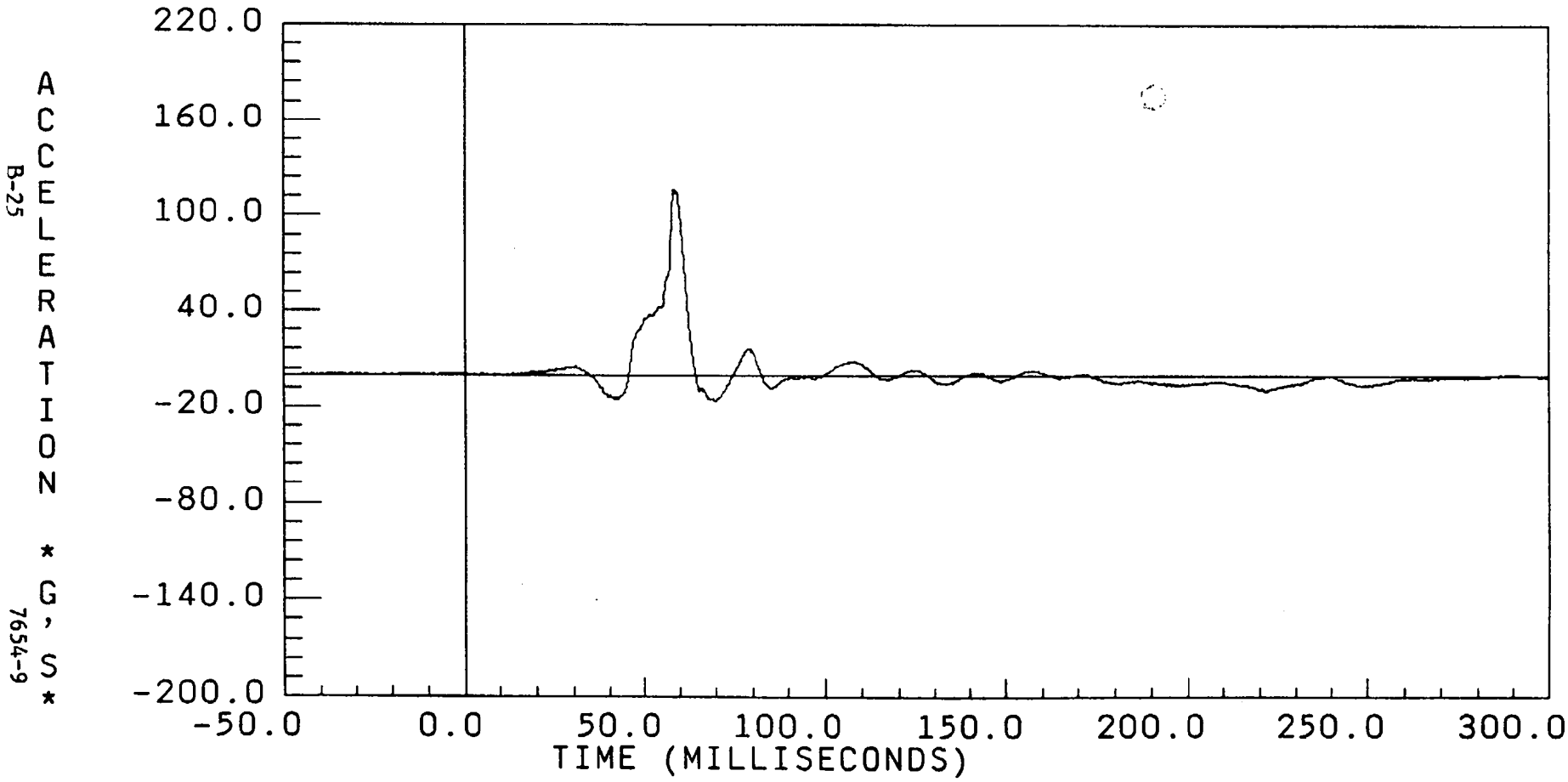
UDS$862-14.DA

0.00 mph

POS#4 HEAD Y

FILTER CUTOFF: 0Hz

Y AXIS
YMIN =-16.36100 at 69.75000
YMAX = 116.3500 at 58.35000



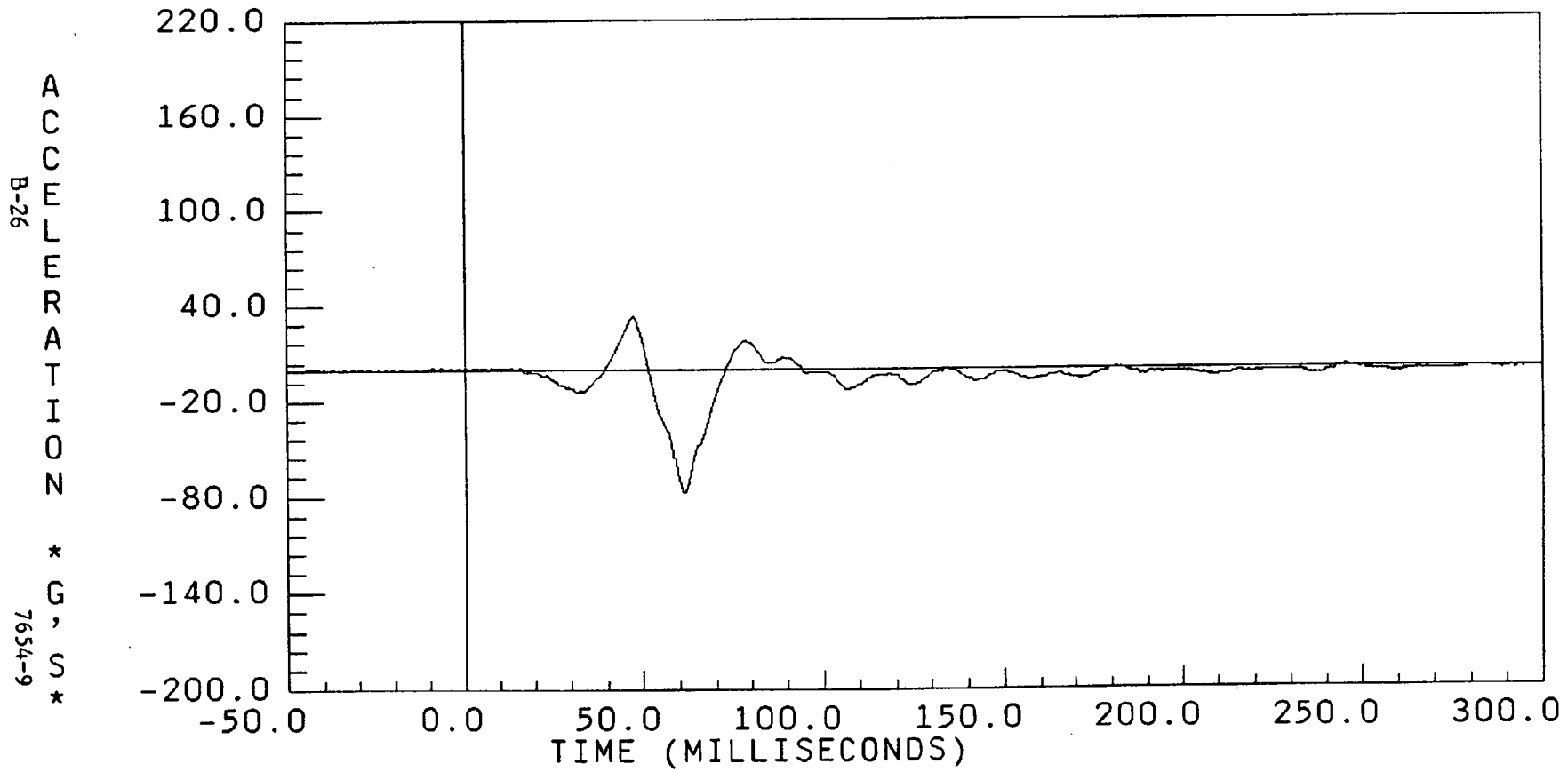
UDS$862-15.DA

0.00 mph

POS#4 HEAD Z

FILTER CUTOFF: 0Hz

Z AXIS
YMIN =-77.56400 at 61.20000
YMAX = 33.07300 at 47.10000

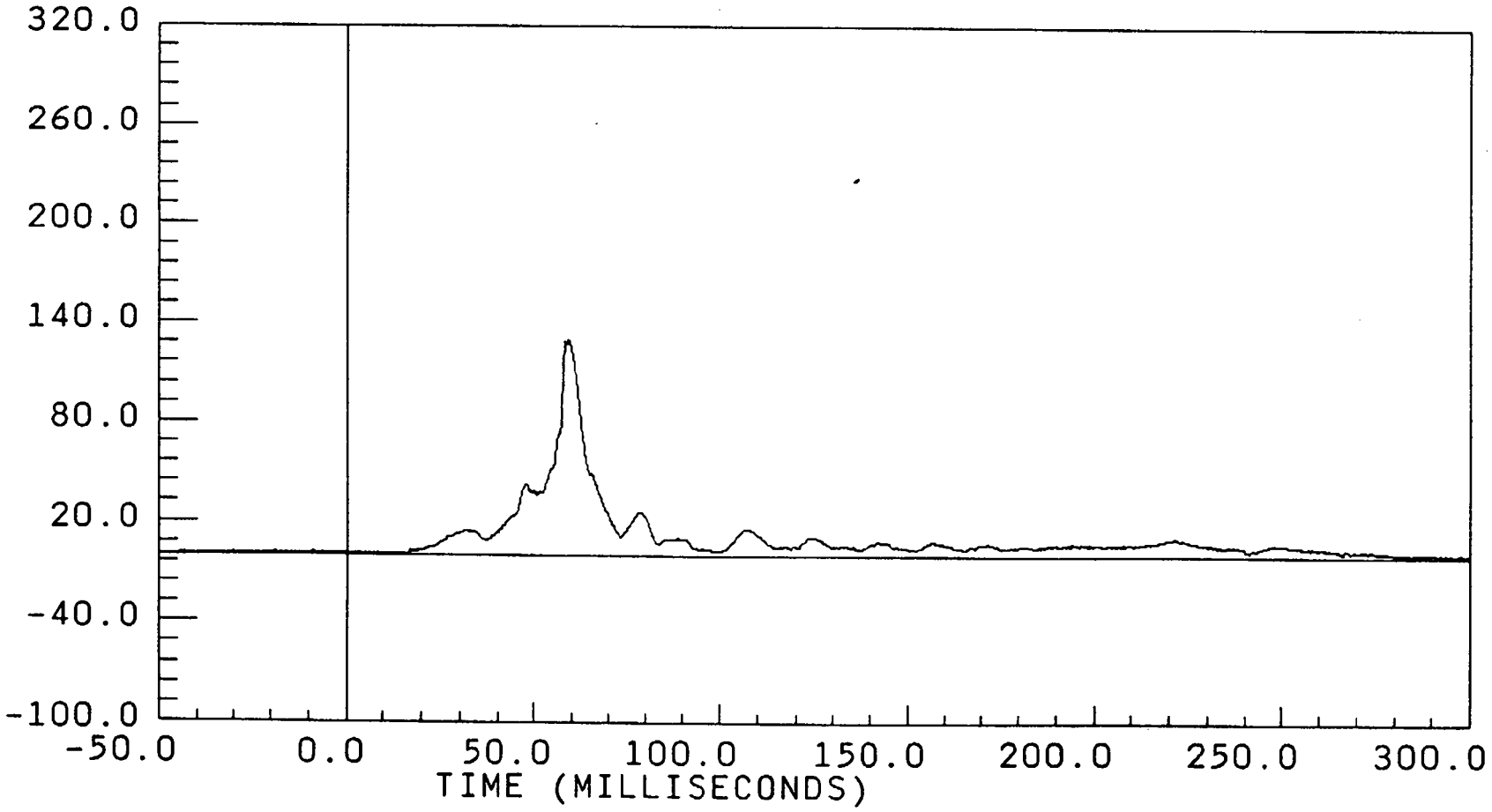


HRES862-13.DA

0.00 mph

POS#4 HEAD
NONSTANDARD
FILTER CUTOFF: 0Hz

RS AXIS
YMIN = 0.314663 at -43.72500
YMAX = 130.5571 at 59.25000



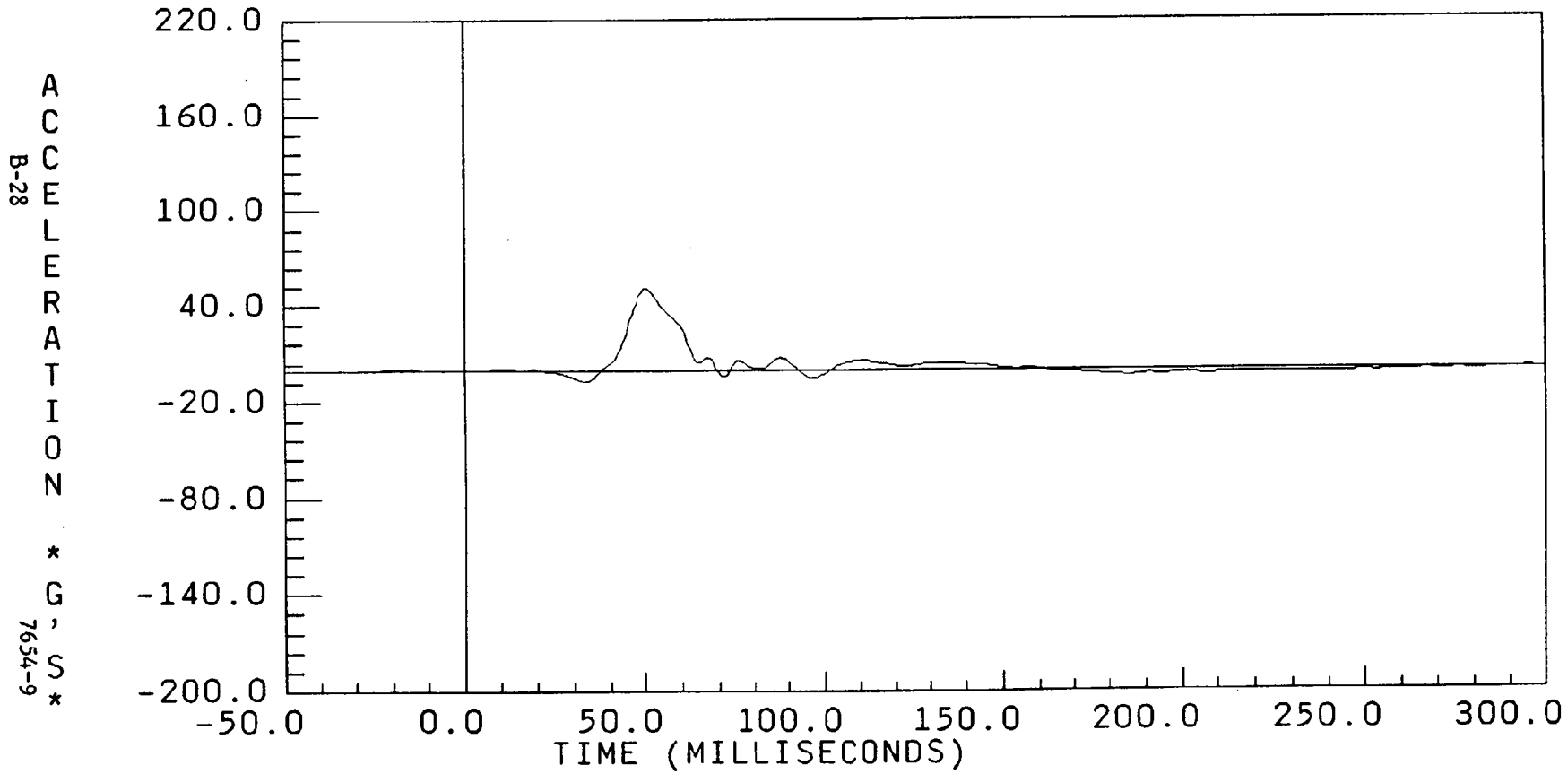
FIR862-24.DAT

0.00 mph

POS#4 UPPER SPINE Y

FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-7.201871 at 33.12500
YMAX = 50.89512 at 50.00000



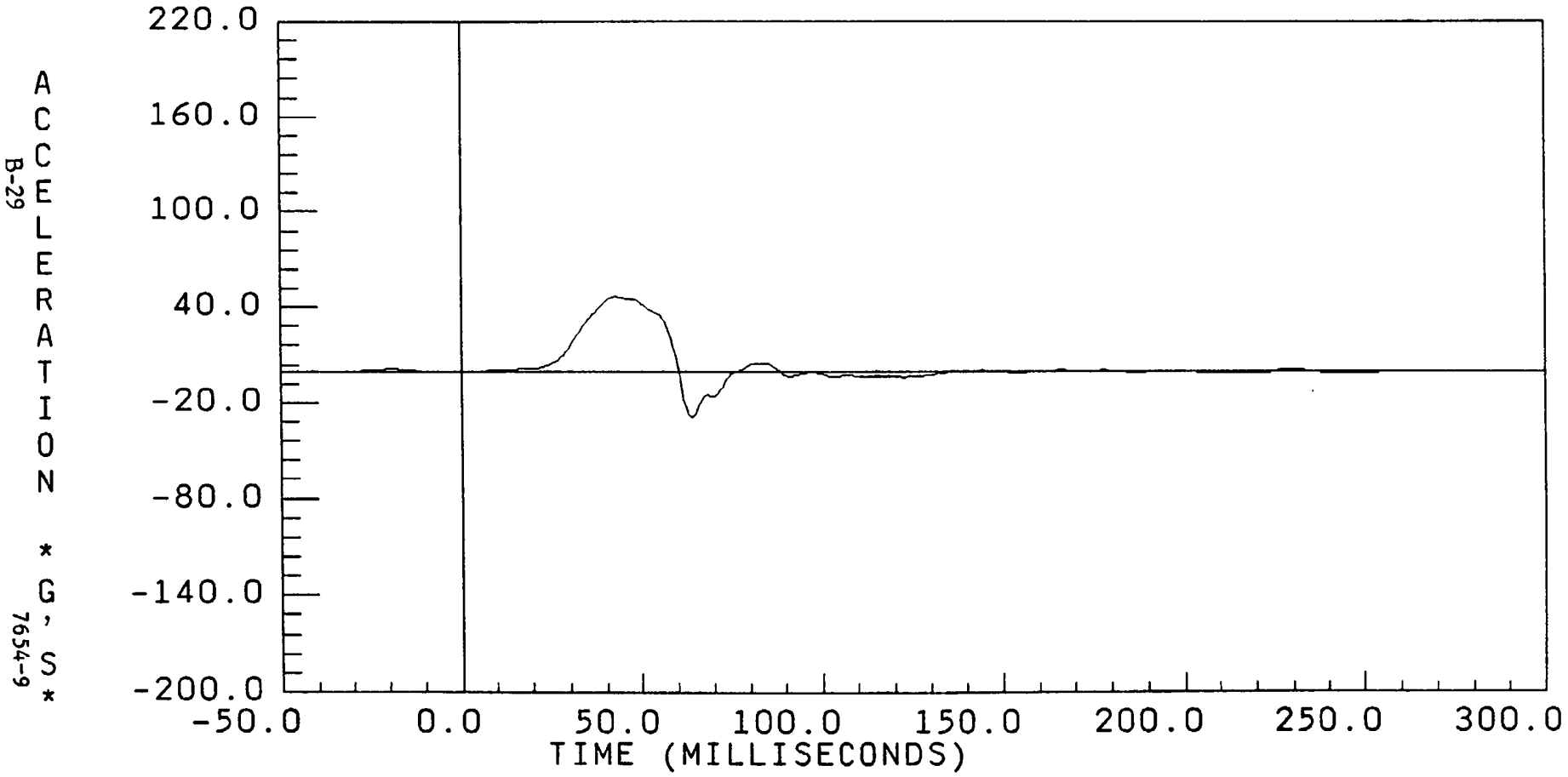
FIR862-20.DAT

0.00 mph

POS#4 LOWER SPINE Y

FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-28.86257 at 63.75000
YMAX = 46.81300 at 42.50000



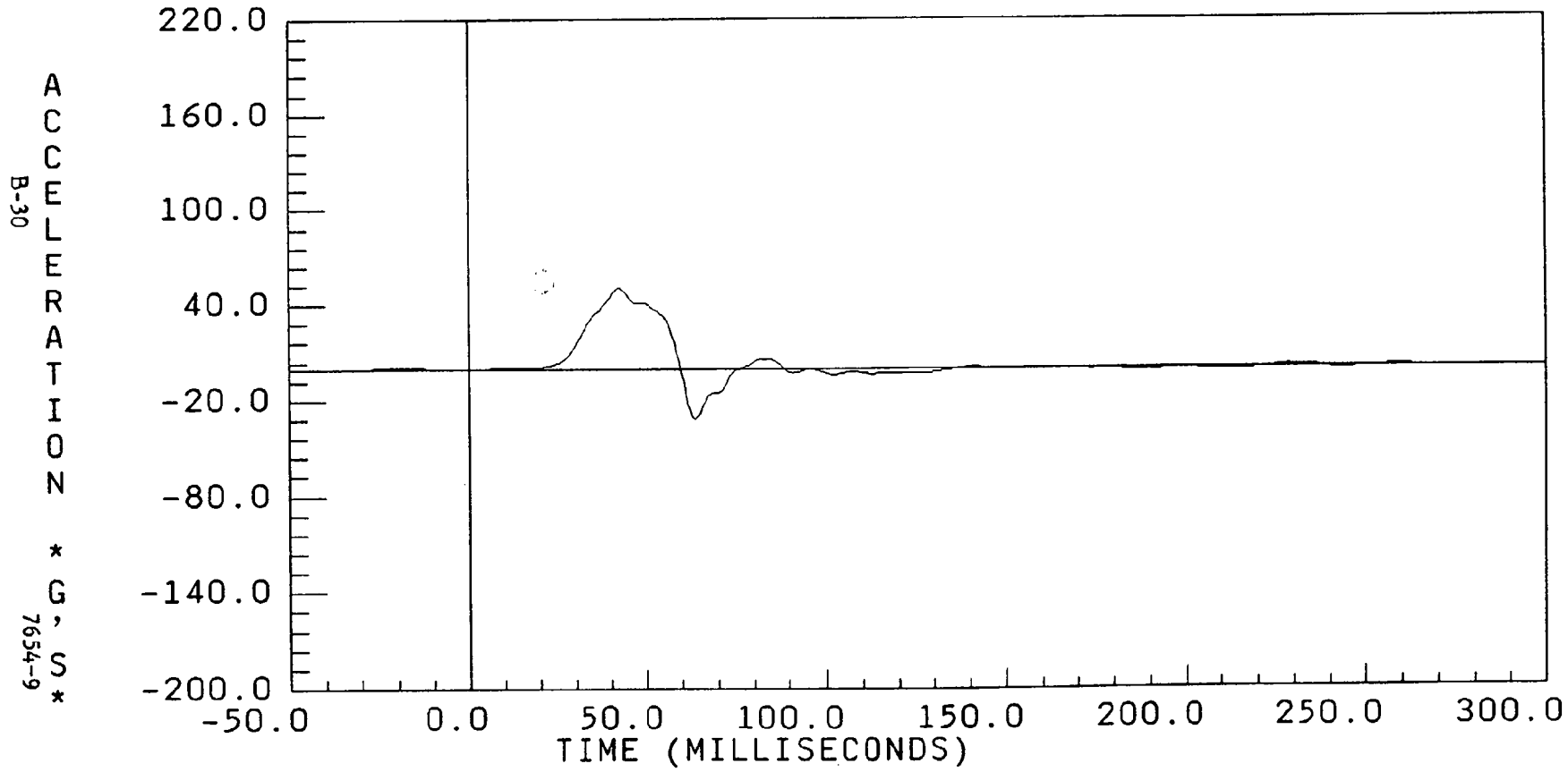
FIR862-21.DAT

0.00 mph

POS#4 LOWER SPINE Y(R)

FILTER CUTOFF: 100Hz
REDUNDANT

Y AXIS
YMIN =-31.52962 at 63.75000
YMAX = 50.78288 at 42.50000



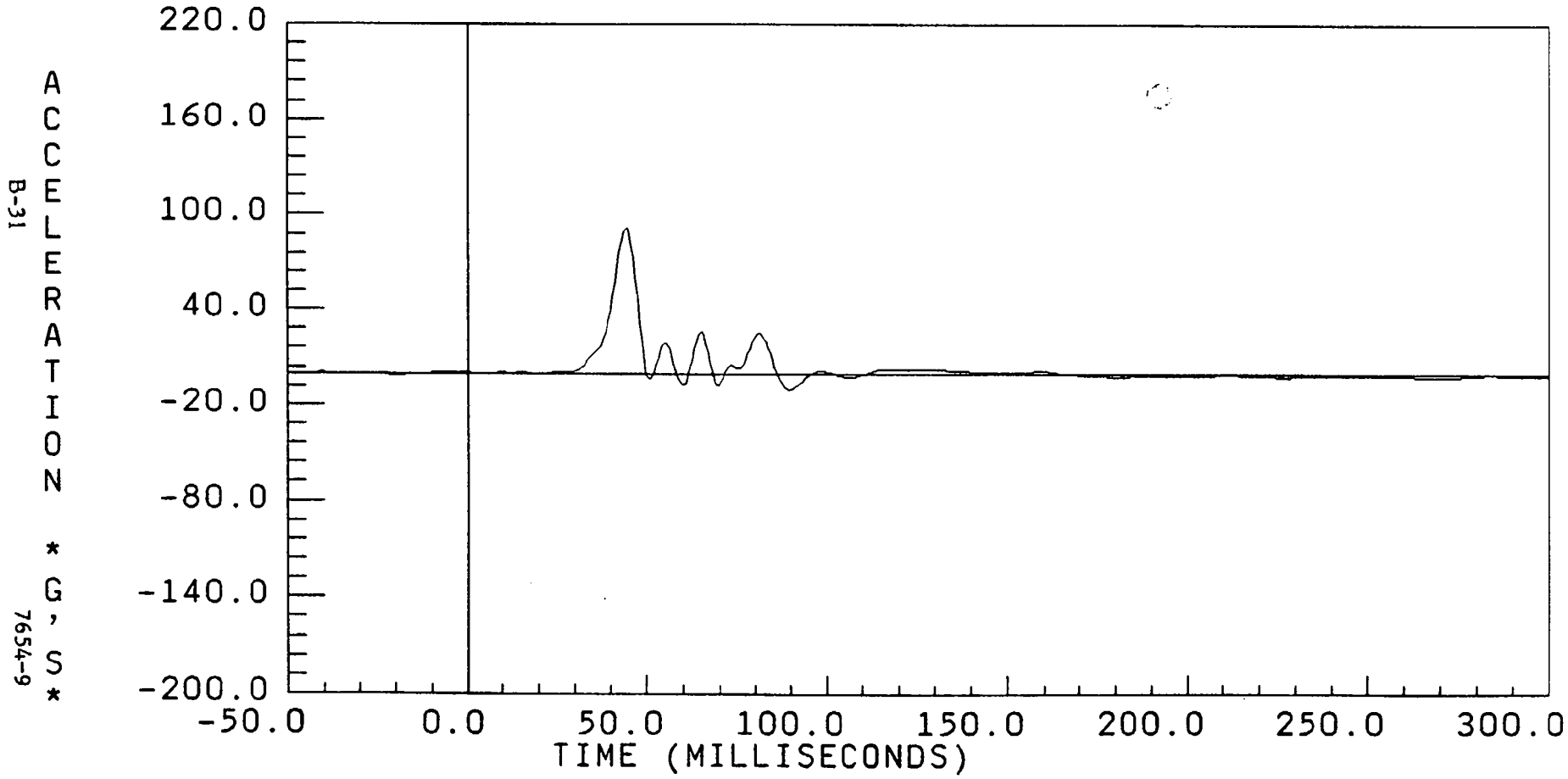
FIR862-16.DAT

0.00 mph

POS#4 UPPER RIB Y

FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-10.02905 at 90.00000
YMAX = 91.45126 at 44.37500



B-31

765+9

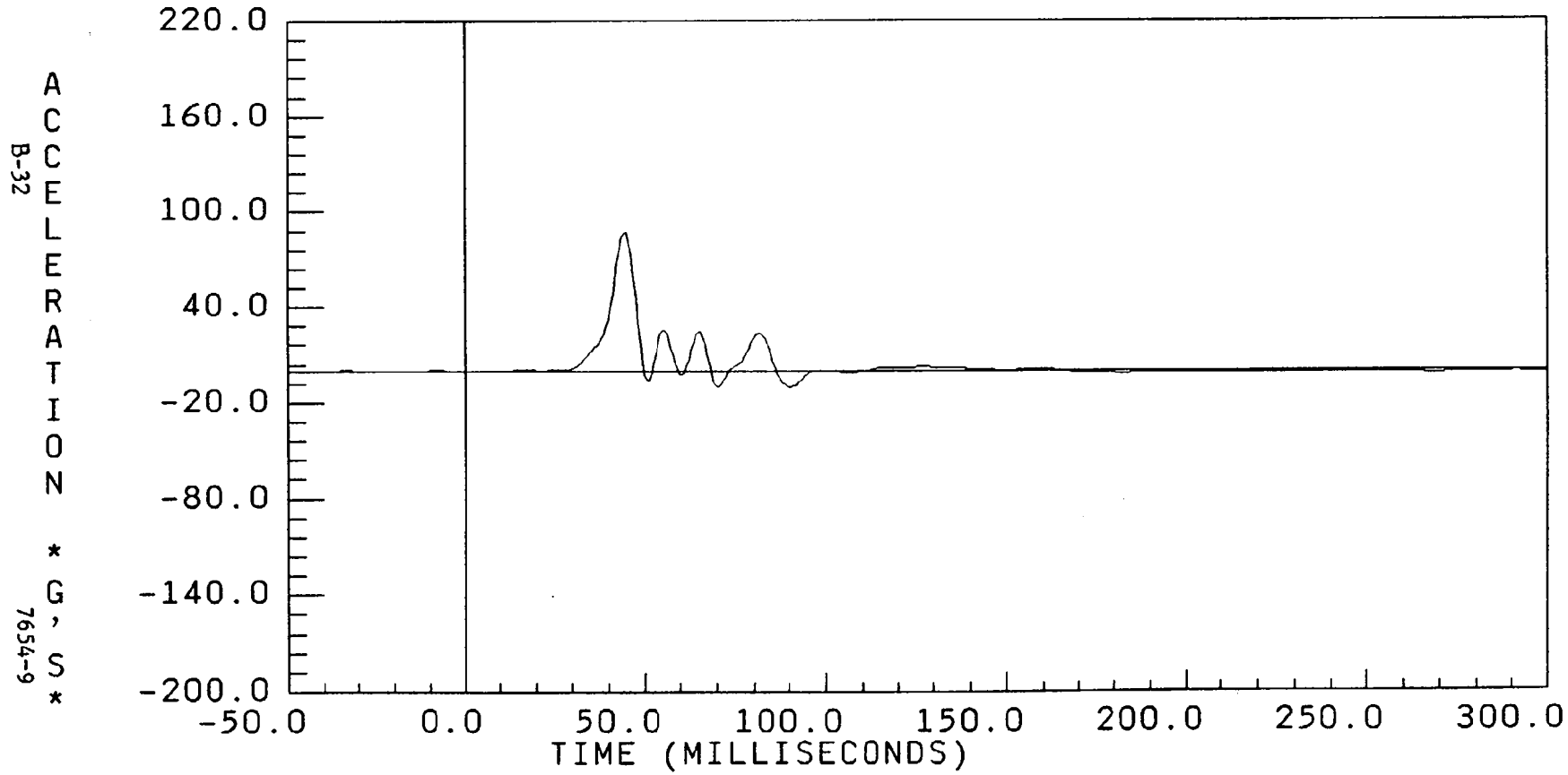
FIR862-17.DAT

0.00 mph

POS#4 UPPER RIB Y(R)

