

V2203

Report Number TRC-95-N08

New Car Assessment Program (NCAP)

Frontal Barrier Impact Test

Mazda Motor Corporation

1995 Mazda MPV

NHTSA Number: MS5401

TRC Test Number: 950106

Prepared By:

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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	meters	m
yd	yards	0.9	kilometers	km
mi	miles	1.6		
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 kilometers	km ²
mi ²	square miles	2.6	hectares	ha
	acres	0.4		
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
VOLUME				
tsp	teaspoons	5	milliliters	ml
fl oz	fluid ounces	15	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 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13.10286.

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
km	kilometers	1.1	yards	yd
		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
m ³	liters	0.26	gallons	gal
m ³	cubic meters	35	cubic feet	ft ³
	cubic meters	1.3	cubic yards	yd ³
TEMPERATURE (exact)				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

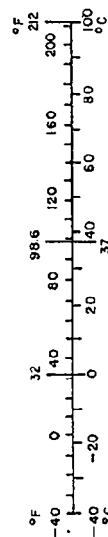


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Section 1.0

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 Mazda MPV multipurpose passenger vehicle, NHTSA Number MS5401, 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 (partial), "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 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) 50th percentile adult male anthropomorphic test devices (dummies). One (1) Part 572E dummy was positioned in the left front outboard designated seating position. One (1) Part 572B dummy was positioned in the right front outboard designated seating position. The dummies were positioned according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant Test Procedure. This test was the second use of the driver dummy and the first use of 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 Part 572E dummy's instrumentation also included a chest potentiometer to measure longitudinal deflection and a six-axis neck load cell to measure longitudinal, lateral, and vertical forces and moments.

The eighty-two (82) 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 sixteen (16) 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 January 6, 1995.

The test vehicle, a 1995 Mazda MPV multipurpose passenger vehicle, NHTSA Number MS5401, was equipped with a 3.0-liter longitudinal engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 2003 kg. The vehicle's impact speed was 56.3 kph. The vehicle sustained 420 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 682. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 52.5 g. The driver's chest maximum deflection was 38 mm. The driver's left and right femur maximum axial forces were 2645 N and 3759 N, respectively.

The passenger's HIC was 768. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 53.0 g. The passenger's left and right femur maximum axial forces were 2719 N and 2020 N, respectively.

There was no loss of windshield periphery retention.

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 right front passenger's head Y-axis accelerometer, HEDYG2, recorded questionable data spikes at 32 and 37 milliseconds. The data spikes affected the right front passenger's head resultant acceleration calculation.

The right front passenger's pelvis X-axis accelerometer, PEVXG2, recorded questionable data during the impact event. The questionable data affected the right front passenger's resultant acceleration calculation.

The engine bottom X-axis accelerometer, ENGXG2, lost data at 15 milliseconds as a result of the accelerometer's cable being cut by the vehicle's crush on impact.

The right brake caliper X-axis accelerometer, BCRXG1, lost data at 40 milliseconds as a result of the accelerometer's cable being cut by the vehicle's crush on impact.

The force load cell at position B4 of the load cell barrier did not return to zero following the impact event. The data not returning to zero affected the load cell barrier group No. 2 force total and the total load cell barrier force calculations.

The force load cell at position B7 of the load cell barrier exceeded the full scale of the data acquisition circuit at 12 milliseconds and did not return to zero following the impact event. The data exceeding full scale and not returning to zero affected the load cell barrier group No. 3 force total and the total load cell barrier force calculations.

Table 1 Crash Test Summary

NHTSA number:	MS5401	
Test type:	Frontal Load Cell Barrier	
Test date:	01/06/95	
Test time:	1443	
Ambient temperature:	22° C	
Vehicle year/make/ model/body style:	1995/Mazda/MPV/multipurpose passenger vehicle	
Vehicle test weight:	2003 kg	
Impact angle ¹ :	0°	
Impact velocity ² :	Primary = 56.3 kph Secondary = 56.3 kph	
Maximum static crush:	420 mm	
Average rebound:	320 mm	
Dummies:	Driver #192	Passenger #713
Type:	Part 572 E	Part 572 B
Location:	Left front	Right front
Restraint:	3-point unbelt and airbag	3-point unbelt
Number of data channels:	82	
Number of cameras:	High-speed 16 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/Mazda/MPV/multipurpose passenger vehicle

Color: Green

VIN: JM3LV5225S0704635

NHTSA number: MS5401

Engine data:

 Placement: Longitudinal

 Cylinders: 6

 Displacement 3.0 liters

Transmission data: 4 speed, __manual, X automatic, __overdrive

 __FWD, XRWD, __4WD

Date vehicle received: 12/19/94

Odometer reading: 72

Dealer's name Ricart Mazda
and address: 4255 S. Hamilton Rd.
 Columbus, OH 43227

Accessories:

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

Certification data from vehicle's label:

Vehicle manufactured by: Mazda Motor Corporation

Date of manufacture: 09/94

VIN: JM3LV5225S0704635

GVWR: 2352 kg

GAWR: Front: 1134 kg

 Rear: 1218 kg

Table 2 Test Vehicle Information, Cont'd.

Size of tires: 195/75R15

Tire pressure with maximum
capacity vehicle load:

Front: 240 kPa

Rear: 240 kPa

Spare tire: Temporary

Type of front seats: Bucket

Tire & capacity data from vehicle's label:

Recommended tire size: P195/75R15

Recommended cold tire pressure:

Front: 240 kPa

Rear: 240 kPa

Designated seating capacity:

Front NA

Rear NA

Total NA

Vehicle capacity weight: NA kg

Test vehicle attitude:

Delivered attitude: LF 737 mm; RF 730 mm; LR 744 mm; RR 731 mm

Pre-test attitude: LF 717 mm; RF 718 mm; LR 701 mm; RR 703 mm

Post-test attitude: LF 739 mm; RF 759 mm; LR 687 mm; RR 719 mm

Table 2 Test Vehicle Information Cont'd

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

Right front	483 kg	Right rear	401 kg
Left front	465 kg	Left rear	372 kg
Total front weight	948 kg	(55.1% of total vehicle weight)	
Total rear weight	773 kg	(44.9% of total vehicle weight)	
Total delivered weight	1721 kg		

Calculation of test vehicle's target test weight:

RCLW¹ = Rated cargo and luggage weight

UDW = Unloaded delivered weight (1721 kg)

VCW = Vehicle capacity weight (NA)

DSC = Designated seating capacity (NA)

RCLW¹ = VCW - 68 (DSC) = 136 kg

Target test weight = UDW + RCLW¹ + (Number of Hybrid III dummies x 76 kg/dummy)
+ (Number of Hybrid II dummies x 74 kg/dummy)

Target test weight = 1721 + 136 + 76 + 74

Target test weight = 2007 kg

Weight of test vehicle with required dummies and 132 kg of cargo weight:

Right front	515 kg	Right rear	492 kg
Left front	514 kg	Left rear	482 kg
Total front weight	1029 kg	(51.4% of total vehicle weight)	
Total rear weight	974 kg	(48.6% of total vehicle weight)	
Total test weight	2003 kg	(0.2 % under target test weight)	

Weight of ballast secured in vehicle: 68 kg

Components removed to meet target test weight: None

CG rearward of front wheel centerline: 1371 mm

Vehicle wheelbase: 2820 mm

¹ Cargo weight for multi-purpose passenger vehicles, trucks, and buses is the vehicle's rated cargo and luggage weight from the vehicle's label or 136 kg, whichever is less.

Table 3 Post-Impact Data

Test number: 950106
NHTSA number: MS5401
Test date: 01/06/95
Test time: 1443
Test type: Frontal load cell barrier
Impact angle: 0°
Ambient temperature
at impact area: 22° C
Temperature in
occupant compartment: 21° C
Impact velocity:
 Primary 56.3 kph
 Secondary 56.3 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:

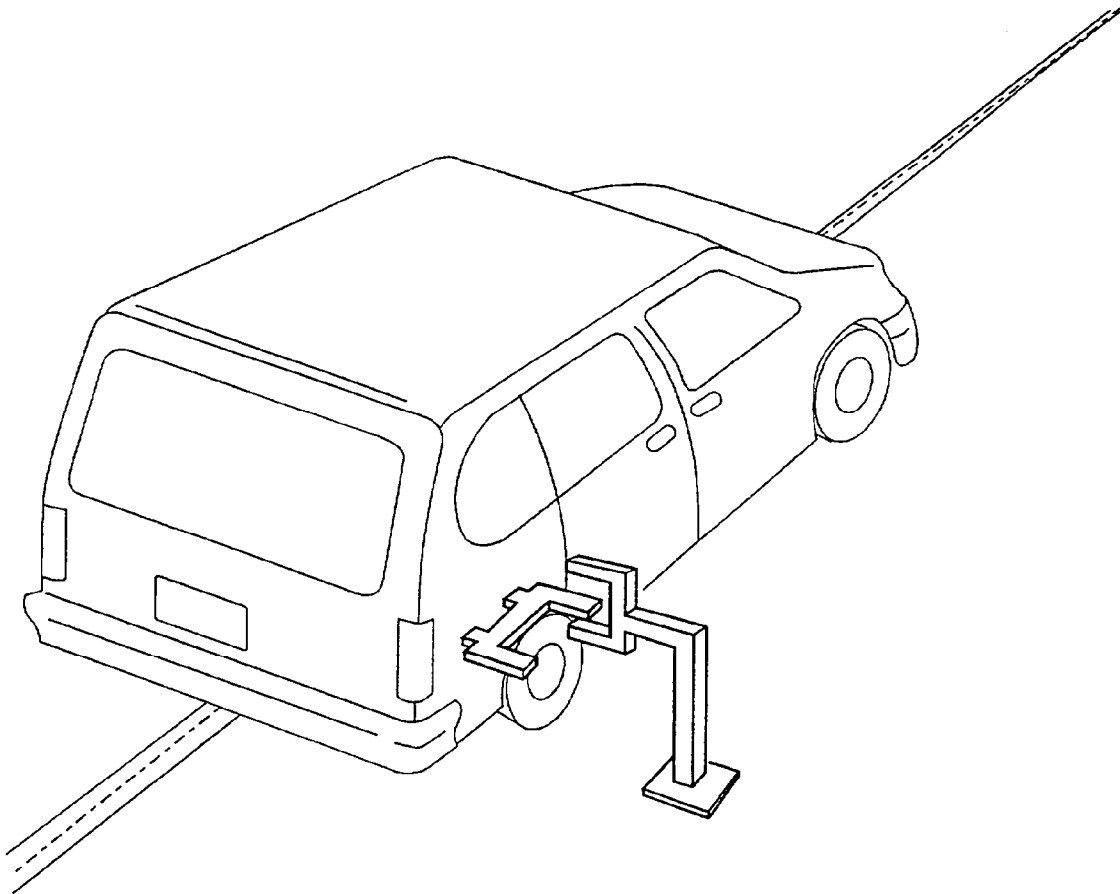
Pre-test: L 4305 mm; C 4434 mm; R 4310 mm
Post-test: L 4010 mm; C 4014 mm; R 4039 mm
Total crush: L 295 mm; C 420 mm; R 271 mm
Average crush: 329 mm

Test vehicle rebound from flat barrier:

Distance from test vehicle to barrier:

Post-test: L 336 mm; C 322 mm; R 301 mm
Average rebound 320 mm

Figure 1 Impact Velocity Measurement System



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

The vanes have 305-millimeter spacing.

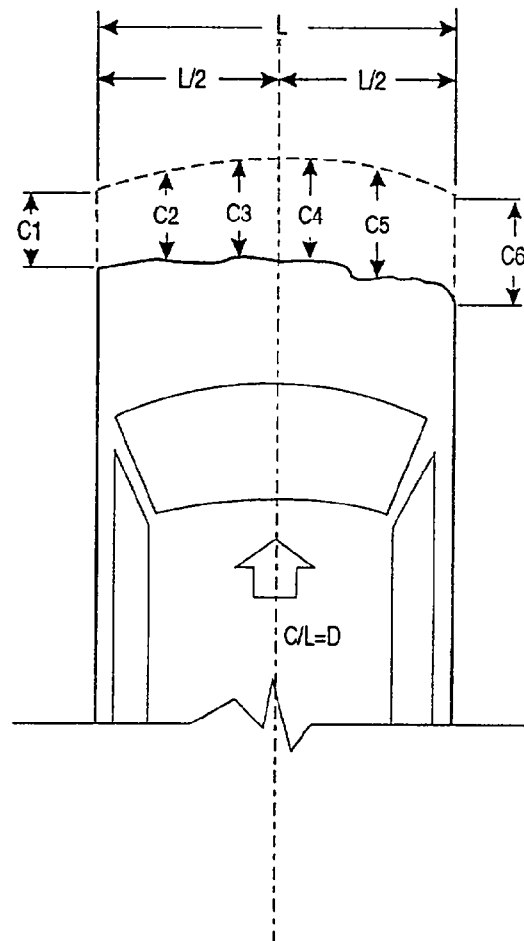
Figure 2 Accident Investigation Division Data
for 56 kph (35 mph) Frontal Barrier Impact

NHTSA number: MS5401
 Test date: 01/06/95
 Vehicle year/make/
 model/body style: 1995/Mazda/MPV/ multipurpose passenger vehicle
 Vehicle size category: Multipurpose passenger vehicle
 VIN: JM3LV5225S0704635
 Build date: 09/94
 Test weight: 2003 kg
 Vehicle wheelbase: 2820 mm
 Maximum width: 1820 mm
 Front overhang: 745 mm

Collision Deformation
 Classification (CDC) code: 12FDEW3

Crush depth
 measurements:

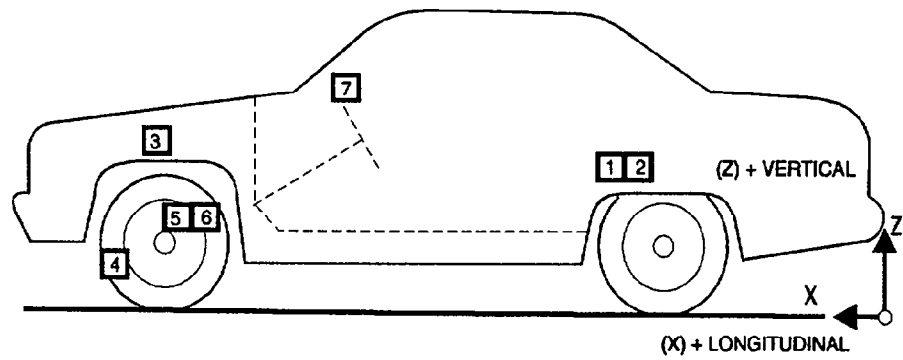
C1	=	295 mm
C2	=	405 mm
C3	=	410 mm
C4	=	416 mm
C5	=	395 mm
C6	=	271 mm



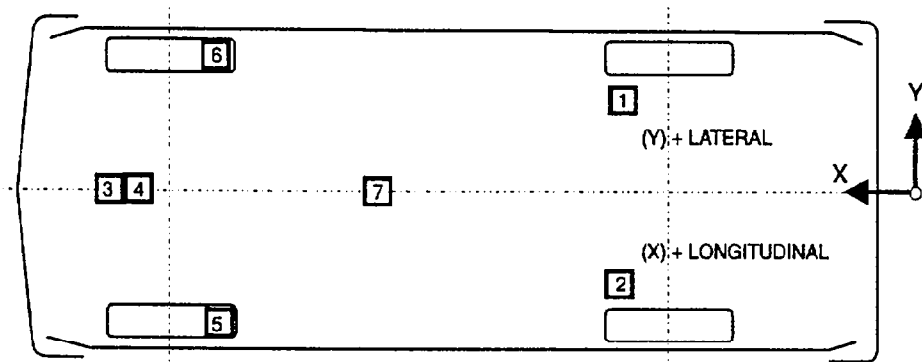
Midpoint of damage: D: Vehicle Longitudinal Centerline

Length of damaged region: L: 1625 mm

Figure 3 Vehicle Accelerometer Placement



SIDE VIEW



BOTTOM VIEW

Table 4 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 950106 No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 LEFT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	3142 mm	538 mm	450 mm	2.0 g @ 104.9 ms 2.4 g @ 104.3 ms	48.3 g @ 39.4 ms 47.9 g @ 39.7 ms
2 RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	3140 mm	-545 mm	455 mm	2.8 g @ 102.9 ms 2.9 g @ 102.7 ms	48.8 g @ 38.1 ms 47.0 g @ 38.1 ms
3 ENGINE TOP LONGITUDINAL	515 mm	0 mm	945 mm	68.4 g @ 36.2 ms	190.3 g @ 28.4 ms
4 ENGINE BOTTOM LONGITUDINAL ¹	598 mm	0 mm	250 mm	---	---
5 RIGHT BRAKE CALIPER LONGITUDINAL ¹	823 mm	-645 mm	300 mm	---	---
6 LEFT BRAKE CALIPER LONGITUDINAL	823 mm	645 mm	302 mm	63.0 g @ 48.6 ms	106.9 g @ 35.5 ms
7 INSTRUMENT PANEL CENTER LONGITUDINAL	1245 mm	-35 mm	1723 mm	9.6 g @ 58.7 ms	58.1 g @ 45.7 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 #192</u>	<u>Passenger #713</u>
Head	Airbag & head restraint	Chest
Chest	Airbag	None
Abdomen	None	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	NA	Easy

Seat Movement:

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

Glazing Damage:

The lower edge of the windshield cracked on impact.

Other Notable Impact Effects:

None

Table 6 FMVSS 208 Data Summary

Vehicle year/make/
model/body style: 1995/Mazda/MPV/multipurpose passenger vehicle

Vehicle NHTSA number: MS5401

Test date: 01/06/95

	Driver Dummy #192		Passenger Dummy #713	
<u>Maximum Accelerations:</u>				
Head X-axis	-69.1	g	-32.0	g
Head Y-axis ¹	17.2	g	-16.7	g
Head Z-axis	20.1	g	-68.3	g
Head resultant ¹	69.7	g	70.6	g
Chest X-axis	-54.2	g	-52.3	g
Chest Y-axis	9.8	g	-14.0	g
Chest Z-axis	16.6	g	-21.6	g
Chest resultant ²	52.5	g	53.0	g
Chest resultant time interval ²	.003	sec	.003	sec
<u>Head Injury Criteria (HIC) Values:</u>				
HIC ³	682		768	
HIC starting time	.042	sec	.053	sec
HIC ending time	.072	sec	.089	sec
Avg. head resultant accel. during HIC time interval	54.7	g	53.9	g
<u>Maximum Chest Deflections:</u>				
Chest X-axis	38	mm	NA	mm
Maximum chest deflection time	.053	sec	NA	sec
<u>Maximum Compressive Femur Forces:</u>				
Left femur	2645	N	2719	N
Right femur	3759	N	2020	N
<u>Maximum Seat Belt Forces:</u>				
Lap belt	10,005	N	9496	N
Shoulder belt	8949	N	10503	N

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

¹ See Data Acquisition Explanations.

² 0.003 Sec. Minimum duration.

³ The maximum HIC time interval is 36 milliseconds.

Table 7 Dummy Neck and Pelvis Data Summary

Vehicle year/make/
model/body style: 1995/Mazda/MPV/multipurpose passenger vehicle
Vehicle NHTSA number: MS5401
Test date: 01/06/95

	Driver Dummy #192	Passenger Dummy #713
<u>Maximum Values:</u>		
Neck X-axis force	1489 N	NA N
Neck Y-axis force	-570 N	NA N
Neck Z-axis force	3066 N	NA N
Neck moment about X-axis	20 N-m	NA N
Neck moment about Y-axis	-87 N-m	NA N
Neck moment about Z-axis	29 N-m	NA N
<u>Maximum Accelerations:</u>		
Pelvis X-axis ¹	-68.0 g	NA
Pelvis Y-axis	21.3 g	16.7 g
Pelvis Z-axis	25.0 g	41.0 g
Pelvis resultant ¹	70.1 g	NA

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 and chest impacted the airbag with the dummy's head rotating rearward. The driver dummy was restrained by the airbag and the three-point unbelt. The dummy rebounded rearward and slightly to the left with the dummy's head contacting the seat back and rotating to the left. The driver dummy came to rest in the driver's seat leaning slightly to the left, restrained by the three-point unbelt.

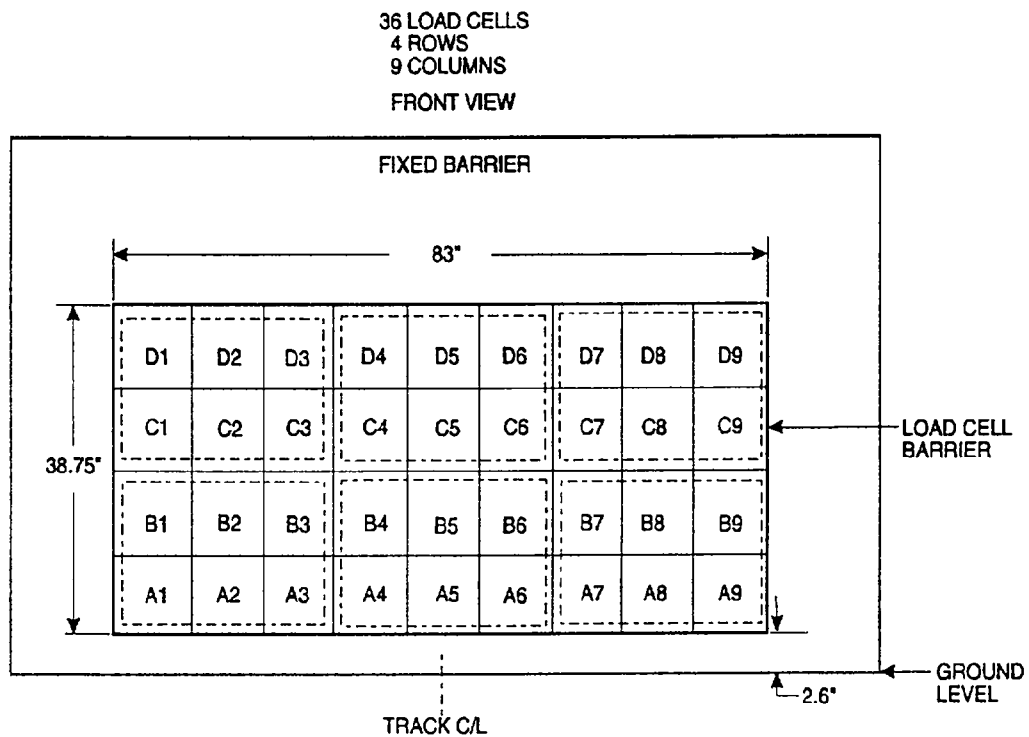
Right Front Passenger Dummy

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated downward contacting the dummy's chest. The right front passenger dummy was restrained by the three-point unbelt. The dummy rebounded rearward into the seat back as the dummy's head rotated rearward contacting the head restraint. The right front passenger dummy came to rest in the right front passenger's seat, leaning slightly to the right, restrained by the three-point unbelt.

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.	3645 mm	3585 mm
Shoulder belt length as measured on Part 572 dummy.	920 mm	940 mm
Lap belt length as measured on Part 572 dummy.	920 mm	965 mm
<u>Shoulder belt spool-off length:</u>		
As determined by film analysis	36 mm	61 mm
As determined mechanically	90 mm	58 mm
As determined electronically	84 mm	65 mm
<u>Belt stretch length:</u>		
As measured mechanically	0 mm/m	0 mm/m
As measured electronically	1 mm/m	19 mm/m
<u>Retractor lock-up time:</u>		
As determined by shoulder belt spool-off	24 ms	64 ms

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	1.2 kN @ 183.3 ms	130.7 kN @ 11.1 ms
Total group 2 ¹	0.1 kN @ 183.3 ms	439.5 kN @ 29.1 ms
Total group 3 ¹	2.4 kN @ 183.3 ms	310.0 kN @ 18.4 ms
Total group 4	1.2 kN @ 184.0 ms	68.7 kN @ 33.9 ms
Total group 5	1.3 kN @ 183.8 ms	265.3 kN @ 29.1 ms
Total group 6	1.8 kN @ 296.2 ms	82.7 kN @ 28.4 ms
Total load cell force ¹	4.6 kN @ 296.2 ms	1186.5 kN @ 29.2 ms

Tension is positive
Compression is negative

¹ See Data Acquisition Explanations

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.:

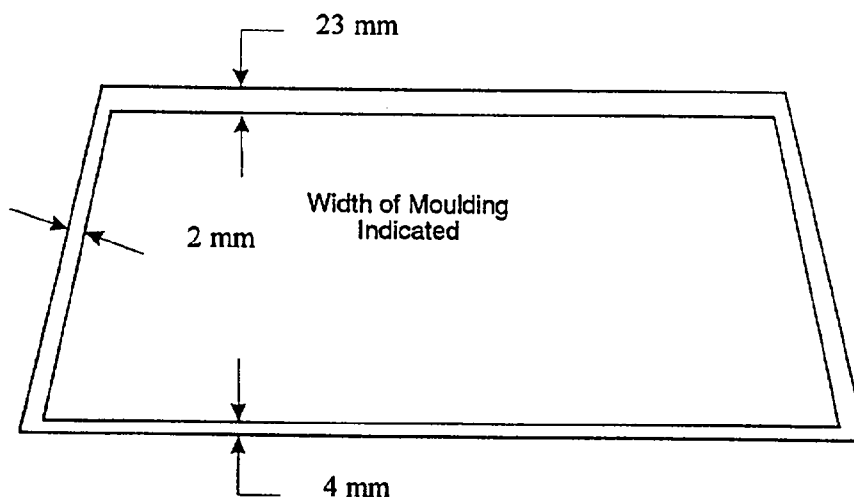
Plastic trim around outer perimeter, adhesive around inner perimeter.

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	2289 mm	2289 mm	100
Left side	2289 mm	2289 mm	100
Total	4378 mm	4378 mm	100

Pre-test windshield mounting material temperature: 21° C



Front view of windshield¹

Loss of windshield retention lengths: None

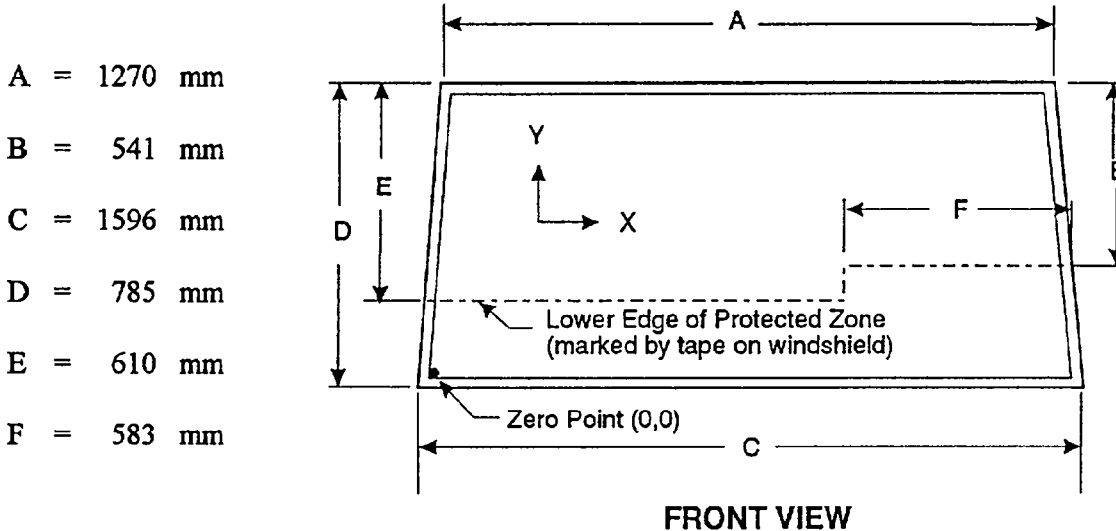
¹ Indicate areas of loss of retention, if any, on windshield diagram.

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/Mazda/MPV/multipurpose passenger vehicle
NHTSA number:	MS5401
Fuel system capacity:	74.0 liters (from owner's manual)
Usable capacity:	73.2 liters (furnished by COTR)
Test volume range:	67.3 liters to 68.8 liters (92-94% of usable)
Actual test volume:	68.1 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 does not operate with ignition switch "on" and the engine not operating.

Details of fuel system:	The fuel tank is located in front of the rear axle on the right side. The fuel filler neck is located on the right side. The fuel lines run along the right side to the front.
-------------------------	--

Table 11 FMVSS 301 Post-Impact Test Data

NHTSA number: MS5401
Test date: 01/06/95
Vehicle year/make/
model/body style: 1995/Mazda/MPV/multipurpose passenger vehicle

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:

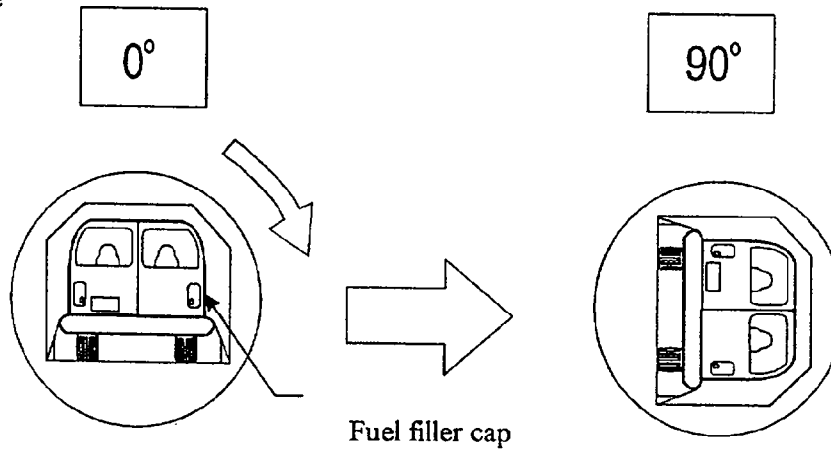
	<u>Test Results</u>	<u>Maximum Allowable</u>
1. From impact until vehicle motion ceases	0 g	28 g
2. 5-minute period after vehicle motion ceases	0 g	142 g
3. Next 25 minutes after 5-minute period	0 g	28 g/min

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data

NHTSA number: MS5401

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

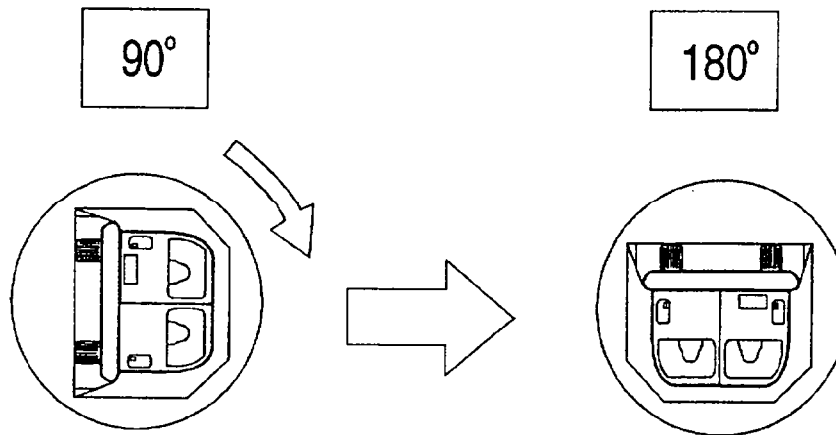
Fuel system fluid spillage measurements:

<u>0° to 90° rotation (fuel filler cap down)</u>		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 = 14 minutes

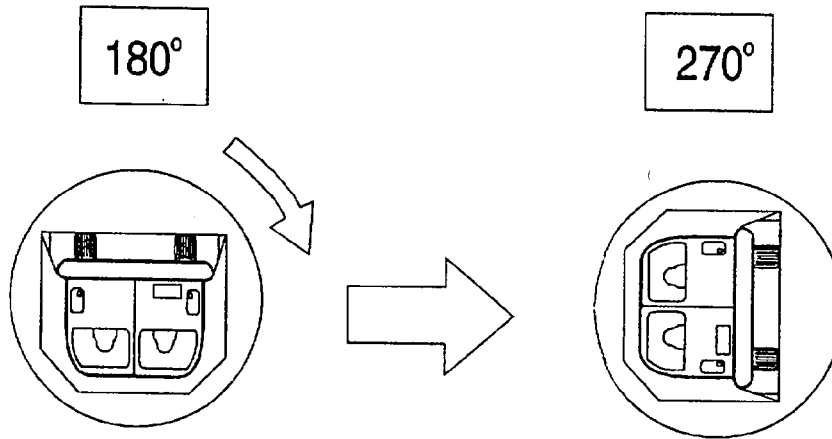
Fuel system fluid spillage measurements:

	Test Results	Maximum Allowable
<u>90° to 180° rotation</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 = 21 minutes

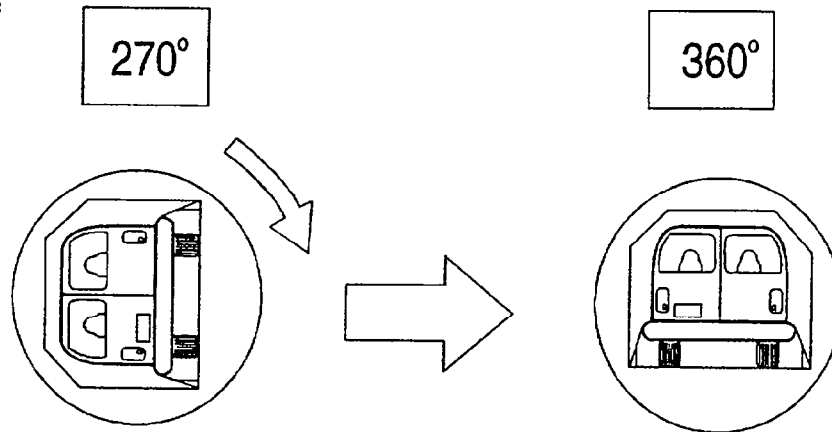
Fuel system fluid spillage measurements:

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:

	Test Results	Maximum Allowable
<u>270° to 360° rotation</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

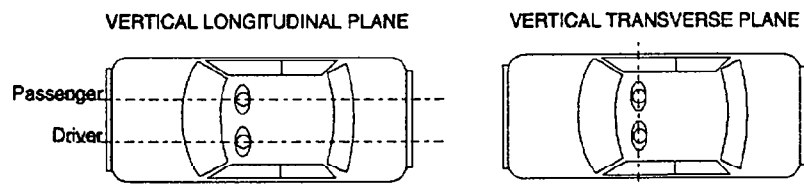
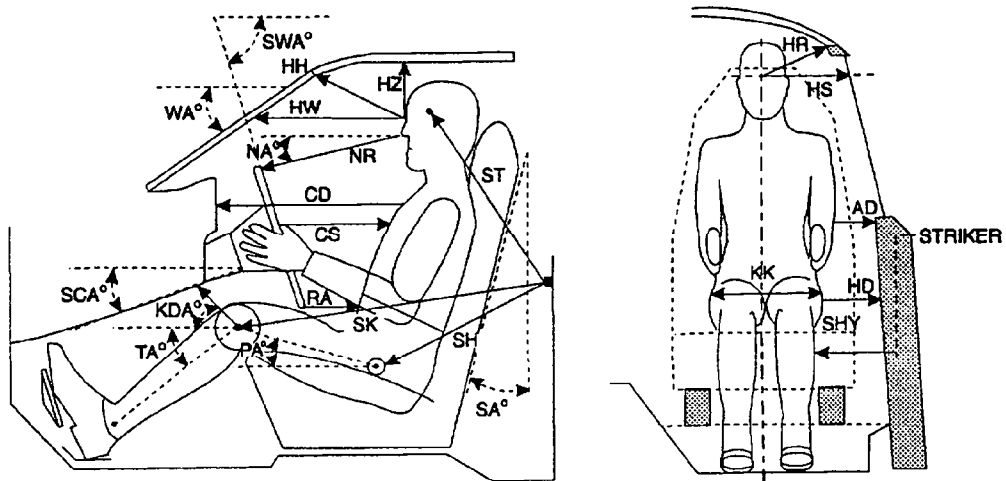
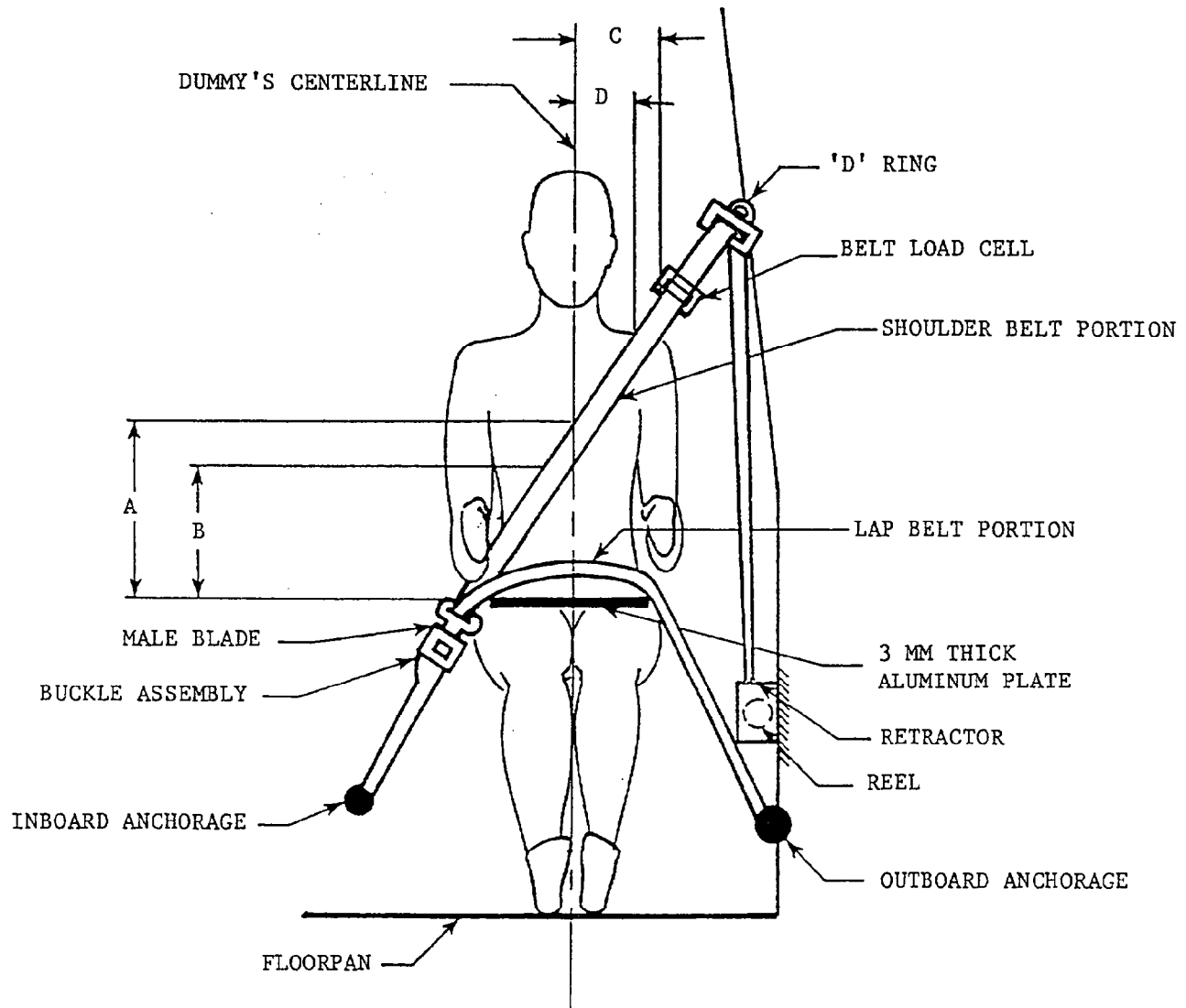


Table 12 Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #192)	Passenger (Serial #713)
WA	Windshield angle	34°	34°
SWA	Steering wheel angle	60°	NA
SCA	Steering column angle	30°	NA
SA	Seat back angle	15°	15°
HZ	Head to roof	235 mm	179 mm
HH	Head to header	386 mm	374 mm
HW	Head to windshield	604 mm	505 mm
HR	Head to side header	259 mm	205 mm
NR	Nose to rim	413 mm	NA
NA	Nose to rim angle	19°	NA
CD	Chest to dash	532 mm	597 mm
CS	Steering wheel to chest	271 mm	NA
RA	Rim to abdomen	167 mm	NA
KDL	Left knee to dash	136 mm	181 mm
KDR	Right knee to dash	136 mm	194 mm
KDA	Outboard knee to dash angle	23°	14°
PA	Pelvic angle	23°	11°
TA	Tibial angle	54°	54°
KK	Knee to knee	285 mm	194 mm
ST ¹	Striker to head	634 mm	662 mm
	Striker to head angle	-80°	-76°
SK ¹	Striker to knee	602 mm	599 mm
	Striker to knee angle	-6°	-4°
SH ¹	Striker to H-point	228 mm	184 mm
	Striker to H-point angle	2°	0°
SHY	Striker to H-point (Y dir.)	222 mm	204 mm
HS	Head to side window	333 mm	292 mm
HD	H-point to door	131 mm	114 mm
AD	Arm to door	111 mm	107 mm

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

Figure 9 Seat Belt Positioning Data



	Driver	Passenger
A - Top surface of aluminum plate to belt upper edge	365 mm	395 mm
B - Top surface of aluminum plate to belt lower edge	278 mm	300 mm
C - Dummy centerline to outer edge of belt at chest flesh top	100 mm	100 mm
D - Dummy centerline to inner edge of belt at chest flesh top	40 mm	31 mm
Lap belt tension	18 N	9 N
Shoulder belt tension	18 N	13 N
Adjustable seat belt anchorage position	NA	NA

Figure 10 Camera Positions

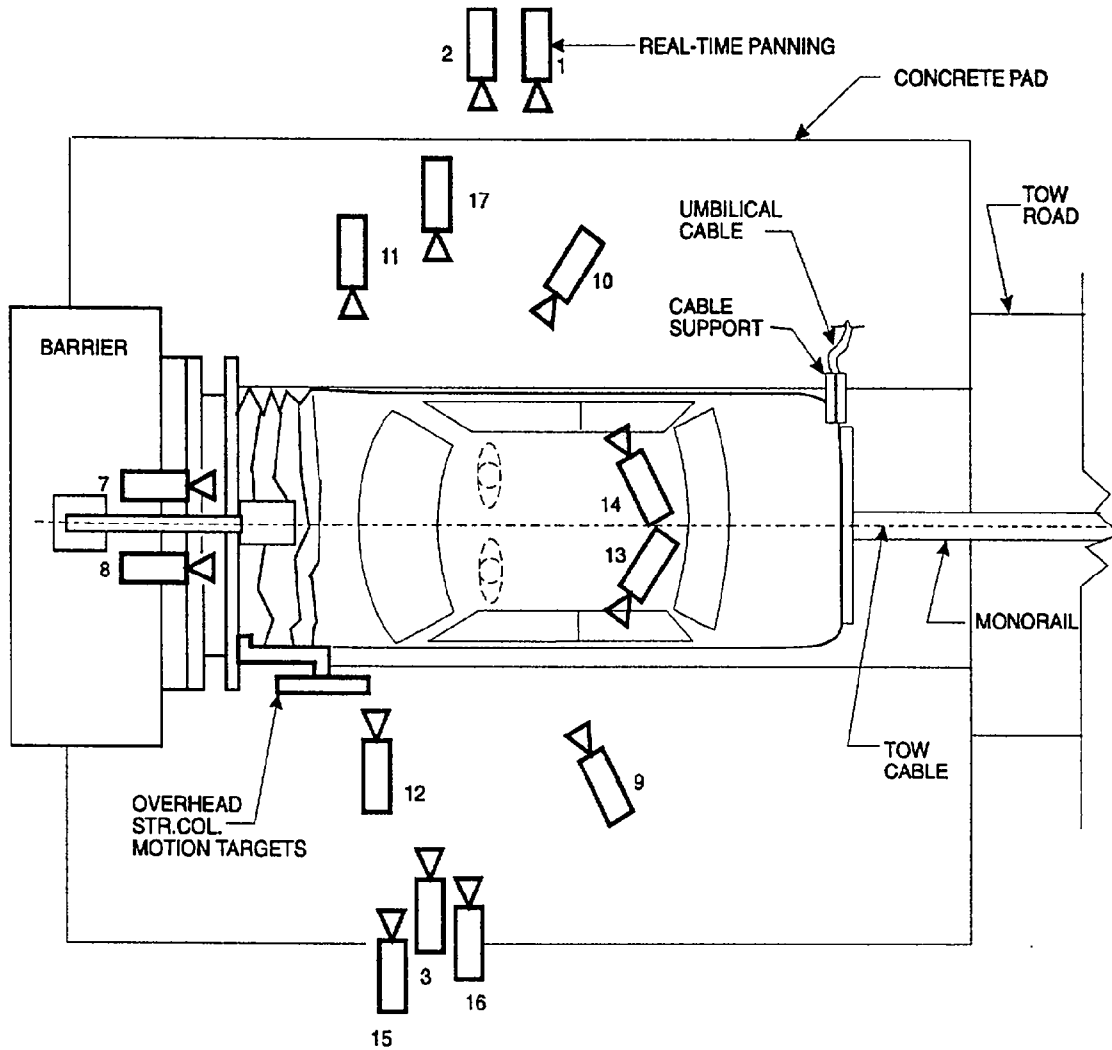
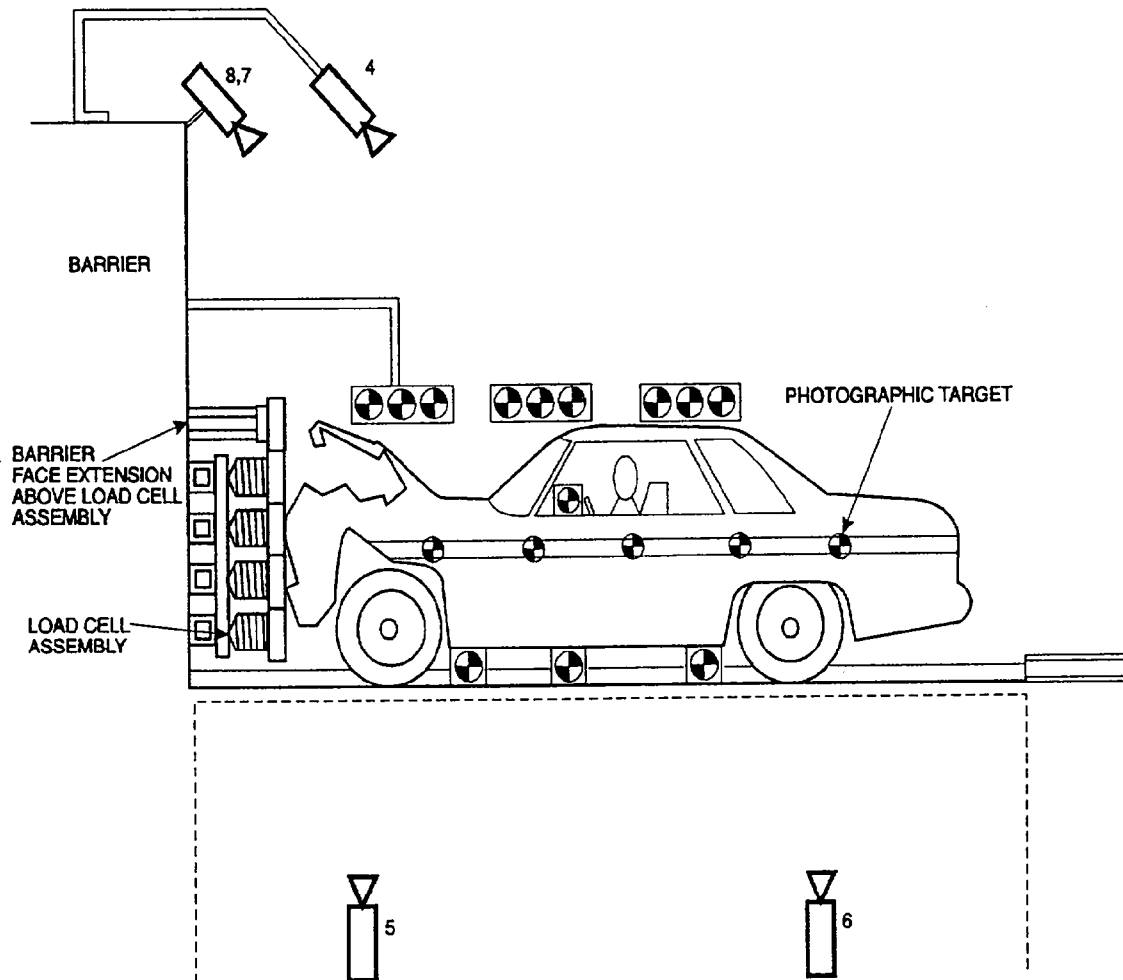


Figure 10 Camera Positions, Cont'd.



Test Number: 950106

Vehicle year/make/model/body style: 1995/Mazda/MPV/multipurpose passenger vehicle

Table 13 Motion Picture Camera Locations

Camera Number	View	Camera Positions ¹			Angle ²	Film Plane to Head Target	Lens	Film Speed
		X	Y	Z				
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	515 frames/s
3	Dummy kinematics	-1054 mm	7493 mm	1118 mm	-12°	5791 mm	25 mm	983 frames/s
4	Windshield damage	-925 mm	0 mm	2489 mm	-40°	NA mm	13 mm	495 frames/s
5	Crush & fluid spillage	-1283 mm	0 mm	-2347 mm	90°	NA mm	13 mm	1000 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°	2489 mm	25 mm	500 frames/s
10	Passenger kinematics	-4674 mm	-1880 mm	2540 mm	-26°	2413 mm	25 mm	495 frames/s
11	Windshield intrusion	-968 mm	-7775 mm	1118 mm	0°	NA mm	50 mm	1000 frames/s
12	Windshield intrusion	-1346 mm	7859 mm	1074 mm	0°	NA mm	50 mm	502 frames/s
13	Driver seat belt movement	NA	NA	NA	NA	NA mm	NA mm	495 frames/s
14	Passenger seat belt movement	NA	NA	NA	NA	NA mm	NA mm	493 frames/s
15	Column movement	-1676 mm	7264 mm	2616 mm	-14°	NA mm	25 mm	500 frames/s
16	Column movement	-1676 mm	7264 mm	1908 mm	-9°	NA mm	25 mm	502 frames/s
17	Passenger kinematics	-986 mm	-5354 mm	1151 mm	7°	5486 mm	25 mm	980 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

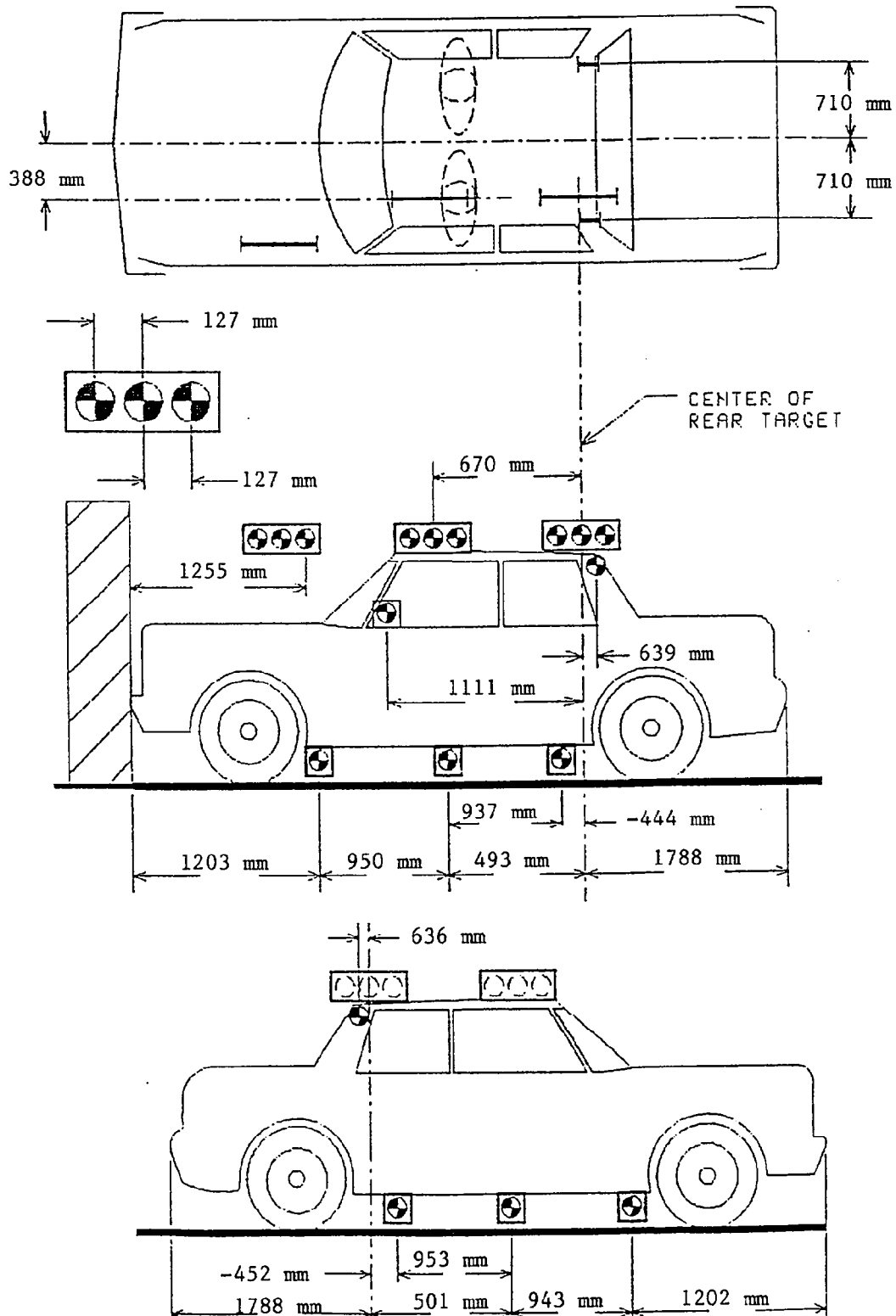


Figure 12 Pre-Test And Post-Test Measurement Points

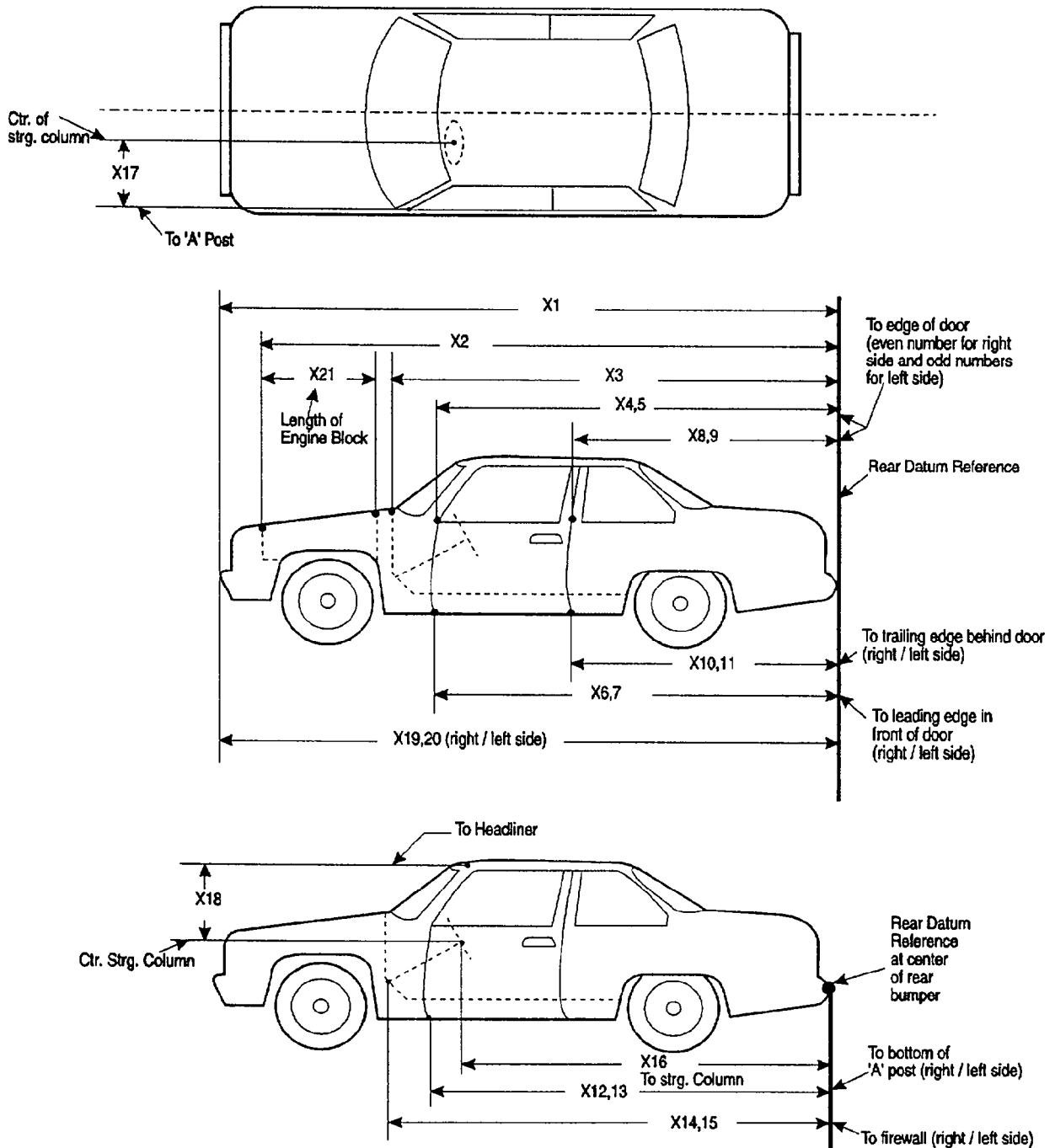


Table 14 Impacted Vehicle Measurements

Vehicle Make/Model: Mazda/MPV

Test Number: 950106

No.	Type of measurement	Pre-test	Post-test	Diff.
X1	Total length of vehicle at centerline	4434 mm	4014 mm	420 mm
X2	Rear surface of vehicle to front of engine block	3999 mm	3773 mm	226 mm
X3	Rear surface of vehicle to firewall	3609 mm	3614 mm	-5 mm
X4	Rear surface of vehicle to upper leading edge of right door	3220 mm	3237 mm	-17 mm
X5	Rear surface of vehicle to upper leading edge of left door	3224 mm	3224 mm	0 mm
X6	Rear surface of vehicle to lower leading edge of right door	3209 mm	3192 mm	17 mm
X7	Rear surface of vehicle to lower leading edge of left door	3209 mm	3201 mm	8 mm
X8	Rear surface of vehicle to upper trailing edge of right door	2147 mm	2169 mm	-22 mm
X9	Rear surface of vehicle to upper trailing edge of left door	2151 mm	2162 mm	-11 mm
X10	Rear surface of vehicle to lower trailing edge of right door	2141 mm	2120 mm	21 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2142 mm	2150 mm	-8 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3212 mm	3202 mm	10 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3214 mm	3210 mm	4 mm
X14	Rear surface of vehicle to firewall - right side	3505 mm	3550 mm	-45 mm
X15	Rear surface of vehicle to firewall - left side	3390 mm	3379 mm	11 mm
X16	Rear surface of vehicle to steering wheel center	2753 mm	2802 mm	-49 mm
X17	Center of steering column to "A" post	304 mm	284 mm	20 mm
X18	Center of steering column to headliner	515 mm	356 mm	159 mm
X19	Rear surface of vehicle to right side of front bumper	4310 mm	4039 mm	271 mm
X20	Rear surface of vehicle to left side of front bumper	4305 mm	4010 mm	295 mm
X21	Length of engine block	400 mm	400 mm	0 mm

