

V2148

Report Number: 214-TRC-95-001

Vehicle Safety Compliance Testing

FMVSS No. 214

Side Impact Protection - Passenger Cars

Hyundai Motor Company

1995 Hyundai Sonata

4-door sedan

NHTSA Number: CS0503

TRC Test Number: 941012

Transportation Research Center Inc.

10820 State Route 347

East Liberty, OH 43319



November 4, 1994

Final Report

Prepared For:

U.S. Department of Transportation

National Highway Traffic Safety Administration

Office of Vehicle Safety Compliance Enforcement (NEF-30)

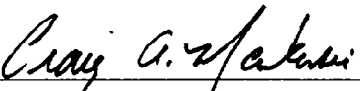
400 Seventh Street, S.W., Room No. 6115

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-07292, Task Order No. TRC-74-0342.

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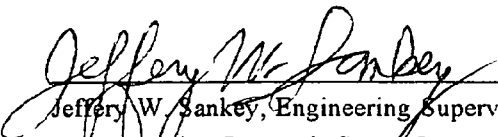
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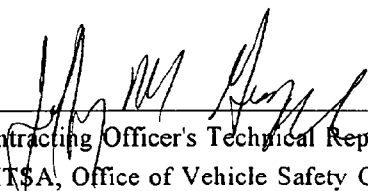
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Date 12/7/94

Final Report Accepted By:



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

Date 2/15/95

1. Report No. 214-TRC-95-001	2. Government Accession No.	3. Recipient's Catalog No.																			
4. Title and Subtitle Final Report of FMVSS No. 214 Compliance Side Impact Testing of a 1995 Hyundai Sonata, 4-door sedan NHTSA No. CS0503		5. Report Date November 4, 1994																			
		6. Performing Organization Code TRC																			
7. Author(s) C. A. Markusic, Senior Project Engineer, TRC		8. Performing Organization Report No. 214-TRC-95-001																			
9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319		10. Work Unit No. (TRAIS)																			
		11. Contract or Grant No. TRC-74-0342																			
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance Enforcement (NEF-30) 400 Seventh St., Washington, DC 20590		13. Type of Report and Period Covered Final Report October - December 1994																			
		14. Sponsoring Agency Code NEF-30																			
15. Supplemental Notes																					
16. Abstract A 30/15 mph 270° Impact (Moving Deformable Barrier) Compliance Test was conducted on a 1995 Hyundai Sonata 4-door sedan, NHTSA No. CS0503, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-03 for the determination of FMVSS No. 214 Side Impact Protection compliance. The test was conducted at Transportation Research Center Inc. on October 12, 1994. The impact velocity of the Moving Deformable Barrier (MDB) was 32.6 mph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 68° F. The target vehicle post-test maximum crush was 17.0 inches at level 2. The test vehicle's performance follows: <table border="1"> <thead> <tr> <th></th> <th>Driver</th> <th>Passenger</th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td>89.5</td> <td>80.1</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td>87.2</td> <td>90.2</td> </tr> <tr> <td>Lower Spine (T12) Accel., g</td> <td>61.0</td> <td>86.3</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td>75</td> <td>88</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td>120</td> <td>120</td> </tr> </tbody> </table> 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 side impact event.					Driver	Passenger	Left Upper Rib (LUR) Accel., g	89.5	80.1	Left Lower Rib (LLR) Accel., g	87.2	90.2	Lower Spine (T12) Accel., g	61.0	86.3	Thoracic Trauma Index (TTI)	75	88	Pelvis (PEV) Accel., g	120	120
	Driver	Passenger																			
Left Upper Rib (LUR) Accel., g	89.5	80.1																			
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Thoracic Trauma Index (TTI)	75	88																			
Pelvis (PEV) Accel., g	120	120																			
17. Key Words Compliance Testing Side Impact Protection FMVSS 214 Side Impact Dummy (SID)		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin. Technical Reference Division Nassif Building, Room 5108 400 Seventh Street, S.W., Washington, DC 20590																			
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. Number of Pages 200	22. Price																		

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol When You Know Multiply by To Find Symbol

LENGTH			
in	inches	2.5	cm
ft	feet	30	m
yd	yards	0.9	m
mi	miles	1.6	km

AREA			
in ²	square inches	6.5	cm ²
ft ²	square feet	0.09	m ²
yd ²	square yards	0.8	m ²
mi ²	square miles	2.6	km ²
	acres	0.4	ha

MASS (weight)			
oz	ounces	28	g
lb	pounds	0.45	kg
	short tons (2000 lb)	0.9	t

VOLUME			
tsp	teaspoons	5	ml
Tbsp	tablespoons	15	ml
fl oz	fluid ounces	30	ml
c	cups	0.24	l
pt	pints	0.47	l
qt	quarts	0.95	l
gal	gallons	3.8	l
ft ³	cubic feet	0.03	m ³
yd ³	cubic yards	0.76	m ³

TEMPERATURE (exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
----	------------------------	----------------------------	---------------------	----

Approximate Conversions from Metric Measures

Symbol When You Know Multiply by To Find Symbol

LENGTH			
mm	millimeters	0.04	inches
cm	centimeters	0.4	inches
m	meters	3.3	feet
in	inches	1.1	yards
km	kilometers	0.6	miles

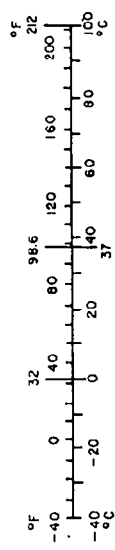
AREA			
cm ²	square centimeters	0.16	square inches
m ²	square meters	1.2	square yards
km ²	square kilometers	0.4	square miles
ha	hectares (10,000 m ²)	2.5	acres

MASS (weight)			
g	grams	0.035	ounces
kg	kilograms	2.2	pounds
t	tonnes (1000 kg)	1.1	short tons

VOLUME			
ml	milliliters	0.03	fluid ounces
l	liters	2.1	pints
l	liters	1.06	quarts
l	liters	0.26	gallons
m ³	cubic meters	35	cubic feet
m ³	cubic meters	1.3	cubic yards

TEMPERATURE (exact)

°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F
----	---------------------	-------------------	------------------------	----



* 1 in. = 2.54 (exact) cm. For other exact conversions and more detailed tables, see NIST Spec. Publ. 286, Units of Weights and Measures, Price \$2.25, SO Catalog No. C13.10-286.

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Section 1.0

Purpose and Test Procedure

Purpose

This 30/15 mph 270° driver's side impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 214 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by the Transportation Research Center Inc. (TRC) under Contract No. DTNH22-88-C-07292, Task Order No. TRC-74-0342. The purpose of this test was to determine if the subject vehicle, a 1995 Hyundai Sonata 4-door sedan, NHTSA No. CS0503, meets the performance requirements of FMVSS 214, "Side Impact Protection - Passenger Cars," in the 30/15 mph 270° driver's side impact mode.

Test Procedure

This test was conducted in accordance with NHTSA's Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-214D-03. Data was obtained relative to FMVSS 214, "Side Impact Protection - Passenger Cars," performance.

The test vehicle was instrumented with seven (7) accelerometers to measure longitudinal, lateral, and vertical axis accelerations. The test vehicle was positioned so that the longitudinal centerline of the vehicle was at an angle of 63° to the tow cable system and the leading edge of contact was 37 inches forward of the mid-point of the test vehicle's wheelbase.

The test vehicle contained two (2) Part 572 F side impact adult male anthropomorphic test devices (dummies). The dummies were positioned in the left front and left rear outboard designated seating positions according to the dummy placement procedure specified as an attachment to the Laboratory Test Procedure. Both dummies were instrumented with spine and rib primary and redundant accelerometers and a pelvis accelerometer to measure lateral accelerations. The dummies were also instrumented with head accelerometers to measure longitudinal, lateral, and vertical accelerations. Each dummy was restrained by a three-point unbelt.

The moving deformable barrier was instrumented with five (5) accelerometers to measure longitudinal, lateral, and vertical axis accelerations. The moving barrier was crabbed clockwise at a 27° angle to the tow cable system. The moving deformable barrier's specified velocity range was 32.4 to 33.4 mph.

The thirty-two (32) data channels were multiplexed and recorded on a 14-track tape drive. The data was digitally sampled at 12,500 samples per second and processed per Section 12.0 of the Laboratory Test Procedure.

The crash event was recorded by one (1) real-time panning motion picture camera and six (6) high-speed motion picture cameras operating at 500 frames per second. The pre-test and post-test conditions were recorded by one (1) real time motion picture camera.

The vehicle and occupant data are summarized in Section 2.0. The FMVSS 214 data are presented in Section 3.0. The vehicle, occupant, and camera measurements are presented in Section 4.0. Appendix A contains the still photographic prints. Appendix B contains the dummy and vehicle data plots. Appendix C contains the dummy calibration data. Appendix D contains miscellaneous test information.

Section 2.0

Side Impact Test Summary

Test Results Summary

This 30/15 mph 270° driver's side impact test was conducted at TRC on October 12, 1994.

The test vehicle was a 1995 Hyundai Sonata 4-door sedan, NHTSA No. CS0503. The driver's Thoracic Trauma Index (TTI) was less than 85 g's. The left rear passenger's Thoracic Trauma Index (TTI) was greater than 85 g's. The pelvis lateral accelerations did not exceed 130 g's as measured by Part 572 F dummies seated in the left front and left rear outboard designated seating positions.

The test vehicle was equipped with a 121.9 cubic inch, transverse engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 3366 pounds. The moving deformable barrier's impact speed was 32.6 mph. The vehicle's maximum static crush was 17.0 inches.

The driver's TTI was 75.2. The driver's pelvis maximum lateral acceleration was 120.1 g.

The left rear passenger's TTI was 88.3. The left rear passenger's pelvis maximum lateral acceleration was 120.0 g.

The doors on the struck side of the test vehicle did not separate from the vehicle's main body at the hinges or latches. The doors on the opposite side did not open during the crash event.

Data Acquisition Explanations

The driver's lower spine Y-axis primary accelerometer, T12YG1, recorded a questionable data spike at 35 milliseconds. The driver's redundant accelerometer, T12YGA, recorded questionable data spikes at 35 and 63 milliseconds. The data spikes affected the driver's primary and redundant Thoracic Trauma Index (TTI) calculations.

The left rear passenger's lower spine primary and redundant Y-axis accelerometers, T12YG4 and T12YGD, recorded questionable data spikes at 39 milliseconds. The questionable data spike affected the left rear passenger's primary and redundant Thoracic Trauma Index (TTI) calculations.

Table 1 Crash Test Summary

Test Type:	Moving Barrier Left Side Impact	
Test Date:	10/12/94	
Test Time:	1631	
Ambient Temperature:	68° F	
Vehicle:	1995 Hyundai Sonata 4-door sedan	
Vehicle Test Weight:	3366 lbs.	
Impact Angle ¹ :	270°	
Impact Velocity ² :	Primary = 32.6 mph Secondary = 32.7 mph	
Maximum Static Crush:	17.0 in.	
Dummies:	Driver #016	Left Rear Passenger #268
Type:	Part 572 F	Part 572 F
Location:	Left Front	Left Rear
Restraint:	3-Point Unibelt	3-Point Unibelt
Number of Data Channels:	32	
Number of Cameras:	High-Speed 6 Real-Time 1	

¹ With respect to tow track centerline.

² Speed trap measurement ($\pm .05$ mph accuracy)

Table 2 Test Vehicle Information

Vehicle Manufacturer: Hyundai Motor Company
 Make/Model/Body Style: Hyundai/Sonata/4-door sedan
 Model Year: 1995
 NHTSA No.: CS0503
 VIN: KMHCF21F9SU175753
 Color: Gold
 Engine Data:
 Type: Transverse
 Cylinders: 4
 Displacement: 2.0 liters
 Transmission Data: 3 Speed, Manual, X Automatic,
 X FWD, RWD, 4WD
 Date Vehicle Received: 10/05/94
 Odometer Reading: 23
 Dealer's Name and Address: NA

Accessories:

Power Steering	Yes	Automatic Transmission	Yes
Power Brakes	Yes	Automatic Speed Control	No
Power Seats	No	Tilting Steering Wheel	Yes
Power Windows	No	Telescoping Steering Wheel	No
Tinted Glass	Yes	Air Conditioning	Yes
Radio	Yes	Anti-Skid Brake	No
Clock	Yes	Rear Window Defroster	Yes
Other	None		

Certification Data from Vehicle's Label:

Vehicle Manufactured by: Hyundai Motor Corporation
 Date of Manufacture: 05/21/94
 VIN: KMHCF21F9SU175753
 GVWR: 3870 lbs.
 GAWR: Front: 2194 lbs.
 Rear: 1918 lbs.

Table 2 Test Vehicle Information, Cont'd.

Tires on Vehicle (Mfr., Line, Size): Michelin, MXV4, P195/70R14

Tire Pressure with Maximum Capacity Vehicle Load: Front: 40 psi
Rear: 40 psi

Spare Tire (Mfr., Line, Size): Kumho, T125/70D15

Type of Seats: Front: Bucket
Rear: Bench

Type of Front Seat Backs: Manually adjustable

Maximum Width: 67.8 inches

Wheelbase: 106.4 inches

Location of "Recommended Tire Pressure" Label:

The label was located on the driver's B-pillar.

Data From Vehicle's "Recommended Tire Pressure" Label:

Recommended Tire Size: P195/70R14

Recommended Cold Tire Pressure: Front: 30 psi; Rear: 30 psi

Seating Capacity: 2 Front 3 Rear 5 Total

Cargo Load: 110 lbs.

Vehicle Capacity Weight: 860 lbs.

Test Vehicle Attitude (all measurements are in inches):

Delivered Attitude: LF 28.3; RF 28.3; LR 27.1; RR 27.0

Fully Loaded Attitude: LF 27.1; RF 27.2; LR 25.4; RR 25.4

Pre-test Attitude: LF 27.1; RF 27.4; LR 25.5; RR 26.1

Post-test Attitude: LF 26.4; RF 26.8; LR 23.5; RR 24.1

Table 2 Test Vehicle Information, Cont'd.

Weight of Test Vehicle as Received (with maximum fluids):

Right Front	882 lbs.	Right Rear	564 lbs.
Left Front	910 lbs.	Left Rear	560 lbs.
Total Front Weight	1792 lbs.	(61.4% of Total Vehicle Weight)	
Total Rear Weight	1124 lbs.	(38.6% of Total Vehicle Weight)	
Total Delivered Weight	2916 lbs.		

Calculation of Test Vehicle's Target Test Weight:

RCLW = Rated Cargo and Luggage Weight

UDW = Unloaded Vehicle Weight (2916 lbs.)

VCW¹ = Vehicle Capacity Weight (860 lbs.)

DSC = Designated Seating Capacity (5)

RCLW = VCW - 150 (DSC) = 110 lbs.

Target Test Weight = UDW + RCLW + (No. of Part 572F Dummies X 178 lbs.)

Target Test Weight = 2916 + 110 + 356 = 3382 lbs.

Weight of test vehicle with required dummies and 94 lb of cargo weight:

Right Front	935 lbs.	Right Rear	682 lbs.
Left Front	1018 lbs.	Left Rear	731 lbs.
Total Front Weight	1953 lbs.	(58.0% of Total Vehicle Weight)	
Total Rear Weight	1413 lbs.	(42.0% of Total Vehicle Weight)	
Total Test Weight	3366 lbs.	(0.5% Under Target Test Weight)	

Weight of Ballast Secured in Vehicle Cargo Area: 0 lbs.

Components Removed to Meet Target Test Weight: Spare tire

CG = 44.7 inches rearward of front wheel centerline

¹ From vehicle's certification label.

Table 2 Test Vehicle Information, Cont'd.

Arm Rest Location:

Driver: 9.3 inches below window opening

Passenger: 9.4 inches below window opening

Seat Belt Anchorage Location: NA

Automatic Belt Rail Location: NA

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

Rear Seat Cushion Placement: Non-adjustable

Total Number of Seat Adjustment Positions for Front Seat: 16

Adjustment Positions: 9th from front

Total Number of Seat Adjustment Positions for Rear Seat: Non-adjustable

Adjustment Positions: NA

Front Seat Back Angle: 26°

Front Seat Cushion Vertical Position: Non-adjustable

Window Positions:

	Front	Rear
Left	Up	Up
Right	Down	Down

Amount of Stoddard in Fuel Tank: 16.0 gallons (93% of Useable Capacity)

Intended location of Impact Point on Test Vehicle Left Side: 37 inches forward of the wheelbase mid-point.

Table 3 Moving Deformable Barrier (MDB) Data

Overall Width of Framework Carriage:	49.2 inches
Overall Length of MDB:	162.0 inches
Wheelbase of Framework Carriage:	102.0 inches
Tread Width of Framework Carriage:	74.0 inches
CG Location Rearward of Front Axle:	42.8 inches
CG Location to Right of Barrier Centerline:	0.1 inch

MDB Test Weight:

Left Front	872 lbs.	Left Rear	625 lbs.
Right Front	871 lbs.	Right Rear	633 lbs.
Total Front Weight	1743 lbs.		
Total Rear Weight	1258 lbs.		
Total Test Weight	3001 lbs.		

Table 4 Post-Impact Data

Test Number:	941012
Test Date:	10/12/94
Test Time:	1631
Test Type:	Moving Barrier Side Impact
Impact Angle:	270°
Ambient Temperature at Impact Area:	68° F
Temperature in Occupant Compartment:	76° F
Impact Velocity:	Primary = 32.6 mph Secondary = 32.7 mph (Specified Range = 32.4 to 33.4 mph)
Distance from Vehicle to Barrier:	Entering Velocity Trap = 14.0 inches Existing Velocity Trap = 2.0 inches

Table 5 Test Conditions

Test Number: 941012
Date of Test: 10/12/94
Time of Test: 1631
Ambient Temperature
at Impact Area: 68° F
Temperature in
Occupant Compartment: 76° F

Vehicle Data

	<u>Actual</u>	<u>Intended</u>
Subject Vehicle Test Weight (lbs.):	3366	3362 - 3382
Moving Deformable Barrier Test Weight (lbs.):	3001	3000 - 3015
Moving Deformable Barrier Velocity (mph) ¹ :	32.6	32.4 - 33.4
Impact Point (in.) ² :	36.6	37.0

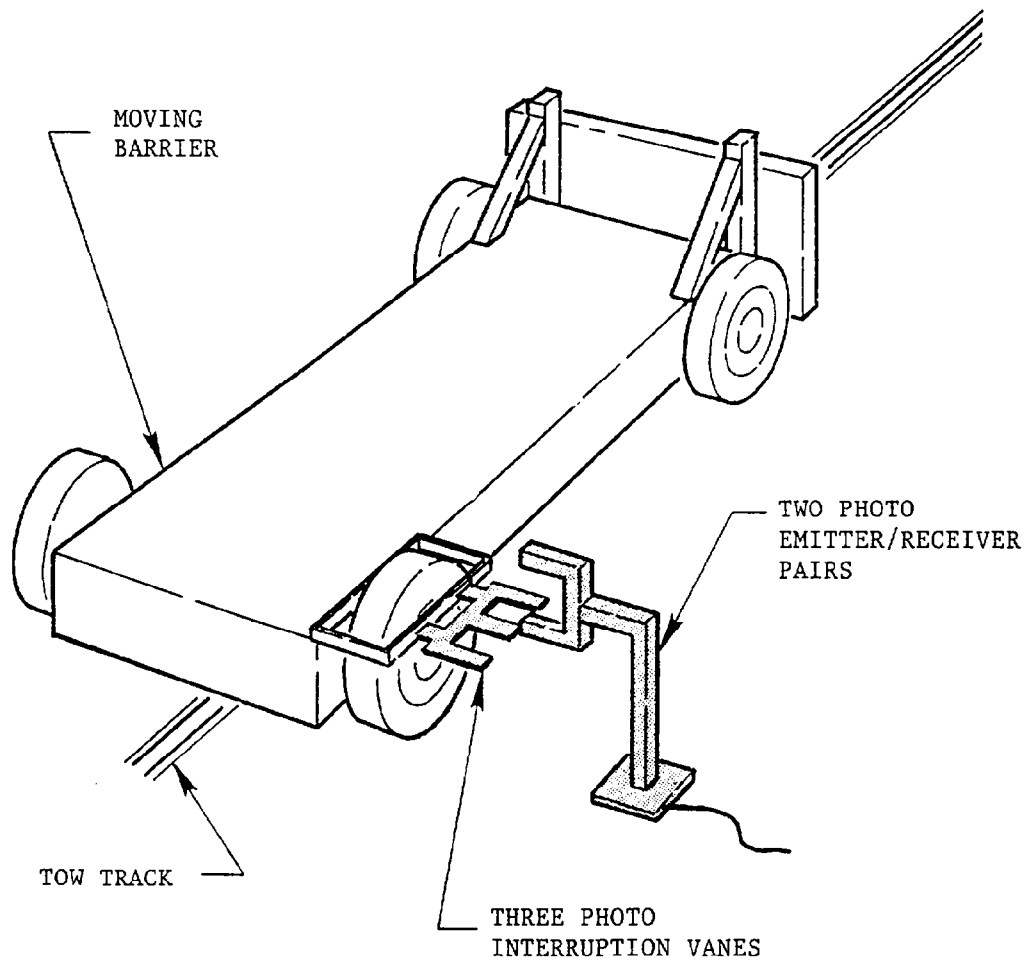
¹ As measured over final 12 inches of travel.

² As measured forward of the subject vehicle's wheelbase mid-point.

Table 5 Test Conditions, Cont'd.

	<u>Dummy Information</u>	
	<u>Driver</u>	<u>Left Rear Passenger</u>
Type:	SID	SID
Serial No.:	016	268
Instrumentation:		
Head Accelerometers:	3	3
Shoulder Accelerometers:		
Shoulder Displacement:		
Upper Spine Accelerometers:		
Upper Rib Accelerometers:	2	2
Center Rib Accelerometers:		
Lower Rib Accelerometers:	2	2
Rib Displacement:		
Lower Spine Accelerometers:	2	2
Upper Abdomen Accelerometers:		
Lower Abdomen Accelerometers:		
Abdomen Displacement:		
Pelvis Accelerometers:	1	1
Restraint System:	3-Point Unibelt	3-Point Unibelt

Figure 1 Impact Velocity Measurement System



The final vane clears the final emitter/receiver pair 2 inches before impact.

The vanes have 12-inch spacing.

Figure 2 Vehicle Accelerometer Placement

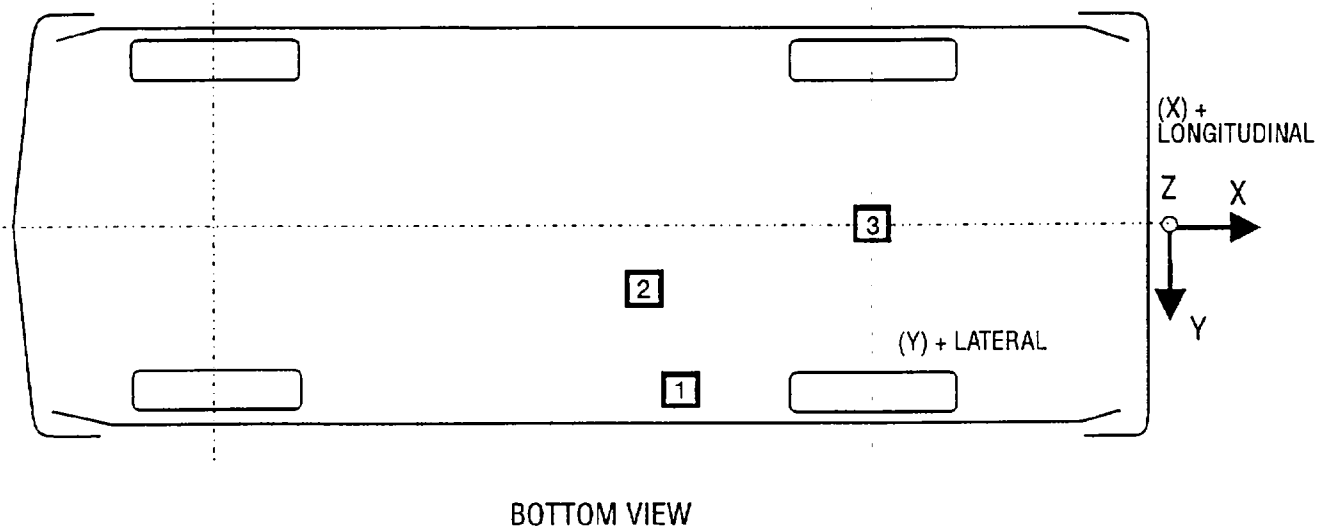
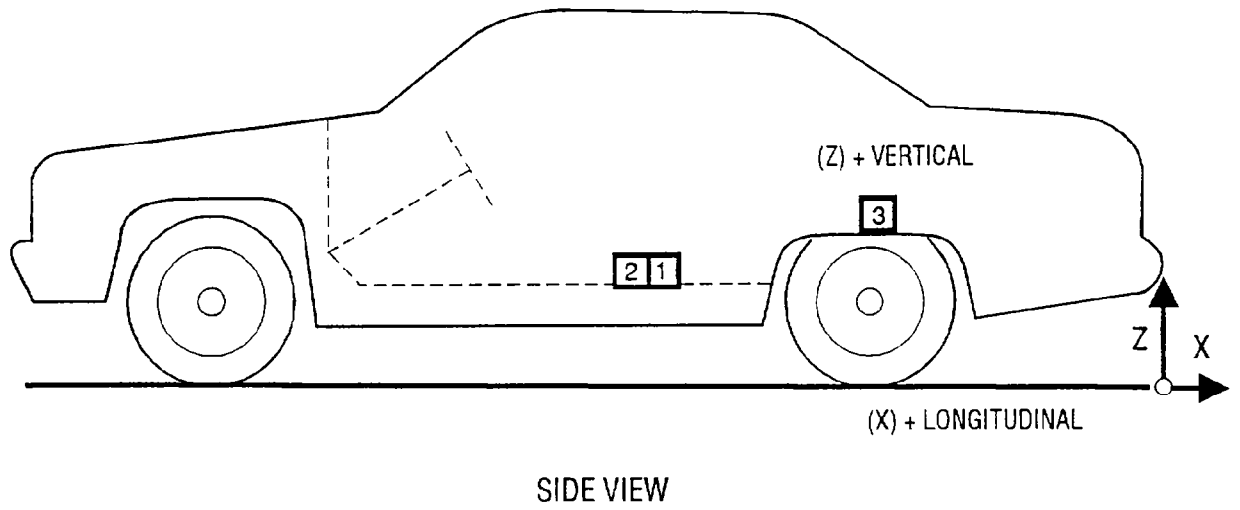
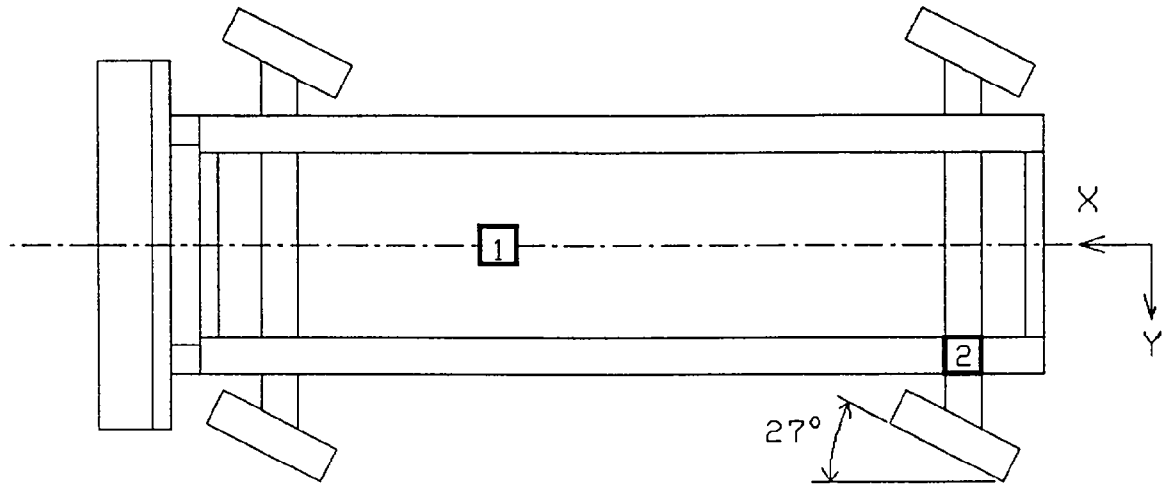


Table 6 Vehicle Accelerometer Locations and Data Summary

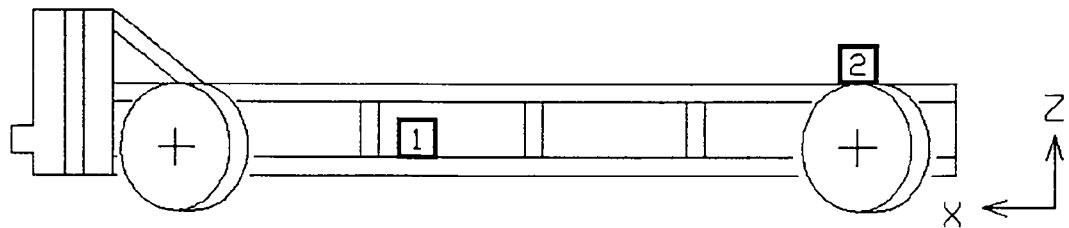
TEST NUMBER: 941012 No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 RIGHT REAR SILL LONGITUDINAL	75.1 in	27.7 in	10.1 in	5.6 g @ 15.6 ms	3.1 g @ 65.8 ms
LATERAL				13.2 g @ 7.4 ms	2.4 g @ 77.0 ms
VERTICAL				5.2 g @ 26.9 ms	5.2 g @ 41.0 ms
RESULTANT				13.6 g @ 10.1 ms	
2 RIGHT REAR SEAT LATERAL	72.4 in	7.5 in	11.5 in	17.1 g @ 9.4 ms	2.6 g @ 76.6 ms
3 REAR FLOORPAN OVER AXLE	41.0 in	0.0 in	18.8 in		
LONGITUDINAL				5.2 g @ 61.8 ms	5.1 g @ 40.1 ms
LATERAL				19.0 g @ 24.7 ms	2.4 g @ 239.0 ms
VERTICAL				4.8 g @ 73.4 ms	11.9 g @ 19.7 ms
RESULTANT				19.0 g @ 24.7 ms	

REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + RIGHTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

Figure 3 Moving Barrier Accelerometer Placement



TOP VIEW



SIDE VIEW

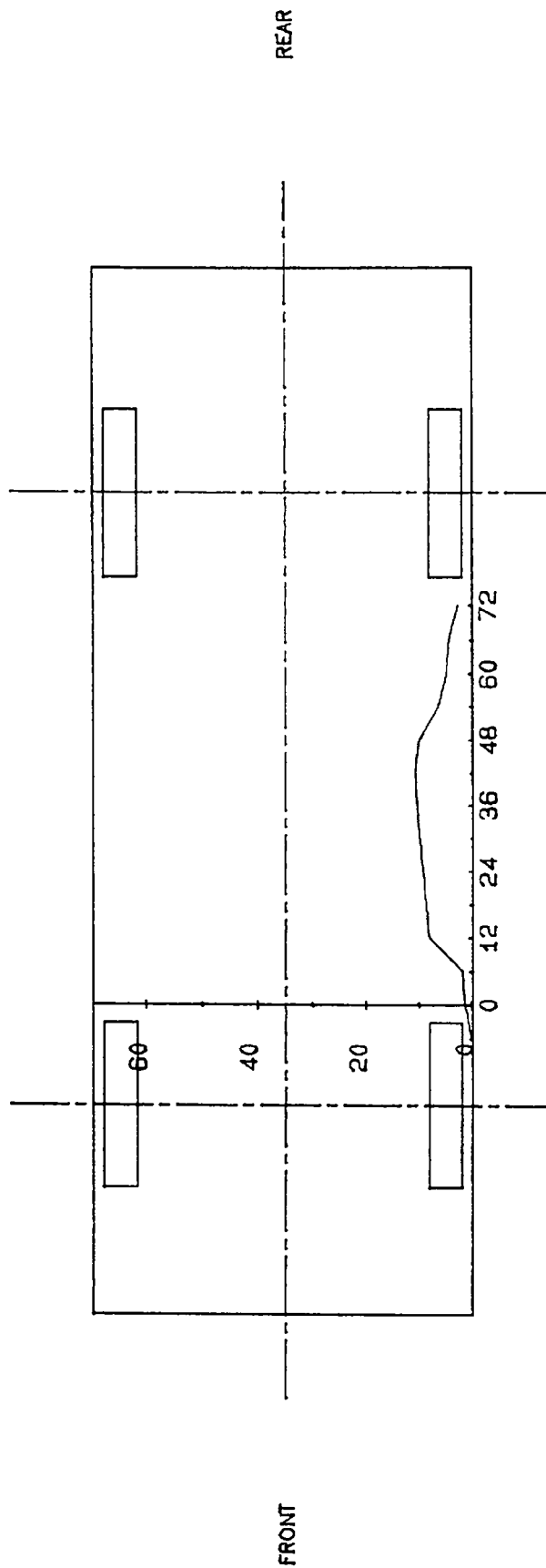
Table 7 Moving Deformable Barrier Accelerometer Locations and Data Summary

TEST NUMBER: 941012					POSITIVE		NEGATIVE	
No. LOCATION		X	Y	Z	DIRECTION		DIRECTION	
1 CENTER OF GRAVITY		72.9 in	0.0 in	12.5 in	15.0 g	@ 34.3 ms	2.2 g	@ 130.5 ms
LONGITUDINAL					1.6 g	@ 203.4 ms	6.5 g	@ 45.2 ms
LATERAL					17.3 g	@ 140.6 ms	13.1 g	@ 149.9 ms
VERTICAL					17.3 g	@ 140.6 ms		
RESULTANT								
2 LEFT FRAME RAIL		15.1 in	-25.1 in	25.0 in	19.1 g	@ 33.4 ms	3.3 g	@ 130.6 ms
OVER REAR AXLE					4.0 g	@ 41.7 ms	4.0 g	@ 156.6 ms
LONGITUDINAL								
LATERAL								

REFERENCE: X: + FORWARD FROM REAR POINT OF FRAME
Y: + RIGHTWARD FROM BARRIER CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

Figure 4

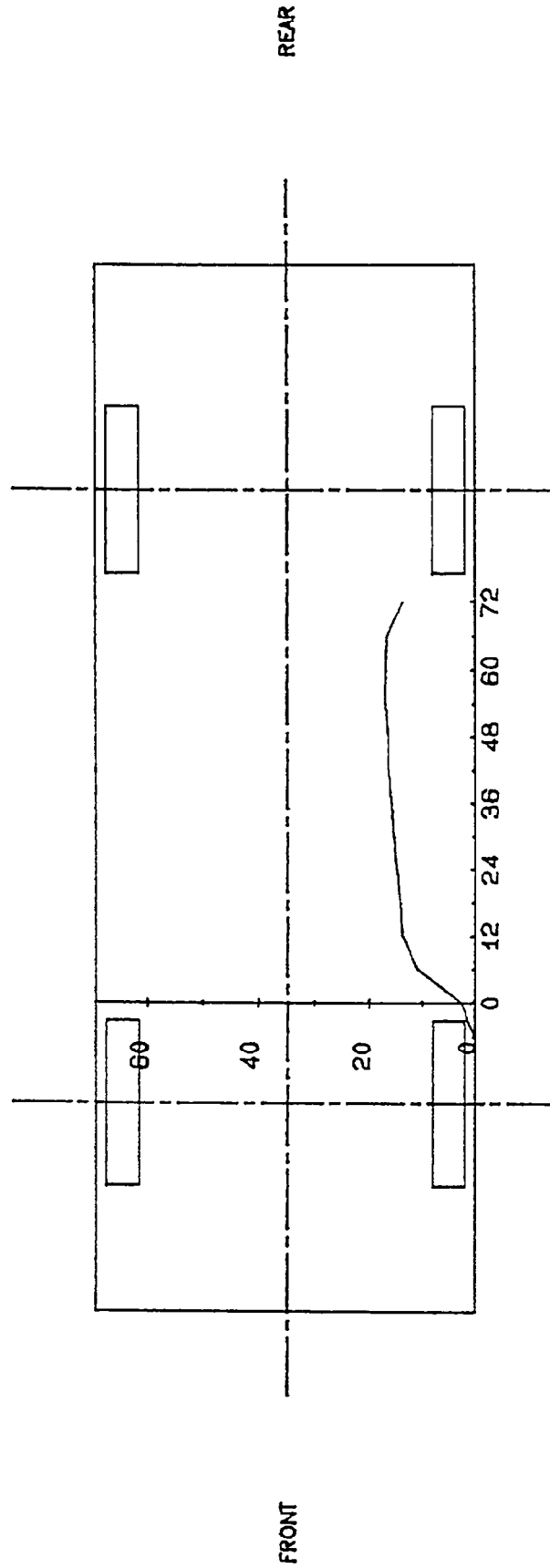
VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS AXLE HEIGHT WHICH IS 11.3 IN. ABOVE GROUND LEVEL.
(0,0) EQUALS PROJECTED IMPACT POINT

Figure 4, Cont'd.

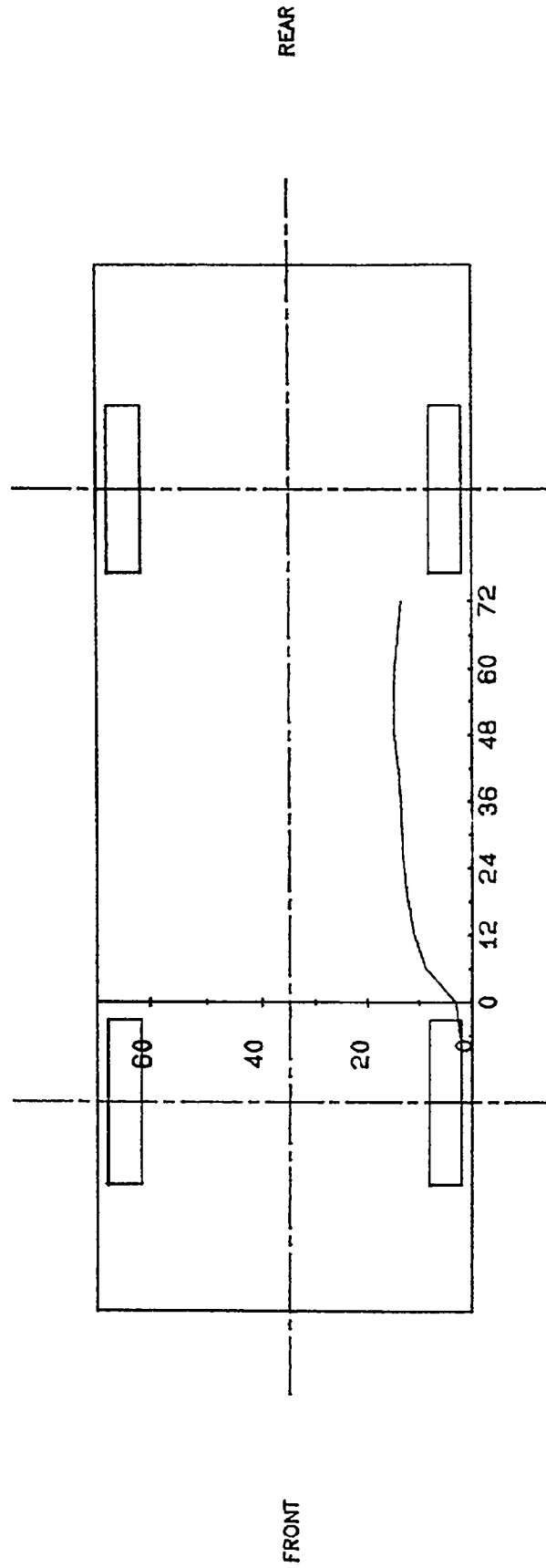
VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS H-POINT HEIGHT WHICH IS 19.8 IN. ABOVE GROUND LEVEL
(0,0) EQUALS PROJECTED IMPACT POINT

Figure 4, Cont'd.

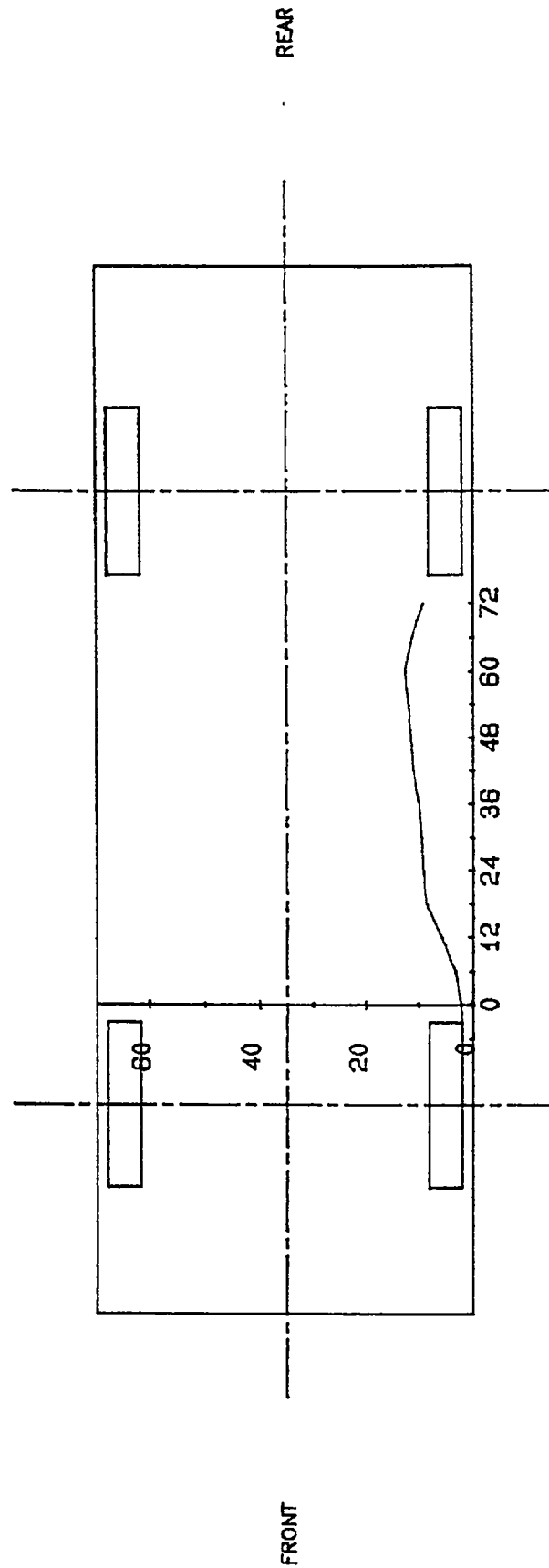
VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS MID DOOR HEIGHT WHICH IS 24.3 IN. ABOVE GROUND LEVEL
(0,0) EQUALS PROJECTED IMPACT POINT

Figure 4, Cont'd.

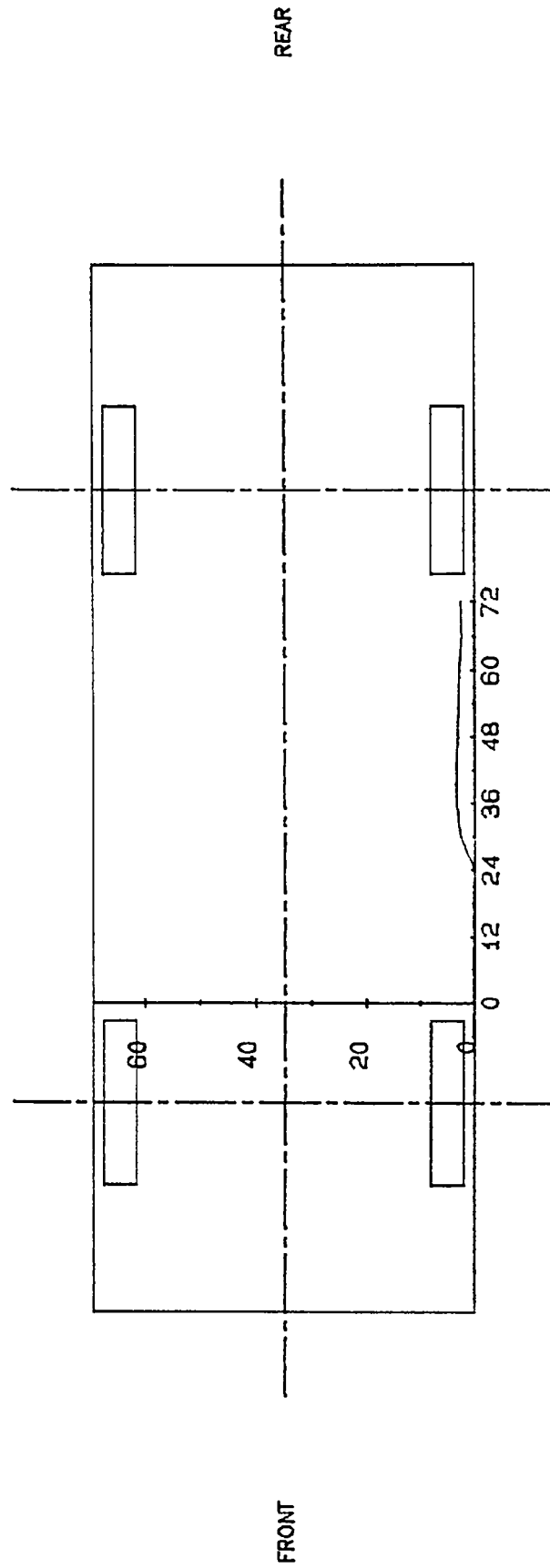
VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW SILL HEIGHT WHICH IS 35.0 IN. ABOVE GROUND LEVEL
(0,0) EQUALS PROJECTED IMPACT POINT

Figure 4, Cont'd.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT WHICH IS 53.3 IN. ABOVE GROUND LEVEL
(0,0) EQUALS PROJECTED IMPACT POINT

TEST NO. 941012

TABLE 8 VEHICLE EXTERIOR PROFILES AND STATIC CRUSH
ZERO DISTANCE AT PROJECTED IMPACT POINT

LOCATION	HEIGHT (in)	PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE ¹)														
		-6.0	0.0	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0	54.0	60.0	66.0	72.0	
AXLE HEIGHT	11.3	0.0	14.6	14.9	14.9	15.0	15.0	15.0	15.3	15.2	15.3	15.3	15.0	15.2	15.0	
I-I POINT	19.8	0.0	13.4	13.5	13.2	13.2	13.0	13.0	13.1	13.0	13.1	13.2	13.1	13.3	13.9	
MID DOOR	24.3	13.4	13.6	13.6	13.5	13.5	13.3	13.2	13.2	13.1	13.6	13.6	13.5	13.6	13.8	
WINDOW SILL	35.0	16.2	15.7	15.8	15.6	15.4	15.2	15.0	15.0	14.6	15.3	15.3	15.0	15.2	15.3	
WINDOW TOP	53.3	0.0	0.0	0.0	0.0	0.0	0.0	25.7	25.3	24.9	25.2	25.6	25.6	25.7	25.4	

LOCATION	HEIGHT (in)	POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE ¹)														
		0.0	16.1	16.8	23.0	23.7	24.3	24.9	25.7	25.9	25.2	21.5	19.7	19.5	17.7	
AXLE HEIGHT	11.3	0.0	16.1	16.8	23.0	23.7	24.3	24.9	25.7	25.9	25.2	21.5	19.7	19.5	17.7	
I-I POINT	19.8	0.0	16.1	24.5	27.0	27.4	28.0	28.4	28.9	29.5	29.6	30.2	30.0	30.0	27.6	
MID DOOR	24.3	15.4	16.7	22.3	24.4	25.7	26.2	26.5	26.7	27.0	28.3	28.3	28.0	27.6	27.2	
WINDOW SILL	35.0	18.1	17.8	19.0	21.3	24.0	24.4	24.5	24.9	25.5	26.7	27.2	27.5	26.3	24.4	
WINDOW TOP	53.3	0.0	0.0	0.0	0.0	0.0	0.0	28.4	28.7	28.3	28.3	28.5	28.4	28.1	28.1	

LOCATION	HEIGHT (in)	STATIC CRUSH (in)													
AXLE HEIGHT	11.3	0.0	1.5	1.9	8.1	8.7	9.3	9.9	10.4	10.7	9.9	6.2	4.7	4.3	2.7
I-I POINT	19.8	0.0	2.7	11.0	13.8	14.2	15.0	15.4	15.8	16.5	16.5	17.0	16.9	16.7	13.7
MID DOOR	24.3	2.0	3.1	8.7	10.9	12.2	12.9	13.3	13.5	13.9	14.7	14.7	14.5	14.0	13.4
WINDOW SILL	35.0	1.9	2.1	3.2	5.7	8.6	9.2	9.5	9.9	10.9	11.4	11.9	12.5	11.1	9.1
WINDOW TOP	53.3	0.0	0.0	0.0	0.0	0.0	0.0	2.7	3.4	3.4	3.1	2.9	2.8	2.4	2.7

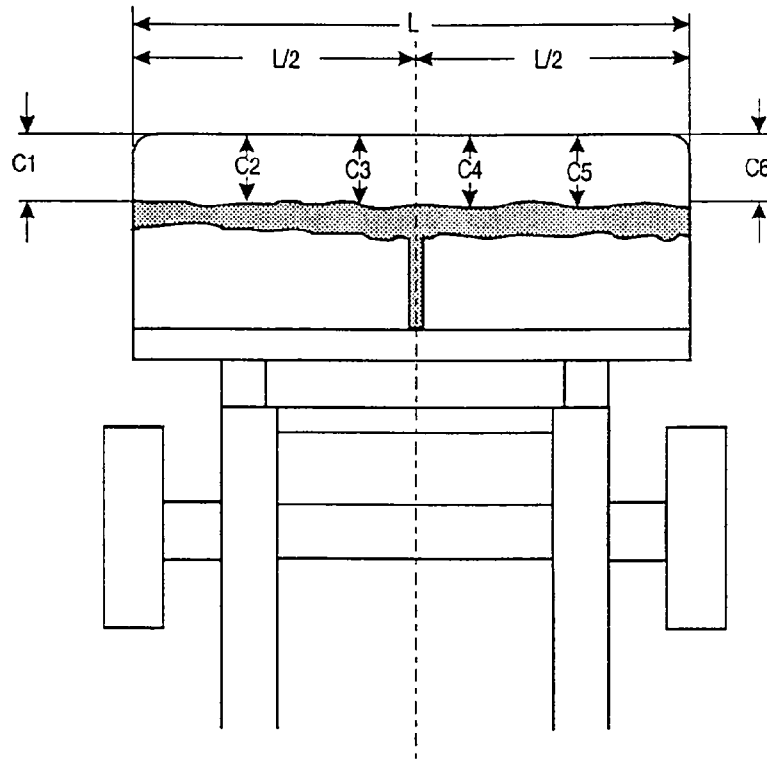
Column readings are front to rear from left to right.

All measurements are in inches.

Impact point is 37 inches forward of driver's side wheelbase midpoint.

¹Reference plane is parallel to and 48 inches from the vehicle's longitudinal centerline

Figure 5 Moving Deformable Barrier Face Crush



NOTES: L is pre-test length of contact surface.
 C1 through C6 are spaced equally apart.
 CL is vehicle centerline.
 All measurements are in inches.

	Pre-test	Post-test	Crush
L	66.0		
C1	15.4	17.8	2.4
C2	15.0	15.9	0.9
C3	15.0	15.7	0.7
C4	14.8	15.2	0.4
C5	15.0	14.9	-0.1
C6	15.8	16.2	0.4
CL	14.8	15.4	0.6

TEST NO. 941012

TABLE 9 MOVING DEFORMABLE BARRIER FACE STATIC CRUSH
ZERO DISTANCE AT BARRIER CENTERLINE¹

LOCATION	HEIGHT in	PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE ¹)																
		32.0	28.0	24.0	20.0	16.0	12.0	8.0	4.0	0.0	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0
TOP OF FACE	32.0	18.9	18.8	18.9	19.1	18.9	19.0	18.9	18.9	18.8	19.0	18.9	18.9	18.8	19.1	18.9	18.7	19.1
MID-FACE	22.0	18.9	18.9	18.9	19.1	19.0	19.1	18.9	18.9	18.8	19.0	18.9	18.9	18.8	19.1	18.9	18.8	19.1
BUMPER	17.0	15.4	15.0	15.0	15.0	15.0	15.0	14.9	14.9	14.8	15.0	14.9	14.8	14.9	15.0	14.9	14.8	15.8

LOCATION	HEIGHT in	POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE ¹)																
		32.0	28.0	24.0	20.0	16.0	12.0	8.0	4.0	0.0	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0
TOP OF FACE	32.0	25.7	22.7	20.9	19.6	19.3	19.3	19.0	19.0	19.1	18.9	19.1	19.0	19.0	18.9	19.6	21.3	
MID-FACE	22.0	21.2	20.1	19.7	19.5	19.3	19.3	19.0	19.0	19.1	19.1	19.0	19.0	18.9	18.9	18.9	19.2	
BUMPER	17.0	17.8	16.5	16.1	15.9	15.8	15.7	15.4	15.4	15.4	15.3	15.2	15.2	15.0	14.9	15.0	16.2	

LOCATION	HEIGHT in	STATIC CRUSH (IN)																
		32.0	28.0	24.0	20.0	16.0	12.0	8.0	4.0	0.0	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0
TOP OF FACE	32.0	6.8	3.9	2.0	0.5	0.4	0.3	0.1	0.1	0.3	-0.1	0.2	0.1	0.2	-0.1	0.0	0.9	2.2
MID-FACE	22.0	2.3	1.2	0.8	0.4	0.3	0.2	0.1	0.1	0.3	0.1	0.1	0.1	0.2	-0.2	0.0	0.1	0.1
BUMPER	17.0	2.4	1.5	1.1	0.9	0.8	0.7	0.5	0.5	0.6	0.3	0.3	0.4	0.1	-0.1	0.0	0.2	0.4

All measurements are in inches.

¹Column readings are left to right across barrier face from left to right.

²Reference plane is 32 inches forward of the rear surface of the deformable barrier face.

Section 3.0

FMVSS 214 Data

Table 10 Dummy Data Summary

TEST NUMBER: 941012

DRIVER DUMMY SERIAL NUMBER: 016

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

HEAD ACCELERATION

LONGITUDINAL	28.8 g	@	72.2 ms	12.2 g	@	266.9 ms
LATERAL	54.8 g	@	47.2 ms	17.5 g	@	59.0 ms
VERTICAL	27.1 g	@	47.7 ms	68.2 g	@	58.2 ms
RESULTANT	68.8 g	@	58.2 ms			
HIC	312 from 42.6 to 78.6 ms					

LOWER SPINE ACCELERATION

LATERAL (P) ¹	61.0 g	@	38.1 ms	16.7 g	@	77.5 ms
LATERAL (R) ¹	62.7 g	@	39.4 ms	17.3 g	@	77.5 ms

LEFT UPPER RIB ACCELERATION

LATERAL (P)	89.5 g	@	38.8 ms	29.4 g	@	72.5 ms
LATERAL (R)	87.3 g	@	39.4 ms	30.1 g	@	73.1 ms

LEFT LOWER RIB ACCELERATION

LATERAL (P)	87.2 g	@	38.8 ms	17.6 g	@	81.3 ms
LATERAL (R)	85.5 g	@	38.8 ms	19.9 g	@	81.3 ms
TTI d (P)	75					
TTI d (R)	75					

PELVIS ACCELERATION

LATERAL	120 g	@	30.6 ms	19 g	@	52.5 ms
---------	-------	---	---------	------	---	---------

POSITIVE DIRECTION

LONGITUDINAL: REARWARD
LATERAL: RIGHTWARD
VERTICAL: UPWARD

NEGATIVE DIRECTION

LONGITUDINAL: FORWARD
LATERAL: LEFTWARD
VERTICAL: DOWNWARD

¹See DATA ACQUISITION EXPLANATION

Table 10 Dummy Data Summary, Cont'd.

TEST NUMBER: 941012

PASSENGER DUMMY SERIAL NUMBER: 268

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

HEAD ACCELERATION

LONGITUDINAL	18.0 g	@	76.4 ms	12.2 g	@	64.1 ms
LATERAL	145.3 g	@	57.1 ms	21.8 g	@	44.5 ms
VERTICAL	38.1 g	@	63.4 ms	26.2 g	@	42.7 ms
RESULTANT	147.8 g	@	57.9 ms			
HIC	1003 from 54.6 to 61.3 ms					

LOWER SPINE ACCELERATION

LATERAL (P) ¹	86.3 g	@	41.9 ms	40.4 g	@	68.1 ms
LATERAL (R) ¹	85.7 g	@	41.9 ms	40.1 g	@	67.5 ms

LEFT UPPER RIB ACCELERATION

LATERAL (P)	80.1 g	@	41.9 ms	13.6 g	@	90.0 ms
LATERAL (R)	78.5 g	@	41.9 ms	12.8 g	@	90.0 ms

LEFT LOWER RIB ACCELERATION

LATERAL (P)	90.2 g	@	41.2 ms	17.3 g	@	61.2 ms
LATERAL (R)	89.8 g	@	41.2 ms	16.0 g	@	61.9 ms
TTI d (P)	88					
TTI d (R)	88					

PELVIS ACCELERATION

LATERAL	120 g	@	34.4 ms	20 g	@	66.9 ms
---------	-------	---	---------	------	---	---------

POSITIVE DIRECTION

LONGITUDINAL: REARWARD
LATERAL: RIGHTWARD
VERTICAL: UPWARD

NEGATIVE DIRECTION

LONGITUDINAL: FORWARD
LATERAL: LEFTWARD
VERTICAL: DOWNWARD

¹See DATA ACQUISITION EXPLANATION

Table 11 Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	<u>Driver #016</u>	<u>Passenger #268</u>
Head	None	C-pillar
Chest	None	None
Abdomen	None	None
Left Knee	Left front door inner panel	Left rear door inner panel
Right Knee	None	None

Door Opening:

	<u>Left</u>	<u>Right</u>
Front	NA	Easy
Rear	NA	Easy

<u>MDB distance from</u>	<u>Horizontal</u>	<u>Vertical</u>
<u>target impact point:</u>	0.4 inches rearward	0.2 inches downward

Seat Movement:

	<u>Seat Back Failure</u>	<u>Seat Shift</u>
Front	None	None
Rear	None	None

Pillar Performance: No separation

Sill Separation: No separation

Glazing Damage: Both of the left side windows shattered on impact.

Other Notable Impact Effects: None

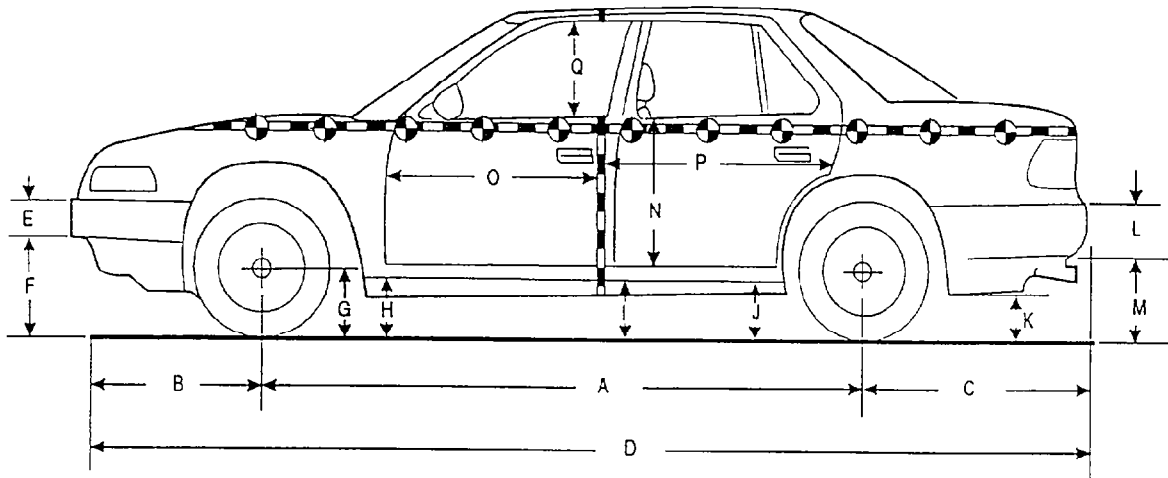
Section 4.0

Vehicle, Occupant, and Camera Measurements

Figure 6 Pre-Test and Post-Test Measurements

Vehicle: 1995 Hyundai Sonata 4-door sedan

Test Date: 10/12/94 NHTSA No.: CS0503



LEFT SIDE VIEW

	Pre-Test	Post-Test	Change		Pre-Test	Post-Test	Change
A	106.3	103.2	3.1	J	8.5	8.9	-0.4
B	37.8	37.6	0.2	K	10.4	10.7	-0.3
C	40.5	40.3	0.2	L	9.2	9.2	0.0
D	188.5	182.9	5.6	M	11.8	12.0	-0.2
E	8.7	8.7	0.0	N	25.0	21.4	3.6
F	9.5	11.1	-1.6	O	28.0	27.2	0.8
G	11.3	11.3	0.0	P	52.6	50.0	2.6
H	8.3	9.2	-0.9	Q	16.0	15.8	0.2
I	8.5	10.5	-2.0				

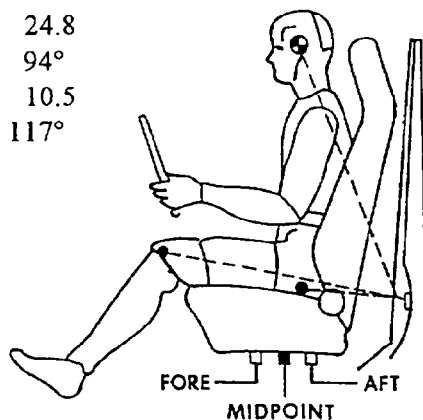
All distance measurements are in inches.

Figure 7 Dummy and Seat Positioning Data

Vehicle: 1995 Hyundai Sonata 4-door sedan
 Seat Type: Bucket
 Adjuster Type: Manual
 Bucket Seat Back type: Adjustable reclining
 Technicians: R. Benavides and B. Crabtree
 Positioning Date: 10/12/94
 Ambient Temperature: 76° F
 Positioning Time: 1430

Driver Dummy¹ #016; Type: SID

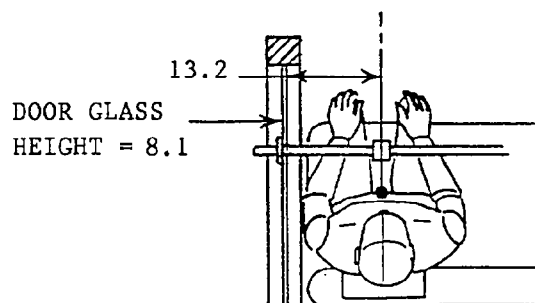
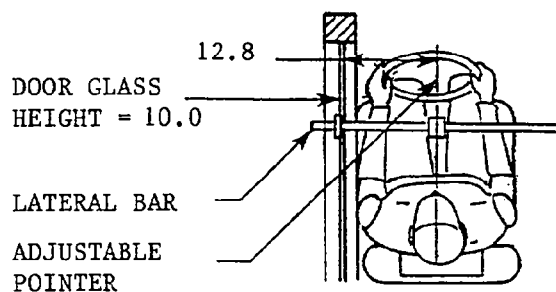
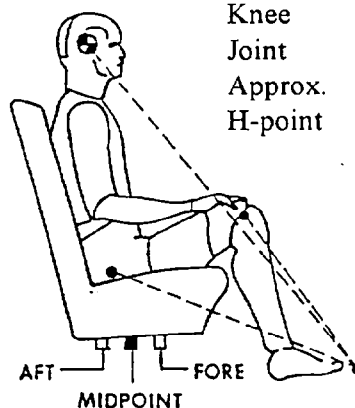
Head 19.3
 Target 3°
 Knee 24.8
 Joint 94°
 Approx. 10.5
 H-point 117°



Left Rear

Passenger Dummy² #268; Type SID

Head 53.7
 Target 47°
 Knee 21.0
 Joint 44°
 Approx. 31.4
 H-point 67°



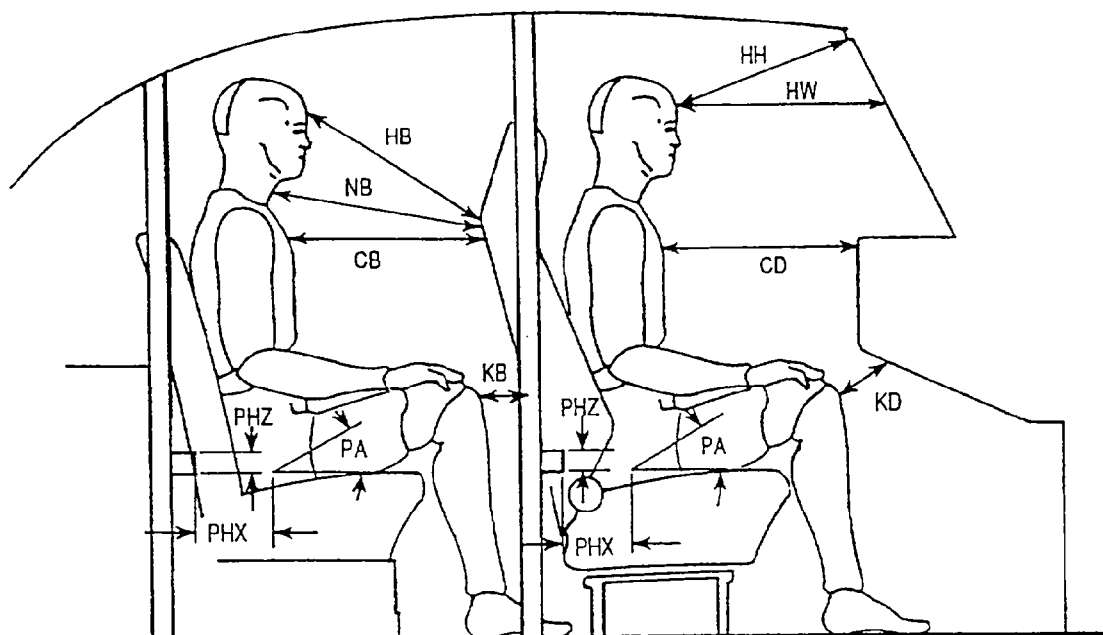
¹ Driver dummy measurements are referenced to top of front door striker.