FILTER CUTOFF: 100Hz
REDUNDANT

Y AXIS
YMIN =-10.10594 at 90.00000
YMAX = 86.73447 at 44.37500



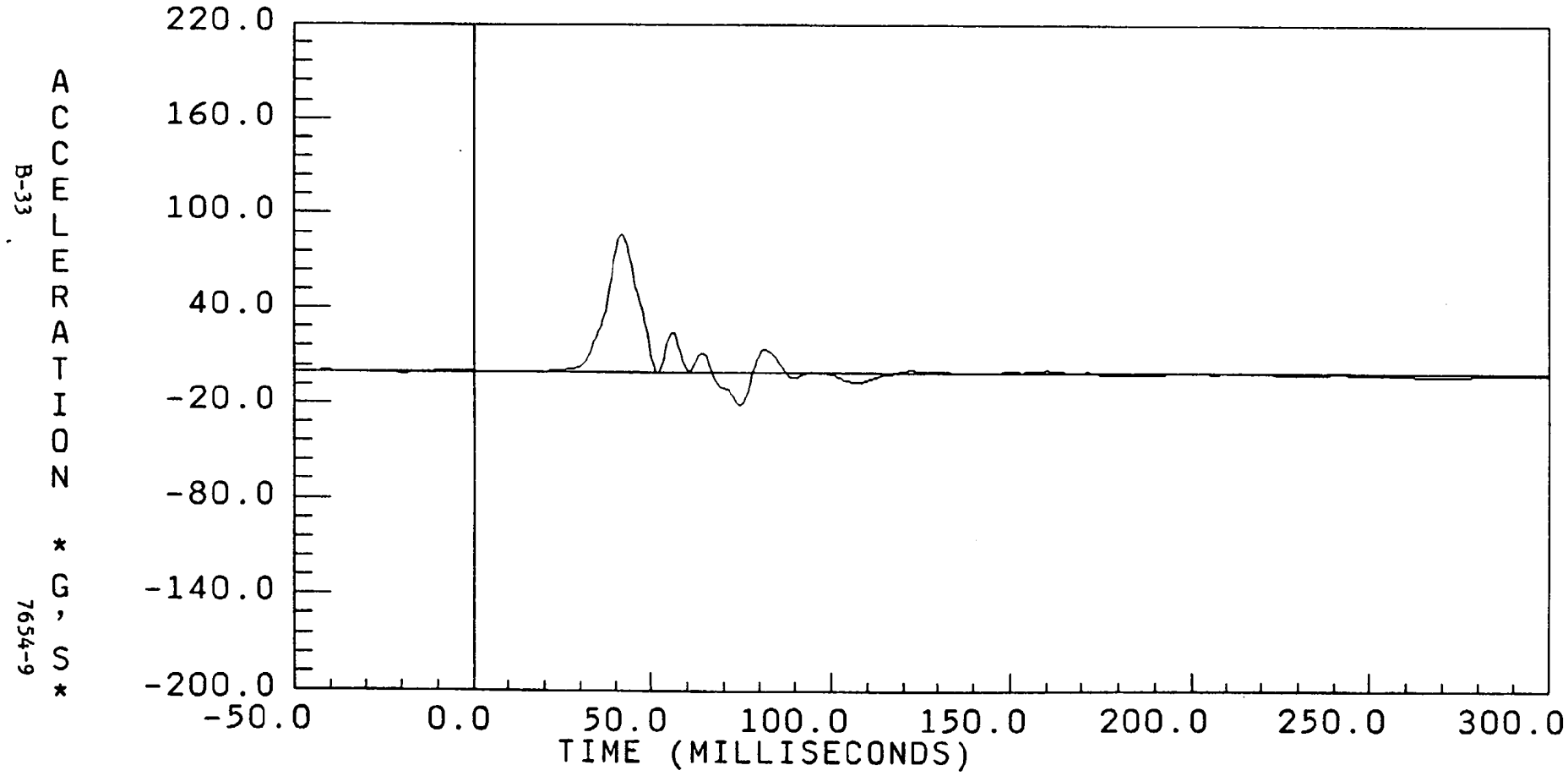
FIR862-18.DAT

0.00 mph

POS#4 LOWER RIB Y

FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-20.99058 at 75.00000
YMAX = 87.02435 at 41.87500



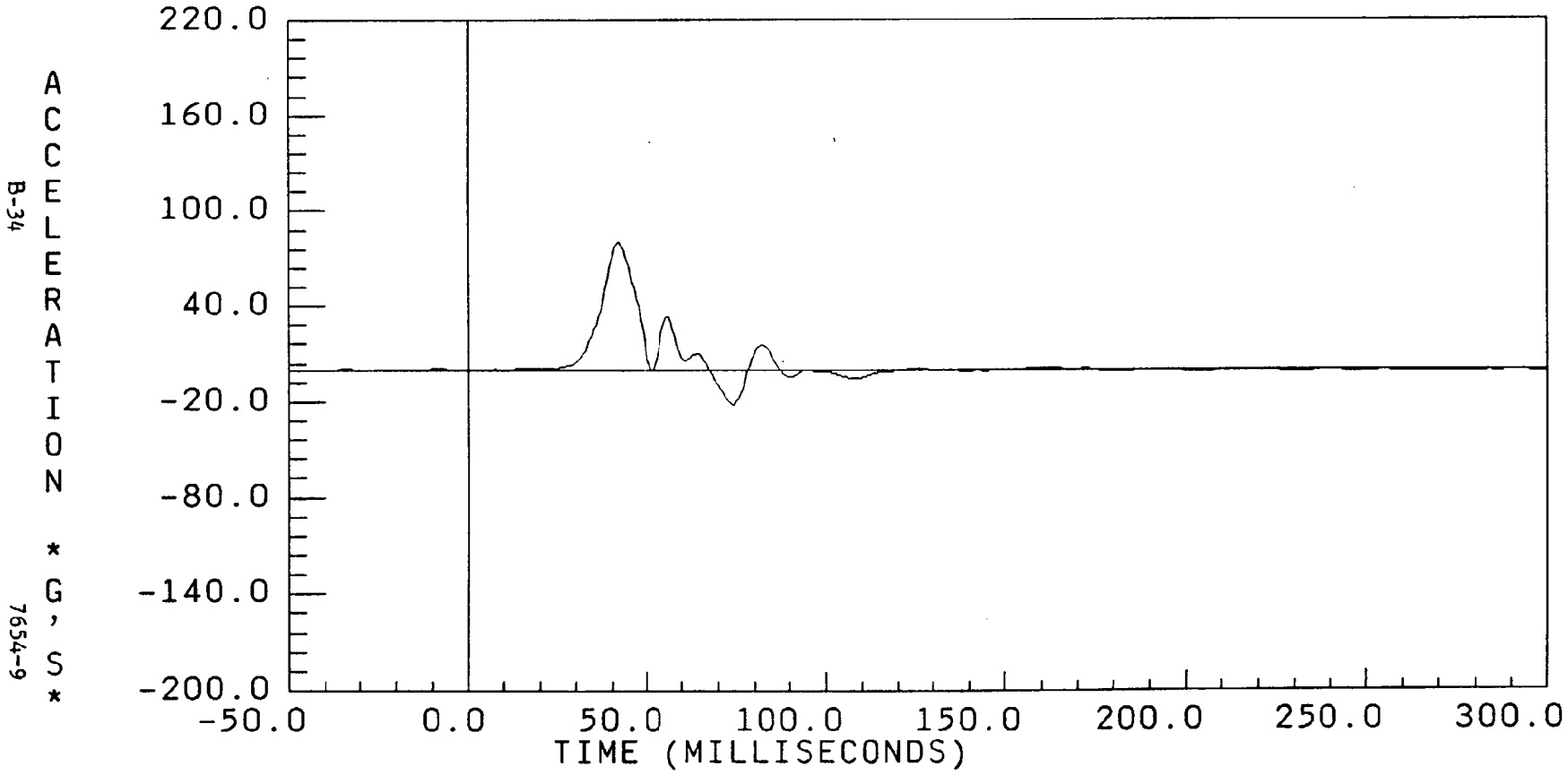
FIR862-19.DAT

0.00 mph

POS#4 LOWER RIB Y(R)

FILTER CUTOFF: 100Hz
REDUNDANT

Y AXIS
YMIN =-21.68036 at 74.37500
YMAX = 80.40079 at 41.87500



B-34

7654-9

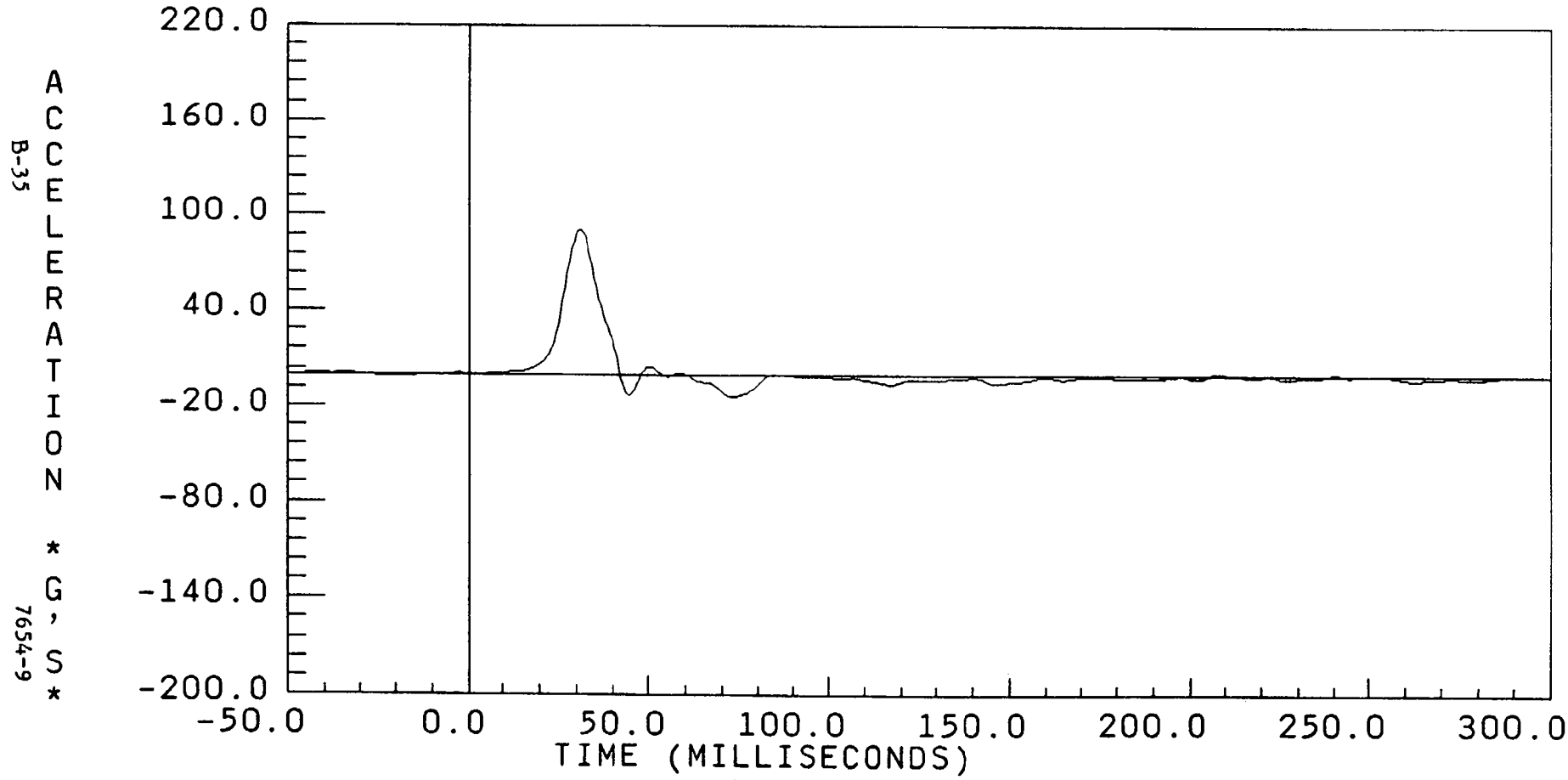
FIR862-22.DAT

0.00 mph

POS#4 PELVIC Y

FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-14.31701 at 73.12500
YMAX = 91.02889 at 31.25000

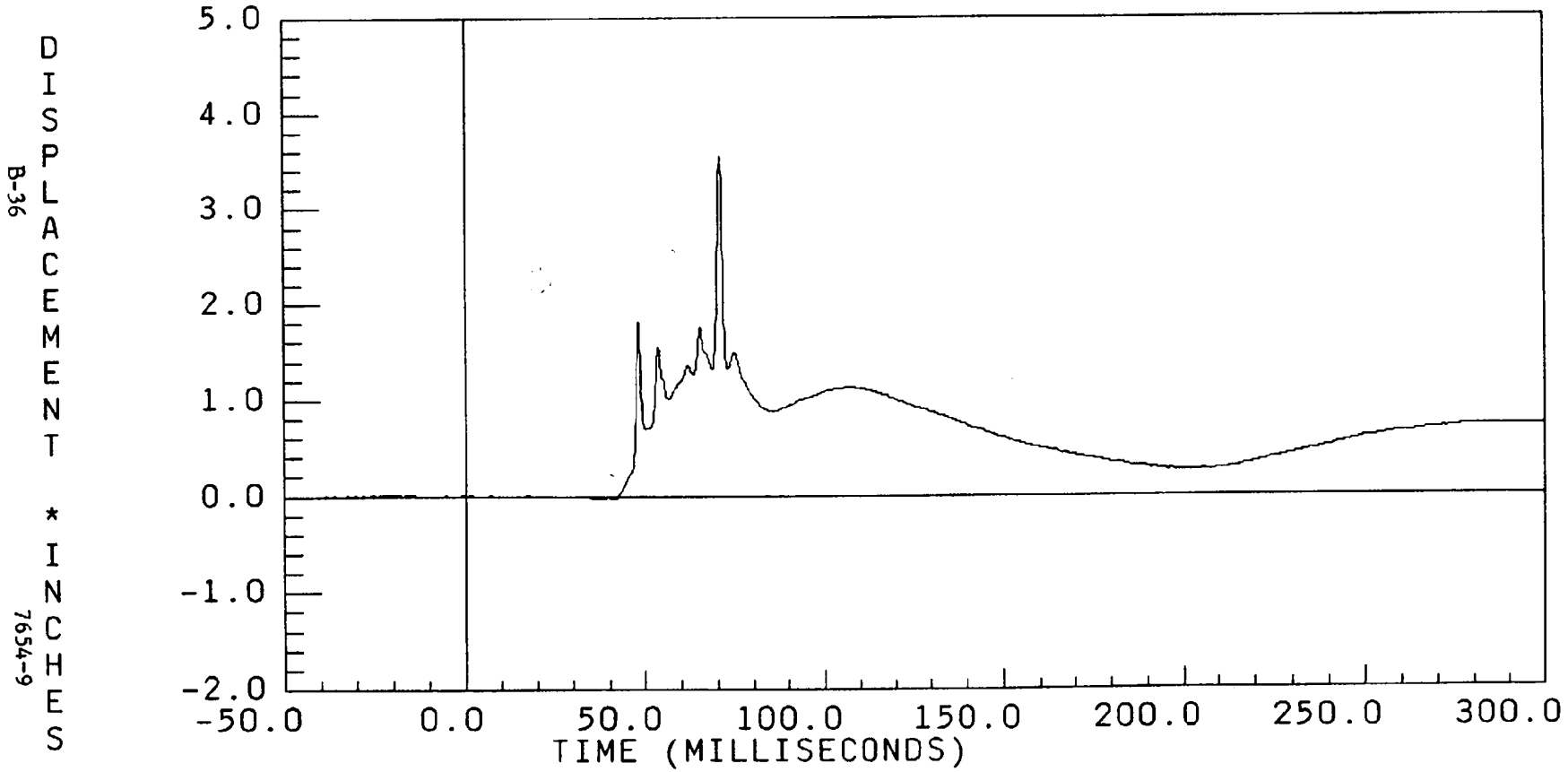


BW862-23.DAT

0.00 mph

POS#4 CHEST DISPLACEMENT
FILTERED
FILTER CUTOFF: 300Hz
SEE TEST ANOMOLIES

AXIS
YMIN =-.0323581 at 41.32500
YMAX = 3.550030 at 70.87500



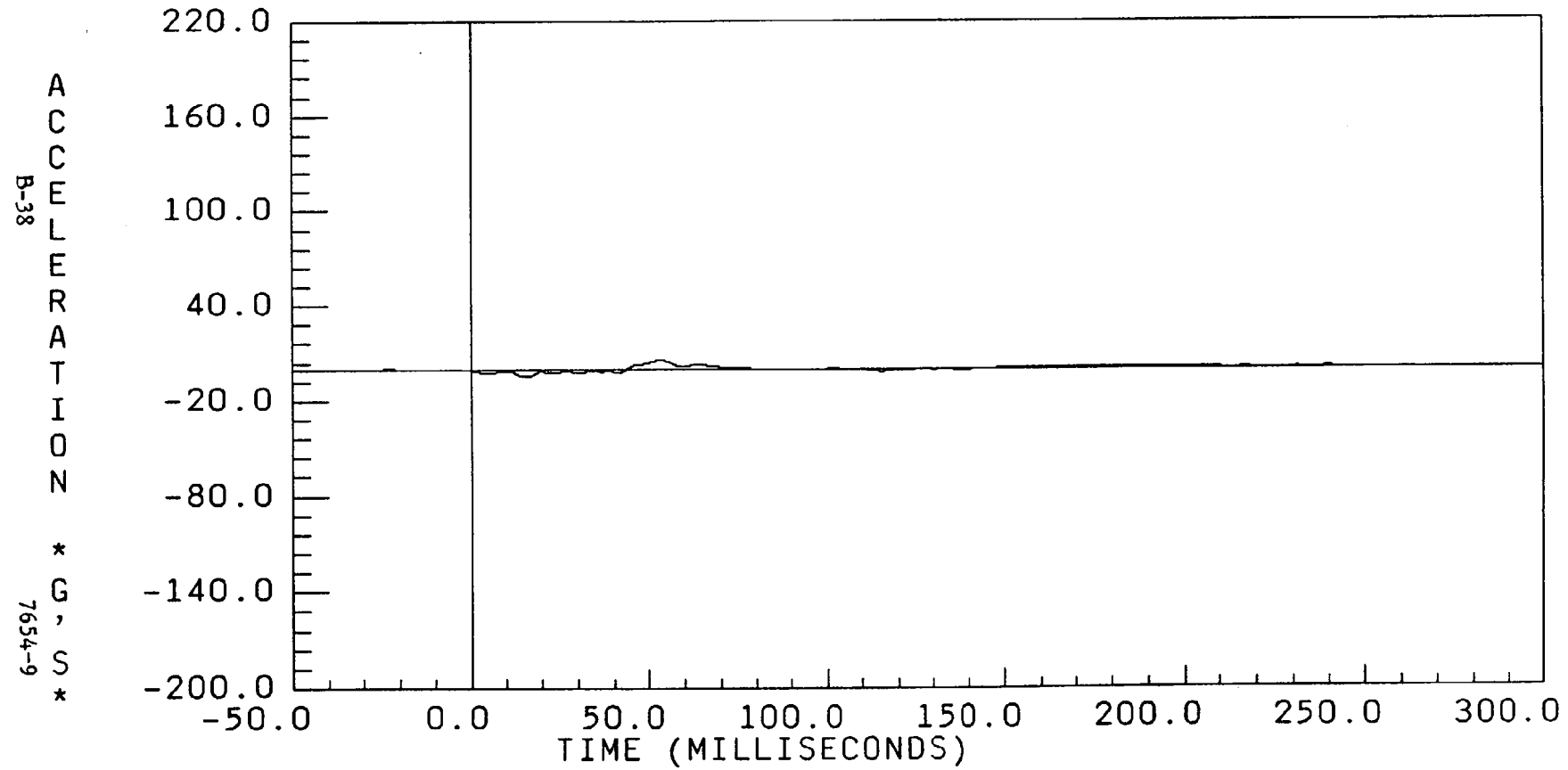
VEHICLE AND MDB DATA

BW862-25.DAT

0.00 mph

DOOR SILL RIGHT FRONT X
FILTERED
FILTER CUTOFF: 100Hz

X AXIS
YMIN =-4.330215 at 16.65000
YMAX = 5.690487 at 53.17500

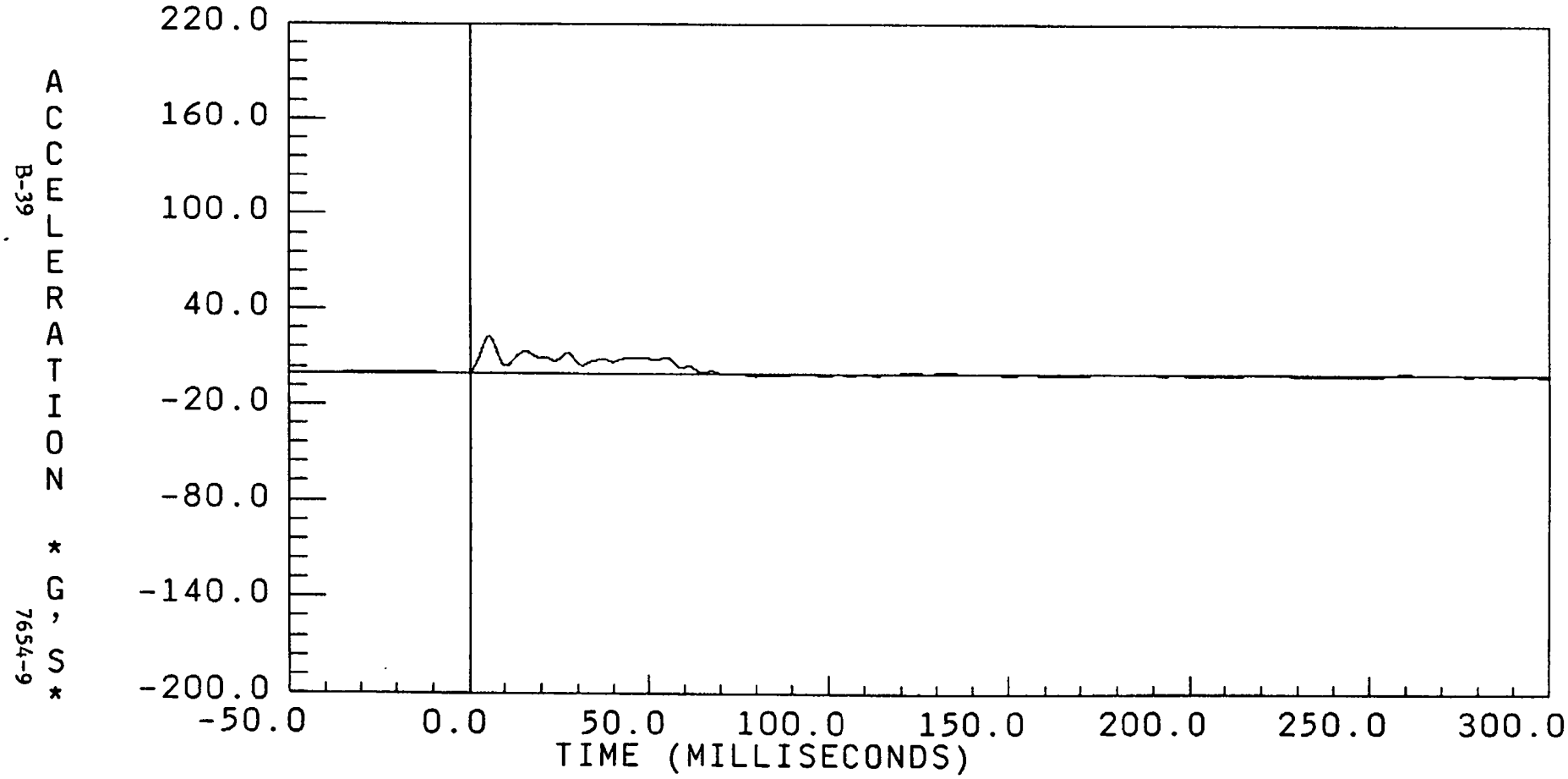


BW862-26.DAT

0.00 mph

DOOR SILL RIGHT FRONT Y
FILTERED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-1.863539 at 80.02500
YMAX = 22.89134 at 5.400000

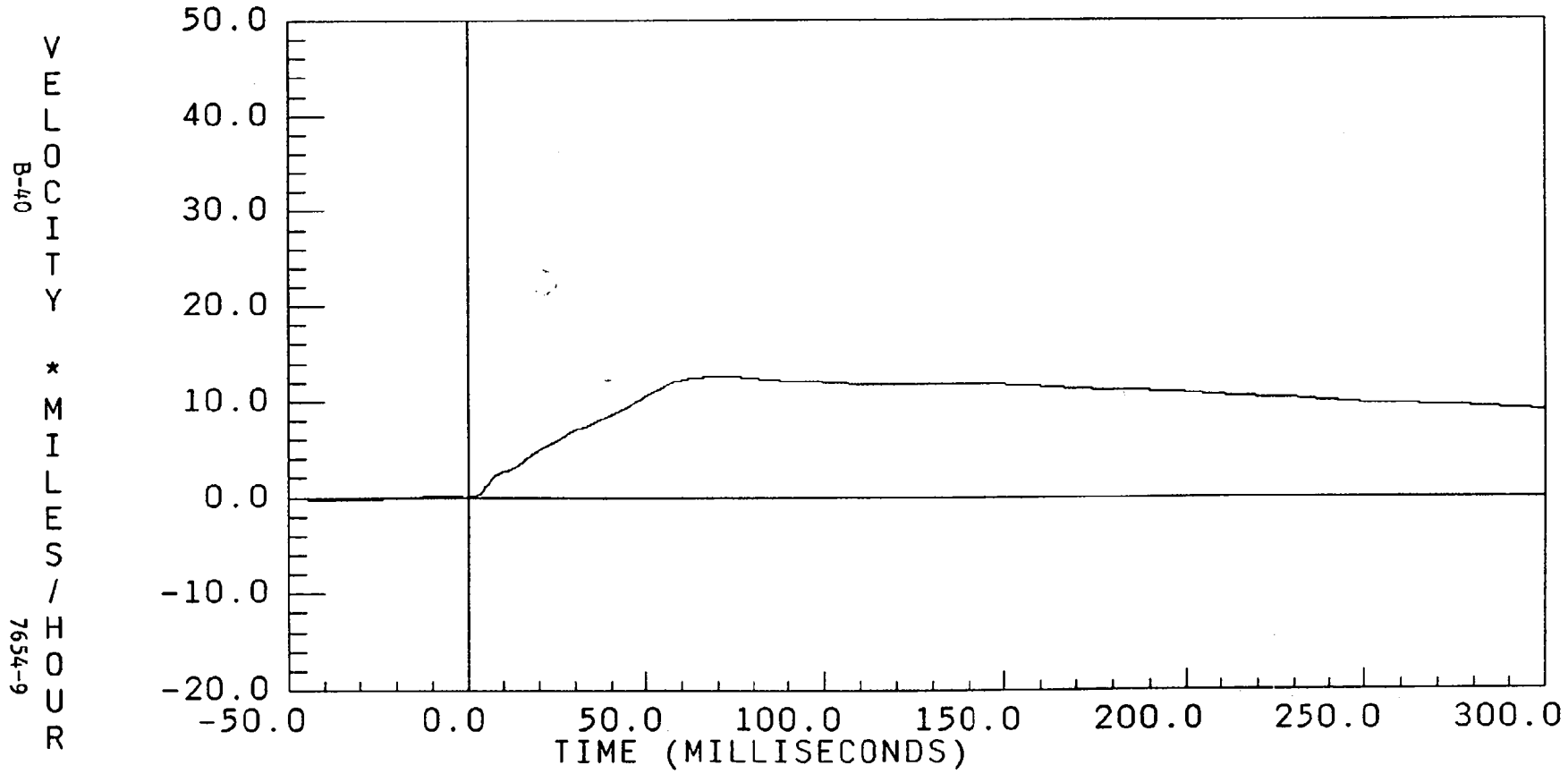


V862-26.DAT

0.00 mph

DOOR SILL RIGHT FRONT Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-0.245685 at -35.92500
YMAX = 12.60934 at 69.97501



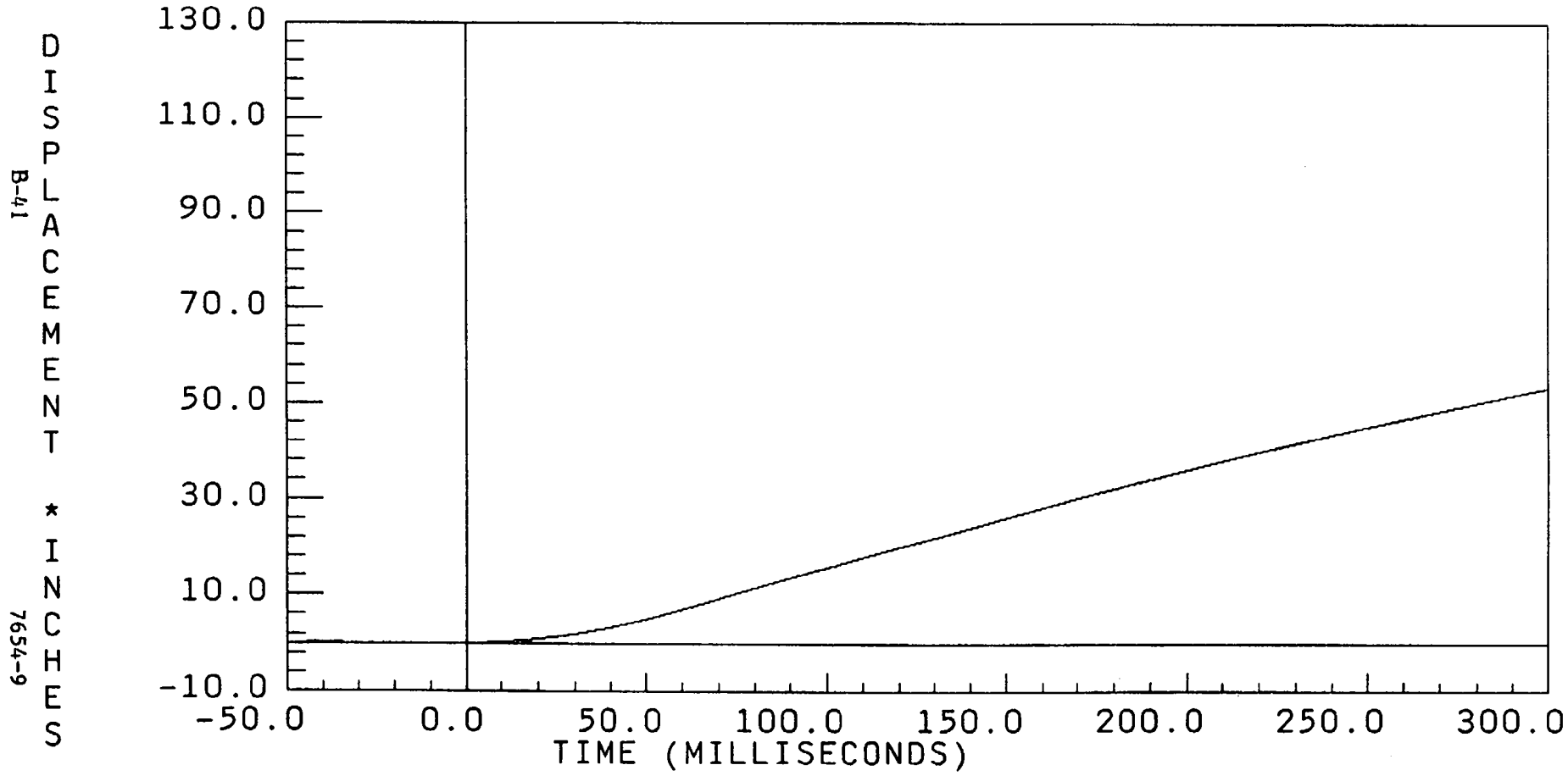
7654-9

D862-26.DAT

0.00 mph

DOOR SILL RIGHT FRONT Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =0.0961809 at -14.62500
YMAX = 53.31804 at 300.0000