Appendix A

Photographs

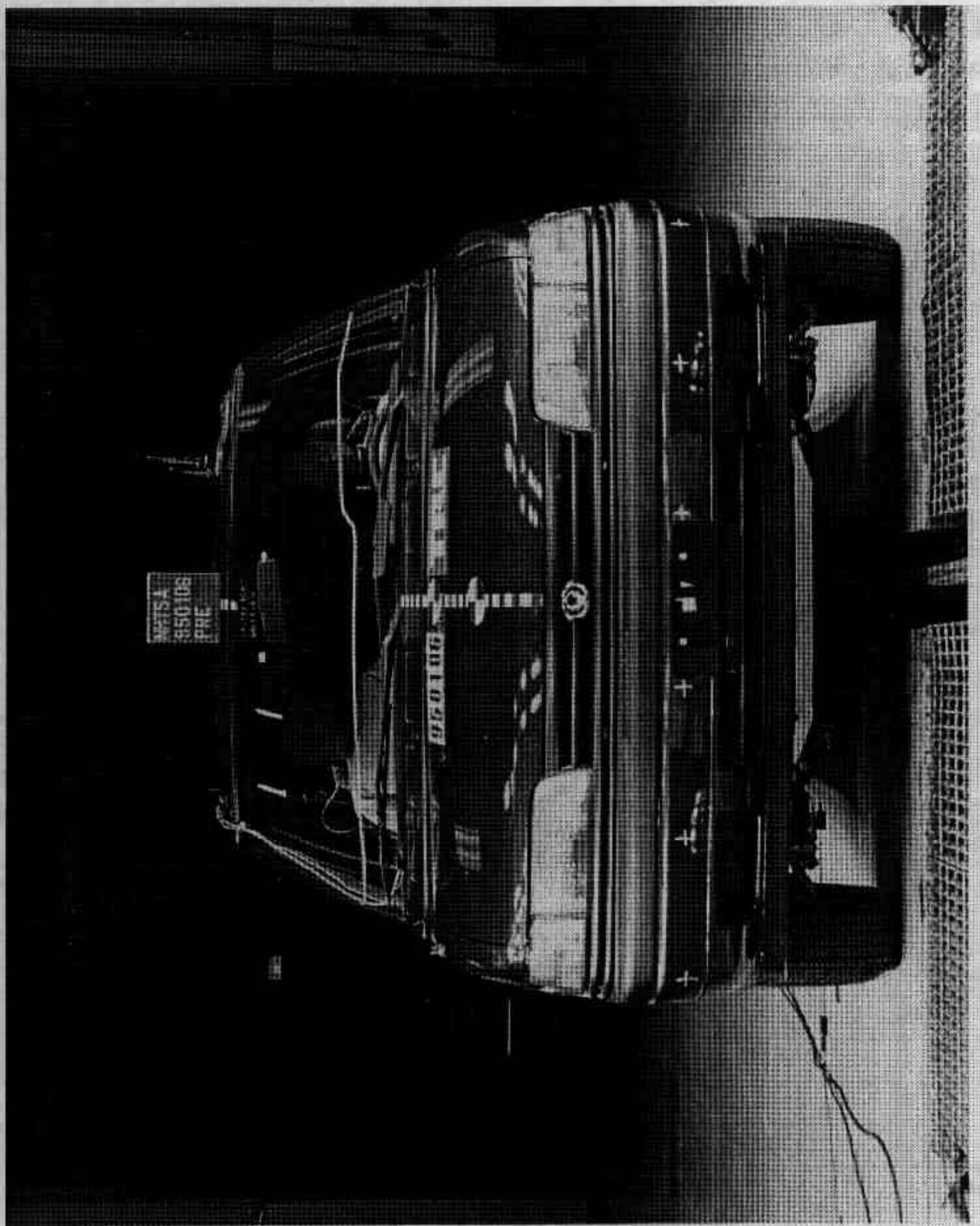


Figure A-1. Pre-Test Front View
A-2

950106

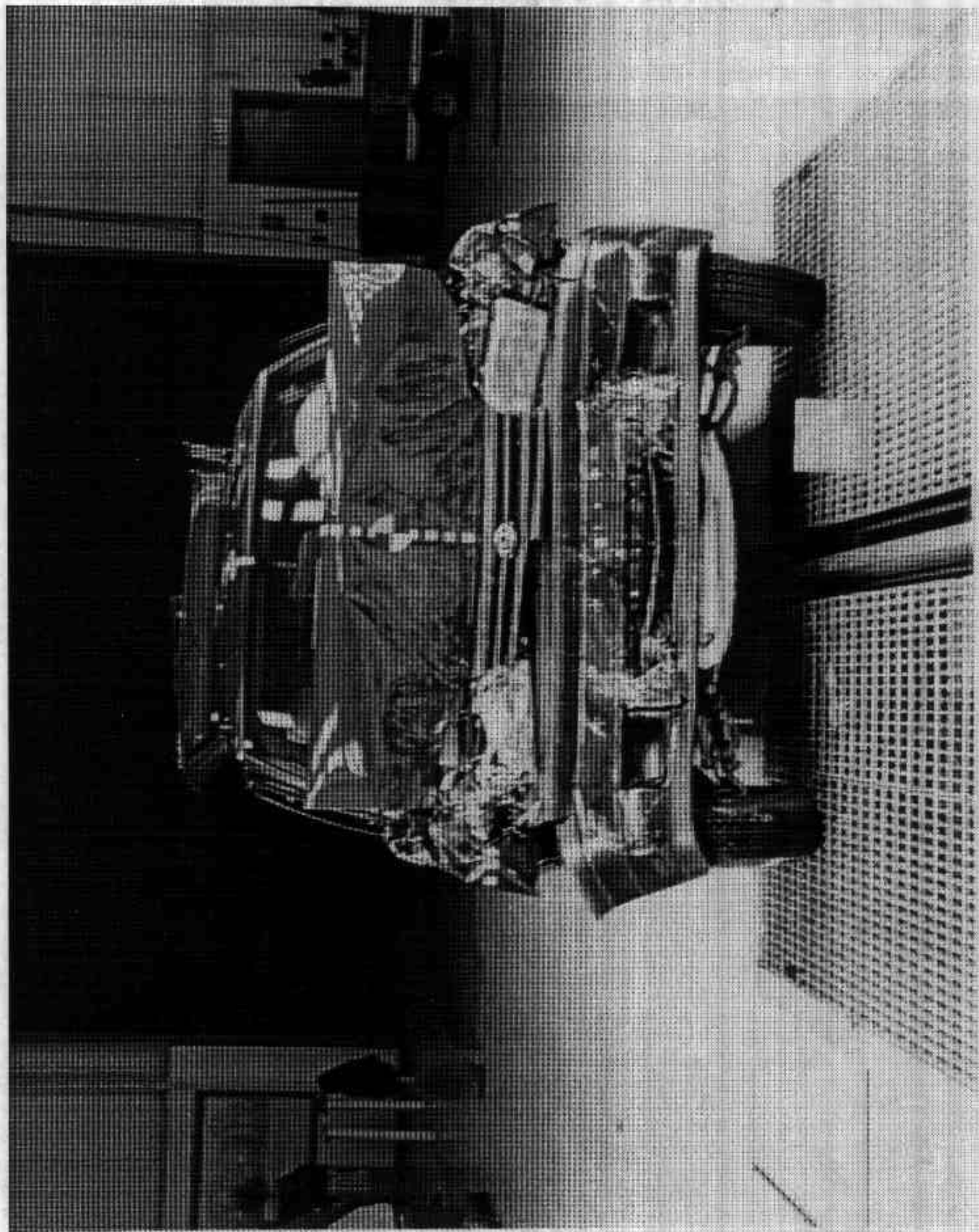


Figure A-2. Post-Test Front View
A-3

950106

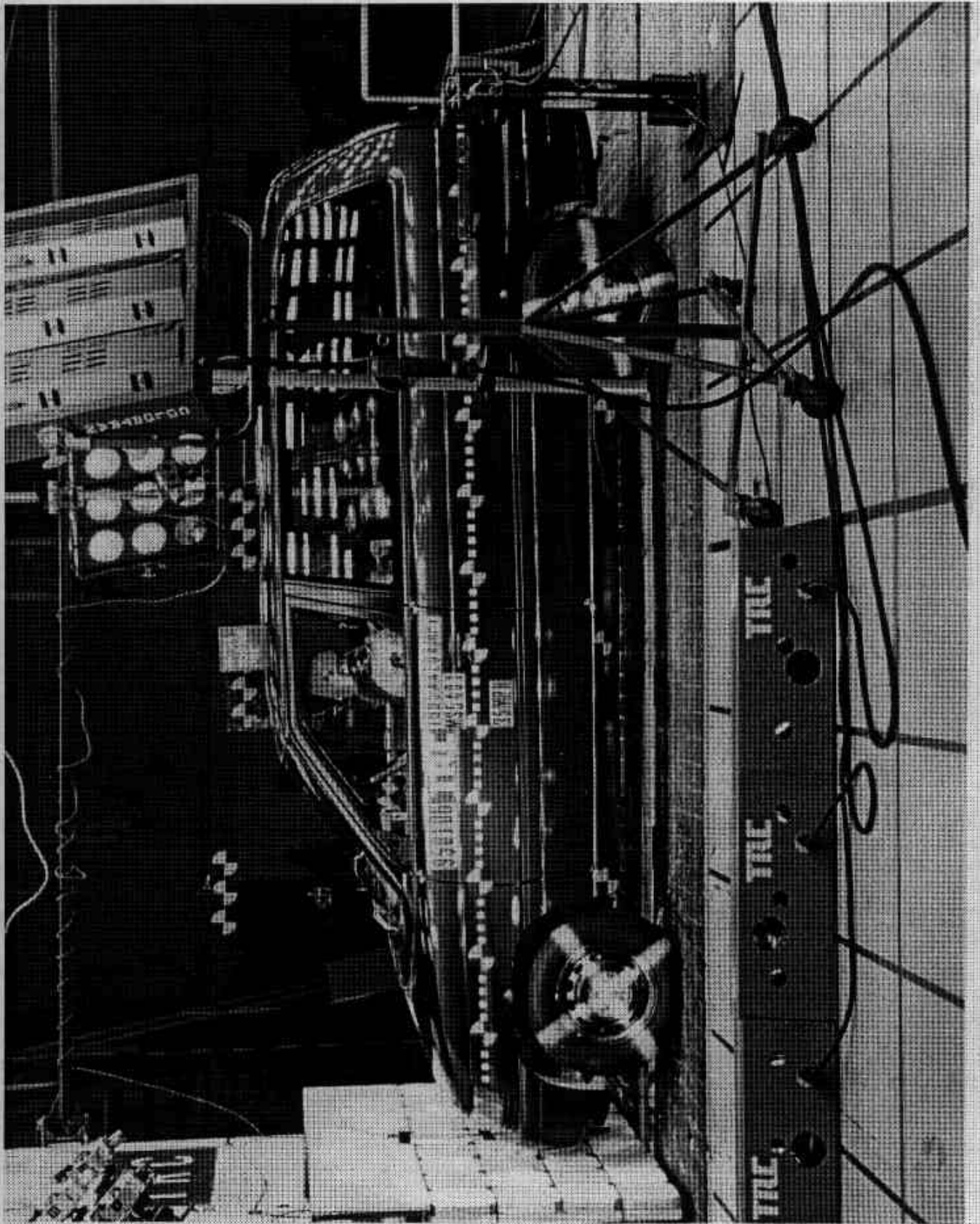


Figure A-3. Pre-Test Left Side View
A-4

950106

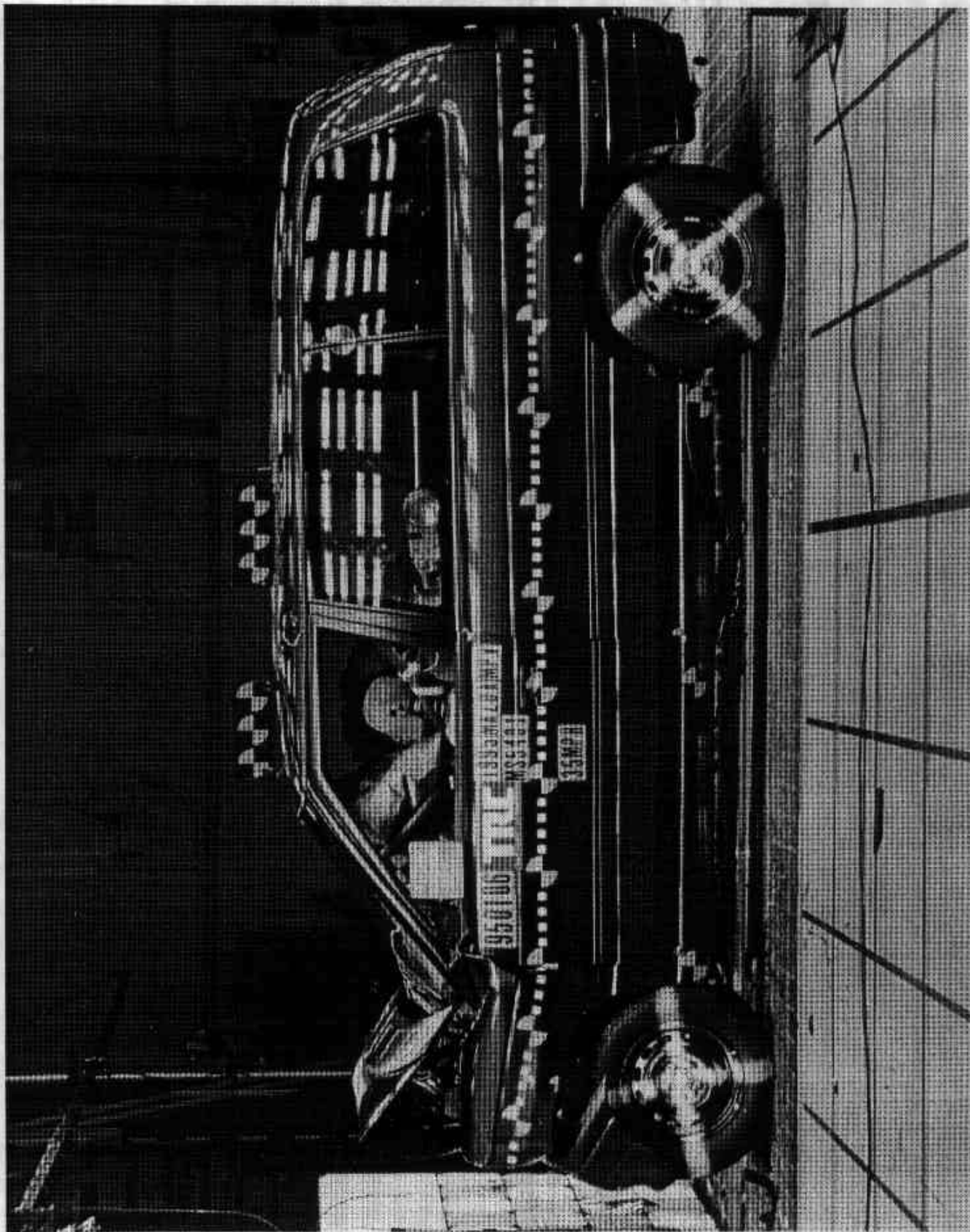


Figure A-4. Post-Test Left Side View
A-5

950106

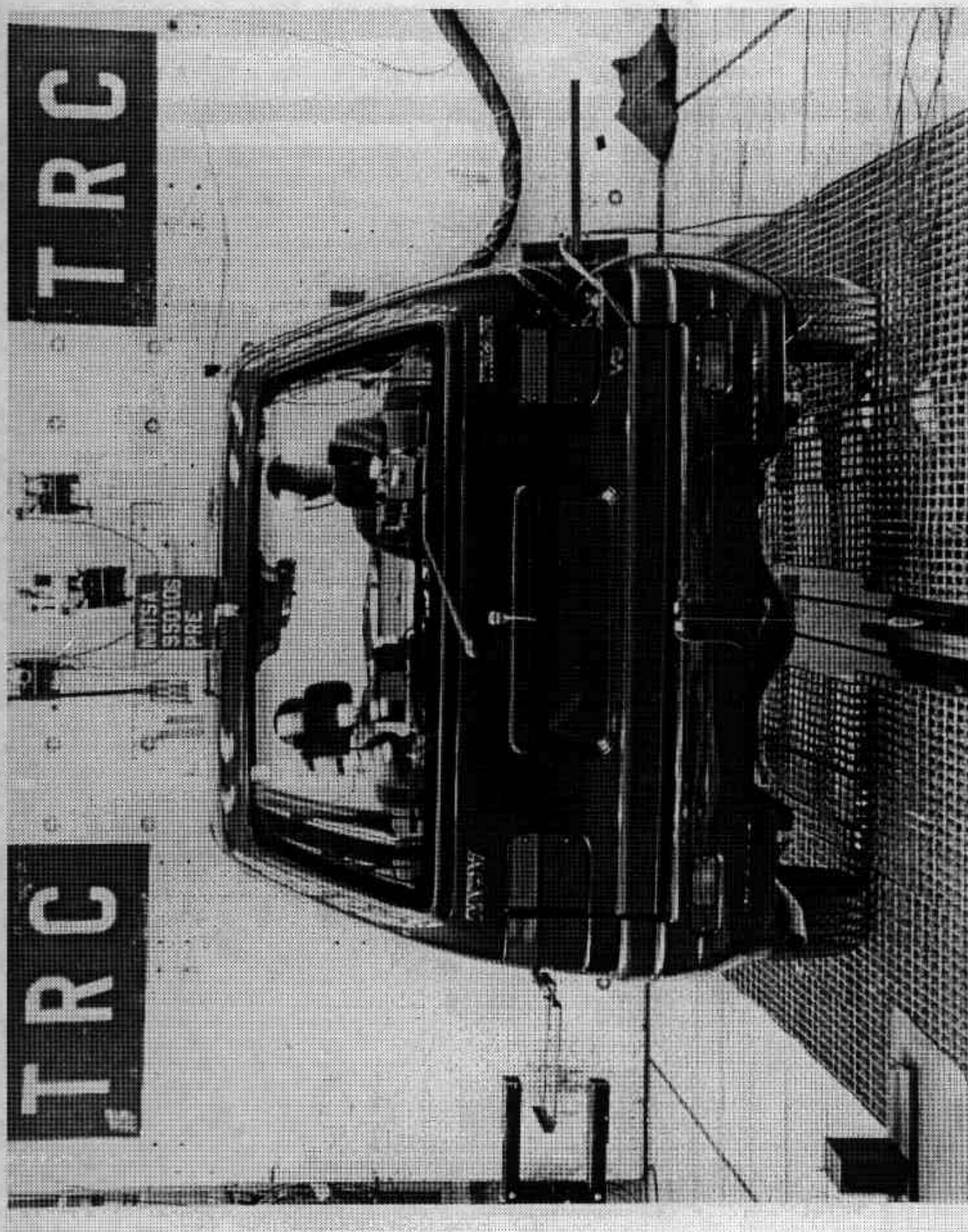


Figure A-5. Pre-Test Rear View
A-6

950106

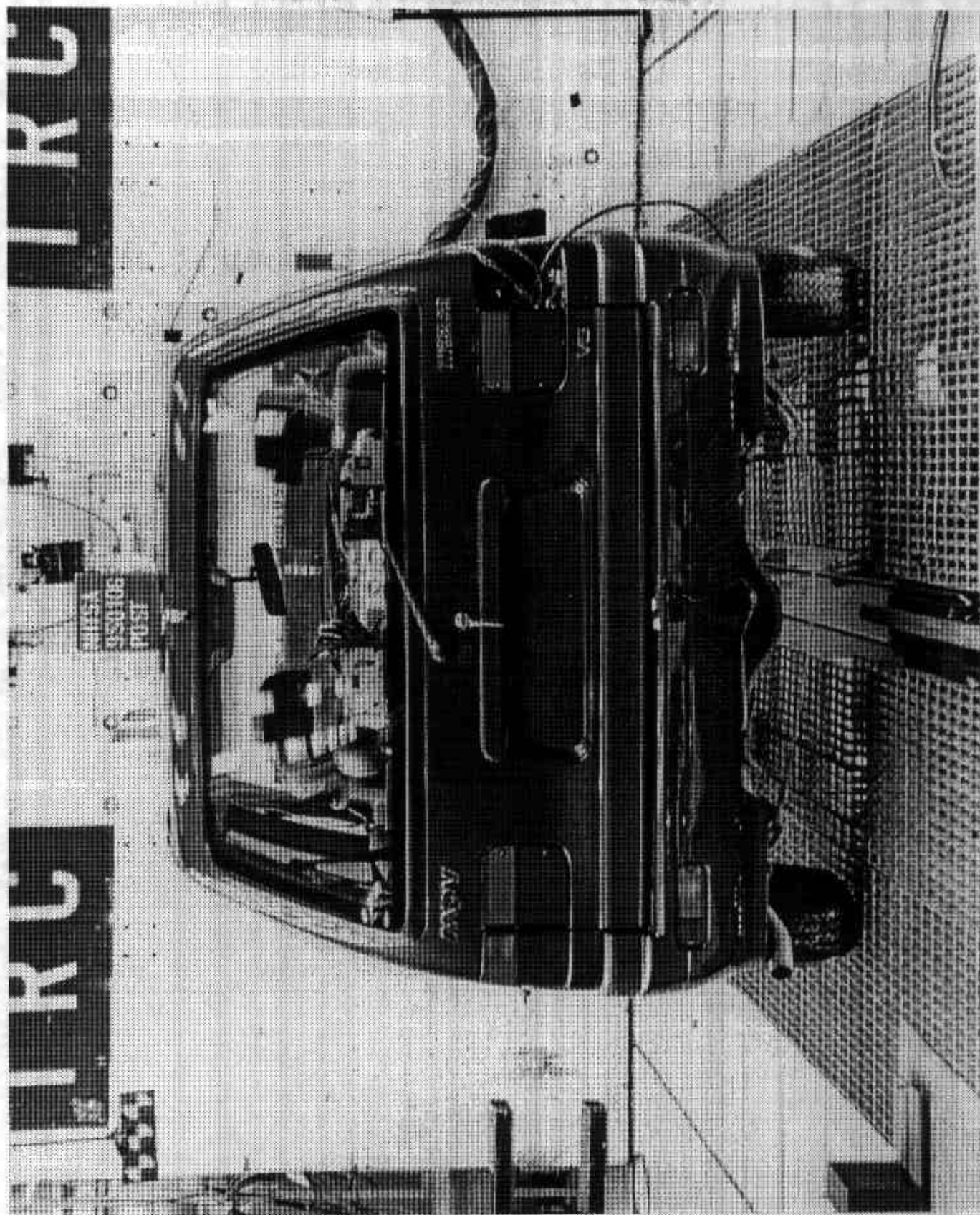


Figure A-6. Post-Test Rear View
A-7

950106

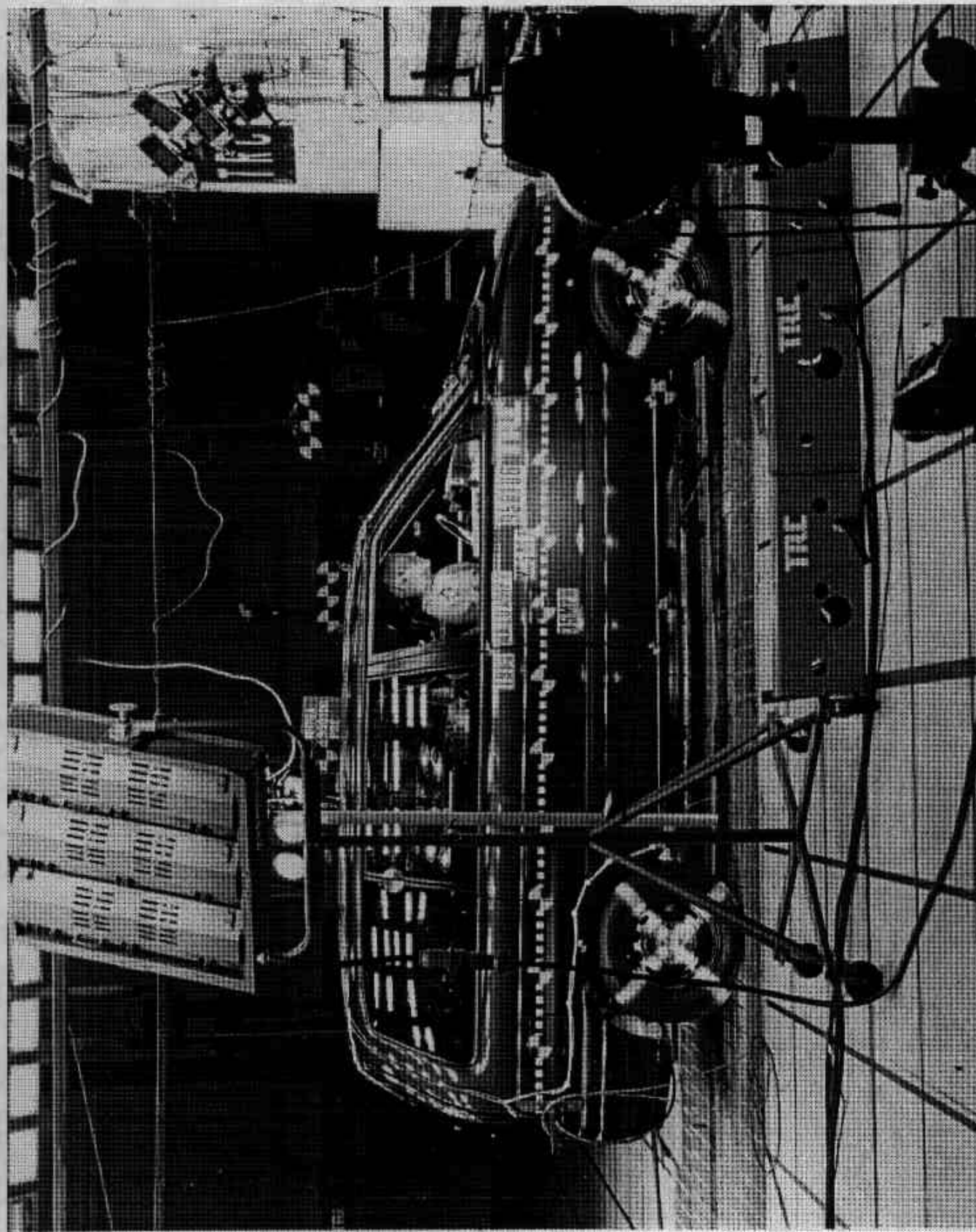


Figure A-7. Pre-Test Right Side View
A-8

950106

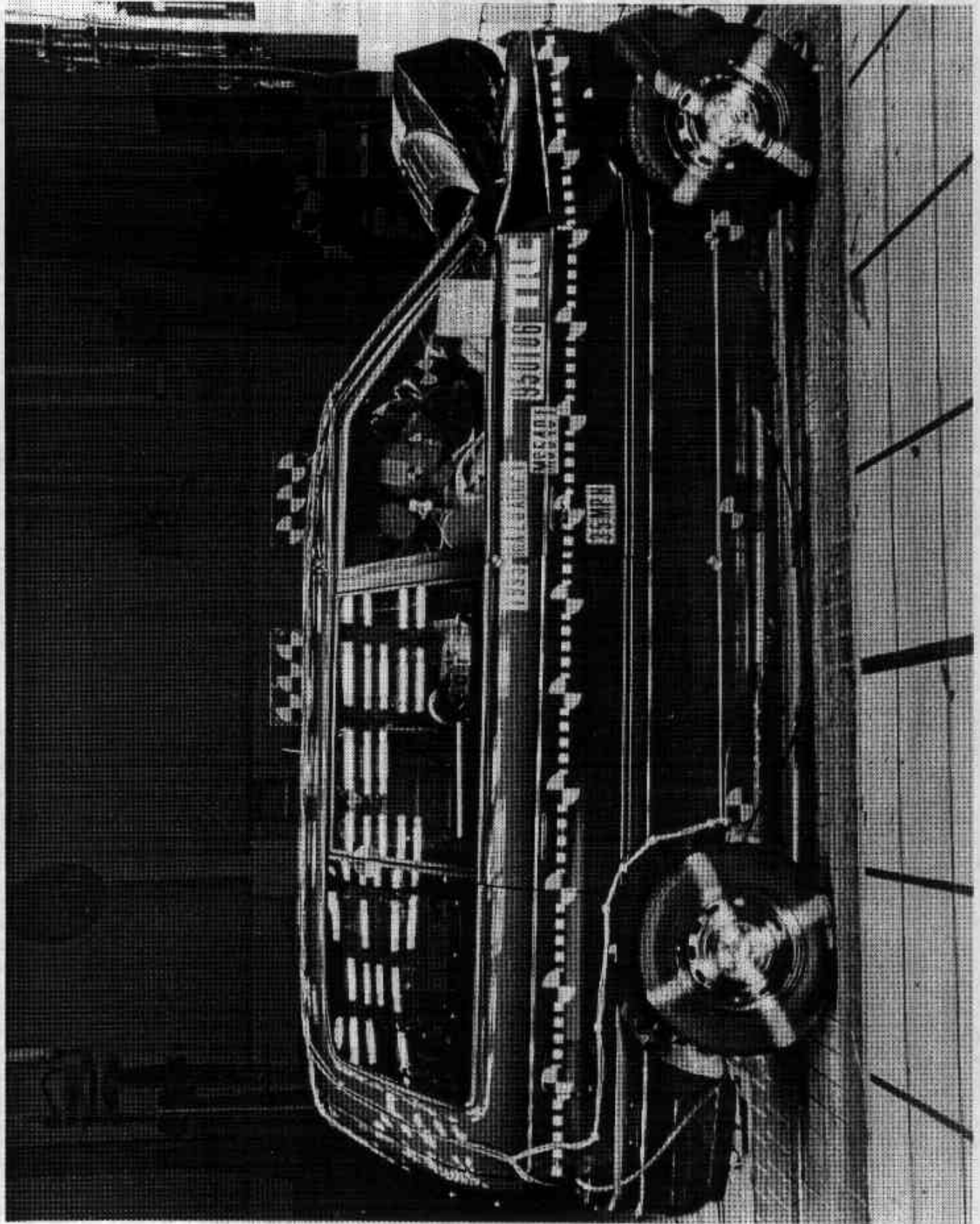


Figure A-8. Post-Test Right Side View
A-9

950106



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

950106

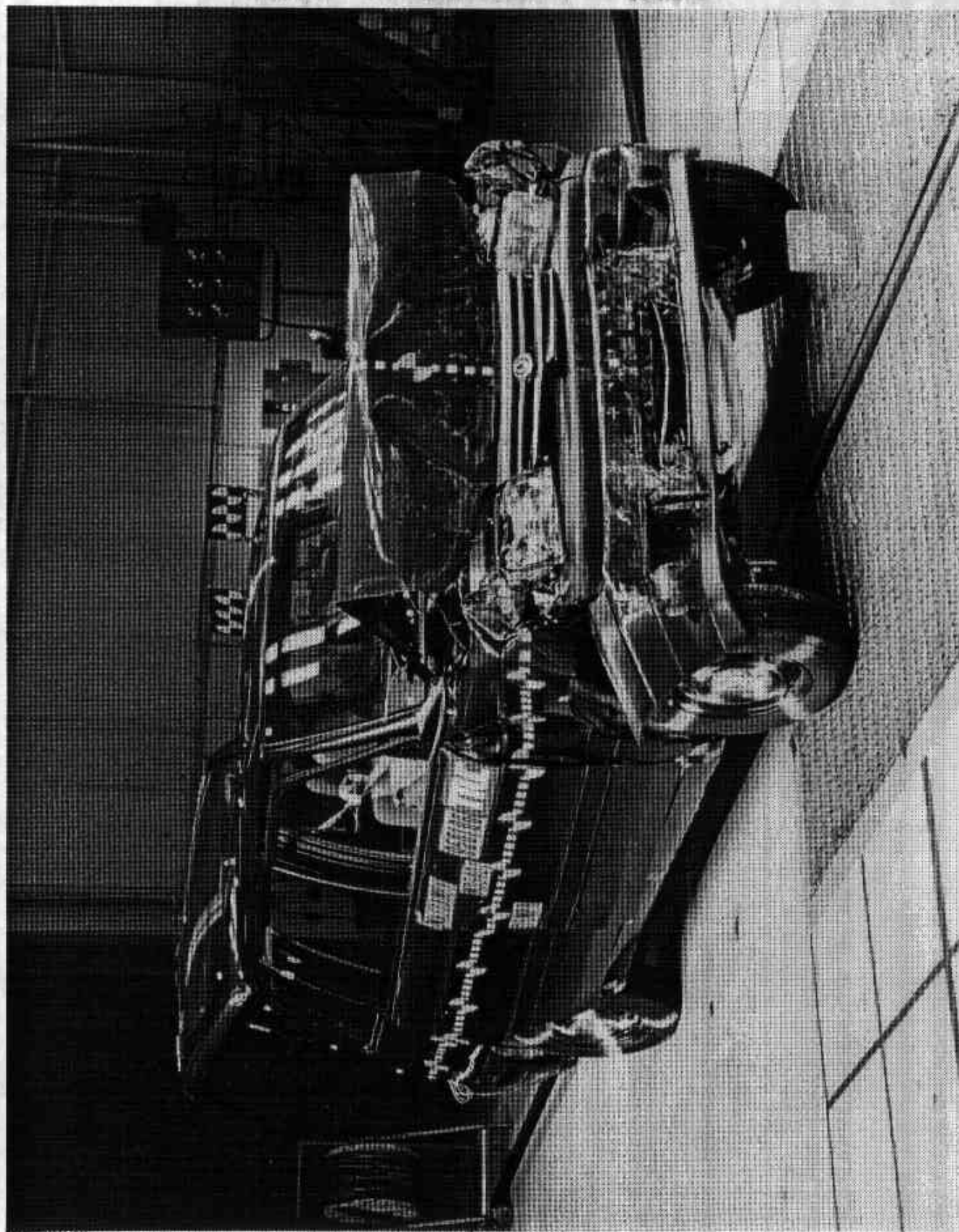


Figure A-10. Post-Test Right Front Three-Quarter View
A-11

950106

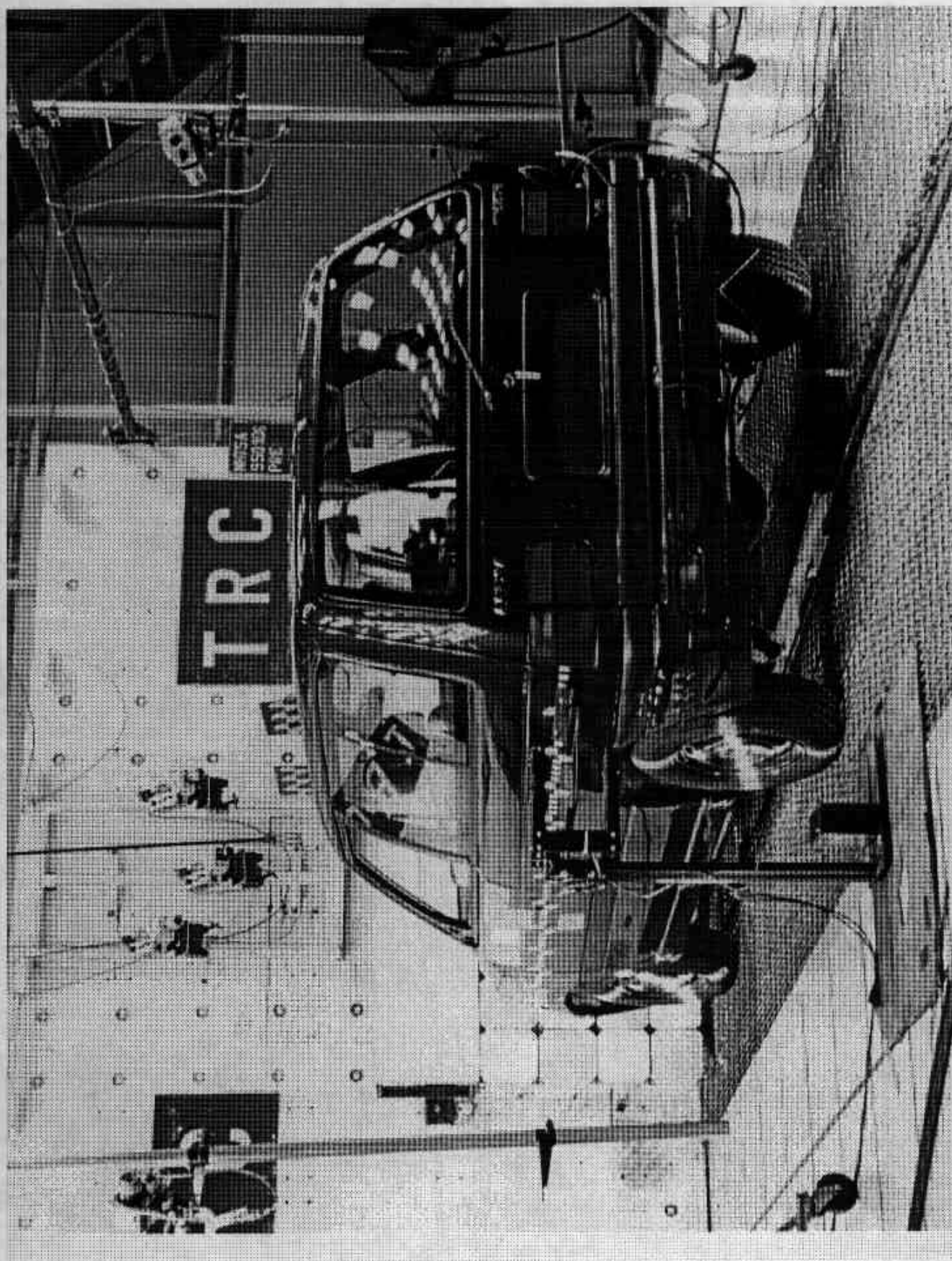


Figure A-11. Pre-Test Left Rear Three-Quarter View
A-12

950106



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

950106

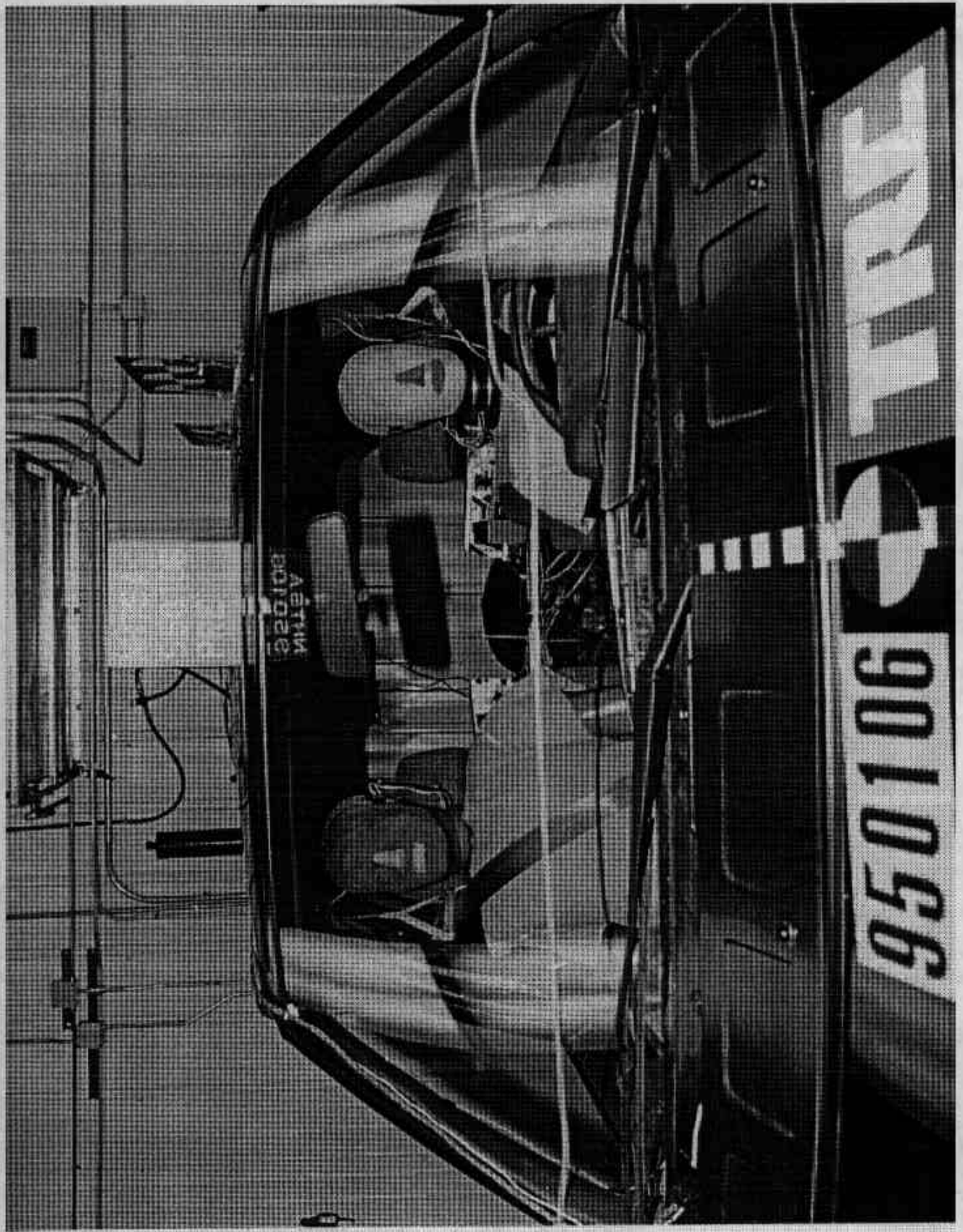


Figure A-13. Pre-Test Windshield View
A-14

950106

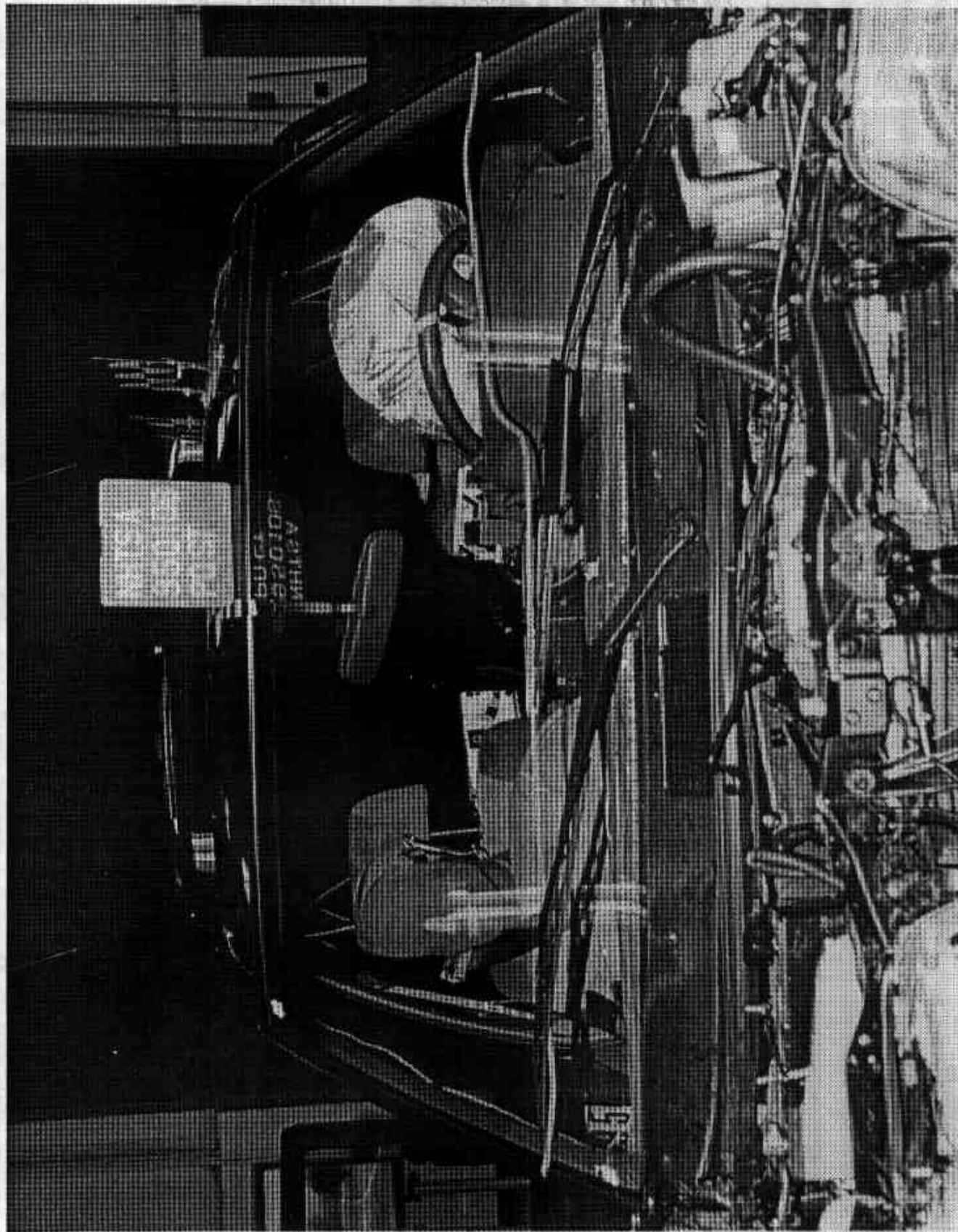


Figure A-14. Post-Test Windshield View
A-15

950106

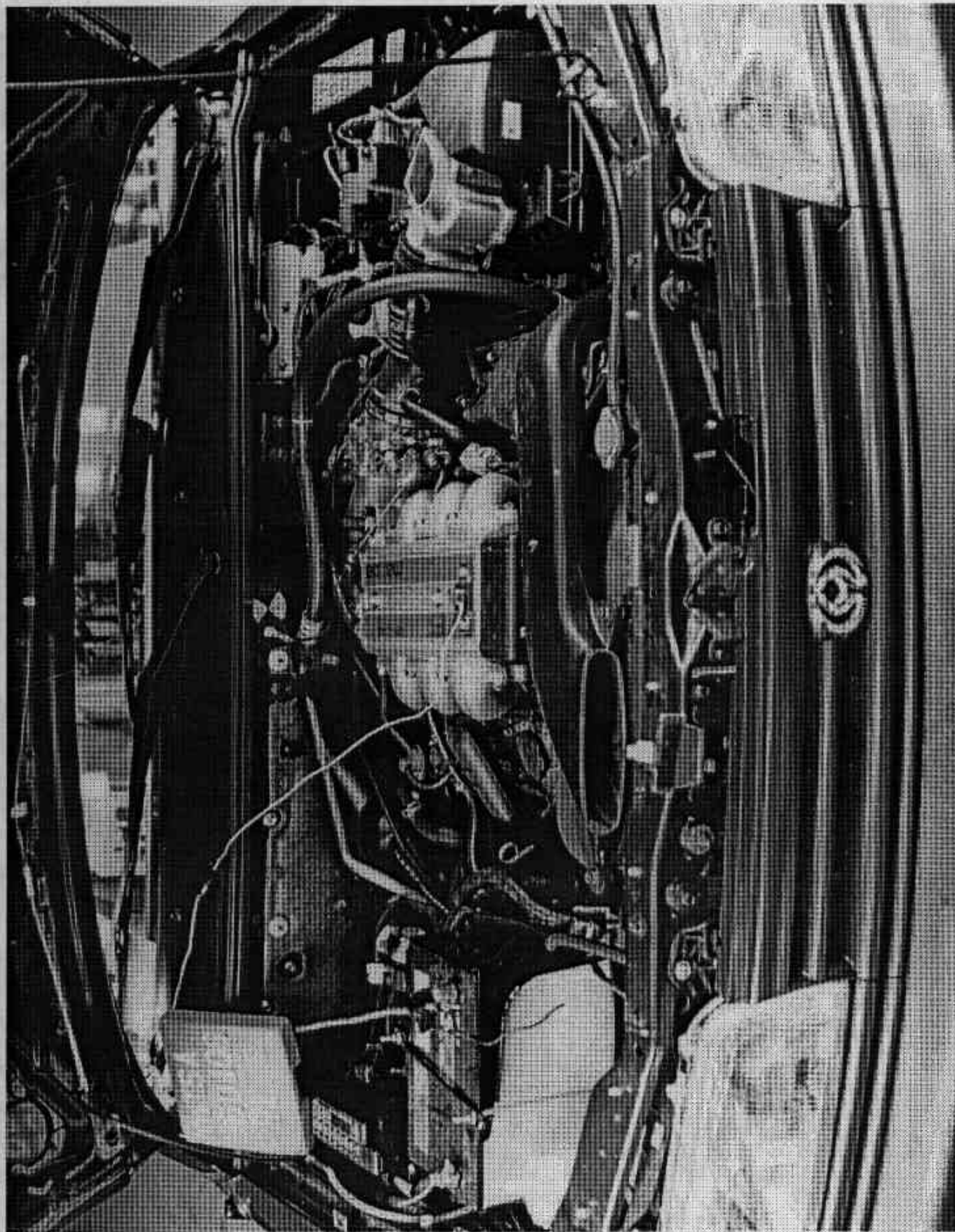


Figure A-15. Pre-Test Engine Compartment View
A-16

950106

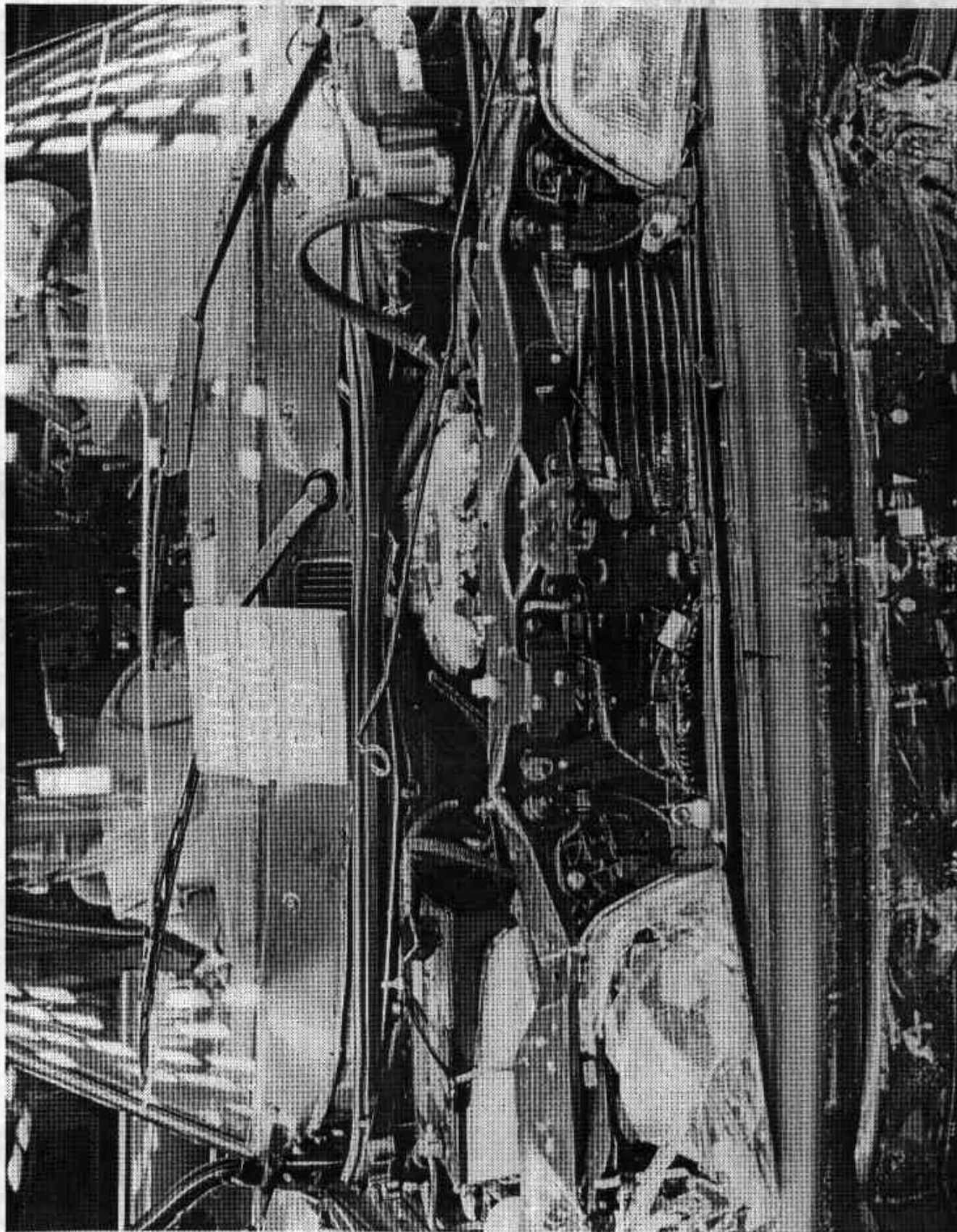


Figure A-16. Post-Test Engine Compartment View
A-17

950106



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

950106

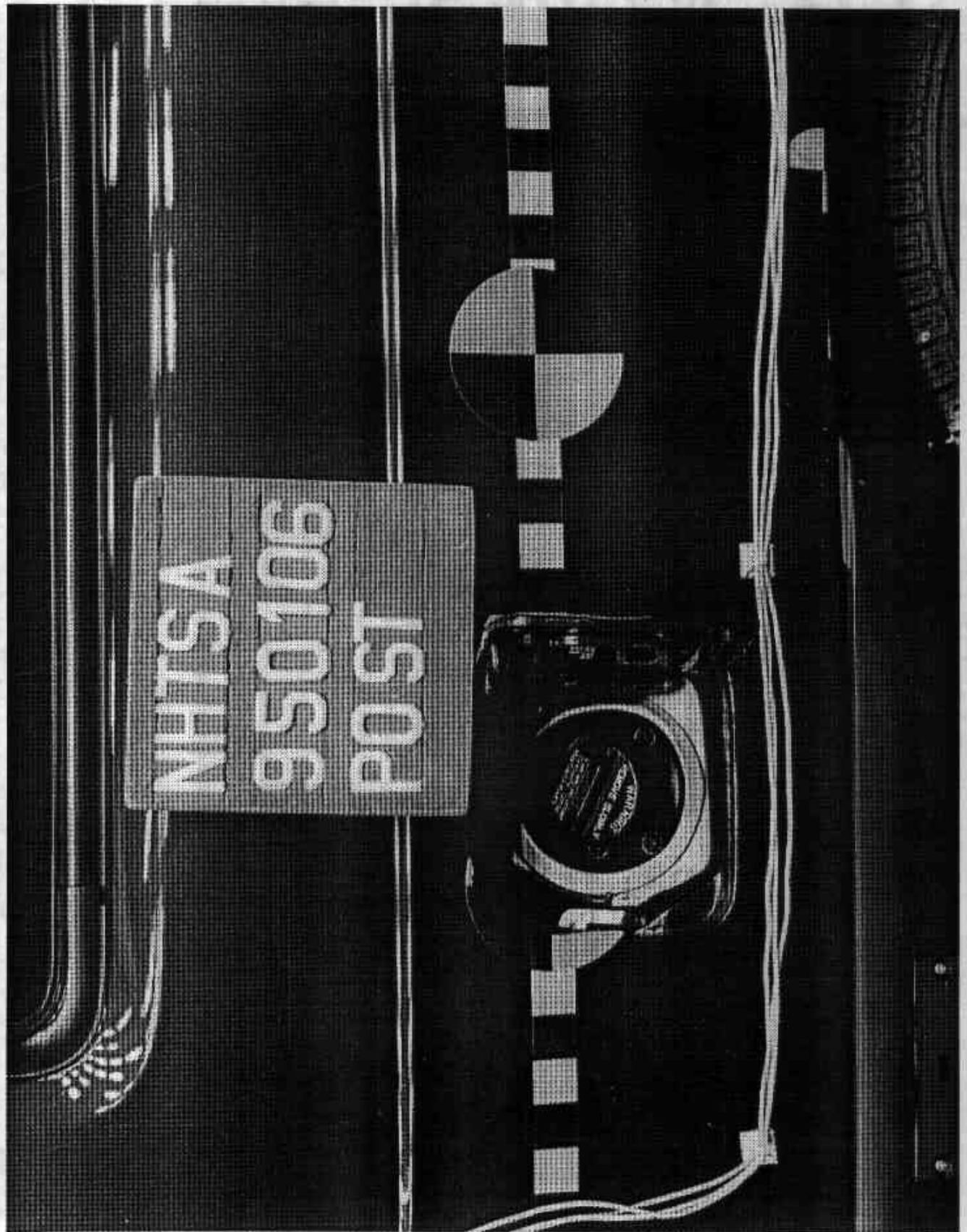


Figure A-18. Post-Test Fuel Filler Cap View
A-19

950106

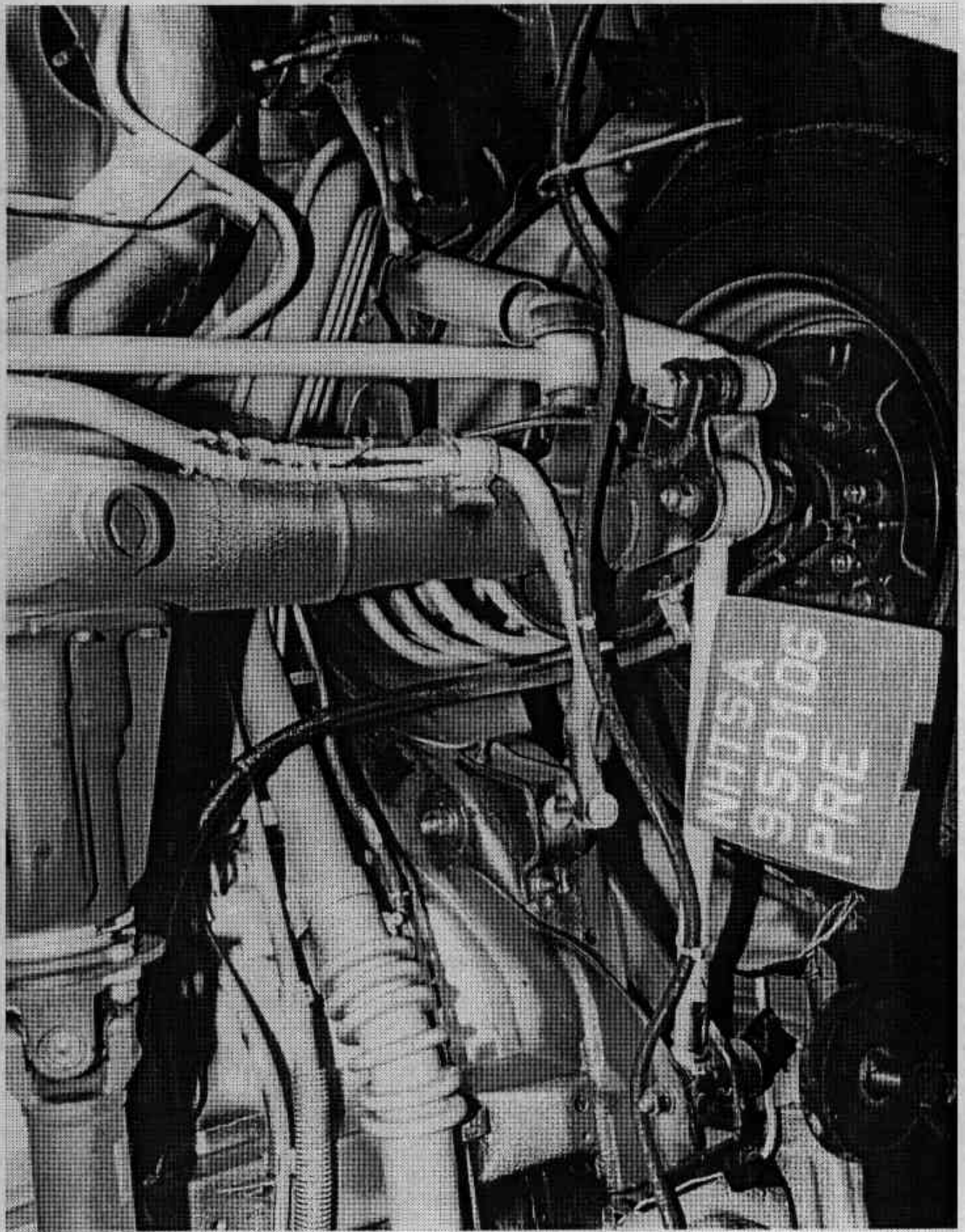


Figure A-19. Pre-Test Fuel Filler Neck View
A-20

950106



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

950106

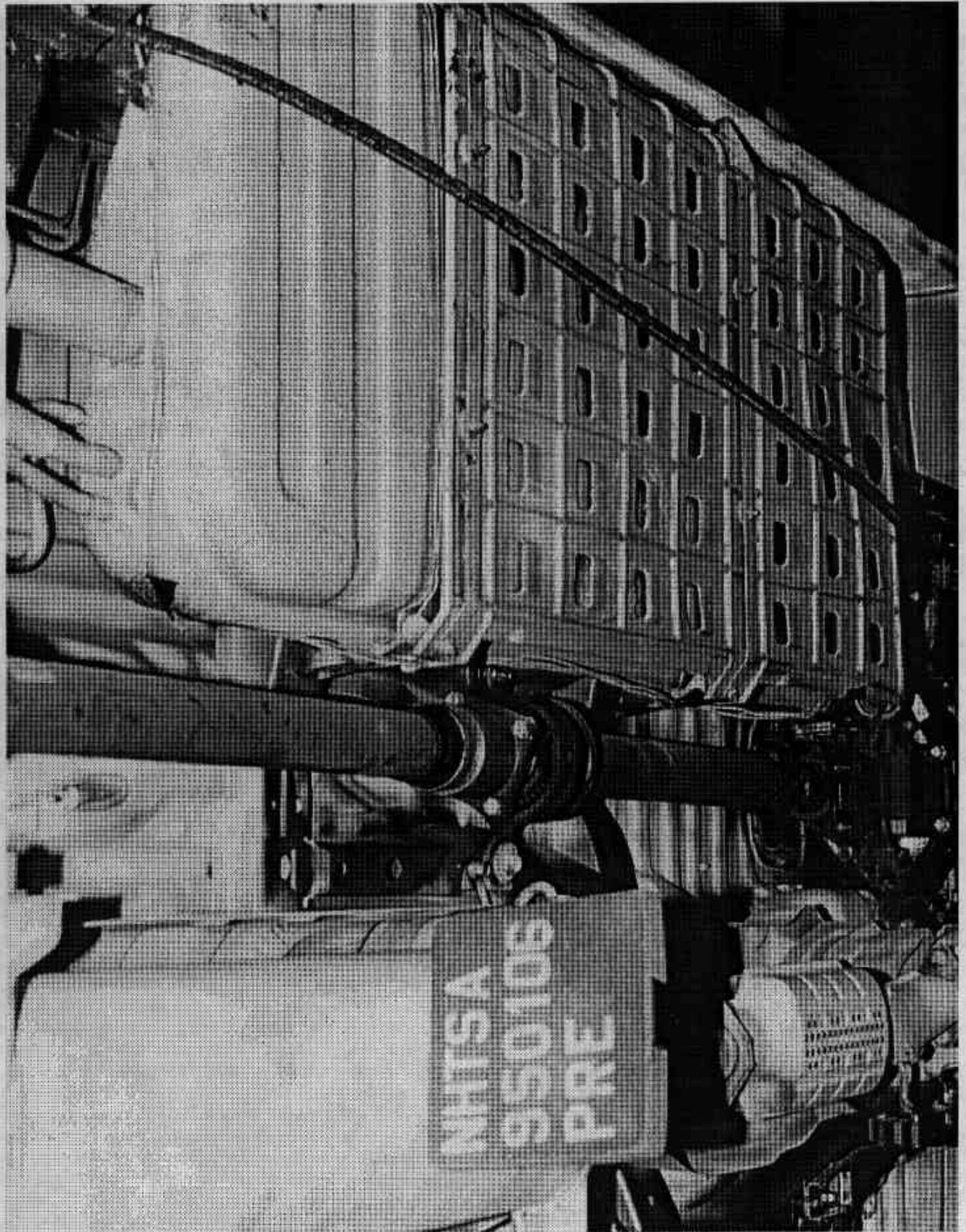


Figure A-21. Pre-Test Fuel Tank View
A-22

950106



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

950106

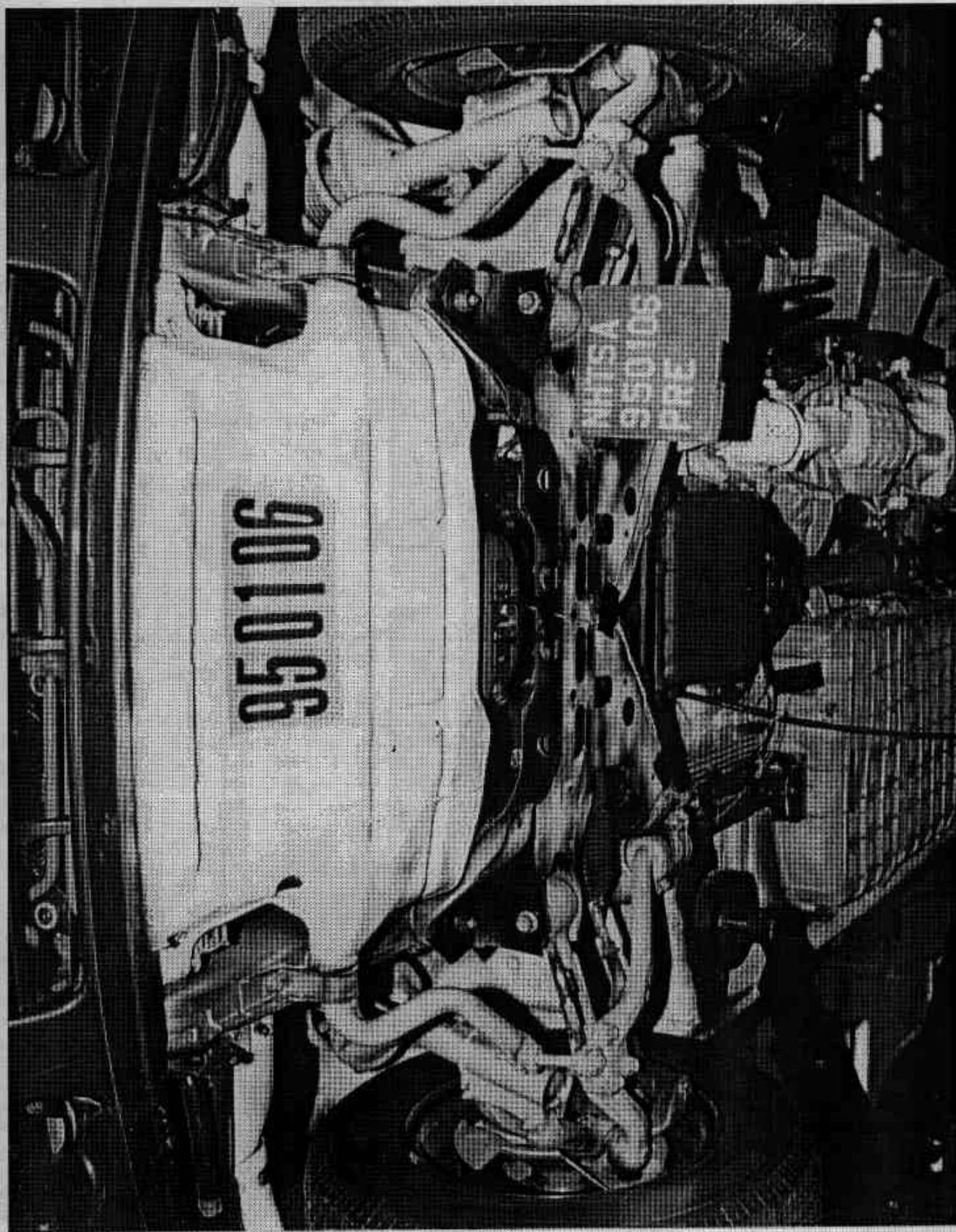


Figure A-23. Pre-Test Front Underbody View

A-24

950106

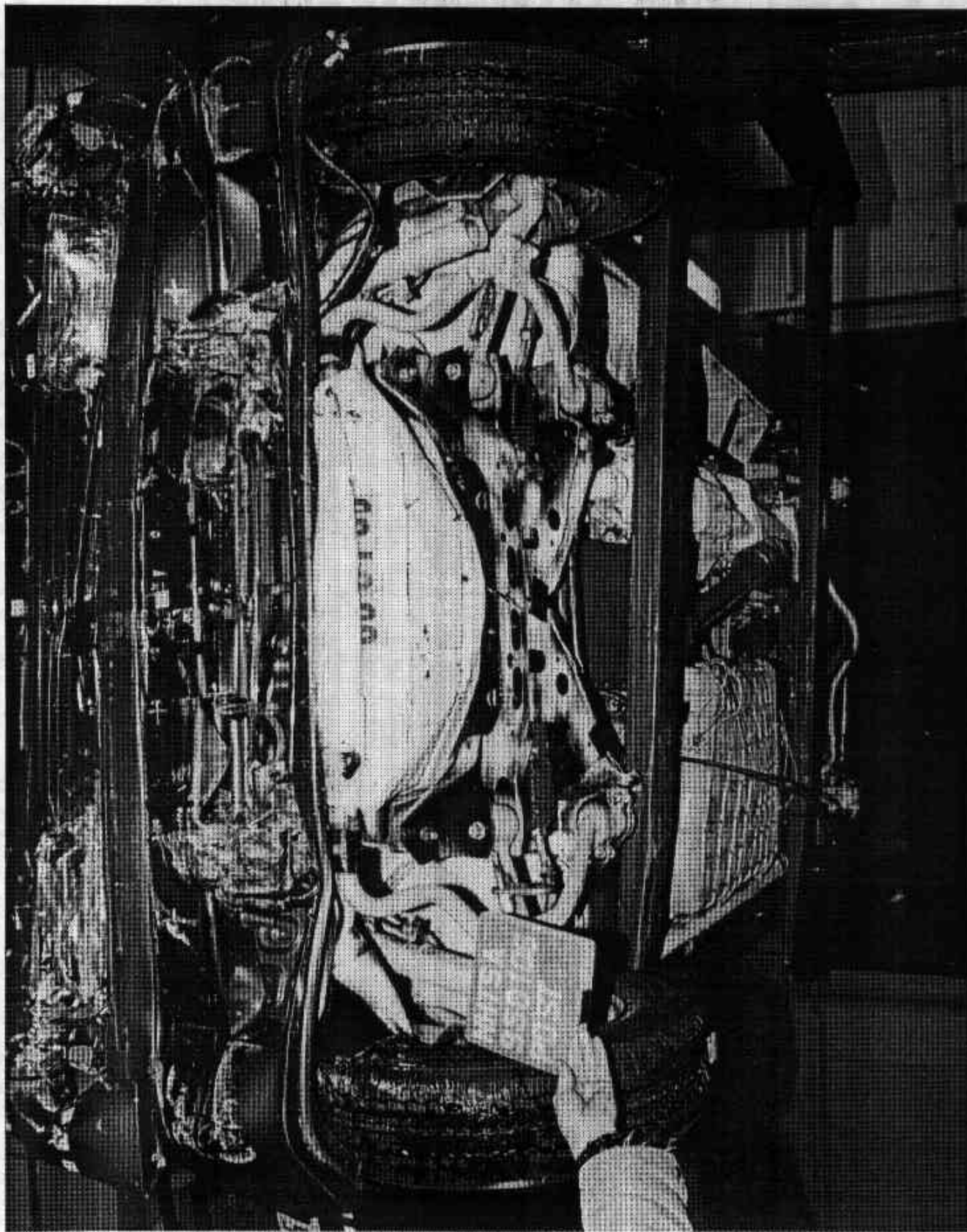


Figure A-24. Post-Test Front Underbody View
A-25

950106

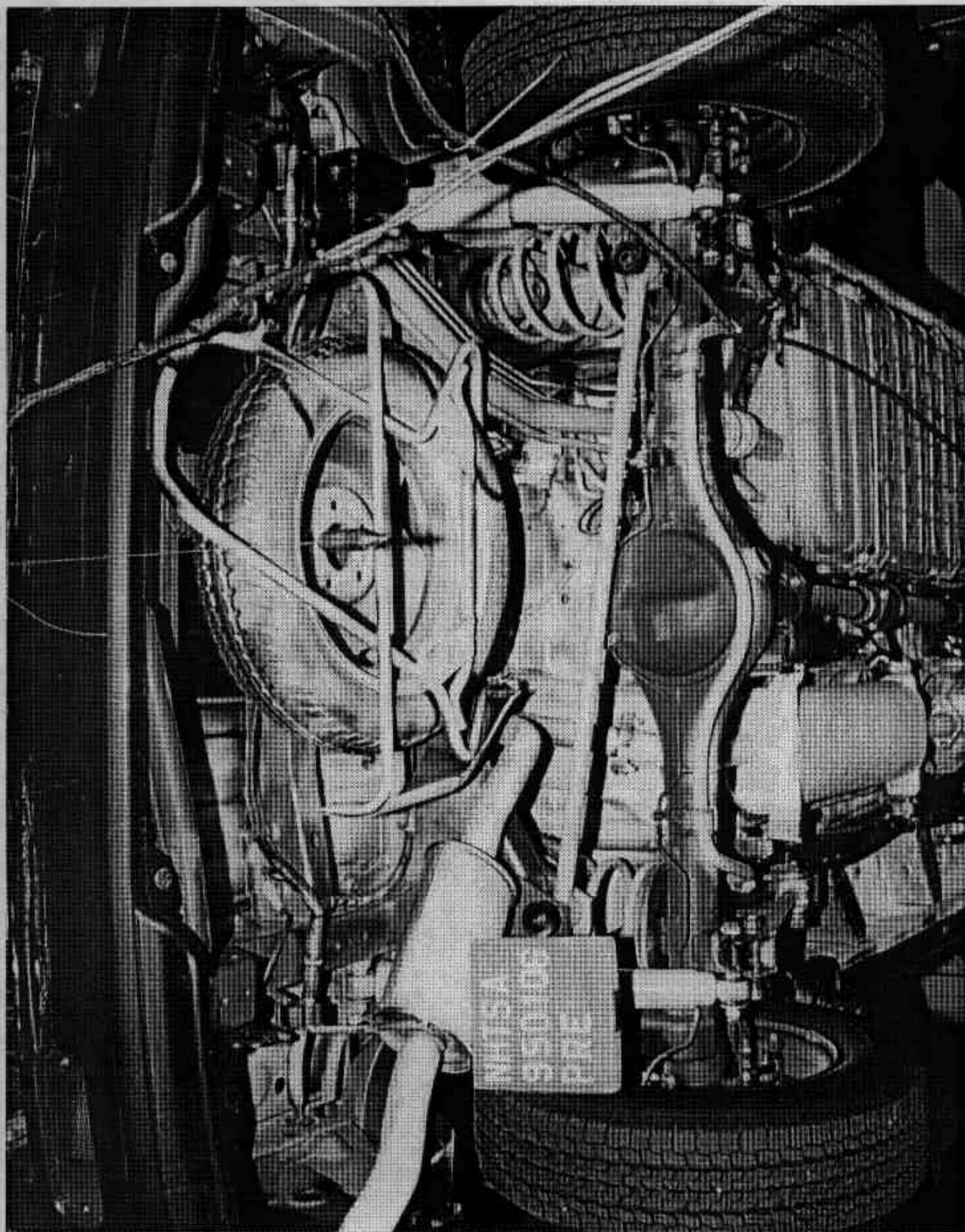


Figure A-25. Pre-Test Rear Underbody View
A-26

950106

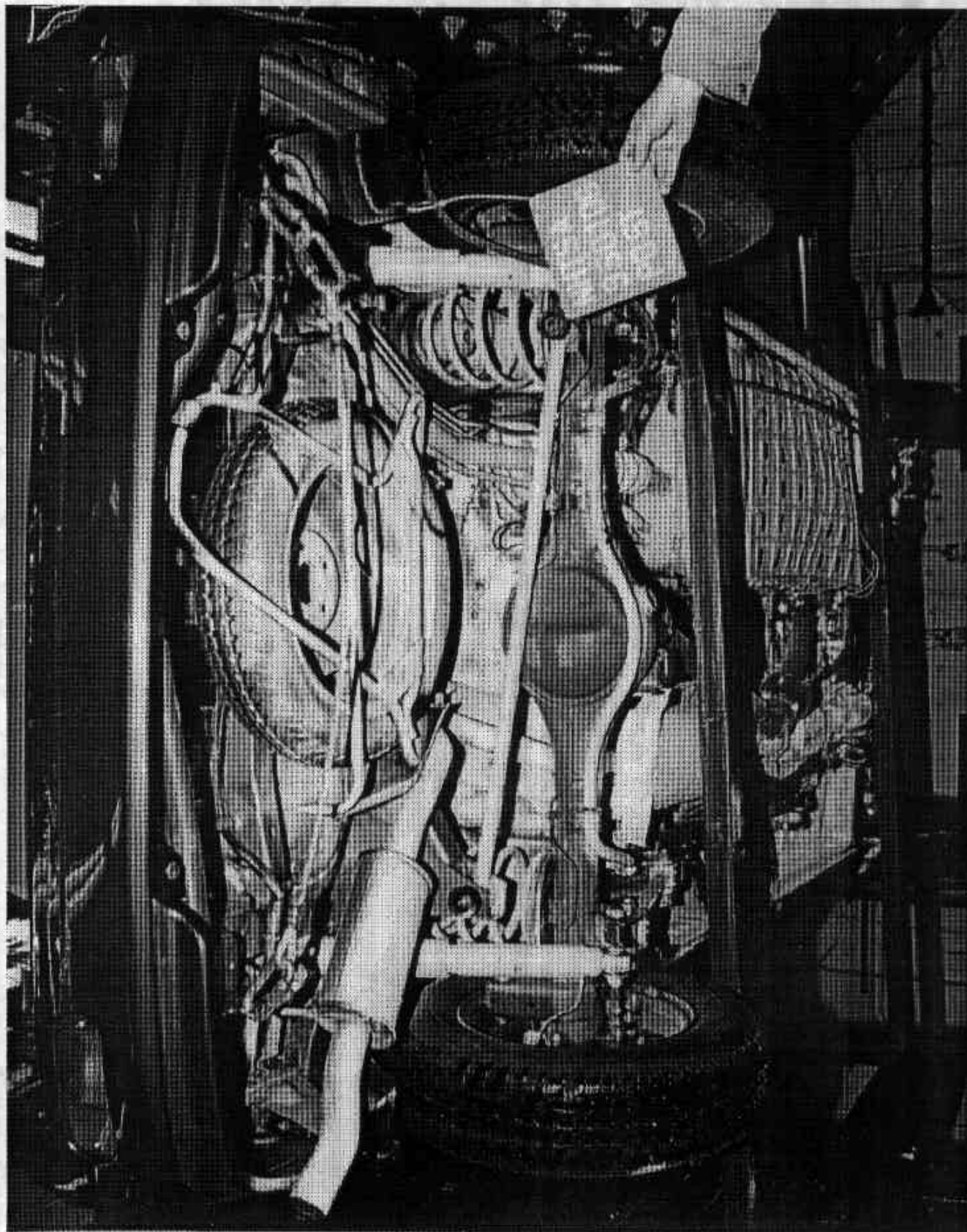


Figure A-26. Post-Test Rear Underbody View
A-27

950106

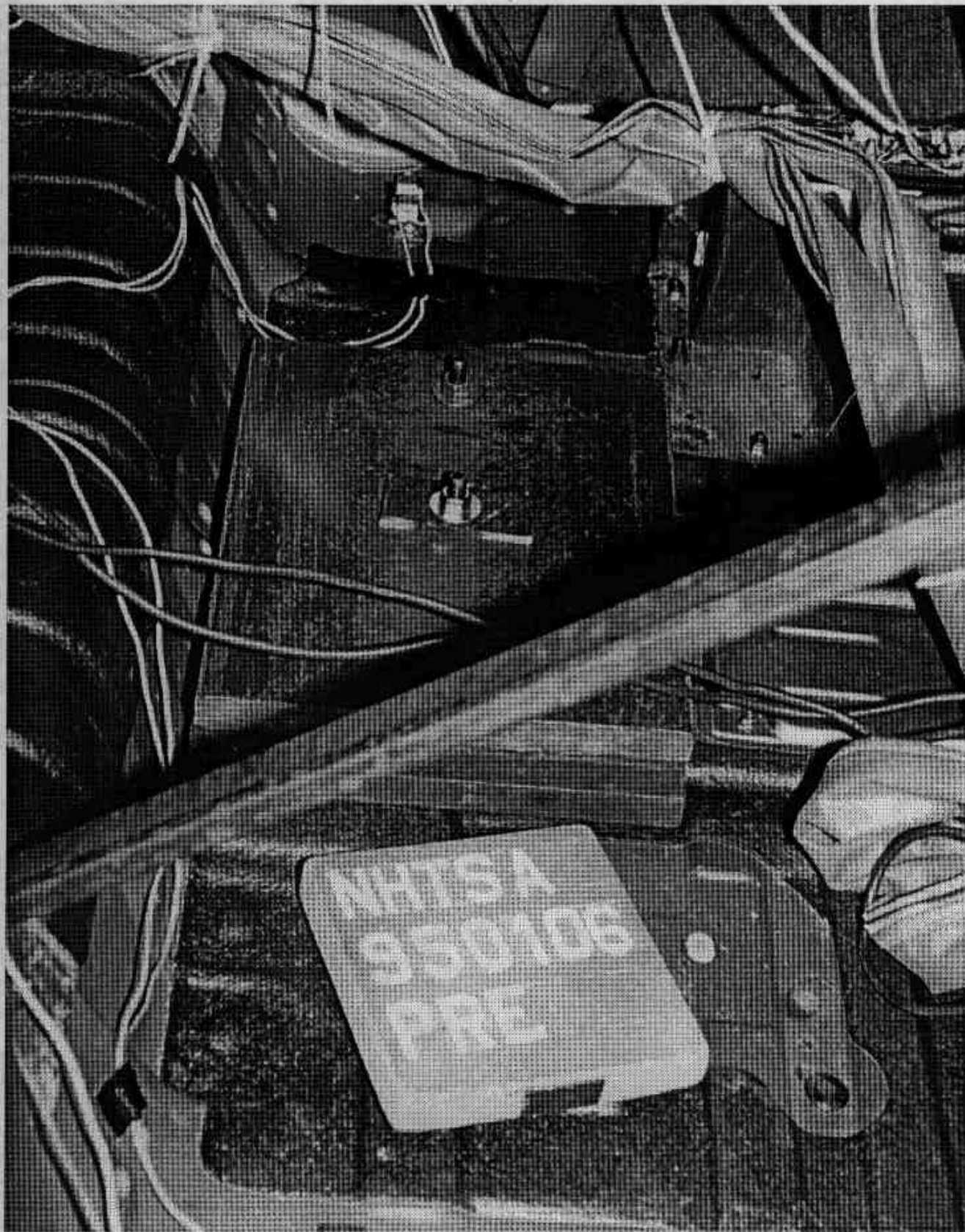


Figure A-27. Pre-Test Ballast Location View
A-28

950106

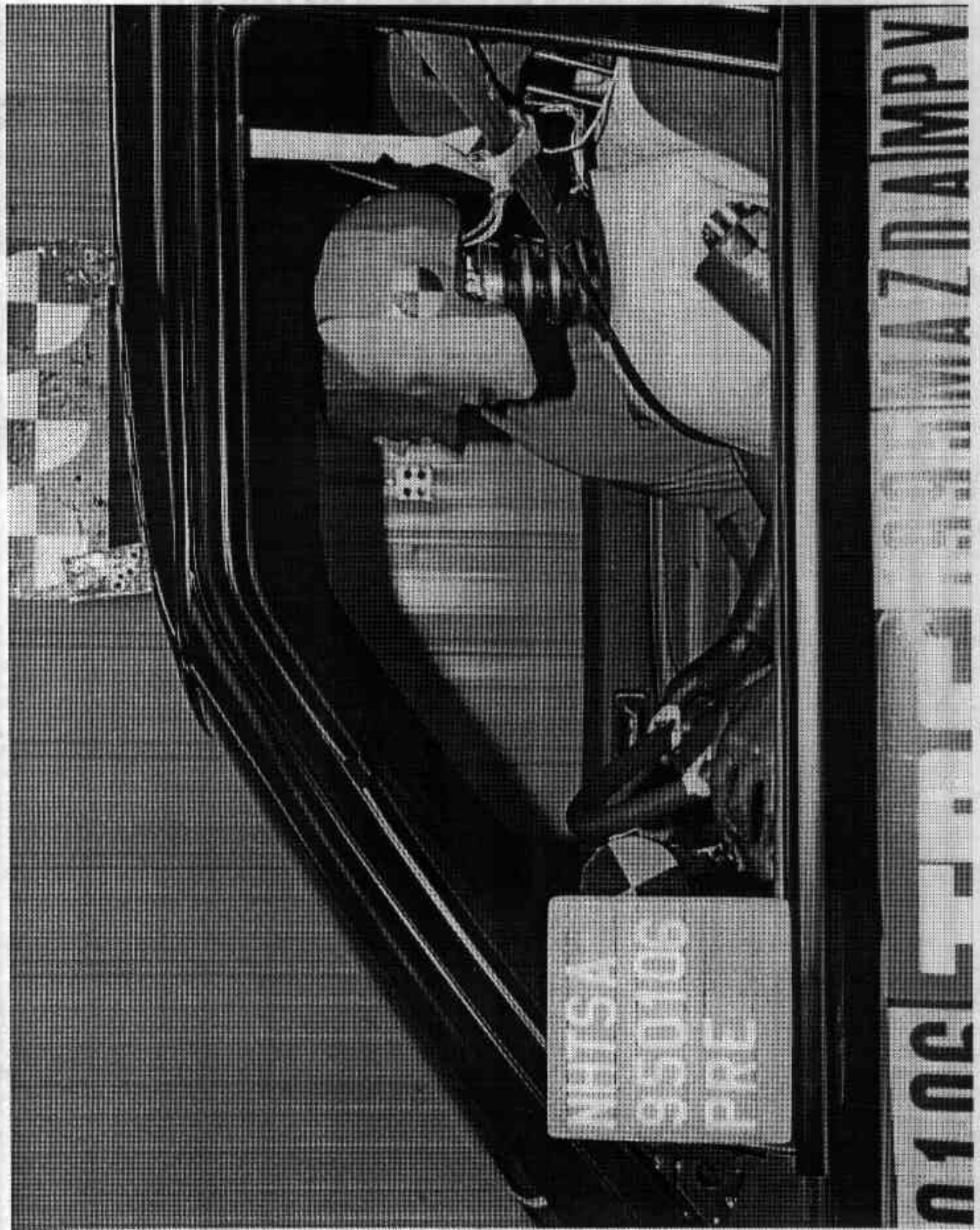


Figure A-28. Pre-Test Driver Dummy Position View
A-29

950106

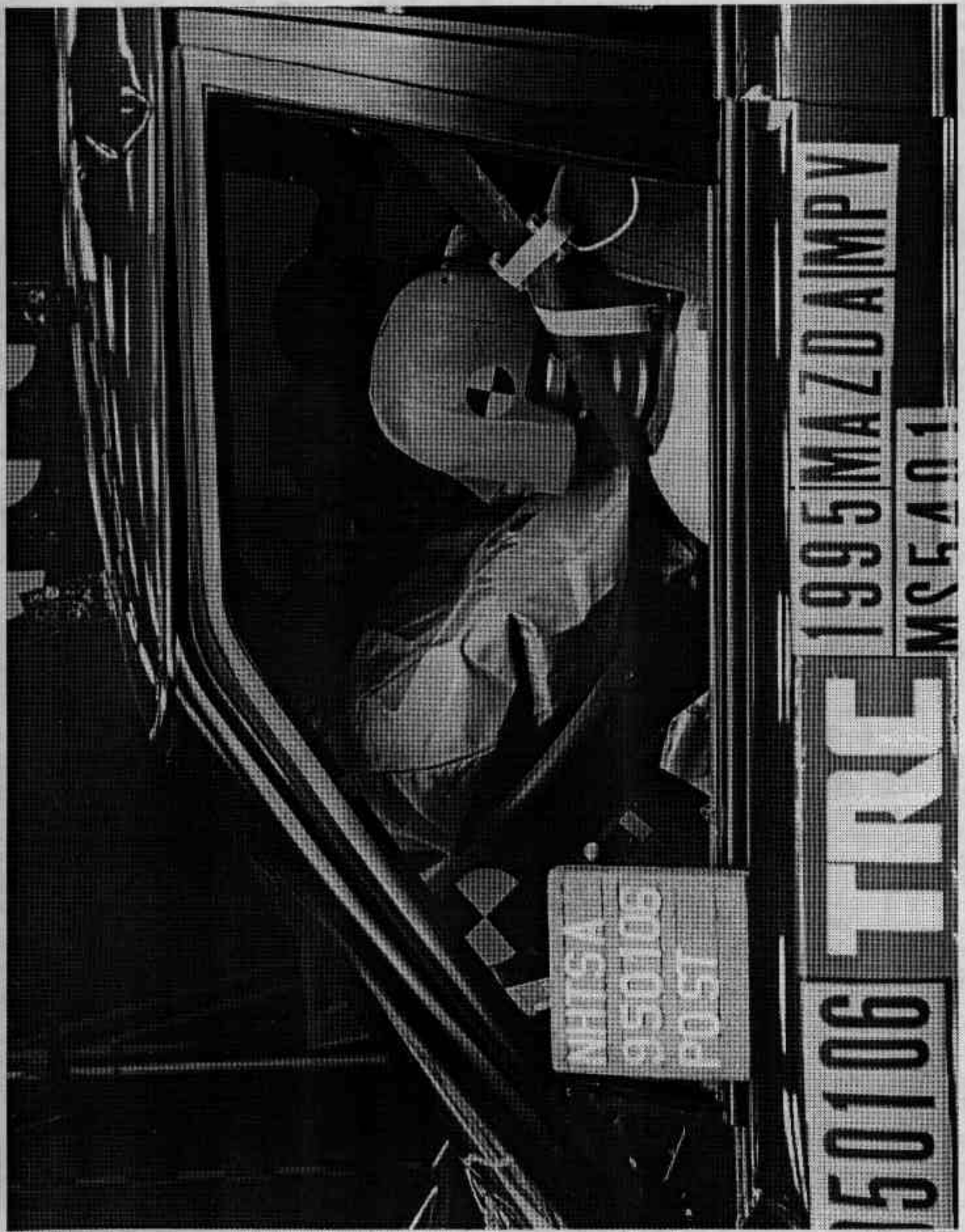


Figure A-29. Post-Test Driver Dummy Position View
A-30

950106

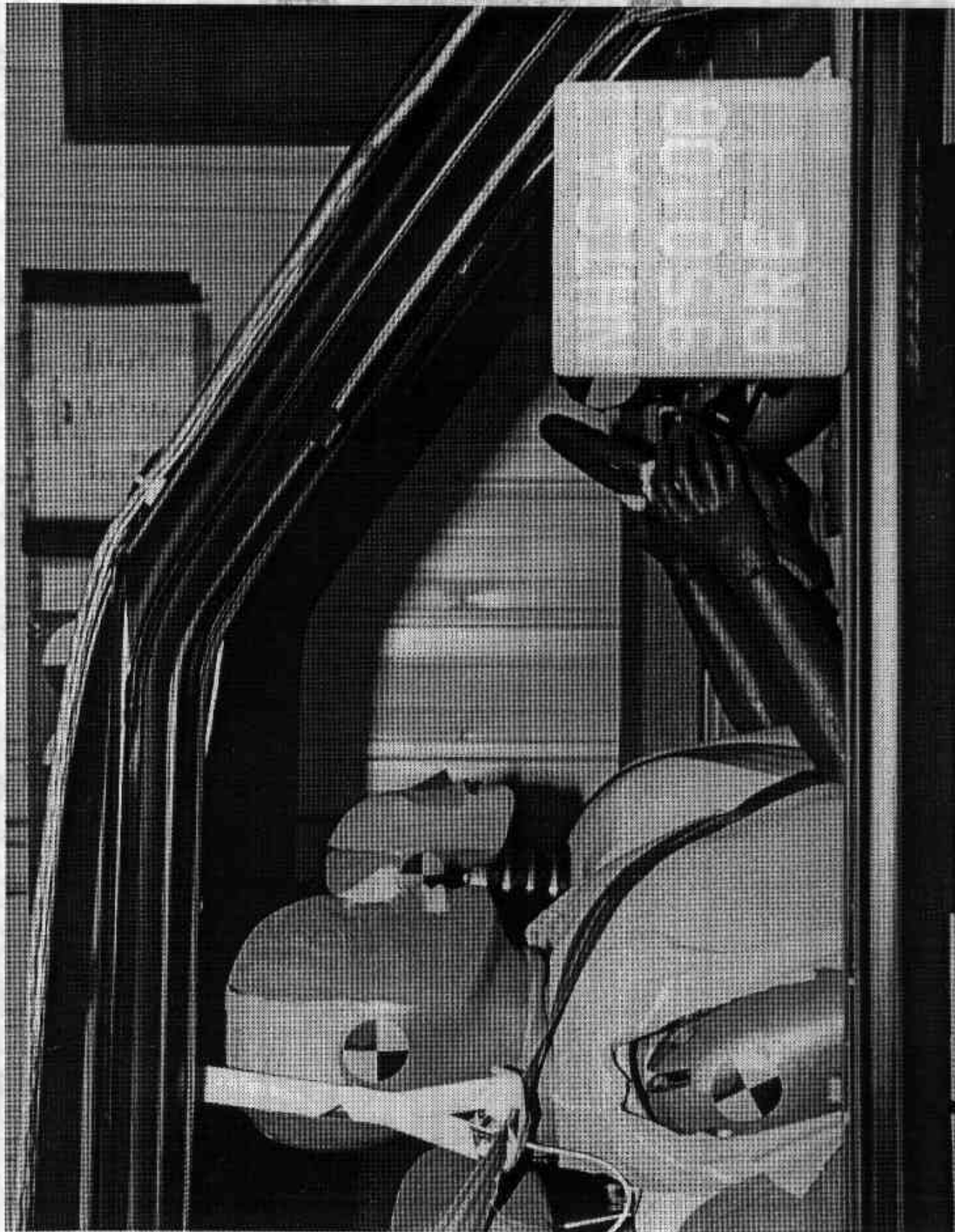


Figure A-30. Pre-Test Passenger Dummy Position View
A-31

950106

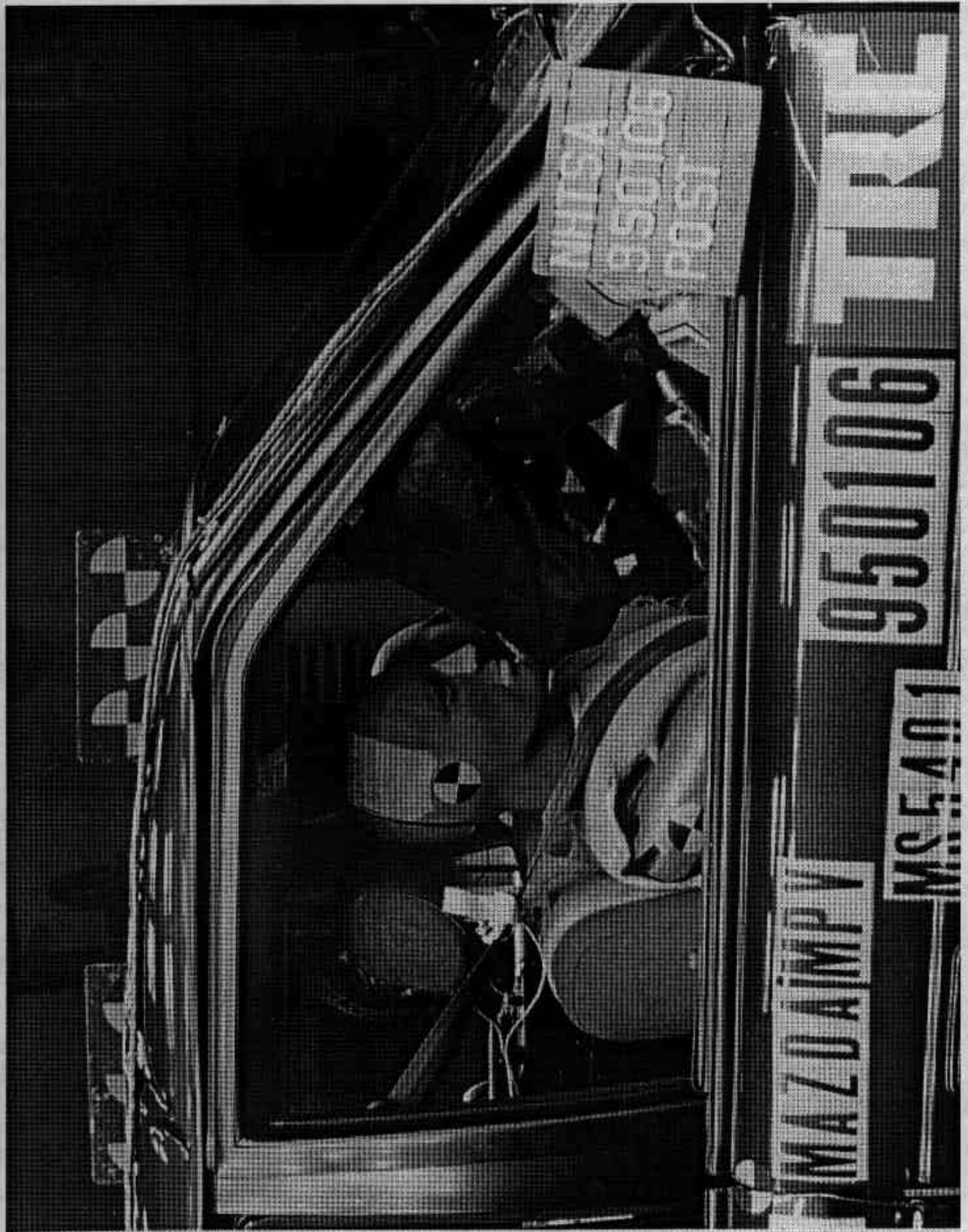


Figure A-31. Post-Test Passenger Dummy Position View
A-32

950106



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

A-33

950106



Figure A-33. Post-Test Driver Dummy & Vehicle Interior - View 1

A-34

950106

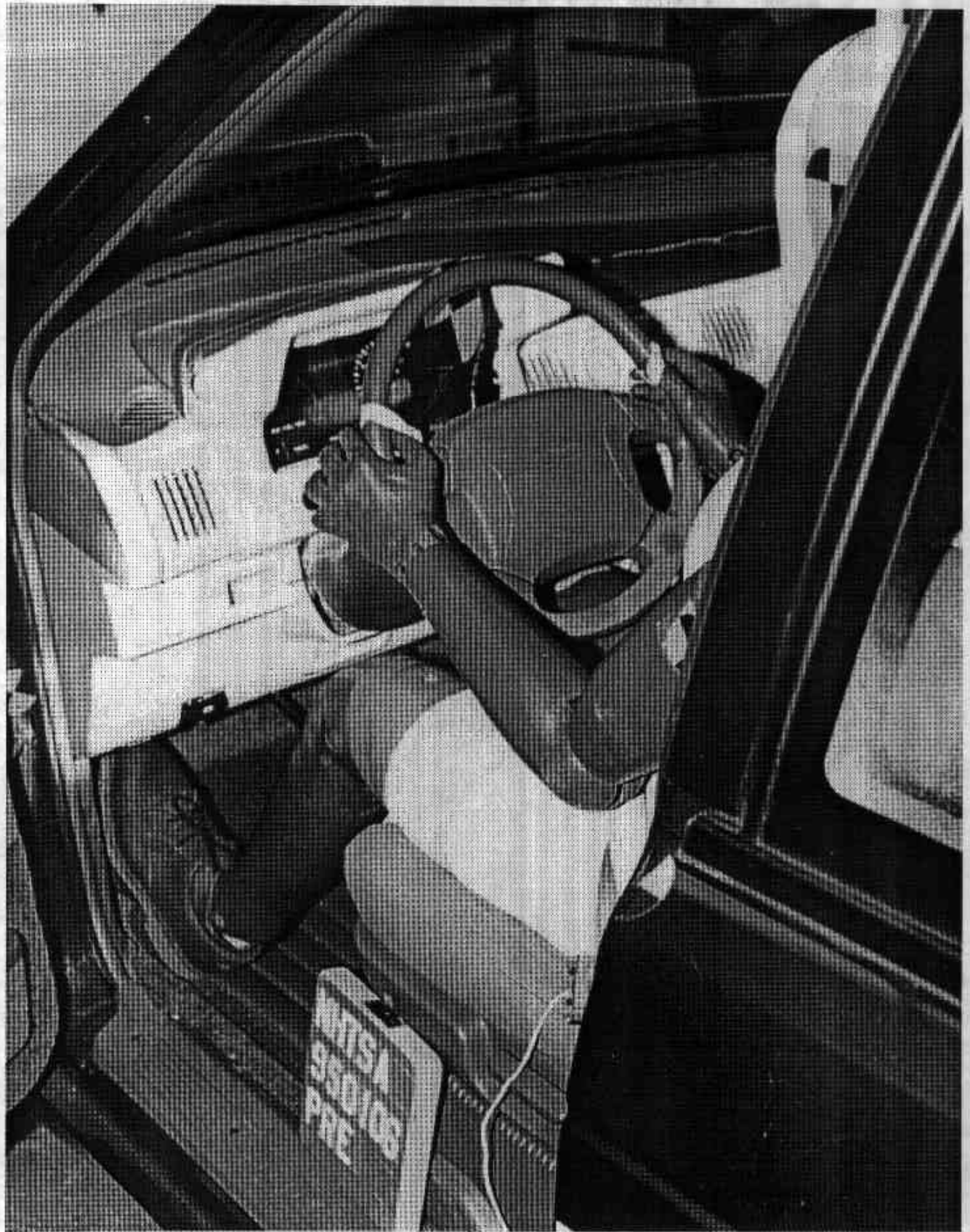


Figure A-34. Pre-Test Driver Dummy & Vehicle Interior - View 2

A-35

950106

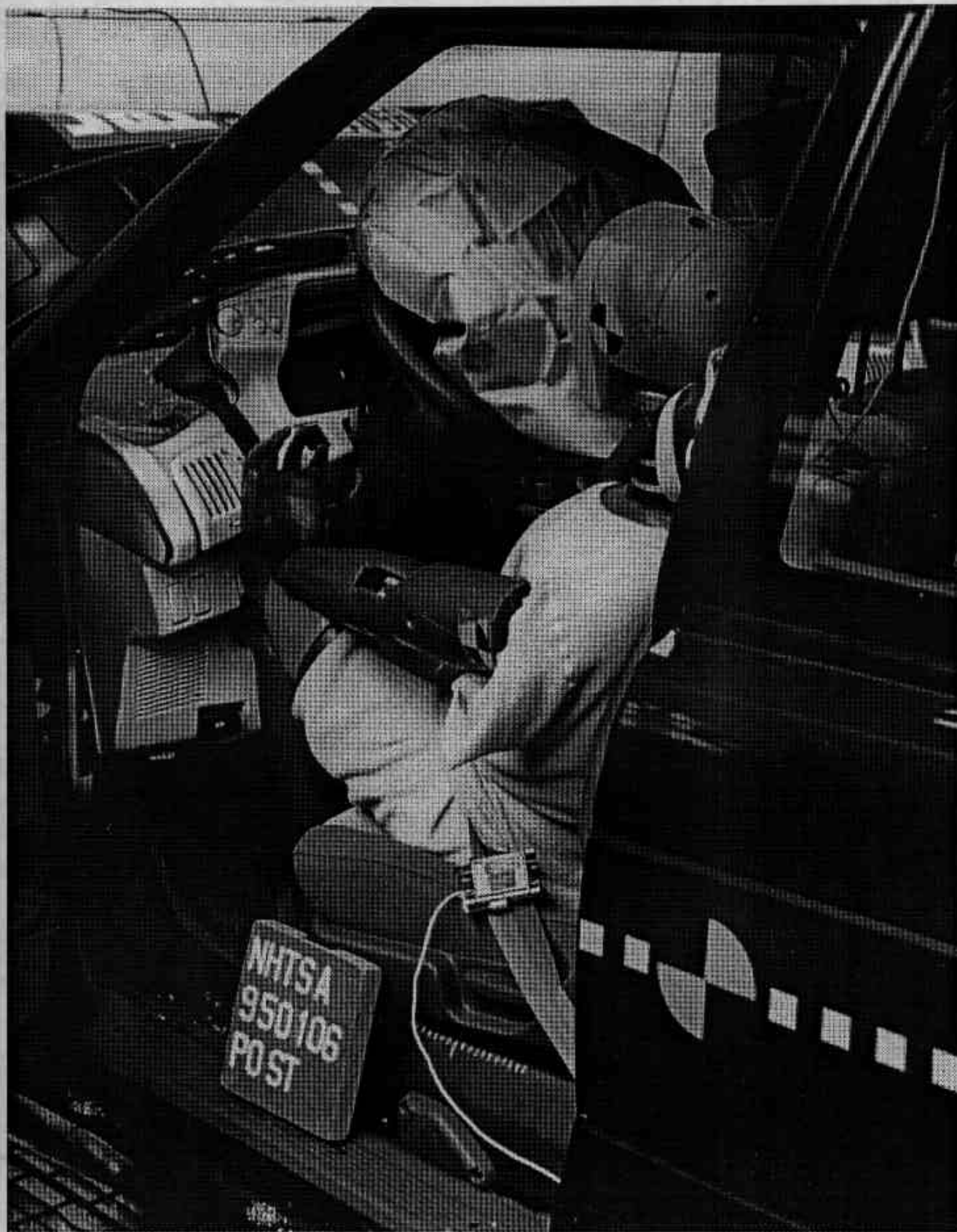


Figure A-35. Post-Test Driver Dummy & Vehicle Interior - View 2

A-36

950106



Figure A-36. Pre-Test Passenger Dummy & Vehicle Interior - View 1

A-37

950106

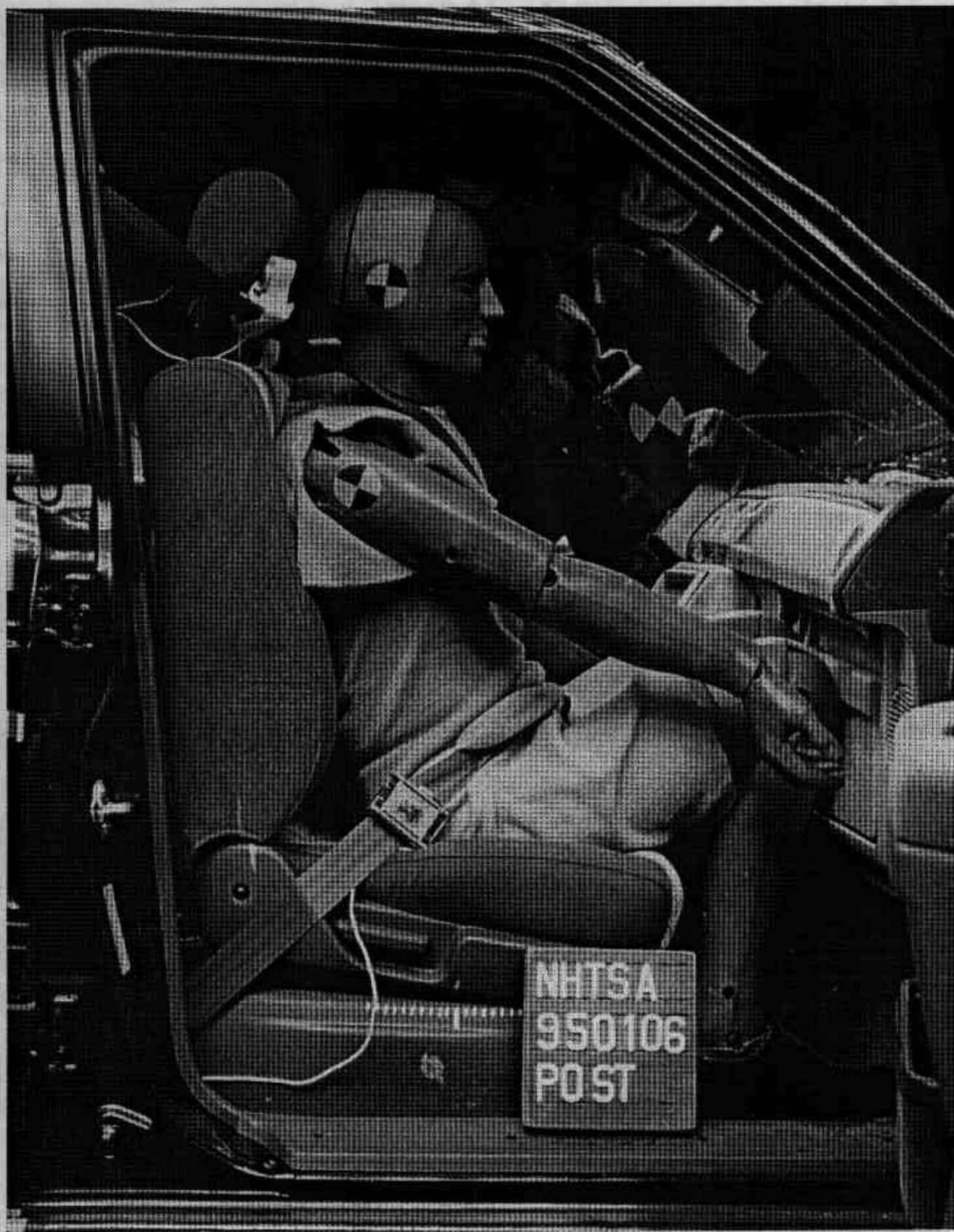


Figure A-37. Post-Test Passenger Dummy & Vehicle Interior - View 1

A-38

950106



Figure A-38. Pre-Test Passenger Dummy & Vehicle Interior - View 2

A-39

950106



Figure A-39. Post-Test Passenger Dummy & Vehicle Interior - View 2

A-40

950106

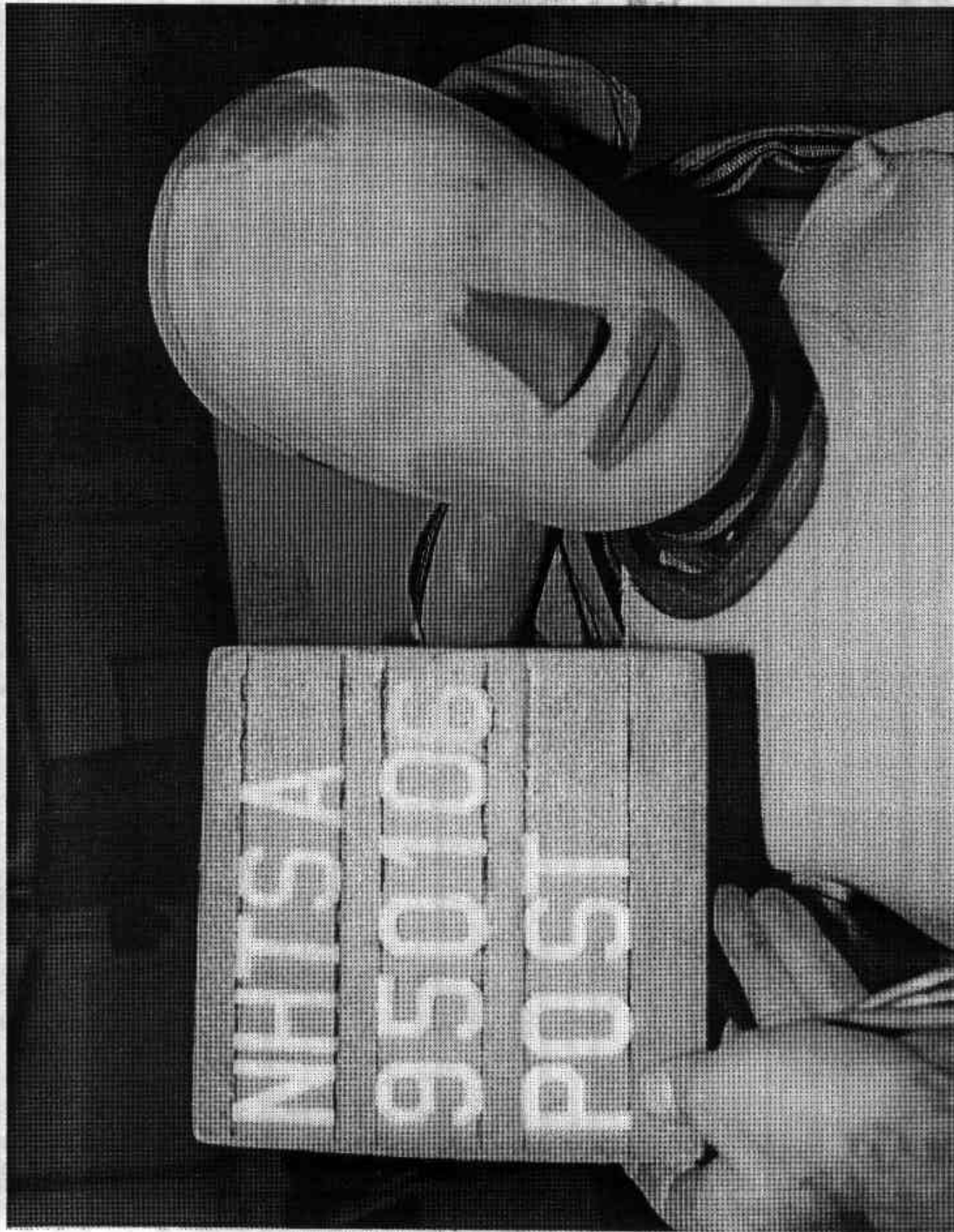


Figure A-40. Post-Test Driver Dummy Head Contact - View 1
A-41

950106

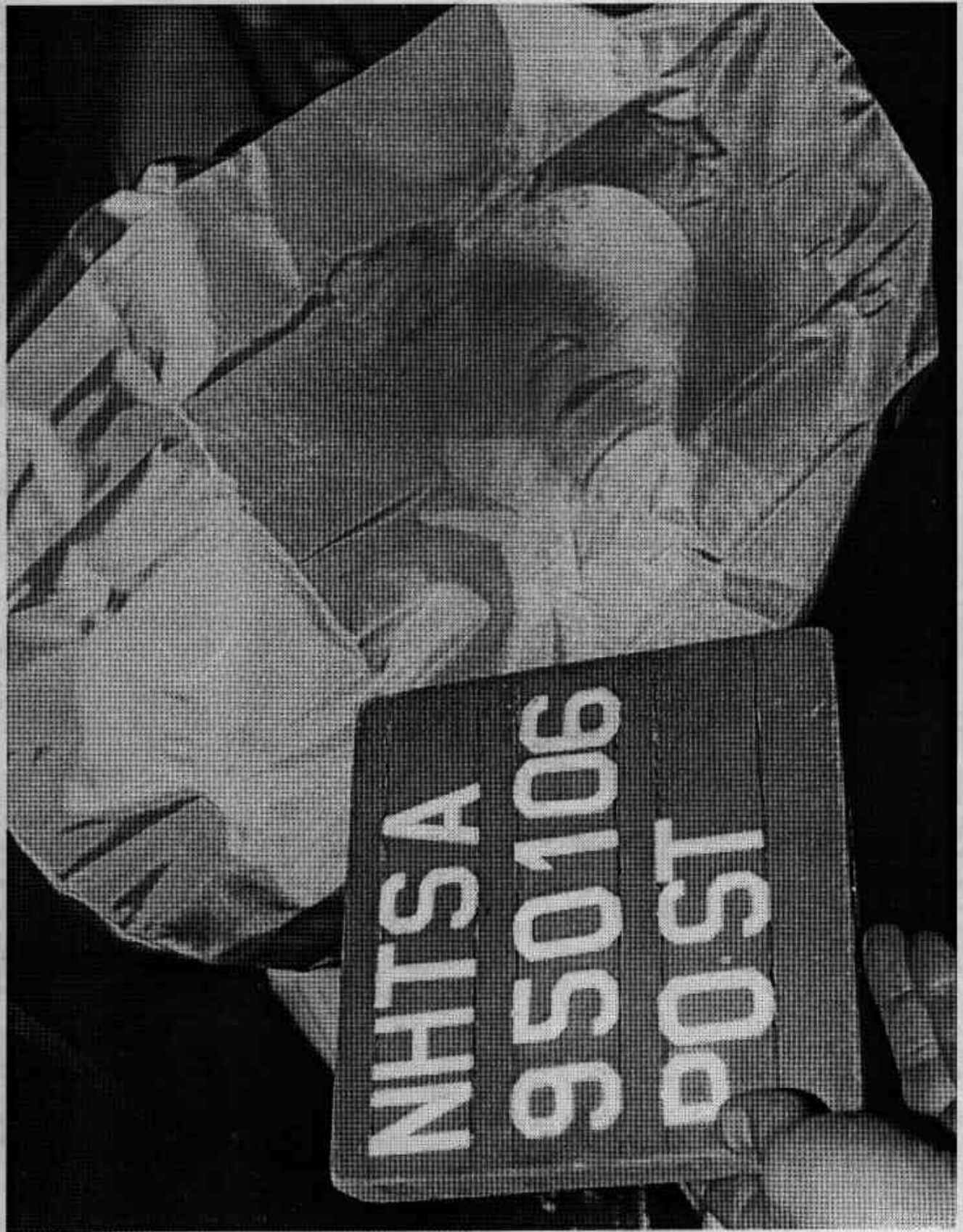


Figure A-41. Post-Test Driver Dummy Head Contact - View 2
A-42

950106

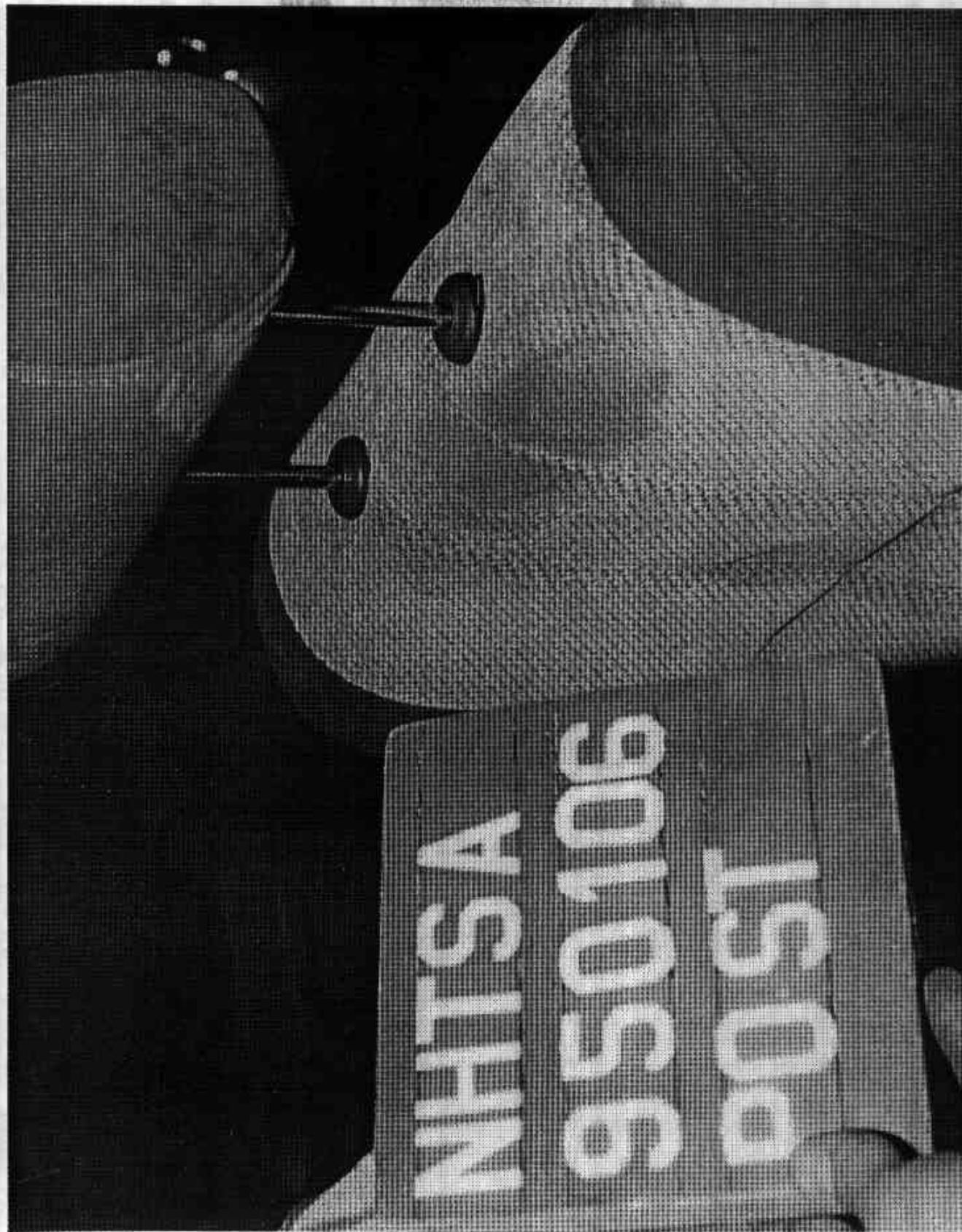


Figure A-42. Post-Test Driver Dummy Head Contact - View 3
A-43

950106



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

A-44

950106

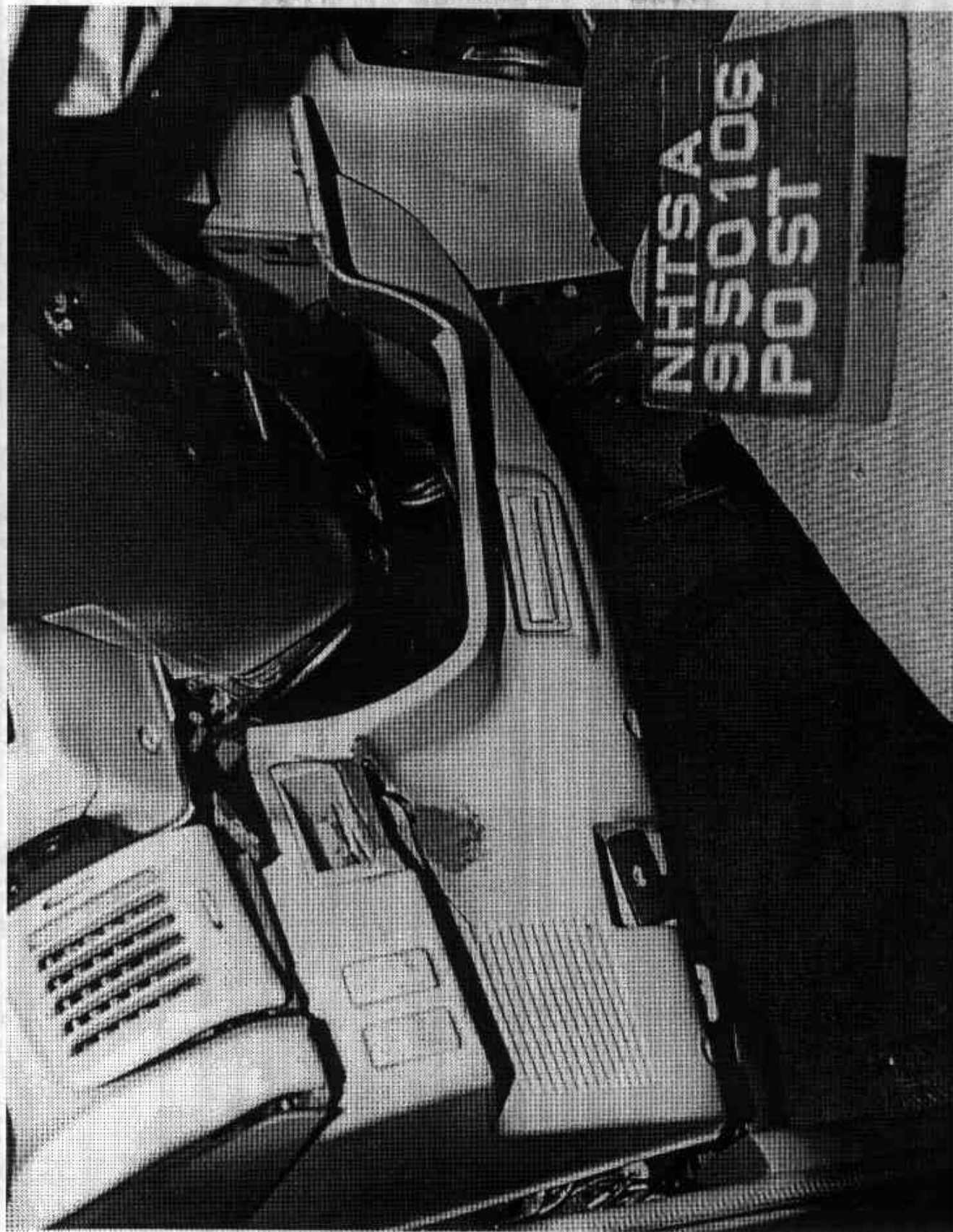


Figure A-44. Post-Test Driver Dummy Knee Contact - View 2

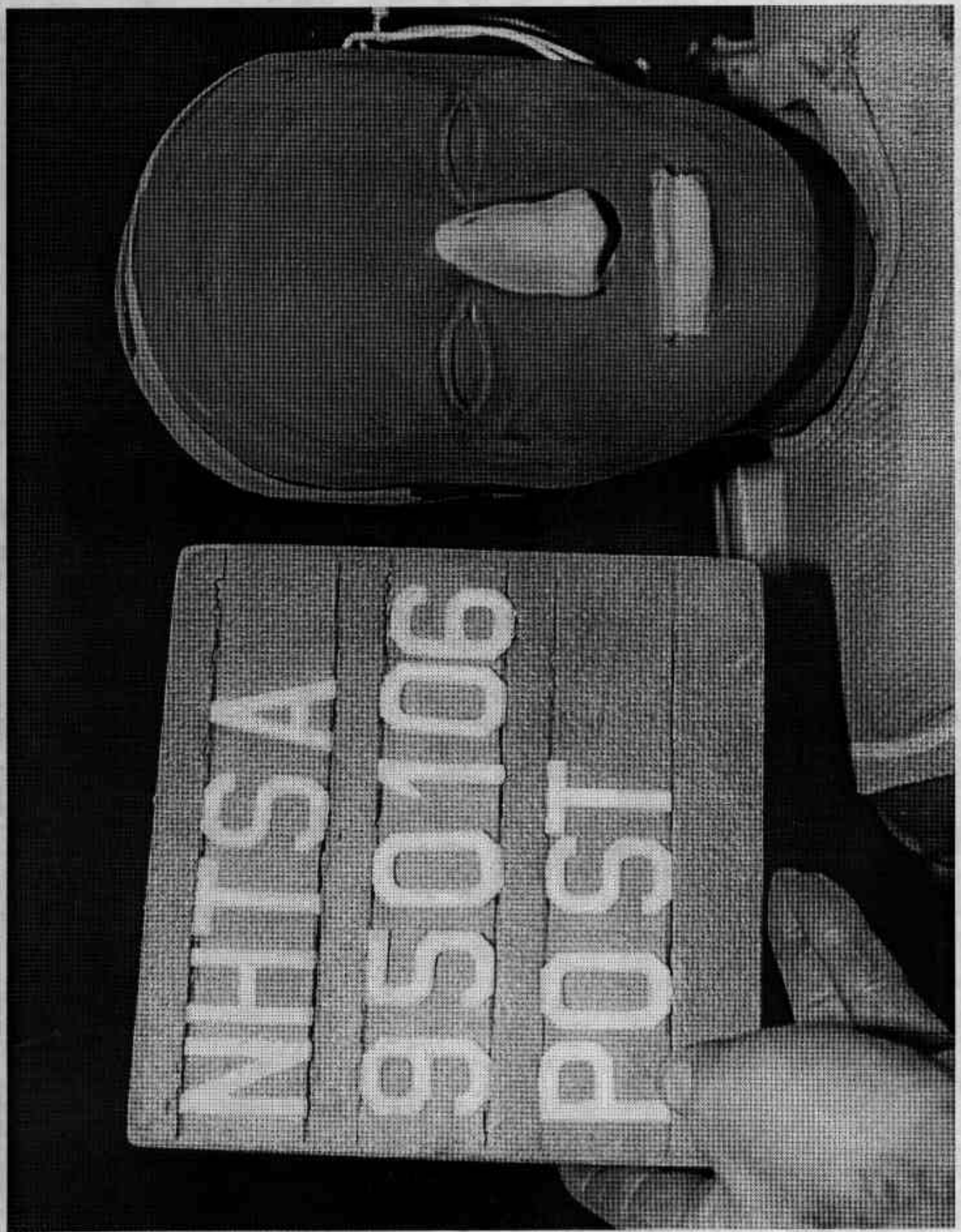


Figure A-45. Post-Test Passenger Dummy Head Contact View
A-46

950106



Figure A-46. Post-Test Passenger Dummy Knee Contact - View 1

A-47

950106



Figure A-47, Post-Test Passenger Dummy Knee Contact - View 2
A-48

950106

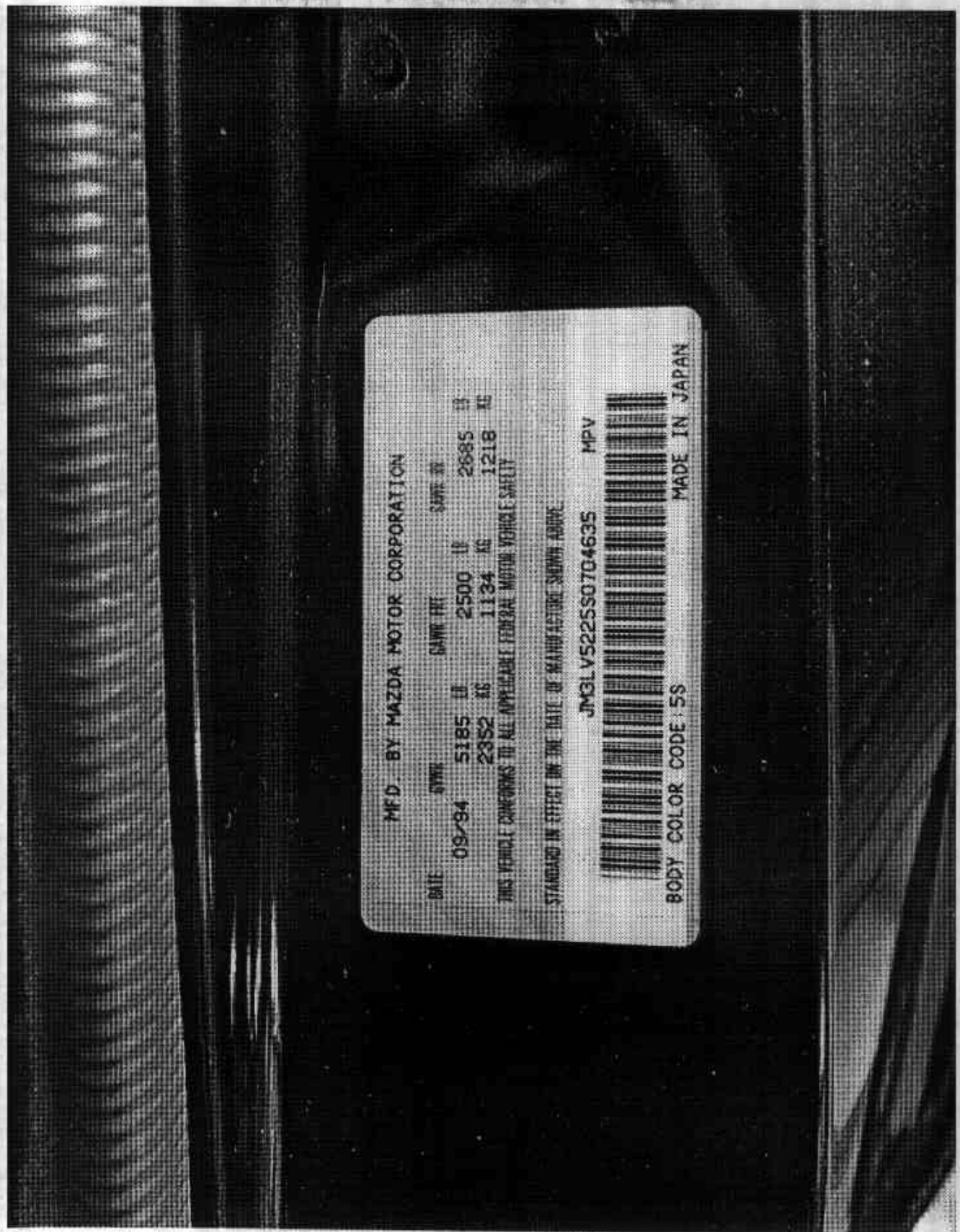


Figure A-48. Pre-Test Vehicle Certification Label View
A-49

950106

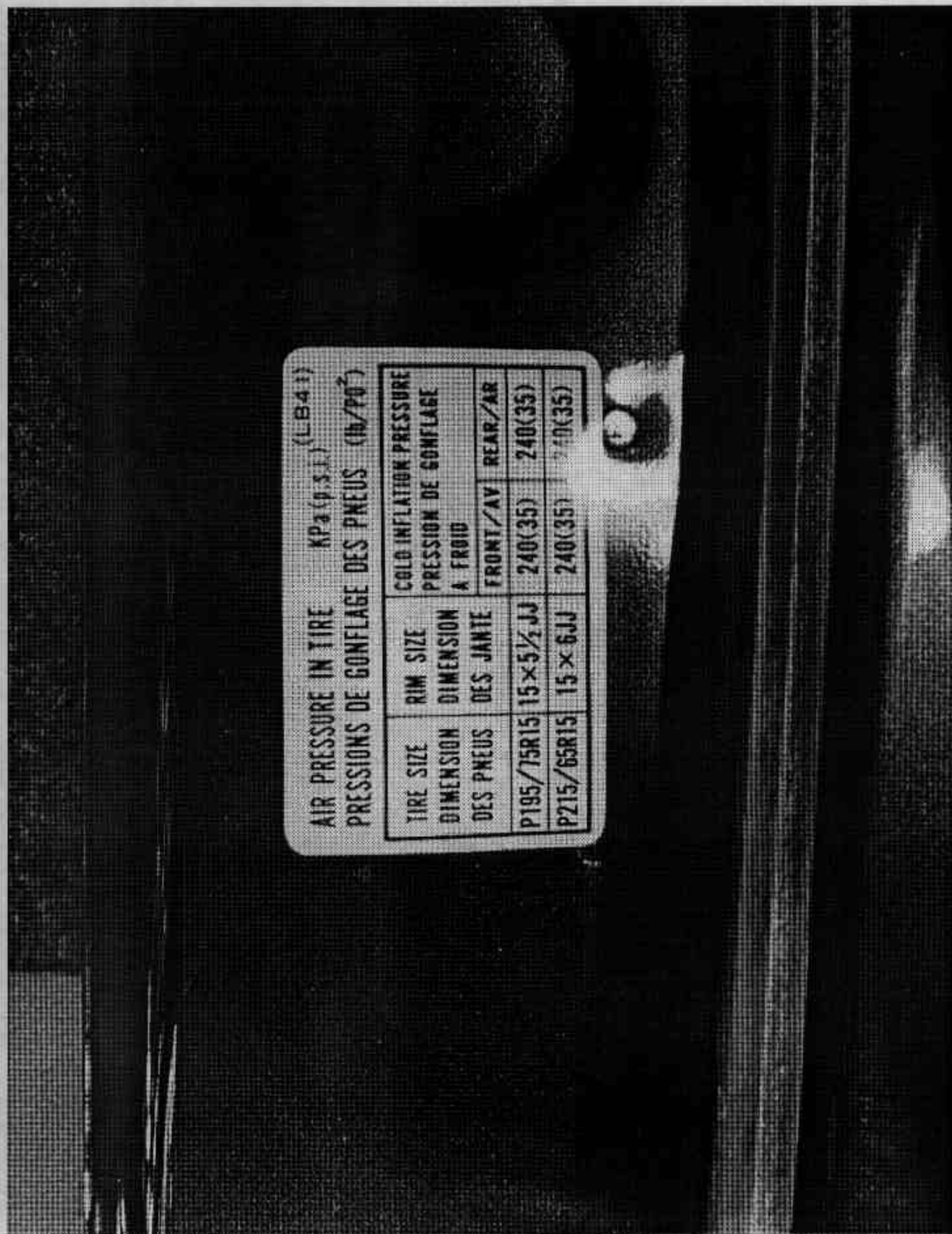


Figure A-49. Pre-Test Vehicle Recommended Tire Pressure Label View

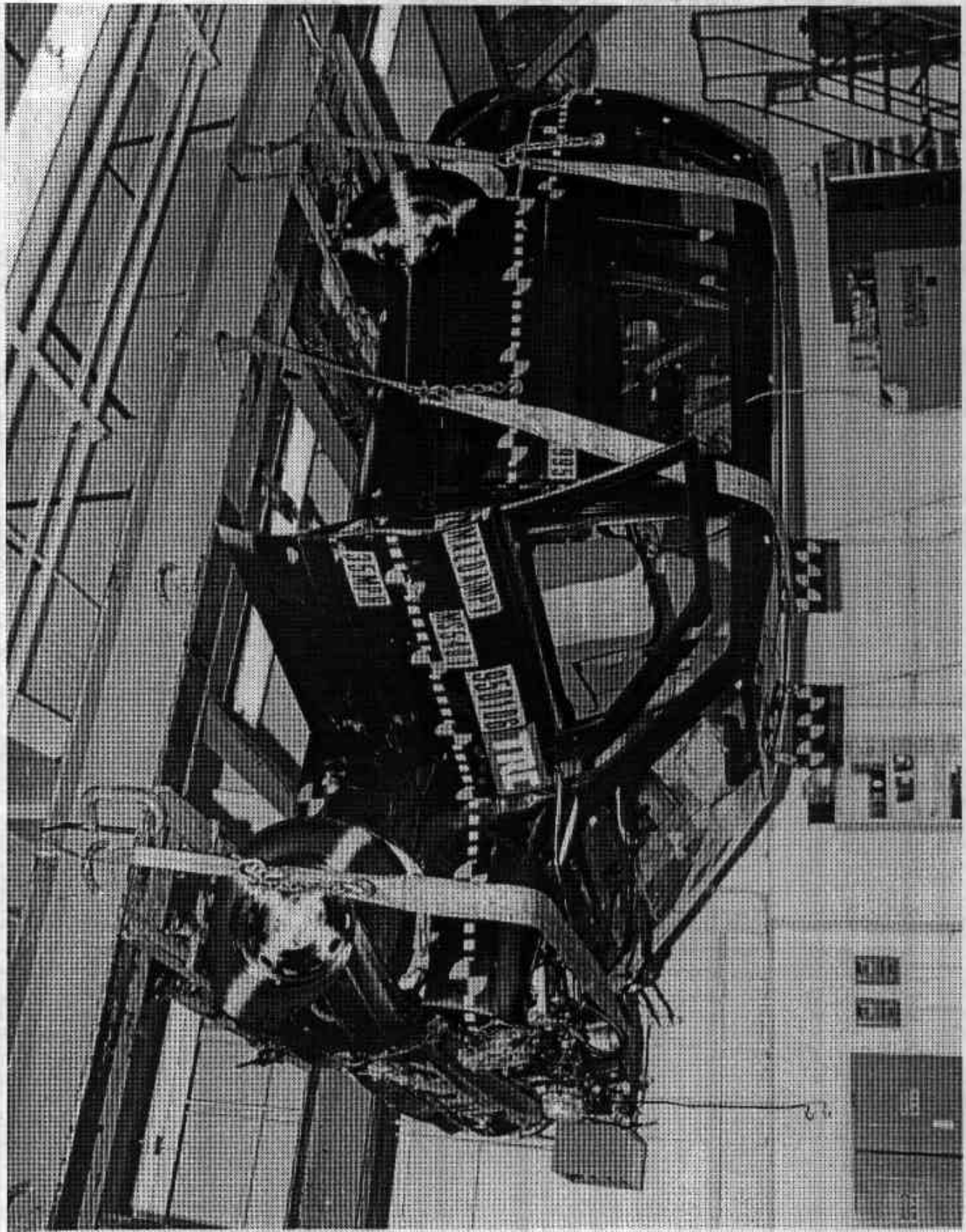


Figure A-50. Post-Test Vehicle on Static Rollover Machine View

A-51

950106

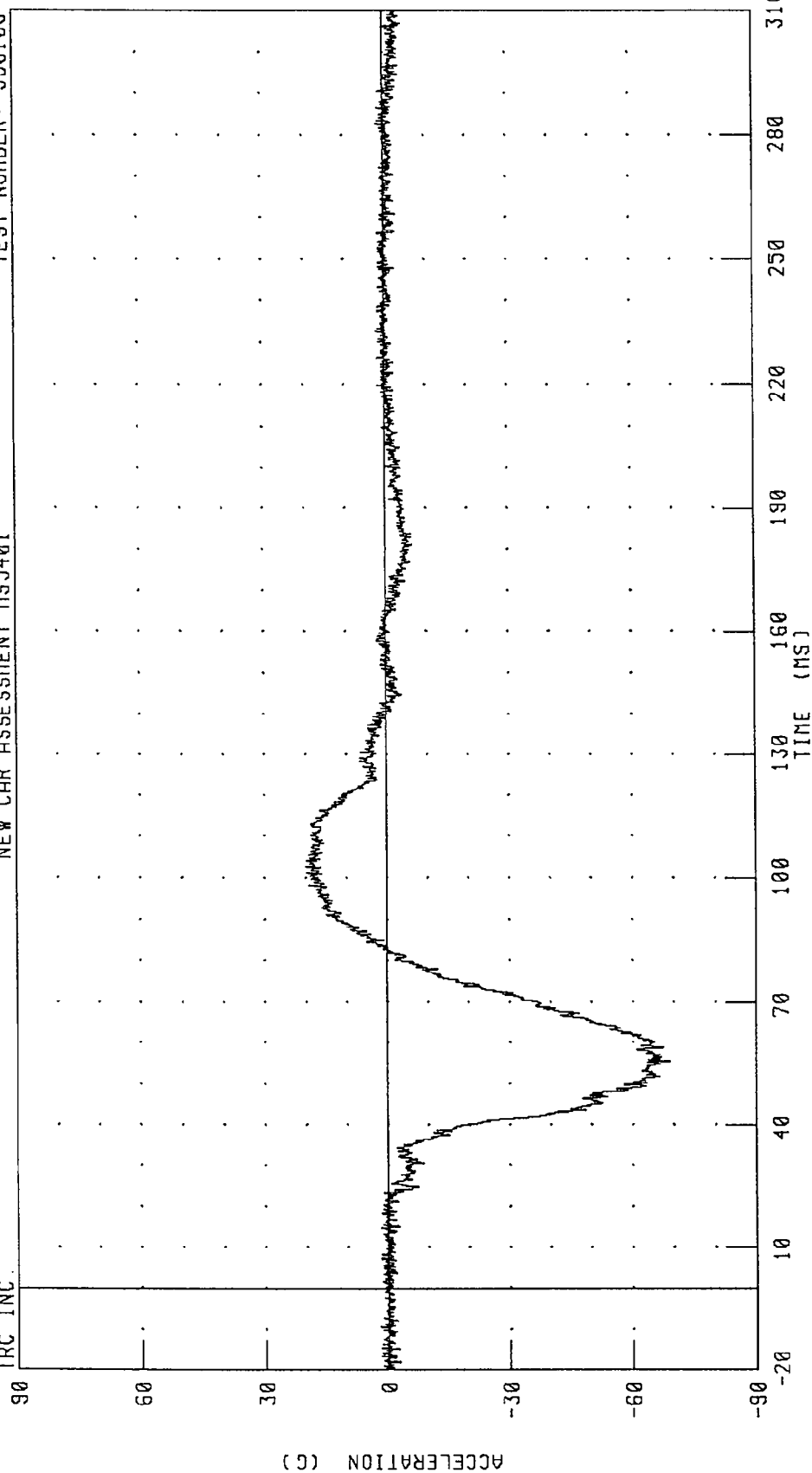
Appendix B

Data Plots

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

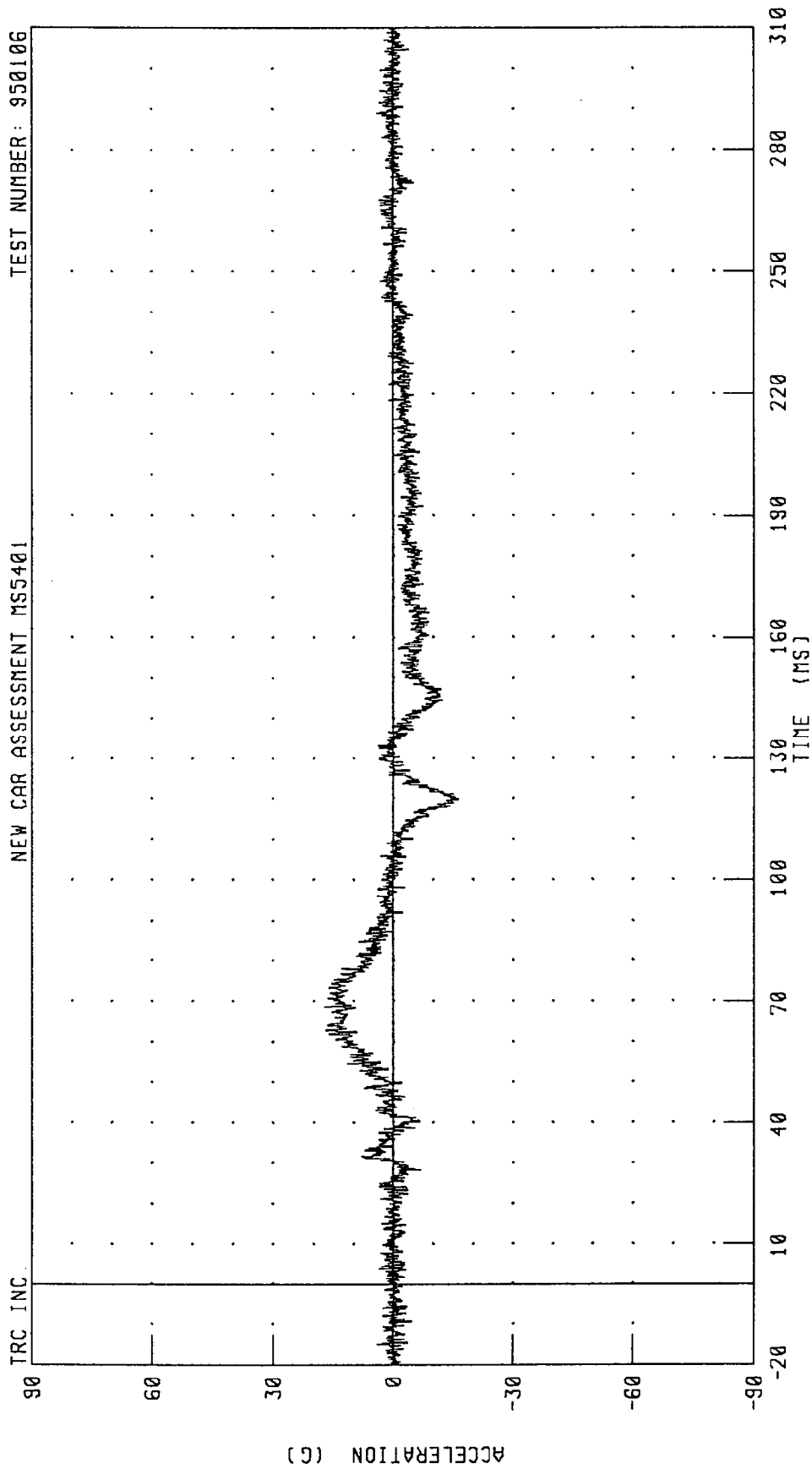


CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

PEAK DATA: 20.18 G @ 102.72 MS; -69.07 G @ 55.36 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



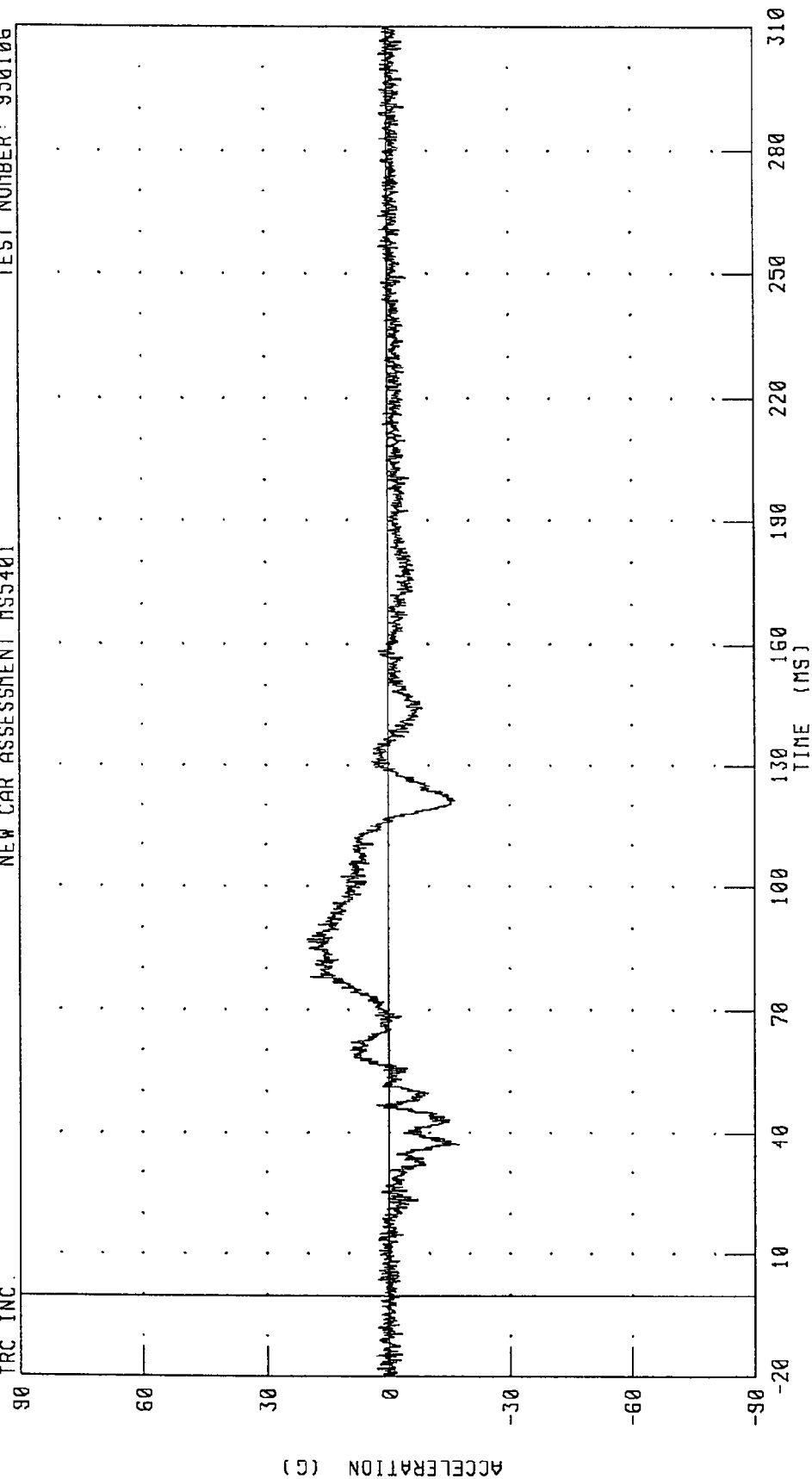
CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

950106

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

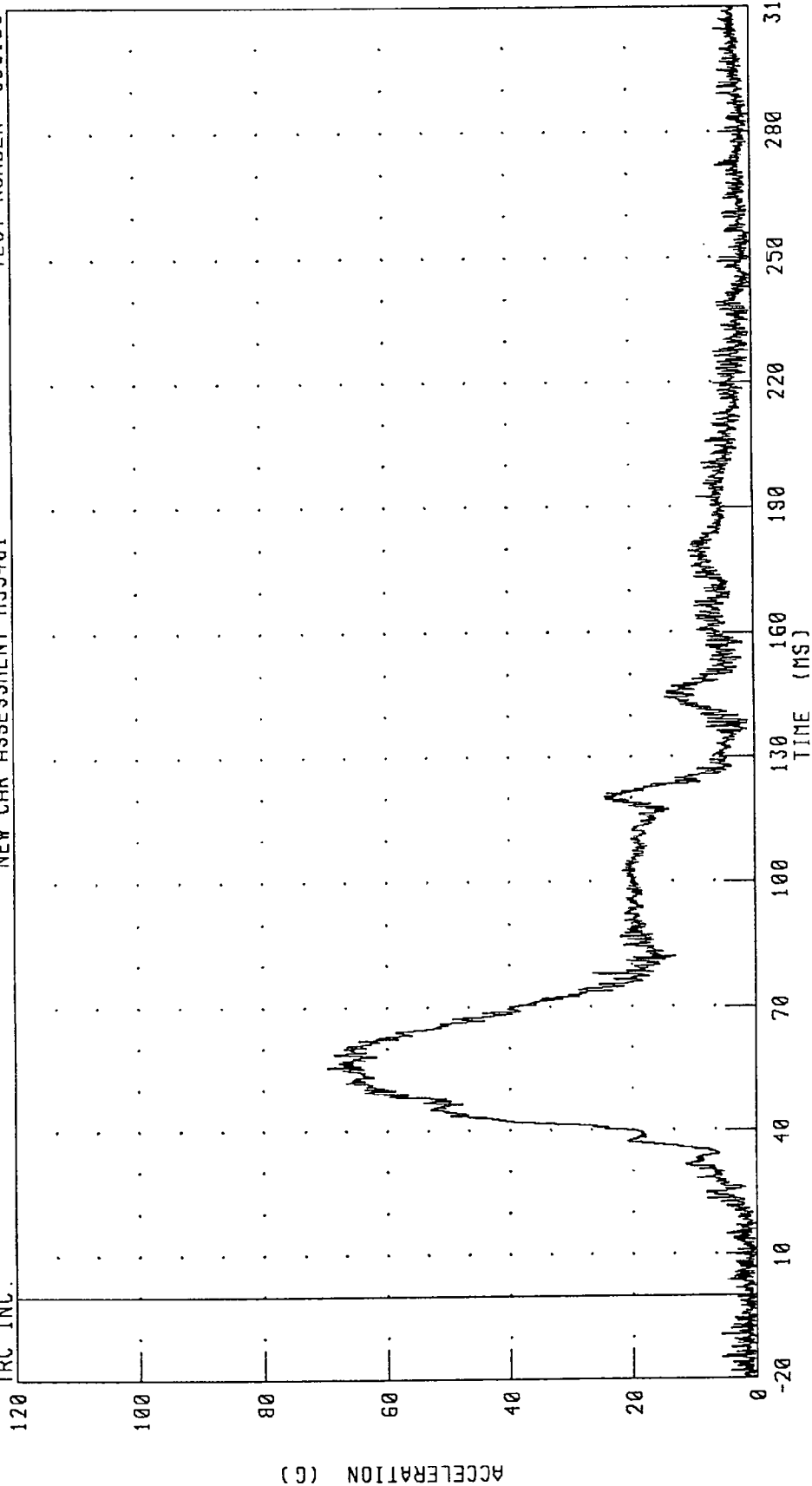
PEAK DATA: 20.13 G @ 87.12 MS, -17.24 G @ 37.12 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

TEST NUMBER: 950106

NEW CAR ASSESSMENT MS5401

TRC INC.



