

Report Number TRC-95-N14

New Car Assessment Program (NCAP)

Frontal Barrier Impact Test

Kia Motors Corporation

1995 Kia Sephia

4-door sedan

NHTSA Number: MS0500

TRC Test Number: 950224

Prepared By:

Transportation Research Center Inc.

10820 State Route 347

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Final Report

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16. Abstract A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1995 Kia Sephia 4-door sedan, NHTSA No. MS0500, at Transportation Research Center Inc. on February 24, 1995. This test was conducted to obtain new car assessment and research data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The barrier impact velocity was 56.5 kph. The vehicle's maximum static crush was 538 millimeters. The ambient temperature was 23° C. The driver's Head Injury Criteria (HIC) was 980. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.7 g. The driver's left and right femur maximum axial forces were 6410 N and 7523 N, respectively. The passenger's HIC was 743. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.1 g. The passenger's left and right femur maximum axial forces were 5682 N and 5792 N, respectively.			
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons	0.9	tonnes	t
	(2000 lb)			
VOLUME				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

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

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
AREA				
cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares (10,000 m ²)	2.5	acres	
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m ³	cubic meters	35	cubic feet	ft ³
m ³	cubic meters	1.3	cubic yards	yd ³
TEMPERATURE (exact)				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

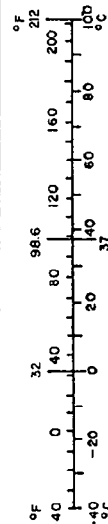


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Section 1.0

Purpose and Test Procedure

Purpose

This 56 kph (35 mph) frontal barrier impact test is part of the New Car Assessment Program (NCAP) conducted for the National Highway Traffic Safety Administration's (NHTSA) Office of Market Incentives by Transportation Research Center Inc. (TRC) under Contract Number DTNH22-90-D-22121.

The purpose of this test was to obtain new car assessment and research data for vehicle crashworthiness and occupant restraint system performance for the subject vehicle, a 1995 Kia Sephia 4-door sedan, NHTSA Number MS0500, at an impact speed in excess of the current 48 kph (30 mph) FMVSS 208 requirements.

Test Procedure

This test was conducted in accordance with NHTSA's Laboratory Indicant Test Procedure, New Car Assessment Program, dated January 1, 1990. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219, "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," performance.

The test vehicle was instrumented with nine (9) accelerometers to measure longitudinal axis accelerations. The driver's and passenger's restraint systems were instrumented with load cells to measure lap and shoulder belt forces and potentiometers to measure shoulder belt stretch and spoolout. The vehicle impacted a frontal load cell barrier instrumented with thirty-six (36) barrier face load cells. The vehicle's specified impact velocity range was 55.5 to 57.1 kph.

The test vehicle contained two (2) Part 572B 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant Test Procedure. This test was the first use of the driver dummy and the passenger dummy.

Both dummies were instrumented with head, chest, and pelvis accelerometers to measure longitudinal, lateral, and vertical accelerations, and with left and right femur load cells to measure axial forces.

The seventy-five (75) data channels were multiplexed and recorded on two (2) 14-track tape drives. The data was digitally sampled at 12,500 samples per second and processed per section IP11 of the Laboratory Indicant Test Procedure.

The crash event was recorded by one (1) real-time panning motion picture camera and fourteen (14) high-speed motion picture cameras. The pre- and post-test conditions were recorded by one (1) real-time motion picture camera.

The vehicle, occupant, and load cell barrier data are presented in Section 2.0. The occupant, camera, and vehicle measurements are presented in Section 3.0. Appendix A contains the still photographic prints. Appendix B contains the dummy, vehicle, and load cell barrier data plots. Appendix C contains the dummy certification data. Appendix D contains miscellaneous test information. Appendix E contains the restraint system instructions from the owner's manual.

Section 2.0

Frontal Barrier Impact Test Summary

Test Results Summary

This frontal load cell barrier test was conducted at TRC on February 24, 1995.

The test vehicle, a 1995 Kia Sephia 4-door sedan, NHTSA Number MS0500, was equipped with a 1.6-liter transverse engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 1290 kg. The vehicle's impact speed was 56.5 kph. The vehicle sustained 538 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 980. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.7 g. The driver's left and right femur maximum axial forces were 6410 N and 7523 N, respectively.

The passenger's HIC was 743. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.1 g. The passenger's left and right femur maximum axial forces were 5682 N and 5792 N, respectively.

There was loss of windshield periphery retention along the lower edge between 100 and 150 mm and 570 and 766 mm as measured from the lower left corner of the windshield.

There was no penetration through the windshield.

Following the impact, no fluid spilled from the vehicle's fuel system prior to the static rollover test or during any portion of the static rollover test.

Data Acquisition Explanations

The engine bottom X-axis accelerometer, ENGXG2, lost data after 48 milliseconds as a result of the vehicle's crush cutting the accelerometer cable.

Table 1 Crash Test Summary

NHTSA number:	MS0500	
Test type:	Frontal Load Cell Barrier	
Test date:	02/24/95	
Test time:	1412	
Ambient temperature:	23° C	
Vehicle year/make/ model/body style:	1995/Kia/Sephia/4-door sedan	
Vehicle test weight:	1290 kg	
Impact angle ¹ :	0°	
Impact velocity ² :	Primary = 56.5 kph Secondary = 56.5 kph	
Maximum static crush:	538 mm	
Average rebound:	599 mm	
Dummies:	Driver #826	Passenger #713
Type:	Part 572 B	Part 572 B
Location:	Left front	Right front
Restraint:	2-point passive belt and manual lap belt	2-point passive belt and manual lap belt
Number of data channels:	75	
Number of cameras:	High-speed	14
	Real-time	2

¹ With respect to tow track centerline.

² Speed trap measurement (± .08 kph accuracy)

Table 2 Test Vehicle Information

Vehicle year/make/
model/body style: 1995/Kia/Sepia/4-door sedan
Color: Beige
VIN: KNAFA1212S5212498
NHTSA number: MS0500
Engine data:
Placement: transverse
Cylinders: 4
Displacement 1.6 liters
Transmission data: 3 speed, manual, X automatic, overdrive
 X FWD, RWD, 4WD
Date vehicle received: 02/06/95
Odometer reading: 20
Dealer's name and address: Phil Long Ford, Inc.
1212 Motor City Drive
Colorado Spring, CO 80906

Accessories:

Power steering	No	Automatic transmission	Yes
Power brakes	No	Automatic speed control	No
Power seats	No	Tilting steering wheel	No
Power windows	No	Telescoping steering wheel	No
Tinted glass	No	Air conditioning	No
Radio	Yes	Anti-skid brake	No
Clock	Yes	Rear window defroster	Yes
Other	None		

Certification data from vehicle's label:

Vehicle manufactured by: Kia Motors Corporation
Date of manufacture: 06/94
VIN: KNAFA1212S5212498
GVWR: 1510 kg
GAWR: Front: 800 kg
Rear: 710 kg

Table 2 Test Vehicle Information, Cont'd.

Size of tires: P175/70R13

Tire pressure with maximum
capacity vehicle load:

Front: 300 kPa

Rear: 300 kPa

Spare tire: Temporary

Type of front seats: Bucket

Tire & capacity data from vehicle's label:

Recommended tire size: P175/70R13

Recommended cold tire pressure:

Front: 200 kPa

Rear: 200 kPa

Designated seating capacity:

Front 2

Rear 3

Total 5

Vehicle capacity weight: 375 kg

Test vehicle attitude:

Delivered attitude: LF 640 mm; RF 642 mm; LR 642 mm; RR 645 mm

Pre-test attitude: LF 640 mm; RF 666 mm; LR 660 mm; RR 638 mm

Post-test attitude: LF 660 mm; RF 670 mm; LR 623 mm; RR 625 mm

Table 2 Test Vehicle Information Cont'd

Weight of test vehicle as received (with maximum fluids):

Right front	330 kg	Right rear	220 kg
Left front	346 kg	Left rear	218 kg
Total front weight	676 kg	(60.7% of total vehicle weight)	
Total rear weight	438 kg	(39.3% of total vehicle weight)	
Total delivered weight	1114 kg		

Calculation of test vehicle's target test weight:

RCLW = Rated cargo and luggage weight

UDW = Unloaded delivered weight (1114 kg)

VCW¹ = Vehicle capacity weight (375 kg)

DSC = Designated seating capacity (5)

RCLW = VCW - 68 (DSC) = 375 - 68(5) = 35 kg

Target test weight = UDW + RCLW¹ + (Number of Hybrid III dummies x 74 kg/dummy)

Target test weight = 1114 + 35 + 148

Target test weight = 1297 kg

Weight of test vehicle with required dummies and 27 kg of cargo weight:

Right front	354 kg	Right rear	276 kg
Left front	379 kg	Left rear	281 kg
Total front weight	733 kg	(56.9% of total vehicle weight)	
Total rear weight	557 kg	(43.1% of total vehicle weight)	
Total test weight	1290 kg	(0.6% under target test weight)	

Weight of ballast secured in vehicle: 0 kg

Components removed to meet target test weight: Trunk lid

CG rearward of front wheel centerline: 1072 mm

Vehicle wheelbase: 2487 mm

¹ From the vehicle's recommended tire pressure label.

Table 3 Post-Impact Data

Test number: 950224
NHTSA number: MS0500
Test date: 02/24/95
Test time: 1412
Test type: Frontal load cell barrier
Impact angle: 0°
Ambient temperature
at impact area: 23° C
Temperature in
occupant compartment: 21° C
Impact velocity:
Primary 56.5 kph
Secondary 56.5 kph
Specified range 55.5 to 57.1 kph

Distance from vehicle to barrier:

Entering velocity trap 356 mm
Exiting velocity trap 51 mm

Test vehicle static crush:

Overall length of test vehicle:

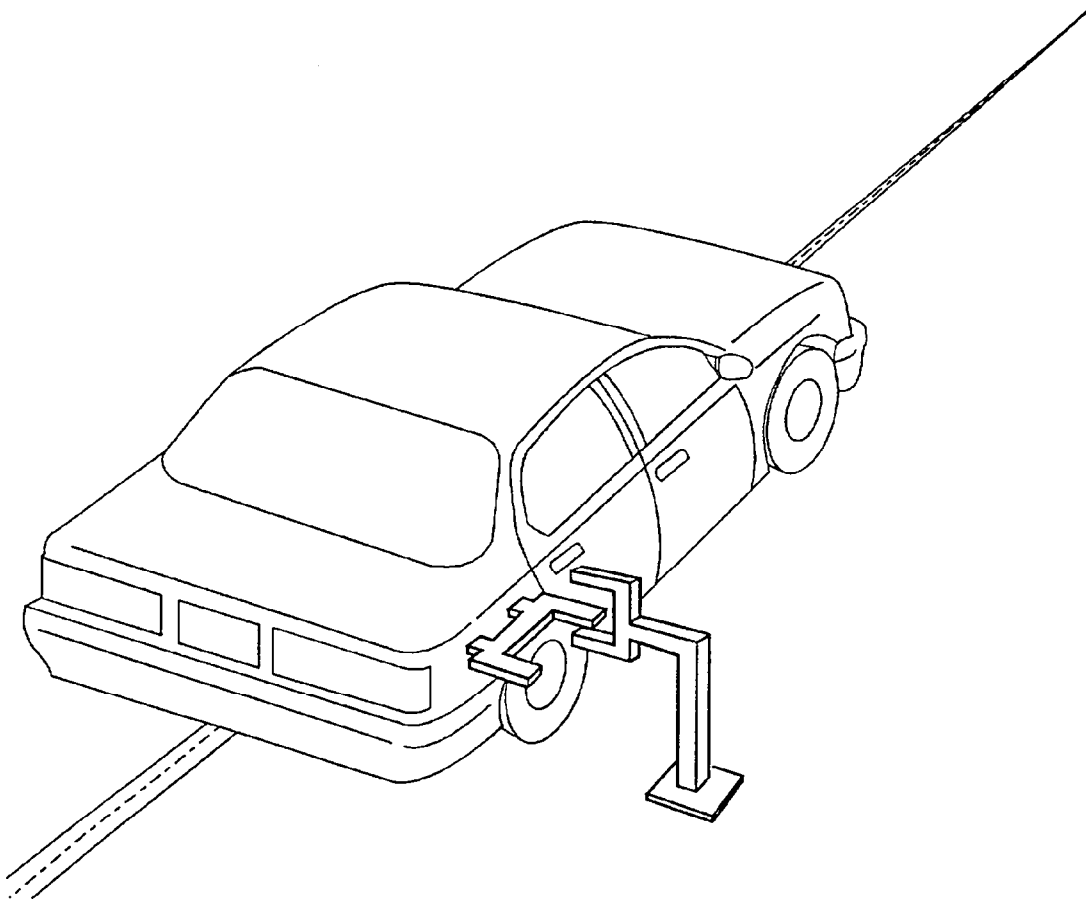
Pre-test:	L	4225 mm;	C	4309 mm;	R	4225 mm
Post-test:	L	3750 mm;	C	3785 mm;	R	3744 mm
Total crush:	L	475 mm;	C	524 mm;	R	481 mm
Average crush:	493 mm					

Test vehicle rebound from flat barrier:

Distance from test vehicle to barrier:

Post-test:	L	624 mm;	C	537 mm;	R	636 mm
Average rebound	599 mm					

Figure 1 Impact Velocity Measurement System



The final vane clears the final emitter/receiver pair 51 millimeters before impact.

The vanes have 305-millimeter spacing.

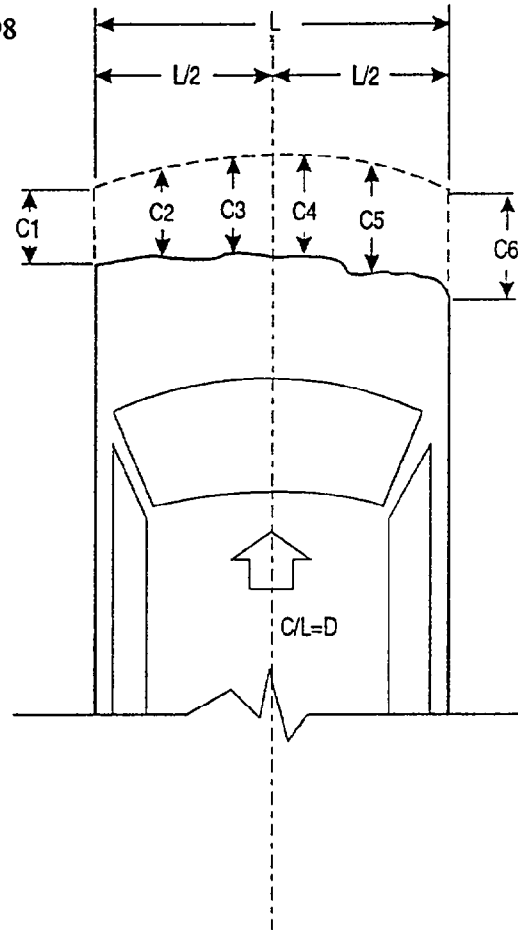
**Figure 2 Accident Investigation Division Data
for 56 kph (35 mph) Frontal Barrier Impact**

NHTSA number: MS0500
 Test date: 02/24/95
 Vehicle year/make/model/body style: 1995/Kia/Sephia/4-door sedan
 Vehicle size category: Compact
 VIN: KNAFA1212S5212498
 Build date: 06/94
 Test weight: 1290 kg
 Vehicle wheelbase: 2487 mm
 Maximum width: 1690 mm
 Front overhang: 808 mm

Collision Deformation
 Classification (CDC) code: 12FDEW3

Crush depth
 measurements:

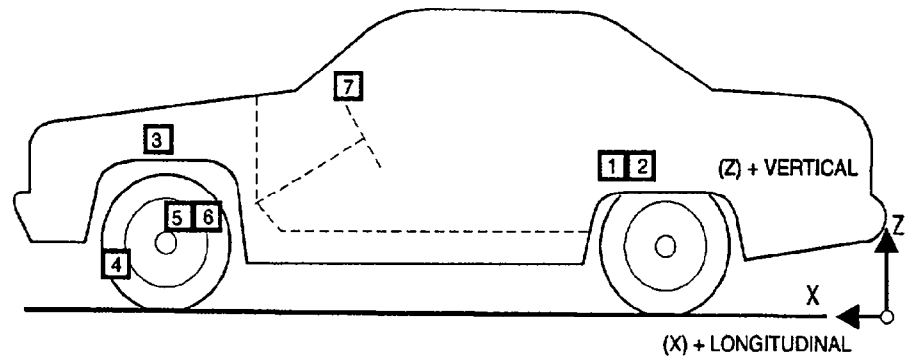
C1	=	475 mm
C2	=	501 mm
C3	=	538 mm
C4	=	522 mm
C5	=	491 mm
C6	=	481 mm



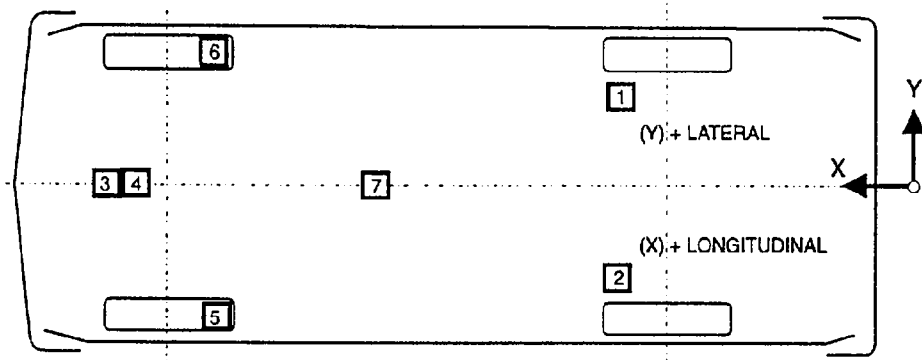
Midpoint of damage: D: Vehicle Longitudinal Centerline

Length of damaged region: L: 1270 mm

Figure 3 Vehicle Accelerometer Placement



SIDE VIEW



BOTTOM VIEW

Table 4 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 950224 No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 LEFT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	2476 mm	649 mm	225 mm	2.6 g @ 136.2 ms 2.2 g @ 135.0 ms	37.0 g @ 36.6 ms 38.2 g @ 36.6 ms
2 RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	2499 mm	-649 mm	230 mm	1.9 g @ 143.4 ms 2.4 g @ 142.4 ms	49.1 g @ 38.4 ms 49.8 g @ 38.4 ms
3 ENGINE TOP LONGITUDINAL	658 mm	-135 mm	737 mm	99.6 g @ 40.7 ms	181.9 g @ 29.1 ms
4 ENGINE BOTTOH LONGITUDINAL ¹	688 mm	-248 mm	162 mm	----	----
5 RIGHT BRAKE CALIPER LONGITUDINAL	756 mm	-615 mm	288 mm	144.2 g @ 46.2 ms	139.4 g @ 30.6 ms
6 LEFT BRAKE CALIPER LONGITUDINAL	756 mm	615 mm	280 mm	51.9 g @ 37.0 ms	87.5 g @ 45.9 ms
7 INSTRUMENT PANEL CENTER LONGITUDINAL	1310 mm	16 mm	906 mm	18.7 g @ 55.0 ms	70.7 g @ 46.2 ms

* X-AXIS LOCATIONS ARE MEASURED REARWARD FROM THE FRONT BUMPER.

REFERENCE: X: + FORWARD ACCELERATION
Y: + LEFT FROM VEHICLE CENTERLINE
Z: + UP FROM GROUND LEVEL

¹ See DATA ACQUISITION EXPLANATIONS

Table 5 Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	<u>Driver #826</u>	<u>Passenger #713</u>
Head	Upper steering wheel rim and hub	Sun visor
Chest	None	None
Abdomen	Lower steering wheel rim	None
Left knee	Instrument panel	Instrument panel
Right knee	Instrument panel	Instrument panel

Door Opening:

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

Seat Movement:

	<u>Seat Back Failure</u>	<u>Seat Shift</u>
Front	None	Driver's seat shifted 1 notch forward
Rear	NA	NA

Glazing Damage:

The entire windshield cracked on impact.

Other Notable Impact Effects:

None

Table 6 FMVSS 208 Data Summary

Vehicle year/make/
model/body style: 1995/Kia/Sephia/4-door sedan
Vehicle NHTSA number: MS0500
Test date: 02/24/95

	Driver Dummy #826		Passenger Dummy #713	
<u>Maximum Accelerations:</u>				
Head X-axis	-188.0	g	-25.3	g
Head Y-axis	20.6	g	-69.6	g
Head Z-axis	-122.7	g	-67.7	g
Head resultant	224.5	g	79.4	g
Chest X-axis	-53.6	g	-52.2	g
Chest Y-axis	13.0	g	-13.6	g
Chest Z-axis	16.0	g	10.8	g
Chest resultant ¹	51.7	g	51.1	g
Chest resultant time interval ¹	.003	sec	.003	sec
<u>Head Injury Criteria (HIC) Values:</u>				
HIC ²	980		743	
HIC starting time	.062	sec	.066	sec
HIC ending time	.098	sec	.102	sec
Avg. head resultant accel. during HIC time interval	59.4	g	53.2	g
<u>Maximum Chest Deflections:</u>				
Chest X-axis	NA		NA	
Maximum chest deflection time	NA		NA	
<u>Maximum Compressive Femur Forces:</u>				
Left femur	6410	N	5682	N
Right femur	7523	N	5792	N
<u>Maximum Seat Belt Forces:</u>				
Lap belt	3906	N	2679	N
Shoulder belt	10867	N	11177	N

Note: All values listed must be occurring during primary impact event.
(Head accelerations listed must be during HIC time interval.)

¹ 0.003 Sec. Minimum duration.

² The maximum HIC time interval is 36 milliseconds.

Table 7 Pelvis Data Summary

Vehicle year/make/
model/body style: 1995/Kia/Sepia/4-door sedan
Vehicle NHTSA number: MS0500
Test date: 02/24/95

	Driver Dummy #826	Passenger Dummy #713
<u>Maximum Accelerations:</u>		
Pelvis X-axis	-75.2 g	-79.7 g
Pelvis Y-axis	30.1 g	28.6 g
Pelvis Z-axis ¹	44.8 g	44.0 g
Pelvis resultant ¹	78.6 g	85.1 g

Note: All values listed must be occurring during primary impact event.

¹ See data acquisition explanations.

Dummy Kinematic Summary

Driver Dummy

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated forward impacting the upper steering wheel rim and hub as the dummy's torso was restrained by the two-point passive belt and manual lap belt. The dummy's head rotated rearward as the dummy rebounded rearward and rightward into the seat back. The dummy came to rest seated in the driver's seat, leaning toward the right, restrained by the two-point passive belt and manual lap belt.

Right Front Passenger Dummy

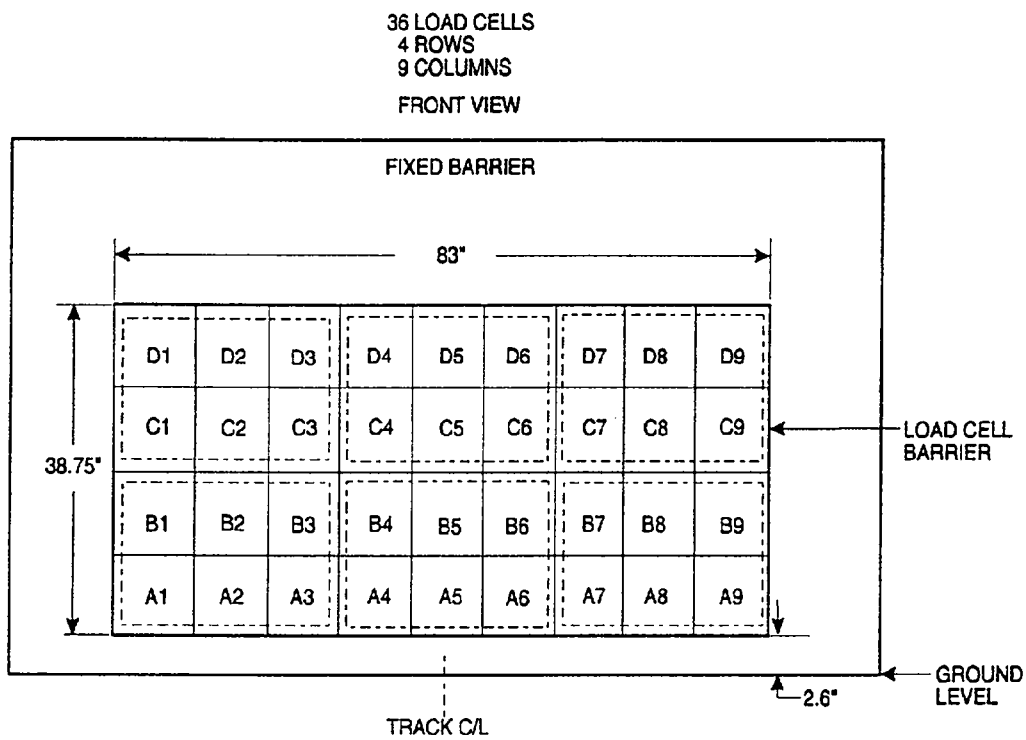
Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated forward, contacting the sun visor, as the dummy's torso was restrained by the two-point passive belt and manual lap belt. The dummy's head rotated rearward as the dummy rebounded rearward and leftward into the seat back. The dummy came to rest seated in the left rear passenger's seat, leaning to the left, restrained by the two-point passive belt and manual lap belt.

Table 8 Seat Belt Performance Assessment Test Data

	Driver	Passenger
<u>Belt length data:</u>		
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	1865 mm	1894 mm
Shoulder belt length as measured on Part 572 dummy.	872 mm	893 mm
Lap belt length as measured on Part 572 dummy.	905 mm	877 mm
<u>Shoulder belt spool-off length:</u>		
As determined by film analysis ¹	NA	NA
As determined mechanically	120 mm	55 mm
As determined electronically	111 mm	112 mm
<u>Belt stretch length:</u>		
As measured mechanically	0 mm/m	0 mm/m
As measured electronically	247 mm/m	249 mm/m
<u>Retractor lock-up time:</u>		
As determined by shoulder belt spool-off ¹	NA	NA

¹ Onboard cameras were removed to achieve test weight.

Figure 4 Load Cell Barrier Configuration



- Group 1: A1 through B3
- Group 2: A4 through B6
- Group 3: A7 through B9
- Group 4: C1 through D3
- Group 5: C4 through D6
- Group 6: C7 through D9

Table 9 Load Cell Barrier Data Summary

Location	Positive direction	Negative direction
Total group 1	3.0 kN @ 2.9 ms	90.0 kN @ 11.4 ms
Total group 2	1.3 kN @ 279.5 ms	234.0 kN @ 48.3 ms
Total group 3	2.1 kN @ 2.5 ms	108.2 kN @ 30.6 ms
Total group 4	1.2 kN @ 111.7 ms	36.9 kN @ 39.1 ms
Total group 5	1.0 kN @ 239.9 ms	43.0 kN @ 30.6 ms
Total group 6	1.4 kN @ 239.8 ms	36.8 kN @ 40.9 ms
Total load cell force	5.4 kN @ 240.1 ms	458.5 kN @ 48.4 ms

Tension is positive
Compression is negative

Section 3.0

FMVSS 212, 219 (partial), and 301 Data

Figure 5 FMVSS 212 Test Data

Details of windshield mounting such as retention method, trim type, etc.:

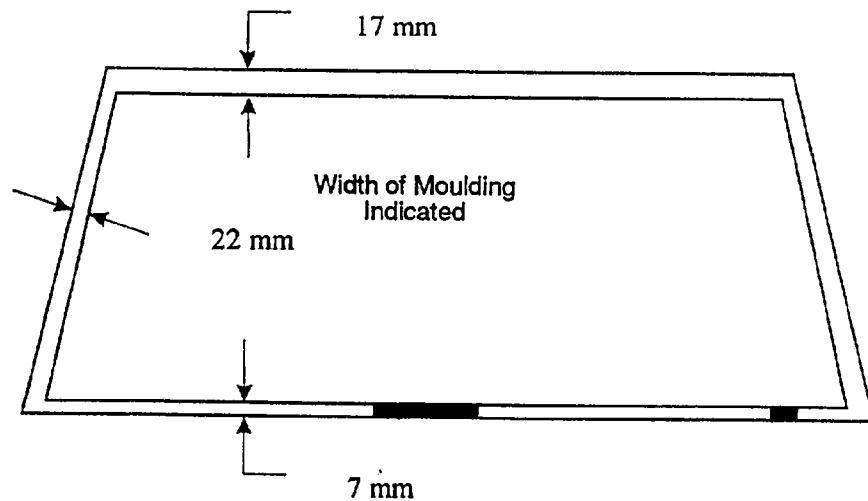
Plastic trim around outer perimeter, adhesive around inner perimeter.

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

Windshield periphery measurements:

	<u>Pre-test</u>	<u>Post-test</u>	<u>Percent retention</u>
Right side	2000 mm	1805 mm	90.2
Left side	2000 mm	1949 mm	97.4
Total	4000 mm	3754 mm	93.8

Pre-test windshield mounting material temperature: 19° C



Front view of windshield¹

Loss of windshield retention lengths:

Retention was lost along the lower perimeter between 100 and 150 mm and 570 and 766 mm as measured from the lower left corner.

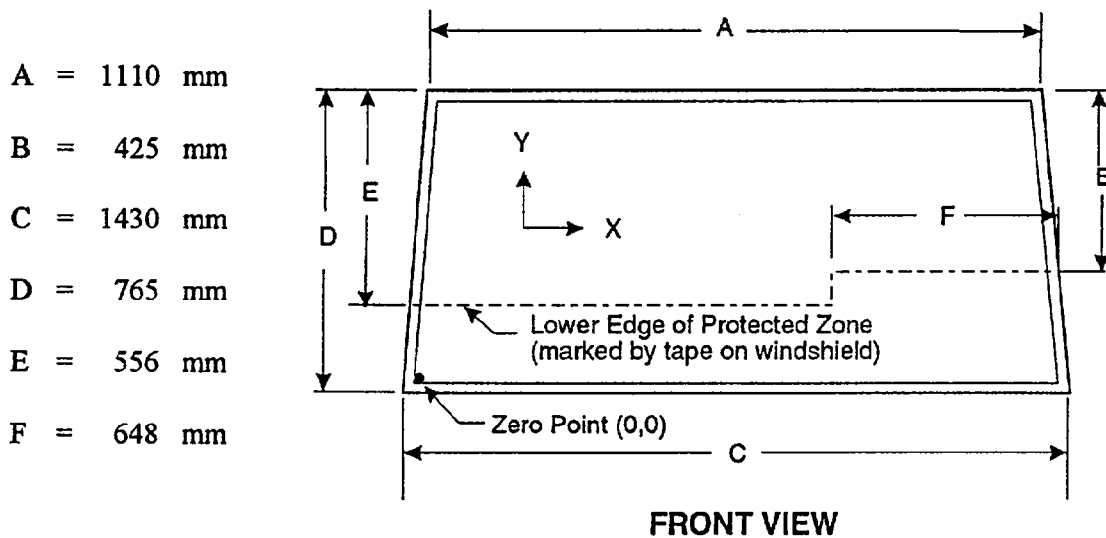
¹ Indicate areas of loss of retention, if any, on windshield diagram.

Figure 6 FMVSS 219 Test Data

Protected zone lower edge requirement:

The lower edge of the protected zone is determined by placing a 165-millimeter diameter rigid sphere weighing 6.8 kg in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. Draw the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 13 millimeters from the locus line. The lower edge of the protected zone is the longitudinal projection onto the outer surface of the windshield of this line.

Windshield measurements:



Method of adhering protected zone template to windshield: NA

Areas of windshield template penetration greater than 6 mm: NA

Coordinates	
X	Y
1.	
2.	
3.	

Areas of windshield penetration, below the protected zone, through the inner surface of the windshield: None

- 1.
- 2.
- 3.

Table 10 Fuel System Data

Vehicle year/make/ model/body style:	1995/Kia/Sephia//4-door sedan
NHTSA number:	MS0500
Fuel system capacity:	50.0 liters (from owner's manual)
Usable capacity:	50.0 liters (furnished by COTR)
Test volume range:	46.0 liters to 40.7 liters (92-94% of usable)
Actual test volume:	46.6 liters (with entire fuel system filled)
Test fluid type:	Stoddard solvent
Specific gravity:	0.764
Kinematic viscosity:	0.99 centistoke
Test fluid color:	Purple

The electric fuel pump did not operate with ignition switch "on" and the engine not operating.

Details of fuel system: The fuel tank was located in front of the rear axle.
 The fuel filler neck was located on the left side and
 entered the rear of the tank.
 The fuel lines ran along the left side to the front.

Table 11 FMVSS 301 Post-Impact Test Data

NHTSA number: MS0500
Test date: 02/24/95
Vehicle year/make/
model/body style: 1995/Kia/Sephia/4-door sedan

Test requirements:

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

Test vehicle impact type:

- ☒ Frontal (56 kph)
☐ Oblique (48 kph) with ___° barrier face first contacting ___ (driver/pass.) side
☐ Rear moving barrier (48 kph)
☐ Lateral moving barrier (32 kph)

Fuel system fluid spillage measurements:

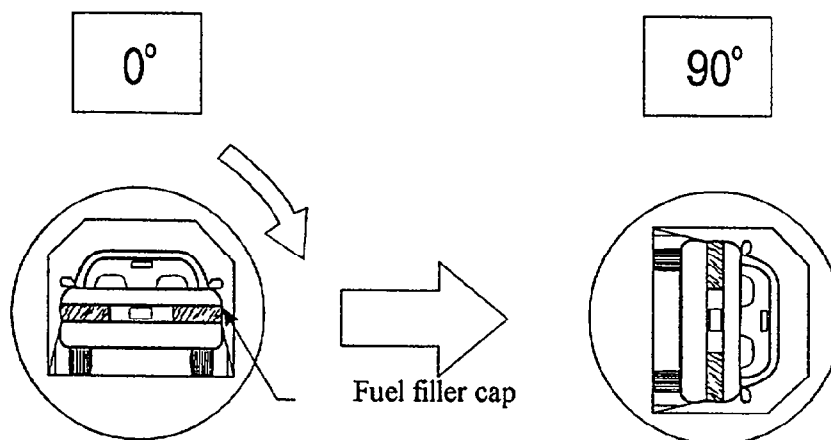
	<u>Test Results</u>	<u>Maximum Allowable</u>
1. From impact until vehicle motion ceases	0 g	28 g
2. 5-minute period after vehicle motion ceases	0 g	142 g
3. Next 25 minutes after 5-minute period	0 g	28 g/min

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data

NHTSA number: MS0500

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90° = 2 minutes, 0 seconds

FMVSS 301 position hold time = 5 minutes, 0 seconds

Total = 7 minutes, 0 seconds

Next whole minute interval = 7 minutes

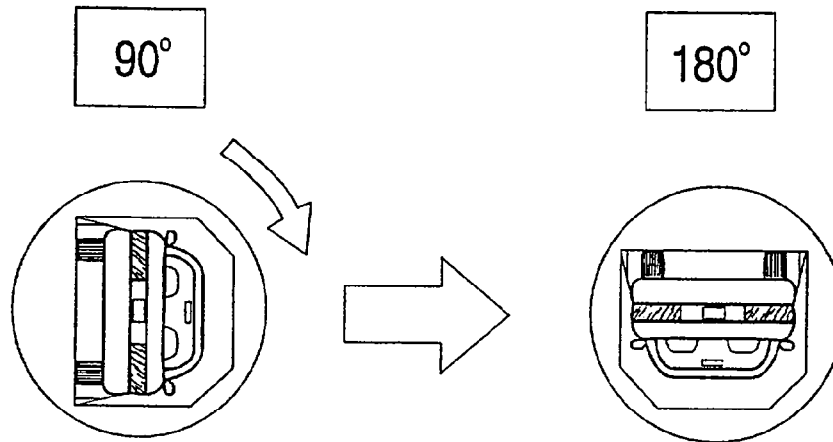
Fuel system fluid spillage measurements:

	Test Results	Maximum Allowable
<u>0° to 90° rotation (fuel filler cap down)</u>		
1. First 5 minutes from onset of rotation	0 g	142 g
2. Sixth minute from onset of rotation	0 g	28 g
3. Seventh minute from onset of rotation	0 g	28 g

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data, Cont'd.

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90° = 2 minutes, 0 seconds
 FMVSS 301 position hold time = 5 minutes, 0 seconds
 Total = 7 minutes, 0 seconds
 Next whole minute interval = 14 minutes

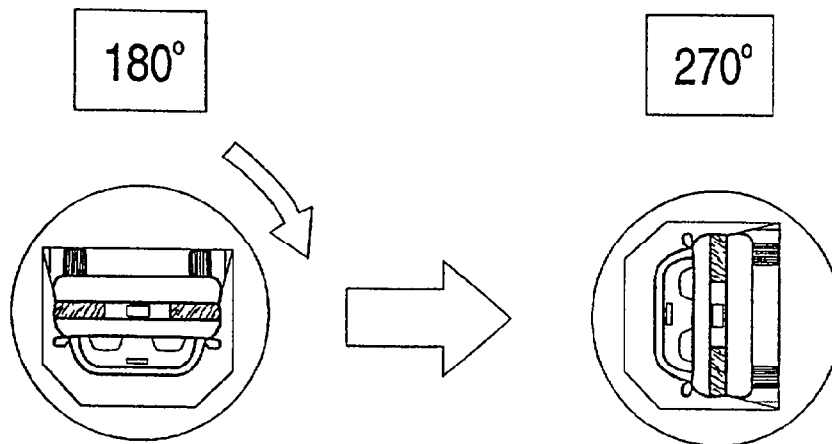
Fuel system fluid spillage measurements:

90° to 180° rotation	Test Results	Maximum Allowable
1. First 5 minutes from onset of rotation	0 g	142 g
2. Sixth minute from onset of rotation	0 g	28 g
3. Seventh minute from onset of rotation	0 g	28 g

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data, Cont'd.

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90° = 2 minutes, 0 seconds
 FMVSS 301 position hold time = 5 minutes, 0 seconds
 Total = 7 minutes, 0 seconds
 Next whole minute interval = 21 minutes

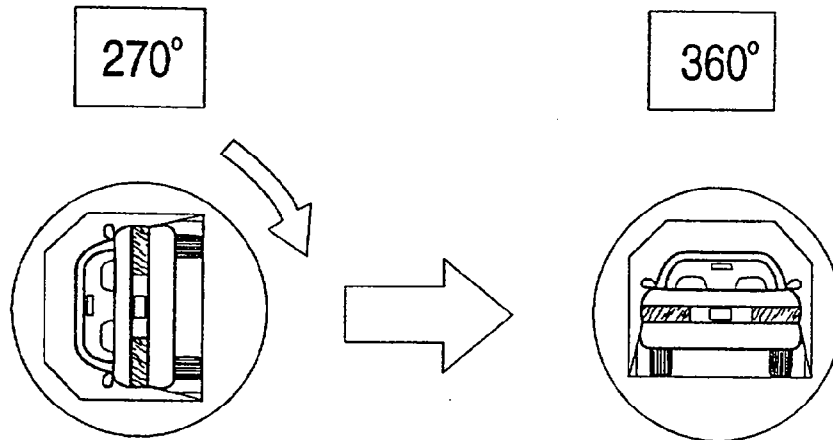
Fuel system fluid spillage measurements:

180° to 270° rotation	Test Results	Maximum Allowable
1. First 5 minutes from onset of rotation	0 g	142 g
2. Sixth minute from onset of rotation	0 g	28 g
3. Seventh minute from onset of rotation	0 g	28 g

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data, Cont'd.

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90° = 2 minutes, 0 seconds
 FMVSS 301 position hold time = 5 minutes, 0 seconds
 Total = 7 minutes, 0 seconds
 Next whole minute interval = 28 minutes

Fuel system fluid spillage measurements:

<u>270° to 360° rotation</u>	<u>Test Results</u>	<u>Maximum Allowable</u>
1. First 5 minutes from onset of rotation	0 g	142 g
2. Sixth minute from onset of rotation	0 g	28 g
3. Seventh minute from onset of rotation	0 g	28 g

Fuel system fluid spillage location(s): None

Section 4.0

Occupant, Camera, and Vehicle Information

Figure 8 Dummy Measurement Locations for Front Seat Occupants

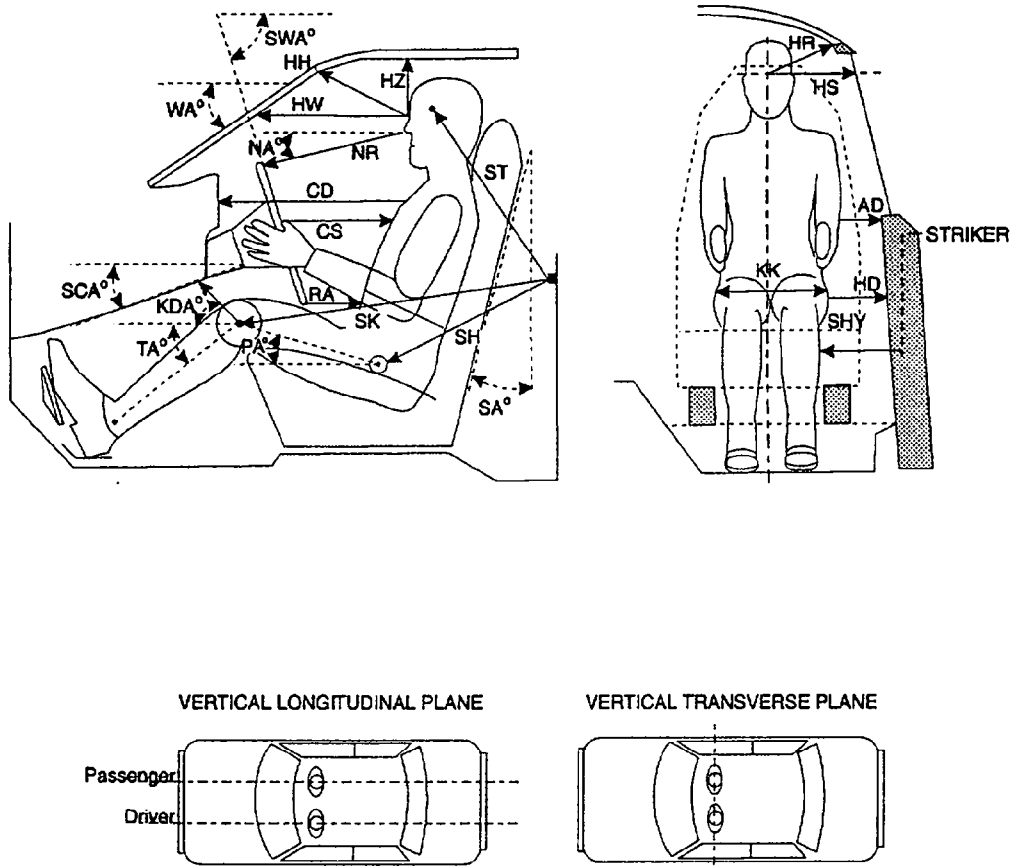


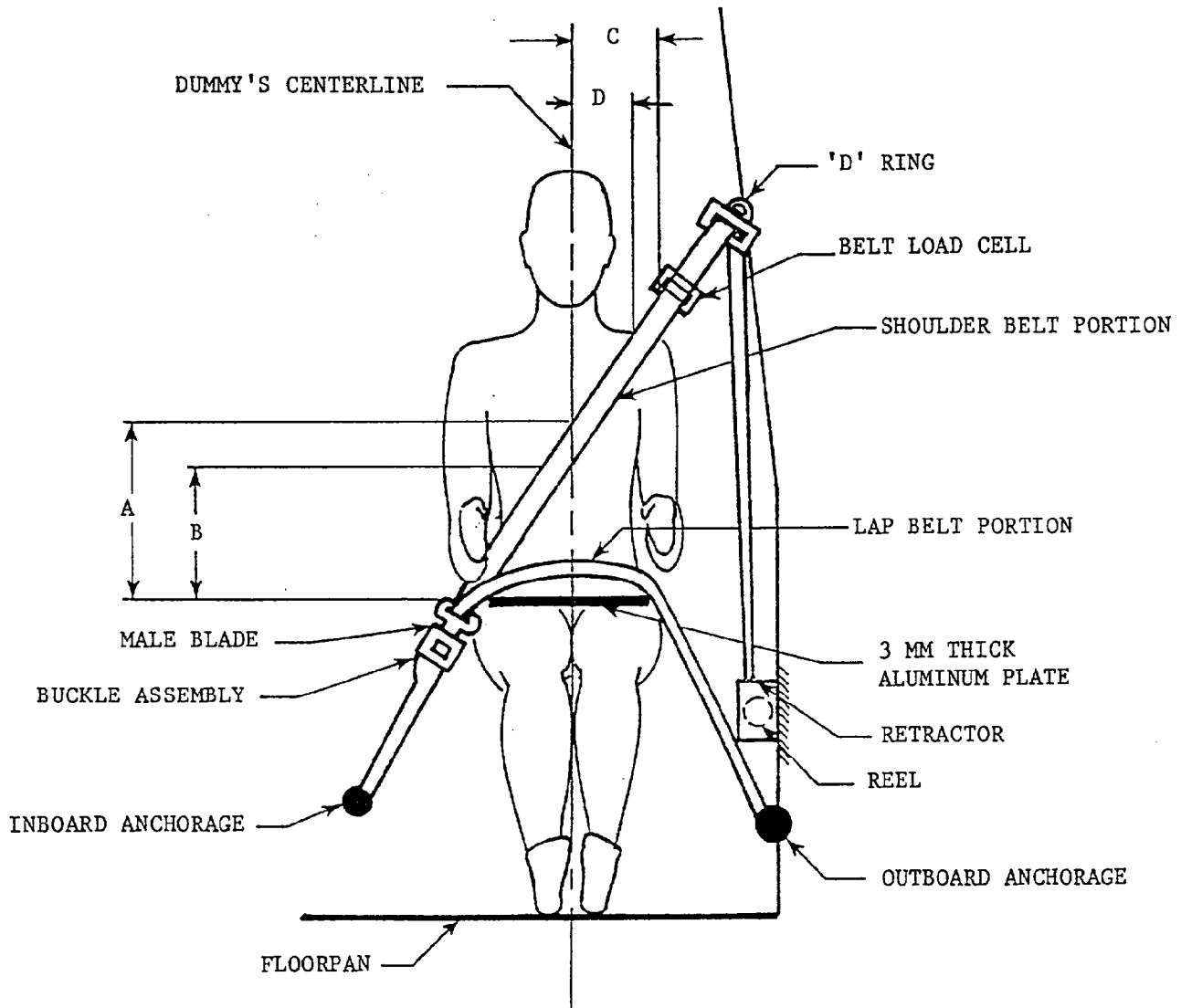
Table 12 Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #826)	Passenger (Serial #713)
WA	Windshield angle	30°	NA
SWA	Steering wheel angle	66°	NA
SCA	Steering column angle	25°	NA
SA	Seat back angle	23°	23°
HZ	Head to roof	114 mm	189 mm
HH	Head to header	368 mm	368 mm
HW	Head to windshield	456 mm	500 mm
HR	Head to side header	183 mm	153 mm
NR	Nose to rim	475 mm	NA
NA	Nose to rim angle	17°	NA
CD	Chest to dash	610 mm	627 mm
CS	Steering wheel to chest	391 mm	NA
RA	Rim to abdomen	167 mm	NA
KDL	Left knee to dash	193 mm	183 mm
KDR	Right knee to dash	211 mm	175 mm
KDA	Outboard knee to dash angle	26°	14°
PA	Pelvic angle	15°	11°
TA	Tibial angle	53°	53°
KK	Knee to knee	338 mm	302 mm
ST ¹	Striker to head	545 mm	536 mm
	Striker to head angle	-89°	-93°
SK ¹	Striker to knee	566 mm	579 mm
	Striker to knee angle	6°	2°
SH ¹	Striker to H-point	191 mm	210 mm
	Striker to H-point angle	40°	23°
SHY	Striker to H-point (Y dir.)	215 mm	224 mm
HS	Head to side window	310 mm	277 mm
HD	H-point to door	180 mm	175 mm
AD	Arm to door	122 mm	102 mm

The seat back angle (SA°) is measured relative to vertical, all other angles are measured relative to horizontal.

¹ A negative angle indicates the measurement point was above the striker.

Figure 9 Seat Belt Positioning Data



	Driver	Passenger
A - Top surface of aluminum plate to belt upper edge	331 mm	333 mm
B - Top surface of aluminum plate to belt lower edge	266 mm	264 mm
C - Dummy centerline to outer edge of belt at chest flesh top	235 mm	227 mm
D - Dummy centerline to inner edge of belt at chest flesh top	163 mm	159 mm
Lap belt tension	16 N	16 N

Figure 10 Camera Positions

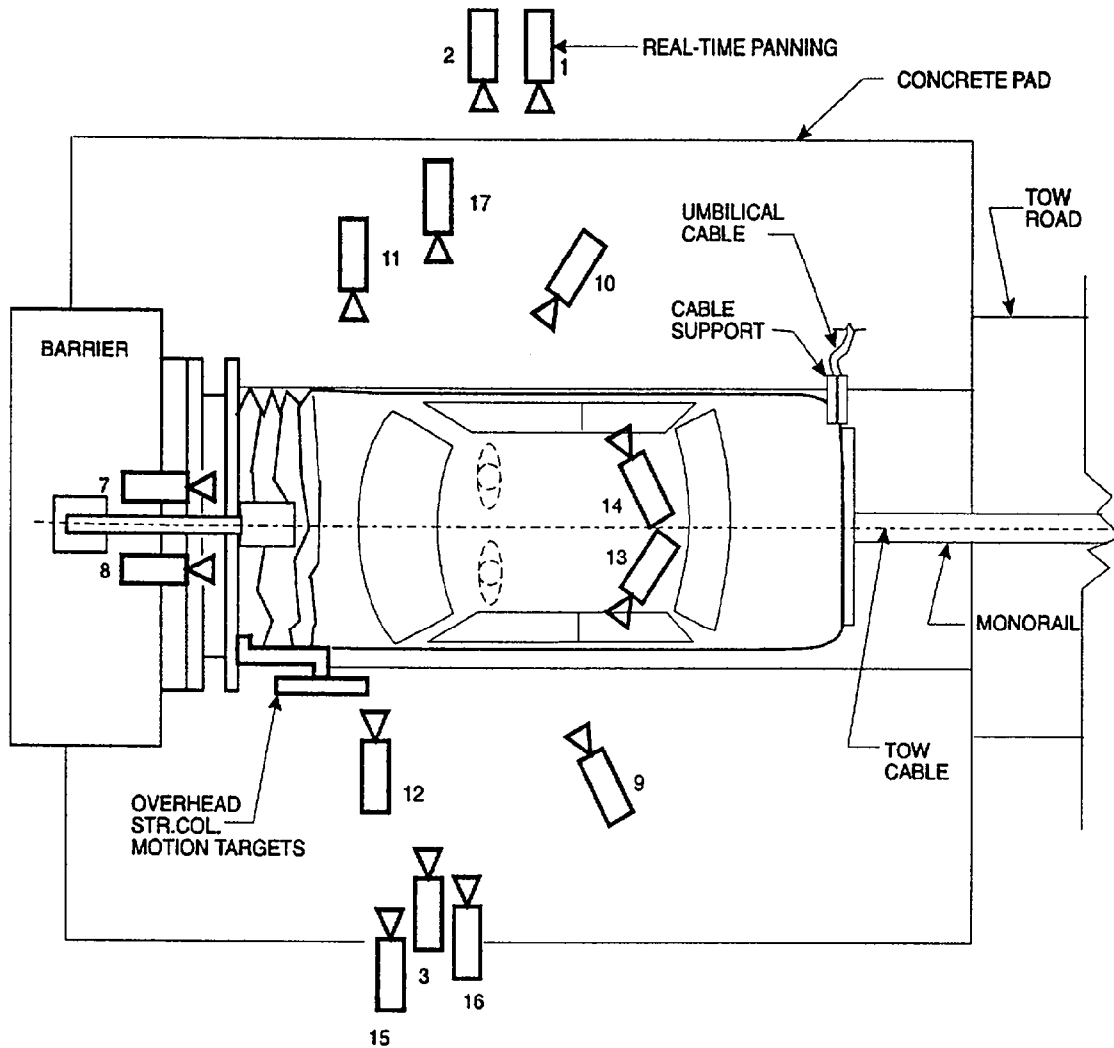
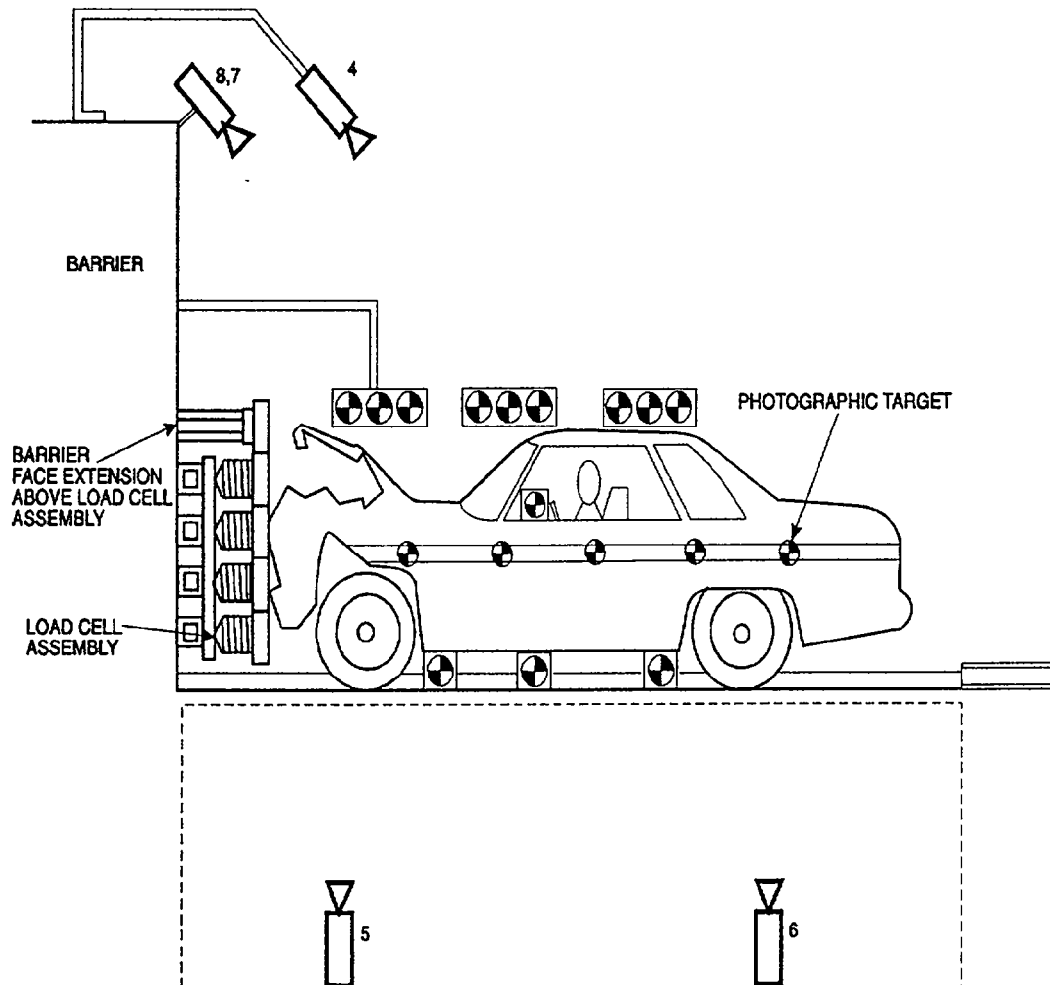


Figure 10 Camera Positions, Cont'd.



Test Number: 950224

Vehicle year/make/model/body style: 1995/Kia/Sephia/4-door sedan

Table 13 Motion Picture Camera Locations

Camera Number	View	X	Y	Z	Angle ²	Film Plane to Head Target	Lens	Film Speed
1	Real-time panning	-3607 mm	-2802 mm	1549 mm	NA	NA mm	16 mm	24 frames/s
2	Vehicle crush	-2065 mm	-6767 mm	942 mm	-2°	NA mm	13 mm	510 frames/s
3	Dummy kinematics	-1054 mm	7493 mm	1118 mm	-12°	5867 mm	25 mm	995 frames/s
4	Windshield damage	-925 mm	0 mm	2489 mm	-40°	NA mm	13 mm	500 frames/s
5	Crush & fluid spillage	-1283 mm	0 mm	-2347 mm	90°	NA mm	13 mm	1002 frames/s
6	Fluid spillage	-2522 mm	0 mm	-2515 mm	90°	NA mm	13 mm	1000 frames/s
7	Passenger kinematics	-114 mm	-351 mm	2159 mm	-40°	NA mm	17 mm	505 frames/s
8	Driver kinematics	-173 mm	368 mm	2159 mm	-41°	NA mm	17 mm	502 frames/s
9	Driver kinematics	-4572 mm	1854 mm	2591 mm	-27°	2515 mm	25 mm	502 frames/s
10	Passenger kinematics	-4674 mm	-1880 mm	2540 mm	-26°	2057 mm	25 mm	492 frames/s
11	Windshield intrusion	-968 mm	-7775 mm	1118 mm	0°	NA mm	50 mm	500 frames/s
12	Windshield intrusion	-1346 mm	7859 mm	1074 mm	0°	NA mm	50 mm	500 frames/s
13	Driver seat belt movement	NA	NA	NA	NA	NA mm	NA mm	NA frames/s
14	Passenger seat belt movement	NA	NA	NA	NA	NA mm	NA mm	NA frames/s
15	Column movement	-2438 mm	7264 mm	2616 mm	-14°	NA mm	25 mm	508 frames/s
16	Column movement	-2438 mm	7264 mm	1908 mm	-9°	NA mm	25 mm	500 frames/s
17	Passenger kinematics	-986 mm	-5354 mm	1151 mm	7°	5309 mm	25 mm	1002 frames/s

¹ +X = Film plane forward of barrier face

+Y = Film plane to left of monorail centerline

+Z = Film plane above ground level

² +Angle = Film plane angled upward from horizontal plane

Figure 11 Vehicle Target Locations

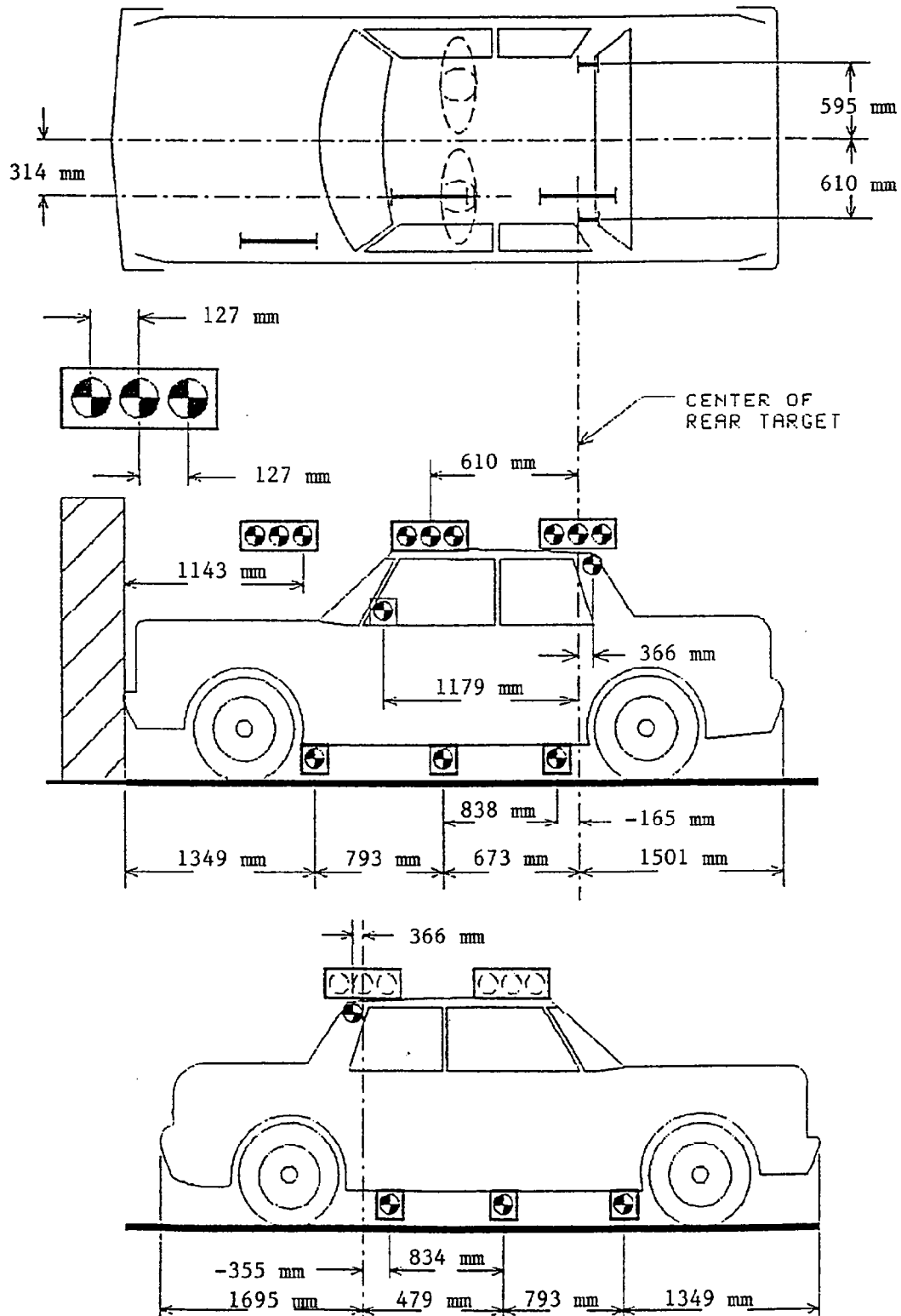


Figure 12 Pre-Test And Post-Test Measurement Points

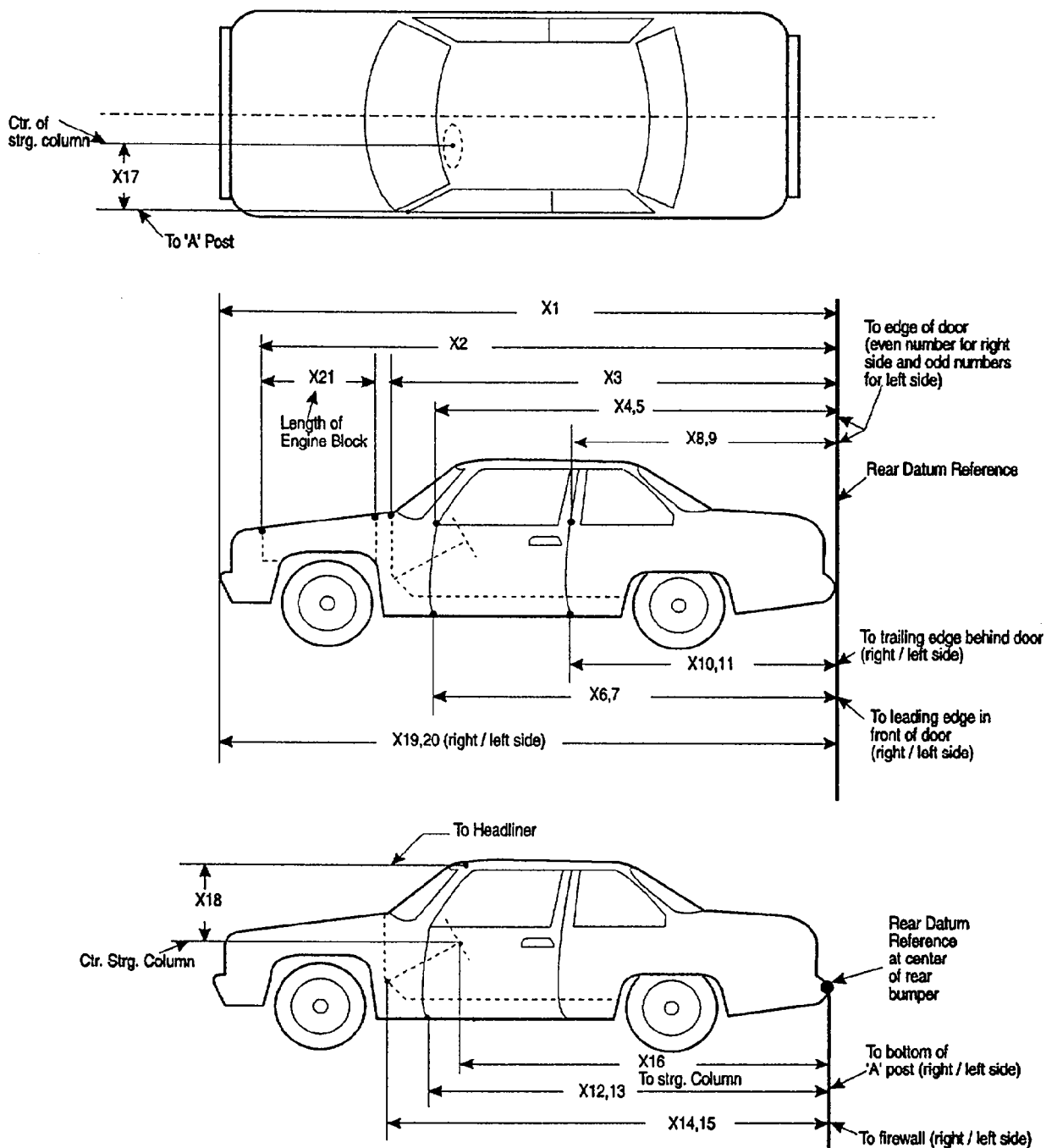


Table 14 Impacted Vehicle Measurements

Vehicle Make/Model: Kia/Sephia

Test Number: 950224

No.	Type of measurement	Pre-test	Post-test	Diff.
X1	Total length of vehicle at centerline	4309 mm	3785 mm	524 mm
X2	Rear surface of vehicle to front of engine block	3794 mm	3553 mm	241 mm
X3	Rear surface of vehicle to firewall	3243 mm	3185 mm	58 mm
X4	Rear surface of vehicle to upper leading edge of right door	3022 mm	3025 mm	-3 mm
X5	Rear surface of vehicle to upper leading edge of left door	3022 mm	3020 mm	2 mm
X6	Rear surface of vehicle to lower leading edge of right door	3012 mm	3000 mm	12 mm
X7	Rear surface of vehicle to lower leading edge of left door	3008 mm	3003 mm	5 mm
X8	Rear surface of vehicle to upper trailing edge of right door	1966 mm	1958 mm	8 mm
X9	Rear surface of vehicle to upper trailing edge of left door	1965 mm	1960 mm	5 mm
X10	Rear surface of vehicle to lower trailing edge of right door	1954 mm	1944 mm	10 mm
X11	Rear surface of vehicle to lower trailing edge of left door	1949 mm	1946 mm	3 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	2986 mm	2970 mm	16 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	2980 mm	2968 mm	12 mm
X14	Rear surface of vehicle to firewall - right side	3245 mm	3156 mm	89 mm
X15	Rear surface of vehicle to firewall - left side	3239 mm	3216 mm	23 mm
X16	Rear surface of vehicle to steering wheel center	2570 mm	2565 mm	5 mm
X17	Center of steering column to "A" post	291 mm	288 mm	3 mm
X18	Center of steering column to headliner	433 mm	389 mm	44 mm
X19	Rear surface of vehicle to right side of front bumper	4225 mm	3744 mm	481 mm
X20	Rear surface of vehicle to left side of front bumper	4225 mm	3750 mm	475 mm
X21	Length of engine block	460 mm	460 mm	0 mm