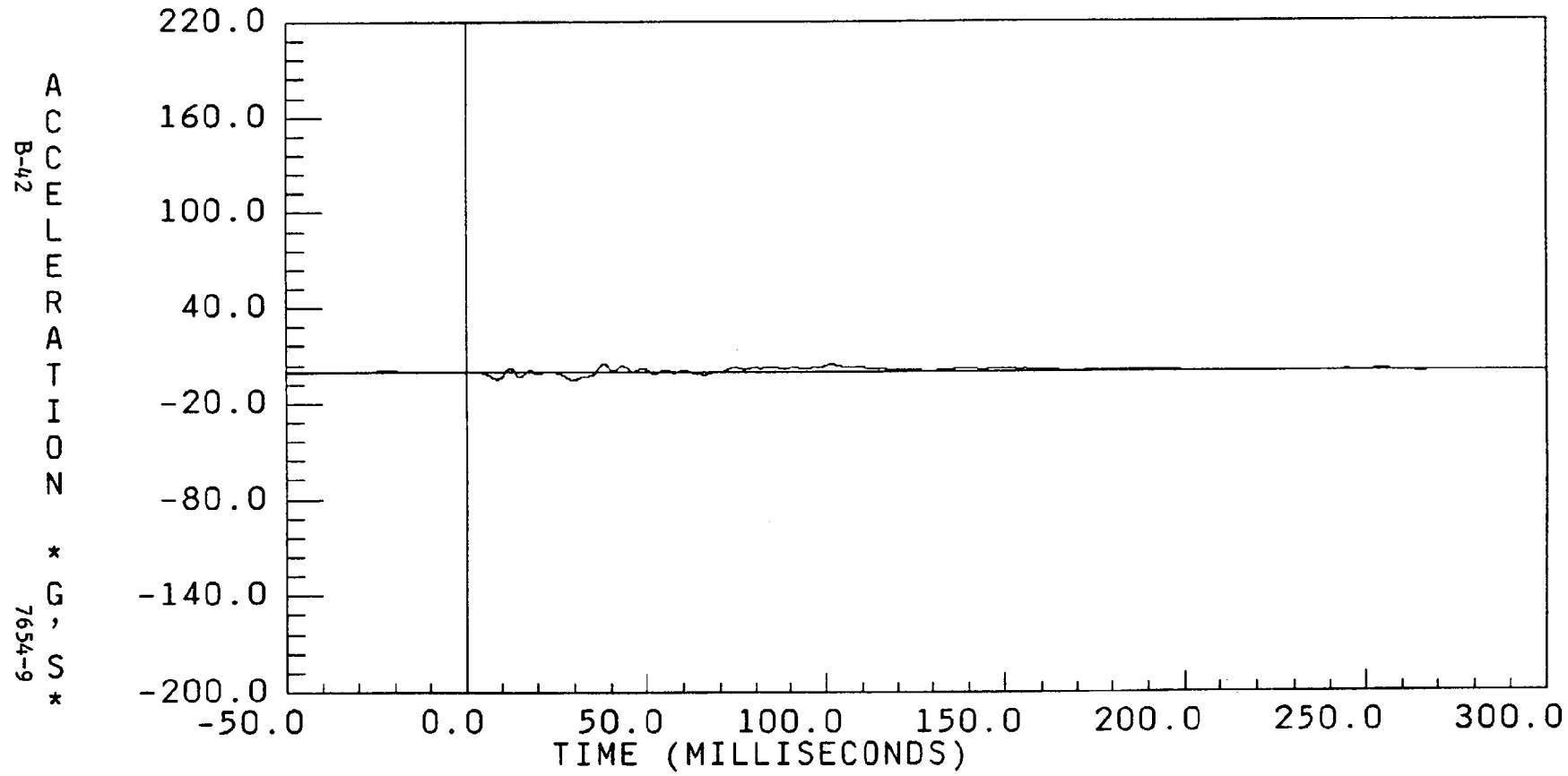
7654-9

BW862-27.DAT

0.00 mph

DOOR SILL RIGHT FRONT Z
FILTERED
FILTER CUTOFF: 100Hz

Z AXIS
YMIN =-5.325103 at 29.62500
YMAX = 4.469148 at 101.5500

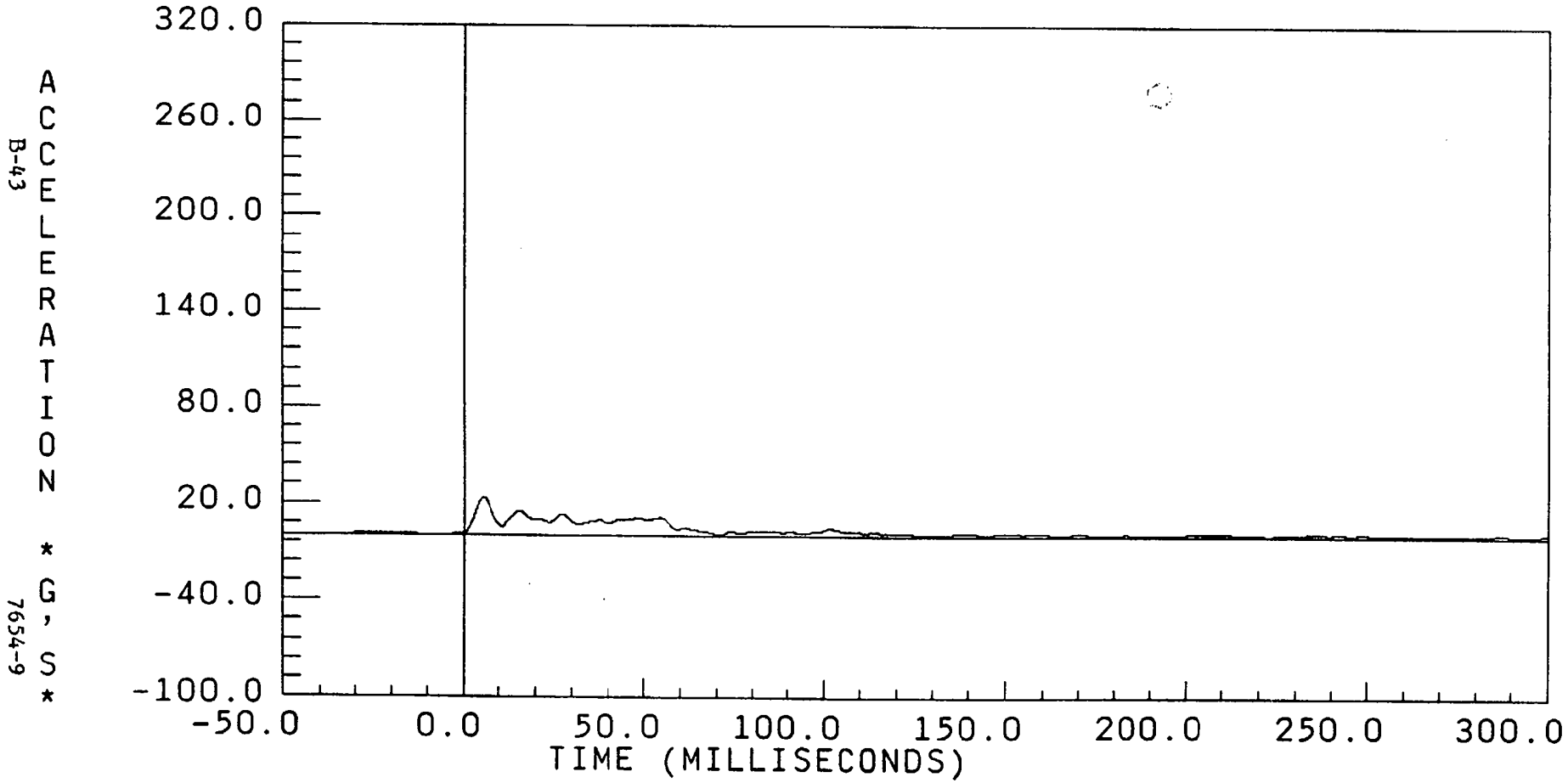


RS862-25.DAT

0.00 mph

DOOR SILL RIGHT FRONT
COMPUTED
FILTER CUTOFF: 100Hz

RS AXIS
YMIN = 0.245453 at -4.425000
YMAX = 23.04914 at 5.400000

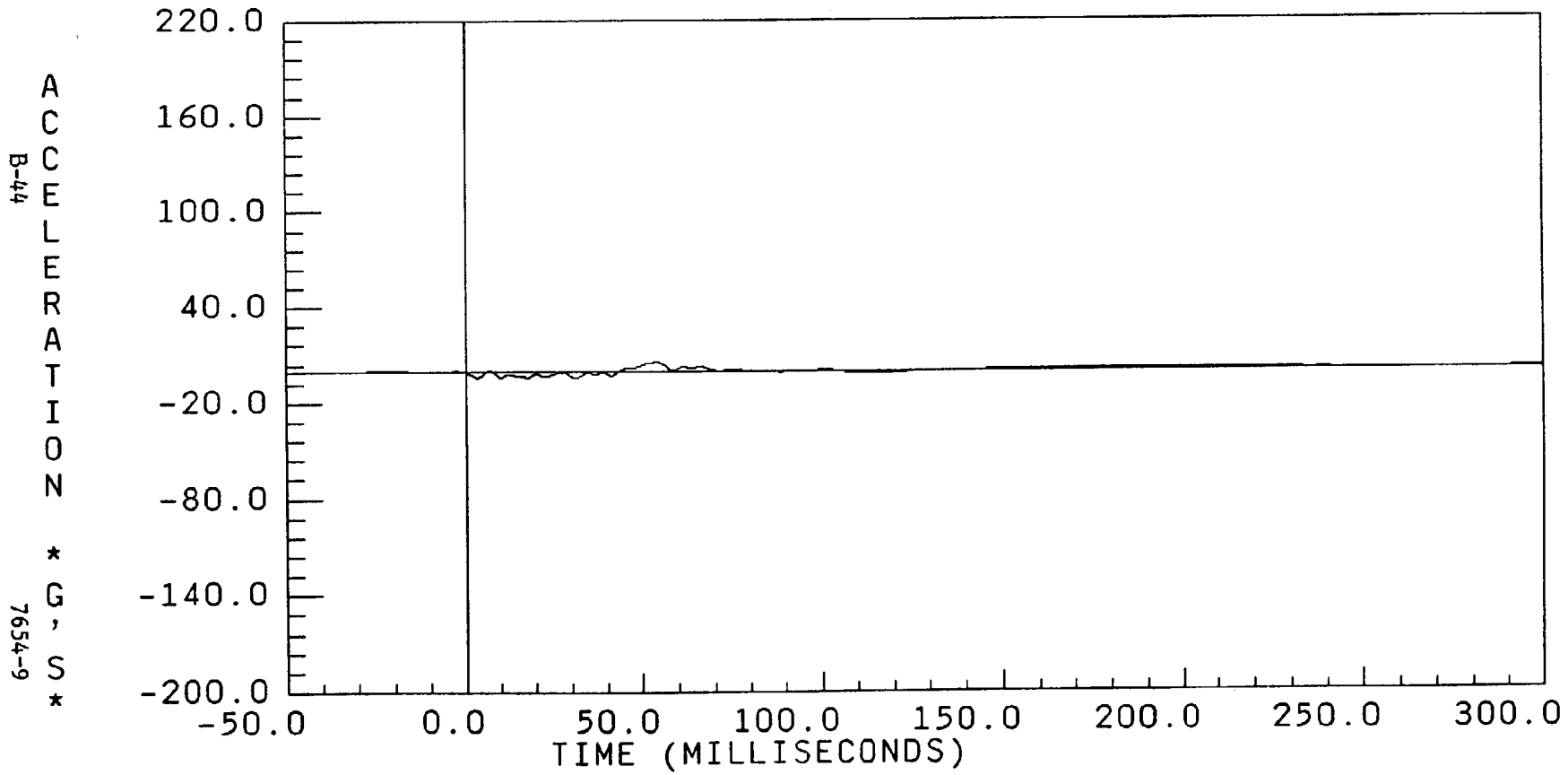


BW862-28.DAT

0.00 mph

DOOR SILL RIGHT REAR X
FILTERED
FILTER CUTOFF: 100Hz

X AXIS
YMIN =-4.240180 at 31.05000
YMAX = 5.247360 at 54.00000



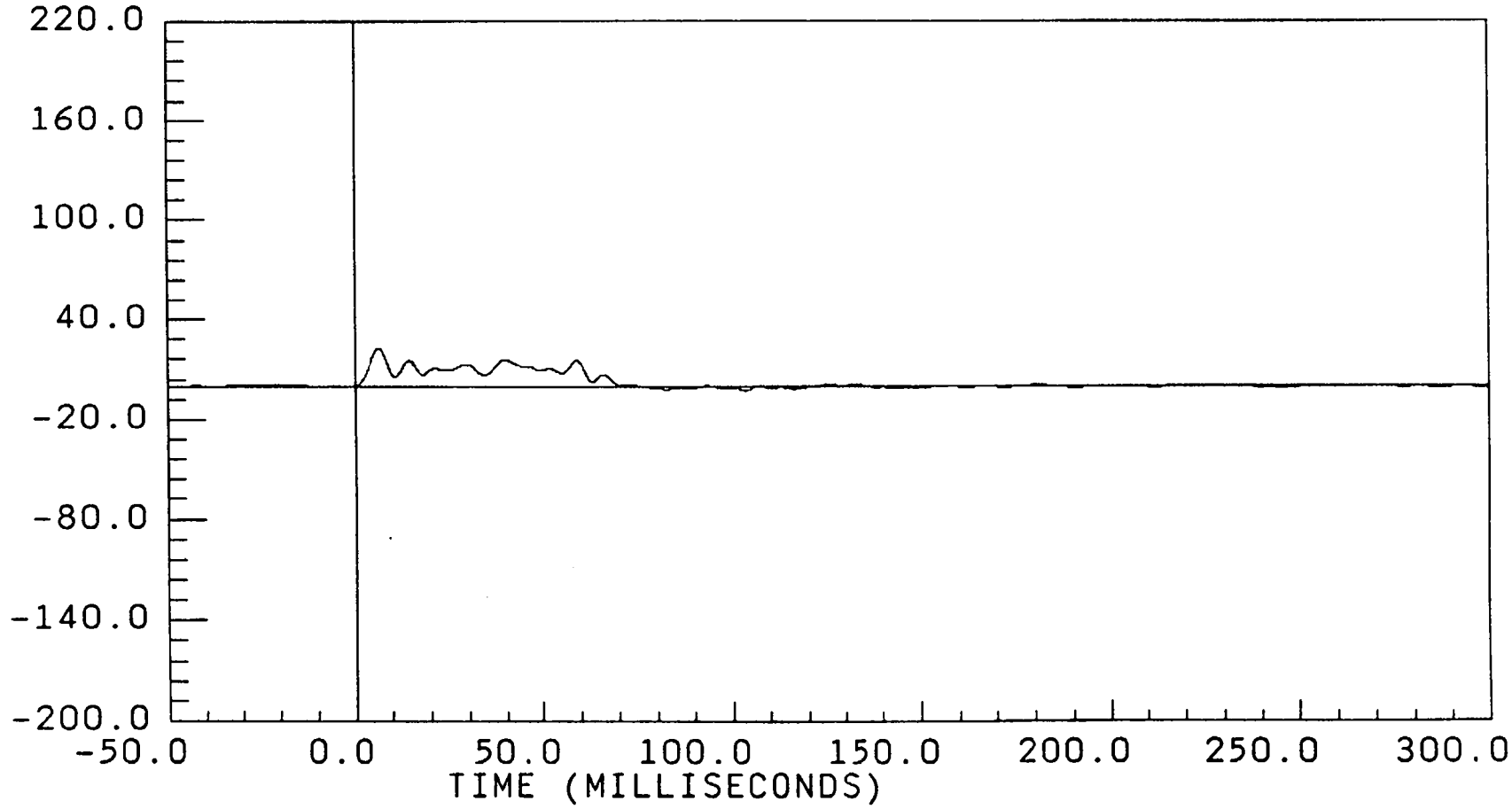
7654-9

BW862-29.DAT

0.00 mph

DOOR SILL RIGHT REAR Y
FILTERED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-2.858007 at 103.7250
YMAX = 22.73537 at 6.450000



B-45

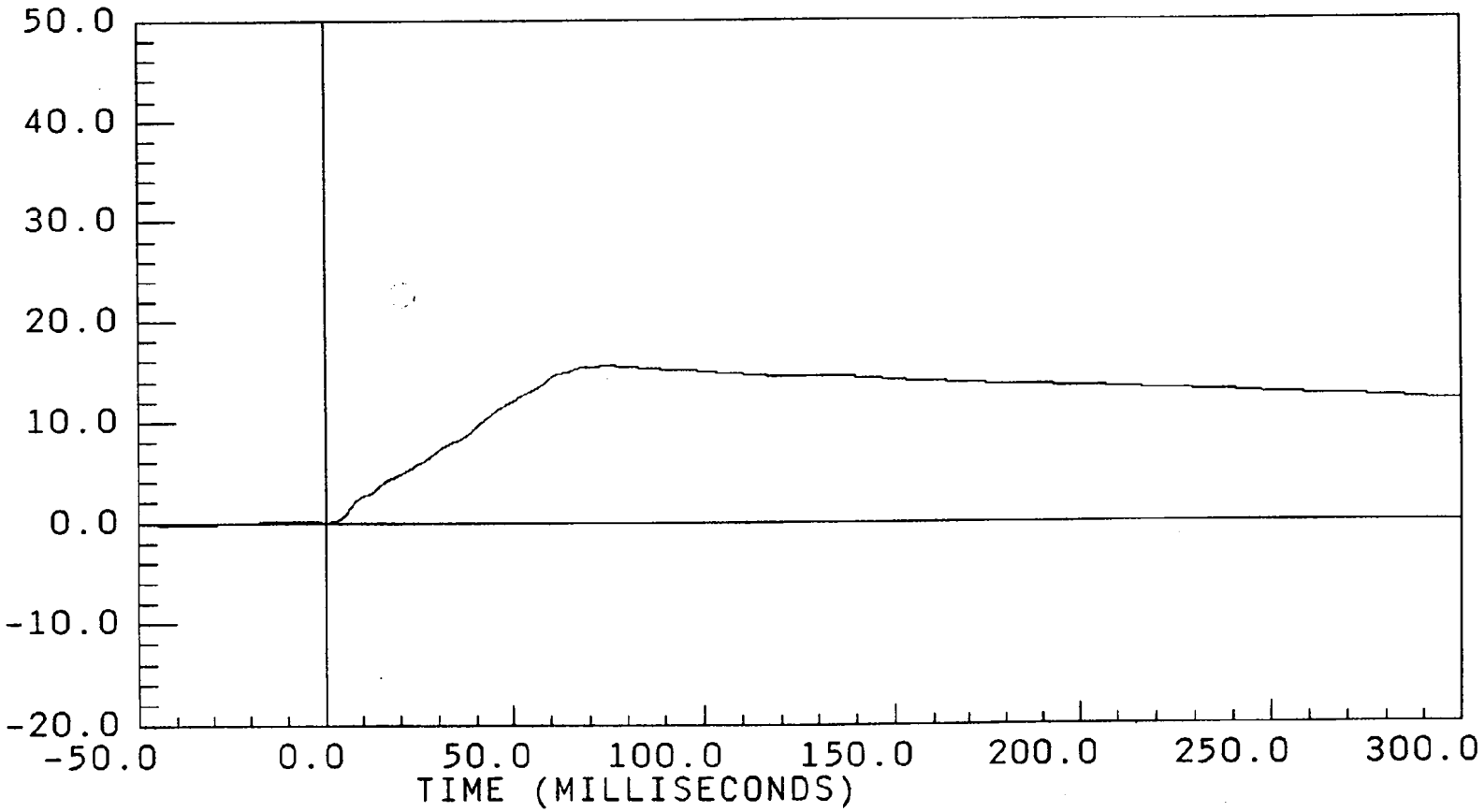
7654-9

V862-29.DAT

0.00 mph

DOOR SILL RIGHT REAR Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-0.176151 at -43.95000
YMAX = 15.52669 at 75.07500



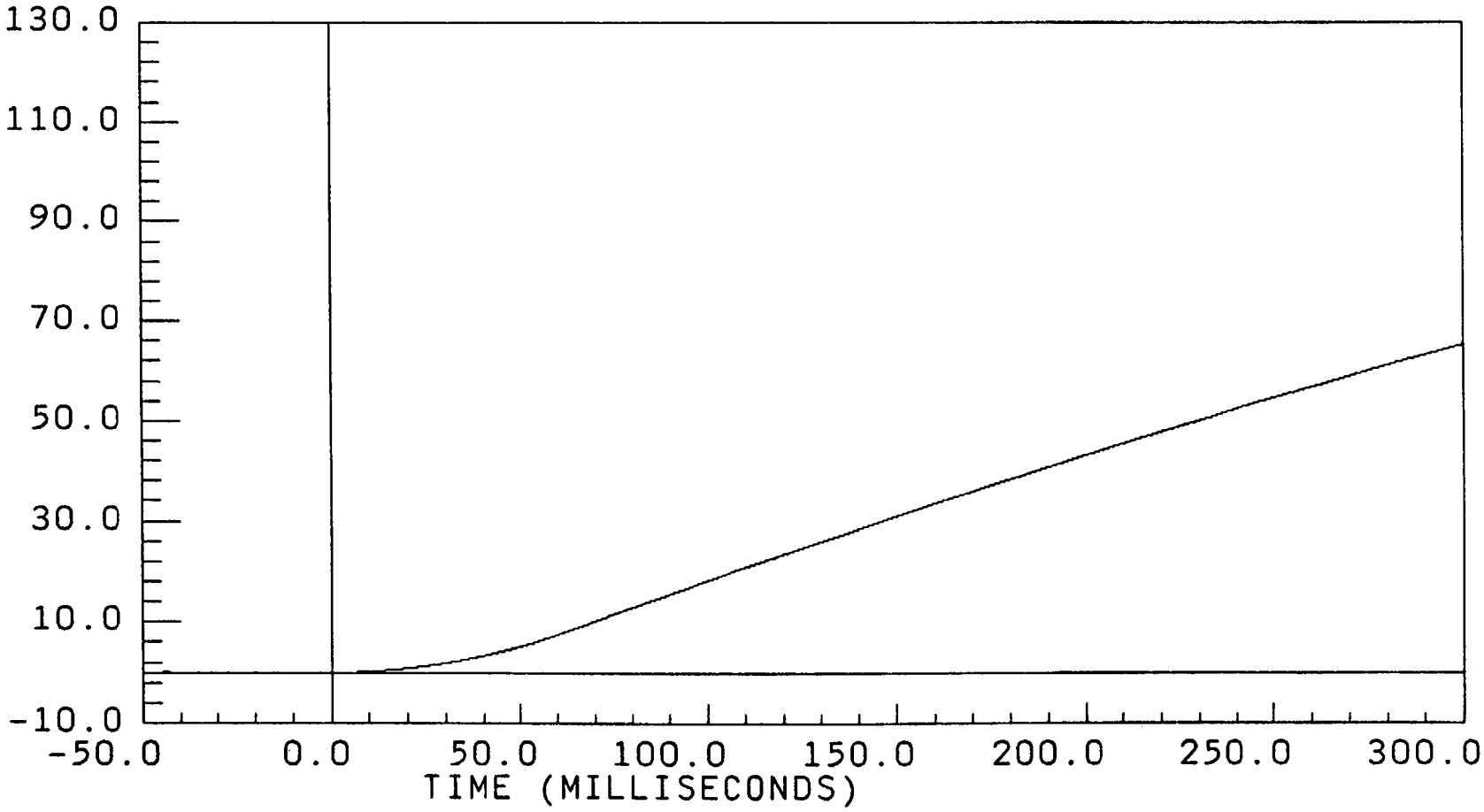
7654-9

D862-29.DAT

0.00 mph

DOOR SILL RIGHT REAR Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =0.0517743 at -18.45000
YMAX = 65.35563 at 300.0000