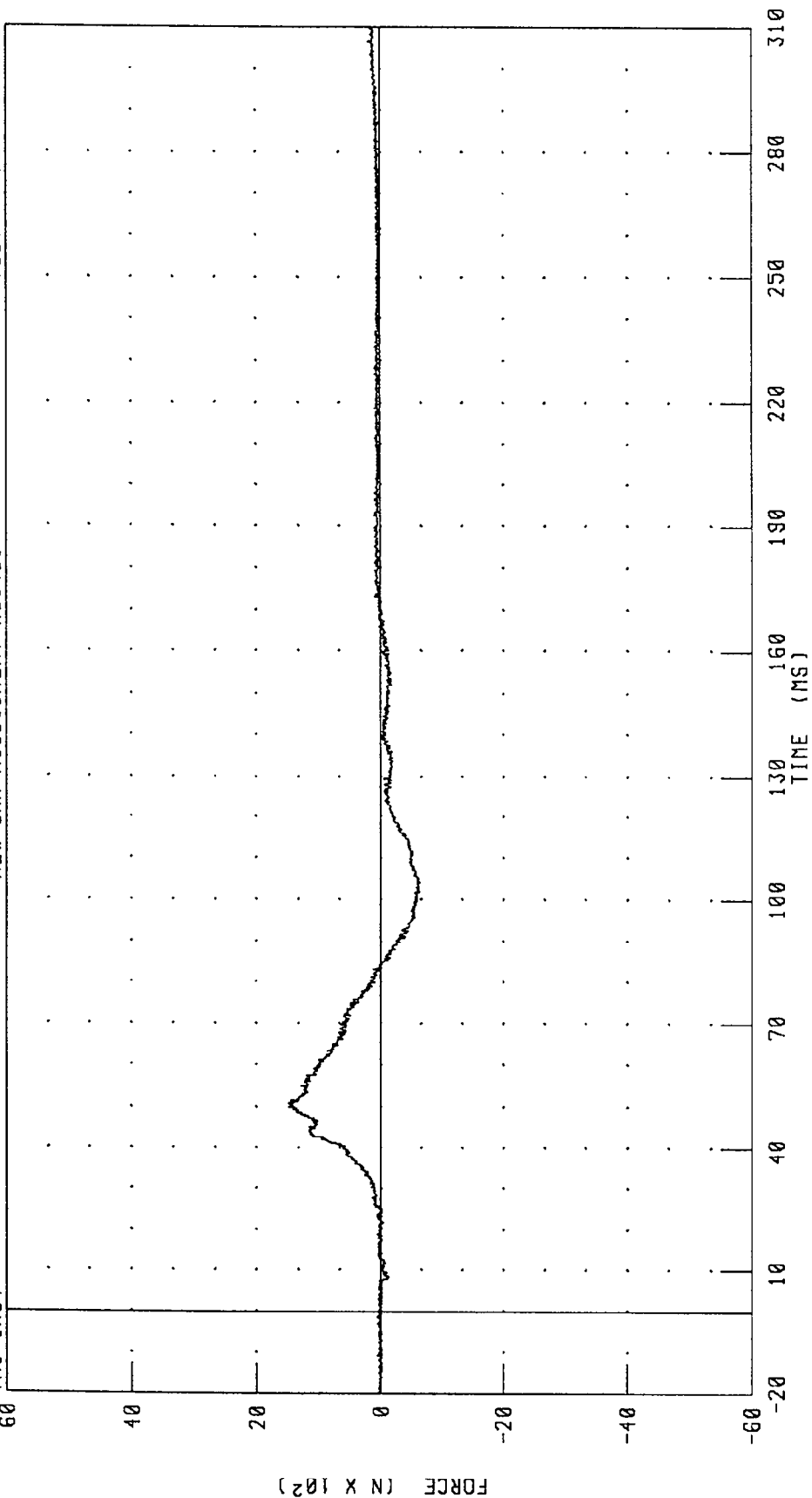
CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

PEAK DATA: 69.71 G @ 55.36 MS; 0.11 G @ 9.44 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK X-AXIS SHEAR FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



PEAK DATA: 1489.25 N @ 50.00 MS; -643.93 N @ 101.92 MS

CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

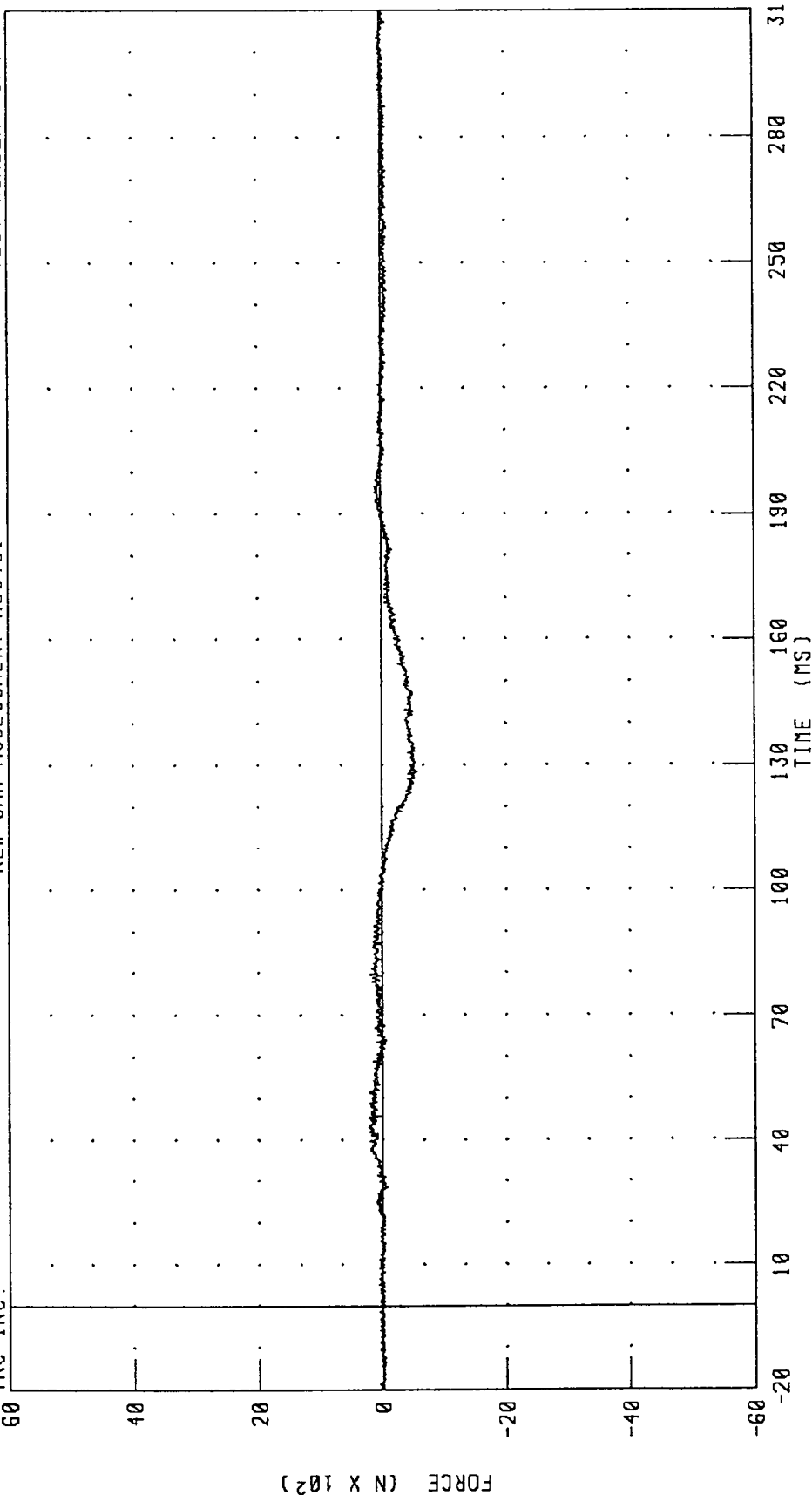
1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER

DRIVER NECK Y-AXIS SHEAR FORCE

NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

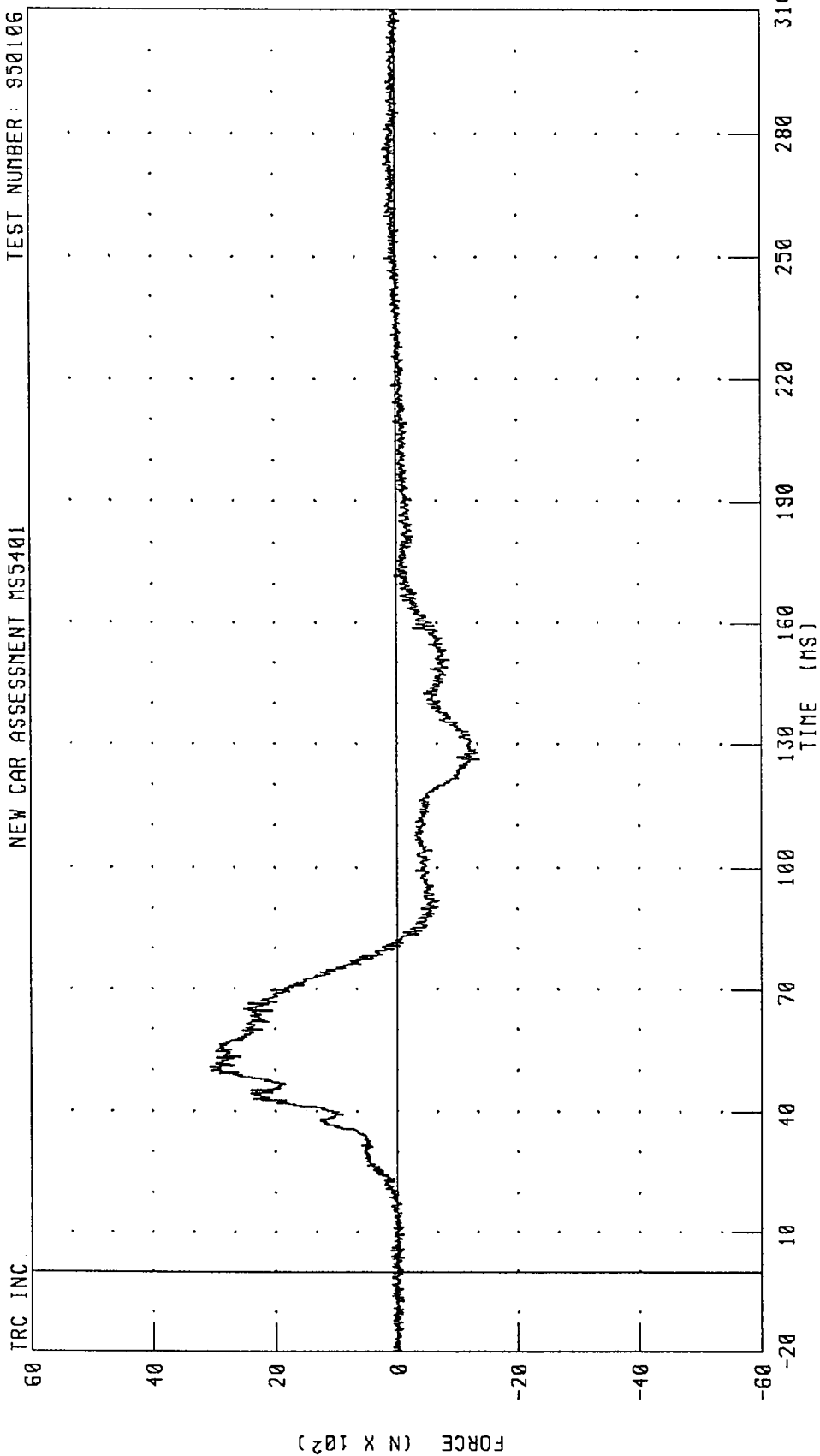


PEAK DATA: 227.04 N @ 45.44 MS; -569.99 N @ 128.32 MS

CHANNEL: NEKYF1 FILTER: CH. CLASS 1000

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK Z-AXIS AXIAL FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



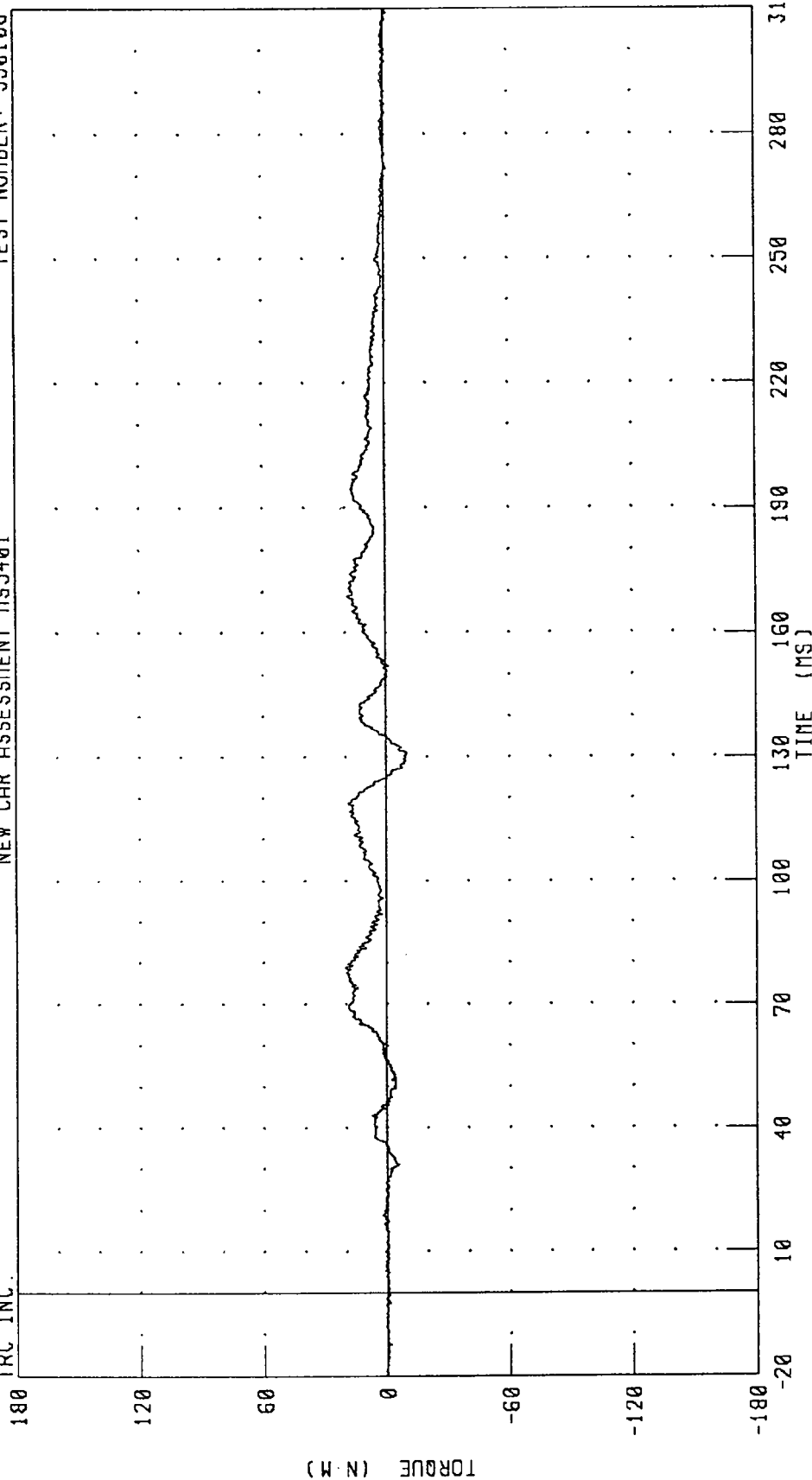
CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

PEAK DATA: 3065.96 N @ 50.80 MS; -1345.35 N @ 126.24 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK MOMENT ABOUT X AXIS
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



PEAK DATA: 20.14 N-M @ 78.88 MS, -10.28 N-M @ 130.88 MS

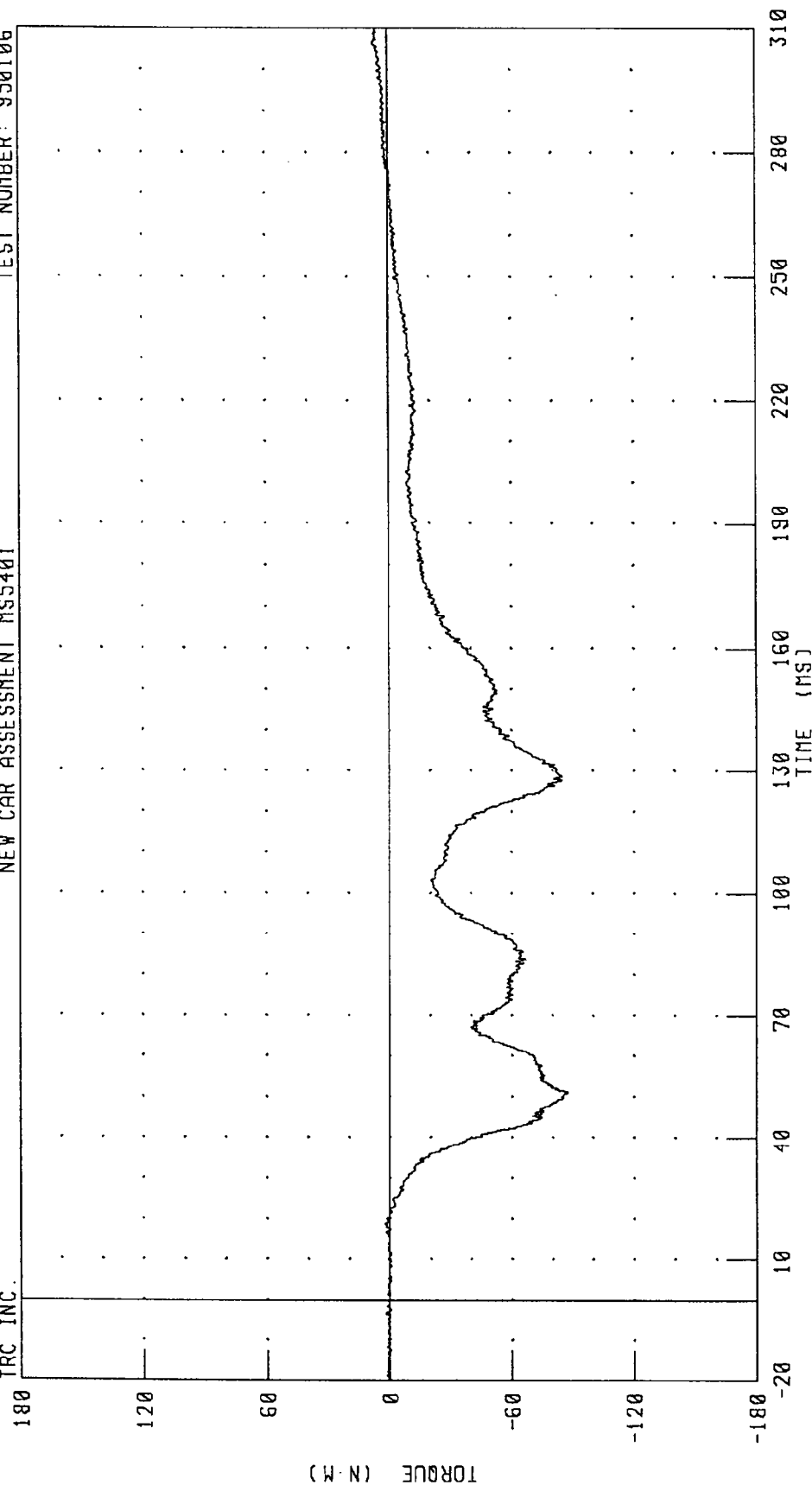
CHANNEL: NEKXMI FILTER: CH. CLASS 600

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Y AXIS

TEST NUMBER: 950106

NEW CAR ASSESSMENT MS5401

TRC INC.

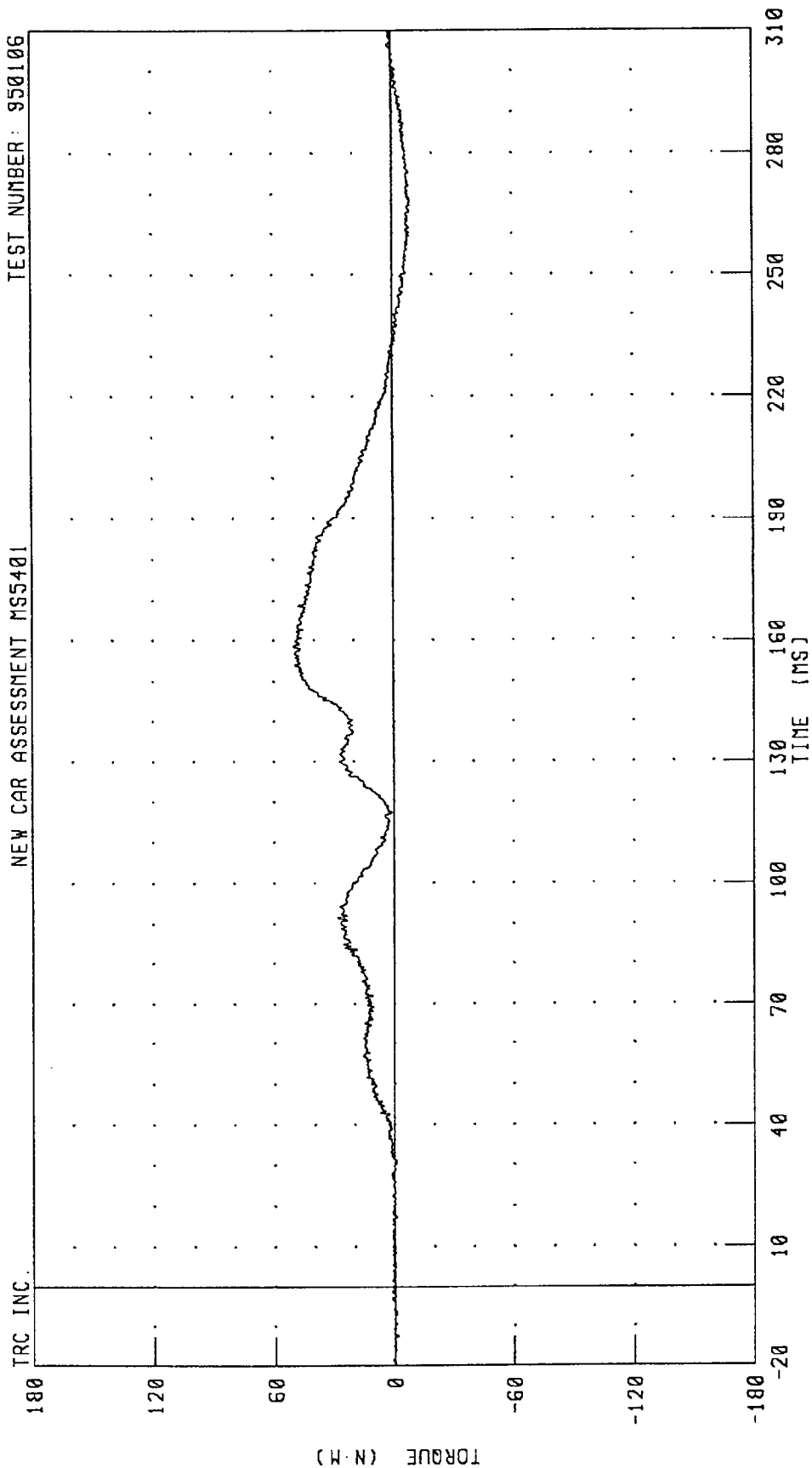


PEAK DATA: 7.28 N-M @ 306.48 MS, -87.19 N-M @ 51.04 MS

CHANNEL: NEKYM1 FILTER: CH. CLASS 600

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK MOMENT ABOUT Z AXIS
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

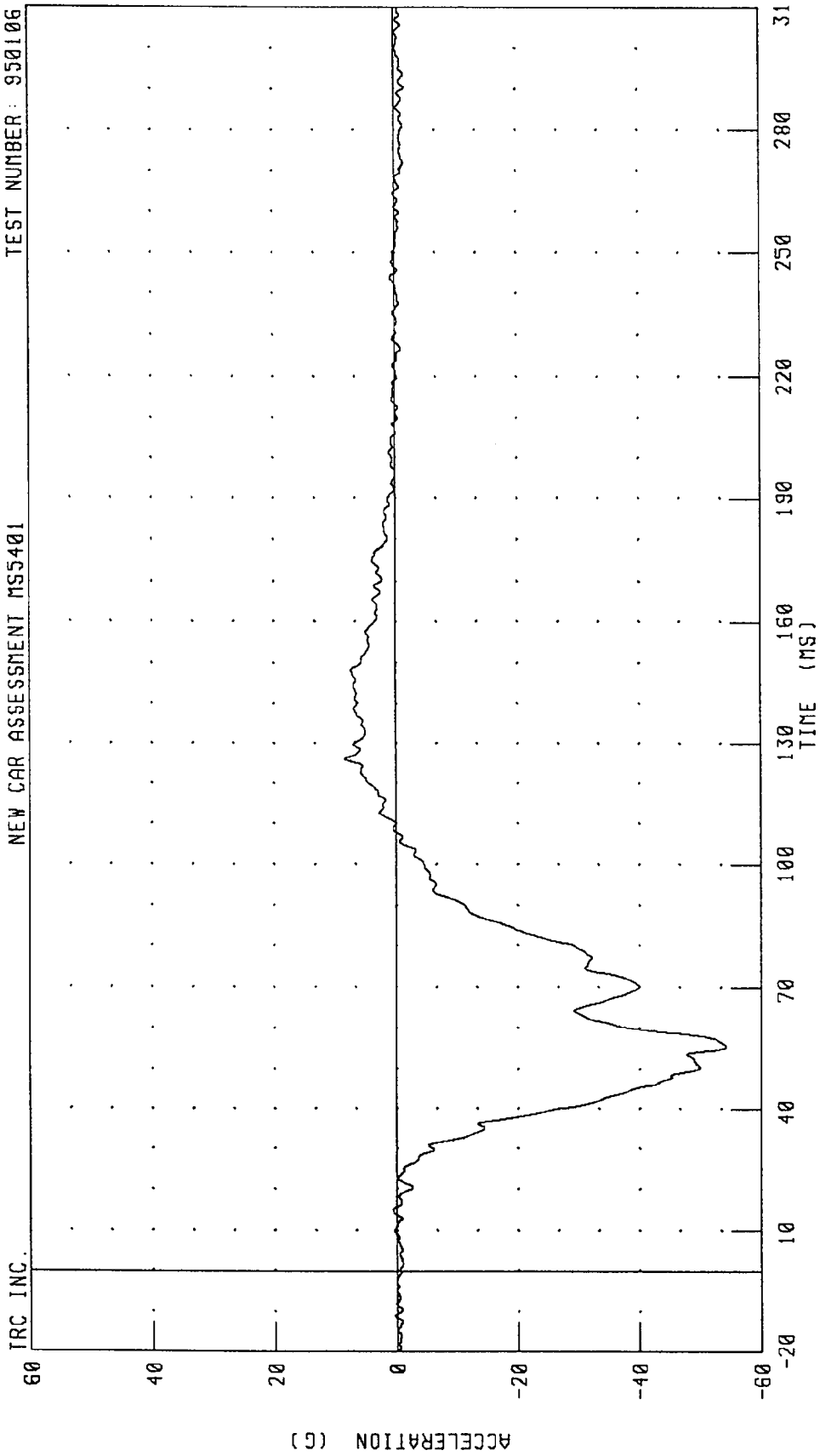


PEAK DATA: 50.30 N.M @ 158.64 MS; -9.19 N.M @ 268.40 MS

CHANNEL: NEKZM1 FILTER: CH. CLASS 600

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

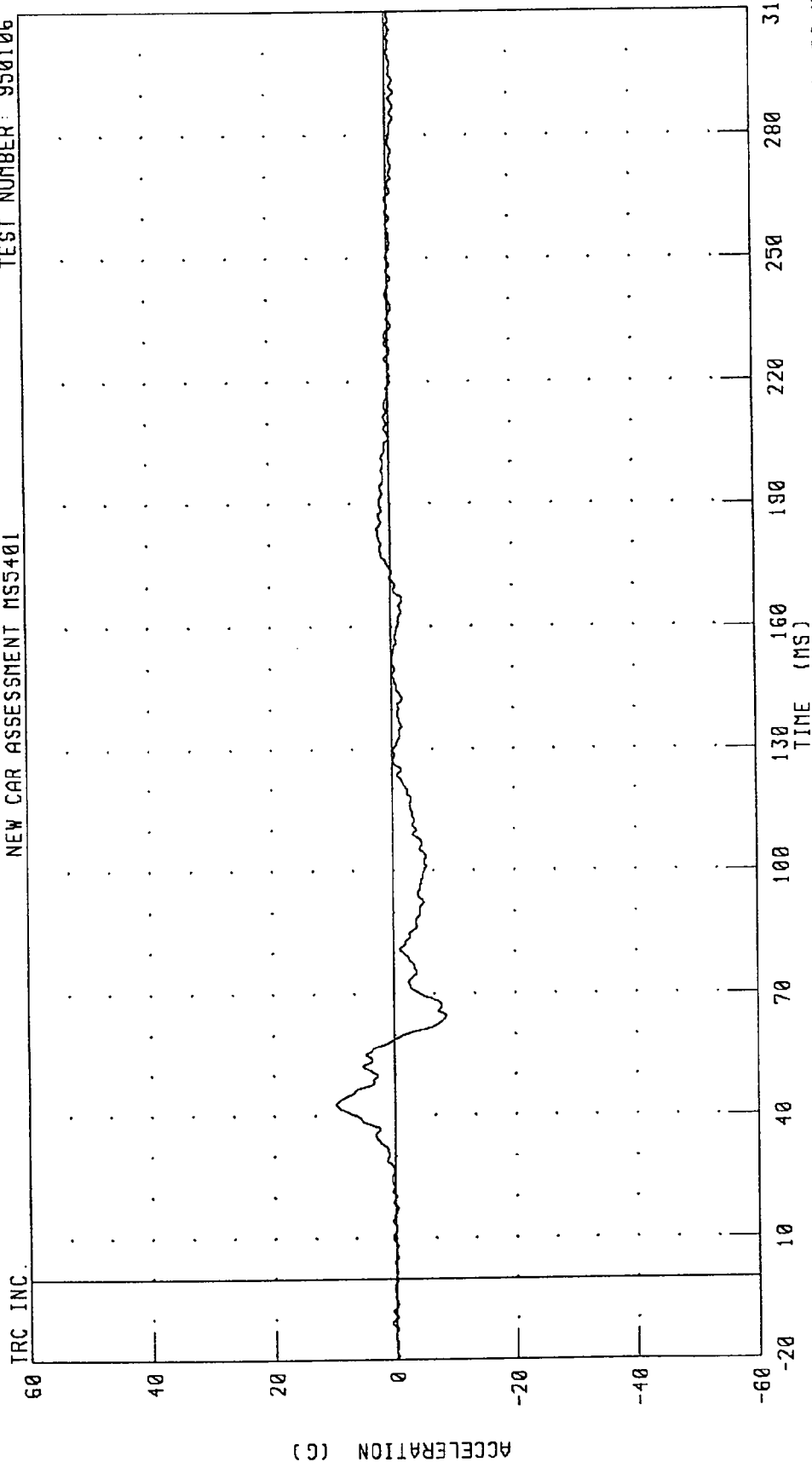


CHANNEL: CSTXG1 FILTER: CH. CLASS 180

PEAK DATA: 8.47 G @ 126.08 MS; -54.21 G @ 55.60 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



CHANNEL: CSTYG1 FILTER: CH. CLASS 180

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

60

40

20

ACCELERATION (G)

0

-20

-40

-60

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

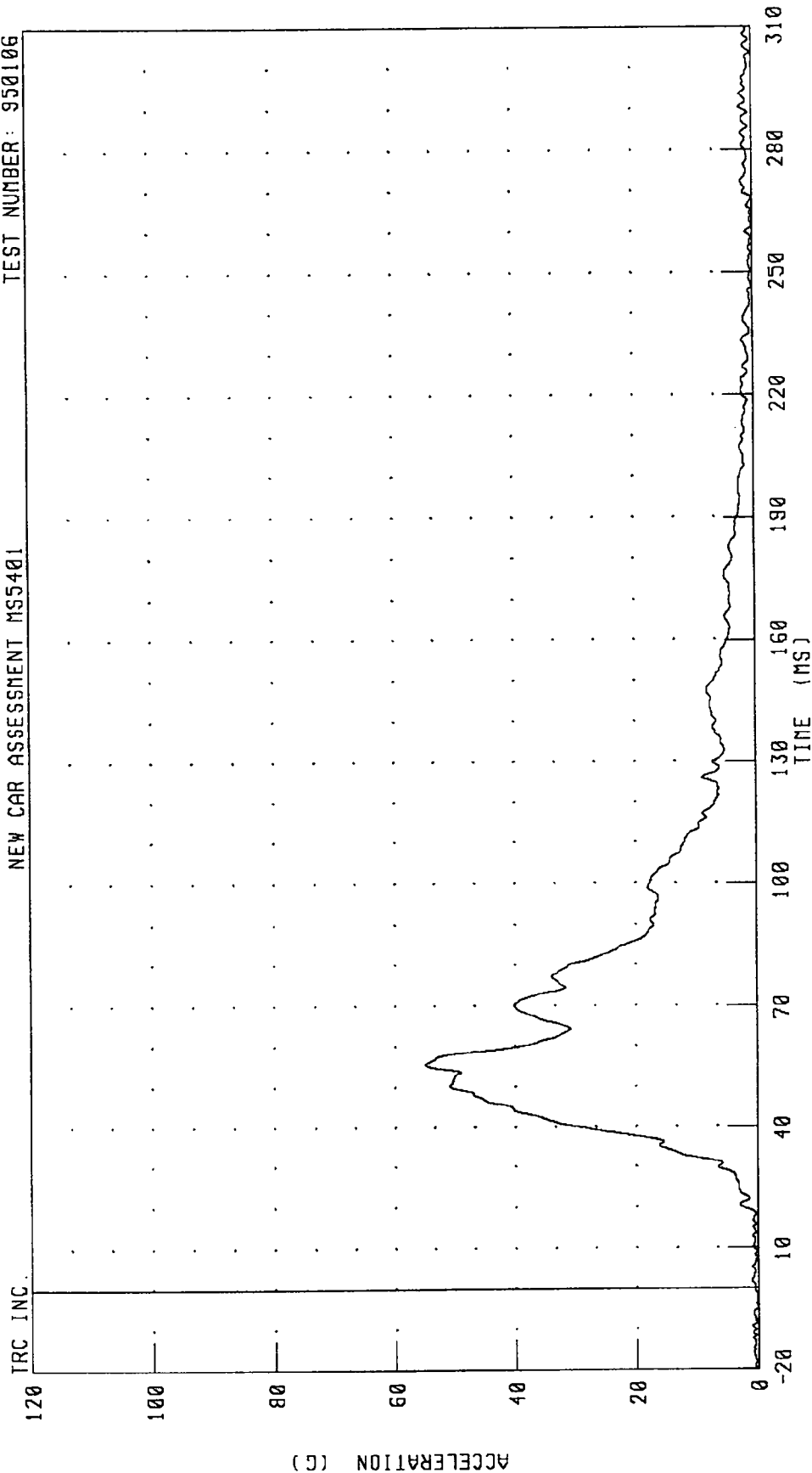
CHANNEL: CSTZG1 FILTER: CH. CLASS 180

PEAK DATA: 16.64 G @ 99.04 MS, -11.92 G @ 48.00 MS

950106

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



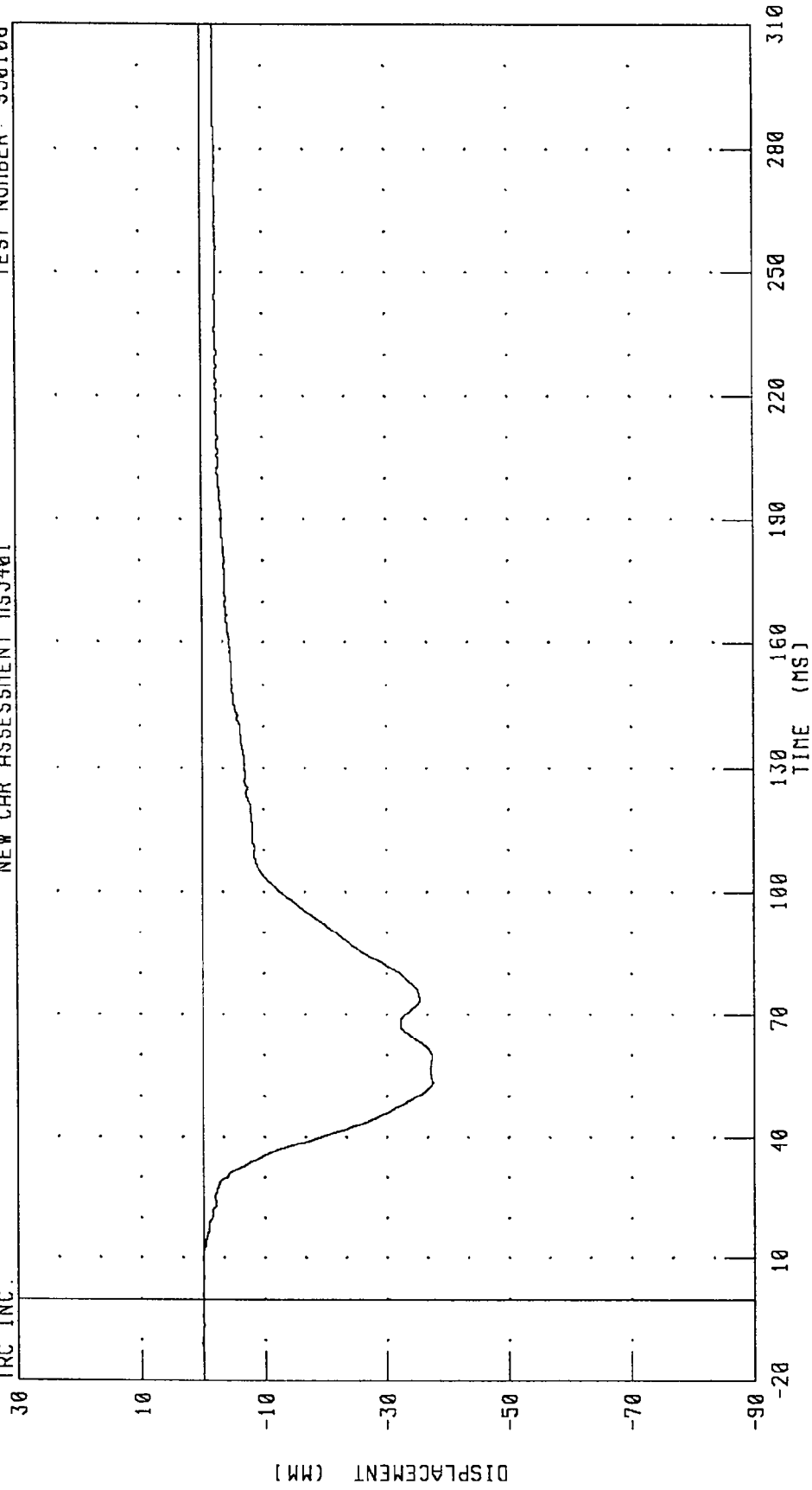
PEAK DATA: 54.90 G @ 55.52 MS; 0.04 G @ 246.48 MS

CHANNEL: CSTRG1 FILTER: CH. CLASS 180

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST DEFLECTION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

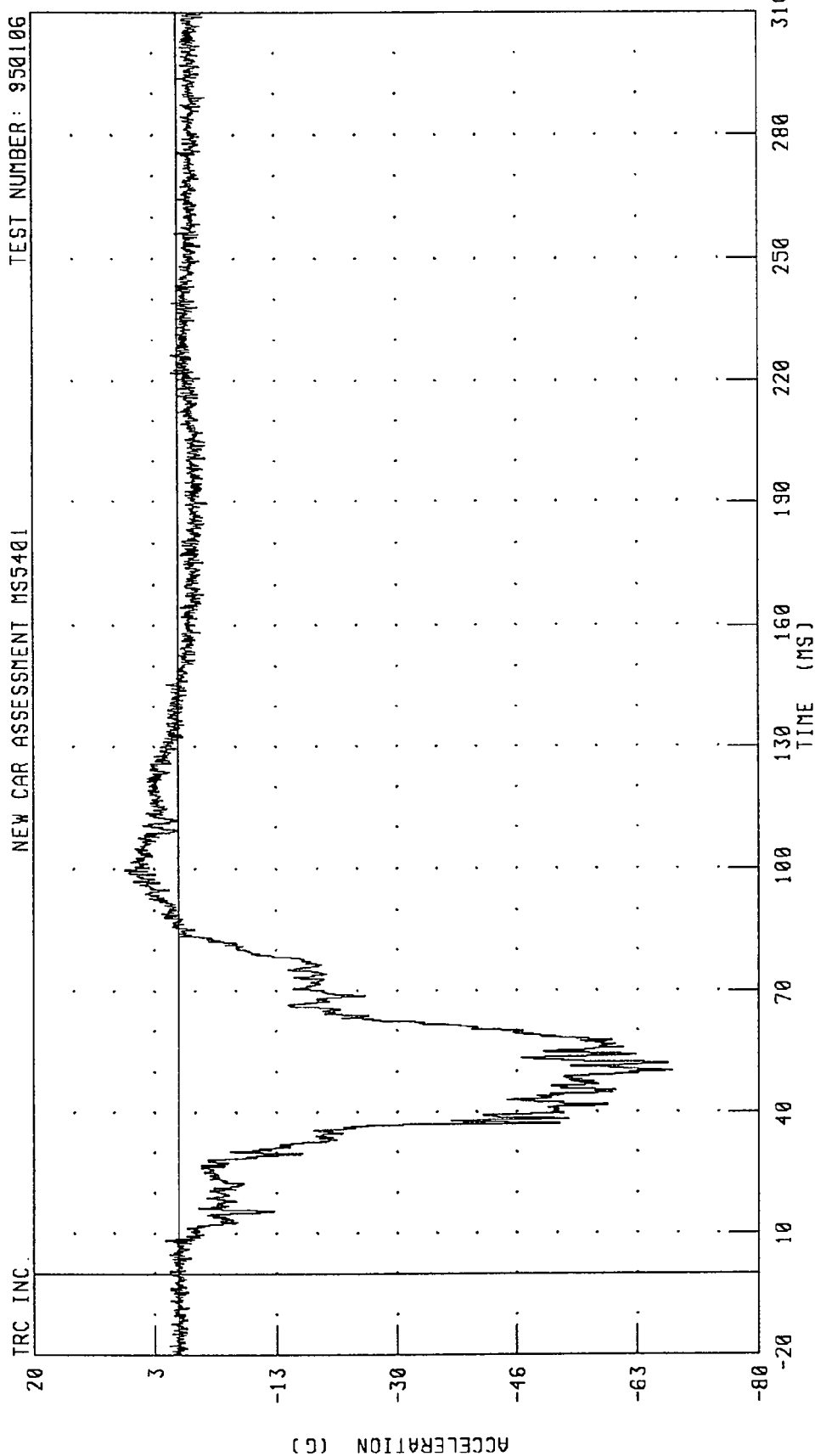


CHANNEL: CSTXD1 FILTER: CH. CLASS 180

PEAK DATA: 0.25 MM @ -10.72 MS; -37.55 MM @ 53.28 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



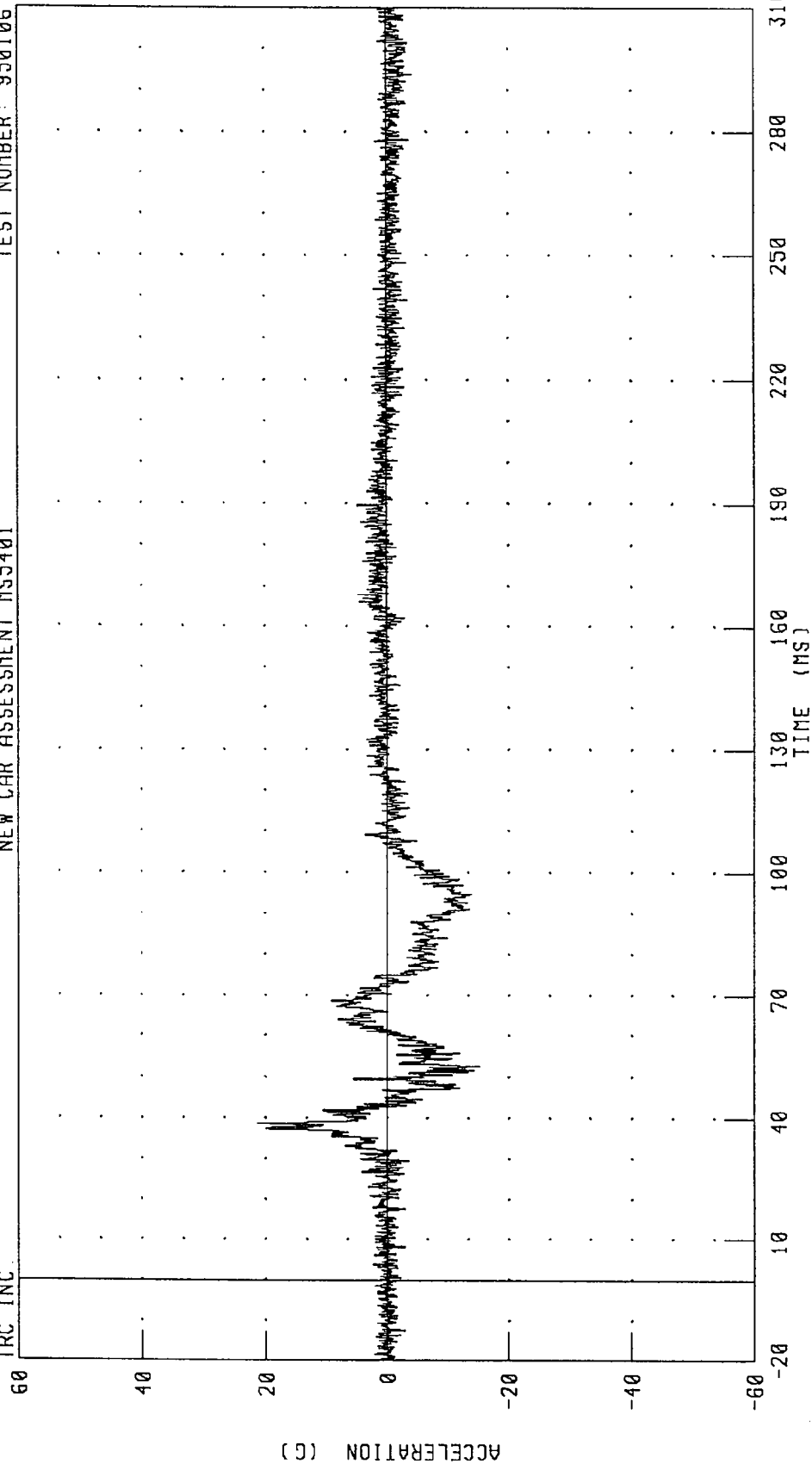
CHANNEL: PEVXG1 FILTER: CH. CLASS 1000

PEAK DATA: 7.39 G @ 99.84 MS; -68.03 G @ 50.08 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

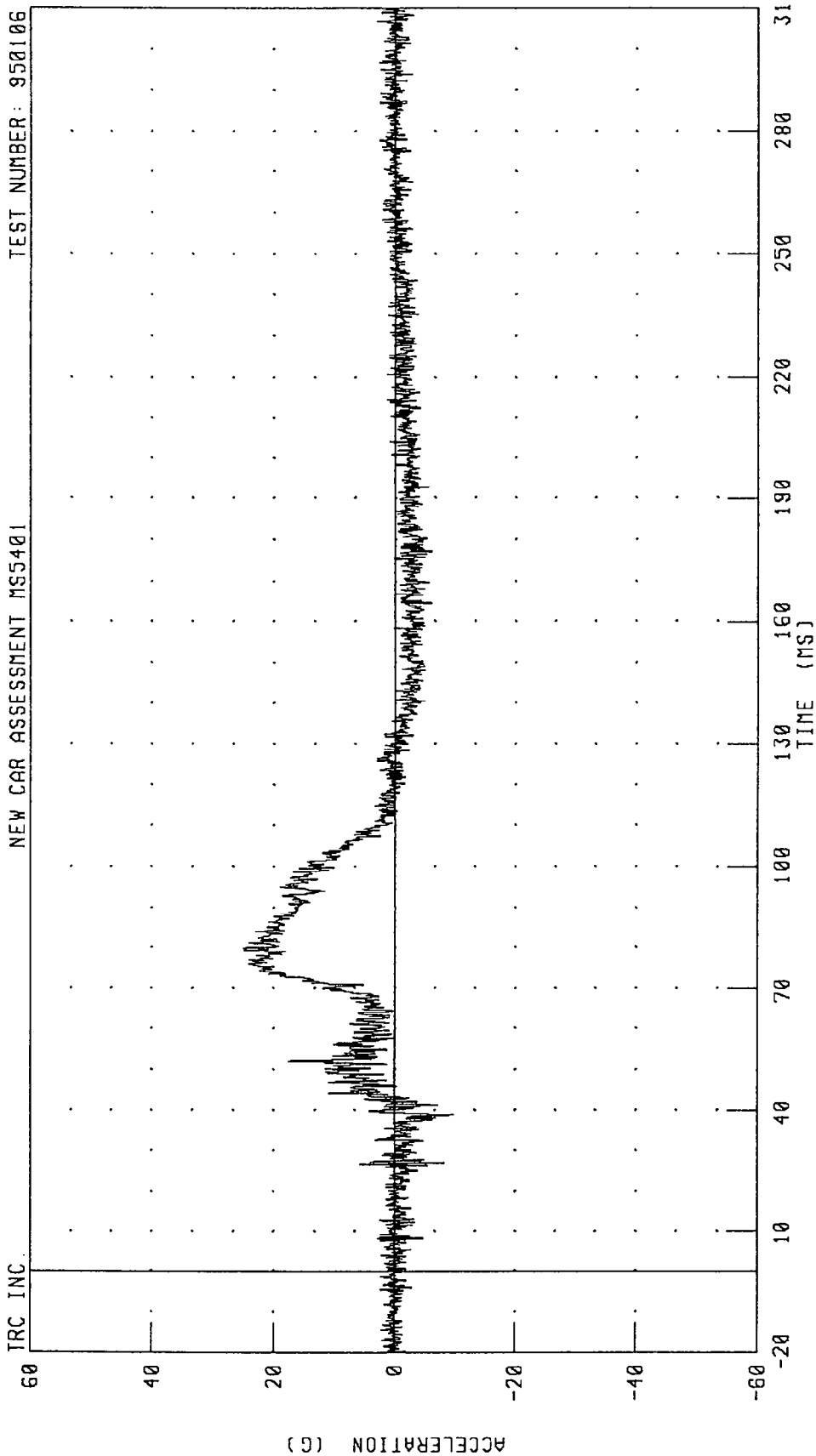
TRC INC.



CHANNEL: PEVYG1 FILTER: CH. CLASS 1000

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS Z-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



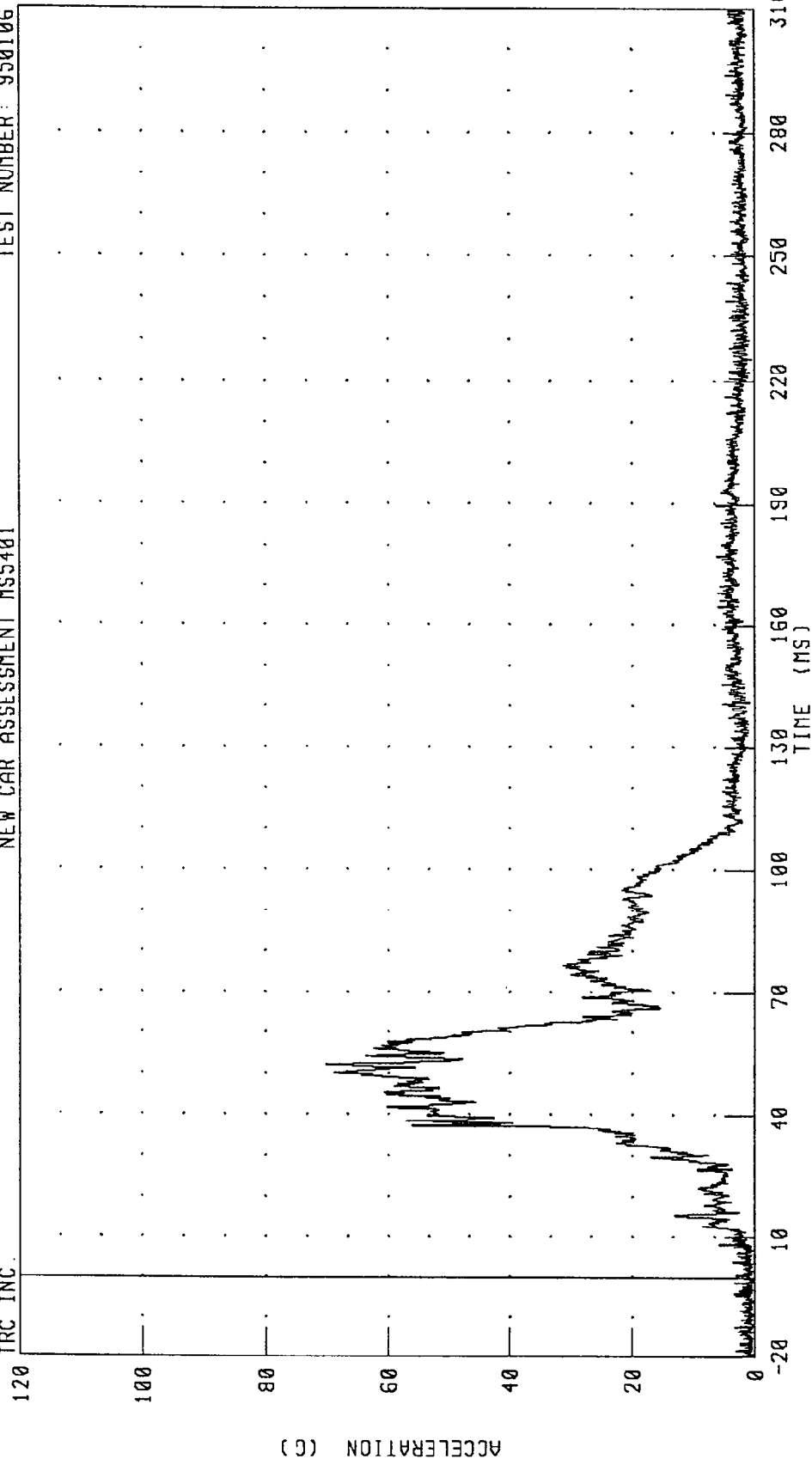
CHANNEL: PEVZG1 FILTER: CH. CLASS 1000

PEAK DATA: 25.04 G @ 79.92 MS; -9.82 G @ 38.96 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS RESULTANT ACCELERATION
 NEW CAR ASSESSMENT MS5481

TEST NUMBER: 950106

TRC INC.

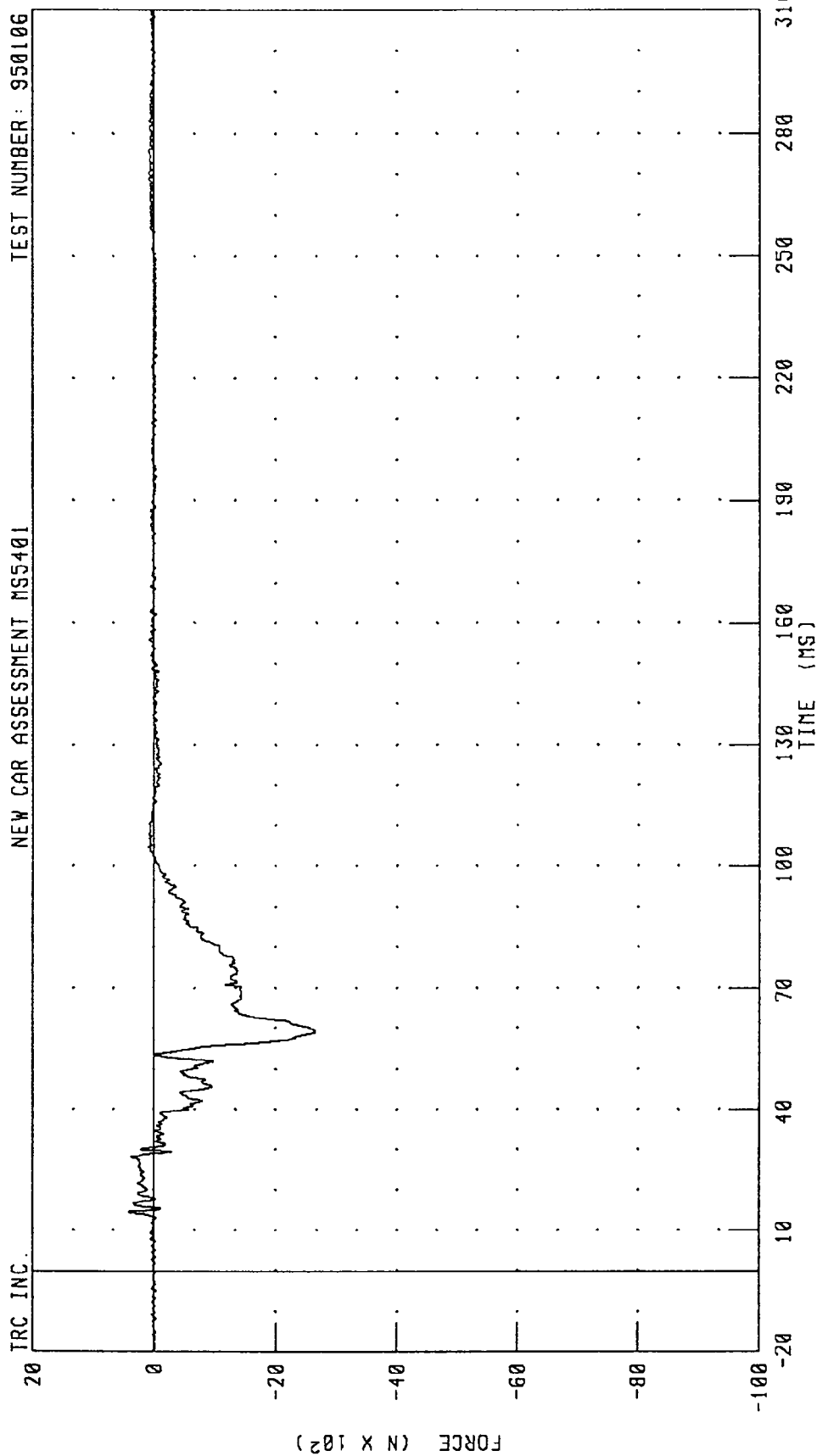


PEAK DATA: 70.14 G @ 52.08 MS, 0.09 G @ -5.68 MS

CHANNEL: PEVRG1 FILTER: CH. CLASS 1000

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER LEFT FEMUR FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



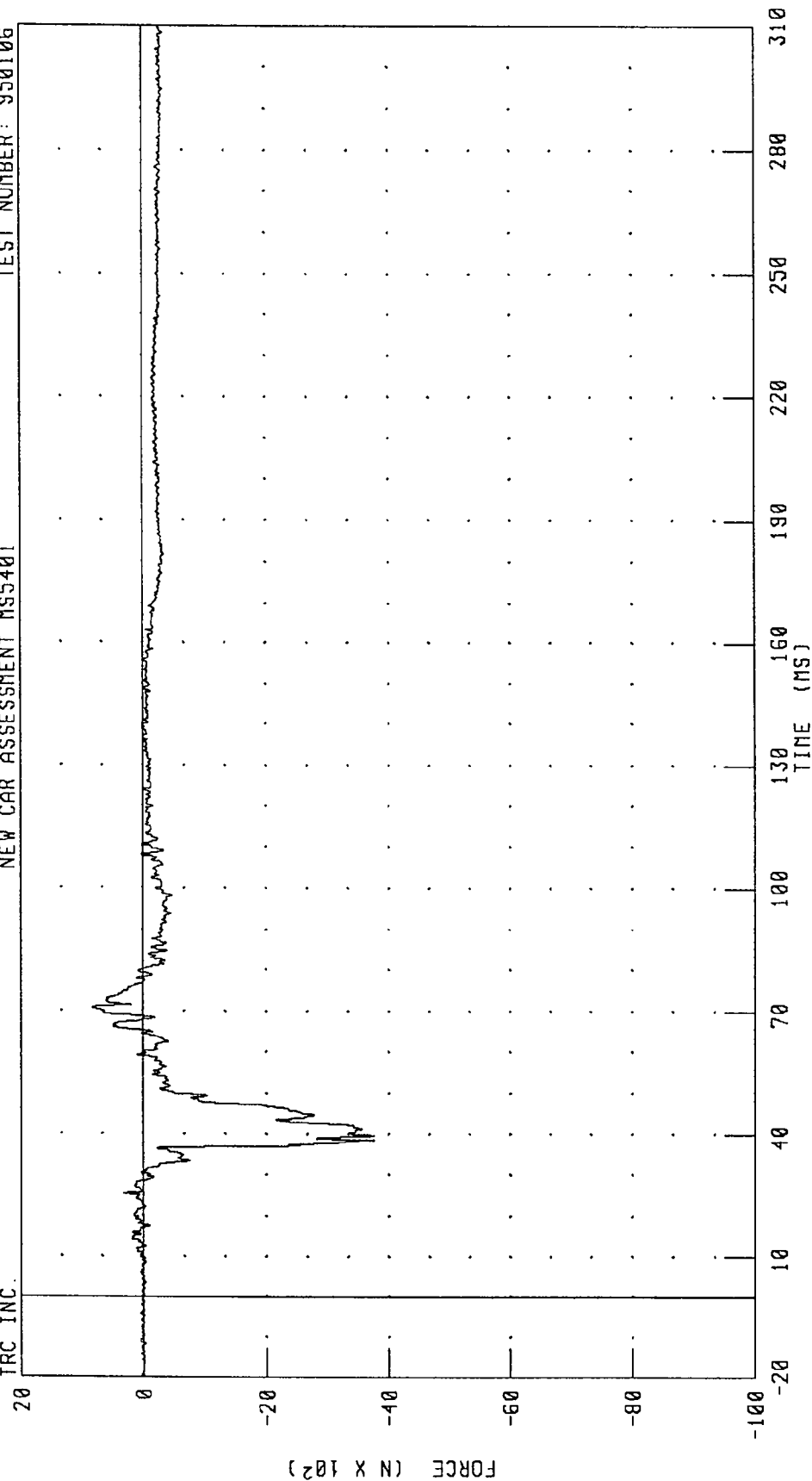
PEAK DATA: 426.35 N @ 14.64 MS; -2645.38 N @ 58.96 MS

CHANNEL: LFMF1 FILTER: CH. CLASS 600

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER RIGHT FEMUR FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



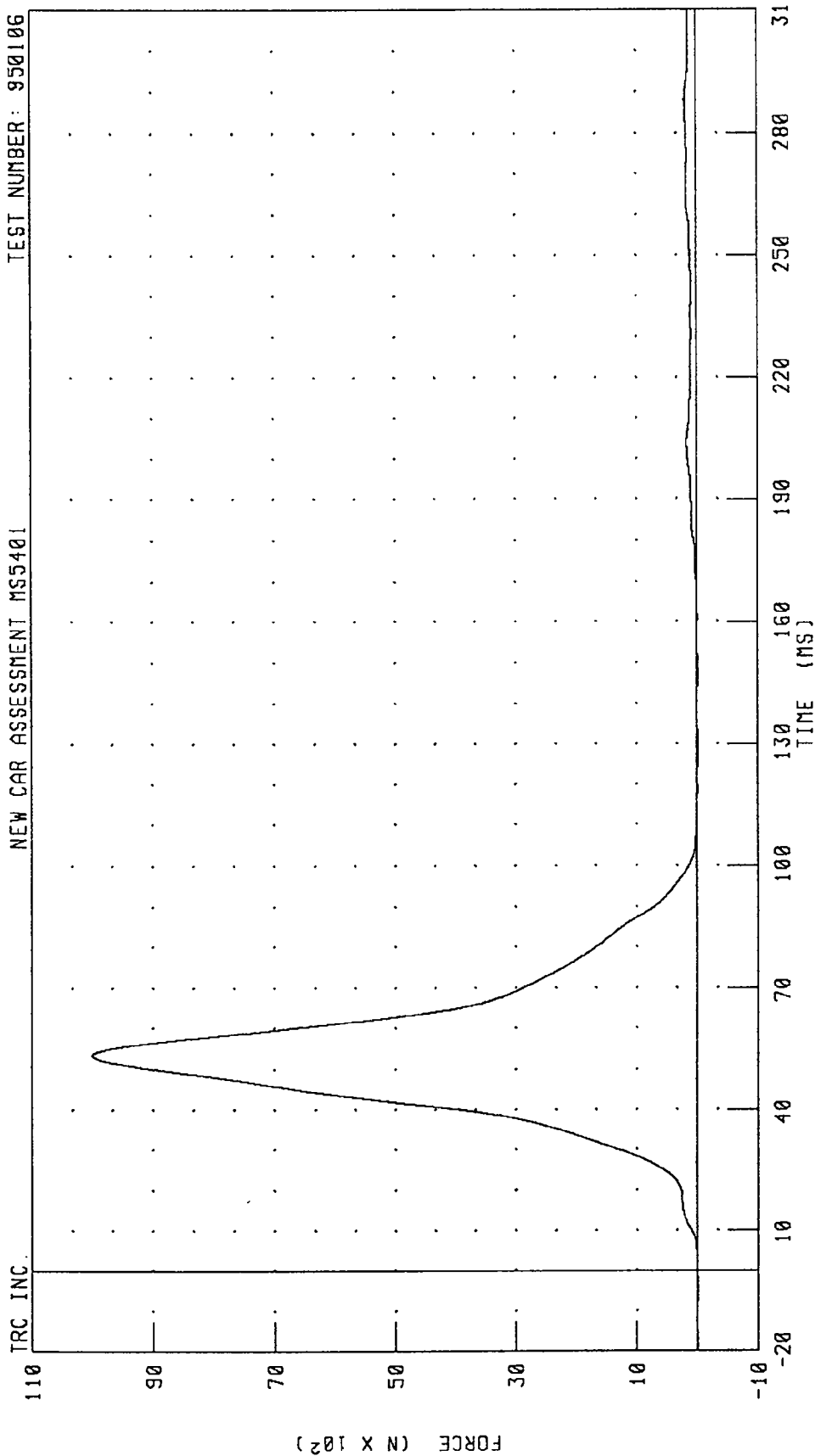
PEAK DATA: 829.15 N @ 70.88 MS; -3758.95 N @ 39.68 MS

FILTER: CH. CLASS 600

CHANNEL: RFMFI

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER LAP BELT OUTBOARD FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



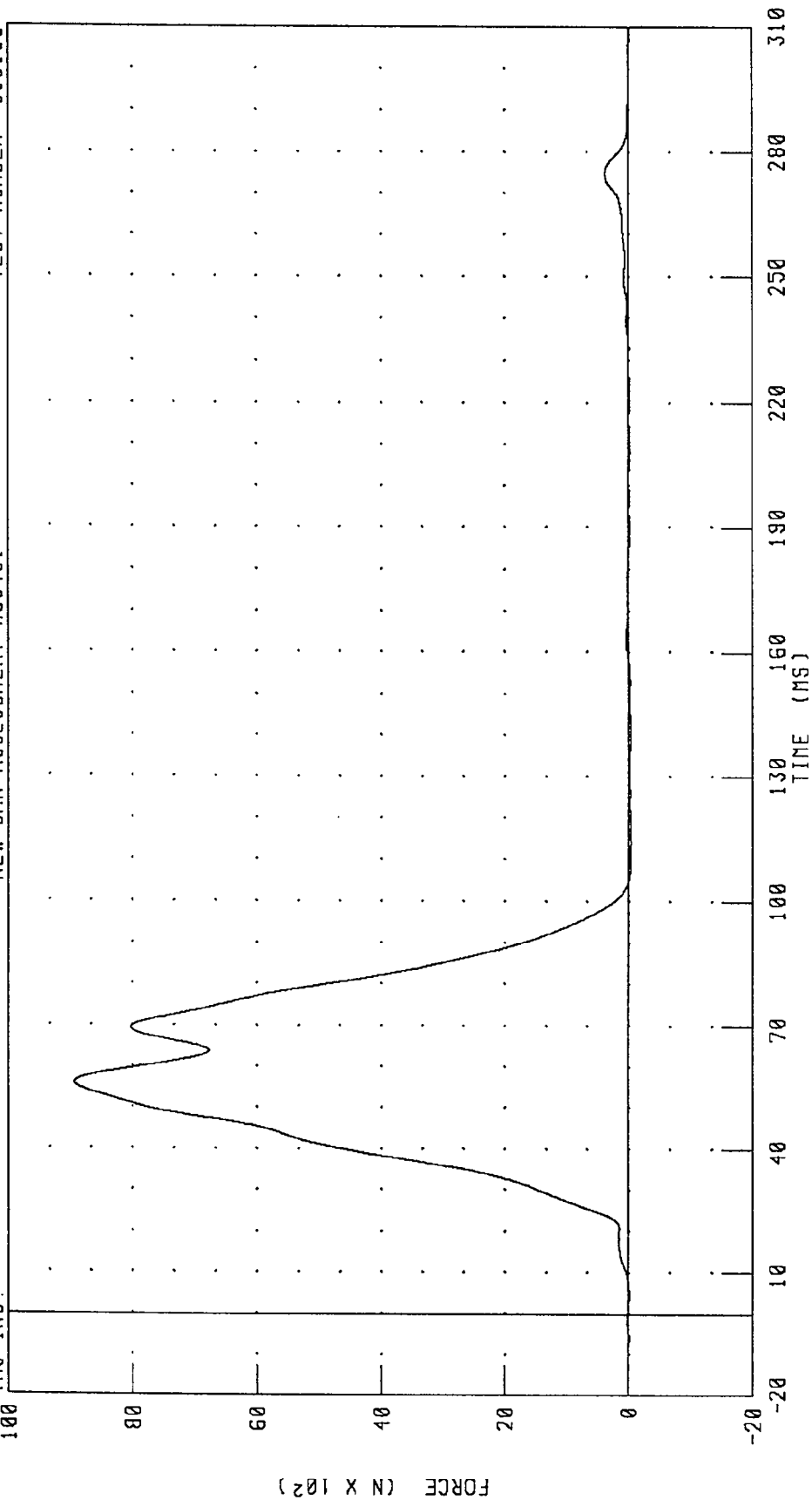
PEAK DATA: 10005.01 N @ 53.52 MS; -16.15 N @ 148.96 MS

CHANNEL: LBOFI FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



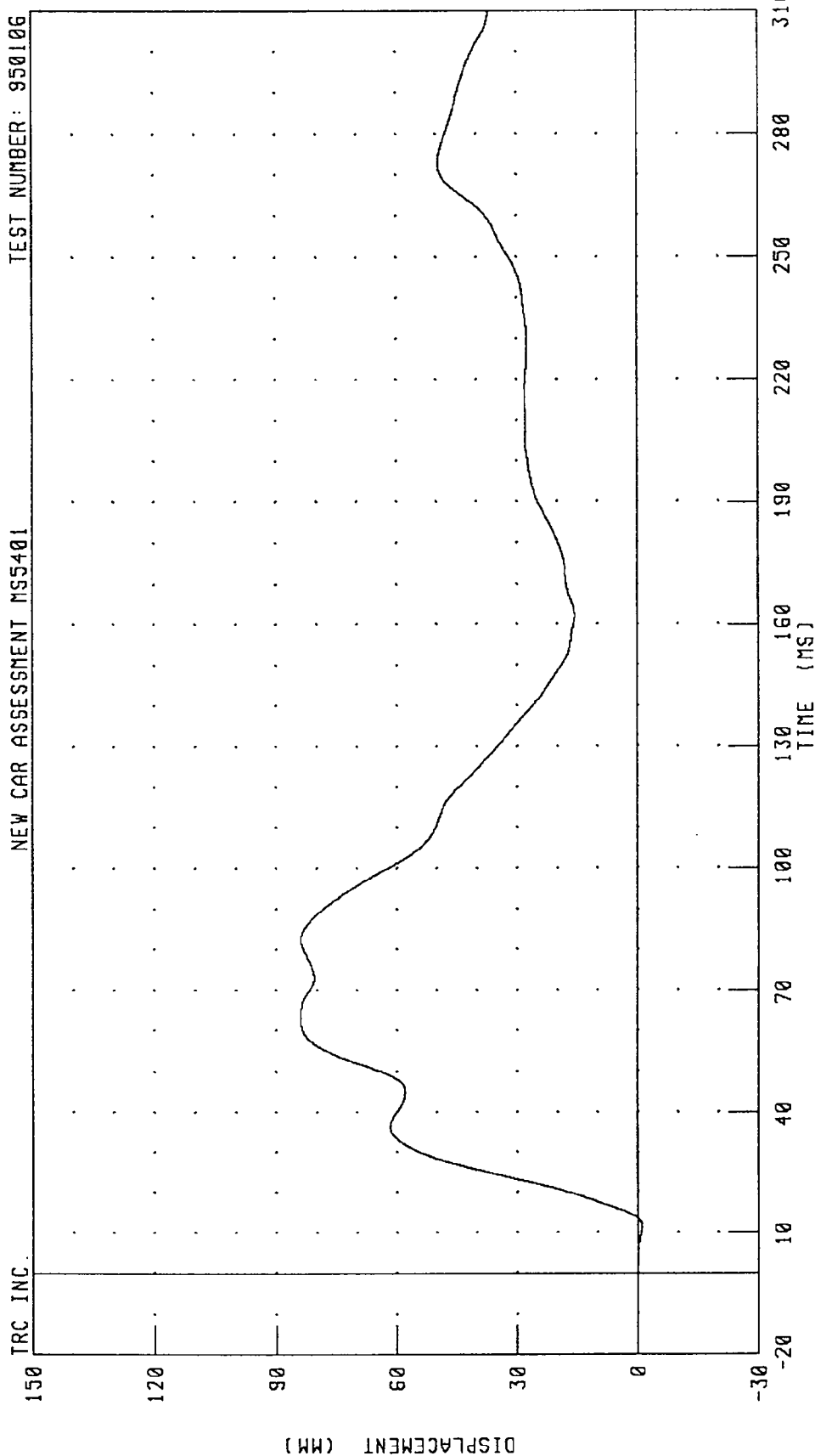
PEAK DATA: 8948.84 N @ 55.92 MS; -38.06 N @ 114.08 MS

FILTER: CH. CLASS 60

CHANNEL: SHBF1

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT DISPLACEMENT
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



PEAK DATA: 83.88 MM @ 62.48 MS; -1.03 MM @ 11.68 MS

CHANNEL: SHBD1 FILTER: CH. CLASS 60

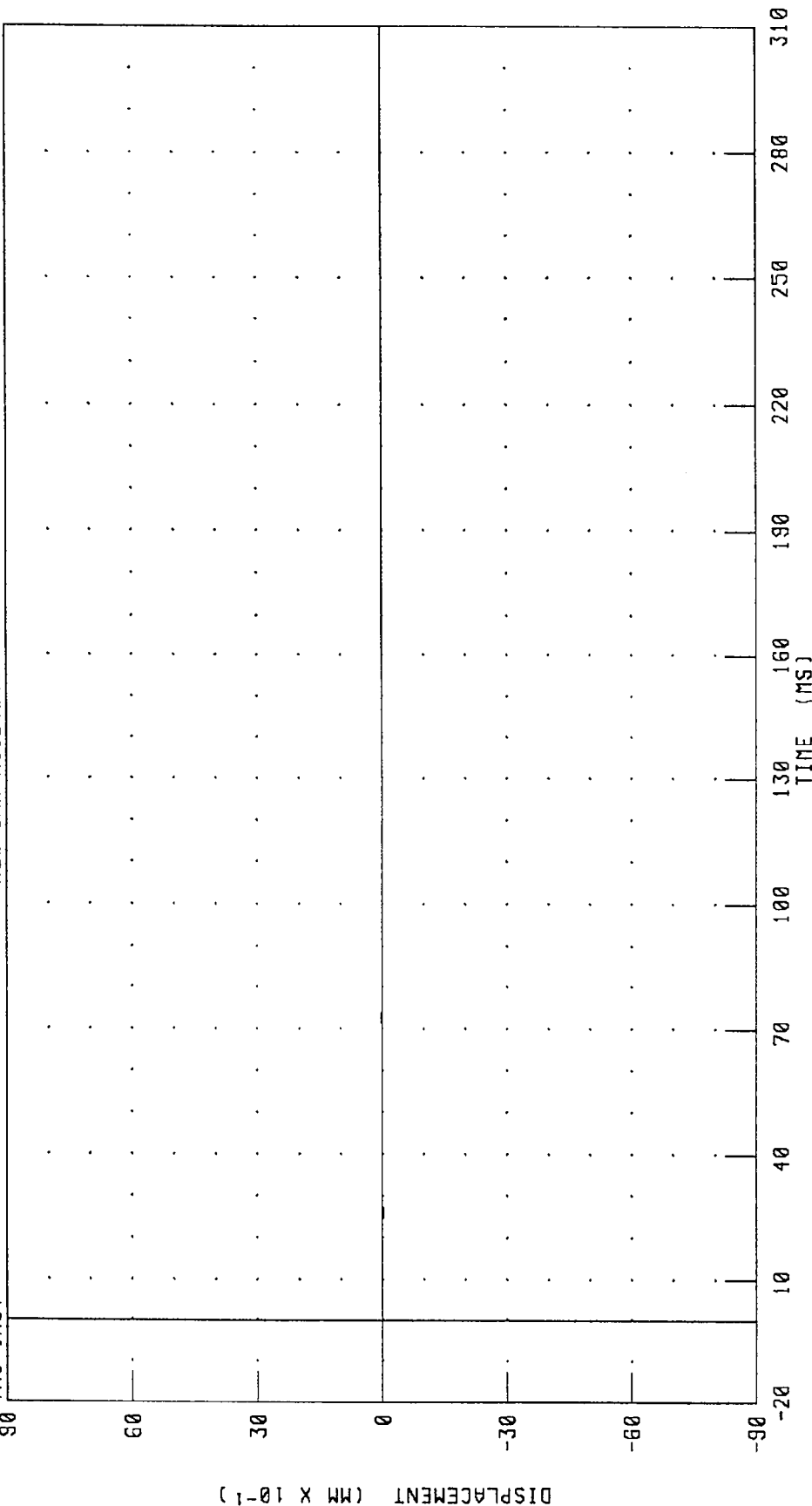
1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER

DRIVER SEAT BELT EXTENSION

NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

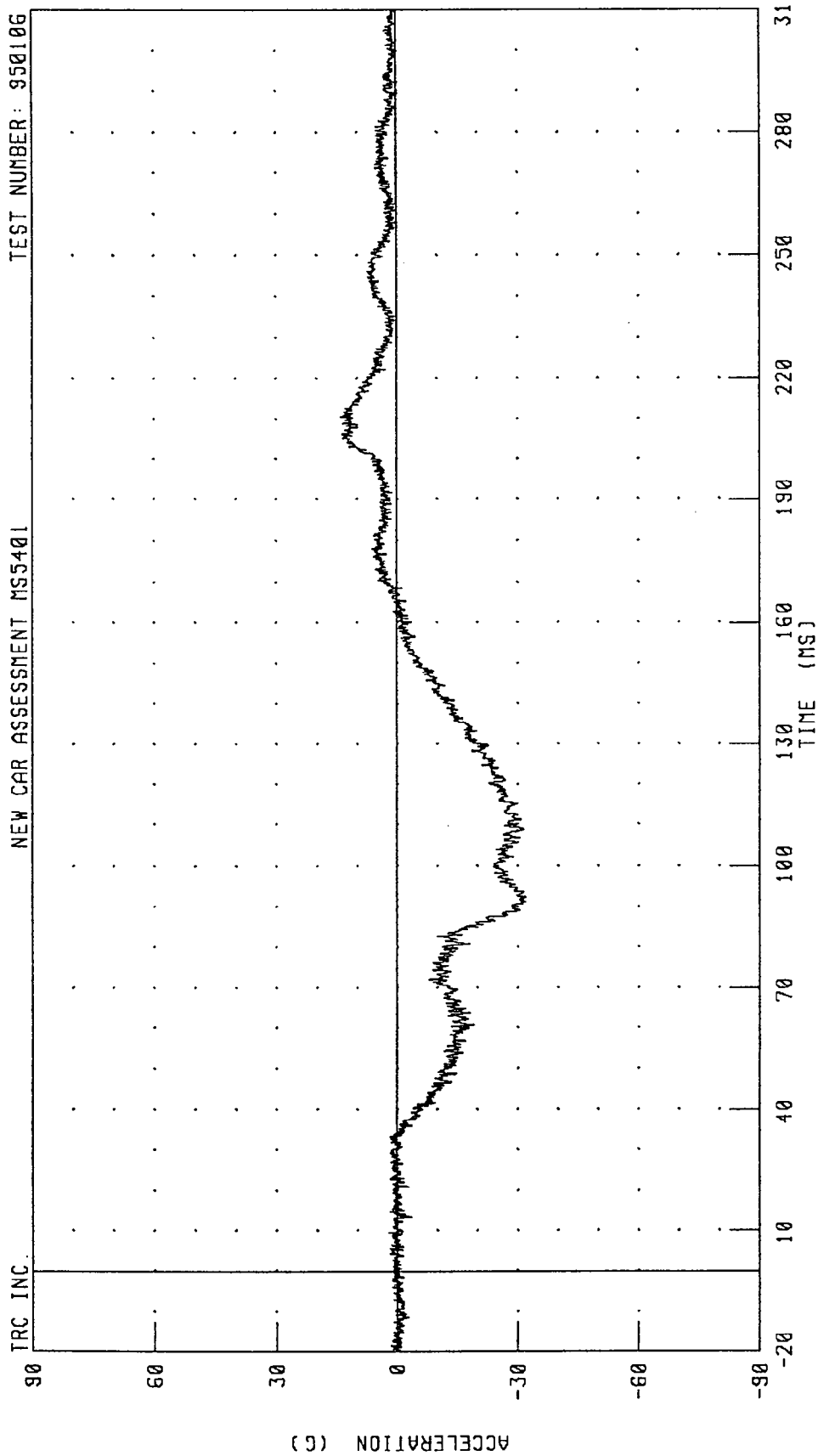
TRC INC.



CHANNEL: SBED1 FILTER: CH. CLASS 60 PEAK DATA: 0.02 MM @ 72.88 MS; -0.01 MM @ 26.08 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



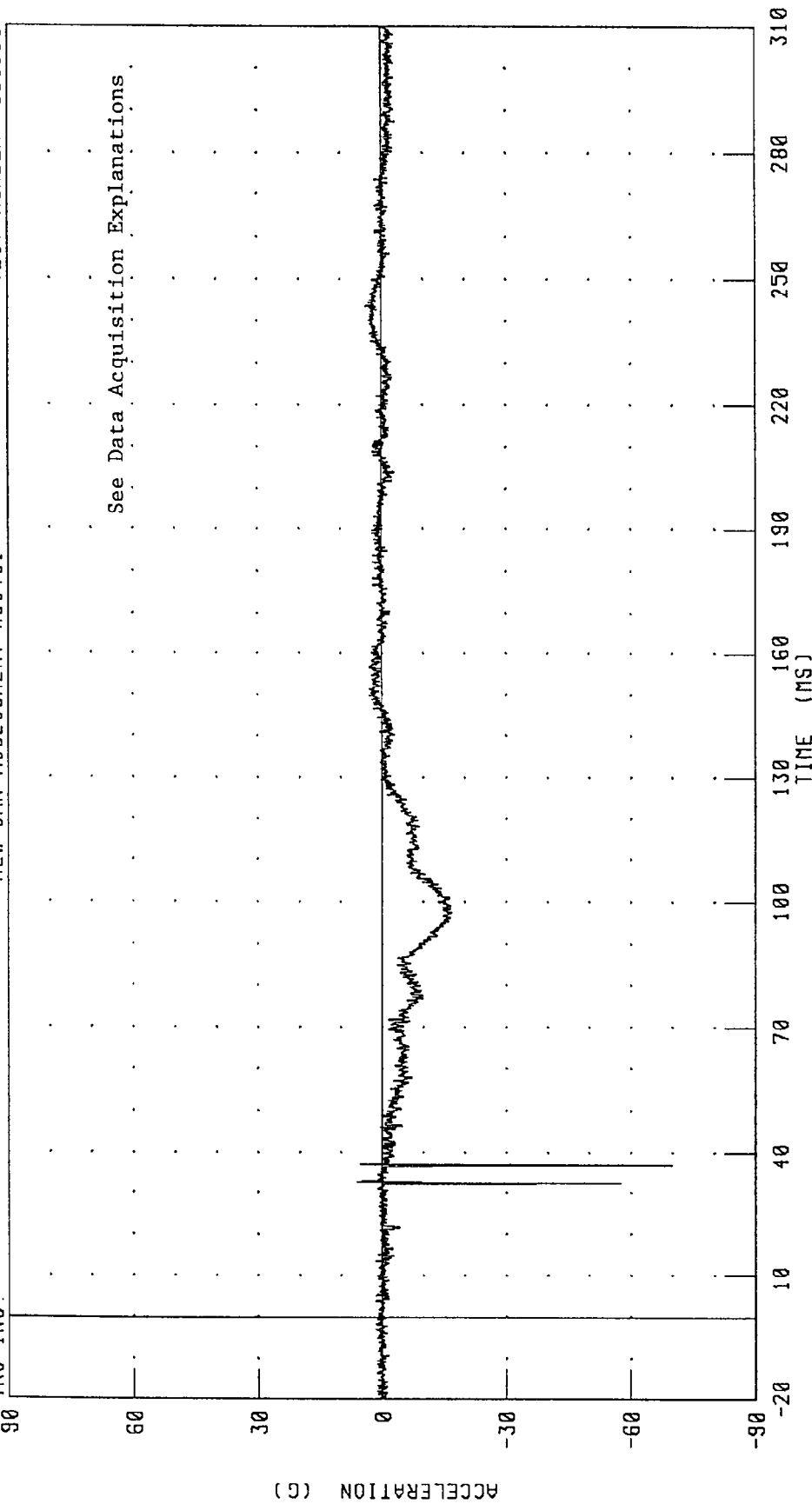
CHANNEL: HEDXC2 FILTER: CH. CLASS 1000

PEAK DATA: 14.10 G @ 210.56 MS; -31.99 G @ 91.28 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

IRC INC.