Appendix A

Photographs



Figure A-1. Pre-Test Front View
A-2

950224

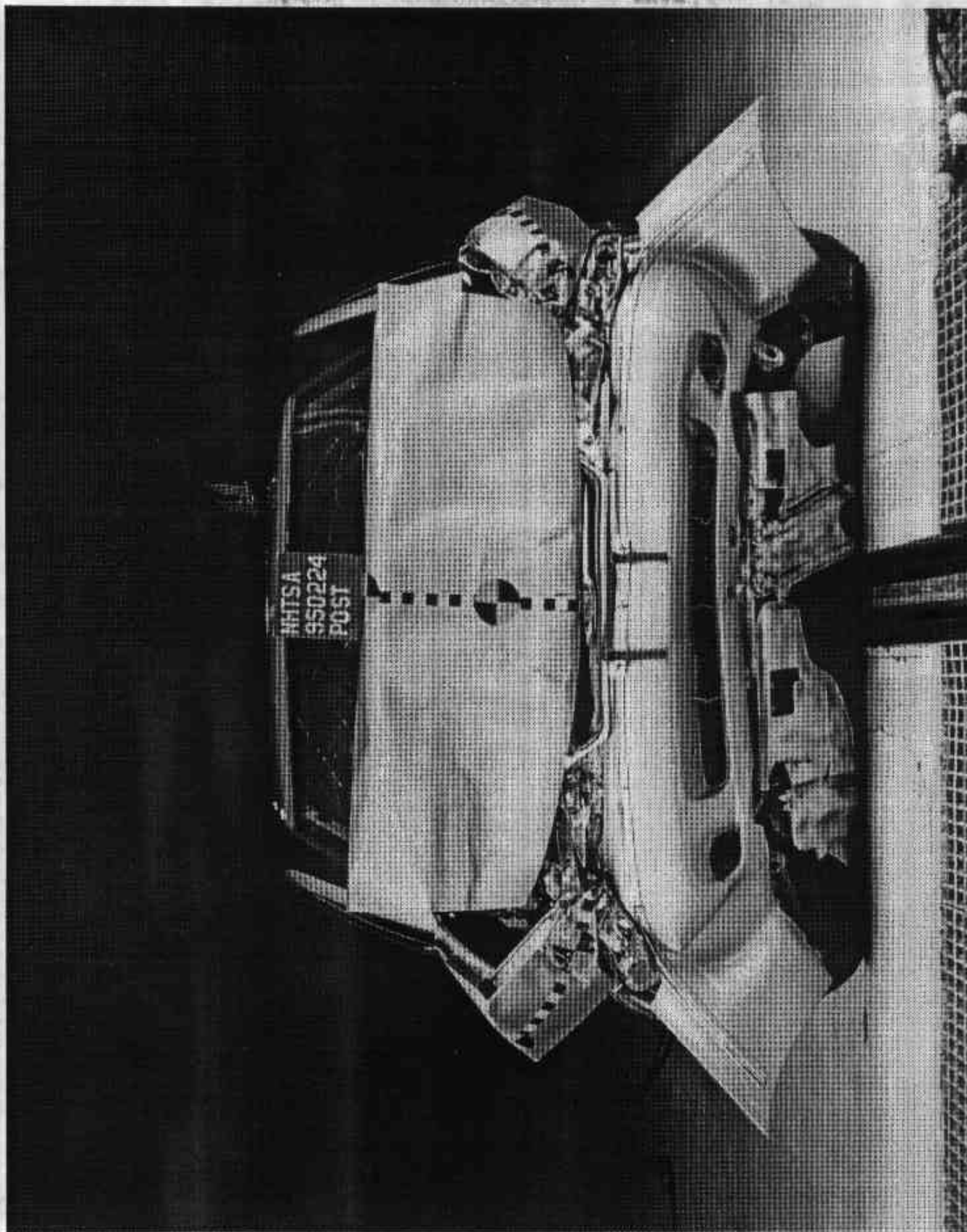


Figure A-2. Post-Test Front View

A-3

950224

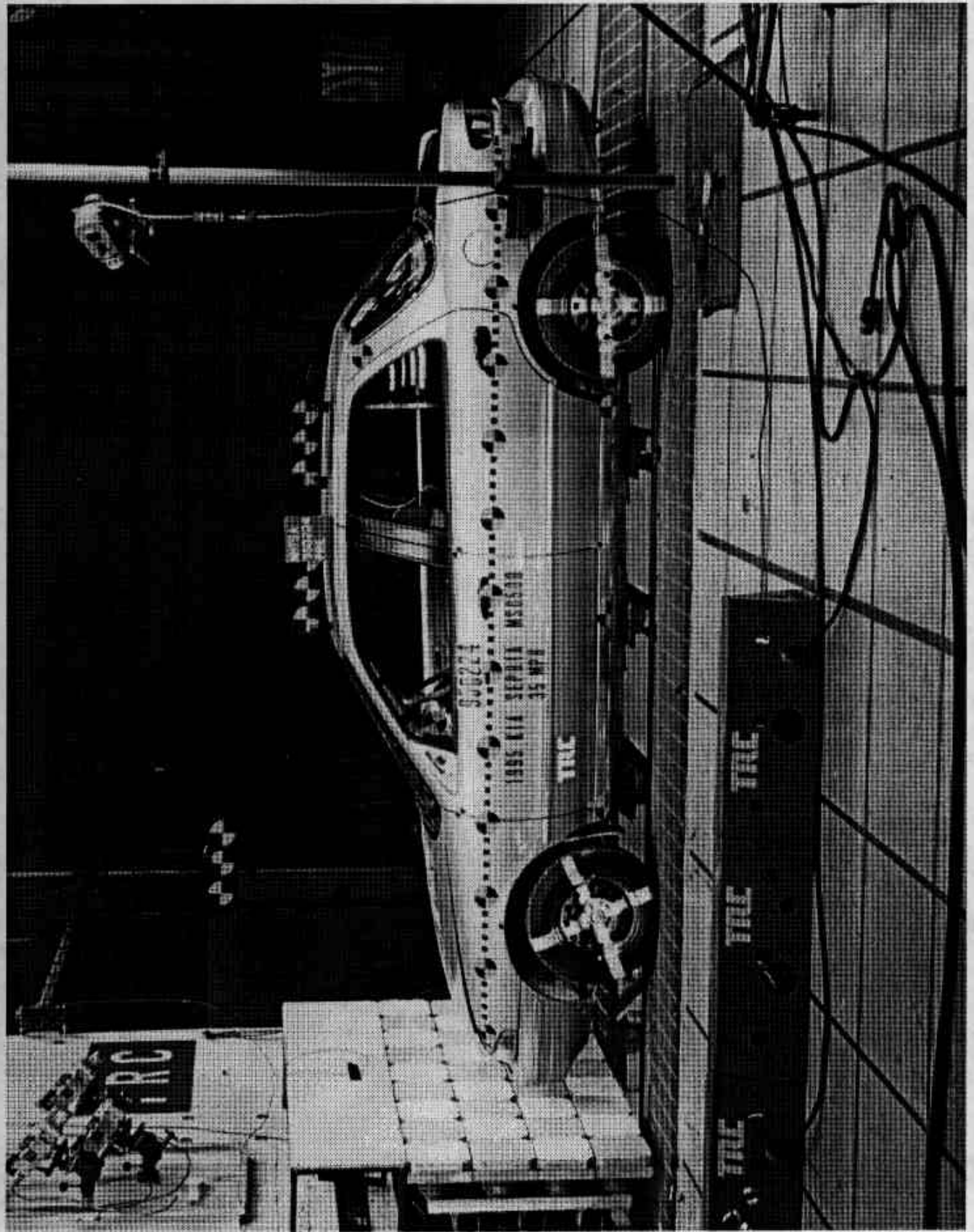


Figure A-3. Pre-Test Left Side View
A-4

950224

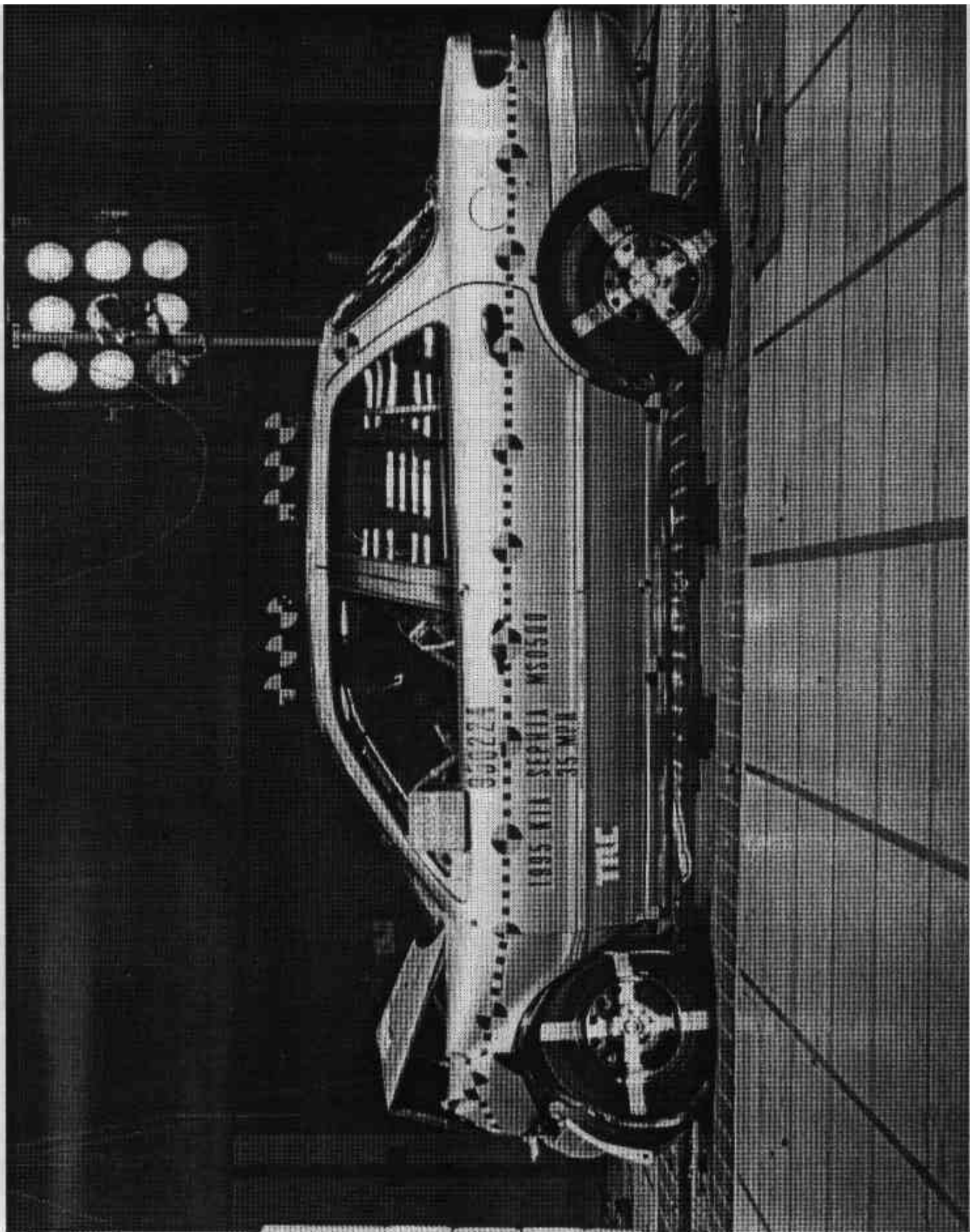


Figure A-4. Post-Test Left Side View

A-5

950224

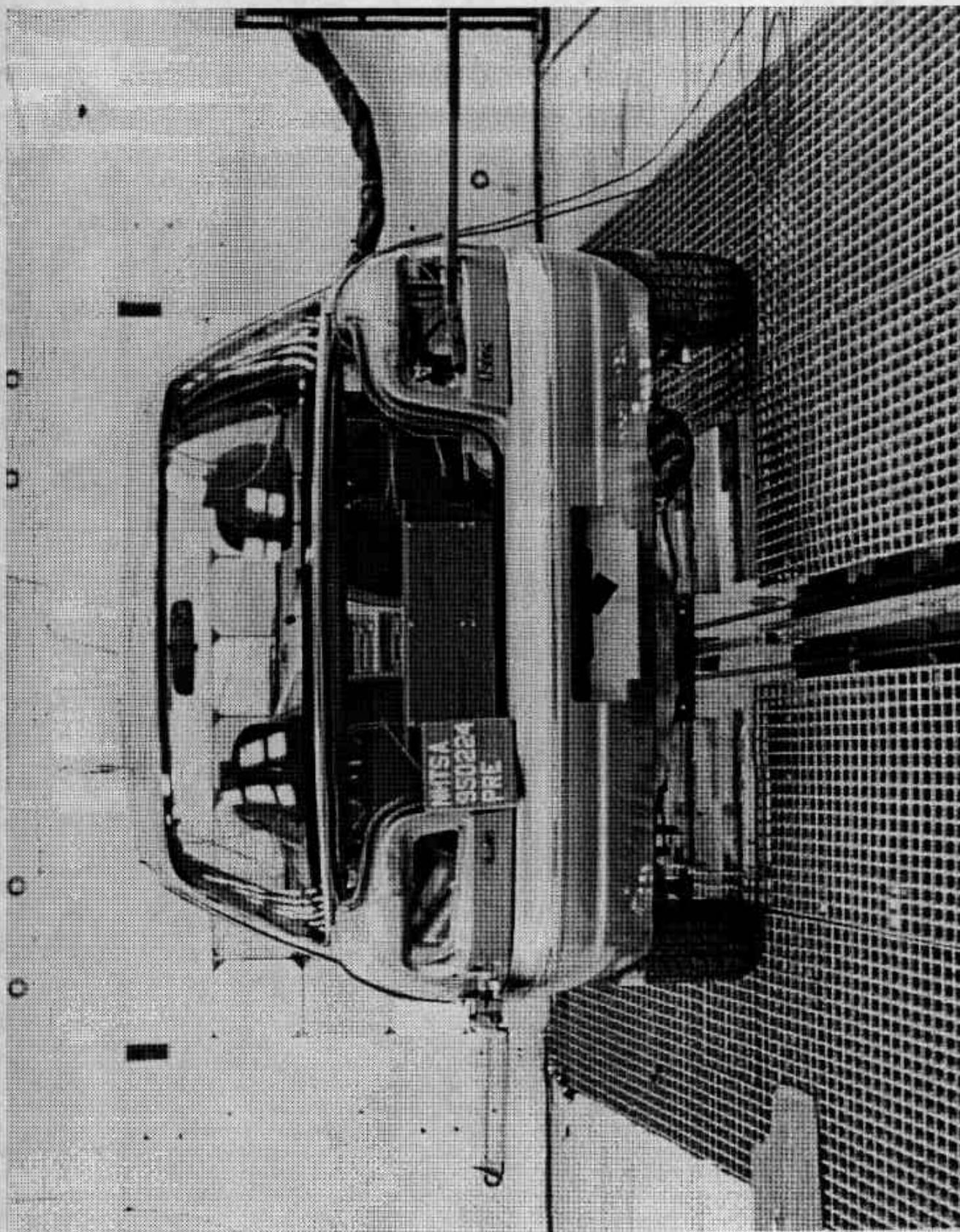


Figure A-5. Pre-Test Rear View
A-6

950224

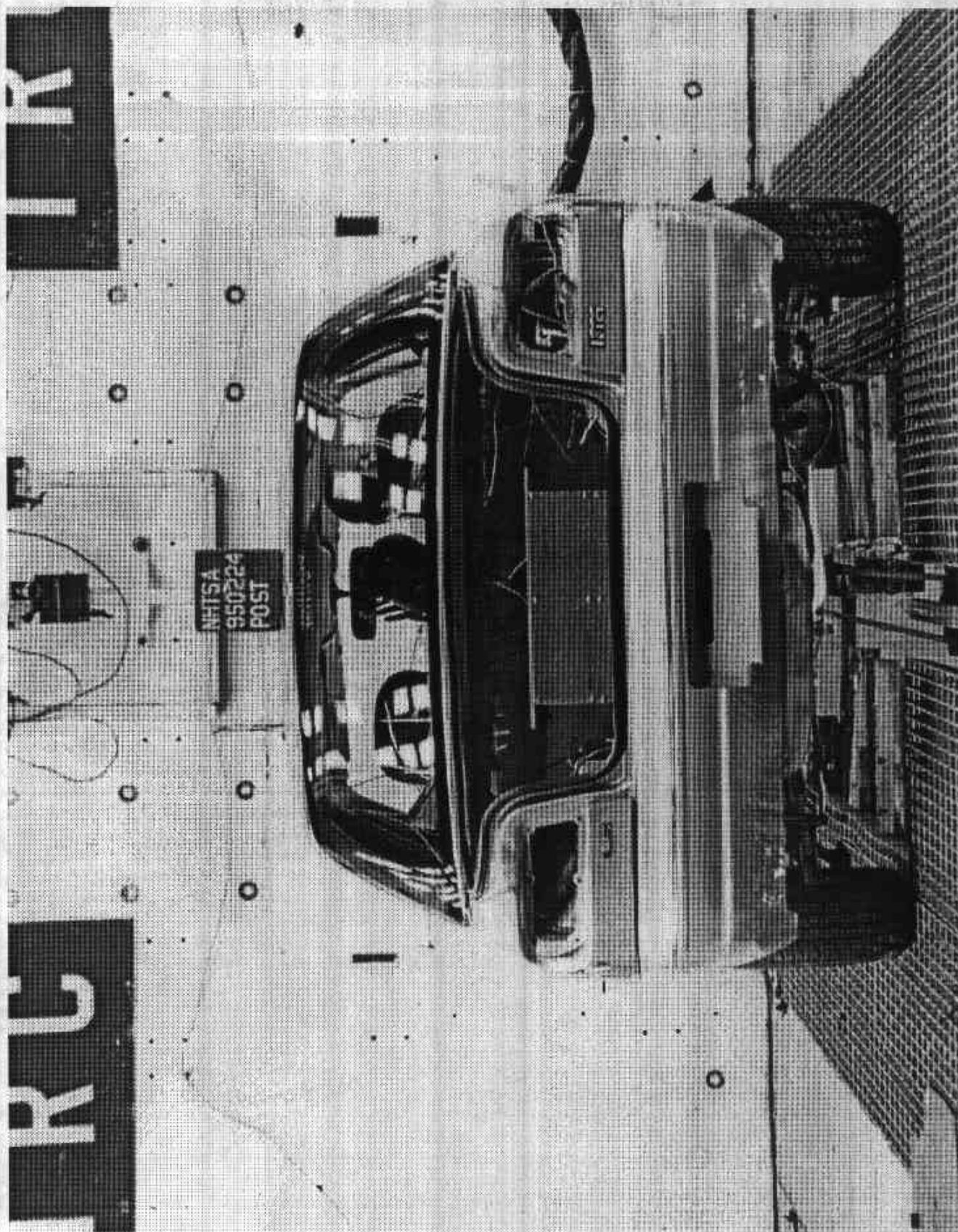


Figure A-6. Post-Test Rear View
A-7

950224

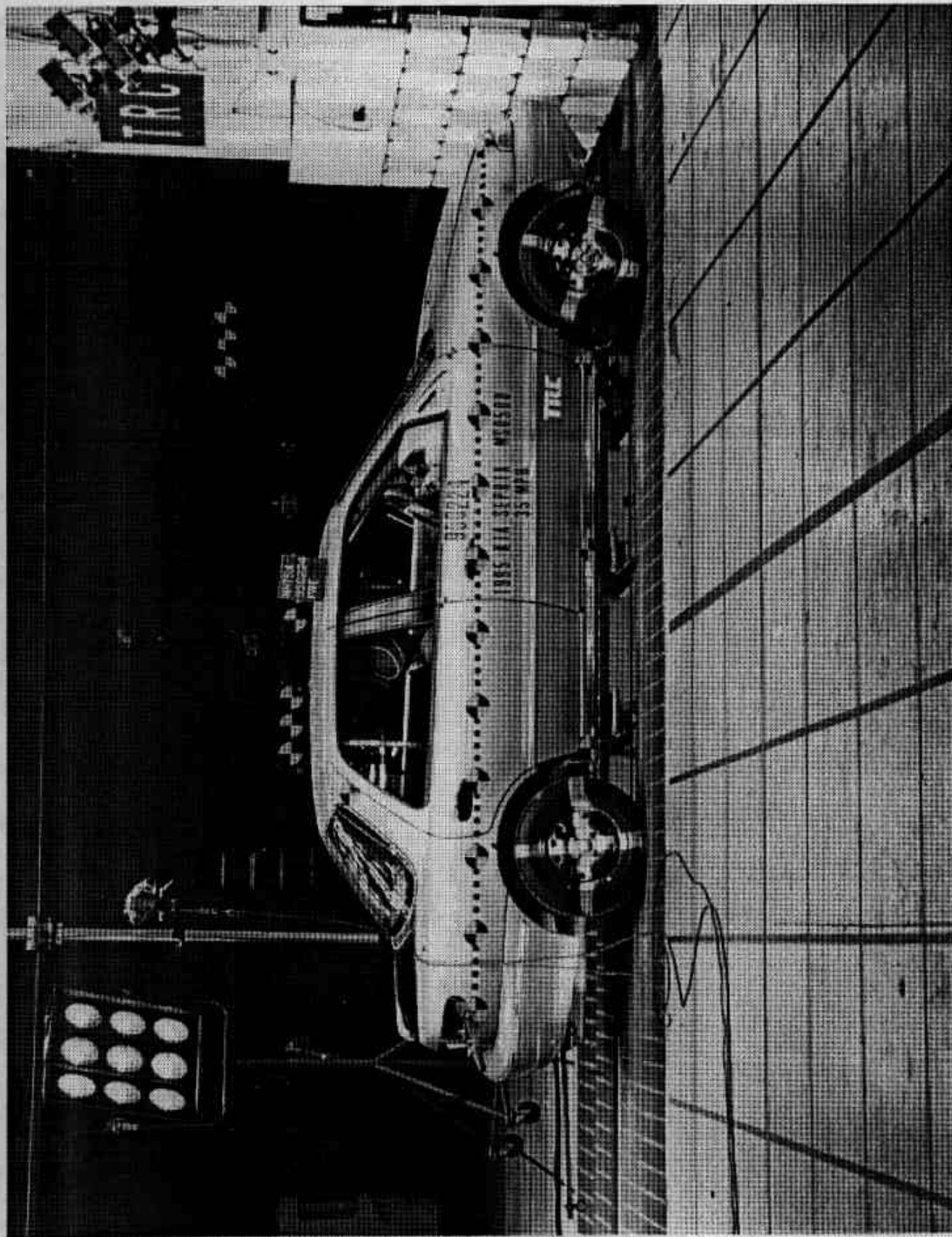


Figure A-7. Pre-Test Right Side View
A-8

950224

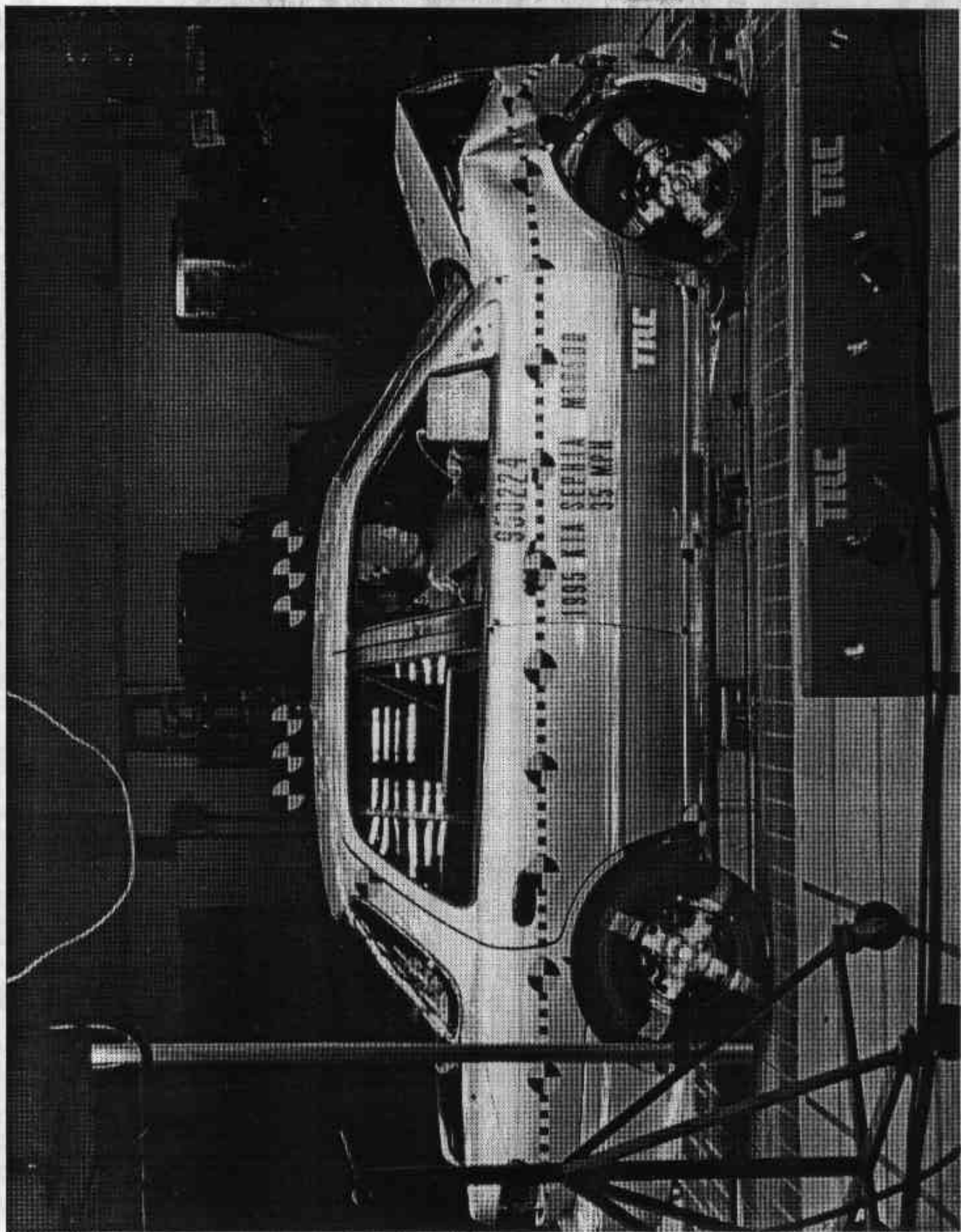


Figure A-8. Post-Test Right Side View

A-9

950224

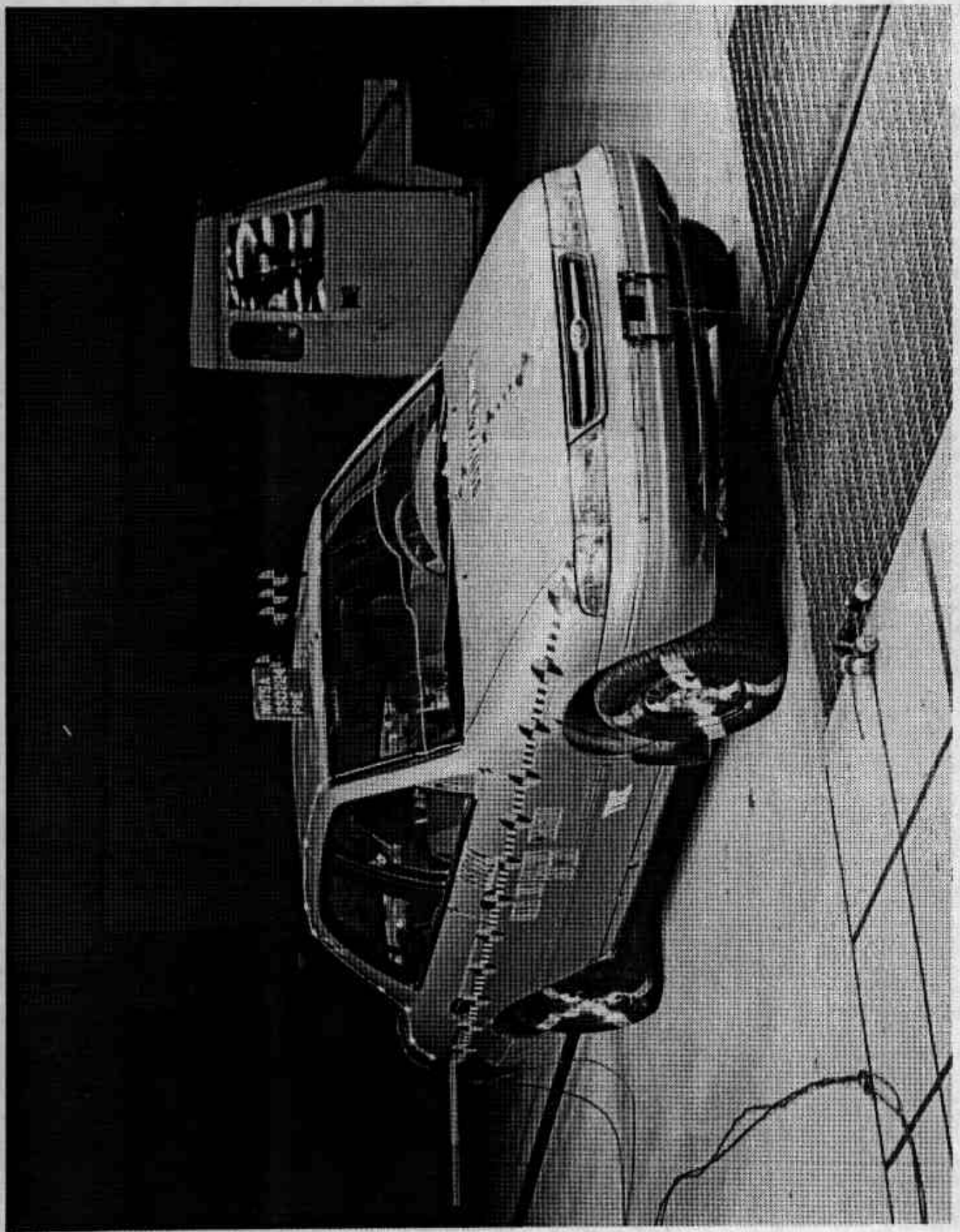


Figure A-9. Pre-Test Right Front Three-Quarter View
A-10

950224

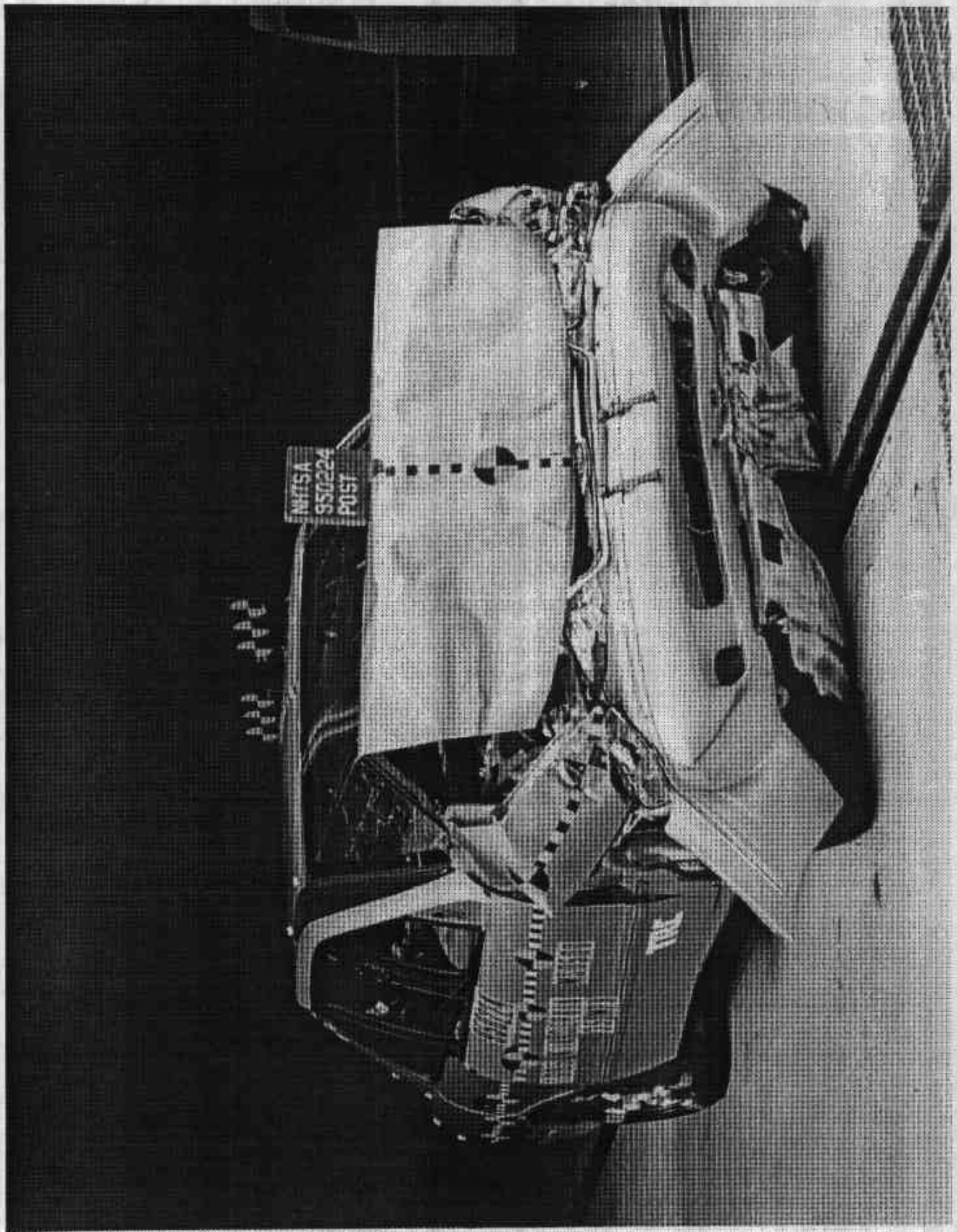


Figure A-10. Post-Test Right Front Three-Quarter View
A-11

950224

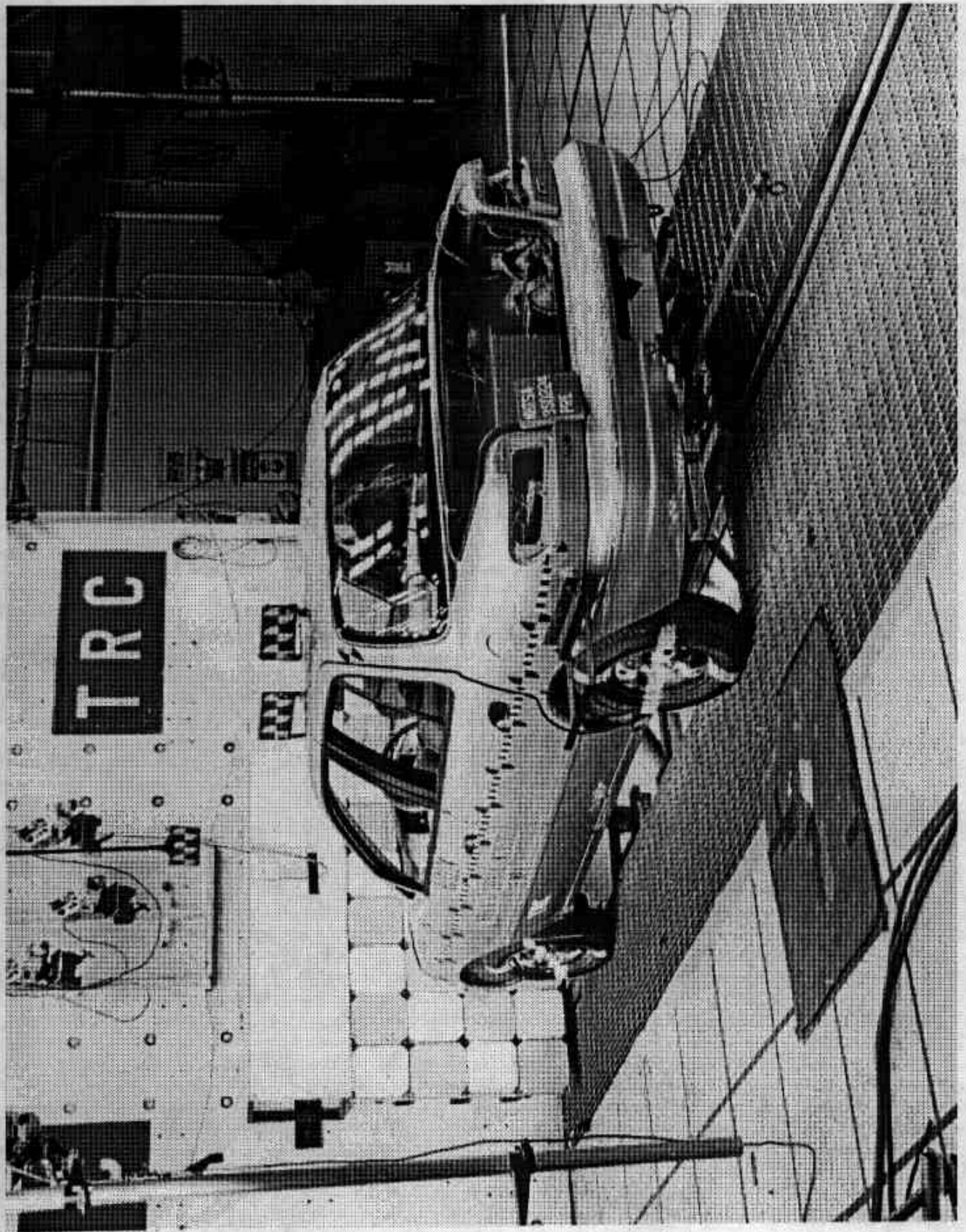


Figure A-11. Pre-Test Left Rear Three-Quarter View
A-12

950224



Figure A-12. Post-Test Left Rear Three-Quarter View
A-13

950224

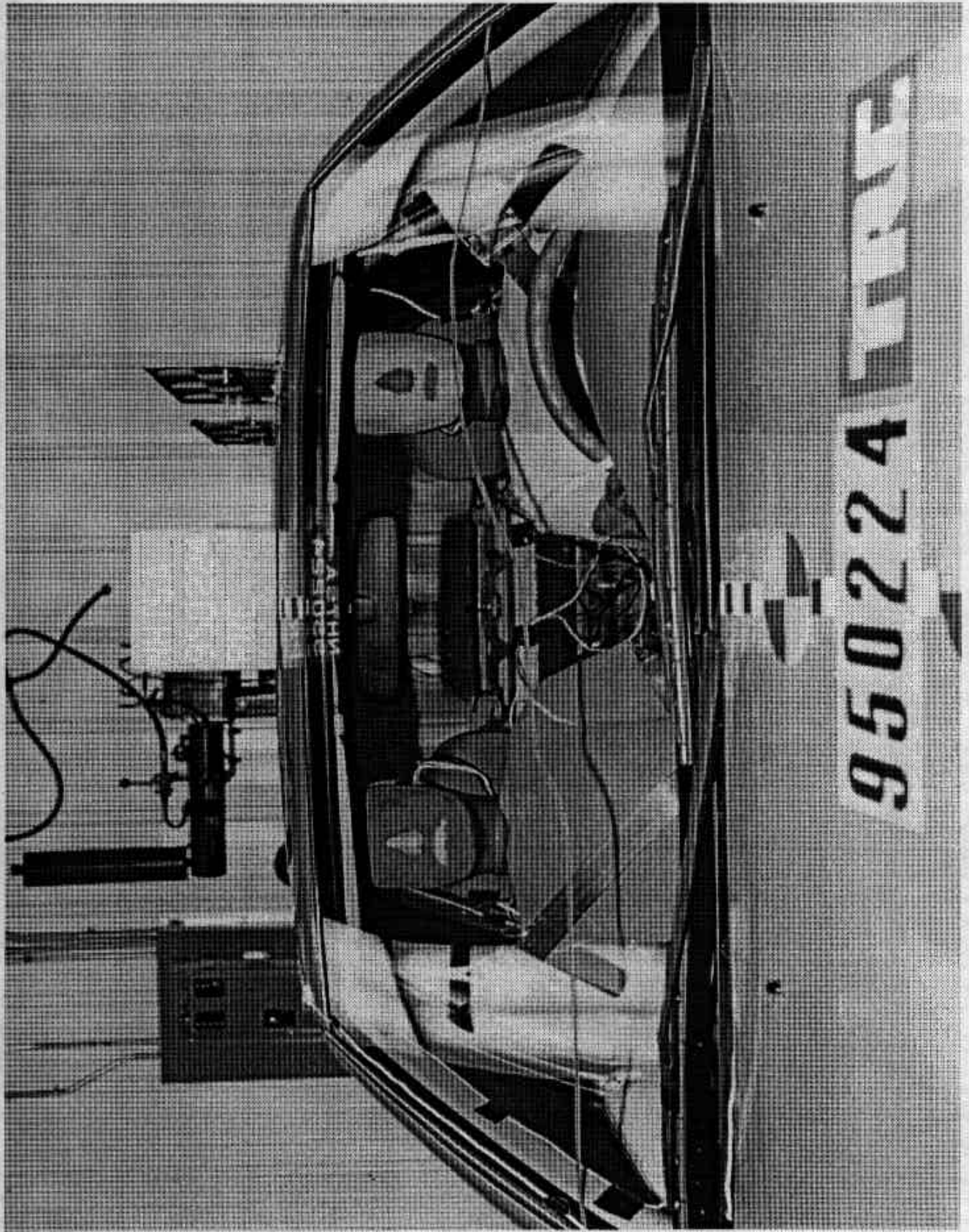


Figure A-13. Pre-Test Windshield View
A-14

950224

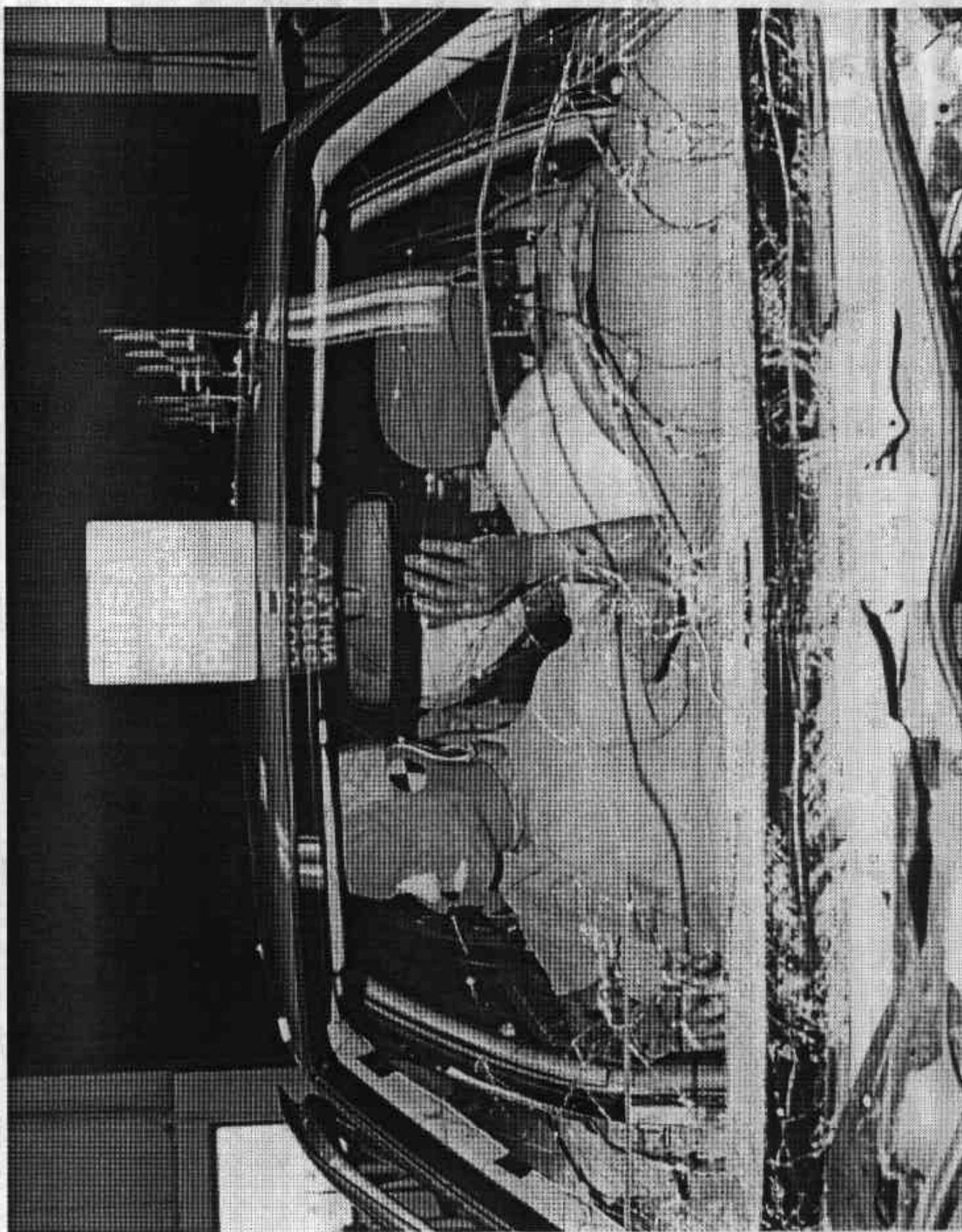


Figure A-14. Post-Test Windshield View
A-15

950224

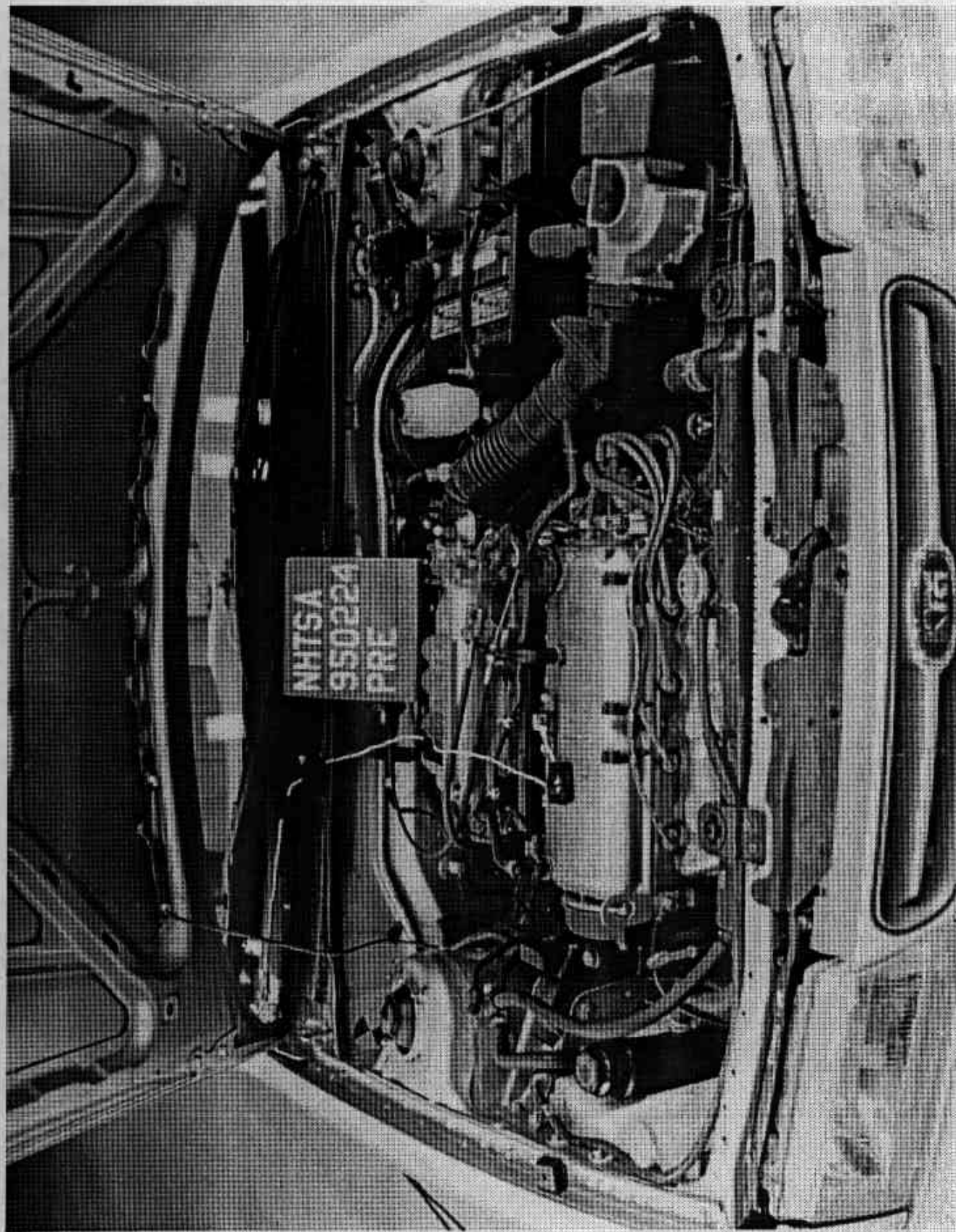


Figure A-15. Pre-Test Engine Compartment View
A-16

950224

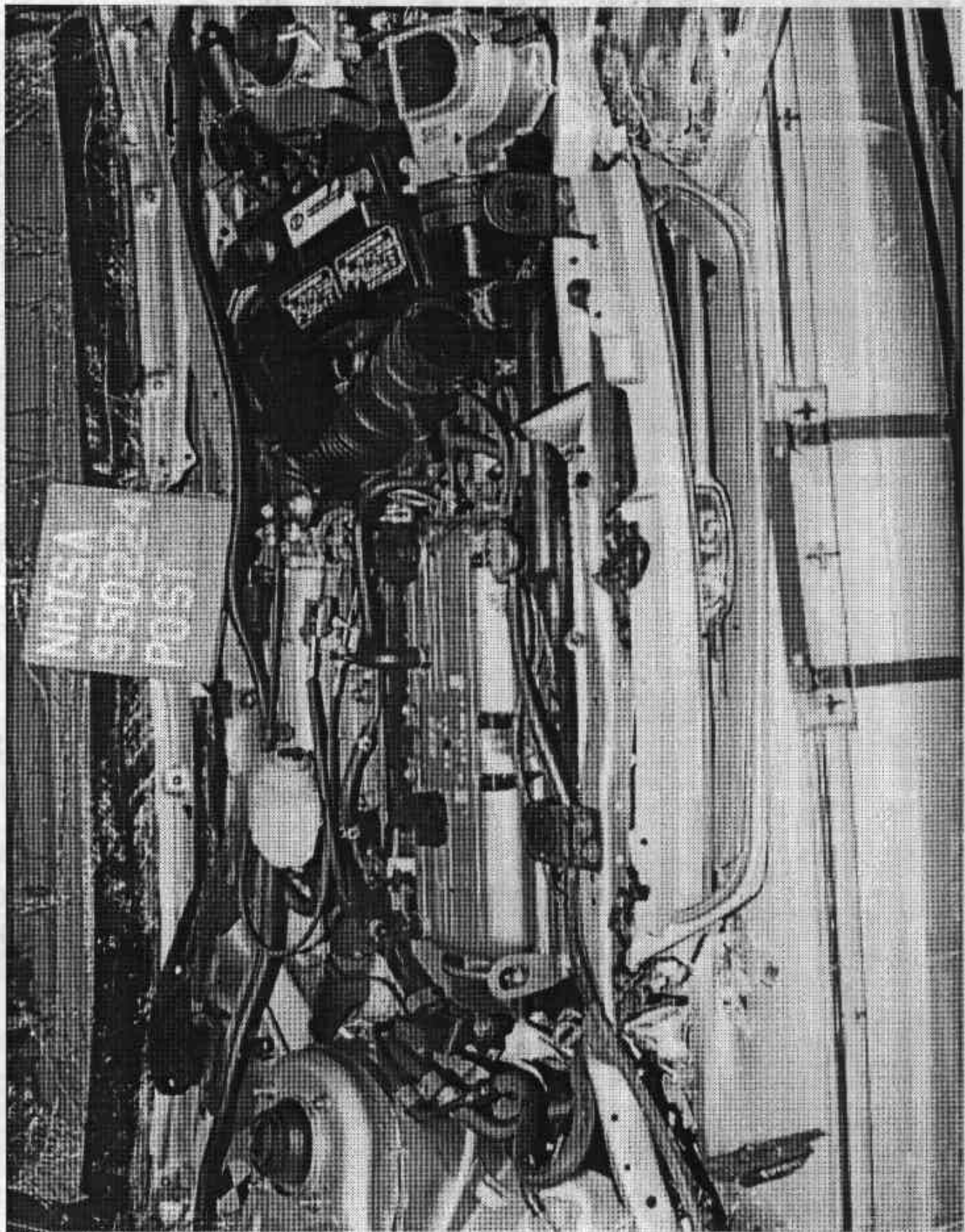


Figure A-16. Post-Test Engine Compartment View
A-17

950224

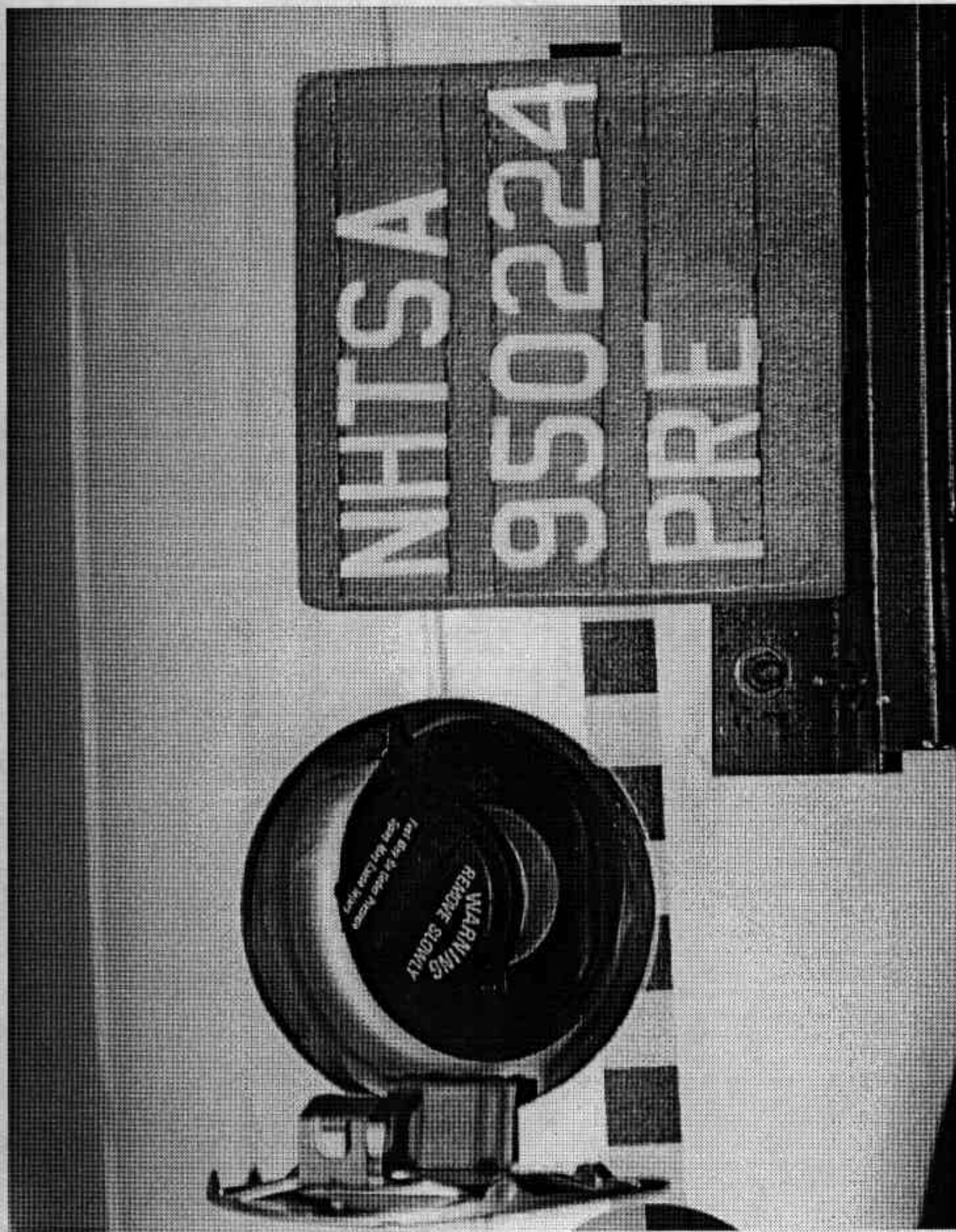


Figure A-17. Pre-Test Fuel Filler Cap View
A-18

950224

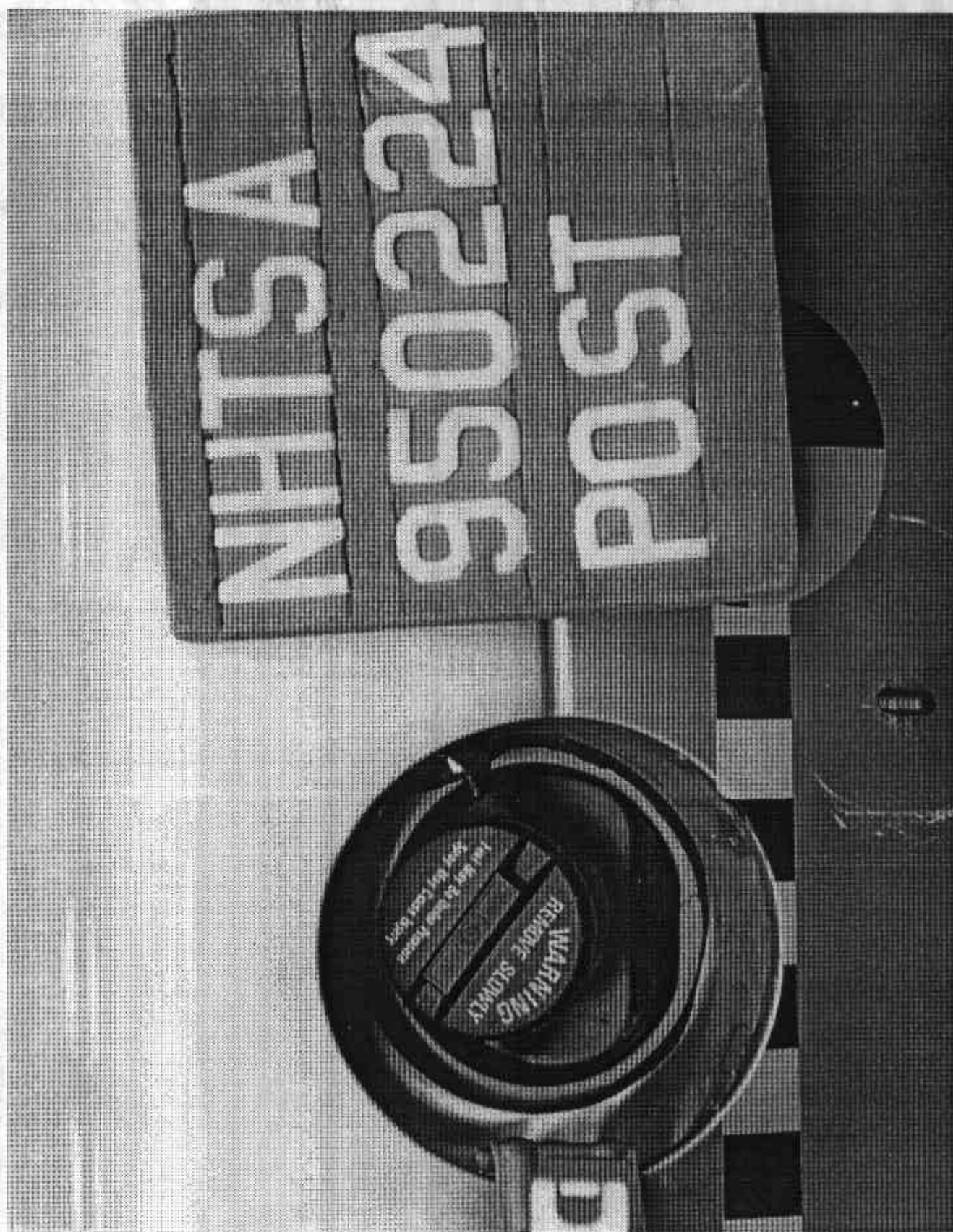


Figure A-18. Post-Test Fuel Filler Cap View
A-19

950224



Figure A-19. Pre-Test Fuel Filler Neck View
A-20

950224

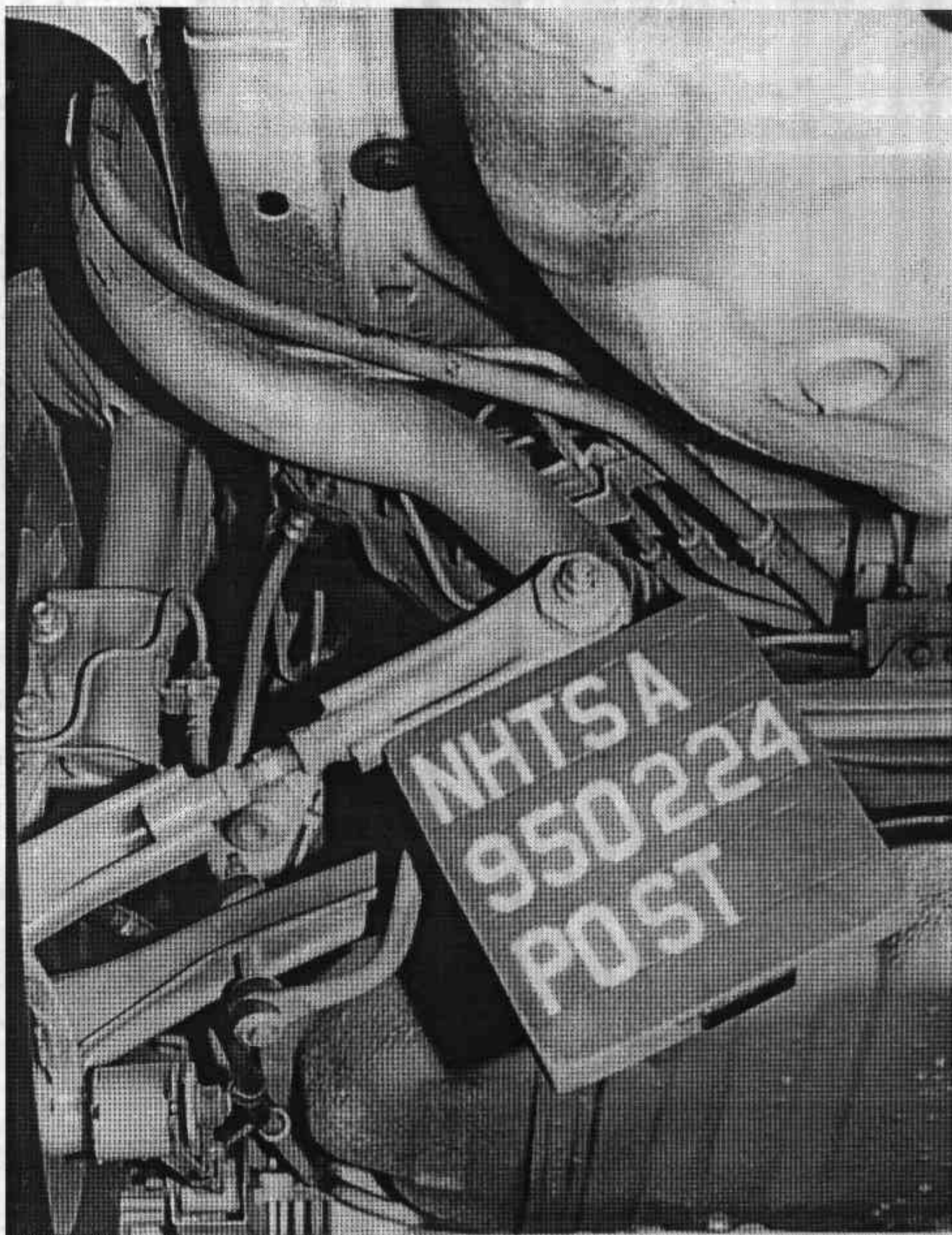


Figure A-20. Post-Test Fuel Filler Neck View
A-21

950224

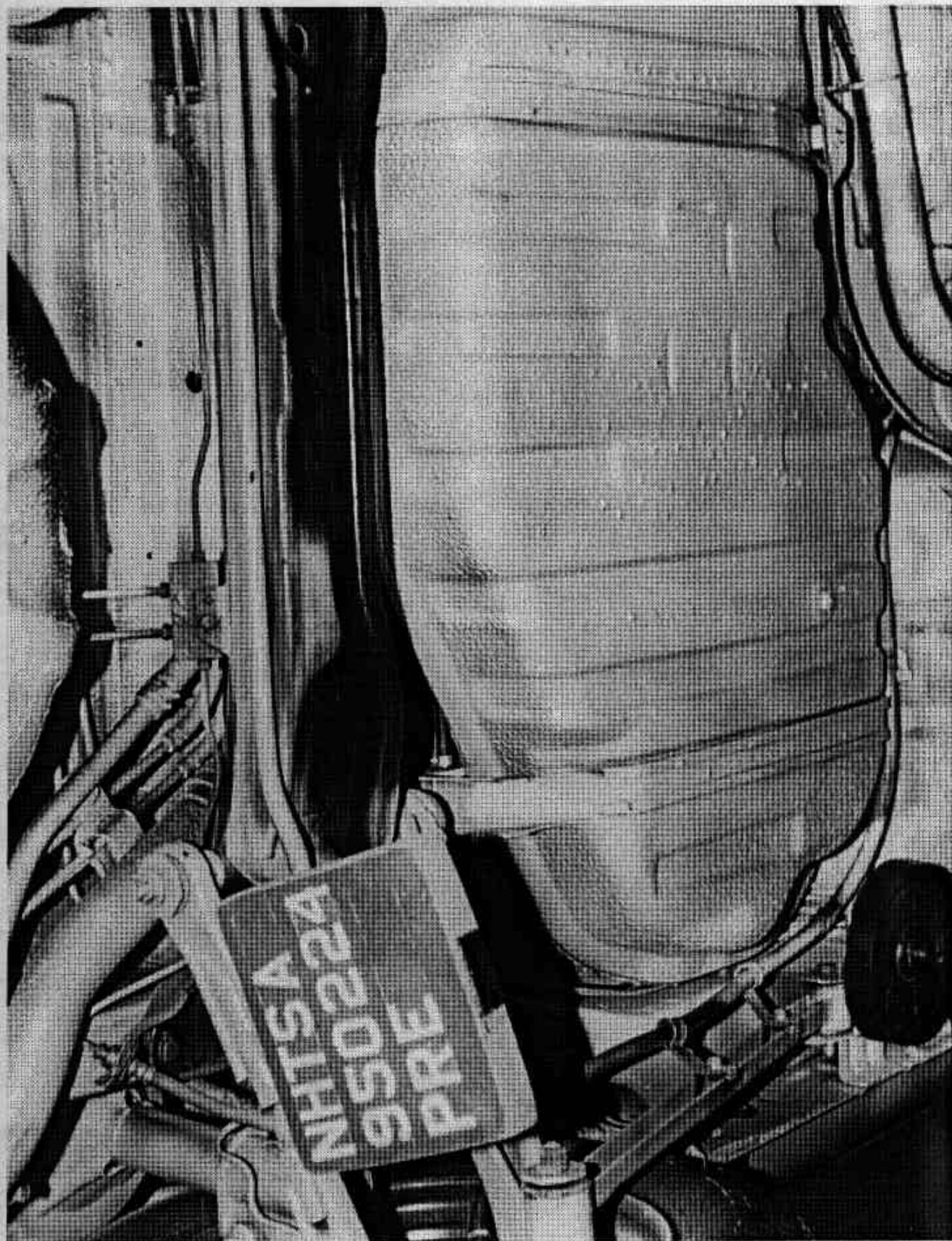


Figure A-21. Pre-Test Fuel Tank View
A-22

950224

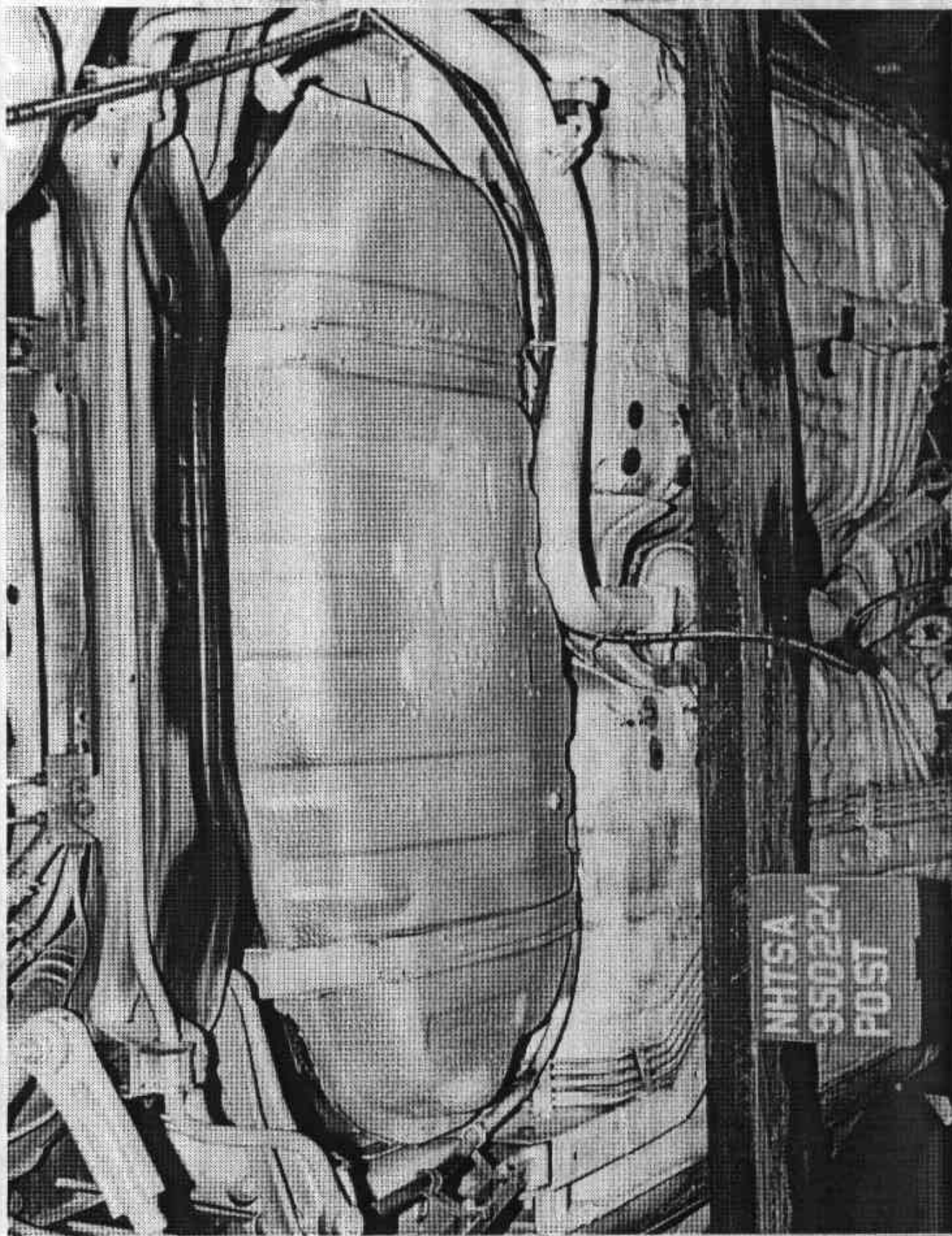


Figure A-22. Post-Test Fuel Tank View
A-23

950224

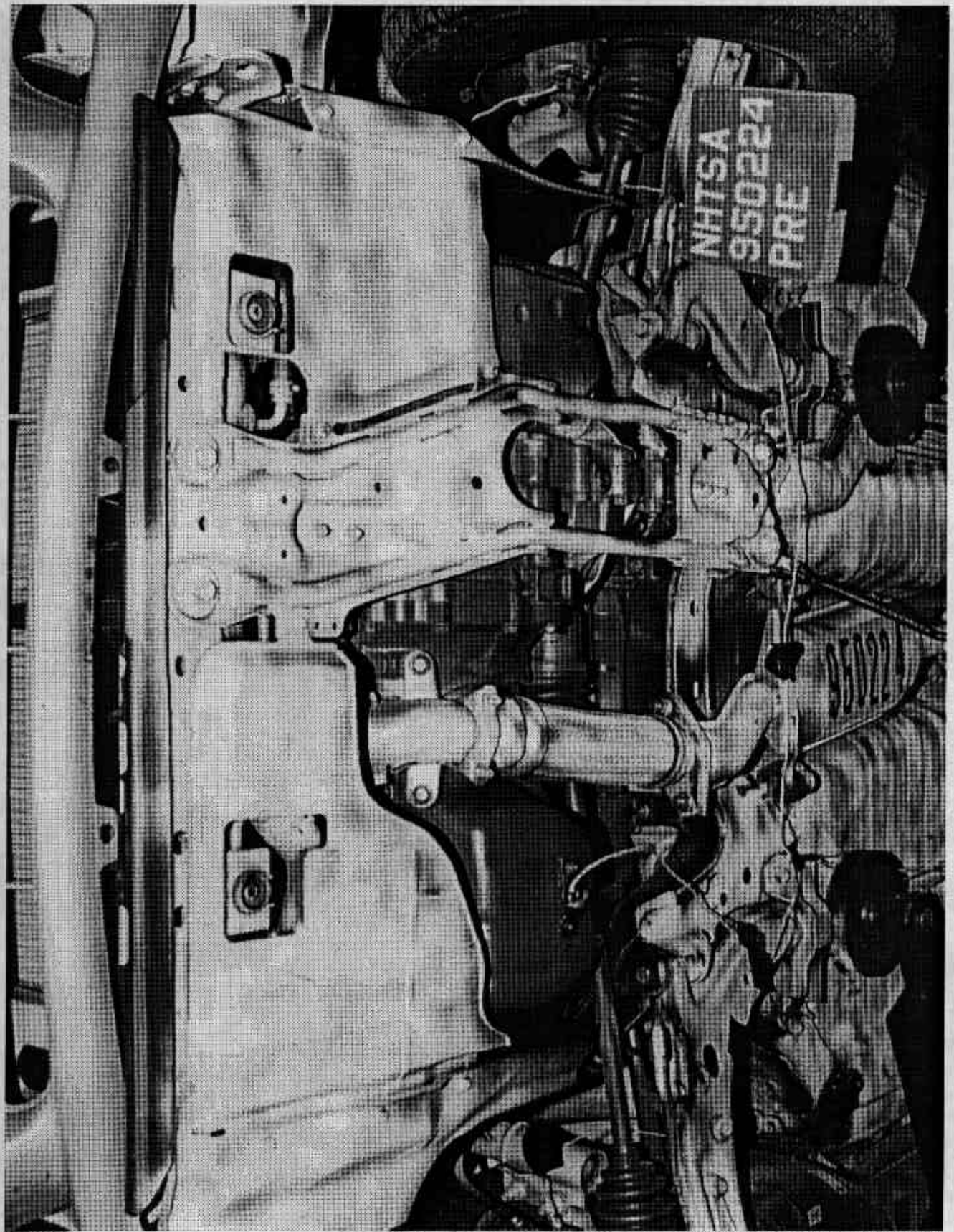


Figure A-23. Pre-Test Front Underbody View

A-24

950224

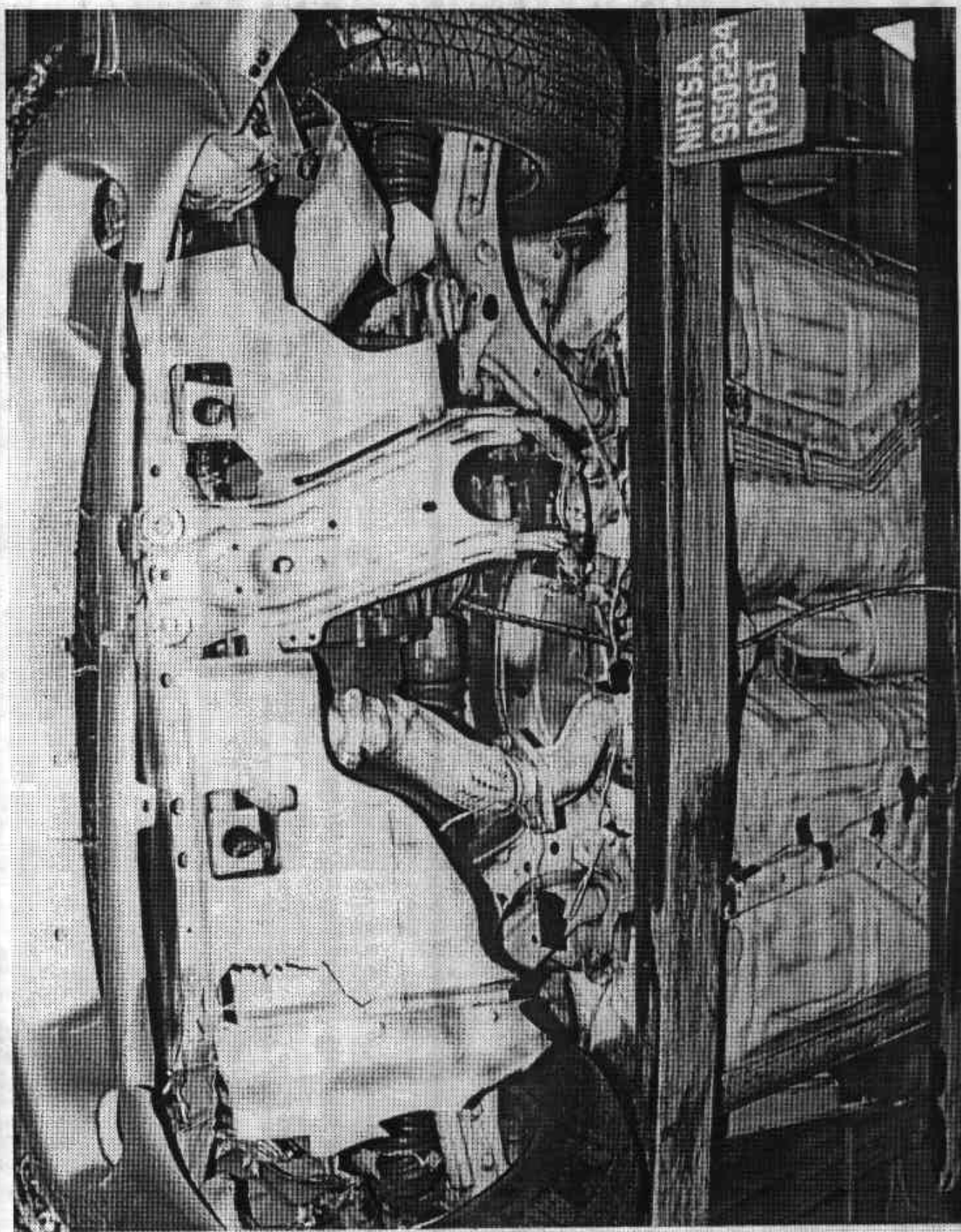


Figure A-24. Post-Test Front Underbody View
A-25

950224

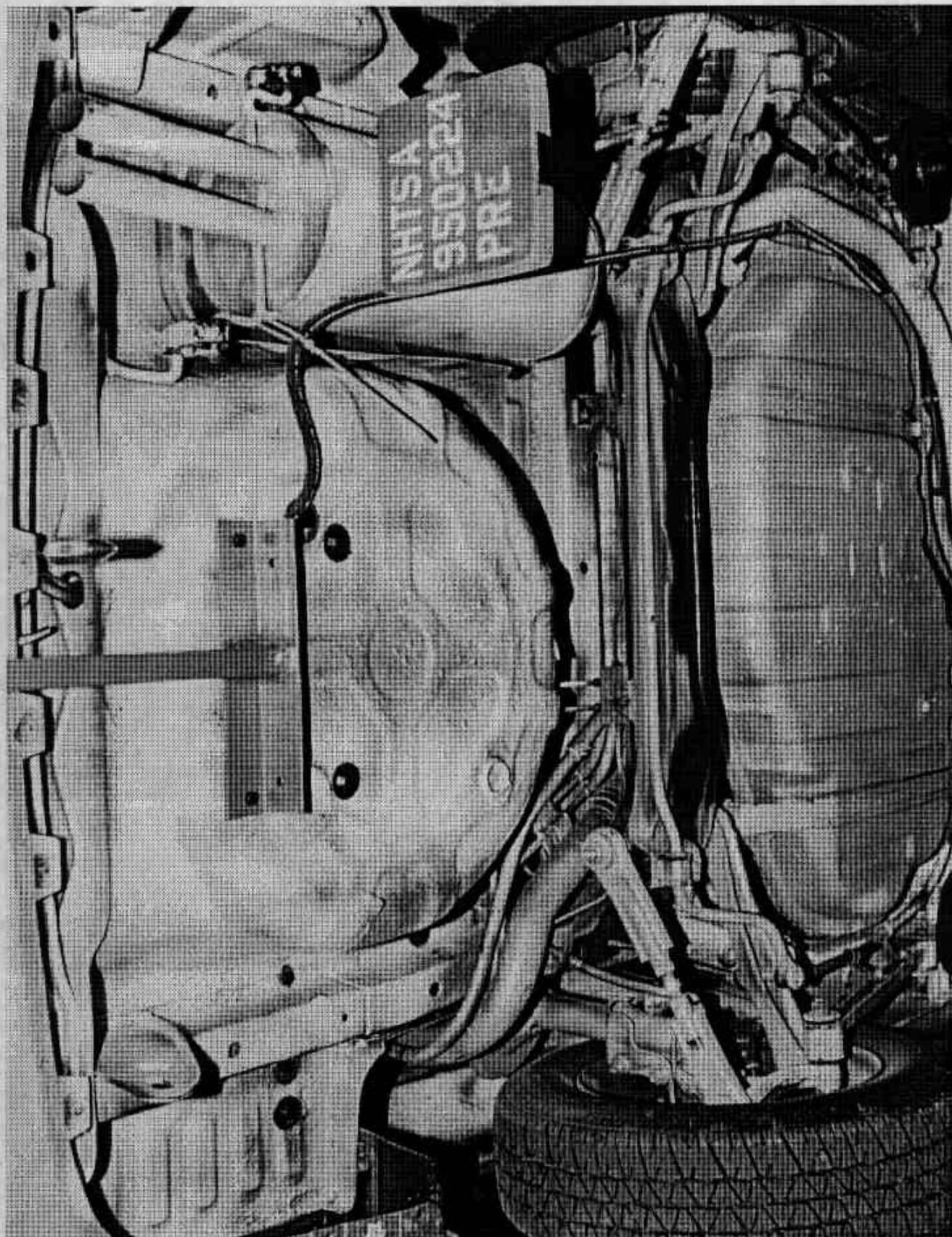


Figure A-25. Pre-Test Rear Underbody View
A-26

950224

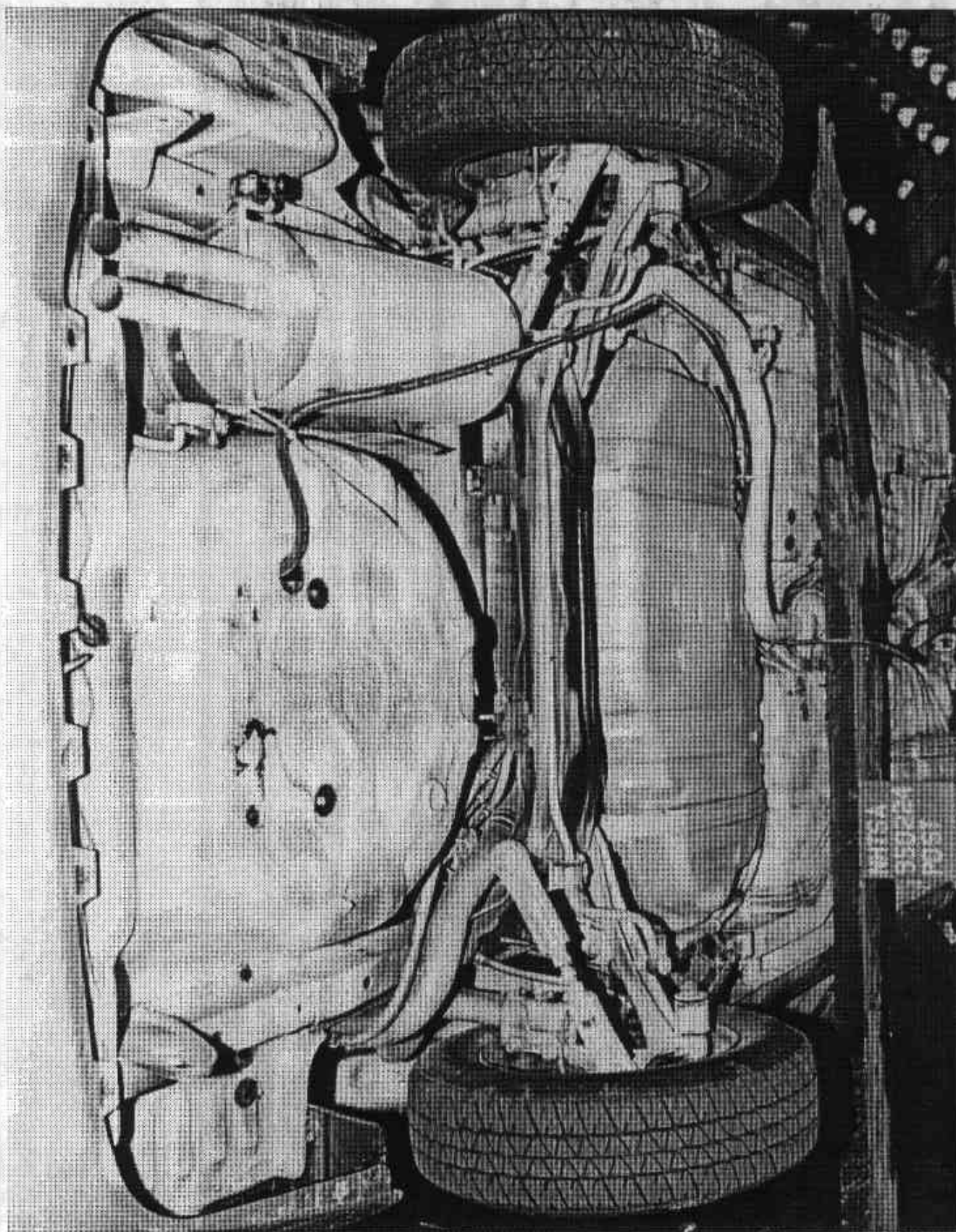


Figure A-26. Post-Test Rear Underbody View
A-27

950224



Figure A-27. Pre-Test Driver Dummy Position View
A-28

950224



Figure A-28. Post-Test Driver Dummy Position View
A-29

950224



Figure A-29. Pre-Test Passenger Dummy Position View
A-30

950224



Figure A-30. Post-Test Passenger Dummy Position View
A-31

950224

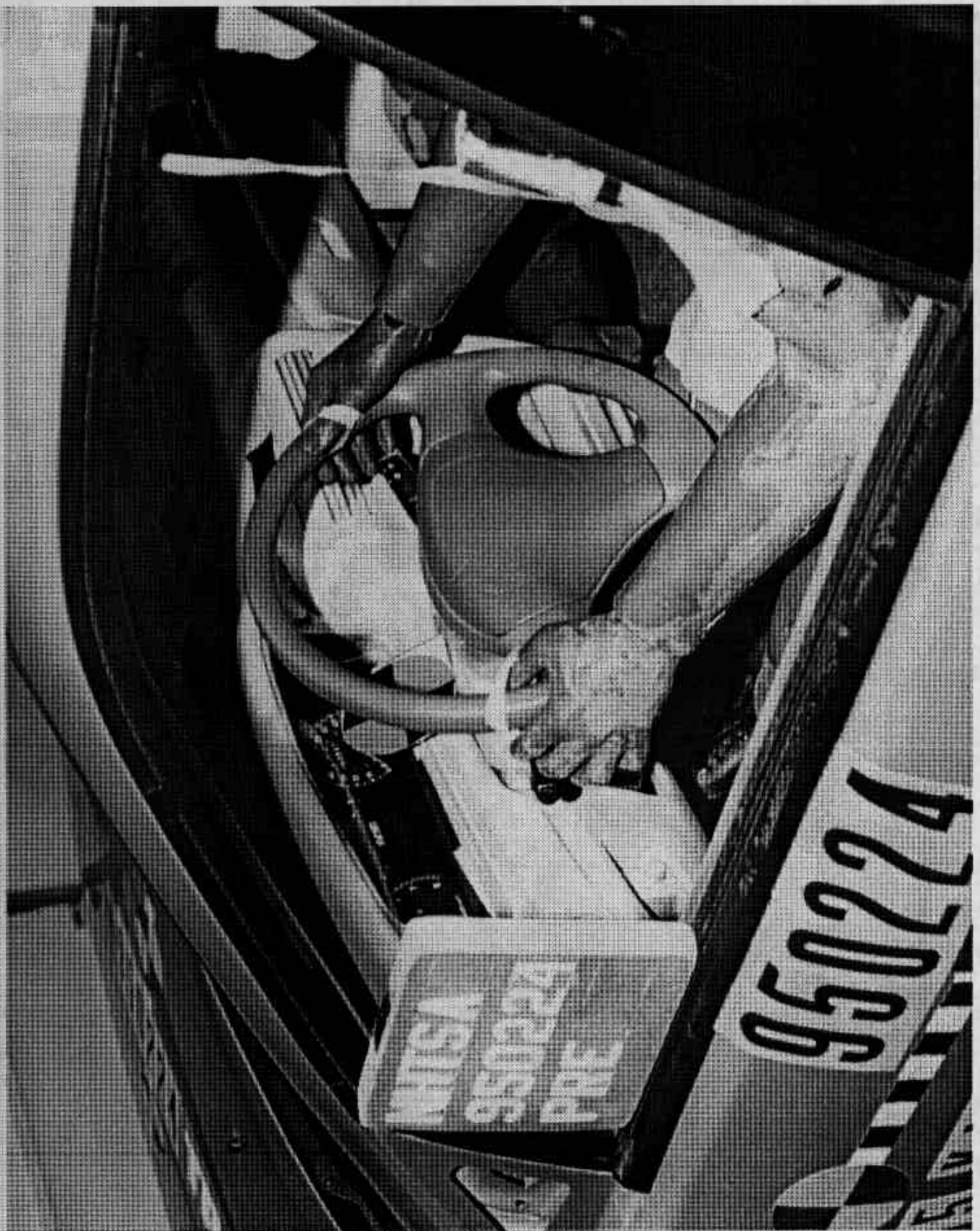


Figure A-31. Pre-Test Driver Dummy & Vehicle Interior View
A-32

950224

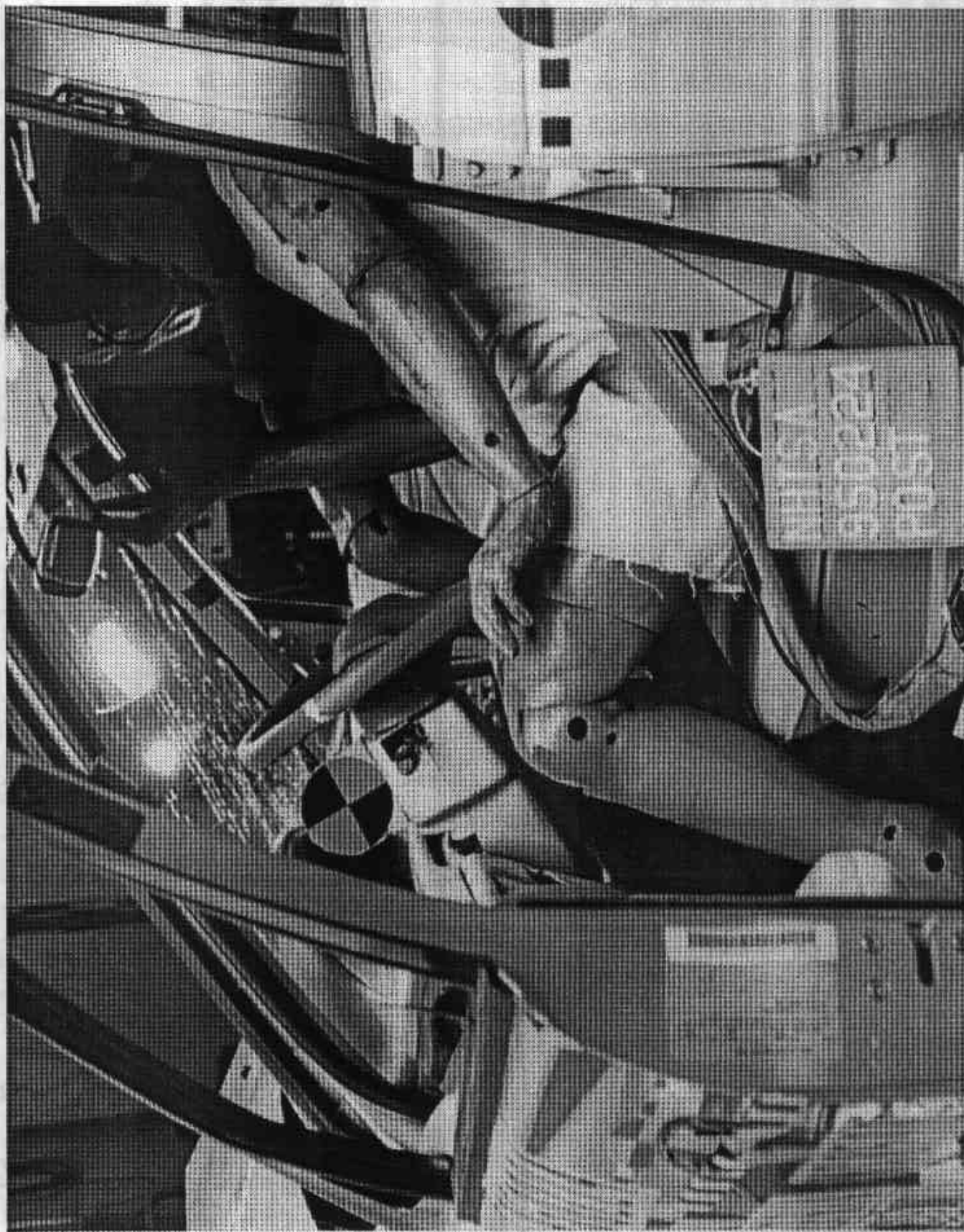


Figure A-32. Post-Test Driver Dummy & Vehicle Interior - View 1

A-33

950224



Figure A-33, Post-Test Driver Dummy & Vehicle Interior - View 2
A-34

950224



Figure A-34. Pre-Test Passenger Dummy & Vehicle Interior View

A-35

950224



Figure A-35. Post-Test Passenger Dummy & Vehicle Interior - View 1

A-36

950224

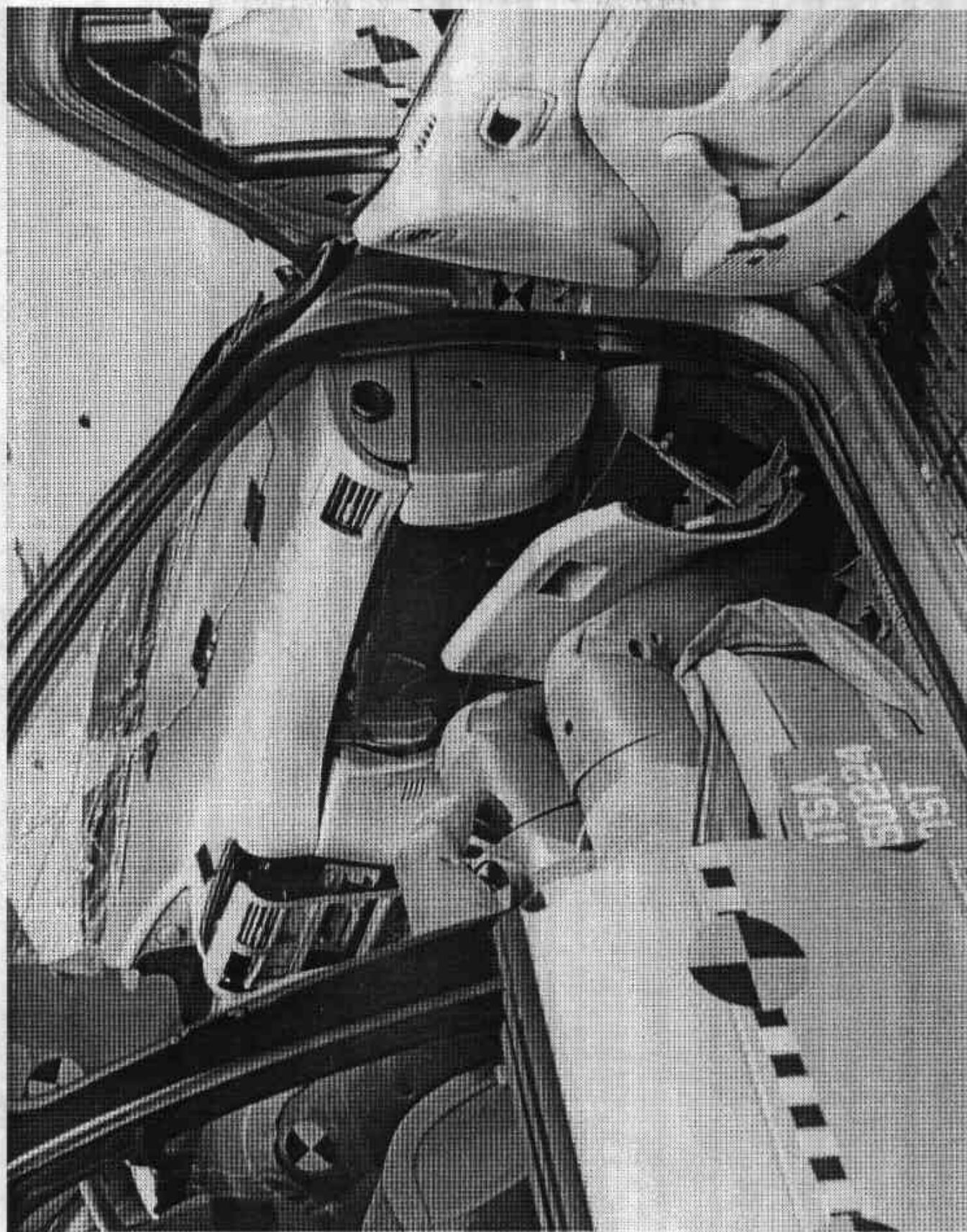


Figure A-36. Post-Test Passenger Dummy & Vehicle Interior - View 2

A-37

950224

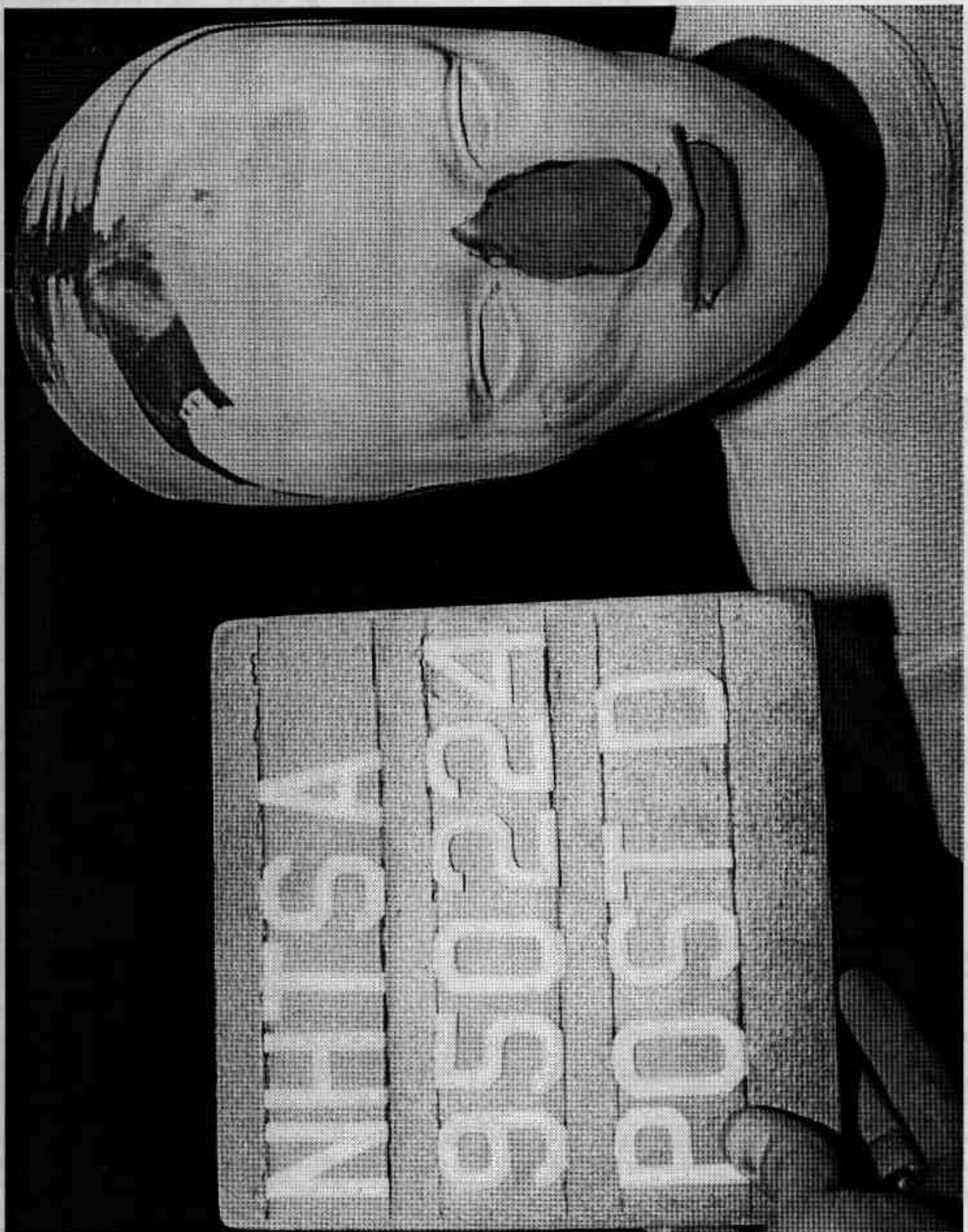


Figure A-37. Post-Test Driver Dummy Head Contact - View 1
A-38

A-38

950224

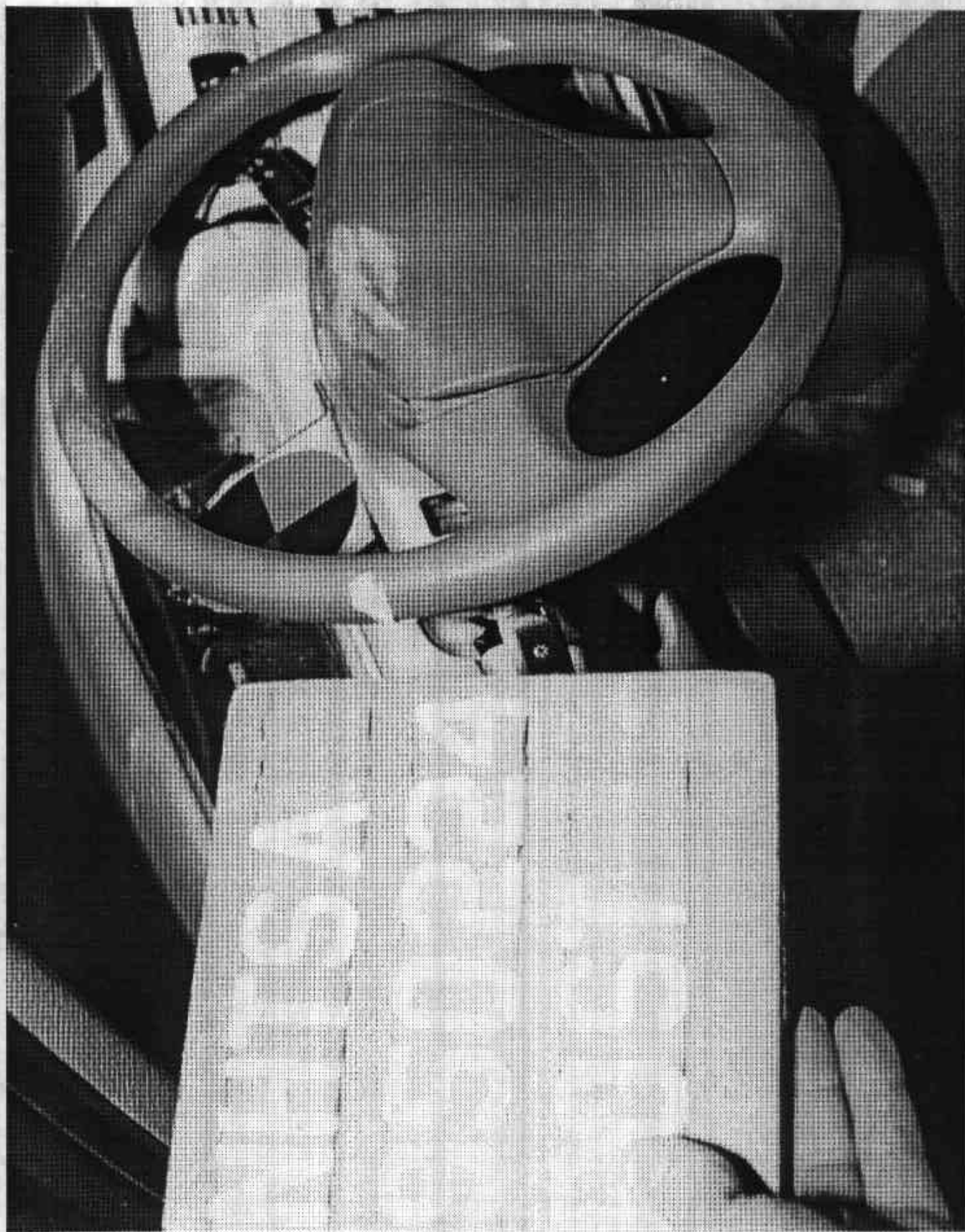


Figure A-38. Post-Test Driver Dummy Head Contact - View 2
A-39

950224

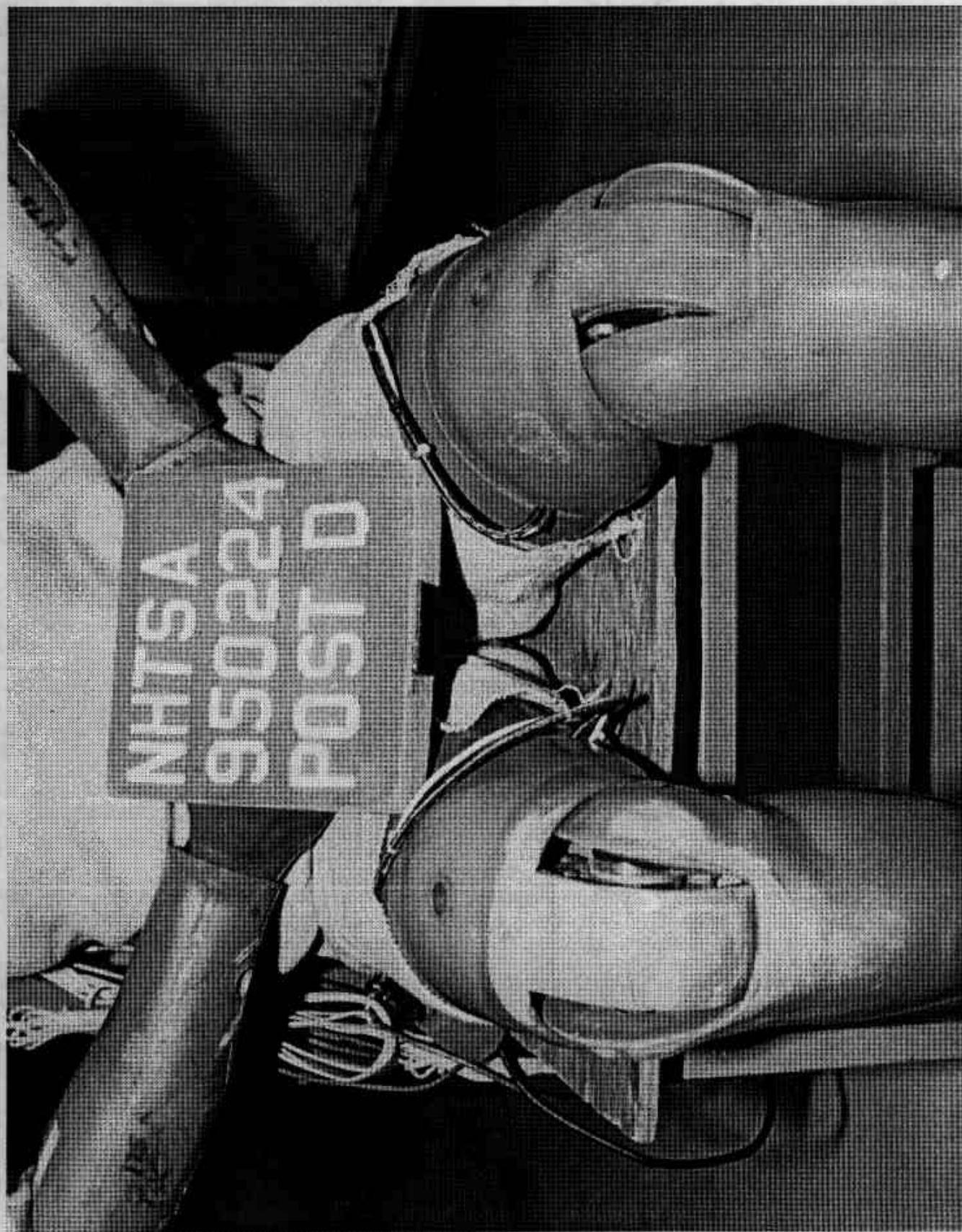


Figure A-39. Post-Test Driver Dummy Knee Contact - View 1
A-40

950224

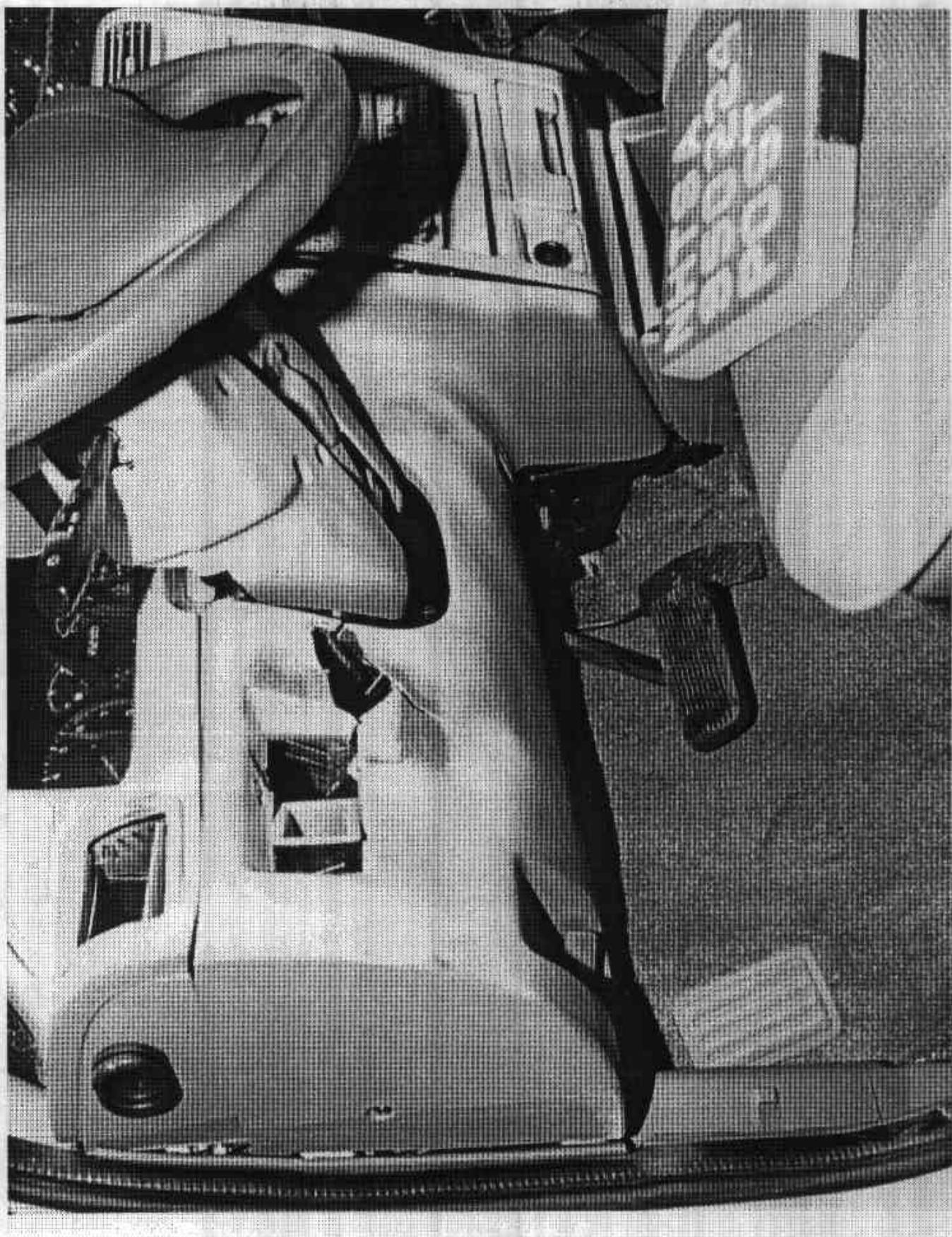


Figure A-40. Post-Test Driver Dummy Knee Contact - View 2
A-41

950224

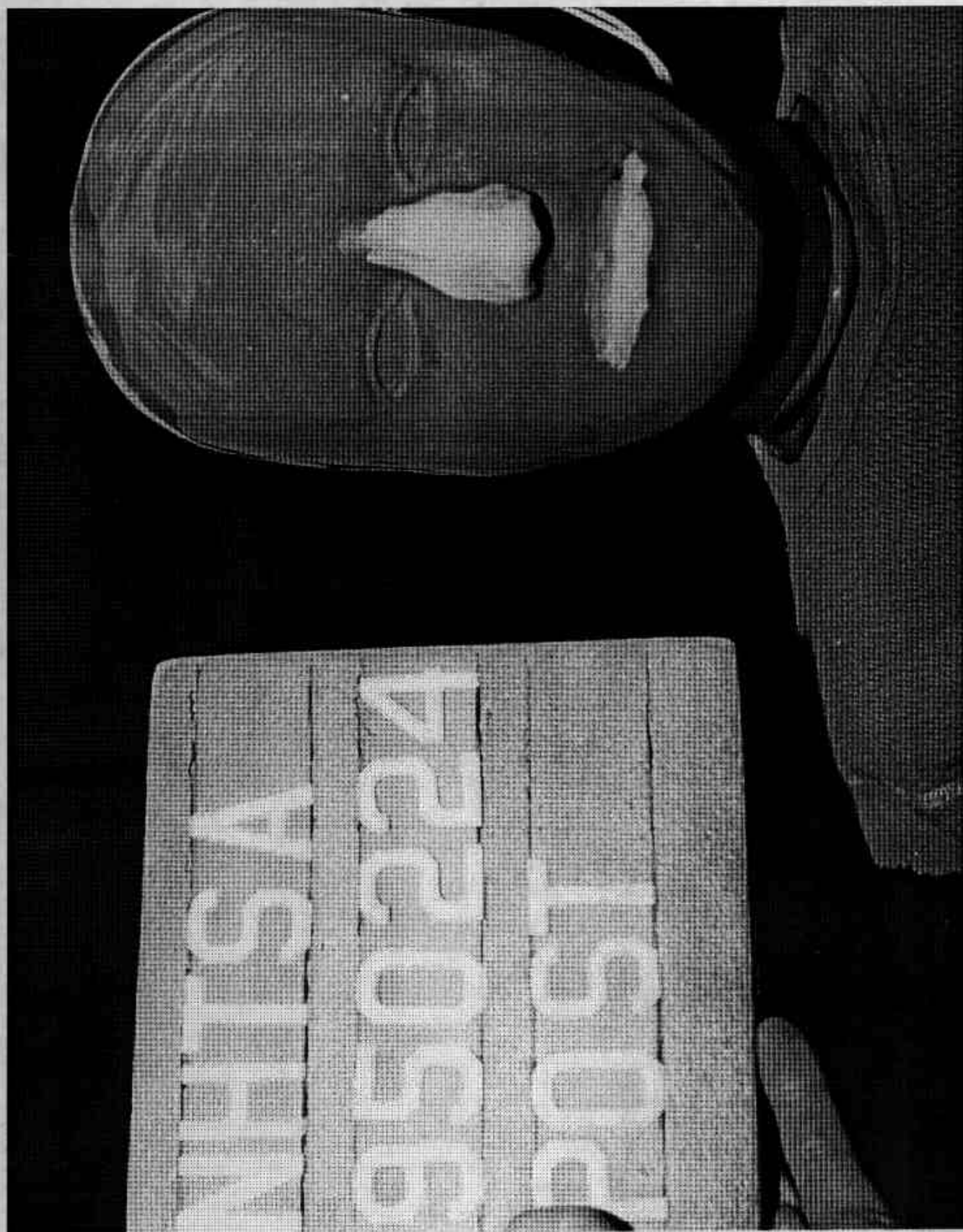


Figure A-41. Post-Test Passenger Dummy Head Contact - View 1
A-42

950224



Figure A-42. Post-Test Passenger Dummy Head Contact - View 2

A-43

950224

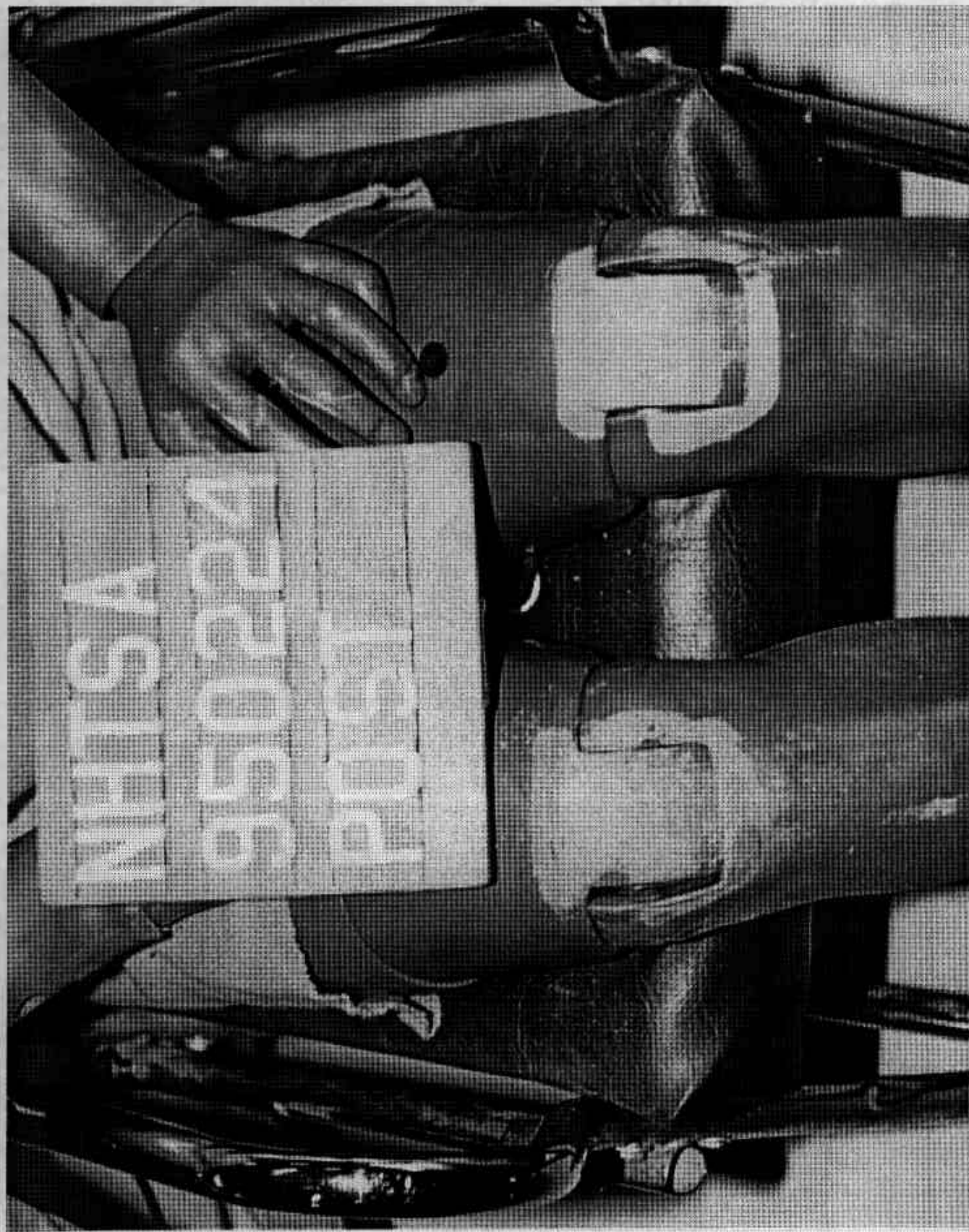


Figure A-43. Post-Test Passenger Dummy Knee Contact - View 1
A-44

950224

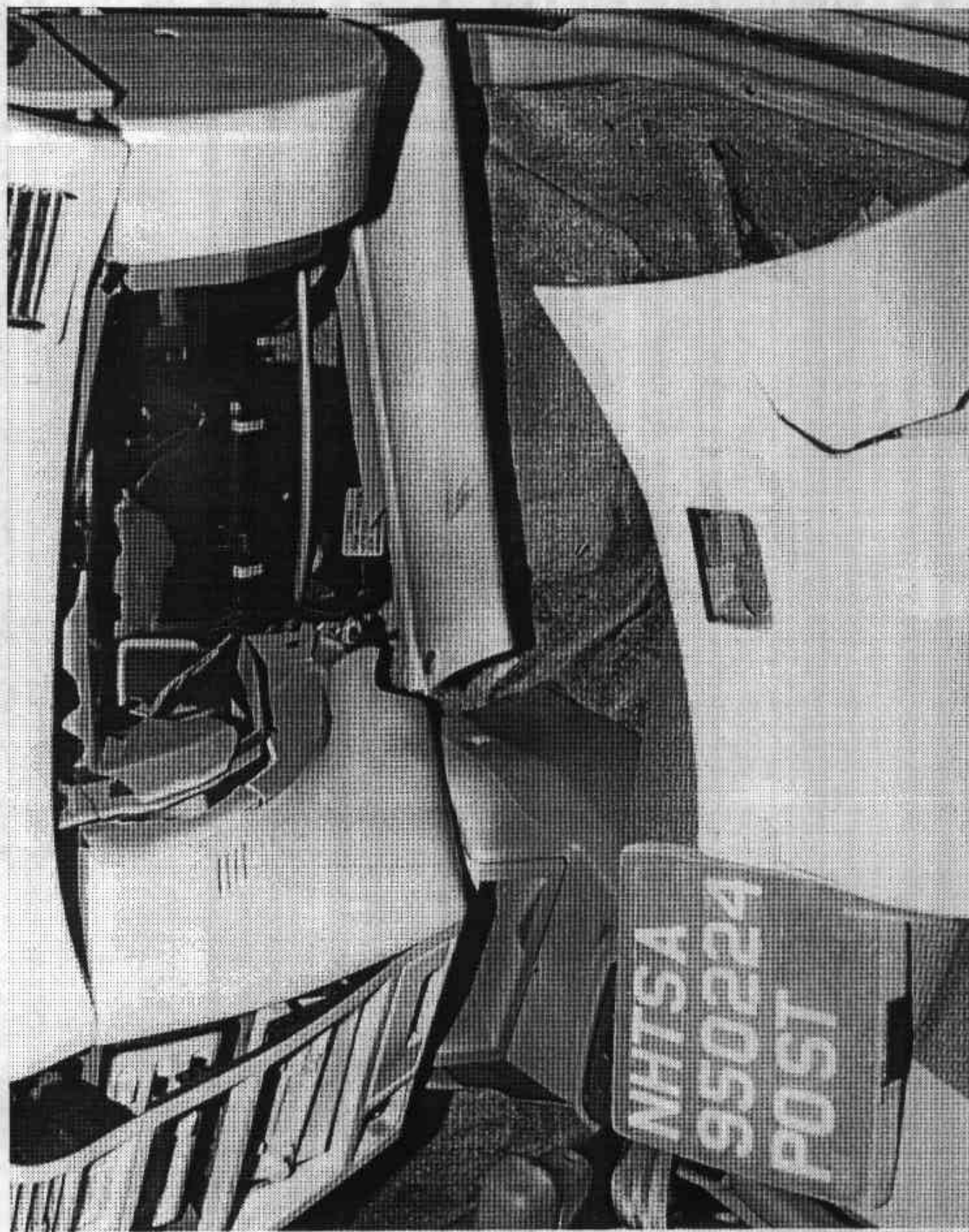


Figure A-44. Post-Test Passenger Dummy Knee Contact - View 2

A-45

950224

DATE	GVWR	LB	CAWR	FT	LB	CAWR	RR	LB	CAWR	RR
06/10/94	3329	1764			800			1565		
	1510							710		

06/10/94 1510

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY BUMPER AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

TYPE KNAFA1212S5212498
TYPE PASSENGER CAR

THE NEW YORK PUBLIC LIBRARY
ASTOR LENOX TILDEN FOUNDATIONS
500 5TH AVENUE
NEW YORK 17, N.Y.

[illegible]

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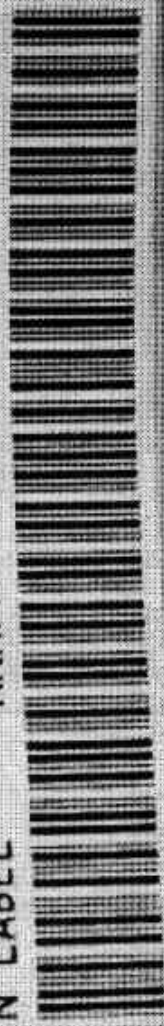
10

34

5

VIN LABEL

KNAFA1212S5212498



A-46

950224

SEPHIA		RECOMMENDED TIRE SIZE AND INFLATION PRESSURE (COLD) (DIMENSIONS RÉGLÉES - PRESSURE DE GONFLAGE RECOMMANDÉE à froid)		A
TIRE SIZE RANGE CHARGE NORMALE	TIRE SIZE RANGE DIMENSIONS DES PNEUS CHARGES NORMALES C ET D NON PNEUS	PRESSURE PRESSON		
		FRONT AVANT	REAR ARRIÈRE	
STD	P175/70R13 82S	29 psi 10/200 ¹ 200 kPa	29 psi 10/200 ¹ 200 kPa	
T	T115/70R15 TEMPORAL SPARE PNEU DE SECOURS PROVISION	60 psi 10/200 ¹ 415 kPa	60 psi 10/200 ¹ 415 kPa	
TOTAL LOAD - OCCUPANTS PLUS LUGAGE CHARGE GÉNÉRALE - OCCUPANTS PLUS BAGAGES				
MODEL MODÈLE	MAXIMUM LOAD CHARGE MAXIMALE	DISTRIBUTION RÉPARTITION		
		FRONT AVANT	REAR ARRIÈRE	
ALL TOUTES	827 10/375 kg	2	3	77 10/375 kg
SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION		FOR VARIETY OF CONDITIONS FOR MORE INFORMATION SUPPLÉMENTAIRE		

Figure A-46. Pre-Test Recommended Tire Pressure Label View



Figure A-47. Post-Test Windshield Retention Loss - View 1

A-48

950224

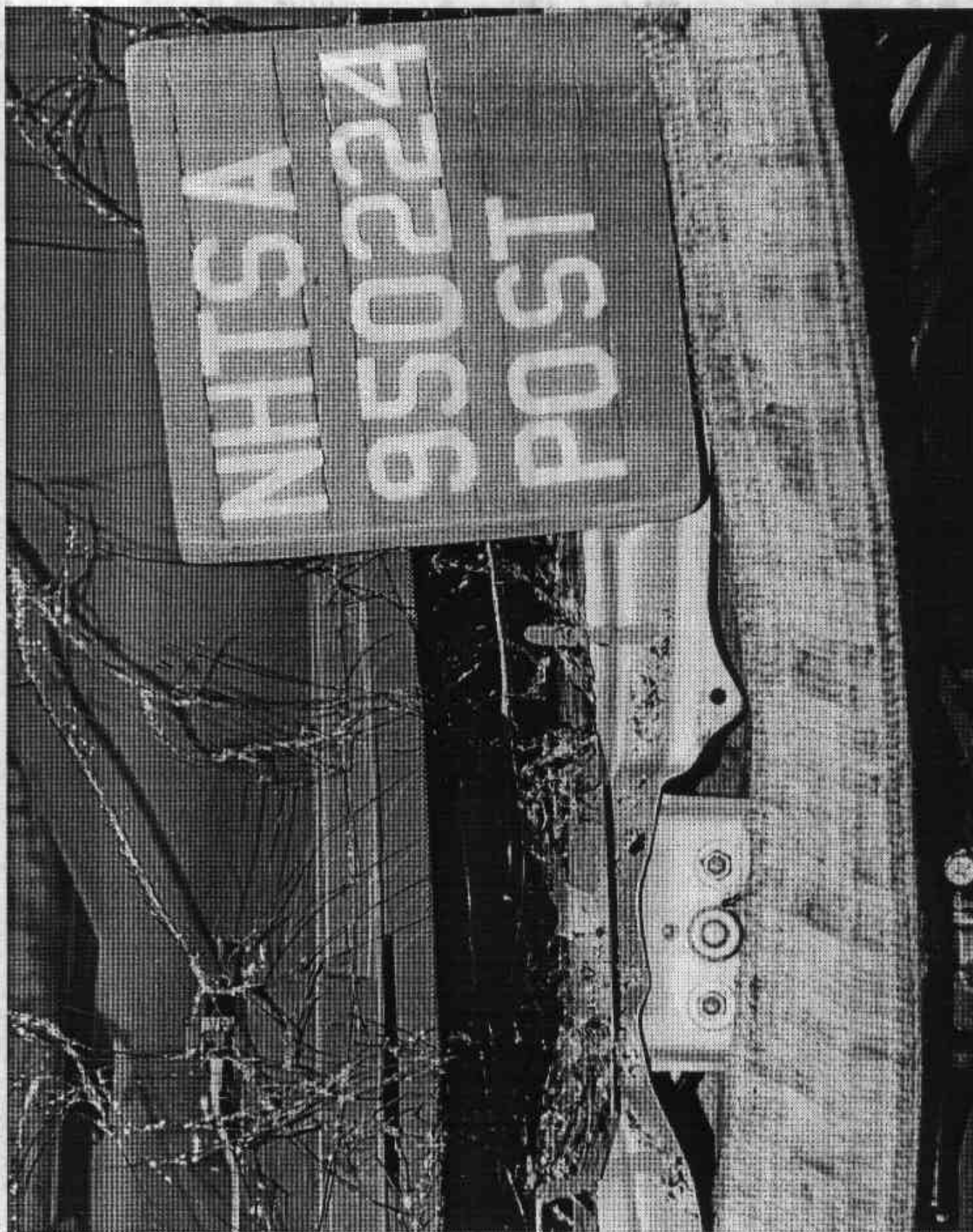


Figure A-48. Post-Test Windshield Retention Loss - View 2

A-49

950224

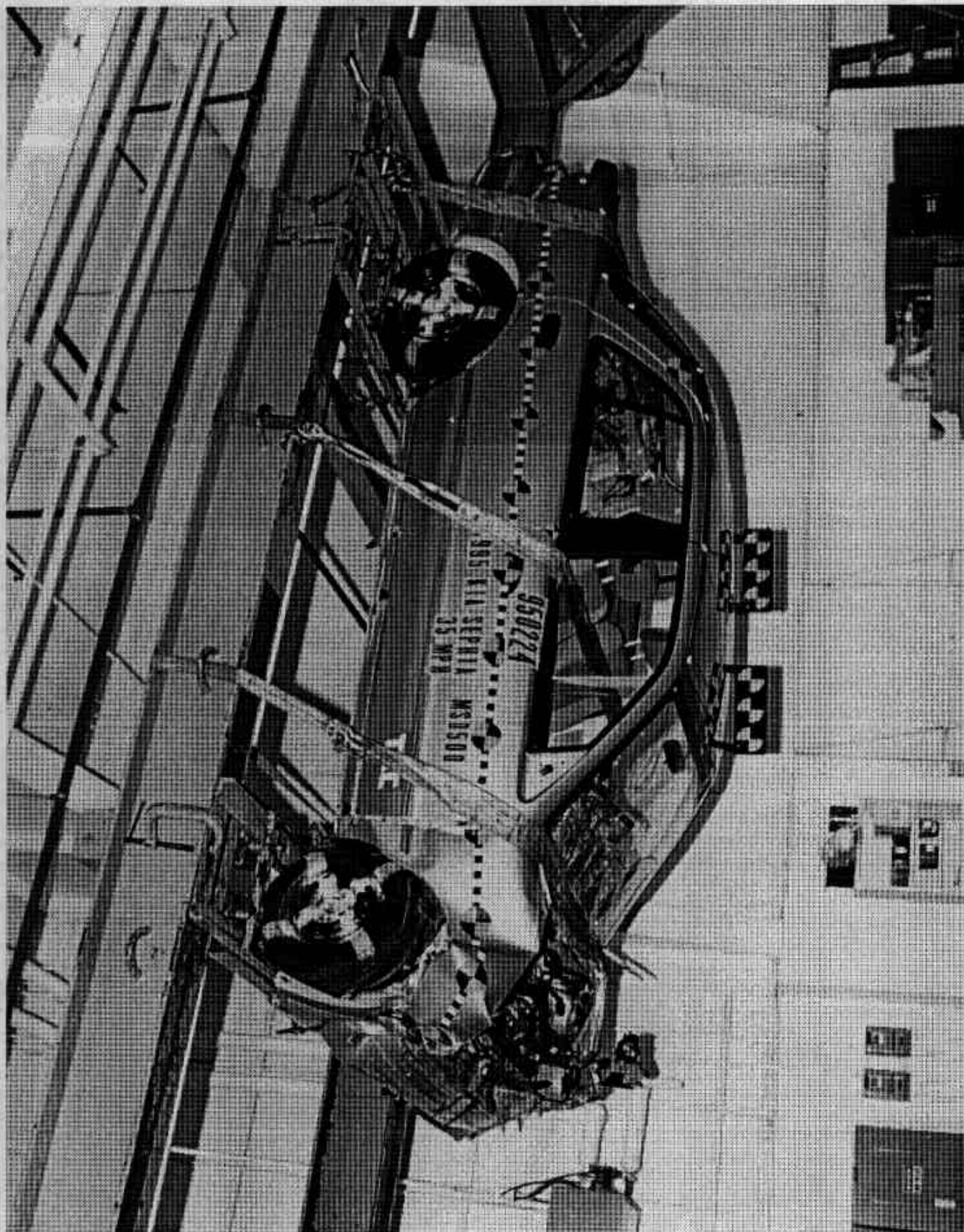


Figure A-49. Post-Test Vehicle on Static Rollover Machine View

A-50

950224

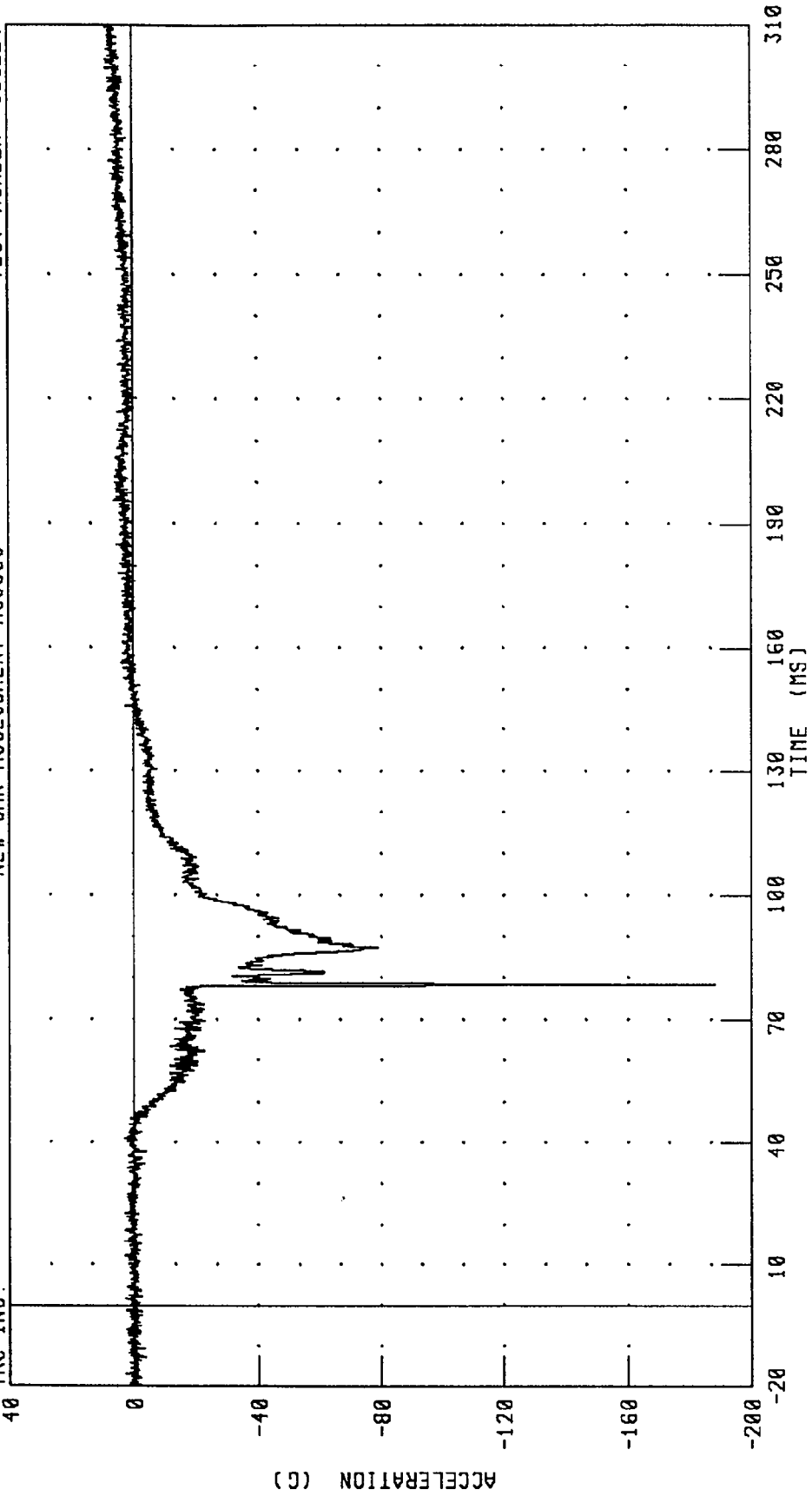
Appendix B

Data Plots

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.