B-47

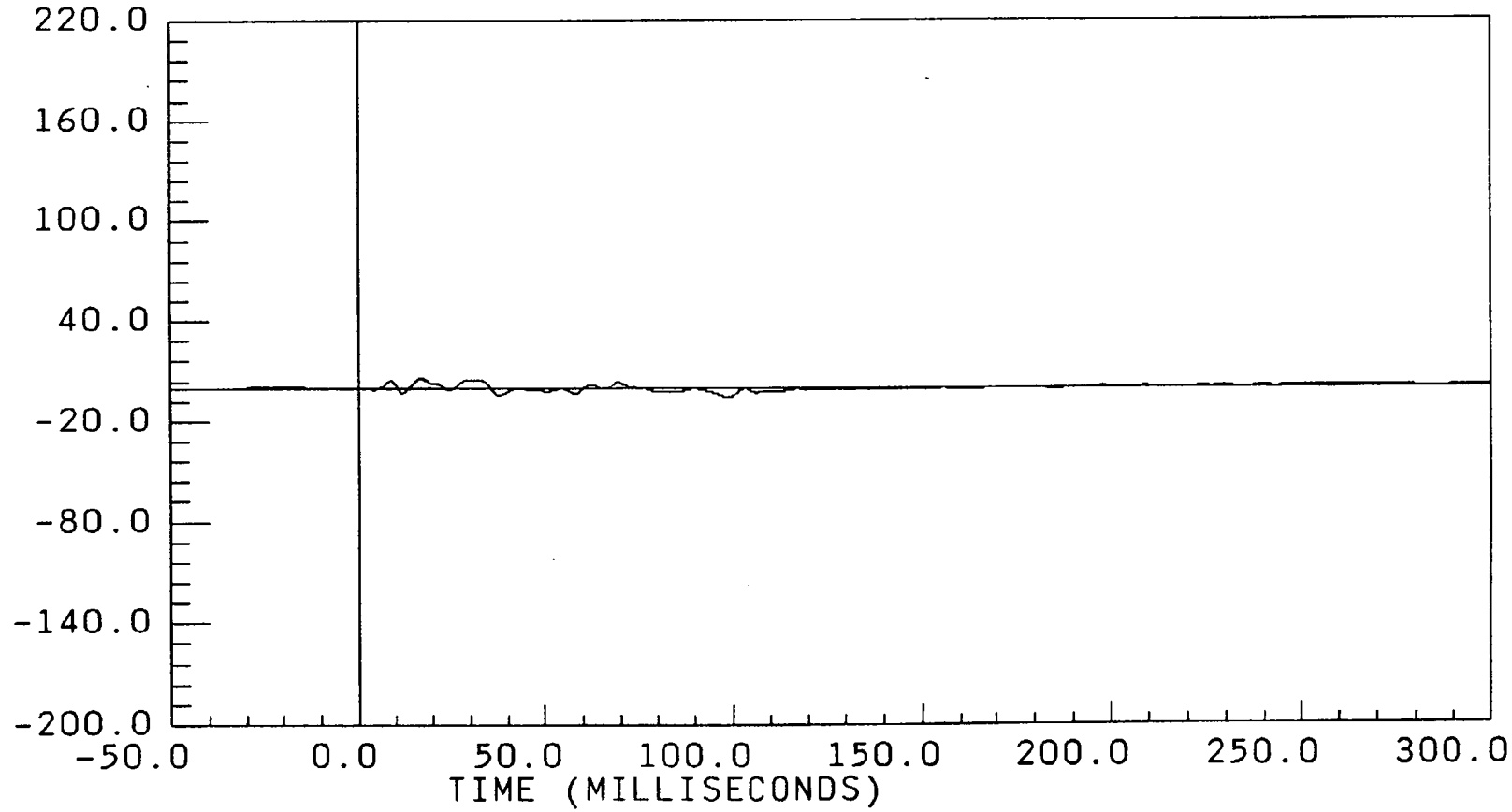
7654-9

BW862-30.DAT

0.00 mph

DOOR SILL RIGHT REAR Z
FILTERED
FILTER CUTOFF: 100Hz

Z AXIS
YMIN =-5.561911 at 98.70000
YMAX = 5.643253 at 16.87500

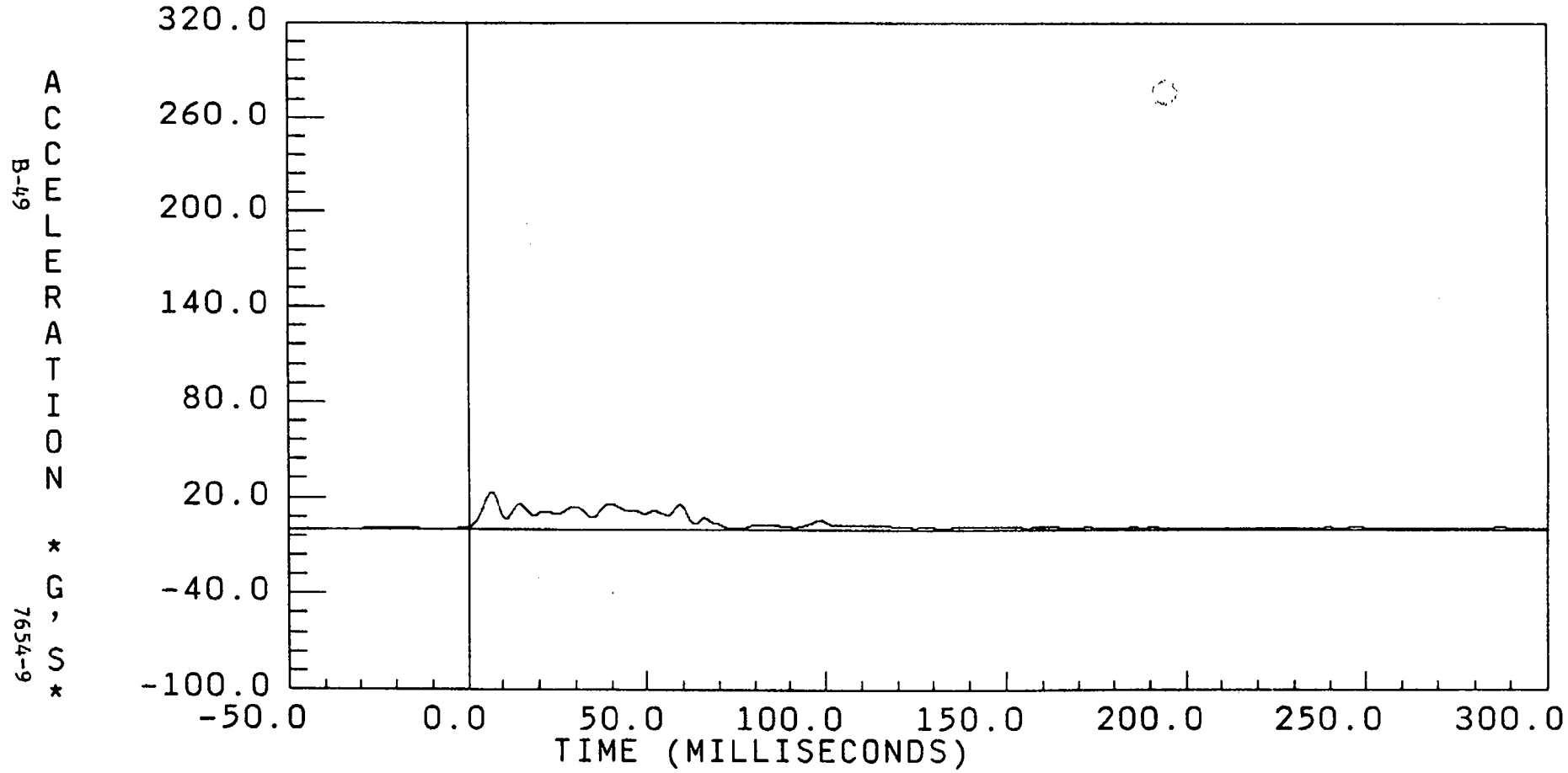


RS862-28.DAT

0.00 mph

DOOR SILL RIGHT REAR
COMPUTED
FILTER CUTOFF: 100Hz

RS AXIS
YMIN = 0.345818 at -11.92500
YMAX = 22.74998 at 6.450000

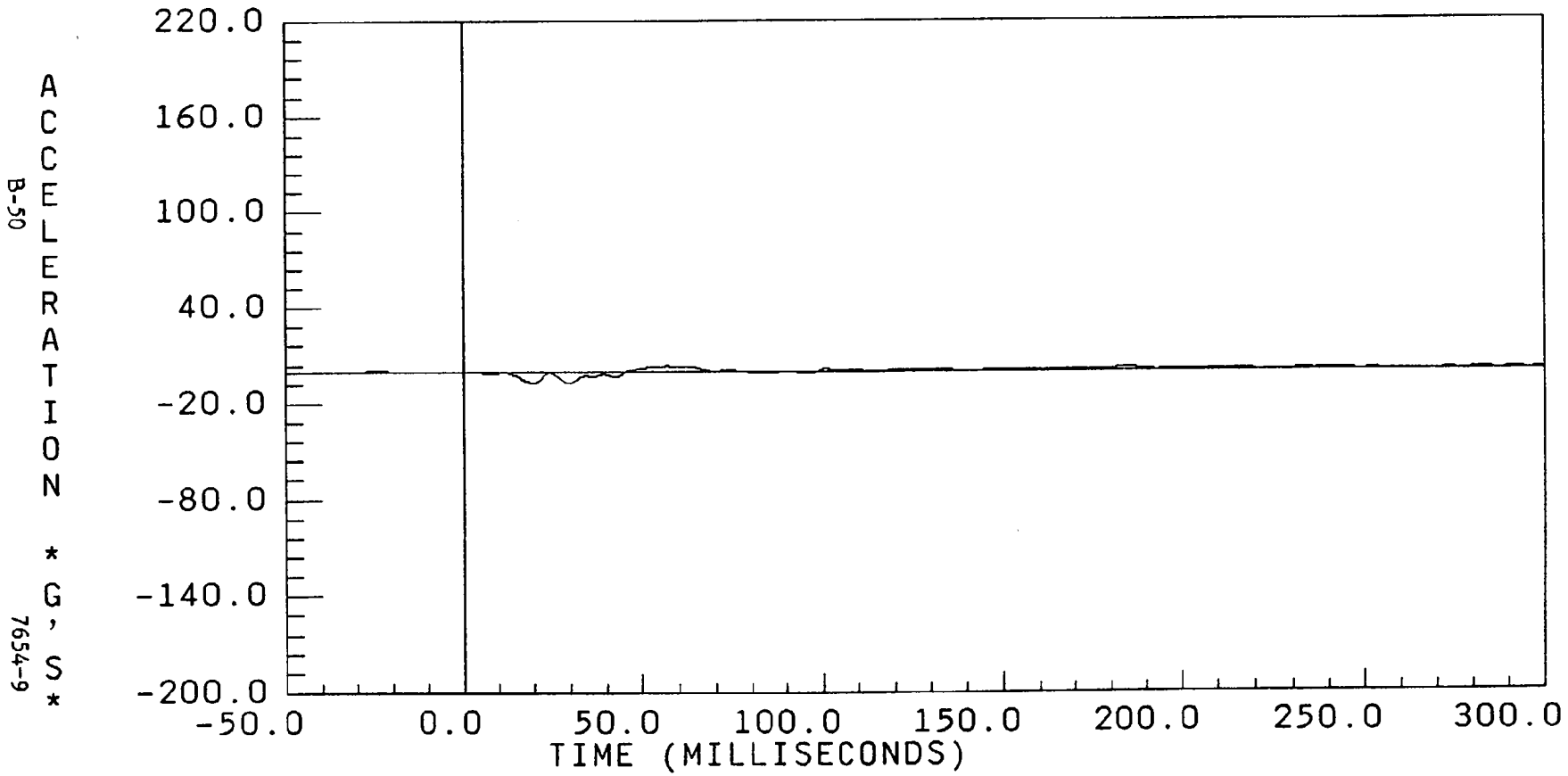


BW862-31.DAT

0.00 mph

FLOOR PAN REAR CL X
FILTERED
FILTER CUTOFF: 100Hz

X AXIS
YMIN =-7.266619 at 29.62500
YMAX = 3.111474 at 56.77500

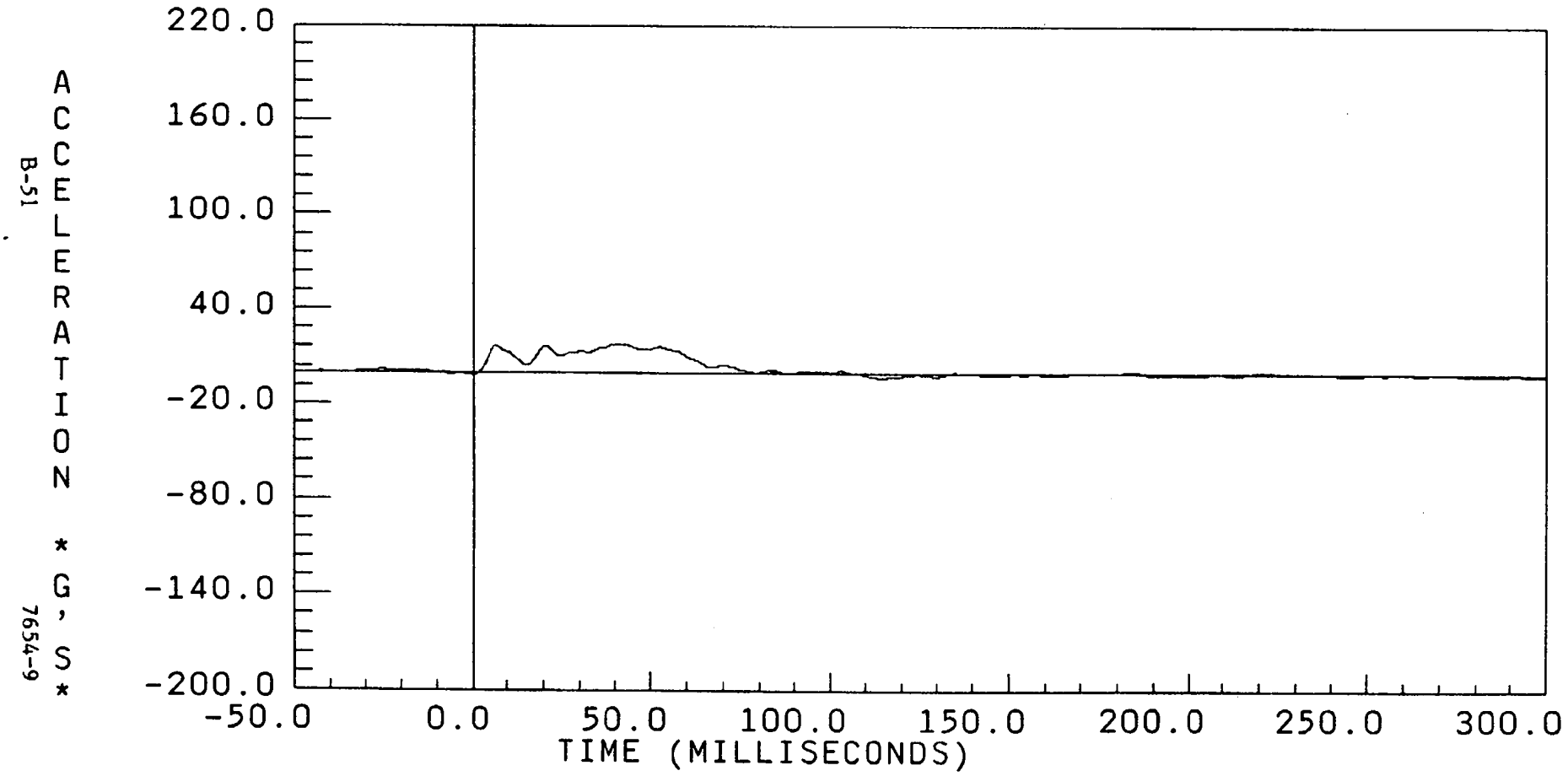


BW862-32.DAT

0.00 mph

FLOOR PAN REAR CL Y
FILTERED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-3.132441 at 114.5250
YMAX = 17.67213 at 42.22500

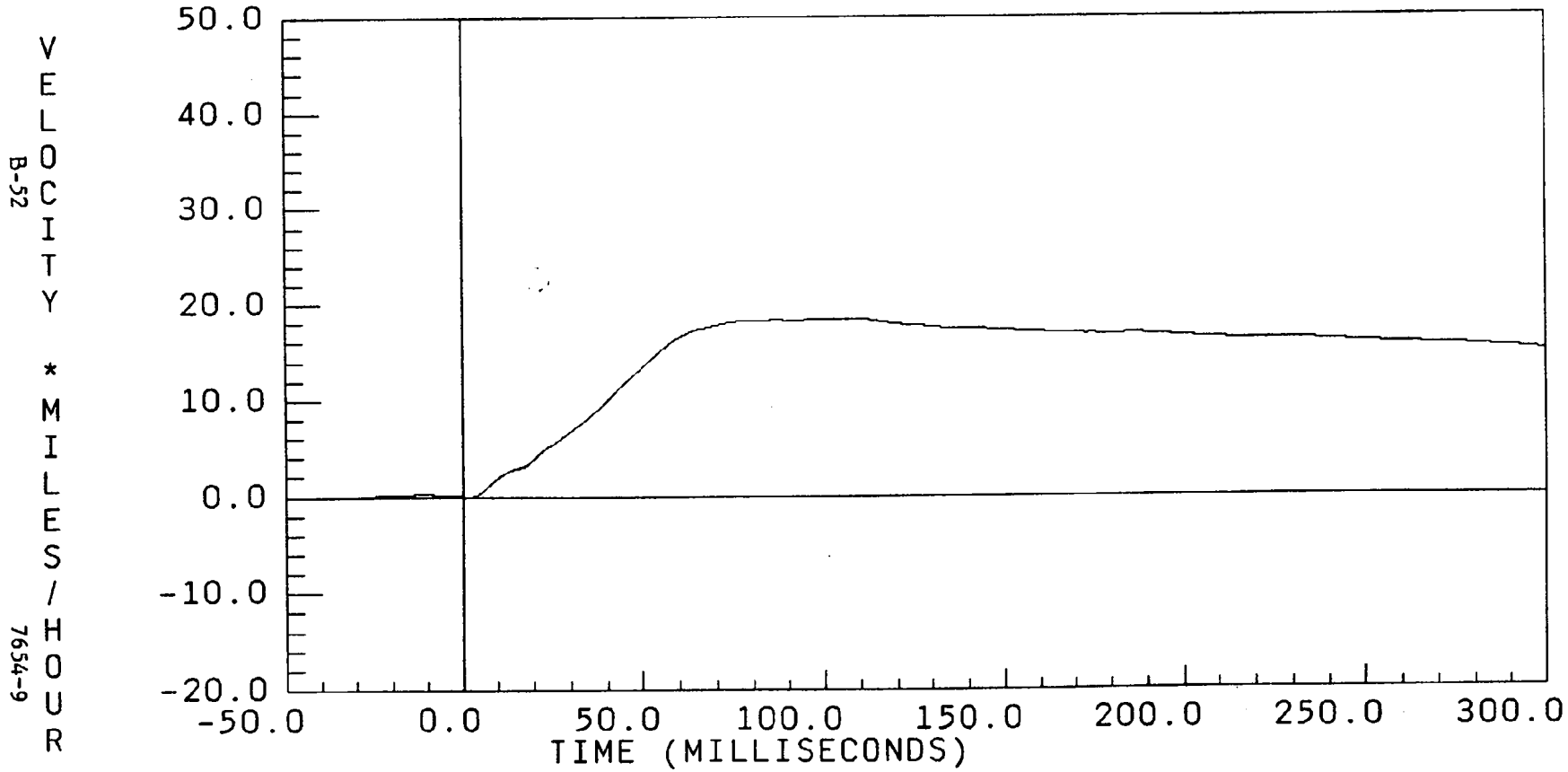


V862-32.DAT

0.00 mph

FLOOR PAN REAR CL Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-.0465292 at -33.15000
YMAX = 18.43907 at 107.8500

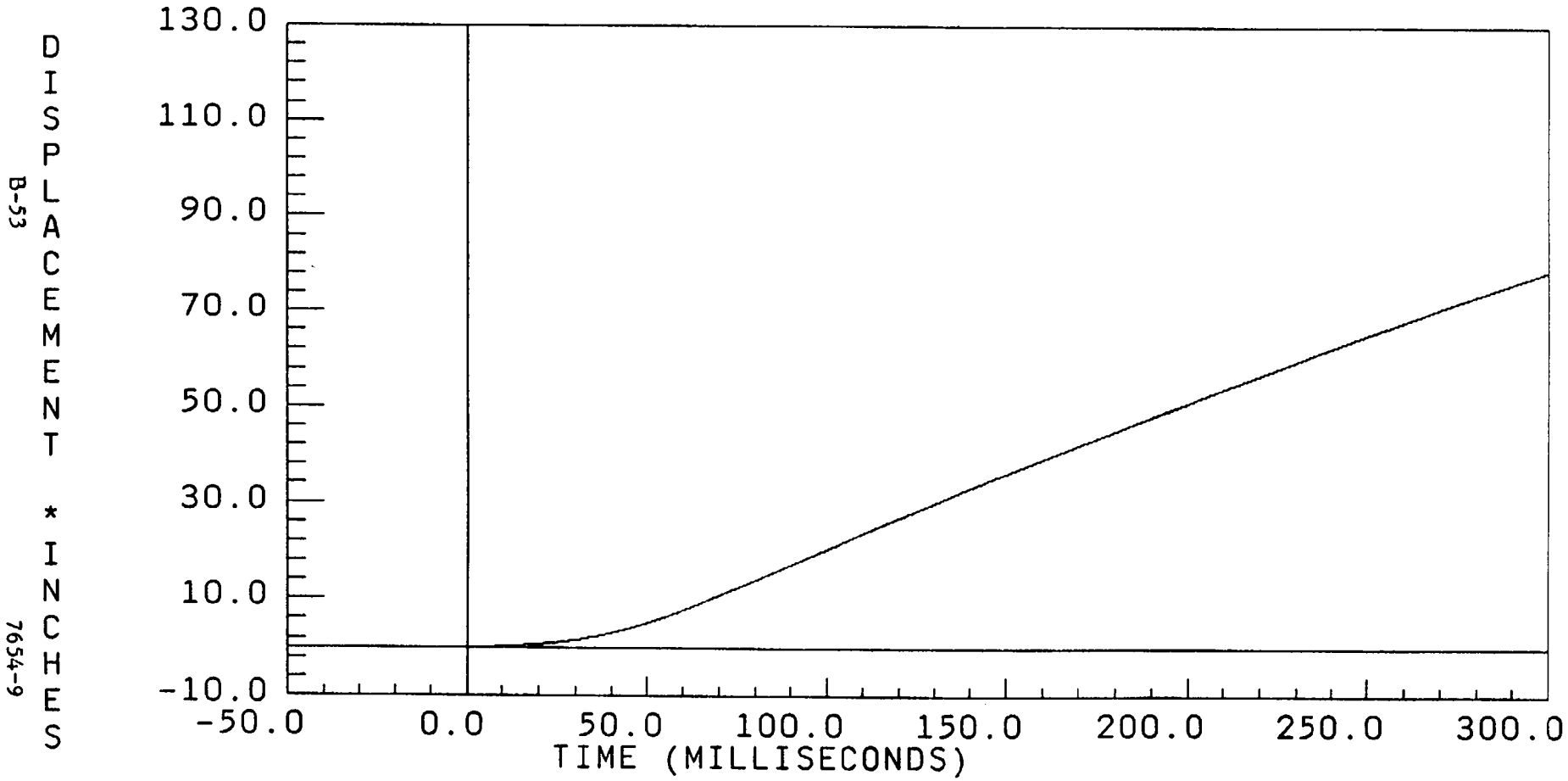


D862-32.DAT

0.00 mph

FLOOR PAN REAR CL Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-.0240707 at -25.27500
YMAX = 78.76498 at 300.0000

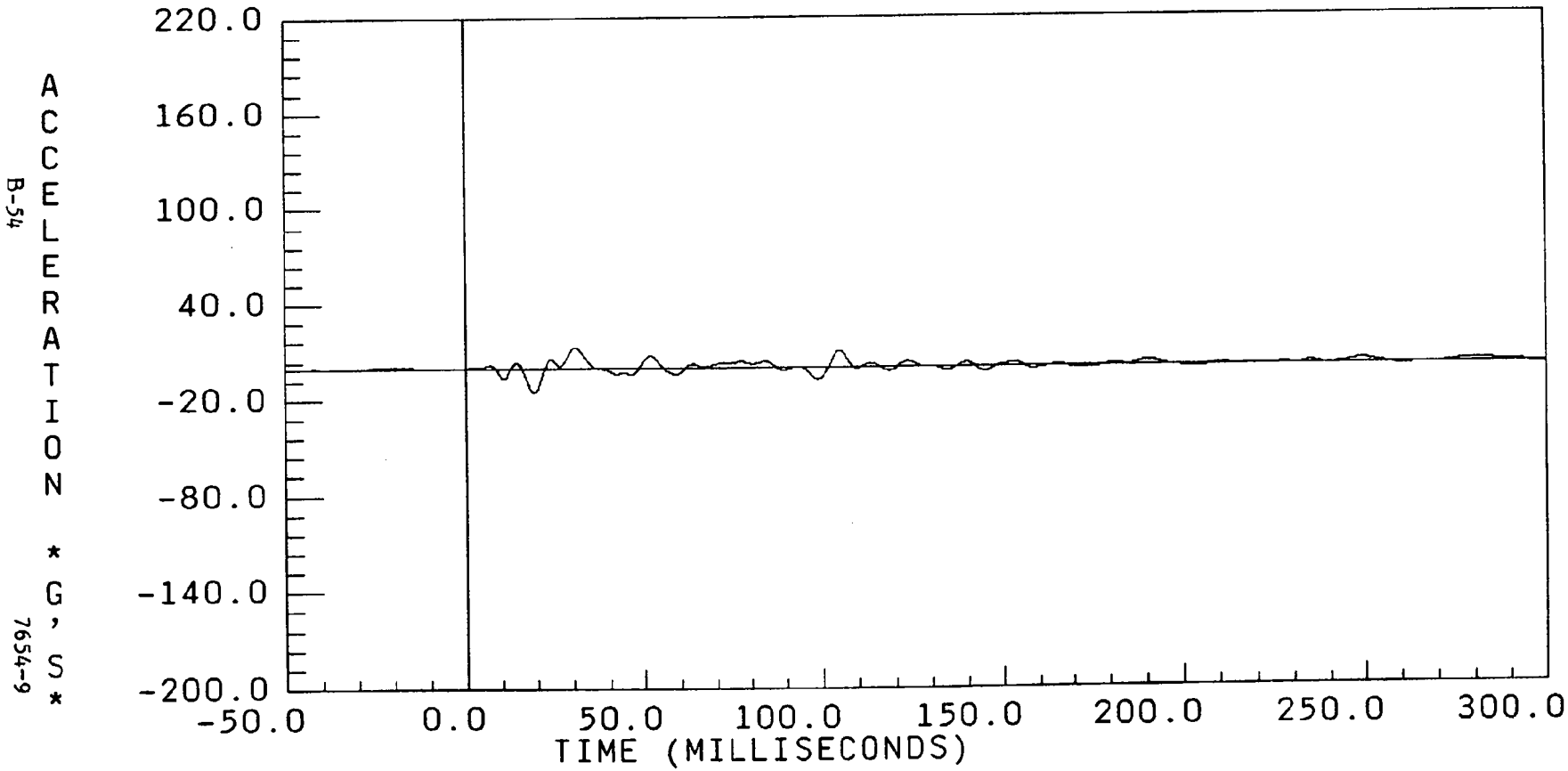


BW862-33.DAT

0.00 mph

FLOOR PAN REAR CL Z
FILTERED
FILTER CUTOFF: 100Hz

Z AXIS
YMIN =-15.40837 at 19.12500
YMAX = 12.85236 at 30.60000

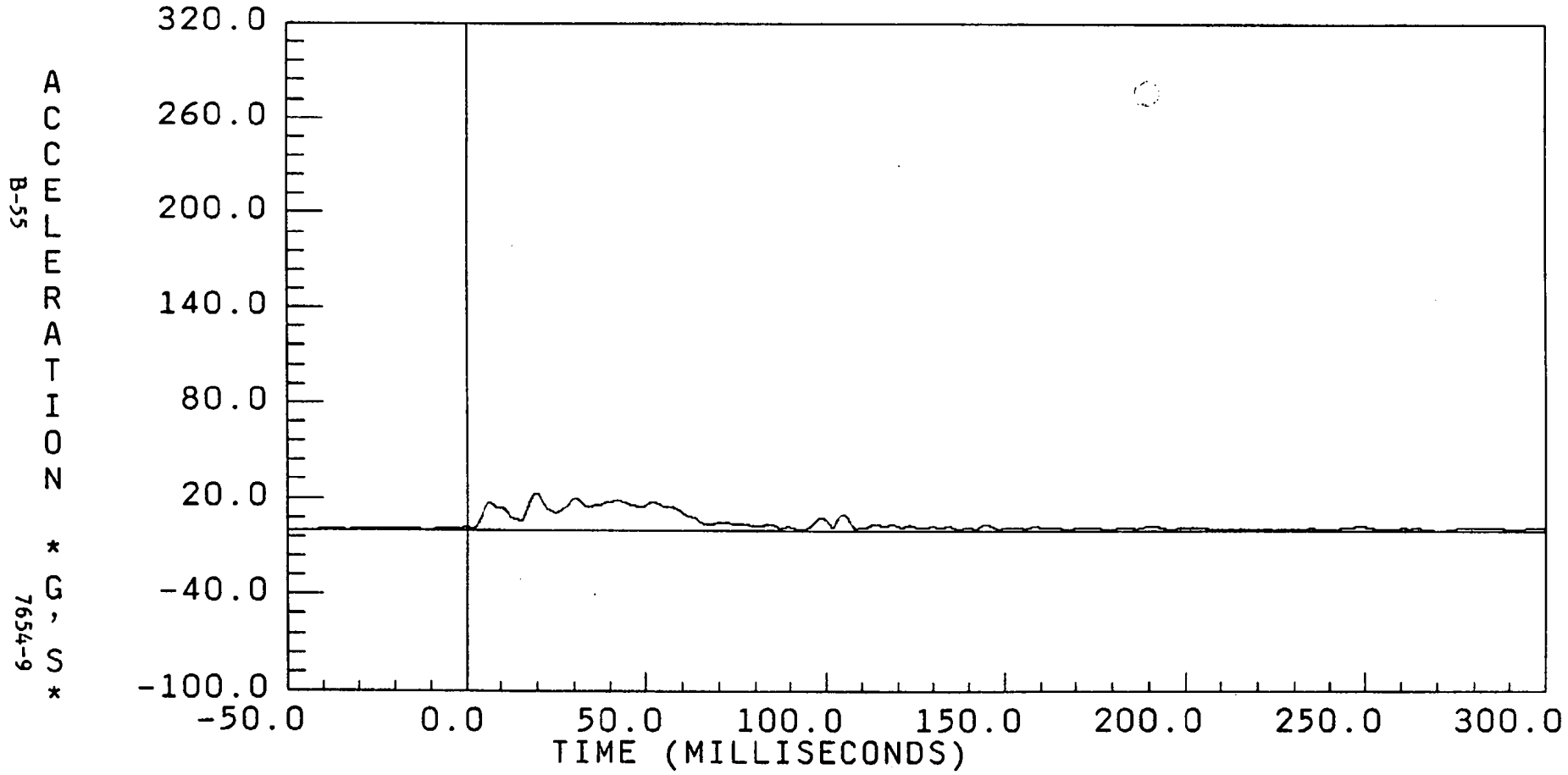


RS862-31.DAT

0.00 mph

FLOOR PAN REAR CL
COMPUTED
FILTER CUTOFF: 100Hz

RS AXIS
YMIN = 0.411449 at -43.80000
YMAX = 22.81450 at 19.65000

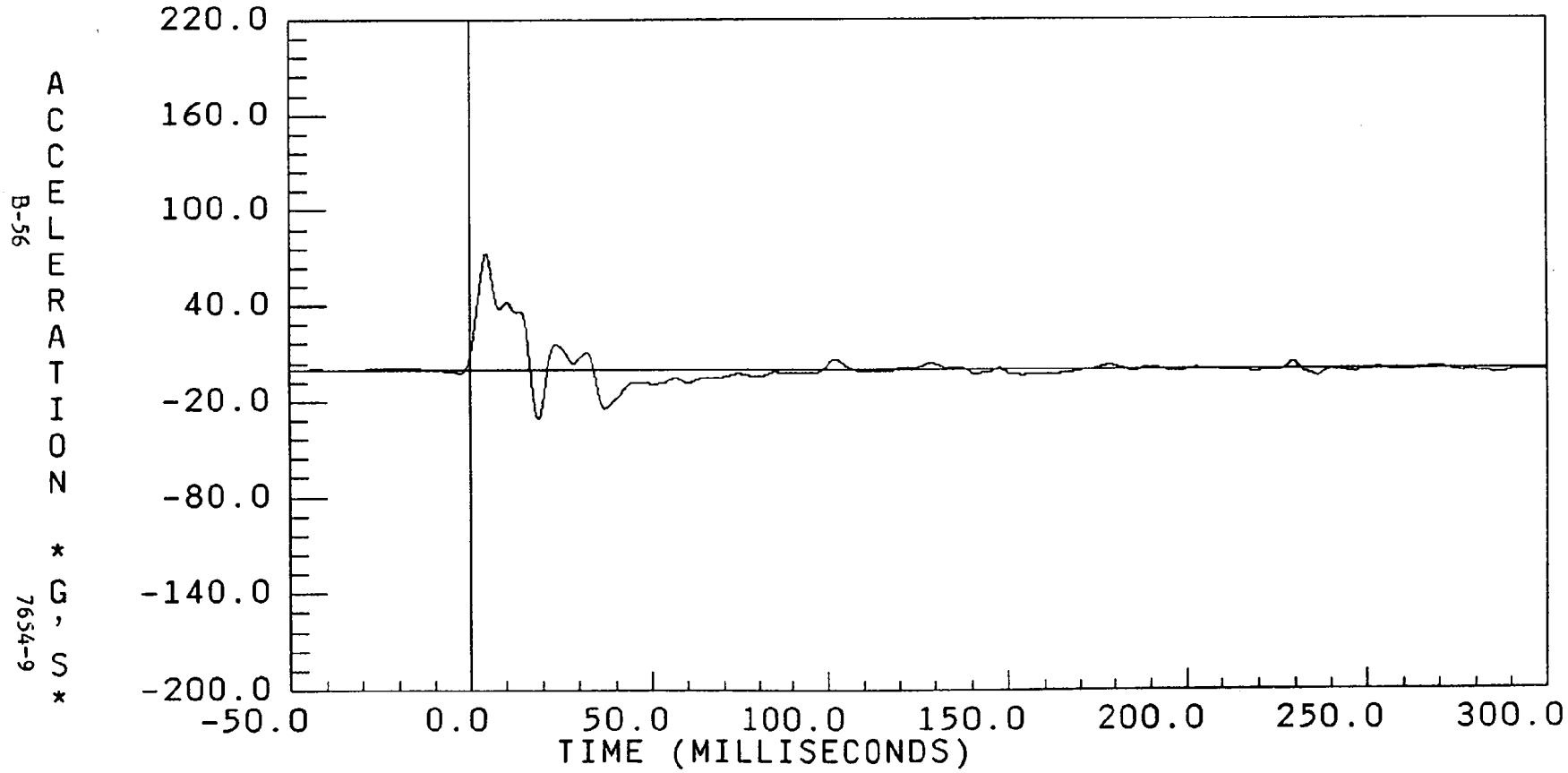


BW862-34.DAT

0.00 mph

DOOR SILL LEFT REAR Y
FILTERED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-31.27122 at 18.75000
YMAX = 73.10073 at 4.575000

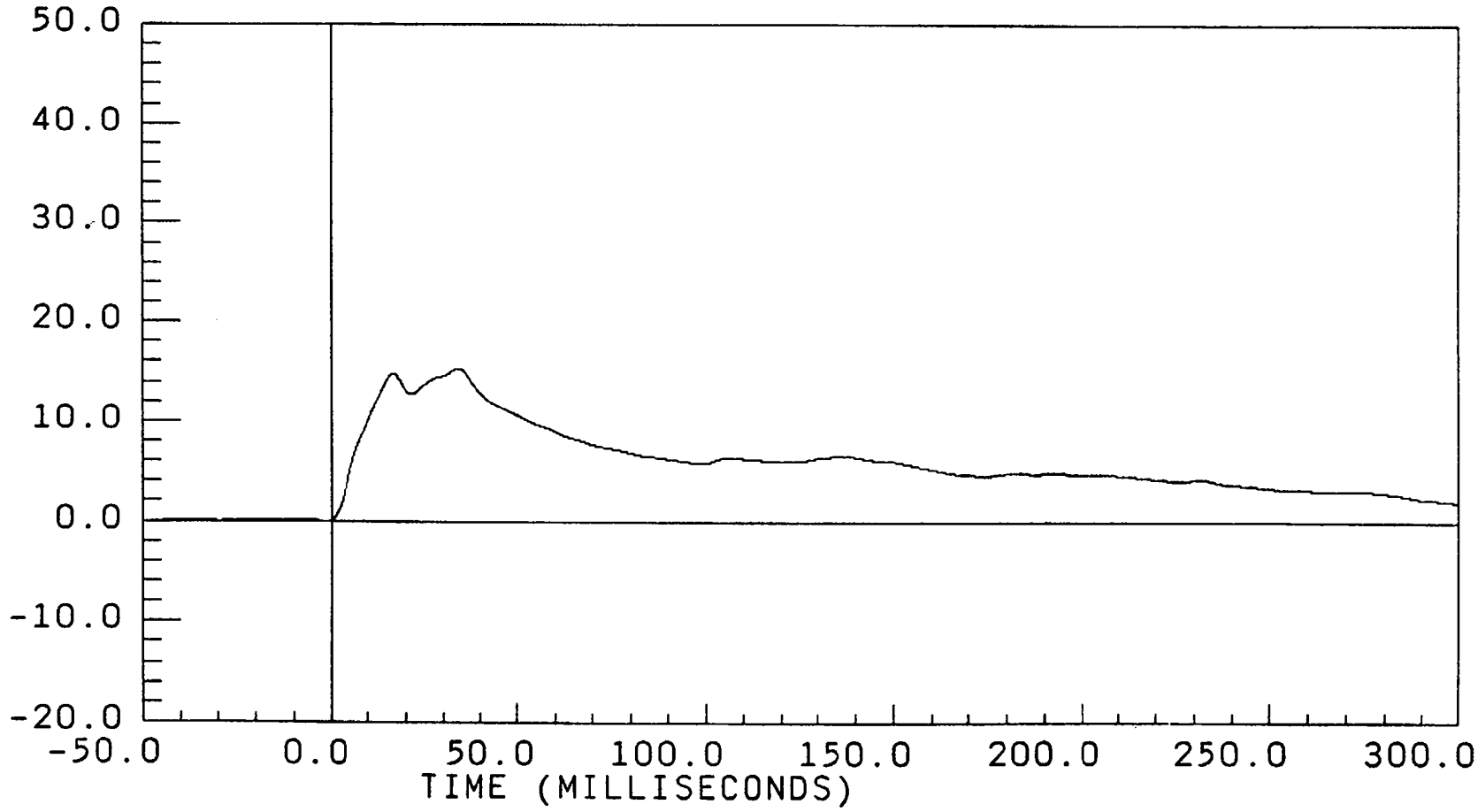


V862-34.DAT

0.00 mph

DOOR SILL LEFT REAR Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =0.0358789 at -1.200000
YMAX = 15.29767 at 34.20000



B-57

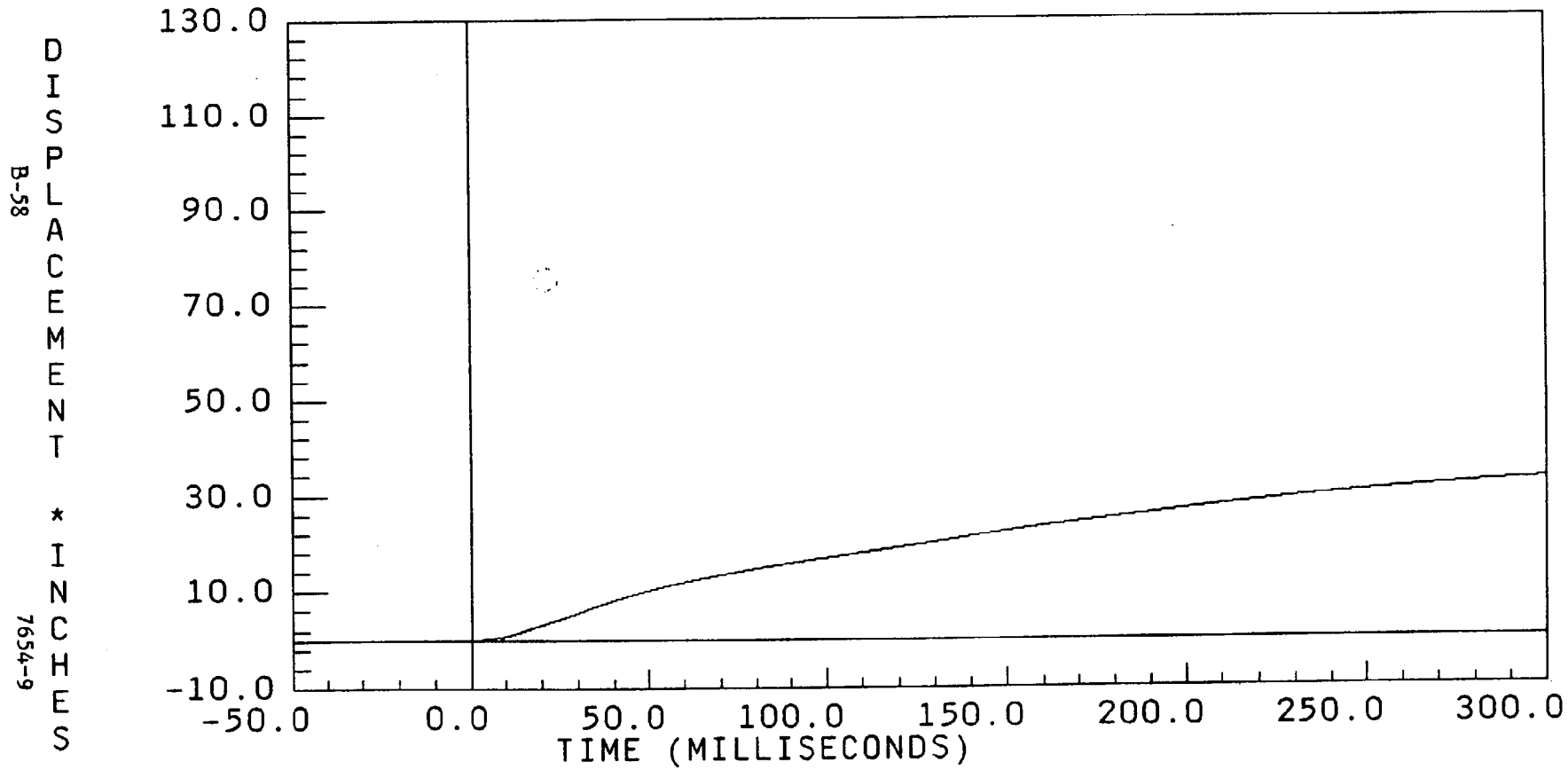
7654-9

D862-34.DAT

0.00 mph

DOOR SILL LEFT REAR Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-.0533093 at -1.200000
YMAX = 32.75834 at 300.0000