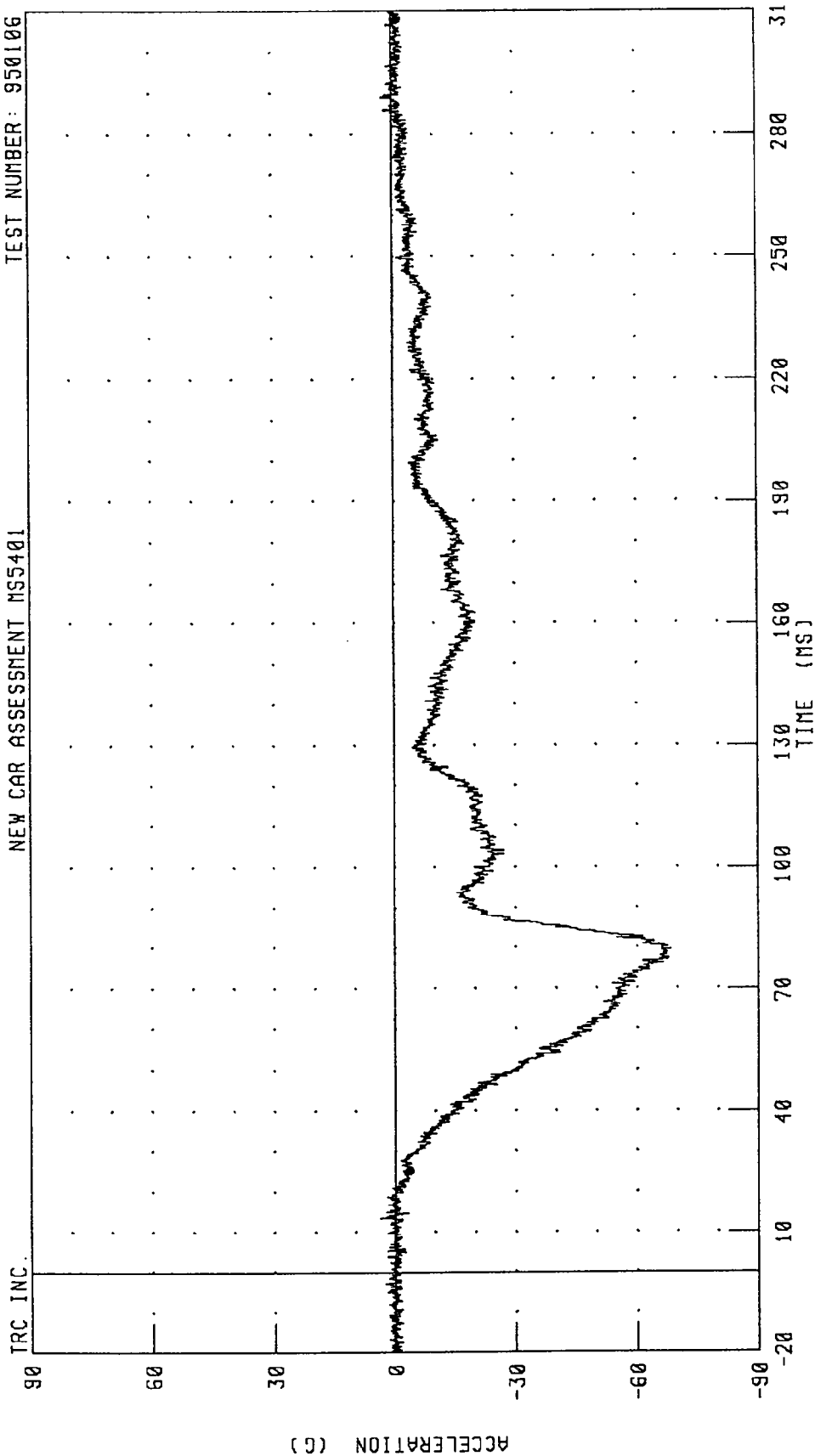


CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

PEAK DATA: 6.08 G @ 32.96 MS; -69.73 G @ 37.04 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

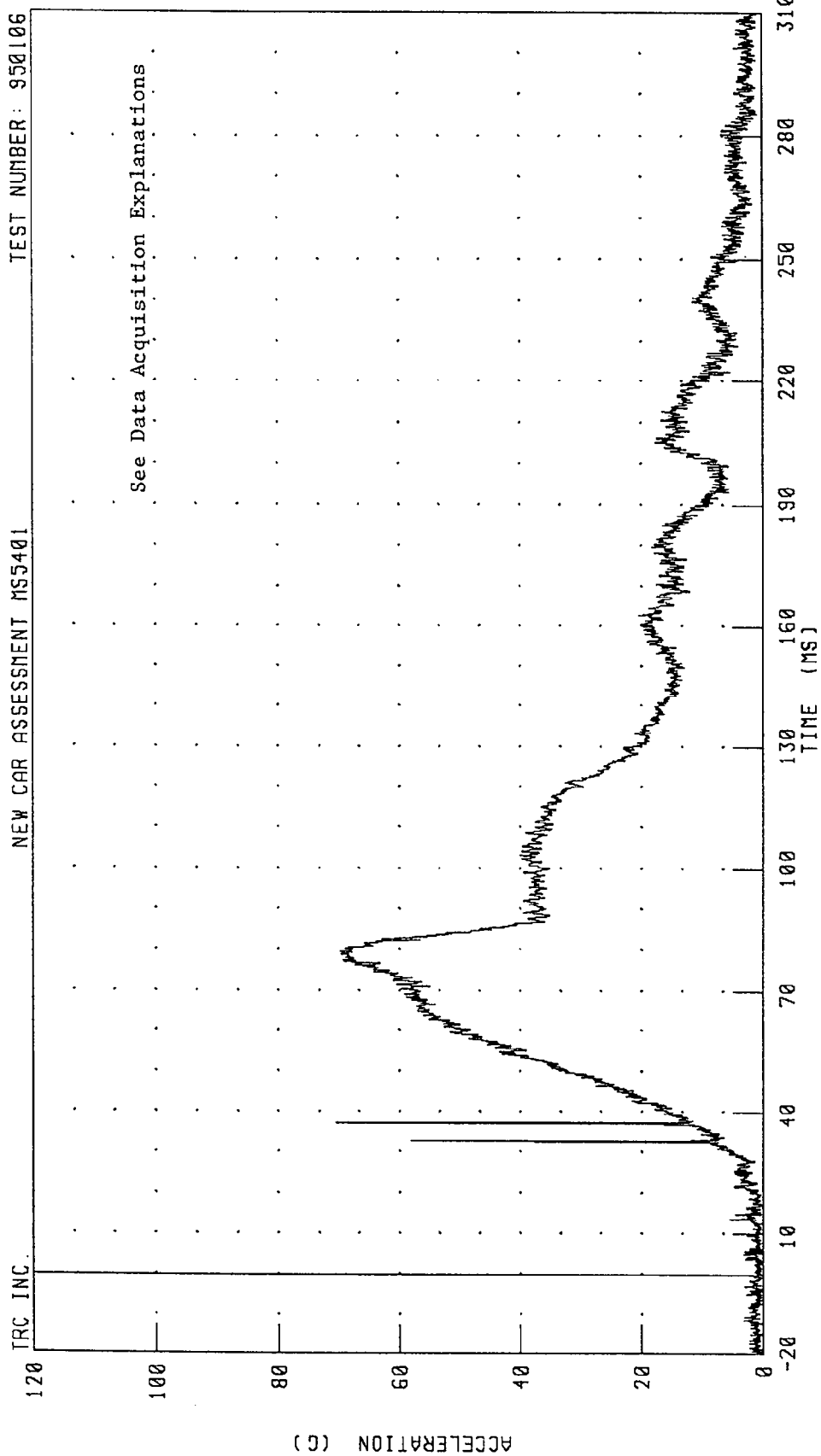


PEAK DATA: 3.95 G @ 13.60 MS; -68.28 G @ 79.60 MS

CHANNEL: HEDZG2 FILTER: CH. CLASS 1000

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

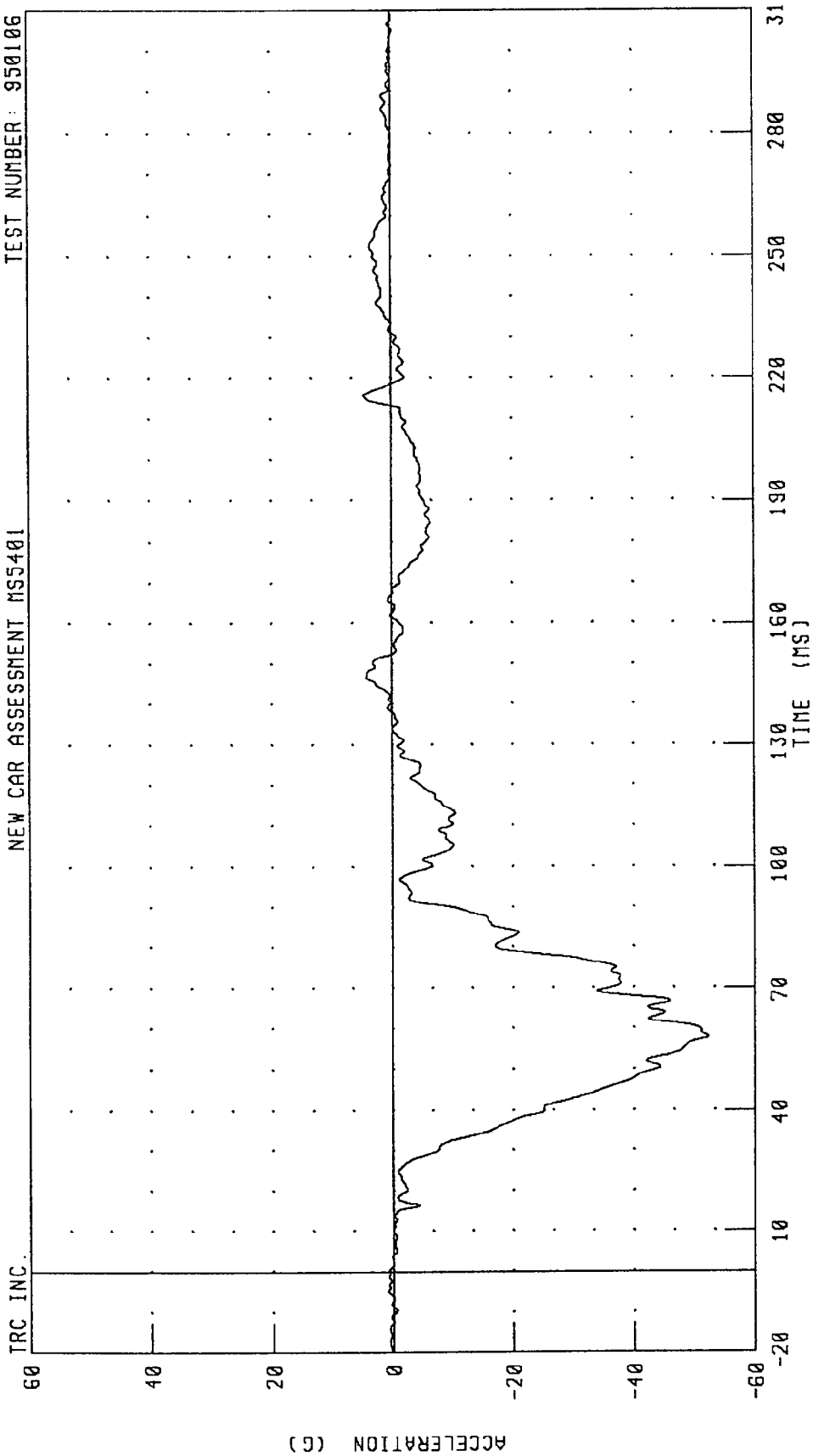


PEAK DATA: 70.58 G @ 37.04 MS; 0.14 G @ -14.96 MS

CHANNEL: HEDRG2 FILTER: CH. CLASS 1000

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT NS5401

TEST NUMBER: 950106

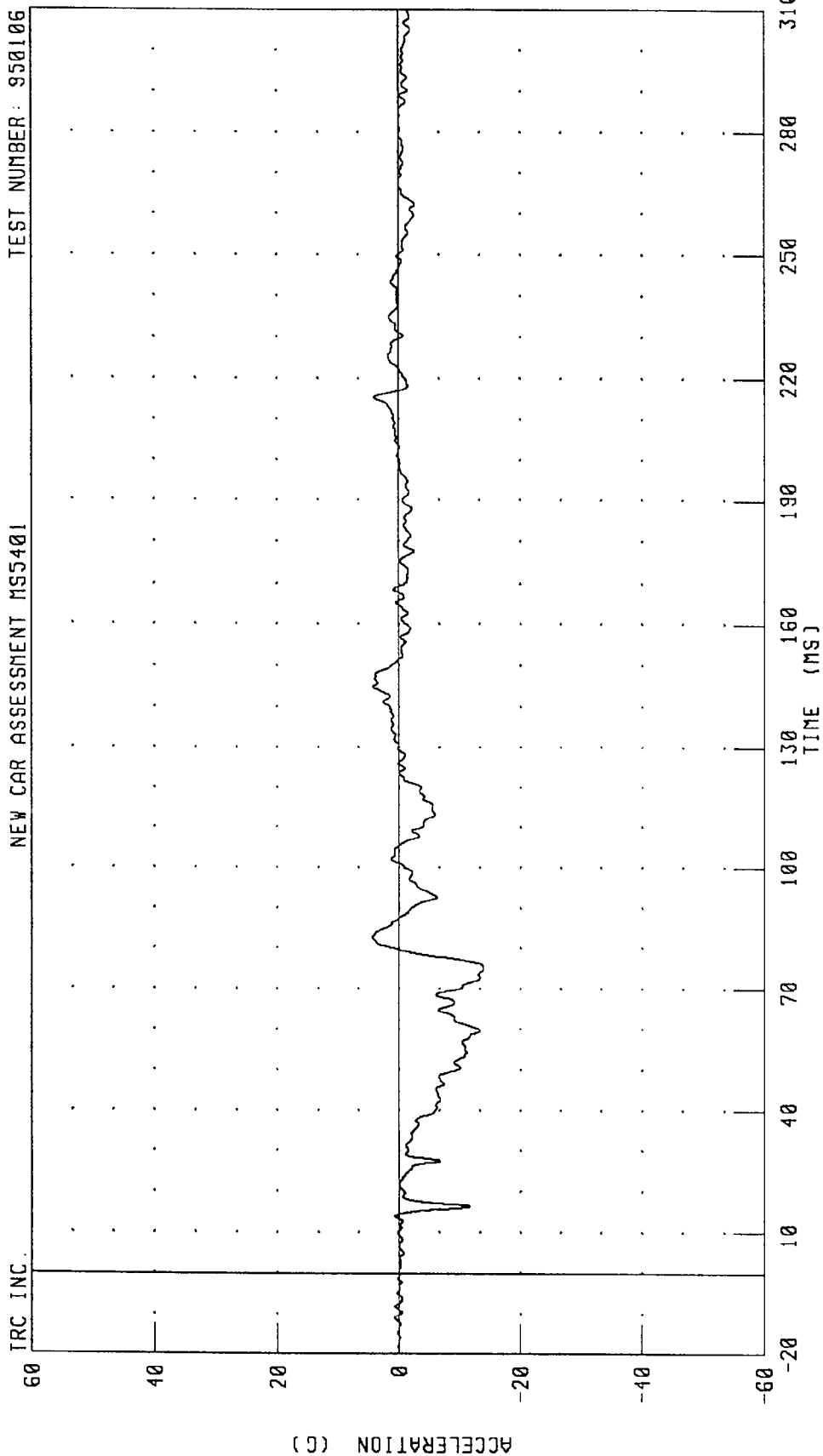


CHANNEL: CSTXG2 FILTER: CH. CLASS 180

PEAK DATA: 4.73 G @ 215.60 MS; -52.28 G @ 57.92 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

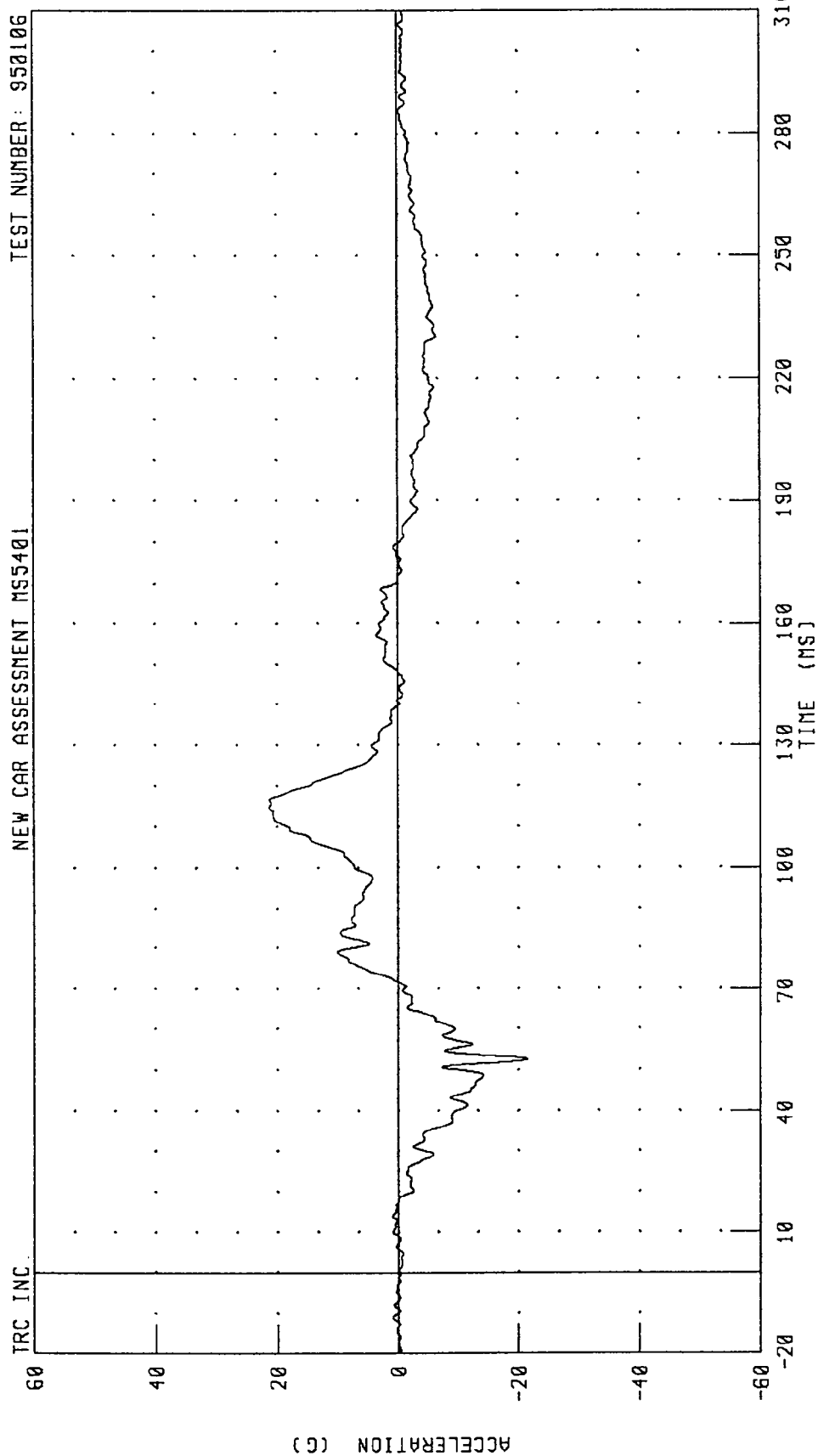


CHANNEL: CSTYG2 FILTER: CH. CLASS 180

PEAK DATA: 4.42 G @ 82.64 MS; -13.95 G @ 75.20 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



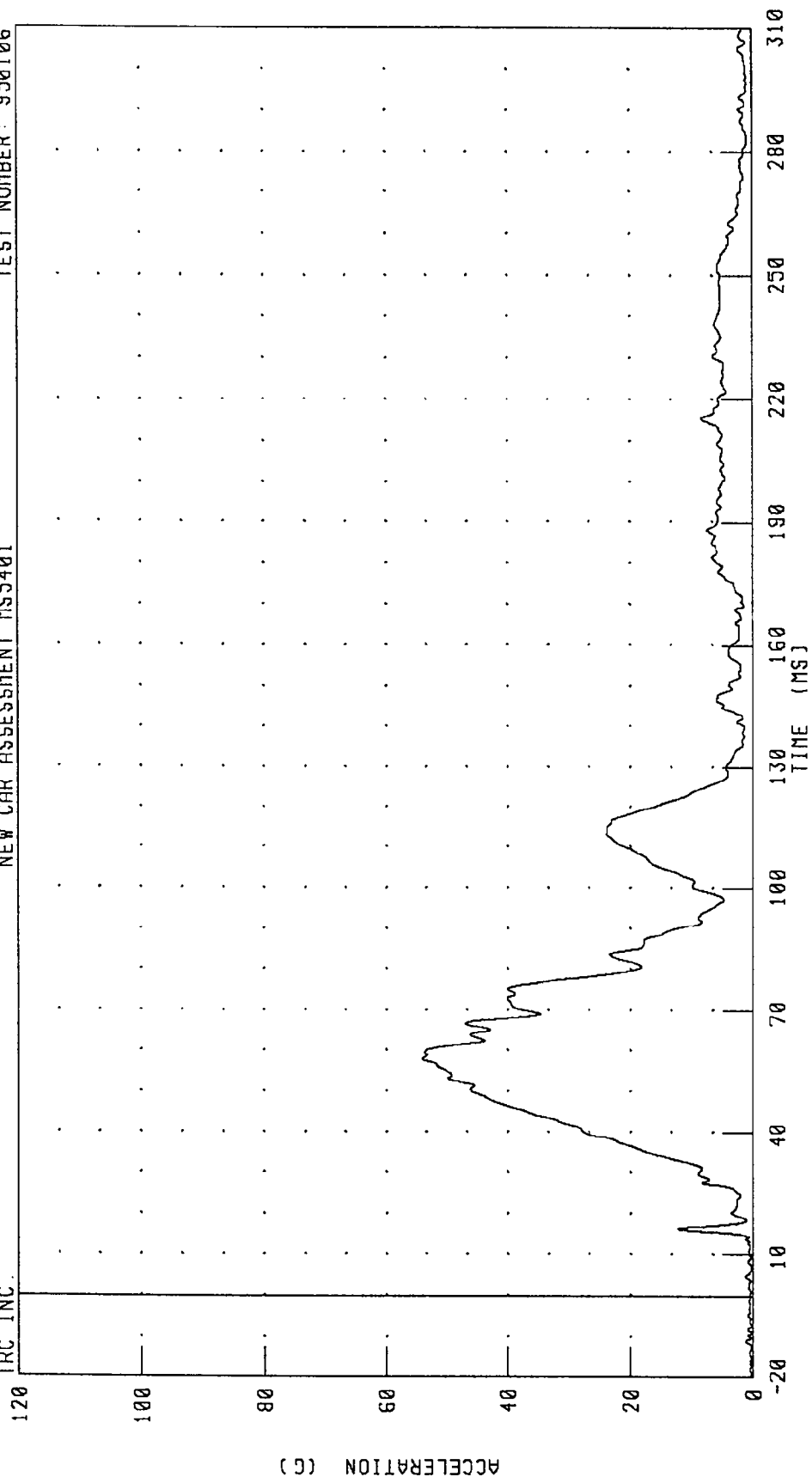
CHANNEL: CSTZG2 FILTER: CH. CLASS 180

PEAK DATA: 21.43 G @ 114.88 MS; -21.57 G @ 21.64 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

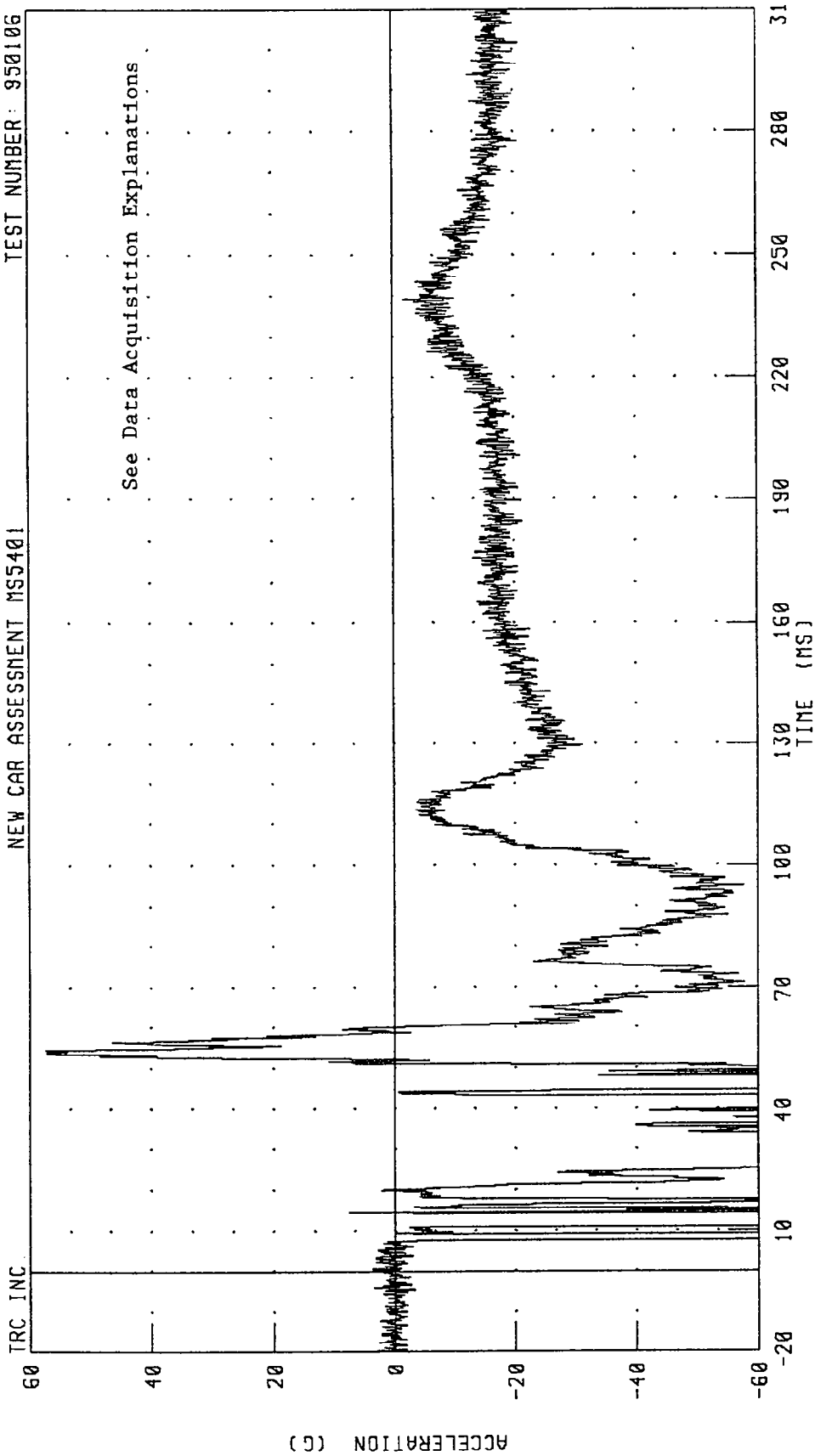


CHANNEL: CSTRG2 FILTER: CH. CLASS 180

PEAK DATA: 54.09 G @ 57.92 MS; 0.07 G @ -20.00 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

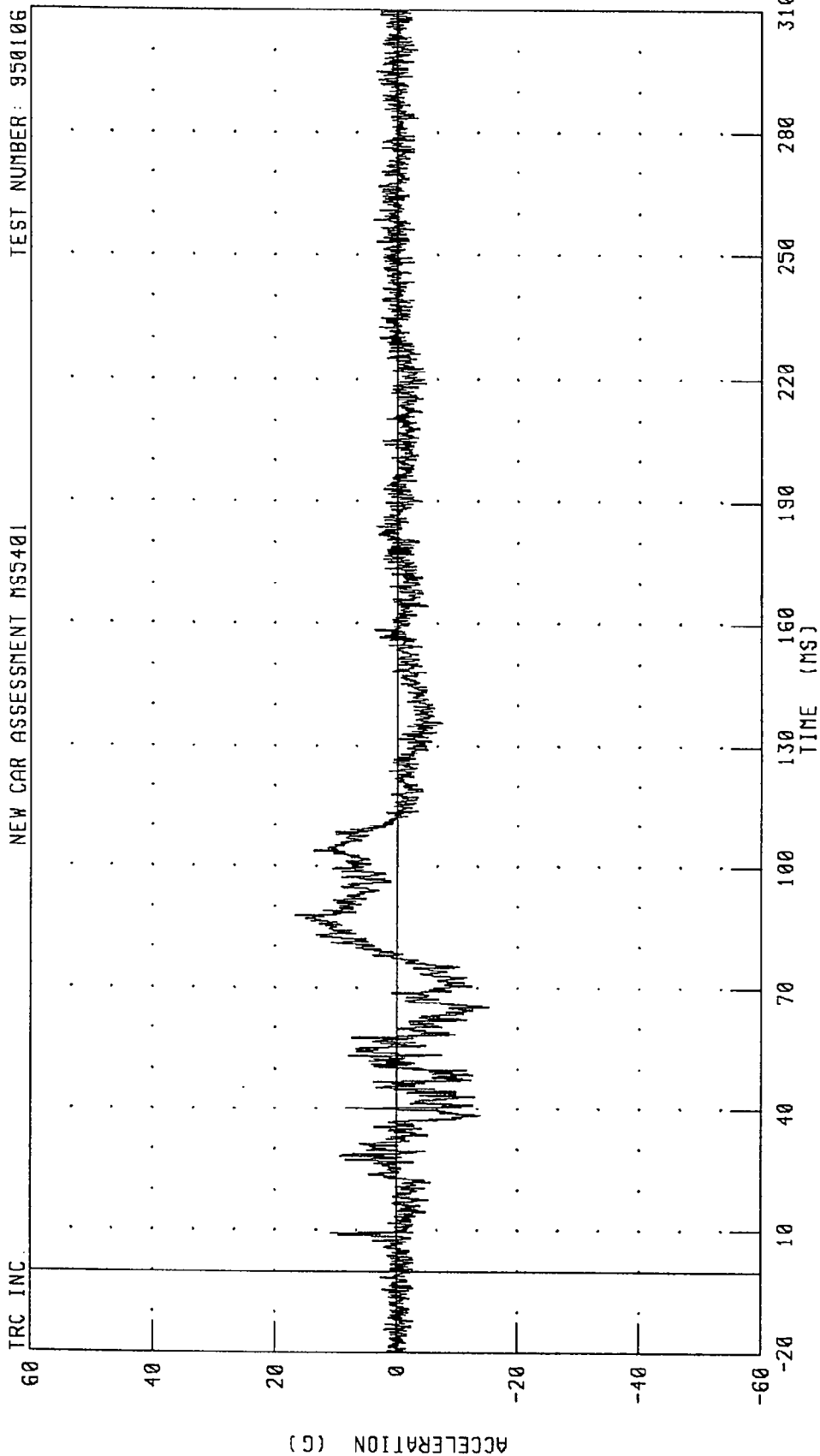


CHANNEL: PEVXC2 FILTER: CH. CLASS 1000

950106

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

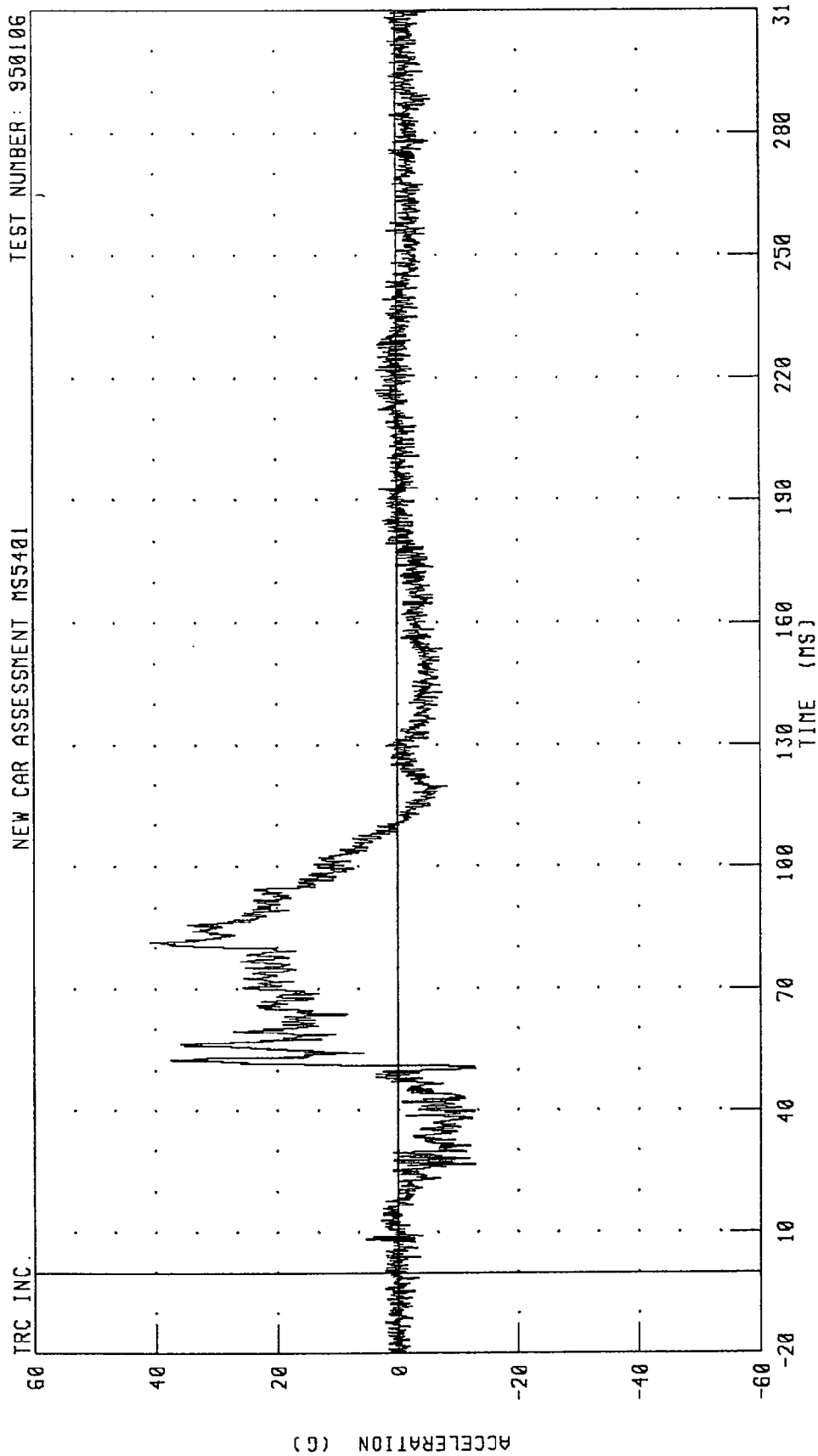


CHANNEL: PEVYG2 FILTER: CH. CLASS 1000

PEAK DATA: 16.69 G @ 87.84 MS; -15.19 G @ 65.28 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

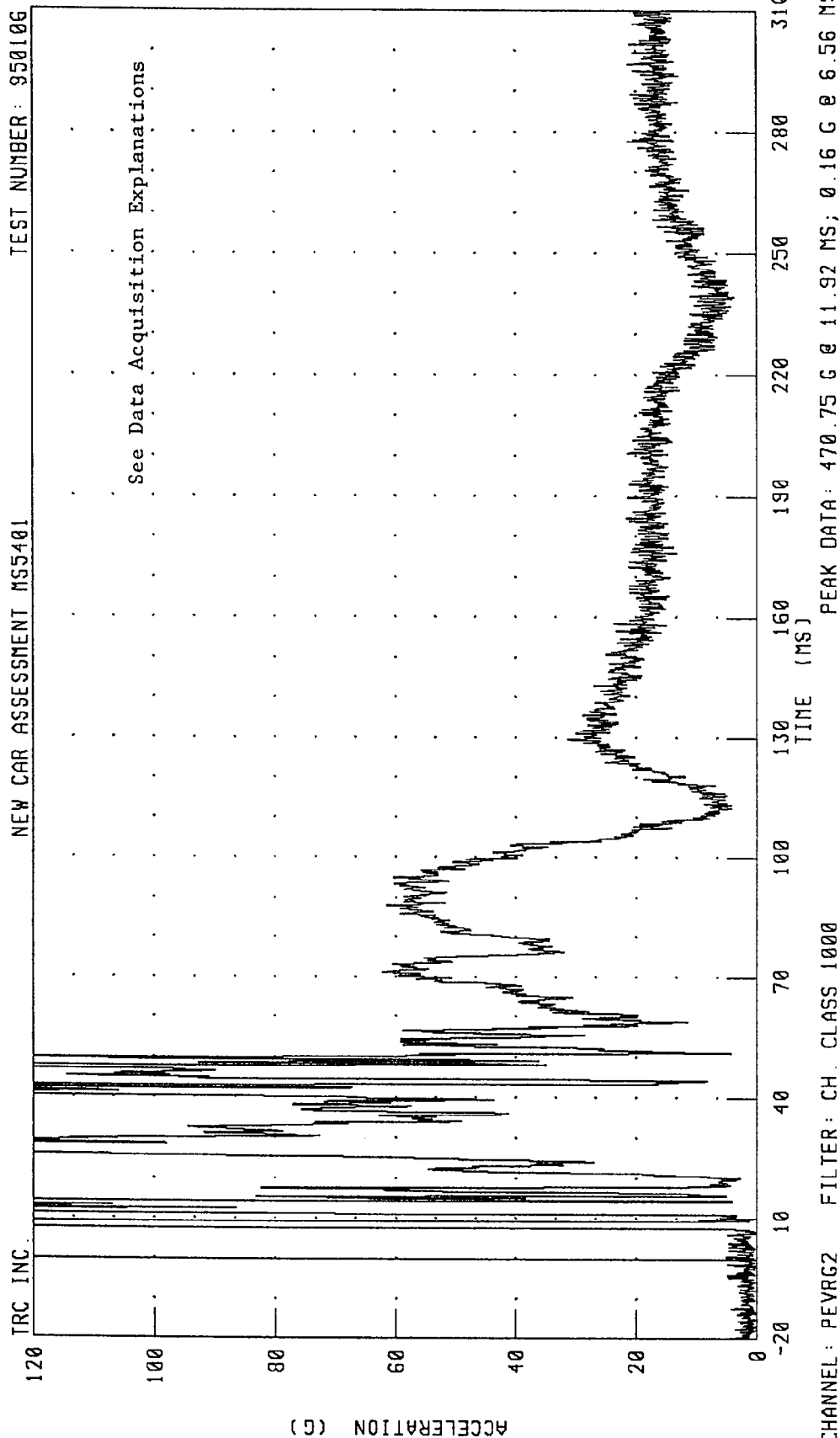


CHANNEL: PEVZG2 FILTER: CH. CLASS 1000

PEAK DATA: 40.97 G @ 81.44 MS; -12.86 G @ 26.64 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS RESULTANT ACCELERATION
NEW CAR ASSESSMENT M55401

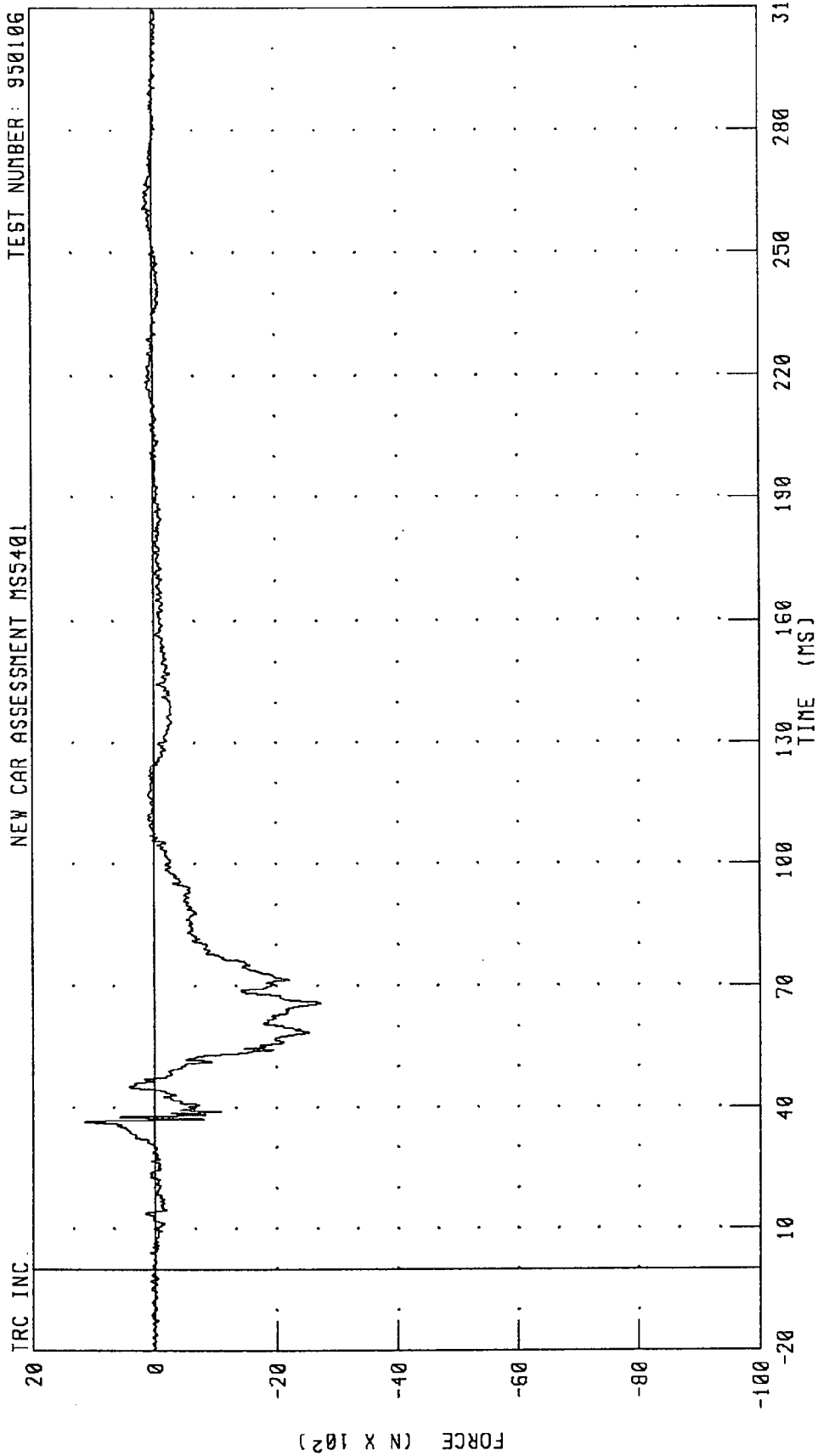
TEST NUMBER: 950106



CHANNEL: PEVRG2 FILTER: CH. CLASS 1000

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FEMUR FORCE
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



CHANNEL: LFMF2 FILTER: CH. CLASS 600

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER

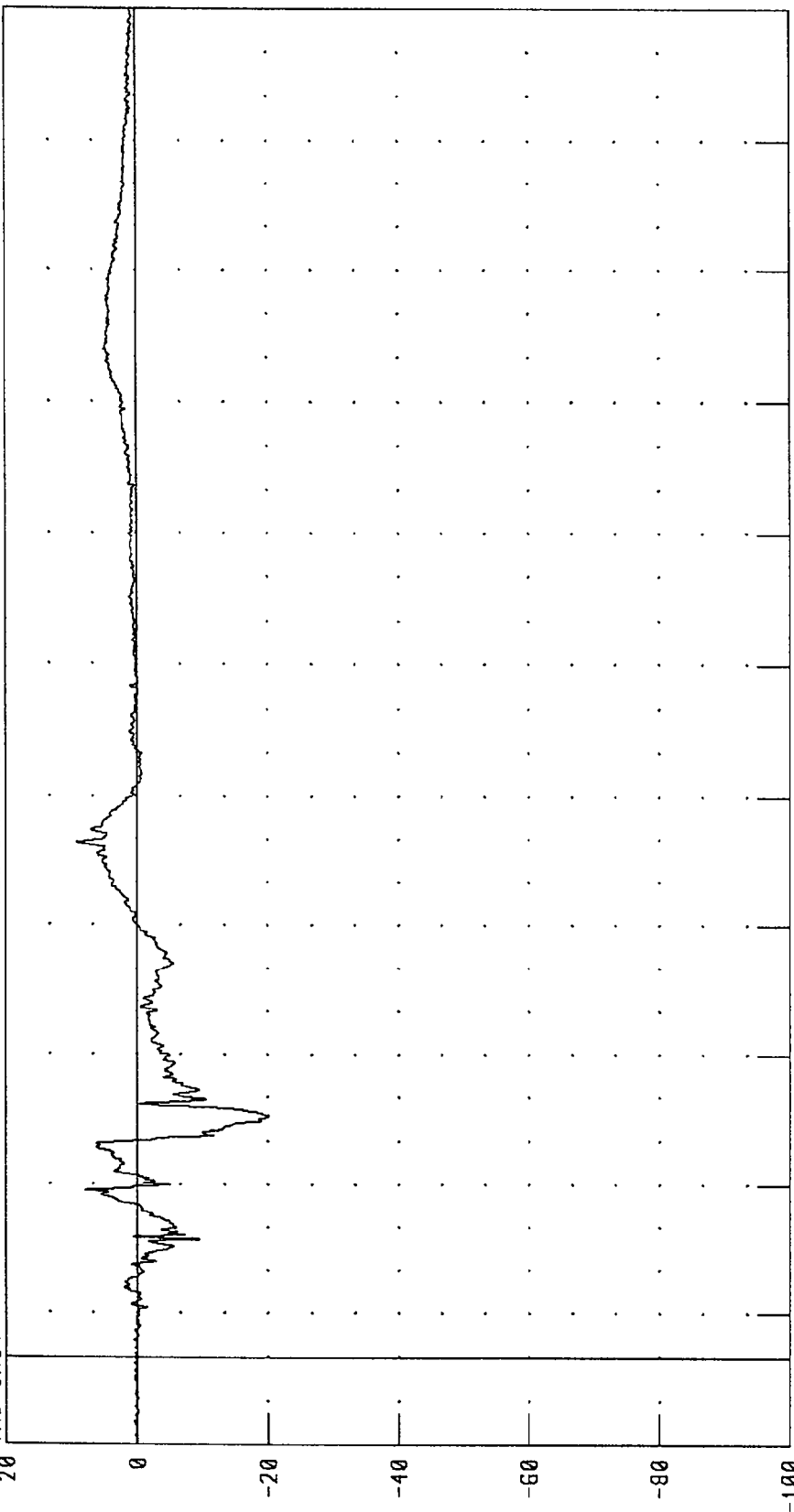
PASSENGER RIGHT FEMUR FORCE

NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

20



FORCE (N X 10²)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

-20

-40

-60

-80

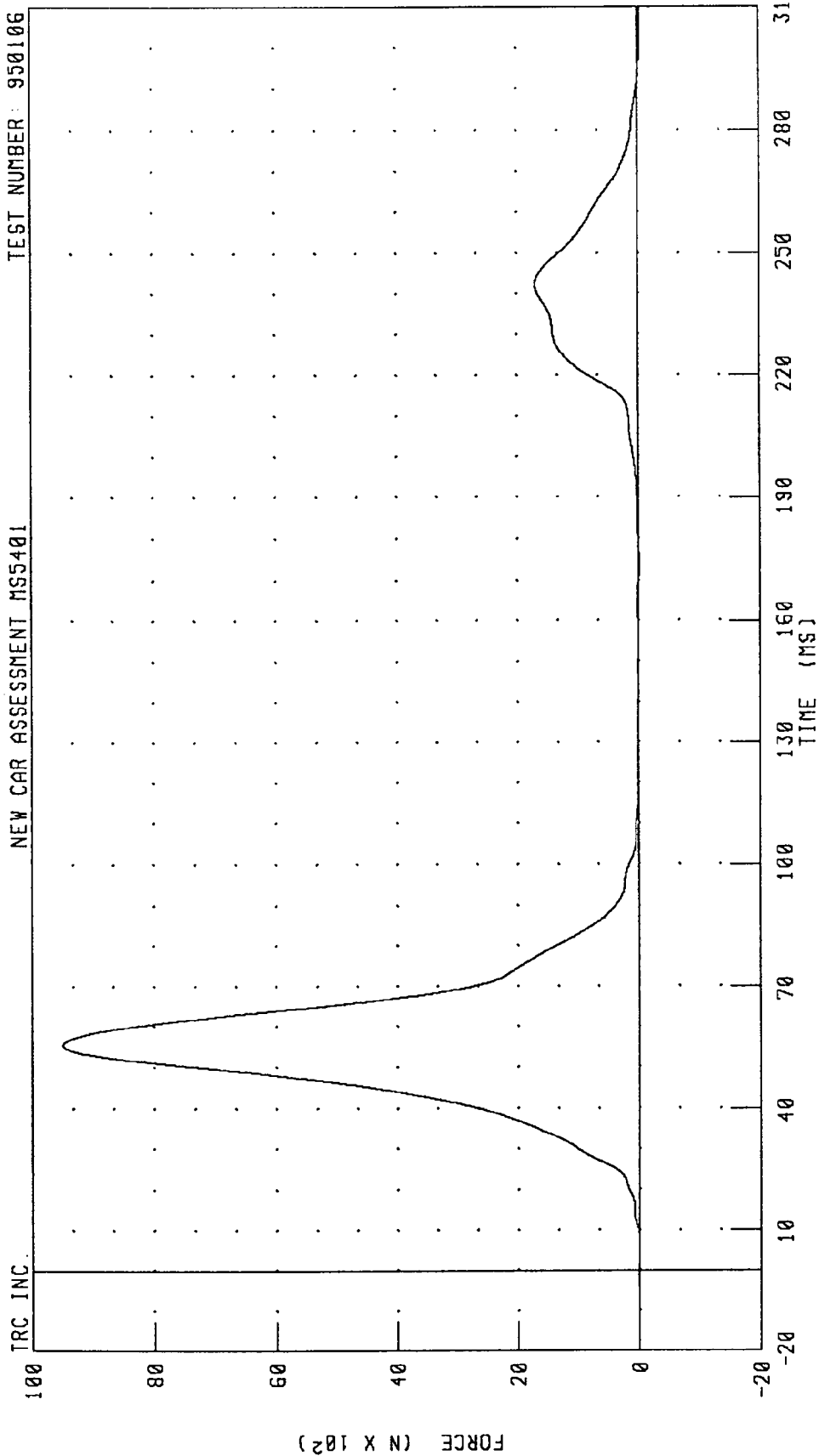
-100

CHANNEL: RFMF2 FILTER: CH. CLASS 600

PEAK DATA: 906.38 N @ 119.36 MS; -2020.03 N @ 55.76 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



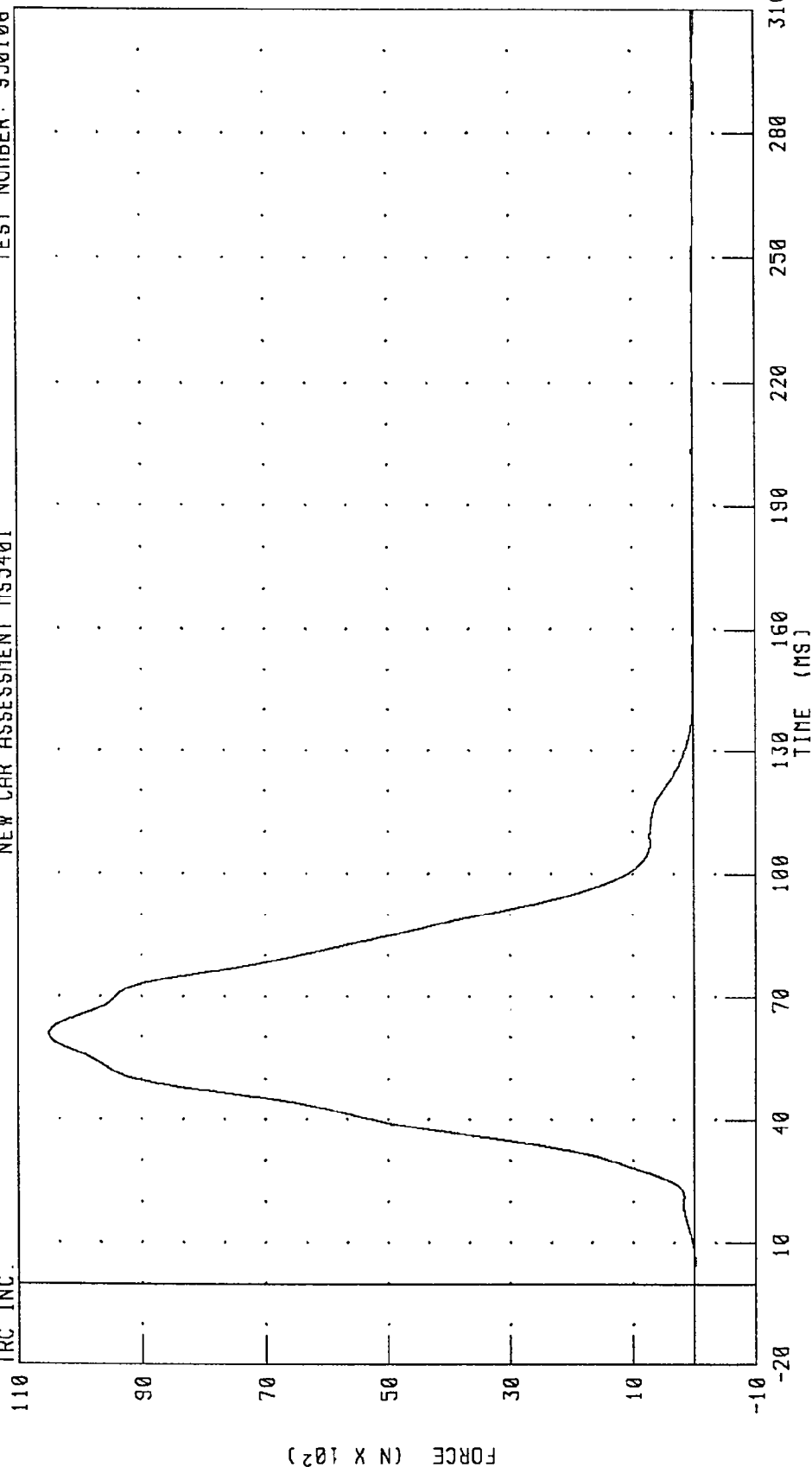
PEAK DATA: 9496.39 N @ 55.44 MS; -34.31 N @ 309.28 MS

CHANNEL: LBOF2 FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT FORCE
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

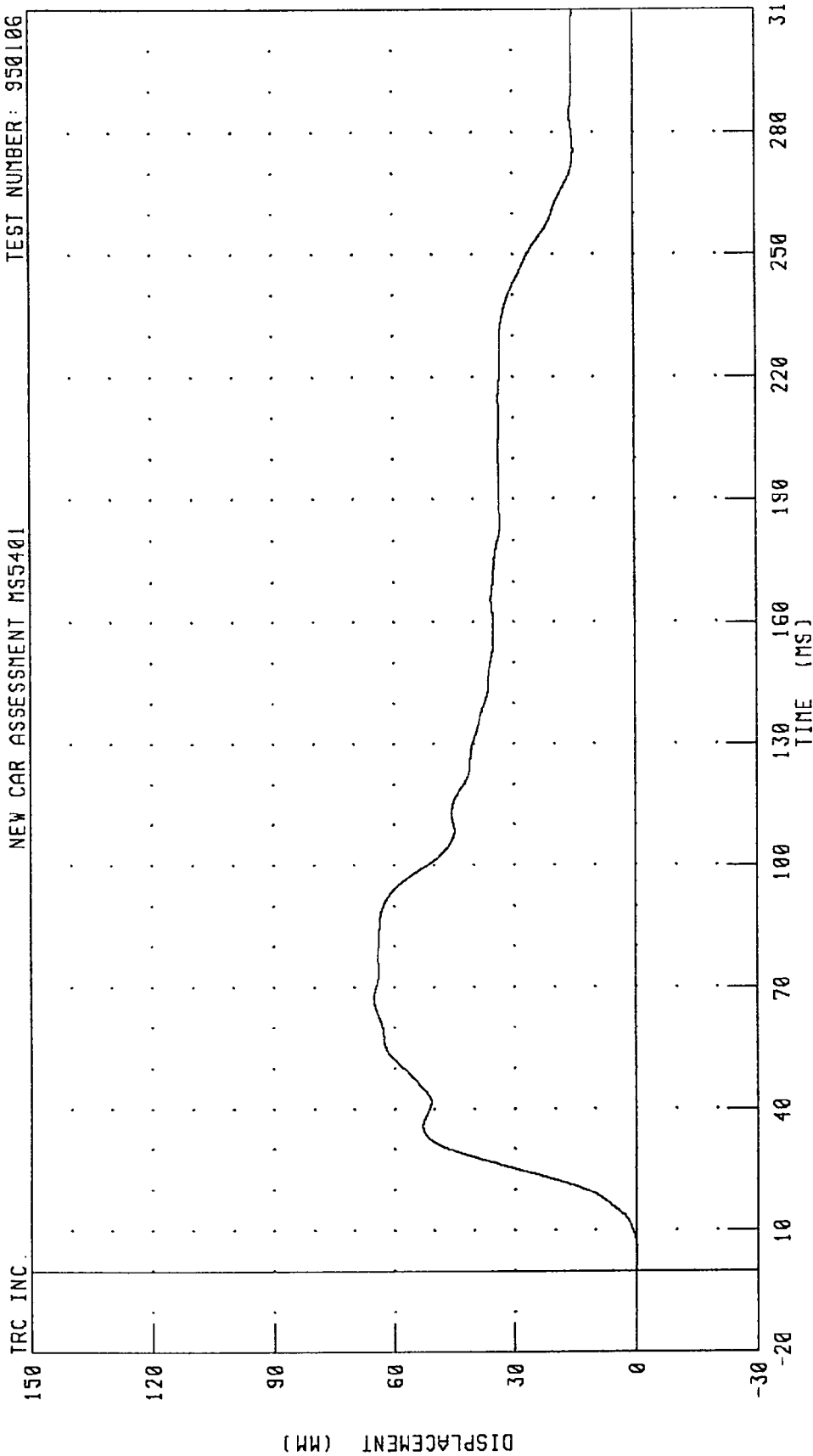


PEAK DATA: 10502.87 N @ 60.64 MS; -35.70 N @ 309.36 MS

CHANNEL: SHBF2 FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



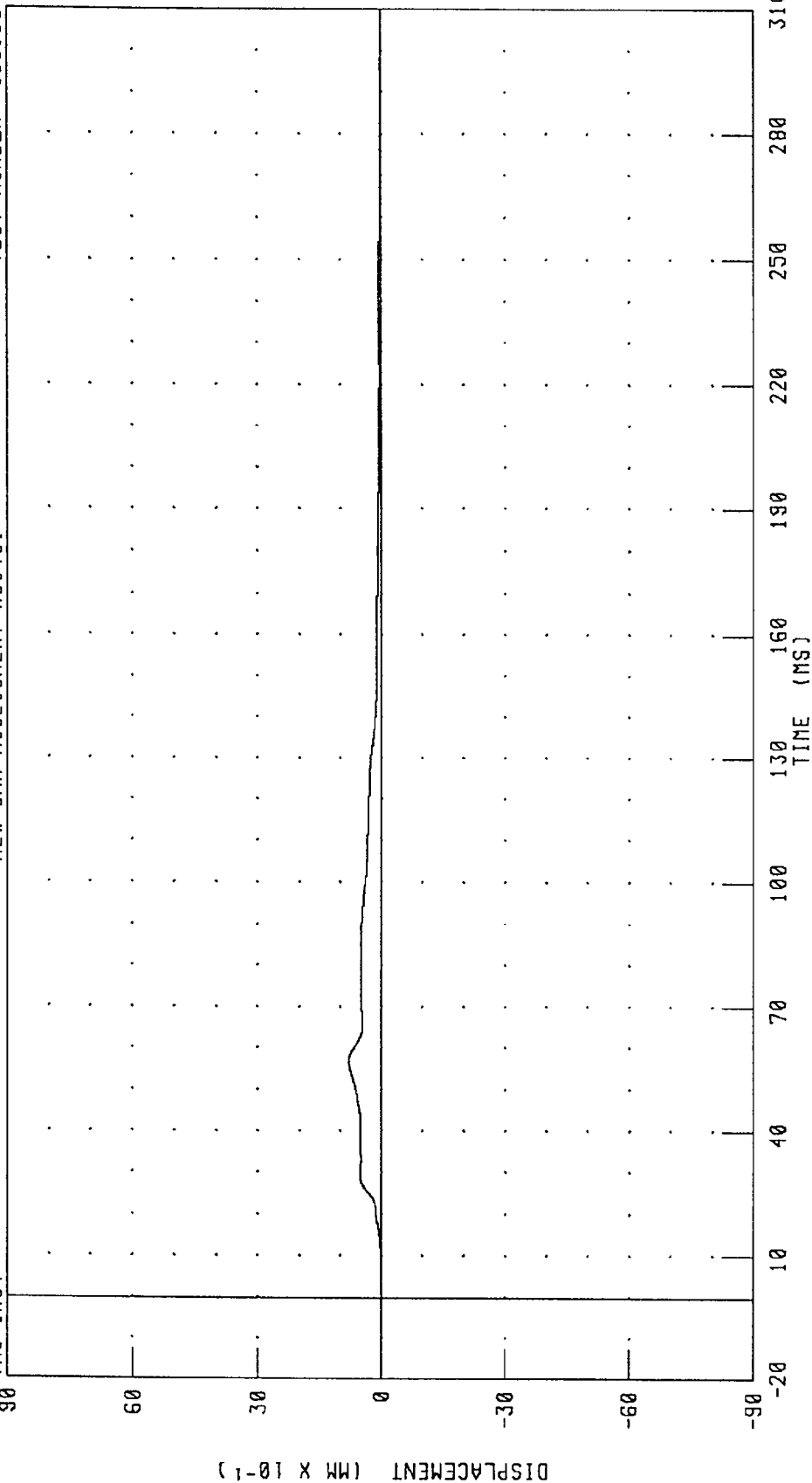
PEAK DATA: 65.15 MM @ 67.12 MS; -0.15 MM @ 3.44 MS

CHANNEL: SH002 FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

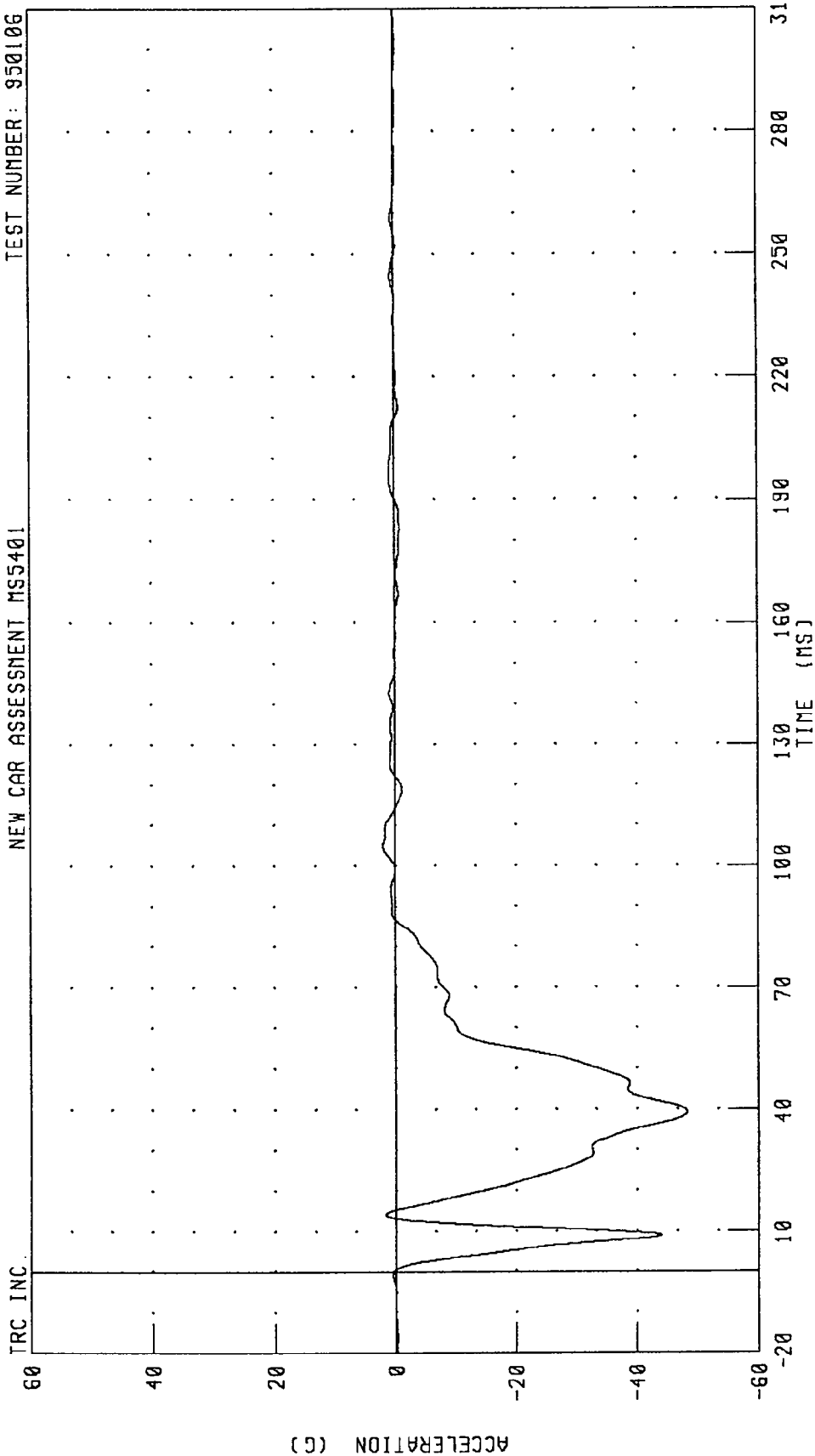


PEAK DATA: 0.79 MM @ 56.80 MS; -0.01 MM @ 5.60 MS

CHANNEL: SBED2 FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



CHANNEL: TLRXG1 FILTER: CH. CLASS 60

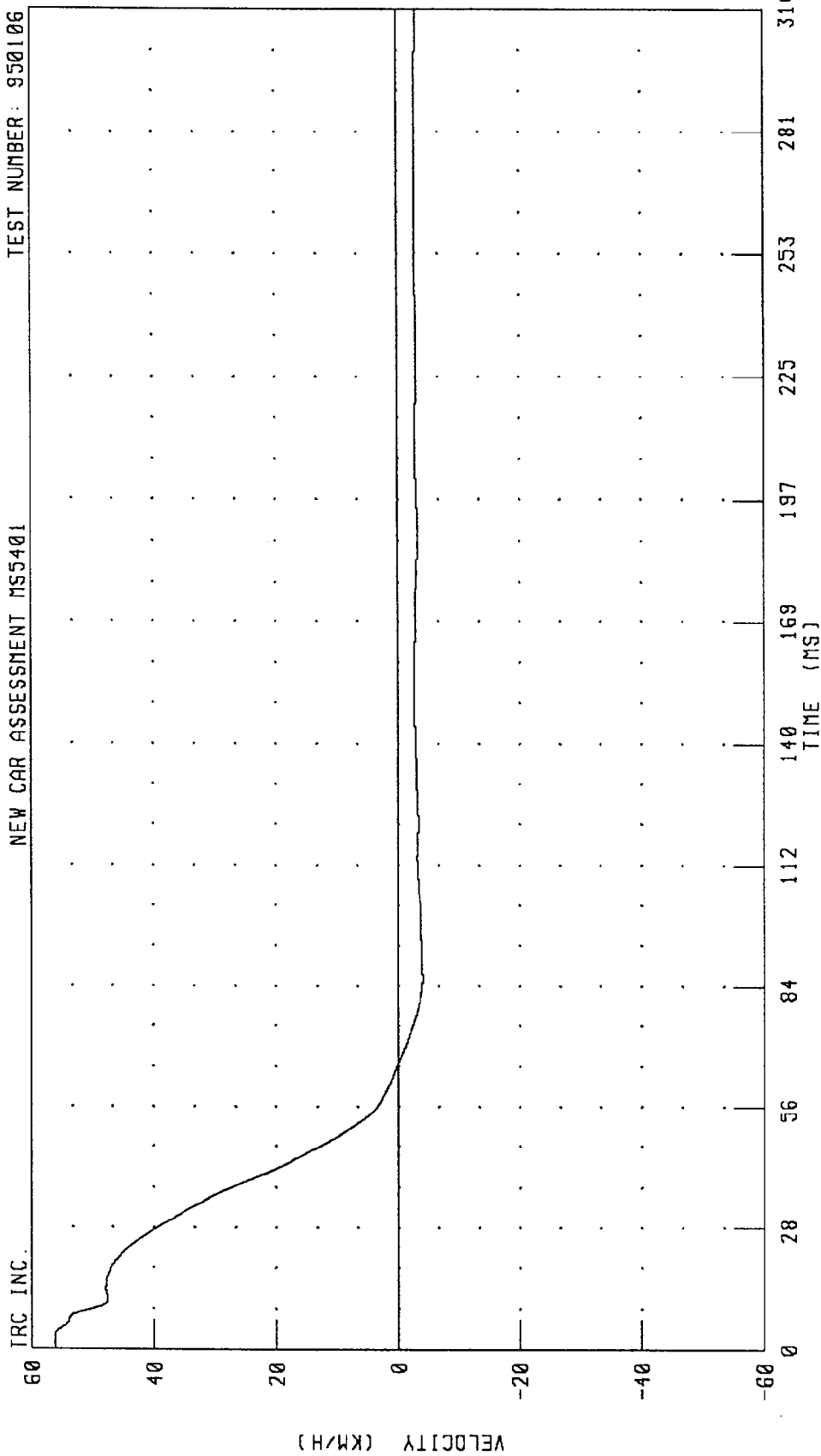
PEAK DATA: 1.99 G @ 104.88 MS; -48.27 G @ 39.44 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER

LEFT REAR SEAT X-AXIS VELOCITY

NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

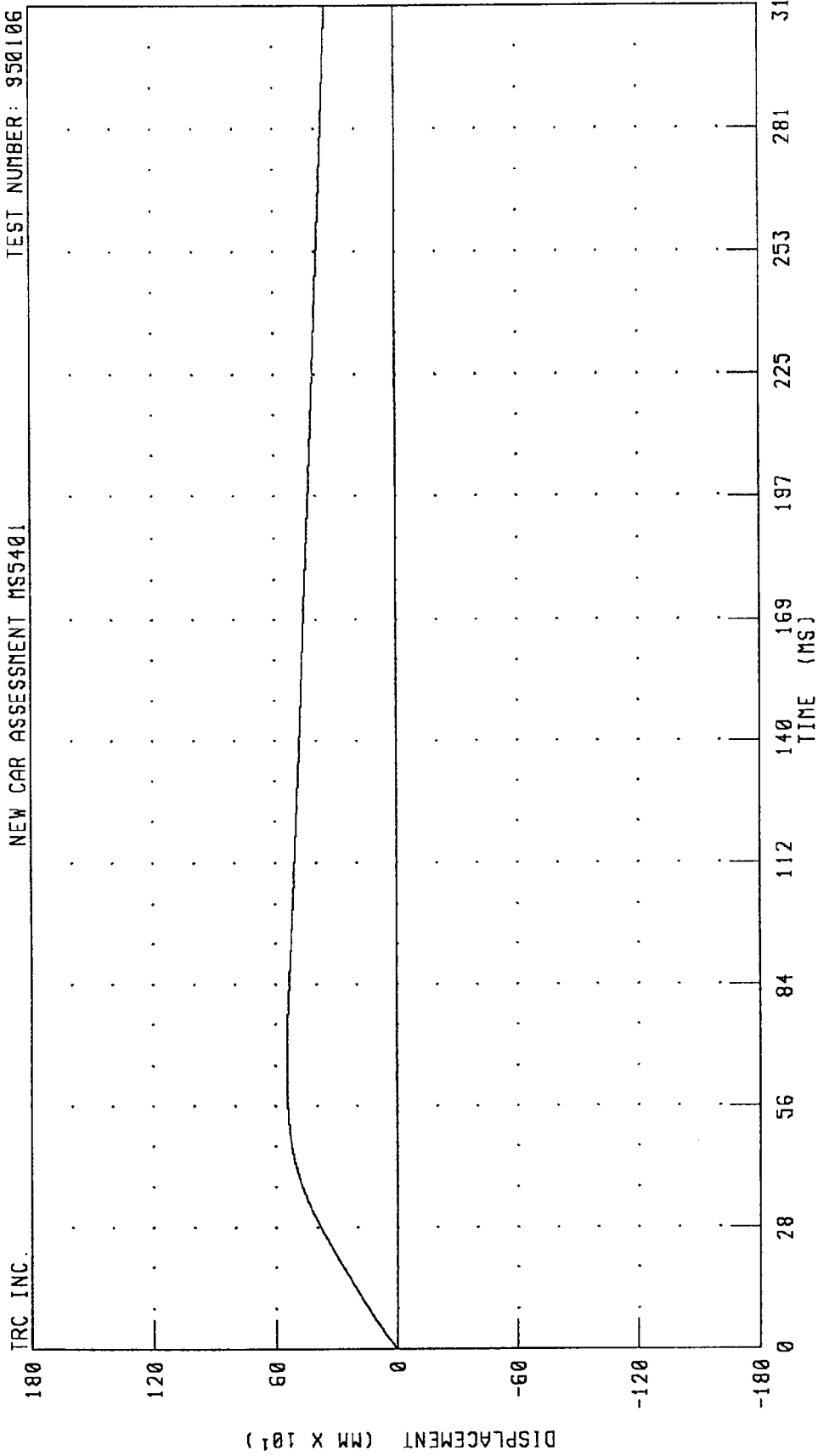


PEAK DATA: 56.30 KM/H @ 0.00 MS; -3.97 KM/H @ 86.24 MS

CHANNEL: TLRXV1 FILTER: CH. CLASS 180

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS DISPLACEMENT
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



PEAK DATA: 546.35 MM @ 66.48 MS; 0.00 MM @ 0.00 MS

CHANNEL: TLRXD1 FILTER: CH. CLASS 180

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION

TEST NUMBER: 950106

NEW CAR ASSESSMENT MS5401

TRC INC.

60

40

20

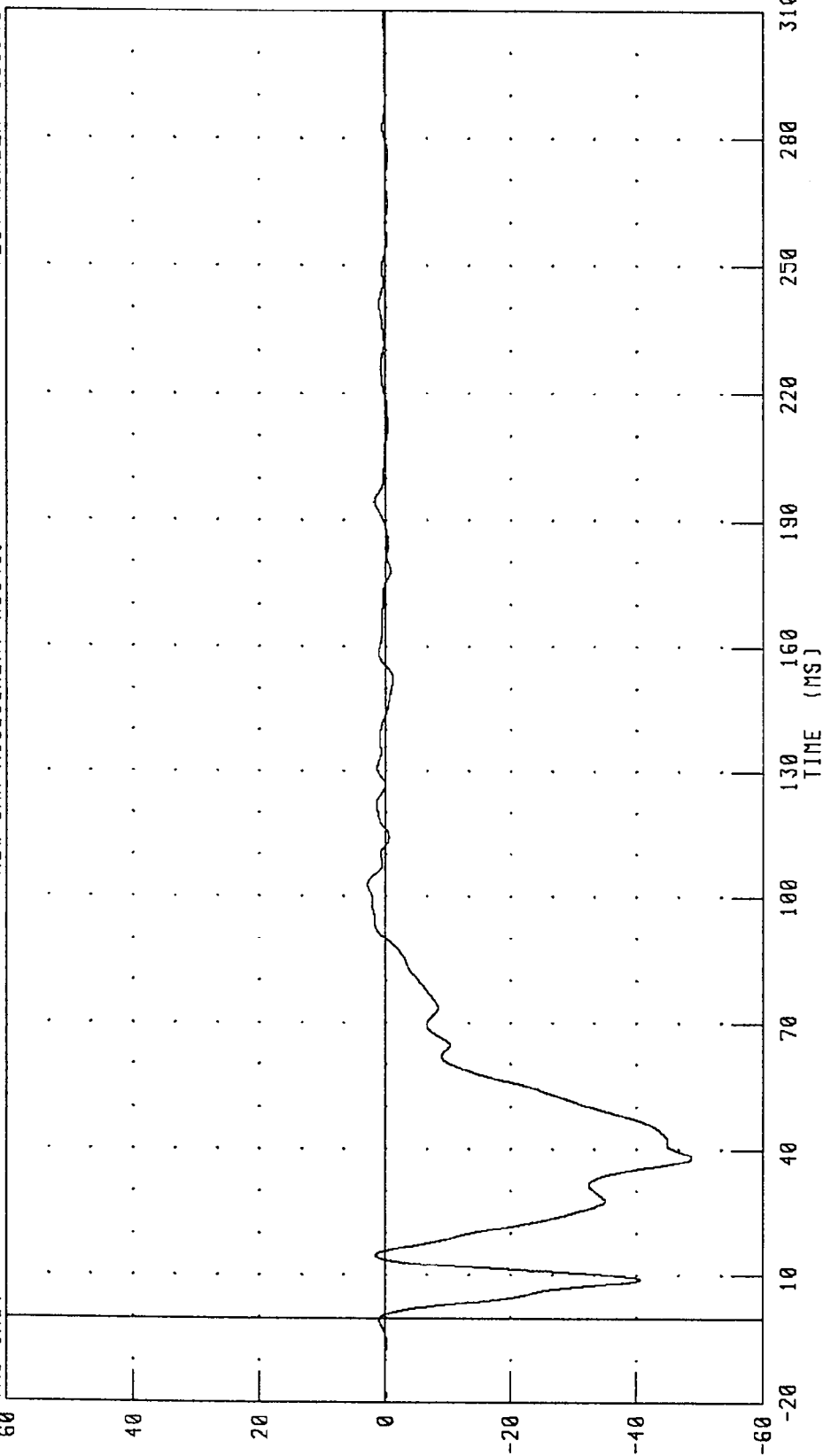
0

-20

-40

-60

ACCELERATION (G)



CHANNEL: TRRXG1 FILTER: CH. CLASS 60

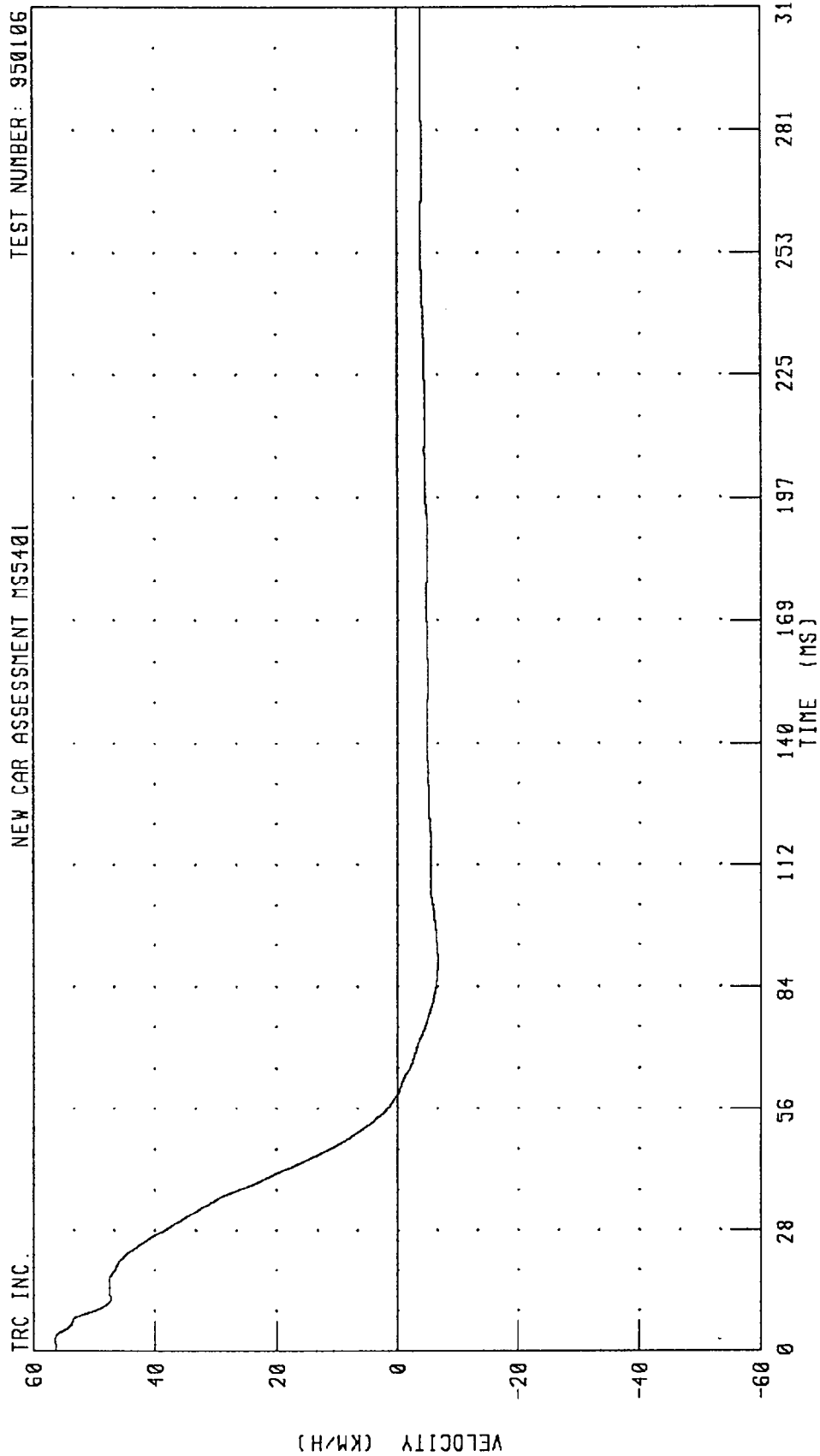
PEAK DATA: 2.83 G @ 102.88 MS; -48.83 G @ 38.08 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER

RIGHT REAR SEAT X-AXIS VELOCITY

NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

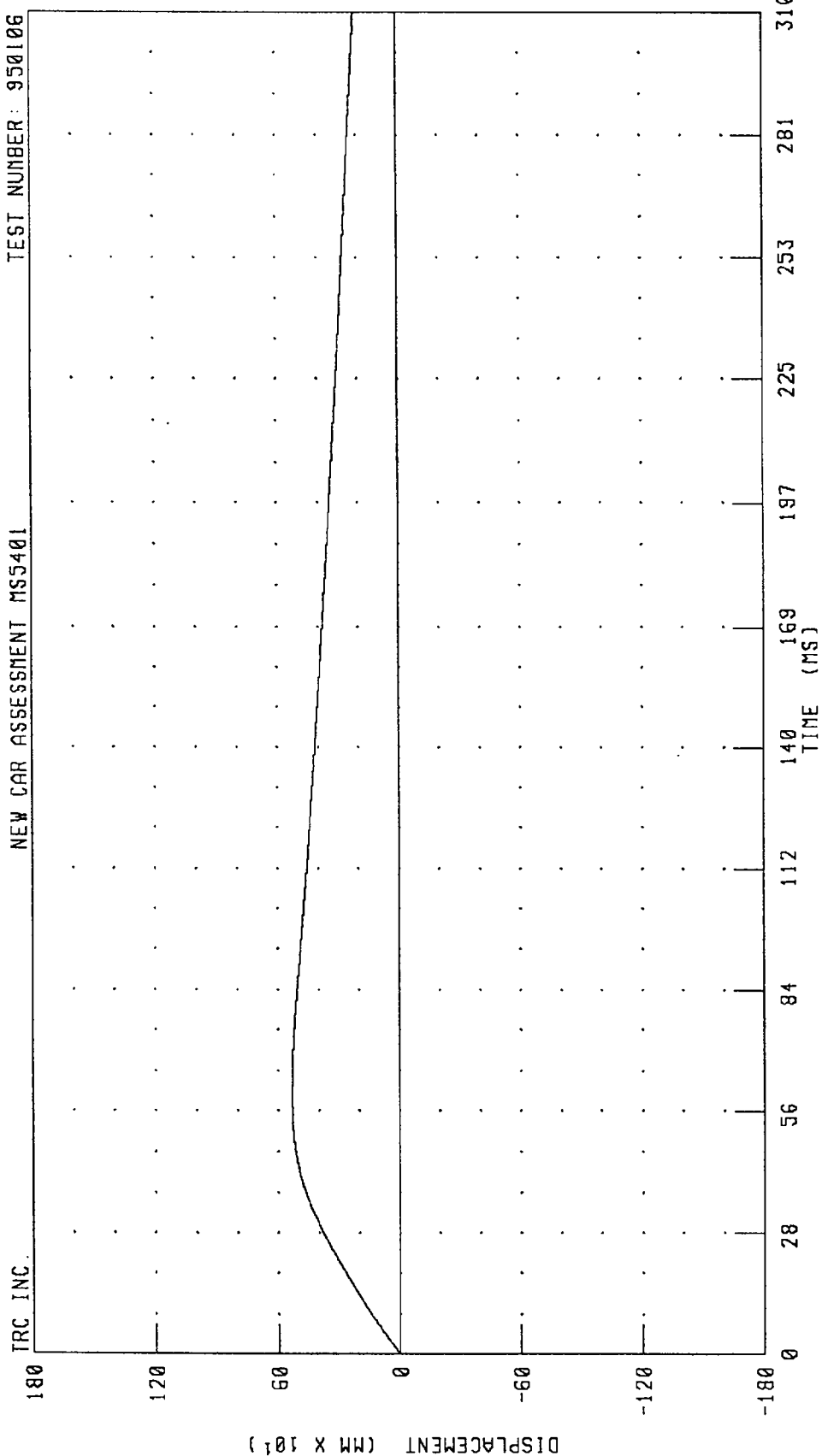


CHANNEL: IRRXV1 FILTER: CH. CLASS 180

PEAK DATA: 56.33 KM/H @ 2.56 MS; -6.75 KM/H @ 90.40 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS DISPLACEMENT
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



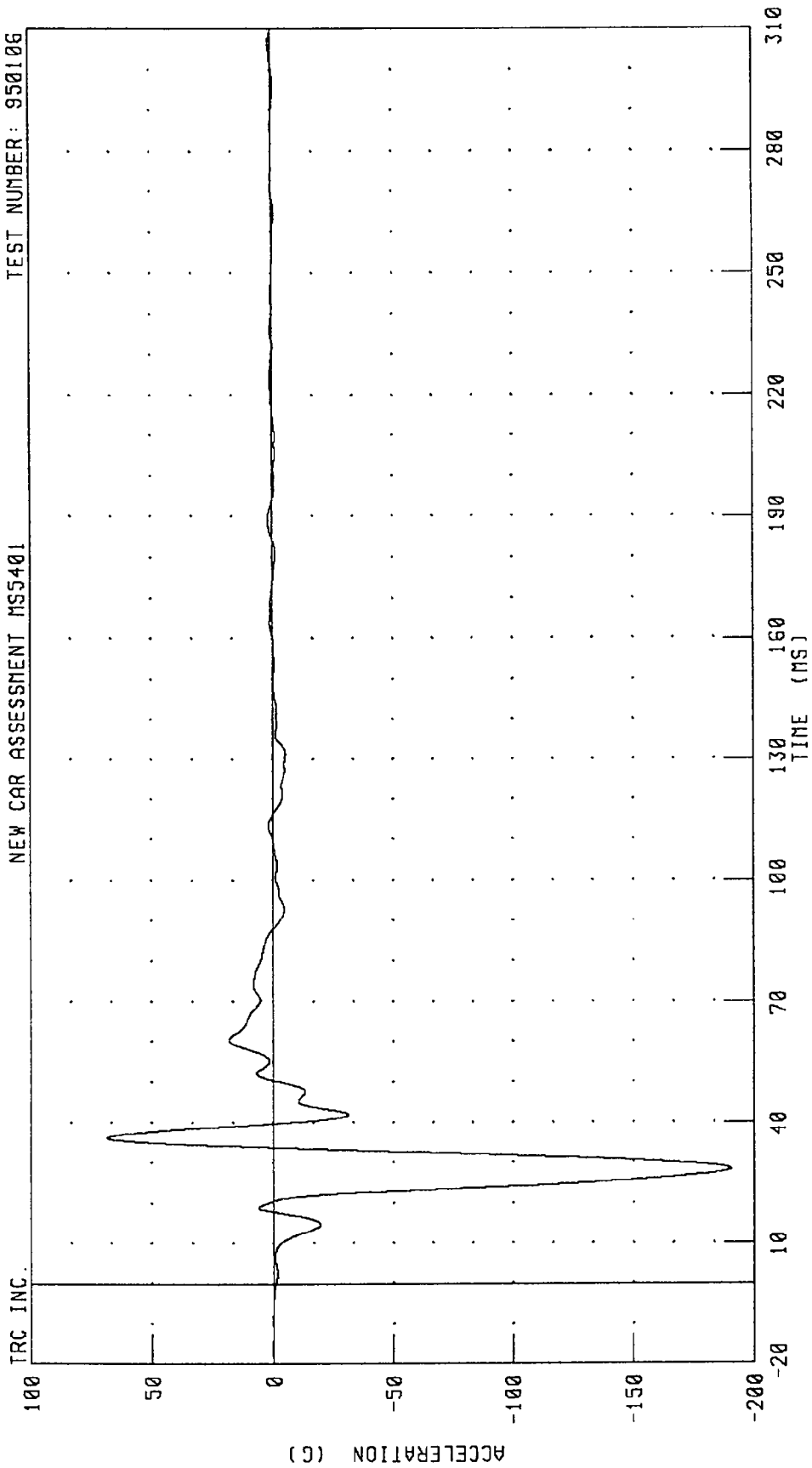
PEAK DATA: 531.43 MM @ 59.84 MS; 0.00 MM @ 0.00 MS

CHANNEL: TRRXD1 FILTER: CH. CLASS 180

TRC INC.

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
ENGINE TOP X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



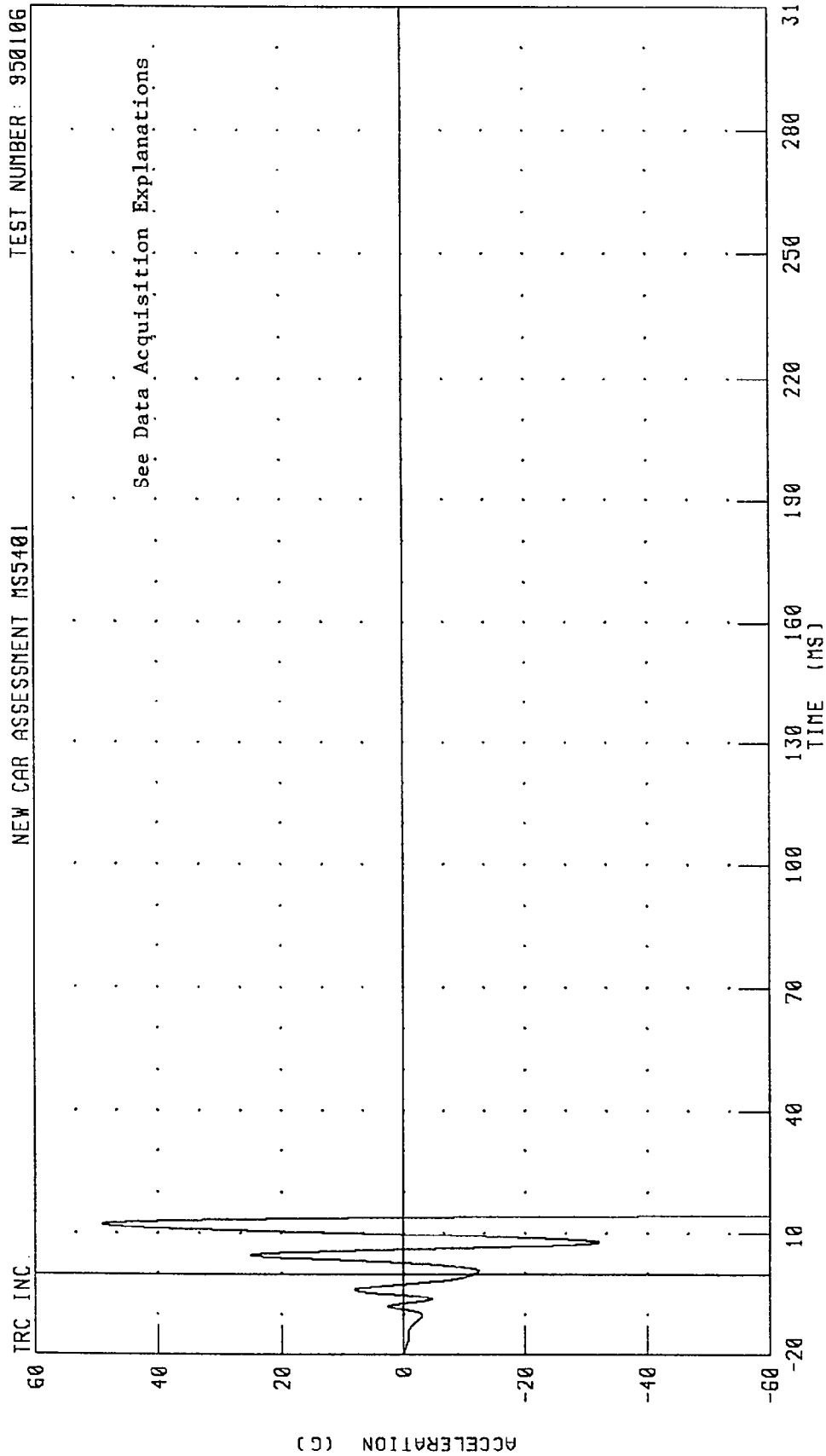
CHANNEL: ENGCG1 FILTER: CH. CLASS 60

950106

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION

TEST NUMBER: 950106

NEW CAR ASSESSMENT MS5401

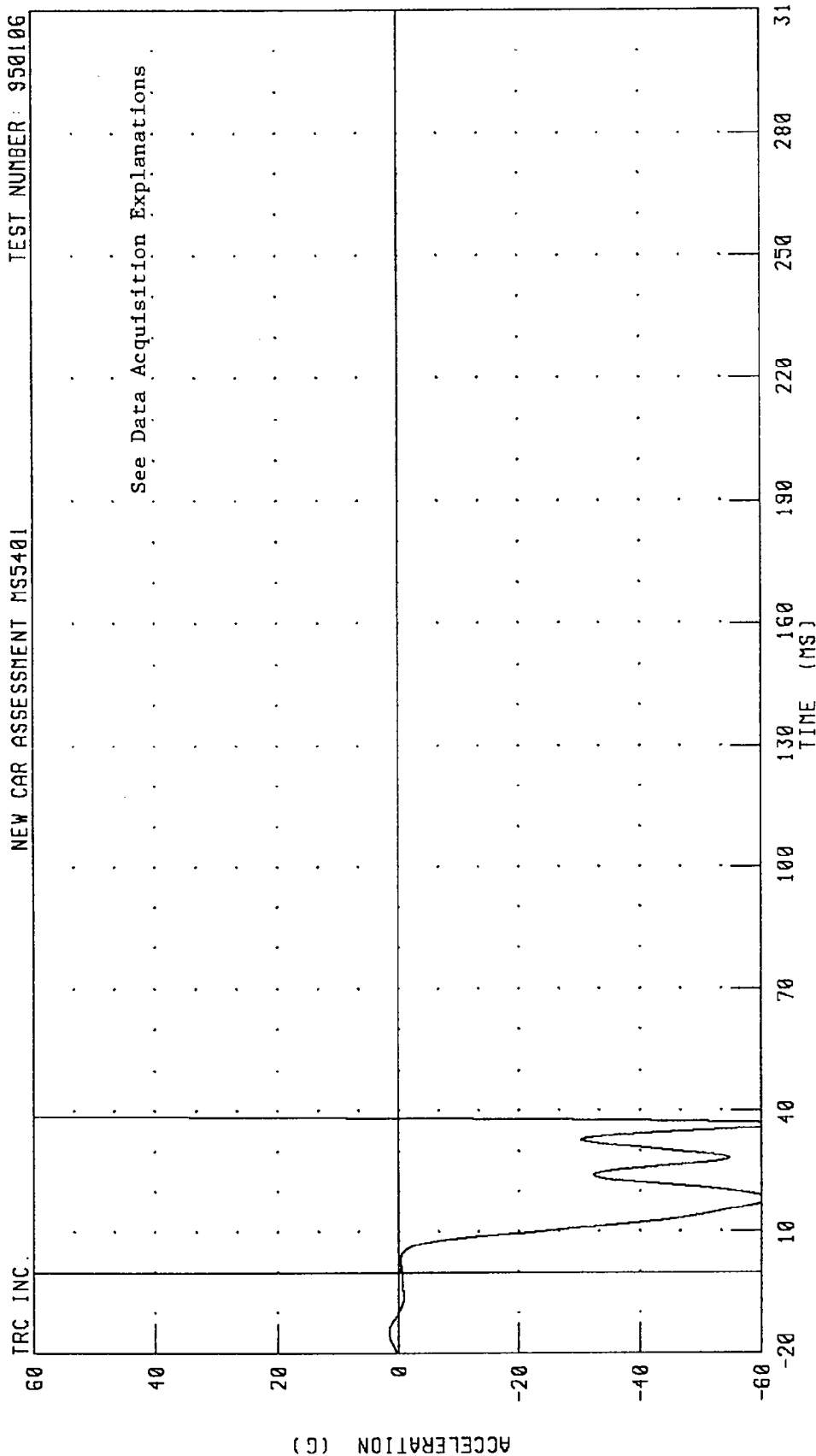


CHANNEL: ENGCG2 FILTER: CH. CLASS 60

PEAK DATA: 49.00 G @ 12.24 MS, -13.19 G @ 13.19 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 RIGHT BRAKE CALIPER X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



PEAK DATA: 924.48 G @ 75.68 MS; -64.22 G @ 36.48 MS

CHANNEL: BCRXG1 FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

70

40

10

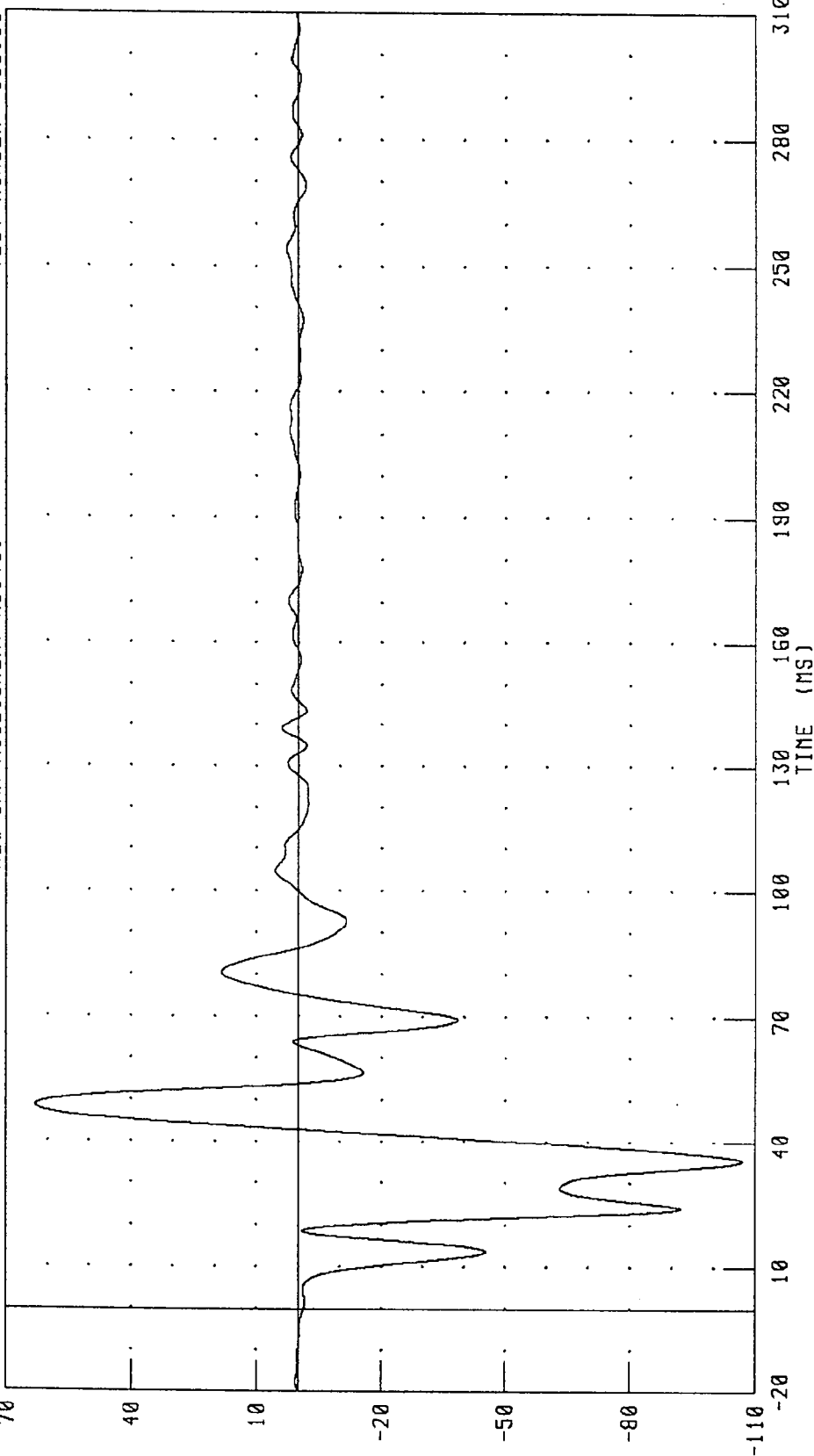
-20

-50

-80

-110

ACCELERATION (G)

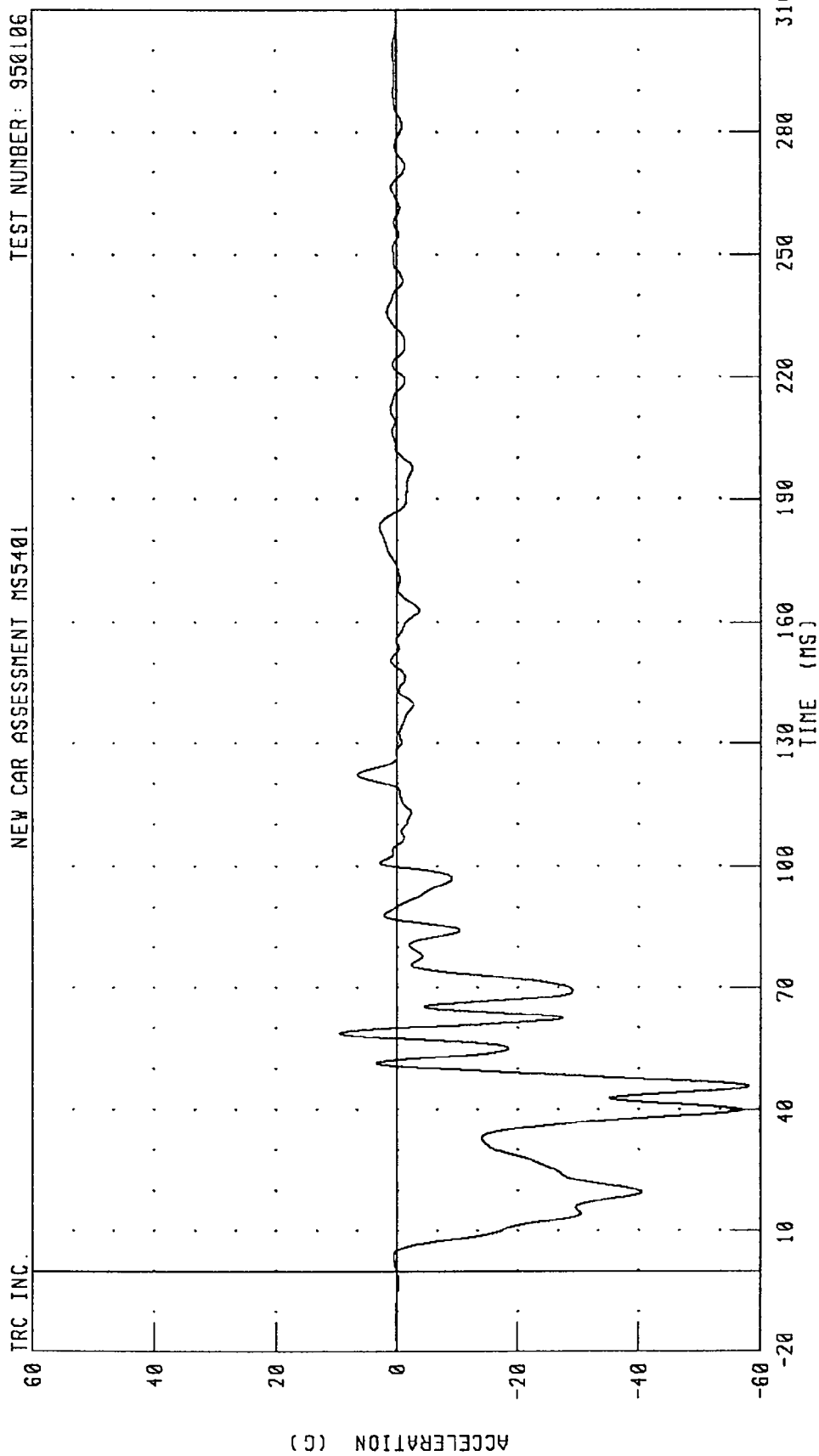


CHANNEL: BCLXG1 FILTER: CH. CLASS 60

PEAK DATA: 62.97 G @ 48.64 MS; -106.85 G @ 35.52 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

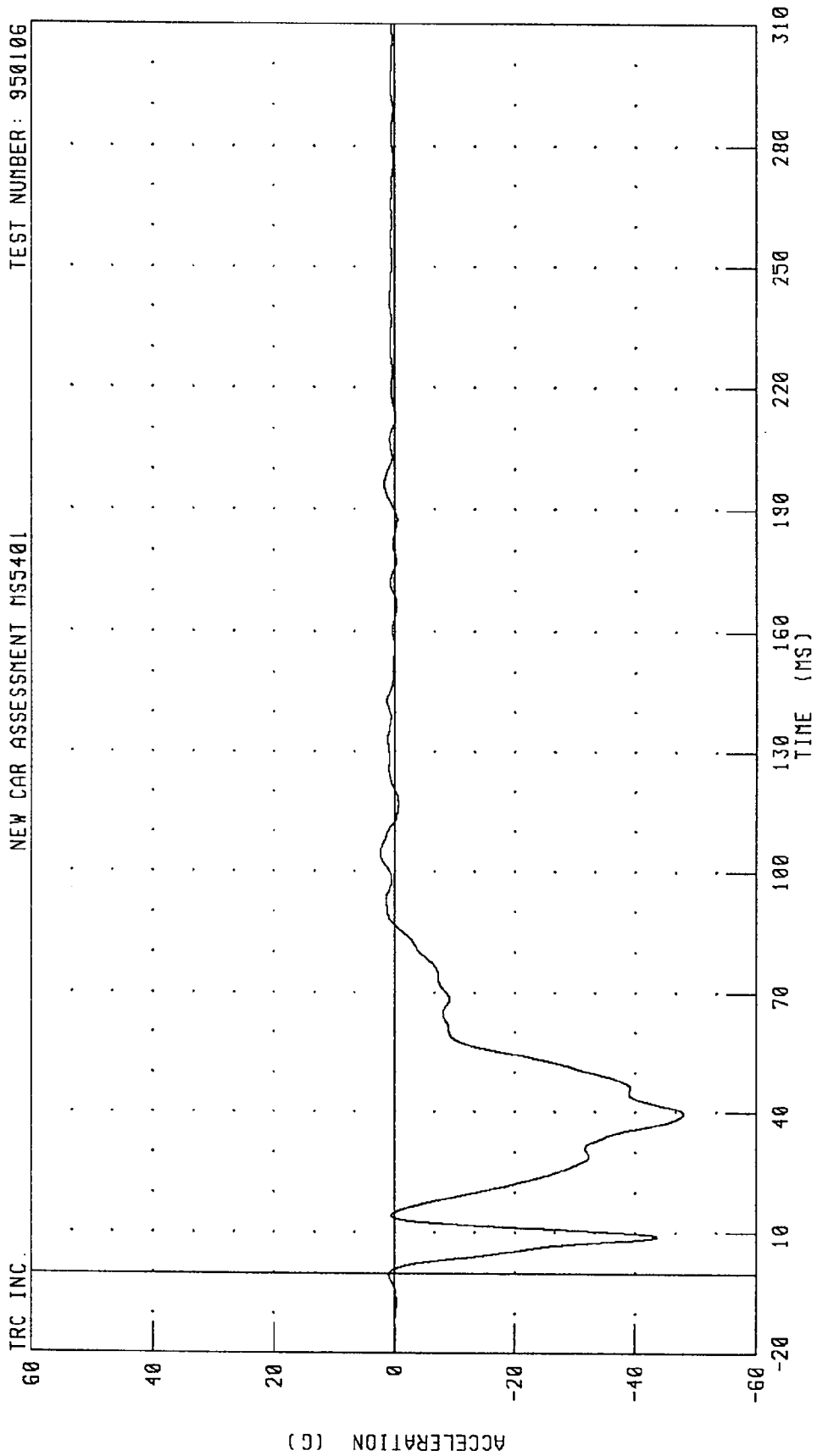
TEST NUMBER: 950106



1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION

TEST NUMBER: 950106

NEW CAR ASSESSMENT MS5401

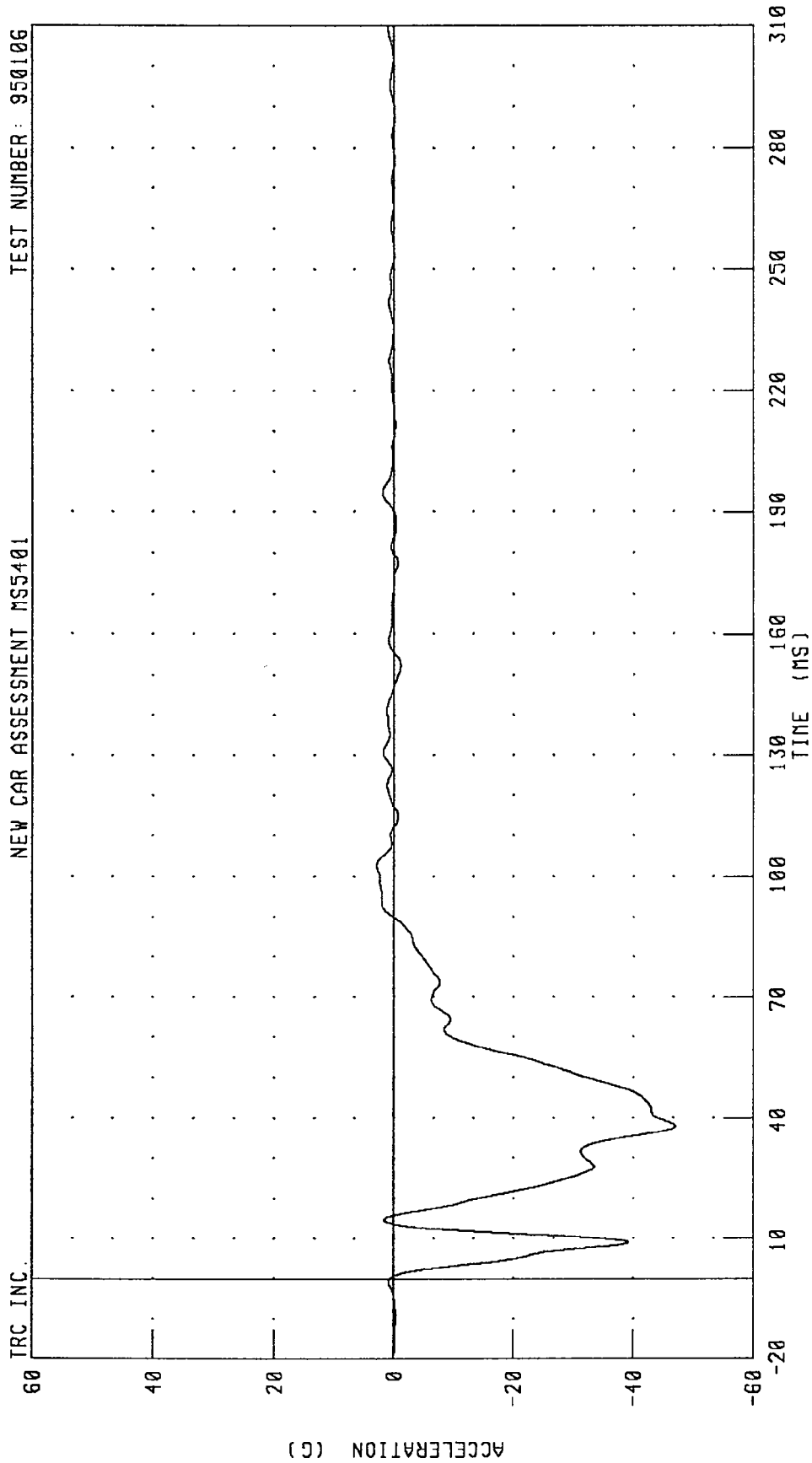


CHANNEL: TLRXGA FILTER: CH. CLASS 60

PEAK DATA: 2.44 G @ 104.32 MS; -47.91 G @ 39.68 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5401

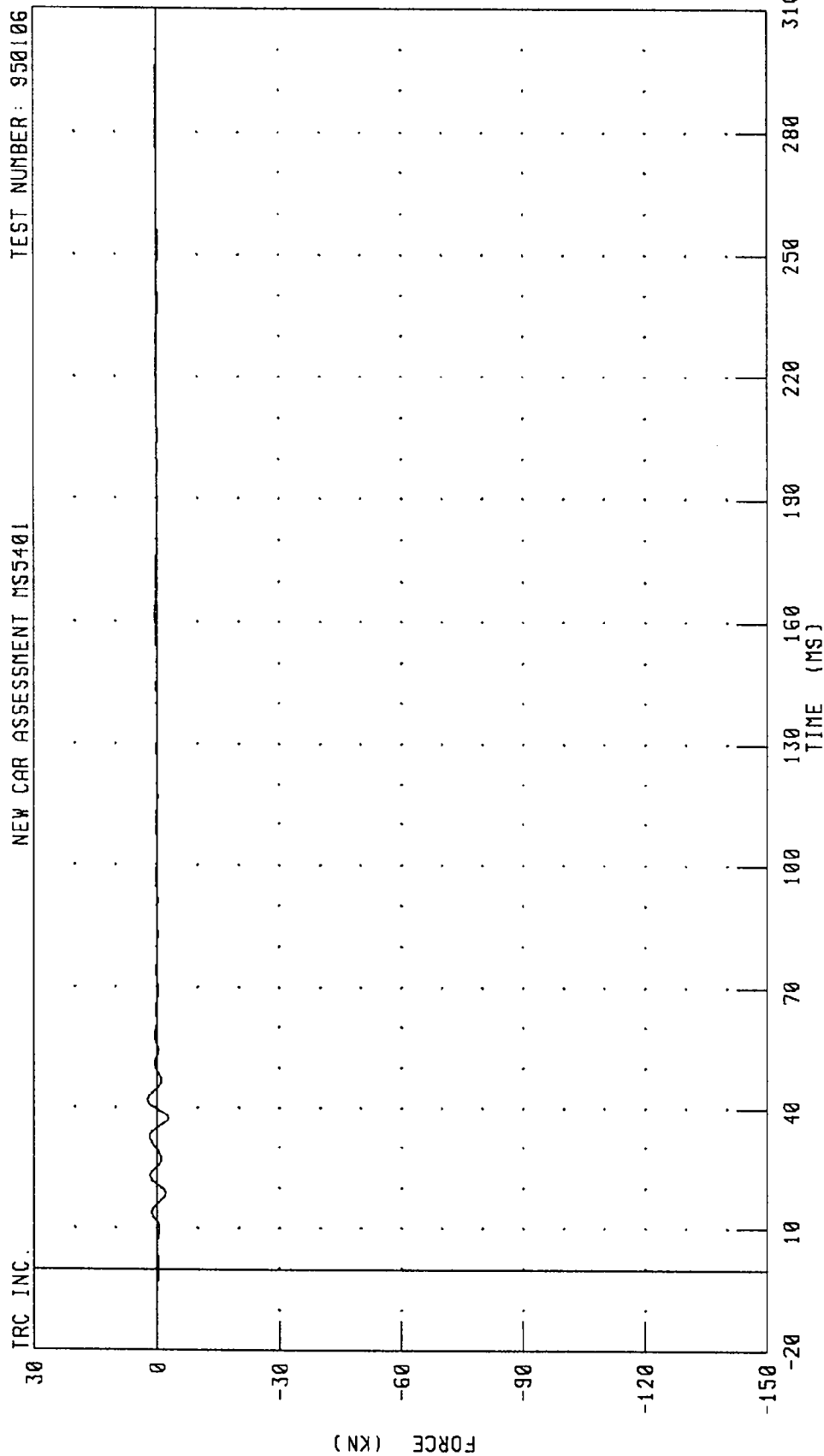
TEST NUMBER: 950106



CHANNEL: TRRXGA FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A1 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



PEAK DATA: 2.23 KN @ 42.00 MS; -2.71 KN @ 37.44 MS

CHANNEL: BA1F FILTER: CH. CLASS 60

FORCE (KN)

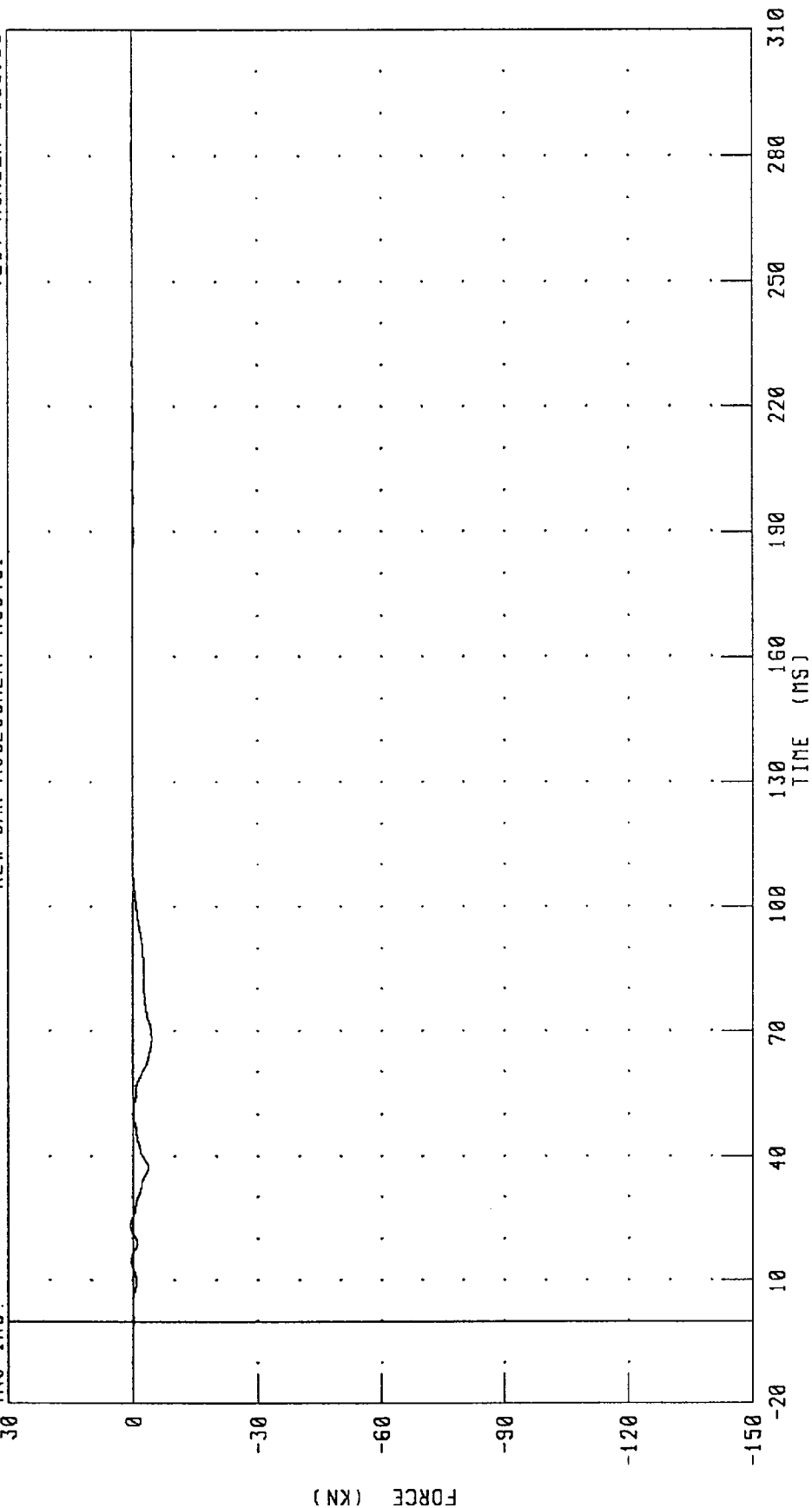
TIME (MS)

TRC INC.