² Passenger dummy measurements are referenced to the driver's seat left rear anchor bolt.

All distance measurements are in inches.

All angles are referenced to vertical.

Figure 8 Dummy Longitudinal Clearance Measurements



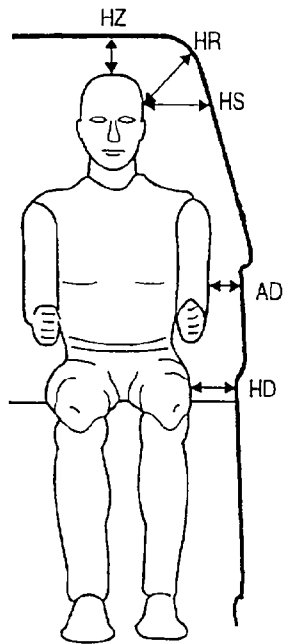
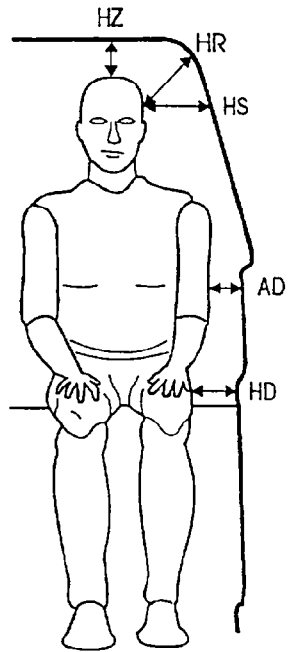
	Driver	Left Rear Passenger
HH	16.0	NA
HW	22.6	NA
CD	23.5	NA
CS	15.3	NA
KDL	4.5	NA
KDR	3.6	NA
PA	24°	23°
PHX	9.1	11.6
PHZ	5.1	11.7
HB	NA	28.6
NB	NA	NA
CB	NA	21.4
KBL	NA	5.2
KBR	NA	5.2

Note: For 2-door vehicles, the rear passenger's PHX and PHZ measurements are referenced to the front door striker.

All distance measurements are in inches.

All angles are referenced to horizontal.

Figure 9 Dummy Lateral Clearance Measurements



	Driver	Left Rear Passenger
HR	6.8	6.1
HS	9.8	6.1
AD	5.0	4.8
HD	6.9	7.2
HZ	4.1	3.0

All distance measurements are in inches.

Figure 10 Camera Positions

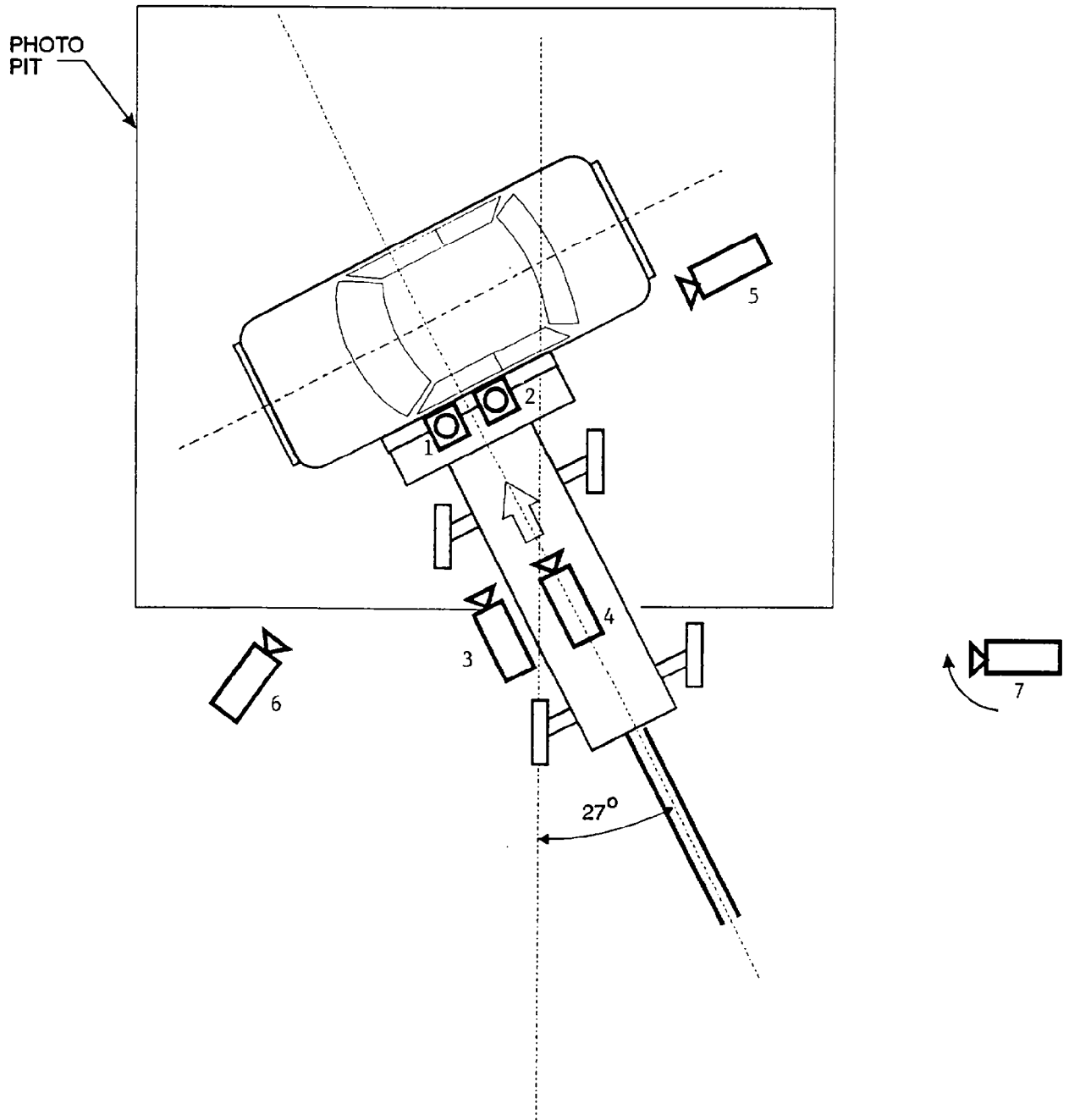


Table 12 Camera Information

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose of Camera Data
1	Overhead wide	Photosonic	8.5	500	Vehicle crush
2	Overhead tight	Photosonic	25	512	Vehicle crush
3	Moving barrier tight	Photosonic	25	498	Impact alignment
4	Moving barrier center	Photosonic	13	495	Impact alignment
5	Right wide	Photosonic	13	498	Vehicle crush
6	Left medium tight	Photosonic	25	500	Vehicle crush
7	Right panning	Beaulieu	120	24	Vehicle dynamics
8	Documentation	Beaulieu	120	24	Real-time documentation