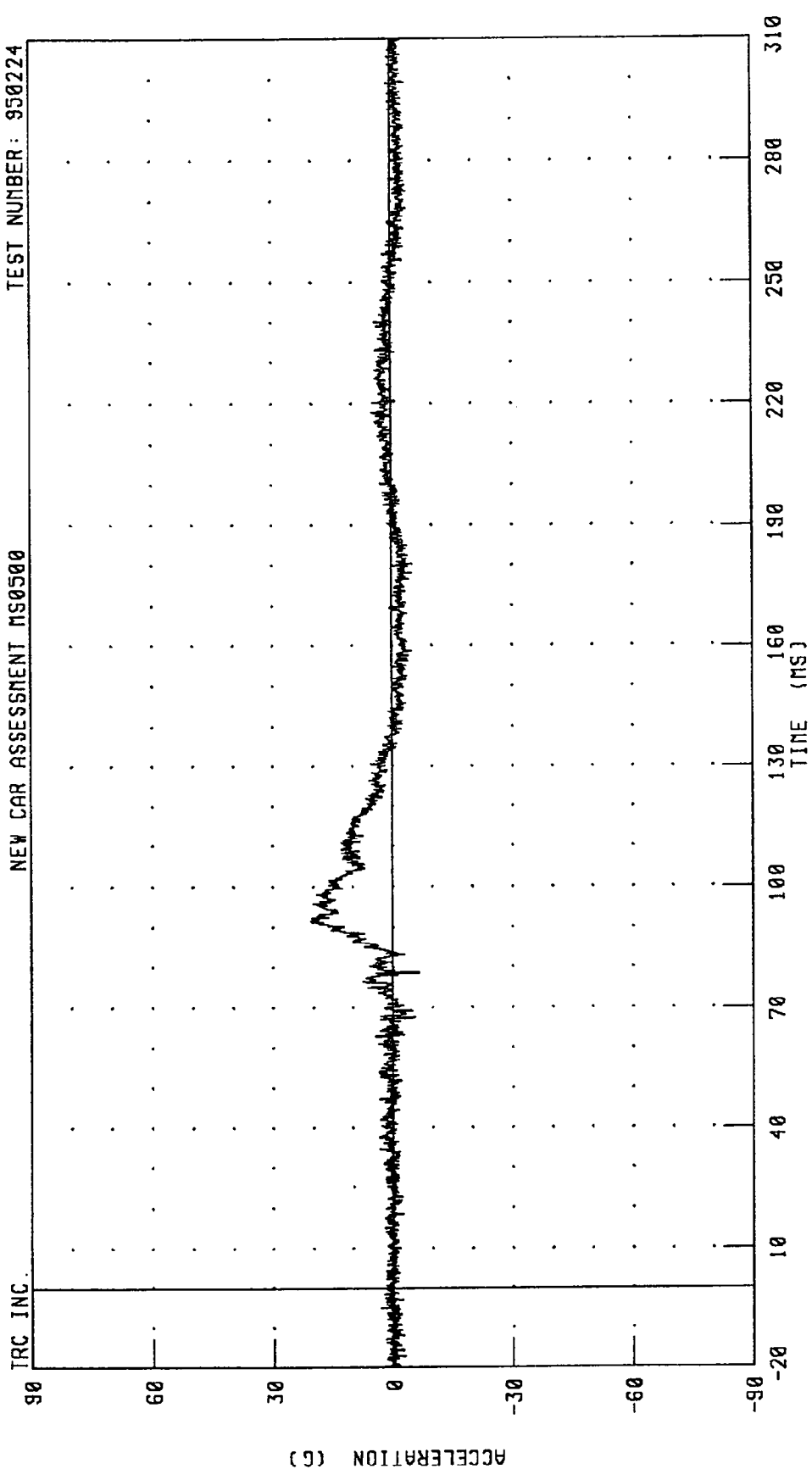


CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

PEAK DATA: 8.57 G @ 299.44 MS; -187.95 G @ 78.48 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

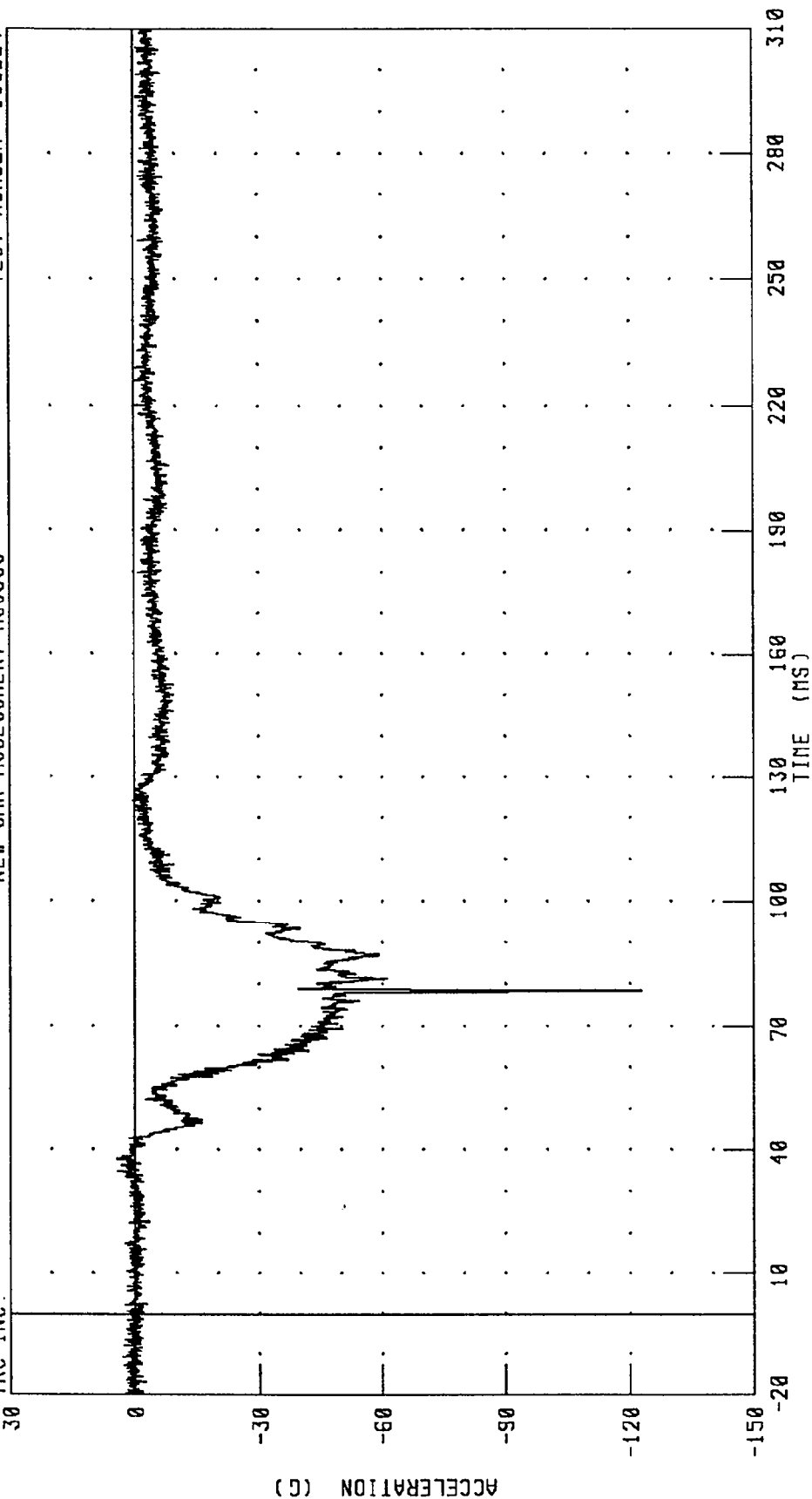


CHANNEL: HEDYC1 FILTER: CH. CLASS 1000

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD Z-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

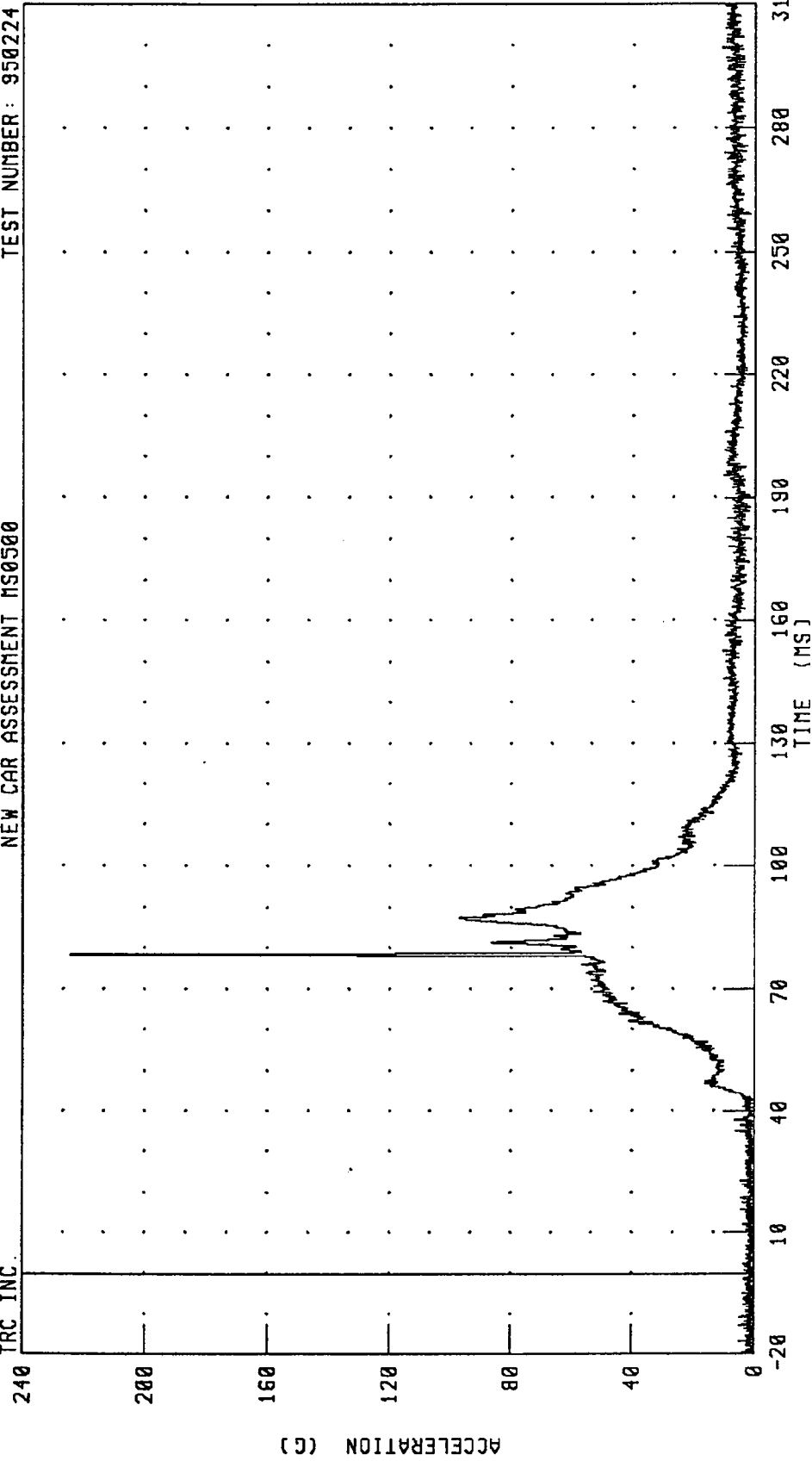
PEAK DATA: 4.36 G @ 37.84 MS; -122.72 G @ 78.48 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

TEST NUMBER: 950224

NEW CAR ASSESSMENT HS0500

TRC INC.



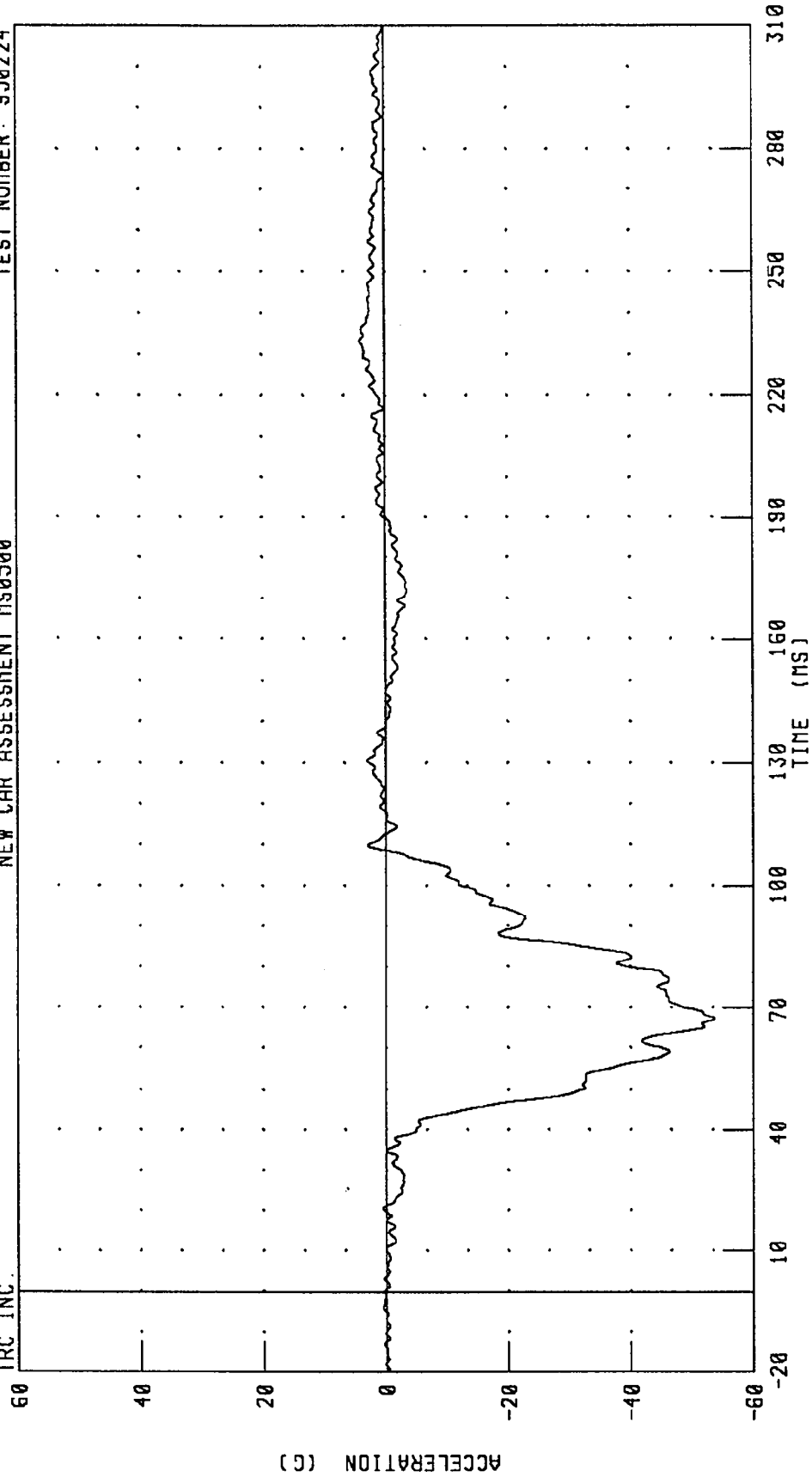
CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

PEAK DATA: 224.49 G @ 78.48 MS; 0.13 G @ 19.76 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST X-AXIS ACCELERATION
 NEW CAR ASSESSMENT M30500

TEST NUMBER: 950224

TRC INC.



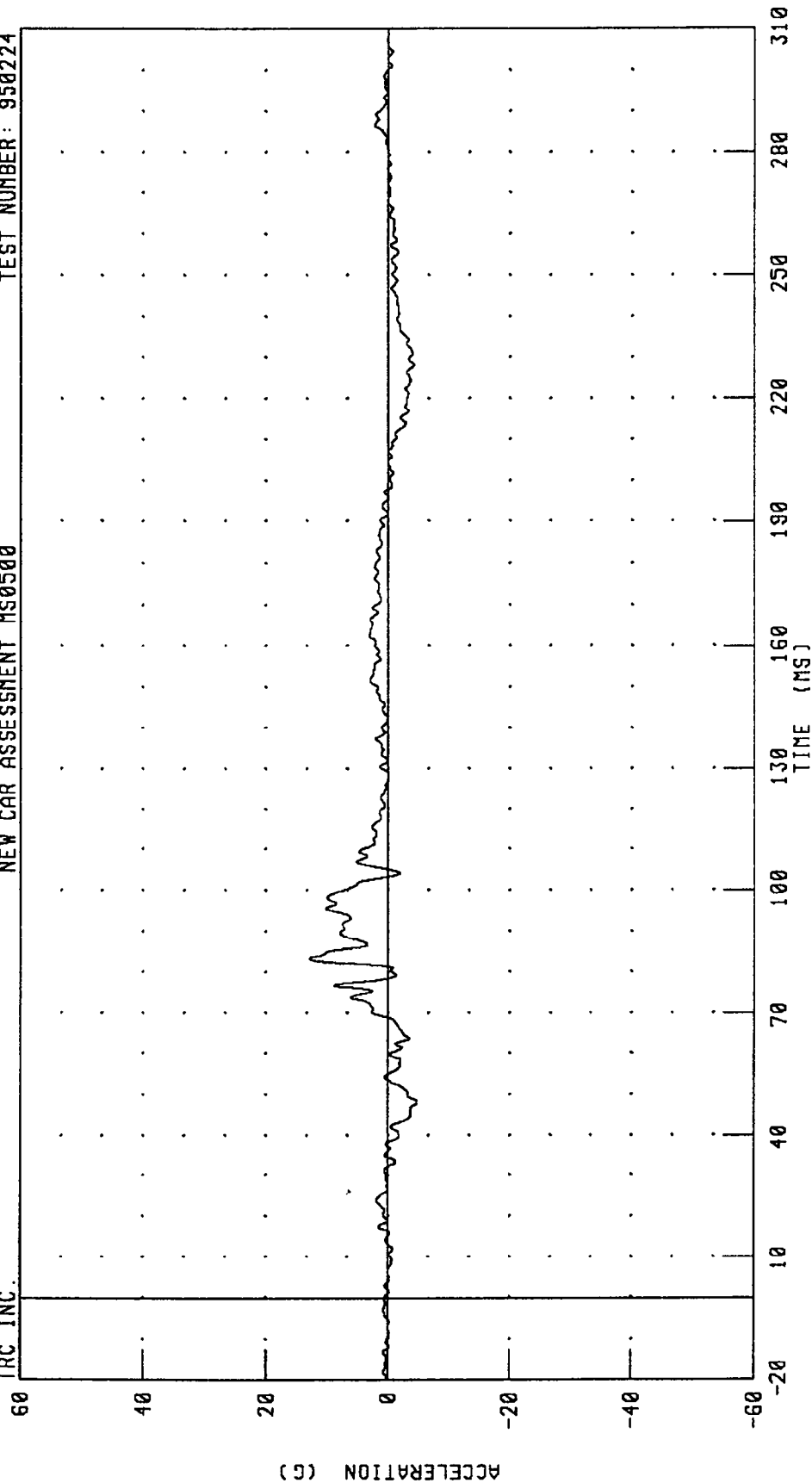
CHANNEL: CSTXG1 FILTER: CH. CLASS 180

PEAK DATA: 4.04 G @ 233.28 MS; -53.63 G @ 67.28 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.

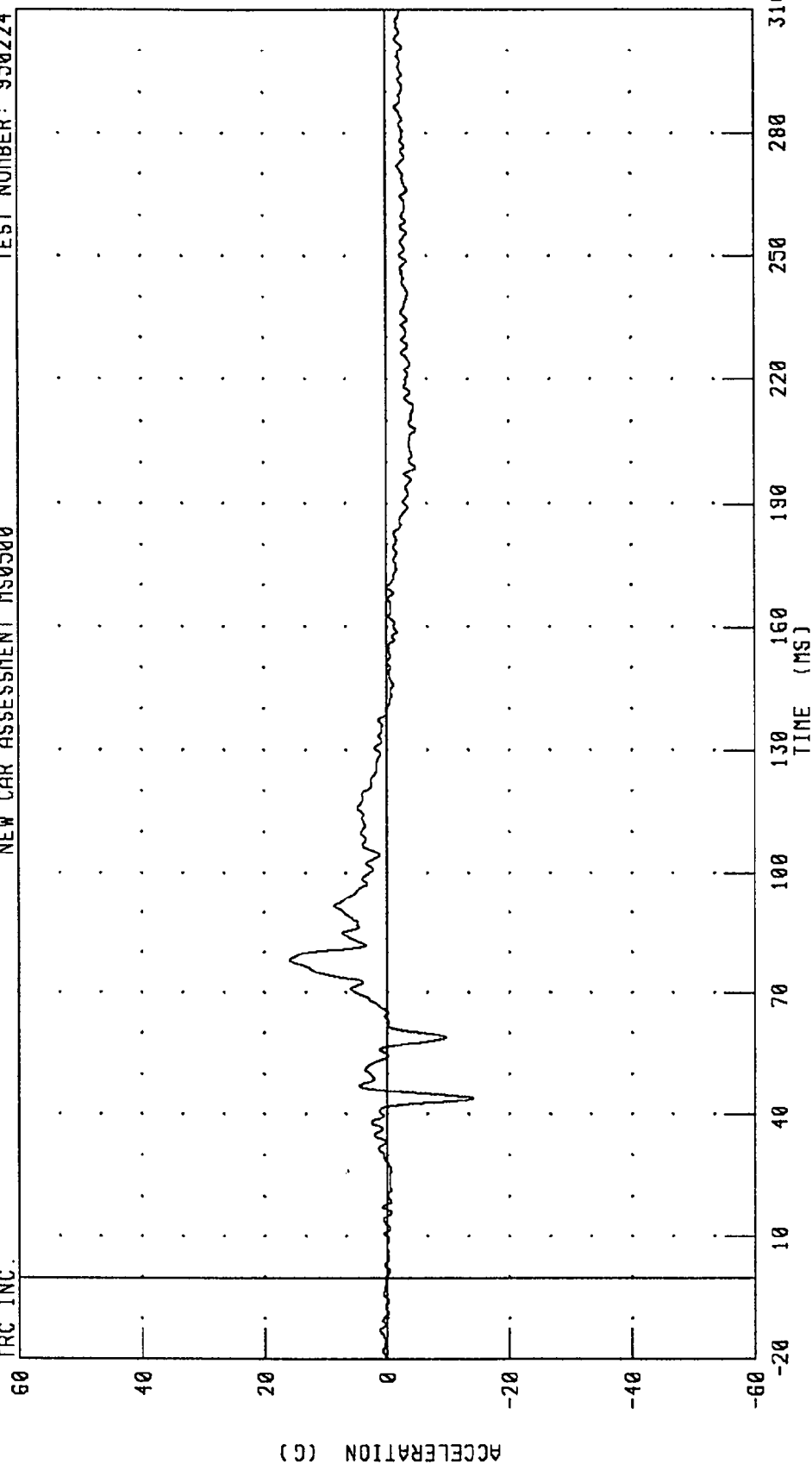


CHANNEL: CSTYG1 FILTER: CH. CLASS 180

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.

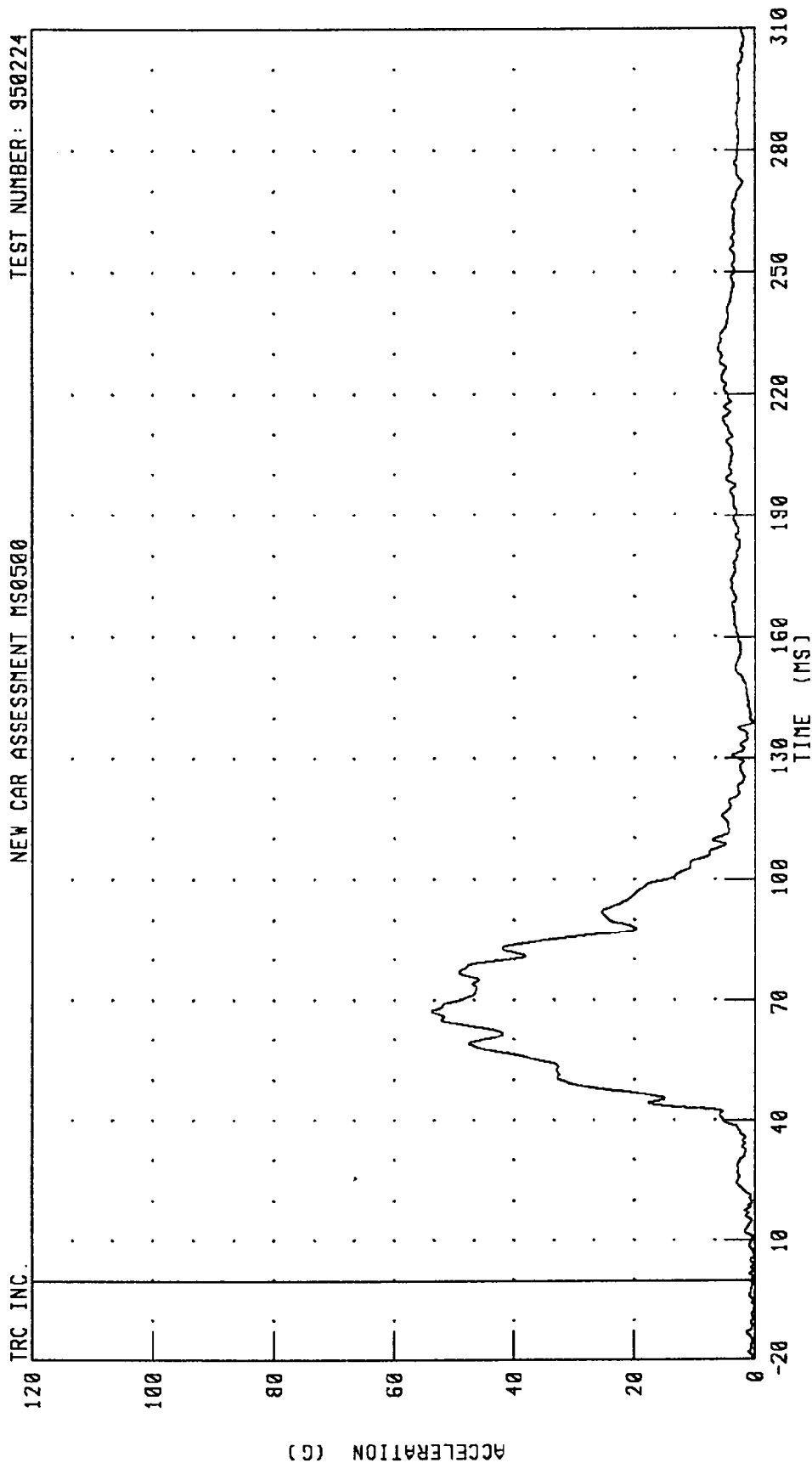


CHANNEL: CSTZG1 FILTER: CH. CLASS 180

PEAK DATA: 15.99 G @ 78.16 MS; -14.03 G @ 44.08 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST RESULTANT ACCELERATION
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224



CHANNEL: CSTRG1 FILTER: CH. CLASS 180

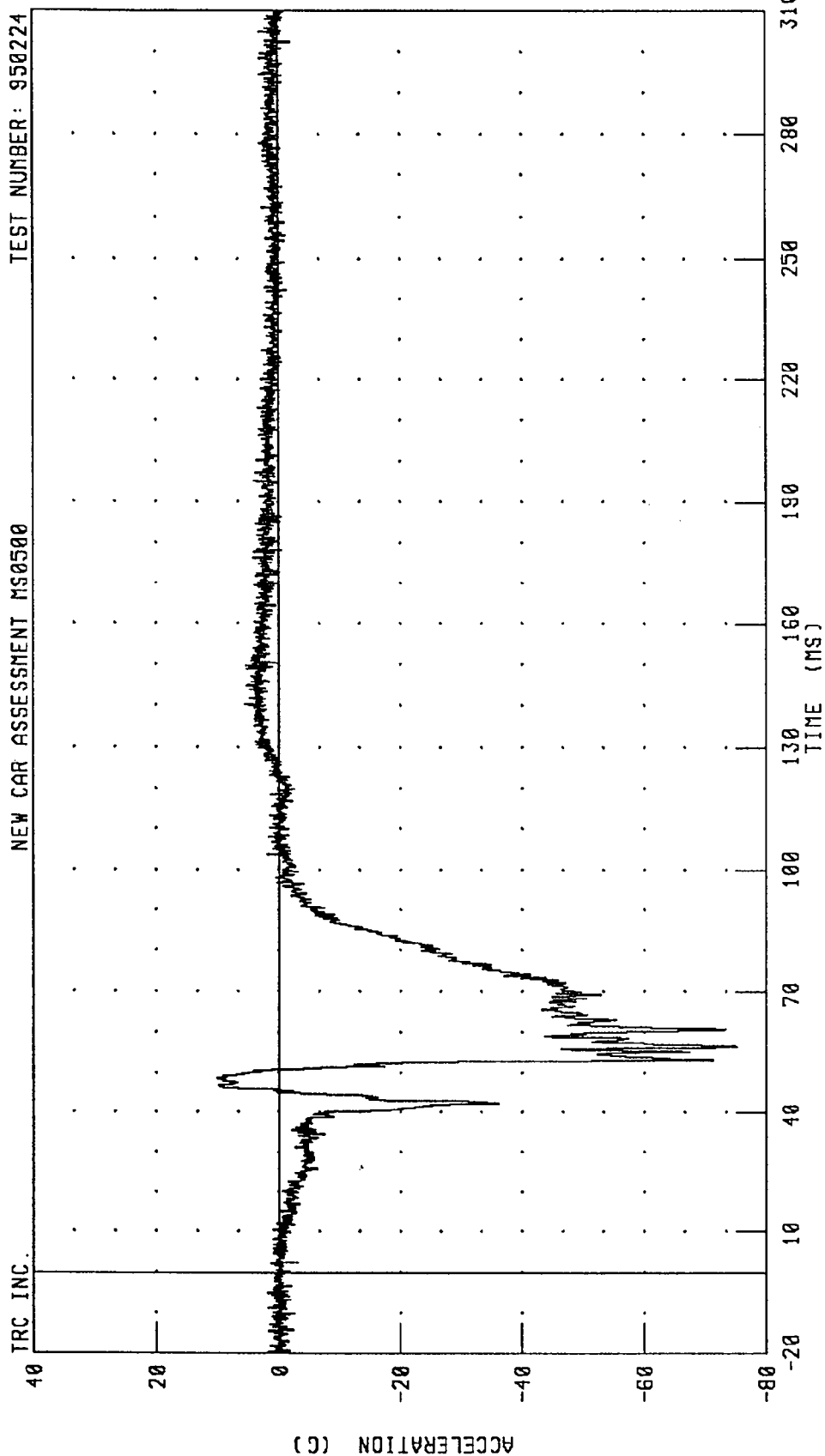
PEAK DATA: 53.67 G @ 67.28 MS; 0.08 G @ -6.40 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS X-AXIS ACCELERATION

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.

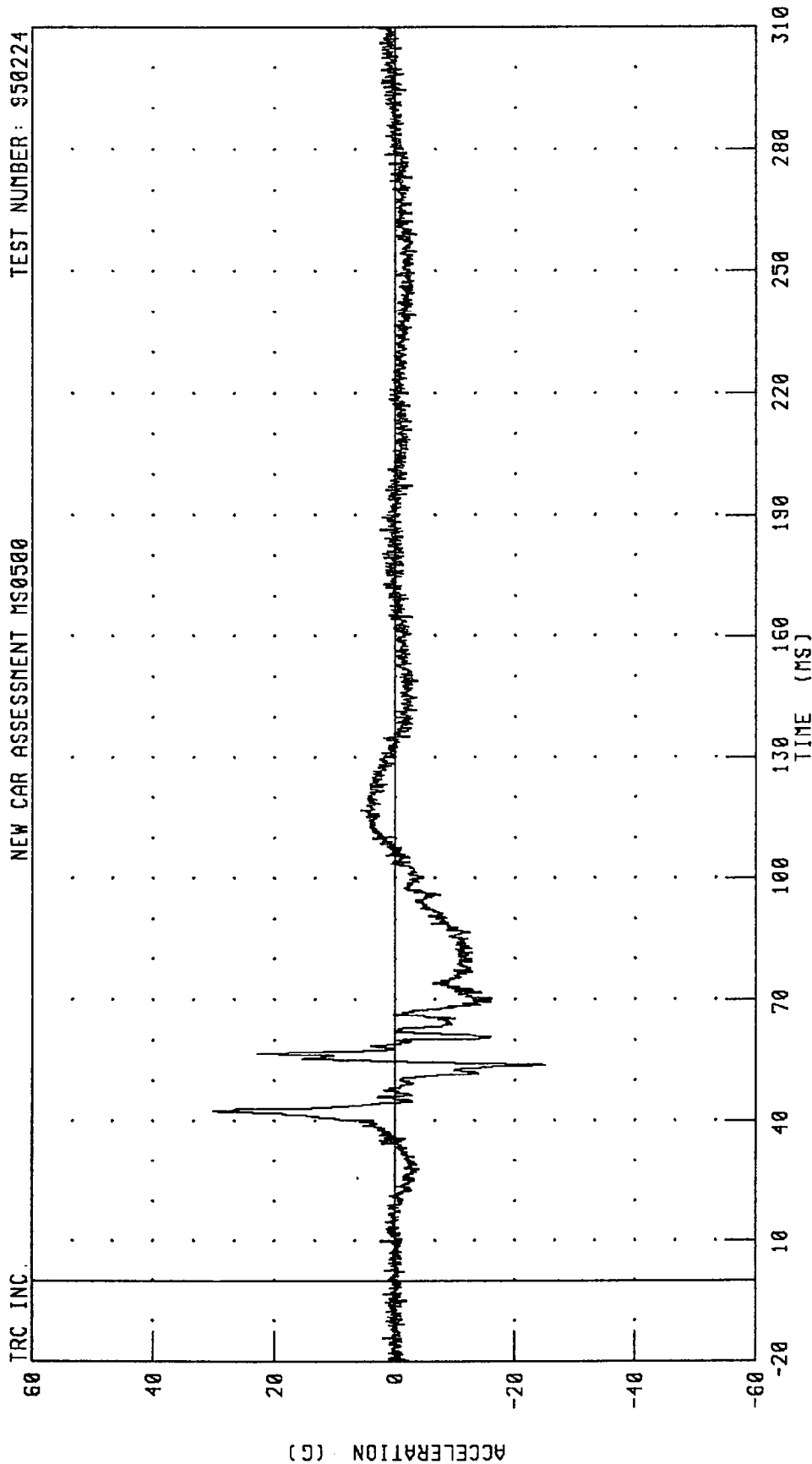


CHANNEL: PEVXG1 FILTER: CH. CLASS 1000

PEAK DATA: 10.19 G @ 48.72 MS; -75.15 G @ 56.48 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224



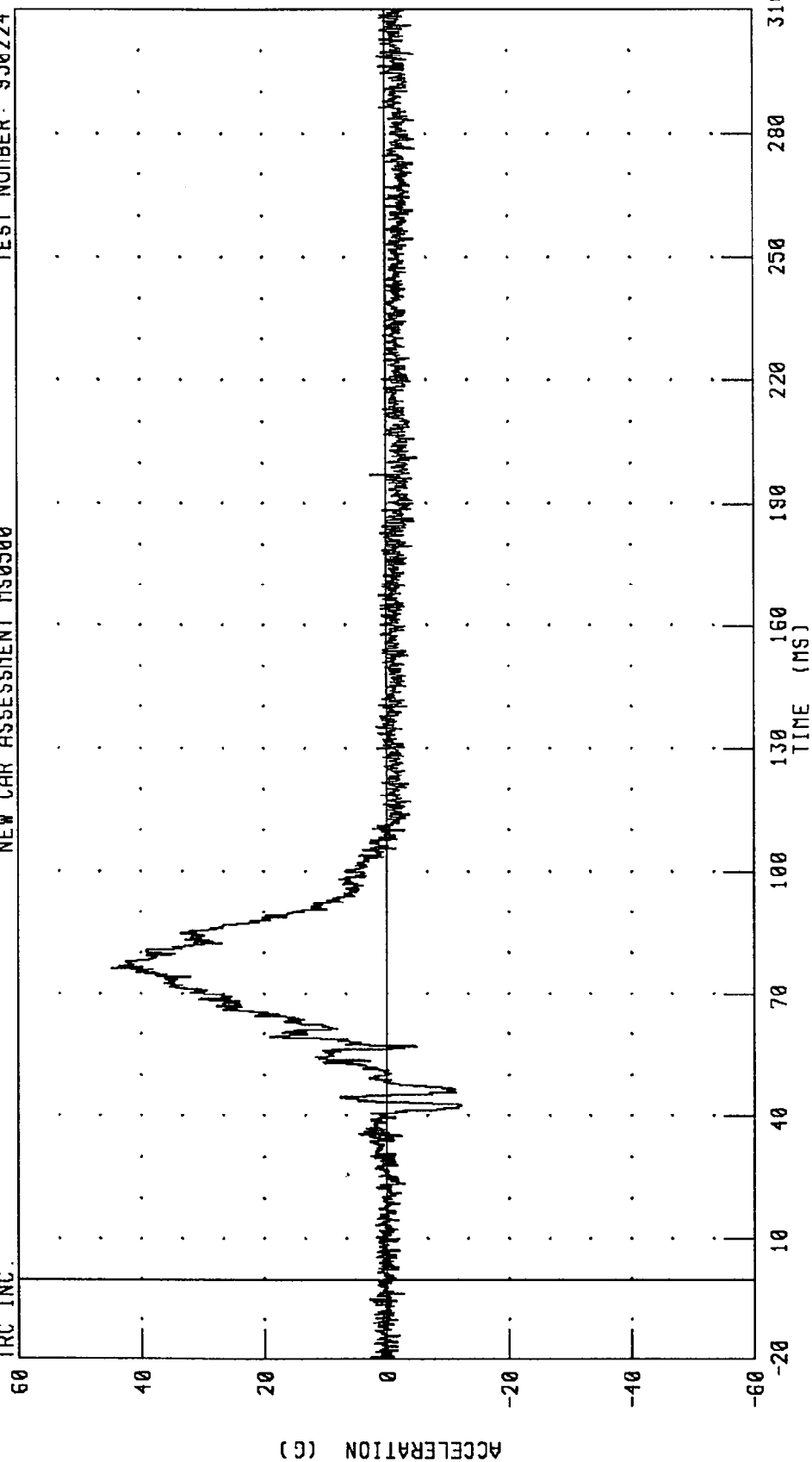
PEAK DATA: 30.07 G @ 42.48 MS; -25.00 G @ 53.76 MS

CHANNEL: PEVYG1 FILTER: CH. CLASS 1000

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS Z-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



CHANNEL: PEVZG1 FILTER: CH. CLASS 1000

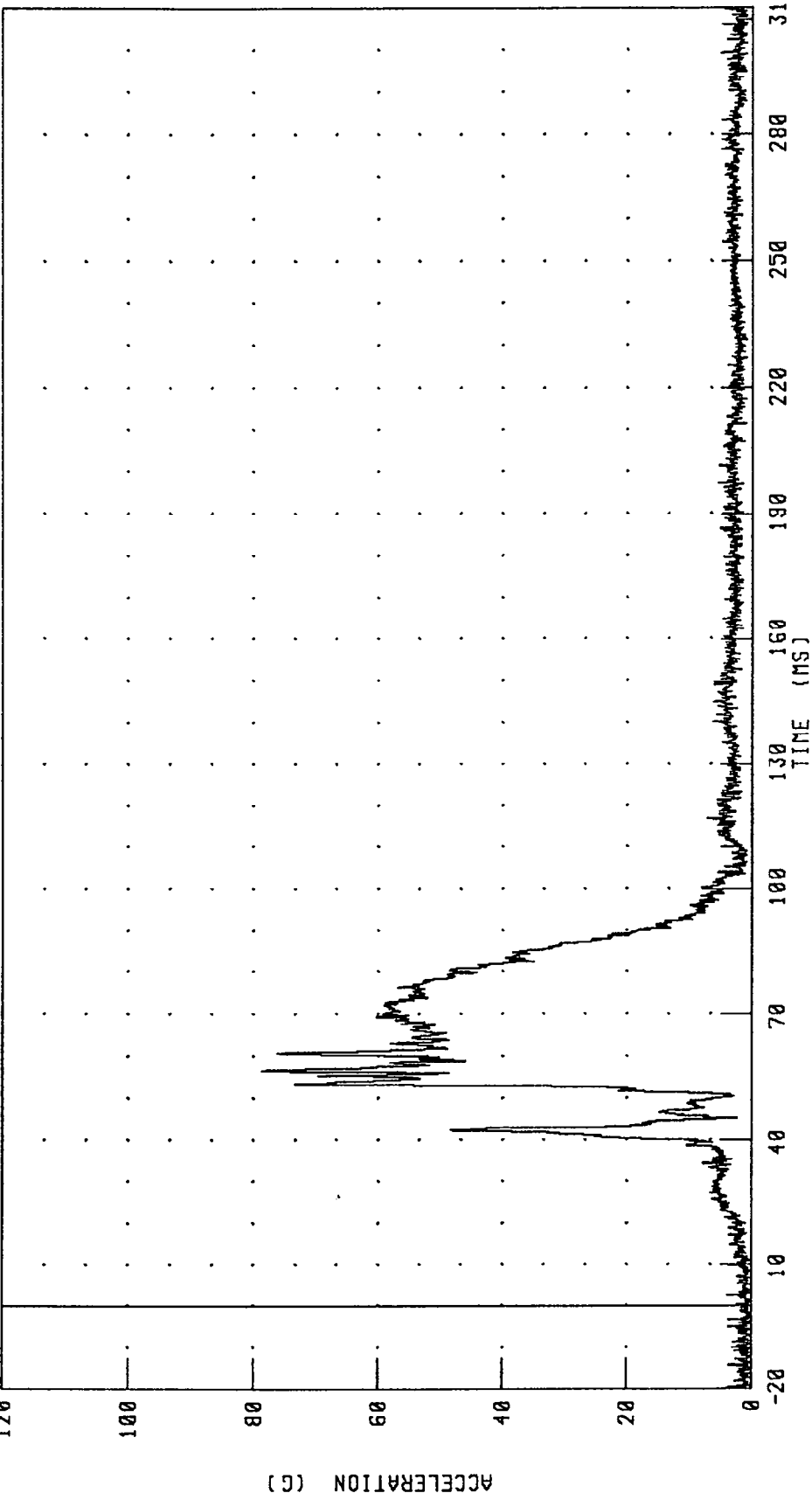
PEAK DATA: 44.83 G @ 76.32 MS, -12.22 G @ 42.48 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS RESULTANT ACCELERATION

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



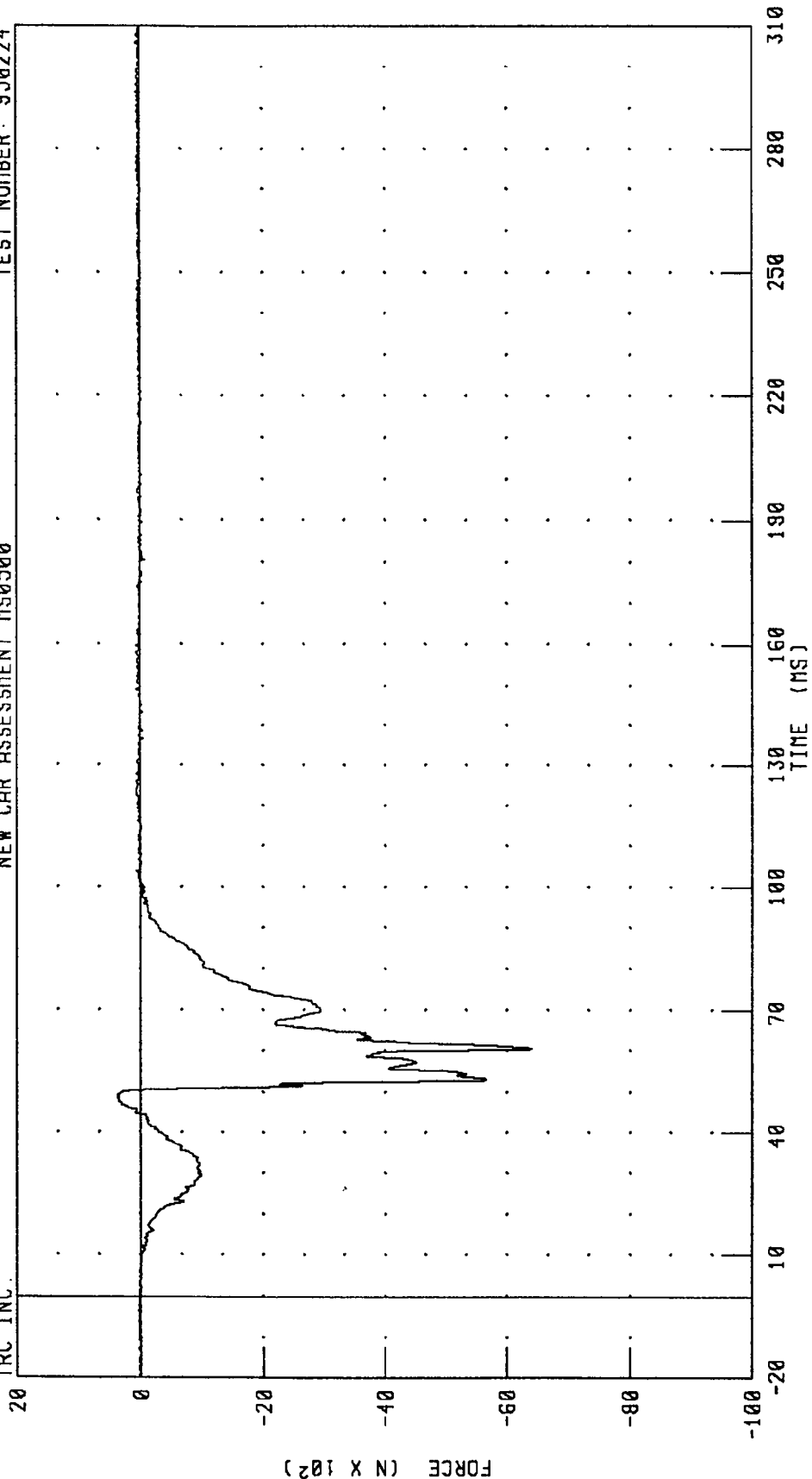
CHANNEL: PEVRG1 FILTER: CH. CLASS 1000

PEAK DATA: 78.59 G @ 56.56 MS; 0.11 G @ -9.28 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER LEFT FEMUR FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



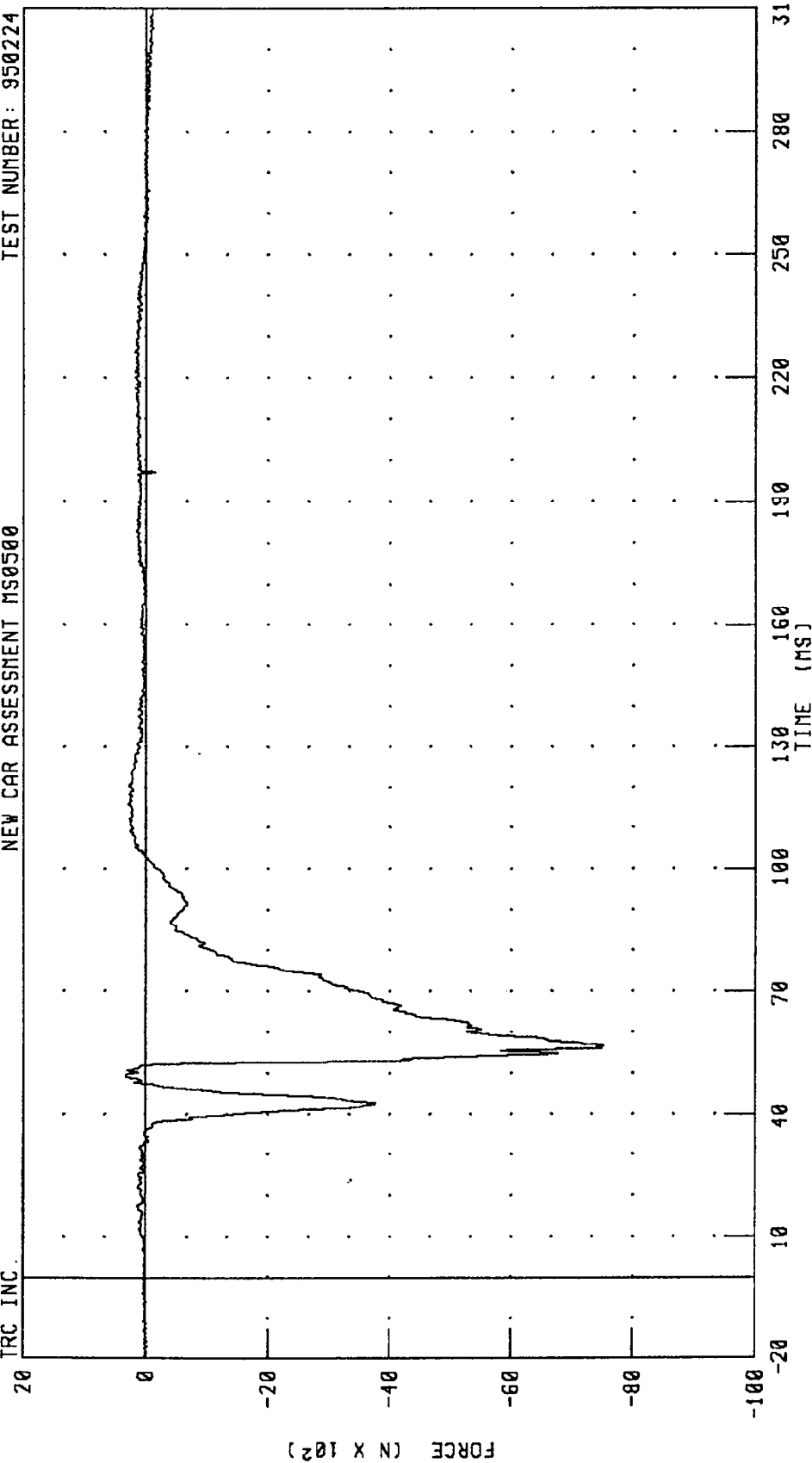
PEAK DATA: 373.86 N @ 48.48 MS; -6409.52 N @ 60.56 MS

CHANNEL: LFMF1 FILTER: CH. CLASS 600

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER RIGHT FEMUR FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



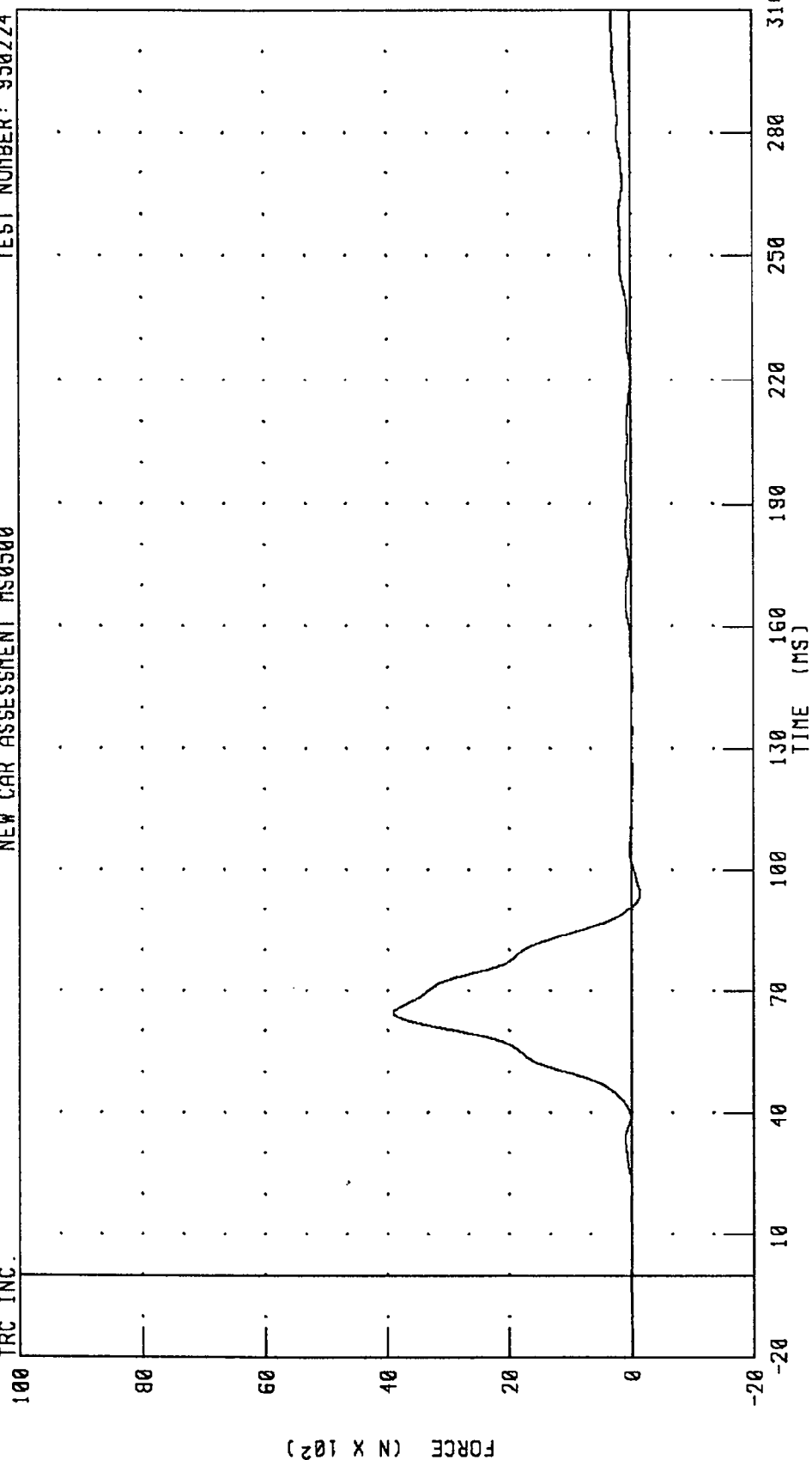
PEAK DATA: 325.26 N @ 49.52 MS; -7523.43 N @ 56.72 MS

CHANNEL: RFMF1 FILTER: CH. CLASS 600

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER LAP BELT OUTBOARD FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



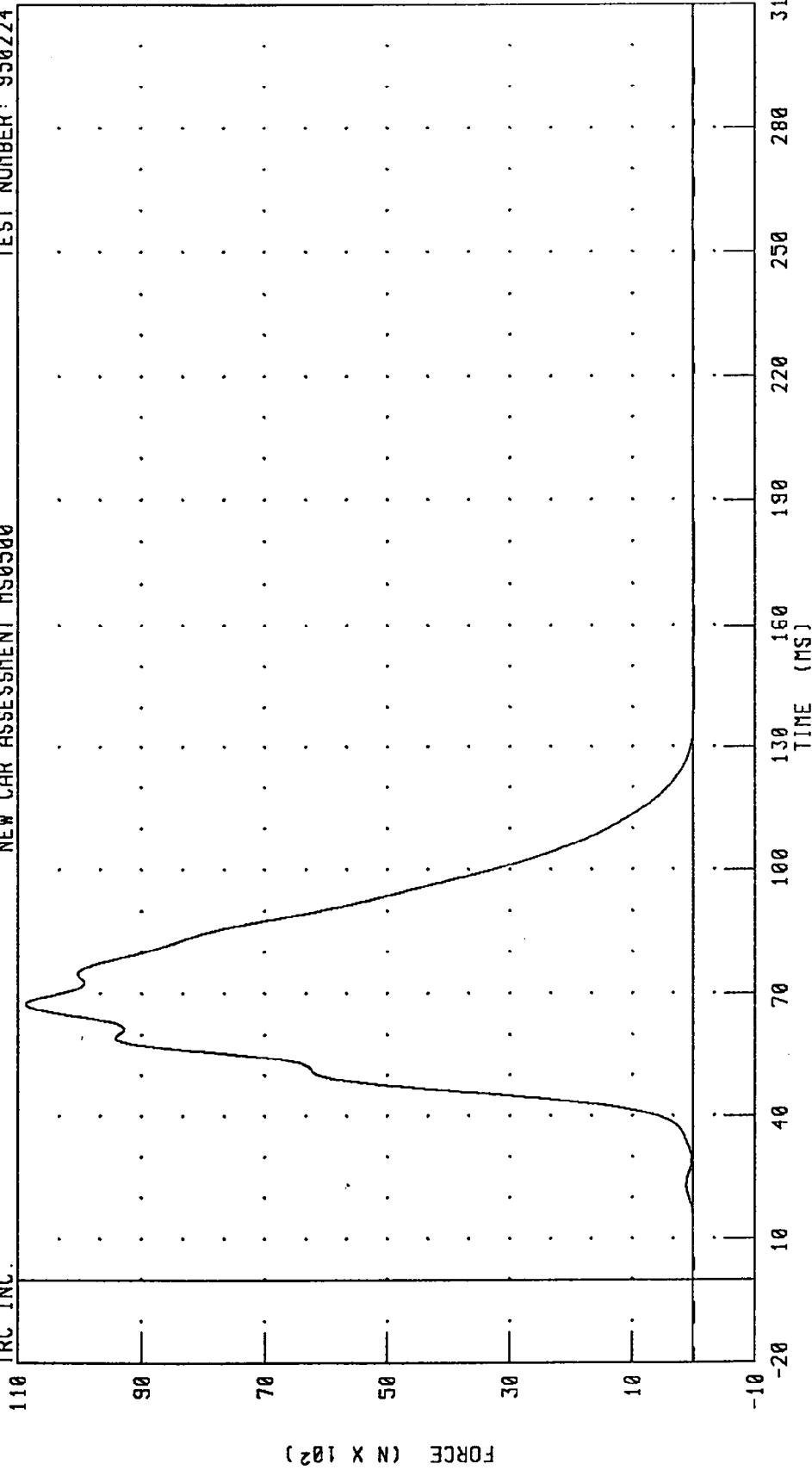
PEAK DATA: 3906.43 N @ 64.48 MS; -134.96 N @ 94.00 MS

CHANNEL: L80F1 FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER : 950224

TRC INC.



PEAK DATA: 10867.01 N @ 67.44 MS; -17.45 N @ 146.56 MS

CHANNEL : SHBF1 FILTER : CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT DISPLACEMENT
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.

150

120

90

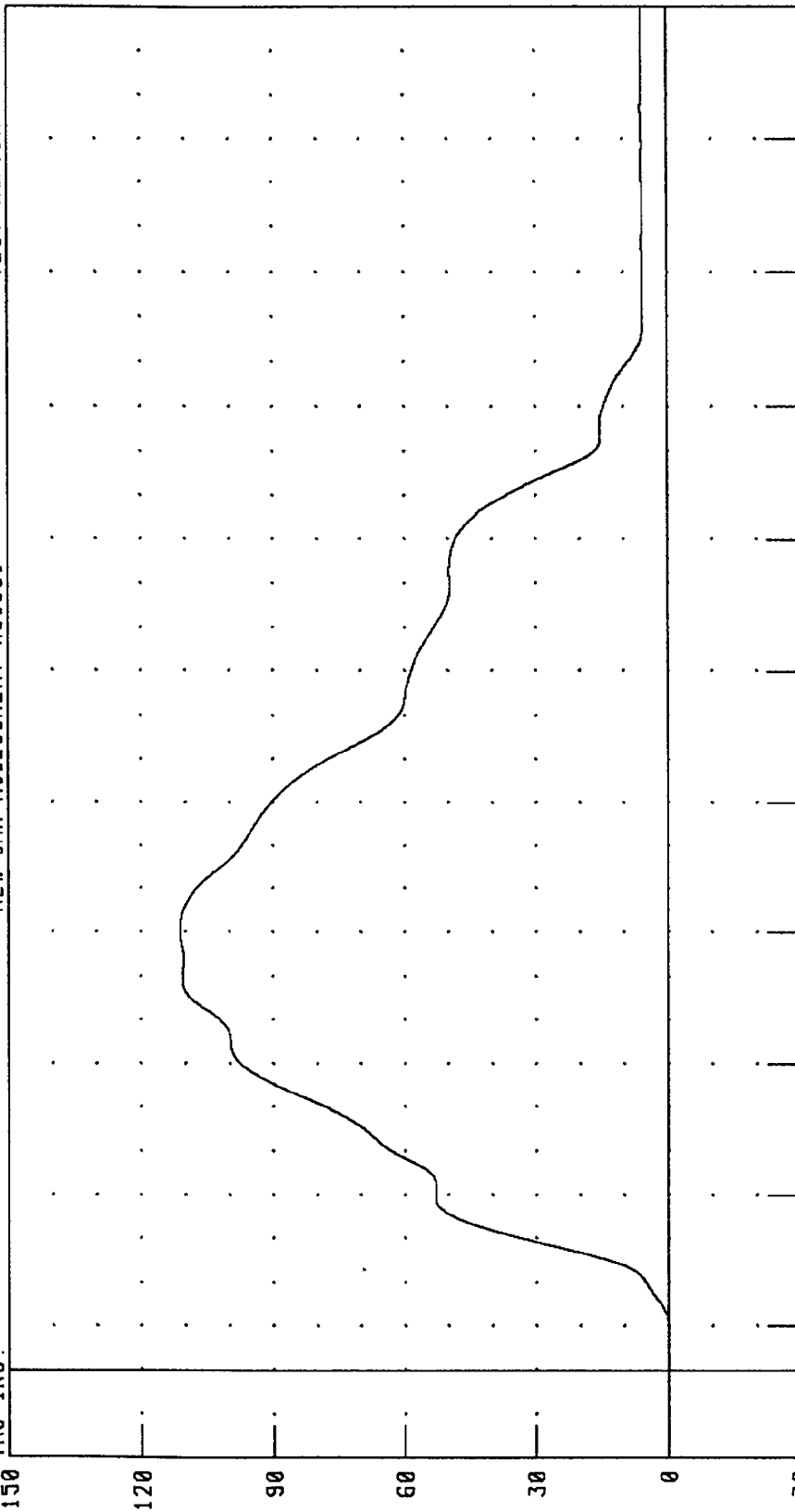
60

30

0

-30

DISPLACEMENT (MM)



TIME (MS)

PEAK DATA: 111.03 MM @ 98.88 MS; -0.07 MM @ 2.24 MS

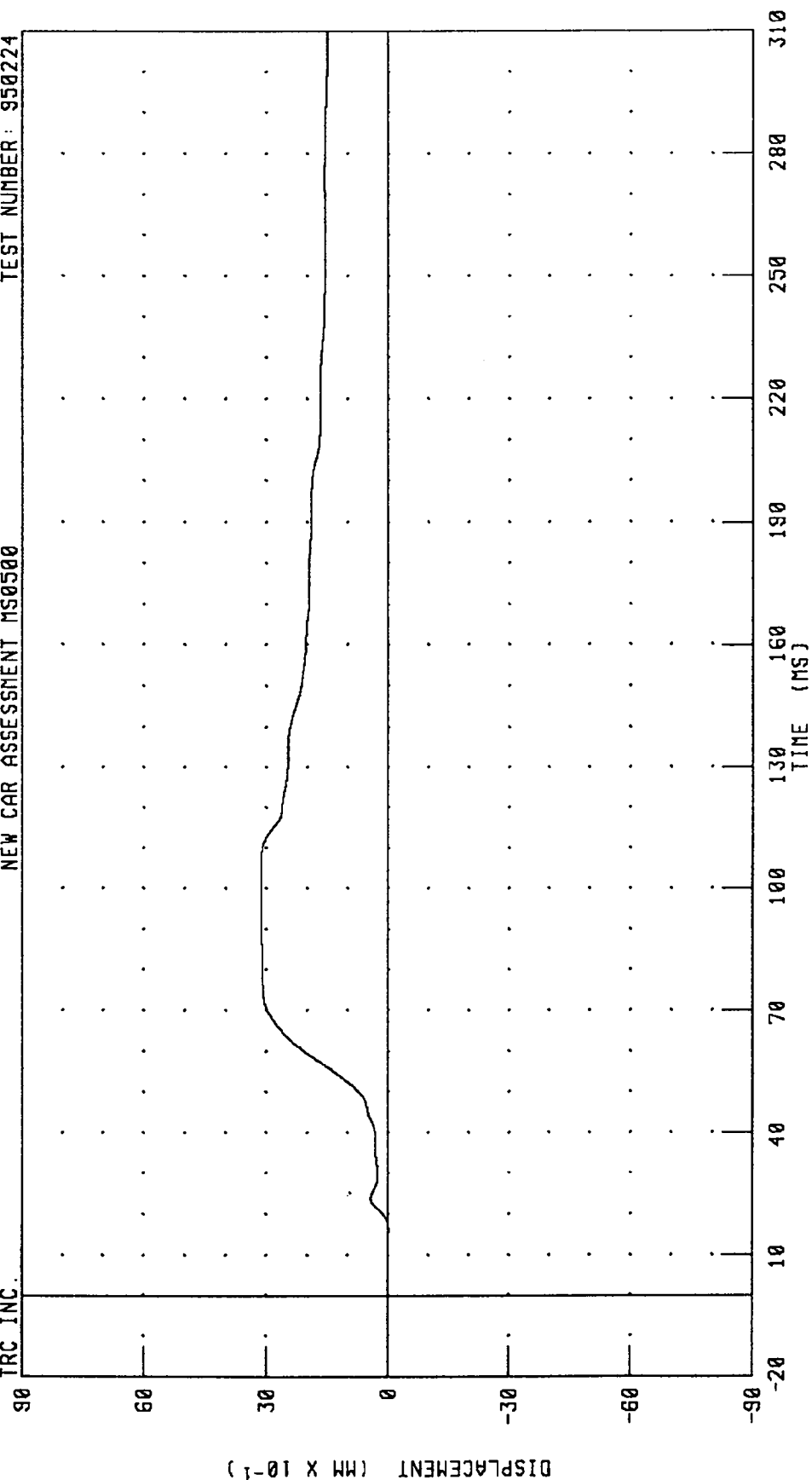
CHANNEL: SHB01 FILTER: CH. CLASS 60

310

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 DRIVER SEAT BELT EXTENSION
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



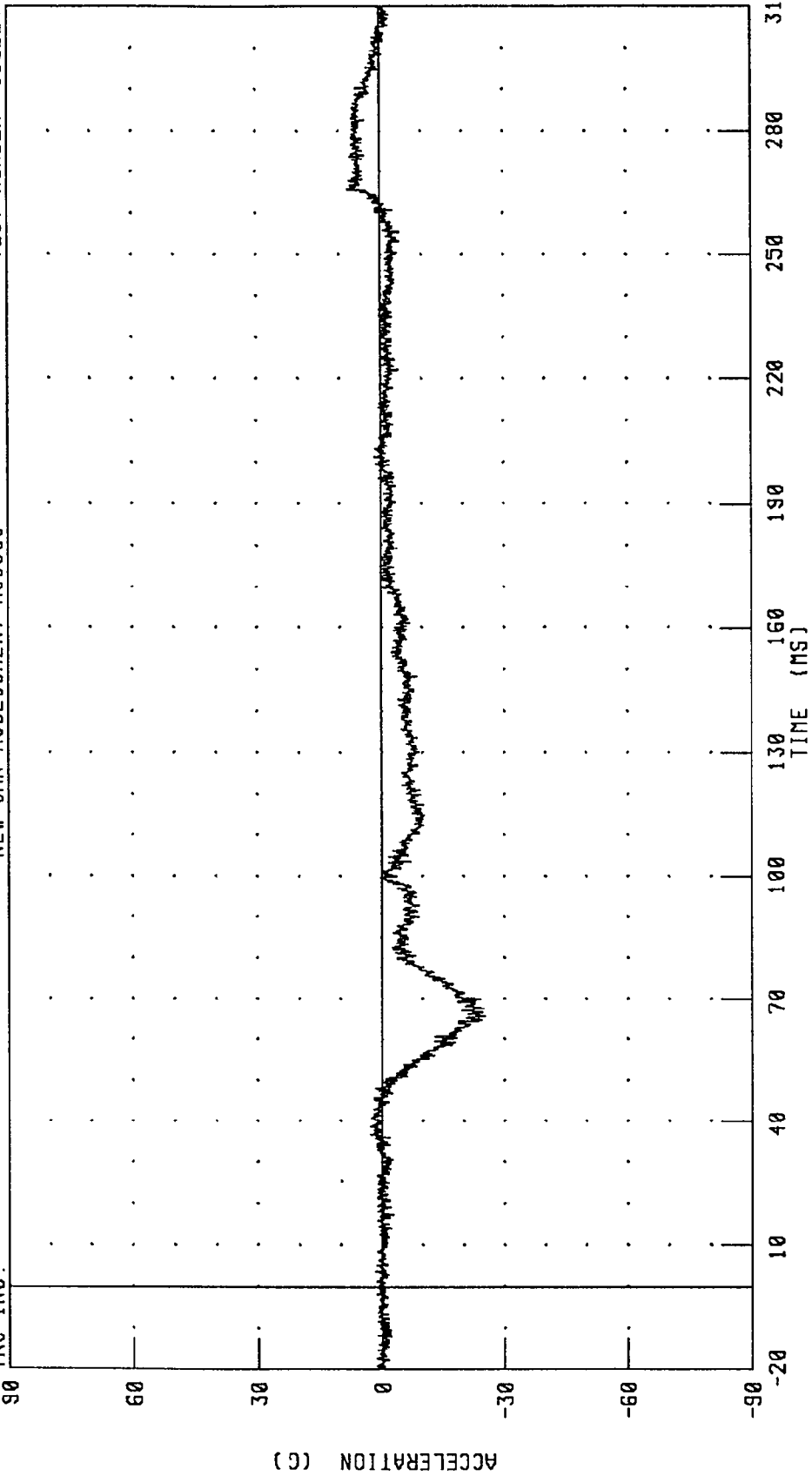
PEAK DATA: 3.14 NM @ 90.56 MS; -0.01 NM @ 16.08 MS

CHANNEL: SBED1 FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.

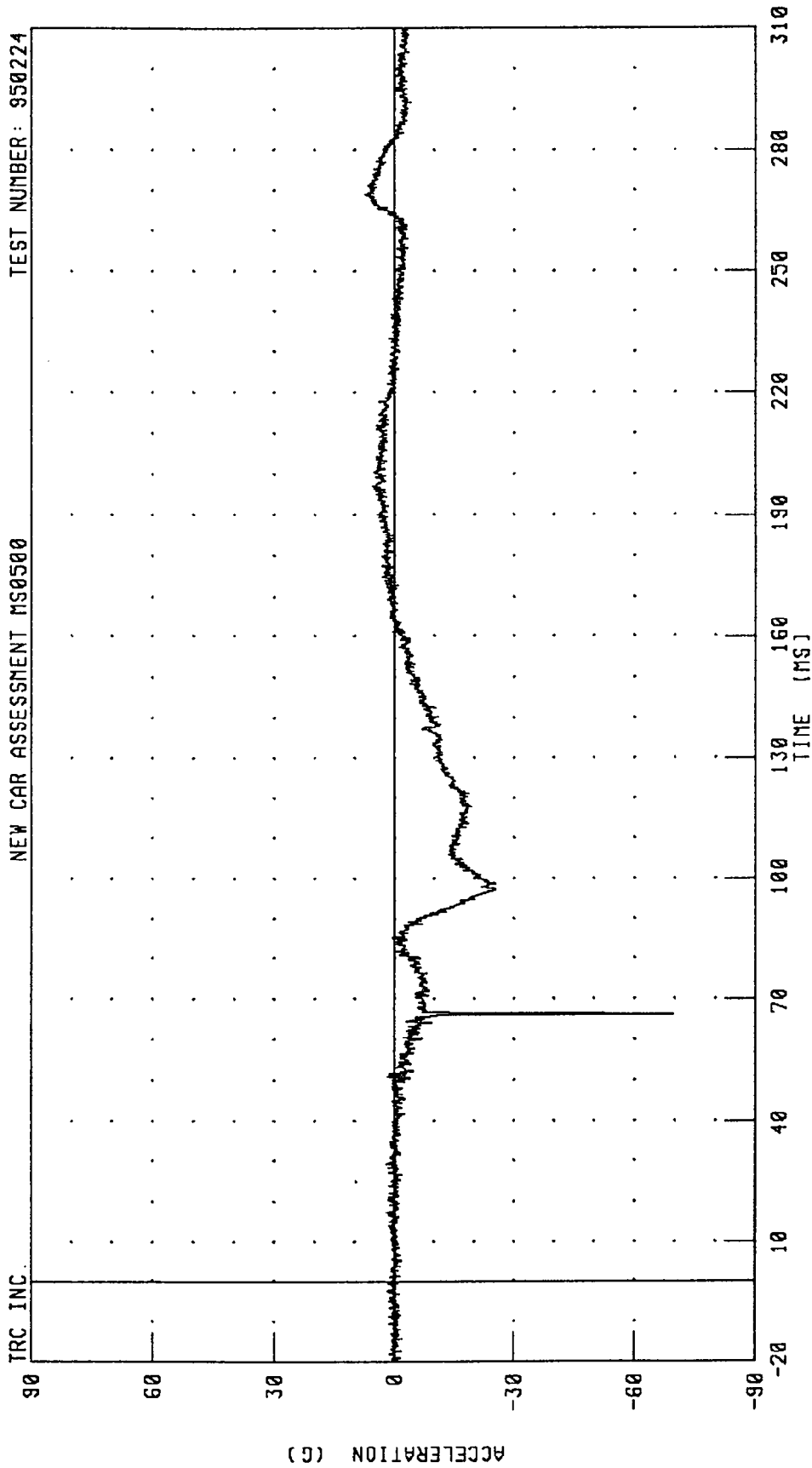


CHANNEL: HEDXG2 FILTER: CH. CLASS 1000

PEAK DATA: 8.00 G @ 265.76 MS, -25.26 G @ 65.60 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT NS0500

TEST NUMBER: 950224



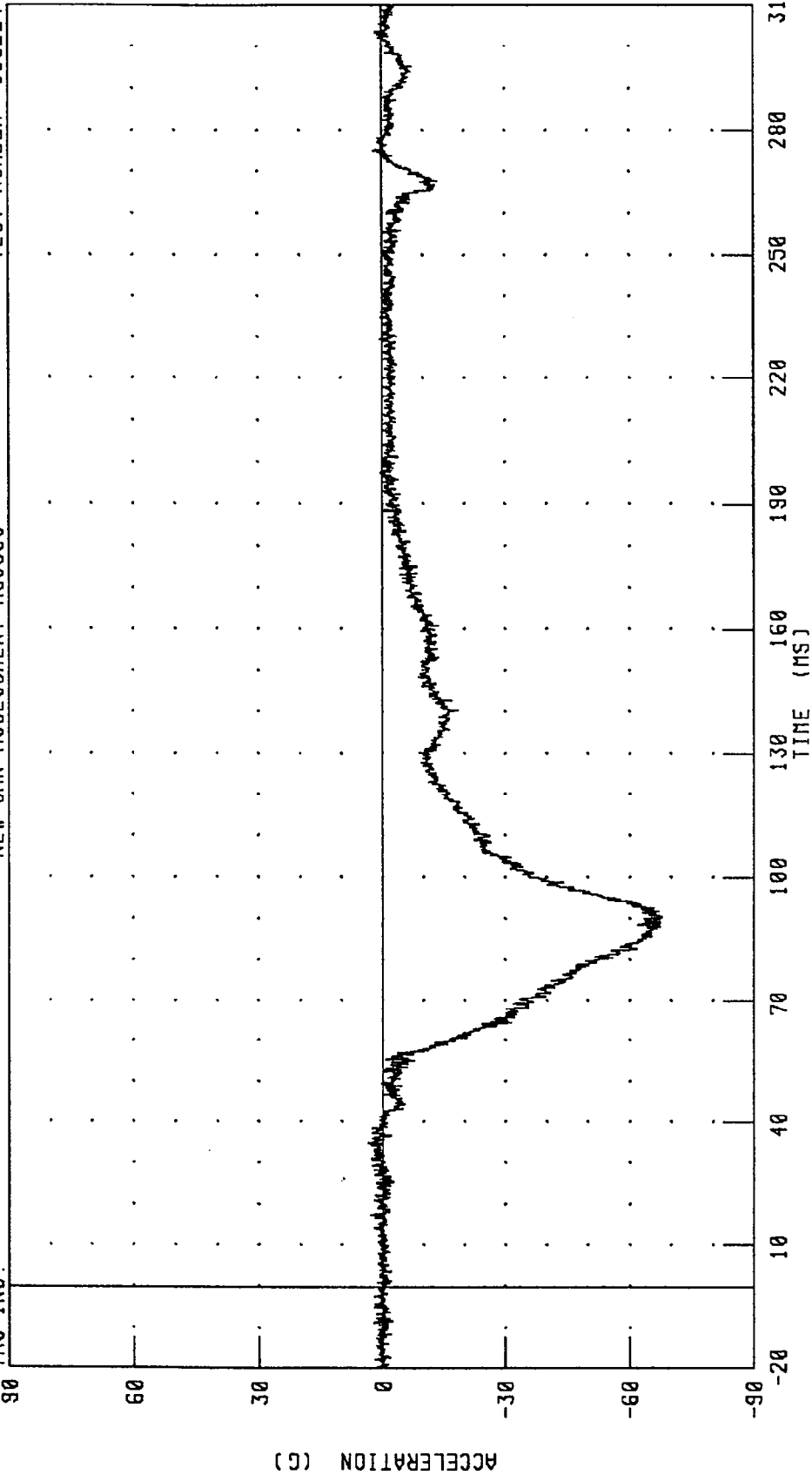
PEAK DATA: 7.43 G @ 269.04 MS; -69.59 G @ 66.32 MS

CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



CHANNEL: HEDZG2 FILTER: CH. CLASS 1000

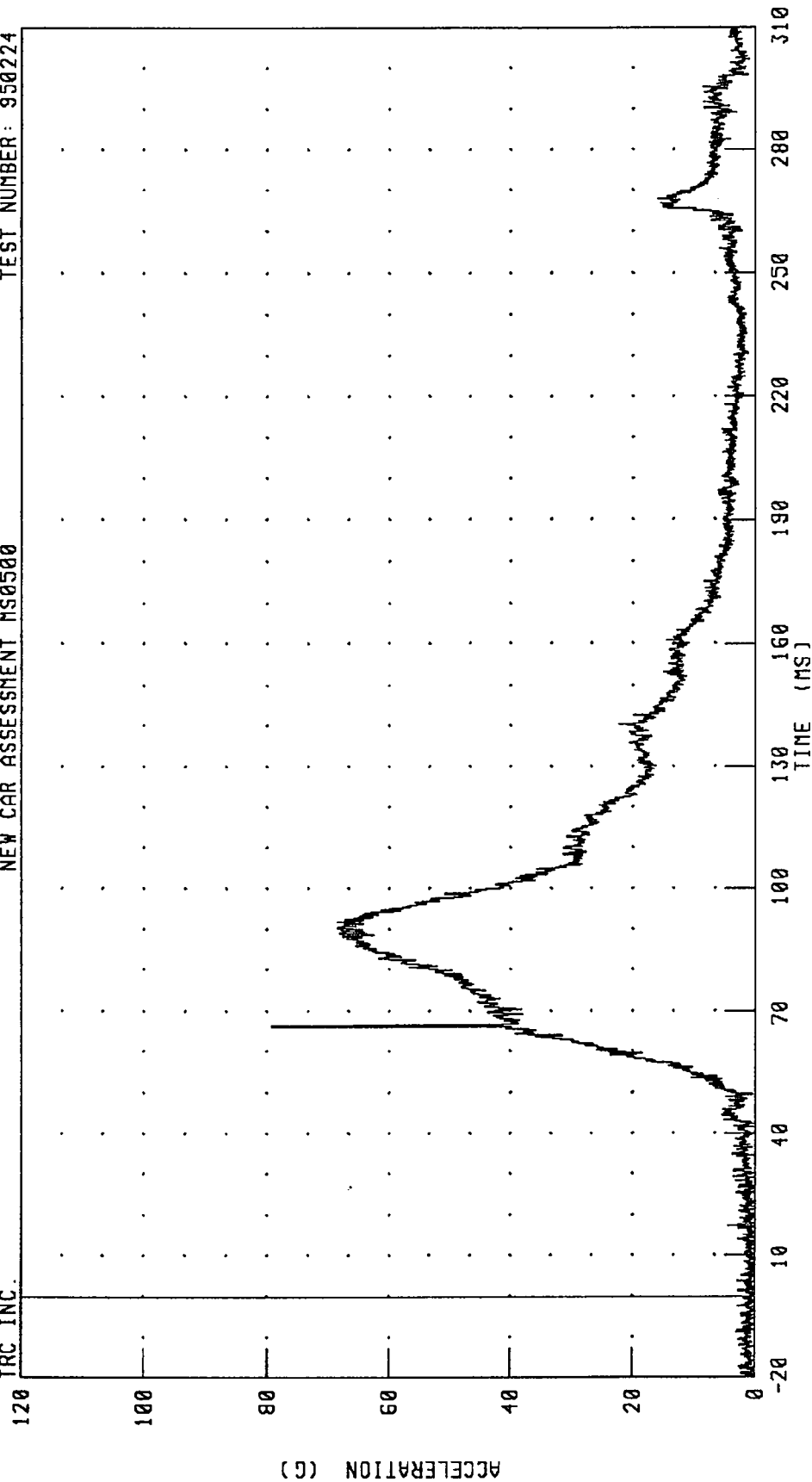
PEAK DATA: 3.59 G @ 34.80 MS; -67.71 G @ 90.40 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.

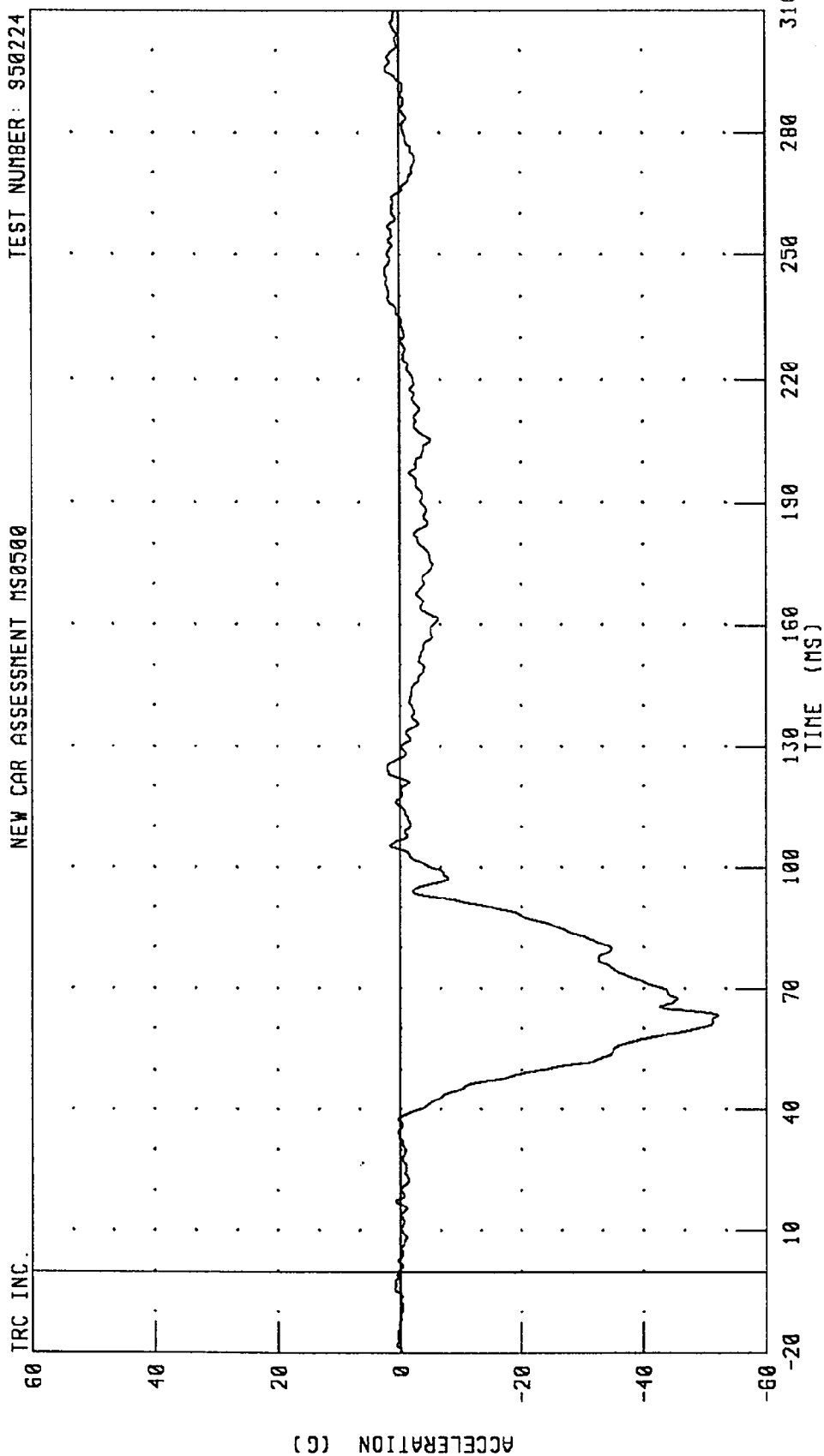


PEAK DATA: 79.37 G @ 66.32 MS; 0.11 G @ -15.84 MS

CHANNEL: HEDG2 FILTER: CH. CLASS 1000

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224



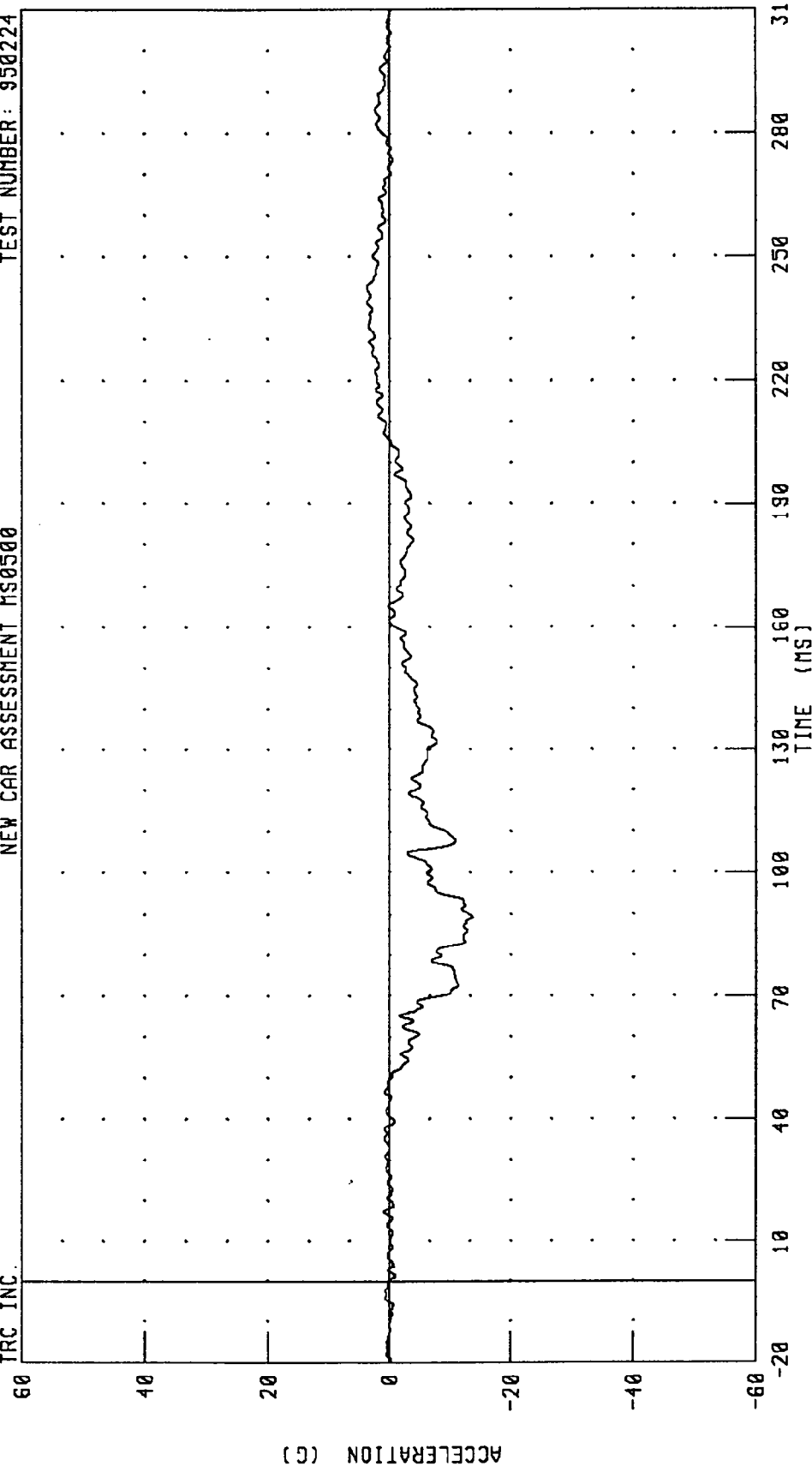
CHANNEL: CSTXG2 FILTER: CH. CLASS 180

PEAK DATA: 2.41 G @ 245.36 MS; -52.16 G @ 63.20 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



CHANNEL: CSTYG2 FILTER: CH. CLASS 180

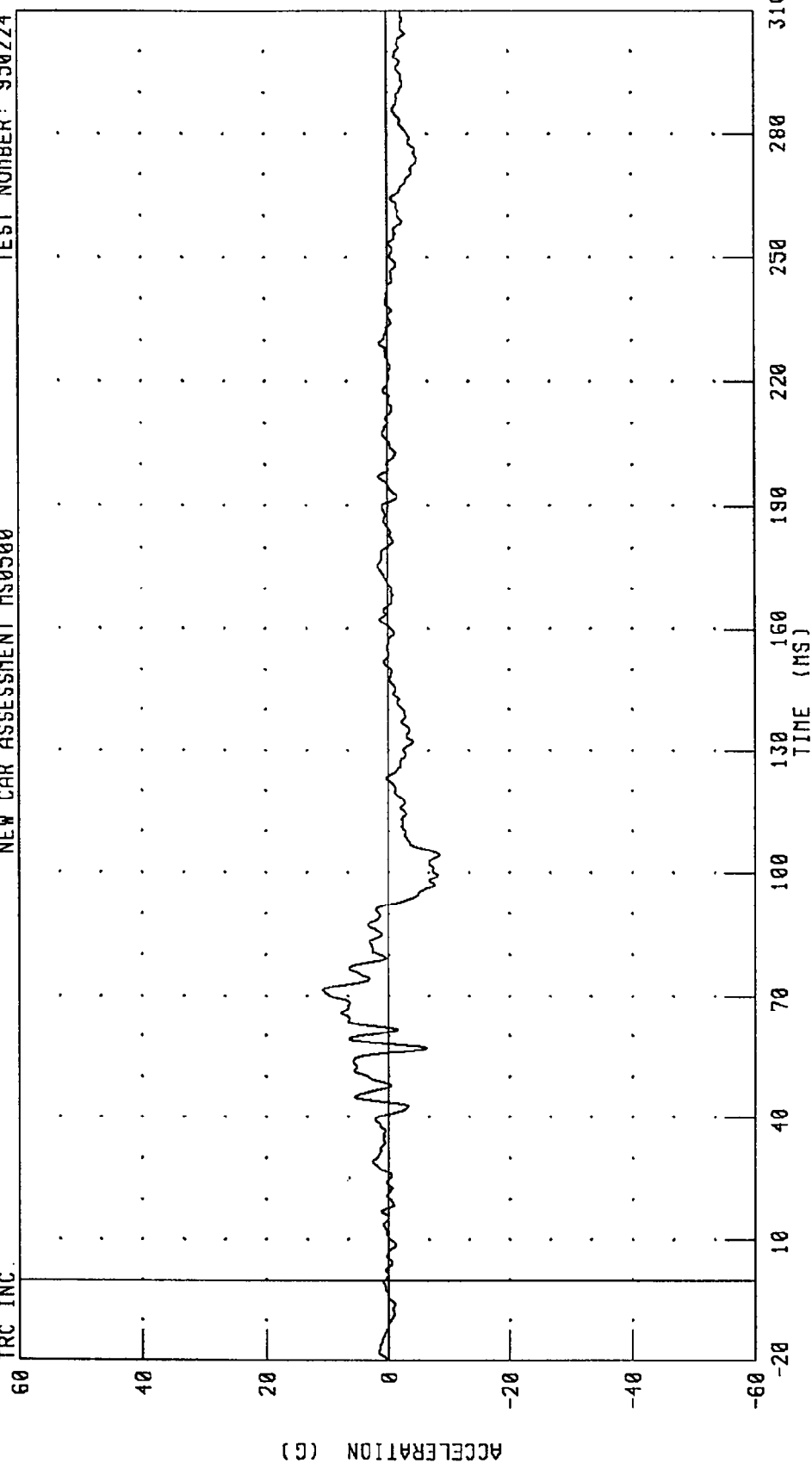
PEAK DATA: 3.76 G @ 242.96 MS; -13.65 G @ 89.52 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



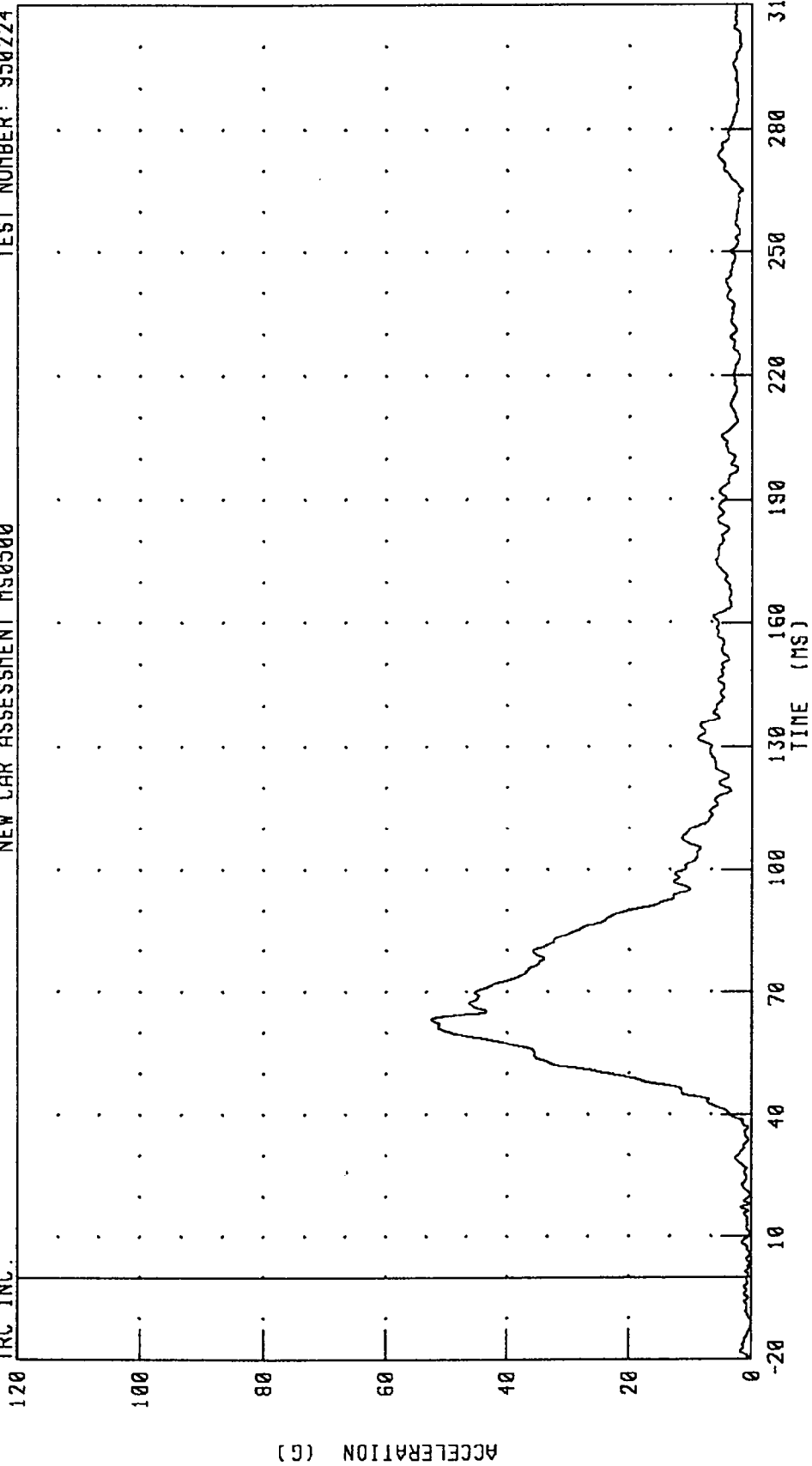
PEAK DATA: 10.77 G @ 71.52 MS, -8.38 G @ 104.40 MS

CHANNEL: CSTZG2 FILTER: CH. CLASS 180

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.