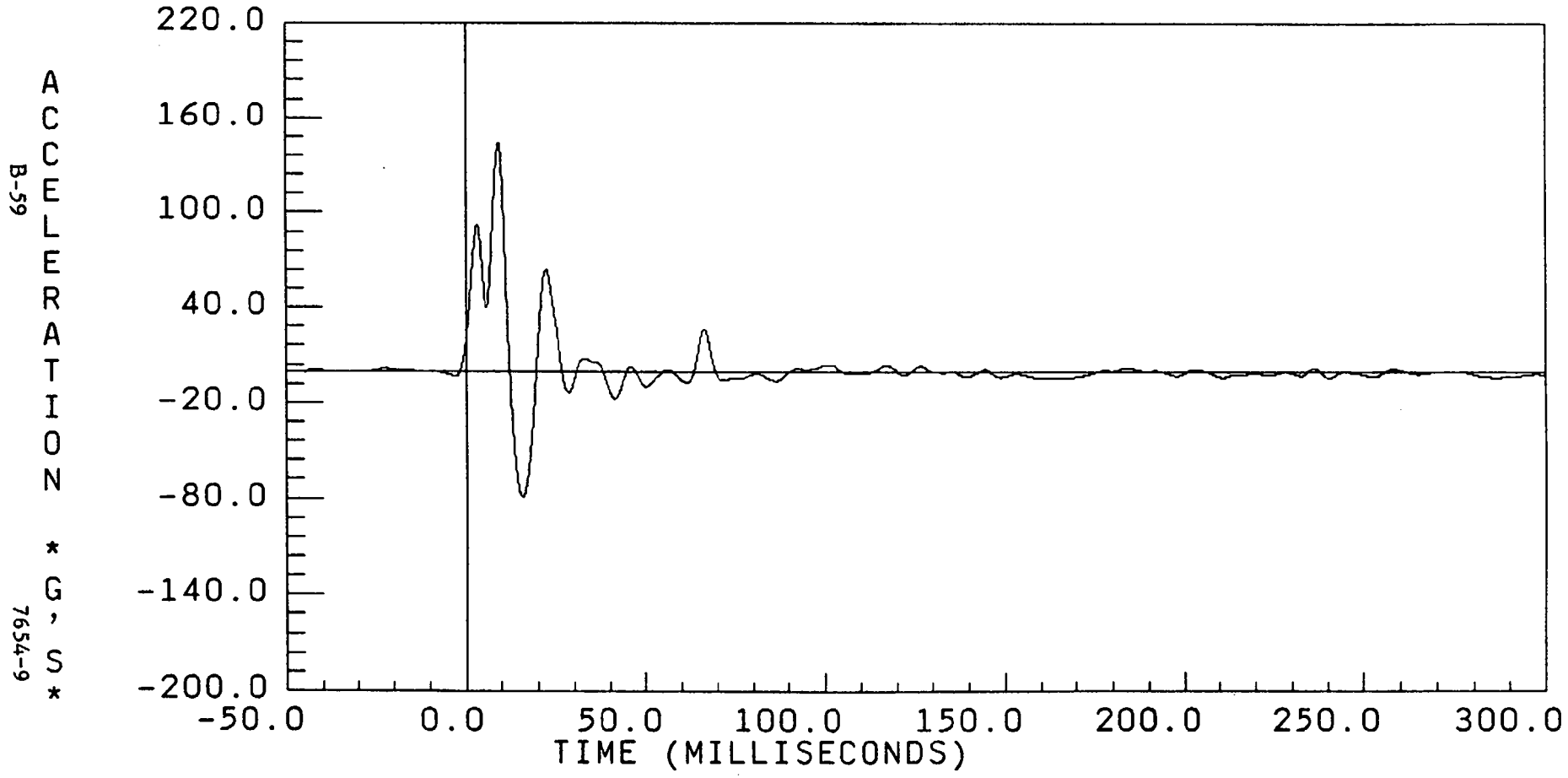


BW862-35.DAT

0.00 mph

DOOR SILL LEFT FRONT Y
FILTERED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-79.60673 at 15.60000
YMAX = 143.9995 at 9.075001

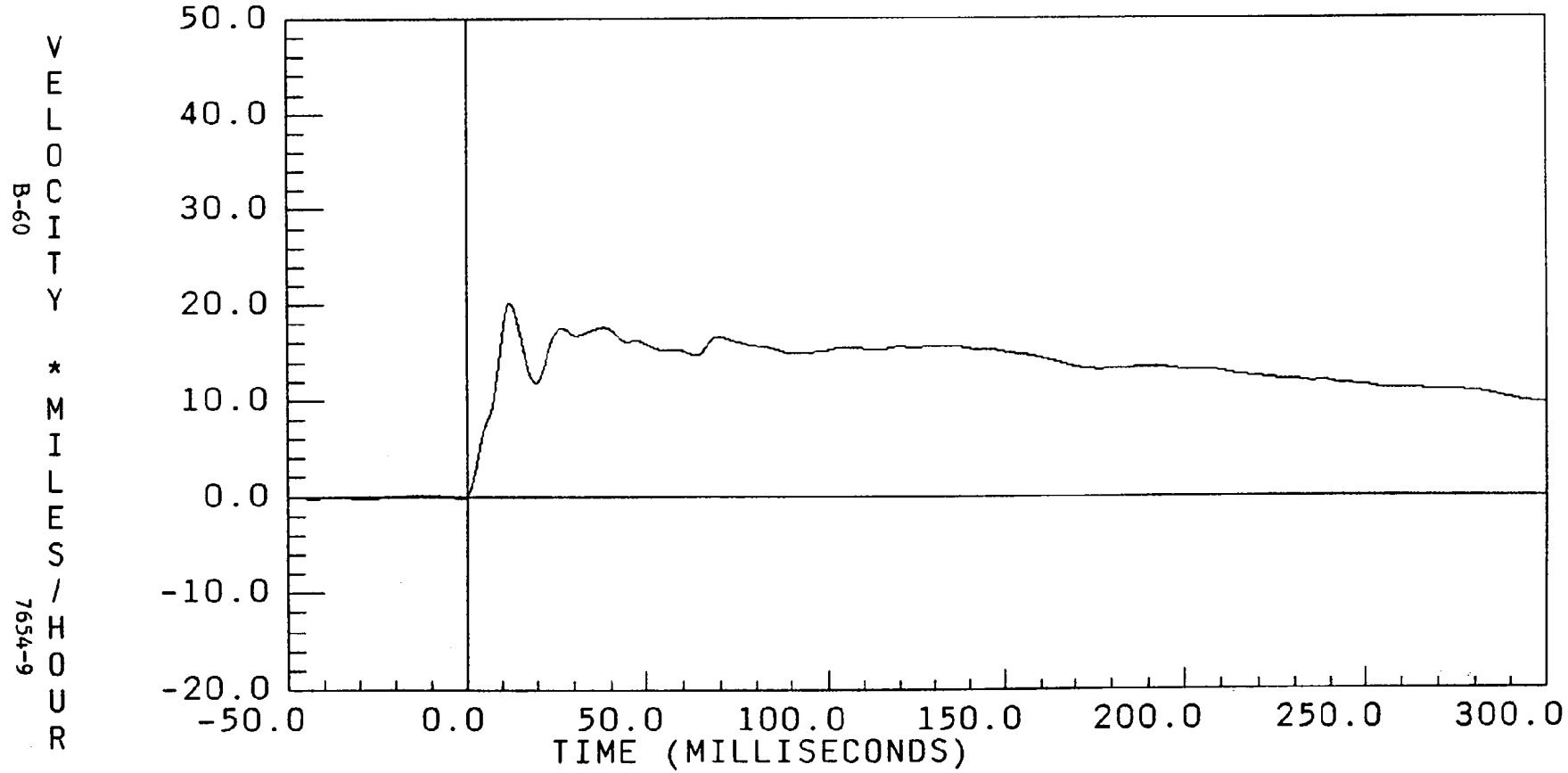


V862-35.DAT

0.00 mph

DOOR SILL LEFT FRONT Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-0.171534 at -1.500000
YMAX = 20.19931 at 12.15000

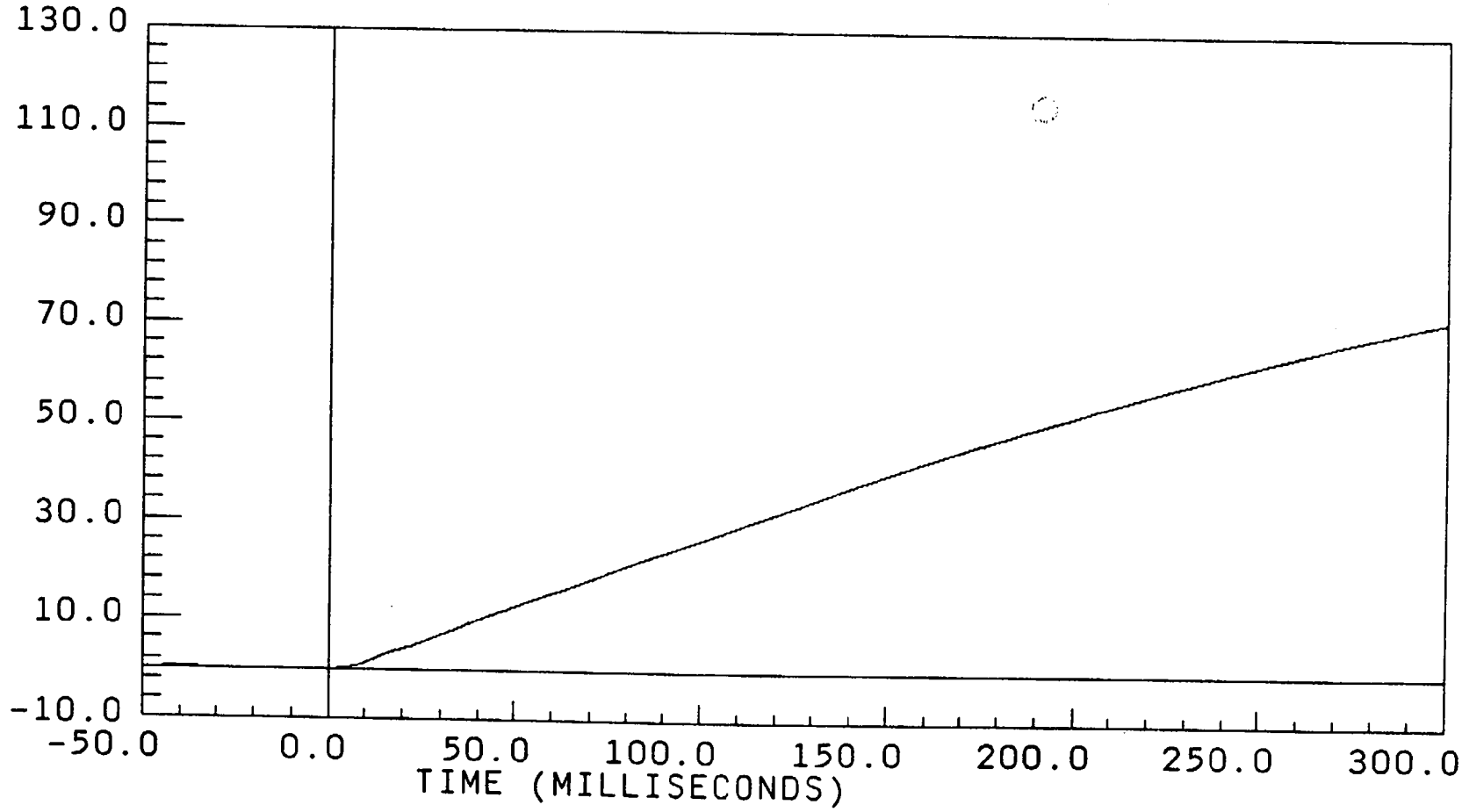


D862-35.DAT

0.00 mph

DOOR SILL LEFT FRONT Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN = 0.000000 at 0.000000
YMAX = 72.26697 at 300.0000

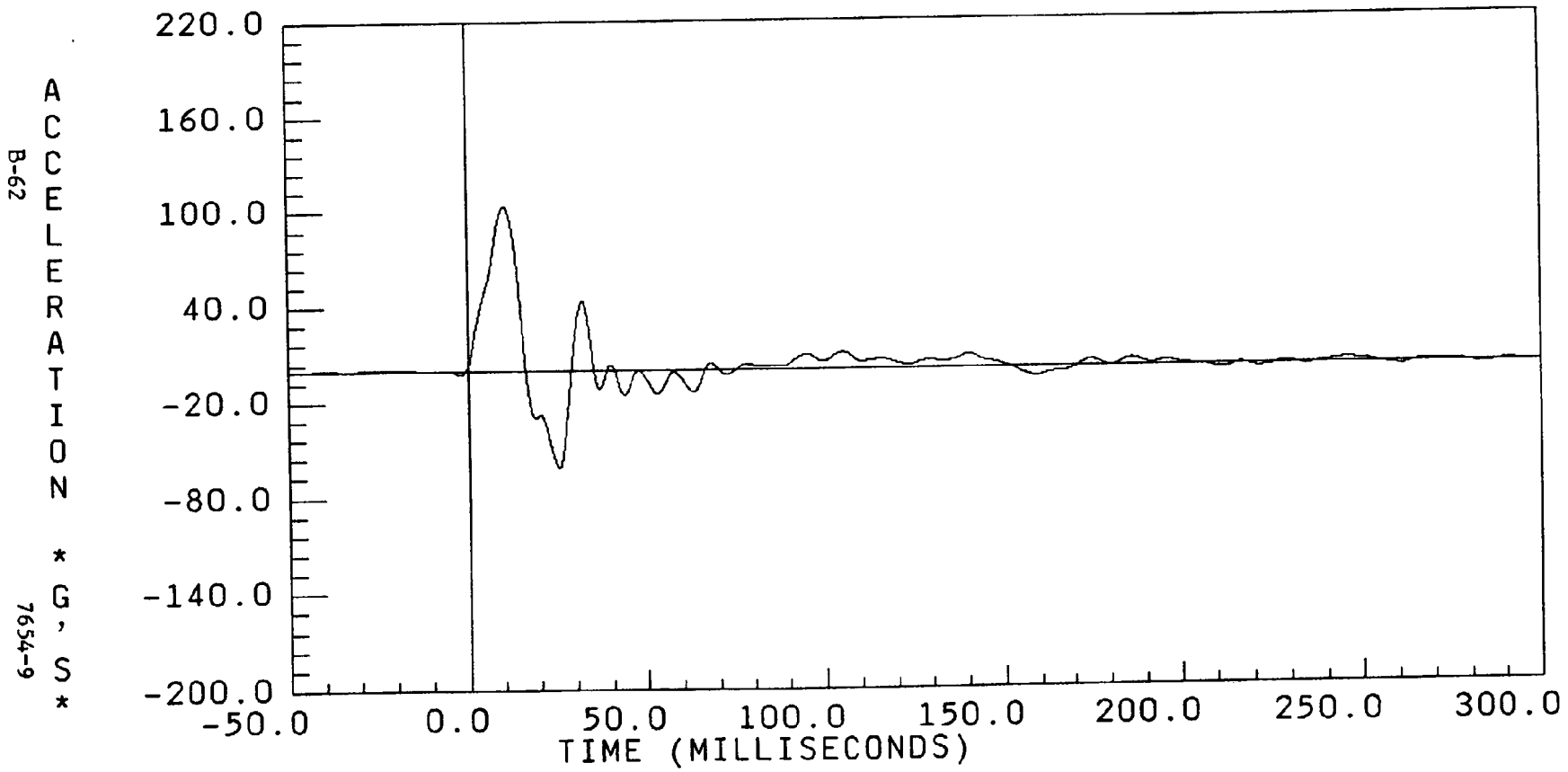


BW862-36.DAT

0.00 mph

LEFT FRONT DOOR CL Y
FILTERED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-61.72670 at 25.35000
YMAX = 103.2945 at 10.27500

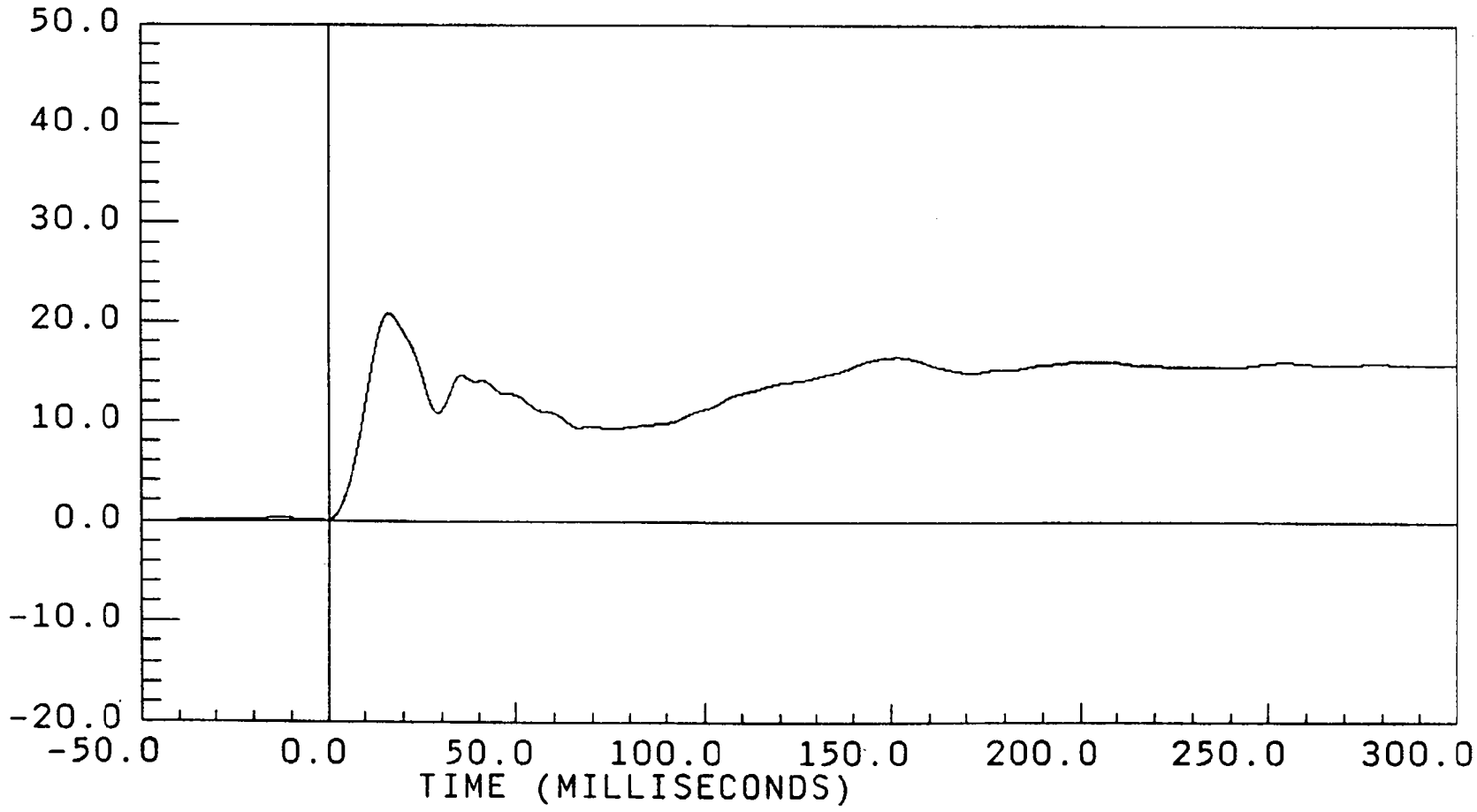


V862-36.DAT

0.00 mph

LEFT FRONT DOOR CL Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =0.0018798 at -0.450000
YMAX = 20.87090 at 16.20000



B-63

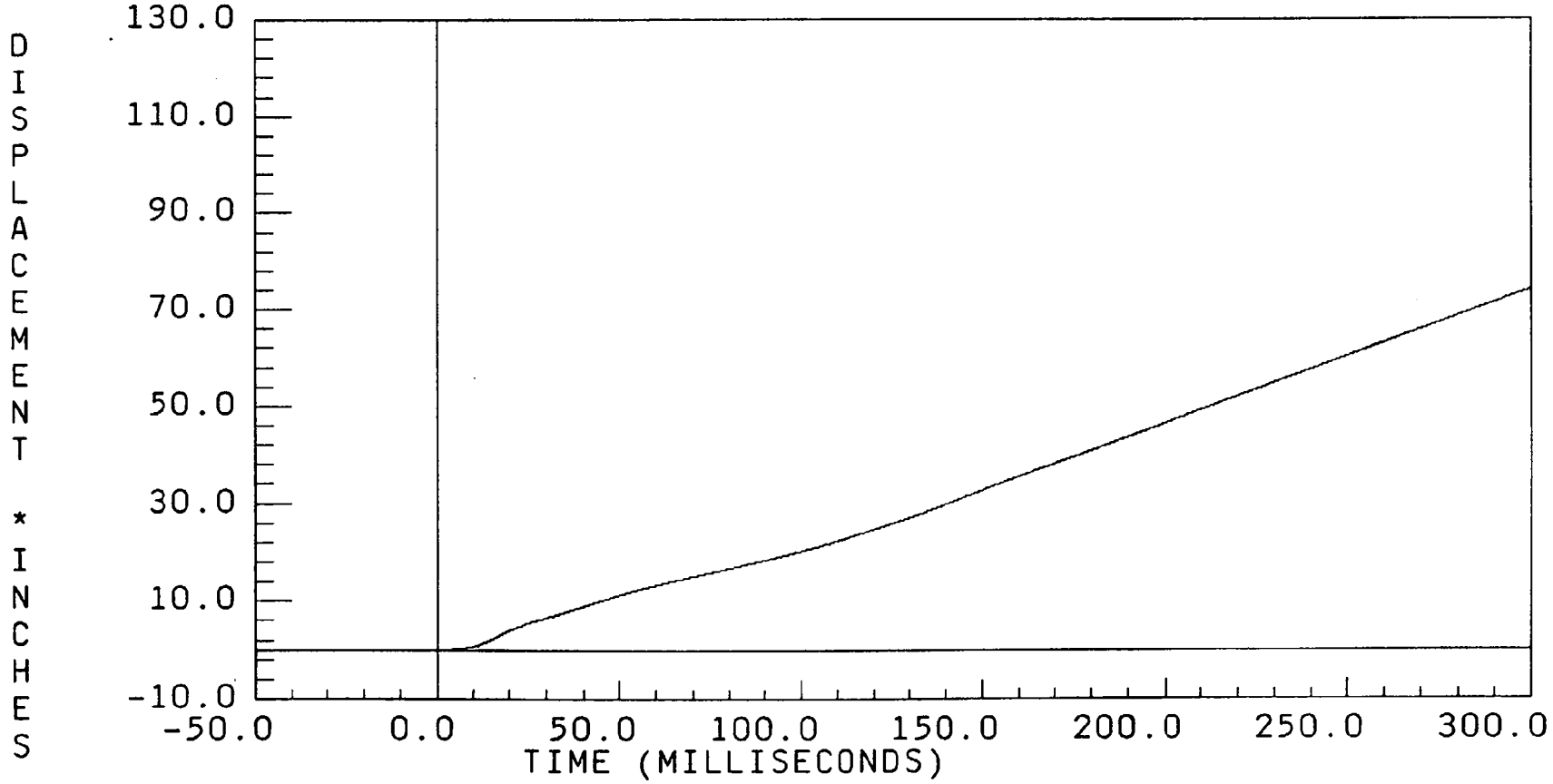
7654-9

D862-36.DAT

0.00 mph

LEFT FRONT DOOR CL Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-.0686754 at -42.30000
YMAX = 74.10242 at 300.0000



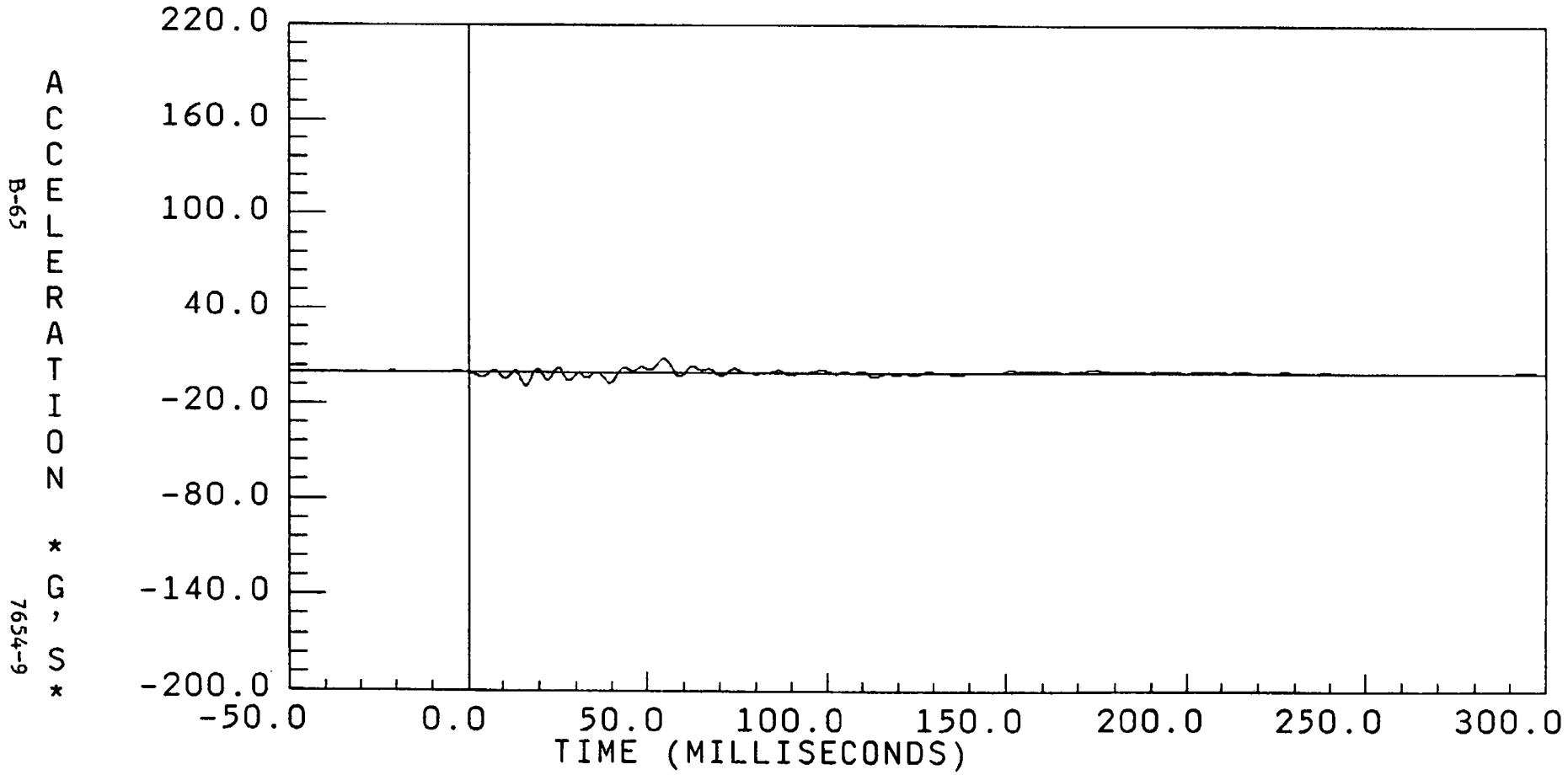
7654-9

BW862-37.DAT

0.00 mph

RIGHT REAR COMPARTMENT X
FILTERED
FILTER CUTOFF: 100Hz

X AXIS
YMIN =-8.815734 at 16.12500
YMAX = 8.585289 at 54.60000

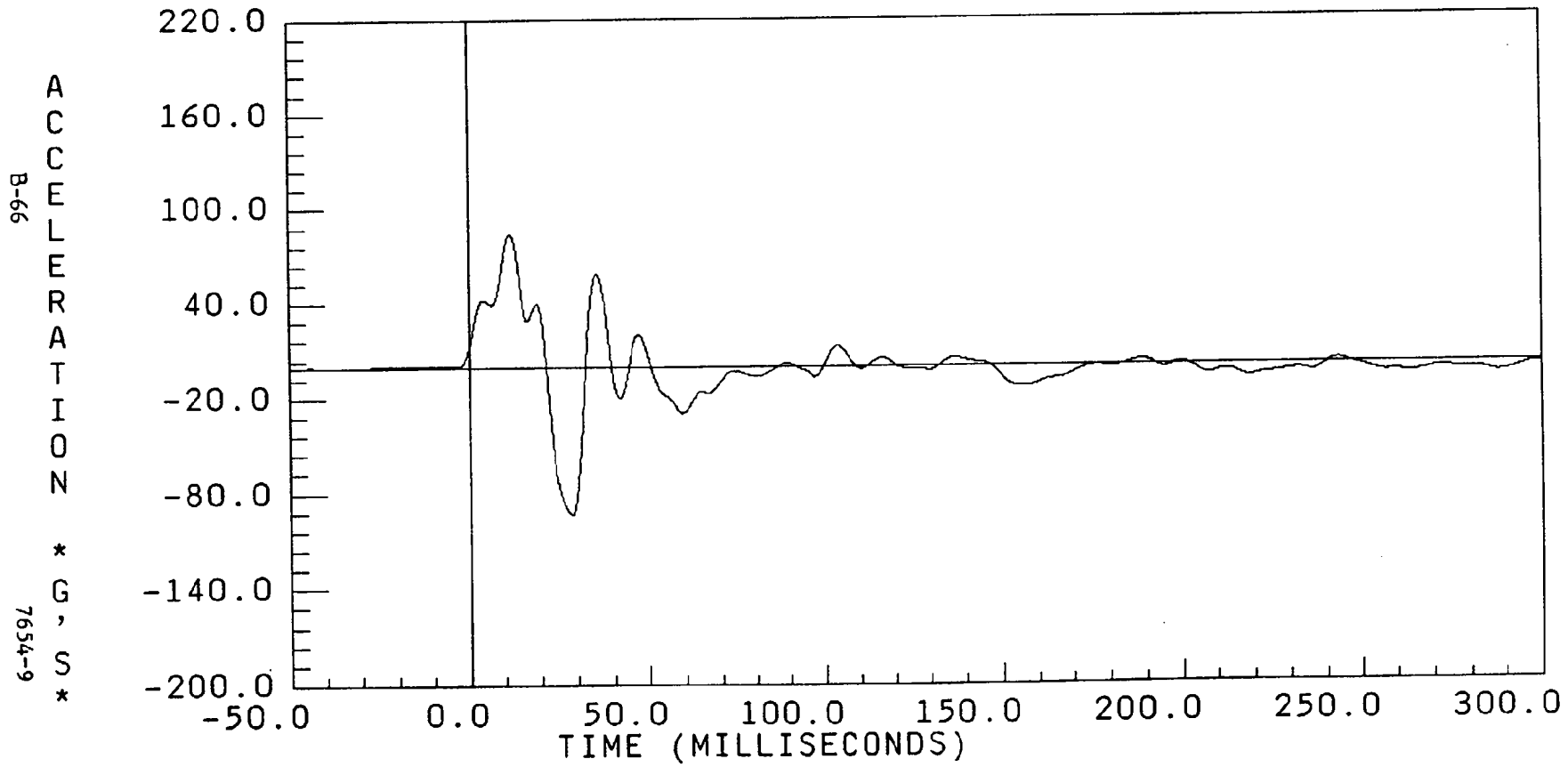


BW862-38.DAT

0.00 mph

LEFT FRONT DOOR MID Y
FILTERED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-93.38689 at 28.57500
YMAX = 84.34393 at 11.62500