Appendix A

Photographs

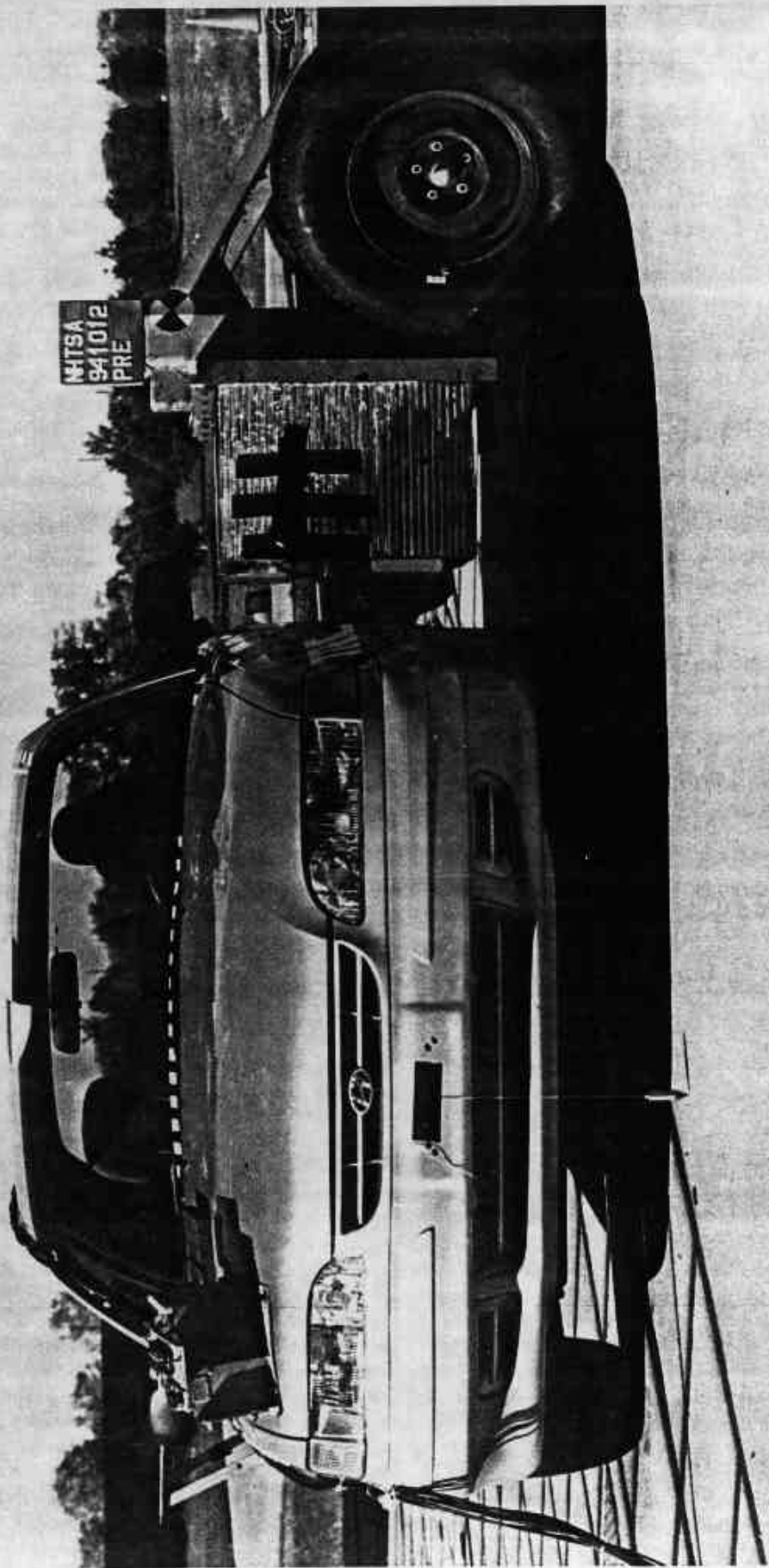


Figure A-1 Pre-test Front View
A-2

941012

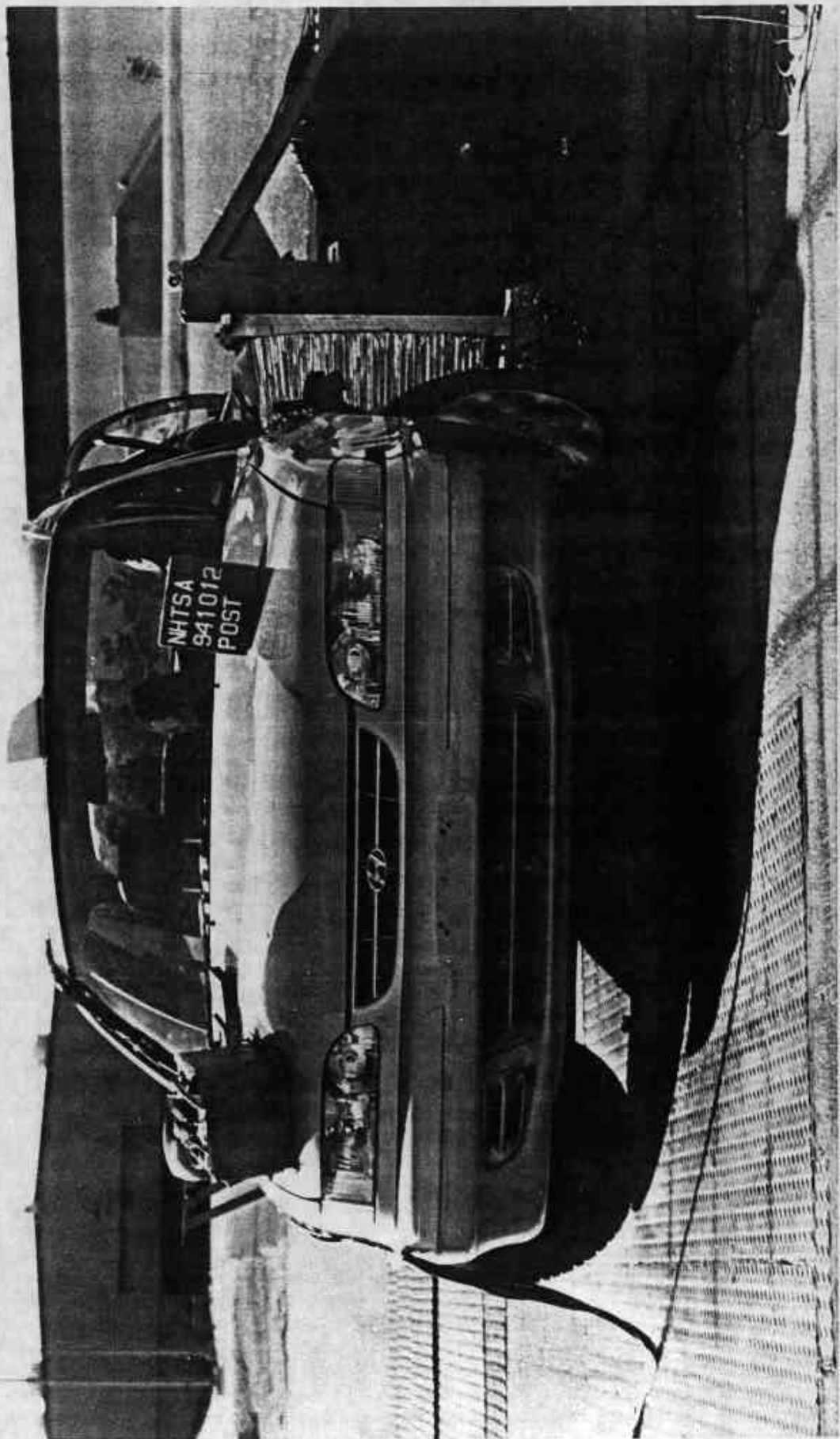


Figure A-2 Post-test Front View
A-3

941012

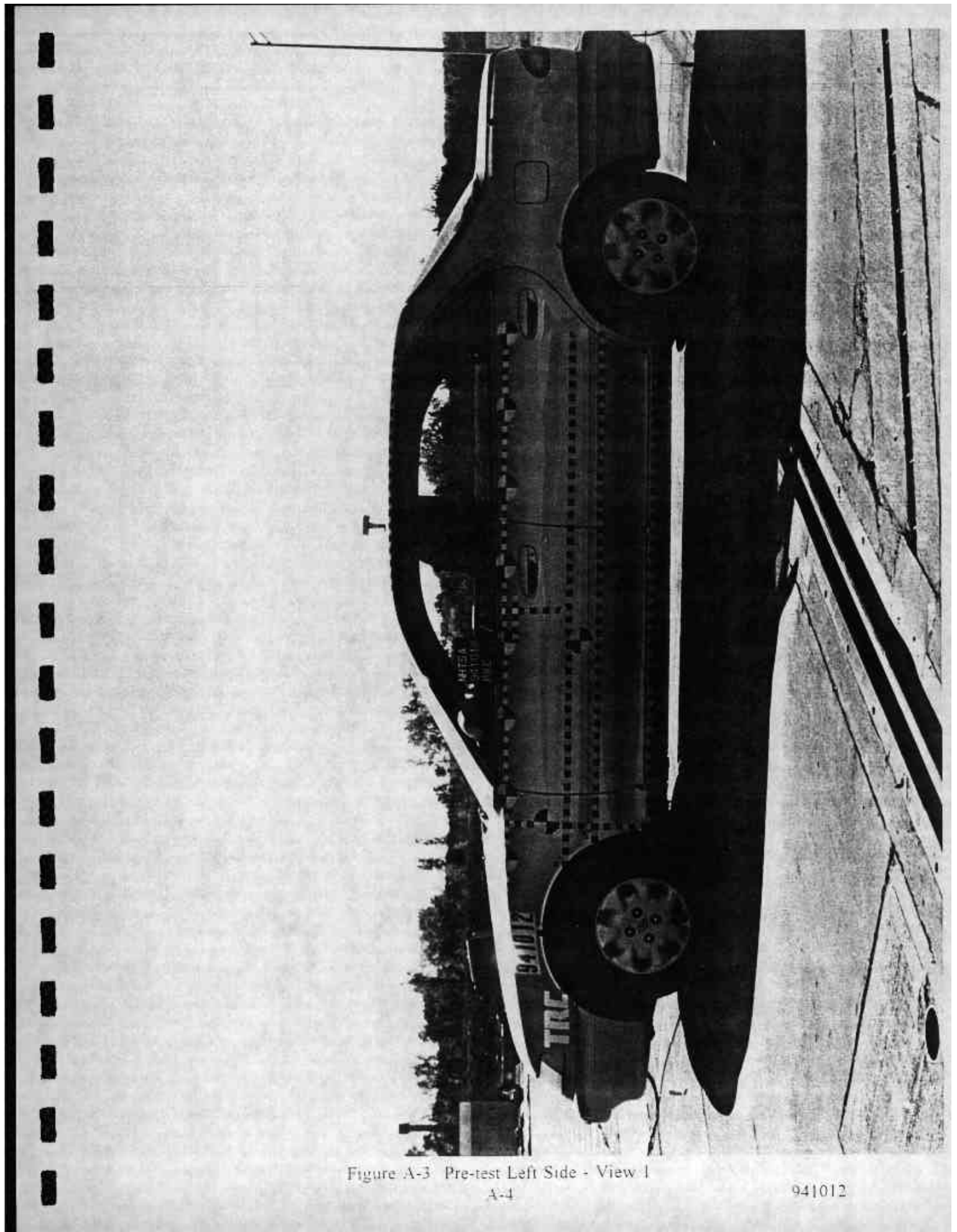


Figure A-3 Pre-test Left Side - View 1
A-4

941012

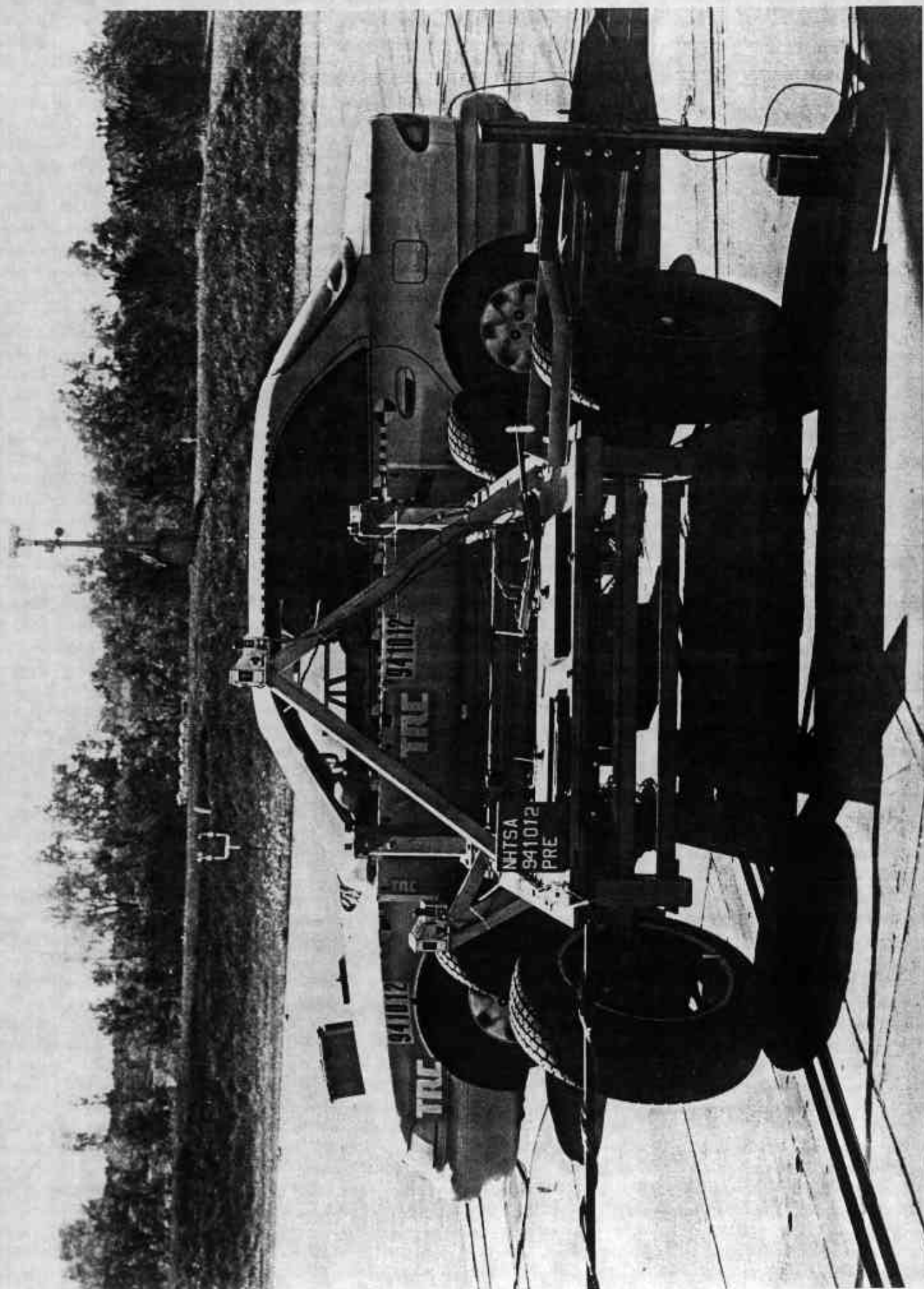


Figure A-4 Pre-test Left Side - View 2
A-5

941012

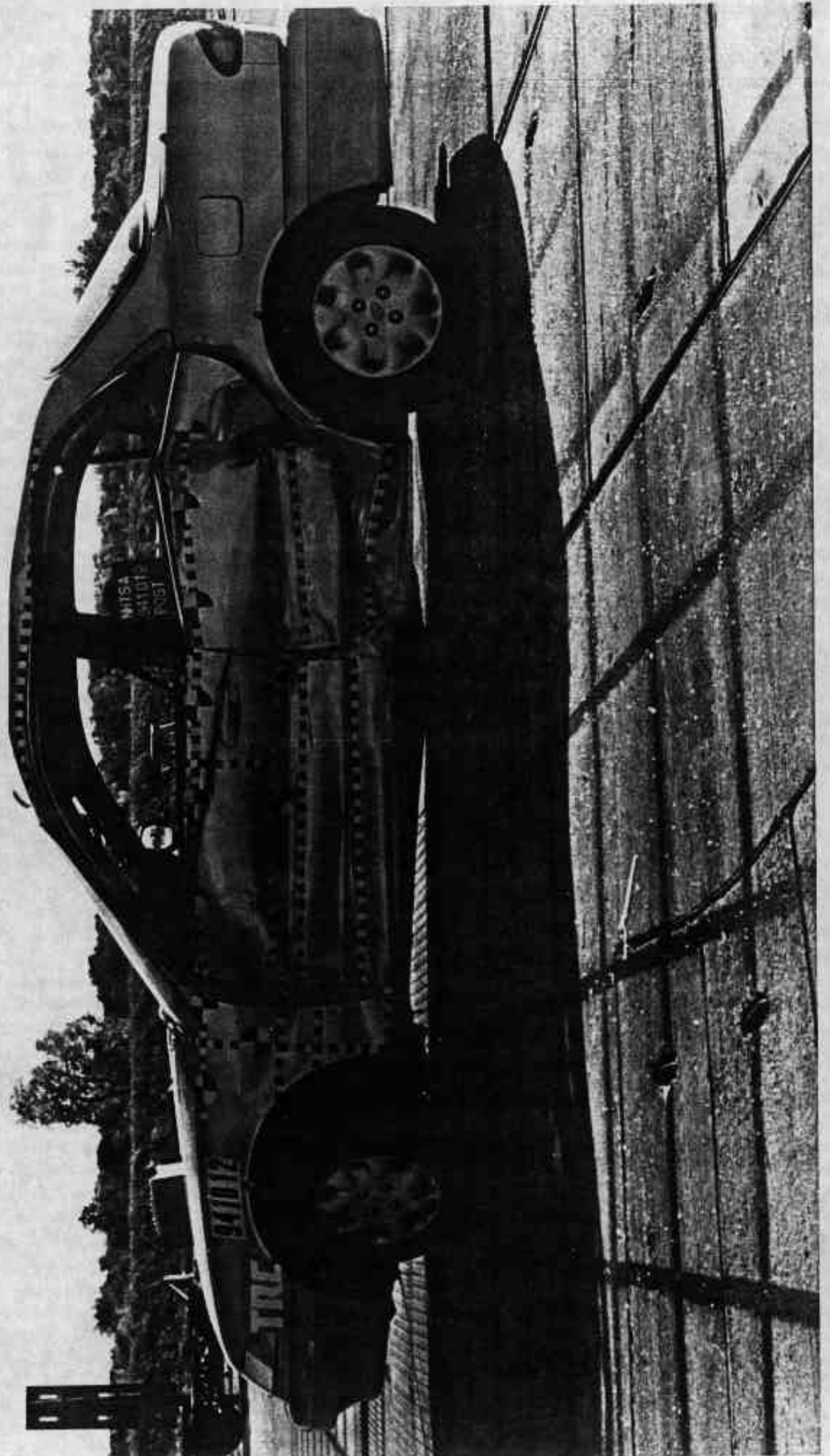


Figure A-5 Post-test Left Side - View 1
A-6

941012

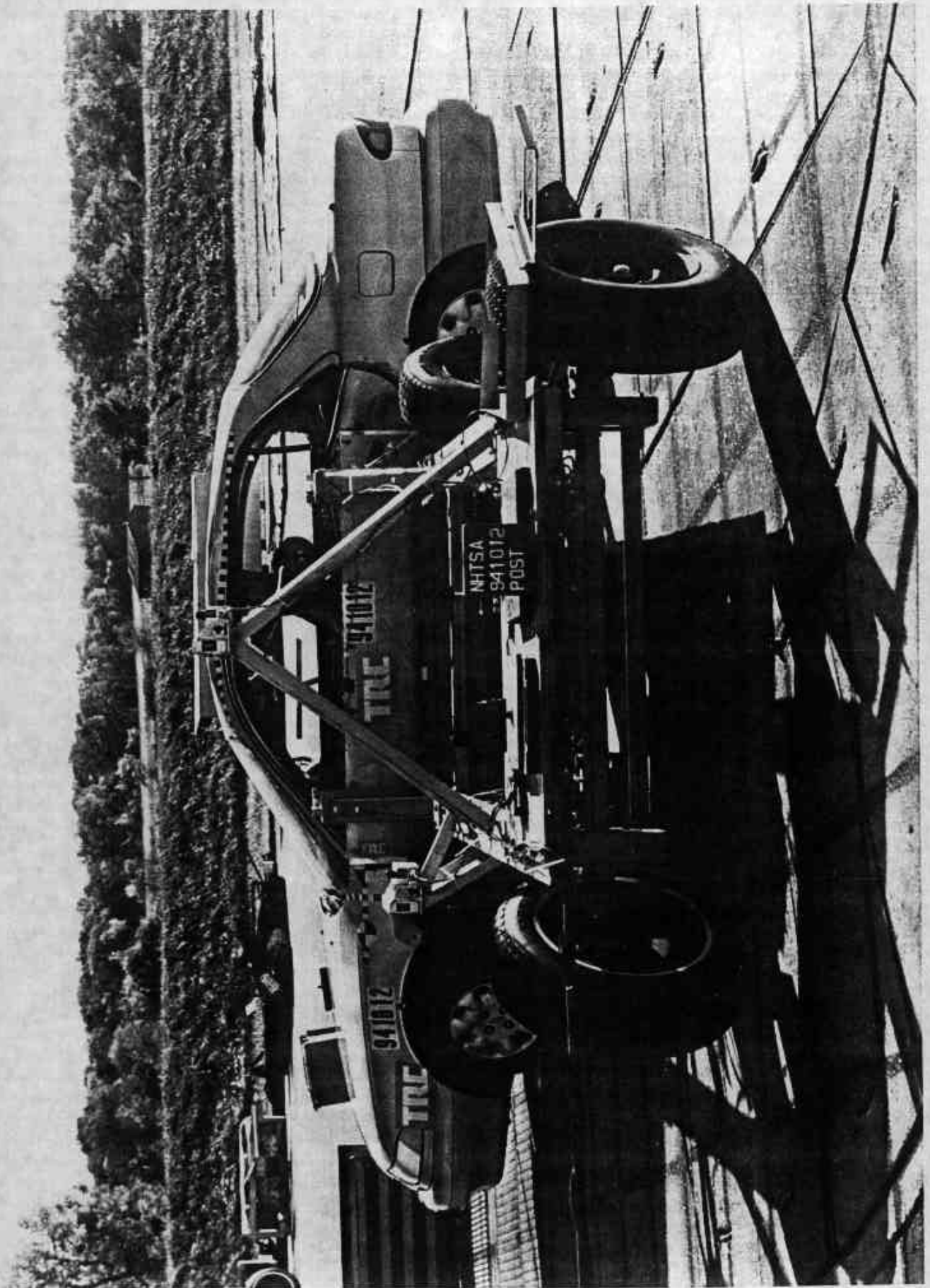


Figure A-6 Post-test Left Side - View 2

A-7

941012

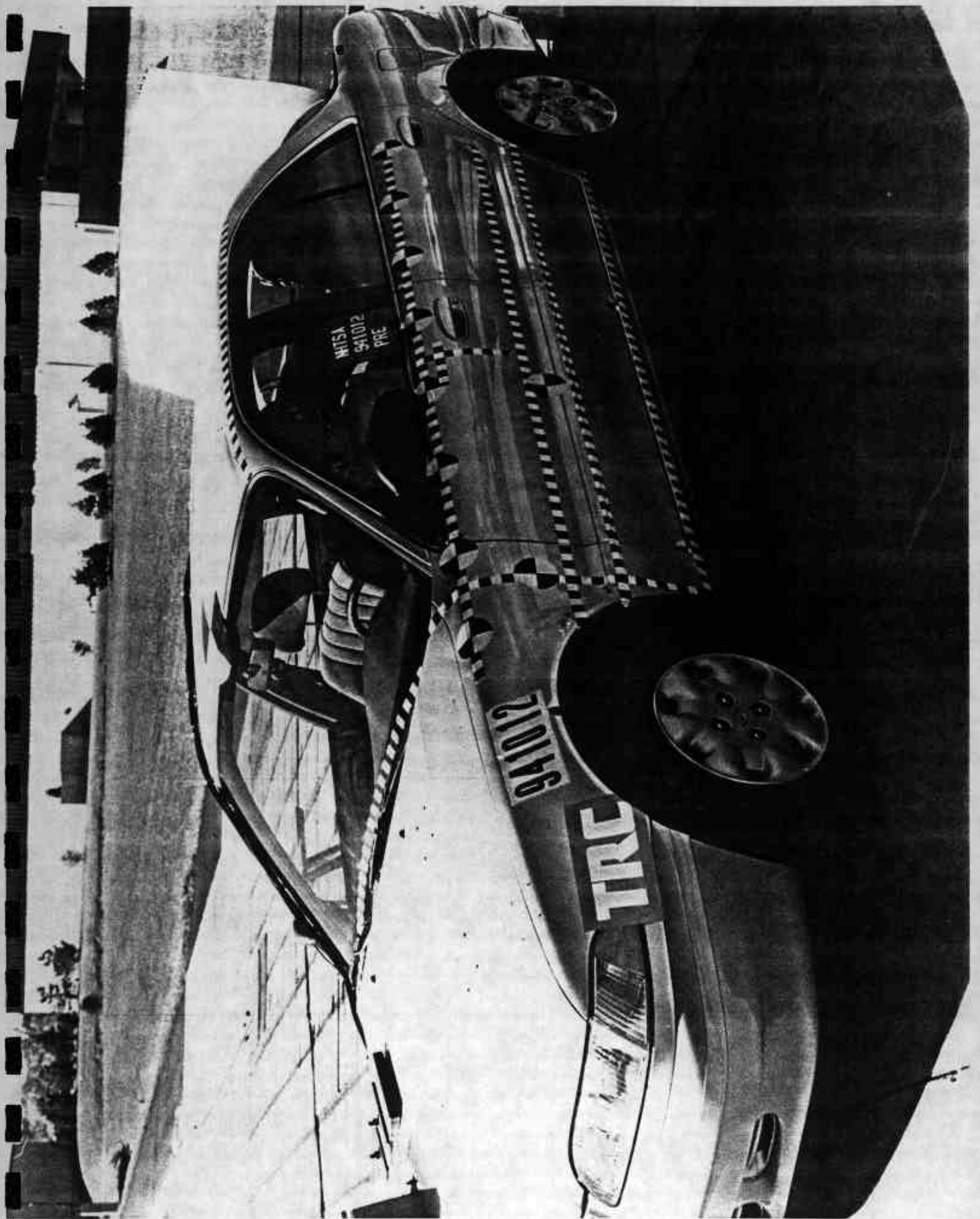


Figure A-7 Pre-test Left Front View
A-8

941012

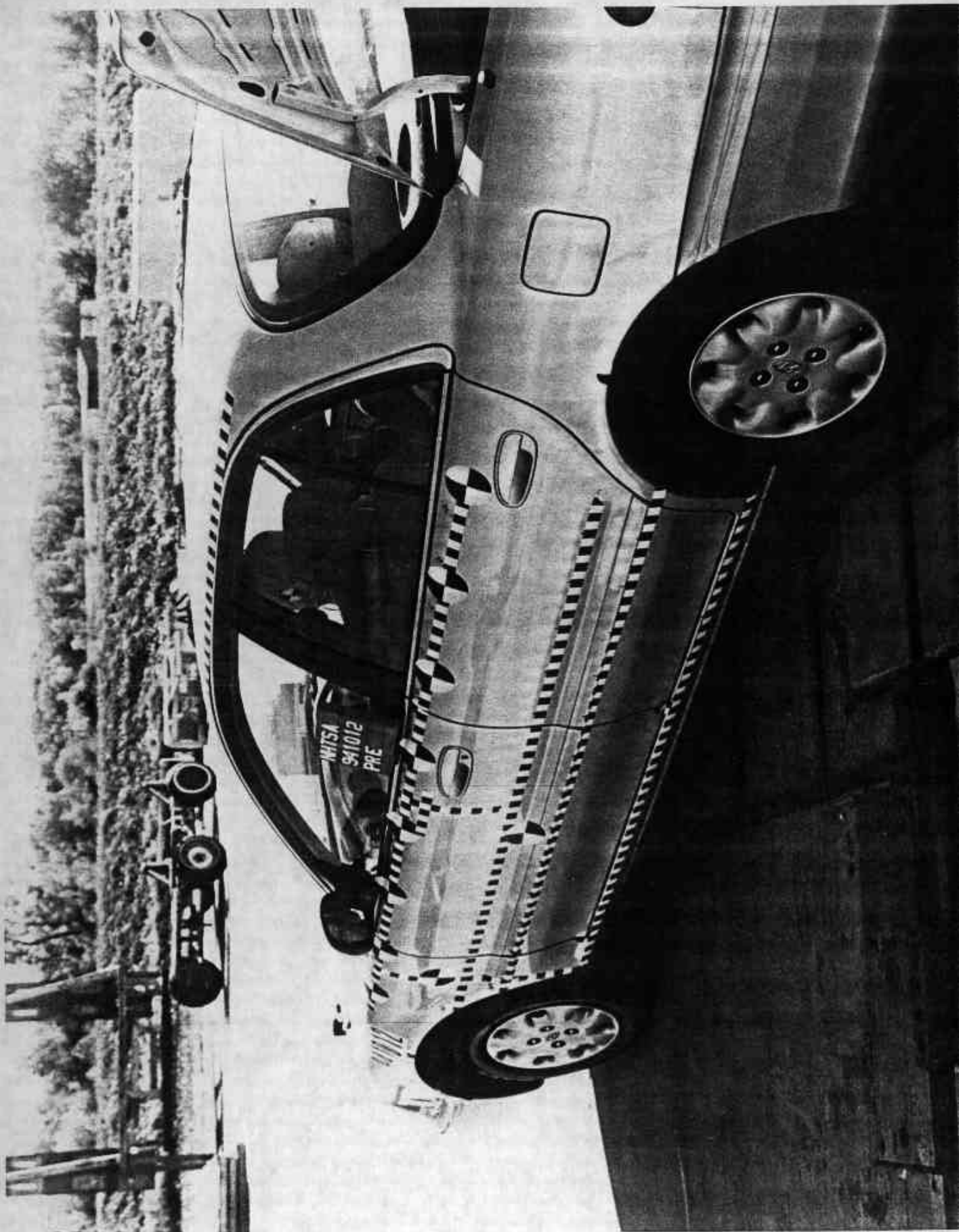


Figure A-8 Pre-test Left Rear View
A-9

941012

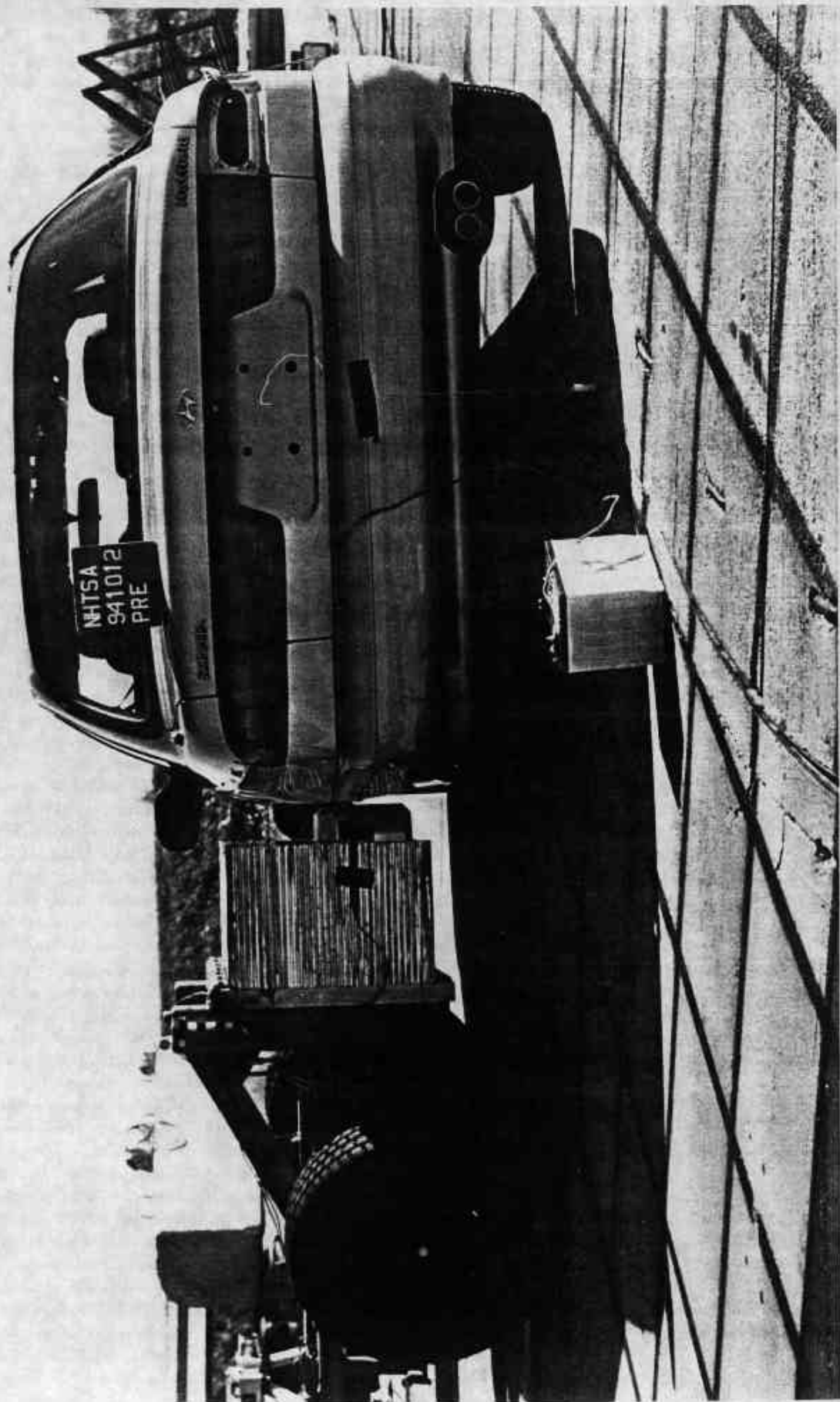


Figure A-9 Pre-test Rear View
A-10

941012



Figure A-10 Post-test Rear View
A-11

941012

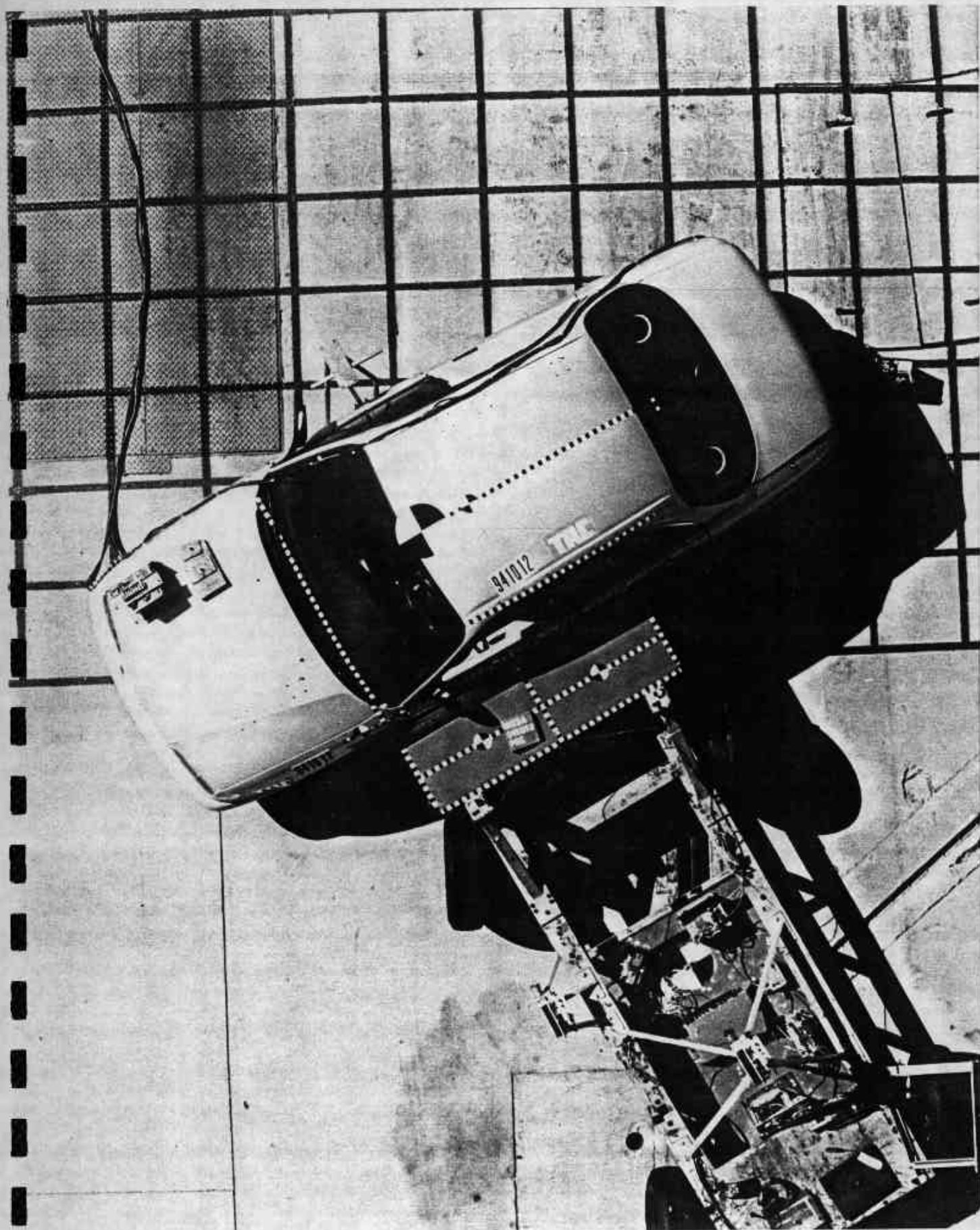


Figure A-11 Pre-test Overhead View
A-12

941012

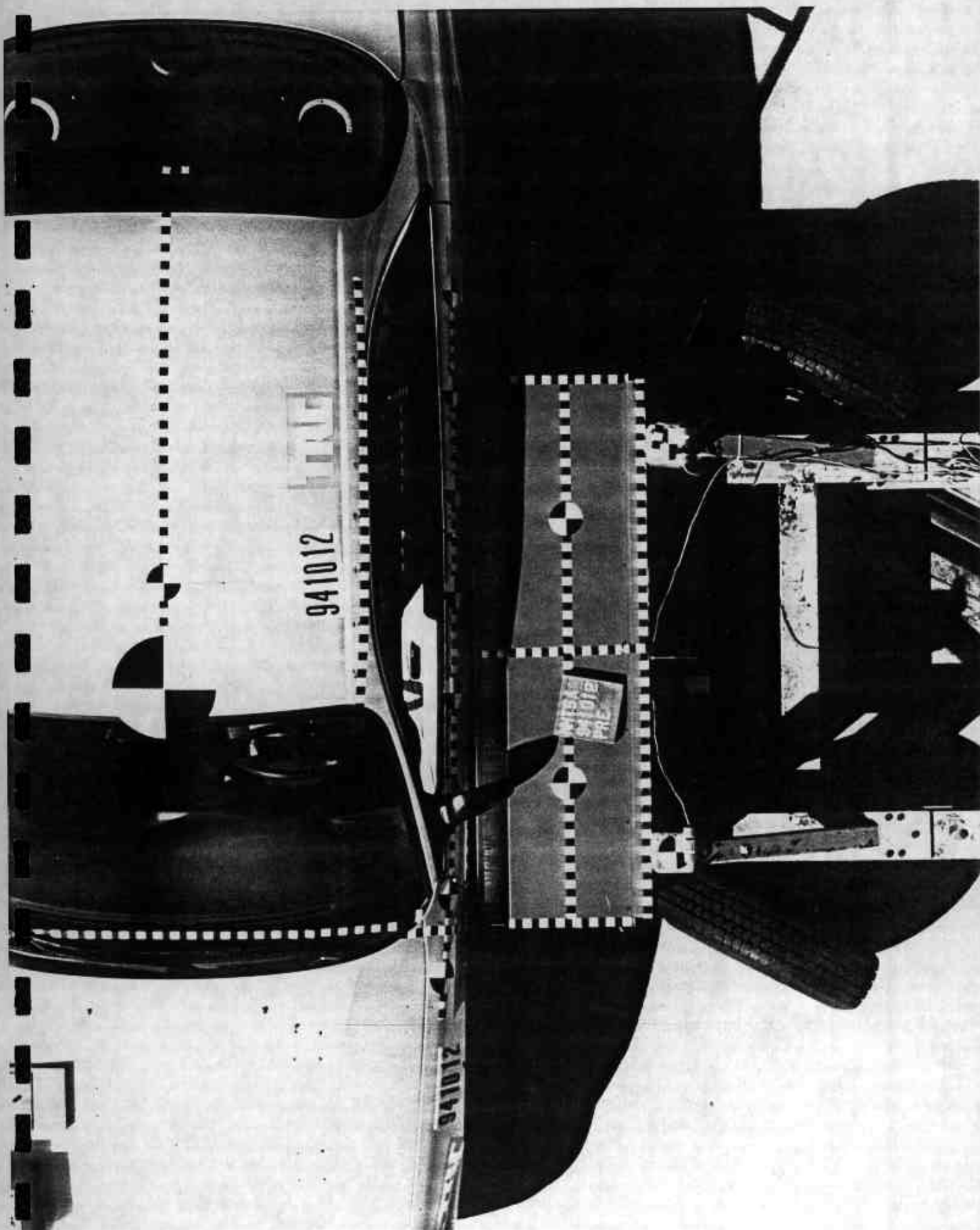


Figure A-12 Pre-test Overhead Close-up View
A-13

941012



Figure A-13 Pre-test Driver Dummy Position - View 1

A-14

941012



Figure A-14 Post-test Driver Dummy Position - View 1
A-15

941012

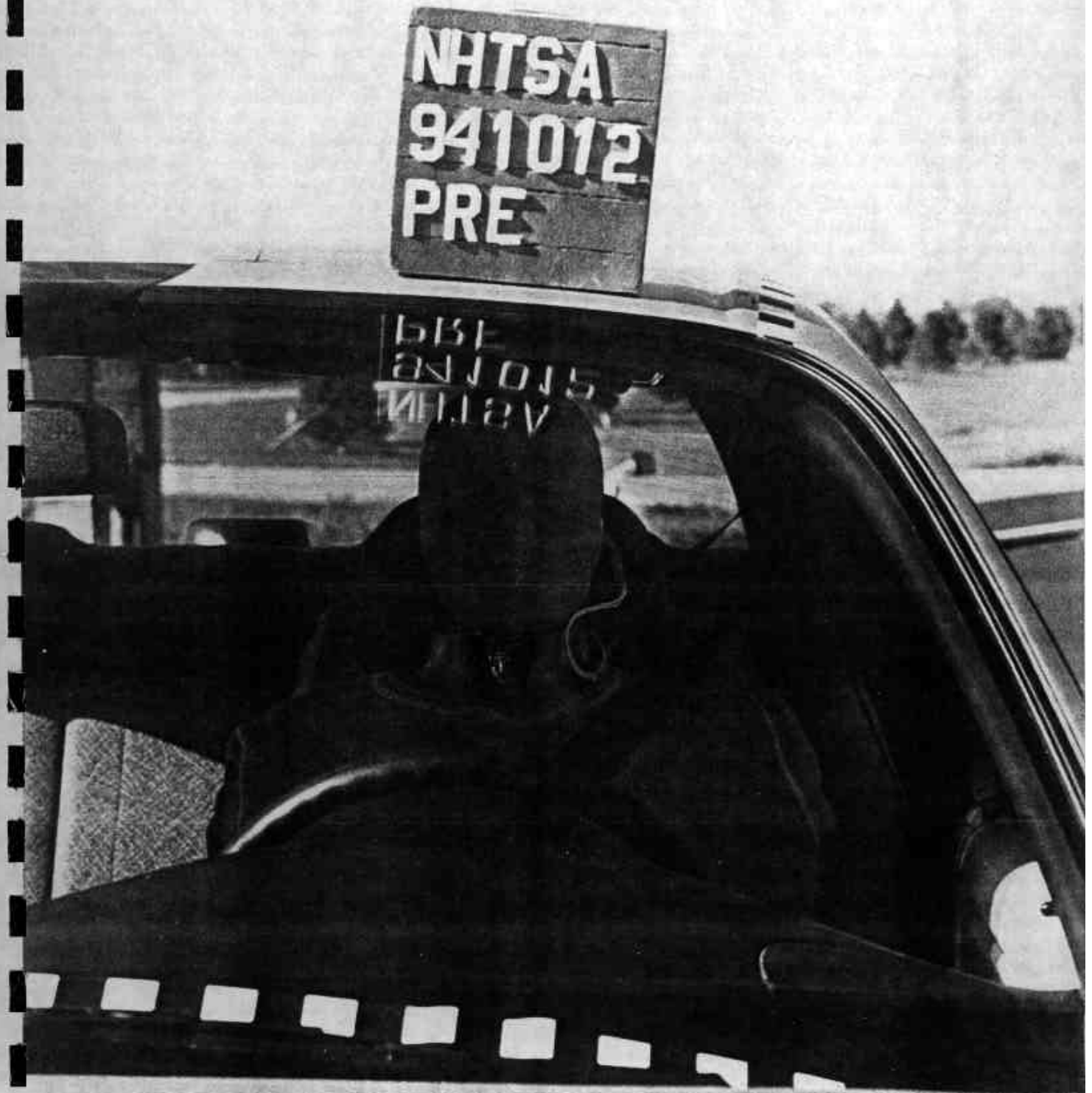


Figure A-15 Pre-test Driver Dummy Position - View 2
A-16

941012



Figure A-16 Post-test Driver Dummy Position - View 2
A-17

941012

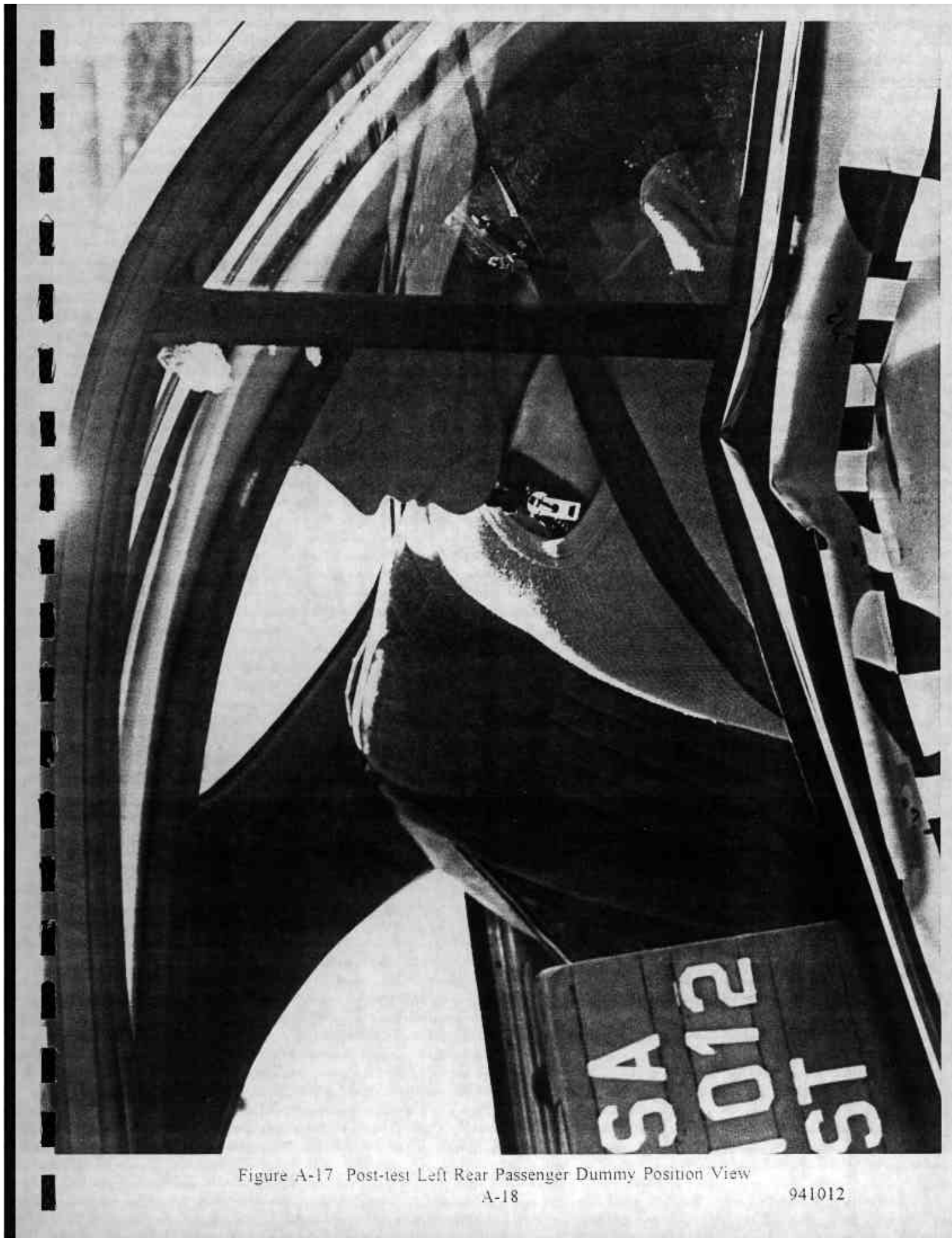


Figure A-17 Post-test Left Rear Passenger Dummy Position View
A-18

941012

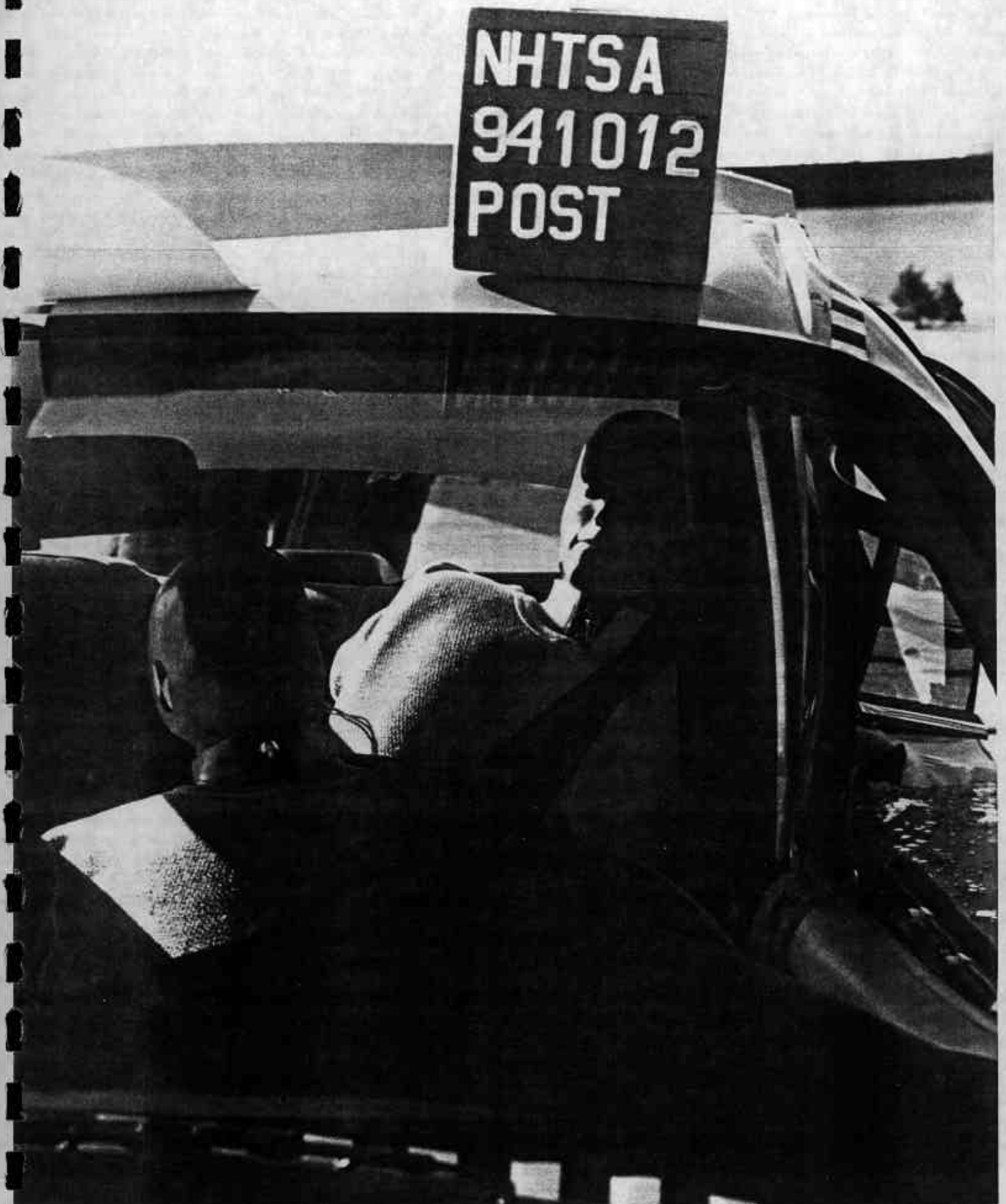


Figure A-18 Post-test Driver and Passenger Dummy Position View
A-19

941012



Figure A-19 Pre-test Driver Dummy to Door Clearance View
A-20

941012

NHTSA
941012
PRE

Figure A-20 Pre-test Passenger Dummy to Door Clearance View
A-21

941012

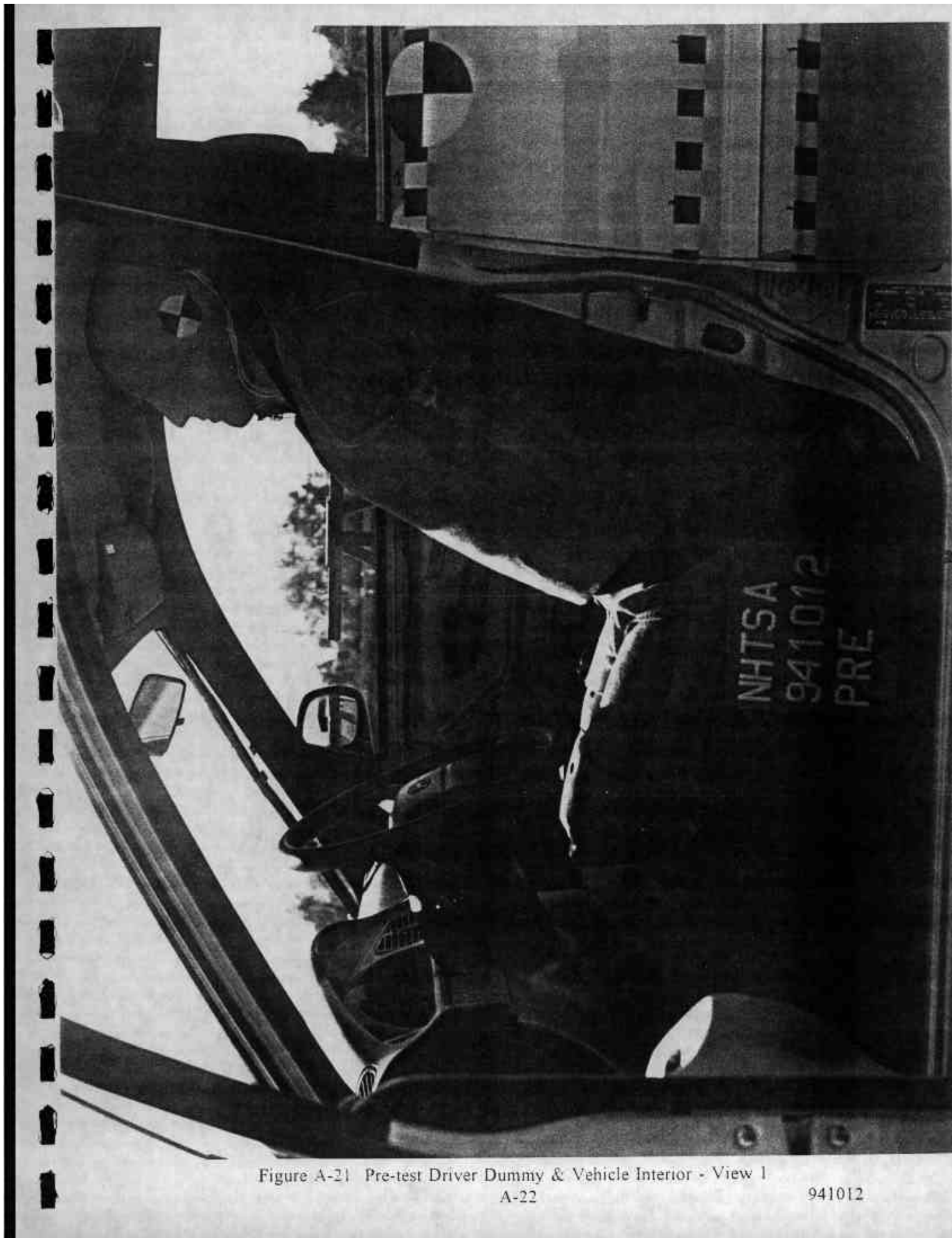


Figure A-21 Pre-test Driver Dummy & Vehicle Interior - View 1
A-22

941012

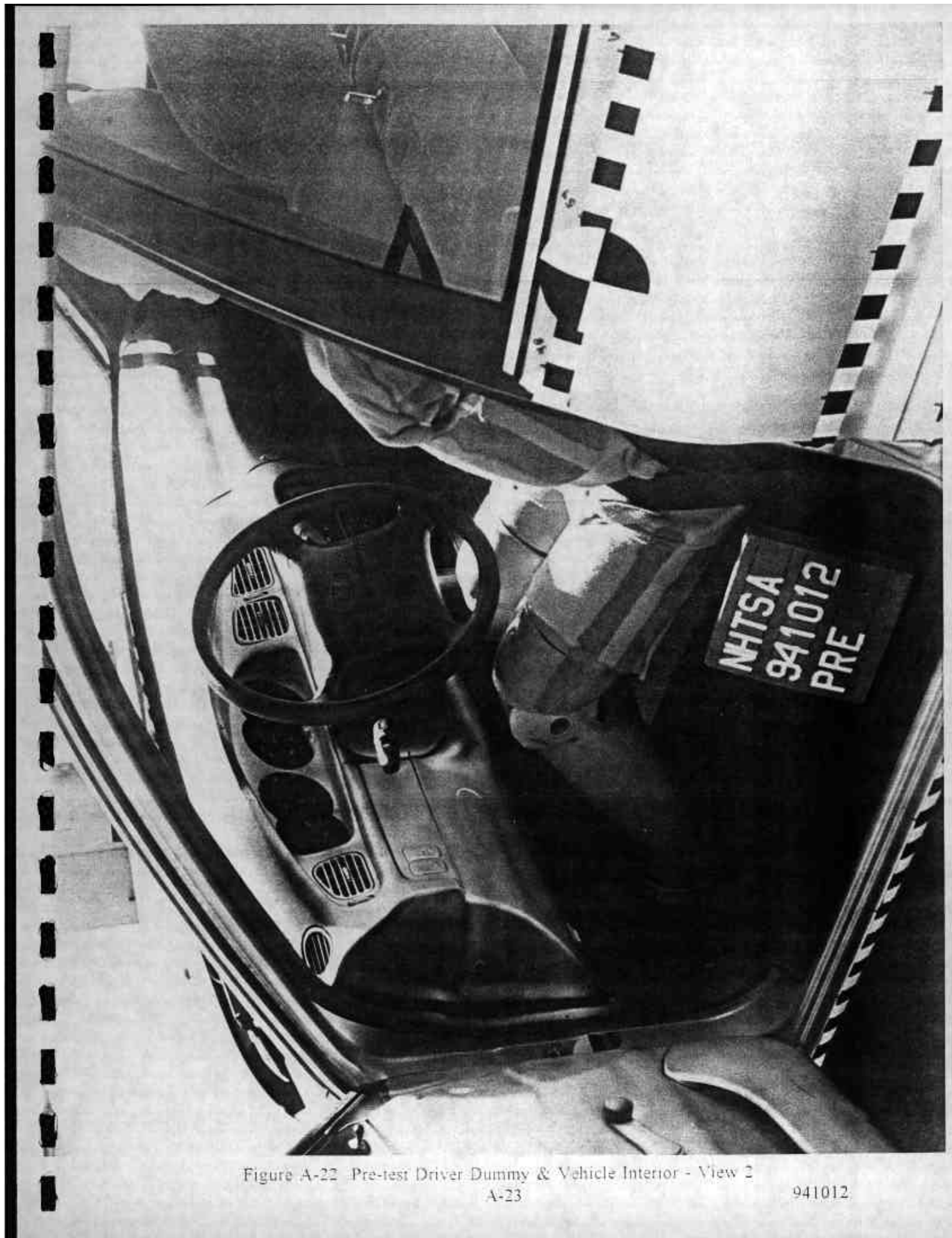


Figure A-22 Pre-test Driver Dummy & Vehicle Interior - View 2
A-23

941012



Figure A-23. Pre-test Driver Dummy & Vehicle Interior - View 3
A-24

941012

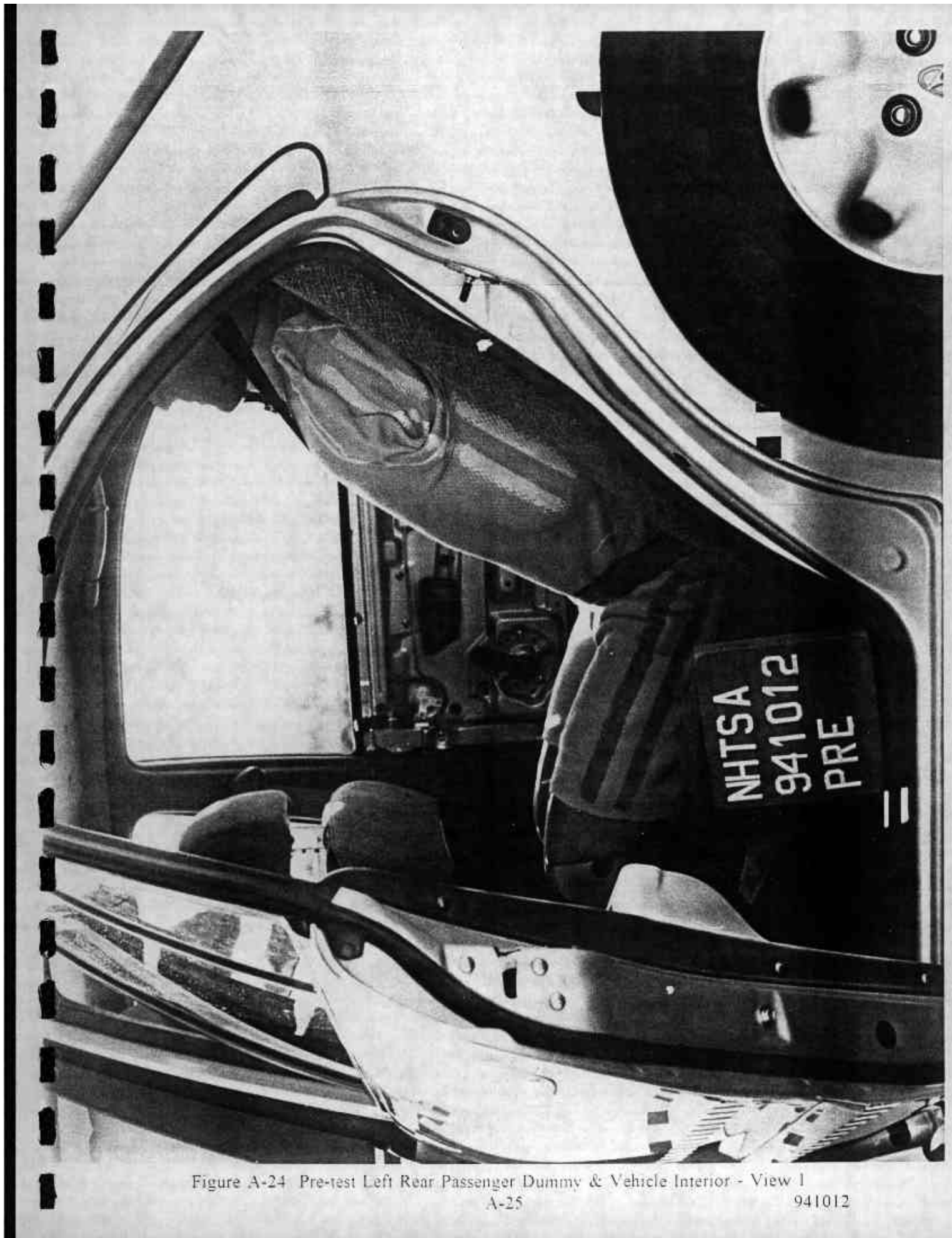


Figure A-24 Pre-test Left Rear Passenger Dummy & Vehicle Interior - View 1

A-25

941012



Figure A-25 Pre-test Left Rear Passenger Dummy & Vehicle Interior - View 2

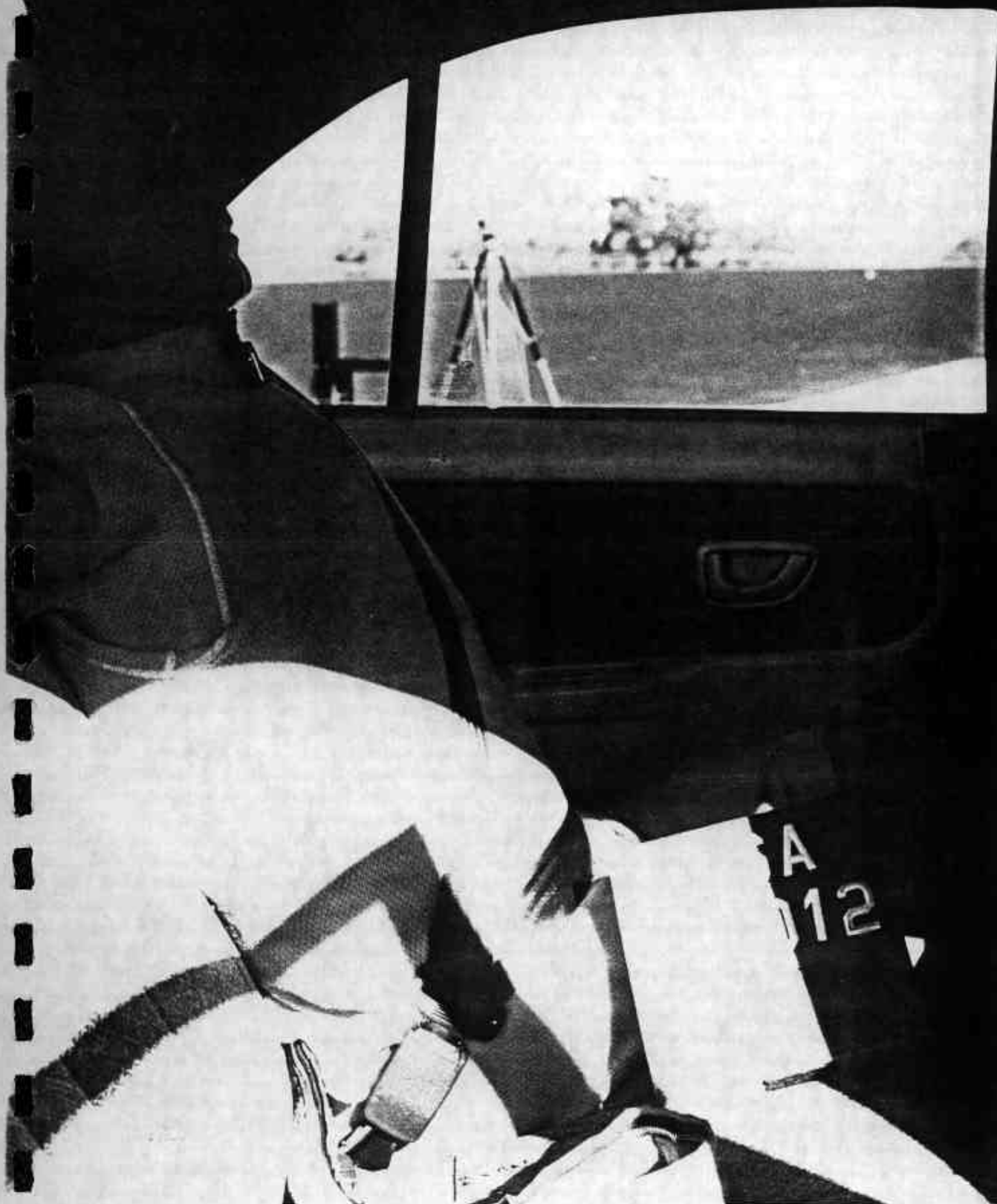


Figure A-26 Pre-test Left Rear Passenger Dummy & Vehicle Interior - View 3

A-27

941012

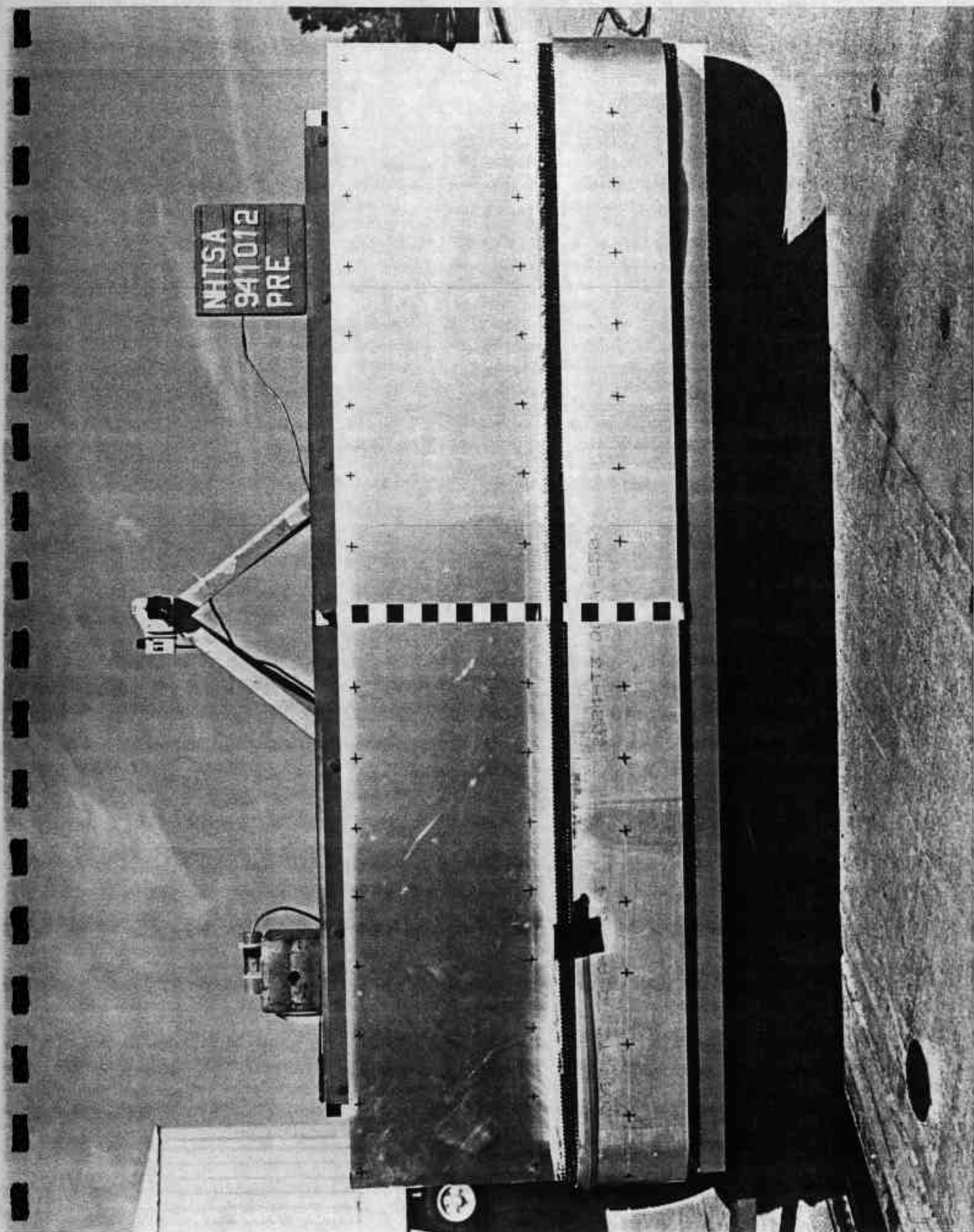


Figure A-27 Pre-test Vehicle Impactor Face - Front View
A-28

941012

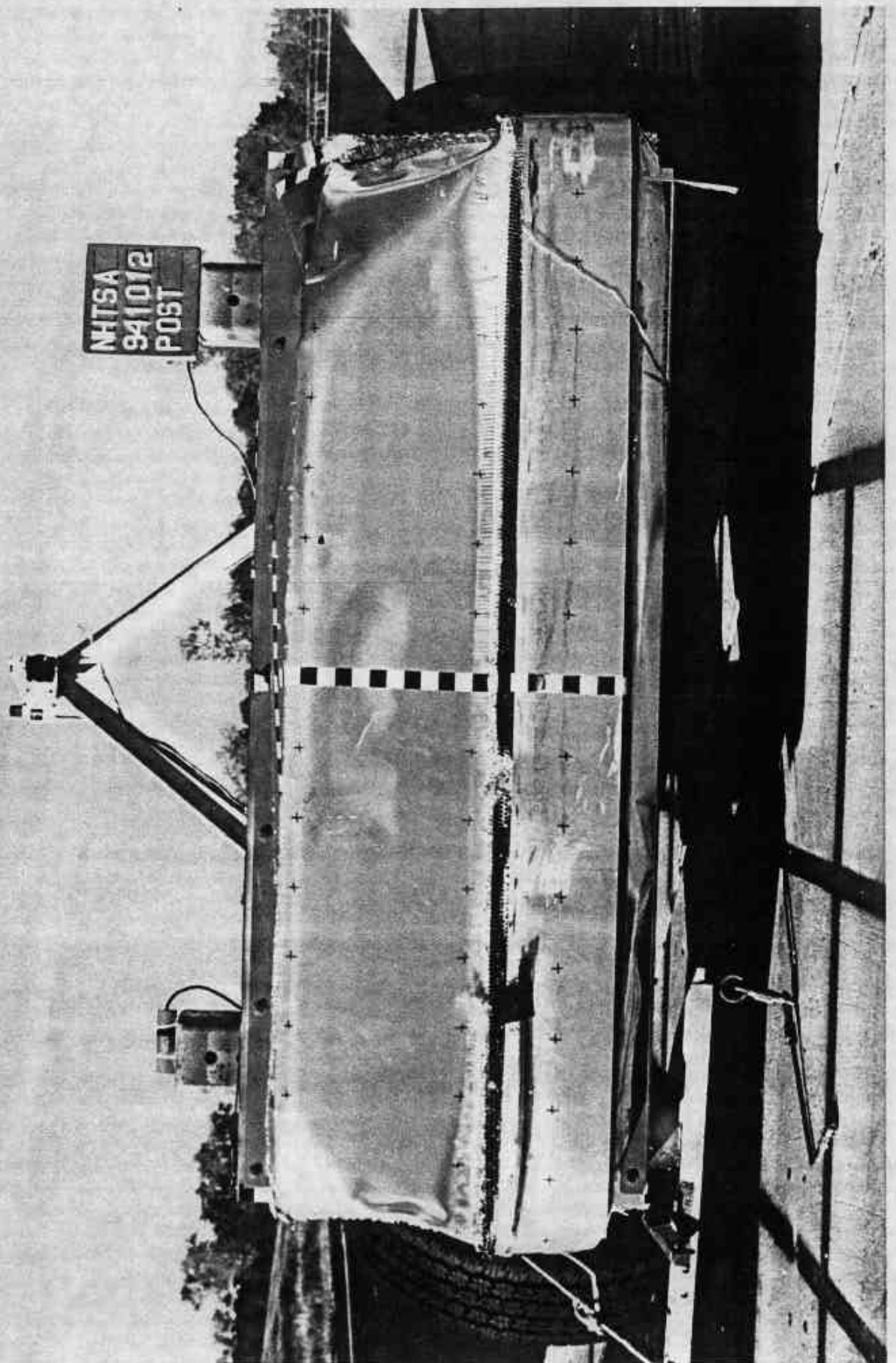


Figure A-28. Post-test Vehicle Impactor Face - Front View
A-29

941012

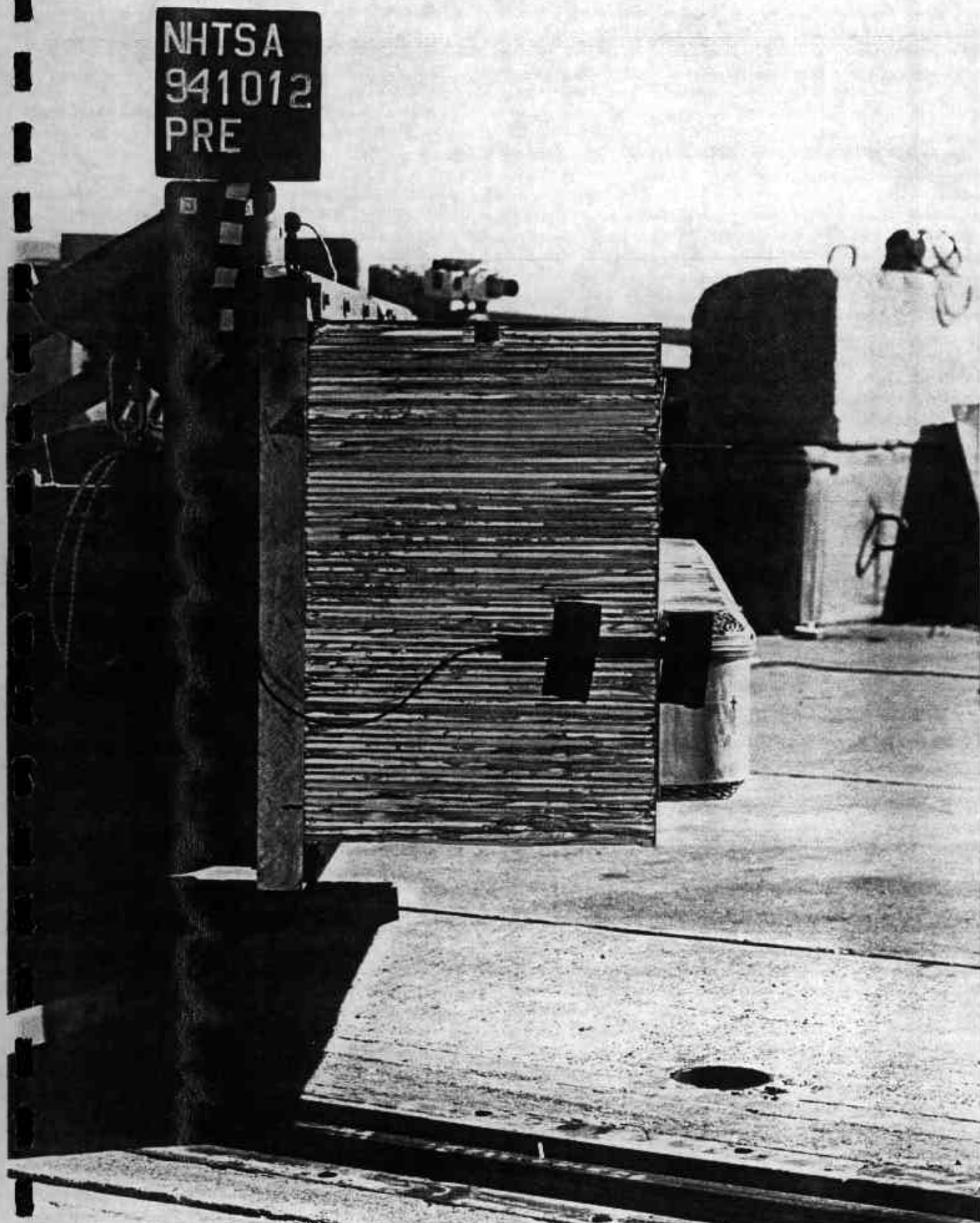


Figure A-29 Pre-test Vehicle Impactor Face - Right Side View
A-30

941012



Figure A-30 Post-test Vehicle Impactor Face - Right Side View
A-31

941012

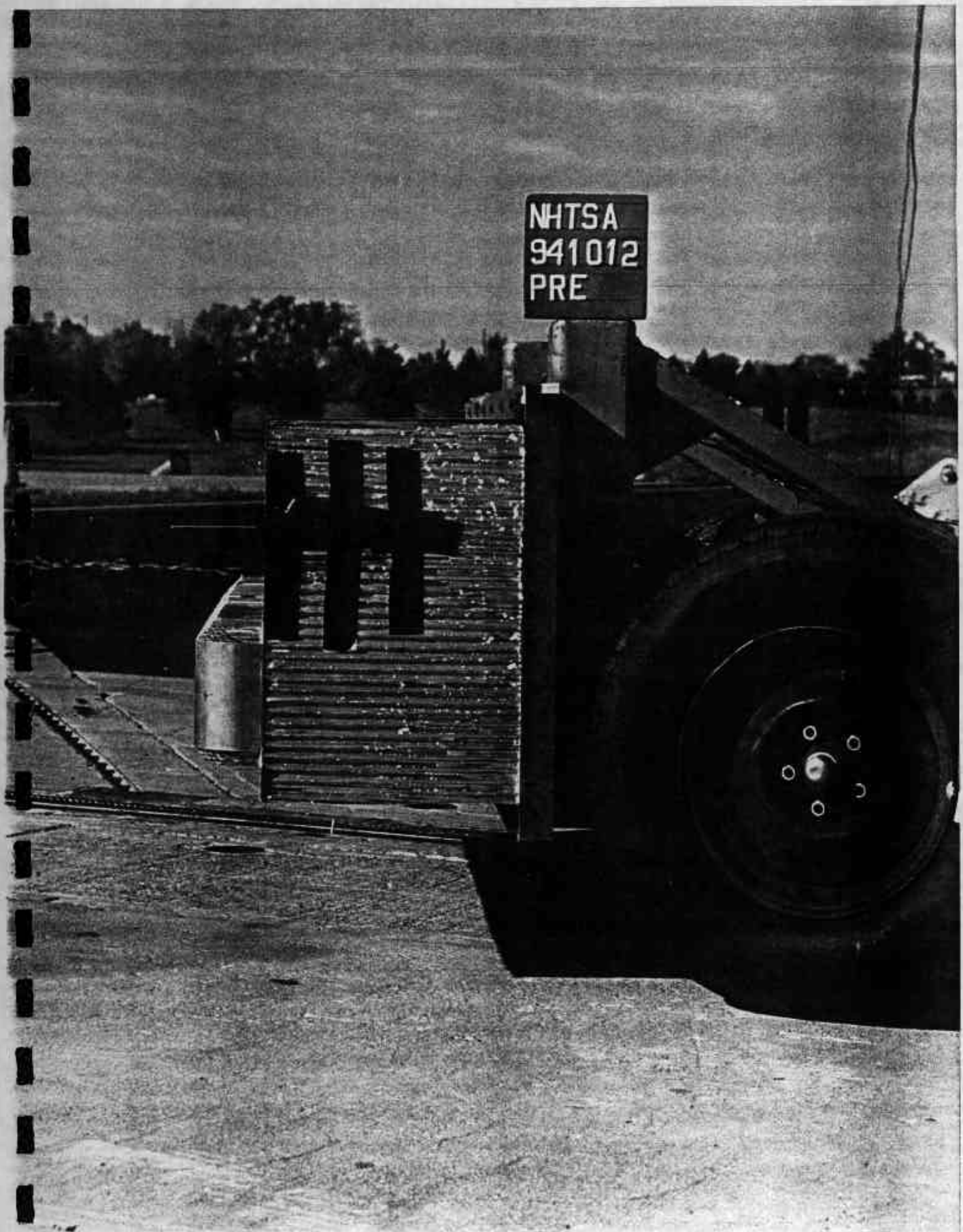


Figure A-31 Pre-test Vehicle Impactor Face - Left Side View
A-32

941012

NHTSA
941012
POST

Figure A-32 Post-test Vehicle Impactor Face - Left Side View
A-33

941012

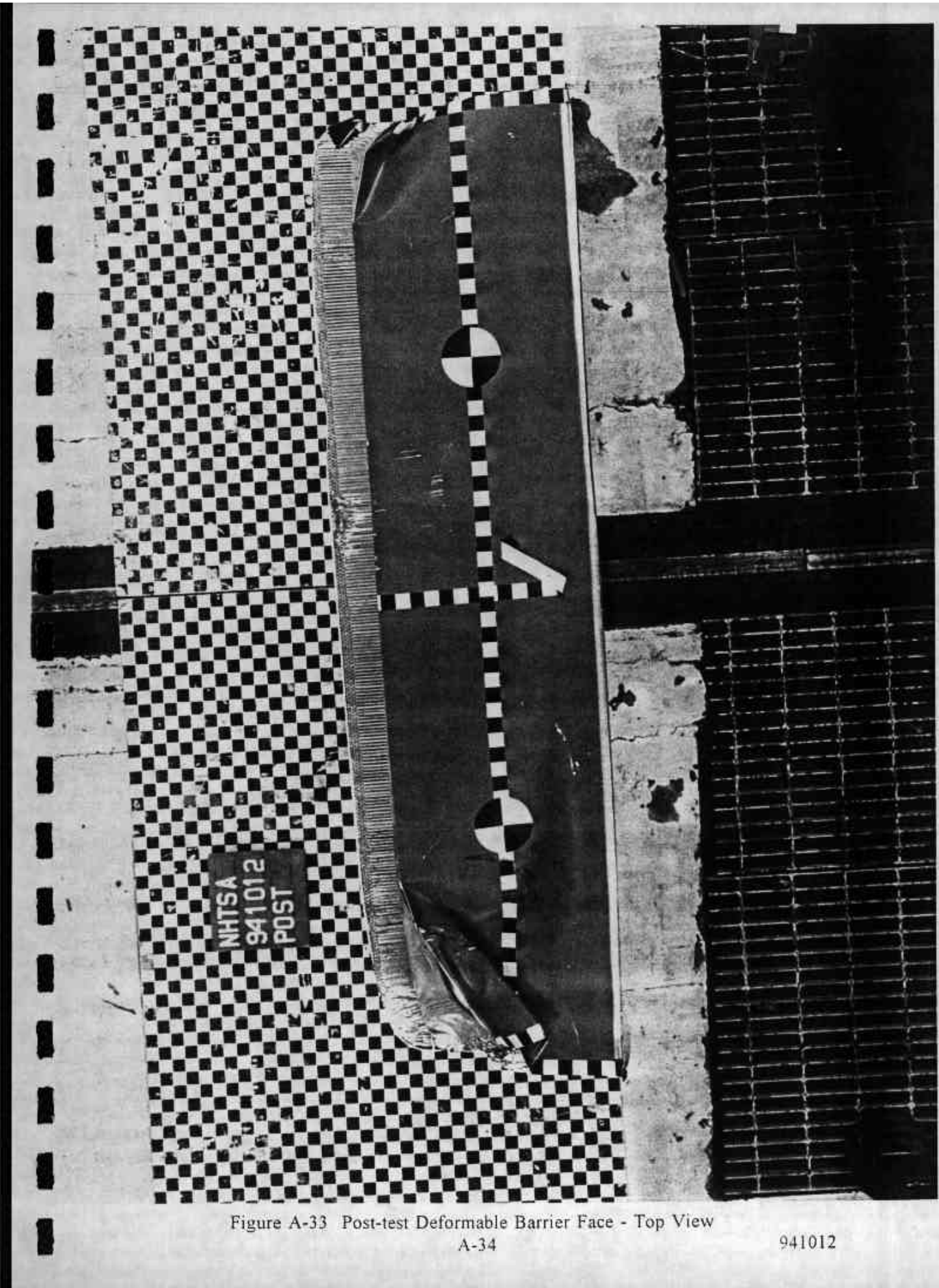


Figure A-33 Post-test Deformable Barrier Face - Top View
A-34

941012

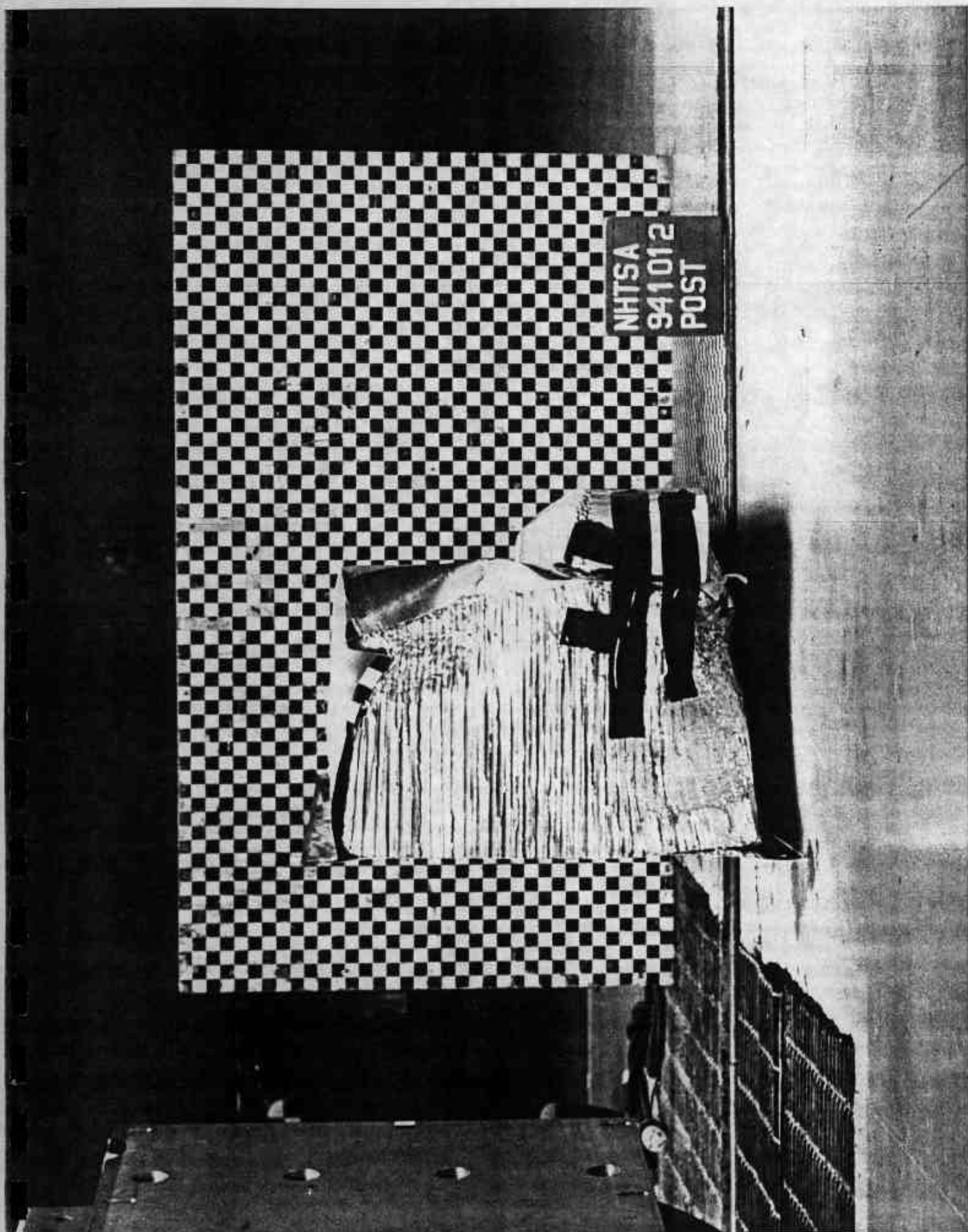


Figure A-34 Post-test Deformable Barrier Face - Right Side View
A-35

941012

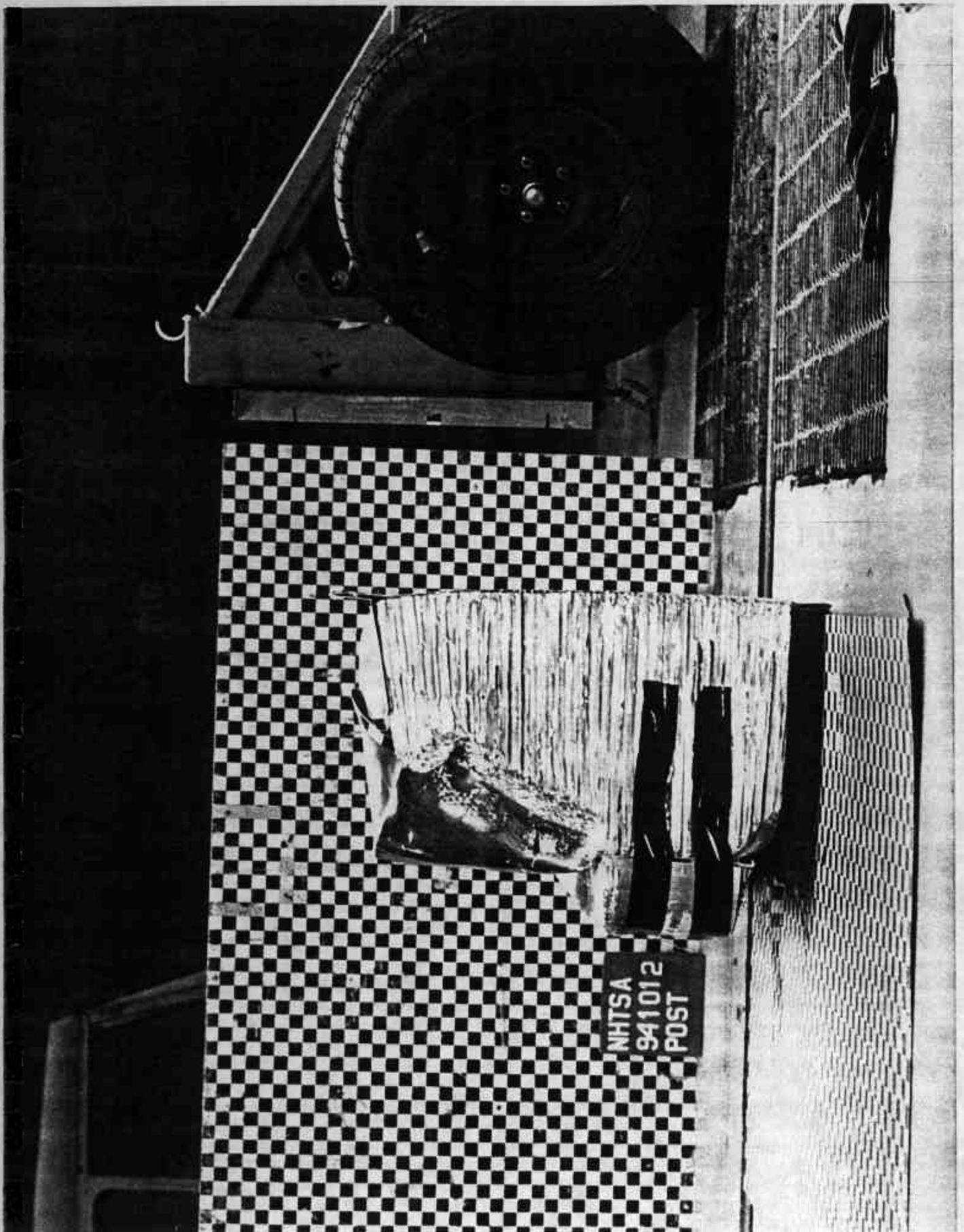


Figure A-35 Post-test Deformable Barrier Face - Left Side View
A-36

941012



Figure A-36 Pre-test Vehicle Certification Label View
A-37

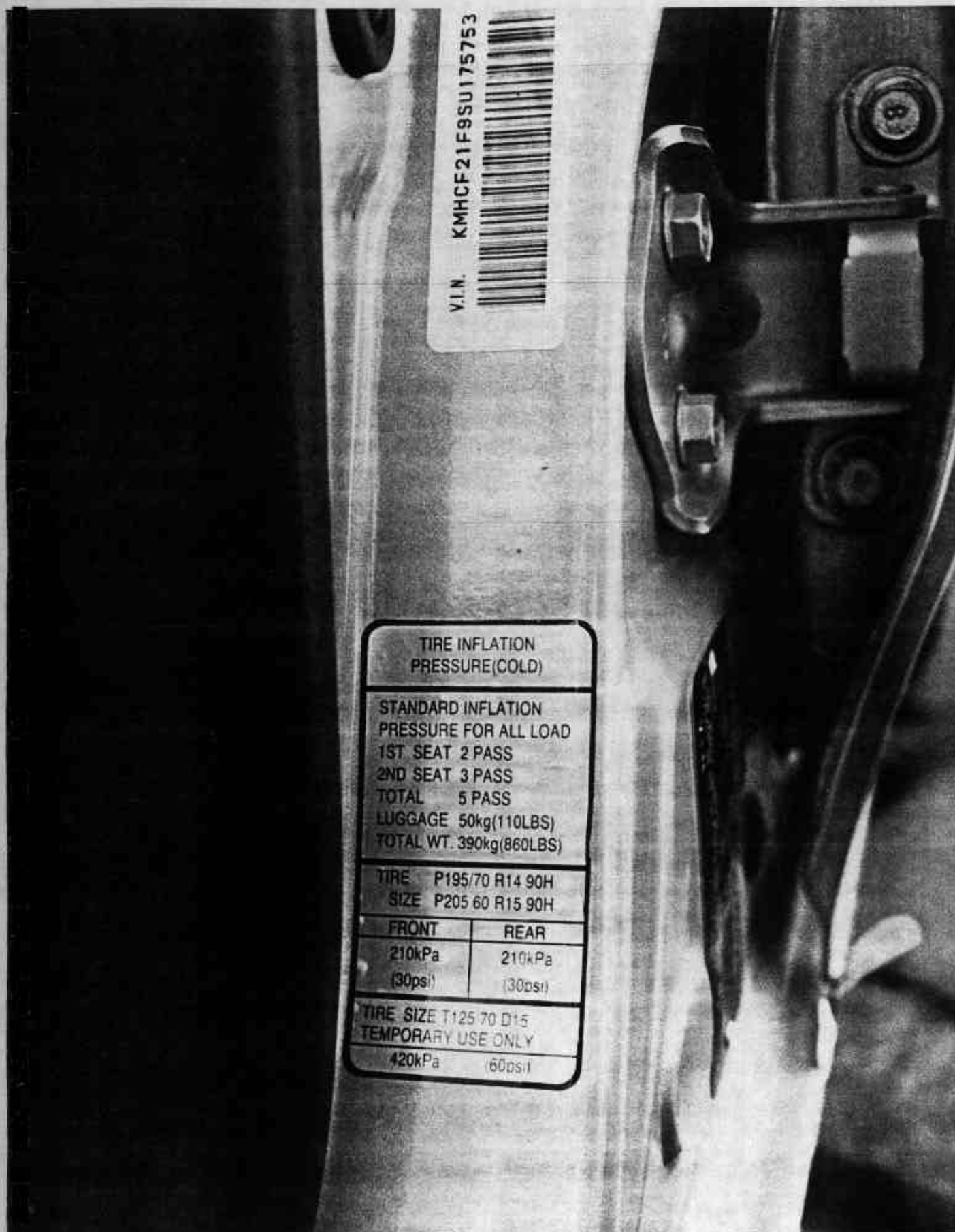


Figure A-37 Pre-test Recommended Tire Pressure Label View
A-38

941012



Figure A-38 Post-test Vehicle to Barrier Impact Alignment Indication
A-39

941012

Appendix B

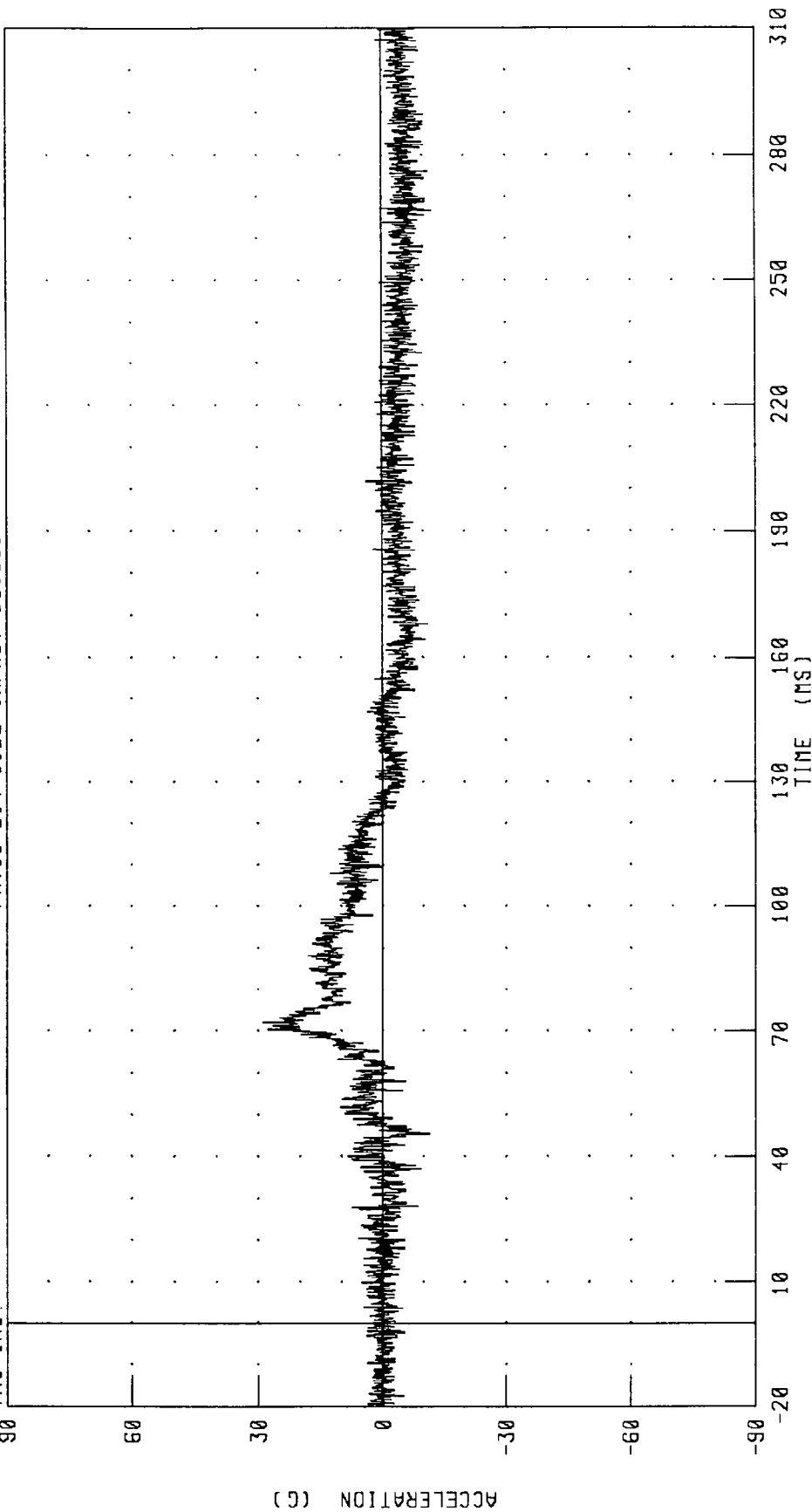
Data Plots

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 DRIVER HEAD X-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.

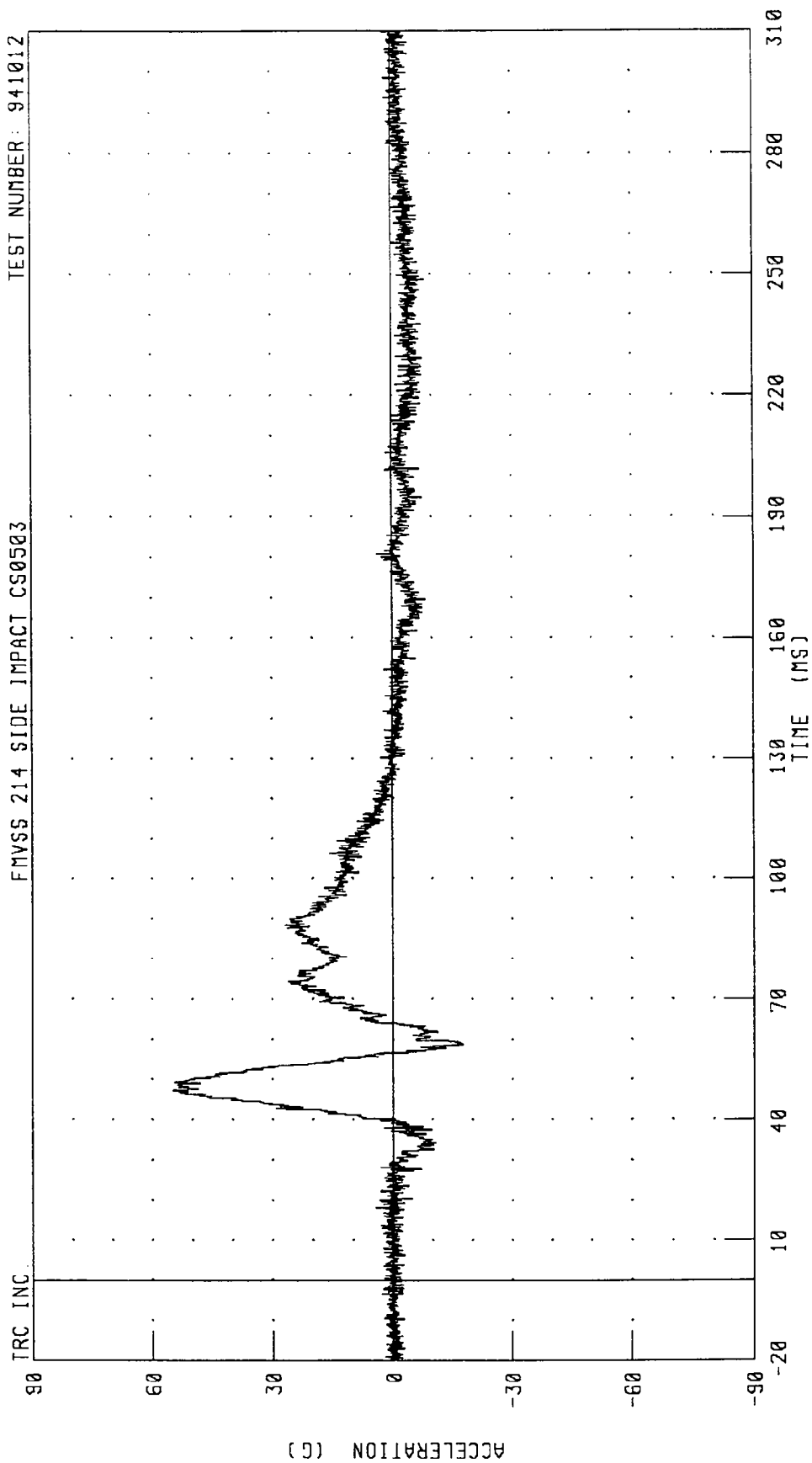


CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

PEAK DATA: 28.80 G @ 72.16 MS, -12.22 G @ 266.88 MS

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 DRIVER HEAD Y-AXIS ACCELERATION
 FMVSS 214 SIDE IMPACT CS0503

TEST NUMBER: 941012



PEAK DATA: 54.78 G @ 47.20 MS; -17.48 G @ 58.96 MS

CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

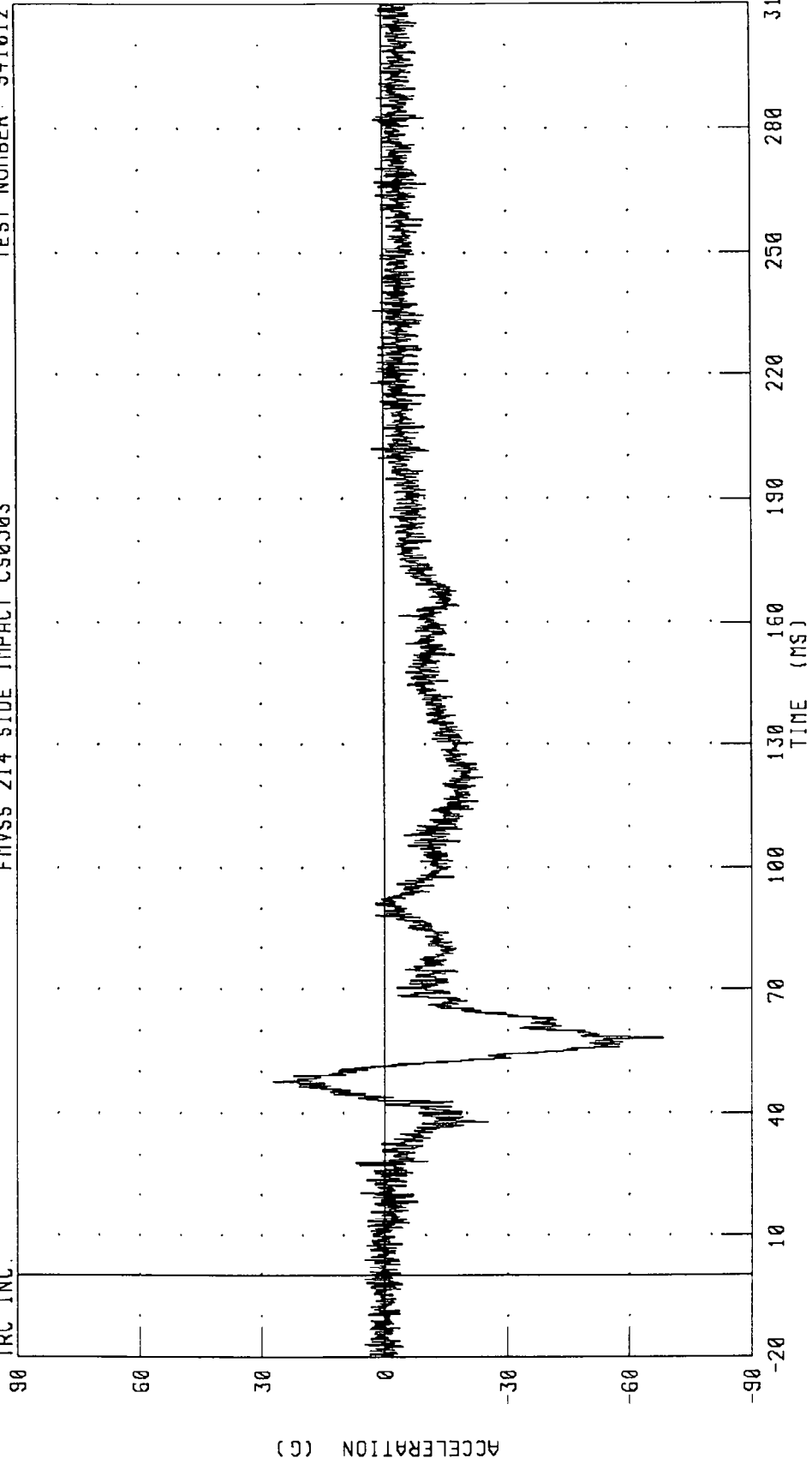
MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA

DRIVER HEAD Z-AXIS ACCELERATION

FMVSS 214 SIDE IMPACT CS0503

TEST NUMBER: 941012

TRC INC.



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

PEAK DATA: 27.13 G @ 47.68 MS, -68.21 G @ 58.16 MS

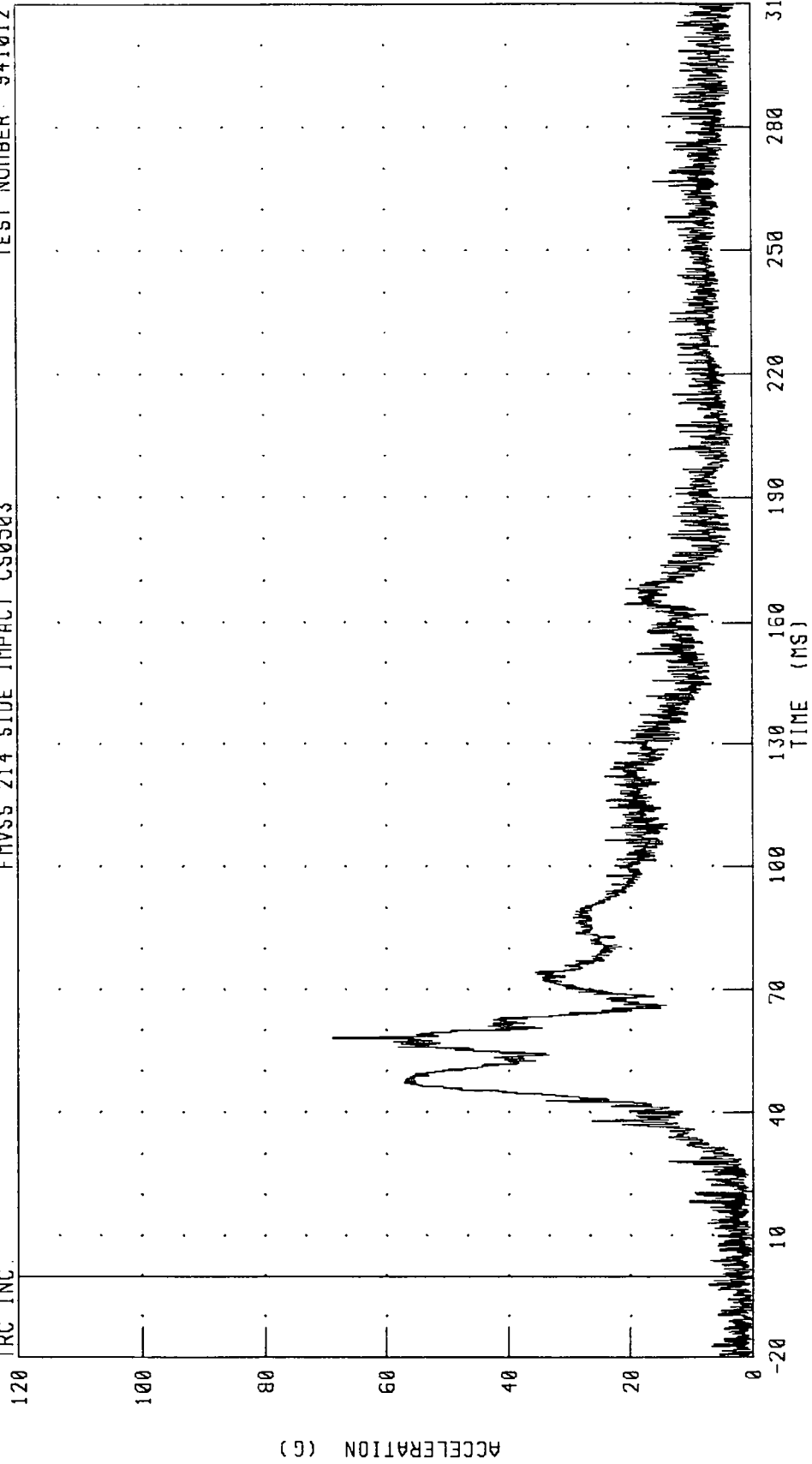
MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA

DRIVER HEAD RESULTANT ACCELERATION

FMVSS 214 SIDE IMPACT CS0503

TEST NUMBER: 941012

TRC INC.

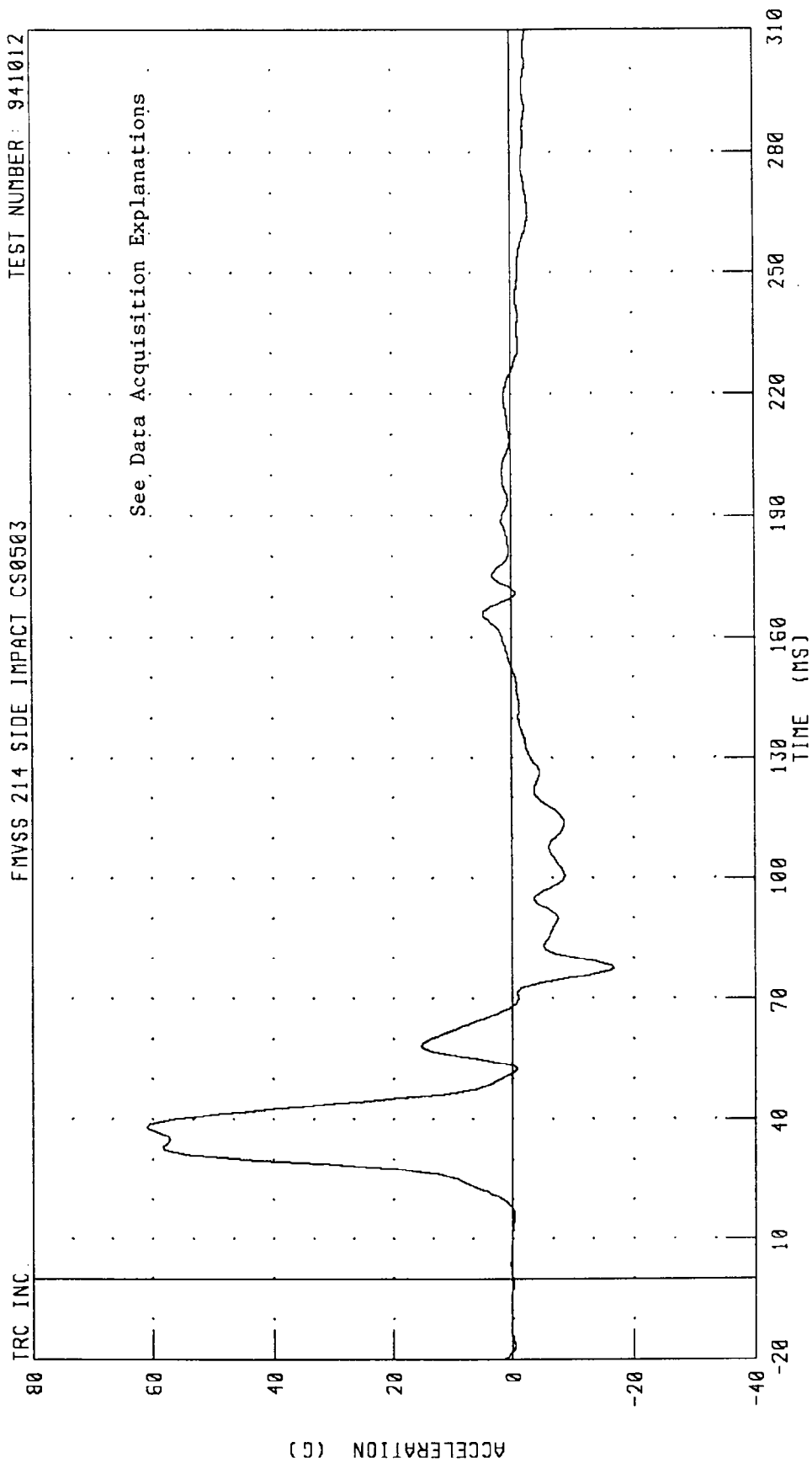


CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

PEAK DATA: 68.81 G @ 58.16 MS; 0.15 G @ 20.64 MS

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 DRIVER LOWER SPINE Y-AXIS ACCELERATION
 FMVSS 214 SIDE IMPACT CS0503

TEST NUMBER: 941012



See Data Acquisition Explanations

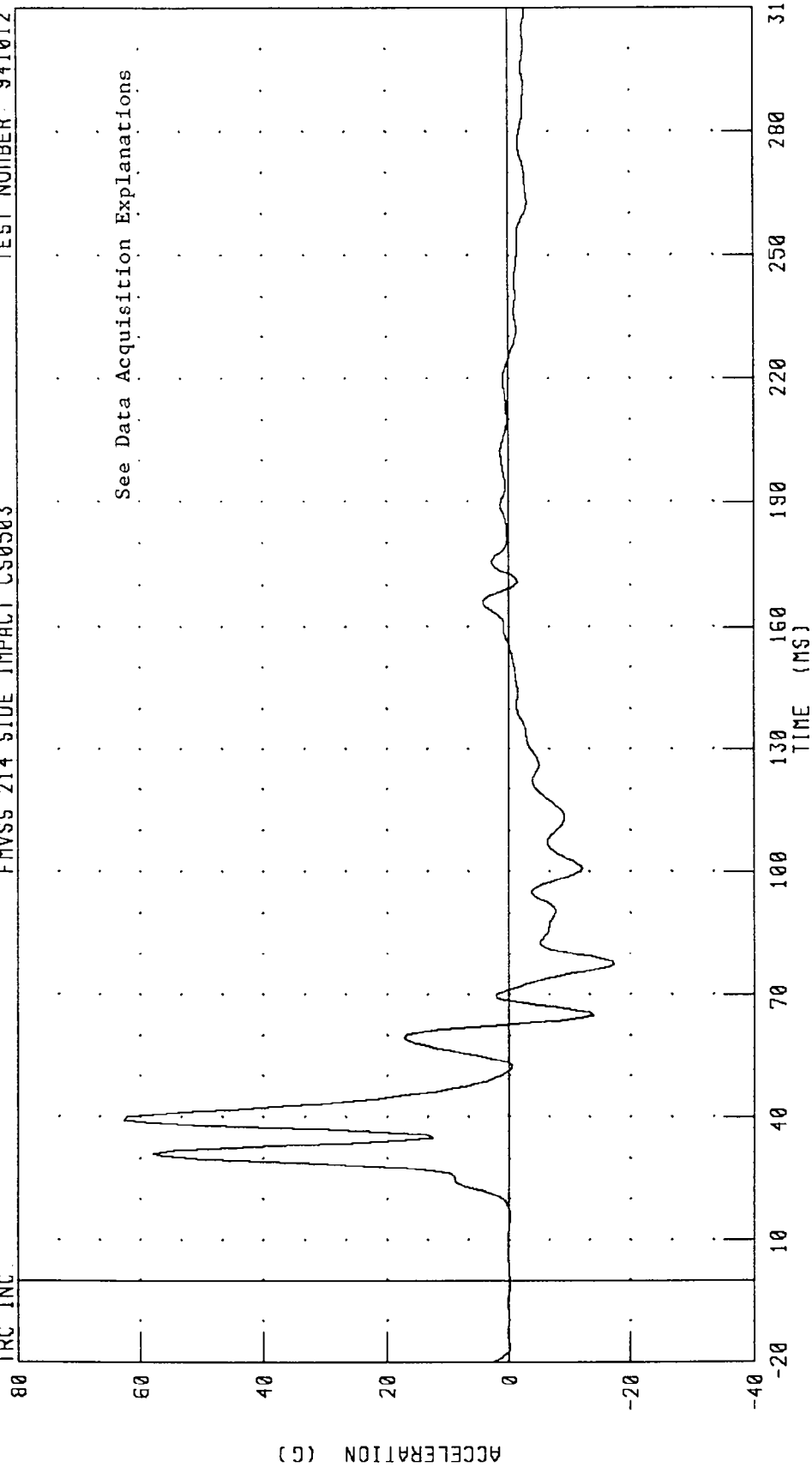
PEAK DATA: 60.99 G @ 38.13 MS, -16.73 G @ 77.50 MS

CHANNEL: T12Y01 FILTER: FIR 100

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION
 FMVSS 214 SIDE IMPACT CS0503

TEST NUMBER: 941012

TRC INC.