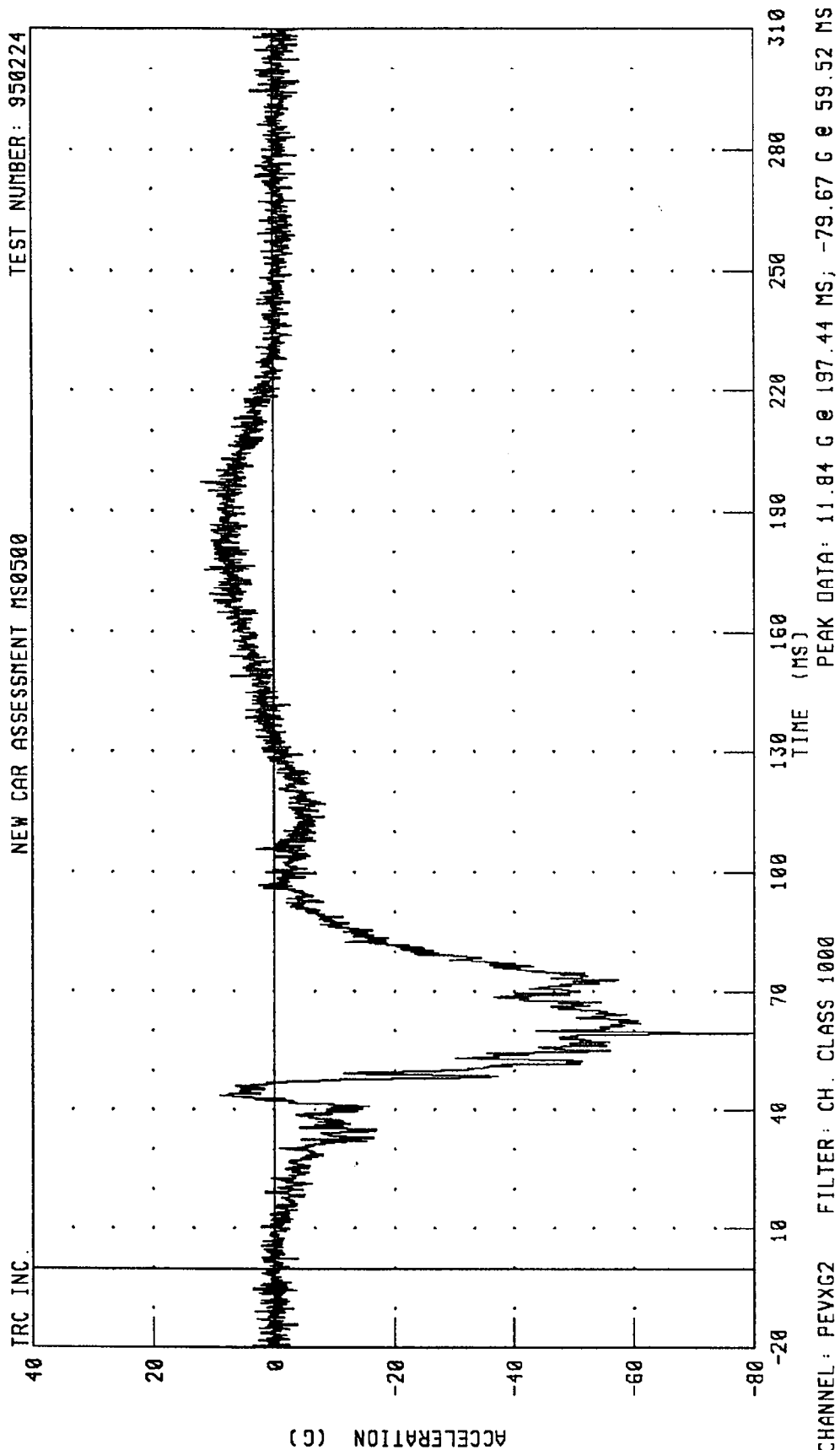


CHANNEL: CSTRG2 FILTER: CH. CLASS 180

PEAK DATA: 52.61 G @ 63.28 MS, 0.13 G @ -11.04 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

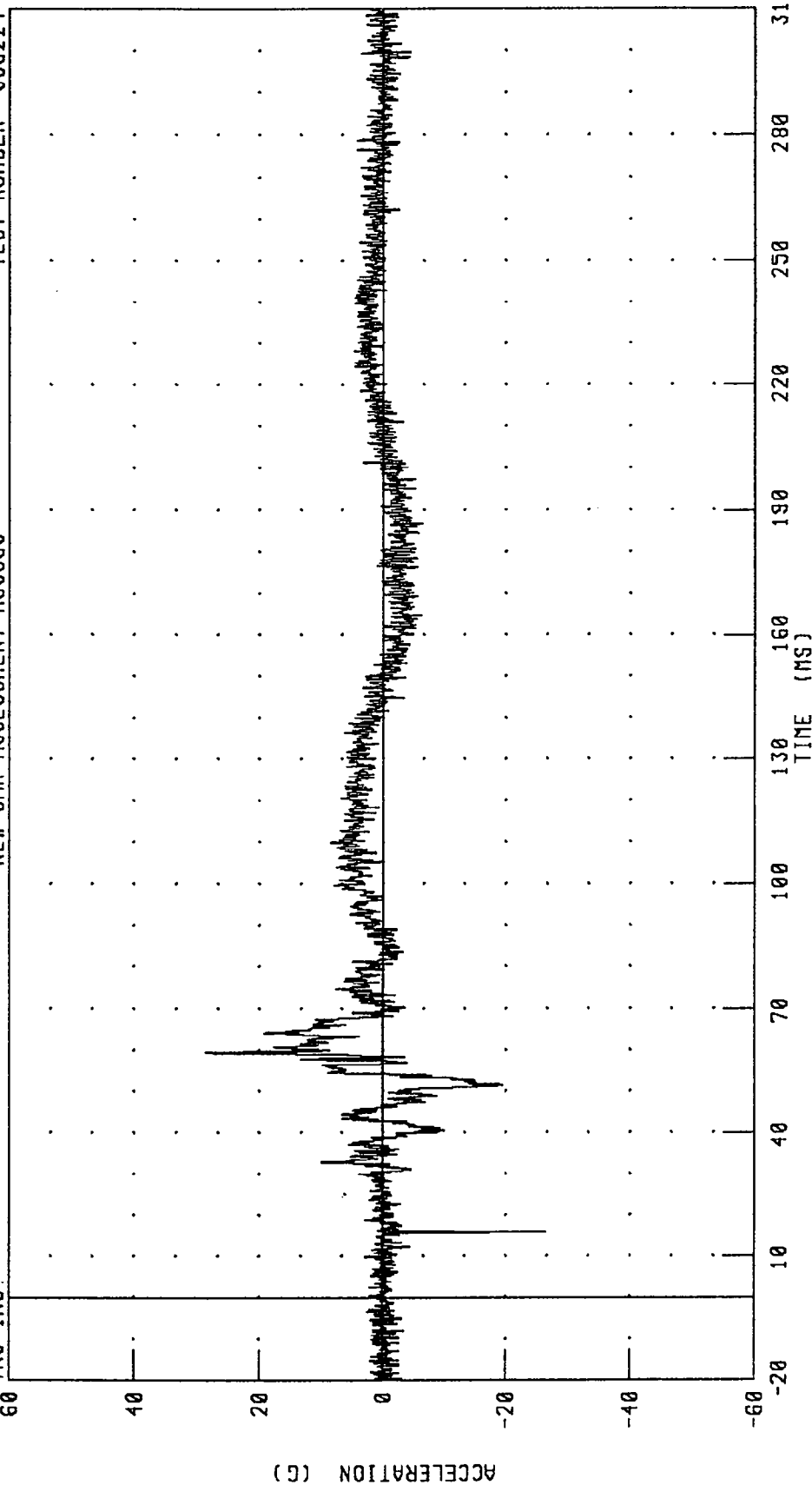


1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Y-AXIS ACCELERATION

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



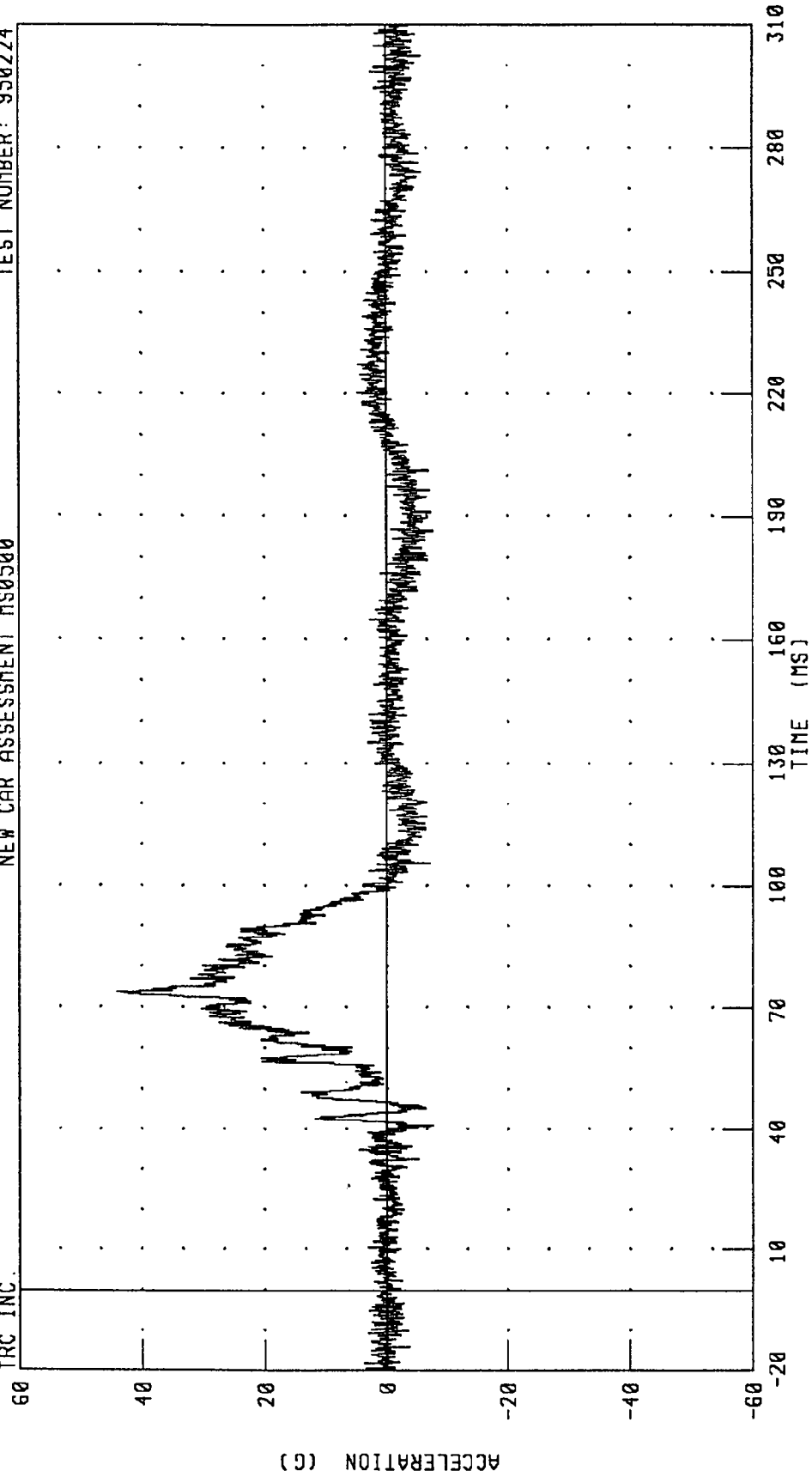
PEAK DATA: 28.62 G @ 59.52 MS; -26.33 G @ 15.84 MS

CHANNEL: PEVYG2 FILTER: CH. CLASS 1000

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



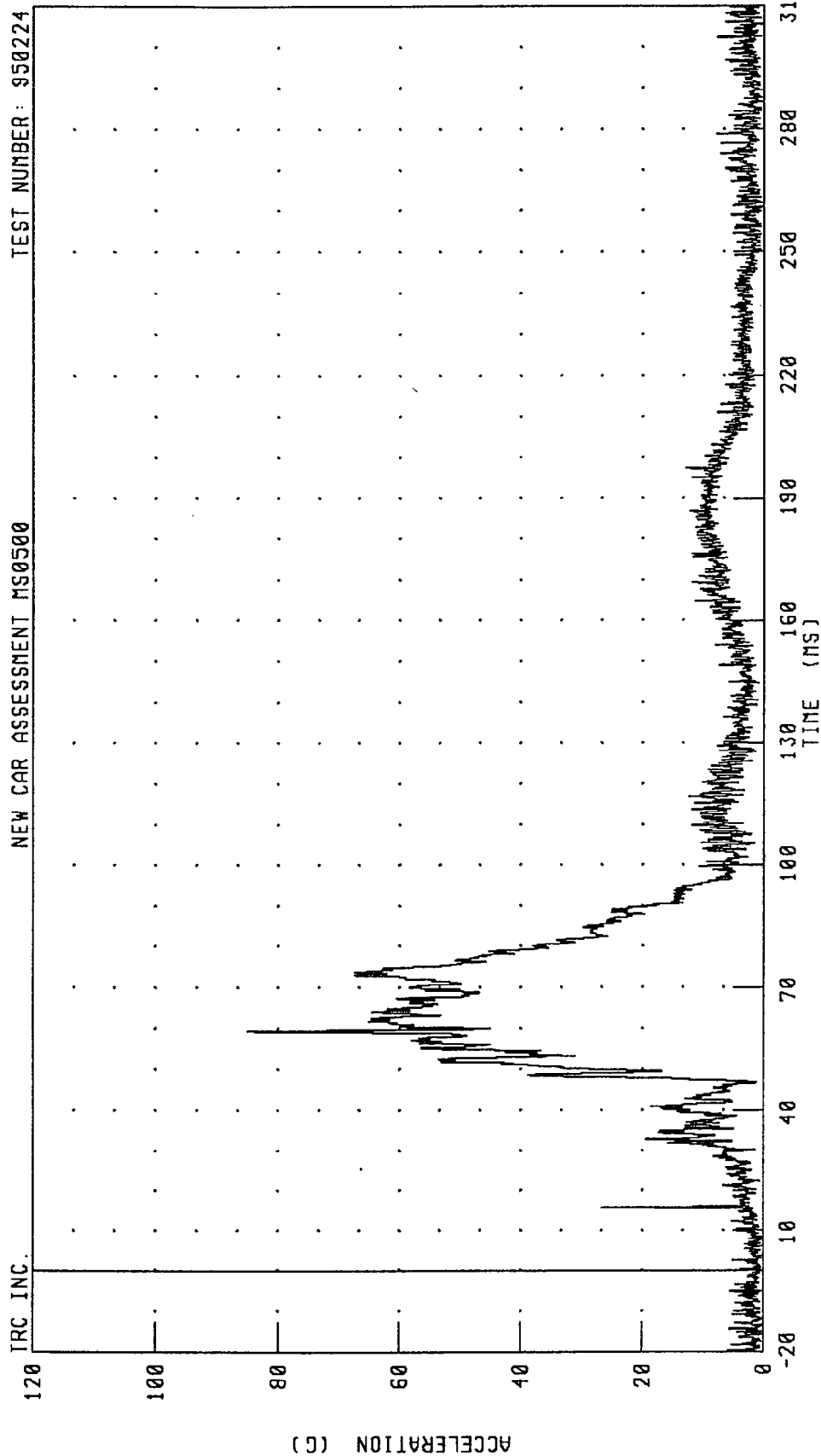
CHANNEL: PEVZG2 FILTER: CH. CLASS 1000

PEAK DATA: 44.02 G @ 73.76 MS; -7.63 G @ 40.96 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS RESULTANT ACCELERATION

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

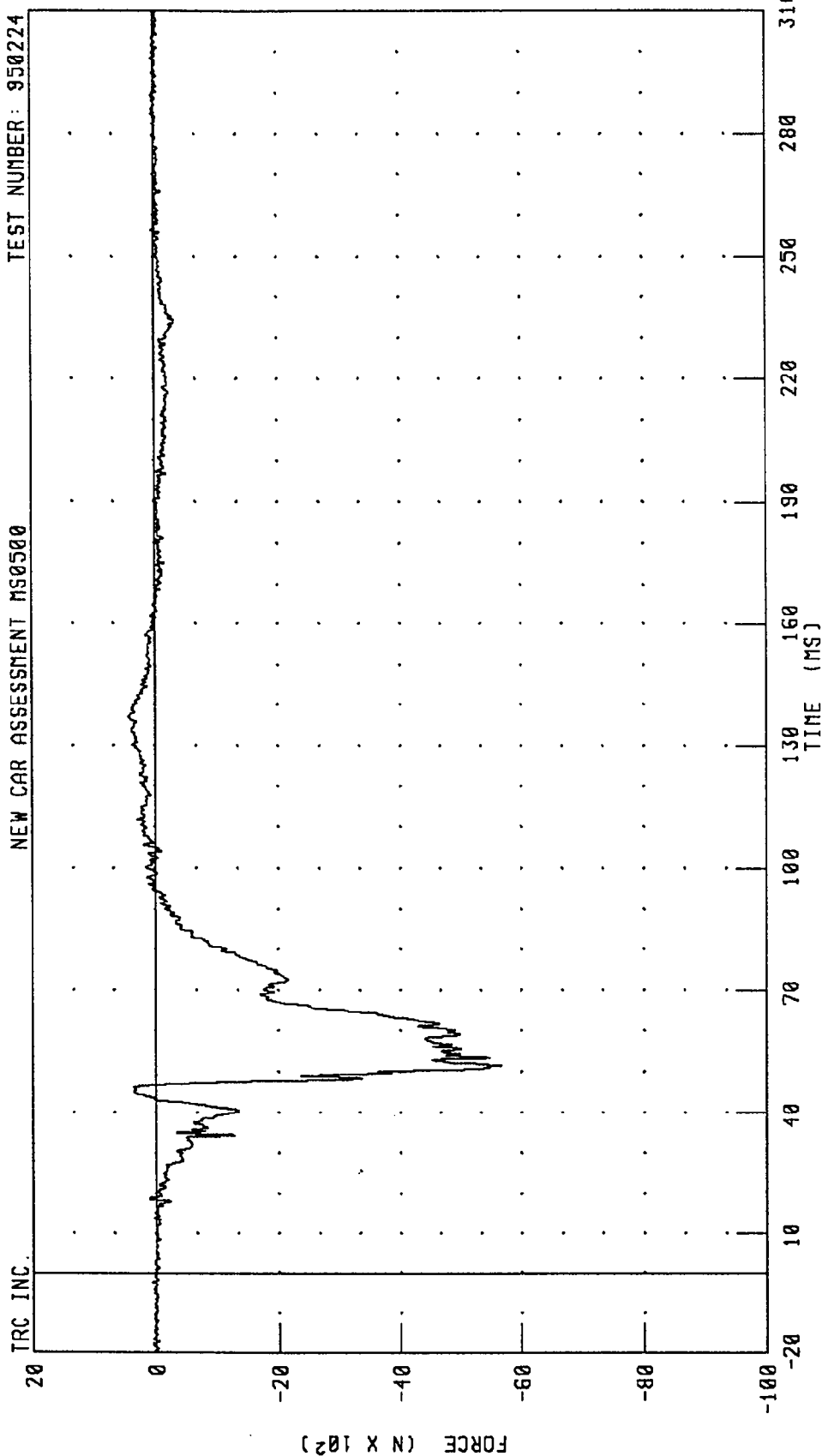


PEAK DATA: 85.07 G @ 59.52 MS; 0.20 G @ 3.76 MS

CHANNEL: PEVRG2 FILTER: CH. CLASS 1000

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FEMUR FORCE
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224



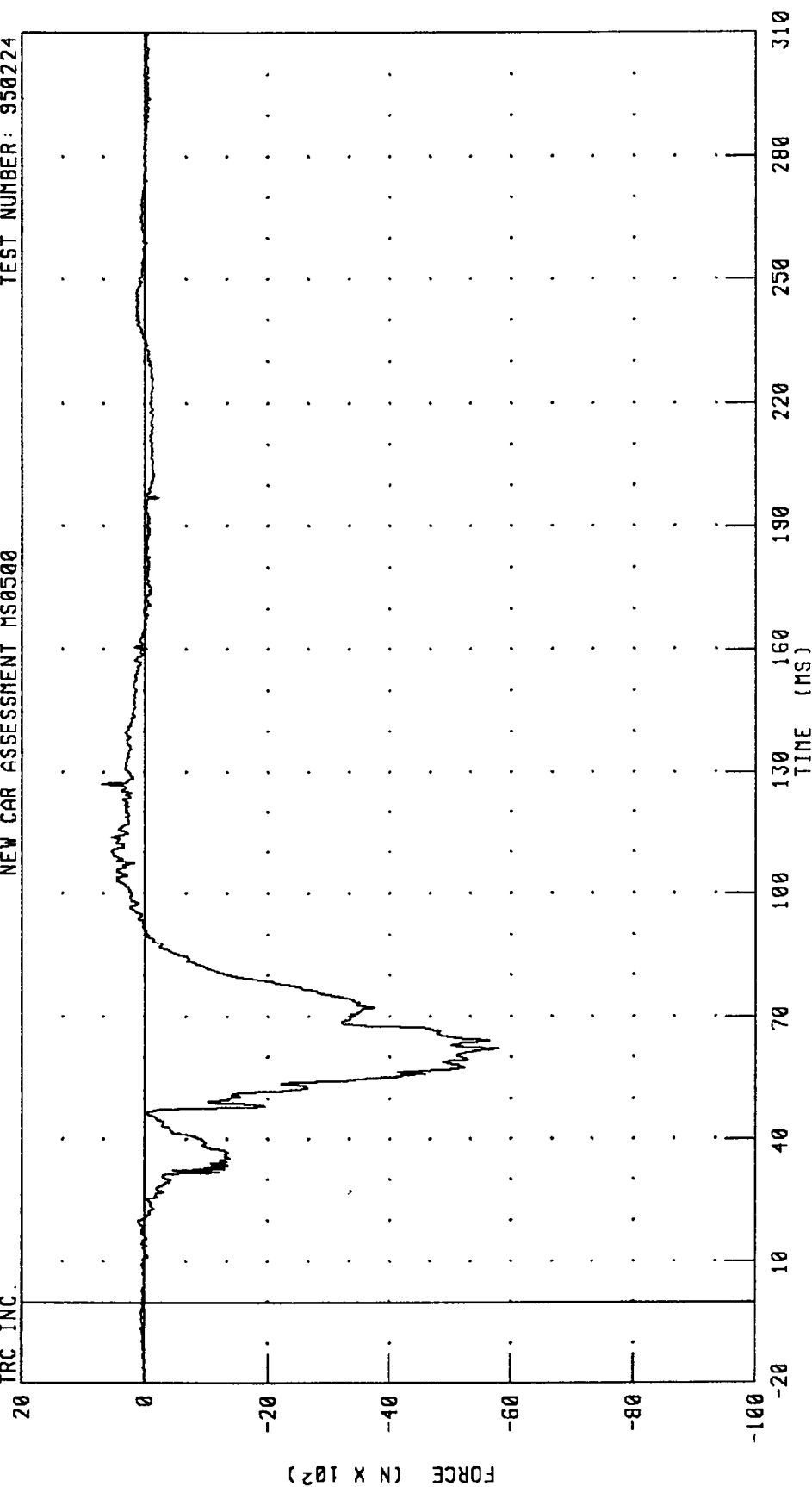
PEAK DATA: 432.37 N @ 136.96 MS; -5682.15 N @ 51.60 MS

CHANNEL: LFMF2 FILTER: CH. CLASS 600

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 PASSENGER RIGHT FEMUR FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



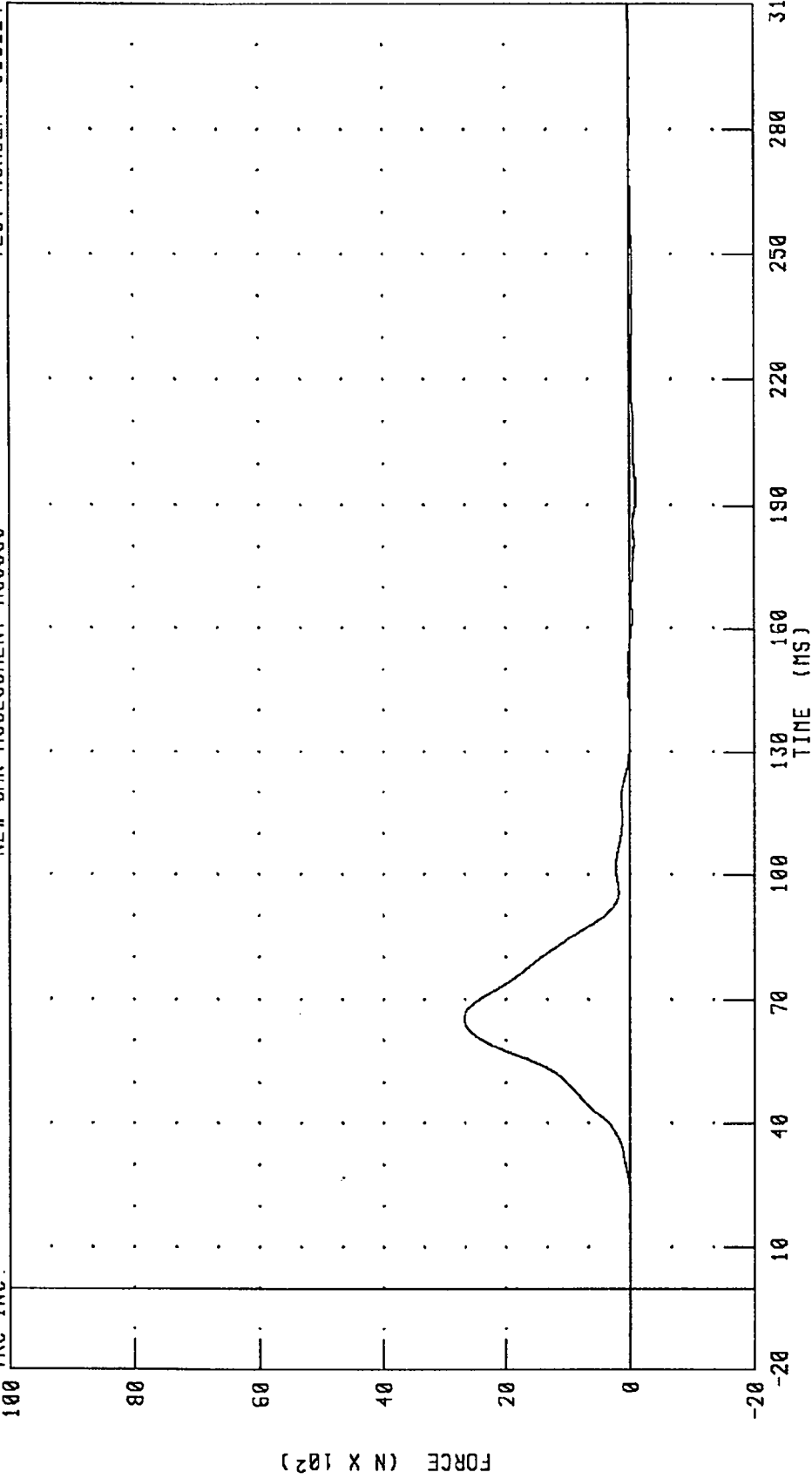
CHANNEL: RFMF2 FILTER: CH. CLASS 600

PEAK DATA: 688.23 N @ 127.12 MS; -5791.62 N @ 62.24 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.

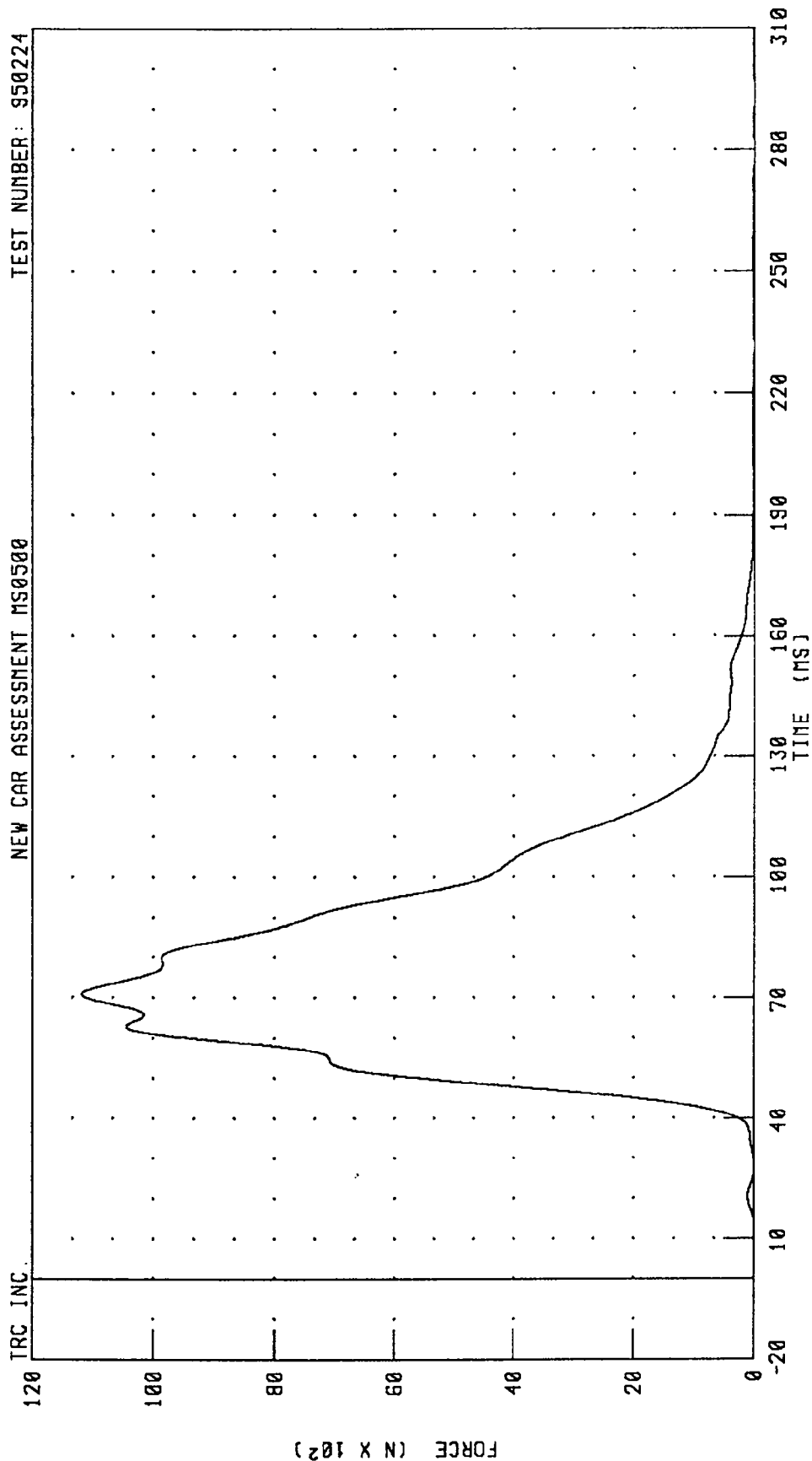


PEAK DATA: 2679.36 N @ 65.28 MS; -105.13 N @ 192.56 MS

CHANNEL: LB0F2 FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT FORCE
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

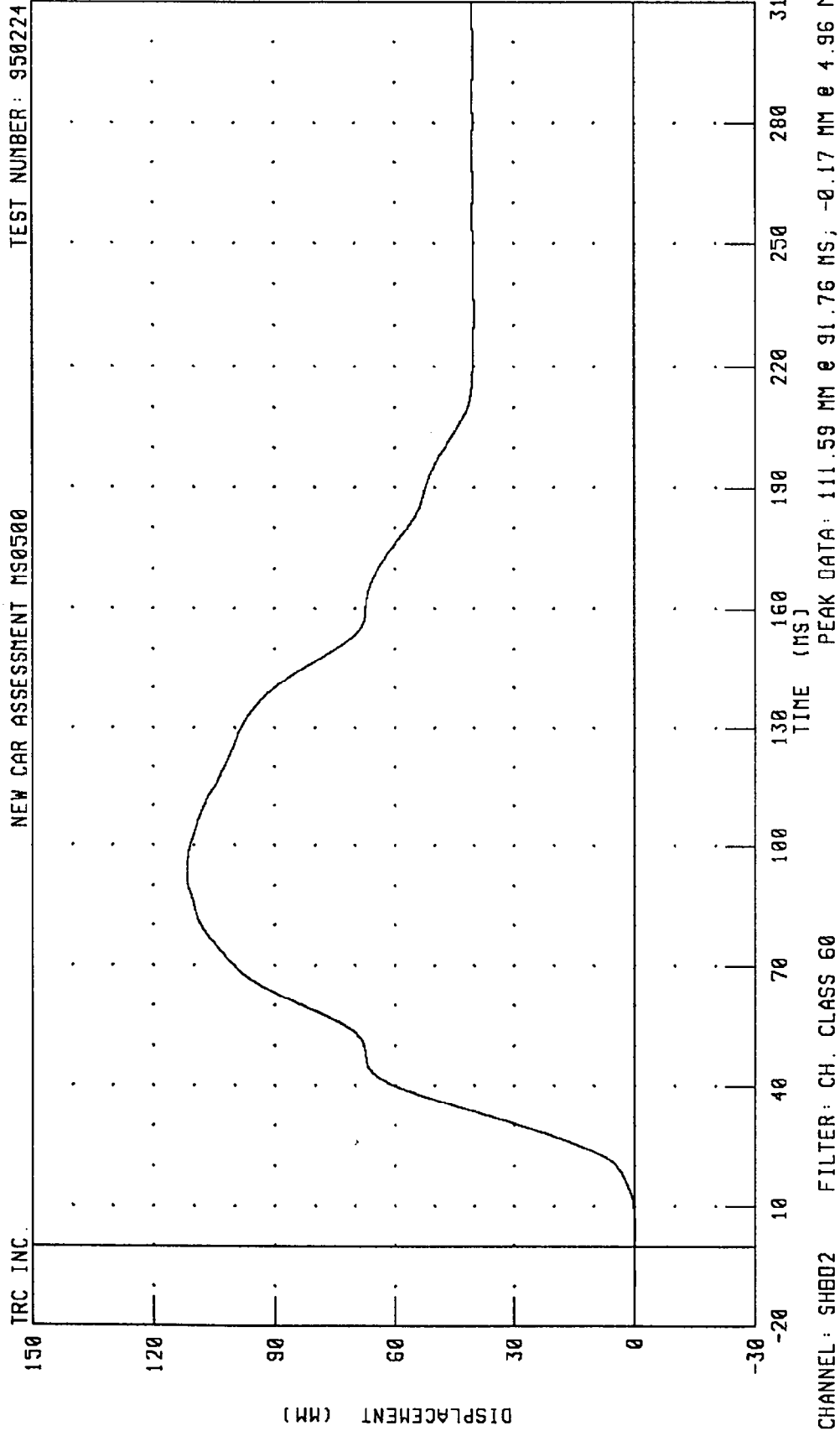


PEAK DATA: 11177.30 N @ 70.88 MS; -13.59 N @ 12.56 MS

CHANNEL: SHBF2 FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT MS0500

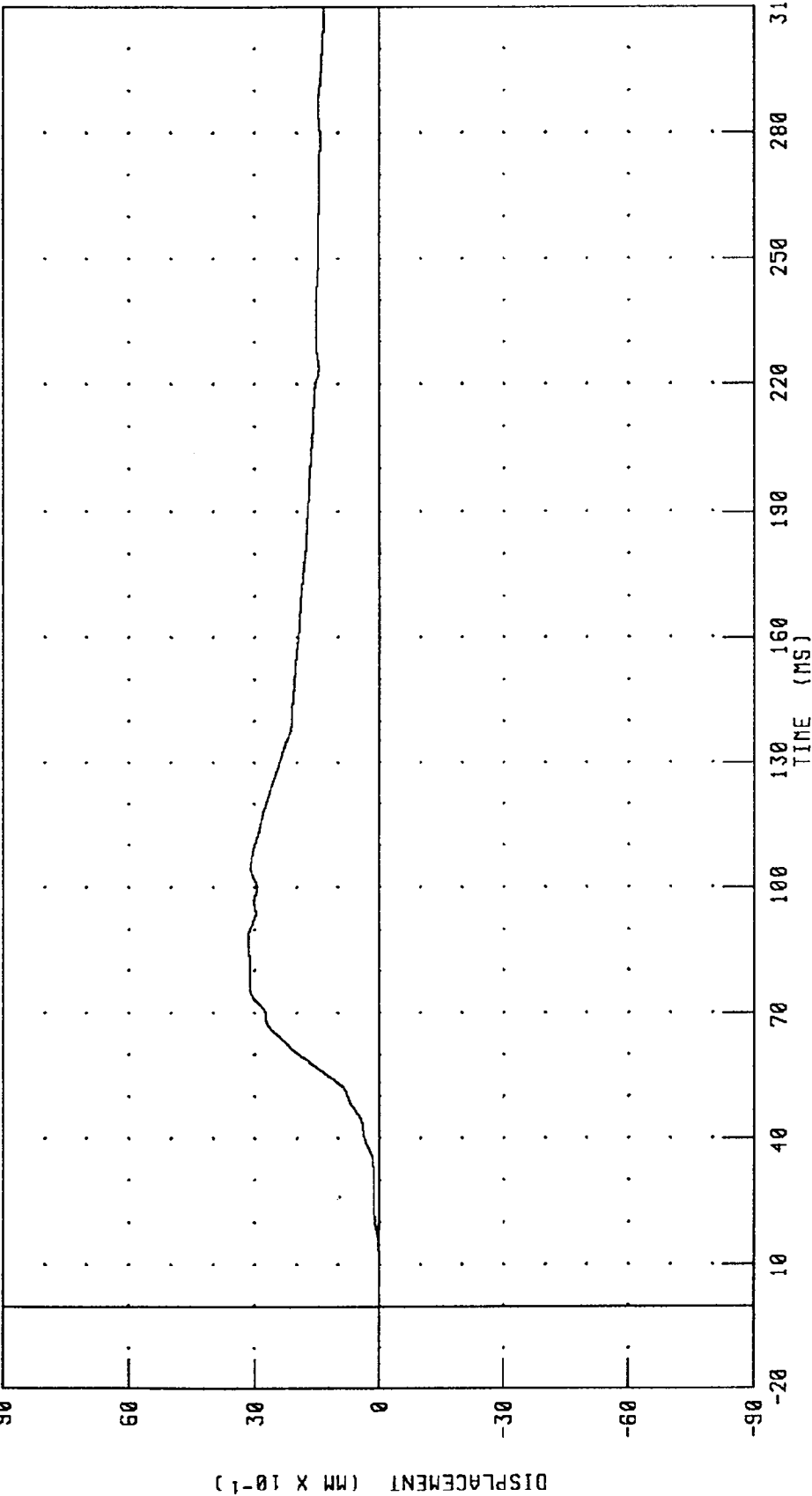
TEST NUMBER: 950224



1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.

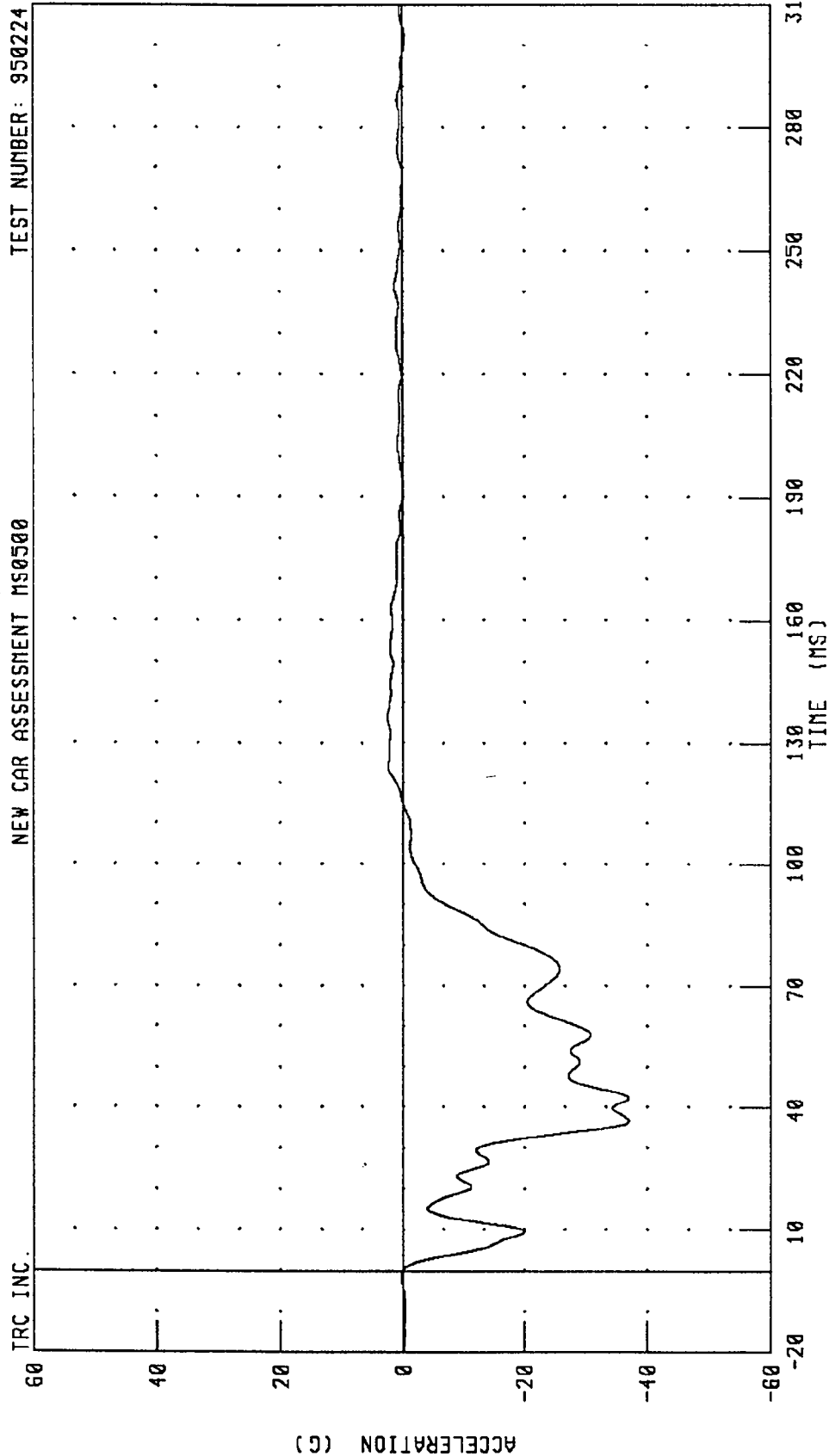


CHANNEL: SBED2 FILTER: CH. CLASS 60

PEAK DATA: 3.16 MM @ 87.52 MS; 0.00 MM @ -20.00 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

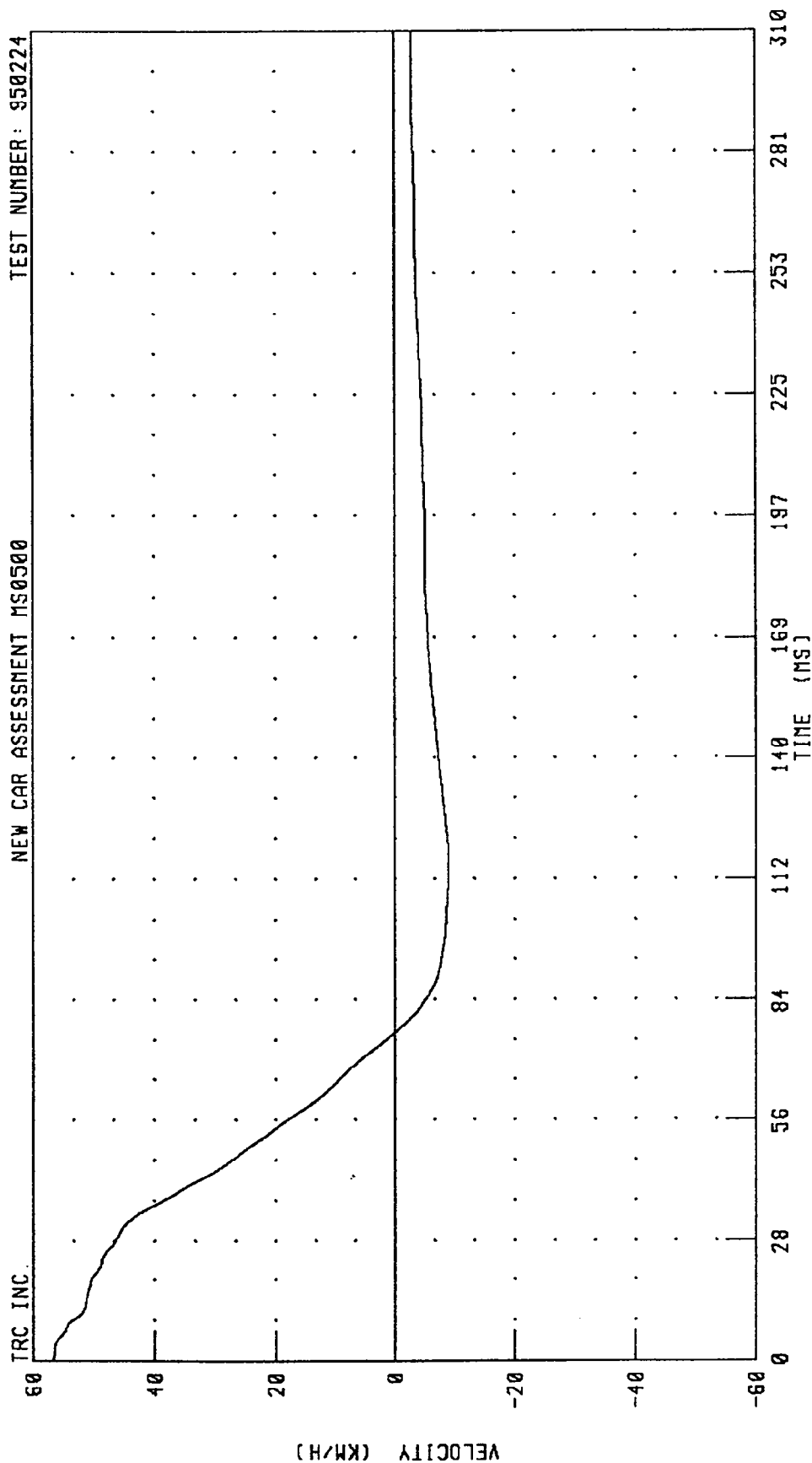


PEAK DATA: 2.56 G @ 136.24 MS; -37.01 G @ 36.64 MS

CHANNEL: TLRXG1 FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS VELOCITY
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224



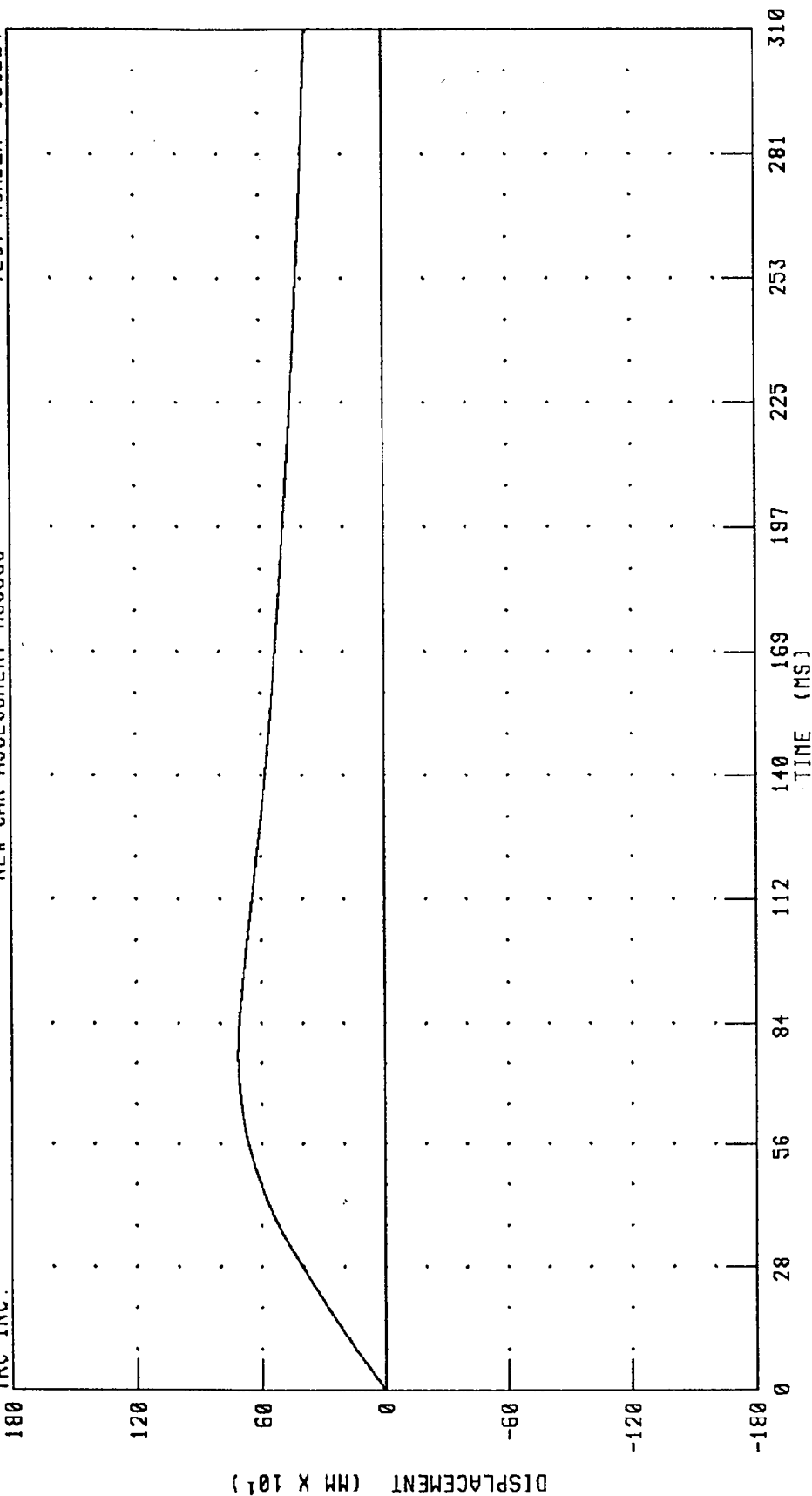
CHANNEL: TLRXV1 FILTER: CH. CLASS 180

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS DISPLACEMENT

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



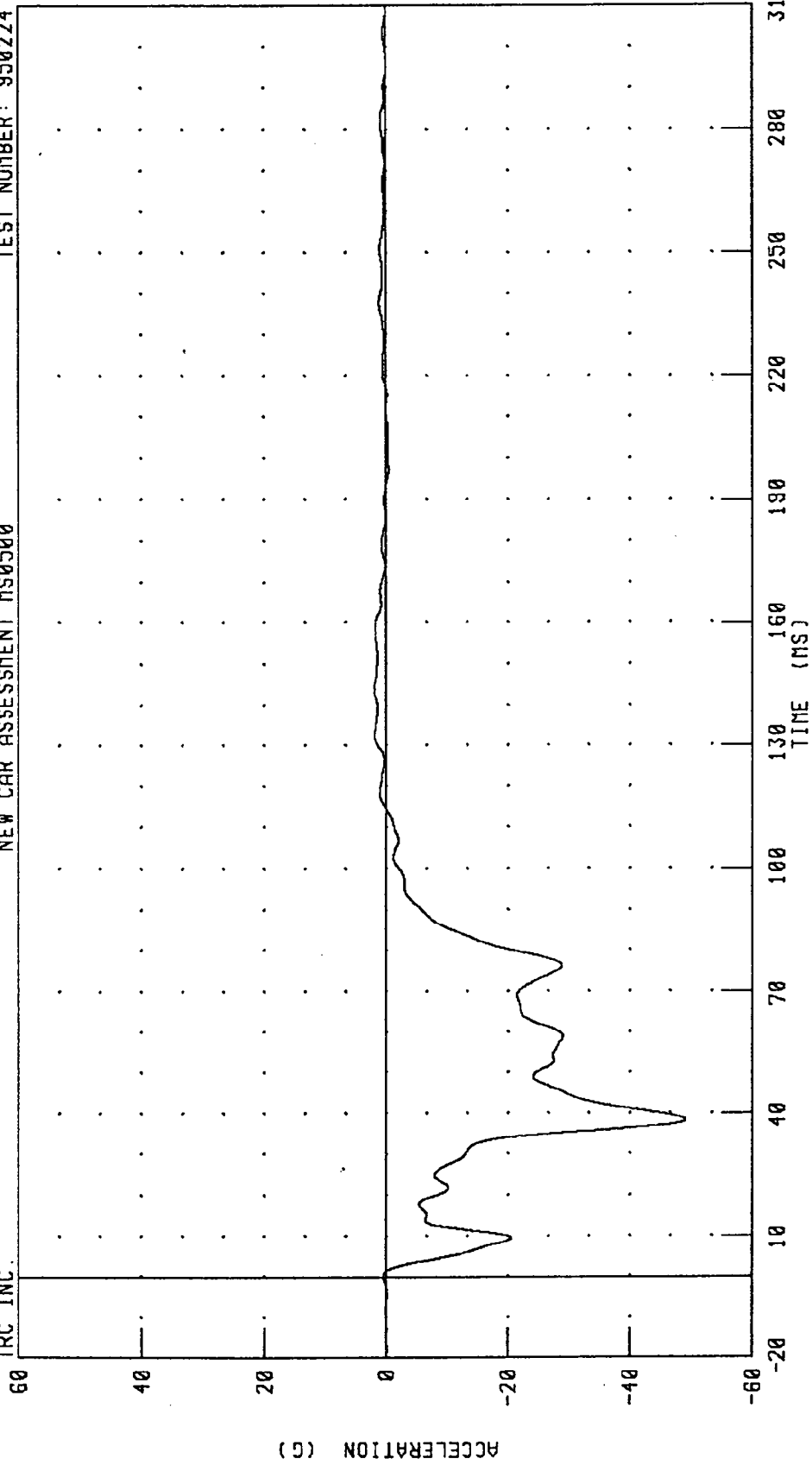
PEAK DATA: 714.13 MM @ 76.88 MS; 0.00 MM @ 0.00 MS

CHANNEL: TLRX01 FILTER: CH. CLASS 180

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

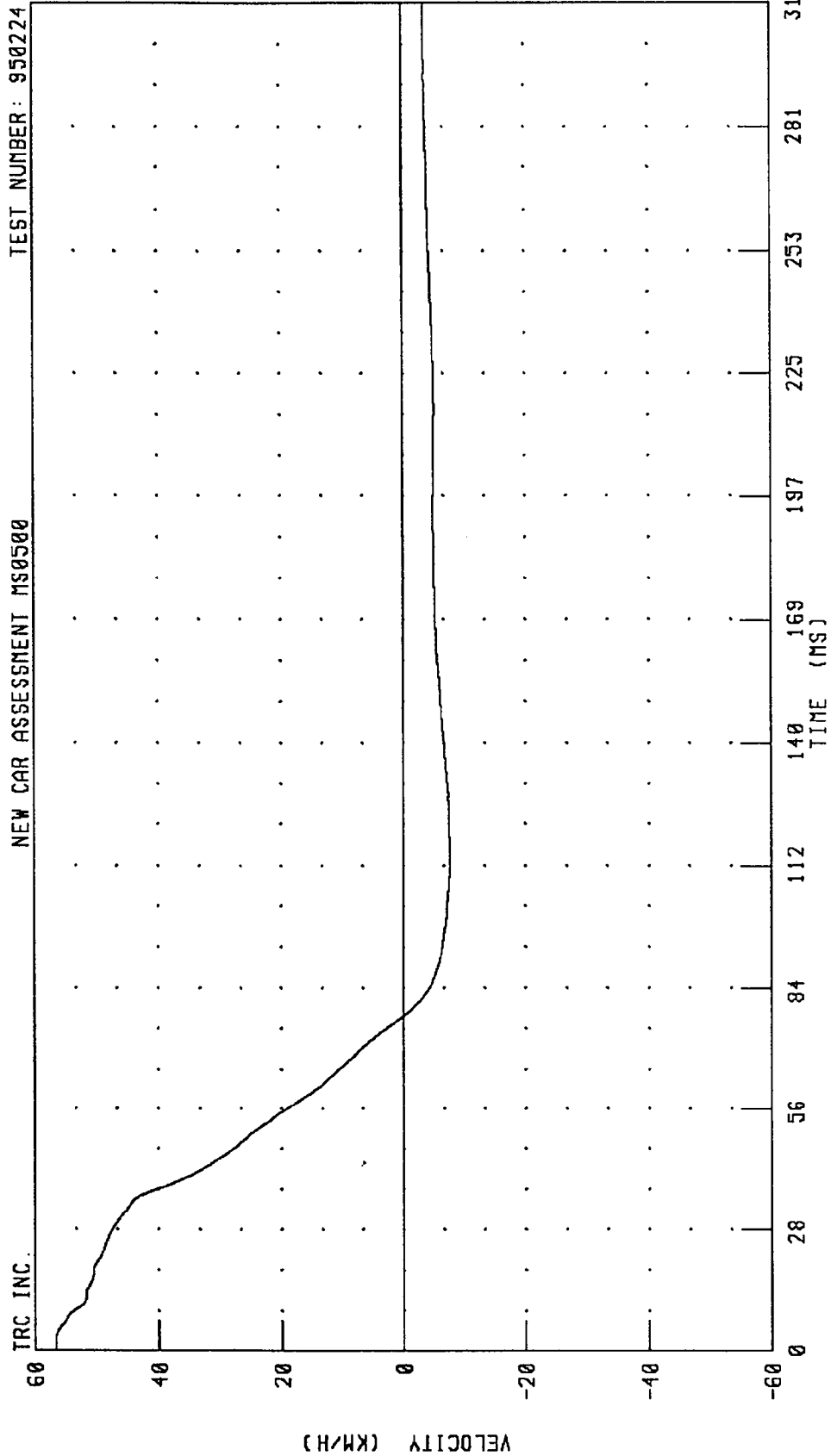
TRC INC.



CHANNEL: TRRXG1 FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS VELOCITY
 NEW CAR ASSESSMENT MS0500

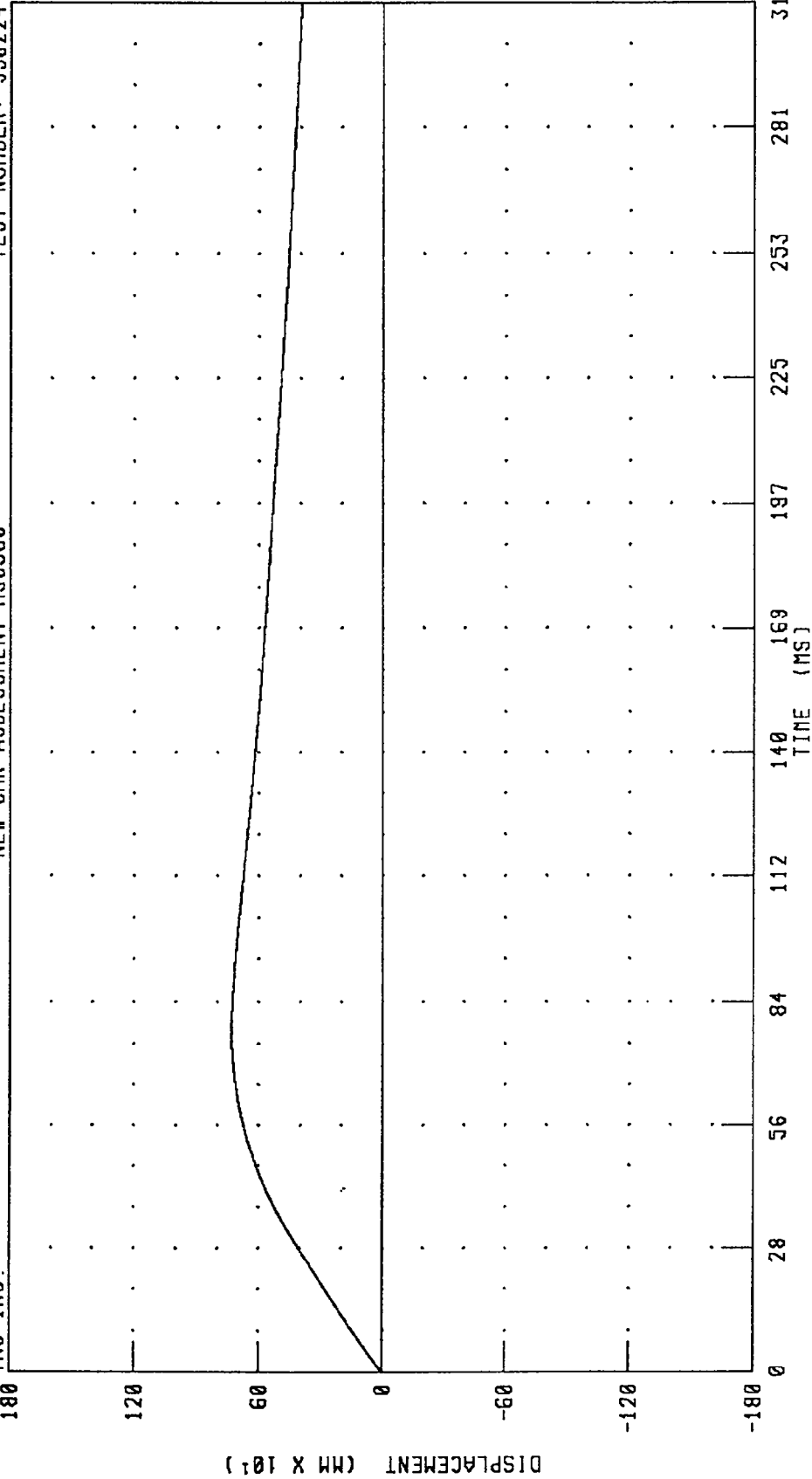
TEST NUMBER: 950224



1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS DISPLACEMENT
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.

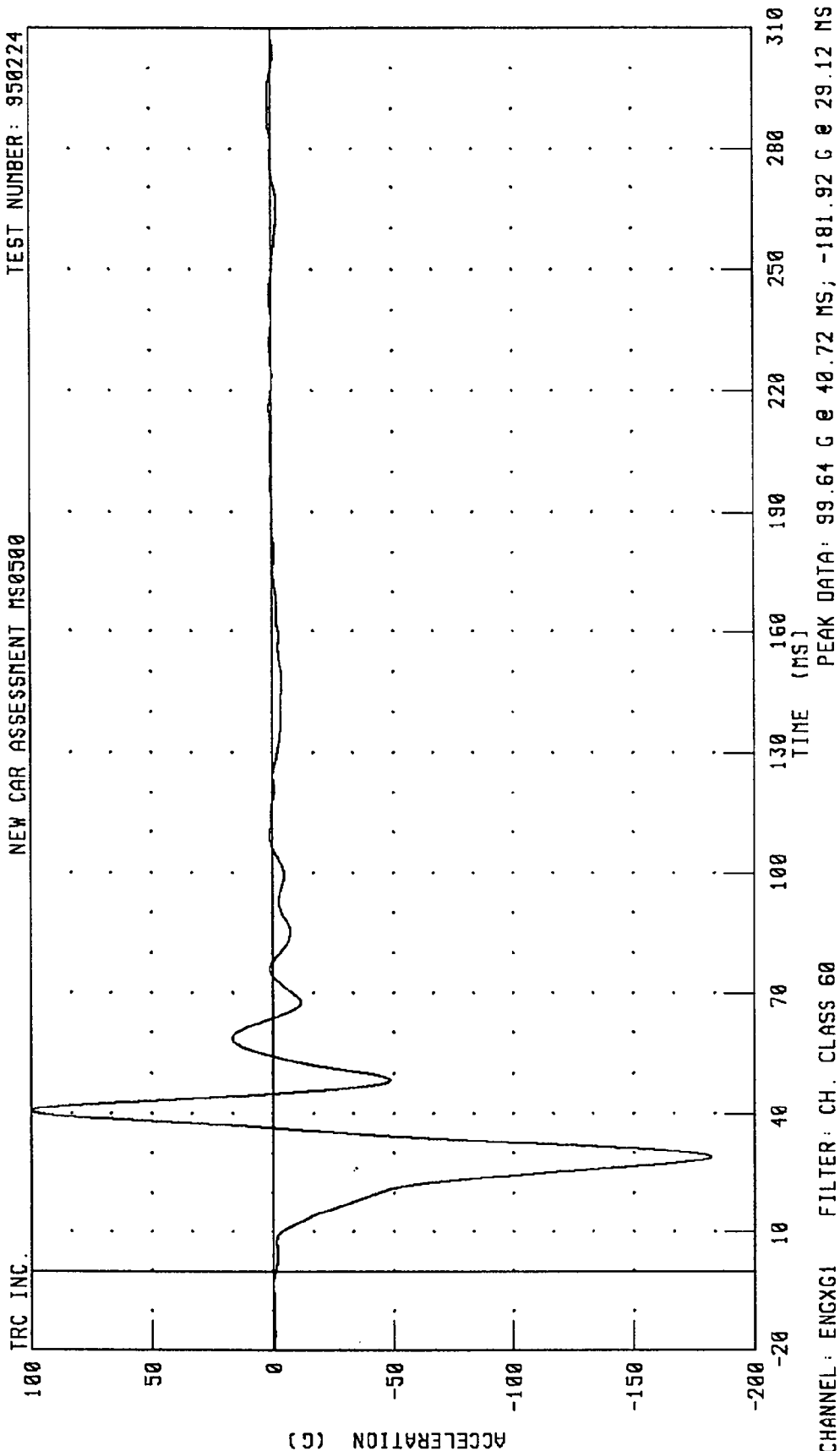


PEAK DATA: 731.41 MM @ 78.00 MS; 0.00 MM @ 0.00 MS

CHANNEL: TRRX01 FILTER: CH. CLASS 180

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
ENGINE TOP X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

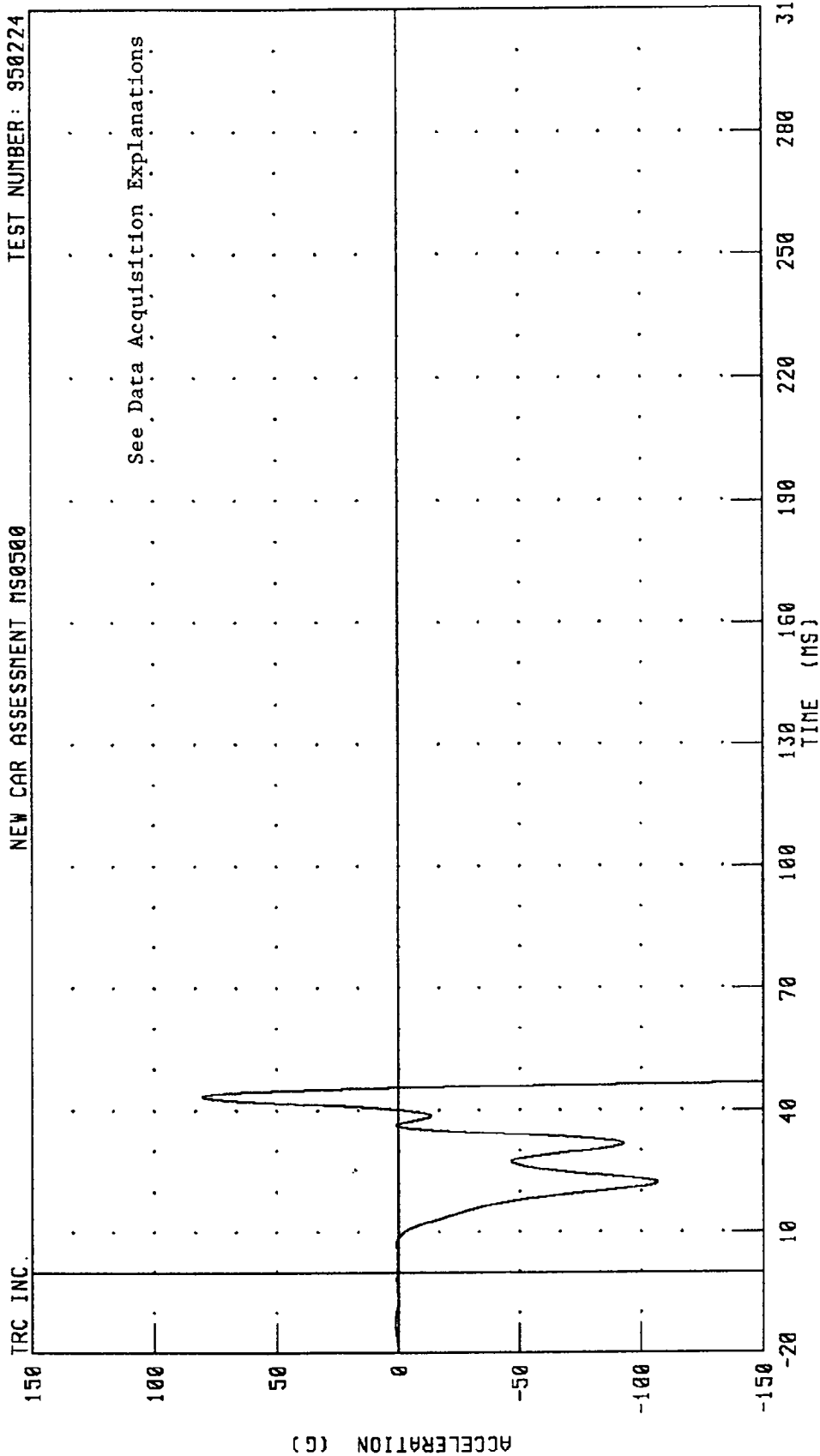


PEAK DATA: 99.64 G @ 40.72 MS; -181.92 G @ 29.12 MS

CHANNEL: ENG1 FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 ENGINE BOTTOM X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

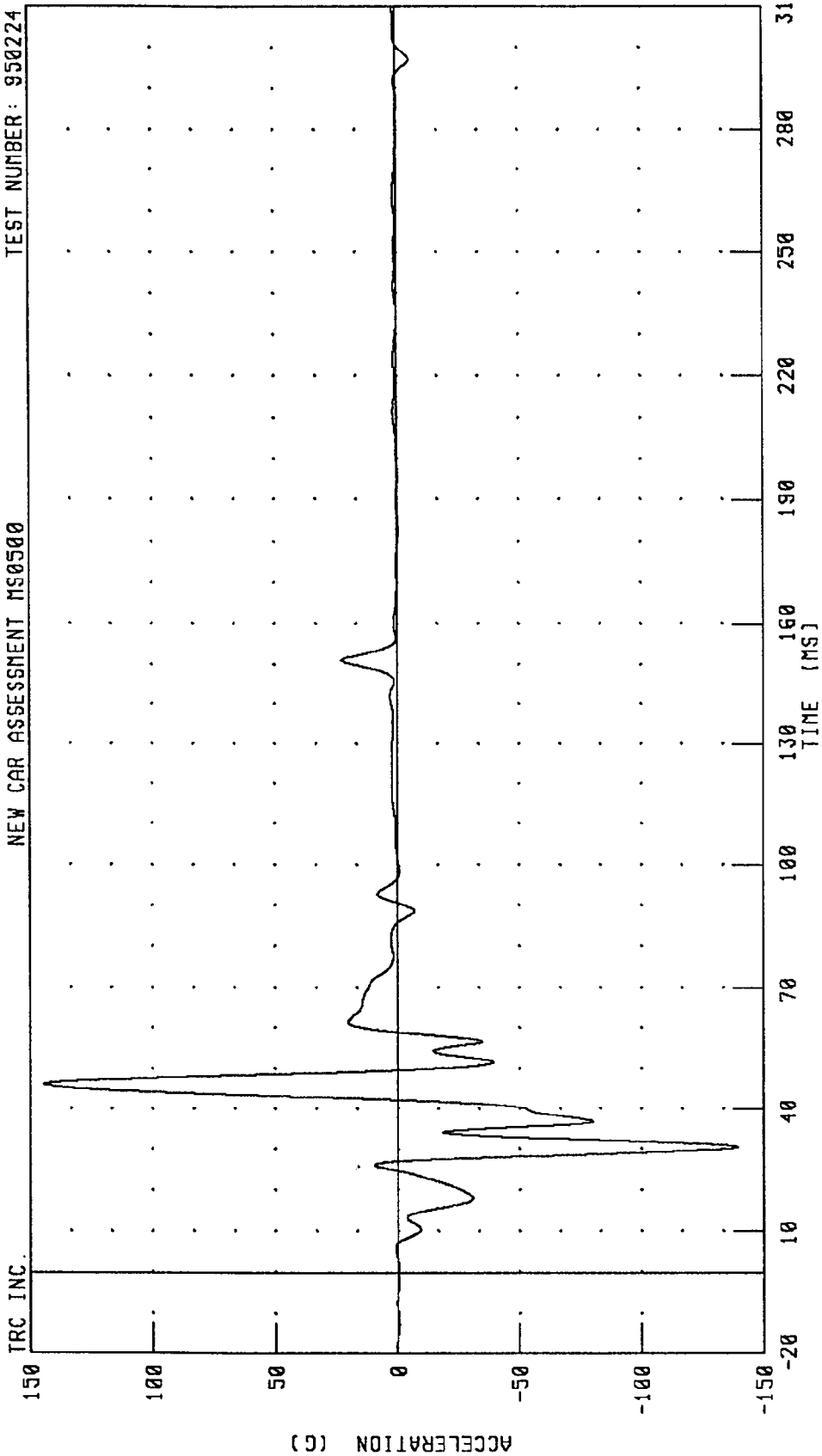


PEAK DATA: 80.32 G @ 43.44 MS; -129.50 G @ 61.20 MS

CHANNEL: ENGXC2 FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 RIGHT BRAKE CALIPER X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS0500

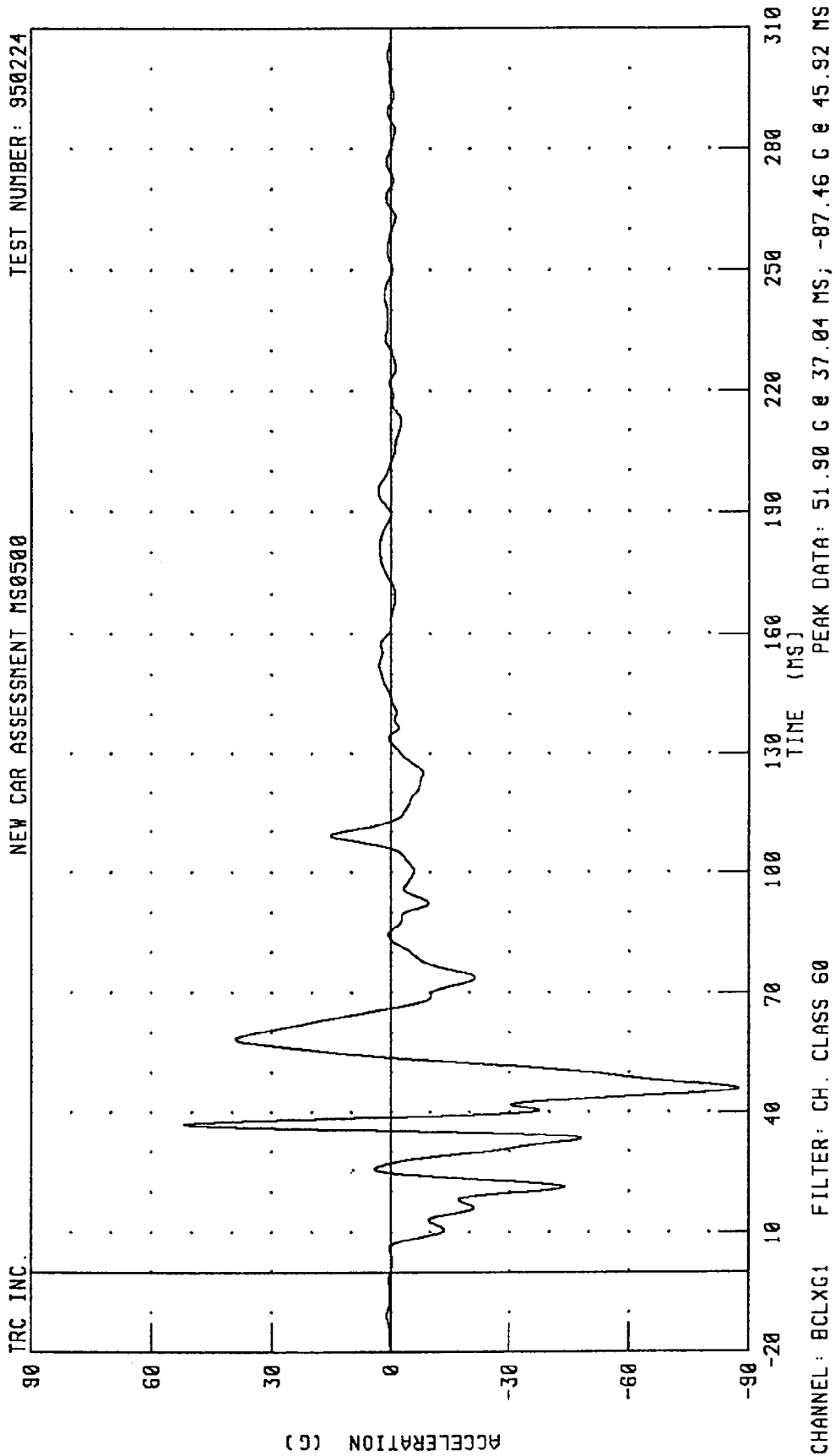
TEST NUMBER: 950224



PEAK DATA: 144.19 G @ 46.16 MS; -139.37 G @ 30.56 MS

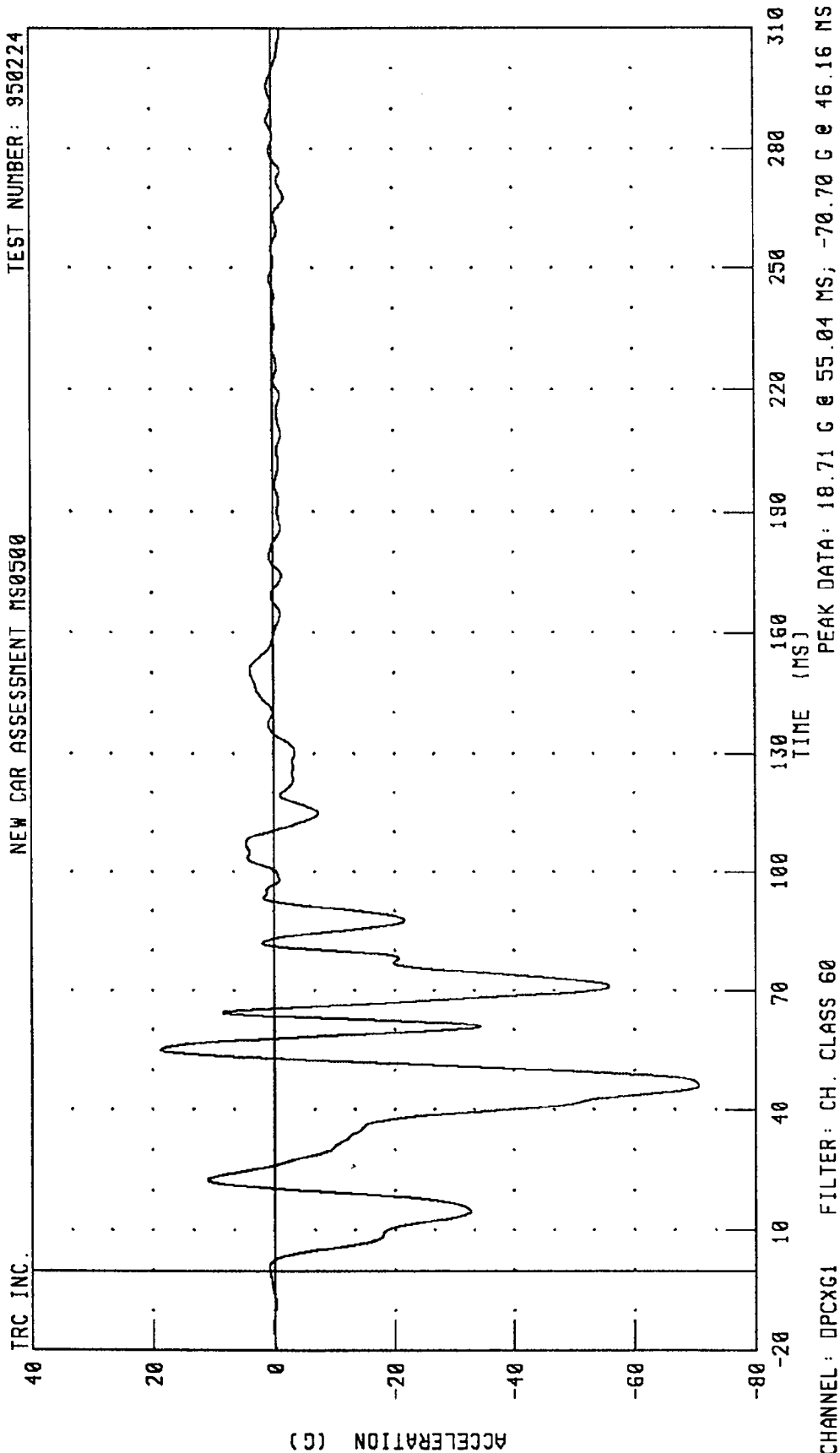
CHANNEL: BCRXG1 FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION



1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

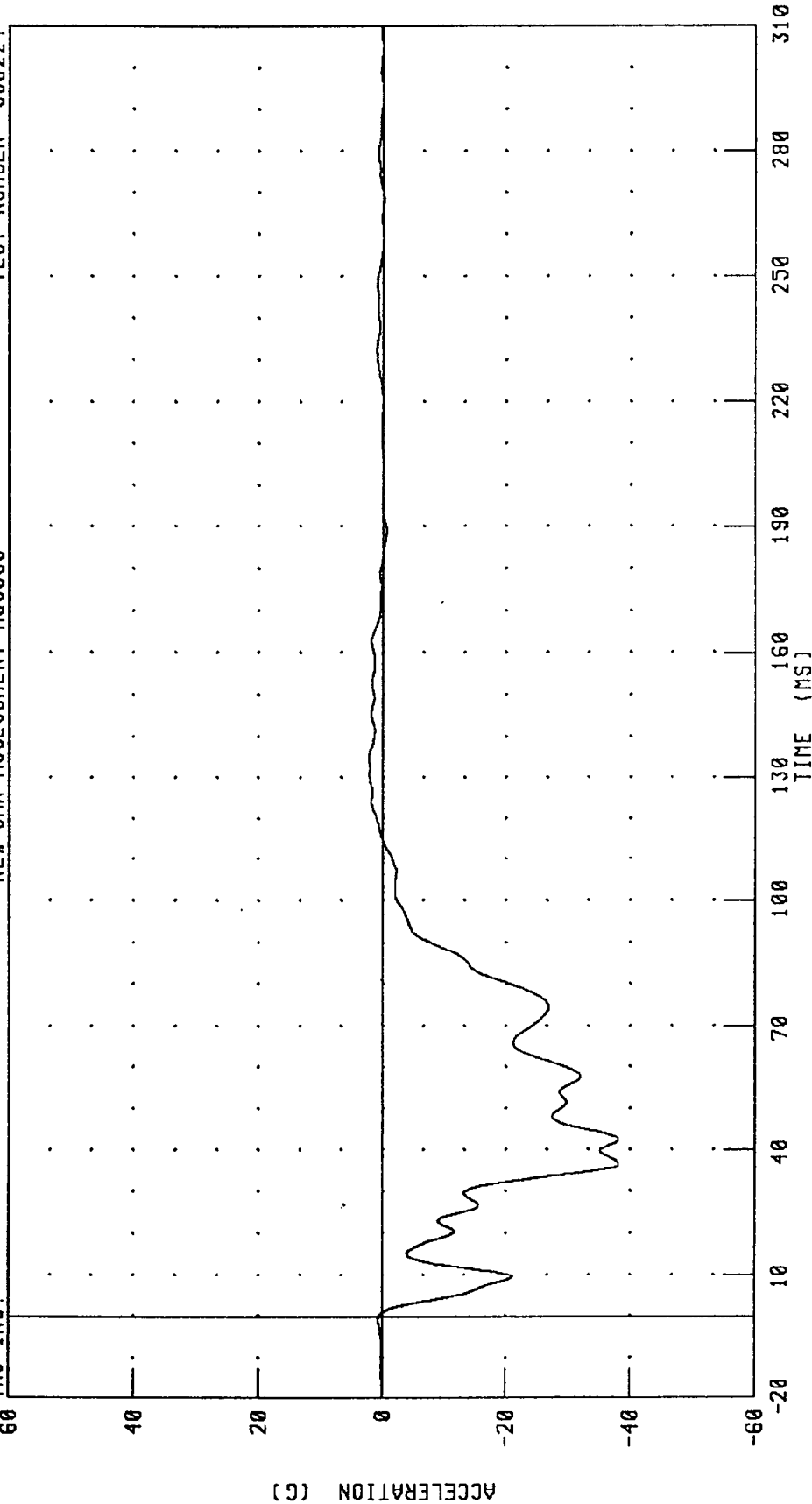


1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.

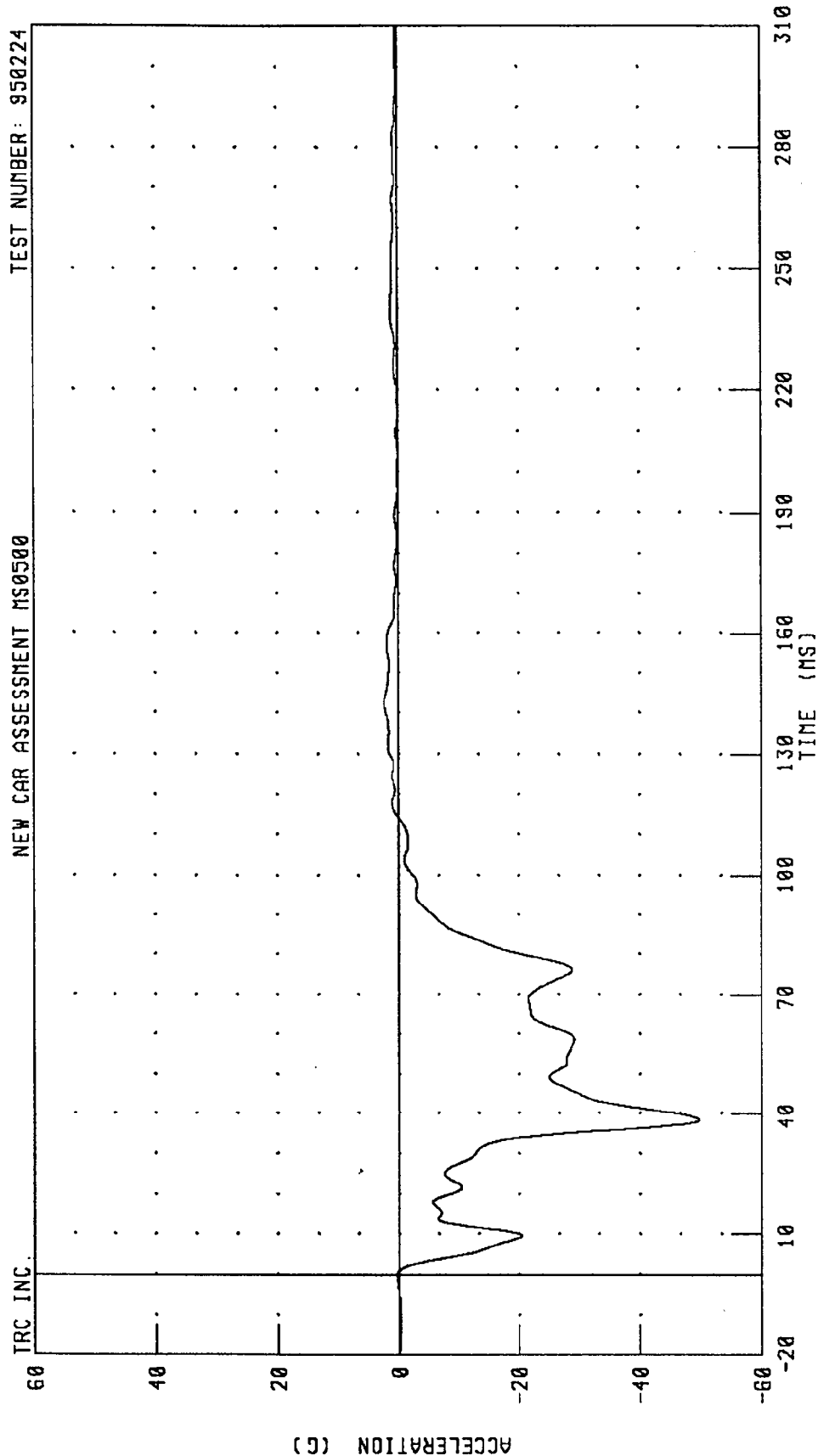


CHANNEL: TLRXGA FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500



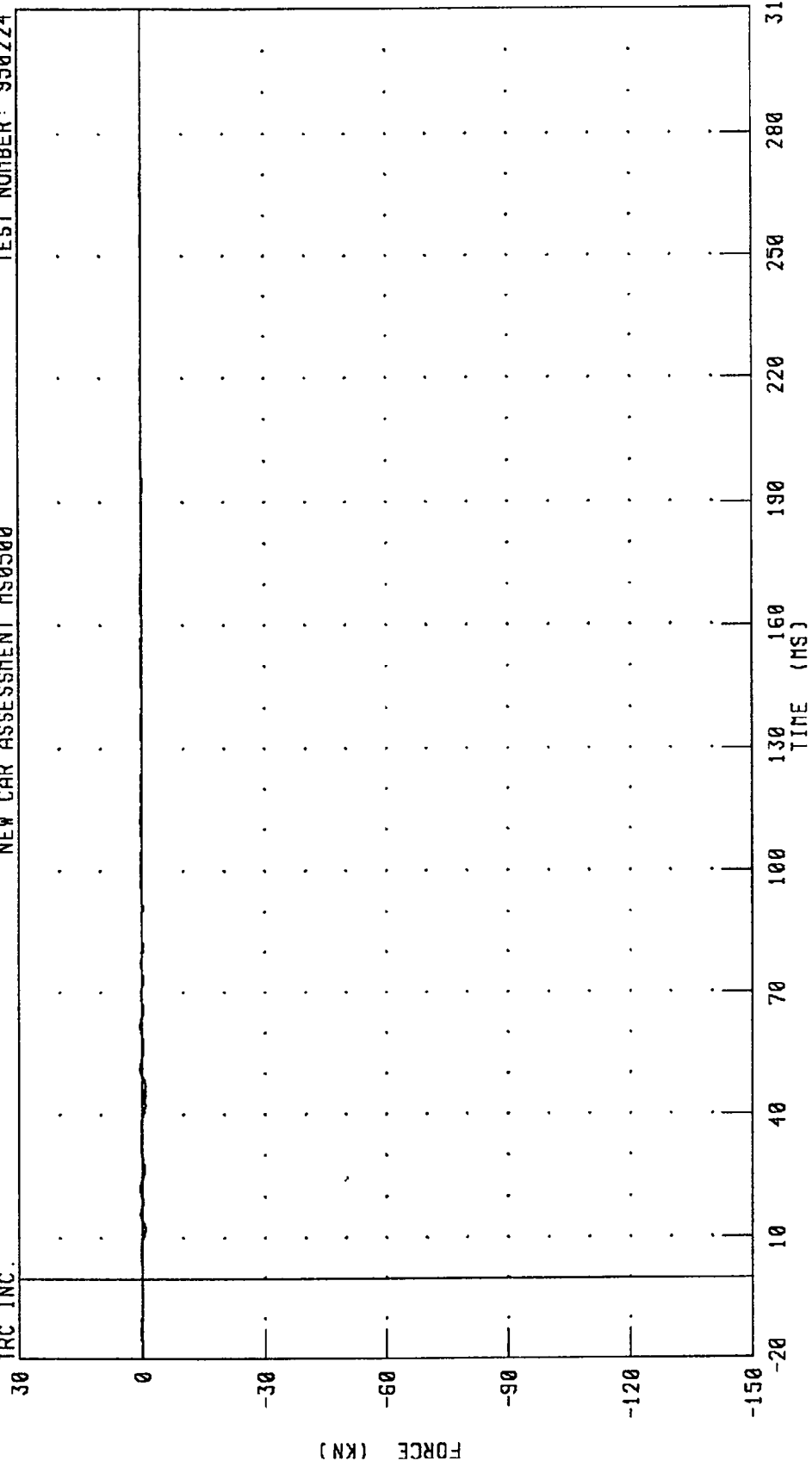
CHANNEL: TRRXGA FILTER: CH. CLASS 60

PEAK DATA: 2.40 G @ 142.40 MS; -49.79 G @ 38.40 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A1 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



PEAK DATA: 0.47 KN @ 51.36 MS; -0.88 KN @ 46.16 MS

FILTER: CH. CLASS 60

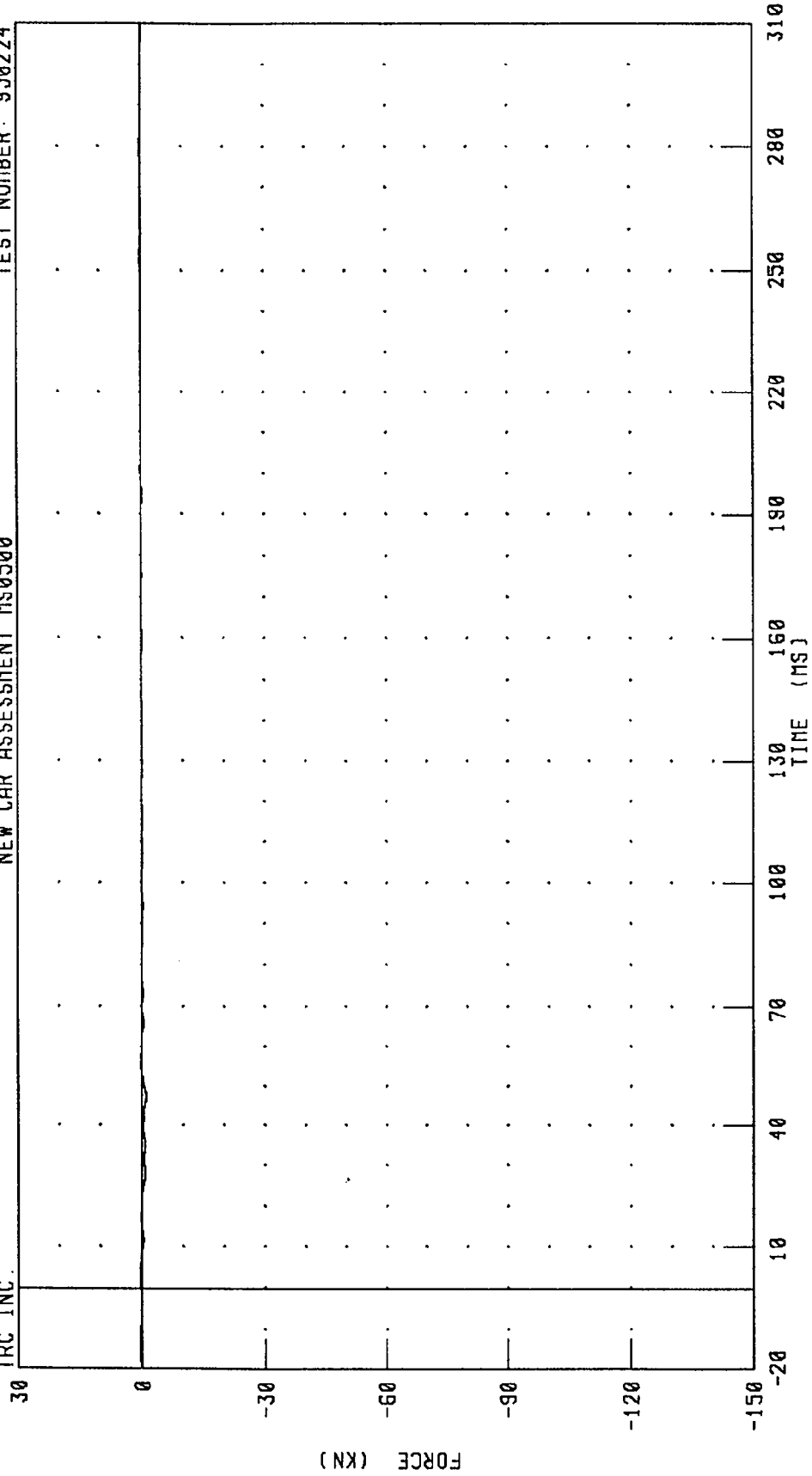
CHANNEL: BA1F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A2 FORCE

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



PEAK DATA: 0.47 KN @ -12.00 MS; -1.13 KN @ 47.36 MS

FILTER: CH. CLASS 60

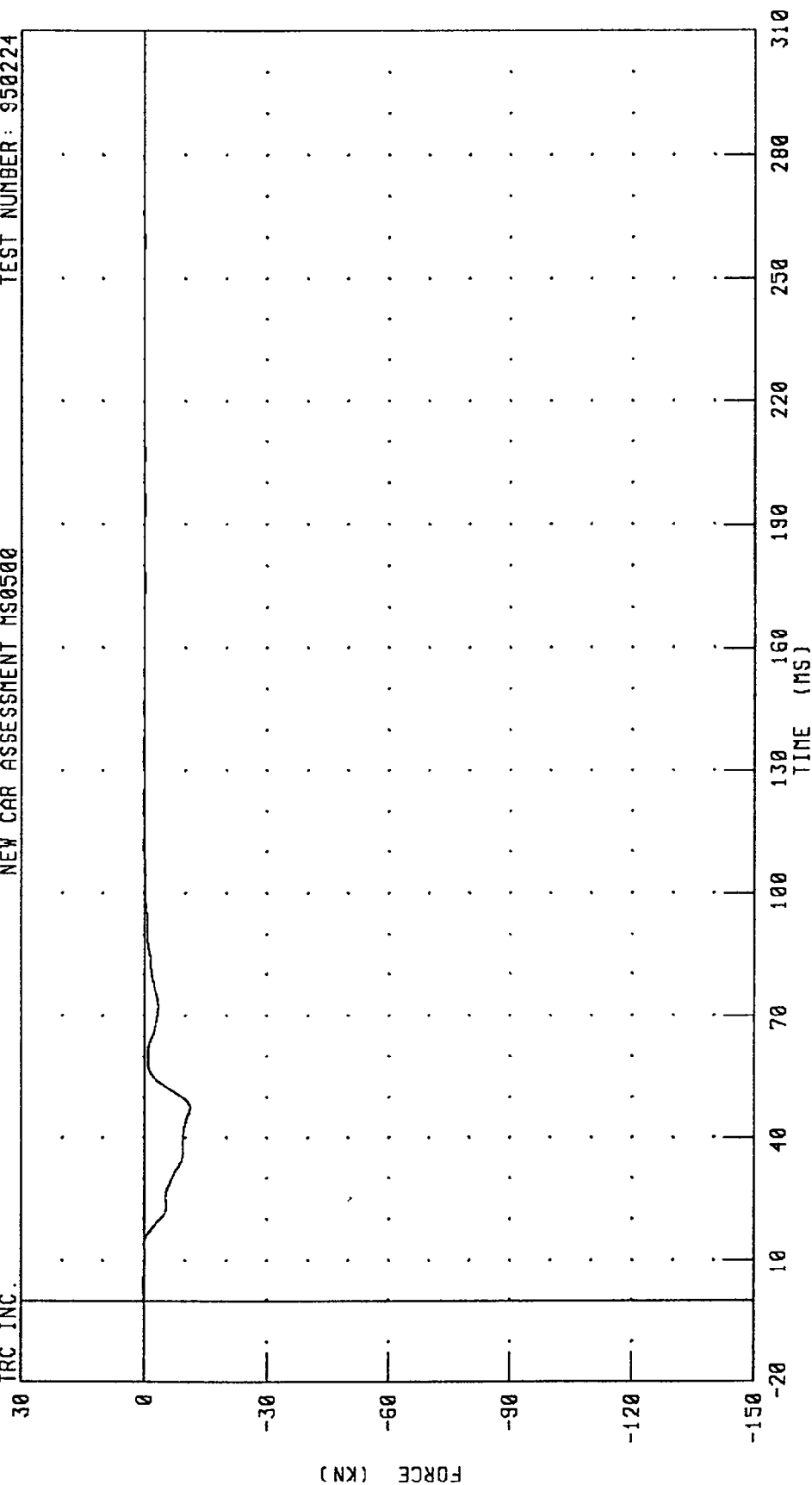
CHANNEL: BA2F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A3 FORCE

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



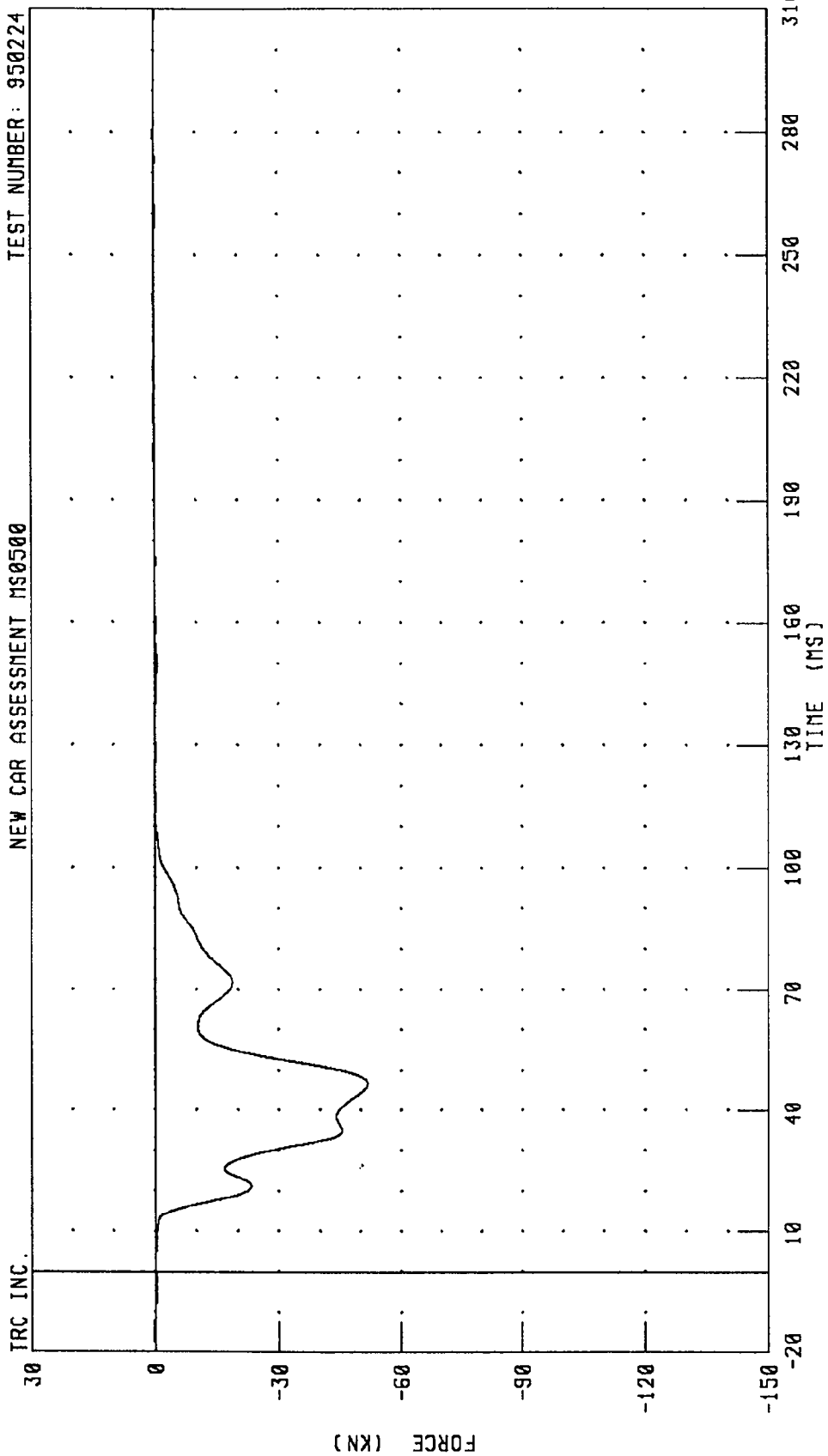
FILTER: CH. CLASS 60

CHANNEL: BA3F

PEAK DATA: 0.22 KN @ 121.52 MS; -11.12 KN @ 47.44 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A4 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