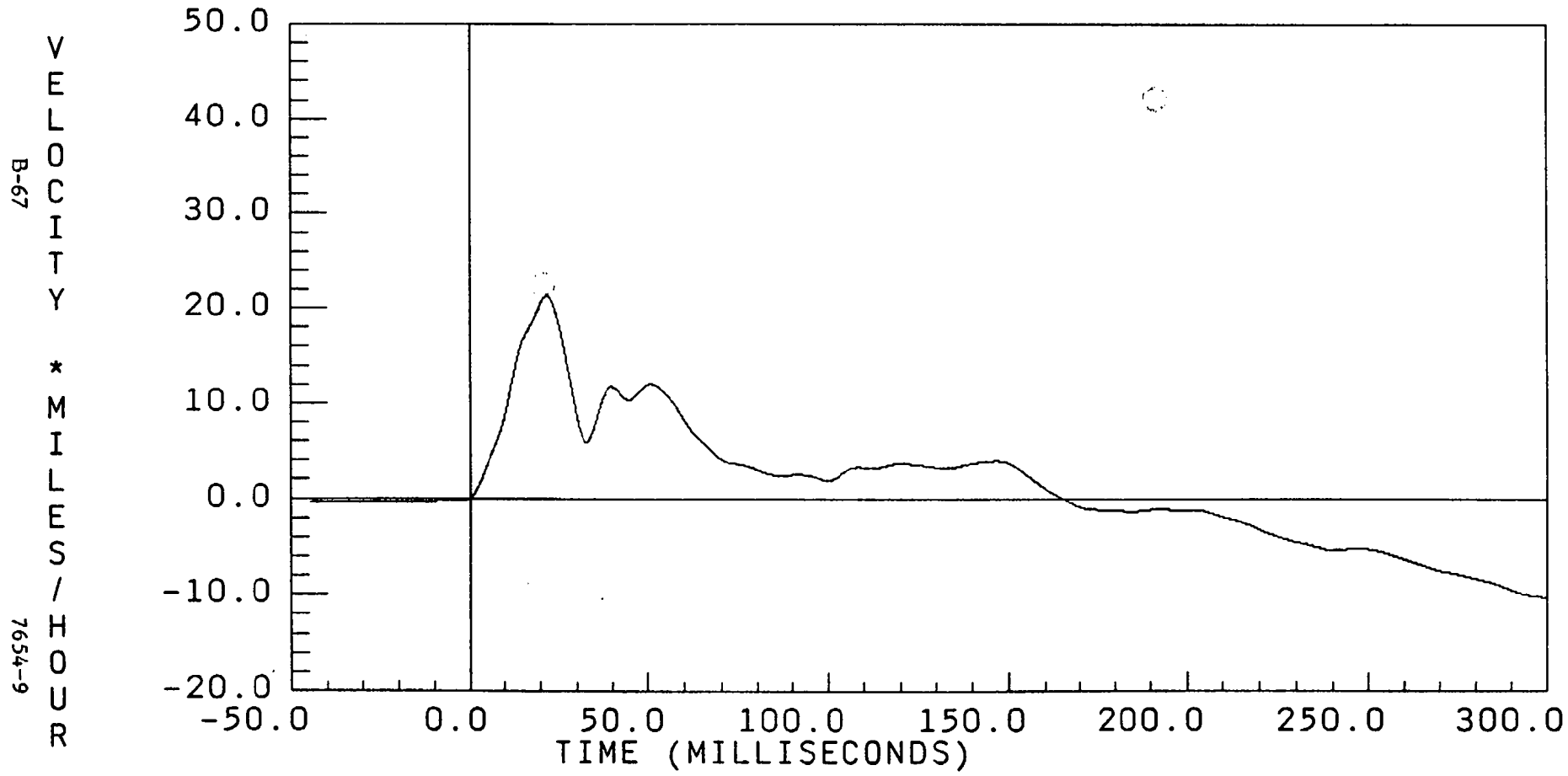


V862-38.DAT

0.00 mph

LEFT FRONT DOOR MID Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-10.23856 at 300.0000
YMAX = 21.29076 at 21.67500



B-67

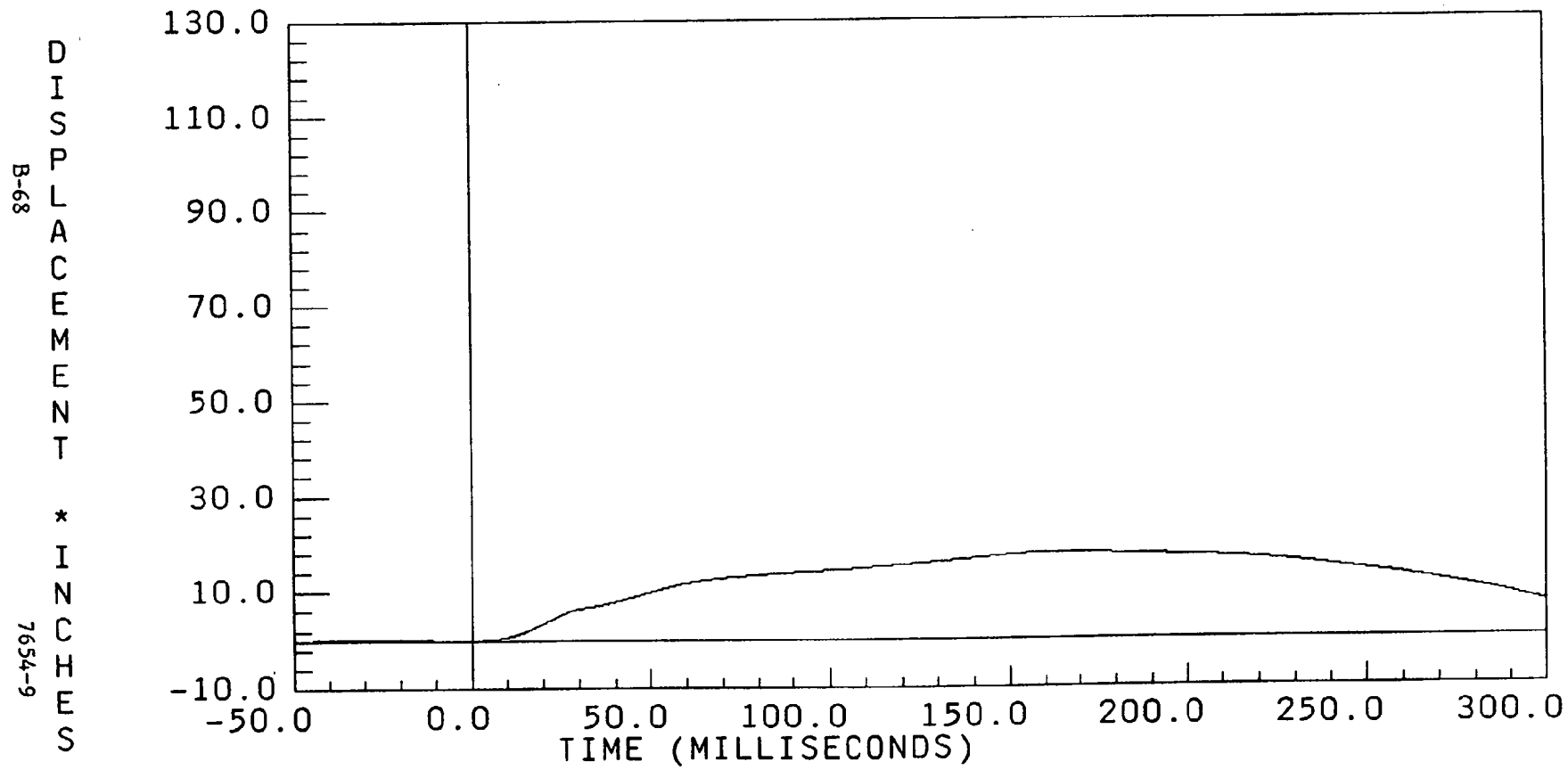
7654-9

D862-38.DAT

0.00 mph

LEFT FRONT DOOR MID Y
COMPUTED
FILTER CUTOFF: 100Hz

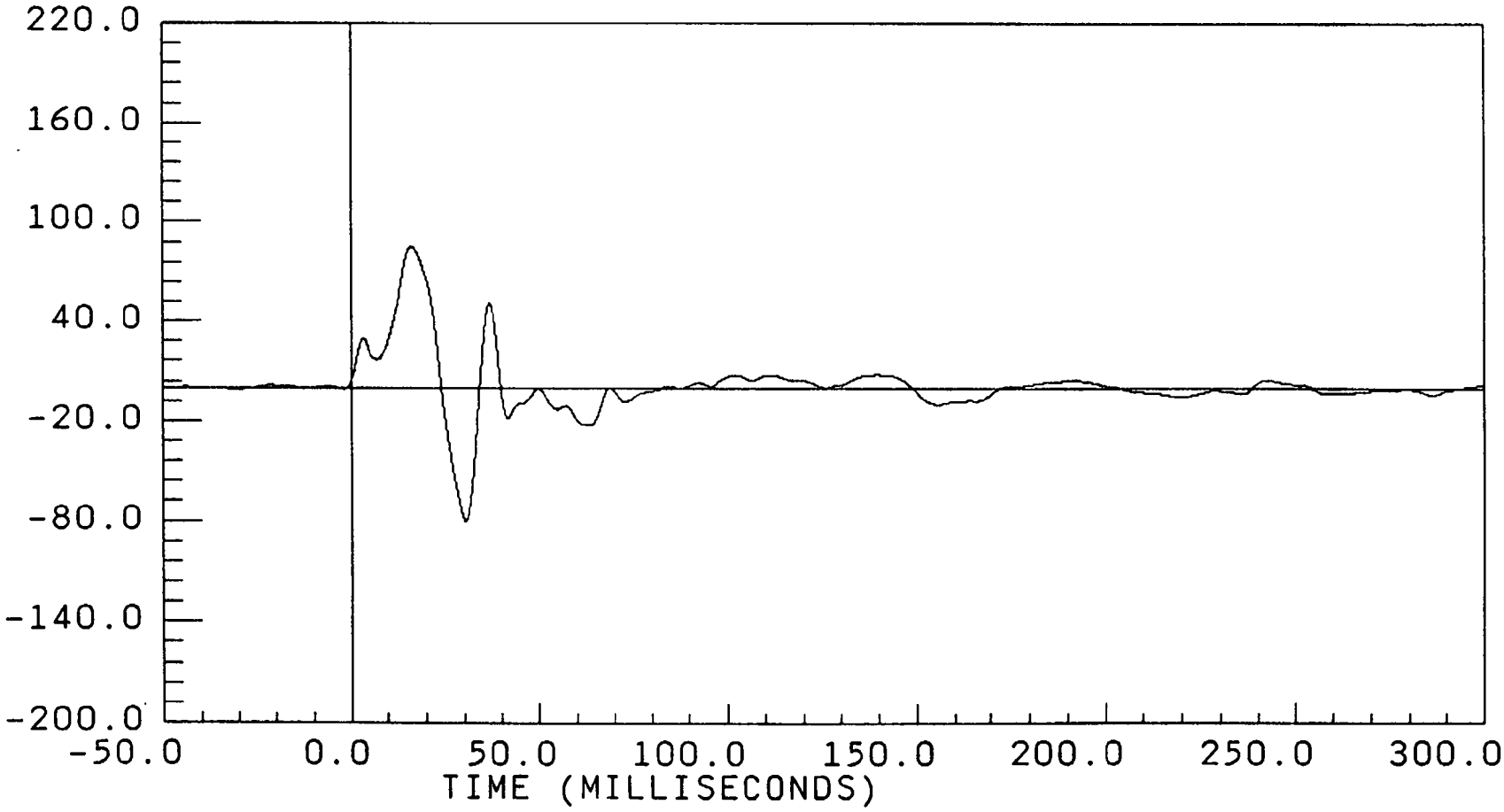
Y AXIS
YMIN = 0.000000 at 0.000000
YMAX = 17.71821 at 164.8500



BW862-39.DAT

0.00 mph

LEFT UPPER FRT. DOOR CL Y Y AXIS
FILTERED YMIN =-80.20759 at 30.30000
FILTER CUTOFF: 100Hz YMAX = 85.11421 at 16.05000

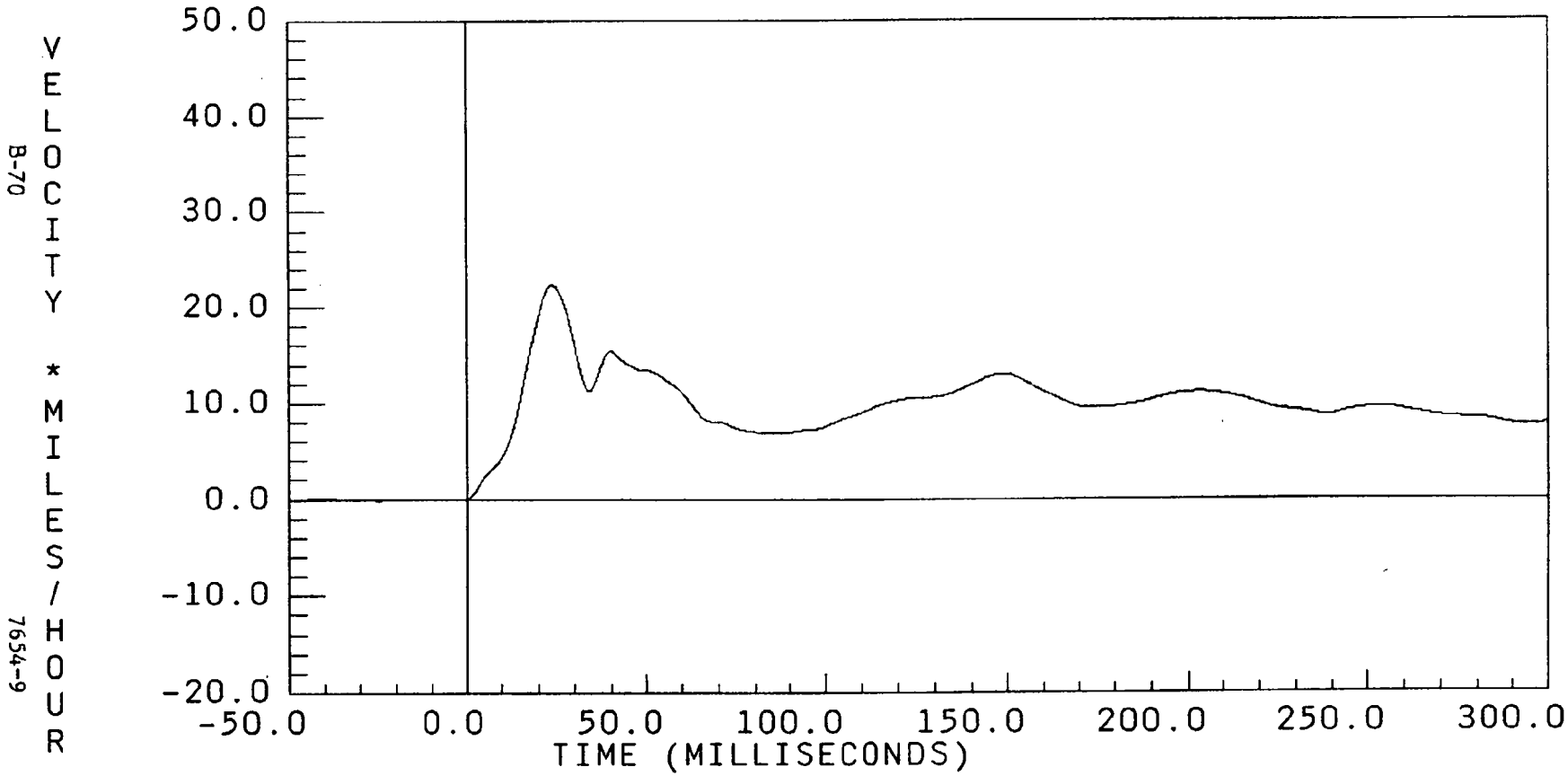


V862-39.DAT

0.00 mph

LEFT UPPER FRT. DOOR CL Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =0.0122601 at -25.27500
YMAX = 22.30238 at 23.92500



B-70

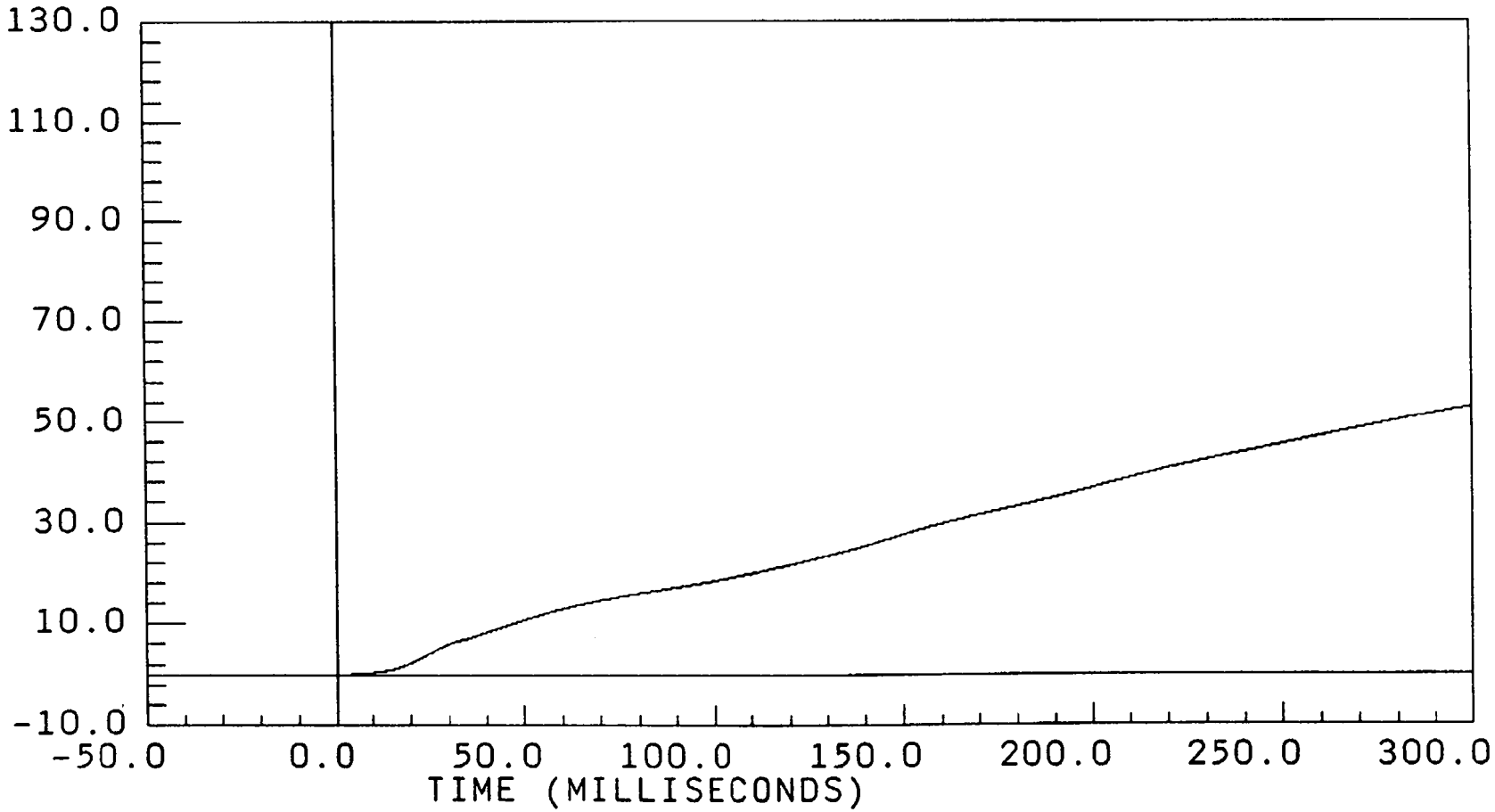
7654-9

D862-39.DAT

0.00 mph

LEFT UPPER FRT. DOOR CL Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN = 0.000000 at 0.000000
YMAX = 52.79407 at 300.0000



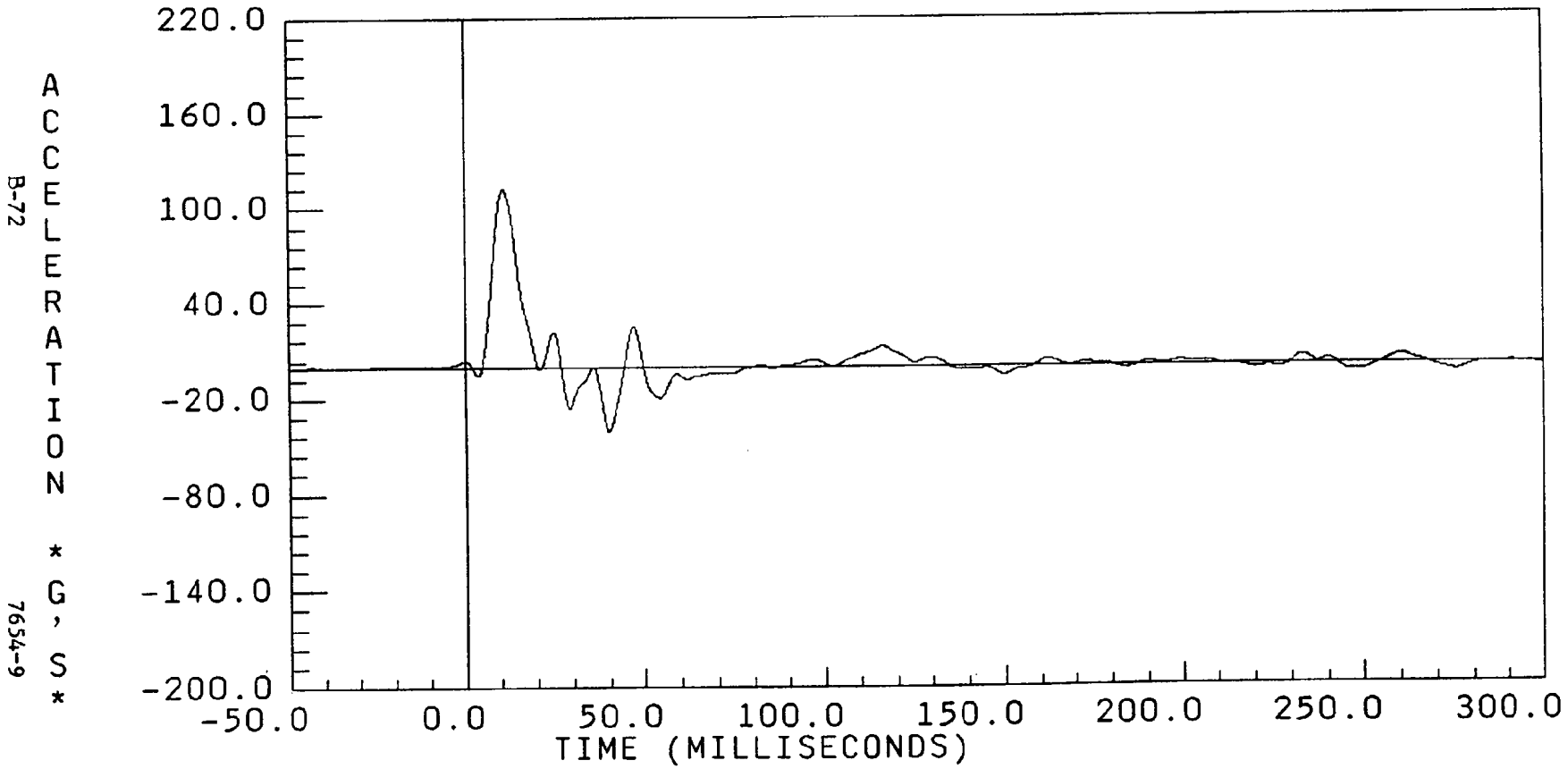
7654-9

BW862-40.DAT

0.00 mph

MID LEFT REAR DOOR Y
FILTERED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-40.59639 at 40.05000
YMAX = 112.3455 at 10.72500

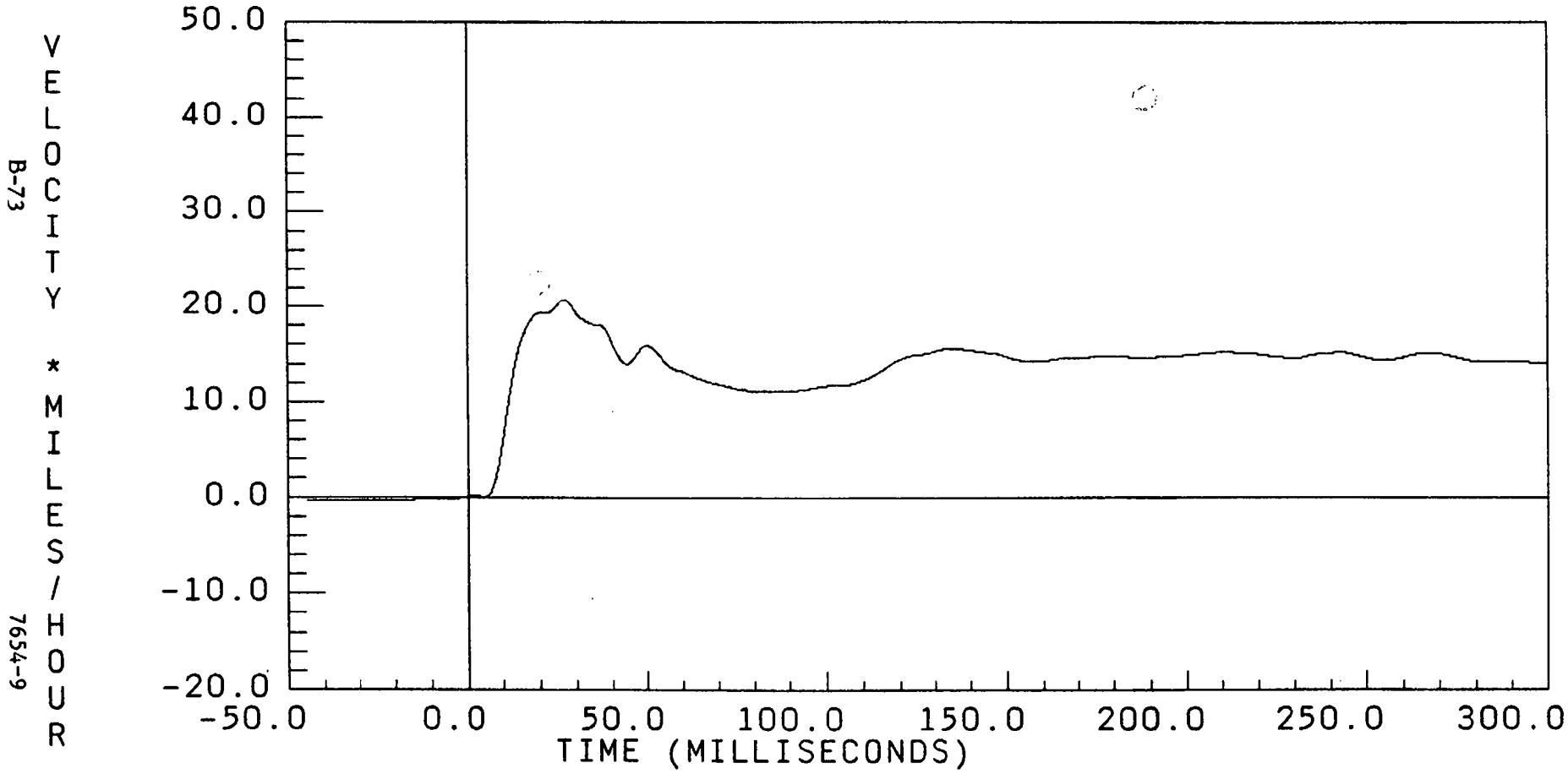


V862-40.DAT

0.00 mph

MID LEFT REAR DOOR Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-0.440164 at -27.22500
YMAX = 20.75495 at 26.77500



B-73

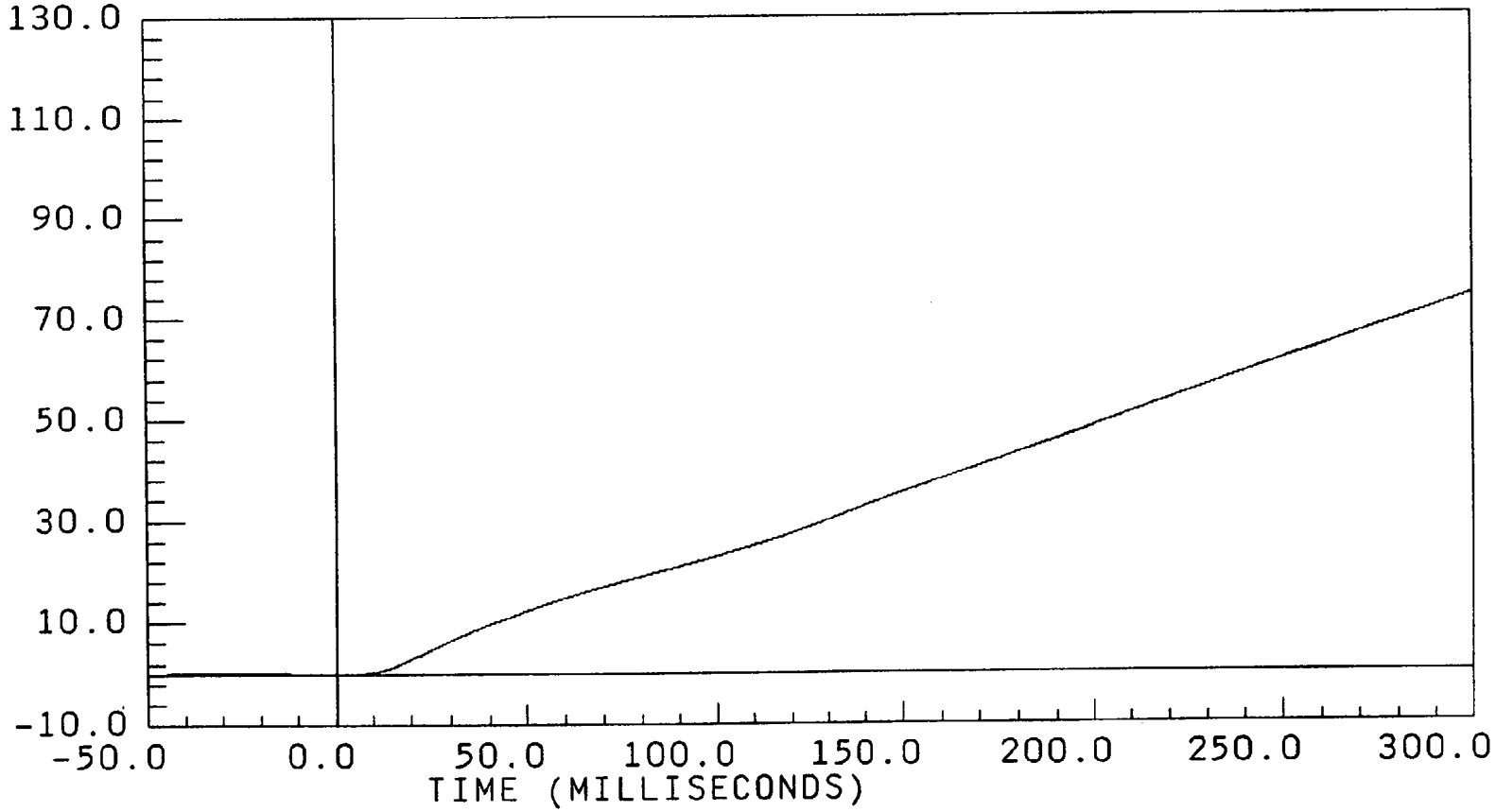
7654-9

D862-40.DAT

0.00 mph

MID LEFT REAR DOOR Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN = 0.000000 at 0.000000
YMAX = 74.06377 at 300.0000