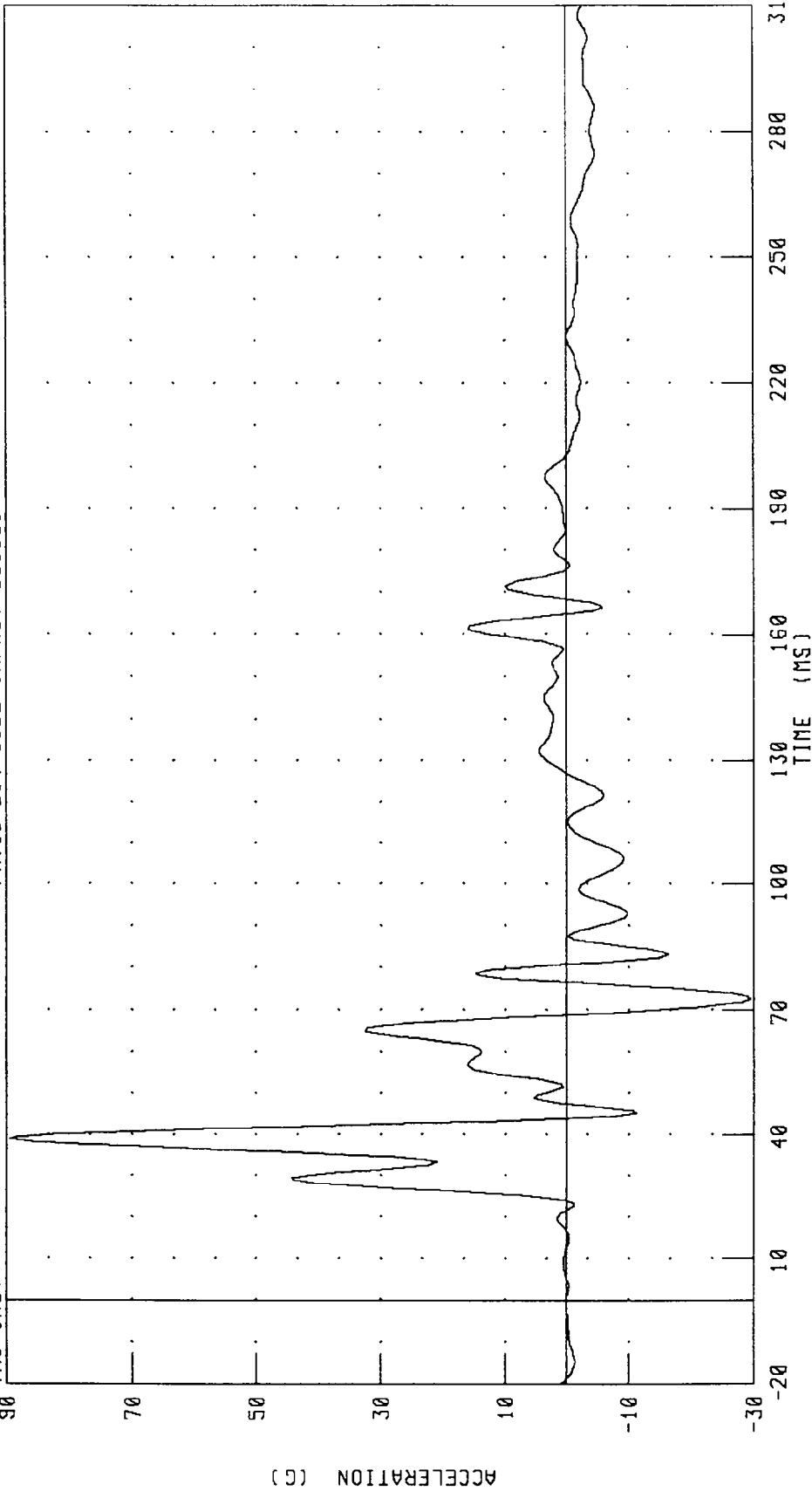
PEAK DATA: 62.71 G @ 39.38 MS; -17.30 G @ 77.50 MS

CHANNEL: T12YGA FILTER: FIR 100

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 DRIVER LEFT UPPER THORAX RIB Y-AXIS ACCELERATION
 FMVSS 214 SIDE IMPACT CS0503

TEST NUMBER: 941012

TRC INC.



PEAK DATA: 89.45 G @ 38.75 MS; -29.38 G @ 72.50 MS

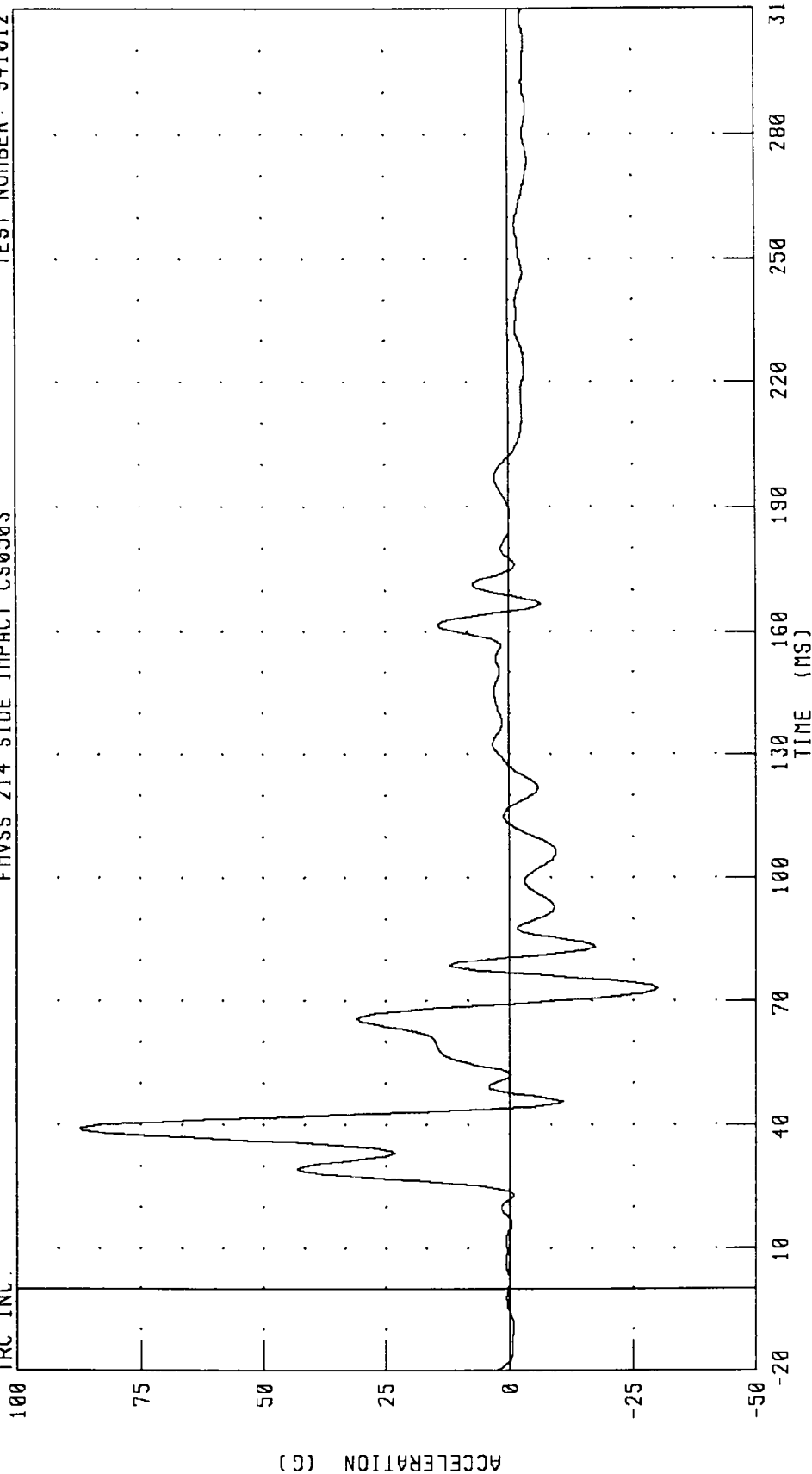
CHANNEL: LURYG1 FILTER: FIR 100

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 DRIVER LEFT UPPER THORAX RIB Y-AXIS REDUNDANT ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.

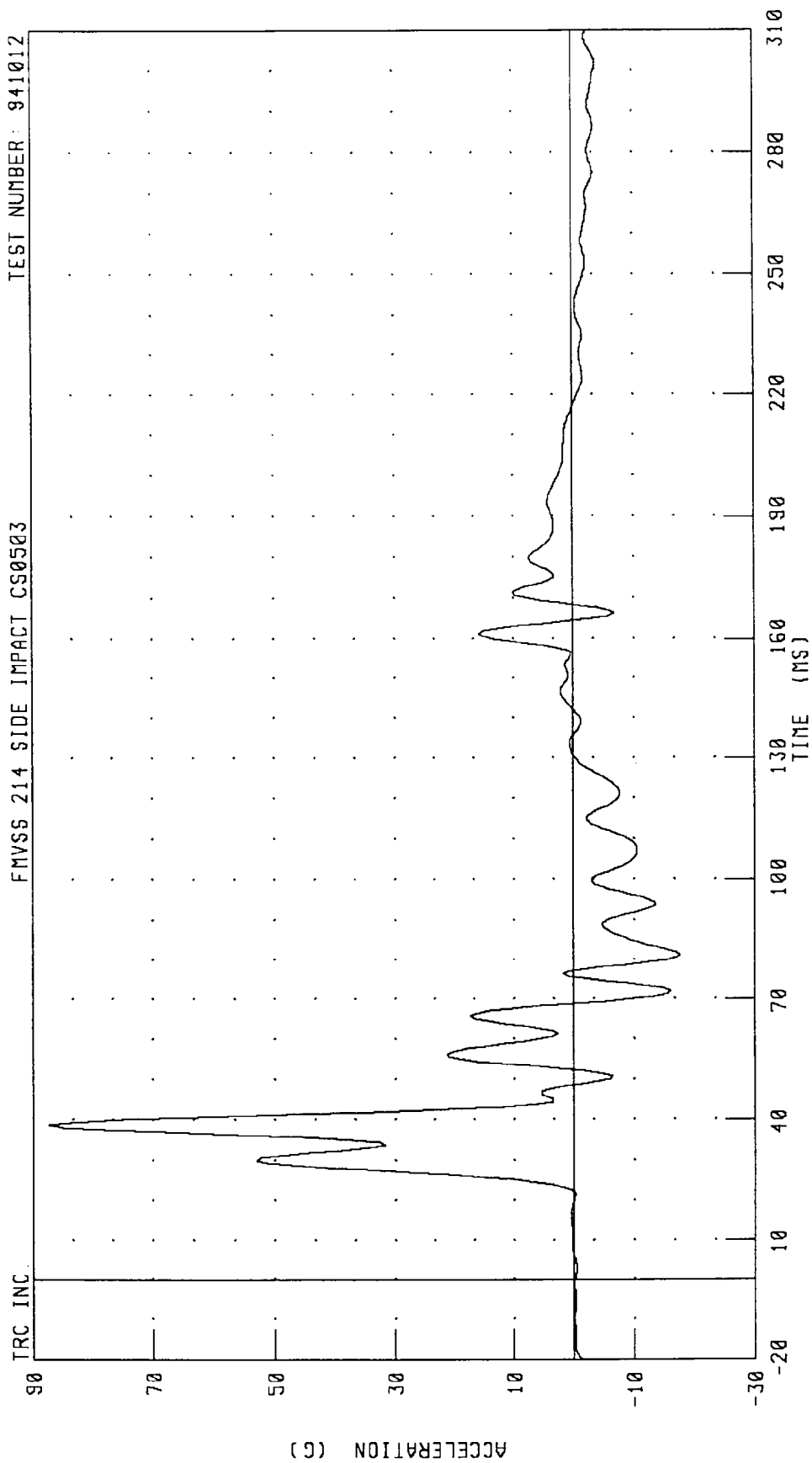


PEAK DATA: 87.32 G @ 39.38 MS, -30.12 G @ 73.13 MS

CHANNEL: LURYCA FILTER: FIR 100

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 DRIVER LEFT LOWER THORAX RIB Y-AXIS ACCELERATION
 FMVSS 214 SIDE IMPACT CS0503

TEST NUMBER: 941012



PEAK DATA: 87.17 G @ 38.75 MS; -17.56 G @ 81.25 MS

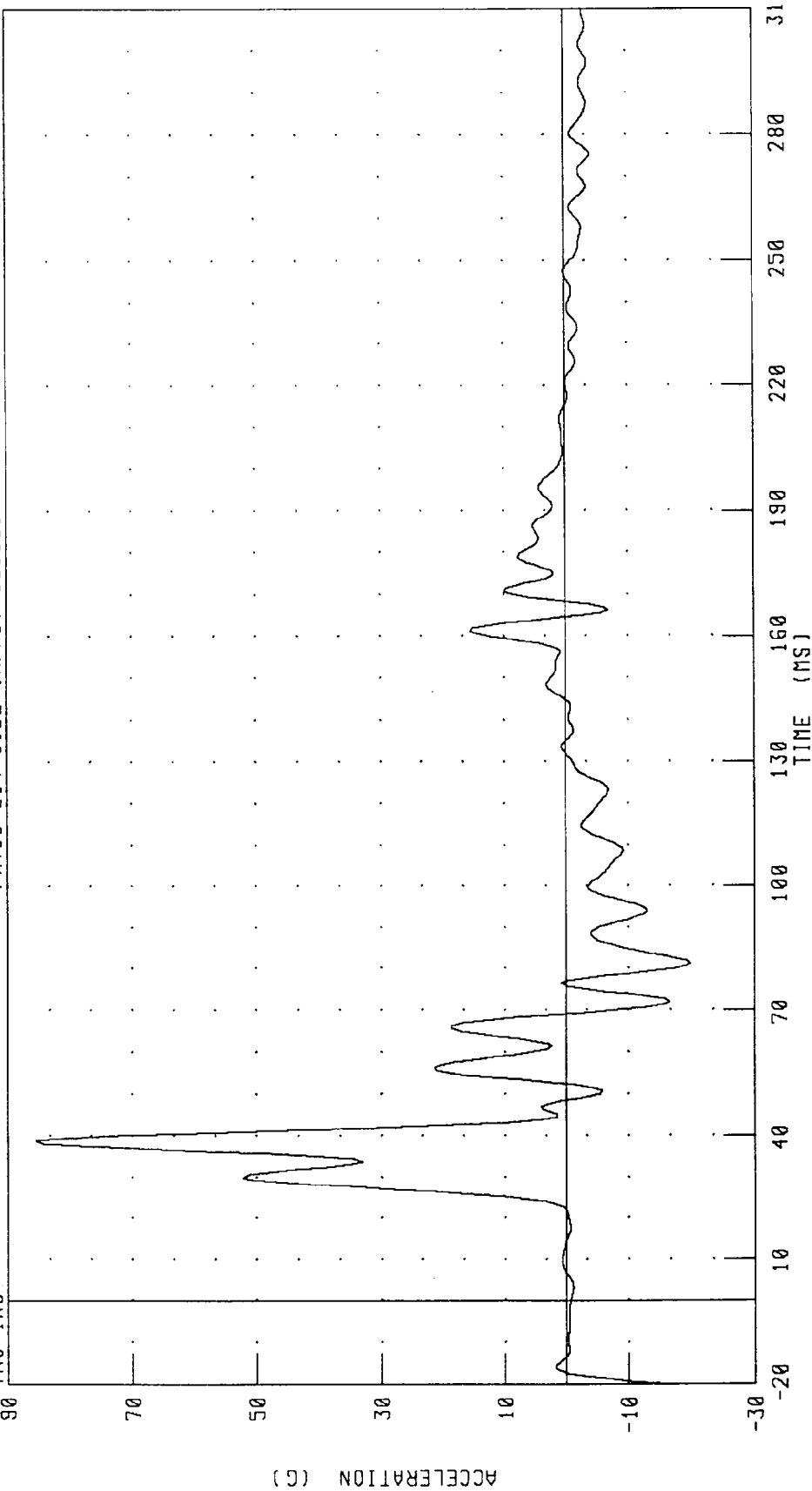
CHANNEL: L1RYG1 FILTER: FIR 100

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 DRIVER LEFT LOWER THORAX RIB Y-AXIS REDUNDANT ACCELERATION

TEST NUMBER 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC



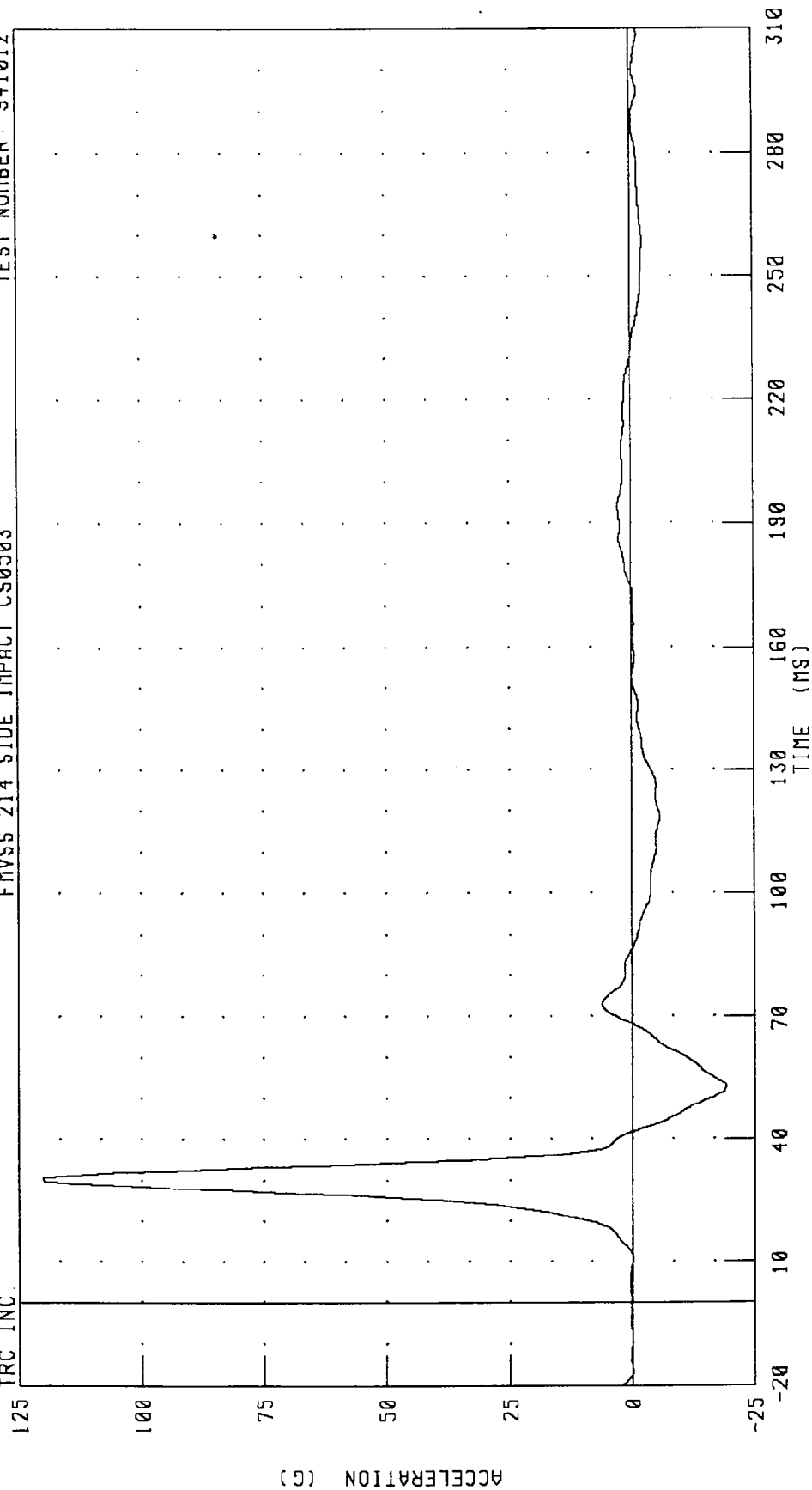
CHANNEL: LLRYGA FILTER: FIR 100

PEAK DATA: 85.54 G @ 38.75 MS; -19.86 G @ 81.25 MS

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 DRIVER PELVIS Y-AXIS ACCELERATION
 FMVSS 214 SIDE IMPACT CS0503

TEST NUMBER 941012

TRC INC.



PEAK DATA: 120.13 G @ 30.62 MS, -19.17 G @ 52.50 MS

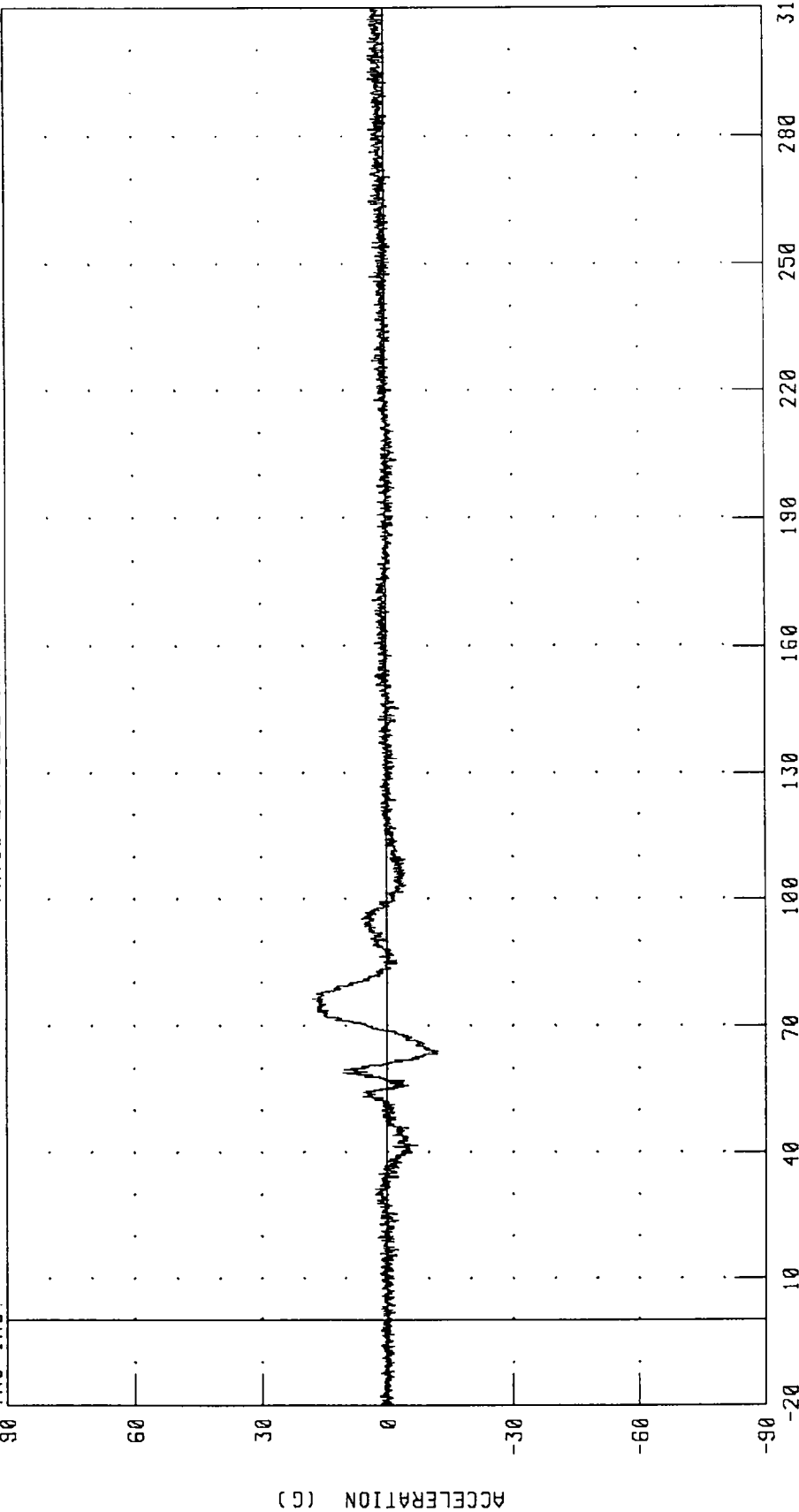
CHANNEL: PEVYG1 FILTER: FIR 100

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
LEFT REAR PASSENGER HEAD X-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



CHANNEL: HEDXG4 FILTER: CH. CLASS 1000

PEAK DATA: 17.96 G @ 76.40 MS, -12.24 G @ 64.08 MS

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
LEFT REAR PASSENGER HEAD Y-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.

150

120

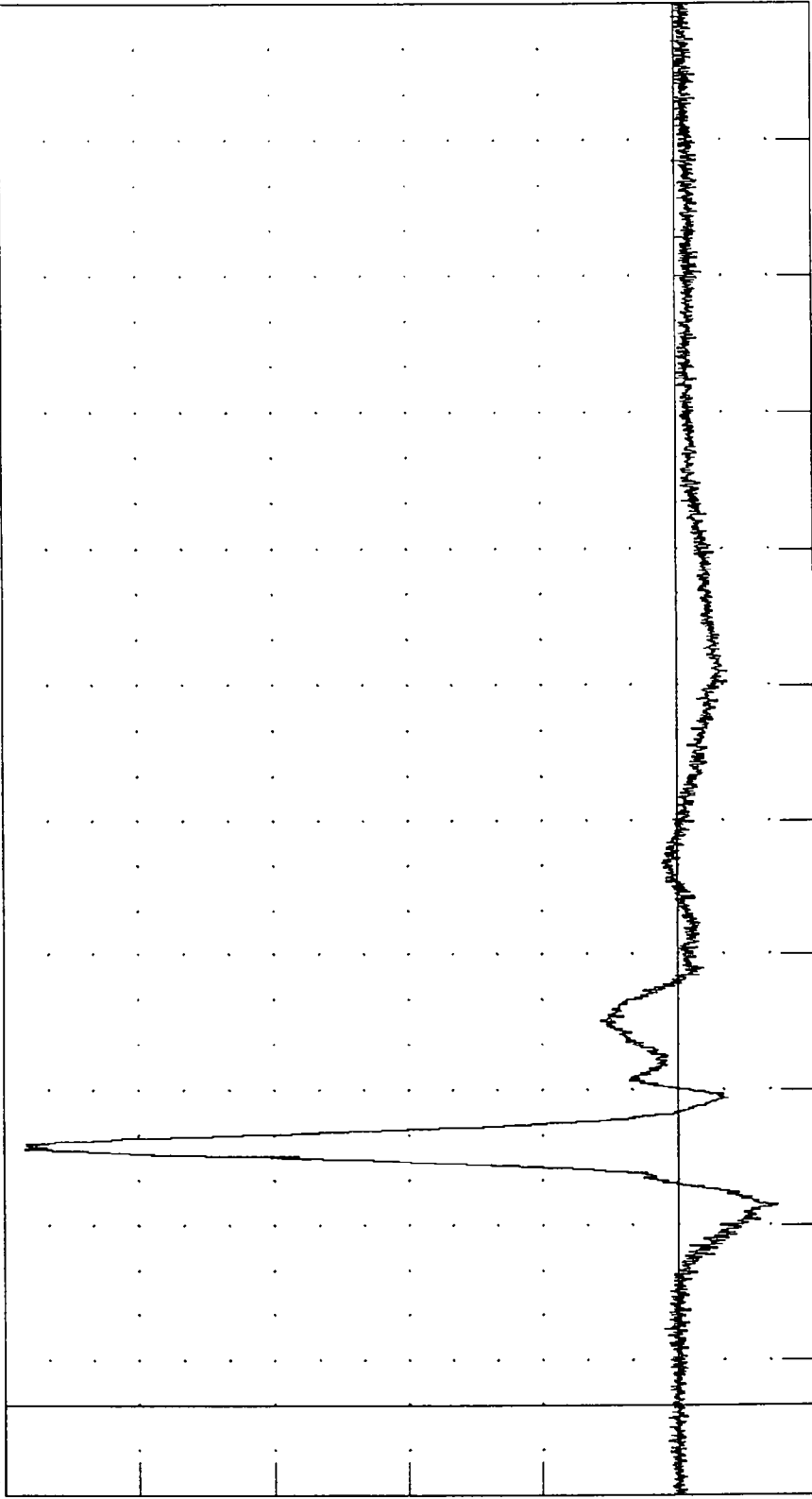
90

60

30

-30

ACCELERATION (G)



TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

-20

PEAK DATA: 145.34 G @ 57.12 MS, -21.79 G @ 44.48 MS

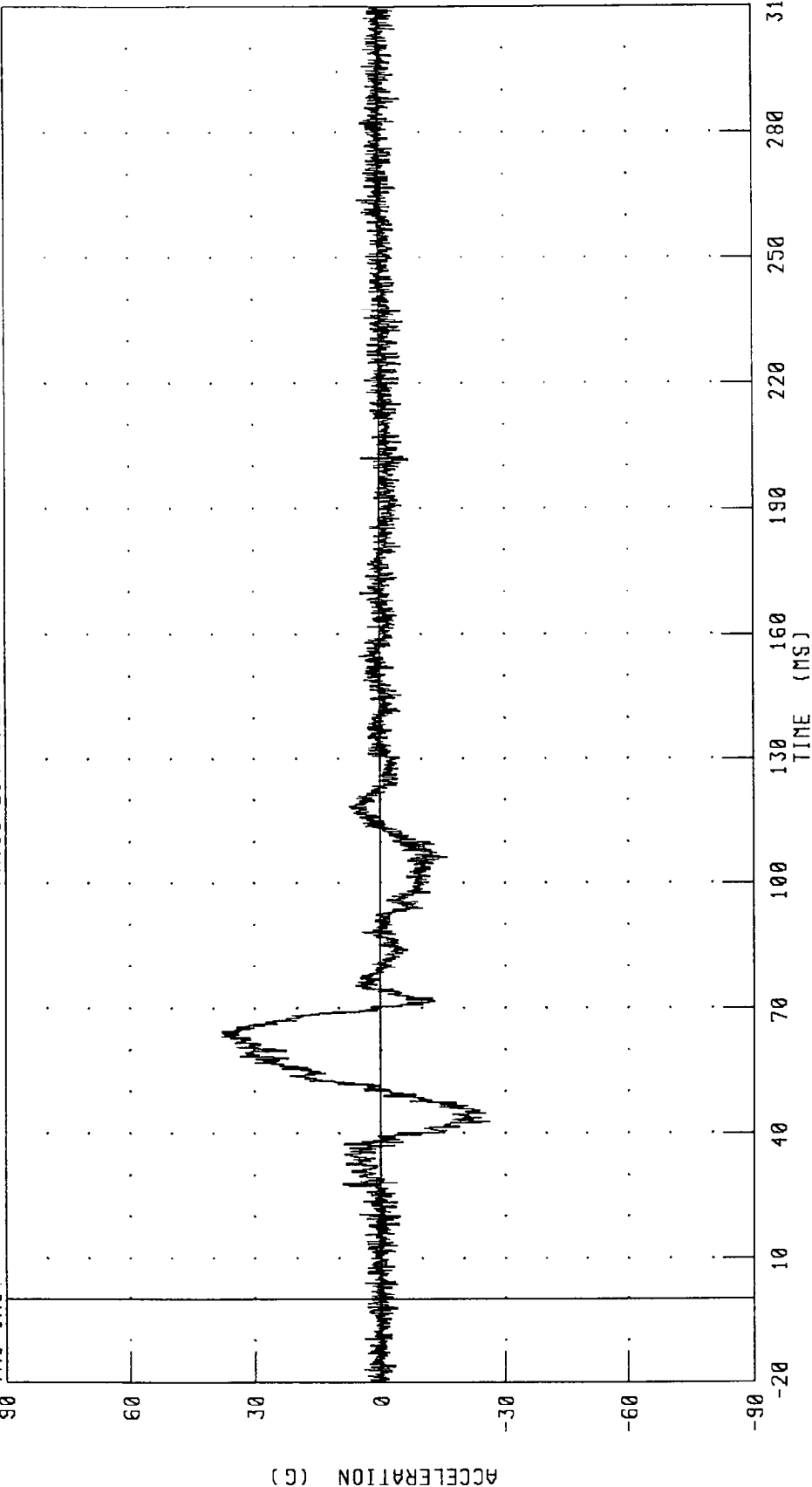
CHANNEL: HEDYG4 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
LEFT REAR PASSENGER HEAD Z-AXIS ACCELERATION

TEST NUMBER 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC



PEAK DATA: 38 06 G @ 63.44 MS, -26.25 G @ 42.72 MS

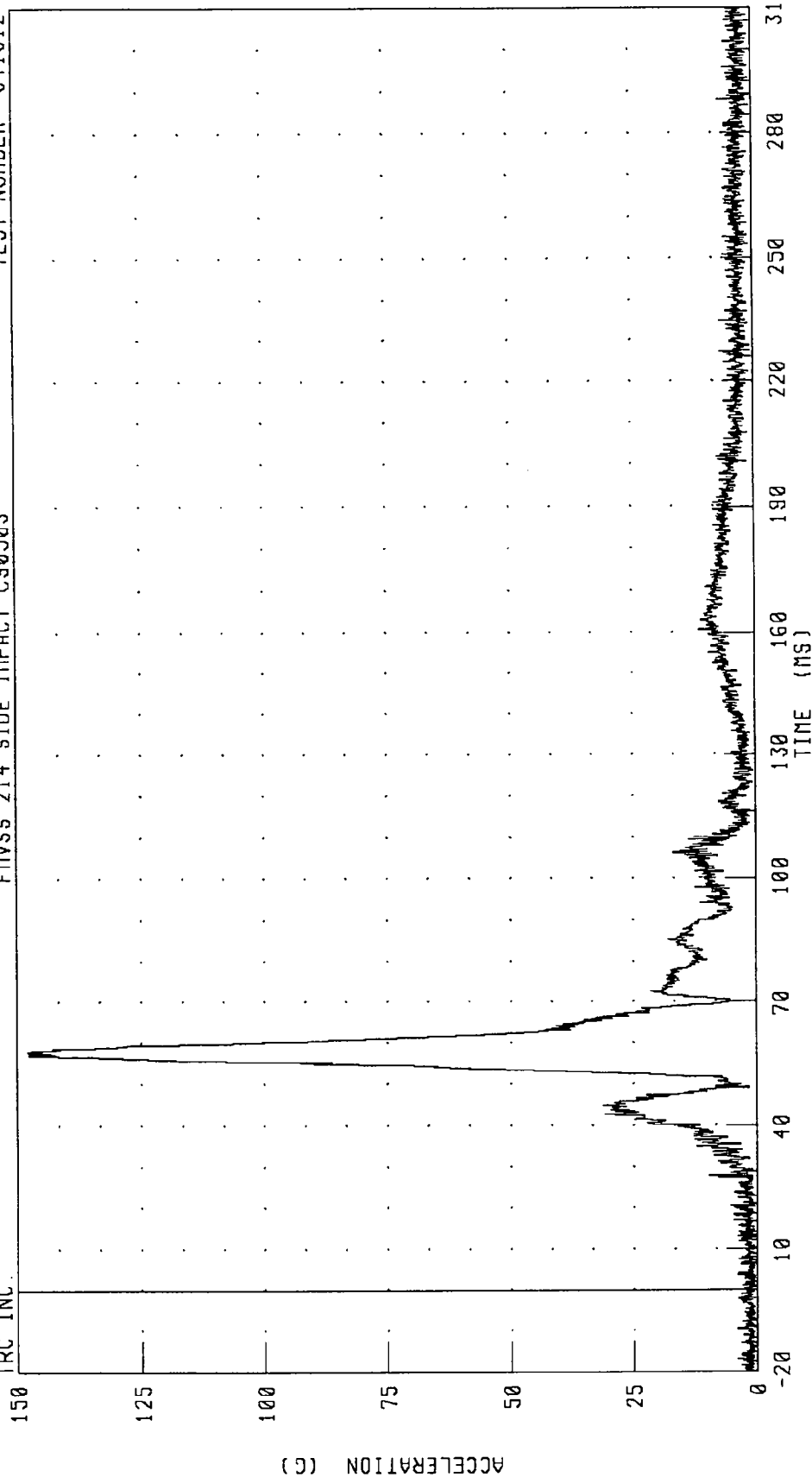
CHANNEL: HEDZG4 FILTER: CH CLASS 1000

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
LEFT REAR PASSENGER HEAD RESULTANT ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



PEAK DATA: 147.77 G @ 57.92 MS; 0.12 G @ -7.60 MS

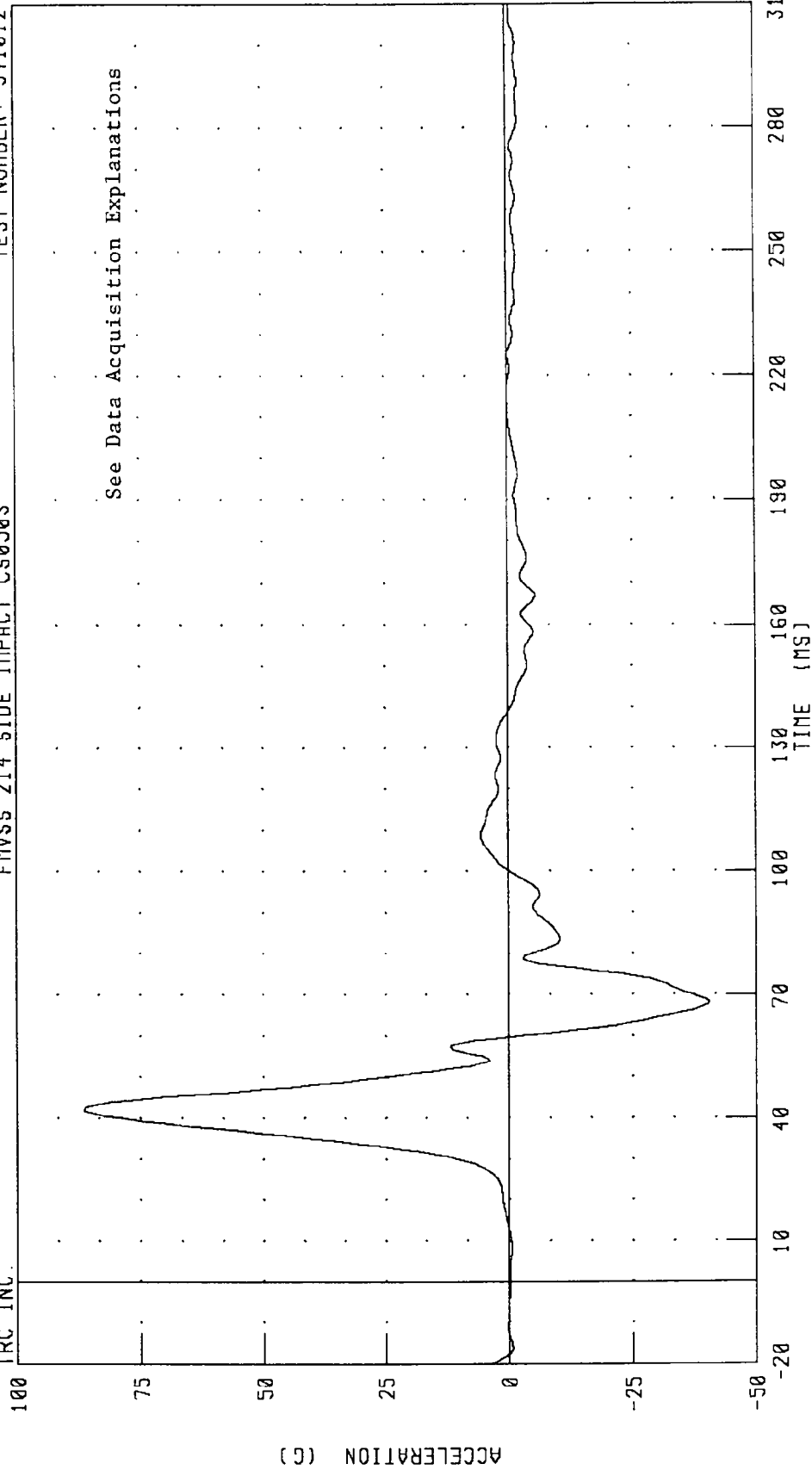
CHANNEL: HEDRG4 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



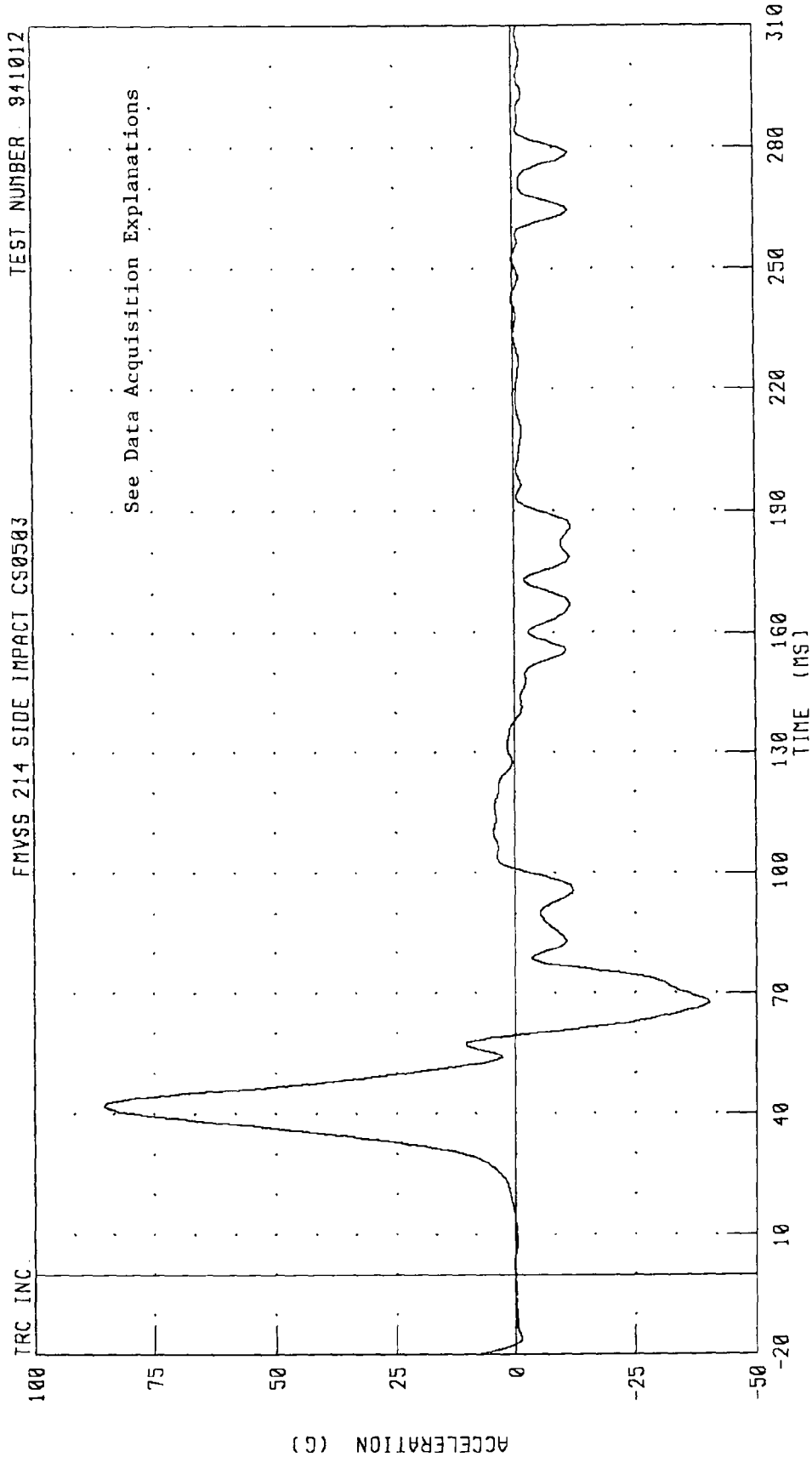
PEAK DATA: 86.34 G @ 41.87 MS, -40.41 G @ 68.13 MS

CHANNEL: T12YG4 FILTER: FIR 100

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

TEST NUMBER 941012

FMVSS 214 SIDE IMPACT CS0503



See Data Acquisition Explanations

CHANNEL: T12YGD FILTER: FIR 100

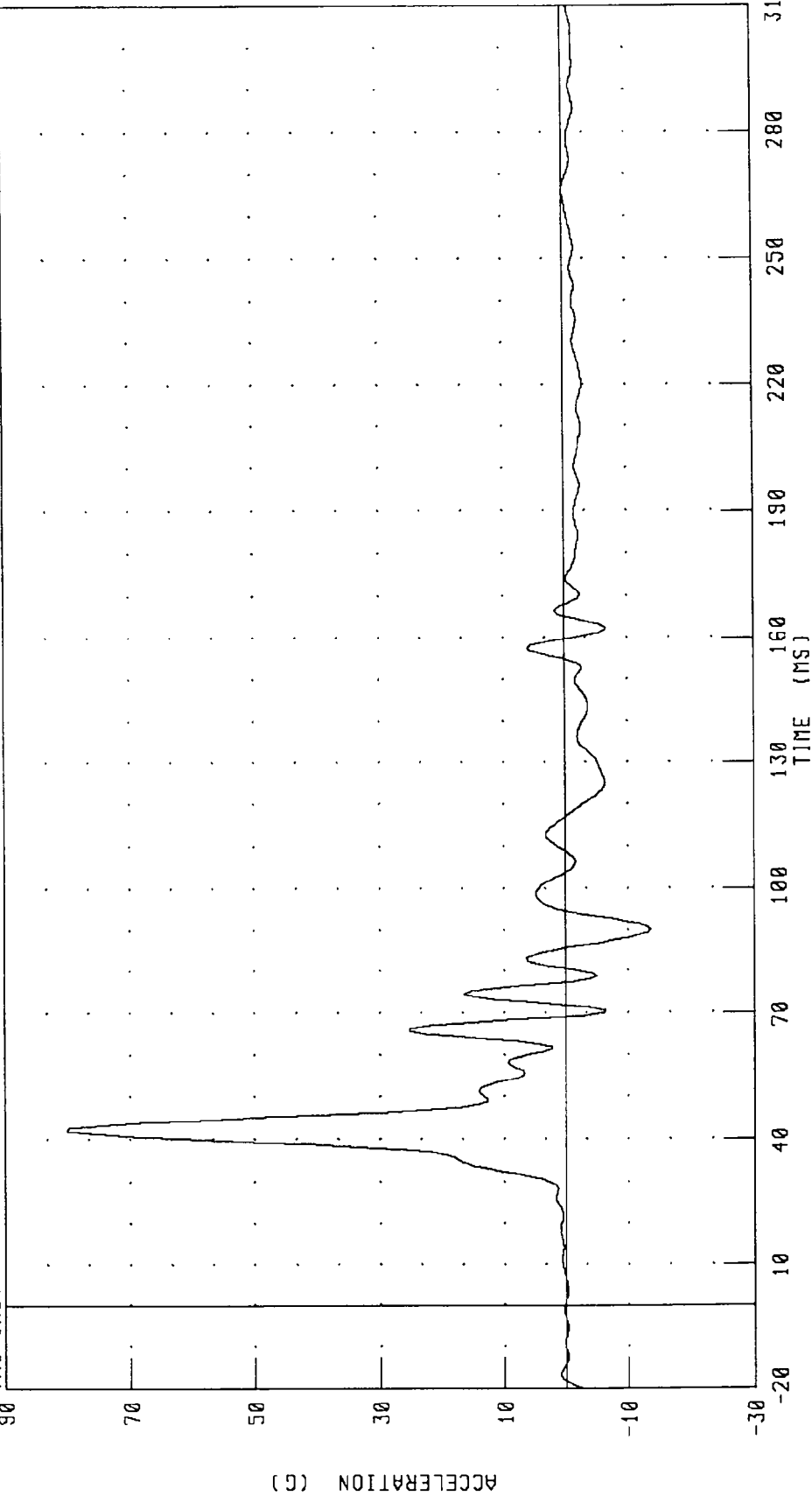
PEAK DATA: 85.65 G @ 41.87 MS, -40.07 G @ 67.50 MS

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 LEFT REAR PASSENGER LEFT UPPER THORAX RIB Y-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



PEAK DATA: 80.13 G @ 41.87 MS; -13.64 G @ 90.00 MS

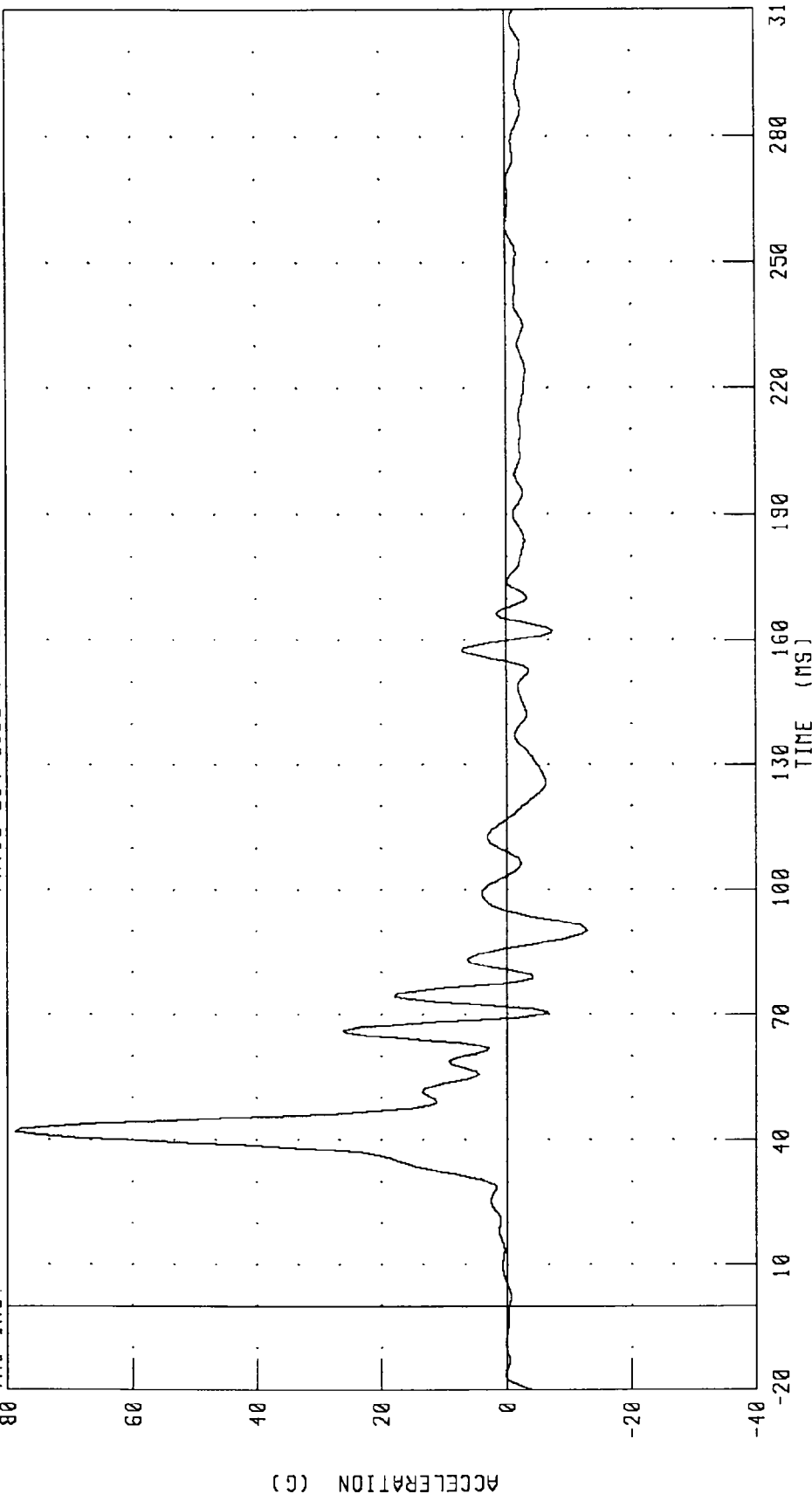
CHANNEL: LURYG4 FILTER: FIR 100

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 LEFT REAR PASSENGER LEFT UPPER THORAX RIB Y-AXIS REDUNDANT ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



CHANNEL: LURYGD FILTER: FIR 100

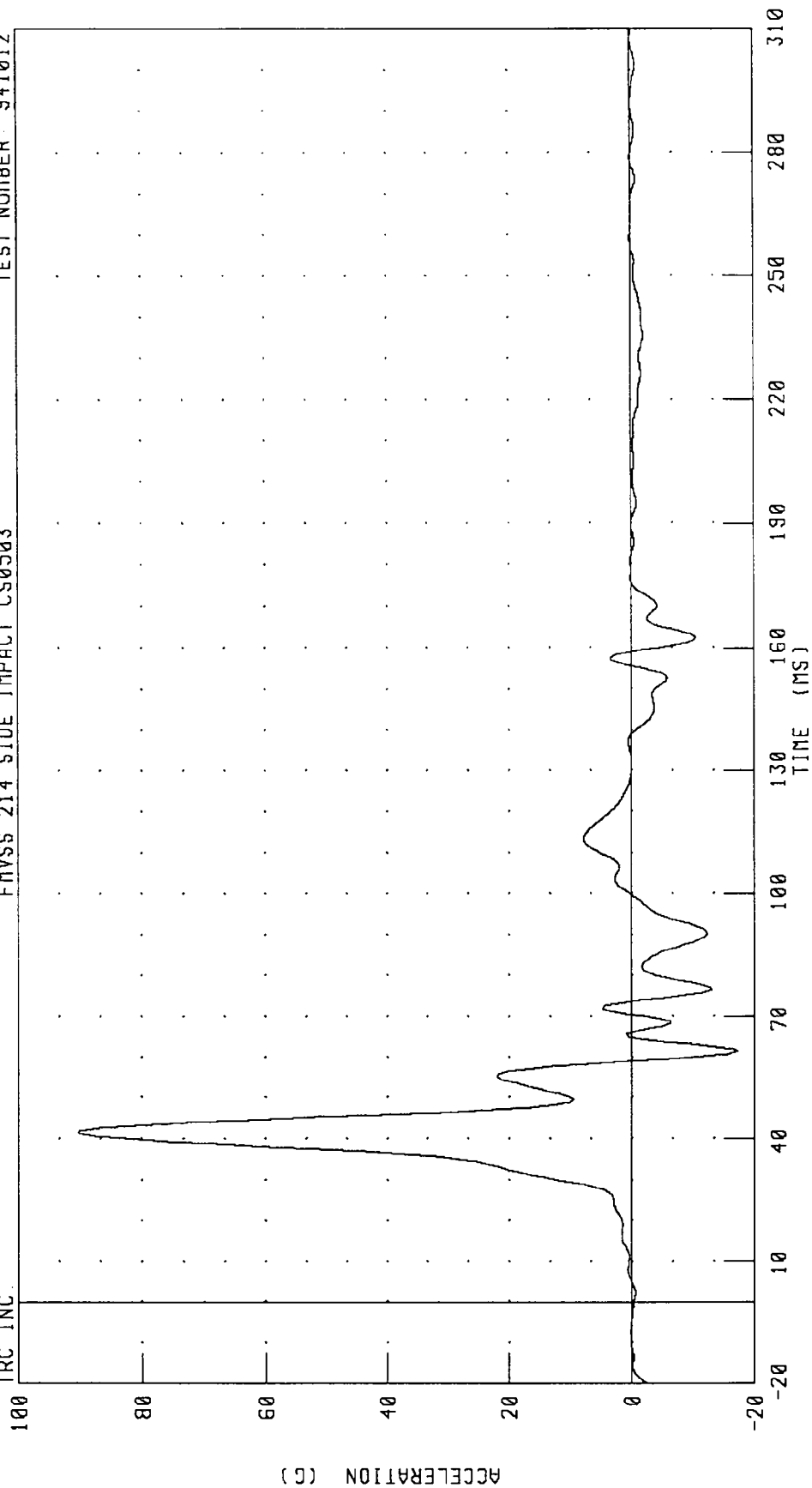
PEAK DATA: 78.54 G @ 41.87 MS, -12.79 G @ 90.00 MS

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 LEFT REAR PASSENGER LEFT LOWER THORAX RIB Y-AXIS ACCELERATION

TEST NUMBER 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



CHANNEL: LLRYG4 FILTER: FIR 100

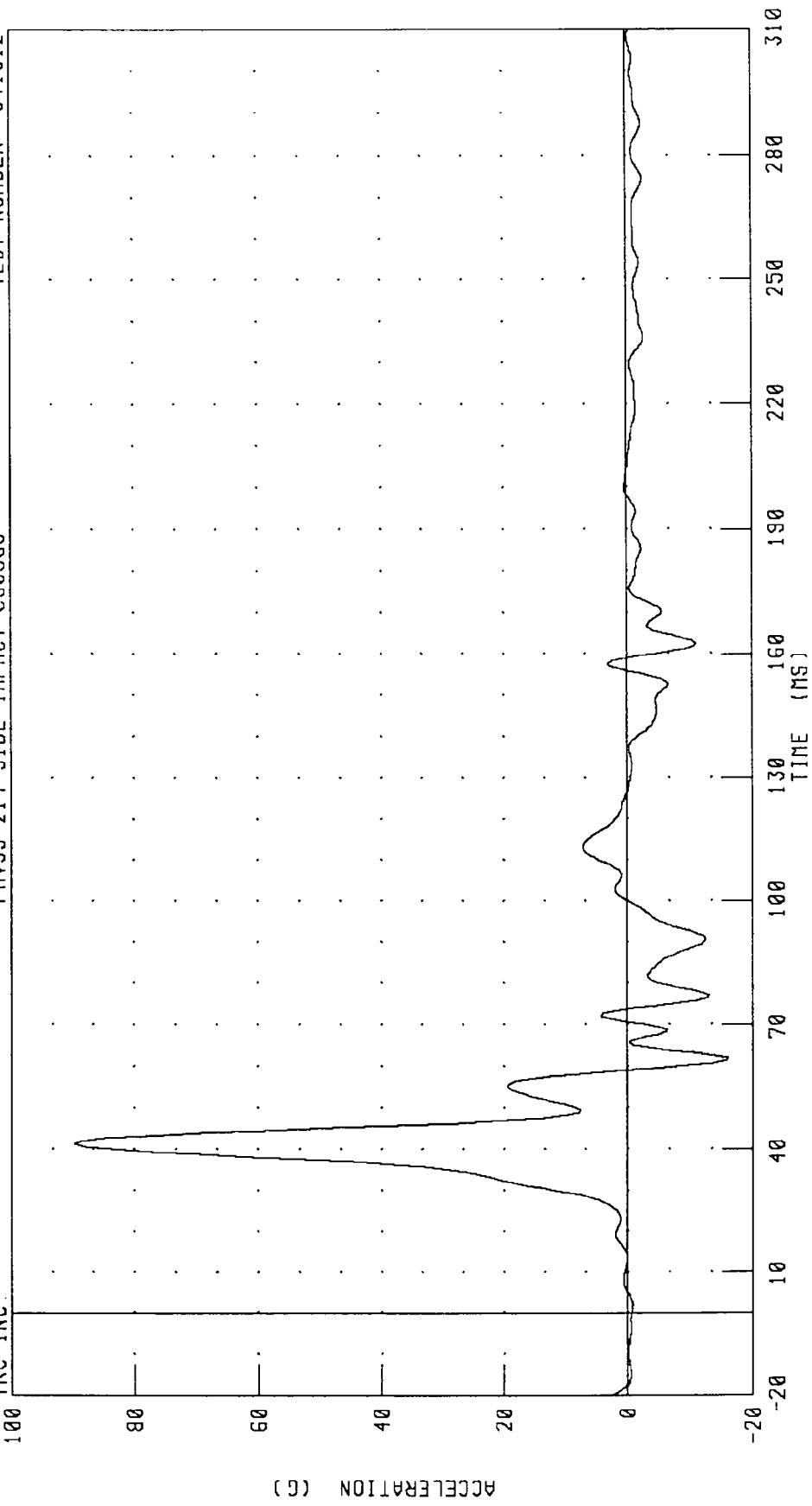
PEAK DATA: 90.24 G @ 41.25 MS, -17.26 G @ 61.25 MS

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 LEFT REAR PASSENGER LEFT LOWER THORAX RIB Y-AXIS REDUNDANT ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