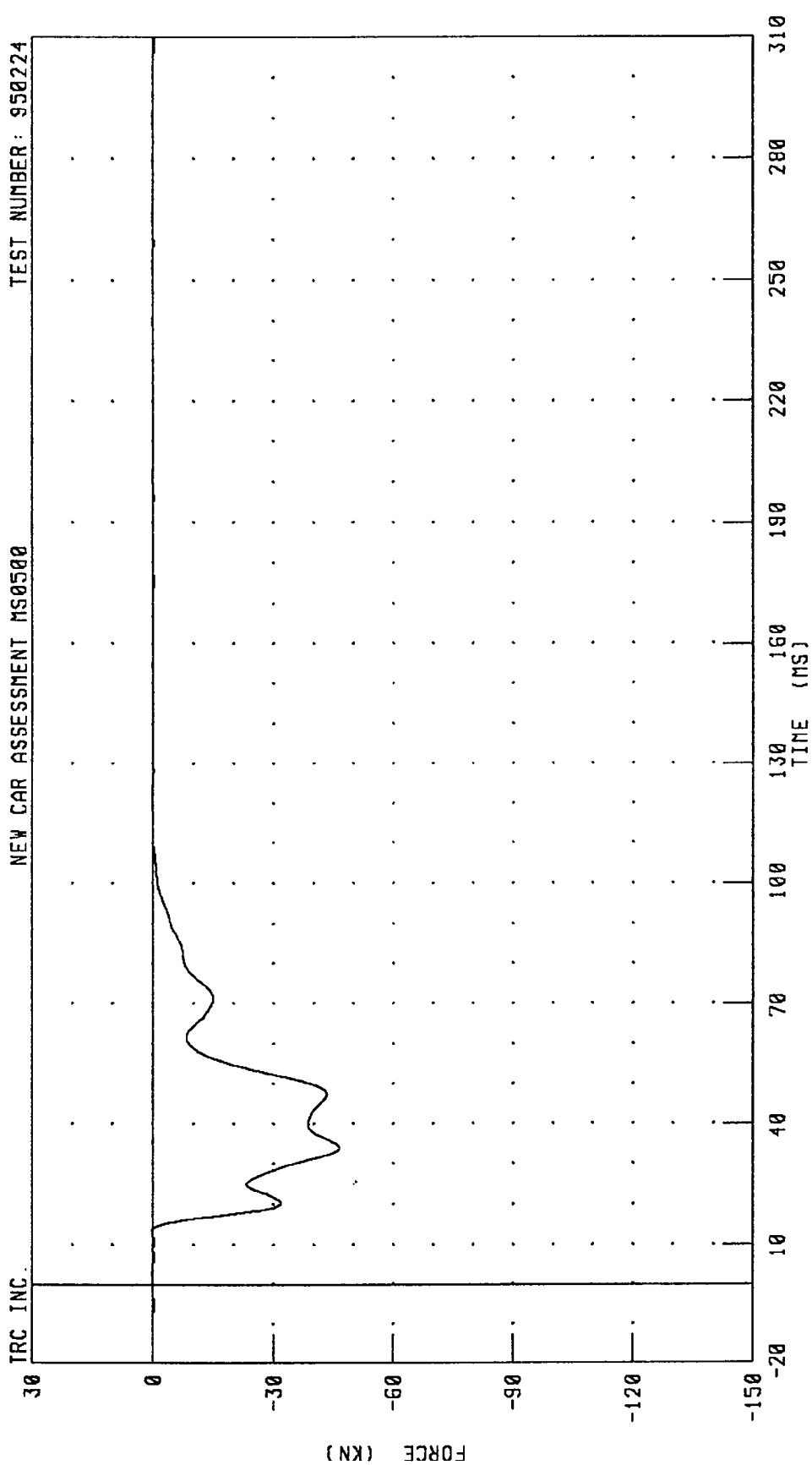


CHANNEL: BA4F FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A5 FORCE

NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224



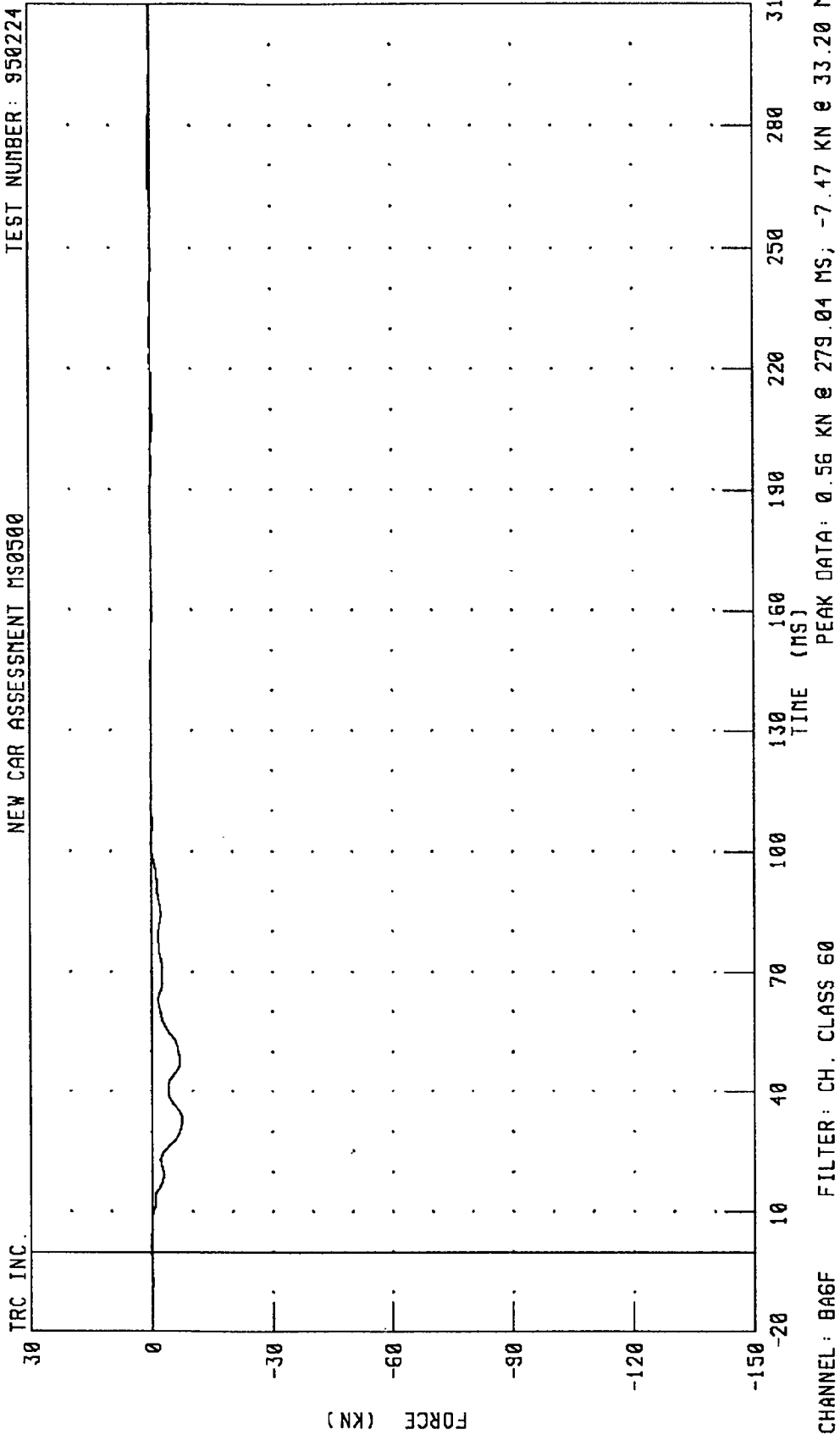
PEAK DATA: 0.30 KN @ 121.28 MS; -46.51 KN @ 34.08 MS

FILTER: CH. CLASS 60

CHANNEL: BASF

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A6 FORCE
 NEW CAR ASSESSMENT M50500

TEST NUMBER: 950224

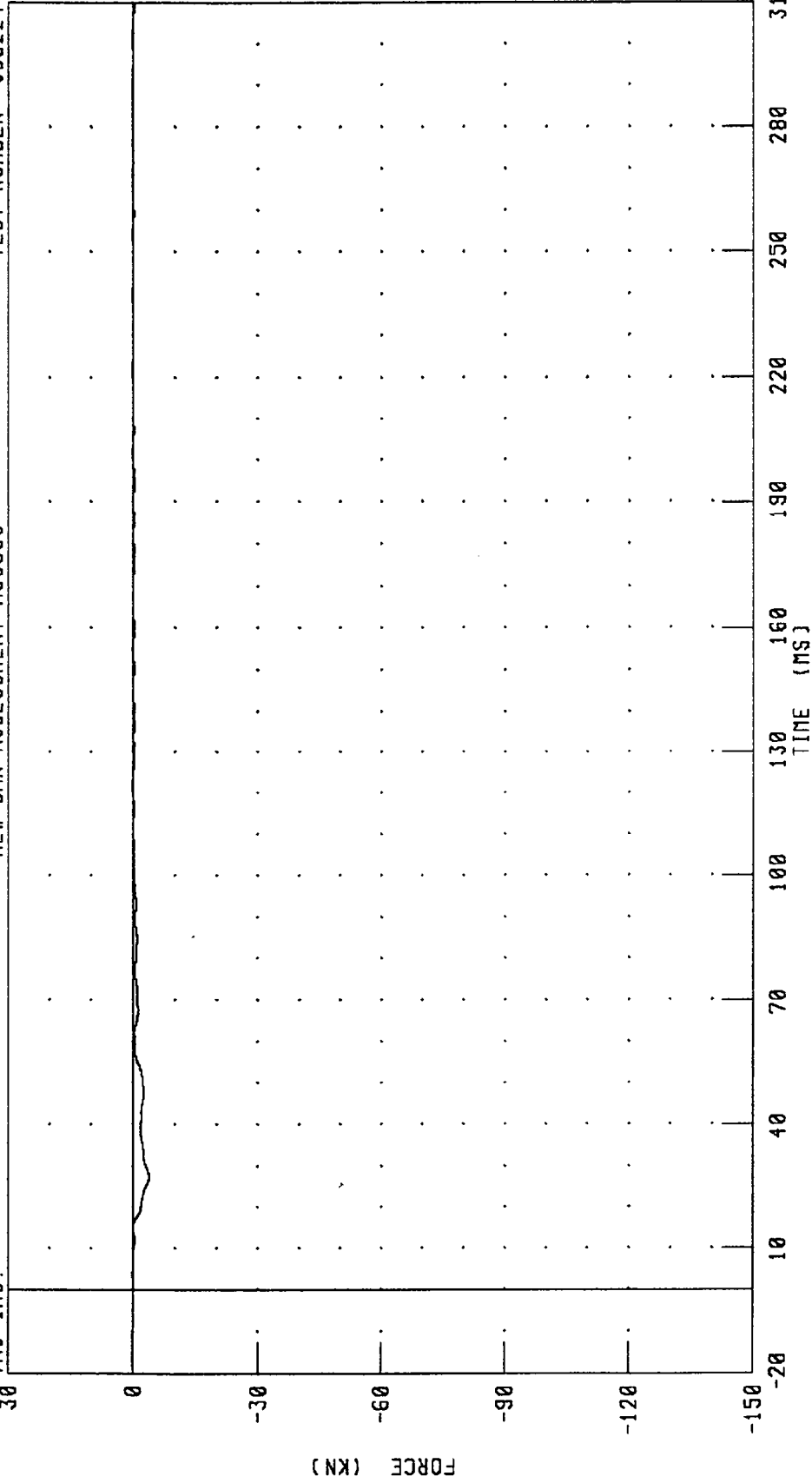


1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A7 FORCE

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



CHANNEL: BA7F

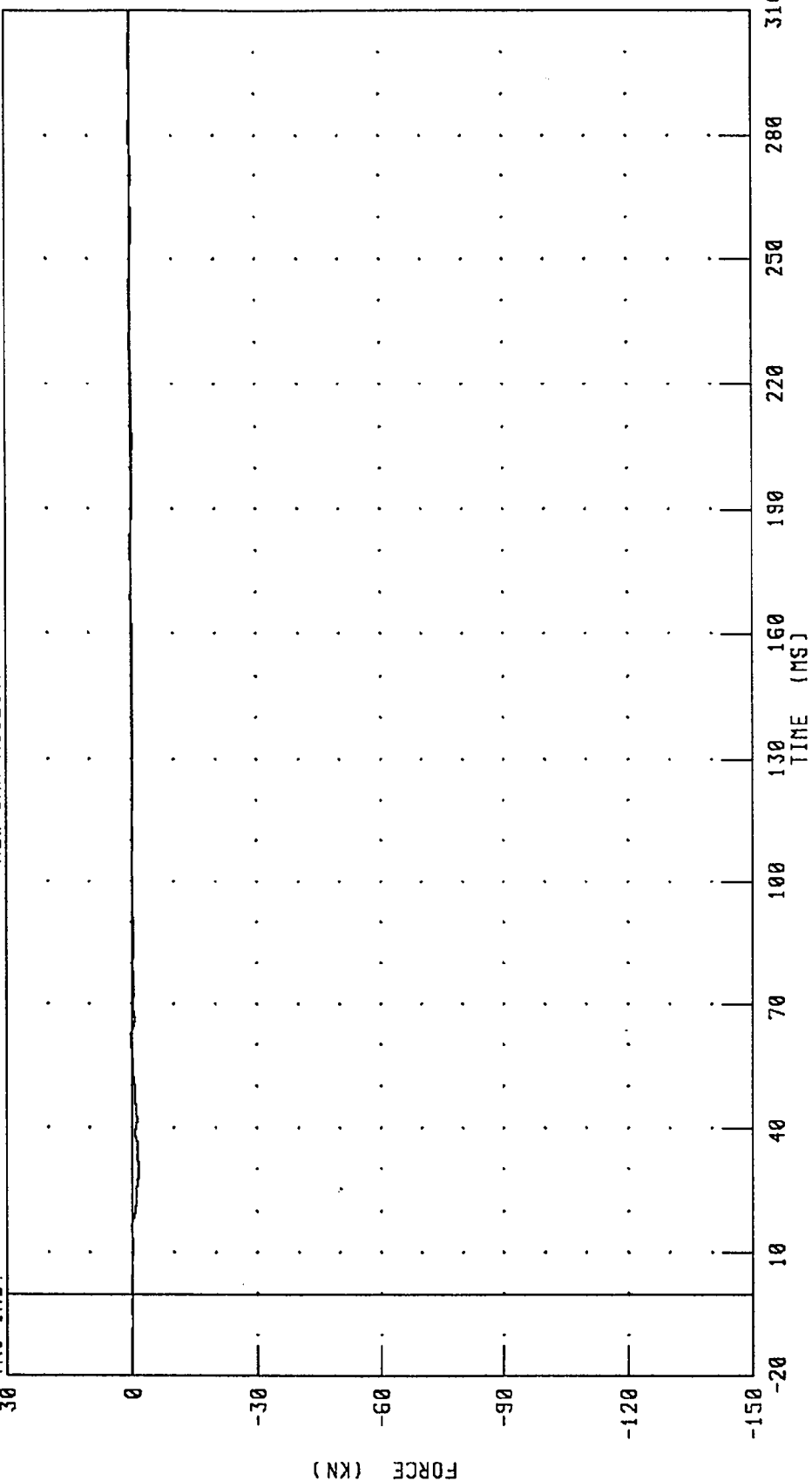
FILTER: CH. CLASS 60

PEAK DATA: 0.31 KN @ 279.44 MS; -3.85 KN @ 27.52 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A8 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



PEAK DATA: 0.29 KN @ -16.48 MS; -1.59 KN @ 29.28 MS

FILTER: CH. CLASS 60

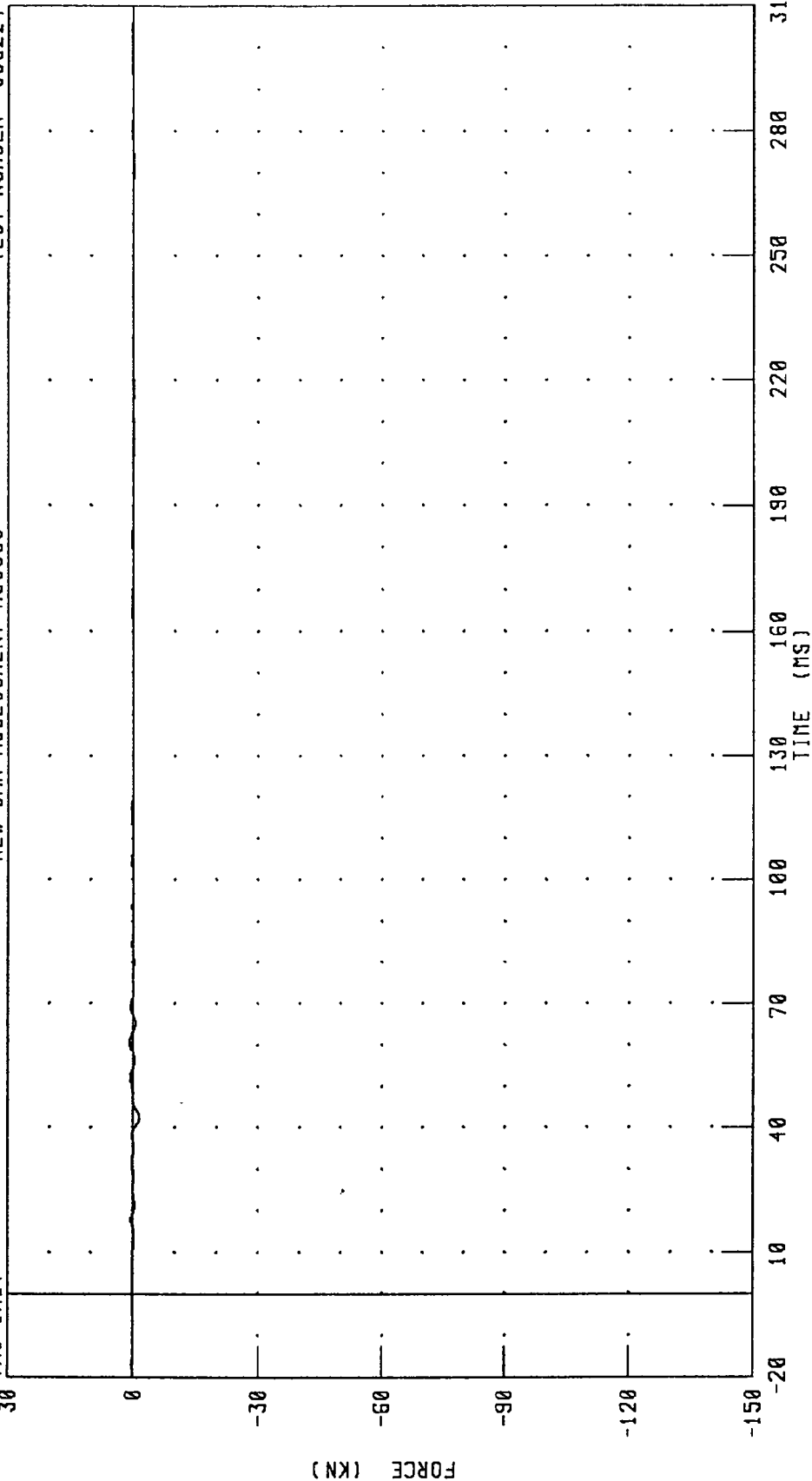
CHANNEL: BA8F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION AS FORCE

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



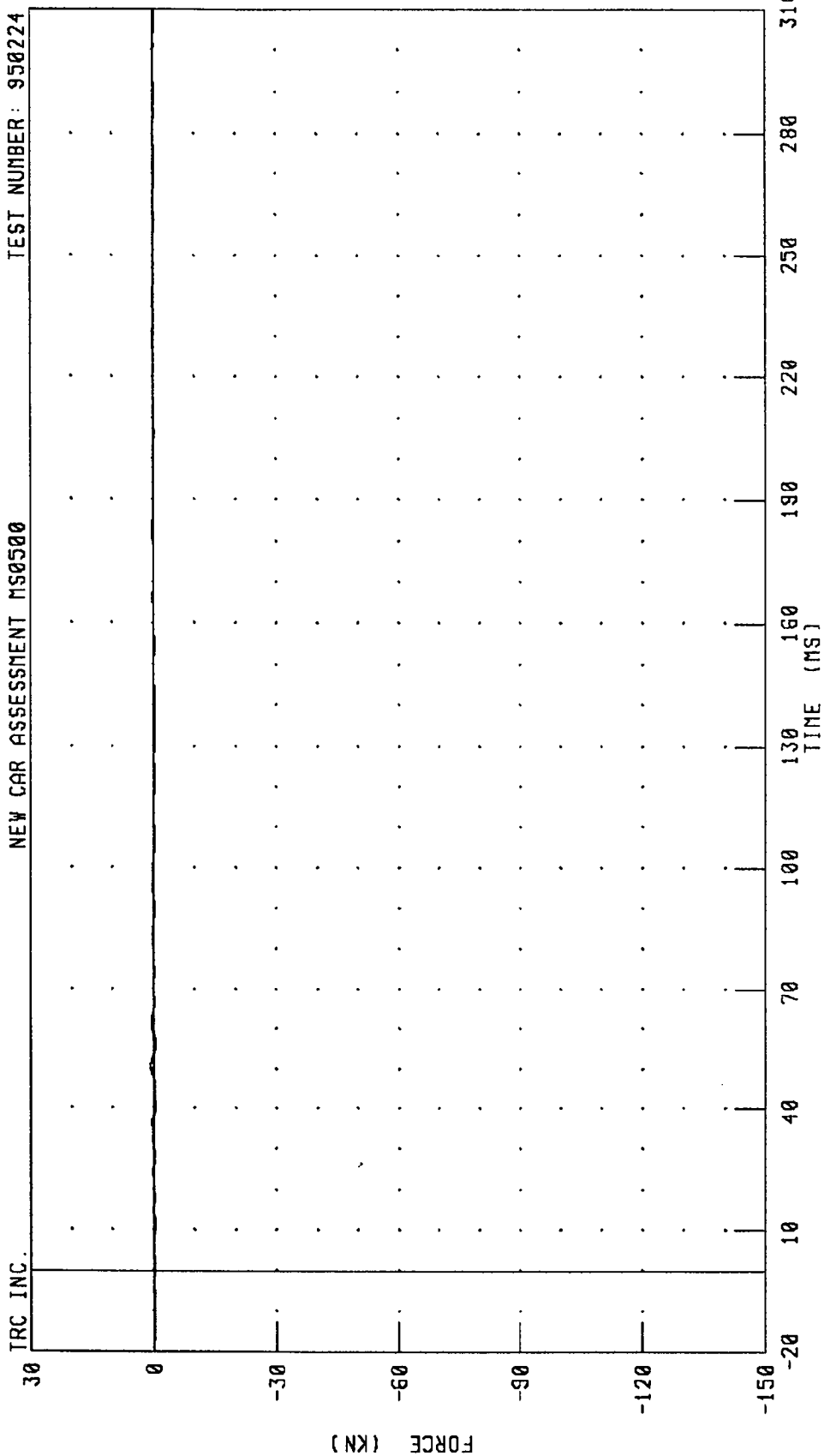
PEAK DATA: 0.72 KN @ 60.64 MS; -1.65 KN @ 42.40 MS

FILTER: CH. CLASS 60

CHANNEL: BASF

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B1 FORCE

NEW CAR ASSESSMENT MS0500 TEST NUMBER: 950224



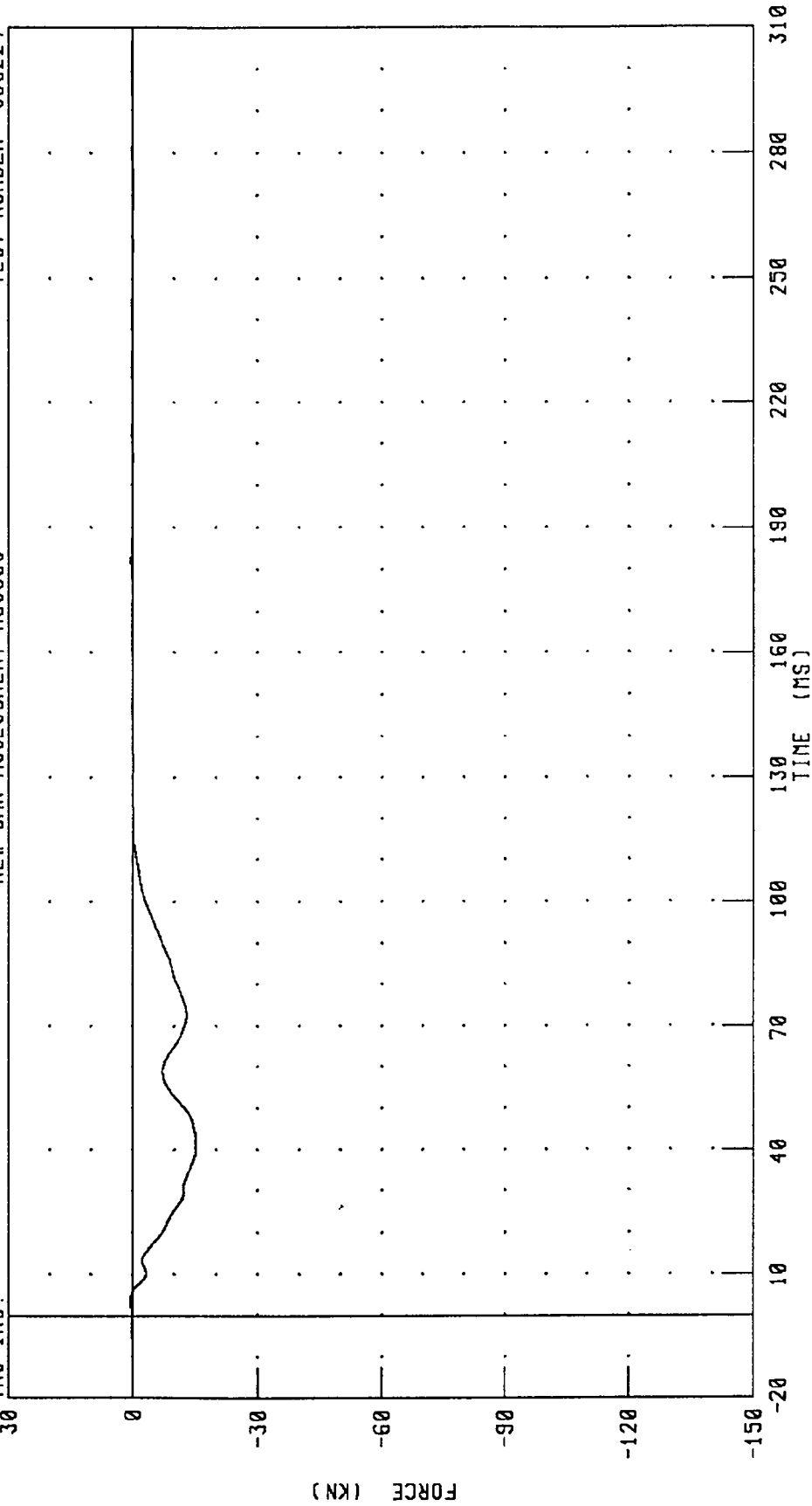
CHANNEL: BBIF FILTER: CH. CLASS 60 PEAK DATA: 0.72 KN @ 50.56 MS; -0.63 KN @ 11.36 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B2 FORCE

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



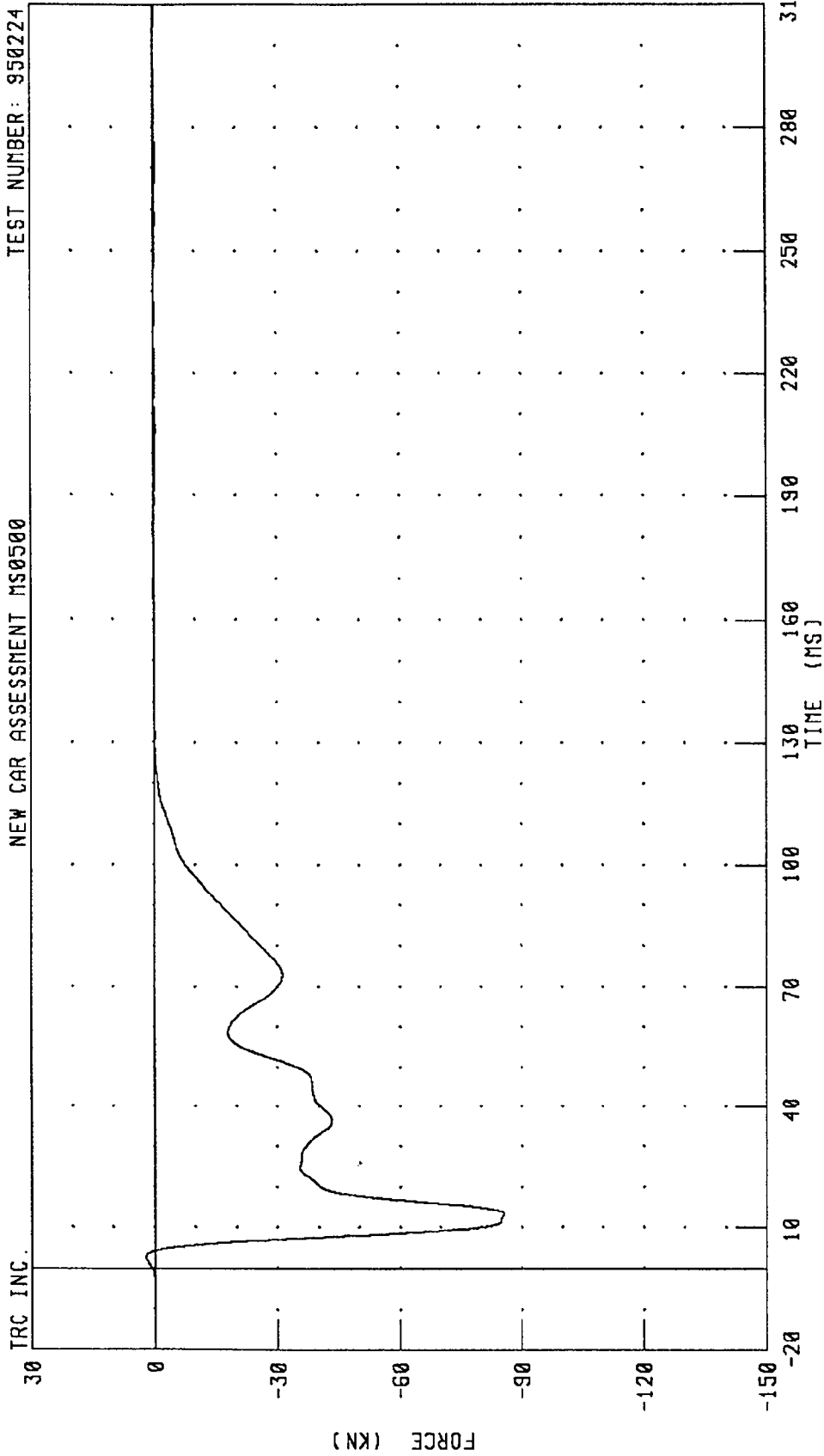
PEAK DATA: 0.46 KN @ 3.44 MS, -15.08 KN @ 42.56 MS

FILTER: CH. CLASS 60

CHANNEL: BB2F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B3 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

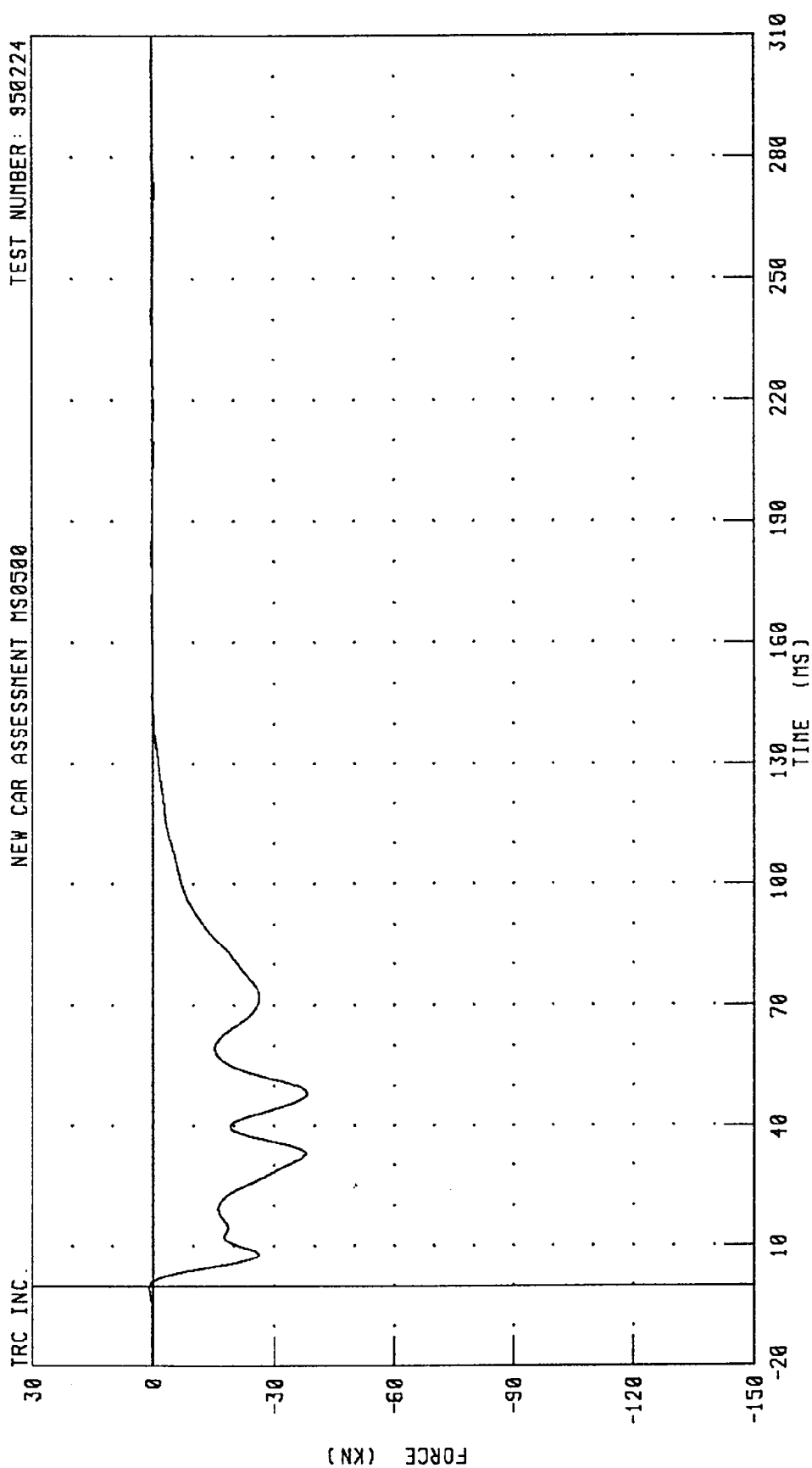


PEAK DATA: 2.17 KN @ 2.72 MS; -85.66 KN @ 13.36 MS

CHANNEL: BB3F FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B4 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224



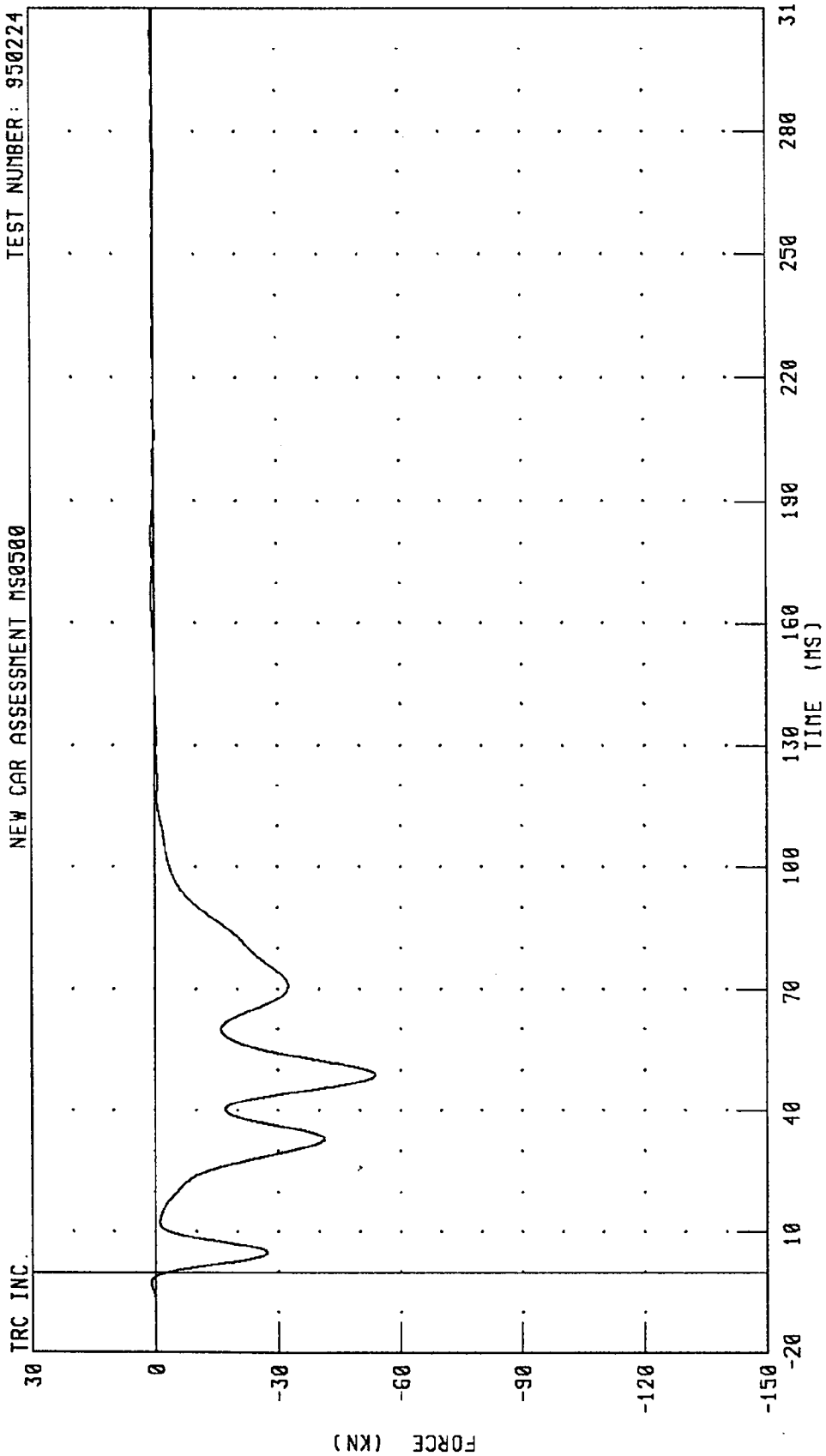
PEAK DATA: 0.90 KN @ -0.64 MS; -38.05 KN @ 48.16 MS

FILTER: CH. CLASS 60

CHANNEL: BB4F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B5 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224



PEAK DATA: 1.09 KN @ -2.72 MS; -53.79 KN @ 48.88 MS

FILTER: CH. CLASS 60

CHANNEL: BB5F

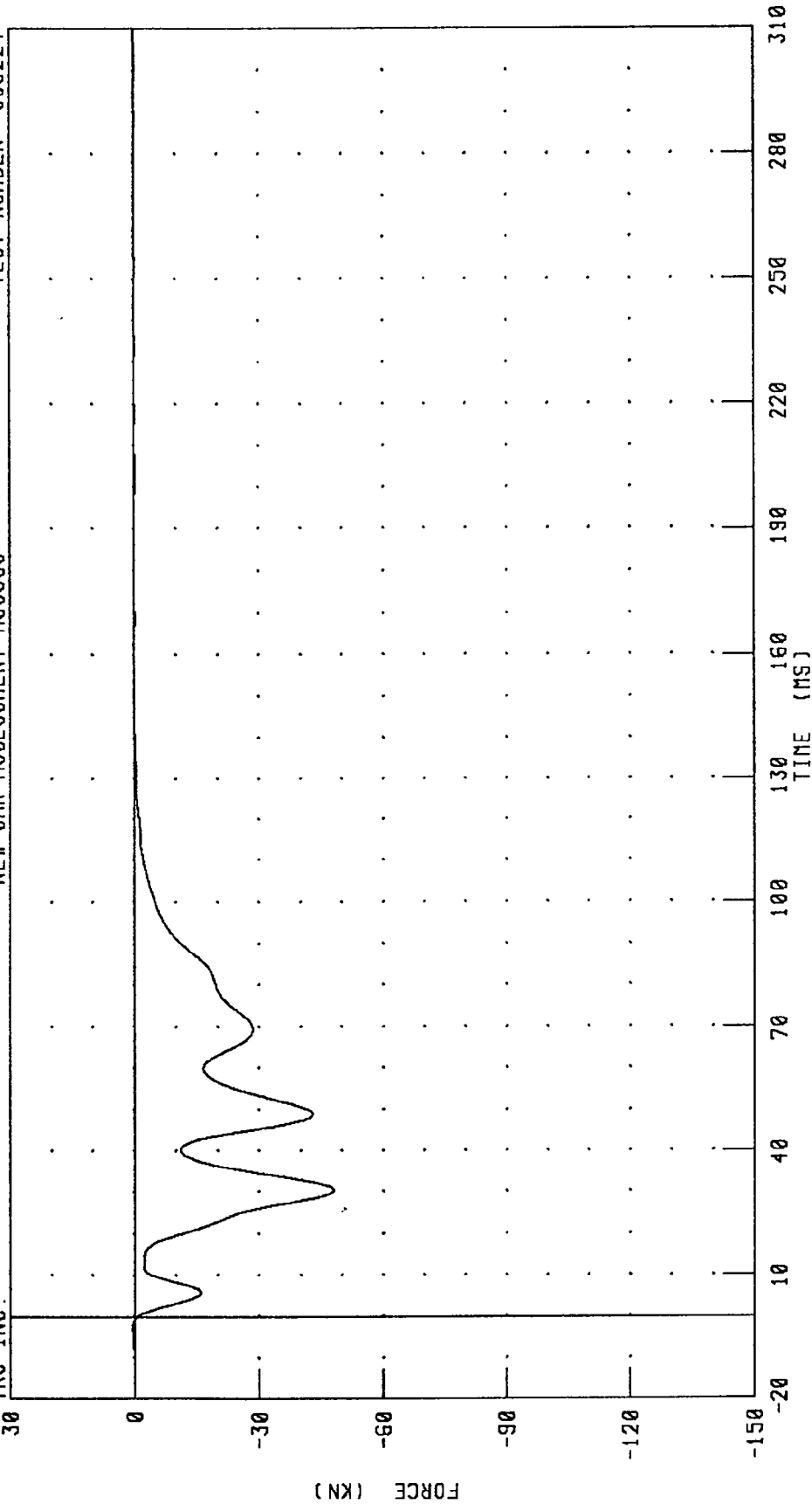
TRC INC.

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B6 FORCE

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



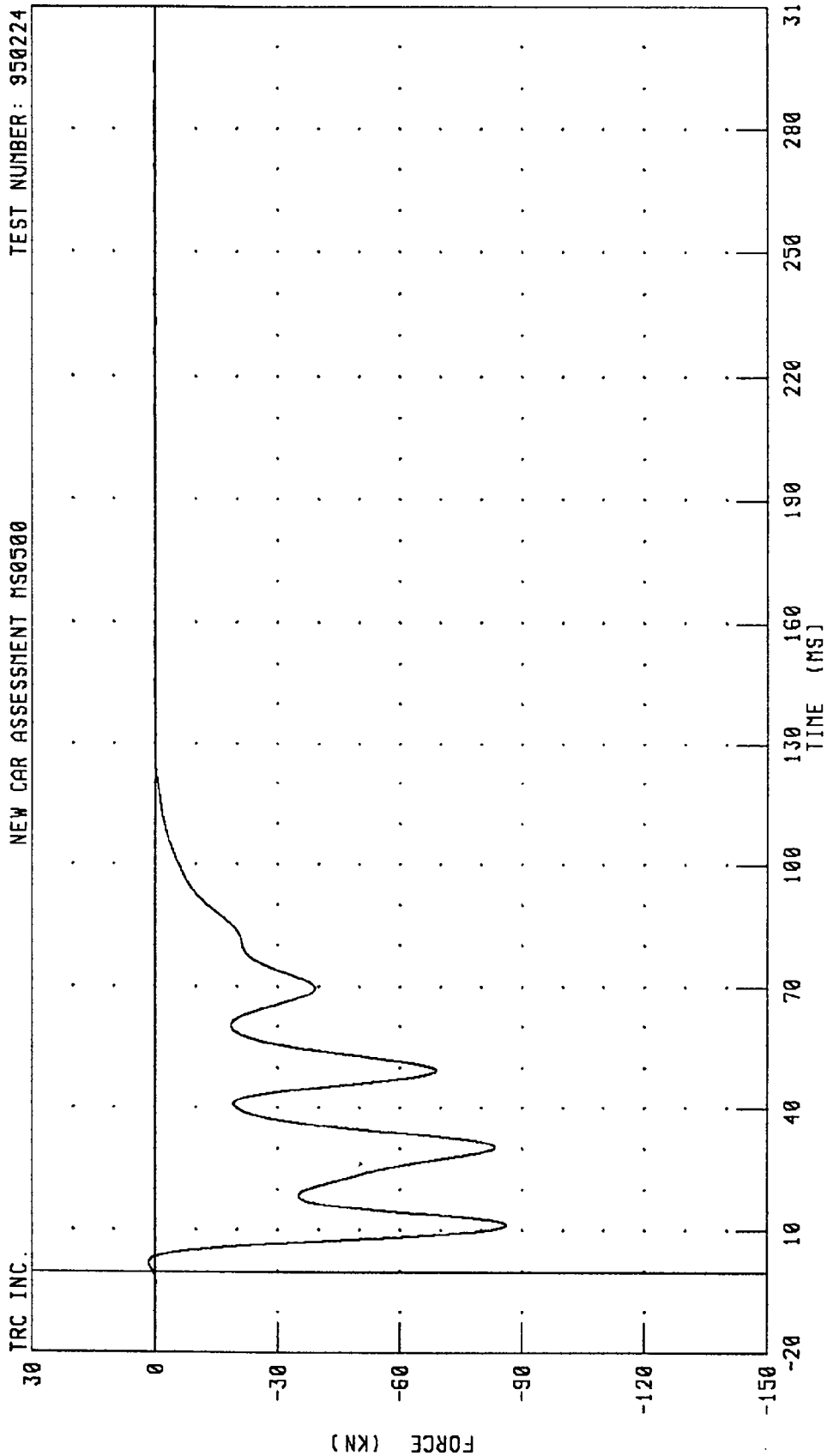
PEAK DATA: 0.36 KN @ -2.56 MS, -48.03 KN @ 30.40 MS

FILTER: CH. CLASS 60

CHANNEL: BB6F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B7 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224



PEAK DATA: 1.55 KN @ 2.16 MS; -86.20 KN @ 11.28 MS

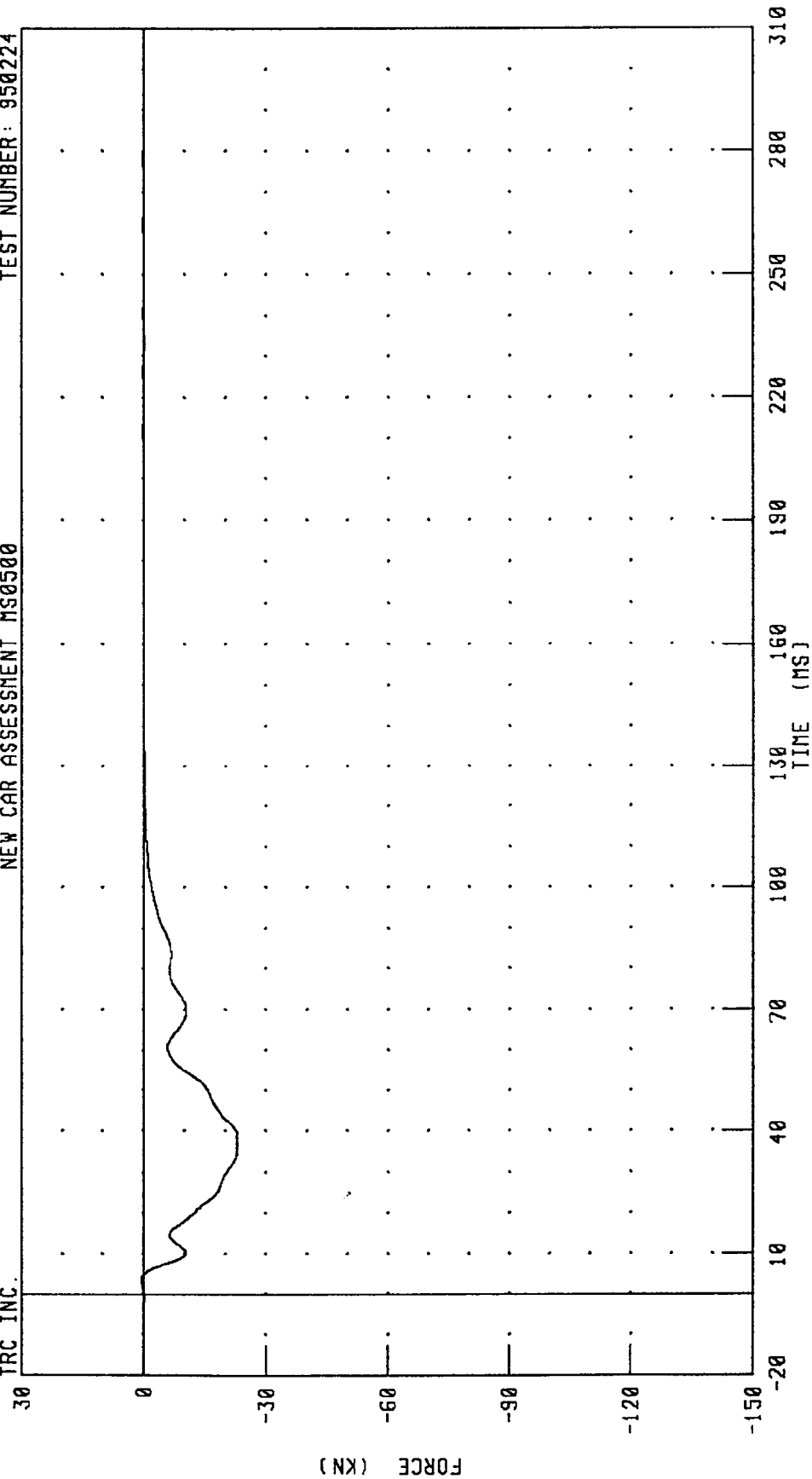
CHANNEL: BB7F FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B8 FORCE

NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.

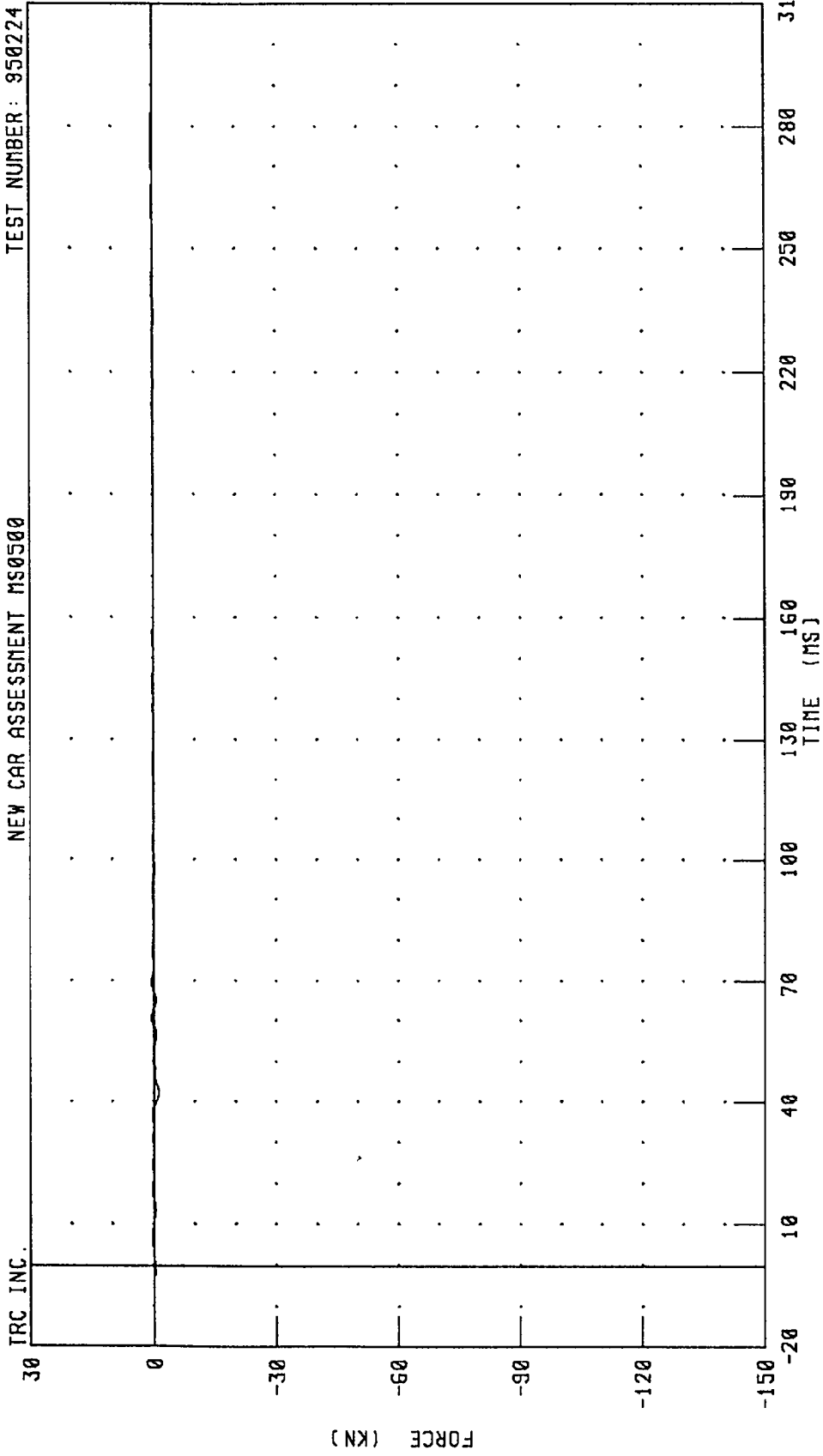


PEAK DATA: 0.44 KN @ 3.52 MS; -23.02 KN @ 35.76 MS

CHANNEL: BB8F FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B9 FORCE
 NEW CAR ASSESSMENT MS0500

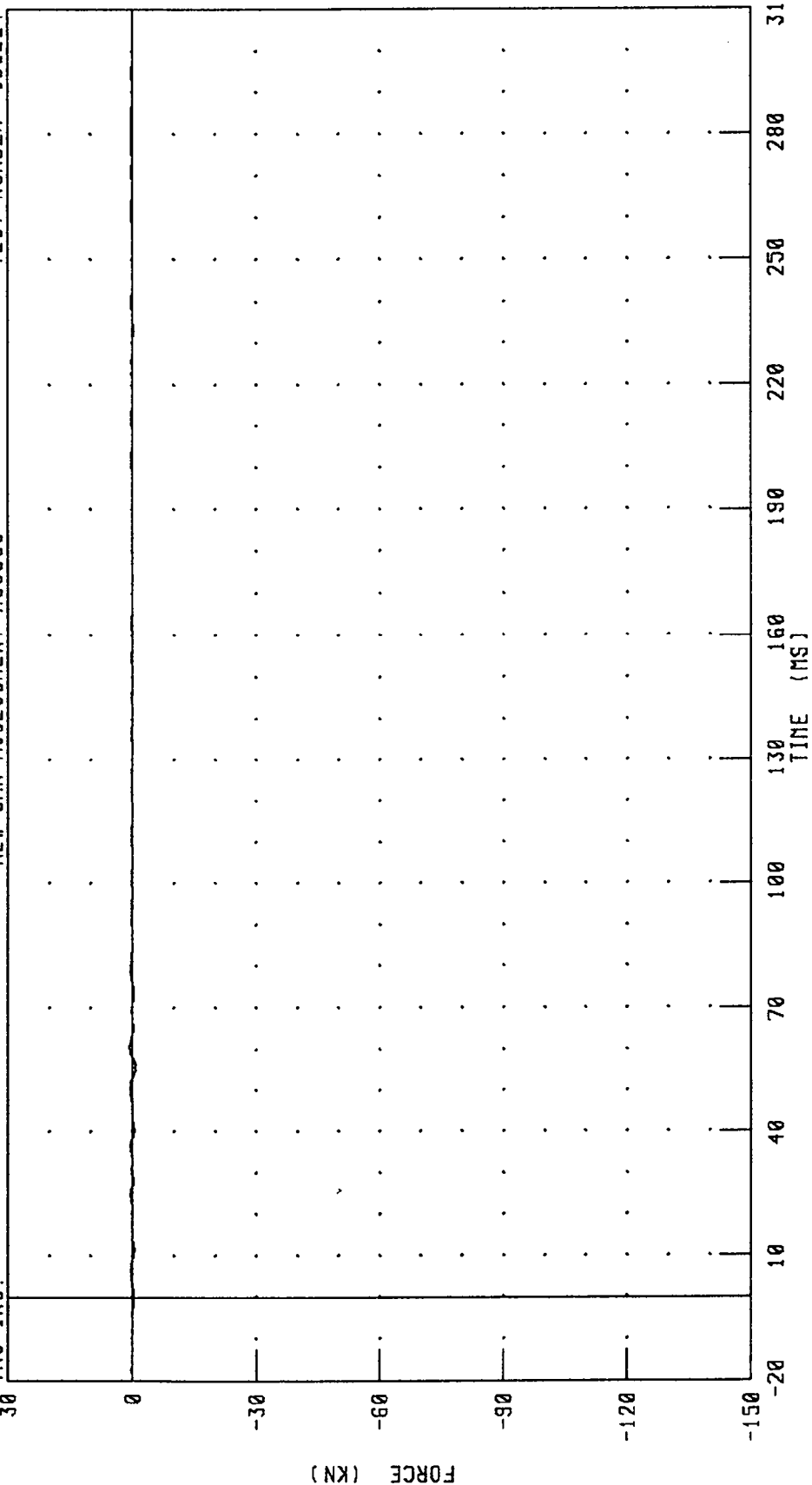
TEST NUMBER: 950224



1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C1 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



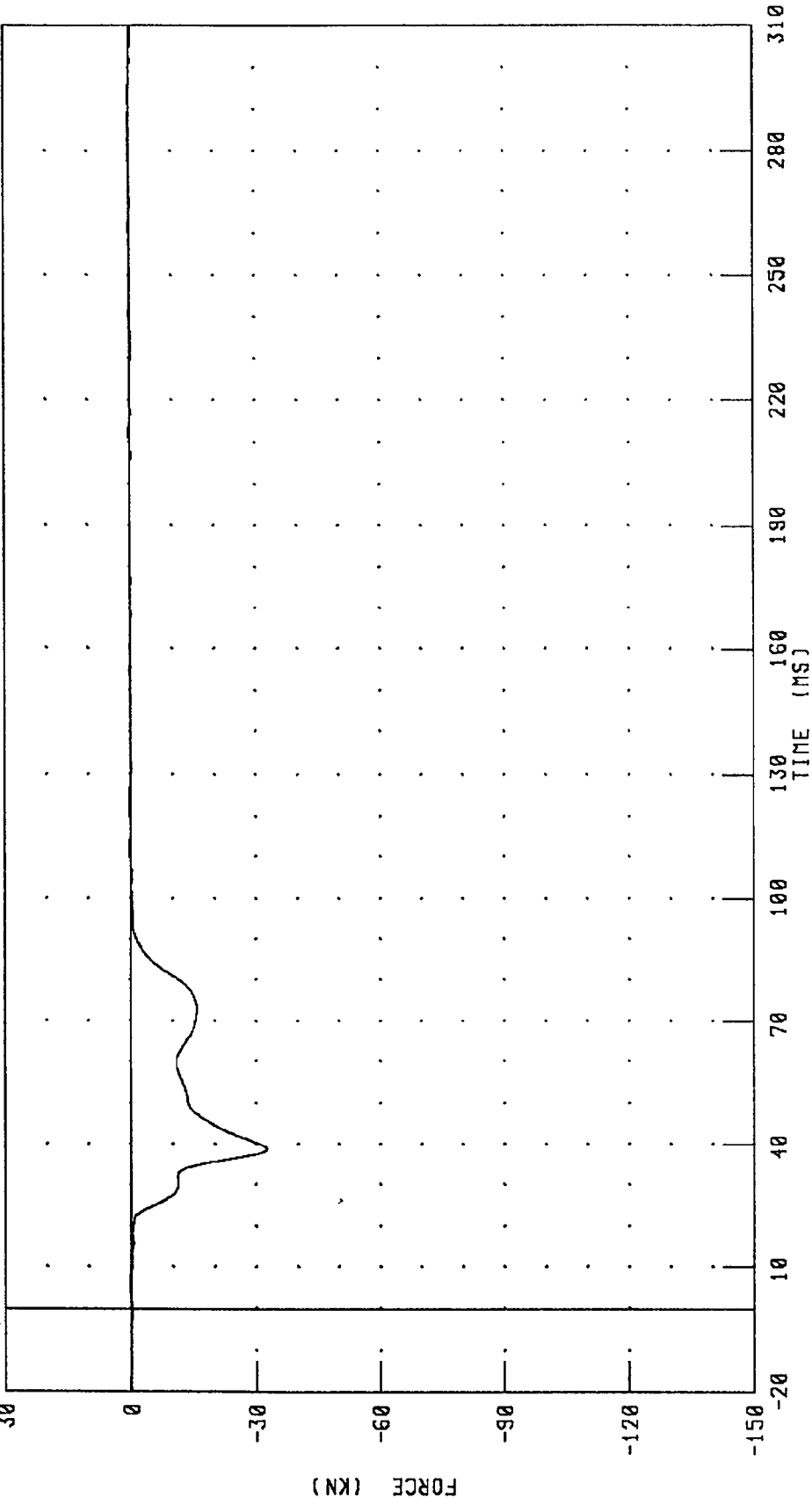
PEAK DATA: 0.62 KN @ 60.56 MS; -0.81 KN @ 55.76 MS

CHANNEL: BC1F FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C2 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



PEAK DATA: 0.21 KN @ 123.84 MS; -32.46 KN @ 38.72 MS

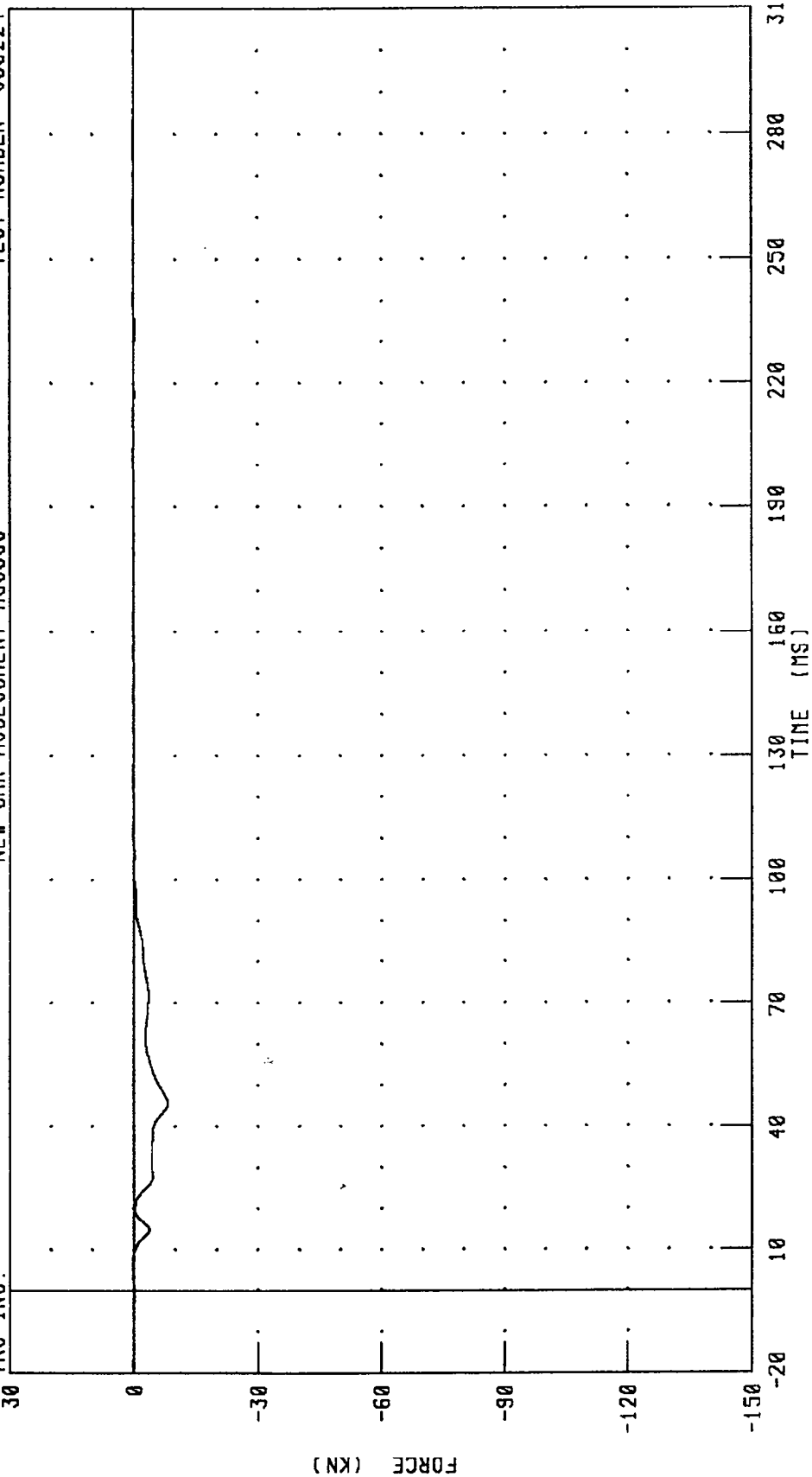
CHANNEL: BC2F FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C3 FORCE

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



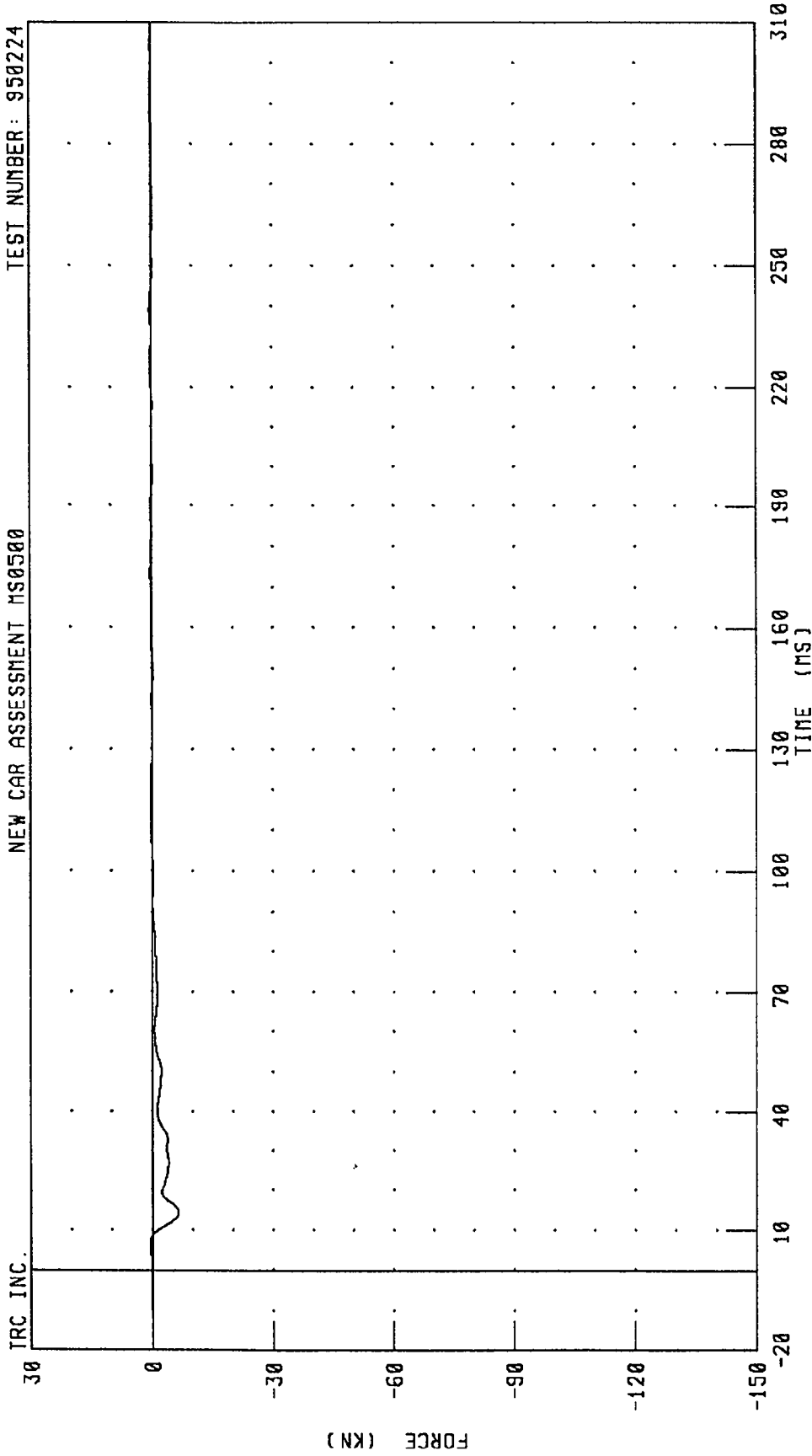
PEAK DATA: 0.26 KN @ 261.68 MS; -8.20 KN @ 45.60 MS

FILTER: CH. CLASS 60

CHANNEL: BC3F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE

TRC INC. NEW CAR ASSESSMENT MS0500 TEST NUMBER: 950224



PEAK DATA: 0.46 KN @ 6.32 MS; -6.48 KN @ 14.40 MS

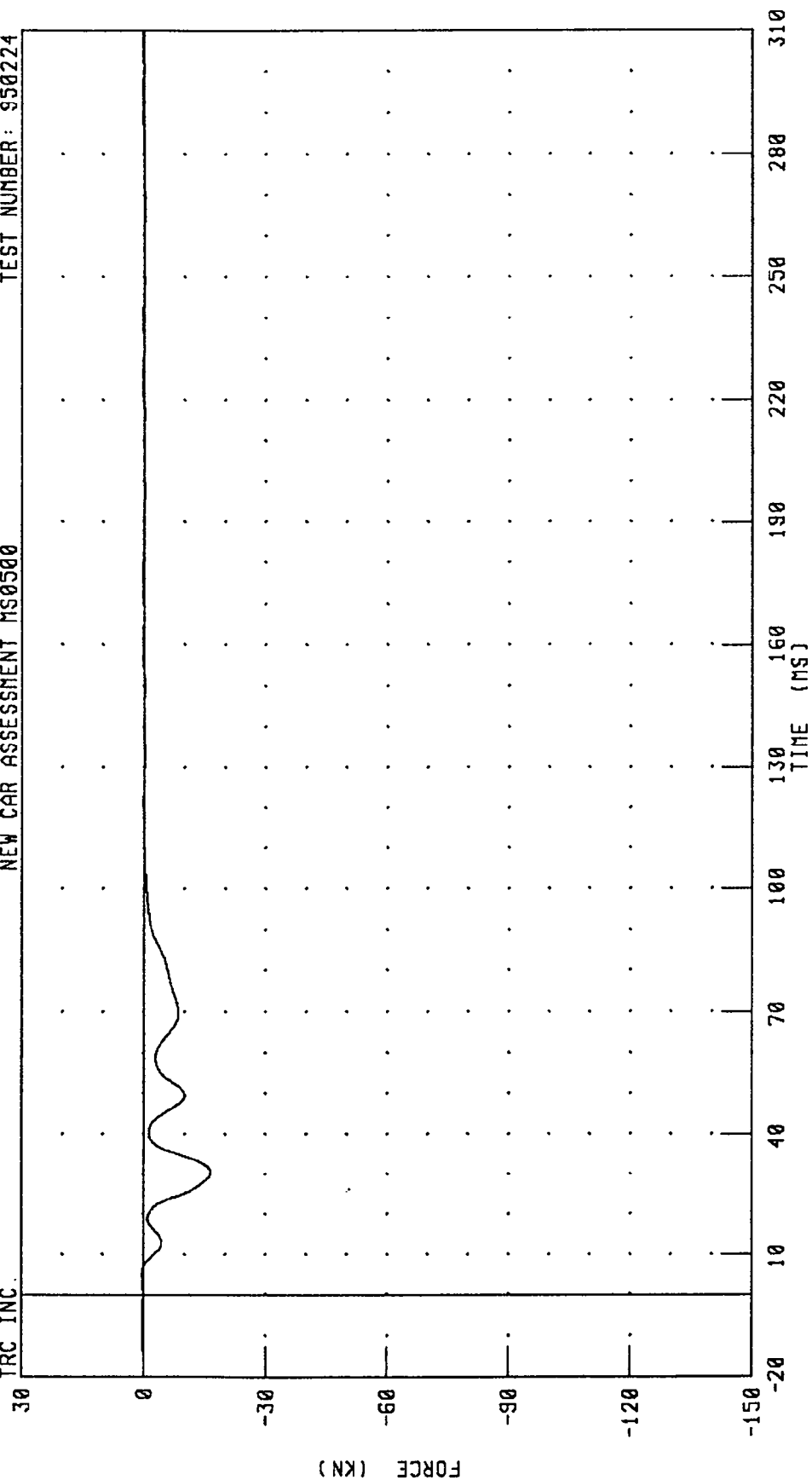
CHANNEL: BC4F FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C5 FORCE

NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



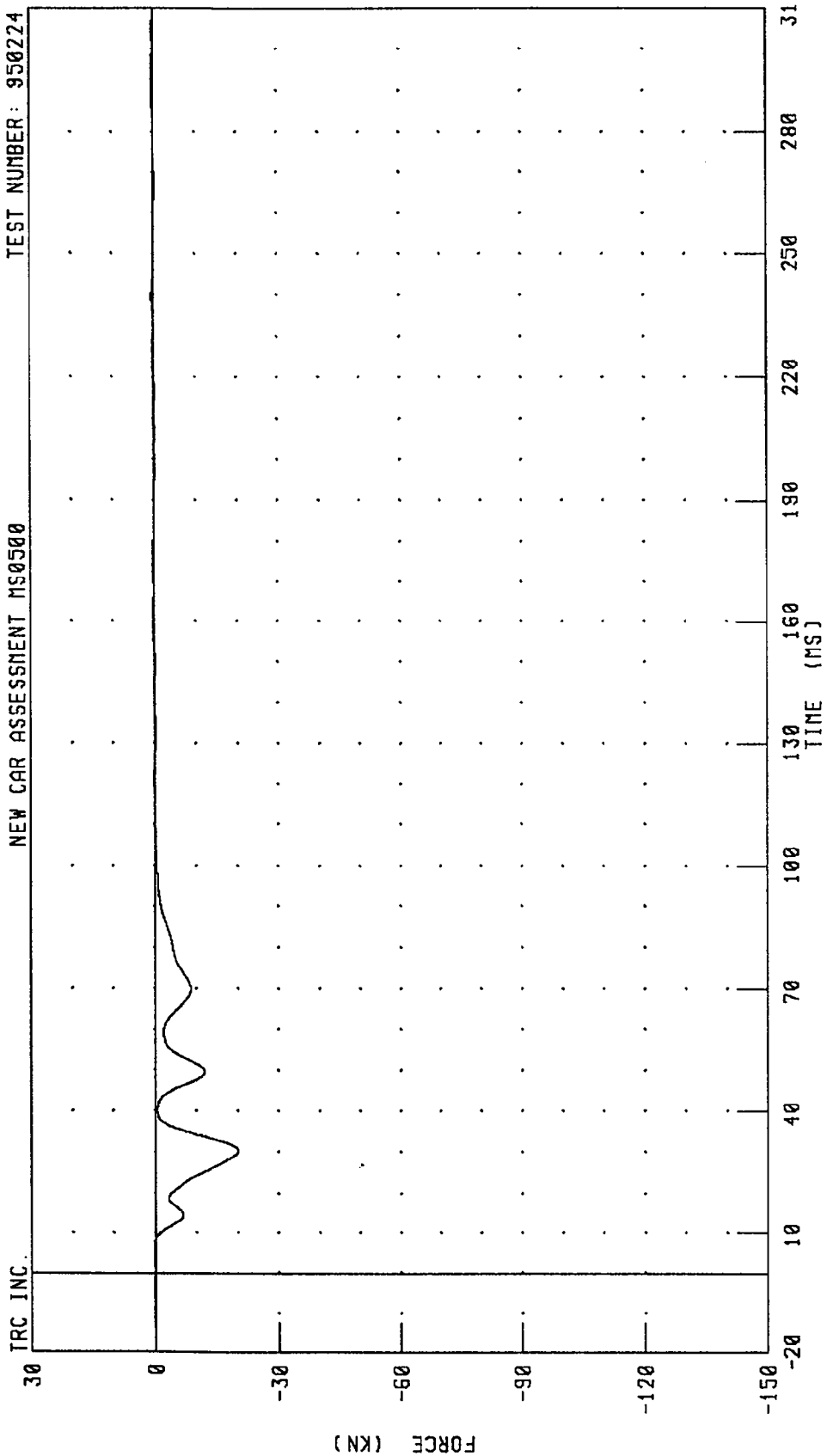
PEAK DATA: 0.34 KN @ 4.96 MS; -16.36 KN @ 30.64 MS

FILTER: CH. CLASS 60

CHANNEL: BC5F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C6 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224



PEAK DATA: 0.35 KN @ 239.60 MS; -20.06 KN @ 30.32 MS

FILTER: CH. CLASS 60

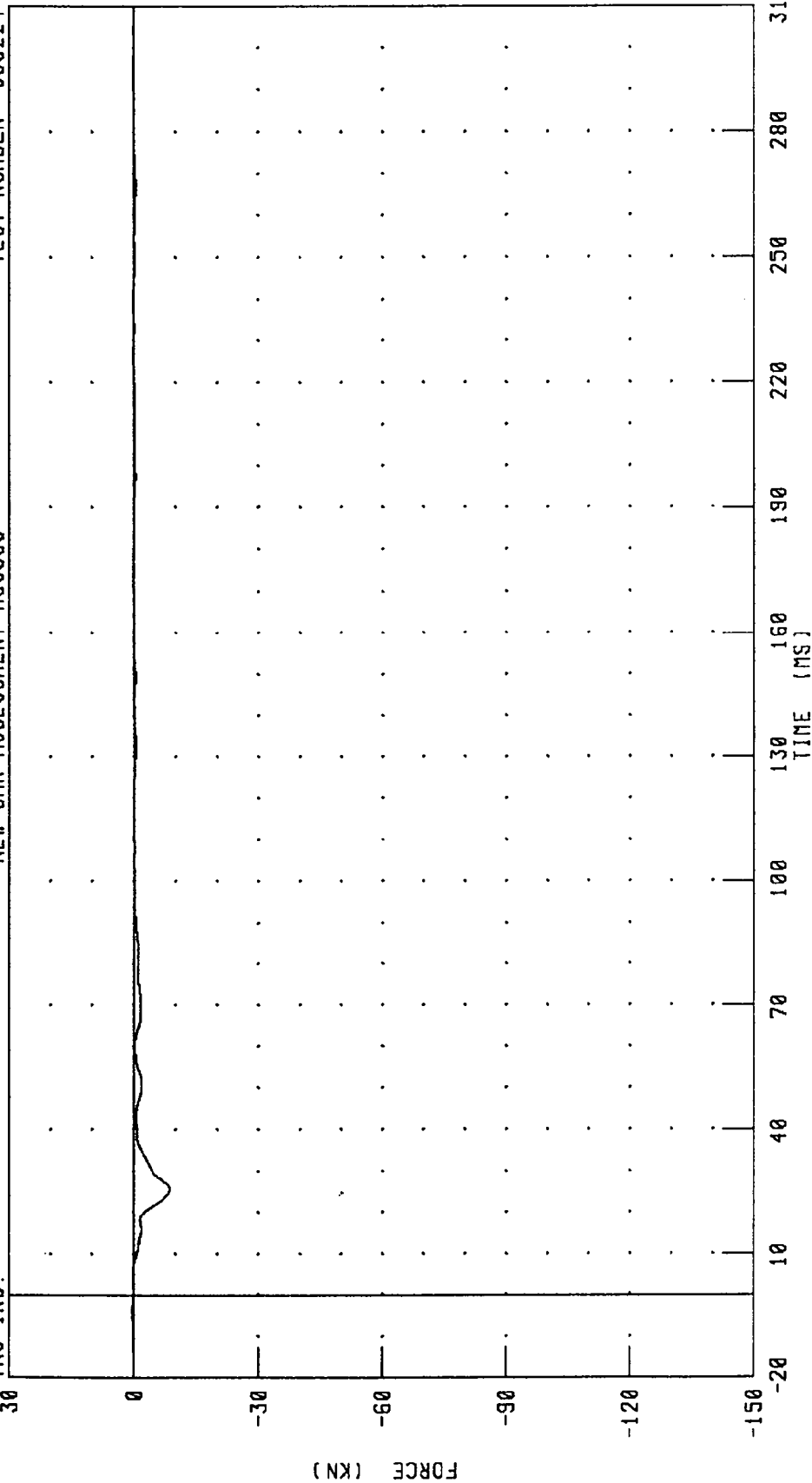
CHANNEL: BCGF

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C7 FORCE

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



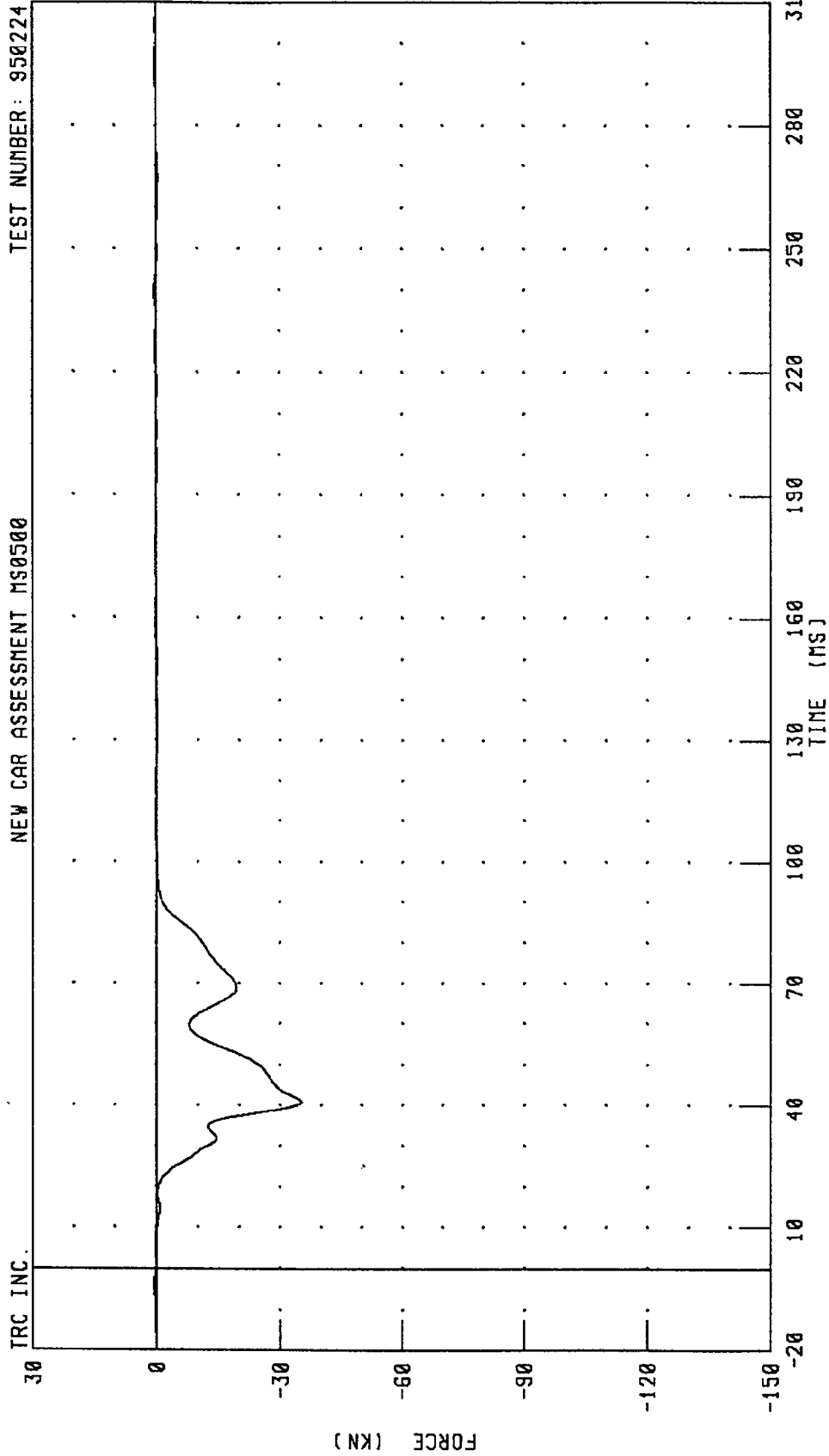
PEAK DATA: 0.36 KN @ -3.68 MS; -8.62 KN @ 25.60 MS

CHANNEL: BC7F FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C8 FORCE

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500



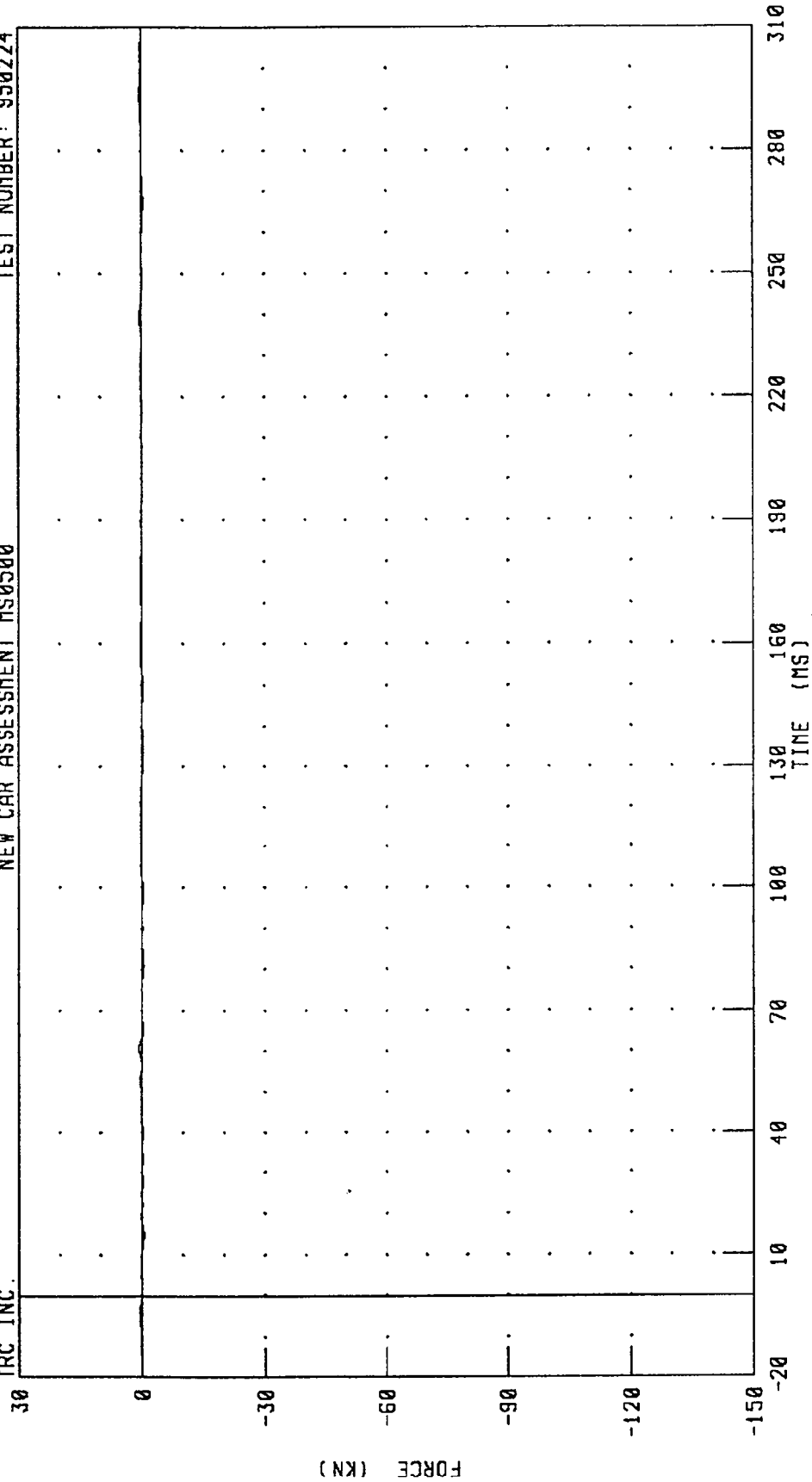
PEAK DATA: 0.40 KN @ -3.68 MS; -35.23 KN @ 40.88 MS

FILTER: CH. CLASS 60

CHANNEL: BC8F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C9 FORCE

TRC INC. NEW CAR ASSESSMENT MS0500 TEST NUMBER: 950224



PEAK DATA: 0.68 KN @ 60.80 MS; -0.50 KN @ 14.80 MS

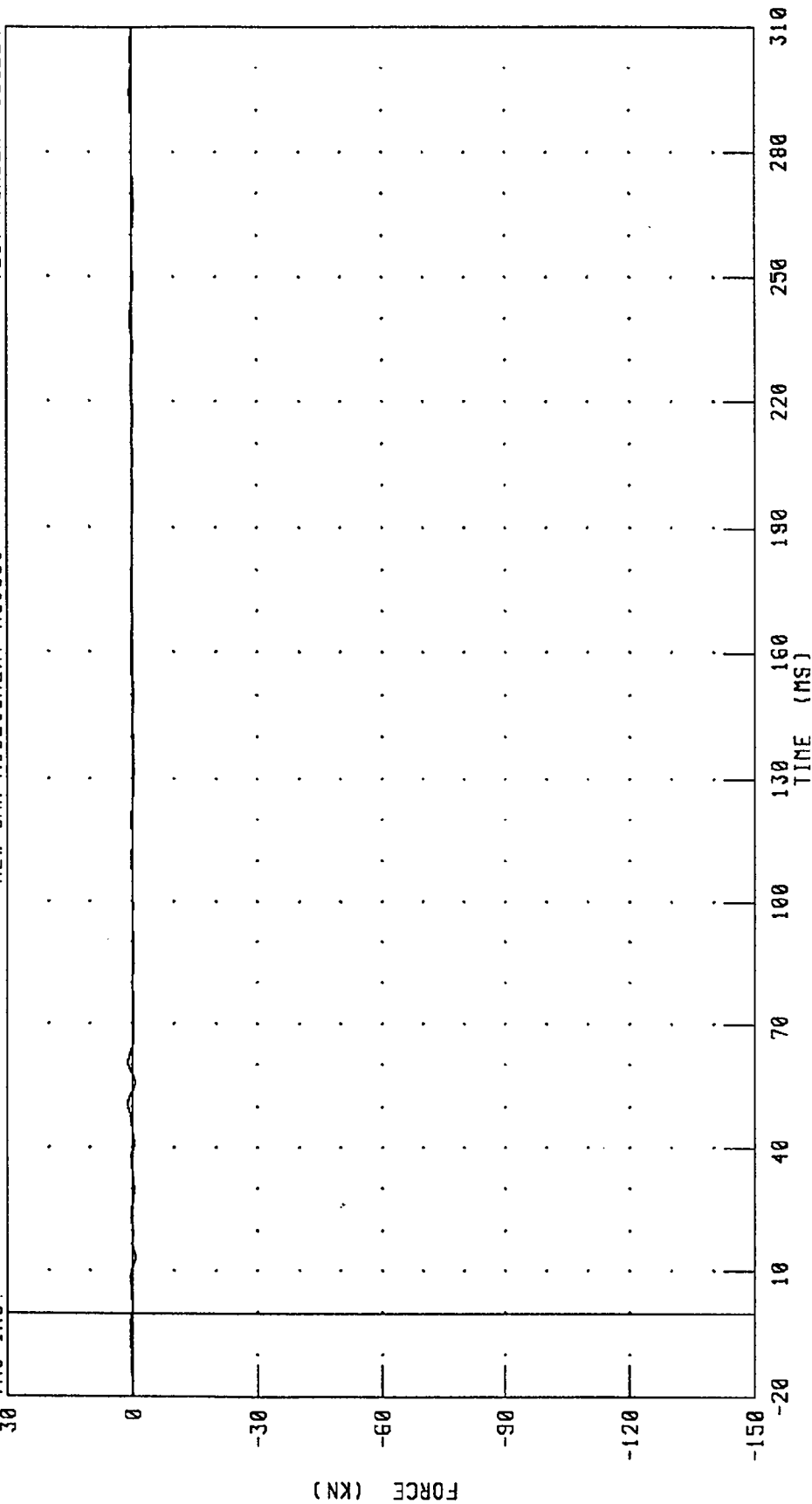
FILTER: CH. CLASS 60

CHANNEL: BC9F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D1 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



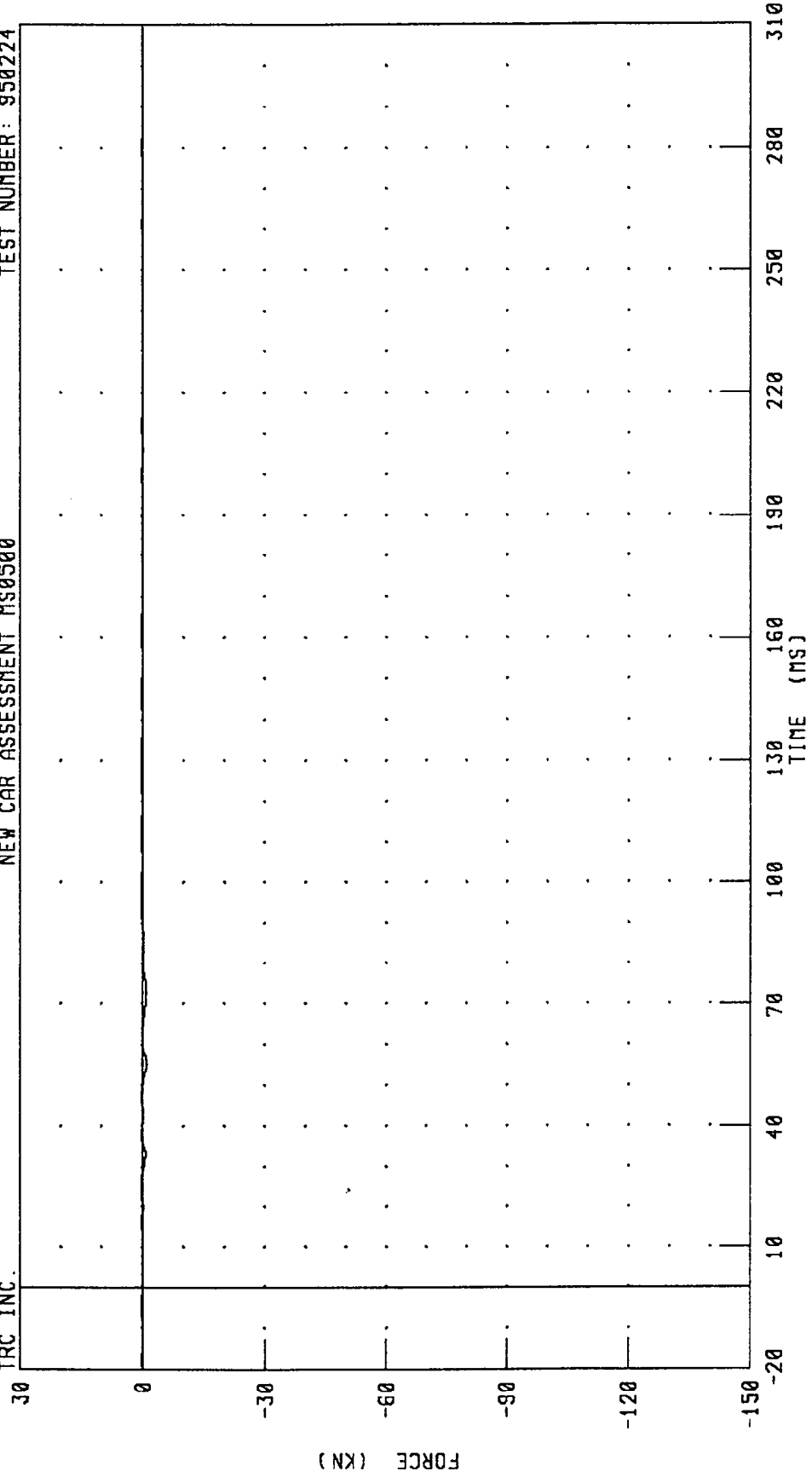
PEAK DATA: 0.98 KN @ 50.72 MS, -0.77 KN @ 13.36 MS

FILTER: CH. CLASS 60

CHANNEL: BD1F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D2 FORCE

TRC INC. NEW CAR ASSESSMENT MS0500 TEST NUMBER: 950224

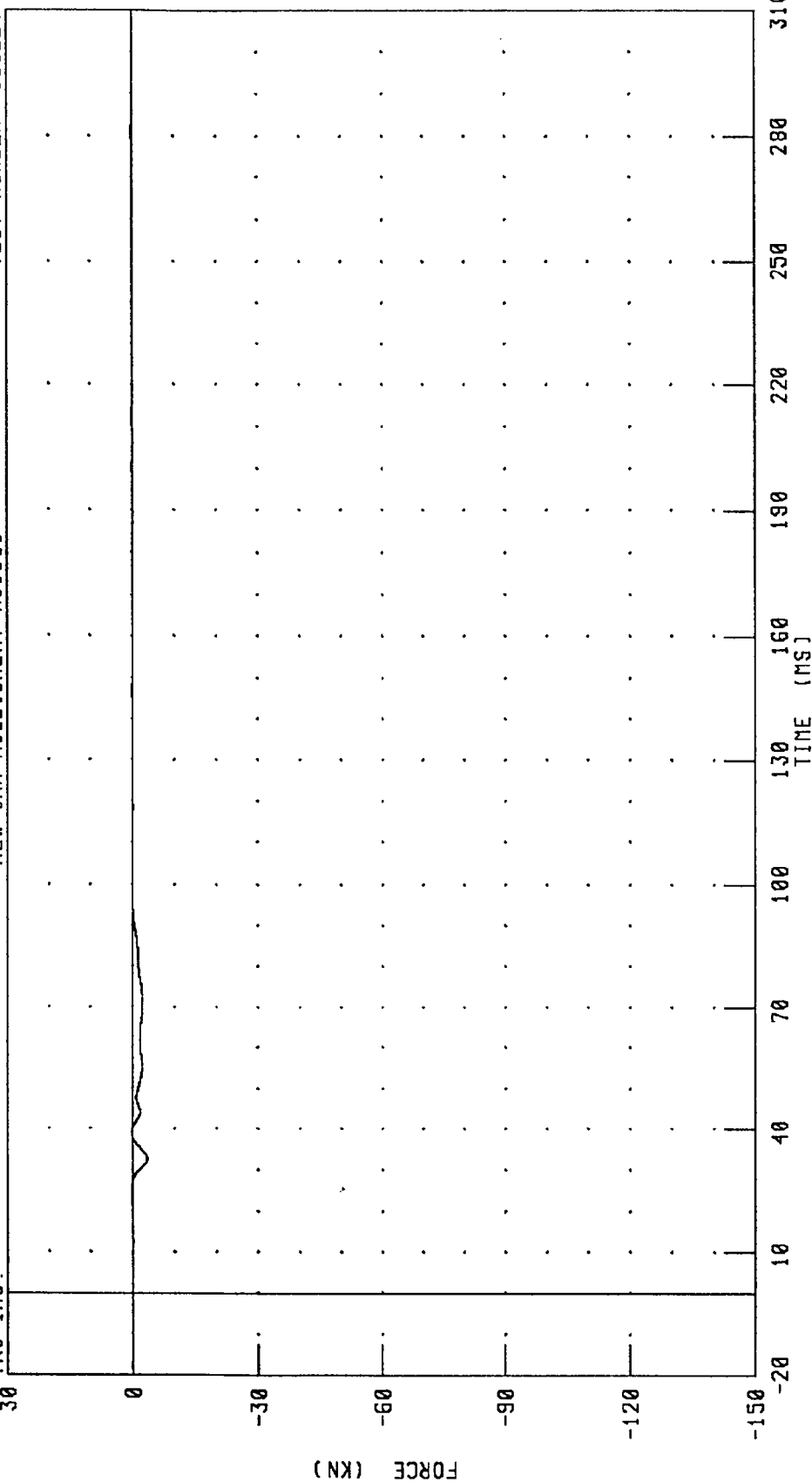


CHANNEL: B02F FILTER: CH. CLASS 60 PEAK DATA: 0.31 KN @ 111.20 MS; -1.09 KN @ 55.44 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D3 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



PEAK DATA: 0.22 KN @ 24.56 MS; -3.50 KN @ 32.64 MS

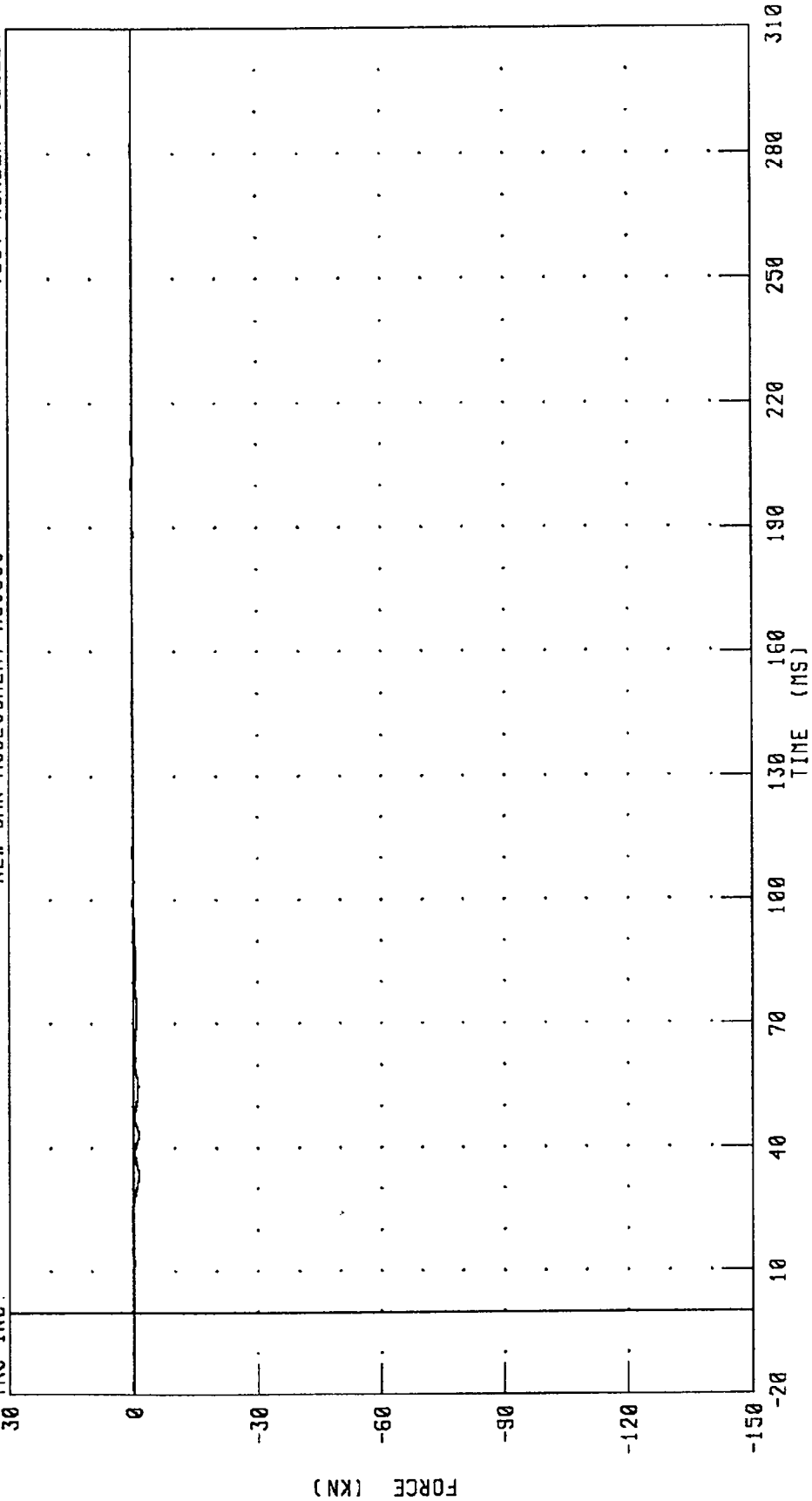
FILTER: CH. CLASS 60

CHANNEL: B03F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D4 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

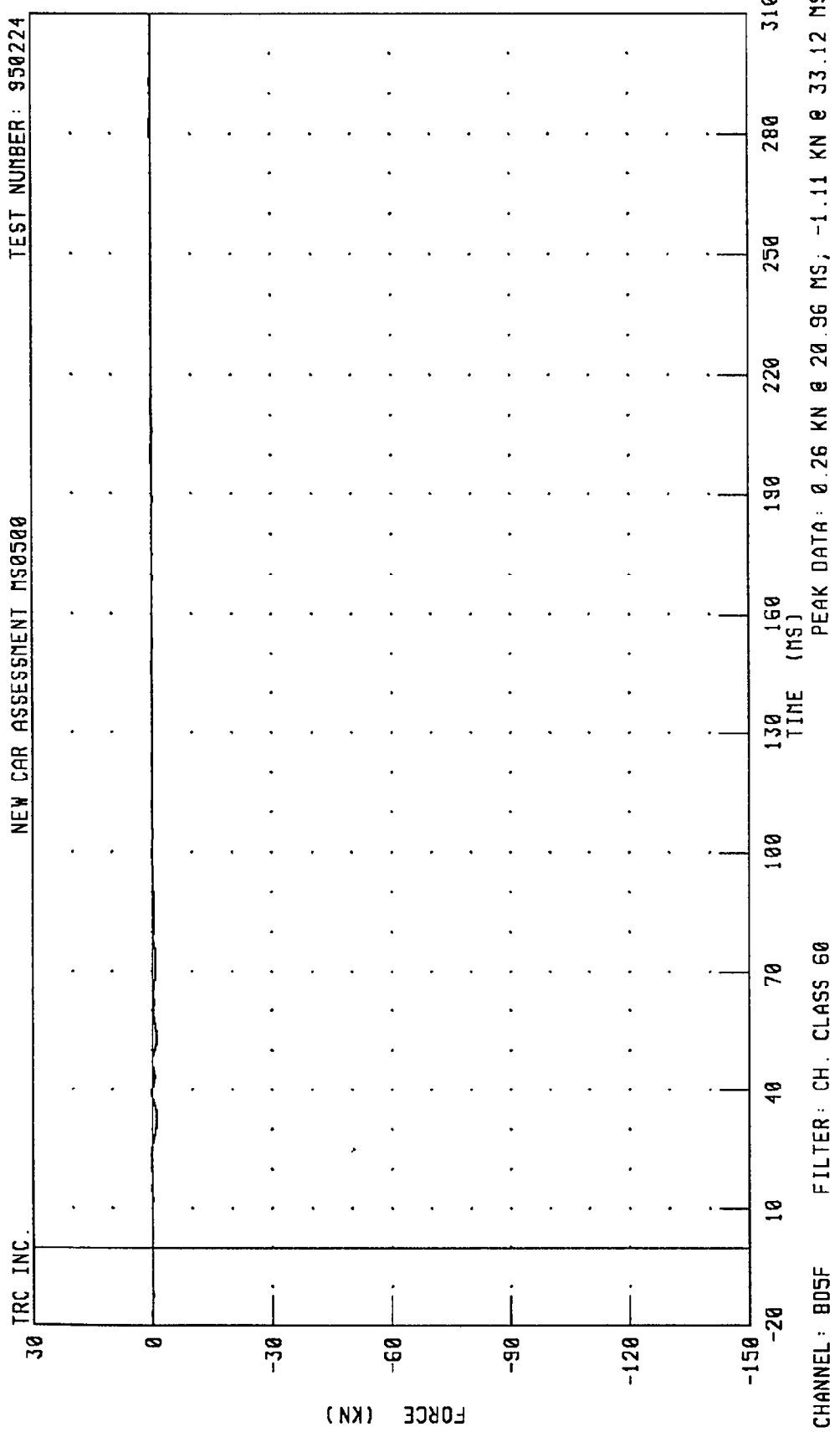
TRC INC.