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A2 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



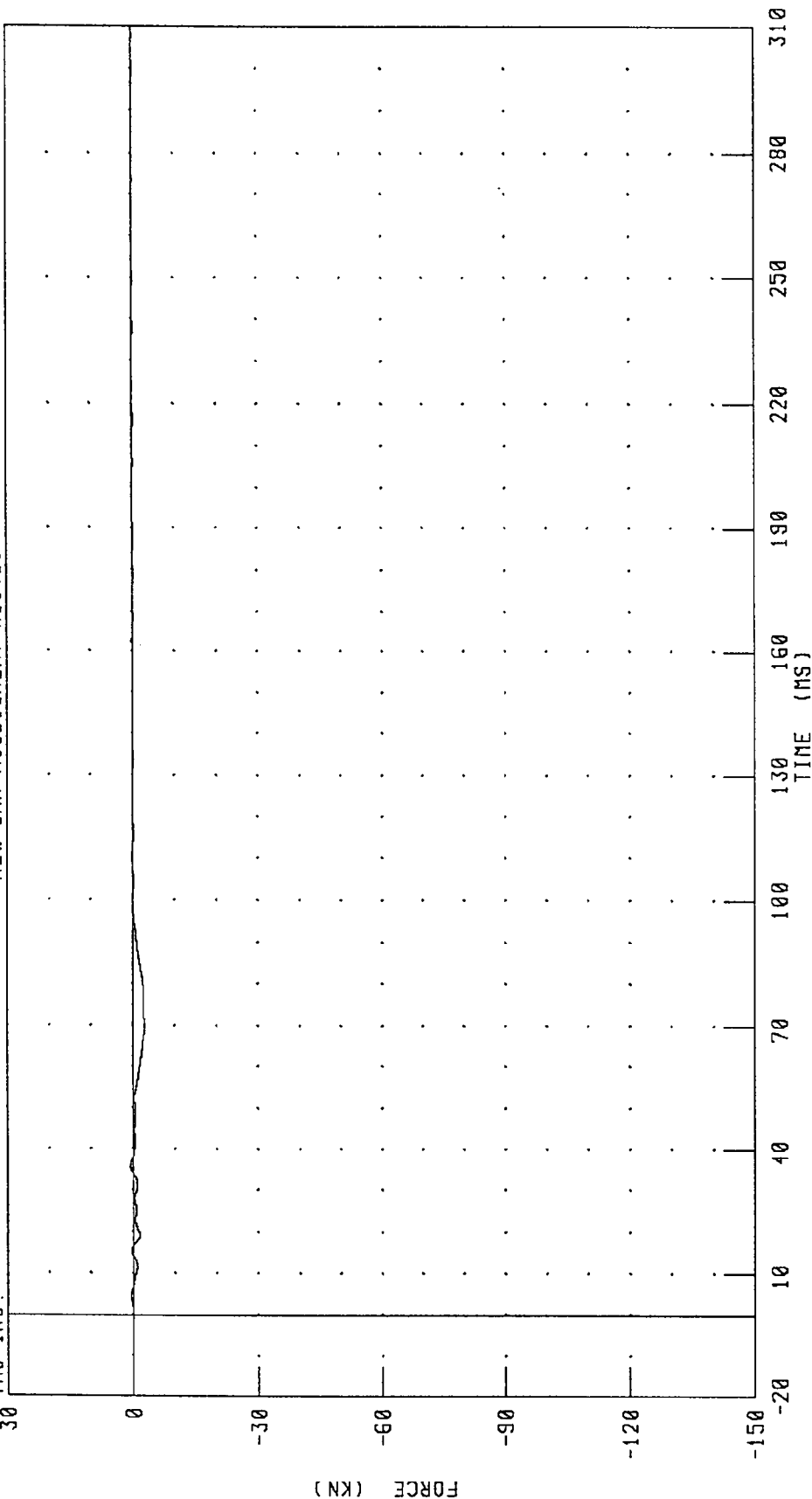
PEAK DATA: 0.63 KN @ 23.28 MS; -4.49 KN @ 68.16 MS

CHANNEL: BA2F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A3 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



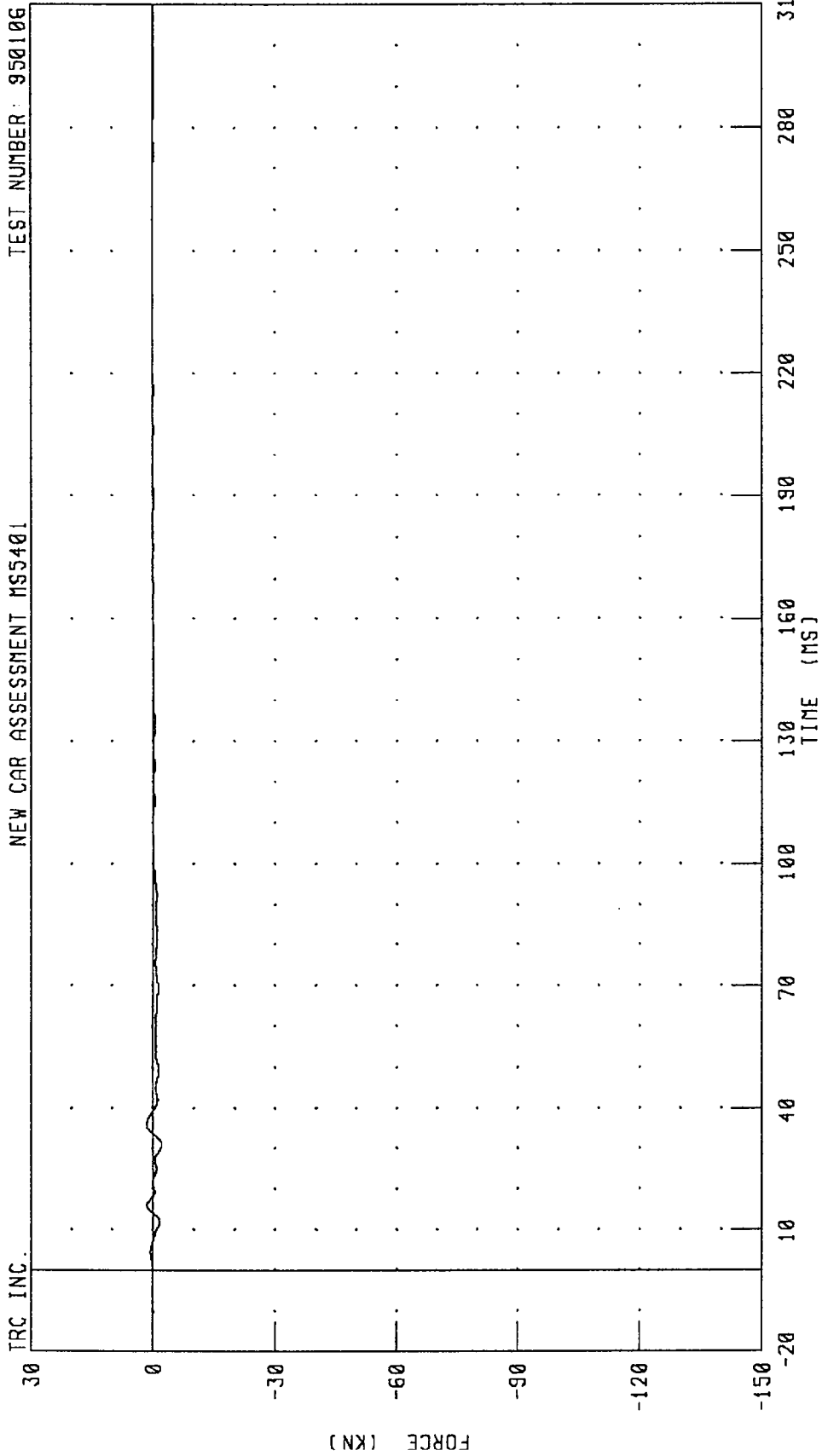
PEAK DATA: 0.62 KN @ 35.60 MS; -2.76 KN @ 70.16 MS

FILTER: CH. CLASS 60

CHANNEL: BA3F

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A4 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



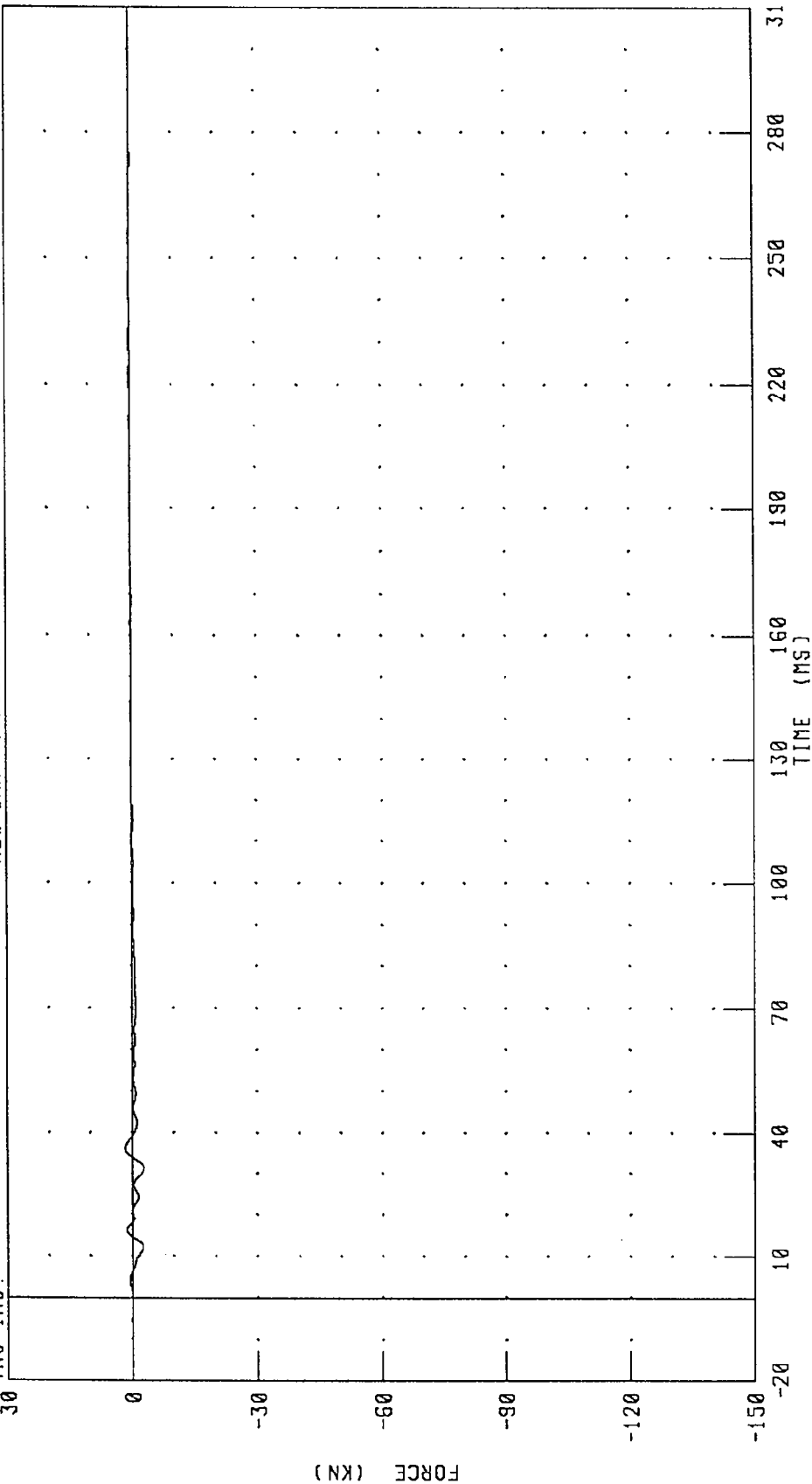
PEAK DATA: 1.54 KN @ 36.08 MS; -2.19 KN @ 30.96 MS

CHANNEL: BA4F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A5 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



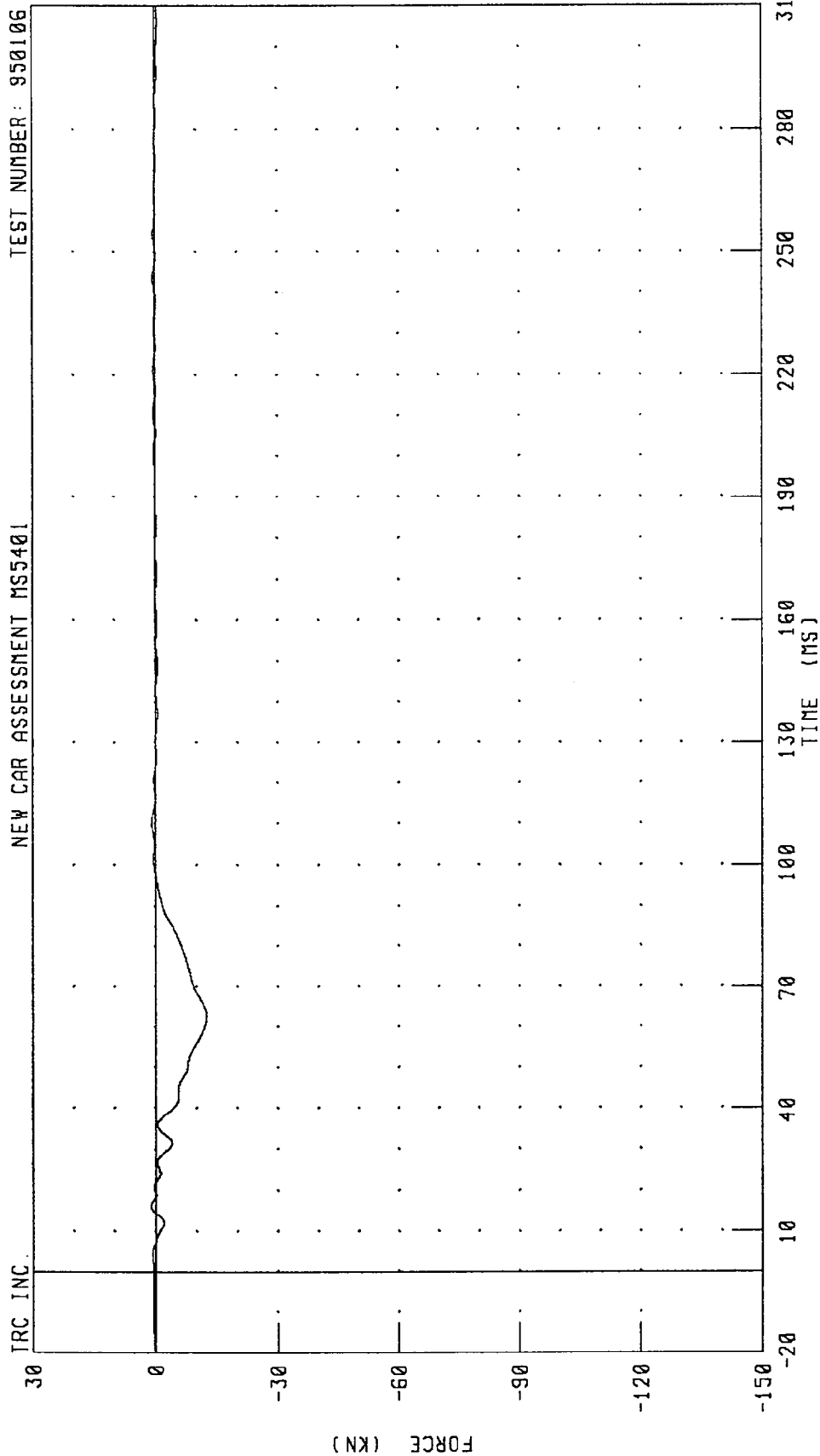
PEAK DATA: 1.62 KN @ 36.08 MS; -2.76 KN @ 31.28 MS

FILTER: CH. CLASS 60

CHANNEL: BASF

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A6 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



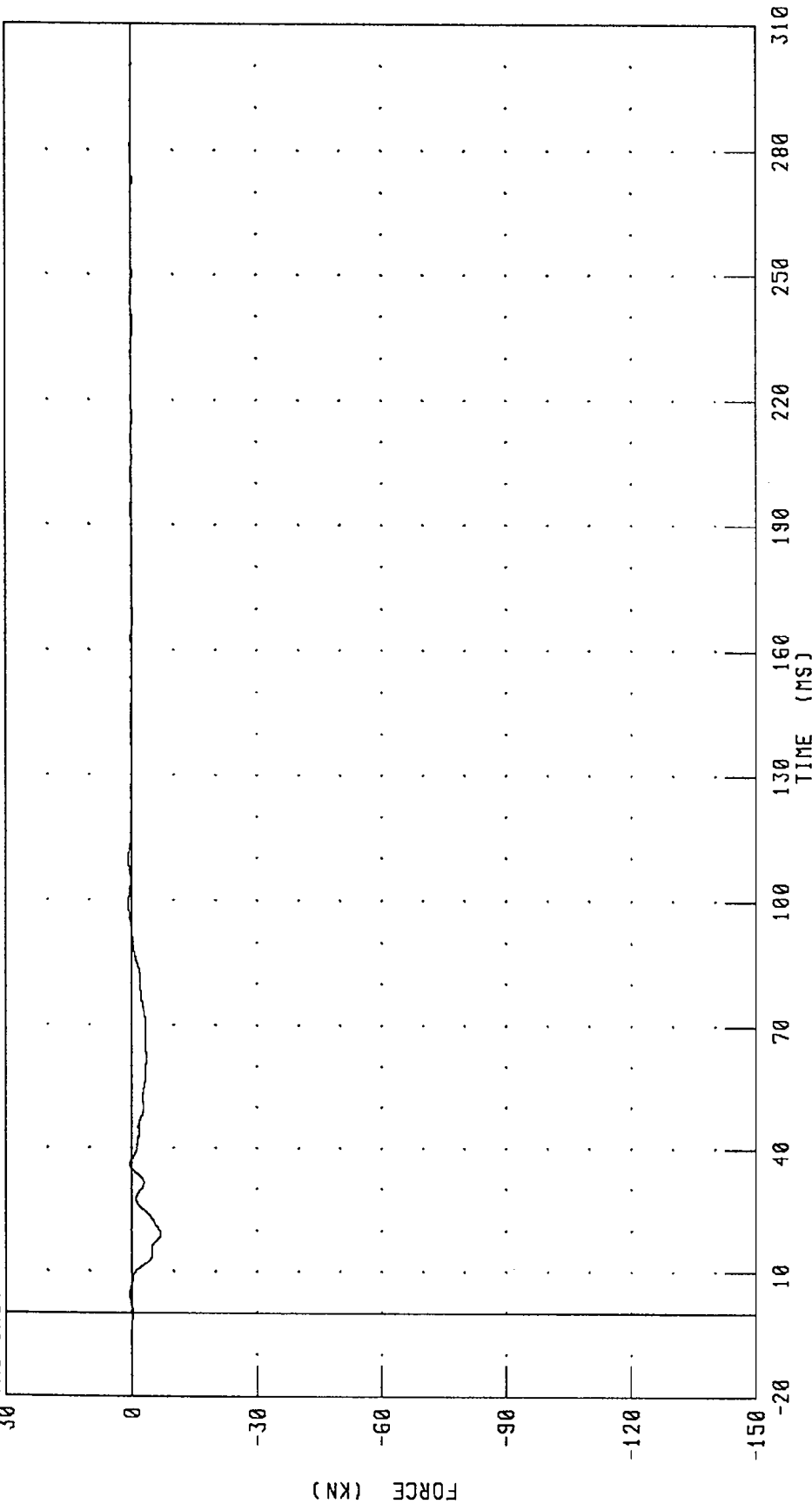
PEAK DATA: 1.27 KN @ 16.08 MS; -12.52 KN @ 62.56 MS

CHANNEL: BA6F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A7 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



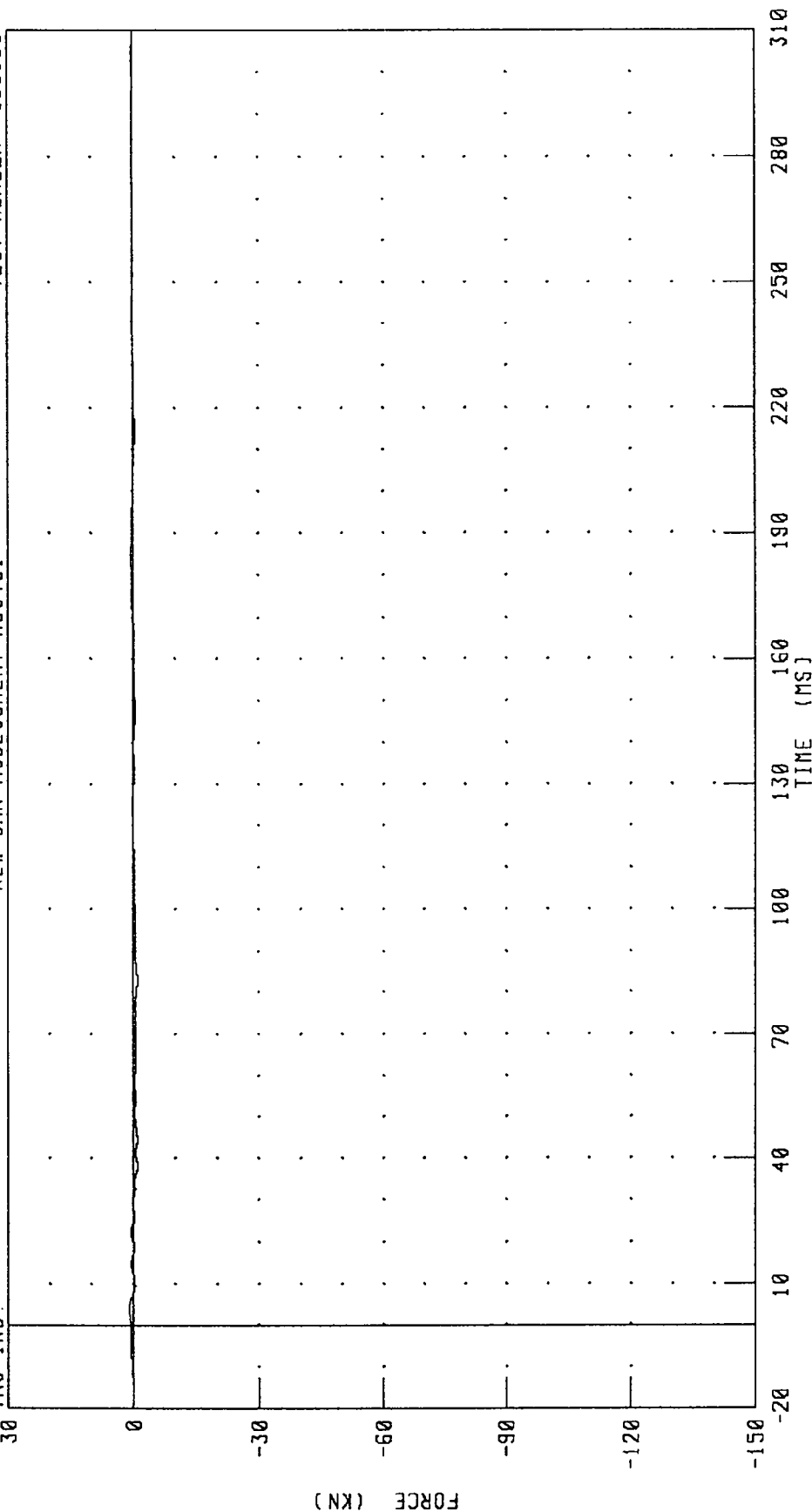
PEAK DATA: 0.69 KN @ 109.44 MS; -6.97 KN @ 19.20 MS

CHANNEL: BA7F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A8 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



PEAK DATA: 0.98 KN @ 3.92 MS; -1.07 KN @ 38.40 MS

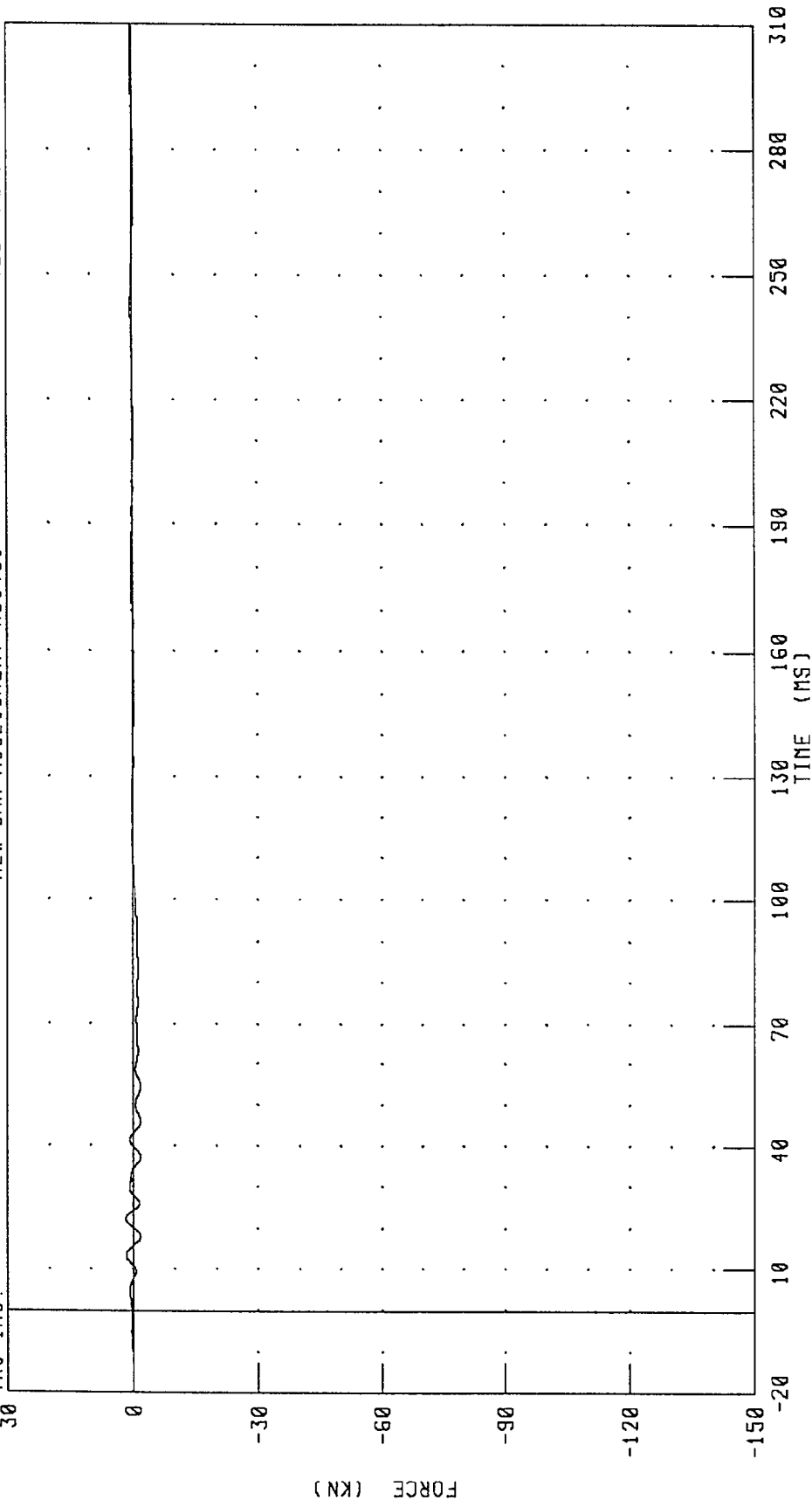
FILTER: CH. CLASS 60

CHANNEL: B8F

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A9 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



CHANNEL: BASF

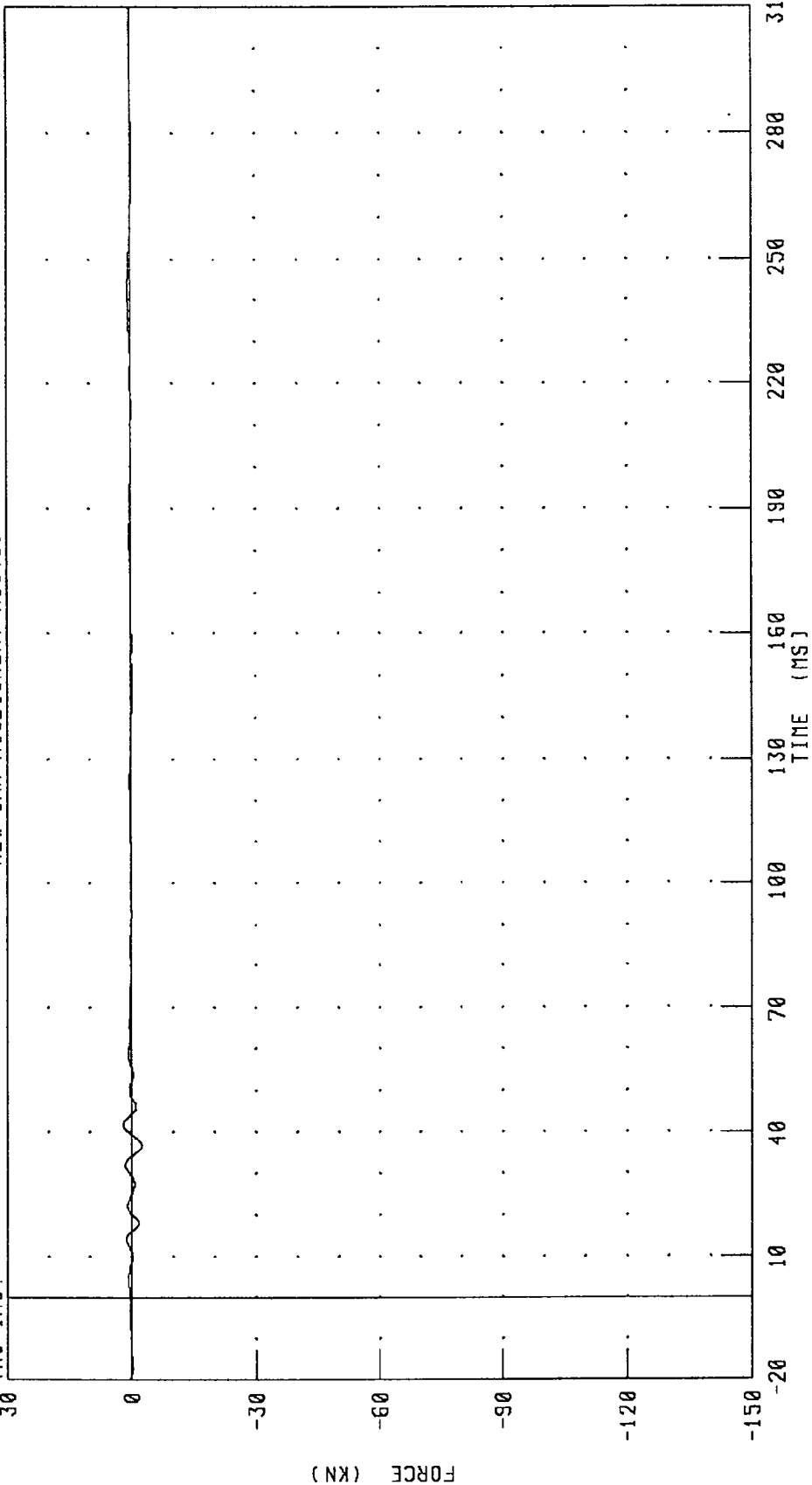
FILTER: CH. CLASS 60

PEAK DATA: 1.66 KN @ 22.16 MS, -1.87 KN @ 37.12 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B1 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

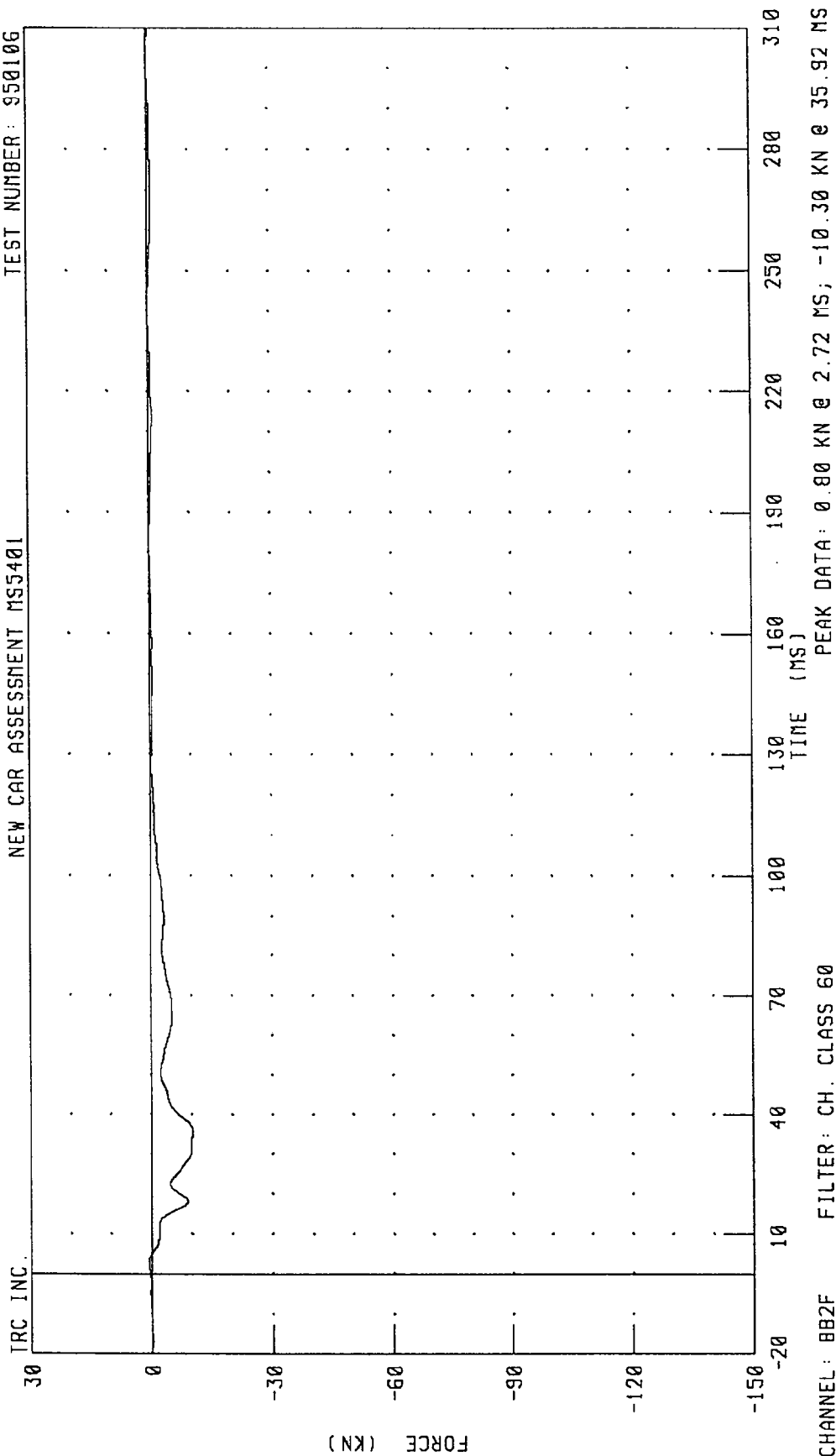


CHANNEL: BB1F FILTER: CH. CLASS 60

PEAK DATA: 1.88 KN @ 41.84 MS; -2.54 KN @ 36.80 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B2 FORCE
 NEW CAR ASSESSMENT MS5401

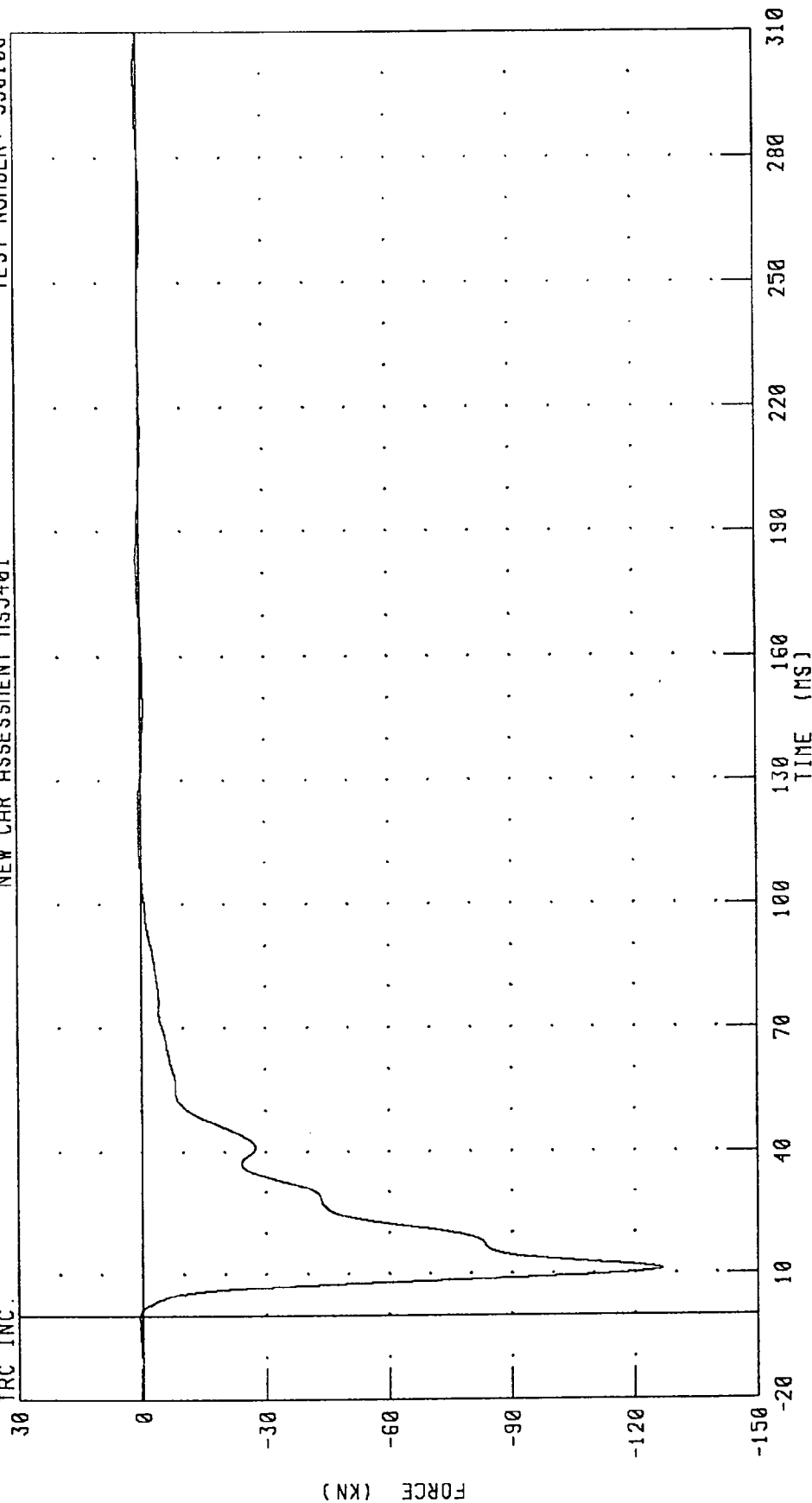
TEST NUMBER: 950106



1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B3 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



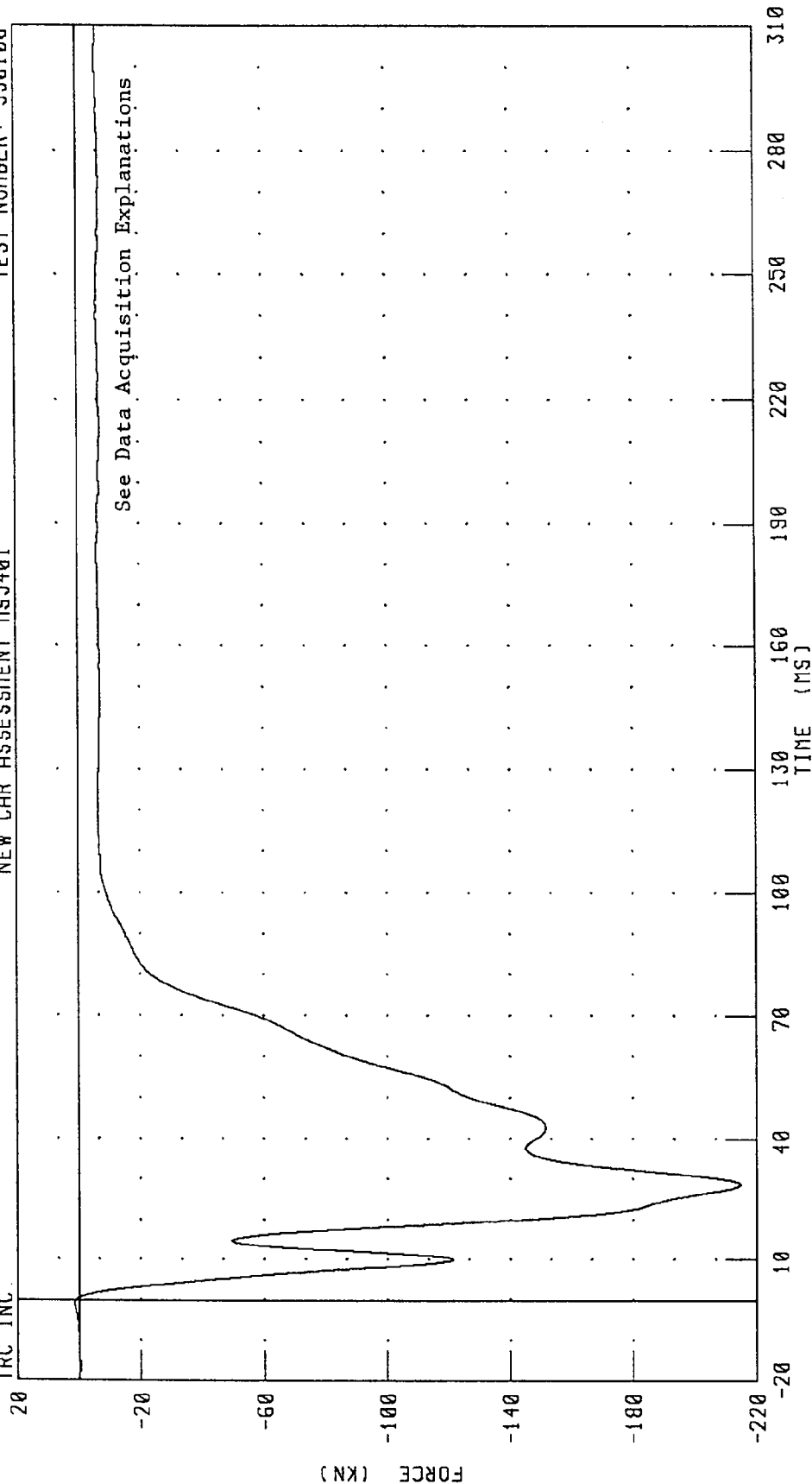
PEAK DATA: 0.88 KN @ 183.44 MS; -126.81 KN @ 11.12 MS

CHANNEL: BB3F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B4 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



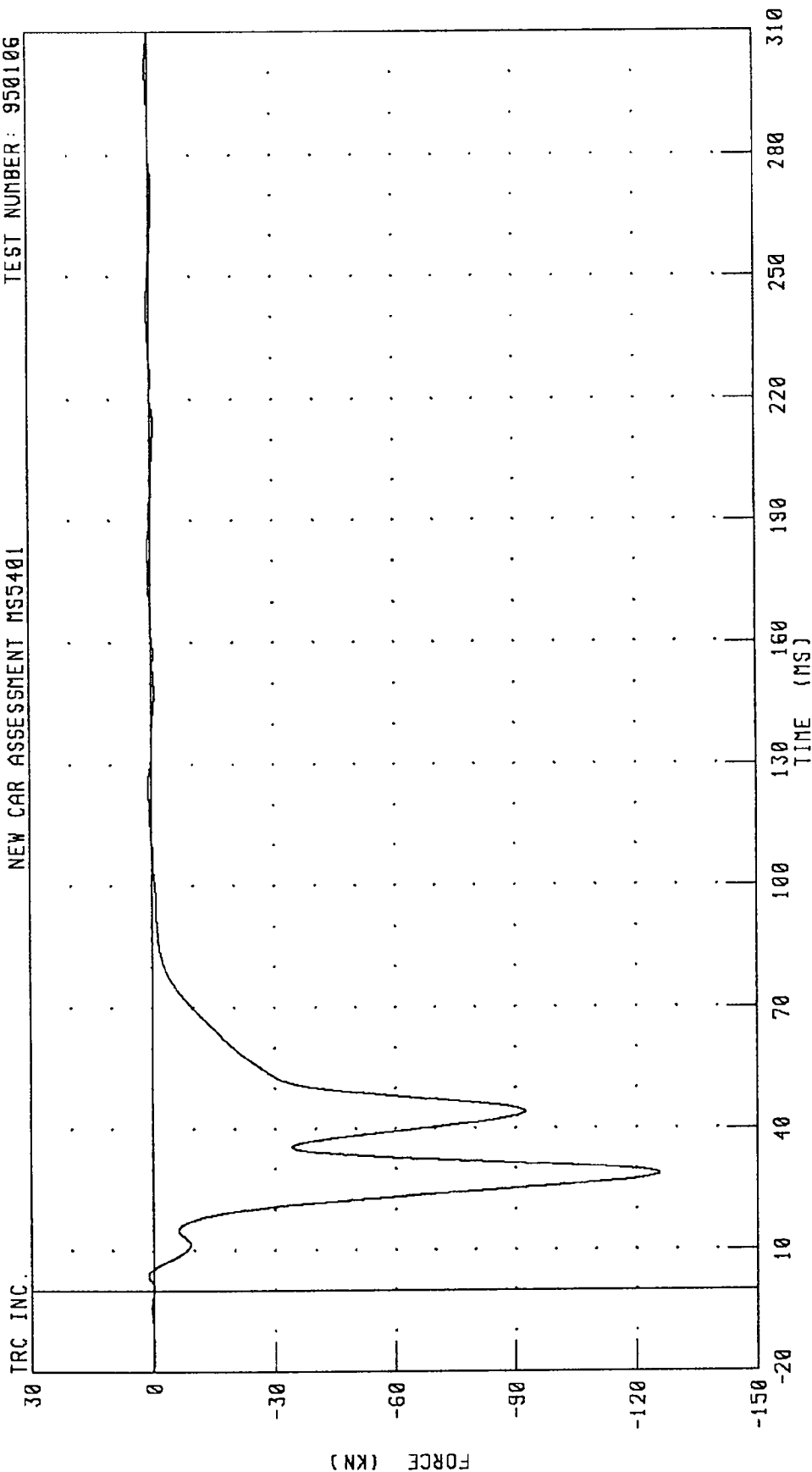
PEAK DATA: 1.51 KN @ -1.04 MS; -214.73 KN @ 28.72 MS

FILTER: CH. CLASS 60

CHANNEL: BB4F

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B5 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



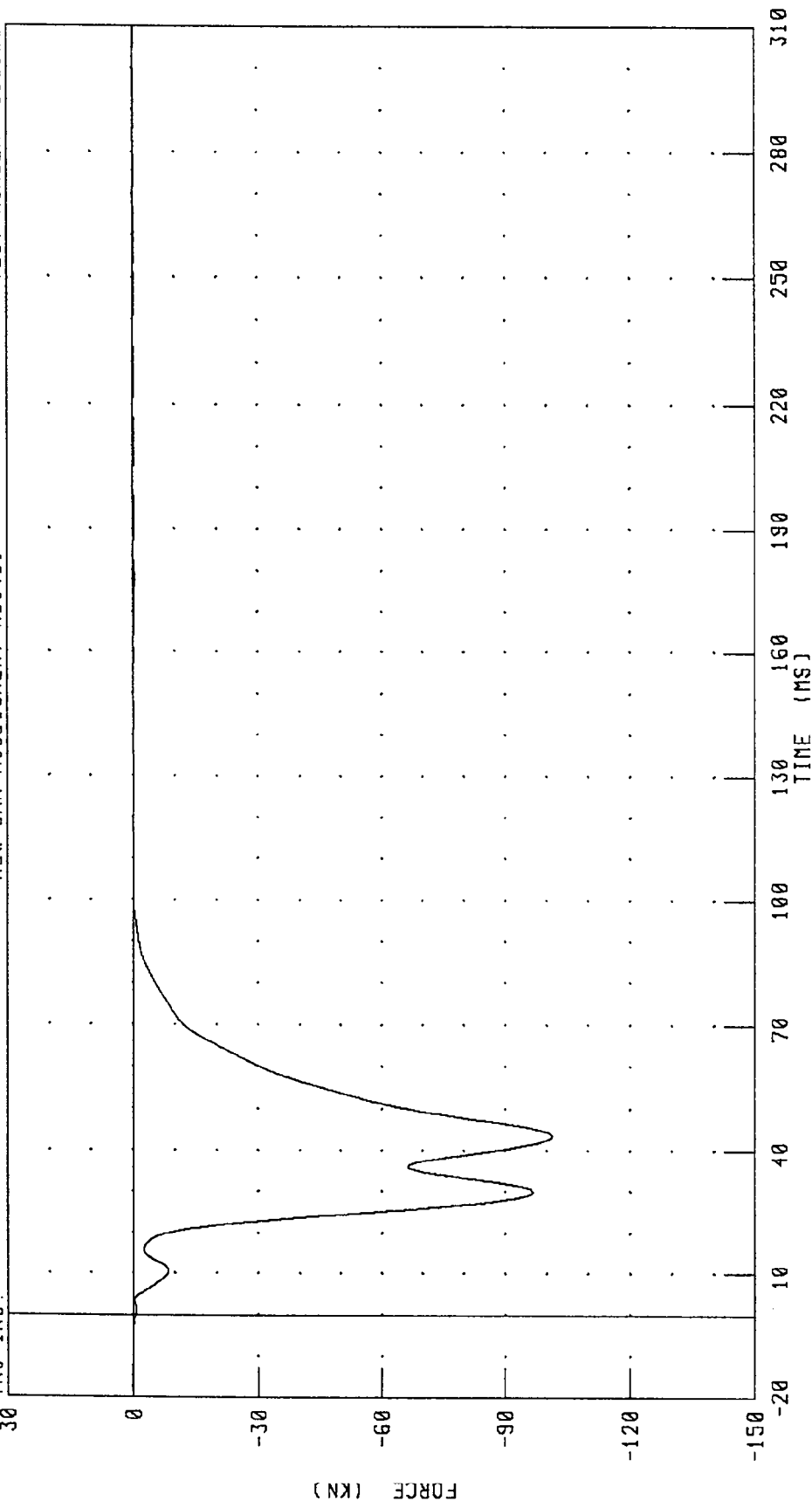
PEAK DATA: 1.08 KN @ 3.60 MS; -125.80 KN @ 28.72 MS

CHANNEL: 005F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B6 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

IRC INC.



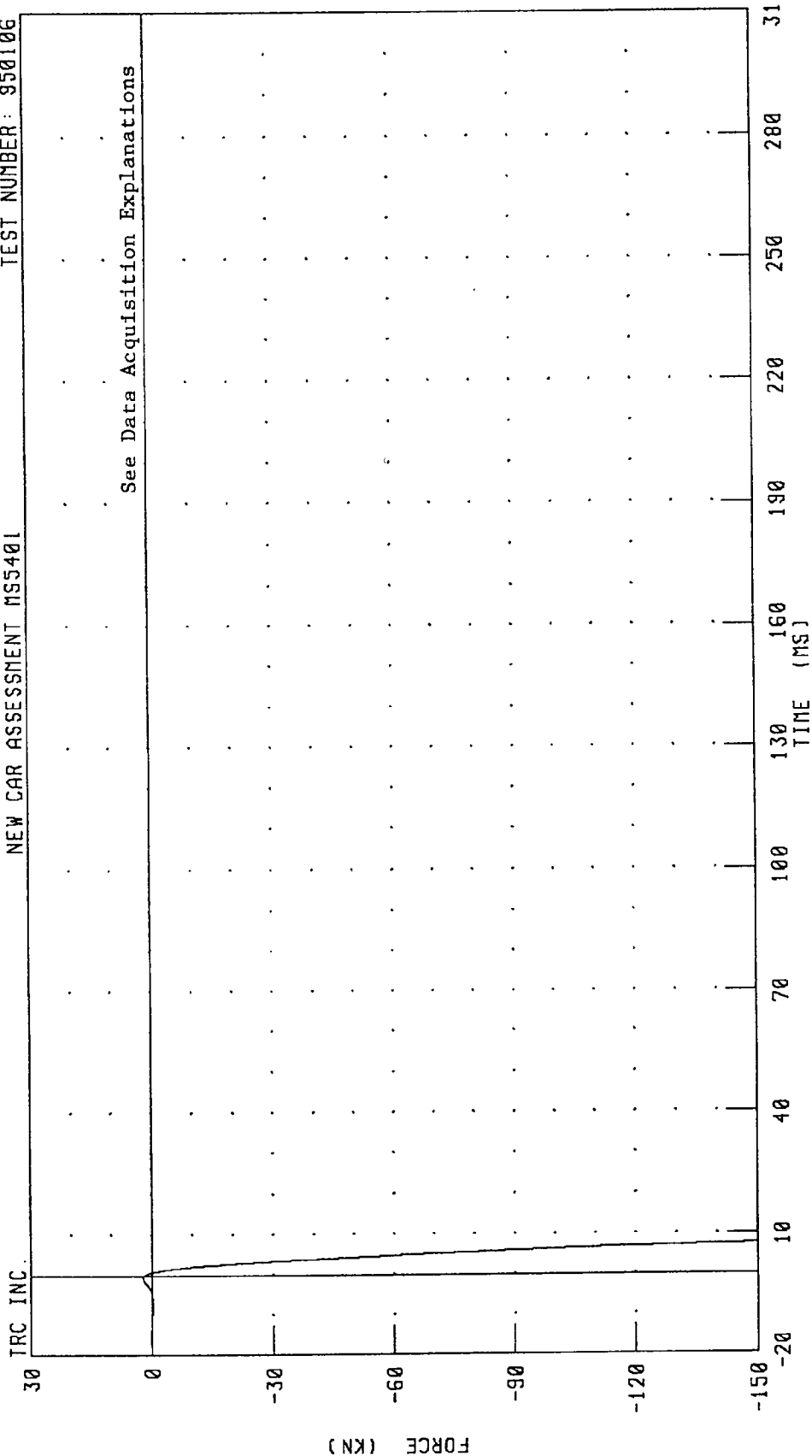
PEAK DATA: 0.25 KN @ -15.04 MS, -101.42 KN @ 43.60 MS

FILTER: CH. CLASS 60

CHANNEL: BB6F

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B7 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



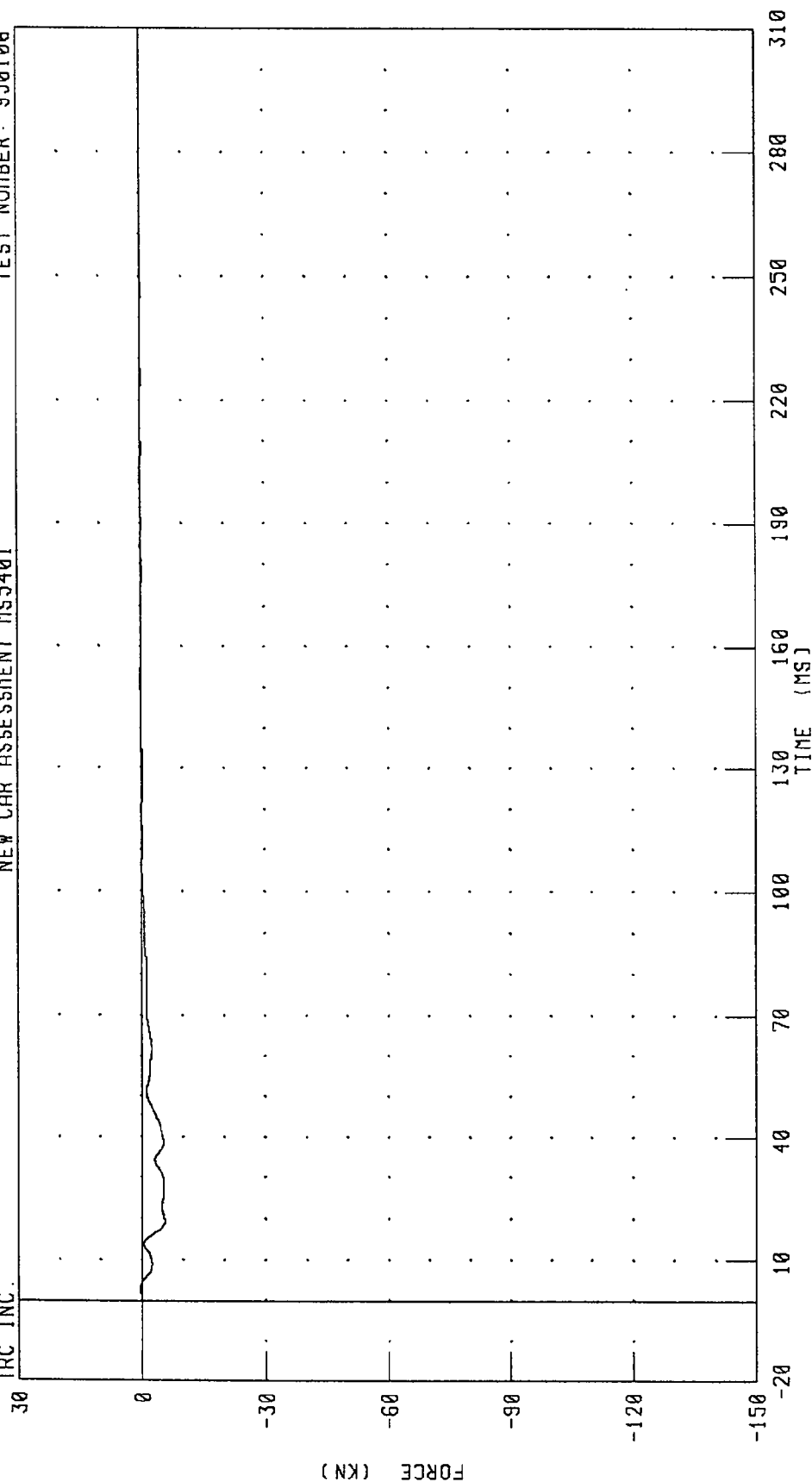
PEAK DATA: 2.17 KN @ -0.72 MS; -299.65 KN @ 12.48 MS

CHANNEL: BB7F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B8 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



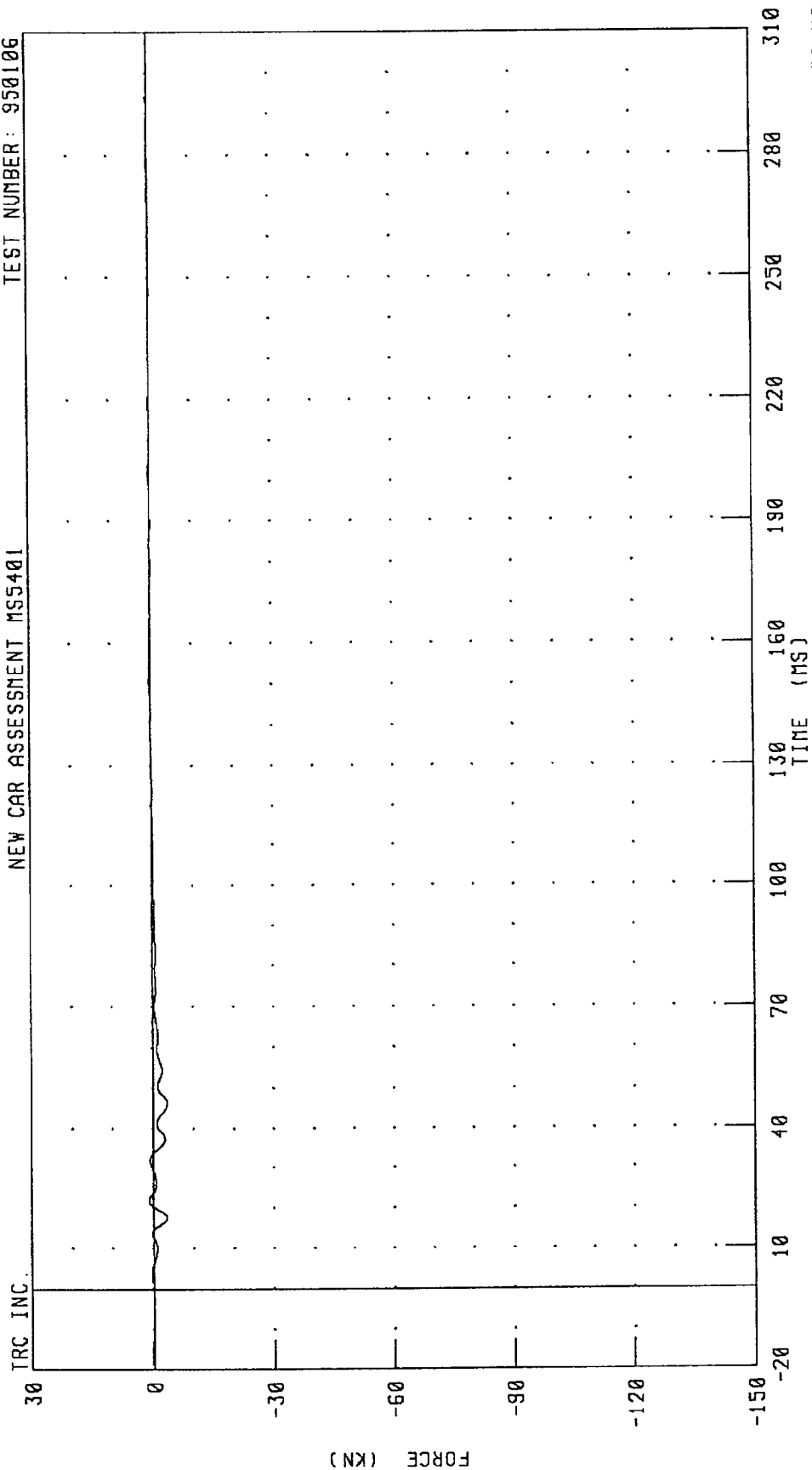
PEAK DATA: 0.45 KN @ 2.80 MS; -5.59 KN @ 19.36 MS

FILTER: CH. CLASS 60

CHANNEL: BB8F

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B9 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

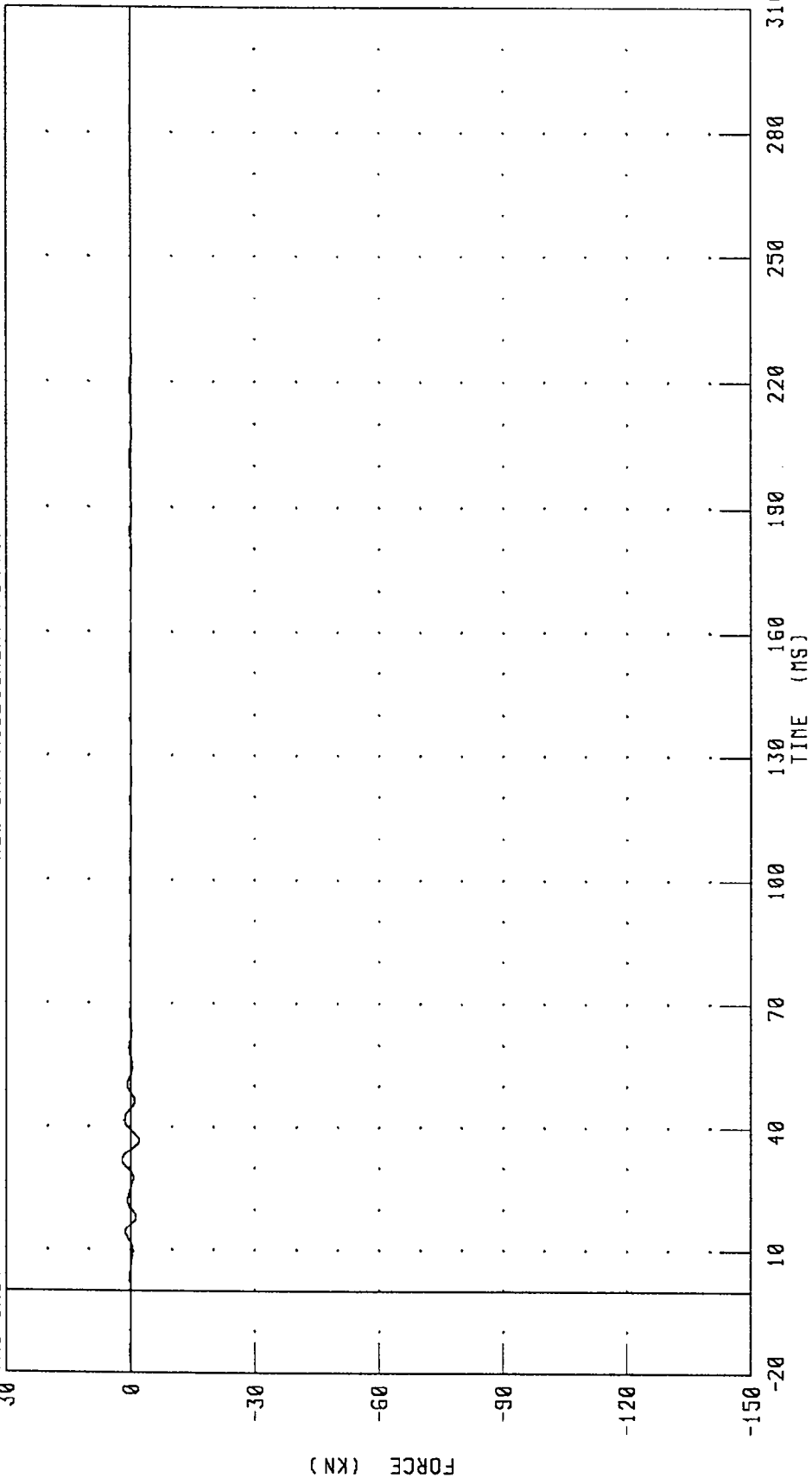


CHANNEL: BB9F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C1 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

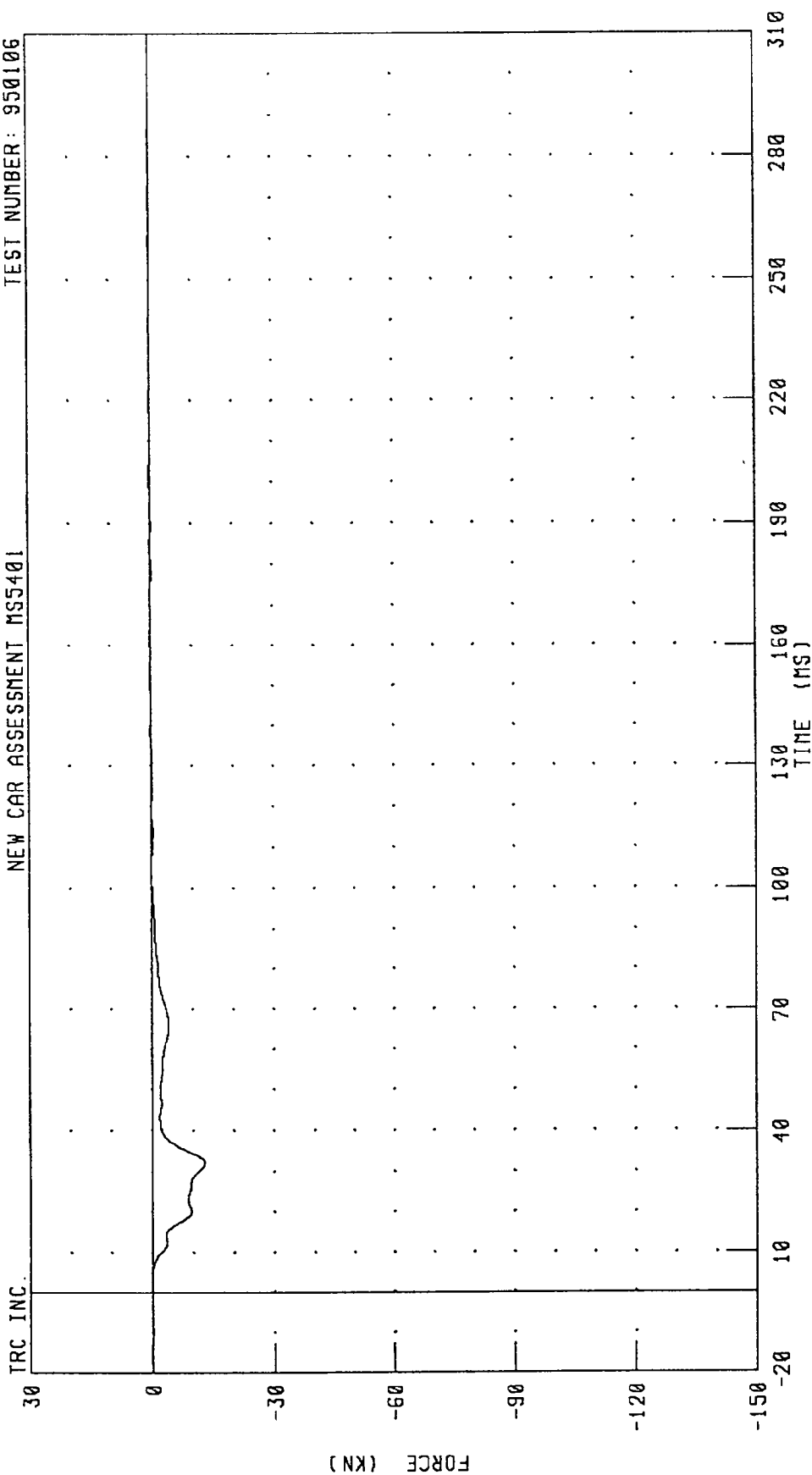


PEAK DATA: 1.93 KN @ 32.08 MS; -2.13 KN @ 36.72 MS

CHANNEL: BC1F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C2 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



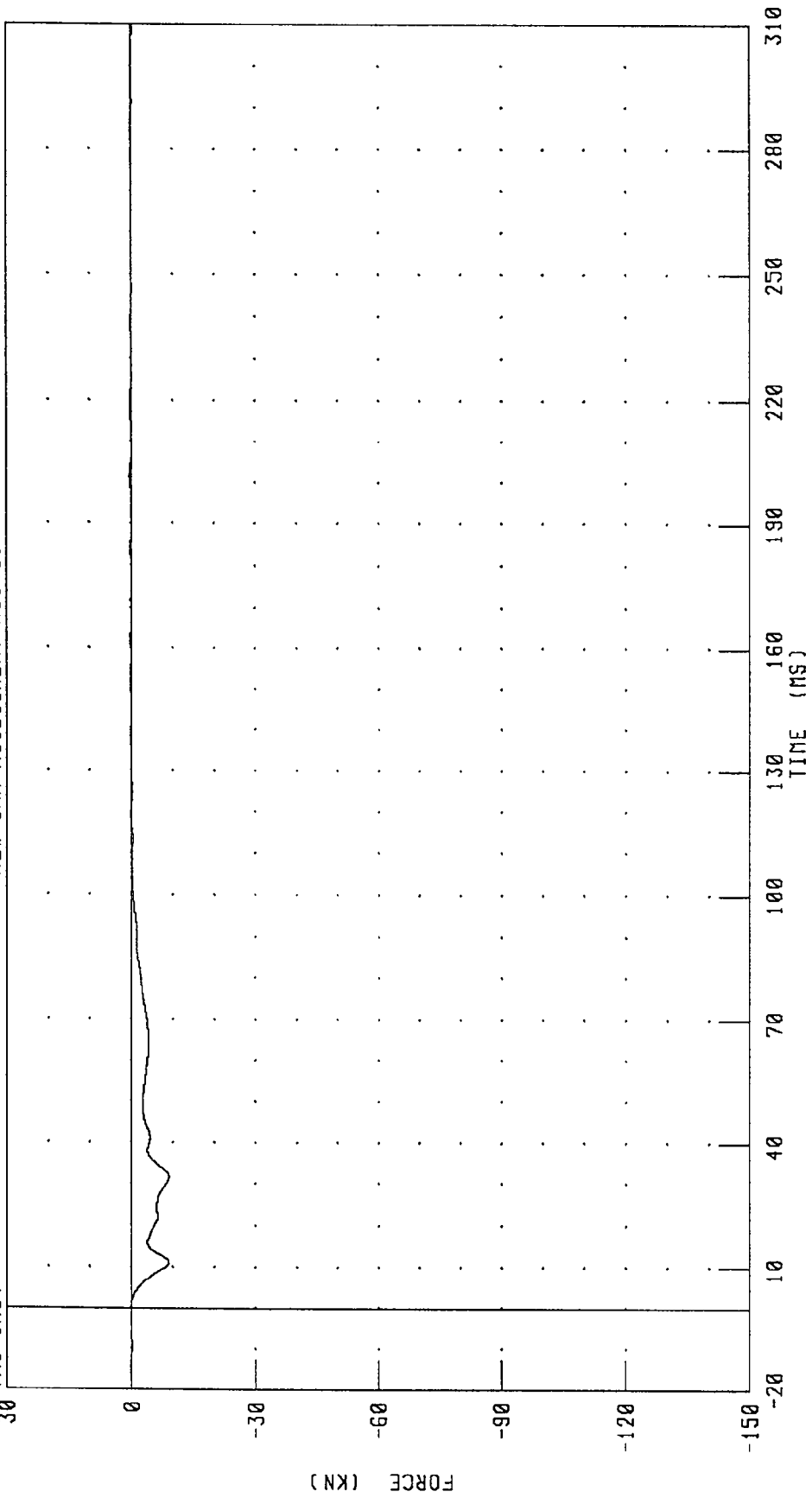
PEAK DATA: 0.27 KN @ 152.08 MS; -12.88 KN @ 32.16 MS

CHANNEL: BC2F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C3 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



PEAK DATA: 0.34 KN @ 201.68 MS; -9.08 KN @ 31.60 MS

FILTER: CH. CLASS 60

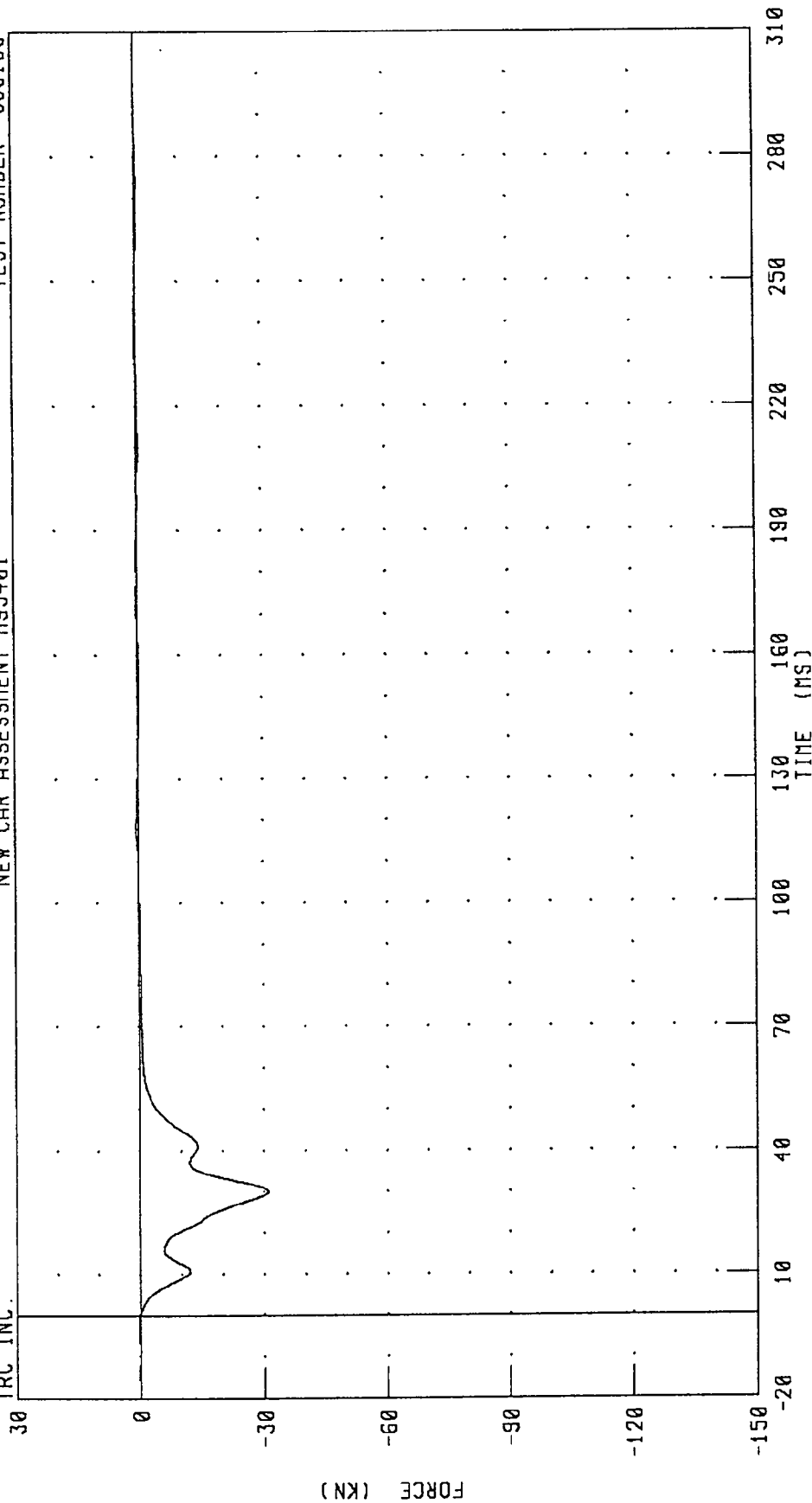
CHANNEL: BC3F

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE

TEST NUMBER: 950106

NEW CAR ASSESSMENT MS5401

TRC INC.



PEAK DATA: 0.46 KN @ 117.92 MS; -30.96 KN @ 30.16 MS

FILTER: CH. CLASS 60

CHANNEL: BC4F

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C5 FORCE
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

0

-30

-60

-90

-120

-150

-180

FORCE (KN)

10

40

70

100

130

160

190

220

250

280

310

TIME (MS)

FILTER: CH. CLASS 60

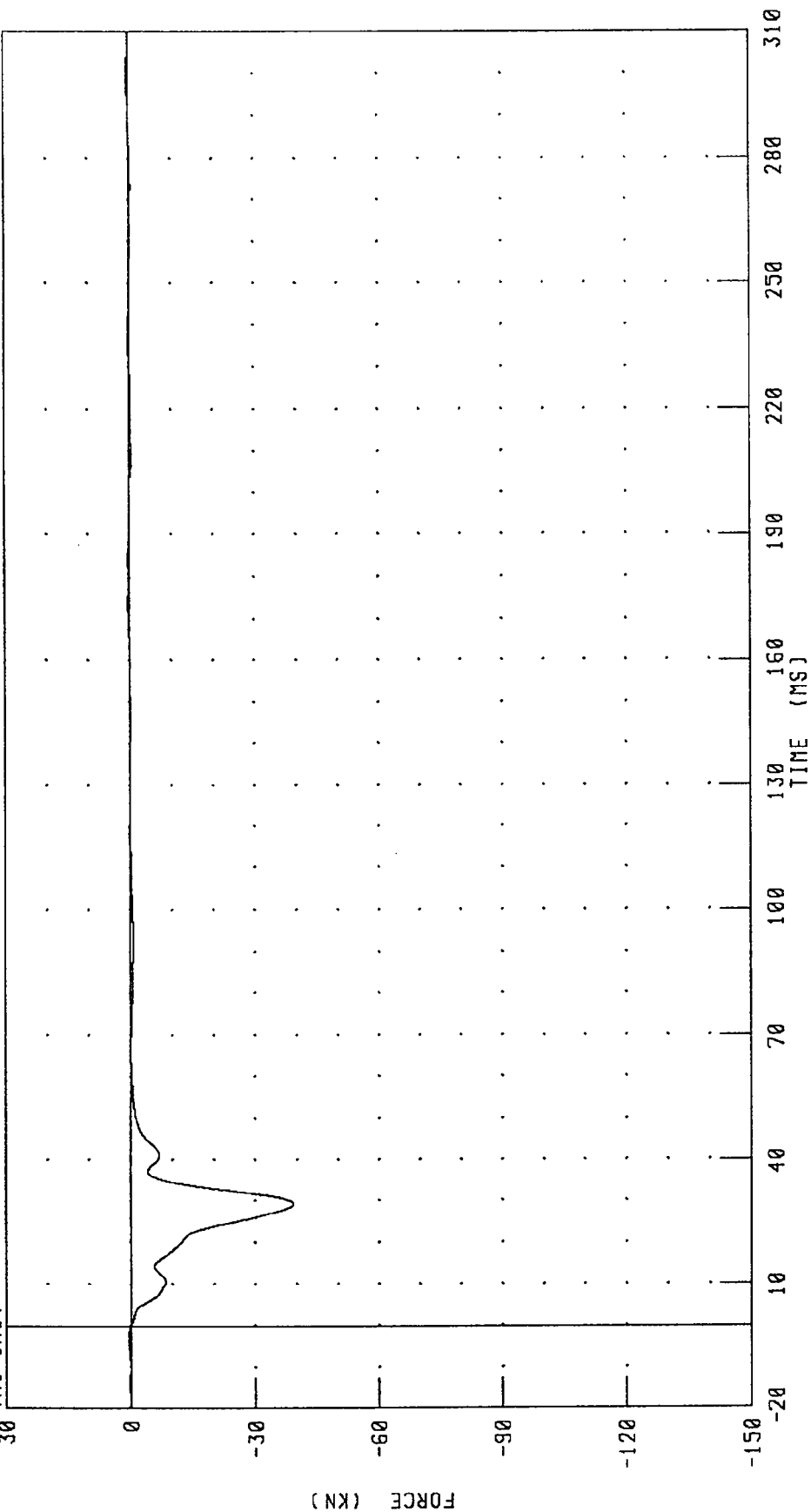
CHANNEL: BC5F

PEAK DATA: 0.45 KN @ -4.08 MS; -179.04 KN @ 28.88 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C6 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



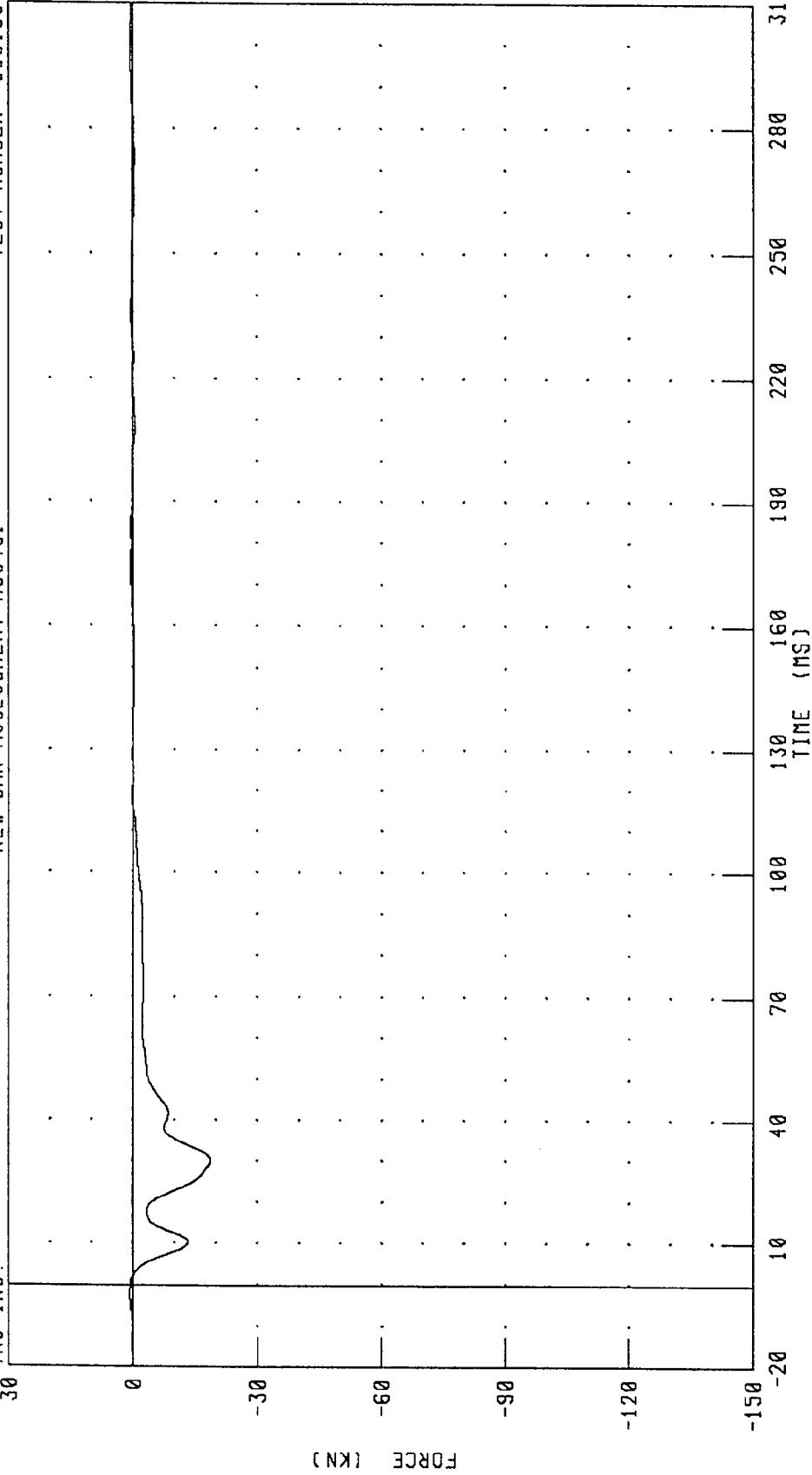
PEAK DATA: 0.54 KN @ -3.52 MS; -39.29 KN @ 29.28 MS

CHANNEL: BC6F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C7 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

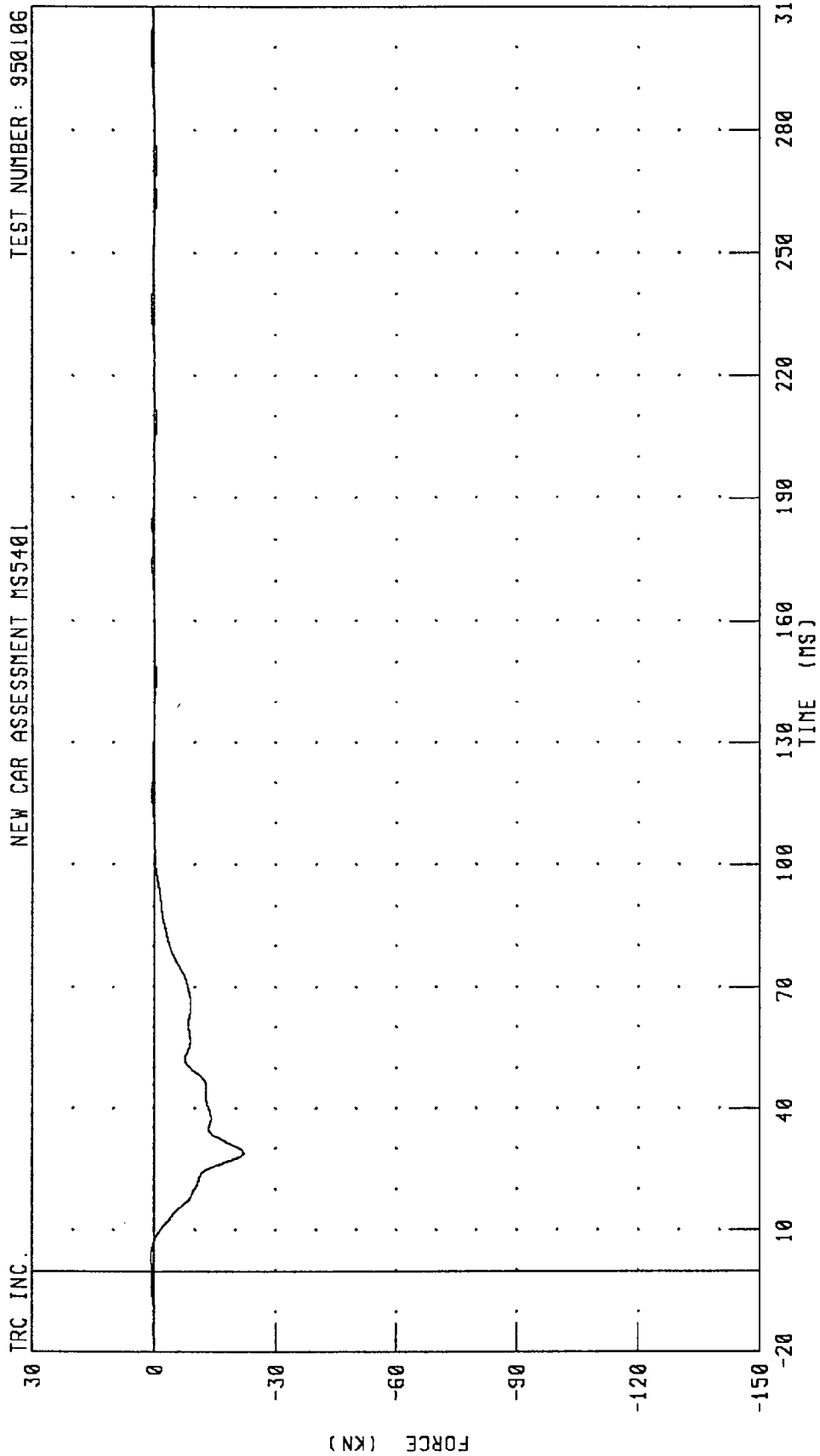


PEAK DATA: 0.61 KN @ -2.16 MS; -18.61 KN @ 30.08 MS

CHANNEL: BC7F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C8 FORCE
 NEW CAR ASSESSMENT MS5401

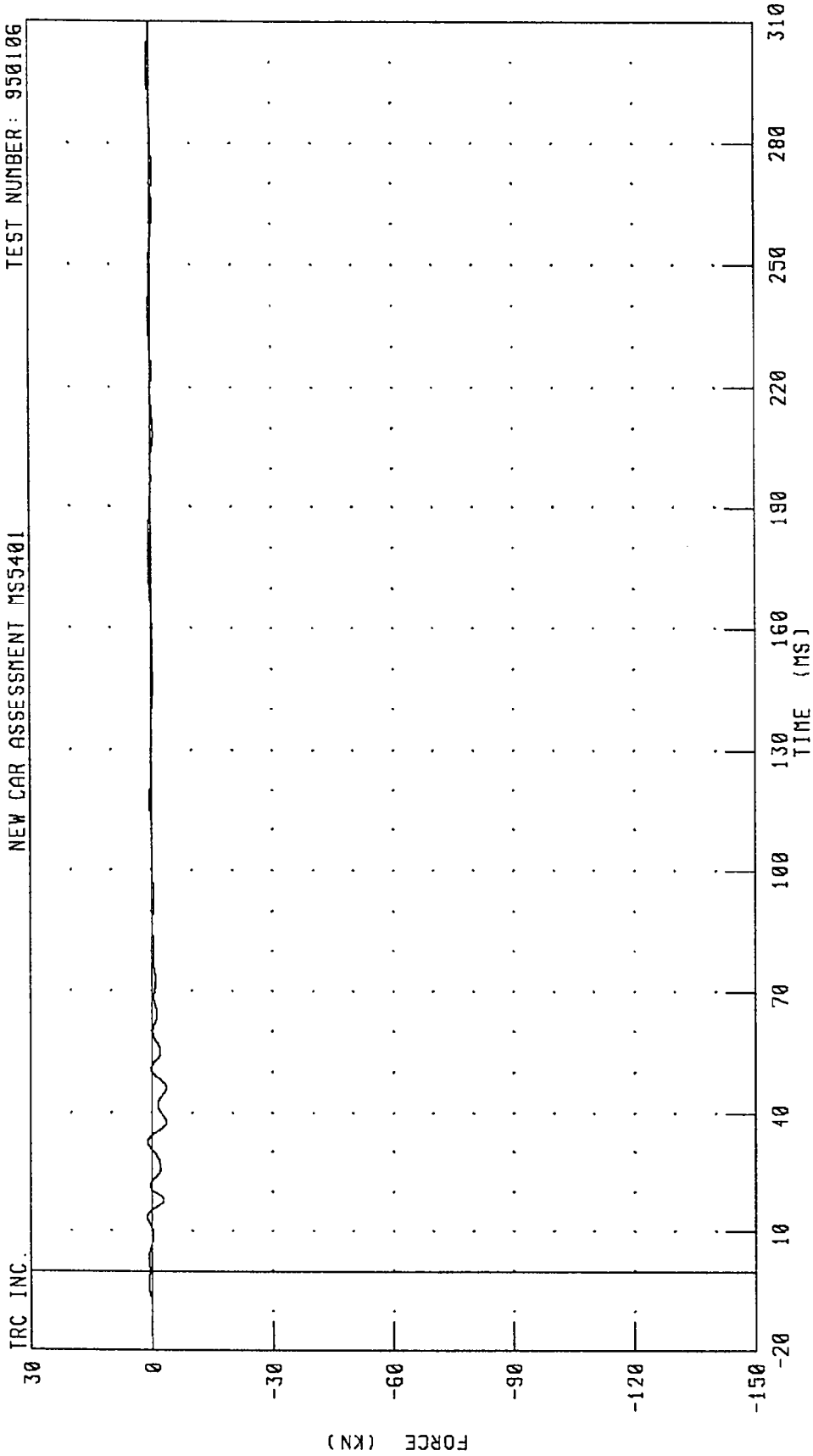
TEST NUMBER: 950106



CHANNEL: BC8F FILTER: CH. CLASS 60
 PEAK DATA: 0.73 KN @ 3.68 MS; -22.02 KN @ 29.04 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C9 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



PEAK DATA: 1.18 KN @ 13.68 MS, -3.69 KN @ 46.16 MS

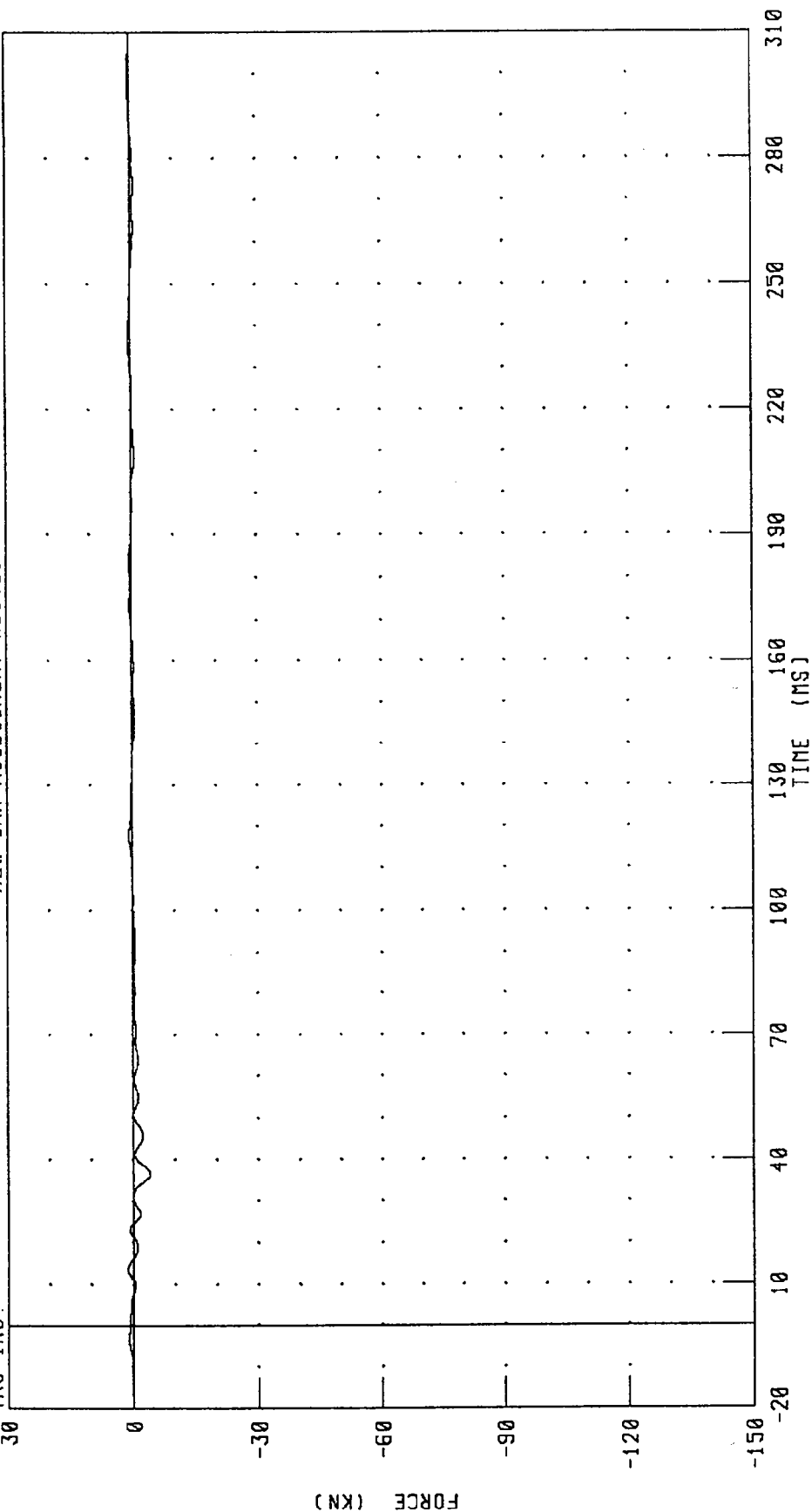
FILTER: CH. CLASS 60

CHANNEL: BC9F

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D1 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