PEAK DATA 89.83 G @ 41.25 MS, -15.99 G @ 61.87 MS

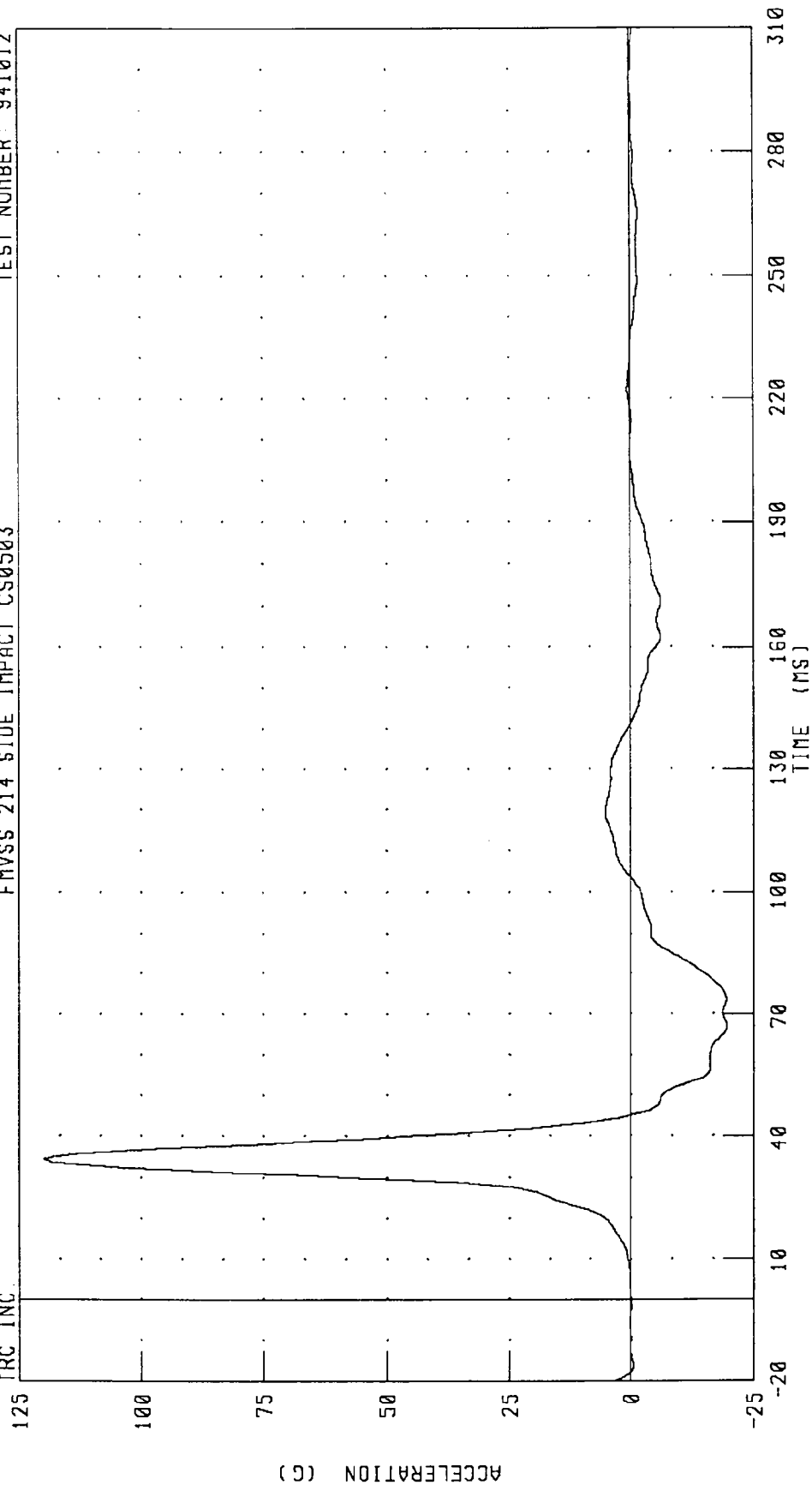
CHANNEL: LLRYGD FILTER: FIR 100

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



PEAK DATA: 119.95 G @ 34.38 MS; -19.47 G @ 66.87 MS

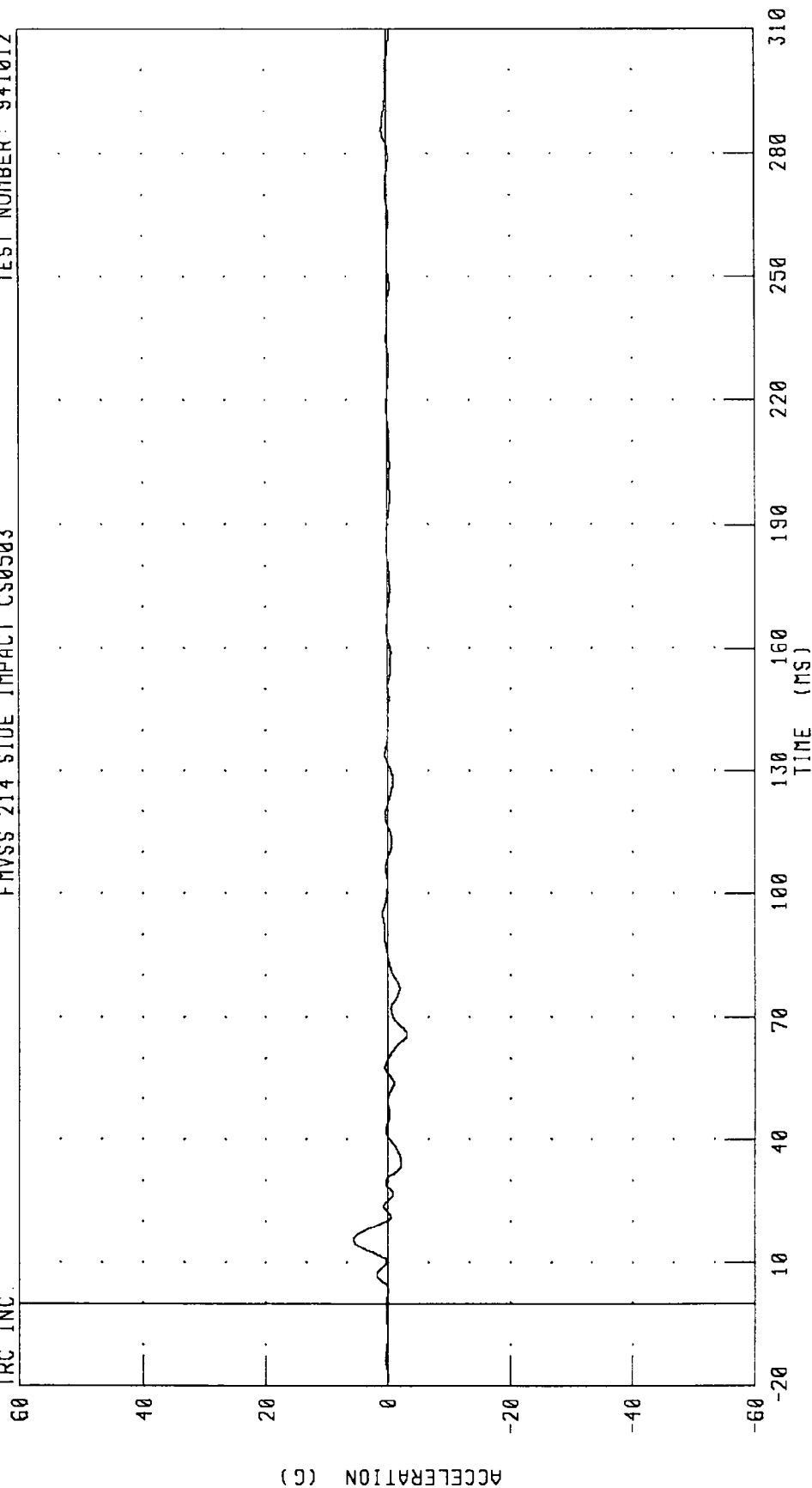
CHANNEL: PEVYG4 FILTER: FIR 100

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 VEHICLE RIGHT REAR SILL X-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



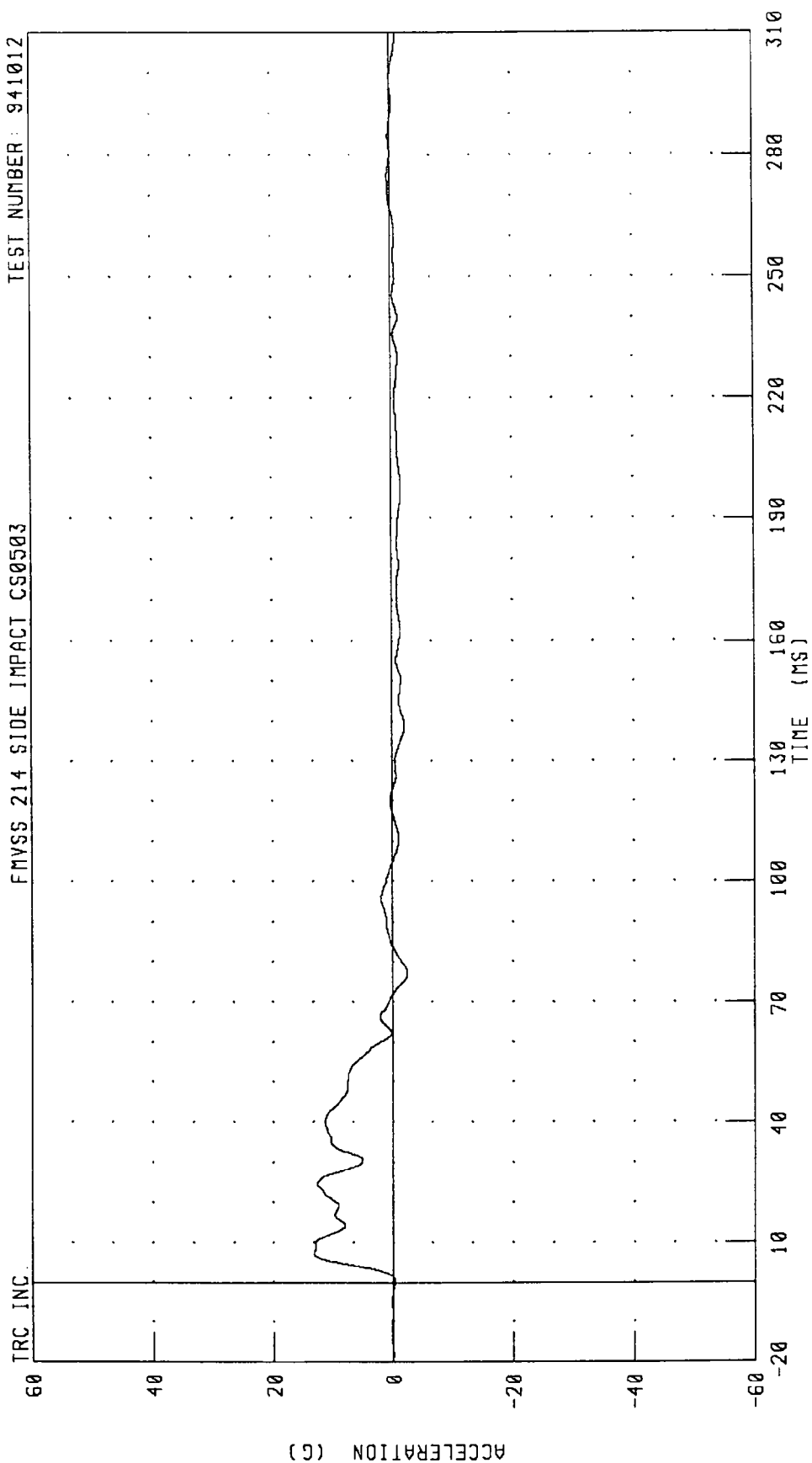
PEAK DATA: 5.60 G @ 15.60 MS; -3.06 G @ 65.84 MS

CHANNEL: RRSXG FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 VEHICLE RIGHT REAR SILL Y-AXIS ACCELERATION

FMVSS 214 SIDE IMPACT CS0503

TEST NUMBER: 941012



CHANNEL: RRSYG FILTER: CH. CLASS 60

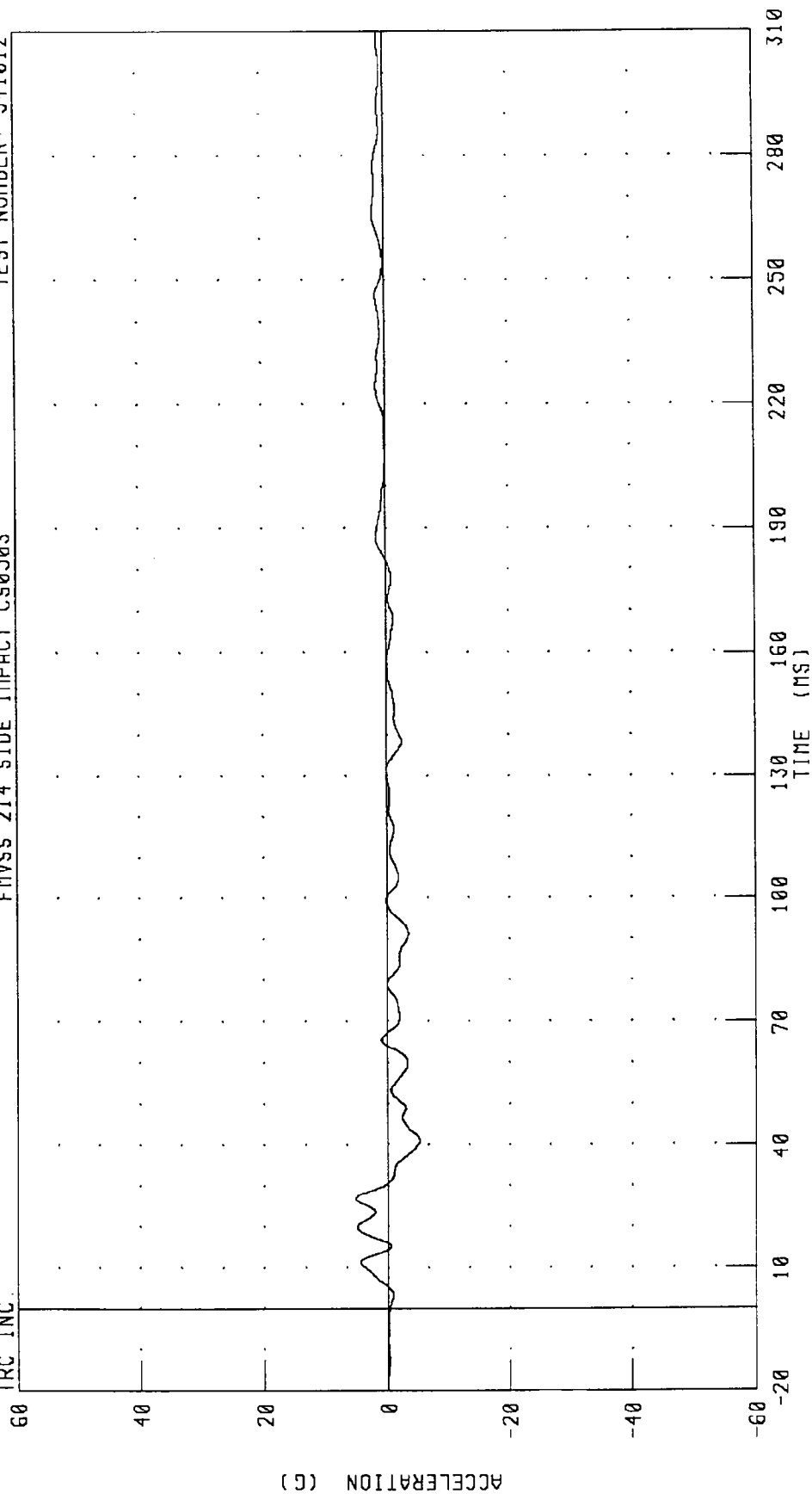
PEAK DATA: 13.23 G @ 7.36 MS, -2.43 G @ 77.04 MS

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 VEHICLE RIGHT REAR SILL Z-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



PEAK DATA: 5.24 G @ 26.88 MS; -5.21 G @ 41.04 MS

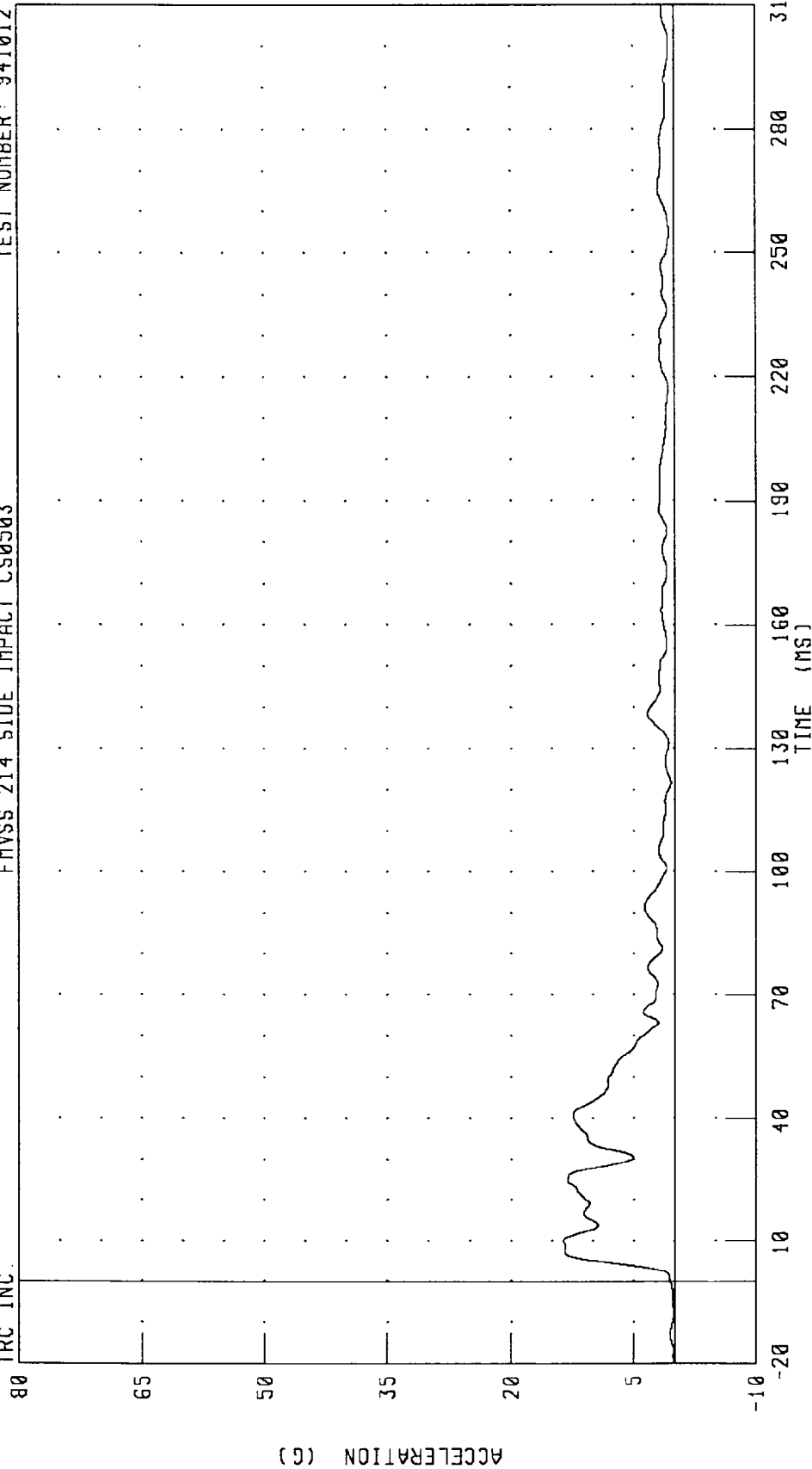
CHANNEL: RRSZG FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 VEHICLE RIGHT REAR SILL RESULTANT ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



PEAK DATA: 13.61 G @ 10.08 MS, 0.02 G @ -19.60 MS

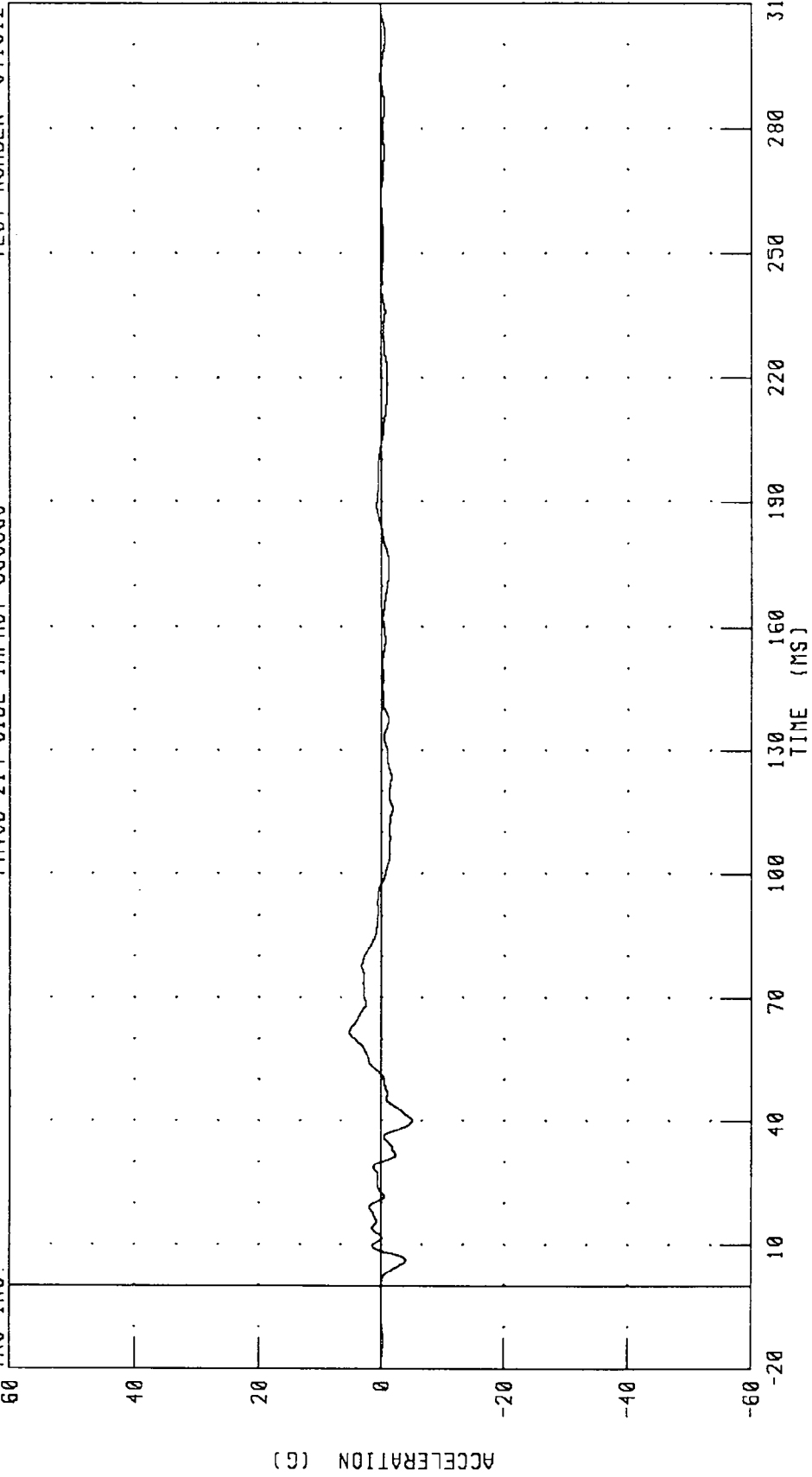
CHANNEL: RRSRG FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 VEHICLE REAR FLOORPAN OVER AXLE X-AXIS ACCELERATION

FMVSS 214 SIDE IMPACT CS0503

TEST NUMBER: 941012

IRC INC.



PEAK DATA: 5.23 G @ 61.76 MS; -5.06 G @ 40.08 MS

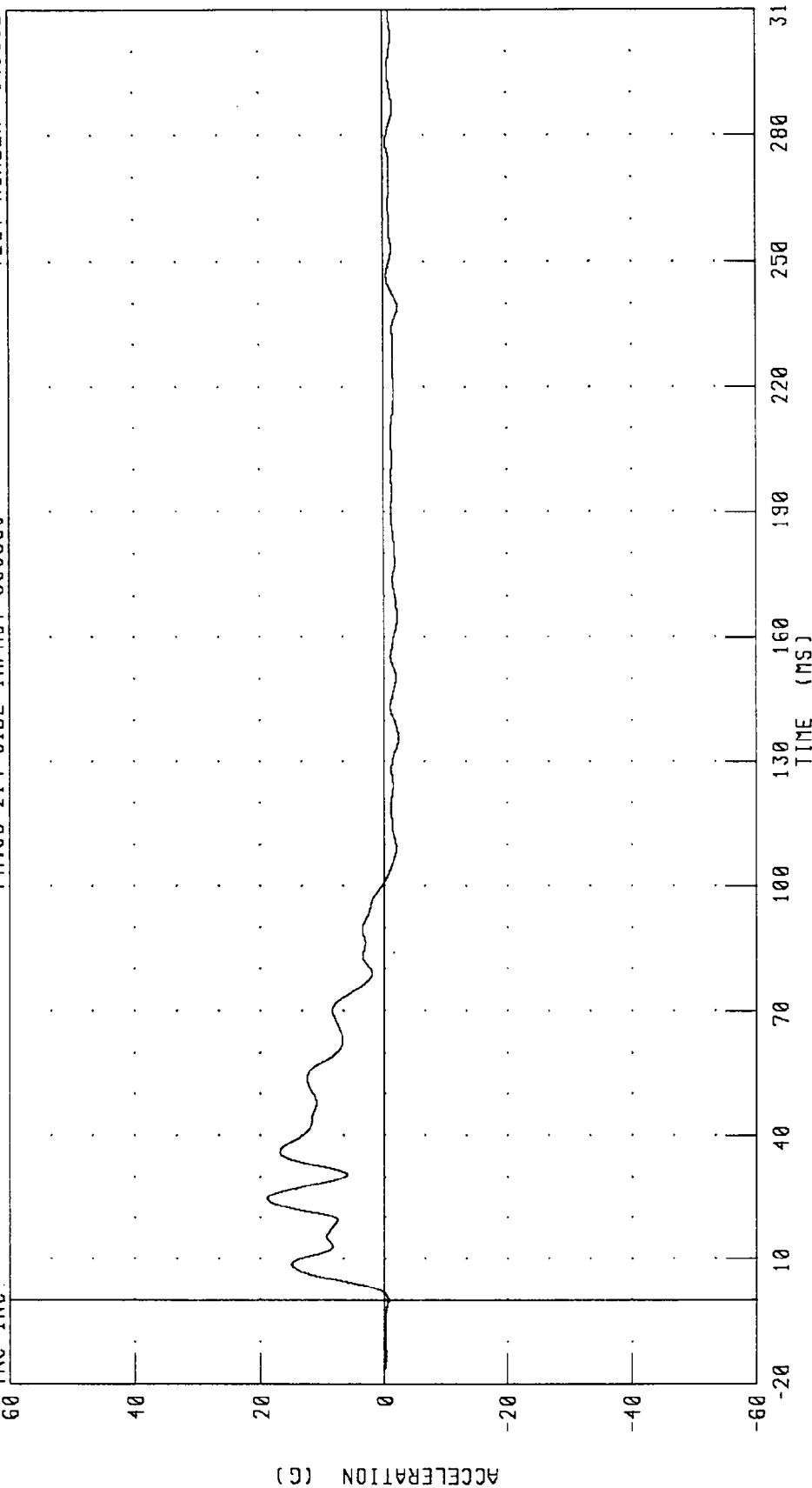
CHANNEL: ROKXC FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 VEHICLE REAR FLOORPAN OVER AXLE Y-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

IRC INC.



CHANNEL: RDKYC FILTER: CH. CLASS 60

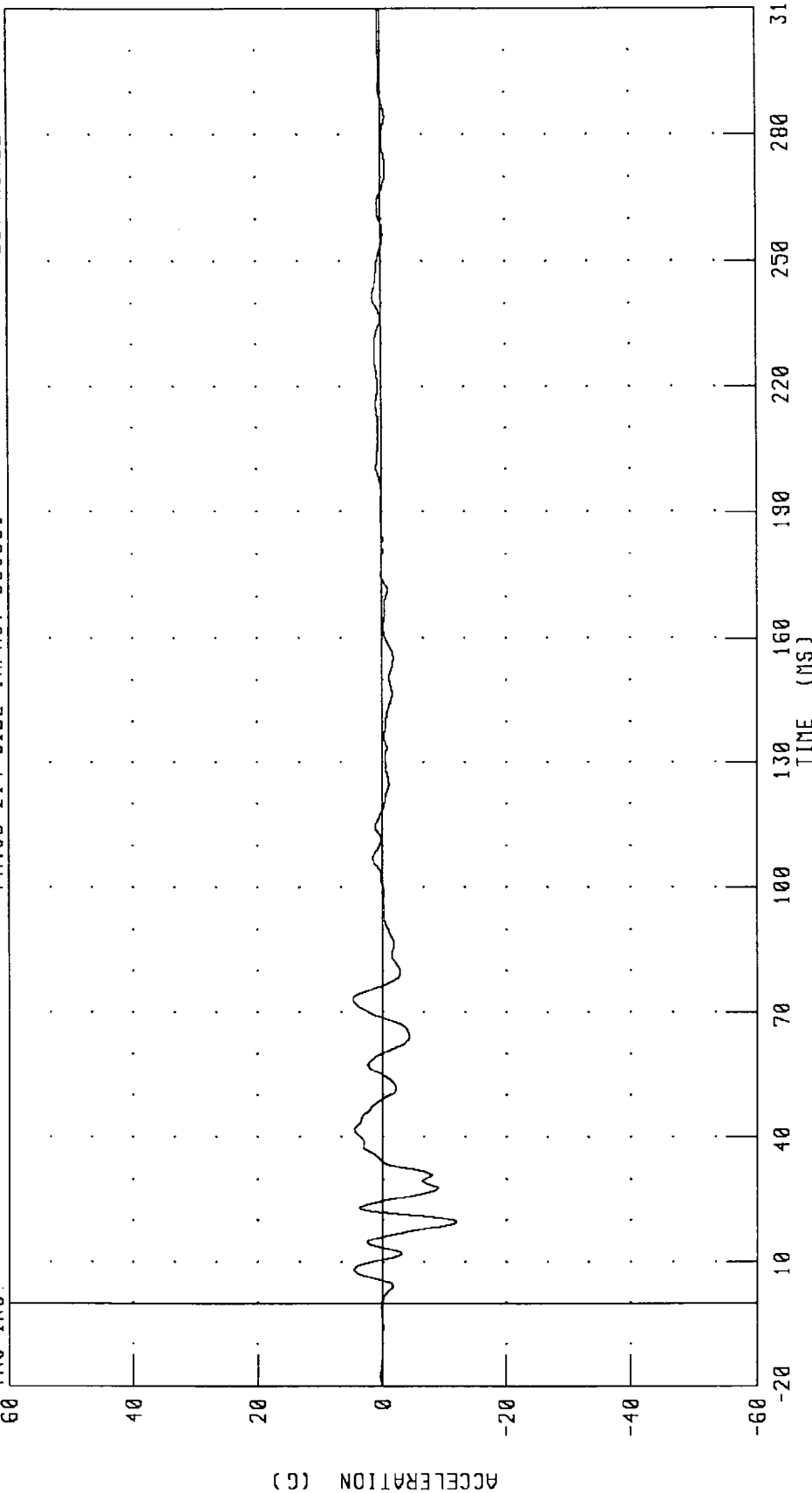
PEAK DATA: 18.95 G @ 24.72 MS, -2.40 G @ 238.96 MS

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 VEHICLE REAR FLOORPAN OVER AXLE Z-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



CHANNEL: ROKZG FILTER: CH. CLASS 60

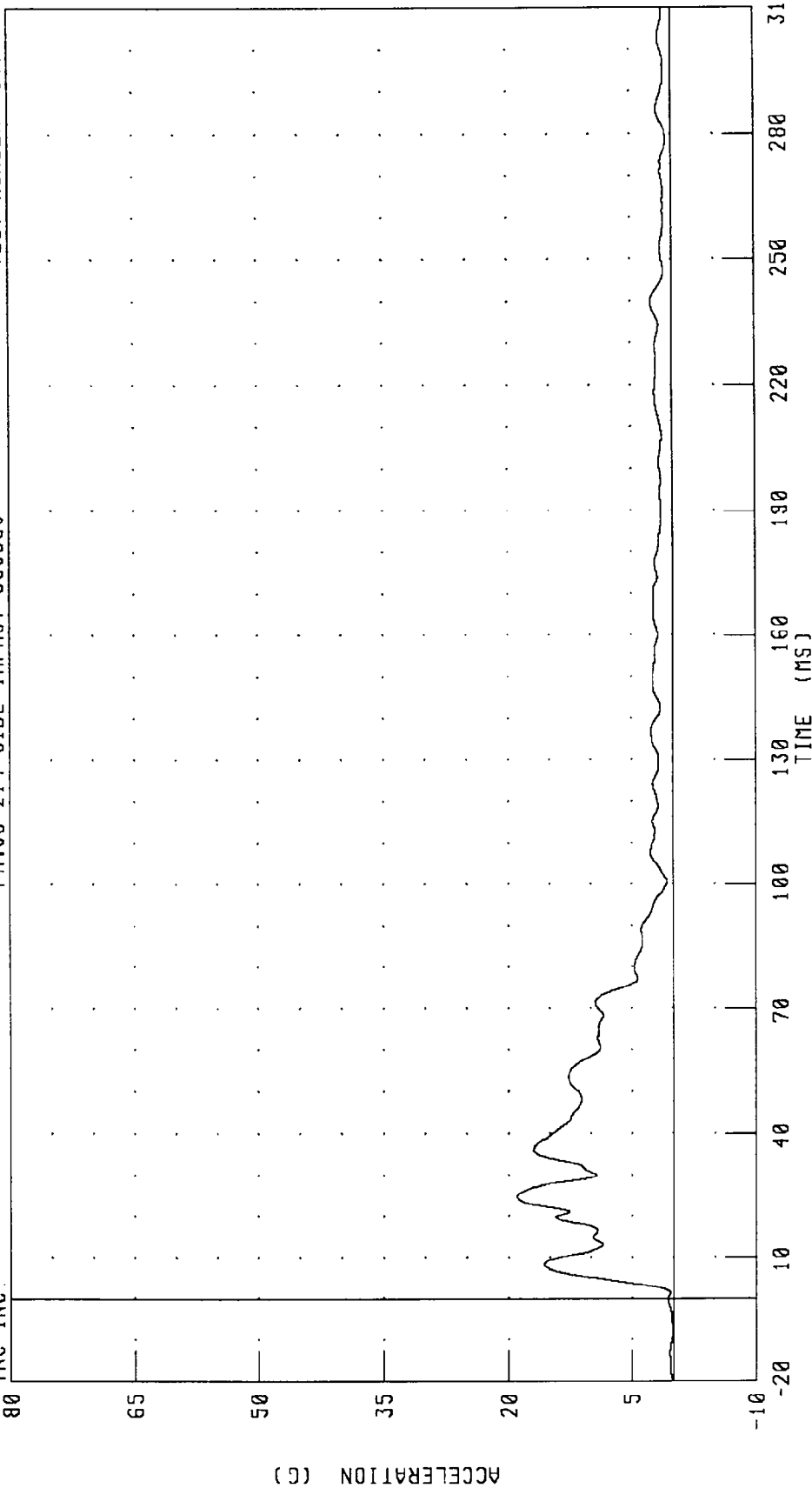
PEAK DATA: 4.77 G @ 73.36 MS, -11.91 G @ 19.68 MS

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 VEHICLE REAR FLOORPAN OVER AXLE RESULTANT ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



PEAK DATA: 18.96 G @ 24.72 MS, 0.08 G @ -8.48 MS

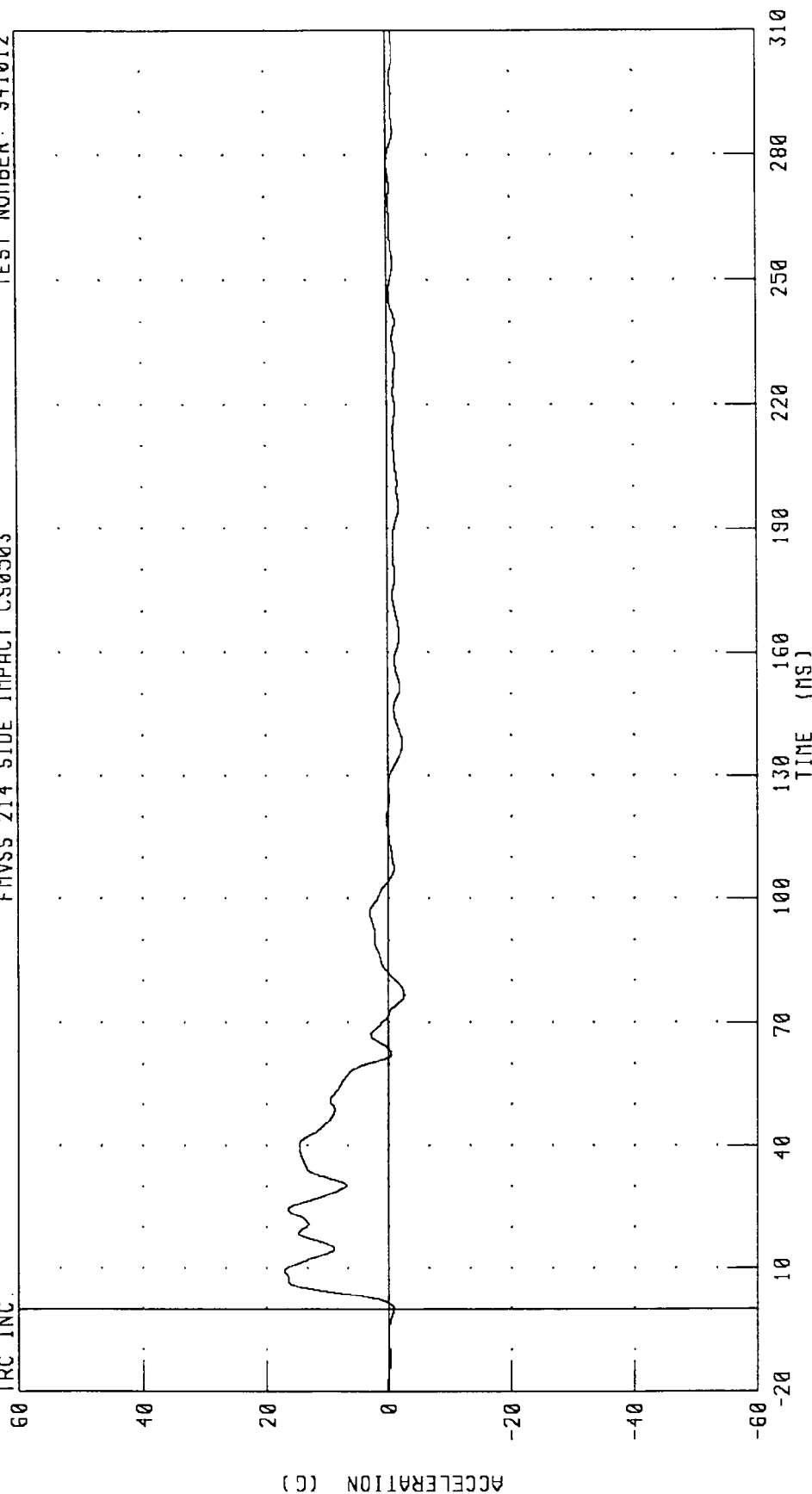
CHANNEL: RDKRC FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 REAR FLOORPAN TUNNEL Y-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



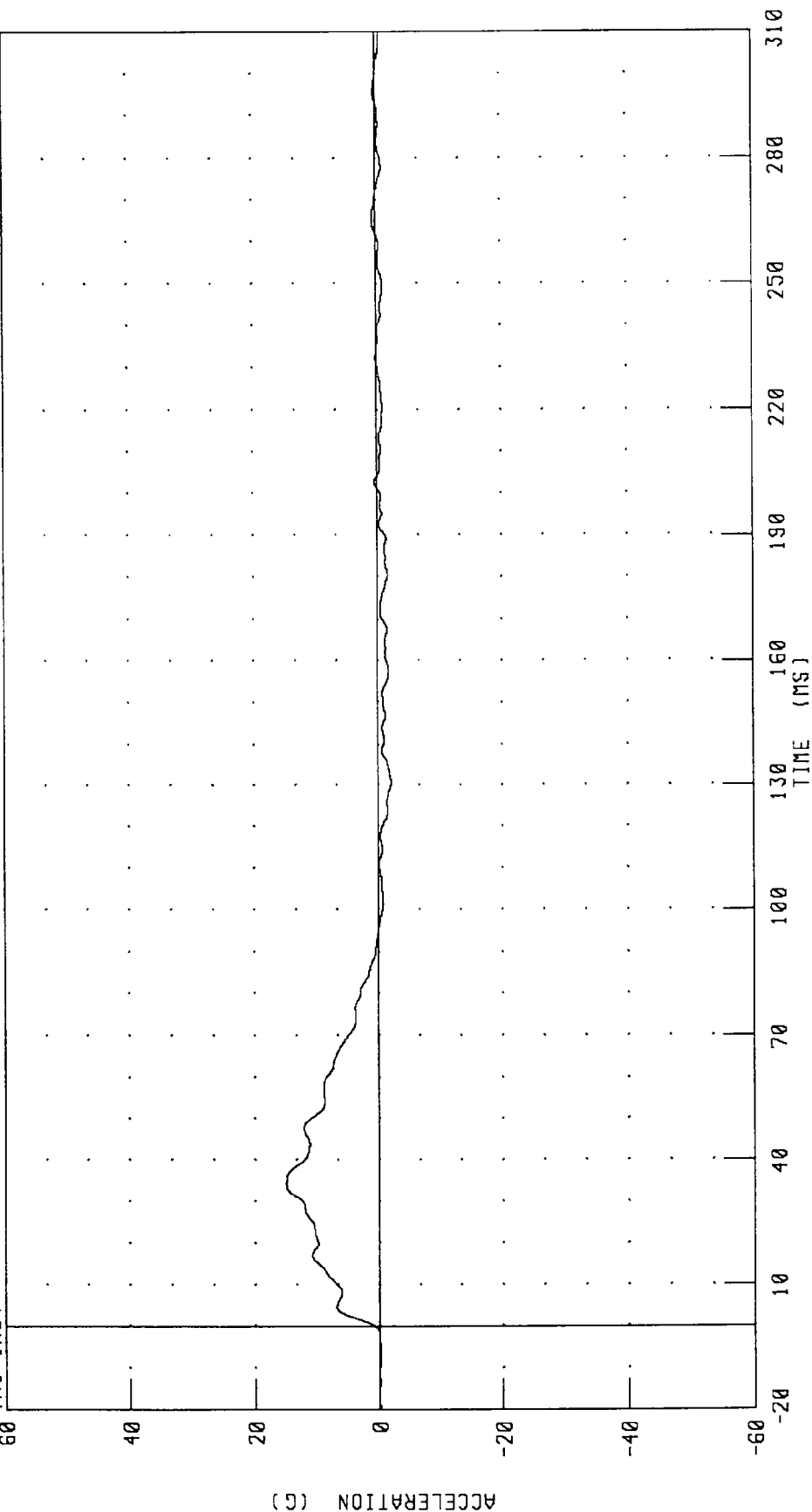
CHANNEL: TTRYG FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.

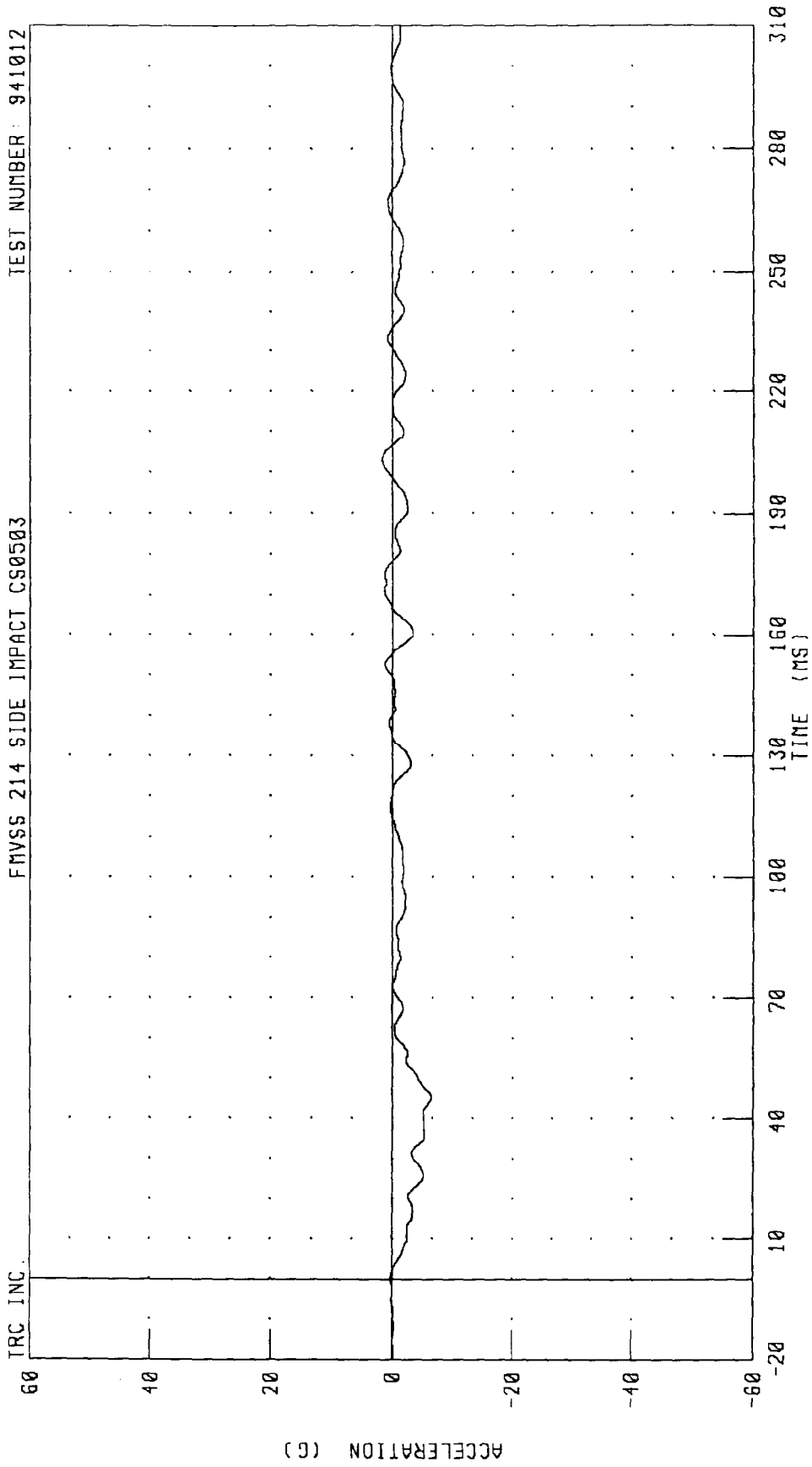


CHANNEL: BCGXG FILTER: CH. CLASS 60

941012

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION
 FMVSS 214 SIDE IMPACT CS0503

TEST NUMBER: 941012



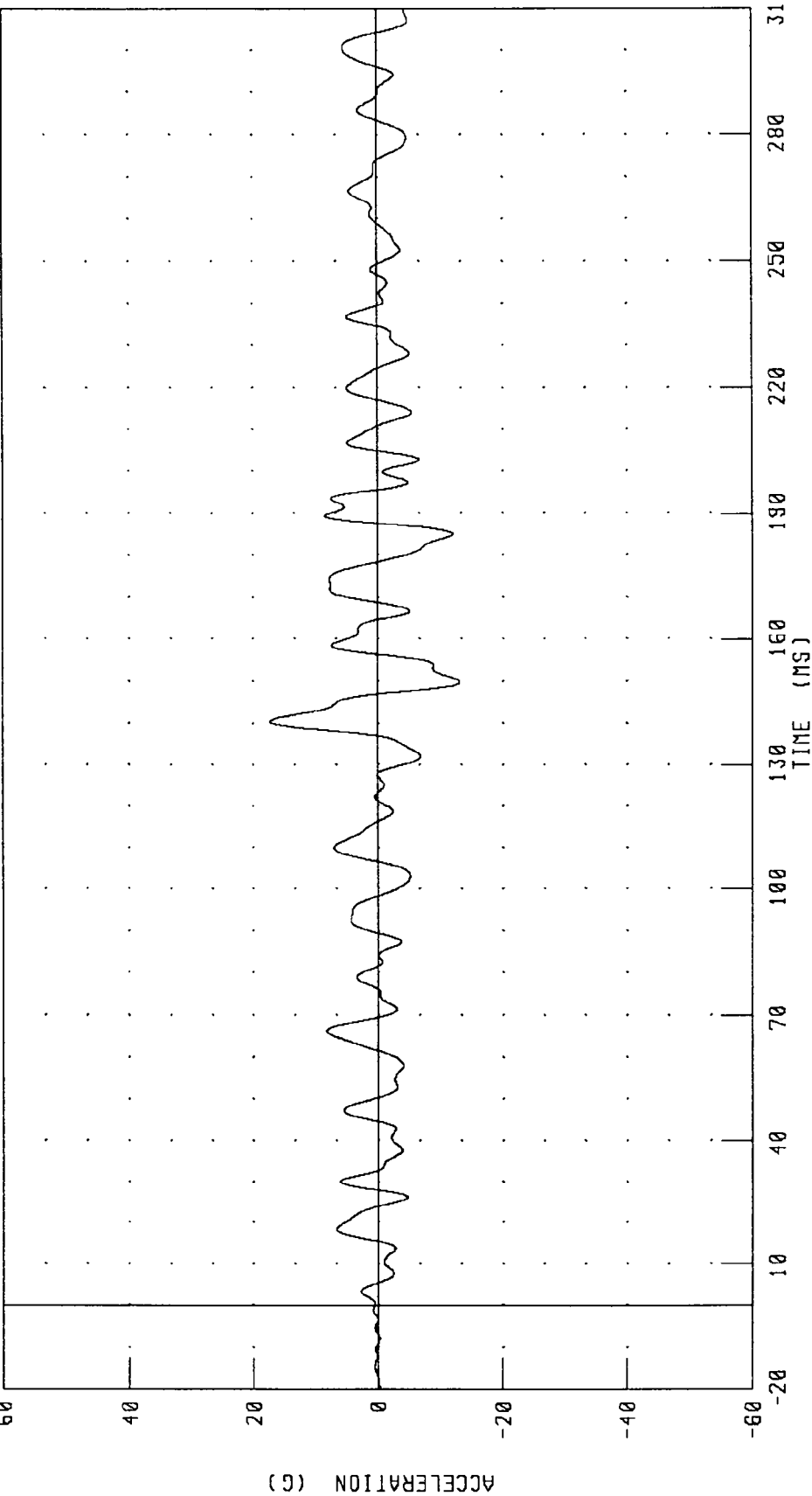
PEAK DATA: 1.64 G @ 203.36 MS, -6.46 G @ 45.20 MS

CHANNEL: BCCYG FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 BARRIER CENTER OF GRAVITY Z-AXIS ACCELERATION
 FMVSS 214 SIDE IMPACT CS0503

TEST NUMBER: 941012

IRC INC.



CHANNEL: BCGZG FILTER: CH. CLASS 60

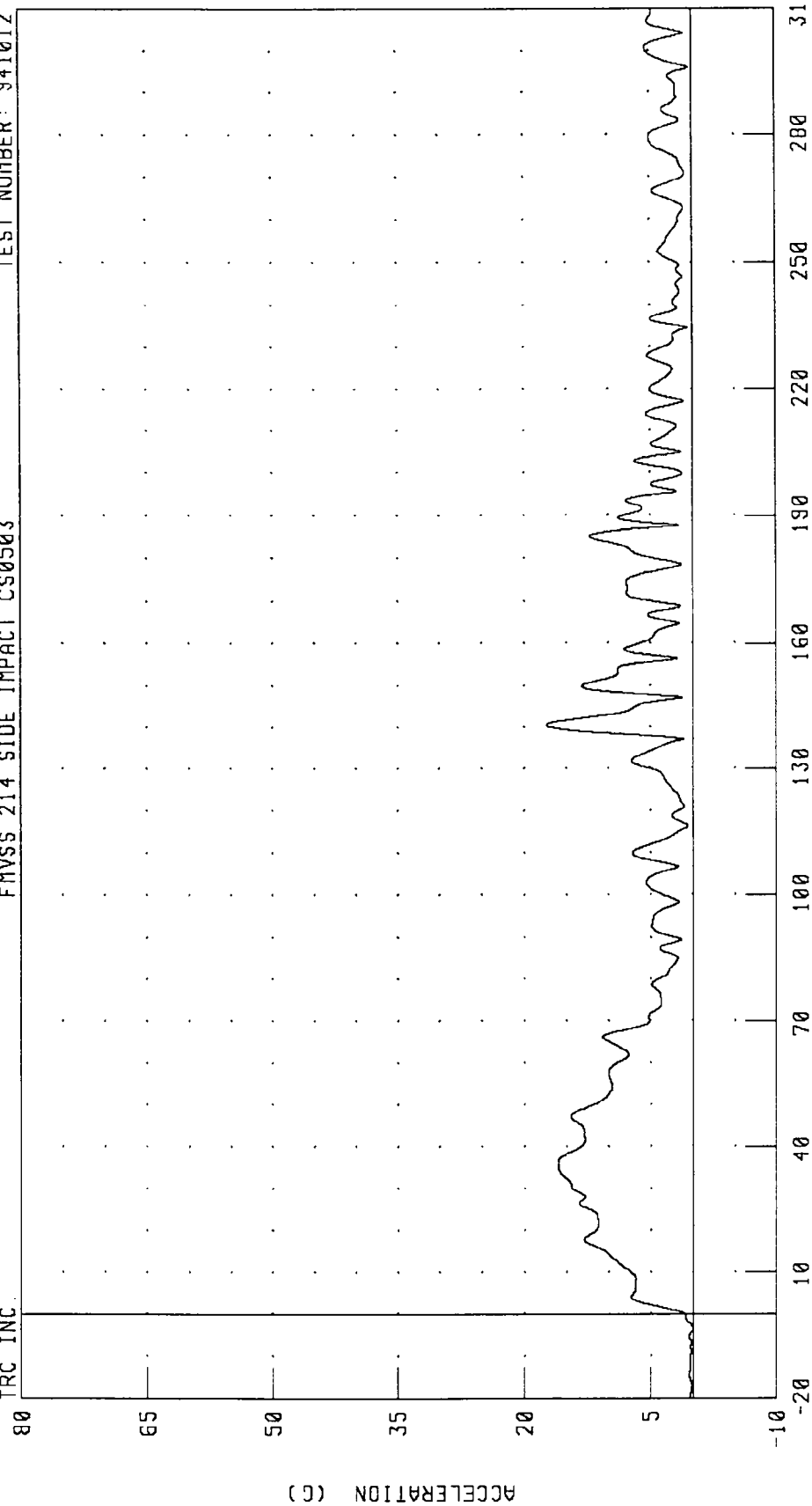
PEAK DATA: 17.27 G @ 140.56 MS; -13.11 G @ 149.92 MS

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



PEAK DATA: 17.31 G @ 140.56 MS; 0.05 G @ -3.60 MS

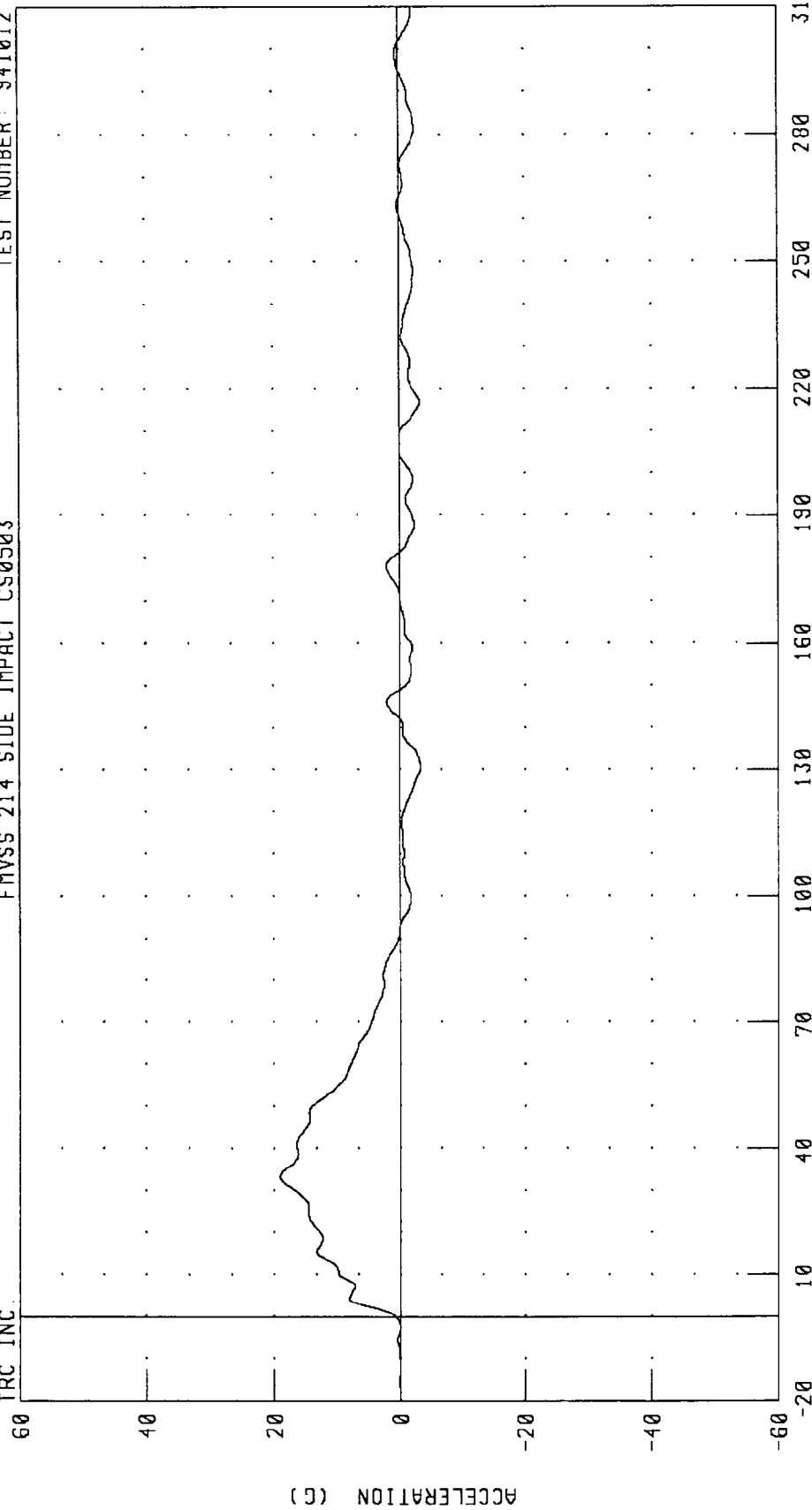
CHANNEL: BCGRG FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 BARRIER LEFT FRAME RAIL OVER REAR AXLE X-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



PEAK DATA: 19.08 G @ 33.44 MS; -3.31 G @ 130.64 MS

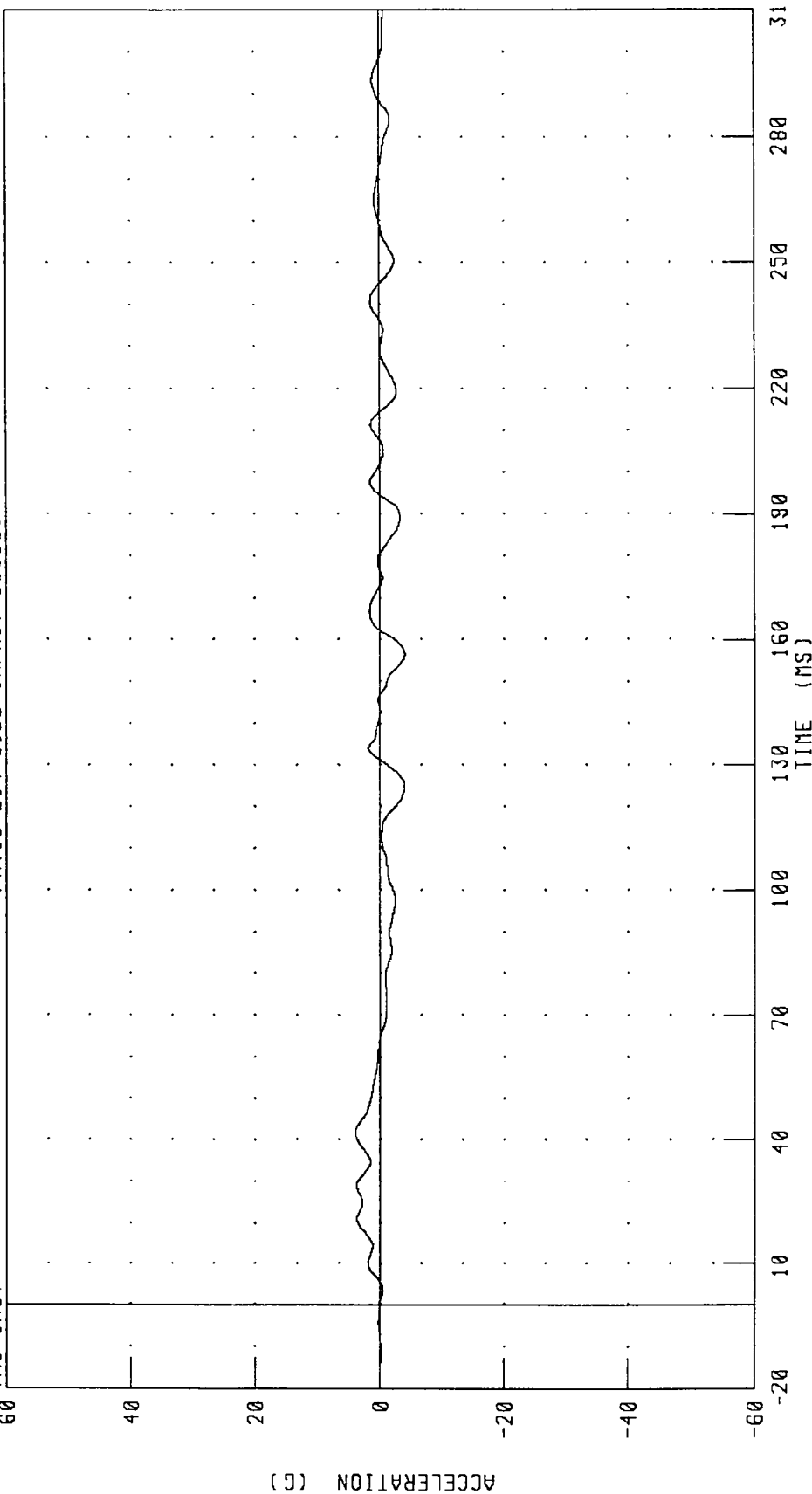
CHANNEL: BSRXC FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1995 HYUNDAI SONATA
 BARRIER LEFT FRAME RAIL OVER REAR AXLE Y-AXIS ACCELERATION

TEST NUMBER: 941012

FMVSS 214 SIDE IMPACT CS0503

TRC INC.



PEAK DATA: 3.98 G @ 41.68 MS, -3.98 G @ 156.56 MS

CHANNEL: BSRYG FILTER: CH. CLASS 60

Appendix C

Dummy Calibration Information

Pre-test Calibration

Driver Dummy S/N 016

Calibration Test Results Summary

Dummy Serial Number: 016

Pre-test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thoracic Shock Absorber Test:	The shock absorber passed all test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Lateral Pelvis Impact Test:	The pelvis passed all impact test requirements.

TRANSPORTATION RESEARCH CENTER INC.
SIDE IMPACT DUMMY
EXTERNAL DIMENSIONS
LEFT SIDE CONFIGURATION
SN 016 VECTOR

07-OCT-94

TRC. TEST NO: ED01602 572F SN016 EXT.DIMENSION CAL02

DIMENSIONS WITH CHEST JACKET INSTALLED			
SYMB	DESCRIPTION	SPECIFICATION	TEST RESULTS
	TEMPERATURE		70.0 DEG. F
	RELATIVE HUMIDITY		53.0 %
SH	SEATED HEIGHT	35.0 - 35.8 IN	35.5 IN
HP	HIP PIVOT HEIGHT	3.9 IN REF.	3.9 IN
KH	KNEE PIVOT FROM BACKLINE	20.1 - 20.7 IN	20.5 IN
KV	KNEE PIVOT FROM FLOOR	19.3 - 19.9 IN	19.3 IN
HW	HIP WIDTH	14.0 - 15.4 IN	14.8 IN
DIMENSIONS WITH CHEST JACKET REMOVED			
SYMB	DESCRIPTION	SPECIFICATION	TEST RESULTS
RH	RIB HEIGHT	19.75 - 20.50 IN	20.30 IN
RD	RIB FROM BACKLINE	9.0 - 9.5 IN	9.2 IN
RW-1	TOP RIB WIDTH FROM C/L	6.5 - 7.1 IN	6.7 IN
RW-2	BOTTOM RIB WIDTH FROM C/L	6.5 - 7.1 IN	6.8 IN
	DIFFERENCE BETWEEN TOP & BOTTOM RIB WIDTH FROM C/L	≤ 0.1 IN	0.1 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN *John F. Smith*

RUN NUMBER: 100794.0821

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

07-OCT-94

TRC INC.

572F SN016 DAMPER TEST CAL02

TEST NUMBERS: DP01602A,DP01602B,DP01602C

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		66 - 78 F	70.0 DEG. F
RELATIVE HUMIDITY		10 - 70 %	56.0 %
VELOCITY	FORCE	188 - 253 LB	210 LB
10.0 FT/S	DISPLACEMENT	1.19 - 1.38 IN	1.29 IN
VELOCITY	FORCE	389 - 472 LB	414 LB
14.0 FT/S	DISPLACEMENT	1.25 - 1.47 IN	1.42 IN
VELOCITY	FORCE	841 - 1000 LB	989 LB
20.0 FT/S	DISPLACEMENT	1.31 - 1.56 IN	1.46 IN

DAMPER SETTING = 7.0

TEST MEETS SPECIFICATIONS

TECHNICIAN Rita F. S.