CHANNEL: BD4F FILTER: CH. CLASS 60 PEAK DATA: 0.25 KN @ 24.72 MS; -1.34 KN @ 33.20 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D5 FORCE
 NEW CAR ASSESSMENT M50500

TEST NUMBER: 950224

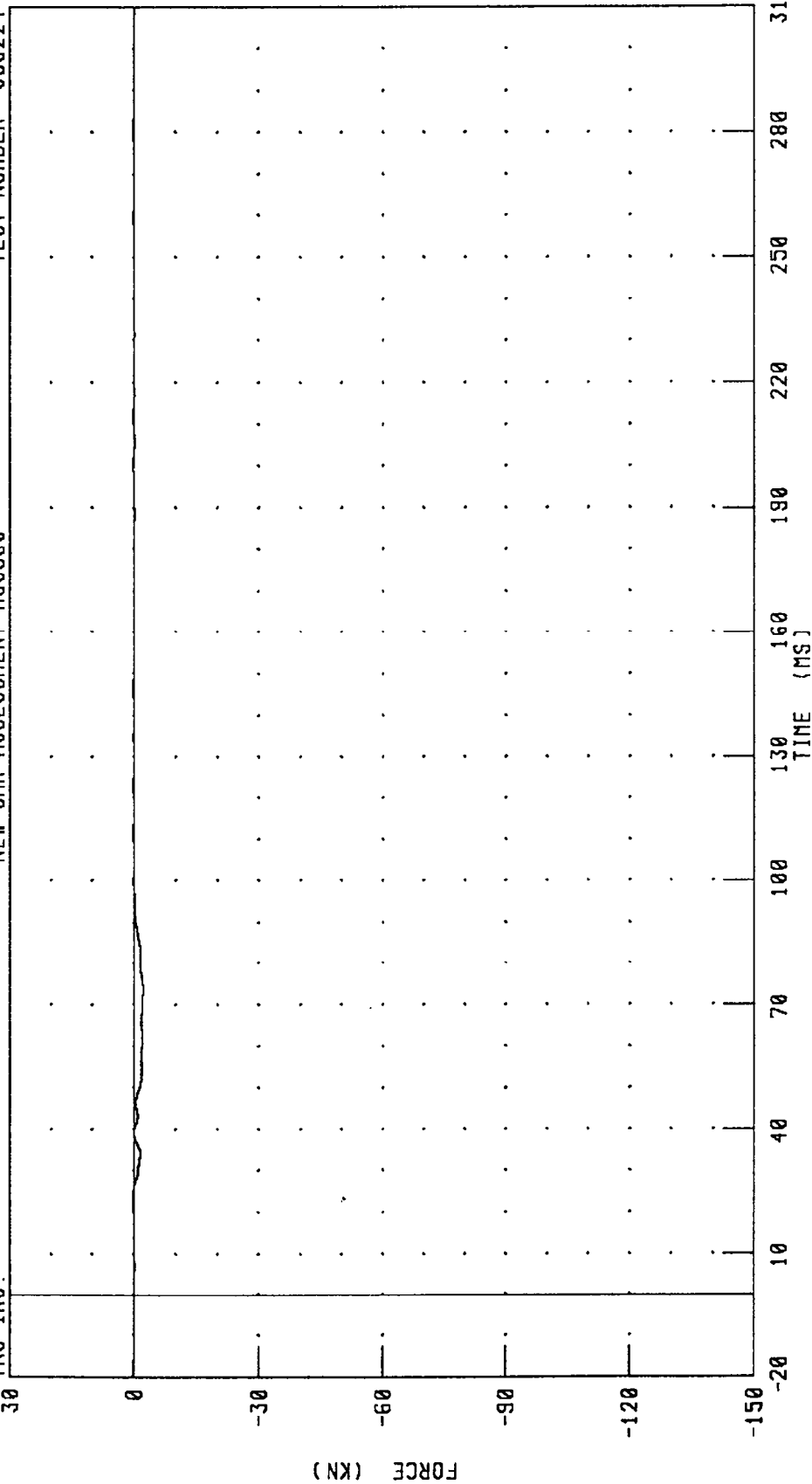


1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D6 FORCE

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



PEAK DATA: 0.30 KN @ 21.76 MS; -2.25 KN @ 73.76 MS

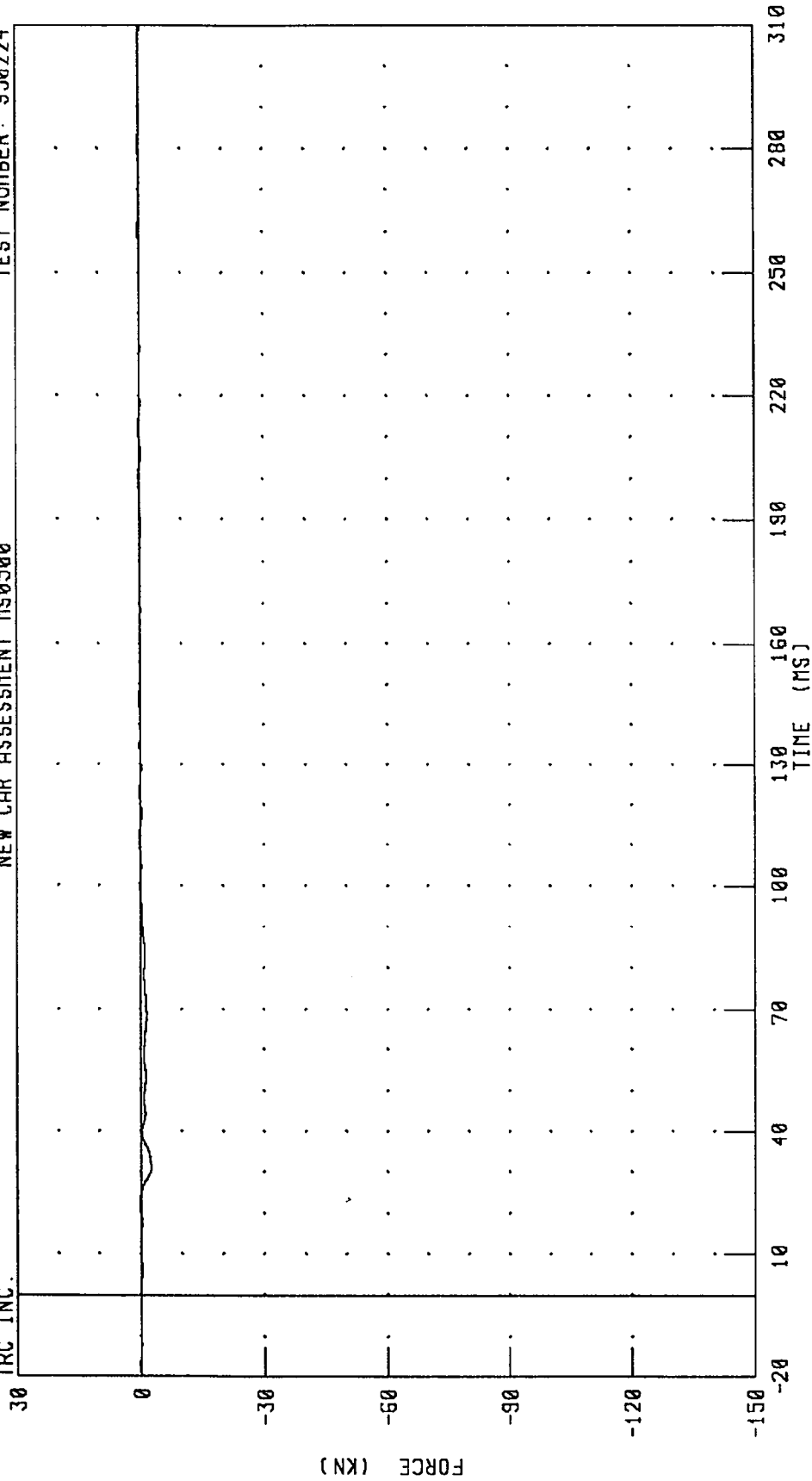
FILTER: CH. CLASS 60

CHANNEL: BD6F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D7 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



PEAK DATA: 0.31 KN @ 22.08 MS; -2.54 KN @ 31.04 MS

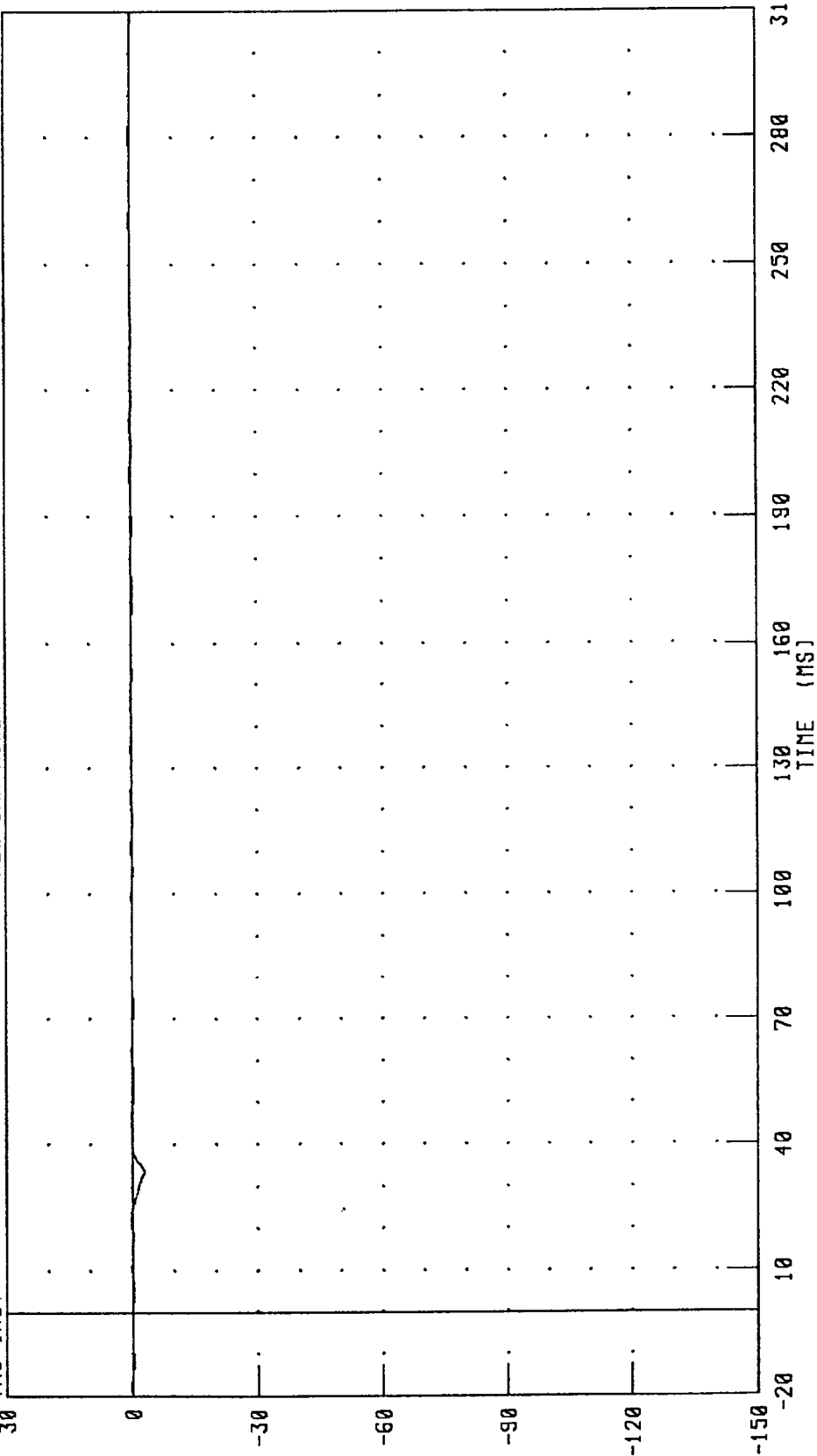
FILTER: CH. CLASS 60

CHANNEL: B07F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D8 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



PEAK DATA: 0.29 KN @ 22.16 MS; -2.76 KN @ 33.68 MS

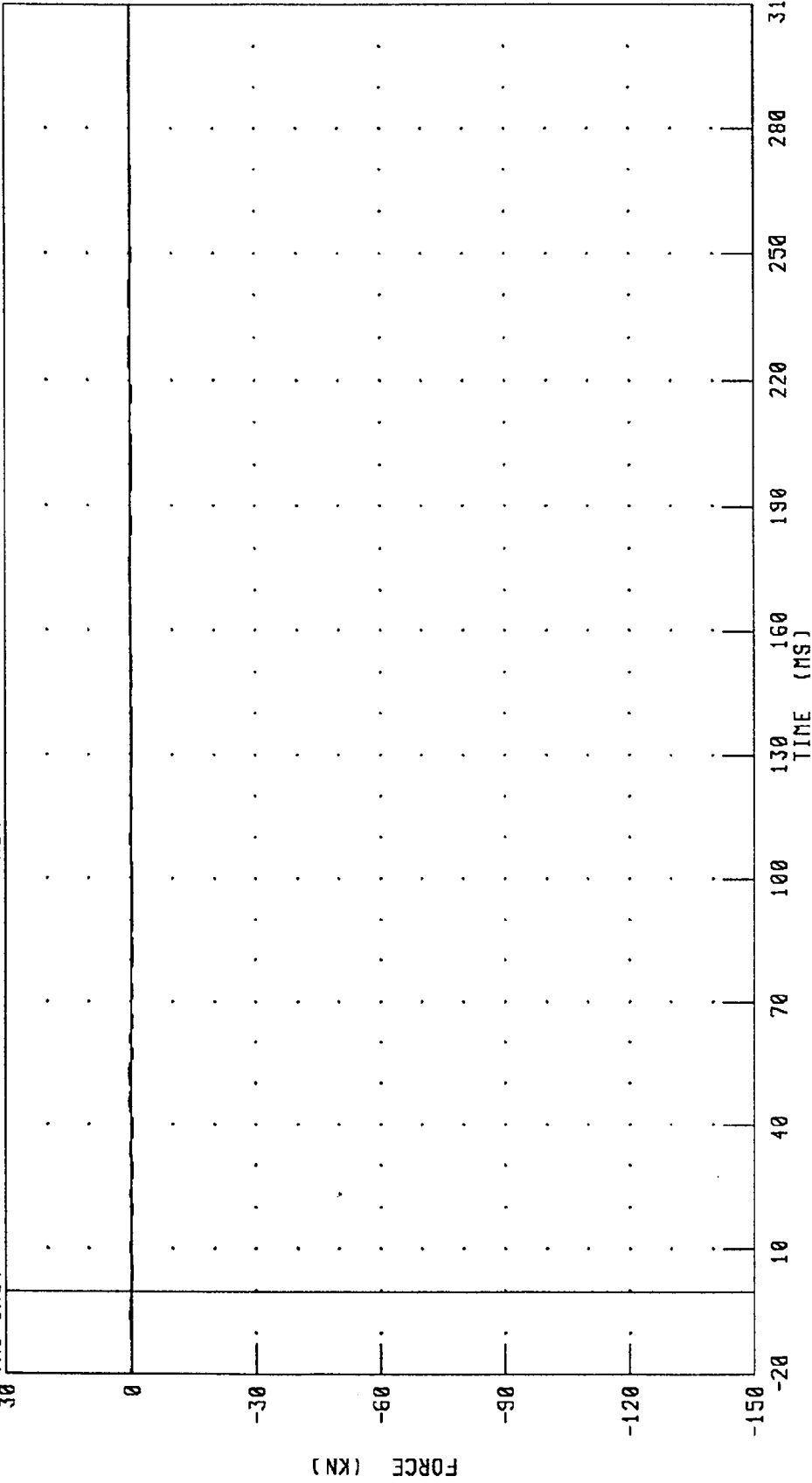
FILTER: CH. CLASS 60

CHANNEL: B08F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D9 FORCE
 NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



PEAK DATA: 0.51 KN @ 52.32 MS; -0.63 KN @ 81.36 MS

FILTER: CH. CLASS 60

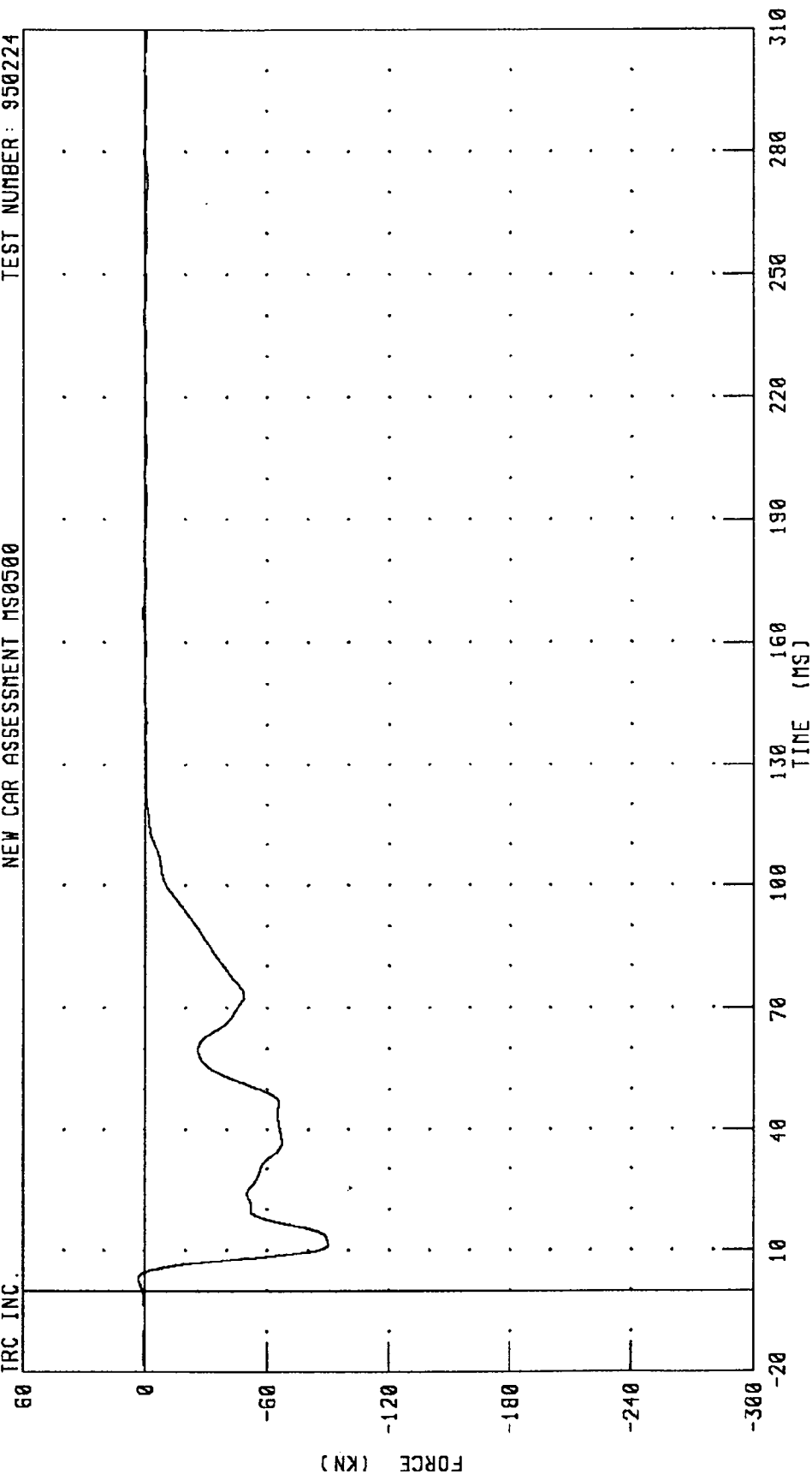
CHANNEL: BD9F

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 1 FORCE TOTAL

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

IRC INC.



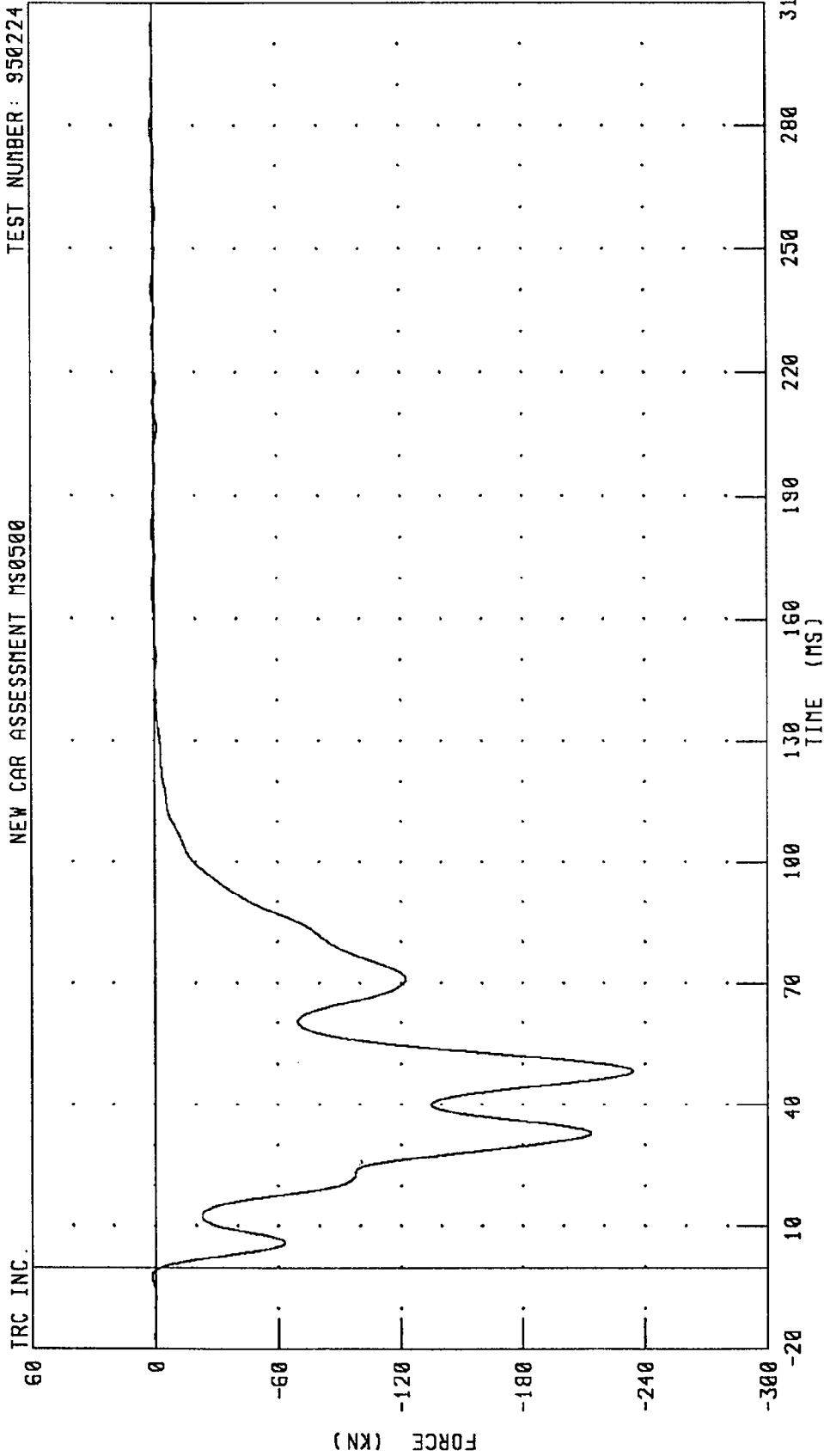
CHANNEL: LCBGIF FILTER: CH. CLASS 60

PEAK DATA: 3.04 KN @ 2.88 MS; -89.99 KN @ 11.36 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 2 FORCE TOTAL

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500



CHANNEL: LCBG2F FILTER: CH. CLASS 60

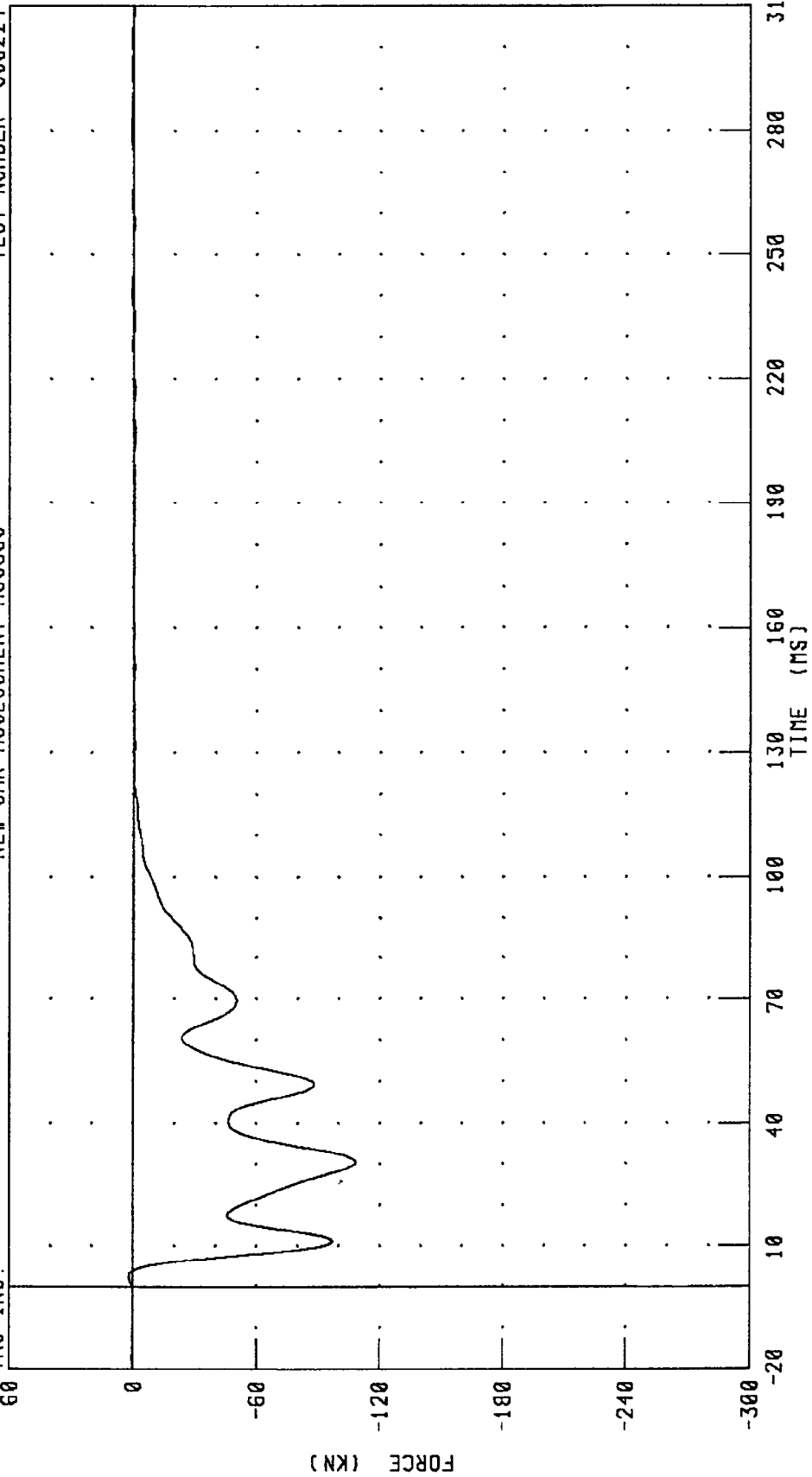
PEAK DATA: 1.67 KN @ -2.32 MS; -234.03 KN @ 48.32 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 3 FORCE TOTAL

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



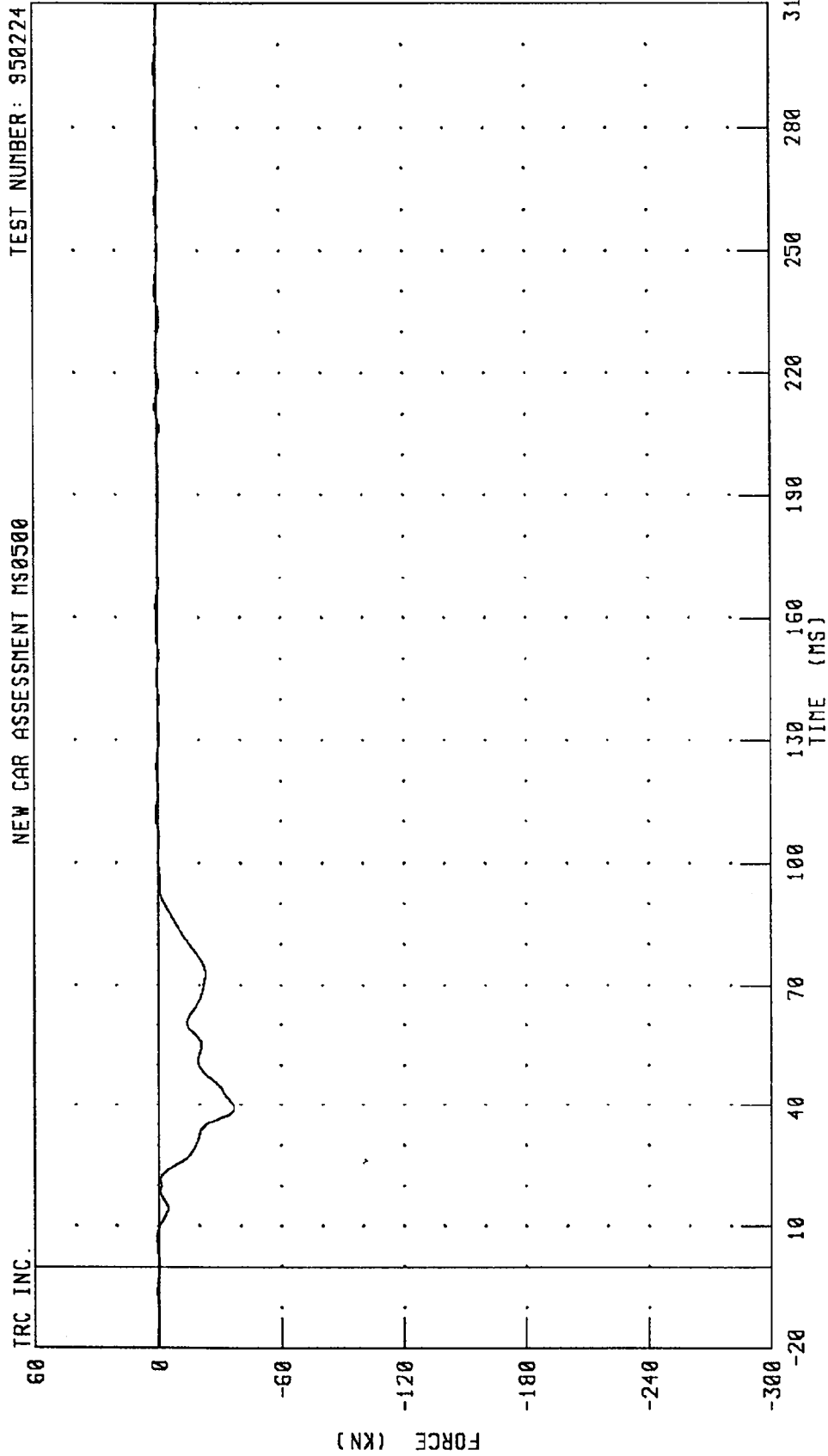
PEAK DATA: 2.12 KN @ 2.48 MS; -108.20 KN @ 30.56 MS

CHANNEL: LCBG3F FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 4 FORCE TOTAL

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500



CHANNEL: LCBG4F FILTER: CH. CLASS 60

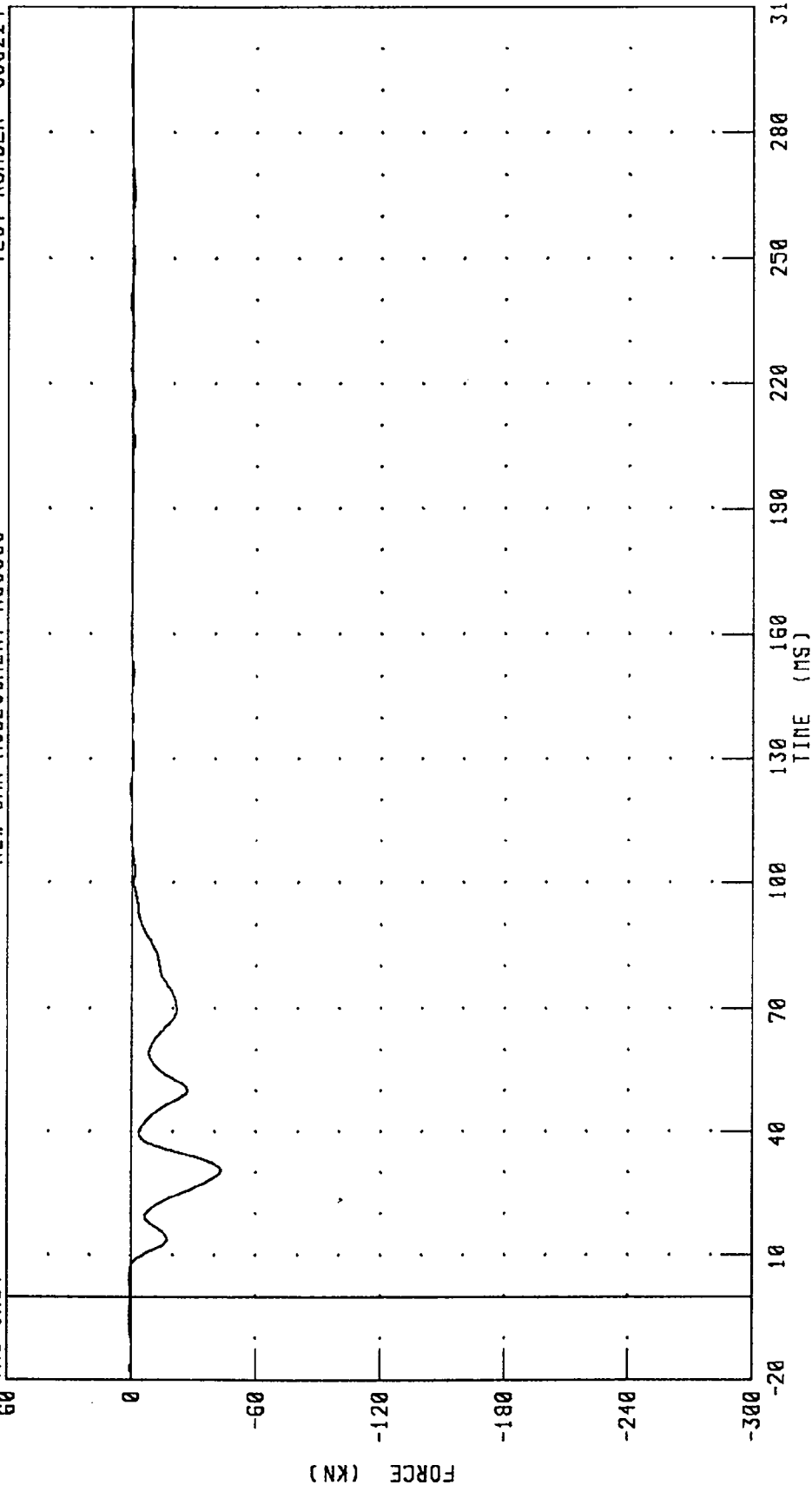
PEAK DATA: 1.17 KN @ 111.68 MS; -36.90 KN @ 39.12 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 5 FORCE TOTAL

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



PEAK DATA: 1 05 KN @ 239.92 MS; -43.04 KN @ 30.56 MS

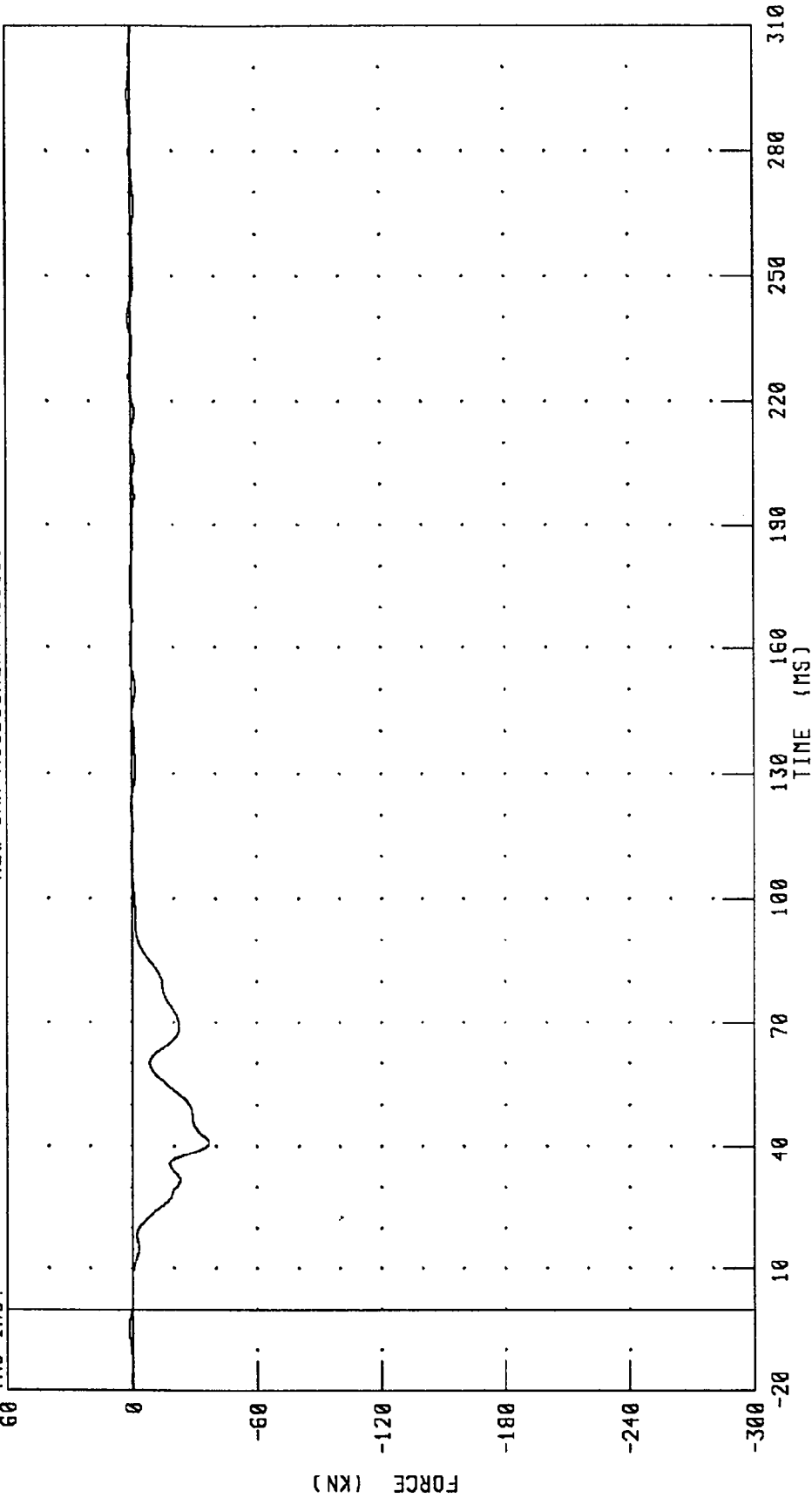
CHANNEL: LCBG5F FILTER: CH. CLASS 60

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 6 FORCE TOTAL

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



CHANNEL: LCBG6F FILTER: CH. CLASS 60

PEAK DATA: 1.53 KN @ -5.36 MS; -36.82 KN @ 40.88 MS

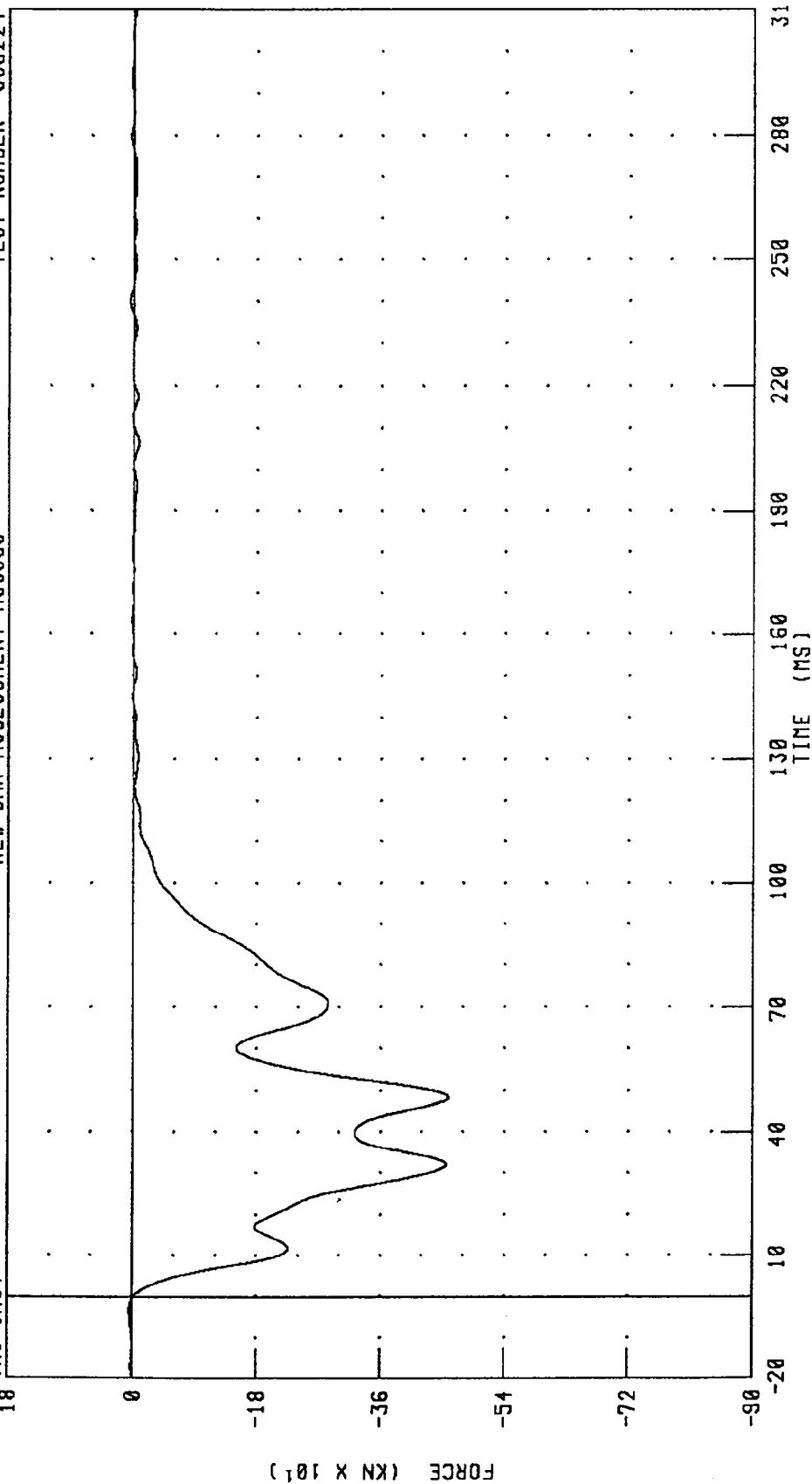
1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER

TOTAL LOAD CELL BARRIER FORCE

NEW CAR ASSESSMENT MS0500

TEST NUMBER: 950224

TRC INC.



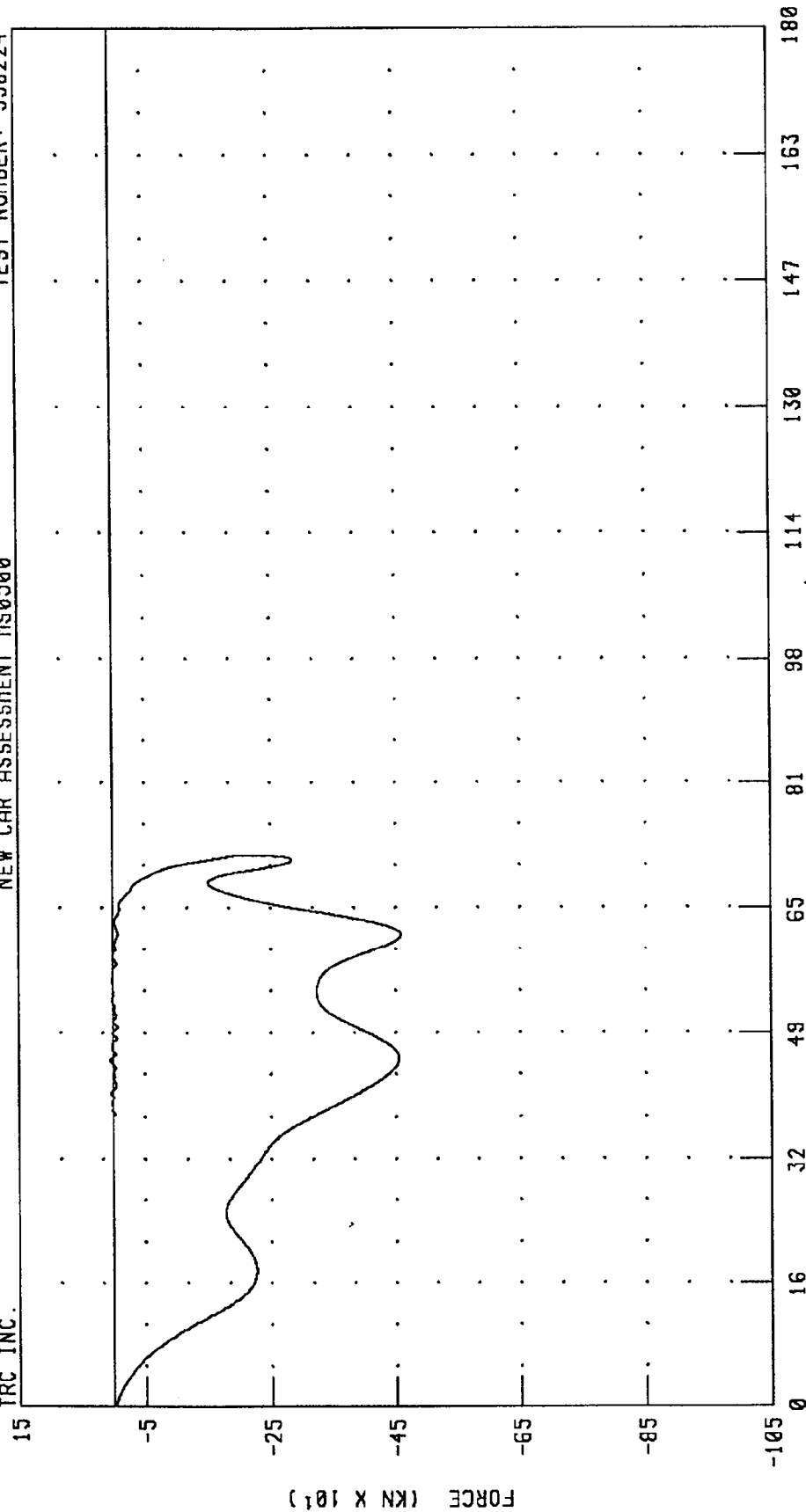
CHANNEL: LCBGT FILTER: CH. CLASS 60 PEAK DATA: 5.35 KN @ 240.08 MS; -458.48 KN @ 48.40 MS

1995 KIA SEPHIA INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT

TEST NUMBER: 950224

NEW CAR ASSESSMENT MS0500

TRC INC.



CHANNEL: 0THXD
LCBGT
FILTER: CH. CLASS 180
CH. CLASS 60
PEAK DATA: 722.73 MM @ 5.35 KN @ 240.08 NS; -458.48 KN @ 48.40 NS
0.00 MM @ 0.00 NS

Appendix C

Dummy Certification Data

Pre-test Certification Data

Driver Dummy S/N: 826

TRANSPORTATION RESEARCH CENTER INC.
PART 572B EXTERNAL DIMENSIONS
SN 826 ALDERSON

21-FEB-95

TRC INC. TEST NO: ED82633 572B SN826 EXT.DIMENSION CAL33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	30 %
SITTING HEIGHT	904 - 909 MM	904. MM
SHOULDER PIVOT HEIGHT	553 - 569 MM	564. MM
HIP PIVOT HEIGHT	99 MM	REFERENCE
HIP PIVOT FROM BACKLINE	122 MM	REFERENCE
KNEE PIVOT FROM BACKLINE	511 - 526 MM	523. MM
REAR OF HEAD FROM BACKLINE	43 MM	REFERENCE
CHEST DEPTH	231 - 241 MM	236. MM
SHOULDER WIDTH	452 - 467 MM	460. MM
CHEST CIRCUMFERENCE OVER NIPPLES	935 - 965 MM	947. MM
WAIST CIRCUMFERENCE AT MIN. GIRTH	798 - 828 MM	826. MM
HIP WIDTH	356 - 391 MM	373. MM
KNEE PIVOT FROM FLOOR	490 - 506 MM	490. MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Pete R. A.*

RUN NUMBER: 022295.1234

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

PART 572B

21-FEB-95

TRC INC.

TEST NO: HD82633

572B SN 826 HEAD DROP CAL 33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	32 %
PEAK RESULTANT ACCELERATION	210 - 260 G	235.93 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MS	1.22 MS
PEAK LATERAL ACCELERATION	10 G MAX	-5.27 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

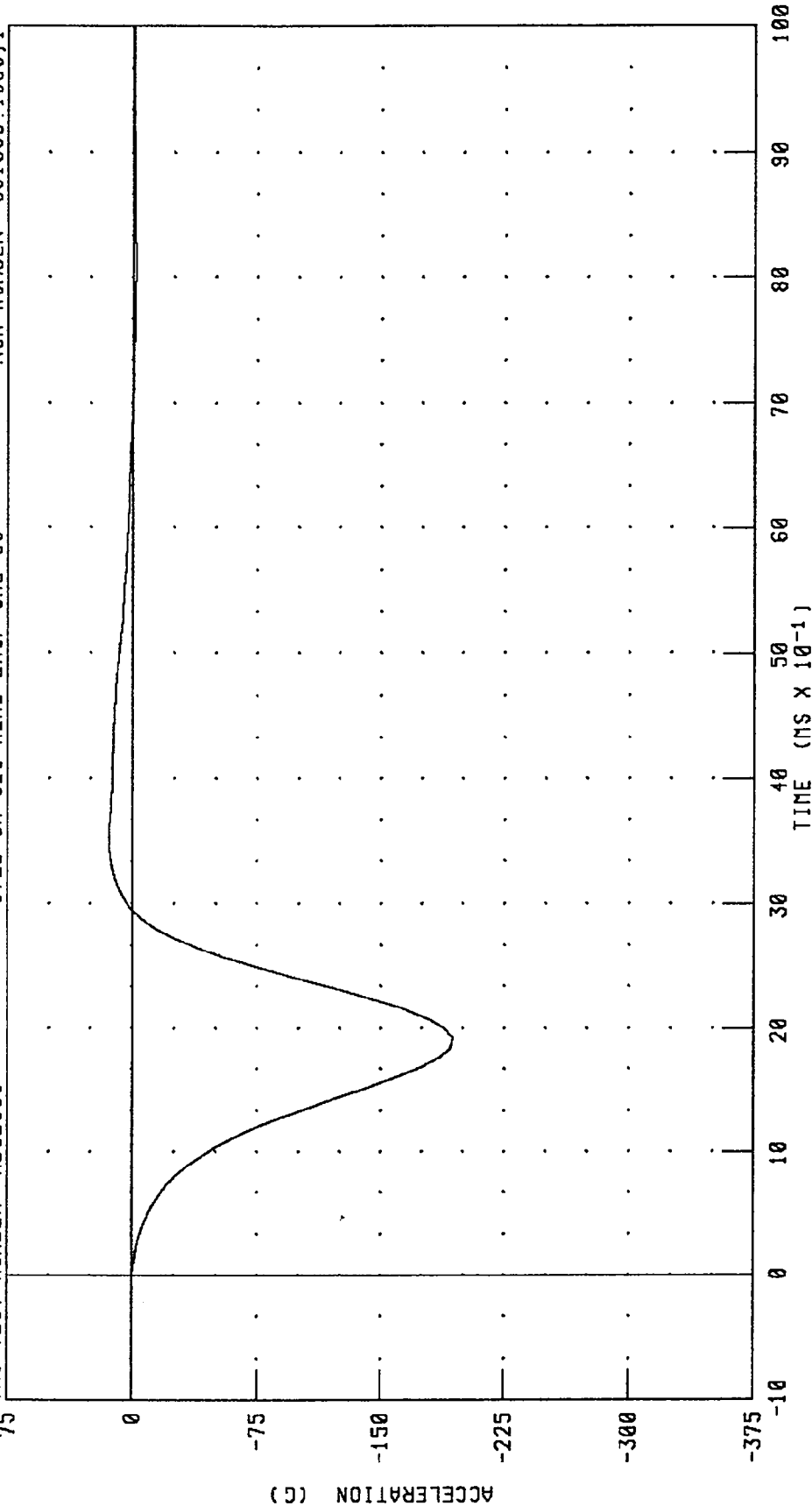
DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Patricia K. Smith*

RUN NUMBER: 022195.1119;1

PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HD82633 572B SN 826 HEAD DROP CAL 33 RUN NUMBER: 031395.1506;1

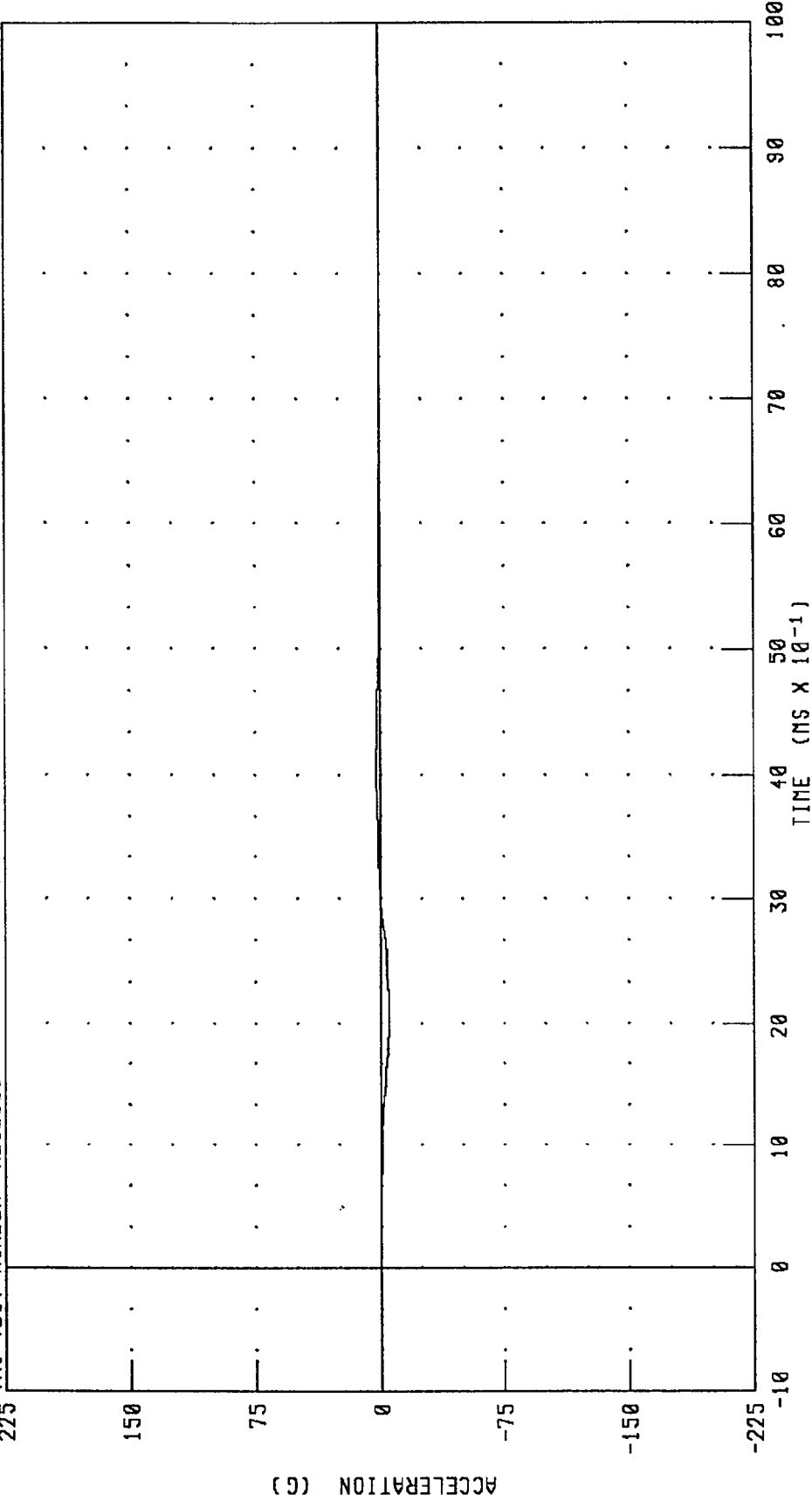


PEAK DATA: 13.77 G @ 3.52 MS; -193.84 G @ 1.92 MS

CHANNEL: HEDXC FILTER: CH. CLASS 1000

PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: HD82633 572B SN 826 HEAD DROP CAL 33 RUN NUMBER: 031395.1506;1

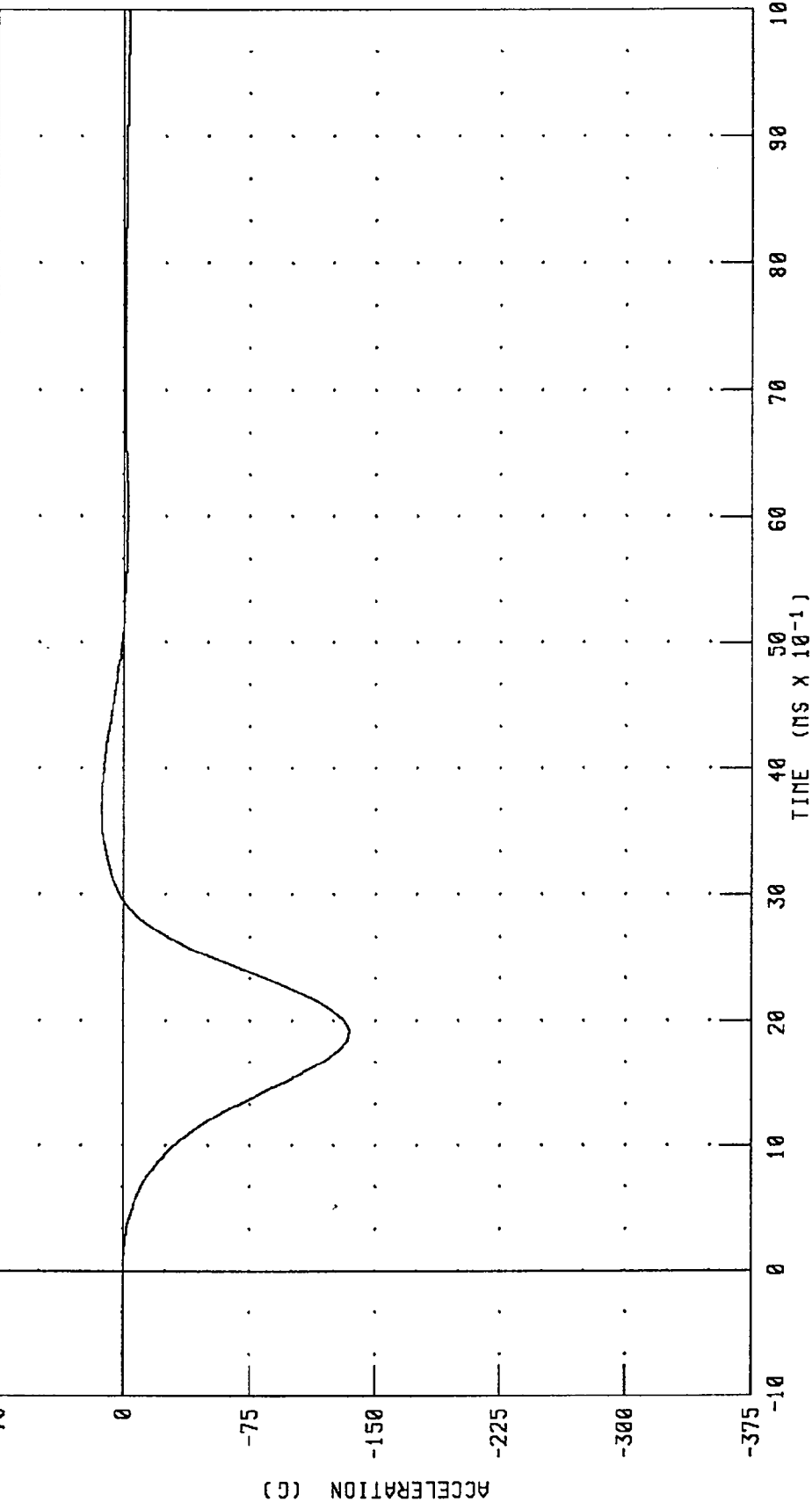


PEAK DATA: 2.47 G @ 4.00 MS; -5.27 G @ 2.00 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: HD82633 572B SN 826 HEAD DROP CAL 33 RUN NUMBER: 031395.1506;1



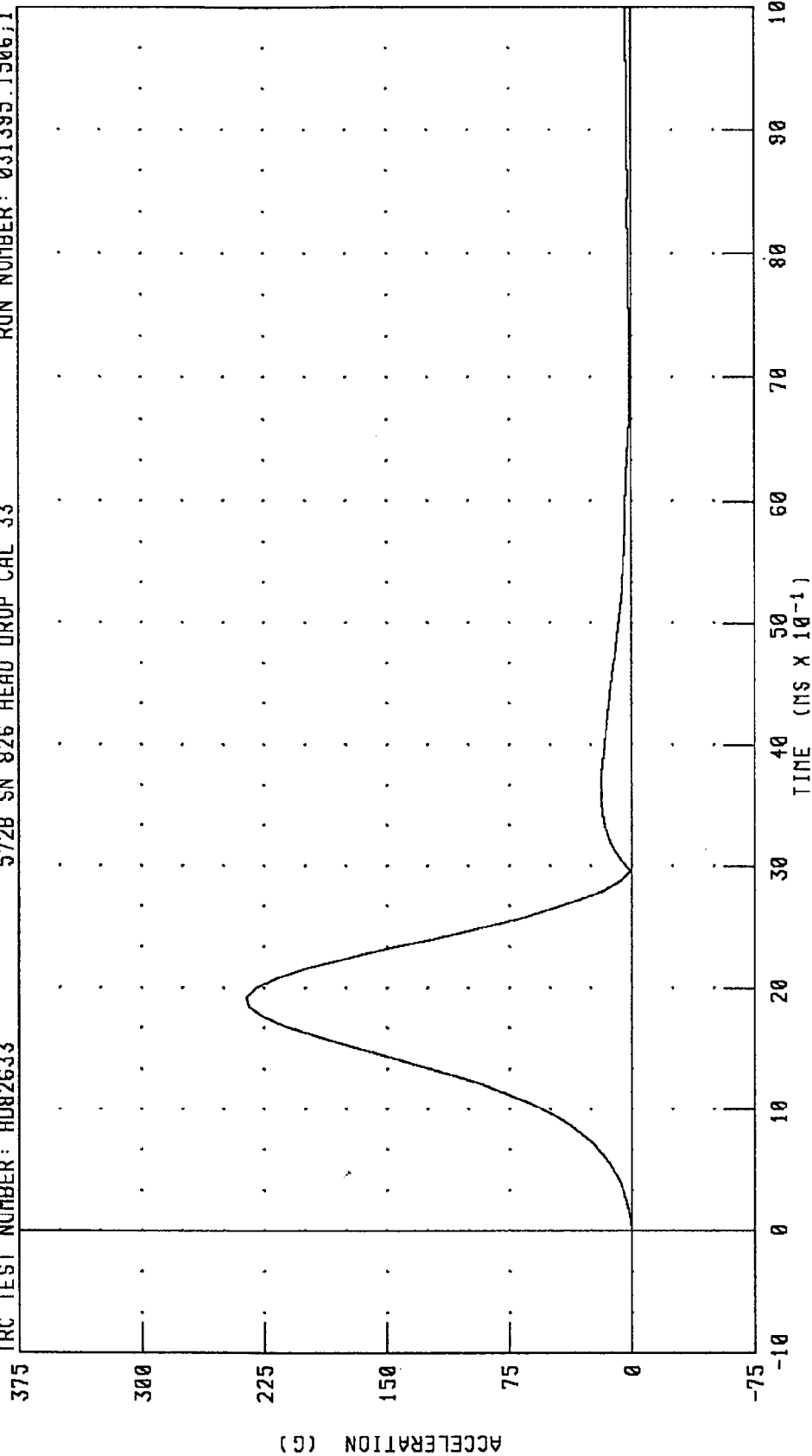
PEAK DATA: 12.98 G @ 3.68 MS; -134.41 G @ 1.92 MS

CHANNEL: HEDZG FILTER: CH. CLASS 1000

PART 572-B HYBRID II HEAD DROP CALIBRATION
 HEAD RESULTANT ACCELERATION
 572B SN 826 HEAD DROP CAL 33

RUN NUMBER: 031395.1506;1

TRC TEST NUMBER: HD82633



PEAK DATA: 235.93 G @ 1.92 MS; 0.10 G @ -0.16 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.
NECK PENDULUM TEST
PART 572B

21-FEB-95

TRC INC. TEST NO: HN82633 572B SN 826 HEAD/NECK CAL 33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	32 %
PENDULUM VELOCITY	6.55 - 7.77 M/S	7.26 M/S
PENDULUM DECELERATION:		
T1 - T2 TIME (5 - 20 G)	3 MS MAX	1.85 MS
T2 - T3 TIME (20 - 20 G)	25 - 30 MS	28.56 MS
T3 - T4 TIME (20 - 5 G)	10 MS MAX	4.35 MS
AVG. G LEVEL T2 - T3	20 - 24 G	23.13 G
MAXIMUM ROTATION ANGLE	63 - 73 DEG.	65.58 DEG.
PEAK HEAD RESULTANT ACCEL	26 G MAX	24.73 G
PENDULUM REVERSAL TIME AFTER NECK RETURN TIME	> 0 MS	15.90 MS

TEST PARAMETER	SPECIFICATION		TEST RESULTS	
ROTATION ANGLE (DEGREES)	TIME (MS)	CHORDAL DISP. (MM)	TIME (MS)	CHORDAL DISP. (MM)
0	-2.0 - +2.0	-12.7 - +12.7	1.12	0.17
30	25.6 - 34.4	53.3 - 78.7	30.13	61.18
60	40.3 - 51.7	109.2 - 134.6	47.20	117.79
MAX	53.2 - 66.8	127.0 - 152.4	60.80	131.75
60	67.0 - 83.0	109.2 - 134.6	71.39	119.71
30	85.4 - 104.6	53.3 - 78.7	90.75	58.70
0	101.0 - 123.0	-12.7 - +12.7	105.35	2.68

DUMMY MEETS SPECIFICATIONS

SND: 151.13 MM

TECHNICIAN

Pete R. S.

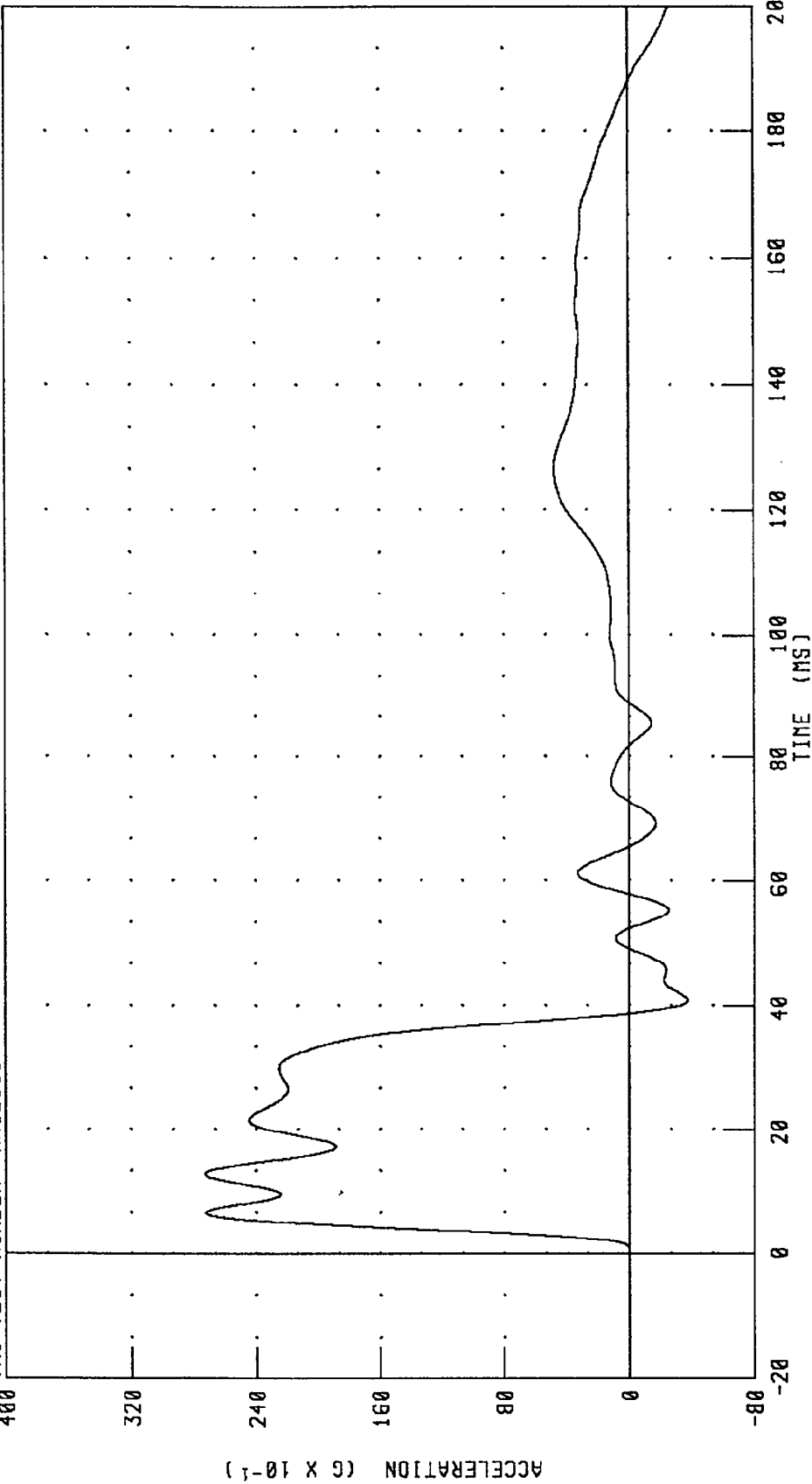
RUN NUMBER: 022195.1229;1

PART 572-B HYBRID II HEAD/NECK CALIBRATION

PENDULUM DECELERATION

572B SN 826 HEAD/NECK CAL 33 RUN NUMBER: 031395.1506,1

TRC TEST NUMBER: HN82633



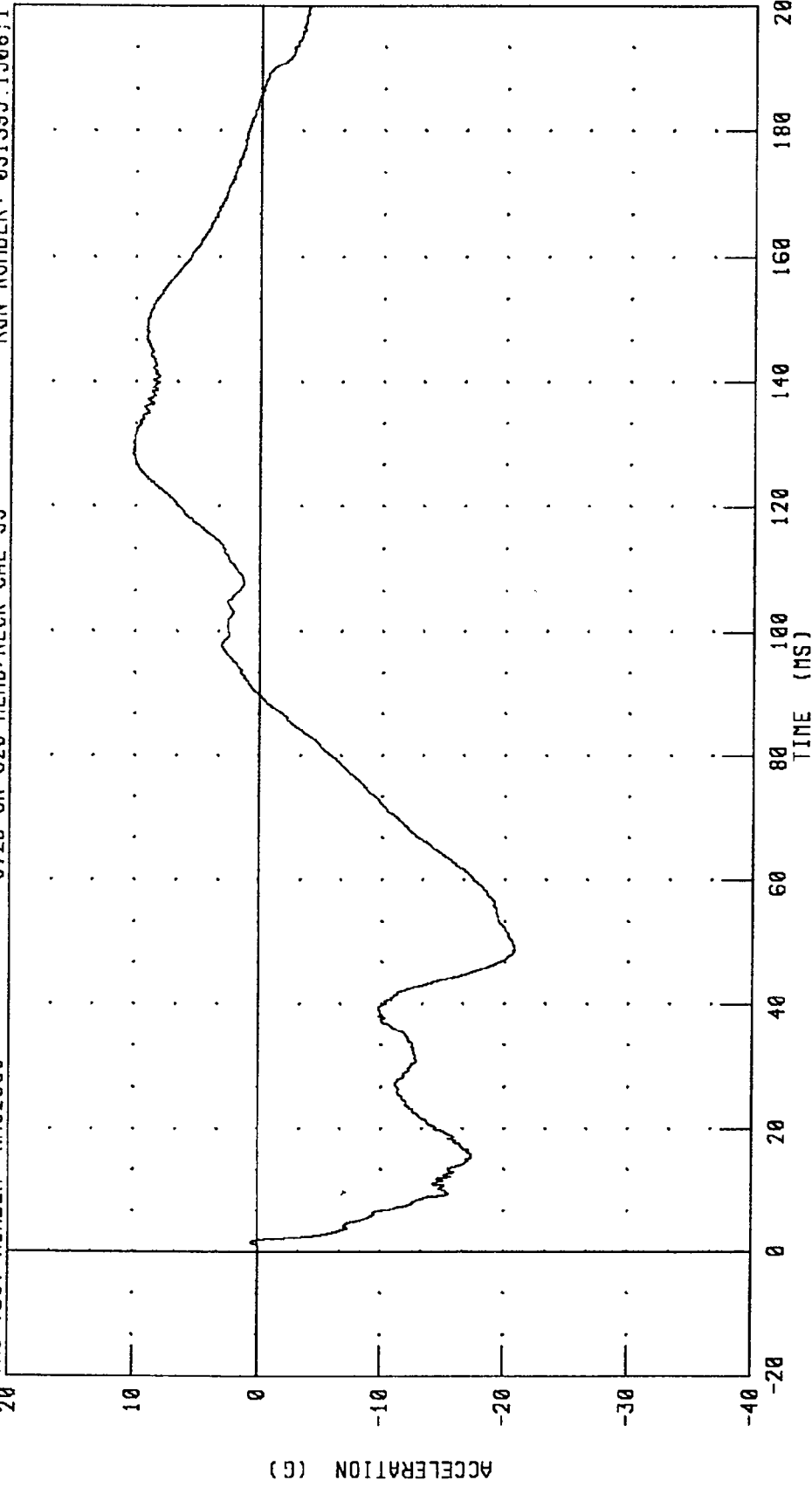
PEAK DATA: 27.32 G @ 12.80 MS; -3.73 G @ 40.88 MS

CHANNEL: PENXG FILTER: CH. CLASS 60

PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HN82633 572B SN 826 HEAD/NECK CAL 33 RUN NUMBER: 031395.1506;1



CHANNEL: HEDXC FILTER: CH. CLASS 1000

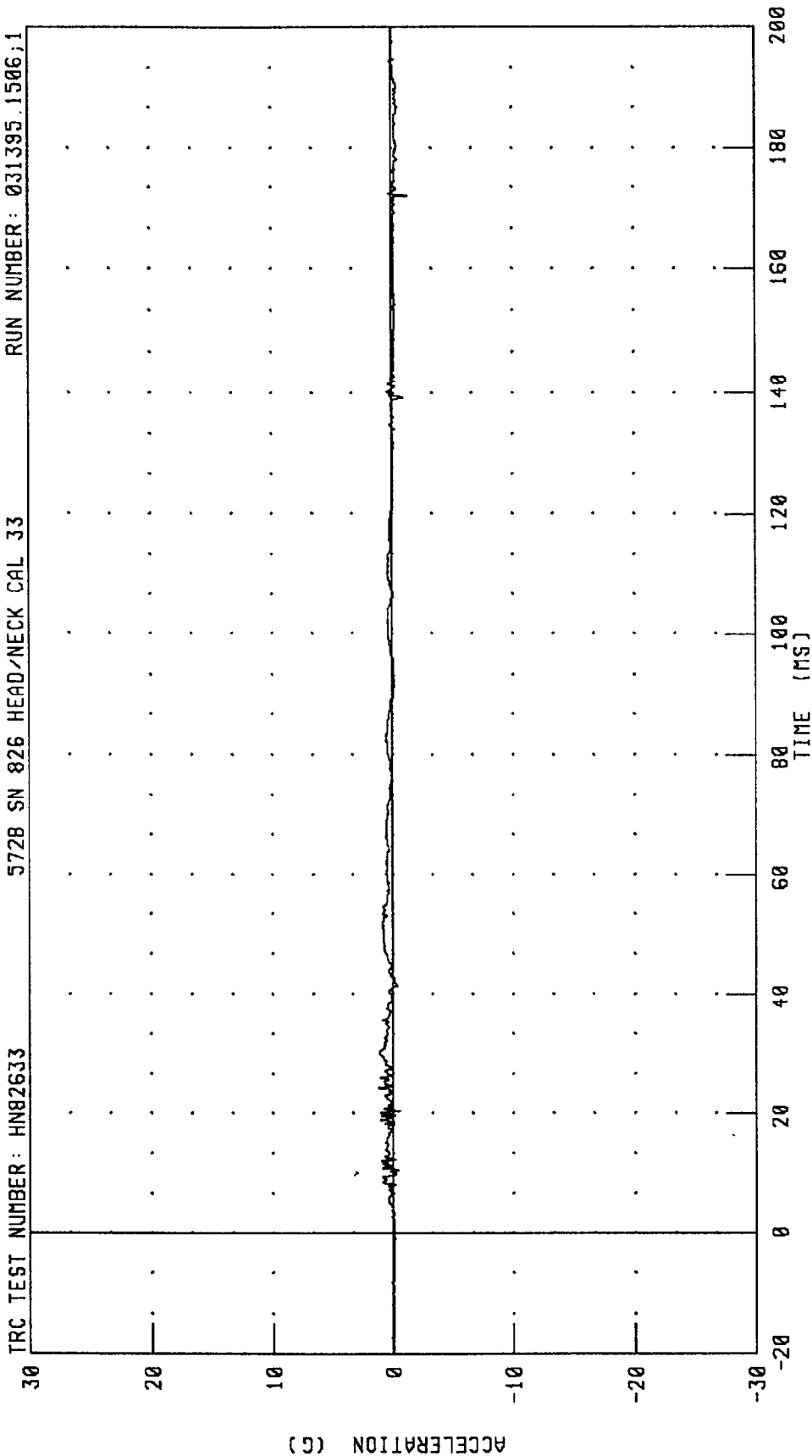
PEAK DATA: 10.21 G @ 128.40 MS; -20.80 G @ 48.80 MS

PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD ACCELERATION Y AXIS

572B SN 826 HEAD/NECK CAL 33 RUN NUMBER: 031395.1506;1

TRC TEST NUMBER: HN82633



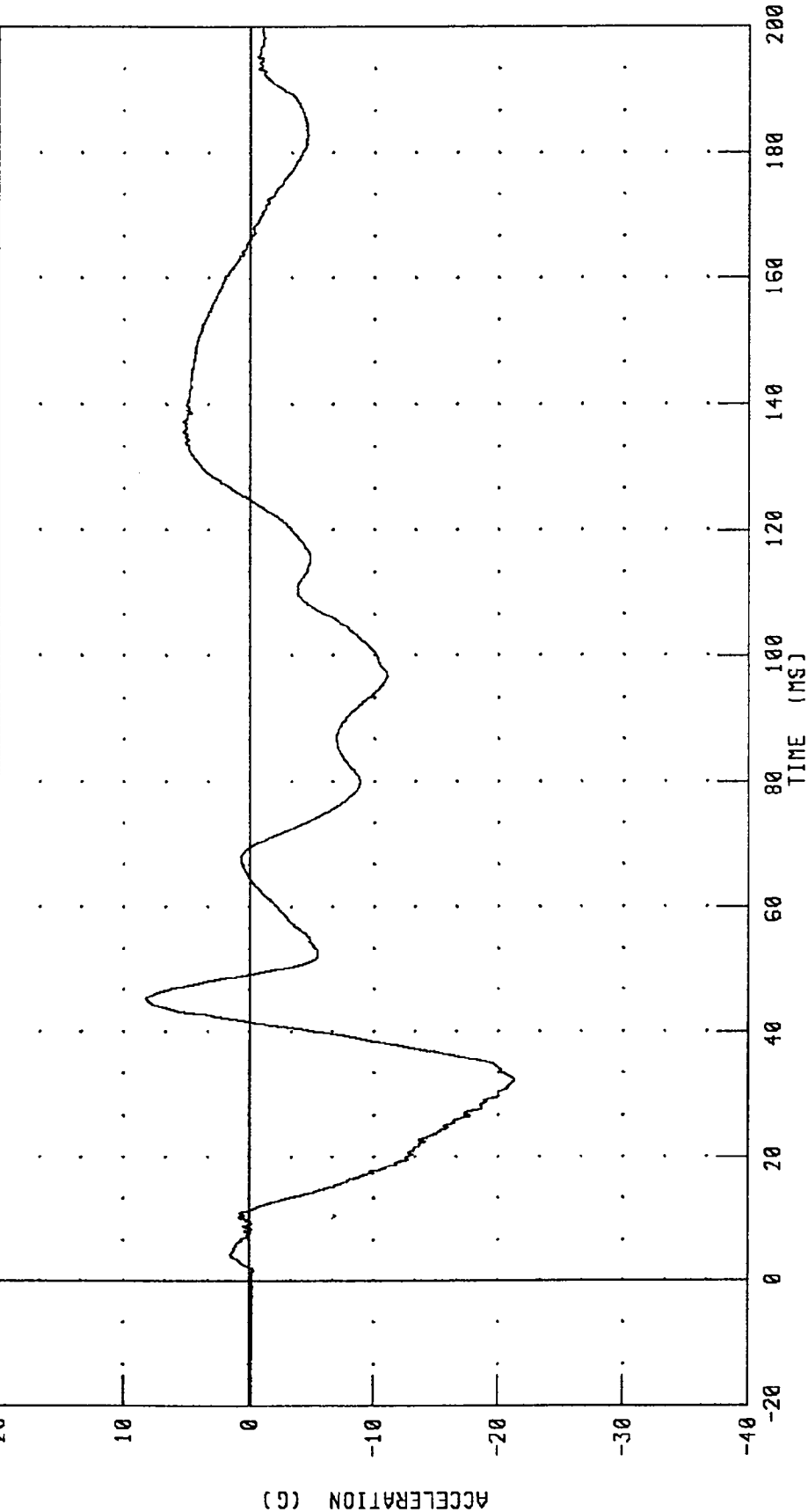
CHANNEL: HEDYG FILTER: CH. CLASS 1000

PEAK DATA: 1.20 G @ 24.32 MS; -1.37 G @ 172.08 MS

PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: HN82633 572B SN 826 HEAD/NECK CAL 33 RUN NUMBER: 031395.1506;1



CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: 8.22 G @ 45.28 MS; -21.25 G @ 32.32 MS

PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD RESULTANT ACCELERATION

572B SN 826 HEAD/NECK CAL 33

TRC TEST NUMBER: HN82633

50

40

30

20

10

0

-10

-20

ACCELERATION (G)

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

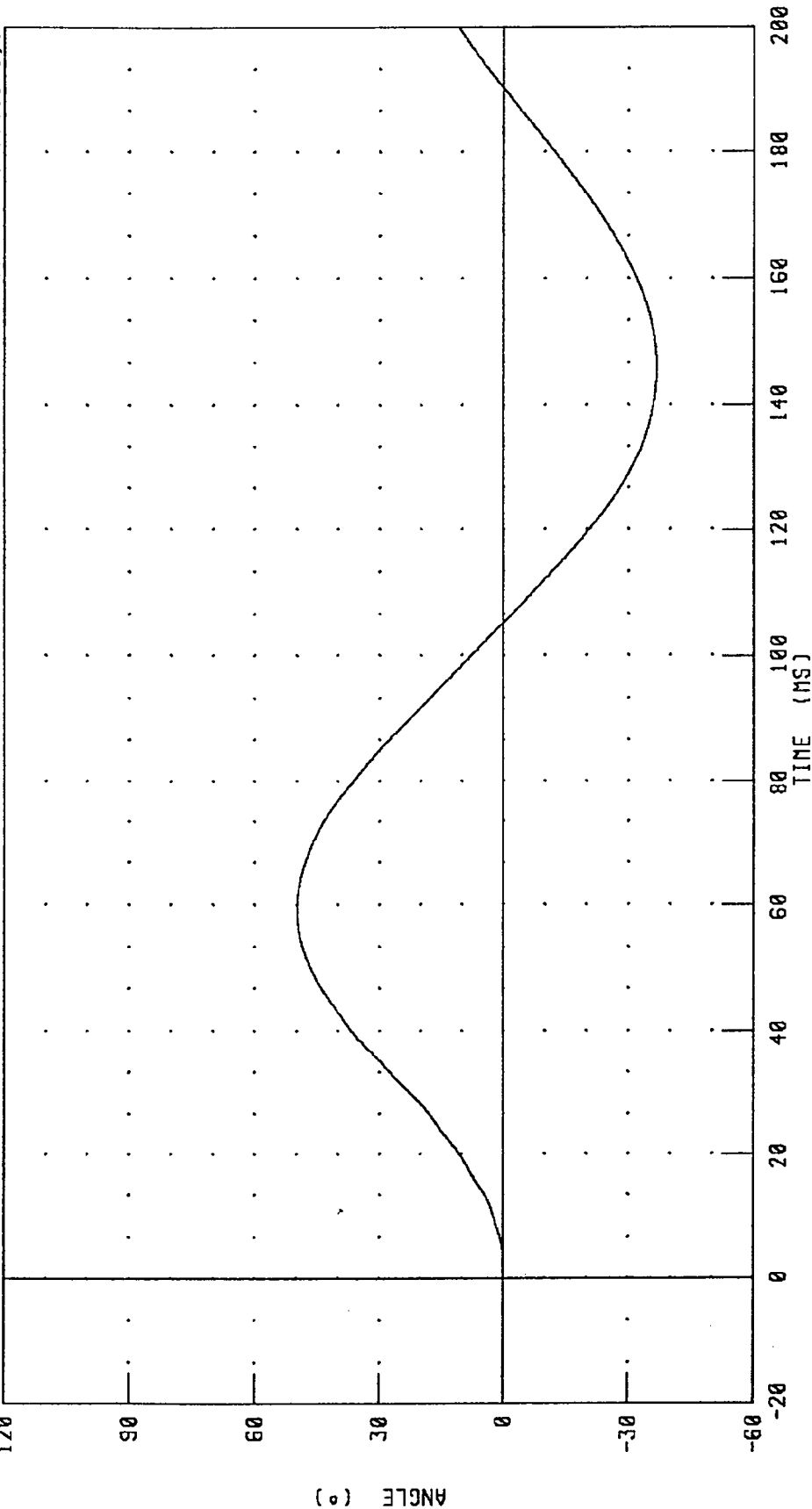
PEAK DATA: 24.73 G @ 32.08 MS; 0.08 G @ -16.32 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

RUN NUMBER: 031395.1506;1

PART 572-B HYBRID II HEAD/NECK CALIBRATION
 ROTATION ABOUT THE BASE OF THE NECK

TRC TEST NUMBER: HN82633 572B SN 826 HEAD/NECK CAL 33 RUN NUMBER: 031395.1506;1



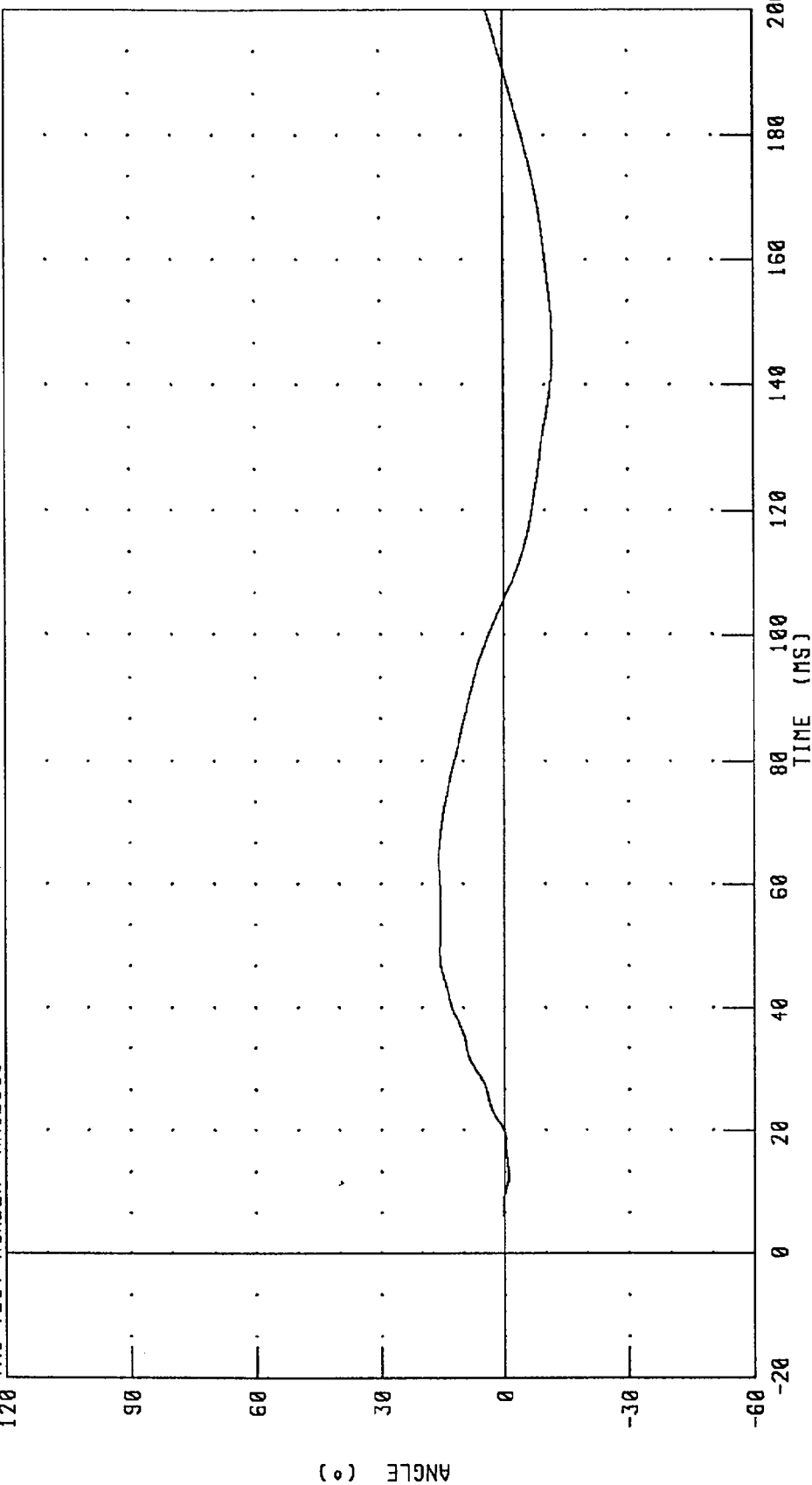
CHANNEL: BETA FILTER: CH. CLASS 60 PEAK DATA: 49.89 ° @ 59.28 MS; -36.76 ° @ 145.76 MS

PART 572-B HYBRID II HEAD/NECK CALIBRATION

ROTATION ABOUT THE HEAD C.G.