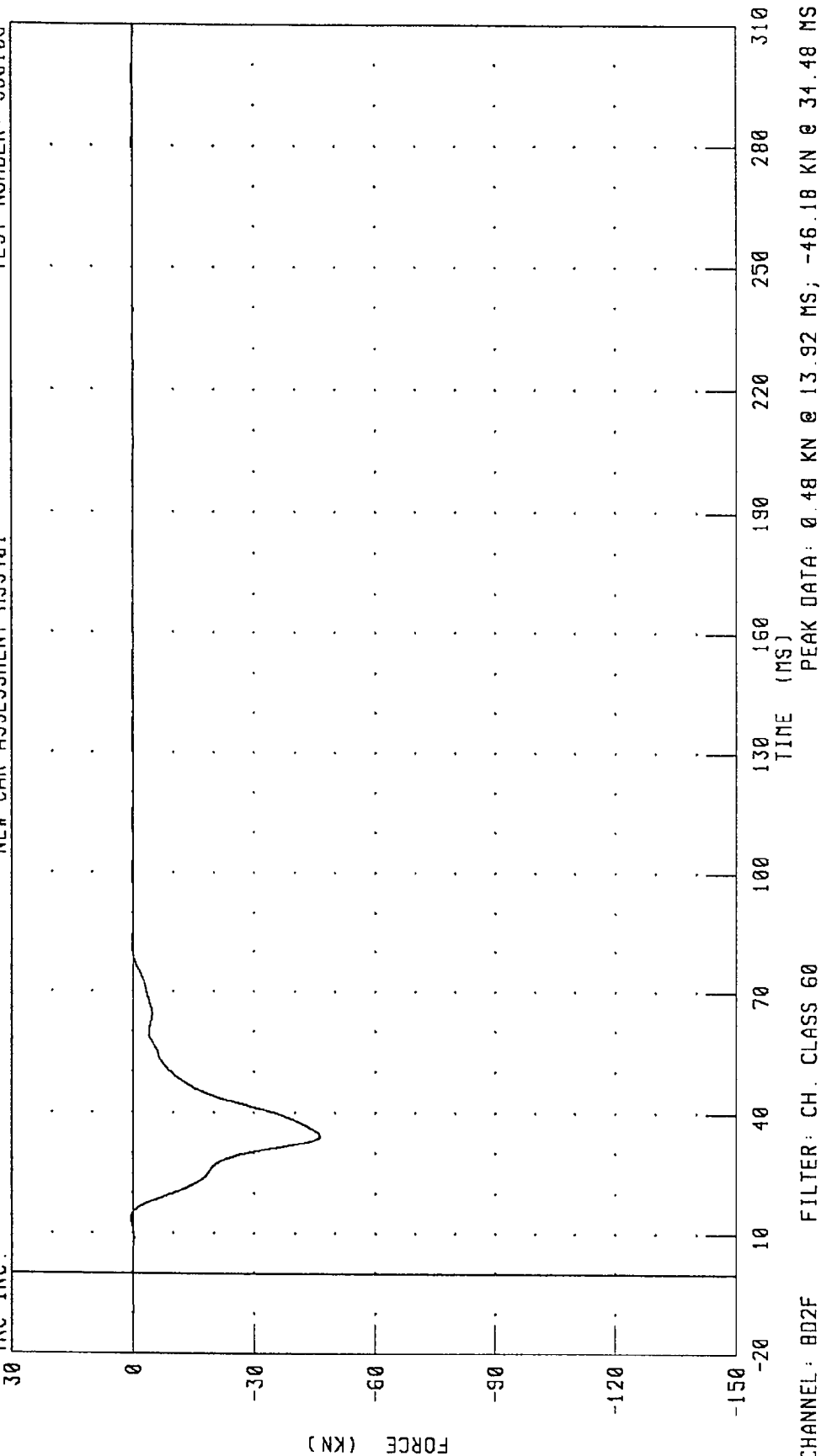
PEAK DATA: 1.23 KN @ 13.60 MS; -4.18 KN @ 36.80 MS

CHANNEL: BD1F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D2 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



CHANNEL: BD2F

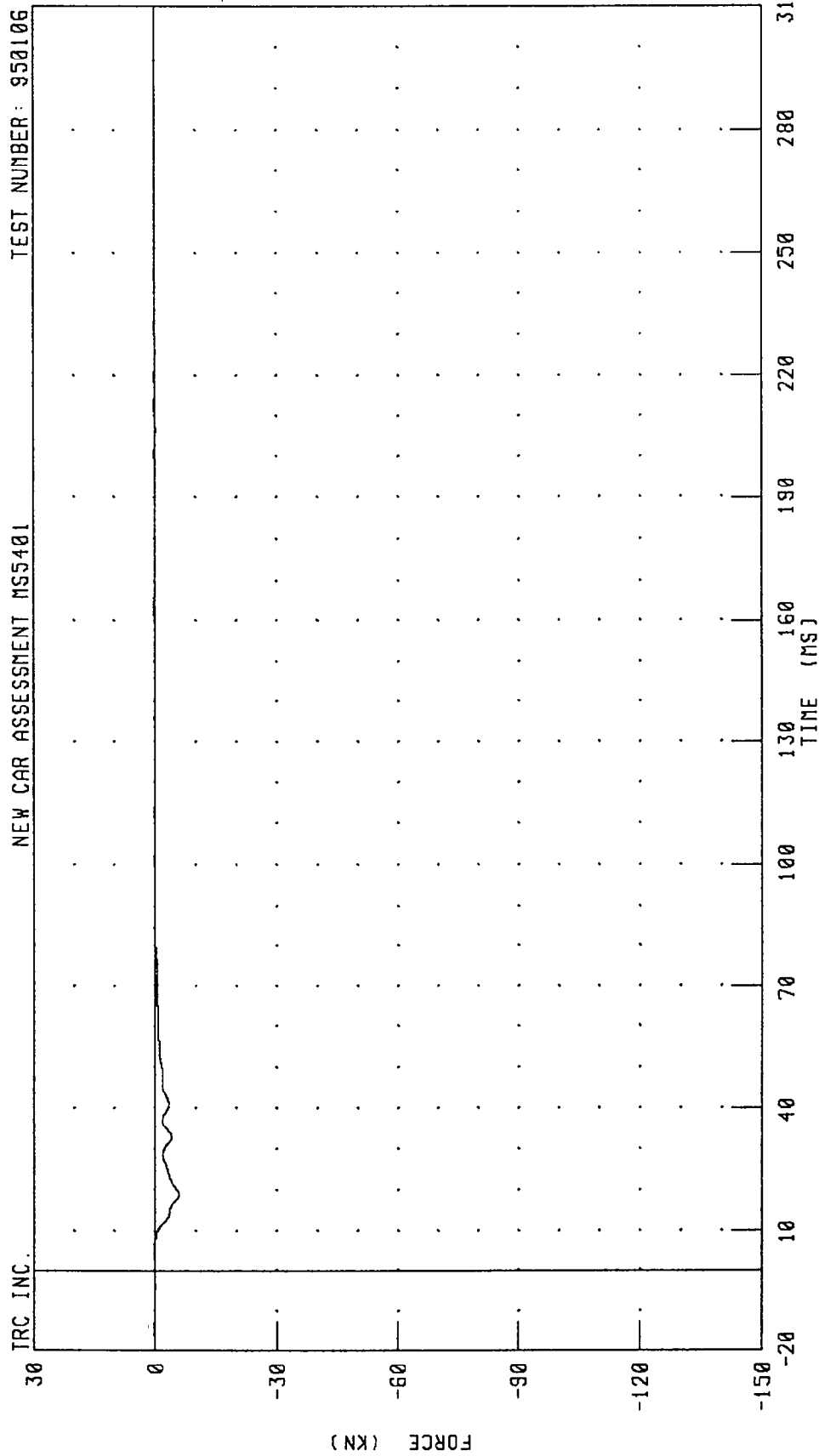
FILTER: CH. CLASS 60

TIME (MS)

PEAK DATA: 0.48 KN @ 13.92 MS; -46.18 KN @ 34.48 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D3 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



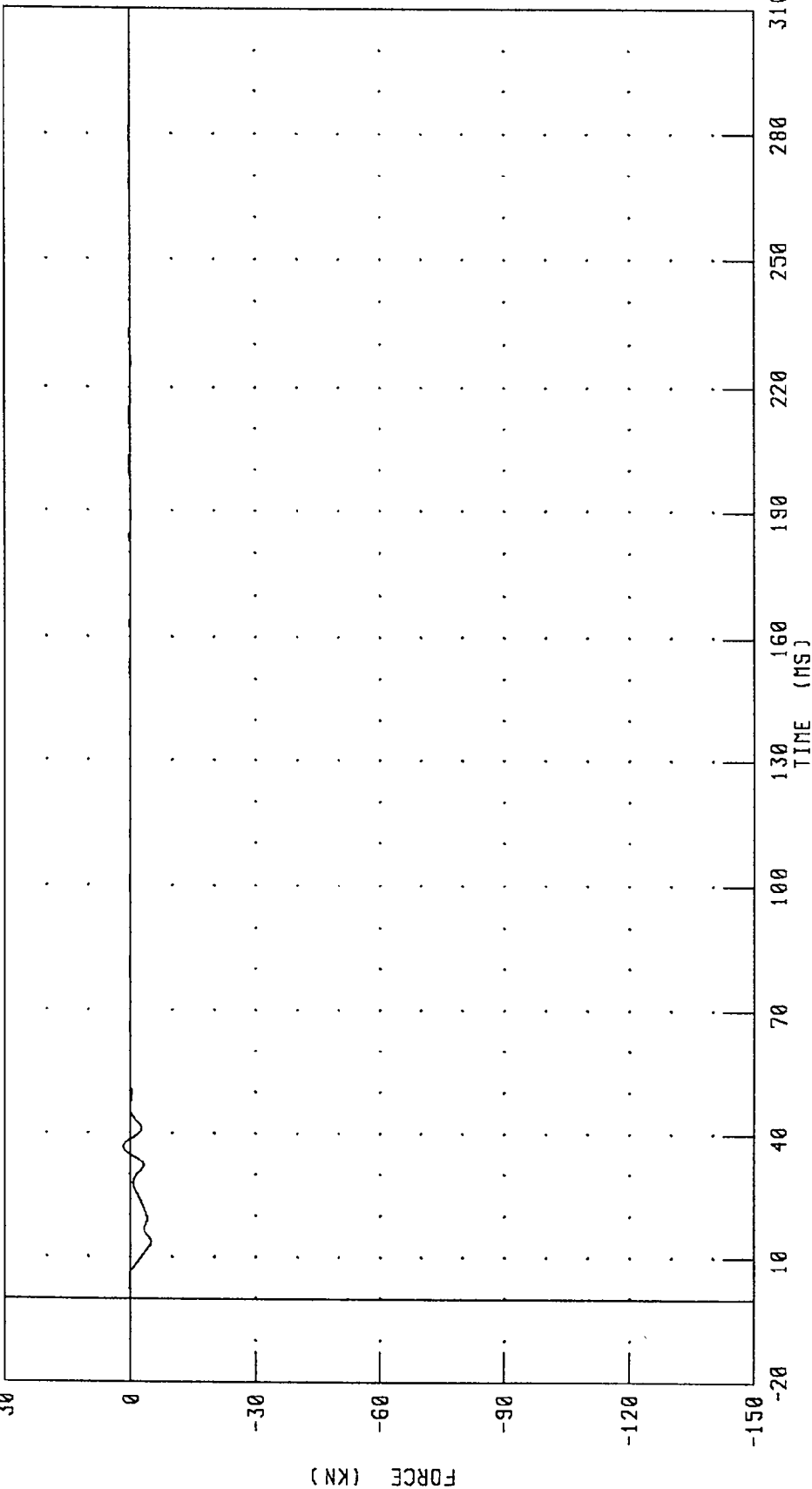
PEAK DATA: 0.24 KN @ 5.04 MS; -5.88 KN @ 18.88 MS

CHANNEL: BD3F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D4 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

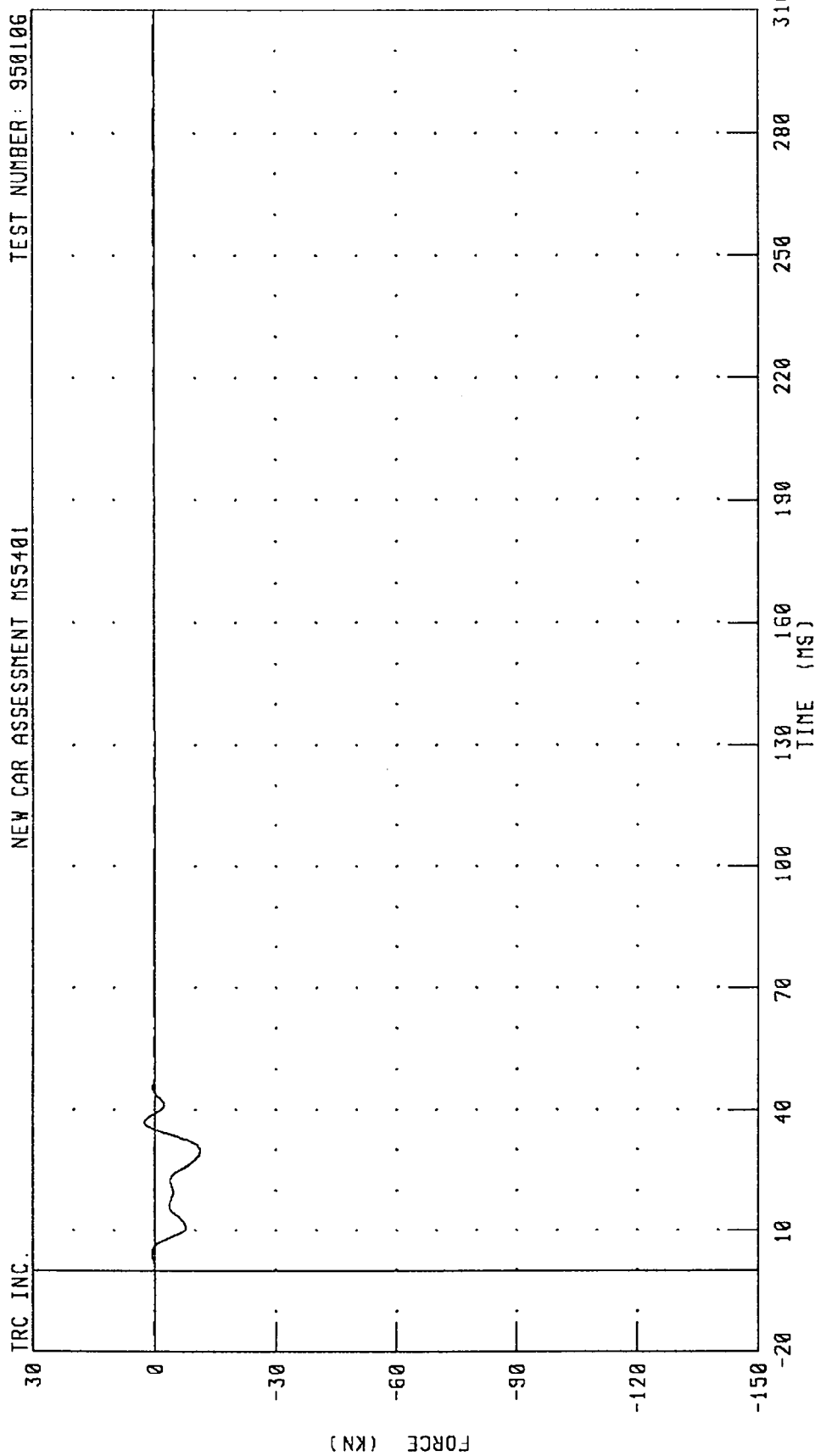


CHANNEL: BD4F FILTER: CH. CLASS 60

PEAK DATA: 1.63 KN @ 36.88 MS; -5.00 KN @ 13.76 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D5 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



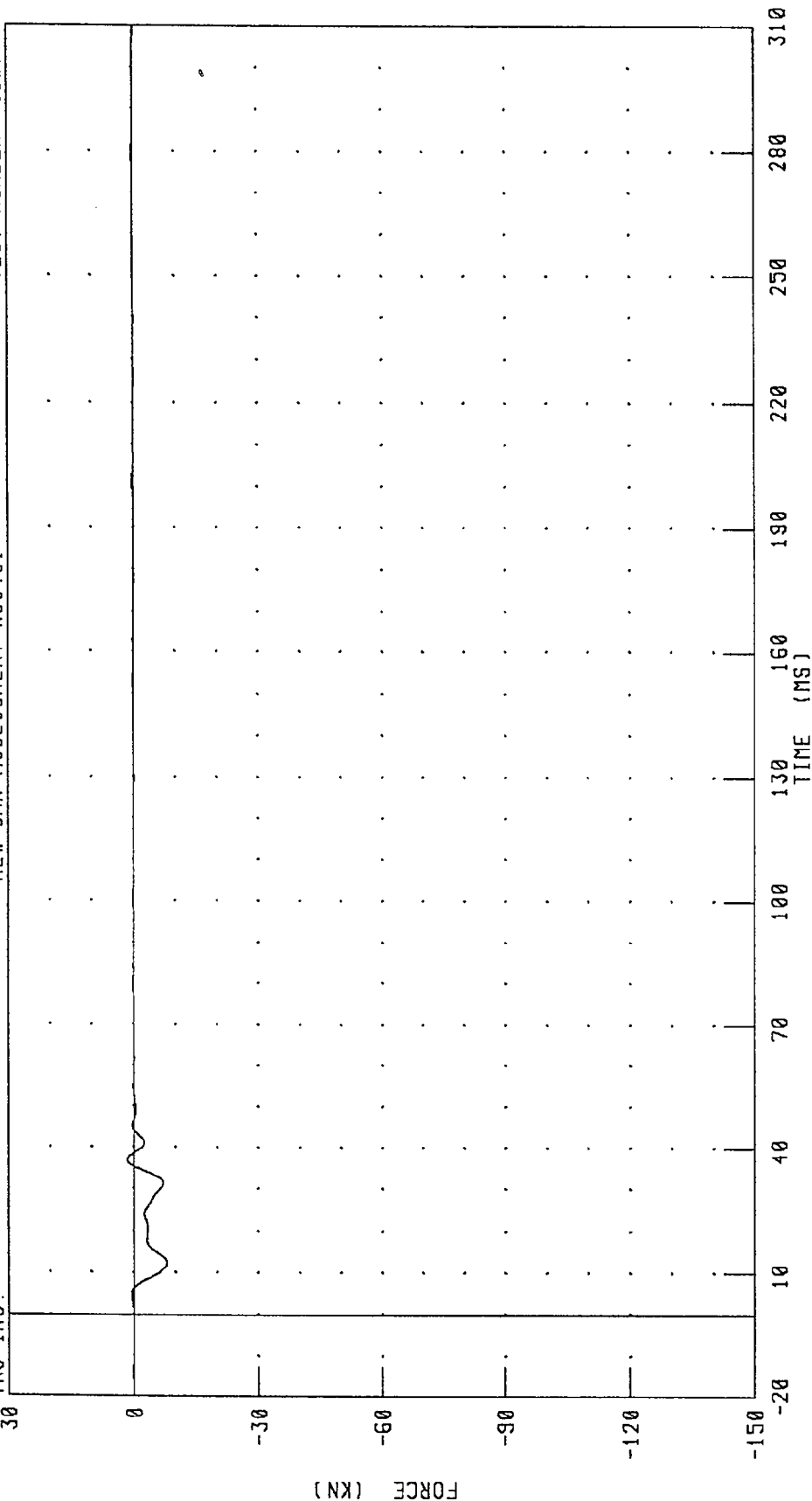
CHANNEL: B05F FILTER: CH. CLASS 60

PEAK DATA: 2.56 KN @ 36.96 MS; -11.19 KN @ 29.76 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D6 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



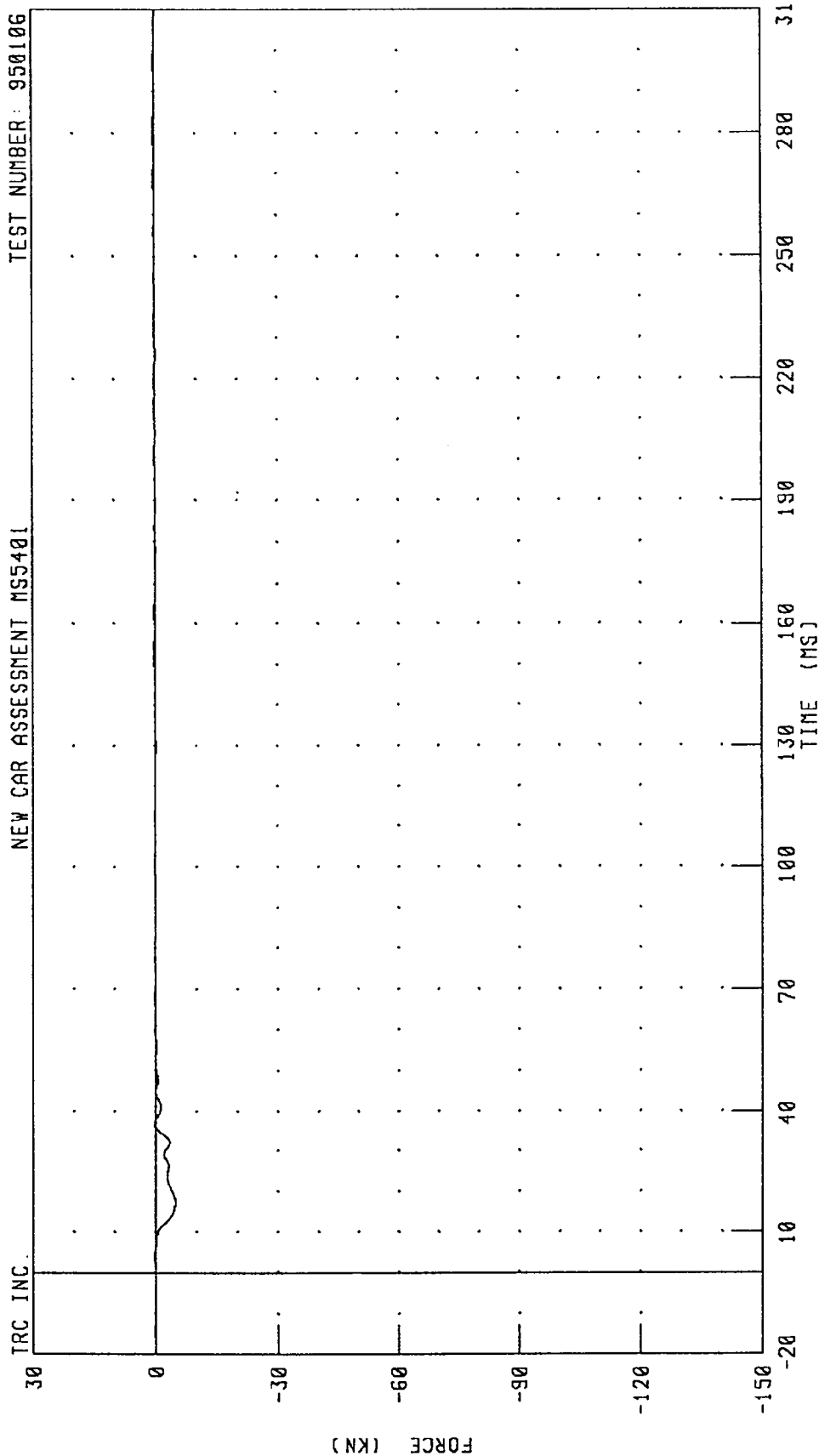
PEAK DATA: 1.58 KN @ 36.96 MS; -8.02 KN @ 12.40 MS

FILTER: CH. CLASS 60

CHANNEL: B06F

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D7 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



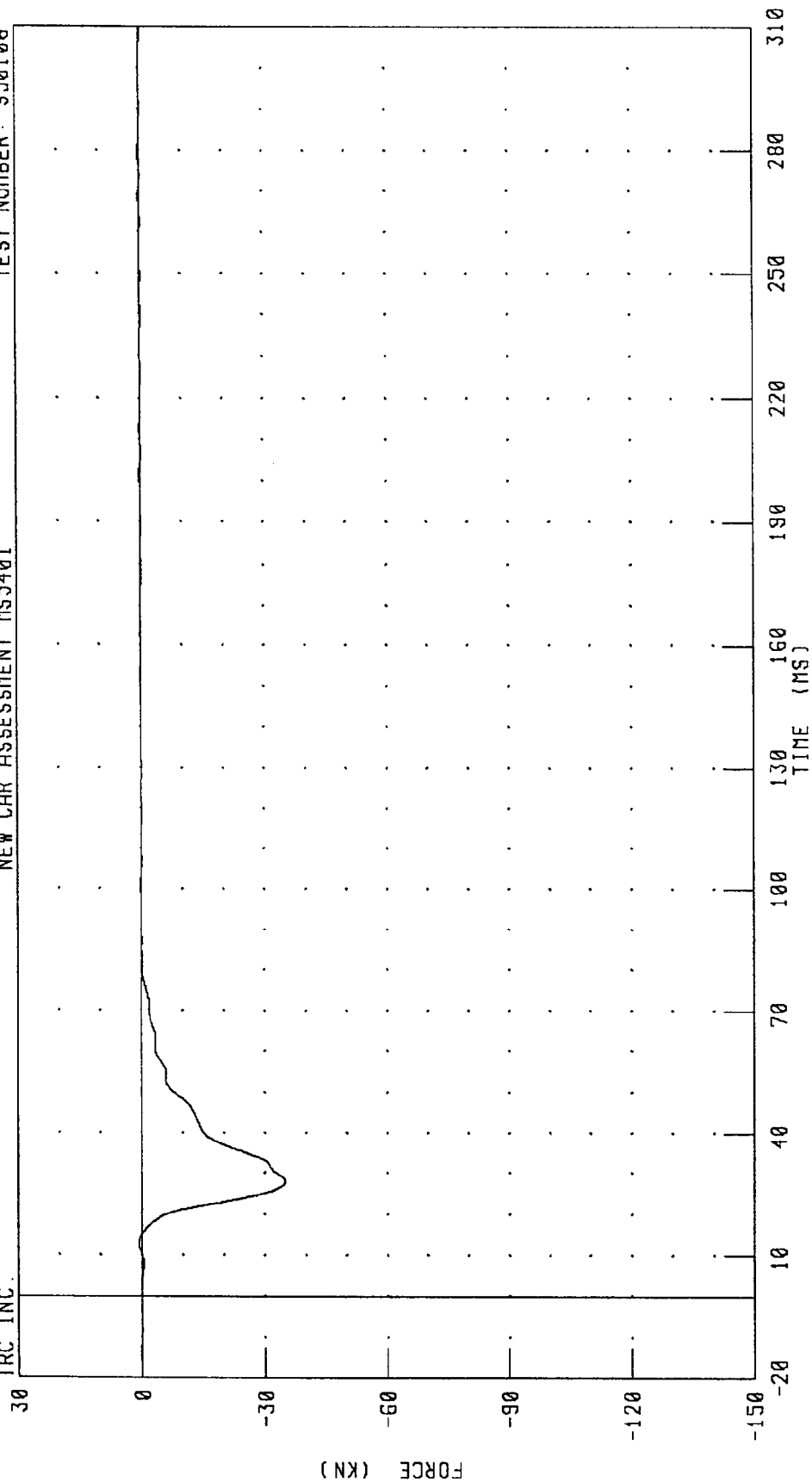
PEAK DATA: 0.25 KN @ 37.04 MS; -4.84 KN @ 17.36 MS

CHANNEL: 807F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION DB FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.



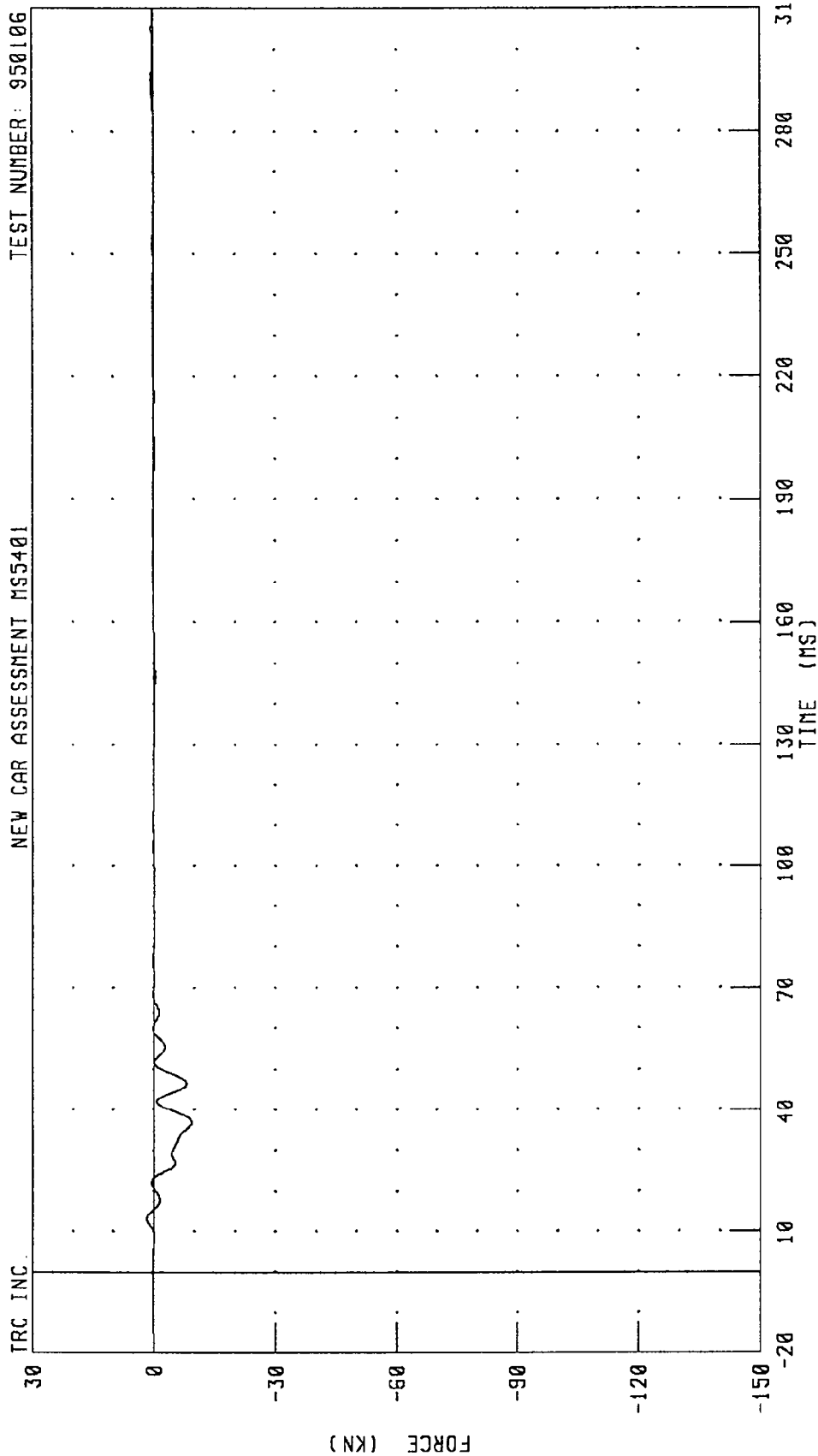
PEAK DATA: 0.76 KN @ 12.88 MS; -34.90 KN @ 28.00 MS

FILTER: CH. CLASS 60

CHANNEL: BD8F

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION 09 FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



PEAK DATA: 1.64 KN @ 13.04 MS; -9.40 KN @ 36.96 MS

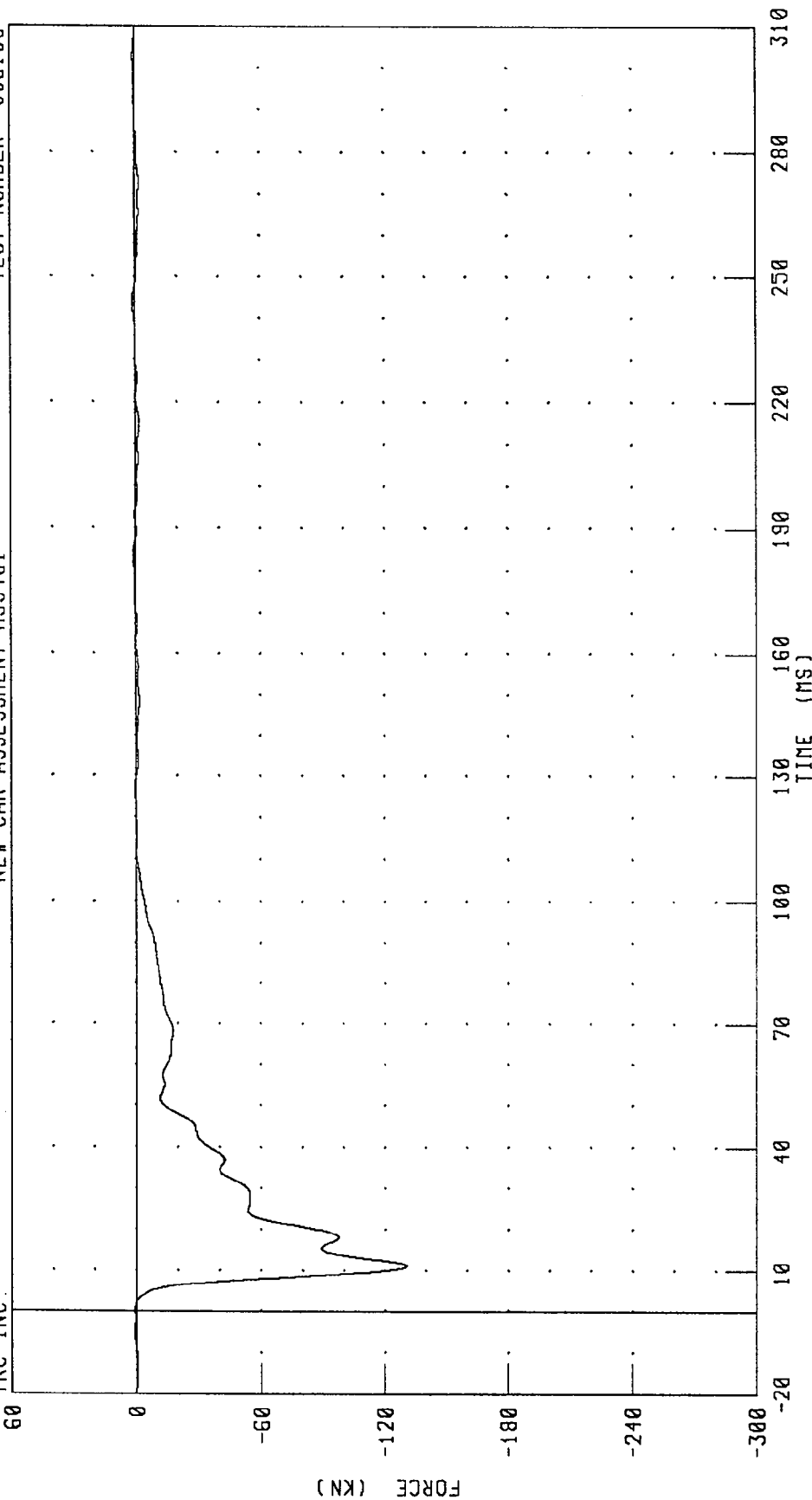
FILTER: CH. CLASS 60

CHANNEL: 809F

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 1 FORCE TOTAL
NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

IRC INC.

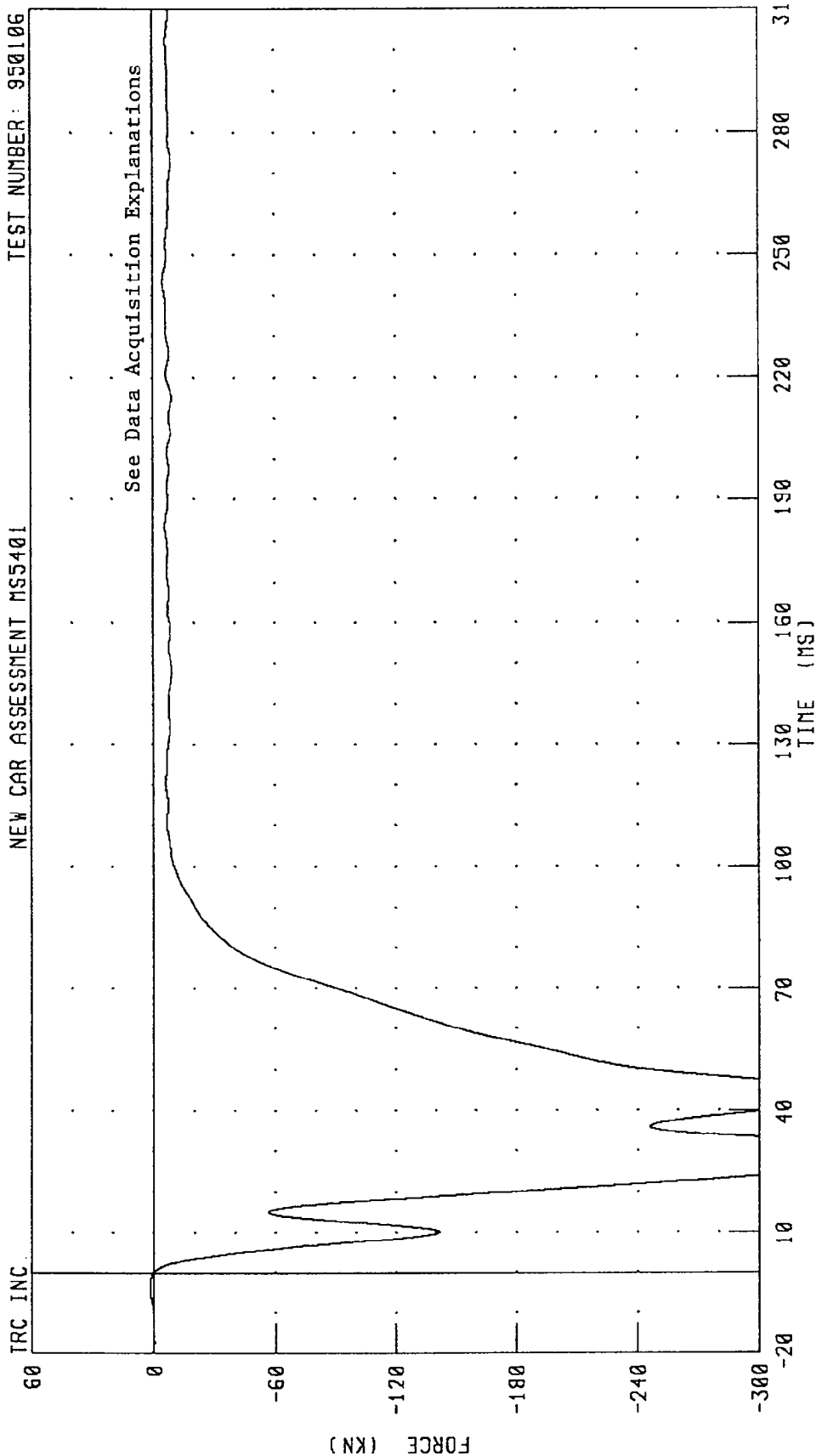


PEAK DATA: 1.17 KN @ 183.28 MS; -130.71 KN @ 11.12 MS

CHANNEL: LCBGIF FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP # 2 FORCE TOTAL
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



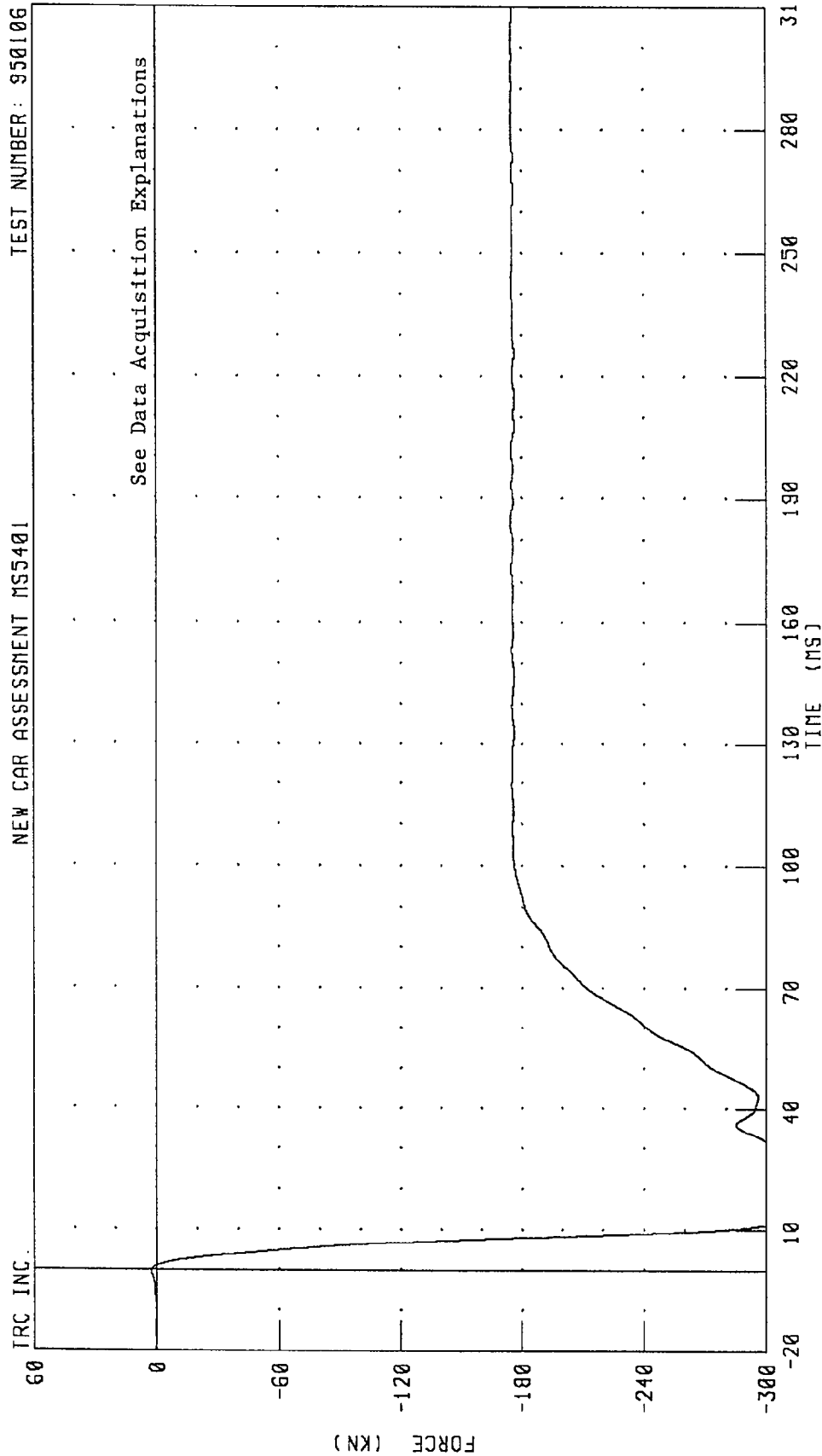
See Data Acquisition Explanations

PEAK DATA: 1.57 KN @ -4.16 MS, -439.51 KN @ 29.12 MS

CHANNEL: LCBG2F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP # 3 FORCE TOTAL
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

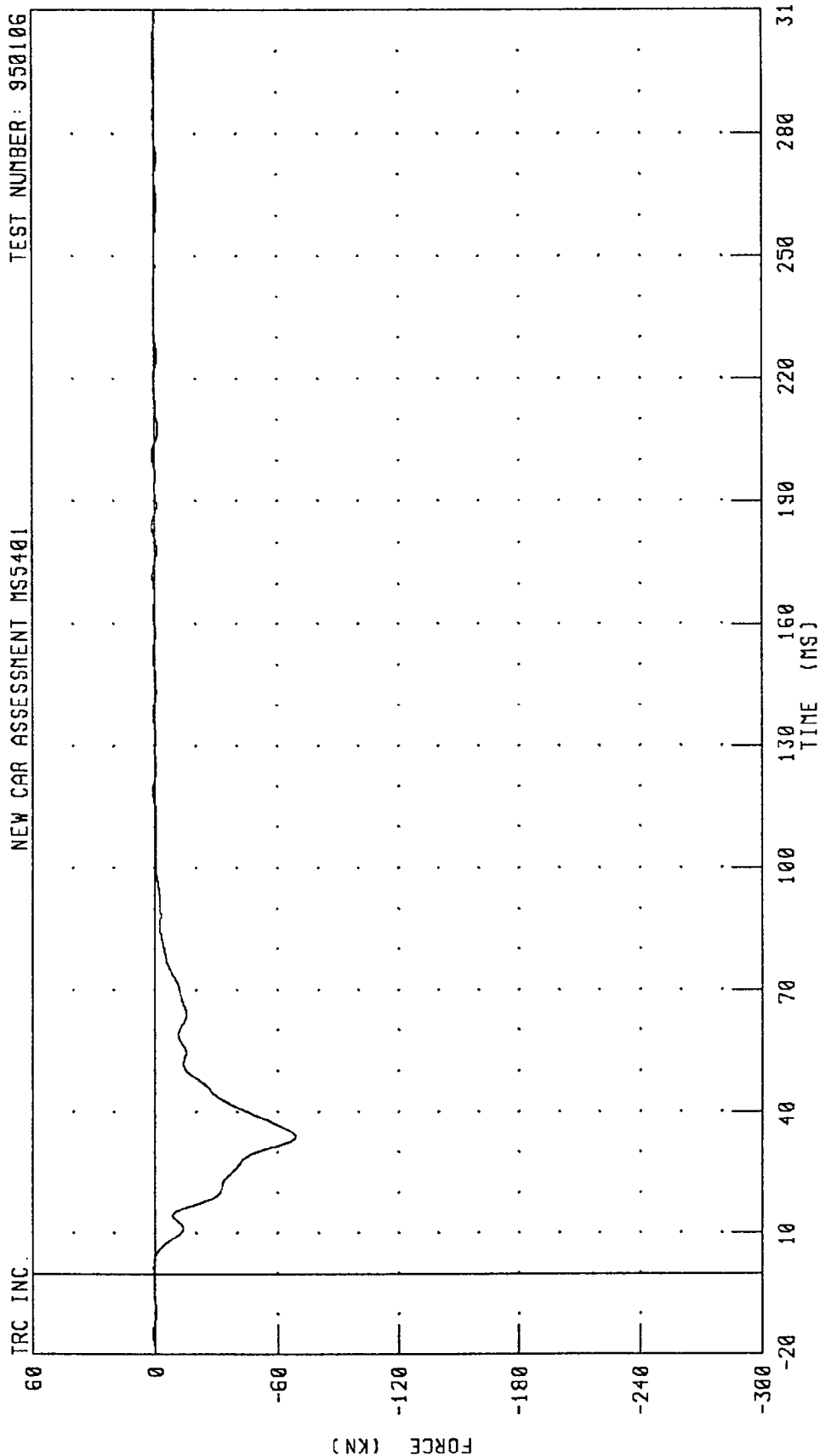


See Data Acquisition Explanations

CHANNEL: LCBG3F FILTER: CH. CLASS 60
 PEAK DATA: 2.64 KN @ -0.56 MS; -309.98 KN @ 18.40 MS

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP # 4 FORCE TOTAL
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106



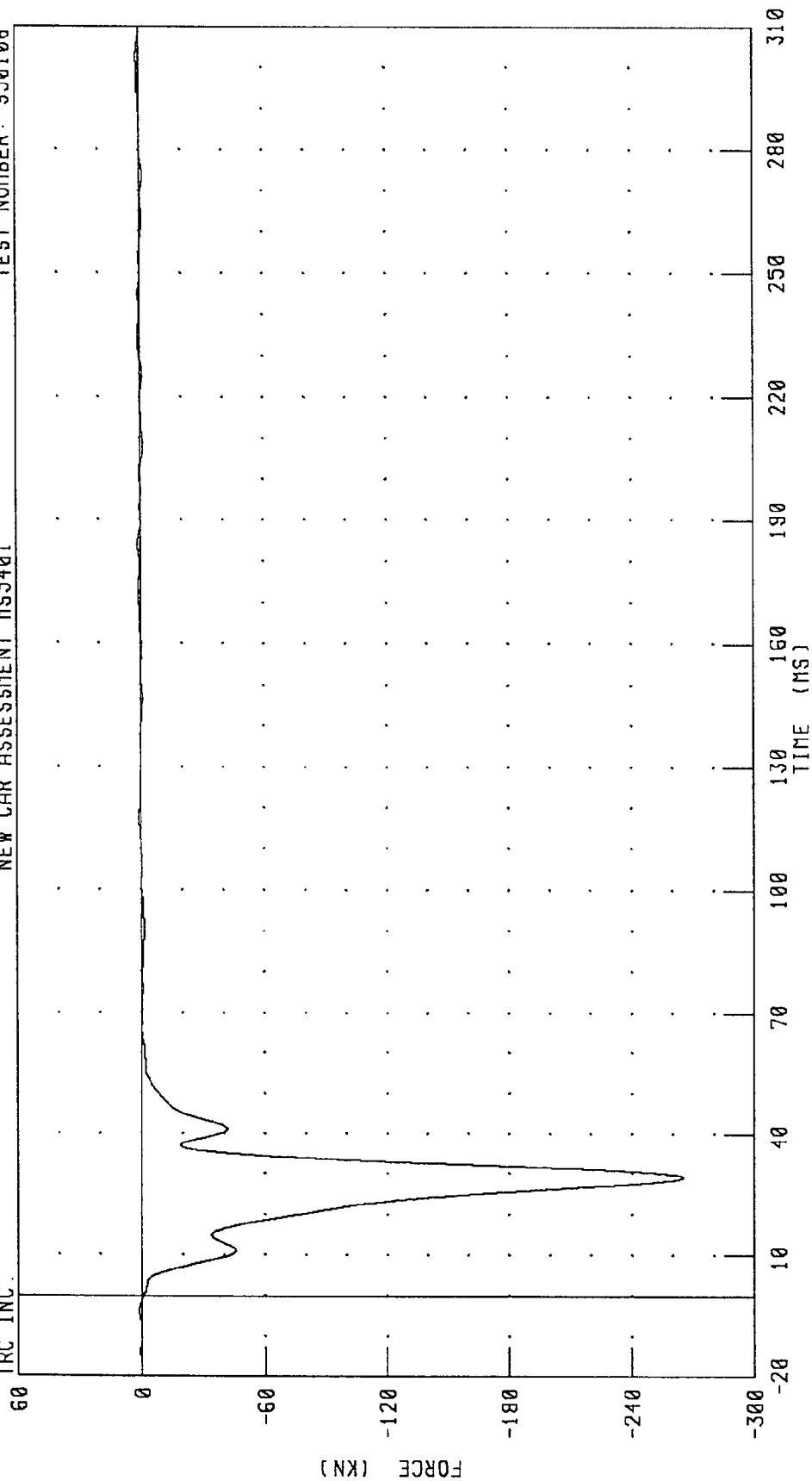
PEAK DATA: 1.23 KN @ 184.00 MS; -68.70 KN @ 33.92 MS

CHANNEL: LCBG4F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP # 5 FORCE TOTAL
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

TRC INC.

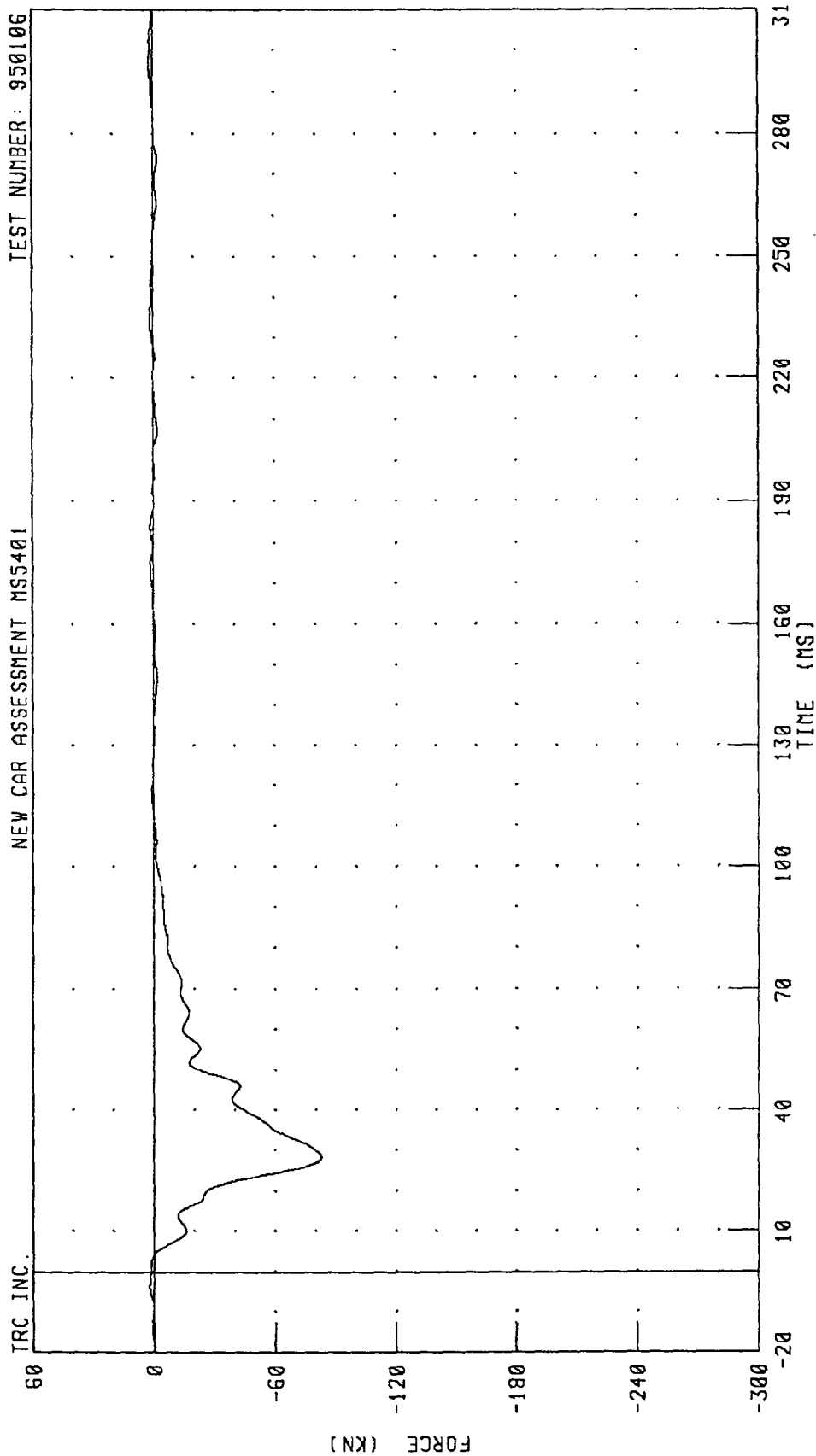


PEAK DATA: 1.35 KN @ 183.84 MS; -265.35 KN @ 29.12 MS

CHANNEL: LCBG5F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP # 6 FORCE TOTAL
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

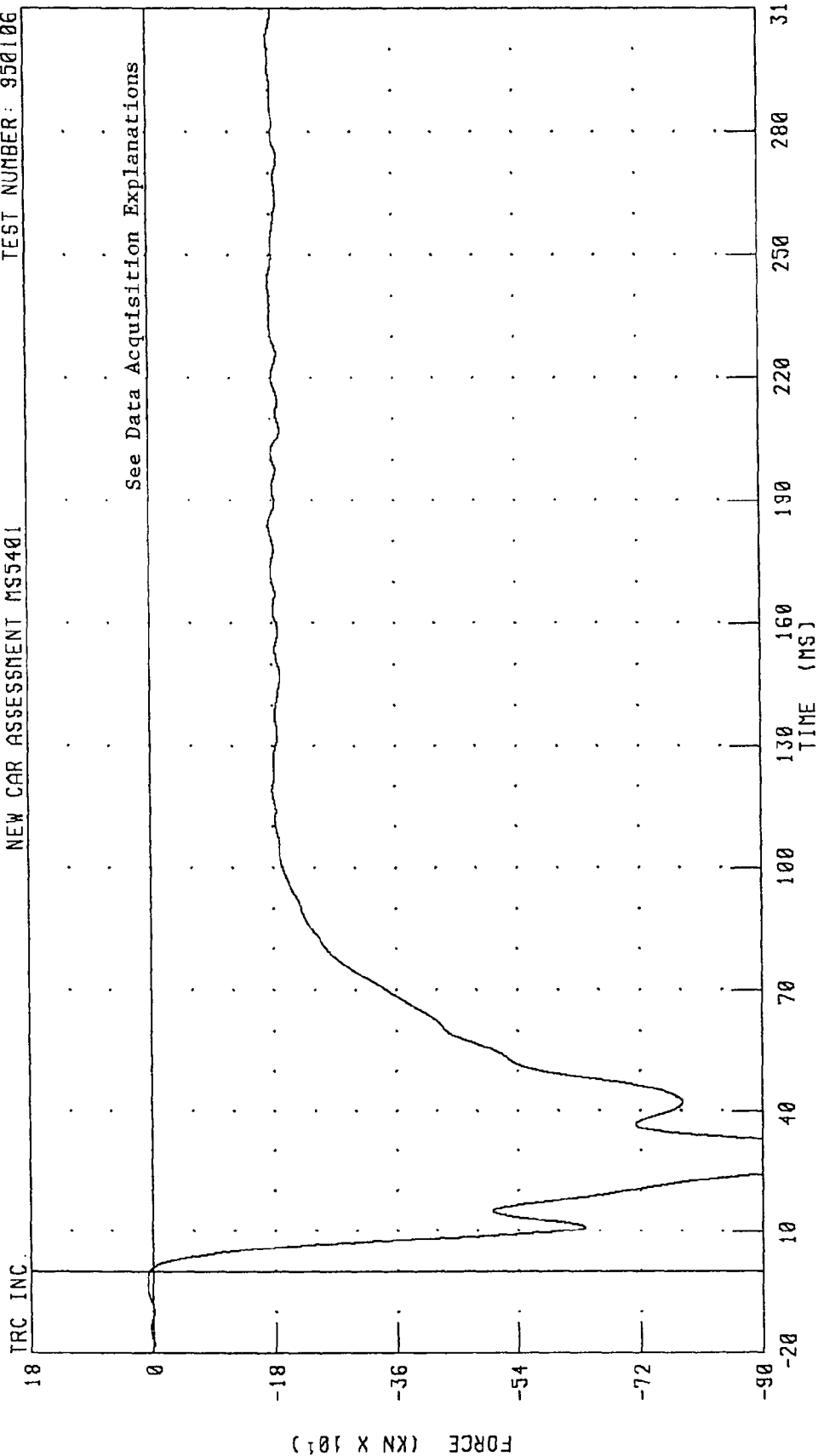


PEAK DATA: 2.25 KN @ -3.84 MS; -82.72 KN @ 28.40 MS

CHANNEL: LCBG6F FILTER: CH. CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE
 NEW CAR ASSESSMENT MS5401

TEST NUMBER: 950106

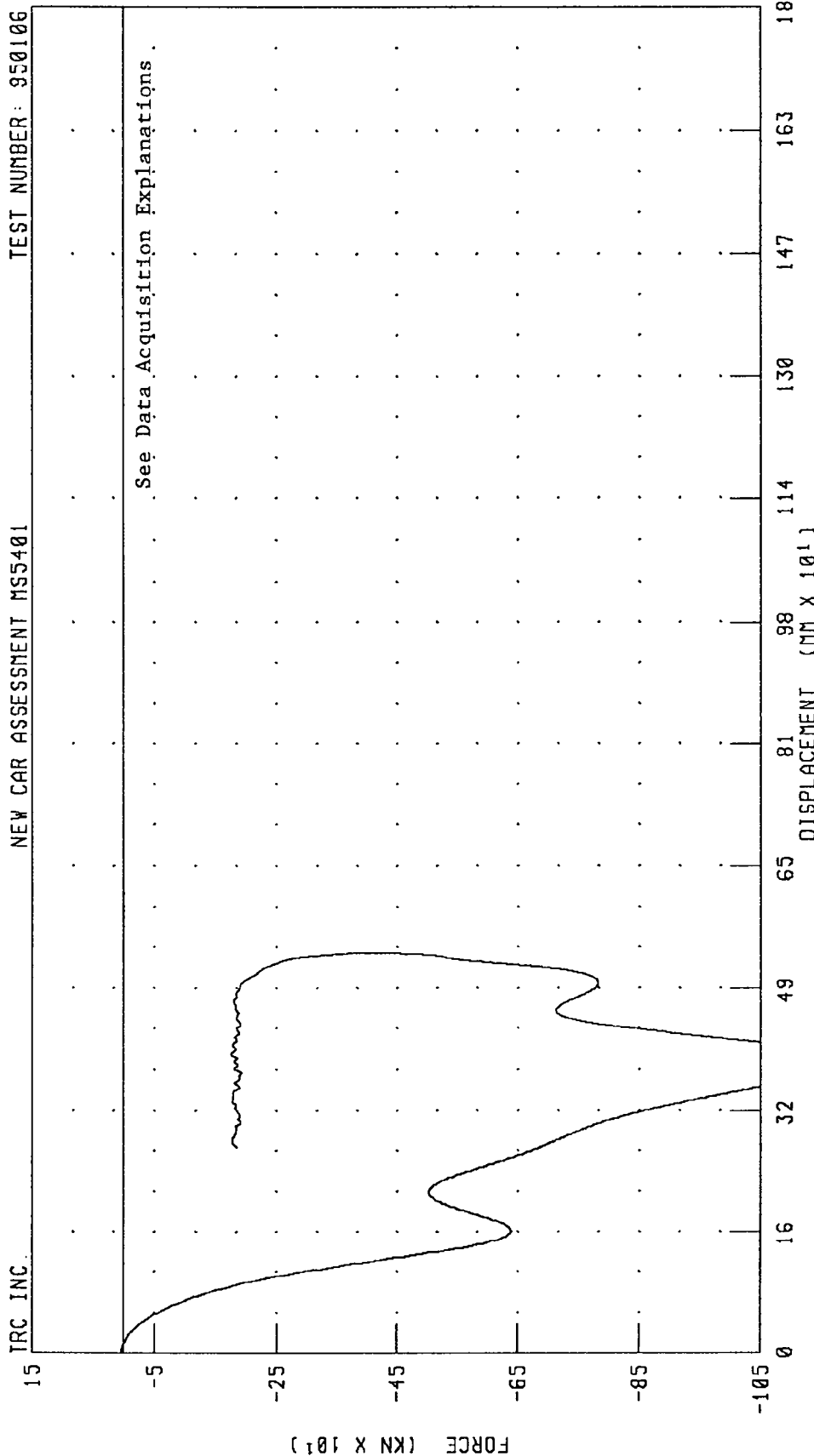


See Data Acquisition Explanations

PEAK DATA: 7.68 KN @ -4.00 MS; -1186.52 KN @ 29.20 MS

CHANNEL: LCBGT FILTER: CH: CLASS 60

1995 MAZDA MPV INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT
 NEW CAR ASSESSMENT MS5401 TEST NUMBER: 950106



CHANNEL: OTHXD FILTER: CH. CLASS 180
 LCBGT CH. CLASS 60
 PEAK DATA: 538.43 MM @ 62.96 MS; -1186.52 KN @ 29.20 MS
 4.61 KN @ 0.00 MS; 0.00 MM @ 0.00 MS

Appendix C

Dummy Certification Data

Pre-test Certification Data

Driver Dummy S/N: 192

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS

192 ALDERSON

26-DEC-94

TRC INC.

TEST NO: 192C24ED1

572E SN192 EXT.DIMENSION CAL24

TEST PARAMETER	(DIMEN.)	SPECIFICATION	TEST RESULTS
LOCATION FOR CHEST CIRCUMFERENCE (AA)		429 - 434 MM	432. MM
LOCATION FOR WAIST CIRCUMFERENCE (BB)		226 - 231 MM	229. MM
CHEST CIRCUMFERENCE (Y)		970 -1001 MM	980. MM
WAIST CIRCUMFERENCE (Z)		836 - 866 MM	851. MM
CHEST DEPTH (O)		213 - 229 MM	218. MM
H-POINT HEIGHT (C)		84 - 89 MM	84. MM
H-POINT FROM SEATBACK (D)		135 - 140 MM	135. MM
SKULL CAP TO BACKLINE (H)		41 - 46 MM	43. MM
TOTAL SITTING HEIGHT (A)		879 - 889 MM	889. MM
THIGH CLEARANCE (F)		140 - 155 MM	150. MM
BUTTOCK KNEE LENGTH (K)		579 - 605 MM	597. MM
BUTTOCK POPLITEAL LENGTH (N)		452 - 478 MM	470. MM
POPLITEAL HEIGHT (L)		429 - 455 MM	447. MM
KNEE PIVOT HEIGHT (M)		485 - 500 MM	493. MM
FOOT LENGTH (P)		252 - 267 MM	259. MM
FOOT BREADTH (W)		91 - 107 MM	102. MM
SHOULDER PIVOT FROM BACKLINE (E)		84 - 94 MM	94. MM
SHOULDER BREADTH (V)		422 - 437 MM	429. MM
SHOULDER PIVOT HEIGHT (B)		506 - 521 MM	516. MM
ELBOW REST HEIGHT (J)		191 - 211 MM	211. MM
SHOULDER-ELBOW LENGTH (I)		330 - 345 MM	345. MM
BACK OF ELBOW TO WRIST PIVOT (G)		290 - 305 MM	290. MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

John Ford

RUN NUMBER: 122694.1303

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

26-DEC-94

TRC INC.

TEST NO: 192C24HD1

572E SN192 HEAD DROP CAL 24

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	33.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	231.15 G
PEAK LATERAL ACCELERATION	15 G MAX	-4.09 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Foster

RUN NUMBER: 122694.0903;1

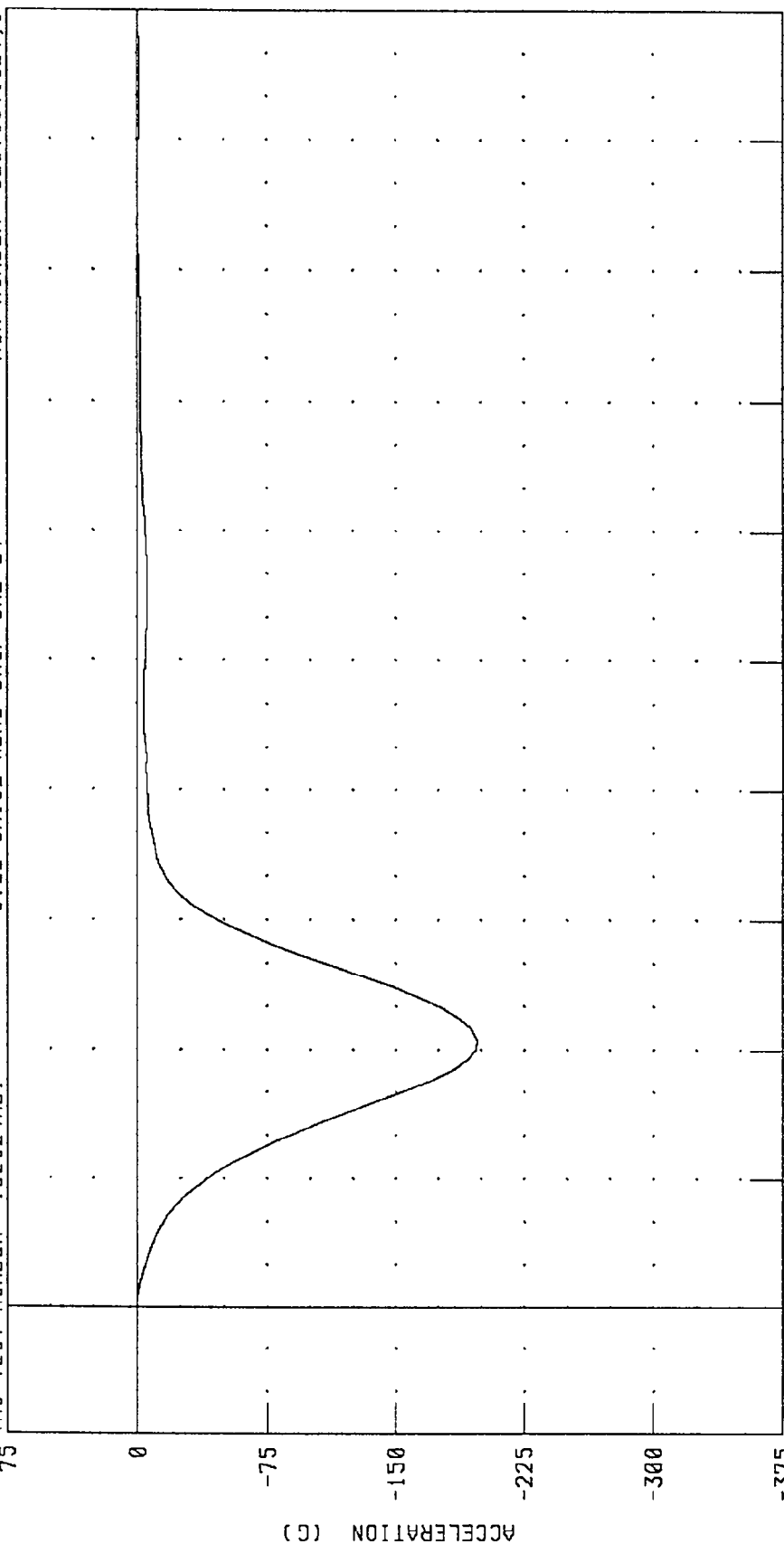
PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS

TRC TEST NUMBER: 192C24HD1

572E SN192 HEAD DRQP CAL 24

RUN NUMBER: 020795.1524;1

75



TIME (MS X 10⁻¹)

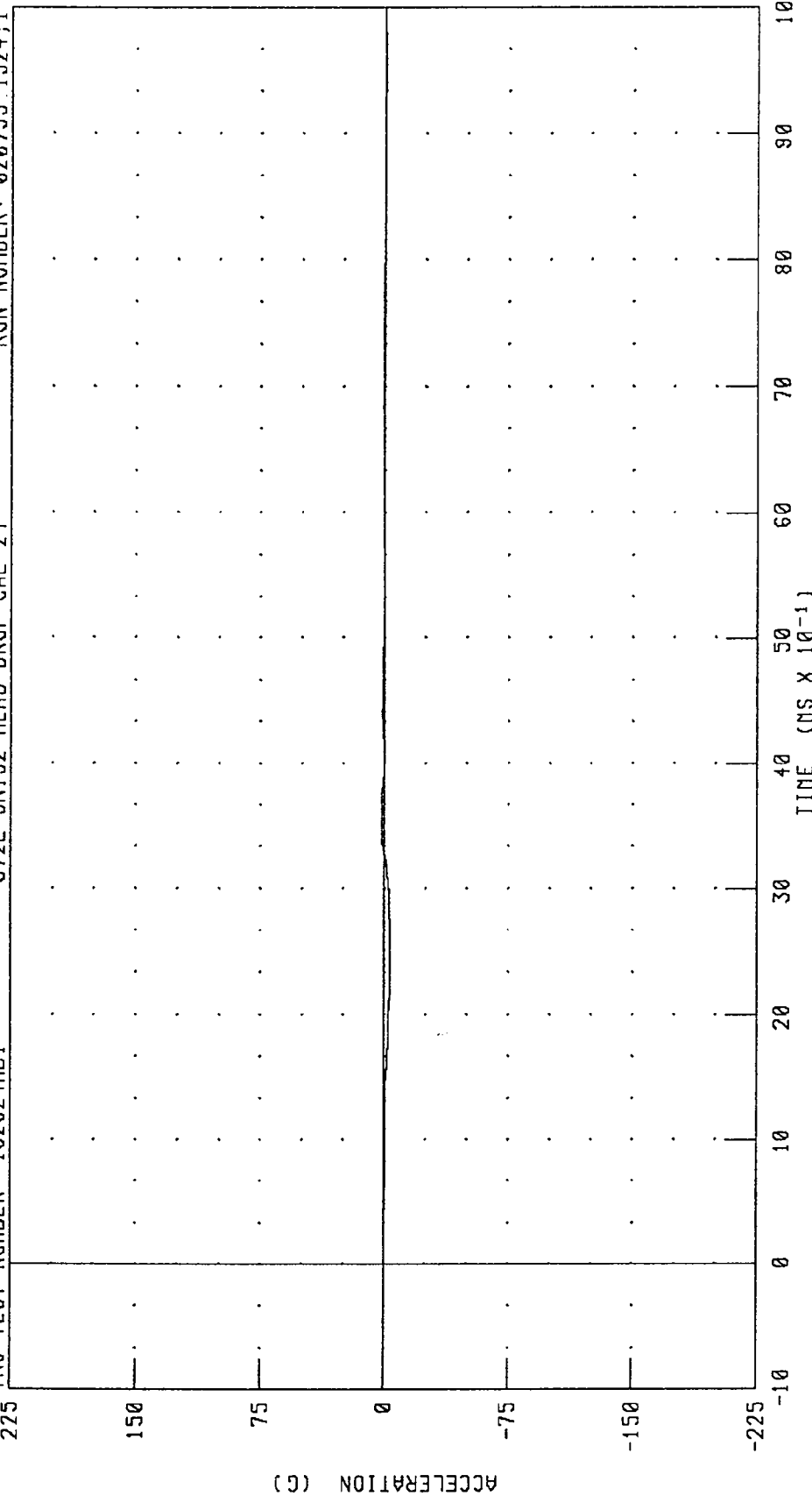
CHANNEL: HEDXC FILTER: CH. CLASS 1000

PEAK DATA: 0.02 G @ -0.08 MS; -197.85 G @ 2.08 MS

PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 192C24HD1 572E SN192 HEAD DROP CAL 24 RUN NUMBER: 020795.1524;1

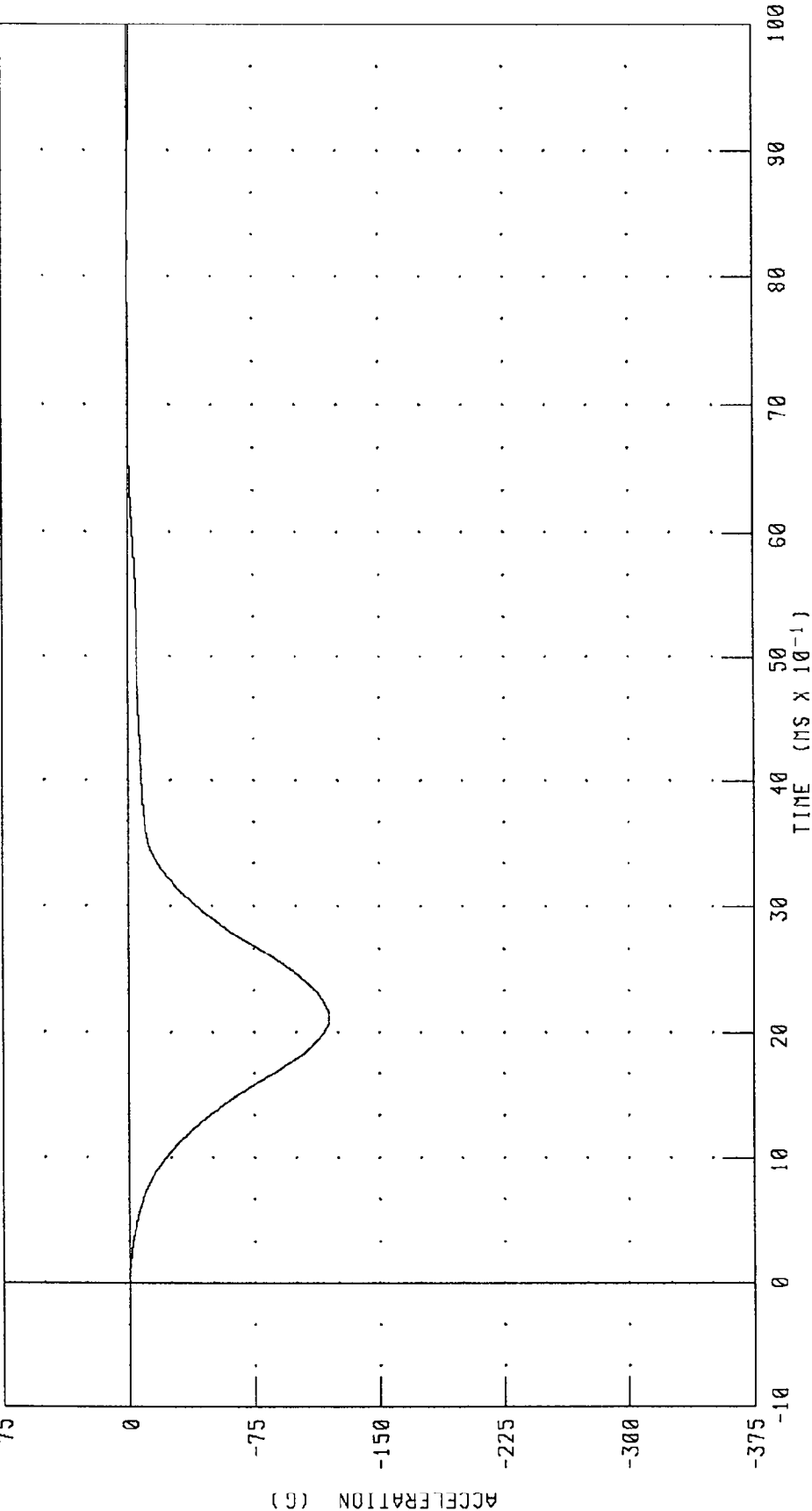


CHANNEL: HEDYG FILTER: CH. CLASS 1000

PEAK DATA: 1.38 G @ 3.52 MS; -4.09 G @ 2.32 MS

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: 192C24HD1 572E SN192 HEAD DROP CAL 24 RUN NUMBER: 020795.1524;1



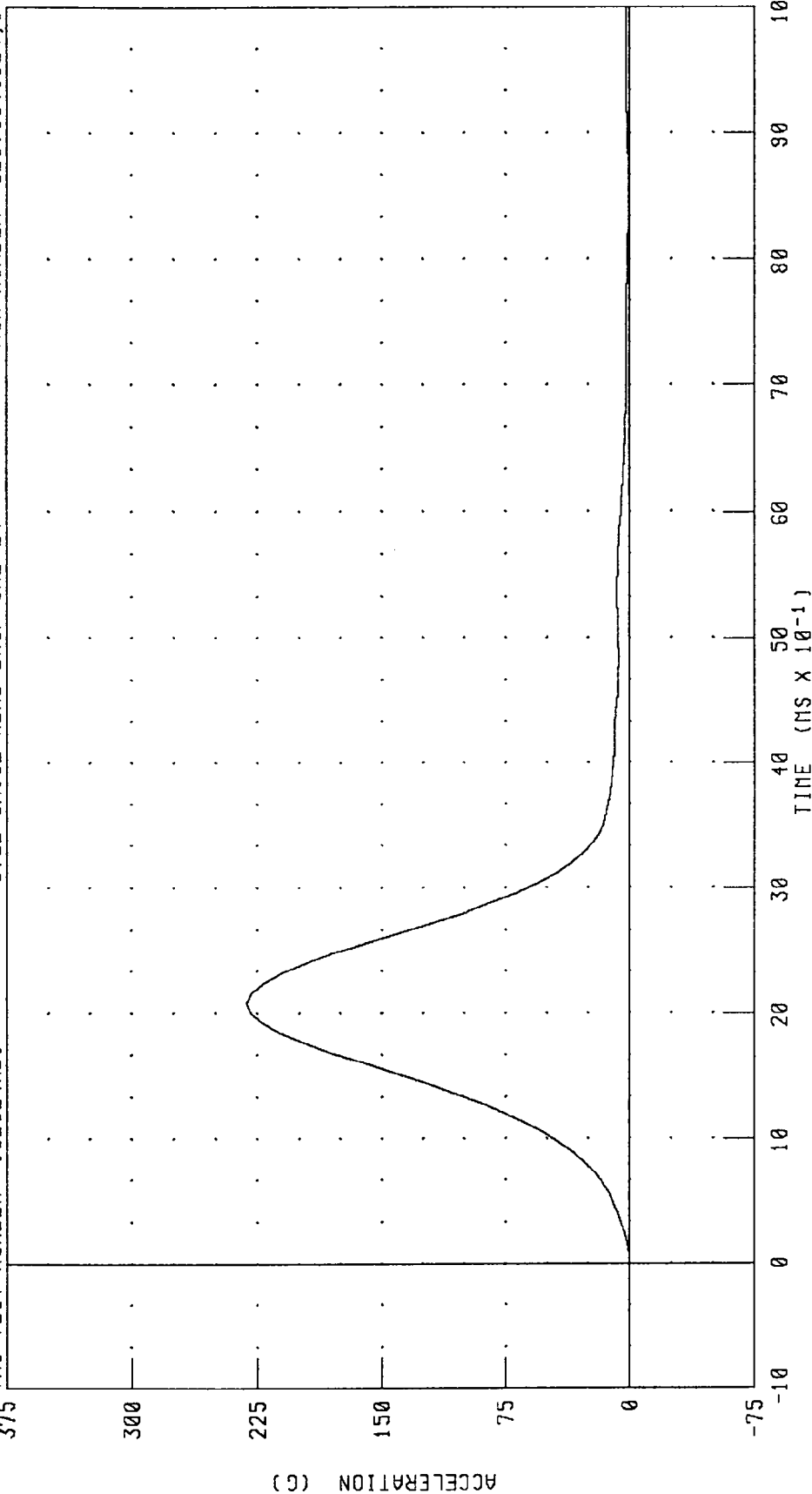
CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: 0.05 G @ -0.96 MS; -119.64 G @ 2.16 MS

PART 572-E HYBRID III HEAD CALIBRATION

HEAD RESULTANT ACCELERATION

572E SN192 HEAD DROP CAL 24 RUN NUMBER: 020795.1524;1

TRC TEST NUMBER: 192C24HD1



PEAK DATA: 231.16 G @ 2.08 MS; 0.07 G @ -0.80 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

26-DEC-94

TRC INC. TEST NO: 192C24NF1 572E SN192 NECK FLEXION CAL24

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	33.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	22.92 G
	20 MS	17.60 - 22.60 G	19.90 G
	30 MS	12.50 - 18.50 G	17.15 G
MAX PENDULUM G		29 G MAX	23.54 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	17.09 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	39.84 MS
D PLANE	MAX	64 - 78 DEG.	65.99 DEG.
ROTATION	TIME	57 - 64 MS	58.96 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	92.82 NM
	TIME	47 - 58 MS	52.40 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	113.68 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	103.68 MS

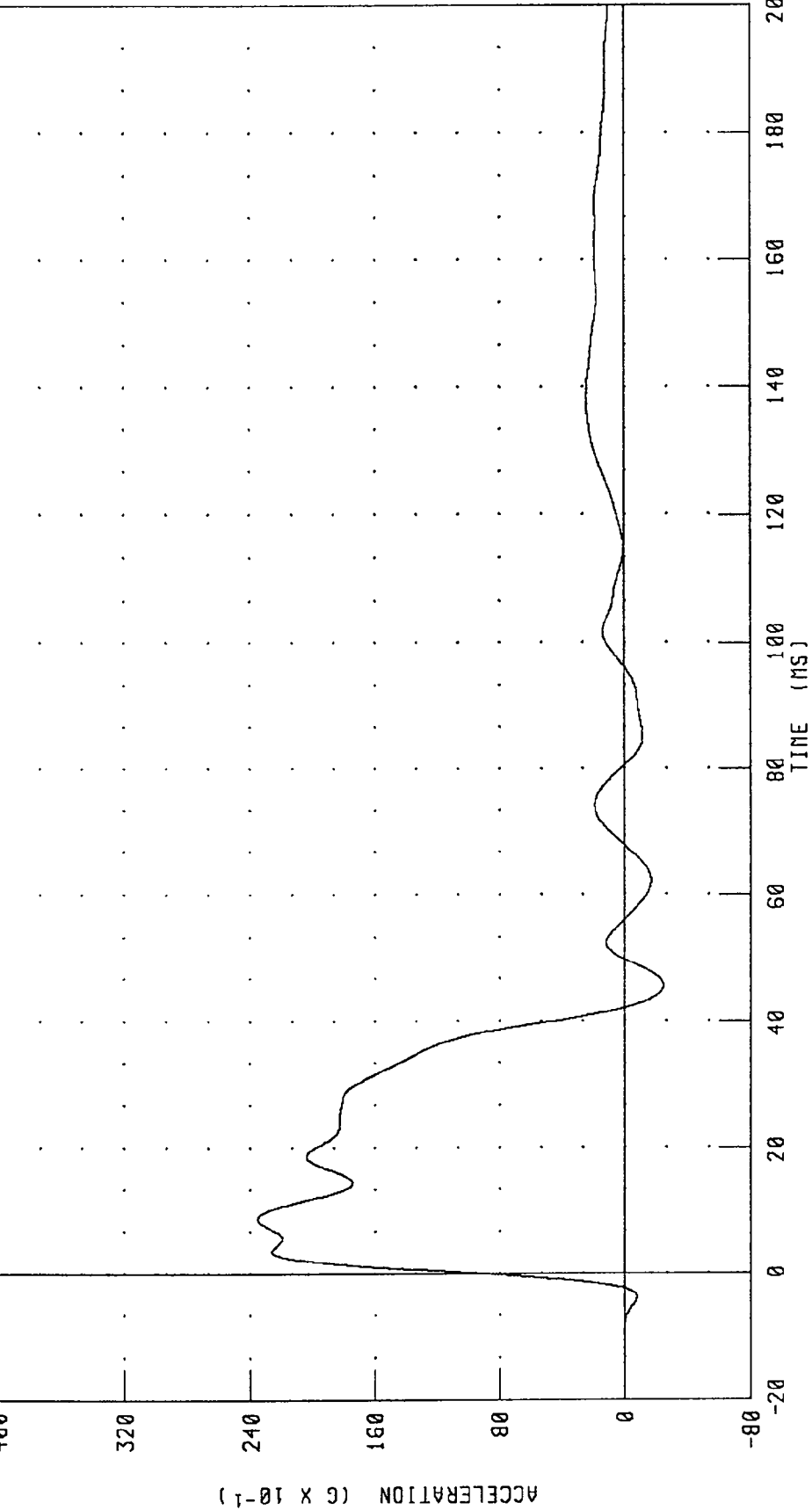
TEST MEETS SPECIFICATIONS

TECHNICIAN Pete SSA

RUN NUMBER: 122694.1313;5

PART 572-E HYBRID III NECK FLEXION CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 192C24NF1 572E SN192 NECK FLEXION CAL24 RUN NUMBER: 020795.1524;5



PEAK DATA: 23.54 G @ 8.80 MS; -2.47 G @ 45.60 MS

CHANNEL: PENXG FILTER: CH. CLASS 60

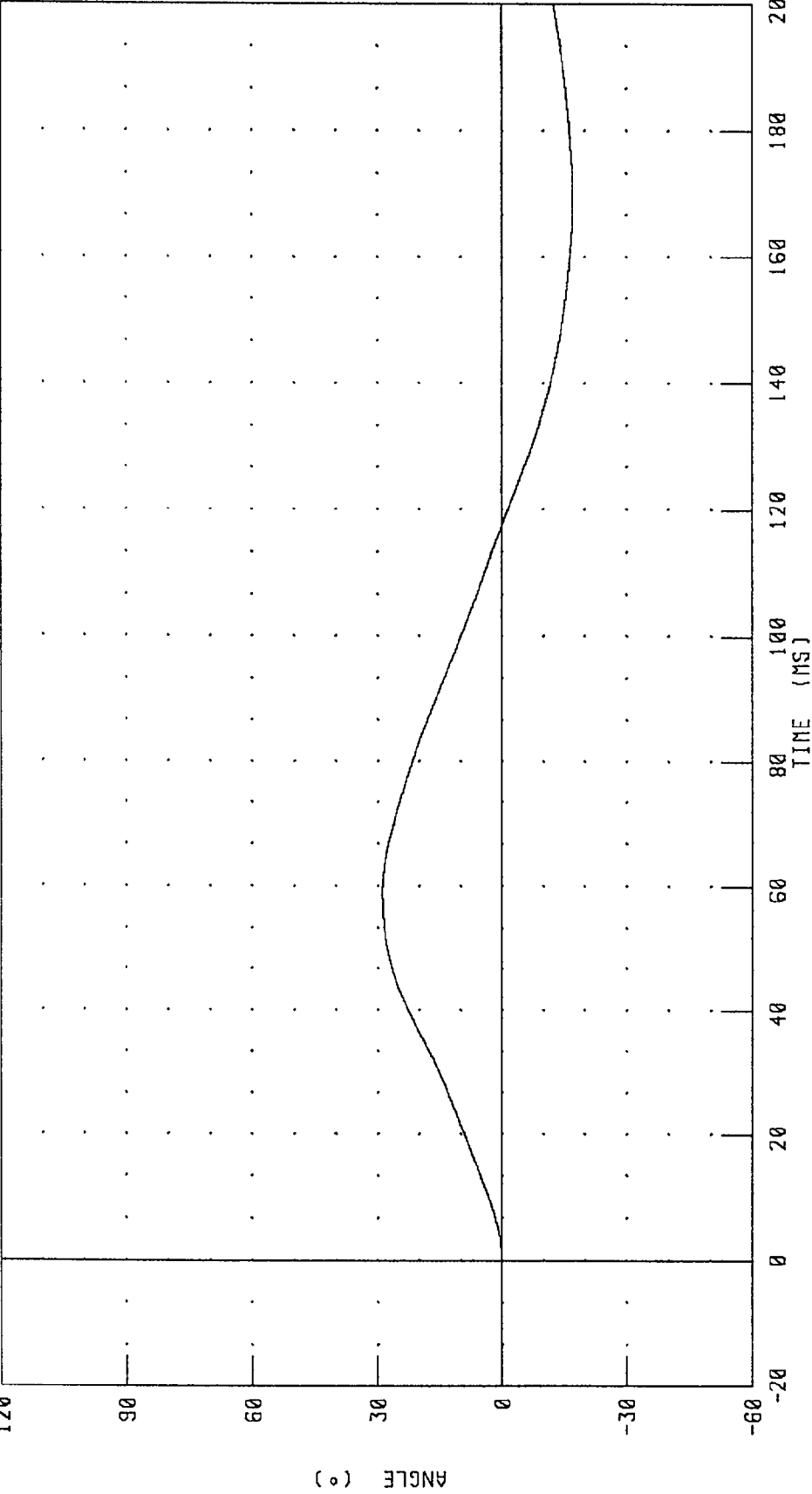
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN192 NECK FLEXION CAL24

IRC TEST NUMBER: 192C24NF1

RUN NUMBER: 020795.1524;5



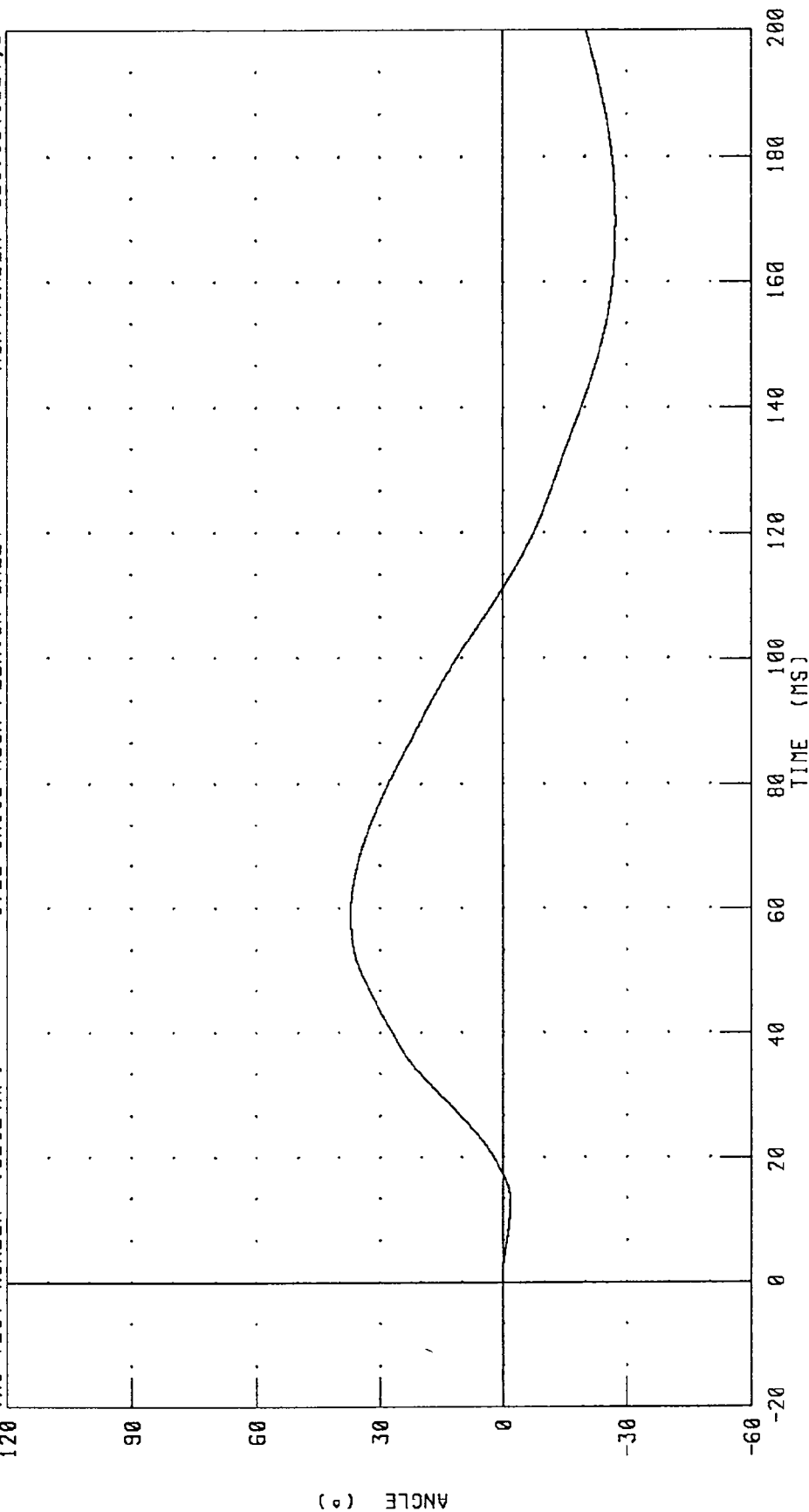
PEAK DATA: 28.90 ° @ 58.96 MS, -16.96 ° @ 171.60 MS

FILTER: CH. CLASS 60

CHANNEL: BETA

PART 572-E HYBRID III NECK FLEXION CALIBRATION
 ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 192C24NF1 572E SN192 NECK FLEXION CAL24 RUN NUMBER: 020795.1524,5



CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 37.10 ° @ 58.88 MS; -27.27 ° @ 169.68 MS

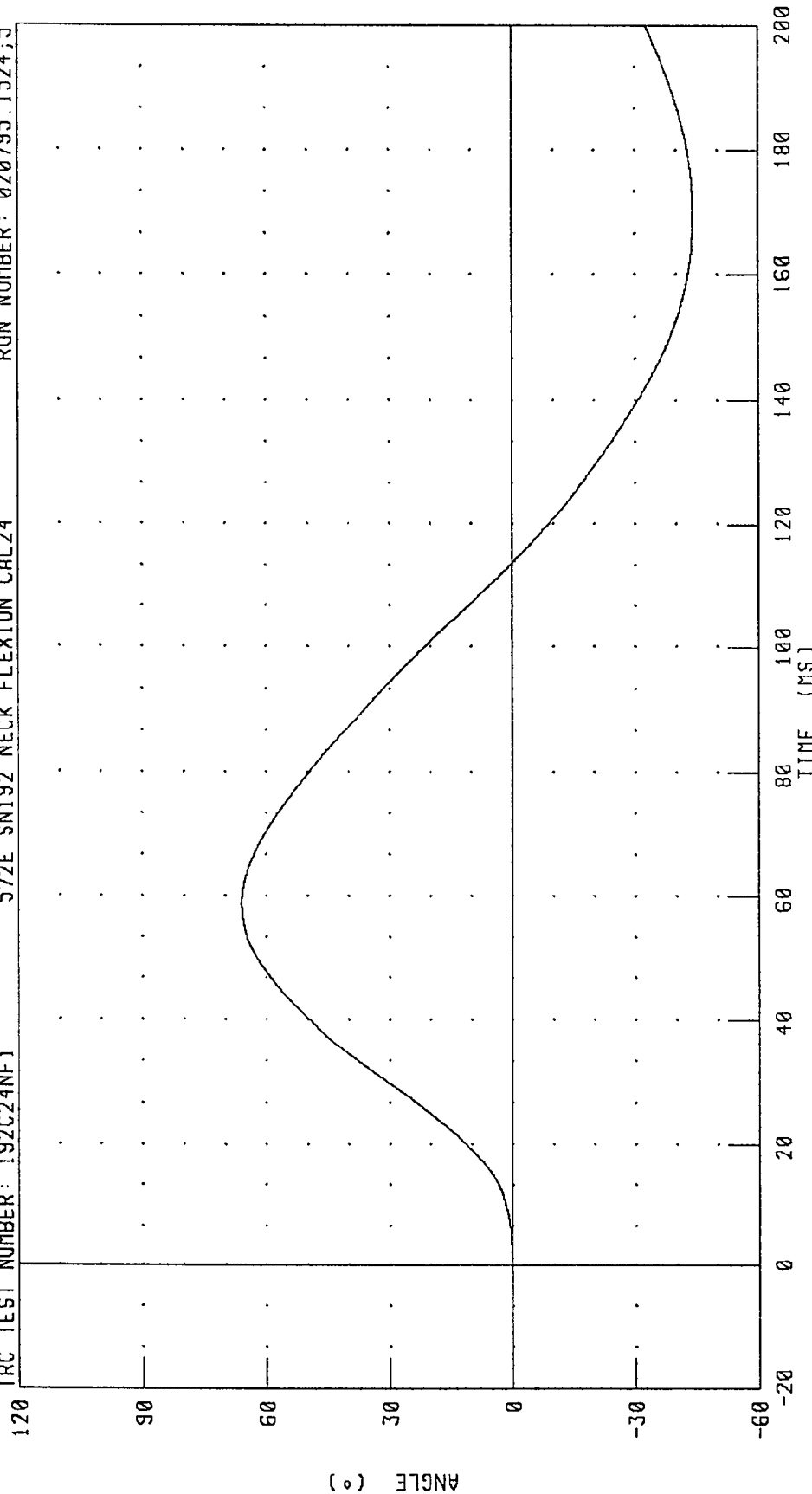
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 192C24NF1

572E SN192 NECK FLEXION CAL24

RUN NUMBER: 020795.1524;5



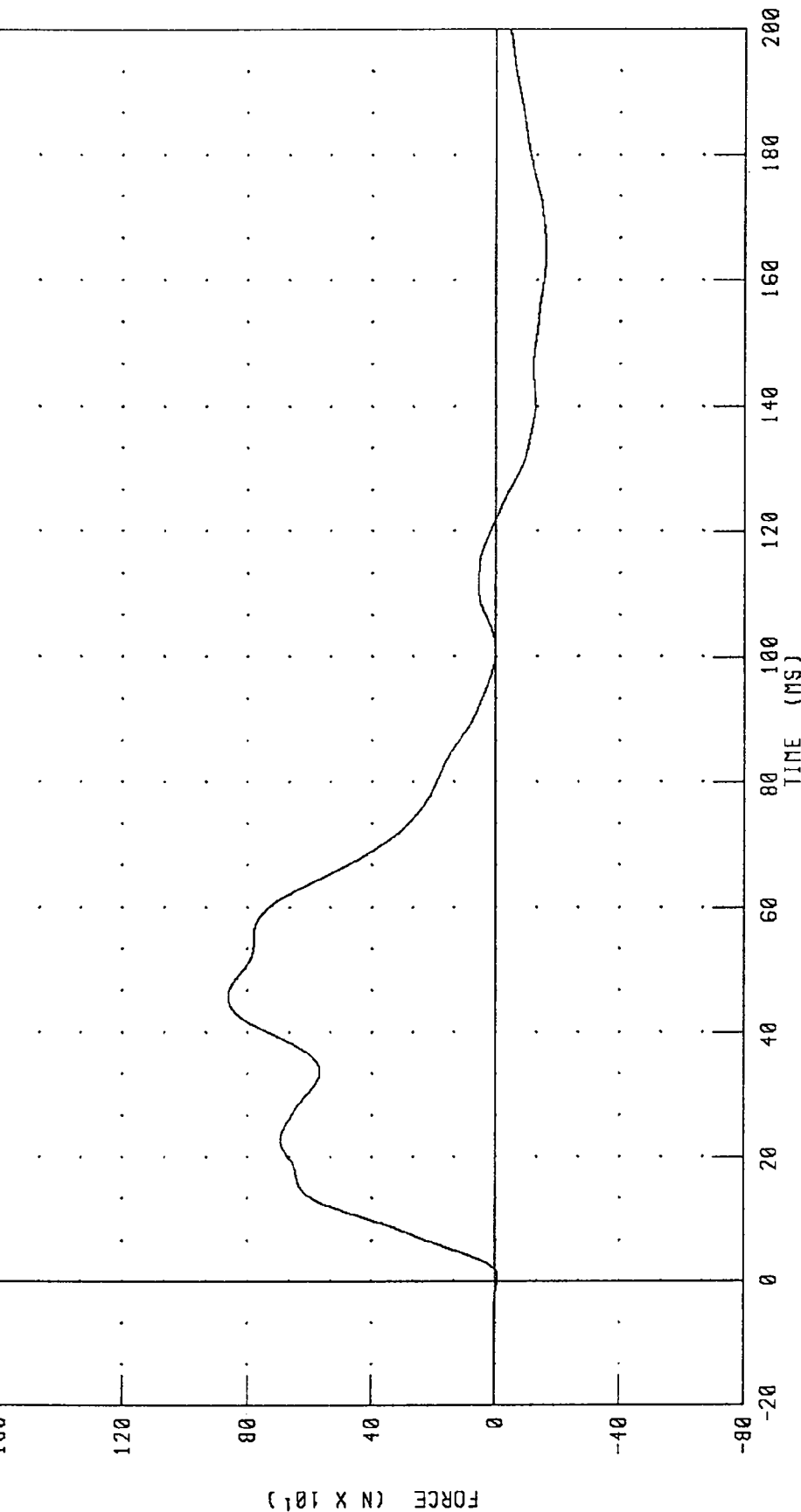
PEAK DATA: 66.00 ° @ 58.96 MS; -44.23 ° @ 169.68 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 192C24NF1 572E SN192 NECK FLEXION CAL24 RUN NUMBER: 020795.1524,5



CHANNEL: NEKXF FILTER: CH. CLASS 60

PEAK DATA: 862.40 N @ 45.68 MS, -163.05 N @ 164.80 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 192C24NF1

572E SN192 NECK FLEXION CAL24

RUN NUMBER: 020795.1524;5

160

120

80

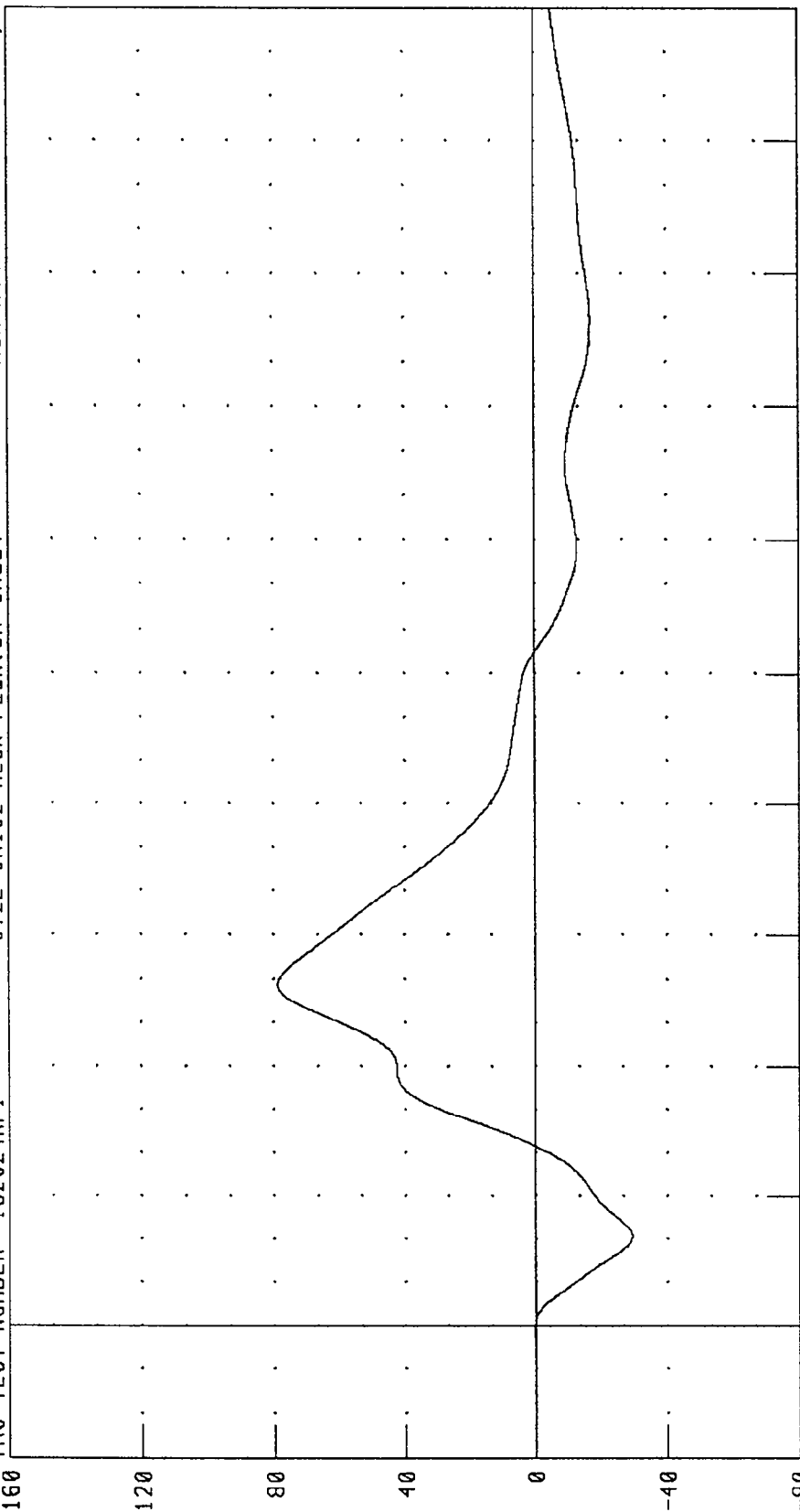
40

0

-40

-80

TORQUE (N·M)



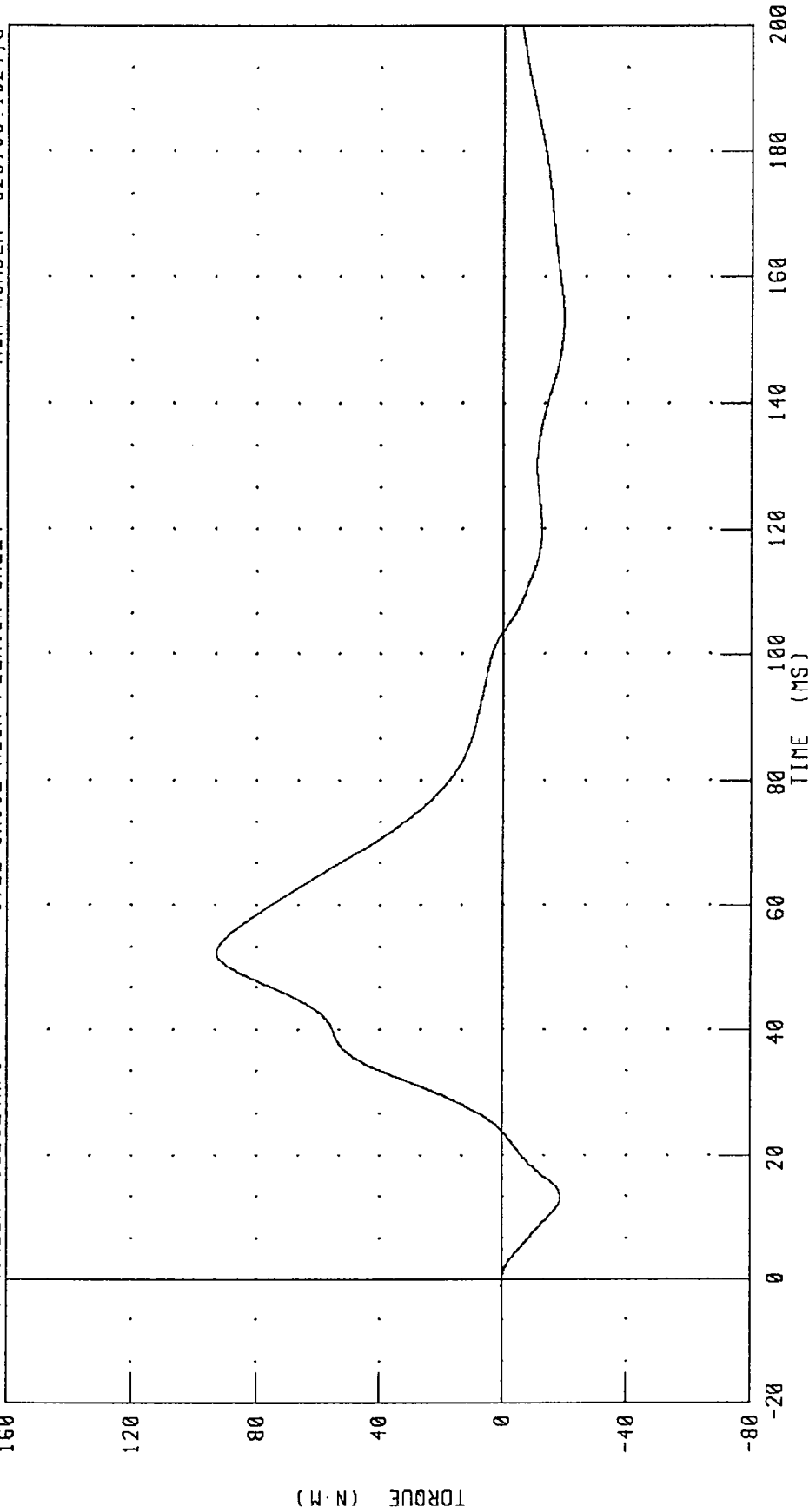
TIME (MS)

PEAK DATA: 78.86 N·M @ 52.48 MS; -29.30 N·M @ 13.76 MS

CHANNEL: NEKYM FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

IRC TEST NUMBER: 192C24NF1 572E SN192 NECK FLEXION CAL24 RUN NUMBER: 020795.1524;5



CHANNEL: NEKOM FILTER: CH. CLASS 60 PEAK DATA: 92.82 N·M @ 52.40 MS, -19.49 N·M @ 153.44 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

26-DEC-94

TRC INC.