RUN NUMBER: 101094.0721;4

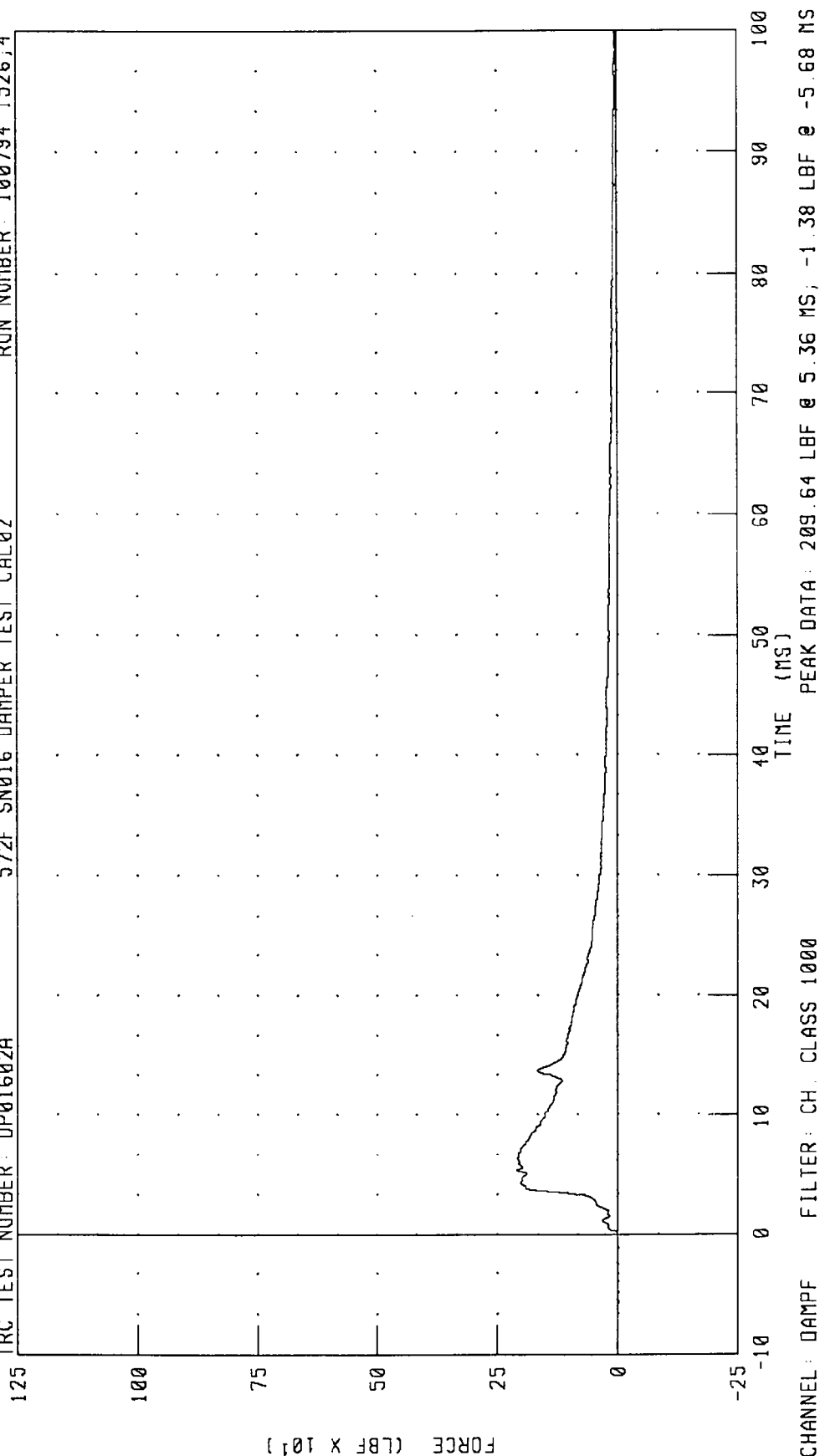
PART 572-F S I D. THORACIC SHOCK ABSORBER CALIBRATION (10 FT/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP01602A

572F SN016 DAMPER TEST CAL02

RUN NUMBER: 100794 1526.4

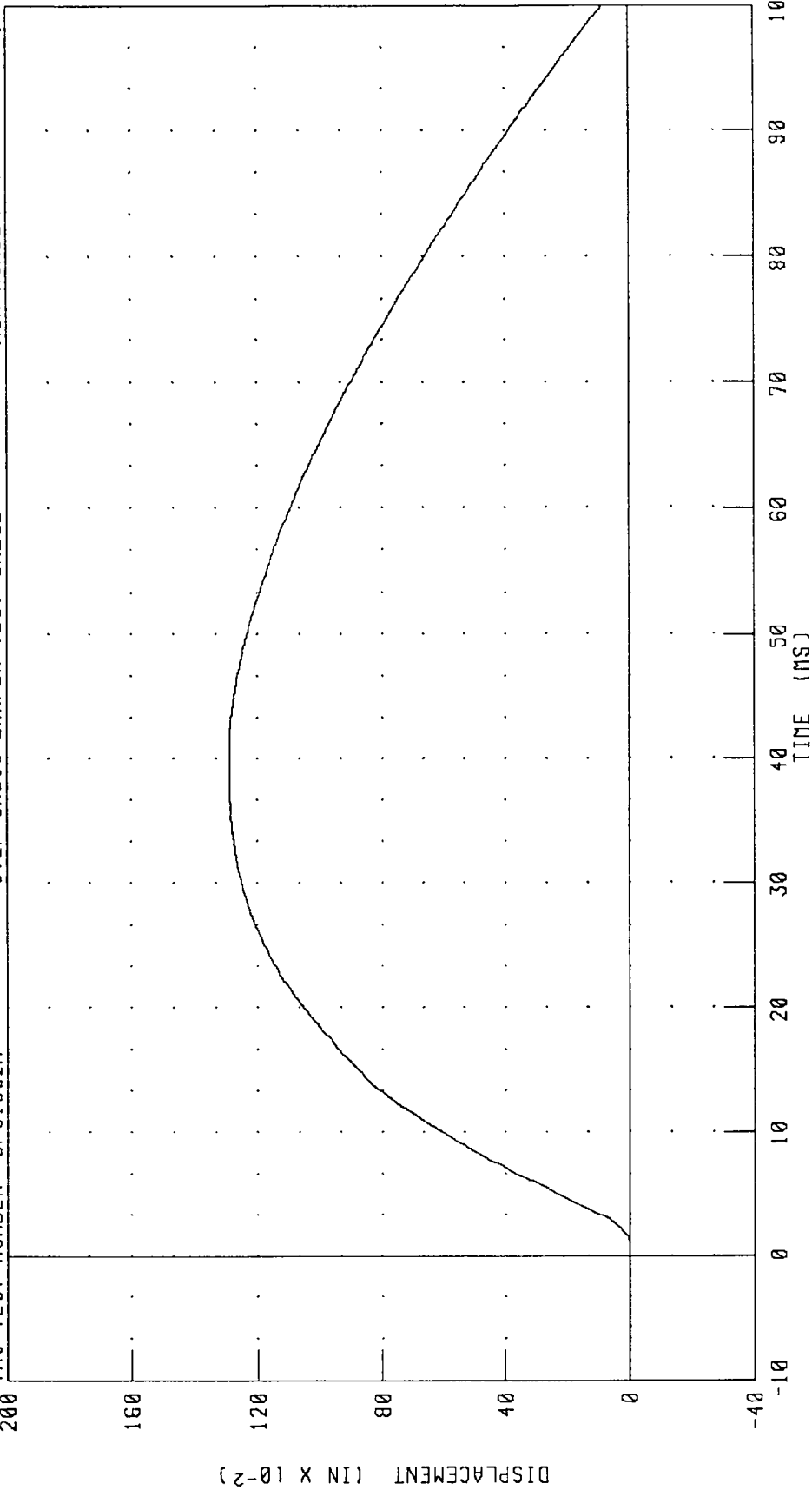


CHANNEL: DAMPF FILTER: CH. CLASS 1000

PEAK DATA: 209.64 LBF @ 5.36 MS, -1.38 LBF @ -5.68 MS

PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (10 FT/SEC)
SHOCK ABSORBER DISPLACEMENT

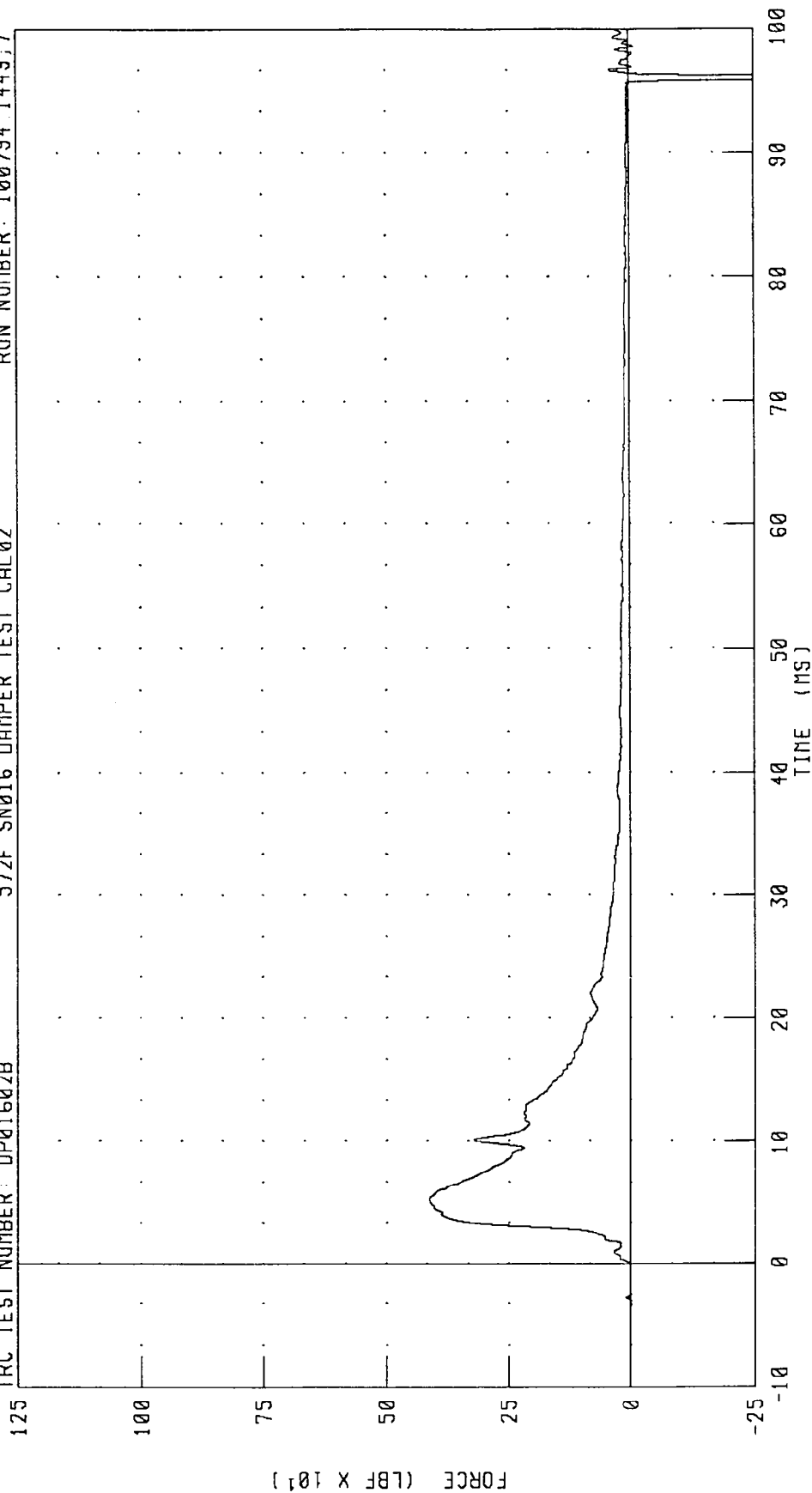
IRC TEST NUMBER DP01602A 572F SN016 DAMPER TEST CAL02 RUN NUMBER: 100794.1526,4



CHANNEL: CSTYD FILTER: CH. CLASS 1000 PEAK DATA: 1.29 IN @ 38.64 MS; 0.00 IN @ -5.68 MS

PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (14 FT/SEC)
SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP01602B 572F SN016 DAMPER TEST CAL02 RUN NUMBER: 100794 1449,7

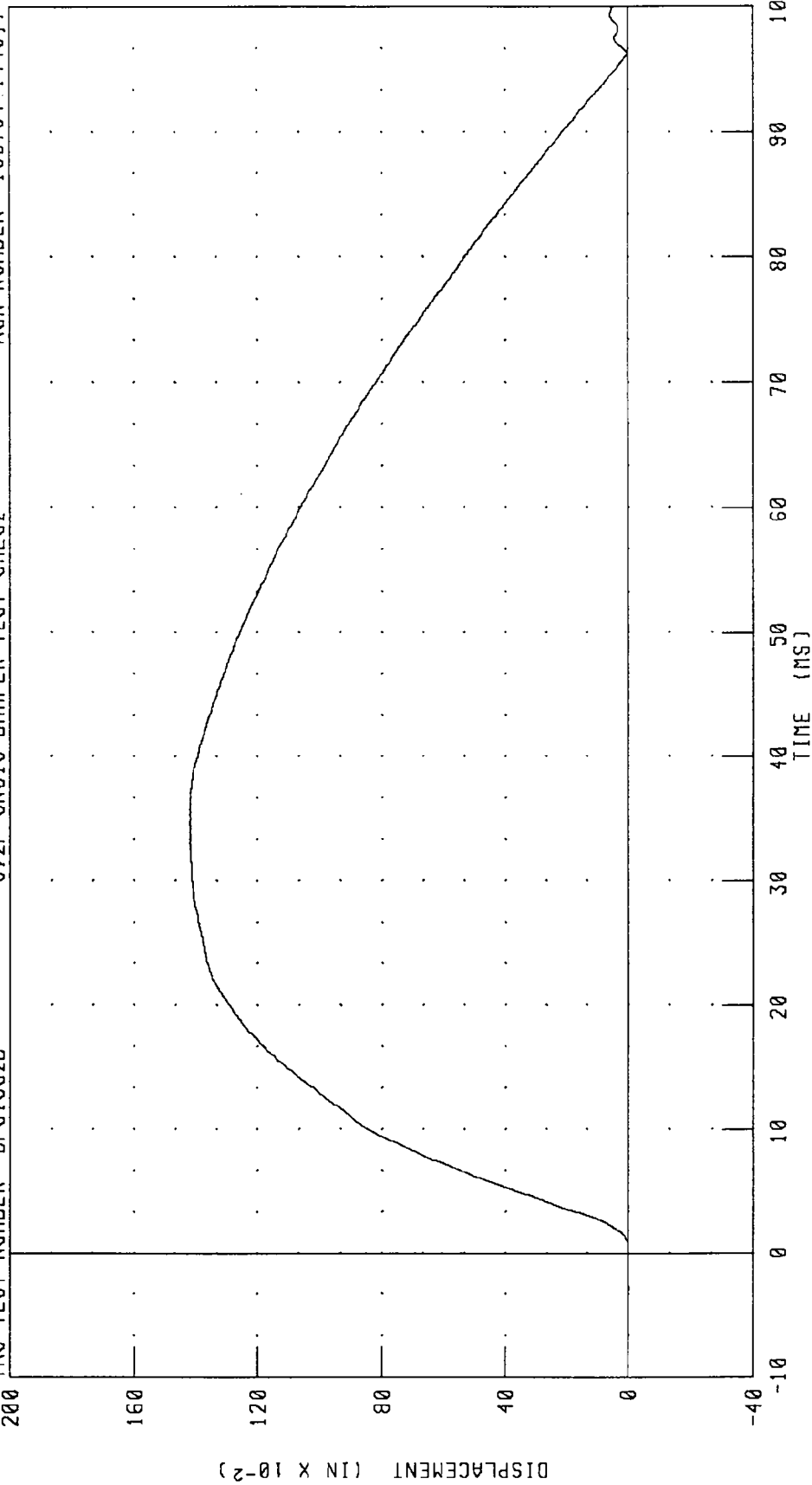


PEAK DATA: 413.65 LBF @ 5.20 MS; -630.63 LBF @ 96.08 MS

CHANNEL: DAMPF FILTER: CH. CLASS 1000

PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (14 FT/SEC)
SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP01602B 572F SN016 DAMPER TEST CAL02 RUN NUMBER: 100794.1449,7



CHANNEL: CSTYD FILTER: CH. CLASS 1000 PEAK DATA: 1.42 IN @ 35.76 MS, 0.00 IN @ -2.88 MS

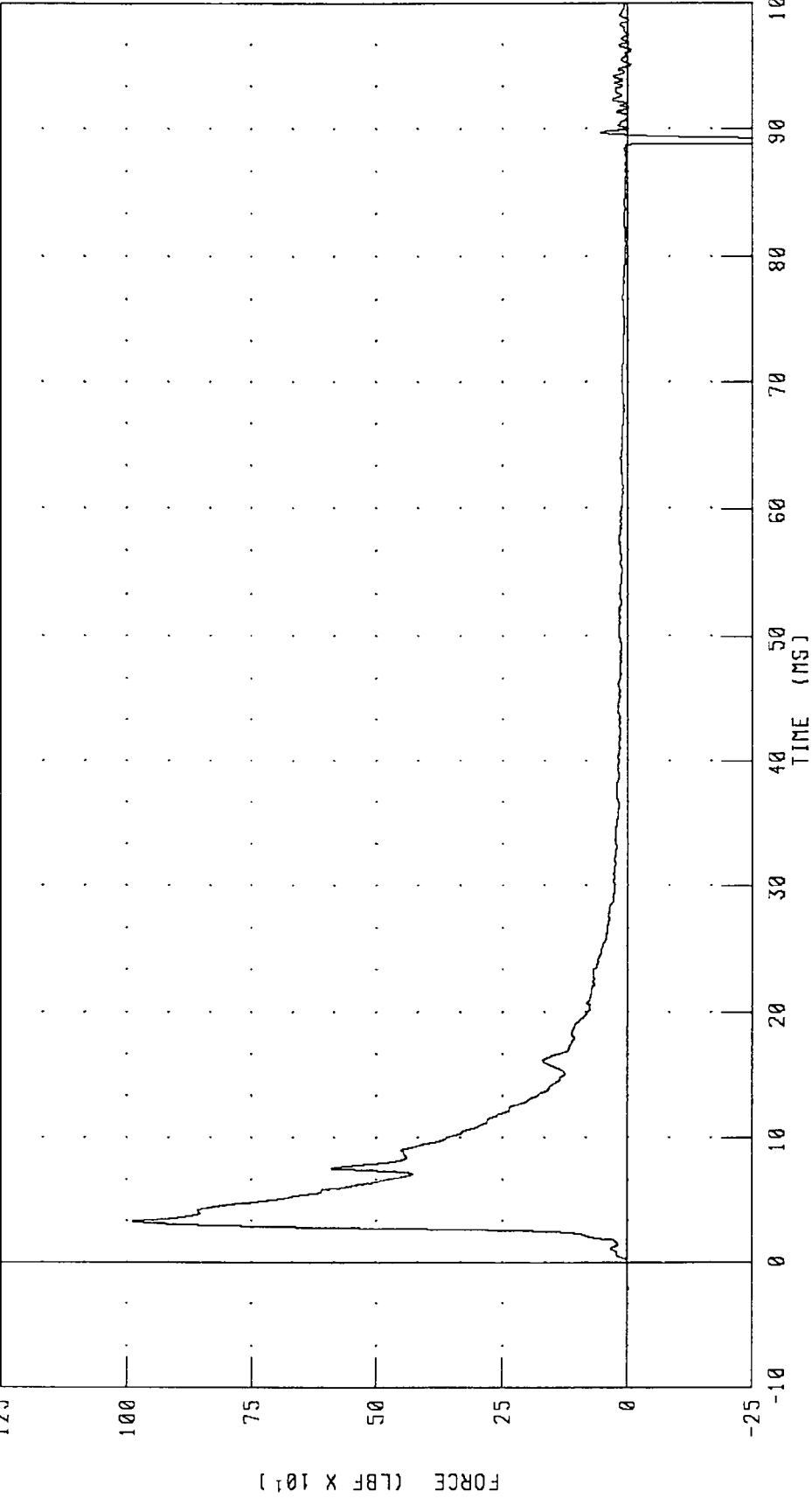
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (20 FT/SEC)

SHOCK ABSORBER RESISTIVE FORCE

572F SN016 DAMPER TEST CAL02

TRC TEST NUMBER DP01602C

RUN NUMBER 100794.1505,3



PEAK DATA: 988.82 LBF @ 3.20 MS, -565.82 LBF @ 89.04 MS

CHANNEL: DAMPF FILTER: CH. CLASS 1000

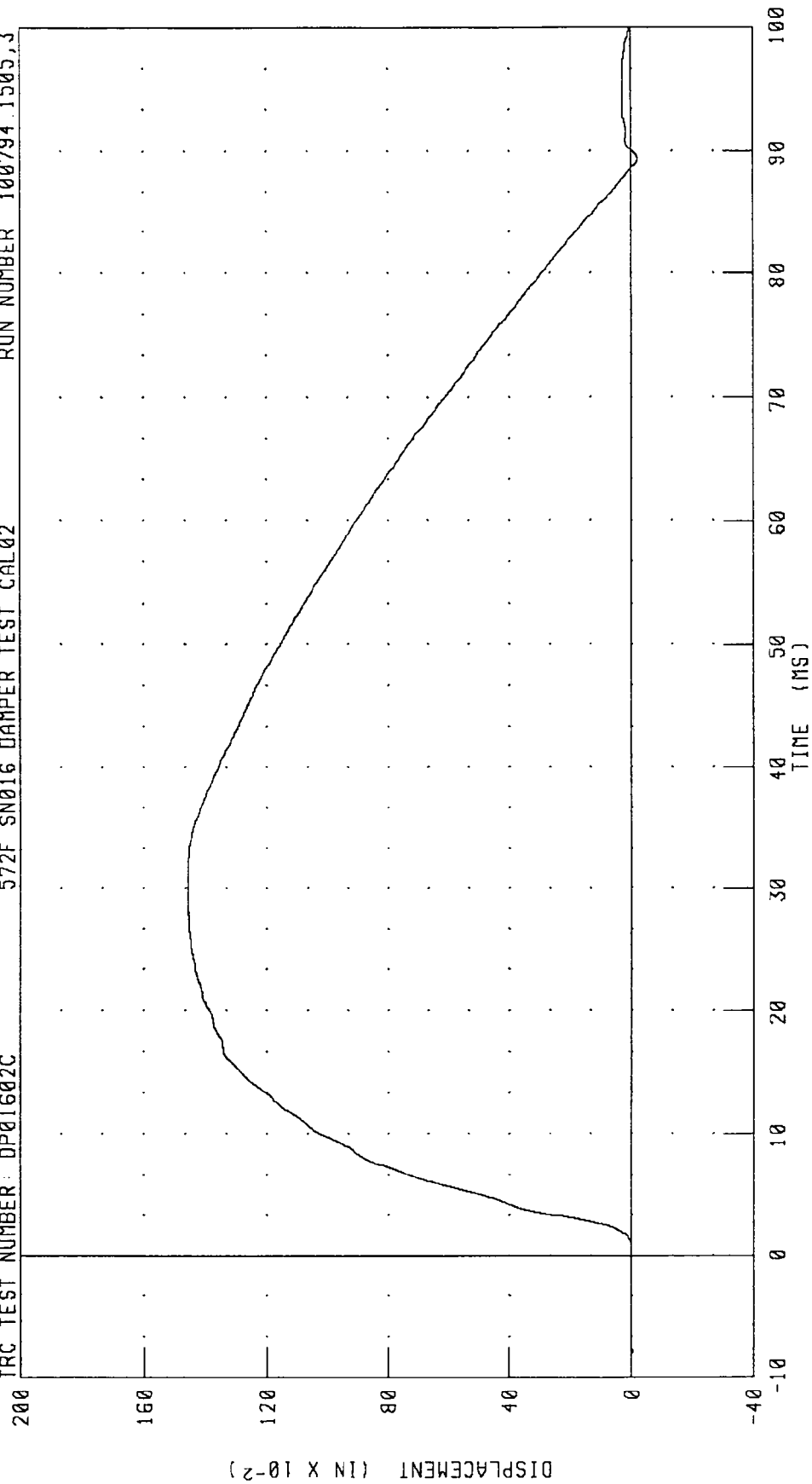
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (20 FT/SEC)

SHOCK ABSORBER DISPLACEMENT

572F SN016 DAMPER TEST CAL02

TRC TEST NUMBER: DP01602C

RUN NUMBER 100794.1505,3



PEAK DATA: 1.46 IN @ 28.56 MS, -0.02 IN @ 89.36 MS

CHANNEL: CSTYD FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

10-OCT-94

LEFT SIDE CONFIGURATION

TRC INC. TEST NO: STL01602

572F SN016 LEFT THORAX CAL02

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	66 - 78 F	69.0 DEG. F
RELATIVE HUMIDITY	10 - 70 %	50.0 %
PISTON VELOCITY	13.80 - 14.20 FT/S	13.92 FT/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	40.6 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	41.4 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	17.4 G

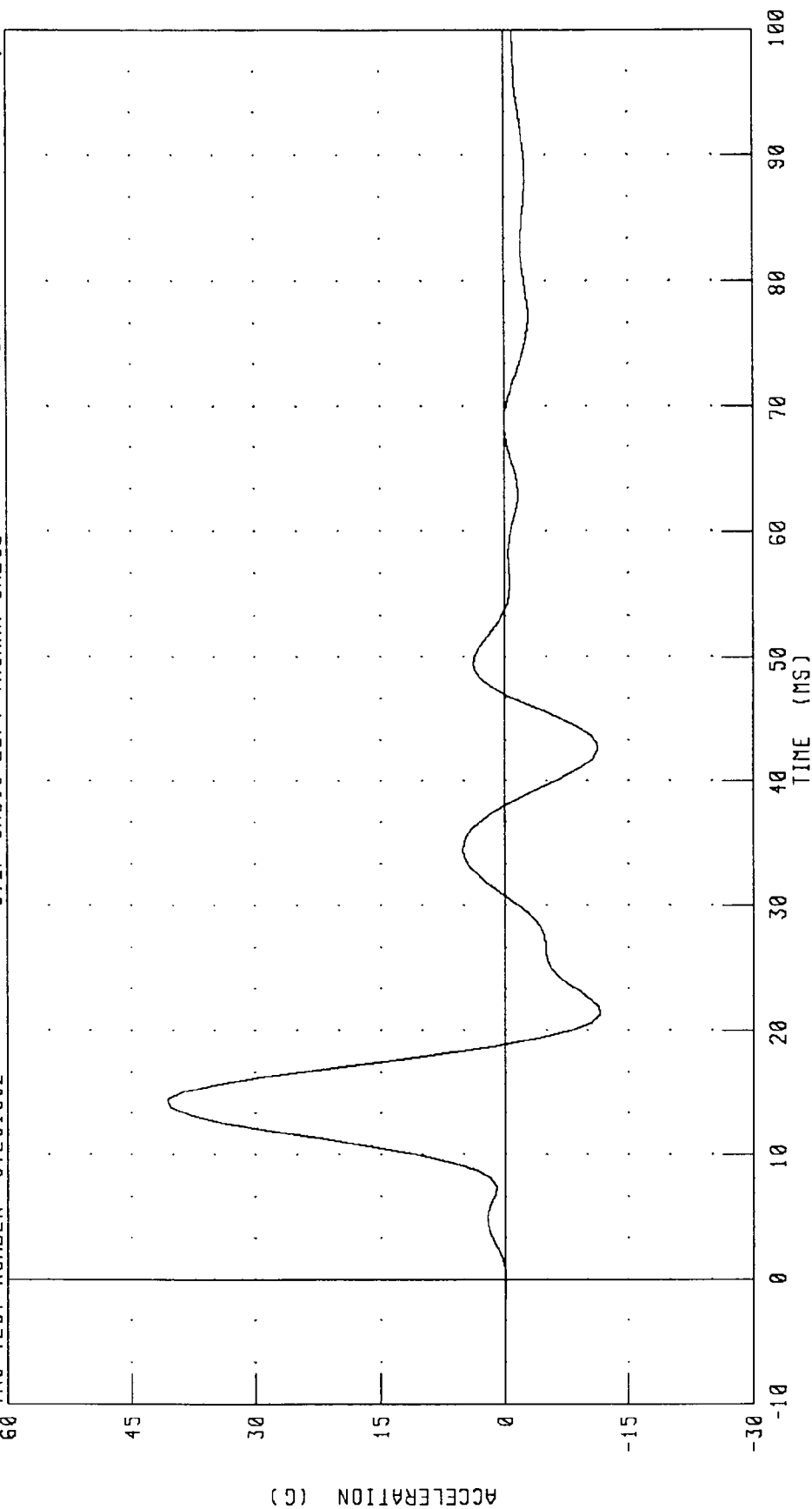
TEST MEETS SPECIFICATIONS

TECHNICIAN V.P. Watters

RUN NUMBER: 110194.1608;3

PART 572-F S I D THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LEFT UPPER RIB ACCELERATION Y AXIS

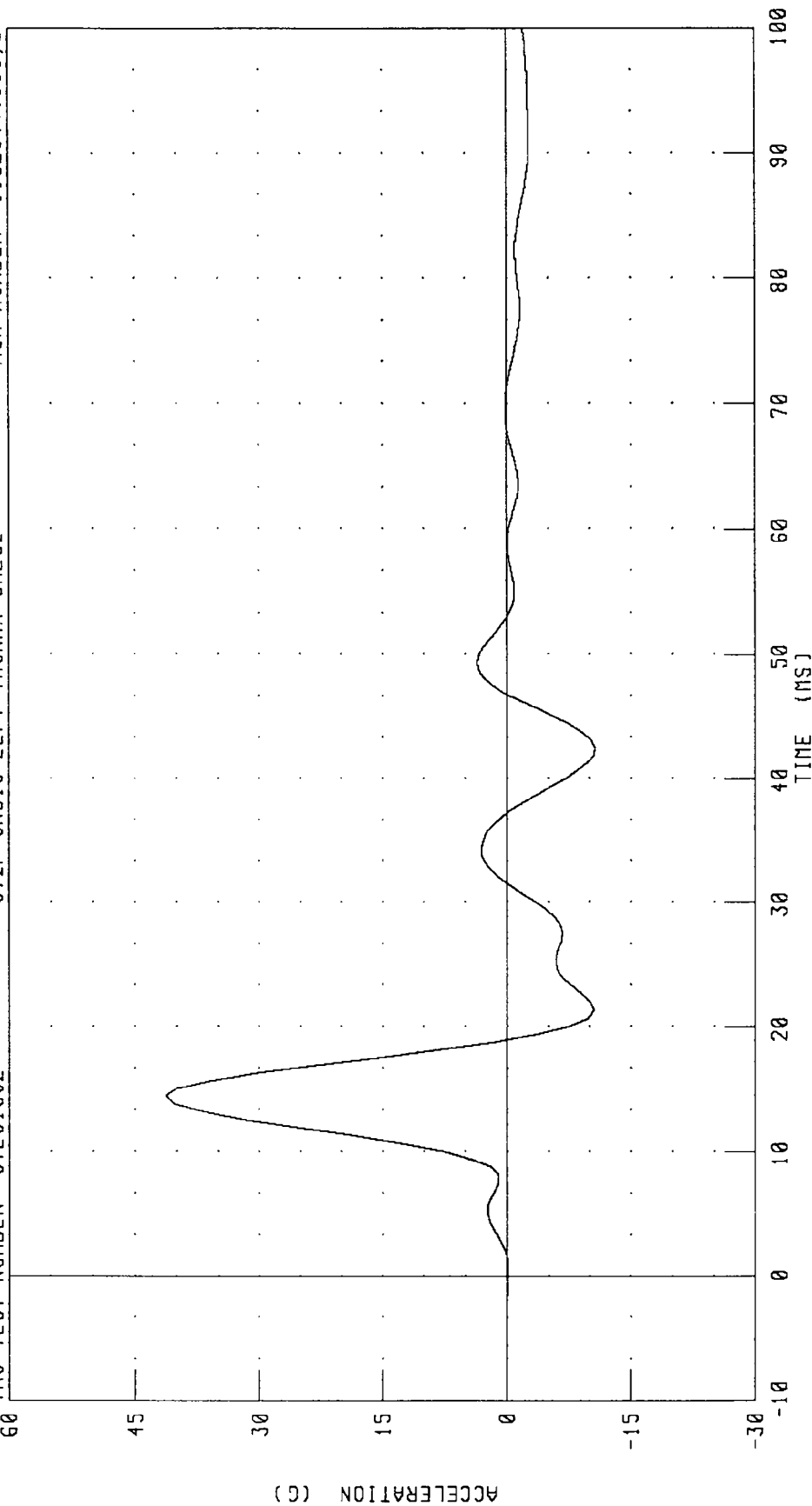
TRC TEST NUMBER: STL01602 572F SN016 LEFT THORAX CAL02 RUN NUMBER 110294 1118,3



CHANNEL: LURYG FILTER: FIR 100 PEAK DATA: 40.65 G @ 14.37 MS, -11.56 G @ 21.25 MS

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL01602 572F SN016 LEFT THORAX CAL02 RUN NUMBER: 110294.1118,3

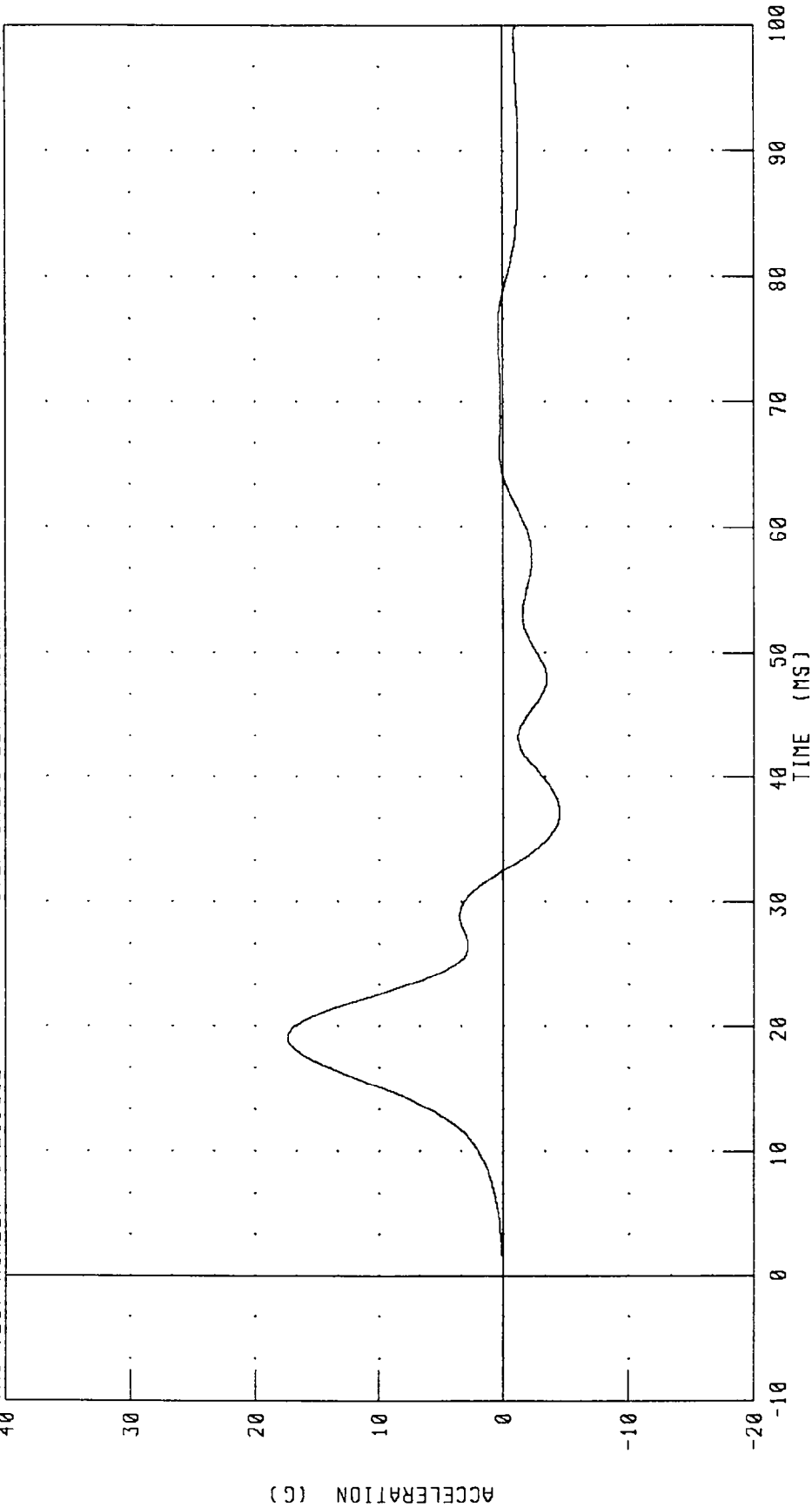


PEAK DATA: 41.36 G @ 14.37 MS, -10.64 G @ 42.50 MS

CHANNEL: LLRYG FILTER: FIR 100

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LOWER SPINE ACCELERATION Y AXIS

IRC TEST NUMBER: STL01602 572F SN016 LEFT THORAX CAL02 RUN NUMBER 110294 1118,3



CHANNEL: T12YG FILTER: FIR 100 PEAK DATA: 17.36 G @ 19.38 MS, -4.51 G @ 36.88 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

10-OCT-94

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: SPL01602

572F SN016 LEFT PELVIS CAL02

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	66 - 78 F	70.0 DEG. F
RELATIVE HUMIDITY	10 - 70 %	53.0 %
PISTON VELOCITY	13.80 - 14.20 FT/S	14.16 FT/S
PEAK PELVIC ACCELERATION	40 - 60 G	48.8 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	5.9 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

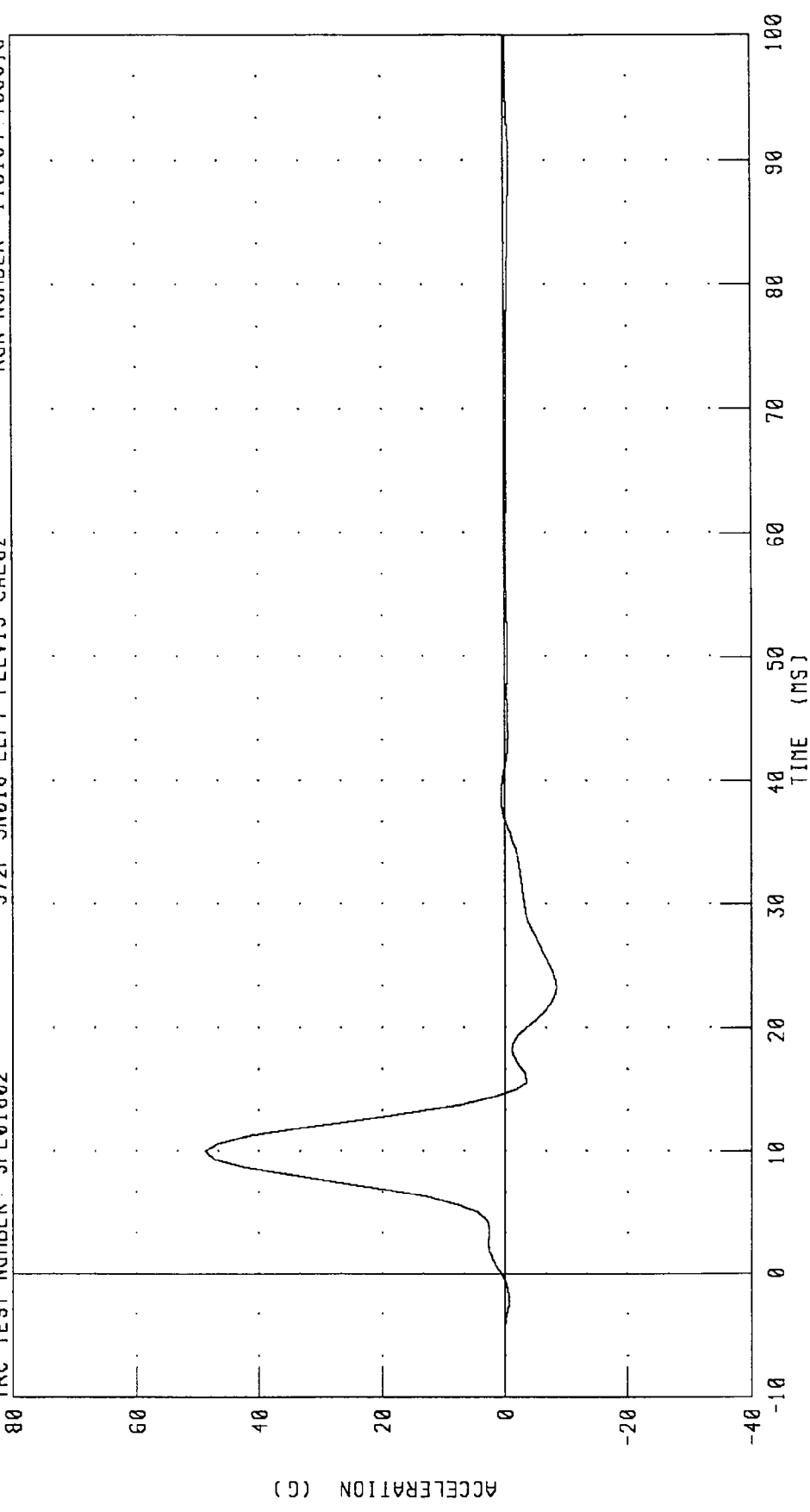
V.F. Watters

RUN NUMBER: 110194.1557;3

PART 572-F S I D PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

TRC TEST NUMBER: SPL01602 572F SN016 LEFT PELVIS CAL02 RUN NUMBER: 110194 1558;3



CHANNEL: PEVYG FILTER: FIR 100 PEAK DATA: 48.79 G @ 10.00 MS; -8.35 G @ 23.13 MS

Pre-test Calibration

Left Rear Passenger Dummy S/N 268

Calibration Test Results Summary

Dummy Serial Number: 268

Pre-test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thoracic Shock Absorber Test:	The shock absorber passed all test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Lateral Pelvis Impact Test:	The pelvis passed all impact test requirements.

TRANSPORTATION RESEARCH CENTER INC.
 SIDE IMPACT DUMMY
 EXTERNAL DIMENSIONS
 LEFT SIDE CONFIGURATION
 SN 268 FIRST TECHNOLOGY

05-OCT-94

TRC. TEST NO: ED26802 572F SN268 EXT.DIMENSION CAL02

DIMENSIONS WITH CHEST JACKET INSTALLED			
SYMB	DESCRIPTION	SPECIFICATION	TEST RESULTS
	TEMPERATURE		70.0 DEG. F
	RELATIVE HUMIDITY		53.0 %
SH	SEATED HEIGHT	35.0 - 35.8 IN	35.3 IN
HP	HIP PIVOT HEIGHT	3.9 IN REF.	3.9 IN
KH	KNEE PIVOT FROM BACKLINE	20.1 - 20.7 IN	20.4 IN
KV	KNEE PIVOT FROM FLOOR	19.3 - 19.9 IN	19.4 IN
HW	HIP WIDTH	14.0 - 15.4 IN	15.1 IN
DIMENSIONS WITH CHEST JACKET REMOVED			
SYMB	DESCRIPTION	SPECIFICATION	TEST RESULTS
RH	RIB HEIGHT	19.75 - 20.50 IN	NA *
RD	RIB FROM BACKLINE	9.0 - 9.5 IN	NA
RW-1	TOP RIB WIDTH FROM C/L	6.5 - 7.1 IN	NA
RW-2	BOTTOM RIB WIDTH FROM C/L	6.5 - 7.1 IN	NA
	DIFFERENCE BETWEEN TOP & BOTTOM RIB WIDTH FROM C/L	≤ 0.1 IN	NA

* THE DUMMY WAS WITHIN SPECIFICATIONS BUT ADJUSTMENTS TO THE RIB CAGE WERE MADE AT THE TIME OF THE THORAX CALIBRATION TESTING WITHOUT REVERIFICATION OF RIB CAGE DIMENSIONS. THE RIB HEIGHT AT THE TIME OF POST-TEST THORAX CALIBRATION WAS VERIFIED AT 20.0 INCHES.

TECHNICIAN V. F. Watters

RUN NUMBER: 100794.0825

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

10-OCT-94

TRC INC.

572F SN268 DAMPER TEST CAL02

TEST NUMBERS: DP26802A,DP26802B,DP26802C

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		66 - 78 F	69.0 DEG. F
RELATIVE HUMIDITY		10 - 70 %	50.0 %
VELOCITY	FORCE	188 - 253 LB	204 LB
10.0 FT/S	DISPLACEMENT	1.19 - 1.38 IN	1.21 IN
VELOCITY	FORCE	389 - 472 LB	400 LB
14.0 FT/S	DISPLACEMENT	1.25 - 1.47 IN	1.36 IN
VELOCITY	FORCE	851 - 1011 LB	931 LB
20.1 FT/S	DISPLACEMENT	1.31 - 1.56 IN	1.42 IN

DAMPER SETTING = 6.0

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Fout

RUN NUMBER: 101394.0936;4

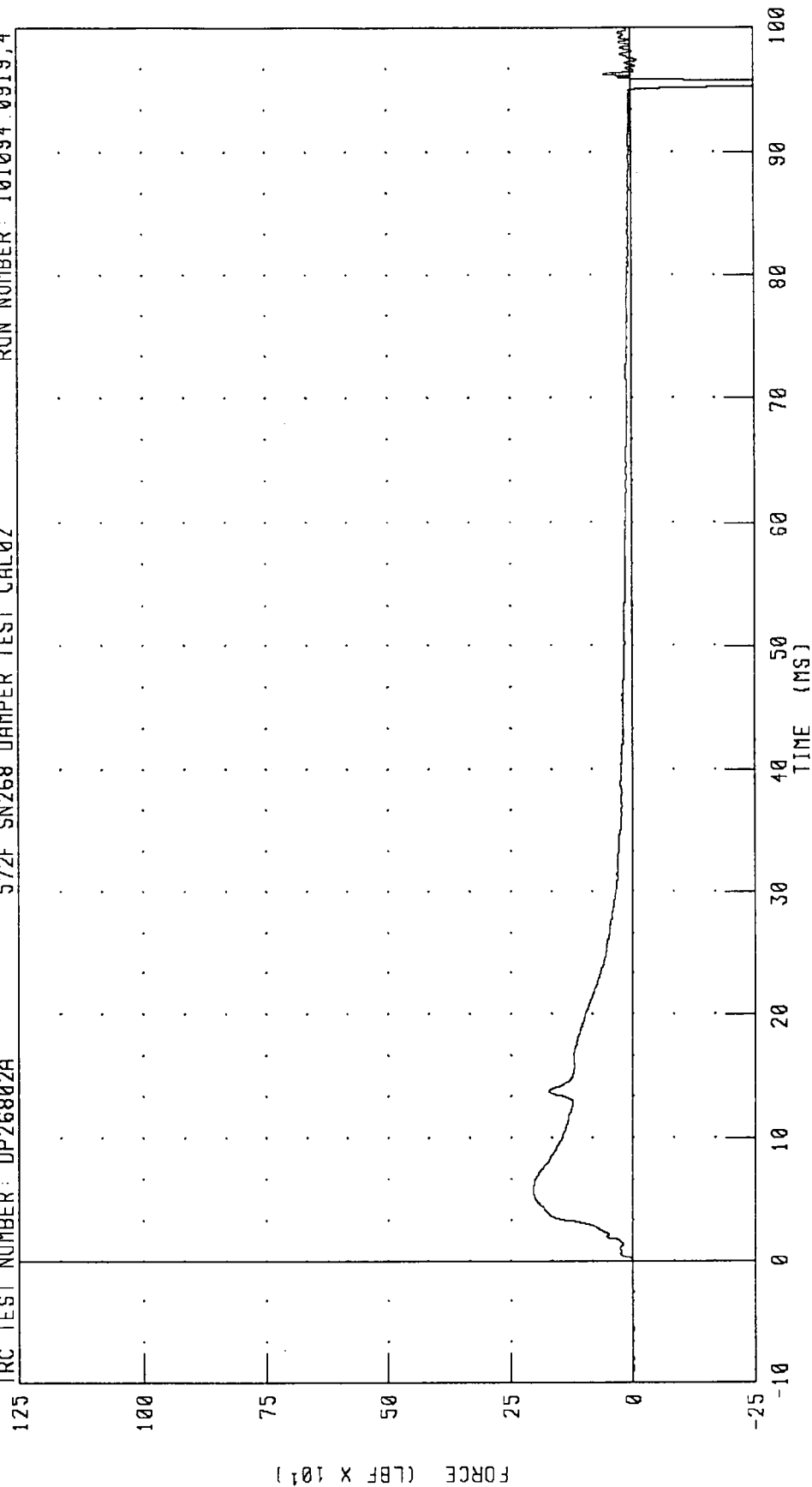
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (10 FT/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP26802A

572F SN268 DAMPER TEST CAL02

RUN NUMBER: 101094.0919,4



PEAK DATA: 204.42 LBF @ 6.00 MS, -460.32 LBF @ 95.52 MS

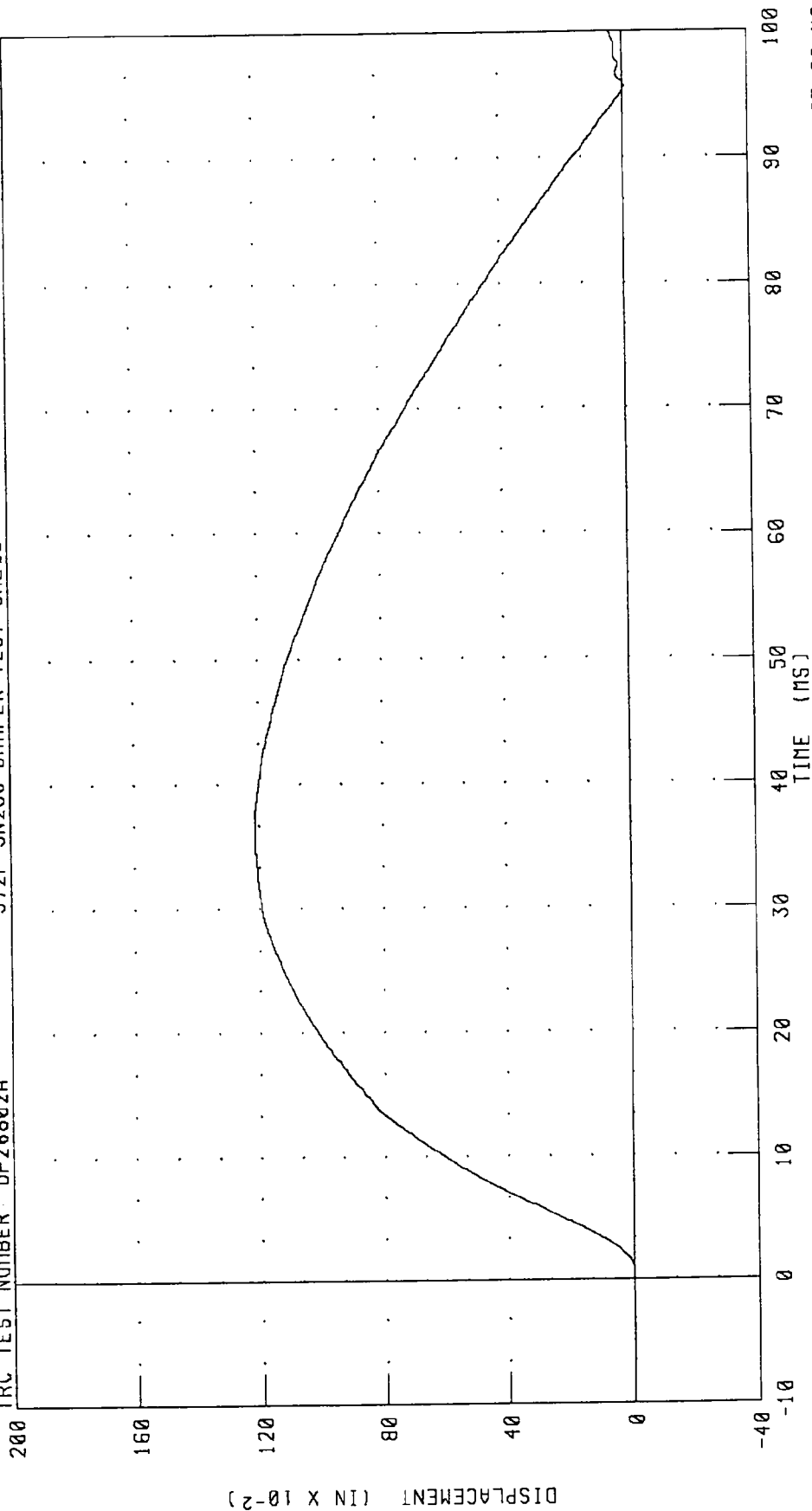
CHANNEL: DAMPF FILTER: CH. CLASS 1000

PART 572-F S I.O. THORACIC SHOCK ABSORBER CALIBRATION (10 FT/SEC)
 SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP26802A

572F SN268 DAMPER TEST CAL02

RUN NUMBER: 101094 0919.4

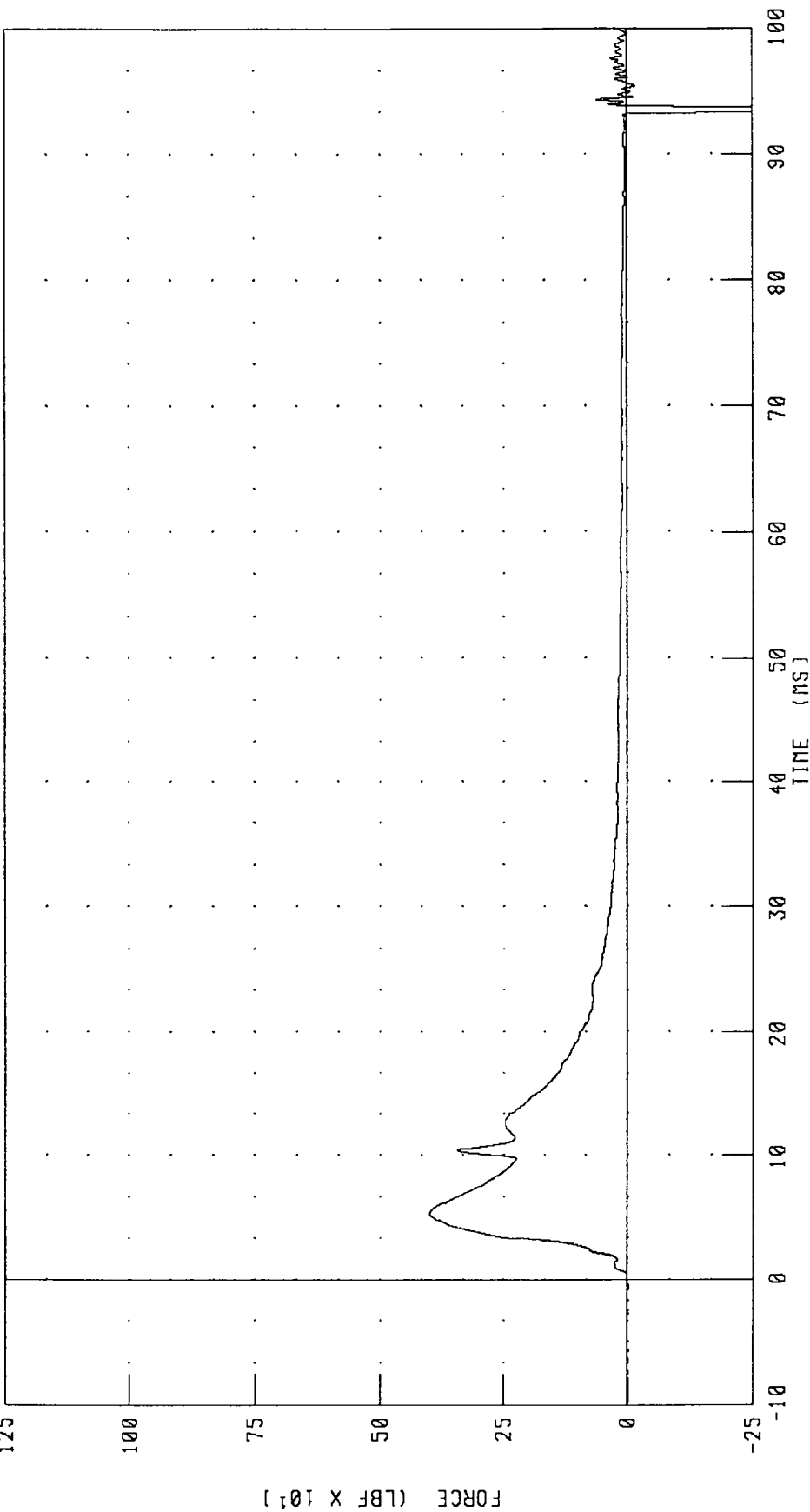


PEAK DATA: 1.21 IN @ 36.24 MS, 0.00 IN @ 95.60 MS

CHANNEL: CSTYD FILTER: CH. CLASS 1000

PART 572-F S I D. THORACIC SHOCK ABSORBER CALIBRATION (14 FT/SEC)
SHOCK ABSORBER RESISTIVE FORCE

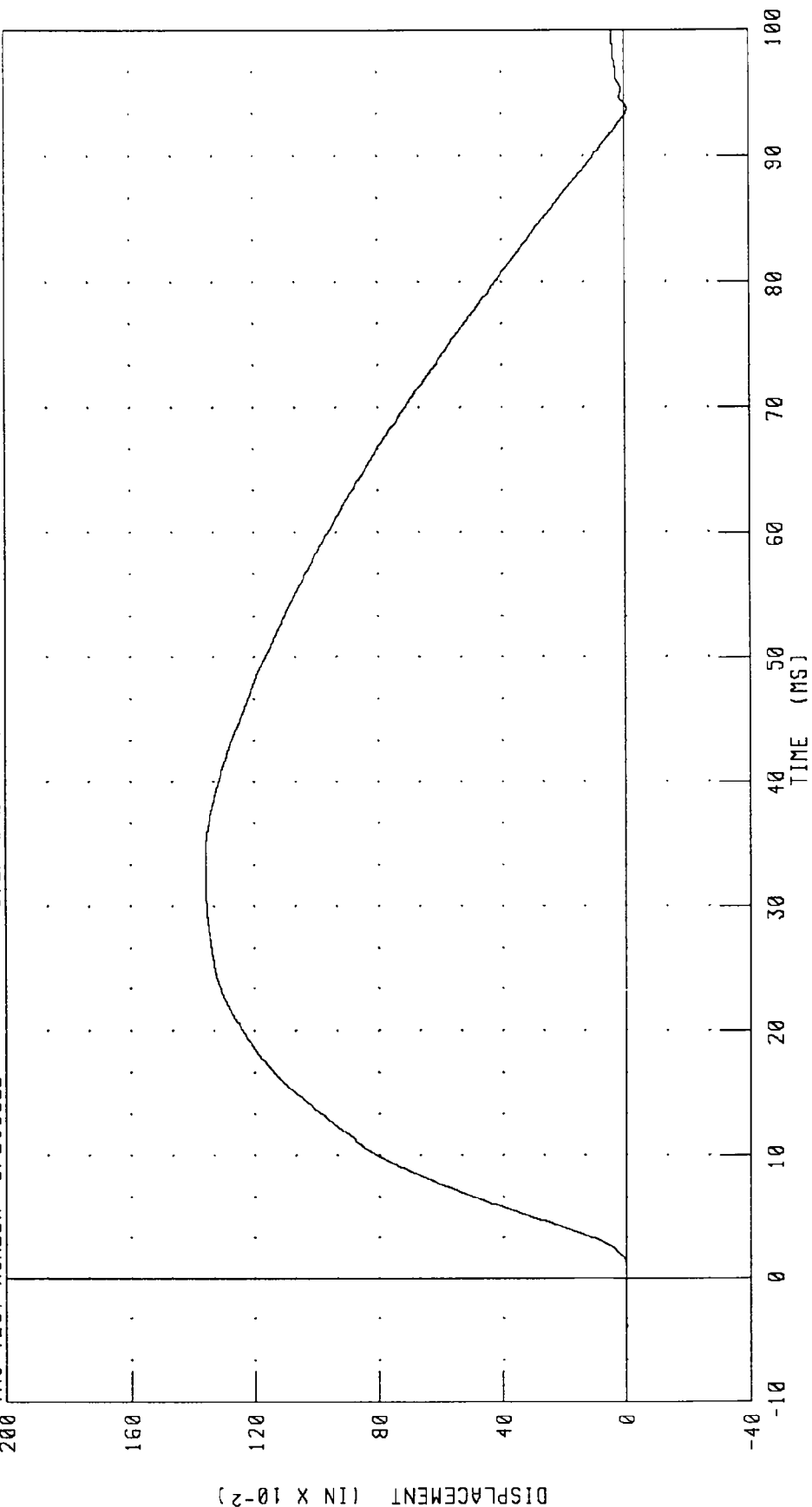
IRC TEST NUMBER: DP26802B 572F SN268 DAMPER TEST CAL02 RUN NUMBER: 101094 0926,8



CHANNEL: DAMPF FILTER: CH. CLASS 1000

PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (14 FT/SEC)
SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP26802B 572F SN268 DAMPER TEST CAL02 RUN NUMBER 101094 0926,8



CHANNEL: CSTYD FILTER: CH. CLASS 1000 PEAK DATA: 1.36 IN @ 33.04 MS, -0.01 IN @ 93.68 MS

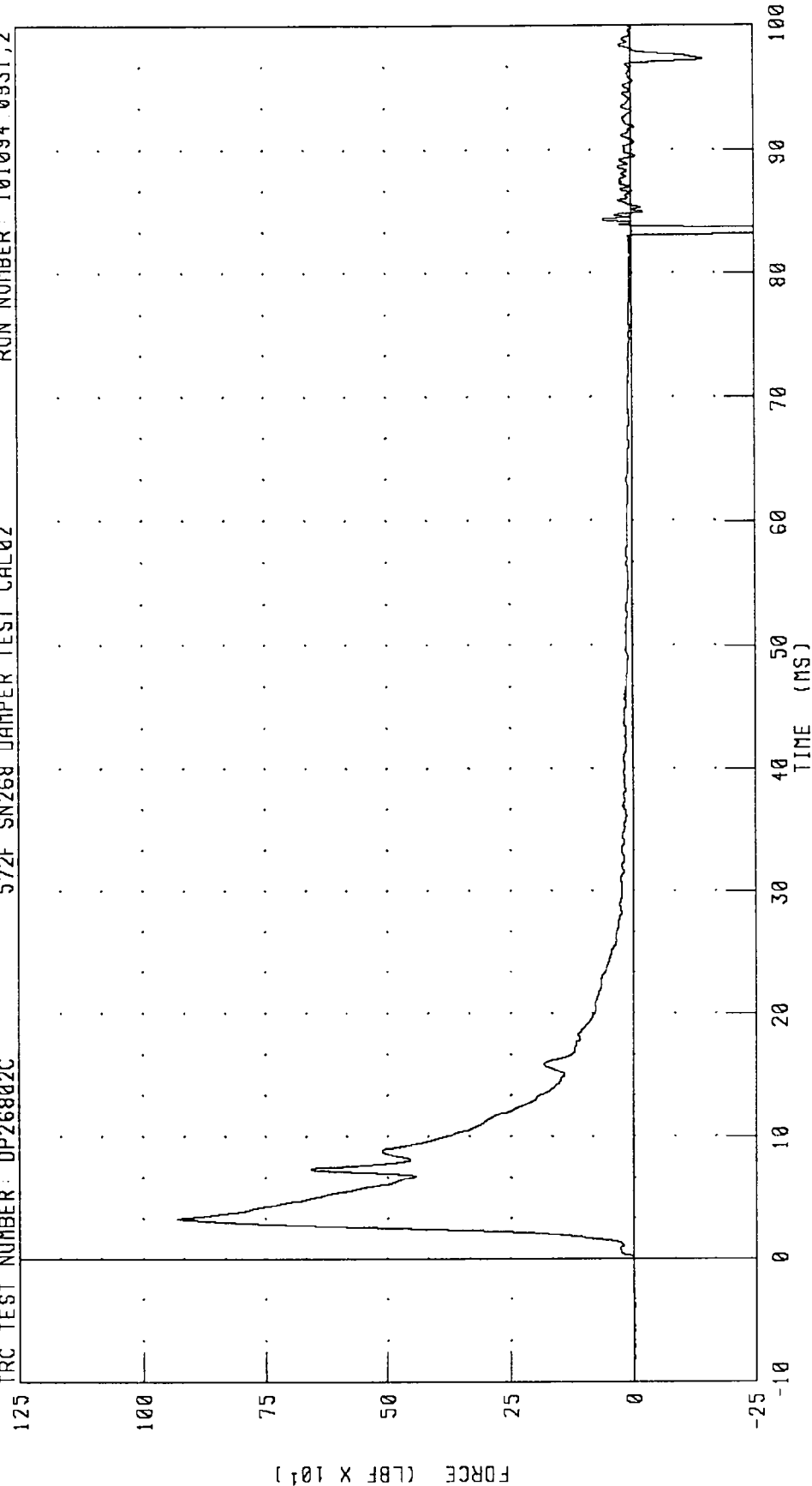
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (20 FT/SEC)