572B SN 826 HEAD/NECK CAL 33 RUN NUMBER: 031395.1506;1

TRC TEST NUMBER: HN82633



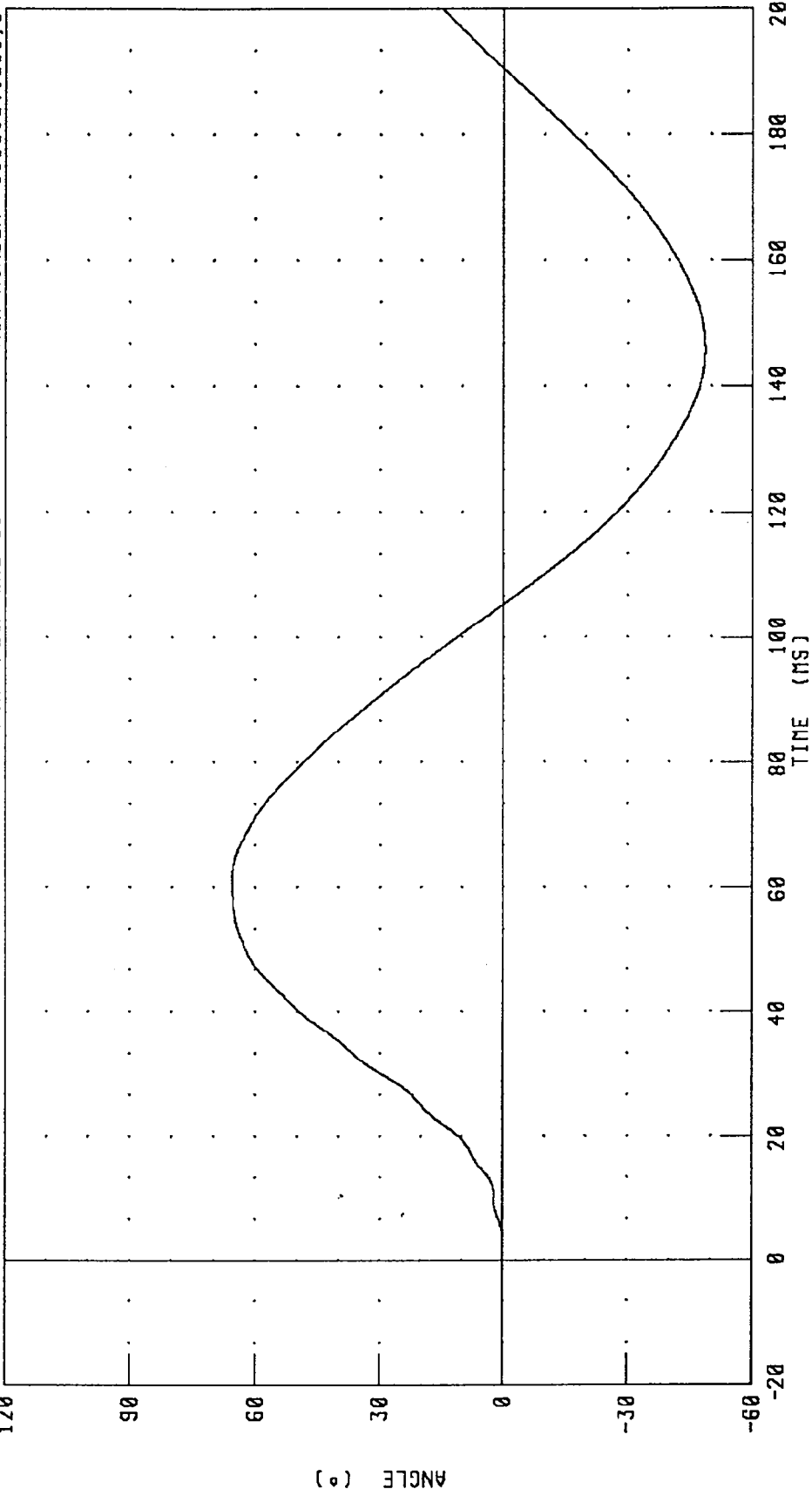
PEAK DATA: 16.02 ° @ 64.00 MS; -11.96 ° @ 145.52 MS

CHANNEL: THETA FILTER: CH. CLASS 60

PART 572-B HYBRID II HEAD/NECK CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: HN82633 572B SN 826 HEAD/NECK CAL 33 RUN NUMBER: 031395.1506,1



PEAK DATA: 65.58 ° @ 60.80 MS; -48.61 ° @ 145.68 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

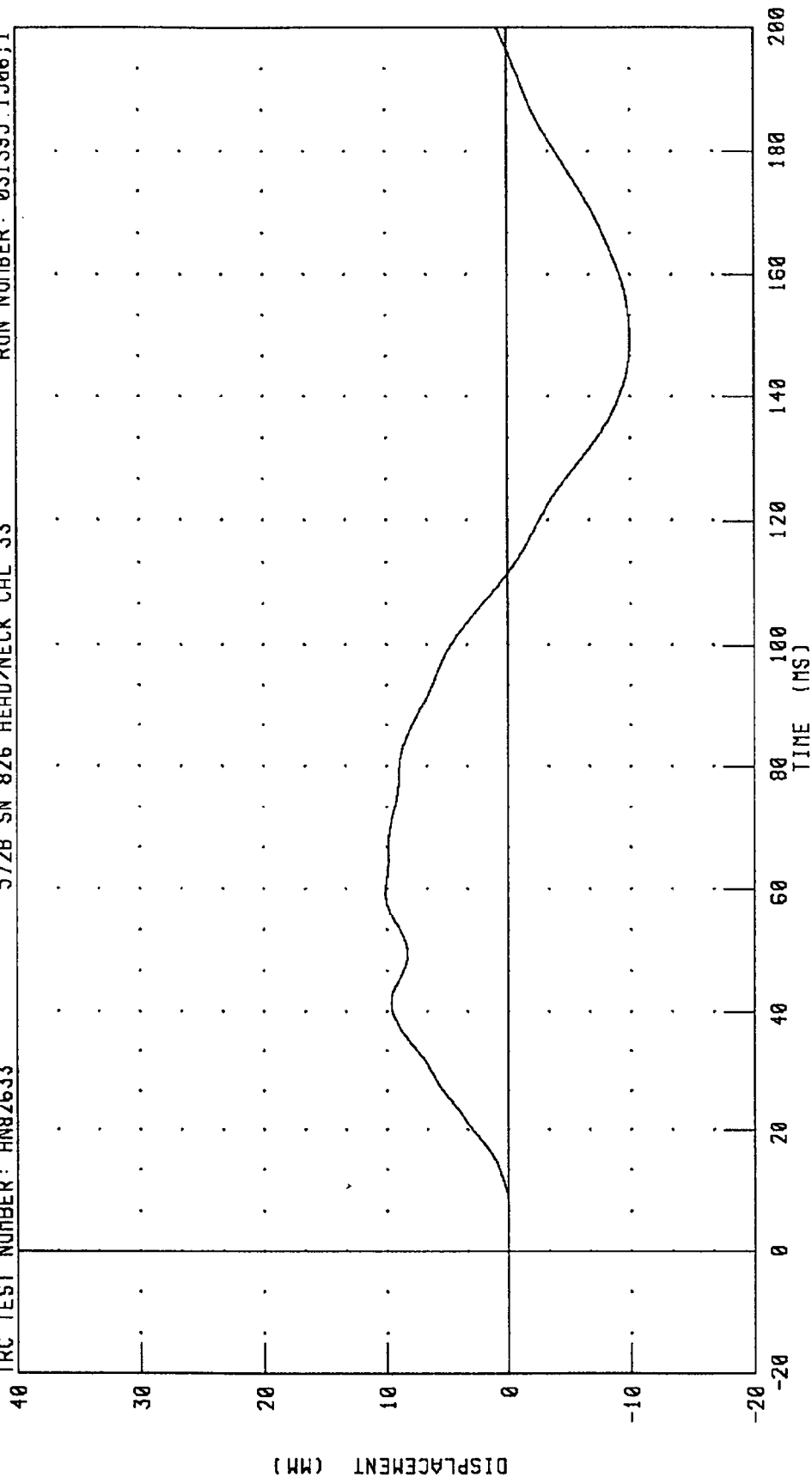
PART 572-B HYBRID II HEAD/NECK CALIBRATION

NECK DISPLACEMENT Z AXIS

572B SN 826 HEAD/NECK CAL 33

RUN NUMBER: 031395.1506;1

TRC TEST NUMBER: HN82633



CHANNEL: NEKZD FILTER: CH. CLASS 60

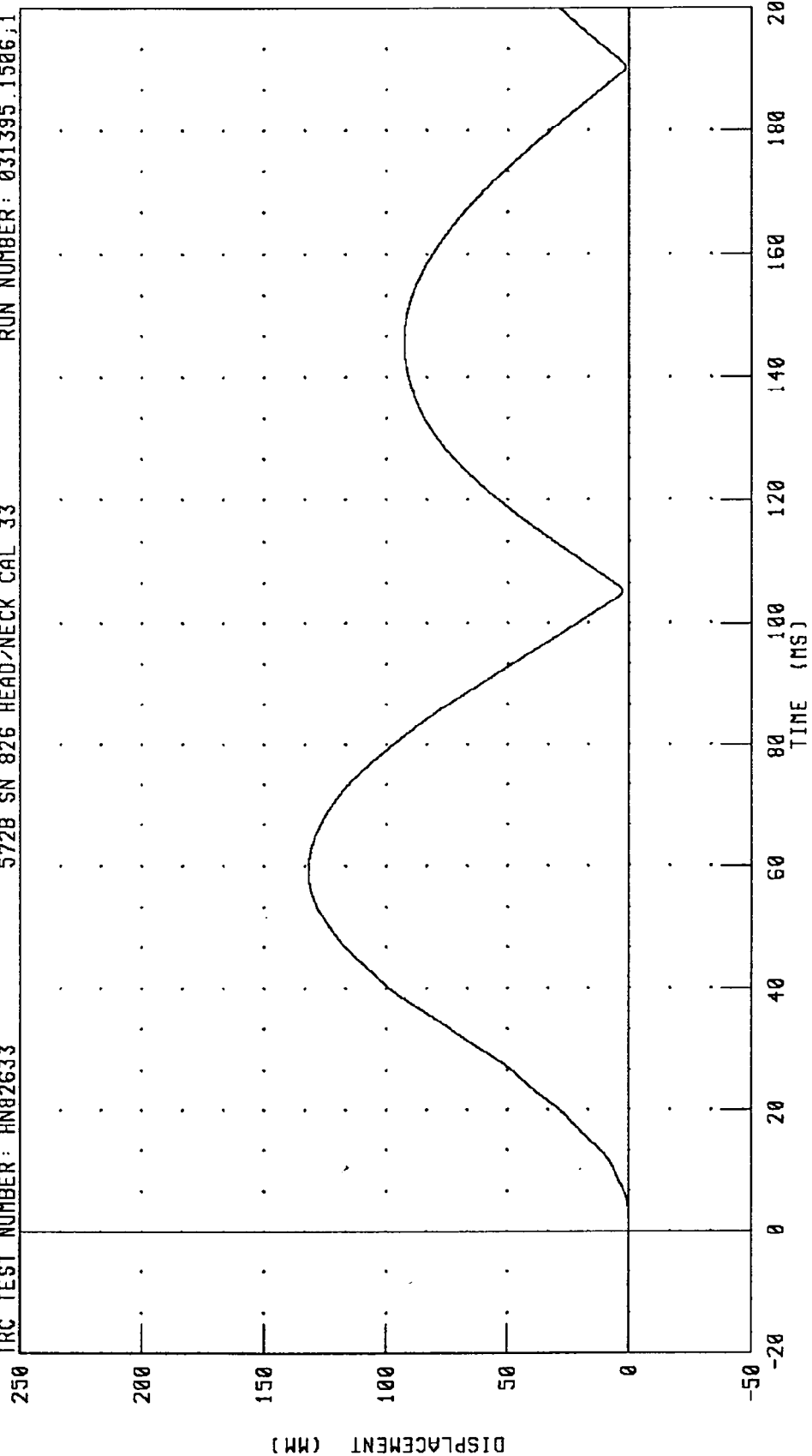
PEAK DATA: 10.08 MM @ 59.44 MS; -9.97 MM @ 149.20 MS

PART 572-B HYBRID I1 HEAD/NECK CALIBRATION
NECK CHORDAL DISPLACEMENT

TRC TEST NUMBER: HN82633

572B SN 826 HEAD/NECK CAL 33

RUN NUMBER: 031395.1506;1

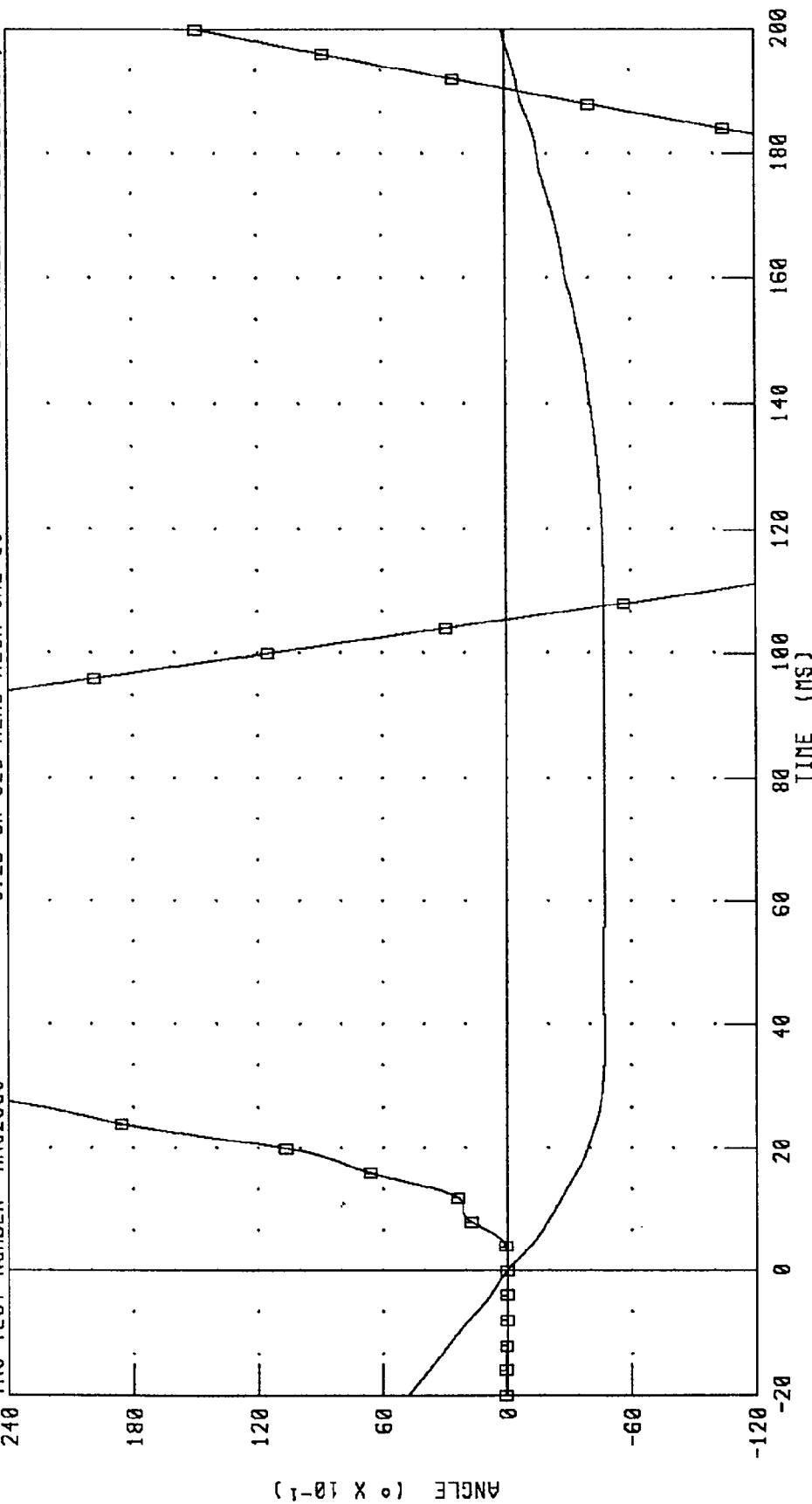


PEAK DATA: 131.98 MM @ 59.28 MS; 0.09 MM @ -20.00 MS

CHANNEL: NEKCD FILTER: CH. CLASS 60

PART 572-B HYBRID II HEAD/NECK CALIBRATION
TOTAL HEAD C.G. ROTATION AND PENDULUM ANGULAR DISPLACEMENT

TRC TEST NUMBER: HN82633 572B SN 826 HEAD/NECK CAL 33 RUN NUMBER: 031395.1506;1



CHANNEL: PENAD FILTER: CH. CLASS 60
TOTAL CH. CLASS 60
PEAK DATA: 4.78 ° @ -20.00 MS; -4.73 ° @ 37.04 MS
65.58 ° @ 60.80 MS; -48.61 ° @ 145.68 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B

22-FEB-95

TRC INC.

TEST NO: TL82633

572B SN 826 L.S.THORAX CAL 33

TEST PARAMETER	LOW SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	30 %
PENDULUM VELOCITY	4.22 - 4.31 M/S	4.30 M/S
PEAK STERNUM DEFLECTION	28 MM MAX.	21.97 MM
PEAK RESISTIVE FORCE	6450. N MAX.	5834. N
INTERNAL HYSTERESIS	50 - 70 %	65.3 %

SCD: 53.34 MM

DUMMY MEETS SPECIFICATIONS

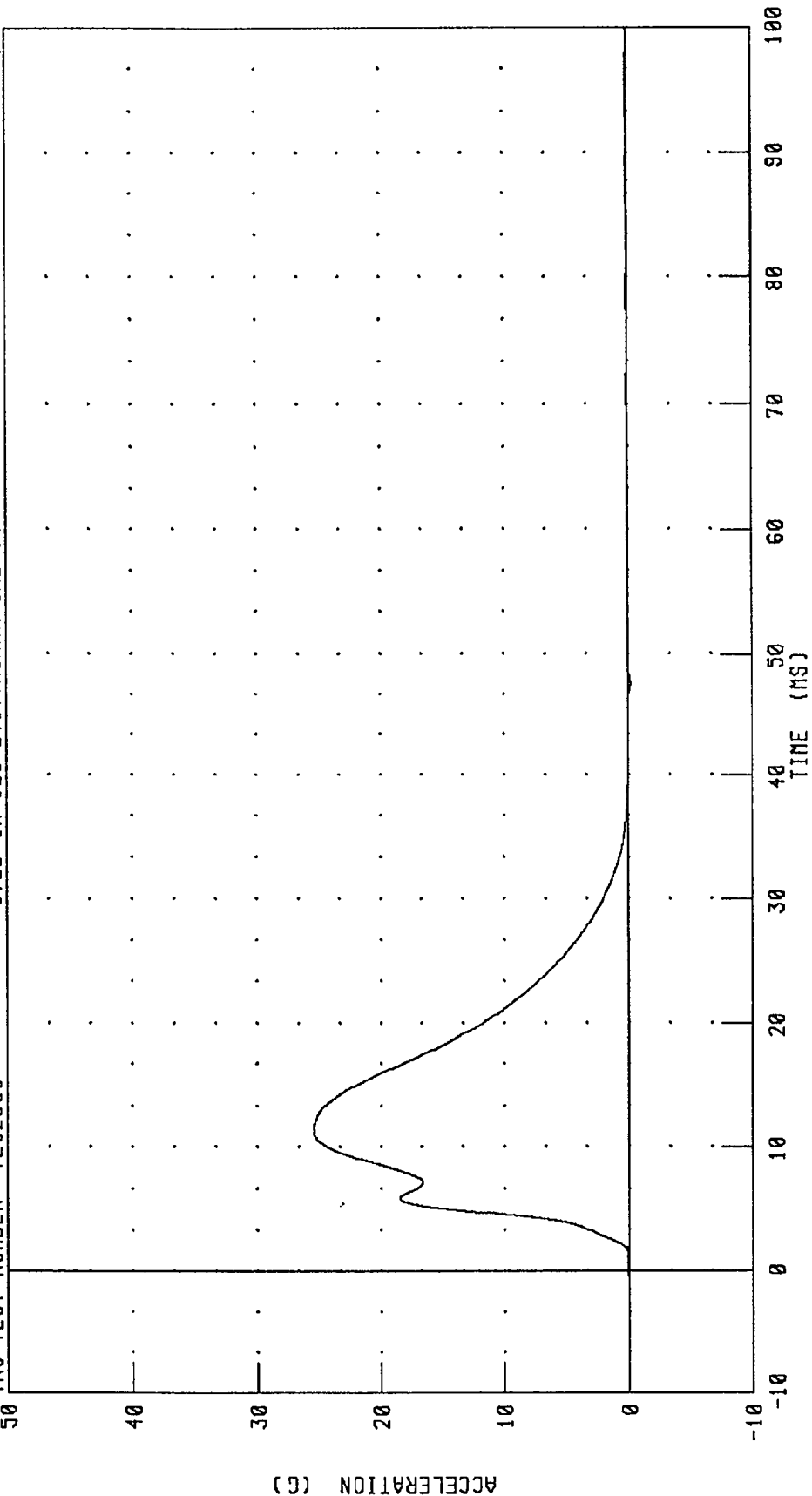
TECHNICIAN

Rita F. J.

RUN NUMBER: 022295.1123;1

PART 572-B HYBRID II THORAX CALIBRATION (4.3 M/SEC)
 PENDULUM DECELERATION

TRC TEST NUMBER: TL82633 572B SN 826 L.S. THORAX CAL 33 RUN NUMBER: 031395.1506;1

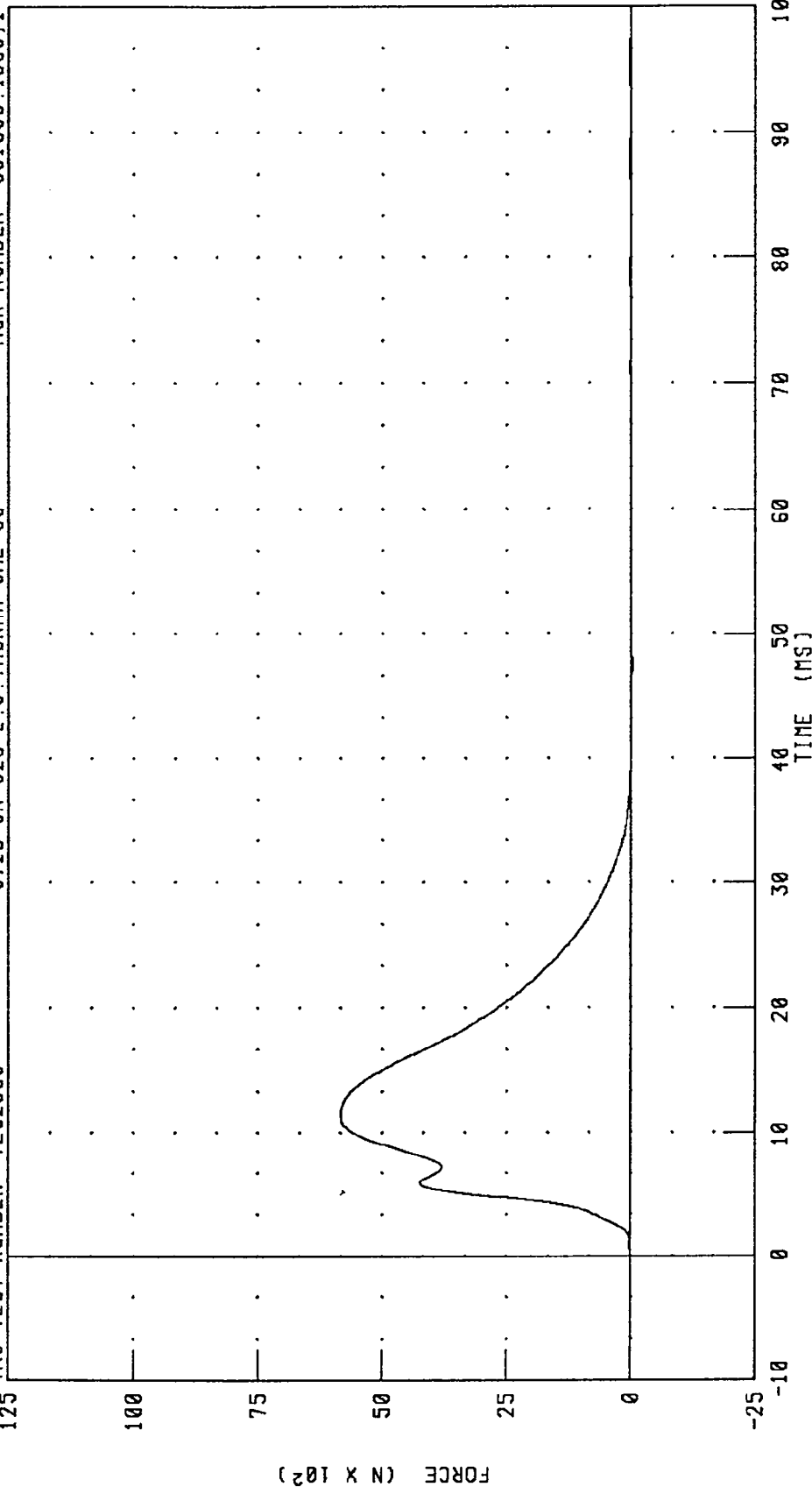


CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 25.47 G @ 11.36 MS; -0.19 G @ 47.52 MS

PART 572-B HYBRID II THORAX CALIBRATION (4.3 N/SEC)

PENDULUM FORCE

TRC TEST NUMBER: IL82633 572B SN 826 L.S. THORAX CAL 33 RUN NUMBER: 031395.1506;1



PEAK DATA: 5833.83 N @ 11.36 MS; -44.14 N @ 47.52 MS

CHANNEL: PENXF FILTER: CH. CLASS 180

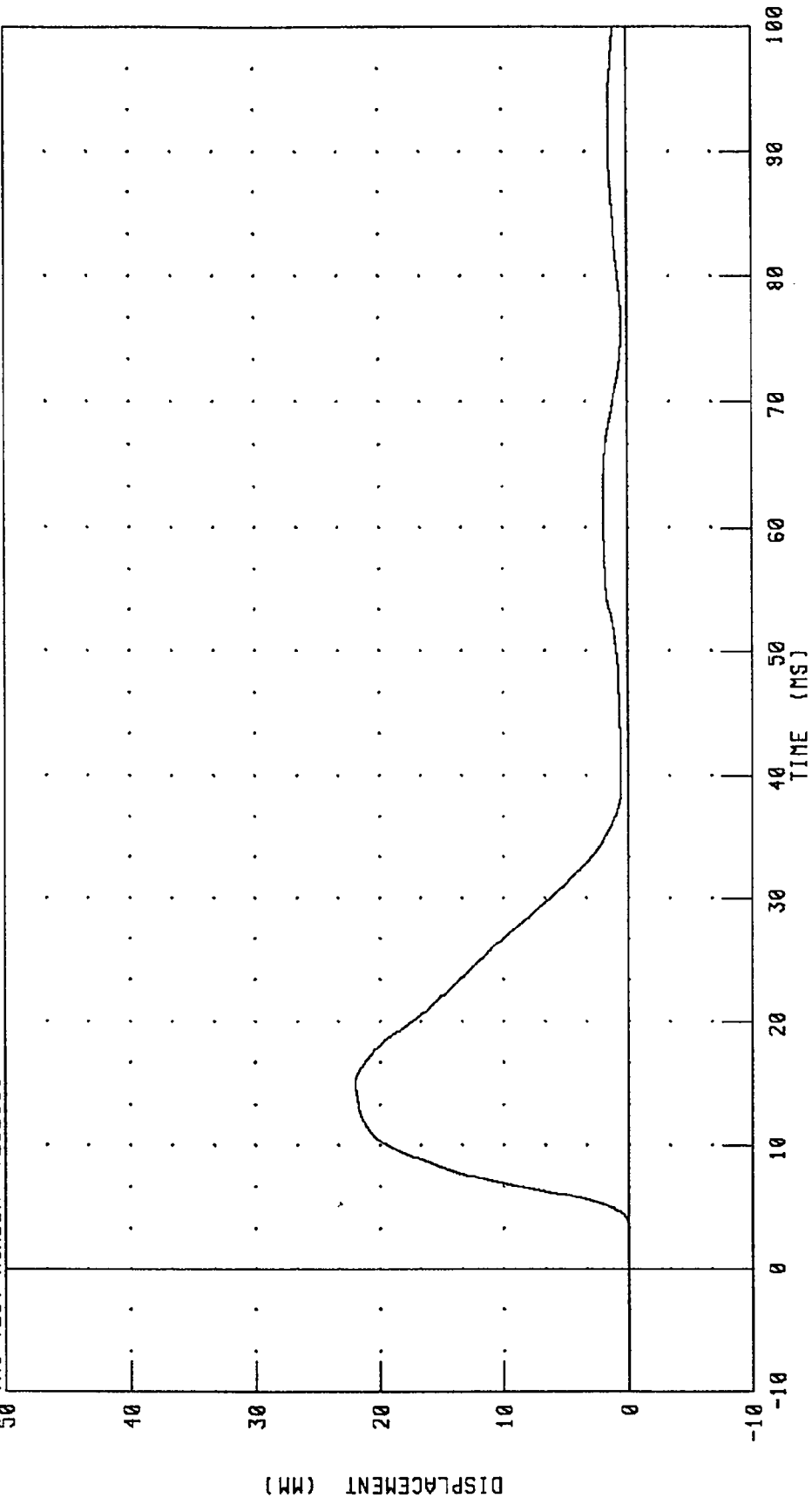
PART 572-B HYBRID II THORAX CALIBRATION (4.3 N/SEC)

STERNUM DISPLACEMENT

TRC TEST NUMBER: TL82633

572B SN 826 L.S. THORAX CAL 33

RUN NUMBER: 031395.1506,1

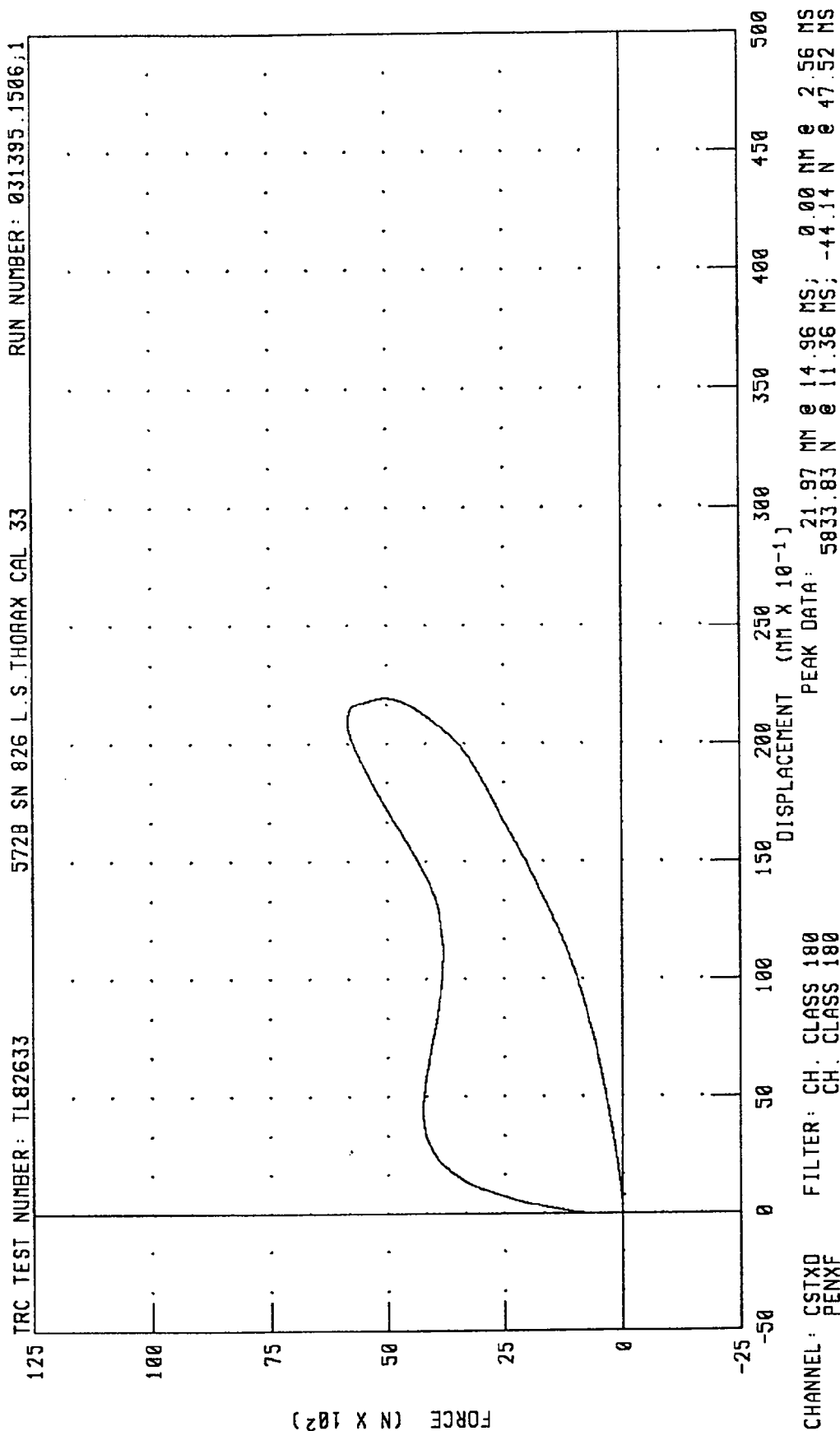


CHANNEL: CSTXD FILTER: CH. CLASS 180

PEAK DATA: 21.97 MM @ 14.96 MS; 0.00 MM @ 2.56 MS

PART 572-B HYBRID II THORAX CALIBRATION (4.3 M/SEC)

CHEST DISPLACEMENT VS PENDULUM FORCE



TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B

22-FEB-95

TRC INC.

TEST NO: TH82633

572B SN 826 H.S.THORAX CAL 33

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	30 %
PENDULUM VELOCITY	6.64 - 6.77 M/S	6.68 M/S
PEAK STERNUM DEFLECTION	43 MM MAX.	36.49 MM
PEAK RESISTIVE FORCE	10009. N MAX.	9250. N
INTERNAL HYSTERESIS	50 - 70 %	69.9 %

SCD: 53.34 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Pete K. S.

RUN NUMBER: 022295.1216;1

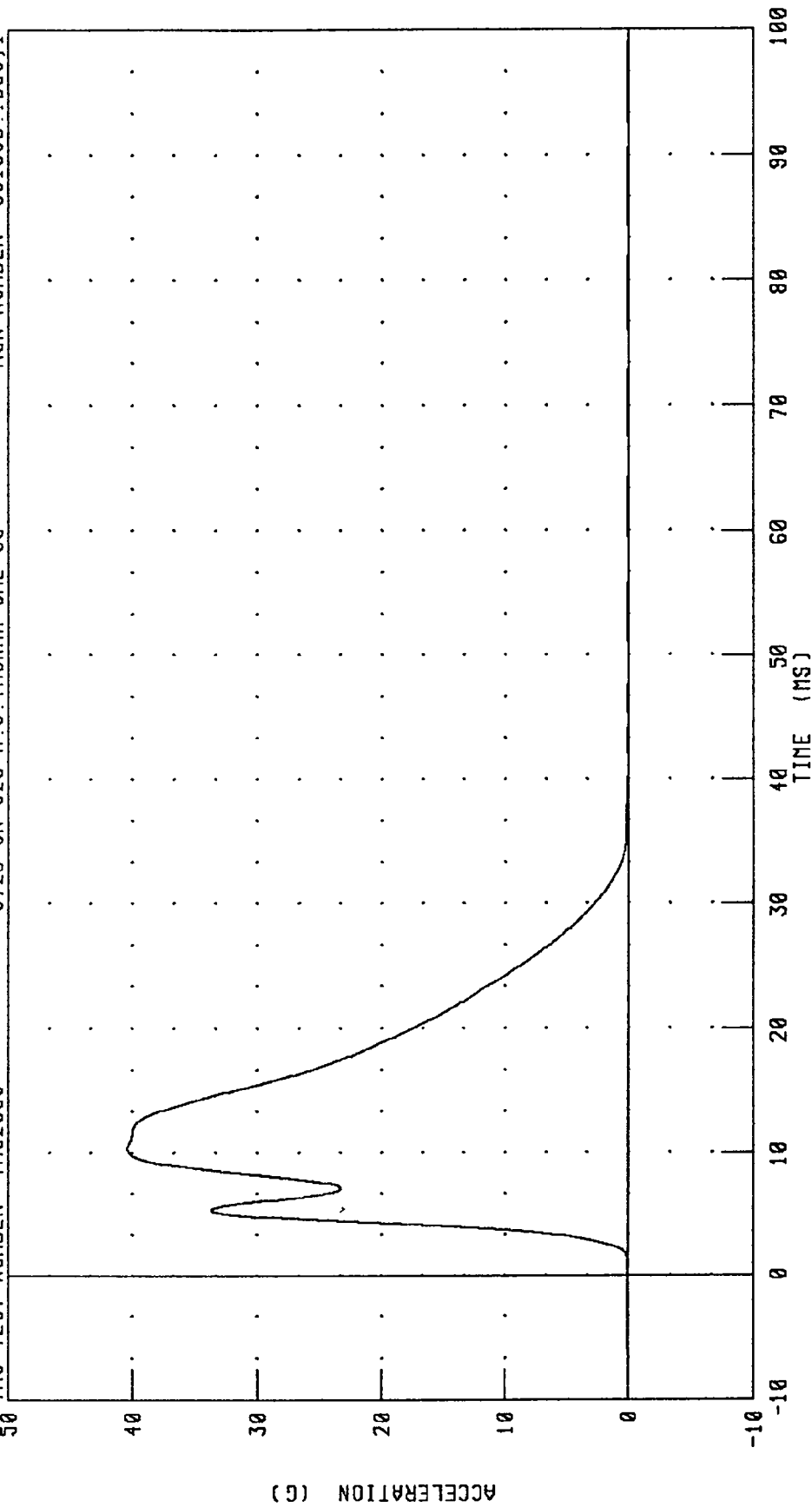
PART 572-B HYBRID II THORAX CALIBRATION (6.7 N/SEC)

PENDULUM DECELERATION

TRC TEST NUMBER: TH82633

5728 SN 826 H.S. THORAX CAL 33

RUN NUMBER: 031395.1506;1



PEAK DATA: 40.38 G @ 10.32 MS; 0.01 G @ 44.72 MS

CHANNEL: PENXG FILTER: CH. CLASS 180

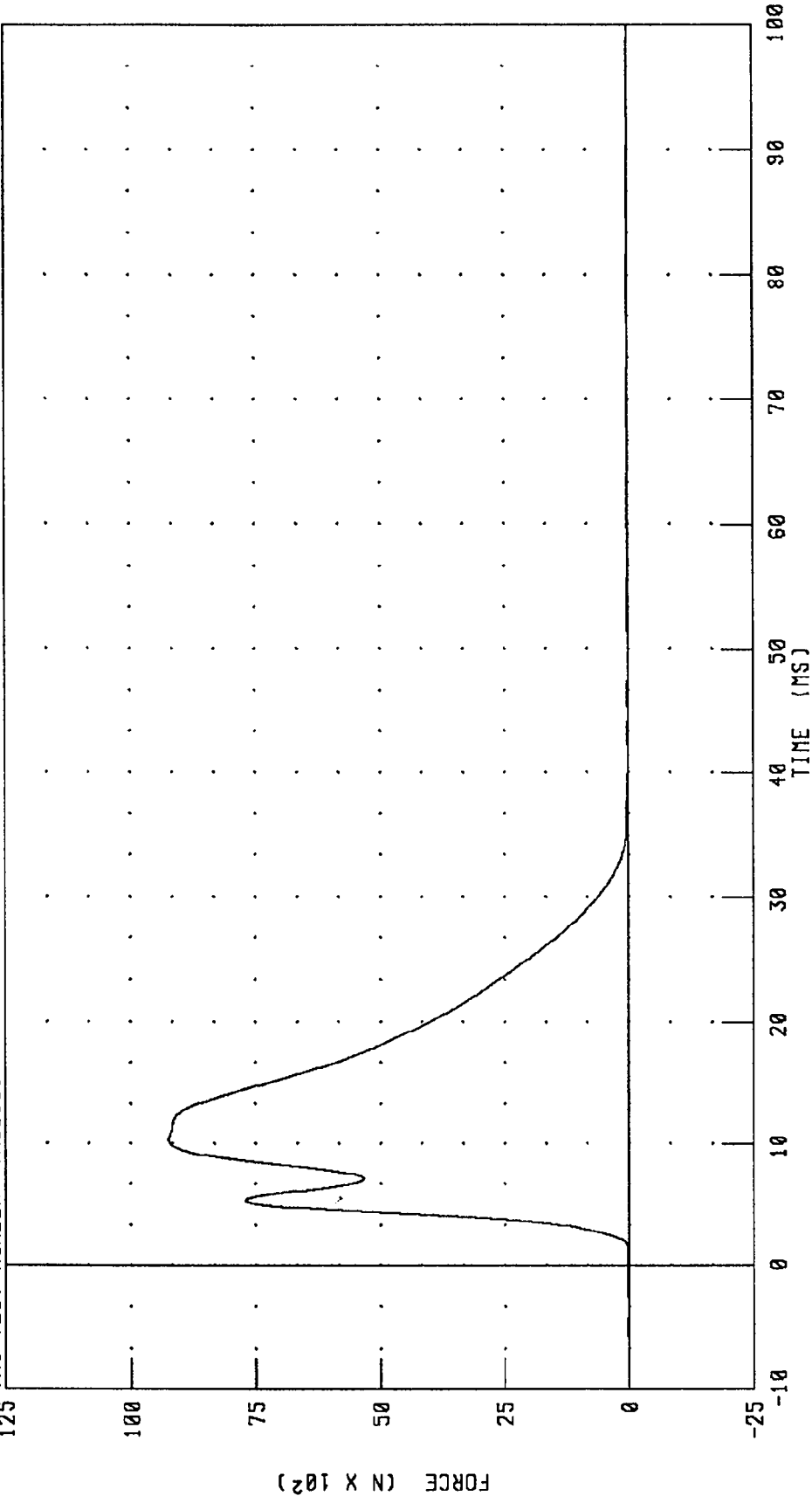
PART 572-B HYBRID II THORAX CALIBRATION (6.7 N/SEC)

PENDULUM FORCE

TRC TEST NUMBER: TH82633

572B SN 826 H.S. THORAX CAL 33

RUN NUMBER: 031395.1506;1



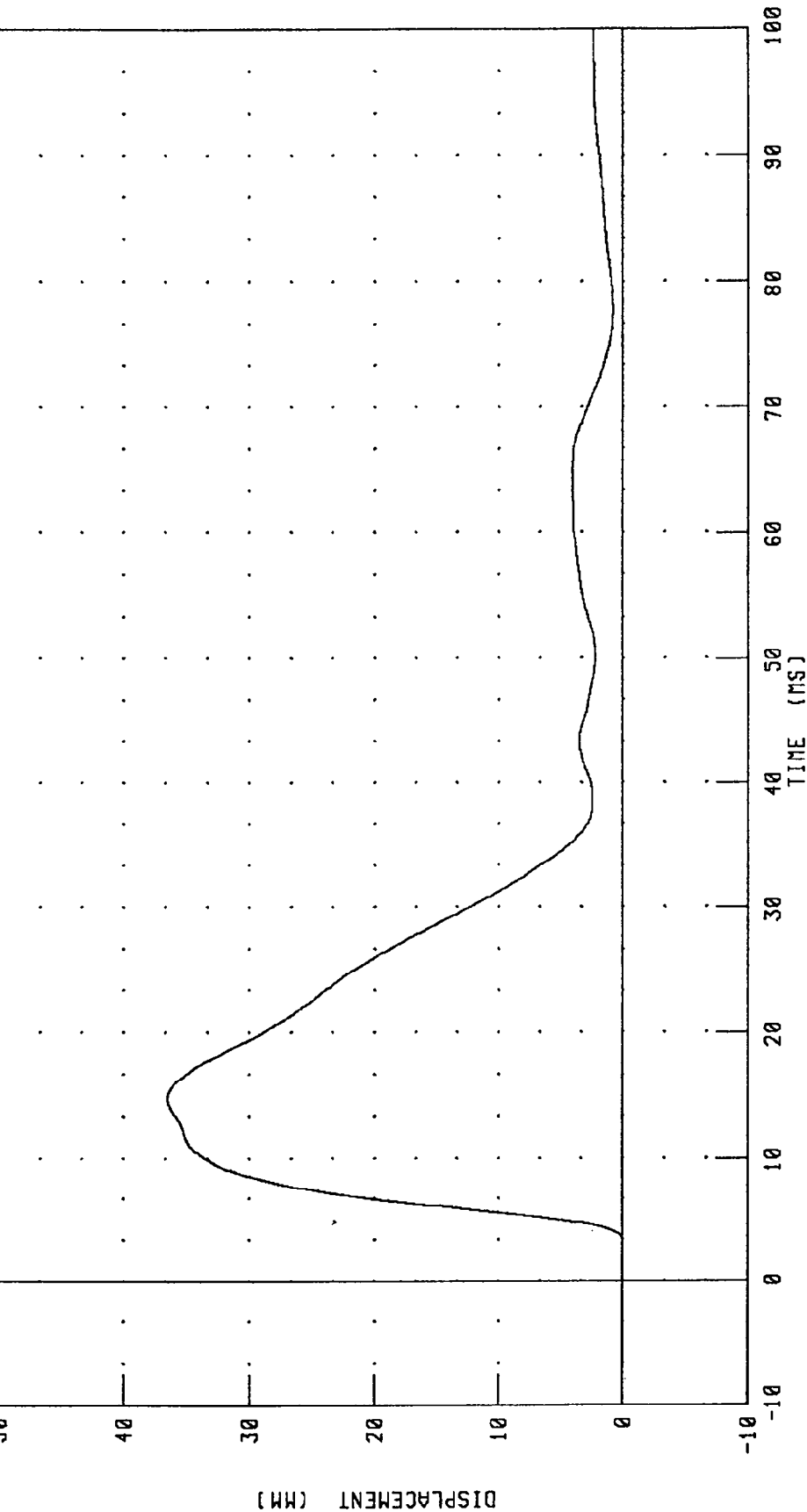
PEAK DATA: 9249.59 N @ 10.32 MS; 1.70 N @ 44.72 MS

CHANNEL: PENXF FILTER: CH. CLASS 180

PART 572-B HYBRID II THORAX CALIBRATION (6.7 M/SEC)

STERNUM DISPLACEMENT

TRC TEST NUMBER: TH82633 572B SN 826 H.S. THORAX CAL 33 RUN NUMBER: 031395.1506;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 36.49 MM @ 14.72 MS; 0.00 NM @ -4.40 MS

PART 572-B HYBRID II THORAX CALIBRATION (6.7 N/SEC)

CHEST DISPLACEMENT VS PENDULUM FORCE

572B SN 826 H.S. THORAX CAL 33

TRC TEST NUMBER: TH82633

125

100

75

50

25

0

-25

0

50

100

150

200

250

300

350

400

450

500

DISPLACEMENT

(MM X 10⁻¹)

PEAK DATA:

36.49 MM @ 14.72 MS;

0.00 NM @ -4.40 MS

9249.59 N @ 10.32 MS;

1.70 N @ 44.72 MS

CHANNEL: CSTX0

PENXF

FILTER: CH. CLASS 180

CH. CLASS 180

RUN NUMBER: 031395.1506;1

FORCE (N X 10²)

TRANSPORTATION RESEARCH CENTER INC.

ABDOMEN COMPRESSION TEST

PART 572B

21-FEB-95

TRC INC.

TEST NO: AB82633

572B SN 826 ABDOM COMPR CAL 33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	32 %
DEFLECTION RATE	6.4 - 8.9 MM/S	7.84 MM/S
FORCE AT 0.00 MM DISP.	44.48 N	44.48 N
FORCE AT 12.7 MM DISP.	102.30 - 160.13 N	129.71 N
FORCE AT 19.1 MM DISP.	160.13 - 222.40 N	182.42 N
FORCE AT 25.4 MM DISP.	222.40 - 280.22 N	241.81 N
FORCE AT 33.0 MM DISP.	324.70 - 391.42 N	333.26 N

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Pete Foster

RUN NUMBER: 022195.1513;5

PART 572-B HYBRID II ABDOMEN CALIBRATION

ABDOMEN DISPLACEMENT

572B SN 826 ABDOM COMP CAL 33 RUN NUMBER: 031395.1506,5

TRC TEST NUMBER: AB82633

480

400

320

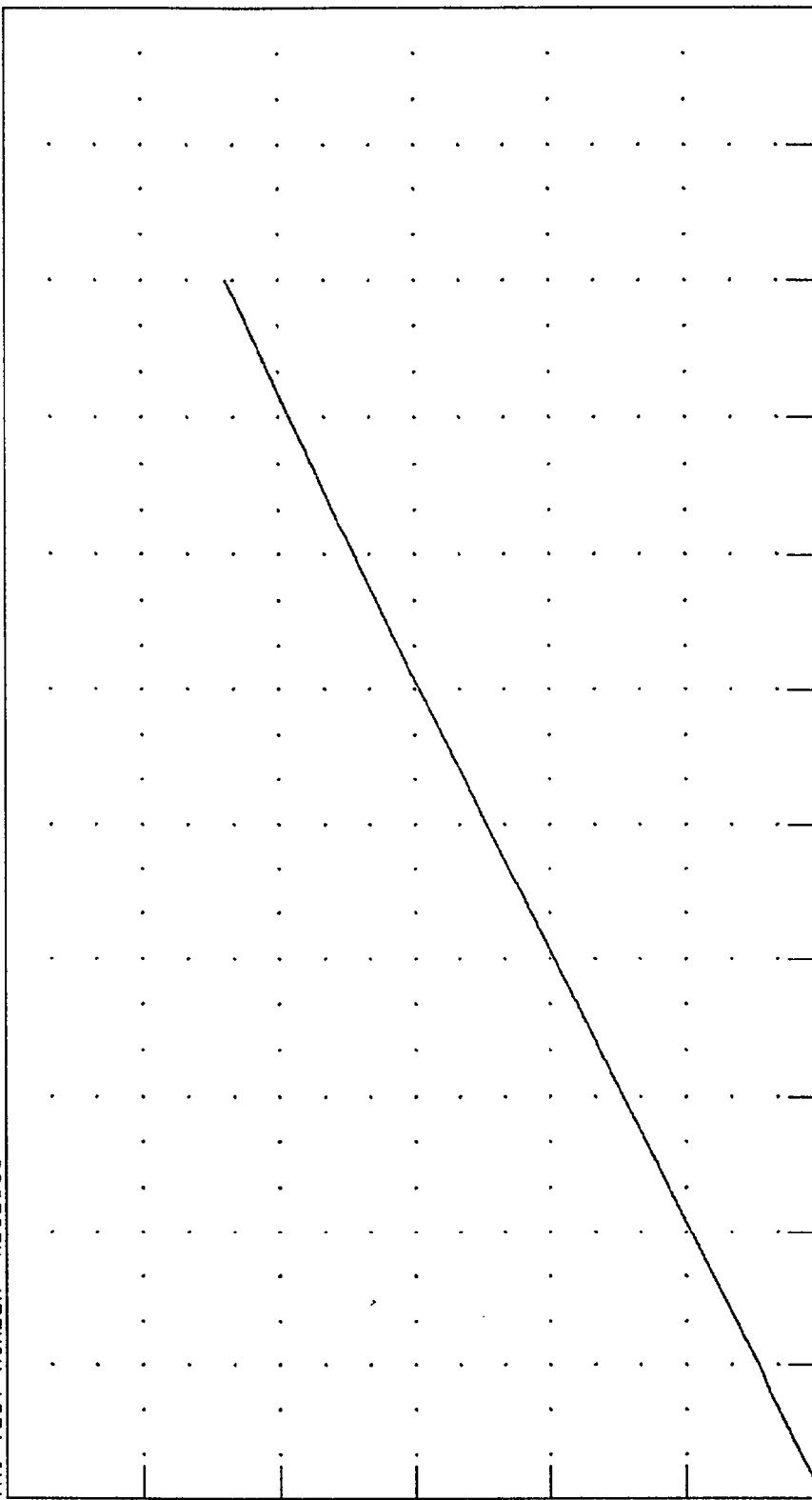
240

160

80

0

DISPLACEMENT (MM X 10⁻¹)



TIME (s X 10⁻²)

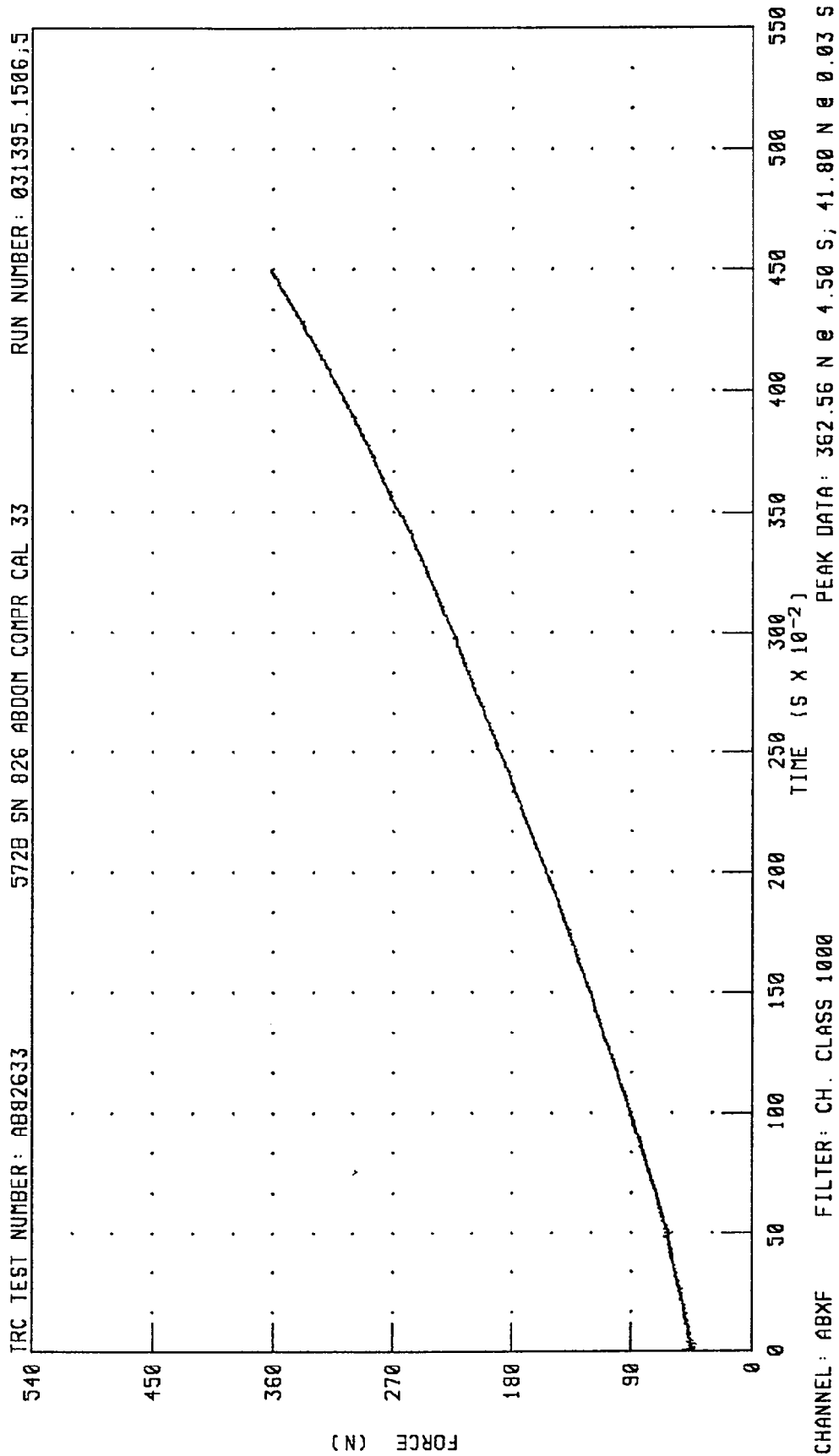
PEAK DATA: 35.09 MM @ 4.50 S; 0.00 MM @ 0.00 S

FILTER: CH. CLASS 1000

CHANNEL: ABXD

PART 572-B HYBRID II ABDOMEN CALIBRATION

ABDOMEN FORCE



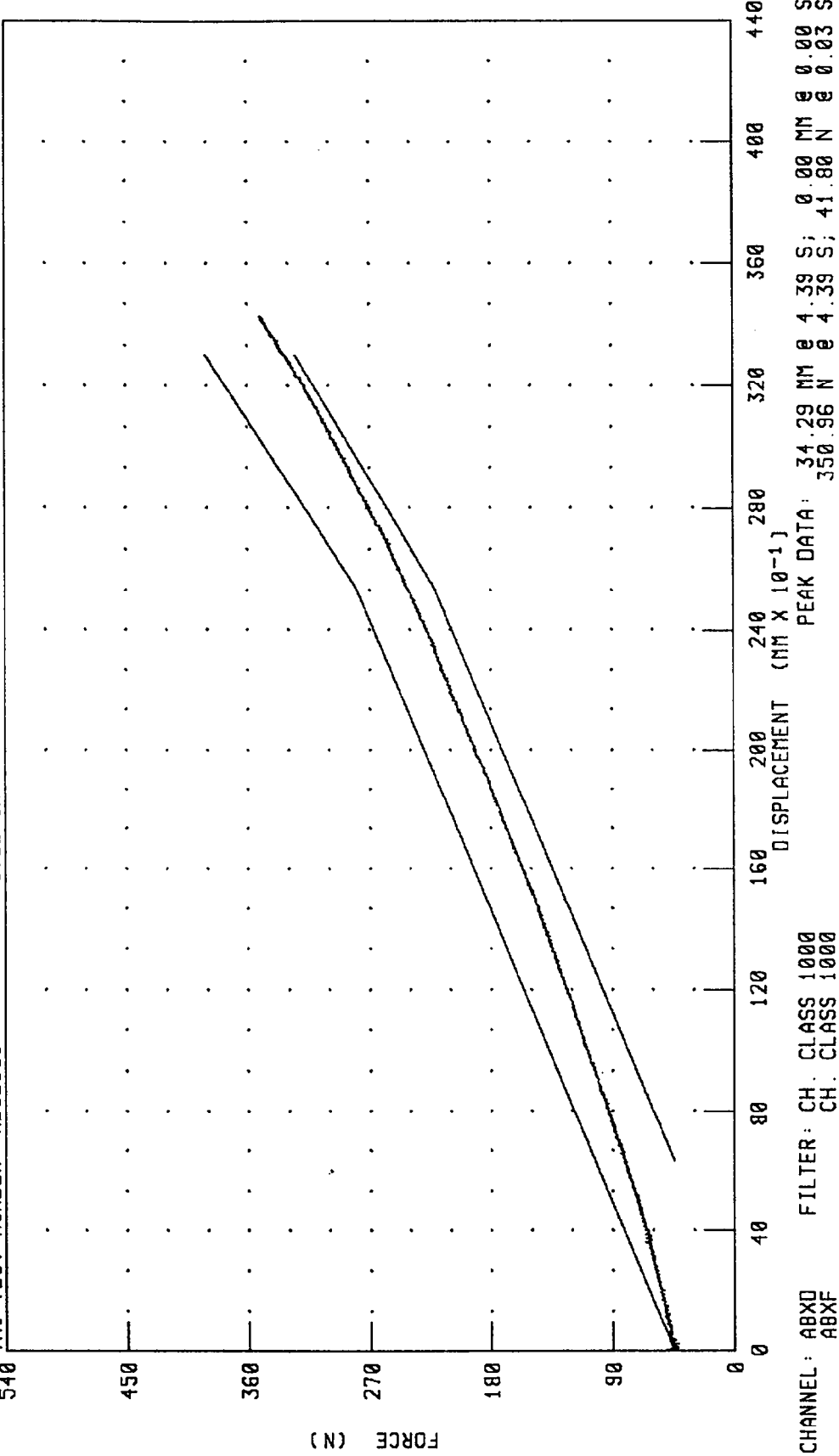
PART 572-B HYBRID II ABDOMEN CALIBRATION

ABDOMEN FORCE VS DISPLACEMENT

572B SN 826 ABDOM COMP CAL 33

TRC TEST NUMBER: AB82633

RUN NUMBER: 031395.1519,5



TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

PART 572B

21-FEB-95

TRC INC.

TEST NO: LF82633

572B SN826 LUMBAR FLEX CAL33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	30 %
FORCE AT 0 DEG. FLEXION	-26.69 - +26.69 N	0.00 N
FORCE AT 20 DEG. FLEXION	97.86 - 151.24 N	120.10 N
FORCE AT 30 DEG. FLEXION	151.24 - 204.62 N	160.13 N
FORCE AT 40 DEG. FLEXION	204.62 - 258.00 N	213.50 N
NET RETURN ANGLE	< 12 DEG.	8.26 DEG.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete F. S.

RUN NUMBER: 022295.1240

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

PART 572B

22-FEB-95

TRC INC.

TEST NO: RK82633

572B SN 826 R.KNEE IMP CAL 33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	30 %
PENDULUM VELOCITY	2.06 - 2.15 M/S	2.14 M/S
PEAK KNEE IMPACT FORCE	8229 - 11121 N	10573.52 N
DURATION ABOVE 4448 N	≥ 1.7 MS	2.02 MS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

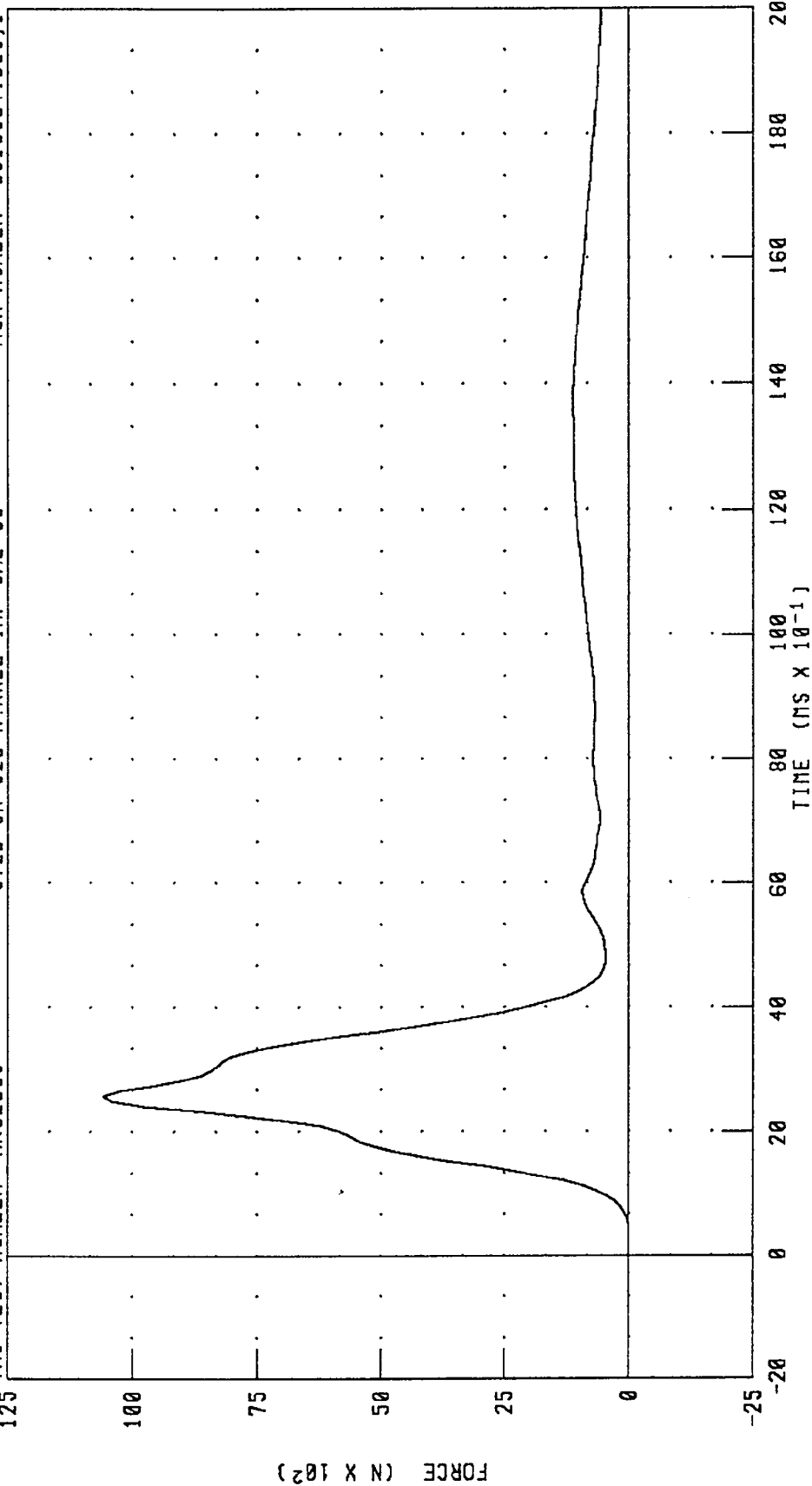
Pete F. S.

RUN NUMBER: 022295.1101;1

PART 572-B HYBRID II RIGHT KNEE CALIBRATION

RIGHT FEMUR FORCE

TRC TEST NUMBER: RK82633 572B SN 826 R.KNEE IMP CAL 33 RUN NUMBER: 031395.1506;1



PEAK DATA: 10573.52 N @ 2.56 MS; -1.98 N @ -1.44 MS

CHANNEL: RFMF FILTER: CH. CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

PART 572B

22-FEB-95

TRC INC.

TEST NO: LK82633

572B SN 826 L.KNEE IMP CAL 33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	30 %
PENDULUM VELOCITY	2.06 - 2.15 M/S	2.14 M/S
PEAK KNEE IMPACT FORCE	8229 - 11121 N	10086.82 N
DURATION ABOVE 4448 N	≥ 1.7 MS	1.90 MS

DUMMY MEETS SPECIFICATIONS

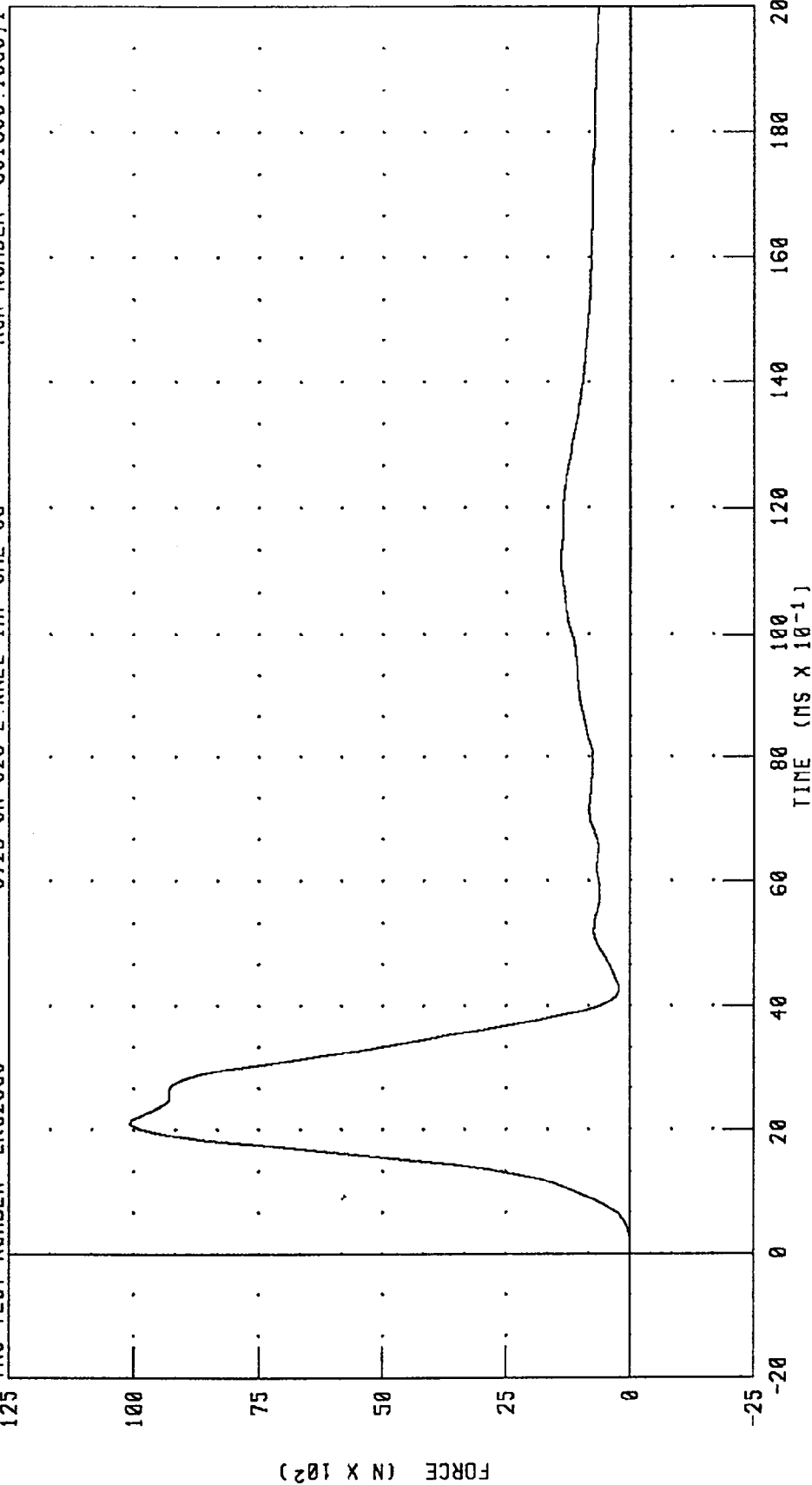
TECHNICIAN Pete F.S.

RUN NUMBER: 022295.1056;1

PART 572-B HYBRID II LEFT KNEE CALIBRATION

LEFT FEMUR FORCE

TRC TEST NUMBER: LK82633 572B SN 826 L KNEE IMP CAL 33 RUN NUMBER: 031395.1506,1



PEAK DATA: 10086.82 N @ 2.08 MS; 0.88 N @ -1.92 MS

CHANNEL: LFMF FILTER: CH. CLASS 600

Pre-test Certification Data

Passenger Dummy S/N: 713

TRANSPORTATION RESEARCH CENTER INC.
PART 572B EXTERNAL DIMENSIONS
SN 713 HUMANOID

21-FEB-95

TRC INC. TEST NO: ED71311 572B SN713 EXT.DIMENSION CAL11

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	30 %
SITTING HEIGHT	904 - 909 MM	904. MM
SHOULDER PIVOT HEIGHT	553 - 569 MM	561. MM
HIP PIVOT HEIGHT	99 MM	REFERENCE
HIP PIVOT FROM BACKLINE	122 MM	REFERENCE
KNEE PIVOT FROM BACKLINE	511 - 526 MM	521. MM
REAR OF HEAD FROM BACKLINE	43 MM	REFERENCE
CHEST DEPTH	231 - 241 MM	239. MM
SHOULDER WIDTH	452 - 467 MM	455. MM
CHEST CIRCUMFERENCE OVER NIPPLES	935 - 965 MM	958. MM
WAIST CIRCUMFERENCE AT MIN. GIRTH	798 - 828 MM	818. MM
HIP WIDTH	356 - 391 MM	378. MM
KNEE PIVOT FROM FLOOR	490 - 506 MM	498. MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Pete F. S.

RUN NUMBER: 022295.1247

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

PART 572B

21-FEB-95

TRC INC.

TEST NO: HD71311

572B SN713 HEAD DROP CAL11

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	32 %
PEAK RESULTANT ACCELERATION	210 - 260 G	249.84 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MS	1.25 MS
PEAK LATERAL ACCELERATION	10 G MAX	1.62 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Rita R. S.

RUN NUMBER: 022195.0900;1

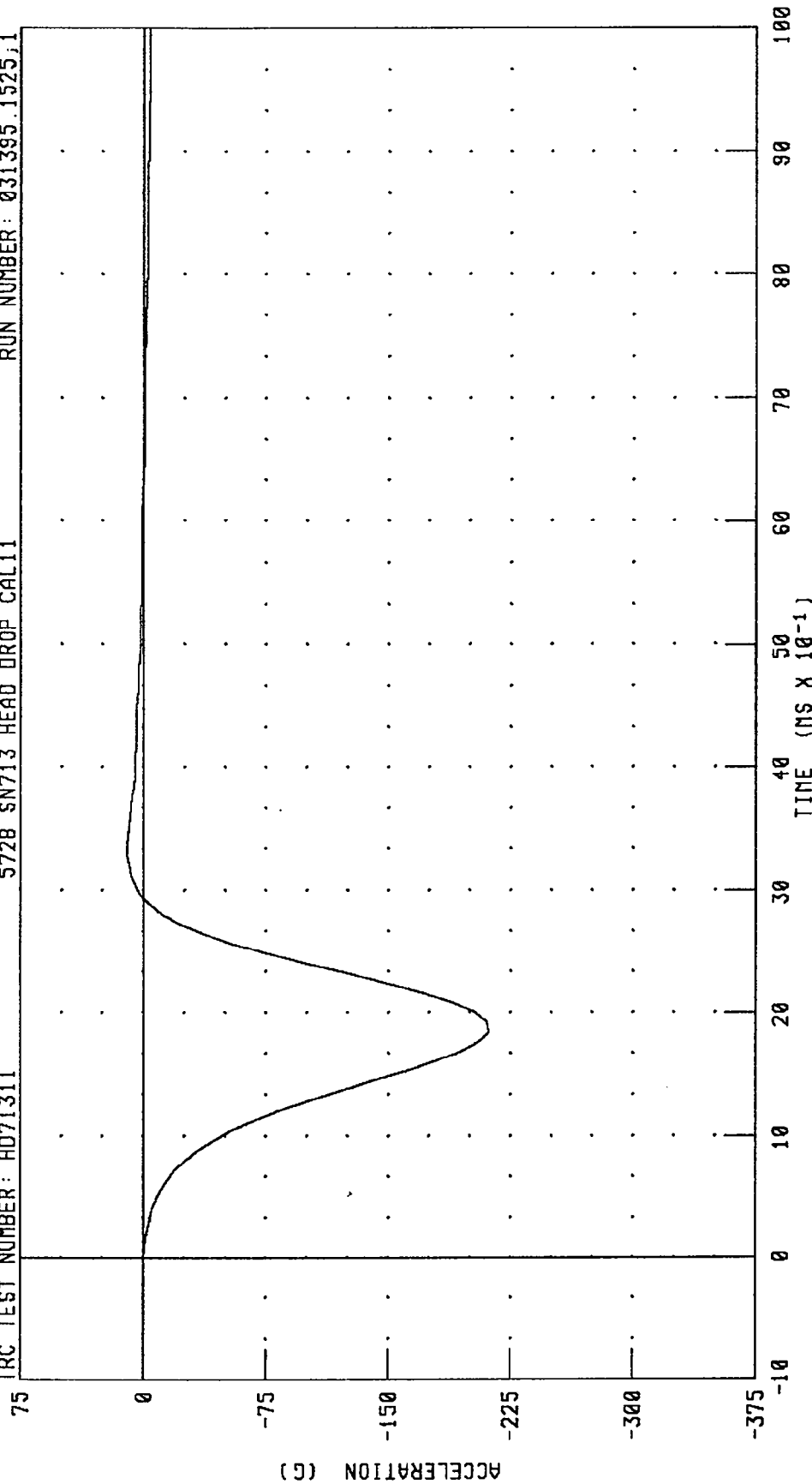
PART 572-B HYBRID II HEAD DROP CALIBRATION

HEAD ACCELERATION X AXIS

572B SN713 HEAD DROP CAL11

TRC TEST NUMBER: HD71311

RUN NUMBER: 031395.1525,1



CHANNEL: HEDXG FILTER: CH. CLASS 1000

PEAK DATA: 10.14 G @ 3.36 MS; -211.30 G @ 1.84 MS

PART 572-B HYBRID II HEAD DROP CALIBRATION

HEAD ACCELERATION Y AXIS

572B SN713 HEAD DROP CAL11

TRC TEST NUMBER: HD71311

225

150

75

0

-75

-150

-225

ACCELERATION (G)

RUN NUMBER: 031395.1525,1

100

90

80

70

60

50

40

30

20

10

0

TIME (MS X 10⁻¹)

CHANNEL: HEDYG

FILTER: CH. CLASS 1000

PEAK DATA: 1.62 G @ 4.88 MS; -1.55 G @ 2.32 MS

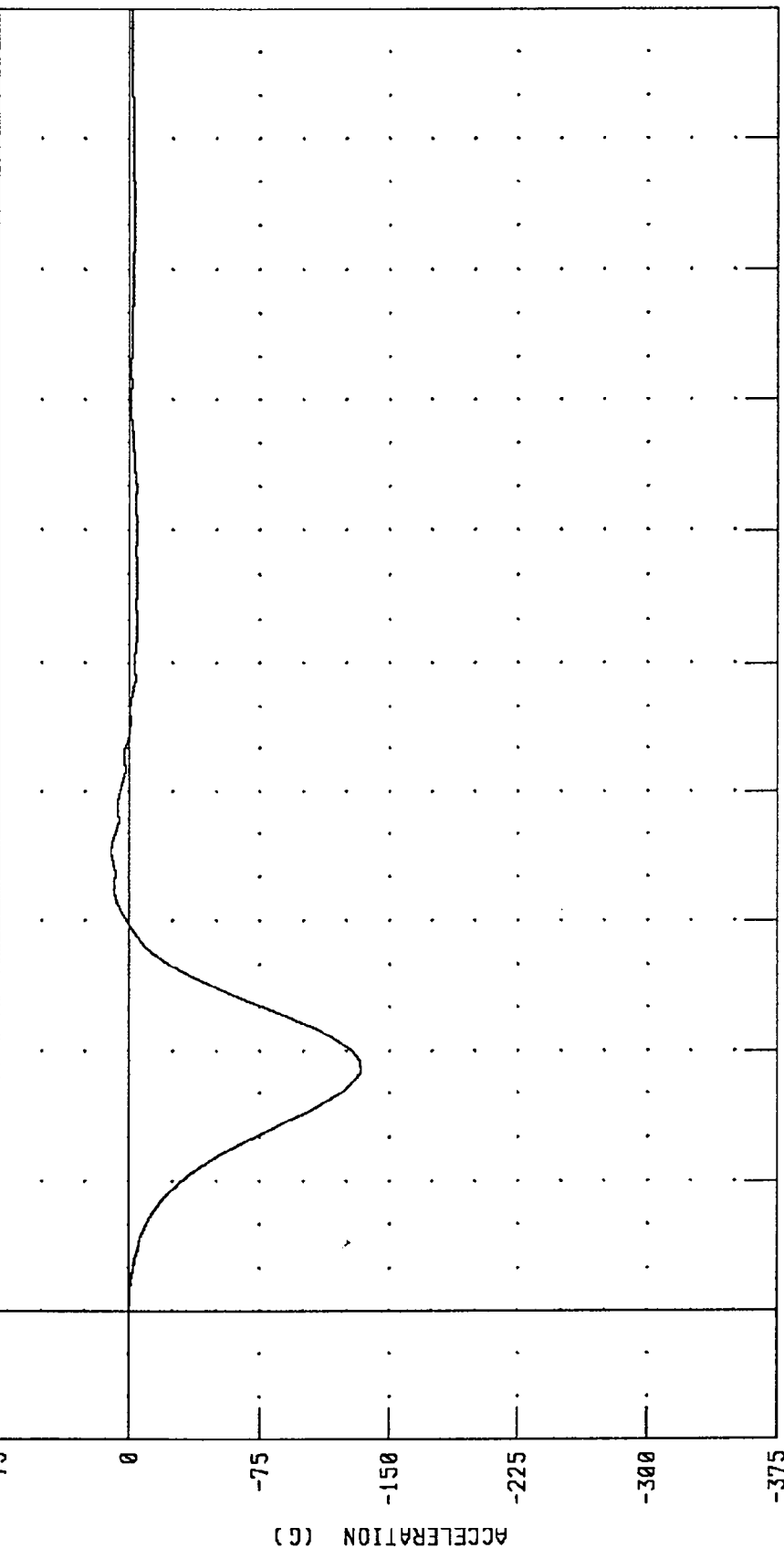
950224

C-44

PART 572-B HYBRID 11 HEAD DROP CALIBRATION

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: HD71311 572B SN713 HEAD DROP CAL11 RUN NUMBER: 031395.1525;1



CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: 9.90 G @ 3.52 MS; -133.32 G @ 1.84 MS

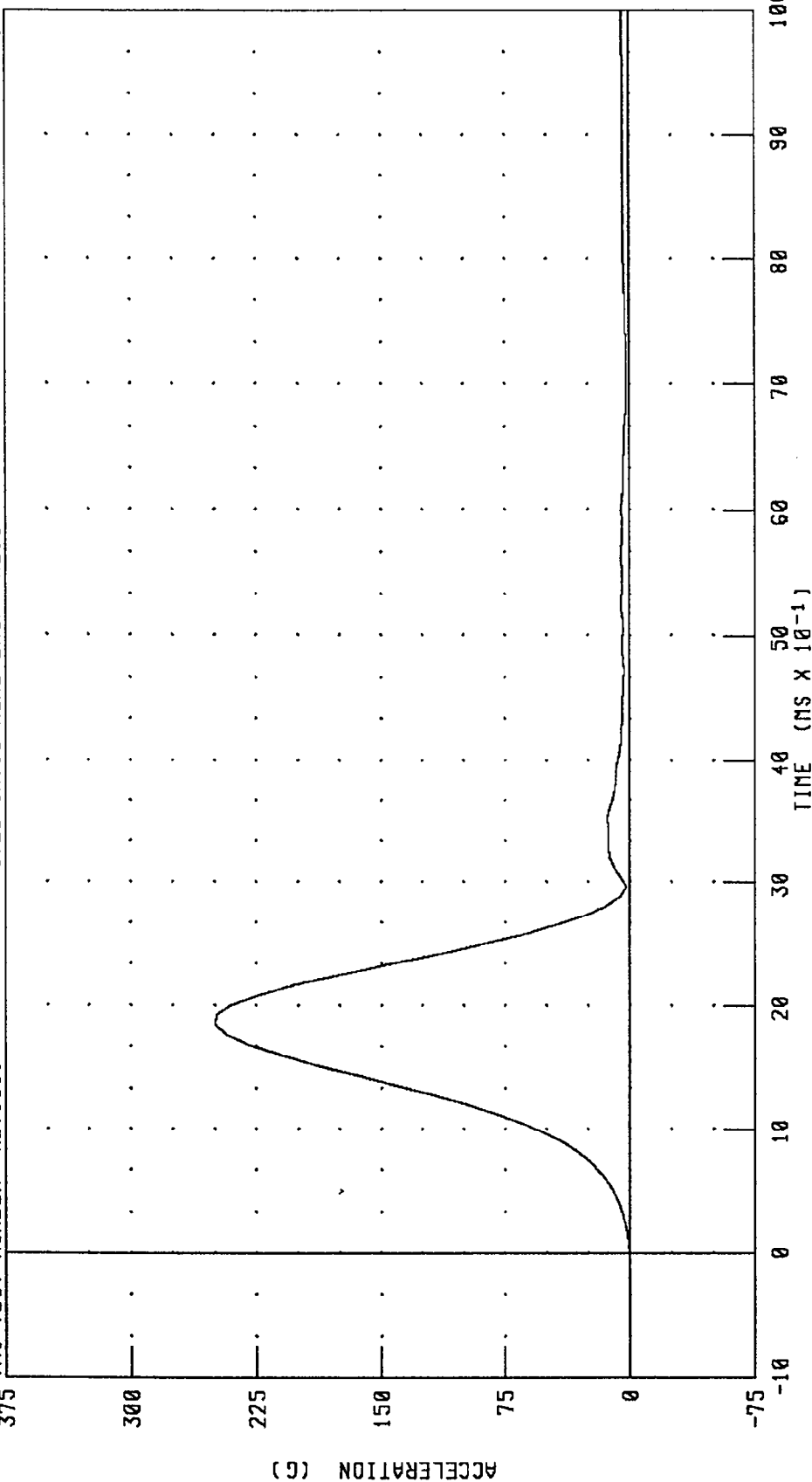
PART 572-B HYBRID II HEAD DROP CALIBRATION

HEAD RESULTANT ACCELERATION

572B SN713 HEAD DROP CAL11

RUN NUMBER: 031395.1525;1

TRC TEST NUMBER: H071311



CHANNEL: HEDRG FILTER: CH. CLASS 1000

PEAK DATA: 249.84 G @ 1.84 MS; 0.02 G @ -0.96 MS

TRANSPORTATION RESEARCH CENTER INC.
NECK PENDULUM TEST
PART 572B

21-FEB-95

TRC INC. TEST NO: HN71311 572B SN713 HEAD/NECK CAL11

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	32 %
PENDULUM VELOCITY	6.55 - 7.77 M/S	7.26 M/S
PENDULUM DECELERATION:		
T1 - T2 TIME (5 - 20 G)	3 MS MAX	2.15 MS
T2 - T3 TIME (20 - 20 G)	25 - 30 MS	26.72 MS
T3 - T4 TIME (20 - 5 G)	10 MS MAX	8.81 MS
AVG. G LEVEL T2 - T3	20 - 24 G	21.53 G
MAXIMUM ROTATION ANGLE	63 - 73 DEG.	65.95 DEG.
PEAK HEAD RESULTANT ACCEL	26 G MAX	21.85 G
PENDULUM REVERSAL TIME AFTER NECK RETURN TIME	> 0 MS	12.37 MS

TEST PARAMETER	SPECIFICATION		TEST RESULTS	
ROTATION ANGLE (DEGREES)	TIME (MS)	CHORDAL DISP. (MM)	TIME (MS)	CHORDAL DISP. (MM)
0	-2.0 - +2.0	-12.7 - +12.7	1.12	0.27
30	25.6 - 34.4	53.3 - 78.7	31.36	62.93
60	40.3 - 51.7	109.2 - 134.6	49.79	125.67
MAX	53.2 - 66.8	127.0 - 152.4	61.60	140.91
60	67.0 - 83.0	109.2 - 134.6	74.92	128.25
30	85.4 - 104.6	53.3 - 78.7	95.48	60.49
0	101.0 - 123.0	-12.7 - +12.7	109.88	3.60

DUMMY MEETS SPECIFICATIONS

SND: 151.13 MM

TECHNICIAN Pete F. J.

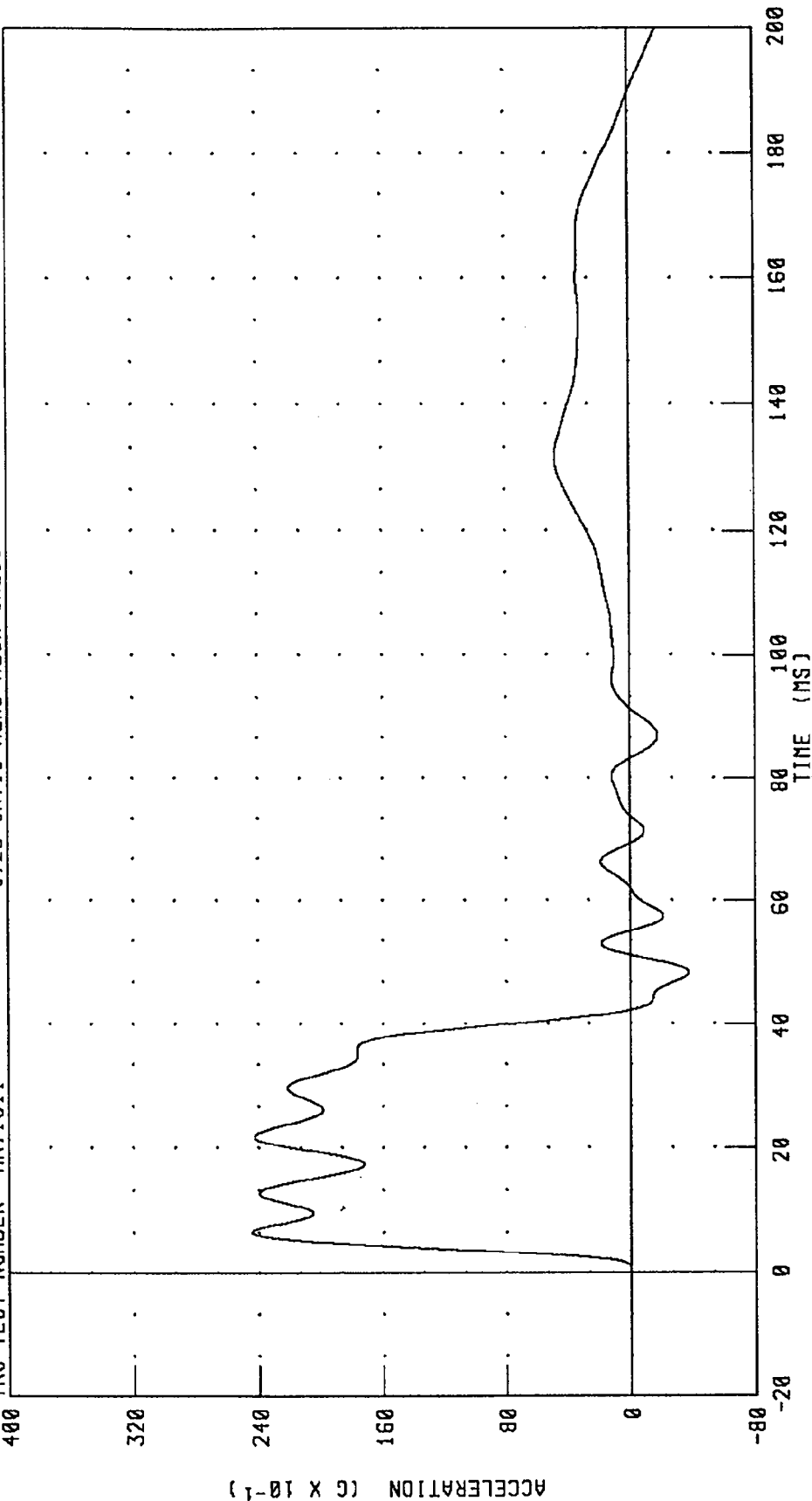
RUN NUMBER: 022195.1035;3

PART 572-B HYBRID II HEAD/NECK CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: HN71311

572B SN713 HEAD/NECK CAL11

RUN NUMBER: 031395.1525;3



PEAK DATA: 24.44 G @ 6.72 MS, -3.71 G @ 48.24 MS

CHANNEL: PENXG FILTER: CH. CLASS 60

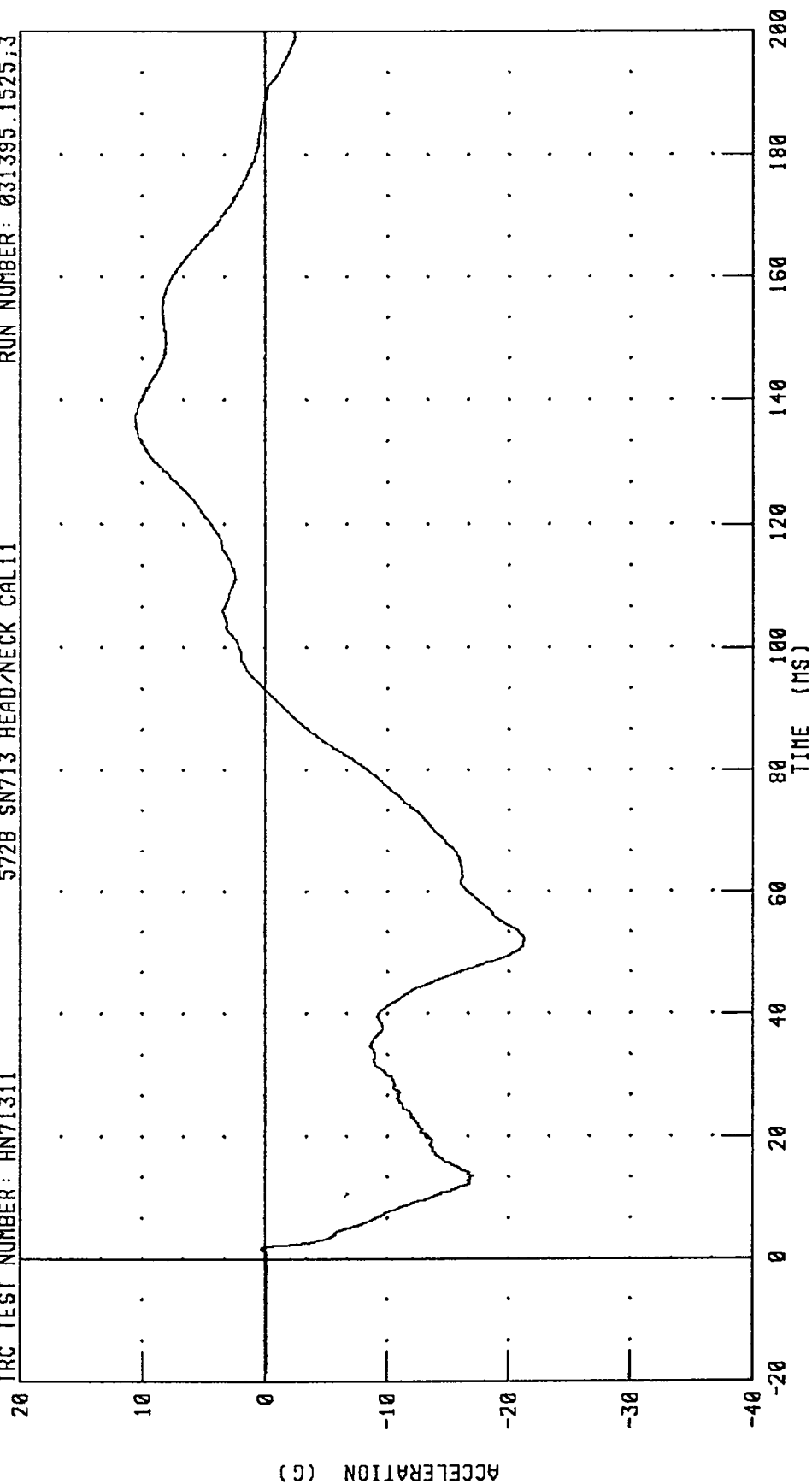
PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HN71311

572B SN713 HEAD/NECK CAL11

RUN NUMBER: 031395.1525.3



PEAK DATA: 10.56 G @ 135.76 MS; -21.25 G @ 51.92 MS

CHANNEL: HEDXG FILTER: CH. CLASS 1000

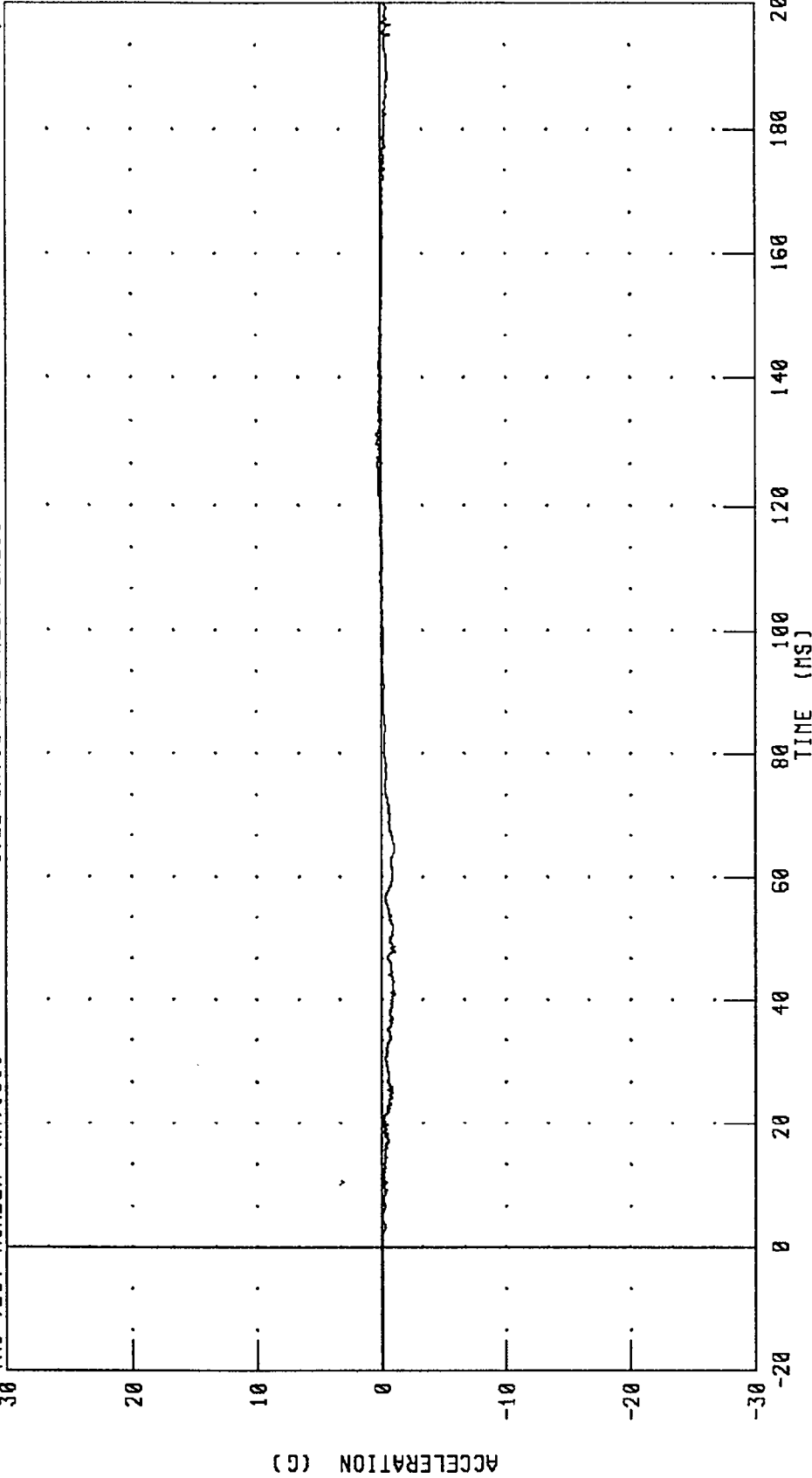
PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD ACCELERATION Y AXIS

572B SN713 HEAD/NECK CAL11

TRC TEST NUMBER: HN71311

RUN NUMBER: 031395.1525;3



CHANNEL: HEDYG FILTER: CH. CLASS 1000

PEAK DATA: 0.33 G @ 131.12 MS; -1.08 G @ 40.80 MS

PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: HN71311

572B SN713 HEAD/NECK CAL11

RUN NUMBER: 031395.1525;3

20

10

ACCELERATION (G)

0

-10

-20

-30

-40

-20

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

CHANNEL: HEDZG

FILTER: CH. CLASS 1000

PEAK DATA: 6.00 G @ 47.84 MS; -20.00 G @ 34.80 MS

PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD RESULTANT ACCELERATION

572B SN713 HEAD/NECK CAL11

TRC TEST NUMBER: HN71311

50

40

30

20

10

0

-10

-20

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 21.85 G @ 35.68 MS; 0.12 G @ -19.28 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

RUN NUMBER: 031395.1525;3

ACCELERATION (G)

C-52

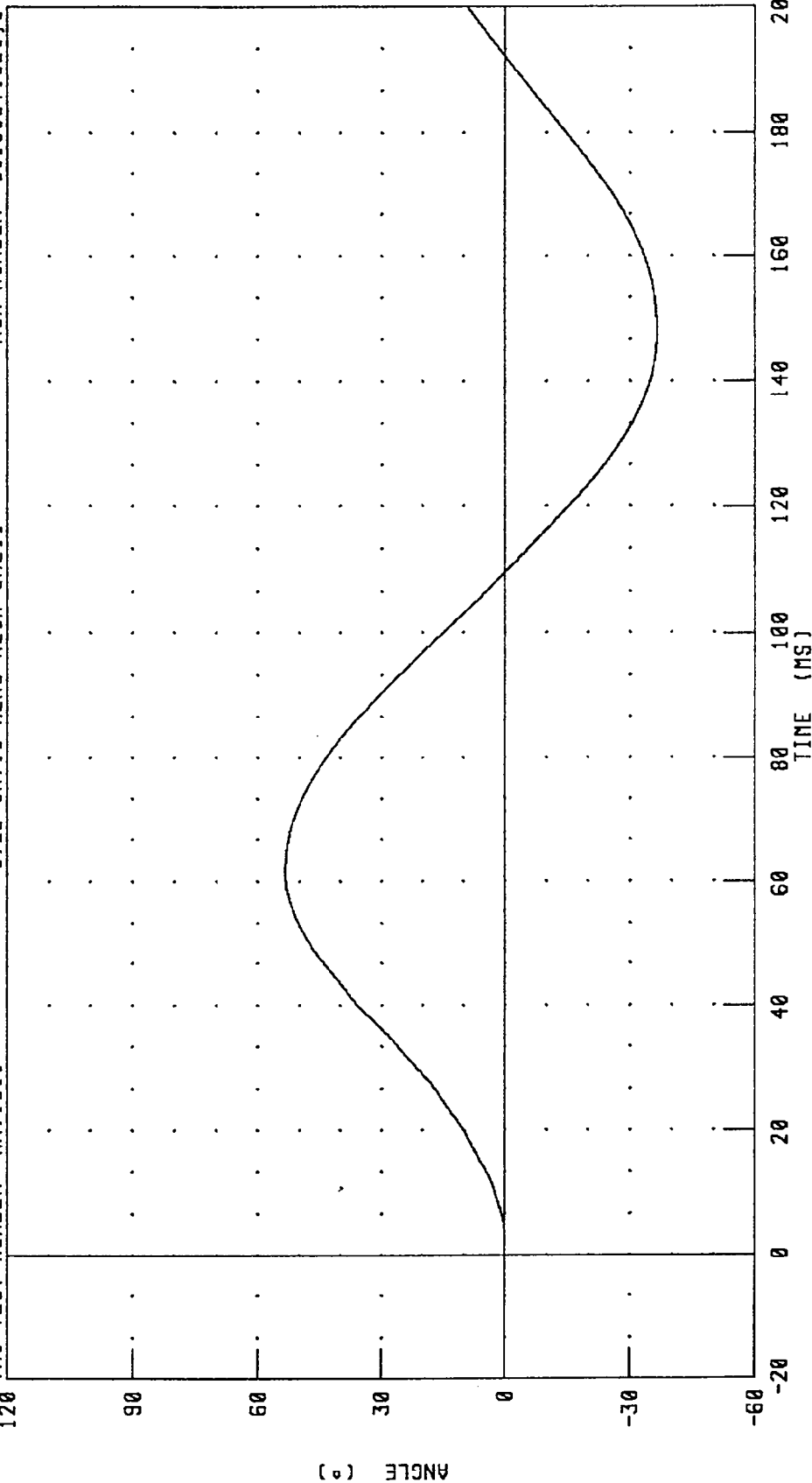
950224

PART 572-B HYBRID 11 HEAD/NECK CALIBRATION
 ROTATION ABOUT THE BASE OF THE NECK

TRC TEST NUMBER: HN71311

572B SN713 HEAD/NECK CAL11

RUN NUMBER: 031395.1525;3

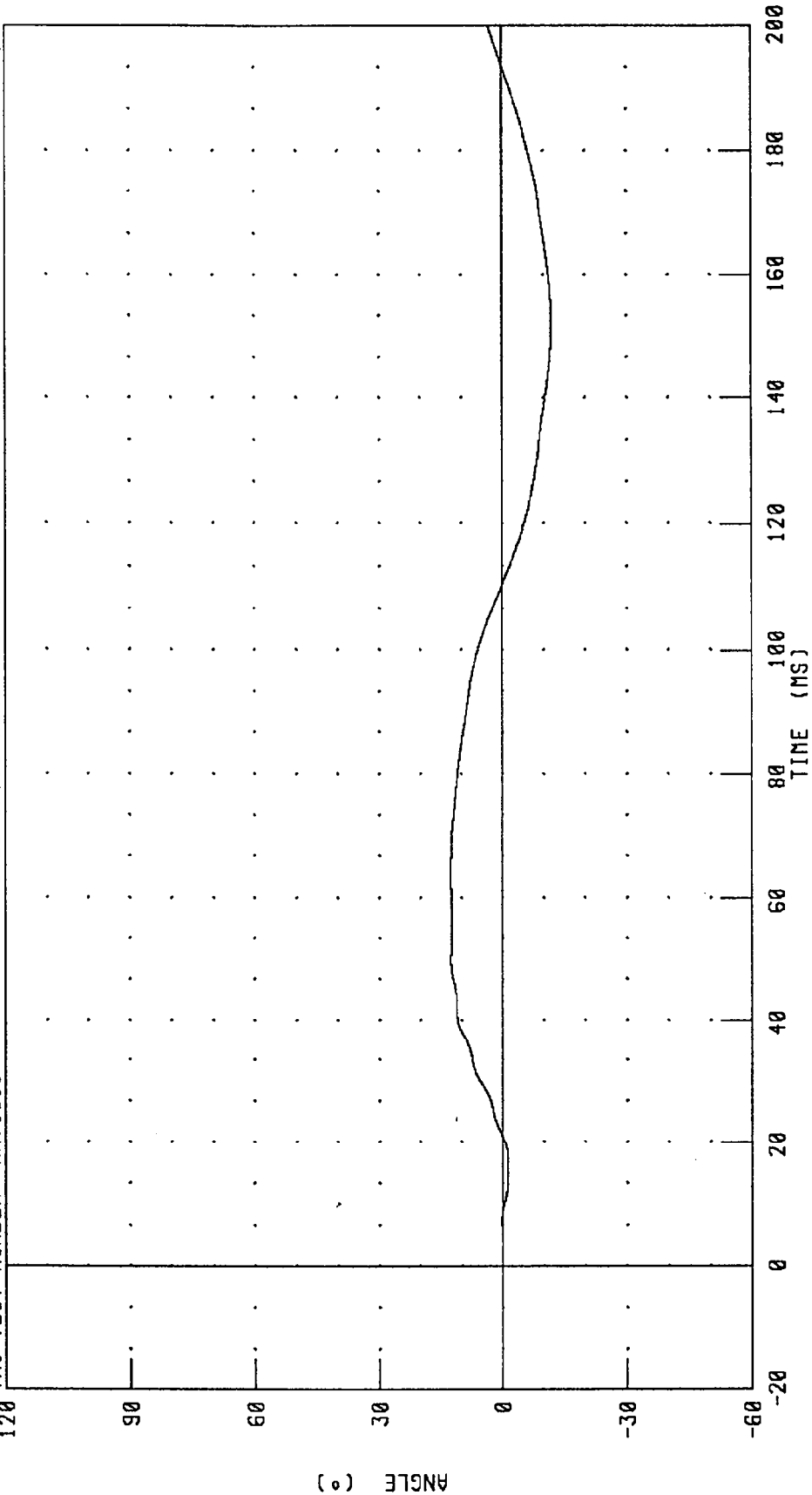


PEAK DATA: 53.33 ° @ 61.44 MS; -36.51 ° @ 148.08 MS

CHANNEL: BETA FILTER: CH. CLASS 60

PART 572-B HYBRID II HEAD/NECK CALIBRATION
 ROTATION ABOUT THE HEAD C.G.