TEST NO: 192C24NE1

572E SN192 NECK EXT. CAL24

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	33.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.02 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.31 G
	20 MS	14.00 - 19.00 G	15.40 G
	30 MS	11.00 - 16.00 G	13.01 G
MAX PENDULUM G		22 G MAX	18.81 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	12.99 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	42.64 MS
D PLANE	MAX	81 - 106 DEG.	92.51 DEG.
ROTATION	TIME	72 - 82 MS	75.44 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-56.14 NM
	TIME	65 - 79 MS	71.84 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	158.00 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	139.44 MS

TEST MEETS SPECIFICATIONS

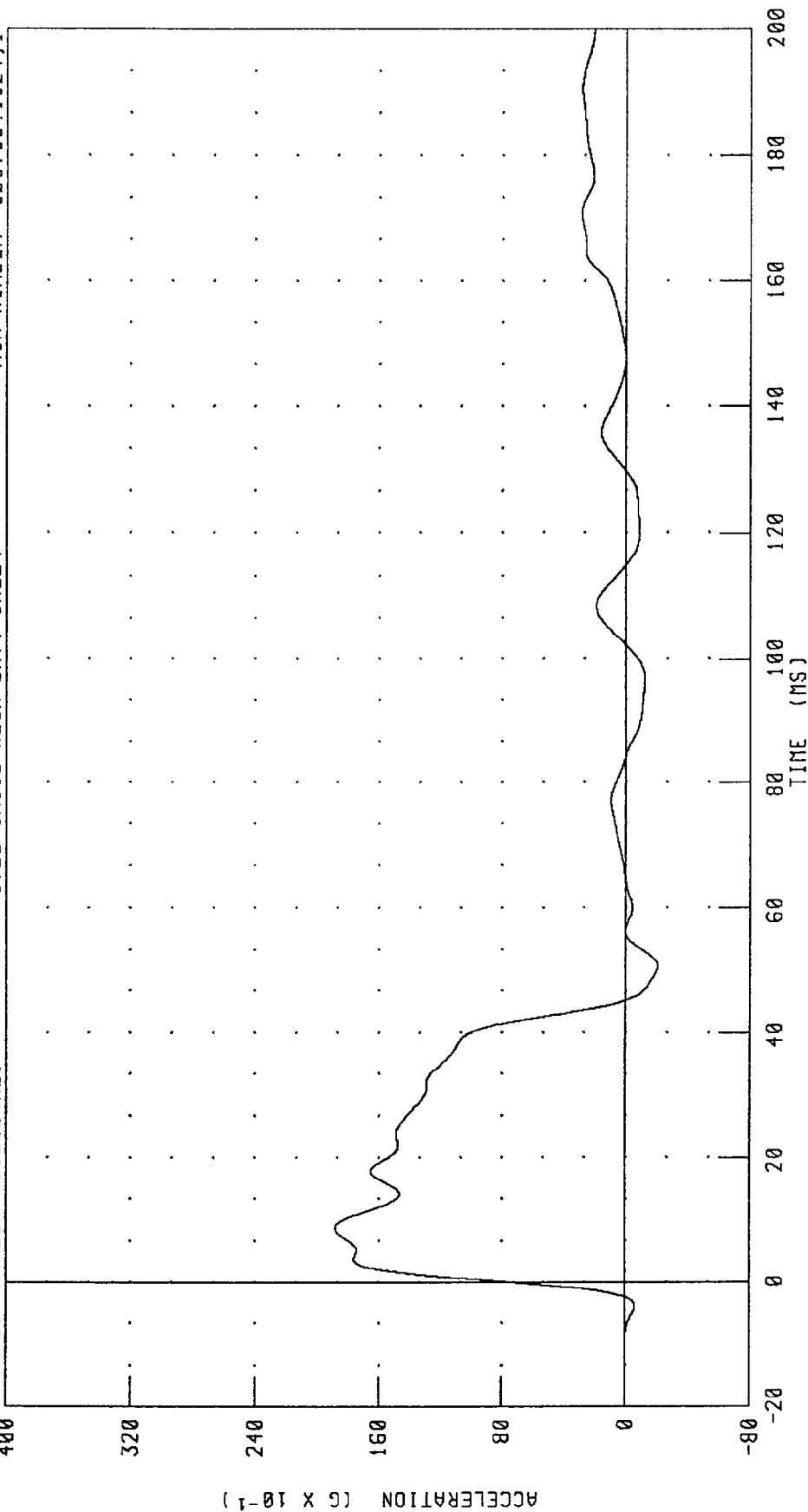
TECHNICIAN Pete Fox

RUN NUMBER: 122694.1323;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

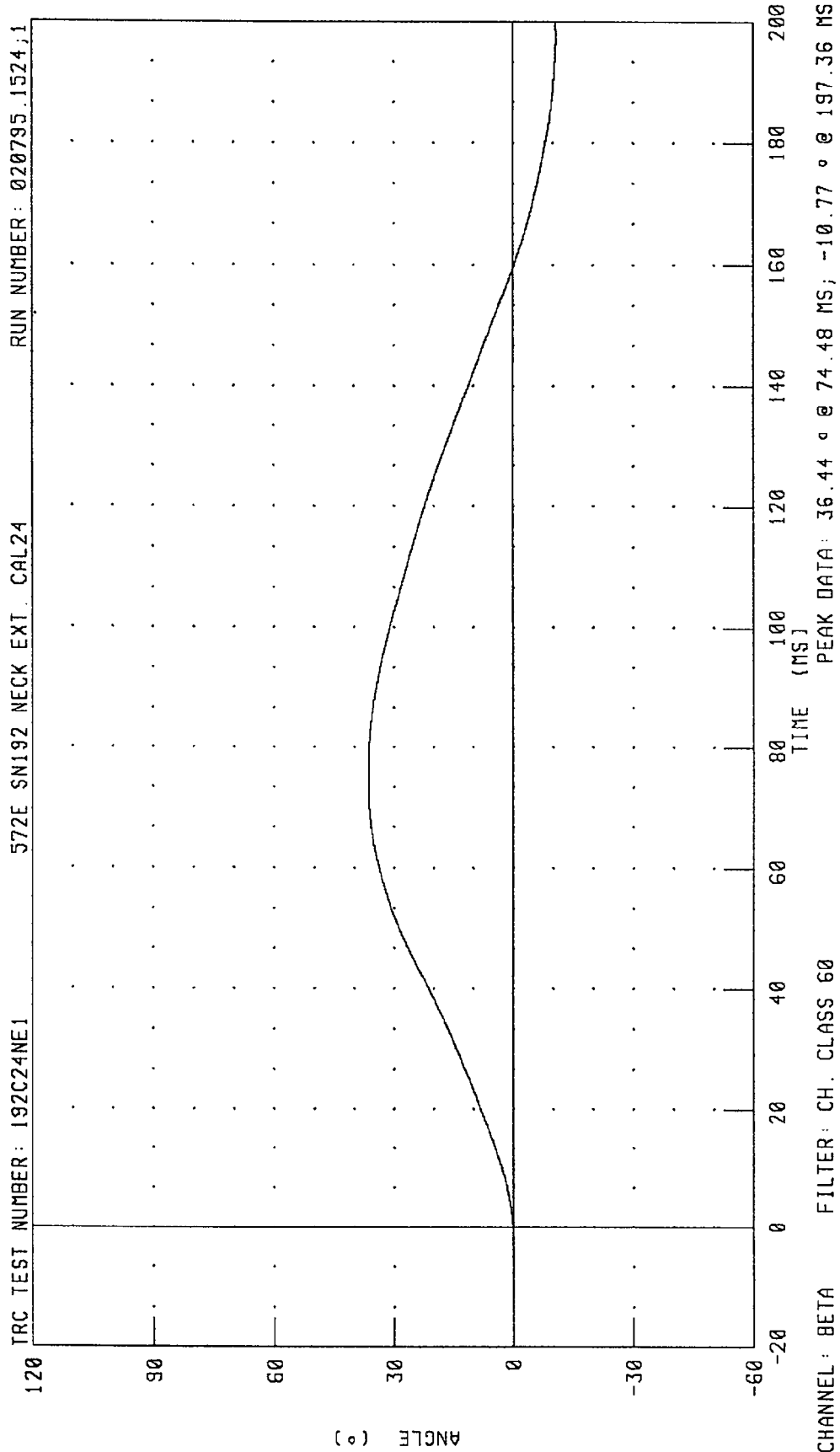
PENDULUM DECELERATION

TRC TEST NUMBER: 192C24NE1 572E SN192 NECK EXT. CAL24 RUN NUMBER: 020795.1524;1



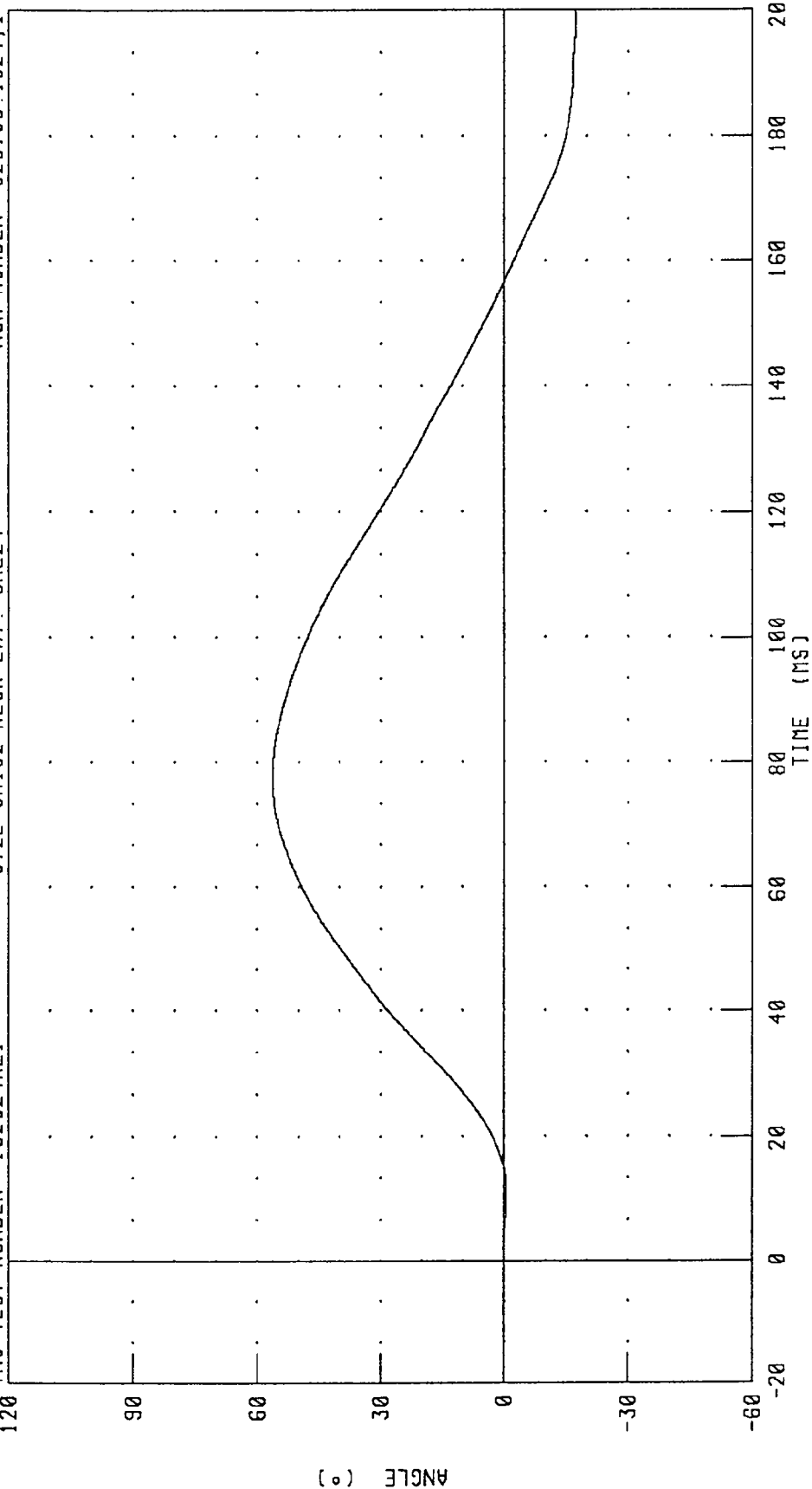
CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 18.82 G @ 8.72 MS; -2.08 G @ 50.64 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 ROTATION ABOUT BASE OF NECK



PART 572-E HYBRID III NECK EXTENSION CALIBRATION ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 192C24NE1 572E SN192 NECK EXT. CAL24 RUN NUMBER: 020795.1524;1



PEAK DATA: 56.11 ° @ 77.04 MS; -17.31 ° @ 197.76 MS

CHANNEL: THETA FILTER: CH. CLASS 60

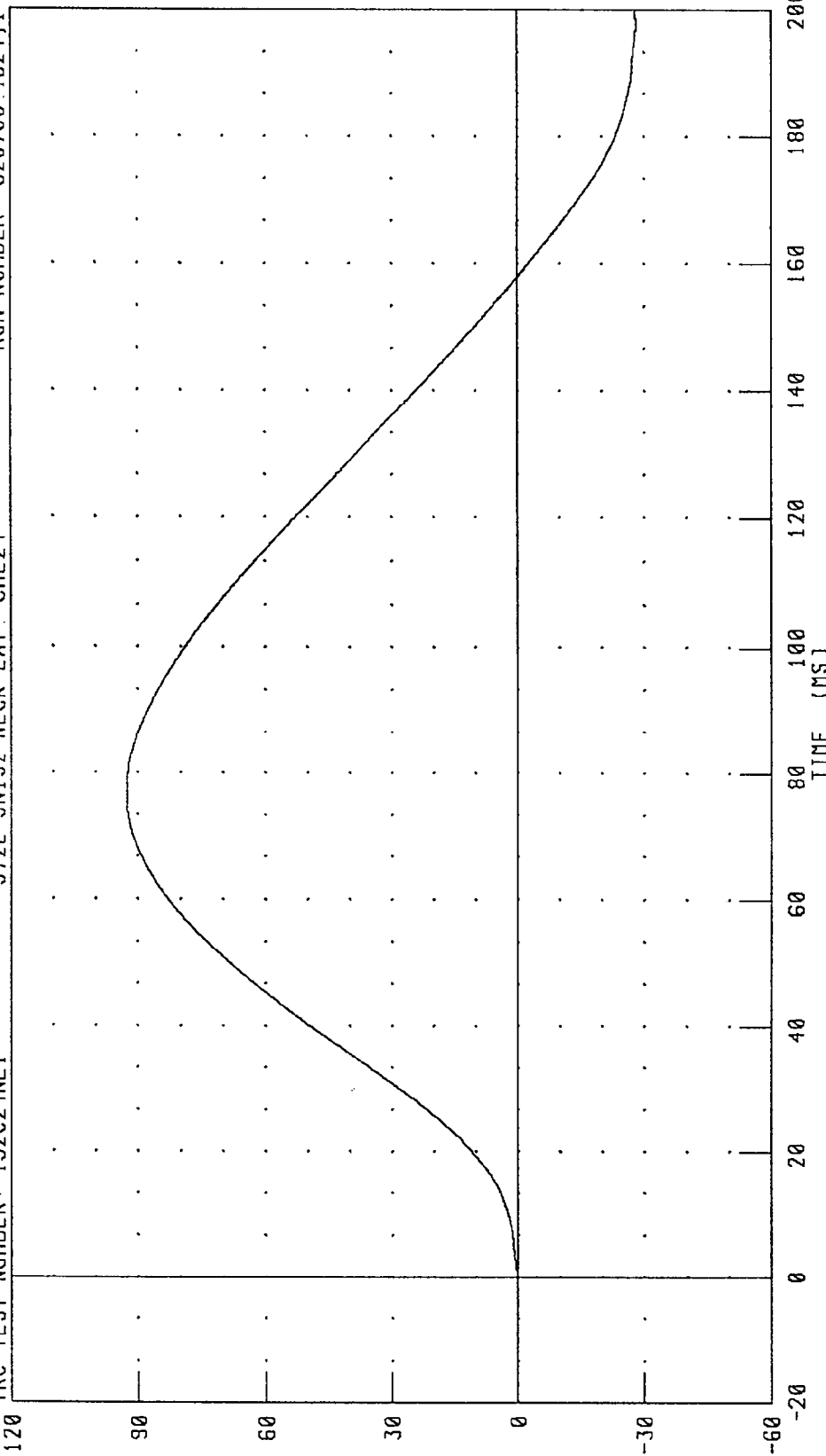
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 192C24NE1

572E SN192 NECK EXT. CAL24

RUN NUMBER: 020795.1524.1



PEAK DATA: 92.52 ° @ 75.44 MS; -28.08 ° @ 197.68 MS

CHANNEL: TOTAL FILTER: CH. CLASS 60

ANGLE (°)

TIME (MS)

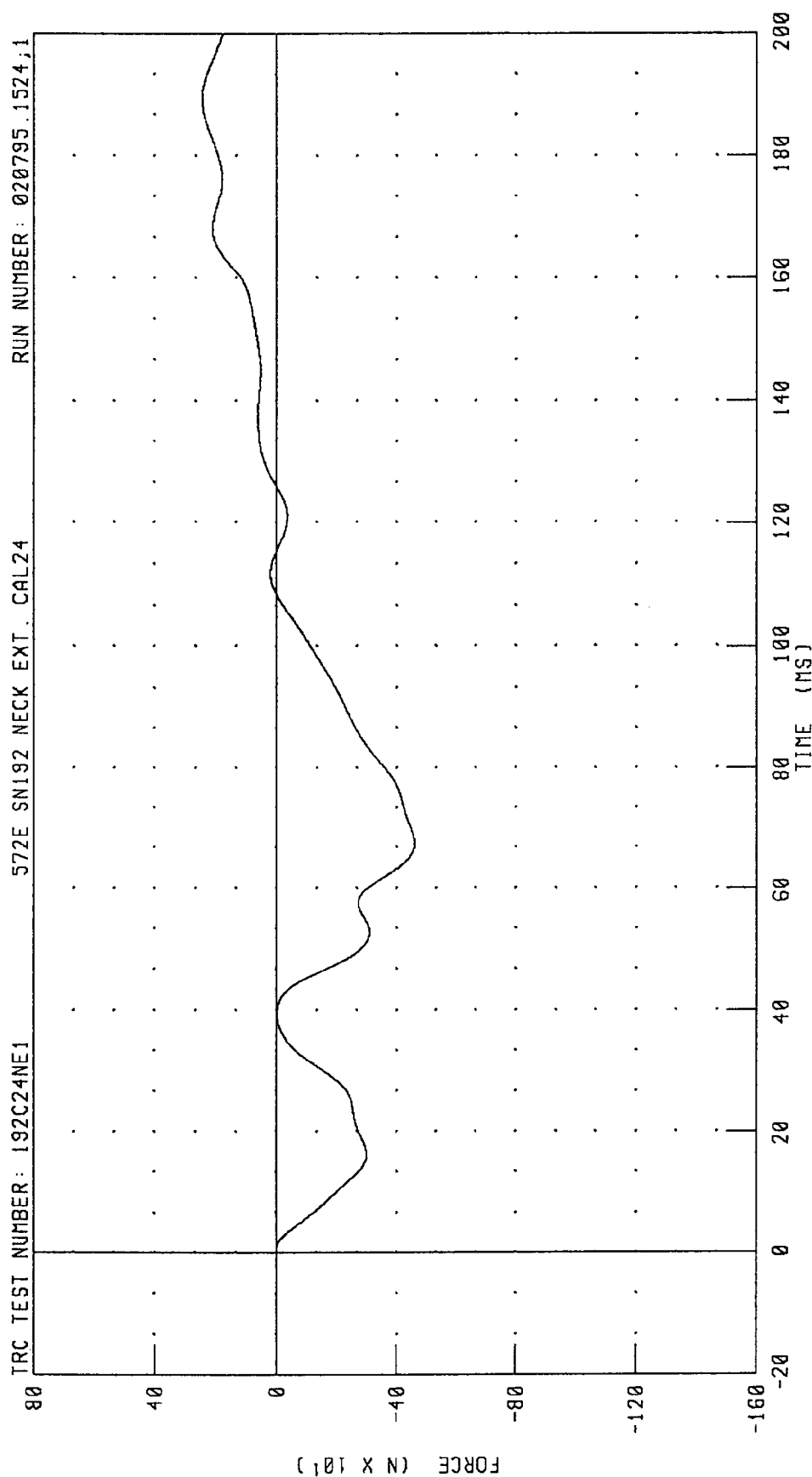
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 192C24NE1

572E SN192 NECK EXT. CAL24

RUN NUMBER: 020795.1524;1



CHANNEL: NEKXF FILTER: CH. CLASS 60

PEAK DATA: 244.03 N @ 189.20 MS; -460.35 N @ 67.36 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 192C24NE1

572E SN192 NECK EXT. CAL24

RUN NUMBER: 020795.1524;1

80

40

0

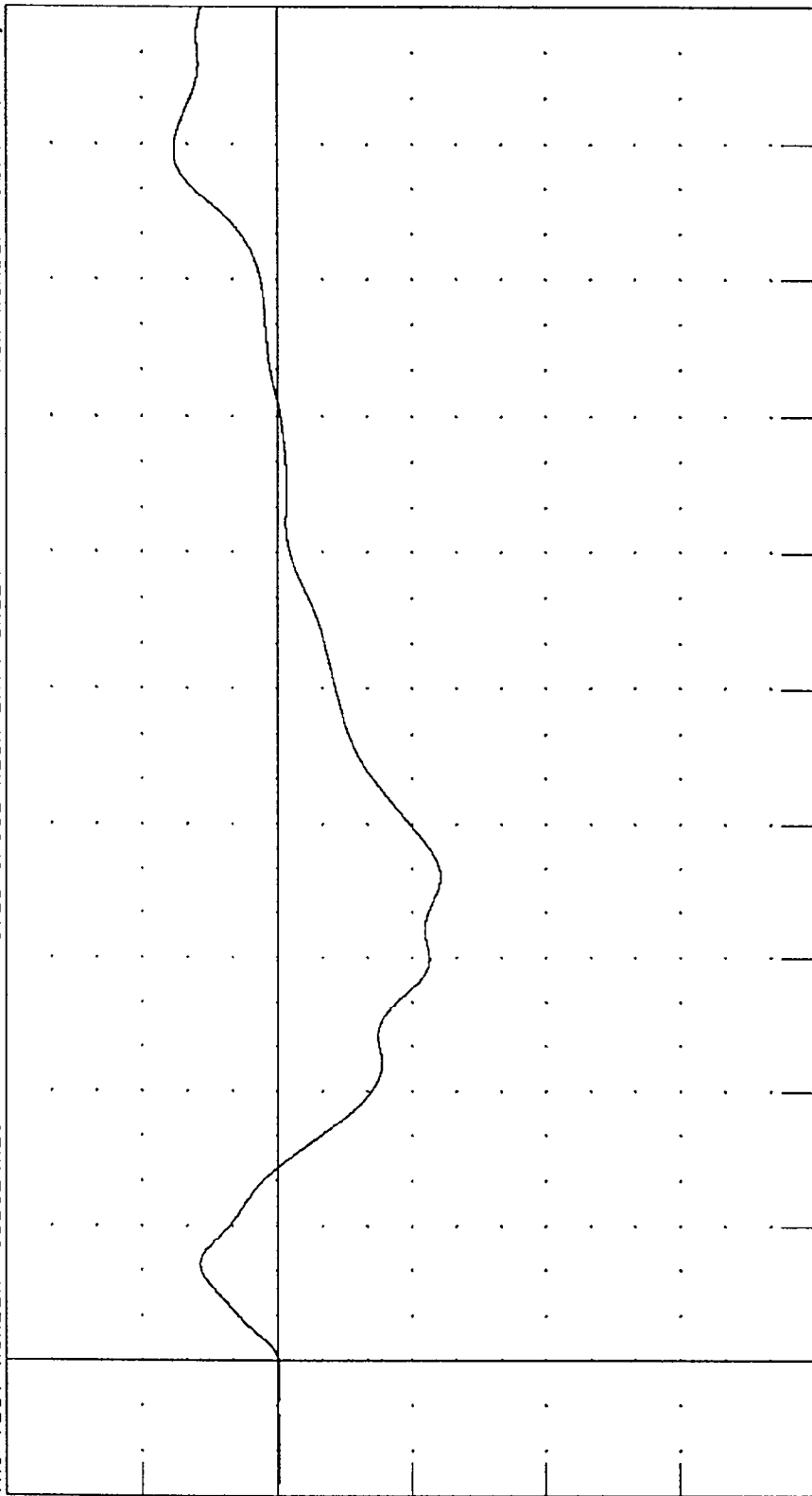
-40

-80

-120

-160

TORQUE (N·M)



TIME (MS)

PEAK DATA: 30.61 N·M @ 179.04 MS; -48.45 N·M @ 72.24 MS

FILTER: CH. CLASS 60

CHANNEL: NEKYM

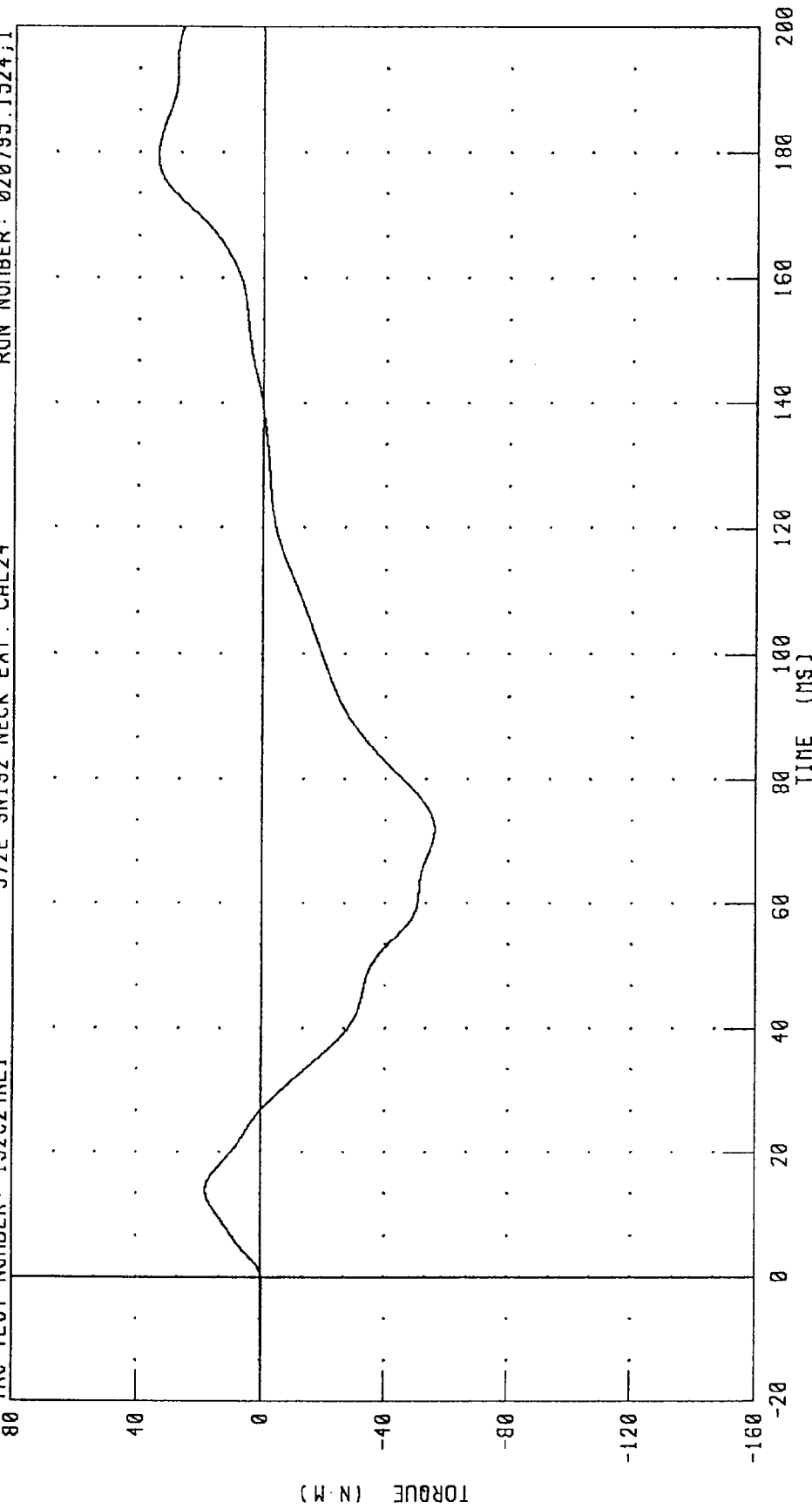
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

572E SN192 NECK EXT. CAL24

IRC TEST NUMBER: 192C24NE1

RUN NUMBER: 020795.1524;1



PEAK DATA: 33.95 N-M @ 179.44 MS; -56.14 N-M @ 71.84 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

26-DEC-94

TRC INC.

TEST NO: 192C24TH1

572E SN192 H.S.THORAX CAL24

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	33.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.68 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	64.7 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5639. N
INTERNAL HYSTERESIS	69% - 85%	72.3%

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete R. S.

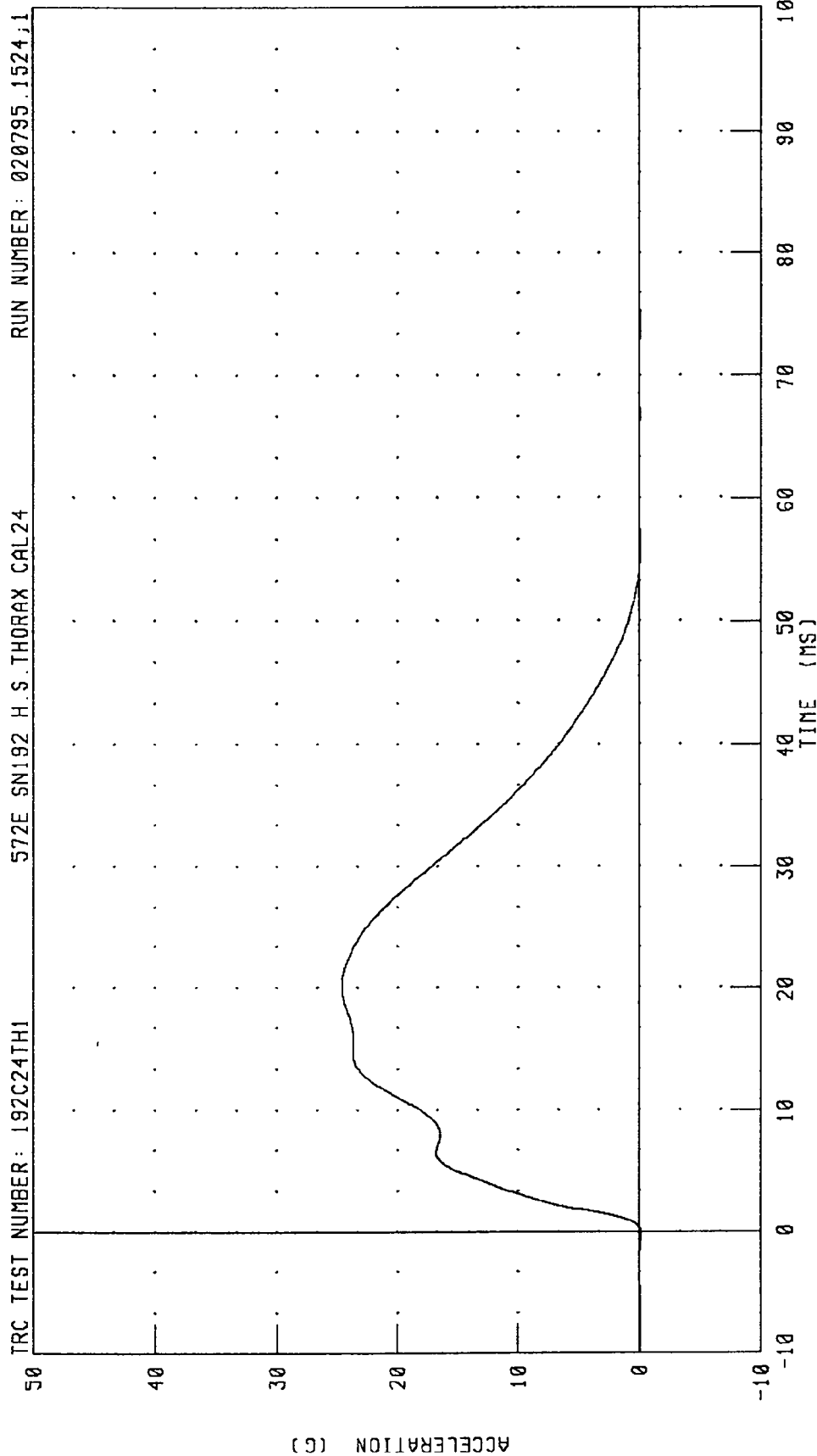
RUN NUMBER: 122694.1416;1

PART 572-E HYBRID III THORAX CALIBRATION PENDULUM DECELERATION

TRC TEST NUMBER: 192C24TH1

572E SN192 H.S. THORAX CAL24

RUN NUMBER: 020795.1524,1

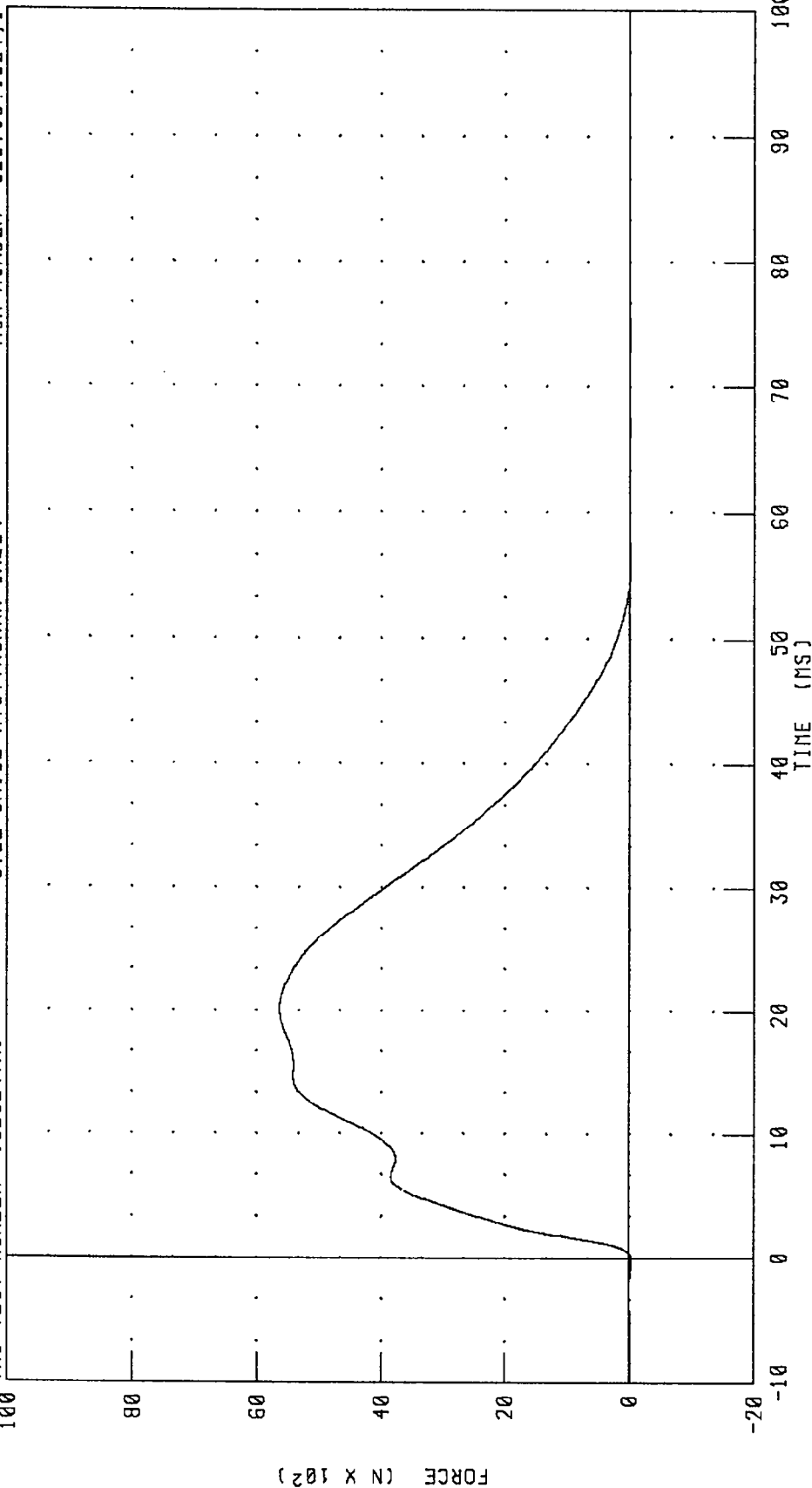


CHANNEL: PENXG FILTER: CH. CLASS 180

PEAK DATA: 24.62 G @ 20.16 MS; -0.15 G @ -0.16 MS

PART 572-E HYBRID III THORAX CALIBRATION PENDULUM FORCE

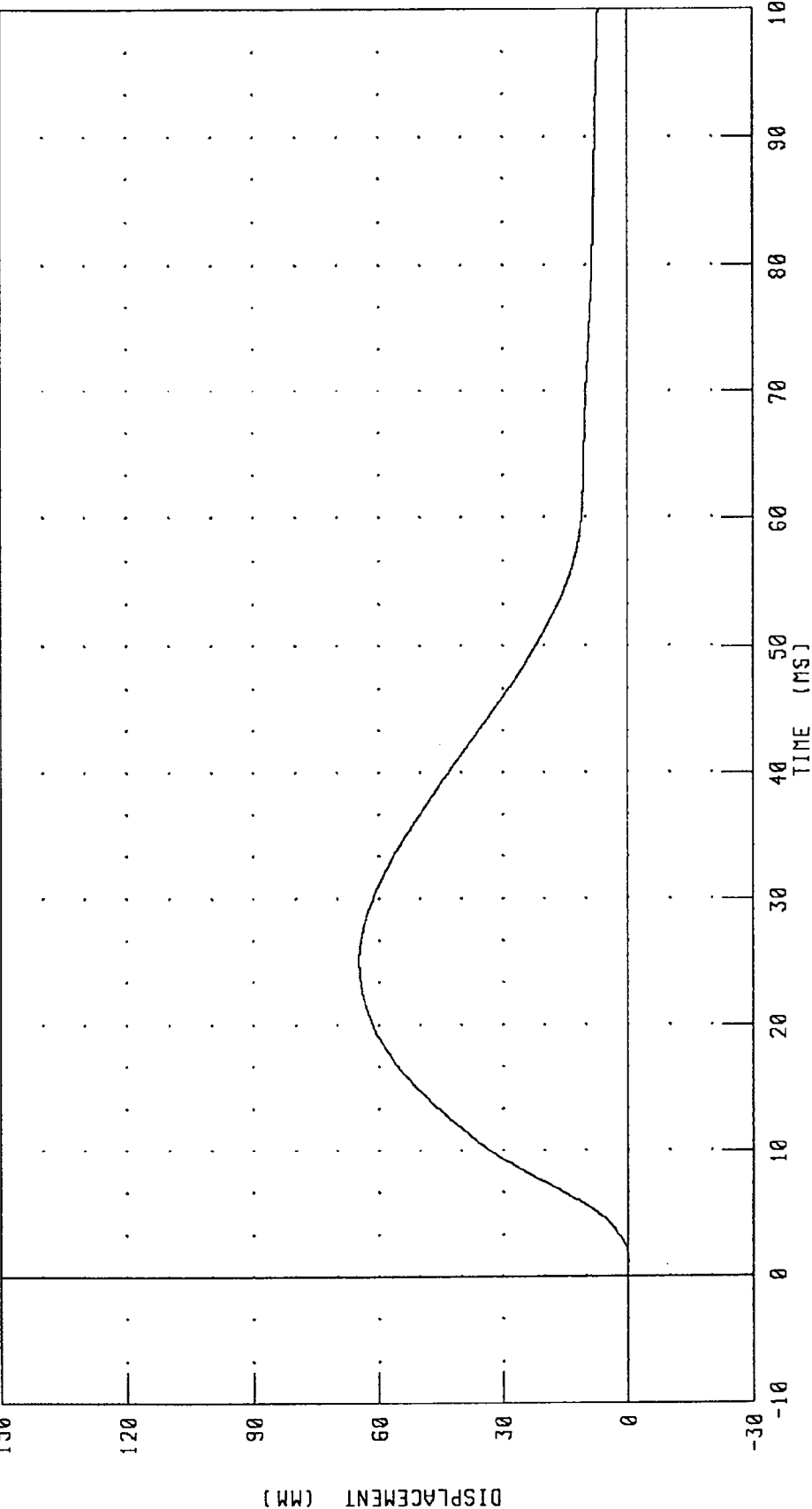
TRC TEST NUMBER: 192C24TH1 572E SN192 H.S. THORAX CAL24 RUN NUMBER: 020795.1524;1



CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 5639.67 N @ 20.16 MS; -33.79 N @ -0.16 MS

PART 572-E HYBRID III THORAX CALIBRATION STERNUM DISPLACEMENT

TRC TEST NUMBER: 192C24TH1 572E SN192 H.S. THORAX CAL24 RUN NUMBER: 020795.1524;1



PEAK DATA: 64.77 MM @ 25.04 MS; -0.06 MM @ 1.20 MS

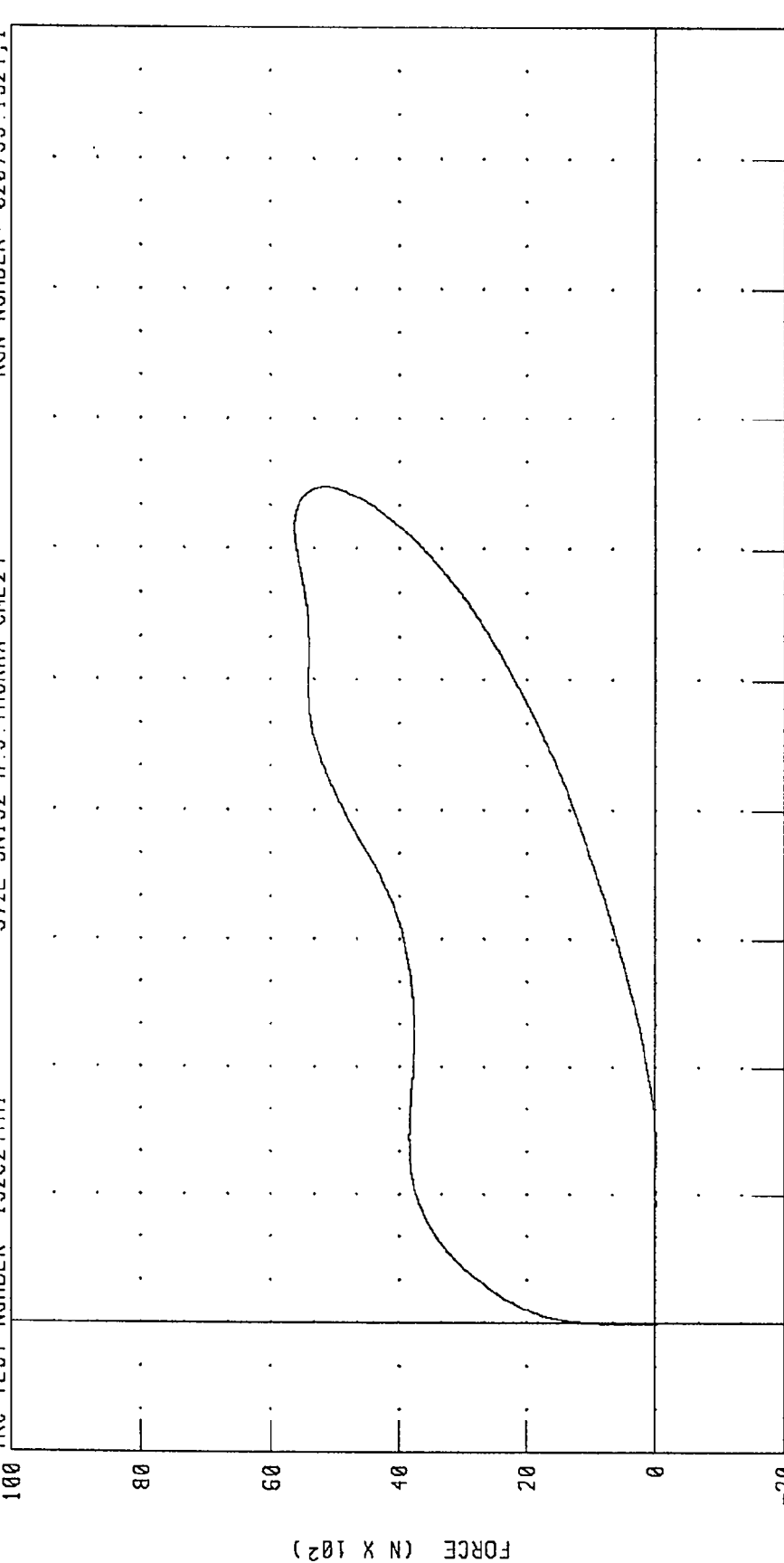
CHANNEL: CSTXD FILTER: CH. CLASS 180

PART 572-E HYBRID III THORAX CALIBRATION
CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: 192C24TH1

572E SN192 H.S. THORAX CAL24

RUN NUMBER: 020795.1524;1



CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

PEAK DATA:

64.77 MM @ 25.04 MS;
5639.67 N @ 20.16 MS;

-0.06 MM @ 1.20 MS
-33.79 N @ -0.16 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

26-DEC-94

TRC INC.

TEST NO: 192C24RK1

572E SN192 RIGHT KNEE CAL 24

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	33.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	5373.4 N

TEST MEETS SPECIFICATIONS

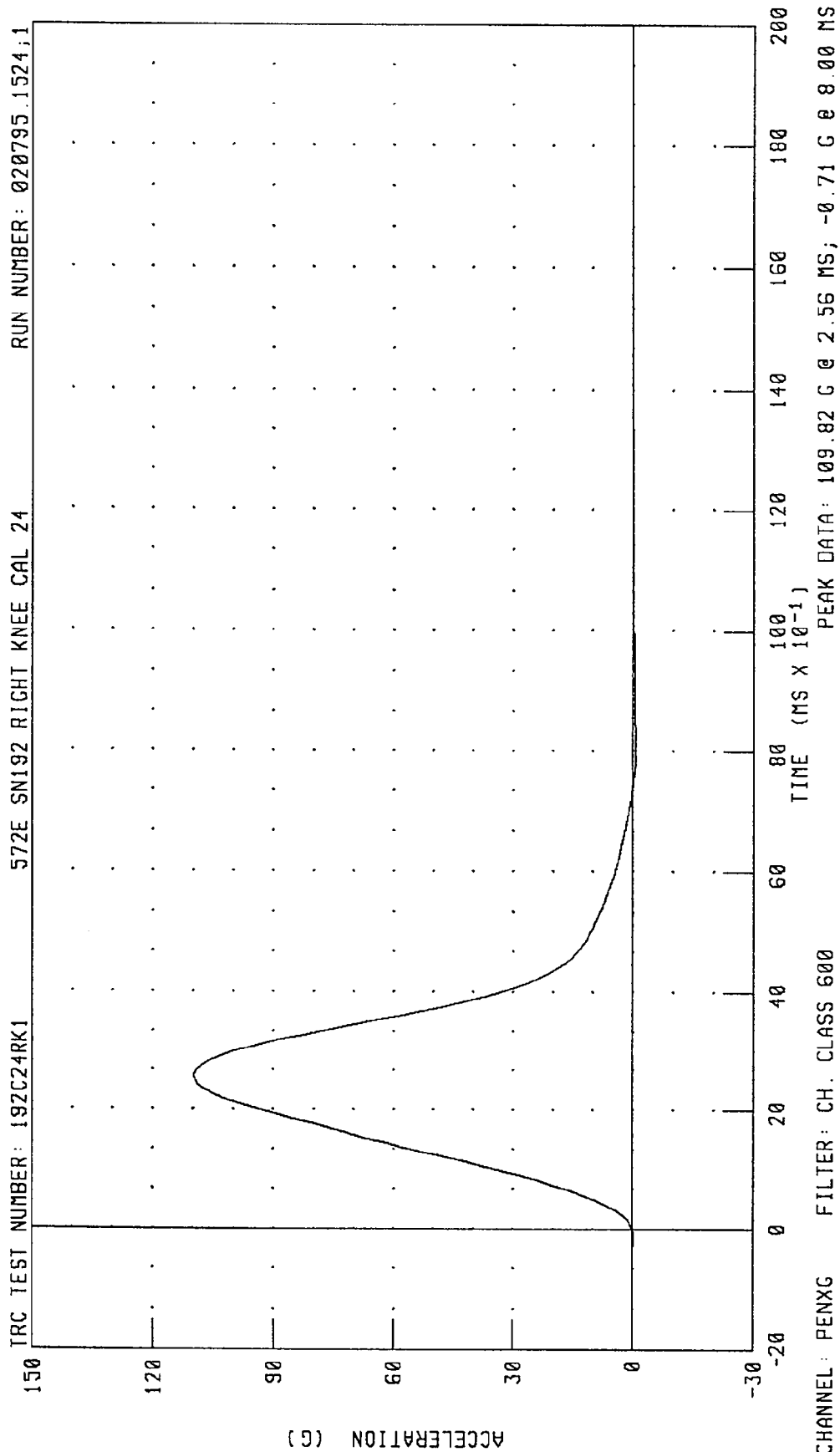
TECHNICIAN

Pete R. A.

RUN NUMBER: 122694.1038;1

PART 572-E HYBRID III RIGHT KNEE CALIBRATION
 PENDULUM DECELERATION (5 KG PEND.)

TRC TEST NUMBER: 192C24RK1 572E SN192 RIGHT KNEE CAL 24 RUN NUMBER: 020795.1524,1



CHANNEL: PENXG FILTER: CH. CLASS 600

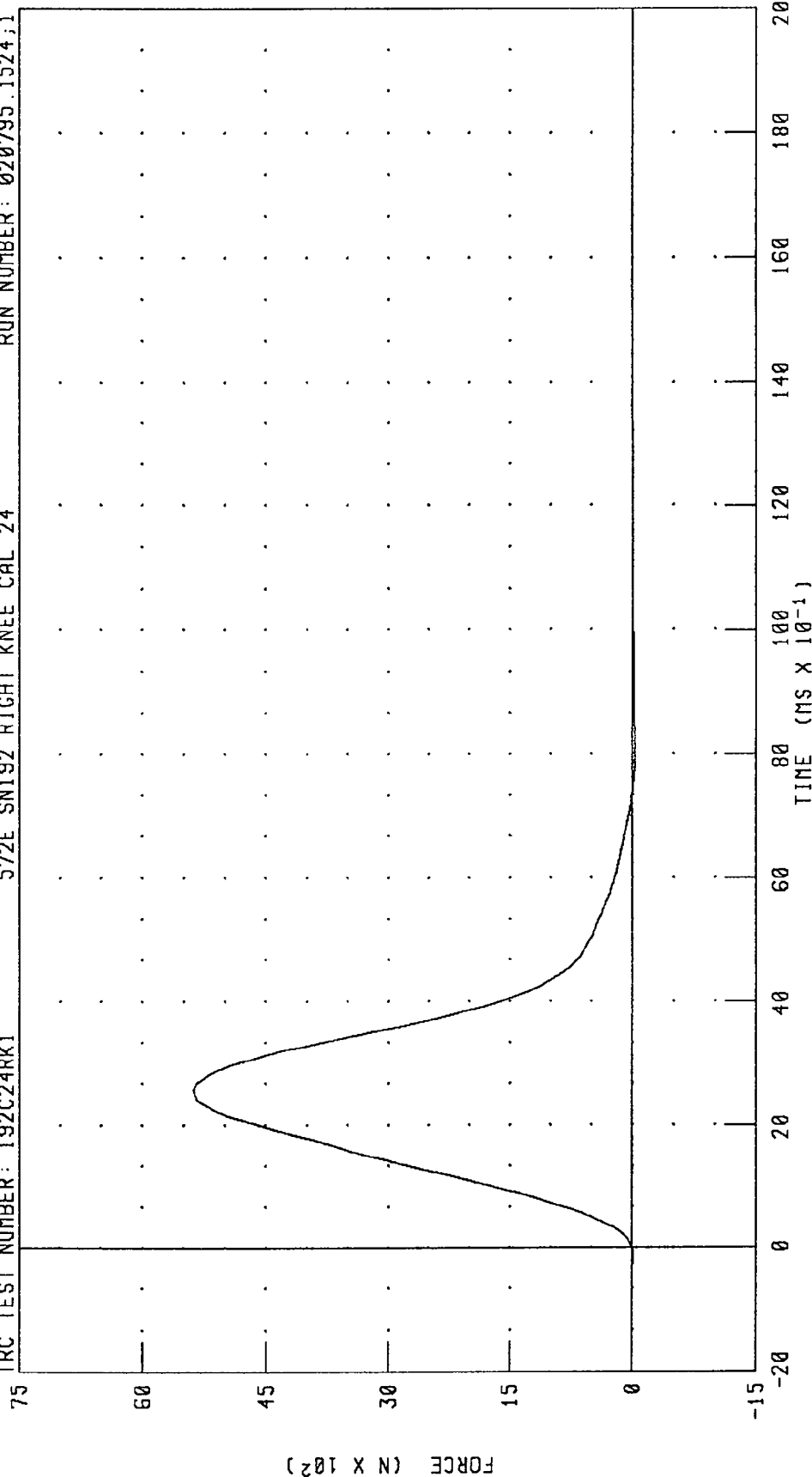
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 192C24RK1

572E SN192 RIGHT KNEE CAL 24

RUN NUMBER: 020795.1524;1



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5373.47 N @ 2.56 MS; -34.60 N @ 8.00 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

26-DEC-94

TRC INC.

TEST NO: 192C24LK1

572E SN192 LEFT KNEE CAL 24

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	33.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	5124.3 N

TEST MEETS SPECIFICATIONS

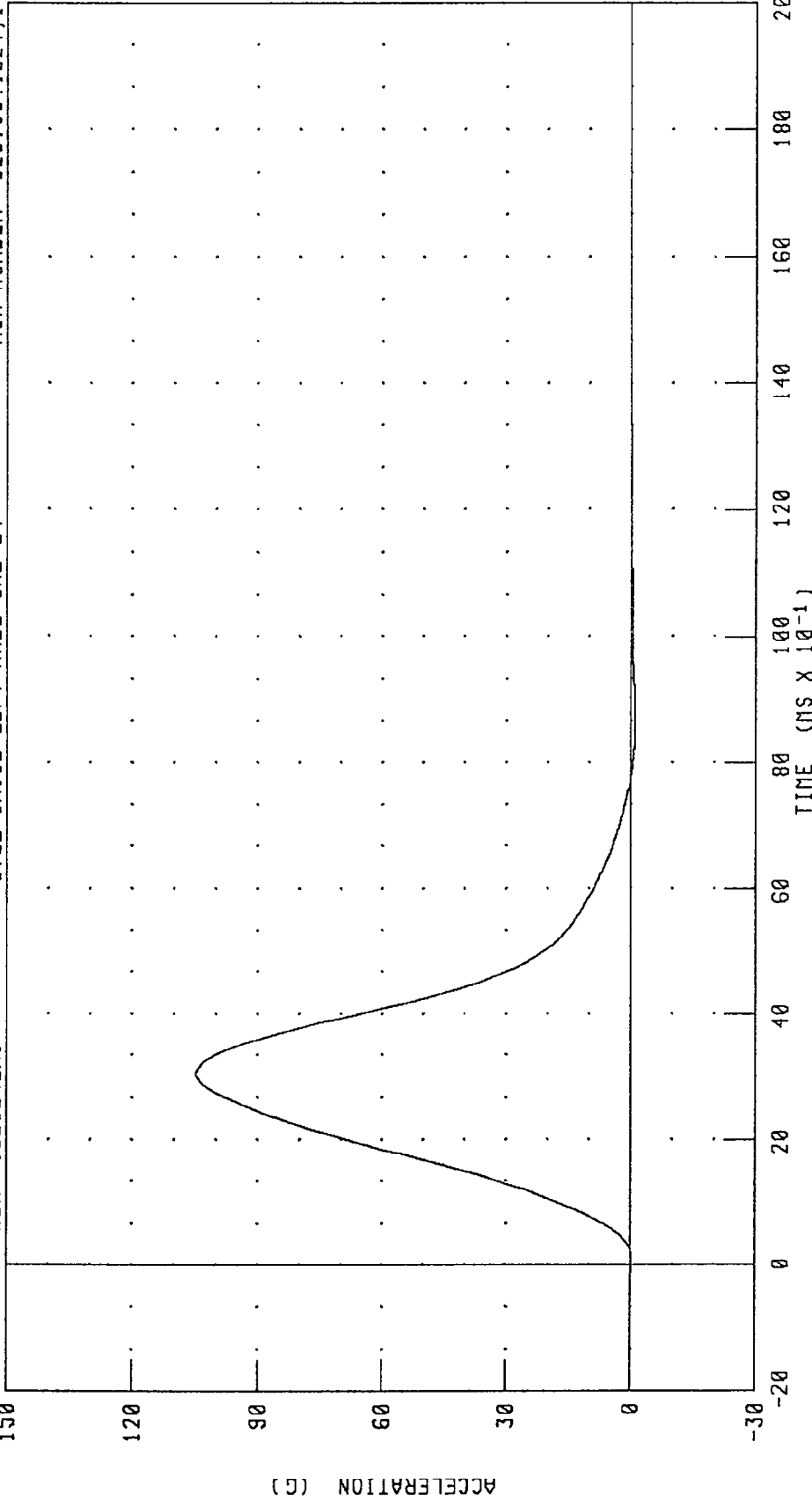
TECHNICIAN Pete Fox

RUN NUMBER: 122694.0928;1

PART 572-E HYBRID III LEFT KNEE CALIBRATION
 PENDULUM DECELERATION (5 KG PEND.)

572E SN192 LEFT KNEE CAL 24 RUN NUMBER: 020795.1524;1

IRC TEST NUMBER: 192C24LK1



CHANNEL: PENXG

FILTER: CH. CLASS 600

TIME (MS X 10⁻¹)

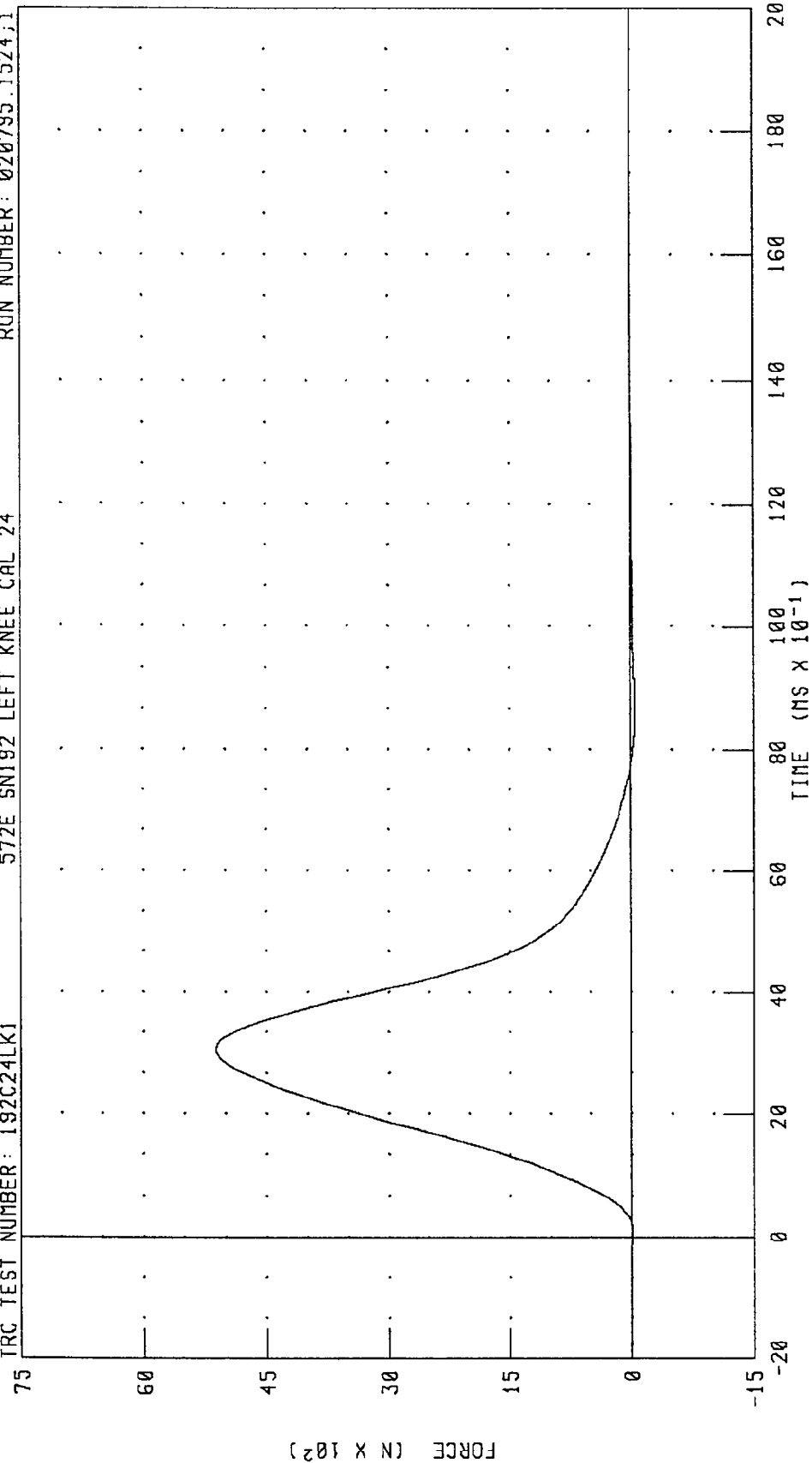
PEAK DATA: 104.73 G @ 3.04 MS; -1.03 G @ 8.72 MS

PART 572-E HYBRID III LEFT KNEE CALIBRATION
 PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 192C24LK1

572E SNI92 LEFT KNEE CAL 24

RUN NUMBER: 020795.1524;1



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5124.36 N @ 3.04 MS, -50.41 N @ 8.72 MS

Pre-test Certification Data

Passenger Dummy S/N: 713

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

02-JAN-95

TRC INC. TEST NO: ED71310 572B SN713 EXT.DIMENSION CAL10

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	33 %
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. J.

RUN NUMBER: 010395.0916

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

PART 572B

02-JAN-95

TRC INC. TEST NO: HD71310

572B SN713 HEAD DROP CAL10

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	33 %
PEAK RESULTANT ACCELERATION	210 - 260 G	254.84 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MS	1.25 MS
PEAK LATERAL ACCELERATION	10 G MAX	-2.37 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete F. S.

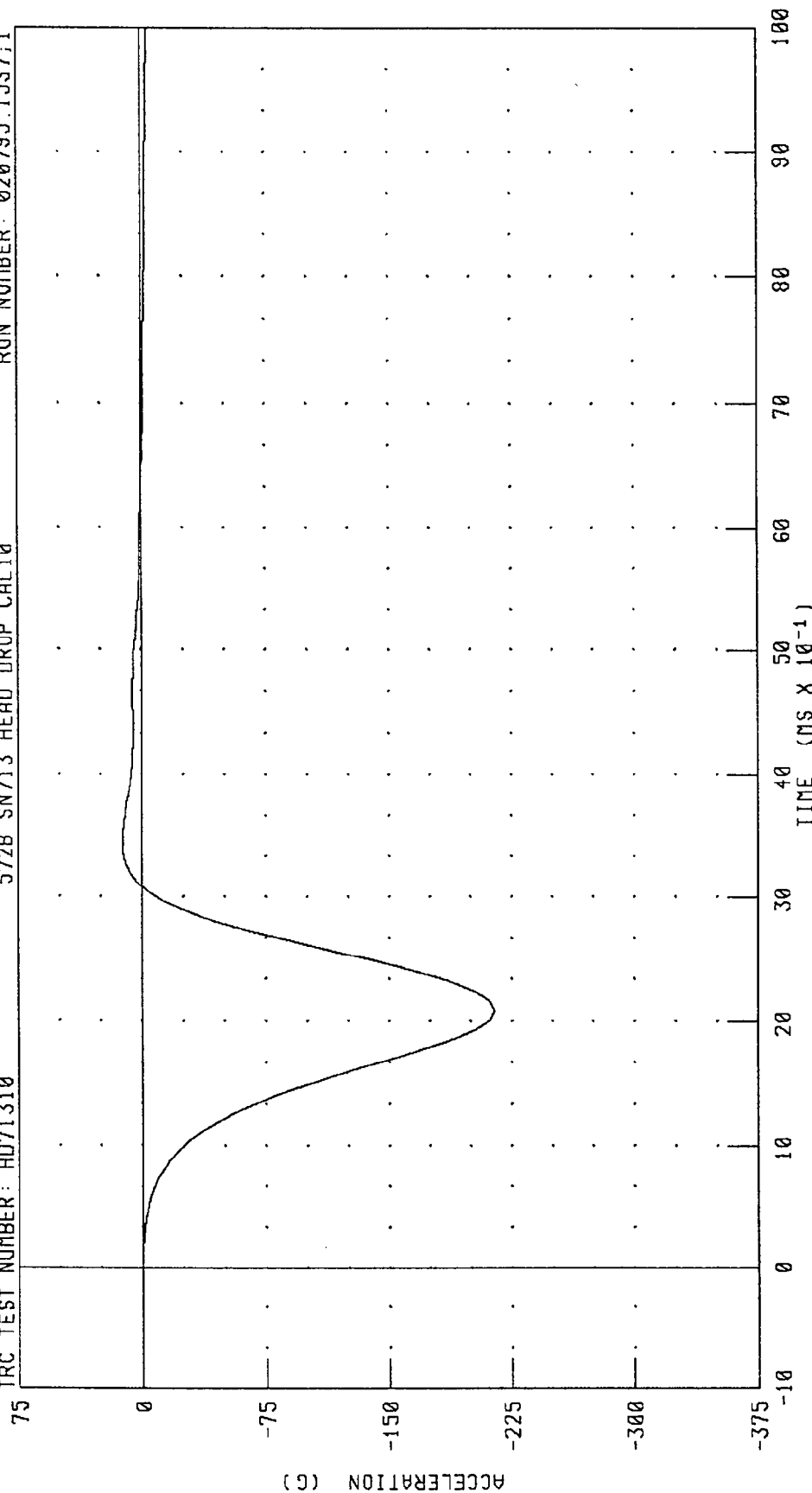
RUN NUMBER: 010295.1307;1

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

TRC TEST NUMBER: HD71310

572B SN713 HEAD DROP CAL10

RUN NUMBER: 020795.1537;1



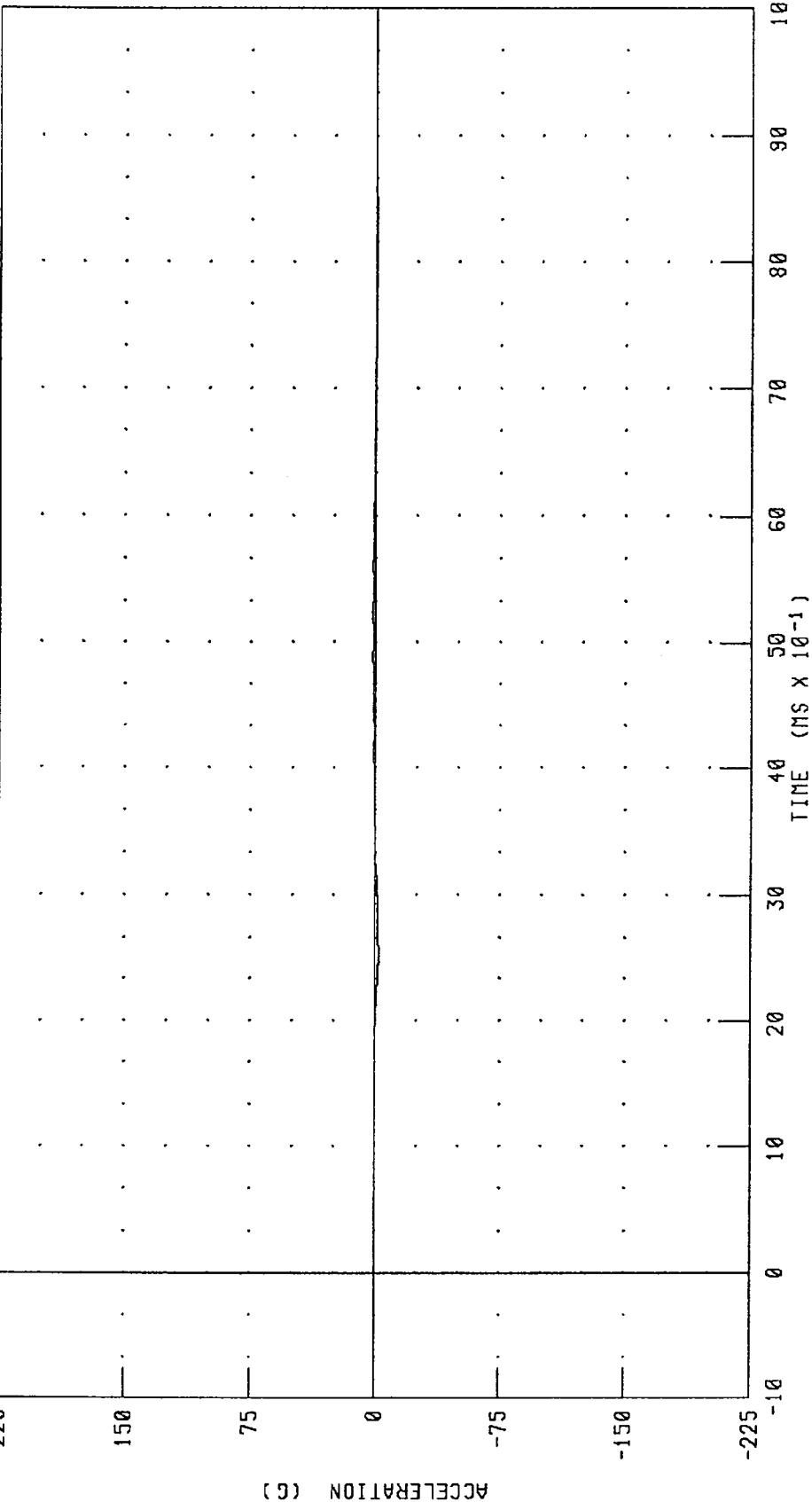
PEAK DATA: 11.34 G @ 3.44 MS; -214.99 G @ 2.08 MS

CHANNEL: HEDXG FILTER: CH. CLASS 1000

PART 572-B HYBRID II HEAD DROP CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: HD71310 572B SN713 HEAD DROP CAL10 RUN NUMBER: 020795.1537;1



PEAK DATA: 1.74 G @ 5.20 MS; -2.37 G @ 2.56 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

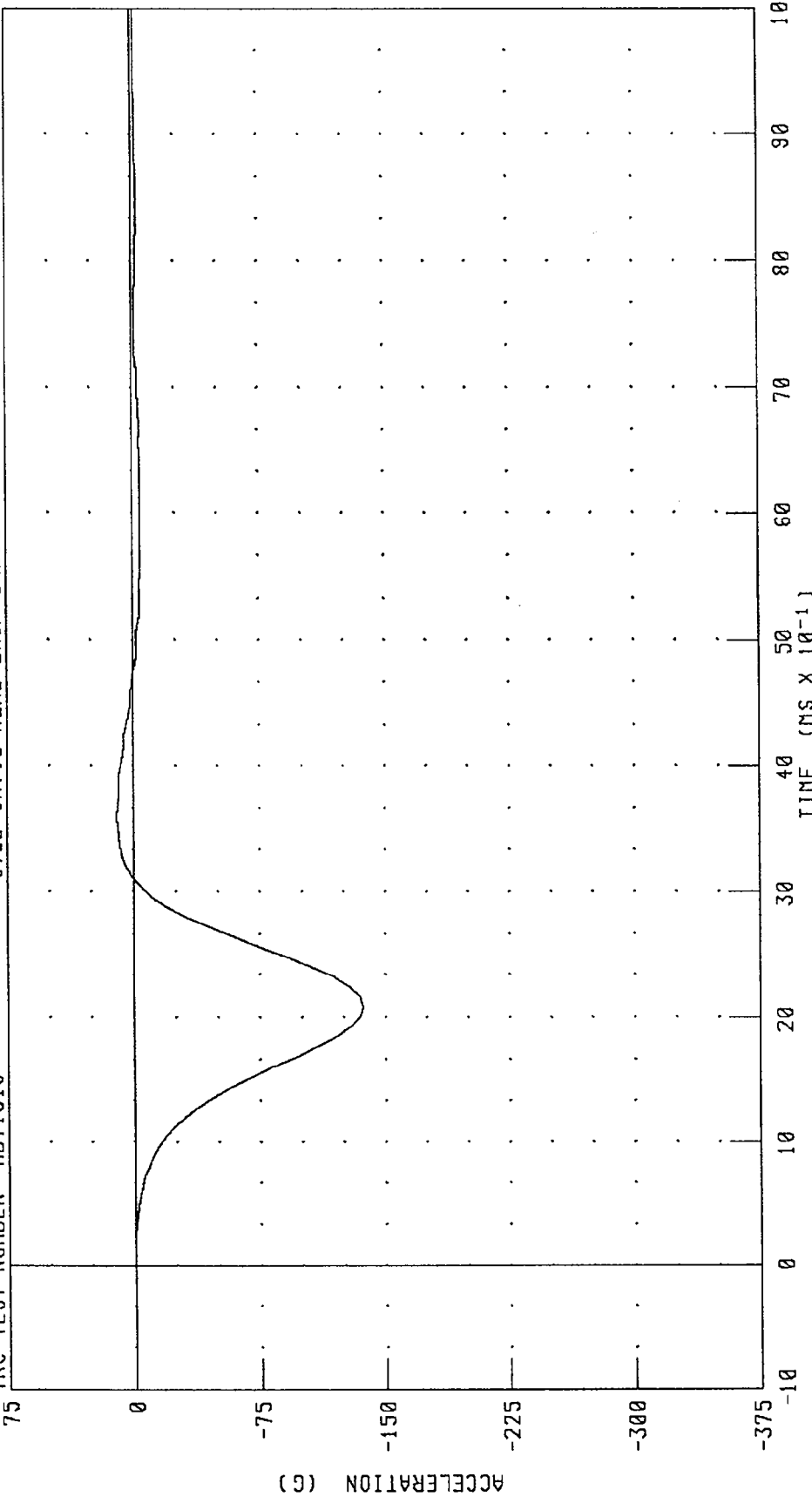
PART 572-B HYBRID II HEAD DROP CALIBRATION

HEAD ACCELERATION Z AXIS

572B SN713 HEAD DROP CAL10

TRC TEST NUMBER: HD71310

RUN NUMBER: 020795.1537.1



PEAK DATA: 9.99 G @ 3.60 MS; -136.83 G @ 2.08 MS

CHANNEL: HEDZG FILTER: CH. CLASS 1000

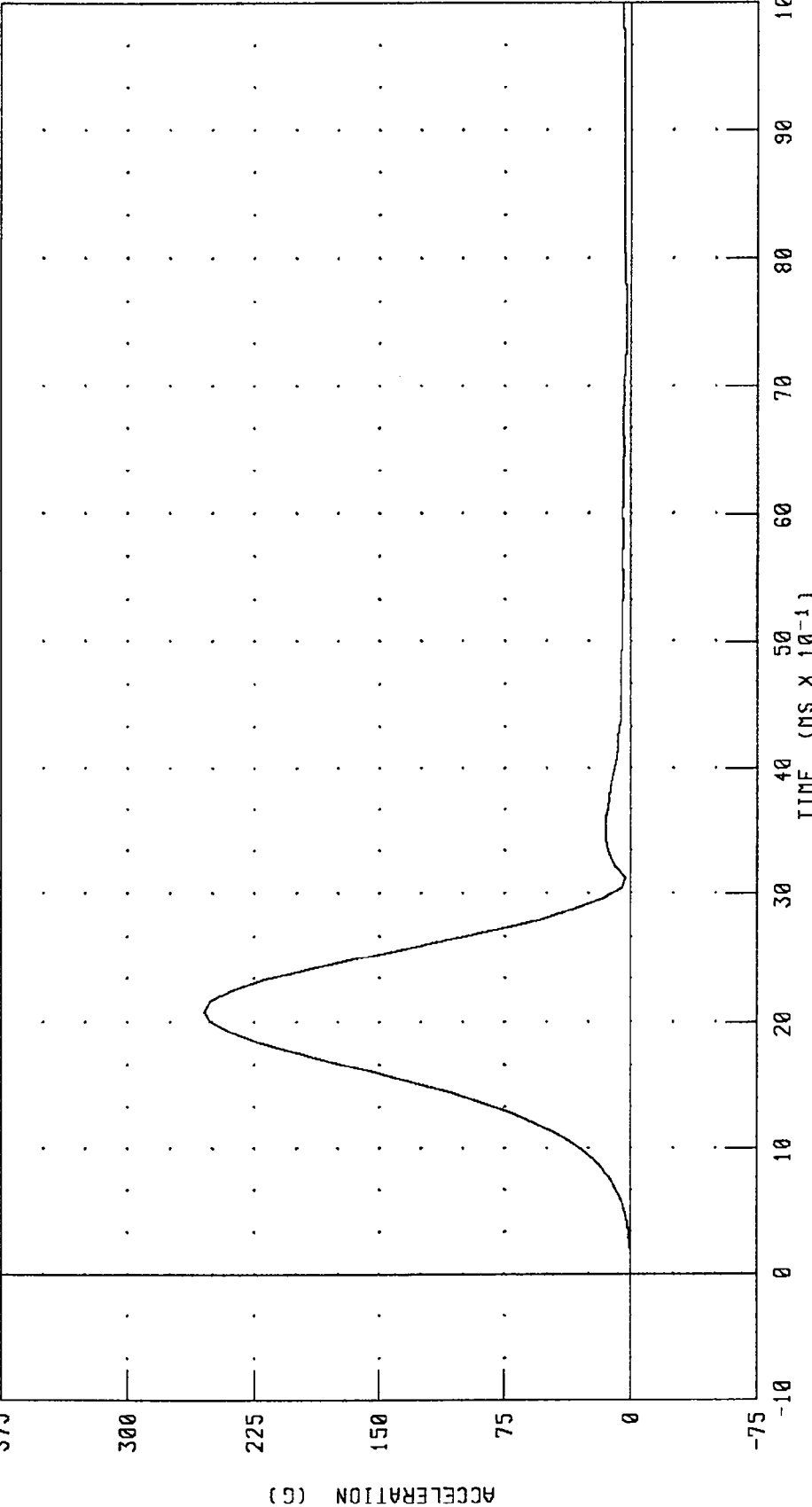
PART 572-B HYBRID II HEAD DROP CALIBRATION

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: HD71310

5728 SN713 HEAD DROP CAL10

RUN NUMBER: 020795.1537;1



CHANNEL: HEDRG FILTER: CH. CLASS 1000

PEAK DATA: 254.84 G @ 2.08 MS; 0.03 G @ 0.00 MS

TRANSPORTATION RESEARCH CENTER INC.
NECK PENDULUM TEST
PART 572B

02-JAN-95

TRC INC. TEST NO: HN71310 572B SN713 HEAD/NECK CAL10

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	33 %
PENDULUM VELOCITY	6.55 - 7.77 M/S	7.23 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	28.10 MS
T3 - T4 TIME (20 - 5 G)	10 MS MAX	4.25 MS
AVG. G LEVEL T2 - T3	20 - 24 G	23.61 G
MAXIMUM ROTATION ANGLE	63 - 73 DEG.	66.66 DEG.
PEAK HEAD RESULTANT ACCEL	26 G MAX	22.88 G
PENDULUM REVERSAL TIME AFTER NECK RETURN TIME	> 0 MS	15.00 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	1.20	0.27
30	25.6 - 34.4	53.3 - 78.7	30.42	63.28
60	40.3 - 51.7	109.2 - 134.6	47.14	122.74
MAX	53.2 - 66.8	127.0 - 152.4	61.76	136.94
60	67.0 - 83.0	109.2 - 134.6	73.56	122.47
30	85.4 - 104.6	53.3 - 78.7	93.87	57.41
0	101.0 - 123.0	-12.7 - +12.7	107.99	2.21

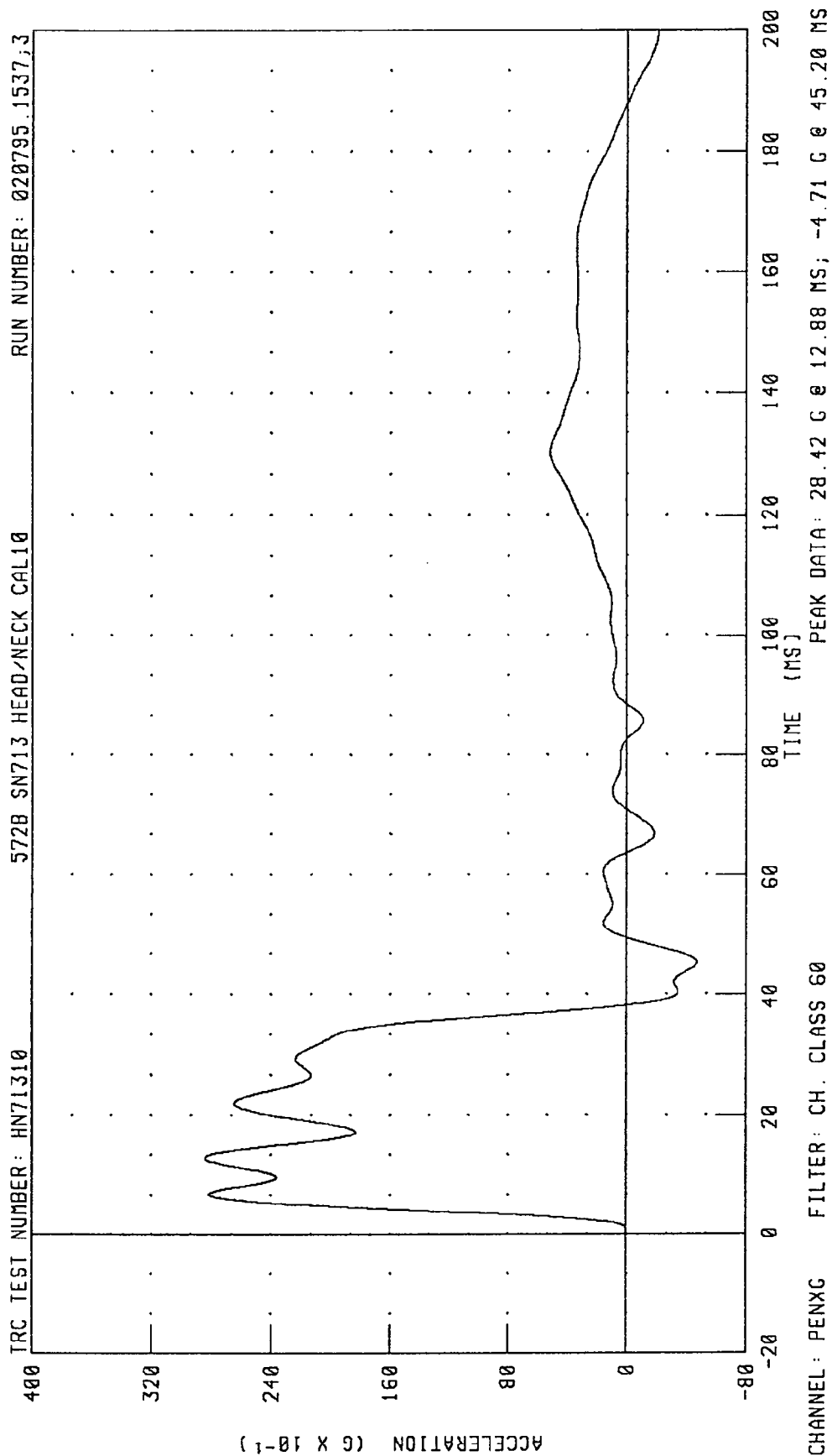
DUMMY MEETS SPECIFICATIONS

SND: 151.13 MM

TECHNICIAN Pete G. J.

RUN NUMBER: 010295.1510;3

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



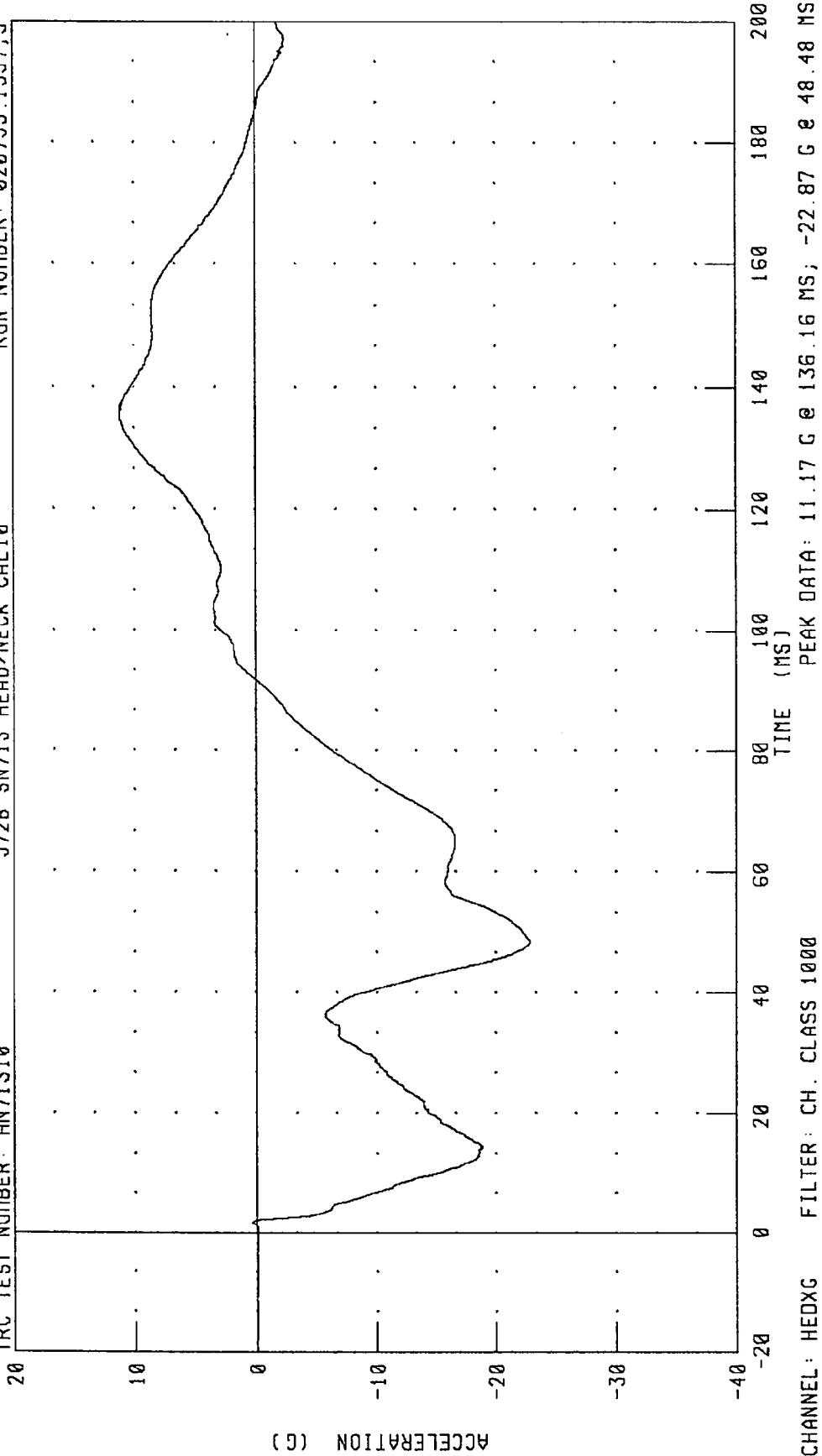
PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HN71310

572B SN713 HEAD/NECK CAL10

RUN NUMBER: 020795.1537.3



CHANNEL: HEDXG FILTER: CH. CLASS 1000

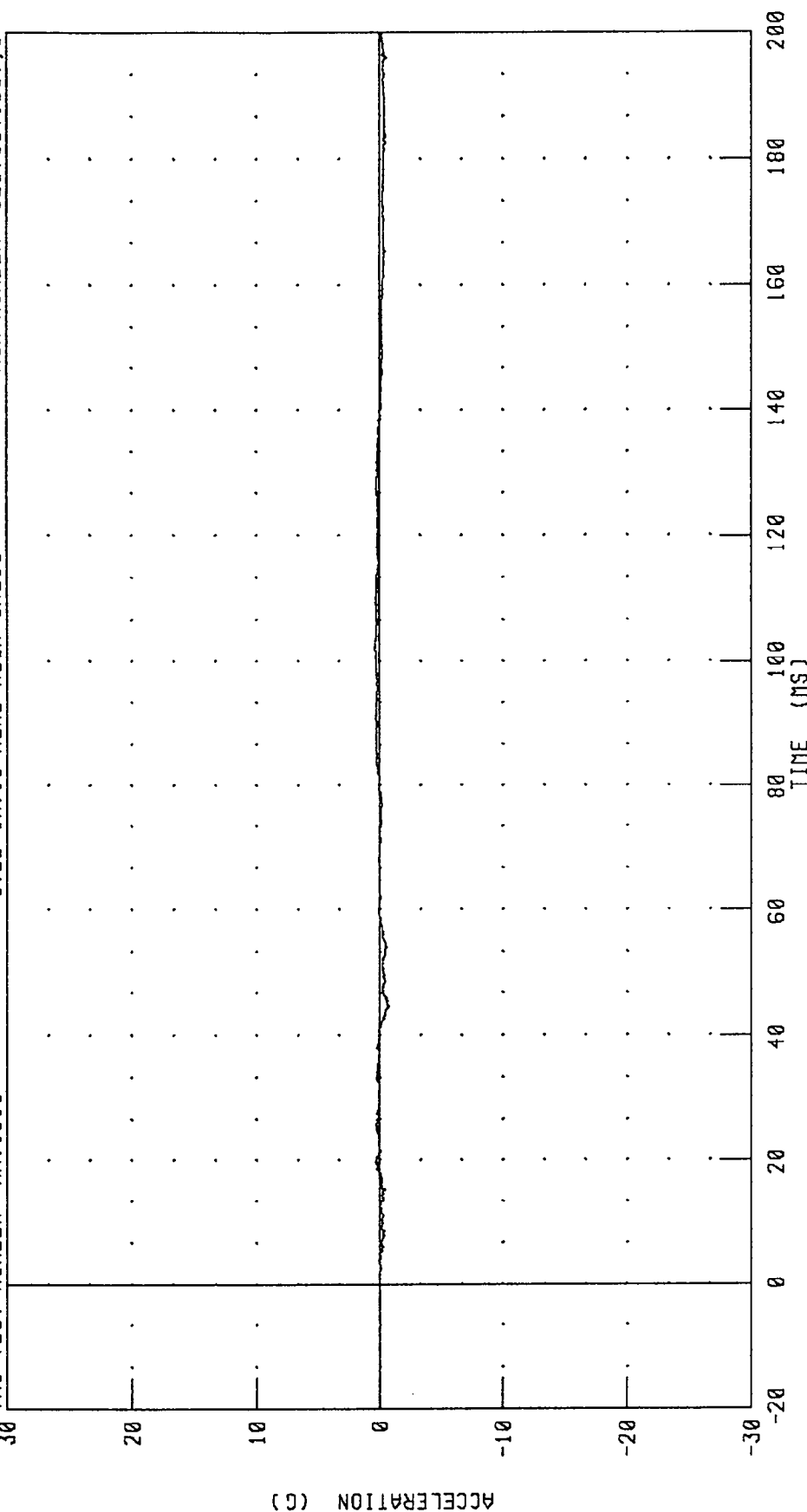
PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: HN71310

572B SN713 HEAD/NECK CAL10

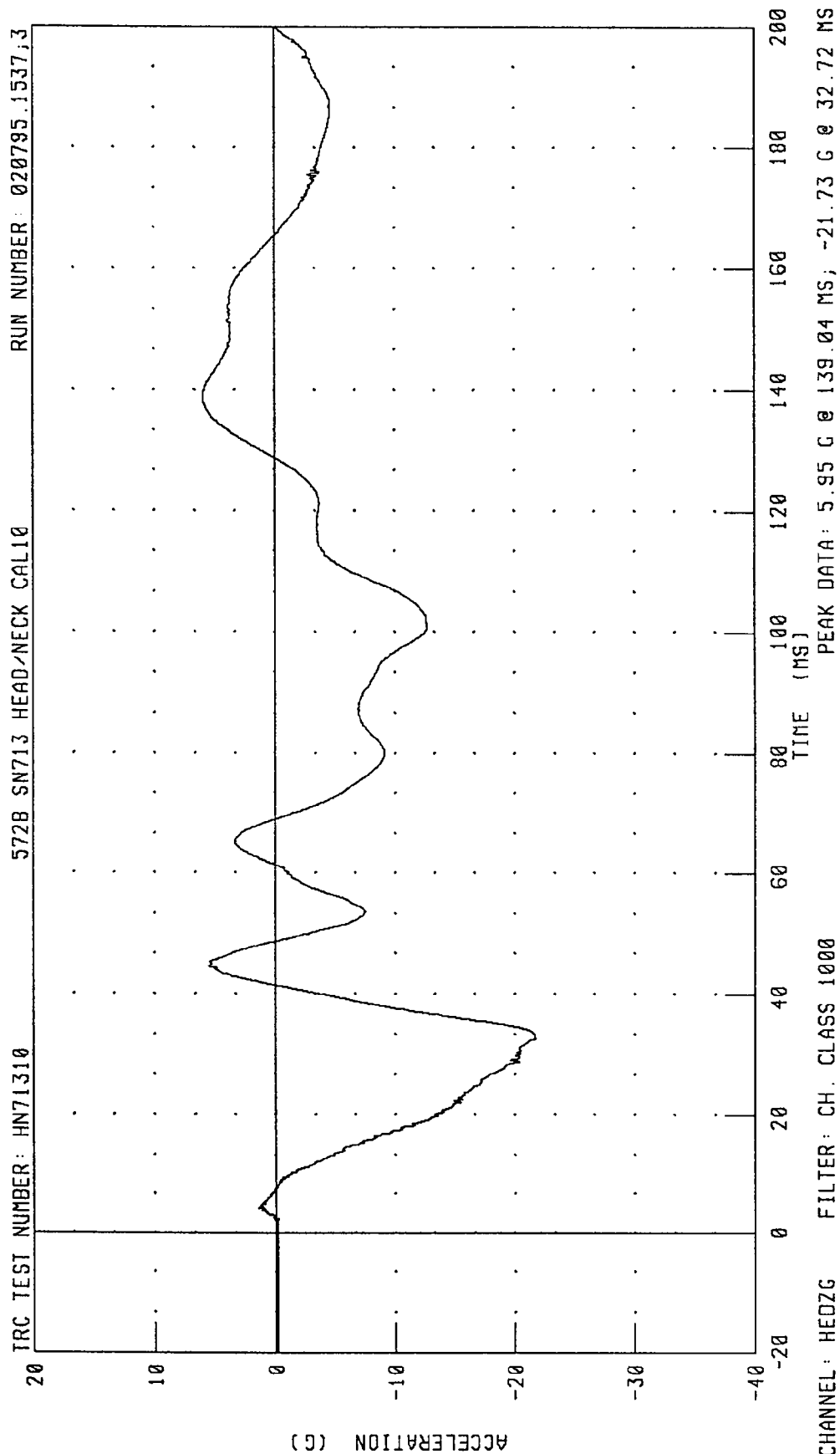
RUN NUMBER: 020795.1537;3



PEAK DATA: 0.40 G @ 102.08 MS; -0.73 G @ 44.72 MS

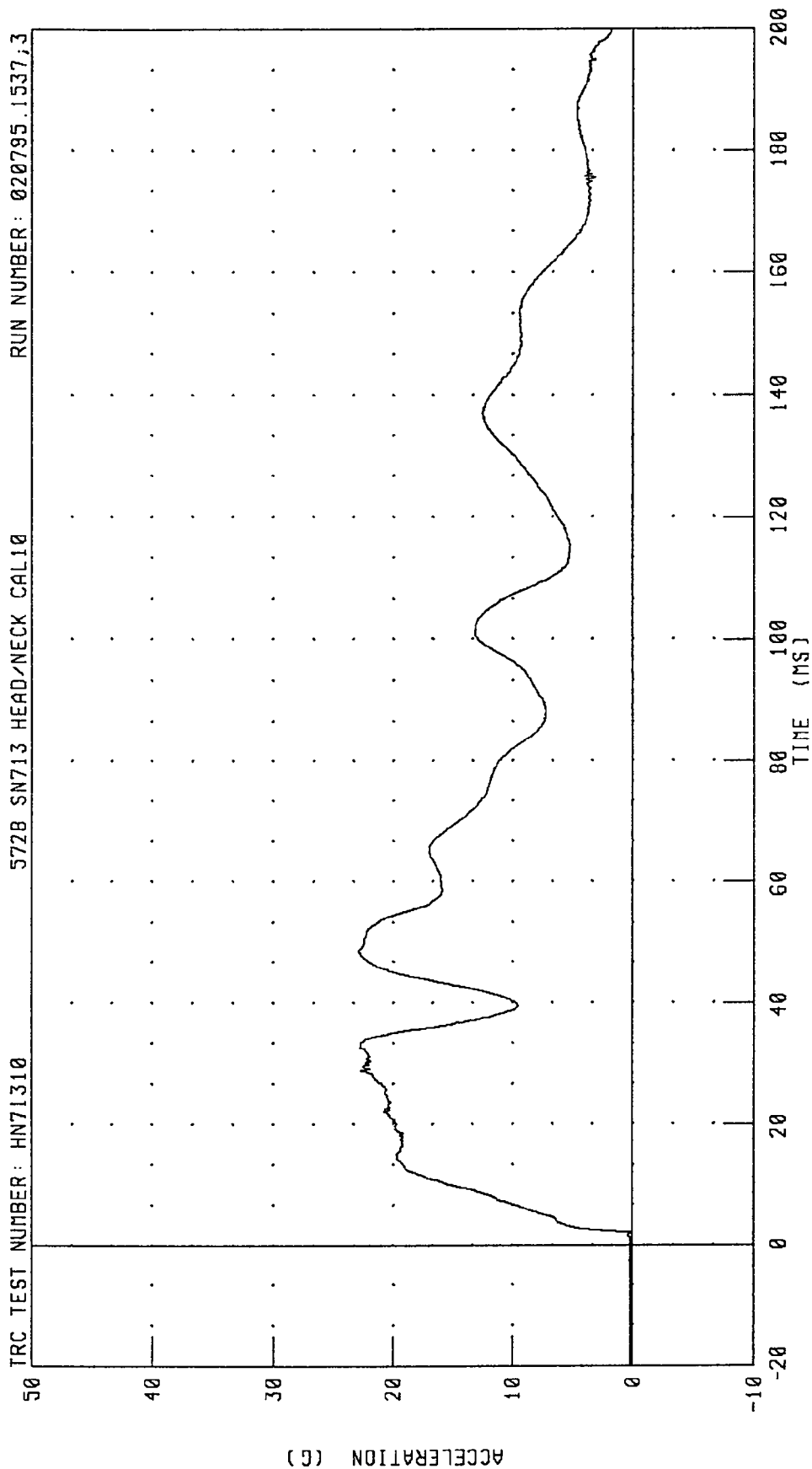
CHANNEL: HEDYC FILTER: CH. CLASS 1000

PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION Z AXIS



CHANNEL: HEDZG FILTER: CH. CLASS 1000

PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD RESULTANT ACCELERATION

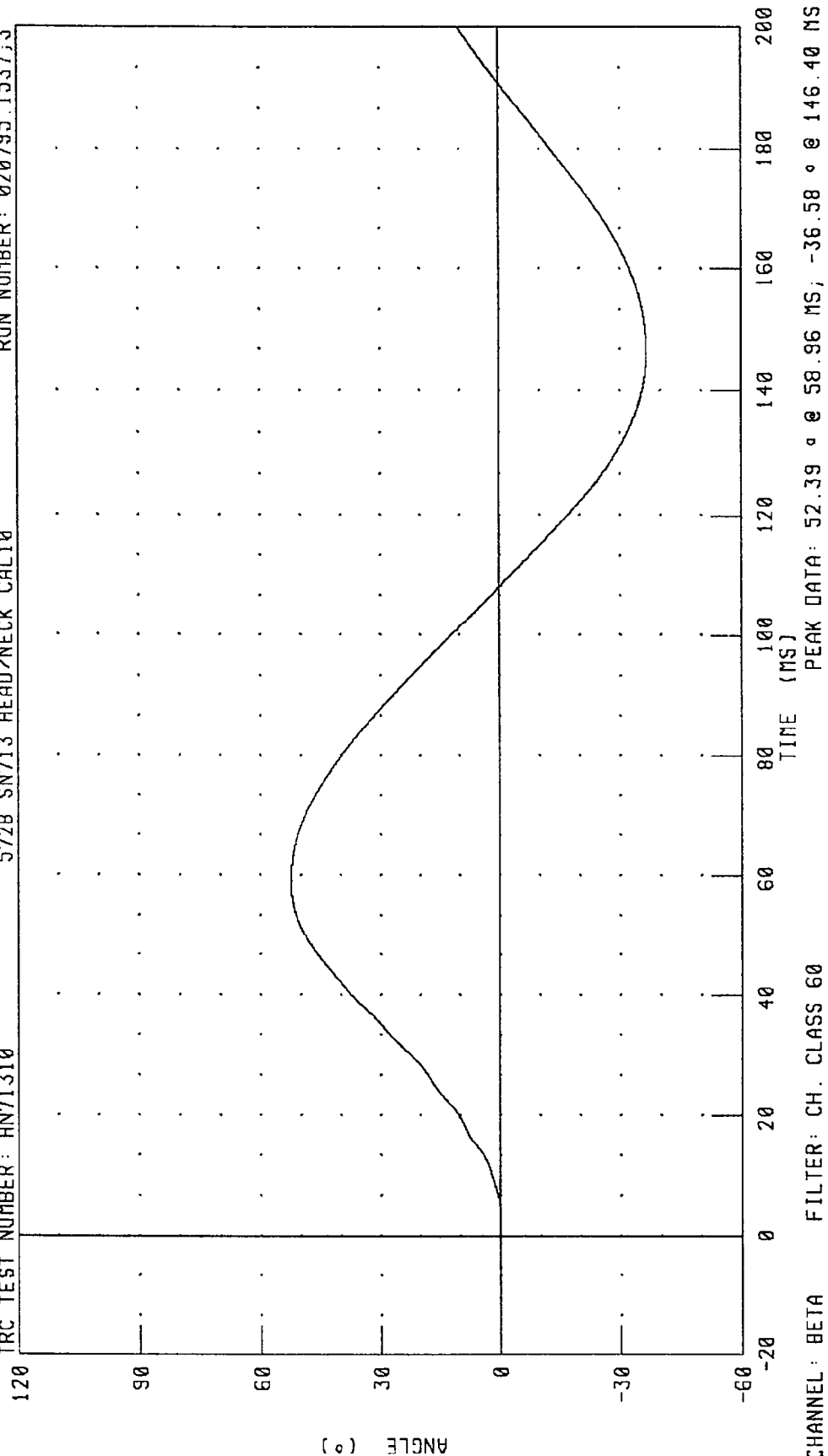


CHANNEL: HEDRG FILTER: CH. CLASS 1000

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

TRC TEST NUMBER: HN71310 RUN NUMBER: 020795.1537.3

572B SN713 HEAD/NECK CAL10



CHANNEL: BETA FILTER: CH. CLASS 60

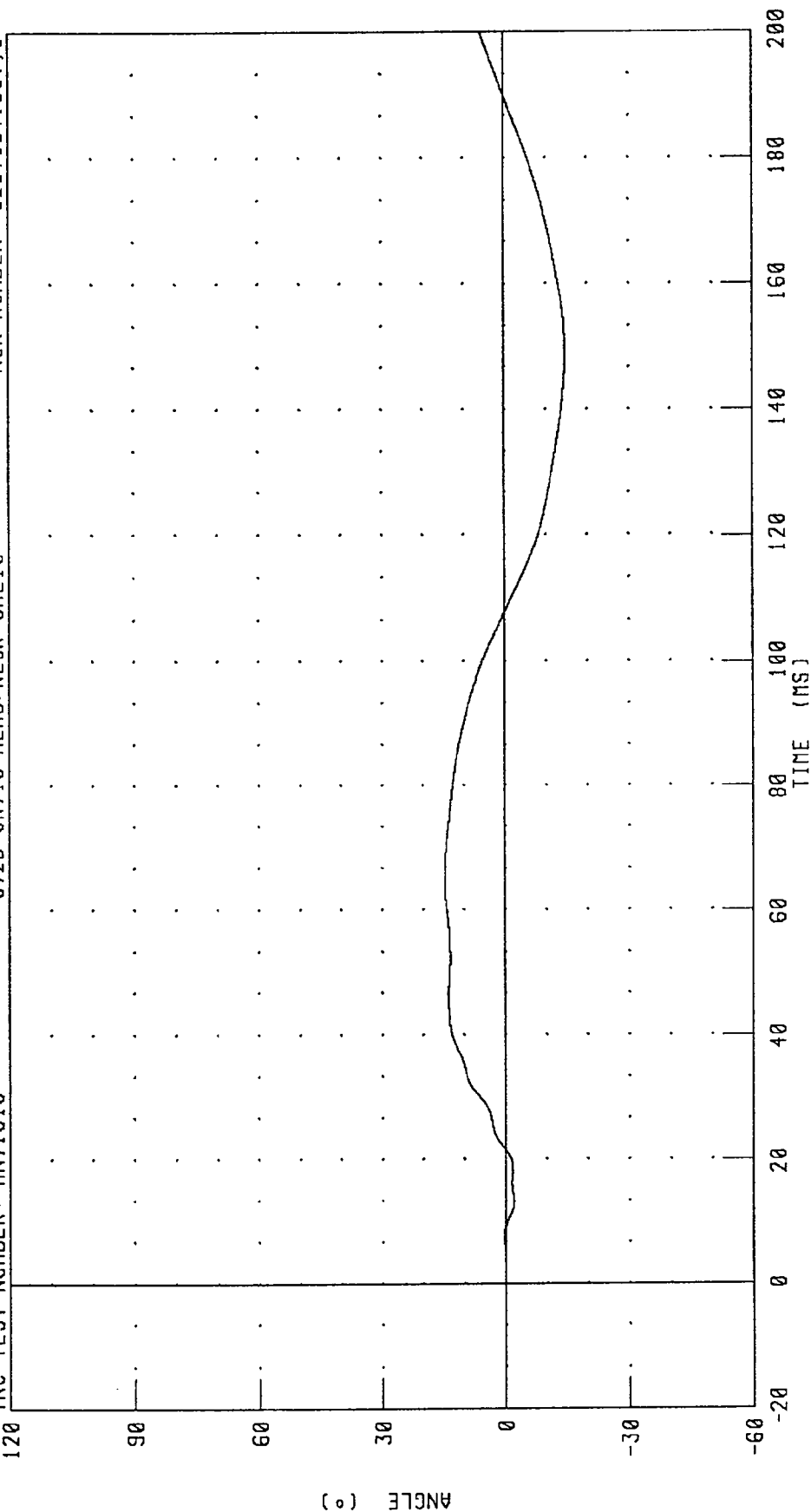
PART 572-B HYBRID II HEAD/NECK CALIBRATION

ROTATION ABOUT THE HEAD C.G.