SHOCK ABSORBER RESISTIVE FORCE

572F SN268 DAMPER TEST CAL02

RUN NUMBER: 101094 0931,2

TRC TEST NUMBER: DP26802C

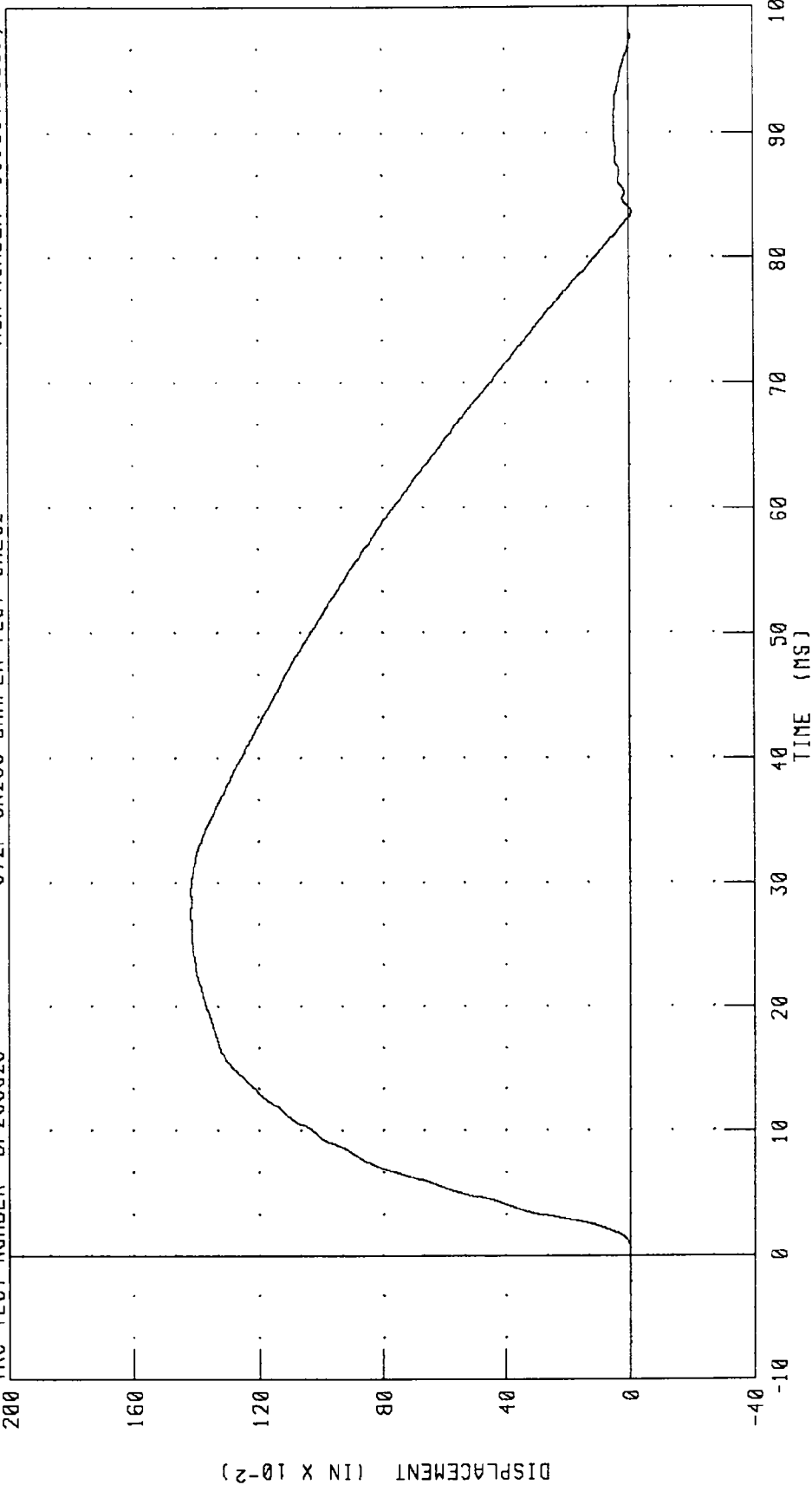


PEAK DATA: 931.39 LBF @ 3.28 MS, -537.11 LBF @ 83.52 MS

CHANNEL: DAMPF FILTER: CH. CLASS 1000

PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (20 FT/SEC)
SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP26802C 572F SN268 DAMPER TEST CAL02 RUN NUMBER: 101094 0931,2



PEAK DATA: 1.42 IN @ 27.28 MS, -0.01 IN @ 83.60 MS

CHANNEL: CSTYD FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

11-OCT-94

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: STL26802

572F SN268 LEFT THORAX CAL02

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	66 - 78 F	70.0 DEG. F
RELATIVE HUMIDITY	10 - 70 %	50.0 %
PISTON VELOCITY	13.80 - 14.20 FT/S	13.85 FT/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	43.3 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	42.7 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	19.4 G

TEST MEETS SPECIFICATIONS

TECHNICIAN V.F. Watters

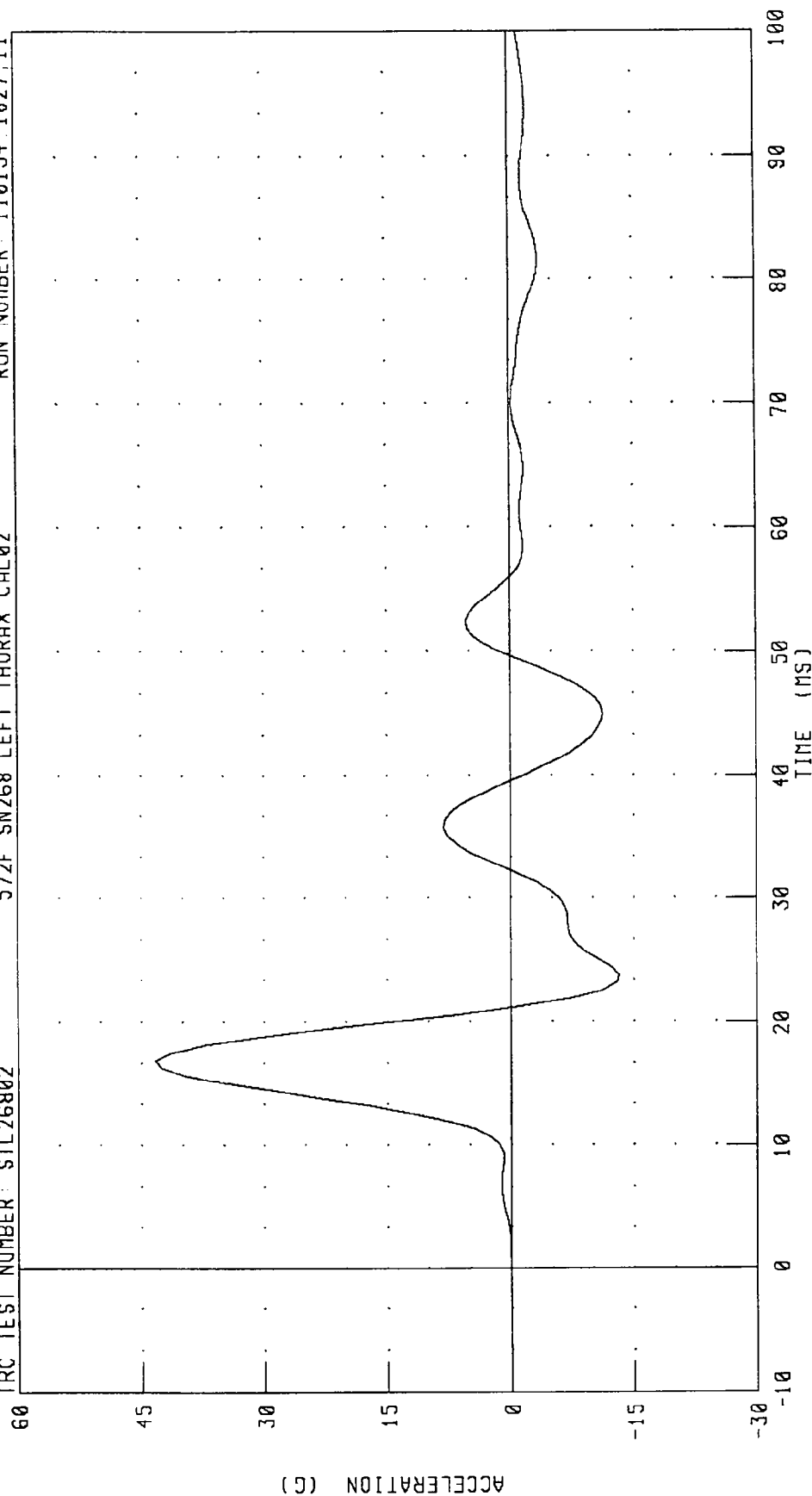
RUN NUMBER: 110194.1625;11

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
LEFT UPPER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL26802

572F SN268 LEFT THORAX CAL02

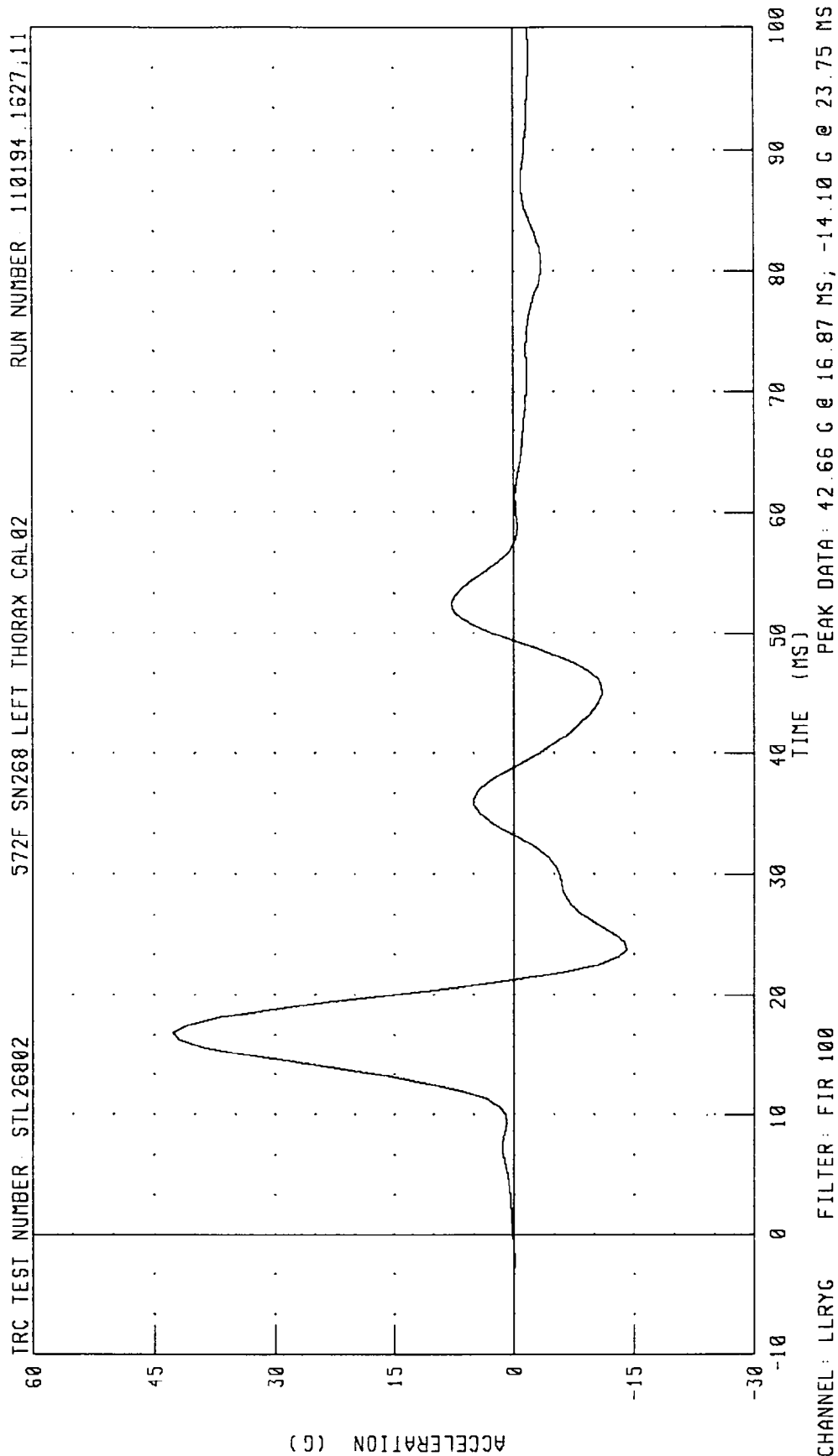
RUN NUMBER: 110194 1627.11



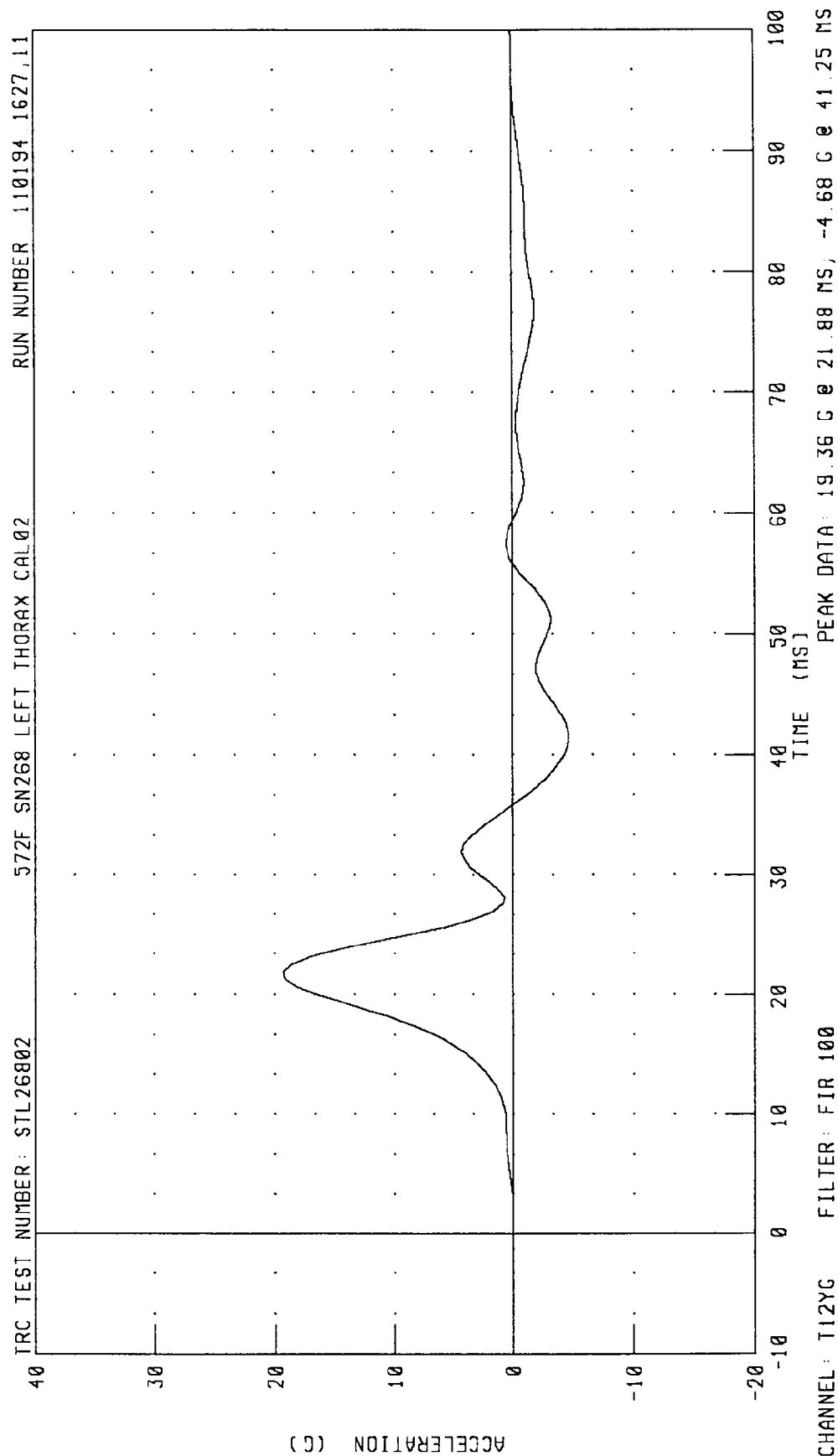
PEAK DATA: 43.32 G @ 16.87 MS, -13.17 G @ 23.75 MS

CHANNEL: LURYG FILTER: FIR 100

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LEFT LOWER RIB ACCELERATION Y AXIS



PART 572-F S I D THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LOWER SPINE ACCELERATION Y AXIS



TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

06-OCT-94

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: SPL26802

572F SN268 LEFT PELVIS CAL02

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	66 - 78 F	70.0 DEG. F
RELATIVE HUMIDITY	10 - 70 %	53.0 %
PISTON VELOCITY	13.80 - 14.20 FT/S	14.08 FT/S
PEAK PELVIC ACCELERATION	40 - 60 G	57.5 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	5.5 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

V.F. Watter

RUN NUMBER: 110194.1619;3

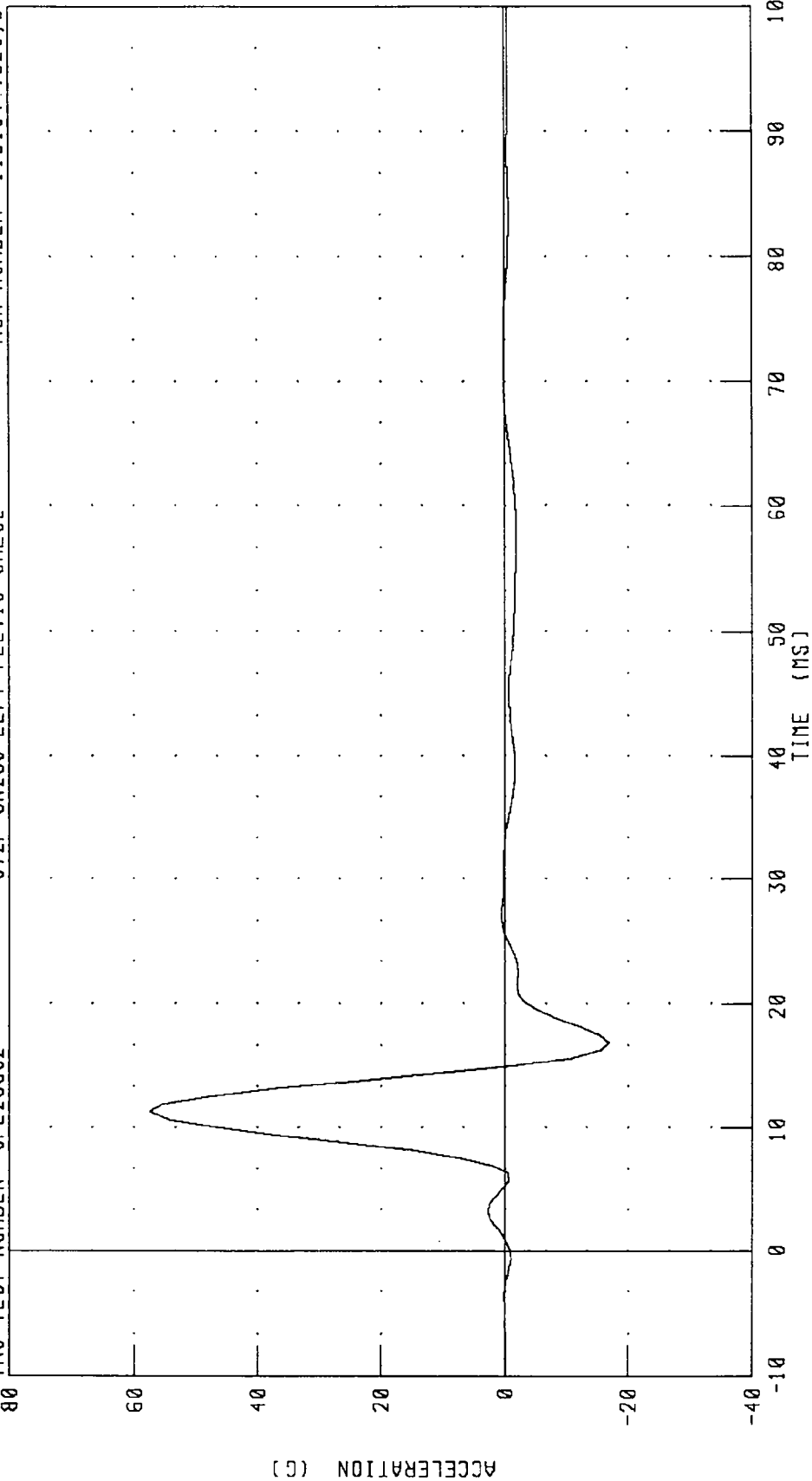
PART 572-F S I D PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

IRC TEST NUMBER SPL26802

572F SN268 LEFT PELVIS CAL02

RUN NUMBER 110194 1620,3



PEAK DATA: 57.46 G @ 11.25 MS; -16.91 G @ 16.87 MS

CHANNEL: PEVYG FILTER: FIR 100

Post-test Calibration

Driver Dummy S/N 016

Calibration Test Results Summary

Dummy Serial Number: 016

Post-test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thoracic Shock Absorber Test:	The shock absorber passed all test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Lateral Pelvis Impact Test:	The pelvis passed all impact test requirements.

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

13-OCT-94

TRC INC.

572F SN016 DAMPER TEST CAL03

TEST NUMBERS: DP01603A,DP01603B,DP01603C

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		66 - 78 F	70.0 DEG. F
RELATIVE HUMIDITY		10 - 70 %	50.0 %
VELOCITY	FORCE	188 - 253 LB	208 LB
10.0 FT/S	DISPLACEMENT	1.19 - 1.38 IN	1.30 IN
VELOCITY	FORCE	389 - 472 LB	403 LB
14.0 FT/S	DISPLACEMENT	1.25 - 1.47 IN	1.42 IN
VELOCITY	FORCE	841 - 1000 LB	926 LB
20.0 FT/S	DISPLACEMENT	1.31 - 1.56 IN	1.48 IN

DAMPER SETTING = 7.0

TEST MEETS SPECIFICATIONS

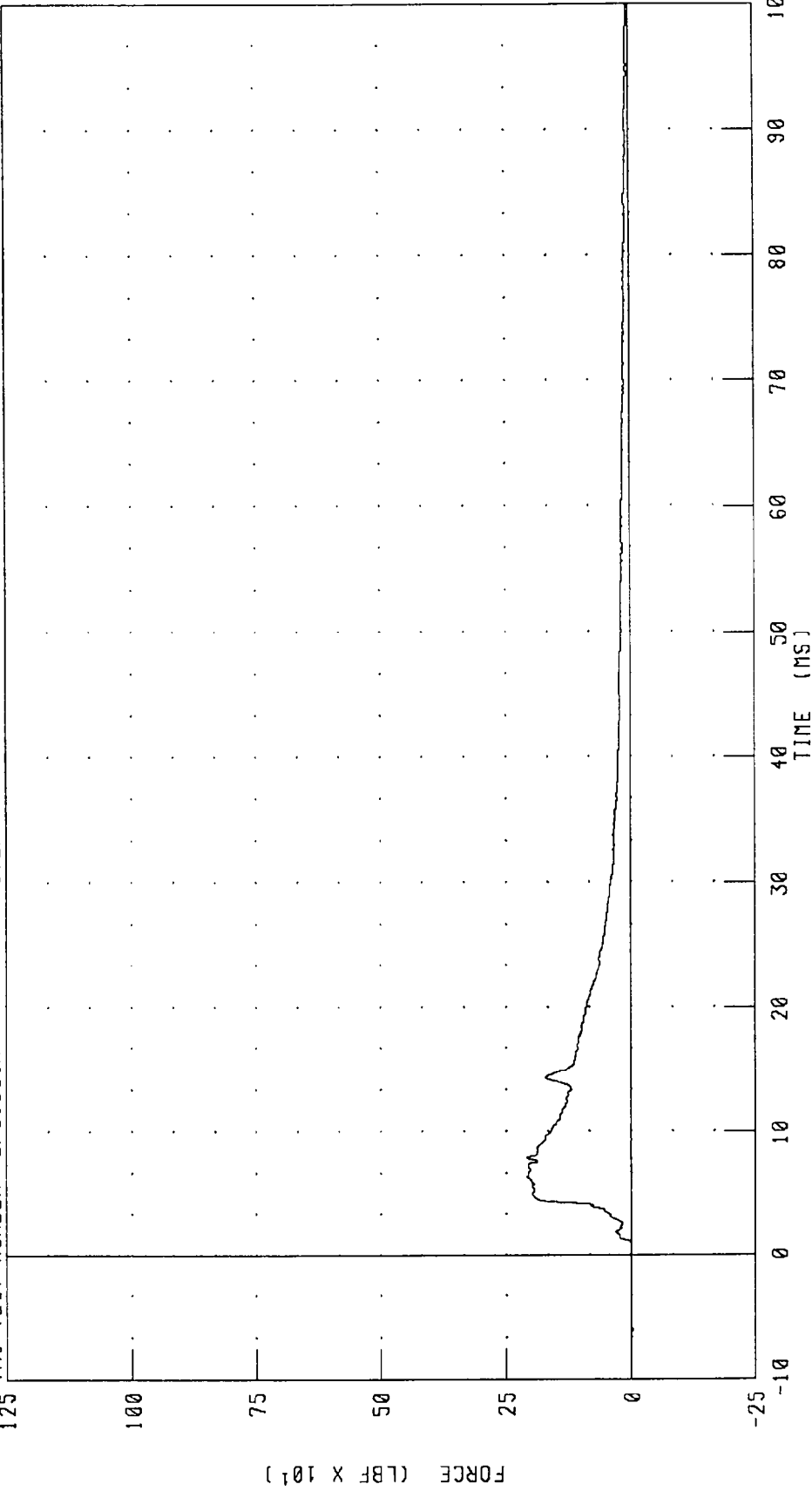
TECHNICIAN

V. F. Watters

RUN NUMBER: 101394.1118;1

PART 572-F S I D THORACIC SHOCK ABSORBER CALIBRATION (10 FT/SEC)
 SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER DP01603A 572F SN016 DAMPER TEST CAL03 RUN NUMBER 101394 1030,1

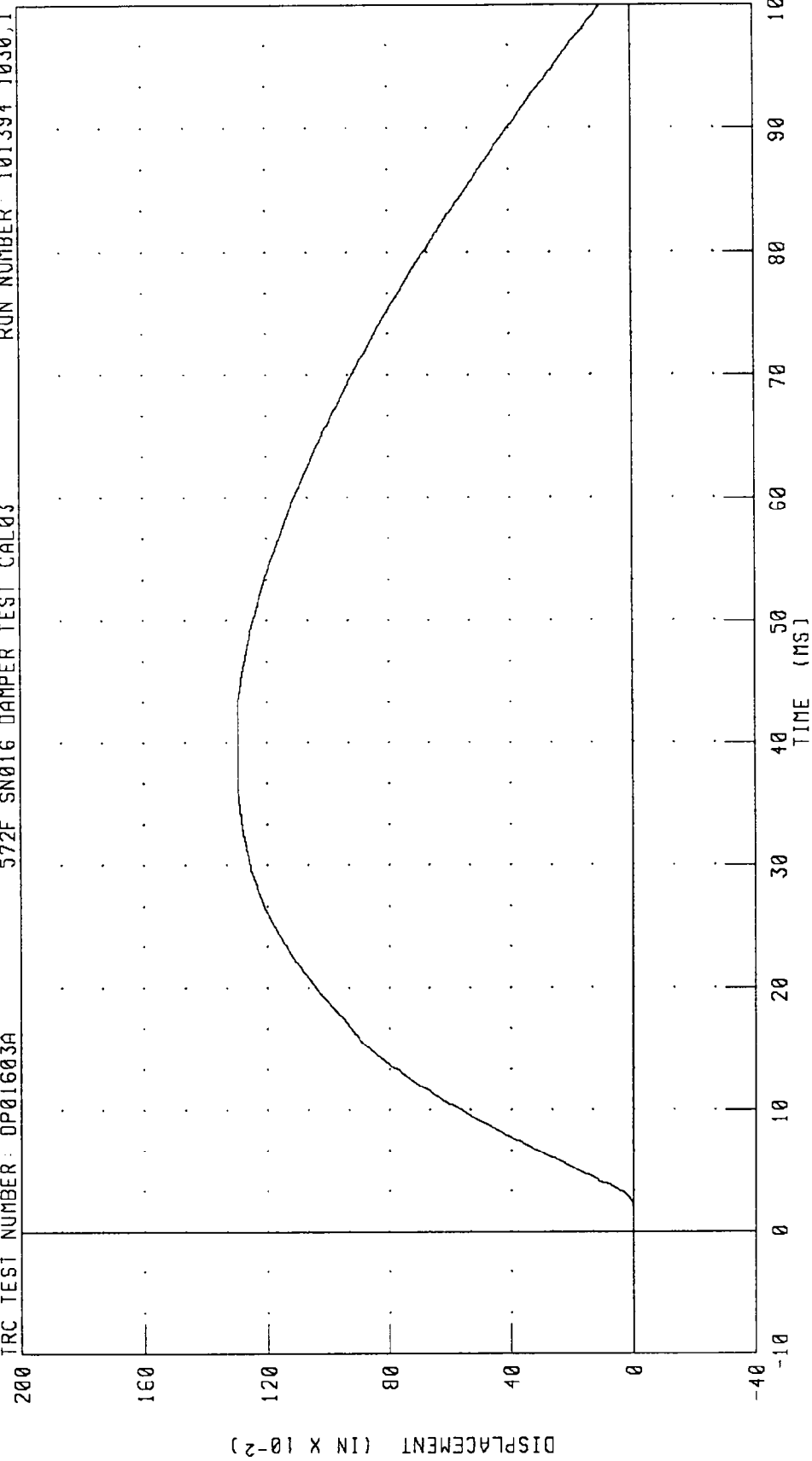


PEAK DATA: 207.82 LBF @ 7.92 MS, -3.19 LBF @ -6.08 MS

CHANNEL: DAMPF FILTER: CH CLASS 1000

PART 572-F S I D THORACIC SHOCK ABSORBER CALIBRATION (10 FT/SEC)
 SHOCK ABSORBER DISPLACEMENT
 572F SN016 DAMPER TEST CAL03

TRC TEST NUMBER: DP01603A RUN NUMBER: 101394 1030,1



PEAK DATA: 1.30 IN @ 39.84 MS, 0.00 IN @ -7.20 MS

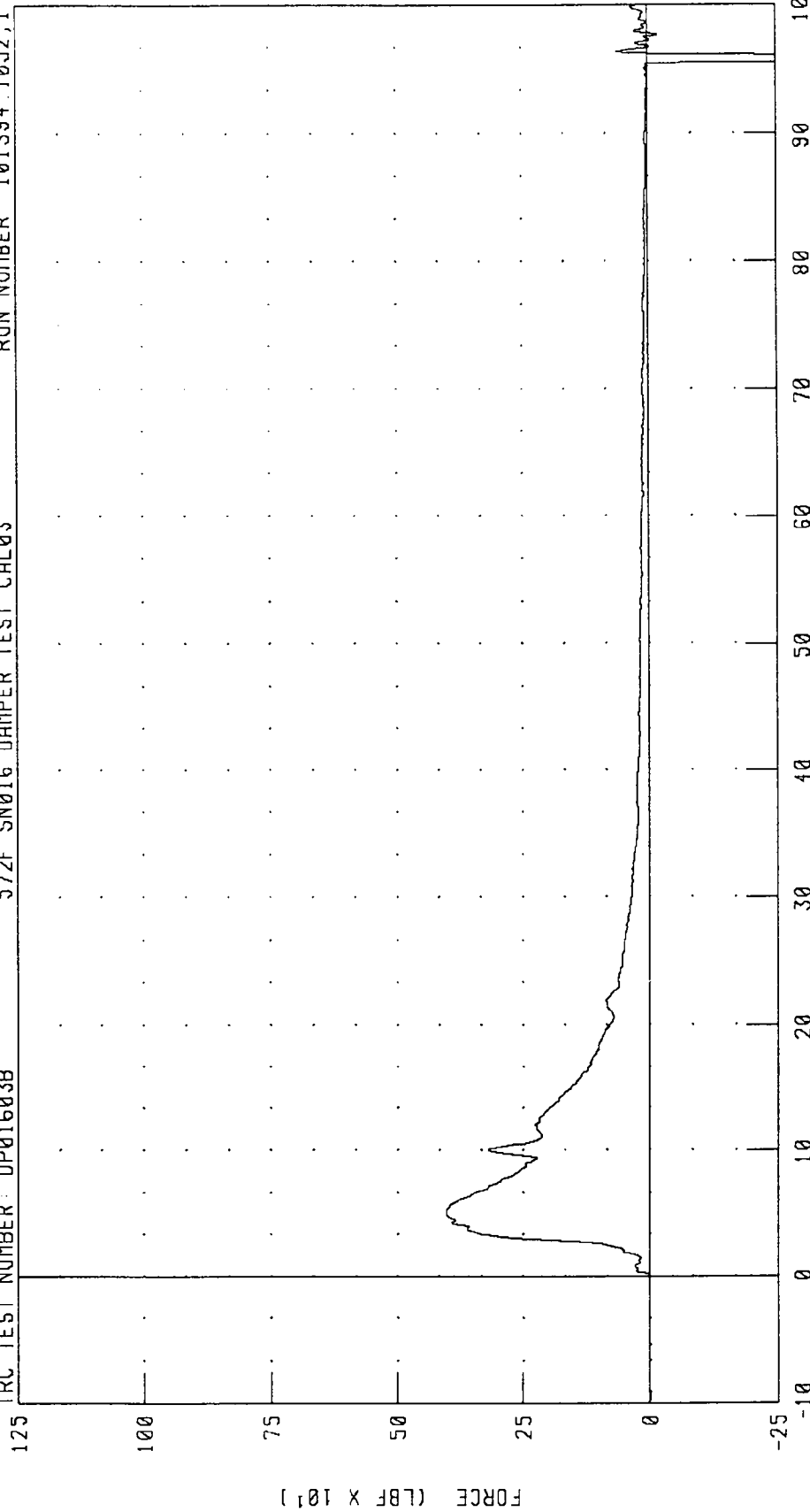
CHANNEL: CSTYD FILTER: CH. CLASS 1000

PART 572-F S I D THORACIC SHOCK ABSORBER CALIBRATION (14 FT/SEC)

SHOCK ABSORBER RESISTIVE FORCE

572F SN016 DAMPER TEST CAL03 RUN NUMBER 101394.1052.1

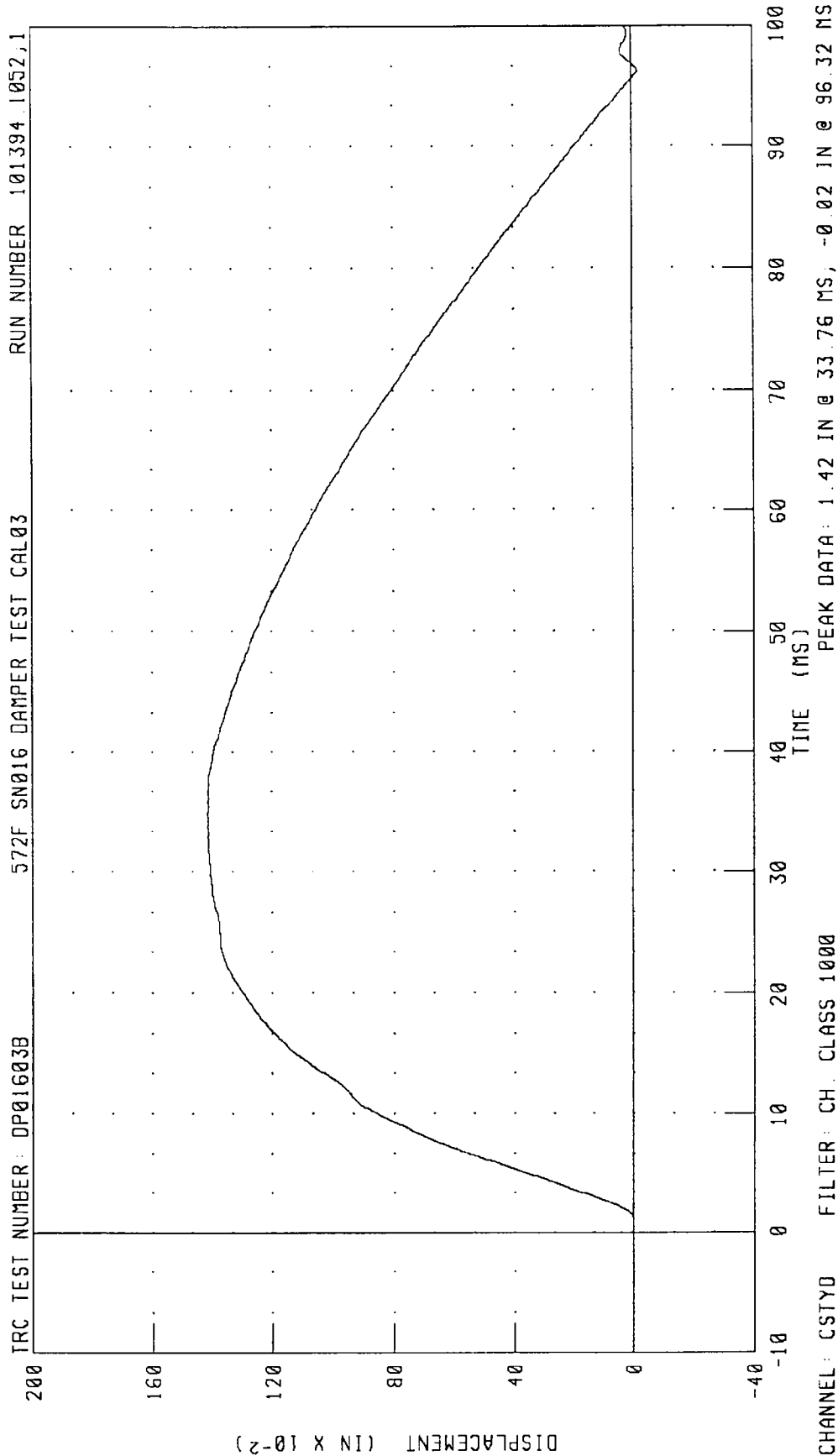
IRC TEST NUMBER: DP01603B



PEAK DATA: 403 16 LBF @ 5 20 MS, -512 18 LBF @ 95 68 MS

CHANNEL: DAMPF FILTER: CH. CLASS 1000

PART 572-F S I D THORACIC SHOCK ABSORBER CALIBRATION (14 FT/SEC)
 SHOCK ABSORBER DISPLACEMENT
 572F SN016 DAMPER TEST CAL03 RUN NUMBER 101394.1052,1

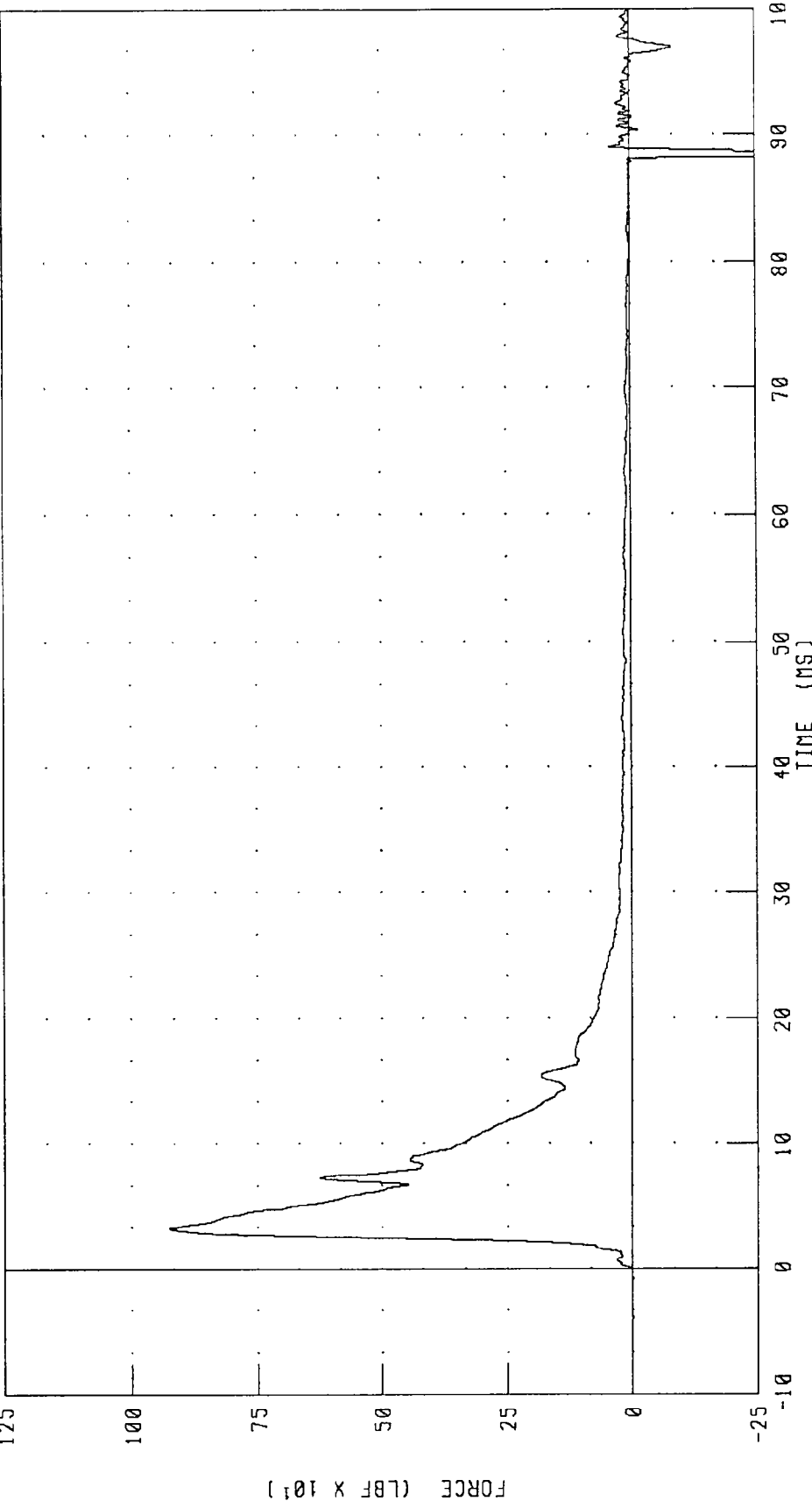


CHANNEL: CSTYD FILTER: CH. CLASS 1000

PART 572-F S I D THORACIC SHOCK ABSORBER CALIBRATION (20 FT/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER DP01603C 572F SN016 DAMPER TEST CAL03 RUN NUMBER 101394 1117.1



PEAK DATA: 925.91 LBF @ 3.20 MS, -467.34 LBF @ 88.40 MS

CHANNEL: DAMPF FILTER: CH. CLASS 1000

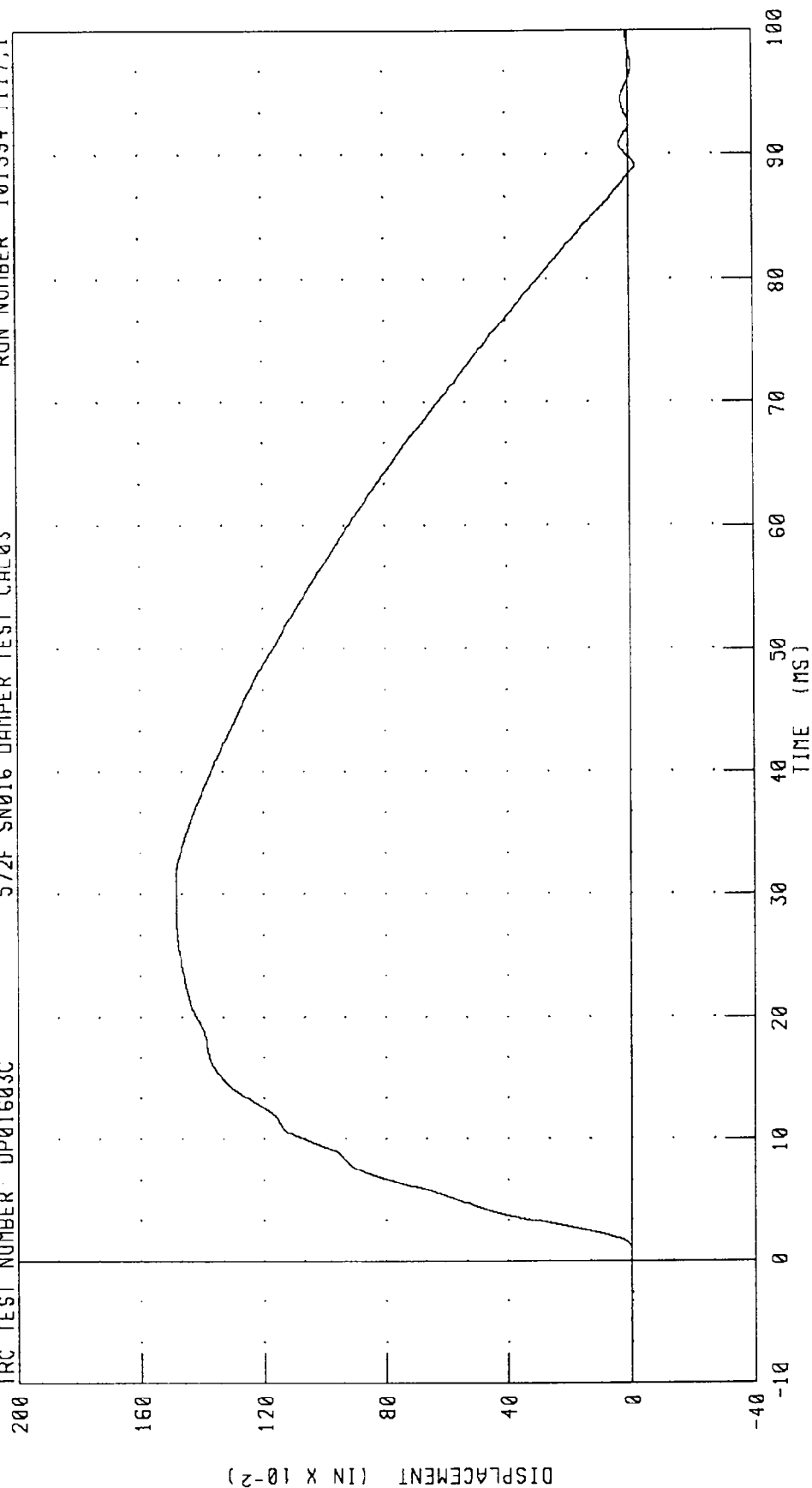
PART 572-F S I D THORACIC SHOCK ABSORBER CALIBRATION (20 FT/SEC)

SHOCK ABSORBER DISPLACEMENT

572F SN016 DAMPER TEST CAL03

TRC TEST NUMBER DP01603C

RUN NUMBER 101394 1117.1



PEAK DATA: 1.48 IN @ 31.76 MS, -0.02 IN @ 89.20 MS

CHANNEL: CSTYD FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

13-OCT-94

LEFT SIDE CONFIGURATION

TRC INC. TEST NO: STL01603

572F SN016 LEFT THORAX CAL03

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	66 - 78 F	70.0 DEG. F
RELATIVE HUMIDITY	10 - 70 %	50.0 %
PISTON VELOCITY	13.80 - 14.20 FT/S	13.92 FT/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	39.5 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	38.9 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	17.6 G

TEST MEETS SPECIFICATIONS

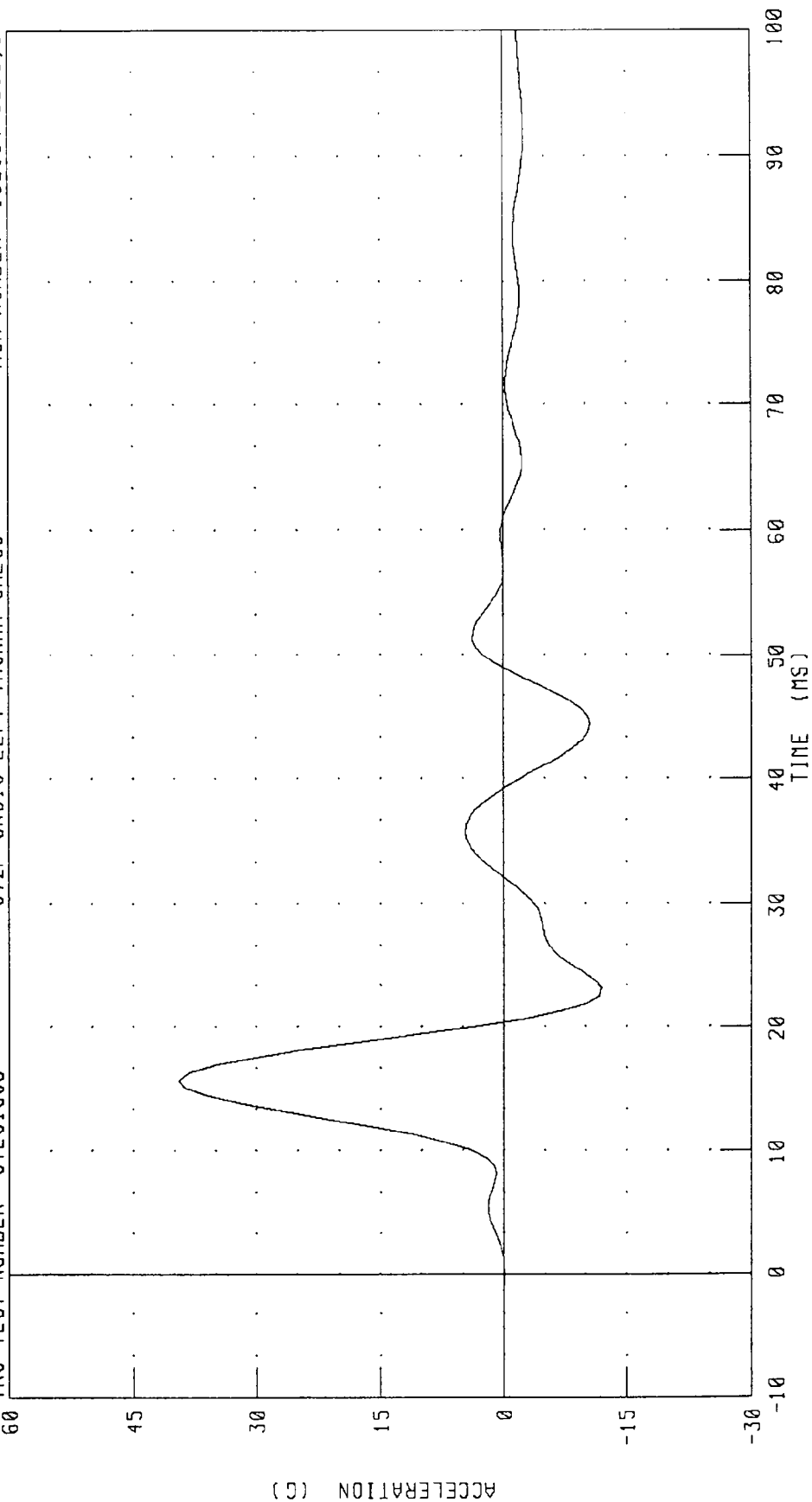
TECHNICIAN

V.L. Watters

RUN NUMBER: 102094.0803;3

PART 572-F S I D THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LEFT UPPER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL01603 572F SN016 LEFT THORAX CAL03 RUN NUMBER 102194 0910,3

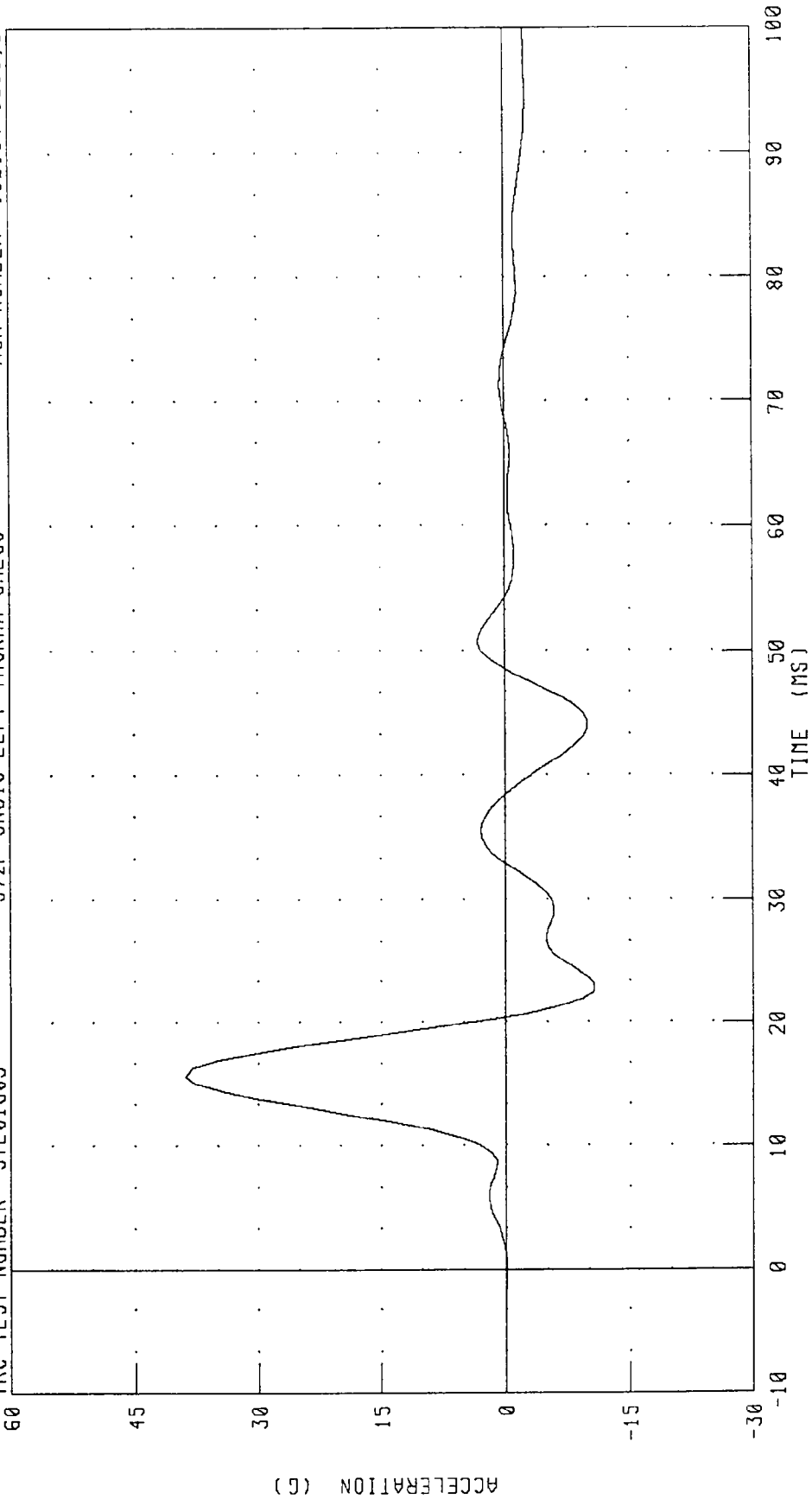


PEAK DATA: 39.47 G @ 15.63 MS, -11.92 G @ 23.13 MS

CHANNEL: LURYG FILTER: FIR 100

PART 572-F S I D THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LEFT LOWER RIB ACCELERATION Y AXIS

IRC TEST NUMBER: STL01603 572F SN016 LEFT THORAX CAL03 RUN NUMBER 102194 0910.3

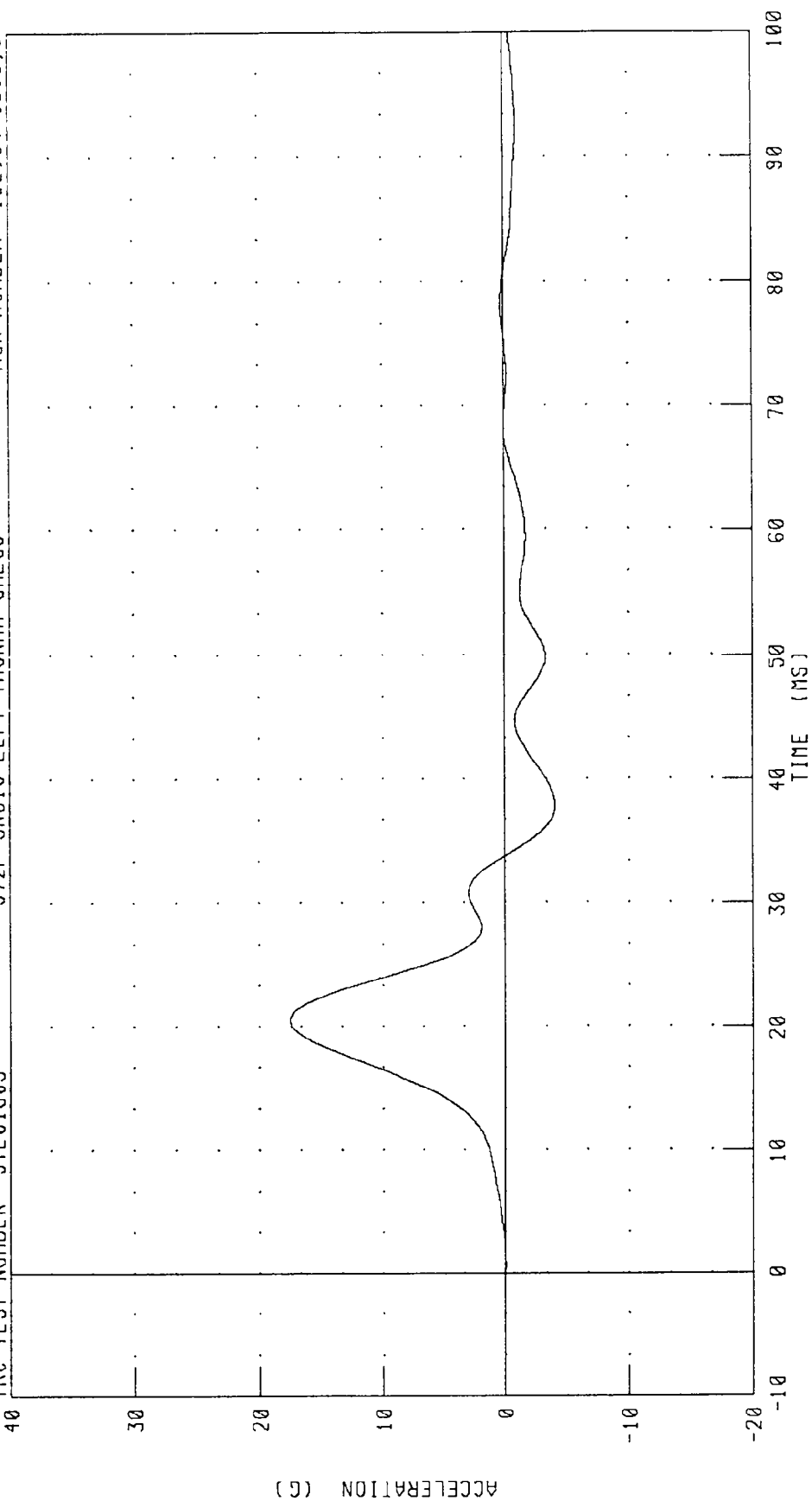


PEAK DATA: 38.90 G @ 15.63 MS; -10.69 G @ 23.13 MS

CHANNEL: LLRYG FILTER: FIR 100

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER: STL01603 572F SN016 LEFT THORAX CAL03 RUN NUMBER 102194 0910,3



CHANNEL: T12YG FILTER: FIR 100 PEAK DATA: 17.58 G @ 20.62 MS; -4.05 G @ 37.50 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

13-OCT-94

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: SPL01603

572F SN016 LEFT PELVIS CAL03

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	66 - 78 F	70.0 DEG. F
RELATIVE HUMIDITY	10 - 70 %	50.0 %
PISTON VELOCITY	13.80 - 14.20 FT/S	14.08 FT/S
PEAK PELVIC ACCELERATION	40 - 60 G	49.4 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	5.9 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

V.P. Watley

RUN NUMBER: 110194.1555;3

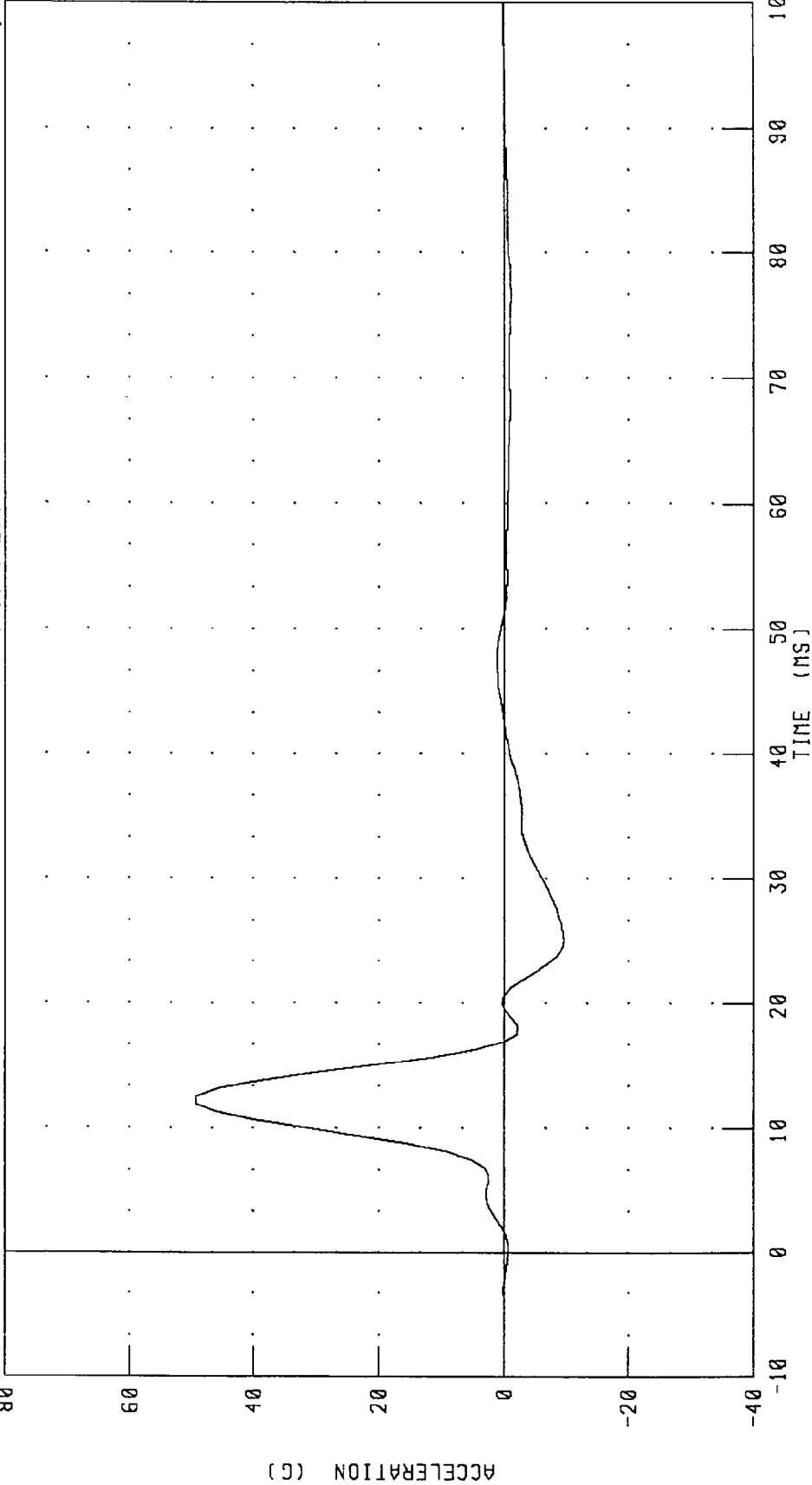
PART 572-F S I D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

572F SN016 LEFT PELVIS CAL03

TRC TEST NUMBER: SPL01603

RUN NUMBER: 110194.1555,3



PEAK DATA: 49.38 G @ 11.88 MS, -9.61 G @ 25.00 MS

CHANNEL: PEVYG FILTER: FIR 100

Post-test Calibration

Left Rear Passenger Dummy S/N 268

Calibration Test Results Summary

Dummy Serial Number: 268

Post-test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thoracic Shock Absorber Test:	The shock absorber passed all test requirements.
Lateral Thorax Impact Test:	The upper and lower rib bar peak accelerations exceeded the maximum allowable value. The rib jacket was replaced and then the thorax passed all impact test requirements.
Lateral Pelvis Impact Test:	The pelvis passed all impact test requirements.