B-74

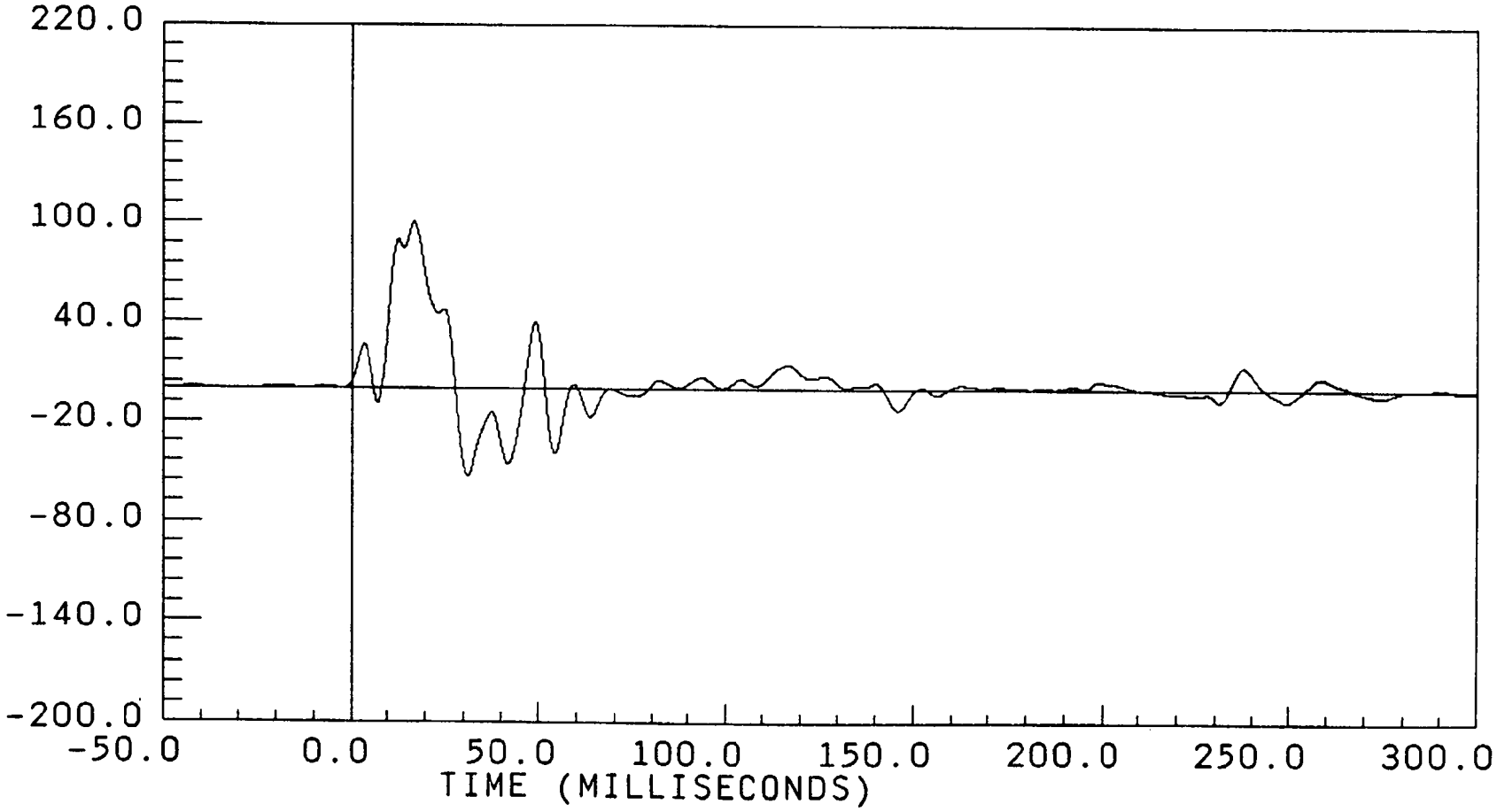
7654-9

BW862-41.DAT

0.00 mph

UPPER LEFT REAR DOOR Y
FILTERED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-53.36856 at 31.27500
YMAX = 100.0348 at 17.02500

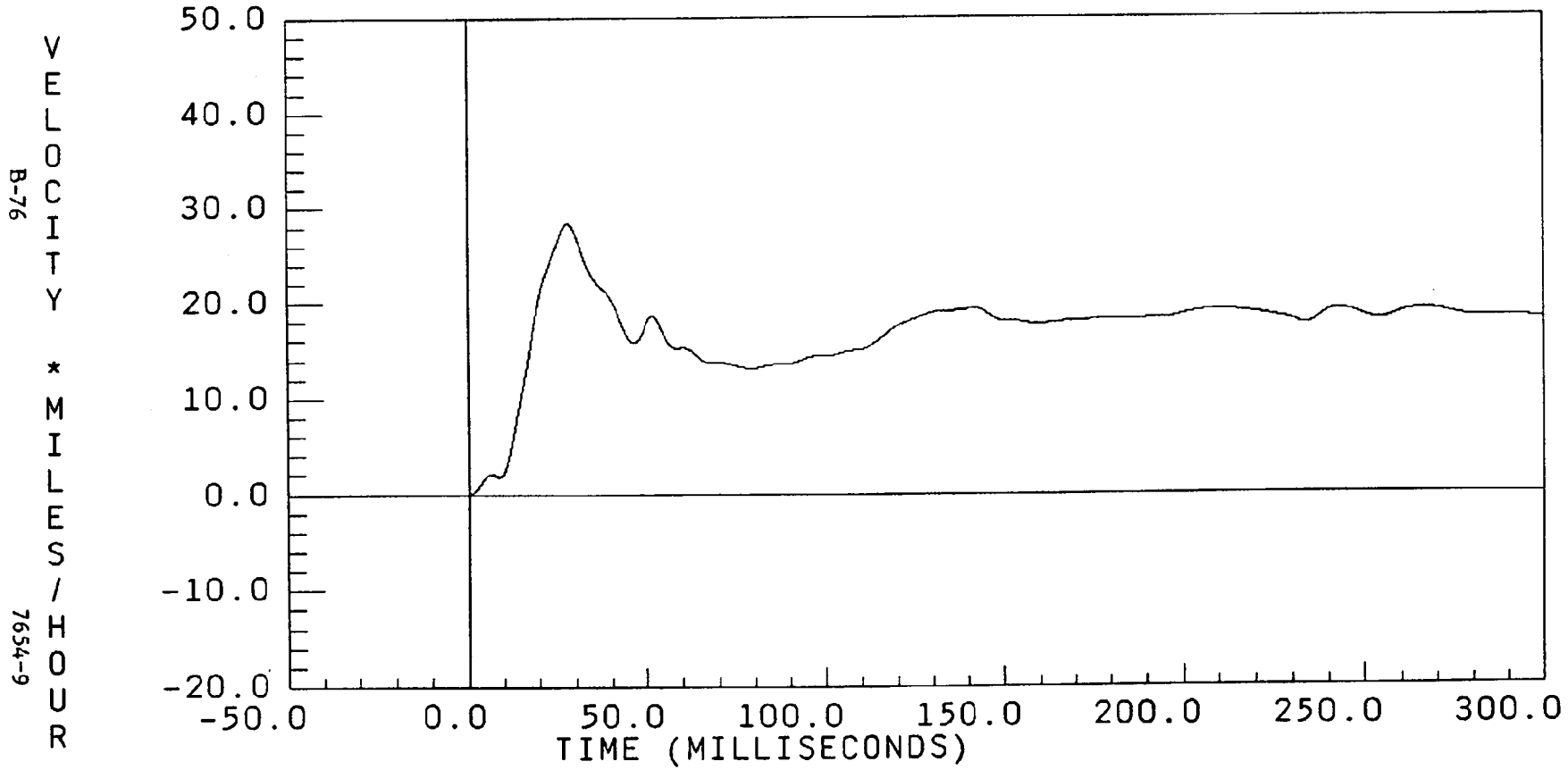


V862-41.DAT

0.00 mph

UPPER LEFT REAR DOOR Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-.0808973 at -24.30000
YMAX = 28.40295 at 27.90000

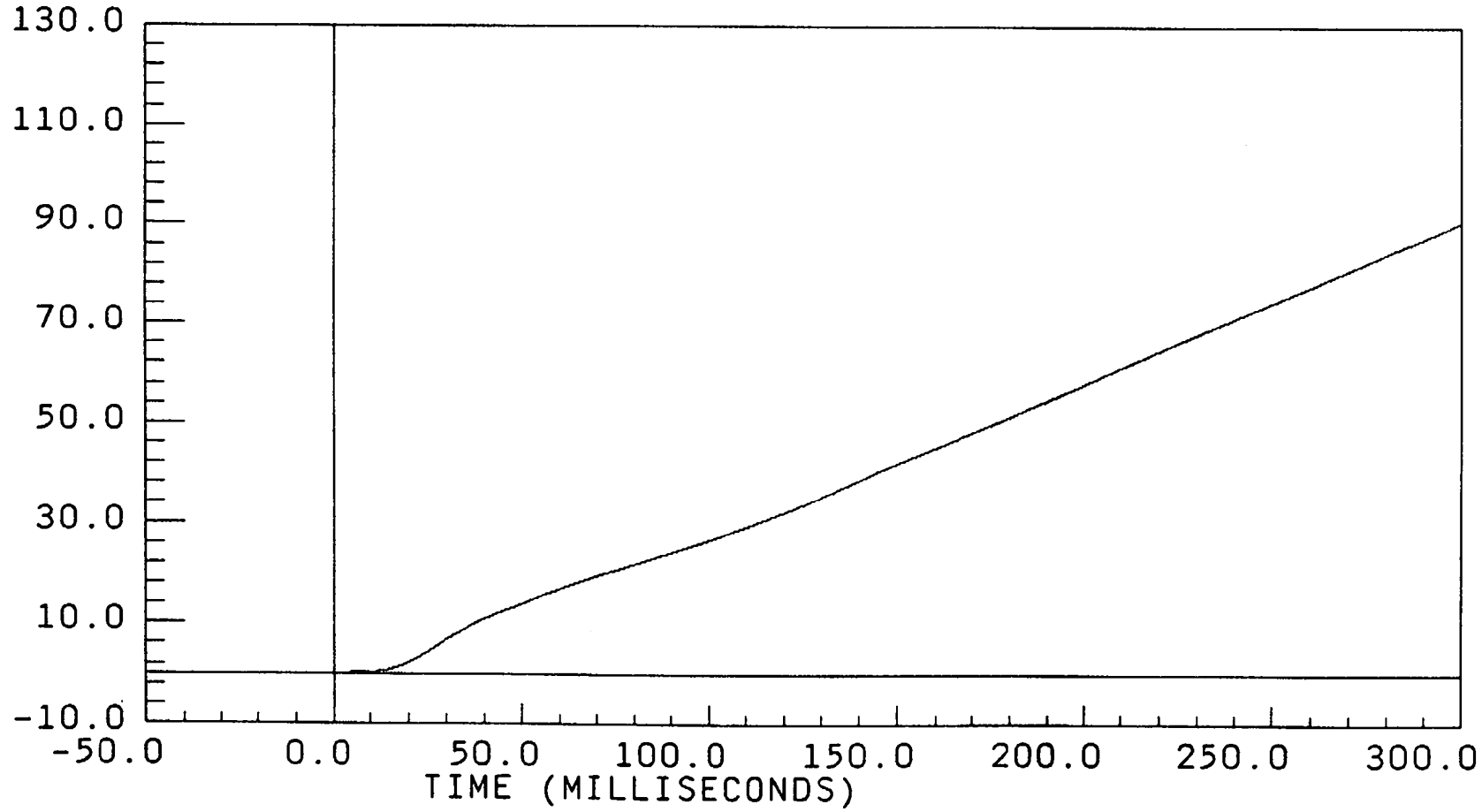


D862-41.DAT

0.00 mph

UPPER LEFT REAR DOOR Y
COMPUTED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN = 0.000000 at 0.000000
YMAX = 90.64516 at 300.0000