TRC TEST NUMBER: HN71311 572B SN713 HEAD/NECK CAL11 RUN NUMBER: 031395.1525,3

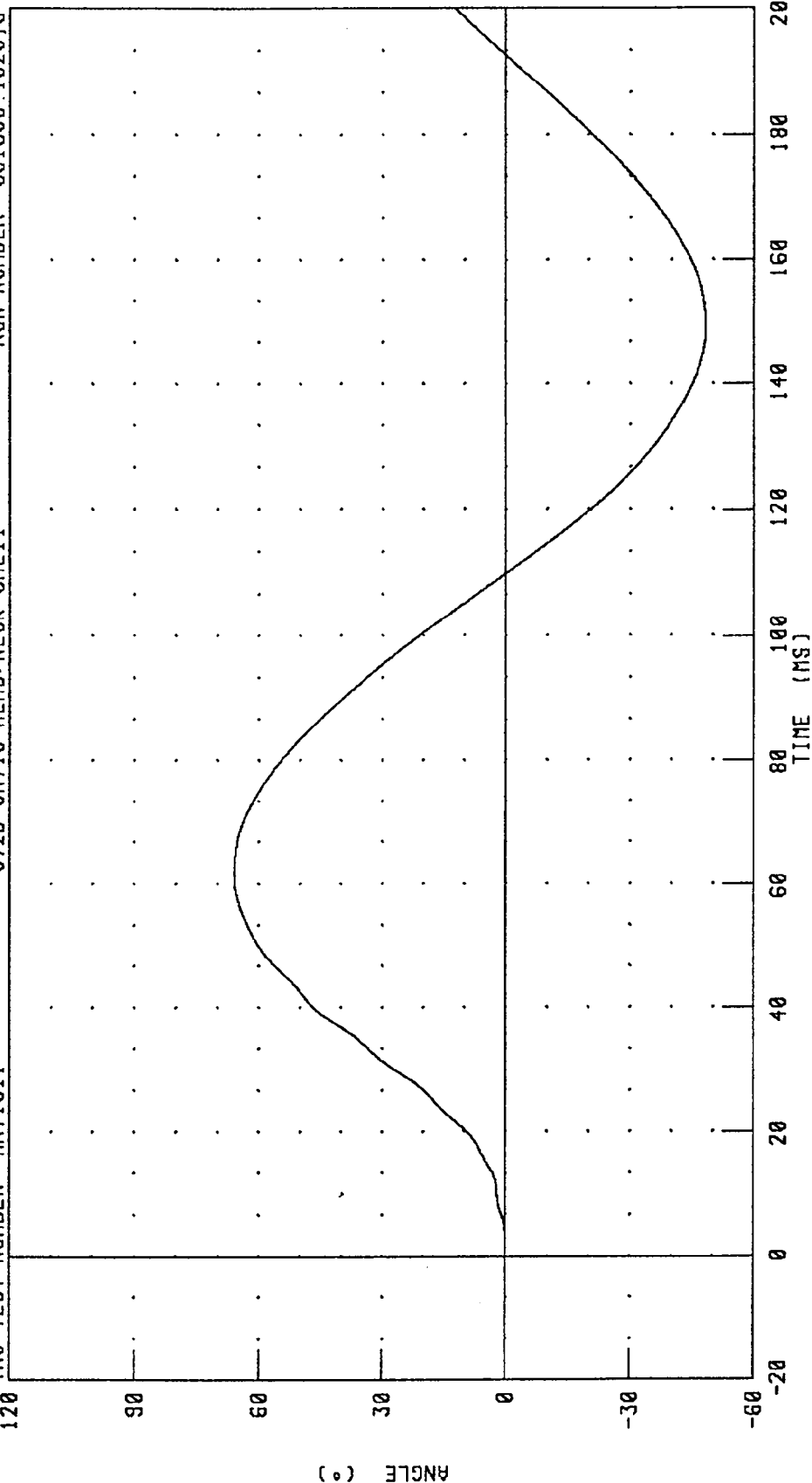


CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 12.64 ° @ 64.00 MS; -11.88 ° @ 151.36 MS

PART 572-B HYBRID II HEAD/NECK CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: HN71311 572B SN713 HEAD/NECK CAL11 RUN NUMBER: 031395.1525;3



CHANNEL: TOTAN FILTER: CH. CLASS 60

PEAK DATA: 65.95 ° @ 61.60 MS; -48.32 ° @ 149.20 MS

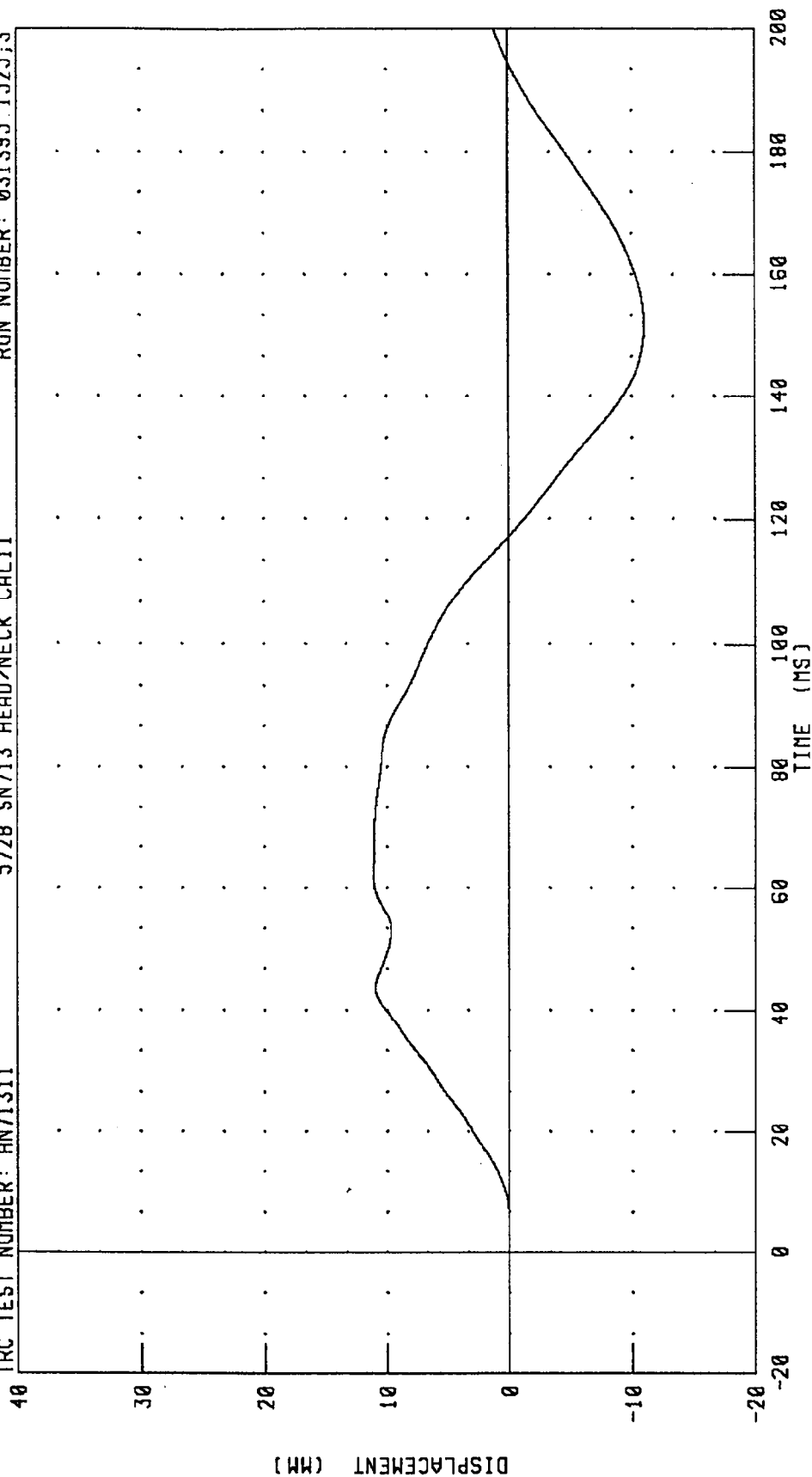
PART 572-B HYBRID II HEAD/NECK CALIBRATION

NECK DISPLACEMENT Z AXIS

5728 SN713 HEAD/NECK CAL11

RUN NUMBER: 031395.1525;3

TRC TEST NUMBER: HN71311



CHANNEL: NEKZD FILTER: CH. CLASS 60

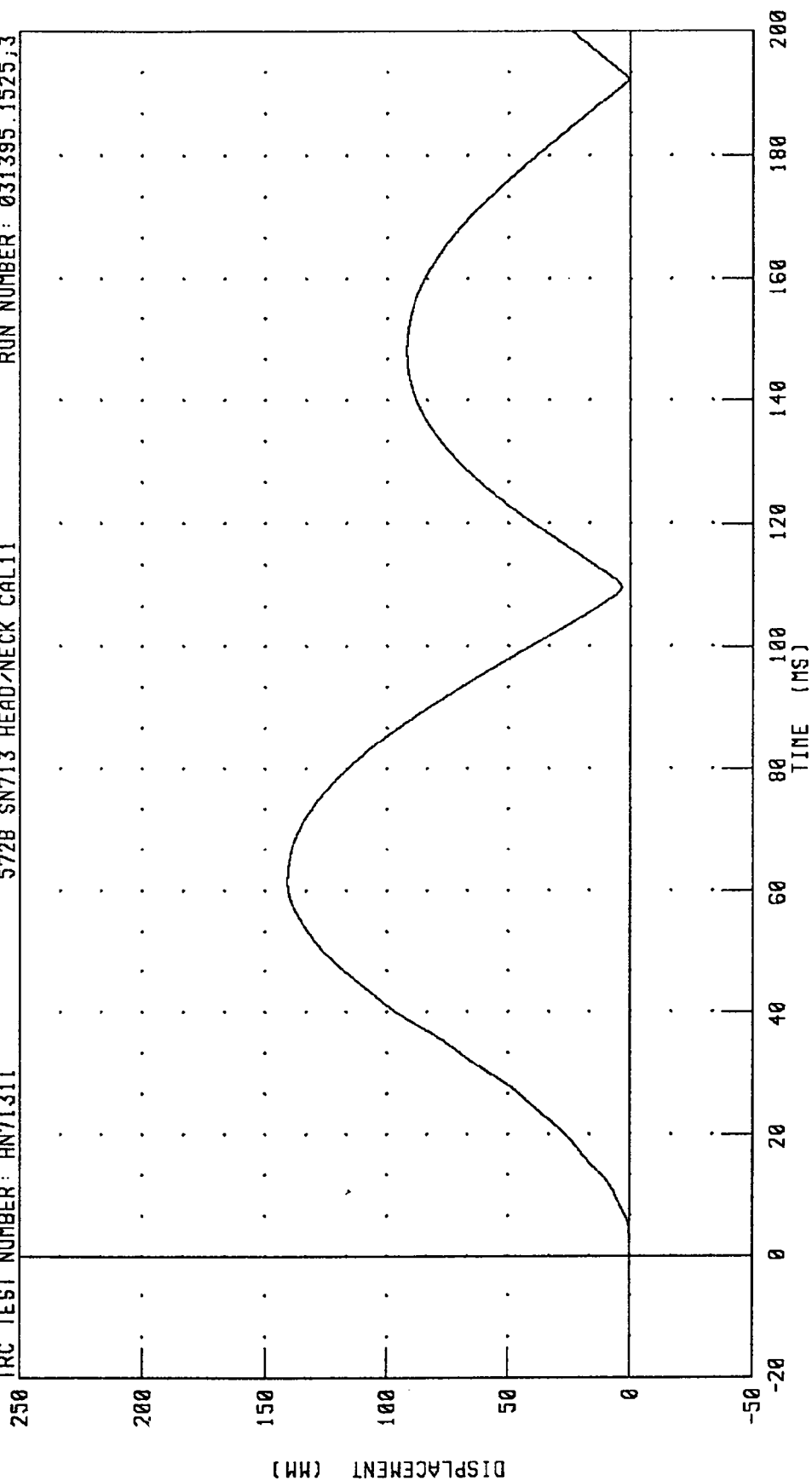
950224

C-56

PART 572-B HYBRID II HEAD/NECK CALIBRATION

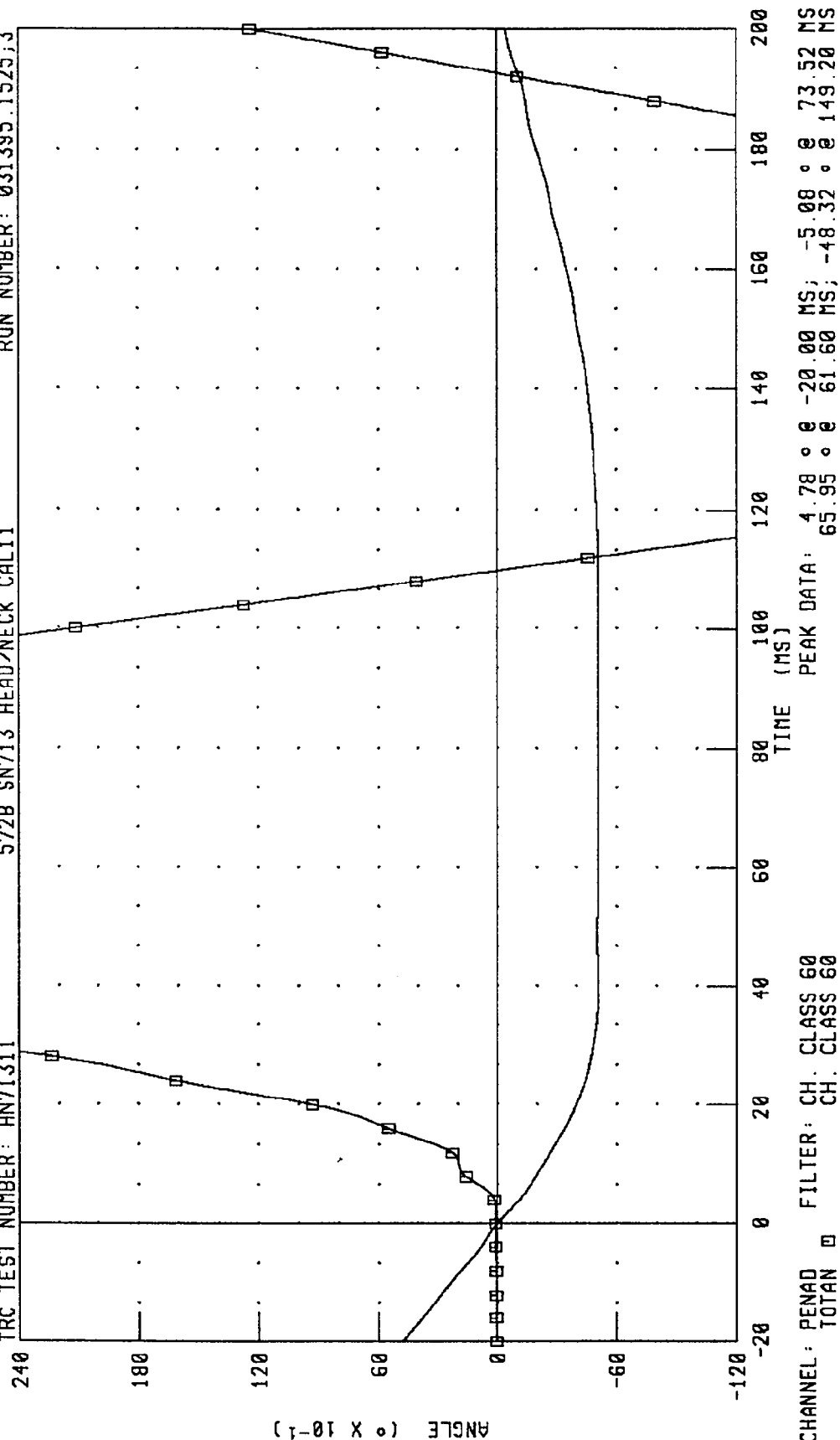
NECK CHORDAL DISPLACEMENT

TRC TEST NUMBER: HN71311 572B SN713 HEAD/NECK CAL11 RUN NUMBER: 031395.1525;3



CHANNEL: NEKCD FILTER: CH. CLASS 60

PART 572-B HYBRID II HEAD/NECK CALIBRATION
 TOTAL HEAD C.C. ROTATION AND PENDULUM ANGULAR DISPLACEMENT
 TRC TEST NUMBER: HN71311 572B SN713 HEAD/NECK CAL11 RUN NUMBER: 031395.1525;3



CHANNEL: PENAD FILTER: CH. CLASS 60
 TOTAL CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B

22-FEB-95

TRC INC.

TEST NO: TL71311

572B SN713 L.S.THORAX CAL11

TEST PARAMETER	LOW SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	30 %
PENDULUM VELOCITY	4.22 - 4.31 M/S	4.30 M/S
PEAK STERNUM DEFLECTION	28 MM MAX.	23.55 MM
PEAK RESISTIVE FORCE	6450. N MAX.	5936. N
INTERNAL HYSTERESIS	50 - 70 %	60.9 %

SCD: 53.34 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Pete F. A.

RUN NUMBER: 022295.0843;1

PART 572-B HYBRID II THORAX CALIBRATION (4.3 M/SEC)

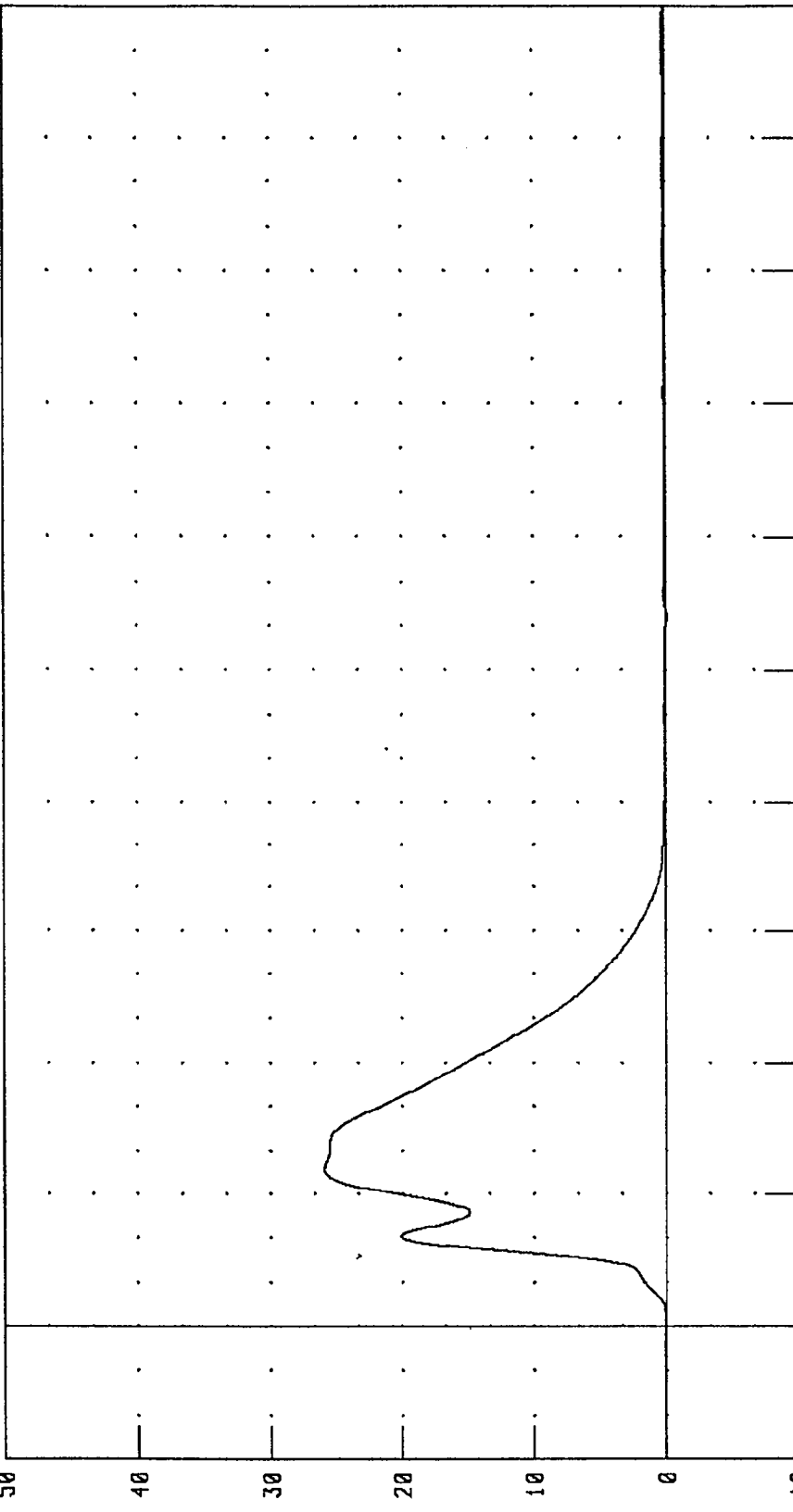
PENDULUM DECELERATION

TRC TEST NUMBER: TL71311

572B SN713 L.S. THORAX CAL11

RUN NUMBER: 031395.1525,1

50



TIME (MS)

PEAK DATA: 25.91 G @ 11.92 MS; -0.14 G @ 54.00 MS

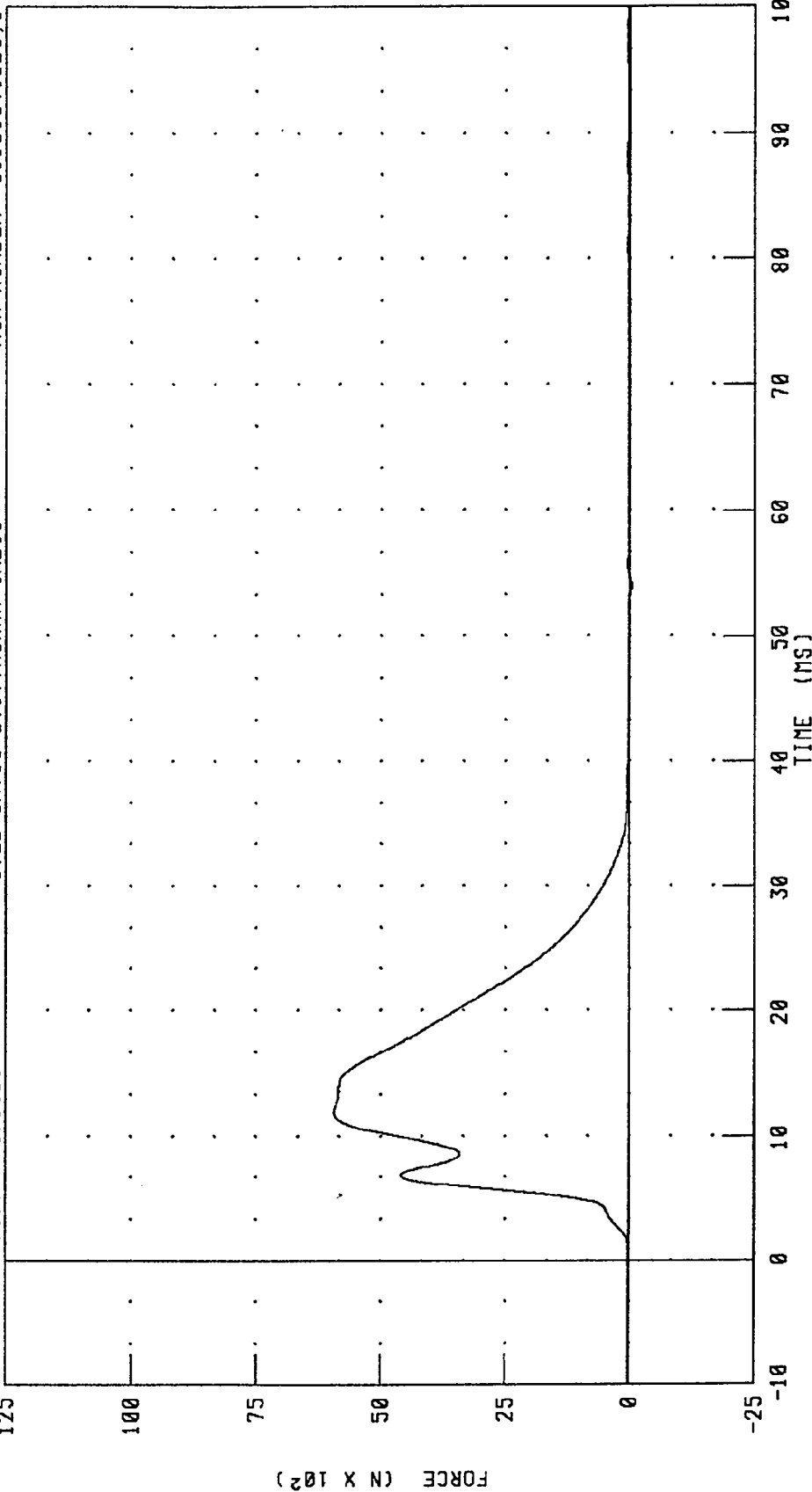
CHANNEL: PENXG FILTER: CH. CLASS 180

ACCELERATION (G)

PART 572-B HYBRID II THORAX CALIBRATION (4.3 N/SEC)

PENDULUM FORCE

TRC TEST NUMBER: TL71311 572B SN713 L.S. THORAX CAL11 RUN NUMBER: 031395.1525;1



PEAK DATA: 5936.05 N @ 11.92 MS; -32.77 N @ 54.00 MS

CHANNEL: PENXF FILTER: CH. CLASS 180

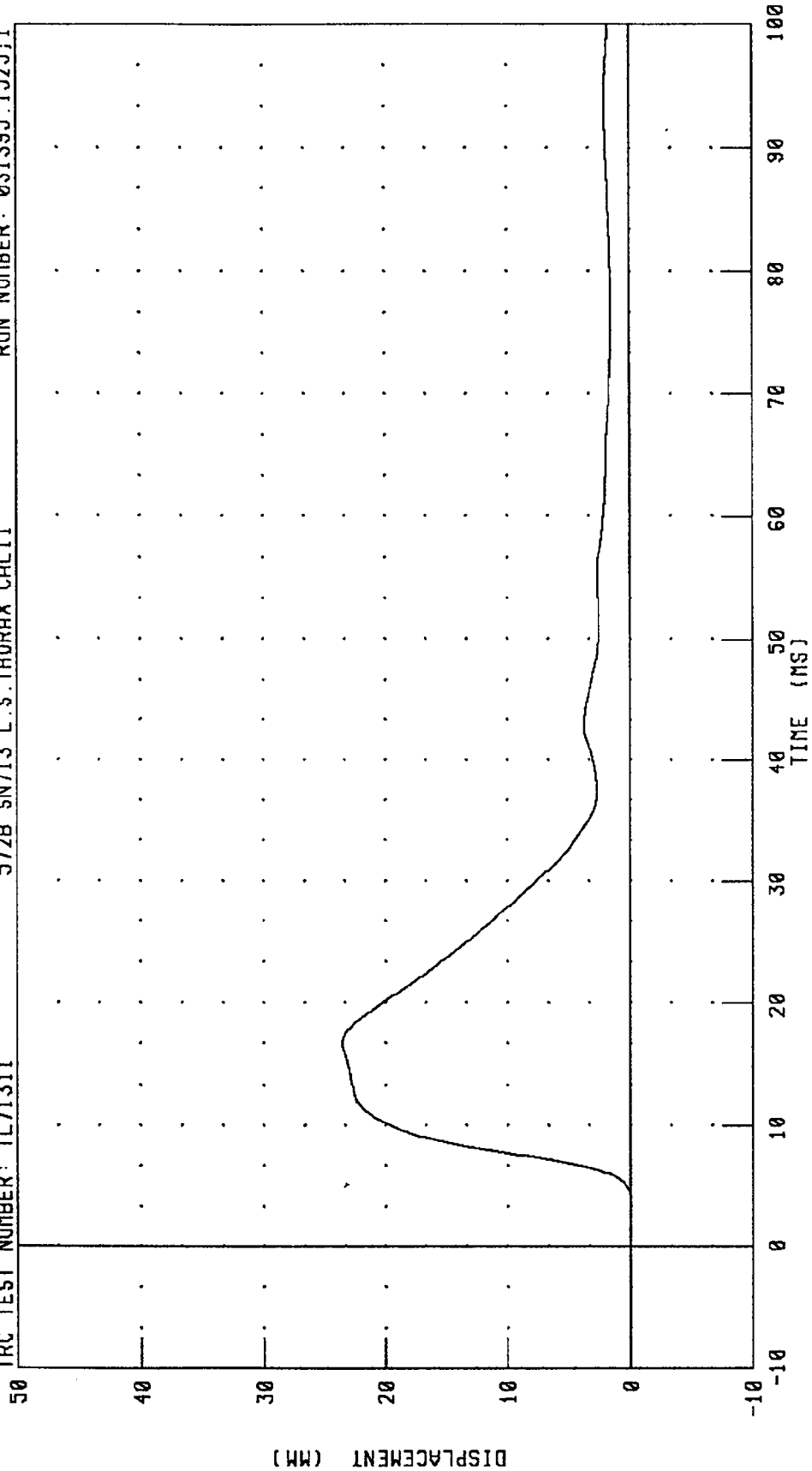
PART 572-B HYBRID II THORAX CALIBRATION (4.3 M/SEC)

STERNUM DISPLACEMENT

TRC TEST NUMBER: TL71311

572B SN713 L.S. THORAX CAL11

RUN NUMBER: 031395.1525;1



CHANNEL: CSTXD FILTER: CH. CLASS 180

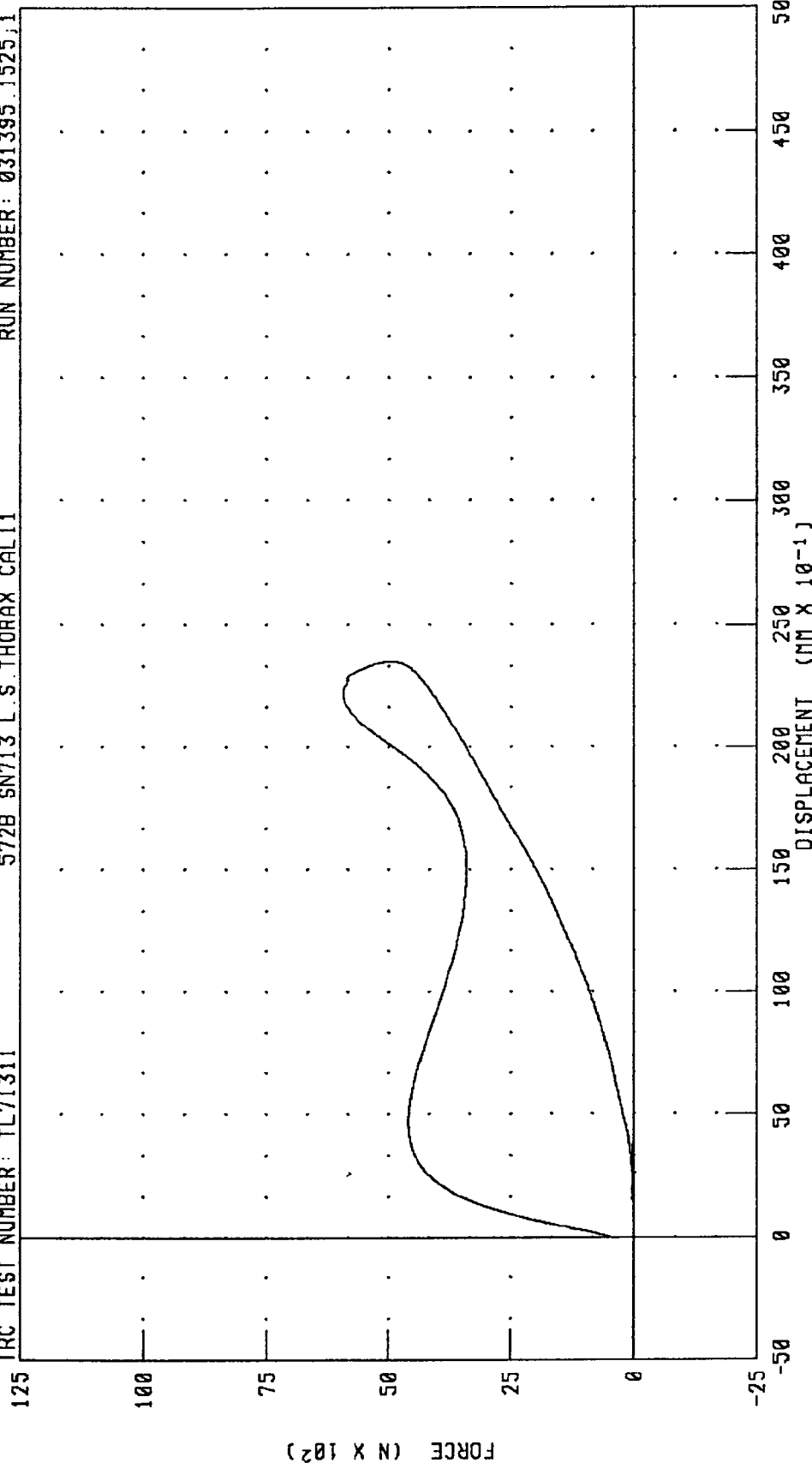
PEAK DATA: 23.55 MM @ 16.64 NS; -0.01 MM @ 0.40 MS

PART 572-B HYBRID II THORAX CALIBRATION (4.3 N/SEC)
CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: TL71311

572B SN713 L.S. THORAX CAL11

RUN NUMBER: 031395.1525.1



CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

PEAK DATA: 23.55 MM @ 16.64 MS;
5936.05 N @ 11.92 MS; -0.01 NM @ 0.40 MS;
-32.77 N @ 54.00 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B

22-FEB-95

TRC INC.

TEST NO: TH71311

572B SN713 H.S.THORAX CAL11

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	30 %
PENDULUM VELOCITY	6.64 - 6.77 M/S	6.68 M/S
PEAK STERNUM DEFLECTION	43 MM MAX.	36.20 MM
PEAK RESISTIVE FORCE	10009. N MAX.	9038. N
INTERNAL HYSTERESIS	50 - 70 %	57.7 %

SCD: 53.34 MM

DUMMY MEETS SPECIFICATIONS

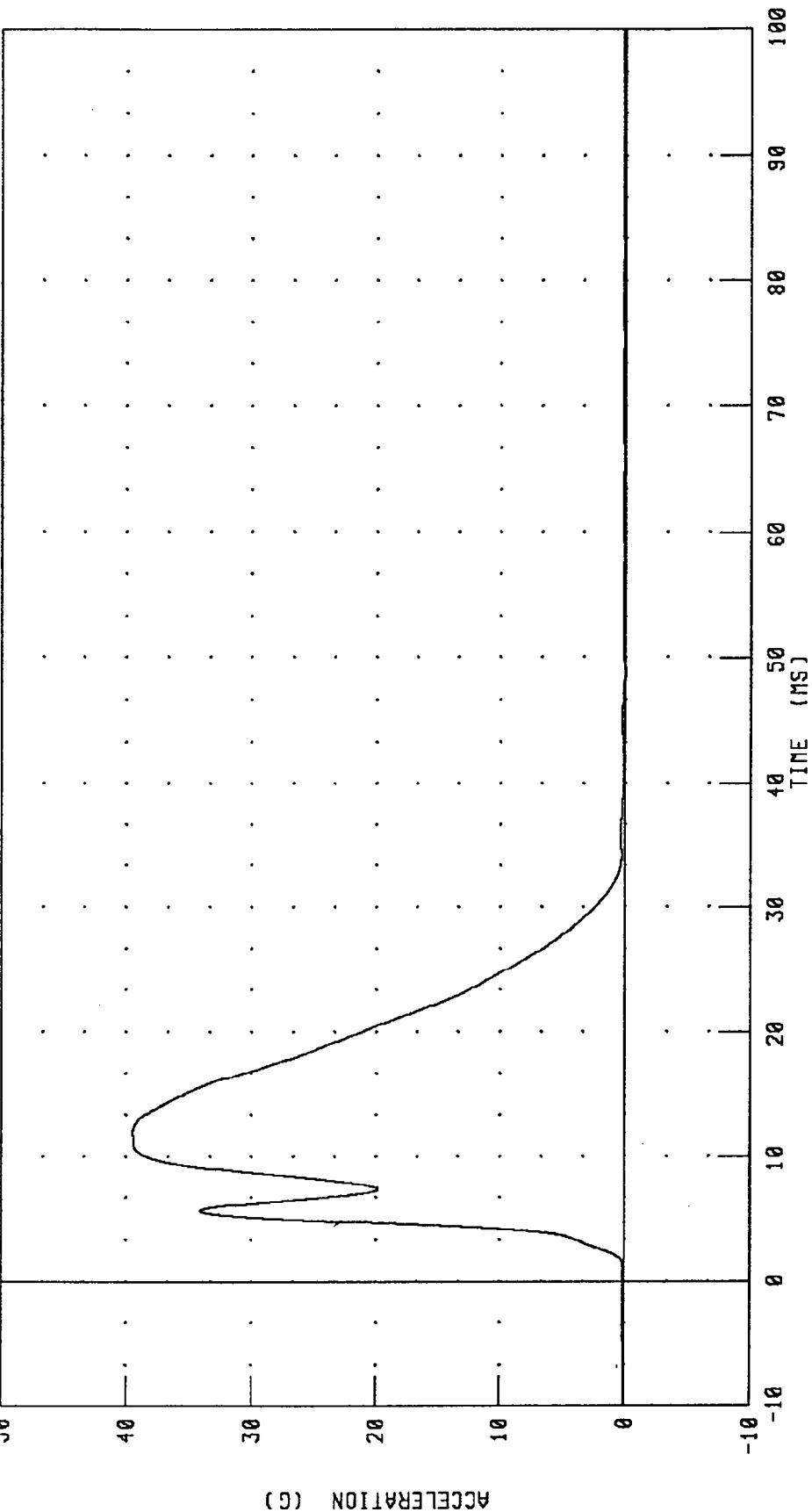
TECHNICIAN

Pete F.S.

RUN NUMBER: 022295.0923;1

PART 572-B HYBRID II THORAX CALIBRATION (6.7 M/SEC)
 PENDULUM DECELERATION

IRC TEST NUMBER: TH71311 572B SN713 H.S. THORAX CAL11 RUN NUMBER: 031395.1525;1

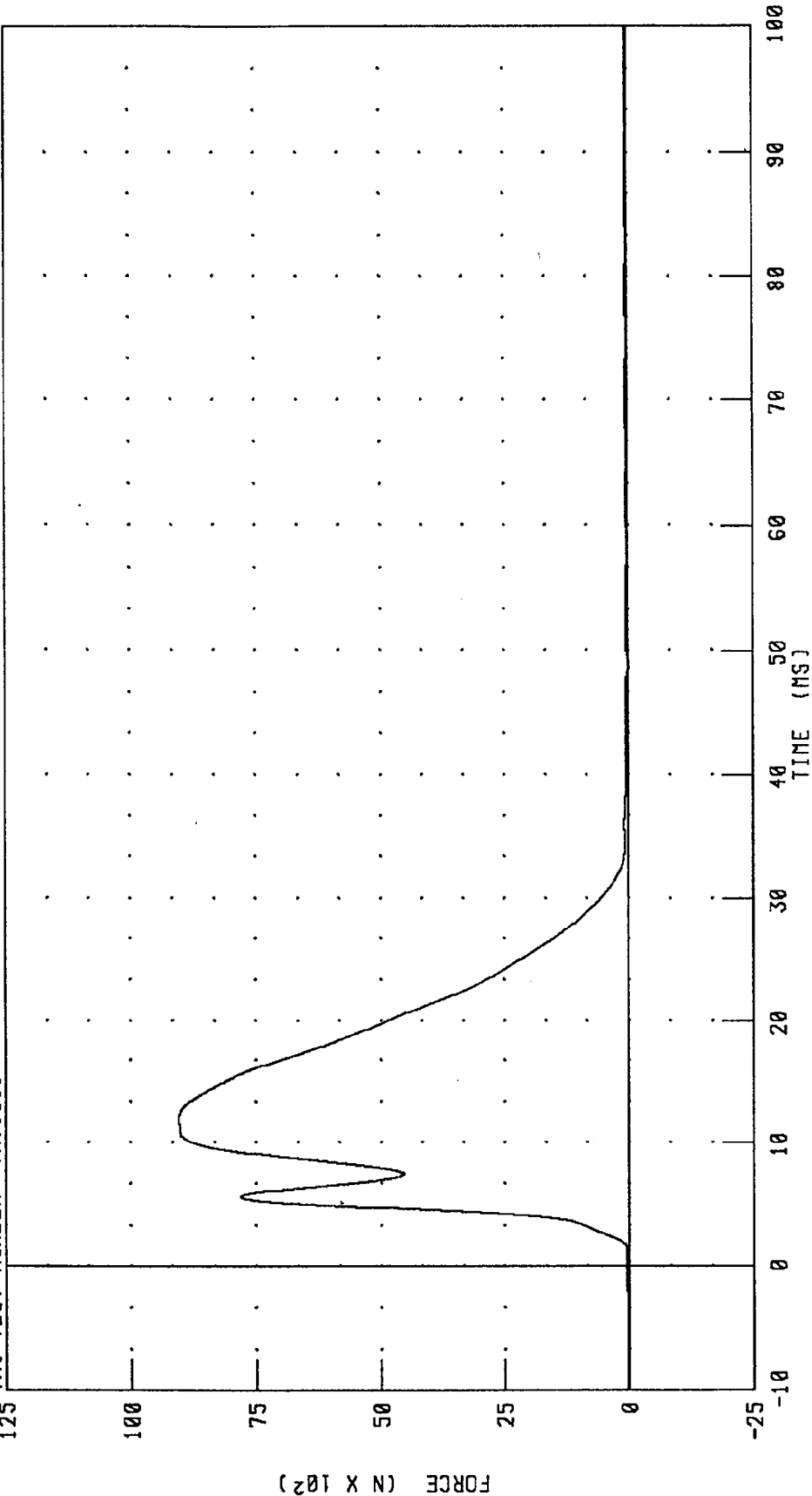


CHANNEL: PENXC FILTER: CH. CLASS 180

PART 572-B HYBRID II THORAX CALIBRATION (6.7 N/SEC)

PENDULUM FORCE

TRC TEST NUMBER: TH71311 572B SN713 H.S. THORAX CAL11 RUN NUMBER: 031395.1525;1



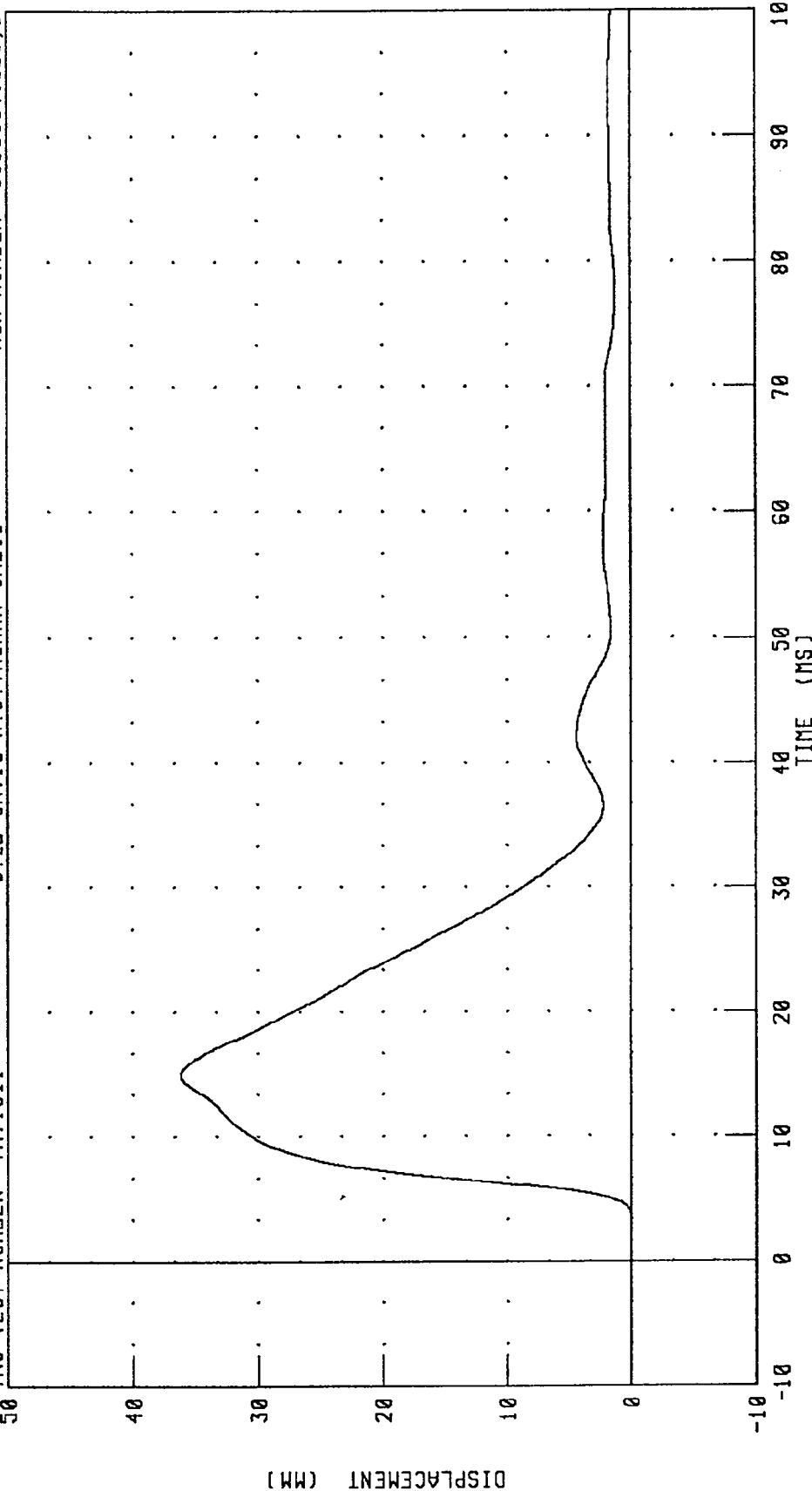
CHANNEL: PENXF FILTER: CH. CLASS 180

PEAK DATA: 9037.85 N @ 11.92 MS, -11.78 N @ 48.80 MS

PART 572-B HYBRID II THORAX CALIBRATION (6.7 M/SEC)

STERNUM DISPLACEMENT

TRC TEST NUMBER: TH71311 572B SN713 H.S. THORAX CAL11 RUN NUMBER: 031395.1525;1



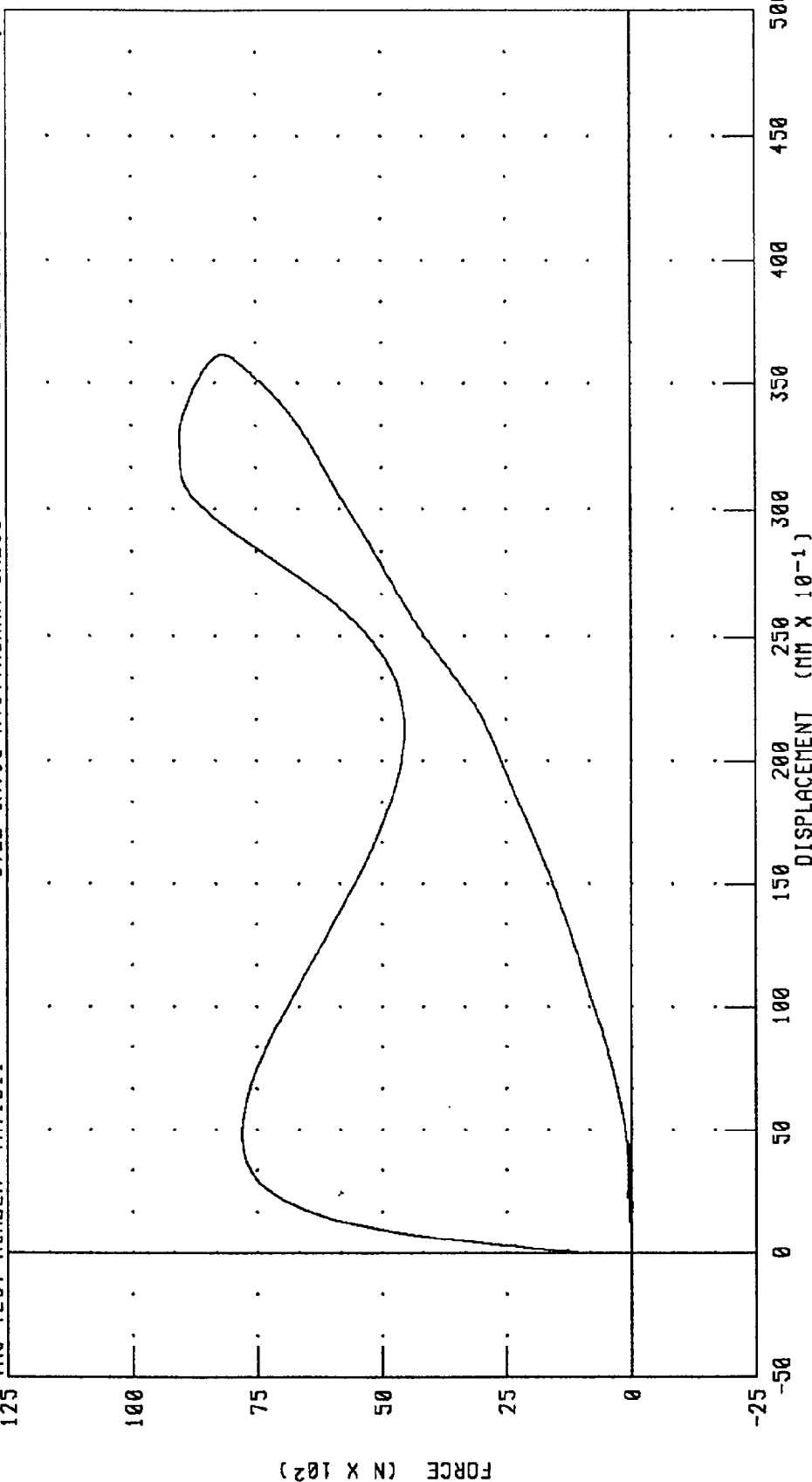
PEAK DATA: 36.20 MM @ 14.80 MS; 0.00 NM @ -4.40 NS

CHANNEL: CSTXD FILTER: CH. CLASS 180

PART 572-B HYBRID II THORAX CALIBRATION (6.7 N/SEC)

CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: TH71311 572B SN713 H.S. THORAX CAL11 RUN NUMBER: 031395.1525;1



CHANNEL: CSTXD FILTER: CH: CLASS 180
PENXF CH: CLASS 180
PEAK DATA: 36.20 MM @ 14.80 MS; 0.00 NM @ -4.40 MS
9037.85 N @ 11.92 MS; -11.78 N @ 48.80 MS

TRANSPORTATION RESEARCH CENTER INC.

ABDOMEN COMPRESSION TEST

PART 572B

21-FEB-95

TRC INC.

TEST NO: AB71311

572B SN713 ABDOM COMP CAL11

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	32 %
DEFLECTION RATE	6.4 - 8.9 MM/S	7.85 MM/S
FORCE AT 0.00 MM DISP.	44.48 N	44.48 N
FORCE AT 12.7 MM DISP.	102.30 - 160.13 N	121.64 N
FORCE AT 19.1 MM DISP.	160.13 - 222.40 N	175.93 N
FORCE AT 25.4 MM DISP.	222.40 - 280.22 N	244.19 N
FORCE AT 33.0 MM DISP.	324.70 - 391.42 N	351.78 N

DUMMY MEETS SPECIFICATIONS

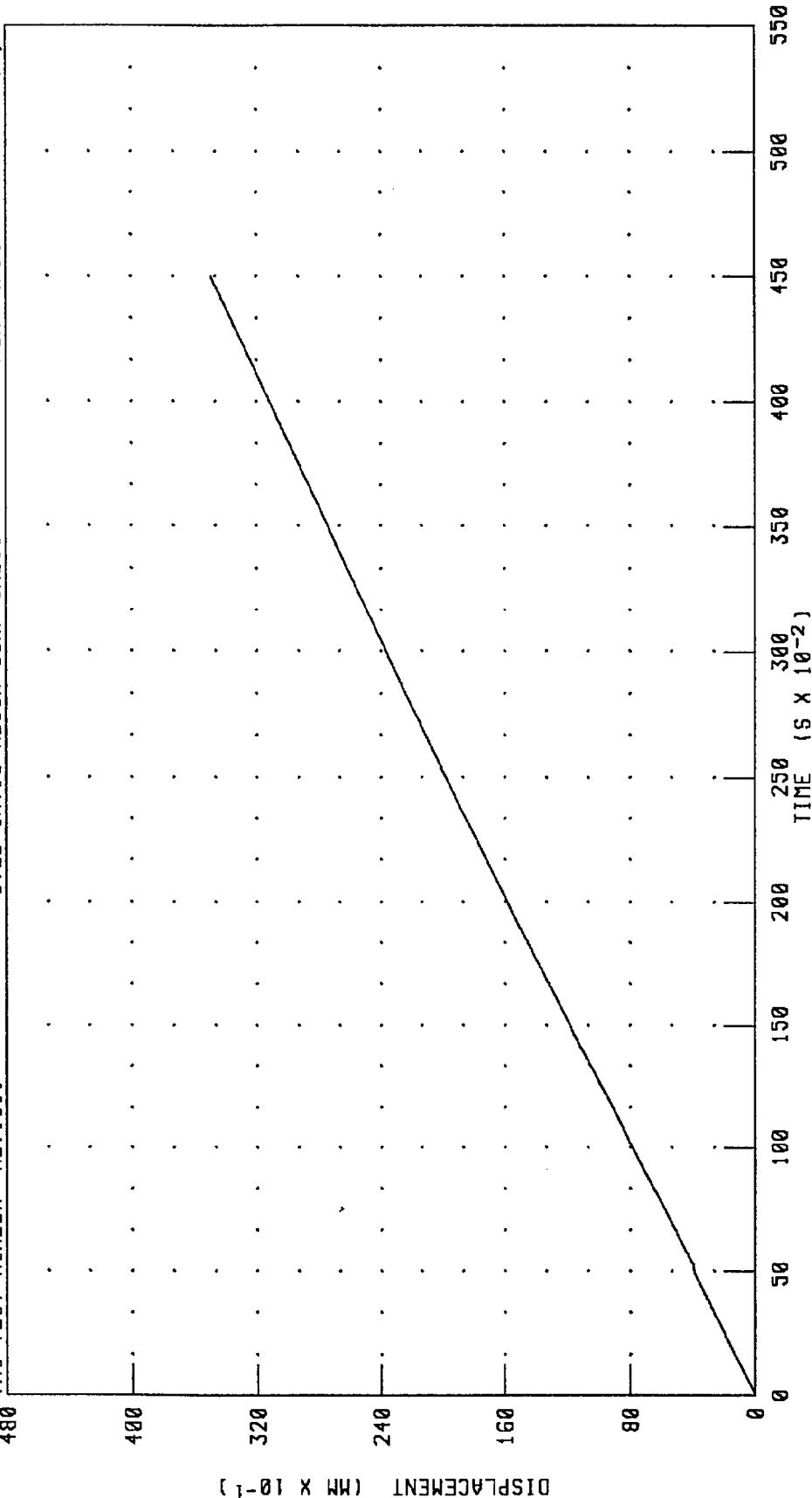
TECHNICIAN

John F. S.

RUN NUMBER: 022195.1348;5

PART 572-B HYBRID II ABDOMEN CALIBRATION
ABDOMEN DISPLACEMENT

TRC TEST NUMBER: AB71311 572B SN713 ABDOM COMP CAL11 RUN NUMBER: 031395.1525;5



CHANNEL: ABXD FILTER: CH. CLASS 1000

PEAK DATA: 34.94 MM @ 4.50 S; 0.00 MM @ 0.00 S

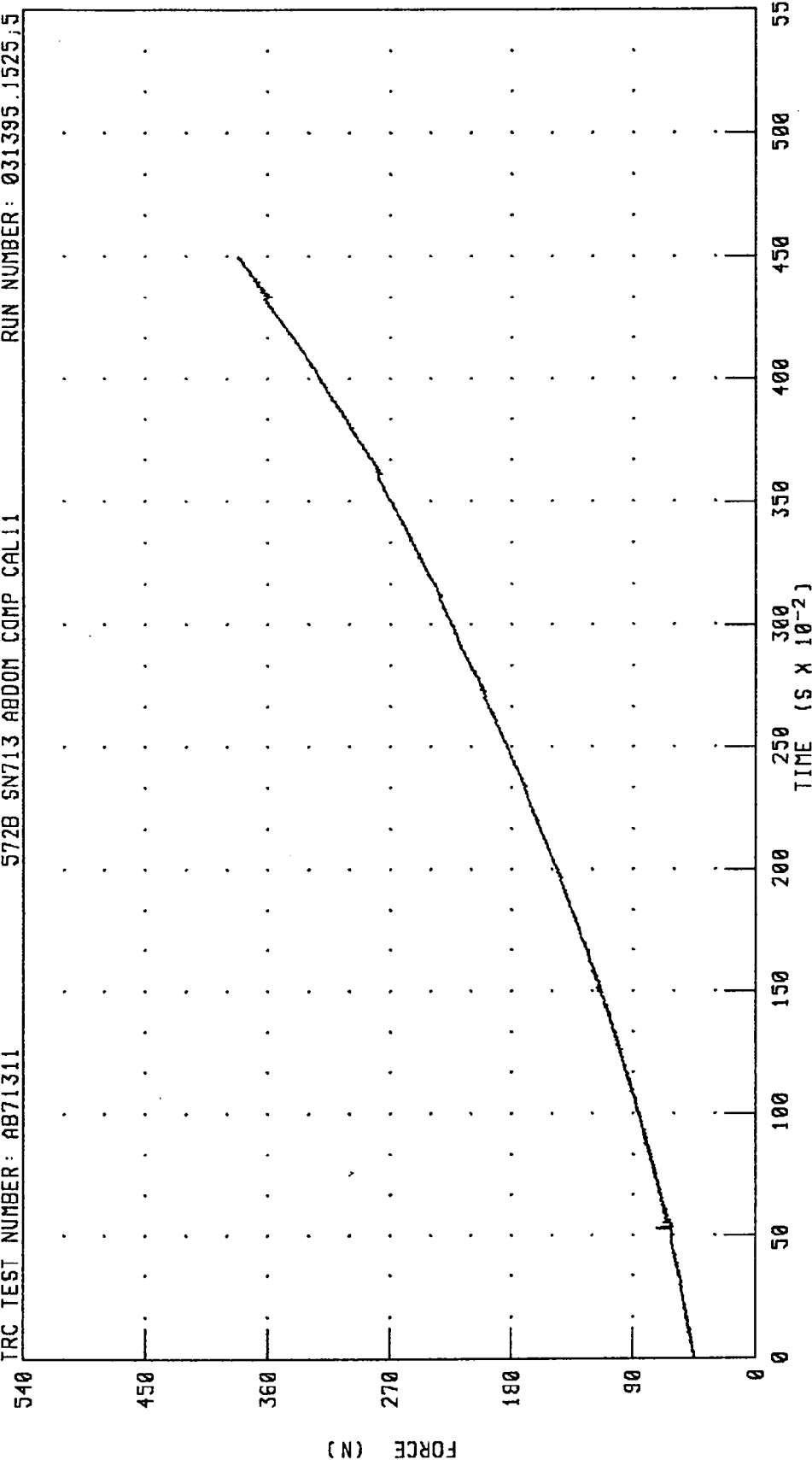
PART 572-B HYBRID II ABDOMEN CALIBRATION

ABDOMEN FORCE

TRC TEST NUMBER: AB71311

572B SN713 ABDOM COMP CAL11

RUN NUMBER: 031395.1525,5



PEAK DATA: 382.27 N @ 4.49 S; 44.15 N @ 0.00 S

CHANNEL: ABXF FILTER: CH. CLASS 1000

PART 572-B HYBRID II ABDOMEN CALIBRATION

ABDOMEN FORCE VS DISPLACEMENT

572B SN713 ABDOM COMP CAL11

TRC TEST NUMBER: AB71311

540

450

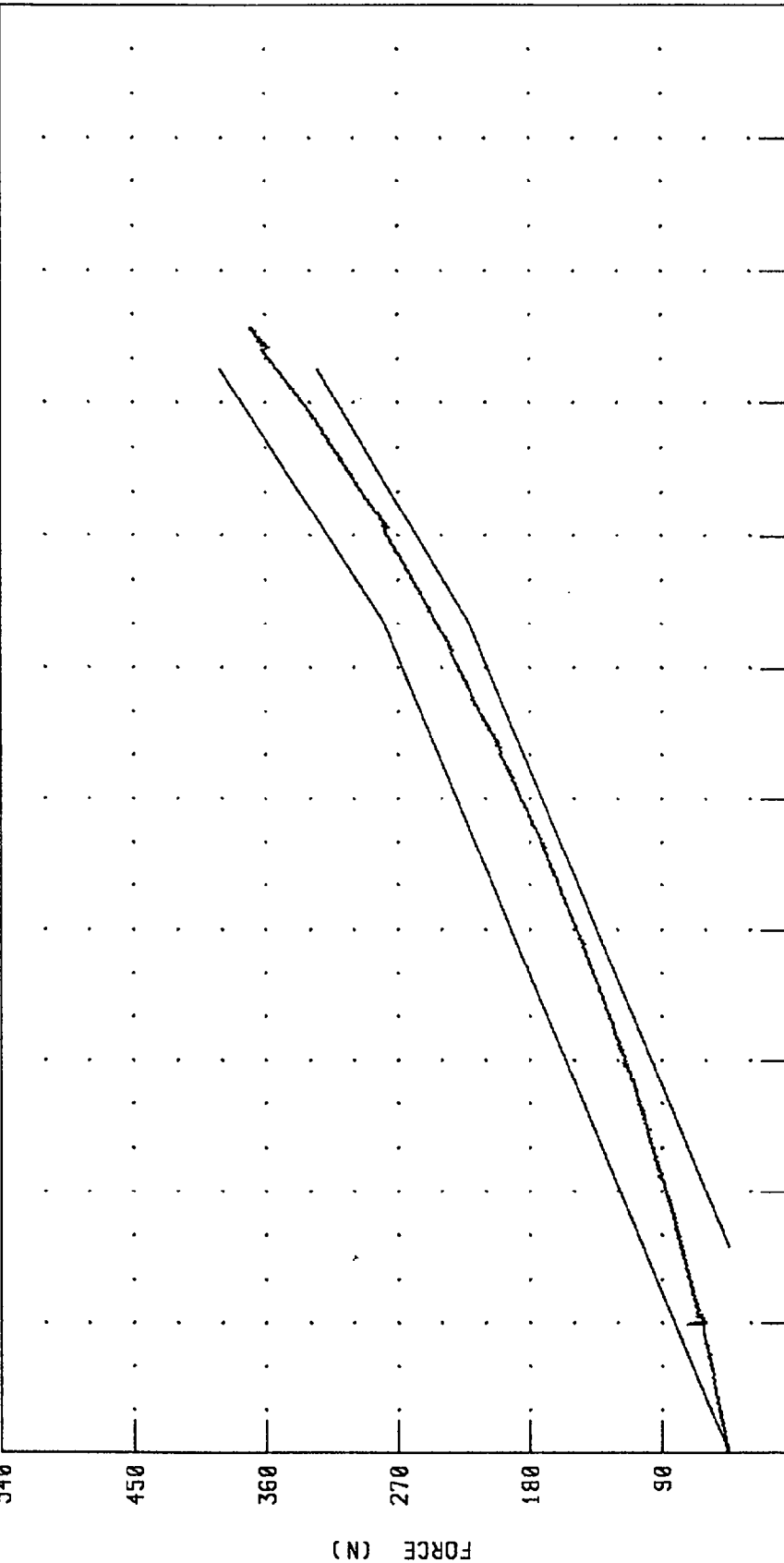
360

270

180

90

0



DISPLACEMENT (MM X 10⁻¹)

0 40 80 120 160 200 240 280 320 360 400 440

0

90

180

270

360

450

540

0

90

180

270

360

450

540

0

CHANNEL: ABXD

ABXF

FILTER: CH. CLASS 1000

CH. CLASS 1000

PEAK DATA:

34.30 MM @ 4.42 S;

370.27 N @ 4.42 S;

0.00 MM @ 0.00 S

44.15 N @ 0.00 S

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

PART 572B

21-FEB-95

TRC INC. TEST NO: LF71311

572B SN713 LUMBAR FLEX CAL11

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	30 %
FORCE AT 0 DEG. FLEXION	-26.69 - +26.69 N	0.00 N
FORCE AT 20 DEG. FLEXION	97.86 - 151.24 N	133.44 N
FORCE AT 30 DEG. FLEXION	151.24 - 204.62 N	177.92 N
FORCE AT 40 DEG. FLEXION	204.62 - 258.00 N	235.74 N
NET RETURN ANGLE	< 12 DEG.	5.60 DEG.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 022295.1251

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

PART 572B

22-FEB-95

TRC INC.

TEST NO: RK71311

572B SN713 R.KNEE IMP CAL11

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	30 %
PENDULUM VELOCITY	2.06 - 2.15 M/S	2.14 M/S
PEAK KNEE IMPACT FORCE	8229 - 11121 N	9671.87 N
DURATION ABOVE 4448 N	>=1.7 MS	1.81 MS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete R. J.

RUN NUMBER: 022295.1013;1

PART 572-B HYBRID II RIGHT KNEE CALIBRATION

RIGHT FEMUR FORCE

TRC TEST NUMBER: RK71311

572B SN713 R.KNEE IMP CAL11

RUN NUMBER: 031395.1525;1

125

100

75

50

25

0

-25

FORCE (N X 10²)

TIME (MS X 10⁻¹)

PEAK DATA: 9671.87 N @ 2.48 MS; -6.21 N @ -0.32 MS

FILTER: CH. CLASS 600

CHANNEL: RFMF

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

PART 572B

22-FEB-95

TRC INC.

TEST NO: LK71311

572B SN713 L.KNEE IMP CAL11

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	30 %
PENDULUM VELOCITY	2.06 - 2.15 M/S	2.14 M/S
PEAK KNEE IMPACT FORCE	8229 - 11121 N	10515.66 N
DURATION ABOVE 4448 N	≥ 1.7 MS	1.76 MS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

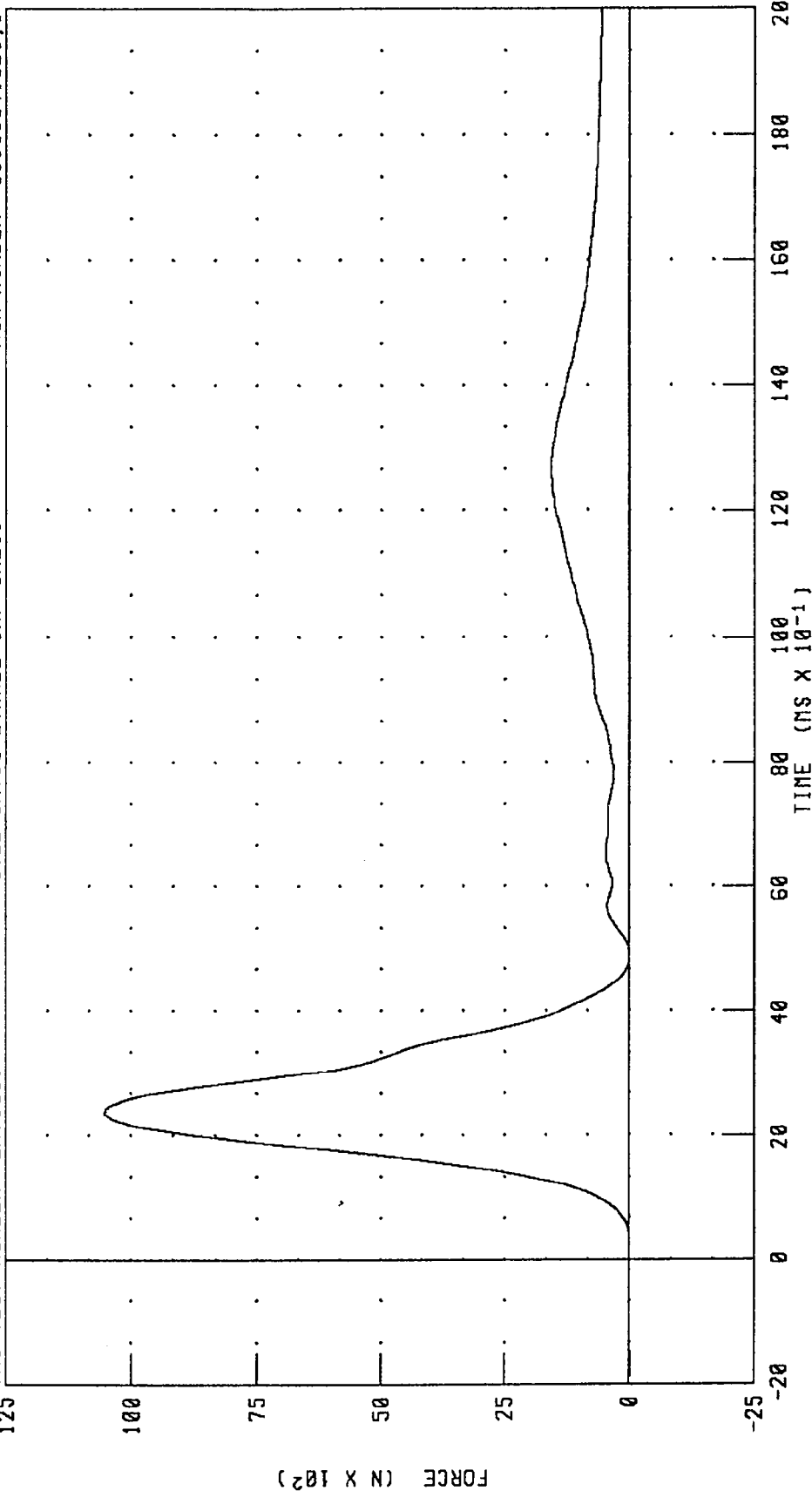
Pete F. S.

RUN NUMBER: 022295.1001;1

PART 572-B HYBRID II LEFT KNEE CALIBRATION

LEFT FEMUR FORCE

TRC TEST NUMBER: LK71311 572B SN713 L.KNEE IMP CAL11 RUN NUMBER: 031395.1525;1



PEAK DATA: 10515.66 N @ 2.32 MS; -6.44 N @ -1.68 MS

CHANNEL: LFMF FILTER: CH. CLASS 600

Appendix D

Miscellaneous Test Information

Dummy Instrument Calibrations

Driver Dummy #826

	Serial Number	Model Number	Manufacturer	Calibration Date Last	Due
Head X-axis accelerometer	AGR85	7264	Endevco	10/07/94	04/07/95
Head Y-axis accelerometer	AGR52	7264	Endevco	10/07/94	04/07/95
Head Z-axis accelerometer	AJ8D3	7264	Endevco	10/10/94	04/10/95
Chest X-axis accelerometer	A79GJ	7264	Endevco	10/10/94	04/10/95
Chest Y-axis accelerometer	AHRK5	7264	Endevco	09/13/94	03/13/95
Chest Z-axis accelerometer	EA32J	7264	Endevco	12/30/94	06/30/95
Left femur force load cell	827	2430	GSE	12/05/94	06/05/95
Right femur force load cell	1003	2430	GSE	01/16/95	07/16/95
Neck X-axis force load cell ¹	NA	NA	NA	NA	NA
Neck Y-axis force load cell ¹	NA	NA	NA	NA	NA
Neck Z-axis force load cell ¹	NA	NA	NA	NA	NA
Neck Moment about X-axis load cell ¹	NA	NA	NA	NA	NA
Neck Moment about Y-axis load cell ¹	NA	NA	NA	NA	NA
Neck Moment about Z-axis load cell ¹	NA	NA	NA	NA	NA
Pelvis X-axis accelerometer	FH18J	7264	Endevco	01/30/95	07/30/95
Pelvis Y-axis accelerometer	AJ658	7264	Endevco	02/09/95	08/09/95
Pelvis Z-axis accelerometer	AGR37	7264	Endevco	02/09/95	08/09/95
Chest deflection potentiometer ¹	NA	NA	NA	NA	NA
Lap belt force load cell	127	3419	Lebow	02/06/95	08/06/95
Shoulder belt force load cell	612	3419	Lebow	02/07/95	08/07/95

¹ Hybrid III use only.

Dummy Instrument Calibrations

Right Front Passenger Dummy #713

	Serial Number	Model Number	Manufacturer	Calibration Date Last	Due
Head X-axis accelerometer	CT44H	7264	Endevco	12/29/94	06/29/95
Head Y-axis accelerometer	AAMT5	7264	Endevco	12/29/94	06/29/95
Head Z-axis accelerometer	ACCM9	7264	Endevco	12/29/94	06/29/95
Chest X-axis accelerometer	AAMJ5	7264	Endevco	12/29/94	06/29/95
Chest Y-axis accelerometer	AC8B8	7264	Endevco	12/29/94	06/29/95
Chest Z-axis accelerometer	CR63H	7264	Endevco	12/29/94	06/29/95
Left femur force load cell	986	2430	GSE	08/30/94	03/01/95
Right femur force load cell	987	2430	GSE	08/30/94	03/01/95
Neck X-axis force load cell ¹	NA	NA	NA	NA	NA
Neck Y-axis force load cell ¹	NA	NA	NA	NA	NA
Neck Z-axis force load cell ¹	NA	NA	NA	NA	NA
Neck Moment about X-axis load cell ¹	NA	NA	NA	NA	NA
Neck Moment about Y-axis load cell ¹	NA	NA	NA	NA	NA
Neck Moment about Z-axis load cell ¹	NA	NA	NA	NA	NA
Pelvis X-axis accelerometer	AJ797	7264	Endevco	01/02/95	07/02/95
Pelvis Y-axis accelerometer	AHRY0	7264	Endevco	01/02/95	07/02/95
Pelvis Z-axis accelerometer	EA52J	7264	Endevco	01/02/95	07/02/95
Chest deflection potentiometer ¹	NA	NA	NA	NA	NA
Lap belt force load cell	234	3419	Lebow	01/11/95	07/11/95
Shoulder belt force load cell	249	3419	Lebow	01/11/95	07/11/95

¹ Hybrid III use only.

Vehicle and Calibration Laboratory Instrument Calibrations

Vehicle Accelerometers

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Left rear seat crossmember X-axis	DY61J	7264	Endevco	01/06/95	07/06/95
Left rear seat crossmember X-axis redundant	DW12J	7264	Endevco	12/13/94	06/13/95
Right rear seat crossmember X-axis	AGRG7	7264	Endevco	09/08/94	03/08/95
Right rear seat crossmember X-axis redundant	DT96JT	7264	Endevco	01/31/95	07/31/95
Engine top X-axis	AGR75	7264	Endevco	09/13/94	03/13/95
Engine bottom X-axis	CP90H	7264	Endevco	01/06/95	07/06/95
Right brake caliper X-axis	DR10JT	7264	Endevco	09/08/94	03/08/95
Left brake caliper X-axis	AGRF9	7264	Endevco	01/26/95	07/26/95
Instrument panel center X-axis	DW34JC	7264	Endevco	10/27/94	04/27/95

Calibration Laboratory Instruments

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Neck bending pendulum accelerometer	CB27	7232	Endevco	09/26/94	03/26/95
Neck bending rotary potentiometer	NA	35435-1-102	Bournes	Mfr. Specification	
Neck bending linear potentiometer	NA	5184-2051846003	Bournes	09/26/94	03/26/95
Thorax/Hybrid II femur pendulum accelerometer	CC64	7232	Endevco	09/26/94	03/26/95
Lumbar flexion force gauge	NA	DPPH-50	Chatillon	05/03/89	repaired
Lumbar flexion rotation gauge	CP17-0601-1	7020	Humphrey	Mfr. Specification	
Abdomen compression displacement gauge	4075-175	80294-2051941504	Bournes	09/26/94	03/26/95
Abdomen compression force gauge	3443	3167	Lebow	09/26/94	03/26/95
Hybrid III femur pendulum accelerometer	CG83	7232	Endevco	09/26/94	03/26/95

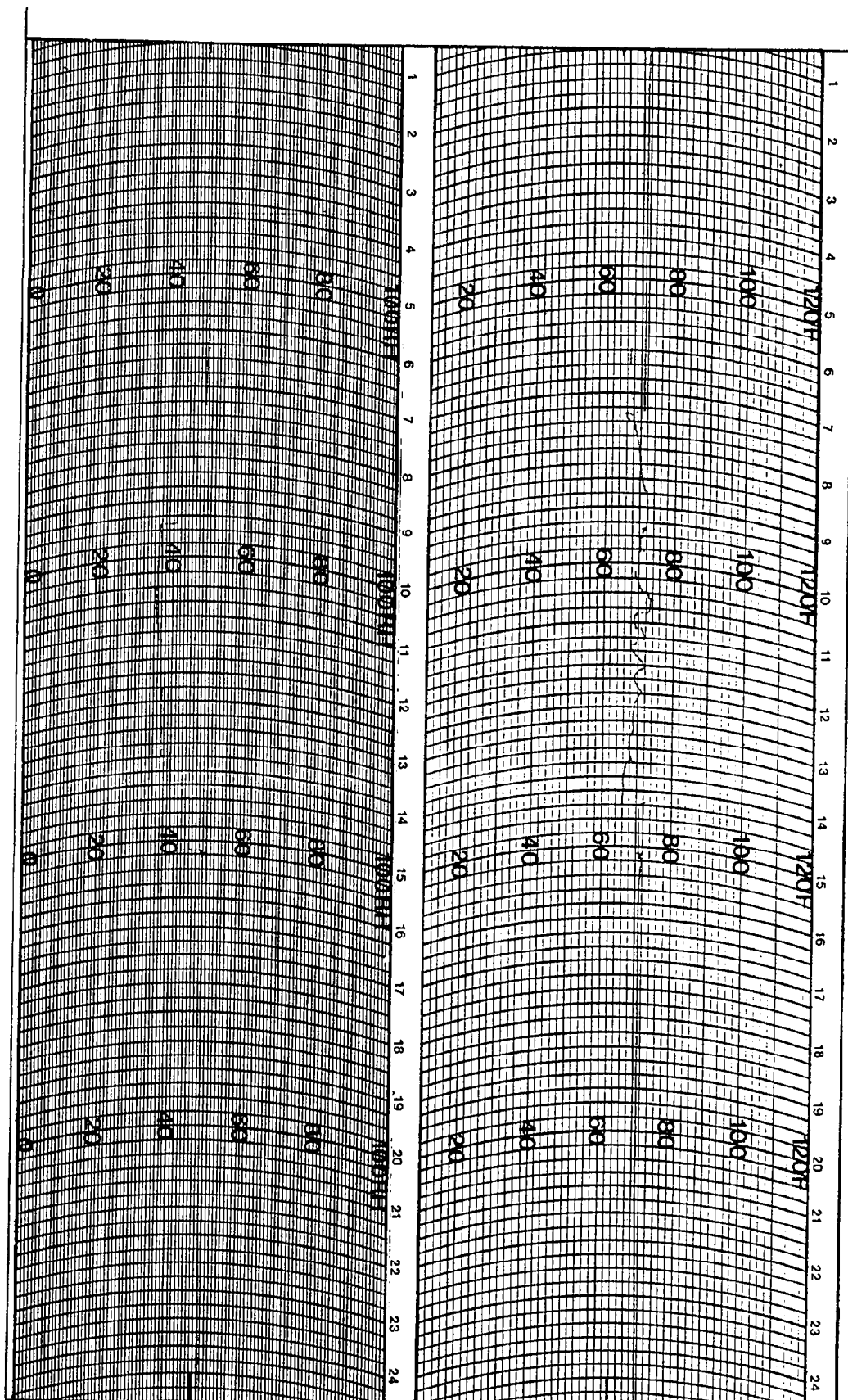
Sign Convention
NHTSA Data Tape Reference Guide

<u>Accelerometers:</u>	+X: Forward	
	+Y: Leftward	
	+Z: Upward	
<u>Potentiometers:</u>	+Chest longitudinal deflection:	Outward
	+Chest lateral deflection:	Leftward
	+Seat belt displacement:	Outward
	+Seat belt extension:	Elongation
	+Knee slider displacement:	Distance between femur and tibia increased (in relation to a seated dummy)
<u>Load cells:</u>	+Femur force:	Tension
	+Seat belt force:	Tension
	+Barrier force:	Tension
<u>Neck load cells:</u>	+X force:	Head pushed forward
	+y force:	Head pushed leftward
	+Z force:	Head pulled upward (tension on neck)
	+X moment:	Right ear rotating toward right shoulder
	+Y moment:	Chin rotating toward chest
	+Z moment:	Chin rotating toward left shoulder
<u>Tibia load cells:</u>	+X force:	Tension
	+Y force:	Tension
	+Z force:	Tension
	+X moment:	Bottom of tibia moving leftward
	+Y moment:	Bottom of tibia moving rearward

Frequency Response Classes

SAE J211 OCT88

<u>Typical Test Measurements</u>	<u>Channel Class</u>
Vehicle Structural Accelerations for use in:	
Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180
Barrier Face Forces	60
Belt Restraint System Loads	60
Anthropomorphic Test Device	
Head accelerations (linear and angular)	1000
Neck	
Forces	1000
Moments	600
Thorax	
Spine accelerations	180
Rib accelerations	1000
Sternum accelerations	1000
Deflections	180
Lumbar	
Forces	1000
Moments	1000
Pelvis	
Accelerations	1000
Forces	1000
Moments	1000
Femur/Knee/Tibia/Ankle	
Forces	600
Moments	600
Displacements	180
Sled Accelerations	60
Steering Column Loads	600
Head form Accelerations	1000



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

HYGROTHERMOGRAPH
1 DAY

CHART # C311 D HF
PART # 699123

STATION _____ DATE ON _____ DATE OFF _____

Appendix E

Restraint System Instructions from Owner's Manual

Seat Belts

SEAT BELT RESTRAINT SYSTEM

To help decrease the possibility or severity of injury during accidents and sudden stops, we recommend that the driver and passengers be properly restrained at all times by using the seat belts provided. The lap/shoulder belts have retractors with inertia locks.

The retractors keep the belts out of the way while passengers enter or exit the vehicle.

Inertia locks allow the belts to remain slack on the passengers for comfort until a deceleration force occurs (such as a sudden stop or collision). At that time the belts will automatically lock in position, and you and your passengers will be restrained.

WARNING!

- Lap/shoulder belt assemblies may be damaged when subjected to the stress and forces of a collision.

The entire restraint system should be inspected following any collision. All belts, retractors, anchorages and hardware damaged by a collision should be promptly replaced.

- Passengers should not be allowed to ride in the cargo area of a vehicle. Each passenger riding in the vehicle should be securely fastened with a seat belt. Persons not riding in a seat with a fastened seat belt are much more likely to suffer serious bodily injury during a collision.

RESTRAINT OF PREGNANT WOMEN

Pregnant women should wear lap/shoulder belt assemblies whenever possible according to specific recommendations by their doctors. The lap belt should be worn **AS SNUGLY AND AS LOW AS POSSIBLE**.

KIA

Knowing Your Vehicle

The KIA logo is located at the top of a vertical decorative bar on the left side of the page. The bar has a textured, metallic appearance and the word "KIA" is written in a bold, sans-serif font inside an oval shape.The text "Knowing Your Vehicle" is written vertically in a bold, sans-serif font along the left side of the page, within the same textured bar as the KIA logo.

Seat Belts (continued)

RESTRAINT OF INFANTS AND SMALL CHILDREN

Small children and infants should be restrained by an approved child-restraining system. Never allow a child to stand or kneel on the seat of a moving vehicle, and never put the same seat belt around a child and yourself at the same time. Also, never hold a child on your lap or in your arms in a moving vehicle. Even a very strong person cannot hold onto a child in the event of a serious accident. If the child is released, they may be injured as they contact parts of the vehicle or may be injured by an unrestrained passenger.

A child-restraint system can help protect small children and infants in a vehicle.

Many companies manufacture safety seats for infants and small children. An acceptable child-restraint system should always satisfy local motor vehicle safety standards.

Moreover, it should be chosen to fit both the size of the child and the size of the vehicle seat. Be sure to follow any instructions provided by the manufacturer when installing the child-restraint system.

CHILDREN

A child who has outgrown the child-restraining system should use the belts provided in the vehicle. When seated, the child should be restrained by both the lap and the shoulder belt. If the child is so small that the shoulder belt binds the neck or face, place the child closer to the center of the vehicle.

NOTE

- All child-restraint systems are designed to be secured in vehicle seats by lap belts or the lap-belt portion of a lap/shoulder belt.

Children could be endangered in a crash if their child restraints are not properly secured in the vehicle.

- According to accident statistics, children are safer when properly restrained in the rear seating positions than the front seating positions.

CAUTION

- Since a safety belt or child-restraint system can become very hot in a closed vehicle during warm weather, be sure and check the seat cover and buckles before using either on a child.
- When the child-restraint system is not in use, store it in the trunk or fasten it with a safety belt so that it will not be thrown forward in the event of a sudden stop or accident.

INSTALLATION OF A CHILD RESTRAINT SYSTEM

The installation of a child-restraint system requires a seat-belt locking clip. Secure the child-restraint system with the lap belt, as shown in the illustrations.

It is recommended that the child-restraint system always be installed in the center of the rear seat and secured with the lap belt.

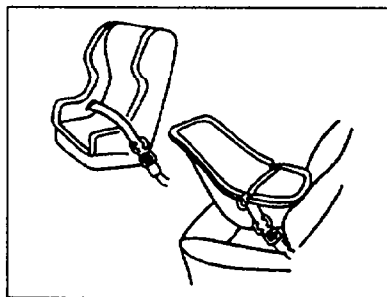
WARNING!

- The passive shoulder belt cannot be used to secure the child-restraint system; do not attempt to use it for this purpose.
- Failure to observe the following instructions could increase the chance and/or severity of injury in an accident.

Front seat

For safety reasons, we recommend that the child seat be used in a rear seat. However, if for some reason it must be installed on the front seat with the lap belt, follow the procedure below.

1. Slide the seat to the rearmost position.
2. Fasten the child seat with the lap belt.
3. Pull the lap belt out fully.



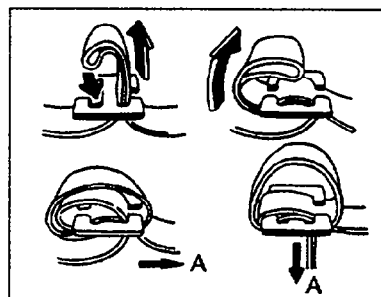
US-9303112

3-11

4. Remove any lap belt slack with the locking clip at any convenient point along the lap belt. Make the loop as large as possible to remove any slack.
5. After securing the belt, pull on it in the directions marked A in the illustration to make sure it does not slip.
6. If necessary, slide the seat forward to remove any remaining slack.

NOTE

When the child seat is not installed, the locking clip should be stored in the vehicle to prevent its loss.



US-9303113

KIA

Knowing Your Vehicle

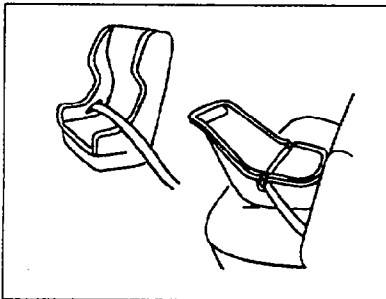
KIA

Knowing Your Vehicle

Seat Belts (continued)

Rear center seat

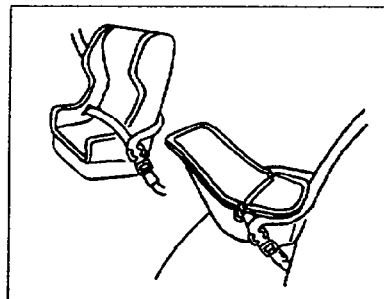
Secure the child seat with the lap belt. When the lap belt is loose, adjust it for a snug fit by pulling on the loose end of the belt webbing.



US-9303121

Rear outboard seat

1. Secure the child seat with the lap/shoulder belts.
2. Tighten the lap belt by pulling on the shoulder belt.

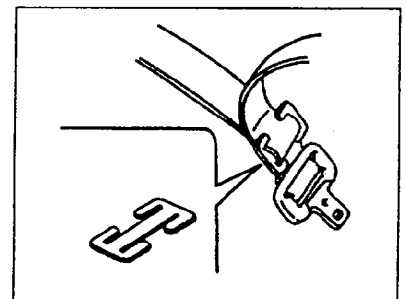


US-9303122

3. To install the locking clip, insert the webbing through the recesses of the locking clip near the seat-belt tongue plate.
4. After securing the belt with the locking clip, tuck the shoulder portion of the belt between the child seat and the seat back.

NOTE

When the child seat is not installed, the locking clip should be stored in the vehicle to prevent its loss.



US-9303123

3-12

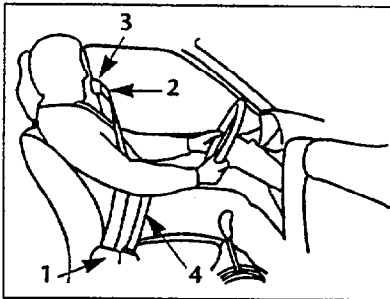
FRONT SEATS

Passive Seat Belts

Your vehicle is equipped with a passive automatic shoulder belt system for both the driver and the passenger.

The shoulder belt operates automatically when you sit down and close the door.

The seat belt system consists of (1) a shoulder belt retractor, (2) a shoulder belt tongue plate, (3) a shoulder belt buckle and (4) a lap belt.



US-9303131

WARNING!

- The shoulder belt should always be buckled and only unfastened in case of an emergency.
- For maximum protection, the lap belt should always be used with the automatic shoulder belt.
- The front seatbacks should always remain upright while the vehicle is in motion. The seat belt system is designed to operate properly with the seatbacks in an upright position.
- Never wear the shoulder belt under the outside arm or over the inside arm.
- When seated in the front seats, the shoulder belt should be across the shoulder and never across the neck.
- Never wear the lap belt over the shoulder belt.
- Be sure the lap belt fits snugly around the hips, not the waist.

- Never allow the doors to close on any part of the seat belts or allow the seat belts to be caught in the seats.
- Make sure the seat belts are not twisted while being worn.

Failure to follow these precautions could increase the chance and severity of injury in an accident.

NOTE

If the belt locks when being pulled out, rewind it completely into the retractor then pull it out to the desired length.



Seat Belts (continued)

Operation of the Passive Belt System

The shoulder belt tab is inserted into the door frame buckle. As the front doors are opened, the belt unwinds from the retractor. When you sit in the vehicle and close the door, the shoulder belt is automatically placed in the proper position.

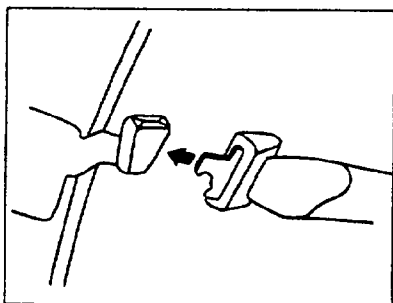
The passive shoulder belt adjusts automatically to the correct length. The retractor allows you to lean forward slowly without locking the shoulder belt. But if you stop suddenly or are involved in an accident, the retractor will lock the belt in position and minimize your chances of injury.

Releasing the Shoulder Belt in an Emergency

To release the shoulder belt from the door frame buckle, press down on the emergency release button located on the buckle. The shoulder belt will rewind into the retractor.

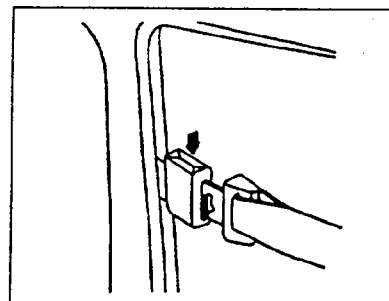
CAUTION

When releasing the shoulder belt from the buckle, hold onto the belt and allow it to rewind into the retractor slowly.



US-9303141

3-14



US-9303142



Knowing Your Vehicle

Seat Belt Warning Light and Chime

If the driver's lap belt is not fastened when the key is turned to the ON position, the seat belt warning light remain on the seat belt warning chime will sound for six seconds.

The seat belt warning light will flash for 60 seconds if the driver's shoulder belt is disconnected while the ignition key is in the ON position.

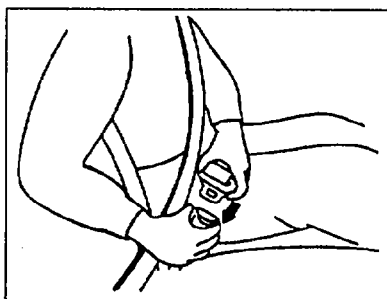
To fasten the front lap belt

1. Grasp the buckle and tongue plate.
2. Slowly pull the lap belt out from the retractor.
3. Insert the tongue plate into the open end of the buckle until an audible "click" is heard, indicating the belt is locked in the buckle.

Position the lap belt across your lap as **LOW ON THE HIPS** as possible to reduce the risk of sliding under it during an accident. Adjust the belt to a **SNUG FIT** by pulling it. The belt retractor is designed to take up excess webbing automatically and to maintain tension on the belt.

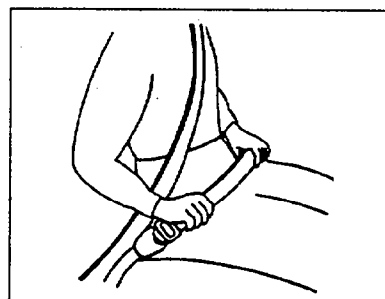


US-9303153



US-9303151

3-15



US-9303152



Seat Belts (continued)

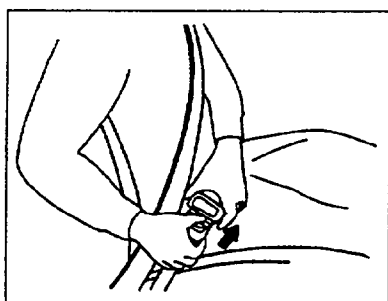
To unfasten the front lap belt

Depress the release button on the buckle.

REAR SEAT BELTS

Two kinds of belts are provided:

- Lap/shoulder belts for people who sit next to the side windows.
- A lap belt for people who sit in the center of the rear seat.



US-9303161

WARNING!

- Never wear the shoulder belt under the arm.
- Never swing it around your neck and over the inside shoulder.
- Never use a single belt for more than one person at a time.
- Be sure the lap portion of the belt is positioned snugly around the hips, not the waist.
- Use the shoulder belt over the outside shoulder only.

Failure to follow these precautions could increase the chance and severity of injury.

NOTE

If the belt locks when being pulled out, rewind it completely into the retractor then pull it out to the desired length.



Knowing Your Vehicle

REAR LAP/SHOULDER BELT (Outboard seats)

To fasten:

1. Grasp the buckle and tongue plate.
2. Slowly pull the lap/shoulder belt out.
3. Insert the tongue plate into the open end of the buckle until an audible "click" is heard, indicating the belt is locked.

To unfasten:

Depress the button on the buckle.

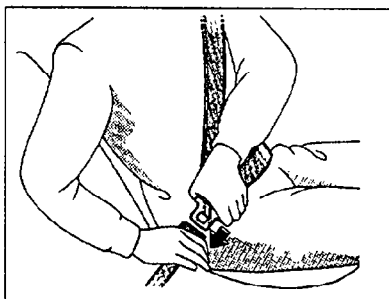
Position the lap/shoulder belt across your lap as **LOW ON THE HIPS** as possible to reduce the risk of sliding under it during an accident. Adjust the belt to a **SNUG FIT** by pulling it.

The belt retractor is designed to take up excess webbing automatically and to maintain tension on the belt.

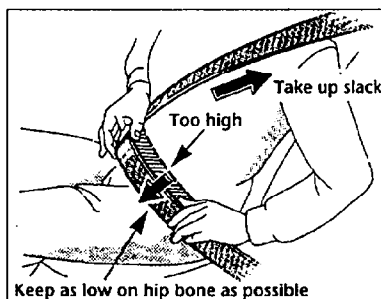
REAR LAP BELT (Center seat)

To fasten:

1. Grasp the buckle end.
2. Insert the tongue plate into the open end of the buckle until an audible "click" is heard, indicating the belt is locked. Make sure the belt is not twisted.
3. If necessary, lengthen or shorten the belt. To adjust, hold the tongue at right angles to the webbing and pull to lengthen, or pull the loose end of the belt webbing to shorten.

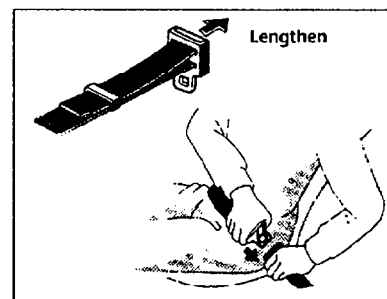


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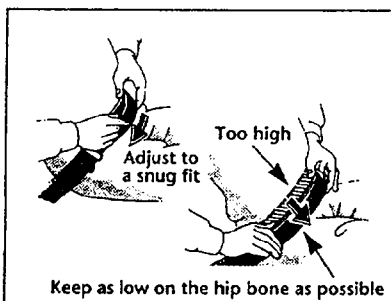


Seat Belts (continued)

Position the lap belt across your lap as **LOW ON THE HIPS** as possible.

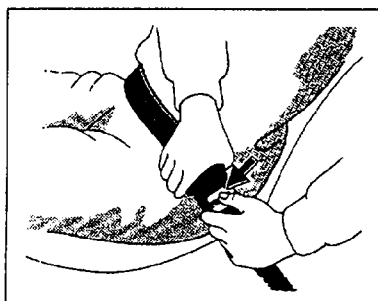
WARNING!

Be sure the lap belt is positioned snugly around the hips, not on the waist. Failure to do so may increase the chance of injury in the event of a collision.



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To unfasten:
Depress the button on the buckle.



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PROPER USE AND CARE OF THE SEAT BELT SYSTEM

To gain maximum effectiveness from the seat belt system, follow these suggestions:

- Use the belts at all times—even on short trips.
- Never use the same belt for more than one person at a time.
- Avoid wearing twisted belts.
- Keep sharp edges and damaging objects away from the belts and other parts of the restraint system.
- Periodically inspect belt webbing, anchors, buckles, and all other parts for signs of wear, damage, and weakness. Replace questionable parts immediately.

- To clean the belt webbing, use any mild soap solution recommended for cleaning upholstery or carpets; follow the instructions provided with the soap. Do not bleach or dye the webbing because this may weaken it.
- No modifications or additions should be made by the user.
- After wearing a seat belt, make sure it fully retracts to the stowed position.

WARNING!

All seat-belt assemblies, including retractors and attaching harness, should be inspected after any collision. We recommend that all seat-belt assemblies in use during a collision be replaced unless the collision was minor and the seat belts show no damage and continue to operate properly. Seat-belt assemblies not in use during a collision should also be inspected and replaced if damage or improper operation is noted.