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

18-OCT-94

TRC INC.

572F SN268 DAMPER TEST CAL03

TEST NUMBERS: DP26803A,DP26803B,DP26803C

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		66 - 78 F	71.0 DEG. F
RELATIVE HUMIDITY		10 - 70 %	48.0 %
VELOCITY	FORCE	192 - 258 LB	207 LB
10.1 FT/S	DISPLACEMENT	1.19 - 1.39 IN	1.25 IN
VELOCITY	FORCE	389 - 472 LB	397 LB
14.0 FT/S	DISPLACEMENT	1.25 - 1.47 IN	1.38 IN
VELOCITY	FORCE	841 - 1000 LB	901 LB
20.0 FT/S	DISPLACEMENT	1.31 - 1.56 IN	1.46 IN

DAMPER SETTING = 6.0

TEST MEETS SPECIFICATIONS

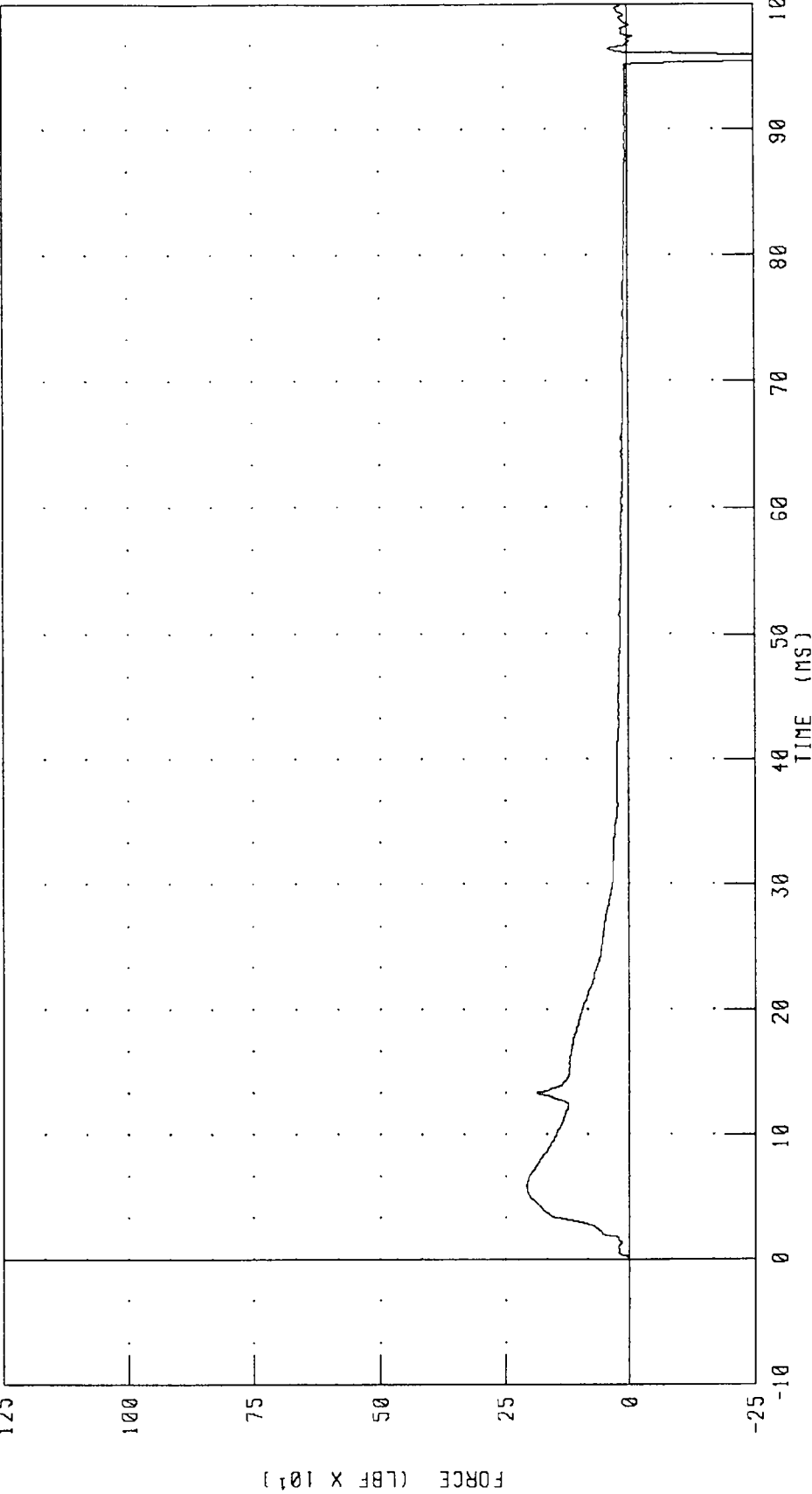
TECHNICIAN Rita L. S.

RUN NUMBER: 101894.1107;1

PART 572-F S I D THORACIC SHOCK ABSORBER CALIBRATION (10 FT/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER DP26803A 572F SN268 DAMPER TEST CAL03 RUN NUMBER 101894 1024,1

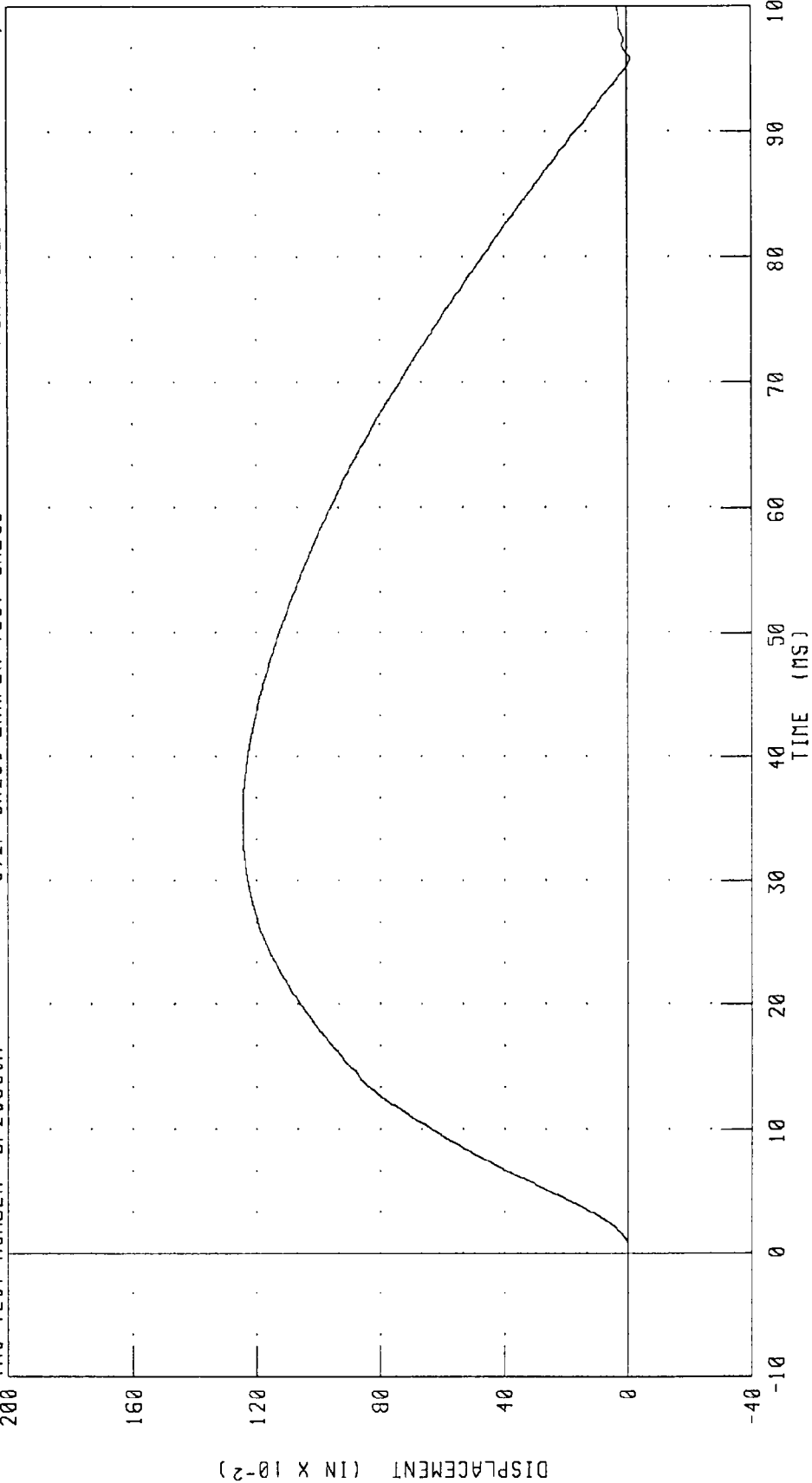


PEAK DATA 207.18 LBF @ 5.84 MS, -384.98 LBF @ 95.60 MS

CHANNEL: DAMPF FILTER: CH. CLASS 1000

PART 572-F S I D THORACIC SHOCK ABSORBER CALIBRATION (10 FT/SEC)
SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER DP26803A 572F SN268 DAMPER TEST CAL03 RUN NUMBER 101894 1024,1



PEAK DATA 1.25 IN @ 35 84 MS, -0 01 IN @ 95 76 MS

CHANNEL: CSTYD FILTER: CH. CLASS 1000

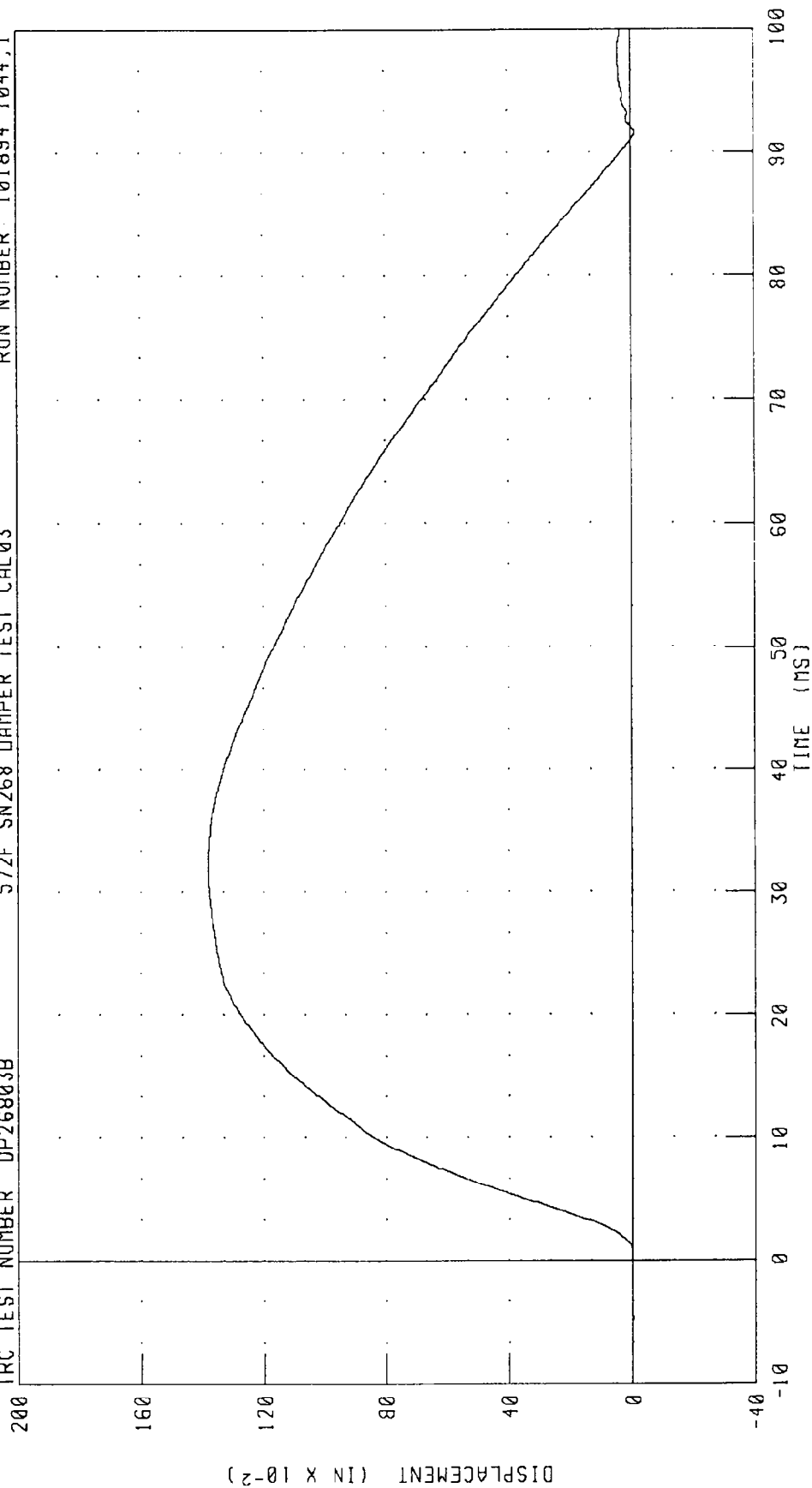
PART 572-F S.I.D THORACIC SHOCK ABSORBER CALIBRATION (14 FT/SEC)

SHOCK ABSORBER DISPLACEMENT

572F SN268 DAMPER TEST CAL03

IRC TEST NUMBER DP26803B

RUN NUMBER 101894 1044.1



PEAK DATA 1.38 IN @ 31.92 MS, -0.01 IN @ 91.52 MS

CHANNEL CSTYD FILTER CH CLASS 1000

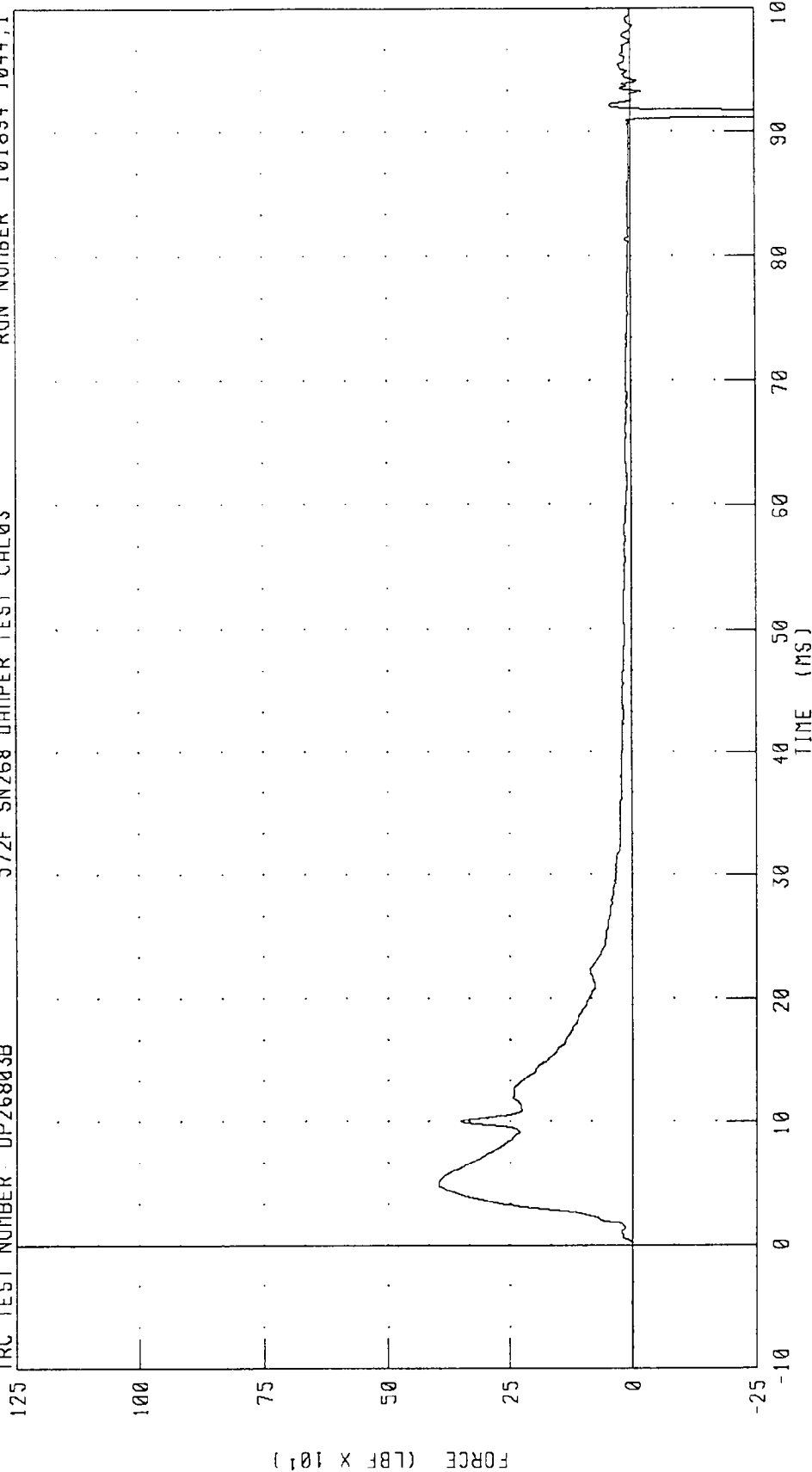
PART 572-F S I D THORACIC SHOCK ABSORBER CALIBRATION (14 FT/SEC)

SHOCK ABSORBER RESISTIVE FORCE

572F SN268 DAMPER TEST CAL03

RUN NUMBER 101894 1044,1

TRC TEST NUMBER DP26803B



PEAK DATA: 397 40 LBF @ 4 96 MS, -429 63 LBF @ 91 36 MS

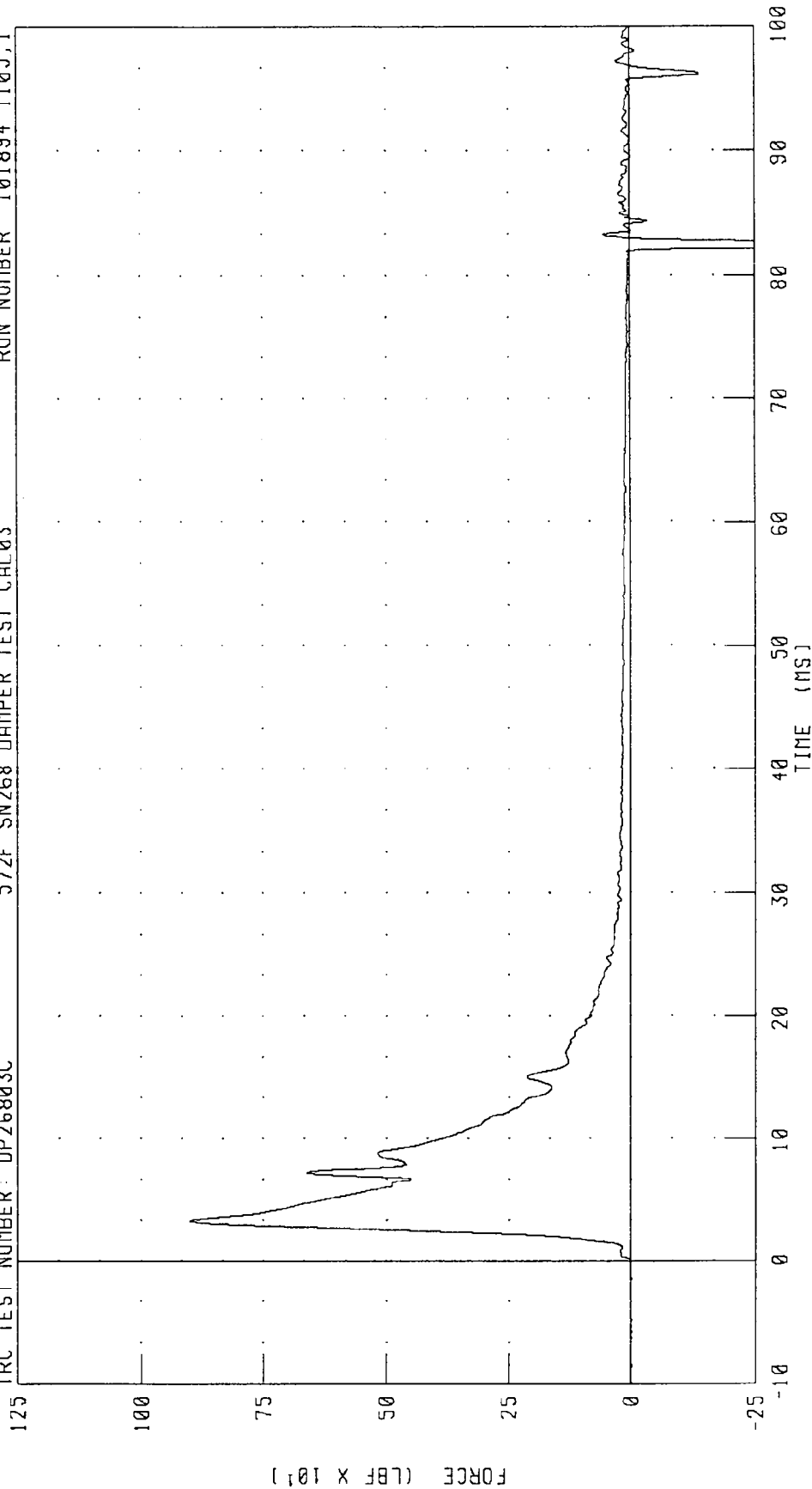
CHANNEL DAMPF FILTER: CH. CLASS 1000

PART 572-F S I D. THORACIC SHOCK ABSORBER CALIBRATION (20 FT/SEC)

SHOCK ABSORBER RESISTIVE FORCE

572F SN268 DAMPER TEST CAL03 RUN NUMBER 101894 1105,1

IRC TEST NUMBER: DP26803C



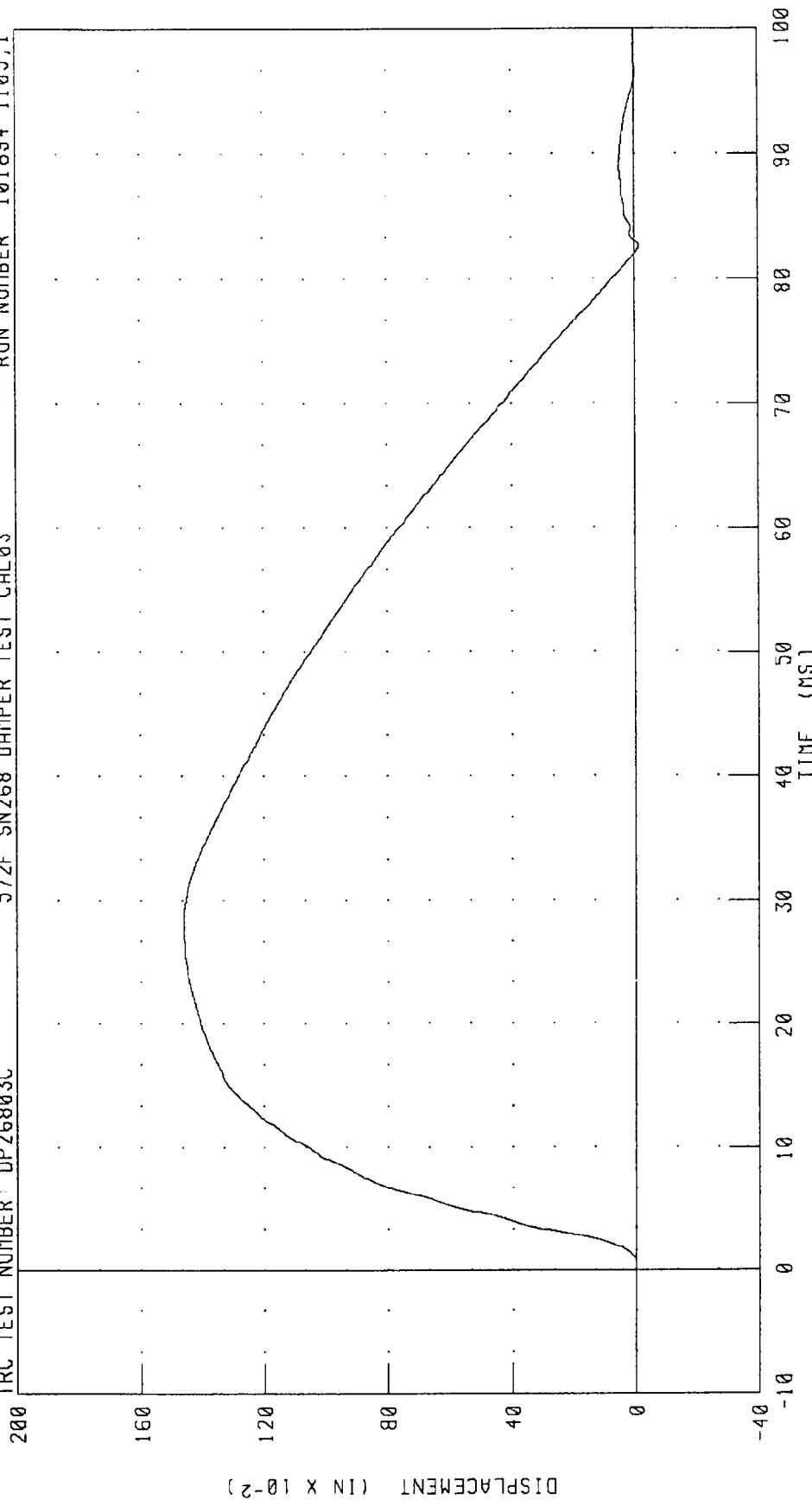
PEAK DATA: 900 68 LBF @ 3 28 MS, -444 83 LBF @ 82 40 MS

CHANNEL DAMPF FILTER: CH CLASS 1000

PART 572-F S I D THORACIC SHOCK ABSORBER CALIBRATION (20 FT/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP26803C 572F SN268 DAMPER TEST CAL03 RUN NUMBER 101894 1105.1



CHANNEL CSTYD FILTER: CH CLASS 1000 PEAK DATA 1 46 IN @ 28 72 MS, -0.01 IN @ 82 56 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

13-OCT-94

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: STL26803

572F SN268 LEFT THORAX CAL03

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	66 - 78 F	70.0 DEG. F
RELATIVE HUMIDITY	10 - 70 %	50.0 %
PISTON VELOCITY	13.80 - 14.20 FT/S	13.81 FT/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	48.9 G *
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	47.9 G *
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	20.2 G

* TEST DOES NOT MEET SPECIFICATIONS

TECHNICIAN

V.F. Watley

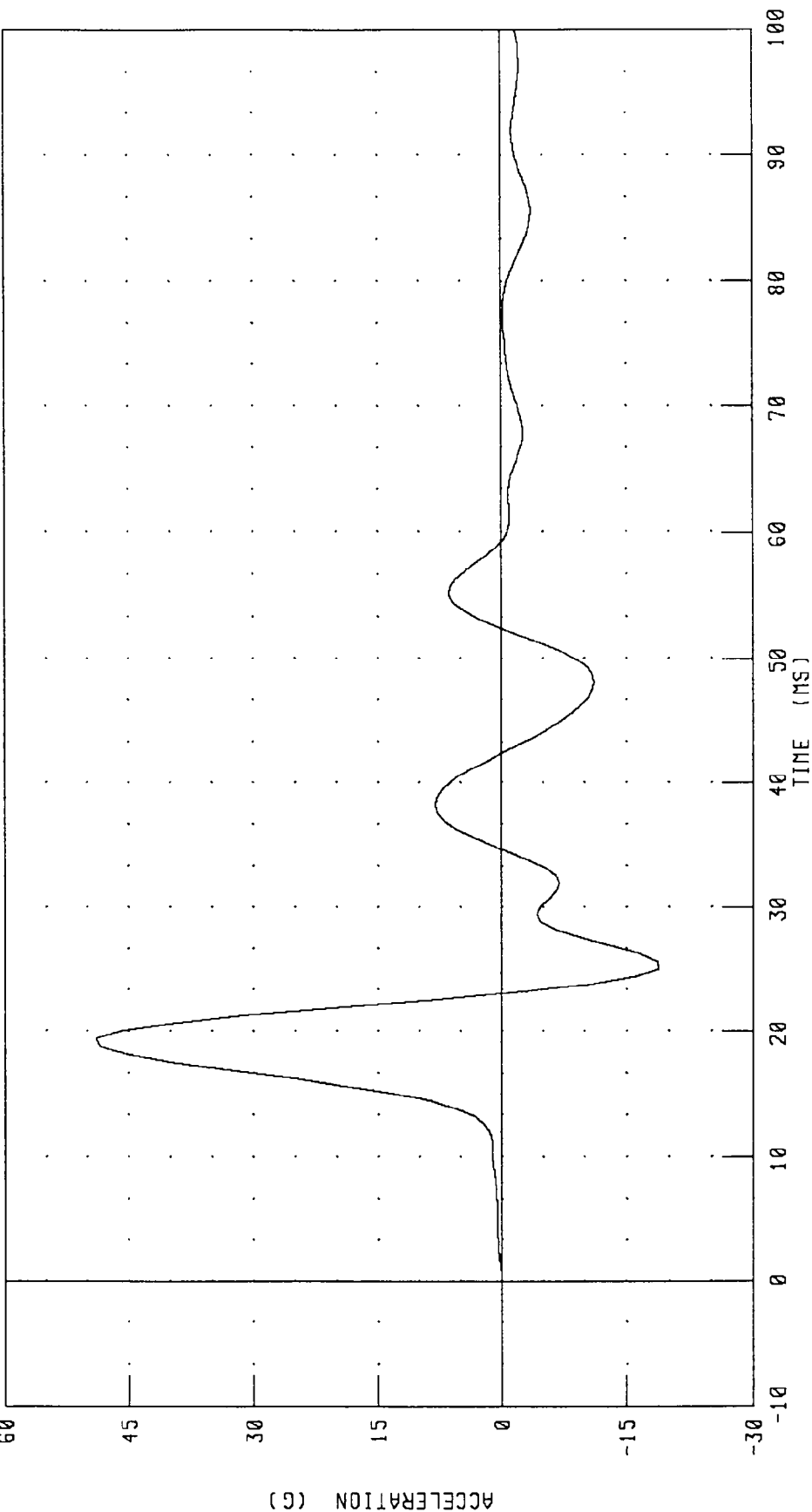
RUN NUMBER: 102094.0825;4

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LEFT UPPER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL26803

572F SN268 LEFT THORAX CAL03

RUN NUMBER: 110294 0838,4



PEAK DATA: 48.85 G @ 19.38 MS; -18.78 G @ 25.00 MS

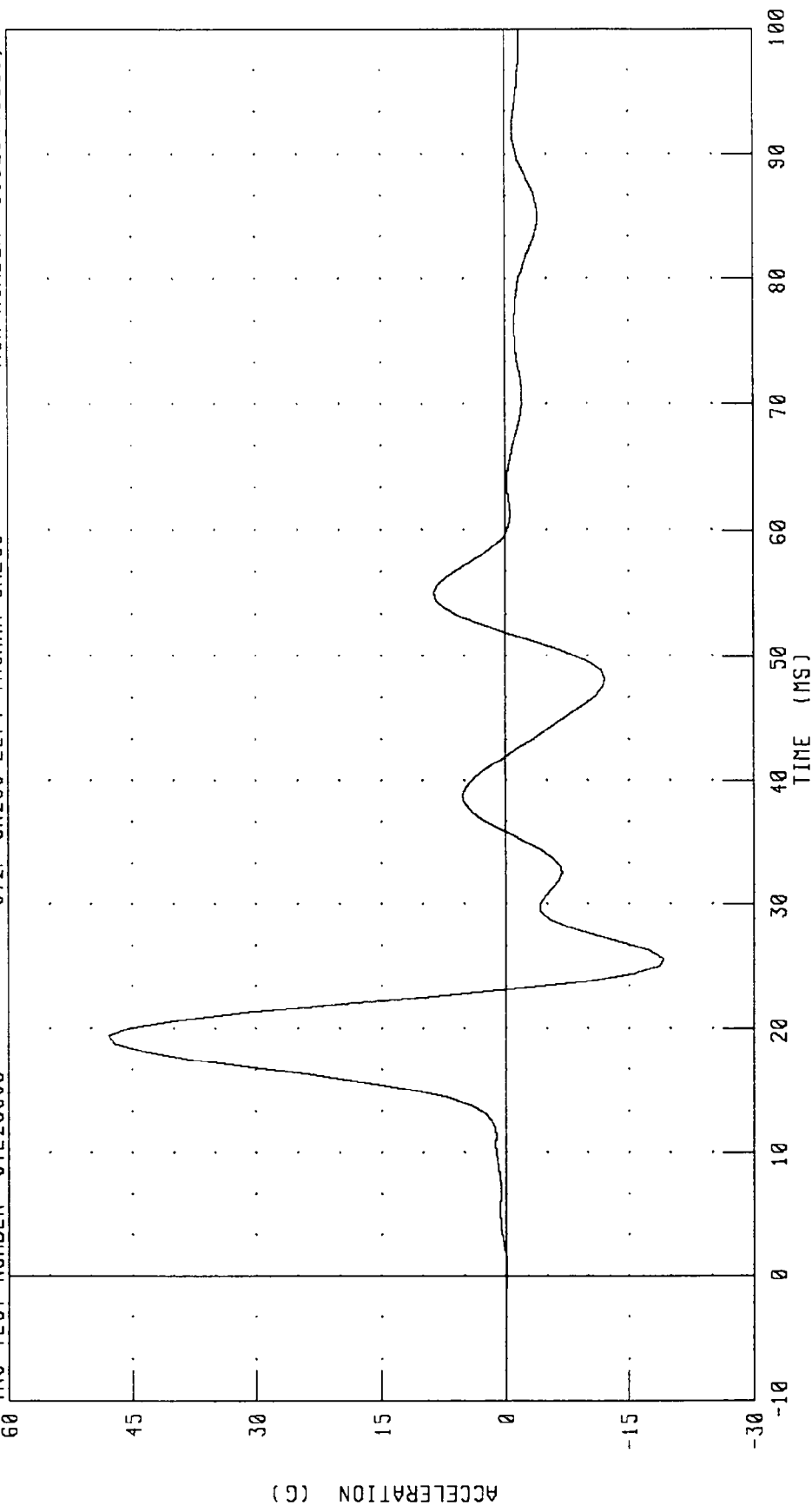
CHANNEL: LURYG FILTER: FIR 100

PART 572-F S I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL26803

572F SN268 LEFT THORAX CAL03

RUN NUMBER: 110294.0838,4



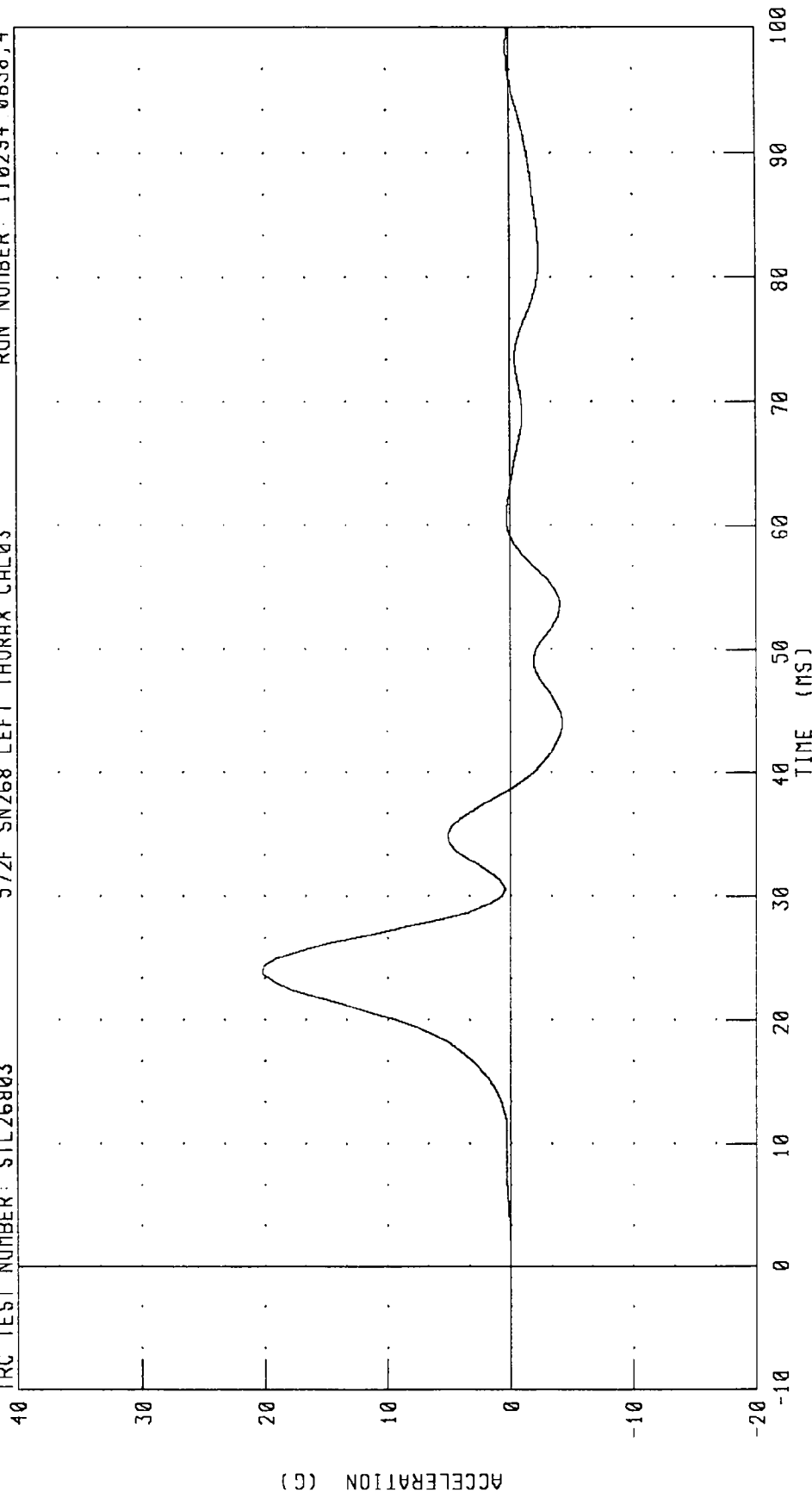
CHANNEL: LLRYG FILTER: FIR 100

PEAK DATA: 47.87 G @ 19.38 MS; -19.16 G @ 25.63 MS

PART 572-F S I O THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LOWER SPINE ACCELERATION Y AXIS

572F SN268 LEFT THORAX CAL03 RUN NUMBER: 110294 0838,4

TRC TEST NUMBER: STL26803



PEAK DATA: 20.24 G @ 23.75 MS, -4.18 G @ 43.75 MS

CHANNEL: T12YG FILTER: FIR 100

TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

13-OCT-94

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: SPL26803

572F SN268 LEFT PELVIS CAL03

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	66 - 78 F	70.0 DEG. F
RELATIVE HUMIDITY	10 - 70 %	50.0 %
PISTON VELOCITY	13.80 - 14.20 FT/S	14.12 FT/S
PEAK PELVIC ACCELERATION	40 - 60 G	59.4 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	5.0 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

V.L. Watters

RUN NUMBER: 110194.1538;4

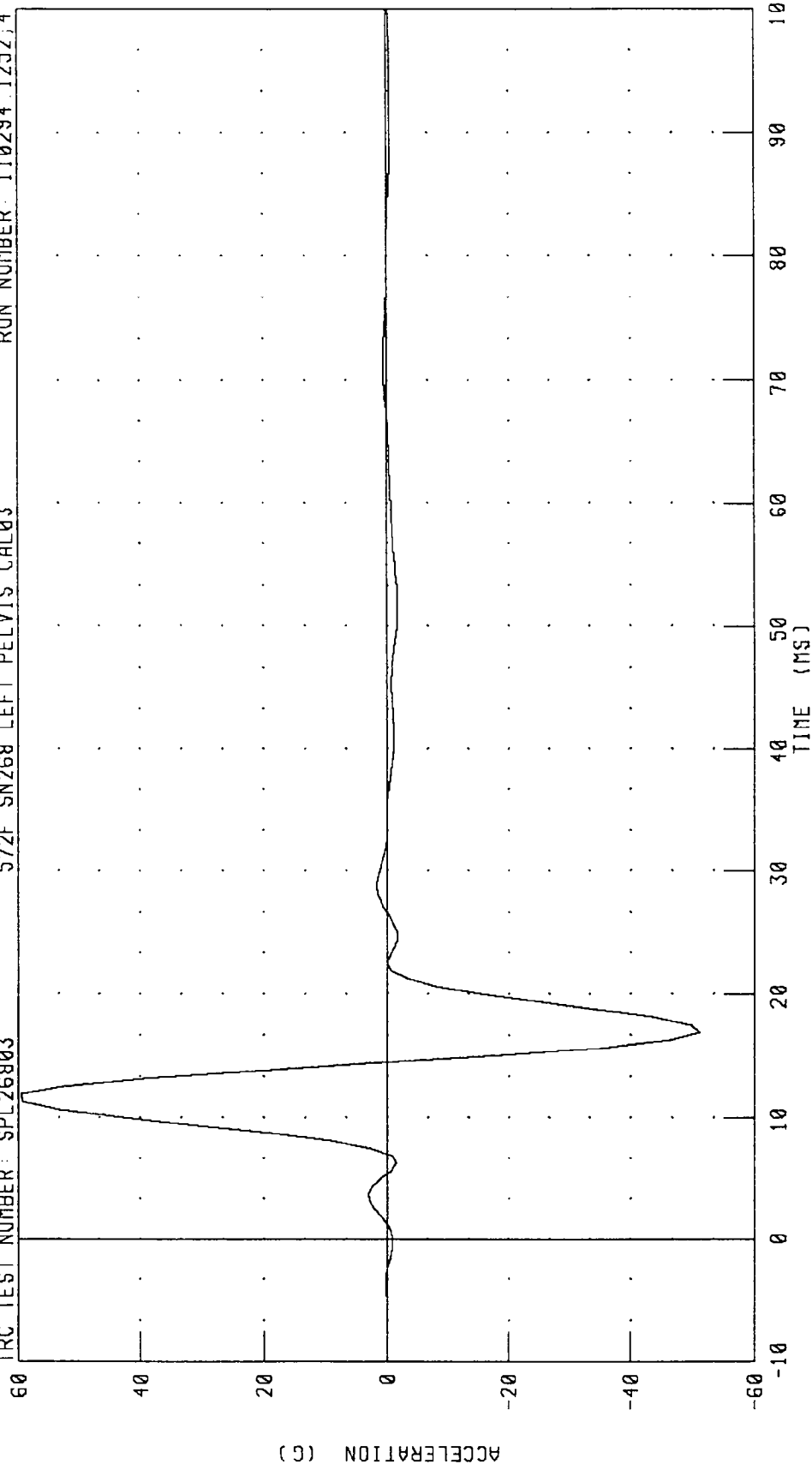
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

572F SN268 LEFT PELVIS CAL03

RUN NUMBER 110294 1252,4

IRC TEST NUMBER: SPL26803



PEAK DATA: 59.38 G @ 11.88 MS, -51.07 G @ 16.87 MS

FILTER: FIR 100

CHANNEL: PEVYG

Appendix D

Miscellaneous Test Information

Dummy Instrumentation Placement

Dummy Manufacturer & S/N: Vector Research/016

Seating Position: Driver

Mnemonic	Location	Axis	Mfr.	Model	S/N	Orientation (+ Sensing)
HEDXG1	Head	X	Endevco	7264	AJ5N1	Rear
HEDYG1	Head	Y	Endevco	7264	AJ4A2	Left
HEDZG1	Head	Z	Endevco	7264	AJ5T3	Up
T12YG1	Lower Spine	Y	Endevco	7264	AJ4B3	Left
T12YGA	Lower Spine Redundant	Y	Endevco	7264	AJ4B4	Left
LURYG1	Left Upper Rib	Y	Endevco	7264	AJ5M9	Right
LURYGA	Left Upper Rib Redundant	Y	Endevco	7264	AJ5N0	Right
LLRYG1	Left Lower Rib	Y	Endevco	7264	AJ5N5	Right
LLRYGA	Left Lower Rib Redundant	Y	Endevco	7264	AJ5N6	Right
PEVYG1	Pelvis	Y	Endevco	7264	AJ5P6	Left

Dummy Instrumentation Placement

Dummy Manufacturer & S/N: First Technology Safety Systems/268

Seating Position: Left Rear Passenger

Mnemonic	Location	Axis	Mfr.	Model	S/N	Orientation (+ Sensing)
HEDXG4	Head	X	Endevco	7264	AJ5R6	Rear
HEDYG4	Head	Y	Endevco	7264	AJ5T0	Left
HEDZG4	Head	Z	Endevco	7264	AJ5T3	Up
T12YG4	Lower Spine	Y	Endevco	7264	AJ5W4	Left
T12YGD	Lower Spine Redundant	Y	Endevco	7264	AJ7F6	Left
LURYG4	Left Upper Rib	Y	Endevco	7264	AJ7F9	Right
LURYGD	Left Upper Rib Redundant	Y	Endevco	7264	AJ7G2	Right
LLRYG4	Left Lower Rib	Y	Endevco	7264	AJ7G5	Right
LLRYGD	Left Lower Rib Redundant	Y	Endevco	7264	AJ7H0	Right
PEVYG4	Pelvis	Y	Endevco	7264	AJ7Y2	Left

Vehicle Instrumentation Placement

Location	Axis	Mfr.	Model	S/N	Orientation (+ Sensing)
Right Rear Sill	X	Endevco	7264	CW87H	Front
Right Rear Sill	Y	Endevco	7264	CJ75H	Left
Right Rear Sill	Z	Endevco	7264	FH41J	Up
Rear Floorpan Over Axle	X	Endevco	7264	CR26H	Rear
Rear Floorpan Over Axle	Y	Endevco	7264	DW12J	Right
Rear Floorpan Over Axle	Z	Endevco	7264	AC861	Up
Right Rear Seat	Y	Endevco	7264	CH74H	Right

Moving Barrier Instrumentation Placement

No.	Location	Axis	Mfr.	Model	S/N	Orientation (+ Sensing)
1	Center of Gravity	X	Endevco	7264	DW34JC	Front
		Y	Endevco	7264	DR49J7	Left
		Z	Endevco	7264	AGRF4	Up
2	Left Frame Rail Over Rear Axle	X	Endevco	7264	CP90H	Front
		Y	Endevco	7264	CM27H	Left

Frequency Response Classes
NHTSA Laboratory Procedure TP-214D-03

<u>Typical Test Measurements</u>	<u>Channel Class</u>
Vehicle Structural Acceleration for use in:	
Total Vehicle Comparison	60
Collision Simulation Input	60
Component Analysis	600
Integration for Velocity or Displacement	180
Anthropomorphic Test Device	
Head Accelerations (linear and angular)	1000
Thorax	
Spine Acceleration ¹	180
Rib Accelerations ¹	180
Deflections	180
Pelvis	
Accelerations ¹	180

¹ The Channel Class 180 data is further processed by subsampling to a 1600 Hz sample rate, removing bias, and filtering with the Finite Impulse Response (FIR100) filter program.



PLAScore

SIDE IMPACT BARRIER CERTIFICATION
PER NHTSA TP 214

Date: October 11, 1994

To: TRC
10602 St. Rt 347
Bldg # 50
E. Liberty, OH 43319
Attn: Jeff Sankey

Purchase Order Number: 95984
Quantity: 06

Core Type: PAMG-1.6-3/8-P-5052-T
Block Number: 080B0694, 021B0894, 024B0894
Cell Size: .375 inches
Density: 1.6 pcf

Unit Numbers: 080B0694 - 2
021B0894 - 1,2,3,4
024B0894 - 1

This is to certify that the aluminum honeycomb core supplied, under the unit numbrs provided, meet the crush requirements of 45 psi +/- 2.5 psi per NHTSA TP214.


Quality Control Representative

**PLASCORE**Crush Data per NHTSA 21445 psi +/- 2.5 psi
7 of 8 samples

Block Number: 080B0694

<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	44.88	45.39	47.08
2	46.92	46.93	47.02
3	45.51	45.04	46.37
4	45.93	45.19	46.74
5	45.91	46.12	45.83
6	46.24	45.21	45.38
7	46.85	46.84	45.83

Block Number: 021B0894

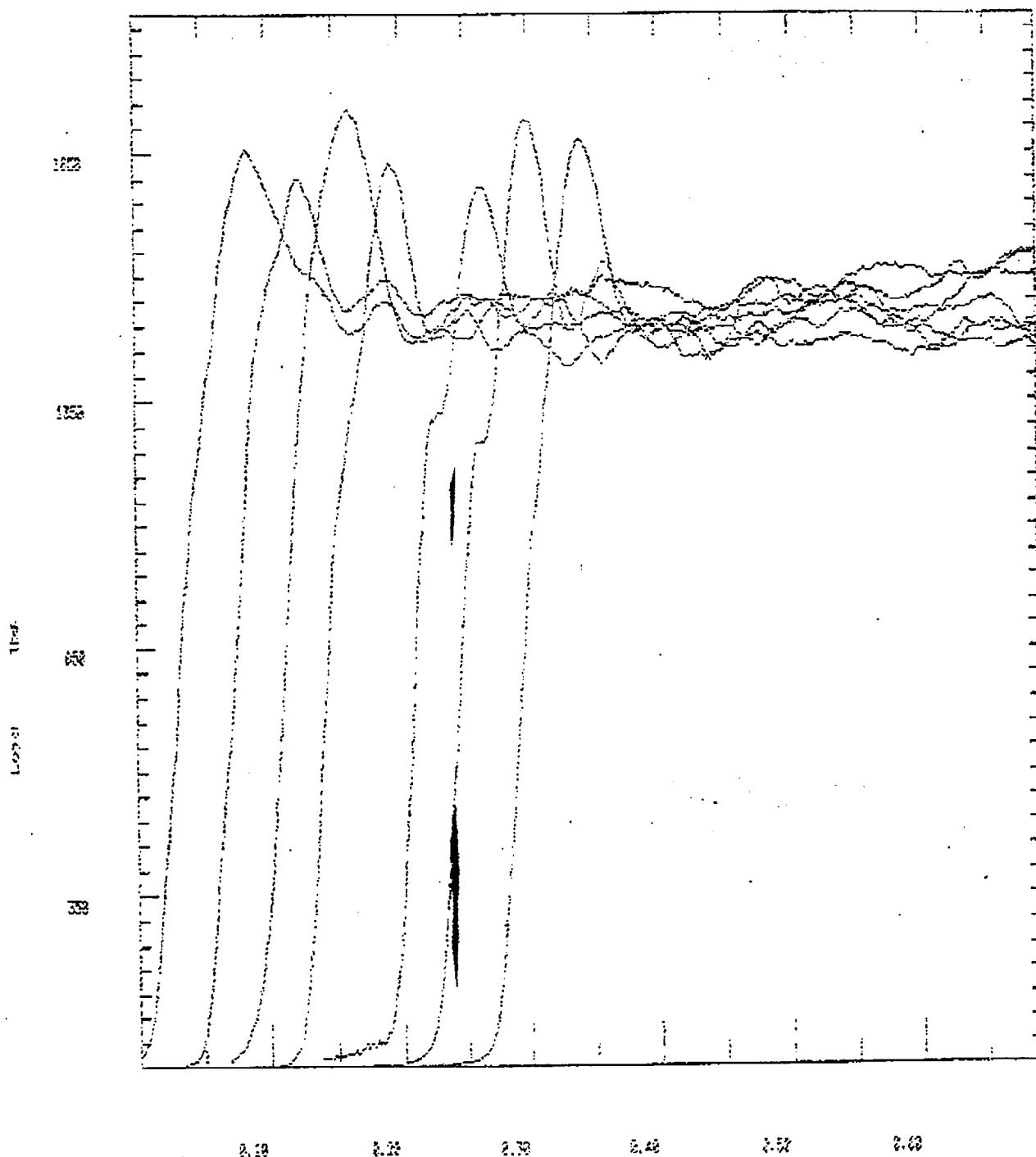
<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	43.11	42.49	42.35
2	45.64	45.70	46.55
3	45.18	46.17	46.32
4	44.06	44.76	45.69
5	44.43	44.39	43.80
6	44.73	45.81	46.86
7	45.67	45.60	46.10
8	45.12	45.76	45.60

BlockNumber: 024B0894

<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	43.66	44.08	43.69
2	44.87	44.94	45.58
3	44.65	44.60	43.40
4	43.48	44.47	44.94
5	44.15	44.61	43.66
6	44.28	44.20	44.43
7	44.39	45.53	45.35
8	43.97	44.24	44.25

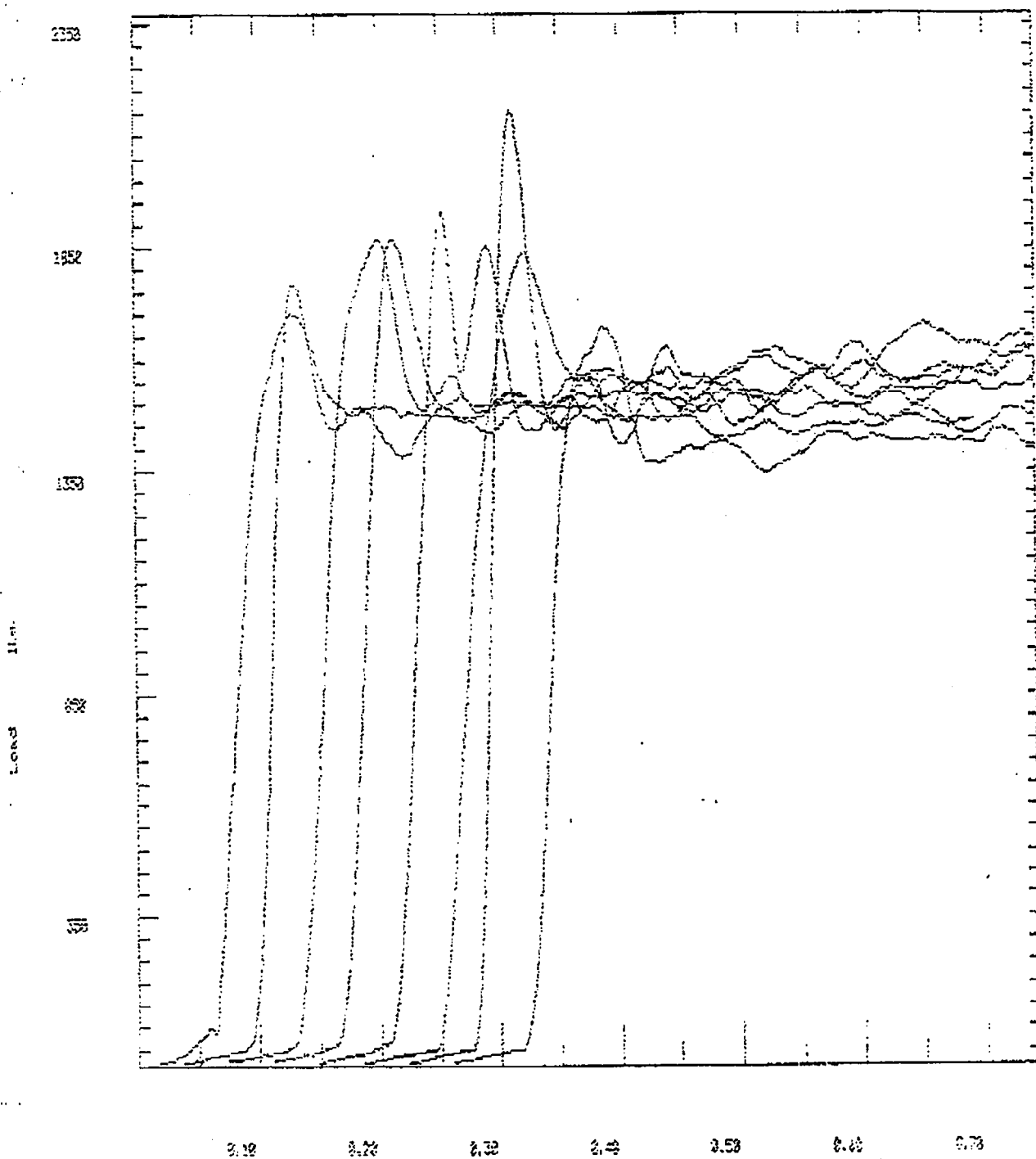
080806941 ALL

080806941 001



21B08941 ALL

21B08941 21

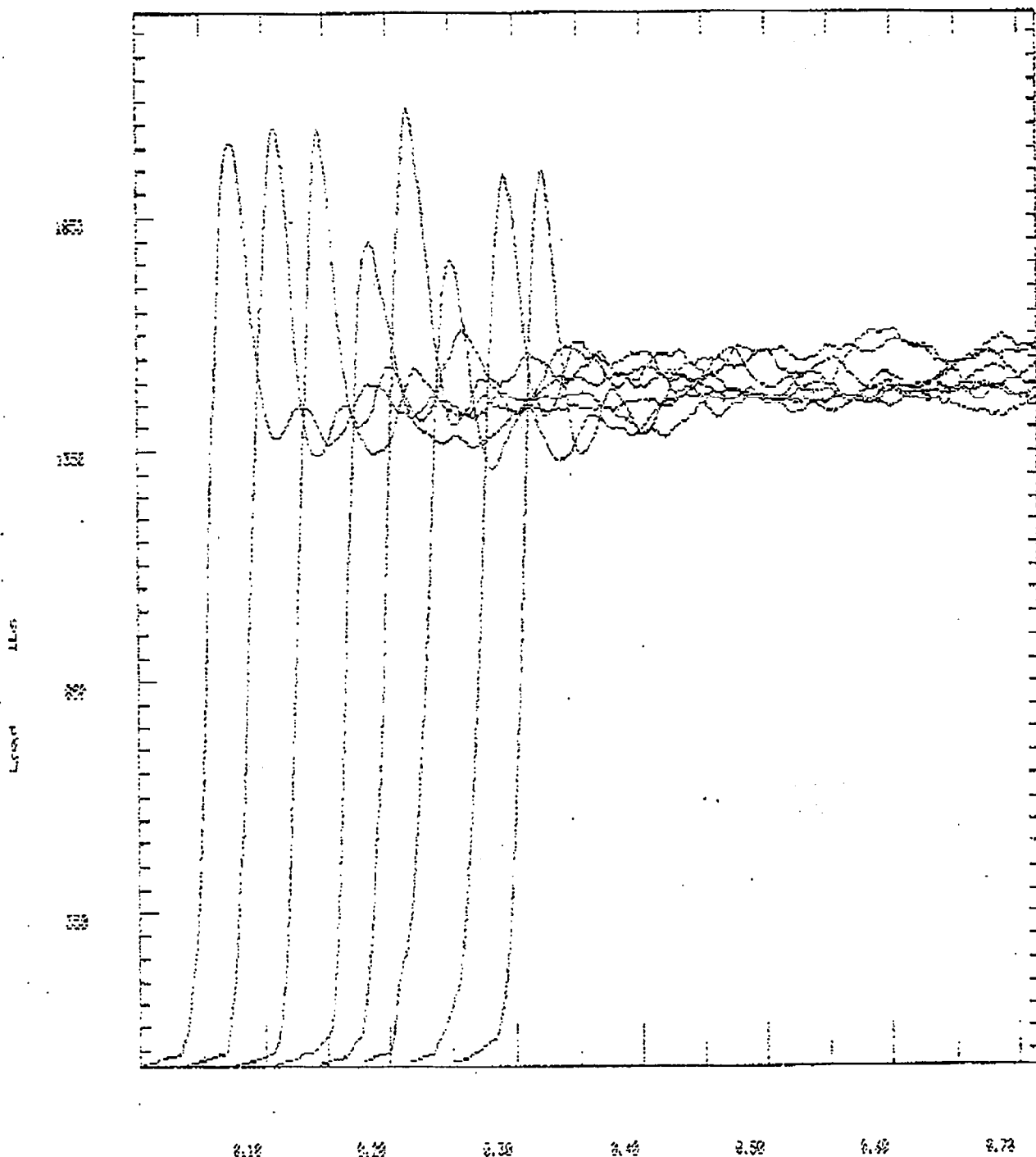


D-10
21B08941 21

210146

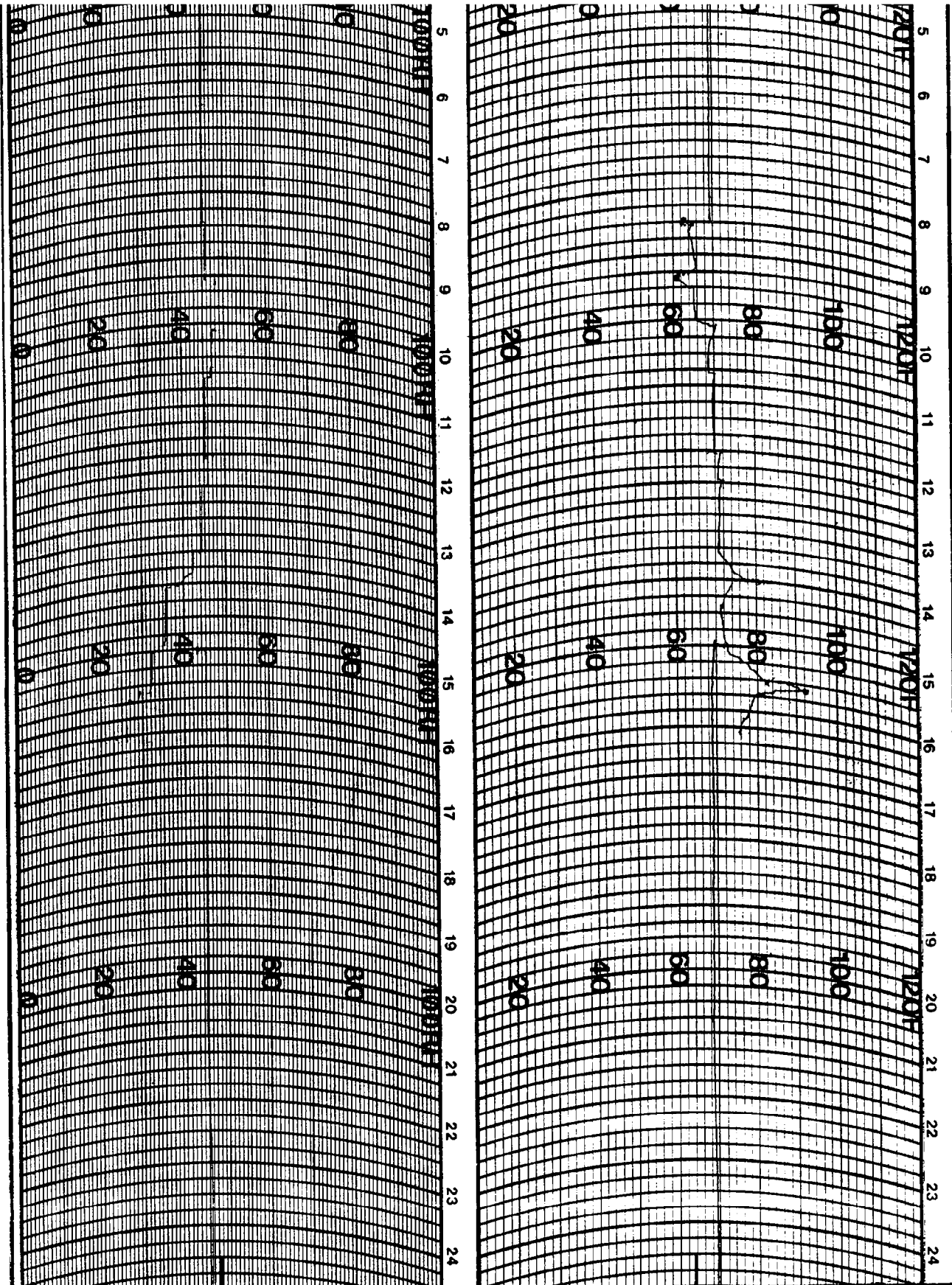
24 B08941 ALL

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WEATHER MEASURE
P.O. BOX 41257
SACRAMENTO, CA. 95841
PHONE (916) 481-7565

HYGROTHERMOGRAPH
1 DAY 15:00 10/15

CHART # C311 D HF
PART # 699123

STATION

DATE ON 10-11-94

DATE OFF 10-12-94