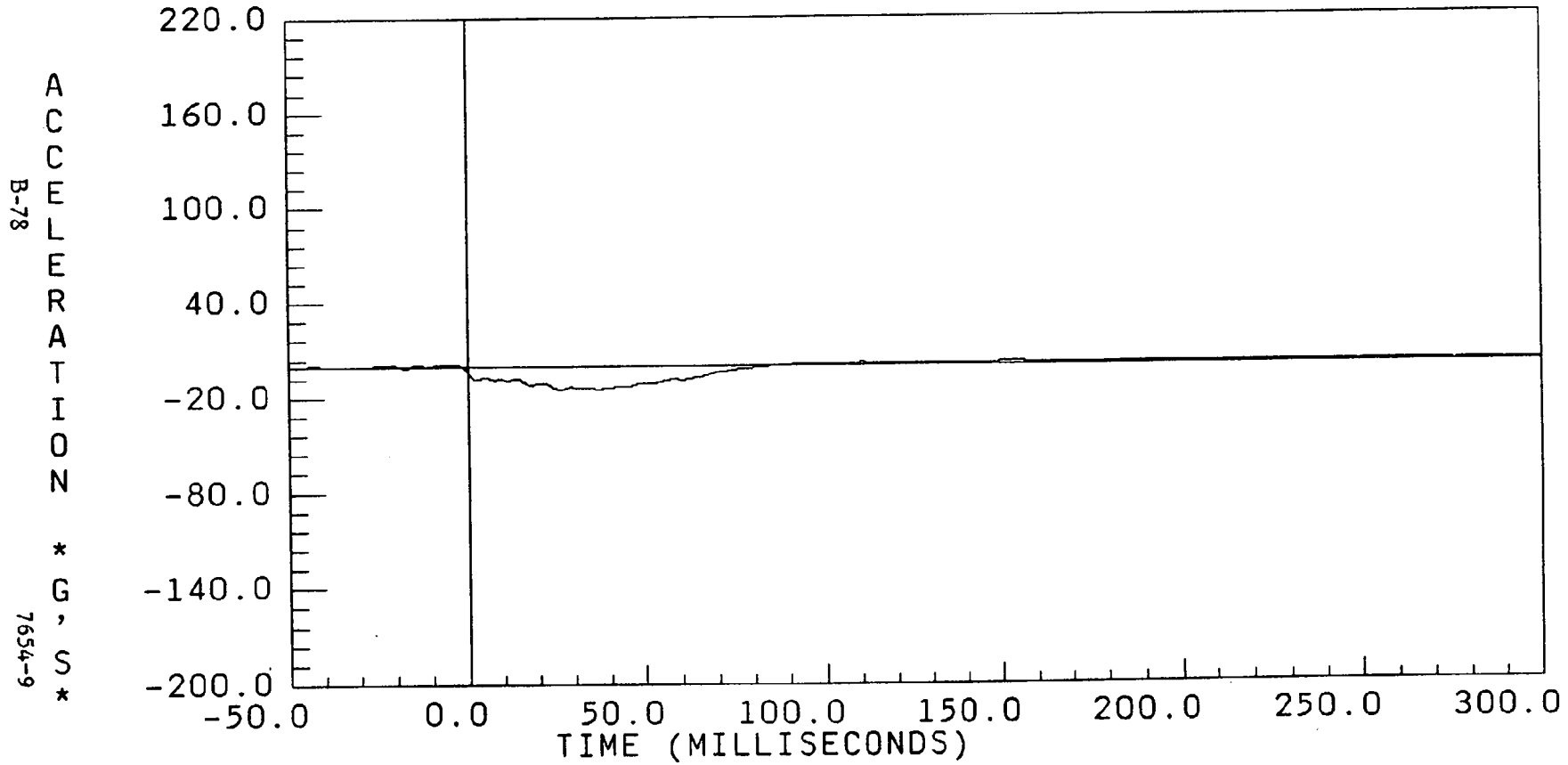
7654-9

BW862-42.DAT

33.40 mph

BARRIER CG X
FILTERED
FILTER CUTOFF: 100Hz

X AXIS
YMIN =-14.95843 at 26.32500
YMAX = 1.396681 at 151.5750

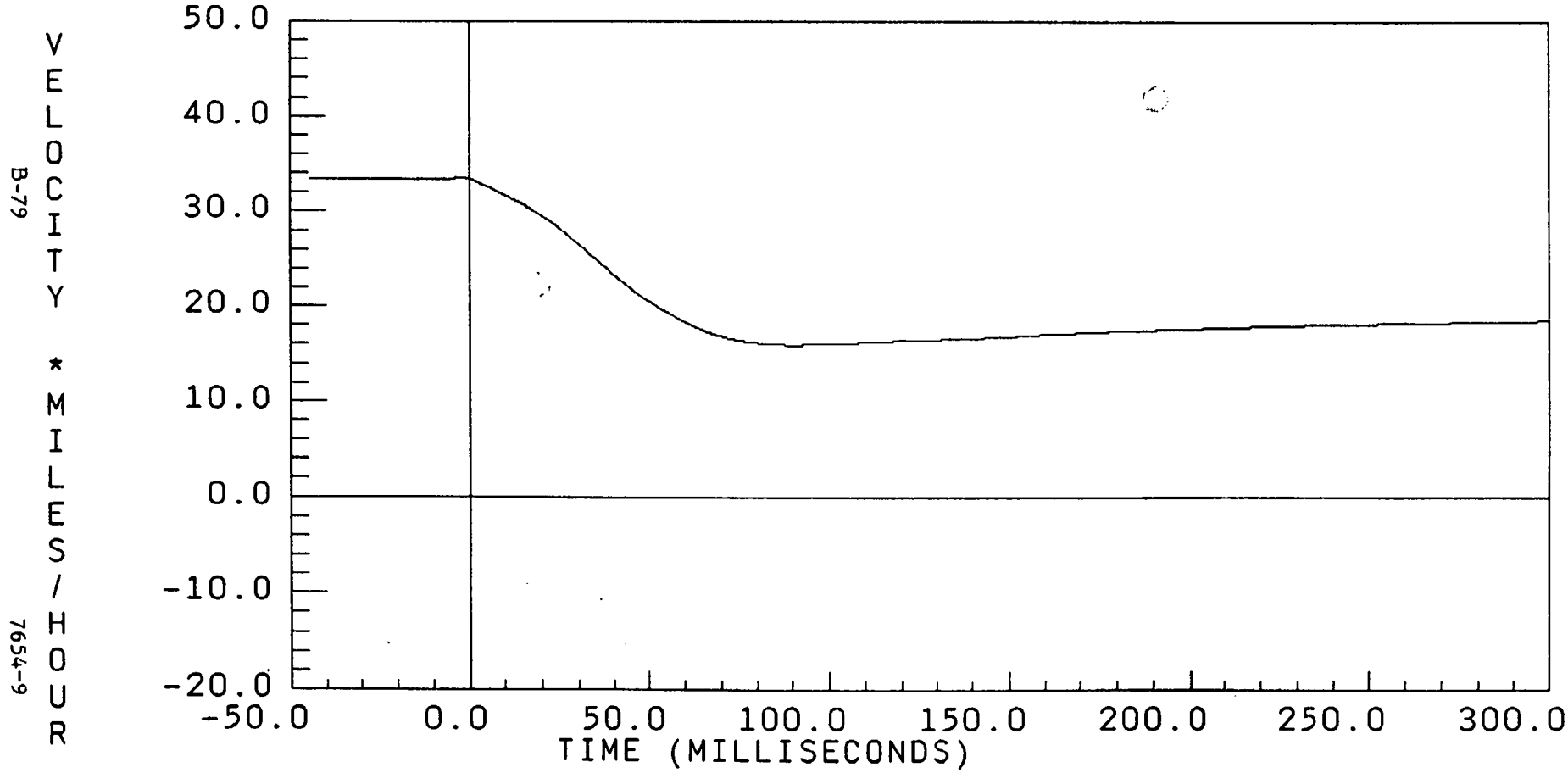


V862-42.DAT

33.40 mph

BARRIER CG X
COMPUTED
FILTER CUTOFF: 100Hz

X AXIS
YMIN = 15.97739 at 89.85001
YMAX = 33.40987 at -1.875000



B-79

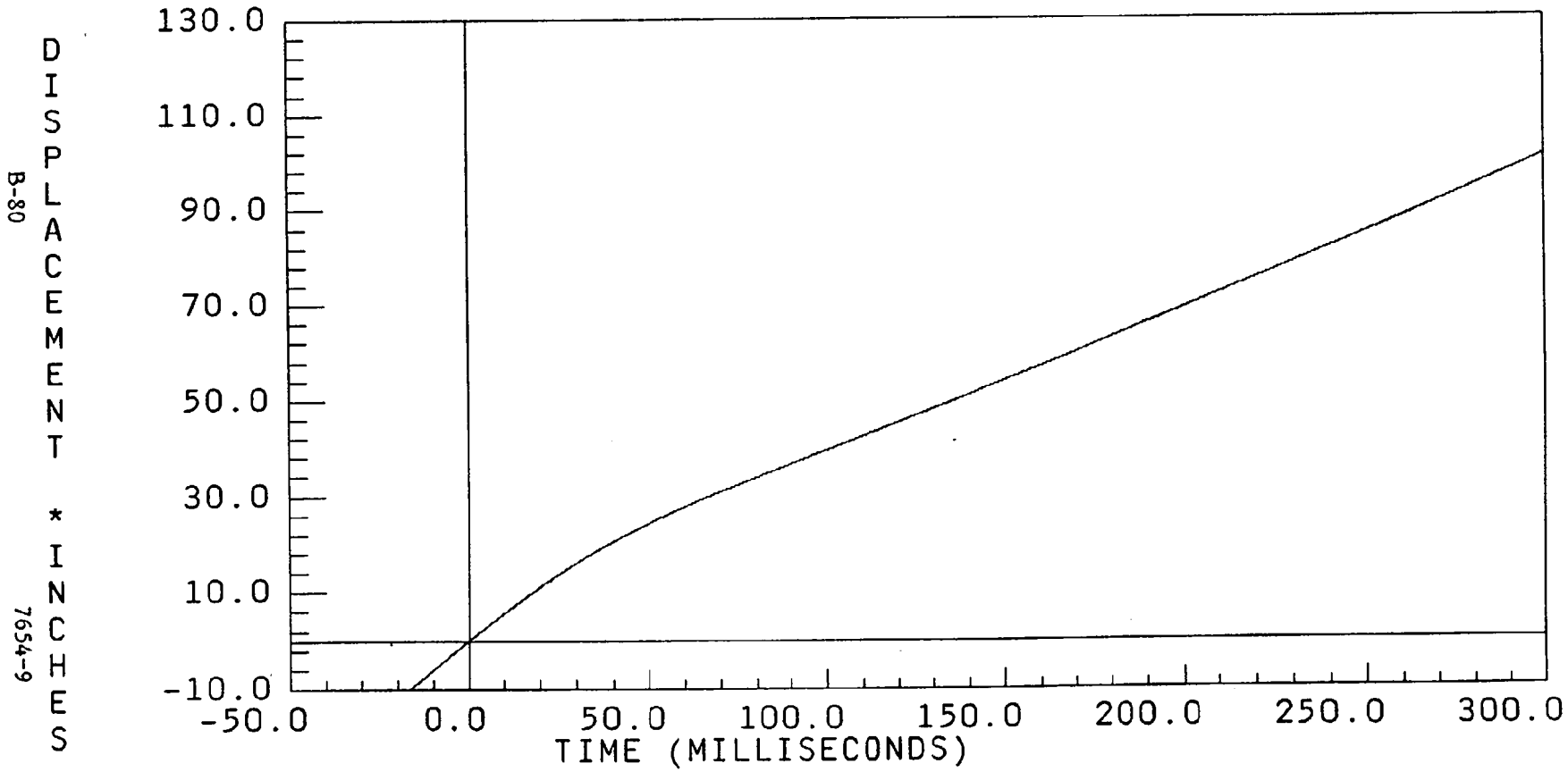
7654-9

D862-42.DAT

33.40 mph

BARRIER CG X
COMPUTED
FILTER CUTOFF: 100Hz

X AXIS
YMIN =-26.41750 at 89.85001
YMAX = 100.7767 at 300.0000

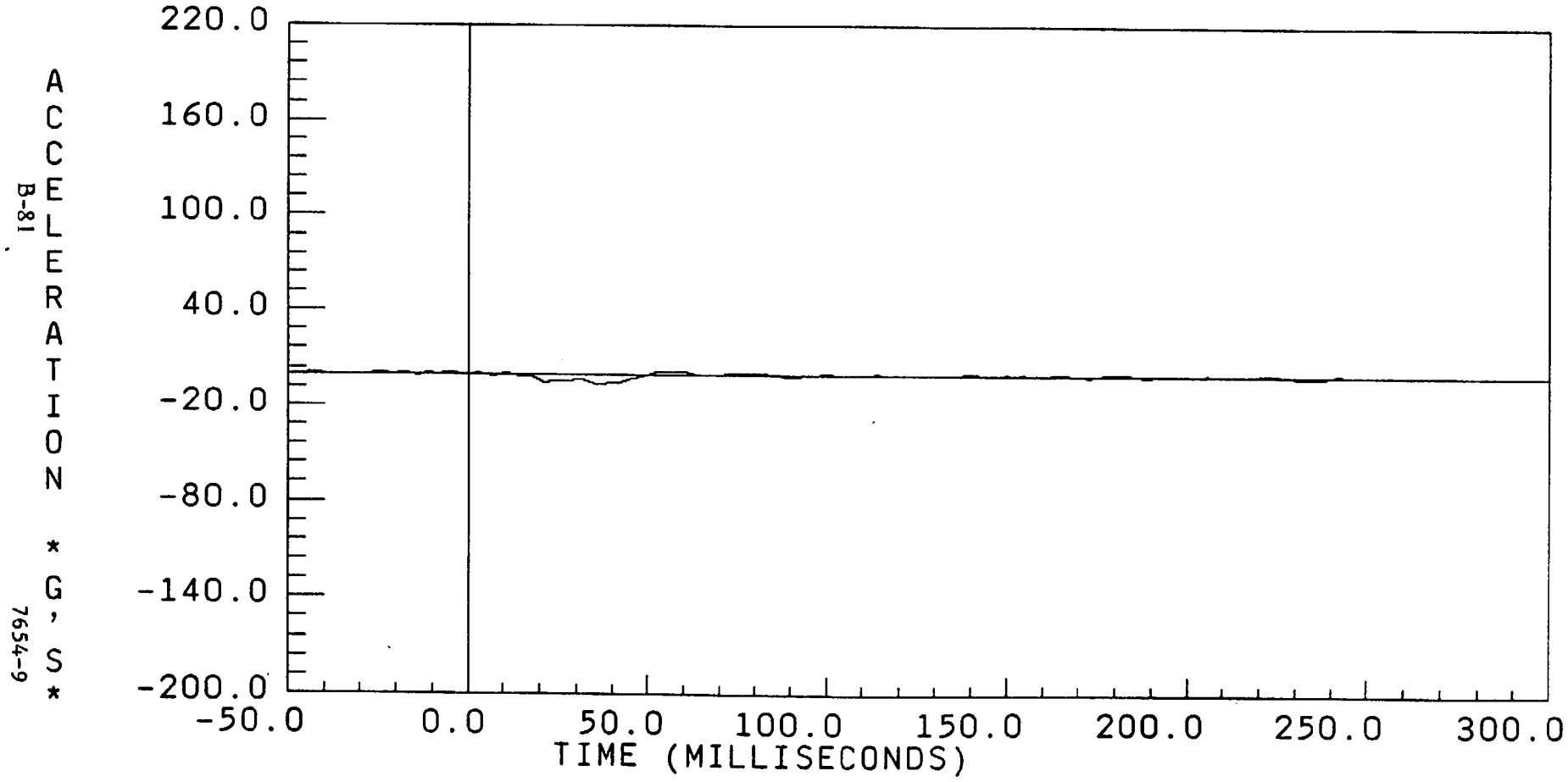


BW862-43.DAT

0.00 mph

BARRIER CG Y
FILTERED
FILTER CUTOFF: 100Hz

Y AXIS
YMIN =-6.514937 at 36.75000
YMAX = 1.764999 at 53.92500



B-81

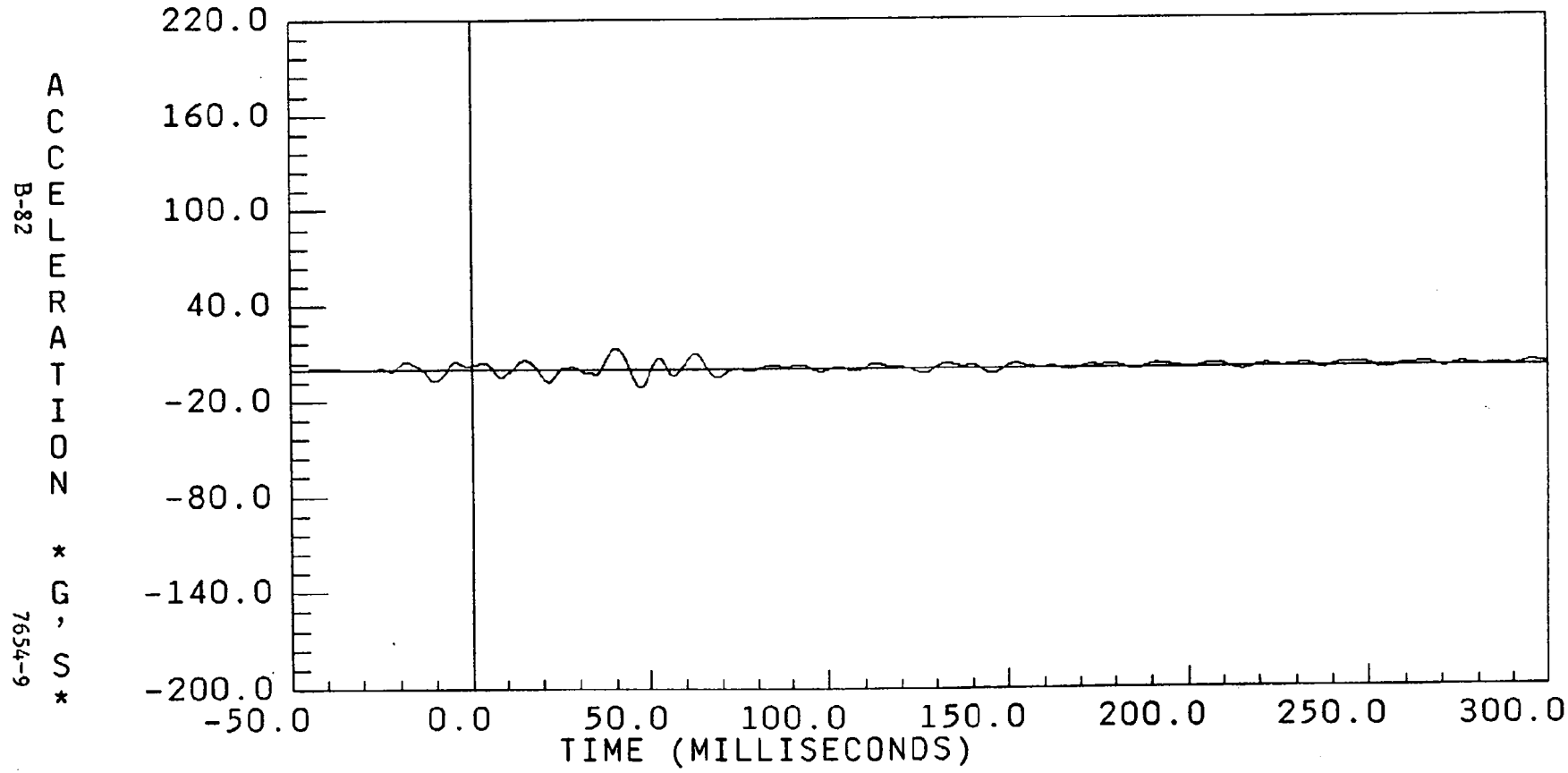
7654-9

BW862-44.DAT

0.00 mph

BARRIER CG Z
FILTERED
FILTER CUTOFF: 100Hz

Z AXIS
YMIN =-11.56075 at 47.17500
YMAX = 12.68847 at 40.20000

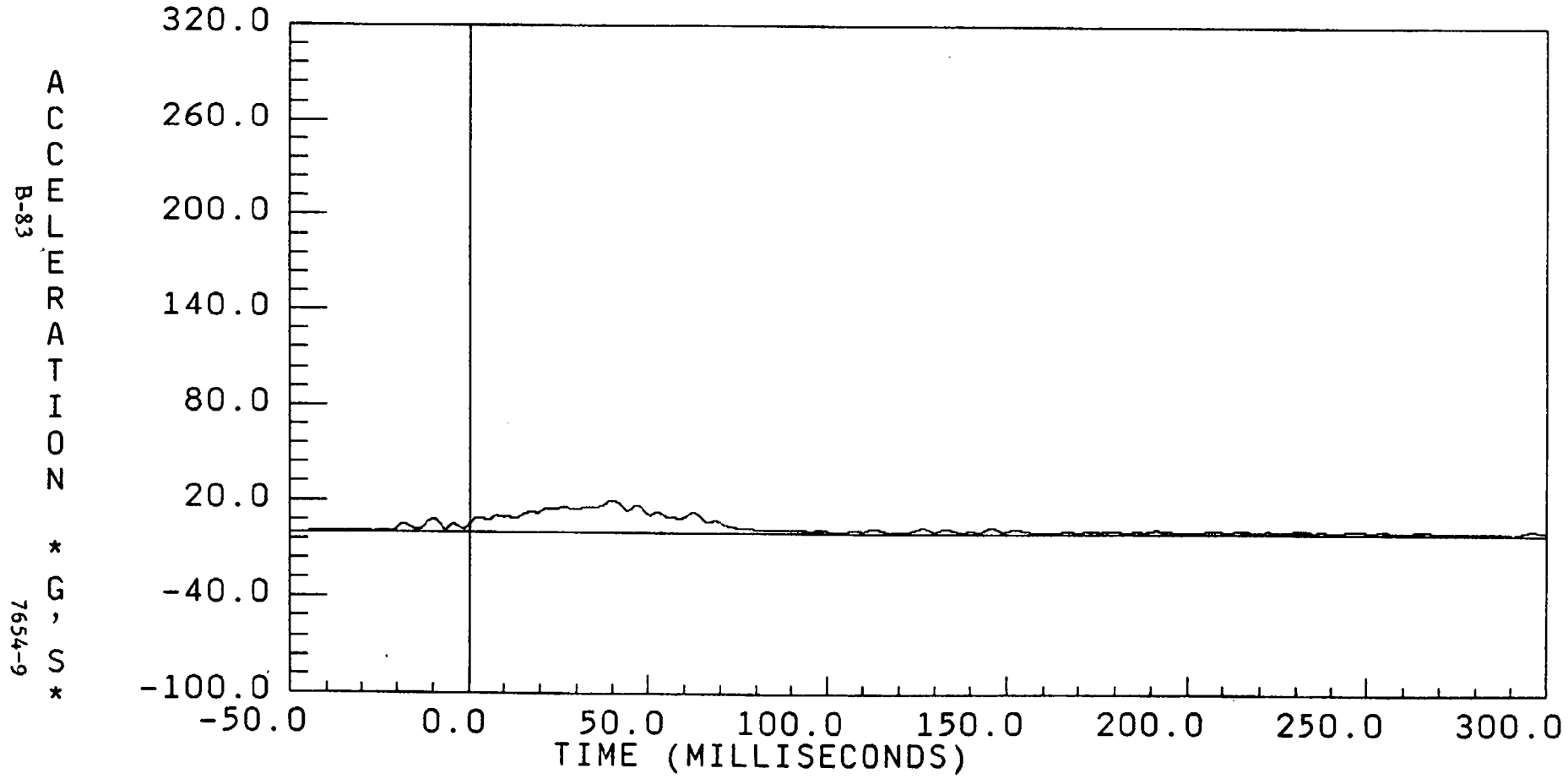


RS862-42.DAT

0.00 mph

BARRIER CG
COMPUTED
FILTER CUTOFF: 100Hz

RS AXIS
YMIN = 0.359303 at -26.55000
YMAX = 19.76962 at 40.05000

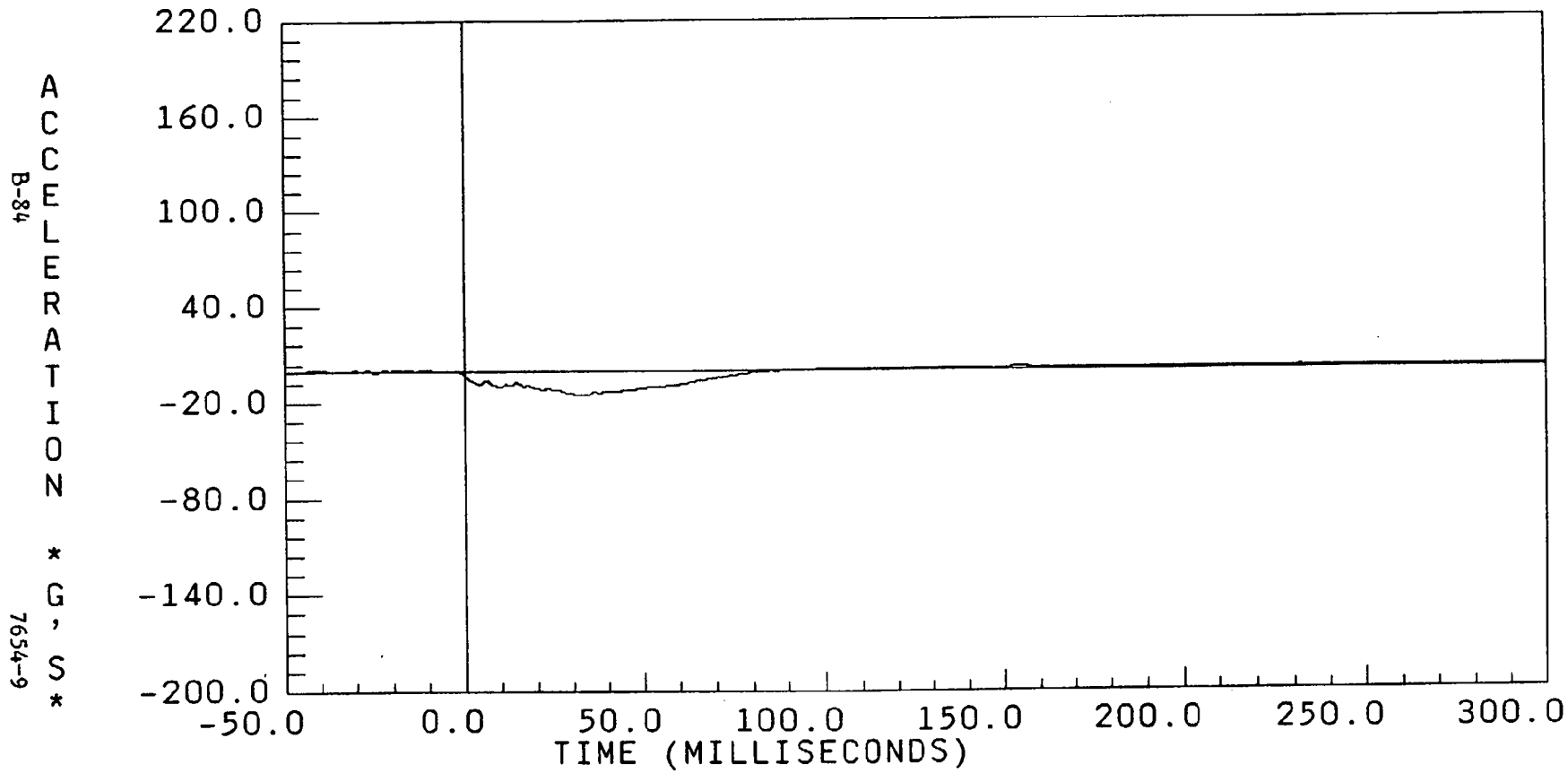


BW862-45.DAT

33.40 mph

BARRIER FRONT FRAME CL X
FILTERED
FILTER CUTOFF: 100Hz

X AXIS
YMIN =-15.41992 at 34.05000
YMAX = 1.300163 at 154.1250

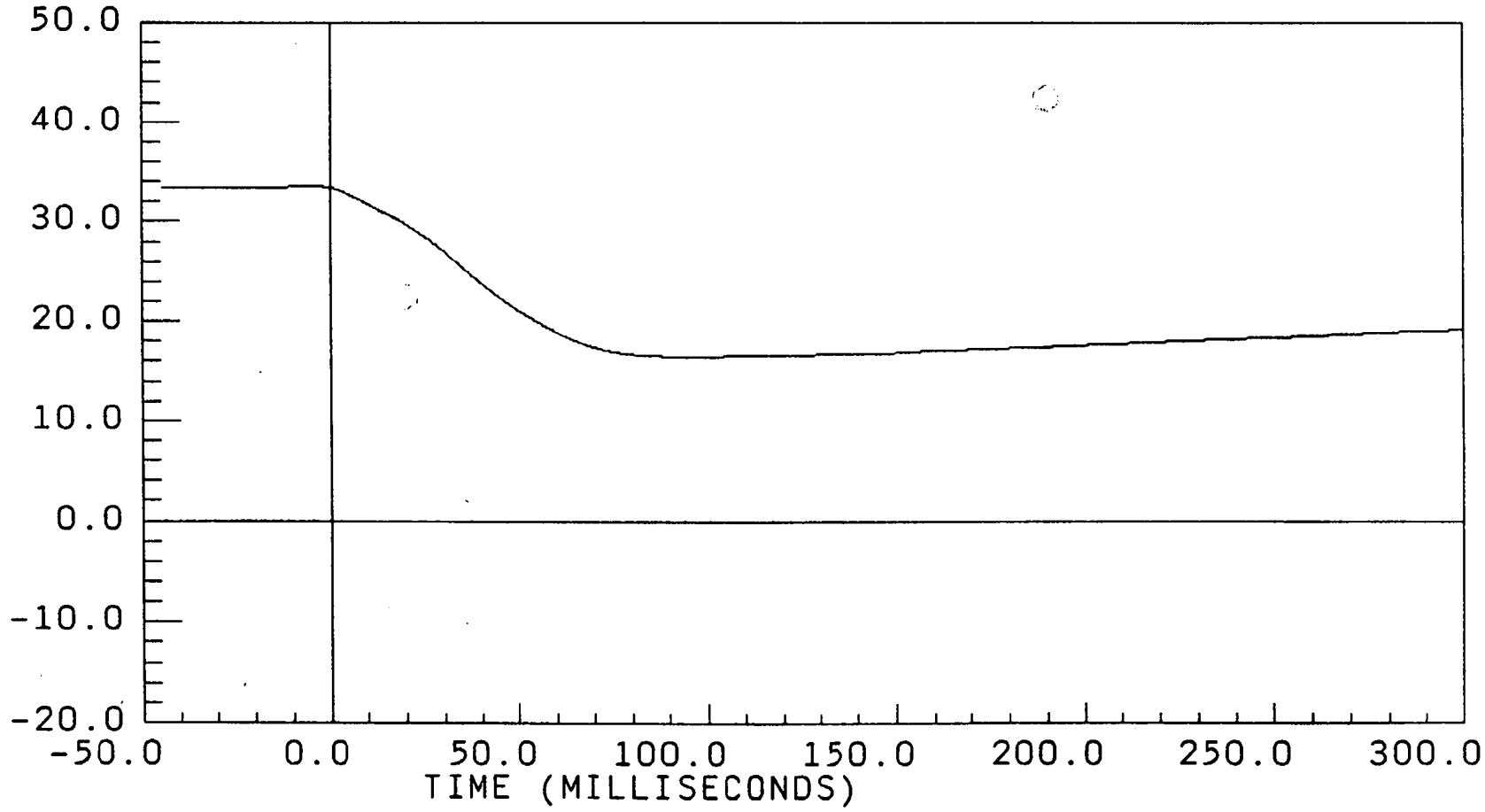


V862-45.DAT

33.40 mph

BARRIER FRONT FRAME CL X
COMPUTED
FILTER CUTOFF: 100Hz

X AXIS
YMIN = 16.42411 at 96.22501
YMAX = 33.41574 at -8.775001

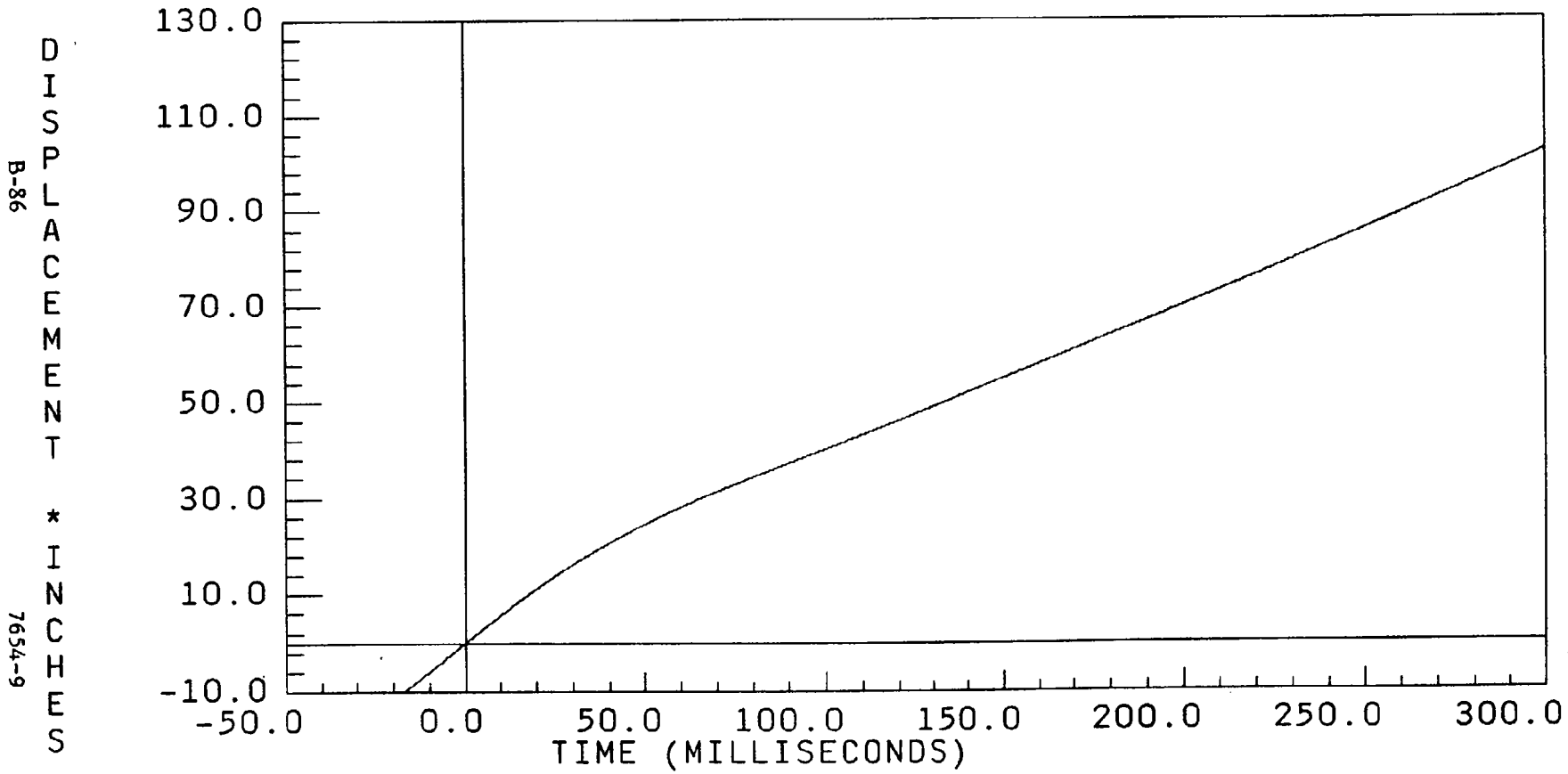


D862-45.DAT

33.40 mph

BARRIER FRONT FRAME CL X
COMPUTED
FILTER CUTOFF: 100Hz

X AXIS
YMIN =-26.43230 at 96.22501
YMAX = 102.2566 at 300.0000

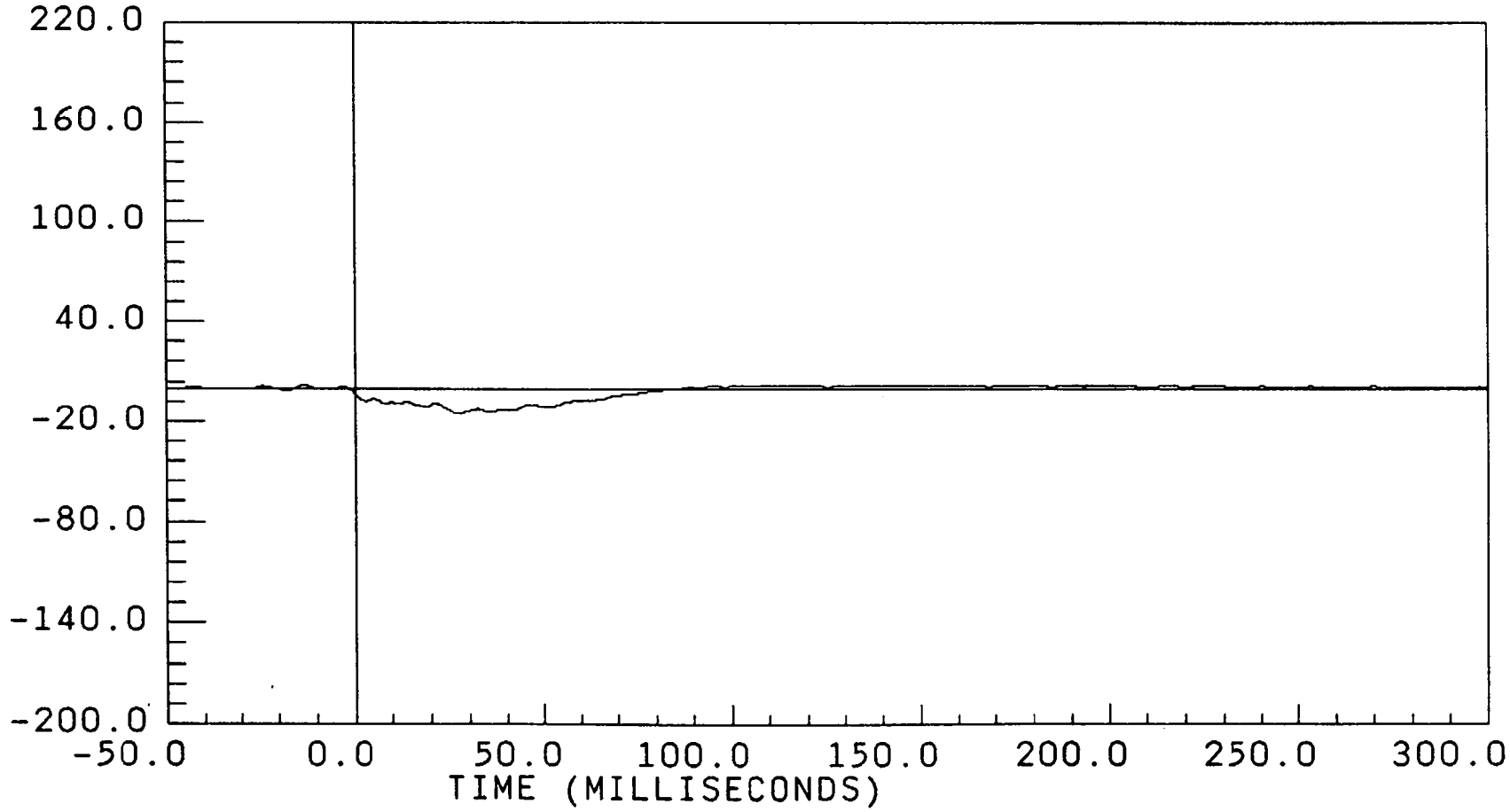


BW862-46.DAT

33.40 mph

BARRIER REAR FRAME CL X
FILTERED
FILTER CUTOFF: 100Hz

X AXIS
YMIN =-15.29842 at 27.00000
YMAX = 2.070436 at 159.0750

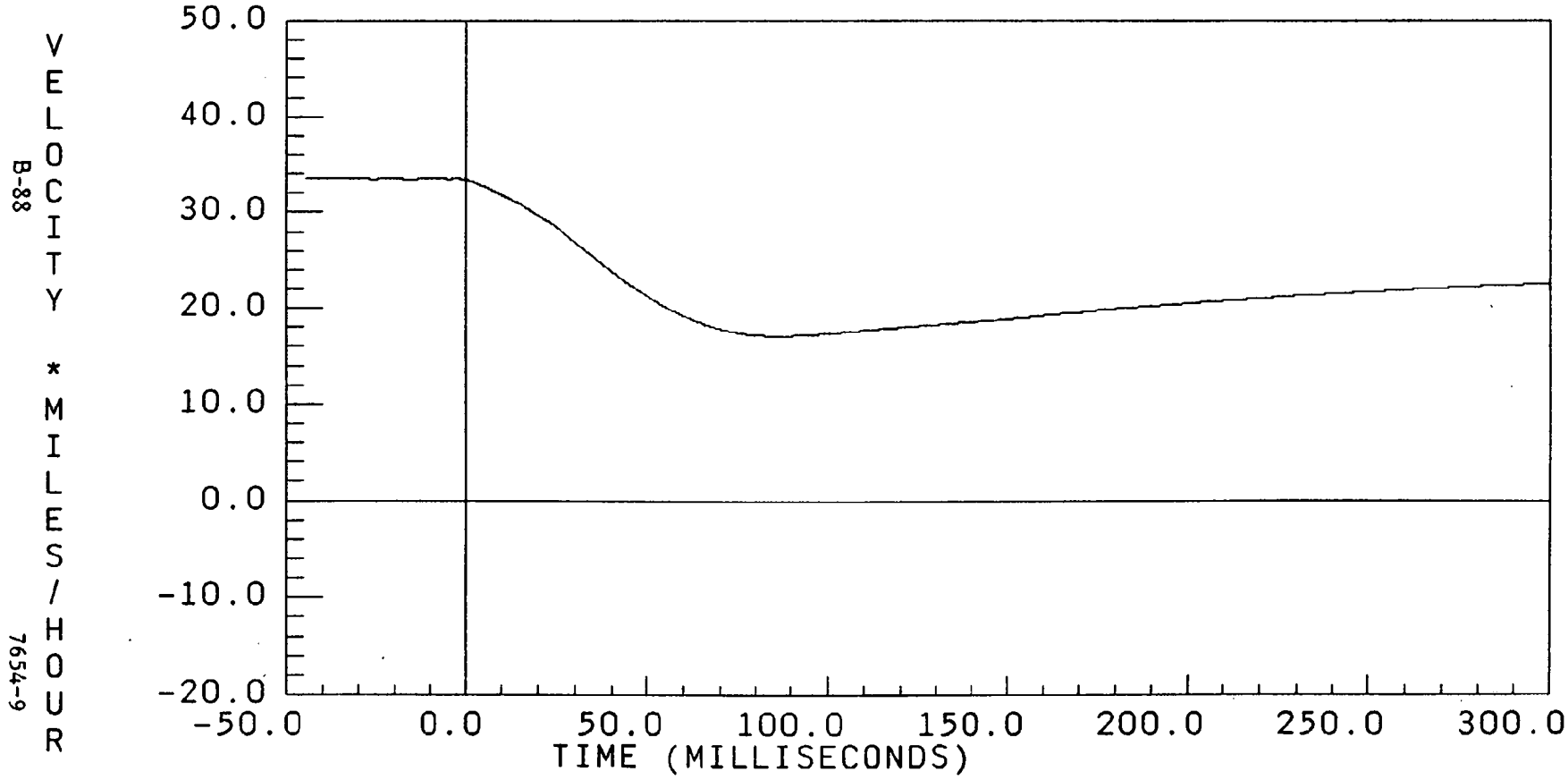


V862-46.DAT

33.40 mph

BARRIER REAR FRAME CL X
COMPUTED
FILTER CUTOFF: 100Hz

X AXIS
YMIN = 17.11378 at 86.55000
YMAX = 33.49844 at -36.75000



B-88

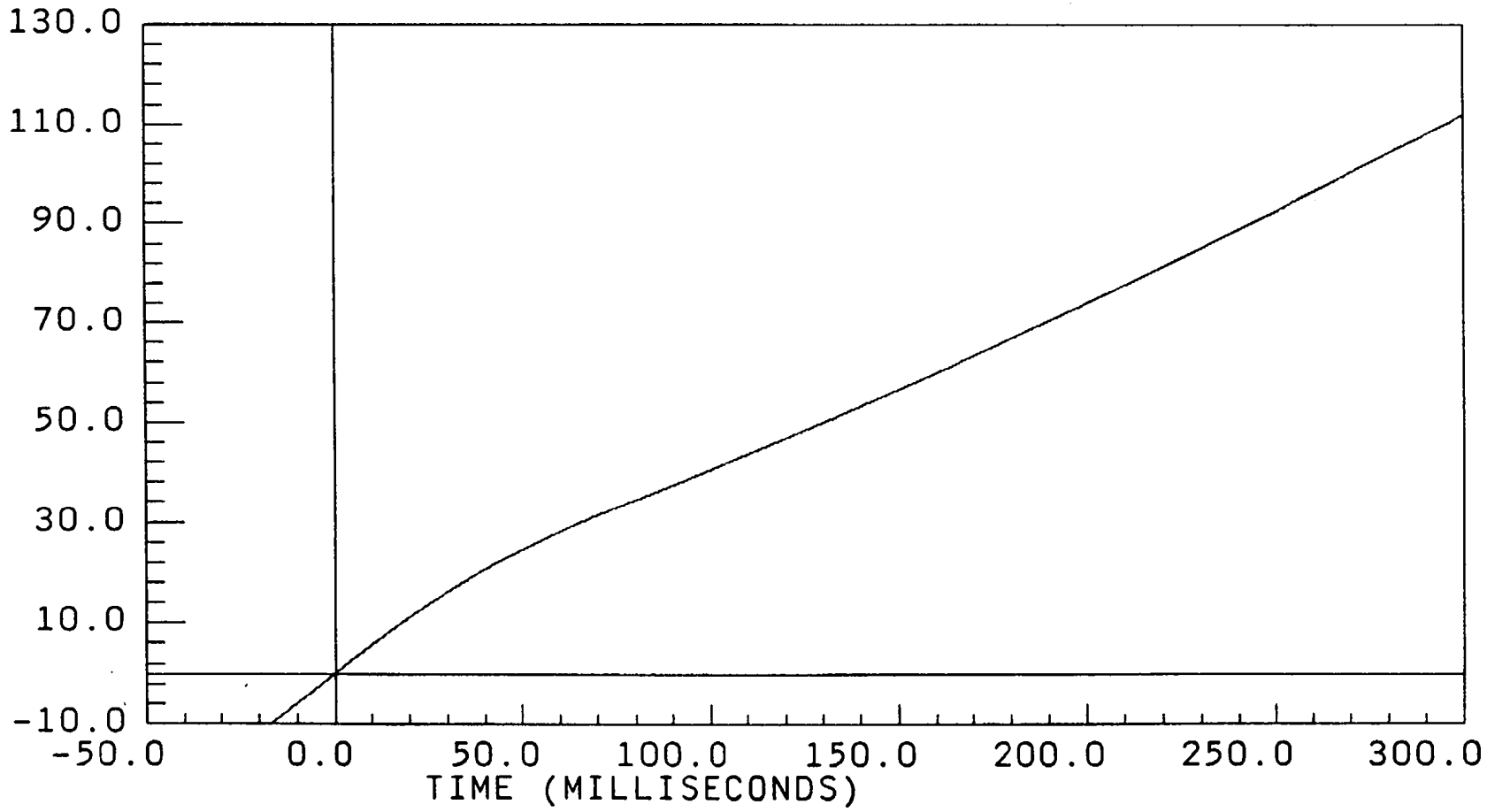
7654-9

D862-46.DAT

33.40 mph

BARRIER REAR FRAME CL X
COMPUTED
FILTER CUTOFF: 100Hz

X AXIS
YMIN =-26.47417 at 86.55000
YMAX = 111.8498 at 300.0000



APPENDIX C

SID CONFIGURATION & PERFORMANCE VERIFICATION DATA

SID PRE-TEST INSPECTION

Prior to each test, each SID is inspected to ensure the integrity of its components. The inspection includes observation of the head and neck areas for lacerations and/or reduction in stiffness. Inspection of the legs is performed to adjust joints to the specified torques and to identify any component failures. Inspection of the thorax is performed to verify the integrity of the SID outer jacket; location of "arm" foram; foam rib wrap assembly, rib anti-sag device; rib assembly; piston; and spine. The abdomen is inspected to identify any reduction in stiffness.

These inspections are performed prior to every test in addition to the veritification tests performed on the following pages at the selected intervals.

SIDE IMPACT DUMMY CALIBRATION

DUMMY SERIAL NUMBER 902

TEST/ DATE	CHANNEL	FILTER CLASS	PEAK ACCELERATION (g) SPECIFICATION	TEST RESULT
THORAX 11/7/88	LEFT UPPER RIB Y-AXIS	FIR	37-46	49.99
	LEFT LOWER RIB Y-AXIS	FIR	37-46	50.63
	LOWER SPINE Y-AXIS	FIR	15-22	24.26
PELVIS 11/8/88	PELVIS Y-AXIS	FIR	40-60	50.06

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

II. PERFORMANCE VERIFICATION DATA

DATE: 07-OCT-88

NHTSA DUMMY I.D. NUMBER: 902

TEST PARAMETER		SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
NECK BENDING TEST				
a. Pendulum Speed		21.5 to 25.5 fps.	22.9 fps	
b. Pend. Avg. Decel. over t3 to t2		20 to 24 G's	24.0 G's	
c. Peak Resultant Head Acceleration		26 G's max.	22.9 G's	
d. Pendulum Decel. (t2-t1)		<= 3 ms.	1.9 ms	
e. Pendulum Decel. (t3-t2)		25 to 30 ms.	27.4 ms	
f. Pendulum Decel. (t4-t3)		<= 10 ms.	3.0 ms	
g. Max. Head Rotation		63 to 73 deg.	70.0 deg	
h. Chordal Displacement				
HEAD ROTATION ANGLE				
0 deg.	Time	-2 to 2 ms.	0.0 ms	
	Displ.	-.5 to .5"	0.0 "	
30 deg.	Time	25.6 to 34.4 ms.	27.6 ms	
	Displ.	2.1 to 3.1"	2.65"	
60 deg.	Time	40.3 to 51.7 ms.	41.0 ms	
	Displ.	4.3 to 5.3"	4.65"	
Maximum (70.0deg)	Time	53.2 to 66.8 ms.	54.4 ms	
	Displ.	5.0 to 6.0"	5.45"	
60 deg.	Time	67.0 to 83.0 ms.	67.9 ms	
	Displ.	4.3 to 5.3"	4.8 "	
30 deg.	Time	85.4 to 104.6 ms.	85.8 ms	
	Displ.	2.1 to 3.1"	2.3 "	
0 deg.	Time	101.0 - 123.0 ms.	* 99.6 ms	
	Displ.	-.5 to 0.5"	0.0 "	

* - DOES NOT MEET SPECIFICATION

TECHNICIANS NAME: I.M.

II. PERFORMANCE VERIFICATION DATA

DATE: 04-OCT-88

NHTSA DUMMY I.D. NUMBER: 902

TEST PARAMETER	SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
ABDOMINAL COMPRESSION			
TEST: (PRELOAD = 10 lbs.)			
a. Force @ 0.5"	23 to 36 lbs.	25.0 lbs	
b. Force @ 0.75"	36 to 50 lbs.	39.5 lbs	
c. Force @ 1.0"	50 to 63 lbs.	57.5 lbs	
d. Force @ 1.3"	73 to 88 lbs.	82.0 lbs	

LUMBAR FLEXION TEST: DATE : 04-OCT-88

TEST PARAMETER	SPECIFICATION	PRE-TEST	POST-TEST
a. Force @ 20 deg.	22 to 34 lbs.	29.0 lbs	
b. Force @ 30 deg.	34 to 46 lbs.	43.5 lbs	
c. Force @ 40 deg.	46 to 58 lbs.	54.0 lbs	
d. Return Angle	12 deg. maximum	11.0 deg	

TECHNICIAN'S NAME: I.M.

SIDE IMPACT DUMMY CALIBRATION

DUMMY SERIAL NUMBER 904

TEST/ DATE	CHANNEL	FILTER CLASS	PEAK ACCELERATION (g) SPECIFICATION	TEST RESULT
THORAX 11/8/88	LEFT UPPER RIB Y-AXIS	FIR	37-46	42.52
	LEFT LOWER RIB Y-AXIS	FIR	37-46	42.52
	LOWER SPINE Y-AXIS	FIR	15-22	20.20
PELVIS 11/8/88	PELVIS Y-AXIS	FIR	40-60	52.71

II. PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER: 904

DATE: 08-DEC-88

TEST PARAMETER		SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
NECK BENDING TEST				
a. Pendulum Speed		21.5 to 25.5 fps.		22.1 fps
b. Pend. Avg. Decel. over t3 to t2		20 to 24 G's		22.2 G's
c. Peak Resultant Head Acceleration		26 G's max.		25.0 G's
d. Pendulum Decel. (t2-t1)		<= 3 ms.		1.9 ms
e. Pendulum Decel. (t3-t2)		25 to 30 ms.		26.0 ms
f. Pendulum Decel. (t4-t3)		<= 10 ms.		4.0 ms
g. Max. Head Rotation		63 to 73 deg.		73.0 deg.
h. Chordal Displacement				
HEAD ROTATION ANGLE				
0 deg.	Time	-2 to 2 ms.		0.0 ms
	Displ.	-.5 to .5"		0.0 "
30 deg.	Time	25.6 to 34.4 ms.		28.4 ms
	Displ.	2.1 to 3.1"		2.85 "
60 deg.	Time	40.3 to 51.7 ms.		41.0 ms
	Displ.	4.3 to 5.3"		4.75 "
Maximum (73.0deg)	Time	53.2 to 66.8 ms.		60.0 ms
	Displ.	5.0 to 6.0"		5.85 "
60 deg.	Time	67.0 to 83.0 ms.		74.9 ms
	Displ.	4.3 to 5.3"		4.85 "
30 deg.	Time	85.4 to 104.6 ms.		90.8 ms
	Displ.	2.1 to 3.1"		2.4 ms
0 deg.	Time	101.0 - 123.0 ms.		104.0 ms
	Displ.	-.5 to 0.5"		0.0 "

TECHNICIANS NAME: I.M.

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

II. PERFORMANCE VERIFICATION DATA

DATE: 06-DEC-88

NHTSA DUMMY I.D. NUMBER: 904

TEST PARAMETER	SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required
ABDOMINAL COMPRESSION			
TEST: (PRELOAD = 10 lbs.)			
a. Force @ 0.5"	23 to 36 lbs.		25.0 lbs
b. Force @ 0.75"	36 to 50 lbs.		38.0 lbs
c. Force @ 1.0"	50 to 63 lbs.		54.5 lbs
d. Force @ 1.3"	73 to 88 lbs.		82.0 lbs

LUMBAR FLEXION TEST: DATE : 07-DEC-88

TEST PARAMETER	SPECIFICATION	PRE-TEST	POST-TEST
a. Force @ 20 deg.	22 to 34 lbs.		32.0 lbs
b. Force @ 30 deg.	34 to 46 lbs.		43.0 lbs
c. Force @ 40 deg.	46 to 58 lbs.		53.0 lbs
d. Return Angle	12 deg. maximum		11.0 deg

TECHNICIAN'S NAME: I.M.