TRC TEST NUMBER: HN71310

572B SN713 HEAD/NECK CAL10

RUN NUMBER: 020795.1537;3



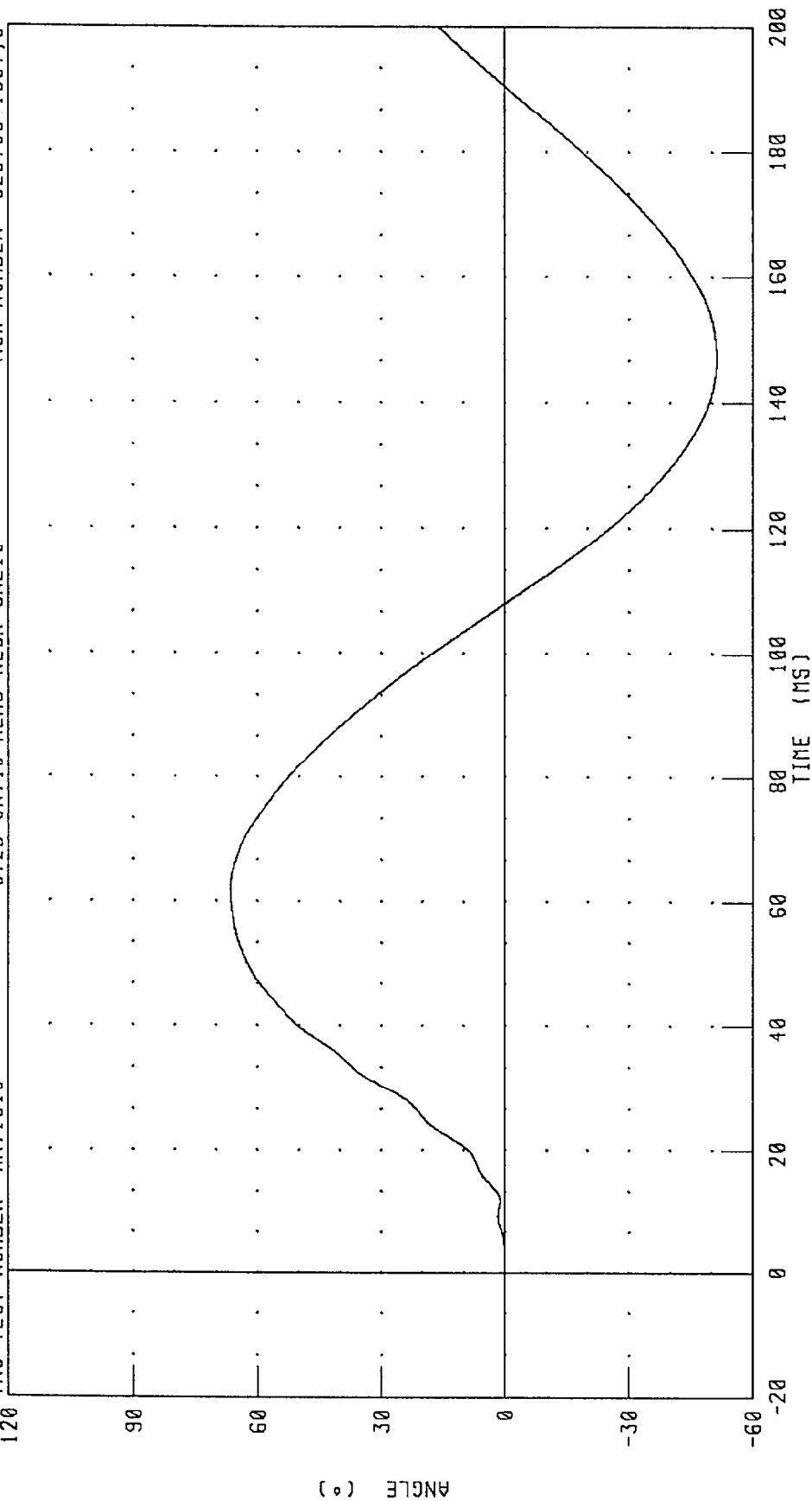
CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 14.59 ° @ 64.24 MS; -14.66 ° @ 148.40 MS

PART 572-B HYBRID II HEAD/NECK CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: HN71310 5728 SN713 HEAD/NECK CAL10 RUN NUMBER: 020795 1537;3



CHANNEL: TOTAL FILTER: CH. CLASS 60

PEAK DATA: 66.66 ° @ 61.76 MS; -51.21 ° @ 147.04 MS

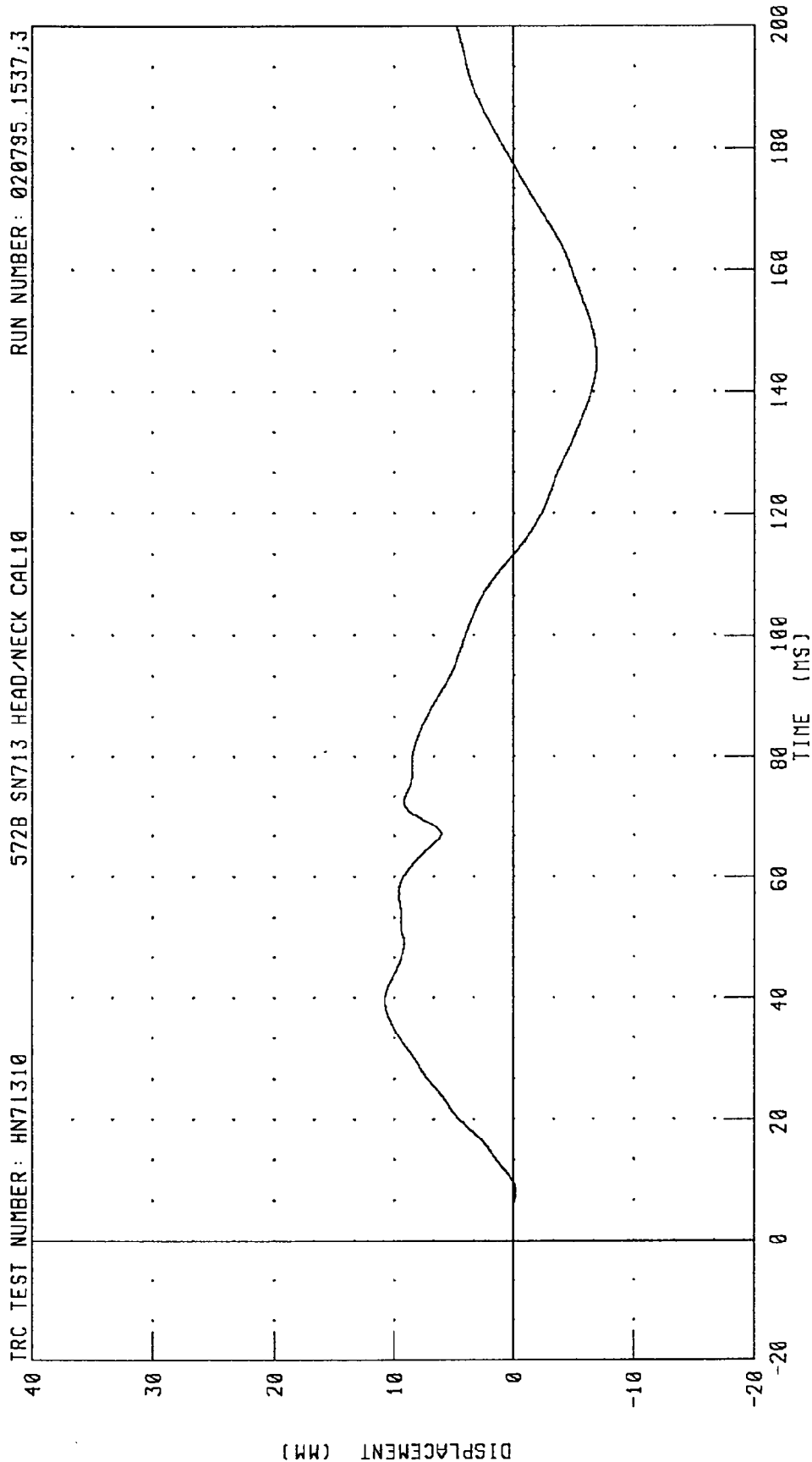
PART 572-B HYBRID II HEAD/NECK CALIBRATION

NECK DISPLACEMENT Z AXIS

TRC TEST NUMBER: HN71310

572B SN713 HEAD/NECK CAL10

RUN NUMBER: 020795.1537;3



PEAK DATA: 10.75 MM @ 39.52 MS; -6.85 MM @ 145.20 MS

CHANNEL: NEKZD FILTER: CH. CLASS 60

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

TRC TEST NUMBER: HN71310 RUN NUMBER: 020795.1537.3

572B SN713 HEAD/NECK CAL10

DISPLACEMENT (MM)

250

200

150

100

50

0

-50

DISPLACEMENT (MM)

TIME (MS)

200

180

160

140

120

100

80

60

40

20

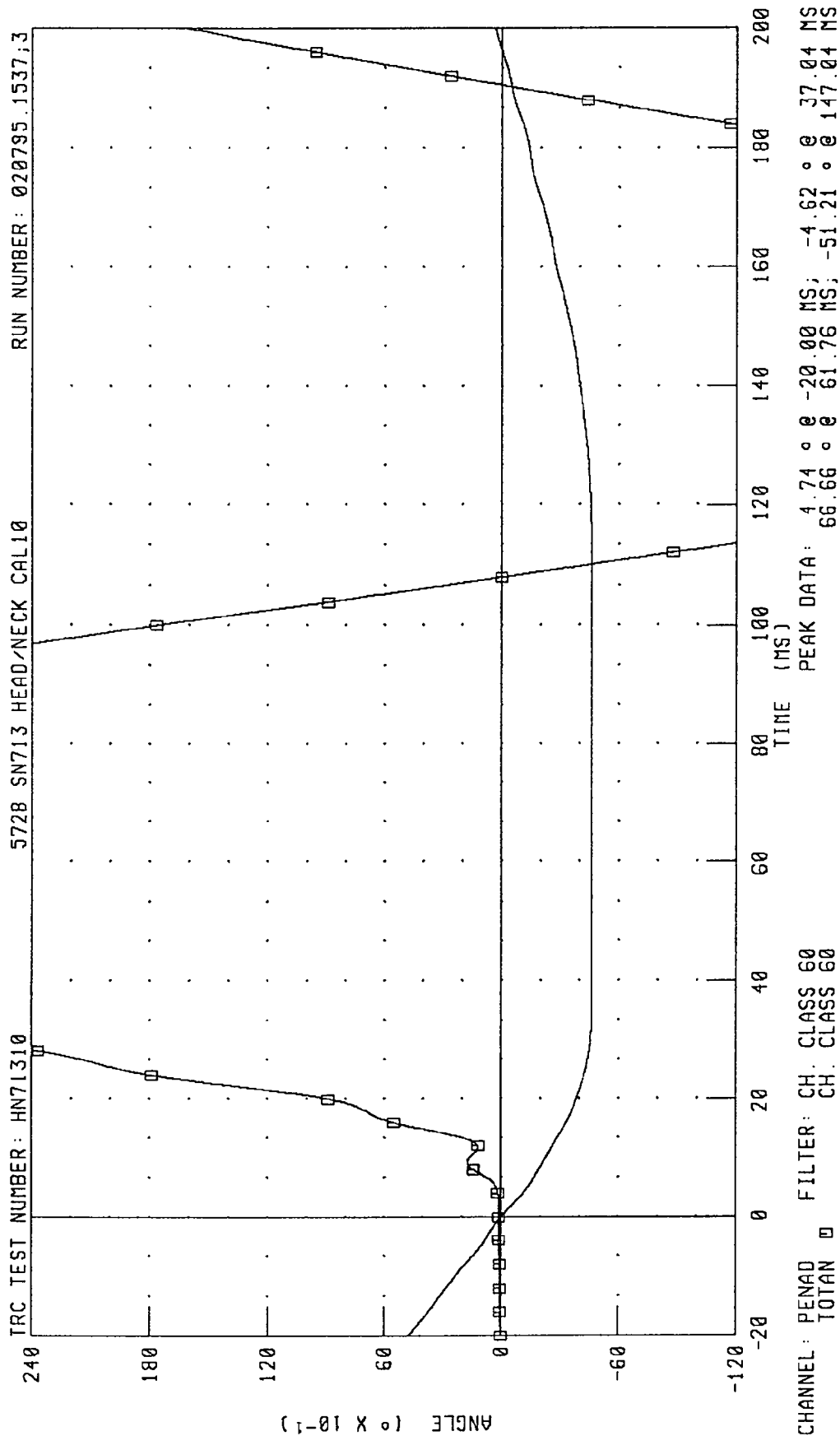
0

-20

CHANNEL: NEKCD FILTER: CH. CLASS 60

PEAK DATA: 137.82 MM @ 58.48 MS; 0.06 MM @ -20.00 MS

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



TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B

03-JAN-95

TRC INC. TEST NO: TL71310

572B SN713 L.S.THORAX CAL10

TEST PARAMETER	LOW SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	26 %
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.	6147. N
INTERNAL HYSTERESIS	50 - 70 %	57.7 %

SCD: 54.61 MM

DUMMY MEETS SPECIFICATIONS

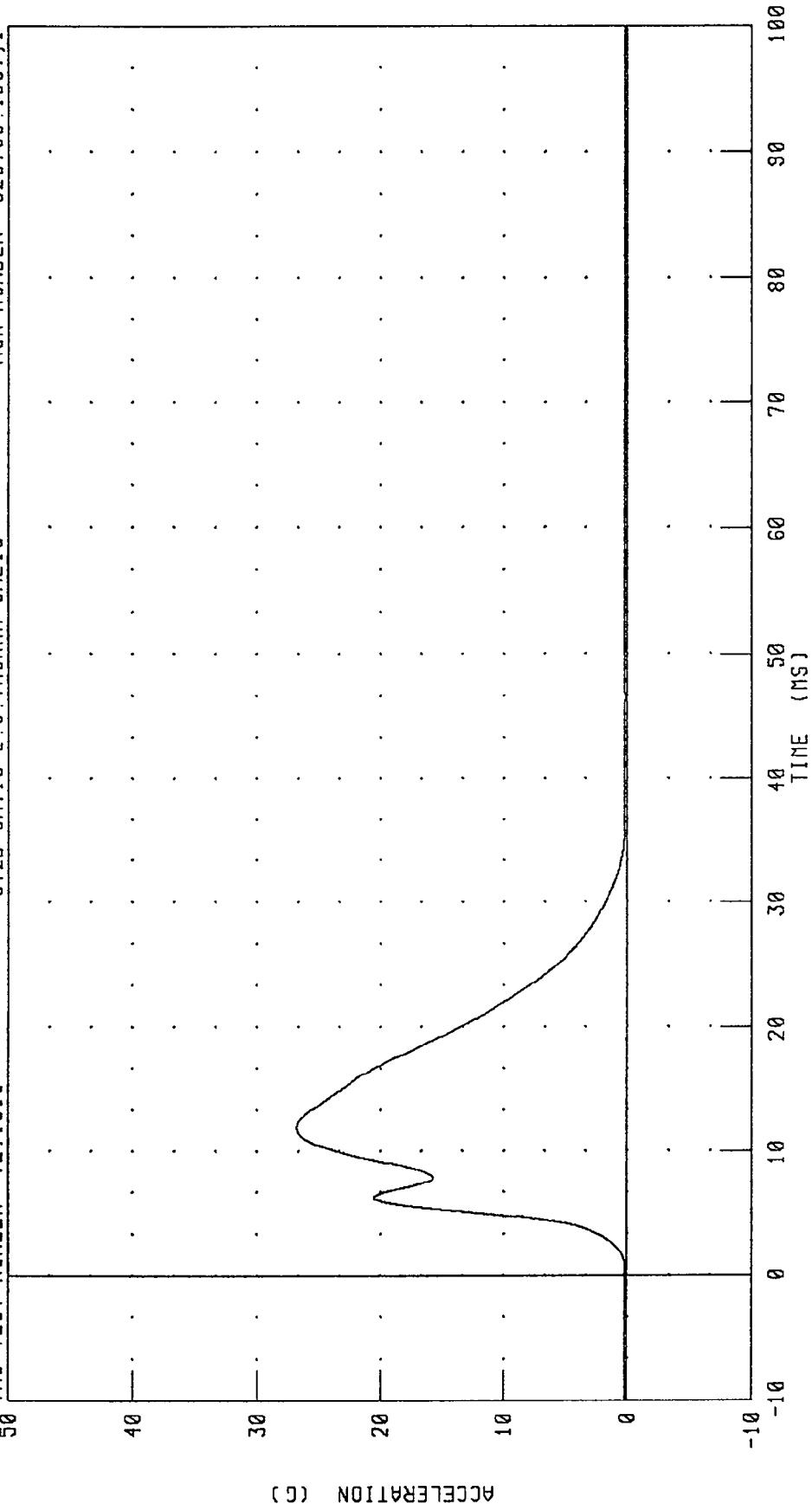
TECHNICIAN Pete Felt

RUN NUMBER: 010395.0757;1

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

PENDULUM DECELERATION

IRC TEST NUMBER: TL71310 572B SN713 L.S. THORAX CALIØ RUN NUMBER: 020795 1537;1

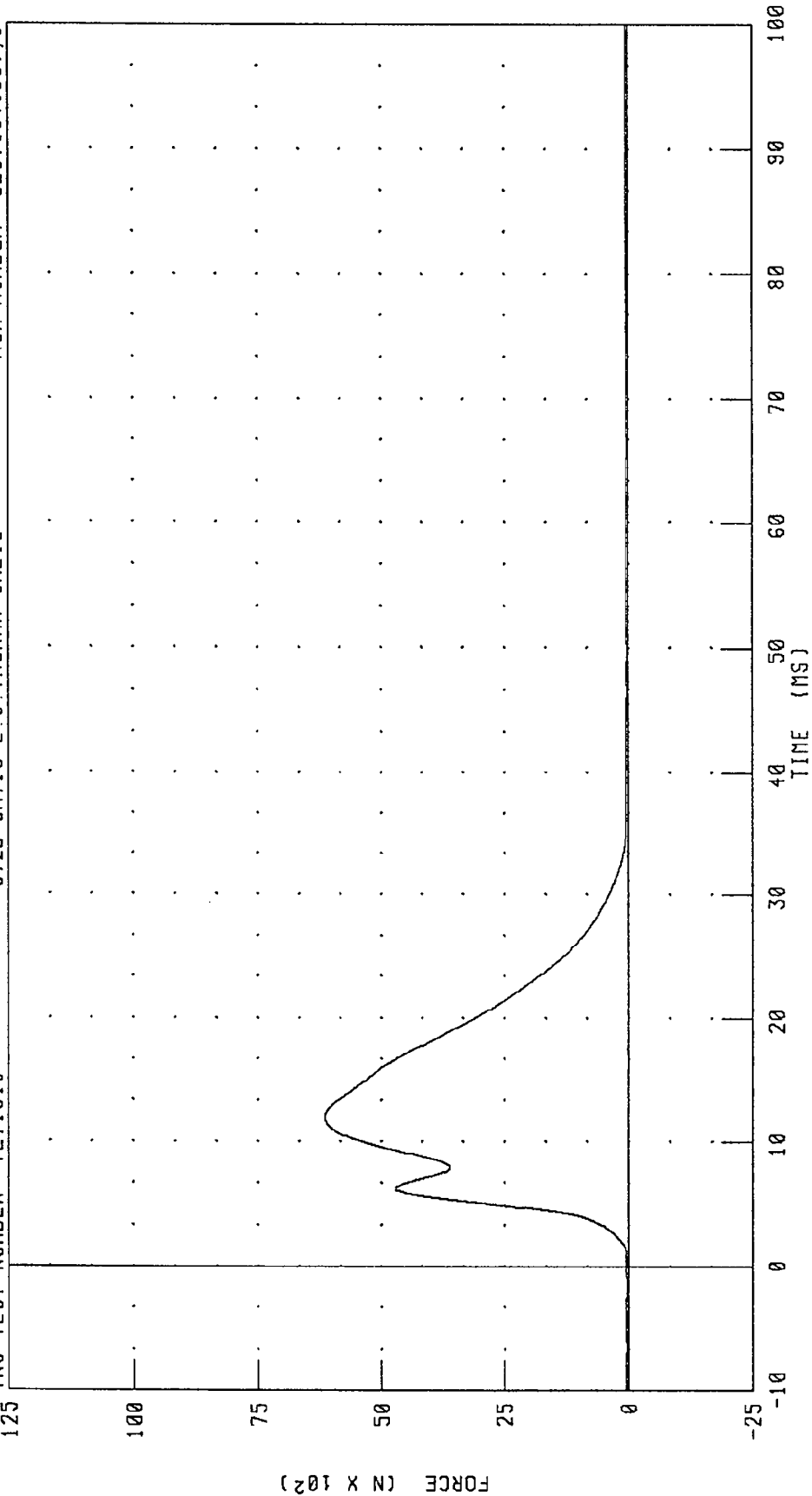


PEAK DATA: 26.83 G @ 11.92 MS; 0.15 G @ 46.48 MS

CHANNEL: PENXG FILTER: CH. CLASS 180

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

TRC TEST NUMBER: TL71310 572B SN713 L.S. THORAX CAL10 RUN NUMBER: 020795.1537;1

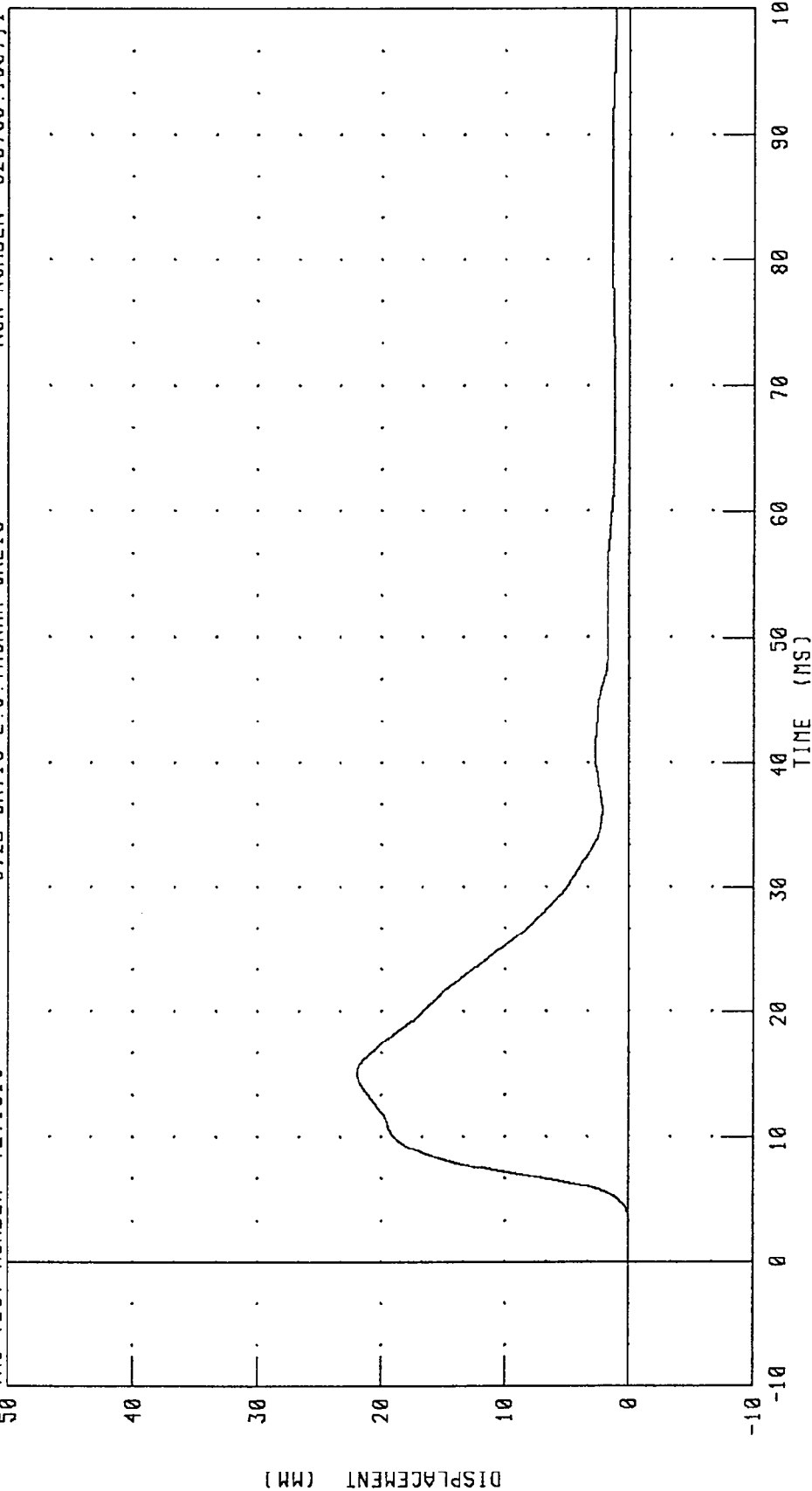


CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 6147.33 N @ 11.92 MS; 34.09 N @ 46.48 MS

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

STERNUM DISPLACEMENT

TRC TEST NUMBER: TL71310 572B SN713 L.S. THORAX CAL10 RUN NUMBER: 020795.1537,1



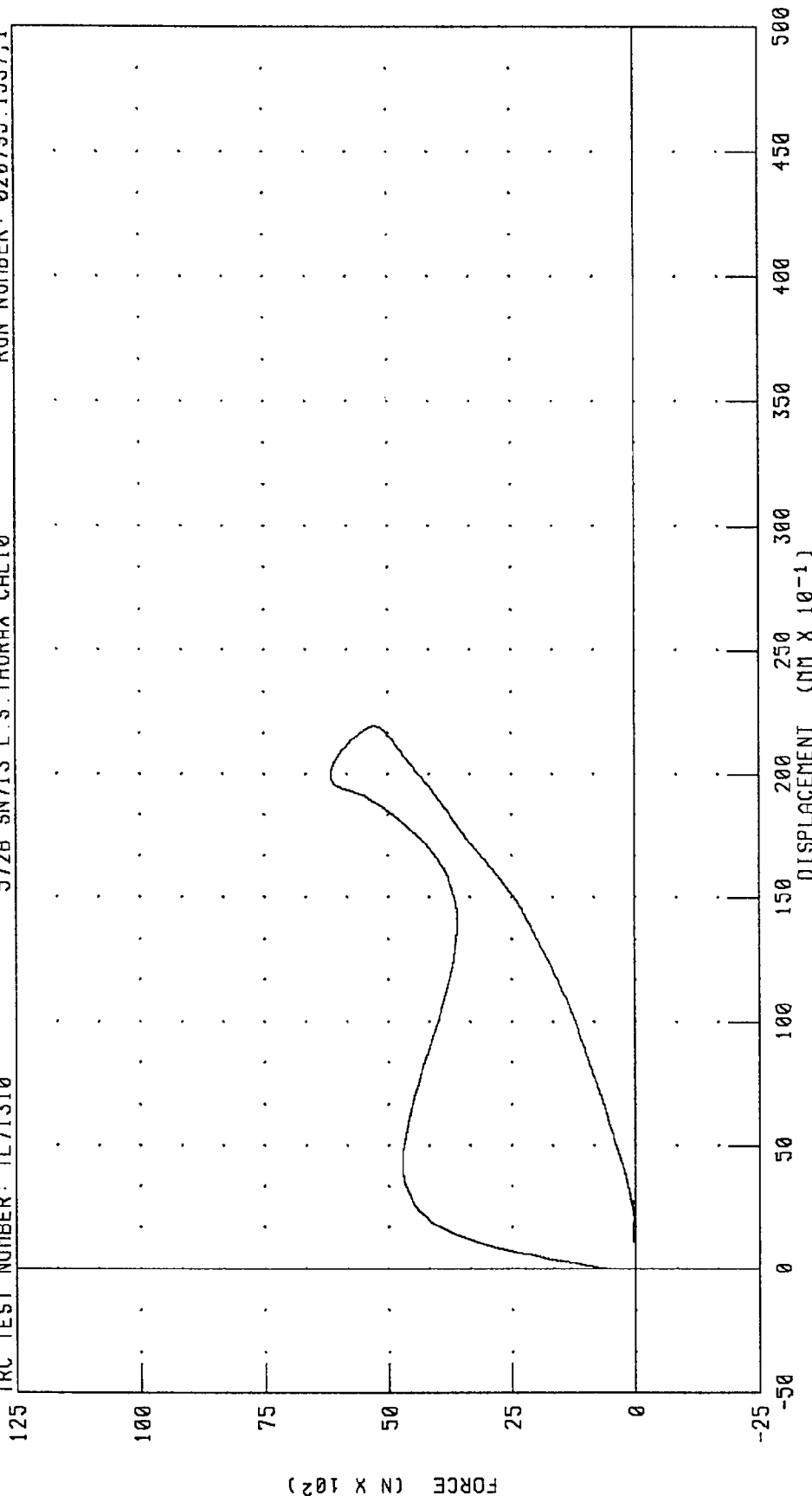
CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 21.97 MM @ 15.04 MS; 0.00 MM @ -3.04 MS

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

TRC TEST NUMBER: TL71310

572B SN713 L.S. THORAX CAL10

RUN NUMBER: 020795.1537,1



PEAK DATA: 21.97 MM @ 15.04 MS; 0.00 MM @ -3.04 MS
6147.33 N @ 11.92 MS; 34.09 N @ 46.48 MS

CHANNEL: CSTXD
PENXF
FILTER: CH. CLASS 180
CH. CLASS 180

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B

03-JAN-95

TRC INC.

TEST NO: TH71310

572B SN713 H.S.THORAX CAL10

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	26 %
PENDULUM VELOCITY	6.64 - 6.77 M/S	6.68 M/S
PEAK STERNUM DEFLECTION	43 MM MAX.	37.14 MM
PEAK RESISTIVE FORCE	10009. N MAX.	9557. N
INTERNAL HYSTERESIS	50 - 70 %	59.7 %

SCD: 54.61 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

P. J. 55

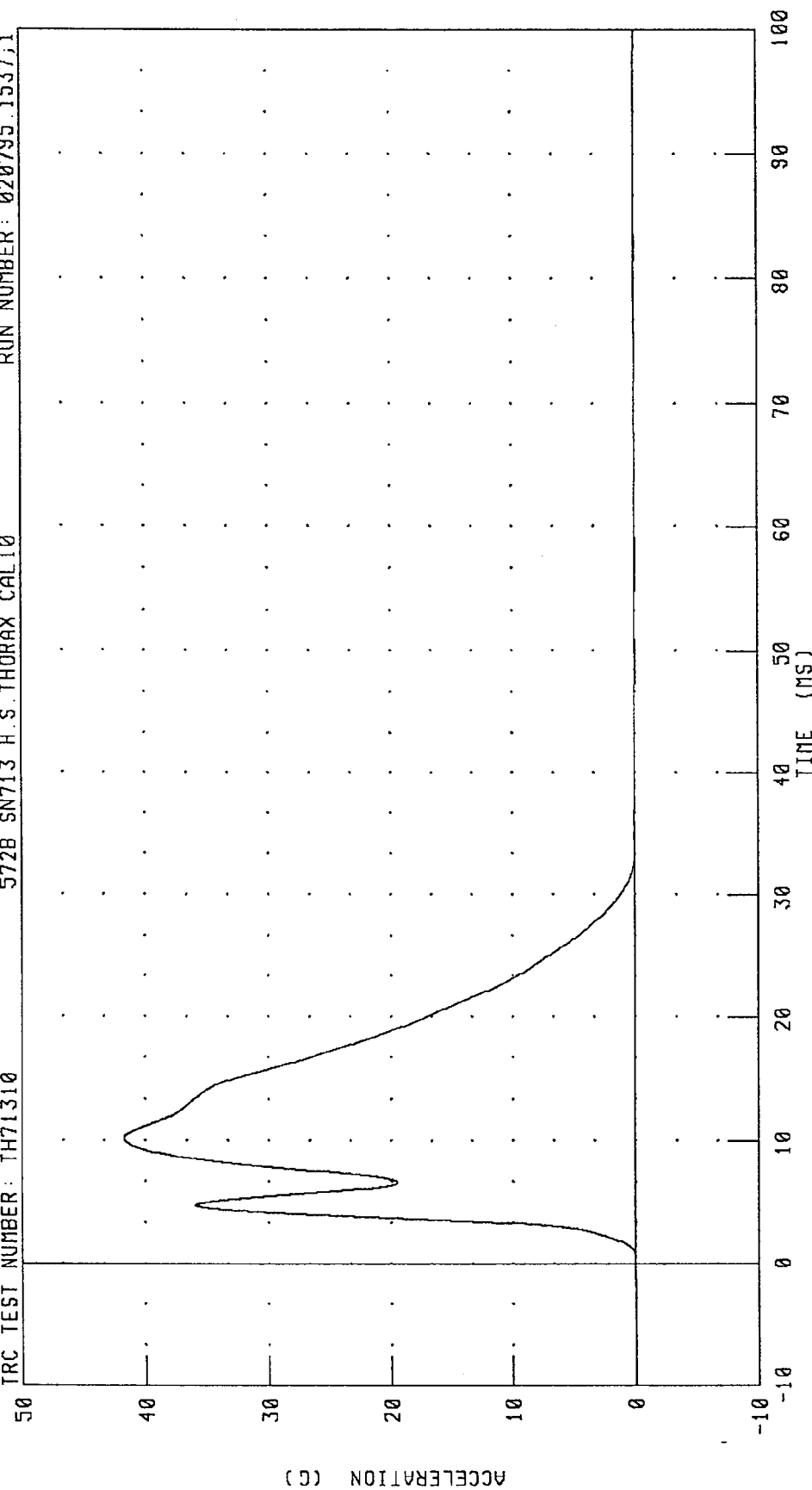
RUN NUMBER: 010395.0828;1

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

TRC TEST NUMBER: TH71310

572B SN713 H.S. THORAX CAL10

RUN NUMBER: 020795.1537,1



PEAK DATA: 41.72 G @ 10.16 MS; -0.05 G @ 65.84 MS

CHANNEL: PENXC FILTER: CH. CLASS 180

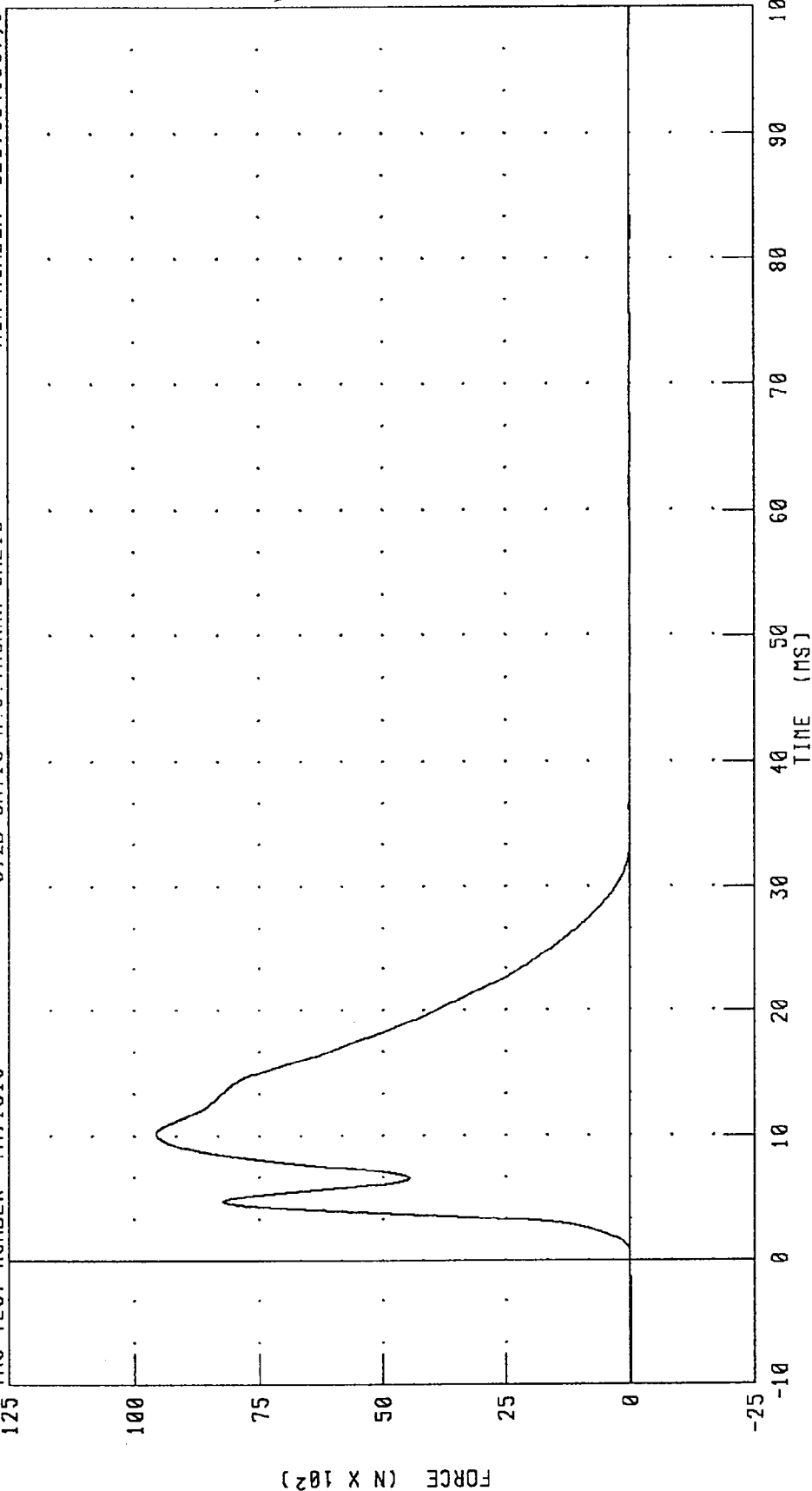
PART 572-B HYBRID II THORAX CALIBRATION (6.7 N/SEC)

PENDULUM FORCE

TRC TEST NUMBER: TH71310

572B SN713 H.S. THORAX CAL10

RUN NUMBER: 020795.1537;1



CHANNEL: PENXF FILTER: CH. CLASS 180

PEAK DATA: 9556.70 N @ 10.16 MS; -12.18 N @ 65.84 MS

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

TRC TEST NUMBER: TH71310

572B SN713 H.S THORAX CAL10

RUN NUMBER: 020795.1537,1

50

40

30

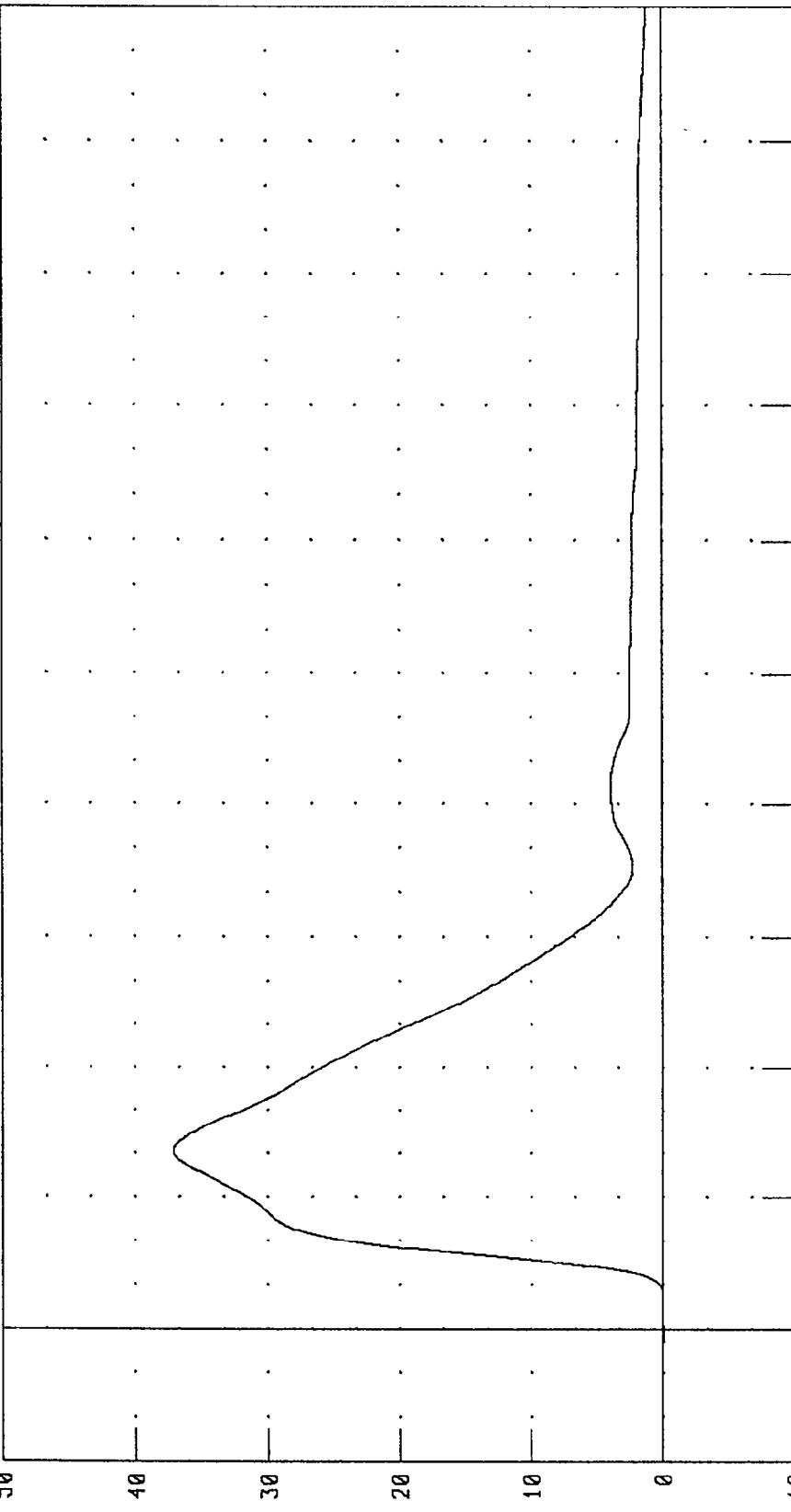
20

10

0

-10

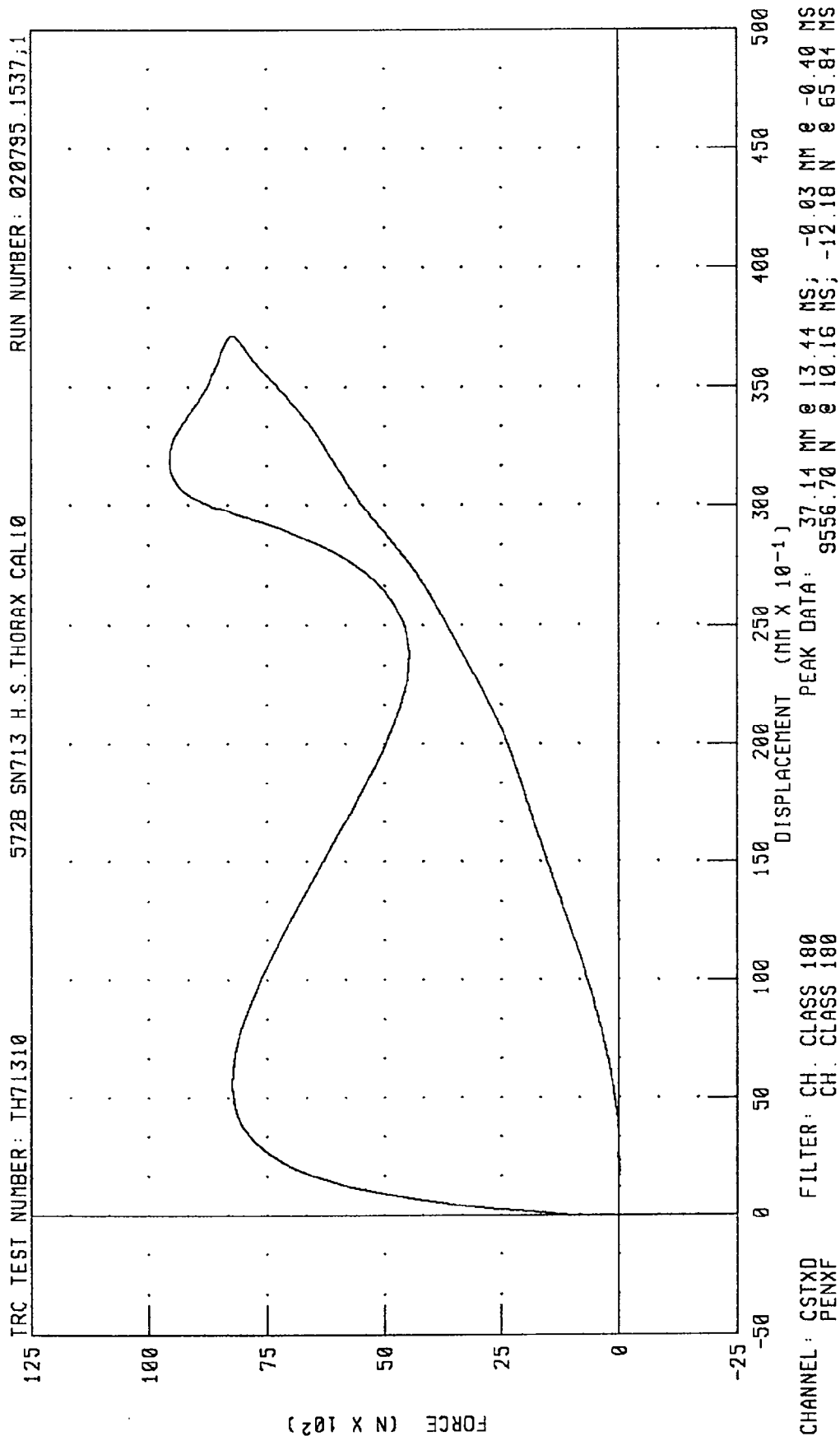
DISPLACEMENT (MM)



PEAK DATA: 37.14 MM @ 13.44 MS; -0.03 MM @ -0.40 MS

CHANNEL: CSTXD FILTER: CH. CLASS 180

PART 572-B HYBRID II THORAX CALIBRATION (6.7 N/SEC)
CHEST DISPLACEMENT VS PENDULUM FORCE



TRANSPORTATION RESEARCH CENTER INC.

ABDOMEN COMPRESSION TEST

PART 572B

02-JAN-95

TRC INC.

TEST NO: AB71310

572B SN713 ABDOM COMP CAL10

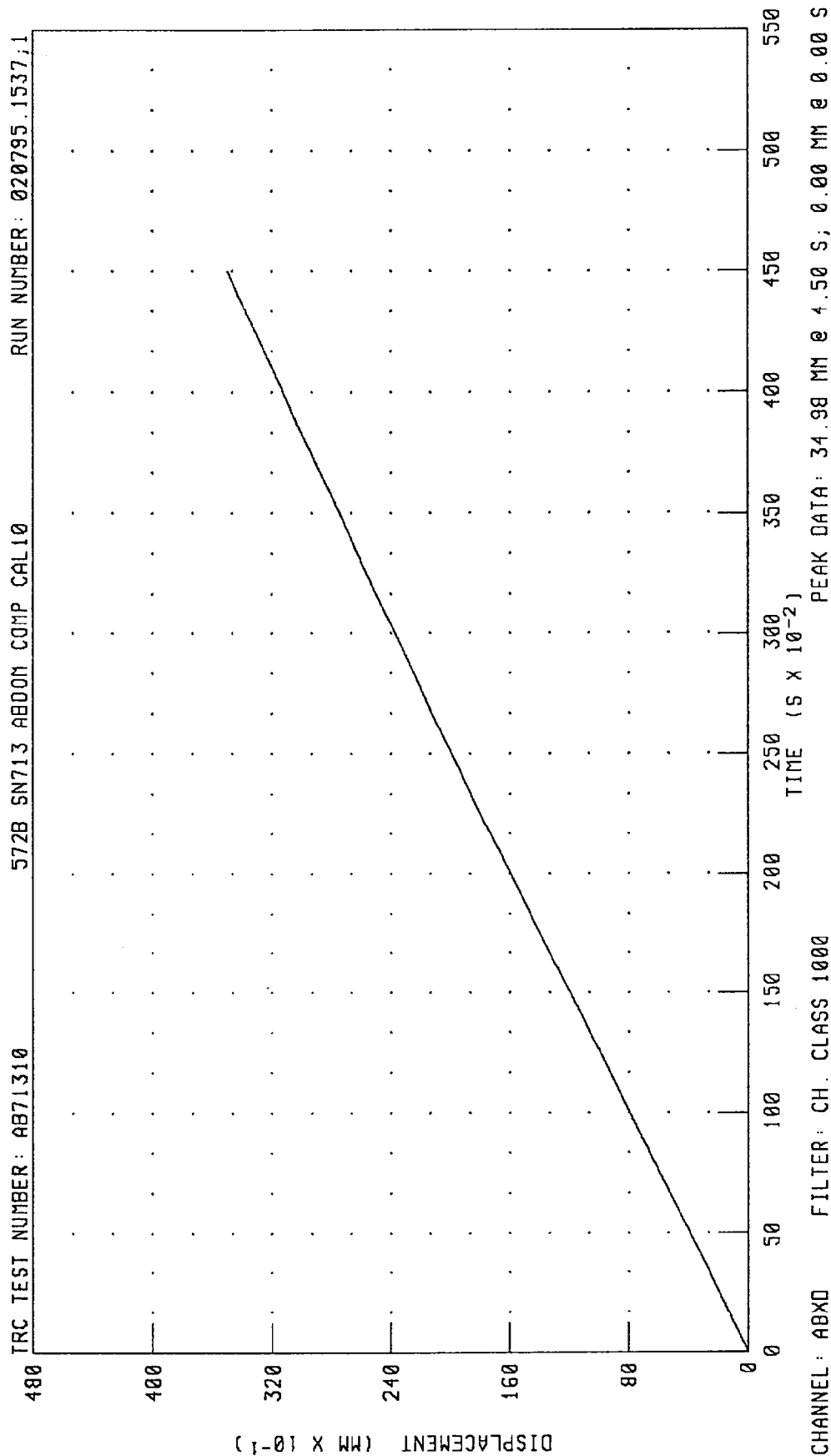
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	33 %
DEFLECTION RATE	6.4 - 8.9 MM/S	7.88 MM/S
FORCE AT 0.00 MM DISP.	44.48 N	44.48 N
FORCE AT 12.7 MM DISP.	102.30 - 160.13 N	123.93 N
FORCE AT 19.1 MM DISP.	160.13 - 222.40 N	179.26 N
FORCE AT 25.4 MM DISP.	222.40 - 280.22 N	250.34 N
FORCE AT 33.0 MM DISP.	324.70 - 391.42 N	360.40 N

DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Rte FJS*

RUN NUMBER: 010295.1120;1

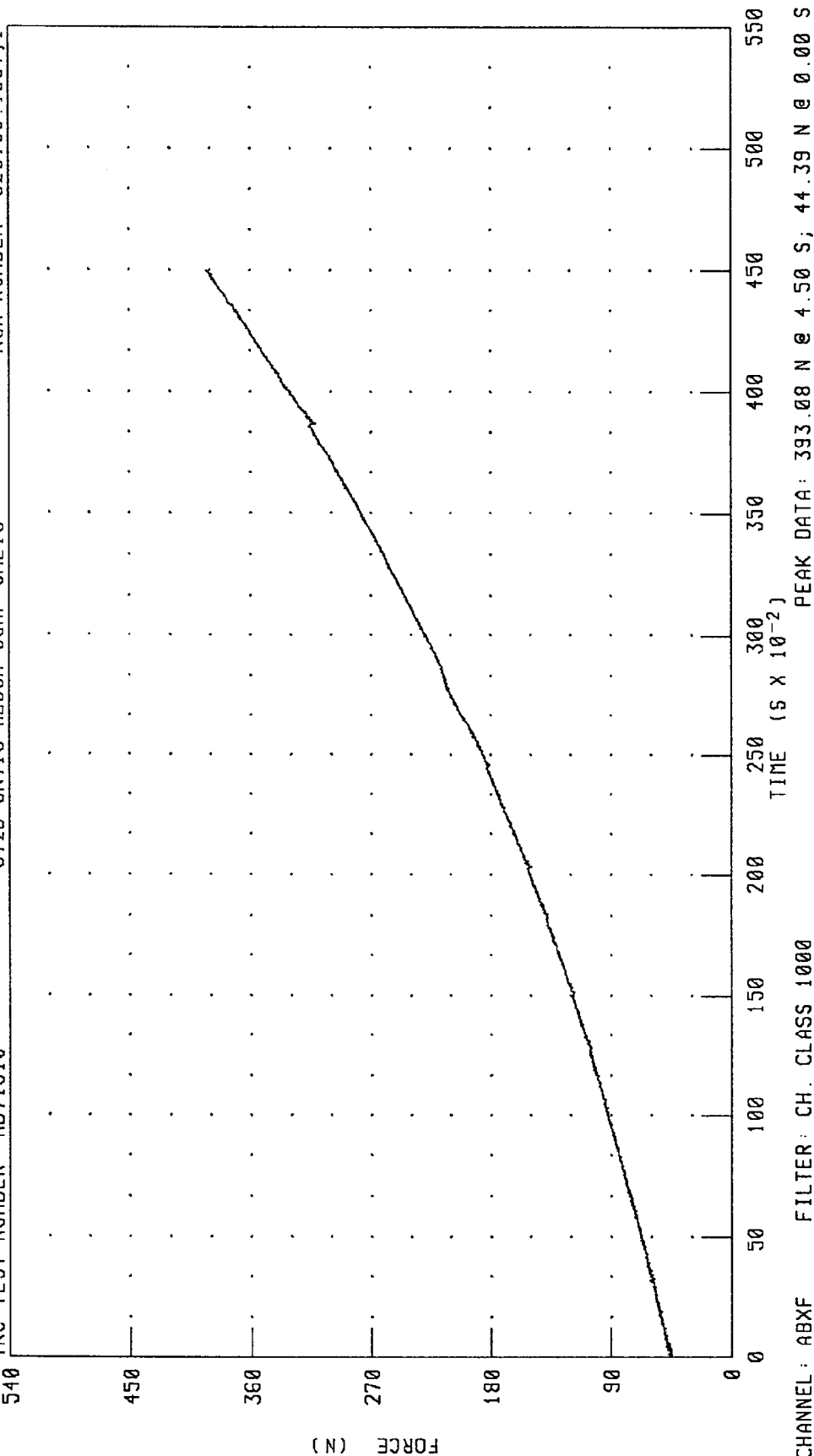
PART 572-8 HYBRID II ABDOMEN CALIBRATION
ABDOMEN DISPLACEMENT



CHANNEL: ABXD FILTER: CH. CLASS 1000

PART 572-B HYBRID II ABDOMEN CALIBRATION ABDOMEN FORCE

TRC TEST NUMBER: AB71310 572B SN713 ABDOM COMP CAL10 RUN NUMBER: 020795.1537;1

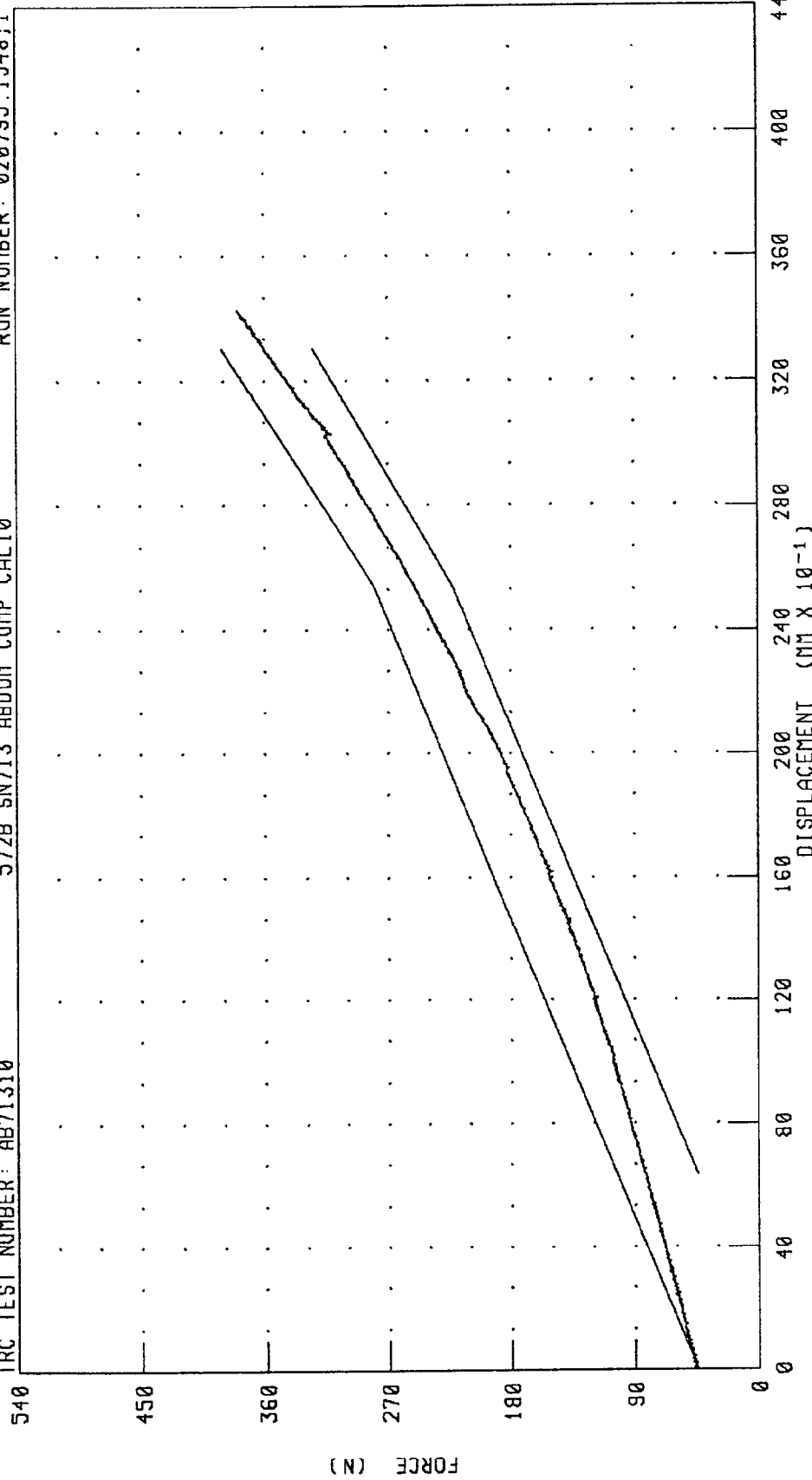


PART 572-B HYBRID II ABDOMEN CALIBRATION
 ABDOMEN FORCE VS DISPLACEMENT

TRC TEST NUMBER: AB71310

572B SN713 ABDOM COMP CAL10

RUN NUMBER: 020795.1548;1



PEAK DATA: 34.29 MM @ 4.41 S; 0.00 MM @ 0.00 S
 379.89 N @ 4.40 S; 44.39 N @ 0.00 S

CHANNEL: ABXD FILTER: CH: CLASS 1000
 ABXF CH: CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

PART 572B

02-JAN-95

TRC INC.

TEST NO: LF71310

572B SN713 LUMBAR FLEX CAL10

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	33 %
FORCE AT 0 DEG. FLEXION	-26.69 - +26.69 N	0.00 N
FORCE AT 20 DEG. FLEXION	97.86 - 151.24 N	115.65 N
FORCE AT 30 DEG. FLEXION	151.24 - 204.62 N	160.13 N
FORCE AT 40 DEG. FLEXION	204.62 - 258.00 N	244.64 N
NET RETURN ANGLE	< 12 DEG.	6.72 DEG.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN P. J. F. J.

RUN NUMBER: 010395.0920

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

PART 572B

03-JAN-95

TRC INC.

TEST NO: RK71310

572B SN713 R.KNEE IMP CAL10

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	26 %
PENDULUM VELOCITY	2.06 - 2.15 M/S	2.14 M/S
PEAK KNEE IMPACT FORCE	8229 - 11121 N	9416.46 N
DURATION ABOVE 4448 N	>=1.7 MS	1.87 MS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Fox

RUN NUMBER: 010395.0841;1

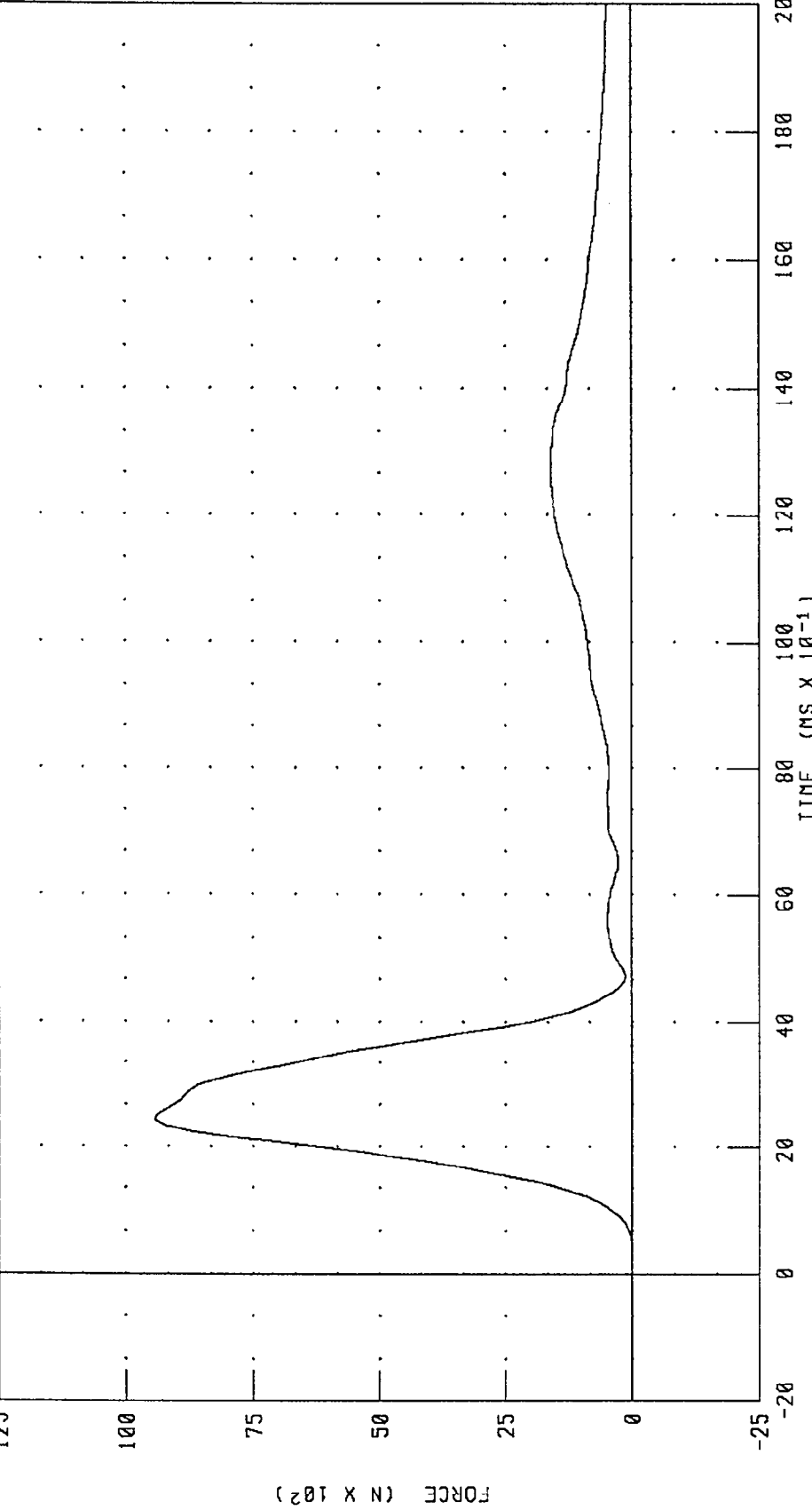
PART 572-B HYBRID II RIGHT KNEE CALIBRATION

RIGHT FEMUR FORCE

TRC TEST NUMBER: RK71310

572B SN713 R.KNEE IMP CALI0

RUN NUMBER: 020795.1537;1



CHANNEL: RFMF

FILTER: CH. CLASS 600

PEAK DATA: 9416.46 N @ 2.40 MS; -1.30 N @ -0.56 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

PART 572B

03-JAN-95

TRC INC. TEST NO: LK71310

572B SN713 L.KNEE IMP CAL10

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	20.0 C
RELATIVE HUMIDITY	10 - 70 %	26 %
PENDULUM VELOCITY	2.06 - 2.15 M/S	2.13 M/S
PEAK KNEE IMPACT FORCE	8229 - 11121 N	9082.35 N
DURATION ABOVE 4448 N	>=1.7 MS	1.71 MS

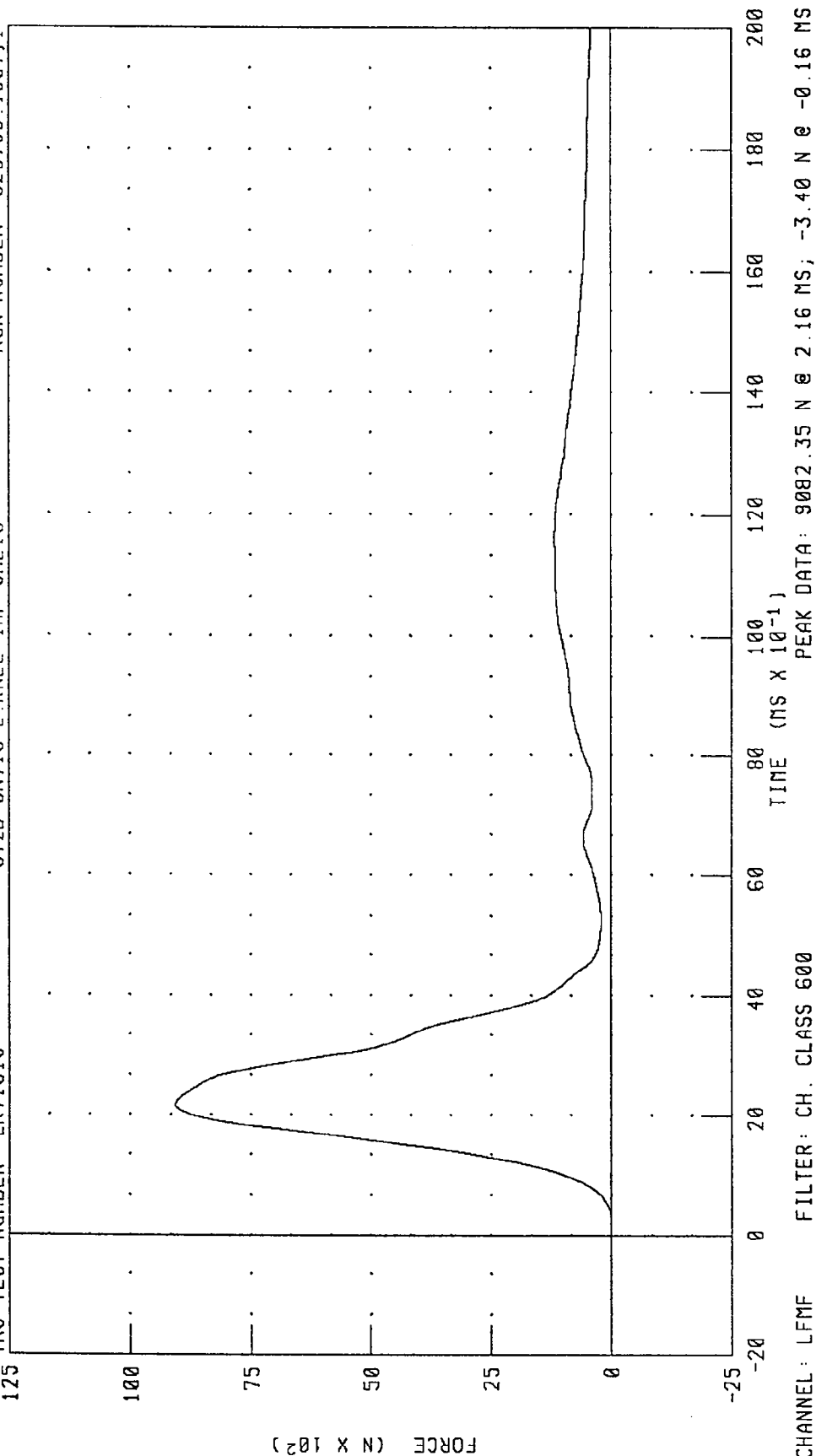
DUMMY MEETS SPECIFICATIONS

TECHNICIAN Rita F. S.

RUN NUMBER: 010395.0837;1

PART 572-B HYBRID II LEFT KNEE CALIBRATION
LEFT FEMUR FORCE

TRC TEST NUMBER: LK71310 572B SN713 L KNEE IMP CAL10 RUN NUMBER: 020795.1537;1



CHANNEL: LFMF FILTER: CH. CLASS 600 PEAK DATA: 9082.35 N @ 2.16 MS; -3.40 N @ -0.16 MS

Appendix D

Miscellaneous Test Information

Dummy Instrument Calibrations

Driver Dummy #192

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Head X-axis accelerometer	AAL82	7264	Endevco	08/30/94	03/01/95
Head Y-axis accelerometer	A84JJ	7264	Endevco	08/30/94	03/01/95
Head Z-axis accelerometer	DW04J	7264	Endevco	08/30/94	03/01/95
Chest X-axis accelerometer	CT22H	7264	Endevco	08/30/94	03/01/95
Chest Y-axis accelerometer	AC708	7264	Endevco	08/30/94	03/01/95
Chest Z-axis accelerometer	CW59H	7264	Endevco	08/30/94	03/01/95
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	085	1716	Denton	08/30/94	03/01/95
Neck Y-axis force load cell ¹	085	1716	Denton	08/30/94	03/01/95
Neck Z-axis force load cell ¹	085	1716	Denton	08/30/94	03/01/95
Neck Moment about X-axis load cell ¹	085	1716	Denton	08/30/94	03/01/95
Neck Moment about Y-axis load cell ¹	085	1716	Denton	08/30/94	03/01/95
Neck Moment about Z-axis load cell ¹	085	1716	Denton	08/30/94	03/01/95
Pelvis X-axis accelerometer	AJ694	7264	Endevco	10/11/94	04/11/95
Pelvis Y-axis accelerometer	AJ656	7264	Endevco	10/11/94	04/11/95
Pelvis Z-axis accelerometer	AJ788	7264	Endevco	10/11/94	04/11/95
Chest deflection potentiometer ¹	87313-96	81422A	Vernitech	08/30/94	03/01/95

¹Hybrid III use only.

Dummy Instrument Calibrations

Right Front Passenger Dummy #713

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Head X-axis accelerometer	AAMT5	7264	Endevco	12/29/94	06/29/95
Head Y-axis accelerometer	CT44H	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	962	2430	GSE	12/29/94	06/29/95
Right femur force load cell	982	2430	GSE	12/29/94	06/29/95
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

Vehicle and Calibration Laboratory Instrument Calibrations

Vehicle Accelerometers

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Left rear seat crossmember X-axis	AGR85	7264	Endevco	10/07/94	04/07/95
Left rear seat crossmember X-axis redundant	AGRG7	7264	Endevco	09/08/94	03/08/95
Right rear seat crossmember X-axis	DW34JC	7264	Endevco	10/27/94	04/27/95
Right rear seat crossmember X-axis redundant	DT96JT	7264	Endevco	11/07/94	05/07/95
Engine top X-axis	DR10JT	7264	Endevco	09/08/94	03/08/95
Engine bottom X-axis	EA25J	7264	Endevco	10/21/94	04/21/95
Right brake caliper X-axis	AGR75	7264	Endevco	09/13/94	03/13/95
Left brake caliper X-axis	AGR85	7264	Endevco	10/07/94	04/07/95
Instrument panel center X-axis	CC71H	7264	Endevco	10/07/94	04/07/95

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

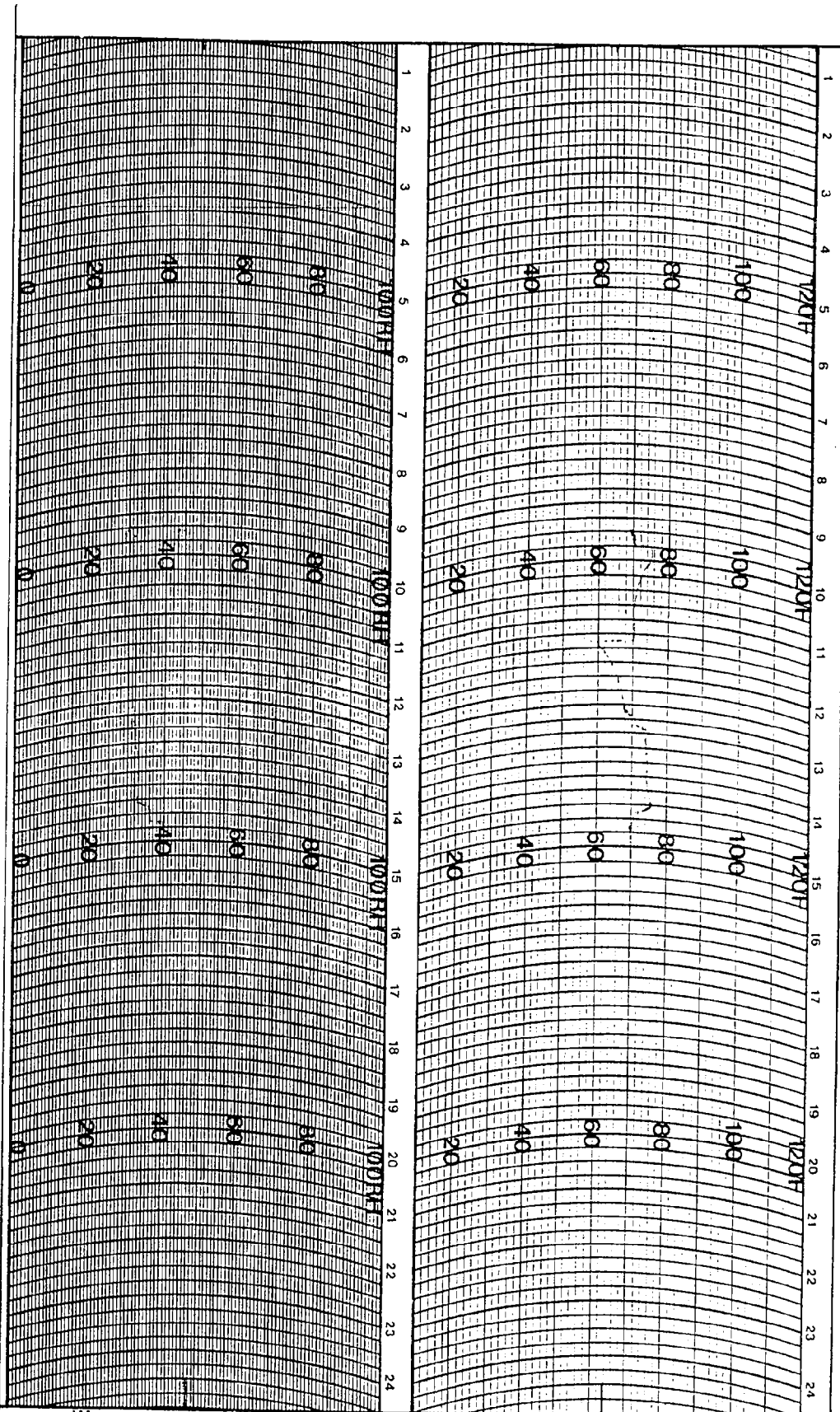
Sign Convention
NHTSA Data Tape Reference Guide

<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

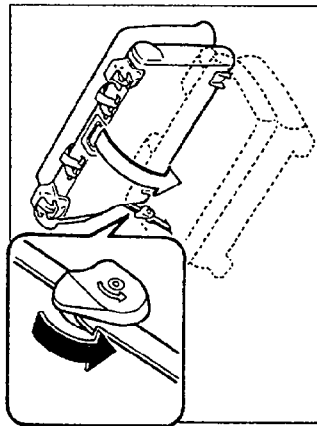
STATION _____ DATE ON _____ DATE OFF _____

Appendix E

Restraint System Instructions from Owner's Manual

⚠ WARNING

Stacking Luggage and Other Cargo: Stacking luggage and other cargo higher than the seat backs can be dangerous. During a sudden stop or collision, it can become a projectile that may hit and injure passengers. Don't stack things higher than the seat backs.



Seat Belt System

Seat belts help decrease the possibility or severity of injury during accidents and sudden stops. Mazda recommends that the driver and passengers wear seat belts at all times.

The front seats have a lap/shoulder belt. These belts have retractors with inertia locks that keep them out of the way when not in use. The locks allow the belts to remain comfortable on users, but they'll lock in position during a collision.

▼ To right rear seat No. 2

The rear seat has lap/shoulder belts that have retractors with inertia locks for the door-side seats and a lap belt with manual adjustment for the center seat.

1. First slip both seat belt tongues over their hooks.
2. Unlock the seat safety stand by turning the release lever with one hand and holding the seat with the other.
3. Use both hands to lower the seat on the outside of the cushion until it is locked.
4. Pull the seat back handle and lift the seat back until it's locked.
5. Unhook the seat belt hooks.

⚠ WARNING

Seat Belts:
 Passengers not wearing seat belts during a collision can be injured much worse than those wearing seat belts. They can hit things inside the vehicle or even be thrown from it. They can be seriously injured or killed. In the same collision, passengers wearing seat belts might be much safer.

⚠ WARNING

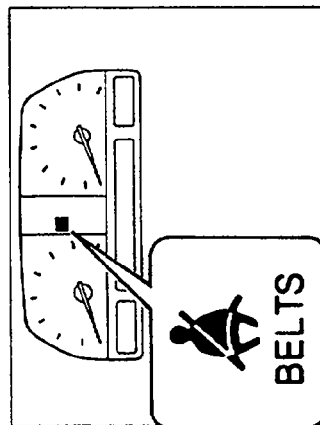
Damaged Seat Belts:
 An accident can damage a seat belt in use. The belt webbing can be weakened and retractors and anchors can be bent or broken. Therefore a damaged seat belt may not provide adequate protection in a collision. Have a professional inspect all seat belt systems in use during an accident before they are used again.

⚠ WARNING

One Belt, One Passenger:
 Using one seat belt for more than one person at a time is dangerous. A seat belt used in this way can't spread the impact forces properly and the two passengers could be crushed together and seriously injured. Never use one belt for more than one person at a time.

⚠ WARNING

Twisted Seat Belts:
 Twisted seat belts can cause injury. In a collision, the full width of the belt isn't available to absorb the impact. This puts more force on the bones beneath the belt, which could break them or cause other serious injury. Don't wear twisted seat belts.



■ Seat Belt Warning Light/Beep

When you turn on the ignition before fastening your seat belt, a warning light will come on and a beep will sound (warning lights/beeps, page 4-34).



■ Front Seat Belts

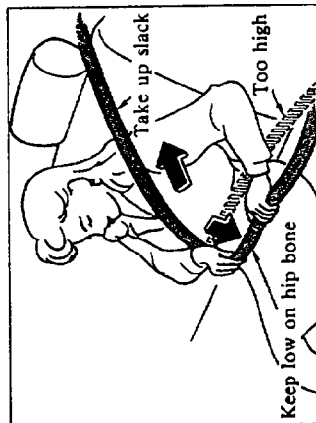
To fasten:

1. Grasp the buckle and tongue plate.
2. Slowly pull out the lap/shoulder belt.
3. Insert the plate into the buckle until you hear a click.

⚠ WARNING

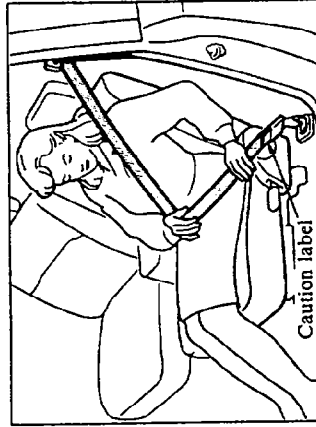
Positioning the Shoulder Portion of the Seat Belt:

Failure to position the shoulder portion of the seat belt properly reduces the amount of protection in an accident and increases the chance of injury. Make sure the shoulder portion of the seat belt is positioned across your shoulder near your neck, not on your neck or upper arm.



To unfasten:

Depress the buckle release.



■ Seat Belt Caution Label

A caution label is inside the sleeve of each lap belt. If a belt is used in an accident, the stress will cause this label to be pulled from the sleeve.

This indicates that the seat belt must be replaced.

Also, if the seat belt undergoes excessive stress at any time, the belt's webbing, metal fittings, and anchor bolt may be damaged. The damage may not be apparent, so the

⚠ WARNING

Positioning the Lap Portion of the

Seat Belt:

The lap portion of the seat belt worn too high can be dangerous. In a collision, this would concentrate the impact force directly on the abdominal area, causing serious injury. Wear the lap portion of the belt snugly and as low as possible.

Knowing Your Mazda

seat belt should be replaced after this kind of stress, even if the label is not exposed.



To unfasten:

Depress the button on the buckle.

NOTE

If a belt does not fully retract, inspect it for kinks and twists.

■ Rear Seat Belts

▼ Lap/shoulder belt

To fasten:

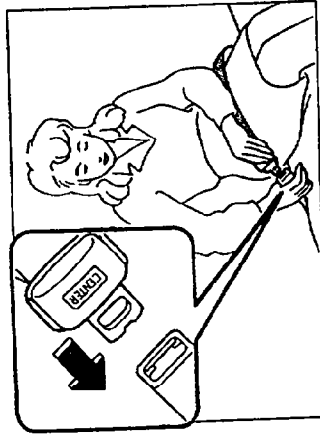
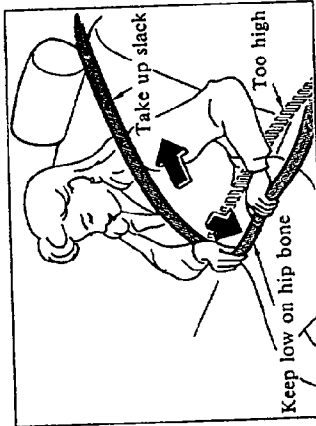
1. Grasp the tongue plate and pull it to the desired length.
2. Insert this plate into the buckle until you hear a click.

The retractor will take up excess belt and maintain tension.

⚠ WARNING

Positioning the Shoulder Portion of the Seat Belt:

Failure to position the shoulder portion of the seat belt properly reduces the amount of protection in an accident and increases the chance of injury. Make sure the shoulder portion of the seat belt is positioned across your shoulder near your neck, not on your neck or upper arm.



▼ Lap belt

To fasten:

1. Pull the tongue to the desired length.
2. Insert it into the buckle until you hear a click.

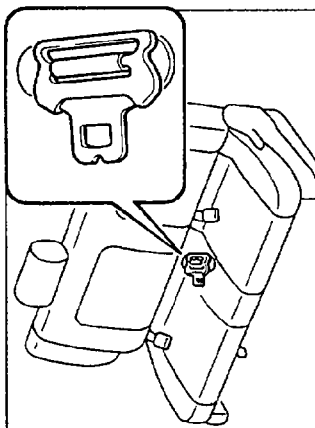
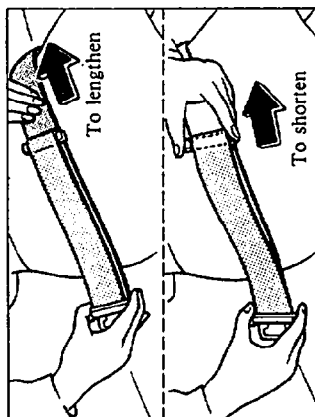
⚠ WARNING

Positioning the Lap Portion of the

Seat Belt:

The lap portion of the seat belt worn too high can be dangerous. In a collision, this would concentrate the impact force directly on the abdominal area, causing serious injury. Wear the lap portion of the belt snugly and as low as possible.

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3. To lengthen the belt, hold the tongue at a right angle to the webbing and pull; to shorten, pull the loose end of the webbing.

To unfasten:

Depress the button on the buckle.

NOTE

On 7 passengers models, the lap belt on rear seat No. 1 adjusts automatically and retracts when not in use.

⚠ WARNING

Wearing the Lap Belt:
A lap belt worn too high can be dangerous. In a collision, this would concentrate the impact force directly on the abdominal area, causing serious injury. Wear the lap belt snugly and as low as possible.

■ Pregnant Women

Pregnant women should wear seat belt assemblies as recommended by their doctors. The lap belt should be worn **SNUGLY AND AS LOW AS POSSIBLE.**

■ Small Children

Small children should be protected by a child-restraint system that meets the Federal Motor Vehicle Safety Standard (FMVSS).

It should fit the seat and the child.

NOTE

Every child-restraint system is designed for use with a lap belt or the lap-belt portion of a lap/shoulder belt.

Follow all instructions when installing a child-restraint system, which should be secured with the lap portion of the lap/shoulder belt. Since accident statistics reveal that a child is safer in the rear seat, we recommend that the child-restraint system be placed in the rear seat.

⚠ WARNING

Unsecured Restraint System:

A child restraint system that is not securely fastened down can be dangerous. In a sudden stop or collision, it can become a projectile and hit someone, causing serious injury. When not in use, remove it from the vehicle or fasten it with a seat belt.

⚠ WARNING

Holding a Child:

A child should never be held on the lap or in the arms of a passenger in a moving vehicle. No matter how strong a person may be, he or she cannot hold a child during an accident. The child may thus be injured by hitting parts of the vehicle or by being crushed by an unrestrained passenger.

⚠ WARNING

Unattended Children:

Leaving children unattended in a vehicle can be dangerous. In hot weather, temperatures inside a parked vehicle can become high enough to cause brain damage or even death. Never leave children or animals unattended in the vehicle.

⚠ WARNING

Child-Restraint Anchor:

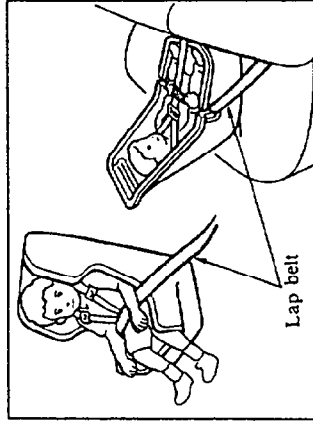
Your Mazda has no child-restraint anchor. Therefore, using a child-restraint system that requires an anchor can be dangerous. In a collision, it would not be properly secured; thus it could move around in the cabin and seriously injure someone. Use only a system designed for use without an anchor.

■ Installing a Child-Restraint System

⚠ WARNING

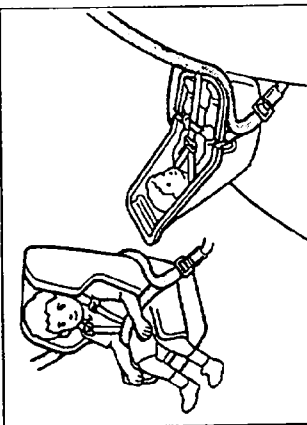
Improperly Secured System:

An improperly secured child restraint may move in a sudden stop or collision and injure the child or someone else. To properly secure it, follow the restraint manufacturer's recommendations along with the installation instructions in this manual.



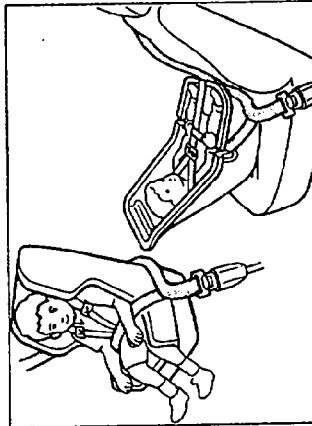
▼ Rear center position

Secure the system with a lap belt. Adjust for a snug fit by pulling on the loose end of the belt webbing.



▼ Rear door-side positions

1. Secure the system with the lap portion of the lap/shoulder belts.
2. Tighten the lap portion by pulling up on the shoulder portion.
3. Tuck the shoulder portion of the belt between the system's seat and the rear seat back.



▼ Front seat passenger position

1. Slide the seat as far back as possible.
2. Secure the system with the lap portion of the lap/shoulder belt.
3. Tighten the lap portion by pulling up on the shoulder portion.
4. Tuck the shoulder portion of the belt between the system's seat and the back.

■ Older Children

A child who has outgrown child-restraint systems should sit in the rear and use seat belts, both lap and shoulder. If the shoulder belt crosses the neck or face, move the child closer to the center.

Accident statistics reveal that a child is safer in the rear seat.

⚠ CAUTION

A seat belt or child restraint can become very hot in a closed vehicle during warm weather. To avoid burning yourself or a child, inspect either before using.

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Supplemental Restraint System —Driver's Side

In a front-end accident, the supplemental restraint system with a driver's side air bag is designed to provide protection for the driver in addition to the three-point seat belt system.

The MPV meets all safety standards required for multipurpose passenger vehicles, but the air bag does not meet all requirements for passenger car certification.

⚠ WARNING

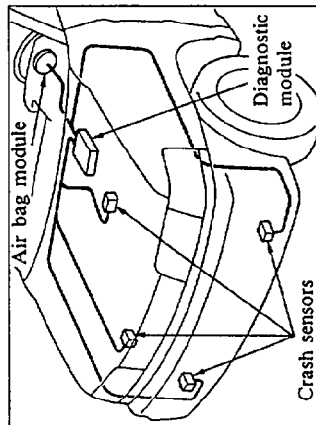
The Importance of Seat Belts:

The air bag must have assistance from the seat belt system to provide its best protection. Alone, the air bag may not prevent severe injury in an accident. Vehicle occupants should always wear seat belts.

⚠ WARNING

Air Bag Activation:

The air bag will inflate only during a frontal or near-frontal collision that is at least moderate in force. In other kinds of accidents, such as side impact, rear impact or roll over, only the seat belt can protect the driver because the air bag will not activate. Vehicle occupants should always wear seat belts to help reduce the possibility of injury during a sudden stop or an accident.

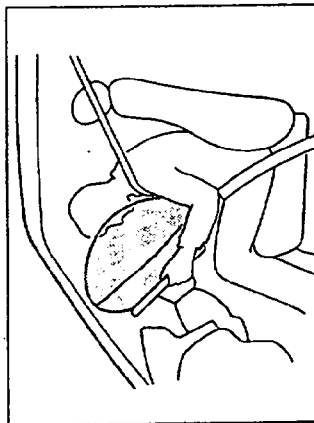


■ System Description

The supplemental restraint system has two basic subsystems:

- 1) The air bag system with inflator and air bag
- 2) The electric system with crash sensors and diagnostic module

The air bag is mounted in the center of the steering wheel, but it is out of sight until activated.



⚠ WARNING

*Seating Position:
Sitting too close to the air-bag storage compartment or placing hands on it increases the risk of injury if the air bag inflates. The driver should hold onto only the steering wheel rim, adjust the seat as far back as possible, and always sit upright against the seat back.*

NOTE

- During a severe front-end impact, you will hear a loud inflation noise and some smoke will be released. Neither will cause injury, and the smoke doesn't indicate a fire.
 - The air bag will function only once. After that, the air bag will not work again and must be replaced.
- Only an Authorized Mazda Dealer can replace the system.

■ How the Air Bag Works

When air bag crash sensors detect a greater than moderate frontal impact, an electrical current is sent to the inflator. Nitrogen gas is produced to inflate the bag. After the inflation, the air bag quickly deflates.

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⚠ WARNING

Modification of the Supplemental Restraint System:

Modifying the components or wiring of the supplemental restraint system is dangerous. You could accidentally activate it or make it inoperable. Don't make any modifications to the supplemental restraint system. This includes installing trim, badges, and anything else over the steering wheel hub. It also includes installing extra electric equipment on or near system components and wiring.

⚠ WARNING

Air Bag Storage Area:

Attaching an object to an air bag storage area or placing one in front of it is dangerous. In an accident, the object could interfere with air bag inflation or injure the occupants. Always keep the air bag storage area free of objects.

⚠ WARNING

Air Bag Inspection after a Collision:

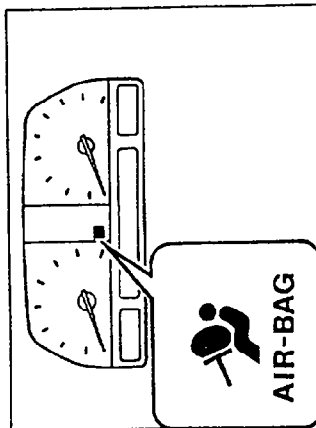
If your Mazda was in a collision not strong enough to inflate the air bag, parts on which the sensors are mounted may be distorted, and without repairs the system may not operate when necessary. Have an Authorized Mazda Dealer make a very careful inspection of the system.

■ Constant Monitoring

These components are monitored by the supplemental restraint system warning light or beeper:

- Crash sensors
- Air bag module
- Diagnostic module
- Related wiring
- Warning light

A diagnostic module continuously monitors the system's readiness. This begins when the ignition is turned on and continues while the vehicle is being driven.



▼ Warning beeper

A warning light is the basic method of reporting the system's condition.

But if the light is out and a malfunction occurs, a series of beeps will be heard.

This also signals need for servicing. Consult an Authorized Mazda Dealer at your first opportunity.

These beeps will continue until the reason for the light being out is taken care of.

Again: **if this happens, the system may not work in an accident.**

▼ Warning light

If the supplemental restraint system is OK, the warning light comes on when the ignition is turned on or after the engine is cranked. After about 6 seconds it goes out.

A system malfunction is indicated when this light constantly flashes or stays on or if it doesn't come on at all. If one of these happens, consult an Authorized Mazda Dealer as soon as possible. The system may not work in an accident.

⚠ WARNING

Supplemental Restrain System Service:
Don't try to self-service the system. Tampering with it could cause it to activate, and this could result in injury. For servicing and repairs, have an Authorized Mazda Dealer do the work.

⚠ WARNING

Air Bag Disposal:
Disposing of an air bag can be dangerous. Unless all safety procedures are followed, injury can result. Ask an Authorized Mazda Dealer how to safely dispose of an air bag or how to scrap an air bag equipped vehicle.

■ Maintenance

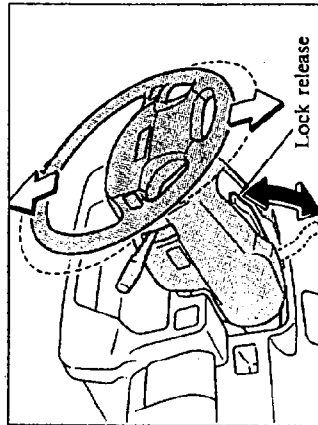
This supplemental restraint system is maintenance-free. But if any of the following occurs, take your vehicle to an Authorized Mazda Dealer as soon as possible.

- Warning light flashes
- Warning light stays on
- Warning light stays off when the ignition is turned on and warning beeps sound
- Air bag inflates

NOTE

Should you sell your Mazda, we urge you to tell the new owner it has a supplemental restraint system and that he or she should become familiar with all instructions about it in the Owner's Manual.

Steering Wheel



■ Tilt Wheel

To change the angle of the steering wheel, pull down the lock release under the steering column, adjust the wheel, and push up the release lever to lock the column.

After adjusting, push the wheel up and down to be certain it's locked.